

## FCC Test Report (PART 22)

**Report No.:** RFBEOP-WTW-P20100005

**FCC ID:** NKRM18QAG

**Test Model:** M18QAG

**Received Date:** July 10, 2020

**Test Date:** July 10 to Oct. 15, 2020

**Issued Date:** Nov. 12, 2020

**Applicant:** Wistron NeWeb Corporation

**Address:** 20 Park Ave. II, Hsinchu Science Park, Hsinchu 308, Taiwan

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**FCC Registration /  
Designation Number:** 723255 / TW2022



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### Release Control Record

| Issue No.            | Description       | Date Issued   |
|----------------------|-------------------|---------------|
| RFBEOP-WTW-P20100005 | Original release. | Nov. 12, 2020 |

## 1 Certificate of Conformity

**Product:** M2M DATA MODULE

**Brand:** Wistron NeWeb Corporation

**Test Model:** M18QAG

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Wistron NeWeb Corporation

**Test Date:** July 10 to Oct. 15, 2020

**Standards:** FCC Part 22, Subpart H

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** Vivian Huang , **Date:** Nov. 12, 2020  
Vivian Huang / Specialist

**Approved by :** Clark Lin , **Date:** Nov. 12, 2020  
Clark Lin / Technical Manager

## 2 Summary of Test Results

| Applied Standard: FCC Part 22 & Part 2 |                              |        |                                                                                    |
|----------------------------------------|------------------------------|--------|------------------------------------------------------------------------------------|
| FCC Clause                             | Test Item                    | Result | Remarks                                                                            |
| 2.1046<br>22.913 (a)                   | Effective radiated power     | PASS   | Meet the requirement of limit.                                                     |
| 22.913(d)                              | Peak to Average Ratio        | PASS   | Meet the requirement of limit.                                                     |
| 2.1047                                 | Modulation characteristics   | PASS   | Meet the requirement                                                               |
| 2.1055<br>22.355                       | Frequency Stability          | PASS   | Meet the requirement of limit.                                                     |
| 2.1049                                 | Occupied Bandwidth           | PASS   | Meet the requirement of limit.                                                     |
| 22.917                                 | Band Edge Measurements       | PASS   | Meet the requirement of limit.                                                     |
| 2.1051<br>22.917                       | Conducted Spurious Emissions | PASS   | Meet the requirement of limit.                                                     |
| 2.1053<br>22.917                       | Radiated Spurious Emissions  | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -46.88 dB at 4132 MHz. |

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement                    | Frequency     | Expanded Uncertainty (k=2) ( $\pm$ ) |
|--------------------------------|---------------|--------------------------------------|
| Radiated Emissions up to 1 GHz | 9kHz ~ 30MHz  | 3.1 dB                               |
|                                | 30MHz ~ 1GHz  | 5.4 dB                               |
| Radiated Emissions above 1 GHz | 1GHz ~ 18GHz  | 5.0 dB                               |
|                                | 18GHz ~ 40GHz | 5.3 dB                               |

## 2.2 Test Site and Instruments

For radiated spurious emissions test:

| DESCRIPTION & MANUFACTURER                 | MODEL NO.            | SERIAL NO.  | CALIBRATED DATE | CALIBRATED UNTIL |
|--------------------------------------------|----------------------|-------------|-----------------|------------------|
| Test Receiver<br>Keysight                  | N9038A               | MY54450088  | July 06, 2020   | July 05, 2021    |
| Pre-Amplifier<br>EMCI                      | EMC001340            | 980142      | May 25, 2020    | May 24, 2021     |
| Loop Antenna<br>Electro-Metrics            | EM-6879              | 264         | Feb. 18, 2020   | Feb. 17, 2021    |
| RF Cable                                   | NA                   | LOOPCAB-001 | Jan. 08, 2020   | Jan. 07, 2021    |
| RF Cable                                   | NA                   | LOOPCAB-002 | Jan. 08, 2020   | Jan. 07, 2021    |
| Pre-Amplifier<br>Mini-Circuits             | ZFL-1000VH2B         | AMP-ZFL-05  | Apr. 28, 2020   | Apr. 27, 2021    |
| Trilog Broadband<br>Antenna<br>SCHWARZBECK | VULB 9168            | 9168-361    | Nov. 11, 2019   | Nov. 10, 2020    |
| RF Cable                                   | 8D                   | 966-3-1     | Mar. 17, 2020   | Mar. 16, 2021    |
| RF Cable                                   | 8D                   | 966-3-2     | Mar. 17, 2020   | Mar. 16, 2021    |
| RF Cable                                   | 8D                   | 966-3-3     | Mar. 17, 2020   | Mar. 16, 2021    |
| Fixed attenuator<br>Mini-Circuits          | UNAT-5+              | PAD-3m-3-01 | Sep. 24, 2020   | Sep. 23, 2021    |
| Horn_Antenna<br>SCHWARZBECK                | BBHA9120-D           | 9120D-406   | Nov. 24, 2019   | Nov. 23, 2020    |
| Pre-Amplifier<br>EMCI                      | EMC12630SE           | 980384      | Jan. 15, 2020   | Jan. 14, 2021    |
| RF Cable                                   | EMC104-SM-SM-1500    | 180504      | Apr. 29, 2020   | Apr. 28, 2021    |
| RF Cable                                   | EMC104-SM-SM-2000    | 180601      | June 09, 2020   | June 08, 2021    |
| RF Cable                                   | EMC104-SM-SM-6000    | 180602      | June 09, 2020   | June 08, 2021    |
| Spectrum Analyzer<br>Keysight              | N9030A               | MY54490679  | July 13, 2020   | July 12, 2021    |
| Pre-Amplifier<br>EMCI                      | EMC184045SE          | 980387      | Jan. 15, 2020   | Jan. 14, 2021    |
| Horn_Antenna<br>SCHWARZBECK                | BBHA 9170            | BBHA9170519 | Nov. 24, 2019   | Nov. 23, 2020    |
| RF Cable                                   | EMC102-KM-KM-1200    | 160924      | Jan. 15, 2020   | Jan. 14, 2021    |
| RF Cable                                   | EMC-KM-KM-4000       | 200214      | Mar. 11, 2020   | Mar. 10, 2021    |
| Software                                   | ADT_Radiated_V8.7.08 | NA          | NA              | NA               |
| Antenna Tower & Turn<br>Table<br>Max-Full  | MF-7802              | MF780208406 | NA              | NA               |
| Boresight Antenna<br>Fixture               | FBA-01               | FBA-SIP01   | NA              | NA               |

### Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: Oct. 14 to 15, 2020

**For other test items (for WCDMA band):**

| DESCRIPTION & MANUFACTURER                 | MODEL NO.                     | SERIAL NO.    | CALIBRATED DATE | CALIBRATED UNTIL |
|--------------------------------------------|-------------------------------|---------------|-----------------|------------------|
| Spectrum Analyzer R&S                      | FSV40                         | 100964        | May 29, 2020    | May 28, 2021     |
| Spectrum Analyzer Keysight                 | N9030A                        | MY54490679    | July 13, 2020   | July 12, 2021    |
| Power meter Anritsu                        | ML2495A                       | 1529002       | July 26, 2019   | July 25, 2020    |
| Power sensor Anritsu                       | MA2411B                       | 1339443       | July 26, 2019   | July 25, 2020    |
| Fixed Attenuator Mini-Circuits             | MDCS18N-10                    | MDCS18N-10-01 | Apr. 14, 2020   | Apr. 13, 2021    |
| DC Power Supply Topward                    | 6603D                         | 795558        | NA              | NA               |
| Temperature & Humidity Chamber Giant Force | GTH-150-40-SP-AR              | MAA0812-008   | Jan. 16, 2020   | Jan. 15, 2021    |
| True RMS Clamp Meter FLUKE                 | 325                           | 31130711WS    | June 06, 2020   | June 05, 2021    |
| Mech Switch Absorptive Mini-Circuits       | MSP4TA-18+                    | 0140          | Feb. 10, 2020   | Feb. 09, 2021    |
| FXD ATTEN Mini-Circuits                    | BW-S3W2+                      | MN71981       | Feb. 10, 2020   | Feb. 09, 2021    |
| Software                                   | ADT_RF Test Software V6.6.5.4 | NA            | NA              | NA               |

- Note:**
1. The test was performed in Oven room 2.
  2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. Tested Date: July 19, 2020

**For other test items (for LTE band):**

| DESCRIPTION & MANUFACTURER                 | MODEL NO.                     | SERIAL NO.    | CALIBRATED DATE | CALIBRATED UNTIL |
|--------------------------------------------|-------------------------------|---------------|-----------------|------------------|
| Spectrum Analyzer R&S                      | FSV40                         | 100964        | May 29, 2020    | May 28, 2021     |
| Spectrum Analyzer Keysight                 | N9030A                        | MY54490679    | July 17, 2019   | July 16, 2020    |
| Power meter Anritsu                        | ML2495A                       | 1529002       | July 26, 2019   | July 25, 2020    |
| Power sensor Anritsu                       | MA2411B                       | 1339443       | July 26, 2019   | July 25, 2020    |
| Fixed Attenuator Mini-Circuits             | MDCS18N-10                    | MDCS18N-10-01 | Apr. 14, 2020   | Apr. 13, 2021    |
| DC Power Supply Topward                    | 6603D                         | 795558        | NA              | NA               |
| Temperature & Humidity Chamber Giant Force | GTH-150-40-SP-AR              | MAA0812-008   | Jan. 16, 2020   | Jan. 15, 2021    |
| True RMS Clamp Meter FLUKE                 | 325                           | 31130711WS    | June 06, 2020   | June 05, 2021    |
| Mech Switch Absorptive Mini-Circuits       | MSP4TA-18+                    | 0140          | Feb. 10, 2020   | Feb. 09, 2021    |
| FXD ATTEN Mini-Circuits                    | BW-S3W2+                      | MN71981       | Feb. 10, 2020   | Feb. 09, 2021    |
| Software                                   | ADT_RF Test Software V6.6.5.4 | NA            | NA              | NA               |

- Note:**
1. The test was performed in Oven room 2.
  2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. Tested Date: July 10, 2020

### 3 General Information

#### 3.1 General Description of EUT

|                     |                                          |                                 |
|---------------------|------------------------------------------|---------------------------------|
| Product             | M2M DATA MODULE                          |                                 |
| Brand               | Wistron NeWeb Corporation                |                                 |
| Test Model          | M18QAG                                   |                                 |
| Status of EUT       | ENGINEERING SAMPLE                       |                                 |
| Power Supply Rating | DC 3.8V from host equipment              |                                 |
| Modulation Type     | WCDMA, HSDPA, HSUPA                      | BPSK                            |
|                     | LTE Band 5                               | QPSK, 16QAM                     |
| Operating Frequency | WCDMA, HSDPA, HSUPA                      | 826.4 MHz ~ 846.6 MHz           |
|                     | LTE Band 5                               | 824.7 MHz ~ 848.3 MHz           |
| Max. ERP Power      | WCDMA B5                                 | 25.90 dBm                       |
|                     | LTE Band 5<br>(Channel Bandwidth 1.4MHz) | 25.26 dBm                       |
|                     | LTE Band 5<br>(Channel Bandwidth 3MHz)   | 25.33 dBm                       |
|                     | LTE Band 5<br>(Channel Bandwidth 5MHz)   | 25.13 dBm                       |
|                     | LTE Band 5<br>(Channel Bandwidth 10MHz)  | 25.15 dBm                       |
| Emission Designator | WCDMA B5                                 | 4M13F9W                         |
|                     | LTE Band 5<br>(Channel Bandwidth 1.4MHz) | QPSK: 1M08G7D<br>16QAM: 1M08D7W |
|                     | LTE Band 5<br>(Channel Bandwidth 3MHz)   | QPSK: 2M68G7D<br>16QAM: 2M68D7W |
|                     | LTE Band 5<br>(Channel Bandwidth 5MHz)   | QPSK: 4M48G7D<br>16QAM: 4M48D7W |
|                     | LTE Band 5<br>(Channel Bandwidth 10MHz)  | QPSK: 8M94G7D<br>16QAM: 8M94D7W |
| Antenna Type        | Refer to Note                            |                                 |
| Antenna Connector   | Refer to Note                            |                                 |
| Accessory Device    | NA                                       |                                 |
| Data Cable Supplied | NA                                       |                                 |

Note:

1. The antennas provided to the EUT, please refer to the following table:

| For GPS     |                  |                   |                        |              |                |
|-------------|------------------|-------------------|------------------------|--------------|----------------|
| Antenna No. | Band             | Freq. Range (MHz) | Antenna Net Gain (dBi) | Antenna Type | Connector Type |
| 1           | GPS              | 1602              | 2.24                   | Dipole       | SMA            |
| For WWAN    |                  |                   |                        |              |                |
| Antenna No. | Band             | Freq. Range (MHz) | Antenna Net Gain (dBi) | Antenna Type | Connector Type |
| 2           | LTE / WCDMA (2)  | 1850~1910         | 1.56                   | Dipole       | SMA            |
|             | LTE / WCDMA (4)  | 1710~1755         | 1.62                   | Dipole       | SMA            |
|             | LTE / WCDMA (5)  | 824~849           | 3.2                    | Dipole       | SMA            |
|             | LTE / WCDMA (12) | 699~716           | 1.49                   | Dipole       | SMA            |
|             | LTE / WCDMA (14) | 788~798           | 1.66                   | Dipole       | SMA            |

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.



### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| ID | Product   | Brand   | Model No.       | Serial No. | FCC ID | Remarks            |
|----|-----------|---------|-----------------|------------|--------|--------------------|
| A. | Test Tool | WNC     | NA              | NA         | NA     | Supplied by client |
| B. | SIM Card  | R&S     | CRT-Z3          | NA         | NA     | Provided by Lab    |
| C. | Adapter   | I.T.E   | MU24-Y120200-A1 | NA         | NA     | Supplied by client |
| D. | Simulator | Anritsu | MT8820C         | 6201127458 | NA     | Provided by Lab    |

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks            |
|----|--------------|------|------------|--------------------|--------------|--------------------|
| 1. | DC Cable     | 1    | 1.8        | No                 | 0            | Supplied by client |

### 3.3 Test Mode Applicability and Tested Channel Detail

#### WCDMA B5

| Test Item                       | Available Channel | Tested Channel   | Mode  |
|---------------------------------|-------------------|------------------|-------|
| ERP                             | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |
| Frequency Stability             | 4132 to 4233      | 4182             | WCDMA |
| Occupied Bandwidth              | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |
| Peak to Average Ratio           | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |
| Band Edge                       | 4132 to 4233      | 4132, 4233       | WCDMA |
| Conducted Emission              | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |
| Radiated Emission<br>Below 1GHz | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |
| Radiated Emission<br>Above 1GHz | 4132 to 4233      | 4132, 4182, 4233 | WCDMA |

## LTE Band 5

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION | MODE                |
|-----------------------|-------------------|---------------------|-------------------|------------|---------------------|
| ERP                   | 20407 to 20643    | 20407, 20525, 20643 | 1.4MHz            | QPSK/16QAM | 1RB / 0 RB Offset   |
|                       | 20415 to 20635    | 20415, 20525, 20635 | 3MHz              | QPSK/16QAM | 1RB / 0 RB Offset   |
|                       | 20425 to 20625    | 20425, 20525, 20625 | 5MHz              | QPSK/16QAM | 1RB / 0 RB Offset   |
|                       | 20450 to 20600    | 20450, 20525, 20600 | 10MHz             | QPSK/16QAM | 1RB / 0 RB Offset   |
| Frequency Stability   | 20407 to 20643    | 20525               | 1.4MHz            | QPSK       | -                   |
|                       | 20415 to 20635    | 20525               | 3MHz              | QPSK       | -                   |
|                       | 20425 to 20625    | 20525               | 5MHz              | QPSK       | -                   |
|                       | 20450 to 20600    | 20525               | 10MHz             | QPSK       | -                   |
| Occupied Bandwidth    | 20407 to 20643    | 20407, 20525, 20643 | 1.4MHz            | QPSK/16QAM | Full RB             |
|                       | 20415 to 20635    | 20415, 20525, 20635 | 3MHz              | QPSK/16QAM | Full RB             |
|                       | 20425 to 20625    | 20425, 20525, 20625 | 5MHz              | QPSK/16QAM | Full RB             |
|                       | 20450 to 20600    | 20450, 20525, 20600 | 10MHz             | QPSK/16QAM | Full RB             |
| Peak to Average Ratio | 20407 to 20643    | 20407, 20525, 20643 | 1.4MHz            | QPSK/16QAM | Full RB             |
|                       | 20415 to 20635    | 20415, 20525, 20635 | 3MHz              | QPSK/16QAM | Full RB             |
|                       | 20425 to 20625    | 20425, 20525, 20625 | 5MHz              | QPSK/16QAM | Full RB             |
|                       | 20450 to 20600    | 20450, 20525, 20600 | 10MHz             | QPSK/16QAM | Full RB             |
| Band Edge             | 20407 to 20643    | 20407               | 1.4MHz            | QPSK       | 1 RB / 0 RB Offset  |
|                       |                   | 20643               |                   |            | 1 RB / 5 RB Offset  |
|                       |                   | 20407, 20643        |                   |            | 6 RB / 0 RB Offset  |
|                       | 20415 to 20635    | 20415               | 3MHz              | QPSK       | 1 RB / 0 RB Offset  |
|                       |                   | 20635               |                   |            | 1 RB / 14 RB Offset |
|                       |                   | 20415, 20635        |                   |            | 15 RB / 0 RB Offset |
|                       | 20425 to 20625    | 20425               | 5MHz              | QPSK       | 1 RB / 0 RB Offset  |
|                       |                   | 20625               |                   |            | 1 RB / 24 RB Offset |
|                       |                   | 20425, 20625        |                   |            | 25 RB / 0 RB Offset |
|                       | 20450 to 20600    | 20450               | 10MHz             | QPSK       | 1 RB / 0 RB Offset  |
|                       |                   | 20600               |                   |            | 1 RB / 49 RB Offset |
|                       |                   | 20450, 20600        |                   |            | 50 RB / 0 RB Offset |
| Conducted Emission    | 20407 to 20643    | 20407, 20525, 20643 | 1.4MHz            | QPSK       | 1RB / 0 RB offset   |
|                       | 20415 to 20635    | 20415, 20525, 20635 | 3MHz              | QPSK       | 1RB / 0 RB offset   |
|                       | 20425 to 20625    | 20425, 20525, 20625 | 5MHz              | QPSK       | 1RB / 0 RB offset   |
|                       | 20450 to 20600    | 20450, 20525, 20600 | 10MHz             | QPSK       | 1RB / 0 RB offset   |
| Radiated Emission     | 20407 to 20643    | 20407, 20525, 20643 | 1.4MHz            | QPSK       | 1RB / 0 RB offset   |
|                       | 20415 to 20635    | 20415, 20525, 20635 | 3MHz              | QPSK       | 1RB / 0 RB offset   |
|                       | 20425 to 20625    | 20425, 20525, 20625 | 5MHz              | QPSK       | 1RB / 0 RB offset   |
|                       | 20450 to 20600    | 20450, 20525, 20600 | 10MHz             | QPSK       | 1RB / 0 RB offset   |

### Note:

All supported modulation types were evaluated. The Worst case of QPSK was selected. Therefore, the Band Edge, Frequency Stability, Condcudeted Emission and Radiated Emission were presented under QPSK mode only.

**Test Condition:**

| Test Item                       | Environmental Conditions | Input Power (System) | Tested By    |
|---------------------------------|--------------------------|----------------------|--------------|
| ERP                             | 25deg. C, 60%RH          | 120Vac, 60Hz         | Charlie Yang |
| Frequency Stability             | 25deg. C, 60%RH          | 120Vac, 60Hz         | Charlie Yang |
| Occupied Bandwidth              | 25deg. C, 60%RH          | 120Vac, 60Hz         | Charlie Yang |
| Band Edge                       | 25deg. C, 60%RH          | 120Vac, 60Hz         | Charlie Yang |
| Peak to Average Ratio           | 25deg. C, 60%RH          | 120Vac, 60Hz         | Charlie Yang |
| Conducuted Emission             | 25deg. C, 60%RH          | 120Vac, 60Hz         | Charlie Yang |
| Radiated Emission<br>Below 1GHz | 23deg. C, 74%RH          | 120Vac, 60Hz         | Tom Yang     |
| Radiated Emission<br>Above 1GHz | 23deg. C, 74%RH          | 120Vac, 60Hz         | Tom Yang     |

**3.4 EUT Operating Conditions**

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

### **3.5 General Description of Applied Standards and references**

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

**Test standard:**

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 22, Subpart H**

**ANSI/TIA/EIA-603-E 2016**

**ANSI 63.26-2015**

All test items have been performed and recorded as per the above standards.

**References Test Guidance:**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

All test items have been performed as a reference to the above KDB test guidance.

## 4 Test Types and Results

### 4.1 Output Power Measurement

#### 4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 watts e.r.p.

#### 4.1.2 Test Procedures

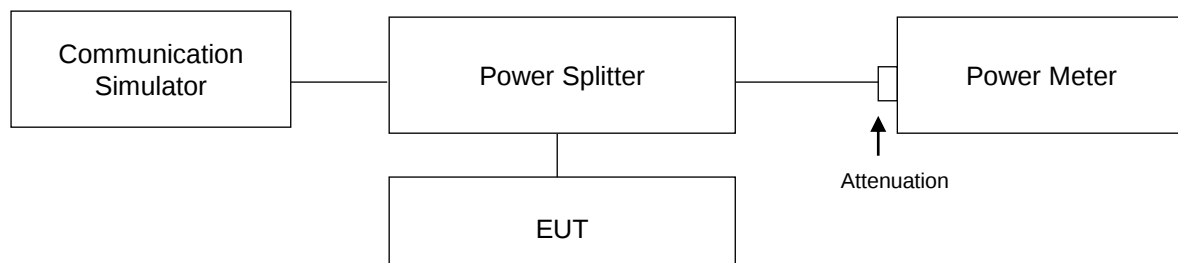
##### Conducted Power Measurement:

The EUT was set up for the maximum power with WCDMA / LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and difference RB size/ RB offset for difference bandwidth record the power level shown on power meter.

##### EIRP / ERP Measurement:

- EIRP = Conducted Output power level + Antenna gain.
- ERP power can be calculated form EIRP power by subtracting the gain of dipole, ERP power = EIRP power - 2.15dBi.
- ERP = Conducted Output power level + Antenna gain (dBi) - Isotropically Factor (2.15dB).

#### 4.1.3 Test Setup



#### 4.1.4 Test Results

#### CONDUCTED OUTPUT POWER (dBm)

##### WCDMA B5

| Band            | WCDMA B5 |       |       |
|-----------------|----------|-------|-------|
| Channel         | 4132     | 4182  | 4233  |
| Frequency (MHz) | 826.4    | 836.4 | 846.6 |
| RMC             | 24.72    | 24.85 | 24.81 |
| HSDPA Subtest-1 | 24.18    | 24.01 | 23.96 |
| HSDPA Subtest-2 | 23.68    | 23.25 | 23.73 |
| HSDPA Subtest-3 | 23.76    | 23.36 | 23.40 |
| HSDPA Subtest-4 | 23.33    | 23.21 | 23.60 |
| HSUPA Subtest-1 | 23.96    | 24.05 | 23.58 |
| HSUPA Subtest-2 | 23.75    | 23.96 | 23.74 |
| HSUPA Subtest-3 | 23.82    | 23.69 | 23.50 |
| HSUPA Subtest-4 | 23.58    | 23.49 | 23.92 |
| HSUPA Subtest-5 | 23.88    | 24.18 | 24.12 |

## LTE Band 5

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 20407  | 20525  | 20643   |               | 20407  | 20525  | 20643   |               |
|           |         |           | 824.7  | 836.5  | 848.3   |               | 824.7  | 836.5  | 848.3   |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 5 / 1.4M  | 1       | 0         | 24.21  | 24.05  | 24.10   | 0             | 22.85  | 23.22  | 23.05   | 1             |
|           | 1       | 2         | 23.82  | 24.03  | 24.13   | 0             | 23.08  | 23.32  | 23.19   | 1             |
|           | 1       | 5         | 23.78  | 24.12  | 23.87   | 0             | 22.89  | 23.30  | 22.93   | 1             |
|           | 3       | 0         | 23.80  | 23.97  | 24.15   | 0             | 22.75  | 22.96  | 23.10   | 1             |
|           | 3       | 1         | 23.93  | 24.01  | 24.07   | 0             | 23.06  | 22.98  | 23.14   | 1             |
|           | 3       | 3         | 23.77  | 24.04  | 24.14   | 0             | 23.01  | 23.03  | 23.18   | 1             |
|           | 6       | 0         | 23.18  | 23.14  | 23.13   | 1             | 22.19  | 22.09  | 22.08   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 20415  | 20525  | 20635   |               | 20415  | 20525  | 20635   |               |
|           |         |           | 825.5  | 836.5  | 847.5   |               | 825.5  | 836.5  | 847.5   |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 5 / 3M    | 1       | 0         | 24.28  | 24.19  | 24.14   | 0             | 23.23  | 22.82  | 23.17   | 1             |
|           | 1       | 7         | 24.16  | 24.13  | 24.24   | 0             | 23.32  | 23.05  | 23.31   | 1             |
|           | 1       | 14        | 24.21  | 24.18  | 24.23   | 0             | 23.24  | 23.19  | 23.21   | 1             |
|           | 8       | 0         | 22.98  | 22.82  | 23.10   | 1             | 21.73  | 22.10  | 22.04   | 2             |
|           | 8       | 3         | 23.12  | 23.07  | 23.08   | 1             | 21.90  | 21.98  | 21.85   | 2             |
|           | 8       | 7         | 23.09  | 22.91  | 23.10   | 1             | 21.88  | 22.16  | 21.85   | 2             |
|           | 15      | 0         | 23.22  | 22.92  | 23.04   | 1             | 22.23  | 22.17  | 22.03   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 20425  | 20525  | 20625   |               | 20425  | 20525  | 20625   |               |
|           |         |           | 826.5  | 836.5  | 846.5   |               | 826.5  | 836.5  | 846.5   |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 5 / 5M    | 1       | 0         | 24.08  | 24.03  | 24.06   | 0             | 23.12  | 23.07  | 23.02   | 1             |
|           | 1       | 12        | 23.90  | 23.91  | 23.89   | 0             | 22.90  | 22.87  | 23.05   | 1             |
|           | 1       | 24        | 23.98  | 23.87  | 23.78   | 0             | 22.84  | 22.96  | 22.89   | 1             |
|           | 12      | 0         | 22.79  | 22.94  | 22.99   | 1             | 21.69  | 21.78  | 21.92   | 2             |
|           | 12      | 6         | 22.88  | 22.85  | 23.01   | 1             | 21.77  | 21.87  | 21.89   | 2             |
|           | 12      | 13        | 22.85  | 22.81  | 23.05   | 1             | 21.69  | 21.84  | 21.86   | 2             |
|           | 25      | 0         | 22.91  | 22.84  | 22.76   | 1             | 21.61  | 21.84  | 21.92   | 2             |

| Band / BW | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|-----------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|           |         |           | 20450  | 20525  | 20600   |               | 20450  | 20525  | 20600   |               |
|           |         |           | 829    | 836.5  | 844     |               | 829    | 836.5  | 844     |               |
|           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 5 / 10M   | 1       | 0         | 24.10  | 23.96  | 23.75   | 0             | 23.04  | 22.98  | 23.22   | 1             |
|           | 1       | 24        | 24.07  | 24.03  | 23.97   | 0             | 23.06  | 23.15  | 23.16   | 1             |
|           | 1       | 49        | 24.05  | 23.87  | 24.07   | 0             | 23.24  | 22.85  | 23.18   | 1             |
|           | 25      | 0         | 22.91  | 23.05  | 22.91   | 1             | 21.89  | 22.08  | 21.89   | 2             |
|           | 25      | 12        | 22.98  | 22.97  | 22.91   | 1             | 21.99  | 21.97  | 21.73   | 2             |
|           | 25      | 25        | 22.91  | 22.81  | 22.96   | 1             | 21.91  | 21.70  | 21.78   | 2             |
|           | 50      | 0         | 22.96  | 23.02  | 22.95   | 1             | 21.87  | 21.95  | 21.76   | 2             |

## ERP POWER

### WCDMA B5

| Band                      | WCDMA B5 |       |       |
|---------------------------|----------|-------|-------|
| Channel                   | 4132     | 4182  | 4233  |
| Frequency (MHz)           | 826.4    | 836.4 | 846.6 |
| RMC 12.2K                 | 24.72    | 24.85 | 24.81 |
| Gain (dBi)                | 3.2      | 3.2   | 3.2   |
| Isotropically Factor (dB) | 2.15     | 2.15  | 2.15  |
| Max. ERP Power (dBm)      | 25.77    | 25.90 | 25.86 |

### LTE Band 5

| Band / BW                 | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|---------------------------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|                           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|                           |         |           | 20407  | 20525  | 20643   |               | 20407  | 20525  | 20643   |               |
|                           |         |           | 824.7  | 836.5  | 848.3   |               | 824.7  | 836.5  | 848.3   |               |
| 5 / 1.4M                  | 1       | 0         | MHz    | MHz    | MHz     | 0             | MHz    | MHz    | MHz     | 1             |
|                           |         |           | 24.21  | 24.05  | 24.10   |               | 22.85  | 23.22  | 23.05   |               |
| Gain (dBi)                |         |           | 3.2    | 3.2    | 3.2     |               | 3.2    | 3.2    | 3.2     |               |
| Isotropically Factor (dB) |         |           | 2.15   | 2.15   | 2.15    |               | 2.15   | 2.15   | 2.15    |               |
| Max. ERP Power (dBm)      |         |           | 25.26  | 25.10  | 25.15   |               | 23.90  | 24.27  | 24.10   |               |

| Band / BW                 | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|---------------------------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|                           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|                           |         |           | 20415  | 20525  | 20635   |               | 20415  | 20525  | 20635   |               |
|                           |         |           | 825.5  | 836.5  | 847.5   |               | 825.5  | 836.5  | 847.5   |               |
| 5 / 3M                    | 1       | 0         | MHz    | MHz    | MHz     | 0             | MHz    | MHz    | MHz     | 1             |
|                           |         |           | 24.28  | 24.19  | 24.14   |               | 23.23  | 22.82  | 23.17   |               |
| Gain (dBi)                |         |           | 3.2    | 3.2    | 3.2     |               | 3.2    | 3.2    | 3.2     |               |
| Isotropically Factor (dB) |         |           | 2.15   | 2.15   | 2.15    |               | 2.15   | 2.15   | 2.15    |               |
| Max. ERP Power (dBm)      |         |           | 25.33  | 25.24  | 25.19   |               | 24.28  | 23.87  | 24.22   |               |

| Band / BW                 | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|---------------------------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|                           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|                           |         |           | 20425  | 20525  | 20625   |               | 20425  | 20525  | 20625   |               |
|                           |         |           | 826.5  | 836.5  | 846.5   |               | 826.5  | 836.5  | 846.5   |               |
| 5 / 5M                    | 1       | 0         | MHz    | MHz    | MHz     | 0             | MHz    | MHz    | MHz     | 1             |
|                           |         |           | 24.08  | 24.03  | 24.06   |               | 23.12  | 23.07  | 23.02   |               |
| Gain (dBi)                |         |           | 3.2    | 3.2    | 3.2     |               | 3.2    | 3.2    | 3.2     |               |
| Isotropically Factor (dB) |         |           | 2.15   | 2.15   | 2.15    |               | 2.15   | 2.15   | 2.15    |               |
| Max. ERP Power (dBm)      |         |           | 25.13  | 25.08  | 25.11   |               | 24.17  | 24.12  | 24.07   |               |

| Band / BW                 | RB Size | RB Offset | QPSK   |        |         | 3GPP MPR (dB) | 16QAM  |        |         | 3GPP MPR (dB) |
|---------------------------|---------|-----------|--------|--------|---------|---------------|--------|--------|---------|---------------|
|                           |         |           | Low CH | Mid CH | High CH |               | Low CH | Mid CH | High CH |               |
|                           |         |           | 20450  | 20525  | 20600   |               | 20450  | 20525  | 20600   |               |
|                           |         |           | 829    | 836.5  | 844     |               | 829    | 836.5  | 844     |               |
|                           |         |           | MHz    | MHz    | MHz     |               | MHz    | MHz    | MHz     |               |
| 5 / 10M                   | 1       | 0         | 24.10  | 23.96  | 23.75   | 0             | 23.04  | 22.98  | 23.22   | 1             |
| Gain (dBi)                |         |           | 3.2    | 3.2    | 3.2     |               | 3.2    | 3.2    | 3.2     |               |
| Isotropically Factor (dB) |         |           | 2.15   | 2.15   | 2.15    |               | 2.15   | 2.15   | 2.15    |               |
| Max. ERP Power (dBm)      |         |           | 25.15  | 25.01  | 24.80   |               | 24.09  | 24.03  | 24.27   |               |

## 4.2 Modulation Characteristics Measurement

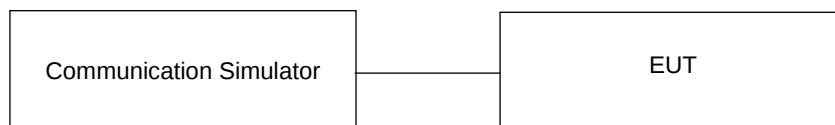
### 4.2.1 Limits of Modulation Characteristics

N/A

### 4.2.2 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

### 4.2.3 Test Setup





### 4.3 Frequency Stability Measurement

#### 4.3.1 Limits of Frequency Stability Measurement

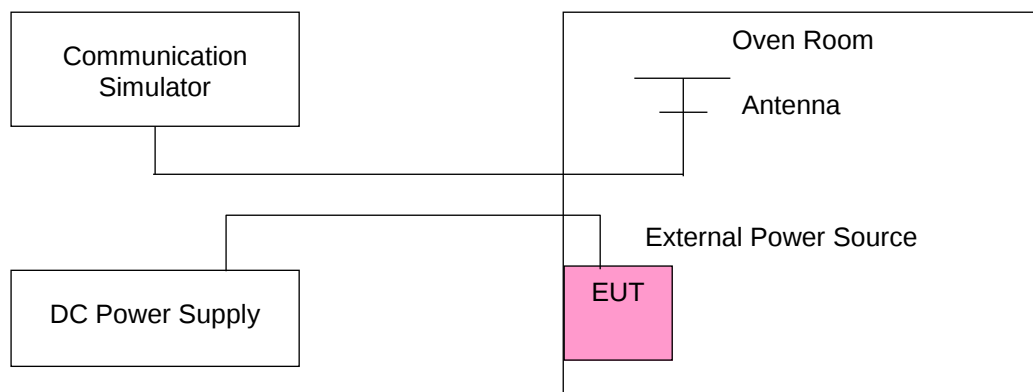
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

#### 4.3.2 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5$  °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

#### 4.3.3 Test Setup



#### 4.3.4 Test Results

##### WCDMA B5

##### Frequency Error vs. Voltage

| Voltage (Volts) | Test result (ppm) | Limit (ppm) | Pass / Fail |
|-----------------|-------------------|-------------|-------------|
| 3.3             | 0.029             | 2.5         | Pass        |
| 4.2             | 0.019             | 2.5         | Pass        |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.3Vdc to 4.2Vdc.

##### Frequency Error vs. Temperature.

| TEMP. (°C) | Test result (ppm) | Limit (ppm) | Pass / Fail |
|------------|-------------------|-------------|-------------|
| 60         | 0.057             | 2.5         | Pass        |
| 50         | -0.044            | 2.5         | Pass        |
| 40         | -0.014            | 2.5         | Pass        |
| 30         | -0.020            | 2.5         | Pass        |
| 20         | -0.008            | 2.5         | Pass        |
| 10         | -0.056            | 2.5         | Pass        |
| 0          | 0.041             | 2.5         | Pass        |
| -10        | 0.058             | 2.5         | Pass        |
| -20        | -0.003            | 2.5         | Pass        |
| -30        | -0.029            | 2.5         | Pass        |

## LTE Band 5

### Frequency Error vs. Voltage

| Voltage<br>(Volts) | Test result (ppm) |       |       |       | Limit<br>(ppm) | Pass / Fail |
|--------------------|-------------------|-------|-------|-------|----------------|-------------|
|                    | 1.4M              | 3M    | 5M    | 10M   |                |             |
| 3.3                | 0.038             | 0.054 | 0.051 | 0.033 | 2.5            | Pass        |
| 4.2                | 0.026             | 0.031 | 0.036 | 0.043 | 2.5            | Pass        |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.3Vdc to 4.2Vdc.

### Frequency Error vs. Temperature.

| TEMP. (°C) | Test result (ppm) |       |       |       | Limit<br>(ppm) | Pass / Fail |
|------------|-------------------|-------|-------|-------|----------------|-------------|
|            | 1.4M              | 3M    | 5M    | 10M   |                |             |
| 60         | 0.050             | 0.036 | 0.029 | 0.054 | 2.5            | Pass        |
| 50         | 0.059             | 0.030 | 0.031 | 0.024 | 2.5            | Pass        |
| 40         | 0.049             | 0.050 | 0.057 | 0.038 | 2.5            | Pass        |
| 30         | 0.026             | 0.025 | 0.053 | 0.056 | 2.5            | Pass        |
| 20         | 0.035             | 0.026 | 0.036 | 0.048 | 2.5            | Pass        |
| 10         | 0.035             | 0.025 | 0.038 | 0.039 | 2.5            | Pass        |
| 0          | 0.043             | 0.032 | 0.051 | 0.036 | 2.5            | Pass        |
| -10        | 0.026             | 0.026 | 0.044 | 0.043 | 2.5            | Pass        |
| -20        | 0.036             | 0.047 | 0.050 | 0.027 | 2.5            | Pass        |
| -30        | 0.036             | 0.055 | 0.041 | 0.050 | 2.5            | Pass        |

## 4.4 Emission Bandwidth Measurement

### 4.4.1 Test Procedure

All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. The bandwidth of the fundamental frequency was measured by spectrum analyzer with  $RBW \geq 1\% \times OBW$  and  $VBW \geq 3 \times VBW$ .

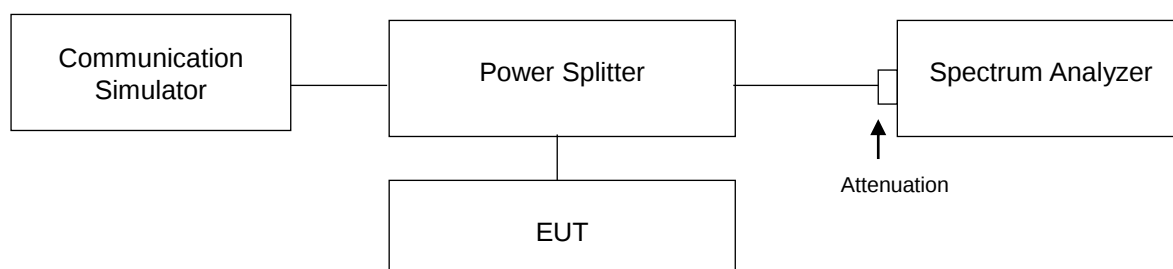
#### Occupied Bandwidth Measurement:

Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

#### 26dB Bandwidth Measurement:

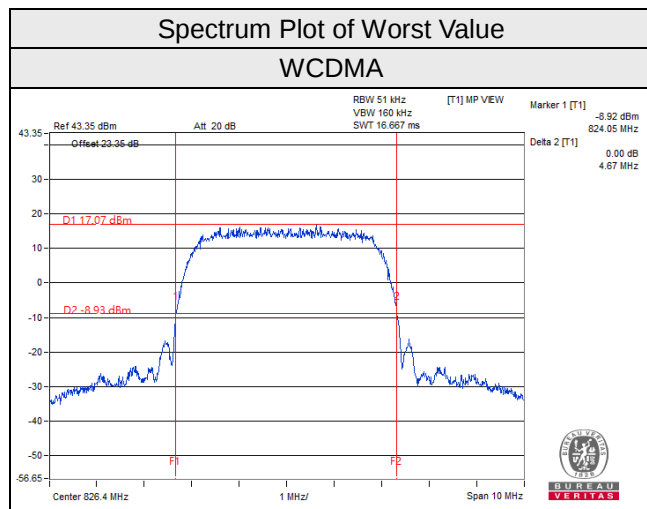
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26dB below the transmitter power.

### 4.4.2 Test Setup

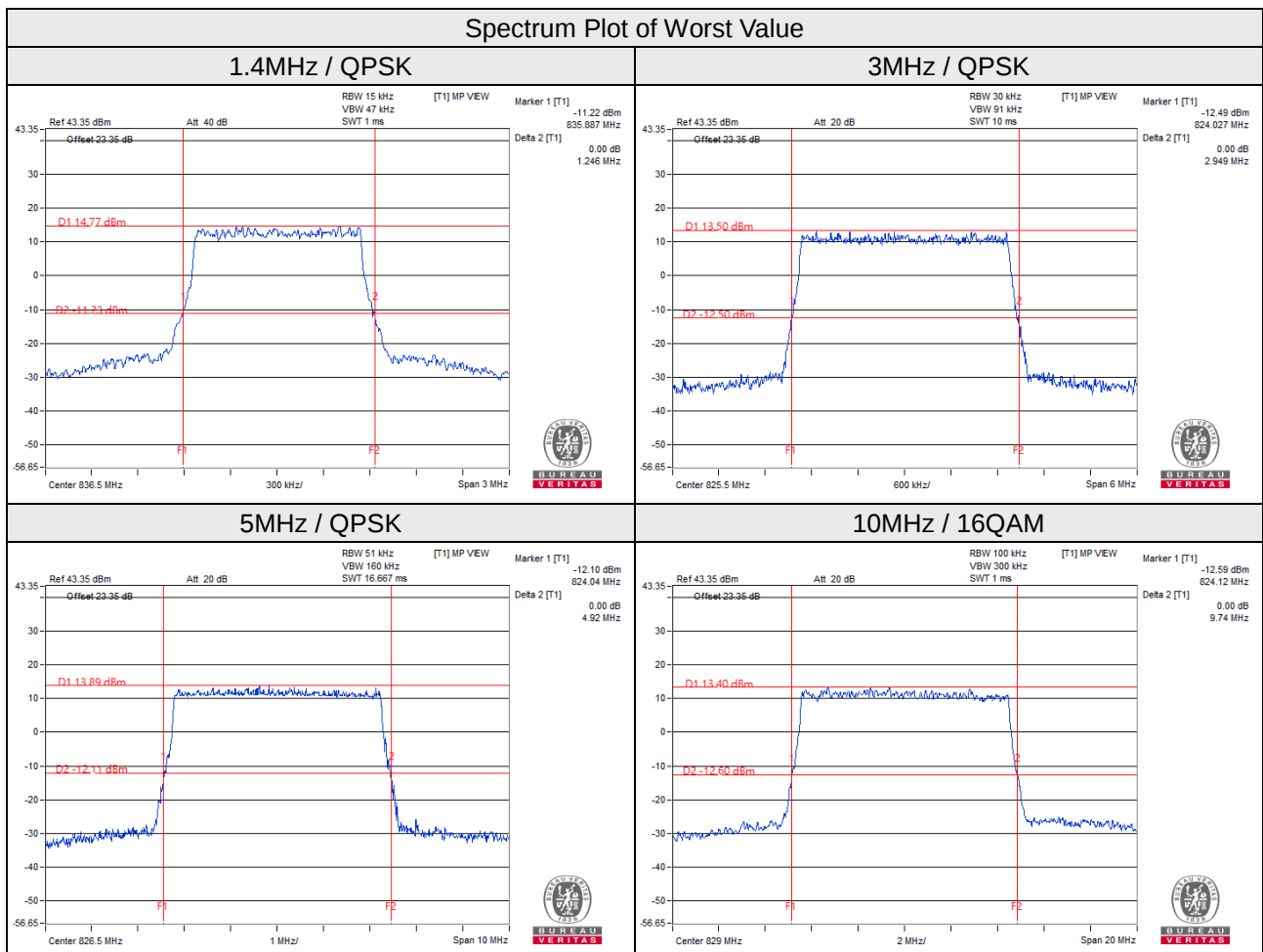


#### 4.4.3 Test Result (-26dB Bandwidth)

| WCDMA B5 |             |                       |
|----------|-------------|-----------------------|
| Channel  | Freq. (MHz) | -26dB Bandwidth (MHz) |
| 4132     | 826.4       | 4.67                  |
| 4182     | 836.4       | 4.65                  |
| 4233     | 846.6       | 4.65                  |

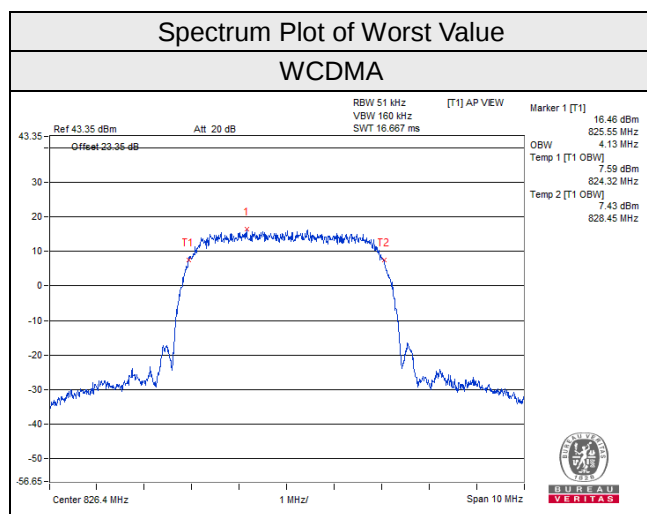


| LTE Band 5               |                 |                       |       |                         |                 |                       |       |
|--------------------------|-----------------|-----------------------|-------|-------------------------|-----------------|-----------------------|-------|
| Channel Bandwidth 1.4MHz |                 |                       |       | Channel Bandwidth 3MHz  |                 |                       |       |
| Channel                  | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | -26dB Bandwidth (MHz) |       |
|                          |                 | QPSK                  | 16QAM |                         |                 | QPSK                  | 16QAM |
| 20407                    | 824.7           | 1.22                  | 1.24  | 20415                   | 825.5           | 2.95                  | 2.91  |
| 20525                    | 836.5           | 1.25                  | 1.25  | 20525                   | 836.5           | 2.95                  | 2.92  |
| 20643                    | 848.3           | 1.23                  | 1.24  | 20635                   | 847.5           | 2.95                  | 2.92  |
| Channel Bandwidth 5MHz   |                 |                       |       | Channel Bandwidth 10MHz |                 |                       |       |
| Channel                  | Frequency (MHz) | -26dB Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | -26dB Bandwidth (MHz) |       |
|                          |                 | QPSK                  | 16QAM |                         |                 | QPSK                  | 16QAM |
| 20425                    | 826.5           | 4.92                  | 4.85  | 20450                   | 829             | 9.69                  | 9.74  |
| 20525                    | 836.5           | 4.91                  | 4.86  | 20525                   | 836.5           | 9.65                  | 9.69  |
| 20625                    | 846.5           | 4.88                  | 4.89  | 20600                   | 844             | 9.66                  | 9.72  |

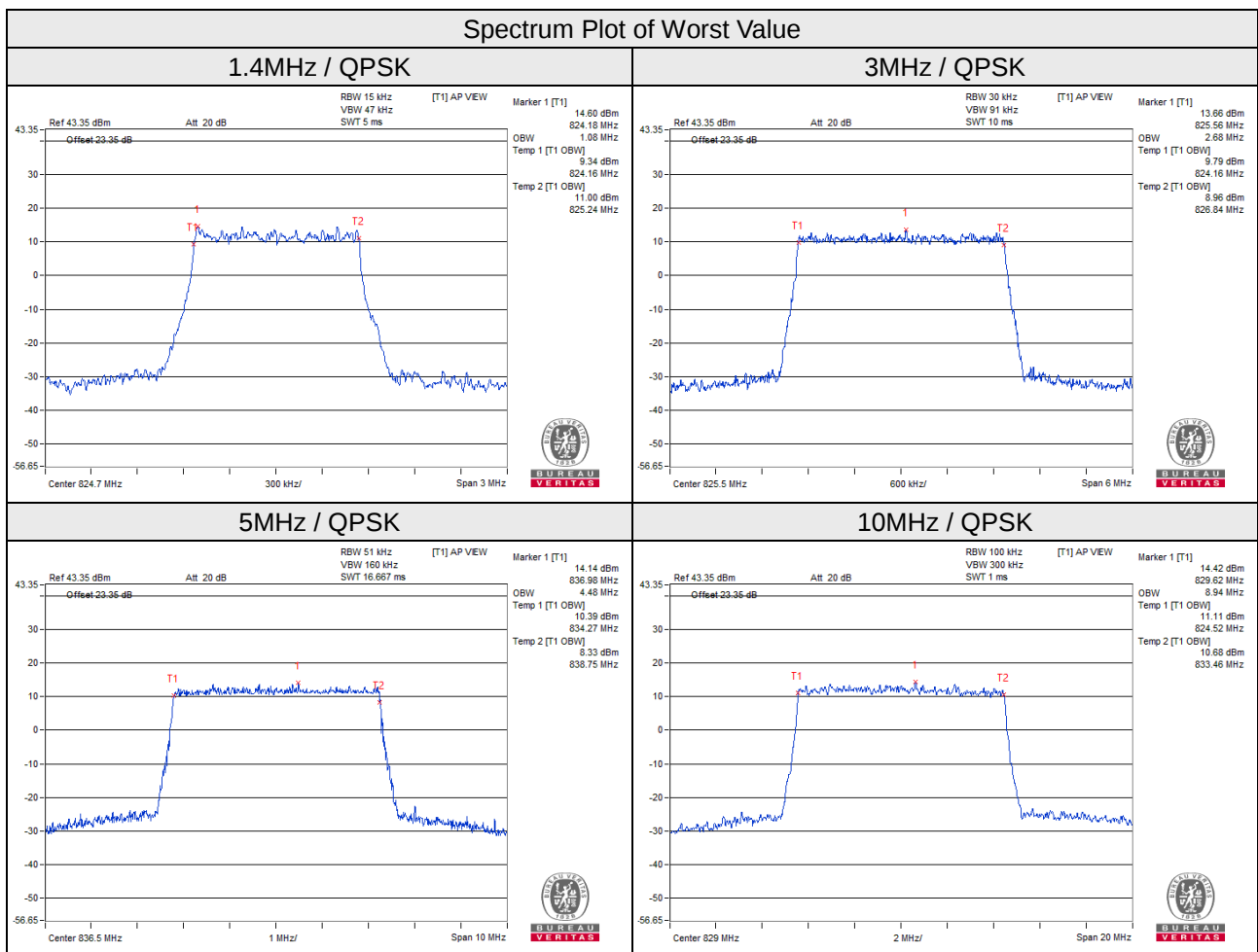


#### 4.4.4 Test Result (Occupied Bandwidth)

| WCDMA B5 |             |                              |
|----------|-------------|------------------------------|
| Channel  | Freq. (MHz) | 99% Occupied Bandwidth (MHz) |
| 4132     | 826.4       | 4.13                         |
| 4182     | 836.4       | 4.13                         |
| 4233     | 846.6       | 4.13                         |



| LTE Band 5               |                 |                              |       |                         |                 |                              |       |
|--------------------------|-----------------|------------------------------|-------|-------------------------|-----------------|------------------------------|-------|
| Channel Bandwidth 1.4MHz |                 |                              |       | Channel Bandwidth 3MHz  |                 |                              |       |
| Channel                  | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       |
|                          |                 | QPSK                         | 16QAM |                         |                 | QPSK                         | 16QAM |
| 20407                    | 824.7           | 1.08                         | 1.08  | 20415                   | 825.5           | 2.68                         | 2.68  |
| 20525                    | 836.5           | 1.08                         | 1.08  | 20525                   | 836.5           | 2.68                         | 2.68  |
| 20643                    | 848.3           | 1.08                         | 1.08  | 20635                   | 847.5           | 2.68                         | 2.68  |
| Channel Bandwidth 5MHz   |                 |                              |       | Channel Bandwidth 10MHz |                 |                              |       |
| Channel                  | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | Channel                 | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       |
|                          |                 | QPSK                         | 16QAM |                         |                 | QPSK                         | 16QAM |
| 20425                    | 826.5           | 4.45                         | 4.47  | 20450                   | 829             | 8.94                         | 8.92  |
| 20525                    | 836.5           | 4.48                         | 4.48  | 20525                   | 836.5           | 8.94                         | 8.94  |
| 20625                    | 846.5           | 4.47                         | 4.46  | 20600                   | 844             | 8.94                         | 8.92  |

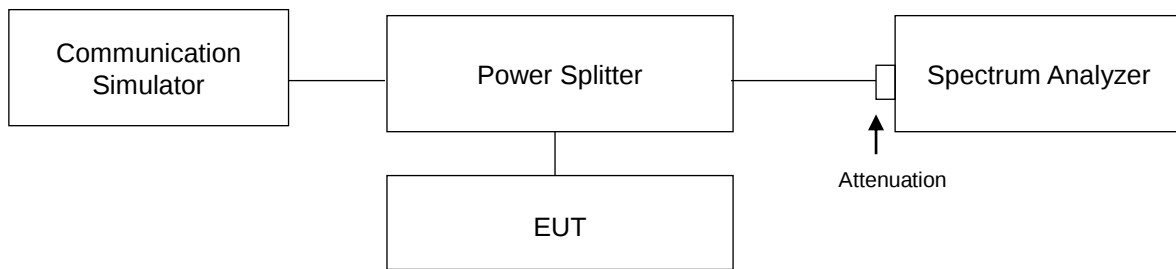


## 4.5 Band Edge Measurement

### 4.5.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

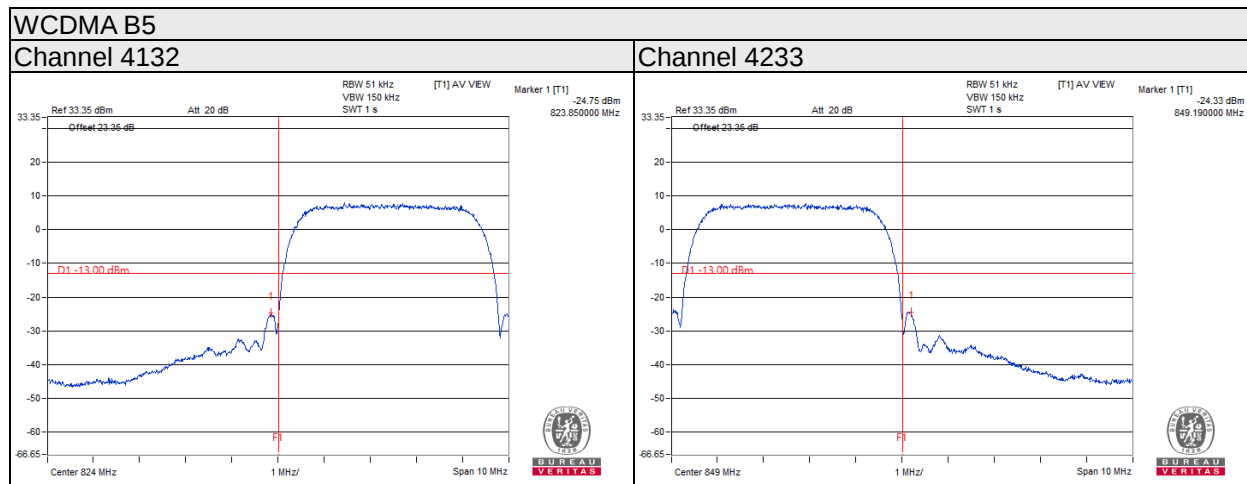
### 4.5.2 Test Setup



### 4.5.3 Test Procedures

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and RB of the spectrum is  $>1\%$  Emission Bandwidth and VB of the spectrum is  $\geq 3 \cdot RB$ .
- Record the max trace plot into the test report.

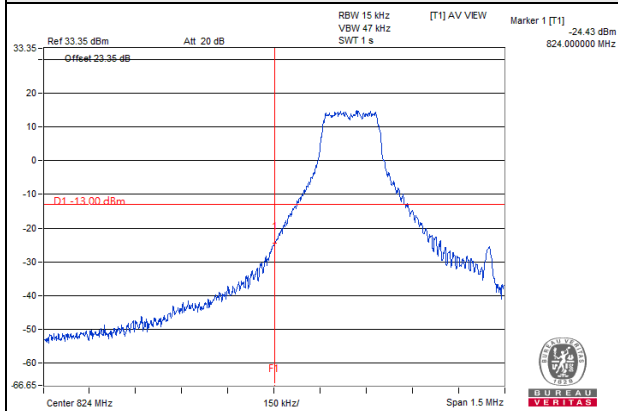
#### 4.5.4 Test Results



# LTE Band 5 Channel Bandwidth: 1.4MHz

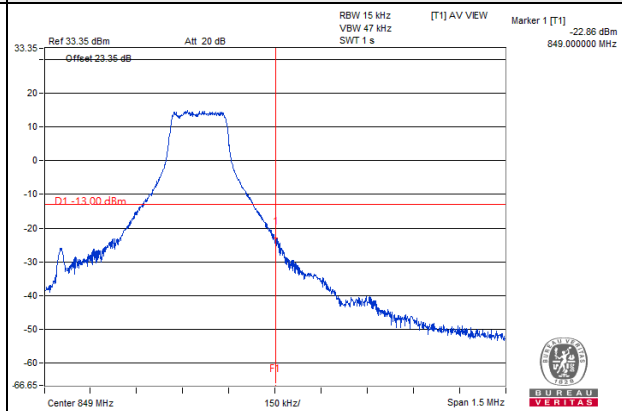
Channel 20407 824.7

1 RB

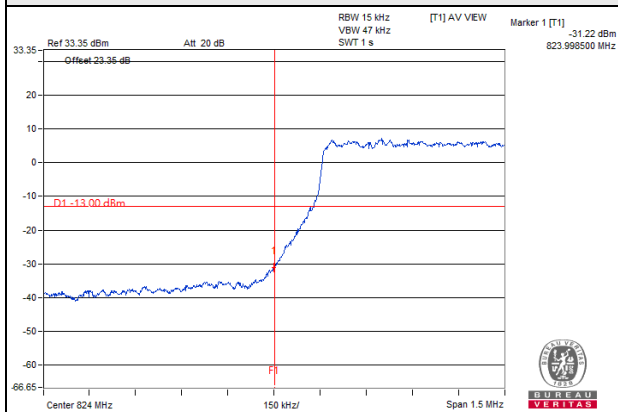


Channel 20643 848.3

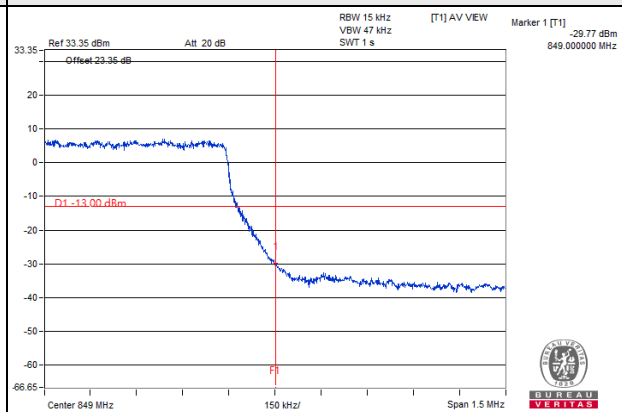
1 RB



6 RB



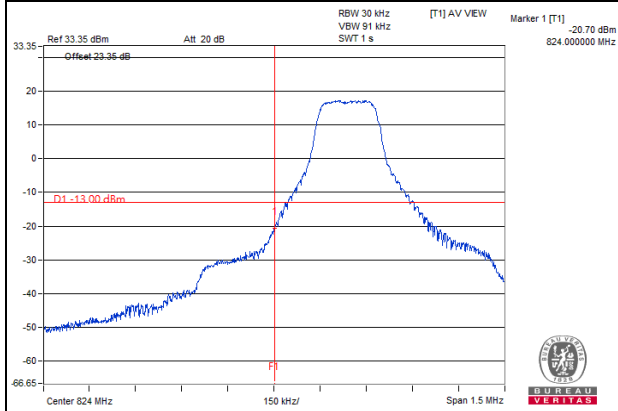
6 RB



# LTE Band 5 Channel Bandwidth: 3MHz

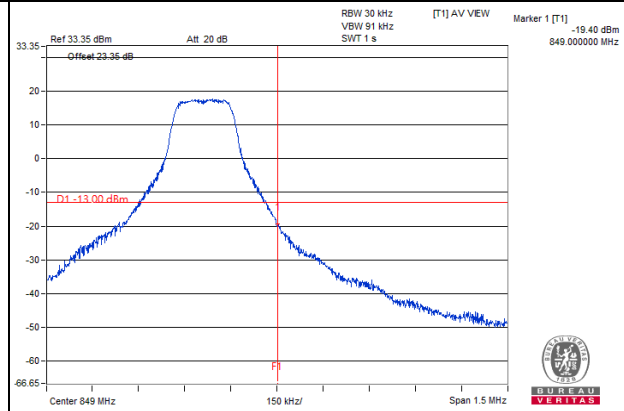
## Channel 20415

### 1 RB

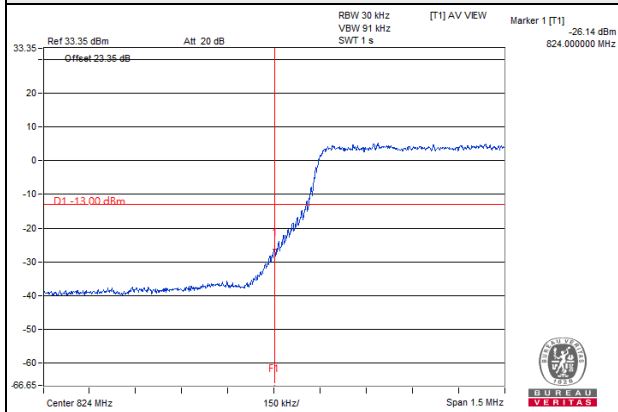


## Channel 20635

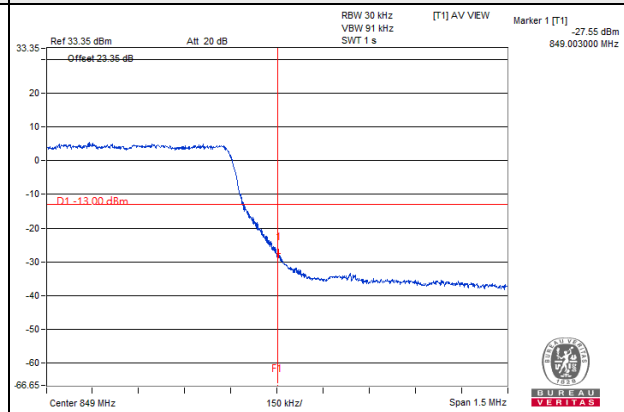
### 1 RB



### 15 RB



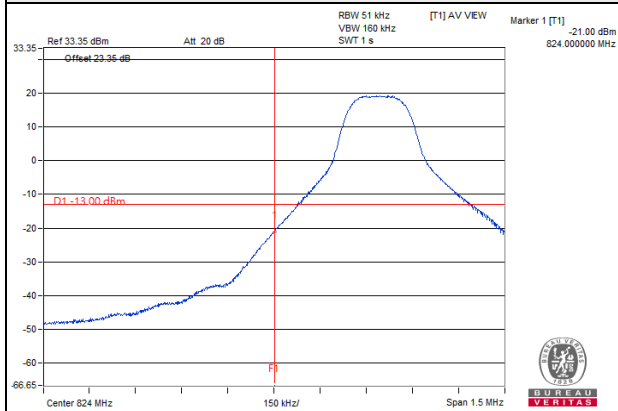
### 15 RB



# LTE Band 5 Channel Bandwidth: 5MHz

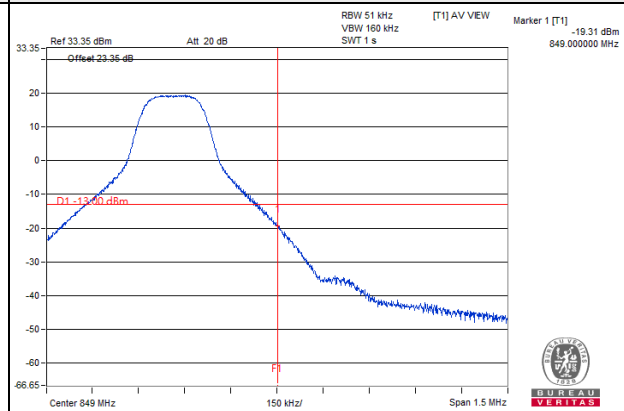
## Channel 20425

### 1 RB

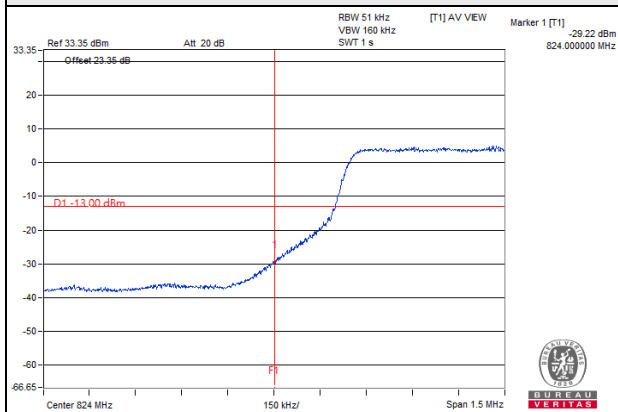


## Channel 20625

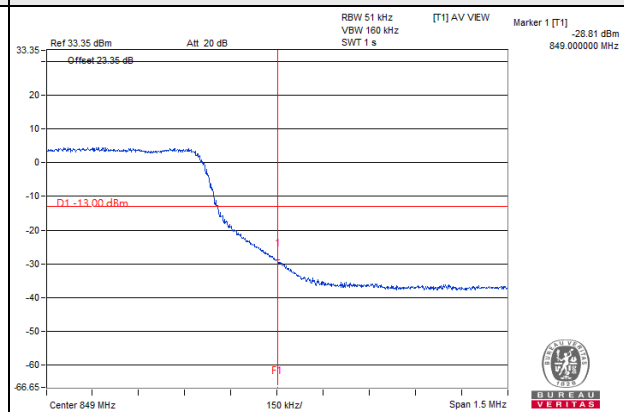
### 1 RB



### 25 RB



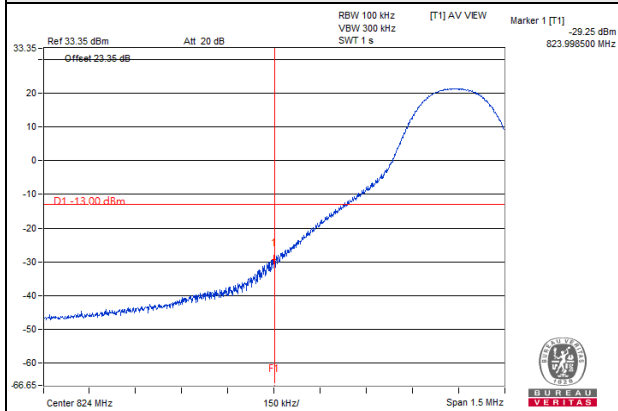
### 25 RB



# LTE Band 5 Channel Bandwidth: 10MHz

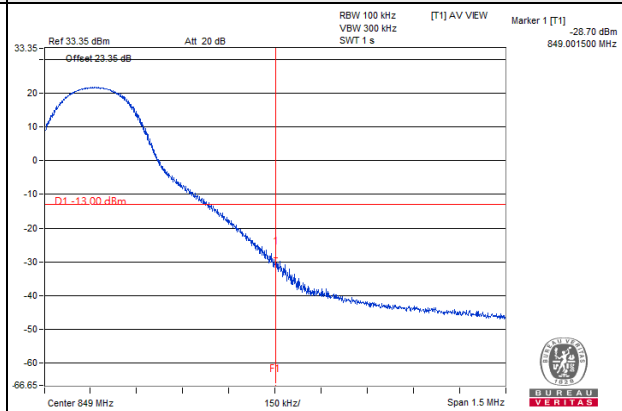
## Channel 20450

### 1 RB

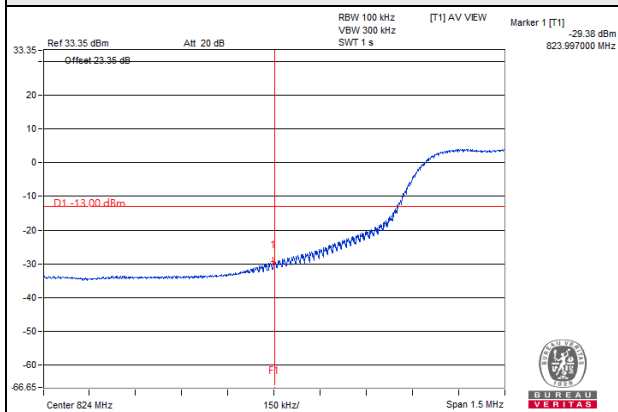


## Channel 20600

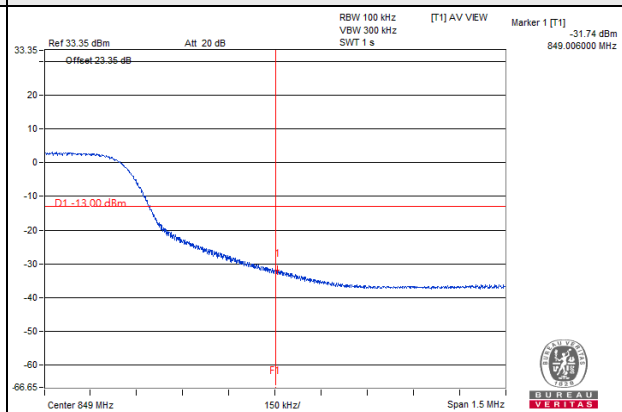
### 1 RB



### 50 RB



### 50 RB

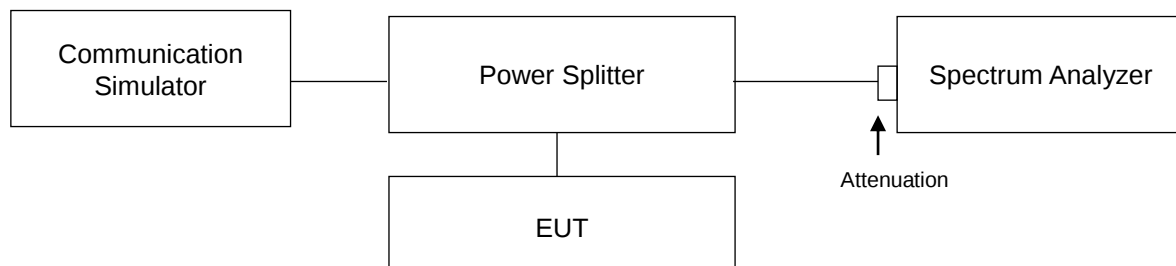


## 4.6 Peak to Average Ratio

### 4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

### 4.5.2 Test Setup

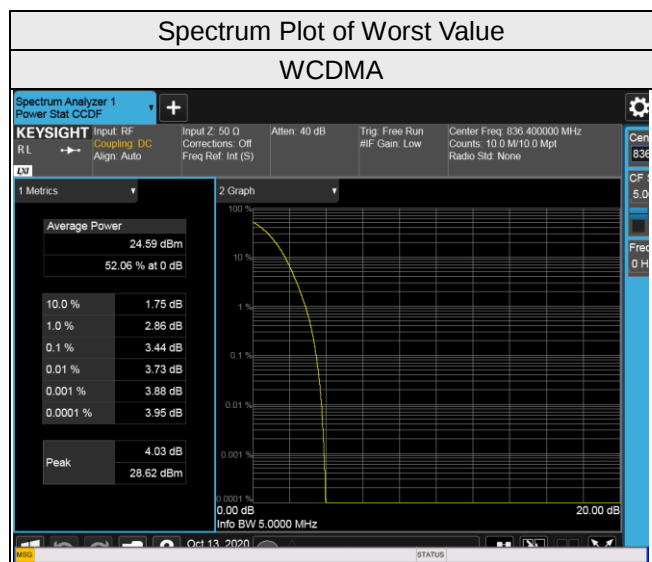


### 4.5.3 Test Procedures

1. Set resolution measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

#### 4.5.4 Test Results

| WCDMA B5 |             |                            |
|----------|-------------|----------------------------|
| Channel  | Freq. (MHz) | Peak to Average Ratio (dB) |
| 4132     | 826.4       | 3.31                       |
| 4183     | 836.4       | 3.44                       |
| 4233     | 846.6       | 3.28                       |



| LTE Band 5               |                 |                            |       |                         |                 |                            |       |
|--------------------------|-----------------|----------------------------|-------|-------------------------|-----------------|----------------------------|-------|
| Channel Bandwidth 1.4MHz |                 |                            |       | Channel Bandwidth 3MHz  |                 |                            |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |
|                          |                 | QPSK                       | 16QAM |                         |                 | QPSK                       | 16QAM |
| 20407                    | 824.7           | 5.52                       | 6.29  | 20415                   | 825.5           | 5.43                       | 6.28  |
| 20525                    | 836.5           | 5.74                       | 6.51  | 20525                   | 836.5           | 5.62                       | 6.46  |
| 20643                    | 848.3           | 5.51                       | 6.33  | 20635                   | 847.5           | 5.46                       | 6.33  |
| Channel Bandwidth 5MHz   |                 |                            |       | Channel Bandwidth 10MHz |                 |                            |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |
|                          |                 | QPSK                       | 16QAM |                         |                 | QPSK                       | 16QAM |
| 20425                    | 826.5           | 5.45                       | 6.31  | 20450                   | 829             | 5.56                       | 6.37  |
| 20525                    | 836.5           | 5.60                       | 6.44  | 20525                   | 836.5           | 5.58                       | 6.42  |
| 20625                    | 846.5           | 5.46                       | 6.31  | 20600                   | 844             | 5.41                       | 6.22  |

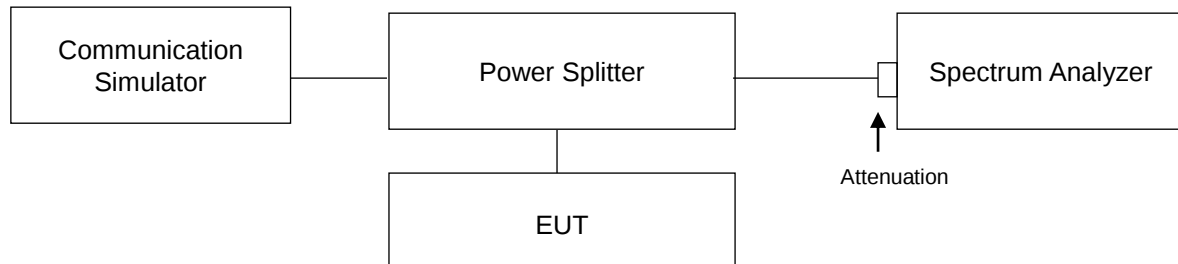


## 4.7 Conducted Spurious Emissions

### 4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

### 4.7.2 Test Setup



### 4.7.3 Test Procedure

- All measurements were done at 3 channels: low, middle and high operational frequency range.
- When the spectrum scanned from 9 kHz to the tenth harmonic of the highest fundamental frequency, it shall be connected to the 20dB pad attenuated the carried frequency.

#### 4.7.4 Test Results

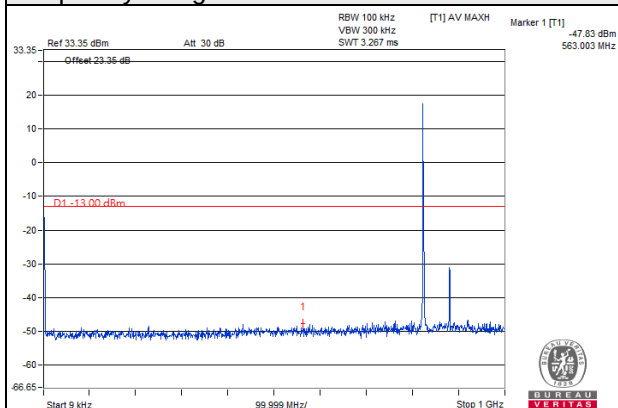


Note: The signal of 9kHz is IF signal from test instrument.

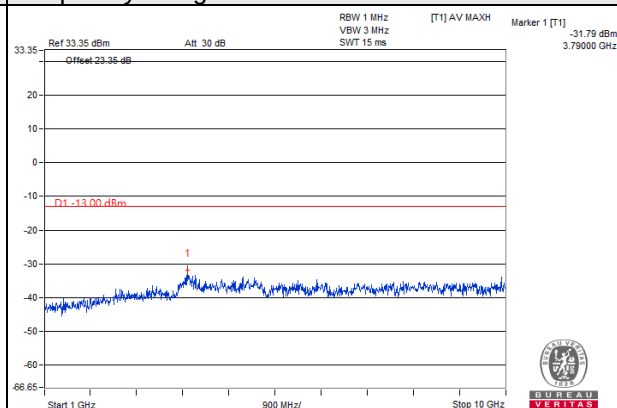
# LTE Band 5 Channel Bandwidth: 1.4MHz

## Channel 20407

### Frequency Range : 9kHz~1GHz

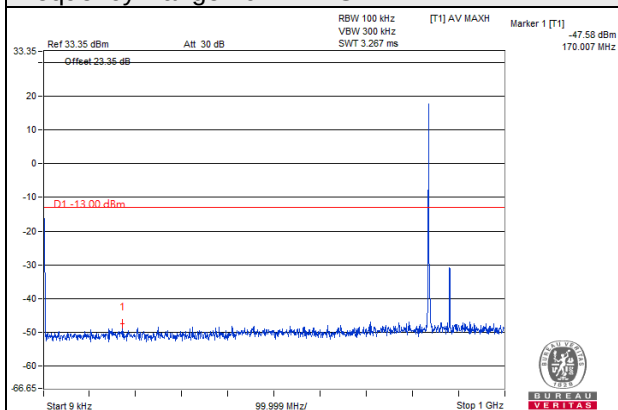


### Frequency Range : 1GHz~10GHz

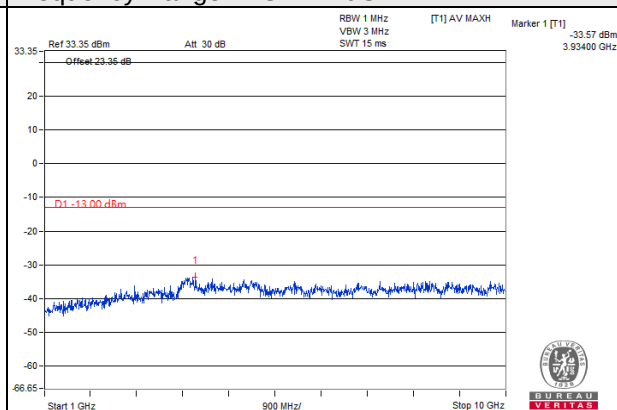


## Channel 20525

### Frequency Range : 9kHz~1GHz

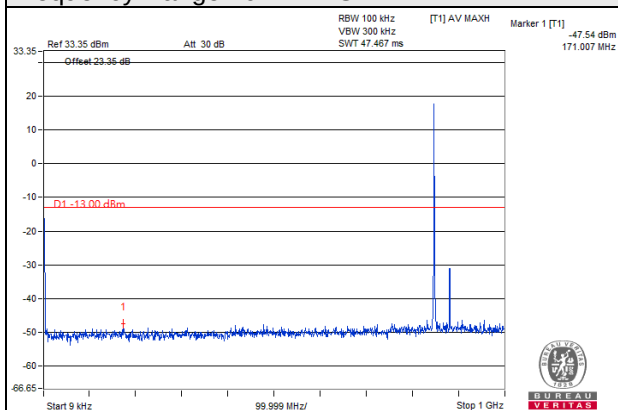


### Frequency Range : 1GHz~10GHz

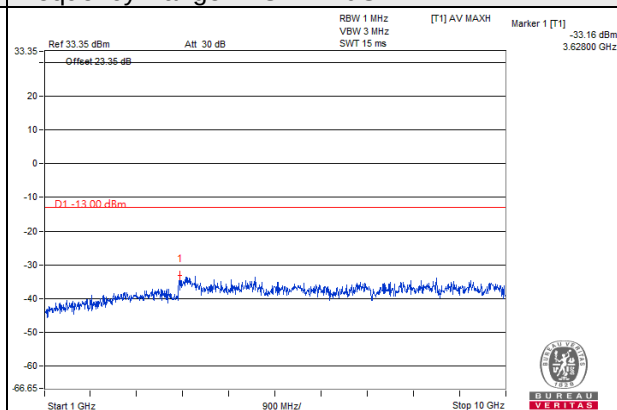


## Channel 20643

### Frequency Range : 9kHz~1GHz



### Frequency Range : 1GHz~10GHz

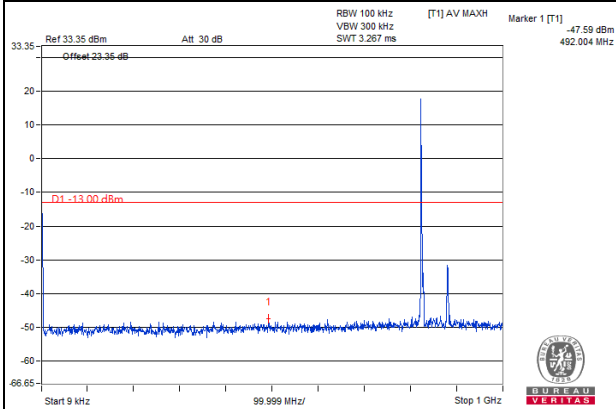


Note: The signal of 9kHz is IF signal from test instrument.

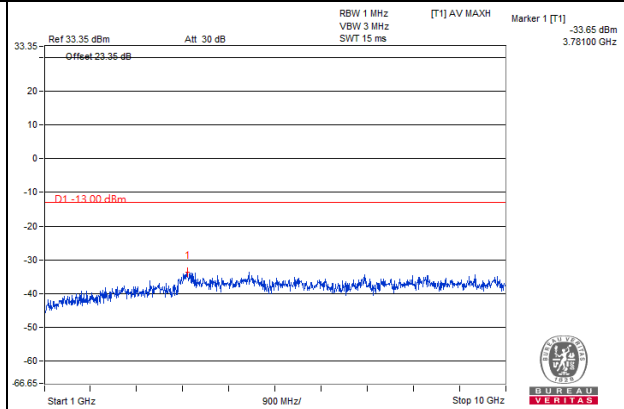
# LTE Band 5 Channel Bandwidth: 3MHz

## Channel 20415

### Frequency Range : 9kHz~1GHz

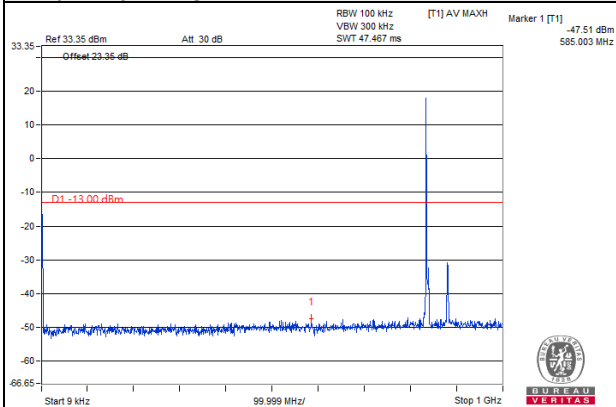


### Frequency Range : 1GHz~10GHz

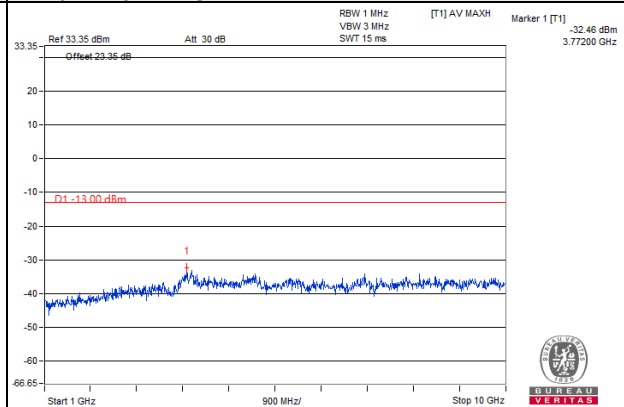


## Channel 20525

### Frequency Range : 9kHz~1GHz

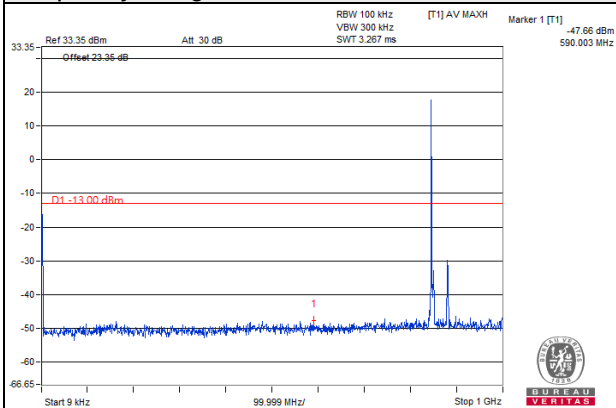


### Frequency Range : 1GHz~10GHz

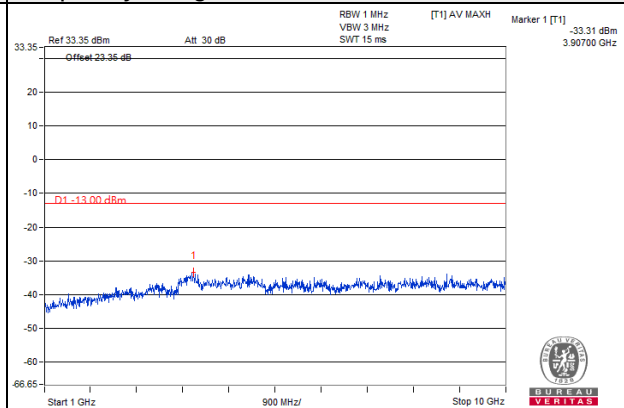


## Channel 20635

### Frequency Range : 9kHz~1GHz



### Frequency Range : 1GHz~10GHz

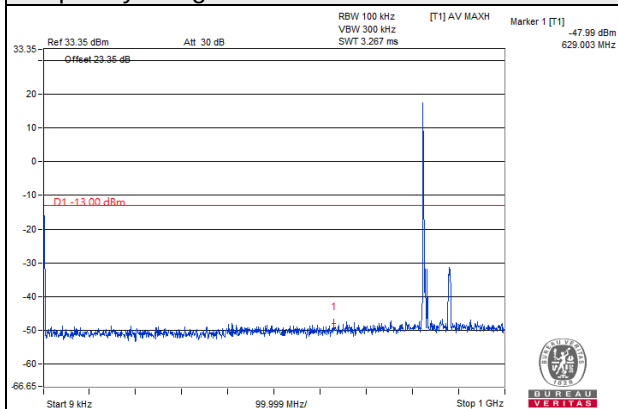


Note: The signal of 9kHz is IF signal from test instrument.

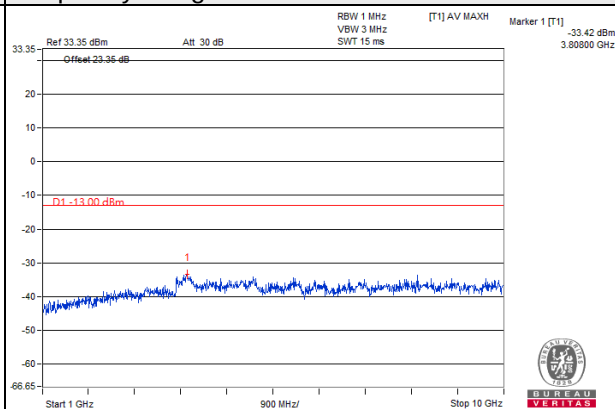
# LTE Band 5 Channel Bandwidth: 5MHz

## Channel 20425

Frequency Range : 9kHz~1GHz

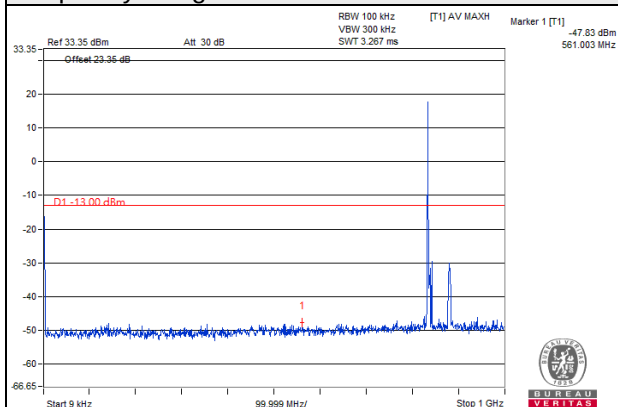


Frequency Range : 1GHz~10GHz

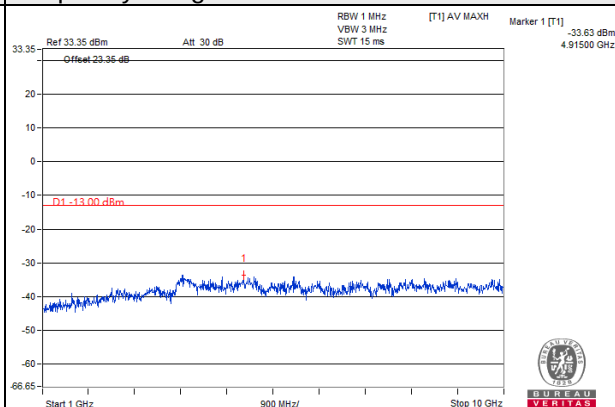


## Channel 20525

Frequency Range : 9kHz~1GHz

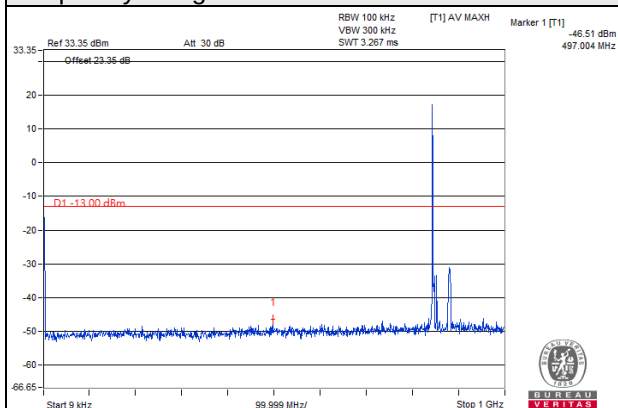


Frequency Range : 1GHz~10GHz

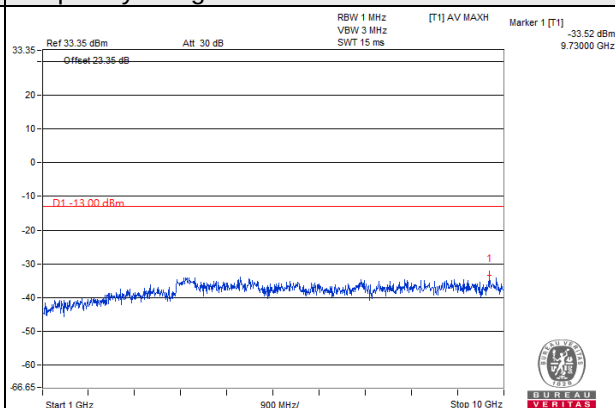


## Channel 20625

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~10GHz

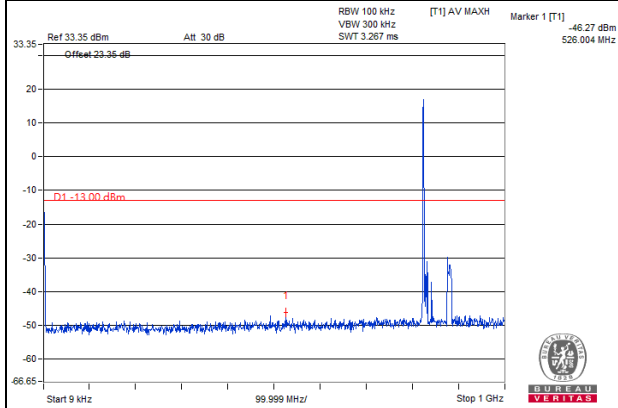


Note: The signal of 9kHz is IF signal from test instrument.

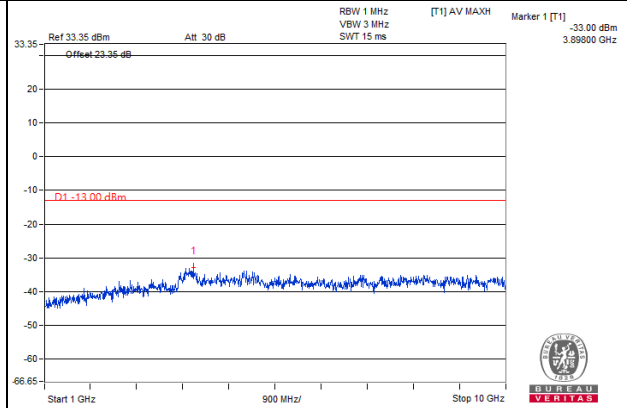
### LTE Band 5 Channel Bandwidth: 10MHz

#### Channel 20450

Frequency Range : 9kHz~1GHz

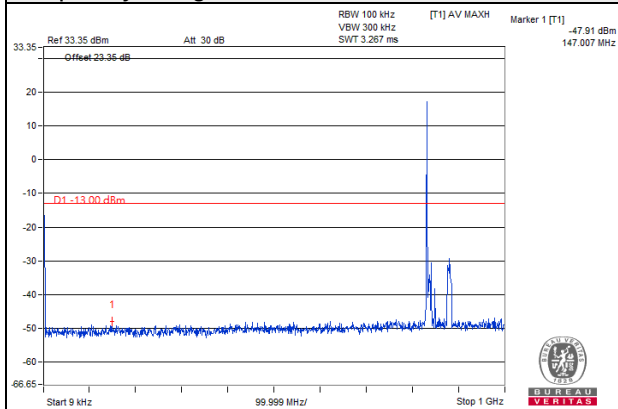


Frequency Range : 1GHz~10GHz

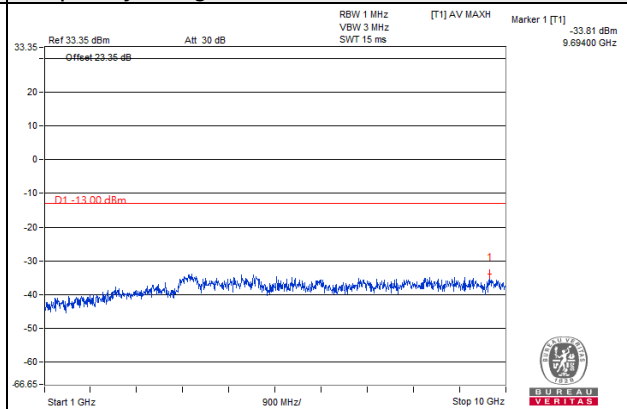


#### Channel 20525

Frequency Range : 9kHz~1GHz

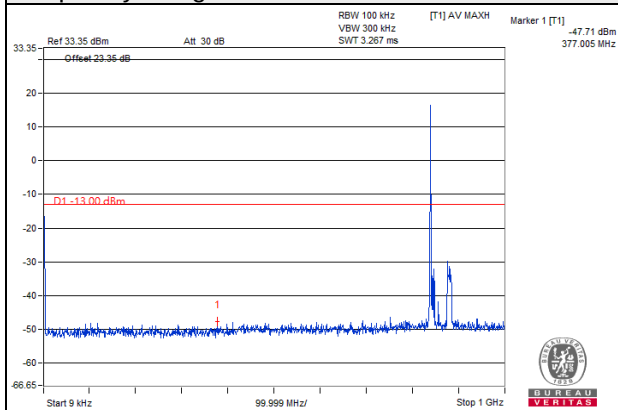


Frequency Range : 1GHz~10GHz

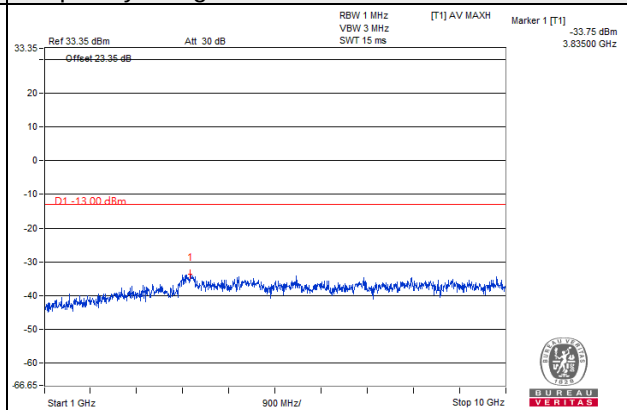


#### Channel 20600

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~10GHz



Note: The signal of 9kHz is IF signal from test instrument.

## 4.8 Radiated Emission Measurement

### 4.8.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

### 4.8.2 Test Procedure

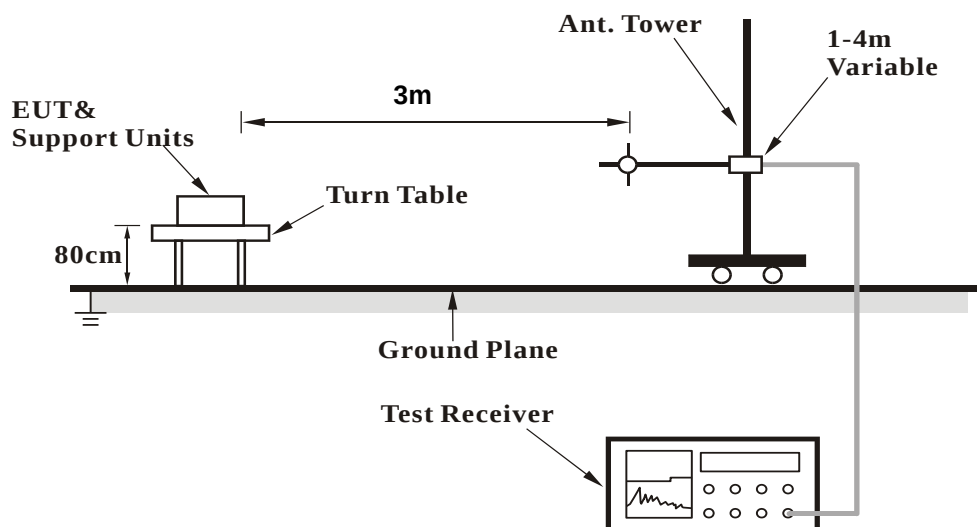
- a. The field strength was measured with Spectrum Analyzer.
- b. Measurement in the semi-anechoic chamber, EUT placed on the 0.8m/1.5m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor.
- c. Perform a field strength measurement and then mathematically convert the measured field strength level to EIRP level.
- d. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = Read Value (dB $\mu$ V/m) - Correction Factor @ 3m
- e. Correction Factor (dB) @ 3m =  $20\log(D) - 104.8$ ; where D is the measurement distance @3m =  $-95.26\text{dB}$

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

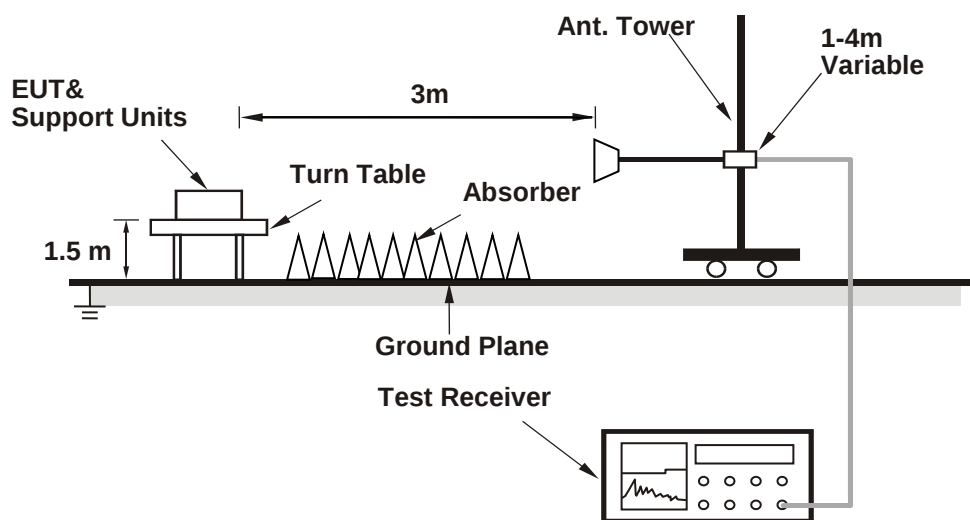
### 4.8.3 Deviation from Test Standard

No deviation.

#### 4.8.4 Test Setup For Below 1GHz



#### For Above 1GHz:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.8.5 Test Results

##### Below 1GHz

##### WCDMA B5:

|      |                 |                 |                |
|------|-----------------|-----------------|----------------|
| Mode | TX channel 4132 | Frequency Range | Below 1000 MHz |
|------|-----------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.53       | 29.82                  | -95.26                 | -65.44         | -13         | -52.44      |
| 2                                                   | 105.51      | 26.52                  | -95.26                 | -68.74         | -13         | -55.74      |
| 3                                                   | 179.2       | 25.62                  | -95.26                 | -69.64         | -13         | -56.64      |
| 4                                                   | 253.34      | 26.2                   | -95.26                 | -69.06         | -13         | -56.06      |
| 5                                                   | 303.65      | 27.43                  | -95.26                 | -67.83         | -13         | -54.83      |
| 6                                                   | 378.96      | 28.89                  | -95.26                 | -66.37         | -13         | -53.37      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.59       | 32.82                  | -95.26                 | -62.44         | -13         | -49.44      |
| 2                                                   | 105.78      | 30.14                  | -95.26                 | -65.12         | -13         | -52.12      |
| 3                                                   | 179.19      | 25.77                  | -95.26                 | -69.49         | -13         | -56.49      |
| 4                                                   | 253.56      | 26.36                  | -95.26                 | -68.90         | -13         | -55.90      |
| 5                                                   | 303.76      | 25.37                  | -95.26                 | -69.89         | -13         | -56.89      |
| 6                                                   | 379.13      | 27.8                   | -95.26                 | -67.46         | -13         | -54.46      |

##### Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m

|      |                 |                 |                |
|------|-----------------|-----------------|----------------|
| Mode | TX channel 4182 | Frequency Range | Below 1000 MHz |
|------|-----------------|-----------------|----------------|

**Antenna Polarity & Test Distance: Horizontal at 3 M**

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.47          | 29.79                     | -95.26                    | -65.47            | -13            | -52.47      |
| 2   | 105.55         | 26.48                     | -95.26                    | -68.78            | -13            | -55.78      |
| 3   | 179.15         | 25.6                      | -95.26                    | -69.66            | -13            | -56.66      |
| 4   | 253.32         | 26.18                     | -95.26                    | -69.08            | -13            | -56.08      |
| 5   | 303.62         | 27.4                      | -95.26                    | -67.86            | -13            | -54.86      |
| 6   | 378.97         | 28.86                     | -95.26                    | -66.40            | -13            | -53.40      |

**Antenna Polarity & Test Distance: Vertical at 3 M**

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.61          | 32.73                     | -95.26                    | -62.53            | -13            | -49.53      |
| 2   | 105.79         | 30.06                     | -95.26                    | -65.20            | -13            | -52.20      |
| 3   | 179.25         | 25.74                     | -95.26                    | -69.52            | -13            | -56.52      |
| 4   | 253.61         | 26.17                     | -95.26                    | -69.09            | -13            | -56.09      |
| 5   | 303.75         | 25.23                     | -95.26                    | -70.03            | -13            | -57.03      |
| 6   | 379.16         | 27.78                     | -95.26                    | -67.48            | -13            | -54.48      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

|      |                 |                 |                |
|------|-----------------|-----------------|----------------|
| Mode | TX channel 4233 | Frequency Range | Below 1000 MHz |
|------|-----------------|-----------------|----------------|

Antenna Polarity & Test Distance: Horizontal at 3 M

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.51          | 29.74                     | -95.26                    | -65.52            | -13            | -52.52      |
| 2   | 105.56         | 26.4                      | -95.26                    | -68.86            | -13            | -55.86      |
| 3   | 179.17         | 25.47                     | -95.26                    | -69.79            | -13            | -56.79      |
| 4   | 253.34         | 26.3                      | -95.26                    | -68.96            | -13            | -55.96      |
| 5   | 303.65         | 27.45                     | -95.26                    | -67.81            | -13            | -54.81      |
| 6   | 378.96         | 28.87                     | -95.26                    | -66.39            | -13            | -53.39      |

Antenna Polarity & Test Distance: Vertical at 3 M

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.54          | 32.67                     | -95.26                    | -62.59            | -13            | -49.59      |
| 2   | 105.78         | 29.93                     | -95.26                    | -65.33            | -13            | -52.33      |
| 3   | 179.19         | 25.85                     | -95.26                    | -69.41            | -13            | -56.41      |
| 4   | 253.57         | 26.22                     | -95.26                    | -69.04            | -13            | -56.04      |
| 5   | 303.74         | 25.34                     | -95.26                    | -69.92            | -13            | -56.92      |
| 6   | 379.12         | 27.82                     | -95.26                    | -67.44            | -13            | -54.44      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

# LTE Band 5: 1.4MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20407 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.67       | 29.68                  | -95.26                 | -65.58         | -13         | -52.58      |
| 2                                                   | 110.26      | 24.58                  | -95.26                 | -70.68         | -13         | -57.68      |
| 3                                                   | 154.8       | 24.5                   | -95.26                 | -70.76         | -13         | -57.76      |
| 4                                                   | 197.96      | 26.57                  | -95.26                 | -68.69         | -13         | -55.69      |
| 5                                                   | 310.25      | 24.68                  | -95.26                 | -70.58         | -13         | -57.58      |
| 6                                                   | 485.46      | 28.77                  | -95.26                 | -66.49         | -13         | -53.49      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.62       | 32.57                  | -95.26                 | -62.69         | -13         | -49.69      |
| 2                                                   | 48.24       | 29.72                  | -95.26                 | -65.54         | -13         | -52.54      |
| 3                                                   | 106.29      | 24.52                  | -95.26                 | -70.74         | -13         | -57.74      |
| 4                                                   | 159.98      | 26.17                  | -95.26                 | -69.09         | -13         | -56.09      |
| 5                                                   | 197.22      | 22.37                  | -95.26                 | -72.89         | -13         | -59.89      |
| 6                                                   | 380.56      | 26.46                  | -95.26                 | -68.80         | -13         | -55.80      |

## Remarks:

- Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
- Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

Antenna Polarity & Test Distance: Horizontal at 3 M

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.69          | 29.73                     | -95.26                    | -65.53            | -13            | -52.53      |
| 2   | 109.35         | 24.74                     | -95.26                    | -70.52            | -13            | -57.52      |
| 3   | 149.58         | 24.7                      | -95.26                    | -70.56            | -13            | -57.56      |
| 4   | 196.96         | 26.69                     | -95.26                    | -68.57            | -13            | -55.57      |
| 5   | 310.25         | 24.91                     | -95.26                    | -70.35            | -13            | -57.35      |
| 6   | 485.48         | 28.84                     | -95.26                    | -66.42            | -13            | -53.42      |

Antenna Polarity & Test Distance: Vertical at 3 M

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.58          | 32.65                     | -95.26                    | -62.61            | -13            | -49.61      |
| 2   | 48.35          | 29.9                      | -95.26                    | -65.36            | -13            | -52.36      |
| 3   | 106.35         | 24.73                     | -95.26                    | -70.53            | -13            | -57.53      |
| 4   | 159.98         | 26.29                     | -95.26                    | -68.97            | -13            | -55.97      |
| 5   | 197.18         | 22.44                     | -95.26                    | -72.82            | -13            | -59.82      |
| 6   | 380.53         | 26.67                     | -95.26                    | -68.59            | -13            | -55.59      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20643 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.47       | 29.82                  | -95.26                 | -65.44         | -13         | -52.44      |
| 2                                                   | 109.32      | 24.71                  | -95.26                 | -70.55         | -13         | -57.55      |
| 3                                                   | 149.56      | 24.6                   | -95.26                 | -70.66         | -13         | -57.66      |
| 4                                                   | 197.01      | 26.71                  | -95.26                 | -68.55         | -13         | -55.55      |
| 5                                                   | 310.14      | 24.77                  | -95.26                 | -70.49         | -13         | -57.49      |
| 6                                                   | 485.56      | 28.85                  | -95.26                 | -66.41         | -13         | -53.41      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.58       | 32.71                  | -95.26                 | -62.55         | -13         | -49.55      |
| 2                                                   | 48.42       | 29.87                  | -95.26                 | -65.39         | -13         | -52.39      |
| 3                                                   | 106.36      | 24.53                  | -95.26                 | -70.73         | -13         | -57.73      |
| 4                                                   | 159.96      | 26.4                   | -95.26                 | -68.86         | -13         | -55.86      |
| 5                                                   | 197.2       | 22.44                  | -95.26                 | -72.82         | -13         | -59.82      |
| 6                                                   | 380.62      | 26.61                  | -95.26                 | -68.65         | -13         | -55.65      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

# LTE Band 5: 3MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20415 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.47       | 30.05                  | -95.26                 | -65.21         | -13         | -52.21      |
| 2                                                   | 109.44      | 24.65                  | -95.26                 | -70.61         | -13         | -57.61      |
| 3                                                   | 149.67      | 24.7                   | -95.26                 | -70.56         | -13         | -57.56      |
| 4                                                   | 197.16      | 26.85                  | -95.26                 | -68.41         | -13         | -55.41      |
| 5                                                   | 310.35      | 25.02                  | -95.26                 | -70.24         | -13         | -57.24      |
| 6                                                   | 485.62      | 28.92                  | -95.26                 | -66.34         | -13         | -53.34      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.66       | 32.66                  | -95.26                 | -62.60         | -13         | -49.60      |
| 2                                                   | 48.35       | 29.73                  | -95.26                 | -65.53         | -13         | -52.53      |
| 3                                                   | 106.57      | 24.73                  | -95.26                 | -70.53         | -13         | -57.53      |
| 4                                                   | 160.07      | 26.4                   | -95.26                 | -68.86         | -13         | -55.86      |
| 5                                                   | 197.35      | 22.42                  | -95.26                 | -72.84         | -13         | -59.84      |
| 6                                                   | 380.72      | 26.65                  | -95.26                 | -68.61         | -13         | -55.61      |

## Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.56       | 30.13                  | -95.26                 | -65.13         | -13         | -52.13      |
| 2                                                   | 109.37      | 24.81                  | -95.26                 | -70.45         | -13         | -57.45      |
| 3                                                   | 149.61      | 24.81                  | -95.26                 | -70.45         | -13         | -57.45      |
| 4                                                   | 197.2       | 26.96                  | -95.26                 | -68.30         | -13         | -55.30      |
| 5                                                   | 310.24      | 25.22                  | -95.26                 | -70.04         | -13         | -57.04      |
| 6                                                   | 485.76      | 29.1                   | -95.26                 | -66.16         | -13         | -53.16      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.67       | 32.67                  | -95.26                 | -62.59         | -13         | -49.59      |
| 2                                                   | 48.47       | 29.84                  | -95.26                 | -65.42         | -13         | -52.42      |
| 3                                                   | 106.51      | 24.96                  | -95.26                 | -70.30         | -13         | -57.30      |
| 4                                                   | 160.16      | 26.51                  | -95.26                 | -68.75         | -13         | -55.75      |
| 5                                                   | 197.18      | 22.43                  | -95.26                 | -72.83         | -13         | -59.83      |
| 6                                                   | 380.64      | 26.84                  | -95.26                 | -68.42         | -13         | -55.42      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20635 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.63       | 30.22                  | -95.26                 | -65.04         | -13         | -52.04      |
| 2                                                   | 109.46      | 24.7                   | -95.26                 | -70.56         | -13         | -57.56      |
| 3                                                   | 149.73      | 24.9                   | -95.26                 | -70.36         | -13         | -57.36      |
| 4                                                   | 197.22      | 27.03                  | -95.26                 | -68.23         | -13         | -55.23      |
| 5                                                   | 310.31      | 25.09                  | -95.26                 | -70.17         | -13         | -57.17      |
| 6                                                   | 485.66      | 28.95                  | -95.26                 | -66.31         | -13         | -53.31      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.72       | 32.82                  | -95.26                 | -62.44         | -13         | -49.44      |
| 2                                                   | 48.6        | 29.78                  | -95.26                 | -65.48         | -13         | -52.48      |
| 3                                                   | 106.46      | 24.86                  | -95.26                 | -70.40         | -13         | -57.40      |
| 4                                                   | 160.09      | 26.5                   | -95.26                 | -68.76         | -13         | -55.76      |
| 5                                                   | 197.29      | 22.55                  | -95.26                 | -72.71         | -13         | -59.71      |
| 6                                                   | 380.6       | 26.87                  | -95.26                 | -68.39         | -13         | -55.39      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

# LTE Band 5: 5MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20425 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.67       | 30.95                  | -95.26                 | -64.31         | -13         | -51.31      |
| 2                                                   | 109.46      | 24.86                  | -95.26                 | -70.40         | -13         | -57.40      |
| 3                                                   | 149.69      | 24.95                  | -95.26                 | -70.31         | -13         | -57.31      |
| 4                                                   | 197.2       | 27                     | -95.26                 | -68.26         | -13         | -55.26      |
| 5                                                   | 310.4       | 25.26                  | -95.26                 | -70.00         | -13         | -57.00      |
| 6                                                   | 485.7       | 29.16                  | -95.26                 | -66.10         | -13         | -53.10      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.69       | 32.82                  | -95.26                 | -62.44         | -13         | -49.44      |
| 2                                                   | 48.6        | 29.87                  | -95.26                 | -65.39         | -13         | -52.39      |
| 3                                                   | 106.72      | 24.9                   | -95.26                 | -70.36         | -13         | -57.36      |
| 4                                                   | 160.11      | 26.49                  | -95.26                 | -68.77         | -13         | -55.77      |
| 5                                                   | 197.49      | 22.49                  | -95.26                 | -72.77         | -13         | -59.77      |
| 6                                                   | 380.95      | 26.79                  | -95.26                 | -68.47         | -13         | -55.47      |

## Remarks:

- Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
- Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

Antenna Polarity & Test Distance: Horizontal at 3 M

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.48          | 31.18                     | -95.26                    | -64.08            | -13            | -51.08      |
| 2   | 109.57         | 24.99                     | -95.26                    | -70.27            | -13            | -57.27      |
| 3   | 149.78         | 24.95                     | -95.26                    | -70.31            | -13            | -57.31      |
| 4   | 197.38         | 27.04                     | -95.26                    | -68.22            | -13            | -55.22      |
| 5   | 310.44         | 25.42                     | -95.26                    | -69.84            | -13            | -56.84      |
| 6   | 485.73         | 29.24                     | -95.26                    | -66.02            | -13            | -53.02      |

Antenna Polarity & Test Distance: Vertical at 3 M

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.84          | 32.84                     | -95.26                    | -62.42            | -13            | -49.42      |
| 2   | 48.5           | 29.99                     | -95.26                    | -65.27            | -13            | -52.27      |
| 3   | 106.65         | 25.02                     | -95.26                    | -70.24            | -13            | -57.24      |
| 4   | 160.31         | 26.56                     | -95.26                    | -68.70            | -13            | -55.70      |
| 5   | 197.45         | 22.57                     | -95.26                    | -72.69            | -13            | -59.69      |
| 6   | 380.96         | 26.92                     | -95.26                    | -68.34            | -13            | -55.34      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20625 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.72       | 31.17                  | -95.26                 | -64.09         | -13         | -51.09      |
| 2                                                   | 109.66      | 24.89                  | -95.26                 | -70.37         | -13         | -57.37      |
| 3                                                   | 149.76      | 25.2                   | -95.26                 | -70.06         | -13         | -57.06      |
| 4                                                   | 197.31      | 27.22                  | -95.26                 | -68.04         | -13         | -55.04      |
| 5                                                   | 310.42      | 25.31                  | -95.26                 | -69.95         | -13         | -56.95      |
| 6                                                   | 485.77      | 29.26                  | -95.26                 | -66.00         | -13         | -53.00      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.74       | 32.96                  | -95.26                 | -62.30         | -13         | -49.30      |
| 2                                                   | 48.45       | 30.1                   | -95.26                 | -65.16         | -13         | -52.16      |
| 3                                                   | 106.62      | 25.07                  | -95.26                 | -70.19         | -13         | -57.19      |
| 4                                                   | 160.14      | 26.61                  | -95.26                 | -68.65         | -13         | -55.65      |
| 5                                                   | 197.36      | 22.64                  | -95.26                 | -72.62         | -13         | -59.62      |
| 6                                                   | 380.75      | 26.88                  | -95.26                 | -68.38         | -13         | -55.38      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

# LTE Band 5: 10MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20450 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.57       | 30.85                  | -95.26                 | -64.41         | -13         | -51.41      |
| 2                                                   | 109.61      | 24.89                  | -95.26                 | -70.37         | -13         | -57.37      |
| 3                                                   | 149.76      | 25                     | -95.26                 | -70.26         | -13         | -57.26      |
| 4                                                   | 197.18      | 27.11                  | -95.26                 | -68.15         | -13         | -55.15      |
| 5                                                   | 310.44      | 25.45                  | -95.26                 | -69.81         | -13         | -56.81      |
| 6                                                   | 485.76      | 29.4                   | -95.26                 | -65.86         | -13         | -52.86      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.88       | 32.61                  | -95.26                 | -62.65         | -13         | -49.65      |
| 2                                                   | 48.76       | 29.97                  | -95.26                 | -65.29         | -13         | -52.29      |
| 3                                                   | 106.8       | 25.11                  | -95.26                 | -70.15         | -13         | -57.15      |
| 4                                                   | 160.19      | 26.61                  | -95.26                 | -68.65         | -13         | -55.65      |
| 5                                                   | 197.39      | 22.66                  | -95.26                 | -72.60         | -13         | -59.60      |
| 6                                                   | 380.85      | 26.91                  | -95.26                 | -68.35         | -13         | -55.35      |

## Remarks:

- Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
- Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

Antenna Polarity & Test Distance: Horizontal at 3 M

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.62          | 30.97                     | -95.26                    | -64.29            | -13            | -51.29      |
| 2   | 109.49         | 25.1                      | -95.26                    | -70.16            | -13            | -57.16      |
| 3   | 149.71         | 25.1                      | -95.26                    | -70.16            | -13            | -57.16      |
| 4   | 197.24         | 27.21                     | -95.26                    | -68.05            | -13            | -55.05      |
| 5   | 310.52         | 25.53                     | -95.26                    | -69.73            | -13            | -56.73      |
| 6   | 485.86         | 29.48                     | -95.26                    | -65.78            | -13            | -52.78      |

Antenna Polarity & Test Distance: Vertical at 3 M

| No. | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
|-----|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| 1   | 30.75          | 32.75                     | -95.26                    | -62.51            | -13            | -49.51      |
| 2   | 48.58          | 30.2                      | -95.26                    | -65.06            | -13            | -52.06      |
| 3   | 106.79         | 25.19                     | -95.26                    | -70.07            | -13            | -57.07      |
| 4   | 160.14         | 26.72                     | -95.26                    | -68.54            | -13            | -55.54      |
| 5   | 197.38         | 22.74                     | -95.26                    | -72.52            | -13            | -59.52      |
| 6   | 380.82         | 27.1                      | -95.26                    | -68.16            | -13            | -55.16      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20600 | Frequency Range | Below 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.78       | 30.92                  | -95.26                 | -64.34         | -13         | -51.34      |
| 2                                                   | 109.87      | 25.07                  | -95.26                 | -70.19         | -13         | -57.19      |
| 3                                                   | 150         | 25.14                  | -95.26                 | -70.12         | -13         | -57.12      |
| 4                                                   | 197.32      | 27.36                  | -95.26                 | -67.90         | -13         | -54.90      |
| 5                                                   | 310.52      | 25.51                  | -95.26                 | -69.75         | -13         | -56.75      |
| 6                                                   | 485.9       | 29.43                  | -95.26                 | -65.83         | -13         | -52.83      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 30.69       | 32.75                  | -95.26                 | -62.51         | -13         | -49.51      |
| 2                                                   | 48.52       | 30.16                  | -95.26                 | -65.10         | -13         | -52.10      |
| 3                                                   | 106.59      | 25.28                  | -95.26                 | -69.98         | -13         | -56.98      |
| 4                                                   | 160.11      | 26.84                  | -95.26                 | -68.42         | -13         | -55.42      |
| 5                                                   | 197.48      | 22.8                   | -95.26                 | -72.46         | -13         | -59.46      |
| 6                                                   | 380.97      | 27.08                  | -95.26                 | -68.18         | -13         | -55.18      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

# Above 1GHz

## WCDMA B5:

|      |                 |                 |                |
|------|-----------------|-----------------|----------------|
| Mode | TX channel 4132 | Frequency Range | Above 1000 MHz |
|------|-----------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |                |                           |                           |                   |                |             |
|-----------------------------------------------------|----------------|---------------------------|---------------------------|-------------------|----------------|-------------|
| No.                                                 | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
| 1                                                   | 1652.8         | 32.86                     | -95.26                    | -62.40            | -13            | -49.40      |
| 2                                                   | 2479.2         | 33.25                     | -95.26                    | -62.01            | -13            | -49.01      |
| 3                                                   | 3305.6         | 33.78                     | -95.26                    | -61.48            | -13            | -48.48      |
| 4                                                   | 4132           | 34.54                     | -95.26                    | -60.72            | -13            | -47.72      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |                |                           |                           |                   |                |             |
| No.                                                 | Freq.<br>(MHz) | Reading<br>(dB $\mu$ V/m) | Correction Factor<br>(dB) | Emission<br>(dBm) | Limit<br>(dBm) | Margin (dB) |
| 1                                                   | 1652.8         | 33.2                      | -95.26                    | -62.06            | -13            | -49.06      |
| 2                                                   | 2479.2         | 33.67                     | -95.26                    | -61.59            | -13            | -48.59      |
| 3                                                   | 3305.6         | 34.49                     | -95.26                    | -60.77            | -13            | -47.77      |
| 4                                                   | 4132           | 35.38                     | -95.26                    | -59.88            | -13            | -46.88      |

### Remarks:

- Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
- Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                 |                 |                |
|------|-----------------|-----------------|----------------|
| Mode | TX channel 4182 | Frequency Range | Above 1000 MHz |
|------|-----------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1672.8      | 32.86                  | -95.26                 | -62.40         | -13         | -49.40      |
| 2                                                   | 2509.2      | 33.29                  | -95.26                 | -61.97         | -13         | -48.97      |
| 3                                                   | 3345.6      | 33.88                  | -95.26                 | -61.38         | -13         | -48.38      |
| 4                                                   | 4182        | 34.4                   | -95.26                 | -60.86         | -13         | -47.86      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1672.8      | 33.41                  | -95.26                 | -61.85         | -13         | -48.85      |
| 2                                                   | 2509.2      | 33.84                  | -95.26                 | -61.42         | -13         | -48.42      |
| 3                                                   | 3345.6      | 34.37                  | -95.26                 | -60.89         | -13         | -47.89      |
| 4                                                   | 4182        | 35.35                  | -95.26                 | -59.91         | -13         | -46.91      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) - 104.8; where D is the measurement distance @3m.

|      |                 |                 |                |
|------|-----------------|-----------------|----------------|
| Mode | TX channel 4233 | Frequency Range | Above 1000 MHz |
|------|-----------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1693.2      | 32.63                  | -95.26                 | -62.63         | -13         | -49.63      |
| 2                                                   | 2539.8      | 33.16                  | -95.26                 | -62.10         | -13         | -49.10      |
| 3                                                   | 3386.4      | 33.87                  | -95.26                 | -61.39         | -13         | -48.39      |
| 4                                                   | 4233        | 34.35                  | -95.26                 | -60.91         | -13         | -47.91      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1693.2      | 33.2                   | -95.26                 | -62.06         | -13         | -49.06      |
| 2                                                   | 2539.8      | 33.68                  | -95.26                 | -61.58         | -13         | -48.58      |
| 3                                                   | 3386.4      | 34.42                  | -95.26                 | -60.84         | -13         | -47.84      |
| 4                                                   | 4233        | 35.24                  | -95.26                 | -60.02         | -13         | -47.02      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

### LTE Band 5: 1.4MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20407 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1649.4      | 32.14                  | -95.26                 | -63.12         | -13         | -50.12      |
| 2                                                   | 2474.1      | 32.46                  | -95.26                 | -62.80         | -13         | -49.80      |
| 3                                                   | 3298.8      | 32.84                  | -95.26                 | -62.42         | -13         | -49.42      |
| 4                                                   | 4123.5      | 33.27                  | -95.26                 | -61.99         | -13         | -48.99      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1649.4      | 32.21                  | -95.26                 | -63.05         | -13         | -50.05      |
| 2                                                   | 2474.1      | 32.63                  | -95.26                 | -62.63         | -13         | -49.63      |
| 3                                                   | 3298.8      | 33.17                  | -95.26                 | -62.09         | -13         | -49.09      |
| 4                                                   | 4123.5      | 33.5                   | -95.26                 | -61.76         | -13         | -48.76      |

#### Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 32.22                  | -95.26                 | -63.04         | -13         | -50.04      |
| 2                                                   | 2509.5      | 32.55                  | -95.26                 | -62.71         | -13         | -49.71      |
| 3                                                   | 3346        | 33.01                  | -95.26                 | -62.25         | -13         | -49.25      |
| 4                                                   | 4182.5      | 33.35                  | -95.26                 | -61.91         | -13         | -48.91      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 32.27                  | -95.26                 | -62.99         | -13         | -49.99      |
| 2                                                   | 2509.5      | 32.64                  | -95.26                 | -62.62         | -13         | -49.62      |
| 3                                                   | 3346        | 33.26                  | -95.26                 | -62.00         | -13         | -49.00      |
| 4                                                   | 4182.5      | 33.51                  | -95.26                 | -61.75         | -13         | -48.75      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20643 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1696.6      | 32.39                  | -95.26                 | -62.87         | -13         | -49.87      |
| 2                                                   | 2544.9      | 32.66                  | -95.26                 | -62.60         | -13         | -49.60      |
| 3                                                   | 3393.2      | 33.18                  | -95.26                 | -62.08         | -13         | -49.08      |
| 4                                                   | 4241.5      | 33.71                  | -95.26                 | -61.55         | -13         | -48.55      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1696.6      | 32.18                  | -95.26                 | -63.08         | -13         | -50.08      |
| 2                                                   | 2544.9      | 32.64                  | -95.26                 | -62.62         | -13         | -49.62      |
| 3                                                   | 3393.2      | 32.89                  | -95.26                 | -62.37         | -13         | -49.37      |
| 4                                                   | 4241.5      | 33.47                  | -95.26                 | -61.79         | -13         | -48.79      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

### LTE Band 5: 3MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20415 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1651        | 32.24                  | -95.26                 | -63.02         | -13         | -50.02      |
| 2                                                   | 2476.5      | 32.58                  | -95.26                 | -62.68         | -13         | -49.68      |
| 3                                                   | 3302        | 33.04                  | -95.26                 | -62.22         | -13         | -49.22      |
| 4                                                   | 4127.5      | 33.28                  | -95.26                 | -61.98         | -13         | -48.98      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1651        | 32.46                  | -95.26                 | -62.80         | -13         | -49.80      |
| 2                                                   | 2476.5      | 32.83                  | -95.26                 | -62.43         | -13         | -49.43      |
| 3                                                   | 3302        | 33.19                  | -95.26                 | -62.07         | -13         | -49.07      |
| 4                                                   | 4127.5      | 33.66                  | -95.26                 | -61.60         | -13         | -48.60      |

#### Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 32.38                  | -95.26                 | -62.88         | -13         | -49.88      |
| 2                                                   | 2509.5      | 32.67                  | -95.26                 | -62.59         | -13         | -49.59      |
| 3                                                   | 3346        | 32.87                  | -95.26                 | -62.39         | -13         | -49.39      |
| 4                                                   | 4182.5      | 33.39                  | -95.26                 | -61.87         | -13         | -48.87      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 32.25                  | -95.26                 | -63.01         | -13         | -50.01      |
| 2                                                   | 2509.5      | 32.79                  | -95.26                 | -62.47         | -13         | -49.47      |
| 3                                                   | 3346        | 33.35                  | -95.26                 | -61.91         | -13         | -48.91      |
| 4                                                   | 4182.5      | 33.51                  | -95.26                 | -61.75         | -13         | -48.75      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20635 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1695        | 32.32                  | -95.26                 | -62.94         | -13         | -49.94      |
| 2                                                   | 2542.5      | 32.64                  | -95.26                 | -62.62         | -13         | -49.62      |
| 3                                                   | 3390        | 33.07                  | -95.26                 | -62.19         | -13         | -49.19      |
| 4                                                   | 4237.5      | 33.51                  | -95.26                 | -61.75         | -13         | -48.75      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1695        | 32.44                  | -95.26                 | -62.82         | -13         | -49.82      |
| 2                                                   | 2542.5      | 32.78                  | -95.26                 | -62.48         | -13         | -49.48      |
| 3                                                   | 3390        | 33.42                  | -95.26                 | -61.84         | -13         | -48.84      |
| 4                                                   | 4237.5      | 33.58                  | -95.26                 | -61.68         | -13         | -48.68      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

### LTE Band 5: 5MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20425 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1653        | 32.21                  | -95.26                 | -63.05         | -13         | -50.05      |
| 2                                                   | 2479.5      | 32.62                  | -95.26                 | -62.64         | -13         | -49.64      |
| 3                                                   | 3306        | 32.95                  | -95.26                 | -62.31         | -13         | -49.31      |
| 4                                                   | 4132.5      | 33.27                  | -95.26                 | -61.99         | -13         | -48.99      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1653        | 32.32                  | -95.26                 | -62.94         | -13         | -49.94      |
| 2                                                   | 2479.5      | 32.75                  | -95.26                 | -62.51         | -13         | -49.51      |
| 3                                                   | 3306        | 33.26                  | -95.26                 | -62.00         | -13         | -49.00      |
| 4                                                   | 4132.5      | 33.73                  | -95.26                 | -61.53         | -13         | -48.53      |

#### Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 32.37                  | -95.26                 | -62.89         | -13         | -49.89      |
| 2                                                   | 2509.5      | 32.46                  | -95.26                 | -62.80         | -13         | -49.80      |
| 3                                                   | 3346        | 32.94                  | -95.26                 | -62.32         | -13         | -49.32      |
| 4                                                   | 4182.5      | 33.43                  | -95.26                 | -61.83         | -13         | -48.83      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 32.31                  | -95.26                 | -62.95         | -13         | -49.95      |
| 2                                                   | 2509.5      | 32.72                  | -95.26                 | -62.54         | -13         | -49.54      |
| 3                                                   | 3346        | 33.21                  | -95.26                 | -62.05         | -13         | -49.05      |
| 4                                                   | 4182.5      | 33.61                  | -95.26                 | -61.65         | -13         | -48.65      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20625 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1693        | 32.23                  | -95.26                 | -63.03         | -13         | -50.03      |
| 2                                                   | 2539.5      | 32.55                  | -95.26                 | -62.71         | -13         | -49.71      |
| 3                                                   | 3386        | 32.9                   | -95.26                 | -62.36         | -13         | -49.36      |
| 4                                                   | 4232.5      | 33.28                  | -95.26                 | -61.98         | -13         | -48.98      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1693        | 32.27                  | -95.26                 | -62.99         | -13         | -49.99      |
| 2                                                   | 2539.5      | 32.73                  | -95.26                 | -62.53         | -13         | -49.53      |
| 3                                                   | 3386        | 33.32                  | -95.26                 | -61.94         | -13         | -48.94      |
| 4                                                   | 4232.5      | 33.74                  | -95.26                 | -61.52         | -13         | -48.52      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

# LTE Band 5: 10MHz

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20450 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1658        | 32.28                  | -95.26                 | -62.98         | -13         | -49.98      |
| 2                                                   | 2487        | 32.53                  | -95.26                 | -62.73         | -13         | -49.73      |
| 3                                                   | 3316        | 33.08                  | -95.26                 | -62.18         | -13         | -49.18      |
| 4                                                   | 4145        | 33.42                  | -95.26                 | -61.84         | -13         | -48.84      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1658        | 32.28                  | -95.26                 | -62.98         | -13         | -49.98      |
| 2                                                   | 2487        | 32.73                  | -95.26                 | -62.53         | -13         | -49.53      |
| 3                                                   | 3316        | 33.3                   | -95.26                 | -61.96         | -13         | -48.96      |
| 4                                                   | 4145        | 33.71                  | -95.26                 | -61.55         | -13         | -48.55      |

## Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20525 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 32.25                  | -95.26                 | -63.01         | -13         | -50.01      |
| 2                                                   | 2509.5      | 32.67                  | -95.26                 | -62.59         | -13         | -49.59      |
| 3                                                   | 3346        | 33.03                  | -95.26                 | -62.23         | -13         | -49.23      |
| 4                                                   | 4182.5      | 33.45                  | -95.26                 | -61.81         | -13         | -48.81      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1673        | 32.35                  | -95.26                 | -62.91         | -13         | -49.91      |
| 2                                                   | 2509.5      | 32.81                  | -95.26                 | -62.45         | -13         | -49.45      |
| 3                                                   | 3346        | 33.31                  | -95.26                 | -61.95         | -13         | -48.95      |
| 4                                                   | 4182.5      | 33.67                  | -95.26                 | -61.59         | -13         | -48.59      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

|      |                  |                 |                |
|------|------------------|-----------------|----------------|
| Mode | TX channel 20600 | Frequency Range | Above 1000 MHz |
|------|------------------|-----------------|----------------|

| Antenna Polarity & Test Distance: Horizontal at 3 M |             |                        |                        |                |             |             |
|-----------------------------------------------------|-------------|------------------------|------------------------|----------------|-------------|-------------|
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1688        | 32.33                  | -95.26                 | -62.93         | -13         | -49.93      |
| 2                                                   | 2532        | 32.56                  | -95.26                 | -62.70         | -13         | -49.70      |
| 3                                                   | 3376        | 33.05                  | -95.26                 | -62.21         | -13         | -49.21      |
| 4                                                   | 4220        | 33.38                  | -95.26                 | -61.88         | -13         | -48.88      |
| Antenna Polarity & Test Distance: Vertical at 3 M   |             |                        |                        |                |             |             |
| No.                                                 | Freq. (MHz) | Reading (dB $\mu$ V/m) | Correction Factor (dB) | Emission (dBm) | Limit (dBm) | Margin (dB) |
| 1                                                   | 1688        | 32.44                  | -95.26                 | -62.82         | -13         | -49.82      |
| 2                                                   | 2532        | 32.83                  | -95.26                 | -62.43         | -13         | -49.43      |
| 3                                                   | 3376        | 33.18                  | -95.26                 | -62.08         | -13         | -49.08      |
| 4                                                   | 4220        | 33.52                  | -95.26                 | -61.74         | -13         | -48.74      |

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = E (dB $\mu$ V/m) - Correction Factor @ 3m.
2. Correction Factor (dB) = 20log(D) – 104.8; where D is the measurement distance @3m.

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

## Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Lin Kou EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**

Tel: 886-3-6668565

Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety Lab**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.

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