

# FCC TEST REPORT (PART 27)

**Product:** LTE Digital Mobile Phone

**Model Name:** NX529J/ nubia Z11 mini

**FCC ID:** SRQ-NX529J-US

**Applicant:** ZTE Corporation

**Address:** ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,  
Nanshan District, Shenzhen, Guangdong, P.R.China

**Manufacturer:** ZTE Corporation

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**Report No.:** RF160614W011-5

**Received Date:** Jun. 14, 2016

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**Issued Date:** July 06, 2016

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## RELEASE CONTROL RECORD

| ISSUE NO.      | REASON FOR CHANGE | DATE ISSUED   |
|----------------|-------------------|---------------|
| RF160614W011-5 | Original release  | July 06, 2016 |



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## 1 CERTIFICATION

**PRODUCT:** LTE Digital Mobile Phone  
**BRAND NAME:** ZTE  
**MODEL NAME:** NX529J/ nubia Z11 mini  
**APPLICANT:** ZTE Corporation  
**TESTED:** Jun. 15, 2016 ~ July 05, 2016  
**TEST SAMPLE:** Identical Prototype  
**TEST STANDARDS:** **FCC Part 27, Subpart C, L**  
**FCC Part 2**  
**ANSI/TIE/EIA-603-D**

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

**PREPARED BY :** Anna , **DATE:** July 06, 2016  
( Anna Du / Engineer)

**APPROVED BY :** Bill , **DATE:** July 06, 2016  
( Bill Yao / Manager)

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 27 & Part 2 |                              |        |                                                                                     |
|----------------------------------------|------------------------------|--------|-------------------------------------------------------------------------------------|
| STANDARD SECTION                       | TEST TYPE AND LIMIT          | RESULT | REMARK                                                                              |
| 2.1046<br>27.50(d)(4)                  | Maximum Peak Output Power    | PASS   | Meet the requirement of limit.                                                      |
| 2.1055<br>27.54                        | Frequency Stability          | PASS   | Meet the requirement of limit.                                                      |
| 2.1049<br>27.53(h)                     | Occupied Bandwidth           | PASS   | Meet the requirement of limit.                                                      |
| 27.50(d)(5)                            | Peak to average ratio        | PASS   | Meet the requirement of limit.                                                      |
| 27.53(h)                               | Band Edge Measurements       | PASS   | Meet the requirement of limit.                                                      |
| 2.1051<br>27.53(h)                     | Conducted Spurious Emissions | PASS   | Meet the requirement of limit.                                                      |
| 2.1053<br>27.53(h)                     | Radiated Spurious Emissions  | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -22.50dB at 5186.00MHz. |

### 2.1 MEASUREMENT UNCERTAINTY

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

| MEASUREMENT         | FREQUENCY     | UNCERTAINTY |
|---------------------|---------------|-------------|
| Conducted emissions | 9kHz~30MHz    | 2.66dB      |
| Radiated emissions  | 9KHz ~ 30MHz  | 2.74dB      |
|                     | 30MHz ~ 1GMHz | 3.55dB      |
|                     | 1GHz ~ 18GHz  | 4.84dB      |
|                     | 18GHz ~ 40GHz | 1.94dB      |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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## 2.2 TEST SITE AND INSTRUMENTS

| Equipment                        | Manufacturer    | Model No.                | Serial No.  | Last Cal.   | Next Cal.   |
|----------------------------------|-----------------|--------------------------|-------------|-------------|-------------|
| EMI Test Receiver                | Rohde&Schwarz   | ESR7                     | 101494      | Apr. 05,16  | Apr. 04,17  |
| Signal and Spectrum Analyzer     | Rohde&Schwarz   | FSV40                    | 101094      | Apr. 05,16  | Apr. 04,17  |
| Bilog Antenna 1                  | Teseq           | CBL 6111D                | 30643       | Aug. 28,15  | Aug. 27,16  |
| Bilog Antenna 2                  | Teseq           | CBL 6111D                | 27089       | Aug. 28,15  | Aug. 27,16  |
| Horn Antenna                     | ETS-Lindgren    | 3117                     | 00062558    | May 30,14   | May 29,17   |
| Horn Antenna (15GHz-40GHz)       | SCHWARZBECK     | BBHA 9170                | BBHA9170147 | Jan. 21,14  | Jan. 20,17  |
| Amplifier                        | Burgeon         | BPA-530                  | 100220      | Apr. 05,16  | Apr. 04,17  |
| Pre-Amplifier                    | HP              | 8449B                    | 3008A00409  | Apr. 25,15  | Apr. 24,17  |
| Pre-Amplifier (18GHz-40GHz)      | EMCI            | EMC 184045               | 980102      | Nov. 11,15  | Nov. 10,16  |
| GPS Generator+ Antenna           | TOJOIN          | GNSS-5000A               | E1-010119   | Aug. 08, 14 | Aug. 07, 16 |
| 3m Semi-anechoic Chamber         | ETS-LINDGREN    | 9m*6m*6m                 | NSEMC003    | Mar. 12,16  | Mar. 11,18  |
| Test Software                    | ADT             | ADT_Radiated V7.6.15.9.2 | N/A         | N/A         | N/A         |
| Power Meter                      | Anritsu         | ML2495A                  | 1139001     | Feb.19,16   | Feb. 18,17  |
| Power Sensor                     | Anritsu         | MA2411B                  | 1126068     | Feb.19,16   | Feb. 18,17  |
| Power Sensor                     | Keysight        | U2021XA                  | MY55060016  | May 27,15   | May 25,17   |
| Power Sensor                     | Keysight        | U2021XA                  | MY55060018  | May 27,15   | May 24,17   |
| Digital Multimeter               | FLUKE           | 15B                      | A1220010DG  | Oct. 12, 15 | Oct.11, 16  |
| Humid & Temp Programmable Tester | Haida           | HD-2257                  | 110807201   | Sep.07,15   | Sep. 06,16  |
| Oscilloscope                     | Agilent         | DSO9254A                 | MY51260160  | Nov. 09,15  | Nov. 08,16  |
| Signal Analyzer                  | Rohde & Schwarz | FSV7                     | 102331      | Nov. 09,15  | Nov. 08,16  |
| Signal Generator                 | Agilent         | N5183A                   | MY50140980  | Apr. 22, 15 | Apr. 21, 17 |
| ESG Vector Signal Generator      | Agilent         | E4438C                   | MY49072505  | Sep. 01,15  | Aug. 31,16  |
| BLUETOOTH TESTER                 | Rohde&Schwarz   | CBT32                    | 100811      | Oct. 12, 15 | Oct.11, 16  |

**NOTE:** 1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in Dongguan 966 Chamber.

3. The horn antenna are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 502831.

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                              |                                                         |                       |
|------------------------------|---------------------------------------------------------|-----------------------|
| <b>PRODUCT</b>               | LTE Digital Mobile Phone                                |                       |
| <b>MODEL NAME</b>            | NX529J/ nubia Z11 mini                                  |                       |
| <b>POWER SUPPLY</b>          | 5.0Vdc (adapter or host equipment)<br>3.85Vdc (battery) |                       |
| <b>MODULATION TECHNOLOGY</b> | <b>WCDMA IV</b>                                         | BPSK                  |
|                              | <b>LTE</b>                                              | QPSK, 16QAM           |
| <b>FREQUENCY RANGE</b>       | <b>WCDMA IV</b>                                         | 1712.4MHz ~ 1752.6MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 1.4MHz</b>         | 1710.7MHz ~ 1754.3MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 3MHz</b>           | 1711.5MHz ~ 1753.5MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 5MHz</b>           | 1712.5MHz ~ 1752.5MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 10MHz</b>          | 1715.0MHz ~ 1750.0MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 15MHz</b>          | 1717.5MHz ~ 1747.5MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 20MHz</b>          | 1720.0MHz ~ 1745.0MHz |
|                              | <b>LTE Band 12<br/>Channel Bandwidth: 1.4MHz</b>        | 699.7MHz ~ 715.3MHz   |
|                              | <b>LTE Band 12<br/>Channel Bandwidth: 3MHz</b>          | 700.5MHz ~ 714.5MHz   |
|                              | <b>LTE Band 12<br/>Channel Bandwidth: 5MHz</b>          | 701.5MHz ~ 713.5MHz   |
|                              | <b>LTE Band 12<br/>Channel Bandwidth: 10MHz</b>         | 704.0MHz ~ 711.0MHz   |
|                              | <b>LTE Band 17<br/>Channel Bandwidth: 5MHz</b>          | 706.5MHz ~ 713.5MHz   |
|                              | <b>LTE Band 17<br/>Channel Bandwidth: 10MHz</b>         | 709.0MHz ~ 711.0MHz   |
| <b>EMISSION DESIGNATOR</b>   | <b>WCDMA IV</b>                                         | 4M12F9W               |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 1.4MHz</b>         | QPSK: 1M09G7D         |
|                              |                                                         | 16QAM: 1M09W7D        |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 3MHz</b>           | QPSK: 2M69G7D         |
|                              |                                                         | 16QAM: 2M68W7D        |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 5MHz</b>           | QPSK: 4M48G7D         |
|                              |                                                         | 16QAM: 4M47W7D        |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 10MHz</b>          | QPSK: 8M93G7D         |
|                              |                                                         | 16QAM: 8M93W7D        |

|                                |                                                  |                                 |
|--------------------------------|--------------------------------------------------|---------------------------------|
| <b>EMISSION<br/>DESIGNATOR</b> | <b>LTE Band 4<br/>Channel Bandwidth: 15MHz</b>   | QPSK: 13M4G7D<br>16QAM: 13M4W7D |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 20MHz</b>   | QPSK: 17M9G7D<br>16QAM: 17M8W7D |
|                                | <b>LTE Band 12<br/>Channel Bandwidth: 1.4MHz</b> | QPSK: 1M09G7D<br>16QAM: 1M08W7D |
|                                | <b>LTE Band 12<br/>Channel Bandwidth: 3MHz</b>   | QPSK: 2M69G7D<br>16QAM: 2M69W7D |
|                                | <b>LTE Band 12<br/>Channel Bandwidth: 5MHz</b>   | QPSK: 4M48G7D<br>16QAM: 4M47W7D |
|                                | <b>LTE Band 12<br/>Channel Bandwidth: 10MHz</b>  | QPSK: 8M94G7D<br>16QAM: 8M94W7D |
|                                | <b>LTE Band 17<br/>Channel Bandwidth: 5MHz</b>   | QPSK: 4M48G7D<br>16QAM: 4M47W7D |
|                                | <b>LTE Band 17<br/>Channel Bandwidth: 10MHz</b>  | QPSK: 8M93G7D<br>16QAM: 8M95W7D |
| <b>MAX. ERP/EIRP<br/>POWER</b> | <b>WCDMA IV</b>                                  | 295mW                           |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 1.4MHz</b>  | 288mW                           |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 3MHz</b>    | 291mW                           |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 5MHz</b>    | 280mW                           |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 10MHz</b>   | 286mW                           |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 15MHz</b>   | 284mW                           |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 20MHz</b>   | 254mW                           |
|                                | <b>LTE Band 12<br/>Channel Bandwidth: 1.4MHz</b> | 191mW                           |
|                                | <b>LTE Band 12<br/>Channel Bandwidth: 3MHz</b>   | 193mW                           |
|                                | <b>LTE Band 12<br/>Channel Bandwidth: 5MHz</b>   | 190mW                           |
|                                | <b>LTE Band 12<br/>Channel Bandwidth: 10MHz</b>  | 171mW                           |
|                                | <b>LTE Band 17<br/>Channel Bandwidth: 5MHz</b>   | 186mW                           |

|                         |                                                       |                                     |
|-------------------------|-------------------------------------------------------|-------------------------------------|
|                         | <b>LTE Band 17</b><br><b>Channel Bandwidth: 10MHz</b> | 166mW                               |
| <b>ANTENNA TYPE</b>     | <b>LTE Band 4</b>                                     | Fixed External Antenna with -2.6dBi |
|                         | <b>LTE Band 12</b>                                    | Fixed External Antenna with -3.4dBi |
|                         | <b>LTE Band 17</b>                                    | Fixed External Antenna with -3.4dBi |
| <b>HW VERSION</b>       | MB_C                                                  |                                     |
| <b>SW VERSION</b>       | NX529J_ENCommon_V1.20                                 |                                     |
| <b>ACCESSORY DEVICE</b> | Refer to note as below                                |                                     |
| <b>DATA CABLE</b>       | USB cable: non-shielded, detachable, 1.0m             |                                     |

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapters:

| <b>ADAPTER 1</b> |                    |
|------------------|--------------------|
| <b>BRAND:</b>    | RUIDE              |
| <b>MODEL:</b>    | STC-A515A-Z        |
| <b>INPUT:</b>    | AC 100-240V, 600mA |
| <b>OUTPUT:</b>   | DC 5V, 1500mA      |

| <b>ADAPTER 2</b> |                    |
|------------------|--------------------|
| <b>BRAND:</b>    | DOKOCOM            |
| <b>MODEL:</b>    | STC-A515A-Z        |
| <b>INPUT:</b>    | AC 100-240V, 600mA |
| <b>OUTPUT:</b>   | DC 5V, 1500mA      |

| <b>ADAPTER 3</b> |                    |
|------------------|--------------------|
| <b>BRAND:</b>    | Salcomp            |
| <b>MODEL:</b>    | STC-A515A-Z        |
| <b>INPUT:</b>    | AC 100-240V, 600mA |
| <b>OUTPUT:</b>   | DC 5V, 1500mA      |

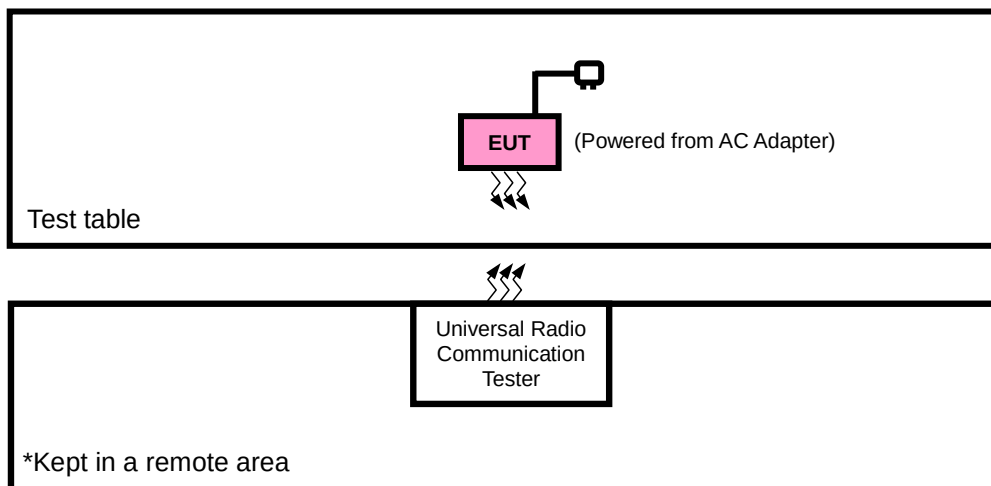
- The EUT matched the following USB cable:

| <b>USB CABLE</b>    |             |
|---------------------|-------------|
| <b>BRAND:</b>       | LIXUN       |
| <b>MODEL:</b>       | ZXMT1511003 |
| <b>SIGNAL LINE:</b> | 1.0 METER   |

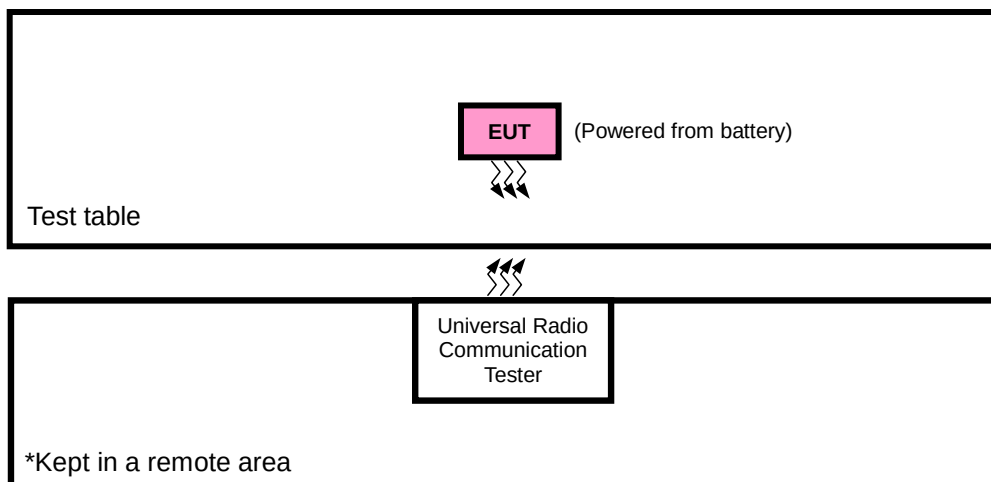
- The above models are identical except the model name for marketing purpose.
- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

## 3.2 CONFIGURATION OF SYSTEM UNDER TEST

### FOR RADIATION EMISSION TEST



### FOR E.R.P./E.I.R.P TEST



### 3.3 DESCRIPTION OF SUPPORT UNITS

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

| NO. | PRODUCT   | BRAND    | MODEL NO. | SERIAL NO. | FCC ID |
|-----|-----------|----------|-----------|------------|--------|
| 1   | DC source | LONG WEI | PS-6403D  | 010934269  | N/A    |
| 2   | PC        | HP       | A6608CN   | 3CR83825X3 | N/A    |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|-----------------------------------------------------|
| 1   | DC Line: Unshielded, Detachable 1.0m                |
| 2   | AC Line: Unshielded, Detachable 1.5m                |

**NOTE:**

1. All power cords of the above support units are non shielded (1.8m).

### 3.4 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on X-plane for ERP/EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

| EUT<br>CONFIGURE<br>MODE | DESCRIPTION                                      |
|--------------------------|--------------------------------------------------|
| A                        | EUT + Adapter + USB Cable with WCDMA or LTE link |
| B                        | EUT + Battery + USB Cable with WCDMA or LTE link |

**WCDMA MODE**

| EUT<br>Configure<br>Mode | Test Item                       | Available Channel | Tested Channel   | Mode  |
|--------------------------|---------------------------------|-------------------|------------------|-------|
| A                        | EIRP                            | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |
| B                        | Frequency Stability             | 1312 to 1513      | 1413             | WCDMA |
| A                        | Occupied Bandwidth              | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |
| A                        | Band Edge                       | 1312 to 1513      | 1312, 1513       | WCDMA |
| A                        | Peak To Average Ratio           | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |
| A                        | Conducuted Emission             | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |
| A                        | Radiated Emission<br>Below 1GHz | 1312 to 1513      | 1312             | WCDMA |
| A                        | Radiated Emission<br>Above 1GHz | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |

**LTE BAND 4**

| EUT CONFIGURE MODE | TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION  | MODE                 |
|--------------------|-----------------------|-------------------|---------------------|-------------------|-------------|----------------------|
| B                  | EIRP                  | 19957 to 20393    | 19957, 20175, 20393 | 1.4MHz            | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 19965 to 20385    | 19965, 20175, 20385 | 3MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 19975 to 20375    | 19975, 20175, 20375 | 5MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 20000 to 20350    | 20000, 20175, 20350 | 10MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 20025 to 20325    | 20025, 20175, 20325 | 15MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 20050 to 20300    | 20050, 20175, 20300 | 20MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
| B                  | FREQUENCY STABILITY   | 19957 to 20393    | 20175               | 1.4MHz            | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 19965 to 20385    | 20175               | 3MHz              | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 19975 to 20375    | 20175               | 5MHz              | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 20000 to 20350    | 20175               | 10MHz             | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 20025 to 20325    | 20175               | 15MHz             | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 20050 to 20300    | 20175               | 20MHz             | QPSK        | 1 RB / 0 RB Offset   |
| B                  | OCCUPIED BANDWIDTH    | 19957 to 20393    | 19957, 20175, 20393 | 1.4MHz            | QPSK, 16QAM | 6 RB / 0 RB Offset   |
|                    |                       | 19965 to 20385    | 19965, 20175, 20385 | 3MHz              | QPSK, 16QAM | 15 RB / 0 RB Offset  |
|                    |                       | 19975 to 20375    | 19975, 20175, 20375 | 5MHz              | QPSK, 16QAM | 25 RB / 0 RB Offset  |
|                    |                       | 20000 to 20350    | 20000, 20175, 20350 | 10MHz             | QPSK, 16QAM | 50 RB / 0 RB Offset  |
|                    |                       | 20025 to 20325    | 20025, 20175, 20325 | 15MHz             | QPSK, 16QAM | 75 RB / 0 RB Offset  |
|                    |                       | 20050 to 20300    | 20050, 20175, 20300 | 20MHz             | QPSK, 16QAM | 100 RB / 0 RB Offset |
| B                  | PEAK TO AVERAGE RATIO | 19957 to 20393    | 19957, 20175, 20393 | 1.4MHz            | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 19965 to 20385    | 19965, 20175, 20385 | 3MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 19975 to 20375    | 19975, 20175, 20375 | 5MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 20000 to 20350    | 20000, 20175, 20350 | 10MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 20025 to 20325    | 20025, 20175, 20325 | 15MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 20050 to 20300    | 20050, 20175, 20300 | 20MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
| B                  | BAND EDGE             | 19957 to 20393    | 19957               | 1.4MHz            | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 6 RB / 0 RB Offset   |
|                    |                       |                   | 20393               | 1.4MHz            | QPSK        | 1 RB / 5 RB Offset   |
|                    |                       |                   |                     |                   |             | 6 RB / 0 RB Offset   |
|                    |                       | 19965 to 20385    | 19965               | 3MHz              | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 15 RB / 0 RB Offset  |
|                    |                       |                   | 20385               | 3MHz              | QPSK        | 1 RB / 14 RB Offset  |
|                    |                       |                   |                     |                   |             | 15 RB / 0 RB Offset  |
|                    |                       | 19975 to 20375    | 19975               | 5MHz              | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 25 RB / 0 RB Offset  |
|                    |                       |                   | 20375               | 5MHz              | QPSK        | 1 RB / 24 RB Offset  |
|                    |                       |                   |                     |                   |             | 25 RB / 0 RB Offset  |
|                    |                       | 20000 to 20350    | 20000               | 10MHz             | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 50 RB / 0 RB Offset  |
|                    |                       |                   | 20350               | 10MHz             | QPSK        | 1 RB / 49 RB Offset  |
|                    |                       |                   |                     |                   |             | 50 RB / 0 RB Offset  |

|   |                      |                |       |        |      |                      |
|---|----------------------|----------------|-------|--------|------|----------------------|
| B | BAND EDGE            | 20025 to 20325 | 20025 | 15MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      | 75 RB / 0 RB Offset  |
|   |                      | 20050 to 20300 | 20325 | 15MHz  | QPSK | 1 RB / 74 RB Offset  |
|   |                      |                |       |        |      | 75 RB / 0 RB Offset  |
|   |                      |                | 20050 | 20MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      | 100 RB / 0 RB Offset |
| B | CONDCUDETED EMISSION | 19957 to 20393 | 20175 | 1.4MHz | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
|   |                      | 19965 to 20385 | 20175 | 3MHz   | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
|   |                      | 19975 to 20375 | 20175 | 5MHz   | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
| A | RADIATED EMISSION    | 20000 to 20350 | 20175 | 10MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
|   |                      | 20025 to 20325 | 20175 | 15MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
|   |                      | 20050 to 20300 | 20175 | 20MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
| A | RADIATED EMISSION    | 19957 to 20393 | 20175 | 1.4MHz | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
|   |                      | 19965 to 20385 | 20175 | 3MHz   | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
|   |                      | 19975 to 20375 | 20175 | 5MHz   | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
| A | RADIATED EMISSION    | 20000 to 20350 | 20175 | 10MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
|   |                      | 20025 to 20325 | 20175 | 15MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |
|   |                      | 20050 to 20300 | 20175 | 20MHz  | QPSK | 1 RB / 0 RB Offset   |
|   |                      |                |       |        |      |                      |

**Note:** This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

**LTE BAND 12**

| EUT<br>CONFIGURE<br>MODE | TEST ITEM                | AVAILABLE<br>CHANNEL | TESTED CHANNEL      | CHANNEL<br>BANDWIDTH | MODULATION  | MODE                |
|--------------------------|--------------------------|----------------------|---------------------|----------------------|-------------|---------------------|
| B                        | ERP                      | 23017 to 23173       | 23017, 23095, 23173 | 1.4MHz               | QPSK,16QAM  | 1 RB / 0 RB Offset  |
|                          |                          | 23025 to 23165       | 23025, 23095, 23165 | 3MHz                 | QPSK,16QAM  | 1 RB / 0 RB Offset  |
|                          |                          | 23035 to 23155       | 23035, 23095, 23155 | 5MHz                 | QPSK,16QAM  | 1 RB / 0 RB Offset  |
|                          |                          | 23060 to 23130       | 23060, 23095, 23130 | 10MHz                | QPSK,16QAM  | 1 RB / 0 RB Offset  |
| B                        | FREQUENCY<br>STABILITY   | 23017 to 23173       | 23095               | 1.4MHz               | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23025 to 23165       | 23095               | 3MHz                 | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23035 to 23155       | 23095               | 5MHz                 | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23060 to 23130       | 23095               | 10MHz                | QPSK        | 1 RB / 0 RB Offset  |
| B                        | OCCUPIED<br>BANDWIDTH    | 23017 to 23173       | 23017, 23095, 23173 | 1.4MHz               | QPSK,16QAM  | 6 RB / 0 RB Offset  |
|                          |                          | 23025 to 23165       | 23025, 23095, 23165 | 3MHz                 | QPSK,16QAM  | 15 RB / 0 RB Offset |
|                          |                          | 23035 to 23155       | 23035, 23095, 23155 | 5MHz                 | QPSK,16QAM  | 25 RB / 0 RB Offset |
|                          |                          | 23060 to 23130       | 23060, 23095, 23130 | 10MHz                | QPSK,16QAM  | 50 RB / 0 RB Offset |
| B                        | PEAK TO<br>AVERAGE RATIO | 23017 to 23173       | 23017, 23095, 23173 | 1.4MHz               | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                          |                          | 23025 to 23165       | 23025, 23095, 23165 | 3MHz                 | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                          |                          | 23035 to 23155       | 23035, 23095, 23155 | 5MHz                 | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                          |                          | 23060 to 23130       | 23060, 23095, 23130 | 10MHz                | QPSK, 16QAM | 1 RB / 0 RB Offset  |
| B                        | BAND EDGE                | 23017 to 23173       | 23017               | 1.4MHz               | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          |                      |                     |                      |             | 6 RB / 0 RB Offset  |
|                          |                          | 23025 to 23165       | 23173               | 1.4MHz               | QPSK        | 1 RB / 5 RB Offset  |
|                          |                          |                      |                     |                      |             | 6 RB / 0 RB Offset  |
|                          |                          | 23035 to 23155       | 23025               | 3MHz                 | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          |                      |                     |                      |             | 15 RB / 0 RB Offset |
|                          |                          | 23060 to 23130       | 23165               | 3MHz                 | QPSK        | 1 RB / 14 RB Offset |
|                          |                          |                      |                     |                      |             | 15 RB / 0 RB Offset |
|                          |                          | 23017 to 23173       | 23035               | 5MHz                 | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          |                      |                     |                      |             | 25 RB / 0 RB Offset |
|                          |                          | 23025 to 23165       | 23155               | 5MHz                 | QPSK        | 1 RB / 24 RB Offset |
|                          |                          |                      |                     |                      |             | 25 RB / 0 RB Offset |
| B                        | CONDCUDED<br>EMISSION    | 23017 to 23173       | 23095               | 1.4MHz               | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23025 to 23165       | 23095               | 3MHz                 | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23035 to 23155       | 23095               | 5MHz                 | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23060 to 23130       | 23095               | 10MHz                | QPSK        | 1 RB / 0 RB Offset  |
| A                        | RADIATED<br>EMISSION     | 23017 to 23173       | 23095               | 1.4MHz               | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23025 to 23165       | 23095               | 3MHz                 | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23035 to 23155       | 23095               | 5MHz                 | QPSK        | 1 RB / 0 RB Offset  |
|                          |                          | 23060 to 23130       | 23095               | 10MHz                | QPSK        | 1 RB / 0 RB Offset  |

## LTE BAND 17

| EUT CONFIGURE MODE | TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION  | MODE                |
|--------------------|-----------------------|-------------------|---------------------|-------------------|-------------|---------------------|
| B                  | ERP                   | 23755 to 23825    | 23755, 23790, 23825 | 5MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                    |                       | 23780 to 23800    | 23780, 23790, 23800 | 10MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset  |
| B                  | FREQUENCY STABILITY   | 23755 to 23825    | 23790               | 5MHz              | QPSK        | 1 RB / 0 RB Offset  |
|                    |                       | 23780 to 23800    | 23790               | 10MHz             | QPSK        | 1 RB / 0 RB Offset  |
| B                  | OCCUPIED BANDWIDTH    | 23755 to 23825    | 23755, 23790, 23825 | 5MHz              | QPSK, 16QAM | 25 RB / 0 RB Offset |
|                    |                       | 23780 to 23800    | 23780, 23790, 23800 | 10MHz             | QPSK, 16QAM | 50 RB / 0 RB Offset |
| B                  | PEAK TO AVERAGE RATIO | 23755 to 23825    | 23755, 23790, 23825 | 5MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset  |
|                    |                       | 23780 to 23800    | 23780, 23790, 23800 | 10MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset  |
| B                  | BAND EDGE             | 23755 to 23825    | 23755               | 5MHz              | QPSK        | 1 RB / 0 RB Offset  |
|                    |                       |                   |                     |                   |             | 25 RB / 0 RB Offset |
|                    |                       | 23755 to 23825    | 23825               | 5MHz              | QPSK        | 1 RB / 24 RB Offset |
|                    |                       |                   |                     |                   |             | 25 RB / 0 RB Offset |
|                    |                       | 23780 to 23800    | 23780               | 10MHz             | QPSK        | 1 RB / 0 RB Offset  |
|                    |                       |                   |                     |                   |             | 50 RB / 0 RB Offset |
| B                  | CONDCUDED EMISSION    | 23755 to 23825    | 23790               | 5MHz              | QPSK        | 1 RB / 0 RB Offset  |
|                    |                       | 23780 to 23800    | 23790               | 10MHz             | QPSK        | 1 RB / 0 RB Offset  |
| A                  | RADIATED EMISSION     | 23755 to 23825    | 23790               | 5MHz              | QPSK        | 1 RB / 0 RB Offset  |
|                    |                       | 23780 to 23800    | 23790               | 10MHz             | QPSK        | 1 RB / 0 RB Offset  |

**Note:** This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

## TEST CONDITION:

| TEST ITEM             | ENVIRONMENTAL CONDITIONS | INPUT POWER          | TESTED BY   |
|-----------------------|--------------------------|----------------------|-------------|
| EIRP(ERP)             | 24deg. C, 60%RH          | 5Vdc from adapter    | Alex Chen   |
| FREQUENCY STABILITY   | 24deg. C, 61%RH          | 3.85Vdc from Battery | Yuqiang Yin |
| OCCUPIED BANDWIDTH    | 24deg. C, 61%RH          | 3.85Vdc from Battery | Yuqiang Yin |
| PEAK TO AVERAGE RATIO | 24deg. C, 61%RH          | 3.85Vdc from Battery | Yuqiang Yin |
| BAND EDGE             | 24deg. C, 61%RH          | 3.85Vdc from Battery | Yuqiang Yin |
| CONDCUDED EMISSION    | 24deg. C, 61%RH          | 3.85Vdc from Battery | Yuqiang Yin |
| RADIATED EMISSION     | 24deg. C, 60%RH          | 5Vdc from adapter    | Alex Chen   |



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### 3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**KDB Publication 971168 D02**

**ANSI/TIA/EIA-603-D**

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

## 4 TEST TYPES AND RESULTS

### 4.1 OUTPUT POWER MEASUREMENT

#### 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 699-716 MHz bands are limited to 3 watts ERP.

#### 4.1.2 TEST PROCEDURES

##### EIRP / ERP MEASUREMENT:

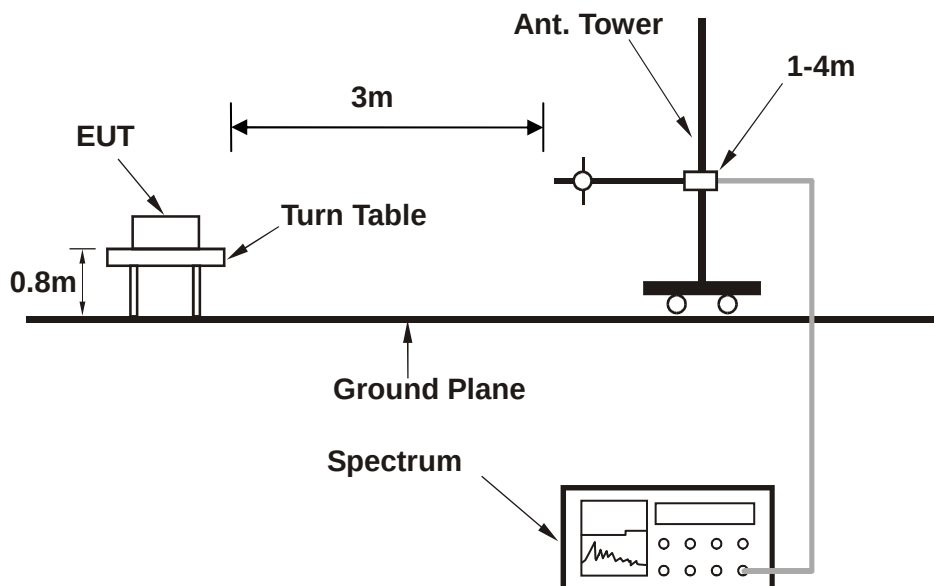
- a. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RBW and VBW is 10MHz for LTE.
- b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G
- d.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$
- e.  $E.R.P = E.I.R.P - 2.15 \text{ dB}$

##### CONDUCTED POWER MEASUREMENT:

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

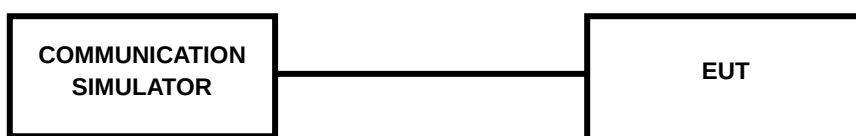
#### 4.1.3 TEST SETUP

##### EIRP / ERP MEASUREMENT:



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

##### CONDUCTED POWER MEASUREMENT:



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

#### 4.1.4 TEST RESULTS

##### AVERAGE CONDUCTED OUTPUT POWER (dBm)

| Band            | WCDMA IV |        |              |
|-----------------|----------|--------|--------------|
| Channel         | 1312     | 1413   | 1513         |
| Frequency (MHz) | 1712.4   | 1732.6 | 1752.6       |
| RMC 12.2K       | 23.22    | 23.16  | <b>23.28</b> |
| HSPA            |          |        |              |
| HSDPA Subtest-1 | 22.24    | 22.20  | 22.27        |
| HSDPA Subtest-2 | 22.22    | 22.19  | 22.21        |
| HSDPA Subtest-3 | 21.74    | 21.66  | 21.72        |
| HSDPA Subtest-4 | 21.74    | 21.65  | 21.71        |
| HSUPA Subtest-1 | 22.20    | 22.19  | 22.24        |
| HSUPA Subtest-2 | 20.19    | 20.17  | 20.23        |
| HSUPA Subtest-3 | 21.17    | 21.18  | 21.26        |
| HSUPA Subtest-4 | 20.22    | 20.21  | 20.25        |
| HSUPA Subtest-5 | 22.21    | 22.19  | 22.28        |

| LTE Band 4 |            |         |           |                         |                         |                         |     |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>19957         | Mid CH<br>20175         | High CH<br>20393        | MPR |
|            |            |         |           | Frequency<br>1710.7 MHz | Frequency<br>1732.5 MHz | Frequency<br>1754.3 MHz |     |
| 1.4MHz     | QPSK       | 1       | 0         | 23.13                   | 23.28                   | 23.18                   | 0   |
|            |            | 1       | 2         | 22.95                   | 23.23                   | 23.13                   | 0   |
|            |            | 1       | 5         | 22.78                   | 23.02                   | 22.95                   | 0   |
|            |            | 3       | 0         | 23.11                   | 23.26                   | 23.16                   | 0   |
|            |            | 3       | 1         | 22.93                   | 23.21                   | 23.11                   | 0   |
|            |            | 3       | 3         | 22.76                   | 23.00                   | 22.93                   | 0   |
|            |            | 6       | 0         | 22.06                   | 22.29                   | 22.25                   | 1   |
|            | 16QAM      | 1       | 0         | 21.81                   | 22.07                   | 21.98                   | 1   |
|            |            | 1       | 2         | 21.74                   | 22.00                   | 21.93                   | 1   |
|            |            | 1       | 5         | 21.74                   | 22.01                   | 21.77                   | 1   |
|            |            | 3       | 0         | 21.80                   | 22.06                   | 21.97                   | 1   |
|            |            | 3       | 1         | 21.73                   | 21.99                   | 21.92                   | 1   |
|            |            | 3       | 3         | 21.73                   | 22.00                   | 21.76                   | 1   |
|            |            | 6       | 0         | 20.92                   | 21.17                   | 21.18                   | 2   |
| LTE Band 4 |            |         |           |                         |                         |                         |     |
| BW         | Modulation | RB Size | RB Offset | Low CH<br>19965         | Mid CH<br>20175         | High CH<br>20385        | MPR |
|            |            |         |           | Frequency<br>1711.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1753.5 MHz |     |
| 3 MHz      | QPSK       | 1       | 0         | 23.14                   | 23.29                   | 23.19                   | 0   |
|            |            | 1       | 7         | 22.96                   | 23.24                   | 23.14                   | 0   |
|            |            | 1       | 14        | 22.79                   | 23.03                   | 22.96                   | 0   |
|            |            | 8       | 0         | 22.21                   | 22.35                   | 22.34                   | 1   |
|            |            | 8       | 3         | 22.14                   | 22.28                   | 22.27                   | 1   |
|            |            | 8       | 7         | 21.94                   | 22.10                   | 22.08                   | 1   |
|            |            | 15      | 0         | 22.07                   | 22.30                   | 22.26                   | 1   |
|            | 16QAM      | 1       | 0         | 21.82                   | 22.08                   | 21.99                   | 1   |
|            |            | 1       | 7         | 21.75                   | 22.01                   | 21.94                   | 1   |
|            |            | 1       | 14        | 21.75                   | 22.02                   | 21.78                   | 1   |
|            |            | 8       | 0         | 21.05                   | 21.19                   | 21.22                   | 2   |
|            |            | 8       | 3         | 21.07                   | 21.32                   | 21.13                   | 2   |
|            |            | 8       | 7         | 21.01                   | 21.14                   | 21.12                   | 2   |
|            |            | 15      | 0         | 20.93                   | 21.18                   | 21.19                   | 2   |

| LTE Band 4 |            |         |           |                         |                         |                         |     |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>19975         | Mid CH<br>20175         | High CH<br>20375        | MPR |
|            |            |         |           | Frequency<br>1712.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1752.5 MHz |     |
| 5 MHz      | QPSK       | 1       | 0         | 23.17                   | 23.32                   | 23.22                   | 0   |
|            |            | 1       | 12        | 22.99                   | 23.27                   | 23.17                   | 0   |
|            |            | 1       | 24        | 22.82                   | 23.06                   | 22.99                   | 0   |
|            |            | 12      | 0         | 22.24                   | 22.38                   | 22.37                   | 1   |
|            |            | 12      | 6         | 22.17                   | 22.31                   | 22.30                   | 1   |
|            |            | 12      | 13        | 21.97                   | 22.13                   | 22.11                   | 1   |
|            |            | 25      | 0         | 22.10                   | 22.33                   | 22.29                   | 1   |
|            | 16QAM      | 1       | 0         | 21.85                   | 22.11                   | 22.02                   | 1   |
|            |            | 1       | 12        | 21.78                   | 22.04                   | 21.97                   | 1   |
|            |            | 1       | 24        | 21.78                   | 22.05                   | 21.81                   | 1   |
|            |            | 12      | 0         | 21.08                   | 21.22                   | 21.25                   | 2   |
|            |            | 12      | 6         | 21.10                   | 21.35                   | 21.16                   | 2   |
|            |            | 12      | 13        | 21.04                   | 21.17                   | 21.15                   | 2   |
|            |            | 25      | 0         | 20.96                   | 21.21                   | 21.22                   | 2   |
| LTE Band 4 |            |         |           |                         |                         |                         |     |
| BW         | Modulation | RB Size | RB Offset | Low CH<br>20000         | Mid CH<br>20175         | High CH<br>20350        | MPR |
|            |            |         |           | Frequency<br>1715 MHz   | Frequency<br>1732.5 MHz | Frequency<br>1750 MHz   |     |
| 10 MHz     | QPSK       | 1       | 0         | 23.21                   | 23.36                   | 23.26                   | 0   |
|            |            | 1       | 24        | 23.03                   | 23.31                   | 23.21                   | 0   |
|            |            | 1       | 49        | 22.86                   | 23.10                   | 23.03                   | 0   |
|            |            | 25      | 0         | 22.28                   | 22.42                   | 22.41                   | 1   |
|            |            | 25      | 12        | 22.21                   | 22.35                   | 22.34                   | 1   |
|            |            | 25      | 25        | 22.01                   | 22.17                   | 22.15                   | 1   |
|            |            | 50      | 0         | 22.14                   | 22.37                   | 22.33                   | 1   |
|            | 16QAM      | 1       | 0         | 21.89                   | 22.15                   | 22.06                   | 1   |
|            |            | 1       | 24        | 21.82                   | 22.08                   | 22.01                   | 1   |
|            |            | 1       | 49        | 21.82                   | 22.09                   | 21.85                   | 1   |
|            |            | 25      | 0         | 21.12                   | 21.26                   | 21.29                   | 2   |
|            |            | 25      | 12        | 21.14                   | 21.39                   | 21.20                   | 2   |
|            |            | 25      | 25        | 21.08                   | 21.21                   | 21.19                   | 2   |
|            |            | 50      | 0         | 21.00                   | 21.25                   | 21.26                   | 2   |

| LTE Band 4 |            |         |           |                         |                         |                         |     |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>20025         | Mid CH<br>20175         | High CH<br>20325        | MPR |
|            |            |         |           | Frequency<br>1717.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1747.5 MHz |     |
| 15 MHz     | QPSK       | 1       | 0         | 23.27                   | 23.42                   | 23.32                   | 0   |
|            |            | 1       | 37        | 23.09                   | 23.37                   | 23.27                   | 0   |
|            |            | 1       | 74        | 22.92                   | 23.16                   | 23.09                   | 0   |
|            |            | 36      | 0         | 22.34                   | 22.48                   | 22.47                   | 1   |
|            |            | 36      | 19        | 22.27                   | 22.41                   | 22.40                   | 1   |
|            |            | 36      | 39        | 22.07                   | 22.23                   | 22.21                   | 1   |
|            |            | 75      | 0         | 22.20                   | 22.43                   | 22.39                   | 1   |
|            | 16QAM      | 1       | 0         | 21.95                   | 22.21                   | 22.12                   | 1   |
|            |            | 1       | 37        | 21.88                   | 22.14                   | 22.07                   | 1   |
|            |            | 1       | 74        | 21.88                   | 22.15                   | 21.91                   | 1   |
|            |            | 36      | 0         | 21.18                   | 21.32                   | 21.35                   | 2   |
|            |            | 36      | 19        | 21.20                   | 21.45                   | 21.26                   | 2   |
|            |            | 36      | 39        | 21.14                   | 21.27                   | 21.25                   | 2   |
|            |            | 75      | 0         | 21.06                   | 21.31                   | 21.32                   | 2   |
| LTE Band 4 |            |         |           |                         |                         |                         |     |
| BW         | Modulation | RB Size | RB Offset | Low CH<br>20050         | Mid CH<br>20175         | High CH<br>20300        | MPR |
|            |            |         |           | Frequency<br>1720 MHz   | Frequency<br>1732.5 MHz | Frequency<br>1745 MHz   |     |
| 20MHz      | QPSK       | 1       | 0         | 23.30                   | 23.45                   | 23.35                   | 0   |
|            |            | 1       | 50        | 23.12                   | 23.40                   | 23.30                   | 0   |
|            |            | 1       | 99        | 22.95                   | 23.19                   | 23.12                   | 0   |
|            |            | 50      | 0         | 22.37                   | 22.51                   | 22.50                   | 1   |
|            |            | 50      | 25        | 22.30                   | 22.44                   | 22.43                   | 1   |
|            |            | 50      | 50        | 22.10                   | 22.26                   | 22.24                   | 1   |
|            |            | 100     | 0         | 22.23                   | 22.46                   | 22.42                   | 1   |
|            | 16QAM      | 1       | 0         | 21.98                   | 22.24                   | 22.15                   | 1   |
|            |            | 1       | 50        | 21.91                   | 22.17                   | 22.10                   | 1   |
|            |            | 1       | 99        | 21.91                   | 22.18                   | 21.94                   | 1   |
|            |            | 50      | 0         | 21.21                   | 21.35                   | 21.38                   | 2   |
|            |            | 50      | 25        | 21.23                   | 21.48                   | 21.29                   | 2   |
|            |            | 50      | 50        | 21.17                   | 21.30                   | 21.28                   | 2   |
|            |            | 100     | 0         | 21.09                   | 21.34                   | 21.35                   | 2   |

| LTE Band 12 |            |         |           |                     |                     |                     |     |
|-------------|------------|---------|-----------|---------------------|---------------------|---------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH 23017        | Mid CH 23095        | High CH 23173       | MPR |
|             |            |         |           | Frequency 699.7 MHz | Frequency 707.5 MHz | Frequency 715.3 MHz |     |
| 1.4 MHz     | QPSK       | 1       | 0         | 23.12               | 23.09               | 23.29               | 0   |
|             |            | 1       | 2         | 23.03               | 23.06               | 23.23               | 0   |
|             |            | 1       | 5         | 22.95               | 22.89               | 23.14               | 0   |
|             |            | 3       | 0         | 23.10               | 23.07               | 23.27               | 0   |
|             |            | 3       | 1         | 23.01               | 23.04               | 23.21               | 0   |
|             |            | 3       | 3         | 22.93               | 22.87               | 23.12               | 0   |
|             |            | 6       | 0         | 22.26               | 22.24               | 22.32               | 1   |
|             | 16QAM      | 1       | 0         | 22.11               | 22.13               | 22.25               | 1   |
|             |            | 1       | 2         | 21.87               | 22.15               | 21.87               | 1   |
|             |            | 1       | 5         | 22.03               | 22.03               | 21.97               | 1   |
|             |            | 3       | 0         | 22.10               | 22.12               | 22.24               | 1   |
|             |            | 3       | 1         | 21.86               | 22.14               | 21.86               | 1   |
|             |            | 3       | 3         | 22.02               | 22.02               | 21.96               | 1   |
|             |            | 6       | 0         | 21.23               | 21.09               | 21.27               | 2   |
| LTE Band 12 |            |         |           |                     |                     |                     |     |
| BW          | Modulation | RB Size | RB Offset | Low CH 23025        | Mid CH 23095        | High CH 23165       | MPR |
|             |            |         |           | Frequency 700.5 MHz | Frequency 707.5 MHz | Frequency 714.5 MHz |     |
| 3 MHz       | QPSK       | 1       | 0         | 23.16               | 23.13               | 23.33               | 0   |
|             |            | 1       | 7         | 23.07               | 23.10               | 23.27               | 0   |
|             |            | 1       | 14        | 22.99               | 22.93               | 23.18               | 0   |
|             |            | 8       | 0         | 22.29               | 22.30               | 22.34               | 1   |
|             |            | 8       | 3         | 22.25               | 22.25               | 22.23               | 1   |
|             |            | 8       | 7         | 22.26               | 22.29               | 22.18               | 1   |
|             |            | 15      | 0         | 22.30               | 22.28               | 22.36               | 1   |
|             | 16QAM      | 1       | 0         | 22.15               | 22.17               | 22.29               | 1   |
|             |            | 1       | 7         | 21.91               | 22.19               | 21.91               | 1   |
|             |            | 1       | 14        | 22.07               | 22.07               | 22.01               | 1   |
|             |            | 8       | 0         | 21.17               | 21.27               | 21.31               | 2   |
|             |            | 8       | 3         | 21.15               | 21.31               | 21.29               | 2   |
|             |            | 8       | 7         | 21.13               | 21.23               | 20.95               | 2   |
|             |            | 15      | 0         | 21.27               | 21.13               | 21.31               | 2   |

| LTE Band 12 |            |         |           |                     |                     |                     |     |
|-------------|------------|---------|-----------|---------------------|---------------------|---------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH 23035        | Mid CH 23095        | High CH 23155       | MPR |
|             |            |         |           | Frequency 701.5 MHz | Frequency 707.5 MHz | Frequency 713.5 MHz |     |
| 5 MHz       | QPSK       | 1       | 0         | 23.22               | 23.19               | 23.39               | 0   |
|             |            | 1       | 12        | 23.13               | 23.16               | 23.33               | 0   |
|             |            | 1       | 24        | 23.05               | 22.99               | 23.24               | 0   |
|             |            | 12      | 0         | 22.35               | 22.36               | 22.40               | 1   |
|             |            | 12      | 6         | 22.31               | 22.31               | 22.29               | 1   |
|             |            | 12      | 13        | 22.32               | 22.35               | 22.24               | 1   |
|             |            | 25      | 0         | 22.36               | 22.34               | 22.42               | 1   |
|             | 16QAM      | 1       | 0         | 22.21               | 22.23               | 22.35               | 1   |
|             |            | 1       | 12        | 21.97               | 22.25               | 21.97               | 1   |
|             |            | 1       | 24        | 22.13               | 22.13               | 22.07               | 1   |
|             |            | 12      | 0         | 21.23               | 21.33               | 21.37               | 2   |
|             |            | 12      | 6         | 21.21               | 21.37               | 21.35               | 2   |
|             |            | 12      | 13        | 21.19               | 21.29               | 21.01               | 2   |
|             |            | 25      | 0         | 21.33               | 21.19               | 21.37               | 2   |
| LTE Band 12 |            |         |           |                     |                     |                     |     |
| BW          | Modulation | RB Size | RB Offset | Low CH 23060        | Mid CH 23095        | High CH 23130       | MPR |
|             |            |         |           | Frequency 704 MHz   | Frequency 707.5 MHz | Frequency 711 MHz   |     |
| 10 MHz      | QPSK       | 1       | 0         | 23.25               | 23.22               | 23.42               | 0   |
|             |            | 1       | 24        | 23.16               | 23.19               | 23.36               | 0   |
|             |            | 1       | 49        | 23.08               | 23.02               | 23.27               | 0   |
|             |            | 25      | 0         | 22.38               | 22.39               | 22.43               | 1   |
|             |            | 25      | 12        | 22.34               | 22.34               | 22.32               | 1   |
|             |            | 25      | 25        | 22.35               | 22.38               | 22.27               | 1   |
|             |            | 50      | 0         | 22.39               | 22.37               | 22.45               | 1   |
|             | 16QAM      | 1       | 0         | 22.24               | 22.26               | 22.38               | 1   |
|             |            | 1       | 24        | 22.00               | 22.28               | 22.00               | 1   |
|             |            | 1       | 49        | 22.16               | 22.16               | 22.10               | 1   |
|             |            | 25      | 0         | 21.26               | 21.36               | 21.40               | 2   |
|             |            | 25      | 12        | 21.24               | 21.40               | 21.38               | 2   |
|             |            | 25      | 25        | 21.22               | 21.32               | 21.04               | 2   |
|             |            | 50      | 0         | 21.36               | 21.22               | 21.40               | 2   |

| LTE Band 17 |            |         |           |                        |                      |                        |     |
|-------------|------------|---------|-----------|------------------------|----------------------|------------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH<br>23755        | Mid CH<br>23790      | High CH<br>23825       | MPR |
|             |            |         |           | Frequency<br>706.5 MHz | Frequency<br>710 MHz | Frequency<br>713.5 MHz |     |
| 5 MHz       | QPSK       | 1       | 0         | 23.40                  | 23.45                | 23.48                  | 0   |
|             |            | 1       | 12        | 23.39                  | 23.43                | 23.38                  | 0   |
|             |            | 1       | 24        | 23.33                  | 23.36                | 23.46                  | 0   |
|             |            | 12      | 0         | 22.38                  | 22.35                | 22.42                  | 1   |
|             |            | 12      | 6         | 22.36                  | 22.34                | 22.29                  | 1   |
|             |            | 12      | 13        | 22.31                  | 22.33                | 22.32                  | 1   |
|             |            | 25      | 0         | 22.26                  | 22.29                | 22.36                  | 1   |
|             | 16QAM      | 1       | 0         | 22.03                  | 22.17                | 22.26                  | 1   |
|             |            | 1       | 12        | 22.10                  | 22.00                | 22.28                  | 1   |
|             |            | 1       | 24        | 21.93                  | 21.98                | 22.21                  | 1   |
|             |            | 12      | 0         | 21.33                  | 21.40                | 21.33                  | 2   |
|             |            | 12      | 6         | 21.33                  | 21.39                | 21.16                  | 2   |
|             |            | 12      | 13        | 21.16                  | 21.12                | 21.21                  | 2   |
|             |            | 25      | 0         | 21.22                  | 21.24                | 21.29                  | 2   |
| LTE Band 17 |            |         |           |                        |                      |                        |     |
| BW          | Modulation | RB Size | RB Offset | Low CH<br>23780        | Mid CH<br>23790      | High CH<br>23800       | MPR |
|             |            |         |           | Frequency<br>709 MHz   | Frequency<br>710 MHz | Frequency<br>711 MHz   |     |
| 10 MHz      | QPSK       | 1       | 0         | 23.44                  | 23.49                | 23.52                  | 0   |
|             |            | 1       | 24        | 23.43                  | 23.47                | 23.42                  | 0   |
|             |            | 1       | 49        | 23.37                  | 23.40                | 23.50                  | 0   |
|             |            | 25      | 0         | 22.42                  | 22.39                | 22.46                  | 1   |
|             |            | 25      | 12        | 22.40                  | 22.38                | 22.33                  | 1   |
|             |            | 25      | 25        | 22.35                  | 22.37                | 22.36                  | 1   |
|             |            | 50      | 0         | 22.30                  | 22.33                | 22.40                  | 1   |
|             | 16QAM      | 1       | 0         | 22.07                  | 22.21                | 22.30                  | 1   |
|             |            | 1       | 24        | 22.14                  | 22.04                | 22.32                  | 1   |
|             |            | 1       | 49        | 21.97                  | 22.02                | 22.25                  | 1   |
|             |            | 25      | 0         | 21.37                  | 21.44                | 21.37                  | 2   |
|             |            | 25      | 12        | 21.37                  | 21.43                | 21.20                  | 2   |
|             |            | 25      | 25        | 21.20                  | 21.16                | 21.25                  | 2   |
|             |            | 50      | 0         | 21.26                  | 21.28                | 21.33                  | 2   |



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## EIRP

### WCDMA IV

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW)       | Polarization (H/V) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|
| 1312    | 1712.4          | -26.83    | 41.39                 | 14.56    | 28.57         | H                  |
| 1413    | 1732.6          | -26.59    | 41.36                 | 14.77    | 29.99         | H                  |
| 1513    | 1752.6          | -26.63    | 42.63                 | 16.00    | 39.80         | H                  |
| 1312    | 1712.4          | -20.78    | 44.17                 | 23.39    | 218.07        | V                  |
| 1413    | 1732.6          | -20.65    | 44.20                 | 23.55    | 226.46        | V                  |
| 1513    | 1752.6          | -19.65    | 44.35                 | 24.70    | <b>294.78</b> | V                  |

### LTE BAND 4

#### CHANNEL BANDWIDTH: 1.4MHz QPSK

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|---------------|--------------------|-----------|
| 19957   | 1710.7          | -22.45    | 41.29                 | 18.84     | 76.63         | H                  | 1         |
| 20175   | 1732.5          | -23.21    | 41.36                 | 18.15     | 65.31         | H                  | 1         |
| 20393   | 1754.3          | -22.94    | 42.74                 | 19.80     | 95.46         | H                  | 1         |
| 19957   | 1710.7          | -19.65    | 44.25                 | 24.60     | <b>288.07</b> | V                  | 1         |
| 20175   | 1732.5          | -20.41    | 44.20                 | 23.79     | 239.33        | V                  | 1         |
| 20393   | 1754.3          | -20.23    | 44.09                 | 23.86     | 242.94        | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

#### CHANNEL BANDWIDTH: 1.4MHz 16QAM

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|-----------|
| 19957   | 1710.7          | -23.32    | 41.29                 | 17.97     | 62.72    | H                  | 1         |
| 20175   | 1732.5          | -24.14    | 41.36                 | 17.22     | 52.72    | H                  | 1         |
| 20393   | 1754.3          | -23.90    | 42.74                 | 18.84     | 76.52    | H                  | 1         |
| 19957   | 1710.7          | -20.52    | 44.25                 | 23.73     | 235.78   | V                  | 1         |
| 20175   | 1732.5          | -21.34    | 44.20                 | 22.86     | 193.20   | V                  | 1         |
| 20393   | 1754.3          | -21.19    | 44.09                 | 22.90     | 194.76   | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

#### LTE BAND 4

##### CHANNEL BANDWIDTH: 3MHz QPSK

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|---------------|--------------------|-----------|
| 19965   | 1711.5          | -22.43    | 41.27                 | 18.84     | 76.51         | H                  | 1         |
| 20175   | 1732.5          | -23.27    | 41.36                 | 18.09     | 64.42         | H                  | 1         |
| 20385   | 1753.5          | -22.89    | 42.76                 | 19.87     | 96.98         | H                  | 1         |
| 19965   | 1711.5          | -19.63    | 44.26                 | 24.63     | <b>290.54</b> | V                  | 1         |
| 20175   | 1732.5          | -20.47    | 44.20                 | 23.73     | 236.05        | V                  | 1         |
| 20385   | 1753.5          | -20.18    | 44.23                 | 24.05     | 254.21        | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

##### CHANNEL BANDWIDTH: 3MHz 16QAM

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|-----------|
| 19965   | 1711.5          | -23.50    | 41.27                 | 17.77     | 59.80    | H                  | 1         |
| 20175   | 1732.5          | -24.16    | 41.36                 | 17.20     | 52.48    | H                  | 1         |
| 20385   | 1753.5          | -23.88    | 42.76                 | 18.88     | 77.21    | H                  | 1         |
| 19965   | 1711.5          | -20.70    | 44.26                 | 23.56     | 227.09   | V                  | 1         |
| 20175   | 1732.5          | -21.36    | 44.20                 | 22.84     | 192.31   | V                  | 1         |
| 20385   | 1753.5          | -21.17    | 44.23                 | 23.06     | 202.40   | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

#### LTE BAND 4

##### CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|---------------|--------------------|-----------|
| 19975   | 1712.5          | -22.49    | 41.39                 | 18.90     | 77.61         | H                  | 1         |
| 20175   | 1732.5          | -23.22    | 41.36                 | 18.14     | 65.16         | H                  | 1         |
| 20375   | 1752.5          | -22.84    | 42.63                 | 19.79     | 95.26         | H                  | 1         |
| 19975   | 1712.5          | -19.69    | 44.17                 | 24.48     | <b>280.29</b> | V                  | 1         |
| 20175   | 1732.5          | -20.42    | 44.20                 | 23.78     | 238.78        | V                  | 1         |
| 20375   | 1752.5          | -20.13    | 44.35                 | 24.22     | 263.94        | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

**CHANNEL BANDWIDTH: 5MHz 16QAM**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|-----------|
| 19975   | 1712.5          | -23.32    | 41.39                 | 18.07     | 64.11    | H                  | 1         |
| 20175   | 1732.5          | -24.24    | 41.36                 | 17.12     | 51.52    | H                  | 1         |
| 20375   | 1752.5          | -23.94    | 42.63                 | 18.69     | 73.94    | H                  | 1         |
| 19975   | 1712.5          | -20.52    | 44.17                 | 23.65     | 231.53   | V                  | 1         |
| 20175   | 1732.5          | -21.44    | 44.20                 | 22.76     | 188.80   | V                  | 1         |
| 20375   | 1752.5          | -21.23    | 44.35                 | 23.12     | 204.88   | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

**LTE BAND 4**

**CHANNEL BANDWIDTH: 10MHz QPSK**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|---------------|--------------------|-----------|
| 20000   | 1715.0          | -22.30    | 41.49                 | 19.19     | 82.91         | H                  | 1         |
| 20175   | 1732.5          | -23.16    | 41.36                 | 18.20     | 66.07         | H                  | 1         |
| 20350   | 1750.0          | -22.71    | 42.28                 | 19.57     | 90.64         | H                  | 1         |
| 20000   | 1715.0          | -19.50    | 44.06                 | 24.56     | <b>285.96</b> | V                  | 1         |
| 20175   | 1732.5          | -20.36    | 44.20                 | 23.84     | 242.10        | V                  | 1         |
| 20350   | 1750.0          | -20.00    | 44.43                 | 24.43     | 277.33        | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

**CHANNEL BANDWIDTH: 10MHz 16QAM**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|-----------|
| 20000   | 1715.0          | -23.45    | 41.49                 | 18.04     | 63.62    | H                  | 1         |
| 20175   | 1732.5          | -24.26    | 41.36                 | 17.10     | 51.29    | H                  | 1         |
| 20350   | 1750.0          | -23.87    | 42.28                 | 18.41     | 69.39    | H                  | 1         |
| 20000   | 1715.0          | -20.65    | 44.06                 | 23.41     | 219.43   | V                  | 1         |
| 20175   | 1732.5          | -21.46    | 44.20                 | 22.74     | 187.93   | V                  | 1         |
| 20350   | 1750.0          | -21.16    | 44.43                 | 23.27     | 212.32   | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

#### LTE BAND 4

##### CHANNEL BANDWIDTH: 15MHz QPSK

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|---------------|--------------------|-----------|
| 20025   | 1717.5          | -22.31    | 41.34                 | 19.03     | 79.95         | H                  | 1         |
| 20175   | 1732.5          | -23.23    | 41.36                 | 18.13     | 65.01         | H                  | 1         |
| 20325   | 1747.5          | -22.78    | 42.09                 | 19.31     | 85.23         | H                  | 1         |
| 20025   | 1717.5          | -19.51    | 44.04                 | 24.53     | <b>284.05</b> | V                  | 1         |
| 20175   | 1732.5          | -20.43    | 44.20                 | 23.77     | 238.23        | V                  | 1         |
| 20325   | 1747.5          | -20.07    | 44.22                 | 24.15     | 259.72        | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

##### CHANNEL BANDWIDTH: 15MHz 16QAM

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|-----------|
| 20025   | 1717.5          | -23.17    | 41.34                 | 18.17     | 65.58    | H                  | 1         |
| 20175   | 1732.5          | -24.10    | 41.36                 | 17.26     | 53.21    | H                  | 1         |
| 20325   | 1747.5          | -23.63    | 42.09                 | 18.46     | 70.08    | H                  | 1         |
| 20025   | 1717.5          | -20.37    | 44.04                 | 23.67     | 233.02   | V                  | 1         |
| 20175   | 1732.5          | -21.30    | 44.20                 | 22.90     | 194.98   | V                  | 1         |
| 20325   | 1747.5          | -20.92    | 44.22                 | 23.30     | 213.55   | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

#### LTE BAND 4

##### CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW)      | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|---------------|--------------------|-----------|
| 20050   | 1720.0          | -22.89    | 41.28                 | 18.39     | 69.04         | H                  | 1         |
| 20175   | 1732.5          | -23.68    | 41.36                 | 17.68     | 58.63         | H                  | 1         |
| 20300   | 1745.0          | -23.36    | 41.96                 | 18.60     | 72.39         | H                  | 1         |
| 20050   | 1720.0          | -20.09    | 44.14                 | 24.05     | <b>253.80</b> | V                  | 1         |
| 20175   | 1732.5          | -20.88    | 44.20                 | 23.32     | 214.59        | V                  | 1         |
| 20300   | 1745.0          | -20.65    | 43.88                 | 23.23     | 210.47        | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

**CHANNEL BANDWIDTH: 20MHz 16QAM**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|-----------|
| 20050   | 1720.0          | -23.82    | 41.28                 | 17.46     | 55.73    | H                  | 1         |
| 20175   | 1732.5          | -24.75    | 41.36                 | 16.61     | 45.82    | H                  | 1         |
| 20300   | 1745.0          | -24.19    | 41.96                 | 17.77     | 59.80    | H                  | 1         |
| 20050   | 1720.0          | -21.02    | 44.14                 | 23.12     | 204.88   | V                  | 1         |
| 20175   | 1732.5          | -21.95    | 44.20                 | 22.25     | 167.73   | V                  | 1         |
| 20300   | 1745.0          | -21.48    | 43.88                 | 22.40     | 173.86   | V                  | 1         |

**NOTE:** EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

**LTE BAND 12**

**CHANNEL BANDWIDTH: 1.4MHz QPSK**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW)       | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|-----------|
| 23017   | 699.7           | -9.31     | 32.77                 | 21.31    | 135.21        | H                  | 3         |
| 23095   | 707.5           | -8.28     | 33.23                 | 22.80    | <b>190.55</b> | H                  | 3         |
| 23173   | 715.3           | -8.45     | 33.14                 | 22.54    | 179.39        | H                  | 3         |
| 23017   | 699.7           | -15.88    | 32.42                 | 14.39    | 27.45         | V                  | 3         |
| 23095   | 707.5           | -15.81    | 32.60                 | 14.64    | 29.11         | V                  | 3         |
| 23173   | 715.3           | -15.98    | 32.19                 | 14.06    | 25.44         | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

**CHANNEL BANDWIDTH: 1.4MHz 16QAM**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------|--------------------|-----------|
| 23017   | 699.7           | -10.14    | 32.77                 | 20.48    | 111.69  | H                  | 3         |
| 23095   | 707.5           | -9.30     | 33.23                 | 21.78    | 150.66  | H                  | 3         |
| 23173   | 715.3           | -9.55     | 33.14                 | 21.44    | 139.25  | H                  | 3         |
| 23017   | 699.7           | -16.71    | 32.42                 | 13.56    | 22.68   | V                  | 3         |
| 23095   | 707.5           | -16.83    | 32.60                 | 13.62    | 23.01   | V                  | 3         |
| 23173   | 715.3           | -17.08    | 32.19                 | 12.96    | 19.75   | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

## LTE BAND 12

### CHANNEL BANDWIDTH: 3MHz QPSK

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW)       | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|-----------|
| 23025   | 700.5           | -9.12     | 32.63                 | 21.36    | 136.80        | H                  | 3         |
| 23095   | 707.5           | -8.22     | 33.23                 | 22.86    | <b>193.20</b> | H                  | 3         |
| 23165   | 714.5           | -8.32     | 33.21                 | 22.74    | 187.72        | H                  | 3         |
| 23025   | 700.5           | -15.69    | 32.33                 | 14.49    | 28.10         | V                  | 3         |
| 23095   | 707.5           | -15.75    | 32.60                 | 14.70    | 29.51         | V                  | 3         |
| 23165   | 714.5           | -15.85    | 32.30                 | 14.30    | 26.92         | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

### CHANNEL BANDWIDTH: 3MHz 16QAM

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------|--------------------|-----------|
| 23025   | 700.5           | -10.27    | 32.63                 | 20.21    | 104.98  | H                  | 3         |
| 23095   | 707.5           | -9.32     | 33.23                 | 21.76    | 149.97  | H                  | 3         |
| 23165   | 714.5           | -9.48     | 33.21                 | 21.58    | 143.71  | H                  | 3         |
| 23025   | 700.5           | -16.84    | 32.33                 | 13.34    | 21.56   | V                  | 3         |
| 23095   | 707.5           | -16.85    | 32.60                 | 13.60    | 22.91   | V                  | 3         |
| 23165   | 714.5           | -17.01    | 32.30                 | 13.14    | 20.61   | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

## LTE BAND 12

### CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW)       | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|-----------|
| 23035   | 701.5           | -9.13     | 32.53                 | 21.25    | 133.20        | H                  | 3         |
| 23095   | 707.5           | -8.29     | 33.23                 | 22.79    | <b>190.02</b> | H                  | 3         |
| 23155   | 713.5           | -8.39     | 33.29                 | 22.75    | 188.23        | H                  | 3         |
| 23035   | 701.5           | -15.70    | 32.25                 | 14.40    | 27.57         | V                  | 3         |
| 23095   | 707.5           | -15.82    | 32.60                 | 14.63    | 29.04         | V                  | 3         |
| 23155   | 713.5           | -15.92    | 32.39                 | 14.32    | 27.01         | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

**CHANNEL BANDWIDTH: 5MHz 16QAM**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------|--------------------|-----------|
| 23035   | 701.5           | -9.99     | 32.53                 | 20.39    | 109.27  | H                  | 3         |
| 23095   | 707.5           | -9.16     | 33.23                 | 21.92    | 155.52  | H                  | 3         |
| 23155   | 713.5           | -9.24     | 33.29                 | 21.90    | 154.77  | H                  | 3         |
| 23035   | 701.5           | -16.56    | 32.25                 | 13.54    | 22.62   | V                  | 3         |
| 23095   | 707.5           | -16.69    | 32.60                 | 13.76    | 23.77   | V                  | 3         |
| 23155   | 713.5           | -16.77    | 32.39                 | 13.47    | 22.21   | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

**LTE BAND 12**

**CHANNEL BANDWIDTH: 10MHz QPSK**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW)       | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|-----------|
| 23060   | 704.0           | -9.71     | 32.68                 | 20.82    | 120.86        | H                  | 3         |
| 23095   | 707.5           | -8.74     | 33.23                 | 22.34    | <b>171.40</b> | H                  | 3         |
| 23130   | 711.0           | -8.97     | 33.39                 | 22.27    | 168.54        | H                  | 3         |
| 23060   | 704.0           | -16.28    | 32.37                 | 13.94    | 24.76         | V                  | 3         |
| 23095   | 707.5           | -16.27    | 32.60                 | 14.18    | 26.18         | V                  | 3         |
| 23130   | 711.0           | -16.50    | 32.56                 | 13.91    | 24.58         | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

**CHANNEL BANDWIDTH: 10MHz 16QAM**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------|--------------------|-----------|
| 23060   | 704.0           | -10.64    | 32.68                 | 19.89    | 97.57   | H                  | 3         |
| 23095   | 707.5           | -9.81     | 33.23                 | 21.27    | 133.97  | H                  | 3         |
| 23130   | 711.0           | -9.80     | 33.39                 | 21.44    | 139.22  | H                  | 3         |
| 23060   | 704.0           | -17.21    | 32.37                 | 13.01    | 19.99   | V                  | 3         |
| 23095   | 707.5           | -17.34    | 32.60                 | 13.11    | 20.46   | V                  | 3         |
| 23130   | 711.0           | -17.33    | 32.56                 | 13.08    | 20.30   | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

**LTE BAND 17**

**CHANNEL BANDWIDTH: 5MHz QPSK**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW)       | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|-----------|
| 23755   | 706.5           | -8.46     | 32.64                 | 22.03    | 159.40        | H                  | 3         |
| 23790   | 710.0           | -8.30     | 32.92                 | 22.47    | 176.60        | H                  | 3         |
| 23825   | 713.5           | -7.98     | 32.83                 | 22.70    | <b>186.04</b> | H                  | 3         |
| 23755   | 706.5           | -16.72    | 32.14                 | 13.27    | 21.21         | V                  | 3         |
| 23790   | 710.0           | -15.73    | 32.18                 | 14.30    | 26.92         | V                  | 3         |
| 23825   | 713.5           | -16.28    | 31.95                 | 13.52    | 22.51         | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

**CHANNEL BANDWIDTH: 5MHz 16QAM**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------|--------------------|-----------|
| 23755   | 706.5           | -9.32     | 32.64                 | 21.17    | 130.77  | H                  | 3         |
| 23790   | 710.0           | -9.17     | 32.92                 | 21.60    | 144.54  | H                  | 3         |
| 23825   | 713.5           | -8.83     | 32.83                 | 21.85    | 152.97  | H                  | 3         |
| 23755   | 706.5           | -17.00    | 32.14                 | 12.99    | 19.89   | V                  | 3         |
| 23790   | 710.0           | -16.60    | 32.18                 | 13.43    | 22.03   | V                  | 3         |
| 23825   | 713.5           | -17.13    | 31.95                 | 12.67    | 18.51   | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

**LTE BAND 17**

**CHANNEL BANDWIDTH: 10MHz QPSK**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW)       | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------------|--------------------|-----------|
| 23780   | 709.0           | -9.04     | 32.90                 | 21.71    | 148.08        | H                  | 3         |
| 23790   | 710.0           | -8.75     | 32.92                 | 22.02    | 159.15        | H                  | 3         |
| 23800   | 711.0           | -8.56     | 32.92                 | 22.21    | <b>166.38</b> | H                  | 3         |
| 23780   | 709.0           | -16.72    | 32.20                 | 13.33    | 21.50         | V                  | 3         |
| 23790   | 710.0           | -16.18    | 32.18                 | 13.85    | 24.28         | V                  | 3         |
| 23800   | 711.0           | -16.86    | 32.13                 | 13.12    | 20.52         | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

**CHANNEL BANDWIDTH: 10MHz 16QAM**

| Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | ERP(dBm) | ERP(mW) | Polarization (H/V) | LIMIT (W) |
|---------|-----------------|-----------|-----------------------|----------|---------|--------------------|-----------|
| 23780   | 709.0           | -9.97     | 32.90                 | 20.78    | 119.54  | H                  | 3         |
| 23790   | 710.0           | -9.82     | 32.92                 | 20.95    | 124.39  | H                  | 3         |
| 23800   | 711.0           | -9.39     | 32.92                 | 21.38    | 137.44  | H                  | 3         |
| 23780   | 709.0           | -17.65    | 32.20                 | 12.40    | 17.36   | V                  | 3         |
| 23790   | 710.0           | -17.25    | 32.18                 | 12.78    | 18.98   | V                  | 3         |
| 23800   | 711.0           | -17.69    | 32.13                 | 12.29    | 16.95   | V                  | 3         |

**NOTE:** ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

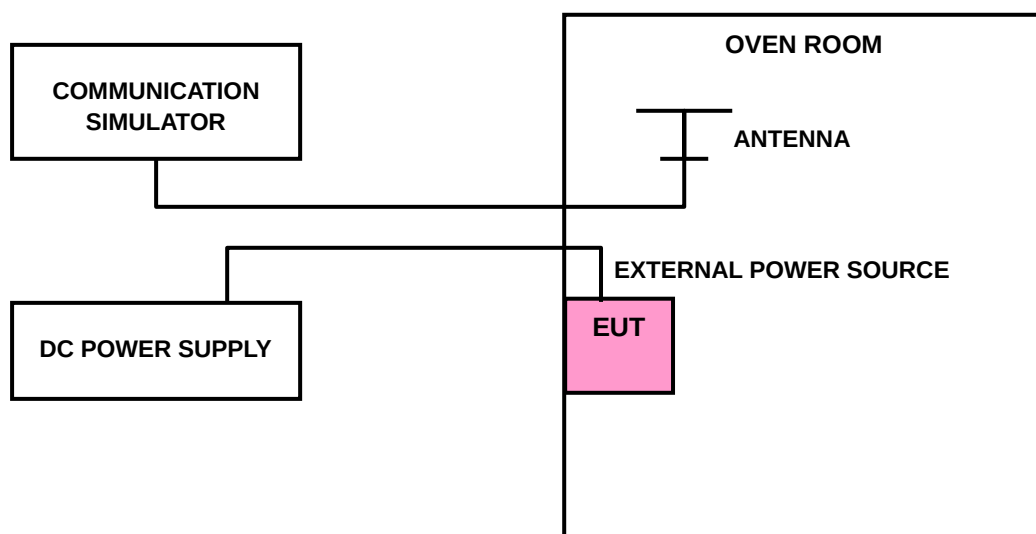
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 4.2.2 TEST PROCEDURE

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

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

### 4.2.3 TEST SETUP



#### 4.2.4 TEST RESULTS

##### FREQUENCY ERROR VS. VOLTAGE

|                    | FREQUENCY ERROR (PPM) |            |         |         |         |         |         |                |
|--------------------|-----------------------|------------|---------|---------|---------|---------|---------|----------------|
| VOLTAGE<br>(Volts) | WCDMA                 | LTE Band 4 |         |         |         |         |         | LIMIT<br>(ppm) |
|                    |                       | 1.4MHz     | 3MHz    | 5MHz    | 10MHz   | 15MHz   | 20MHz   |                |
| 3.85               | 0.0011                | 0.0007     | 0.0003  | 0.0008  | 0.0007  | 0.0013  | 0.0006  | 2.5            |
| 3.3                | 0.0012                | -0.0025    | -0.0020 | -0.0017 | -0.0015 | -0.0011 | -0.0014 | 2.5            |
| 4.4                | 0.0013                | -0.0022    | -0.0024 | -0.0017 | -0.0018 | -0.0009 | -0.0014 | 2.5            |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.3Vdc to 4.4Vdc.

##### FREQUENCY ERROR vs. TEMPERATURE.

|            | Frequency Error (PPM) |            |         |         |         |         |         |                |
|------------|-----------------------|------------|---------|---------|---------|---------|---------|----------------|
| TEMP. (°C) | WCDMA                 | LTE Band 4 |         |         |         |         |         | LIMIT<br>(ppm) |
|            |                       | 1.4MHz     | 3MHz    | 5MHz    | 10MHz   | 15MHz   | 20MHz   |                |
| -30        | 0.0028                | -0.0074    | -0.0069 | -0.0068 | -0.0050 | -0.0049 | -0.0067 | 2.5            |
| -20        | 0.0030                | -0.0065    | -0.0060 | -0.0061 | -0.0029 | -0.0029 | -0.0060 | 2.5            |
| -10        | 0.0023                | -0.0058    | -0.0054 | -0.0053 | -0.0046 | -0.0054 | -0.0048 | 2.5            |
| 0          | 0.0033                | -0.0051    | -0.0048 | -0.0047 | -0.0044 | -0.0037 | -0.0044 | 2.5            |
| 10         | 0.0026                | -0.0043    | -0.0041 | -0.0040 | -0.0035 | -0.0042 | -0.0031 | 2.5            |
| 20         | 0.0026                | -0.0036    | -0.0036 | -0.0031 | 0.0054  | -0.0034 | -0.0024 | 2.5            |
| 30         | 0.0031                | -0.0031    | -0.0029 | -0.0022 | -0.0007 | -0.0025 | -0.0013 | 2.5            |
| 40         | 0.0040                | -0.0023    | -0.0022 | -0.0012 | -0.0020 | -0.0013 | -0.0006 | 2.5            |
| 50         | 0.0038                | -0.0014    | -0.0012 | -0.0011 | -0.0005 | -0.0012 | -0.0002 | 2.5            |
| 60         | 0.0050                | -0.0008    | -0.0004 | -0.0002 | -0.0027 | -0.0001 | 0.0003  | 2.5            |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | FREQUENCY ERROR (ppm) |         |         |         |             |         | LIMIT (ppm) |
|-----------------|-----------------------|---------|---------|---------|-------------|---------|-------------|
|                 | LTE Band 12           |         |         |         | LTE Band 17 |         |             |
|                 | 1.4MHz                | 3MHz    | 5MHz    | 10MHz   | 5MHz        | 10MHz   |             |
| 3.85            | 0.0007                | 0.0016  | 0.0010  | 0.0005  | 0.0020      | 0.0025  | 2.5         |
| 3.3             | -0.0018               | -0.0041 | -0.0032 | -0.0018 | -0.0009     | -0.0031 | 2.5         |
| 4.4             | 0.0039                | 0.0030  | 0.0047  | 0.0037  | -0.0013     | 0.0038  | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.3Vdc to 4.4Vdc.

#### FREQUENCY ERROR vs. TEMPERATURE.

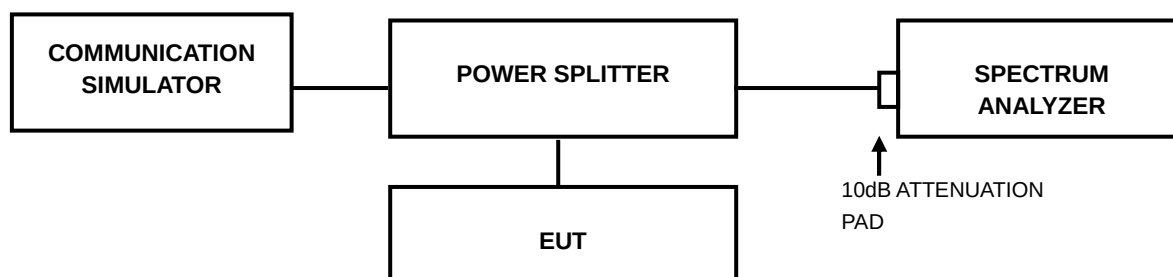
| VOLTAGE (Volts) | FREQUENCY ERROR (ppm) |         |         |         |             |         | LIMIT (ppm) |
|-----------------|-----------------------|---------|---------|---------|-------------|---------|-------------|
|                 | LTE Band 12           |         |         |         | LTE Band 17 |         |             |
|                 | 1.4MHz                | 3MHz    | 5MHz    | 10MHz   | 5MHz        | 10MHz   |             |
| -30             | -0.0165               | -0.0152 | -0.0146 | -0.0144 | -0.0150     | -0.0146 | 2.5         |
| -20             | -0.0145               | -0.0132 | -0.0136 | -0.0137 | -0.0132     | -0.0130 | 2.5         |
| -10             | -0.0132               | -0.0116 | -0.0119 | -0.0121 | -0.0117     | -0.0119 | 2.5         |
| 0               | -0.0119               | -0.0097 | -0.0104 | -0.0103 | -0.0104     | -0.0104 | 2.5         |
| 10              | -0.0102               | -0.0074 | -0.0083 | -0.0091 | -0.0084     | -0.0094 | 2.5         |
| 20              | -0.0090               | -0.0061 | -0.0061 | -0.0069 | -0.0060     | -0.0072 | 2.5         |
| 30              | -0.0068               | -0.0049 | -0.0044 | -0.0045 | -0.0042     | -0.0056 | 2.5         |
| 40              | -0.0045               | -0.0030 | -0.0025 | -0.0028 | -0.0027     | -0.0039 | 2.5         |
| 50              | -0.0042               | -0.0015 | -0.0006 | -0.0003 | -0.0009     | -0.0001 | 2.5         |
| 60              | 0.0005                | 0.0006  | 0.0027  | 0.0016  | 0.0016      | 0.0016  | 2.5         |

## 4.3 OCCUPIED BANDWIDTH MEASUREMENT

### 4.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

### 4.3.2 TEST SETUP



### 4.3.3 TEST PROCEDURES

- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.



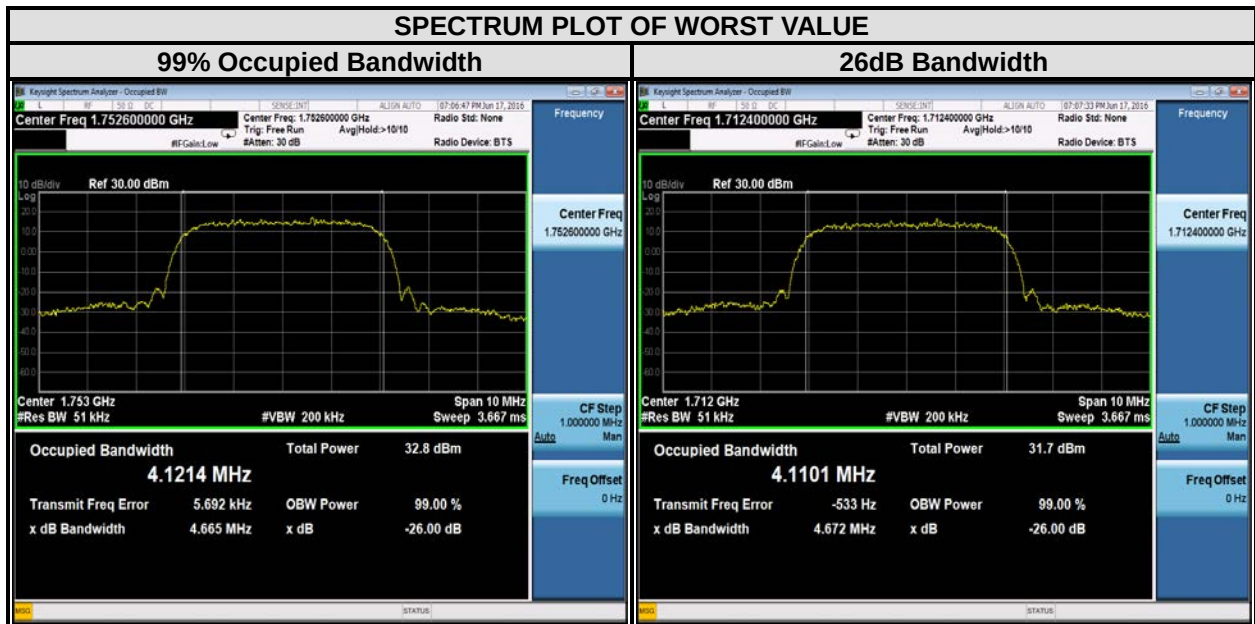
**BUREAU  
VERITAS**

Test Report No.: RF160614W011-5

#### 4.3.4 TEST RESULTS

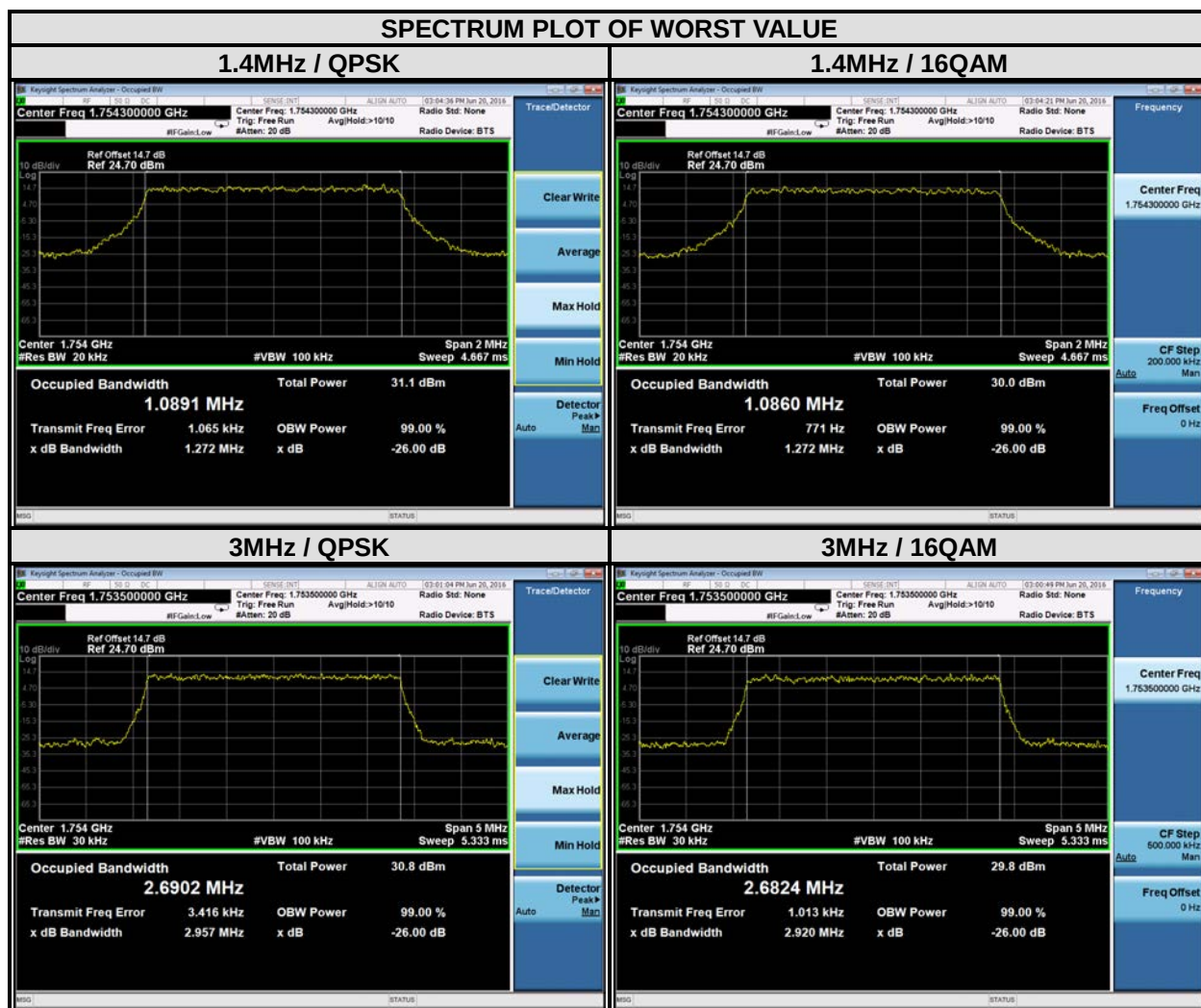
##### WCDMA BAND IV

| Channel | FREQ. (MHz) | 99% Occupied Bandwidth (MHz) | Channel | FREQ. (MHz) | 26dB Bandwidth (MHz) |
|---------|-------------|------------------------------|---------|-------------|----------------------|
|         |             | WCDMA                        |         |             | WCDMA                |
| 1312    | 1712.40     | 4.11                         | 1312    | 1712.40     | 4.67                 |
| 1413    | 1732.60     | 4.11                         | 1413    | 1732.60     | 4.67                 |
| 1513    | 1752.60     | 4.12                         | 1513    | 1752.60     | 4.67                 |



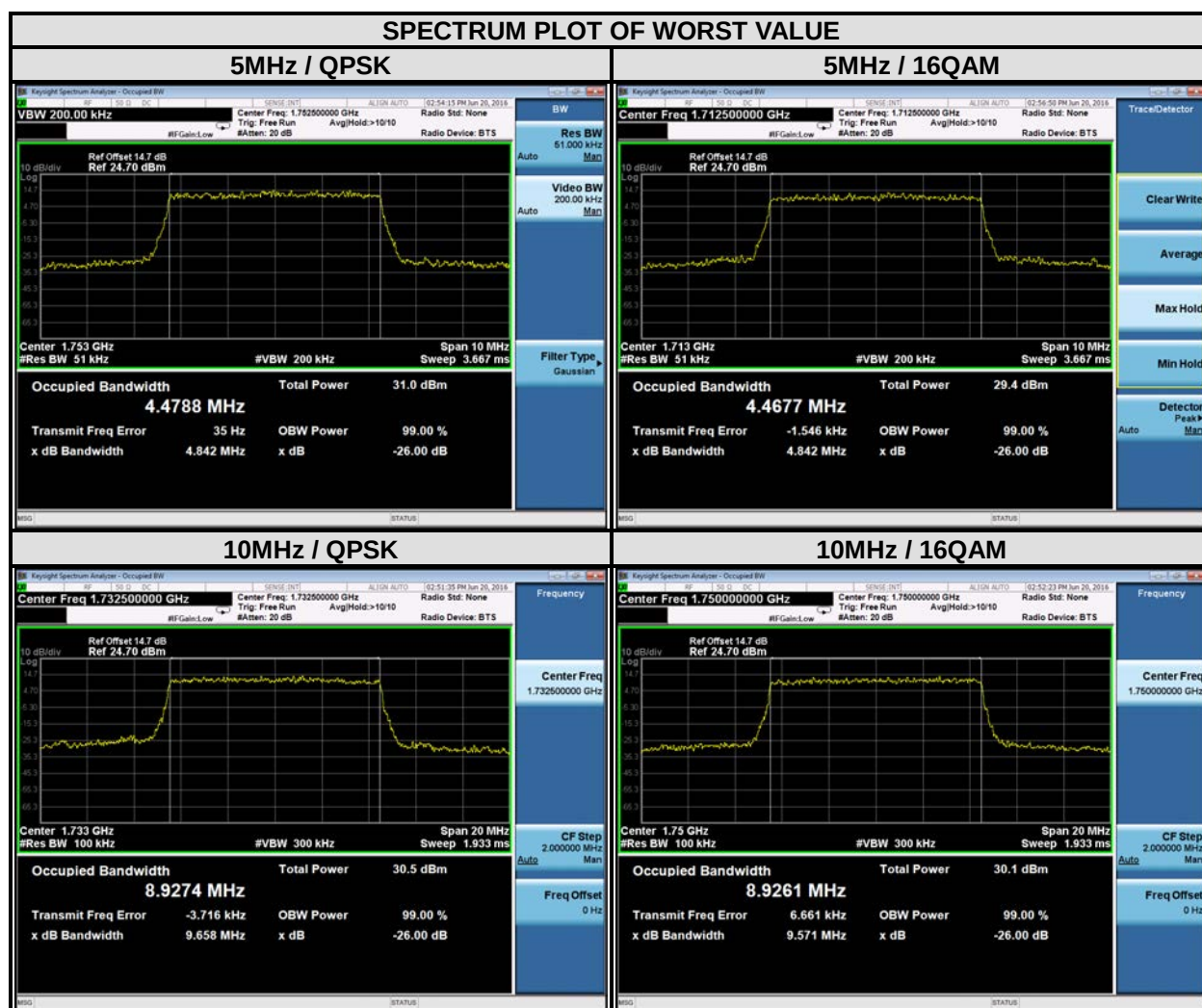
## LTE BAND 4

| CHANNEL BANDWIDTH: 1.4MHz |                 |                              |       | CHANNEL BANDWIDTH: 3MHz |                 |                              |       |
|---------------------------|-----------------|------------------------------|-------|-------------------------|-----------------|------------------------------|-------|
| CHANNEL                   | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |       | CHANNEL                 | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |       |
|                           |                 | QPSK                         | 16QAM |                         |                 | QPSK                         | 16QAM |
| 19957                     | 1710.7          | 1.09                         | 1.09  | 19965                   | 1711.5          | 2.69                         | 2.68  |
| 20175                     | 1732.5          | 1.09                         | 1.08  | 20175                   | 1732.5          | 2.69                         | 2.68  |
| 20393                     | 1754.3          | 1.09                         | 1.09  | 20385                   | 1753.5          | 2.69                         | 2.68  |



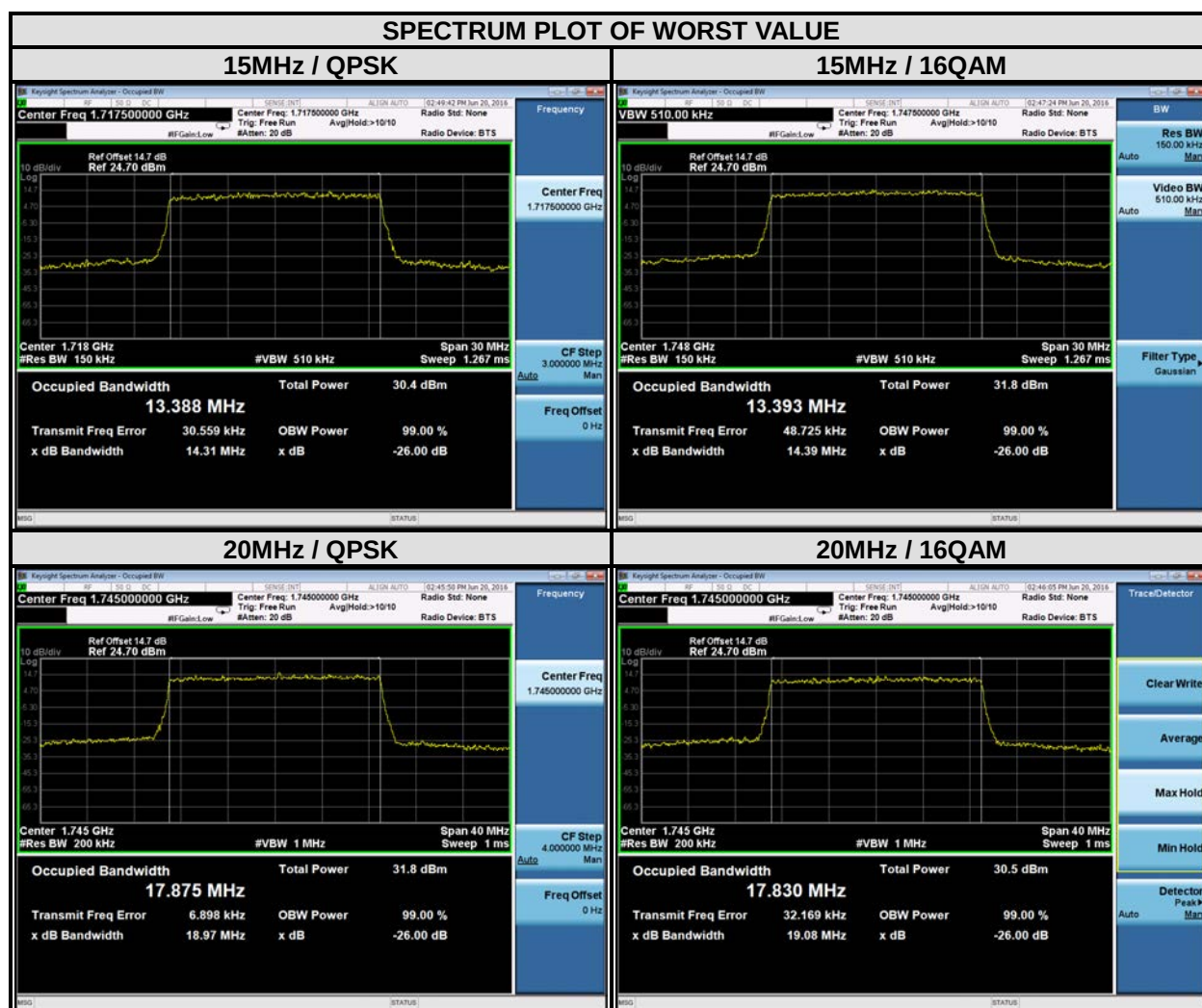
## LTE BAND 4

| CHANNEL BANDWIDTH: 5MHz |                 |                              |       | CHANNEL BANDWIDTH: 10MHz |                 |                              |       |
|-------------------------|-----------------|------------------------------|-------|--------------------------|-----------------|------------------------------|-------|
| CHANNEL                 | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |       | CHANNEL                  | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |       |
|                         |                 | QPSK                         | 16QAM |                          |                 | QPSK                         | 16QAM |
| 19975                   | 1712.5          | 4.47                         | 4.47  | 20000                    | 1715            | 8.92                         | 8.92  |
| 20175                   | 1732.5          | 4.47                         | 4.47  | 20175                    | 1732.5          | 8.93                         | 8.92  |
| 20375                   | 1752.5          | 4.48                         | 4.46  | 20350                    | 1750            | 8.93                         | 8.93  |



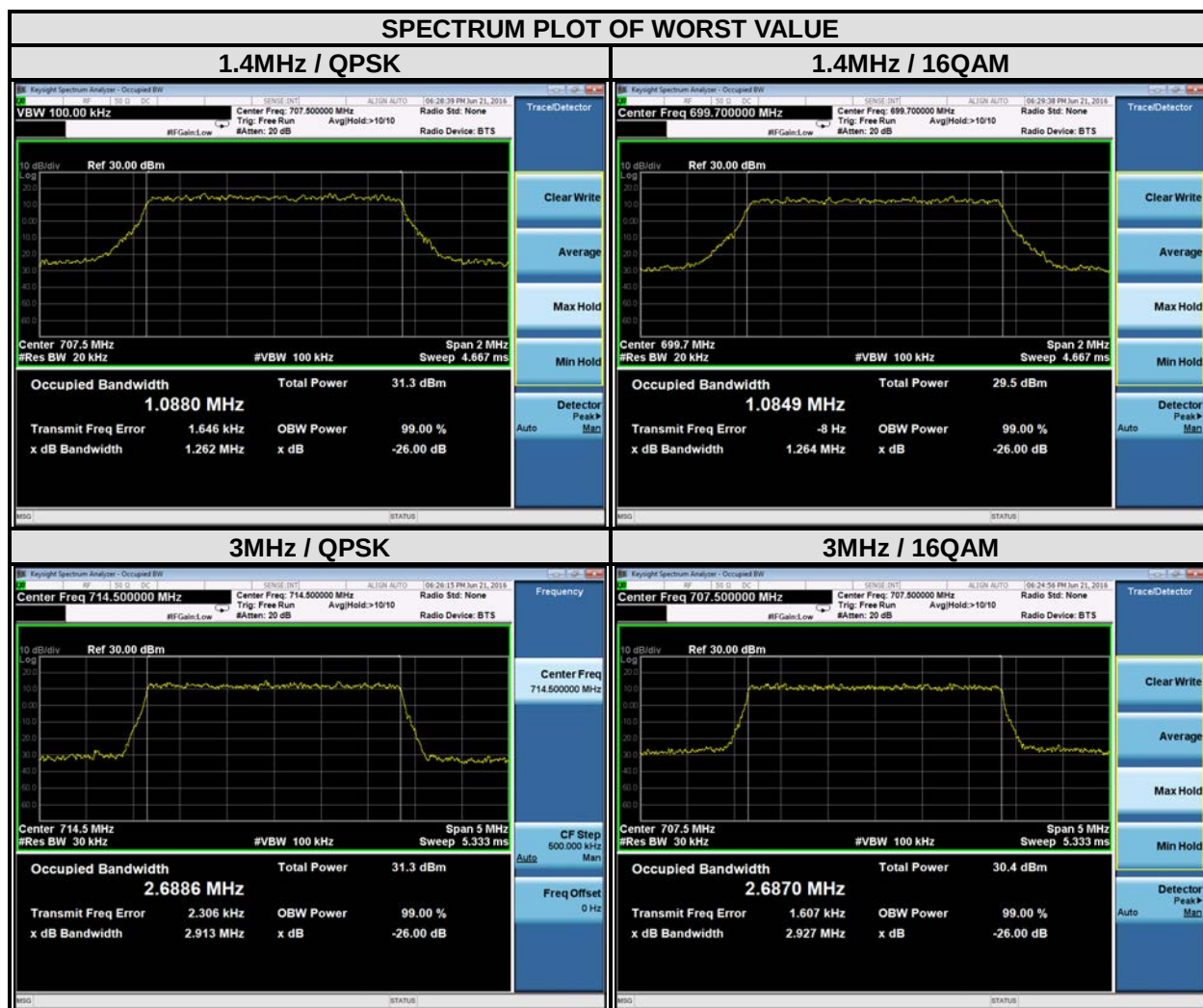
## LTE BAND 4

| CHANNEL BANDWIDTH: 15MHz |                 |                              |       | CHANNEL BANDWIDTH: 20MHz |                 |                              |       |
|--------------------------|-----------------|------------------------------|-------|--------------------------|-----------------|------------------------------|-------|
| CHANNEL                  | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |       | CHANNEL                  | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |       |
|                          |                 | QPSK                         | 16QAM |                          |                 | QPSK                         | 16QAM |
| 20025                    | 1717.5          | 13.39                        | 13.37 | 20050                    | 1720            | 17.86                        | 17.79 |
| 20175                    | 1732.5          | 13.37                        | 13.36 | 20175                    | 1732.5          | 17.84                        | 17.81 |
| 20325                    | 1747.5          | 13.36                        | 13.39 | 20300                    | 1745            | 17.88                        | 17.83 |



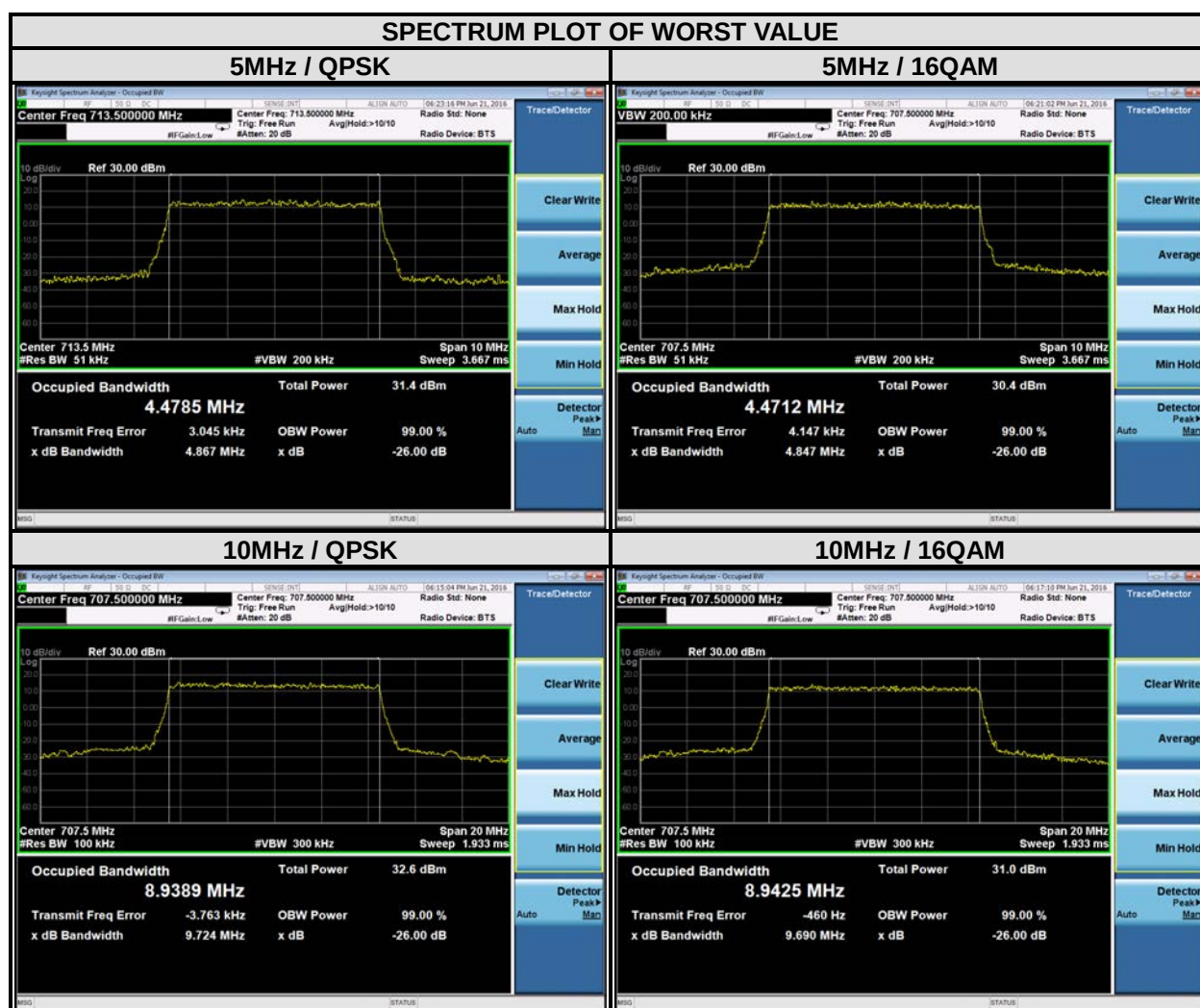
## LTE BAND 12

| CHANNEL BANDWIDTH: 1.4MHz |                 |                              |       | CHANNEL BANDWIDTH: 3MHz |                 |                              |       |
|---------------------------|-----------------|------------------------------|-------|-------------------------|-----------------|------------------------------|-------|
| CHANNEL                   | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |       | CHANNEL                 | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |       |
|                           |                 | QPSK                         | 16QAM |                         |                 | QPSK                         | 16QAM |
| 23017                     | 699.7           | 1.09                         | 1.08  | 23025                   | 700.5           | 2.68                         | 2.68  |
| 23095                     | 707.5           | 1.09                         | 1.08  | 23095                   | 707.5           | 2.69                         | 2.69  |
| 23173                     | 715.3           | 1.09                         | 1.08  | 23165                   | 714.5           | 2.69                         | 2.68  |



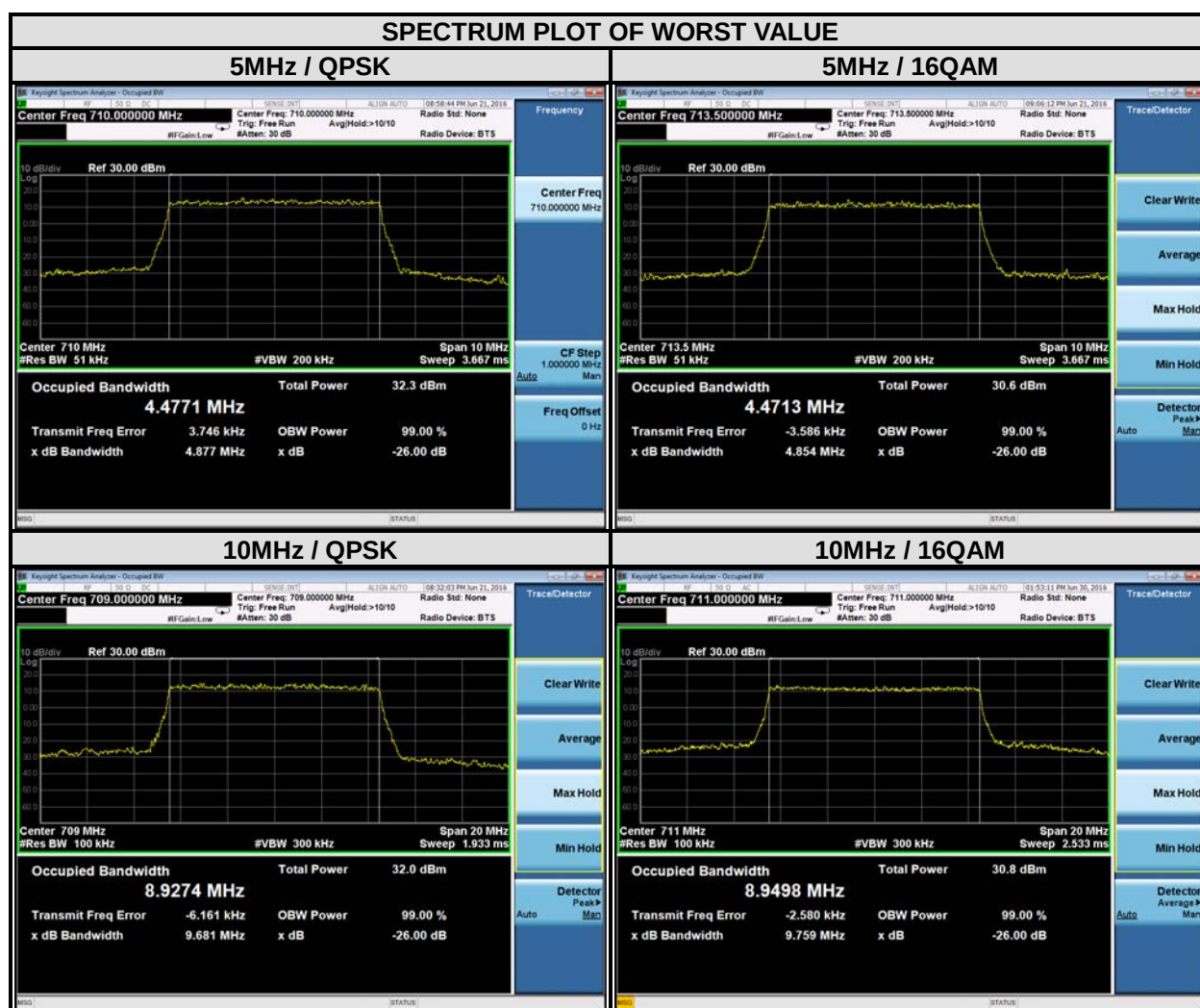
## LTE BAND 12

| CHANNEL BANDWIDTH: 5MHz |                 |                              |       | CHANNEL BANDWIDTH: 10MHz |                 |                              |       |
|-------------------------|-----------------|------------------------------|-------|--------------------------|-----------------|------------------------------|-------|
| CHANNEL                 | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |       | CHANNEL                  | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |       |
|                         |                 | QPSK                         | 16QAM |                          |                 | QPSK                         | 16QAM |
| 23035                   | 701.5           | 4.47                         | 4.46  | 23060                    | 704             | 8.92                         | 8.91  |
| 23095                   | 707.5           | 4.48                         | 4.47  | 23095                    | 707.5           | 8.94                         | 8.94  |
| 23155                   | 713.5           | 4.48                         | 4.46  | 23130                    | 711             | 8.93                         | 8.93  |



## LTE BAND 17

| CHANNEL BANDWIDTH: 5MHz |                 |                              |       | CHANNEL BANDWIDTH: 10MHz |                 |                              |       |
|-------------------------|-----------------|------------------------------|-------|--------------------------|-----------------|------------------------------|-------|
| CHANNEL                 | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |       | CHANNEL                  | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) |       |
|                         |                 | QPSK                         | 16QAM |                          |                 | QPSK                         | 16QAM |
| 23755                   | 706.5           | 4.47                         | 4.47  | 23780                    | 709             | 8.93                         | 8.94  |
| 23790                   | 710             | 4.48                         | 4.47  | 23790                    | 710             | 8.93                         | 8.93  |
| 23825                   | 713.5           | 4.48                         | 4.47  | 23800                    | 711             | 8.92                         | 8.95  |

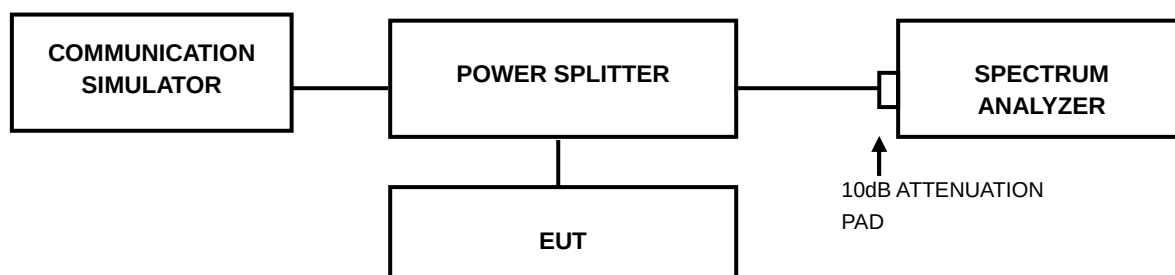


#### 4.4 PEAK TO AVERAGE RATIO

##### 4.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

##### 4.4.2 TEST SETUP



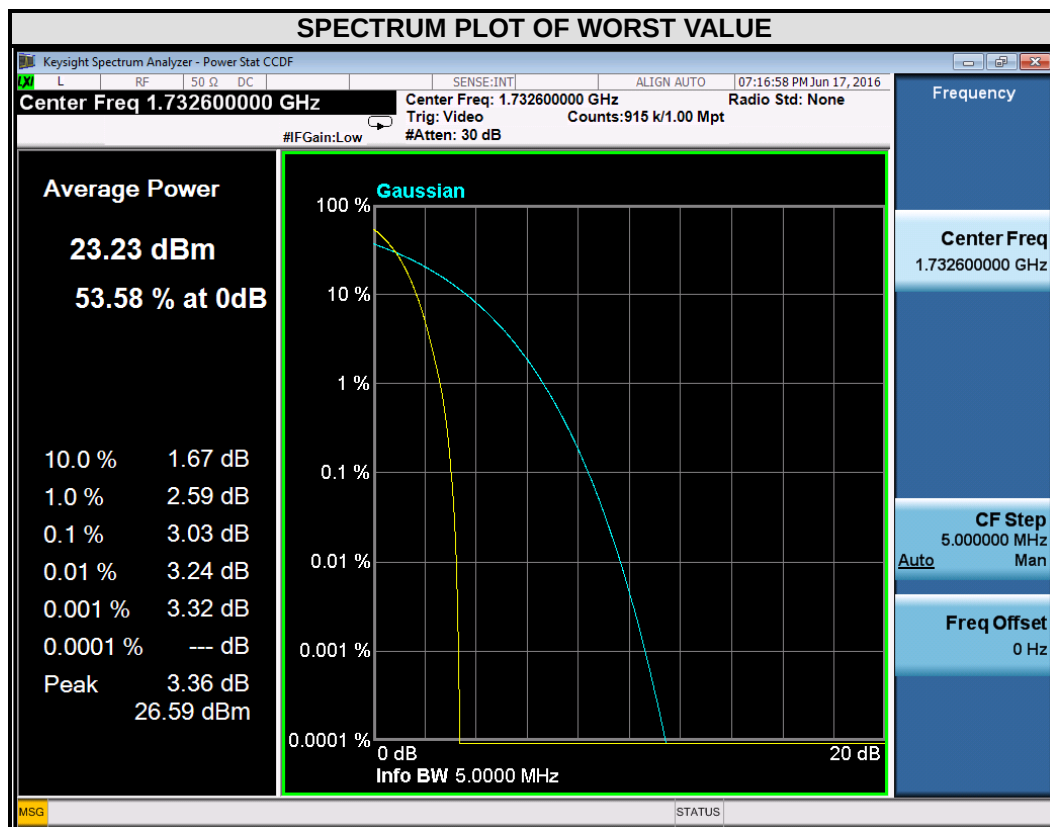
##### 4.4.3 TEST PROCEDURES

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

#### 4.4.4 TEST RESULTS

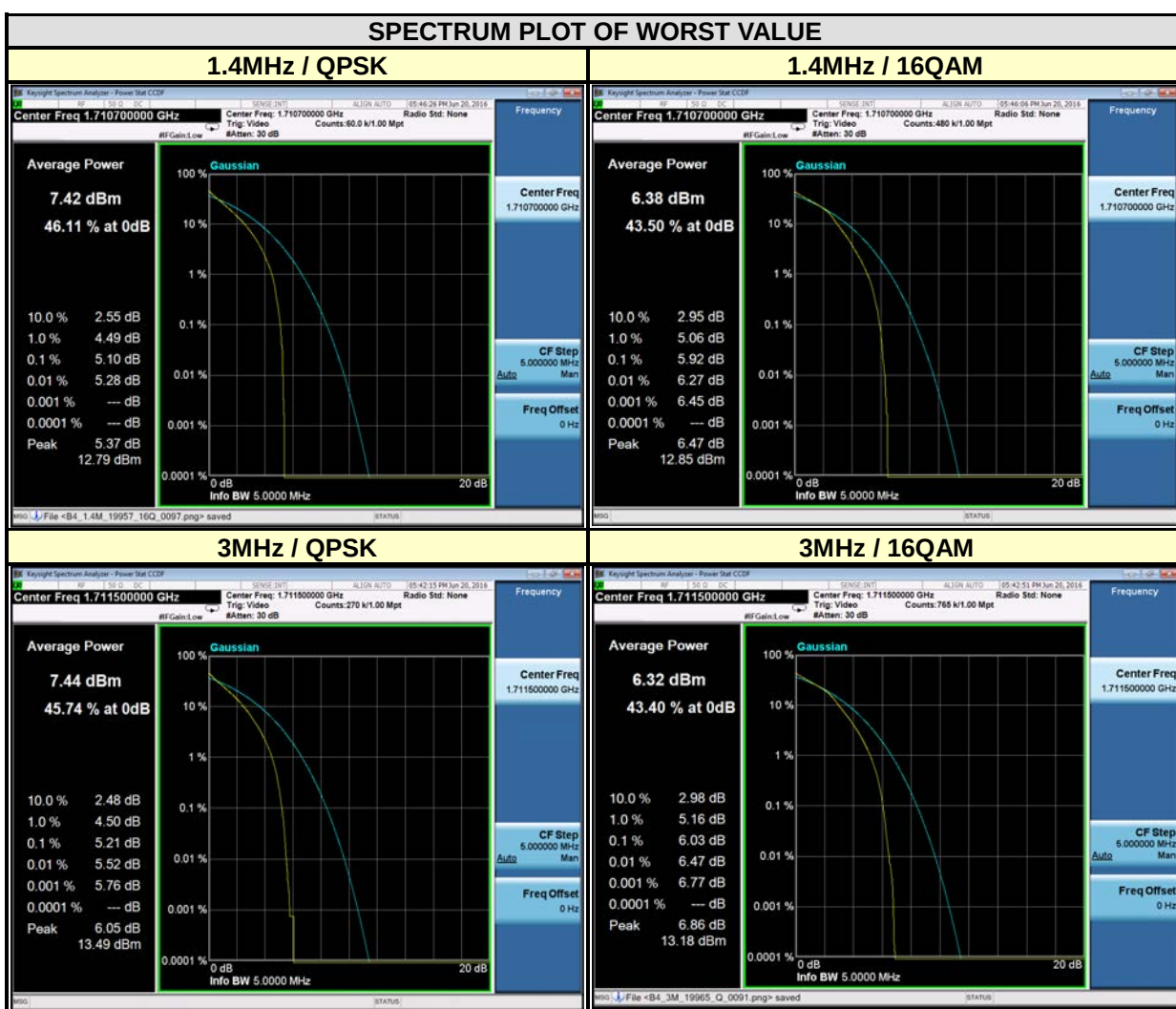
##### WCDMA

| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 1413    | 1732.6          | 3.03                       |

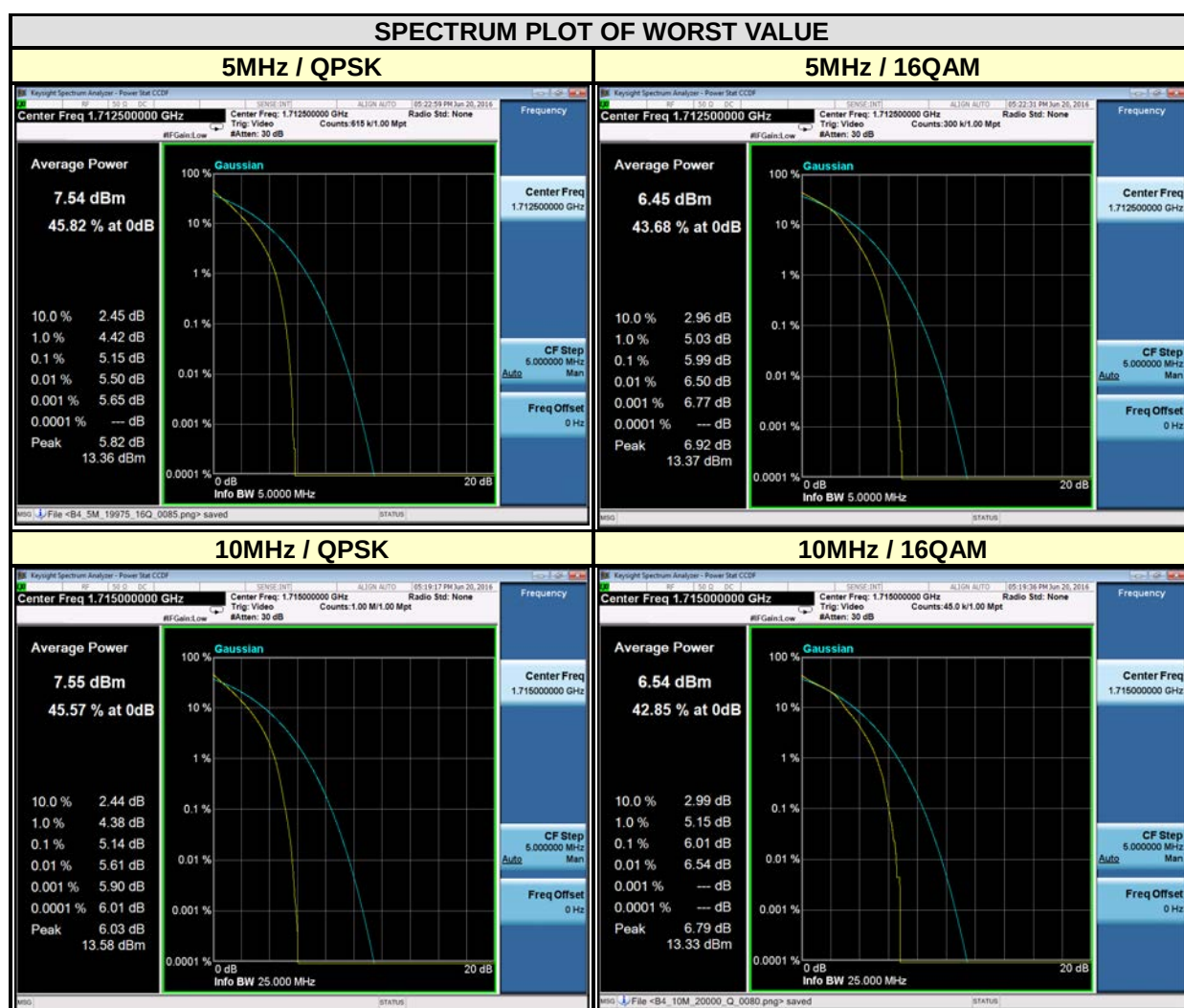


#### LTE BAND 4

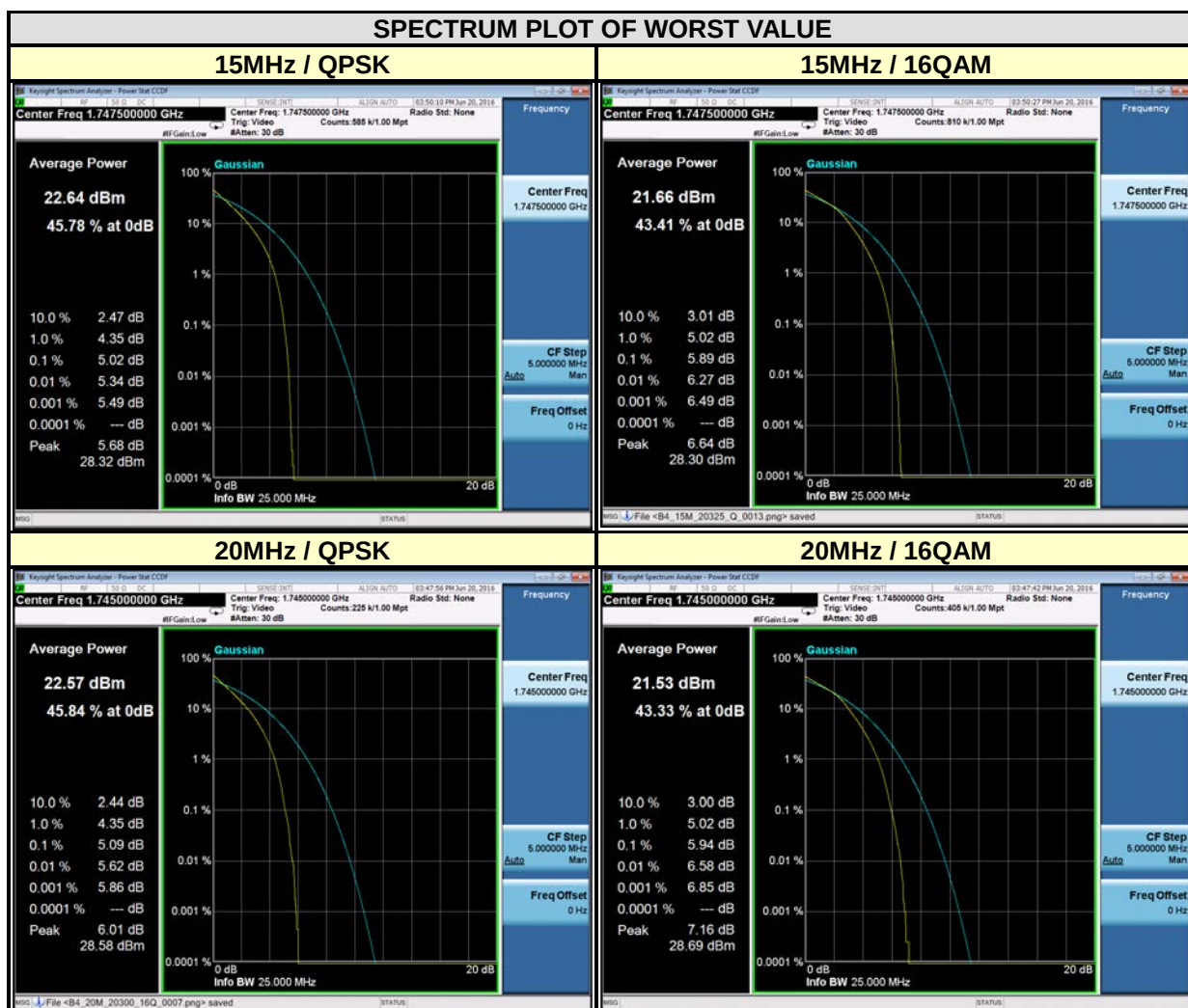
| CHANNEL BANDWIDTH: 1.4MHz |                 |                            |       | CHANNEL BANDWIDTH: 3MHz |                 |                            |       |
|---------------------------|-----------------|----------------------------|-------|-------------------------|-----------------|----------------------------|-------|
| CHANNEL                   | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       | CHANNEL                 | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                           |                 | QPSK                       | 16QAM |                         |                 | QPSK                       | 16QAM |
| 19957                     | 1710.7          | 5.10                       | 5.92  | 19965                   | 1711.5          | 5.21                       | 6.03  |
| 20175                     | 1732.5          | 4.73                       | 5.49  | 20175                   | 1732.5          | 4.86                       | 5.75  |
| 20393                     | 1754.3          | 4.56                       | 5.31  | 20385                   | 1753.5          | 4.84                       | 5.69  |



| CHANNEL BANDWIDTH: 5MHz |                 |                            |       | CHANNEL BANDWIDTH: 10MHz |                 |                            |       |
|-------------------------|-----------------|----------------------------|-------|--------------------------|-----------------|----------------------------|-------|
| CHANNEL                 | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       | CHANNEL                  | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                         |                 | QPSK                       | 16QAM |                          |                 | QPSK                       | 16QAM |
| 19975                   | 1712.5          | 5.15                       | 5.99  | 20000                    | 1715            | 5.14                       | 6.01  |
| 20175                   | 1732.5          | 4.95                       | 5.77  | 20175                    | 1732.5          | 4.93                       | 5.65  |
| 20375                   | 1752.5          | 4.98                       | 5.80  | 20350                    | 1750            | 5.00                       | 5.89  |

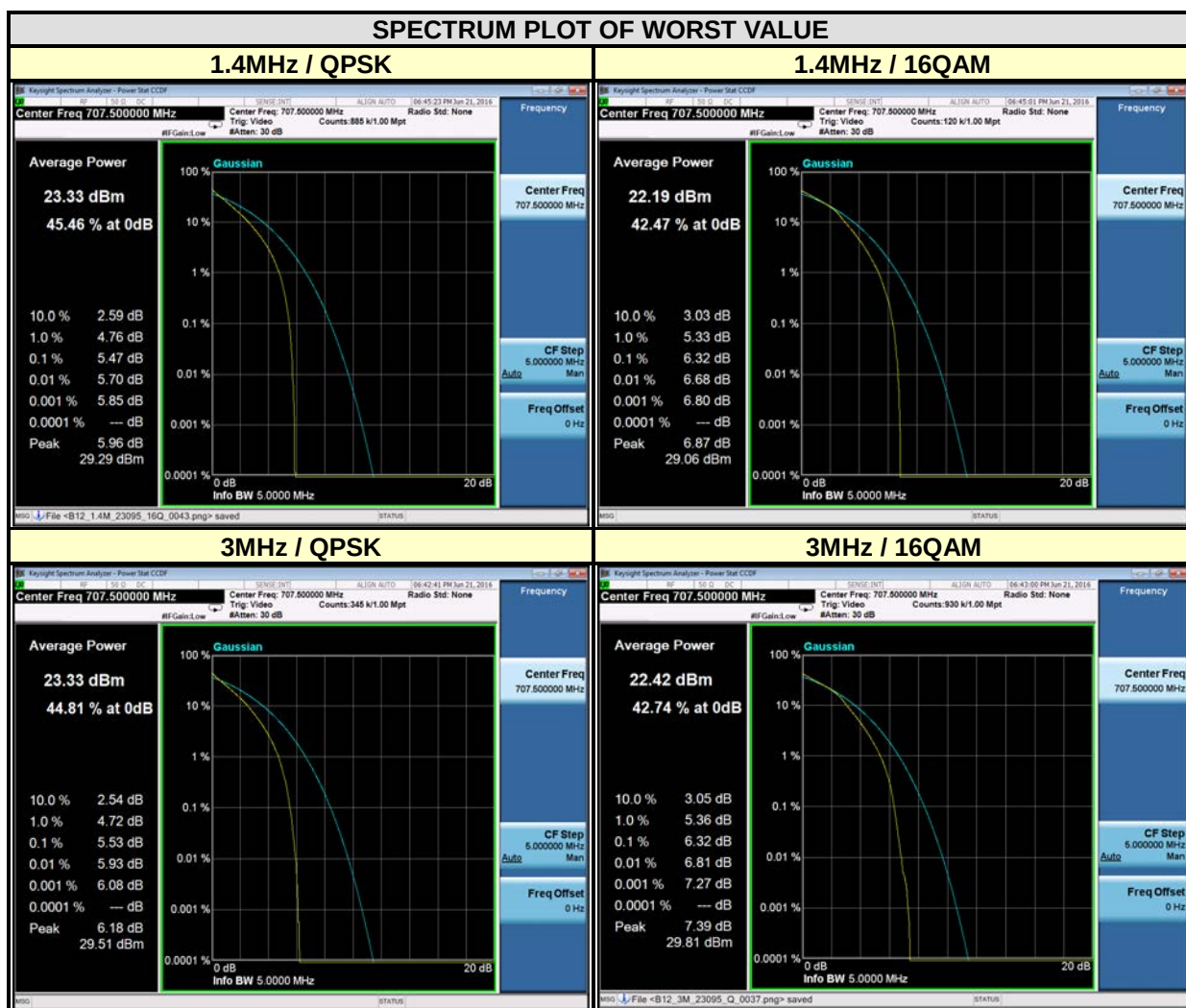


| CHANNEL BANDWIDTH: 15MHz |                 |                            |       | CHANNEL BANDWIDTH: 20MHz |                 |                            |       |
|--------------------------|-----------------|----------------------------|-------|--------------------------|-----------------|----------------------------|-------|
| CHANNEL                  | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       | CHANNEL                  | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                          |                 | QPSK                       | 16QAM |                          |                 | QPSK                       | 16QAM |
| 20025                    | 1717.5          | 4.99                       | 5.82  | 20050                    | 1720            | 4.98                       | 5.81  |
| 20175                    | 1732.5          | 4.86                       | 5.72  | 20175                    | 1732.5          | 4.98                       | 5.77  |
| 20325                    | 1747.5          | 5.02                       | 5.89  | 20300                    | 1745            | 5.09                       | 5.94  |

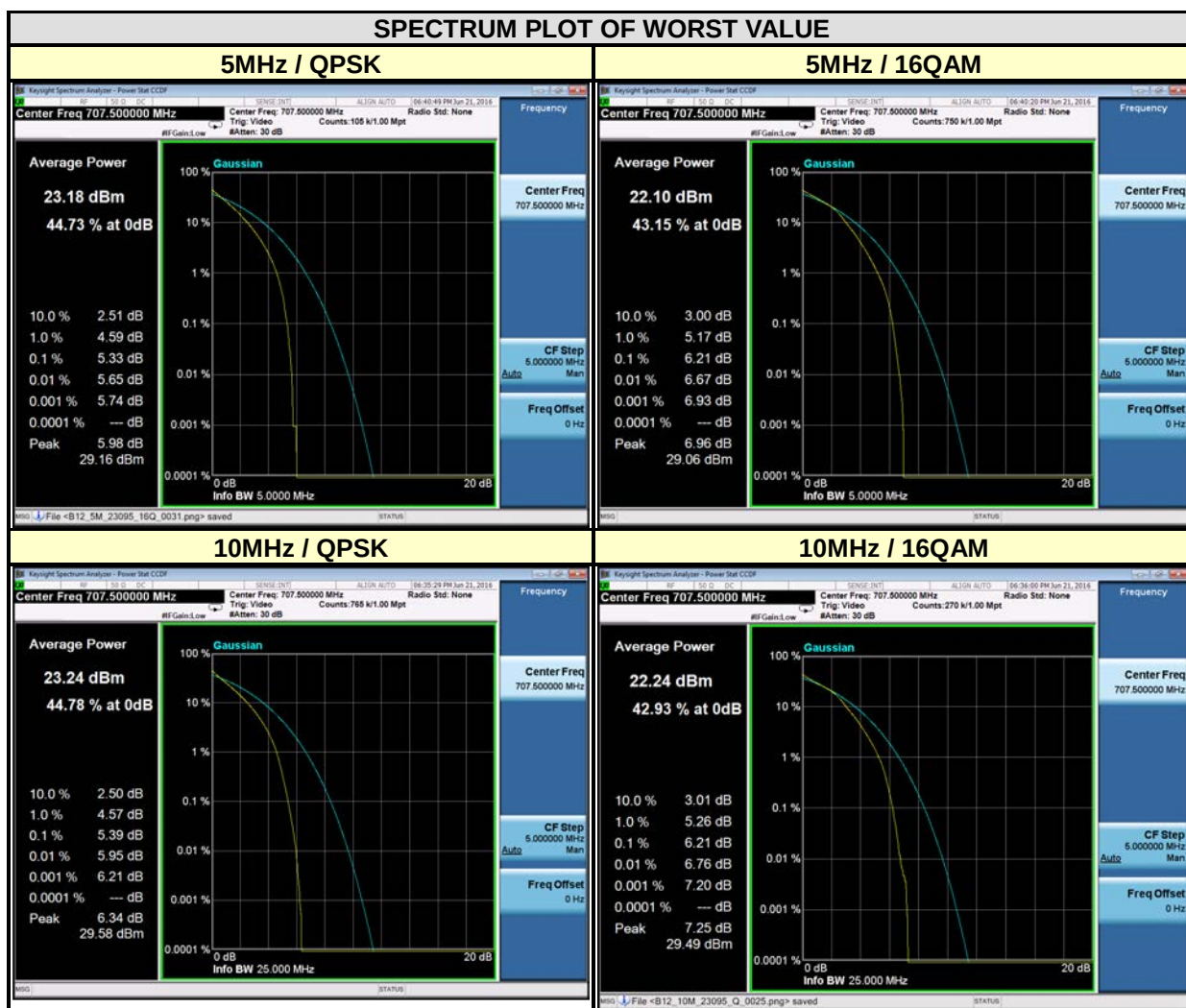


## LTE BAND 12

| CHANNEL BANDWIDTH: 1.4MHz |                 |                            |       | CHANNEL BANDWIDTH: 3MHz |                 |                            |       |
|---------------------------|-----------------|----------------------------|-------|-------------------------|-----------------|----------------------------|-------|
| CHANNEL                   | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       | CHANNEL                 | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                           |                 | QPSK                       | 16QAM |                         |                 | QPSK                       | 16QAM |
| 23017                     | 699.7           | 5.16                       | 6.05  | 23025                   | 700.5           | 5.23                       | 6.06  |
| 23095                     | 707.5           | 5.47                       | 6.32  | 23095                   | 707.5           | 5.53                       | 6.32  |
| 23173                     | 715.3           | 4.99                       | 5.93  | 23165                   | 714.5           | 5.12                       | 5.91  |

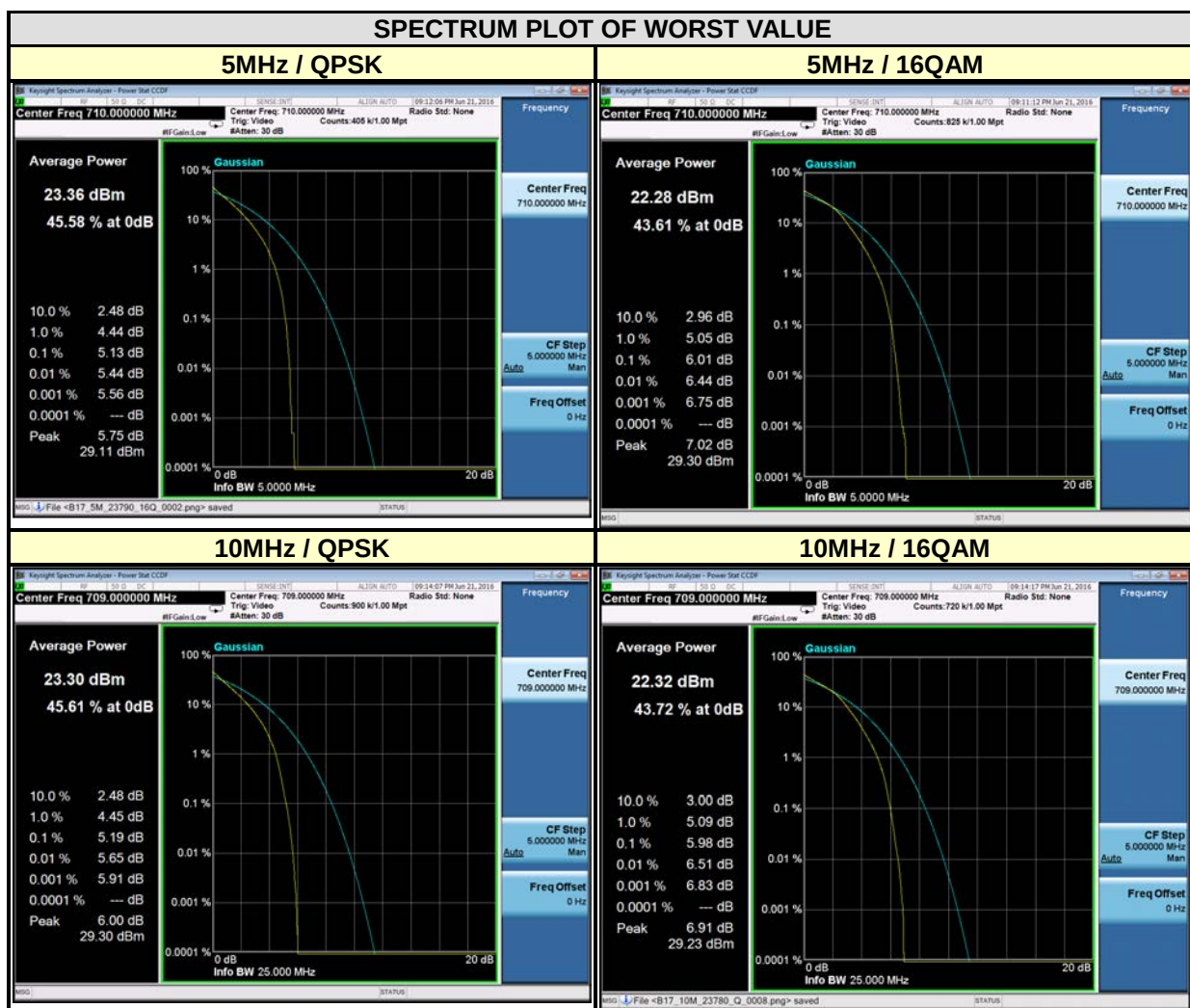


| CHANNEL BANDWIDTH: 5MHz |                 |                            |       | CHANNEL BANDWIDTH: 10MHz |                 |                            |       |
|-------------------------|-----------------|----------------------------|-------|--------------------------|-----------------|----------------------------|-------|
| CHANNEL                 | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       | CHANNEL                  | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                         |                 | QPSK                       | 16QAM |                          |                 | QPSK                       | 16QAM |
| 23035                   | 701.5           | 5.13                       | 6.00  | 23060                    | 704             | 5.36                       | 6.14  |
| 23095                   | 707.5           | 5.33                       | 6.21  | 23095                    | 707.5           | 5.39                       | 6.21  |
| 23155                   | 713.5           | 5.10                       | 5.94  | 23130                    | 711             | 5.30                       | 6.08  |



## LTE BAND 17

| CHANNEL BANDWIDTH: 5MHz |                 |                            |       | CHANNEL BANDWIDTH: 10MHz |                 |                            |       |
|-------------------------|-----------------|----------------------------|-------|--------------------------|-----------------|----------------------------|-------|
| CHANNEL                 | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       | CHANNEL                  | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                         |                 | QPSK                       | 16QAM |                          |                 | QPSK                       | 16QAM |
| 23755                   | 706.5           | 5.19                       | 6.00  | 23780                    | 709             | 5.19                       | 5.98  |
| 23790                   | 710             | 5.13                       | 6.01  | 23790                    | 710             | 5.15                       | 5.97  |
| 23825                   | 713.5           | 4.97                       | 5.80  | 23800                    | 711             | 5.10                       | 5.91  |



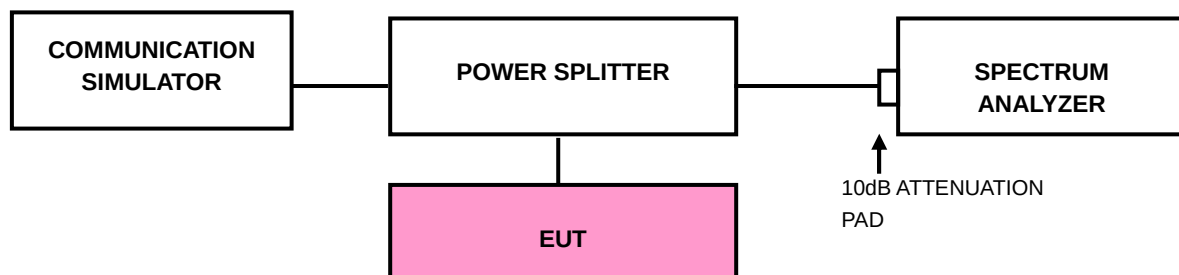
## 4.5 BAND EDGE MEASUREMENT

### 4.5.1 LIMITS OF BAND EDGE MEASUREMENT

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

### 4.5.2 TEST SETUP



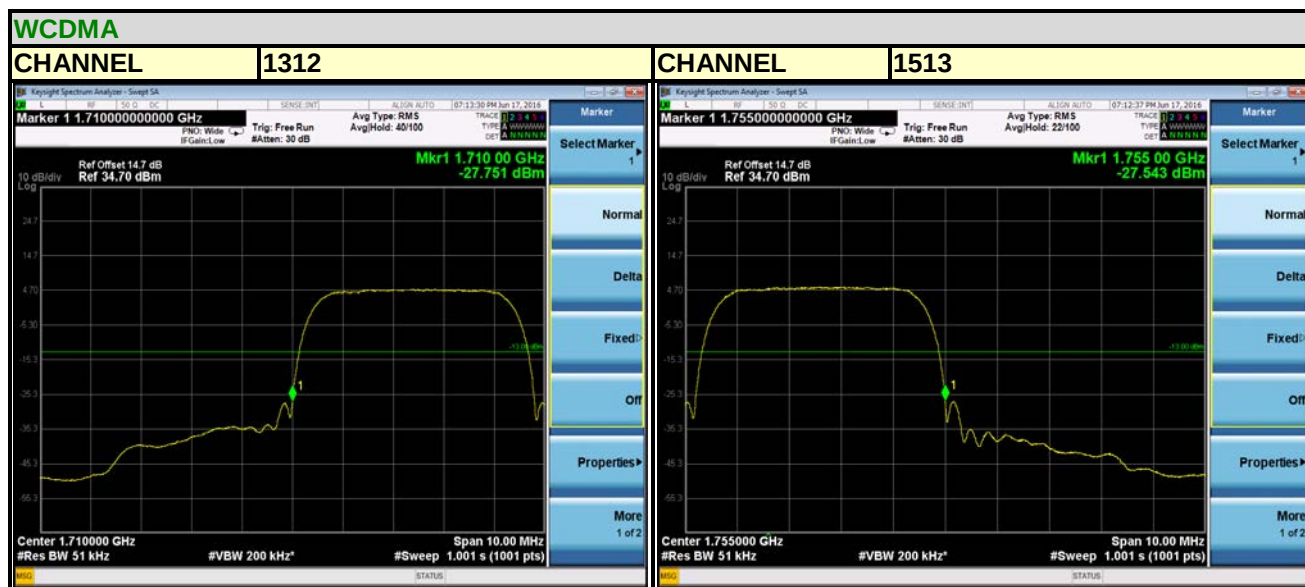
### 4.5.3 TEST PROCEDURES

- The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 20kHz and VB of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)

- e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz. (LTE bandwidth 3MHz)
- f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 50kHz and VB of the spectrum is 200kHz. (LTE bandwidth 5MHz)
- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz. (LTE bandwidth 10MHz)
- h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz. (LTE bandwidth 15MHz)
- i. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz. (LTE bandwidth 20MHz)
- j. Record the max trace plot into the test report.

## 4.5.4 TEST RESULTS

### WCDMA BAND 4





Test Report No.: RF160614W011-5

## LTE BAND 4

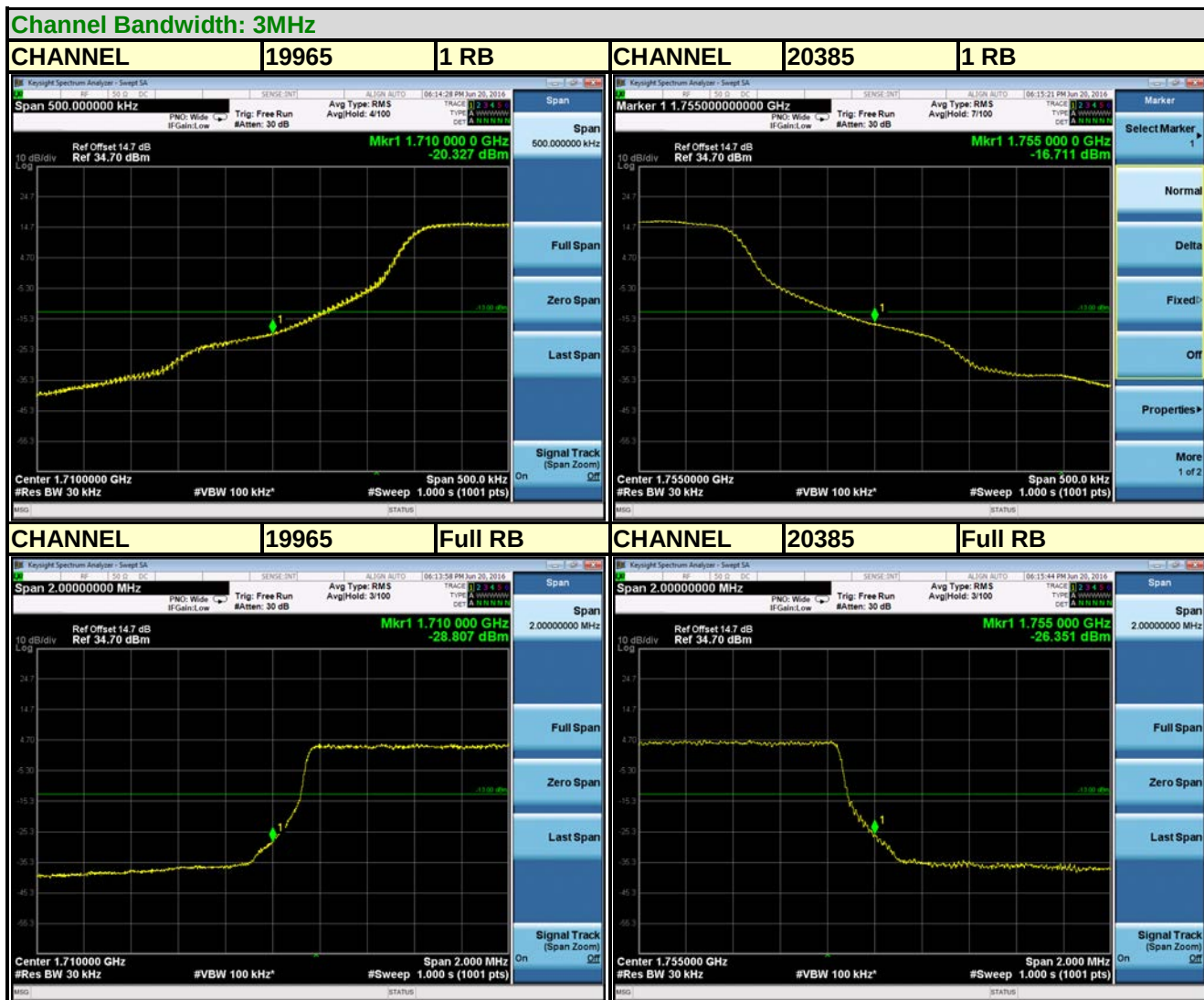
### Channel Bandwidth: 1.4MHz



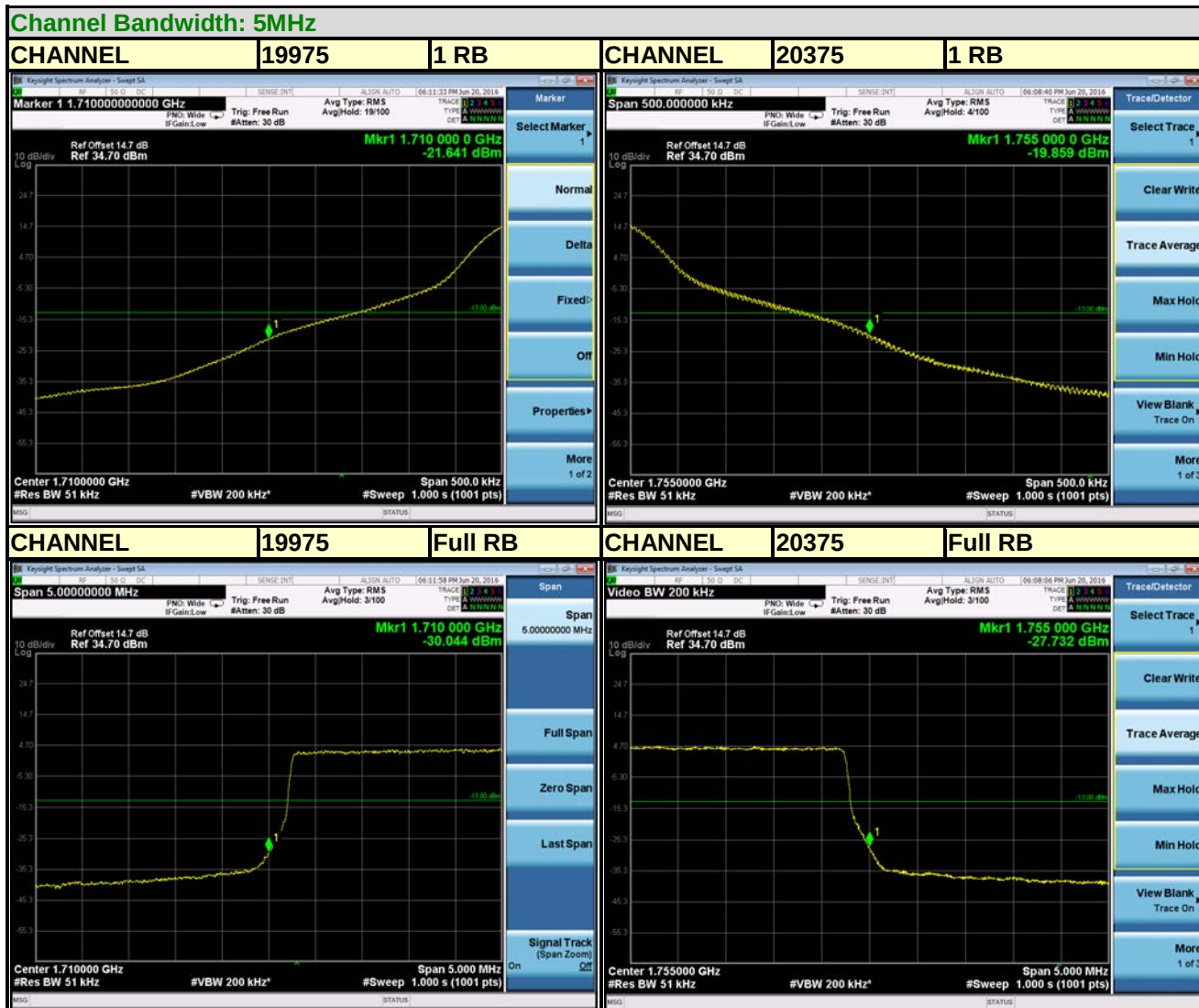


Test Report No.: RF160614W011-5

## LTE BAND 4



LTE BAND 4

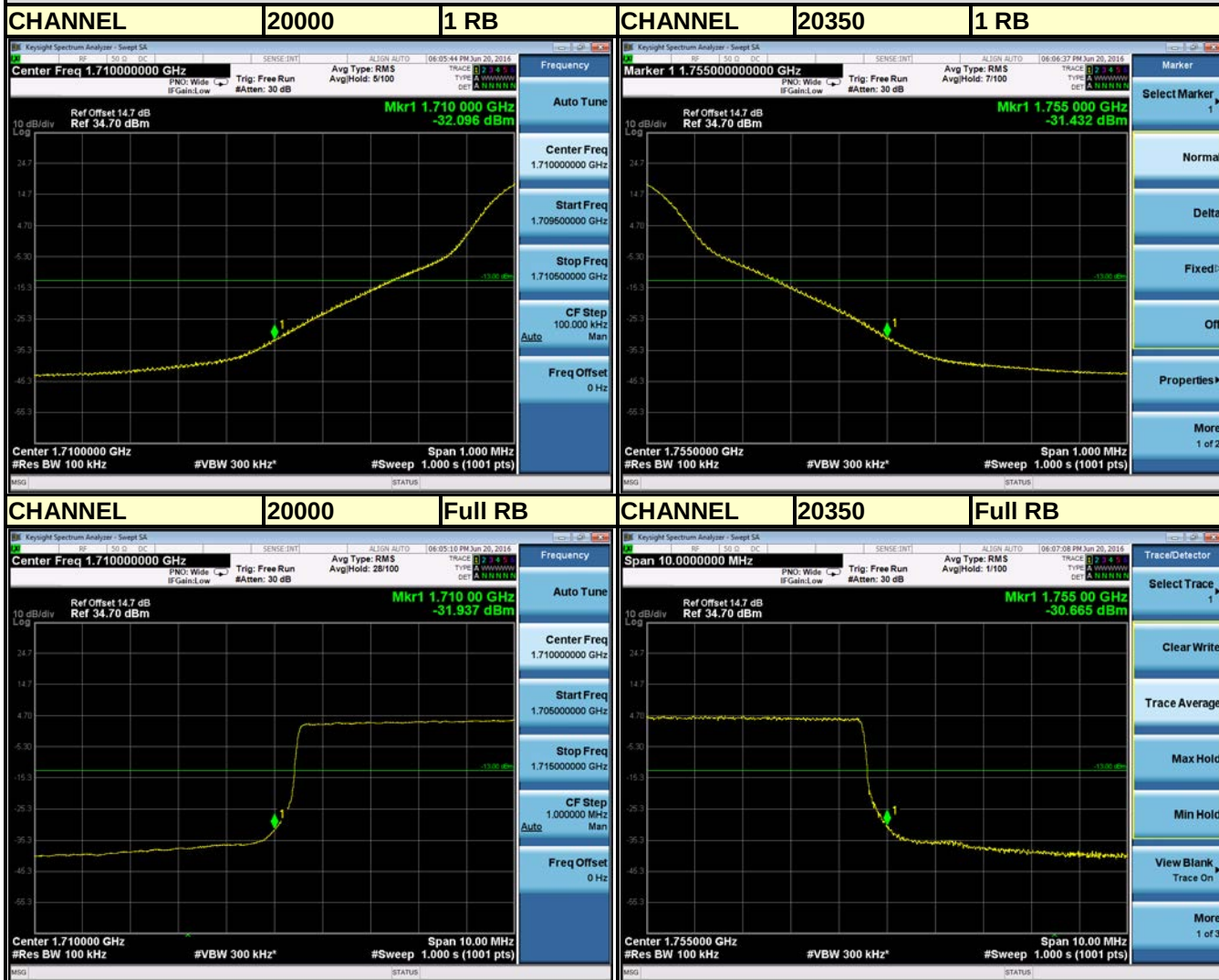




Test Report No.: RF160614W011-5

## LTE BAND 4

### Channel Bandwidth: 10MHz

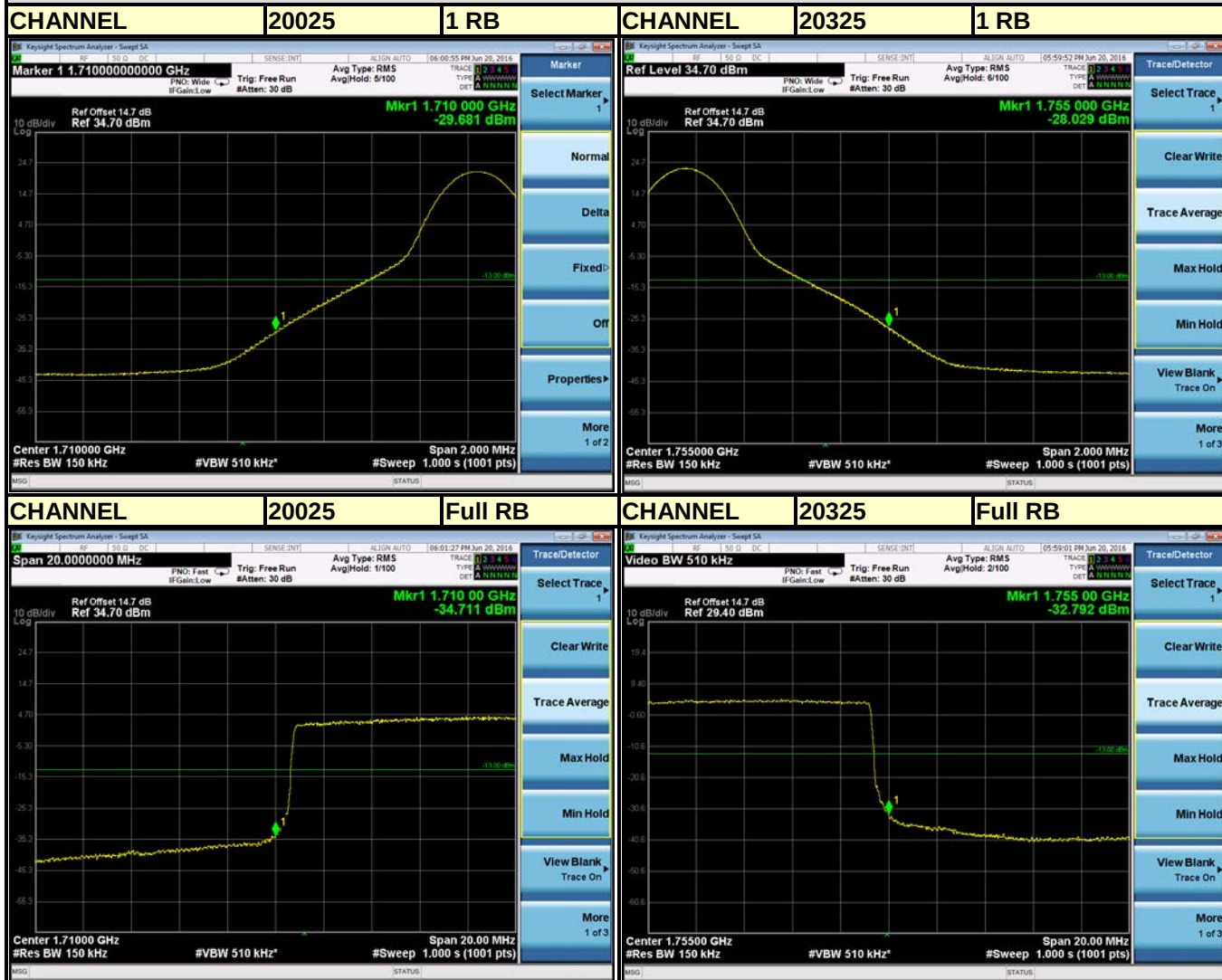




Test Report No.: RF160614W011-5

## LTE BAND 4

### Channel Bandwidth: 15MHz





Test Report No.: RF160614W011-5

## LTE BAND 4

### Channel Bandwidth: 20MHz

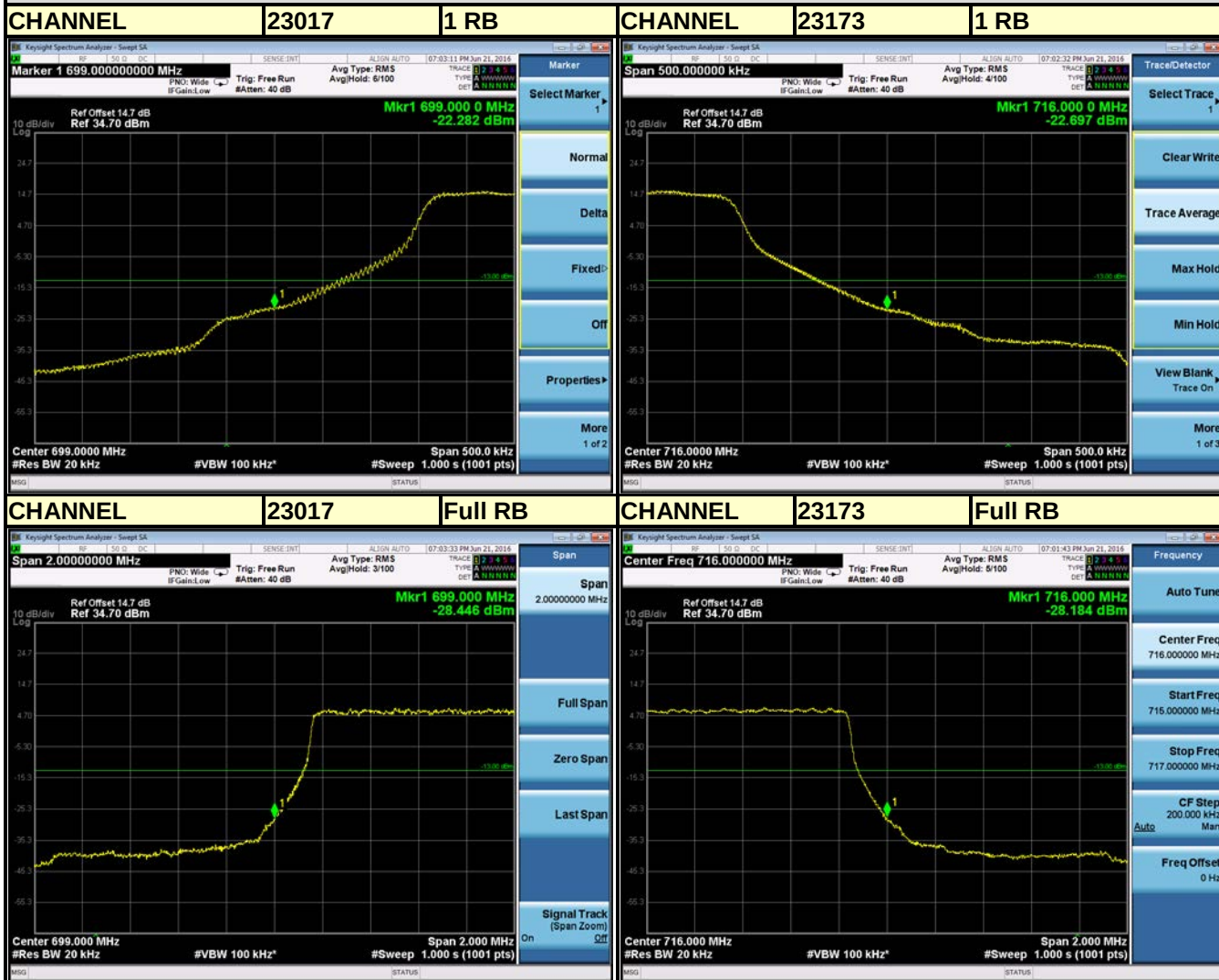




Test Report No.: RF160614W011-5

## LTE BAND 12

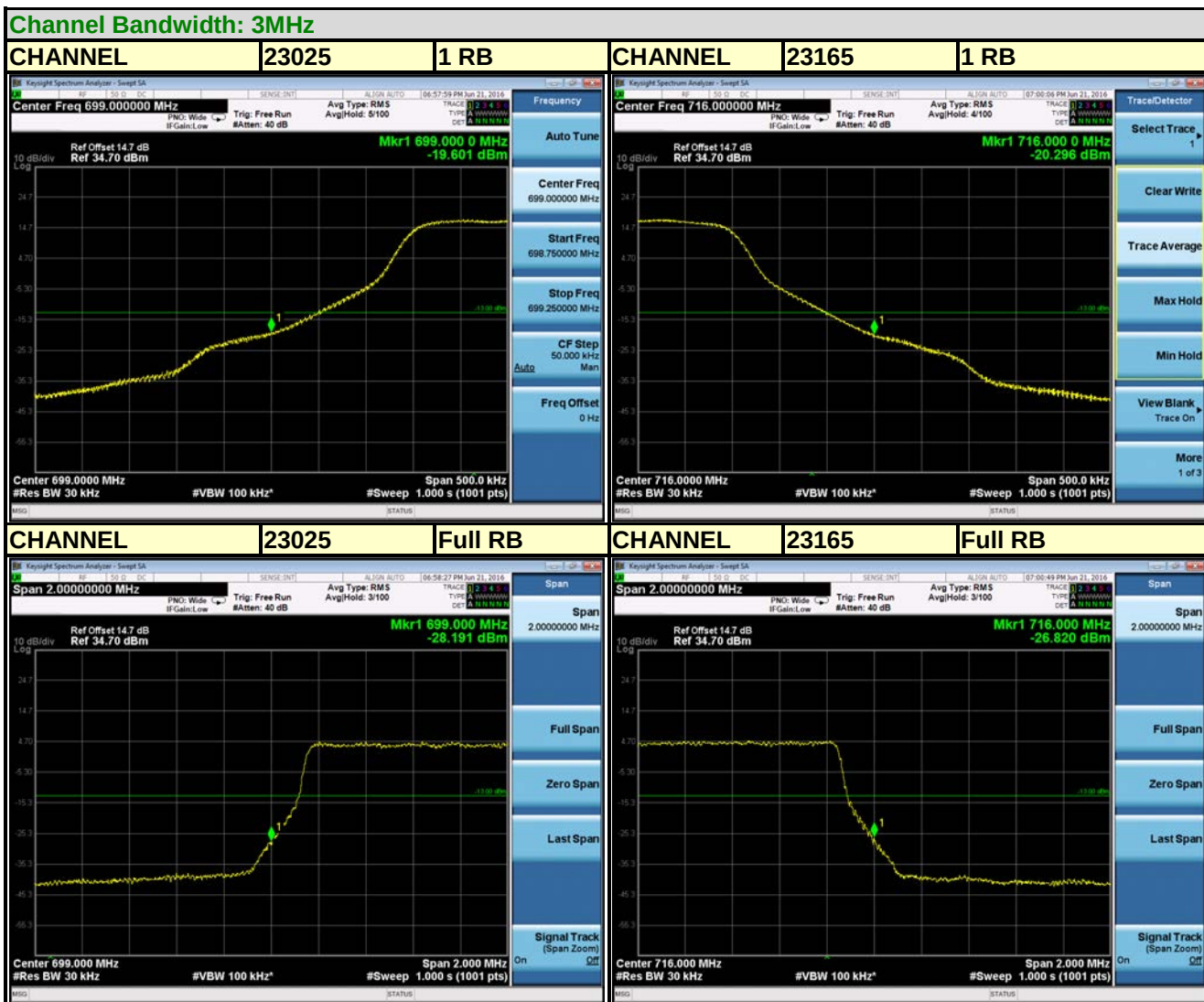
### Channel Bandwidth: 1.4MHz





Test Report No.: RF160614W011-5

## LTE BAND 12

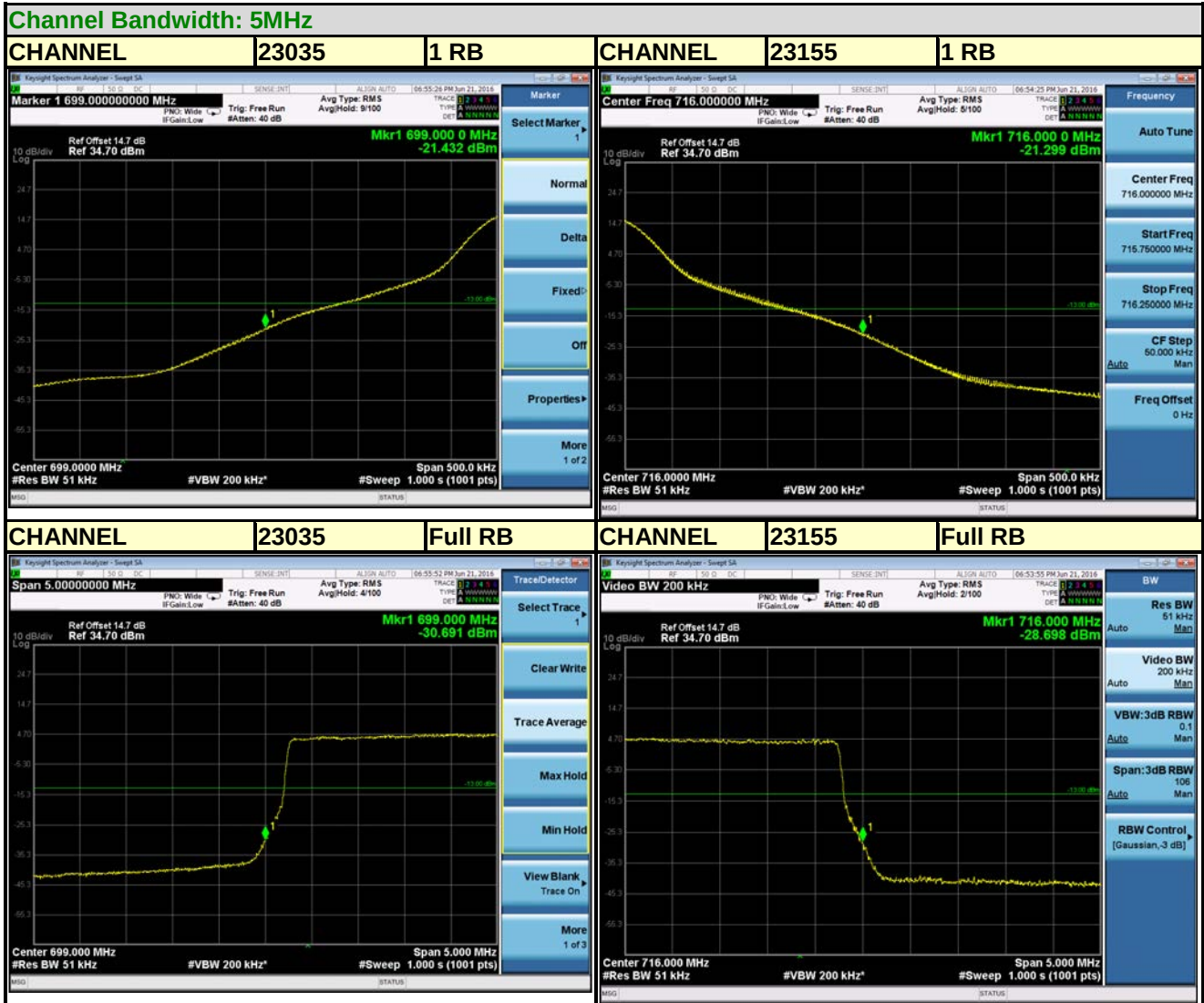




BUREAU  
VERITAS

Test Report No.: RF160614W011-5

## LTE BAND 12

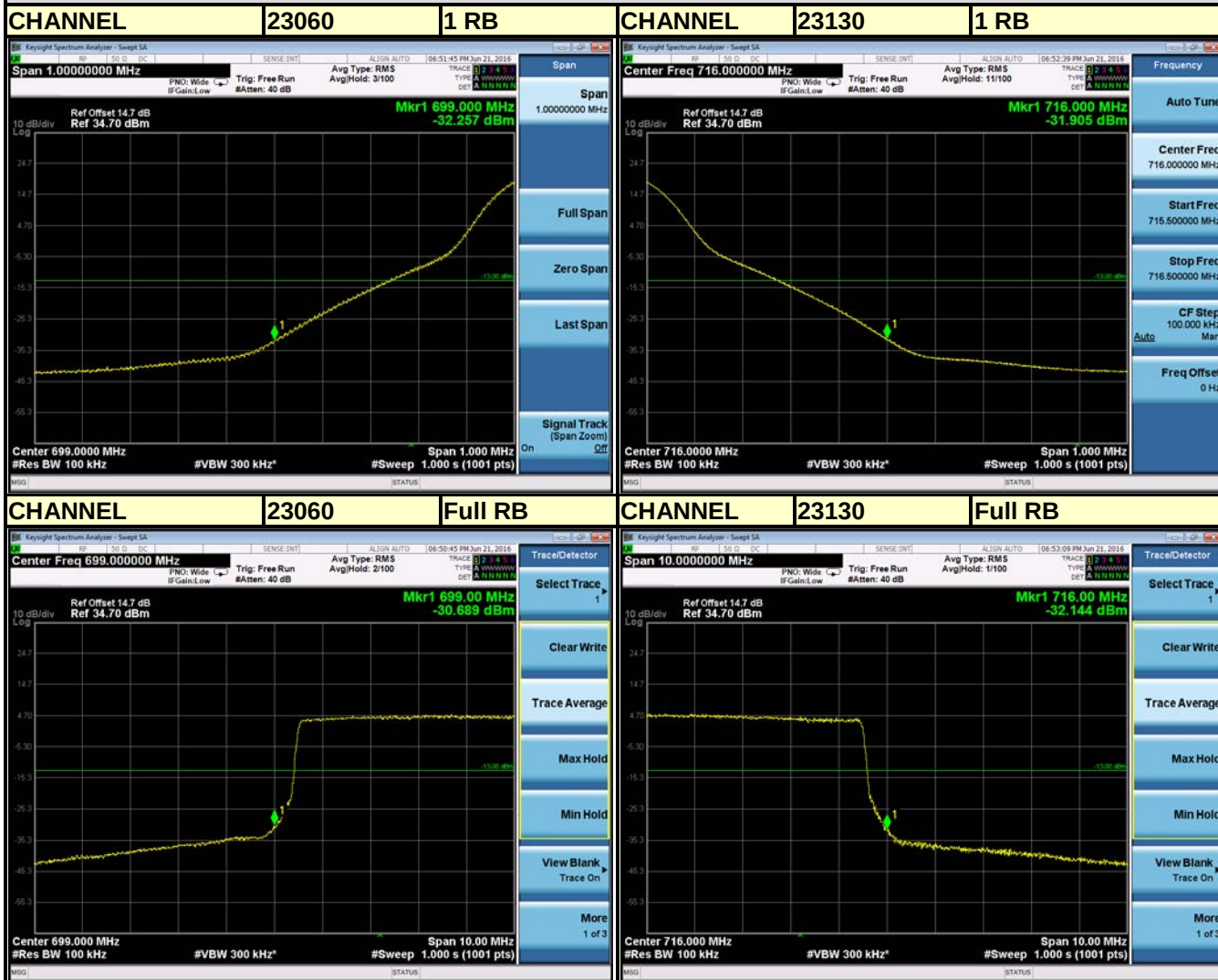




Test Report No.: RF160614W011-5

## LTE BAND 12

### Channel Bandwidth: 10MHz





Test Report No.: RF160614W011-5

## LTE BAND 17

### Channel Bandwidth: 5MHz





Test Report No.: RF160614W011-5

## LTE BAND 17

### Channel Bandwidth: 10MHz



## 4.6 CONDUCTED SPURIOUS EMISSIONS

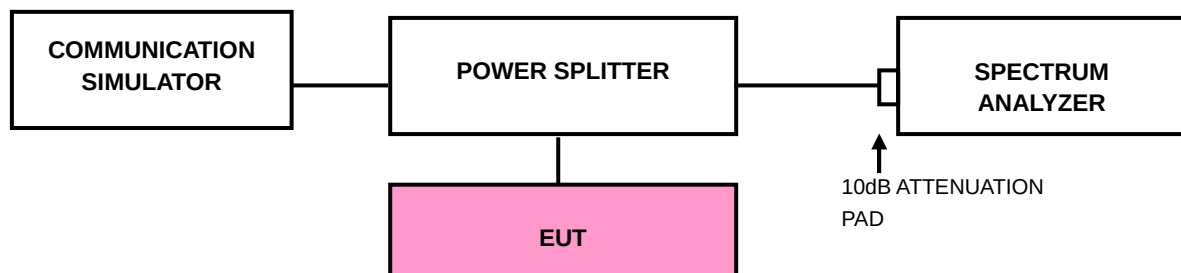
### 4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB. The limit of emission equal to  $-13\text{dBm}$

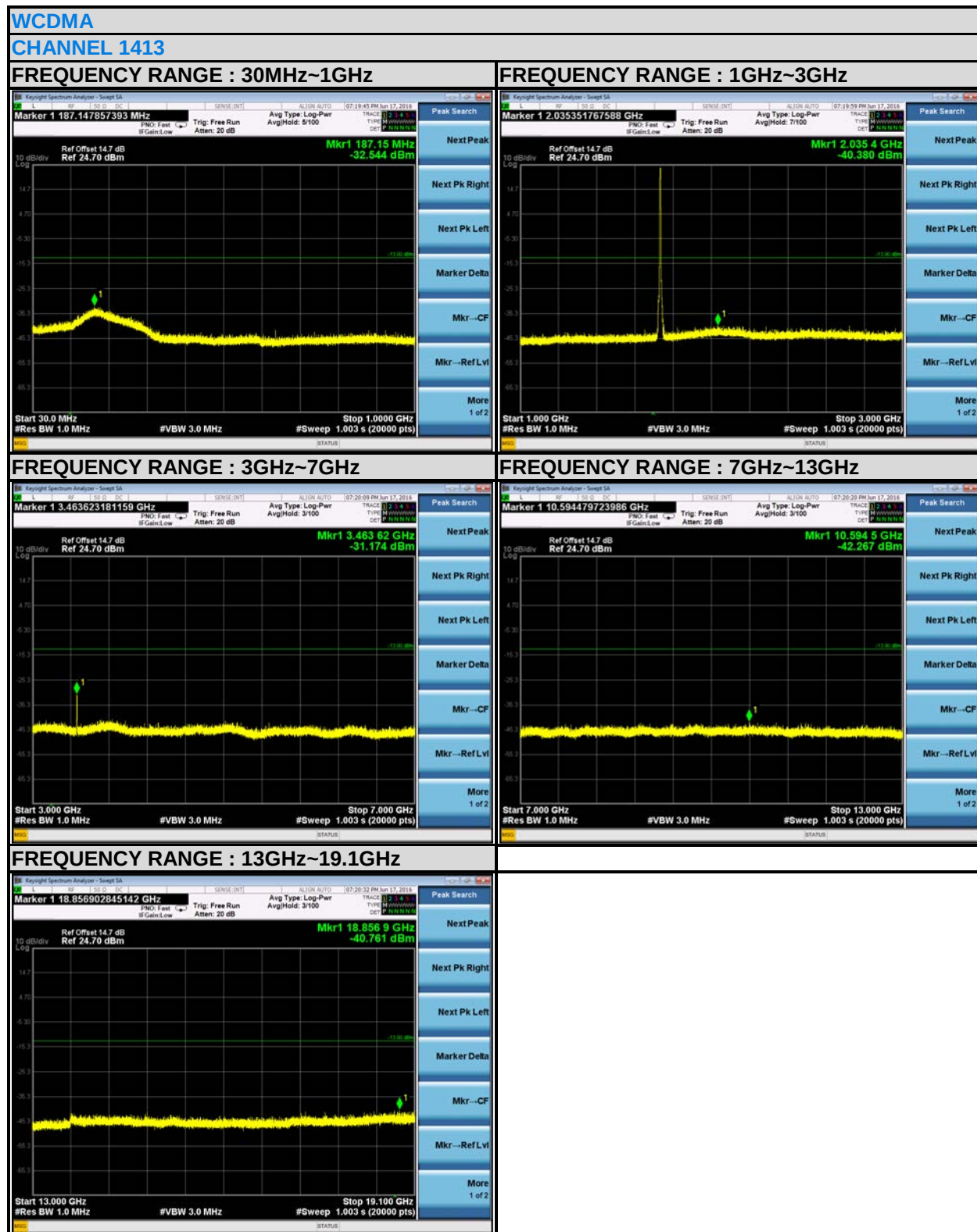
### 4.6.2 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. All measurements were done at middle operational frequency range.
- b. Measuring frequency range is from 30 MHz to 19.1GHz for LTE Band 4 and 30 MHz to 9GHz for LTE Band 12 & LTE Band 17. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

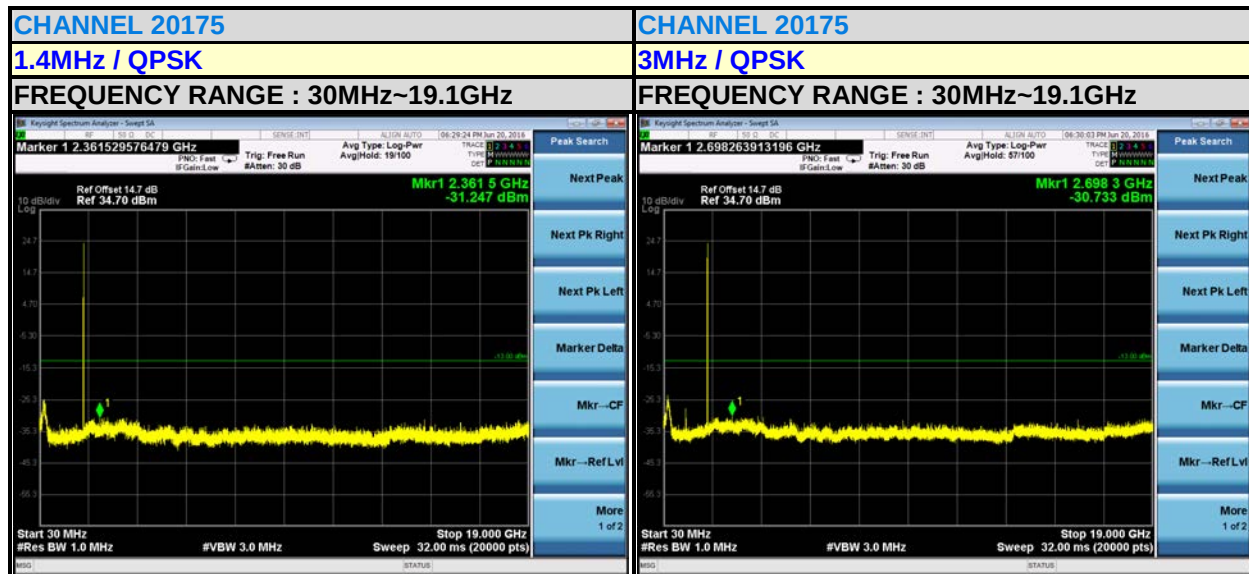
### 4.6.3 TEST SETUP



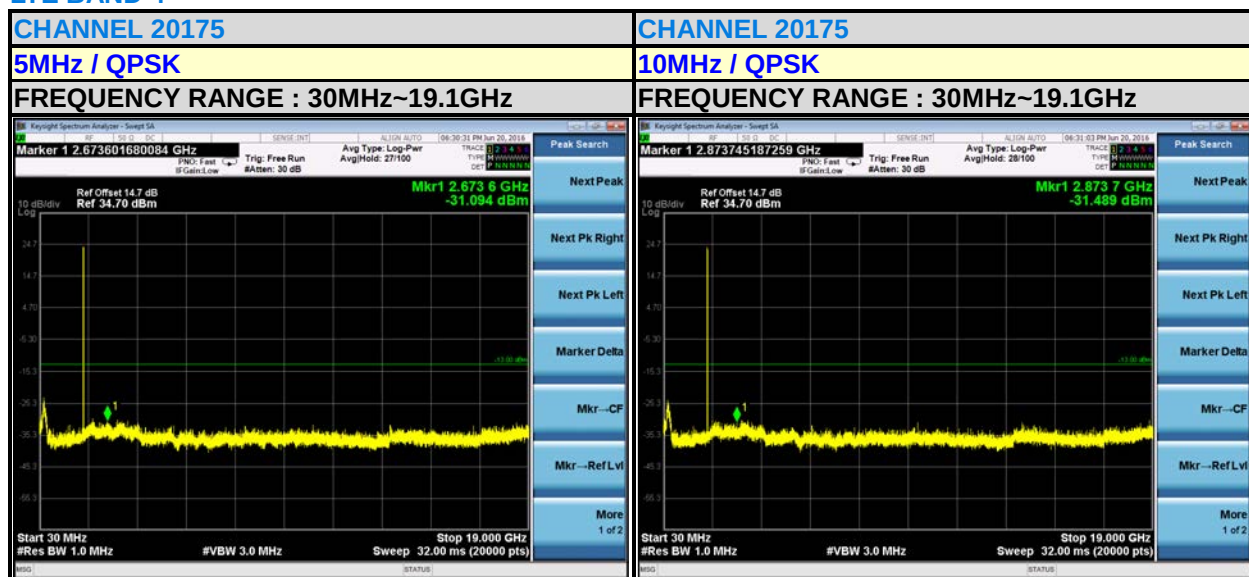
#### 4.6.4 TEST RESULTS



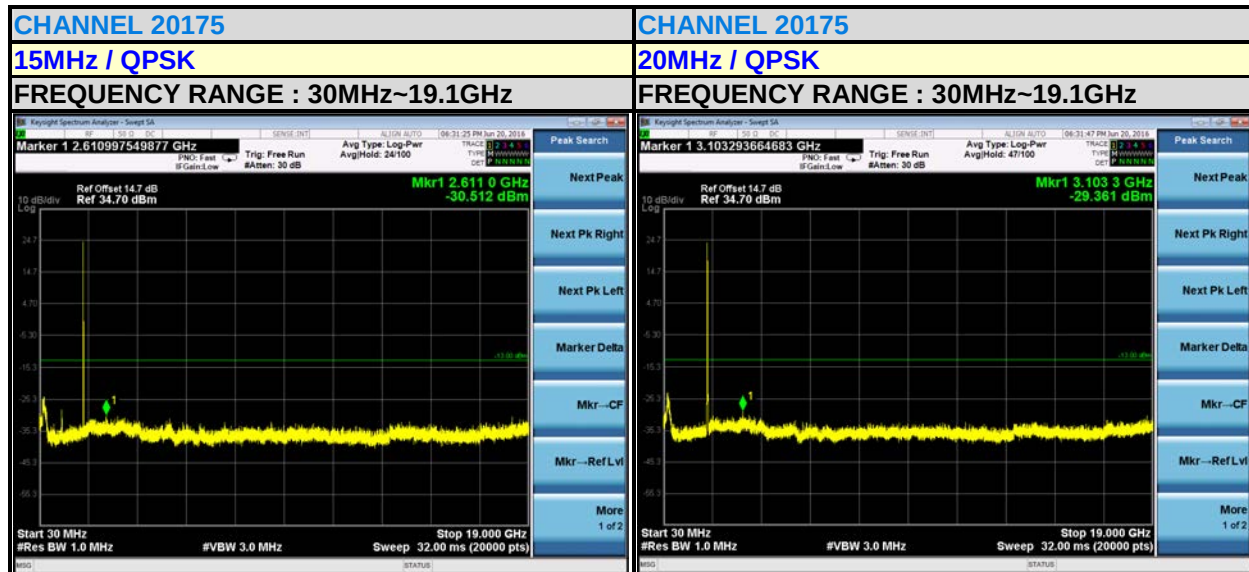
#### LTE BAND 4



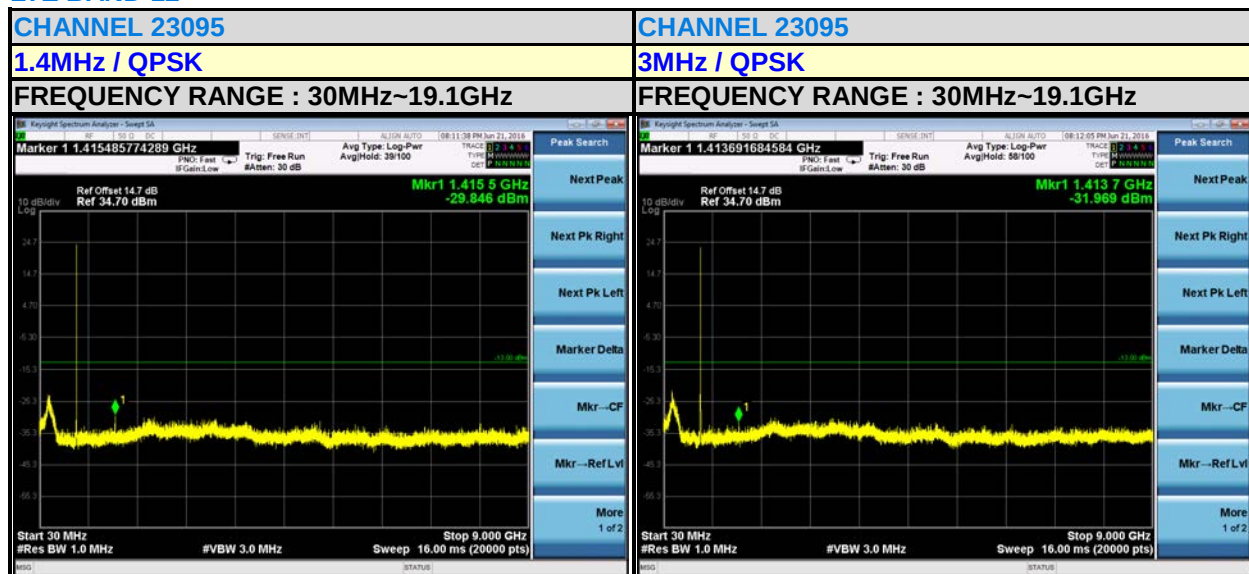
#### LTE BAND 4



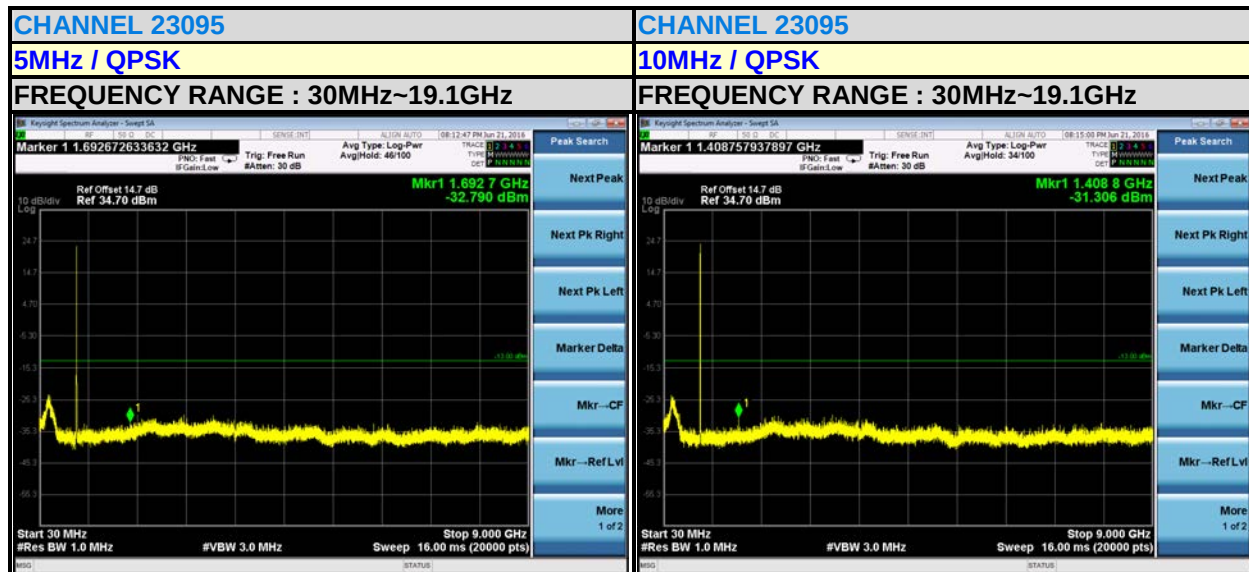
## LTE BAND 4



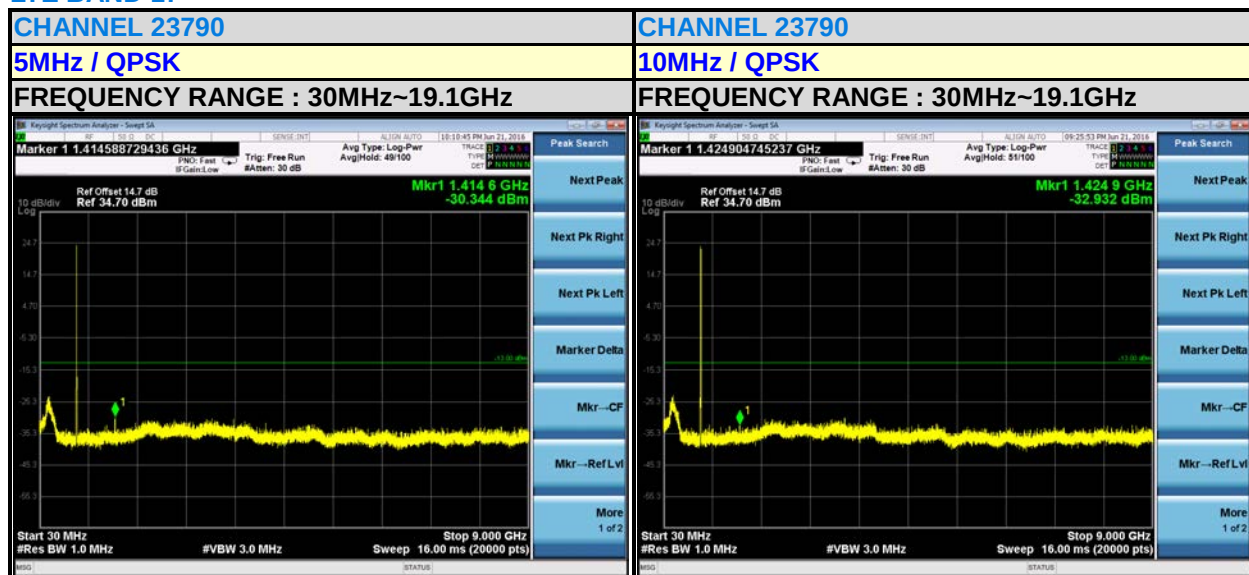
## LTE BAND 12



## LTE BAND 12



## LTE BAND 17



## 4.7 RADIATED EMISSION MEASUREMENT

### 4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB. The limit of emission equal to  $-13\text{dBm}$

### 4.7.2 TEST PROCEDURES

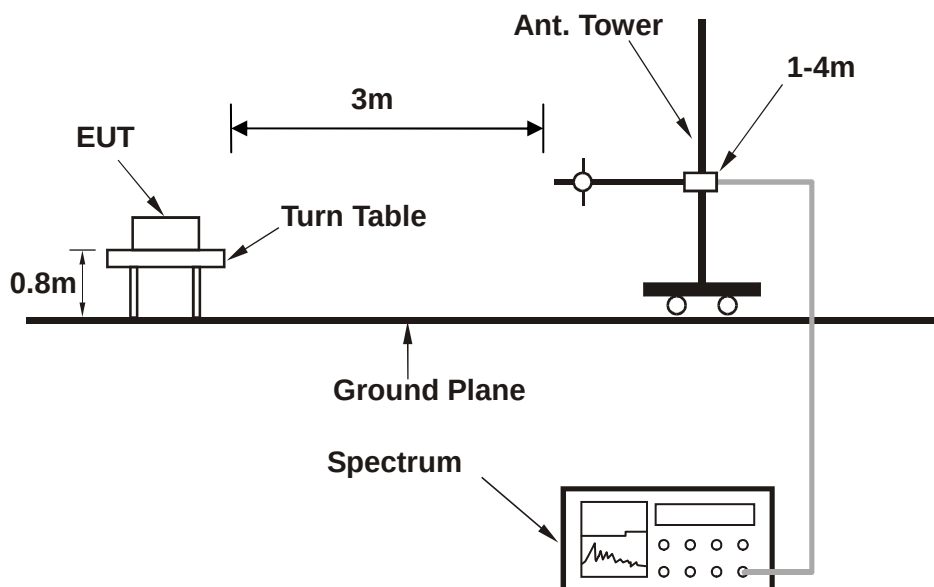
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G
- c.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}.$

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

### 4.7.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.7.4 TEST SETUP



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

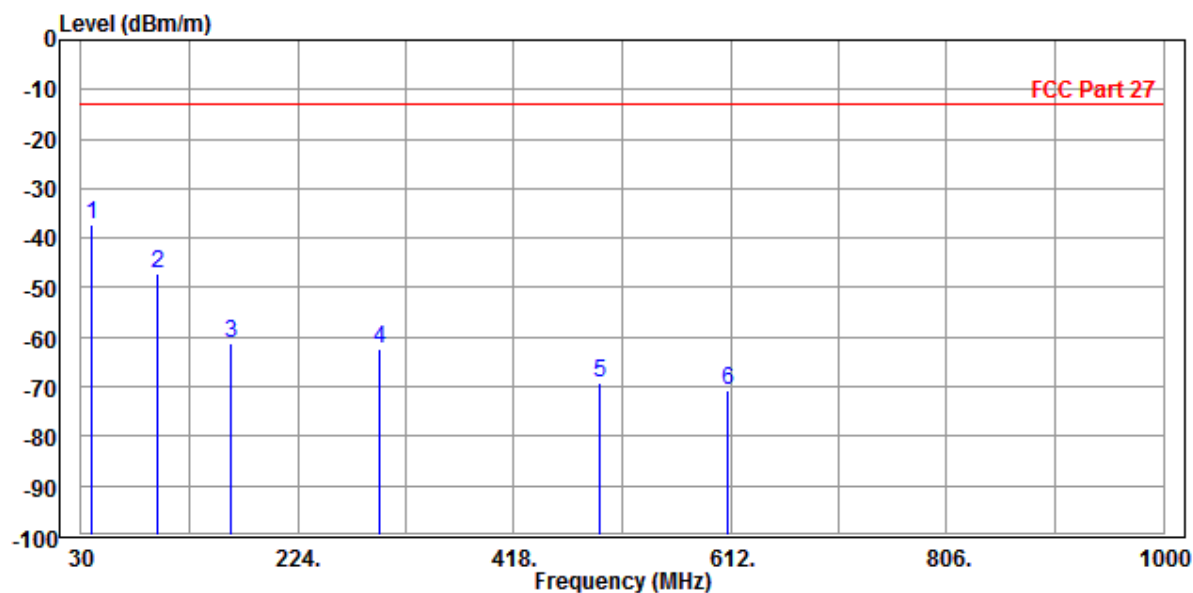
## 4.7.5 TEST RESULTS

### BELOW 1GHz WORST-CASE DATA

#### LTE Band 4:

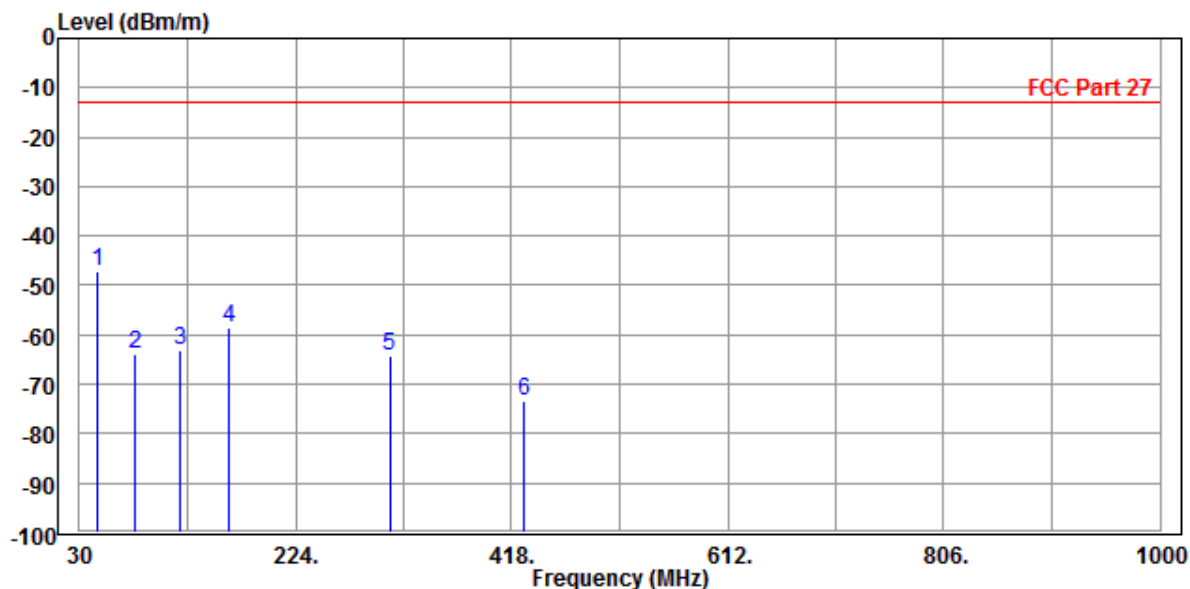
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Below 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|   |    | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|----|---------|--------|------------|------------|------------|--------|--------|
|   |    | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1 | PP | 39.700  | -37.11 | -49.19     | -13.00     | -24.11     | 12.08  | Peak   |
| 2 |    | 98.870  | -47.24 | -36.33     | -13.00     | -34.24     | -10.91 | Peak   |
| 3 |    | 164.830 | -61.31 | -43.01     | -13.00     | -48.31     | -18.30 | Peak   |
| 4 |    | 296.750 | -62.51 | -48.54     | -13.00     | -49.51     | -13.97 | Peak   |
| 5 |    | 494.630 | -69.12 | -58.73     | -13.00     | -56.12     | -10.39 | Peak   |
| 6 |    | 610.060 | -70.59 | -62.23     | -13.00     | -57.59     | -8.36  | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Below 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

|   |    | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|----|---------|--------|------------|------------|------------|--------|--------|
|   |    | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1 | PP | 46.490  | -47.30 | -53.64     | -13.00     | -34.30     | 6.34   | Peak   |
| 2 |    | 79.470  | -63.78 | -55.89     | -13.00     | -50.78     | -7.89  | Peak   |
| 3 |    | 120.210 | -63.20 | -47.85     | -13.00     | -50.20     | -15.35 | Peak   |
| 4 |    | 164.830 | -58.54 | -40.24     | -13.00     | -45.54     | -18.30 | Peak   |
| 5 |    | 308.390 | -64.11 | -50.58     | -13.00     | -51.11     | -13.53 | Peak   |
| 6 |    | 428.670 | -73.22 | -62.78     | -13.00     | -60.22     | -10.44 | Peak   |

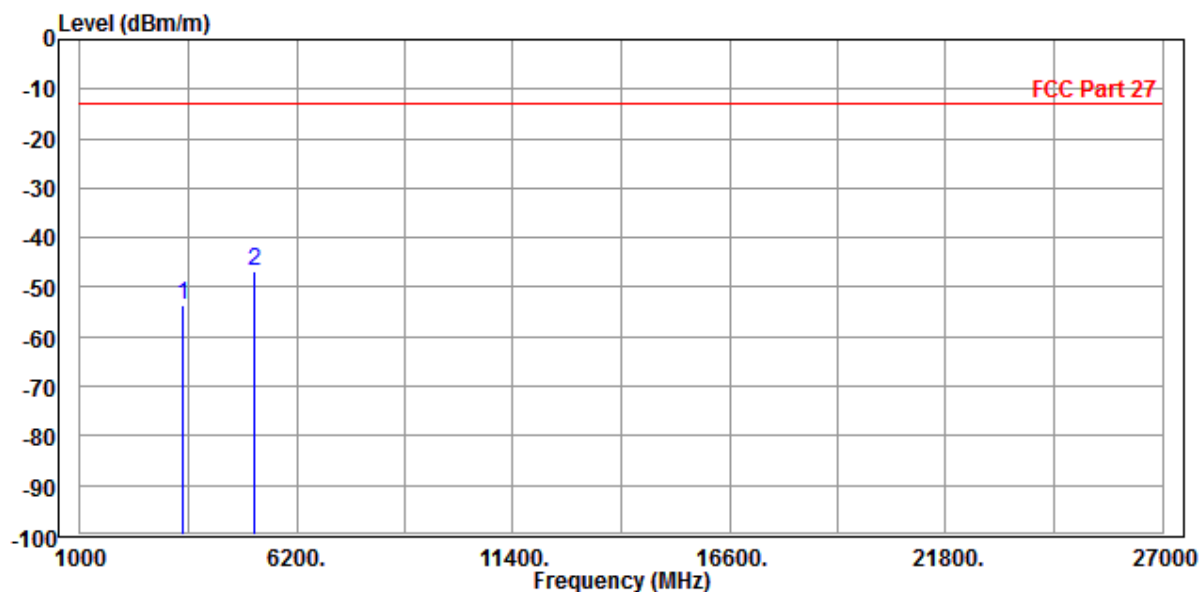


ABOVE 1GHz

WCDMA Band IV:

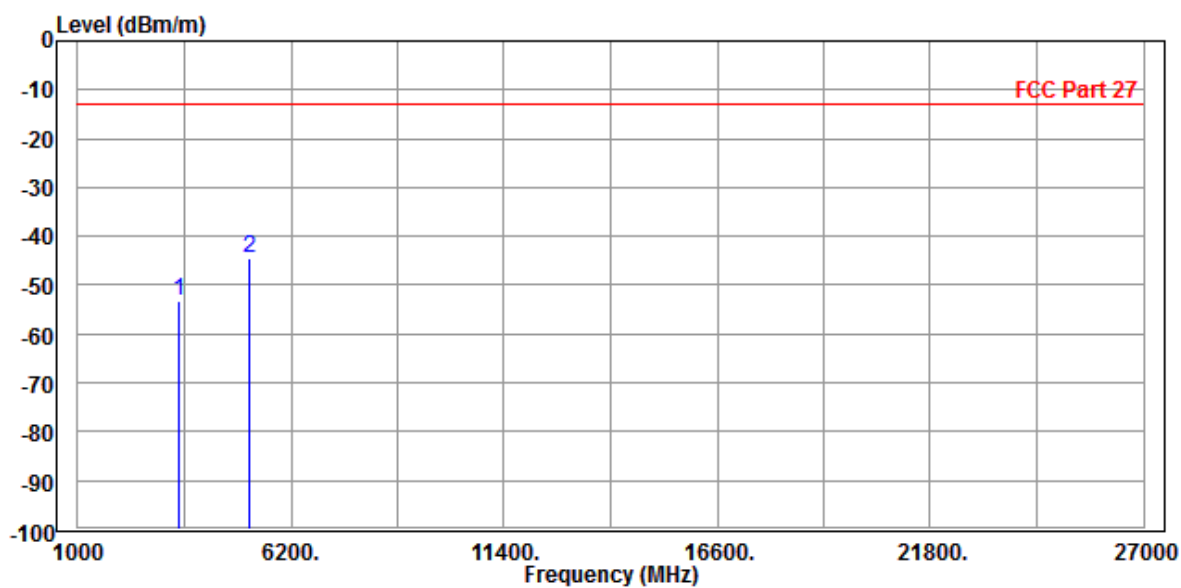
|                                                     |                 |                 |                    |
|-----------------------------------------------------|-----------------|-----------------|--------------------|
| MODE                                                | TX channel 1413 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen       |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                 |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -53.54 | -55.59     | -13.00     | -40.54     | 2.05   | Peak   |
| 2 PP | 5197.000 | -46.58 | -55.19     | -13.00     | -33.58     | 8.61   | Peak   |



|                                                   |                 |                 |                    |
|---------------------------------------------------|-----------------|-----------------|--------------------|
| MODE                                              | TX channel 1413 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen       |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                 |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -53.10 | -55.15     | -13.00     | -40.10     | 2.05   | Peak   |
| 2 PP | 5197.000 | -44.62 | -53.23     | -13.00     | -31.62     | 8.61   | Peak   |





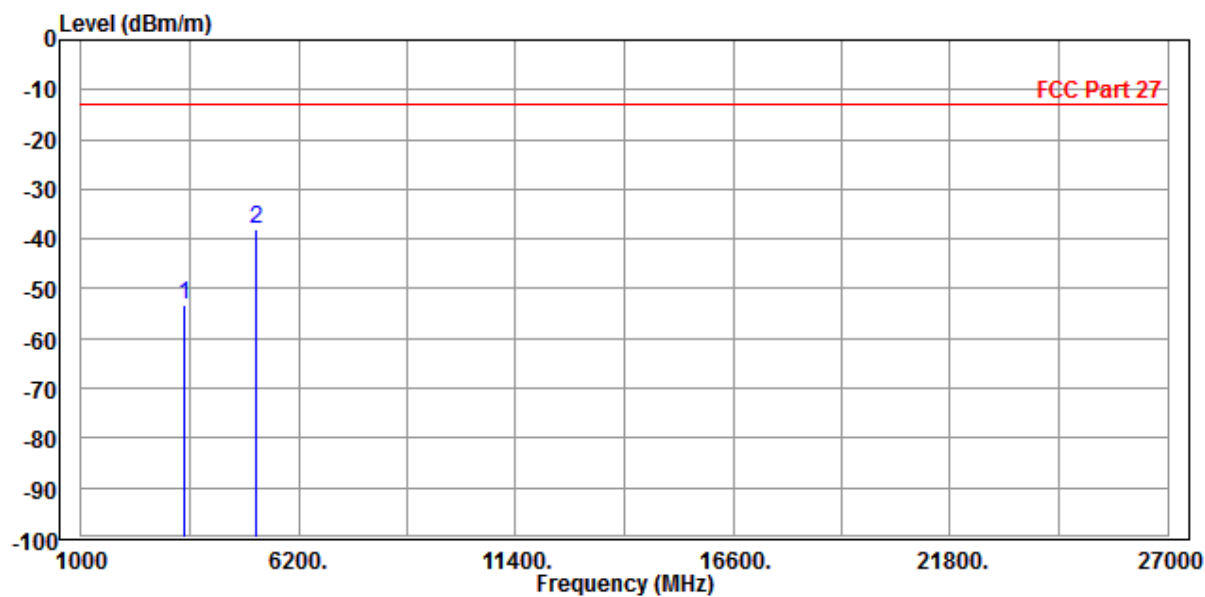
Test Report No.: RF160614W011-5

## LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz / QPSK

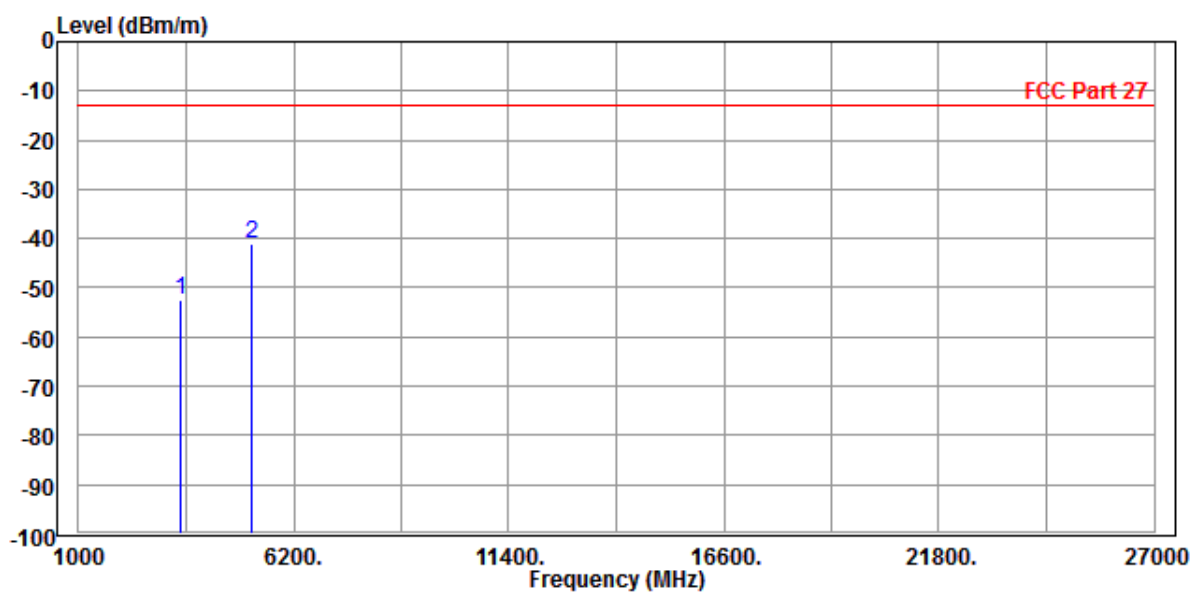
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -53.41 | -55.46     | -13.00     | -40.41     | 2.05   | Peak   |
| 2 PP | 5186.000 | -37.91 | -46.50     | -13.00     | -24.91     | 8.59   | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

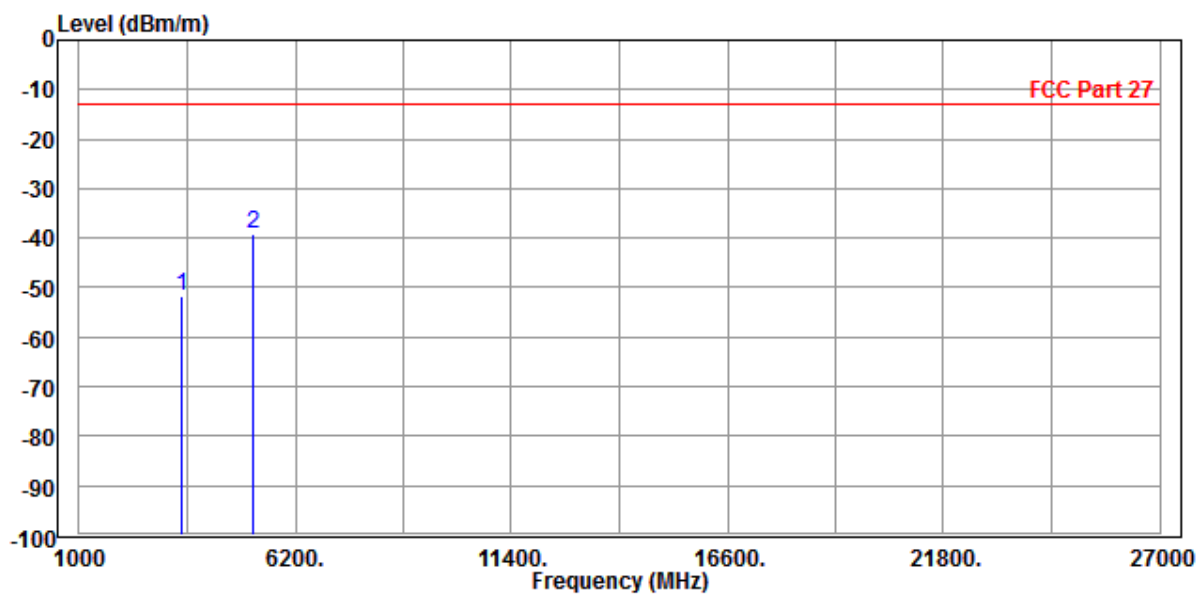
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -52.39 | -54.92     | -13.00     | -39.39     | 2.53   | Peak   |
| 2 PP | 5186.000 | -41.15 | -49.13     | -13.00     | -28.15     | 7.98   | Peak   |



**CHANNEL BANDWIDTH: 3MHz / QPSK**

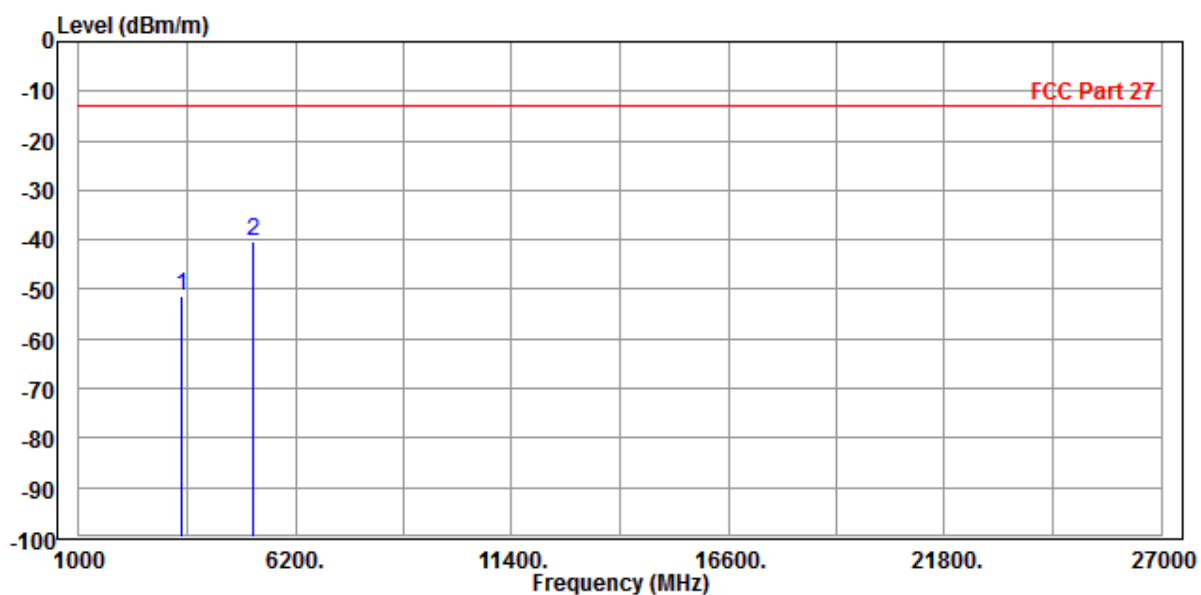
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -51.59 | -53.64     | -13.00     | -38.59     | 2.05   | Peak   |
| 2 PP | 5186.000 | -39.35 | -47.94     | -13.00     | -26.35     | 8.59   | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

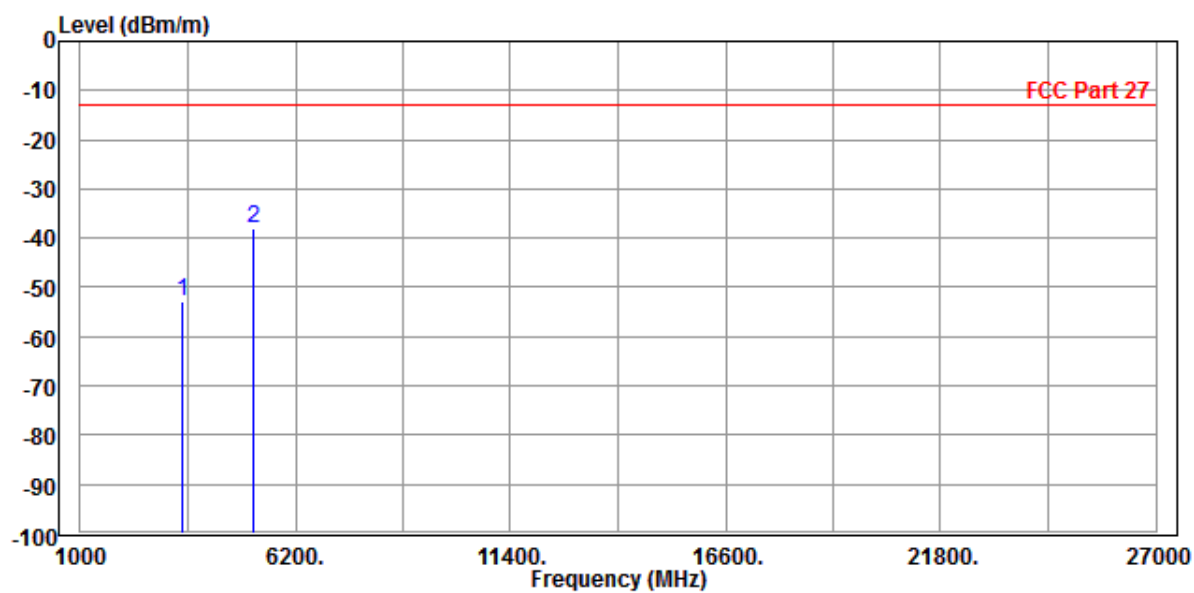
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -51.49 | -54.02     | -13.00     | -38.49     | 2.53   | Peak   |
| 2 PP | 5186.000 | -40.40 | -48.38     | -13.00     | -27.40     | 7.98   | Peak   |



**CHANNEL BANDWIDTH: 5MHz / QPSK**

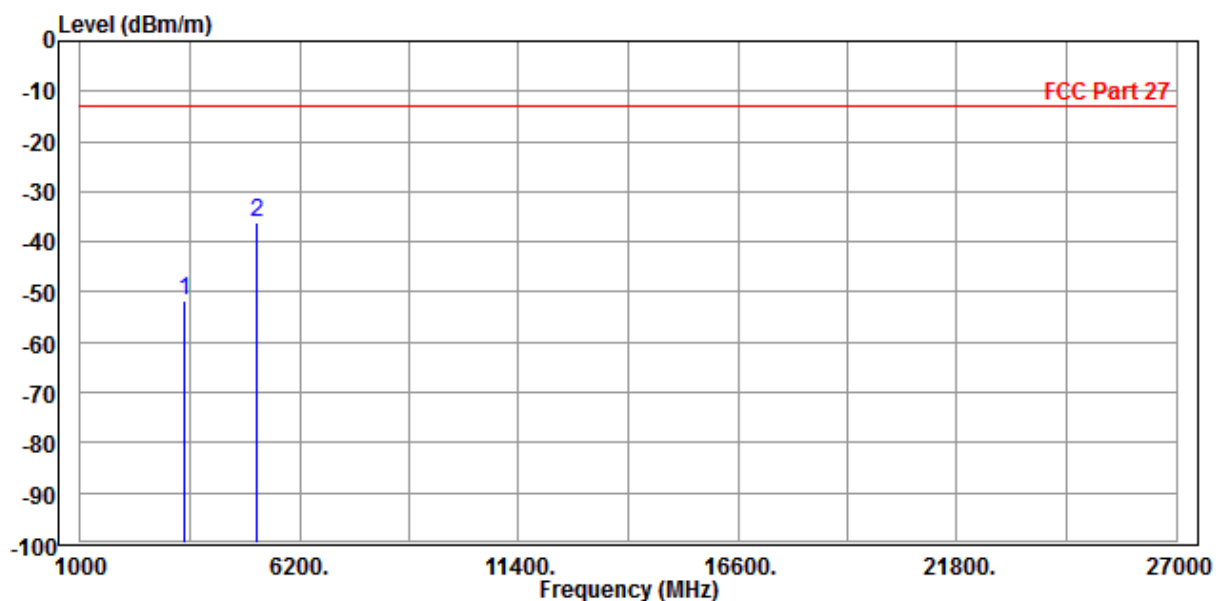
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -52.91 | -54.96     | -13.00     | -39.91     | 2.05   | Peak   |
| 2 PP | 5186.000 | -37.87 | -46.46     | -13.00     | -24.87     | 8.59   | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

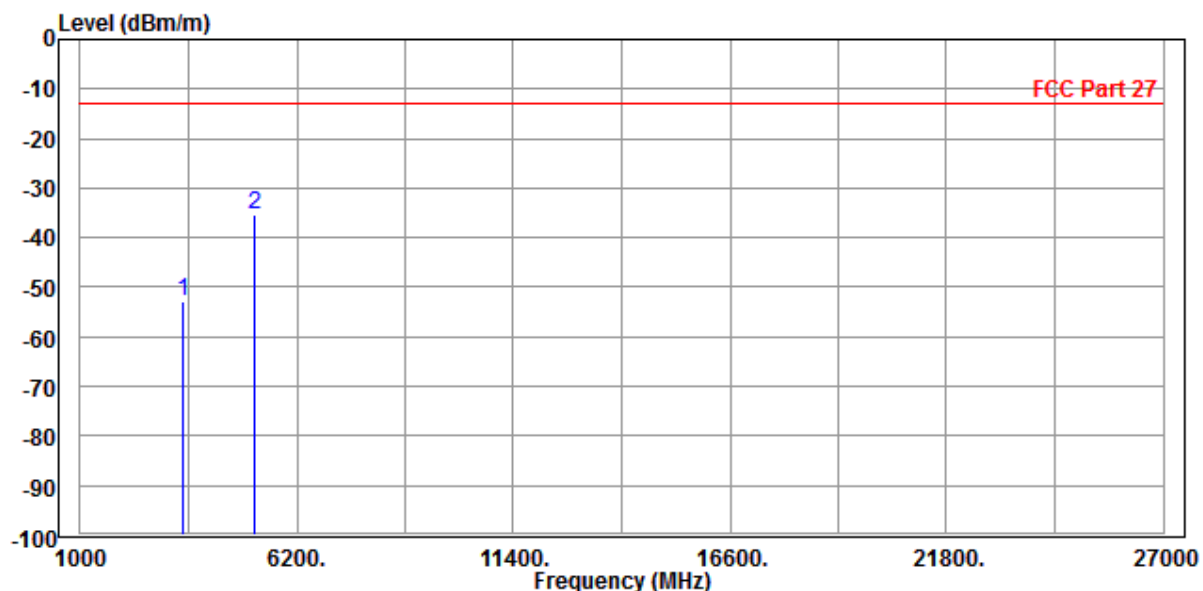
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -51.85 | -54.38     | -13.00     | -38.85     | 2.53   | Peak   |
| 2 PP | 5186.000 | -36.19 | -44.17     | -13.00     | -23.19     | 7.98   | Peak   |



**CHANNEL BANDWIDTH: 10MHz / QPSK**

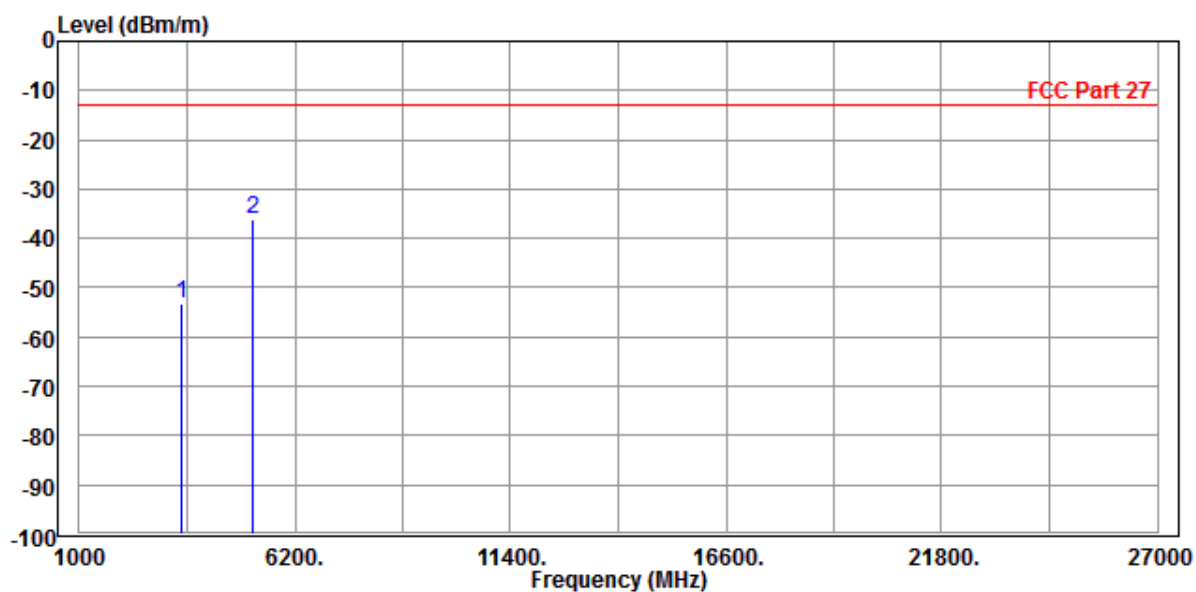
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -52.88 | -54.93     | -13.00     | -39.88     | 2.05   | Peak   |
| 2 PP | 5186.000 | -35.50 | -44.09     | -13.00     | -22.50     | 8.59   | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

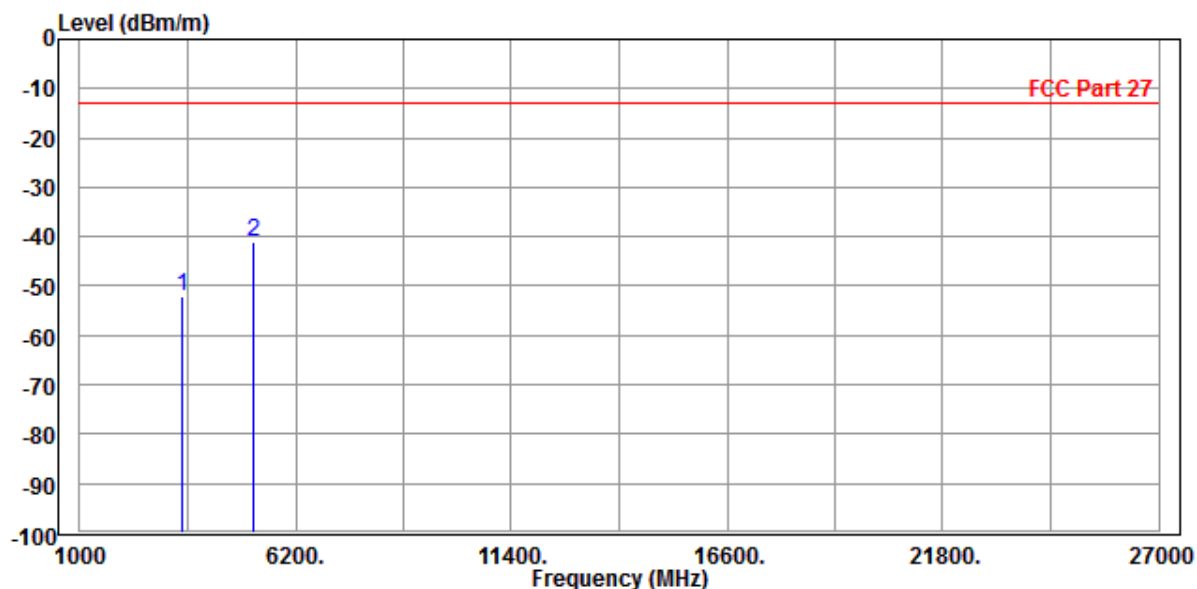
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -53.14 | -55.67     | -13.00     | -40.14     | 2.53   | Peak   |
| 2 PP | 5186.000 | -36.23 | -44.21     | -13.00     | -23.23     | 7.98   | Peak   |



**CHANNEL BANDWIDTH: 15MHz / QPSK**

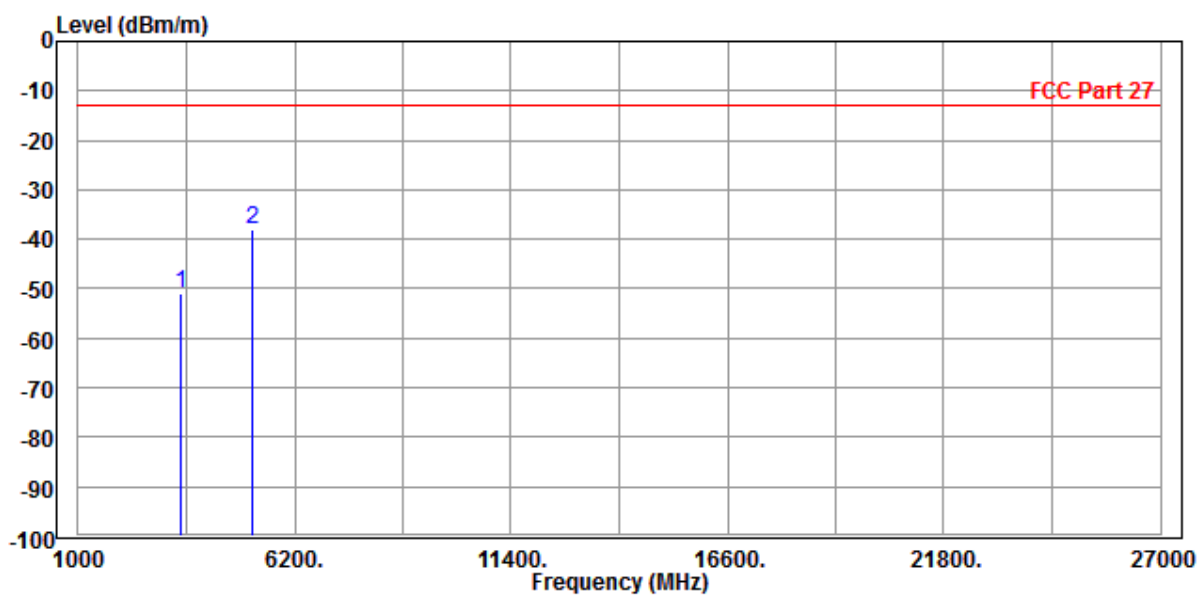
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -51.97 | -54.02     | -13.00     | -38.97     | 2.05   | Peak   |
| 2 PP | 5186.000 | -41.21 | -49.80     | -13.00     | -28.21     | 8.59   | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

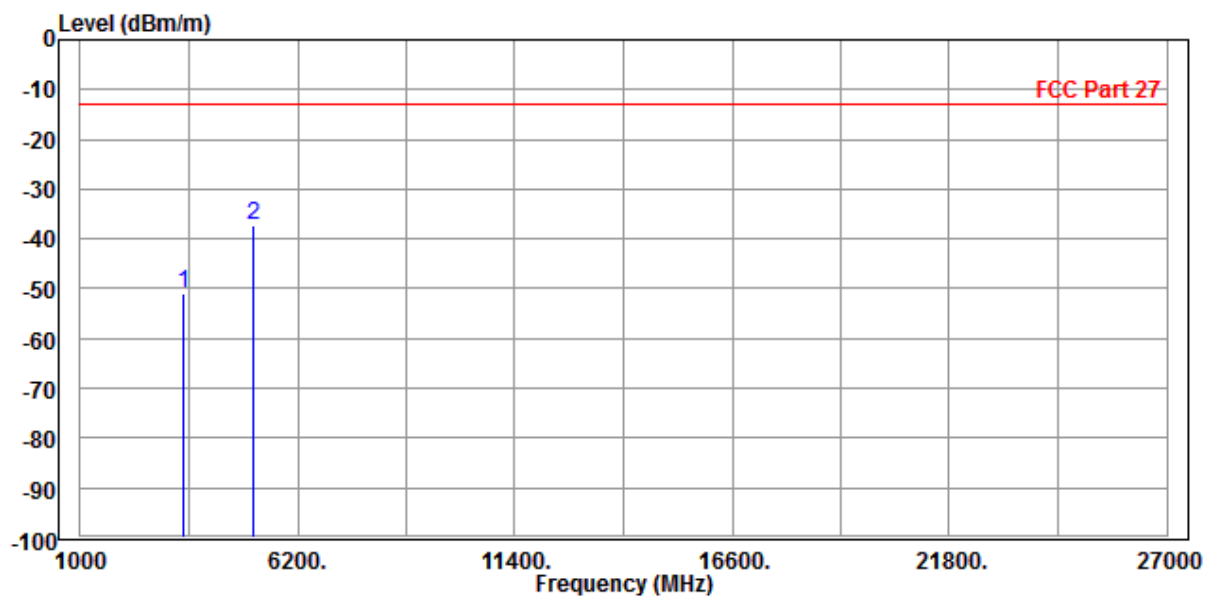
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -50.85 | -53.38     | -13.00     | -37.85     | 2.53   | Peak   |
| 2 PP | 5186.000 | -37.90 | -45.88     | -13.00     | -24.90     | 7.98   | Peak   |



**CHANNEL BANDWIDTH: 20MHz / QPSK**

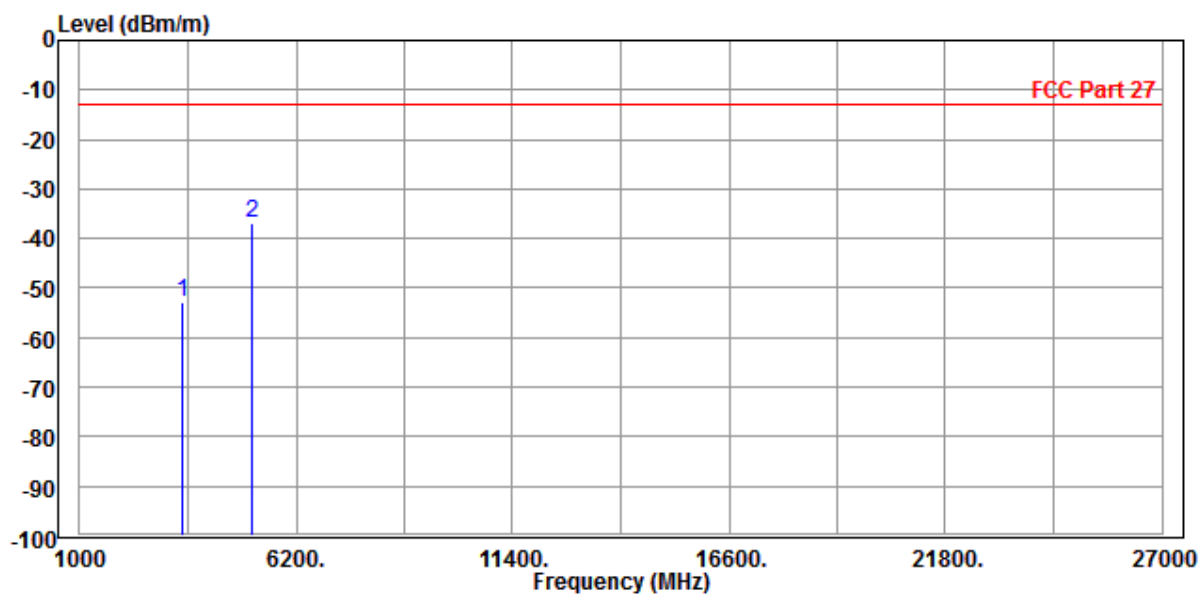
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      |          |        | Read   | Limit  | Over   |        |        |
|------|----------|--------|--------|--------|--------|--------|--------|
|      | Freq     | Level  | Level  | Line   | Limit  | Factor | Remark |
|      | MHz      | dBm/m  | dBm    | dBm/m  | dB     | dB/m   |        |
| 1    | 3470.000 | -51.07 | -53.12 | -13.00 | -38.07 | 2.05   | Peak   |
| 2 PP | 5160.000 | -37.26 | -45.82 | -13.00 | -24.26 | 8.56   | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 3470.000 | -52.77 | -55.30     | -13.00     | -39.77     | 2.53   | Peak   |
| 2 PP | 5160.000 | -36.78 | -44.76     | -13.00     | -23.78     | 7.98   | Peak   |





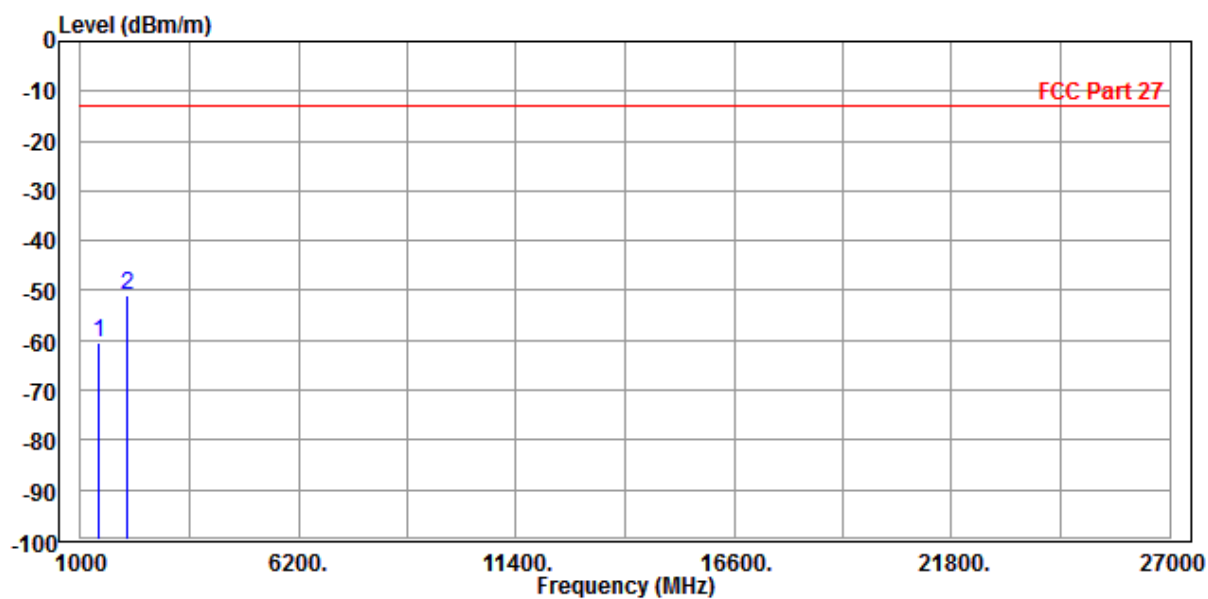
Test Report No.: RF160614W011-5

## LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK

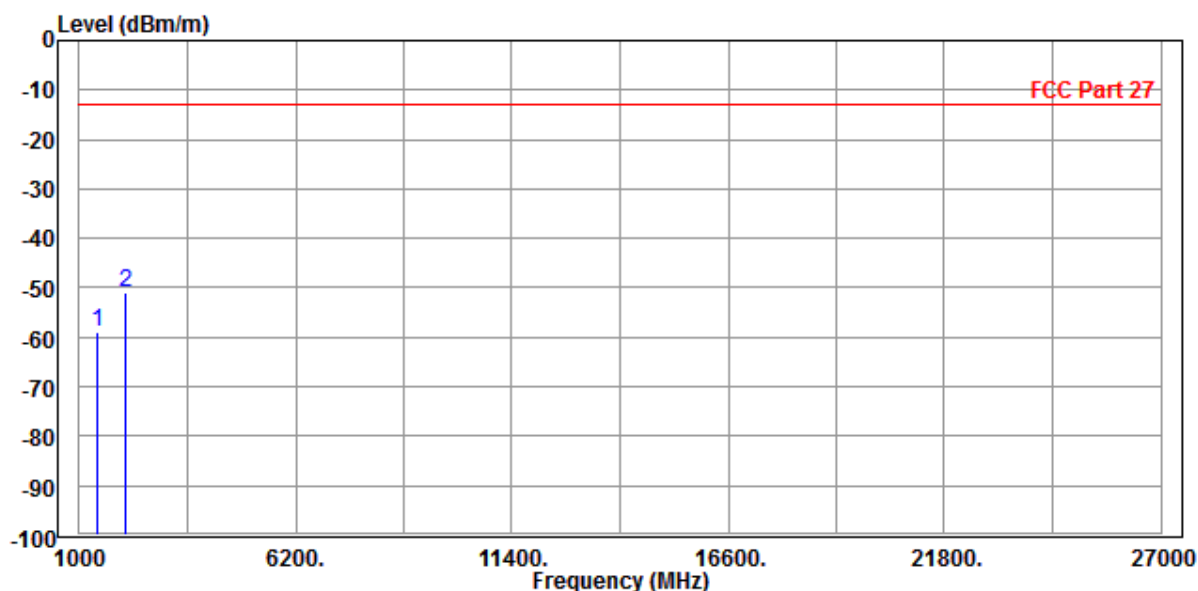
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1415.000 | -60.27 | -53.55     | -13.00     | -47.27     | -6.72  | Peak   |
| 2 PP | 2118.000 | -51.03 | -49.09     | -13.00     | -38.03     | -1.94  | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1415.000 | -59.11 | -53.66     | -13.00     | -46.11     | -5.45  | Peak   |
| 2 PP | 2118.000 | -50.87 | -50.63     | -13.00     | -37.87     | -0.24  | Peak   |



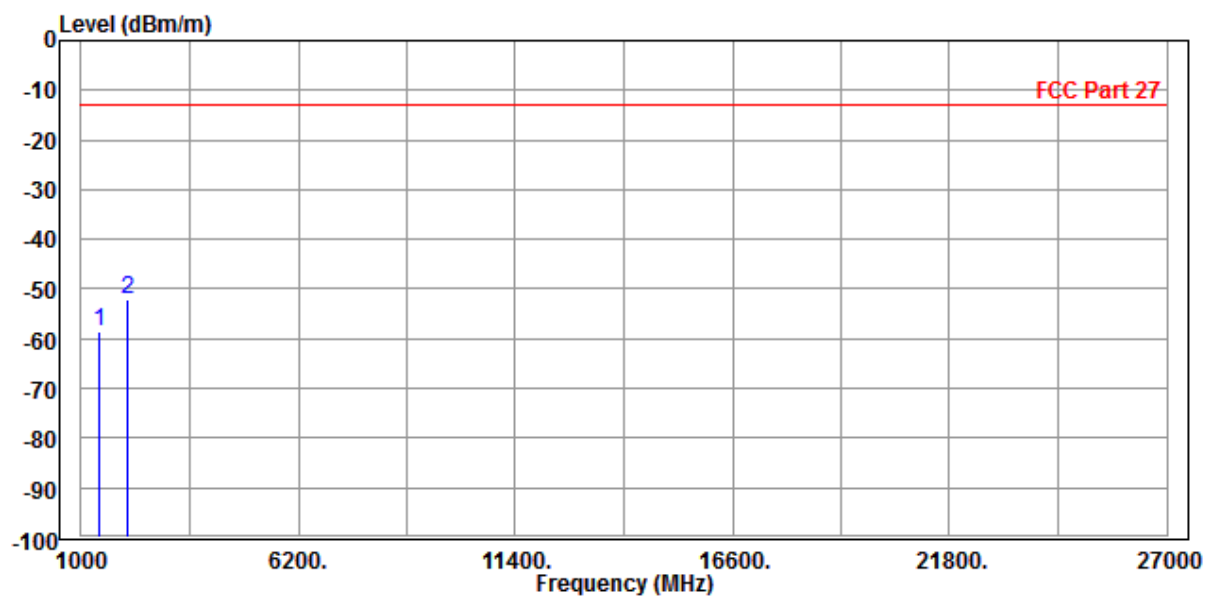


Test Report No.: RF160614W011-5

CHANNEL BANDWIDTH: 3MHz / QPSK

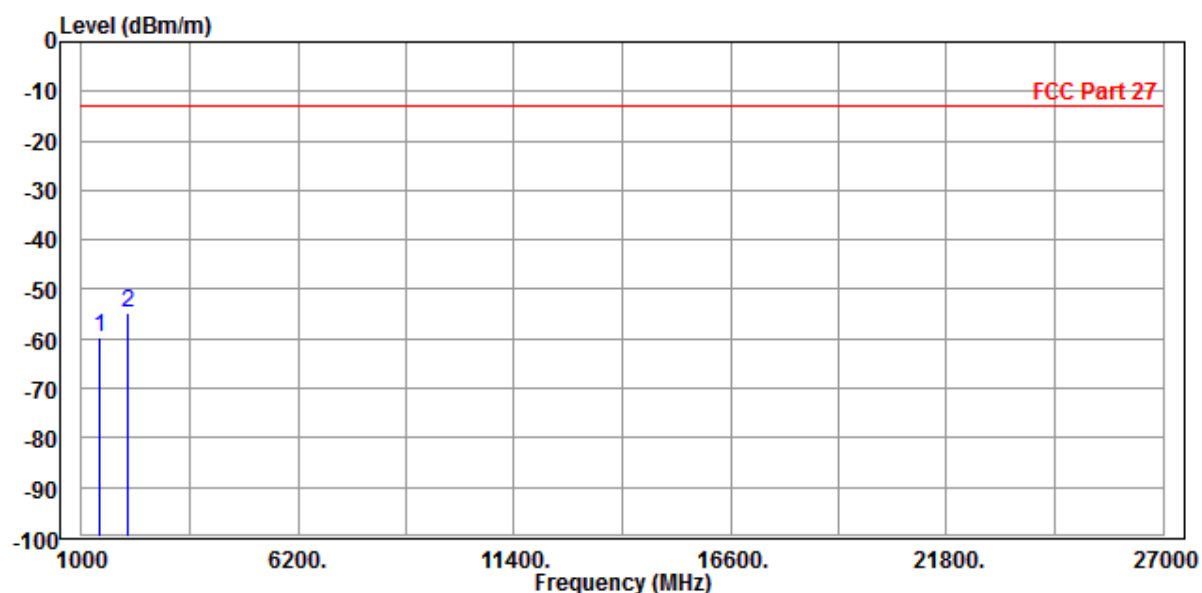
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1415.000 | -58.58 | -51.86     | -13.00     | -45.58     | -6.72  | Peak   |
| 2 PP | 2118.000 | -51.92 | -49.98     | -13.00     | -38.92     | -1.94  | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

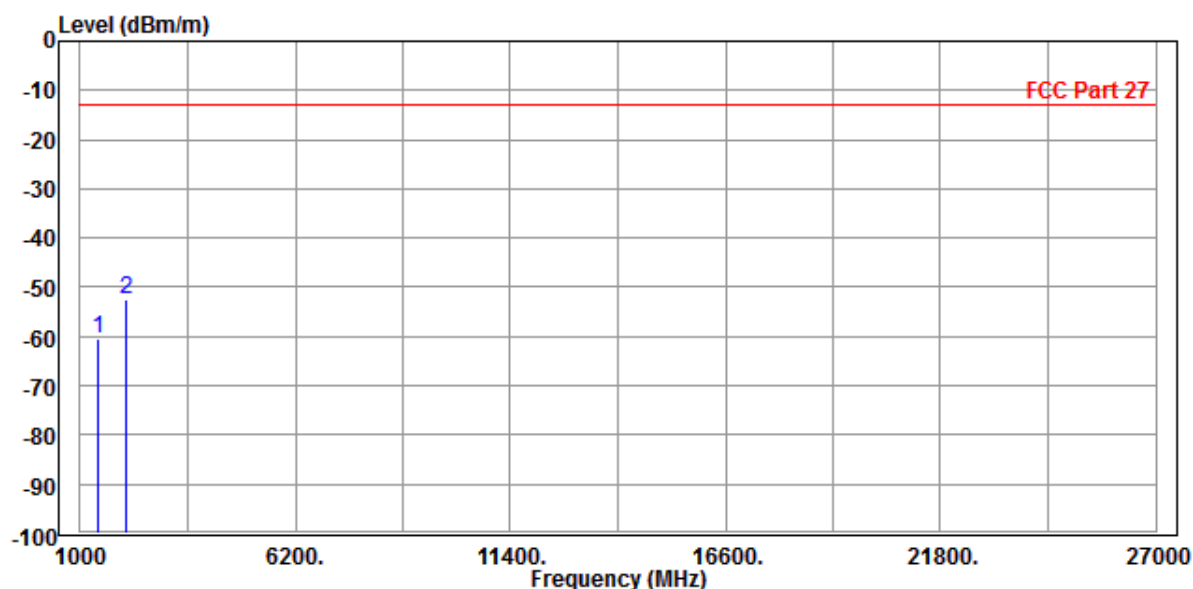
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1416.000 | -59.65 | -54.21     | -13.00     | -46.65     | -5.44  | Peak   |
| 2 PP | 2118.000 | -54.89 | -54.65     | -13.00     | -41.89     | -0.24  | Peak   |



**CHANNEL BANDWIDTH: 5MHz / QPSK**

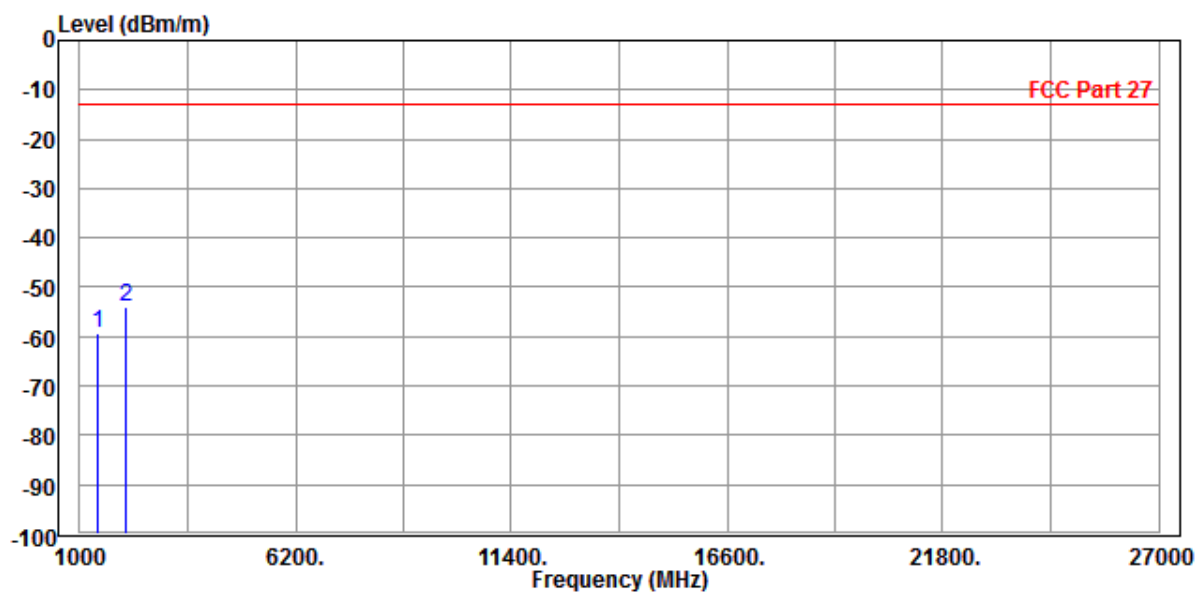
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1415.000 | -60.59 | -53.87     | -13.00     | -47.59     | -6.72  | Peak   |
| 2 PP | 2118.000 | -52.37 | -50.43     | -13.00     | -39.37     | -1.94  | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

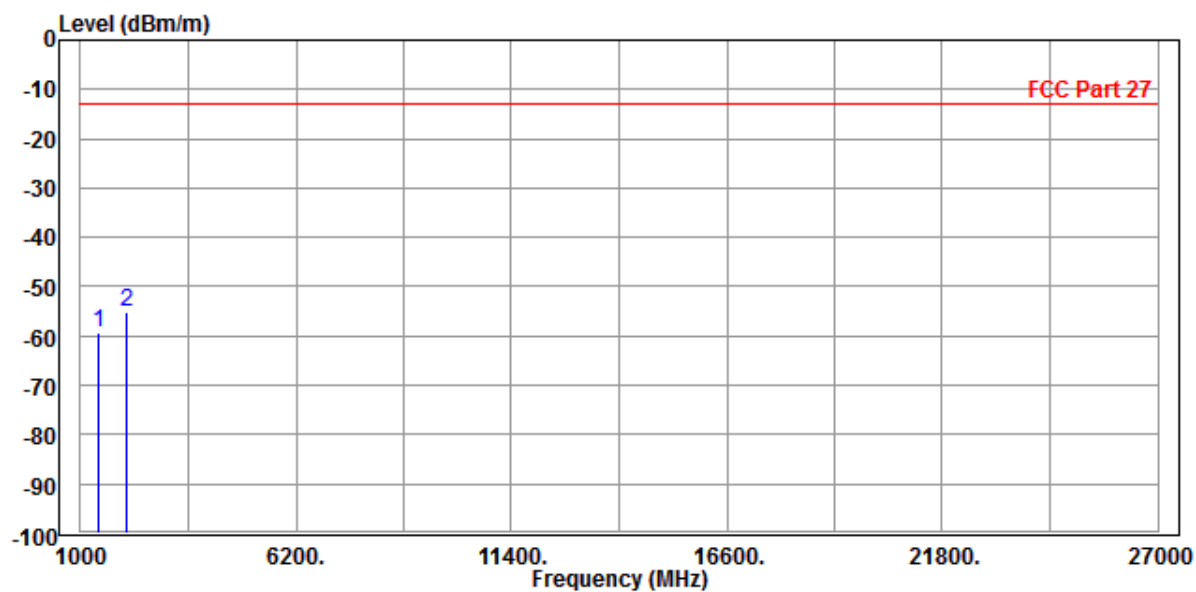
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1416.000 | -59.42 | -53.98     | -13.00     | -46.42     | -5.44  | Peak   |
| 2 PP | 2118.000 | -54.11 | -53.87     | -13.00     | -41.11     | -0.24  | Peak   |



**CHANNEL BANDWIDTH: 10MHz / QPSK**

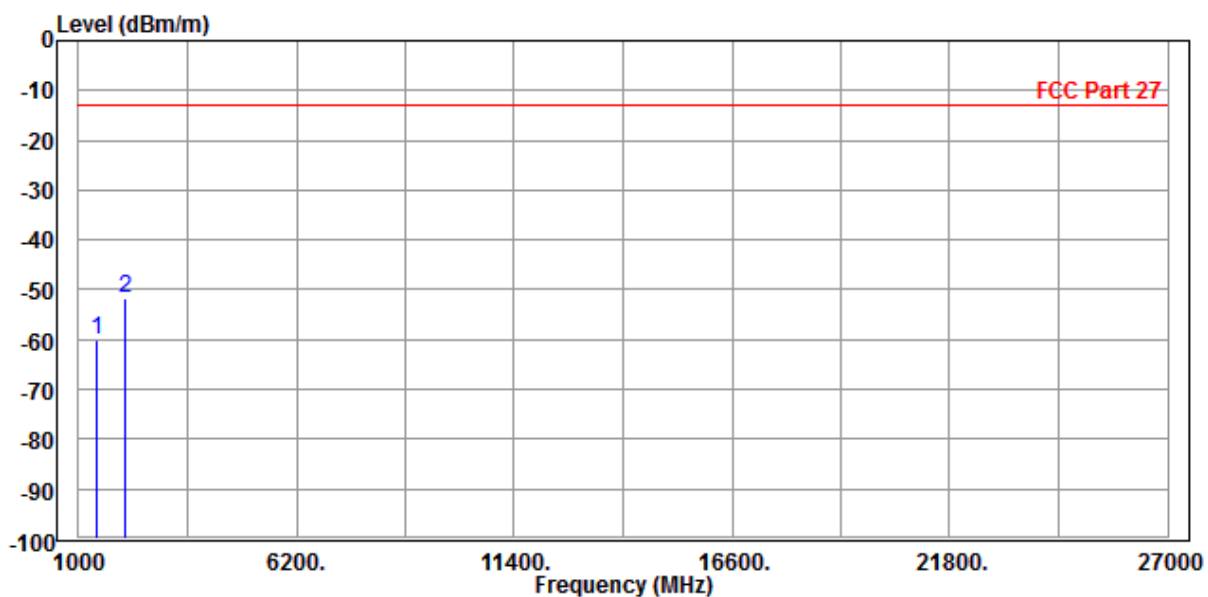
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1416.000 | -59.34 | -52.62     | -13.00     | -46.34     | -6.72  | Peak   |
| 2 PP | 2122.500 | -55.21 | -53.28     | -13.00     | -42.21     | -1.93  | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1416.000 | -59.94 | -53.22     | -13.00     | -46.94     | -6.72  | Peak   |
| 2 PP | 2118.000 | -51.75 | -49.81     | -13.00     | -38.75     | -1.94  | Peak   |





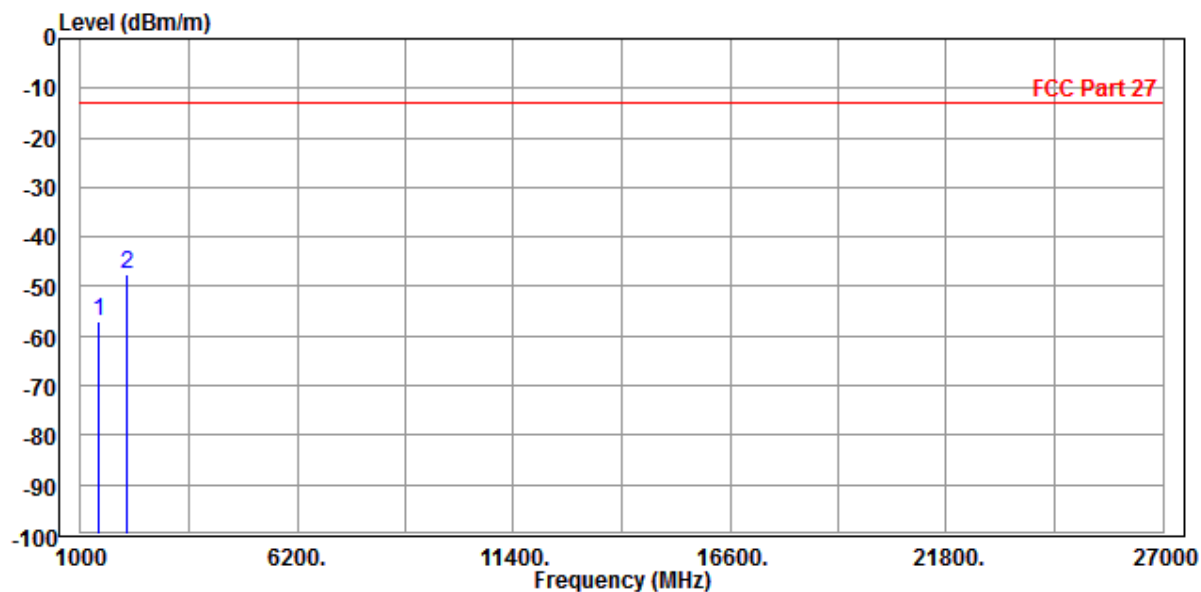
Test Report No.: RF160614W011-5

# LTE Band 17

## CHANNEL BANDWIDTH: 5MHz / QPSK

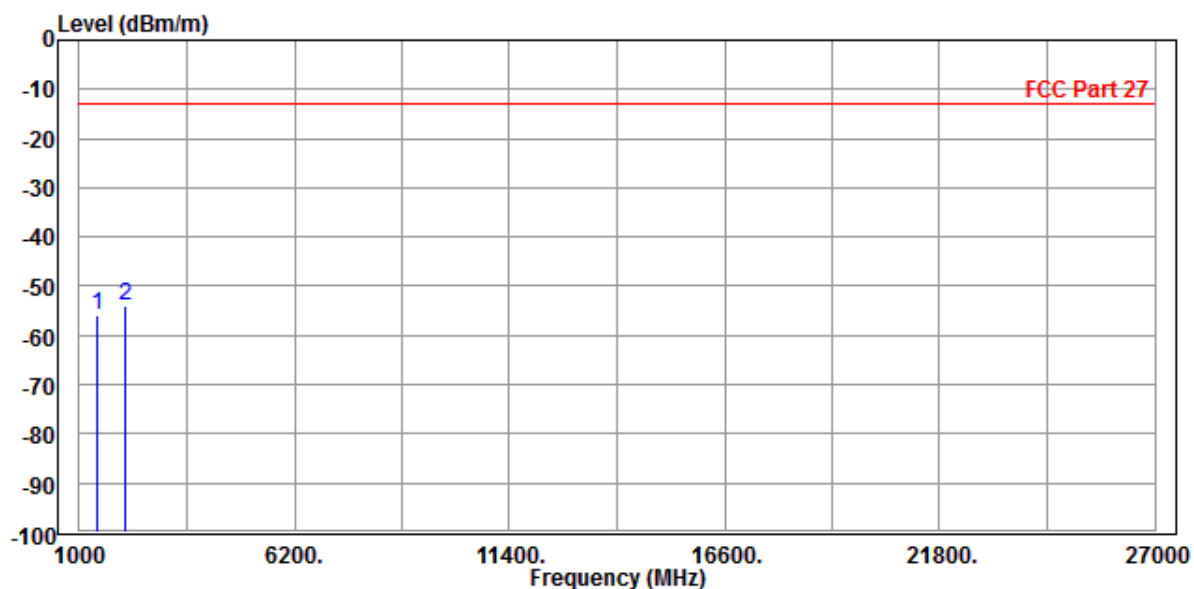
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 23790 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      |          |        | Read   | Limit  | Over   |        |        |
|------|----------|--------|--------|--------|--------|--------|--------|
|      | Freq     | Level  | Level  | Line   | Limit  | Factor | Remark |
|      | MHz      | dBm/m  | dBm    | dBm/m  | dB     | dB/m   |        |
| 1    | 1416.000 | -56.91 | -50.19 | -13.00 | -43.91 | -6.72  | Peak   |
| 2 PP | 2118.000 | -47.51 | -45.57 | -13.00 | -34.51 | -1.94  | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 23790 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

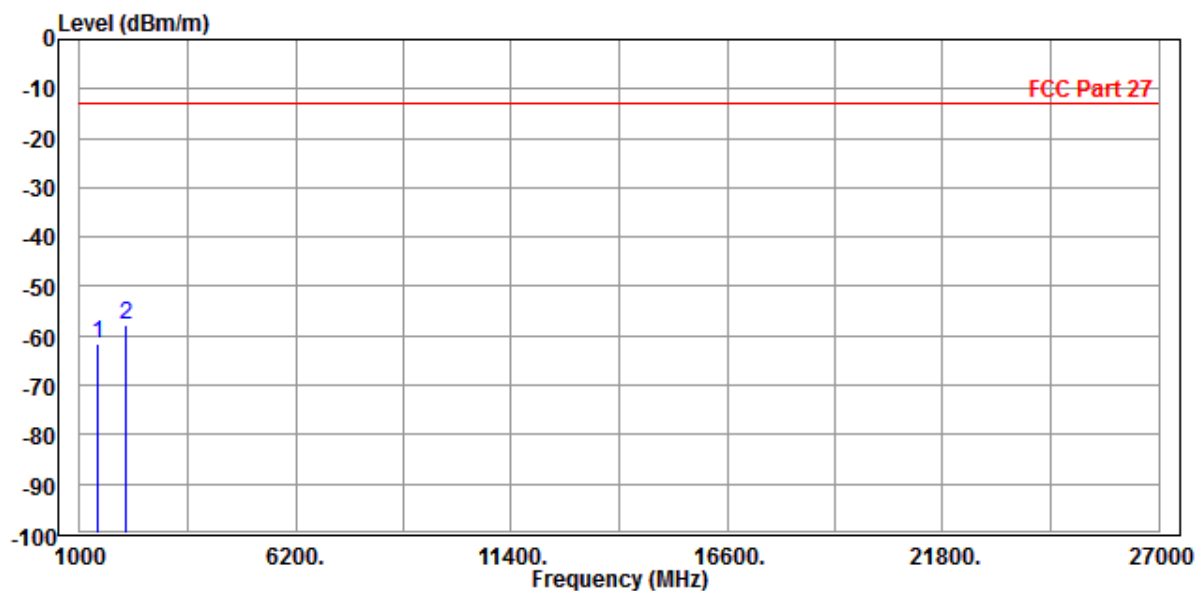
|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1416.000 | -55.83 | -50.39     | -13.00     | -42.83     | -5.44  | Peak   |
| 2 PP | 2118.000 | -53.82 | -53.58     | -13.00     | -40.82     | -0.24  | Peak   |



**CHANNEL BANDWIDTH: 10MHz / QPSK**

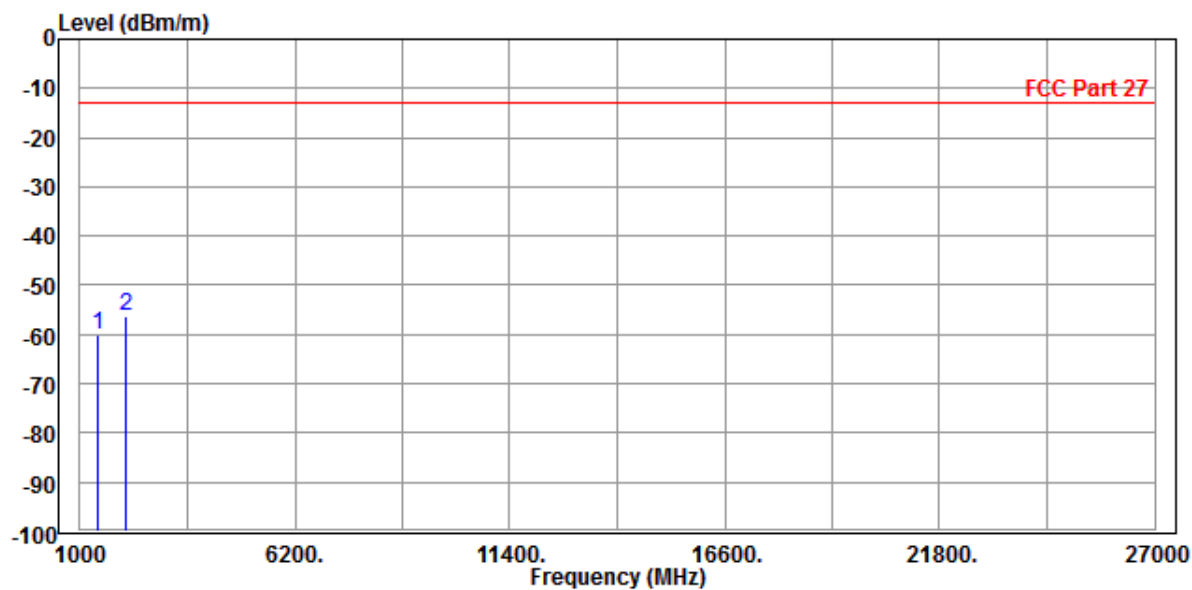
|                                                     |                  |                 |                    |
|-----------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                                | TX channel 23790 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                            | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                           | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 1420.000 | -61.45 | -54.76     | -13.00     | -48.45     | -6.69  | Peak   |
| 2 PP | 2130.000 | -57.63 | -55.70     | -13.00     | -44.63     | -1.93  | Peak   |



|                                                   |                  |                 |                    |
|---------------------------------------------------|------------------|-----------------|--------------------|
| MODE                                              | TX channel 23790 | FREQUENCY RANGE | Above 1000MHz      |
| ENVIRONMENTAL CONDITIONS                          | 26deg. C, 56%RH  | INPUT POWER     | DC 5V from adapter |
| TESTED BY                                         | Alex Chen        |                 |                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |                  |                 |                    |

|      | Freq     | Level  | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|------|----------|--------|------------|------------|------------|--------|--------|-----------|
|      | MHz      | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |           |
| 1    | 1420.000 | -60.08 | -54.67     | -13.00     | -47.08     | -5.41  | Peak   | Vertical  |
| 2 PP | 2130.000 | -56.15 | -55.91     | -13.00     | -43.15     | -0.24  | Peak   | Vertical  |





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## 5 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch, were founded in 2002 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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

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Web Site: [www.adt.com.tw](http://www.adt.com.tw)

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



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## 6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

---END---