

## FCC Test Report

### (PART 24)

**Report No.:** RF150727C10-1

**FCC ID:** NM82PQ9300

**Test Model:** 2PQ9300

**Received Date:** Jul. 27, 2015

**Test Date:** Jul. 29, 2015 ~ Sep. 01, 2015

**Issued Date:** Sep. 17, 2015

**Applicant:** HTC Corporation

**Address:** 1F, 6-3 Baoqiang Road, Xindian City, Taipei County 231, Taiwan

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan  
( R.O.C )

**Test Location:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan  
Hsien 333, Taiwan, R.O.C.



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### Release Control Record

| Issue No.     | Description      | Date Issued   |
|---------------|------------------|---------------|
| RF150727C10-1 | Original Release | Sep. 17, 2015 |

## 1 Certificate of Conformity

**Product:** Smartphone

**Brand:** HTC

**Test Model:** 2PQ9300

**Sample Status:** Identical Prototype

**Applicant:** HTC Corporation

**Test Date:** Jul. 29, 2015 ~ Sep. 01, 2015

**Standards:** FCC Part 24, Subpart E

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

**Prepared by :**



**Date:**

Sep. 17, 2015

Ivonne Wu / Supervisor

**Approved by :**



**Date:**

Sep. 17, 2015

Kay Wu / Supervisor

## 2 Summary of Test Results

| Applied Standard: FCC Part 24 & Part 2 |                                    |        |                                                                                   |
|----------------------------------------|------------------------------------|--------|-----------------------------------------------------------------------------------|
| FCC Clause                             | Test Item                          | Result | Remarks                                                                           |
| 2.1046<br>24.232                       | Effective Isotropic Radiated Power | PASS   | Meet the requirement of limit.                                                    |
| 2.1046<br>24.232(d)                    | Peak To Average Ratio              | PASS   | Meet the requirement of limit.                                                    |
| 2.1055<br>24.235                       | Frequency Stability                | PASS   | Meet the requirement of limit.                                                    |
| 2.1049<br>24.238(b)                    | Occupied Bandwidth                 | PASS   | Meet the requirement of limit.                                                    |
| 24.238(b)                              | Band Edge Measurements             | PASS   | Meet the requirement of limit.                                                    |
| 2.1051<br>24.238                       | Conducted Spurious Emissions       | PASS   | Meet the requirement of limit.                                                    |
| 2.1053<br>24.238                       | Radiated Spurious Emissions        | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -31.78dB at 40.53MHz. |

### 2.1 Measurement Uncertainty

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

| Measurement                        | Frequency        | Expanded Uncertainty (k=2) ( $\pm$ ) |
|------------------------------------|------------------|--------------------------------------|
| Conducted Emissions at mains ports | 150kHz ~ 30MHz   | 2.44 dB                              |
| Radiated Emissions up to 1 GHz     | 30MHz ~ 200MHz   | 2.0153 dB                            |
|                                    | 200MHz ~ 1000MHz | 2.0224 dB                            |
| Radiated Emissions above 1 GHz     | 1GHz ~ 18GHz     | 1.0121 dB                            |
|                                    | 18GHz ~ 40GHz    | 1.1508 dB                            |

## 2.2 Test Site And Instruments

| Description & Manufacturer                     | Model No.      | Serial No.          | Date of Calibration | Due Date of Calibration |
|------------------------------------------------|----------------|---------------------|---------------------|-------------------------|
| Test Receiver<br>Agilent                       | N9038A         | MY51210203          | Jan. 21, 2015       | Jan. 21, 2016           |
| Spectrum Analyzer<br>Agilent                   | N9010A         | MY52220314          | Sep. 03, 2015       | Sep. 02, 2016           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ           | FSU43          | 101261              | Dec. 10, 2014       | Dec. 09, 2015           |
| BILOG Antenna<br>SCHWARZBECK                   | VULB9168       | 9168-472            | Feb. 04, 2015       | Feb. 04, 2016           |
| HORN Antenna<br>SCHWARZBECK                    | BBHA 9120 D    | 9120D-969           | Feb. 09, 2015       | Feb. 09, 2016           |
| HORN Antenna<br>SCHWARZBECK                    | BBHA 9170      | 9170-480            | Feb. 04, 2015       | Feb. 04, 2016           |
| Preamplifier<br>EMCI                           | EMC 012645     | 980115              | Dec. 12, 2014       | Dec. 11, 2015           |
| Preamplifier<br>EMCI                           | EMC 184045     | 980116              | Jan. 09, 2015       | Jan. 08, 2016           |
| Preamplifier<br>EMCI                           | EMC 330H       | 980112              | Dec. 27, 2014       | Dec. 26, 2015           |
| Power Meter<br>Anritsu                         | ML2495A        | 1232002             | Sep. 17, 2014       | Sep. 16, 2015           |
| Power Sensor<br>Anritsu                        | MA2411B        | 1207325             | Sep. 17, 2014       | Sep. 16, 2015           |
| RF signal cable<br>HUBER+SUHNNER               | SUCOFLEX 104   | 309219/4<br>2950114 | Oct. 18, 2014       | Oct. 17, 2015           |
| RF signal cable<br>HUBER+SUHNNER               | SUCOFLEX 104   | 250130/4            | Oct. 18, 2014       | Oct. 17, 2015           |
| RF Coaxial Cable<br>Worken                     | 8D-FB          | Cable-Ch10-01       | Nov. 07, 2014       | Nov. 06, 2015           |
| Software<br>BV ADT                             | E3<br>6.120103 | NA                  | NA                  | NA                      |
| Antenna Tower<br>MF                            | MFA-440H       | NA                  | NA                  | NA                      |
| Turn Table<br>MF                               | MFT-201SS      | NA                  | NA                  | NA                      |
| Antenna Tower & Turn<br>Table Controller<br>MF | MF-7802        | NA                  | NA                  | NA                      |
| Communications<br>Tester-Wireless<br>Agilent   | 8960 Series 10 | MY53201073          | Jul. 03, 2015       | Jul. 02, 2017           |
| Radio Communication<br>Analyzer<br>Anritsu     | MT8820C        | 6201240432          | Jul. 06, 2015       | Jul. 05, 2017           |

- Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 690701.
5. The IC Site Registration No. is IC7450F-10.

### 3 General Information

#### 3.1 General Description of EUT

|                     |                                                                |                     |
|---------------------|----------------------------------------------------------------|---------------------|
| Product             | Smartphone                                                     |                     |
| Brand               | HTC                                                            |                     |
| Test Model          | 2PQ9300                                                        |                     |
| Status of EUT       | Identical Prototype                                            |                     |
| Power Supply Rating | 5.0Vdc (adapter or host equipment)<br>3.85Vdc (Li-ion battery) |                     |
| Modulation Type     | CDMA                                                           | QPSK, OQPSK, HPSK   |
|                     | LTE                                                            | QPSK, 16QAM         |
| Frequency Range     | CDMA                                                           | 1851.3 ~ 1908.8 MHz |
|                     | LTE Band 2 (Channel Bandwidth: 1.4MHz)                         | 1850.7 ~ 1909.3 MHz |
|                     | LTE Band 2 (Channel Bandwidth: 3MHz)                           | 1851.5 ~ 1908.5 MHz |
|                     | LTE Band 2 (Channel Bandwidth: 5MHz)                           | 1852.5 ~ 1907.5 MHz |
|                     | LTE Band 2 (Channel Bandwidth: 10MHz)                          | 1855.0 ~ 1905.0 MHz |
|                     | LTE Band 2 (Channel Bandwidth: 15MHz)                          | 1857.5 ~ 1902.5 MHz |
|                     | LTE Band 2 (Channel Bandwidth: 20MHz)                          | 1860.0 ~ 1900.0 MHz |
|                     | LTE Band 25 (Channel Bandwidth: 1.4MHz)                        | 1850.7 ~ 1914.3 MHz |
|                     | LTE Band 25 (Channel Bandwidth: 3MHz)                          | 1851.5 ~ 1913.5 MHz |
|                     | LTE Band 25 (Channel Bandwidth: 5MHz)                          | 1852.5 ~ 1912.5 MHz |
|                     | LTE Band 25 (Channel Bandwidth: 10MHz)                         | 1855.0 ~ 1910.0 MHz |
|                     | LTE Band 25 (Channel Bandwidth: 15MHz)                         | 1857.5 ~ 1907.5 MHz |
|                     | LTE Band 25 (Channel Bandwidth: 20MHz)                         | 1860.0 ~ 1905.0 MHz |
| Max. EIRP Power     | CDMA                                                           | 185.50mW            |
|                     | LTE Band 2 (Channel Bandwidth: 1.4MHz)                         | 70.96mW             |
|                     | LTE Band 2 (Channel Bandwidth: 3MHz)                           | 84.53mW             |
|                     | LTE Band 2 (Channel Bandwidth: 5MHz)                           | 81.85mW             |
|                     | LTE Band 2 (Channel Bandwidth: 10MHz)                          | 79.80mW             |
|                     | LTE Band 2 (Channel Bandwidth: 15MHz)                          | 72.61mW             |
|                     | LTE Band 2 (Channel Bandwidth: 20MHz)                          | 61.52mW             |
|                     | LTE Band 25 (Channel Bandwidth: 1.4MHz)                        | 82.41mW             |
|                     | LTE Band 25 (Channel Bandwidth: 3MHz)                          | 80.35mW             |
|                     | LTE Band 25 (Channel Bandwidth: 5MHz)                          | 73.79mW             |
|                     | LTE Band 25 (Channel Bandwidth: 10MHz)                         | 71.29mW             |
|                     | LTE Band 25 (Channel Bandwidth: 15MHz)                         | 66.22mW             |
|                     | LTE Band 25 (Channel Bandwidth: 20MHz)                         | 69.18mW             |

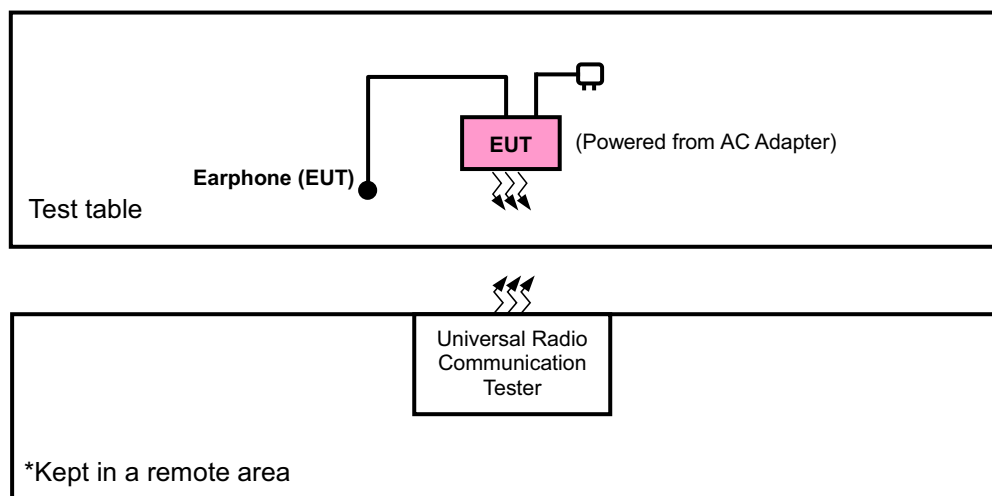
|                     |                                         |         |
|---------------------|-----------------------------------------|---------|
| Emission Designator | CDMA                                    | 1M28F9W |
|                     | LTE Band 2 (Channel Bandwidth: 1.4MHz)  | 1M09G7D |
|                     | LTE Band 2 (Channel Bandwidth: 3MHz)    | 2M70G7D |
|                     | LTE Band 2 (Channel Bandwidth: 5MHz)    | 4M49G7D |
|                     | LTE Band 2 (Channel Bandwidth: 10MHz)   | 8M95G7D |
|                     | LTE Band 2 (Channel Bandwidth: 15MHz)   | 13M4G7D |
|                     | LTE Band 2 (Channel Bandwidth: 20MHz)   | 17M9W7D |
|                     | LTE Band 25 (Channel Bandwidth: 1.4MHz) | 1M09G7D |
|                     | LTE Band 25 (Channel Bandwidth: 3MHz)   | 2M70G7D |
|                     | LTE Band 25 (Channel Bandwidth: 5MHz)   | 4M49G7D |
|                     | LTE Band 25 (Channel Bandwidth: 10MHz)  | 8M96W7D |
|                     | LTE Band 25 (Channel Bandwidth: 15MHz)  | 13M4G7D |
|                     | LTE Band 25 (Channel Bandwidth: 20MHz)  | 17M9W7D |
| Antenna Type        | Fixed Internal Antenna                  |         |
| Accessory Device    | Refer to Note as below                  |         |
| Data Cable Supplied | Refer to Note as below                  |         |

Note:

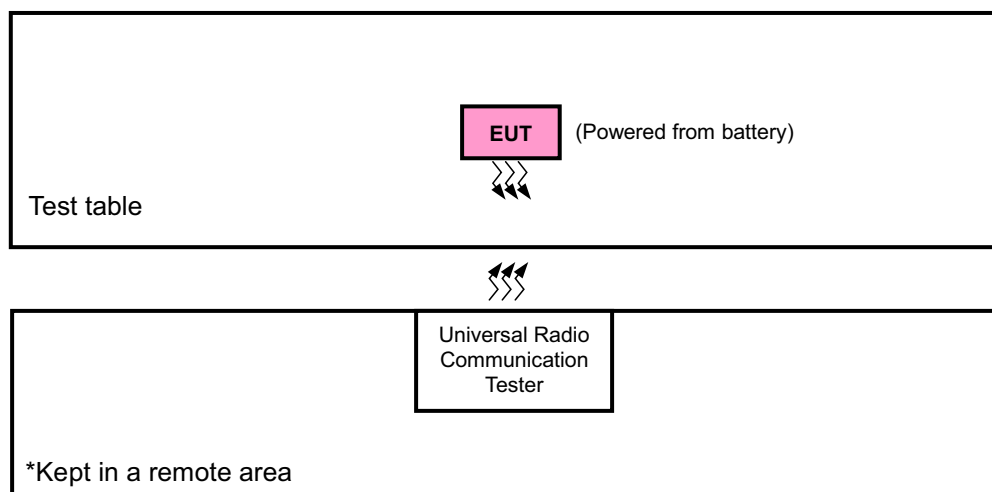
1. The EUT's accessories list refers to Ext. Pho.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

## 3.2 Configuration Of System Under Test

### <Radiated Emission Test>



### <E.I.R.P. Test>



### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

### 3.3 Test Mode Applicability and Tested Channel Detail

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 as the table below. Following channel(s) was (were) selected for the final test as listed below:

| Band        | EIRP    | Radiated Emission |
|-------------|---------|-------------------|
| CDMA        | Z-plane | Z-axis            |
| LTE Band 2  | Z-plane | Z-axis            |
| LTE Band 25 | Z-plane | Z-axis            |

#### CDMA MODE

| EUT Configure Mode | Test Item             | Available Channel | Tested Channel | Mode  |
|--------------------|-----------------------|-------------------|----------------|-------|
| -                  | ERP                   | 25 to 1175        | 25, 600, 1175  | 1xRTT |
| -                  | Frequency Stability   | 25 to 1175        | 600            | 1xRTT |
| -                  | Occupied Bandwidth    | 25 to 1175        | 25, 600, 1175  | 1xRTT |
| -                  | Band Edge             | 25 to 1175        | 25, 600, 1175  | 1xRTT |
| -                  | Peak to Average Ratio | 25 to 1175        | 25, 1175       | 1xRTT |
| -                  | Conducuted Emission   | 25 to 1175        | 600            | 1xRTT |
| -                  | Radiated Emission     | 25 to 1175        | 600            | 1xRTT |

## LTE BAND 2 MODE

| EUT Configure Mode | Test Item             | Available Channel | Tested Channel      | Channel Bandwidth | Modulation  | Mode                 |
|--------------------|-----------------------|-------------------|---------------------|-------------------|-------------|----------------------|
| -                  | EIRP                  | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
| -                  | Frequency Stability   | 18607 to 19193    | 18900               | 1.4MHz            | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18900               | 3MHz              | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 18625 to 19175    | 18900               | 5MHz              | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 18650 to 19150    | 18900               | 10MHz             | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 18675 to 19125    | 18900               | 15MHz             | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       | 18700 to 19100    | 18900               | 20MHz             | QPSK        | 1 RB / 0 RB Offset   |
| -                  | Occupied Bandwidth    | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK, 16QAM | 6 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK, 16QAM | 15 RB / 0 RB Offset  |
|                    |                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK, 16QAM | 25 RB / 0 RB Offset  |
|                    |                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK, 16QAM | 50 RB / 0 RB Offset  |
|                    |                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK, 16QAM | 75 RB / 0 RB Offset  |
|                    |                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK, 16QAM | 100 RB / 0 RB Offset |
| -                  | Peak to Average Ratio | 18607 to 19193    | 18607, 18900, 19193 | 1.4MHz            | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18615, 18900, 19185 | 3MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18625 to 19175    | 18625, 18900, 19175 | 5MHz              | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18650 to 19150    | 18650, 18900, 19150 | 10MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18675 to 19125    | 18675, 18900, 19125 | 15MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 18700 to 19100    | 18700, 18900, 19100 | 20MHz             | QPSK, 16QAM | 1 RB / 0 RB Offset   |
| -                  | Band Edge             | 18607 to 19193    | 18607               | 1.4MHz            | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 6 RB / 0 RB Offset   |
|                    |                       |                   | 19193               | 1.4MHz            | QPSK        | 1 RB / 5 RB Offset   |
|                    |                       |                   |                     |                   |             | 6 RB / 0 RB Offset   |
|                    |                       | 18615 to 19185    | 18615               | 3MHz              | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 15 RB / 0 RB Offset  |
|                    |                       |                   | 19185               | 3MHz              | QPSK        | 1 RB / 14 RB Offset  |
|                    |                       |                   |                     |                   |             | 15 RB / 0 RB Offset  |
|                    |                       | 18625 to 19175    | 18625               | 5MHz              | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 25 RB / 0 RB Offset  |
|                    |                       |                   | 19175               | 5MHz              | QPSK        | 1 RB / 24 RB Offset  |
|                    |                       |                   |                     |                   |             | 25 RB / 0 RB Offset  |
|                    |                       | 18650 to 19150    | 18650               | 10MHz             | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 50 RB / 0 RB Offset  |
|                    |                       |                   | 19150               | 10MHz             | QPSK        | 1 RB / 49 RB Offset  |
|                    |                       |                   |                     |                   |             | 50 RB / 0 RB Offset  |
|                    |                       | 18675 to 19125    | 18675               | 15MHz             | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 75 RB / 0 RB Offset  |
|                    |                       |                   | 19125               | 15MHz             | QPSK        | 1 RB / 74 RB Offset  |
|                    |                       |                   |                     |                   |             | 75 RB / 0 RB Offset  |
|                    |                       | 18700 to 19100    | 18700               | 20MHz             | QPSK        | 1 RB / 0 RB Offset   |
|                    |                       |                   |                     |                   |             | 100 RB / 0 RB Offset |
|                    |                       |                   | 19100               | 20MHz             | QPSK        | 1 RB / 99 RB Offset  |
|                    |                       |                   |                     |                   |             | 100 RB / 0 RB Offset |

| EUT Configure Mode | Test Item          | Available Channel | Tested Channel | Channel Bandwidth | Modulation | Mode               |
|--------------------|--------------------|-------------------|----------------|-------------------|------------|--------------------|
| -                  | Conducted Emission | 18607 to 19193    | 18900          | 1.4MHz            | QPSK       | 1 RB / 0 RB Offset |
|                    |                    | 18615 to 19185    | 18900          | 3MHz              | QPSK       | 1 RB / 0 RB Offset |
|                    |                    | 18625 to 19175    | 18900          | 5MHz              | QPSK       | 1 RB / 0 RB Offset |
|                    |                    | 18650 to 19150    | 18900          | 10MHz             | QPSK       | 1 RB / 0 RB Offset |
|                    |                    | 18675 to 19125    | 18900          | 15MHz             | QPSK       | 1 RB / 0 RB Offset |
|                    |                    | 18700 to 19100    | 18900          | 20MHz             | QPSK       | 1 RB / 0 RB Offset |
| -                  | Radiated Emission  | 18700 to 19100    | 18900          | 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 25 MODE

| EUT Configure Mode | Test Item             | Available Channel | Tested Channel      | Channel Bandwidth | Modulation   | Mode                 |
|--------------------|-----------------------|-------------------|---------------------|-------------------|--------------|----------------------|
| -                  | EIRP                  | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK / 16QAM | 1 RB / 0 RB Offset   |
| -                  | Frequency Stability   | 26047 to 26683    | 26365               | 1.4MHz            | QPSK         | 1 RB / 0 RB Offset   |
|                    |                       | 26055 to 26675    | 26365               | 3MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                    |                       | 26065 to 26665    | 26365               | 5MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                    |                       | 26090 to 26640    | 26365               | 10MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                    |                       | 26115 to 26615    | 26365               | 15MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                    |                       | 26140 to 26590    | 26365               | 20MHz             | QPSK         | 1 RB / 0 RB Offset   |
| -                  | Occupied Bandwidth    | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK / 16QAM | 6 RB / 0 RB Offset   |
|                    |                       | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK / 16QAM | 15 RB / 0 RB Offset  |
|                    |                       | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK / 16QAM | 25 RB / 0 RB Offset  |
|                    |                       | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK / 16QAM | 50 RB / 0 RB Offset  |
|                    |                       | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK / 16QAM | 75 RB / 0 RB Offset  |
|                    |                       | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK / 16QAM | 100 RB / 0 RB Offset |
| -                  | Peak to Average Ratio | 26047 to 26683    | 26047, 26365, 26683 | 1.4MHz            | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26055 to 26675    | 26055, 26365, 26675 | 3MHz              | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26065 to 26665    | 26065, 26365, 26665 | 5MHz              | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26090 to 26640    | 26090, 26365, 26640 | 10MHz             | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26115 to 26615    | 26115, 26365, 26615 | 15MHz             | QPSK / 16QAM | 1 RB / 0 RB Offset   |
|                    |                       | 26140 to 26590    | 26140, 26365, 26590 | 20MHz             | QPSK / 16QAM | 1 RB / 0 RB Offset   |

| EUT Configure Mode | Test Item          | Available Channel | Tested Channel | Channel Bandwidth | Modulation | Mode                 |
|--------------------|--------------------|-------------------|----------------|-------------------|------------|----------------------|
| -                  | Band Edge          | 26047 to 26683    | 26047          | 1.4MHz            | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    |                   | 26683          | 1.4MHz            | QPSK       | 6 RB / 0 RB Offset   |
|                    |                    | 26055 to 26675    | 26055          | 3MHz              | QPSK       | 1 RB / 5 RB Offset   |
|                    |                    |                   | 26675          | 3MHz              | QPSK       | 6 RB / 0 RB Offset   |
|                    |                    |                   | 26055          | 3MHz              | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    |                   | 26675          | 3MHz              | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    | 26065 to 26665    | 26065          | 5MHz              | QPSK       | 1 RB / 14 RB Offset  |
|                    |                    |                   | 26665          | 5MHz              | QPSK       | 15 RB / 0 RB Offset  |
|                    |                    |                   | 26065          | 5MHz              | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    |                   | 26665          | 5MHz              | QPSK       | 25 RB / 0 RB Offset  |
|                    |                    | 26090 to 26640    | 26090          | 10MHz             | QPSK       | 1 RB / 24 RB Offset  |
|                    |                    |                   | 26640          | 10MHz             | QPSK       | 25 RB / 0 RB Offset  |
|                    |                    |                   | 26090          | 10MHz             | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    |                   | 26640          | 10MHz             | QPSK       | 50 RB / 0 RB Offset  |
|                    |                    | 26115 to 26615    | 26115          | 15MHz             | QPSK       | 1 RB / 49 RB Offset  |
|                    |                    |                   | 26615          | 15MHz             | QPSK       | 50 RB / 0 RB Offset  |
|                    |                    |                   | 26115          | 15MHz             | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    |                   | 26615          | 15MHz             | QPSK       | 75 RB / 0 RB Offset  |
|                    |                    | 26140 to 26590    | 26140          | 20MHz             | QPSK       | 1 RB / 74 RB Offset  |
|                    |                    |                   | 26590          | 20MHz             | QPSK       | 75 RB / 0 RB Offset  |
|                    |                    |                   | 26140          | 20MHz             | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    |                   | 26590          | 20MHz             | QPSK       | 100 RB / 0 RB Offset |
| -                  | Conducted Emission | 26047 to 26683    | 26365          | 1.4MHz            | QPSK       | 1 RB / 99 RB Offset  |
|                    |                    | 26055 to 26675    | 26365          | 3MHz              | QPSK       | 100 RB / 0 RB Offset |
|                    |                    | 26065 to 26665    | 26365          | 5MHz              | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    | 26090 to 26640    | 26365          | 10MHz             | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    | 26115 to 26615    | 26365          | 15MHz             | QPSK       | 1 RB / 0 RB Offset   |
|                    |                    | 26140 to 26590    | 26365          | 20MHz             | QPSK       | 1 RB / 0 RB Offset   |
| -                  | Radiated Emission  | 26140 to 26590    | 26365          | 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.

#### Test Condition:

| Test Item             | Environmental Conditions | Input Power  | Tested By   |
|-----------------------|--------------------------|--------------|-------------|
| EIRP                  | 26deg. C, 58%RH          | 3.85Vdc      | Anson Lin   |
| Frequency Stability   | 26deg. C, 58%RH          | 3.85Vdc      | Carlos Chen |
| Occupied Bandwidth    | 26deg. C, 58%RH          | 3.85Vdc      | Carlos Chen |
| Band Edge             | 26deg. C, 58%RH          | 3.85Vdc      | Carlos Chen |
| Peak To Average Ratio | 26deg. C, 58%RH          | 3.85Vdc      | Carlos Chen |
| Condcudeted Emission  | 26deg. C, 58%RH          | 3.85Vdc      | Carlos Chen |
| Radiated Emission     | 25deg. C, 65%RH          | 120Vac, 60Hz | Anson Lin   |

### **3.4 EUT Operating Conditions**

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

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

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 24**

**ANSI/TIA/EIA-603-C 2004**

**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

Mobile / Portable station are limited to 2 watts e.i.r.p.

#### 4.1.2 Test Procedures

##### **EIRP / ERP Measurement:**

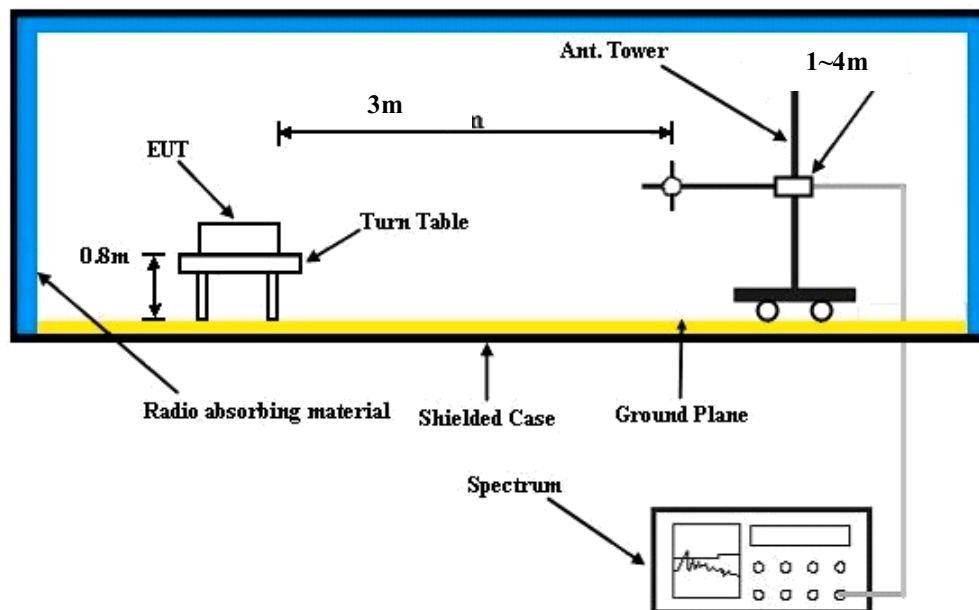
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM, GPRS & EDGE, 5MHz for WCDMA and CDMA, and 10MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn 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.
- 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 b. 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.R.P power can be calculated from E.I.R.P power by subtracting the gain of dipole,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi}$ .

##### **Conducted Power Measurement:**

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA, CDMA, and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

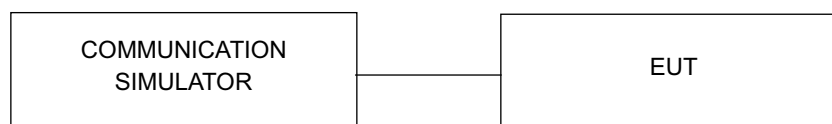
### 4.1.3 Test Setup

#### EIRP / ERP MEASUREMENT:



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

#### CONDUCTED POWER MEASUREMENT:



#### 4.1.4 Test Results

##### CONDUCTED OUTPUT POWER (dBm)

| Band              | CDMA    |       |         |
|-------------------|---------|-------|---------|
| Channel           | 25      | 600   | 1175    |
| Frequency (MHz)   | 1851.25 | 1880  | 1908.75 |
| RC1+SO55          | 23.85   | 24.02 | 24.01   |
| RC3+SO55          | 23.86   | 24.03 | 24.02   |
| RC3+SO32(+ F-SCH) | 23.80   | 23.97 | 23.96   |
| RC3+SO32(+SCH)    | 23.75   | 23.92 | 23.91   |
| RTAP 153.6        | 23.79   | 23.96 | 23.95   |
| RETAP 4096        | 23.81   | 23.98 | 23.97   |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 18607 | Mid Ch 18900 | High Ch 19193 |               | Low Ch 18607 | Mid Ch 18900 | High Ch 19193 |               |
|           |         |           | 1850.7 MHz   | 1880.0 MHz   | 1909.3 MHz    |               | 1850.7 MHz   | 1880.0 MHz   | 1909.3 MHz    |               |
| 2 / 1.4M  | 1       | 0         | 22.54        | 22.63        | 22.28         | 0             | 21.47        | 21.56        | 21.21         | 1             |
|           | 1       | 2         | 22.42        | 22.51        | 22.16         | 0             | 21.35        | 21.44        | 21.09         | 1             |
|           | 1       | 5         | 22.37        | 22.46        | 22.11         | 0             | 21.30        | 21.39        | 21.04         | 1             |
|           | 3       | 0         | 21.36        | 21.45        | 21.10         | 0             | 20.29        | 20.38        | 20.03         | 1             |
|           | 3       | 1         | 21.30        | 21.39        | 21.04         | 0             | 20.23        | 20.32        | 19.97         | 1             |
|           | 3       | 3         | 21.18        | 21.27        | 20.92         | 0             | 20.11        | 20.20        | 19.85         | 1             |
|           | 6       | 0         | 21.34        | 21.43        | 21.43         | 1             | 20.27        | 20.36        | 20.36         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 18615 | Mid Ch 18900 | High Ch 19185 |               | Low Ch 18615 | Mid Ch 18900 | High Ch 19185 |               |
|           |         |           | 1851.5 MHz   | 1880.0 MHz   | 1908.5 MHz    |               | 1851.5 MHz   | 1880.0 MHz   | 1908.5 MHz    |               |
| 2 / 3M    | 1       | 0         | 22.62        | 22.71        | 22.36         | 0             | 21.55        | 21.64        | 21.29         | 1             |
|           | 1       | 7         | 22.50        | 22.59        | 22.24         | 0             | 21.43        | 21.52        | 21.17         | 1             |
|           | 1       | 14        | 22.45        | 22.54        | 22.19         | 0             | 21.38        | 21.47        | 21.12         | 1             |
|           | 8       | 0         | 21.44        | 21.53        | 21.18         | 1             | 20.37        | 20.46        | 20.11         | 2             |
|           | 8       | 3         | 21.38        | 21.47        | 21.12         | 1             | 20.31        | 20.40        | 20.05         | 2             |
|           | 8       | 7         | 21.26        | 21.35        | 21.00         | 1             | 20.19        | 20.28        | 19.93         | 2             |
|           | 15      | 0         | 21.42        | 21.51        | 21.51         | 1             | 20.35        | 20.44        | 20.44         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 18625 | Mid Ch 18900 | High Ch 19175 |               | Low Ch 18625 | Mid Ch 18900 | High Ch 19175 |               |
|           |         |           | 1852.5 MHz   | 1880.0 MHz   | 1907.5 MHz    |               | 1852.5 MHz   | 1880.0 MHz   | 1907.5 MHz    |               |
| 2 / 5M    | 1       | 0         | 22.70        | 22.79        | 22.44         | 0             | 21.63        | 21.72        | 21.37         | 1             |
|           | 1       | 12        | 22.58        | 22.67        | 22.32         | 0             | 21.51        | 21.60        | 21.25         | 1             |
|           | 1       | 24        | 22.53        | 22.62        | 22.27         | 0             | 21.46        | 21.55        | 21.20         | 1             |
|           | 12      | 0         | 21.52        | 21.61        | 21.26         | 1             | 20.45        | 20.54        | 20.19         | 2             |
|           | 12      | 6         | 21.46        | 21.55        | 21.20         | 1             | 20.39        | 20.48        | 20.13         | 2             |
|           | 12      | 13        | 21.34        | 21.43        | 21.08         | 1             | 20.27        | 20.36        | 20.01         | 2             |
|           | 25      | 0         | 21.50        | 21.59        | 21.59         | 1             | 20.43        | 20.52        | 20.52         | 2             |



| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 18650 | Mid Ch 18900 | High Ch 19150 |               | Low Ch 18650 | Mid Ch 18900 | High Ch 19150 |               |
|           |         |           | 1855.0 MHz   | 1880.0 MHz   | 1905.0 MHz    |               | 1855.0 MHz   | 1880.0 MHz   | 1905.0 MHz    |               |
| 2 / 10M   | 1       | 0         | 22.77        | 22.86        | 22.51         | 0             | 21.70        | 21.79        | 21.44         | 1             |
|           | 1       | 24        | 22.65        | 22.74        | 22.39         | 0             | 21.58        | 21.67        | 21.32         | 1             |
|           | 1       | 49        | 22.60        | 22.69        | 22.34         | 0             | 21.53        | 21.62        | 21.27         | 1             |
|           | 25      | 0         | 21.59        | 21.68        | 21.33         | 1             | 20.52        | 20.61        | 20.26         | 2             |
|           | 25      | 12        | 21.53        | 21.62        | 21.27         | 1             | 20.46        | 20.55        | 20.20         | 2             |
|           | 25      | 25        | 21.41        | 21.50        | 21.15         | 1             | 20.34        | 20.43        | 20.08         | 2             |
|           | 50      | 0         | 21.57        | 21.66        | 21.66         | 1             | 20.50        | 20.59        | 20.59         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 18675 | Mid Ch 18900 | High Ch 19125 |               | Low Ch 18675 | Mid Ch 18900 | High Ch 19125 |               |
|           |         |           | 1857.5 MHz   | 1880.0 MHz   | 1902.5 MHz    |               | 1857.5 MHz   | 1880.0 MHz   | 1902.5 MHz    |               |
| 2 / 15M   | 1       | 0         | 22.86        | 22.95        | 22.60         | 0             | 21.79        | 21.88        | 21.53         | 1             |
|           | 1       | 37        | 22.74        | 22.83        | 22.48         | 0             | 21.67        | 21.76        | 21.41         | 1             |
|           | 1       | 74        | 22.69        | 22.78        | 22.43         | 0             | 21.62        | 21.71        | 21.36         | 1             |
|           | 36      | 0         | 21.68        | 21.77        | 21.42         | 1             | 20.61        | 20.70        | 20.35         | 2             |
|           | 36      | 19        | 21.62        | 21.71        | 21.36         | 1             | 20.55        | 20.64        | 20.29         | 2             |
|           | 36      | 39        | 21.50        | 21.59        | 21.24         | 1             | 20.43        | 20.52        | 20.17         | 2             |
|           | 75      | 0         | 21.66        | 21.75        | 21.75         | 1             | 20.59        | 20.68        | 20.68         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 18700 | Mid Ch 18900 | High Ch 19100 |               | Low Ch 18700 | Mid Ch 18900 | High Ch 19100 |               |
|           |         |           | 1860.0 MHz   | 1880.0 MHz   | 1900.0 MHz    |               | 1860.0 MHz   | 1880.0 MHz   | 1900.0 MHz    |               |
| 2 / 20M   | 1       | 0         | 22.93        | 23.02        | 22.67         | 0             | 21.86        | 21.95        | 21.60         | 1             |
|           | 1       | 50        | 22.81        | 22.90        | 22.55         | 0             | 21.74        | 21.83        | 21.48         | 1             |
|           | 1       | 99        | 22.76        | 22.85        | 22.50         | 0             | 21.69        | 21.78        | 21.43         | 1             |
|           | 50      | 0         | 21.75        | 21.84        | 21.49         | 1             | 20.68        | 20.77        | 20.42         | 2             |
|           | 50      | 25        | 21.69        | 21.78        | 21.43         | 1             | 20.62        | 20.71        | 20.36         | 2             |
|           | 50      | 50        | 21.57        | 21.66        | 21.31         | 1             | 20.50        | 20.59        | 20.24         | 2             |
|           | 100     | 0         | 21.73        | 21.82        | 21.82         | 1             | 20.66        | 20.75        | 20.75         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 26047 | Mid Ch 26365 | High Ch 26683 |               | Low Ch 26047 | Mid Ch 26365 | High Ch 26683 |               |
|           |         |           | 1850.7 MHz   | 1882.5 MHz   | 1914.3 MHz    |               | 1850.7 MHz   | 1882.5 MHz   | 1914.3 MHz    |               |
| 25 / 1.4M | 1       | 0         | 22.30        | 22.43        | 22.06         | 0             | 21.32        | 21.45        | 21.08         | 1             |
|           | 1       | 2         | 22.25        | 22.38        | 22.01         | 0             | 21.27        | 21.40        | 21.03         | 1             |
|           | 1       | 5         | 22.07        | 22.20        | 21.83         | 0             | 21.09        | 21.22        | 20.85         | 1             |
|           | 3       | 0         | 21.28        | 21.41        | 21.04         | 0             | 20.30        | 20.43        | 20.06         | 1             |
|           | 3       | 1         | 21.26        | 21.39        | 21.02         | 0             | 20.28        | 20.41        | 20.04         | 1             |
|           | 3       | 3         | 21.06        | 21.19        | 20.82         | 0             | 20.08        | 20.21        | 19.84         | 1             |
|           | 6       | 0         | 21.16        | 21.29        | 20.92         | 1             | 20.18        | 20.31        | 19.94         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 26055 | Mid Ch 26365 | High Ch 26675 |               | Low Ch 26055 | Mid Ch 26365 | High Ch 26675 |               |
|           |         |           | 1851.5 MHz   | 1882.5 MHz   | 1913.5 MHz    |               | 1851.5 MHz   | 1882.5 MHz   | 1913.5 MHz    |               |
| 25 / 3M   | 1       | 0         | 22.38        | 22.51        | 22.14         | 0             | 21.40        | 21.53        | 21.16         | 1             |
|           | 1       | 7         | 22.33        | 22.46        | 22.09         | 0             | 21.35        | 21.48        | 21.11         | 1             |
|           | 1       | 14        | 22.15        | 22.28        | 21.91         | 0             | 21.17        | 21.30        | 20.93         | 1             |
|           | 8       | 0         | 21.36        | 21.49        | 21.12         | 1             | 20.38        | 20.51        | 20.14         | 2             |
|           | 8       | 3         | 21.34        | 21.47        | 21.10         | 1             | 20.36        | 20.49        | 20.12         | 2             |
|           | 8       | 7         | 21.14        | 21.27        | 20.90         | 1             | 20.16        | 20.29        | 19.92         | 2             |
|           | 15      | 0         | 21.24        | 21.37        | 21.00         | 1             | 20.26        | 20.39        | 20.02         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 26065 | Mid Ch 26365 | High Ch 26665 |               | Low Ch 26065 | Mid Ch 26365 | High Ch 26665 |               |
|           |         |           | 1852.5 MHz   | 1882.5 MHz   | 1912.5 MHz    |               | 1852.5 MHz   | 1882.5 MHz   | 1912.5 MHz    |               |
| 25 / 5M   | 1       | 0         | 22.47        | 22.60        | 22.23         | 0             | 21.49        | 21.62        | 21.25         | 1             |
|           | 1       | 12        | 22.42        | 22.55        | 22.18         | 0             | 21.44        | 21.57        | 21.20         | 1             |
|           | 1       | 24        | 22.24        | 22.37        | 22.00         | 0             | 21.26        | 21.39        | 21.02         | 1             |
|           | 12      | 0         | 21.45        | 21.58        | 21.21         | 1             | 20.47        | 20.60        | 20.23         | 2             |
|           | 12      | 6         | 21.43        | 21.56        | 21.19         | 1             | 20.45        | 20.58        | 20.21         | 2             |
|           | 12      | 13        | 21.23        | 21.36        | 20.99         | 1             | 20.25        | 20.38        | 20.01         | 2             |
|           | 25      | 0         | 21.33        | 21.46        | 21.09         | 1             | 20.35        | 20.48        | 20.11         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 26090 | Mid Ch 26365 | High Ch 26640 |               | Low Ch 26090 | Mid Ch 26365 | High Ch 26640 |               |
|           |         |           | 1855.0 MHz   | 1882.5 MHz   | 1910.0 MHz    |               | 1855.0 MHz   | 1882.5 MHz   | 1910.0 MHz    |               |
| 25 / 10M  | 1       | 0         | 22.56        | 22.69        | 22.32         | 0             | 21.58        | 21.71        | 21.34         | 1             |
|           | 1       | 24        | 22.51        | 22.64        | 22.27         | 0             | 21.53        | 21.66        | 21.29         | 1             |
|           | 1       | 49        | 22.33        | 22.46        | 22.09         | 0             | 21.35        | 21.48        | 21.11         | 1             |
|           | 25      | 0         | 21.54        | 21.67        | 21.30         | 1             | 20.56        | 20.69        | 20.32         | 2             |
|           | 25      | 12        | 21.52        | 21.65        | 21.28         | 1             | 20.54        | 20.67        | 20.30         | 2             |
|           | 25      | 25        | 21.32        | 21.45        | 21.08         | 1             | 20.34        | 20.47        | 20.10         | 2             |
|           | 50      | 0         | 21.42        | 21.55        | 21.18         | 1             | 20.44        | 20.57        | 20.20         | 2             |



| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 26115 | Mid Ch 26365 | High Ch 26615 |               | Low Ch 26115 | Mid Ch 26365 | High Ch 26615 |               |
|           |         |           | 1857.5 MHz   | 1882.5 MHz   | 1907.5 MHz    |               | 1857.5 MHz   | 1882.5 MHz   | 1907.5 MHz    |               |
| 25 / 15M  | 1       | 0         | 22.63        | 22.76        | 22.39         | 0             | 21.65        | 21.78        | 21.41         | 1             |
|           | 1       | 37        | 22.58        | 22.71        | 22.34         | 0             | 21.60        | 21.73        | 21.36         | 1             |
|           | 1       | 74        | 22.40        | 22.53        | 22.16         | 0             | 21.42        | 21.55        | 21.18         | 1             |
|           | 36      | 0         | 21.61        | 21.74        | 21.37         | 1             | 20.63        | 20.76        | 20.39         | 2             |
|           | 36      | 19        | 21.59        | 21.72        | 21.35         | 1             | 20.61        | 20.74        | 20.37         | 2             |
|           | 36      | 39        | 21.39        | 21.52        | 21.15         | 1             | 20.41        | 20.54        | 20.17         | 2             |
|           | 75      | 0         | 21.49        | 21.62        | 21.25         | 1             | 20.51        | 20.64        | 20.27         | 2             |

| Band / BW | RB Size | RB Offset | QPSK         |              |               | 3GPP MPR (dB) | 16QAM        |              |               | 3GPP MPR (dB) |
|-----------|---------|-----------|--------------|--------------|---------------|---------------|--------------|--------------|---------------|---------------|
|           |         |           | Low Ch 26140 | Mid Ch 26365 | High Ch 26590 |               | Low Ch 26140 | Mid Ch 26365 | High Ch 26590 |               |
|           |         |           | 1860.0 MHz   | 1882.5 MHz   | 1905.0 MHz    |               | 1860.0 MHz   | 1882.5 MHz   | 1905.0 MHz    |               |
| 25 / 20M  | 1       | 0         | 22.69        | 22.82        | 22.45         | 0             | 21.71        | 21.84        | 21.47         | 1             |
|           | 1       | 50        | 22.64        | 22.77        | 22.40         | 0             | 21.66        | 21.79        | 21.42         | 1             |
|           | 1       | 99        | 22.46        | 22.59        | 22.22         | 0             | 21.48        | 21.61        | 21.24         | 1             |
|           | 50      | 0         | 21.67        | 21.80        | 21.43         | 1             | 20.69        | 20.82        | 20.45         | 2             |
|           | 50      | 25        | 21.65        | 21.78        | 21.41         | 1             | 20.67        | 20.80        | 20.43         | 2             |
|           | 50      | 50        | 21.45        | 21.58        | 21.21         | 1             | 20.47        | 20.60        | 20.23         | 2             |
|           | 100     | 0         | 21.55        | 21.68        | 21.31         | 1             | 20.57        | 20.70        | 20.33         | 2             |



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## EIRP Power (dBm)

| CDMA  |         |                 |           |                       |           |          |                    |
|-------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Plane | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z     | 25      | 1851.25         | -14.19    | 36.57                 | 22.38     | 173.13   | H                  |
|       | 600     | 1880.00         | -14.71    | 37.22                 | 22.51     | 178.27   |                    |
|       | 1175    | 1908.75         | -14.50    | 37.18                 | 22.68     | 185.50   |                    |
|       | 25      | 1851.25         | -19.39    | 37.65                 | 18.26     | 66.97    | V                  |
|       | 600     | 1880.00         | -18.40    | 37.58                 | 19.18     | 82.86    |                    |
|       | 1175    | 1908.75         | -17.88    | 37.48                 | 19.60     | 91.21    |                    |

| LTE Band 2                       |         |                 |           |                       |           |          |                    |
|----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 1.4MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                | 18607   | 1850.7          | -19.49    | 36.57                 | 17.08     | 51.05    | H                  |
|                                  | 18900   | 1880.0          | -18.71    | 37.22                 | 18.51     | 70.96    |                    |
|                                  | 19193   | 1909.3          | -18.80    | 37.18                 | 18.38     | 68.87    |                    |
|                                  | 18607   | 1850.7          | -22.77    | 37.65                 | 14.88     | 30.76    | V                  |
|                                  | 18900   | 1880.0          | -21.69    | 37.58                 | 15.89     | 38.82    |                    |
|                                  | 19193   | 1909.3          | -21.75    | 37.48                 | 15.73     | 37.41    |                    |

| LTE Band 2                        |         |                 |           |                       |           |          |                    |
|-----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 1.4MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                             | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                 | 18607   | 1850.7          | -19.17    | 36.57                 | 17.40     | 54.95    | H                  |
|                                   | 18900   | 1880.0          | -19.71    | 37.22                 | 17.51     | 56.36    |                    |
|                                   | 19193   | 1909.3          | -20.54    | 37.18                 | 16.64     | 46.13    |                    |
|                                   | 18607   | 1850.7          | -24.18    | 37.65                 | 13.47     | 22.23    | V                  |
|                                   | 18900   | 1880.0          | -23.35    | 37.58                 | 14.23     | 26.49    |                    |
|                                   | 19193   | 1909.3          | -22.59    | 37.48                 | 14.89     | 30.83    |                    |

| LTE Band 2                     |         |                 |           |                       |           |          |                    |
|--------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 3MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                          | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                              | 18615   | 1851.5          | -17.61    | 36.57                 | 18.96     | 78.70    | H                  |
|                                | 18900   | 1880.0          | -17.95    | 37.22                 | 19.27     | 84.53    |                    |
|                                | 19185   | 1908.5          | -18.20    | 37.18                 | 18.98     | 79.07    |                    |
|                                | 18615   | 1851.5          | -22.79    | 37.65                 | 14.86     | 30.62    | V                  |
|                                | 18900   | 1880.0          | -21.59    | 37.58                 | 15.99     | 39.72    |                    |
|                                | 19185   | 1908.5          | -21.34    | 37.48                 | 16.14     | 41.11    |                    |

| LTE Band 2                      |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 3MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 18615   | 1851.5          | -18.52    | 36.57                 | 18.05     | 63.83    | H                  |
|                                 | 18900   | 1880.0          | -19.66    | 37.22                 | 17.56     | 57.02    |                    |
|                                 | 19185   | 1908.5          | -20.17    | 37.18                 | 17.01     | 50.23    |                    |
|                                 | 18615   | 1851.5          | -23.64    | 37.65                 | 14.01     | 25.18    | V                  |
|                                 | 18900   | 1880.0          | -23.33    | 37.58                 | 14.25     | 26.61    |                    |
|                                 | 19185   | 1908.5          | -23.31    | 37.48                 | 14.17     | 26.12    |                    |

| LTE Band 2                     |         |                 |           |                       |           |          |                    |
|--------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 5MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                          | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                              | 18625   | 1852.5          | -17.95    | 36.57                 | 18.62     | 72.78    | H                  |
|                                | 18900   | 1880.0          | -18.09    | 37.22                 | 19.13     | 81.85    |                    |
|                                | 19175   | 1907.5          | -18.13    | 37.18                 | 19.05     | 80.35    |                    |
|                                | 18625   | 1852.5          | -23.12    | 37.65                 | 14.53     | 28.38    | V                  |
|                                | 18900   | 1880.0          | -21.79    | 37.58                 | 15.79     | 37.93    |                    |
|                                | 19175   | 1907.5          | -21.23    | 37.48                 | 16.25     | 42.17    |                    |

| LTE Band 2                      |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 5MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 18625   | 1852.5          | -19.18    | 36.57                 | 17.39     | 54.83    | H                  |
|                                 | 18900   | 1880.0          | -19.68    | 37.22                 | 17.54     | 56.75    |                    |
|                                 | 19175   | 1907.5          | -18.91    | 37.18                 | 18.27     | 67.14    |                    |
|                                 | 18625   | 1852.5          | -24.36    | 37.65                 | 13.29     | 21.33    | V                  |
|                                 | 18900   | 1880.0          | -23.38    | 37.58                 | 14.20     | 26.30    |                    |
|                                 | 19175   | 1907.5          | -22.01    | 37.48                 | 15.47     | 35.24    |                    |

| LTE Band 2                      |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 10MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 18650   | 1855.0          | -18.27    | 36.57                 | 18.30     | 67.61    | H                  |
|                                 | 18900   | 1880.0          | -18.20    | 37.22                 | 19.02     | 79.80    |                    |
|                                 | 19150   | 1905.0          | -18.57    | 37.18                 | 18.61     | 72.61    |                    |
|                                 | 18650   | 1855.0          | -23.45    | 37.65                 | 14.20     | 26.30    | V                  |
|                                 | 18900   | 1880.0          | -22.06    | 37.58                 | 15.52     | 35.65    |                    |
|                                 | 19150   | 1905.0          | -21.67    | 37.48                 | 15.81     | 38.11    |                    |

| LTE Band 2                       |         |                 |           |                       |           |          |                    |
|----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 10MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                | 18650   | 1855.0          | -19.10    | 36.57                 | 17.47     | 55.85    | H                  |
|                                  | 18900   | 1880.0          | -19.93    | 37.22                 | 17.29     | 53.58    |                    |
|                                  | 19150   | 1905.0          | -20.49    | 37.18                 | 16.69     | 46.67    |                    |
|                                  | 18650   | 1855.0          | -24.26    | 37.65                 | 13.39     | 21.83    | V                  |
|                                  | 18900   | 1880.0          | -23.78    | 37.58                 | 13.80     | 23.99    |                    |
|                                  | 19150   | 1905.0          | -23.60    | 37.48                 | 13.88     | 24.43    |                    |

| LTE Band 2                      |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 15MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 18675   | 1857.5          | -18.70    | 36.57                 | 17.87     | 61.24    | H                  |
|                                 | 18900   | 1880.0          | -18.61    | 37.22                 | 18.61     | 72.61    |                    |
|                                 | 19125   | 1902.5          | -19.85    | 37.18                 | 17.33     | 54.08    |                    |
|                                 | 18675   | 1857.5          | -23.87    | 37.65                 | 13.78     | 23.88    | V                  |
|                                 | 18900   | 1880.0          | -22.55    | 37.58                 | 15.03     | 31.84    |                    |
|                                 | 19125   | 1902.5          | -22.99    | 37.48                 | 14.49     | 28.12    |                    |

| LTE Band 2                       |         |                 |           |                       |           |          |                    |
|----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 15MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                | 18675   | 1857.5          | -20.21    | 36.57                 | 16.36     | 43.25    | H                  |
|                                  | 18900   | 1880.0          | -20.26    | 37.22                 | 16.96     | 49.66    |                    |
|                                  | 19125   | 1902.5          | -20.71    | 37.18                 | 16.47     | 44.36    |                    |
|                                  | 18675   | 1857.5          | -25.38    | 37.65                 | 12.27     | 16.87    | V                  |
|                                  | 18900   | 1880.0          | -24.21    | 37.58                 | 13.37     | 21.73    |                    |
|                                  | 19125   | 1902.5          | -23.86    | 37.48                 | 13.62     | 23.01    |                    |

| LTE Band 2                      |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 20MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 18700   | 1860.0          | -18.97    | 36.57                 | 17.60     | 57.54    | H                  |
|                                 | 18900   | 1880.0          | -19.33    | 37.22                 | 17.89     | 61.52    |                    |
|                                 | 19100   | 1900.0          | -20.41    | 37.18                 | 16.77     | 47.53    |                    |
|                                 | 18700   | 1860.0          | -24.13    | 37.65                 | 13.52     | 22.49    | V                  |
|                                 | 18900   | 1880.0          | -23.20    | 37.58                 | 14.38     | 27.42    |                    |
|                                 | 19100   | 1900.0          | -23.74    | 37.48                 | 13.74     | 23.66    |                    |

| LTE Band 2                       |         |                 |           |                       |           |          |                    |
|----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 20MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                | 18700   | 1860.0          | -20.33    | 36.57                 | 16.24     | 42.07    | H                  |
|                                  | 18900   | 1880.0          | -20.86    | 37.22                 | 16.36     | 43.25    |                    |
|                                  | 19100   | 1900.0          | -21.17    | 37.18                 | 16.01     | 39.90    |                    |
|                                  | 18700   | 1860.0          | -25.49    | 37.65                 | 12.16     | 16.44    | V                  |
|                                  | 18900   | 1880.0          | -24.72    | 37.58                 | 12.86     | 19.32    |                    |
|                                  | 19100   | 1900.0          | -24.50    | 37.48                 | 12.98     | 19.86    |                    |

| LTE Band 25                      |         |                 |           |                       |           |          |                    |
|----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 1.4MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                | 26047   | 1850.7          | -17.41    | 36.57                 | 19.16     | 82.41    | H                  |
|                                  | 26365   | 1882.5          | -18.34    | 37.22                 | 18.88     | 77.27    |                    |
|                                  | 26683   | 1914.3          | -18.70    | 37.18                 | 18.48     | 70.47    |                    |
|                                  | 26047   | 1850.7          | -22.45    | 37.65                 | 15.20     | 33.11    | V                  |
|                                  | 26365   | 1882.5          | -21.84    | 37.58                 | 15.74     | 37.50    |                    |
|                                  | 26683   | 1914.3          | -21.65    | 37.48                 | 15.83     | 38.28    |                    |

| LTE Band 25                       |         |                 |           |                       |           |          |                    |
|-----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 1.4MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                             | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                 | 26047   | 1850.7          | -19.20    | 36.57                 | 17.37     | 54.58    | H                  |
|                                   | 26365   | 1882.5          | -20.00    | 37.22                 | 17.22     | 52.72    |                    |
|                                   | 26683   | 1914.3          | -19.59    | 37.18                 | 17.59     | 57.41    |                    |
|                                   | 26047   | 1850.7          | -24.27    | 37.65                 | 13.38     | 21.78    | V                  |
|                                   | 26365   | 1882.5          | -23.50    | 37.58                 | 14.08     | 25.59    |                    |
|                                   | 26683   | 1914.3          | -22.54    | 37.48                 | 14.94     | 31.19    |                    |

| LTE Band 25                    |         |                 |           |                       |           |          |                    |
|--------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 3MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                          | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                              | 26055   | 1851.5          | -17.52    | 36.57                 | 19.05     | 80.35    | H                  |
|                                | 26365   | 1882.5          | -18.38    | 37.22                 | 18.84     | 76.56    |                    |
|                                | 26675   | 1913.5          | -19.09    | 37.18                 | 18.09     | 64.42    |                    |
|                                | 26055   | 1851.5          | -22.63    | 37.65                 | 15.02     | 31.77    | V                  |
|                                | 26365   | 1882.5          | -21.91    | 37.58                 | 15.67     | 36.90    |                    |
|                                | 26675   | 1913.5          | -21.84    | 37.48                 | 15.64     | 36.64    |                    |

| LTE Band 25                     |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 3MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 26055   | 1851.5          | -19.42    | 36.57                 | 17.15     | 51.88    | H                  |
|                                 | 26365   | 1882.5          | -20.13    | 37.22                 | 17.09     | 51.17    |                    |
|                                 | 26675   | 1913.5          | -20.78    | 37.18                 | 16.40     | 43.65    |                    |
|                                 | 26055   | 1851.5          | -24.46    | 37.65                 | 13.19     | 20.84    | V                  |
|                                 | 26365   | 1882.5          | -23.64    | 37.58                 | 13.94     | 24.77    |                    |
|                                 | 26675   | 1913.5          | -23.48    | 37.48                 | 14.00     | 25.12    |                    |

| LTE Band 25                    |         |                 |           |                       |           |          |                    |
|--------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 5MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                          | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                              | 26065   | 1852.5          | -17.96    | 36.57                 | 18.61     | 72.61    | H                  |
|                                | 26365   | 1882.5          | -18.54    | 37.22                 | 18.68     | 73.79    |                    |
|                                | 26665   | 1912.5          | -19.52    | 37.18                 | 17.66     | 58.34    |                    |
|                                | 26065   | 1852.5          | -23.07    | 37.65                 | 14.58     | 28.71    | V                  |
|                                | 26365   | 1882.5          | -22.07    | 37.58                 | 15.51     | 35.56    |                    |
|                                | 26665   | 1912.5          | -22.31    | 37.48                 | 15.17     | 32.89    |                    |

| LTE Band 25                     |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 5MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 26065   | 1852.5          | -19.73    | 36.57                 | 16.84     | 48.31    | H                  |
|                                 | 26365   | 1882.5          | -20.25    | 37.22                 | 16.97     | 49.77    |                    |
|                                 | 26665   | 1912.5          | -20.33    | 37.18                 | 16.85     | 48.42    |                    |
|                                 | 26065   | 1852.5          | -24.85    | 37.65                 | 12.80     | 19.05    | V                  |
|                                 | 26365   | 1882.5          | -23.80    | 37.58                 | 13.78     | 23.88    |                    |
|                                 | 26665   | 1912.5          | -23.13    | 37.48                 | 14.35     | 27.23    |                    |

| LTE Band 25                     |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 10MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 26090   | 1855.0          | -18.37    | 36.57                 | 18.20     | 66.07    | H                  |
|                                 | 26365   | 1882.5          | -18.69    | 37.22                 | 18.53     | 71.29    |                    |
|                                 | 26640   | 1910.0          | -18.79    | 37.18                 | 18.39     | 69.02    |                    |
|                                 | 26090   | 1855.0          | -23.51    | 37.65                 | 14.14     | 25.94    | V                  |
|                                 | 26365   | 1882.5          | -22.31    | 37.58                 | 15.27     | 33.65    |                    |
|                                 | 26640   | 1910.0          | -21.83    | 37.48                 | 15.65     | 36.73    |                    |

| LTE Band 25                      |         |                 |           |                       |           |          |                    |
|----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 10MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                | 26090   | 1855.0          | -20.25    | 36.57                 | 16.32     | 42.85    | H                  |
|                                  | 26365   | 1882.5          | -20.58    | 37.22                 | 16.64     | 46.13    |                    |
|                                  | 26640   | 1910.0          | -20.65    | 37.18                 | 16.53     | 44.98    |                    |
|                                  | 26090   | 1855.0          | -25.37    | 37.65                 | 12.28     | 16.90    | V                  |
|                                  | 26365   | 1882.5          | -24.20    | 37.58                 | 13.38     | 21.78    |                    |
|                                  | 26640   | 1910.0          | -23.68    | 37.48                 | 13.80     | 23.99    |                    |



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| LTE Band 25                     |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 15MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 26115   | 1857.5          | -18.78    | 36.57                 | 17.79     | 60.12    | H                  |
|                                 | 26365   | 1882.5          | -19.01    | 37.22                 | 18.21     | 66.22    |                    |
|                                 | 26615   | 1907.5          | -19.16    | 37.18                 | 18.02     | 63.39    |                    |
|                                 | 26115   | 1857.5          | -23.92    | 37.65                 | 13.73     | 23.60    | V                  |
|                                 | 26365   | 1882.5          | -22.75    | 37.58                 | 14.83     | 30.41    |                    |
|                                 | 26615   | 1907.5          | -22.03    | 37.48                 | 15.45     | 35.08    |                    |

| LTE Band 25                      |         |                 |           |                       |           |          |                    |
|----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 15MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                | 26115   | 1857.5          | -20.73    | 36.57                 | 15.84     | 38.37    | H                  |
|                                  | 26365   | 1882.5          | -20.76    | 37.22                 | 16.46     | 44.26    |                    |
|                                  | 26615   | 1907.5          | -19.86    | 37.18                 | 17.32     | 53.95    |                    |
|                                  | 26115   | 1857.5          | -25.87    | 37.65                 | 11.78     | 15.07    | V                  |
|                                  | 26365   | 1882.5          | -24.57    | 37.58                 | 13.01     | 20.00    |                    |
|                                  | 26615   | 1907.5          | -22.90    | 37.48                 | 14.58     | 28.71    |                    |

| LTE Band 25                     |         |                 |           |                       |           |          |                    |
|---------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 20MHz / QPSK |         |                 |           |                       |           |          |                    |
| Plane                           | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                               | 26140   | 1860.0          | -19.10    | 36.57                 | 17.47     | 55.85    | H                  |
|                                 | 26365   | 1882.5          | -18.82    | 37.22                 | 18.40     | 69.18    |                    |
|                                 | 26590   | 1905.0          | -20.33    | 37.18                 | 16.85     | 48.42    |                    |
|                                 | 26140   | 1860.0          | -24.24    | 37.65                 | 13.41     | 21.93    | V                  |
|                                 | 26365   | 1882.5          | -22.73    | 37.58                 | 14.85     | 30.55    |                    |
|                                 | 26590   | 1905.0          | -23.42    | 37.48                 | 14.06     | 25.47    |                    |



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| LTE Band 25                      |         |                 |           |                       |           |          |                    |
|----------------------------------|---------|-----------------|-----------|-----------------------|-----------|----------|--------------------|
| Channel Bandwidth: 20MHz / 16QAM |         |                 |           |                       |           |          |                    |
| Plane                            | Channel | Frequency (MHz) | LVL (dBm) | Correction Factor(dB) | EIRP(dBm) | EIRP(mW) | Polarization (H/V) |
| Z                                | 26140   | 1860.0          | -19.85    | 36.57                 | 16.72     | 46.99    | H                  |
|                                  | 26365   | 1882.5          | -20.71    | 37.22                 | 16.51     | 44.77    |                    |
|                                  | 26590   | 1905.0          | -21.90    | 37.18                 | 15.28     | 33.73    |                    |
|                                  | 26140   | 1860.0          | -24.98    | 37.65                 | 12.67     | 18.49    | V                  |
|                                  | 26365   | 1882.5          | -24.63    | 37.58                 | 12.95     | 19.72    |                    |
|                                  | 26590   | 1905.0          | -24.98    | 37.48                 | 12.50     | 17.78    |                    |

## 4.2 Frequency Stability Measurement

### 4.2.1 Limits of Frequency Stability Measurement

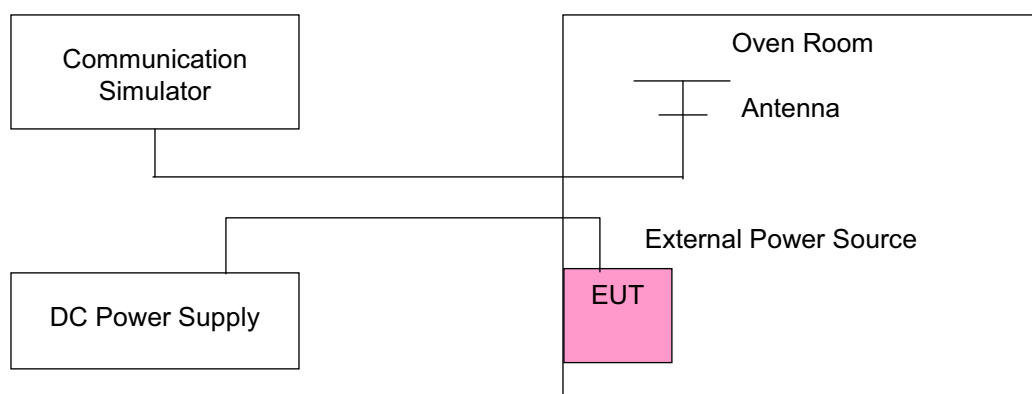
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 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  $\pm 0.5$  °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

| Voltage<br>(Volts) | Frequency Error (ppm) |            |         |         |         |         |         | Limit (ppm) |
|--------------------|-----------------------|------------|---------|---------|---------|---------|---------|-------------|
|                    | CDMA                  | LTE Band 2 |         |         |         |         |         |             |
|                    |                       | 1.4MHz     | 3MHz    | 5MHz    | 10MHz   | 15MHz   | 20MHz   |             |
| 3.85               | 0.001                 | 0.00138    | 0.00155 | 0.00155 | 0.00057 | 0.00034 | 0.00039 | 2.5         |
| 3.6                | 0.001                 | 0.00189    | 0.00002 | 0.00106 | 0.00120 | 0.00004 | 0.00082 | 2.5         |
| 4.4                | -0.001                | 0.00148    | 0.00074 | 0.00178 | 0.00081 | 0.00097 | 0.00051 | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.4Vdc.

##### Frequency Error vs. Temperature

| Temp. (°C) | Frequency Error (ppm) |            |          |          |          |          |          | Limit (ppm) |
|------------|-----------------------|------------|----------|----------|----------|----------|----------|-------------|
|            | CDMA                  | LTE Band 2 |          |          |          |          |          |             |
|            |                       | 1.4MHz     | 3MHz     | 5MHz     | 10MHz    | 15MHz    | 20MHz    |             |
| -30        | 0.001                 | 0.00206    | 0.00093  | 0.00131  | 0.00055  | 0.00006  | 0.00137  | 2.5         |
| -20        | -0.001                | 0.00156    | 0.00020  | 0.00204  | 0.00098  | 0.00011  | 0.00006  | 2.5         |
| -10        | 0.001                 | 0.00210    | 0.00014  | 0.00055  | 0.00081  | 0.00154  | 0.00156  | 2.5         |
| 0          | 0.001                 | 0.00202    | 0.00210  | 0.00207  | 0.00093  | 0.00043  | 0.00054  | 2.5         |
| 10         | -0.001                | 0.00055    | 0.00028  | 0.00035  | 0.00014  | 0.00007  | 0.00004  | 2.5         |
| 20         | -0.002                | -0.00040   | -0.00158 | -0.00112 | -0.00098 | -0.00061 | -0.00046 | 2.5         |
| 30         | 0.002                 | -0.00141   | -0.00085 | -0.00022 | -0.00071 | -0.00089 | -0.00179 | 2.5         |
| 40         | -0.001                | -0.00052   | -0.00039 | -0.00128 | -0.00122 | -0.00067 | -0.00212 | 2.5         |
| 50         | -0.001                | -0.00076   | -0.00171 | -0.00152 | -0.00059 | -0.00173 | -0.00209 | 2.5         |
| 60         | -0.001                | -0.00207   | -0.00188 | -0.00139 | -0.00173 | -0.00199 | -0.00048 | 2.5         |

### Frequency Error vs. Voltage

| Voltage (Volts) | Frequency Error (ppm) |         |         |         |         |         | Limit (ppm) |
|-----------------|-----------------------|---------|---------|---------|---------|---------|-------------|
|                 | LTE Band 25           |         |         |         |         |         |             |
|                 | 1.4MHz                | 3MHz    | 5MHz    | 10MHz   | 15MHz   | 20MHz   |             |
| 3.85            | 0.00114               | 0.00063 | 0.00141 | 0.00002 | 0.00155 | 0.00004 | 2.5         |
| 3.6             | 0.00183               | 0.00018 | 0.00114 | 0.00001 | 0.00108 | 0.00063 | 2.5         |
| 4.4             | 0.00070               | 0.00042 | 0.00099 | 0.00039 | 0.00078 | 0.00028 | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.4Vdc.

### Frequency Error vs. Temperature

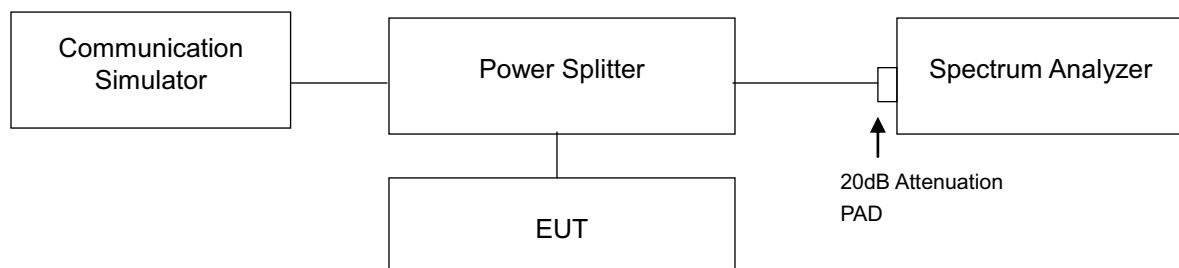
| Temp. (°C) | Frequency Error (ppm) |          |          |          |          |          | Limit (ppm) |
|------------|-----------------------|----------|----------|----------|----------|----------|-------------|
|            | LTE Band 25           |          |          |          |          |          |             |
|            | 1.4MHz                | 3MHz     | 5MHz     | 10MHz    | 15MHz    | 20MHz    |             |
| -30        | 0.00082               | 0.00180  | 0.00018  | 0.00195  | 0.00018  | 0.00159  | 2.5         |
| -20        | 0.00026               | 0.00173  | 0.00017  | 0.00108  | 0.00124  | 0.00168  | 2.5         |
| -10        | 0.00155               | 0.00075  | 0.00048  | 0.00064  | 0.00073  | 0.00002  | 2.5         |
| 0          | 0.00121               | 0.00194  | 0.00052  | 0.00129  | 0.00179  | 0.00147  | 2.5         |
| 10         | 0.00122               | 0.00202  | 0.00084  | 0.00155  | 0.00128  | 0.00006  | 2.5         |
| 20         | -0.00161              | -0.00206 | -0.00206 | -0.00156 | -0.00177 | -0.00011 | 2.5         |
| 30         | -0.00155              | -0.00198 | -0.00160 | -0.00199 | -0.00119 | -0.00211 | 2.5         |
| 40         | -0.00166              | -0.00105 | -0.00055 | -0.00189 | -0.00180 | -0.00044 | 2.5         |
| 50         | -0.00026              | -0.00186 | -0.00159 | -0.00184 | -0.00031 | -0.00189 | 2.5         |
| 60         | -0.00193              | -0.00205 | -0.00161 | -0.00140 | -0.00037 | -0.00203 | 2.5         |

### 4.3 Occupied Bandwidth Measurement

#### 4.3.1 Test Procedure

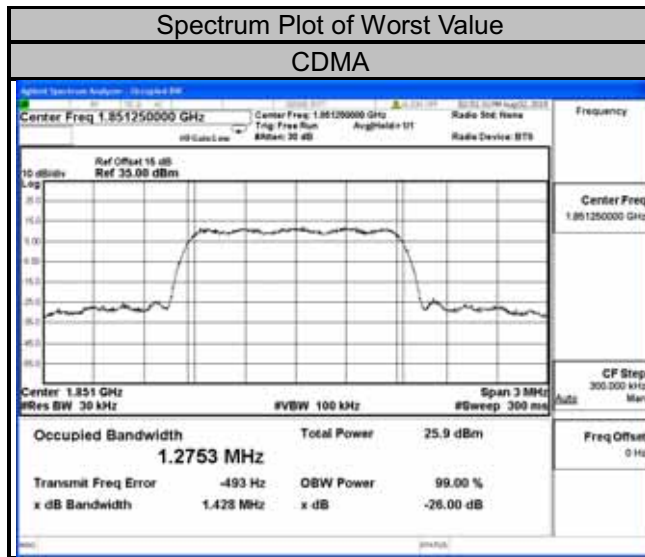
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

#### 4.3.2 Test Setup



#### 4.3.3 Test Result

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) |
|---------|-----------------|------------------------------|
|         |                 | CDMA                         |
| 25      | 1851.25         | 1.2753                       |
| 600     | 1880.00         | 1.2718                       |
| 1175    | 1908.75         | 1.2742                       |





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## LTE Band 2

Channel Bandwidth: 1.4MHz

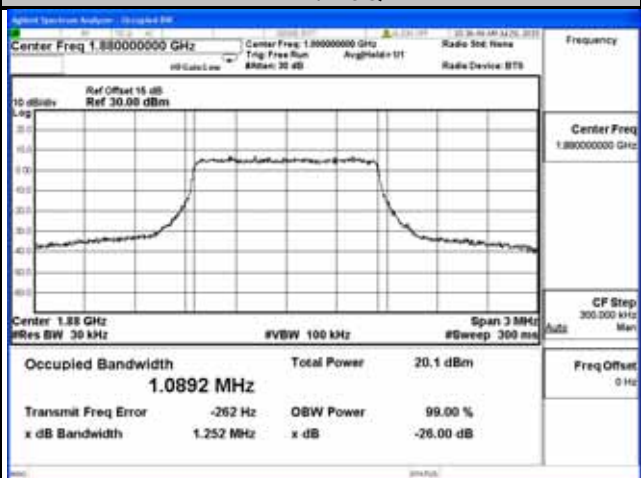
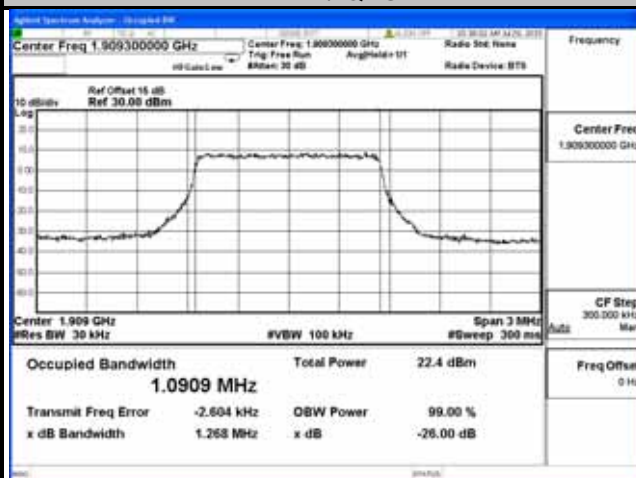
Channel Bandwidth: 3MHz

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        |
|---------|-----------------|------------------------------|--------|---------|-----------------|------------------------------|--------|
|         |                 | QPSK                         | 16QAM  |         |                 | QPSK                         | 16QAM  |
| 18607   | 1850.7          | 1.0896                       | 1.0871 | 18615   | 1851.5          | 2.6941                       | 2.6956 |
| 18900   | 1880.0          | 1.0900                       | 1.0892 | 18900   | 1880.0          | 2.6967                       | 2.6946 |
| 19193   | 1909.3          | 1.0909                       | 1.0881 | 19185   | 1908.5          | 2.6953                       | 2.6943 |

## Spectrum Plot of Worst Value

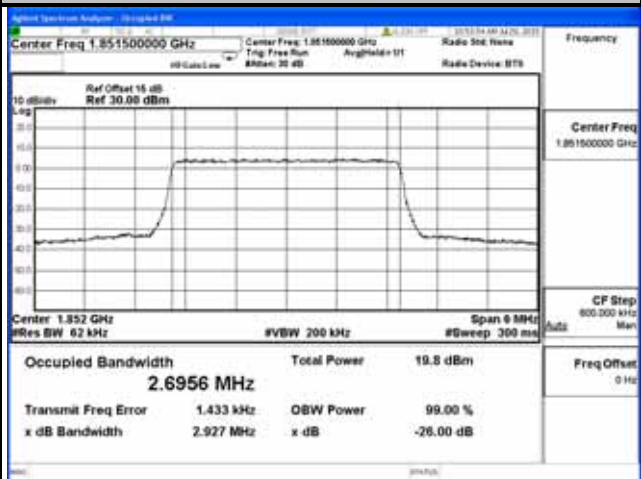
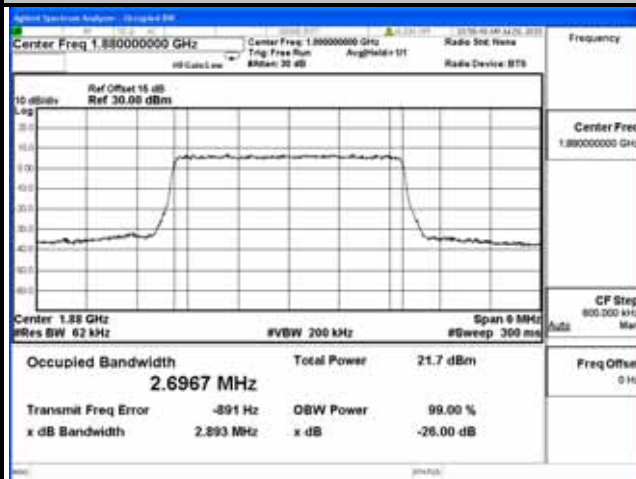
1.4MHz / QPSK

1.4MHz / 16QAM



3MHz / QPSK

3MHz / 16QAM





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## LTE Band 2

Channel Bandwidth: 5MHz

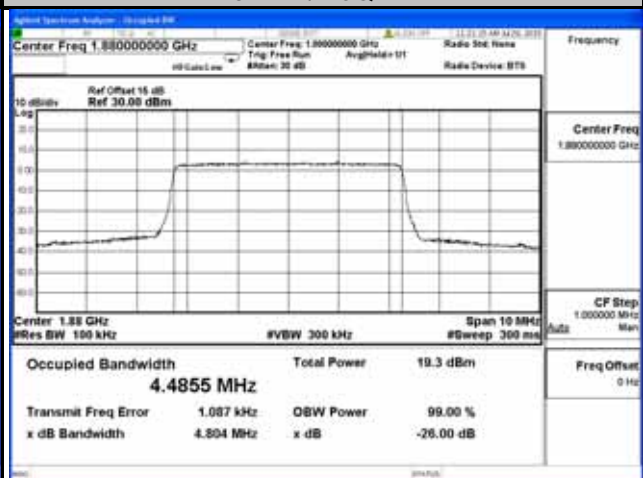
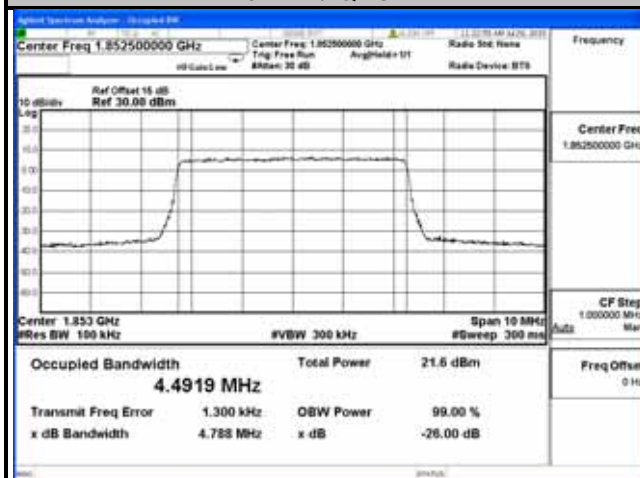
Channel Bandwidth: 10MHz

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        |
|---------|-----------------|------------------------------|--------|---------|-----------------|------------------------------|--------|
|         |                 | QPSK                         | 16QAM  |         |                 | QPSK                         | 16QAM  |
| 18625   | 1852.5          | 4.4919                       | 4.4839 | 18650   | 1855.0          | 8.9494                       | 8.9459 |
| 18900   | 1880.0          | 4.4889                       | 4.4855 | 18900   | 1880.0          | 8.9548                       | 8.9511 |
| 19175   | 1907.5          | 4.4860                       | 4.4852 | 19150   | 1905.0          | 8.9468                       | 8.9482 |

## Spectrum Plot of Worst Value

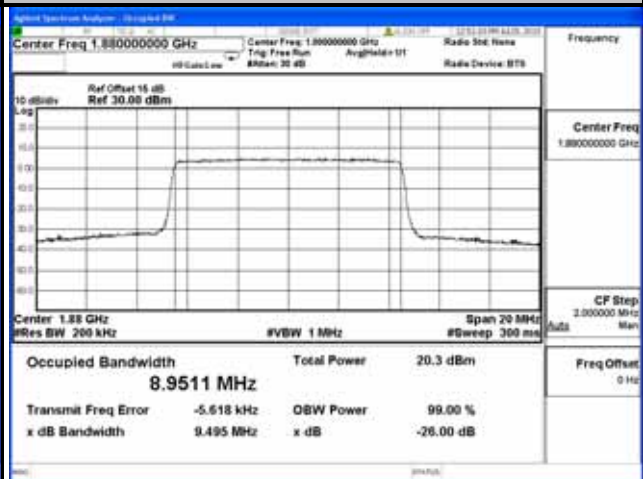
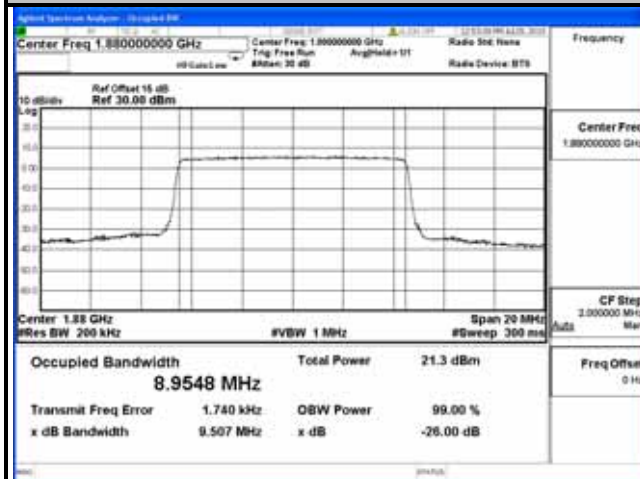
5MHz / QPSK

5MHz / 16QAM



10MHz / QPSK

10MHz / 16QAM





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## LTE Band 2

Channel Bandwidth: 15MHz

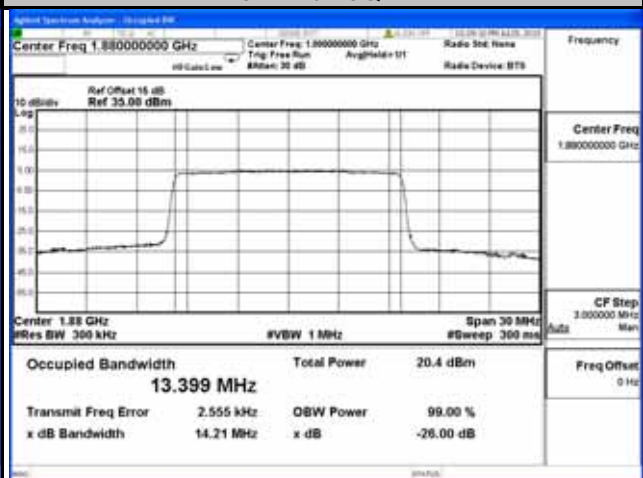
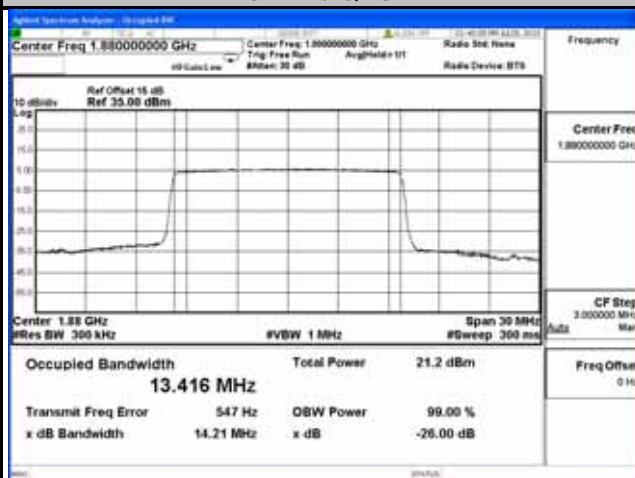
Channel Bandwidth: 20MHz

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        |
|---------|-----------------|------------------------------|--------|---------|-----------------|------------------------------|--------|
|         |                 | QPSK                         | 16QAM  |         |                 | QPSK                         | 16QAM  |
| 18675   | 1857.5          | 13.403                       | 13.395 | 18700   | 1860.0          | 17.846                       | 17.859 |
| 18900   | 1880.0          | 13.416                       | 13.399 | 18900   | 1880.0          | 17.872                       | 17.888 |
| 19125   | 1902.5          | 13.402                       | 13.397 | 19100   | 1900.0          | 17.845                       | 17.860 |

## Spectrum Plot of Worst Value

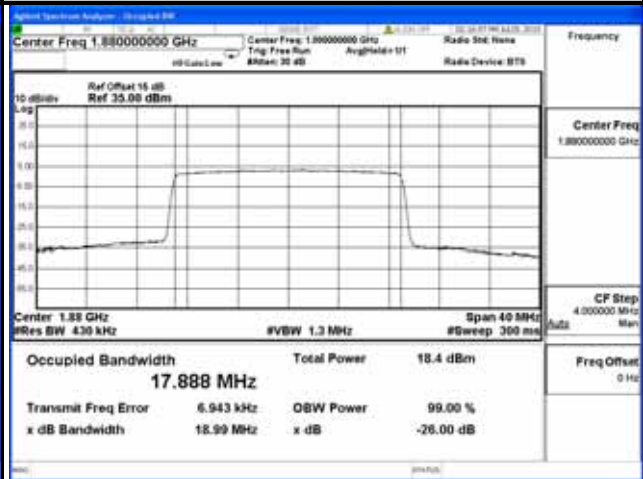
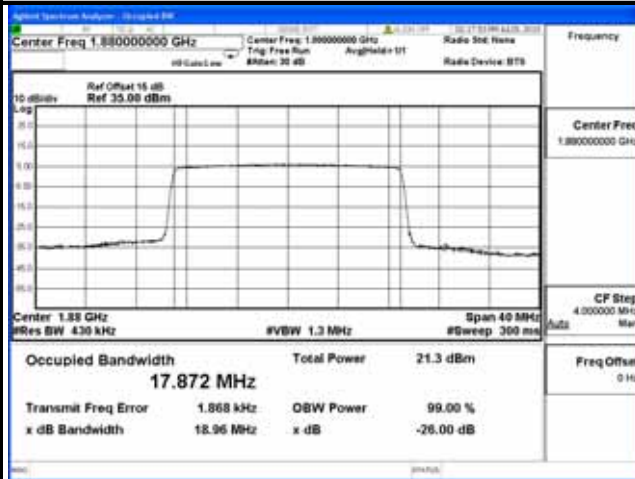
15MHz / QPSK

15MHz / 16QAM



20MHz / QPSK

20MHz / 16QAM





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## LTE Band 25

Channel Bandwidth: 1.4MHz

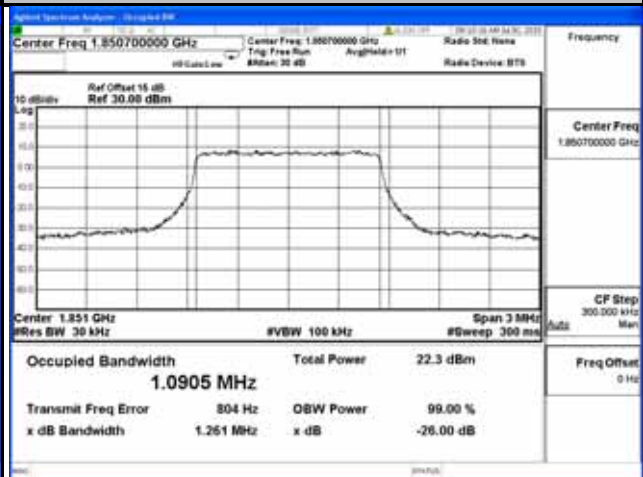
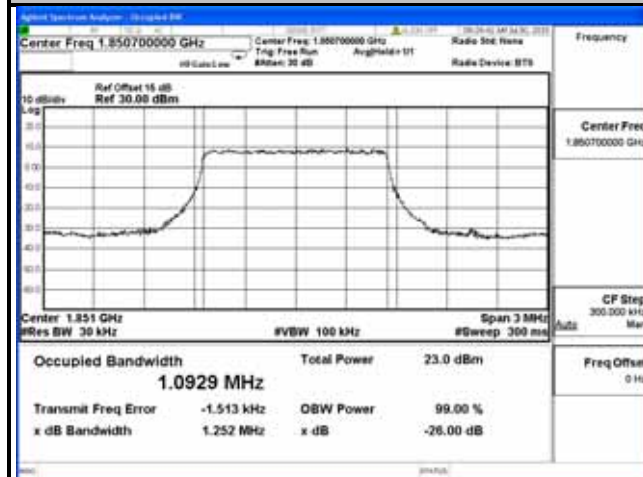
Channel Bandwidth: 3MHz

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        |
|---------|-----------------|------------------------------|--------|---------|-----------------|------------------------------|--------|
|         |                 | QPSK                         | 16QAM  |         |                 | QPSK                         | 16QAM  |
| 26047   | 1850.7          | 1.0929                       | 1.0905 | 26055   | 1851.5          | 2.6934                       | 2.6956 |
| 26365   | 1882.5          | 1.0924                       | 1.0893 | 26365   | 1882.5          | 2.6952                       | 2.6955 |
| 26683   | 1914.3          | 1.0919                       | 1.0893 | 26675   | 1913.5          | 2.6964                       | 2.6948 |

## Spectrum Plot of Worst Value

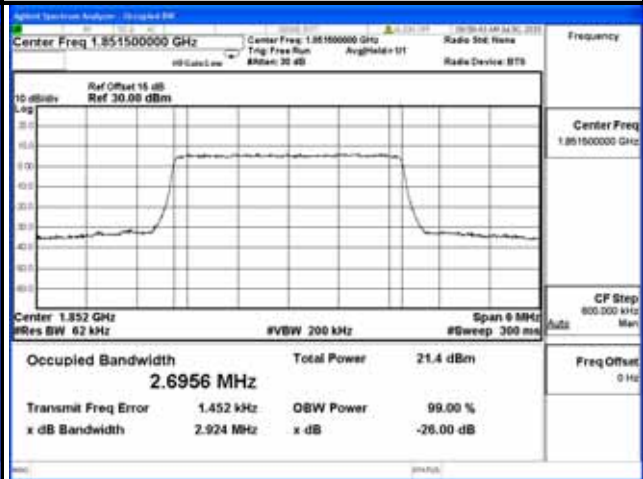
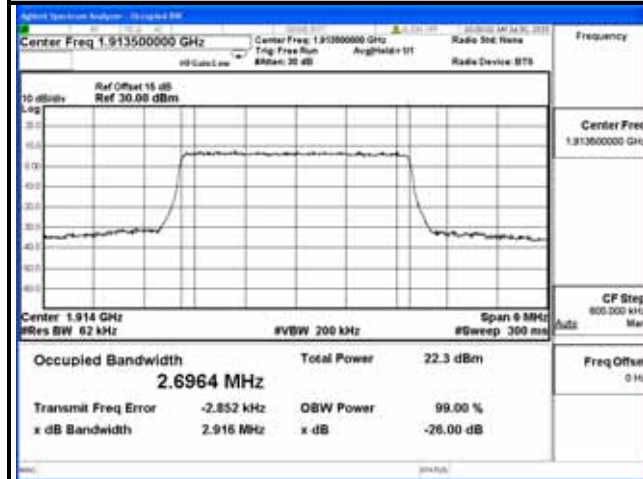
1.4MHz / QPSK

1.4MHz / 16QAM



3MHz / QPSK

3MHz / 16QAM





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## LTE Band 25

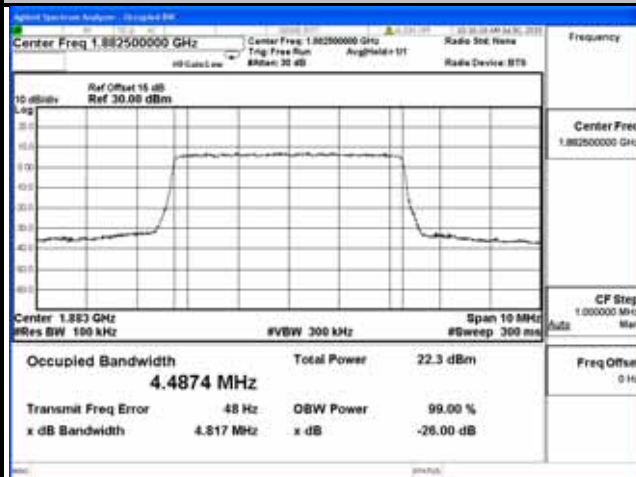
## Channel Bandwidth: 5MHz

## Channel Bandwidth: 10MHz

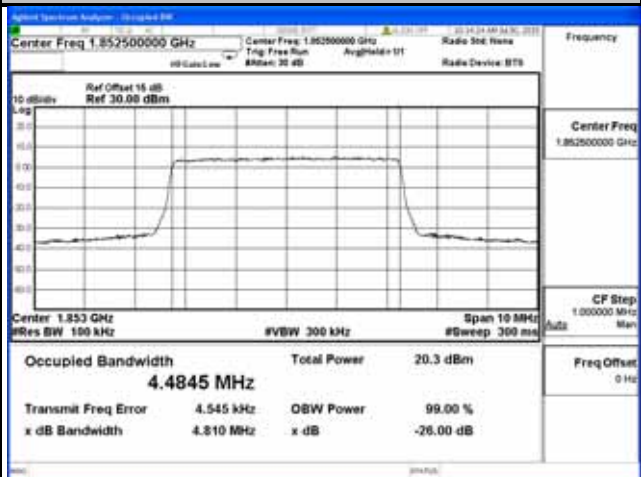
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        |
|---------|-----------------|------------------------------|--------|---------|-----------------|------------------------------|--------|
|         |                 | QPSK                         | 16QAM  |         |                 | QPSK                         | 16QAM  |
| 26065   | 1852.5          | 4.4854                       | 4.4845 | 26090   | 1855.0          | 8.9471                       | 8.9497 |
| 26365   | 1882.5          | 4.4874                       | 4.4837 | 26365   | 1882.5          | 8.9532                       | 8.9583 |
| 26665   | 1912.5          | 4.4841                       | 4.4833 | 26640   | 1910.0          | 8.9469                       | 8.9419 |

## Spectrum Plot of Worst Value

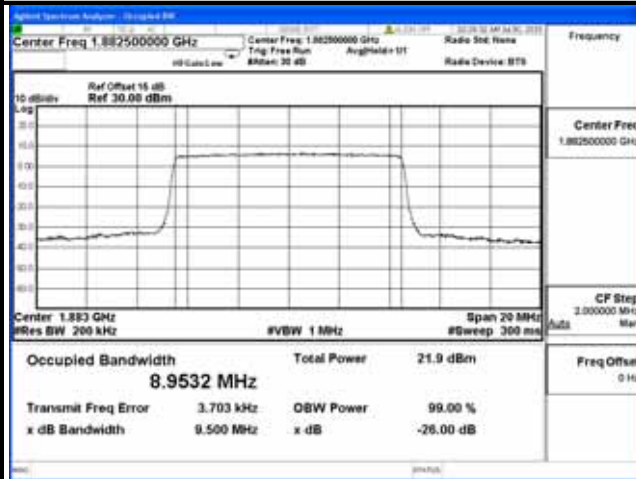
## 5MHz / QPSK



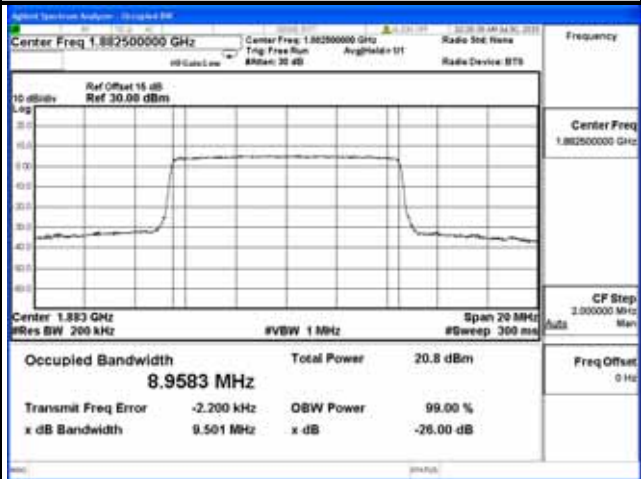
## 5MHz / 16QAM



## 10MHz / QPSK



## 10MHz / 16QAM





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## LTE BAND 25

Channel Bandwidth: 15MHz

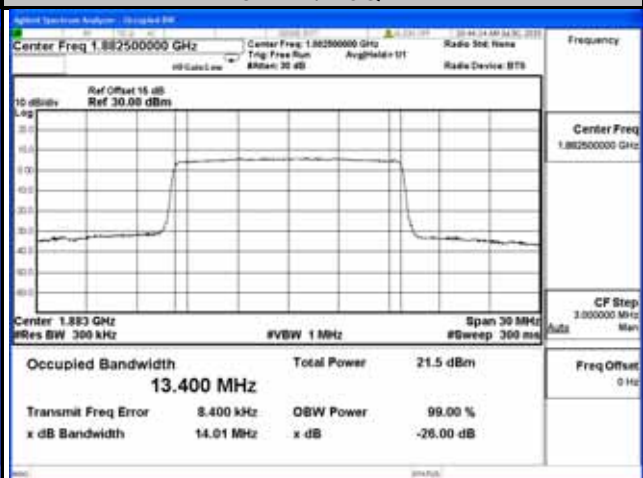
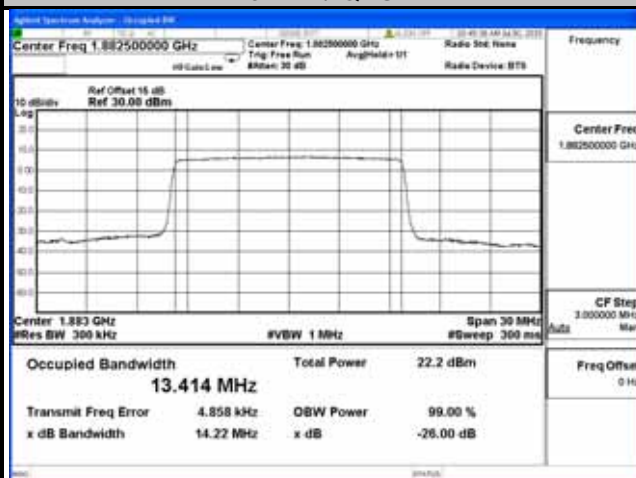
Channel Bandwidth: 20MHz

| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        |
|---------|-----------------|------------------------------|--------|---------|-----------------|------------------------------|--------|
|         |                 | QPSK                         | 16QAM  |         |                 | QPSK                         | 16QAM  |
| 26115   | 1857.5          | 13.407                       | 13.399 | 26140   | 1860            | 17.851                       | 17.856 |
| 26365   | 1882.5          | 13.414                       | 13.400 | 26365   | 1882.5          | 17.869                       | 17.885 |
| 26615   | 1907.5          | 13.402                       | 13.399 | 26590   | 1905            | 17.866                       | 17.878 |

## Spectrum Plot of Worst Value

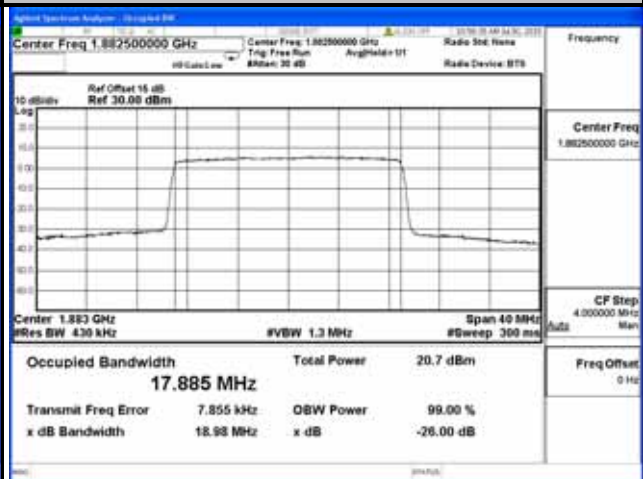
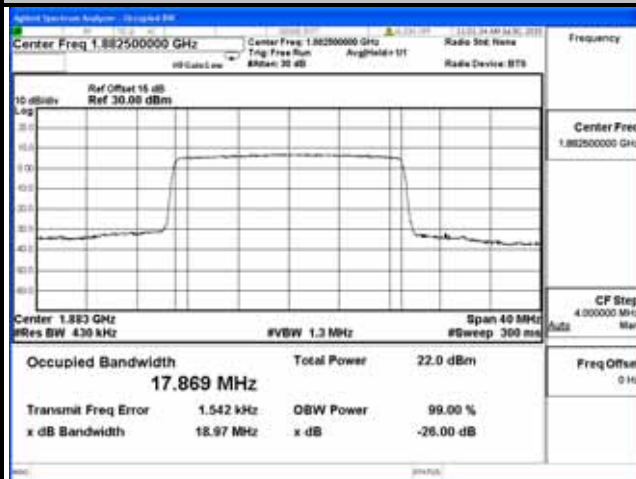
15MHz / QPSK

15MHz / 16QAM



20MHz / QPSK

20MHz / 16QAM

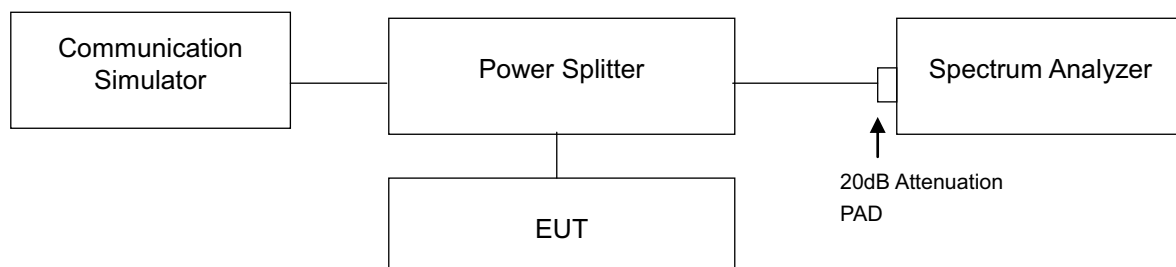


## 4.4 Band Edge Measurement

### 4.4.1 Limits of Band Edge Measurement

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

### 4.4.2 Test Setup



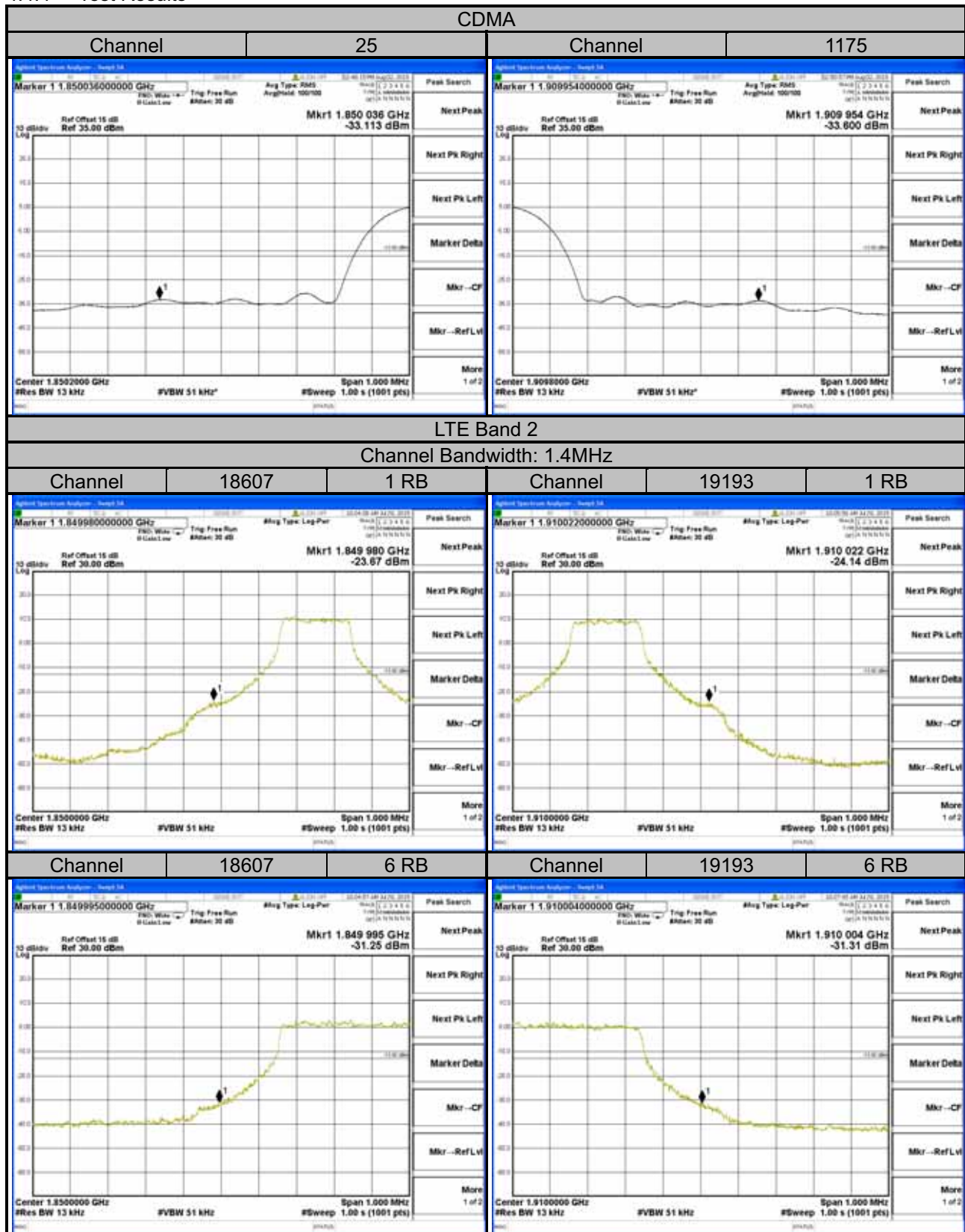
### 4.4.3 Test Procedures

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (CDMA / LTE Bandwidth 1.4MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Bandwidth 3MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 5MHz/10MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Bandwidth 15MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 180kHz and VB of the spectrum is 560kHz (LTE Bandwidth 20MHz).
- Record the max trace plot into the test report.



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## 4.4.4 Test Results





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## LTE Band 2

Channel Bandwidth: 3MHz

Channel

18615

1 RB

Channel

19185

1 RB



Channel

18615

15 RB

Channel

19185

15 RB





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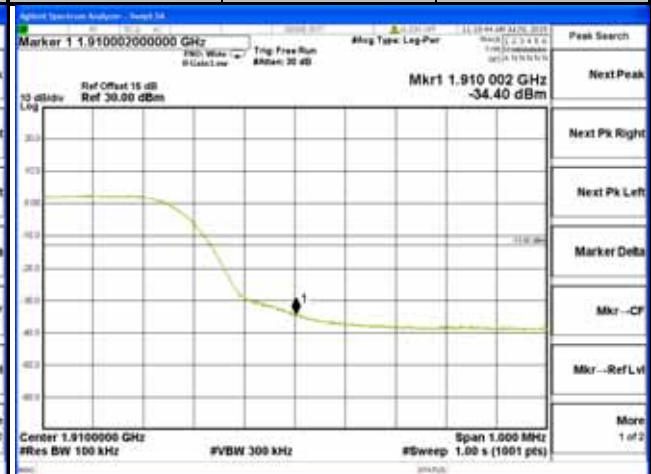
LTE Band 2

Channel Bandwidth: 5MHz

| Channel | 18625 | 1 RB | Channel | 19175 | 1 RB |
|---------|-------|------|---------|-------|------|
|---------|-------|------|---------|-------|------|



| Channel | 18625 | 25 RB | Channel | 19175 | 25 RB |
|---------|-------|-------|---------|-------|-------|
|---------|-------|-------|---------|-------|-------|





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## LTE Band 2

Channel Bandwidth: 10MHz

Channel

18650

1 RB

Channel

19150

1 RB



Channel

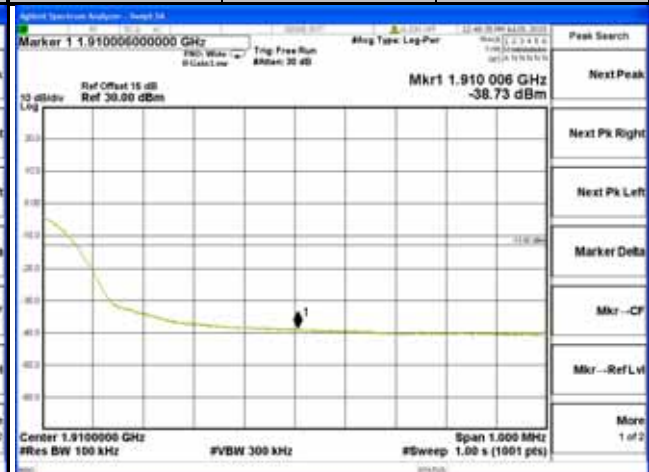
18650

50 RB

Channel

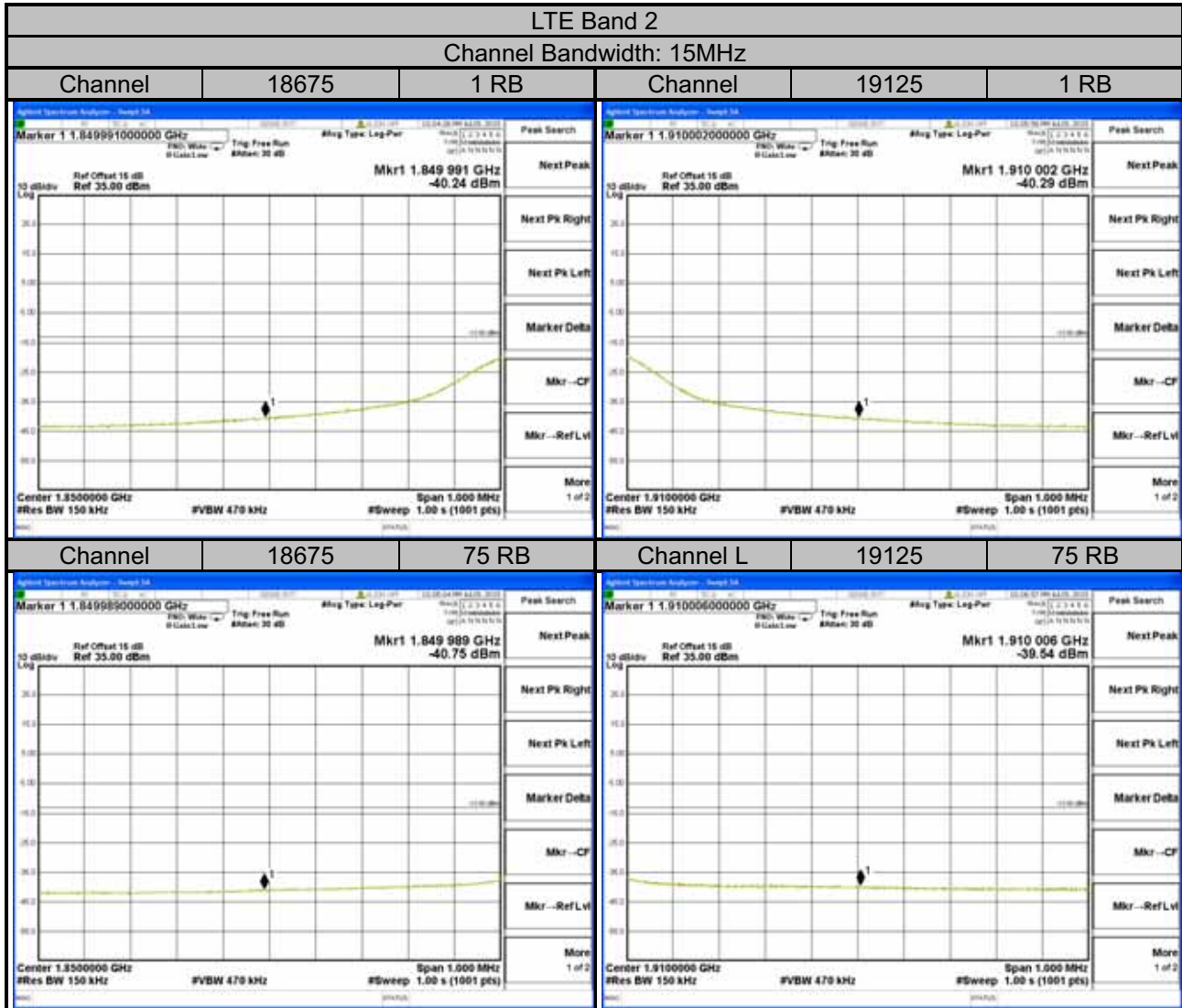
19150

50 RB



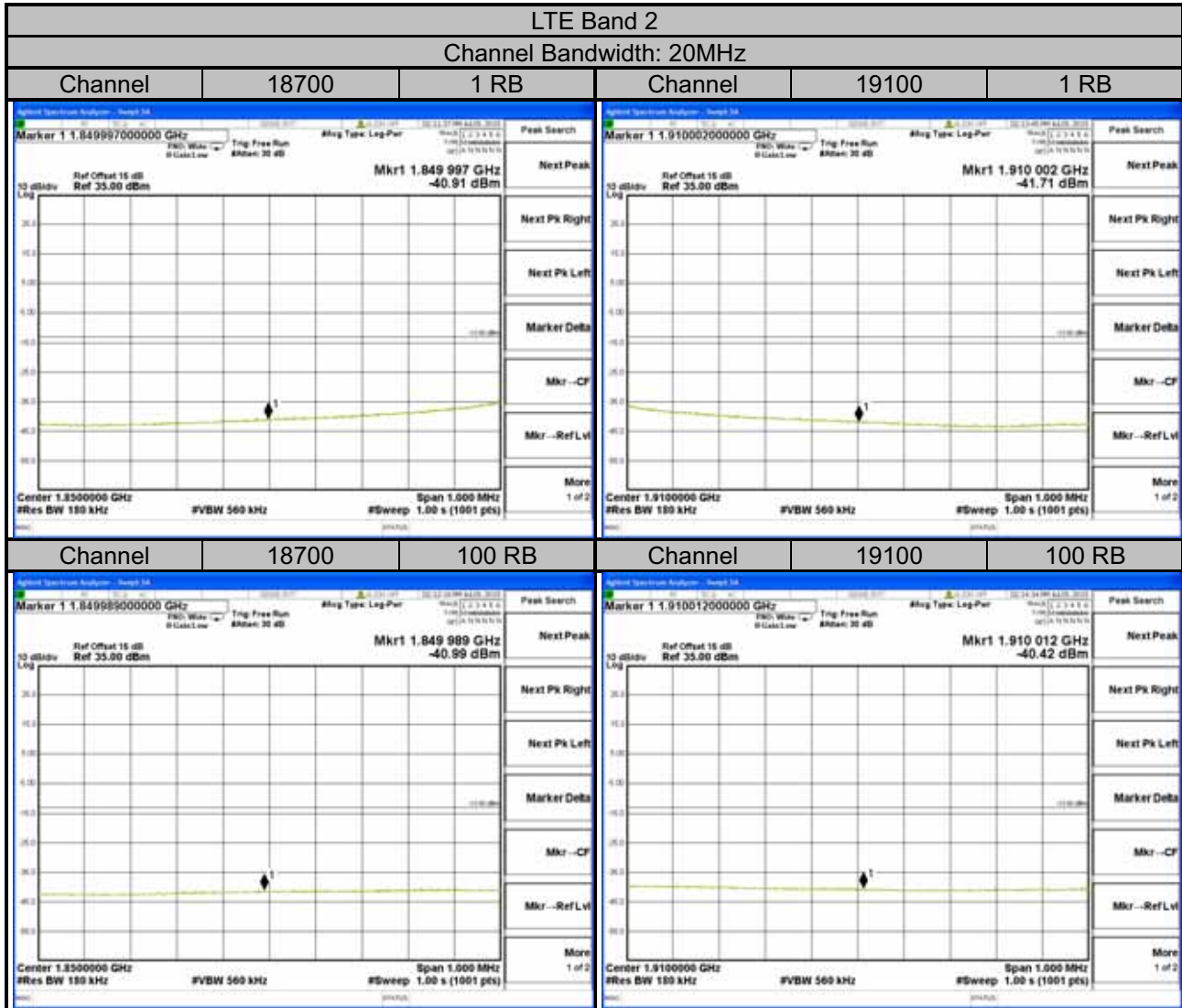


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## LTE Band 25

Channel Bandwidth: 1.4MHz

Channel

26047

1 RB

Channel

26683

1 RB



Channel

26047

6 RB

Channel

26683

6 RB





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## LTE Band 25

Channel Bandwidth: 3MHz

Channel

26055

1 RB

Channel

26675

1 RB



Channel

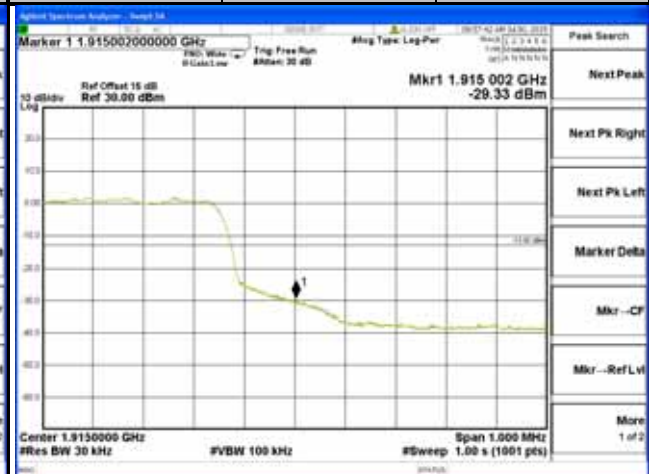
26055

15 RB

Channel

26675

15 RB



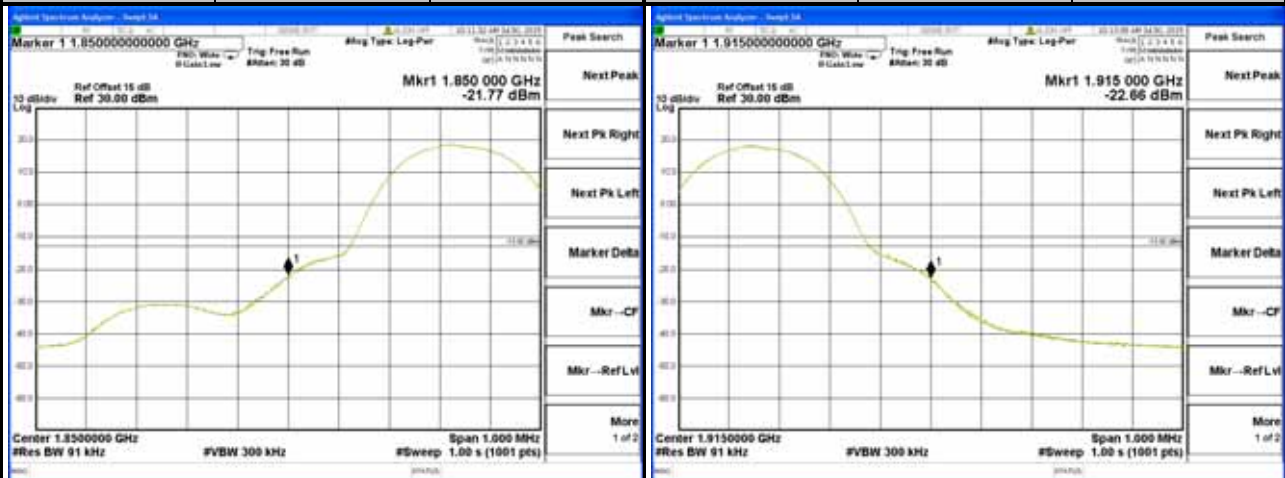


A O T

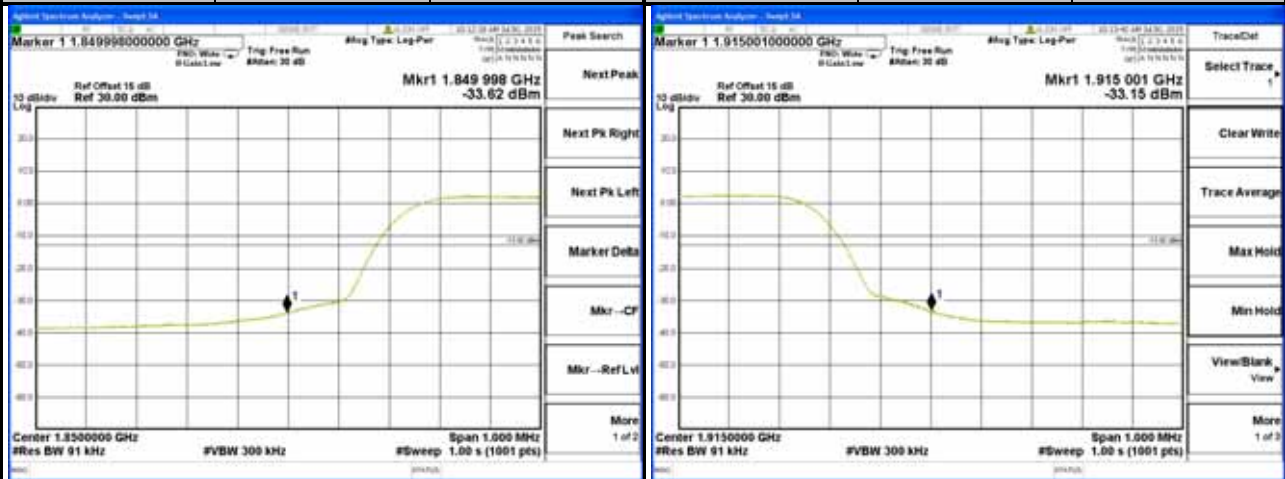
LTE Band 25

Channel Bandwidth: 5MHz

| Channel | 26065 | 1 RB | Channel | 26665 | 1 RB |
|---------|-------|------|---------|-------|------|
|---------|-------|------|---------|-------|------|



| Channel | 26065 | 25 RB | Channel | 26665 | 25 RB |
|---------|-------|-------|---------|-------|-------|
|---------|-------|-------|---------|-------|-------|





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## LTE Band 25

Channel Bandwidth: 10MHz

Channel

26090

1 RB

Channel

26640

1 RB



Channel

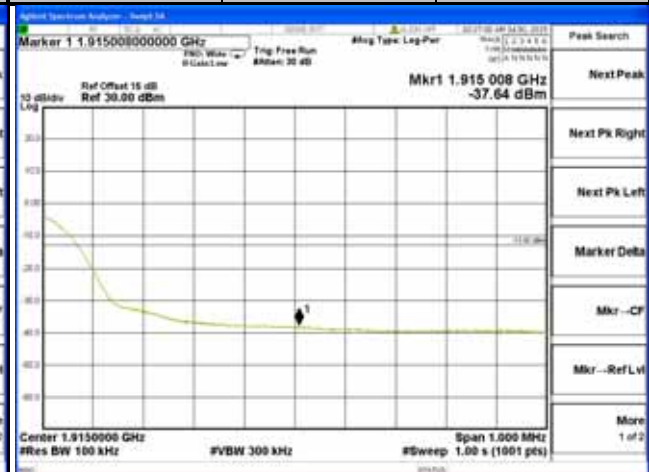
26090

50 RB

Channel

26640

50 RB



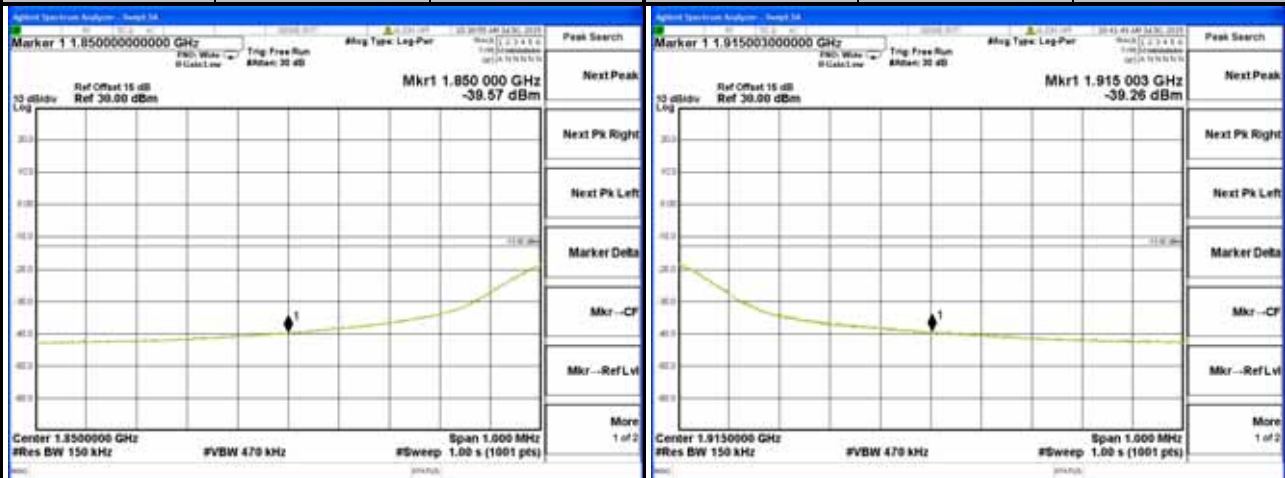


A O T

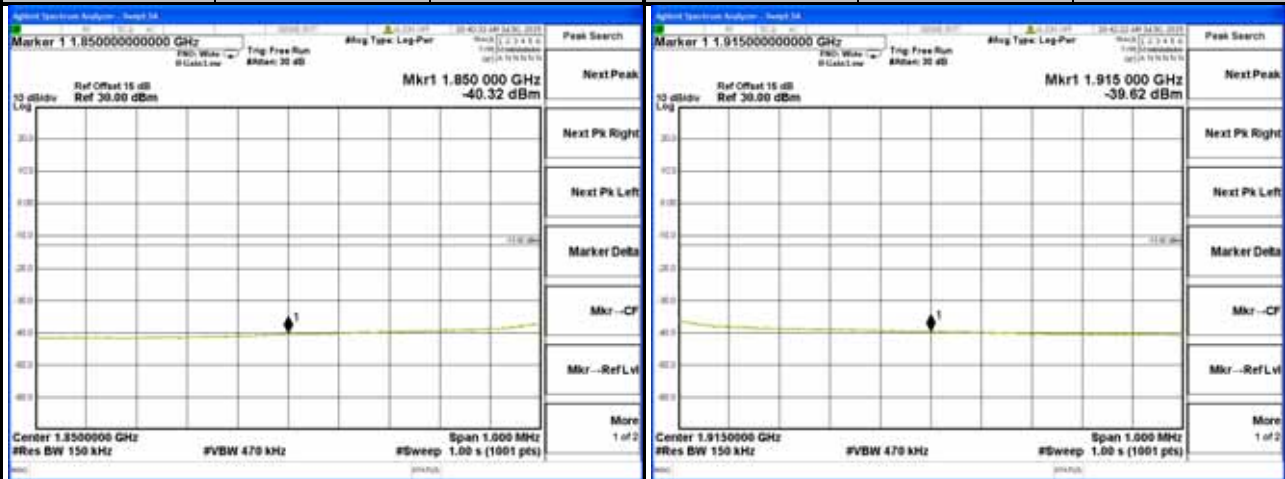
LTE Band 25

Channel Bandwidth: 15MHz

| Channel | 26115 | 1 RB | Channel | 26615 | 1 RB |
|---------|-------|------|---------|-------|------|
|---------|-------|------|---------|-------|------|



| Channel | 26115 | 75 RB | Channel | 26615 | 75 RB |
|---------|-------|-------|---------|-------|-------|
|---------|-------|-------|---------|-------|-------|



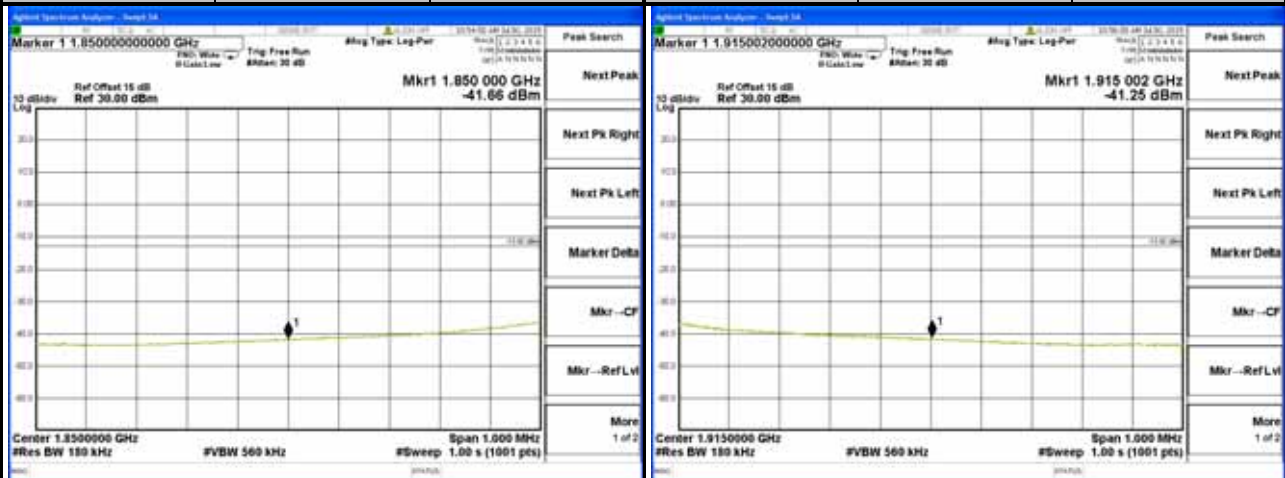


A O T

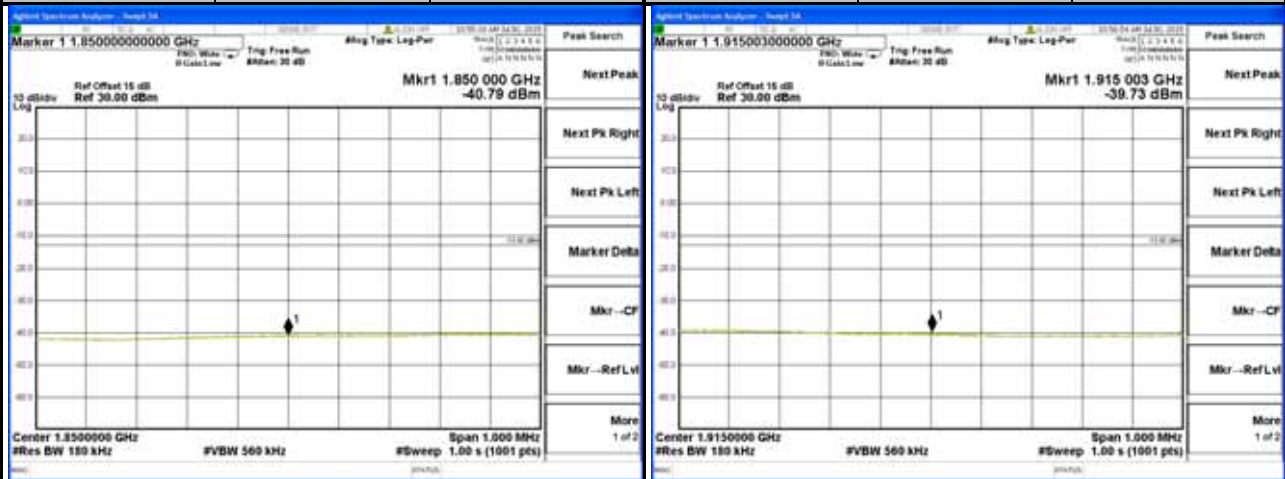
LTE Band 25

Channel Bandwidth: 20MHz

| Channel | 26140 | 1 RB | Channel | 26590 | 1 RB |
|---------|-------|------|---------|-------|------|
|---------|-------|------|---------|-------|------|



| Channel | 26140 | 100 RB | Channel | 26590 | 100 RB |
|---------|-------|--------|---------|-------|--------|
|---------|-------|--------|---------|-------|--------|

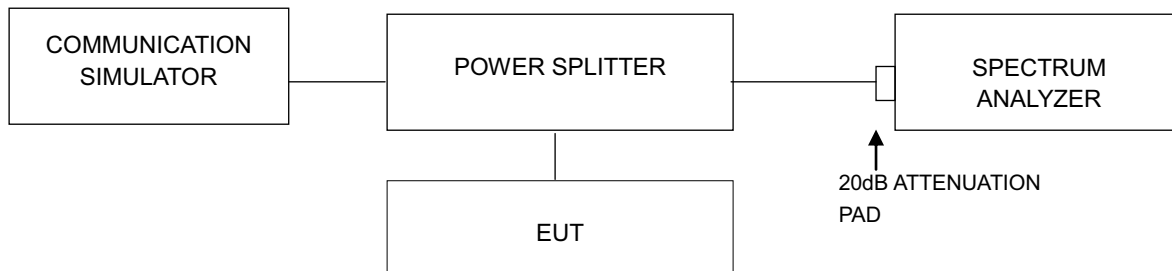


## 4.5 Peak To Average Ratio

### 4.5.1 Limits of Peak to Average Ratio Measurement

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

### 4.5.2 Test Setup

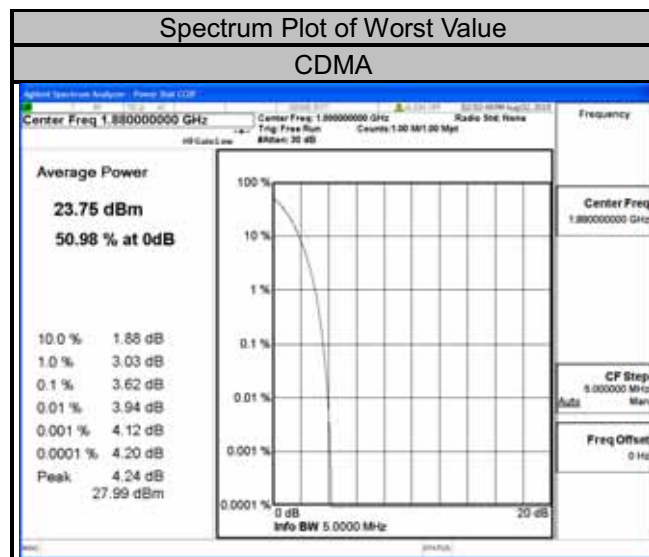


### 4.5.3 Test Procedures

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

#### 4.5.4 Test Results

| Channel | Frequency (MHz) | Peak to Average Ratio (dB) |
|---------|-----------------|----------------------------|
|         |                 | CDMA                       |
| 25      | 1851.25         | 3.14                       |
| 600     | 1880.00         | 3.62                       |
| 1175    | 1908.75         | 3.34                       |





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## LTE Band 2

Channel Bandwidth: 1.4MHz

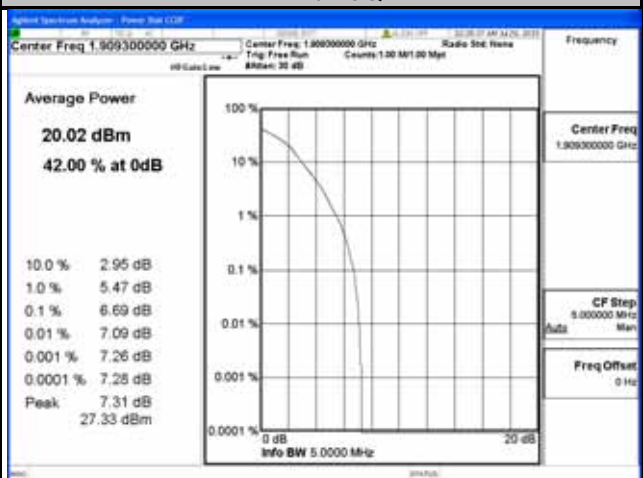
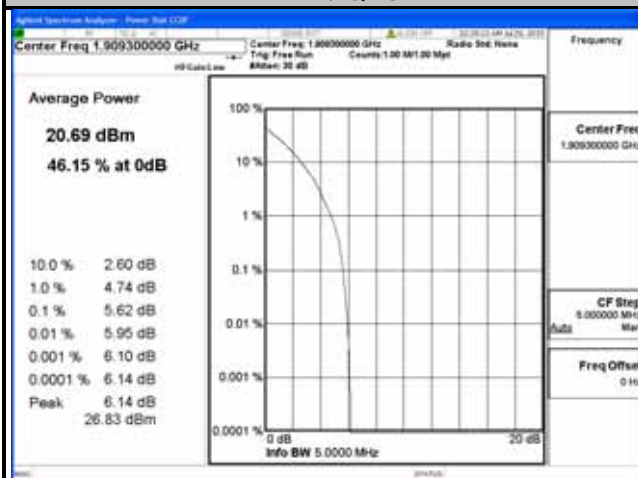
Channel Bandwidth: 3MHz

| Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       | Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       |
|---------|-----------------|----------------------------|-------|---------|-----------------|----------------------------|-------|
|         |                 | QPSK                       | 16QAM |         |                 | QPSK                       | 16QAM |
| 18607   | 1850.7          | 5.06                       | 6.40  | 18615   | 1851.5          | 4.99                       | 6.34  |
| 18900   | 1880.0          | 5.60                       | 6.67  | 18900   | 1880.0          | 5.35                       | 6.67  |
| 19193   | 1909.3          | 5.62                       | 6.69  | 19185   | 1908.5          | 5.25                       | 6.80  |

## Spectrum Plot of Worst Value

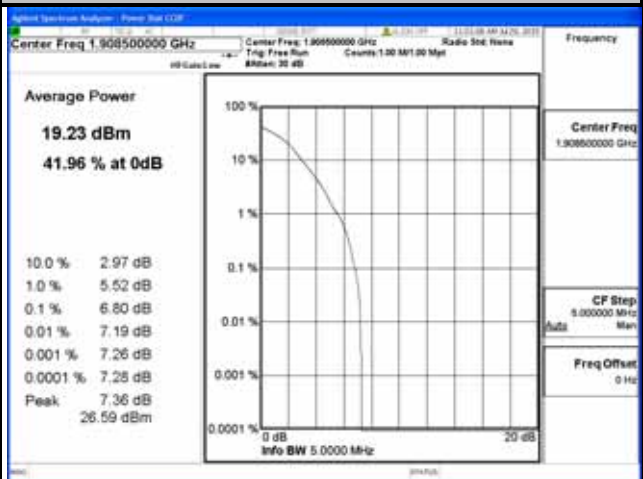
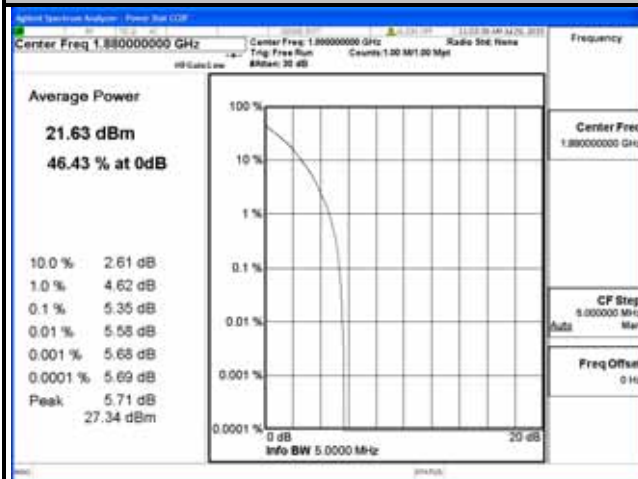
1.4MHz / QPSK

1.4MHz / 16QAM



3MHz / QPSK

3MHz / 16QAM





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## LTE Band 2

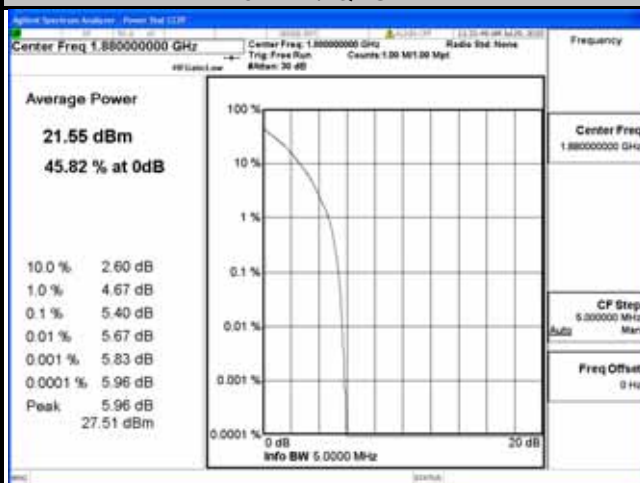
Channel Bandwidth: 5MHz

Channel Bandwidth: 10MHz

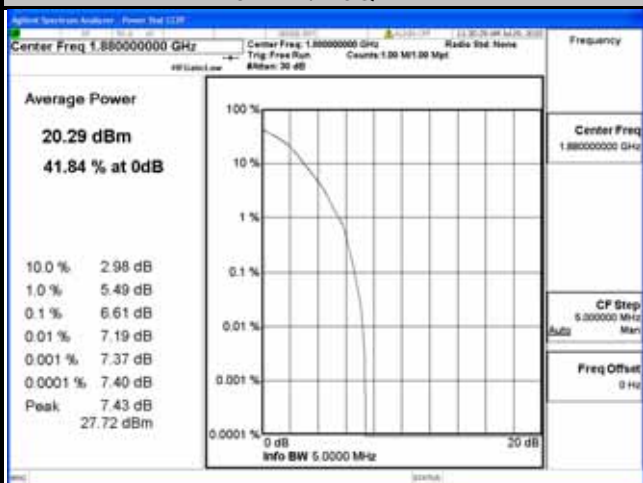
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       | Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       |
|---------|-----------------|----------------------------|-------|---------|-----------------|----------------------------|-------|
|         |                 | QPSK                       | 16QAM |         |                 | QPSK                       | 16QAM |
| 18625   | 1852.5          | 5.13                       | 6.34  | 18650   | 1855.0          | 5.25                       | 6.47  |
| 18900   | 1880.0          | 5.40                       | 6.61  | 18900   | 1880.0          | 5.39                       | 6.74  |
| 19175   | 1907.5          | 5.22                       | 6.49  | 19150   | 1905.0          | 5.17                       | 6.34  |

## Spectrum Plot of Worst Value

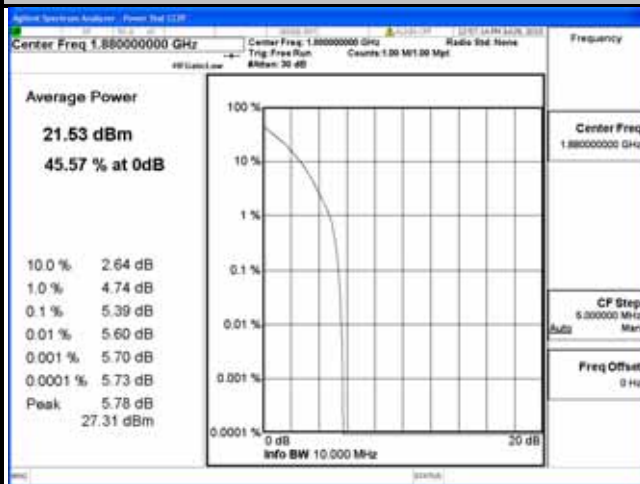
5MHz / QPSK



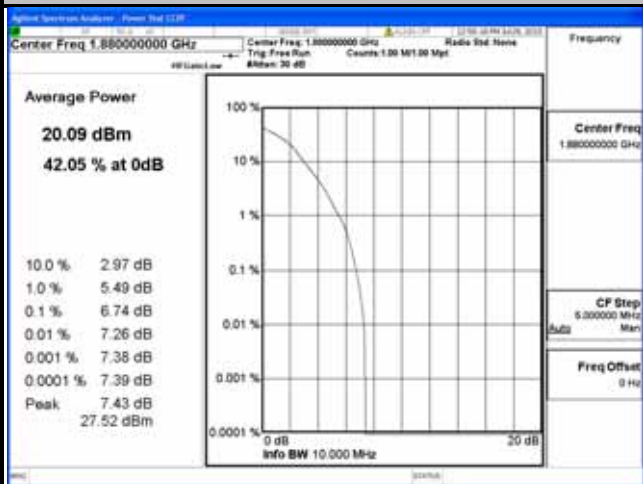
5MHz / 16QAM



10MHz / QPSK



10MHz / 16QAM





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## LTE Band 2

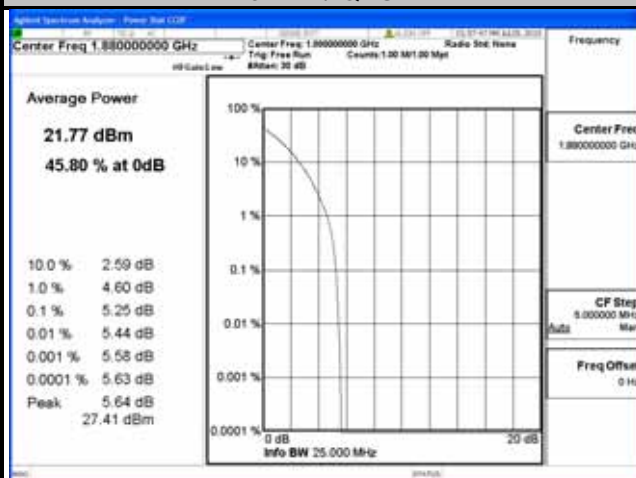
Channel Bandwidth: 15MHz

Channel Bandwidth: 20MHz

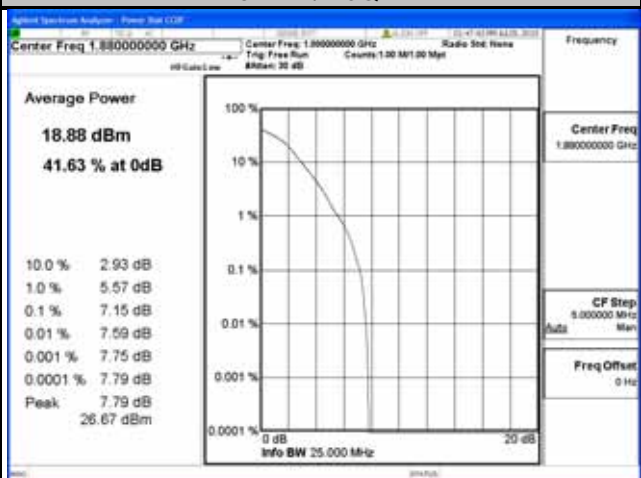
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       | Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       |
|---------|-----------------|----------------------------|-------|---------|-----------------|----------------------------|-------|
|         |                 | QPSK                       | 16QAM |         |                 | QPSK                       | 16QAM |
| 18675   | 1857.5          | 5.14                       | 6.56  | 18700   | 1860.0          | 5.07                       | 7.25  |
| 18900   | 1880.0          | 5.25                       | 7.15  | 18900   | 1880.0          | 5.12                       | 7.10  |
| 19125   | 1902.5          | 5.12                       | 7.06  | 19100   | 1900.0          | 5.42                       | 6.71  |

## Spectrum Plot of Worst Value

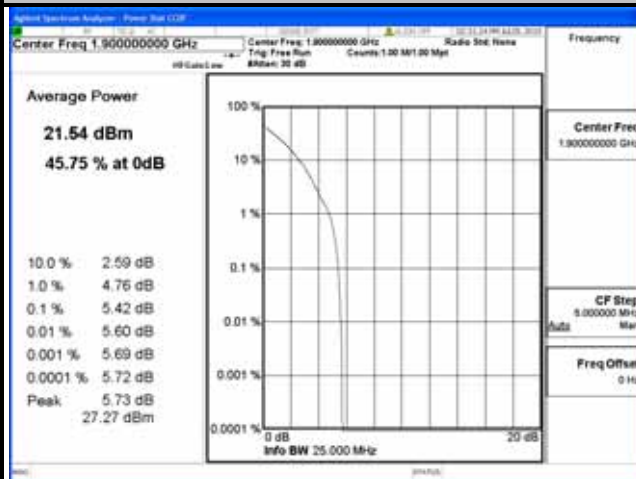
15MHz / QPSK



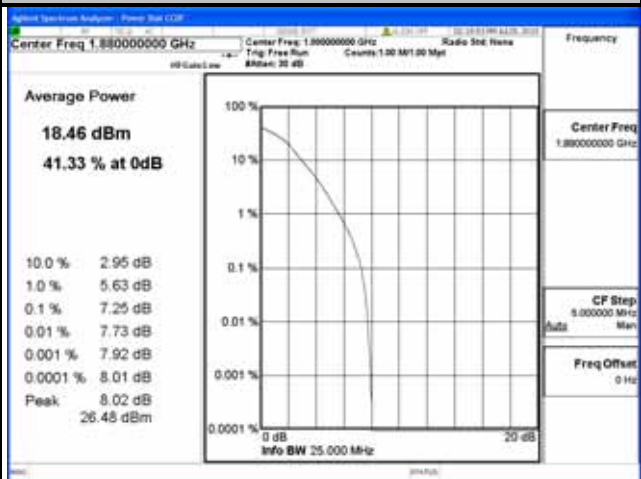
15MHz / 16QAM



20MHz / QPSK



20MHz / 16QAM





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## LTE Band 25

Channel Bandwidth: 1.4MHz

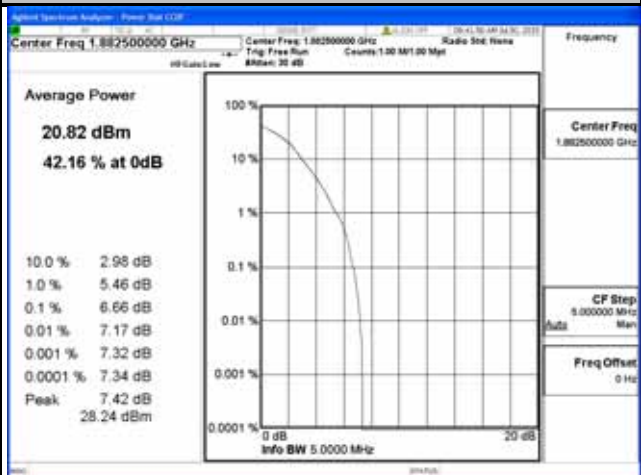
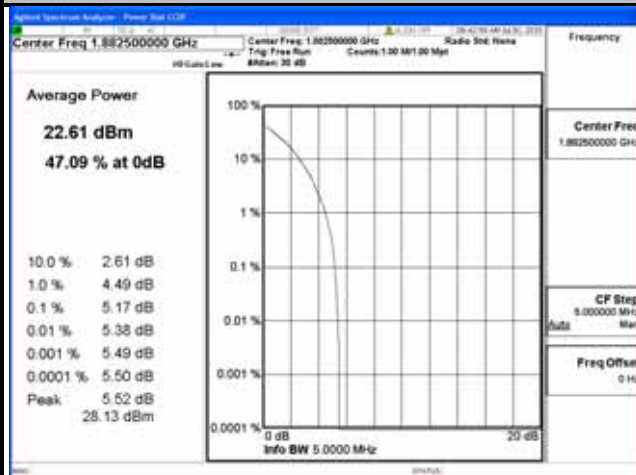
Channel Bandwidth: 3MHz

| Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       | Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       |
|---------|-----------------|----------------------------|-------|---------|-----------------|----------------------------|-------|
|         |                 | QPSK                       | 16QAM |         |                 | QPSK                       | 16QAM |
| 26047   | 1850.7          | 4.91                       | 6.32  | 26055   | 1851.5          | 4.70                       | 6.24  |
| 26365   | 1882.5          | 5.17                       | 6.66  | 26365   | 1882.5          | 5.06                       | 6.59  |
| 26683   | 1914.3          | 4.76                       | 6.14  | 26675   | 1913.5          | 4.38                       | 6.26  |

## Spectrum Plot of Worst Value

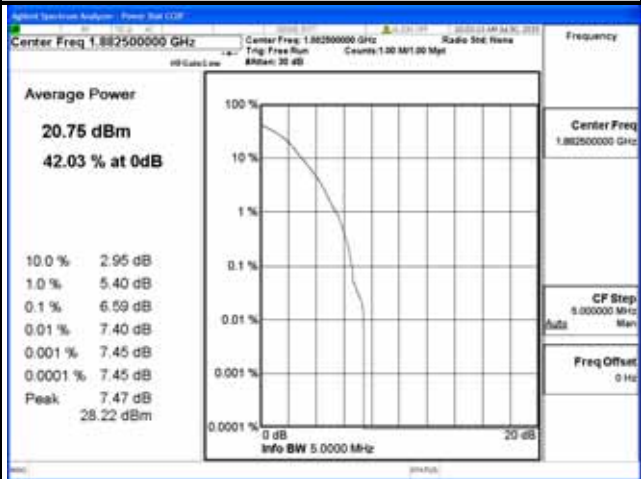
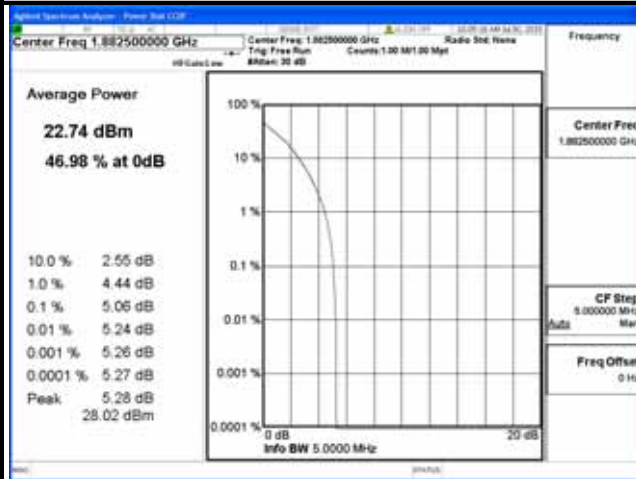
1.4MHz / QPSK

1.4MHz / 16QAM



3MHz / QPSK

3MHz / 16QAM





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## LTE Band 25

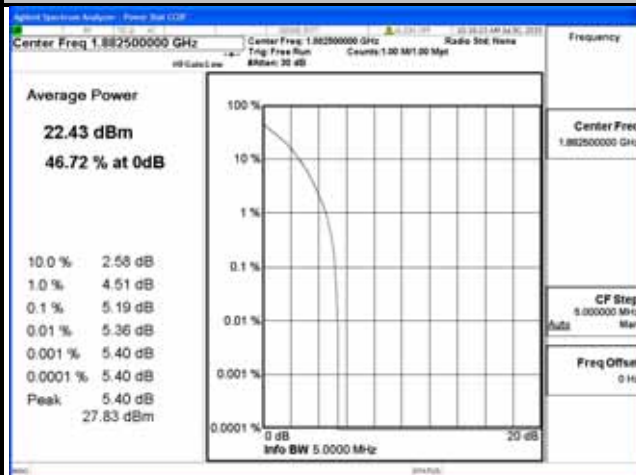
## Channel Bandwidth: 5MHz

## Channel Bandwidth: 10MHz

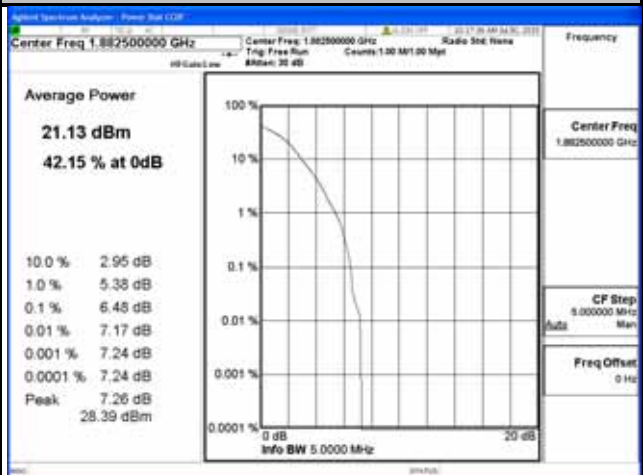
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       | Channel | Frequency (MHz) | Peak to Average Ratio (dB) |       |
|---------|-----------------|----------------------------|-------|---------|-----------------|----------------------------|-------|
|         |                 | QPSK                       | 16QAM |         |                 | QPSK                       | 16QAM |
| 26065   | 1852.5          | 4.69                       | 6.48  | 26090   | 1855.0          | 4.84                       | 6.00  |
| 26365   | 1882.5          | 5.19                       | 6.17  | 26365   | 1882.5          | 5.15                       | 6.41  |
| 26665   | 1912.5          | 4.80                       | 6.06  | 26640   | 1910.0          | 5.03                       | 6.12  |

## Spectrum Plot of Worst Value

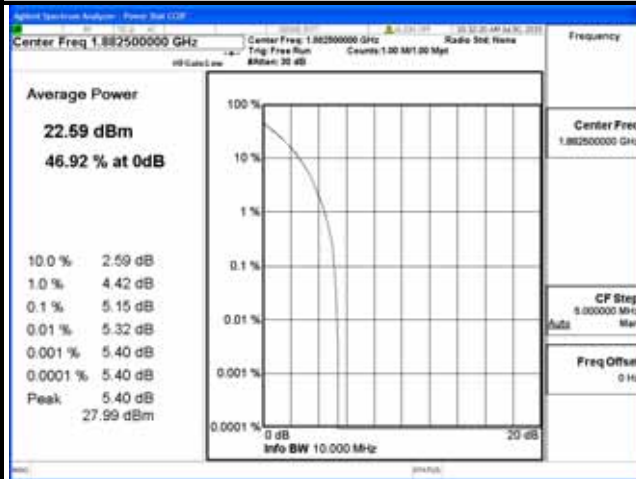
## 5MHz / QPSK



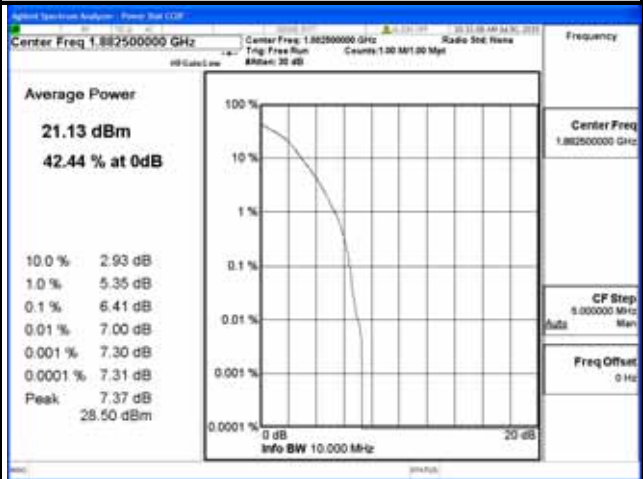
## 5MHz / 16QAM



## 10MHz / QPSK



## 10MHz / 16QAM





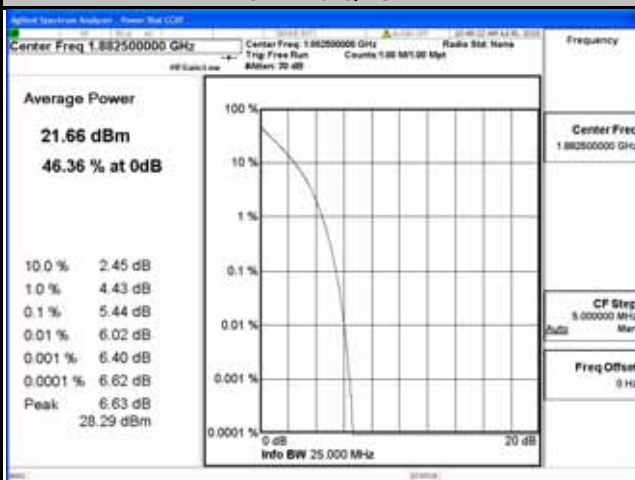
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## LTE BAND 25

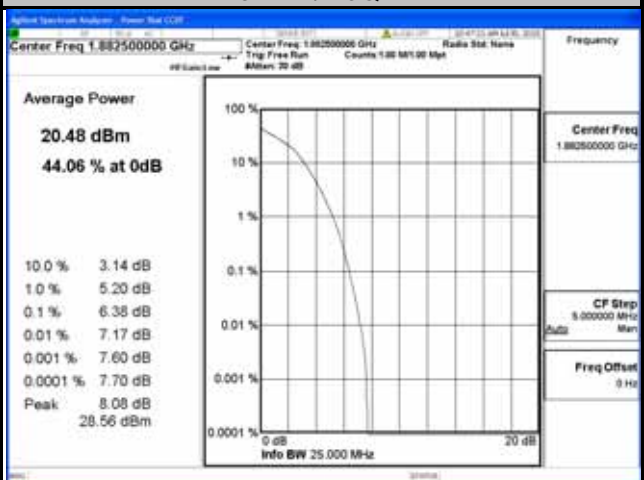
| Channel Bandwidth: 15MHz |                 |                            |       | Channel Bandwidth: 20MHz |                 |                            |       |
|--------------------------|-----------------|----------------------------|-------|--------------------------|-----------------|----------------------------|-------|
| Channel                  | Frequency (MHz) | Peak to Average Ratio (dB) |       | Channel                  | Frequency (MHz) | Peak to Average Ratio (dB) |       |
|                          |                 | QPSK                       | 16QAM |                          |                 | QPSK                       | 16QAM |
| 26115                    | 1857.5          | 5.15                       | 5.94  | 26140                    | 1860            | 5.21                       | 6.14  |
| 26365                    | 1882.5          | 5.44                       | 6.38  | 26365                    | 1882.5          | 5.55                       | 6.39  |
| 26615                    | 1907.5          | 5.31                       | 6.09  | 26590                    | 1905            | 5.48                       | 6.35  |

## Spectrum Plot of Worst Value

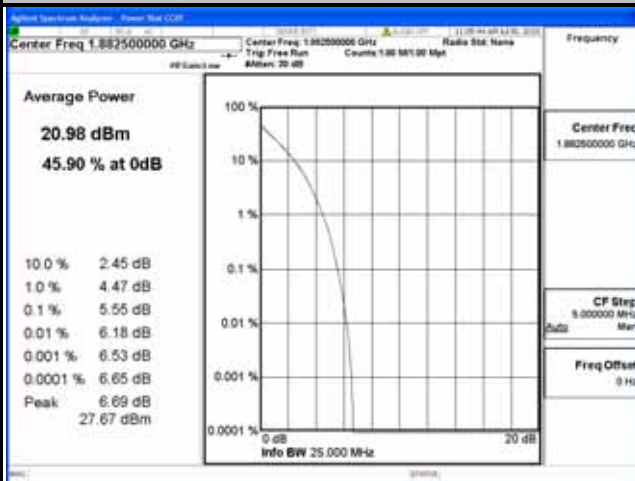
15MHz / QPSK



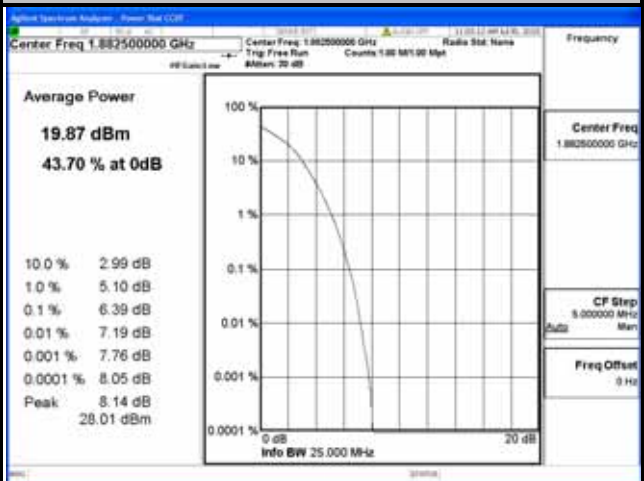
15MHz / 16QAM



20MHz / QPSK



20MHz / 16QAM

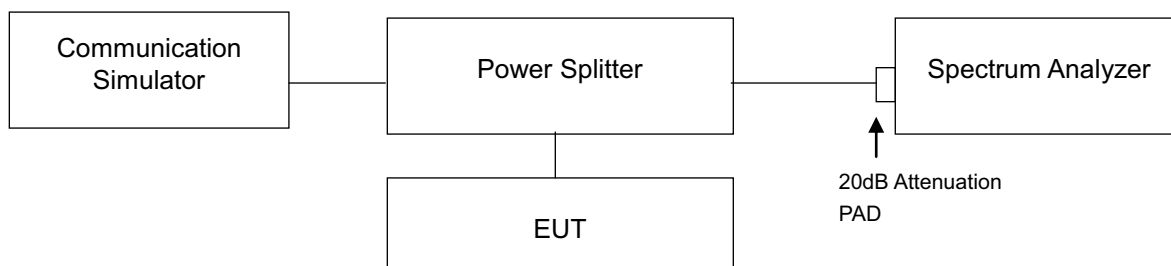


## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

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

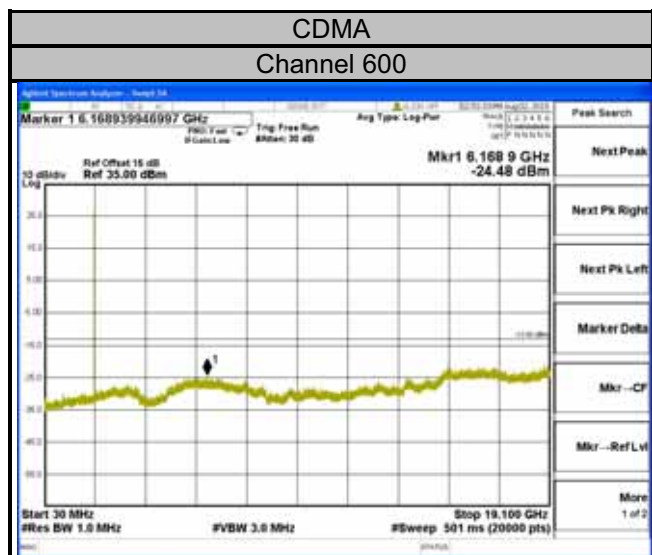
### 4.6.2 Test Setup



### 4.6.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

### 4.6.4 Test Results





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LTE Band 2  
Channel 18900

Channel Bandwidth: 1.4MHz



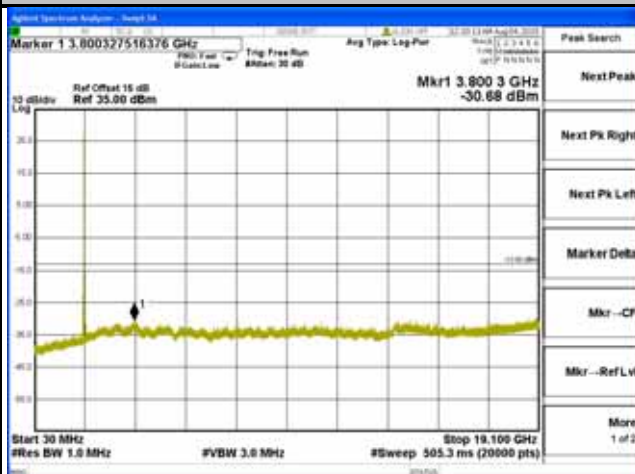
Channel Bandwidth: 3MHz



Channel Bandwidth: 5MHz



Channel Bandwidth: 10MHz



Channel Bandwidth: 15MHz



Channel Bandwidth: 20MHz





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LTE Band 25  
Channel 26365

Channel Bandwidth: 1.4MHz



Channel Bandwidth: 3MHz



Channel Bandwidth: 5MHz



Channel Bandwidth: 10MHz



Channel Bandwidth: 15MHz



Channel Bandwidth: 20MHz



## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

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

### 4.7.2 Test Procedure

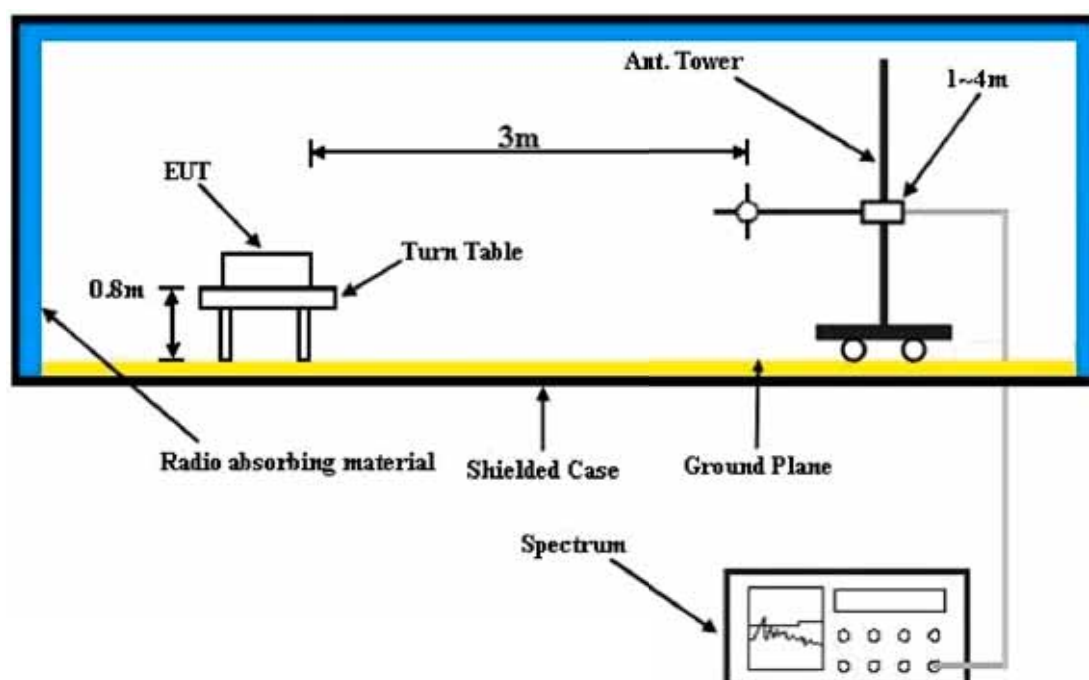
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- 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
- EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

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

### 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

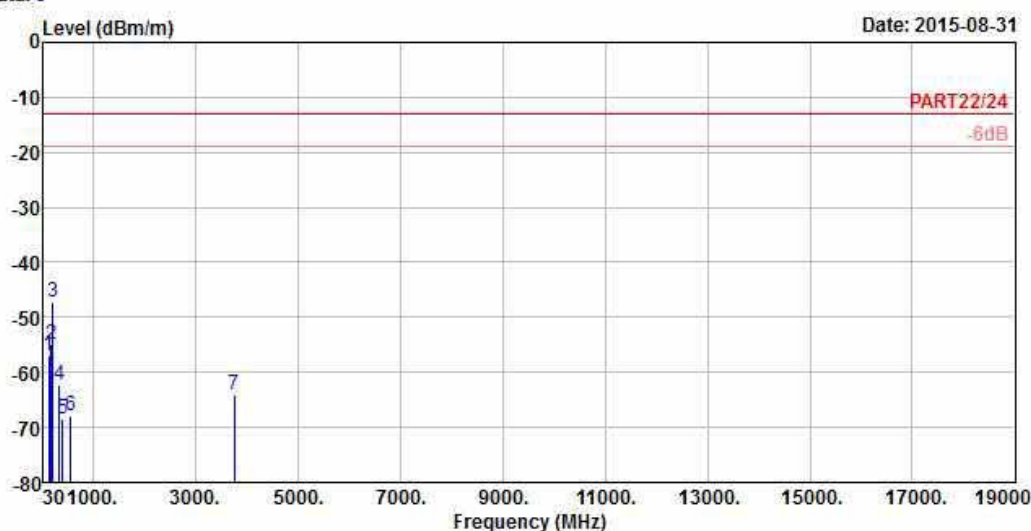
CDMA:



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 9



Site : 966 Chamber 5  
Condition: PART22/24 3m HORIZONTAL  
Remark : CDMA BC1 Link  
Tested by: Anson Lin  
Plane : Z

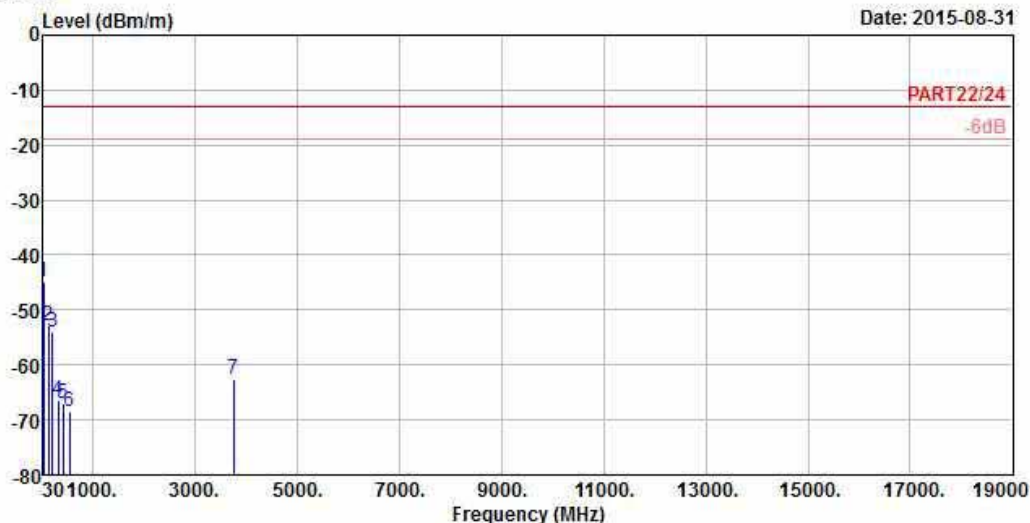
|      | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
|      | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 126.39  | -56.94 | -47.79     | -13.00     | -43.94     | -9.15  | Peak   |
| 2    | 174.99  | -54.95 | -48.57     | -13.00     | -41.95     | -6.38  | Peak   |
| 3 pp | 212.52  | -47.21 | -39.70     | -13.00     | -34.21     | -7.51  | Peak   |
| 4    | 335.70  | -62.38 | -55.92     | -13.00     | -49.38     | -6.46  | Peak   |
| 5    | 400.10  | -68.41 | -62.47     | -13.00     | -55.41     | -5.94  | Peak   |
| 6    | 554.80  | -67.78 | -65.13     | -13.00     | -54.78     | -2.65  | Peak   |
| 7    | 3760.00 | -64.19 | -56.13     | -13.00     | -51.19     | -8.06  | Peak   |



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 10



Site : 966 Chamber 5  
Condition: PART22/24 3m VERTICAL  
Remark : CDMA BC1 Link  
Tested by: Anson Lin  
Plane : Z

|      | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
|      | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1 pp | 40.53   | -44.78 | -44.90     | -13.00     | -31.78     | 0.12   | Peak   |
| 2    | 122.34  | -52.76 | -43.14     | -13.00     | -39.76     | -9.62  | Peak   |
| 3    | 212.25  | -54.10 | -46.59     | -13.00     | -41.10     | -7.51  | Peak   |
| 4    | 314.00  | -66.44 | -59.65     | -13.00     | -53.44     | -6.79  | Peak   |
| 5    | 417.60  | -67.06 | -61.26     | -13.00     | -54.06     | -5.80  | Peak   |
| 6    | 545.00  | -68.43 | -65.41     | -13.00     | -55.43     | -3.02  | Peak   |
| 7    | 3760.00 | -62.73 | -54.67     | -13.00     | -49.73     | -8.06  | Peak   |

LTE Band 2

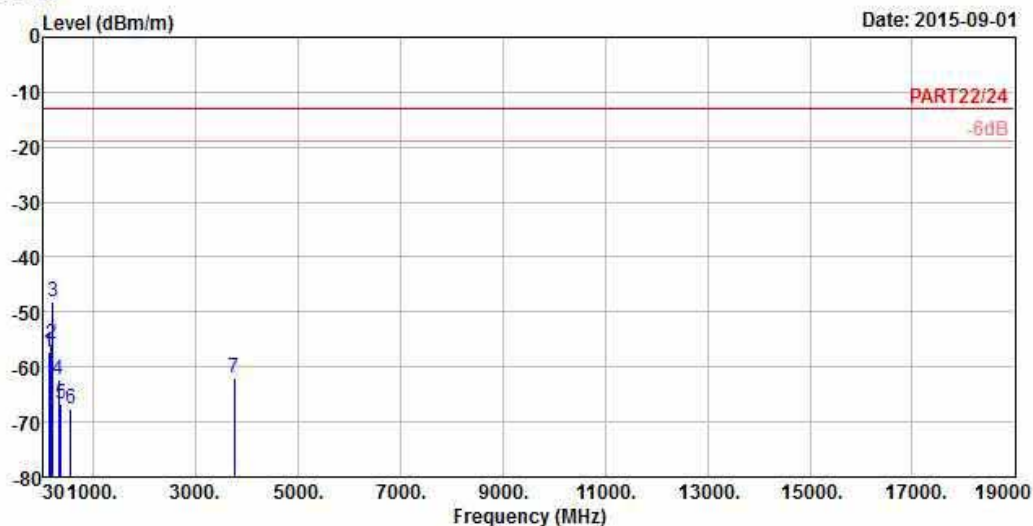
Channel Bandwidth: 20MHz / QPSK



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13



Site : 966 Chamber 5

Condition: PART22/24 3m HORIZONTAL

Remark : LTE Band 2\_QPSK\_20M\_(1,0)

Tested by: Anson Lin

Plane : Z

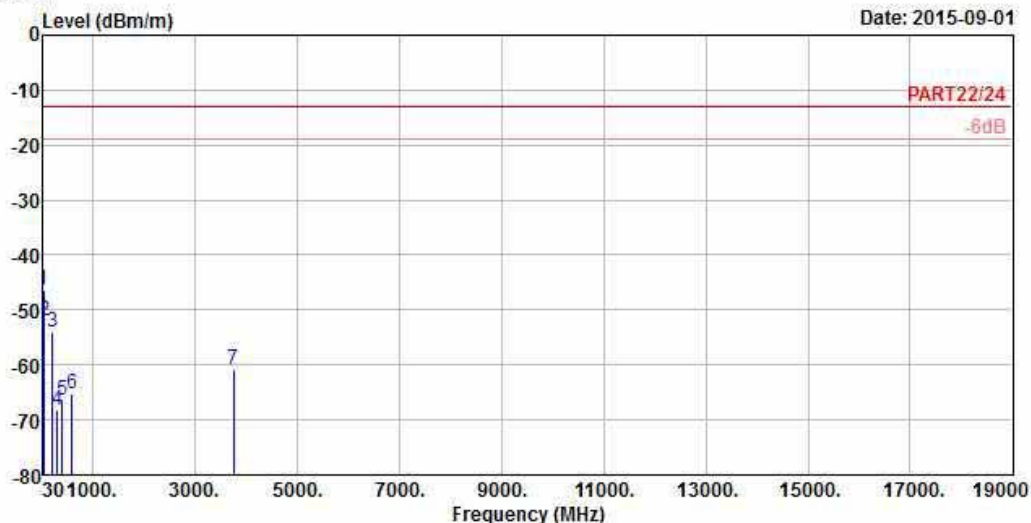
|      | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
|      | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 128.01  | -57.40 | -48.48     | -13.00     | -44.40     | -8.92  | Peak   |
| 2    | 182.28  | -55.70 | -48.36     | -13.00     | -42.70     | -7.34  | Peak   |
| 3 pp | 213.87  | -47.98 | -40.54     | -13.00     | -34.98     | -7.44  | Peak   |
| 4    | 328.00  | -62.35 | -55.77     | -13.00     | -49.35     | -6.58  | Peak   |
| 5    | 376.30  | -66.75 | -60.67     | -13.00     | -53.75     | -6.08  | Peak   |
| 6    | 555.50  | -67.72 | -65.11     | -13.00     | -54.72     | -2.61  | Peak   |
| 7    | 3760.00 | -62.05 | -53.99     | -13.00     | -49.05     | -8.06  | Peak   |



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14



Site : 966 Chamber 5  
Condition: PART22/24 3m VERTICAL  
Remark : LTE Band 2\_QPSK\_20M\_(1,0)  
Tested by: Anson Lin  
Plane : Z

|      | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
|      | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1 pp | 42.15   | -46.47 | -45.53     | -13.00     | -33.47     | -0.94  | Peak   |
| 2    | 56.46   | -52.06 | -45.46     | -13.00     | -39.06     | -6.60  | Peak   |
| 3    | 216.30  | -54.01 | -46.65     | -13.00     | -41.01     | -7.36  | Peak   |
| 4    | 301.40  | -68.33 | -61.35     | -13.00     | -55.33     | -6.98  | Peak   |
| 5    | 405.70  | -66.41 | -60.51     | -13.00     | -53.41     | -5.90  | Peak   |
| 6    | 596.80  | -65.29 | -64.38     | -13.00     | -52.29     | -0.91  | Peak   |
| 7    | 3760.00 | -60.70 | -52.64     | -13.00     | -47.70     | -8.06  | Peak   |

LTE Band 25

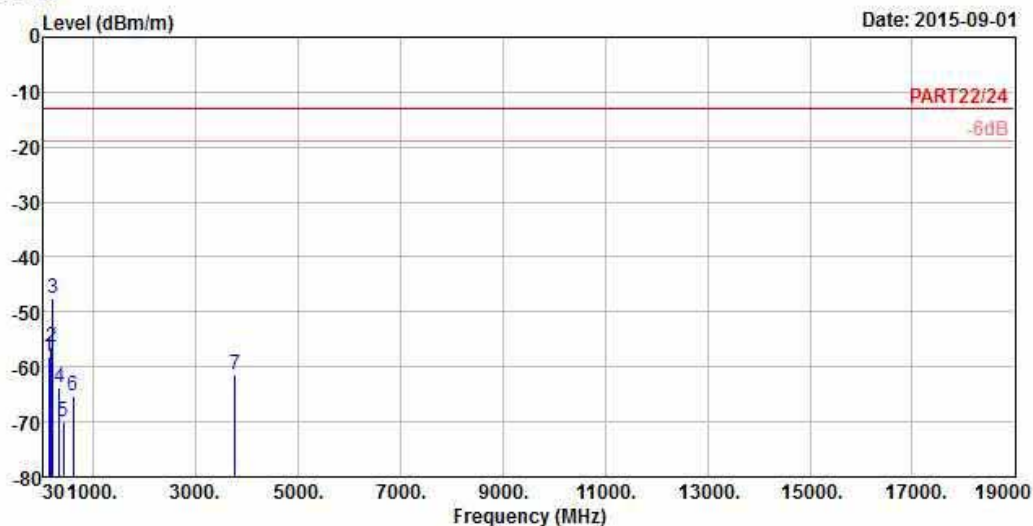
Channel Bandwidth: 20MHz / QPSK



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13



Site : 966 Chamber 5

Condition: PART22/24 3m HORIZONTAL

Remark : LTE Band 25\_QPSK\_20M\_(1,0)

Tested by: Anson Lin

Plane : Z

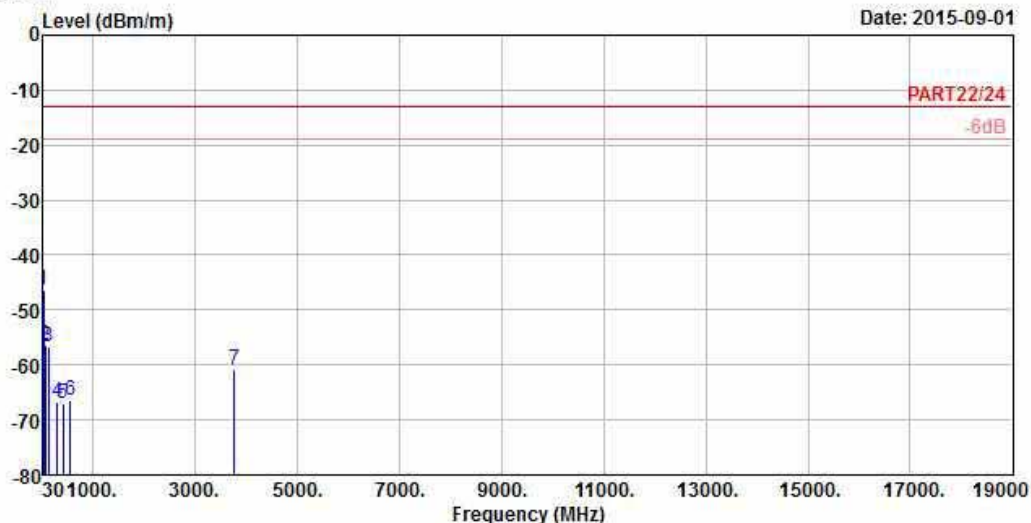
|      | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
|      | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1    | 128.01  | -58.11 | -49.19     | -13.00     | -45.11     | -8.92  | Peak   |
| 2    | 176.88  | -56.28 | -49.56     | -13.00     | -43.28     | -6.72  | Peak   |
| 3 pp | 207.12  | -47.42 | -39.71     | -13.00     | -34.42     | -7.71  | Peak   |
| 4    | 331.50  | -63.67 | -57.15     | -13.00     | -50.67     | -6.52  | Peak   |
| 5    | 423.90  | -69.95 | -64.19     | -13.00     | -56.95     | -5.76  | Peak   |
| 6    | 601.70  | -65.14 | -64.38     | -13.00     | -52.14     | -0.76  | Peak   |
| 7    | 3765.00 | -61.41 | -53.44     | -13.00     | -48.41     | -7.97  | Peak   |



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14



Site : 966 Chamber 5

Condition: PART22/24 3m VERTICAL

Remark : LTE Band 25\_QPSK\_20M\_(1,0)

Tested by: Anson Lin

Plane : Z

|      | Freq    | Level  | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
|      | MHz     | dBm/m  | dBm        | dBm/m      | dB         | dB/m   |        |
| 1 pp | 41.34   | -46.34 | -45.93     | -13.00     | -33.34     | -0.41  | Peak   |
| 2    | 64.02   | -56.25 | -48.29     | -13.00     | -43.25     | -7.96  | Peak   |
| 3    | 126.93  | -56.70 | -47.66     | -13.00     | -43.70     | -9.04  | Peak   |
| 4    | 307.70  | -66.85 | -59.96     | -13.00     | -53.85     | -6.89  | Peak   |
| 5    | 413.40  | -66.95 | -61.11     | -13.00     | -53.95     | -5.84  | Peak   |
| 6    | 566.00  | -66.43 | -64.27     | -13.00     | -53.43     | -2.16  | Peak   |
| 7    | 3765.00 | -60.89 | -52.92     | -13.00     | -47.89     | -7.97  | Peak   |

## 5 Pictures of Test Arrangements

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

## Appendix – Information on the Testing Laboratories

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

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

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Fax: 886-2-26051924

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

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