



# **CERTIFICATION TEST REPORT**

**Report Number. :** 12607346-E9V2

**Applicant :** APPLE, INC.  
1 APPLE PARK WAY  
CUPERTINO, CA 95014, U.S.A.

**Model :** A2160, A2216, A2217

**FCC ID :** BCG-E3305A

**EUT Description :** SMARTPHONE

**Test Standard(s) :** CFR47 PART 22 H, PART 27

**Date Of Issue:**  
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NVLAP Lab code: 200065-0

Revision History

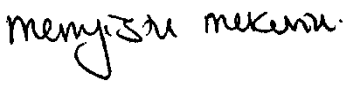
| Rev. | Issue Date | Revisions              | Revised By       |
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| V1   | 8/9/2019   | Initial Review         | Mengistu Mekuria |
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## TABLE OF CONTENTS

|                                                |           |
|------------------------------------------------|-----------|
| <b>1. ATTESTATION OF TEST RESULTS .....</b>    | <b>5</b>  |
| <b>2. TEST METHODOLOGY .....</b>               | <b>6</b>  |
| <b>3. FACILITIES AND ACCREDITATION .....</b>   | <b>6</b>  |
| <b>4. CALIBRATION AND UNCERTAINTY .....</b>    | <b>6</b>  |
| 4.1. MEASURING INSTRUMENT CALIBRATION .....    | 6         |
| 4.2. SAMPLE CALCULATION .....                  | 6         |
| 4.3. MEASUREMENT UNCERTAINTY .....             | 7         |
| <b>5. EQUIPMENT UNDER TEST .....</b>           | <b>8</b>  |
| 5.1. DESCRIPTION OF EUT .....                  | 8         |
| 5.2. DIFFERENCE IN MODEL NUMBER .....          | 8         |
| 5.3. MAXIMUM OUTPUT POWER .....                | 8         |
| 5.4. SOFTWARE AND FIRMWARE .....               | 11        |
| 5.5. MAXIMUM ANTENNA GAIN .....                | 11        |
| 5.6. WORST-CASE CONFIGURATION AND MODE .....   | 11        |
| 5.7. DESCRIPTION OF TEST SETUP .....           | 12        |
| <b>6. TEST AND MEASUREMENT EQUIPMENT .....</b> | <b>14</b> |
| <b>7. RF OUTPUT POWER VERIFICATION .....</b>   | <b>15</b> |
| 7.1. LTE BAND 5 .....                          | 16        |
| 7.2. LTE BAND 7 .....                          | 18        |
| 7.3. LTE BAND 41 .....                         | 22        |
| <b>8. CONDUCTED TEST RESULTS .....</b>         | <b>26</b> |
| 8.1. OCCUPIED BANDWIDTH .....                  | 26        |
| 8.1.1. LTE BAND 5 .....                        | 29        |
| 8.1.2. LTE BAND 7 .....                        | 32        |
| 8.1.3. LTE BAND 41 .....                       | 35        |
| 8.2. BAND EDGE AND EMISSION MASK .....         | 39        |
| 8.2.1. LTE BAND 5 .....                        | 41        |
| 8.2.2. LTE BAND 7 .....                        | 45        |
| 8.2.3. LTE BAND 41 .....                       | 50        |
| 8.3. OUT OF BAND EMISSIONS .....               | 54        |

|            |                                                   |           |
|------------|---------------------------------------------------|-----------|
| 8.3.1.     | LTE BAND 5.....                                   | 55        |
| 8.3.2.     | LTE BAND 7.....                                   | 58        |
| 8.3.3.     | LTE BAND 41.....                                  | 60        |
| 8.4.       | FREQUENCY STABILITY .....                         | 62        |
| 8.4.1.     | LTE BAND 5.....                                   | 63        |
| 8.4.2.     | LTE BAND 7.....                                   | 64        |
| 8.4.3.     | LTE BAND 41.....                                  | 65        |
| 8.5.       | PEAK-TO-AVERAGE POWER RATIO .....                 | 66        |
| 8.5.1.     | LTE BAND 5.....                                   | 67        |
| 8.5.2.     | LTE BAND 7.....                                   | 67        |
| 8.5.3.     | LTE BAND 41.....                                  | 67        |
| <b>9.</b>  | <b>RADIATED TEST RESULTS .....</b>                | <b>69</b> |
| 9.1.       | FIELD STRENGTH OF SPURIOUS RADIATION, ANT 1 ..... | 70        |
| 9.1.1.     | LTE BAND 5.....                                   | 70        |
| 9.1.2.     | LTE BAND 7.....                                   | 73        |
| 9.1.3.     | LTE BAND 41.....                                  | 75        |
| 9.2.       | FIELD STRENGTH OF SPURIOUS RADIATION, ANT 2 ..... | 77        |
| 9.2.1.     | LTE BAND 5.....                                   | 77        |
| 9.2.2.     | LTE BAND 7.....                                   | 79        |
| 9.2.3.     | LTE BAND 41.....                                  | 81        |
| 9.3.       | FIELD STRENGTH OF SPURIOUS RADIATION, ANT 3 ..... | 83        |
| 9.3.1.     | LTE BAND 7.....                                   | 83        |
| 9.3.2.     | LTE BAND 41.....                                  | 85        |
| 9.4.       | FIELD STRENGTH OF SPURIOUS RADIATION, ANT 4 ..... | 87        |
| 9.4.1.     | LTE BAND 7.....                                   | 87        |
| 9.4.2.     | LTE BAND 41.....                                  | 89        |
| <b>10.</b> | <b>SETUP PHOTOS.....</b>                          | <b>91</b> |

## 1. ATTESTATION OF TEST RESULTS

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Applicant Name and Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | APPLE, INC.<br>1 APPLE PARK WAY<br>CUPERTINO, CA 95014, U.S.A.                                       |
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A2160, A2216, A2217                                                                                  |
| FCC ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | BCG-E3309A                                                                                           |
| EUT Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | SMARTPHONE                                                                                           |
| Serial Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | C39YV073N2R5 (Conducted), C39YJ033MKLX (Radiated)                                                    |
| Date Tested                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | MARCH 29, 2019 to AUGUST 01, 2019                                                                    |
| Applicable Standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CFR47 22H and PART 27                                                                                |
| Test Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | COMPLIES                                                                                             |
| <p>UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p> <p>The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.</p> <p>This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.</p> |                                                                                                      |
| Approved & Released By:<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Prepared By:<br> |
| Mengistu Mekuria<br>Lead Test Engineer<br>UL Verification Services Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Lieu Nguyen<br>Test Engineer<br>UL Verification Services Inc.                                        |

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.26:2015, CFR 47 Part 2, KDB 971168 D01 v03r01/ D02 v02r01, KDB 412172 D01 Determining ERP and EIRP v01r01, Part 22H, Part 27.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 47173 Benicia Street                                         | 47266 Benicia Street                              | 47658 Kato Rd.                                     |
|--------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> Chamber A (ISED:2324B-1) | <input type="checkbox"/> Chamber D (ISED:22541-1) | <input type="checkbox"/> Chamber I (ISED: 2324A-5) |
| <input checked="" type="checkbox"/> Chamber B (ISED:2324B-2) | <input type="checkbox"/> Chamber E (ISED:22541-2) | <input type="checkbox"/> Chamber J (ISED: 2324A-6) |
| <input type="checkbox"/> Chamber C (ISED:2324B-3)            | <input type="checkbox"/> Chamber F (ISED:22541-3) | <input type="checkbox"/> Chamber K (ISED: 2324A-1) |
|                                                              | <input type="checkbox"/> Chamber G (ISED:22541-4) | <input type="checkbox"/> Chamber L (ISED: 2324A-3) |
|                                                              | <input type="checkbox"/> Chamber H (ISED:22541-5) |                                                    |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

#### RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)  
 $36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$

#### MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.  
 $36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER                                | UNCERTAINTY |
|------------------------------------------|-------------|
| Conducted Disturbance, 9KHz to 0.15 MHz  | 3.84 dB     |
| Conducted Disturbance, 0.15 to 30 MHz    | 3.65 dB     |
| Radiated Disturbance, 9KHz to 30 MHz     | 2.52 dB     |
| Radiated Disturbance, 30 to 1000 MHz     | 4.88 dB     |
| Radiated Disturbance, 1000 to 18000 MHz  | 4.24 dB     |
| Radiated Disturbance, 18000 to 26000 MHz | 4.37 dB     |
| Radiated Disturbance, 26000 to 40000 MHz | 5.17 dB     |
| Occupied Channel Bandwidth               | ±0.39 %     |
| Temperature                              | ±0.9 °C     |
| Supply voltages                          | ±0.45 %     |
| Time                                     | ±0.02 %     |

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

EUT is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, TD-SCDMA, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wide band, GPS and NFC. All models support at least one UICC based SIM. The second SIM, if present, is either UICC based pSIM (physical SIM) or e-SIM (electronic SIM). The device has a built-in inductive charging receiver. The rechargeable battery is also not user accessible.

### 5.2. DIFFERENCE IN MODEL NUMBER

Model A2160, A2216 and A2217 is electrically identical to Model A2160. Three model numbers are allocated for marketing and logistic purposes only. A2160 was used to perform all final tests.

### 5.3. MAXIMUM OUTPUT POWER

#### ERP/EIRP LIMIT

FCC: \$2.1046, \$22.913, \$27.50

#### EIRP TEST PROCEDURE

ANSI C63.26:2015  
KDB 971168 D01 Section 5.6  
KDB 412172 D01 Determining ERP and EIRP v01r01

$$\text{ERP/EIRP} = \text{PMeas} + \text{GT} - \text{LC}$$

where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted and ERP/EIRP output powers as follows:

### OUTPUT POWER FOR LTE BAND 5

| Part 22H           |            |                     |                       |                         |                   |                 |              |                     |
|--------------------|------------|---------------------|-----------------------|-------------------------|-------------------|-----------------|--------------|---------------------|
| ERP Limit (W)      |            | 7.00                |                       |                         |                   |                 |              |                     |
| Antenna Gain (dBi) |            | -5.00               |                       |                         |                   |                 |              |                     |
| Bandwidth (MHz)    | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | ERP Average (dBm) | ERP Average (W) | 99% BW (kHz) | Emission Designator |
| 3+5                | QPSK       | 825.5               | 846.5                 | 25.0                    | 17.85             | 0.061           | 7531.4       | 7M53G7W             |
|                    | 16QAM      |                     |                       | 24.5                    | 17.35             | 0.054           | 7541.9       | 7M54D7W             |
|                    | 64QAM      |                     |                       | 23.8                    | 16.65             | 0.046           | 7564.1       | 7M56D7W             |
| 5+3                | QPSK       | 826.5               | 847.5                 | 25.0                    | 17.85             | 0.061           | 7563.9       | 7M56G7W             |
|                    | 16QAM      |                     |                       | 24.4                    | 17.25             | 0.053           | 7532.5       | 7M53D7W             |
|                    | 64QAM      |                     |                       | 23.6                    | 16.45             | 0.044           | 7521.6       | 7M52D7W             |
| 5+10               | QPSK       | 826.5               | 844.0                 | 24.9                    | 17.75             | 0.060           | 13886.0      | 13M9G7W             |
|                    | 16QAM      |                     |                       | 24.0                    | 16.85             | 0.048           | 13876.0      | 13M9D7W             |
|                    | 64QAM      |                     |                       | 21.2                    | 14.05             | 0.025           | 13854.0      | 13M9D7W             |
| 10+5               | QPSK       | 829.0               | 846.5                 | 25.0                    | 17.86             | 0.061           | 13911.0      | 13M9G7W             |
|                    | 16QAM      |                     |                       | 23.9                    | 16.75             | 0.047           | 13895.0      | 13M9D7W             |
|                    | 64QAM      |                     |                       | 22.9                    | 15.75             | 0.038           | 13896.0      | 13M9D7W             |
| 10+10              | QPSK       | 829.0               | 844.0                 | 24.9                    | 17.75             | 0.060           | 19506.0      | 19M5G7W             |
|                    | 16QAM      |                     |                       | 23.9                    | 16.75             | 0.047           | 19467.0      | 19M5D7W             |
|                    | 64QAM      |                     |                       | 22.9                    | 15.75             | 0.038           | 19306.0      | 19M3D7W             |

### OUTPUT POWER FOR LTE BAND 7

| Part 27 / RSS 199  |            |                     |                       |                         |                    |                  |              |                     |
|--------------------|------------|---------------------|-----------------------|-------------------------|--------------------|------------------|--------------|---------------------|
| EIRP Limit (W)     |            | 2.00                |                       |                         |                    |                  |              |                     |
| Antenna Gain (dBi) |            | -2.70               |                       |                         |                    |                  |              |                     |
| Bandwidth (MHz)    | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
| 10+20              | QPSK       | 2505.5              | 2560.0                | 25.0                    | 22.28              | 0.169            | 27867.1      | 27M9G7W             |
|                    | 16QAM      |                     |                       | 24.1                    | 21.38              | 0.138            | 27875.2      | 27M9D7W             |
|                    | 64QAM      |                     |                       | 23.4                    | 20.70              | 0.117            | 27866.3      | 27M9D7W             |
| 20+10              | QPSK       | 2510.0              | 2564.5                | 24.5                    | 21.83              | 0.153            | 27856.8      | 27M9G7W             |
|                    | 16QAM      |                     |                       | 23.5                    | 20.84              | 0.121            | 27851        | 27M9D7W             |
|                    | 64QAM      |                     |                       | 22.9                    | 20.20              | 0.105            | 27873.3      | 27M9D7W             |
| 15+15              | QPSK       | 2507.5              | 2562.5                | 24.5                    | 21.78              | 0.151            | 28441.1      | 28M4G7W             |
|                    | 16QAM      |                     |                       | 23.6                    | 20.90              | 0.123            | 28450.9      | 28M5D7W             |
|                    | 64QAM      |                     |                       | 22.7                    | 19.98              | 0.100            | 28422.2      | 28M4D7W             |
| 15+20              | QPSK       | 2507.8              | 2560.0                | 24.7                    | 21.99              | 0.158            | 32684.3      | 32M7G7W             |
|                    | 16QAM      |                     |                       | 23.7                    | 21.01              | 0.126            | 32649.1      | 32M6D7W             |
|                    | 64QAM      |                     |                       | 23.2                    | 20.50              | 0.112            | 32674.1      | 32M7D7W             |
| 20+15              | QPSK       | 2510.0              | 2562.2                | 24.6                    | 21.88              | 0.154            | 32595.5      | 32M6G7W             |
|                    | 16QAM      |                     |                       | 23.6                    | 20.93              | 0.124            | 32668.9      | 32M7D7W             |
|                    | 64QAM      |                     |                       | 23.0                    | 20.25              | 0.106            | 32661.2      | 32M7D7W             |
| 20+20              | QPSK       | 2510.0              | 2560.0                | 24.7                    | 21.96              | 0.157            | 37577.5      | 37M6G7W             |
|                    | 16QAM      |                     |                       | 23.7                    | 21.03              | 0.127            | 37569.9      | 37M6D7W             |
|                    | 64QAM      |                     |                       | 23.1                    | 20.40              | 0.110            | 37549        | 37M5D7W             |

**OUTPUT POWER FOR LTE BAND 41**

| Part 27            |            |                     |                       |                         |                    |                  |              |                     |
|--------------------|------------|---------------------|-----------------------|-------------------------|--------------------|------------------|--------------|---------------------|
| EIRP Limit (W)     |            | 2.00                |                       |                         |                    |                  |              |                     |
| Antenna Gain (dBi) |            | -2.70               |                       |                         |                    |                  |              |                     |
| Bandwidth (MHz)    | Modulation | Low Frequency (MHz) | Upper Frequency (MHz) | Conducted Average (dBm) | EIRP Average (dBm) | EIRP Average (W) | 99% BW (kHz) | Emission Designator |
| 5+20               | QPSK       | 2499.3              | 2680.0                | 26.8                    | 24.12              | 0.258            | 22942        | 22M9G7W             |
|                    | 16QAM      |                     |                       | 25.8                    | 23.10              | 0.204            | 22895.4      | 22M9D7W             |
|                    | 64QAM      |                     |                       | 23.5                    | 20.82              | 0.121            | 22697.2      | 22M7D7W             |
| 20+5               | QPSK       | 2506.0              | 2686.7                | 26.7                    | 24.03              | 0.253            | 23067.1      | 23M1G7W             |
|                    | 16QAM      |                     |                       | 26.0                    | 23.25              | 0.211            | 23093.5      | 23M1D7W             |
|                    | 64QAM      |                     |                       | 23.7                    | 21.05              | 0.127            | 23168.8      | 23M2D7W             |
| 10+20              | QPSK       | 2501.5              | 2680.0                | 26.9                    | 24.18              | 0.262            | 28012.8      | 28M0G7W             |
|                    | 16QAM      |                     |                       | 25.7                    | 22.98              | 0.198            | 27829.7      | 27M8D7W             |
|                    | 64QAM      |                     |                       | 23.9                    | 21.19              | 0.132            | 27822.3      | 27M8D7W             |
| 20+10              | QPSK       | 2506.0              | 2684.5                | 26.8                    | 24.12              | 0.258            | 27811.1      | 27M8G7W             |
|                    | 16QAM      |                     |                       | 25.9                    | 23.20              | 0.209            | 27391.8      | 27M4D7W             |
|                    | 64QAM      |                     |                       | 23.8                    | 21.06              | 0.128            | 27955.6      | 28M0D7W             |
| 15+15              | QPSK       | 2503.5              | 2682.5                | 26.9                    | 24.15              | 0.260            | 28582        | 28M6G7W             |
|                    | 16QAM      |                     |                       | 25.8                    | 23.10              | 0.204            | 28484        | 28M5D7W             |
|                    | 64QAM      |                     |                       | 23.6                    | 20.90              | 0.123            | 28529        | 28M5D7W             |
| 15+20              | QPSK       | 2503.8              | 2680.0                | 27.0                    | 24.26              | 0.267            | 32791.9      | 32M8G7W             |
|                    | 16QAM      |                     |                       | 26.0                    | 23.28              | 0.213            | 32565.4      | 32M6D7W             |
|                    | 64QAM      |                     |                       | 23.8                    | 21.12              | 0.129            | 32704.3      | 32M7D7W             |
| 20+15              | QPSK       | 2506.0              | 2682.2                | 26.8                    | 24.06              | 0.255            | 32443.8      | 32M4G7W             |
|                    | 16QAM      |                     |                       | 25.7                    | 23.03              | 0.201            | 32406.9      | 32M4D7W             |
|                    | 64QAM      |                     |                       | 23.8                    | 21.09              | 0.129            | 32706.6      | 32M7D7W             |
| 20+20              | QPSK       | 2506.0              | 2680.0                | 27.0                    | 24.30              | 0.269            | 37352.3      | 37M4G7W             |
|                    | 16QAM      |                     |                       | 26.1                    | 23.41              | 0.219            | 37454.3      | 37M5D7W             |
|                    | 64QAM      |                     |                       | 23.9                    | 21.19              | 0.132            | 37209.7      | 37M2D7W             |

## 5.4. SOFTWARE AND FIRMWARE

The EUT Firmware installed during testing was version: 19-01.1919.01\_27-0.22.00-27.

## 5.5. MAXIMUM ANTENNA GAIN

Please see table below:

| LTE Bands                    | Ant 1 Gain (dBi) | Ant 2 Gain (dBi) | Ant 3 Gain (dBi) | Ant 4 Gain (dBi) |
|------------------------------|------------------|------------------|------------------|------------------|
| LTE Band 5, 824 – 849 MHz    | -5.0             | -5.1             | N/A              | N/A              |
| LTE Band 7, 2500 – 2570 MHz  | -2.7             | -4.6             | -8.4             | -2.0             |
| LTE Band 41, 2496 – 2690 MHz | -2.7             | -3.9             | -7.5             | -1.9             |

## 5.6. WORST-CASE CONFIGURATION AND MODE

The EUT supports LTE dual carrier Bands of: Band 5, 7, and Band 41.

The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM and 64QAM modulations. It was found that QPSK and 16QAM results were worst case. All testing was performed using QPSK and 16QAM modulations to represent the worst case. Tests were performed on the conducted test at Ant 1 antenna as worst case since it has higher output powers.

The EUT was investigated in three orthogonal orientations X/Y/Z on antennas 1, 2, 3, and 4. For ANT 1 antenna, it was determined that Y (Landscape) orientation was worst-case orientation for bands 7 and 41; X (Flatbed) orientation was worst-case orientation for band 5 without AC/DC adapter.

For ANT 2 antenna, it was determined that X (Flatbed) orientation was worst-case orientation for all bands without AC/DC adapter.

For ANT 3 antenna, it was determined that X (Flatbed) orientation was worst-case orientation for all bands without AC/DC adapter.

For ANT 4 antenna, it was determined that Y (Landscape) orientation was worst-case for bands 7 and 41 without AC/DC adapter

For Band Edge and Emission Mask: The highest BW combo and sample lower BW combinations were tested. Combination pairs of the same BW are considered generally equivalent. The RB combinations were selected such that the signal is active closest to the band limit, as this is the worst case.

For Out of Band Emissions: The highest combination and a sample lower combination was tested. The highest power RB combination was selected as worst case.

Radiated spurious emissions were investigated below 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found on below 30MHz and 30MHz-1GHz.

For interband transmission of multiple channels in Ant 1 and Ant 2 in Cellular bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |              |               |                  |
|------------------------|--------------|---------------|------------------|
| Description            | Manufacturer | Model         | Serial Number    |
| Laptop AC/DC adapter   | Apple        | 85W MagSafe 2 | C0651730MMM6P4AL |
| Laptop                 | Apple        | Macbook Pro   | C02PM012G3QD     |
| Laptop                 | Apple        | Macbook Pro   | C02P52HGG085     |

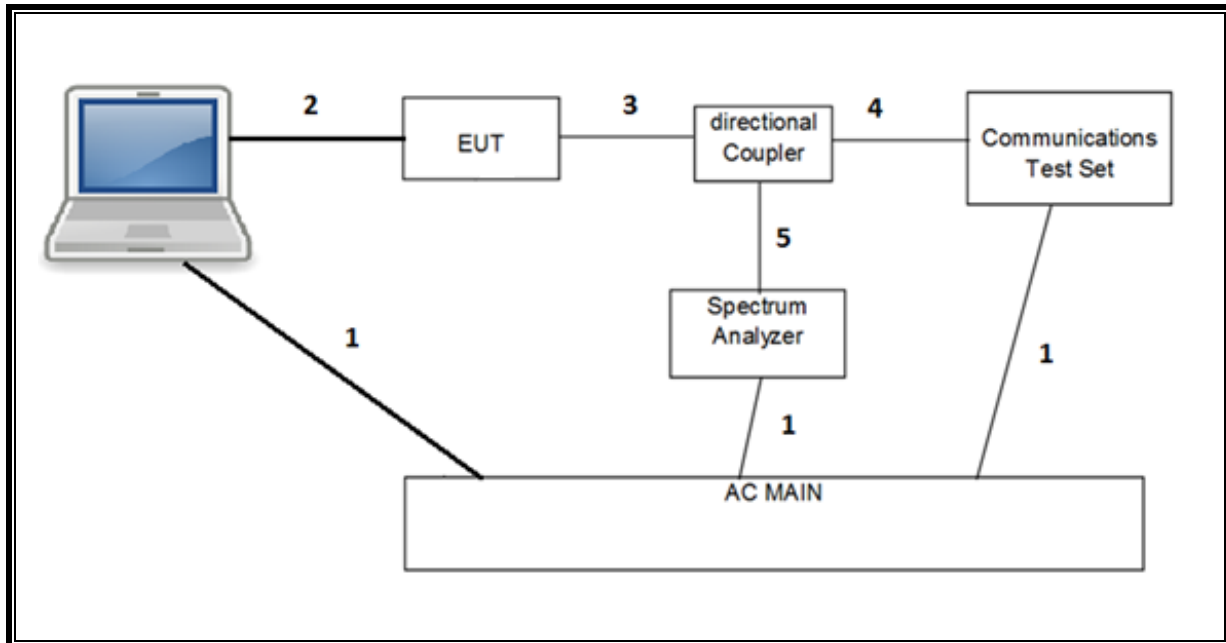
### I/O CABLES (RF Conducted Test)

| I/O Cable List |           |                      |                        |             |                  |         |
|----------------|-----------|----------------------|------------------------|-------------|------------------|---------|
| Cable No       | Port      | # of identical ports | Connector Type         | Cable Type  | Cable Length (m) | Remarks |
| 1              | AC        | 3                    | US 115V                | Un-shielded | 2.0m             | N/A     |
| 2              | USB       | 1                    | DC                     | Un-shielded | 1.0m             | N/A     |
| 3              | RF In/Out | 1                    | EUT                    | Un-shielded | 0.6m             | N/A     |
| 4              | RF In/Out | 1                    | Communication Test Set | Un-shielded | 1.2m             | N/A     |
| 5              | RF In/Out | 1                    | Barrel                 | N/A         | N/A              | N/A     |

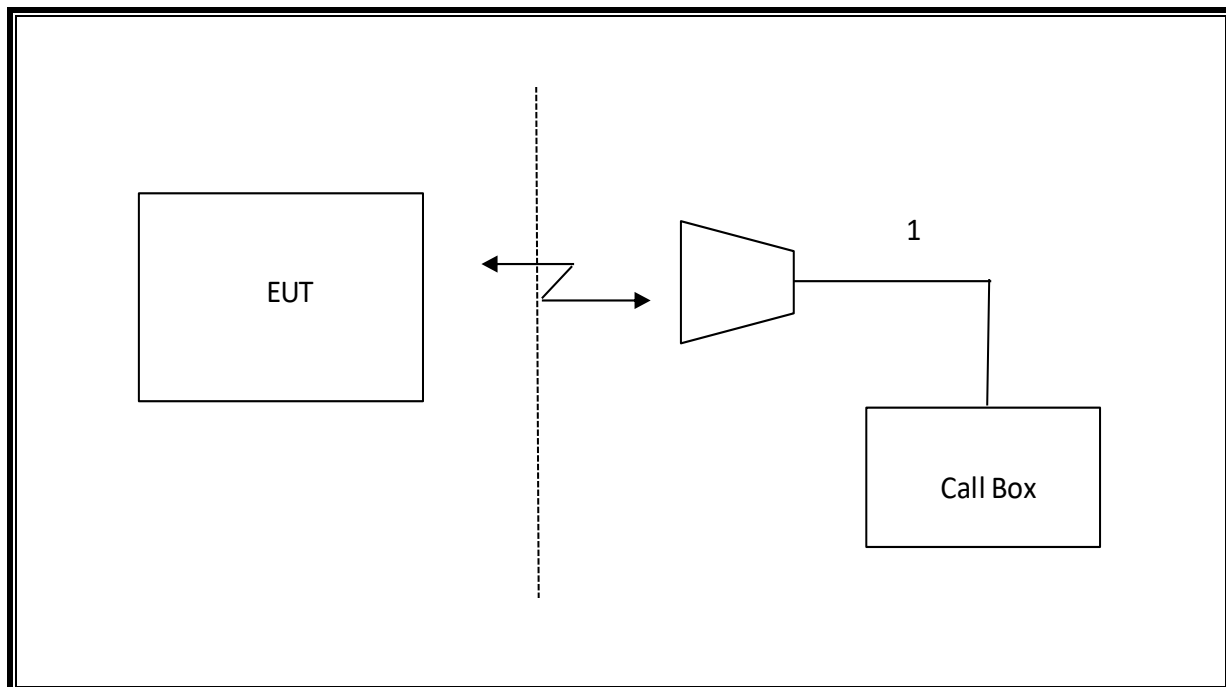
### I/O CABLES (RF Radiated Test)

| I/O Cable List |           |                      |                |             |                  |         |
|----------------|-----------|----------------------|----------------|-------------|------------------|---------|
| Cable No       | Port      | # of identical ports | Connector Type | Cable Type  | Cable Length (m) | Remarks |
| 1              | RF In/Out | 1                    | Antenna        | Un-shielded | 5.0m             | N/A     |

### CONDUCTED SETUP



### RADIATED SETUP



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| TEST EQUIPMENT LIST                              |                     |                        |                         |            |
|--------------------------------------------------|---------------------|------------------------|-------------------------|------------|
| Description                                      | Manufacturer        | Model                  | Asset                   | Cal Due    |
| Amplifier, 10KHz to 1GHz, 32dB                   | Sonoma              | 310N                   | T15                     | 08/15/2019 |
| Amplifier, 18-26GHz                              | Agilent             | 8449B                  | T404                    | 3/23/2020  |
| Amplifier, 26-40GHz                              | Miteq               | TTA2640                | T1804                   | 3/23/2020  |
| Spectrum Analyzer, PXA 3Hz to 44GHz              | Agilent             | N9030A                 | T905                    | 1/24/2020  |
| Spectrum Analyzer, PXA 3Hz to 44GHz              | Keysight            | N9030A                 | T340                    | 01/22/2020 |
| Spectrum Analyzer, PXA 3Hz to 44GHz              | Keysight            | N9030A                 | T1454                   | 01/23/2020 |
| Spectrum Analyzer, PXA 3Hz to 44GHz              | Keysight            | N9030A                 | T908                    | 01/23/2020 |
| Spectrum Analyzer, PXA 3Hz to 44GHz              | Keysight            | N9030A                 | T339                    | 01/29/2020 |
| Amplifier, 1 to 18GHz                            | MITEQ               | AFS42-00101800-25-S-42 | T931                    | 05/11/2020 |
| Amplifier, 10KHz to 1GHz, 32dB                   | Sonoma              | 310N                   | PRE0180176              | 11/01/2019 |
| Spectrum Analyzer, PSA, 3Hz to 44GHz             | Keysight            | E4446A                 | T177                    | 04/12/2019 |
| Spectrum Analyzer, PSA, 3Hz to 44GHz             | Keysight            | E4446A                 | T123                    | 01/28/2020 |
| Spectrum Analyzer, PSA, 3Hz to 44GHz             | Keysight            | E4440A                 | T198                    | 01/30/2020 |
| Spectrum Analyzer, PSA, 3Hz to 44GHz             | Keysight            | E4440A                 | T99                     | 1/28/2020  |
| Directional Coupler                              | KRYTAR              | 152610                 | T1536                   | 04/27/2019 |
| Directional Coupler                              | KRYTAR              | 152610                 | T1537                   | 04/27/2019 |
| Wireless Communications Test Set, 8960 Series 10 | Agilent             | E5515C                 | T211                    | 05/10/2020 |
| Filter, HPF 3.0GHz                               | Micro-Tronics       | HPM17543               | T487                    | 12/04/2019 |
| Filter, HPF 1.2GHz                               | Micro-Tronics       | WHKX1.2/15G-6ST        | T1182                   | 05/19/2019 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz             | Keysight            | N9030A                 | T459                    | 07/25/2019 |
| Wideband Communication Test Set, Call Box        | R&S GmbH & Co. KG   | CMW500                 | T959                    | 02/16/2020 |
| Wideband Communication Test Set, Call Box        | R&S GmbH & Co. KG   | CMW500                 | T1871                   | 02/18/2020 |
| Wideband Communication Test Set, Call Box        | R&S GmbH & Co. KG   | CMW500                 | T921                    | 02/18/2020 |
| Wideband Communication Test Set, Call Box        | R&S GmbH & Co. KG   | CMW500                 | T376                    | 02/21/2020 |
| Wideband Communication Test Set, Call Box        | R&S GmbH & Co. KG   | CMW500                 | T958                    | 02/20/2020 |
| Chamber, Environmental                           | Cincinnati Sub Zero | ZPHS-8-3.5-SCT/WC      | T754                    | 08/15/2019 |
| Power Meter, P-series single channel             | Keysight            | N1911A                 | T1268                   | 01/31/2020 |
| Power Sensor                                     | Keysight            | N1921A                 | T1228                   | 07/10/2019 |
| Antenna, Horn 1-18GHz                            | ETS Lindgren        | 3117                   | T346                    | 05/14/2020 |
| Antenna, Horn 1-18GHz                            | ETS Lindgren        | 3117                   | T344                    | 05/07/2020 |
| Antenna, Horn 18-26GHz                           | ARA                 | MWH-1826/B             | T447                    | 6/16/2019  |
| Antenna, Horn 26-40GHz                           | ARA                 | MWH-2640/B             | T446                    | 8/9/2019   |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz      | Sunol Sciences      | JB3                    | PRE0181574              | 08/01/2019 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz      | Sunol Sciences      | JB3                    | PRE0077974              | 05/13/2020 |
| Antenna, Active Loop 9KHz to 30MHz               | EMCO                | 6502                   | T1616                   | 10/18/2019 |
| UL AUTOMATION SOFTWARE                           |                     |                        |                         |            |
| CLT Software                                     | UL                  | UL RF                  | Ver 9.5, April 26, 2016 |            |
| Power Measurement Software                       | UL                  | UL RF                  | Ver 2.2, June 2017      |            |

### NOTES:

- For equipment listed above that had a calibration due during the testing period, its use was paused to allow for calibration.

## 7. RF OUTPUT POWER VERIFICATION

### RULE PART(S)

FCC: §2.1046

### MODES TESTED

- LTE Band 5
- LTE Band 7
- LTE Band 41

### RESULT

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows:

## 7.1. LTE BAND 5

|            |       |              |           |
|------------|-------|--------------|-----------|
| <b>ID:</b> | 10646 | <b>Date:</b> | 6/16/2019 |
|------------|-------|--------------|-----------|

### OUTPUT POWER FOR LTE BAND 5 (3.0MHz + 5.0MHz)

| Bandwidth   | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB Size | PCC RB Offset | SCC1 RB Size | SCC1 RB Offset | Conducted Average (dBm) |       |       |       |       |       |
|-------------|---------------------|----------------------|-------------|---------------|--------------|----------------|-------------------------|-------|-------|-------|-------|-------|
|             |                     |                      |             |               |              |                | Ant 1                   |       |       | Ant 2 |       |       |
|             |                     |                      |             |               |              |                | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 3MHz / 5MHz | 825.5               | 829.4                | 1           | 14            | 1            | 0              | 24.7                    | 24.2  | 23.6  | 23.3  | 22.7  | 21.8  |
|             |                     |                      | 15          | 0             | 25           | 0              | 23.6                    | 22.7  | 22.3  | 21.2  | 20.7  | 19.8  |
|             | 834.0               | 837.9                | 1           | 14            | 1            | 0              | 25.0                    | 24.5  | 23.8  | 22.9  | 21.2  | 21.9  |
|             |                     |                      | 15          | 0             | 25           | 0              | 23.5                    | 22.8  | 22.3  | 20.8  | 21.3  | 19.8  |
|             | 847.5               | 843.6                | 1           | 14            | 1            | 0              | 24.9                    | 24.4  | 23.5  | 23.1  | 21.2  | 21.7  |
|             |                     |                      | 15          | 0             | 25           | 0              | 23.5                    | 22.8  | 22.0  | 20.7  | 20.2  | 19.8  |

### OUTPUT POWER FOR LTE BAND 5 (5.0MHz + 3.0MHz)

| Bandwidth   | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB Size | PCC RB Offset | SCC1 RB Size | SCC1 RB Offset | Conducted Average (dBm) |       |       |       |       |       |
|-------------|---------------------|----------------------|-------------|---------------|--------------|----------------|-------------------------|-------|-------|-------|-------|-------|
|             |                     |                      |             |               |              |                | Ant 1                   |       |       | Ant 2 |       |       |
|             |                     |                      |             |               |              |                | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 5MHz / 3MHz | 826.5               | 830.4                | 1           | 24            | 1            | 0              | 24.6                    | 24.1  | 23.6  | 23.3  | 22.7  | 21.6  |
|             |                     |                      | 25          | 0             | 15           | 0              | 23.0                    | 21.9  | 22.0  | 21.2  | 20.2  | 20.2  |
|             | 835.0               | 838.9                | 1           | 24            | 1            | 0              | 24.9                    | 24.4  | 23.4  | 23.3  | 22.2  | 21.4  |
|             |                     |                      | 25          | 0             | 15           | 0              | 22.9                    | 22.0  | 21.8  | 21.2  | 20.2  | 20.2  |
|             | 846.5               | 842.6                | 1           | 24            | 1            | 0              | 25.0                    | 23.7  | 23.5  | 23.2  | 22.7  | 21.5  |
|             |                     |                      | 25          | 0             | 15           | 0              | 22.8                    | 21.9  | 21.9  | 21.1  | 20.1  | 20.2  |

### OUTPUT POWER FOR LTE BAND 5 (5.0MHz + 10.0MHz)

| Bandwidth    | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB Size | PCC RB Offset | SCC1 RB Size | SCC1 RB Offset | Conducted Average (dBm) |       |       |       |       |       |
|--------------|---------------------|----------------------|-------------|---------------|--------------|----------------|-------------------------|-------|-------|-------|-------|-------|
|              |                     |                      |             |               |              |                | Ant 1                   |       |       | Ant 2 |       |       |
|              |                     |                      |             |               |              |                | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 5MHz / 10MHz | 826.5               | 833.7                | 1           | 24            | 1            | 0              | 24.9                    | 24.0  | 21.2  | 23.2  | 22.1  | 20.3  |
|              |                     |                      | 25          | 0             | 50           | 0              | 22.7                    | 21.7  | 21.0  | 21.2  | 20.2  | 20.2  |
|              | 831.6               | 838.8                | 1           | 24            | 1            | 0              | 24.7                    | 23.8  | 21.0  | 22.9  | 21.8  | 19.9  |
|              |                     |                      | 25          | 0             | 50           | 0              | 22.7                    | 21.6  | 20.9  | 21.0  | 20.0  | 20.0  |
|              | 846.5               | 839.3                | 1           | 24            | 1            | 0              | 24.6                    | 23.7  | 20.9  | 23.1  | 22.0  | 20.2  |
|              |                     |                      | 25          | 0             | 50           | 0              | 22.5                    | 21.6  | 20.7  | 20.9  | 19.9  | 19.9  |

**OUTPUT POWER FOR LTE BAND 5 (10.0MHz + 5.0MHz)**

| Bandwidth      | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|----------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|                |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|                |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 10MHz/<br>5MHz | 829.0               | 836.2                | 1      | 49     | 1       | 0       | 25.0                    | 23.9  | 22.9  | 23.5  | 22.5  | 20.4  |
|                |                     |                      | 1      | 0      | 1       | 24      | 16.2                    | 16.2  | 17.3  | 14.6  | 14.6  | 14.7  |
|                |                     |                      | 50     | 0      | 25      | 0       | 22.7                    | 21.8  | 22.7  | 21.3  | 20.3  | 20.3  |
|                | 834.3               | 841.5                | 1      | 49     | 1       | 0       | 24.9                    | 23.8  | 22.8  | 23.3  | 22.3  | 20.5  |
|                |                     |                      | 1      | 0      | 1       | 24      | 16.1                    | 16.1  | 17.3  | 14.5  | 14.4  | 14.6  |
|                |                     |                      | 50     | 0      | 25      | 0       | 22.7                    | 21.7  | 22.7  | 21.1  | 20.0  | 20.1  |
|                | 839.3               | 846.5                | 1      | 49     | 1       | 0       | 24.7                    | 23.5  | 22.9  | 22.9  | 21.9  | 20.0  |
|                |                     |                      | 1      | 0      | 1       | 24      | 16.1                    | 16.1  | 17.1  | 14.3  | 14.3  | 14.5  |
|                |                     |                      | 50     | 0      | 25      | 0       | 22.6                    | 21.7  | 22.6  | 20.9  | 19.9  | 19.9  |

**OUTPUT POWER FOR LTE BAND 5 (10.0MHz + 10.0MHz)**

| Bandwidth       | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|-----------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|                 |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|                 |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 10MHz/<br>10MHz | 829.0               | 838.9                | 1      | 49     | 1       | 0       | 24.9                    | 23.9  | 21.3  | 23.3  | 22.5  | 20.3  |
|                 |                     |                      | 1      | 0      | 1       | 49      | 16.2                    | 16.3  | 15.6  | 14.4  | 14.5  | 14.4  |
|                 |                     |                      | 50     | 0      | 50      | 0       | 22.6                    | 21.7  | 21.0  | 20.9  | 20.0  | 20.0  |
|                 | 831.5               | 841.4                | 1      | 49     | 1       | 0       | 24.9                    | 23.9  | 22.1  | 23.2  | 22.1  | 20.2  |
|                 |                     |                      | 1      | 0      | 1       | 49      | 16.1                    | 16.2  | 16.5  | 14.4  | 14.4  | 14.5  |
|                 |                     |                      | 50     | 0      | 50      | 0       | 22.6                    | 21.7  | 22.7  | 21.0  | 19.9  | 20.0  |
|                 | 844.0               | 834.1                | 1      | 49     | 1       | 0       | 24.7                    | 23.8  | 22.9  | 22.9  | 21.9  | 19.9  |
|                 |                     |                      | 1      | 0      | 1       | 49      | 16.1                    | 16.1  | 17.1  | 14.3  | 14.3  | 14.4  |
|                 |                     |                      | 50     | 0      | 50      | 0       | 22.6                    | 21.7  | 22.7  | 20.8  | 19.9  | 19.9  |

## 7.2. LTE BAND 7

|            |       |              |         |
|------------|-------|--------------|---------|
| <b>ID:</b> | 19467 | <b>Date:</b> | 6/16/19 |
|------------|-------|--------------|---------|

### OUTPUT POWER FOR LTE BAND 7 (10.0MHz + 20.0MHz)

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 10MHz / 20MHz | 2505.5              | 2519.9               | 1      | 49     | 1       | 0       | 25.0                    | 24.1  | 23.4  | 19.9  | 19.0  | 17.8  |
|               |                     |                      | 50     | 0      | 100     | 0       | 22.9                    | 22.0  | 21.9  | 18.3  | 17.3  | 17.2  |
|               | 2525.6              | 2540.0               | 1      | 49     | 1       | 0       | 22.1                    | 21.4  | 20.9  | 19.8  | 19.2  | 18.0  |
|               |                     |                      | 50     | 0      | 100     | 0       | 20.1                    | 19.2  | 19.0  | 18.1  | 17.1  | 17.0  |
|               | 2545.5              | 2560.0               | 1      | 49     | 1       | 0       | 22.6                    | 21.7  | 21.0  | 19.8  | 19.1  | 18.3  |
|               |                     |                      | 50     | 0      | 100     | 0       | 20.2                    | 19.2  | 19.0  | 17.9  | 16.9  | 16.8  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 10MHz / 20MHz | 2505.5              | 2519.9               | 1      | 49     | 1       | 0       | 24.0                    | 23.0  | 21.7  | 17.8  | 16.9  | 15.9  |
|               |                     |                      | 50     | 0      | 100     | 0       | 22.1                    | 21.2  | 22.4  | 15.9  | 14.9  | 15.9  |
|               | 2525.6              | 2540.0               | 1      | 49     | 1       | 0       | 24.0                    | 23.4  | 22.5  | 17.6  | 16.8  | 16.2  |
|               |                     |                      | 50     | 0      | 100     | 0       | 22.3                    | 21.4  | 22.6  | 16.0  | 14.9  | 16.0  |
|               | 2545.5              | 2560.0               | 1      | 49     | 1       | 0       | 24.3                    | 23.2  | 21.8  | 18.0  | 17.0  | 16.2  |
|               |                     |                      | 50     | 0      | 100     | 0       | 22.2                    | 21.2  | 22.1  | 16.0  | 14.9  | 15.8  |

### OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 10.0MHz)

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 10MHz | 2510.0              | 2524.4               | 1      | 99     | 1       | 0       | 24.5                    | 23.5  | 20.9  | 20.5  | 19.5  | 17.4  |
|               |                     |                      | 1      | 0      | 1       | 49      | 15.8                    | 15.9  | 15.5  | 11.7  | 11.7  | 11.6  |
|               |                     |                      | 100    | 0      | 50      | 0       | 22.3                    | 21.3  | 20.9  | 18.2  | 17.3  | 17.1  |
|               | 2530.1              | 2544.5               | 1      | 99     | 1       | 0       | 24.3                    | 23.3  | 20.7  | 20.2  | 19.2  | 16.8  |
|               |                     |                      | 1      | 0      | 1       | 49      | 15.7                    | 15.7  | 15.2  | 11.4  | 11.5  | 11.4  |
|               |                     |                      | 100    | 0      | 50      | 0       | 22.2                    | 21.2  | 20.6  | 18.1  | 17.1  | 16.8  |
|               | 2550.1              | 2564.5               | 1      | 99     | 1       | 0       | 24.4                    | 23.4  | 20.9  | 20.2  | 19.3  | 17.2  |
|               |                     |                      | 1      | 0      | 1       | 49      | 15.8                    | 15.7  | 15.0  | 11.3  | 11.4  | 11.3  |
|               |                     |                      | 100    | 0      | 50      | 0       | 22.2                    | 21.2  | 20.5  | 17.9  | 16.9  | 16.8  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 10MHz | 2510.0              | 2524.4               | 1      | 99     | 1       | 0       | 24.4                    | 23.3  | 22.9  | 18.2  | 17.2  | 16.2  |
|               |                     |                      | 1      | 0      | 1       | 49      | 15.5                    | 15.5  | 16.9  | 9.3   | 9.3   | 10.4  |
|               |                     |                      | 100    | 0      | 50      | 0       | 22.3                    | 21.2  | 22.5  | 15.9  | 14.9  | 15.9  |
|               | 2530.1              | 2544.5               | 1      | 99     | 1       | 0       | 24.3                    | 23.5  | 22.7  | 18.0  | 17.0  | 16.2  |
|               |                     |                      | 1      | 0      | 1       | 49      | 15.7                    | 15.7  | 17.0  | 9.3   | 9.3   | 10.6  |
|               |                     |                      | 100    | 0      | 50      | 0       | 22.4                    | 21.3  | 22.5  | 15.9  | 14.9  | 16.0  |
|               | 2550.1              | 2564.5               | 1      | 99     | 1       | 0       | 24.3                    | 23.4  | 20.6  | 18.2  | 17.1  | 16.1  |
|               |                     |                      | 1      | 0      | 1       | 49      | 15.4                    | 15.6  | 16.6  | 9.4   | 9.3   | 10.3  |
|               |                     |                      | 100    | 0      | 50      | 0       | 22.2                    | 21.1  | 22.1  | 15.9  | 14.8  | 15.6  |

**OUTPUT POWER FOR LTE BAND 7 (15.0MHz + 15.0MHz)**

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 15MHz / 15MHz | 2507.5              | 2522.5               | 1      | 74     | 1       | 0       | 24.5                    | 23.6  | 21.0  | 20.4  | 19.3  | 18.2  |
|               |                     |                      | 75     | 0      | 75      | 0       | 22.3                    | 21.4  | 21.0  | 18.2  | 17.3  | 17.1  |
|               | 2527.5              | 2542.5               | 1      | 74     | 1       | 0       | 24.3                    | 23.4  | 20.8  | 20.2  | 19.3  | 18.2  |
|               |                     |                      | 75     | 0      | 75      | 0       | 22.3                    | 21.3  | 20.6  | 18.1  | 17.1  | 17.0  |
|               | 2547.5              | 2562.5               | 1      | 74     | 1       | 0       | 24.4                    | 23.5  | 20.7  | 20.1  | 19.2  | 18.0  |
|               |                     |                      | 75     | 0      | 75      | 0       | 22.3                    | 21.3  | 20.5  | 17.9  | 16.9  | 16.7  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 15MHz / 15MHz | 2507.5              | 2522.5               | 1      | 74     | 1       | 0       | 24.3                    | 23.4  | 22.5  | 17.9  | 17.0  | 16.1  |
|               |                     |                      | 75     | 0      | 75      | 0       | 22.2                    | 21.2  | 22.4  | 15.8  | 14.8  | 14.5  |
|               | 2527.5              | 2542.5               | 1      | 74     | 1       | 0       | 24.4                    | 23.4  | 22.7  | 17.6  | 16.9  | 16.1  |
|               |                     |                      | 75     | 0      | 75      | 0       | 22.3                    | 21.3  | 22.6  | 15.6  | 14.9  | 14.4  |
|               | 2547.5              | 2562.5               | 1      | 74     | 1       | 0       | 24.3                    | 23.4  | 22.5  | 17.8  | 16.9  | 15.9  |
|               |                     |                      | 75     | 0      | 75      | 0       | 22.2                    | 21.1  | 22.2  | 15.7  | 14.9  | 15.0  |

**OUTPUT POWER FOR LTE BAND 7 (15.0MHz + 20.0MHz)**

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 15MHz / 20MHz | 2507.8              | 2524.9               | 1      | 74     | 1       | 0       | 24.7                    | 23.6  | 23.2  | 20.4  | 19.6  | 18.3  |
|               |                     |                      | 75     | 0      | 100     | 0       | 22.4                    | 21.4  | 20.9  | 18.3  | 17.3  | 17.2  |
|               | 2525.3              | 2542.4               | 1      | 74     | 1       | 0       | 24.5                    | 23.5  | 23.0  | 20.3  | 19.4  | 18.4  |
|               |                     |                      | 75     | 0      | 100     | 0       | 22.3                    | 21.3  | 20.7  | 18.2  | 17.2  | 17.0  |
|               | 2542.9              | 2560.0               | 1      | 74     | 1       | 0       | 24.7                    | 23.7  | 23.1  | 20.1  | 19.2  | 18.6  |
|               |                     |                      | 75     | 0      | 100     | 0       | 22.4                    | 21.4  | 20.5  | 17.9  | 17.1  | 16.9  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 15MHz / 20MHz | 2507.8              | 2524.9               | 1      | 74     | 1       | 0       | 24.4                    | 23.5  | 22.9  | 16.3  | 15.4  | 16.2  |
|               |                     |                      | 75     | 0      | 100     | 0       | 22.2                    | 21.3  | 22.5  | 14.2  | 13.2  | 16.0  |
|               | 2525.3              | 2542.4               | 1      | 74     | 1       | 0       | 24.3                    | 23.5  | 23.0  | 18.1  | 16.8  | 16.2  |
|               |                     |                      | 75     | 0      | 100     | 0       | 22.3                    | 21.4  | 22.8  | 16.0  | 15.0  | 16.1  |
|               | 2542.9              | 2560.0               | 1      | 74     | 1       | 0       | 24.3                    | 23.5  | 22.7  | 18.1  | 17.0  | 16.2  |
|               |                     |                      | 75     | 0      | 100     | 0       | 22.3                    | 21.3  | 22.4  | 16.0  | 15.0  | 15.8  |

#### OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 15.0MHz)

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 15MHz | 2510.0              | 2527.1               | 1      | 99     | 1       | 0       | 24.6                    | 23.6  | 22.8  | 20.5  | 19.5  | 18.4  |
|               |                     |                      | 100    | 0      | 75      | 0       | 22.4                    | 21.5  | 20.9  | 18.3  | 17.4  | 17.2  |
|               | 2527.6              | 2544.7               | 1      | 99     | 1       | 0       | 24.2                    | 23.4  | 22.7  | 20.2  | 19.3  | 18.2  |
|               |                     |                      | 100    | 0      | 75      | 0       | 22.3                    | 21.3  | 20.7  | 18.2  | 17.2  | 17.0  |
|               | 2545.1              | 2562.2               | 1      | 99     | 1       | 0       | 21.5                    | 23.5  | 22.9  | 20.1  | 19.3  | 18.1  |
|               |                     |                      | 100    | 0      | 75      | 0       | 22.4                    | 21.3  | 20.6  | 18.0  | 17.0  | 16.9  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 15MHz | 2510.0              | 2527.1               | 1      | 99     | 1       | 0       | 24.5                    | 23.6  | 23.0  | 18.3  | 17.2  | 16.3  |
|               |                     |                      | 100    | 0      | 75      | 0       | 22.3                    | 21.3  | 22.6  | 16.0  | 16.1  | 16.0  |
|               | 2527.6              | 2544.7               | 1      | 99     | 1       | 0       | 24.5                    | 23.6  | 22.7  | 18.3  | 17.3  | 16.1  |
|               |                     |                      | 100    | 0      | 75      | 0       | 22.4                    | 21.4  | 22.7  | 16.2  | 16.2  | 16.0  |
|               | 2545.1              | 2562.2               | 1      | 99     | 1       | 0       | 24.4                    | 23.4  | 22.5  | 18.2  | 17.5  | 16.8  |
|               |                     |                      | 100    | 0      | 75      | 0       | 22.2                    | 21.3  | 22.4  | 16.3  | 16.0  | 15.8  |

#### OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 20.0MHz)

| Bandwidth    | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|--------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|              |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|              |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz/ 20MHz | 2510.0              | 2529.8               | 1      | 99     | 1       | 0       | 24.6                    | 23.7  | 22.8  | 20.5  | 19.6  | 18.6  |
|              |                     |                      | 1      | 0      | 1       | 99      | 15.4                    | 15.9  | 15.3  | 11.4  | 11.3  | 11.5  |
|              |                     |                      | 100    | 0      | 100     | 0       | 22.4                    | 21.4  | 20.9  | 18.2  | 17.3  | 17.1  |
|              | 2525.1              | 2544.9               | 1      | 99     | 1       | 0       | 24.4                    | 23.6  | 23.0  | 20.3  | 19.4  | 18.4  |
|              |                     |                      | 1      | 0      | 1       | 99      | 15.5                    | 15.8  | 15.1  | 11.2  | 11.5  | 11.5  |
|              |                     |                      | 100    | 0      | 100     | 0       | 22.3                    | 21.3  | 20.6  | 18.2  | 17.2  | 17.1  |
|              | 2540.2              | 2560.0               | 1      | 99     | 1       | 0       | 24.7                    | 23.7  | 23.1  | 20.2  | 19.2  | 18.2  |
|              |                     |                      | 1      | 0      | 1       | 99      | 15.7                    | 15.7  | 14.8  | 11.2  | 11.4  | 11.2  |
|              |                     |                      | 100    | 0      | 100     | 0       | 22.3                    | 21.4  | 20.6  | 18.0  | 16.9  | 16.9  |

| Bandwidth       | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|-----------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|                 |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|                 |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz/<br>20MHz | 2510.0              | 2529.8               | 1      | 99     | 1       | 0       | 24.5                    | 23.5  | 23.0  | 17.4  | 16.5  | 16.4  |
|                 |                     |                      | 1      | 0      | 1       | 99      | 15.4                    | 15.2  | 16.6  | 11.3  | 10.1  | 10.3  |
|                 |                     |                      | 100    | 0      | 100     | 0       | 22.3                    | 21.3  | 22.5  | 14.2  | 13.2  | 16.0  |
|                 | 2525.1              | 2544.9               | 1      | 99     | 1       | 0       | 24.4                    | 23.3  | 22.9  | 17.3  | 16.3  | 16.4  |
|                 |                     |                      | 1      | 0      | 1       | 99      | 15.7                    | 15.5  | 16.7  | 11.5  | 10.4  | 10.5  |
|                 |                     |                      | 100    | 0      | 100     | 0       | 22.4                    | 21.4  | 22.6  | 14.2  | 13.2  | 16.1  |
|                 | 2540.2              | 2560.0               | 1      | 99     | 1       | 0       | 24.5                    | 23.5  | 22.7  | 17.4  | 16.3  | 16.2  |
|                 |                     |                      | 1      | 0      | 1       | 99      | 15.2                    | 15.6  | 16.7  | 11.2  | 10.5  | 10.2  |
|                 |                     |                      | 100    | 0      | 100     | 0       | 22.3                    | 21.3  | 22.3  | 14.2  | 13.2  | 15.9  |

### 7.3. LTE BAND 41

|            |       |              |         |
|------------|-------|--------------|---------|
| <b>ID:</b> | 19467 | <b>Date:</b> | 6/16/19 |
|------------|-------|--------------|---------|

#### OUTPUT POWER FOR LTE BAND 41 (5.0MHz + 20.0MHz)

| Bandwidth    | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|--------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|              |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|              |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 5MHz / 20MHz | 2499.3              | 2511.0               | 1      | 24     | 1       | 0       | 26.8                    | 25.8  | 23.5  | 22.3  | 21.2  | 20.3  |
|              |                     |                      | 25     | 0      | 100     | 0       | 24.8                    | 23.8  | 23.4  | 20.4  | 19.4  | 20.3  |
|              | 2583.8              | 2595.5               | 1      | 24     | 1       | 0       | 26.7                    | 25.6  | 23.4  | 22.4  | 21.4  | 20.5  |
|              |                     |                      | 25     | 0      | 100     | 0       | 24.5                    | 23.5  | 23.2  | 20.4  | 19.3  | 20.4  |
|              | 2668.3              | 2680.0               | 1      | 24     | 1       | 0       | 26.6                    | 25.6  | 23.2  | 22.6  | 21.6  | 20.9  |
|              |                     |                      | 25     | 0      | 100     | 0       | 24.5                    | 23.4  | 23.4  | 20.5  | 19.5  | 20.6  |

| Bandwidth    | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|--------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|              |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|              |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 5MHz / 20MHz | 2499.3              | 2511.0               | 1      | 24     | 1       | 0       | 26.5                    | 25.6  | 23.4  | 20.8  | 19.7  | 17.7  |
|              |                     |                      | 25     | 0      | 100     | 0       | 24.1                    | 23.1  | 23.1  | 18.4  | 17.6  | 17.5  |
|              | 2583.8              | 2595.5               | 1      | 24     | 1       | 0       | 26.2                    | 25.2  | 23.5  | 20.4  | 19.3  | 17.4  |
|              |                     |                      | 25     | 0      | 100     | 0       | 24.0                    | 23.0  | 23.0  | 18.3  | 17.4  | 17.2  |
|              | 2668.3              | 2680.0               | 1      | 24     | 1       | 0       | 25.3                    | 24.3  | 22.8  | 19.9  | 19.7  | 17.6  |
|              |                     |                      | 25     | 0      | 100     | 0       | 23.6                    | 22.7  | 22.7  | 17.5  | 17.5  | 17.5  |

#### OUTPUT POWER FOR LTE BAND 41 (20.0MHz + 5.0MHz)

| Bandwidth    | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|--------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|              |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|              |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 5MHz | 2506.0              | 2517.7               | 1      | 99     | 1       | 0       | 26.7                    | 26.0  | 23.7  | 22.6  | 21.7  | 20.6  |
|              |                     |                      | 1      | 0      | 1       | 24      | 18.1                    | 18.2  | 17.9  | 13.8  | 13.9  | 14.8  |
|              |                     |                      | 100    | 0      | 25      | 0       | 24.6                    | 23.6  | 23.5  | 20.4  | 19.4  | 20.3  |
|              | 2590.5              | 2602.2               | 1      | 99     | 1       | 0       | 26.5                    | 25.6  | 23.7  | 22.5  | 21.7  | 20.5  |
|              |                     |                      | 1      | 0      | 1       | 24      | 17.9                    | 17.9  | 18.1  | 13.7  | 13.8  | 14.8  |
|              |                     |                      | 100    | 0      | 25      | 0       | 24.4                    | 23.4  | 23.4  | 20.4  | 19.4  | 20.3  |
|              | 2675.0              | 2686.7               | 1      | 99     | 1       | 0       | 26.6                    | 25.6  | 23.7  | 22.7  | 21.7  | 20.7  |
|              |                     |                      | 1      | 0      | 1       | 24      | 17.9                    | 17.8  | 18.1  | 13.9  | 14.0  | 15.0  |
|              |                     |                      | 100    | 0      | 25      | 0       | 24.4                    | 23.4  | 23.6  | 20.6  | 19.5  | 20.6  |

| Bandwidth    | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|--------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|              |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|              |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 5MHz | 2506.0              | 2517.7               | 1      | 99     | 1       | 0       | 26.3                    | 25.4  | 23.4  | 20.9  | 20.2  | 18.0  |
|              |                     |                      | 1      | 0      | 1       | 24      | 17.6                    | 17.7  | 17.6  | 11.9  | 12.0  | 11.8  |
|              |                     |                      | 100    | 0      | 25      | 0       | 24.3                    | 23.3  | 23.2  | 18.7  | 17.8  | 17.6  |
|              | 2590.5              | 2602.2               | 1      | 99     | 1       | 0       | 26.1                    | 25.2  | 23.2  | 20.5  | 19.7  | 17.5  |
|              |                     |                      | 1      | 0      | 1       | 24      | 17.4                    | 17.4  | 17.5  | 11.7  | 11.9  | 11.7  |
|              |                     |                      | 100    | 0      | 25      | 0       | 23.9                    | 22.9  | 22.9  | 18.3  | 17.4  | 17.2  |
|              | 2675.0              | 2686.7               | 1      | 99     | 1       | 0       | 25.9                    | 24.9  | 23.0  | 20.5  | 19.6  | 17.6  |
|              |                     |                      | 1      | 0      | 1       | 24      | 17.0                    | 17.1  | 17.0  | 11.8  | 11.9  | 11.9  |
|              |                     |                      | 100    | 0      | 25      | 0       | 23.6                    | 22.6  | 22.6  | 18.5  | 17.5  | 17.4  |

**OUTPUT POWER FOR LTE BAND 41 (10.0MHz + 20.0MHz)**

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 10MHz / 20MHz | 2501.5              | 2515.9               | 1      | 49     | 1       | 0       | 26.9                    | 25.7  | 23.9  | 22.5  | 21.3  | 20.6  |
|               |                     |                      | 50     | 0      | 100     | 0       | 24.6                    | 23.6  | 23.3  | 20.4  | 19.4  | 20.3  |
|               | 2583.6              | 2598.0               | 1      | 49     | 1       | 0       | 21.5                    | 21.5  | 23.7  | 22.6  | 21.5  | 20.5  |
|               |                     |                      | 50     | 0      | 100     | 0       | 24.4                    | 23.4  | 23.0  | 20.4  | 19.4  | 20.4  |
|               | 2665.6              | 2680.0               | 1      | 49     | 1       | 0       | 26.4                    | 25.4  | 23.8  | 22.7  | 21.7  | 20.5  |
|               |                     |                      | 50     | 0      | 100     | 0       | 24.3                    | 23.3  | 23.4  | 20.5  | 19.5  | 20.5  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 10MHz / 20MHz | 2501.5              | 2515.9               | 1      | 49     | 1       | 0       | 26.3                    | 25.3  | 23.1  | 20.8  | 19.8  | 17.7  |
|               |                     |                      | 50     | 0      | 100     | 0       | 24.2                    | 23.1  | 23.2  | 18.6  | 17.6  | 17.6  |
|               | 2583.6              | 2598.0               | 1      | 49     | 1       | 0       | 26.3                    | 25.3  | 23.5  | 20.5  | 19.3  | 17.6  |
|               |                     |                      | 50     | 0      | 100     | 0       | 24.0                    | 23.0  | 23.0  | 18.3  | 17.4  | 17.2  |
|               | 2665.6              | 2680.0               | 1      | 49     | 1       | 0       | 26.3                    | 25.3  | 23.0  | 20.6  | 19.7  | 17.6  |
|               |                     |                      | 50     | 0      | 100     | 0       | 23.5                    | 22.5  | 22.6  | 18.4  | 17.4  | 17.4  |

**OUTPUT POWER FOR LTE BAND 41 (20.0MHz + 10.0MHz)**

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 10MHz | 2506.0              | 2520.4               | 1      | 99     | 1       | 0       | 26.8                    | 25.9  | 23.8  | 22.6  | 21.8  | 21.0  |
|               |                     |                      | 100    | 0      | 50      | 0       | 24.8                    | 23.7  | 23.6  | 20.4  | 19.4  | 20.9  |
|               | 2588.1              | 2602.5               | 1      | 99     | 1       | 0       | 26.6                    | 25.7  | 23.5  | 22.5  | 21.7  | 21.3  |
|               |                     |                      | 100    | 0      | 50      | 0       | 24.6                    | 23.5  | 23.4  | 20.4  | 19.4  | 21.1  |
|               | 2670.1              | 2684.5               | 1      | 99     | 1       | 0       | 26.6                    | 25.7  | 23.8  | 22.8  | 21.8  | 21.3  |
|               |                     |                      | 100    | 0      | 50      | 0       | 24.5                    | 23.5  | 23.6  | 20.5  | 19.5  | 21.3  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 10MHz | 2506.0              | 2520.4               | 1      | 99     | 1       | 0       | 26.3                    | 25.3  | 23.3  | 21.0  | 20.2  | 18.0  |
|               |                     |                      | 100    | 0      | 50      | 0       | 24.1                    | 23.2  | 23.2  | 18.7  | 17.8  | 17.6  |
|               | 2588.1              | 2602.5               | 1      | 99     | 1       | 0       | 26.0                    | 25.1  | 23.2  | 20.4  | 19.5  | 17.8  |
|               |                     |                      | 100    | 0      | 50      | 0       | 23.9                    | 22.9  | 23.0  | 18.2  | 17.4  | 17.2  |
|               | 2670.1              | 2684.5               | 1      | 99     | 1       | 0       | 25.8                    | 24.9  | 22.9  | 20.5  | 19.6  | 17.7  |
|               |                     |                      | 100    | 0      | 50      | 0       | 23.6                    | 22.6  | 22.6  | 17.4  | 16.4  | 16.4  |

**OUTPUT POWER FOR LTE BAND 41 (15.0MHz + 15.0MHz)**

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 15MHz / 15MHz | 2503.5              | 2518.5               | 1      | 74     | 1       | 0       | 26.9                    | 25.8  | 23.6  | 22.6  | 21.5  | 20.5  |
|               |                     |                      | 75     | 0      | 75      | 0       | 24.8                    | 23.7  | 23.6  | 20.5  | 19.5  | 20.4  |
|               | 2585.5              | 2600.5               | 1      | 74     | 1       | 0       | 26.6                    | 25.8  | 23.5  | 22.6  | 21.6  | 20.5  |
|               |                     |                      | 75     | 0      | 75      | 0       | 24.5                    | 23.6  | 23.4  | 20.4  | 19.4  | 20.4  |
|               | 2667.5              | 2682.5               | 1      | 74     | 1       | 0       | 26.6                    | 25.7  | 23.5  | 22.7  | 21.7  | 20.7  |
|               |                     |                      | 75     | 0      | 75      | 0       | 24.5                    | 23.5  | 23.5  | 20.5  | 19.5  | 20.5  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 15MHz / 15MHz | 2503.5              | 2518.5               | 1      | 74     | 1       | 0       | 26.3                    | 25.2  | 23.3  | 20.8  | 20.0  | 17.9  |
|               |                     |                      | 75     | 0      | 75      | 0       | 24.2                    | 23.2  | 23.2  | 18.6  | 17.7  | 17.6  |
|               | 2585.5              | 2600.5               | 1      | 74     | 1       | 0       | 26.1                    | 25.2  | 23.0  | 20.5  | 19.5  | 17.4  |
|               |                     |                      | 75     | 0      | 75      | 0       | 23.9                    | 23.0  | 23.0  | 18.3  | 17.3  | 17.2  |
|               | 2667.5              | 2682.5               | 1      | 74     | 1       | 0       | 25.7                    | 24.9  | 22.7  | 20.5  | 19.5  | 17.6  |
|               |                     |                      | 75     | 0      | 75      | 0       | 23.6                    | 22.6  | 22.6  | 17.5  | 17.4  | 17.5  |

**OUTPUT POWER FOR LTE BAND 41 (15.0MHz + 20.0MHz)**

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 15MHz / 20MHz | 2503.8              | 2520.9               | 1      | 74     | 1       | 0       | 27.0                    | 26.0  | 23.8  | 22.6  | 21.6  | 20.6  |
|               |                     |                      | 75     | 0      | 100     | 0       | 24.8                    | 23.8  | 23.8  | 20.5  | 19.5  | 20.4  |
|               | 2583.3              | 2600.4               | 1      | 74     | 1       | 0       | 26.8                    | 25.9  | 23.3  | 22.5  | 21.5  | 20.6  |
|               |                     |                      | 75     | 0      | 100     | 0       | 24.6                    | 23.6  | 23.5  | 20.4  | 19.4  | 20.4  |
|               | 2662.9              | 2680.0               | 1      | 74     | 1       | 0       | 26.7                    | 25.7  | 23.6  | 22.5  | 21.6  | 20.7  |
|               |                     |                      | 75     | 0      | 100     | 0       | 24.6                    | 23.5  | 23.6  | 20.5  | 19.5  | 20.6  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 15MHz / 20MHz | 2503.8              | 2520.9               | 1      | 74     | 1       | 0       | 26.5                    | 25.4  | 23.5  | 21.0  | 20.0  | 17.9  |
|               |                     |                      | 75     | 0      | 100     | 0       | 24.2                    | 23.3  | 23.3  | 18.8  | 17.9  | 17.7  |
|               | 2583.3              | 2600.4               | 1      | 74     | 1       | 0       | 26.3                    | 25.4  | 23.3  | 20.5  | 19.8  | 17.5  |
|               |                     |                      | 75     | 0      | 100     | 0       | 24.0                    | 23.1  | 23.1  | 18.4  | 17.5  | 17.3  |
|               | 2662.9              | 2680.0               | 1      | 74     | 1       | 0       | 26.4                    | 25.4  | 22.7  | 20.5  | 19.6  | 17.8  |
|               |                     |                      | 75     | 0      | 100     | 0       | 23.7                    | 22.7  | 22.7  | 17.5  | 17.6  | 17.5  |

**OUTPUT POWER FOR LTE BAND 41 (20.0MHz + 15.0MHz)**

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 15MHz | 2506.0              | 2523.1               | 1      | 99     | 1       | 0       | 26.8                    | 25.7  | 23.8  | 22.7  | 21.9  | 20.6  |
|               |                     |                      | 100    | 0      | 75      | 0       | 24.7                    | 23.4  | 23.7  | 20.5  | 19.5  | 20.4  |
|               | 2585.6              | 2602.7               | 1      | 99     | 1       | 0       | 26.5                    | 25.6  | 23.6  | 22.6  | 21.7  | 20.6  |
|               |                     |                      | 100    | 0      | 75      | 0       | 24.6                    | 23.6  | 23.5  | 20.5  | 19.5  | 20.4  |
|               | 2665.1              | 2682.2               | 1      | 99     | 1       | 0       | 26.5                    | 25.6  | 23.7  | 22.7  | 21.8  | 20.8  |
|               |                     |                      | 100    | 0      | 75      | 0       | 24.5                    | 23.5  | 23.7  | 20.5  | 19.6  | 20.6  |

| Bandwidth     | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|---------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|               |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|               |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz / 15MHz | 2506.0              | 2523.1               | 1      | 99     | 1       | 0       | 26.4                    | 25.7  | 23.8  | 21.0  | 20.2  | 18.1  |
|               |                     |                      | 100    | 0      | 75      | 0       | 24.6                    | 23.7  | 23.7  | 18.8  | 17.9  | 17.7  |
|               | 2585.6              | 2602.7               | 1      | 99     | 1       | 0       | 26.3                    | 25.4  | 23.3  | 20.5  | 19.7  | 17.5  |
|               |                     |                      | 100    | 0      | 75      | 0       | 24.3                    | 23.3  | 23.3  | 18.4  | 17.5  | 17.3  |
|               | 2665.1              | 2682.2               | 1      | 99     | 1       | 0       | 26.1                    | 25.2  | 23.2  | 20.6  | 19.7  | 17.8  |
|               |                     |                      | 100    | 0      | 75      | 0       | 24.0                    | 23.0  | 23.0  | 18.5  | 17.6  | 17.5  |

**OUTPUT POWER FOR LTE BAND 41 (20.0MHz + 20.0MHz)**

| Bandwidth    | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|--------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|              |                     |                      | Size   | Offset | Size    | Offset  | Ant 1                   |       |       | Ant 2 |       |       |
|              |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz/ 20MHz | 2506.0              | 2525.8               | 1      | 99     | 1       | 0       | 27.0                    | 26.1  | 23.9  | 22.7  | 21.9  | 20.8  |
|              |                     |                      | 1      | 0      | 1       | 99      | 18.0                    | 18.1  | 18.0  | 13.3  | 13.6  | 14.7  |
|              |                     |                      | 100    | 0      | 100     | 0       | 24.9                    | 23.9  | 23.7  | 20.5  | 19.5  | 20.4  |
|              | 2583.1              | 2602.9               | 1      | 99     | 1       | 0       | 26.9                    | 25.9  | 23.7  | 22.6  | 21.8  | 20.8  |
|              |                     |                      | 1      | 0      | 1       | 99      | 17.8                    | 17.9  | 17.6  | 13.3  | 13.8  | 14.6  |
|              |                     |                      | 100    | 0      | 100     | 0       | 24.7                    | 23.8  | 23.5  | 20.5  | 19.5  | 20.4  |
|              | 2660.2              | 2680.0               | 1      | 99     | 1       | 0       | 26.8                    | 25.8  | 23.7  | 22.7  | 21.8  | 20.8  |
|              |                     |                      | 1      | 0      | 1       | 99      | 17.8                    | 17.9  | 17.9  | 13.4  | 13.8  | 14.8  |
|              |                     |                      | 100    | 0      | 100     | 0       | 24.7                    | 23.6  | 23.7  | 20.5  | 19.5  | 20.5  |

| Bandwidth    | PCC Frequency (MHz) | SCC1 Frequency (MHz) | PCC RB | PCC RB | SCC1 RB | SCC1 RB | Conducted Average (dBm) |       |       |       |       |       |
|--------------|---------------------|----------------------|--------|--------|---------|---------|-------------------------|-------|-------|-------|-------|-------|
|              |                     |                      | Size   | Offset | Size    | Offset  | Ant 3                   |       |       | Ant 4 |       |       |
|              |                     |                      |        |        |         |         | QPSK                    | 16QAM | 64QAM | QPSK  | 16QAM | 64QAM |
| 20MHz/ 20MHz | 2506.0              | 2525.8               | 1      | 99     | 1       | 0       | 26.5                    | 25.5  | 23.4  | 21.0  | 20.2  | 18.2  |
|              |                     |                      | 1      | 0      | 1       | 99      | 17.4                    | 17.4  | 17.7  | 11.9  | 11.9  | 11.5  |
|              |                     |                      | 100    | 0      | 100     | 0       | 24.3                    | 23.3  | 23.3  | 18.8  | 17.8  | 17.7  |
|              | 2583.1              | 2602.9               | 1      | 99     | 1       | 0       | 26.2                    | 25.3  | 23.2  | 20.6  | 19.7  | 17.7  |
|              |                     |                      | 1      | 0      | 1       | 99      | 17.1                    | 17.2  | 17.2  | 11.7  | 11.3  | 11.6  |
|              |                     |                      | 100    | 0      | 100     | 0       | 23.9                    | 23.0  | 23.0  | 18.4  | 17.5  | 17.3  |
|              | 2660.2              | 2680.0               | 1      | 99     | 1       | 0       | 25.8                    | 24.9  | 22.8  | 20.7  | 19.9  | 17.9  |
|              |                     |                      | 1      | 0      | 1       | 99      | 16.8                    | 16.8  | 16.9  | 11.4  | 11.8  | 11.8  |
|              |                     |                      | 100    | 0      | 100     | 0       | 23.7                    | 22.7  | 22.7  | 18.5  | 17.6  | 17.5  |

## 8. CONDUCTED TEST RESULTS

### 8.1. OCCUPIED BANDWIDTH

#### RULE PART(S)

FCC: §2.1049

#### LIMITS

For reporting purposes only

#### TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

#### MODES TESTED

- LTE Band 5
- LTE Band 7
- LTE Band 41

#### RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested

### LTE BAND 5

| Band       | Mode                     | RB Allocation/RB Offset | f (MHz) | 99% BW (MHz) | - 26dB BW (MHz) |
|------------|--------------------------|-------------------------|---------|--------------|-----------------|
| LTE BAND 5 | 3MHz + 5MHz BAND QPSK    | 15/0 + 25/0             | 836.5   | 7.5314       | 8.094           |
|            | 3MHz + 5MHz BAND 16QAM   |                         |         | 7.5419       | 8.091           |
|            | 3MHz + 5MHz BAND 64QAM   |                         |         | 7.5641       | 8.020           |
|            | 5MHz + 3MHz BAND QPSK    | 25/0 + 15/0             |         | 7.5639       | 8.082           |
|            | 5MHz + 3MHz BAND 16QAM   |                         |         | 7.5325       | 8.017           |
|            | 5MHz + 3MHz BAND 64QAM   |                         |         | 7.5216       | 8.060           |
|            | 5MHz + 10MHz BAND QPSK   | 25/0 + 50/0             |         | 13.886       | 14.85           |
|            | 5MHz + 10MHz BAND 16QAM  |                         |         | 13.876       | 14.84           |
|            | 5MHz + 10MHz BAND 64QAM  |                         |         | 13.854       | 14.80           |
|            | 10MHz + 5MHz BAND QPSK   | 50/0 + 25/0             |         | 13.911       | 15.01           |
|            | 10MHz + 5MHz BAND 16QAM  |                         |         | 13.895       | 14.93           |
|            | 10MHz + 5MHz BAND 64QAM  |                         |         | 13.896       | 14.86           |
|            | 10MHz + 10MHz BAND QPSK  | 50/0 + 50/0             |         | 19.506       | 21.43           |
|            | 10MHz + 10MHz BAND 16QAM |                         |         | 19.467       | 22.16           |
|            | 10MHz + 10MHz BAND 64QAM |                         |         | 19.306       | 21.15           |

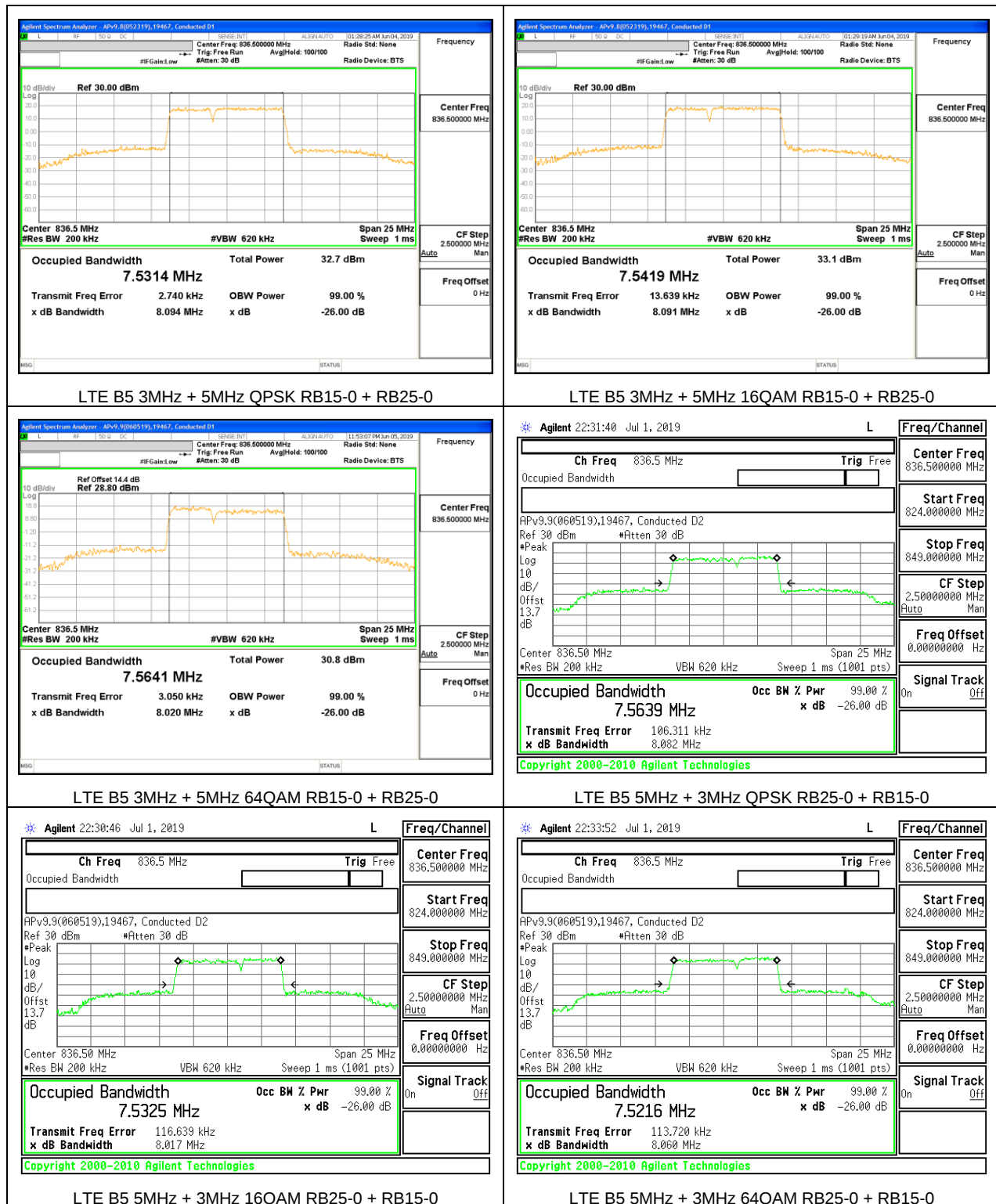
### LTE BAND 7

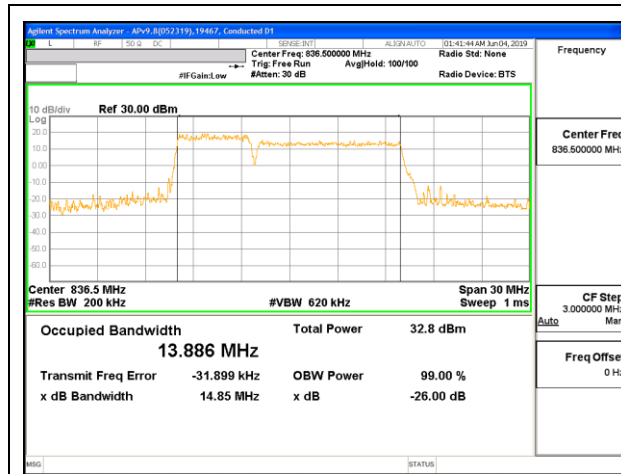
| Band       | Mode                     | RB Allocation/RB Offset | f (MHz) | 99% BW (MHz) | - 26dB BW (MHz) |
|------------|--------------------------|-------------------------|---------|--------------|-----------------|
| LTE BAND 7 | 10MHz + 20MHz BAND QPSK  | 50/0 + 100/0            | 2535    | 27.8671      | 29.955          |
|            | 10MHz + 20MHz BAND 16QAM |                         |         | 27.8752      | 29.911          |
|            | 10MHz + 20MHz BAND 64QAM |                         |         | 27.8663      | 29.955          |
|            | 20MHz + 10MHz BAND QPSK  | 100/0 + 50/0            |         | 27.8568      | 29.943          |
|            | 20MHz + 10MHz BAND 16QAM |                         |         | 27.8510      | 29.918          |
|            | 20MHz + 10MHz BAND 64QAM |                         |         | 27.8733      | 29.904          |
|            | 15MHz + 15MHz BAND QPSK  | 75/0 + 75/0             |         | 28.4411      | 30.665          |
|            | 15MHz + 15MHz BAND 16QAM |                         |         | 28.4509      | 30.630          |
|            | 15MHz + 15MHz BAND 64QAM |                         |         | 28.4222      | 30.656          |
|            | 15MHz + 20MHz BAND QPSK  | 75/0 + 100/0            |         | 32.6843      | 34.933          |
|            | 15MHz + 20MHz BAND 16QAM |                         |         | 32.6491      | 34.979          |
|            | 15MHz + 20MHz BAND 64QAM |                         |         | 32.6741      | 34.997          |
|            | 20MHz + 15MHz BAND QPSK  | 100/0 + 75/0            |         | 32.5955      | 34.921          |
|            | 20MHz + 15MHz BAND 16QAM |                         |         | 32.6689      | 34.944          |
|            | 20MHz + 15MHz BAND 64QAM |                         |         | 32.6612      | 34.965          |
|            | 20MHz + 20MHz BAND QPSK  | 100/0 + 100/0           |         | 37.5775      | 39.989          |
|            | 20MHz + 20MHz BAND 16QAM |                         |         | 37.5699      | 39.984          |
|            | 20MHz + 20MHz BAND 64QAM |                         |         | 37.5490      | 40.012          |

# LTE BAND 41

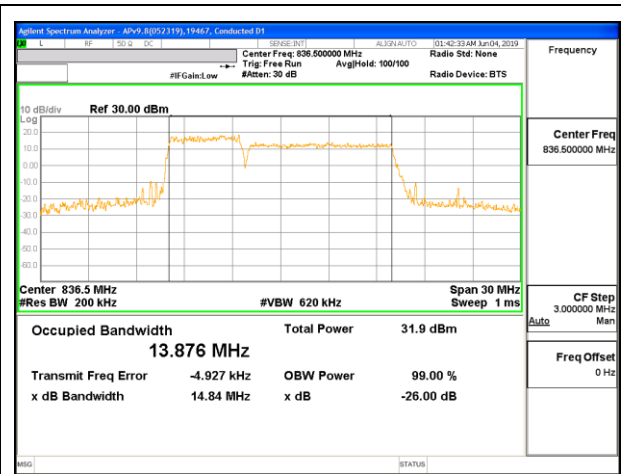
| Band              | Mode                     | RB Allocation/RB Offset | f (MHz) | 99% BW (MHz) | - 26dB BW (MHz) |
|-------------------|--------------------------|-------------------------|---------|--------------|-----------------|
| LTE BAND 41 (FCC) | 5MHz + 20MHz BAND QPSK   | 25/0 + 100/0            | 2593    | 22.9420      | 24.692          |
|                   | 5MHz + 20MHz BAND 16QAM  |                         |         | 22.8954      | 24.750          |
|                   | 5MHz + 20MHz BAND 64QAM  |                         |         | 22.6972      | 24.748          |
|                   | 20MHz + 5MHz BAND QPSK   | 100/0 + 25/0            |         | 23.0671      | 24.907          |
|                   | 20MHz + 5MHz BAND 16QAM  |                         |         | 23.0935      | 25.096          |
|                   | 20MHz + 5MHz BAND 64QAM  |                         |         | 23.1688      | 25.046          |
|                   | 10MHz + 20MHz BAND QPSK  | 50/0 + 100/0            |         | 28.0128      | 29.944          |
|                   | 10MHz + 20MHz BAND 16QAM |                         |         | 27.8297      | 29.892          |
|                   | 10MHz + 20MHz BAND 64QAM |                         |         | 27.8223      | 29.840          |
|                   | 20MHz + 10MHz BAND QPSK  | 100/0 + 50/0            |         | 27.8111      | 30.418          |
|                   | 20MHz + 10MHz BAND 16QAM |                         |         | 27.3918      | 29.893          |
|                   | 20MHz + 10MHz BAND 64QAM |                         |         | 27.9556      | 30.103          |
|                   | 15MHz + 15MHz BAND QPSK  | 75/0 + 75/0             |         | 28.5820      | 44.790          |
|                   | 15MHz + 15MHz BAND 16QAM |                         |         | 28.4840      | 30.460          |
|                   | 15MHz + 15MHz BAND 64QAM |                         |         | 28.5290      | 30.540          |
|                   | 15MHz + 20MHz BAND QPSK  | 75/0 + 100/0            |         | 32.7919      | 35.790          |
|                   | 15MHz + 20MHz BAND 16QAM |                         |         | 32.5654      | 35.879          |
|                   | 15MHz + 20MHz BAND 64QAM |                         |         | 32.7043      | 35.852          |
|                   | 20MHz + 15MHz BAND QPSK  | 100/0 + 75/0            |         | 32.7220      | 34.520          |
|                   | 20MHz + 15MHz BAND 16QAM |                         |         | 32.7140      | 34.540          |
|                   | 20MHz + 15MHz BAND 64QAM |                         |         | 32.8210      | 34.840          |
|                   | 20MHz + 20MHz BAND QPSK  | 100/0 + 100/0           |         | 37.431       | 40.210          |
|                   | 20MHz + 20MHz BAND 16QAM |                         |         | 37.4240      | 40.250          |
|                   | 20MHz + 20MHz BAND 64QAM |                         |         | 37.5710      | 39.840          |

### 8.1.1. LTE BAND 5

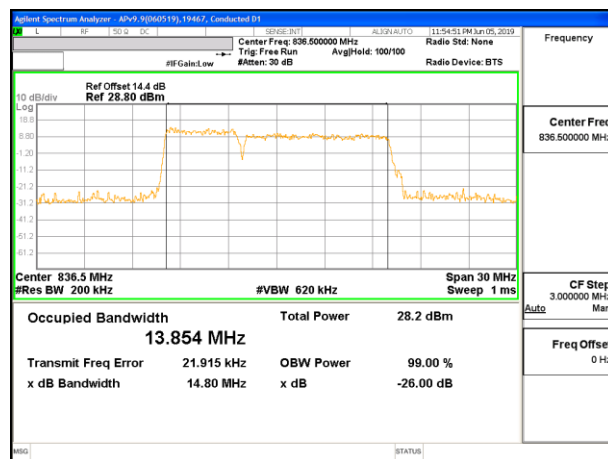




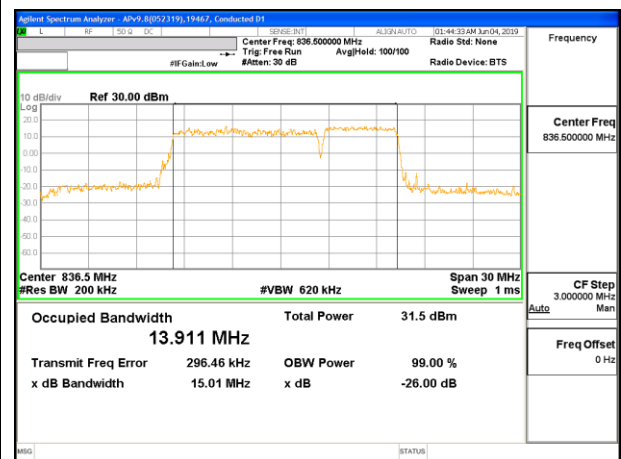
LTE B5 5MHz + 10MHz QPSK RB25-0 + RB50-0



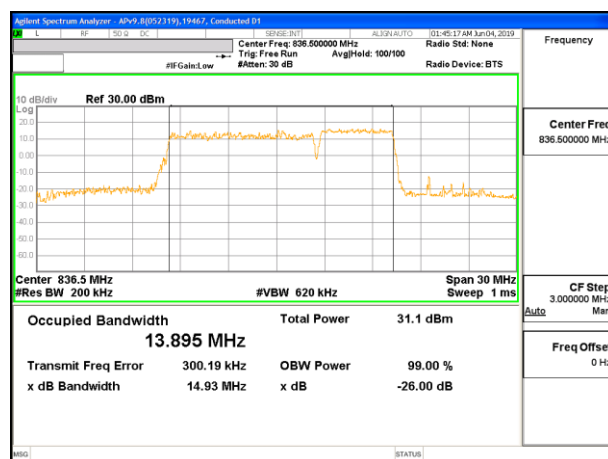
LTE B5 5MHz + 10MHz 16QAM RB25-0 + RB50-0



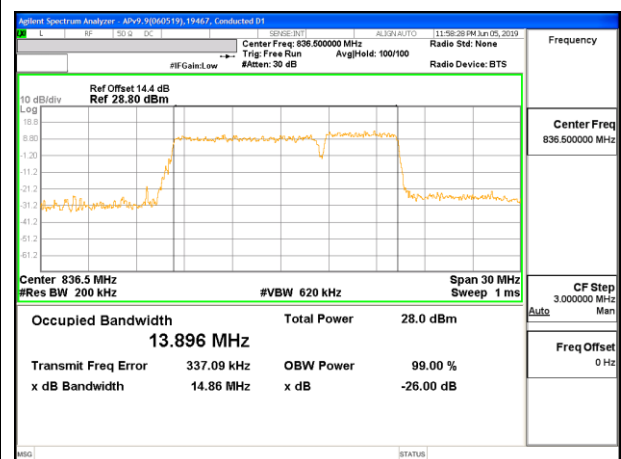
B5 5MHz + 10MHz 64QAM RB25-0 + RB50-0



LTE B5 10MHz + 5MHz QPSK RB50-0 + RB25-0



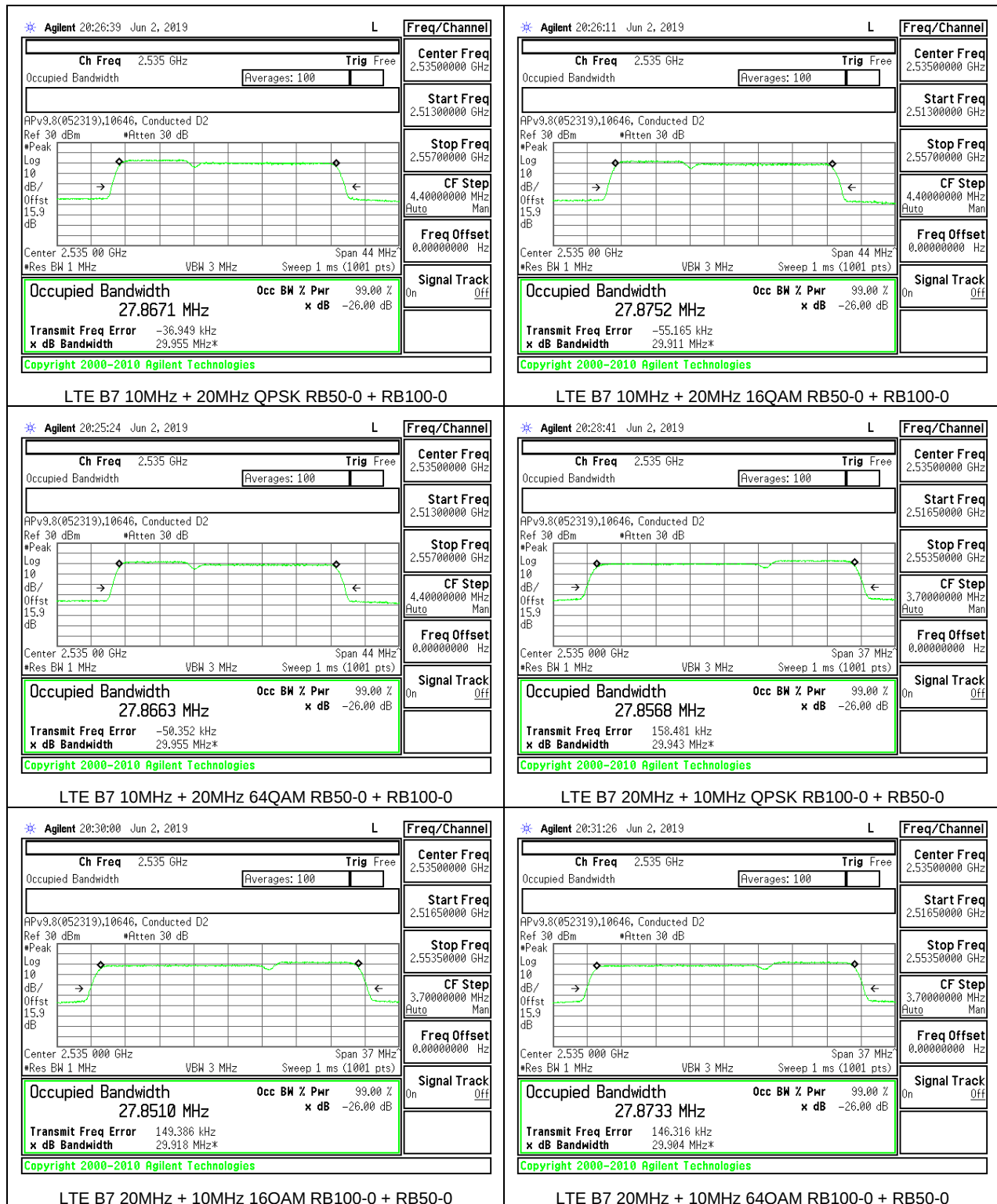
LTE B5 10MHz + 5MHz 16QAM RB50-0 + RB25-0

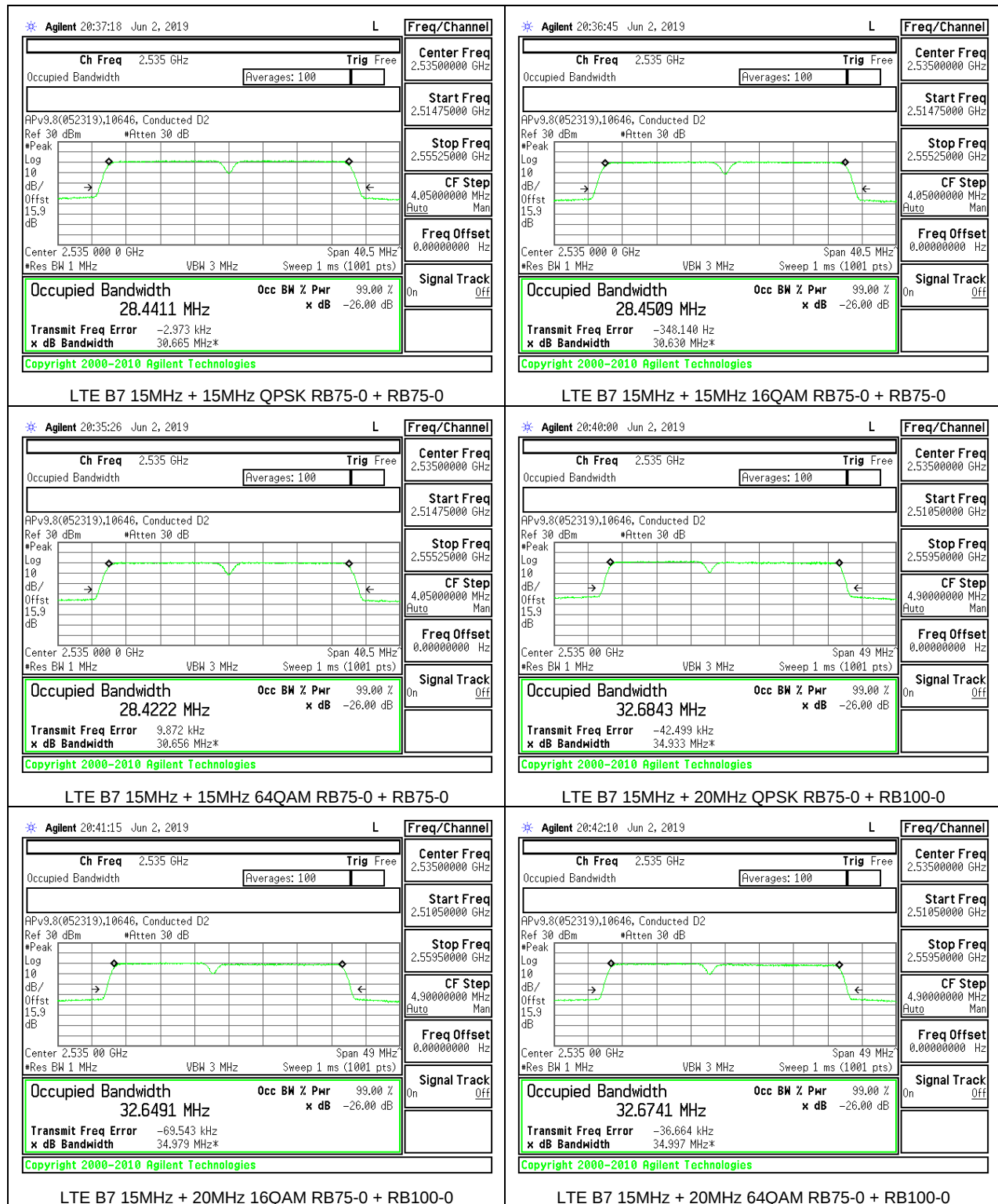


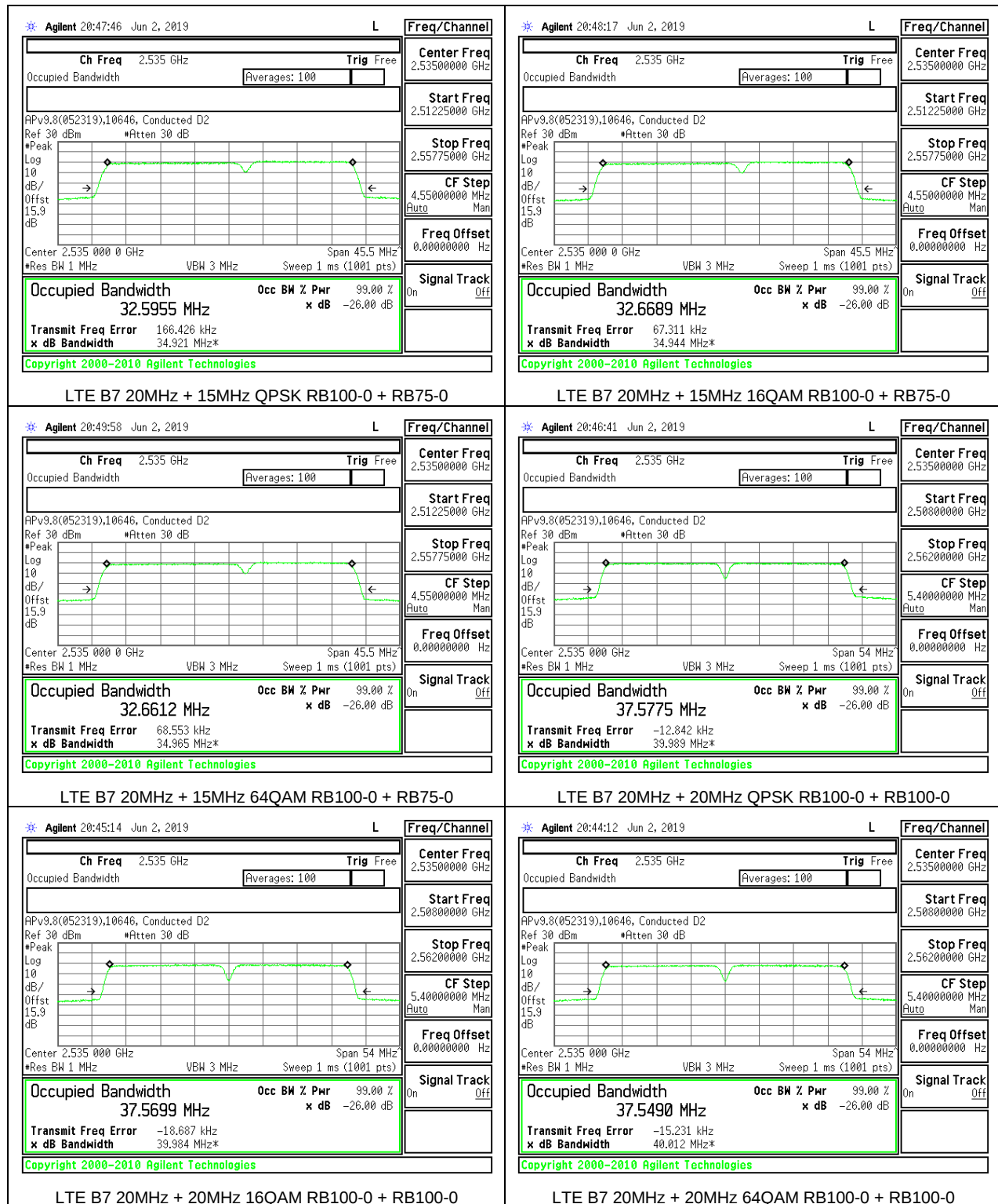
LTE B5 10MHz + 5MHz 64QAM RB50-0 + RB25-0



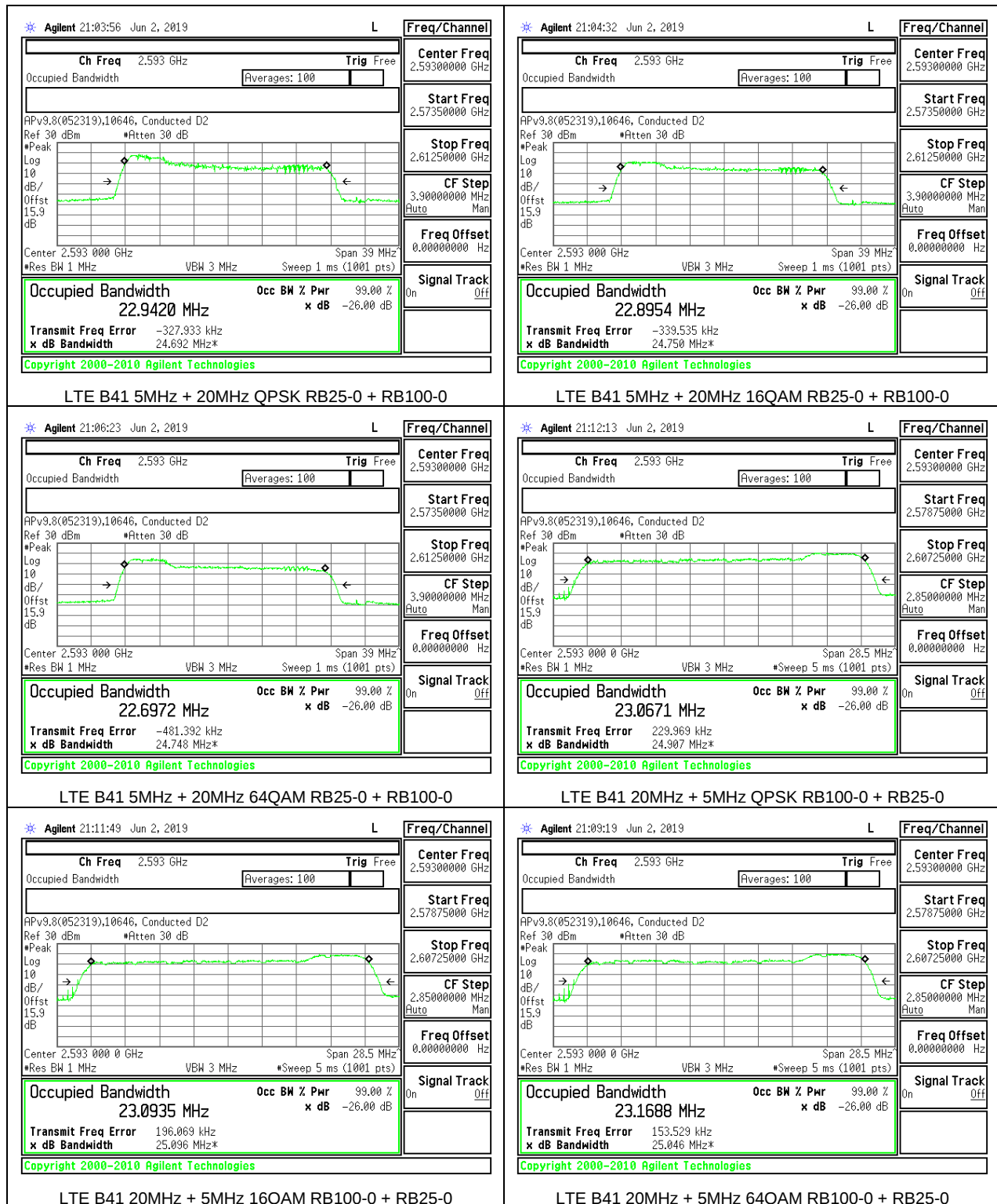
## 8.1.2. LTE BAND 7

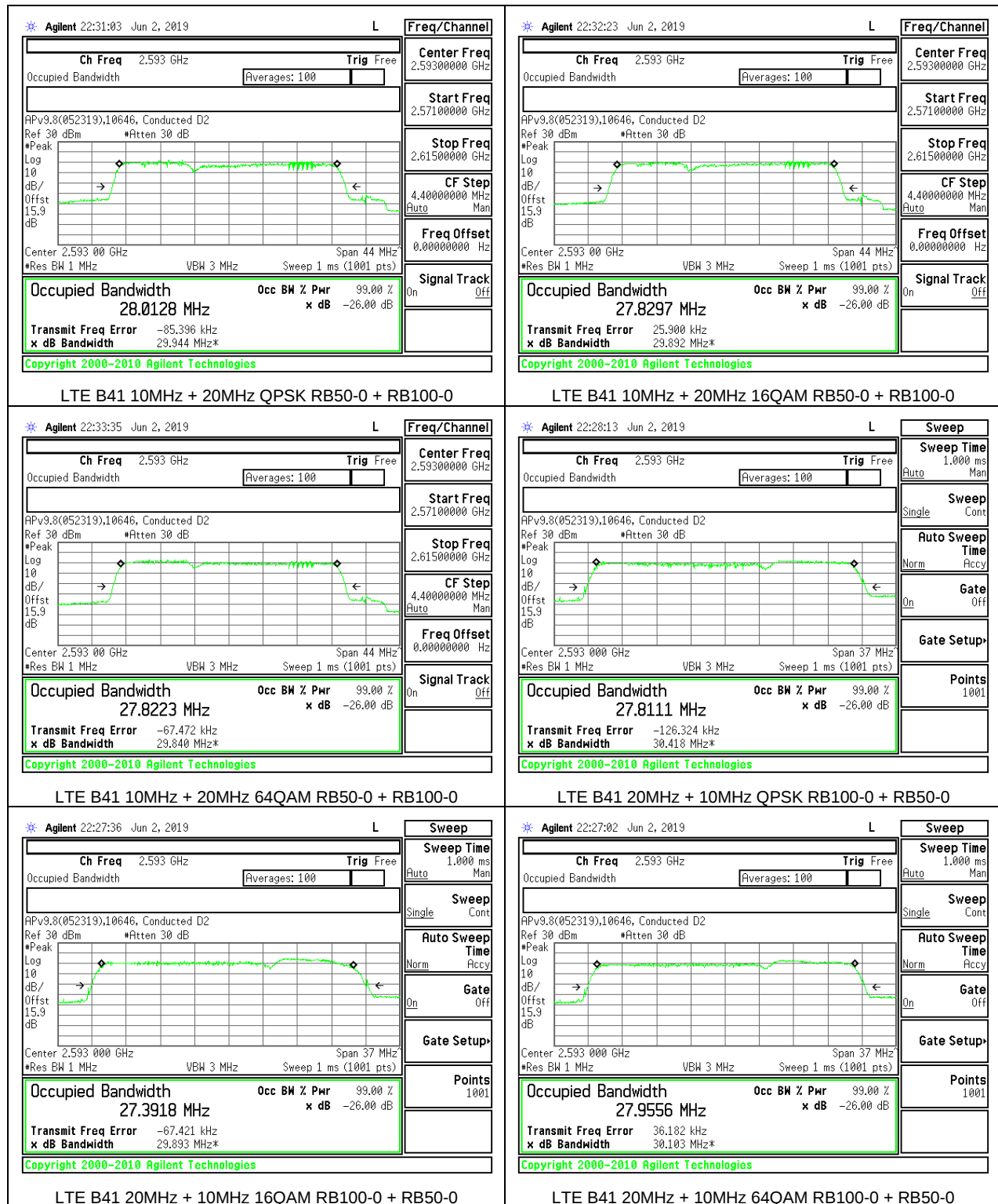


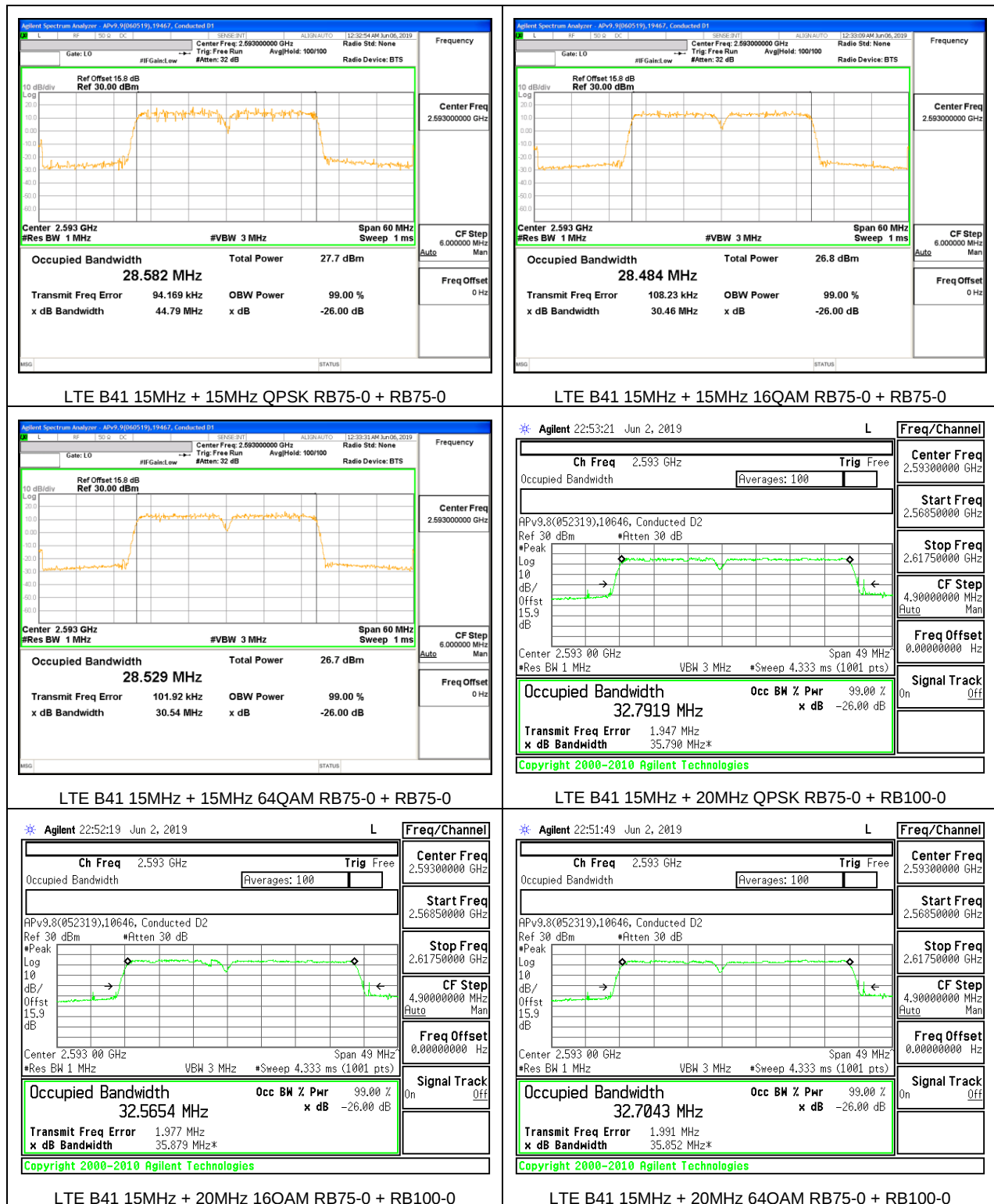


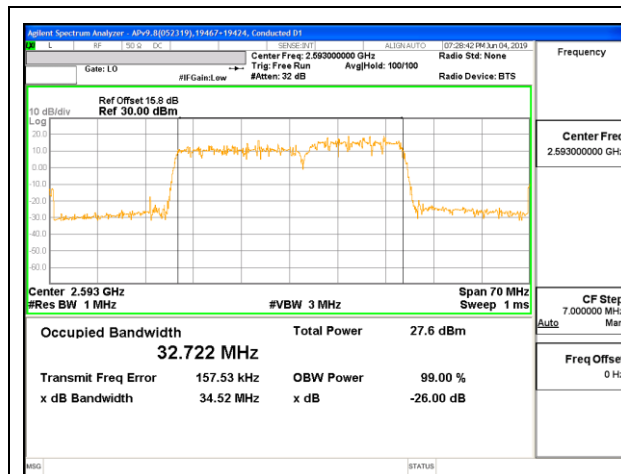


### 8.1.3. LTE BAND 41

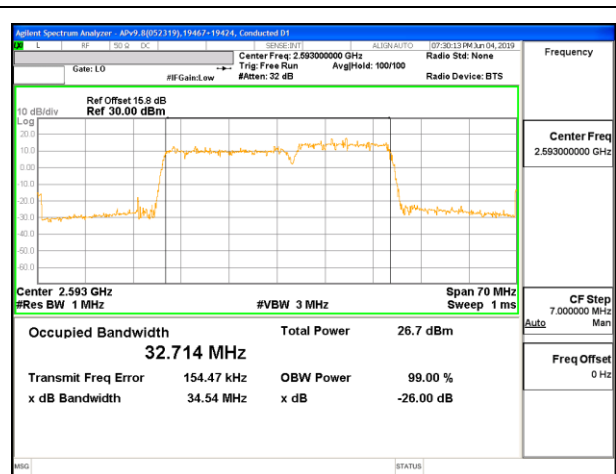




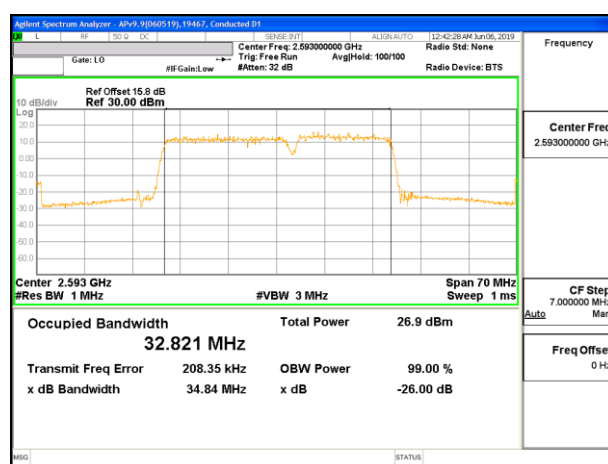




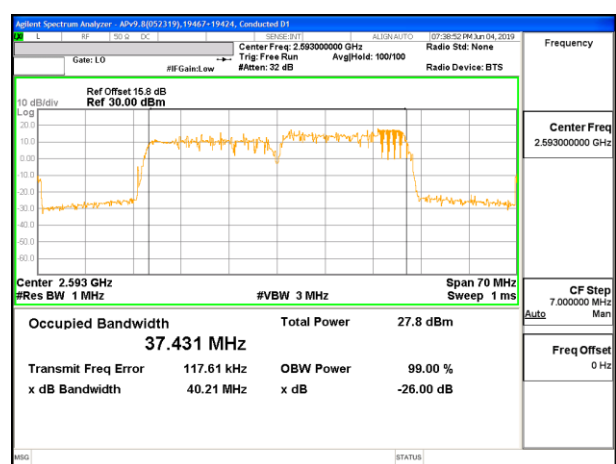
LTE B41 20MHz + 15MHz QPSK RB100-0 + RB75-0



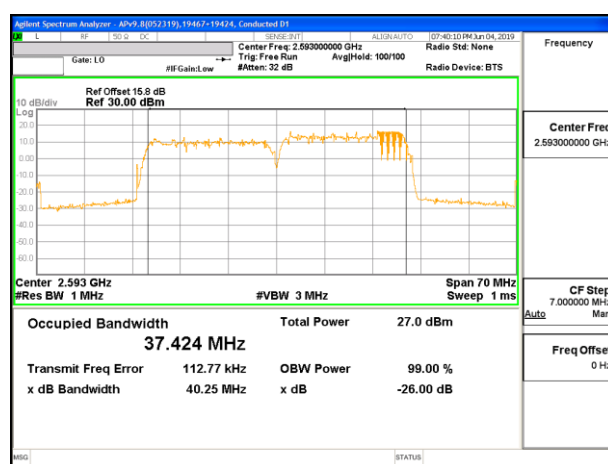
LTE B41 20MHz + 15MHz 16QAM RB100-0 + RB75-0



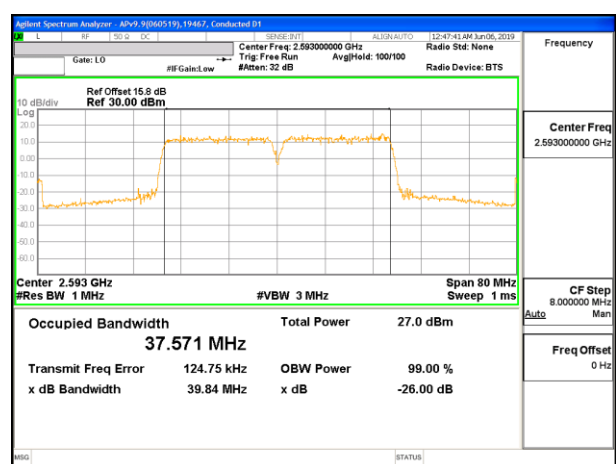
LTE B41 20MHz + 15MHz 64QAM RB100-0 + RB75-0



LTE B41 20MHz + 20MHz QPSK RB100-0 + RB100-0



LTE B41 20MHz + 20MHz 16QAM RB100-0 + RB100-0



LTE B41 20MHz + 20MHz 64QAM RB100-0 + RB100-0

## 8.2. BAND EDGE AND EMISSION MASK

### RULE PART(S)

FCC: §2.1051, §22.917, and §27.53

### LIMITS

FCC: §22.917, §24.238, §27.53(h)

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.

FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

### TEST PROCEDURE FOR FCC PART 27

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

1. Set the spectrum analyzer span to include the block edge frequency.
2. Set a marker to point the corresponding band edge frequency in each test case.
3. Set display line at -13 dBm

Set resolution bandwidth to at least 1% of emission bandwidth.

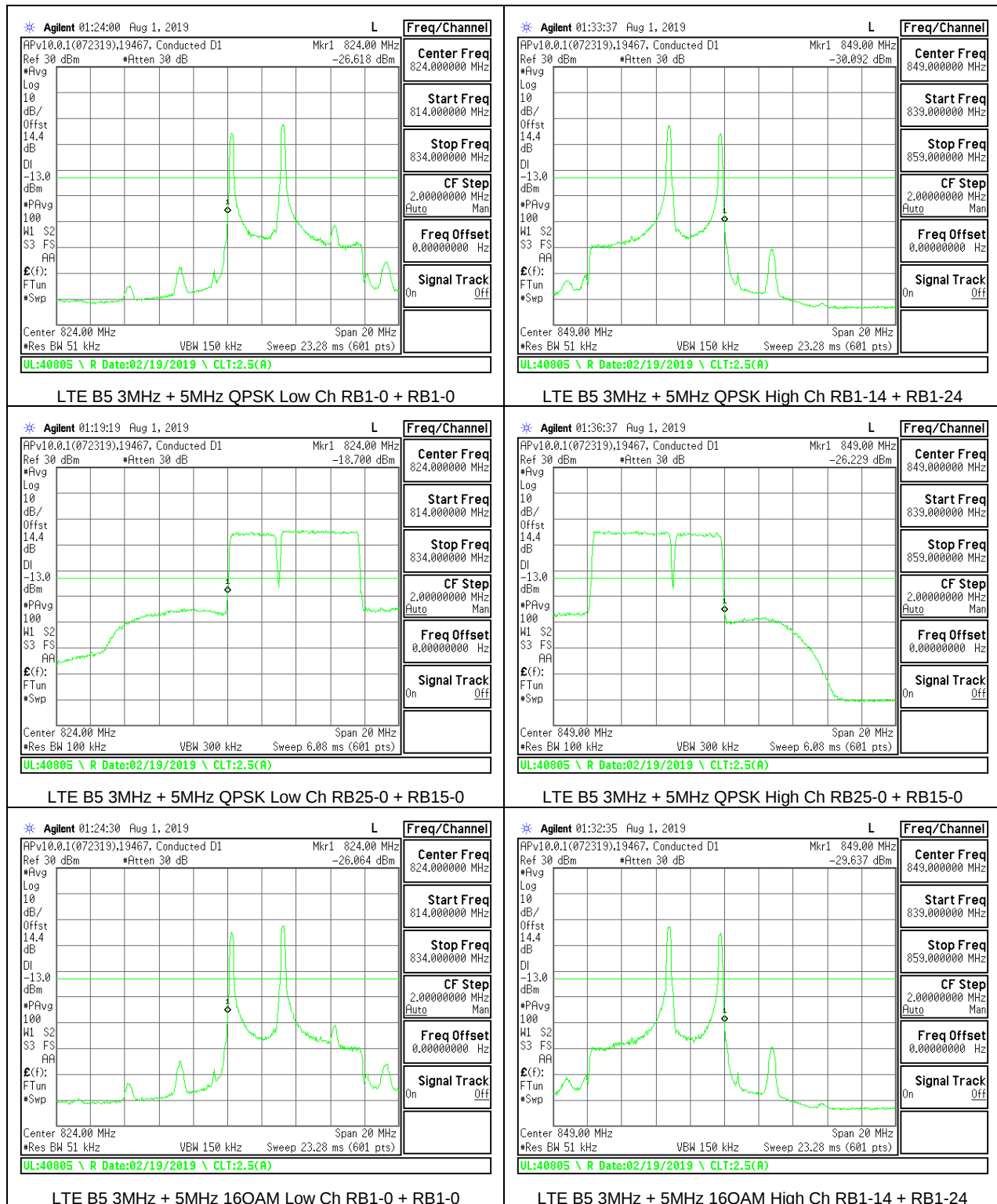
(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). 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 emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

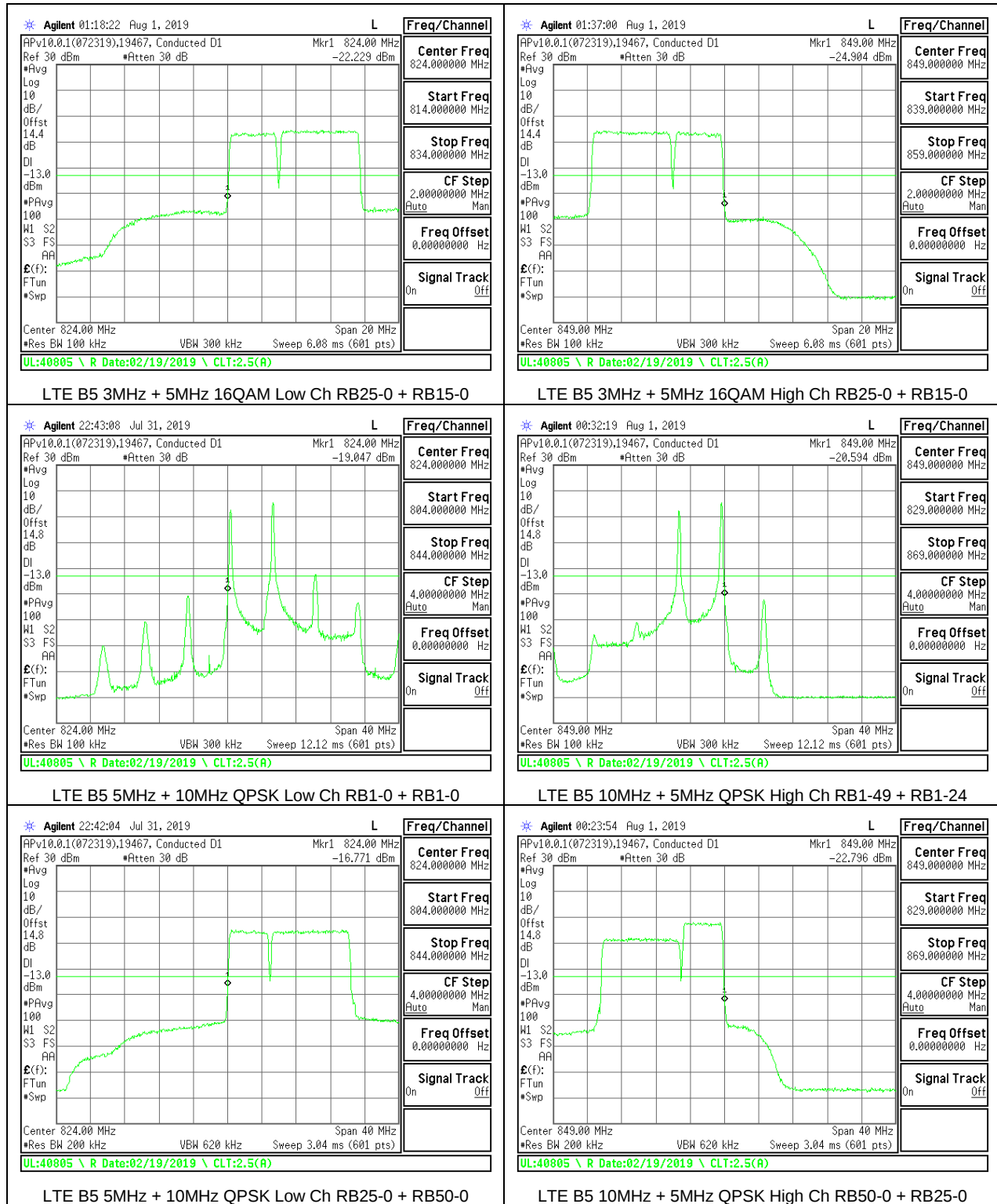
**MODES TESTED**

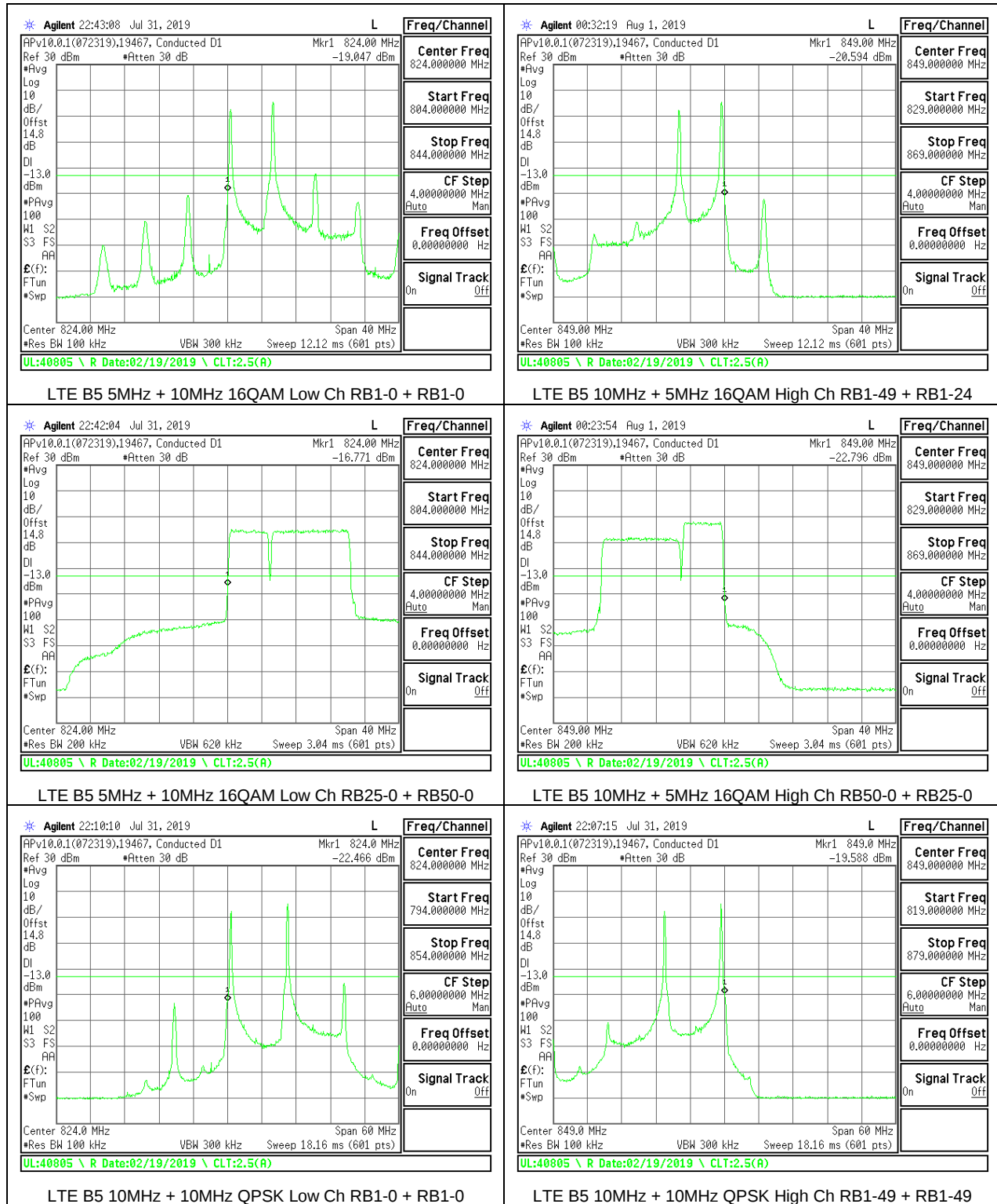
- LTE Band 5
- LTE Band 7
- LTE Band 41

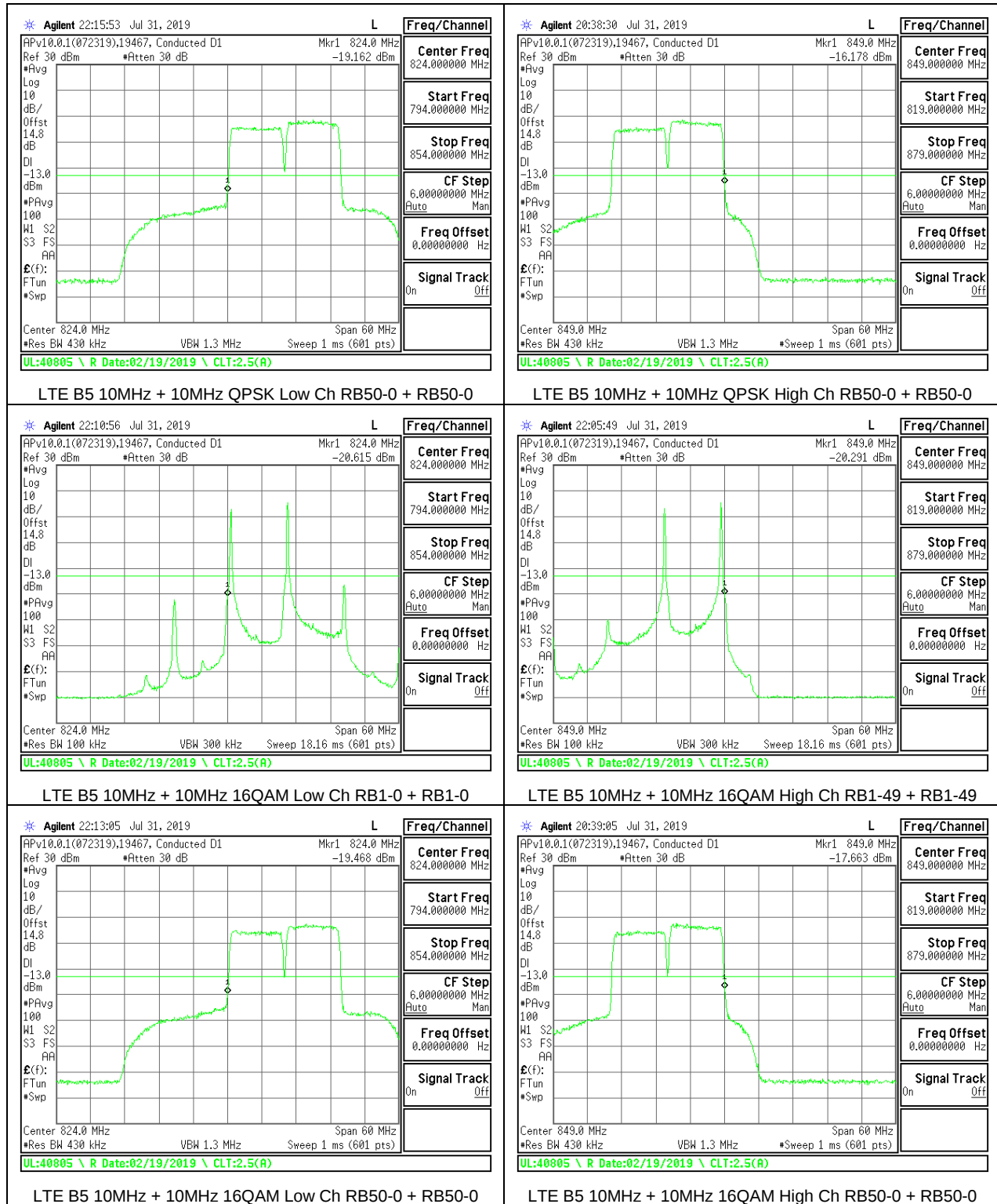
**RESULTS**

## 8.2.1. LTE BAND 5



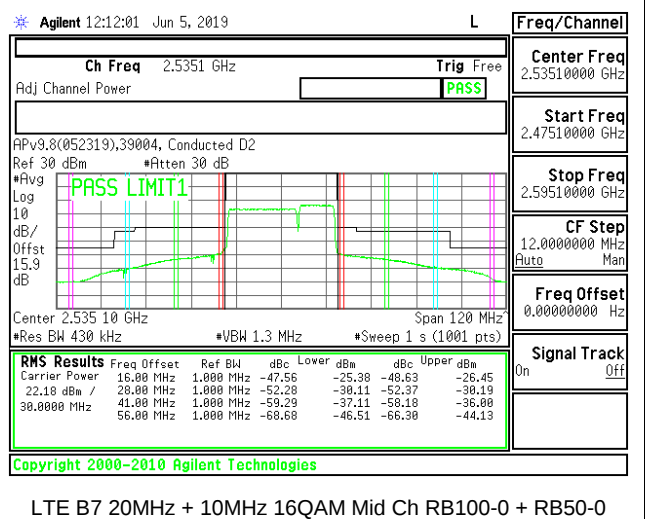
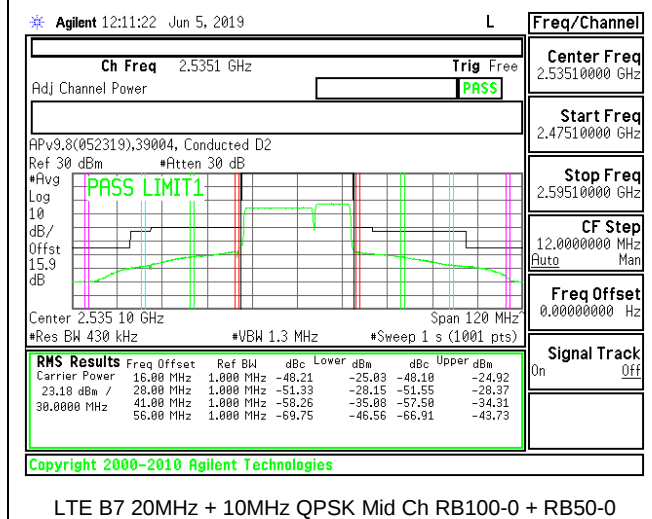
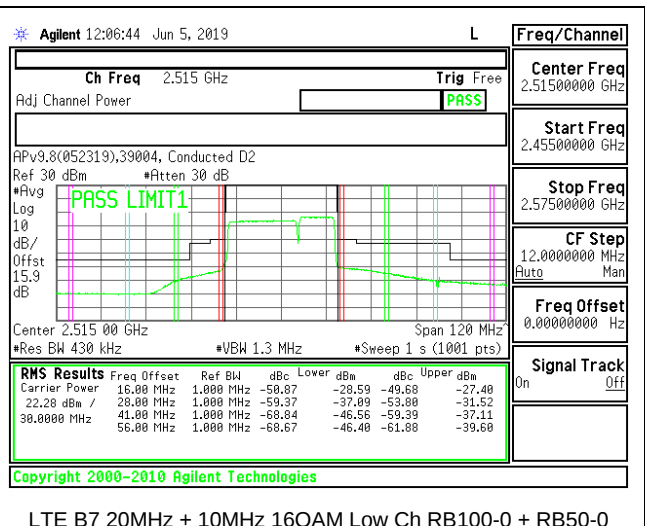
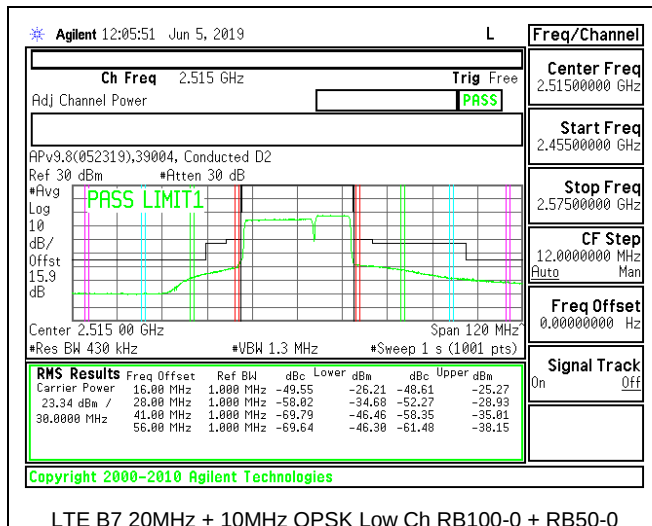
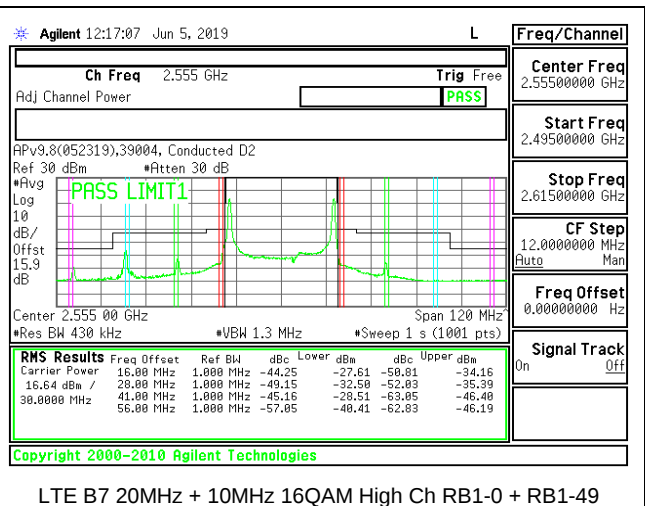
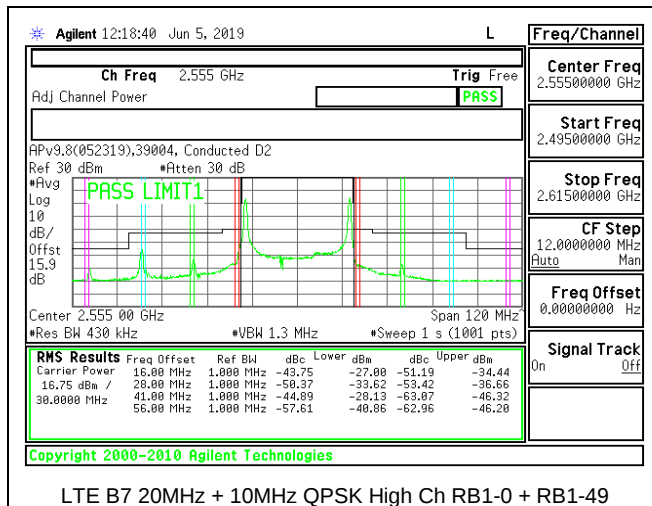


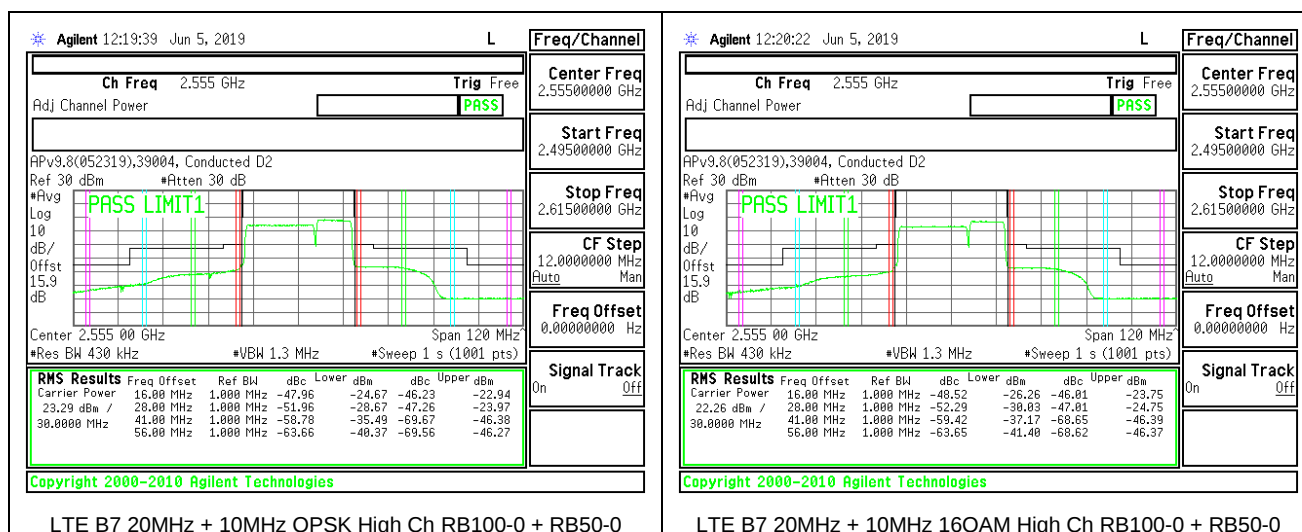


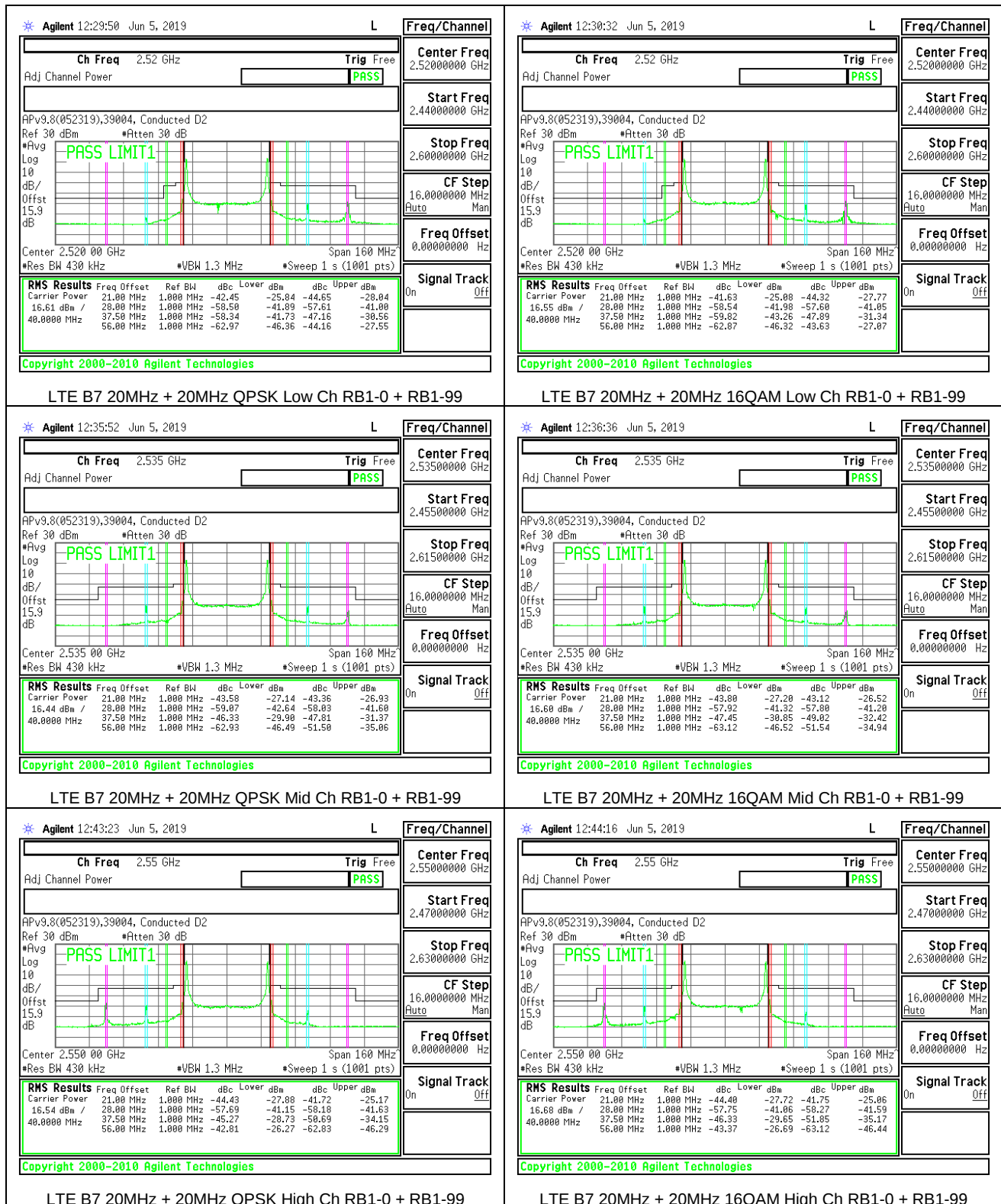


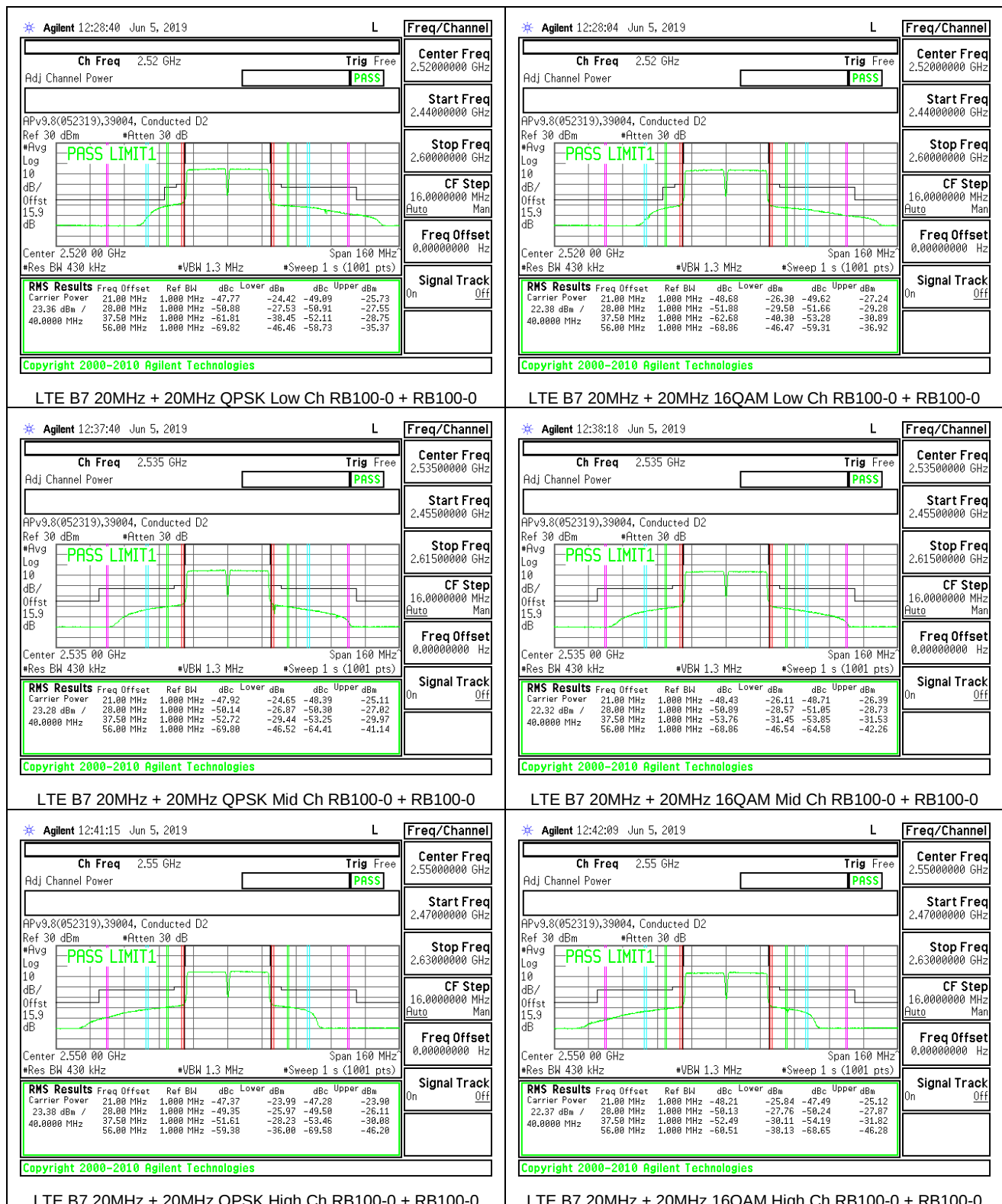
## 8.2.2. LTE BAND 7



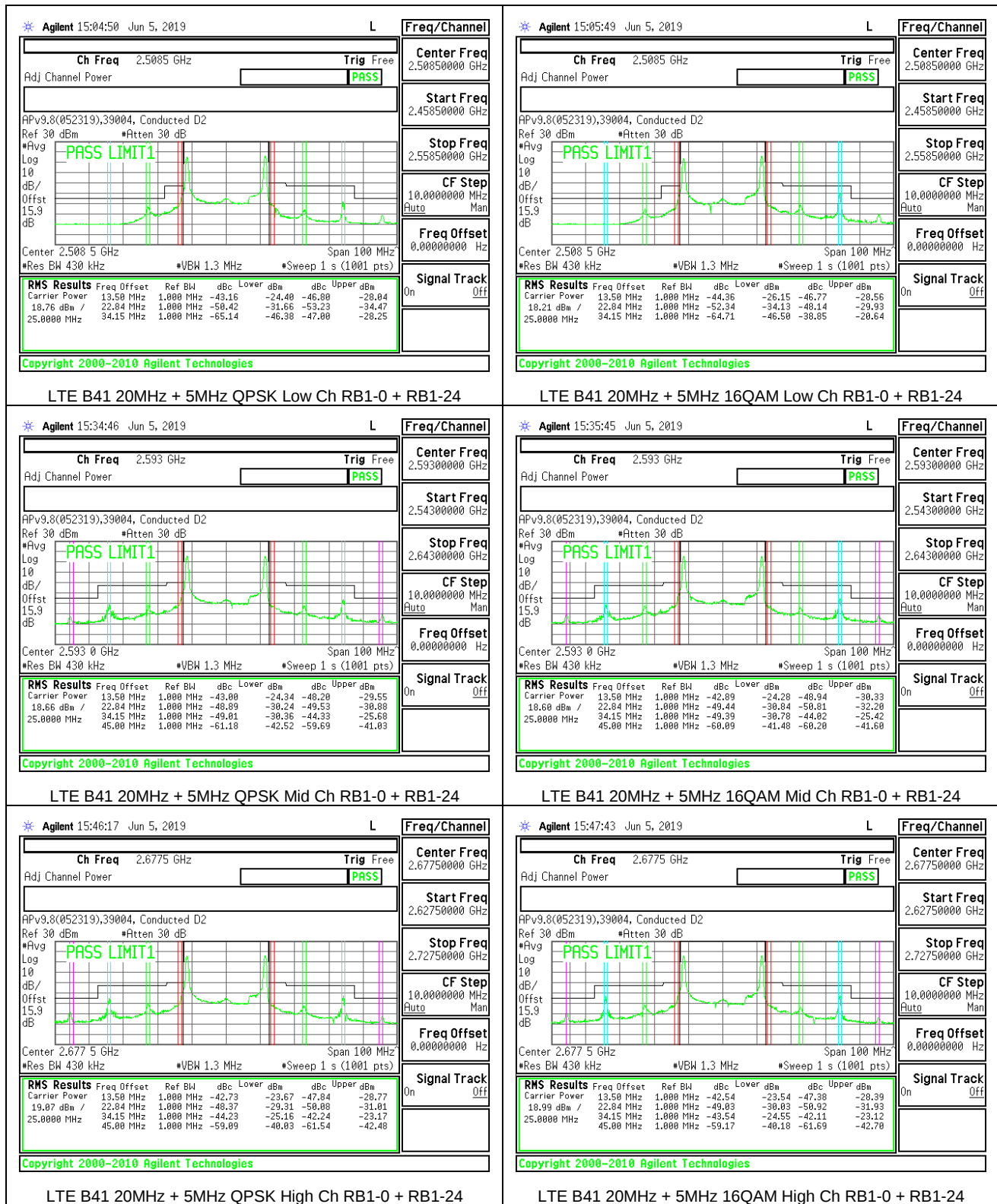


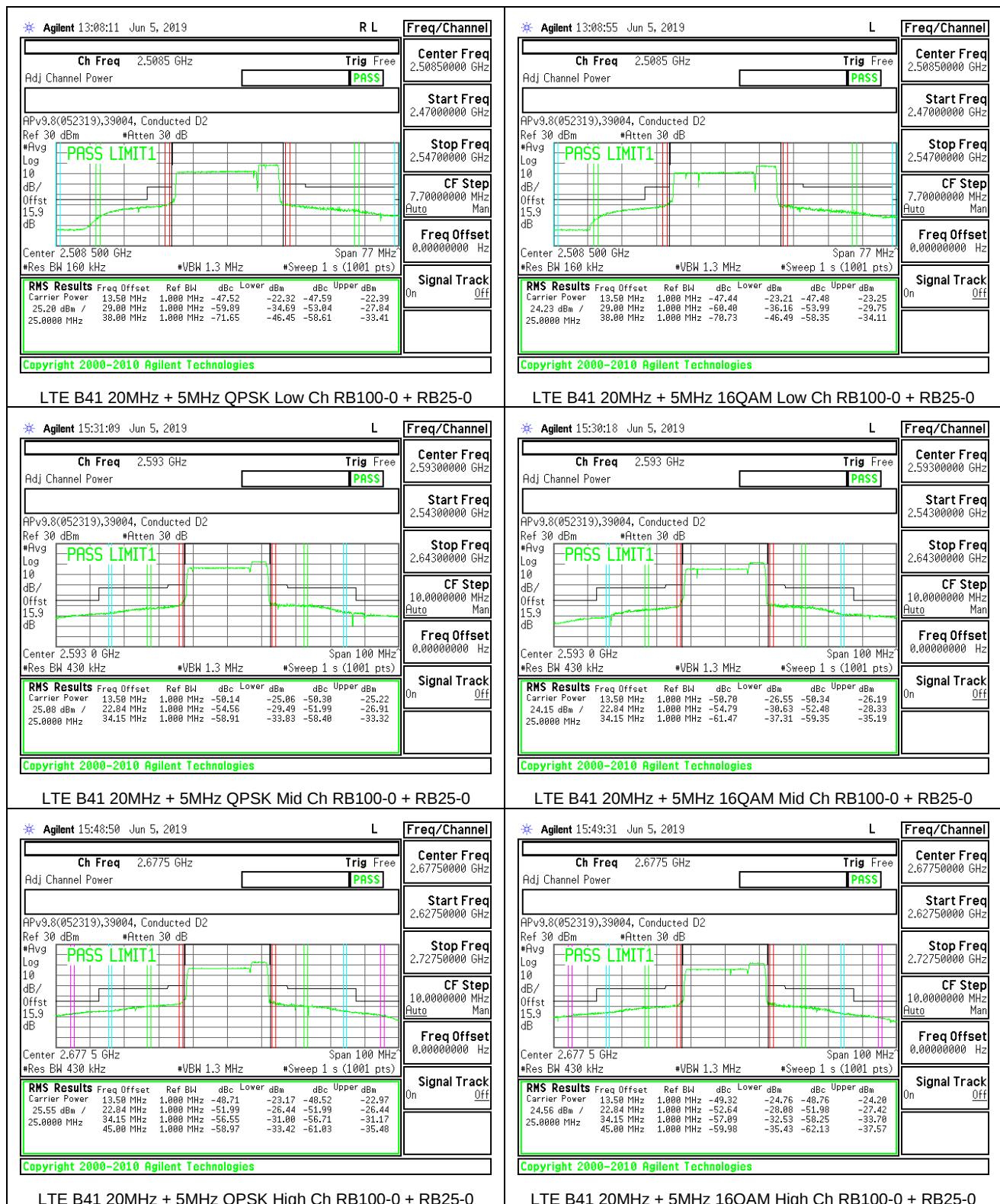


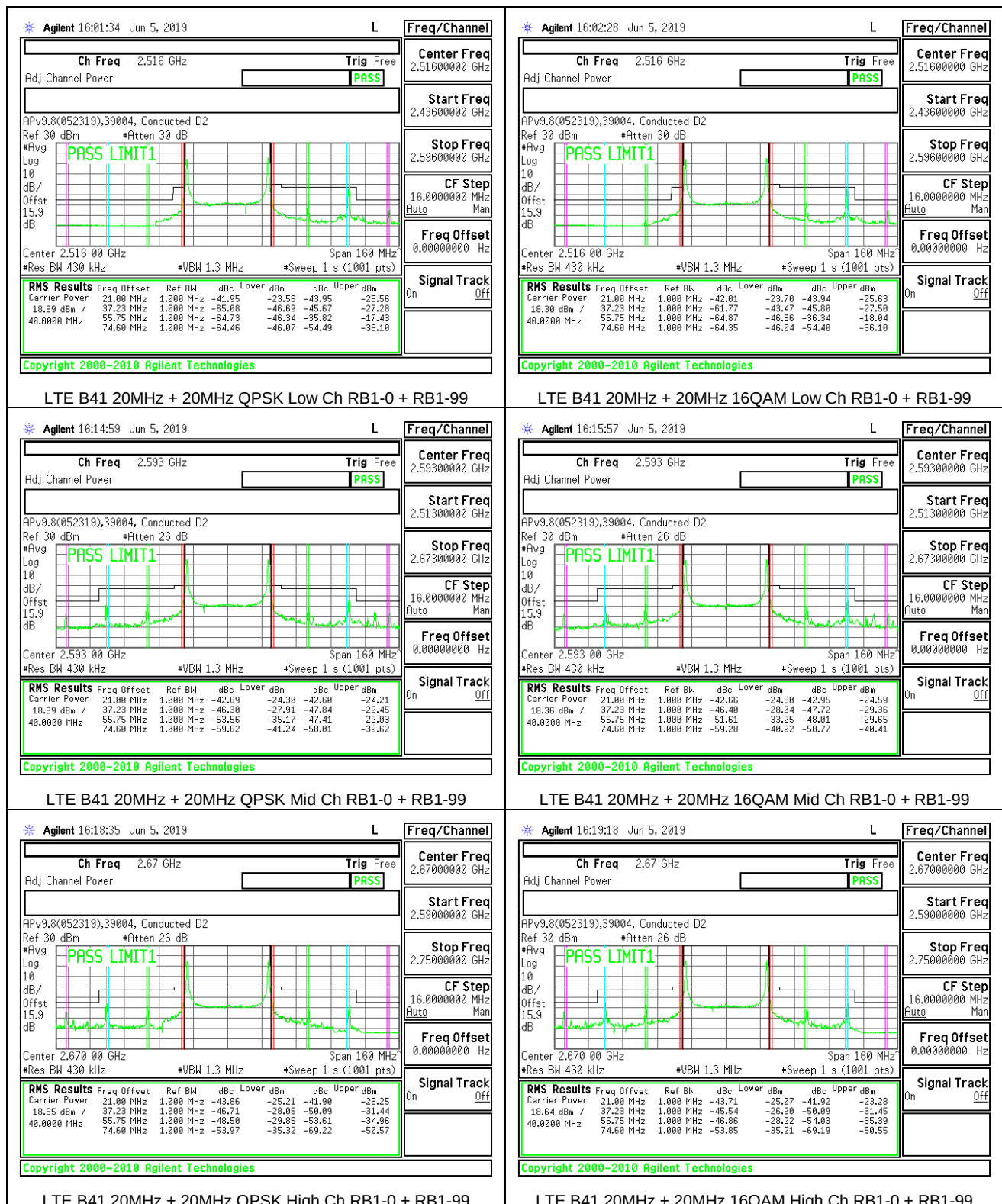


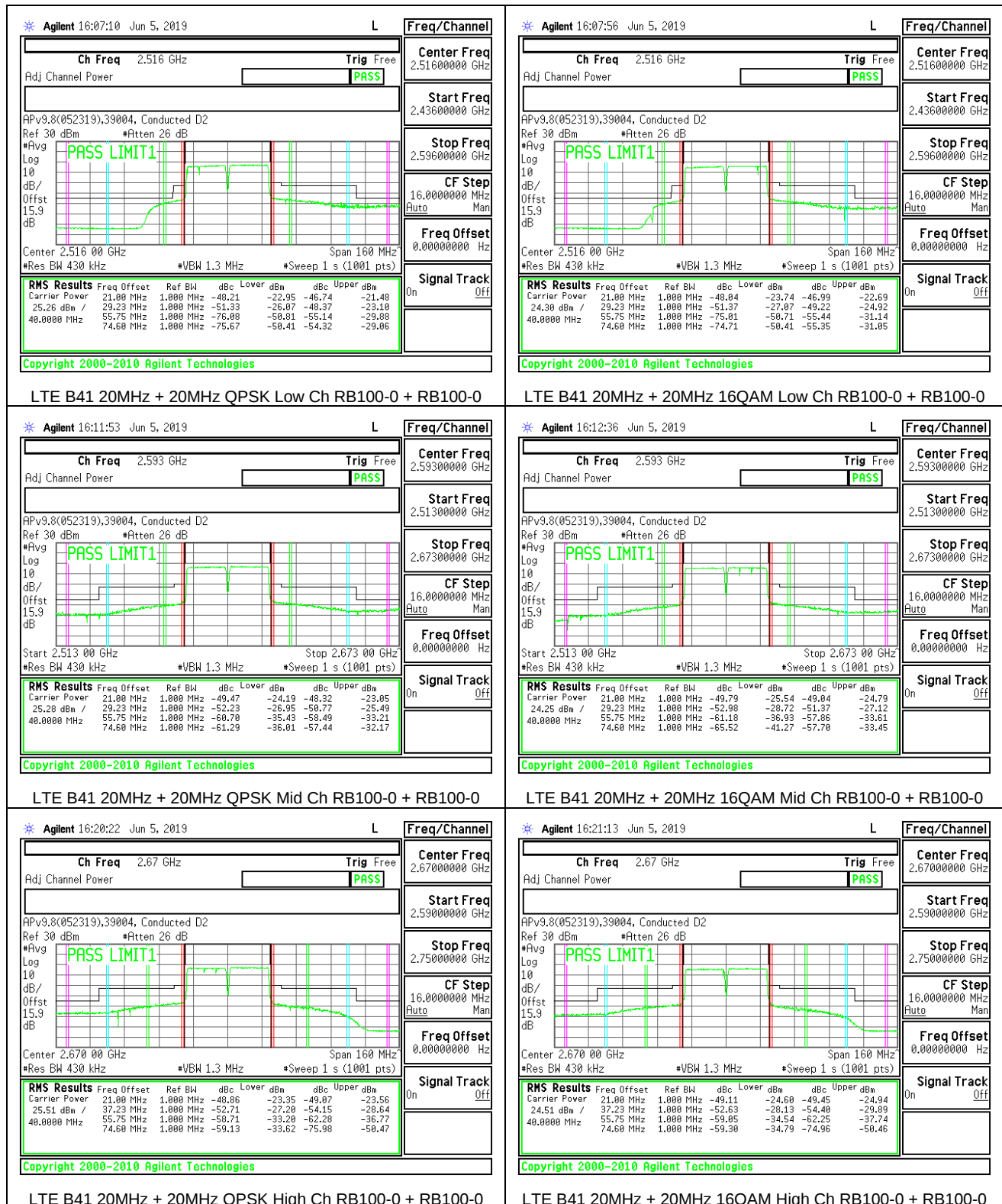


### 8.2.3. LTE BAND 41









### 8.3. OUT OF BAND EMISSIONS

#### RULE PART(S)

FCC: §2.1051, §22.917, §27.53

#### LIMITS

FCC: §27.53 (m)

The minimum permissible attenuation level of any spurious emissions is  $55 + 10 \log (P)$  dB where transmitting power (P) in Watts.

#### TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

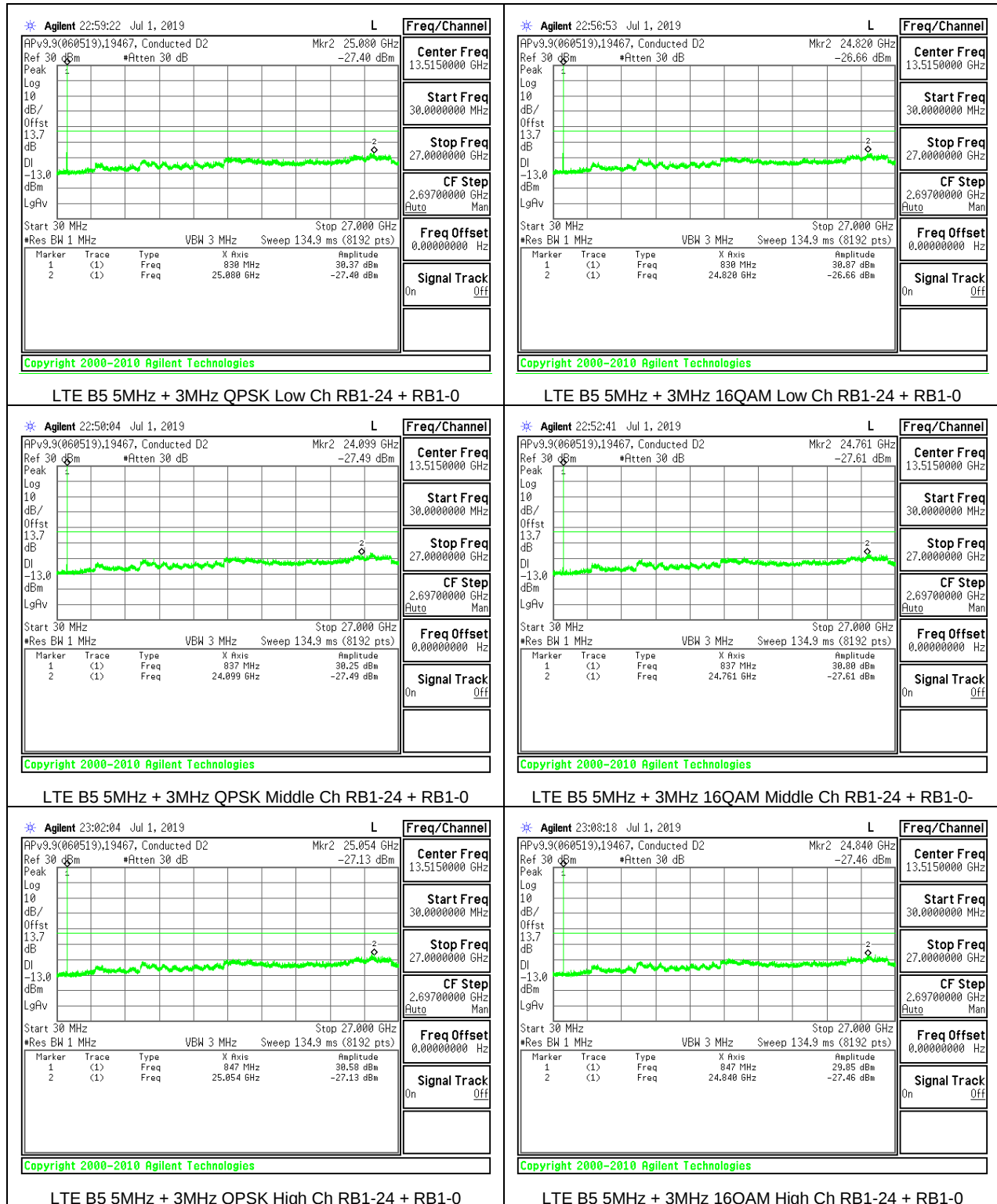
For each out of band emissions measurement:

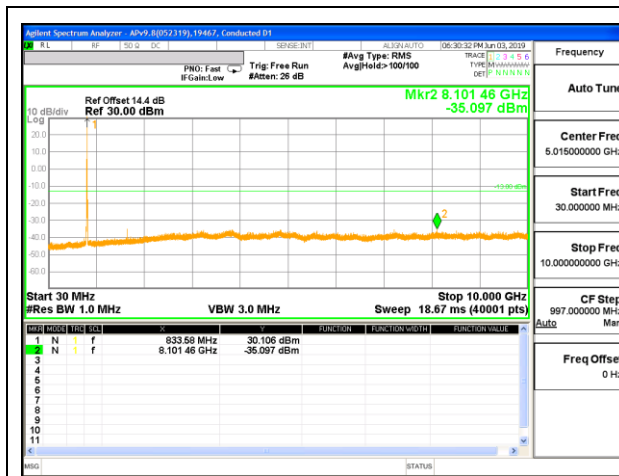
- Set display line at -25 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.  
(NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

#### MODES TESTED

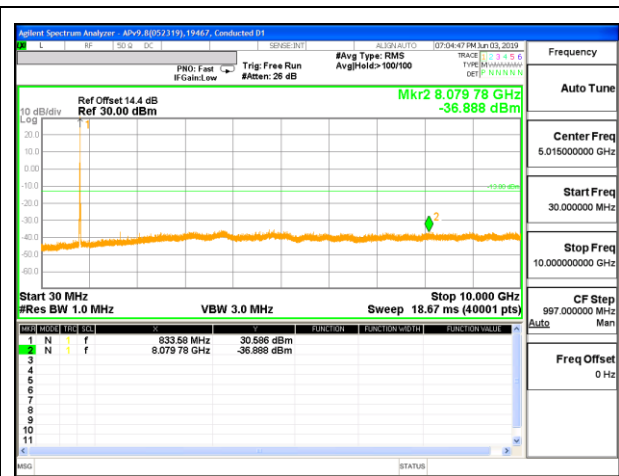
- LTE Band 5
- LTE Band 7
- LTE Band 41

### 8.3.1. LTE BAND 5

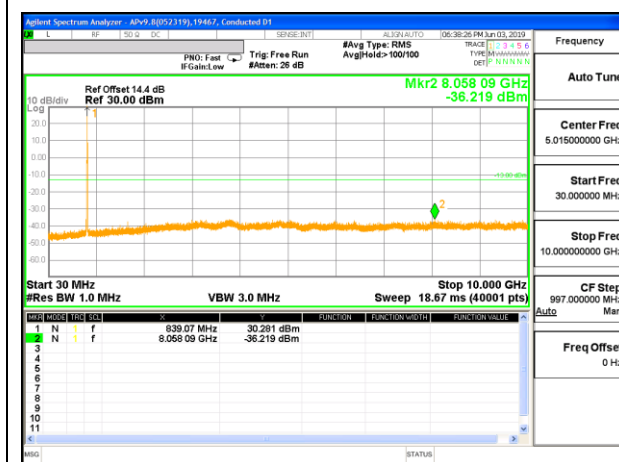




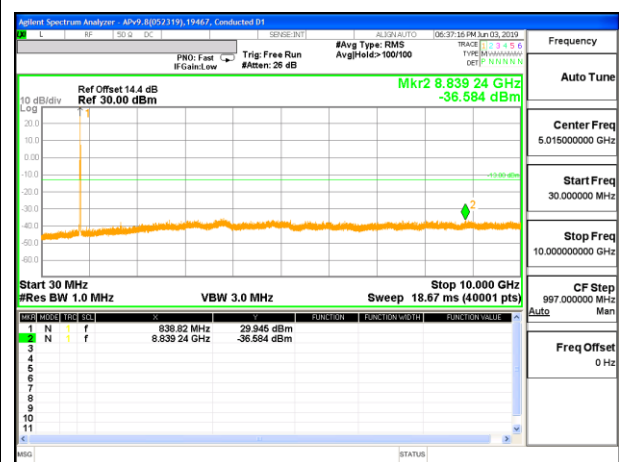
LTE B5 10MHz + 5MHz QPSK Low Ch RB1-49 + RB1-0



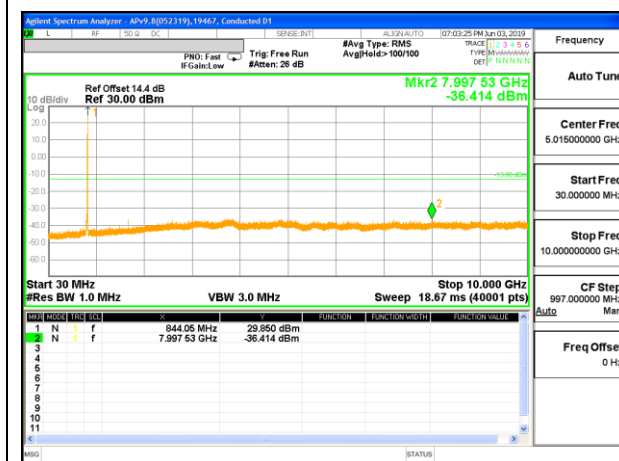
LTE B5 10MHz + 5MHz 16QAM Low Ch RB1-49 + RB1-0



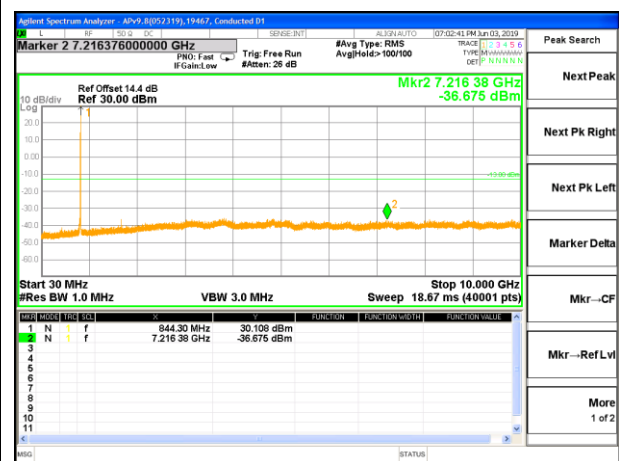
LTE B5 10MHz + 5MHz QPSK Middle Ch RB1-49 + RB1-0



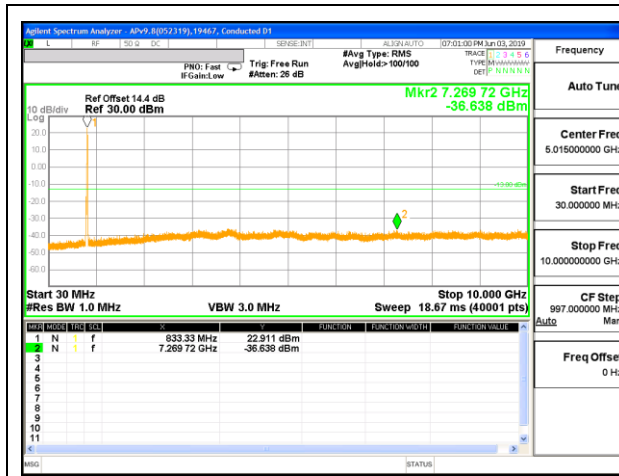
LTE B5 10MHz + 5MHz 16QAM Middle Ch RB1-49 + RB1-0



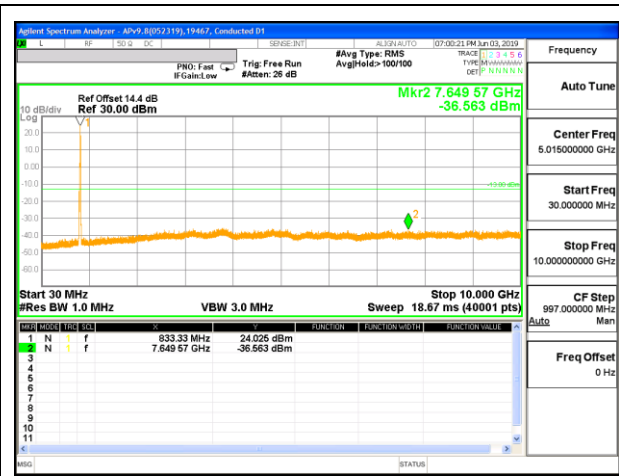
LTE B5 10MHz + 5MHz QPSK High Ch RB1-49 + RB1-0



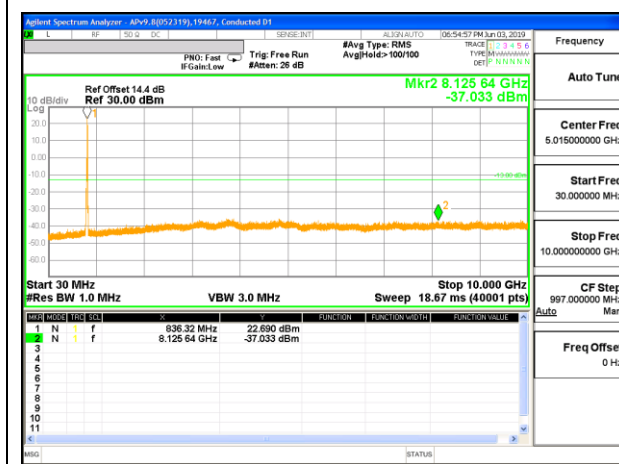
LTE B5 10MHz + 5MHz 16QAM High Ch RB1-49 + RB1-0



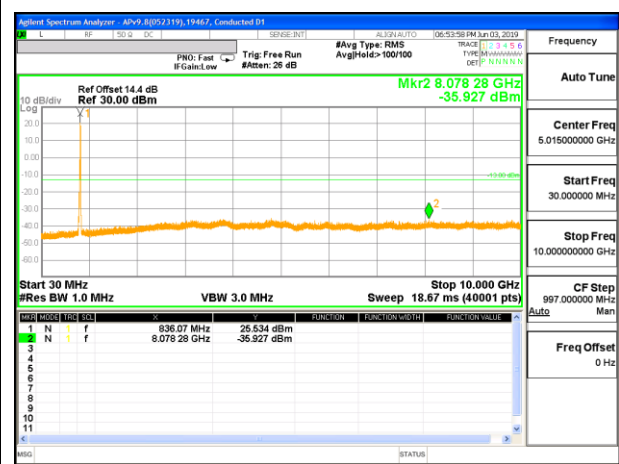
LTE B5 10MHz + 10MHz QPSK Low Ch RB1-49 + RB1-0



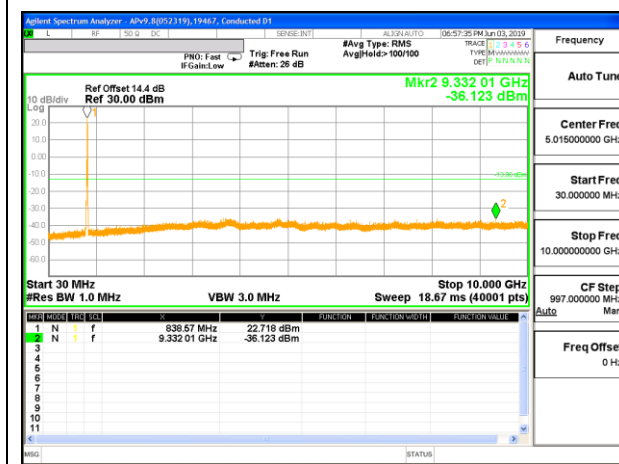
LTE B5 10MHz + 10MHz 16QAM Low Ch RB1-49 + RB1-0



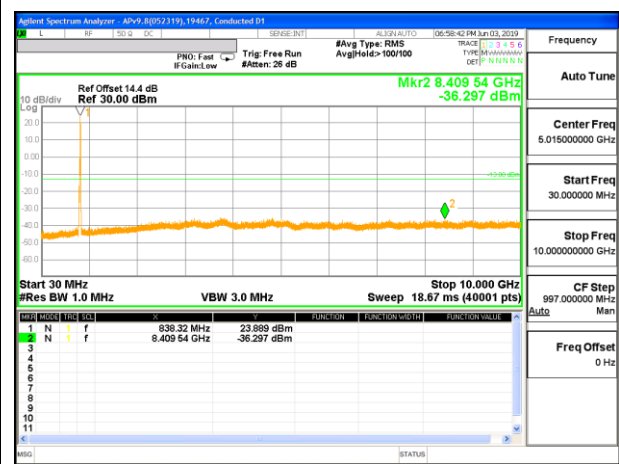
LTE B5 10MHz + 10MHz QPSK Middle Ch RB1-49 + RB1-0



LTE B5 10MHz + 10MHz 16QAM Middle Ch RB1-49 + RB1-0



LTE B5 10MHz + 10MHz QPSK High Ch RB1-49 + RB1-0



LTE B5 10MHz + 10MHz 16QAM High Ch RB1-49 + RB1-0

### 8.3.2. LTE BAND 7

