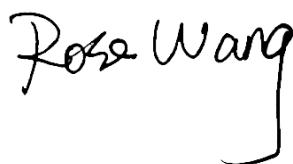


# FCC SAR Test Report

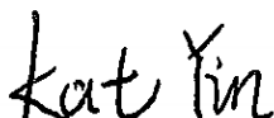
APPLICANT : Inseego Corp.  
EQUIPMENT : UMTS/LTE USB Modem  
BRAND NAME : Inseego  
MODEL NAME : MC800  
FCC ID : PKRISGMC800  
STANDARD : FCC 47 CFR Part 2 (2.1093)  
ANSI/IEEE C95.1-1992  
IEEE 1528-2013

The product was received on Apr. 24, 2019 and testing was started from Jun. 05, 2019 and completed on Jun. 16, 2019. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.



Reviewed by: Rose Wang / Supervisor



Approved by: Kat Yin / Manager



**Sporton International (Kunshan) Inc.**

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300  
People's Republic of China



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## History of this test report

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FA942417   | Rev. 01 | Initial issue of report | Jul. 10, 2019 |
|            |         |                         |               |
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## 1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Inseego Corp., UMTS/LTE USB Modem, MC800**, are as follows.

| Highest 1g SAR Summary                                                                                                                                                                                                                                                                                                   |                |                      |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------|--------------------|
| Equipment Class                                                                                                                                                                                                                                                                                                          | Frequency Band |                      | Body 1g SAR (W/kg) |
| Licensed                                                                                                                                                                                                                                                                                                                 | WCDMA          | Band V               | 1.19               |
|                                                                                                                                                                                                                                                                                                                          |                | Band IV              | 1.18               |
|                                                                                                                                                                                                                                                                                                                          |                | Band II              | 1.13               |
|                                                                                                                                                                                                                                                                                                                          | LTE            | Band 12/17           | 1.19               |
|                                                                                                                                                                                                                                                                                                                          |                | Band 13              | 1.19               |
|                                                                                                                                                                                                                                                                                                                          |                | Band 14              | 1.10               |
|                                                                                                                                                                                                                                                                                                                          |                | Band 5               | 1.12               |
|                                                                                                                                                                                                                                                                                                                          |                | Band 66/4            | 1.14               |
|                                                                                                                                                                                                                                                                                                                          |                | Band 2               | 1.19               |
|                                                                                                                                                                                                                                                                                                                          |                | Band 30              | 1.17               |
|                                                                                                                                                                                                                                                                                                                          |                | Band 7               | 1.08               |
| Date of Testing:                                                                                                                                                                                                                                                                                                         |                | 2019/6/5 ~ 2019/6/16 |                    |
| Remark: This device supports LTE B4/17 and B66/12. Since the supported frequency span for LTE B4/17 falls completely within the supports frequency span for LTE B66/12, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66/12. |                |                      |                    |

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.



## **2. Administration Data**

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

| Testing Laboratory |                                                                                                                                                                          |                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Test Firm          | Sporton International (Kunshan) Inc.                                                                                                                                     |                                |
| Test Site Location | No. 1098, Pengxi North Road, Kunshan Economic Development Zone<br>Jiangsu Province 215300 People's Republic of China<br>TEL : +86-512-57900158<br>FAX : +86-512-57900958 |                                |
| Test Site No.      | FCC Designation No.                                                                                                                                                      | FCC Test Firm Registration No. |
|                    | CN1257                                                                                                                                                                   | 314309                         |

| Applicant    |                                                                              |
|--------------|------------------------------------------------------------------------------|
| Company Name | Inseego Corp.                                                                |
| Address      | 9605 Scranton Road, Suite 300, San Diego, CA 92121, United States of America |

### **3. Guidance Applied**

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 447498 D02 SAR Procedures for Dongle Xmtr v02r01
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02

## **4. Equipment Under Test (EUT) Information**

### **4.1 General Information**

| <b>Product Feature &amp; Specification</b>                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Equipment Name</b>                                                                                                                                                                                                                                                                                                                                                         | UMTS/LTE USB Modem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Brand Name</b>                                                                                                                                                                                                                                                                                                                                                             | Inseego                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Model Name</b>                                                                                                                                                                                                                                                                                                                                                             | MC800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>FCC ID</b>                                                                                                                                                                                                                                                                                                                                                                 | PKRISGMC800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>IMEI Code</b>                                                                                                                                                                                                                                                                                                                                                              | 990013100005250                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Wireless Technology and Frequency Range</b>                                                                                                                                                                                                                                                                                                                                | WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz<br>WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz<br>WCDMA Band V: 826.4 MHz ~ 846.6 MHz<br>LTE Band 2: 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4: 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5: 824.7 MHz ~ 848.3 MHz<br>LTE Band 7: 2502.5 MHz ~ 2567.5 MHz<br>LTE Band 12: 699.7 MHz ~ 715.3 MHz<br>LTE Band 13: 779.5 MHz ~ 784.5 MHz<br>LTE Band 14: 790.5 MHz ~ 795.5 MHz<br>LTE Band 17: 706.5 MHz ~ 713.5 MHz<br>LTE Band 30: 2307.5 MHz ~ 2312.5 MHz<br>LTE Band 66: 1710.7 MHz ~ 1779.3 MHz |
| <b>Mode</b>                                                                                                                                                                                                                                                                                                                                                                   | RMC 12.2Kbps<br>HSDPA<br>HSUPA<br>DC-HSDPA<br>HSPA+ (16QAM uplink)<br>LTE: QPSK, 16QAM, 64QAM                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>HW Version</b>                                                                                                                                                                                                                                                                                                                                                             | V1.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>SW Version</b>                                                                                                                                                                                                                                                                                                                                                             | 1.30.0.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>EUT Stage</b>                                                                                                                                                                                                                                                                                                                                                              | Identical Prototype                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Remark:</b><br>1. The device employs proximity sensor that detect the presence of the user's body also a finger or hand at the Horizontal Down or Up faces, Vertical Back or Front or Tip Side faces of the device. When Horizontal Down or Up faces, Vertical Back or Front or Tip Side faces of body condition is detected, all WWAN bands reduced power will be active. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## 4.2 General LTE SAR Test and Reporting Considerations

| Summarized necessary items addressed in KDB 941225 D05 v02r05 |  |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                               |         |       |        |        |          |        |
|---------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------|-------|--------|--------|----------|--------|
| FCC ID                                                        |  | PKRISGMC800                                                                                                                                                                                                                                                                                                                                                                                               |                                                               |         |       |        |        |          |        |
| Equipment Name                                                |  | UMTS/LTE USB Modem                                                                                                                                                                                                                                                                                                                                                                                        |                                                               |         |       |        |        |          |        |
| Operating Frequency Range of each LTE transmission band       |  | LTE Band 2: 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4: 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5: 824.7 MHz ~ 848.3 MHz<br>LTE Band 7: 2502.5 MHz ~ 2567.5 MHz<br>LTE Band 12: 699.7 MHz ~ 715.3 MHz<br>LTE Band 13: 779.5 MHz ~ 784.5 MHz<br>LTE Band 14: 790.5 MHz ~ 795.5 MHz<br>LTE Band 17: 706.5 MHz ~ 713.5 MHz<br>LTE Band 30: 2307.5 MHz ~ 2312.5 MHz<br>LTE Band 66: 1710.7 MHz ~ 1779.3 MHz            |                                                               |         |       |        |        |          |        |
| Channel Bandwidth                                             |  | LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz<br>LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz<br>LTE Band 13: 5MHz, 10MHz<br>LTE Band 14: 5MHz, 10MHz<br>LTE Band 17: 5MHz, 10MHz<br>LTE Band 30: 5MHz, 10MHz<br>LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz |                                                               |         |       |        |        |          |        |
| uplink modulations used                                       |  | QPSK / 16QAM / 64QAM                                                                                                                                                                                                                                                                                                                                                                                      |                                                               |         |       |        |        |          |        |
| LTE Voice / Data requirements                                 |  | Data only                                                                                                                                                                                                                                                                                                                                                                                                 |                                                               |         |       |        |        |          |        |
| LTE Release Version                                           |  | R13, Cat13                                                                                                                                                                                                                                                                                                                                                                                                |                                                               |         |       |        |        |          |        |
| CA Support                                                    |  | Supported, Downlink only                                                                                                                                                                                                                                                                                                                                                                                  |                                                               |         |       |        |        |          |        |
| LTE MPR permanently built-in by design                        |  | Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3                                                                                                                                                                                                                                                                                                                                   |                                                               |         |       |        |        |          |        |
|                                                               |  | Modulation                                                                                                                                                                                                                                                                                                                                                                                                | Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> ) |         |       |        |        | MPR (dB) |        |
|                                                               |  |                                                                                                                                                                                                                                                                                                                                                                                                           | 1.4 MHz                                                       | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz |          | 20 MHz |
|                                                               |  | QPSK                                                                                                                                                                                                                                                                                                                                                                                                      | > 5                                                           | > 4     | > 8   | > 12   | > 16   | > 18     | ≤ 1    |
|                                                               |  | 16 QAM                                                                                                                                                                                                                                                                                                                                                                                                    | ≤ 5                                                           | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18     | ≤ 1    |
|                                                               |  | 16 QAM                                                                                                                                                                                                                                                                                                                                                                                                    | > 5                                                           | > 4     | > 8   | > 12   | > 16   | > 18     | ≤ 2    |
|                                                               |  | 64 QAM                                                                                                                                                                                                                                                                                                                                                                                                    | ≤ 5                                                           | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18     | ≤ 2    |
|                                                               |  | 64 QAM                                                                                                                                                                                                                                                                                                                                                                                                    | > 5                                                           | > 4     | > 8   | > 12   | > 16   | > 18     | ≤ 3    |
|                                                               |  | 256 QAM                                                                                                                                                                                                                                                                                                                                                                                                   | ≥ 1                                                           |         |       |        |        | ≤ 5      |        |
| LTE A-MPR                                                     |  | In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)                                                                                                                                                                                                             |                                                               |         |       |        |        |          |        |
| Spectrum plots for RB configuration                           |  | A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.                                                                                                                                                                                                    |                                                               |         |       |        |        |          |        |
| Power reduction applied to satisfy SAR compliance             |  | Yes, Proximity Sensor. Power reduction will be active at all WWAN bands.                                                                                                                                                                                                                                                                                                                                  |                                                               |         |       |        |        |          |        |
| LTE Carrier Aggregation Combinations                          |  | Inter-Band and Intra-Band possible combinations and the detail power verification please referred to section 13.                                                                                                                                                                                                                                                                                          |                                                               |         |       |        |        |          |        |
| LTE Carrier Aggregation Additional Information                |  | This device supports maximum of 5 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.                                                                                                                                                                     |                                                               |         |       |        |        |          |        |

| Transmission (H, M, L) channel numbers and frequencies in each LTE band |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|-------------------------------------------------------------------------|-------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
| LTE Band 2                                                              |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L                                                                       | 18607             | 1850.7      | 18615            | 1851.5      | 18625            | 1852.5      | 18650            | 1855        | 18675            | 1857.5      | 18700            | 1860        |
| M                                                                       | 18900             | 1880        | 18900            | 1880        | 18900            | 1880        | 18900            | 1880        | 18900            | 1880        | 18900            | 1880        |
| H                                                                       | 19193             | 1909.3      | 19185            | 1908.5      | 19175            | 1907.5      | 19150            | 1905        | 19125            | 1902.5      | 19100            | 1900        |
| LTE Band 4                                                              |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L                                                                       | 19957             | 1710.7      | 19965            | 1711.5      | 19975            | 1712.5      | 20000            | 1715        | 20025            | 1717.5      | 20050            | 1720        |
| M                                                                       | 20175             | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      |
| H                                                                       | 20393             | 1754.3      | 20385            | 1753.5      | 20375            | 1752.5      | 20350            | 1750        | 20325            | 1747.5      | 20300            | 1745        |
| LTE Band 5                                                              |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |             | Bandwidth 10 MHz |             |                  |             |                  |             |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L                                                                       | 20407             | 824.7       | 20415            | 825.5       | 20425            | 826.5       | 20450            | 829         |                  |             |                  |             |
| M                                                                       | 20525             | 836.5       | 20525            | 836.5       | 20525            | 836.5       | 20525            | 836.5       |                  |             |                  |             |
| H                                                                       | 20643             | 848.3       | 20635            | 847.5       | 20625            | 846.5       | 20600            | 844         |                  |             |                  |             |
| LTE Band 7                                                              |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 5 MHz   |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |                  |             |                  |             |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L                                                                       | 20775             | 2502.5      | 20800            | 2505        | 20825            | 2507.5      | 20850            | 2510        |                  |             |                  |             |
| M                                                                       | 21100             | 2535        | 21100            | 2535        | 21100            | 2535        | 21100            | 2535        |                  |             |                  |             |
| H                                                                       | 21425             | 2567.5      | 21400            | 2565        | 21375            | 2562.5      | 21350            | 2560        |                  |             |                  |             |
| LTE Band 12                                                             |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |             | Bandwidth 10 MHz |             |                  |             |                  |             |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L                                                                       | 23017             | 699.7       | 23025            | 700.5       | 23035            | 701.5       | 23060            | 704         |                  |             |                  |             |
| M                                                                       | 23095             | 707.5       | 23095            | 707.5       | 23095            | 707.5       | 23095            | 707.5       |                  |             |                  |             |
| H                                                                       | 23173             | 715.3       | 23165            | 714.5       | 23155            | 713.5       | 23130            | 711         |                  |             |                  |             |
| LTE Band 13                                                             |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 5 MHz   |             |                  |             | Bandwidth 10 MHz |             |                  |             |                  |             |                  |             |
|                                                                         | Channel #         |             | Freq.(MHz)       |             | Channel #        |             | Freq.(MHz)       |             |                  |             |                  |             |
| L                                                                       | 23205             |             | 779.5            |             | 23230            |             | 782              |             |                  |             |                  |             |
| M                                                                       | 23230             |             | 782              |             |                  |             |                  |             |                  |             |                  |             |
| H                                                                       | 23255             |             | 784.5            |             |                  |             |                  |             |                  |             |                  |             |
| LTE Band 14                                                             |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 5 MHz   |             |                  |             | Bandwidth 10 MHz |             |                  |             |                  |             |                  |             |
|                                                                         | Channel #         |             | Channel #        |             | Channel #        |             | Freq.(MHz)       |             |                  |             |                  |             |
| L                                                                       | 23305             |             | 790.5            |             | 23330            |             | 793              |             |                  |             |                  |             |
| M                                                                       | 23330             |             | 793              |             |                  |             |                  |             |                  |             |                  |             |
| H                                                                       | 23355             |             | 795.5            |             |                  |             |                  |             |                  |             |                  |             |
| LTE Band 17                                                             |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |
|                                                                         | Bandwidth 5 MHz   |             |                  |             | Bandwidth 10 MHz |             |                  |             |                  |             |                  |             |
|                                                                         | Channel #         |             | Freq.(MHz)       |             | Channel #        |             | Freq. (MHz)      |             |                  |             |                  |             |
| L                                                                       | 23755             |             | 706.5            |             | 23780            |             | 709              |             |                  |             |                  |             |
| M                                                                       | 23790             |             | 710              |             | 23790            |             | 710              |             |                  |             |                  |             |
| H                                                                       | 23825             |             | 713.5            |             | 23800            |             | 711              |             |                  |             |                  |             |

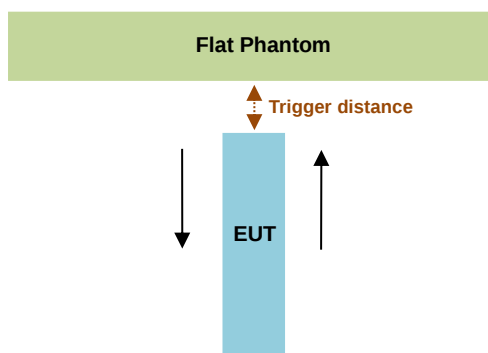


| LTE Band 30 |                   |             |                 |             |                 |             |                  |             |                  |             |                  |             |
|-------------|-------------------|-------------|-----------------|-------------|-----------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
|             | Bandwidth 5 MHz   |             |                 |             |                 |             | Bandwidth 10 MHz |             |                  |             |                  |             |
|             | Channel #         |             | Freq.(MHz)      |             |                 |             | Channel #        |             | Freq.(MHz)       |             |                  |             |
| L           | 27685             |             | 2307.5          |             |                 |             | 27710            |             | 2310             |             |                  |             |
| M           | 27710             |             | 2310            |             |                 |             |                  |             |                  |             |                  |             |
| H           | 27735             |             | 2312.5          |             |                 |             |                  |             |                  |             |                  |             |
| LTE Band 66 |                   |             |                 |             |                 |             |                  |             |                  |             |                  |             |
|             | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz |             | Bandwidth 5 MHz |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |
|             | Ch. #             | Freq. (MHz) | Ch. #           | Freq. (MHz) | Ch. #           | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L           | 131979            | 1710.7      | 131987          | 1711.5      | 131997          | 1712.5      | 132022           | 1715        | 132047           | 1717.5      | 132072           | 1720        |
| M           | 132322            | 1745        | 132322          | 1745        | 132322          | 1745        | 132322           | 1745        | 132322           | 1745        | 132322           | 1745        |
| H           | 132665            | 1779.3      | 132657          | 1778.5      | 132647          | 1777.5      | 132622           | 1775        | 132597           | 1772.5      | 132572           | 1770        |

## 5. Proximity Sensor Triggering Test

### <Proximity Sensor Triggering Distance (KDB 616217 D04 section 6.2)>:

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency (WWAN 2600MHz) and lowest (WWAN 700MHz) frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensor placed coincident with WWAN antenna, utilized to trigger reduced power when the device comes in proximity of the user's body at the Horizontal Up or Down, Vertical Front or Back or Tip Side of the device.
3. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
4. When the sensor is active, power reduction will be active at all WWAN bands.
5. The sensors used to detect the proximity of the user's body and device use a detection threshold distance. The data shown in the sections below shows the distance(s).



### <WWAN Frequency Bands>

| Proximity Sensor Triggering Distance (mm) |                       |             |                       |             |                |             |
|-------------------------------------------|-----------------------|-------------|-----------------------|-------------|----------------|-------------|
| Position                                  | Horizontal –Up & Down |             | Vertical Front & Back |             | Tip Side       |             |
|                                           | Moving towards        | Moving away | Moving towards        | Moving away | Moving towards | Moving away |
| Minimum                                   | 25                    | 28          | 20                    | 22          | 23             | 25          |

**Proximity sensor power reduction**

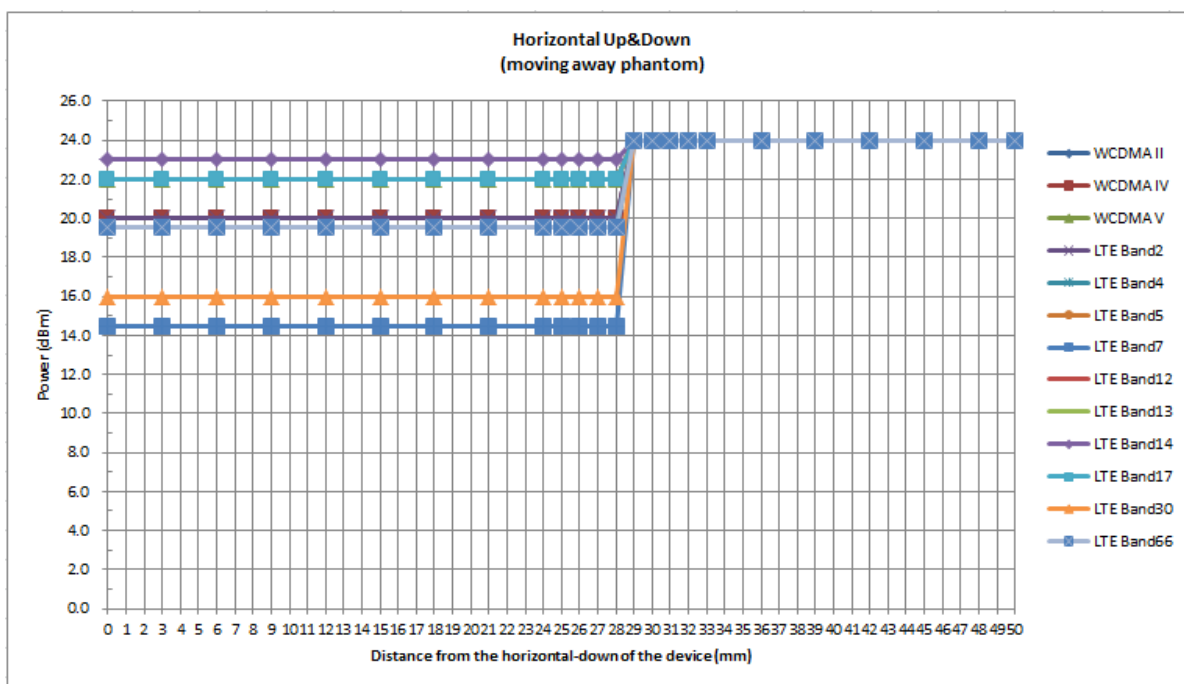
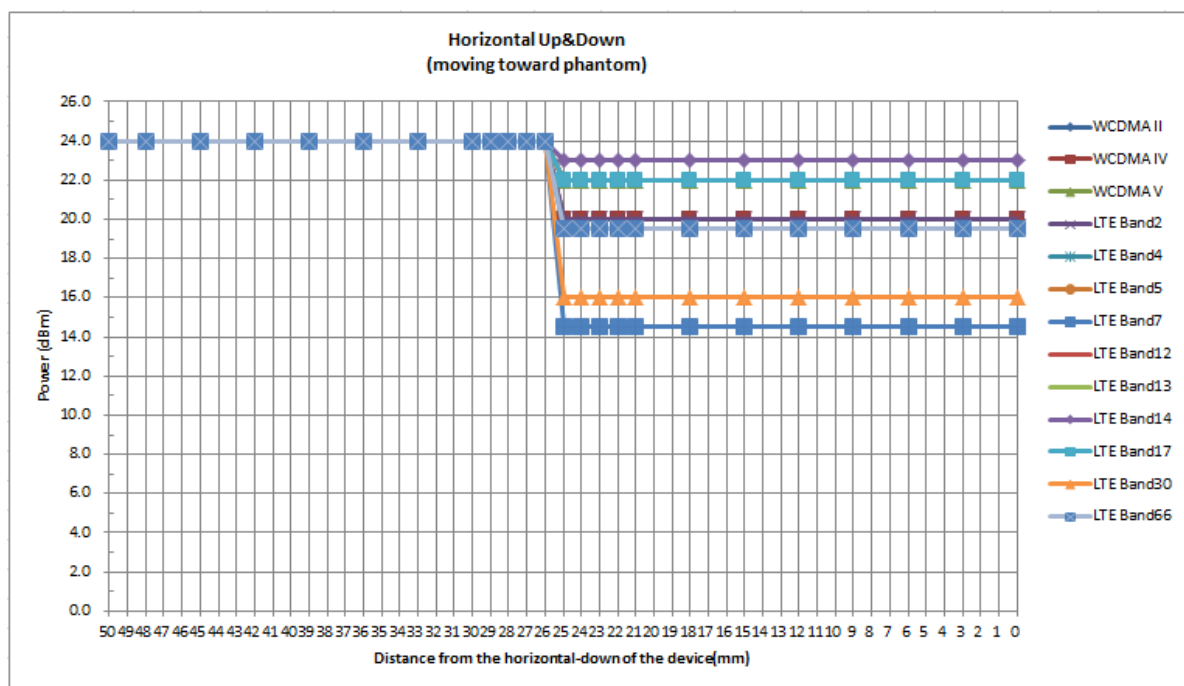
| Exposure Position / wireless mode | Horizontal Up & Down | Vertical Front & Back | Tip Side |
|-----------------------------------|----------------------|-----------------------|----------|
| WCDMA V                           | 2.0 dB               | 2.0 dB                | 2.0 dB   |
| WCDMA IV                          | 4.0 dB               | 4.0 dB                | 4.0 dB   |
| WCDMA II                          | 4.0 dB               | 4.0 dB                | 4.0 dB   |
| LTE Band2                         | 4.0 dB               | 4.0 dB                | 4.0 dB   |
| LTE Band4                         | 4.5 dB               | 4.5 dB                | 4.5 dB   |
| LTE Band5                         | 2.0 dB               | 2.0 dB                | 2.0 dB   |
| LTE Band7                         | 9.5 dB               | 9.5 dB                | 9.5 dB   |
| LTE Band12                        | 2.0 dB               | 2.0 dB                | 2.0 dB   |
| LTE Band13                        | 2.0 dB               | 2.0 dB                | 2.0 dB   |
| LTE Band14                        | 1.0 dB               | 1.0 dB                | 1.0 dB   |
| LTE Band17                        | 2.0 dB               | 2.0 dB                | 2.0 dB   |
| LTE Band30                        | 8.0 dB               | 8.0 dB                | 8.0 dB   |
| LTE Band66                        | 4.5 dB               | 4.5 dB                | 4.5 dB   |

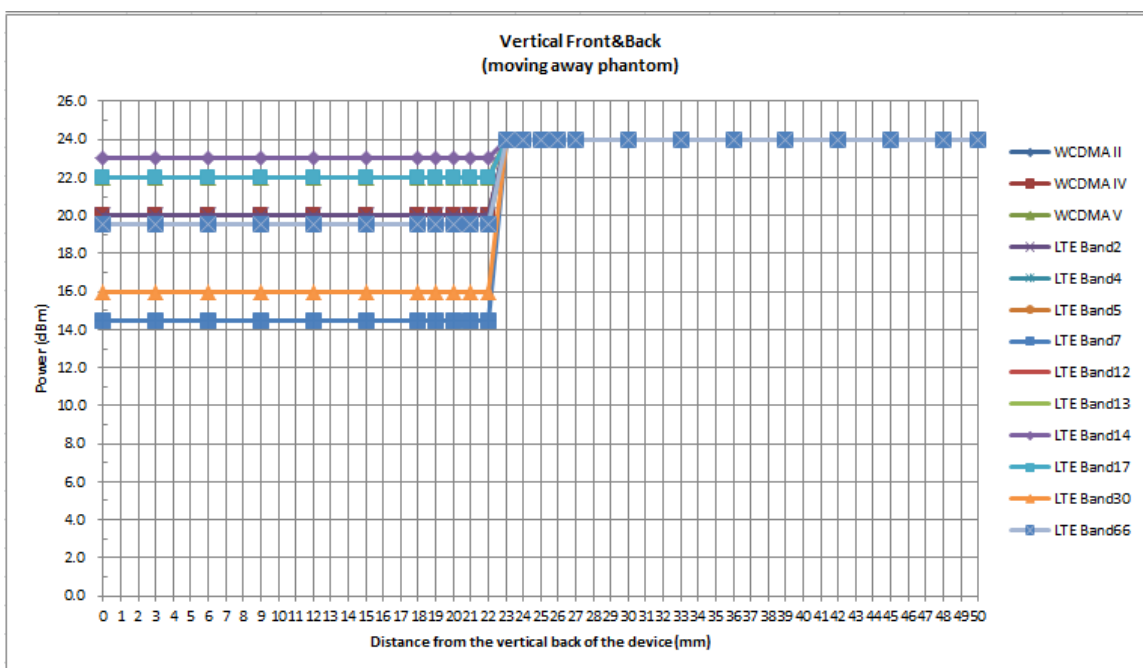
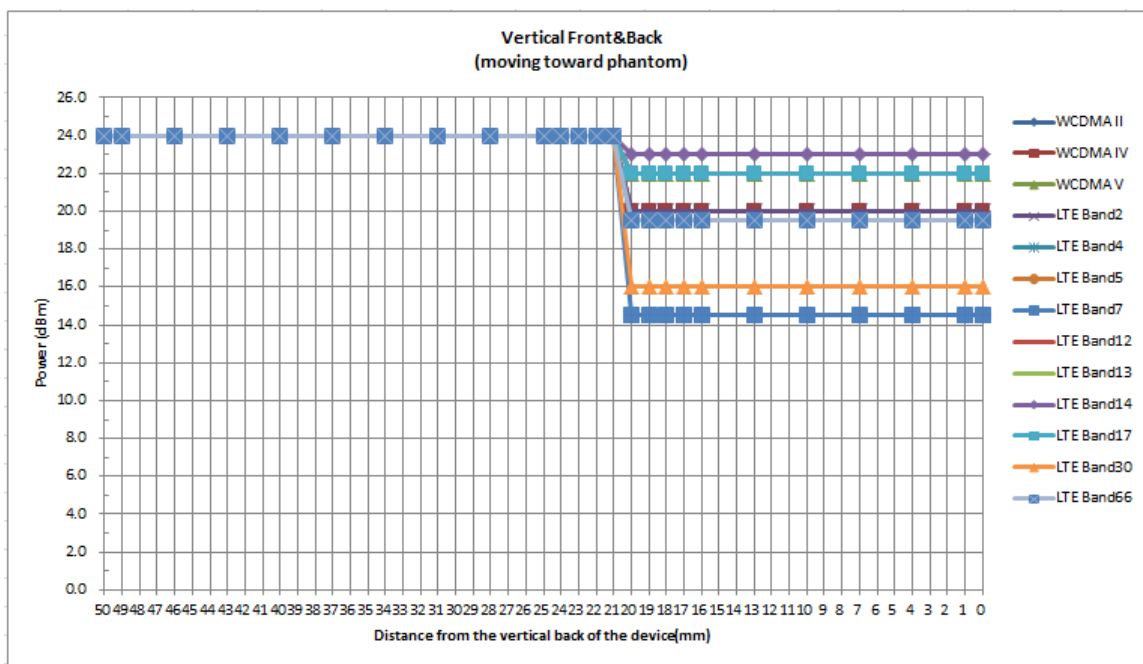
**Remark:**

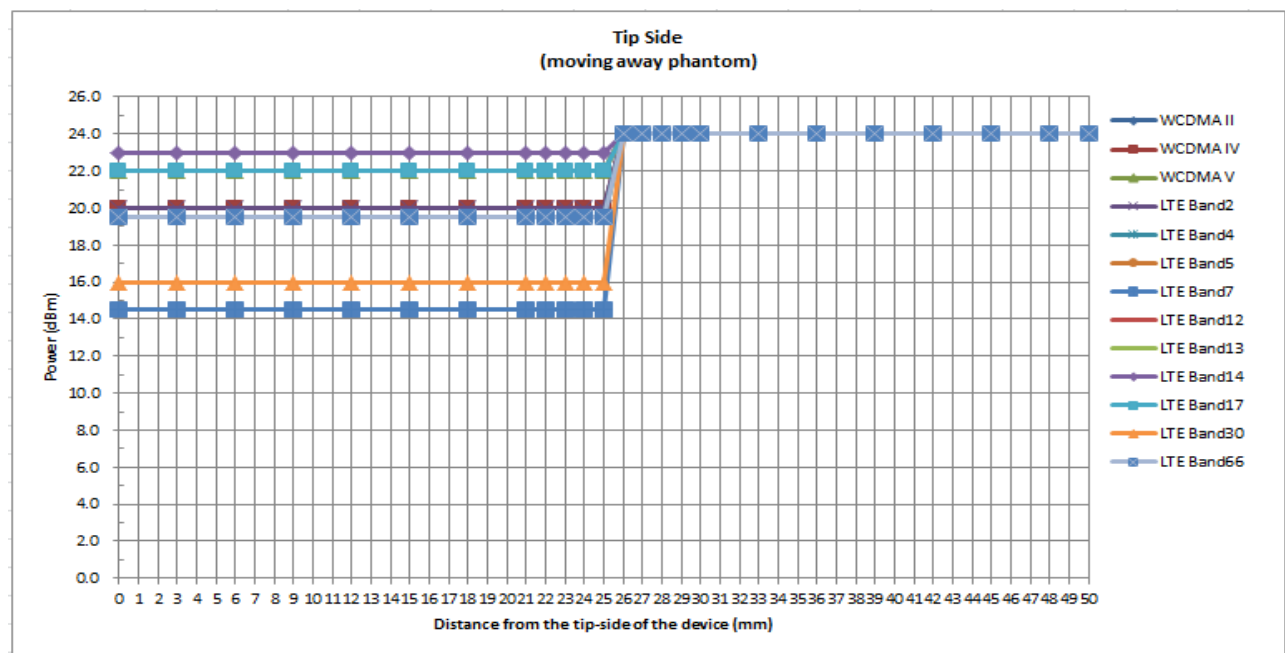
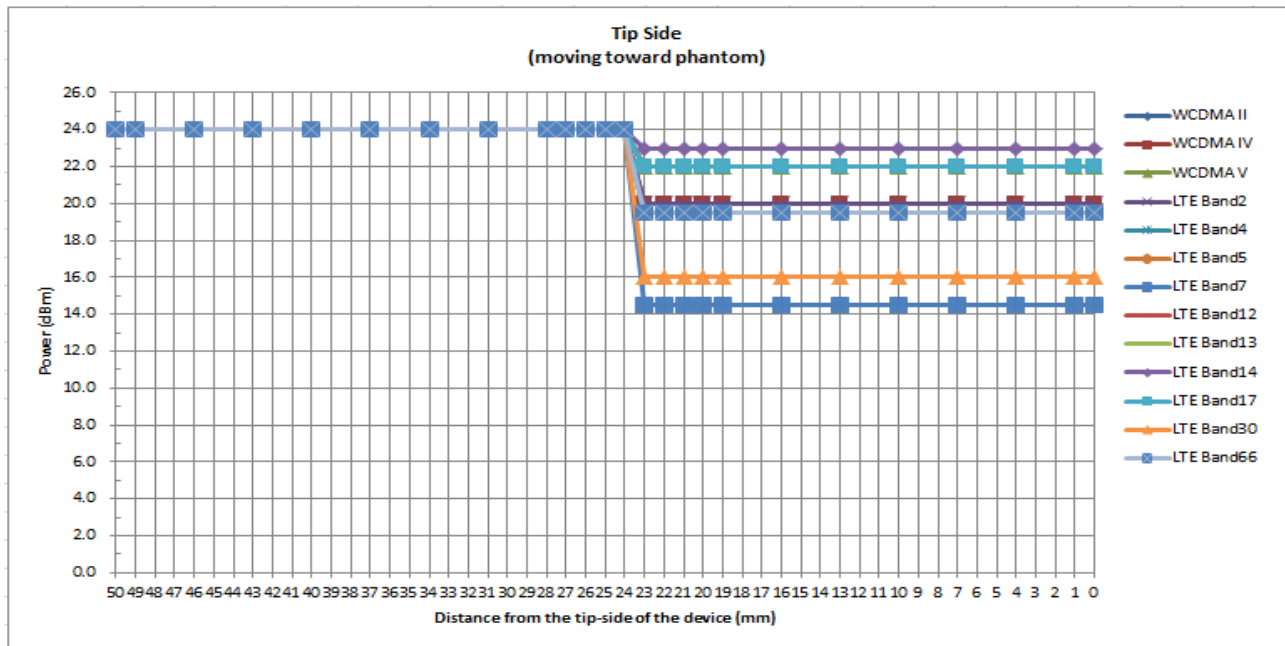
- Tests were performed in accordance with KDB 616217 D04 section 6.2 and compliant results are shown and described in exhibit "P-Sensor operational description"
- For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
  - Horizontal Up & Down & Tip Side n: 20 mm(manufacturer declared)
  - Vertical Front & Back: 15 mm(manufacturer declared)

**Power Measurement during Sensor Trigger distance testing**

| Band/Mode                      | Ch #   | Measured power reduction (dBm) |                   | Reduction Levels |
|--------------------------------|--------|--------------------------------|-------------------|------------------|
|                                |        | w/o power back-off             | w/ power back-off | (dB)             |
| WCDMA Band V (RMC 12.2Kbps)    | 4182   | 22.96                          | 20.88             | 2.08             |
| WCDMA Band IV (RMC 12.2Kbps)   | 1312   | 23.25                          | 19.88             | 3.37             |
| WCDMA Band II (RMC 12.2Kbps)   | 9538   | 23.35                          | 19.91             | 3.44             |
| LTE Band 2 20MHz 1RB 0offset   | 19100  | 23.25                          | 19.64             | 3.61             |
| LTE Band 4 20MHz 1RB 0offset   | 20300  | 23.09                          | 18.71             | 4.38             |
| LTE Band 5 10MHz 1RB 0offset   | 20450  | 22.99                          | 20.52             | 2.47             |
| LTE Band7 20MHz 1RB 0offset    | 21100  | 23.20                          | 13.41             | 9.79             |
| LTE Band12 10MHz 1RB 49offset  | 23095  | 22.97                          | 21.66             | 1.31             |
| LTE Band 13 10MHz 1RB 0 offset | 23230  | 23.09                          | 21.38             | 1.71             |
| LTE Band14 10MHz 1RB 0 offset  | 23330  | 22.79                          | 21.38             | 1.41             |
| LTE Band17 10MHz 1RB 0 offset  | 23790  | 22.86                          | 21.62             | 1.24             |
| LTE Band30 10MHz 1RB 0 offset  | 27710  | 22.89                          | 15.80             | 7.09             |
| LTE Band66 20MHz 1RB 0 offset  | 132322 | 23.19                          | 18.89             | 4.30             |







## **6. RF Exposure Limits**

### **6.1 Uncontrolled Environment**

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

### **6.2 Controlled Environment**

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

**Limits for Occupational/Controlled Exposure (W/kg)**

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|------------|--------------|--------------------------------|
| 0.4        | 8.0          | 20.0                           |

**Limits for General Population/Uncontrolled Exposure (W/kg)**

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|------------|--------------|--------------------------------|
| 0.08       | 1.6          | 4.0                            |

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

## **7. Specific Absorption Rate (SAR)**

### **7.1 Introduction**

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

### **7.2 SAR Definition**

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt} \left( \frac{dW}{dm} \right) = \frac{d}{dt} \left( \frac{dW}{\rho dv} \right)$$

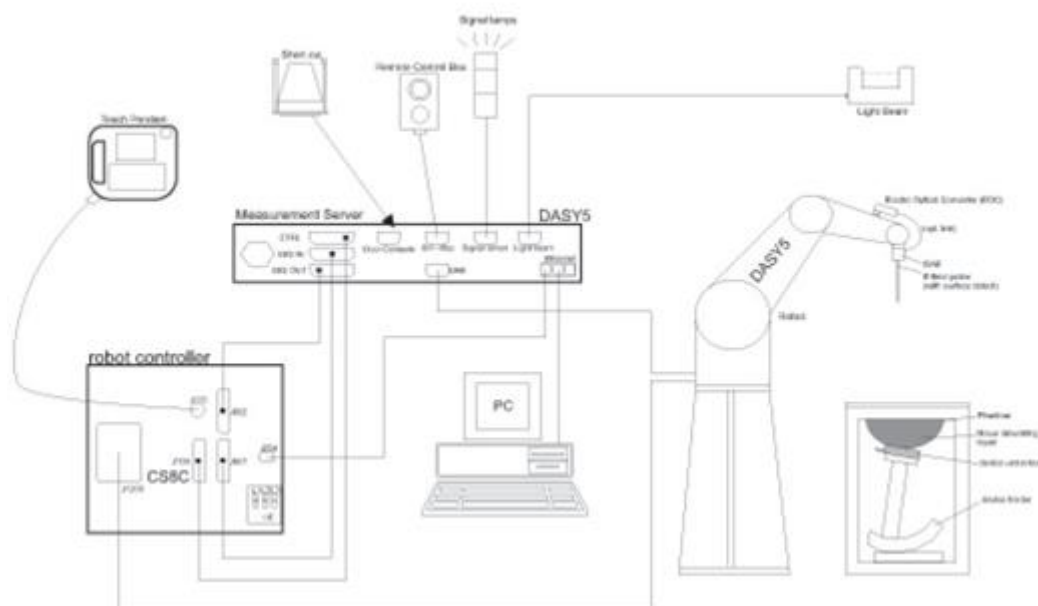
SAR is expressed in units of Watts per kilogram (W/kg)

$$SAR = \frac{\sigma |E|^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

## 8. System Description and Setup

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## 8.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG). The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

### <EX3DV4 Probe>

|                      |                                                                                                                                                           |                                                                                    |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Construction</b>  | Symmetric design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |  |
| <b>Frequency</b>     | 10 MHz – >6 GHz<br>Linearity: $\pm 0.2$ dB (30 MHz – 6 GHz)                                                                                               |                                                                                    |
| <b>Directivity</b>   | $\pm 0.3$ dB in TSL (rotation around probe axis)<br>$\pm 0.5$ dB in TSL (rotation normal to probe axis)                                                   |                                                                                    |
| <b>Dynamic Range</b> | 10 $\mu$ W/g – >100 mW/g<br>Linearity: $\pm 0.2$ dB (noise: typically <1 $\mu$ W/g)                                                                       |                                                                                    |
| <b>Dimensions</b>    | Overall length: 337 mm (tip: 20 mm)<br>Tip diameter: 2.5 mm (body: 12 mm)<br>Typical distance from probe tip to dipole centers: 1 mm                      |                                                                                    |

## 8.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



**Photo of DAE**

### 8.3 Phantom

#### <SAM Twin Phantom>

|                   |                                                         |                                                                                    |
|-------------------|---------------------------------------------------------|------------------------------------------------------------------------------------|
| Shell Thickness   | 2 ± 0.2 mm;<br>Center ear point: 6 ± 0.2 mm             |  |
| Filling Volume    | Approx. 25 liters                                       |                                                                                    |
| Dimensions        | Length: 1000 mm; Width: 500 mm; Height: adjustable feet |                                                                                    |
| Measurement Areas | Left Hand, Right Hand, Flat Phantom                     |                                                                                    |

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

#### <ELI Phantom>

|                 |                                                  |                                                                                     |
|-----------------|--------------------------------------------------|-------------------------------------------------------------------------------------|
| Shell Thickness | 2 ± 0.2 mm (sagging: <1%)                        |  |
| Filling Volume  | Approx. 30 liters                                |                                                                                     |
| Dimensions      | Major ellipse axis: 600 mm<br>Minor axis: 400 mm |                                                                                     |

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

## **8.4 Device Holder**

### **<Mounting Device for Hand-Held Transmitter>**

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

### **<Mounting Device for Laptops and other Body-Worn Transmitters>**

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.



Mounting Device for Laptops

## **9. Measurement Procedures**

The measurement procedures are as follows:

### **<Conducted power measurement>**

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

### **<SAR measurement>**

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix D demonstrates.
- (c) Set scan area, grid size and other setting on the DASY software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

### **9.1 Spatial Peak SAR Evaluation**

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

## **9.2 Power Reference Measurement**

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

## **9.3 Area Scan**

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

|                                                                                                        | $\leq 3$ GHz                                                                                                                                                                                                                                                           | $> 3$ GHz                                              |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | $5 \pm 1$ mm                                                                                                                                                                                                                                                           | $\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm     |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location              | $30^\circ \pm 1^\circ$                                                                                                                                                                                                                                                 | $20^\circ \pm 1^\circ$                                 |
| Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$                            | $\leq 2$ GHz: $\leq 15$ mm<br>$2 - 3$ GHz: $\leq 12$ mm                                                                                                                                                                                                                | $3 - 4$ GHz: $\leq 12$ mm<br>$4 - 6$ GHz: $\leq 10$ mm |
|                                                                                                        | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device. |                                                        |

### 9.4 Zoom Scan

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

|                                                                                                                                                                                                                                                                                                             |                                           |                                                                                             | $\leq 3$ GHz                                           | $> 3$ GHz                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|
| Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$                                                                                                                                                                                                                      |                                           |                                                                                             | $\leq 2$ GHz: $\leq 8$ mm<br>$2 - 3$ GHz: $\leq 5$ mm* | $3 - 4$ GHz: $\leq 5$ mm*<br>$4 - 6$ GHz: $\leq 4$ mm*                              |
| Maximum zoom scan spatial resolution, normal to phantom surface                                                                                                                                                                                                                                             | uniform grid: $\Delta z_{\text{Zoom}}(n)$ |                                                                                             | $\leq 5$ mm                                            | $3 - 4$ GHz: $\leq 4$ mm<br>$4 - 5$ GHz: $\leq 3$ mm<br>$5 - 6$ GHz: $\leq 2$ mm    |
|                                                                                                                                                                                                                                                                                                             | graded grid                               | $\Delta z_{\text{Zoom}}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface | $\leq 4$ mm                                            | $3 - 4$ GHz: $\leq 3$ mm<br>$4 - 5$ GHz: $\leq 2.5$ mm<br>$5 - 6$ GHz: $\leq 2$ mm  |
|                                                                                                                                                                                                                                                                                                             |                                           | $\Delta z_{\text{Zoom}}(n>1)$ : between subsequent points                                   | $\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$           |                                                                                     |
| Minimum zoom scan volume                                                                                                                                                                                                                                                                                    | x, y, z                                   |                                                                                             | $\geq 30$ mm                                           | $3 - 4$ GHz: $\geq 28$ mm<br>$4 - 5$ GHz: $\geq 25$ mm<br>$5 - 6$ GHz: $\geq 22$ mm |
| Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.                                                                                                                                                           |                                           |                                                                                             |                                                        |                                                                                     |
| * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz. |                                           |                                                                                             |                                                        |                                                                                     |

### 9.5 Volume Scan Procedures

The volume scan is used to assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

### 9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASy measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

**10. Test Equipment List**

| Manufacturer    | Name of Equipment               | Type/Model    | Serial Number | Calibration |            |
|-----------------|---------------------------------|---------------|---------------|-------------|------------|
|                 |                                 |               |               | Last Cal.   | Due Date   |
| SPEAG           | 750MHz System Validation Kit    | D750V3        | 1087          | 2019/3/27   | 2020/3/26  |
| SPEAG           | 835MHz System Validation Kit    | D835V2        | 4d151         | 2019/3/27   | 2020/3/26  |
| SPEAG           | 1750MHz System Validation Kit   | D1750V2       | 1090          | 2019/3/27   | 2020/3/26  |
| SPEAG           | 1900MHz System Validation Kit   | D1900V2       | 5d170         | 2019/3/26   | 2020/3/25  |
| SPEAG           | 2300MHz System Validation Kit   | D2300V2       | 1055          | 2018/9/20   | 2019/9/19  |
| SPEAG           | 2600MHz System Validation Kit   | D2600V2       | 1061          | 2018/12/7   | 2019/12/6  |
| SPEAG           | Data Acquisition Electronics    | DAE4          | 1279          | 2018/10/22  | 2019/10/21 |
| SPEAG           | Dosimetric E-Field Probe        | EX3DV4        | 3843          | 2018/9/27   | 2019/9/26  |
| SPEAG           | SAM Twin Phantom                | QD 000 P40 CB | TP-1754       | NCR         | NCR        |
| SPEAG           | SAM Twin Phantom                | QD 000 P40 CB | TP-1503       | NCR         | NCR        |
| SPEAG           | Phone Positioner                | N/A           | N/A           | NCR         | NCR        |
| Anritsu         | Radio Communication Analyzer    | MT8821C       | 6201432831    | 2019/4/17   | 2020/4/16  |
| Agilent         | Wireless Communication Test Set | E5515C        | MY52102706    | 2019/4/17   | 2020/4/16  |
| Agilent         | ENA Series Network Analyzer     | E5071C        | MY46111157    | 2019/4/17   | 2020/4/16  |
| SPEAG           | Dielectric Probe Kit            | DAK-3.5       | 1138          | 2018/11/20  | 2019/11/19 |
| Anritsu         | Vector Signal Generator         | MG3710A       | 6201682672    | 2019/1/14   | 2020/1/13  |
| Rohde & Schwarz | Power Meter                     | NRVD          | 102081        | 2018/8/20   | 2019/8/19  |
| Rohde & Schwarz | Power Sensor                    | NRV-Z5        | 100538        | 2018/8/20   | 2019/8/19  |
| Rohde & Schwarz | Power Sensor                    | NRV-Z5        | 100539        | 2018/8/20   | 2019/8/19  |
| Testo           | Hygrometer                      | 608-H1        | 1241332126    | 2018/8/21   | 2019/8/20  |
| FLUKE           | DIGITAC THERMOMETER             | 51II          | 97240029      | 2018/8/8    | 2019/8/7   |
| R&S             | CBT BLUETOOTH TESTER            | CBT           | 101641        | 2019/1/14   | 2020/1/13  |
| EXA             | Spectrum Analyzer               | FSV7          | 101631        | 2019/1/14   | 2020/1/13  |
| ARRA            | Power Divider                   | A3200-2       | N/A           | Note        |            |
| MCL             | Attenuation1                    | BW-S10W5+     | N/A           | Note        |            |
| MCL             | Attenuation2                    | BW-S10W5+     | N/A           | Note        |            |
| MCL             | Attenuation3                    | BW-S10W5+     | N/A           | Note        |            |
| BONN            | POWER AMPLIFIER                 | BLMA 0830-3   | 087193A       | Note        |            |
| BONN            | POWER AMPLIFIER                 | BLMA 2060-2   | 087193B       | Note        |            |
| Agilent         | Dual Directional Coupler        | 778D          | 20500         | Note        |            |
| Agilent         | Dual Directional Coupler        | 11691D        | MY48151020    | Note        |            |

**Note:** Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

## **11. System Verification**

### **11.1 Tissue Simulating Liquids**

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid.. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.1



**Fig 11.1 Photo of Liquid Height for Body SAR**

### **11.2 Tissue Verification**

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

| Frequency (MHz)  | Water (%) | Sugar (%) | Cellulose (%) | Salt (%) | Preventol (%) | DGBE (%) | Conductivity ( $\sigma$ ) | Permittivity ( $\epsilon_r$ ) |
|------------------|-----------|-----------|---------------|----------|---------------|----------|---------------------------|-------------------------------|
| 750              | 51.7      | 47.2      | 0             | 0.9      | 0.1           | 0        | 0.96                      | 55.5                          |
| 835              | 50.8      | 48.2      | 0             | 0.9      | 0.1           | 0        | 0.97                      | 55.2                          |
| 1800, 1900, 2000 | 70.2      | 0         | 0             | 0.4      | 0             | 29.4     | 1.52                      | 53.3                          |
| 2450             | 68.6      | 0         | 0             | 0        | 0             | 31.4     | 1.95                      | 52.7                          |
| 2600             | 68.1      | 0         | 0             | 0.1      | 0             | 31.8     | 2.16                      | 52.5                          |

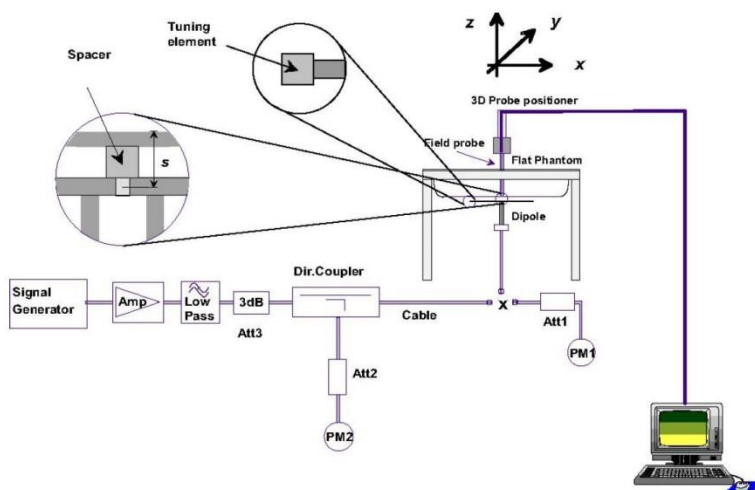
### **<Tissue Dielectric Parameter Check Results>**

| Frequency (MHz) | Tissue Type | Liquid Temp. (°C) | Conductivity ( $\sigma$ ) | Permittivity ( $\epsilon_r$ ) | Conductivity Target ( $\sigma$ ) | Permittivity Target ( $\epsilon_r$ ) | Delta ( $\sigma$ ) (%) | Delta ( $\epsilon_r$ ) (%) | Limit (%) | Date      |
|-----------------|-------------|-------------------|---------------------------|-------------------------------|----------------------------------|--------------------------------------|------------------------|----------------------------|-----------|-----------|
| 750             | Head        | 22.6              | 0.900                     | 41.538                        | 0.89                             | 41.90                                | 1.12                   | -0.86                      | ±5        | 2019/6/8  |
| 835             | Head        | 22.6              | 0.911                     | 42.060                        | 0.90                             | 41.50                                | 1.22                   | 1.35                       | ±5        | 2019/6/9  |
| 1750            | Head        | 22.8              | 1.349                     | 40.850                        | 1.37                             | 40.10                                | -1.53                  | 1.87                       | ±5        | 2019/6/10 |
| 1900            | Head        | 22.6              | 1.424                     | 38.837                        | 1.40                             | 40.00                                | 1.71                   | -2.91                      | ±5        | 2019/6/5  |
| 2300            | Head        | 22.6              | 1.690                     | 39.535                        | 1.67                             | 39.50                                | 1.20                   | 0.09                       | ±5        | 2019/6/11 |
| 2600            | Head        | 22.7              | 2.028                     | 38.274                        | 1.96                             | 39.00                                | 3.47                   | -1.86                      | ±5        | 2019/6/16 |

### 11.3 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

| Date      | Frequency (MHz) | Tissue Type | Input Power (mW) | Dipole S/N | Probe S/N | DAE S/N | Measured 1g SAR (W/kg) | Targeted 1g SAR (W/kg) | Normalized 1g SAR (W/kg) | Deviation (%) |
|-----------|-----------------|-------------|------------------|------------|-----------|---------|------------------------|------------------------|--------------------------|---------------|
| 2019/6/8  | 750             | Head        | 250              | 1087       | 3843      | 1279    | 2.01                   | 8.36                   | 8.04                     | -3.83         |
| 2019/6/9  | 835             | Head        | 250              | 4d151      | 3843      | 1279    | 2.25                   | 9.30                   | 9.00                     | -3.23         |
| 2019/6/10 | 1750            | Head        | 250              | 1090       | 3843      | 1279    | 9.14                   | 36.40                  | 36.56                    | 0.44          |
| 2019/6/5  | 1900            | Head        | 250              | 5d170      | 3843      | 1279    | 9.60                   | 39.00                  | 38.40                    | -1.54         |
| 2019/6/11 | 2300            | Head        | 250              | 1055       | 3843      | 1279    | 11.80                  | 48.70                  | 47.20                    | -3.08         |
| 2019/6/16 | 2600            | Head        | 250              | 1061       | 3843      | 1279    | 14.50                  | 57.70                  | 58.00                    | 0.52          |



**Fig 11.3.1 System Performance Check Setup**



**Fig 11.3.2 Setup Photo**

## **12. RF Exposure Positions**

This EUT was tested in four different USB configurations. They are “direct laptop plug-in for configuration 1 and 3”, “USB cable plug-in for configuration 2 and 4”, and “USB cable plug-in for Tip Mode (the tip of the EUT)” shown as below. Both direct laptop plug-in and USB cable plug-in test configurations are tested with 5 cm separation between the particular dongle orientation and the flat phantom. Please refer to Appendix D for the test setup photos.

### **12.1 SAR Testing for USB Dongle**

Test all USB orientations [see figure below: (A) Horizontal-Up, (B) Horizontal-Down, (C) Vertical-Front, and (D) Vertical-Back] with a device-to-phantom separation distance of 5 mm or less, according to KDB Publication 447498 D02 requirements. These test orientations are intended for the exposure conditions found in typical laptop/notebook/netbook or tablet computers with either horizontal or vertical USB connector configurations at various locations in the keyboard section of the computer. Current generation portable host computers should be used to establish the required SAR measurement separation distance. The same test separation distance must be used to test all frequency bands and modes in each USB orientation. The typical Horizontal-Up USB connection (A), found in the majority of host computers, must be tested using an appropriate host computer. A host computer with either Vertical-Front (C) or Vertical Back (D) USB connection should be used to test one of the vertical USB orientations. If a suitable host computer is not available for testing the Horizontal-Down (B) or the remaining Vertical USB orientation, a high quality USB cable, 12 inches or less, may be used for testing these other orientations. It must be documented that the USB cable does not influence the radiating characteristics and output power of the transmitter.

|                                                                                     |                                                                                     |                                                                                     |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |
| Configuration 1<br>(Horizontal Up)                                                  | Configuration 2<br>(Horizontal Down)                                                | Configuration 3<br>(Vertical Front)                                                 | Configuration 4<br>(Vertical Back)                                                    |

### **13. Conducted RF Output Power (Unit: dBm)**

#### **<WCDMA Conducted Power>**

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.

A summary of these settings are illustrated below:

#### **HSDPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each
  - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
  - iii. Set RMC 12.2Kbps + HSDPA mode.
  - iv. Set Cell Power = -86 dBm
  - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
  - vi. Select HSDPA Uplink Parameters
  - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
  - viii. Set Ack-Nack Repetition Factor to 3
  - ix. Set CQI Feedback Cycle (k) to 4 ms
  - x. Set CQI Repetition Factor to 2
  - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH**

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{hs}$<br>(Note 1,<br>Note 2) | CM (dB)<br>(Note 3) | MPR (dB)<br>(Note 3) |
|----------|-------------------|-------------------|-------------------|-------------------|-------------------------------------|---------------------|----------------------|
| 1        | 2/15              | 15/15             | 64                | 2/15              | 4/15                                | 0.0                 | 0.0                  |
| 2        | 12/15<br>(Note 4) | 15/15<br>(Note 4) | 64                | 12/15<br>(Note 4) | 24/15                               | 1.0                 | 0.0                  |
| 3        | 15/15             | 8/15              | 64                | 15/8              | 30/15                               | 1.5                 | 0.5                  |
| 4        | 15/15             | 4/15              | 64                | 15/4              | 30/15                               | 1.5                 | 0.5                  |

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ .

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ , and  $\Delta_{CQI} = 24/15$  with  $\beta_{hs} = 24/15 * \beta_c$ .

Note 3: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

#### **Setup Configuration**

**HSUPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting \* :
  - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
  - ii. Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
  - iii. Set Cell Power = -86 dBm
  - iv. Set Channel Type = 12.2k + HSPA
  - v. Set UE Target Power
  - vi. Power Ctrl Mode= Alternating bits
  - vii. Set and observe the E-TFCI
  - viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

| Sub-test | $\beta_c$      | $\beta_d$      | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ (Note 1) | $\beta_{ec}$ | $\beta_{ed}$ (Note 4) (Note 5)                 | $\beta_{ed}$ (SF) | $\beta_{ed}$ (Codes) | CM (dB) (Note 2) | MPR (dB) (Note 2) (Note 6) | AG Index (Note 5) | E-TFCI |
|----------|----------------|----------------|----------------|-------------------|-----------------------|--------------|------------------------------------------------|-------------------|----------------------|------------------|----------------------------|-------------------|--------|
| 1        | 11/15 (Note 3) | 15/15 (Note 3) | 64             | 11/15 (Note 3)    | 22/15                 | 209/25       | 1309/225                                       | 4                 | 1                    | 1.0              | 0.0                        | 20                | 75     |
| 2        | 6/15           | 15/15          | 64             | 6/15              | 12/15                 | 12/15        | 94/75                                          | 4                 | 1                    | 3.0              | 2.0                        | 12                | 67     |
| 3        | 15/15          | 9/15           | 64             | 15/9              | 30/15                 | 30/15        | $\beta_{ed1}$ : 47/15<br>$\beta_{ed2}$ : 47/15 | 4                 | 2                    | 2.0              | 1.0                        | 15                | 92     |
| 4        | 2/15           | 15/15          | 64             | 2/15              | 4/15                  | 2/15         | 56/75                                          | 4                 | 1                    | 3.0              | 2.0                        | 17                | 71     |
| 5        | 15/15          | 0              | -              | -                 | 5/15                  | 5/15         | 47/15                                          | 4                 | 1                    | 1.0              | 0.0                        | 12                | 67     |

Note 1: For sub-test 1 to 4,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ . For sub-test 5,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 5/15$  with  $\beta_{hs} = 5/15 * \beta_c$ .

Note 2: CM = 1 for  $\beta_d/\beta_c = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

**Setup Configuration**

## DC-HSDPA 3GPP release 8 Setup Configuration:

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set RMC 12.2Kbps + HSDPA mode.
  - ii. Set Cell Power = -25 dBm
  - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
  - iv. Select HSDPA Uplink Parameters
  - v. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
    - a). Subtest 1:  $\beta_c/\beta_d=2/15$
    - b). Subtest 2:  $\beta_c/\beta_d=12/15$
    - c). Subtest 3:  $\beta_c/\beta_d=15/8$
    - d). Subtest 4:  $\beta_c/\beta_d=15/4$
  - vi. Set Delta ACK, Delta NACK and Delta CQI = 8
  - vii. Set Ack-Nack Repetition Factor to 3
  - viii. Set CQI Feedback Cycle (k) to 4 ms
  - ix. Set CQI Repetition Cycle to 2
  - x. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

### C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

| Parameter                                                                                                                                              | Unit      | Value |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|
| Nominal Avg. Inf. Bit Rate                                                                                                                             | kbps      | 60    |
| Inter-TTI Distance                                                                                                                                     | TTI's     | 1     |
| Number of HARQ Processes                                                                                                                               | Processes | 6     |
| Information Bit Payload ( $N_{INF}$ )                                                                                                                  | Bits      | 120   |
| Number Code Blocks                                                                                                                                     | Blocks    | 1     |
| Binary Channel Bits Per TTI                                                                                                                            | Bits      | 960   |
| Total Available SML's in UE                                                                                                                            | SML's     | 19200 |
| Number of SML's per HARQ Proc.                                                                                                                         | SML's     | 3200  |
| Coding Rate                                                                                                                                            |           | 0.15  |
| Number of Physical Channel Codes                                                                                                                       | Codes     | 1     |
| Modulation                                                                                                                                             |           | QPSK  |
| Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.               |           |       |
| Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used. |           |       |

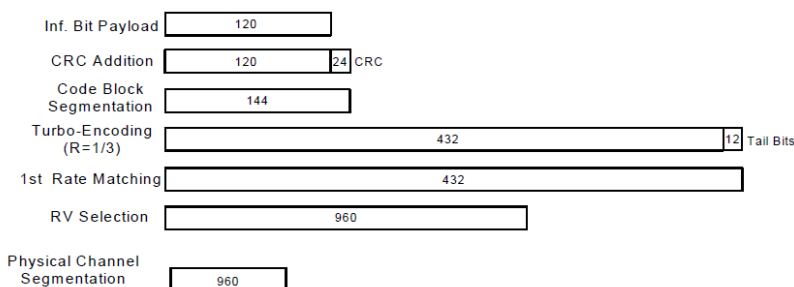


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

## Setup Configuration

**HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting \* :
  - i. Call Configs = 5.2E:HSPA+:UL with 16QAM
  - ii. Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.4, quoted from the TS 34.121-1 s5.2E
  - iii. Set Channel Params
  - iv. Set Cell Power = -86 dBm
  - v. Set Channel Type = HSPA
  - vi. Set UE Target Power =21 dBm
  - vii. Power Ctrl Mode= All Up Bits
  - viii. Set Manual Uplink DPCH Bc/Bd = Manual
  - ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
  - x. Set HSPA Conn DL Channel Levels
  - xi. Set HS-SCCH Configs
  - xii. Set RB Test Mode Setup
  - xiii. Set Common HSUPA Parameters
  - xiv. Set Serving Grant
  - xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

**Table C.11.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM**

| Sub-test | $\beta_c$<br>(Note 3) | $\beta_d$ | $\beta_{HS}$<br>(Note 1) | $\beta_{ec}$ | $\beta_{ed}$<br>(2xSF2)<br>(Note 4)            | $\beta_{ed}$<br>(2xSF4)<br>(Note 4)            | CM<br>(dB)<br>(Note 2) | MPR<br>(dB)<br>(Note 2) | AG<br>Index<br>(Note 4) | E-TFCI<br>(Note 5) | E-TFCI<br>(boost) |
|----------|-----------------------|-----------|--------------------------|--------------|------------------------------------------------|------------------------------------------------|------------------------|-------------------------|-------------------------|--------------------|-------------------|
| 1        | 1                     | 0         | 30/15                    | 30/15        | $\beta_{ed1}$ : 30/15<br>$\beta_{ed2}$ : 30/15 | $\beta_{ed3}$ : 24/15<br>$\beta_{ed4}$ : 24/15 | 3.5                    | 2.5                     | 14                      | 105                | 105               |

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ .

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the  $\beta_c$  is set to 1 and  $\beta_d = 0$  by default.

Note 4:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

**Setup Configuration**

**<WCDMA Conducted Power>**
**General Note:**

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA, HSPA+) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

**<Full Power Mode>**

| Band            |                         | WCDMA II |       |        | Tune-up Limit (dBm) | WCDMA IV |        |        | Tune-up Limit (dBm) | WCDMA V |       |       | Tune-up Limit (dBm) |
|-----------------|-------------------------|----------|-------|--------|---------------------|----------|--------|--------|---------------------|---------|-------|-------|---------------------|
| TX Channel      |                         | 9262     | 9400  | 9538   |                     | 1312     | 1413   | 1513   |                     | 4132    | 4182  | 4233  |                     |
| Rx Channel      |                         | 9662     | 9800  | 9938   |                     | 1537     | 1638   | 1738   |                     | 4357    | 4407  | 4458  |                     |
| Frequency (MHz) |                         | 1852.4   | 1880  | 1907.6 |                     | 1712.4   | 1732.6 | 1752.6 |                     | 826.4   | 836.4 | 846.6 |                     |
| 3GPP Rel 99     | RMC 12.2Kbps            | 23.26    | 23.34 | 23.35  | 24.00               | 23.25    | 23.07  | 23.09  | 24.00               | 22.74   | 22.96 | 22.92 | 24.00               |
| 3GPP Rel 6      | HSDPA Subtest-1         | 22.09    | 22.09 | 22.15  | 23.00               | 22.04    | 21.96  | 21.89  | 23.00               | 21.72   | 21.89 | 21.90 | 23.00               |
| 3GPP Rel 6      | HSDPA Subtest-2         | 22.07    | 22.09 | 22.25  | 23.00               | 22.02    | 21.95  | 21.97  | 23.00               | 21.76   | 22.00 | 21.96 | 23.00               |
| 3GPP Rel 6      | HSDPA Subtest-3         | 21.58    | 21.64 | 21.70  | 22.50               | 21.54    | 21.46  | 21.42  | 22.50               | 21.23   | 21.44 | 21.44 | 22.50               |
| 3GPP Rel 6      | HSDPA Subtest-4         | 21.56    | 21.62 | 21.74  | 22.50               | 21.51    | 21.43  | 21.45  | 22.50               | 21.25   | 21.43 | 21.43 | 22.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-1      | 22.04    | 22.03 | 22.11  | 23.00               | 22.01    | 21.92  | 21.86  | 23.00               | 21.70   | 21.85 | 21.87 | 23.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-2      | 22.02    | 22.02 | 22.20  | 23.00               | 22.00    | 21.91  | 21.95  | 23.00               | 21.72   | 21.97 | 21.92 | 23.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-3      | 21.53    | 21.60 | 21.71  | 22.50               | 21.52    | 21.42  | 21.40  | 22.50               | 21.20   | 21.40 | 21.42 | 22.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-4      | 21.51    | 21.59 | 21.70  | 22.50               | 21.53    | 21.41  | 21.42  | 22.50               | 21.23   | 21.41 | 21.42 | 22.50               |
| 3GPP Rel 6      | HSUPA Subtest-1         | 22.07    | 22.04 | 22.20  | 23.00               | 22.02    | 21.94  | 21.92  | 23.00               | 21.63   | 21.78 | 21.73 | 23.00               |
| 3GPP Rel 6      | HSUPA Subtest-2         | 20.04    | 20.10 | 20.13  | 21.00               | 19.98    | 19.92  | 19.96  | 21.00               | 19.64   | 19.83 | 19.75 | 21.00               |
| 3GPP Rel 6      | HSUPA Subtest-3         | 20.98    | 21.07 | 21.16  | 22.00               | 21.02    | 20.87  | 20.89  | 22.00               | 20.68   | 20.84 | 20.66 | 22.00               |
| 3GPP Rel 6      | HSUPA Subtest-4         | 20.01    | 20.11 | 20.12  | 21.00               | 19.96    | 19.90  | 19.89  | 21.00               | 19.64   | 19.84 | 19.77 | 21.00               |
| 3GPP Rel 6      | HSUPA Subtest-5         | 22.08    | 22.10 | 22.10  | 23.00               | 22.00    | 21.90  | 21.90  | 23.00               | 21.70   | 21.80 | 21.73 | 23.00               |
| 3GPP Rel 7      | HSPA+ (16QAM) Subtest-1 | 19.30    | 19.13 | 19.42  | 20.50               | 19.31    | 19.14  | 19.03  | 20.50               | 19.06   | 19.21 | 19.11 | 20.50               |

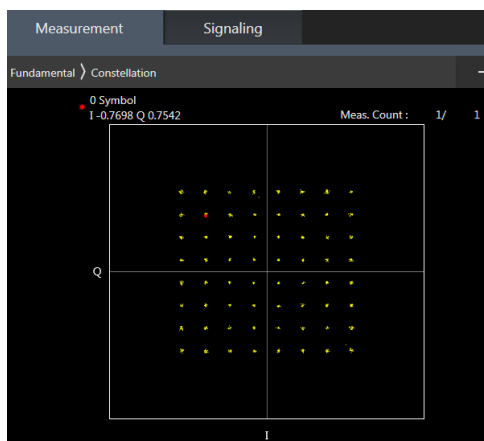
**<Reduced Power Mode for P-Sensor On>**

| Band            |                         | WCDMA II |       |        | Tune-up<br>Limit<br>(dBm) | WCDMA IV |        |        | Tune-up<br>Limit<br>(dBm) | WCDMA V |       |       | Tune-up<br>Limit<br>(dBm) |
|-----------------|-------------------------|----------|-------|--------|---------------------------|----------|--------|--------|---------------------------|---------|-------|-------|---------------------------|
| TX Channel      |                         | 9262     | 9400  | 9538   |                           | 1312     | 1413   | 1513   |                           | 4132    | 4182  | 4233  |                           |
| Rx Channel      |                         | 9662     | 9800  | 9938   |                           | 1537     | 1638   | 1738   |                           | 4357    | 4407  | 4458  |                           |
| Frequency (MHz) |                         | 1852.4   | 1880  | 1907.6 |                           | 1712.4   | 1732.6 | 1752.6 |                           | 826.4   | 836.4 | 846.6 |                           |
| 3GPP Rel 99     | RMC 12.2Kbps            | 19.76    | 19.88 | 19.91  | 20.00                     | 19.88    | 19.71  | 19.82  | 20.00                     | 20.80   | 20.88 | 20.84 | 22.00                     |
| 3GPP Rel 6      | HSDPA Subtest-1         | 18.73    | 18.83 | 18.85  | 19.00                     | 18.79    | 18.72  | 18.82  | 19.00                     | 20.03   | 20.03 | 19.97 | 21.00                     |
| 3GPP Rel 6      | HSDPA Subtest-2         | 18.83    | 18.89 | 18.87  | 19.00                     | 18.75    | 18.74  | 18.77  | 19.00                     | 20.08   | 20.12 | 20.08 | 21.00                     |
| 3GPP Rel 6      | HSDPA Subtest-3         | 18.32    | 18.43 | 18.39  | 18.50                     | 18.23    | 18.26  | 18.28  | 18.50                     | 19.53   | 19.54 | 19.59 | 20.50                     |
| 3GPP Rel 6      | HSDPA Subtest-4         | 18.30    | 18.42 | 18.40  | 18.50                     | 18.25    | 18.22  | 18.26  | 18.50                     | 19.56   | 19.53 | 19.55 | 20.50                     |
| 3GPP Rel 8      | DC-HSDPA Subtest-1      | 18.75    | 18.80 | 18.84  | 19.00                     | 18.76    | 18.68  | 18.77  | 19.00                     | 19.98   | 19.99 | 19.94 | 21.00                     |
| 3GPP Rel 8      | DC-HSDPA Subtest-2      | 18.85    | 18.86 | 18.86  | 19.00                     | 18.72    | 18.70  | 18.72  | 19.00                     | 20.03   | 20.08 | 20.05 | 21.00                     |
| 3GPP Rel 8      | DC-HSDPA Subtest-3      | 18.34    | 18.40 | 18.38  | 18.50                     | 18.20    | 18.22  | 18.23  | 18.50                     | 19.48   | 19.50 | 19.56 | 20.50                     |
| 3GPP Rel 8      | DC-HSDPA Subtest-4      | 18.32    | 18.39 | 18.39  | 18.50                     | 18.22    | 18.18  | 18.21  | 18.50                     | 19.51   | 19.49 | 19.52 | 20.50                     |
| 3GPP Rel 6      | HSUPA Subtest-1         | 18.55    | 18.73 | 18.78  | 19.00                     | 18.61    | 18.58  | 18.65  | 19.00                     | 20.10   | 19.99 | 19.87 | 21.00                     |
| 3GPP Rel 6      | HSUPA Subtest-2         | 16.72    | 16.79 | 16.83  | 17.00                     | 16.52    | 16.59  | 16.63  | 17.00                     | 18.07   | 18.04 | 17.89 | 19.00                     |
| 3GPP Rel 6      | HSUPA Subtest-3         | 17.69    | 17.78 | 17.80  | 18.00                     | 17.52    | 17.59  | 17.60  | 18.00                     | 19.05   | 19.05 | 18.80 | 20.00                     |
| 3GPP Rel 6      | HSUPA Subtest-4         | 16.69    | 16.82 | 16.82  | 17.00                     | 16.48    | 16.55  | 16.64  | 17.00                     | 18.02   | 18.05 | 17.91 | 19.00                     |
| 3GPP Rel 6      | HSUPA Subtest-5         | 18.69    | 18.79 | 18.79  | 19.00                     | 18.49    | 18.59  | 18.59  | 19.00                     | 20.00   | 20.01 | 19.87 | 21.00                     |
| 3GPP Rel 7      | HSPA+ (16QAM) Subtest-1 | 16.43    | 16.48 | 16.46  | 16.50                     | 16.25    | 16.31  | 16.26  | 16.50                     | 17.61   | 17.56 | 17.54 | 18.50                     |

## <LTE Conducted Power>

### General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B5 / B12 / B17 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 4/17 SAR test was covered by Band 66/12; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



**64QAM**



**16QAM**



**<Full Power Mode>**

**<LTE Band 2>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 18700                 | 18900                    | 19100                  |                     |          |
| Frequency (MHz) |            |         |           | 1860                  | 1880                     | 1900                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.00                 | 23.03                    | 23.25                  | 24                  | 0        |
| 20              | QPSK       | 1       | 49        | 22.89                 | 22.85                    | 23.06                  |                     |          |
| 20              | QPSK       | 1       | 99        | 22.83                 | 22.91                    | 22.95                  |                     |          |
| 20              | QPSK       | 50      | 0         | 22.07                 | 21.99                    | 22.16                  | 23                  | 1        |
| 20              | QPSK       | 50      | 24        | 21.94                 | 21.95                    | 22.22                  |                     |          |
| 20              | QPSK       | 50      | 50        | 21.82                 | 21.87                    | 22.11                  |                     |          |
| 20              | QPSK       | 100     | 0         | 21.96                 | 21.96                    | 22.08                  |                     |          |
| 20              | 16QAM      | 1       | 0         | 22.26                 | 22.40                    | 22.45                  | 23                  | 1        |
| 20              | 16QAM      | 1       | 49        | 22.19                 | 22.28                    | 22.44                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 22.11                 | 21.97                    | 22.19                  |                     |          |
| 20              | 16QAM      | 50      | 0         | 21.15                 | 21.15                    | 21.21                  | 22                  | 2        |
| 20              | 16QAM      | 50      | 24        | 21.00                 | 21.08                    | 21.36                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 20.96                 | 20.97                    | 21.23                  |                     |          |
| 20              | 16QAM      | 100     | 0         | 21.01                 | 21.02                    | 21.14                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 21.03                 | 21.26                    | 21.25                  | 22                  | 2        |
| 20              | 64QAM      | 1       | 49        | 20.93                 | 21.15                    | 21.22                  |                     |          |
| 20              | 64QAM      | 1       | 99        | 20.94                 | 20.94                    | 21.00                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 20.00                 | 20.06                    | 20.10                  | 21                  | 3        |
| 20              | 64QAM      | 50      | 24        | 19.91                 | 19.94                    | 20.16                  |                     |          |
| 20              | 64QAM      | 50      | 50        | 19.87                 | 19.86                    | 20.12                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 19.92                 | 19.92                    | 20.05                  |                     |          |
| Channel         |            |         |           | 18675                 | 18900                    | 19125                  |                     |          |
| Frequency (MHz) |            |         |           | 1857.5                | 1880                     | 1902.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 22.97                 | 23.10                    | 23.21                  | 24                  | 0        |
| 15              | QPSK       | 1       | 37        | 22.77                 | 22.88                    | 23.18                  |                     |          |
| 15              | QPSK       | 1       | 74        | 22.83                 | 22.81                    | 23.16                  |                     |          |
| 15              | QPSK       | 36      | 0         | 21.93                 | 22.00                    | 22.38                  | 23                  | 1        |
| 15              | QPSK       | 36      | 20        | 21.94                 | 21.92                    | 22.30                  |                     |          |
| 15              | QPSK       | 36      | 39        | 21.96                 | 21.90                    | 22.22                  |                     |          |
| 15              | QPSK       | 75      | 0         | 21.93                 | 21.94                    | 22.28                  |                     |          |
| 15              | 16QAM      | 1       | 0         | 22.25                 | 22.37                    | 22.44                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 37        | 22.05                 | 22.20                    | 22.31                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 22.14                 | 22.13                    | 22.29                  |                     |          |
| 15              | 16QAM      | 36      | 0         | 21.01                 | 21.15                    | 21.41                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 20        | 21.00                 | 21.04                    | 21.42                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 21.01                 | 20.99                    | 21.31                  |                     |          |
| 15              | 16QAM      | 75      | 0         | 21.04                 | 21.04                    | 21.37                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 21.02                 | 21.32                    | 21.39                  | 22                  | 2        |
| 15              | 64QAM      | 1       | 37        | 20.91                 | 21.04                    | 21.30                  |                     |          |
| 15              | 64QAM      | 1       | 74        | 20.93                 | 20.89                    | 21.09                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 19.89                 | 20.02                    | 20.31                  | 21                  | 3        |
| 15              | 64QAM      | 36      | 20        | 19.87                 | 19.93                    | 20.30                  |                     |          |
| 15              | 64QAM      | 36      | 39        | 19.81                 | 19.88                    | 20.21                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 19.91                 | 19.93                    | 20.23                  |                     |          |

| Channel         |       |    |    | 18650  | 18900 | 19150  | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|-------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 1855   | 1880  | 1905   |                     |          |
| 10              | QPSK  | 1  | 0  | 22.92  | 22.99 | 23.10  | 24                  | 0        |
| 10              | QPSK  | 1  | 25 | 22.83  | 22.86 | 23.16  |                     |          |
| 10              | QPSK  | 1  | 49 | 22.82  | 22.77 | 23.06  |                     |          |
| 10              | QPSK  | 25 | 0  | 21.93  | 21.95 | 22.30  | 23                  | 1        |
| 10              | QPSK  | 25 | 12 | 21.91  | 21.91 | 22.27  |                     |          |
| 10              | QPSK  | 25 | 25 | 21.91  | 21.87 | 22.22  |                     |          |
| 10              | QPSK  | 50 | 0  | 21.97  | 21.91 | 22.24  |                     |          |
| 10              | 16QAM | 1  | 0  | 22.25  | 22.30 | 22.47  | 23                  | 1        |
| 10              | 16QAM | 1  | 25 | 21.99  | 22.23 | 22.42  |                     |          |
| 10              | 16QAM | 1  | 49 | 22.15  | 22.10 | 22.33  |                     |          |
| 10              | 16QAM | 25 | 0  | 20.97  | 21.09 | 21.40  | 22                  | 2        |
| 10              | 16QAM | 25 | 12 | 20.96  | 21.08 | 21.37  |                     |          |
| 10              | 16QAM | 25 | 25 | 20.96  | 20.97 | 21.26  |                     |          |
| 10              | 16QAM | 50 | 0  | 21.02  | 21.01 | 21.37  |                     |          |
| 10              | 64QAM | 1  | 0  | 20.98  | 21.09 | 21.28  | 22                  | 2        |
| 10              | 64QAM | 1  | 25 | 20.78  | 21.03 | 21.27  |                     |          |
| 10              | 64QAM | 1  | 49 | 20.90  | 20.90 | 21.07  |                     |          |
| 10              | 64QAM | 25 | 0  | 19.88  | 19.97 | 20.30  | 21                  | 3        |
| 10              | 64QAM | 25 | 12 | 19.83  | 19.89 | 20.26  |                     |          |
| 10              | 64QAM | 25 | 25 | 19.84  | 19.86 | 20.13  |                     |          |
| 10              | 64QAM | 50 | 0  | 19.88  | 19.89 | 20.23  |                     |          |
| Channel         |       |    |    | 18625  | 18900 | 19175  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1907.5 |                     |          |
| 5               | QPSK  | 1  | 0  | 22.87  | 22.89 | 23.23  | 24                  | 0        |
| 5               | QPSK  | 1  | 12 | 22.81  | 22.90 | 23.15  |                     |          |
| 5               | QPSK  | 1  | 24 | 22.77  | 22.79 | 23.06  |                     |          |
| 5               | QPSK  | 12 | 0  | 21.88  | 21.92 | 22.27  | 23                  | 1        |
| 5               | QPSK  | 12 | 7  | 21.92  | 21.91 | 22.21  |                     |          |
| 5               | QPSK  | 12 | 13 | 21.83  | 21.86 | 22.18  |                     |          |
| 5               | QPSK  | 25 | 0  | 21.89  | 21.89 | 22.20  |                     |          |
| 5               | 16QAM | 1  | 0  | 22.15  | 22.31 | 22.49  | 23                  | 1        |
| 5               | 16QAM | 1  | 12 | 22.12  | 22.25 | 22.38  |                     |          |
| 5               | 16QAM | 1  | 24 | 22.07  | 22.16 | 22.28  |                     |          |
| 5               | 16QAM | 12 | 0  | 20.92  | 21.02 | 21.34  | 22                  | 2        |
| 5               | 16QAM | 12 | 7  | 20.95  | 21.03 | 21.29  |                     |          |
| 5               | 16QAM | 12 | 13 | 20.87  | 20.99 | 21.24  |                     |          |
| 5               | 16QAM | 25 | 0  | 20.91  | 21.00 | 21.23  |                     |          |
| 5               | 64QAM | 1  | 0  | 20.94  | 21.01 | 21.20  | 22                  | 2        |
| 5               | 64QAM | 1  | 12 | 20.89  | 21.02 | 21.23  |                     |          |
| 5               | 64QAM | 1  | 24 | 20.81  | 20.91 | 21.12  |                     |          |
| 5               | 64QAM | 12 | 0  | 19.81  | 19.90 | 20.21  | 21                  | 3        |
| 5               | 64QAM | 12 | 7  | 19.82  | 19.91 | 20.21  |                     |          |
| 5               | 64QAM | 12 | 13 | 19.75  | 19.87 | 20.12  |                     |          |
| 5               | 64QAM | 25 | 0  | 19.81  | 19.89 | 20.13  |                     |          |

| Channel         |       |    |    | 18615  | 18900 | 19185  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1908.5 |                           |             |
| 3               | QPSK  | 1  | 0  | 22.76  | 22.81 | 23.15  | 24                        | 0           |
| 3               | QPSK  | 1  | 8  | 22.73  | 22.82 | 23.07  |                           |             |
| 3               | QPSK  | 1  | 14 | 22.72  | 22.80 | 23.05  |                           |             |
| 3               | QPSK  | 8  | 0  | 21.85  | 21.90 | 22.14  | 23                        | 1           |
| 3               | QPSK  | 8  | 4  | 21.80  | 21.89 | 22.17  |                           |             |
| 3               | QPSK  | 8  | 7  | 21.79  | 21.84 | 22.15  |                           |             |
| 3               | QPSK  | 15 | 0  | 21.80  | 21.85 | 22.19  |                           |             |
| 3               | 16QAM | 1  | 0  | 22.07  | 22.21 | 22.41  | 23                        | 1           |
| 3               | 16QAM | 1  | 8  | 22.08  | 22.12 | 22.24  |                           |             |
| 3               | 16QAM | 1  | 14 | 21.96  | 22.17 | 22.22  |                           |             |
| 3               | 16QAM | 8  | 0  | 20.94  | 21.01 | 21.25  | 22                        | 2           |
| 3               | 16QAM | 8  | 4  | 20.90  | 21.06 | 21.23  |                           |             |
| 3               | 16QAM | 8  | 7  | 20.89  | 20.99 | 21.21  |                           |             |
| 3               | 16QAM | 15 | 0  | 20.89  | 20.96 | 21.23  |                           |             |
| 3               | 64QAM | 1  | 0  | 20.84  | 20.90 | 21.18  | 22                        | 2           |
| 3               | 64QAM | 1  | 8  | 20.78  | 20.98 | 21.15  |                           |             |
| 3               | 64QAM | 1  | 14 | 20.80  | 20.91 | 21.02  |                           |             |
| 3               | 64QAM | 8  | 0  | 19.78  | 19.86 | 20.11  | 21                        | 3           |
| 3               | 64QAM | 8  | 4  | 19.80  | 19.91 | 20.08  |                           |             |
| 3               | 64QAM | 8  | 7  | 19.72  | 19.90 | 20.08  |                           |             |
| 3               | 64QAM | 15 | 0  | 19.78  | 19.84 | 20.09  |                           |             |
| Channel         |       |    |    | 18607  | 18900 | 19193  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1909.3 |                           |             |
| 1.4             | QPSK  | 1  | 0  | 22.83  | 22.88 | 23.19  | 24                        | 0           |
| 1.4             | QPSK  | 1  | 3  | 22.79  | 22.87 | 23.06  |                           |             |
| 1.4             | QPSK  | 1  | 5  | 22.82  | 22.86 | 23.08  |                           |             |
| 1.4             | QPSK  | 3  | 0  | 22.88  | 22.92 | 22.49  |                           |             |
| 1.4             | QPSK  | 3  | 1  | 22.81  | 22.95 | 22.49  |                           |             |
| 1.4             | QPSK  | 3  | 3  | 22.85  | 22.87 | 22.48  |                           |             |
| 1.4             | QPSK  | 6  | 0  | 21.87  | 21.88 | 22.22  | 23                        | 1           |
| 1.4             | 16QAM | 1  | 0  | 22.10  | 22.25 | 22.41  | 23                        | 1           |
| 1.4             | 16QAM | 1  | 3  | 22.04  | 22.30 | 22.34  |                           |             |
| 1.4             | 16QAM | 1  | 5  | 22.02  | 22.18 | 22.21  |                           |             |
| 1.4             | 16QAM | 3  | 0  | 21.36  | 21.09 | 21.26  |                           |             |
| 1.4             | 16QAM | 3  | 1  | 21.32  | 21.08 | 21.27  |                           |             |
| 1.4             | 16QAM | 3  | 3  | 21.39  | 21.03 | 21.24  |                           |             |
| 1.4             | 16QAM | 6  | 0  | 20.96  | 21.01 | 21.25  | 22                        | 2           |
| 1.4             | 64QAM | 1  | 0  | 20.98  | 21.10 | 21.30  | 22                        | 2           |
| 1.4             | 64QAM | 1  | 3  | 20.96  | 20.98 | 21.16  |                           |             |
| 1.4             | 64QAM | 1  | 5  | 20.83  | 20.99 | 21.13  |                           |             |
| 1.4             | 64QAM | 3  | 0  | 20.68  | 20.72 | 20.54  |                           |             |
| 1.4             | 64QAM | 3  | 1  | 20.64  | 20.68 | 20.62  |                           |             |
| 1.4             | 64QAM | 3  | 3  | 20.67  | 20.67 | 20.67  |                           |             |
| 1.4             | 64QAM | 6  | 0  | 19.50  | 19.56 | 19.46  | 21                        | 3           |

**<LTE Band 4>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 20050                 | 20175                    | 20300                  |                     |          |
| Frequency (MHz) |            |         |           | 1720                  | 1732.5                   | 1745                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.03                 | 23.03                    | 23.09                  | 24                  | 0        |
| 20              | QPSK       | 1       | 49        | 22.80                 | 22.87                    | 22.90                  |                     |          |
| 20              | QPSK       | 1       | 99        | 22.86                 | 22.89                    | 22.91                  |                     |          |
| 20              | QPSK       | 50      | 0         | 22.03                 | 22.04                    | 22.01                  | 23                  | 1        |
| 20              | QPSK       | 50      | 24        | 21.92                 | 21.95                    | 22.01                  |                     |          |
| 20              | QPSK       | 50      | 50        | 21.91                 | 21.85                    | 21.91                  |                     |          |
| 20              | QPSK       | 100     | 0         | 21.93                 | 21.94                    | 21.98                  | 23                  | 1        |
| 20              | 16QAM      | 1       | 0         | 22.31                 | 22.33                    | 22.41                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 22.13                 | 22.28                    | 22.15                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 22.22                 | 22.19                    | 22.16                  | 22                  | 2        |
| 20              | 16QAM      | 50      | 0         | 21.08                 | 21.15                    | 21.07                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 20.99                 | 21.04                    | 21.08                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 21.06                 | 20.95                    | 20.99                  | 22                  | 2        |
| 20              | 16QAM      | 100     | 0         | 20.98                 | 21.03                    | 21.05                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 21.18                 | 21.09                    | 21.26                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 20.87                 | 21.09                    | 21.04                  | 22                  | 2        |
| 20              | 64QAM      | 1       | 99        | 20.94                 | 21.03                    | 20.98                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 19.99                 | 20.04                    | 19.95                  | 21                  | 3        |
| 20              | 64QAM      | 50      | 24        | 19.90                 | 19.94                    | 19.94                  |                     |          |
| 20              | 64QAM      | 50      | 50        | 19.93                 | 19.84                    | 19.84                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 19.90                 | 19.93                    | 19.97                  |                     |          |
| Channel         |            |         |           | 20025                 | 20175                    | 20325                  |                     |          |
| Frequency (MHz) |            |         |           | 1717.5                | 1732.5                   | 1747.5                 | Tune-up limit (dBm) | MPR (dB) |
| 15              | QPSK       | 1       | 0         | 23.05                 | 23.03                    | 23.07                  | 24                  | 0        |
| 15              | QPSK       | 1       | 37        | 22.92                 | 22.91                    | 22.91                  |                     |          |
| 15              | QPSK       | 1       | 74        | 22.88                 | 22.95                    | 22.97                  |                     |          |
| 15              | QPSK       | 36      | 0         | 22.05                 | 22.07                    | 22.08                  | 23                  | 1        |
| 15              | QPSK       | 36      | 20        | 22.00                 | 21.99                    | 21.98                  |                     |          |
| 15              | QPSK       | 36      | 39        | 21.89                 | 21.90                    | 21.91                  |                     |          |
| 15              | QPSK       | 75      | 0         | 21.99                 | 22.00                    | 22.01                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 0         | 22.40                 | 22.35                    | 22.50                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 22.16                 | 22.23                    | 22.11                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 22.13                 | 22.34                    | 22.24                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 0         | 21.09                 | 21.12                    | 21.15                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 21.05                 | 21.08                    | 21.08                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 20.98                 | 20.98                    | 20.98                  | 22                  | 2        |
| 15              | 16QAM      | 75      | 0         | 21.04                 | 21.07                    | 21.05                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 21.19                 | 21.10                    | 21.39                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 21.01                 | 21.06                    | 20.99                  | 22                  | 2        |
| 15              | 64QAM      | 1       | 74        | 21.02                 | 21.07                    | 21.09                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 19.99                 | 20.01                    | 20.06                  | 21                  | 3        |
| 15              | 64QAM      | 36      | 20        | 19.92                 | 19.91                    | 19.92                  |                     |          |
| 15              | 64QAM      | 36      | 39        | 19.85                 | 19.87                    | 19.86                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 19.91                 | 19.92                    | 19.96                  |                     |          |

| Channel         |       |    |    | 20000  | 20175  | 20350  | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|--------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 1715   | 1732.5 | 1750   |                     |          |
| 10              | QPSK  | 1  | 0  | 22.86  | 23.03  | 23.06  | 24                  | 0        |
| 10              | QPSK  | 1  | 25 | 22.72  | 22.88  | 22.97  |                     |          |
| 10              | QPSK  | 1  | 49 | 22.80  | 22.93  | 23.00  |                     |          |
| 10              | QPSK  | 25 | 0  | 21.81  | 21.98  | 22.02  | 23                  | 1        |
| 10              | QPSK  | 25 | 12 | 21.91  | 21.94  | 21.96  |                     |          |
| 10              | QPSK  | 25 | 25 | 21.86  | 21.91  | 22.03  |                     |          |
| 10              | QPSK  | 50 | 0  | 21.89  | 21.94  | 21.98  |                     |          |
| 10              | 16QAM | 1  | 0  | 22.21  | 22.30  | 22.36  | 23                  | 1        |
| 10              | 16QAM | 1  | 25 | 21.97  | 22.22  | 22.33  |                     |          |
| 10              | 16QAM | 1  | 49 | 22.06  | 22.39  | 22.26  |                     |          |
| 10              | 16QAM | 25 | 0  | 20.92  | 21.08  | 21.04  | 22                  | 2        |
| 10              | 16QAM | 25 | 12 | 20.96  | 21.04  | 21.04  |                     |          |
| 10              | 16QAM | 25 | 25 | 20.90  | 20.98  | 21.11  |                     |          |
| 10              | 16QAM | 50 | 0  | 20.98  | 21.04  | 21.03  |                     |          |
| 10              | 64QAM | 1  | 0  | 20.89  | 21.14  | 21.21  | 22                  | 2        |
| 10              | 64QAM | 1  | 25 | 20.82  | 20.97  | 21.08  |                     |          |
| 10              | 64QAM | 1  | 49 | 20.90  | 21.15  | 21.09  |                     |          |
| 10              | 64QAM | 25 | 0  | 19.76  | 19.92  | 19.97  | 21                  | 3        |
| 10              | 64QAM | 25 | 12 | 19.87  | 19.93  | 19.91  |                     |          |
| 10              | 64QAM | 25 | 25 | 19.80  | 19.91  | 19.94  |                     |          |
| 10              | 64QAM | 50 | 0  | 19.85  | 19.90  | 19.92  |                     |          |
| Channel         |       |    |    | 19975  | 20175  | 20375  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1712.5 | 1732.5 | 1752.5 |                     |          |
| 5               | QPSK  | 1  | 0  | 22.79  | 22.96  | 23.08  | 24                  | 0        |
| 5               | QPSK  | 1  | 12 | 22.74  | 22.88  | 22.98  |                     |          |
| 5               | QPSK  | 1  | 24 | 22.75  | 22.90  | 22.96  |                     |          |
| 5               | QPSK  | 12 | 0  | 21.81  | 21.96  | 22.04  | 23                  | 1        |
| 5               | QPSK  | 12 | 7  | 21.85  | 21.97  | 22.07  |                     |          |
| 5               | QPSK  | 12 | 13 | 21.74  | 21.95  | 21.99  |                     |          |
| 5               | QPSK  | 25 | 0  | 21.77  | 21.91  | 22.06  |                     |          |
| 5               | 16QAM | 1  | 0  | 22.11  | 22.34  | 22.37  | 23                  | 1        |
| 5               | 16QAM | 1  | 12 | 22.04  | 22.26  | 22.35  |                     |          |
| 5               | 16QAM | 1  | 24 | 22.01  | 22.18  | 22.32  |                     |          |
| 5               | 16QAM | 12 | 0  | 20.90  | 21.03  | 21.16  | 22                  | 2        |
| 5               | 16QAM | 12 | 7  | 20.90  | 21.03  | 21.12  |                     |          |
| 5               | 16QAM | 12 | 13 | 20.87  | 21.01  | 21.05  |                     |          |
| 5               | 16QAM | 25 | 0  | 20.81  | 21.05  | 21.13  |                     |          |
| 5               | 64QAM | 1  | 0  | 20.91  | 21.08  | 21.15  | 22                  | 2        |
| 5               | 64QAM | 1  | 12 | 20.84  | 21.03  | 21.11  |                     |          |
| 5               | 64QAM | 1  | 24 | 20.78  | 21.10  | 21.09  |                     |          |
| 5               | 64QAM | 12 | 0  | 19.74  | 19.92  | 20.00  | 21                  | 3        |
| 5               | 64QAM | 12 | 7  | 19.77  | 19.94  | 19.96  |                     |          |
| 5               | 64QAM | 12 | 13 | 19.75  | 19.92  | 19.97  |                     |          |
| 5               | 64QAM | 25 | 0  | 19.70  | 19.88  | 20.01  |                     |          |

| Channel         |       |    |    | 19965  | 20175  | 20385  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|--------|--------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 1711.5 | 1732.5 | 1753.5 |                           |             |
| 3               | QPSK  | 1  | 0  | 22.78  | 22.94  | 22.99  | 24                        | 0           |
| 3               | QPSK  | 1  | 8  | 22.76  | 22.86  | 22.97  |                           |             |
| 3               | QPSK  | 1  | 14 | 22.71  | 22.85  | 22.92  |                           |             |
| 3               | QPSK  | 8  | 0  | 21.81  | 21.89  | 22.02  | 23                        | 1           |
| 3               | QPSK  | 8  | 4  | 21.82  | 21.97  | 22.00  |                           |             |
| 3               | QPSK  | 8  | 7  | 21.78  | 21.93  | 21.94  |                           |             |
| 3               | QPSK  | 15 | 0  | 21.76  | 21.91  | 22.01  |                           |             |
| 3               | 16QAM | 1  | 0  | 22.01  | 22.31  | 22.21  | 23                        | 1           |
| 3               | 16QAM | 1  | 8  | 22.11  | 22.26  | 22.27  |                           |             |
| 3               | 16QAM | 1  | 14 | 22.03  | 22.17  | 22.21  |                           |             |
| 3               | 16QAM | 8  | 0  | 20.94  | 21.01  | 21.12  | 22                        | 2           |
| 3               | 16QAM | 8  | 4  | 20.98  | 21.11  | 21.13  |                           |             |
| 3               | 16QAM | 8  | 7  | 20.87  | 21.05  | 21.08  |                           |             |
| 3               | 16QAM | 15 | 0  | 20.88  | 21.01  | 21.11  |                           |             |
| 3               | 64QAM | 1  | 0  | 20.91  | 20.99  | 21.11  | 22                        | 2           |
| 3               | 64QAM | 1  | 8  | 20.80  | 20.99  | 21.09  |                           |             |
| 3               | 64QAM | 1  | 14 | 20.79  | 21.05  | 21.07  |                           |             |
| 3               | 64QAM | 8  | 0  | 19.83  | 19.88  | 19.96  | 21                        | 3           |
| 3               | 64QAM | 8  | 4  | 19.77  | 19.92  | 19.96  |                           |             |
| 3               | 64QAM | 8  | 7  | 19.75  | 19.87  | 19.92  |                           |             |
| 3               | 64QAM | 15 | 0  | 19.74  | 19.87  | 19.95  |                           |             |
| Channel         |       |    |    | 19957  | 20175  | 20393  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1710.7 | 1732.5 | 1754.3 |                           |             |
| 1.4             | QPSK  | 1  | 0  | 22.58  | 22.71  | 22.82  | 24                        | 0           |
| 1.4             | QPSK  | 1  | 3  | 22.66  | 22.79  | 22.88  |                           |             |
| 1.4             | QPSK  | 1  | 5  | 22.58  | 22.70  | 22.81  |                           |             |
| 1.4             | QPSK  | 3  | 0  | 22.63  | 22.76  | 22.88  |                           |             |
| 1.4             | QPSK  | 3  | 1  | 22.62  | 22.80  | 22.91  |                           |             |
| 1.4             | QPSK  | 3  | 3  | 22.61  | 22.78  | 22.84  |                           |             |
| 1.4             | QPSK  | 6  | 0  | 21.62  | 21.80  | 21.88  | 23                        | 1           |
| 1.4             | 16QAM | 1  | 0  | 21.87  | 22.07  | 22.14  | 23                        | 1           |
| 1.4             | 16QAM | 1  | 3  | 21.94  | 22.16  | 22.22  |                           |             |
| 1.4             | 16QAM | 1  | 5  | 21.81  | 22.02  | 22.08  |                           |             |
| 1.4             | 16QAM | 3  | 0  | 21.74  | 21.88  | 21.93  |                           |             |
| 1.4             | 16QAM | 3  | 1  | 21.68  | 21.90  | 21.97  |                           |             |
| 1.4             | 16QAM | 3  | 3  | 21.68  | 21.85  | 21.88  |                           |             |
| 1.4             | 16QAM | 6  | 0  | 20.78  | 20.95  | 20.93  | 22                        | 2           |
| 1.4             | 64QAM | 1  | 0  | 20.74  | 20.84  | 21.03  | 22                        | 2           |
| 1.4             | 64QAM | 1  | 3  | 20.72  | 20.92  | 20.94  |                           |             |
| 1.4             | 64QAM | 1  | 5  | 20.72  | 20.85  | 20.97  |                           |             |
| 1.4             | 64QAM | 3  | 0  | 20.64  | 20.81  | 20.84  |                           |             |
| 1.4             | 64QAM | 3  | 1  | 20.66  | 20.79  | 20.89  |                           |             |
| 1.4             | 64QAM | 3  | 3  | 20.60  | 20.76  | 20.83  |                           |             |
| 1.4             | 64QAM | 6  | 0  | 19.57  | 19.71  | 19.73  | 21                        | 3           |

**<LTE Band 5>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 20450                 | 20525                    | 20600                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 829                   | 836.5                    | 844                    |                     |          |
| 10              | QPSK       | 1       | 0         | 22.99                 | 22.77                    | 22.78                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 22.95                 | 22.68                    | 22.77                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.68                 | 22.56                    | 22.72                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.54                 | 21.80                    | 21.77                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 21.65                 | 21.80                    | 21.89                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.71                 | 21.69                    | 21.86                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.71                 | 21.77                    | 21.75                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         | 22.14                 | 21.94                    | 22.07                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 21.92                 | 21.97                    | 22.14                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 21.98                 | 21.85                    | 22.01                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 20.84                 | 20.96                    | 20.91                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.94                 | 20.95                    | 20.96                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.92                 | 20.89                    | 20.89                  | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         | 20.91                 | 20.97                    | 20.86                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 20.85                 | 20.91                    | 20.86                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 20.68                 | 20.76                    | 20.82                  | 21                  | 3        |
| 10              | 64QAM      | 1       | 49        | 20.73                 | 20.78                    | 20.79                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 19.76                 | 19.87                    | 19.78                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 19.83                 | 19.83                    | 19.85                  | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        | 19.77                 | 19.78                    | 19.81                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 19.81                 | 19.81                    | 19.73                  |                     |          |
| Channel         |            |         |           | 20425                 | 20525                    | 20625                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 826.5                 | 836.5                    | 846.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.97                 | 22.94                    | 22.93                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.89                 | 22.90                    | 22.92                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.90                 | 22.89                    | 22.88                  |                     |          |
| 5               | QPSK       | 12      | 0         | 22.03                 | 22.00                    | 22.00                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 22.01                 | 21.98                    | 22.02                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.95                 | 21.97                    | 21.93                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.97                 | 21.99                    | 22.02                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 22.28                 | 22.16                    | 22.15                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 22.27                 | 22.12                    | 22.14                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.17                 | 22.14                    | 22.10                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 21.10                 | 21.04                    | 21.06                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 21.12                 | 21.06                    | 21.03                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 21.07                 | 21.05                    | 20.97                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 21.05                 | 21.07                    | 21.05                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 21.08                 | 20.94                    | 21.06                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 21.04                 | 20.97                    | 20.92                  | 21                  | 3        |
| 5               | 64QAM      | 1       | 24        | 20.96                 | 20.89                    | 20.90                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.96                 | 19.90                    | 19.95                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 20.01                 | 19.92                    | 19.91                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 13        | 19.91                 | 19.88                    | 19.88                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.95                 | 19.94                    | 19.93                  |                     |          |

| Channel         |       |    |    | 20415 | 20525 | 20635 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|-------|-------|-------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 825.5 | 836.5 | 847.5 |                           |             |
| 3               | QPSK  | 1  | 0  | 22.96 | 22.83 | 22.90 | 24                        | 0           |
| 3               | QPSK  | 1  | 8  | 22.92 | 22.83 | 22.88 |                           |             |
| 3               | QPSK  | 1  | 14 | 22.89 | 22.76 | 22.88 |                           |             |
| 3               | QPSK  | 8  | 0  | 22.08 | 21.83 | 21.89 | 23                        | 1           |
| 3               | QPSK  | 8  | 4  | 22.10 | 21.90 | 21.95 |                           |             |
| 3               | QPSK  | 8  | 7  | 22.07 | 21.84 | 21.92 |                           |             |
| 3               | QPSK  | 15 | 0  | 22.11 | 21.86 | 21.95 |                           |             |
| 3               | 16QAM | 1  | 0  | 22.30 | 22.03 | 22.05 | 23                        | 1           |
| 3               | 16QAM | 1  | 8  | 22.30 | 22.05 | 22.07 |                           |             |
| 3               | 16QAM | 1  | 14 | 22.24 | 22.04 | 22.04 |                           |             |
| 3               | 16QAM | 8  | 0  | 21.20 | 20.94 | 20.97 | 22                        | 2           |
| 3               | 16QAM | 8  | 4  | 21.22 | 20.97 | 21.02 |                           |             |
| 3               | 16QAM | 8  | 7  | 21.16 | 20.88 | 20.99 |                           |             |
| 3               | 16QAM | 15 | 0  | 21.18 | 20.93 | 20.98 |                           |             |
| 3               | 64QAM | 1  | 0  | 21.13 | 20.90 | 20.93 | 22                        | 2           |
| 3               | 64QAM | 1  | 8  | 21.15 | 20.91 | 20.77 |                           |             |
| 3               | 64QAM | 1  | 14 | 21.10 | 20.85 | 20.87 |                           |             |
| 3               | 64QAM | 8  | 0  | 20.06 | 19.80 | 19.82 | 21                        | 3           |
| 3               | 64QAM | 8  | 4  | 20.06 | 19.81 | 19.86 |                           |             |
| 3               | 64QAM | 8  | 7  | 19.97 | 19.77 | 19.84 |                           |             |
| 3               | 64QAM | 15 | 0  | 20.04 | 19.81 | 19.83 |                           |             |
| Channel         |       |    |    | 20407 | 20525 | 20643 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 824.7 | 836.5 | 848.3 |                           |             |
| 1.4             | QPSK  | 1  | 0  | 22.89 | 22.86 | 22.83 | 24                        | 0           |
| 1.4             | QPSK  | 1  | 3  | 22.91 | 22.91 | 22.95 |                           |             |
| 1.4             | QPSK  | 1  | 5  | 22.84 | 22.80 | 22.84 |                           |             |
| 1.4             | QPSK  | 3  | 0  | 22.97 | 22.91 | 22.84 |                           |             |
| 1.4             | QPSK  | 3  | 1  | 22.95 | 22.92 | 22.93 |                           |             |
| 1.4             | QPSK  | 3  | 3  | 22.89 | 22.87 | 22.88 |                           |             |
| 1.4             | QPSK  | 6  | 0  | 21.94 | 21.90 | 21.92 | 23                        | 1           |
| 1.4             | 16QAM | 1  | 0  | 22.17 | 22.11 | 22.01 | 23                        | 1           |
| 1.4             | 16QAM | 1  | 3  | 22.28 | 22.15 | 22.14 |                           |             |
| 1.4             | 16QAM | 1  | 5  | 22.16 | 22.02 | 21.98 |                           |             |
| 1.4             | 16QAM | 3  | 0  | 22.00 | 21.89 | 21.86 |                           |             |
| 1.4             | 16QAM | 3  | 1  | 22.05 | 21.95 | 21.96 |                           |             |
| 1.4             | 16QAM | 3  | 3  | 21.94 | 21.87 | 21.84 |                           |             |
| 1.4             | 16QAM | 6  | 0  | 21.11 | 21.03 | 21.01 | 22                        | 2           |
| 1.4             | 64QAM | 1  | 0  | 21.01 | 20.86 | 20.85 | 22                        | 2           |
| 1.4             | 64QAM | 1  | 3  | 21.02 | 20.92 | 20.92 |                           |             |
| 1.4             | 64QAM | 1  | 5  | 20.89 | 20.79 | 20.86 |                           |             |
| 1.4             | 64QAM | 3  | 0  | 20.91 | 20.81 | 20.81 |                           |             |
| 1.4             | 64QAM | 3  | 1  | 20.99 | 20.84 | 20.85 |                           |             |
| 1.4             | 64QAM | 3  | 3  | 20.96 | 20.81 | 20.79 |                           |             |
| 1.4             | 64QAM | 6  | 0  | 19.93 | 19.85 | 19.84 | 21                        | 3           |

**<LTE Band 7>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 20850                 | 21100                    | 21350                  |                     |          |
| Frequency (MHz) |            |         |           | 2510                  | 2535                     | 2560                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.10                 | 23.20                    | 23.03                  | 24                  | 0        |
| 20              | QPSK       | 1       | 49        | 22.93                 | 23.04                    | 22.90                  |                     |          |
| 20              | QPSK       | 1       | 99        | 22.99                 | 23.13                    | 22.90                  |                     |          |
| 20              | QPSK       | 50      | 0         | 22.07                 | 22.17                    | 21.95                  | 23                  | 1        |
| 20              | QPSK       | 50      | 24        | 22.05                 | 22.11                    | 22.00                  |                     |          |
| 20              | QPSK       | 50      | 50        | 22.01                 | 22.12                    | 21.94                  |                     |          |
| 20              | QPSK       | 100     | 0         | 22.04                 | 22.05                    | 22.00                  | 23                  | 1        |
| 20              | 16QAM      | 1       | 0         | 22.37                 | 22.44                    | 22.32                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 22.30                 | 22.27                    | 22.25                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 22.32                 | 22.33                    | 22.24                  | 22                  | 2        |
| 20              | 16QAM      | 50      | 0         | 21.15                 | 21.16                    | 21.02                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 21.09                 | 21.12                    | 21.08                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 21.08                 | 21.04                    | 20.96                  | 22                  | 2        |
| 20              | 16QAM      | 100     | 0         | 21.07                 | 21.19                    | 21.02                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 21.19                 | 21.33                    | 21.11                  | 22                  | 2        |
| 20              | 64QAM      | 1       | 49        | 21.12                 | 21.00                    | 21.00                  |                     |          |
| 20              | 64QAM      | 1       | 99        | 21.16                 | 21.14                    | 21.00                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 20.01                 | 20.12                    | 19.91                  | 21                  | 3        |
| 20              | 64QAM      | 50      | 24        | 19.97                 | 20.07                    | 19.93                  |                     |          |
| 20              | 64QAM      | 50      | 50        | 19.95                 | 20.02                    | 19.81                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 19.99                 | 20.10                    | 19.95                  |                     |          |
| Channel         |            |         |           | 20825                 | 21100                    | 21375                  |                     |          |
| Frequency (MHz) |            |         |           | 2507.5                | 2535                     | 2562.5                 | Tune-up limit (dBm) | MPR (dB) |
| 15              | QPSK       | 1       | 0         | 23.01                 | 23.07                    | 23.01                  | 24                  | 0        |
| 15              | QPSK       | 1       | 37        | 22.89                 | 23.03                    | 22.94                  |                     |          |
| 15              | QPSK       | 1       | 74        | 22.89                 | 23.12                    | 22.84                  |                     |          |
| 15              | QPSK       | 36      | 0         | 21.97                 | 22.11                    | 21.96                  | 23                  | 1        |
| 15              | QPSK       | 36      | 20        | 21.94                 | 22.13                    | 21.91                  |                     |          |
| 15              | QPSK       | 36      | 39        | 21.81                 | 22.06                    | 21.92                  |                     |          |
| 15              | QPSK       | 75      | 0         | 21.93                 | 22.08                    | 21.89                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 0         | 22.30                 | 22.49                    | 22.33                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 22.20                 | 22.28                    | 22.24                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 22.17                 | 22.39                    | 22.13                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 0         | 20.99                 | 21.22                    | 21.02                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 21.00                 | 21.17                    | 20.99                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 20.95                 | 21.12                    | 20.96                  | 22                  | 2        |
| 15              | 16QAM      | 75      | 0         | 20.97                 | 21.15                    | 20.94                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 21.19                 | 21.46                    | 21.20                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 21.02                 | 21.29                    | 21.07                  | 22                  | 2        |
| 15              | 64QAM      | 1       | 74        | 21.03                 | 21.28                    | 21.00                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 19.97                 | 20.06                    | 19.99                  | 21                  | 3        |
| 15              | 64QAM      | 36      | 20        | 20.02                 | 20.02                    | 19.93                  |                     |          |
| 15              | 64QAM      | 36      | 39        | 19.93                 | 19.94                    | 19.94                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 19.97                 | 19.98                    | 19.91                  |                     |          |

| Channel         |       |    |    | 20800  | 21100 | 21400  | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|-------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 2505   | 2535  | 2565   |                     |          |
| 10              | QPSK  | 1  | 0  | 22.98  | 22.98 | 22.90  | 24                  | 0        |
| 10              | QPSK  | 1  | 25 | 22.95  | 22.95 | 22.86  |                     |          |
| 10              | QPSK  | 1  | 49 | 22.95  | 22.85 | 22.81  |                     |          |
| 10              | QPSK  | 25 | 0  | 22.03  | 21.96 | 21.92  | 23                  | 1        |
| 10              | QPSK  | 25 | 12 | 22.01  | 21.98 | 21.94  |                     |          |
| 10              | QPSK  | 25 | 25 | 22.02  | 21.95 | 21.89  |                     |          |
| 10              | QPSK  | 50 | 0  | 22.00  | 21.98 | 21.84  |                     |          |
| 10              | 16QAM | 1  | 0  | 22.31  | 22.37 | 22.24  | 23                  | 1        |
| 10              | 16QAM | 1  | 25 | 22.37  | 22.26 | 22.21  |                     |          |
| 10              | 16QAM | 1  | 49 | 22.29  | 22.18 | 22.15  |                     |          |
| 10              | 16QAM | 25 | 0  | 21.09  | 21.07 | 20.94  | 22                  | 2        |
| 10              | 16QAM | 25 | 12 | 21.09  | 21.04 | 21.03  |                     |          |
| 10              | 16QAM | 25 | 25 | 21.02  | 21.00 | 20.91  |                     |          |
| 10              | 16QAM | 50 | 0  | 21.06  | 21.01 | 20.87  |                     |          |
| 10              | 64QAM | 1  | 0  | 21.06  | 21.15 | 20.95  | 22                  | 2        |
| 10              | 64QAM | 1  | 25 | 21.07  | 21.07 | 20.97  |                     |          |
| 10              | 64QAM | 1  | 49 | 20.98  | 21.06 | 20.91  |                     |          |
| 10              | 64QAM | 25 | 0  | 19.96  | 19.94 | 19.85  | 21                  | 3        |
| 10              | 64QAM | 25 | 12 | 19.94  | 19.95 | 19.89  |                     |          |
| 10              | 64QAM | 25 | 25 | 19.92  | 19.86 | 19.85  |                     |          |
| 10              | 64QAM | 50 | 0  | 19.92  | 19.89 | 19.79  |                     |          |
| Channel         |       |    |    | 20775  | 21100 | 21425  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 2502.5 | 2535  | 2567.5 |                     |          |
| 5               | QPSK  | 1  | 0  | 22.89  | 22.91 | 22.88  | 24                  | 0        |
| 5               | QPSK  | 1  | 12 | 22.84  | 22.94 | 22.83  |                     |          |
| 5               | QPSK  | 1  | 24 | 22.83  | 22.90 | 22.80  |                     |          |
| 5               | QPSK  | 12 | 0  | 21.89  | 21.96 | 21.93  | 23                  | 1        |
| 5               | QPSK  | 12 | 7  | 21.94  | 22.02 | 21.94  |                     |          |
| 5               | QPSK  | 12 | 13 | 21.91  | 21.94 | 21.88  |                     |          |
| 5               | QPSK  | 25 | 0  | 21.92  | 21.94 | 21.87  |                     |          |
| 5               | 16QAM | 1  | 0  | 22.20  | 22.23 | 22.19  | 23                  | 1        |
| 5               | 16QAM | 1  | 12 | 22.22  | 22.26 | 22.14  |                     |          |
| 5               | 16QAM | 1  | 24 | 22.11  | 22.24 | 22.08  |                     |          |
| 5               | 16QAM | 12 | 0  | 20.98  | 21.05 | 20.97  | 22                  | 2        |
| 5               | 16QAM | 12 | 7  | 20.98  | 21.03 | 21.00  |                     |          |
| 5               | 16QAM | 12 | 13 | 20.95  | 21.01 | 20.93  |                     |          |
| 5               | 16QAM | 25 | 0  | 20.97  | 21.01 | 20.95  |                     |          |
| 5               | 64QAM | 1  | 0  | 20.93  | 21.05 | 20.90  | 22                  | 2        |
| 5               | 64QAM | 1  | 12 | 20.98  | 21.04 | 20.91  |                     |          |
| 5               | 64QAM | 1  | 24 | 20.95  | 21.02 | 20.83  |                     |          |
| 5               | 64QAM | 12 | 0  | 19.83  | 19.91 | 19.83  | 21                  | 3        |
| 5               | 64QAM | 12 | 7  | 19.88  | 19.94 | 19.83  |                     |          |
| 5               | 64QAM | 12 | 13 | 19.86  | 19.87 | 19.81  |                     |          |
| 5               | 64QAM | 25 | 0  | 19.86  | 19.91 | 19.83  |                     |          |

**<LTE Band 12>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23060                 | 23095                    | 23130                  |                     |          |
| Frequency (MHz) |            |         |           | 704                   | 707.5                    | 711                    |                     |          |
| 10              | QPSK       | 1       | 0         | 22.73                 | 22.82                    | 22.85                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 22.78                 | 22.83                    | 22.79                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.77                 | 22.97                    | 22.89                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.70                 | 21.75                    | 21.75                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 21.72                 | 21.76                    | 21.74                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.66                 | 21.72                    | 21.68                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.66                 | 21.75                    | 21.70                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         | 21.62                 | 21.78                    | 21.85                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 21.80                 | 21.80                    | 21.82                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 21.76                 | 22.00                    | 21.97                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 20.70                 | 20.78                    | 20.74                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.73                 | 20.80                    | 20.77                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.68                 | 20.79                    | 20.73                  | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         | 20.73                 | 20.78                    | 20.77                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 20.47                 | 20.67                    | 20.66                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 20.63                 | 20.64                    | 20.56                  | 21                  | 3        |
| 10              | 64QAM      | 1       | 49        | 20.60                 | 20.78                    | 20.73                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 19.62                 | 19.66                    | 19.64                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 19.60                 | 19.69                    | 19.62                  | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        | 19.59                 | 19.64                    | 19.60                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 19.60                 | 19.67                    | 19.63                  |                     |          |
| Channel         |            |         |           | 23035                 | 23095                    | 23155                  |                     |          |
| Frequency (MHz) |            |         |           | 701.5                 | 707.5                    | 713.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.71                 | 22.74                    | 22.81                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.71                 | 22.73                    | 22.85                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.70                 | 22.74                    | 22.82                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.62                 | 21.82                    | 21.81                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.67                 | 21.81                    | 21.97                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.75                 | 21.78                    | 21.97                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.78                 | 21.84                    | 21.86                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 21.89                 | 21.96                    | 22.03                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 21.94                 | 22.01                    | 21.98                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 21.85                 | 21.94                    | 21.98                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 20.74                 | 20.83                    | 20.87                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.77                 | 20.83                    | 20.96                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.81                 | 20.82                    | 20.94                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 20.76                 | 20.87                    | 20.87                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.65                 | 20.76                    | 20.81                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.70                 | 20.69                    | 20.92                  | 21                  | 3        |
| 5               | 64QAM      | 1       | 24        | 20.66                 | 20.74                    | 20.89                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.63                 | 19.71                    | 19.72                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 19.65                 | 19.72                    | 19.85                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 13        | 19.61                 | 19.70                    | 19.85                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.70                 | 19.71                    | 19.77                  |                     |          |

| Channel         |       |    |    | 23025 | 23095 | 23165 | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|-------|-------|-------|---------------------|----------|
| Frequency (MHz) |       |    |    | 700.5 | 707.5 | 714.5 |                     |          |
| 3               | QPSK  | 1  | 0  | 22.85 | 22.85 | 22.88 | 24                  | 0        |
| 3               | QPSK  | 1  | 8  | 22.81 | 22.82 | 22.82 |                     |          |
| 3               | QPSK  | 1  | 14 | 22.79 | 22.84 | 22.82 |                     |          |
| 3               | QPSK  | 8  | 0  | 21.86 | 21.87 | 21.86 | 23                  | 1        |
| 3               | QPSK  | 8  | 4  | 21.86 | 21.88 | 21.88 |                     |          |
| 3               | QPSK  | 8  | 7  | 21.84 | 21.88 | 21.92 |                     |          |
| 3               | QPSK  | 15 | 0  | 21.86 | 21.92 | 21.91 |                     |          |
| 3               | 16QAM | 1  | 0  | 21.85 | 21.99 | 22.00 | 23                  | 1        |
| 3               | 16QAM | 1  | 8  | 21.93 | 22.02 | 21.98 |                     |          |
| 3               | 16QAM | 1  | 14 | 21.97 | 22.03 | 21.99 |                     |          |
| 3               | 16QAM | 8  | 0  | 20.81 | 20.93 | 20.92 | 22                  | 2        |
| 3               | 16QAM | 8  | 4  | 20.90 | 20.92 | 20.97 |                     |          |
| 3               | 16QAM | 8  | 7  | 20.89 | 20.95 | 20.95 |                     |          |
| 3               | 16QAM | 15 | 0  | 20.88 | 20.91 | 20.98 |                     |          |
| 3               | 64QAM | 1  | 0  | 20.72 | 20.86 | 20.83 | 22                  | 2        |
| 3               | 64QAM | 1  | 8  | 20.73 | 20.80 | 20.86 |                     |          |
| 3               | 64QAM | 1  | 14 | 20.79 | 20.84 | 20.82 |                     |          |
| 3               | 64QAM | 8  | 0  | 19.72 | 19.78 | 19.77 | 21                  | 3        |
| 3               | 64QAM | 8  | 4  | 19.75 | 19.78 | 19.81 |                     |          |
| 3               | 64QAM | 8  | 7  | 19.69 | 19.77 | 19.79 |                     |          |
| 3               | 64QAM | 15 | 0  | 19.78 | 19.79 | 19.82 |                     |          |
| Channel         |       |    |    | 23017 | 23095 | 23173 | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 699.7 | 707.5 | 715.3 |                     |          |
| 1.4             | QPSK  | 1  | 0  | 22.66 | 22.64 | 22.68 | 24                  | 0        |
| 1.4             | QPSK  | 1  | 3  | 22.64 | 22.71 | 22.71 |                     |          |
| 1.4             | QPSK  | 1  | 5  | 22.61 | 22.61 | 22.64 |                     |          |
| 1.4             | QPSK  | 3  | 0  | 22.61 | 22.61 | 22.72 |                     |          |
| 1.4             | QPSK  | 3  | 1  | 22.72 | 22.73 | 22.73 |                     |          |
| 1.4             | QPSK  | 3  | 3  | 22.65 | 22.66 | 22.61 |                     |          |
| 1.4             | QPSK  | 6  | 0  | 21.81 | 21.86 | 21.79 | 23                  | 1        |
| 1.4             | 16QAM | 1  | 0  | 21.94 | 22.03 | 21.92 | 23                  | 1        |
| 1.4             | 16QAM | 1  | 3  | 22.06 | 22.06 | 22.01 |                     |          |
| 1.4             | 16QAM | 1  | 5  | 21.99 | 22.00 | 21.96 |                     |          |
| 1.4             | 16QAM | 3  | 0  | 21.78 | 21.82 | 21.77 |                     |          |
| 1.4             | 16QAM | 3  | 1  | 21.85 | 21.92 | 21.83 |                     |          |
| 1.4             | 16QAM | 3  | 3  | 21.79 | 21.87 | 21.74 |                     |          |
| 1.4             | 16QAM | 6  | 0  | 20.99 | 21.03 | 20.90 | 22                  | 2        |
| 1.4             | 64QAM | 1  | 0  | 20.71 | 20.87 | 20.71 | 22                  | 2        |
| 1.4             | 64QAM | 1  | 3  | 20.89 | 20.92 | 20.89 |                     |          |
| 1.4             | 64QAM | 1  | 5  | 20.80 | 20.87 | 20.78 |                     |          |
| 1.4             | 64QAM | 3  | 0  | 20.74 | 20.79 | 20.69 |                     |          |
| 1.4             | 64QAM | 3  | 1  | 20.73 | 20.81 | 20.75 |                     |          |
| 1.4             | 64QAM | 3  | 3  | 20.73 | 20.76 | 20.77 |                     |          |
| 1.4             | 64QAM | 6  | 0  | 19.76 | 19.83 | 19.76 | 21                  | 3        |

**<LTE Band 13>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23230                 |                          |                        |                     |          |
| Frequency (MHz) |            |         |           | 782                   |                          |                        |                     |          |
| 10              | QPSK       | 1       | 0         |                       | 23.09                    |                        | 24                  | 0        |
| 10              | QPSK       | 1       | 25        |                       | 23.05                    |                        |                     |          |
| 10              | QPSK       | 1       | 49        |                       | 22.98                    |                        |                     |          |
| 10              | QPSK       | 25      | 0         |                       | 22.06                    |                        | 23                  | 1        |
| 10              | QPSK       | 25      | 12        |                       | 22.03                    |                        |                     |          |
| 10              | QPSK       | 25      | 25        |                       | 21.95                    |                        |                     |          |
| 10              | QPSK       | 50      | 0         |                       | 22.00                    |                        | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         |                       | 22.13                    |                        |                     |          |
| 10              | 16QAM      | 1       | 25        |                       | 22.23                    |                        |                     |          |
| 10              | 16QAM      | 1       | 49        |                       | 22.16                    |                        | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         |                       | 21.14                    |                        |                     |          |
| 10              | 16QAM      | 25      | 12        |                       | 21.06                    |                        |                     |          |
| 10              | 16QAM      | 25      | 25        |                       | 21.03                    |                        | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         |                       | 21.09                    |                        |                     |          |
| 10              | 64QAM      | 1       | 0         |                       | 20.98                    |                        |                     |          |
| 10              | 64QAM      | 1       | 25        |                       | 20.99                    |                        | 22                  | 2        |
| 10              | 64QAM      | 1       | 49        |                       | 21.06                    |                        |                     |          |
| 10              | 64QAM      | 25      | 0         |                       | 20.02                    |                        |                     |          |
| 10              | 64QAM      | 25      | 12        |                       | 19.97                    |                        | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        |                       | 19.87                    |                        |                     |          |
| 10              | 64QAM      | 50      | 0         |                       | 19.97                    |                        |                     |          |
| Channel         |            |         |           | 23205                 | 23230                    | 23255                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 779.5                 | 782                      | 784.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.83                 | 22.89                    | 22.87                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.88                 | 22.77                    | 22.98                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.87                 | 22.83                    | 22.89                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.92                 | 21.87                    | 21.91                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.90                 | 21.86                    | 21.97                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.87                 | 21.73                    | 21.97                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.91                 | 21.72                    | 21.89                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 22.06                 | 22.09                    | 22.09                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 22.07                 | 22.05                    | 22.11                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.05                 | 22.08                    | 22.12                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 20.92                 | 20.89                    | 20.96                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.96                 | 20.83                    | 21.04                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.92                 | 20.77                    | 20.99                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 20.92                 | 20.88                    | 20.93                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.87                 | 20.94                    | 20.84                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.95                 | 20.80                    | 21.00                  | 22                  | 2        |
| 5               | 64QAM      | 1       | 24        | 20.86                 | 20.89                    | 20.97                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.75                 | 19.78                    | 19.78                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 19.74                 | 19.80                    | 19.92                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 13        | 19.82                 | 19.75                    | 19.85                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.86                 | 19.76                    | 19.80                  |                     |          |

**<LTE Band 14>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23330                 |                          |                        |                     |          |
| Frequency (MHz) |            |         |           | 793                   |                          |                        |                     |          |
| 10              | QPSK       | 1       | 0         |                       | 22.79                    |                        | 24                  | 0        |
| 10              | QPSK       | 1       | 25        |                       | 22.65                    |                        |                     |          |
| 10              | QPSK       | 1       | 49        |                       | 22.58                    |                        |                     |          |
| 10              | QPSK       | 25      | 0         |                       | 21.74                    |                        | 23                  | 1        |
| 10              | QPSK       | 25      | 12        |                       | 21.74                    |                        |                     |          |
| 10              | QPSK       | 25      | 25        |                       | 21.64                    |                        |                     |          |
| 10              | QPSK       | 50      | 0         |                       | 21.73                    |                        | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         |                       | 21.93                    |                        |                     |          |
| 10              | 16QAM      | 1       | 25        |                       | 22.08                    |                        |                     |          |
| 10              | 16QAM      | 1       | 49        |                       | 21.88                    |                        | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         |                       | 20.83                    |                        |                     |          |
| 10              | 16QAM      | 25      | 12        |                       | 20.80                    |                        |                     |          |
| 10              | 16QAM      | 25      | 25        |                       | 20.79                    |                        | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         |                       | 20.82                    |                        |                     |          |
| 10              | 64QAM      | 1       | 0         |                       | 20.73                    |                        |                     |          |
| 10              | 64QAM      | 1       | 25        |                       | 20.78                    |                        | 22                  | 2        |
| 10              | 64QAM      | 1       | 49        |                       | 20.76                    |                        |                     |          |
| 10              | 64QAM      | 25      | 0         |                       | 19.74                    |                        |                     |          |
| 10              | 64QAM      | 25      | 12        |                       | 19.73                    |                        | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        |                       | 19.66                    |                        |                     |          |
| 10              | 64QAM      | 50      | 0         |                       | 19.67                    |                        |                     |          |
| Channel         |            |         |           | 23305                 | 23330                    | 23355                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 790.5                 | 793                      | 795.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.77                 | 22.77                    | 22.65                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.78                 | 22.76                    | 22.64                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.75                 | 22.69                    | 22.78                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.85                 | 21.79                    | 21.86                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.88                 | 21.79                    | 21.88                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.79                 | 21.80                    | 21.87                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.87                 | 21.77                    | 21.82                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 22.08                 | 22.03                    | 22.16                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 22.02                 | 22.04                    | 22.19                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.00                 | 22.05                    | 22.06                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 20.97                 | 20.94                    | 20.99                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.96                 | 20.97                    | 21.02                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.91                 | 20.86                    | 20.98                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 20.91                 | 20.87                    | 20.97                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.85                 | 20.82                    | 20.96                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.86                 | 20.89                    | 20.96                  | 22                  | 2        |
| 5               | 64QAM      | 1       | 24        | 20.77                 | 20.81                    | 20.85                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.81                 | 19.82                    | 19.85                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 7         | 19.86                 | 19.87                    | 19.87                  |                     |          |
| 5               | 64QAM      | 12      | 13        | 19.78                 | 19.74                    | 19.83                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.83                 | 19.77                    | 19.85                  |                     |          |

**<LTE Band 17>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23780                 | 23790                    | 23800                  |                     |          |
| Frequency (MHz) |            |         |           | 709                   | 710                      | 711                    |                     |          |
| 10              | QPSK       | 1       | 0         | 22.78                 | 22.86                    | 22.70                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 22.69                 | 22.72                    | 22.69                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.70                 | 22.67                    | 22.64                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.79                 | 21.78                    | 21.78                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 21.81                 | 21.82                    | 21.79                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.78                 | 21.77                    | 21.76                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.79                 | 21.78                    | 21.79                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         | 21.97                 | 21.91                    | 21.91                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 21.99                 | 21.92                    | 21.95                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 21.84                 | 21.84                    | 21.90                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 20.84                 | 20.83                    | 20.82                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.82                 | 20.84                    | 20.82                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.80                 | 20.80                    | 20.82                  | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         | 20.83                 | 20.78                    | 20.81                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 20.76                 | 20.80                    | 20.70                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 20.73                 | 20.74                    | 20.79                  | 21                  | 3        |
| 10              | 64QAM      | 1       | 49        | 20.66                 | 20.72                    | 20.69                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 19.70                 | 19.66                    | 19.68                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 19.69                 | 19.69                    | 19.71                  | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        | 19.73                 | 19.71                    | 19.67                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 19.71                 | 19.70                    | 19.66                  |                     |          |
| Channel         |            |         |           | 23755                 | 23790                    | 23825                  |                     |          |
| Frequency (MHz) |            |         |           | 706.5                 | 710                      | 713.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.85                 | 22.80                    | 22.77                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.84                 | 22.80                    | 22.77                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.84                 | 22.77                    | 22.67                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.89                 | 21.85                    | 21.79                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.88                 | 21.86                    | 21.78                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.92                 | 21.82                    | 21.77                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.85                 | 21.85                    | 21.81                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 22.01                 | 22.08                    | 21.98                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 22.02                 | 22.03                    | 21.95                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.07                 | 21.98                    | 21.94                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 20.92                 | 20.86                    | 20.79                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.93                 | 20.88                    | 20.84                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.91                 | 20.87                    | 20.75                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 20.92                 | 20.88                    | 20.83                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.89                 | 20.84                    | 20.82                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.81                 | 20.78                    | 20.78                  | 21                  | 3        |
| 5               | 64QAM      | 1       | 24        | 20.87                 | 20.86                    | 20.67                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.82                 | 19.76                    | 19.69                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 19.83                 | 19.75                    | 19.71                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 13        | 19.79                 | 19.74                    | 19.67                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.83                 | 19.76                    | 19.70                  |                     |          |

**<LTE Band 30>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 27710                 |                          |                        |                     |          |
| Frequency (MHz) |            |         |           | 2310                  |                          |                        |                     |          |
| 10              | QPSK       | 1       | 0         |                       | 22.89                    |                        | 24                  | 0        |
| 10              | QPSK       | 1       | 25        |                       | 22.74                    |                        |                     |          |
| 10              | QPSK       | 1       | 49        |                       | 22.83                    |                        |                     |          |
| 10              | QPSK       | 25      | 0         |                       | 21.32                    |                        | 23                  | 1        |
| 10              | QPSK       | 25      | 12        |                       | 21.30                    |                        |                     |          |
| 10              | QPSK       | 25      | 25        |                       | 21.28                    |                        |                     |          |
| 10              | QPSK       | 50      | 0         |                       | 21.08                    |                        | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         |                       | 21.70                    |                        |                     |          |
| 10              | 16QAM      | 1       | 25        |                       | 22.11                    |                        |                     |          |
| 10              | 16QAM      | 1       | 49        |                       | 22.04                    |                        | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         |                       | 20.77                    |                        |                     |          |
| 10              | 16QAM      | 25      | 12        |                       | 20.54                    |                        |                     |          |
| 10              | 16QAM      | 25      | 25        |                       | 20.59                    |                        | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         |                       | 20.51                    |                        |                     |          |
| 10              | 64QAM      | 1       | 0         |                       | 20.46                    |                        |                     |          |
| 10              | 64QAM      | 1       | 25        |                       | 20.60                    |                        | 22                  | 2        |
| 10              | 64QAM      | 1       | 49        |                       | 20.92                    |                        |                     |          |
| 10              | 64QAM      | 25      | 0         |                       | 19.57                    |                        |                     |          |
| 10              | 64QAM      | 25      | 12        |                       | 19.47                    |                        | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        |                       | 19.46                    |                        |                     |          |
| 10              | 64QAM      | 50      | 0         |                       | 19.38                    |                        |                     |          |
| Channel         |            |         |           | 27685                 | 27710                    | 27735                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 2307.5                | 2310                     | 2312.5                 |                     |          |
| 5               | QPSK       | 1       | 0         | 22.29                 | 22.31                    | 22.28                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.57                 | 22.60                    | 22.78                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.41                 | 22.53                    | 22.71                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.27                 | 21.37                    | 21.48                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.21                 | 21.23                    | 21.53                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.09                 | 21.21                    | 21.51                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.19                 | 21.14                    | 21.45                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 21.81                 | 21.83                    | 21.99                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 21.86                 | 21.92                    | 22.24                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 21.83                 | 22.00                    | 22.21                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 20.62                 | 20.77                    | 20.83                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.47                 | 20.52                    | 20.84                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.43                 | 20.50                    | 20.66                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 20.28                 | 20.45                    | 20.62                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.48                 | 20.64                    | 20.84                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.69                 | 20.65                    | 20.83                  | 22                  | 2        |
| 5               | 64QAM      | 1       | 24        | 20.61                 | 20.70                    | 20.93                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.29                 | 19.64                    | 19.78                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 19.36                 | 19.46                    | 19.75                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 13        | 19.32                 | 19.48                    | 19.73                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.22                 | 19.35                    | 19.68                  |                     |          |



**<LTE Band 66>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 132072                | 132322                   | 132572                 |                     |          |
| Frequency (MHz) |            |         |           | 1720                  | 1745                     | 1770                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.04                 | 23.19                    | 23.13                  | 24                  | 0        |
| 20              | QPSK       | 1       | 49        | 22.85                 | 22.98                    | 22.89                  |                     |          |
| 20              | QPSK       | 1       | 99        | 22.88                 | 22.91                    | 22.79                  |                     |          |
| 20              | QPSK       | 50      | 0         | 22.05                 | 22.19                    | 22.08                  | 23                  | 1        |
| 20              | QPSK       | 50      | 24        | 22.06                 | 22.07                    | 21.98                  |                     |          |
| 20              | QPSK       | 50      | 50        | 21.96                 | 22.00                    | 21.90                  |                     |          |
| 20              | QPSK       | 100     | 0         | 22.04                 | 22.11                    | 22.01                  | 23                  | 1        |
| 20              | 16QAM      | 1       | 0         | 22.35                 | 22.54                    | 22.56                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 22.19                 | 22.33                    | 22.43                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 22.29                 | 22.20                    | 22.09                  | 22                  | 2        |
| 20              | 16QAM      | 50      | 0         | 21.08                 | 21.29                    | 21.23                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 21.16                 | 21.17                    | 21.12                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 21.04                 | 21.09                    | 20.97                  | 22                  | 2        |
| 20              | 16QAM      | 100     | 0         | 21.11                 | 21.15                    | 21.11                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 21.23                 | 21.35                    | 21.34                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 20.95                 | 21.10                    | 21.12                  | 22                  | 2        |
| 20              | 64QAM      | 1       | 99        | 21.09                 | 21.04                    | 20.87                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 20.00                 | 20.15                    | 20.10                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 20.00                 | 20.07                    | 19.98                  | 21                  | 3        |
| 20              | 64QAM      | 50      | 50        | 19.91                 | 19.95                    | 19.85                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 20.01                 | 20.07                    | 19.99                  |                     |          |
| Channel         |            |         |           | 132047                | 132322                   | 132597                 |                     |          |
| Frequency (MHz) |            |         |           | 1717.5                | 1745                     | 1772.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 23.03                 | 23.16                    | 23.08                  | 24                  | 0        |
| 15              | QPSK       | 1       | 37        | 22.90                 | 22.98                    | 22.82                  |                     |          |
| 15              | QPSK       | 1       | 74        | 22.97                 | 22.96                    | 22.78                  |                     |          |
| 15              | QPSK       | 36      | 0         | 22.07                 | 22.14                    | 22.00                  | 23                  | 1        |
| 15              | QPSK       | 36      | 20        | 22.01                 | 22.07                    | 21.94                  |                     |          |
| 15              | QPSK       | 36      | 39        | 22.04                 | 22.01                    | 21.86                  |                     |          |
| 15              | QPSK       | 75      | 0         | 22.02                 | 22.09                    | 21.90                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 0         | 22.39                 | 22.54                    | 22.39                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 22.16                 | 22.33                    | 22.26                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 22.30                 | 22.29                    | 22.09                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 0         | 21.11                 | 21.25                    | 21.10                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 21.04                 | 21.19                    | 21.04                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 21.01                 | 21.07                    | 20.93                  | 22                  | 2        |
| 15              | 16QAM      | 75      | 0         | 20.97                 | 21.14                    | 21.00                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 21.14                 | 21.32                    | 21.24                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 20.93                 | 21.09                    | 20.96                  | 22                  | 2        |
| 15              | 64QAM      | 1       | 74        | 21.04                 | 21.01                    | 20.84                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 19.89                 | 20.13                    | 20.03                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 19.86                 | 20.02                    | 19.95                  | 21                  | 3        |
| 15              | 64QAM      | 36      | 39        | 19.85                 | 19.96                    | 19.83                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 19.84                 | 20.04                    | 19.91                  |                     |          |

| Channel         |       |    |    | 132022 | 132322 | 132622 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|--------|--------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 1715   | 1745   | 1775   |                           |             |
| 10              | QPSK  | 1  | 0  | 22.91  | 23.00  | 23.00  | 24                        | 0           |
| 10              | QPSK  | 1  | 25 | 22.82  | 22.97  | 22.87  |                           |             |
| 10              | QPSK  | 1  | 49 | 22.84  | 22.91  | 22.79  |                           |             |
| 10              | QPSK  | 25 | 0  | 21.90  | 22.08  | 21.98  | 23                        | 1           |
| 10              | QPSK  | 25 | 12 | 21.97  | 22.03  | 21.92  |                           |             |
| 10              | QPSK  | 25 | 25 | 21.92  | 21.95  | 21.90  |                           |             |
| 10              | QPSK  | 50 | 0  | 21.96  | 22.03  | 21.95  |                           |             |
| 10              | 16QAM | 1  | 0  | 22.30  | 22.32  | 22.48  | 23                        | 1           |
| 10              | 16QAM | 1  | 25 | 22.10  | 22.32  | 22.15  |                           |             |
| 10              | 16QAM | 1  | 49 | 22.25  | 22.30  | 22.14  |                           |             |
| 10              | 16QAM | 25 | 0  | 20.98  | 21.16  | 21.12  | 22                        | 2           |
| 10              | 16QAM | 25 | 12 | 21.07  | 21.09  | 21.03  |                           |             |
| 10              | 16QAM | 25 | 25 | 20.98  | 21.05  | 20.97  |                           |             |
| 10              | 16QAM | 50 | 0  | 21.03  | 21.14  | 21.04  |                           |             |
| 10              | 64QAM | 1  | 0  | 21.08  | 21.08  | 21.20  | 22                        | 2           |
| 10              | 64QAM | 1  | 25 | 20.94  | 21.14  | 21.06  |                           |             |
| 10              | 64QAM | 1  | 49 | 20.92  | 21.06  | 20.89  |                           |             |
| 10              | 64QAM | 25 | 0  | 19.93  | 20.05  | 20.01  | 21                        | 3           |
| 10              | 64QAM | 25 | 12 | 19.97  | 20.05  | 19.93  |                           |             |
| 10              | 64QAM | 25 | 25 | 19.92  | 19.97  | 19.87  |                           |             |
| 10              | 64QAM | 50 | 0  | 19.92  | 19.98  | 19.95  |                           |             |
| Channel         |       |    |    | 131997 | 132322 | 132647 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1712.5 | 1745   | 1777.5 |                           |             |
| 5               | QPSK  | 1  | 0  | 22.92  | 22.95  | 22.79  | 24                        | 0           |
| 5               | QPSK  | 1  | 12 | 22.87  | 22.83  | 22.75  |                           |             |
| 5               | QPSK  | 1  | 24 | 22.83  | 22.94  | 22.76  |                           |             |
| 5               | QPSK  | 12 | 0  | 21.95  | 21.94  | 21.81  | 23                        | 1           |
| 5               | QPSK  | 12 | 7  | 21.83  | 21.99  | 21.91  |                           |             |
| 5               | QPSK  | 12 | 13 | 21.91  | 21.91  | 21.85  |                           |             |
| 5               | QPSK  | 25 | 0  | 21.88  | 21.93  | 21.83  |                           |             |
| 5               | 16QAM | 1  | 0  | 22.49  | 22.11  | 22.10  | 23                        | 1           |
| 5               | 16QAM | 1  | 12 | 22.04  | 22.37  | 22.35  |                           |             |
| 5               | 16QAM | 1  | 24 | 22.15  | 22.21  | 22.06  |                           |             |
| 5               | 16QAM | 12 | 0  | 21.00  | 21.16  | 21.04  | 22                        | 2           |
| 5               | 16QAM | 12 | 7  | 20.88  | 21.04  | 20.90  |                           |             |
| 5               | 16QAM | 12 | 13 | 21.02  | 21.05  | 20.96  |                           |             |
| 5               | 16QAM | 25 | 0  | 20.87  | 21.05  | 20.98  |                           |             |
| 5               | 64QAM | 1  | 0  | 20.93  | 21.16  | 21.33  | 22                        | 2           |
| 5               | 64QAM | 1  | 12 | 20.99  | 20.96  | 20.92  |                           |             |
| 5               | 64QAM | 1  | 24 | 20.96  | 21.28  | 20.89  |                           |             |
| 5               | 64QAM | 12 | 0  | 19.87  | 19.89  | 19.97  | 21                        | 3           |
| 5               | 64QAM | 12 | 7  | 19.82  | 19.95  | 19.84  |                           |             |
| 5               | 64QAM | 12 | 13 | 19.81  | 19.87  | 19.79  |                           |             |
| 5               | 64QAM | 25 | 0  | 19.83  | 19.95  | 19.72  |                           |             |



| Channel         |       |    |    | 131987 | 132322 | 132657 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|--------|--------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 1711.5 | 1745   | 1778.5 |                           |             |
| 3               | QPSK  | 1  | 0  | 22.85  | 22.96  | 22.80  | 24                        | 0           |
| 3               | QPSK  | 1  | 8  | 22.79  | 22.95  | 22.75  |                           |             |
| 3               | QPSK  | 1  | 14 | 22.80  | 22.94  | 22.68  |                           |             |
| 3               | QPSK  | 8  | 0  | 21.84  | 21.99  | 21.81  | 23                        | 1           |
| 3               | QPSK  | 8  | 4  | 21.87  | 22.01  | 21.80  |                           |             |
| 3               | QPSK  | 8  | 7  | 21.84  | 21.99  | 21.75  |                           |             |
| 3               | QPSK  | 15 | 0  | 21.86  | 22.01  | 21.76  |                           |             |
| 3               | 16QAM | 1  | 0  | 22.18  | 22.22  | 22.08  | 23                        | 1           |
| 3               | 16QAM | 1  | 8  | 22.14  | 22.35  | 22.08  |                           |             |
| 3               | 16QAM | 1  | 14 | 22.15  | 22.29  | 21.97  |                           |             |
| 3               | 16QAM | 8  | 0  | 20.96  | 21.16  | 20.91  | 22                        | 2           |
| 3               | 16QAM | 8  | 4  | 21.02  | 21.13  | 20.94  |                           |             |
| 3               | 16QAM | 8  | 7  | 20.94  | 21.10  | 20.88  |                           |             |
| 3               | 16QAM | 15 | 0  | 20.95  | 21.13  | 20.88  |                           |             |
| 3               | 64QAM | 1  | 0  | 20.87  | 21.12  | 20.94  | 22                        | 2           |
| 3               | 64QAM | 1  | 8  | 20.99  | 21.12  | 20.84  |                           |             |
| 3               | 64QAM | 1  | 14 | 20.99  | 21.11  | 20.83  |                           |             |
| 3               | 64QAM | 8  | 0  | 19.85  | 20.02  | 19.79  | 21                        | 3           |
| 3               | 64QAM | 8  | 4  | 19.86  | 20.01  | 19.76  |                           |             |
| 3               | 64QAM | 8  | 7  | 19.82  | 19.96  | 19.72  |                           |             |
| 3               | 64QAM | 15 | 0  | 19.79  | 19.98  | 19.76  |                           |             |
| Channel         |       |    |    | 131979 | 132322 | 132665 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1710.7 | 1745   | 1779.3 |                           |             |
| 1.4             | QPSK  | 1  | 0  | 22.53  | 22.70  | 22.54  | 24                        | 0           |
| 1.4             | QPSK  | 1  | 3  | 22.61  | 22.80  | 22.53  |                           |             |
| 1.4             | QPSK  | 1  | 5  | 22.50  | 22.69  | 22.33  |                           |             |
| 1.4             | QPSK  | 3  | 0  | 22.60  | 22.76  | 22.49  |                           |             |
| 1.4             | QPSK  | 3  | 1  | 22.62  | 22.77  | 22.48  |                           |             |
| 1.4             | QPSK  | 3  | 3  | 22.57  | 22.75  | 22.36  |                           |             |
| 1.4             | QPSK  | 6  | 0  | 21.55  | 21.76  | 21.37  | 23                        | 1           |
| 1.4             | 16QAM | 1  | 0  | 21.84  | 22.07  | 21.70  | 23                        | 1           |
| 1.4             | 16QAM | 1  | 3  | 21.93  | 22.07  | 21.63  |                           |             |
| 1.4             | 16QAM | 1  | 5  | 21.85  | 22.04  | 21.62  |                           |             |
| 1.4             | 16QAM | 3  | 0  | 21.88  | 21.93  | 21.60  |                           |             |
| 1.4             | 16QAM | 3  | 1  | 21.93  | 21.90  | 21.54  |                           |             |
| 1.4             | 16QAM | 3  | 3  | 21.87  | 21.95  | 21.59  |                           |             |
| 1.4             | 16QAM | 6  | 0  | 20.72  | 20.95  | 20.61  | 22                        | 2           |
| 1.4             | 64QAM | 1  | 0  | 20.69  | 20.62  | 20.52  | 22                        | 2           |
| 1.4             | 64QAM | 1  | 3  | 20.78  | 20.76  | 20.53  |                           |             |
| 1.4             | 64QAM | 1  | 5  | 20.65  | 20.69  | 20.42  |                           |             |
| 1.4             | 64QAM | 3  | 0  | 20.65  | 20.62  | 20.27  |                           |             |
| 1.4             | 64QAM | 3  | 1  | 20.60  | 20.67  | 20.32  |                           |             |
| 1.4             | 64QAM | 3  | 3  | 20.57  | 20.63  | 20.31  |                           |             |
| 1.4             | 64QAM | 6  | 0  | 19.54  | 19.54  | 19.32  | 21                        | 3           |

**<Reduced Power Mode for P-Sensor On>**
**<LTE Band 2>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 18700                 | 18900                    | 19100                  |                     |          |
| Frequency (MHz) |            |         |           | 1860                  | 1880                     | 1900                   |                     |          |
| 20              | QPSK       | 1       | 0         | 19.45                 | 19.45                    | 19.64                  | 20                  | 0        |
| 20              | QPSK       | 1       | 49        | 19.38                 | 19.25                    | 19.44                  |                     |          |
| 20              | QPSK       | 1       | 99        | 19.21                 | 19.15                    | 19.49                  |                     |          |
| 20              | QPSK       | 50      | 0         | 19.49                 | 19.41                    | 19.57                  | 20                  | 0        |
| 20              | QPSK       | 50      | 24        | 19.40                 | 19.36                    | 19.70                  |                     |          |
| 20              | QPSK       | 50      | 50        | 19.28                 | 19.36                    | 19.59                  |                     |          |
| 20              | QPSK       | 100     | 0         | 19.38                 | 19.43                    | 19.56                  | 20                  | 0        |
| 20              | 16QAM      | 1       | 0         | 19.68                 | 19.71                    | 19.72                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 19.68                 | 19.62                    | 19.88                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 19.55                 | 19.42                    | 19.82                  | 20                  | 0        |
| 20              | 16QAM      | 50      | 0         | 19.56                 | 19.64                    | 19.71                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 19.47                 | 19.49                    | 19.76                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 19.44                 | 19.41                    | 19.70                  | 20                  | 0        |
| 20              | 16QAM      | 100     | 0         | 19.52                 | 19.56                    | 19.63                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 19.70                 | 19.65                    | 19.76                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 19.54                 | 19.45                    | 19.70                  | 20                  | 0        |
| 20              | 64QAM      | 1       | 99        | 19.52                 | 19.38                    | 19.72                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 19.60                 | 19.59                    | 19.68                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 19.54                 | 19.46                    | 19.84                  | 20                  | 0        |
| 20              | 64QAM      | 50      | 50        | 19.48                 | 19.43                    | 19.71                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 19.55                 | 19.54                    | 19.67                  |                     |          |
| Channel         |            |         |           | 18675                 | 18900                    | 19125                  |                     |          |
| Frequency (MHz) |            |         |           | 1857.5                | 1880                     | 1902.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 19.50                 | 19.52                    | 19.69                  | 20                  | 0        |
| 15              | QPSK       | 1       | 37        | 19.30                 | 19.33                    | 19.62                  |                     |          |
| 15              | QPSK       | 1       | 74        | 19.29                 | 19.30                    | 19.67                  |                     |          |
| 15              | QPSK       | 36      | 0         | 19.39                 | 19.45                    | 19.80                  | 20                  | 0        |
| 15              | QPSK       | 36      | 20        | 19.39                 | 19.38                    | 19.78                  |                     |          |
| 15              | QPSK       | 36      | 39        | 19.35                 | 19.34                    | 19.68                  |                     |          |
| 15              | QPSK       | 75      | 0         | 19.47                 | 19.38                    | 19.68                  | 20                  | 0        |
| 15              | 16QAM      | 1       | 0         | 19.97                 | 19.95                    | 19.92                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 19.83                 | 19.73                    | 19.71                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 19.83                 | 19.73                    | 19.99                  | 20                  | 0        |
| 15              | 16QAM      | 36      | 0         | 19.50                 | 19.58                    | 19.89                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 19.59                 | 19.47                    | 19.87                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 19.45                 | 19.42                    | 19.83                  | 20                  | 0        |
| 15              | 16QAM      | 75      | 0         | 19.52                 | 19.44                    | 19.83                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 19.75                 | 19.73                    | 19.80                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 19.51                 | 19.61                    | 19.78                  | 20                  | 0        |
| 15              | 64QAM      | 1       | 74        | 19.65                 | 19.50                    | 19.71                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 19.45                 | 19.49                    | 19.87                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 19.54                 | 19.47                    | 19.83                  | 20                  | 0        |
| 15              | 64QAM      | 36      | 39        | 19.44                 | 19.42                    | 19.82                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 19.54                 | 19.49                    | 19.84                  |                     |          |

| Channel         |       |    |    | 18650  | 18900 | 19150  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 1855   | 1880  | 1905   |                           |             |
| 10              | QPSK  | 1  | 0  | 19.36  | 19.39 | 19.67  | 20                        | 0           |
| 10              | QPSK  | 1  | 25 | 19.27  | 19.27 | 19.57  |                           |             |
| 10              | QPSK  | 1  | 49 | 19.31  | 19.28 | 19.46  |                           |             |
| 10              | QPSK  | 25 | 0  | 19.31  | 19.44 | 19.75  | 20                        | 0           |
| 10              | QPSK  | 25 | 12 | 19.33  | 19.32 | 19.67  |                           |             |
| 10              | QPSK  | 25 | 25 | 19.33  | 19.31 | 19.68  |                           |             |
| 10              | QPSK  | 50 | 0  | 19.33  | 19.36 | 19.70  |                           |             |
| 10              | 16QAM | 1  | 0  | 19.68  | 19.80 | 19.97  | 20                        | 0           |
| 10              | 16QAM | 1  | 25 | 19.56  | 19.60 | 19.76  |                           |             |
| 10              | 16QAM | 1  | 49 | 19.79  | 19.51 | 19.82  |                           |             |
| 10              | 16QAM | 25 | 0  | 19.44  | 19.55 | 19.88  | 20                        | 0           |
| 10              | 16QAM | 25 | 12 | 19.43  | 19.50 | 19.80  |                           |             |
| 10              | 16QAM | 25 | 25 | 19.52  | 19.46 | 19.76  |                           |             |
| 10              | 16QAM | 50 | 0  | 19.53  | 19.50 | 19.84  |                           |             |
| 10              | 64QAM | 1  | 0  | 19.61  | 19.54 | 19.97  | 20                        | 0           |
| 10              | 64QAM | 1  | 25 | 19.60  | 19.58 | 19.88  |                           |             |
| 10              | 64QAM | 1  | 49 | 19.54  | 19.60 | 19.93  |                           |             |
| 10              | 64QAM | 25 | 0  | 19.42  | 19.50 | 19.85  | 20                        | 0           |
| 10              | 64QAM | 25 | 12 | 19.43  | 19.45 | 19.83  |                           |             |
| 10              | 64QAM | 25 | 25 | 19.45  | 19.35 | 19.74  |                           |             |
| 10              | 64QAM | 50 | 0  | 19.52  | 19.48 | 19.83  |                           |             |
| Channel         |       |    |    | 18625  | 18900 | 19175  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1907.5 |                           |             |
| 5               | QPSK  | 1  | 0  | 19.38  | 19.33 | 19.75  | 20                        | 0           |
| 5               | QPSK  | 1  | 12 | 19.33  | 19.35 | 19.66  |                           |             |
| 5               | QPSK  | 1  | 24 | 19.34  | 19.31 | 19.60  |                           |             |
| 5               | QPSK  | 12 | 0  | 19.42  | 19.41 | 19.72  | 20                        | 0           |
| 5               | QPSK  | 12 | 7  | 19.38  | 19.36 | 19.70  |                           |             |
| 5               | QPSK  | 12 | 13 | 19.33  | 19.37 | 19.66  |                           |             |
| 5               | QPSK  | 25 | 0  | 19.38  | 19.35 | 19.71  |                           |             |
| 5               | 16QAM | 1  | 0  | 19.81  | 19.71 | 19.79  | 20                        | 0           |
| 5               | 16QAM | 1  | 12 | 19.97  | 19.64 | 19.72  |                           |             |
| 5               | 16QAM | 1  | 24 | 19.47  | 19.73 | 19.70  |                           |             |
| 5               | 16QAM | 12 | 0  | 19.53  | 19.51 | 19.79  | 20                        | 0           |
| 5               | 16QAM | 12 | 7  | 19.45  | 19.49 | 19.79  |                           |             |
| 5               | 16QAM | 12 | 13 | 19.41  | 19.44 | 19.72  |                           |             |
| 5               | 16QAM | 25 | 0  | 19.46  | 19.37 | 19.81  |                           |             |
| 5               | 64QAM | 1  | 0  | 19.60  | 19.52 | 19.72  | 20                        | 0           |
| 5               | 64QAM | 1  | 12 | 19.64  | 19.55 | 19.81  |                           |             |
| 5               | 64QAM | 1  | 24 | 19.54  | 19.47 | 19.83  |                           |             |
| 5               | 64QAM | 12 | 0  | 19.48  | 19.44 | 19.78  | 20                        | 0           |
| 5               | 64QAM | 12 | 7  | 19.43  | 19.52 | 19.85  |                           |             |
| 5               | 64QAM | 12 | 13 | 19.48  | 19.49 | 19.74  |                           |             |
| 5               | 64QAM | 25 | 0  | 19.40  | 19.49 | 19.76  |                           |             |



| Channel         |       |    |    | 18615  | 18900 | 19185  | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|-------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1908.5 |                     |          |
| 3               | QPSK  | 1  | 0  | 19.46  | 19.32 | 19.61  | 20                  | 0        |
| 3               | QPSK  | 1  | 8  | 19.35  | 19.33 | 19.57  |                     |          |
| 3               | QPSK  | 1  | 14 | 19.28  | 19.29 | 19.59  |                     |          |
| 3               | QPSK  | 8  | 0  | 19.34  | 19.33 | 19.69  | 20                  | 0        |
| 3               | QPSK  | 8  | 4  | 19.37  | 19.37 | 19.68  |                     |          |
| 3               | QPSK  | 8  | 7  | 19.34  | 19.35 | 19.69  |                     |          |
| 3               | QPSK  | 15 | 0  | 19.36  | 19.33 | 19.71  |                     |          |
| 3               | 16QAM | 1  | 0  | 19.63  | 19.85 | 19.90  | 20                  | 0        |
| 3               | 16QAM | 1  | 8  | 19.77  | 19.64 | 19.91  |                     |          |
| 3               | 16QAM | 1  | 14 | 19.64  | 19.65 | 19.83  |                     |          |
| 3               | 16QAM | 8  | 0  | 19.55  | 19.51 | 19.85  | 20                  | 0        |
| 3               | 16QAM | 8  | 4  | 19.49  | 19.50 | 19.90  |                     |          |
| 3               | 16QAM | 8  | 7  | 19.50  | 19.48 | 19.83  |                     |          |
| 3               | 16QAM | 15 | 0  | 19.42  | 19.43 | 19.72  |                     |          |
| 3               | 64QAM | 1  | 0  | 19.50  | 19.45 | 19.86  | 20                  | 0        |
| 3               | 64QAM | 1  | 8  | 19.50  | 19.51 | 19.84  |                     |          |
| 3               | 64QAM | 1  | 14 | 19.43  | 19.57 | 19.72  |                     |          |
| 3               | 64QAM | 8  | 0  | 19.49  | 19.51 | 19.72  | 20                  | 0        |
| 3               | 64QAM | 8  | 4  | 19.49  | 19.49 | 19.73  |                     |          |
| 3               | 64QAM | 8  | 7  | 19.46  | 19.49 | 19.78  |                     |          |
| 3               | 64QAM | 15 | 0  | 19.36  | 19.47 | 19.73  |                     |          |
| Channel         |       |    |    | 18607  | 18900 | 19193  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1909.3 |                     |          |
| 1.4             | QPSK  | 1  | 0  | 19.28  | 19.26 | 19.57  | 20                  | 0        |
| 1.4             | QPSK  | 1  | 3  | 19.31  | 19.29 | 19.57  |                     |          |
| 1.4             | QPSK  | 1  | 5  | 19.22  | 19.18 | 19.56  |                     |          |
| 1.4             | QPSK  | 3  | 0  | 19.27  | 19.24 | 19.64  |                     |          |
| 1.4             | QPSK  | 3  | 1  | 19.32  | 19.34 | 19.70  |                     |          |
| 1.4             | QPSK  | 3  | 3  | 19.29  | 19.26 | 19.61  |                     |          |
| 1.4             | QPSK  | 6  | 0  | 19.35  | 19.27 | 19.56  | 20                  | 0        |
| 1.4             | 16QAM | 1  | 0  | 19.56  | 19.57 | 19.99  | 20                  | 0        |
| 1.4             | 16QAM | 1  | 3  | 19.66  | 19.60 | 19.82  |                     |          |
| 1.4             | 16QAM | 1  | 5  | 19.59  | 19.68 | 19.97  |                     |          |
| 1.4             | 16QAM | 3  | 0  | 19.39  | 19.42 | 19.67  |                     |          |
| 1.4             | 16QAM | 3  | 1  | 19.44  | 19.39 | 19.68  |                     |          |
| 1.4             | 16QAM | 3  | 3  | 19.33  | 19.39 | 19.70  |                     |          |
| 1.4             | 16QAM | 6  | 0  | 19.43  | 19.44 | 19.77  | 20                  | 0        |
| 1.4             | 64QAM | 1  | 0  | 19.46  | 19.51 | 19.70  | 20                  | 0        |
| 1.4             | 64QAM | 1  | 3  | 19.42  | 19.55 | 19.78  |                     |          |
| 1.4             | 64QAM | 1  | 5  | 19.41  | 19.41 | 19.72  |                     |          |
| 1.4             | 64QAM | 3  | 0  | 19.31  | 19.50 | 19.77  |                     |          |
| 1.4             | 64QAM | 3  | 1  | 19.42  | 19.43 | 19.66  |                     |          |
| 1.4             | 64QAM | 3  | 3  | 19.34  | 19.49 | 19.64  |                     |          |
| 1.4             | 64QAM | 6  | 0  | 19.36  | 19.48 | 19.72  | 20                  | 0        |

**<LTE Band 4>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 20050                 | 20175                    | 20300                  |                     |          |
| Frequency (MHz) |            |         |           | 1720                  | 1732.5                   | 1745                   |                     |          |
| 20              | QPSK       | 1       | 0         | 18.76                 | 18.77                    | 18.71                  | 19.5                | 0        |
| 20              | QPSK       | 1       | 49        | 18.56                 | 18.47                    | 18.60                  |                     |          |
| 20              | QPSK       | 1       | 99        | 18.43                 | 18.49                    | 18.58                  |                     |          |
| 20              | QPSK       | 50      | 0         | 18.63                 | 18.69                    | 18.60                  | 19.5                | 0        |
| 20              | QPSK       | 50      | 24        | 18.65                 | 18.57                    | 18.70                  |                     |          |
| 20              | QPSK       | 50      | 50        | 18.59                 | 18.52                    | 18.63                  |                     |          |
| 20              | QPSK       | 100     | 0         | 18.65                 | 18.59                    | 18.71                  | 19.5                | 0        |
| 20              | 16QAM      | 1       | 0         | 18.94                 | 18.93                    | 18.88                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 18.91                 | 18.82                    | 18.82                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 18.78                 | 18.81                    | 18.86                  | 19.5                | 0        |
| 20              | 16QAM      | 50      | 0         | 18.76                 | 18.78                    | 18.77                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 18.78                 | 18.69                    | 18.70                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 18.67                 | 18.61                    | 18.71                  | 19.5                | 0        |
| 20              | 16QAM      | 100     | 0         | 18.72                 | 18.75                    | 18.75                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 18.89                 | 18.92                    | 18.98                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 18.64                 | 18.83                    | 18.72                  | 19.5                | 0        |
| 20              | 64QAM      | 1       | 99        | 18.63                 | 18.82                    | 18.91                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 18.75                 | 18.78                    | 18.72                  | 19.5                | 0        |
| 20              | 64QAM      | 50      | 24        | 18.76                 | 18.74                    | 18.73                  |                     |          |
| 20              | 64QAM      | 50      | 50        | 18.67                 | 18.67                    | 18.67                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 18.80                 | 18.71                    | 18.73                  |                     |          |
| Channel         |            |         |           | 20025                 | 20175                    | 20325                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 1717.5                | 1732.5                   | 1747.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 18.72                 | 18.70                    | 18.73                  | 19.5                | 0        |
| 15              | QPSK       | 1       | 37        | 18.50                 | 18.53                    | 18.40                  |                     |          |
| 15              | QPSK       | 1       | 74        | 18.60                 | 18.59                    | 18.58                  |                     |          |
| 15              | QPSK       | 36      | 0         | 18.71                 | 18.68                    | 18.60                  | 19.5                | 0        |
| 15              | QPSK       | 36      | 20        | 18.56                 | 18.54                    | 18.53                  |                     |          |
| 15              | QPSK       | 36      | 39        | 18.59                 | 18.51                    | 18.48                  |                     |          |
| 15              | QPSK       | 75      | 0         | 18.70                 | 18.63                    | 18.61                  | 19.5                | 0        |
| 15              | 16QAM      | 1       | 0         | 18.83                 | 18.89                    | 18.88                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 18.68                 | 18.72                    | 18.71                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 18.77                 | 18.84                    | 18.77                  | 19.5                | 0        |
| 15              | 16QAM      | 36      | 0         | 18.73                 | 18.78                    | 18.71                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 18.70                 | 18.74                    | 18.63                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 18.75                 | 18.66                    | 18.57                  | 19.5                | 0        |
| 15              | 16QAM      | 75      | 0         | 18.76                 | 18.72                    | 18.65                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 18.87                 | 18.99                    | 18.87                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 18.73                 | 18.67                    | 18.70                  | 19.5                | 0        |
| 15              | 64QAM      | 1       | 74        | 18.75                 | 18.79                    | 18.71                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 18.69                 | 18.80                    | 18.71                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 18.67                 | 18.69                    | 18.63                  | 19.5                | 0        |
| 15              | 64QAM      | 36      | 39        | 18.65                 | 18.56                    | 18.65                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 18.69                 | 18.67                    | 18.63                  |                     |          |

| Channel         |       |    |    | 20000  | 20175  | 20350  | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|--------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 1715   | 1732.5 | 1750   |                     |          |
| 10              | QPSK  | 1  | 0  | 18.53  | 18.56  | 18.65  | 19.5                | 0        |
| 10              | QPSK  | 1  | 25 | 18.52  | 18.50  | 18.67  |                     |          |
| 10              | QPSK  | 1  | 49 | 18.35  | 18.51  | 18.60  |                     |          |
| 10              | QPSK  | 25 | 0  | 18.59  | 18.56  | 18.64  | 19.5                | 0        |
| 10              | QPSK  | 25 | 12 | 18.52  | 18.57  | 18.62  |                     |          |
| 10              | QPSK  | 25 | 25 | 18.41  | 18.53  | 18.63  |                     |          |
| 10              | QPSK  | 50 | 0  | 18.49  | 18.54  | 18.64  |                     |          |
| 10              | 16QAM | 1  | 0  | 18.84  | 18.82  | 18.85  | 19.5                | 0        |
| 10              | 16QAM | 1  | 25 | 18.77  | 18.70  | 18.82  |                     |          |
| 10              | 16QAM | 1  | 49 | 18.75  | 18.91  | 18.88  |                     |          |
| 10              | 16QAM | 25 | 0  | 18.57  | 18.68  | 18.73  | 19.5                | 0        |
| 10              | 16QAM | 25 | 12 | 18.57  | 18.89  | 18.72  |                     |          |
| 10              | 16QAM | 25 | 25 | 18.47  | 18.64  | 18.75  |                     |          |
| 10              | 16QAM | 50 | 0  | 18.59  | 18.69  | 18.68  |                     |          |
| 10              | 64QAM | 1  | 0  | 18.70  | 18.78  | 18.79  | 19.5                | 0        |
| 10              | 64QAM | 1  | 25 | 18.72  | 18.87  | 18.86  |                     |          |
| 10              | 64QAM | 1  | 49 | 18.53  | 18.96  | 18.90  |                     |          |
| 10              | 64QAM | 25 | 0  | 18.62  | 18.72  | 18.74  | 19.5                | 0        |
| 10              | 64QAM | 25 | 12 | 18.64  | 18.71  | 18.71  |                     |          |
| 10              | 64QAM | 25 | 25 | 18.58  | 18.58  | 18.73  |                     |          |
| 10              | 64QAM | 50 | 0  | 18.61  | 18.64  | 18.66  |                     |          |
| Channel         |       |    |    | 19975  | 20175  | 20375  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1712.5 | 1732.5 | 1752.5 |                     |          |
| 5               | QPSK  | 1  | 0  | 18.54  | 18.58  | 18.64  | 19.5                | 0        |
| 5               | QPSK  | 1  | 12 | 18.47  | 18.44  | 18.60  |                     |          |
| 5               | QPSK  | 1  | 24 | 18.43  | 18.47  | 18.64  |                     |          |
| 5               | QPSK  | 12 | 0  | 18.48  | 18.55  | 18.69  | 19.5                | 0        |
| 5               | QPSK  | 12 | 7  | 18.52  | 18.59  | 18.72  |                     |          |
| 5               | QPSK  | 12 | 13 | 18.47  | 18.47  | 18.63  |                     |          |
| 5               | QPSK  | 25 | 0  | 18.52  | 18.54  | 18.64  |                     |          |
| 5               | 16QAM | 1  | 0  | 18.91  | 18.89  | 18.87  | 19.5                | 0        |
| 5               | 16QAM | 1  | 12 | 18.61  | 18.72  | 18.87  |                     |          |
| 5               | 16QAM | 1  | 24 | 18.67  | 18.82  | 18.88  |                     |          |
| 5               | 16QAM | 12 | 0  | 18.59  | 18.67  | 18.75  | 19.5                | 0        |
| 5               | 16QAM | 12 | 7  | 18.57  | 18.65  | 18.72  |                     |          |
| 5               | 16QAM | 12 | 13 | 18.52  | 18.66  | 18.75  |                     |          |
| 5               | 16QAM | 25 | 0  | 18.62  | 18.65  | 18.77  |                     |          |
| 5               | 64QAM | 1  | 0  | 18.91  | 18.94  | 18.86  | 19.5                | 0        |
| 5               | 64QAM | 1  | 12 | 18.85  | 18.86  | 18.83  |                     |          |
| 5               | 64QAM | 1  | 24 | 18.68  | 18.75  | 18.91  |                     |          |
| 5               | 64QAM | 12 | 0  | 18.67  | 18.72  | 18.77  | 19.5                | 0        |
| 5               | 64QAM | 12 | 7  | 18.68  | 18.68  | 18.86  |                     |          |
| 5               | 64QAM | 12 | 13 | 18.61  | 18.68  | 18.75  |                     |          |
| 5               | 64QAM | 25 | 0  | 18.64  | 18.60  | 18.73  |                     |          |



| Channel         |       |    |    | 19965  | 20175  | 20385  | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|--------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 1711.5 | 1732.5 | 1753.5 |                     |          |
| 3               | QPSK  | 1  | 0  | 18.53  | 18.53  | 18.60  | 19.5                | 0        |
| 3               | QPSK  | 1  | 8  | 18.53  | 18.55  | 18.64  |                     |          |
| 3               | QPSK  | 1  | 14 | 18.48  | 18.49  | 18.56  |                     |          |
| 3               | QPSK  | 8  | 0  | 18.51  | 18.51  | 18.59  | 19.5                | 0        |
| 3               | QPSK  | 8  | 4  | 18.45  | 18.56  | 18.62  |                     |          |
| 3               | QPSK  | 8  | 7  | 18.46  | 18.48  | 18.66  |                     |          |
| 3               | QPSK  | 15 | 0  | 18.64  | 18.51  | 18.59  |                     |          |
| 3               | 16QAM | 1  | 0  | 18.82  | 18.66  | 18.88  | 19.5                | 0        |
| 3               | 16QAM | 1  | 8  | 18.78  | 18.90  | 18.81  |                     |          |
| 3               | 16QAM | 1  | 14 | 18.67  | 18.59  | 18.75  |                     |          |
| 3               | 16QAM | 8  | 0  | 18.61  | 18.67  | 18.67  | 19.5                | 0        |
| 3               | 16QAM | 8  | 4  | 18.68  | 18.67  | 18.73  |                     |          |
| 3               | 16QAM | 8  | 7  | 18.56  | 18.69  | 18.71  |                     |          |
| 3               | 16QAM | 15 | 0  | 18.61  | 18.63  | 18.65  |                     |          |
| 3               | 64QAM | 1  | 0  | 18.79  | 18.79  | 18.85  | 19.5                | 0        |
| 3               | 64QAM | 1  | 8  | 18.69  | 18.84  | 18.79  |                     |          |
| 3               | 64QAM | 1  | 14 | 18.76  | 18.73  | 18.82  |                     |          |
| 3               | 64QAM | 8  | 0  | 18.67  | 18.63  | 18.76  | 19.5                | 0        |
| 3               | 64QAM | 8  | 4  | 18.61  | 18.71  | 18.80  |                     |          |
| 3               | 64QAM | 8  | 7  | 18.64  | 18.60  | 18.84  |                     |          |
| 3               | 64QAM | 15 | 0  | 18.62  | 18.64  | 18.78  |                     |          |
| Channel         |       |    |    | 19957  | 20175  | 20393  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1710.7 | 1732.5 | 1754.3 |                     |          |
| 1.4             | QPSK  | 1  | 0  | 18.47  | 18.46  | 18.55  | 19.5                | 0        |
| 1.4             | QPSK  | 1  | 3  | 18.54  | 18.53  | 18.59  |                     |          |
| 1.4             | QPSK  | 1  | 5  | 18.39  | 18.48  | 18.59  |                     |          |
| 1.4             | QPSK  | 3  | 0  | 18.53  | 18.44  | 18.60  |                     |          |
| 1.4             | QPSK  | 3  | 1  | 18.46  | 18.58  | 18.62  |                     |          |
| 1.4             | QPSK  | 3  | 3  | 18.53  | 18.55  | 18.55  |                     |          |
| 1.4             | QPSK  | 6  | 0  | 18.46  | 18.48  | 18.59  | 19.5                | 0        |
| 1.4             | 16QAM | 1  | 0  | 18.85  | 18.78  | 18.76  | 19.5                | 0        |
| 1.4             | 16QAM | 1  | 3  | 18.73  | 18.81  | 18.98  |                     |          |
| 1.4             | 16QAM | 1  | 5  | 18.79  | 18.79  | 18.86  |                     |          |
| 1.4             | 16QAM | 3  | 0  | 18.61  | 18.55  | 18.56  |                     |          |
| 1.4             | 16QAM | 3  | 1  | 18.54  | 18.58  | 18.67  |                     |          |
| 1.4             | 16QAM | 3  | 3  | 18.47  | 18.55  | 18.66  |                     |          |
| 1.4             | 16QAM | 6  | 0  | 18.58  | 18.69  | 18.68  | 19.5                | 0        |
| 1.4             | 64QAM | 1  | 0  | 18.56  | 18.75  | 18.73  | 19.5                | 0        |
| 1.4             | 64QAM | 1  | 3  | 18.71  | 18.73  | 18.74  |                     |          |
| 1.4             | 64QAM | 1  | 5  | 18.58  | 18.65  | 18.76  |                     |          |
| 1.4             | 64QAM | 3  | 0  | 18.68  | 18.47  | 18.76  |                     |          |
| 1.4             | 64QAM | 3  | 1  | 18.70  | 18.69  | 18.74  |                     |          |
| 1.4             | 64QAM | 3  | 3  | 18.68  | 18.56  | 18.75  |                     |          |
| 1.4             | 64QAM | 6  | 0  | 18.59  | 18.64  | 18.76  | 19.5                | 0        |

**<LTE Band 5>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 20450                 | 20525                    | 20600                  | 22                  | 0        |
| Frequency (MHz) |            |         |           | 829                   | 836.5                    | 844                    |                     |          |
| 10              | QPSK       | 1       | 0         | 20.52                 | 20.50                    | 20.56                  | 22                  | 0        |
| 10              | QPSK       | 1       | 25        | 20.52                 | 20.46                    | 20.48                  |                     |          |
| 10              | QPSK       | 1       | 49        | 20.48                 | 20.50                    | 20.52                  |                     |          |
| 10              | QPSK       | 25      | 0         | 20.44                 | 20.39                    | 20.33                  | 22                  | 0        |
| 10              | QPSK       | 25      | 12        | 20.48                 | 20.36                    | 20.38                  |                     |          |
| 10              | QPSK       | 25      | 25        | 20.47                 | 20.25                    | 20.35                  |                     |          |
| 10              | QPSK       | 50      | 0         | 20.43                 | 20.35                    | 20.26                  | 22                  | 0        |
| 10              | 16QAM      | 1       | 0         | 20.69                 | 20.54                    | 20.64                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 20.62                 | 20.58                    | 20.57                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 20.67                 | 20.52                    | 20.53                  | 22                  | 0        |
| 10              | 16QAM      | 25      | 0         | 20.56                 | 20.46                    | 20.36                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.51                 | 20.45                    | 20.49                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.56                 | 20.40                    | 20.39                  | 22                  | 0        |
| 10              | 16QAM      | 50      | 0         | 20.50                 | 20.41                    | 20.31                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 20.56                 | 20.46                    | 20.52                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 20.52                 | 20.52                    | 20.53                  | 21                  | 1        |
| 10              | 64QAM      | 1       | 49        | 20.55                 | 20.42                    | 20.39                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 19.52                 | 19.46                    | 19.36                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 19.50                 | 19.45                    | 19.44                  | 21                  | 1        |
| 10              | 64QAM      | 25      | 25        | 19.56                 | 19.40                    | 19.34                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 19.49                 | 19.41                    | 19.30                  |                     |          |
| Channel         |            |         |           | 20425                 | 20525                    | 20625                  | 22                  | 0        |
| Frequency (MHz) |            |         |           | 826.5                 | 836.5                    | 846.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 20.45                 | 20.37                    | 20.41                  | 22                  | 0        |
| 5               | QPSK       | 1       | 12        | 20.41                 | 20.27                    | 20.37                  |                     |          |
| 5               | QPSK       | 1       | 24        | 20.50                 | 20.26                    | 20.32                  |                     |          |
| 5               | QPSK       | 12      | 0         | 20.45                 | 20.35                    | 20.43                  | 22                  | 0        |
| 5               | QPSK       | 12      | 7         | 20.58                 | 20.33                    | 20.44                  |                     |          |
| 5               | QPSK       | 12      | 13        | 20.57                 | 20.33                    | 20.36                  |                     |          |
| 5               | QPSK       | 25      | 0         | 20.56                 | 20.35                    | 20.41                  | 22                  | 0        |
| 5               | 16QAM      | 1       | 0         | 20.48                 | 20.33                    | 20.41                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 20.41                 | 20.32                    | 20.33                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 20.42                 | 20.25                    | 20.31                  | 22                  | 0        |
| 5               | 16QAM      | 12      | 0         | 20.55                 | 20.42                    | 20.49                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.65                 | 20.40                    | 20.45                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.57                 | 20.39                    | 20.45                  | 22                  | 0        |
| 5               | 16QAM      | 25      | 0         | 20.62                 | 20.40                    | 20.47                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.73                 | 20.53                    | 20.64                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.66                 | 20.49                    | 20.55                  | 21                  | 1        |
| 5               | 64QAM      | 1       | 24        | 20.67                 | 20.51                    | 20.54                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.54                 | 19.42                    | 19.46                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 19.62                 | 19.41                    | 19.45                  | 21                  | 1        |
| 5               | 64QAM      | 12      | 13        | 19.57                 | 19.38                    | 19.46                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.63                 | 19.40                    | 19.49                  |                     |          |



| Channel         |       |    |    | 20415 | 20525 | 20635 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|-------|-------|-------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 825.5 | 836.5 | 847.5 |                           |             |
| 3               | QPSK  | 1  | 0  | 20.43 | 20.32 | 20.42 | 22                        | 0           |
| 3               | QPSK  | 1  | 8  | 20.38 | 20.28 | 20.33 |                           |             |
| 3               | QPSK  | 1  | 14 | 20.39 | 20.26 | 20.34 |                           |             |
| 3               | QPSK  | 8  | 0  | 20.45 | 20.31 | 20.39 | 22                        | 0           |
| 3               | QPSK  | 8  | 4  | 20.49 | 20.37 | 20.43 |                           |             |
| 3               | QPSK  | 8  | 7  | 20.45 | 20.31 | 20.37 |                           |             |
| 3               | QPSK  | 15 | 0  | 20.46 | 20.36 | 20.41 | 22                        | 0           |
| 3               | 16QAM | 1  | 0  | 20.75 | 20.59 | 20.61 |                           |             |
| 3               | 16QAM | 1  | 8  | 20.72 | 20.56 | 20.64 |                           |             |
| 3               | 16QAM | 1  | 14 | 20.70 | 20.54 | 20.63 | 22                        | 0           |
| 3               | 16QAM | 8  | 0  | 20.57 | 20.42 | 20.48 |                           |             |
| 3               | 16QAM | 8  | 4  | 20.59 | 20.45 | 20.52 |                           |             |
| 3               | 16QAM | 8  | 7  | 20.55 | 20.43 | 20.49 | 22                        | 0           |
| 3               | 16QAM | 15 | 0  | 20.55 | 20.44 | 20.50 |                           |             |
| 3               | 64QAM | 1  | 0  | 20.69 | 20.53 | 20.59 |                           |             |
| 3               | 64QAM | 1  | 8  | 20.66 | 20.49 | 20.55 | 22                        | 0           |
| 3               | 64QAM | 1  | 14 | 20.60 | 20.48 | 20.56 |                           |             |
| 3               | 64QAM | 8  | 0  | 19.53 | 19.37 | 19.41 |                           |             |
| 3               | 64QAM | 8  | 4  | 19.56 | 19.41 | 19.48 | 21                        | 1           |
| 3               | 64QAM | 8  | 7  | 19.49 | 19.40 | 19.43 |                           |             |
| 3               | 64QAM | 15 | 0  | 19.53 | 19.41 | 19.49 |                           |             |
| Channel         |       |    |    | 20407 | 20525 | 20643 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 824.7 | 836.5 | 848.3 |                           |             |
| 1.4             | QPSK  | 1  | 0  | 20.26 | 20.19 | 20.27 | 22                        | 0           |
| 1.4             | QPSK  | 1  | 3  | 20.30 | 20.30 | 20.34 |                           |             |
| 1.4             | QPSK  | 1  | 5  | 20.23 | 20.22 | 20.25 |                           |             |
| 1.4             | QPSK  | 3  | 0  | 20.28 | 20.28 | 20.32 |                           |             |
| 1.4             | QPSK  | 3  | 1  | 20.35 | 20.30 | 20.40 |                           |             |
| 1.4             | QPSK  | 3  | 3  | 20.29 | 20.25 | 20.32 |                           |             |
| 1.4             | QPSK  | 6  | 0  | 20.30 | 20.26 | 20.35 | 22                        | 0           |
| 1.4             | 16QAM | 1  | 0  | 20.59 | 20.56 | 20.59 | 22                        | 0           |
| 1.4             | 16QAM | 1  | 3  | 20.72 | 20.53 | 20.65 |                           |             |
| 1.4             | 16QAM | 1  | 5  | 20.64 | 20.52 | 20.56 |                           |             |
| 1.4             | 16QAM | 3  | 0  | 20.49 | 20.32 | 20.39 |                           |             |
| 1.4             | 16QAM | 3  | 1  | 20.51 | 20.35 | 20.42 |                           |             |
| 1.4             | 16QAM | 3  | 3  | 20.46 | 20.29 | 20.39 |                           |             |
| 1.4             | 16QAM | 6  | 0  | 20.54 | 20.42 | 20.50 | 22                        | 0           |
| 1.4             | 64QAM | 1  | 0  | 20.61 | 20.49 | 20.50 | 22                        | 0           |
| 1.4             | 64QAM | 1  | 3  | 20.67 | 20.47 | 20.57 |                           |             |
| 1.4             | 64QAM | 1  | 5  | 20.55 | 20.40 | 20.50 |                           |             |
| 1.4             | 64QAM | 3  | 0  | 20.53 | 20.35 | 20.42 |                           |             |
| 1.4             | 64QAM | 3  | 1  | 20.53 | 20.35 | 20.46 |                           |             |
| 1.4             | 64QAM | 3  | 3  | 20.49 | 20.35 | 20.42 |                           |             |
| 1.4             | 64QAM | 6  | 0  | 19.46 | 19.35 | 19.44 | 21                        | 1           |

**<LTE Band 7>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 20850                 | 21100                    | 21350                  |                     |          |
| Frequency (MHz) |            |         |           | 2510                  | 2535                     | 2560                   |                     |          |
| 20              | QPSK       | 1       | 0         | 13.09                 | 13.41                    | 13.34                  | 14.5                | 0        |
| 20              | QPSK       | 1       | 49        | 13.07                 | 13.40                    | 13.12                  |                     |          |
| 20              | QPSK       | 1       | 99        | 13.17                 | 13.27                    | 13.20                  |                     |          |
| 20              | QPSK       | 50      | 0         | 13.11                 | 13.26                    | 13.16                  | 14.5                | 0        |
| 20              | QPSK       | 50      | 24        | 13.21                 | 13.20                    | 13.17                  |                     |          |
| 20              | QPSK       | 50      | 50        | 13.13                 | 13.14                    | 13.12                  |                     |          |
| 20              | QPSK       | 100     | 0         | 13.15                 | 13.16                    | 13.16                  | 14.5                | 0        |
| 20              | 16QAM      | 1       | 0         | 13.10                 | 13.16                    | 13.06                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 13.28                 | 13.27                    | 13.24                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 13.26                 | 13.22                    | 13.29                  | 14.5                | 0        |
| 20              | 16QAM      | 50      | 0         | 13.16                 | 13.30                    | 13.13                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 13.18                 | 13.19                    | 13.16                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 13.13                 | 13.12                    | 13.13                  | 14.5                | 0        |
| 20              | 16QAM      | 100     | 0         | 13.16                 | 13.19                    | 13.11                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 13.34                 | 13.25                    | 13.27                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 13.40                 | 13.26                    | 13.41                  | 14.5                | 0        |
| 20              | 64QAM      | 1       | 99        | 13.36                 | 13.40                    | 13.29                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 13.13                 | 13.27                    | 13.10                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 13.16                 | 13.24                    | 13.15                  | 14.5                | 0        |
| 20              | 64QAM      | 50      | 50        | 13.10                 | 13.07                    | 13.08                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 13.13                 | 13.14                    | 13.11                  |                     |          |
| Channel         |            |         |           | 20825                 | 21100                    | 21375                  |                     |          |
| Frequency (MHz) |            |         |           | 2507.5                | 2535                     | 2562.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 13.26                 | 13.35                    | 13.30                  | 14.5                | 0        |
| 15              | QPSK       | 1       | 37        | 13.05                 | 13.04                    | 13.10                  |                     |          |
| 15              | QPSK       | 1       | 74        | 13.26                 | 13.33                    | 13.17                  |                     |          |
| 15              | QPSK       | 36      | 0         | 13.16                 | 13.28                    | 13.26                  | 14.5                | 0        |
| 15              | QPSK       | 36      | 20        | 13.24                 | 13.22                    | 13.19                  |                     |          |
| 15              | QPSK       | 36      | 39        | 13.22                 | 13.17                    | 13.17                  |                     |          |
| 15              | QPSK       | 75      | 0         | 13.23                 | 13.24                    | 13.15                  | 14.5                | 0        |
| 15              | 16QAM      | 1       | 0         | 13.15                 | 13.06                    | 13.05                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 13.11                 | 13.32                    | 13.33                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 13.23                 | 13.30                    | 13.31                  | 14.5                | 0        |
| 15              | 16QAM      | 36      | 0         | 12.87                 | 12.96                    | 12.98                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 12.93                 | 12.97                    | 12.91                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 12.85                 | 12.89                    | 12.91                  | 14.5                | 0        |
| 15              | 16QAM      | 75      | 0         | 12.89                 | 12.91                    | 12.87                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 13.12                 | 13.30                    | 13.38                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 13.00                 | 13.28                    | 13.09                  | 14.5                | 0        |
| 15              | 64QAM      | 1       | 74        | 13.15                 | 13.19                    | 13.14                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 12.89                 | 13.01                    | 12.93                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 12.91                 | 12.95                    | 12.90                  | 14.5                | 0        |
| 15              | 64QAM      | 36      | 39        | 12.90                 | 12.91                    | 12.93                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 12.93                 | 12.96                    | 12.92                  |                     |          |

| Channel         |       |    |    | 20800  | 21100 | 21400  | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|-------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 2505   | 2535  | 2565   |                     |          |
| 10              | QPSK  | 1  | 0  | 13.13  | 13.22 | 13.13  | 14.5                | 0        |
| 10              | QPSK  | 1  | 25 | 13.11  | 13.26 | 13.24  |                     |          |
| 10              | QPSK  | 1  | 49 | 13.03  | 13.09 | 13.04  |                     |          |
| 10              | QPSK  | 25 | 0  | 13.04  | 13.21 | 13.14  | 14.5                | 0        |
| 10              | QPSK  | 25 | 12 | 13.05  | 13.16 | 13.19  |                     |          |
| 10              | QPSK  | 25 | 25 | 13.02  | 13.08 | 13.12  |                     |          |
| 10              | QPSK  | 50 | 0  | 13.04  | 13.06 | 13.12  | 14.5                | 0        |
| 10              | 16QAM | 1  | 0  | 12.99  | 13.10 | 12.93  |                     |          |
| 10              | 16QAM | 1  | 25 | 13.31  | 13.28 | 13.34  |                     |          |
| 10              | 16QAM | 1  | 49 | 13.05  | 13.27 | 13.18  | 14.5                | 0        |
| 10              | 16QAM | 25 | 0  | 12.74  | 12.90 | 12.82  |                     |          |
| 10              | 16QAM | 25 | 12 | 12.79  | 12.85 | 12.89  |                     |          |
| 10              | 16QAM | 25 | 25 | 12.76  | 12.82 | 12.86  | 14.5                | 0        |
| 10              | 16QAM | 50 | 0  | 12.78  | 12.84 | 12.82  |                     |          |
| 10              | 64QAM | 1  | 0  | 12.97  | 13.21 | 13.13  |                     |          |
| 10              | 64QAM | 1  | 25 | 13.13  | 13.17 | 13.14  | 14.5                | 0        |
| 10              | 64QAM | 1  | 49 | 12.81  | 13.04 | 13.02  |                     |          |
| 10              | 64QAM | 25 | 0  | 12.76  | 12.91 | 12.78  |                     |          |
| 10              | 64QAM | 25 | 12 | 12.76  | 12.83 | 12.86  | 14.5                | 0        |
| 10              | 64QAM | 25 | 25 | 12.73  | 12.77 | 12.83  |                     |          |
| 10              | 64QAM | 50 | 0  | 12.74  | 12.81 | 12.72  |                     |          |
| Channel         |       |    |    | 20775  | 21100 | 21425  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 2502.5 | 2535  | 2567.5 |                     |          |
| 5               | QPSK  | 1  | 0  | 13.08  | 13.14 | 13.17  | 14.5                | 0        |
| 5               | QPSK  | 1  | 12 | 13.04  | 13.10 | 13.17  |                     |          |
| 5               | QPSK  | 1  | 24 | 13.03  | 13.11 | 13.10  |                     |          |
| 5               | QPSK  | 12 | 0  | 13.09  | 13.23 | 13.17  | 14.5                | 0        |
| 5               | QPSK  | 12 | 7  | 13.14  | 13.28 | 13.27  |                     |          |
| 5               | QPSK  | 12 | 13 | 13.07  | 13.18 | 13.19  |                     |          |
| 5               | QPSK  | 25 | 0  | 13.01  | 13.12 | 13.10  | 14.5                | 0        |
| 5               | 16QAM | 1  | 0  | 13.03  | 12.95 | 13.00  |                     |          |
| 5               | 16QAM | 1  | 12 | 13.13  | 13.25 | 13.30  |                     |          |
| 5               | 16QAM | 1  | 24 | 13.20  | 13.21 | 13.16  | 14.5                | 0        |
| 5               | 16QAM | 12 | 0  | 13.18  | 13.23 | 13.18  |                     |          |
| 5               | 16QAM | 12 | 7  | 12.89  | 12.93 | 12.96  |                     |          |
| 5               | 16QAM | 12 | 13 | 12.89  | 12.98 | 12.91  | 14.5                | 0        |
| 5               | 16QAM | 25 | 0  | 12.80  | 12.94 | 12.91  |                     |          |
| 5               | 64QAM | 1  | 0  | 12.77  | 12.80 | 12.83  |                     |          |
| 5               | 64QAM | 1  | 12 | 13.06  | 13.18 | 13.13  | 14.5                | 0        |
| 5               | 64QAM | 1  | 24 | 12.99  | 13.10 | 13.15  |                     |          |
| 5               | 64QAM | 12 | 0  | 12.97  | 13.02 | 13.18  |                     |          |
| 5               | 64QAM | 12 | 7  | 12.78  | 12.97 | 12.92  | 14.5                | 0        |
| 5               | 64QAM | 12 | 13 | 12.95  | 12.94 | 12.95  |                     |          |
| 5               | 64QAM | 25 | 0  | 12.81  | 12.86 | 12.90  |                     |          |

**<LTE Band 12>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23060                 | 23095                    | 23130                  |                     |          |
| Frequency (MHz) |            |         |           | 704                   | 707.5                    | 711                    |                     |          |
| 10              | QPSK       | 1       | 0         | 21.61                 | 21.54                    | 21.40                  | 22                  | 0        |
| 10              | QPSK       | 1       | 25        | 21.49                 | 21.43                    | 21.31                  |                     |          |
| 10              | QPSK       | 1       | 49        | 21.31                 | 21.70                    | 21.20                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.59                 | 21.53                    | 21.38                  | 22                  | 0        |
| 10              | QPSK       | 25      | 12        | 21.56                 | 21.60                    | 21.35                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.48                 | 21.41                    | 21.25                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.49                 | 21.50                    | 21.33                  | 22                  | 0        |
| 10              | 16QAM      | 1       | 0         | 21.74                 | 21.83                    | 21.75                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 21.71                 | 21.64                    | 21.41                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 21.63                 | 21.66                    | 21.53                  | 22                  | 0        |
| 10              | 16QAM      | 25      | 0         | 21.16                 | 21.13                    | 20.84                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 21.09                 | 21.11                    | 20.87                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 21.06                 | 20.99                    | 20.72                  | 22                  | 0        |
| 10              | 16QAM      | 50      | 0         | 21.11                 | 21.08                    | 20.78                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 21.28                 | 21.18                    | 21.10                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 21.17                 | 21.17                    | 20.86                  | 21                  | 1        |
| 10              | 64QAM      | 1       | 49        | 21.05                 | 21.03                    | 20.84                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 20.15                 | 20.09                    | 19.86                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 20.14                 | 20.03                    | 19.86                  | 21                  | 1        |
| 10              | 64QAM      | 25      | 25        | 20.02                 | 20.01                    | 19.75                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 20.13                 | 20.11                    | 19.83                  |                     |          |
| Channel         |            |         |           | 23035                 | 23095                    | 23155                  |                     |          |
| Frequency (MHz) |            |         |           | 701.5                 | 707.5                    | 713.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 21.59                 | 21.48                    | 21.41                  | 22                  | 0        |
| 5               | QPSK       | 1       | 12        | 21.46                 | 21.40                    | 21.41                  |                     |          |
| 5               | QPSK       | 1       | 24        | 21.37                 | 21.37                    | 21.38                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.55                 | 21.45                    | 21.41                  | 22                  | 0        |
| 5               | QPSK       | 12      | 7         | 21.52                 | 21.44                    | 21.53                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.40                 | 21.41                    | 21.44                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.54                 | 21.40                    | 21.35                  | 22                  | 0        |
| 5               | 16QAM      | 1       | 0         | 21.63                 | 21.82                    | 21.70                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 21.72                 | 21.71                    | 21.75                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 21.62                 | 21.55                    | 21.68                  | 22                  | 0        |
| 5               | 16QAM      | 12      | 0         | 20.94                 | 20.95                    | 20.94                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 21.04                 | 20.96                    | 20.99                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.97                 | 20.89                    | 20.88                  | 22                  | 0        |
| 5               | 16QAM      | 25      | 0         | 21.07                 | 20.95                    | 20.88                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 21.08                 | 21.03                    | 21.05                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 21.06                 | 21.17                    | 20.98                  | 21                  | 1        |
| 5               | 64QAM      | 1       | 24        | 21.03                 | 21.00                    | 20.93                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 20.03                 | 20.04                    | 19.97                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 20.02                 | 20.07                    | 20.08                  | 21                  | 1        |
| 5               | 64QAM      | 12      | 13        | 20.05                 | 19.97                    | 19.98                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 20.02                 | 19.98                    | 19.92                  |                     |          |

| Channel         |       |    |    | 23025 | 23095 | 23165 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|-------|-------|-------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 700.5 | 707.5 | 714.5 |                           |             |
| 3               | QPSK  | 1  | 0  | 21.48 | 21.49 | 21.35 | 22                        | 0           |
| 3               | QPSK  | 1  | 8  | 21.40 | 21.37 | 21.32 |                           |             |
| 3               | QPSK  | 1  | 14 | 21.43 | 21.35 | 21.31 |                           |             |
| 3               | QPSK  | 8  | 0  | 21.48 | 21.42 | 21.38 | 22                        | 0           |
| 3               | QPSK  | 8  | 4  | 21.53 | 21.46 | 21.36 |                           |             |
| 3               | QPSK  | 8  | 7  | 21.52 | 21.40 | 21.41 |                           |             |
| 3               | QPSK  | 15 | 0  | 21.53 | 21.45 | 21.41 |                           |             |
| 3               | 16QAM | 1  | 0  | 21.77 | 21.67 | 21.72 | 22                        | 0           |
| 3               | 16QAM | 1  | 8  | 21.75 | 21.75 | 21.63 |                           |             |
| 3               | 16QAM | 1  | 14 | 21.74 | 21.61 | 21.63 |                           |             |
| 3               | 16QAM | 8  | 0  | 21.11 | 21.07 | 20.89 | 22                        | 0           |
| 3               | 16QAM | 8  | 4  | 21.10 | 21.11 | 20.92 |                           |             |
| 3               | 16QAM | 8  | 7  | 21.11 | 21.05 | 20.84 |                           |             |
| 3               | 16QAM | 15 | 0  | 21.13 | 21.01 | 20.93 |                           |             |
| 3               | 64QAM | 1  | 0  | 21.22 | 21.14 | 20.97 | 22                        | 0           |
| 3               | 64QAM | 1  | 8  | 21.16 | 21.09 | 20.92 |                           |             |
| 3               | 64QAM | 1  | 14 | 21.18 | 21.05 | 20.96 |                           |             |
| 3               | 64QAM | 8  | 0  | 20.16 | 20.12 | 19.93 | 21                        | 1           |
| 3               | 64QAM | 8  | 4  | 20.17 | 20.11 | 19.94 |                           |             |
| 3               | 64QAM | 8  | 7  | 20.14 | 20.04 | 19.86 |                           |             |
| 3               | 64QAM | 15 | 0  | 20.05 | 20.03 | 19.95 |                           |             |
| Channel         |       |    |    | 23017 | 23095 | 23173 | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 699.7 | 707.5 | 715.3 |                           |             |
| 1.4             | QPSK  | 1  | 0  | 21.39 | 21.28 | 21.20 | 22                        | 0           |
| 1.4             | QPSK  | 1  | 3  | 21.53 | 21.38 | 21.33 |                           |             |
| 1.4             | QPSK  | 1  | 5  | 21.41 | 21.31 | 21.24 |                           |             |
| 1.4             | QPSK  | 3  | 0  | 21.49 | 21.38 | 21.27 |                           |             |
| 1.4             | QPSK  | 3  | 1  | 21.45 | 21.38 | 21.30 |                           |             |
| 1.4             | QPSK  | 3  | 3  | 21.37 | 21.36 | 21.30 |                           |             |
| 1.4             | QPSK  | 6  | 0  | 21.51 | 21.36 | 21.26 | 22                        | 0           |
| 1.4             | 16QAM | 1  | 0  | 21.72 | 21.63 | 21.45 | 22                        | 0           |
| 1.4             | 16QAM | 1  | 3  | 21.55 | 21.69 | 21.61 |                           |             |
| 1.4             | 16QAM | 1  | 5  | 21.58 | 21.73 | 21.50 |                           |             |
| 1.4             | 16QAM | 3  | 0  | 21.46 | 21.48 | 21.34 |                           |             |
| 1.4             | 16QAM | 3  | 1  | 21.48 | 21.45 | 21.40 |                           |             |
| 1.4             | 16QAM | 3  | 3  | 21.32 | 21.35 | 21.35 |                           |             |
| 1.4             | 16QAM | 6  | 0  | 21.11 | 20.97 | 20.88 | 22                        | 0           |
| 1.4             | 64QAM | 1  | 0  | 20.98 | 20.97 | 20.96 | 22                        | 0           |
| 1.4             | 64QAM | 1  | 3  | 21.11 | 21.02 | 20.90 |                           |             |
| 1.4             | 64QAM | 1  | 5  | 21.05 | 20.89 | 20.85 |                           |             |
| 1.4             | 64QAM | 3  | 0  | 21.09 | 20.90 | 20.92 |                           |             |
| 1.4             | 64QAM | 3  | 1  | 21.11 | 21.00 | 20.88 |                           |             |
| 1.4             | 64QAM | 3  | 3  | 21.03 | 20.93 | 20.85 |                           |             |
| 1.4             | 64QAM | 6  | 0  | 20.02 | 19.79 | 19.77 | 21                        | 1           |

**<LTE Band 13>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23230                 |                          |                        | 22                  | 0        |
| Frequency (MHz) |            |         |           | 782                   |                          |                        |                     |          |
| 10              | QPSK       | 1       | 0         |                       | 21.38                    |                        | 22                  | 0        |
| 10              | QPSK       | 1       | 25        |                       | 21.19                    |                        |                     |          |
| 10              | QPSK       | 1       | 49        |                       | 21.14                    |                        |                     |          |
| 10              | QPSK       | 25      | 0         |                       | 21.36                    |                        | 22                  | 0        |
| 10              | QPSK       | 25      | 12        |                       | 21.29                    |                        |                     |          |
| 10              | QPSK       | 25      | 25        |                       | 21.16                    |                        |                     |          |
| 10              | QPSK       | 50      | 0         |                       | 21.24                    |                        | 22                  | 0        |
| 10              | 16QAM      | 1       | 0         |                       | 21.64                    |                        |                     |          |
| 10              | 16QAM      | 1       | 25        |                       | 21.43                    |                        |                     |          |
| 10              | 16QAM      | 1       | 49        |                       | 21.47                    |                        | 22                  | 0        |
| 10              | 16QAM      | 25      | 0         |                       | 20.42                    |                        |                     |          |
| 10              | 16QAM      | 25      | 12        |                       | 20.39                    |                        |                     |          |
| 10              | 16QAM      | 25      | 25        |                       | 20.28                    |                        | 22                  | 0        |
| 10              | 16QAM      | 50      | 0         |                       | 20.38                    |                        |                     |          |
| 10              | 64QAM      | 1       | 0         |                       | 20.54                    |                        |                     |          |
| 10              | 64QAM      | 1       | 25        |                       | 20.39                    |                        | 22                  | 0        |
| 10              | 64QAM      | 1       | 49        |                       | 20.40                    |                        |                     |          |
| 10              | 64QAM      | 25      | 0         |                       | 19.44                    |                        |                     |          |
| 10              | 64QAM      | 25      | 12        |                       | 19.43                    |                        | 21                  | 1        |
| 10              | 64QAM      | 25      | 25        |                       | 19.33                    |                        |                     |          |
| 10              | 64QAM      | 50      | 0         |                       | 19.33                    |                        |                     |          |
| Channel         |            |         |           | 23205                 | 23230                    | 23255                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 779.5                 | 782                      | 784.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 21.36                 | 21.31                    | 21.27                  | 22                  | 0        |
| 5               | QPSK       | 1       | 12        | 21.28                 | 21.20                    | 21.37                  |                     |          |
| 5               | QPSK       | 1       | 24        | 21.14                 | 21.25                    | 21.24                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.37                 | 21.34                    | 21.30                  | 22                  | 0        |
| 5               | QPSK       | 12      | 7         | 21.39                 | 21.28                    | 21.42                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.27                 | 21.24                    | 21.31                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.33                 | 21.23                    | 21.30                  | 22                  | 0        |
| 5               | 16QAM      | 1       | 0         | 21.60                 | 21.66                    | 21.61                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 21.56                 | 21.61                    | 21.63                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 21.49                 | 21.45                    | 21.71                  | 22                  | 0        |
| 5               | 16QAM      | 12      | 0         | 20.40                 | 20.39                    | 20.45                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.52                 | 20.45                    | 20.49                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.40                 | 20.34                    | 20.45                  | 22                  | 0        |
| 5               | 16QAM      | 25      | 0         | 20.41                 | 20.38                    | 20.40                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.53                 | 20.55                    | 20.60                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.58                 | 20.40                    | 20.67                  | 22                  | 0        |
| 5               | 64QAM      | 1       | 24        | 20.54                 | 20.46                    | 20.56                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.53                 | 19.49                    | 19.50                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 19.49                 | 19.49                    | 19.55                  | 21                  | 1        |
| 5               | 64QAM      | 12      | 13        | 19.48                 | 19.40                    | 19.52                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.43                 | 19.42                    | 19.40                  |                     |          |



**<LTE Band 14>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23330                 |                          |                        |                     |          |
| Frequency (MHz) |            |         |           | 793                   |                          |                        |                     |          |
| 10              | QPSK       | 1       | 0         |                       | 21.38                    |                        | 23                  | 0        |
| 10              | QPSK       | 1       | 25        |                       | 21.23                    |                        |                     |          |
| 10              | QPSK       | 1       | 49        |                       | 21.13                    |                        |                     |          |
| 10              | QPSK       | 25      | 0         |                       | 21.36                    |                        | 23                  | 0        |
| 10              | QPSK       | 25      | 12        |                       | 21.29                    |                        |                     |          |
| 10              | QPSK       | 25      | 25        |                       | 21.28                    |                        |                     |          |
| 10              | QPSK       | 50      | 0         |                       | 21.29                    |                        | 23                  | 0        |
| 10              | 16QAM      | 1       | 0         |                       | 21.55                    |                        |                     |          |
| 10              | 16QAM      | 1       | 25        |                       | 21.52                    |                        |                     |          |
| 10              | 16QAM      | 1       | 49        |                       | 21.41                    |                        | 22                  | 1        |
| 10              | 16QAM      | 25      | 0         |                       | 20.67                    |                        |                     |          |
| 10              | 16QAM      | 25      | 12        |                       | 20.69                    |                        |                     |          |
| 10              | 16QAM      | 25      | 25        |                       | 20.56                    |                        | 22                  | 1        |
| 10              | 16QAM      | 50      | 0         |                       | 20.68                    |                        |                     |          |
| 10              | 64QAM      | 1       | 0         |                       | 20.87                    |                        |                     |          |
| 10              | 64QAM      | 1       | 25        |                       | 20.79                    |                        | 22                  | 1        |
| 10              | 64QAM      | 1       | 49        |                       | 20.62                    |                        |                     |          |
| 10              | 64QAM      | 25      | 0         |                       | 19.69                    |                        |                     |          |
| 10              | 64QAM      | 25      | 12        |                       | 19.72                    |                        | 21                  | 2        |
| 10              | 64QAM      | 25      | 25        |                       | 19.61                    |                        |                     |          |
| 10              | 64QAM      | 50      | 0         |                       | 19.67                    |                        |                     |          |
| Channel         |            |         |           | 23305                 | 23330                    | 23355                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 790.5                 | 793                      | 795.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 21.33                 | 21.27                    | 21.40                  | 23                  | 0        |
| 5               | QPSK       | 1       | 12        | 21.33                 | 21.34                    | 21.27                  |                     |          |
| 5               | QPSK       | 1       | 24        | 21.25                 | 21.21                    | 21.30                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.36                 | 21.33                    | 21.45                  | 23                  | 0        |
| 5               | QPSK       | 12      | 7         | 21.36                 | 21.32                    | 21.42                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.33                 | 21.31                    | 21.34                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.39                 | 21.30                    | 21.34                  | 23                  | 0        |
| 5               | 16QAM      | 1       | 0         | 21.66                 | 21.55                    | 21.73                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 21.64                 | 21.64                    | 21.63                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 21.60                 | 21.52                    | 21.65                  | 22                  | 1        |
| 5               | 16QAM      | 12      | 0         | 20.65                 | 20.64                    | 20.69                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.71                 | 20.67                    | 20.77                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.59                 | 20.58                    | 20.61                  | 22                  | 1        |
| 5               | 16QAM      | 25      | 0         | 20.65                 | 20.60                    | 20.70                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.84                 | 20.82                    | 20.91                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.72                 | 20.66                    | 20.77                  | 22                  | 1        |
| 5               | 64QAM      | 1       | 24        | 20.79                 | 20.72                    | 20.78                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.71                 | 19.71                    | 19.82                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 19.72                 | 19.71                    | 19.80                  | 21                  | 2        |
| 5               | 64QAM      | 12      | 13        | 19.69                 | 19.71                    | 19.77                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.70                 | 19.68                    | 19.70                  |                     |          |

**<LTE Band 17>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|---------------------------|-------------|
| Channel         |            |         |           | 23780                    | 23790                       | 23800                     |                           |             |
| Frequency (MHz) |            |         |           | 709                      | 710                         | 711                       |                           |             |
| 10              | QPSK       | 1       | 0         | 21.53                    | 21.62                       | 21.51                     | 22                        | 0           |
| 10              | QPSK       | 1       | 25        | 21.49                    | 21.49                       | 21.46                     |                           |             |
| 10              | QPSK       | 1       | 49        | 21.43                    | 21.43                       | 21.43                     |                           |             |
| 10              | QPSK       | 25      | 0         | 21.60                    | 21.58                       | 21.56                     | 22                        | 0           |
| 10              | QPSK       | 25      | 12        | 21.58                    | 21.59                       | 21.58                     |                           |             |
| 10              | QPSK       | 25      | 25        | 21.56                    | 21.57                       | 21.54                     |                           |             |
| 10              | QPSK       | 50      | 0         | 21.53                    | 21.55                       | 21.55                     | 22                        | 0           |
| 10              | 16QAM      | 1       | 0         | 21.34                    | 21.36                       | 21.43                     |                           |             |
| 10              | 16QAM      | 1       | 25        | 21.39                    | 21.40                       | 21.36                     |                           |             |
| 10              | 16QAM      | 1       | 49        | 21.36                    | 21.33                       | 21.34                     | 22                        | 0           |
| 10              | 16QAM      | 25      | 0         | 20.32                    | 20.31                       | 20.31                     |                           |             |
| 10              | 16QAM      | 25      | 12        | 20.33                    | 20.30                       | 20.31                     |                           |             |
| 10              | 16QAM      | 25      | 25        | 20.28                    | 20.25                       | 20.25                     | 22                        | 0           |
| 10              | 16QAM      | 50      | 0         | 20.30                    | 20.30                       | 20.29                     |                           |             |
| 10              | 64QAM      | 1       | 0         | 20.33                    | 20.34                       | 20.35                     |                           |             |
| 10              | 64QAM      | 1       | 25        | 20.31                    | 20.29                       | 20.25                     | 22                        | 0           |
| 10              | 64QAM      | 1       | 49        | 20.22                    | 20.22                       | 20.24                     |                           |             |
| 10              | 64QAM      | 25      | 0         | 19.33                    | 19.30                       | 19.30                     |                           |             |
| 10              | 64QAM      | 25      | 12        | 19.31                    | 19.31                       | 19.29                     | 21                        | 1           |
| 10              | 64QAM      | 25      | 25        | 19.27                    | 19.24                       | 19.24                     |                           |             |
| 10              | 64QAM      | 50      | 0         | 19.28                    | 19.28                       | 19.28                     |                           |             |
| Channel         |            |         |           | 23755                    | 23790                       | 23825                     |                           |             |
| Frequency (MHz) |            |         |           | 706.5                    | 710                         | 713.5                     |                           |             |
| 5               | QPSK       | 1       | 0         | 21.30                    | 21.50                       | 21.50                     | 22                        | 0           |
| 5               | QPSK       | 1       | 12        | 21.52                    | 21.49                       | 21.45                     |                           |             |
| 5               | QPSK       | 1       | 24        | 21.50                    | 21.45                       | 21.43                     |                           |             |
| 5               | QPSK       | 12      | 0         | 21.32                    | 21.53                       | 21.34                     | 22                        | 0           |
| 5               | QPSK       | 12      | 7         | 21.37                    | 21.36                       | 21.54                     |                           |             |
| 5               | QPSK       | 12      | 13        | 21.34                    | 21.52                       | 21.49                     |                           |             |
| 5               | QPSK       | 25      | 0         | 21.38                    | 21.35                       | 21.51                     | 22                        | 0           |
| 5               | 16QAM      | 1       | 0         | 21.37                    | 21.40                       | 21.41                     |                           |             |
| 5               | 16QAM      | 1       | 12        | 21.34                    | 21.41                       | 21.31                     |                           |             |
| 5               | 16QAM      | 1       | 24        | 21.33                    | 21.36                       | 21.31                     | 22                        | 0           |
| 5               | 16QAM      | 12      | 0         | 20.31                    | 20.27                       | 20.23                     |                           |             |
| 5               | 16QAM      | 12      | 7         | 20.32                    | 20.27                       | 20.22                     |                           |             |
| 5               | 16QAM      | 12      | 13        | 20.30                    | 20.26                       | 20.19                     | 22                        | 0           |
| 5               | 16QAM      | 25      | 0         | 20.32                    | 20.28                       | 20.25                     |                           |             |
| 5               | 64QAM      | 1       | 0         | 20.36                    | 20.31                       | 20.32                     |                           |             |
| 5               | 64QAM      | 1       | 12        | 20.35                    | 20.27                       | 20.24                     | 22                        | 0           |
| 5               | 64QAM      | 1       | 24        | 20.35                    | 20.25                       | 20.26                     |                           |             |
| 5               | 64QAM      | 12      | 0         | 19.32                    | 19.22                       | 19.19                     |                           |             |
| 5               | 64QAM      | 12      | 7         | 19.30                    | 19.28                       | 19.20                     | 21                        | 1           |
| 5               | 64QAM      | 12      | 13        | 19.26                    | 19.24                       | 19.14                     |                           |             |
| 5               | 64QAM      | 25      | 0         | 19.30                    | 19.29                       | 19.21                     |                           |             |

**<LTE Band 30>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 27710                 |                          |                        |                     |          |
| Frequency (MHz) |            |         |           | 2310                  |                          |                        |                     |          |
| 10              | QPSK       | 1       | 0         |                       | 15.80                    |                        | 16                  | 0        |
| 10              | QPSK       | 1       | 25        |                       | 15.68                    |                        |                     |          |
| 10              | QPSK       | 1       | 49        |                       | 15.69                    |                        |                     |          |
| 10              | QPSK       | 25      | 0         |                       | 15.55                    |                        | 16                  | 0        |
| 10              | QPSK       | 25      | 12        |                       | 15.50                    |                        |                     |          |
| 10              | QPSK       | 25      | 25        |                       | 15.37                    |                        |                     |          |
| 10              | QPSK       | 50      | 0         |                       | 15.49                    |                        | 16                  | 0        |
| 10              | 16QAM      | 1       | 0         |                       | 15.79                    |                        |                     |          |
| 10              | 16QAM      | 1       | 25        |                       | 15.75                    |                        |                     |          |
| 10              | 16QAM      | 1       | 49        |                       | 15.64                    |                        | 16                  | 0        |
| 10              | 16QAM      | 25      | 0         |                       | 15.63                    |                        |                     |          |
| 10              | 16QAM      | 25      | 12        |                       | 15.60                    |                        |                     |          |
| 10              | 16QAM      | 25      | 25        |                       | 15.47                    |                        | 16                  | 0        |
| 10              | 16QAM      | 50      | 0         |                       | 15.57                    |                        |                     |          |
| 10              | 64QAM      | 1       | 0         |                       | 15.74                    |                        |                     |          |
| 10              | 64QAM      | 1       | 25        |                       | 15.68                    |                        | 16                  | 0        |
| 10              | 64QAM      | 1       | 49        |                       | 15.56                    |                        |                     |          |
| 10              | 64QAM      | 25      | 0         |                       | 15.65                    |                        |                     |          |
| 10              | 64QAM      | 25      | 12        |                       | 15.59                    |                        | 16                  | 0        |
| 10              | 64QAM      | 25      | 25        |                       | 15.49                    |                        |                     |          |
| 10              | 64QAM      | 50      | 0         |                       | 15.55                    |                        |                     |          |
| Channel         |            |         |           | 27685                 | 27710                    | 27735                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 2307.5                | 2310                     | 2312.5                 |                     |          |
| 5               | QPSK       | 1       | 0         | 15.52                 | 15.43                    | 15.59                  | 16                  | 0        |
| 5               | QPSK       | 1       | 12        | 15.39                 | 15.45                    | 15.46                  |                     |          |
| 5               | QPSK       | 1       | 24        | 15.44                 | 15.39                    | 15.42                  |                     |          |
| 5               | QPSK       | 12      | 0         | 15.48                 | 15.53                    | 15.56                  | 16                  | 0        |
| 5               | QPSK       | 12      | 7         | 15.55                 | 15.51                    | 15.54                  |                     |          |
| 5               | QPSK       | 12      | 13        | 15.48                 | 15.45                    | 15.45                  |                     |          |
| 5               | QPSK       | 25      | 0         | 15.50                 | 15.49                    | 15.51                  | 16                  | 0        |
| 5               | 16QAM      | 1       | 0         | 15.70                 | 15.76                    | 15.71                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 15.67                 | 15.79                    | 15.74                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 15.78                 | 15.69                    | 15.76                  | 16                  | 0        |
| 5               | 16QAM      | 12      | 0         | 15.54                 | 15.62                    | 15.63                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 15.62                 | 15.58                    | 15.60                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 15.55                 | 15.53                    | 15.54                  | 16                  | 0        |
| 5               | 16QAM      | 25      | 0         | 15.60                 | 15.55                    | 15.58                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 15.73                 | 15.65                    | 15.70                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 15.66                 | 15.68                    | 15.70                  | 16                  | 0        |
| 5               | 64QAM      | 1       | 24        | 15.69                 | 15.59                    | 15.66                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 15.55                 | 15.54                    | 15.60                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 15.63                 | 15.54                    | 15.58                  | 16                  | 0        |
| 5               | 64QAM      | 12      | 13        | 15.54                 | 15.49                    | 15.53                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 15.59                 | 15.53                    | 15.59                  |                     |          |

**<LTE Band 66>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 132072                | 132322                   | 132572                 |                     |          |
| Frequency (MHz) |            |         |           | 1720                  | 1745                     | 1770                   |                     |          |
| 20              | QPSK       | 1       | 0         | 18.75                 | 18.89                    | 18.86                  | 19.5                | 0        |
| 20              | QPSK       | 1       | 49        | 18.56                 | 18.60                    | 18.65                  |                     |          |
| 20              | QPSK       | 1       | 99        | 18.64                 | 18.60                    | 18.69                  |                     |          |
| 20              | QPSK       | 50      | 0         | 18.78                 | 18.85                    | 18.83                  | 19.5                | 0        |
| 20              | QPSK       | 50      | 24        | 18.67                 | 18.70                    | 18.71                  |                     |          |
| 20              | QPSK       | 50      | 50        | 18.73                 | 18.60                    | 18.62                  |                     |          |
| 20              | QPSK       | 100     | 0         | 18.75                 | 18.77                    | 18.76                  | 19.5                | 0        |
| 20              | 16QAM      | 1       | 0         | 19.12                 | 19.25                    | 19.25                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 18.84                 | 18.81                    | 19.09                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 18.82                 | 18.85                    | 18.86                  | 19.5                | 0        |
| 20              | 16QAM      | 50      | 0         | 18.83                 | 18.92                    | 18.88                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 18.74                 | 18.82                    | 18.85                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 18.75                 | 18.67                    | 18.77                  | 19.5                | 0        |
| 20              | 16QAM      | 100     | 0         | 18.72                 | 18.78                    | 18.79                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 19.12                 | 19.00                    | 19.15                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 18.89                 | 18.85                    | 18.95                  | 19.5                | 0        |
| 20              | 64QAM      | 1       | 99        | 18.88                 | 18.86                    | 18.87                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 18.93                 | 18.88                    | 18.92                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 18.82                 | 18.78                    | 18.84                  | 19.5                | 0        |
| 20              | 64QAM      | 50      | 50        | 18.80                 | 18.68                    | 18.73                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 18.81                 | 18.78                    | 18.79                  |                     |          |
| Channel         |            |         |           | 132047                | 132322                   | 132597                 |                     |          |
| Frequency (MHz) |            |         |           | 1717.5                | 1745                     | 1772.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 18.82                 | 18.79                    | 18.84                  | 19.5                | 0        |
| 15              | QPSK       | 1       | 37        | 18.64                 | 18.62                    | 18.76                  |                     |          |
| 15              | QPSK       | 1       | 74        | 18.60                 | 18.58                    | 18.62                  |                     |          |
| 15              | QPSK       | 36      | 0         | 18.79                 | 18.79                    | 18.78                  | 19.5                | 0        |
| 15              | QPSK       | 36      | 20        | 18.72                 | 18.71                    | 18.69                  |                     |          |
| 15              | QPSK       | 36      | 39        | 18.64                 | 18.63                    | 18.76                  |                     |          |
| 15              | QPSK       | 75      | 0         | 18.69                 | 18.68                    | 18.68                  | 19.5                | 0        |
| 15              | 16QAM      | 1       | 0         | 19.13                 | 19.06                    | 19.15                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 18.94                 | 18.84                    | 19.06                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 18.82                 | 18.71                    | 18.97                  | 19.5                | 0        |
| 15              | 16QAM      | 36      | 0         | 18.83                 | 18.88                    | 18.86                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 18.79                 | 18.79                    | 18.77                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 18.69                 | 18.72                    | 18.80                  | 19.5                | 0        |
| 15              | 16QAM      | 75      | 0         | 18.79                 | 18.75                    | 18.80                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 18.98                 | 19.05                    | 19.06                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 18.88                 | 18.82                    | 18.95                  | 19.5                | 0        |
| 15              | 64QAM      | 1       | 74        | 18.81                 | 18.83                    | 18.81                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 18.95                 | 18.84                    | 18.92                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 18.83                 | 18.82                    | 18.83                  | 19.5                | 0        |
| 15              | 64QAM      | 36      | 39        | 18.79                 | 18.71                    | 18.87                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 18.81                 | 18.78                    | 18.85                  |                     |          |

| Channel         |       |    |    | 132022 | 132322 | 132622 | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|--------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 1715   | 1745   | 1775   |                     |          |
| 10              | QPSK  | 1  | 0  | 18.71  | 18.75  | 18.76  | 19.5                | 0        |
| 10              | QPSK  | 1  | 25 | 18.63  | 18.63  | 18.72  |                     |          |
| 10              | QPSK  | 1  | 49 | 18.66  | 18.57  | 18.60  |                     |          |
| 10              | QPSK  | 25 | 0  | 18.66  | 18.73  | 18.69  | 19.5                | 0        |
| 10              | QPSK  | 25 | 12 | 18.77  | 18.73  | 18.75  |                     |          |
| 10              | QPSK  | 25 | 25 | 18.68  | 18.62  | 18.77  |                     |          |
| 10              | QPSK  | 50 | 0  | 18.79  | 18.70  | 18.71  |                     |          |
| 10              | 16QAM | 1  | 0  | 18.97  | 19.19  | 19.18  | 19.5                | 0        |
| 10              | 16QAM | 1  | 25 | 18.89  | 18.94  | 19.01  |                     |          |
| 10              | 16QAM | 1  | 49 | 18.87  | 18.81  | 19.01  |                     |          |
| 10              | 16QAM | 25 | 0  | 18.74  | 18.82  | 18.81  | 19.5                | 0        |
| 10              | 16QAM | 25 | 12 | 18.80  | 18.75  | 18.82  |                     |          |
| 10              | 16QAM | 25 | 25 | 18.74  | 18.68  | 18.79  |                     |          |
| 10              | 16QAM | 50 | 0  | 18.78  | 18.81  | 18.73  |                     |          |
| 10              | 64QAM | 1  | 0  | 18.98  | 19.08  | 19.00  | 19.5                | 0        |
| 10              | 64QAM | 1  | 25 | 18.82  | 18.90  | 18.90  |                     |          |
| 10              | 64QAM | 1  | 49 | 18.94  | 18.86  | 18.87  |                     |          |
| 10              | 64QAM | 25 | 0  | 18.77  | 18.86  | 18.81  | 19.5                | 0        |
| 10              | 64QAM | 25 | 12 | 18.89  | 18.77  | 18.85  |                     |          |
| 10              | 64QAM | 25 | 25 | 18.84  | 18.71  | 18.80  |                     |          |
| 10              | 64QAM | 50 | 0  | 18.88  | 18.77  | 18.77  |                     |          |
| Channel         |       |    |    | 131997 | 132322 | 132647 | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1712.5 | 1745   | 1777.5 |                     |          |
| 5               | QPSK  | 1  | 0  | 18.66  | 18.70  | 18.76  | 19.5                | 0        |
| 5               | QPSK  | 1  | 12 | 18.67  | 18.62  | 18.65  |                     |          |
| 5               | QPSK  | 1  | 24 | 18.63  | 18.60  | 18.64  |                     |          |
| 5               | QPSK  | 12 | 0  | 18.72  | 18.69  | 18.79  | 19.5                | 0        |
| 5               | QPSK  | 12 | 7  | 18.66  | 18.70  | 18.76  |                     |          |
| 5               | QPSK  | 12 | 13 | 18.64  | 18.66  | 18.73  |                     |          |
| 5               | QPSK  | 25 | 0  | 18.61  | 18.64  | 18.75  |                     |          |
| 5               | 16QAM | 1  | 0  | 19.04  | 18.97  | 19.09  | 19.5                | 0        |
| 5               | 16QAM | 1  | 12 | 18.88  | 19.00  | 18.96  |                     |          |
| 5               | 16QAM | 1  | 24 | 18.94  | 18.87  | 18.92  |                     |          |
| 5               | 16QAM | 12 | 0  | 18.77  | 18.76  | 18.85  | 19.5                | 0        |
| 5               | 16QAM | 12 | 7  | 18.76  | 18.75  | 18.80  |                     |          |
| 5               | 16QAM | 12 | 13 | 18.73  | 18.74  | 18.74  |                     |          |
| 5               | 16QAM | 25 | 0  | 18.73  | 18.73  | 18.77  |                     |          |
| 5               | 64QAM | 1  | 0  | 19.04  | 18.87  | 19.01  | 19.5                | 0        |
| 5               | 64QAM | 1  | 12 | 18.81  | 18.92  | 18.82  |                     |          |
| 5               | 64QAM | 1  | 24 | 18.75  | 18.82  | 18.94  |                     |          |
| 5               | 64QAM | 12 | 0  | 18.80  | 18.82  | 18.89  | 19.5                | 0        |
| 5               | 64QAM | 12 | 7  | 18.81  | 18.83  | 18.85  |                     |          |
| 5               | 64QAM | 12 | 13 | 18.72  | 18.72  | 18.81  |                     |          |
| 5               | 64QAM | 25 | 0  | 18.73  | 18.74  | 18.78  |                     |          |

| Channel         |       |    |    | 131987 | 132322 | 132657 | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|--------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 1711.5 | 1745   | 1778.5 |                     |          |
| 3               | QPSK  | 1  | 0  | 18.64  | 18.64  | 18.77  | 19.5                | 0        |
| 3               | QPSK  | 1  | 8  | 18.62  | 18.65  | 18.68  |                     |          |
| 3               | QPSK  | 1  | 14 | 18.60  | 18.60  | 18.71  |                     |          |
| 3               | QPSK  | 8  | 0  | 18.67  | 18.69  | 18.74  | 19.5                | 0        |
| 3               | QPSK  | 8  | 4  | 18.62  | 18.71  | 18.78  |                     |          |
| 3               | QPSK  | 8  | 7  | 18.65  | 18.70  | 18.72  |                     |          |
| 3               | QPSK  | 15 | 0  | 18.60  | 18.65  | 18.74  |                     |          |
| 3               | 16QAM | 1  | 0  | 18.93  | 18.83  | 18.93  | 19.5                | 0        |
| 3               | 16QAM | 1  | 8  | 18.86  | 18.89  | 19.06  |                     |          |
| 3               | 16QAM | 1  | 14 | 18.73  | 18.79  | 18.82  |                     |          |
| 3               | 16QAM | 8  | 0  | 18.77  | 18.81  | 18.80  | 19.5                | 0        |
| 3               | 16QAM | 8  | 4  | 18.75  | 18.80  | 18.88  |                     |          |
| 3               | 16QAM | 8  | 7  | 18.72  | 18.76  | 18.78  |                     |          |
| 3               | 16QAM | 15 | 0  | 18.73  | 18.69  | 18.85  |                     |          |
| 3               | 64QAM | 1  | 0  | 18.84  | 18.88  | 19.04  | 19.5                | 0        |
| 3               | 64QAM | 1  | 8  | 18.83  | 18.86  | 18.87  |                     |          |
| 3               | 64QAM | 1  | 14 | 18.79  | 18.92  | 18.90  |                     |          |
| 3               | 64QAM | 8  | 0  | 18.81  | 18.79  | 18.82  | 19.5                | 0        |
| 3               | 64QAM | 8  | 4  | 18.78  | 18.82  | 18.86  |                     |          |
| 3               | 64QAM | 8  | 7  | 18.77  | 18.75  | 18.79  |                     |          |
| 3               | 64QAM | 15 | 0  | 18.73  | 18.73  | 18.79  |                     |          |
| Channel         |       |    |    | 131979 | 132322 | 132665 | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1710.7 | 1745   | 1779.3 |                     |          |
| 1.4             | QPSK  | 1  | 0  | 18.47  | 18.48  | 18.48  | 19.5                | 0        |
| 1.4             | QPSK  | 1  | 3  | 18.55  | 18.56  | 18.61  |                     |          |
| 1.4             | QPSK  | 1  | 5  | 18.46  | 18.48  | 18.45  |                     |          |
| 1.4             | QPSK  | 3  | 0  | 18.53  | 18.54  | 18.56  |                     |          |
| 1.4             | QPSK  | 3  | 1  | 18.54  | 18.55  | 18.58  |                     |          |
| 1.4             | QPSK  | 3  | 3  | 18.53  | 18.46  | 18.59  |                     |          |
| 1.4             | QPSK  | 6  | 0  | 18.47  | 18.54  | 18.51  | 19.5                | 0        |
| 1.4             | 16QAM | 1  | 0  | 18.76  | 18.83  | 18.69  | 19.5                | 0        |
| 1.4             | 16QAM | 1  | 3  | 18.83  | 18.90  | 18.83  |                     |          |
| 1.4             | 16QAM | 1  | 5  | 18.63  | 18.82  | 18.60  |                     |          |
| 1.4             | 16QAM | 3  | 0  | 18.56  | 18.53  | 18.55  |                     |          |
| 1.4             | 16QAM | 3  | 1  | 18.53  | 18.53  | 18.59  |                     |          |
| 1.4             | 16QAM | 3  | 3  | 18.53  | 18.56  | 18.56  | 19.5                | 0        |
| 1.4             | 16QAM | 6  | 0  | 18.64  | 18.68  | 18.70  |                     |          |
| 1.4             | 64QAM | 1  | 0  | 18.77  | 18.66  | 18.83  |                     |          |
| 1.4             | 64QAM | 1  | 3  | 18.70  | 18.85  | 18.85  |                     |          |
| 1.4             | 64QAM | 1  | 5  | 18.60  | 18.68  | 18.69  |                     |          |
| 1.4             | 64QAM | 3  | 0  | 18.66  | 18.71  | 18.70  |                     |          |
| 1.4             | 64QAM | 3  | 1  | 18.69  | 18.78  | 18.77  | 19.5                | 0        |
| 1.4             | 64QAM | 3  | 3  | 18.67  | 18.73  | 18.71  |                     |          |
| 1.4             | 64QAM | 6  | 0  | 18.59  | 18.61  | 18.66  |                     |          |



**<LTE Carrier Aggregation combinations>**

**General Note:**

1. This device supports carrier aggregation on uplink and downlink for inter and intra band. For the device supports combination bands and configurations are according to 3GPP and the combinations list as below table.
2. The gray color table is covered by other combinations and no need to verify power.
3. All permutations exist. No restrictions on Pcell & Scell combinations. Only LTE Band 29 is limited to Scell.

| 2CC Downlink Carrier Aggregation |             |             |                                 | 3CC Downlink Carrier Aggregation |                |             |                                 |
|----------------------------------|-------------|-------------|---------------------------------|----------------------------------|----------------|-------------|---------------------------------|
| Number                           | Combination | Restriction | Covered by Measurement Superset | Number                           | Combination    | Restriction | Covered by Measurement Superset |
| 1                                | CA_2A-2A    |             |                                 | 1                                | CA_2A-2A-4A    |             |                                 |
| 2                                | CA_2A-4A    |             |                                 | 2                                | CA_2A-2A-5A    |             |                                 |
| 3                                | CA_2A-5A    |             |                                 | 3                                | CA_2A-2A-12A   |             |                                 |
| 4                                | CA_2A-7A    |             |                                 | 4                                | CA_2A-2A-14A   |             |                                 |
| 5                                | CA_2A-12A   |             |                                 | 5                                | CA_2A-2A-66A   |             |                                 |
| 6                                | CA_2A-14A   |             |                                 | 6                                | CA_2A-4A-4A    |             |                                 |
| 7                                | CA_2A-17A   |             |                                 | 7                                | CA_2A-4A-5A    |             |                                 |
| 8                                | CA_2A-29A   |             |                                 | 8                                | CA_2A-4A-7A    |             |                                 |
| 9                                | CA_2A-30A   |             |                                 | 9                                | CA_2A-4A-12A   |             |                                 |
| 10                               | CA_2A-66A   |             |                                 | 10                               | CA_2A-4A-29A   |             |                                 |
| 11                               | CA_2C       |             |                                 | 11                               | CA_2A-4A-30A   |             |                                 |
| 12                               | CA_4A-4A    |             |                                 | 12                               | CA_2A-5A-30A   |             |                                 |
| 13                               | CA_4A-5A    |             |                                 | 13                               | CA_2A-5A-66A   |             |                                 |
| 14                               | CA_4A-7A    |             |                                 | 14                               | CA_2A-7A-7A    |             |                                 |
| 15                               | CA_4A-12A   |             |                                 | 15                               | CA_2A-7A-12A   |             |                                 |
| 16                               | CA_4A-17A   |             |                                 | 16                               | CA_2A-7A-66A   |             |                                 |
| 17                               | CA_4A-29A   |             |                                 | 17                               | CA_2A-12A-30A  |             |                                 |
| 18                               | CA_4A-30A   |             |                                 | 18                               | CA_2A-12A-66A  |             |                                 |
| 19                               | CA_5A-7A    |             |                                 | 19                               | CA_2A-12B      |             |                                 |
| 20                               | CA_5A-30A   |             |                                 | 20                               | CA_2A-12B      |             |                                 |
| 21                               | CA_5A-66A   |             |                                 | 21                               | CA_2A-14A-30A  |             |                                 |
| 22                               | CA_5B       |             |                                 | 22                               | CA_2A-14A-66A  |             |                                 |
| 23                               | CA_7A_66A   |             |                                 | 23                               | CA_2A-29A-30A  |             |                                 |
| 24                               | CA_7A-7A    |             |                                 | 24                               | CA_2A-30A-66A  |             |                                 |
| 25                               | CA_7A-12A   |             |                                 | 25                               | CA_2A-66A-66A  |             |                                 |
| 26                               | CA_12A-30A  |             |                                 | 26                               | CA_2A-66C      |             |                                 |
| 27                               | CA_12A-66A  |             |                                 | 27                               | CA_4A-4A-7A    |             |                                 |
| 28                               | CA_12B      |             |                                 | 28                               | CA_4A-4A-12A   |             |                                 |
| 29                               | CA_14A-30A  |             |                                 | 29                               | CA_4A-5A-30A   |             |                                 |
| 30                               | CA_14A-66A  |             |                                 | 30                               | CA_4A-7A-7A    |             |                                 |
| 31                               | CA_29A-30A  |             |                                 | 31                               | CA_4A-7A-12A   |             |                                 |
| 32                               | CA_29A-66A  |             |                                 | 32                               | CA_4A-12A-30A  |             |                                 |
| 33                               | CA_30A-66A  |             |                                 | 33                               | CA_4A-12B      |             |                                 |
| 34                               | CA_66A-66A  |             |                                 | 34                               | CA_4A-29A-30A  |             |                                 |
| 35                               | CA_66B      |             |                                 | 35                               | CA_5A-7A-7A    |             |                                 |
| 36                               | CA_66C      |             |                                 | 36                               | CA_5A-30A-66A  |             |                                 |
|                                  |             |             |                                 | 37                               | CA_5A-66A-66A  |             |                                 |
|                                  |             |             |                                 | 38                               | CA_7A-66A-66A  |             |                                 |
|                                  |             |             |                                 | 39                               | CA_12A-30A-66A |             |                                 |
|                                  |             |             |                                 | 40                               | CA_12A-66A-66A |             |                                 |
|                                  |             |             |                                 | 41                               | CA_12A-66C     |             |                                 |
|                                  |             |             |                                 | 42                               | CA_14A-30A-66A |             |                                 |
|                                  |             |             |                                 | 43                               | CA_14A-66A-66A |             |                                 |
|                                  |             |             |                                 | 44                               | CA_30A-66A-66A |             |                                 |



***Sporton International (Kunshan) Inc.***

**<Power verification when LTE Carrier Aggregation Active>**
**General Note:**

- According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.
- Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
- The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
- Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.
- For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.
- For inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band. For SCC DL RB size and offset will base on the PCC corresponding RB allocation.
- For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lceil \frac{BW_{\text{Channel}(1)} + BW_{\text{Channel}(2)} - 0.1|BW_{\text{Channel}(1)} - BW_{\text{Channel}(2)}|}{0.6} \right\rceil 0.3 \text{ [MHz]}$$

**<Full Power Mode>**
**<Two Carrier power verification>**

| Configure  | CA Configuration (BCS) | PCC     |       |       |         |      |     |        | SCC     |       |        |         | Full Power |            |
|------------|------------------------|---------|-------|-------|---------|------|-----|--------|---------|-------|--------|---------|------------|------------|
|            |                        | LTE     | BW    | UL    | UL      | Mod. | UL# | UL     | LTE     | BW    | DL     | DL      | With CA    | Without CA |
|            |                        | Band    | (MHz) | Freq. | Channel |      | RB  | RB     | Band    | (MHz) | Freq.  | Channel | Tx. Power  | Tx. Power  |
|            |                        |         |       | (MHz) |         |      |     | Offset |         |       | (MHz)  |         | (dBm)      | (dBm)      |
| Inter-Band | CA_2A-17A              | Band 2  | 10M   | 1905  | 19150   | QPSK | 1   | 25     | Band 17 | 10M   | 740    | 5790    | 22.52      | 23.16      |
|            |                        | Band 17 | 10M   | 710   | 23790   | QPSK | 1   | 0      | Band 2  | 10M   | 1960   | 900     | 22.63      | 22.86      |
|            | CA_4A-17A              | Band 4  | 10M   | 1750  | 20350   | QPSK | 1   | 0      | Band 17 | 10M   | 740    | 5790    | 22.64      | 23.06      |
|            |                        | Band 17 | 10M   | 710   | 23790   | QPSK | 1   | 0      | Band 4  | 10M   | 2132.5 | 2175    | 22.67      | 22.86      |

**<Three Carrier power verification>(two bands)**

| Configure  |             | PCC  |       |       |         |      |     |        | SCC1 |       |        |         | SCC2 |       |        |         | Power     |            |
|------------|-------------|------|-------|-------|---------|------|-----|--------|------|-------|--------|---------|------|-------|--------|---------|-----------|------------|
|            |             | LTE  | BW    | UL    | UL      | Mod. | UL# | UL     | LTE  | BW    | DL     | DL      | LTE  | BW    | DL     | DL      | With CA   | Without CA |
|            |             | Band | (MHz) | Freq. | Channel |      | RB  | RB     | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq.  | Channel | Tx. Power | Tx. Power  |
|            |             |      |       | (MHz) |         |      |     | Offset |      |       | (MHz)  |         |      |       | (MHz)  |         | (dBm)     | (dBm)      |
| Inter-Band | CA_2A-2A-4A | 2    | 20M   | 1900  | 19100   | QPSK | 1   | 0      | 2    | 5M    | 1932.5 | 625     | 4    | 20M   | 2132.5 | 2175    | 22.6      | 23.25      |
|            |             | 4    | 20M   | 1745  | 20300   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 22.7      | 23.09      |
|            | CA_4A-4A-7A | 4    | 20M   | 1745  | 20300   | QPSK | 1   | 0      | 4    | 5M    | 2112.5 | 1975    | 7    | 20M   | 2655   | 3100    | 22.56     | 23.09      |
|            |             | 7    | 20M   | 2535  | 21100   | QPSK | 1   | 0      | 4    | 20M   | 2132.5 | 2175    | 4    | 5M    | 2152.5 | 2375    | 22.57     | 23.2       |
|            | CA_5A-7A-7A | 5    | 10M   | 829   | 20450   | QPSK | 1   | 0      | 7    | 20M   | 2630   | 2850    | 7    | 20    | 2680   | 3350    | 22.97     | 22.99      |
|            |             | 7    | 20M   | 2535  | 21100   | QPSK | 1   | 0      | 7    | 20M   | 2680   | 3350    | 5    | 10M   | 881.5  | 2525    | 22.51     | 23.2       |
|            | CA_12A-66C  | 12   | 10M   | 707.5 | 23095   | QPSK | 1   | 49     | 66   | 20M   | 2155   | 66886   | 66   | 20M   | 2174.8 | 67084   | 22.4      | 22.97      |
|            |             | 66   | 20M   | 1745  | 132322  | QPSK | 1   | 0      | 66   | 20M   | 2174.8 | 67084   | 12   | 10M   | 737.5  | 5095    | 22.4      | 23.19      |

**<Three Carrier power verification>(three bands)**

| Configure  |              | PCC     |       |       |         |      |     |        | SCC1    |       |       |         | SCC2    |       |       |         | Power     |            |
|------------|--------------|---------|-------|-------|---------|------|-----|--------|---------|-------|-------|---------|---------|-------|-------|---------|-----------|------------|
|            |              | LTE     | BW    | UL    | UL      | Mod. | UL# | UL     | LTE     | BW    | DL    | DL      | LTE     | BW    | DL    | DL      | With CA   | Without CA |
|            |              | Band    | (MHz) | Freq. | Channel |      | RB  | RB     | Band    | (MHz) | Freq. | Channel | Band    | (MHz) | Freq. | Channel | Tx. Power | Tx. Power  |
|            |              |         |       | (MHz) |         |      |     | Offset |         |       | (MHz) |         |         |       | (MHz) |         |           |            |
| Inter-Band | CA_2A-7A-66A | Band 2  | 20M   | 1900  | 19100   | QPSK | 1   | 0      | Band 7  | 20M   | 2655  | 3100    | Band 66 | 20M   | 2155  | 66886   | 23.28     | 23.25      |
|            |              | Band 7  | 20M   | 2535  | 21100   | QPSK | 1   | 0      | Band 66 | 20M   | 2155  | 66886   | Band 2  | 20M   | 1960  | 900     | 23.36     | 23.2       |
|            |              | Band 66 | 20M   | 1745  | 132322  | QPSK | 1   | 0      | Band 2  | 20M   | 1960  | 900     | Band 7  | 20M   | 2655  | 3100    | 22.87     | 23.19      |



## &lt; Four Carrier power verification&gt;(three bands)

| Configure  |                   | PCC  |       |       |         |      |    |        | SCC1 |       |        |         | SCC2 |       |        |         | SCC3 |       |        |         | Power     |            |
|------------|-------------------|------|-------|-------|---------|------|----|--------|------|-------|--------|---------|------|-------|--------|---------|------|-------|--------|---------|-----------|------------|
|            |                   | LTE  | BW    | UL    | UL      | UL#  | UL | UL     | LTE  | BW    | DL     | DL      | LTE  | BW    | DL     | DL      | LTE  | BW    | DL     | DL      | With CA   | Without CA |
|            |                   | Band | (MHz) | Freq. | Channel | Mod. | RB | Offset | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq.  | Channel | Tx. Power | Tx. Power  |
|            |                   |      | (MHz) | (MHz) |         |      |    |        |      | (MHz) | (MHz)  |         |      | (MHz) | (MHz)  |         |      | (MHz) | (MHz)  |         | (dBm)     | (dBm)      |
| Inter-Band | CA_2A-2A-5A-30A   | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 5    | 10M   | 881.5  | 2525    | 30   | 10M   | 2355   | 9820    | 22.44     | 23.25      |
|            |                   | 5    | 10M   | 829   | 20450   | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 30   | 10M   | 2355   | 9820    | 22.57     | 22.99      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 5    | 10M   | 881.5  | 2525    | 22.64     | 22.89      |
|            | CA_2A-2A-5A-66A   | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 5    | 10M   | 881.5  | 2525    | 66   | 20M   | 2155   | 66886   | 22.28     | 23.25      |
|            |                   | 5    | 10M   | 829   | 20450   | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 66   | 20M   | 2155   | 66886   | 22.49     | 22.99      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 5    | 10M   | 881.5  | 2525    | 22.72     | 23.19      |
|            | CA_2A-2A-12A-30A  | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 12   | 10M   | 737.5  | 5095    | 30   | 10M   | 2355   | 9820    | 22.5      | 23.25      |
|            |                   | 12   | 10M   | 707.5 | 23095   | QPSK | 1  | 49     | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 30   | 10M   | 2355   | 9820    | 22.55     | 22.97      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 12   | 10M   | 737.5  | 5095    | 22.36     | 22.89      |
|            | CA_2A-2A-12A-66A  | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 12   | 10M   | 737.5  | 5095    | 66   | 20M   | 2155   | 66886   | 22.34     | 23.25      |
|            |                   | 12   | 10M   | 707.5 | 23095   | QPSK | 1  | 49     | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 66   | 20M   | 2155   | 66886   | 22.51     | 22.97      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 12   | 10M   | 737.5  | 5095    | 22.45     | 23.19      |
|            | CA_2A-2A-12B      | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 12   | 5M    | 732.8  | 5048    | 12   | 10M   | 740    | 5120    | 22.56     | 23.25      |
|            |                   | 12   | 5M    | 703.8 | 23058   | QPSK | 1  | 12     | 12   | 10M   | 741    | 5130    | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 22.34     | 22.85      |
|            | CA_2A-2A-14A-66A  | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 14   | 10M   | 763    | 5330    | 66   | 20M   | 2155   | 66886   | 22.35     | 23.25      |
|            |                   | 14   | 10M   | 793   | 23330   | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 66   | 20M   | 2155   | 66886   | 22.6      | 22.79      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 14   | 10M   | 763    | 5330    | 22.18     | 23.19      |
|            | CA_2A-2A-29A-30A  | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 29   | 10M   | 722.5  | 9715    | 30   | 10M   | 2355   | 9820    | 22.54     | 23.25      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1  | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 29   | 10M   | 722.5  | 9715    | 22.45     | 22.89      |
|            | CA_2A-2A-66A-66A  | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 66   | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 22.62     | 23.25      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1  | 0      | 66   | 5M    | 2197.5 | 67311   | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 22.5      | 23.19      |
|            | CA_2A-2A-66C      | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 5M    | 1932.5 | 625     | 66   | 20M   | 2155   | 66886   | 66   | 20M   | 2174.8 | 67084   | 22.35     | 23.25      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1  | 0      | 66   | 20M   | 2174.8 | 67084   | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 22.47     | 23.19      |
|            | CA_2A-4A-4A-12A   | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 4    | 20M   | 2132.5 | 2175    | 4    | 5M    | 2152.5 | 2375    | 12   | 10M   | 744.7  | 5167    | 22.56     | 23.25      |
|            |                   | 4    | 20M   | 1745  | 20300   | QPSK | 1  | 0      | 4    | 5M    | 2112.5 | 1975    | 2    | 20M   | 1960   | 900     | 12   | 10M   | 737.5  | 5095    | 22.54     | 23.09      |
|            |                   | 12   | 10M   | 707.5 | 23095   | QPSK | 1  | 49     | 4    | 20M   | 2132.5 | 2175    | 4    | 5M    | 2152.5 | 2375    | 2    | 20M   | 1960   | 900     | 22.48     | 22.97      |
|            | CA_2A-4A-7A-7A    | 4    | 20M   | 1745  | 20300   | QPSK | 1  | 0      | 7    | 20M   | 2655   | 3100    | 7    | 5M    | 2687.5 | 3425    | 2    | 20M   | 1960   | 900     | 22.57     | 23.09      |
|            |                   | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 7    | 20M   | 2655   | 3100    | 7    | 5M    | 2687.5 | 3425    | 4    | 20M   | 2132.5 | 2175    | 23.06     | 23.25      |
|            |                   | 7    | 20M   | 2535  | 21100   | QPSK | 1  | 0      | 7    | 5M    | 2687.5 | 3425    | 4    | 20M   | 2132.5 | 2175    | 2    | 20M   | 1960   | 900     | 22.34     | 23.2       |
|            | CA_2A-4A-7C       | 4    | 20M   | 1745  | 20300   | QPSK | 1  | 0      | 7    | 20M   | 2655   | 3100    | 7    | 20M   | 2674.8 | 3298    | 2    | 20M   | 1960   | 900     | 22.23     | 23.09      |
|            |                   | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 7    | 20M   | 2655   | 3100    | 7    | 20M   | 2674.8 | 3298    | 4    | 20M   | 2132.5 | 2175    | 22.54     | 23.25      |
|            |                   | 7    | 20M   | 2535  | 21100   | QPSK | 1  | 0      | 7    | 20M   | 2674.8 | 3298    | 4    | 20M   | 2132.5 | 2175    | 2    | 20M   | 1960   | 900     | 22.54     | 23.2       |
|            | CA_2A-4A-12B      | 4    | 20M   | 1745  | 20300   | QPSK | 1  | 0      | 12   | 5M    | 732.8  | 5048    | 12   | 10M   | 740    | 5120    | 2    | 20M   | 1960   | 900     | 22.19     | 23.09      |
|            |                   | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 12   | 5M    | 732.8  | 5048    | 12   | 10M   | 740    | 5120    | 4    | 20M   | 2132.5 | 2175    | 22.19     | 23.25      |
|            |                   | 12   | 5M    | 703.8 | 23058   | QPSK | 1  | 12     | 12   | 10M   | 741    | 5130    | 4    | 20M   | 2132.5 | 2175    | 2    | 20M   | 1960   | 900     | 22.25     | 22.85      |
|            | CA_2A-12A-66A-66A | 12   | 10M   | 707.5 | 23095   | QPSK | 1  | 49     | 66   | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 2    | 20M   | 1960   | 900     | 22.67     | 22.97      |
|            |                   | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 66   | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 12   | 10M   | 737.5  | 5095    | 22.52     | 23.25      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1  | 0      | 66   | 5M    | 2197.5 | 67311   | 12   | 10M   | 744.7  | 5167    | 2    | 20M   | 1960   | 900     | 22.22     | 23.19      |
|            | CA_2A-14A-66A-66A | 14   | 10M   | 793   | 23330   | QPSK | 1  | 0      | 66   | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 2    | 20M   | 1960   | 900     | 22.7      | 22.79      |
|            |                   | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 66   | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 14   | 10M   | 763    | 5330    | 22.16     | 23.25      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1  | 0      | 66   | 5M    | 2197.5 | 67311   | 14   | 10M   | 763    | 5330    | 2    | 20M   | 1960   | 900     | 22.79     | 23.19      |
|            | CA_2C-66A-66A     | 2    | 20M   | 1900  | 19100   | QPSK | 1  | 0      | 2    | 20M   | 1960.2 | 902     | 66   | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 22.6      | 23.25      |



# FCC SAR TEST REPORT

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|  |                    |    |     |       |        |      |   |    |    |     |        |       |    |     |        |       |    |     |        |      |       |       |
|--|--------------------|----|-----|-------|--------|------|---|----|----|-----|--------|-------|----|-----|--------|-------|----|-----|--------|------|-------|-------|
|  | CA_4A-4A-12A-30A   | 66 | 20M | 1745  | 132322 | QPSK | 1 | 0  | 66 | 5M  | 2197.5 | 67311 | 2  | 20M | 1960   | 900   | 2  | 20M | 1979.8 | 1098 | 22.76 | 23.19 |
|  |                    | 4  | 20M | 1745  | 20300  | QPSK | 1 | 0  | 4  | 5M  | 2112.5 | 1975  | 12 | 10M | 737.5  | 5095  | 30 | 10M | 2355   | 9820 | 22.65 | 23.09 |
|  |                    | 12 | 10M | 707.5 | 23095  | QPSK | 1 | 49 | 4  | 20M | 2132.5 | 2175  | 4  | 5M  | 2152.5 | 2375  | 30 | 10M | 2355   | 9820 | 22.42 | 22.97 |
|  |                    | 30 | 10M | 2310  | 27710  | QPSK | 1 | 0  | 4  | 20M | 2132.5 | 2175  | 4  | 5M  | 2152.5 | 2375  | 12 | 10M | 737.5  | 5095 | 22.33 | 22.89 |
|  | CA_12A-30A-66A-66A | 66 | 20M | 1745  | 132322 | QPSK | 1 | 0  | 66 | 5M  | 2197.5 | 67311 | 12 | 10M | 737.5  | 5095  | 30 | 10M | 2355   | 9820 | 22.67 | 23.19 |
|  |                    | 12 | 10M | 707.5 | 23095  | QPSK | 1 | 49 | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 30 | 10M | 2355   | 9820 | 22.43 | 22.97 |
|  |                    | 30 | 10M | 2310  | 27710  | QPSK | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 12 | 10M | 737.5  | 5095 | 22.87 | 22.89 |
|  | CA_14A-30A-66A-66A | 66 | 20M | 1745  | 132322 | QPSK | 1 | 0  | 66 | 5M  | 2197.5 | 67311 | 14 | 10M | 763    | 5330  | 30 | 10M | 2355   | 9820 | 22.53 | 23.19 |
|  |                    | 14 | 10M | 793   | 23330  | QPSK | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 30 | 10M | 2355   | 9820 | 22.77 | 22.79 |
|  |                    | 30 | 10M | 2310  | 27710  | QPSK | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 14 | 10M | 763    | 5330 | 22.83 | 22.89 |
|  | CA_29A-30A-66A-66A | 66 | 20M | 1745  | 132322 | QPSK | 1 | 0  | 66 | 5M  | 2197.5 | 67311 | 29 | 10M | 722.5  | 9715  | 30 | 10M | 2355   | 9820 | 22.7  | 23.19 |
|  |                    | 30 | 10M | 2310  | 27710  | QPSK | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 29 | 10M | 722.5  | 9715 | 22.45 | 22.89 |

## < Four Carrier power verification>(four bands)

| Configure  |                   | PCC  |       |       |         |      |     |        | SCC1 |       |        |         | SCC2 |       |        |         | SCC3 |       |       |         | Power     |            |
|------------|-------------------|------|-------|-------|---------|------|-----|--------|------|-------|--------|---------|------|-------|--------|---------|------|-------|-------|---------|-----------|------------|
|            |                   | LTE  | BW    | UL    | UL      | Mod. | UL# | UL     | LTE  | BW    | DL     | DL      | LTE  | BW    | DL     | DL      | LTE  | BW    | DL    | DL      | With CA   | Without CA |
|            |                   | Band | (MHz) | Freq. | Channel |      | RB  | Offset | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq. | Channel | Tx. Power | Tx. Power  |
|            |                   |      |       | (MHz) |         |      |     |        |      |       | (MHz)  |         |      |       | (MHz)  |         |      |       | (dBm) |         |           |            |
| Inter-Band | CA_2A-4A-5A-30A   | 2    | 20M   | 1900  | 19100   | QPSK | 1   | 0      | 4    | 20M   | 2132.5 | 2175    | 5    | 10M   | 881.5  | 2525    | 30   | 10M   | 2355  | 9820    | 22.78     | 23.25      |
|            |                   | 4    | 20M   | 1745  | 20300   | QPSK | 1   | 0      | 5    | 10M   | 881.5  | 2525    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 22.55     | 23.09      |
|            |                   | 5    | 10M   | 829   | 20450   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 30   | 10M   | 2355  | 9820    | 22.48     | 22.99      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 5    | 10M   | 881.5 | 2525    | 22.78     | 22.89      |
|            | CA_2A-4A-7A-12A   | 2    | 20M   | 1900  | 19100   | QPSK | 1   | 0      | 4    | 20M   | 2132.5 | 2175    | 7    | 20M   | 2655   | 3100    | 12   | 10M   | 737.5 | 5095    | 22.55     | 23.25      |
|            |                   | 4    | 20M   | 1745  | 20300   | QPSK | 1   | 0      | 7    | 20M   | 2655   | 3100    | 2    | 20M   | 1960   | 900     | 12   | 10M   | 737.5 | 5095    | 22.49     | 23.09      |
|            |                   | 7    | 20M   | 2535  | 21100   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 12   | 10M   | 737.5 | 5095    | 22.58     | 23.2       |
|            |                   | 12   | 10M   | 707.5 | 23095   | QPSK | 1   | 49     | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 7    | 20M   | 2655  | 3100    | 22.77     | 22.97      |
|            | CA_2A-4A-12A-30A  | 2    | 20M   | 1900  | 19100   | QPSK | 1   | 0      | 4    | 20M   | 2132.5 | 2175    | 12   | 10M   | 737.5  | 5095    | 30   | 10M   | 2355  | 9820    | 22.73     | 23.25      |
|            |                   | 4    | 20M   | 1745  | 20300   | QPSK | 1   | 0      | 12   | 10M   | 737.5  | 5095    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 22.45     | 23.09      |
|            |                   | 12   | 10M   | 707.5 | 23095   | QPSK | 1   | 49     | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 30   | 10M   | 2355  | 9820    | 22.71     | 22.97      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 12   | 10M   | 737.5 | 5095    | 22.79     | 22.89      |
|            | CA_2A-4A-29A-30A  | 2    | 20M   | 1900  | 19100   | QPSK | 1   | 0      | 4    | 20M   | 2132.5 | 2175    | 30   | 10M   | 2355   | 9820    | 29   | 10M   | 722.5 | 9715    | 22.46     | 23.25      |
|            |                   | 4    | 20M   | 1745  | 20300   | QPSK | 1   | 0      | 30   | 10M   | 2355   | 9820    | 2    | 20M   | 1960   | 900     | 29   | 10M   | 722.5 | 9715    | 22.31     | 23.09      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 29   | 10M   | 722.5 | 9715    | 22.39     | 22.89      |
|            |                   |      |       |       |         |      |     |        |      |       |        |         |      |       |        |         |      |       |       |         |           |            |
|            | CA_2A-12A-30A-66A | 2    | 20M   | 1900  | 19100   | QPSK | 1   | 0      | 66   | 20M   | 2155   | 66886   | 12   | 10M   | 737.5  | 5095    | 30   | 10M   | 2355  | 9820    | 22.53     | 23.25      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1   | 0      | 12   | 10M   | 737.5  | 5095    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 22.31     | 23.19      |
|            |                   | 12   | 10M   | 707.5 | 23095   | QPSK | 1   | 49     | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 30   | 10M   | 2355  | 9820    | 22.76     | 22.97      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 12   | 10M   | 737.5 | 5095    | 22.62     | 22.89      |
|            | CA_2A-14A-30A-66A | 2    | 20M   | 1900  | 19100   | QPSK | 1   | 0      | 66   | 20M   | 2155   | 66886   | 14   | 10M   | 763    | 5330    | 30   | 10M   | 2355  | 9820    | 22.53     | 23.25      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1   | 0      | 14   | 10M   | 763    | 5330    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 22.31     | 23.19      |
|            |                   | 14   | 10M   | 793   | 23330   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 30   | 10M   | 2355  | 9820    | 22.74     | 22.79      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 14   | 10M   | 763   | 5330    | 22.55     | 22.89      |
|            | CA_2A-29A-30A-66A | 2    | 20M   | 1900  | 19100   | QPSK | 1   | 0      | 66   | 20M   | 2155   | 66886   | 29   | 10M   | 722.5  | 9715    | 30   | 10M   | 2355  | 9820    | 22.8      | 23.25      |
|            |                   | 66   | 20M   | 1745  | 132322  | QPSK | 1   | 0      | 29   | 10M   | 722.5  | 9715    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 22.36     | 23.19      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK | 1   | 0      | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 29   | 10M   | 722.5 | 9715    | 22.78     | 22.89      |



**< Five Carrier power verification >**

| Configure  |                  | PCC  |       |       |         |      |        |    | SCC1  |       |        |         | SCC2 |       |       |         | SCC3 |       |        |         | SCC4  |       |       |         | Power     |            |
|------------|------------------|------|-------|-------|---------|------|--------|----|-------|-------|--------|---------|------|-------|-------|---------|------|-------|--------|---------|-------|-------|-------|---------|-----------|------------|
|            |                  | LTE  | BW    | UL    | UL      | Mod. | UL#    | UL | LTE   | BW    | DL     | DL      | LTE  | BW    | DL    | DL      | LTE  | BW    | DL     | DL      | LTE   | BW    | DL    | DL      | With CA   | Without CA |
|            |                  | Band | (MHz) | Freq. | Channel |      | RB     | RB | Band  | (MHz) | Freq.  | Channel | Band | (MHz) | Freq. | Channel | Band | (MHz) | Freq.  | Channel | Band  | (MHz) | Freq. | Channel | Tx. Power | Tx. Power  |
|            |                  |      |       | (MHz) |         |      | Offset |    | (MHz) |       | (MHz)  |         |      | (MHz) |       | (MHz)   |      |       | (MHz)  |         | (MHz) |       |       | (dBm)   | (dBm)     |            |
| Inter-Band | CA_2A-5B-30A-66A | 2    | 20M   | 1900  | 19100   | QPSK | 1      | 0  | 5     | 5M    | 876.8  | 2478    | 5    | 10M   | 884   | 2550    | 30   | 10M   | 2355   | 9820    | 66    | 10M   | 2155  | 66886   | 23.05     | 23.25      |
|            |                  | 5    | 5M    | 826.8 | 20428   | QPSK | 1      | 0  | 5     | 10M   | 879    | 2500    | 66   | 20M   | 2155  | 66886   | 30   | 10M   | 2355   | 9820    | 2     | 20M   | 1960  | 900     | 22.89     | 22.99      |
|            |                  | 66   | 20M   | 1745  | 132322  | QPSK | 1      | 0  | 5     | 5M    | 876.8  | 2478    | 5    | 10M   | 884   | 2550    | 30   | 10M   | 2355   | 9820    | 2     | 20M   | 1960  | 900     | 22.96     | 23.19      |
|            |                  | 30   | 10M   | 2310  | 27710   | QPSK | 1      | 0  | 5     | 5M    | 876.8  | 2478    | 5    | 10M   | 884   | 2550    | 66   | 20M   | 2155   | 66886   | 2     | 20M   | 1960  | 900     | 22.56     | 22.89      |
|            | CA_2A-5B-66A-66A | 2    | 20M   | 1900  | 19100   | QPSK | 1      | 0  | 5     | 5M    | 876.8  | 2478    | 5    | 10M   | 884   | 2550    | 66   | 20M   | 2155   | 66886   | 66    | 5M    | 2198  | 67311   | 23.05     | 23.25      |
|            |                  | 5    | 5M    | 826.8 | 20428   | QPSK | 1      | 0  | 5     | 10M   | 879    | 2500    | 66   | 20M   | 2155  | 66886   | 66   | 5M    | 2197.5 | 67311   | 2     | 20M   | 1960  | 900     | 22.77     | 22.99      |
|            |                  | 66   | 20M   | 1745  | 132322  | QPSK | 1      | 0  | 66    | 5M    | 2197.5 | 67311   | 5    | 5M    | 876.8 | 2478    | 5    | 10M   | 884    | 2550    | 2     | 20M   | 1960  | 900     | 22.16     | 23.19      |
|            |                  |      |       |       |         |      |        |    |       |       |        |         |      |       |       |         |      |       |        |         |       |       |       |         |           |            |

### <Reduced Power for P-Sensor On>

#### <Two Carrier power verification>

| Configure  | CA List   | PCC  |       |        |         |       |     |        | SCC  |       |        |         | Power     |            |
|------------|-----------|------|-------|--------|---------|-------|-----|--------|------|-------|--------|---------|-----------|------------|
|            |           | LTE  | BW    | UL     | UL      | Mod.  | UL# | UL     | LTE  | BW    | DL     | DL      | With CA   | Without CA |
|            |           | Band | (MHz) | Freq.  | Channel |       | RB  | RB     | Band | (MHz) | Freq.  | Channel | Tx. Power | Tx. Power  |
|            |           |      |       | (MHz)  |         |       |     | Offset |      |       | (MHz)  |         | (dBm)     | (dBm)      |
| Inter-Band | CA_2A-17A | 2    | 10M   | 1905   | 19150   | 64QAM | 1   | 0      | 17   | 10M   | 740    | 5790    | 19.50     | 19.97      |
|            |           | 17   | 10M   | 710    | 23790   | QPSK  | 1   | 0      | 2    | 10M   | 1960   | 900     | 21.44     | 21.62      |
|            | CA_4A-17A | 4    | 10M   | 1732.5 | 20175   | 64QAM | 1   | 49     | 17   | 10M   | 740    | 5790    | 18.56     | 18.96      |
|            |           | 17   | 10M   | 710    | 23790   | QPSK  | 1   | 0      | 4    | 10M   | 2132.5 | 2175    | 21.31     | 21.62      |

#### <Three Carrier power verification>(two bands)

| Configure  |             | PCC  |       |       |         |       |     |        | SCC1 |       |        |         | SCC2 |       |        |         | Power     |            |
|------------|-------------|------|-------|-------|---------|-------|-----|--------|------|-------|--------|---------|------|-------|--------|---------|-----------|------------|
|            |             | LTE  | BW    | UL    | UL      | Mod.  | UL# | UL     | LTE  | BW    | DL     | DL      | LTE  | BW    | DL     | DL      | With CA   | Without CA |
|            |             | Band | (MHz) | Freq. | Channel |       | RB  | RB     | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq.  | Channel | Tx. Power | Tx. Power  |
|            |             |      |       | (MHz) |         |       |     | Offset |      |       | (MHz)  |         |      |       | (MHz)  |         | (dBm)     | (dBm)      |
| Inter-Band | CA_2A-2A-4A | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49     | 2    | 5M    | 1932.5 | 625     | 4    | 20M   | 2132.5 | 2175    | 19.46     | 19.88      |
|            |             | 4    | 20M   | 1745  | 20300   | 64QAM | 1   | 0      | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 18.7      | 18.98      |
|            | CA_4A-4A-7A | 4    | 20M   | 1745  | 20300   | 64QAM | 1   | 0      | 4    | 5M    | 2112.5 | 1975    | 7    | 20M   | 2655   | 3100    | 19.66     | 18.98      |
|            |             | 7    | 20M   | 2535  | 21100   | QPSK  | 1   | 0      | 4    | 20M   | 2132.5 | 2175    | 4    | 5M    | 2152.5 | 2375    | 13.3      | 13.41      |
|            | CA_5A-7A-7A | 5    | 10M   | 829   | 20450   | 16QAM | 1   | 0      | 7    | 20M   | 2630   | 2850    | 7    | 20    | 2680   | 3350    | 20.12     | 20.69      |
|            |             | 7    | 20M   | 2535  | 21100   | QPSK  | 1   | 0      | 7    | 20M   | 2680   | 3350    | 5    | 10M   | 881.5  | 2525    | 13.14     | 13.41      |
|            | CA_12A-66C  | 12   | 10M   | 707.5 | 23095   | 16QAM | 1   | 0      | 66   | 20M   | 2155   | 66886   | 66   | 20M   | 2174.8 | 67084   | 21.33     | 21.83      |
|            |             | 66   | 20M   | 1745  | 132322  | 16QAM | 1   | 0      | 66   | 20M   | 2174.8 | 67084   | 12   | 10M   | 737.5  | 5095    | 19.17     | 19.26      |

#### <Three Carrier power verification>(three bands)

| Configure  |              | PCC  |       |       |         |       |     |        | SCC1 |       |       |         | SCC2 |       |       |         | Power     |            |
|------------|--------------|------|-------|-------|---------|-------|-----|--------|------|-------|-------|---------|------|-------|-------|---------|-----------|------------|
|            |              | LTE  | BW    | UL    | UL      | Mod.  | UL# | UL     | LTE  | BW    | DL    | DL      | LTE  | BW    | DL    | DL      | With CA   | Without CA |
|            |              | Band | (MHz) | Freq. | Channel |       | RB  | RB     | Band | (MHz) | Freq. | Channel | Band | (MHz) | Freq. | Channel | Tx. Power | Tx. Power  |
|            |              |      |       | (MHz) |         |       |     | Offset |      |       | (MHz) |         |      |       | (dBm) |         | (dBm)     |            |
| Inter-Band | CA_2A-7A-66A | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49     | 7    | 20M   | 2655  | 3100    | 66   | 20M   | 2155  | 66886   | 19.12     | 19.88      |
|            |              | 7    | 20M   | 2535  | 21100   | QPSK  | 1   | 0      | 66   | 20M   | 2155  | 66886   | 2    | 20M   | 1960  | 900     | 13.22     | 13.41      |
|            |              | 66   | 20M   | 1745  | 132322  | 16QAM | 1   | 0      | 2    | 20M   | 1960  | 900     | 7    | 20M   | 2655  | 3100    | 19.03     | 19.25      |



**< Four Carrier power verification>(three bands)**

| Configure  |                   | PCC  |       |       |         |       |        |    | SCC1    |       |        |         | SCC2 |       |        |         | SCC3 |       |        |         | Power     |            |
|------------|-------------------|------|-------|-------|---------|-------|--------|----|---------|-------|--------|---------|------|-------|--------|---------|------|-------|--------|---------|-----------|------------|
|            |                   | LTE  | BW    | UL    | UL      |       | UL#    | UL | LTE     | BW    | DL     | DL      | LTE  | BW    | DL     | DL      | LTE  | BW    | DL     | DL      | With CA   | Without CA |
|            |                   | Band | (MHz) | Freq. | Channel | Mod.  | RB     | RB | Band    | (MHz) | Freq.  | Channel | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq.  | Channel | Tx. Power | Tx. Power  |
|            |                   |      |       | (MHz) |         |       | Offset |    |         |       | (MHz)  |         |      |       | (MHz)  |         |      |       | (MHz)  |         | (dBm)     | (dBm)      |
| Inter-Band | CA_2A-2A-5A-30A   | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 2       | 5M    | 1932.5 | 625     | 5    | 10M   | 881.5  | 2525    | 30   | 10M   | 2355   | 9820    | 19.36     | 19.88      |
|            |                   | 5    | 10M   | 829   | 20450   | 16QAM | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 30   | 10M   | 2355   | 9820    | 20.42     | 20.69      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 5    | 10M   | 881.5  | 2525    | 15.39     | 15.8       |
|            | CA_2A-2A-5A-66A   | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 2       | 5M    | 1932.5 | 625     | 5    | 10M   | 881.5  | 2525    | 66   | 20M   | 2155   | 66886   | 19.52     | 19.88      |
|            |                   | 5    | 10M   | 829   | 20450   | 16QAM | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 66   | 20M   | 2155   | 66886   | 20.42     | 20.69      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 5    | 10M   | 881.5  | 2525    | 18.92     | 19.25      |
|            | CA_2A-2A-12A-30A  | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 2       | 5M    | 1932.5 | 625     | 12   | 10M   | 737.5  | 5095    | 30   | 10M   | 2355   | 9820    | 19.55     | 19.88      |
|            |                   | 12   | 10M   | 707.5 | 23095   | QPSK  | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 30   | 10M   | 2355   | 9820    | 21.49     | 21.83      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 12   | 10M   | 737.5  | 5095    | 15.38     | 15.8       |
|            | CA_2A-2A-12A-66A  | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 2       | 5M    | 1932.5 | 625     | 12   | 10M   | 737.5  | 5095    | 66   | 20M   | 2155   | 66886   | 18.5      | 19.88      |
|            |                   | 12   | 10M   | 707.5 | 23095   | 16QAM | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 66   | 20M   | 2155   | 66886   | 21.42     | 21.83      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 12   | 10M   | 737.5  | 5095    | 19        | 19.25      |
|            | CA_2A-2A-12B      | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 0  | Band 2  | 5M    | 1932.5 | 625     | 12   | 5M    | 732.8  | 5048    | 12   | 10M   | 740    | 5120    | 19.62     | 19.88      |
|            |                   | 12   | 5M    | 703.8 | 23058   | 16QAM | 1      | 0  | Band 12 | 10M   | 741    | 5130    | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 21.32     | 21.75      |
|            | CA_2A-2A-14A-66A  | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 2       | 5M    | 1932.5 | 625     | 14   | 10M   | 763    | 5330    | 66   | 20M   | 2155   | 66886   | 19.56     | 19.88      |
|            |                   | 14   | 10M   | 793   | 23330   | 16QAM | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 66   | 20M   | 2155   | 66886   | 21.05     | 21.55      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 14   | 10M   | 763    | 5330    | 18.92     | 19.25      |
|            | CA_2A-2A-29A-30A  | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 2       | 5M    | 1932.5 | 625     | 29   | 10M   | 722.5  | 9715    | 30   | 10M   | 2355   | 9820    | 19.65     | 19.88      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1      | 0  | 2       | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 29   | 10M   | 722.5  | 9715    | 15.73     | 15.8       |
|            | CA_2A-2A-66A-66A  | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 2       | 5M    | 1932.5 | 625     | 66   | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 19.8      | 19.88      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 66      | 5M    | 2197.5 | 67311   | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 18.72     | 19.25      |
|            | CA_2A-2A-66C      | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 2       | 5M    | 1932.5 | 625     | 66   | 20M   | 2155   | 66886   | 66   | 20M   | 2174.8 | 67084   | 19.61     | 19.88      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 66      | 20M   | 2174.8 | 67084   | 2    | 20M   | 1960   | 900     | 2    | 5M    | 1987.5 | 1175    | 19.05     | 19.25      |
|            | CA_2A-4A-12A      | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 4       | 20M   | 2132.5 | 2175    | 4    | 5M    | 2152.5 | 2375    | 12   | 10M   | 744.7  | 5167    | 19.83     | 19.88      |
|            |                   | 4    | 20M   | 1745  | 20300   | 64QAM | 1      | 0  | 4       | 5M    | 2112.5 | 1975    | 2    | 20M   | 1960   | 900     | 12   | 10M   | 737.5  | 5095    | 18.9      | 18.98      |
|            |                   | 12   | 10M   | 707.5 | 23095   | 16QAM | 1      | 0  | 4       | 20M   | 2132.5 | 2175    | 4    | 5M    | 2152.5 | 2375    | 2    | 20M   | 1960   | 900     | 21.54     | 21.83      |
|            | CA_2A-4A-7A-7A    | 4    | 20M   | 1745  | 20300   | 64QAM | 1      | 0  | 7       | 20M   | 2655   | 3100    | 7    | 5M    | 2687.5 | 3425    | 2    | 20M   | 1960   | 900     | 18.91     | 18.98      |
|            |                   | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 7       | 20M   | 2655   | 3100    | 7    | 5M    | 2687.5 | 3425    | 4    | 20M   | 2132.5 | 2175    | 19.84     | 19.88      |
|            |                   | 7    | 20M   | 2535  | 21100   | QPSK  | 1      | 0  | 7       | 5M    | 2687.5 | 3425    | 4    | 20M   | 2132.5 | 2175    | 2    | 20M   | 1960   | 900     | 13.42     | 13.41      |
|            | CA_2A-4A-7C       | 4    | 20M   | 1745  | 20300   | 64QAM | 1      | 0  | 7       | 20M   | 2655   | 3100    | 7    | 20M   | 2674.8 | 3298    | 2    | 20M   | 1960   | 900     | 18.56     | 18.98      |
|            |                   | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 7       | 20M   | 2655   | 3100    | 7    | 20M   | 2674.8 | 3298    | 4    | 20M   | 2132.5 | 2175    | 19.87     | 19.88      |
|            |                   | 7    | 20M   | 2535  | 21100   | QPSK  | 1      | 0  | 7       | 20M   | 2674.8 | 3298    | 4    | 20M   | 2132.5 | 2175    | 2    | 20M   | 1960   | 900     | 13.16     | 13.41      |
|            | CA_2A-4A-12B      | 4    | 20M   | 1745  | 20300   | 64QAM | 1      | 0  | 12      | 5M    | 732.8  | 5048    | 12   | 10M   | 740    | 5120    | 2    | 20M   | 1960   | 900     | 18.58     | 18.98      |
|            |                   | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 12      | 5M    | 732.8  | 5048    | 12   | 10M   | 740    | 5120    | 4    | 20M   | 2132.5 | 2175    | 19.47     | 19.88      |
|            |                   | 12   | 5M    | 703.8 | 23058   | 16QAM | 1      | 0  | 12      | 10M   | 741    | 5130    | 4    | 20M   | 2132.5 | 2175    | 2    | 20M   | 1960   | 900     | 21.38     | 21.75      |
|            | CA_2A-12A-66A-66A | 12   | 10M   | 707.5 | 23095   | 16QAM | 1      | 0  | 66      | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 2    | 20M   | 1960   | 900     | 21.62     | 21.83      |
|            |                   | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 66      | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 12   | 10M   | 737.5  | 5095    | 19.51     | 19.88      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 66      | 5M    | 2197.5 | 67311   | 12   | 10M   | 744.7  | 5167    | 2    | 20M   | 1960   | 900     | 19.21     | 19.25      |
|            | CA_2A-14A-66A-66A | 14   | 10M   | 793   | 23330   | 16QAM | 1      | 0  | 66      | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 2    | 20M   | 1960   | 900     | 21.65     | 21.55      |
|            |                   | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 66      | 20M   | 2155   | 66886   | 66   | 5M    | 2197.5 | 67311   | 14   | 10M   | 763    | 5330    | 19.4      | 19.88      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 66      | 5M    | 2197.5 | 67311   | 14   | 10M   | 763    | 5330    | 2    | 20M   | 1960   | 900     | 18.95     | 19.25      |



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|  |                    |    |     |       |        |       |   |    |    |     |        |       |    |     |        |       |    |     |        |       |       |       |
|--|--------------------|----|-----|-------|--------|-------|---|----|----|-----|--------|-------|----|-----|--------|-------|----|-----|--------|-------|-------|-------|
|  | CA_2C-66A-66A      | 2  | 20M | 1900  | 19100  | 16QAM | 1 | 49 | 2  | 20M | 1960.2 | 902   | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 18.71 | 19.88 |
|  |                    | 66 | 20M | 1745  | 132322 | 16QAM | 1 | 0  | 66 | 5M  | 2197.5 | 67311 | 2  | 20M | 1960   | 900   | 2  | 20M | 1979.8 | 1098  | 18.73 | 19.25 |
|  | CA_4A-4A-12A-30A   | 4  | 20M | 1745  | 20300  | 64QAM | 1 | 0  | 4  | 5M  | 2112.5 | 1975  | 12 | 10M | 737.5  | 5095  | 30 | 10M | 2355   | 9820  | 18.42 | 18.98 |
|  |                    | 12 | 10M | 707.5 | 23095  | 16QAM | 1 | 49 | 4  | 20M | 2132.5 | 2175  | 4  | 5M  | 2152.5 | 2375  | 30 | 10M | 2355   | 9820  | 21.58 | 21.83 |
|  |                    | 30 | 10M | 2310  | 27710  | QPSK  | 1 | 0  | 4  | 20M | 2132.5 | 2175  | 4  | 5M  | 2152.5 | 2375  | 12 | 10M | 737.5  | 5095  | 15.17 | 15.8  |
|  | CA_12A-30A-66A-66A | 66 | 20M | 1745  | 132322 | 16QAM | 1 | 0  | 66 | 5M  | 2197.5 | 67311 | 12 | 10M | 737.5  | 5095  | 30 | 10M | 2355   | 9820  | 19.15 | 19.25 |
|  |                    | 12 | 10M | 707.5 | 23095  | 16QAM | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 30 | 10M | 2355   | 9820  | 21.88 | 21.83 |
|  |                    | 30 | 10M | 2310  | 27710  | QPSK  | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 12 | 10M | 737.5  | 5095  | 15.81 | 15.8  |
|  | CA_14A-30A-66A-66A | 66 | 20M | 1745  | 132322 | 16QAM | 1 | 0  | 66 | 5M  | 2197.5 | 67311 | 14 | 10M | 763    | 5330  | 30 | 10M | 2355   | 9820  | 19.17 | 19.25 |
|  |                    | 14 | 10M | 793   | 23330  | 16QAM | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 30 | 10M | 2355   | 9820  | 21.45 | 21.55 |
|  |                    | 30 | 10M | 2310  | 27710  | QPSK  | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 14 | 10M | 763    | 5330  | 15.8  | 15.8  |
|  | CA_29A-30A-66A-66A | 66 | 20M | 1745  | 132322 | 16QAM | 1 | 0  | 66 | 5M  | 2197.5 | 67311 | 29 | 10M | 722.5  | 9715  | 30 | 10M | 2355   | 9820  | 19.21 | 19.25 |
|  |                    | 30 | 10M | 2310  | 27710  | QPSK  | 1 | 0  | 66 | 20M | 2155   | 66886 | 66 | 5M  | 2197.5 | 67311 | 29 | 10M | 722.5  | 9715  | 15.45 | 15.8  |

## < Four Carrier power verification>(four bands)

| Configure  |                   | PCC  |       |       |         |       |     |              | SCC1 |       |        |         | SCC2 |       |        |         | SCC3 |       |       |         | Power     |            |
|------------|-------------------|------|-------|-------|---------|-------|-----|--------------|------|-------|--------|---------|------|-------|--------|---------|------|-------|-------|---------|-----------|------------|
|            |                   | LTE  | BW    | UL    | UL      | Mod.  | UL# | UL           | LTE  | BW    | DL     | DL      | LTE  | BW    | DL     | DL      | LTE  | BW    | DL    | DL      | With CA   | Without CA |
|            |                   | Band | (MHz) | Freq. | Channel |       | RB  | RB<br>Offset | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq.  | Channel | Band | (MHz) | Freq. | Channel | Tx. Power | Tx. Power  |
|            |                   |      |       | (MHz) |         |       |     |              |      |       | (MHz)  |         |      |       | (MHz)  |         |      |       | (dBm) |         | (dBm)     |            |
| Inter-Band | CA_2A-4A-5A-30A   | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49           | 4    | 20M   | 2132.5 | 2175    | 5    | 10M   | 881.5  | 2525    | 30   | 10M   | 2355  | 9820    | 19.35     | 19.88      |
|            |                   | 4    | 20M   | 1745  | 20300   | 64QAM | 1   | 0            | 5    | 10M   | 881.5  | 2525    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 18.61     | 18.98      |
|            |                   | 5    | 10M   | 829   | 20450   | 16QAM | 1   | 0            | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 30   | 10M   | 2355  | 9820    | 20.43     | 20.69      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1   | 0            | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 5    | 10M   | 881.5 | 2525    | 15.23     | 15.8       |
|            | CA_2A-4A-7A-12A   | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49           | 4    | 20M   | 2132.5 | 2175    | 7    | 20M   | 2655   | 3100    | 12   | 10M   | 737.5 | 5095    | 19.5      | 19.88      |
|            |                   | 4    | 20M   | 1745  | 20300   | 64QAM | 1   | 0            | 7    | 20M   | 2655   | 3100    | 2    | 20M   | 1960   | 900     | 12   | 10M   | 737.5 | 5095    | 18.72     | 18.98      |
|            |                   | 7    | 20M   | 2535  | 21100   | QPSK  | 1   | 0            | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 12   | 10M   | 737.5 | 5095    | 13.2      | 13.41      |
|            |                   | 12   | 10M   | 707.5 | 23095   | 16QAM | 1   | 0            | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 7    | 20M   | 2655  | 3100    | 21.61     | 21.83      |
|            | CA_2A-4A-12A-30A  | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49           | 4    | 20M   | 2132.5 | 2175    | 12   | 10M   | 737.5  | 5095    | 30   | 10M   | 2355  | 9820    | 19.23     | 19.88      |
|            |                   | 4    | 20M   | 1745  | 20300   | 64QAM | 1   | 0            | 12   | 10M   | 737.5  | 5095    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 18.65     | 18.98      |
|            |                   | 12   | 10M   | 707.5 | 23095   | 16QAM | 1   | 0            | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 30   | 10M   | 2355  | 9820    | 21.67     | 21.83      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1   | 0            | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 12   | 10M   | 737.5 | 5095    | 15.4      | 15.8       |
|            | CA_2A-4A-29A-30A  | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49           | 4    | 20M   | 2132.5 | 2175    | 30   | 10M   | 2355   | 9820    | 29   | 10M   | 722.5 | 9715    | 19.43     | 19.88      |
|            |                   | 4    | 20M   | 1745  | 20300   | 64QAM | 1   | 0            | 30   | 10M   | 2355   | 9820    | 2    | 20M   | 1960   | 900     | 29   | 10M   | 722.5 | 9715    | 18.81     | 18.98      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1   | 0            | 2    | 20M   | 1960   | 900     | 4    | 20M   | 2132.5 | 2175    | 29   | 10M   | 722.5 | 9715    | 15.3      | 15.8       |
|            | CA_2A-12A-30A-66A | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49           | 66   | 20M   | 2155   | 66886   | 12   | 10M   | 737.5  | 5095    | 30   | 10M   | 2355  | 9820    | 19.34     | 19.88      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1   | 0            | 12   | 10M   | 737.5  | 5095    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 19.17     | 19.25      |
|            |                   | 12   | 10M   | 707.5 | 23095   | 16QAM | 1   | 0            | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 30   | 10M   | 2355  | 9820    | 21.67     | 21.83      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1   | 0            | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 12   | 10M   | 737.5 | 5095    | 15.43     | 15.8       |
|            | CA_2A-14A-30A-66A | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49           | 66   | 20M   | 2155   | 66886   | 14   | 10M   | 763    | 5330    | 30   | 10M   | 2355  | 9820    | 19.43     | 19.88      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1   | 0            | 14   | 10M   | 763    | 5330    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 19.32     | 19.25      |
|            |                   | 14   | 10M   | 793   | 23330   | 16QAM | 1   | 0            | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 30   | 10M   | 2355  | 9820    | 21.35     | 21.55      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1   | 0            | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 14   | 10M   | 763   | 5330    | 15.63     | 15.8       |
|            | CA_2A-29A-30A-66A | 2    | 20M   | 1900  | 19100   | 16QAM | 1   | 49           | 66   | 20M   | 2155   | 66886   | 29   | 10M   | 722.5  | 9715    | 30   | 10M   | 2355  | 9820    | 19.34     | 19.88      |
|            |                   | 66   | 20M   | 1745  | 132322  | 16QAM | 1   | 0            | 29   | 10M   | 722.5  | 9715    | 2    | 20M   | 1960   | 900     | 30   | 10M   | 2355  | 9820    | 19.08     | 19.25      |
|            |                   | 30   | 10M   | 2310  | 27710   | QPSK  | 1   | 0            | 2    | 20M   | 1960   | 900     | 66   | 20M   | 2155   | 66886   | 29   | 10M   | 722.5 | 9715    | 15.45     | 15.8       |

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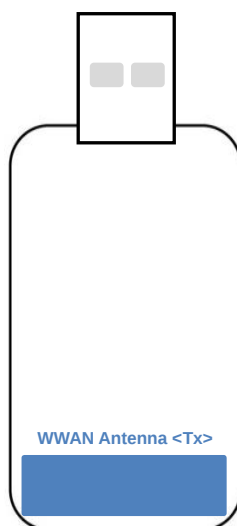
Form version. : 181113



**< Five Carrier power verification >**

| Configure  |                  | PCC  |       |       |         |       |        |    | SCC1  |       |        |         | SCC2 |       |       |         | SCC3 |       |        |         | SCC4  |       |        |         | Power     |            |
|------------|------------------|------|-------|-------|---------|-------|--------|----|-------|-------|--------|---------|------|-------|-------|---------|------|-------|--------|---------|-------|-------|--------|---------|-----------|------------|
|            |                  | LTE  | BW    | UL    | UL      | Mod.  | UL#    | UL | LTE   | BW    | DL     | DL      | LTE  | BW    | DL    | DL      | LTE  | BW    | DL     | DL      | LTE   | BW    | DL     | DL      | With CA   | Without CA |
|            |                  | Band | (MHz) | Freq. | Channel |       | RB     | RB | Band  | (MHz) | Freq.  | Channel | Band | (MHz) | Freq. | Channel | Band | (MHz) | Freq.  | Channel | Band  | (MHz) | Freq.  | Channel | Tx. Power | Tx. Power  |
|            |                  |      |       | (MHz) |         |       | Offset |    | (MHz) |       | (MHz)  |         | Band | (MHz) |       | (MHz)   |      | Band  | (MHz)  |         | (MHz) |       |        |         | (dBm)     | (dBm)      |
| Inter-Band | CA_2A-5B-30A-66A | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 5     | 5M    | 876.8  | 2478    | 5    | 10M   | 884   | 2550    | 30   | 10M   | 2355   | 9820    | 66    | 10M   | 2155   | 66886   | 19.82     | 19.88      |
|            |                  | 5    | 5M    | 826.8 | 20428   | 64QAM | 1      | 0  | 5     | 10M   | 879    | 2500    | 66   | 20M   | 2155  | 66886   | 30   | 10M   | 2355   | 9820    | 2     | 20M   | 1960   | 900     | 20.35     | 20.69      |
|            |                  | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 5     | 5M    | 876.8  | 2478    | 5    | 10M   | 884   | 2550    | 30   | 10M   | 2355   | 9820    | 2     | 20M   | 1960   | 900     | 18.9      | 19.25      |
|            |                  | 30   | 10M   | 2310  | 27710   | QPSK  | 1      | 0  | 5     | 5M    | 876.8  | 2478    | 5    | 10M   | 884   | 2550    | 66   | 20M   | 2155   | 66886   | 2     | 20M   | 1960   | 900     | 15.71     | 15.8       |
|            | CA_2A-5B-66A-66A | 2    | 20M   | 1900  | 19100   | 16QAM | 1      | 49 | 5     | 5M    | 876.8  | 2478    | 5    | 10M   | 884   | 2550    | 66   | 20M   | 2155   | 66886   | 66    | 5M    | 2197.5 | 67311   | 19.72     | 19.88      |
|            |                  | 5    | 5M    | 826.8 | 20428   | 64QAM | 1      | 0  | 5     | 10M   | 879    | 2500    | 66   | 20M   | 2155  | 66886   | 66   | 5M    | 2197.5 | 67311   | 2     | 20M   | 1960   | 900     | 20.45     | 20.69      |
|            |                  | 66   | 20M   | 1745  | 132322  | 16QAM | 1      | 0  | 66    | 5M    | 2197.5 | 67311   | 5    | 5M    | 876.8 | 2478    | 5    | 10M   | 884    | 2550    | 2     | 20M   | 1960   | 900     | 19.14     | 19.25      |

## 14. Antenna Location



Front View

| Antennas          | DUT Test Position |                 |                |               |          |
|-------------------|-------------------|-----------------|----------------|---------------|----------|
|                   | Horizontal Up     | Horizontal Down | Vertical Front | Vertical Back | Tip Mode |
| WWAN Main Antenna | Yes               | Yes             | Yes            | Yes           | Yes      |

## **15. SAR Test Results**

### **General Note:**

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
  - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
  - b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)\*Tune-up Scaling Factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
  - $\leq 0.6$  W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
  - $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.
4. The device employs proximity sensor that detect the presence of the user's body also a finger or hand at the Horizontal Down or Up faces, Vertical Back or Front or Tip Side faces of the device. When Horizontal Down or Up faces, Vertical Back or Front or Tip Side faces of body condition is detected, all WWAN bands reduced power will be active.
5. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
  - Horizontal Up & Down and Tip Side : 20 mm(manufacturer declared)
  - Vertical Front & Back: 15 mm(manufacturer declared)

**WCDMA Note:**

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA, HSPA+) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

**LTE Note:**

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $> \text{not } \frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $> \text{not } \frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B12 / B5 /17 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 4/17 SAR test was covered by Band 66/12; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. The maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion.
  - b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.



# 15.1 Body SAR

## <WCDMA SAR>

| Plot No. | Band          | Mode         | Test Position   | Gap (mm) | Power Mode | Ch.  | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|---------------|--------------|-----------------|----------|------------|------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | WCDMA Band V  | RMC 12.2Kbps | Horizontal Down | 5        | Reduced    | 4182 | 836.4       | 20.88               | 22.00               | 1.294                  | 0.02             | 0.609                  | 0.788                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 4182 | 836.4       | 20.88               | 22.00               | 1.294                  | -0.02            | 0.907                  | 1.174                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 4132 | 826.4       | 20.80               | 22.00               | 1.318                  | -0.02            | 0.877                  | 1.156                  |
| 01       | WCDMA Band V  | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 4233 | 846.6       | 20.84               | 22.00               | 1.306                  | 0.03             | 0.911                  | 1.190                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Vertical Back   | 5        | Reduced    | 4182 | 836.4       | 20.88               | 22.00               | 1.294                  | -0.19            | 0.305                  | 0.395                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Vertical Front  | 5        | Reduced    | 4182 | 836.4       | 20.88               | 22.00               | 1.294                  | 0.06             | 0.350                  | 0.453                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Tip Side        | 5        | Reduced    | 4182 | 836.4       | 20.88               | 22.00               | 1.294                  | 0.02             | 0.203                  | 0.263                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Horizontal Down | 20       | Full       | 4182 | 836.4       | 22.96               | 24.00               | 1.271                  | 0.06             | 0.244                  | 0.310                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Horizontal Up   | 20       | Full       | 4182 | 836.4       | 22.96               | 24.00               | 1.271                  | -0.01            | 0.453                  | 0.576                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Vertical Back   | 15       | Full       | 4182 | 836.4       | 22.96               | 24.00               | 1.271                  | 0.07             | 0.189                  | 0.240                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Vertical Front  | 15       | Full       | 4182 | 836.4       | 22.96               | 24.00               | 1.271                  | -0.13            | 0.125                  | 0.159                  |
|          | WCDMA Band V  | RMC 12.2Kbps | Tip Side        | 20       | Full       | 4182 | 836.4       | 22.96               | 24.00               | 1.271                  | 0.05             | 0.034                  | 0.043                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Down | 5        | Reduced    | 1312 | 1712.4      | 19.88               | 20.00               | 1.028                  | 0.01             | 1.070                  | 1.100                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Down | 5        | Reduced    | 1413 | 1732.6      | 19.71               | 20.00               | 1.069                  | 0.03             | 1.100                  | 1.176                  |
| 02       | WCDMA Band IV | RMC 12.2Kbps | Horizontal Down | 5        | Reduced    | 1513 | 1752.6      | 19.82               | 20.00               | 1.042                  | 0.02             | 1.130                  | 1.178                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 1312 | 1712.4      | 19.88               | 20.00               | 1.028                  | 0.03             | 1.030                  | 1.059                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 1413 | 1732.6      | 19.71               | 20.00               | 1.069                  | 0.01             | 1.070                  | 1.144                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 1513 | 1752.6      | 19.82               | 20.00               | 1.042                  | -0.07            | 1.050                  | 1.094                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Vertical Back   | 5        | Reduced    | 1312 | 1712.4      | 19.88               | 20.00               | 1.028                  | 0.06             | 0.572                  | 0.588                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Vertical Front  | 5        | Reduced    | 1312 | 1712.4      | 19.88               | 20.00               | 1.028                  | -0.1             | 0.507                  | 0.521                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Tip Side        | 5        | Reduced    | 1312 | 1712.4      | 19.88               | 20.00               | 1.028                  | 0.03             | 0.387                  | 0.398                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Down | 20       | Full       | 1312 | 1712.4      | 23.25               | 24.00               | 1.189                  | -0.06            | 0.374                  | 0.444                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Up   | 20       | Full       | 1312 | 1712.4      | 23.25               | 24.00               | 1.189                  | -0.1             | 0.712                  | 0.846                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Up   | 20       | Full       | 1413 | 1732.6      | 23.07               | 24.00               | 1.239                  | -0.13            | 0.711                  | 0.881                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Horizontal Up   | 20       | Full       | 1513 | 1752.6      | 23.09               | 24.00               | 1.233                  | 0.05             | 0.683                  | 0.842                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Vertical Back   | 15       | Full       | 1312 | 1712.4      | 23.25               | 24.00               | 1.189                  | 0.01             | 0.326                  | 0.387                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Vertical Front  | 15       | Full       | 1312 | 1712.4      | 23.25               | 24.00               | 1.189                  | -0.01            | 0.351                  | 0.417                  |
|          | WCDMA Band IV | RMC 12.2Kbps | Tip Side        | 20       | Full       | 1312 | 1712.4      | 23.25               | 24.00               | 1.189                  | 0.05             | 0.069                  | 0.082                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Down | 5        | Reduced    | 9538 | 1907.6      | 19.91               | 20.00               | 1.021                  | -0.03            | 1.080                  | 1.103                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Down | 5        | Reduced    | 9262 | 1852.4      | 19.76               | 20.00               | 1.057                  | -0.08            | 1.010                  | 1.067                  |
| 03       | WCDMA Band II | RMC 12.2Kbps | Horizontal Down | 5        | Reduced    | 9400 | 1880        | 19.88               | 20.00               | 1.028                  | -0.05            | 1.100                  | 1.131                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 9538 | 1907.6      | 19.91               | 20.00               | 1.021                  | 0.02             | 1.050                  | 1.072                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 9262 | 1852.4      | 19.76               | 20.00               | 1.057                  | 0.01             | 0.951                  | 1.005                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Up   | 5        | Reduced    | 9400 | 1880        | 19.88               | 20.00               | 1.028                  | 0.05             | 1.020                  | 1.049                  |
|          | WCDMA Band II | RMC 12.2Kbps | Vertical Back   | 5        | Reduced    | 9538 | 1907.6      | 19.91               | 20.00               | 1.021                  | 0.1              | 0.420                  | 0.429                  |
|          | WCDMA Band II | RMC 12.2Kbps | Vertical Front  | 5        | Reduced    | 9538 | 1907.6      | 19.91               | 20.00               | 1.021                  | -0.18            | 0.593                  | 0.605                  |
|          | WCDMA Band II | RMC 12.2Kbps | Tip Side        | 5        | Reduced    | 9538 | 1907.6      | 19.91               | 20.00               | 1.021                  | 0.03             | 0.496                  | 0.506                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Down | 20       | Full       | 9538 | 1907.6      | 23.35               | 24.00               | 1.161                  | 0.06             | 0.350                  | 0.407                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Up   | 20       | Full       | 9538 | 1907.6      | 23.35               | 24.00               | 1.161                  | -0.01            | 0.753                  | 0.875                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Up   | 20       | Full       | 9262 | 1852.4      | 23.26               | 24.00               | 1.186                  | 0.05             | 0.727                  | 0.862                  |
|          | WCDMA Band II | RMC 12.2Kbps | Horizontal Up   | 20       | Full       | 9400 | 1880        | 23.34               | 24.00               | 1.164                  | 0.09             | 0.729                  | 0.849                  |
|          | WCDMA Band II | RMC 12.2Kbps | Vertical Back   | 15       | Full       | 9538 | 1907.6      | 23.35               | 24.00               | 1.161                  | 0.05             | 0.293                  | 0.340                  |
|          | WCDMA Band II | RMC 12.2Kbps | Vertical Front  | 15       | Full       | 9538 | 1907.6      | 23.35               | 24.00               | 1.161                  | 0.07             | 0.531                  | 0.617                  |
|          | WCDMA Band II | RMC 12.2Kbps | Tip Side        | 20       | Full       | 9538 | 1907.6      | 23.35               | 24.00               | 1.161                  | -0.06            | 0.131                  | 0.152                  |



## &lt;LTE SAR&gt;

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB Offset | Test Position   | Gap (mm) | Power Reduction | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|-------------|----------|------------|---------|-----------|-----------------|----------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
| 04       | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Horizontal Down | 5        | Reduced         | 23095 | 707.5       | 21.70               | 22.00               | 1.072                  | -0.08            | 0.635                  | 0.680                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Horizontal Down | 5        | Reduced         | 23095 | 707.5       | 21.60               | 22.00               | 1.096                  | -0.03            | 0.664                  | 0.728                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Horizontal Up   | 5        | Reduced         | 23095 | 707.5       | 21.70               | 22.00               | 1.072                  | 0.07             | 1.110                  | 1.189                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Horizontal Up   | 5        | Reduced         | 23095 | 707.5       | 21.60               | 22.00               | 1.096                  | 0.06             | 0.891                  | 0.977                  |
|          | LTE Band 12 | 10M      | QPSK       | 50      | 0         | Horizontal Up   | 5        | Reduced         | 23095 | 707.5       | 21.50               | 22.00               | 1.122                  | 0.12             | 0.888                  | 0.996                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Vertical Back   | 5        | Reduced         | 23095 | 707.5       | 21.70               | 22.00               | 1.072                  | -0.03            | 0.293                  | 0.314                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Vertical Back   | 5        | Reduced         | 23095 | 707.5       | 21.60               | 22.00               | 1.096                  | -0.06            | 0.302                  | 0.331                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Vertical Front  | 5        | Reduced         | 23095 | 707.5       | 21.70               | 22.00               | 1.072                  | -0.05            | 0.284                  | 0.304                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Vertical Front  | 5        | Reduced         | 23095 | 707.5       | 21.60               | 22.00               | 1.096                  | -0.03            | 0.264                  | 0.289                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Tip Side        | 5        | Reduced         | 23095 | 707.5       | 21.70               | 22.00               | 1.072                  | 0.01             | 0.267                  | 0.286                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Tip Side        | 5        | Reduced         | 23095 | 707.5       | 21.60               | 22.00               | 1.096                  | 0.01             | 0.219                  | 0.240                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Horizontal Down | 20       | Full            | 23095 | 707.5       | 22.97               | 24.00               | 1.268                  | -0.09            | 0.608                  | 0.771                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Horizontal Down | 20       | Full            | 23095 | 707.5       | 21.76               | 23.00               | 1.330                  | 0.07             | 0.504                  | 0.671                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Horizontal Up   | 20       | Full            | 23095 | 707.5       | 22.97               | 24.00               | 1.268                  | -0.09            | 0.430                  | 0.545                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Horizontal Up   | 20       | Full            | 23095 | 707.5       | 21.76               | 23.00               | 1.330                  | -0.16            | 0.364                  | 0.484                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Vertical Back   | 15       | Full            | 23095 | 707.5       | 22.97               | 24.00               | 1.268                  | 0.03             | 0.183                  | 0.232                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Vertical Back   | 15       | Full            | 23095 | 707.5       | 21.76               | 23.00               | 1.330                  | 0.02             | 0.151                  | 0.201                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Vertical Front  | 15       | Full            | 23095 | 707.5       | 22.97               | 24.00               | 1.268                  | 0.03             | 0.163                  | 0.207                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Vertical Front  | 15       | Full            | 23095 | 707.5       | 21.76               | 23.00               | 1.330                  | -0.07            | 0.135                  | 0.180                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 49        | Tip Side        | 20       | Full            | 23095 | 707.5       | 22.97               | 24.00               | 1.268                  | 0.06             | 0.098                  | 0.124                  |
| 05       | LTE Band 12 | 10M      | QPSK       | 25      | 12        | Tip Side        | 20       | Full            | 23095 | 707.5       | 21.76               | 23.00               | 1.330                  | -0.03            | 0.085                  | 0.113                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 23230 | 782         | 21.38               | 22.00               | 1.153                  | -0.04            | 0.733                  | 0.845                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Horizontal Down | 5        | Reduced         | 23230 | 782         | 21.36               | 22.00               | 1.159                  | -0.03            | 0.740                  | 0.857                  |
|          | LTE Band 13 | 10M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 23230 | 782         | 21.24               | 22.00               | 1.191                  | -0.09            | 0.723                  | 0.861                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 23230 | 782         | 21.38               | 22.00               | 1.153                  | -0.16            | 1.030                  | 1.188                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Horizontal Up   | 5        | Reduced         | 23230 | 782         | 21.36               | 22.00               | 1.159                  | 0.1              | 0.801                  | 0.928                  |
|          | LTE Band 13 | 10M      | QPSK       | 50      | 0         | Horizontal Up   | 5        | Reduced         | 23230 | 782         | 21.24               | 22.00               | 1.191                  | 0.05             | 0.888                  | 1.058                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Vertical Back   | 5        | Reduced         | 23230 | 782         | 21.38               | 22.00               | 1.153                  | 0.01             | 0.639                  | 0.737                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Vertical Back   | 5        | Reduced         | 23230 | 782         | 21.36               | 22.00               | 1.159                  | 0.01             | 0.541                  | 0.627                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Vertical Front  | 5        | Reduced         | 23230 | 782         | 21.38               | 22.00               | 1.153                  | 0.02             | 0.399                  | 0.460                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Vertical Front  | 5        | Reduced         | 23230 | 782         | 21.36               | 22.00               | 1.159                  | -0.01            | 0.318                  | 0.368                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 23230 | 782         | 21.38               | 22.00               | 1.153                  | 0.06             | 0.214                  | 0.247                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Tip Side        | 5        | Reduced         | 23230 | 782         | 21.36               | 22.00               | 1.159                  | 0.16             | 0.174                  | 0.202                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Horizontal Down | 20       | Full            | 23230 | 782         | 23.09               | 24.00               | 1.233                  | -0.07            | 0.458                  | 0.565                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Horizontal Down | 20       | Full            | 23230 | 782         | 22.06               | 23.00               | 1.242                  | 0.02             | 0.390                  | 0.484                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Horizontal Up   | 20       | Full            | 23230 | 782         | 23.09               | 24.00               | 1.233                  | -0.08            | 0.520                  | 0.641                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Horizontal Up   | 20       | Full            | 23230 | 782         | 22.06               | 23.00               | 1.242                  | 0.01             | 0.413                  | 0.513                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Vertical Back   | 15       | Full            | 23230 | 782         | 23.09               | 24.00               | 1.233                  | 0.01             | 0.202                  | 0.249                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Vertical Back   | 15       | Full            | 23230 | 782         | 22.06               | 23.00               | 1.242                  | 0.04             | 0.160                  | 0.199                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Vertical Front  | 15       | Full            | 23230 | 782         | 23.09               | 24.00               | 1.233                  | 0.06             | 0.188                  | 0.232                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Vertical Front  | 15       | Full            | 23230 | 782         | 22.06               | 23.00               | 1.242                  | -0.04            | 0.149                  | 0.185                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Tip Side        | 20       | Full            | 23230 | 782         | 23.09               | 24.00               | 1.233                  | -0.01            | 0.048                  | 0.059                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Tip Side        | 20       | Full            | 23230 | 782         | 22.06               | 23.00               | 1.242                  | 0.06             | 0.036                  | 0.045                  |



# FCC SAR TEST REPORT

Report No. : FA942417

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB Offset | Test Position   | Gap (mm) | Power Reduction | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|-------------|----------|------------|---------|-----------|-----------------|----------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 23330 | 793         | 21.38               | 23.00               | 1.452                  | -0.02            | 0.744                  | 1.080                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Horizontal Down | 5        | Reduced         | 23330 | 793         | 21.36               | 23.00               | 1.459                  | -0.07            | 0.733                  | 1.069                  |
|          | LTE Band 14 | 10M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 23330 | 793         | 21.29               | 23.00               | 1.483                  | -0.05            | 0.731                  | 1.084                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 23330 | 793         | 21.38               | 23.00               | 1.452                  | 0.04             | 0.736                  | 1.069                  |
| 06       | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Horizontal Up   | 5        | Reduced         | 23330 | 793         | 21.36               | 23.00               | 1.459                  | -0.09            | 0.753                  | 1.098                  |
|          | LTE Band 14 | 10M      | QPSK       | 50      | 0         | Horizontal Up   | 5        | Reduced         | 23330 | 793         | 21.29               | 23.00               | 1.483                  | -0.04            | 0.630                  | 0.934                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Vertical Back   | 5        | Reduced         | 23330 | 793         | 21.38               | 23.00               | 1.452                  | 0.01             | 0.610                  | 0.886                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Vertical Back   | 5        | Reduced         | 23330 | 793         | 21.36               | 23.00               | 1.459                  | -0.04            | 0.569                  | 0.830                  |
|          | LTE Band 14 | 10M      | QPSK       | 50      | 0         | Vertical Back   | 5        | Reduced         | 23330 | 793         | 21.29               | 23.00               | 1.483                  | 0.06             | 0.613                  | 0.909                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Vertical Front  | 5        | Reduced         | 23330 | 793         | 21.38               | 23.00               | 1.452                  | 0.01             | 0.419                  | 0.608                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Vertical Front  | 5        | Reduced         | 23330 | 793         | 21.36               | 23.00               | 1.459                  | 0.04             | 0.420                  | 0.613                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 23330 | 793         | 21.38               | 23.00               | 1.452                  | -0.08            | 0.200                  | 0.290                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Tip Side        | 5        | Reduced         | 23330 | 793         | 21.36               | 23.00               | 1.459                  | 0.02             | 0.181                  | 0.264                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Horizontal Down | 20       | Full            | 23330 | 793         | 22.79               | 24.00               | 1.321                  | -0.02            | 0.465                  | 0.614                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Horizontal Down | 20       | Full            | 23330 | 793         | 21.74               | 23.00               | 1.337                  | 0.06             | 0.372                  | 0.497                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Horizontal Up   | 20       | Full            | 23330 | 793         | 22.79               | 24.00               | 1.321                  | 0.09             | 0.460                  | 0.608                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Horizontal Up   | 20       | Full            | 23330 | 793         | 21.74               | 23.00               | 1.337                  | -0.03            | 0.355                  | 0.474                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Vertical Back   | 15       | Full            | 23330 | 793         | 22.79               | 24.00               | 1.321                  | 0.02             | 0.190                  | 0.251                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Vertical Back   | 15       | Full            | 23330 | 793         | 21.74               | 23.00               | 1.337                  | 0.02             | 0.152                  | 0.203                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Vertical Front  | 15       | Full            | 23330 | 793         | 22.79               | 24.00               | 1.321                  | 0.07             | 0.172                  | 0.227                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Vertical Front  | 15       | Full            | 23330 | 793         | 21.74               | 23.00               | 1.337                  | -0.11            | 0.130                  | 0.174                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Tip Side        | 20       | Full            | 23330 | 793         | 22.79               | 24.00               | 1.321                  | -0.05            | 0.035                  | 0.046                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Tip Side        | 20       | Full            | 23330 | 793         | 21.74               | 23.00               | 1.337                  | -0.12            | 0.026                  | 0.035                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 20525 | 836.5       | 20.50               | 22.00               | 1.413                  | 0.05             | 0.608                  | 0.859                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Horizontal Down | 5        | Reduced         | 20525 | 836.5       | 20.36               | 22.00               | 1.459                  | -0.08            | 0.720                  | 1.050                  |
|          | LTE Band 5  | 10M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 20525 | 836.5       | 20.35               | 22.00               | 1.462                  | -0.09            | 0.602                  | 0.880                  |
| 07       | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 20525 | 836.5       | 20.50               | 22.00               | 1.413                  | -0.01            | 0.793                  | 1.120                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Horizontal Up   | 5        | Reduced         | 20525 | 836.5       | 20.36               | 22.00               | 1.459                  | 0.09             | 0.759                  | 1.107                  |
|          | LTE Band 5  | 10M      | QPSK       | 50      | 0         | Horizontal Up   | 5        | Reduced         | 20525 | 836.5       | 20.35               | 22.00               | 1.462                  | 0.13             | 0.766                  | 1.120                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Vertical Back   | 5        | Reduced         | 20525 | 836.5       | 20.50               | 22.00               | 1.413                  | 0.01             | 0.503                  | 0.711                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Vertical Back   | 5        | Reduced         | 20525 | 836.5       | 20.36               | 22.00               | 1.459                  | 0.04             | 0.481                  | 0.702                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Vertical Front  | 5        | Reduced         | 20525 | 836.5       | 20.50               | 22.00               | 1.413                  | 0.06             | 0.555                  | 0.784                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Vertical Front  | 5        | Reduced         | 20525 | 836.5       | 20.36               | 22.00               | 1.459                  | 0.04             | 0.416                  | 0.607                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 20525 | 836.5       | 20.50               | 22.00               | 1.413                  | 0.01             | 0.218                  | 0.308                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Tip Side        | 5        | Reduced         | 20525 | 836.5       | 20.36               | 22.00               | 1.459                  | 0.05             | 0.185                  | 0.270                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Horizontal Down | 20       | Full            | 20525 | 836.5       | 22.77               | 24.00               | 1.327                  | -0.15            | 0.526                  | 0.698                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Horizontal Down | 20       | Full            | 20525 | 836.5       | 21.80               | 23.00               | 1.318                  | 0.04             | 0.417                  | 0.550                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Horizontal Up   | 20       | Full            | 20525 | 836.5       | 22.77               | 24.00               | 1.327                  | 0.03             | 0.528                  | 0.701                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Horizontal Up   | 20       | Full            | 20525 | 836.5       | 21.80               | 23.00               | 1.318                  | 0.04             | 0.437                  | 0.576                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Vertical Back   | 15       | Full            | 20525 | 836.5       | 22.77               | 24.00               | 1.327                  | 0.03             | 0.223                  | 0.296                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Vertical Back   | 15       | Full            | 20525 | 836.5       | 21.80               | 23.00               | 1.318                  | 0.02             | 0.174                  | 0.229                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Vertical Front  | 15       | Full            | 20525 | 836.5       | 22.77               | 24.00               | 1.327                  | -0.05            | 0.207                  | 0.275                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Vertical Front  | 15       | Full            | 20525 | 836.5       | 21.80               | 23.00               | 1.318                  | 0.06             | 0.161                  | 0.212                  |
|          | LTE Band 5  | 10M      | QPSK       | 1       | 0         | Tip Side        | 20       | Full            | 20525 | 836.5       | 22.77               | 24.00               | 1.327                  | -0.03            | 0.029                  | 0.039                  |
|          | LTE Band 5  | 10M      | QPSK       | 25      | 12        | Tip Side        | 20       | Full            | 20525 | 836.5       | 21.80               | 23.00               | 1.318                  | -0.05            | 0.245                  | 0.323                  |



# FCC SAR TEST REPORT

Report No. : FA942417

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB Offset | Test Position   | Gap (mm) | Power Reduction | Ch.    | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|-------------|----------|------------|---------|-----------|-----------------|----------|-----------------|--------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 132322 | 1745        | 18.89               | 19.50               | 1.151                  | 0.09             | 0.914                  | 1.052                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 132072 | 1720        | 18.75               | 19.50               | 1.189                  | 0.08             | 0.832                  | 0.989                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 132572 | 1770        | 18.86               | 19.50               | 1.159                  | 0.06             | 0.970                  | 1.124                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 132322 | 1745        | 18.85               | 19.50               | 1.161                  | 0.09             | 0.943                  | 1.095                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 132072 | 1720        | 18.78               | 19.50               | 1.180                  | 0.02             | 0.857                  | 1.012                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 132572 | 1770        | 18.83               | 19.50               | 1.167                  | -0.19            | 0.958                  | 1.118                  |
|          | LTE Band 66 | 20M      | QPSK       | 100     | 0         | Horizontal Down | 5        | Reduced         | 132322 | 1745        | 18.77               | 19.50               | 1.183                  | 0.04             | 0.930                  | 1.100                  |
| 08       | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 132322 | 1745        | 18.89               | 19.50               | 1.151                  | 0.05             | 0.994                  | 1.144                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 132072 | 1720        | 18.75               | 19.50               | 1.189                  | 0.03             | 0.816                  | 0.970                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 132572 | 1770        | 18.86               | 19.50               | 1.159                  | 0.05             | 0.961                  | 1.114                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Horizontal Up   | 5        | Reduced         | 132322 | 1745        | 18.85               | 19.50               | 1.161                  | -0.15            | 0.847                  | 0.984                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Horizontal Up   | 5        | Reduced         | 132072 | 1720        | 18.78               | 19.50               | 1.180                  | -0.04            | 0.781                  | 0.922                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Horizontal Up   | 5        | Reduced         | 132572 | 1770        | 18.83               | 19.50               | 1.167                  | -0.07            | 0.824                  | 0.961                  |
|          | LTE Band 66 | 20M      | QPSK       | 100     | 0         | Horizontal Up   | 5        | Reduced         | 132322 | 1745        | 18.77               | 19.50               | 1.183                  | -0.08            | 0.794                  | 0.939                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Vertical Back   | 5        | Reduced         | 132322 | 1745        | 18.89               | 19.50               | 1.151                  | -0.03            | 0.365                  | 0.420                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Vertical Back   | 5        | Reduced         | 132322 | 1745        | 18.85               | 19.50               | 1.161                  | -0.09            | 0.395                  | 0.459                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Vertical Front  | 5        | Reduced         | 132322 | 1745        | 18.89               | 19.50               | 1.151                  | 0.02             | 0.436                  | 0.502                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Vertical Front  | 5        | Reduced         | 132322 | 1745        | 18.85               | 19.50               | 1.161                  | 0.03             | 0.447                  | 0.519                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 132322 | 1745        | 18.89               | 19.50               | 1.151                  | 0.012            | 0.354                  | 0.407                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Tip Side        | 5        | Reduced         | 132322 | 1745        | 18.85               | 19.50               | 1.161                  | 0.03             | 0.369                  | 0.429                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 20       | Full            | 132322 | 1745        | 23.19               | 24.00               | 1.205                  | 0.11             | 0.351                  | 0.423                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Horizontal Down | 20       | Full            | 132322 | 1745        | 22.19               | 23.00               | 1.205                  | -0.19            | 0.281                  | 0.339                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 20       | Full            | 132322 | 1745        | 23.19               | 24.00               | 1.205                  | 0.02             | 0.356                  | 0.429                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Horizontal Up   | 20       | Full            | 132322 | 1745        | 22.19               | 23.00               | 1.205                  | 0.02             | 0.287                  | 0.346                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Vertical Back   | 15       | Full            | 132322 | 1745        | 23.19               | 24.00               | 1.205                  | 0.12             | 0.275                  | 0.331                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Vertical Back   | 15       | Full            | 132322 | 1745        | 22.19               | 23.00               | 1.205                  | -0.16            | 0.214                  | 0.258                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Vertical Front  | 15       | Full            | 132322 | 1745        | 23.19               | 24.00               | 1.205                  | 0.06             | 0.338                  | 0.407                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Vertical Front  | 15       | Full            | 132322 | 1745        | 22.19               | 23.00               | 1.205                  | 0.01             | 0.273                  | 0.329                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Tip Side        | 20       | Full            | 132322 | 1745        | 23.19               | 24.00               | 1.205                  | 0.09             | 0.063                  | 0.076                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Tip Side        | 20       | Full            | 132322 | 1745        | 22.19               | 23.00               | 1.205                  | 0.03             | 0.059                  | 0.071                  |



| Plot No. | Band       | BW (MHz) | Modulation | RB Size | RB Offset | Test Position   | Gap (mm) | Power Reduction | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|------------|----------|------------|---------|-----------|-----------------|----------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 19100 | 1900        | 19.64               | 20.00               | 1.086                  | 0.17             | 0.989                  | 1.074                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 18900 | 1880        | 19.45               | 20.00               | 1.135                  | 0.13             | 1.050                  | 1.192                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 18700 | 1860        | 19.45               | 20.00               | 1.135                  | 0.17             | 1.020                  | 1.158                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Horizontal Down | 5        | Reduced         | 19100 | 1900        | 19.70               | 20.00               | 1.072                  | 0.11             | 1.060                  | 1.136                  |
| 09       | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Horizontal Down | 5        | Reduced         | 18700 | 1860        | 19.40               | 20.00               | 1.148                  | 0.09             | 1.040                  | 1.194                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Horizontal Down | 5        | Reduced         | 18900 | 1880        | 19.36               | 20.00               | 1.159                  | -0.06            | 0.972                  | 1.126                  |
|          | LTE Band 2 | 20M      | QPSK       | 100     | 0         | Horizontal Down | 5        | Reduced         | 19100 | 1900        | 19.56               | 20.00               | 1.107                  | 0.12             | 1.070                  | 1.184                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 19100 | 1900        | 19.64               | 20.00               | 1.086                  | 0.16             | 0.989                  | 1.074                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 18900 | 1880        | 19.45               | 20.00               | 1.135                  | 0.02             | 0.954                  | 1.083                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 18700 | 1860        | 19.45               | 20.00               | 1.135                  | 0.02             | 0.858                  | 0.974                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Horizontal Up   | 5        | Reduced         | 19100 | 1900        | 19.70               | 20.00               | 1.072                  | -0.1             | 0.947                  | 1.015                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Horizontal Up   | 5        | Reduced         | 18700 | 1860        | 19.40               | 20.00               | 1.148                  | 0.03             | 0.870                  | 0.999                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Horizontal Up   | 5        | Reduced         | 18900 | 1880        | 19.36               | 20.00               | 1.159                  | 0.13             | 0.850                  | 0.985                  |
|          | LTE Band 2 | 20M      | QPSK       | 100     | 0         | Horizontal Up   | 5        | Reduced         | 19100 | 1900        | 19.56               | 20.00               | 1.107                  | -0.04            | 0.916                  | 1.014                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Vertical Back   | 5        | Reduced         | 19100 | 1900        | 19.64               | 20.00               | 1.086                  | 0.01             | 0.472                  | 0.513                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Vertical Back   | 5        | Reduced         | 19100 | 1900        | 19.70               | 20.00               | 1.072                  | 0.11             | 0.383                  | 0.410                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Vertical Front  | 5        | Reduced         | 19100 | 1900        | 19.64               | 20.00               | 1.086                  | 0.05             | 0.623                  | 0.677                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Vertical Front  | 5        | Reduced         | 19100 | 1900        | 19.70               | 20.00               | 1.072                  | 0.02             | 0.569                  | 0.610                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 19100 | 1900        | 19.64               | 20.00               | 1.086                  | 0.05             | 0.389                  | 0.423                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Tip Side        | 5        | Reduced         | 19100 | 1900        | 19.70               | 20.00               | 1.072                  | -0.05            | 0.480                  | 0.514                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 20       | Full            | 19100 | 1900        | 23.25               | 24.00               | 1.189                  | -0.05            | 0.201                  | 0.239                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Horizontal Down | 20       | Full            | 19100 | 1900        | 22.22               | 23.00               | 1.197                  | 0.09             | 0.174                  | 0.208                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 20       | Full            | 19100 | 1900        | 23.25               | 24.00               | 1.189                  | 0.01             | 0.428                  | 0.509                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Horizontal Up   | 20       | Full            | 19100 | 1900        | 22.22               | 23.00               | 1.197                  | 0.02             | 0.333                  | 0.399                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Vertical Back   | 15       | Full            | 19100 | 1900        | 23.25               | 24.00               | 1.189                  | -0.12            | 0.281                  | 0.334                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Vertical Back   | 15       | Full            | 19100 | 1900        | 22.22               | 23.00               | 1.197                  | 0.15             | 0.209                  | 0.250                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Vertical Front  | 15       | Full            | 19100 | 1900        | 23.25               | 24.00               | 1.189                  | -0.08            | 0.527                  | 0.626                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Vertical Front  | 15       | Full            | 19100 | 1900        | 22.22               | 23.00               | 1.197                  | 0.16             | 0.396                  | 0.474                  |
|          | LTE Band 2 | 20M      | QPSK       | 1       | 0         | Tip Side        | 20       | Full            | 19100 | 1900        | 23.25               | 24.00               | 1.189                  | -0.03            | 0.140                  | 0.166                  |
|          | LTE Band 2 | 20M      | QPSK       | 50      | 24        | Tip Side        | 20       | Full            | 19100 | 1900        | 22.22               | 23.00               | 1.197                  | -0.09            | 0.111                  | 0.133                  |



# FCC SAR TEST REPORT

Report No. : FA942417

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB Offset | Test Position   | Gap (mm) | Power Reduction | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|-------------|----------|------------|---------|-----------|-----------------|----------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 27710 | 2310        | 15.80               | 16.00               | 1.047                  | -0.08            | 1.030                  | 1.079                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Horizontal Down | 5        | Reduced         | 27710 | 2310        | 15.55               | 16.00               | 1.109                  | -0.02            | 1.050                  | 1.165                  |
| 10       | LTE Band 30 | 10M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 27710 | 2310        | 15.49               | 16.00               | 1.125                  | -0.09            | 1.040                  | 1.170                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 27710 | 2310        | 15.80               | 16.00               | 1.047                  | 0.08             | 0.516                  | 0.540                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Horizontal Up   | 5        | Reduced         | 27710 | 2310        | 15.55               | 16.00               | 1.109                  | 0.01             | 0.514                  | 0.570                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Vertical Back   | 5        | Reduced         | 27710 | 2310        | 15.80               | 16.00               | 1.047                  | 0.02             | 0.053                  | 0.055                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Vertical Back   | 5        | Reduced         | 27710 | 2310        | 15.55               | 16.00               | 1.109                  | 0.06             | 0.052                  | 0.058                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Vertical Front  | 5        | Reduced         | 27710 | 2310        | 15.80               | 16.00               | 1.047                  | 0.02             | 0.190                  | 0.199                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Vertical Front  | 5        | Reduced         | 27710 | 2310        | 15.55               | 16.00               | 1.109                  | 0.06             | 0.183                  | 0.203                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 27710 | 2310        | 15.80               | 16.00               | 1.047                  | 0.05             | 0.564                  | 0.591                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Tip Side        | 5        | Reduced         | 27710 | 2310        | 15.55               | 16.00               | 1.109                  | 0.09             | 0.568                  | 0.630                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Horizontal Down | 20       | Full            | 27710 | 2310        | 22.89               | 24.00               | 1.291                  | 0.03             | 0.516                  | 0.666                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Horizontal Down | 20       | Full            | 27710 | 2310        | 21.32               | 23.00               | 1.472                  | 0.01             | 0.409                  | 0.602                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Horizontal Up   | 20       | Full            | 27710 | 2310        | 22.89               | 24.00               | 1.291                  | 0.06             | 0.671                  | 0.866                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Horizontal Up   | 20       | Full            | 27710 | 2310        | 21.32               | 23.00               | 1.472                  | -0.05            | 0.476                  | 0.701                  |
|          | LTE Band 30 | 10M      | QPSK       | 50      | 0         | Horizontal Up   | 20       | Full            | 27710 | 2310        | 21.08               | 23.00               | 1.556                  | 0.05             | 0.336                  | 0.523                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Vertical Back   | 15       | Full            | 27710 | 2310        | 22.89               | 24.00               | 1.291                  | 0.01             | 0.366                  | 0.473                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Vertical Back   | 15       | Full            | 27710 | 2310        | 21.32               | 23.00               | 1.472                  | -0.12            | 0.281                  | 0.414                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Vertical Front  | 15       | Full            | 27710 | 2310        | 22.89               | 24.00               | 1.291                  | 0.06             | 0.069                  | 0.089                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Vertical Front  | 15       | Full            | 27710 | 2310        | 21.32               | 23.00               | 1.472                  | 0.01             | 0.056                  | 0.083                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Tip Side        | 20       | Full            | 27710 | 2310        | 22.89               | 24.00               | 1.291                  | 0.07             | 0.350                  | 0.452                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Tip Side        | 20       | Full            | 27710 | 2310        | 21.32               | 23.00               | 1.472                  | 0.05             | 0.273                  | 0.402                  |



| Plot No. | Band       | BW (MHz) | Modulation | RB Size | RB Offset | Test Position   | Gap (mm) | Power Reduction | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|------------|----------|------------|---------|-----------|-----------------|----------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 21100 | 2535        | 13.41               | 14.50               | 1.285                  | 0.05             | 0.791                  | 1.017                  |
| 11       | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 20850 | 2510        | 13.09               | 14.50               | 1.384                  | 0.01             | 0.779                  | <b>1.078</b>           |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 5        | Reduced         | 21350 | 2560        | 13.34               | 14.50               | 1.306                  | 0.06             | 0.763                  | 0.997                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 21100 | 2535        | 13.26               | 14.50               | 1.330                  | 0.1              | 0.773                  | 1.028                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 20850 | 2510        | 13.11               | 14.50               | 1.377                  | 0.18             | 0.745                  | 1.026                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Horizontal Down | 5        | Reduced         | 21350 | 2560        | 13.16               | 14.50               | 1.361                  | 0.16             | 0.725                  | 0.987                  |
|          | LTE Band 7 | 20M      | QPSK       | 100     | 0         | Horizontal Down | 5        | Reduced         | 21100 | 2535        | 13.16               | 14.50               | 1.361                  | 0.02             | 0.757                  | 1.031                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 5        | Reduced         | 21100 | 2535        | 13.41               | 14.50               | 1.285                  | -0.06            | 0.397                  | 0.510                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Horizontal Up   | 5        | Reduced         | 21100 | 2535        | 13.26               | 14.50               | 1.330                  | -0.09            | 0.382                  | 0.508                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Vertical Back   | 5        | Reduced         | 21100 | 2535        | 13.41               | 14.50               | 1.285                  | 0.01             | 0.145                  | 0.186                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Vertical Back   | 5        | Reduced         | 21100 | 2535        | 13.26               | 14.50               | 1.330                  | 0.01             | 0.147                  | 0.196                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Vertical Front  | 5        | Reduced         | 21100 | 2535        | 13.41               | 14.50               | 1.285                  | 0.02             | 0.061                  | 0.079                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Vertical Front  | 5        | Reduced         | 21100 | 2535        | 13.26               | 14.50               | 1.330                  | 0.04             | 0.059                  | 0.078                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 21100 | 2535        | 13.41               | 14.50               | 1.285                  | 0.01             | 0.681                  | 0.875                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 21350 | 2560        | 13.09               | 14.50               | 1.384                  | 0.01             | 0.744                  | 1.029                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Tip Side        | 5        | Reduced         | 20850 | 2510        | 13.34               | 14.50               | 1.306                  | -0.09            | 0.630                  | 0.823                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Tip Side        | 5        | Reduced         | 21100 | 2535        | 13.26               | 14.50               | 1.330                  | 0.03             | 0.711                  | 0.946                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Tip Side        | 5        | Reduced         | 20850 | 2510        | 13.11               | 14.50               | 1.377                  | 0.01             | 0.631                  | 0.869                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Tip Side        | 5        | Reduced         | 21350 | 2560        | 13.16               | 14.50               | 1.361                  | 0.01             | 0.703                  | 0.957                  |
|          | LTE Band 7 | 20M      | QPSK       | 100     | 0         | Tip Side        | 5        | Reduced         | 21350 | 2560        | 13.16               | 14.50               | 1.361                  | 0.03             | 0.699                  | 0.952                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Horizontal Down | 20       | Full            | 21100 | 2535        | 23.20               | 24.00               | 1.202                  | 0.06             | 0.655                  | 0.787                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Horizontal Down | 20       | Full            | 21100 | 2535        | 22.17               | 23.00               | 1.211                  | -0.05            | 0.547                  | 0.662                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Horizontal Up   | 20       | Full            | 21100 | 2535        | 23.20               | 24.00               | 1.202                  | -0.01            | 0.511                  | 0.614                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Horizontal Up   | 20       | Full            | 21100 | 2535        | 22.17               | 23.00               | 1.211                  | 0.06             | 0.407                  | 0.493                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Vertical Back   | 15       | Full            | 21100 | 2535        | 23.20               | 24.00               | 1.202                  | 0.03             | 0.262                  | 0.315                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Vertical Back   | 15       | Full            | 21100 | 2535        | 22.17               | 23.00               | 1.211                  | 0.09             | 0.223                  | 0.270                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Vertical Front  | 15       | Full            | 21100 | 2535        | 23.20               | 24.00               | 1.202                  | -0.05            | 0.333                  | 0.400                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Vertical Front  | 15       | Full            | 21100 | 2535        | 22.17               | 23.00               | 1.211                  | 0.05             | 0.275                  | 0.333                  |
|          | LTE Band 7 | 20M      | QPSK       | 1       | 0         | Tip Side        | 20       | Full            | 21100 | 2535        | 23.20               | 24.00               | 1.202                  | -0.08            | 0.577                  | 0.694                  |
|          | LTE Band 7 | 20M      | QPSK       | 50      | 0         | Tip Side        | 20       | Full            | 21100 | 2535        | 22.17               | 23.00               | 1.211                  | 0.01             | 0.465                  | 0.563                  |

### 15.2 Repeated SAR Measurement

| No. | Band          | Mode         | BW (MHz) | Modulation | RB Size | RB Offset | Test Position   | Gap (mm) | Power Mode | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Ratio | Reported 1g SAR (W/kg) |
|-----|---------------|--------------|----------|------------|---------|-----------|-----------------|----------|------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|-------|------------------------|
| 1st | WCDMA Band V  | RMC 12.2Kbps | -        | -          | -       | -         | Horizontal Up   | 5mm      | Reduced    | 4233  | 846.6       | 20.84               | 22.00               | 1.306                  | 0.03             | 0.911                  | 1     | 1.190                  |
| 2nd | WCDMA Band V  | RMC 12.2Kbps | -        | -          | -       | -         | Horizontal Up   | 5mm      | Reduced    | 4233  | 846.6       | 20.84               | 22.00               | 1.306                  | -0.09            | 0.899                  | 1.013 | 1.174                  |
| 1st | WCDMA Band IV | RMC 12.2Kbps | -        | -          | -       | -         | Horizontal Down | 5mm      | Reduced    | 1513  | 1752.6      | 19.82               | 20.00               | 1.042                  | 0.02             | 1.130                  | 1     | 1.178                  |
| 2nd | WCDMA Band IV | RMC 12.2Kbps | -        | -          | -       | -         | Horizontal Down | 5mm      | Reduced    | 1513  | 1752.6      | 19.82               | 20.00               | 1.042                  | 0.08             | 1.090                  | 1.037 | 1.136                  |
| 1st | WCDMA Band II | RMC 12.2Kbps | -        | -          | -       | -         | Horizontal Down | 5mm      | Reduced    | 9400  | 1880        | 19.88               | 20.00               | 1.028                  | -0.05            | 1.100                  | 1     | 1.131                  |
| 2nd | WCDMA Band II | RMC 12.2Kbps | -        | -          | -       | -         | Horizontal Down | 5mm      | Reduced    | 9400  | 1880        | 19.88               | 20.00               | 1.028                  | 0.07             | 1.030                  | 1.068 | 1.059                  |
| 1st | LTE Band 12   | -            | 10M      | QPSK       | 1       | 49        | Horizontal Up   | 5mm      | Reduced    | 23095 | 707.5       | 21.70               | 22.00               | 1.072                  | 0.07             | 1.110                  | 1     | 1.189                  |
| 2nd | LTE Band 12   | -            | 10M      | QPSK       | 1       | 49        | Horizontal Up   | 5mm      | Reduced    | 23095 | 707.5       | 21.70               | 22.00               | 1.072                  | -0.11            | 1.080                  | 1.028 | 1.157                  |
| 1st | LTE Band 30   | -            | 10M      | QPSK       | 25      | 0         | Horizontal Down | 5mm      | Reduced    | 27710 | 2310        | 15.55               | 16.00               | 1.109                  | -0.02            | 1.050                  | 1     | 1.165                  |
| 2nd | LTE Band 30   | -            | 10M      | QPSK       | 25      | 0         | Horizontal Down | 5mm      | Reduced    | 27710 | 2310        | 15.55               | 16.00               | 1.109                  | 0.08             | 1.010                  | 1.040 | 1.120                  |

**General Note:**

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8\text{W/kg}$ .
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is  $\leq 1.2$  and the measured SAR  $< 1.45\text{W/kg}$ , only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

**Test Engineer :** Nick Hu, Yuan Zhao, Jiaxing Chang, Yuankai Kong



## **16. Uncertainty Assessment**

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is  $< 1.5$  W/kg and the measured 10-g SAR within a frequency band is  $< 3.75$  W/kg. The expanded SAR measurement uncertainty must be  $\leq 30\%$ , for a confidence interval of  $k = 2$ . If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg. Therefore, the measurement uncertainty table is not required in this report.

## **17. References**

- [1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”
- [2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992
- [3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015
- [6] FCC KDB 447498 D02 v02r01, “SAR Measurement Procedures for USB Dongle Transmitters”, Oct 2015.
- [7] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015
- [8] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015
- [9] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015
- [10] FCC KDB 865664 D01 v01r04, “SAR Measurement Requirements for 100 MHz to 6 GHz”, Aug 2015.
- [11] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.



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***Appendix A. Plots of System Performance Check***

The plots are shown as follows.

**System Check\_Head\_750MHz****DUT: D750V3 - SN:1087**

Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1

Medium: HSL\_750 Medium parameters used:  $f = 750$  MHz;  $\sigma = 0.9$  S/m;  $\epsilon_r = 41.538$ ;  $\rho = 1000$

kg/m<sup>3</sup>

Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(9.27, 9.27, 9.27); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Pin=250mW/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.52 W/kg

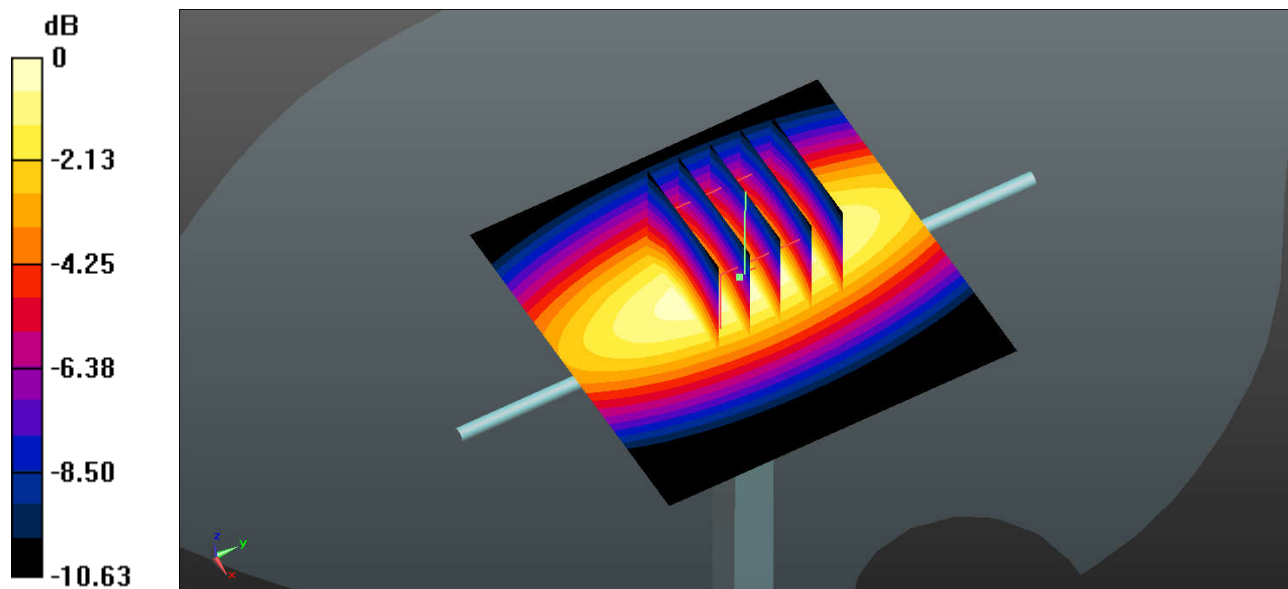
**Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 47.68 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 2.98 W/kg

**SAR(1 g) = 2.01 W/kg; SAR(10 g) = 1.33 W/kg**

Maximum value of SAR (measured) = 2.54 W/kg



0 dB = 2.54 W/kg = 1.05 dBW/kg

**System Check\_Head\_835MHz****DUT: D835V2 - SN:4d151**

Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL\_835 Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.911$  S/m;  $\epsilon_r = 42.06$ ;  $\rho = 1000$

kg/m<sup>3</sup>

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(9.01, 9.01, 9.01); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Pin=250mW/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.86 W/kg

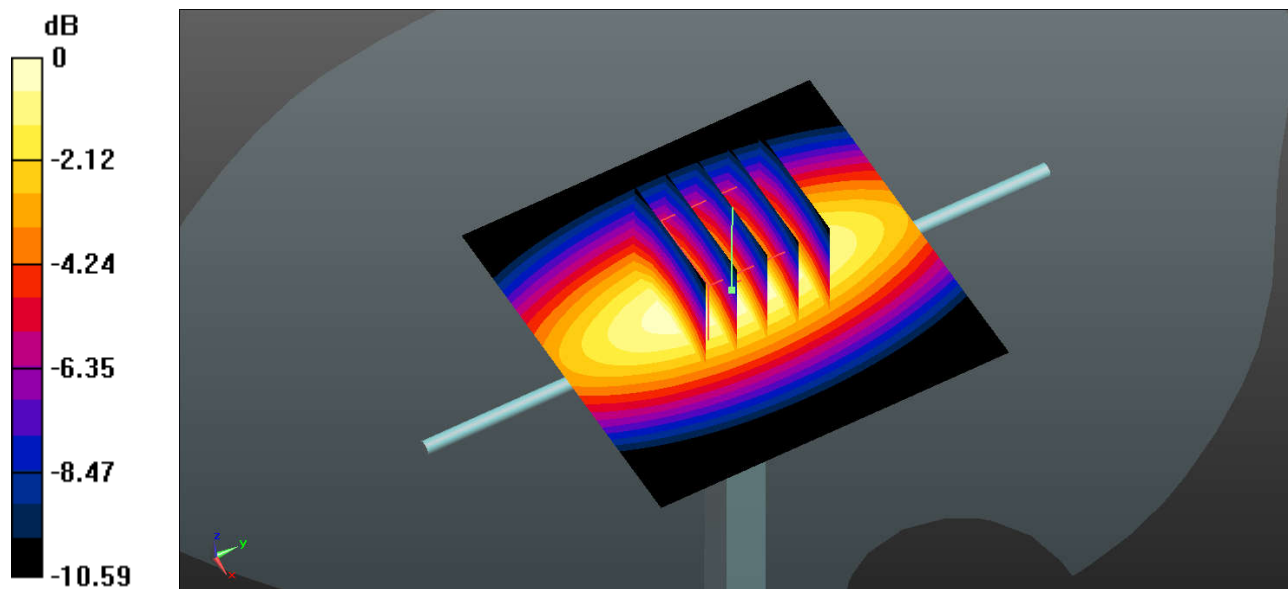
**Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 54.78 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 3.42 W/kg

**SAR(1 g) = 2.25 W/kg; SAR(10 g) = 1.47 W/kg**

Maximum value of SAR (measured) = 2.88 W/kg



0 dB = 2.88 W/kg = 4.59 dBW/kg

**System Check\_Head\_1750MHz****DUT: D1750V2 - SN:1090**

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: HSL\_1750 Medium parameters used:  $f = 1750$  MHz;  $\sigma = 1.349$  S/m;  $\epsilon_r = 40.85$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.8 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(7.79, 7.79, 7.79); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Pin=250mW/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 13.0 W/kg

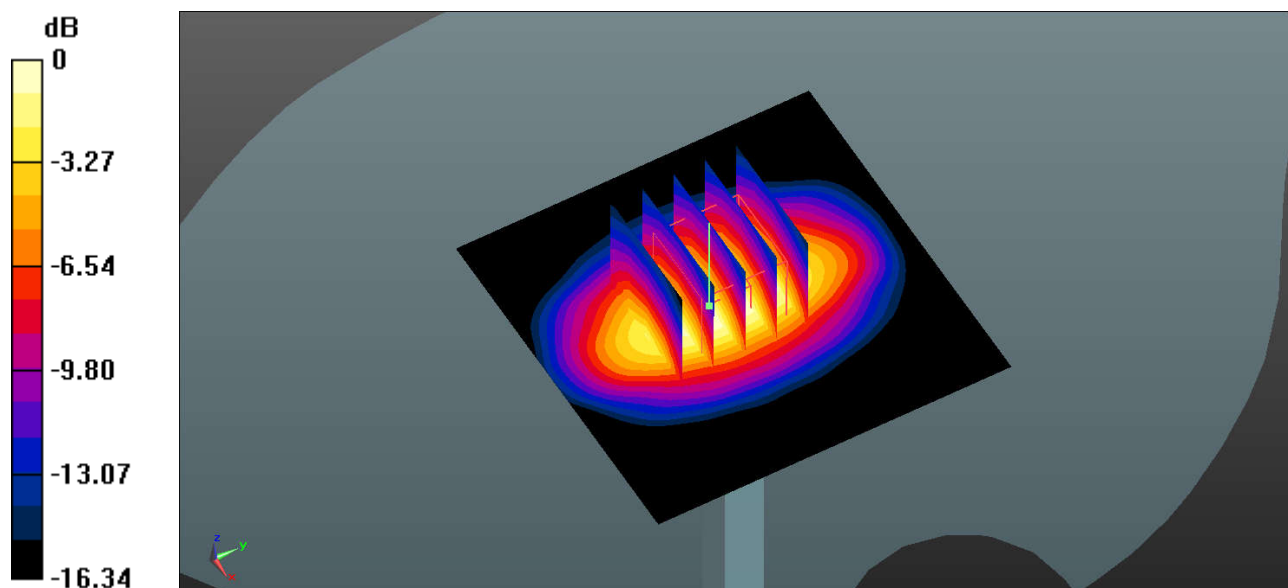
**Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 84.92 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 15.6 W/kg

**SAR(1 g) = 9.14 W/kg; SAR(10 g) = 5 W/kg**

Maximum value of SAR (measured) = 12.6 W/kg



0 dB = 12.6 W/kg = 11.00 dBW/kg

**System Check\_Head\_1900MHz****DUT: D1900V2 - SN:5d170**

Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL\_1900 Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.424$  S/m;  $\epsilon_r = 38.837$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 23.1 °C ; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(7.4, 7.4, 7.4); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Pin=250mW/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 13.7 W/kg

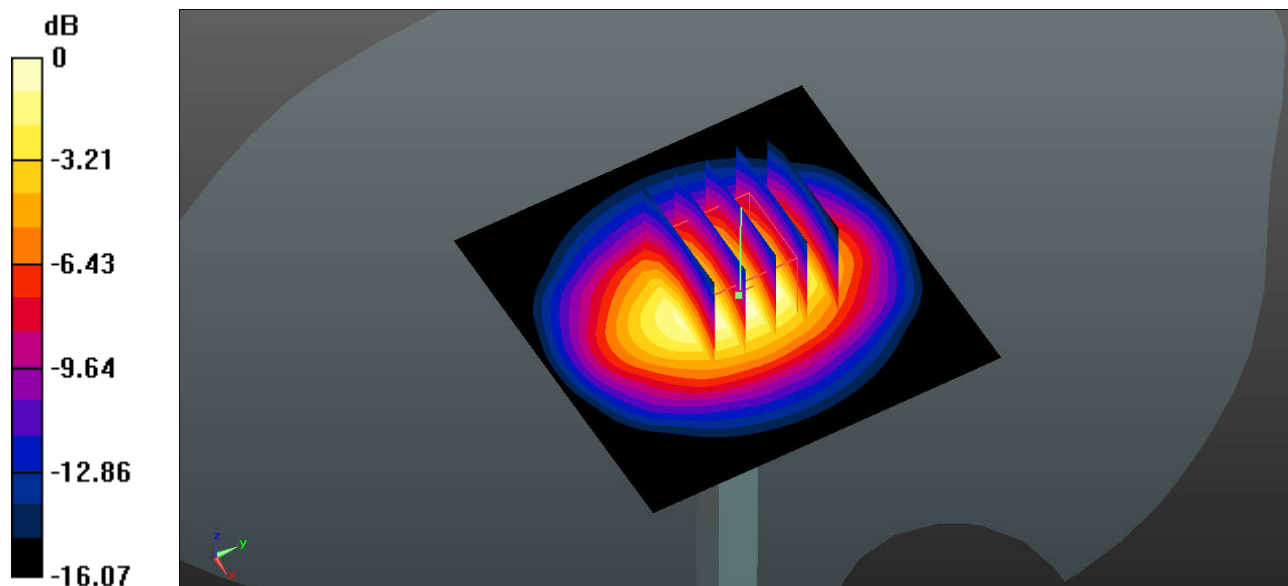
**Pin=250mW/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 85.47 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 17.3 W/kg

**SAR(1 g) = 9.6 W/kg; SAR(10 g) = 5.07 W/kg**

Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.37 dBW/kg

**System Check\_Head\_2300MHz****DUT: D2300V2 - SN:1055**

Communication System: UID 0, CW (0); Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: HSL\_2300 Medium parameters used:  $f = 2300$  MHz;  $\sigma = 1.69$  S/m;  $\epsilon_r = 39.535$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(7.31, 7.31, 7.31); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Pin=250mW/Area Scan (71x71x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 17.7 W/kg

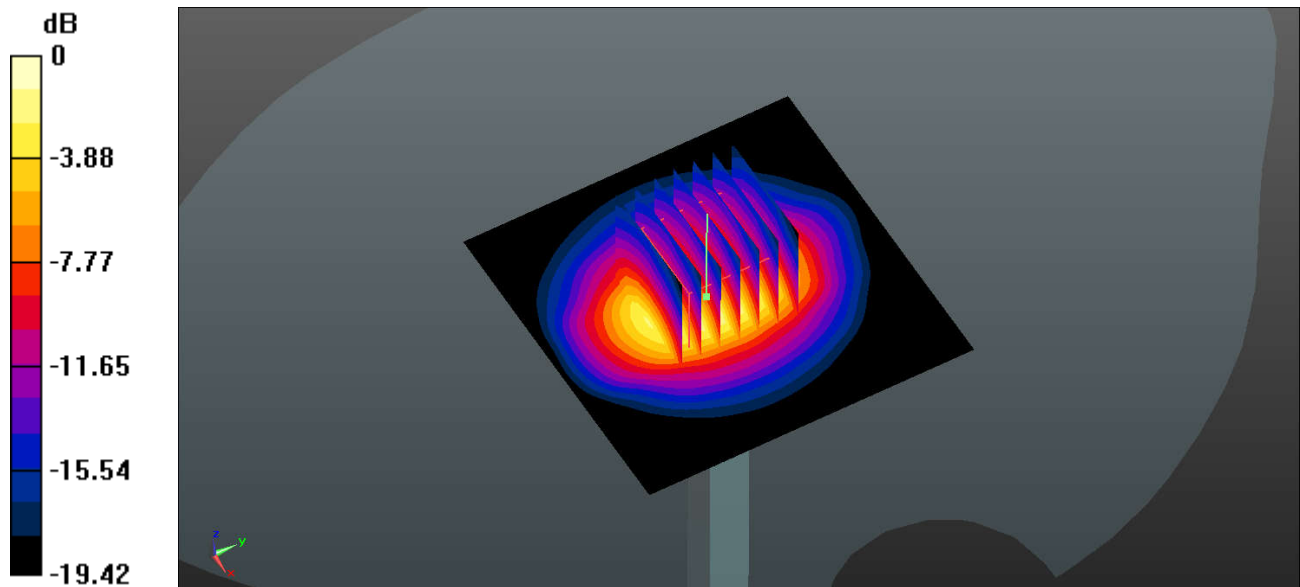
**Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.28 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 22.2 W/kg

**SAR(1 g) = 11.8 W/kg; SAR(10 g) = 5.79 W/kg**

Maximum value of SAR (measured) = 17.3 W/kg



0 dB = 17.3 W/kg = 12.38 dBW/kg

**System Check\_Head\_2600MHz****DUT: D2600V2 - SN:1061**

Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: HSL\_2600 Medium parameters used:  $f = 2600$  MHz;  $\sigma = 2.028$  S/m;  $\epsilon_r = 38.274$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3843; ConvF(6.86, 6.86, 6.86); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Pin=250mW/Area Scan (71x71x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 12.1 W/kg

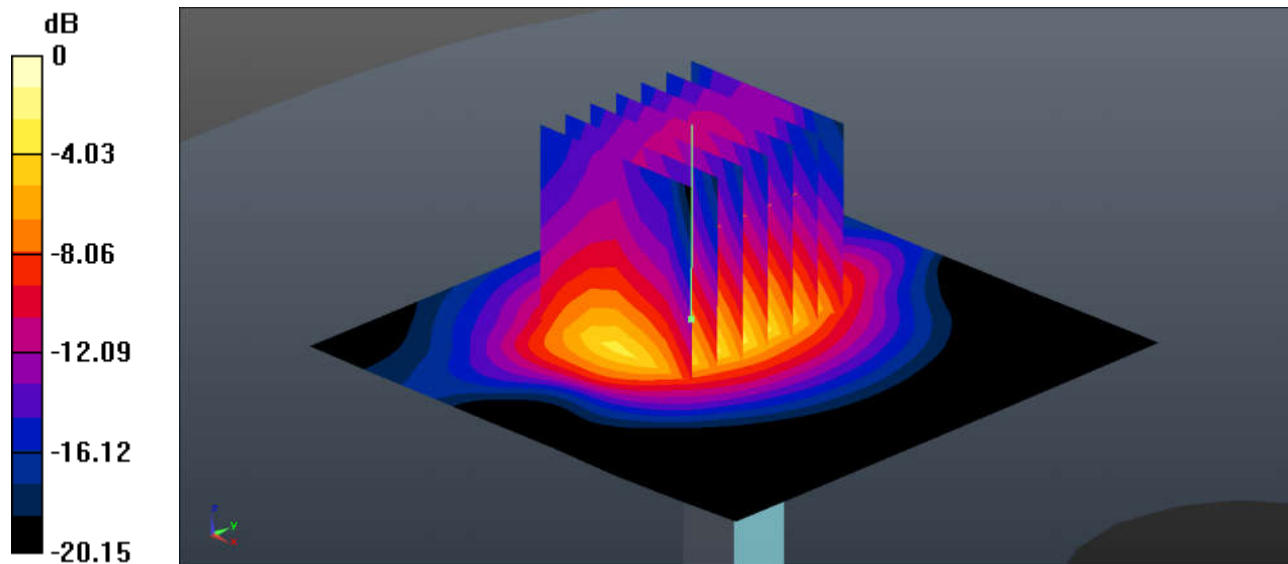
**Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.04 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 31.6 W/kg

**SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.42 W/kg**

Maximum value of SAR (measured) = 23.0 W/kg



0 dB = 23.0 W/kg = 13.62 dBW/kg



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## ***Appendix B. Plots of SAR Measurement***

The plots are shown as follows.

**01\_WCDMA V\_RMC 12.2Kbps\_Horizontal Up\_5mm\_Sensor On\_Ch4233**

Communication System: UID 0, WCDMA (0); Frequency: 846.6 MHz; Duty Cycle: 1:1  
Medium: HSL\_835 Medium parameters used:  $f = 847$  MHz;  $\sigma = 0.922$  S/m;  $\epsilon_r = 41.918$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(9.01, 9.01, 9.01); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch4233/Area Scan (41x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.20 W/kg

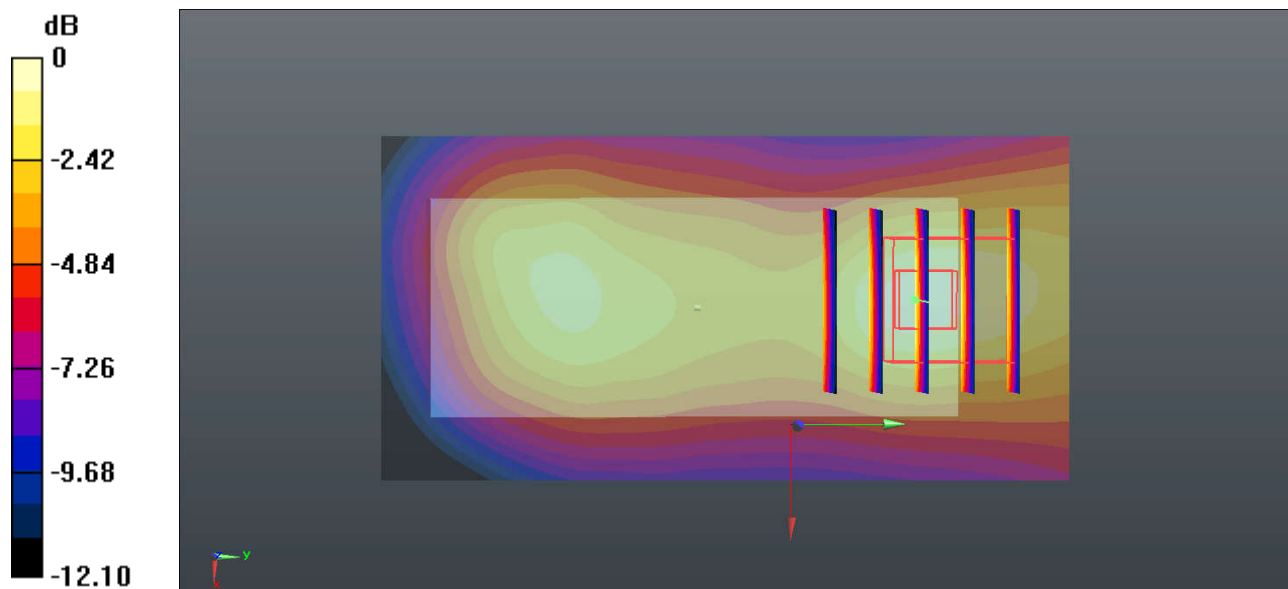
**Ch4233/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.06 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.73 W/kg

**SAR(1 g) = 0.911 W/kg; SAR(10 g) = 0.577 W/kg**

Maximum value of SAR (measured) = 1.27 W/kg



0 dB = 1.27 W/kg = 1.04 dBW/kg

**02\_WCDMA IV\_RMC 12.2Kbps\_Horizontal Down\_5mm\_Sensor On\_Ch1513**

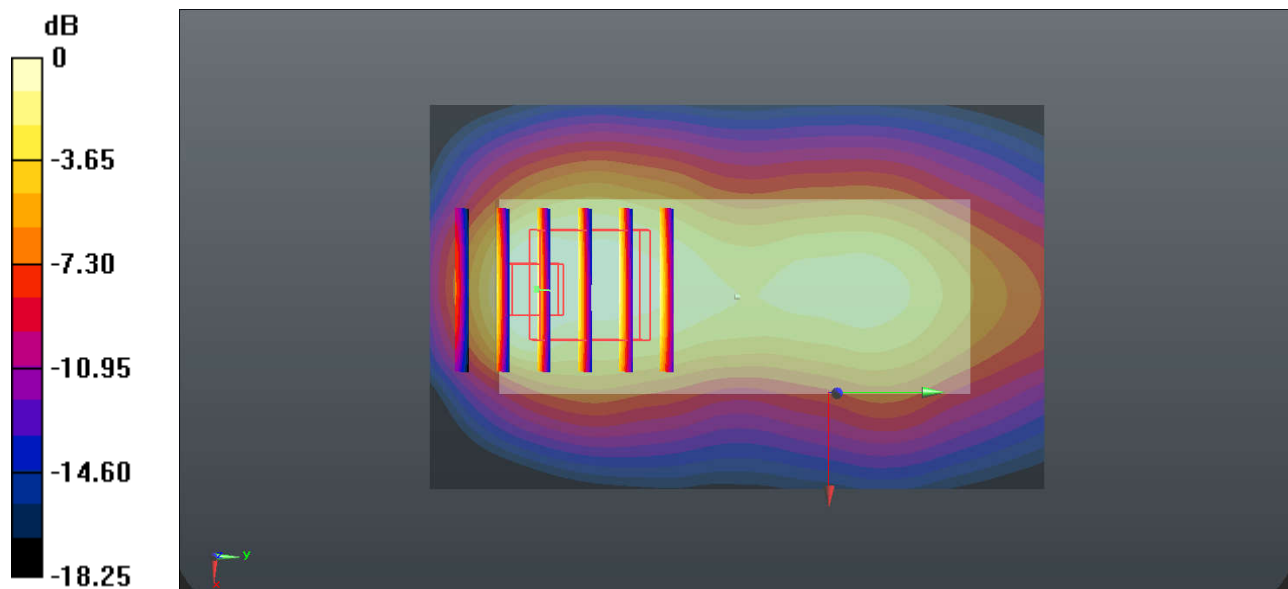
Communication System: UID 0, WCDMA (0); Frequency: 1752.6 MHz; Duty Cycle: 1:1  
Medium: HSL\_1750 Medium parameters used:  $f = 1753$  MHz;  $\sigma = 1.352$  S/m;  $\epsilon_r = 40.837$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.8 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(7.79, 7.79, 7.79); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch1513/Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 1.70 W/kg

**Ch1513/Zoom Scan (5x6x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 25.00 V/m; Power Drift = 0.02 dB  
Peak SAR (extrapolated) = 2.15 W/kg  
**SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.644 W/kg**  
Maximum value of SAR (measured) = 1.45 W/kg



0 dB = 1.45 W/kg = 1.61 dBW/kg

**03\_WCDMA II\_RMC 12.2Kbps\_Horizontal Down\_5mm\_Sensor On\_Ch9400**

Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: HSL\_1900 Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.405$  S/m;  $\epsilon_r = 38.93$ ;  $\rho = 1000$

kg/m<sup>3</sup>

Ambient Temperature : 23.1 °C ; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3843; ConvF(7.4, 7.4, 7.4); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch9400/Area Scan (51x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.66 W/kg

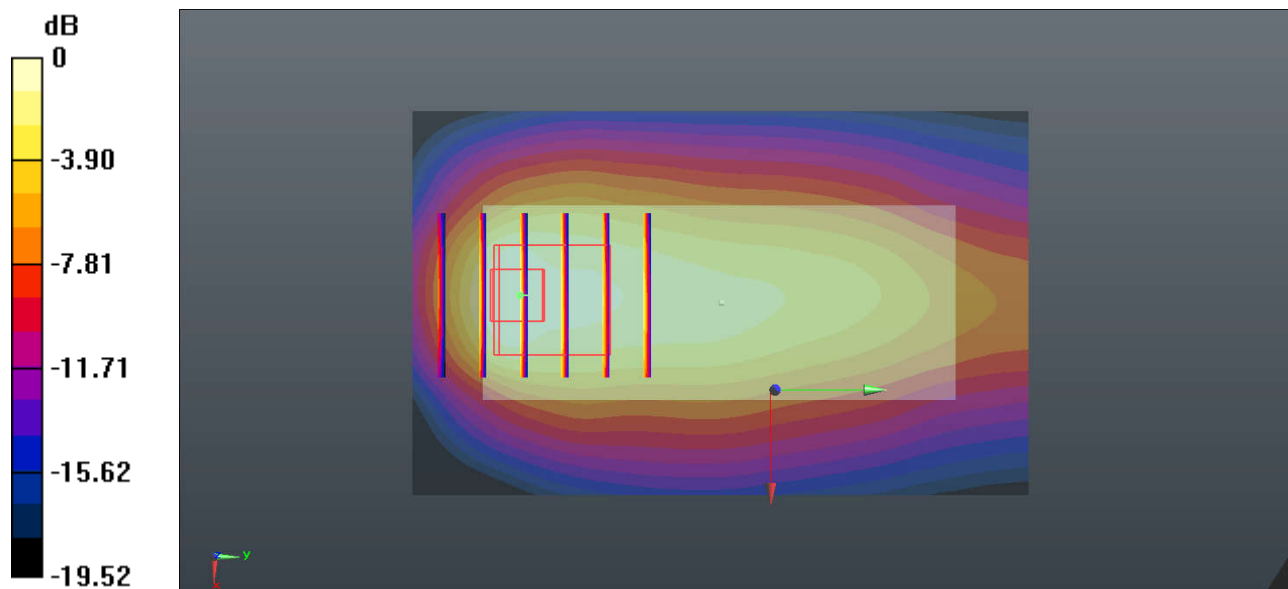
**Ch9400/Zoom Scan (5x6x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.24 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 2.21 W/kg

**SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.578 W/kg**

Maximum value of SAR (measured) = 1.43 W/kg



0 dB = 1.43 W/kg = 1.55 dBW/kg

**04\_LTE Band 12\_10M\_QPSK\_1RB\_49Offset\_Horizontal Up\_5mm\_Sensor On\_Ch23095**

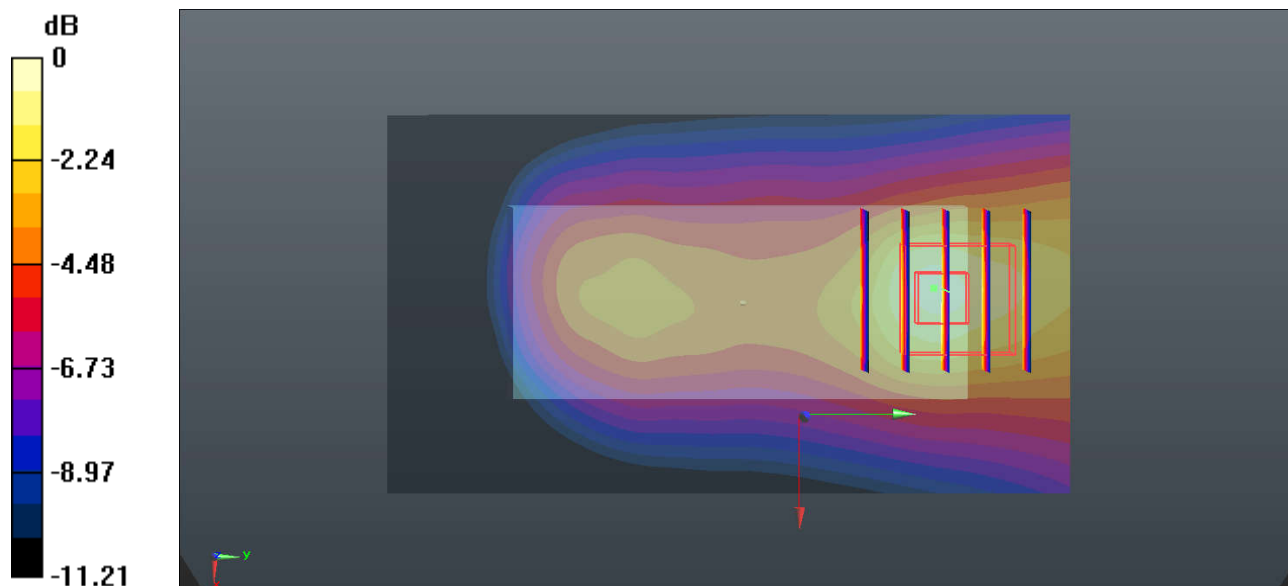
Communication System: UID 0, FDD\_LTE (0); Frequency: 707.5 MHz; Duty Cycle: 1:1  
Medium: HSL\_750 Medium parameters used :  $f = 707.5$  MHz;  $\sigma = 0.861$  S/m;  $\epsilon_r = 42.097$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(9.27, 9.27, 9.27); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch23095/Area Scan (51x91x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 1.25 W/kg

**Ch23095/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 27.47 V/m; Power Drift = 0.07 dB  
Peak SAR (extrapolated) = 1.89 W/kg  
**SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.685 W/kg**  
Maximum value of SAR (measured) = 1.38 W/kg



0 dB = 1.38 W/kg = 1.40 dBW/kg

**05\_LTE Band 13\_10M\_QPSK\_1RB\_0Offset\_Horizontal Up\_5mm\_Sensor On\_Ch23230**

Communication System: UID 0, FDD\_LTE (0); Frequency: 782 MHz; Duty Cycle: 1:1

Medium: HSL\_750 Medium parameters used:  $f = 782$  MHz;  $\sigma = 0.931$  S/m;  $\epsilon_r = 41.111$ ;  $\rho = 1000$

kg/m<sup>3</sup>

Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3843; ConvF(9.27, 9.27, 9.27); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch23230/Area Scan (41x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.24 W/kg

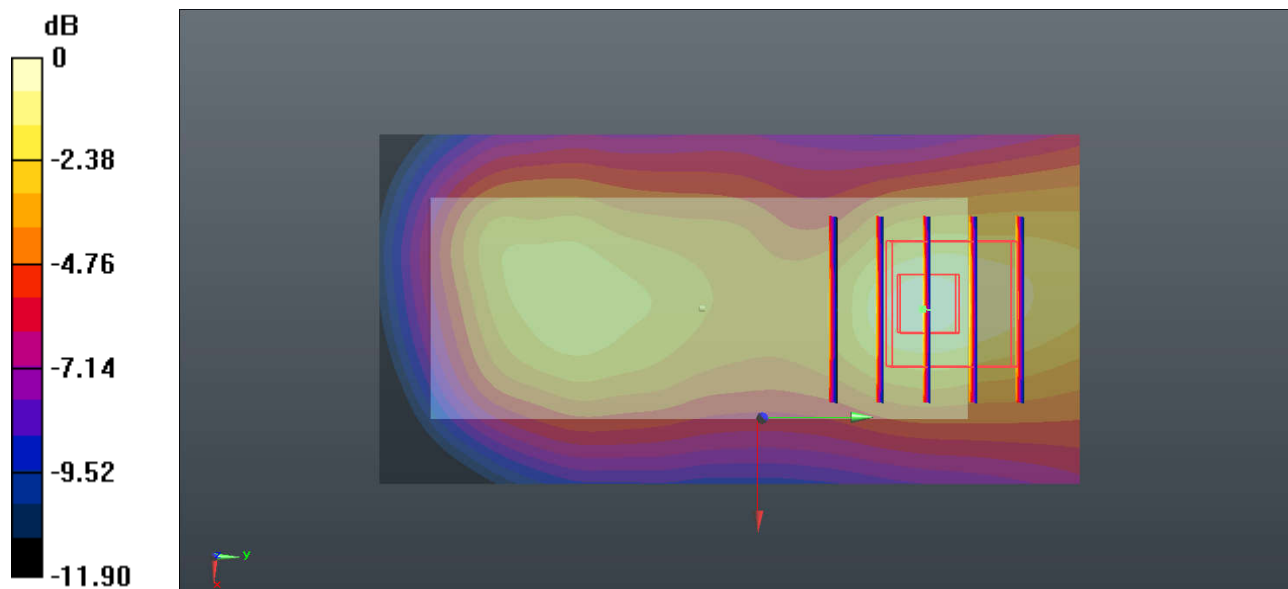
**Ch23230/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.991 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 1.84 W/kg

**SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.624 W/kg**

Maximum value of SAR (measured) = 1.32 W/kg



0 dB = 1.32 W/kg = 1.21 dBW/kg

**06\_LTE Band 14\_10M\_QPSK\_25RB\_0Offset\_Horizontal Up\_5mm\_Sensor On\_Ch23330**

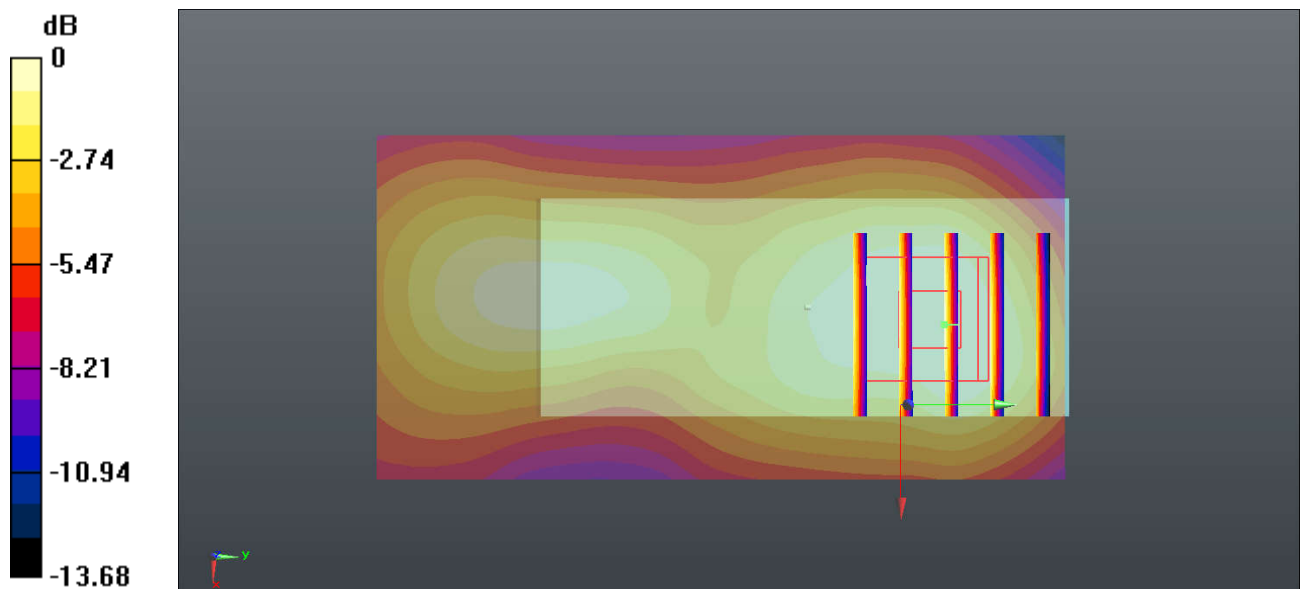
Communication System: UID 0, FDD\_LTE (0); Frequency: 793 MHz; Duty Cycle: 1:1  
Medium: HSL\_750 Medium parameters used:  $f = 793$  MHz;  $\sigma = 0.941$  S/m;  $\epsilon_r = 40.969$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(9.27, 9.27, 9.27); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch23330/Area Scan (41x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.970 W/kg

**Ch23330/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 27.82 V/m; Power Drift = -0.09 dB  
Peak SAR (extrapolated) = 1.16 W/kg  
**SAR(1 g) = 0.753 W/kg; SAR(10 g) = 0.485 W/kg**  
Maximum value of SAR (measured) = 0.877 W/kg



0 dB = 0.877 W/kg = -0.57 dBW/kg

**07\_LTE Band 5\_10M\_QPSK\_1RB\_0Offset\_Horizontal up\_5mm\_Sensor On\_Ch20525**

Communication System: UID 0, LTE-FDD (0); Frequency: 836.5 MHz; Duty Cycle: 1:1

Medium: HSL\_835 Medium parameters used:  $f = 836.5$  MHz;  $\sigma = 0.912$  S/m;  $\epsilon_r = 42.041$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3843; ConvF(9.01, 9.01, 9.01); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch20525/Area Scan (51x91x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.00 W/kg

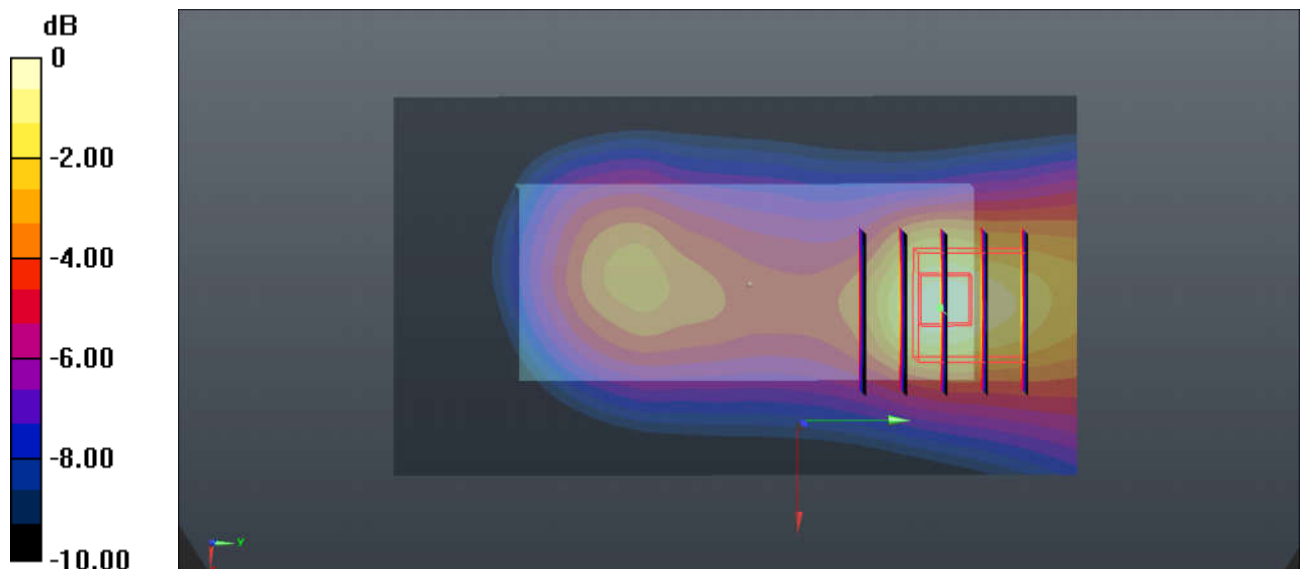
**Ch20525/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.17 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.49 W/kg

**SAR(1 g) = 0.793 W/kg; SAR(10 g) = 0.456 W/kg**

Maximum value of SAR (measured) = 1.04 W/kg



0 dB = 1.04 W/kg = 0.17 dBW/kg

**08\_LTE Band 66\_20M\_QPSK\_1RB\_0Offset\_Back\_5mm\_Sensor On\_Ch132322**

Communication System: UID 0, FDD\_LTE (0); Frequency: 1745 MHz; Duty Cycle: 1:1  
Medium: HSL\_1750 Medium parameters used:  $f = 1745$  MHz;  $\sigma = 1.344$  S/m;  $\epsilon_r = 40.864$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.8 °C

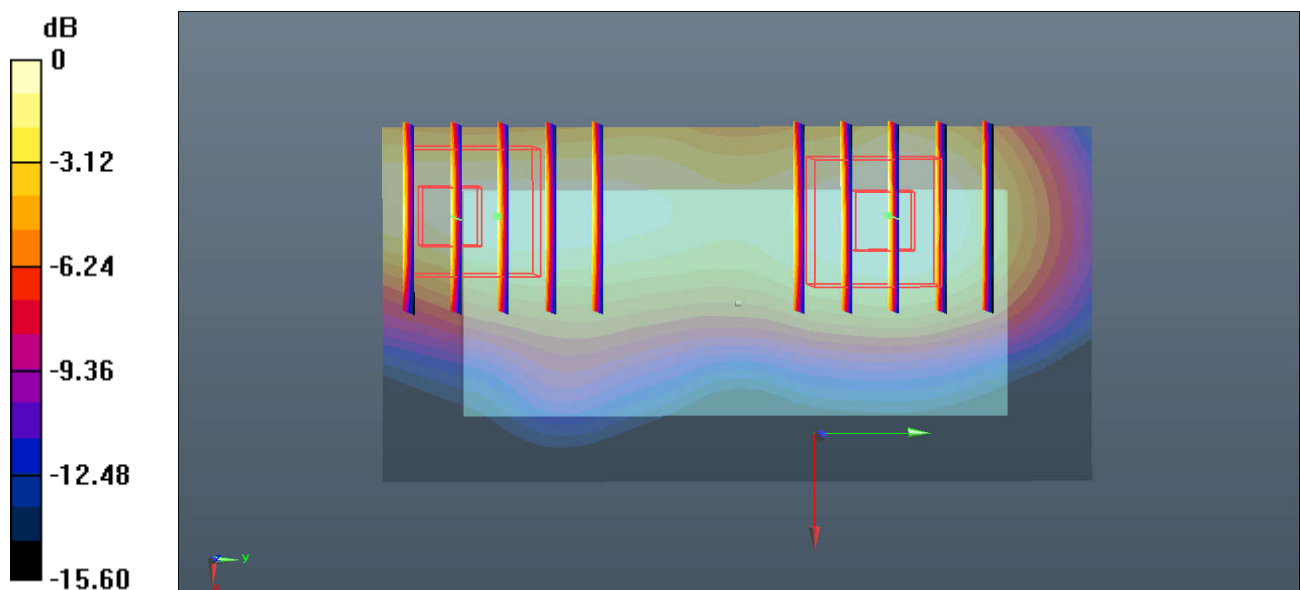
**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(7.79, 7.79, 7.79); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch132322/Area Scan (41x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 1.26 W/kg

**Ch132322/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 15.99 V/m; Power Drift = 0.05 dB  
Peak SAR (extrapolated) = 1.73 W/kg  
**SAR(1 g) = 0.994 W/kg; SAR(10 g) = 0.560 W/kg**  
Maximum value of SAR (measured) = 1.22 W/kg

**Ch132322/Zoom Scan (5x5x7)/Cube 1:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 15.99 V/m; Power Drift = 0.05 dB  
Peak SAR (extrapolated) = 1.48 W/kg  
**SAR(1 g) = 0.909 W/kg; SAR(10 g) = 0.515 W/kg**  
Maximum value of SAR (measured) = 1.13 W/kg



**09\_LTE Band 2\_20M\_QPSK\_50RB\_24Offset\_Horizontal Down\_5mm\_Sensor On\_Ch18700**

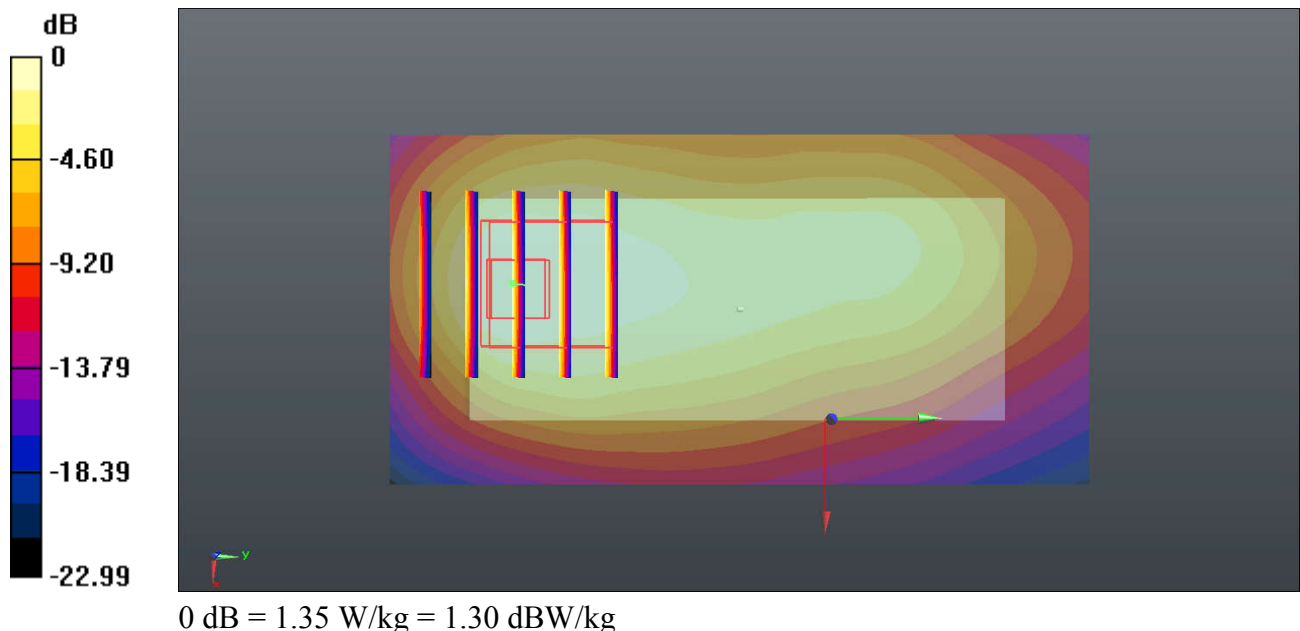
Communication System: UID 0, FDD\_LTE (0); Frequency: 1860 MHz; Duty Cycle: 1:1  
Medium: HSL\_1900 Medium parameters used:  $f = 1860$  MHz;  $\sigma = 1.387$  S/m;  $\epsilon_r = 39.019$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.1 °C ; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(7.4, 7.4, 7.4); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch18700/Area Scan (41x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 1.47 W/kg

**Ch18700/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 25.30 V/m; Power Drift = 0.09 dB  
Peak SAR (extrapolated) = 2.26 W/kg  
**SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.546 W/kg**  
Maximum value of SAR (measured) = 1.35 W/kg



**10\_LTE Band 30\_10M\_QPSK\_50RB\_0Offset\_Horizontal Down\_5mm\_Sensor On\_Ch27710**

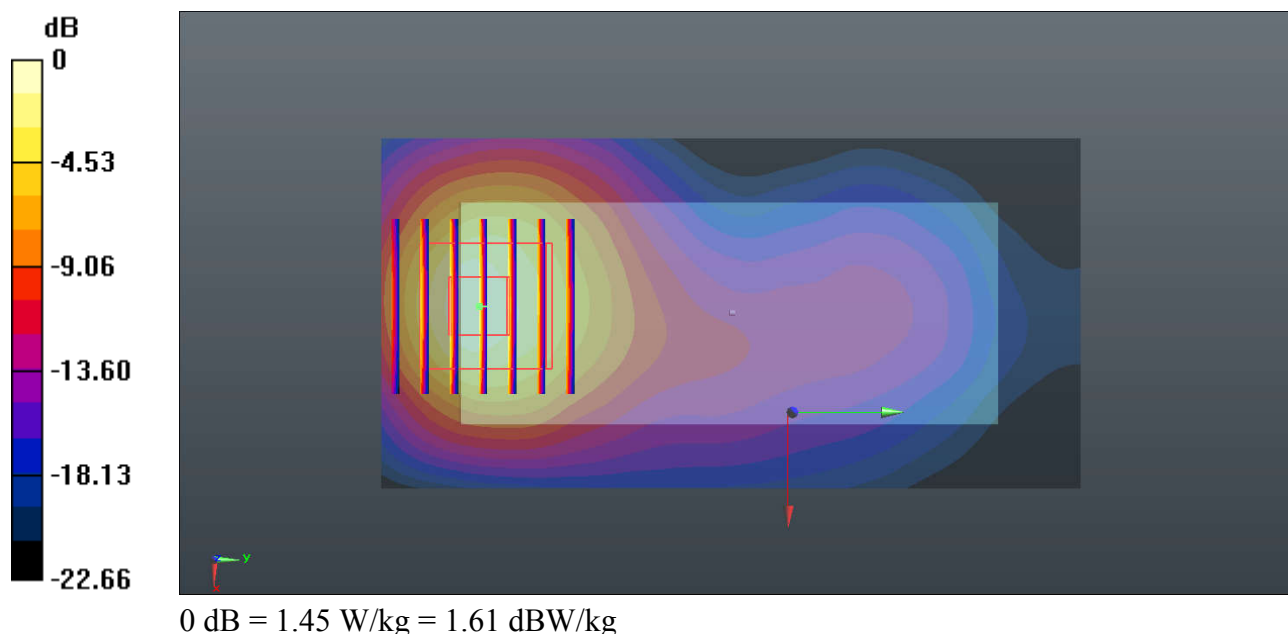
Communication System: UID 0, FDD\_LTE (0); Frequency: 2310 MHz; Duty Cycle: 1:1  
Medium: HSL\_2300 Medium parameters used:  $f = 2310$  MHz;  $\sigma = 1.702$  S/m;  $\epsilon_r = 39.489$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.2 °C; Liquid Temperature : 22.6 °C

**DASY5 Configuration:**

- Probe: EX3DV4 - SN3843; ConvF(7.31, 7.31, 7.31); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch27710/Area Scan (51x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 1.41 W/kg

**Ch27710/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 7.026 V/m; Power Drift = -0.09 dB  
Peak SAR (extrapolated) = 2.42 W/kg  
**SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.453 W/kg**  
Maximum value of SAR (measured) = 1.45 W/kg



**11\_LTE Band 7\_20M\_QPSK\_1RB\_0Offset\_Horizontal Down\_5mm\_Sensor On\_Ch20850**

Communication System: UID 0, FDD\_LTE (0); Frequency: 2510 MHz; Duty Cycle: 1:1

Medium: HSL\_2600 Medium parameters used:  $f = 2510$  MHz;  $\sigma = 1.922$  S/m;  $\epsilon_r = 38.652$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3843; ConvF(6.86, 6.86, 6.86); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.10.22
- Phantom: SAM2; Type: SAM; Serial: TP-1503
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch20850/Area Scan (51x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.09 W/kg

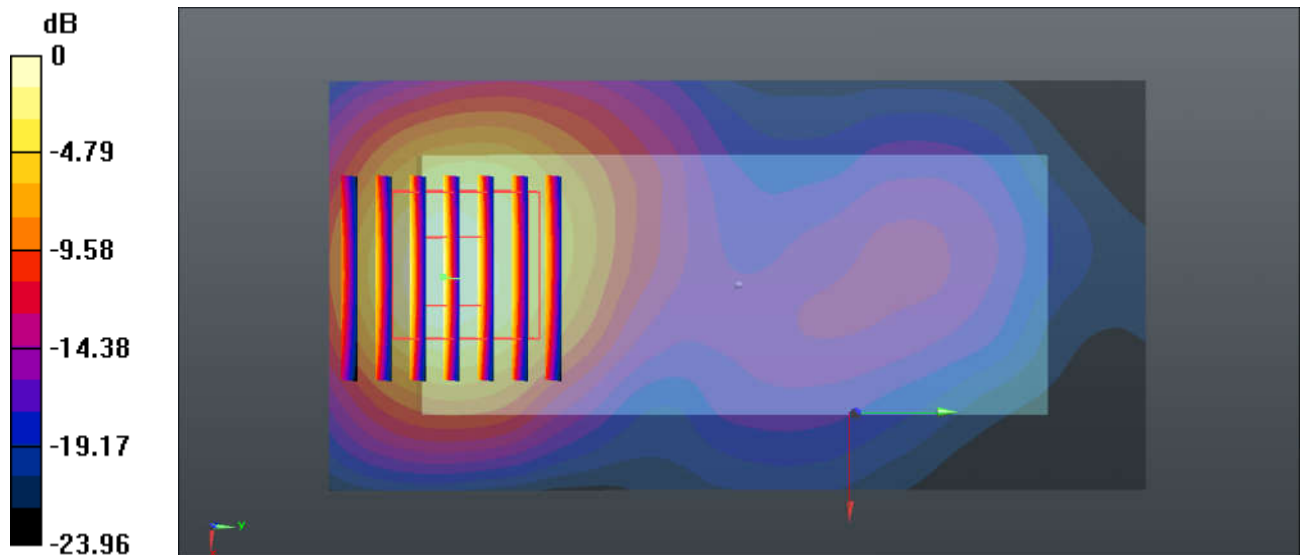
**Ch20850/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.848 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.82 W/kg

**SAR(1 g) = 0.779 W/kg; SAR(10 g) = 0.335 W/kg**

Maximum value of SAR (measured) = 1.07 W/kg



0 dB = 1.07 W/kg = 0.29 dBW/kg



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***Appendix C. DASY Calibration Certificate***

The DASY calibration certificates are shown as follows.



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中国认可  
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CNAS L0570

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Client

**Sporton**

Certificate No: **Z19-60081**

## CALIBRATION CERTIFICATE

Object

D750V3 - SN: 1087

Calibration Procedure(s)

FF-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

March 27, 2019

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|------------------------------------------|-----------------------|
| Power Meter NRP2        | 106277     | 20-Aug-18 (CTTL, No.J18X06862)           | Aug-19                |
| Power sensor NRP8S      | 104291     | 20-Aug-18 (CTTL, No.J18X06862)           | Aug-19                |
| Reference Probe EX3DV4  | SN 3617    | 31-Jan-19(SPEAG,No.EX3-3617_Jan19)       | Jan-20                |
| DAE4                    | SN 1331    | 06-Feb-19(SPEAG,No.DAE4-1331_Feb19)      | Feb-20                |
| Secondary Standards     | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 23-Jan-19 (CTTL, No.J19X00336)           | Jan-20                |
| NetworkAnalyzer E5071C  | MY46110673 | 24-Jan-19 (CTTL, No.J19X00547)           | Jan-20                |

|                | Name        | Function           | Signature |
|----------------|-------------|--------------------|-----------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |           |
| Reviewed by:   | Lin Hao     | SAR Test Engineer  |           |
| Approved by:   | Qi Dianyuan | SAR Project Leader |           |

Issued: March 29, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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### Glossary:

|       |                                            |
|-------|--------------------------------------------|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| N/A   | not applicable or not measured             |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.



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**Measurement Conditions**

DASY system configuration, as far as not given on page 1.

|                              |                          |              |
|------------------------------|--------------------------|--------------|
| DASY Version                 | DASY52                   | 52.10.2.1495 |
| Extrapolation                | Advanced Extrapolation   |              |
| Phantom                      | Triple Flat Phantom 5.1C |              |
| Distance Dipole Center - TSL | 15 mm                    | with Spacer  |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm        |              |
| Frequency                    | 750 MHz $\pm$ 1 MHz      |              |

**Head TSL parameters**

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 41.9           | 0.89 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 43.0 $\pm$ 6 % | 0.90 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | <1.0 °C             | ----           | ----                 |

**SAR result with Head TSL**

|                                                |                    |                              |
|------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 $cm^3$ (1 g) of Head TSL   | Condition          |                              |
| SAR measured                                   | 250 mW input power | 2.10 W/kg                    |
| SAR for nominal Head TSL parameters            | normalized to 1W   | 8.36 W/kg $\pm$ 18.8 % (k=2) |
| SAR averaged over 10 $cm^3$ (10 g) of Head TSL | Condition          |                              |
| SAR measured                                   | 250 mW input power | 1.42 W/kg                    |
| SAR for nominal Head TSL parameters            | normalized to 1W   | 5.65 W/kg $\pm$ 18.7 % (k=2) |

**Body TSL parameters**

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 55.5           | 0.96 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 56.9 $\pm$ 6 % | 0.94 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | <1.0 °C             | ----           | ----                 |

**SAR result with Body TSL**

|                                                |                    |                              |
|------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 $cm^3$ (1 g) of Body TSL   | Condition          |                              |
| SAR measured                                   | 250 mW input power | 2.09 W/kg                    |
| SAR for nominal Body TSL parameters            | normalized to 1W   | 8.58 W/kg $\pm$ 18.8 % (k=2) |
| SAR averaged over 10 $cm^3$ (10 g) of Body TSL | Condition          |                              |
| SAR measured                                   | 250 mW input power | 1.41 W/kg                    |
| SAR for nominal Body TSL parameters            | normalized to 1W   | 5.75 W/kg $\pm$ 18.7 % (k=2) |



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## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 52.4Ω- 2.59jΩ |
| Return Loss                          | - 29.3dB      |

### Antenna Parameters with Body TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 51.6Ω- 3.86jΩ |
| Return Loss                          | - 27.7dB      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 0.898 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|



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## DASY5 Validation Report for Head TSL

Date: 03.26.2019

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1087**

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 750$  MHz;  $\sigma = 0.903$  S/m;  $\epsilon_r = 43.01$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(10.03, 10.03, 10.03) @ 750 MHz; Calibrated: 1/31/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP\_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

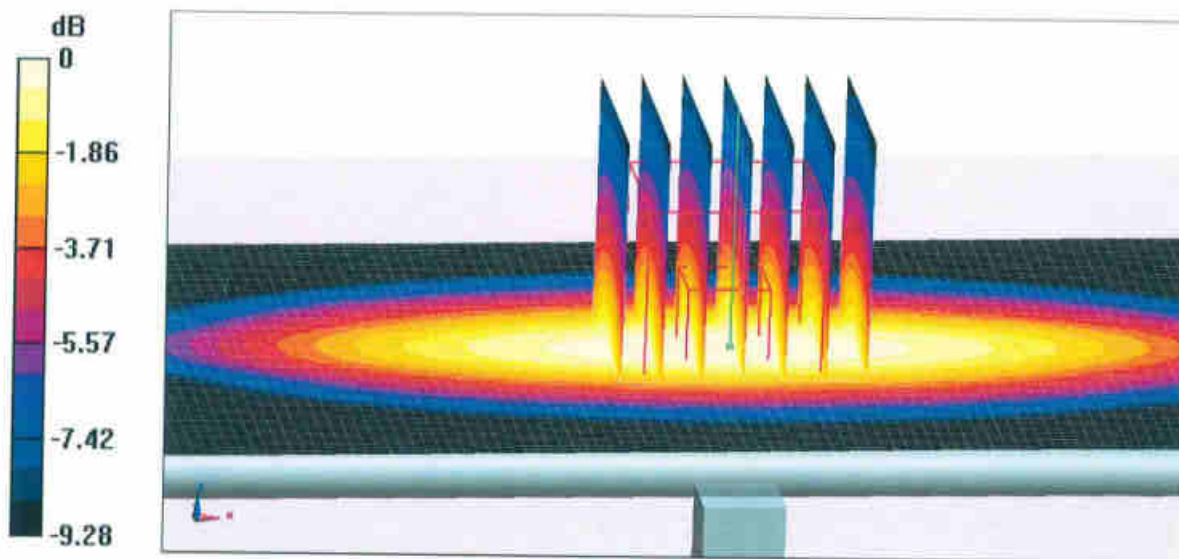
**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.05 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.00 W/kg

**SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.42 W/kg**

Maximum value of SAR (measured) = 2.72 W/kg



0 dB = 2.72 W/kg = 4.35 dBW/kg



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## Impedance Measurement Plot for Head TSL

