

# FCC CFR47 PART 22H, 24E, 27, 90S CERTIFICATION TEST REPORT

## FCC ID: 2A9FT-Z400-H

**Product:** Smart LTE Module

**Trade Mark:** ZelusTek

**Model No.:** Z400-H

**Family Model:** Z400-H(A), Z400-H(EU)

**Report No.:** S23033100205006

**Issue Date:** May 05, 2023

### Prepared for

Zelus (Shenzhen) Technology Ltd.

503, Building No.4, Block No.1, Shenzhen Bay ECO-Technology Park,  
No.22, Gaoxin Nanhuan Road, Nanshan District, Shenzhen, China

### Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community,  
Xixiang Street Bao'an District, Shenzhen 518126 P.R. China

Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090

Website: <http://www.ntek.org.cn>

## TEST RESULT CERTIFICATION

**Applicant's name** ..... : Zelus (Shenzhen) Technology Ltd.

**Address**..... : 503, Building No.4, Block No.1, Shenzhen Bay ECO-Technology Park,  
No.22, Gaoxin Nanhuan Road, Nanshan District, Shenzhen, China

**Manufacturer's Name**..... : Zelus (Shenzhen) Technology Ltd.

**Address**..... : 503, Building No.4, Block No.1, Shenzhen Bay ECO-Technology Park,  
No.22, Gaoxin Nanhuan Road, Nanshan District, Shenzhen, China

**Product name**..... : Smart LTE Module

**Trade Mark**..... : ZelusTek

**Model and/or type reference** .. : Z400-H

**Family Model**..... : Z400-H(A), Z400-H(EU)

**Test Sample Number** ..... : S230331002006

**Standards**..... : FCC CFR 47 Part 22H, Part 24E, Part 27, Part 90S

**Test procedure** ..... ANSI C63.26:2015

ANSI/TIA-603-E-2016

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of NTEK, this document may be altered or revised by NTEK, personal only, and shall be noted in the revision of the document.

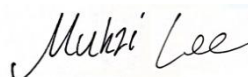
**Date of Test** .....

**Date (s) of performance of tests**..... Apr 03, 2023 ~ May 05, 2023

**Date of Issue** ..... May 05, 2023

**Test Result**..... **Pass**

Testing Engineer : \_\_\_\_\_



(Mukzi Lee)

Authorized Signatory : \_\_\_\_\_



(Alex Li)

## TABLE OF CONTENTS

|                                                   |           |
|---------------------------------------------------|-----------|
| <b>1. GENERAL INFORMATION.....</b>                | <b>6</b>  |
| <b>1. GENERAL INFORMATION.....</b>                | <b>6</b>  |
| <b>1.1 PRODUCT DESCRIPTION .....</b>              | <b>6</b>  |
| <b>1.2 RELATED SUBMITTAL(S) / GRANT (S) .....</b> | <b>8</b>  |
| <b>1.3 TEST METHODOLOGY.....</b>                  | <b>8</b>  |
| <b>1.4 TEST FACILITY.....</b>                     | <b>8</b>  |
| <b>MEASUREMENT UNCERTAINTY .....</b>              | <b>8</b>  |
| <b>1.5 SPECIAL ACCESSORIES.....</b>               | <b>8</b>  |
| <b>1.6 WORST-CASE CONFIGURATION AND MODE.....</b> | <b>8</b>  |
| <b>2. SYSTEM TEST CONFIGURATION .....</b>         | <b>9</b>  |
| <b>2.1 EUT CONFIGURATION.....</b>                 | <b>9</b>  |
| <b>2.2 EUT EXERCISE .....</b>                     | <b>9</b>  |
| <b>2.3 CONFIGURATION OF EUT SYSTEM.....</b>       | <b>9</b>  |
| <b>2.4 TEST SETUP .....</b>                       | <b>10</b> |
| <b>3.TEST AND MEASUREMENT EQUIPMENT .....</b>     | <b>11</b> |
| <b>4. OUTPUT POWER.....</b>                       | <b>13</b> |
| <b>4.1 OUTPUT POWER MEASUREMENT .....</b>         | <b>13</b> |
| <b>6. BANDEDGE AND EMISSION MASK.....</b>         | <b>16</b> |
| <b>7. OUT OF BAND EMISSIONS .....</b>             | <b>18</b> |
| <b>7.1 MEASUREMENT METHOD .....</b>               | <b>18</b> |
| <b>8. RADIATED MEASUREMENT .....</b>              | <b>19</b> |
| <b>8.1. RADIATED POWER (ERP &amp; EIRP).....</b>  | <b>19</b> |
| <b>8.2 LTE BAND 2.....</b>                        | <b>20</b> |

|                                             |           |
|---------------------------------------------|-----------|
| 8.3 LTE BAND 4.....                         | 23        |
| 8.4 LTE BAND 5.....                         | 26        |
| 8.5 LTE BAND 7.....                         | 28        |
| 8.6 LTE BAND 12 .....                       | 30        |
| 8.7 LTE BAND 13 .....                       | 32        |
| 8.7 LTE BAND 14 .....                       | 34        |
| 8.8 LTE BAND 17 .....                       | 36        |
| 8.9 LTE BAND 25 .....                       | 38        |
| 8.10 LTE BAND 26 A .....                    | 41        |
| 8.11 LTE BAND 26B .....                     | 43        |
| 8.12 LTE BAND 38 .....                      | 45        |
| 8.13 LTE BAND 41 .....                      | 47        |
| 8.14 LTE BAND 66 .....                      | 49        |
| 8.15 LTE BAND 71 .....                      | 52        |
| <b>9. SPURIOUS RADIATION EMISSION .....</b> | <b>54</b> |
| 9.1 LTE BAND 2.....                         | 56        |
| 9.2 LTE BAND 4.....                         | 58        |
| 9.3 LTE BAND 5.....                         | 60        |
| 9.4 LTE BAND 7.....                         | 62        |
| 9.5 LTE BAND 12 .....                       | 64        |
| 9.6 LTE BAND 13 .....                       | 66        |
| 9.7 LTE BAND 14 .....                       | 68        |
| 9.8 LTE BAND 17 .....                       | 70        |
| 9.9 LTE BAND 25 .....                       | 72        |
| 9.10 LTE BAND 26A .....                     | 74        |
| 9.11 LTE BAND 26B .....                     | 76        |
| 9.12 LTE BAND 38 .....                      | 78        |
| 9.13 LTE BAND 41 .....                      | 80        |
| 9.14 LTE BAND 66 .....                      | 82        |

|                                              |     |
|----------------------------------------------|-----|
| 9.15 LTE BAND 71 .....                       | 84  |
| 10. FREQUENCY STABILITY .....                | 86  |
| 10.1 LTE BAND 2 .....                        | 87  |
| 10.2 LTE BAND 4 .....                        | 89  |
| 10.3 LTE BAND 5 .....                        | 91  |
| 10.4 LTE BAND 7 .....                        | 93  |
| 10.5 LTE BAND 12 .....                       | 95  |
| 10.6 LTE BAND 13 .....                       | 97  |
| 10.7 LTE BAND 14 .....                       | 99  |
| 10.8 LTE BAND 17 .....                       | 101 |
| 10.9 LTE BAND 25 .....                       | 103 |
| 10.10 LTE BAND 26A .....                     | 105 |
| 10.11 LTE BAND 26B .....                     | 107 |
| 10.12 LTE BAND 38.....                       | 109 |
| 10.13 LTE BAND 41.....                       | 111 |
| 10.14 LTE BAND 66.....                       | 113 |
| 10.15 LTE BAND 71.....                       | 115 |
| 11. PEAK-TO-AVERAGE RATIO.....               | 117 |
| 11.1 Description of the PAR Measurement..... | 117 |
| 11.2 Measuring Instruments .....             | 117 |
| 11.3 Test Procedures.....                    | 117 |
| 11.4 Test Setup.....                         | 118 |

## 1. GENERAL INFORMATION

### 1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Designation: | Smart LTE Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Trade Mark           | ZelusTek                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Model Name           | Z400-H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Family Model         | Z400-H(A), Z400-H(EU)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Model Difference     | All the model are the same circuit and RF module,except the model name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| FCC ID:              | 2A9FT-Z400-H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Frequency Bands:     | U.S. Bands:<br><input checked="" type="checkbox"/> LTE FDD Band 2,4,5,7,12,13,14,17,25,26<br>LTE TDD Band 38,41,66,71                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Frequency Range:     | LTE FDD Band 2 Uplink: 1850MHz-1910MHz,<br>Downlink: 1930MHz-1990MHz;<br>LTE FDD Band 4 Uplink: 1710MHz-1755MHz,<br>Downlink: 2110MHz-2155MHz;<br>LTE FDD Band 5 Uplink: 824MHz-849MHz,<br>Downlink: 869MHz-894MHz;<br>LTE-FDD Band 7 Uplink: 2500MHz-2570MHz,<br>Downlink: 2620MHz-2690MHz;<br>LTE FDD Band 12 Uplink: 699MHz-716MHz,<br>Downlink: 729MHz-746MHz;<br>LTE FDD Band 13 Uplink: 777MHz-787MHz,<br>Downlink: 746MHz-756MHz;<br>LTE FDD Band 14 Uplink: 788MHz-798MHz,<br>Downlink: 758MHz-768MHz;<br>LTE FDD Band 17 Uplink: 704MHz-716MHz,<br>Downlink: 734MHz-746MHz;<br>LTE FDD Band 25 Uplink: 1850MHz-1915MHz,<br>Downlink: 1930MHz-1995MHz;<br>LTE FDD Band 26A Uplink: 814MHz-824MHz,<br>Downlink: 859MHz-869MHz;<br>LTE FDD Band 26B Uplink: 824MHz-849MHz,<br>Downlink: 869MHz-894MHz;<br>LTE TDD Band 38 Uplink & Downlink: 2570 MHz to 2620 MHz<br>LTE TDD Band 41 Uplink & Downlink: 2535MHz-2655MHz,<br>LTE TDD Band 66 Uplink: 1710MHz-1780MHz,<br>Downlink: 2110MHz-2200MHz;<br>LTE TDD Band 71 Uplink: 663MHz-698MHz,<br>Downlink: 617MHz-652MHz; |
| Type of Modulation:  | QPSK/16QAM/64QAM(Only Downlink)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                                                                                                                                                    |                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Antenna:                                                                                                                                                           | External Antenna                              |
| Antenna gain:                                                                                                                                                      | 1 dBi;                                        |
| Adapter                                                                                                                                                            | N/A                                           |
| Battery                                                                                                                                                            | N/A                                           |
| Power supply                                                                                                                                                       | DC 4V                                         |
| Extreme Vol. Limits:                                                                                                                                               | DC 3.5V to DC 4.4V (Nominal DC 4.0V) (Note 1) |
| HW Version                                                                                                                                                         | Z400-H V3.0                                   |
| SW Version                                                                                                                                                         | N/A                                           |
| <p>** Note1: The High Voltage DC 4.4V and Low Voltage DC 3.5V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.</p> |                                               |

## 1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2A9FT-Z400-H** filing to comply with the FCC Part 22H&24E&27&90S.

## 1.3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI/TIA-603-E-2016, FCC CFR 47 Part 2, Part 22, Part 24, Part 27, Part 90S, ANSI C63.26:2015.

## 1.4 TEST FACILITY

The test site used to collect the radiated data is located at:

ShenZhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R.China.

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.26:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

## MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

| No. | Item                                                                     | Uncertainty |
|-----|--------------------------------------------------------------------------|-------------|
| 1   | Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ ) | 2.5dB       |
|     |                                                                          |             |

## 1.5 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

## 1.6 WORST-CASE CONFIGURATION AND MODE

The worst-case scenario for all measurements is based on the investigation results.

The device has LTE Bands of: Band 2/4/5/7/12/13/14/17/25/26/38/41/66/71

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.

For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientations of the EUT alone. After the investigations the worst case was determined to be at X orientation for all LTE bands.



## 2. SYSTEM TEST CONFIGURATION

### 2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

### 2.3 CONFIGURATION OF EUT SYSTEM

Table 2-1 Equipment Used in EUT System

| Item | Equipment        | Model No. | ID or Specification  | Note |
|------|------------------|-----------|----------------------|------|
| 1    | Smart LTE Module | Z400-H    | FCC ID: 2A9FT-Z400-H | EUT  |
|      |                  |           |                      |      |
|      |                  |           |                      |      |

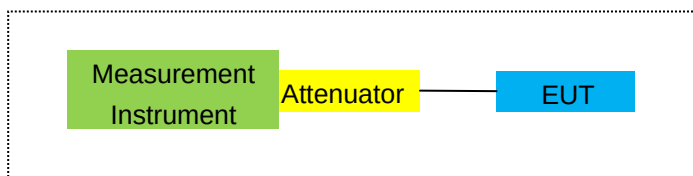
*Note: All the accessories have been used during the test.  
the following "EUT" in setup diagram means EUT system.*

## 2.4 TEST SETUP

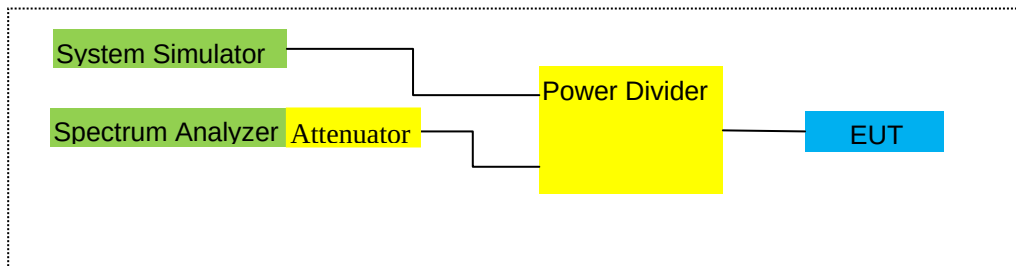
For Radiated Test Cases



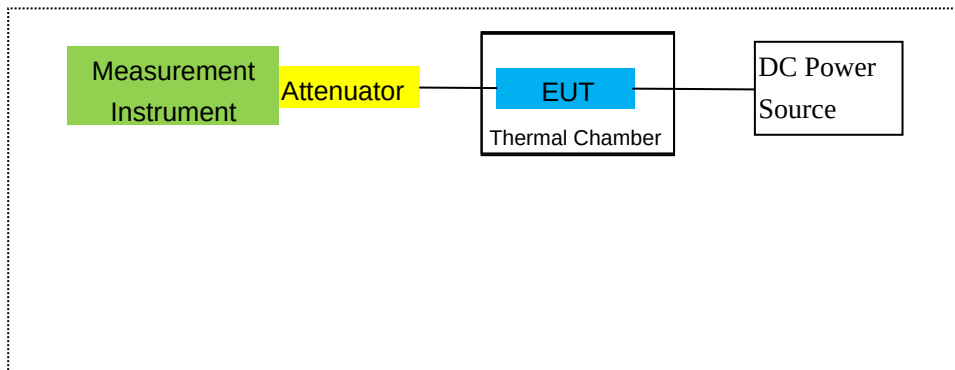
For Conducted Output Power



For Peak-to Average Ratio, Occupied Bandwidth, Conducted Band edge and Conducted Spurious Emission



For Frequency Stability



Note: EUT built-in battery-powered, the battery is fully-charged.

### 3.TEST AND MEASUREMENT EQUIPMENT

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

| Item | Kind of Equipment     | Manufacturer | Type No.    | Serial No.   | Last calibration | Calibrated until | Calibration period |
|------|-----------------------|--------------|-------------|--------------|------------------|------------------|--------------------|
| 1    | MXA Signal Analyzer   | Agilent      | N9020A      | MY49100060   | 2022.06.16       | 2023.06.17       | 1 year             |
| 2    | Test Receiver         | R&S          | ESPI        | 101318       | 2023.03.27       | 2024.03.26       | 1 year             |
| 3    | Bilog Antenna         | TESEQ        | CBL6111D    | 31216        | 2023.03.16       | 2024.03.15       | 1 year             |
| 4    | 50Ω Coaxial Switch    | Anritsu      | MP59B       | 6200983705   | 2020.05.11       | 2023.05.10       | 3 year             |
| 5    | Horn Antenna          | SCHWARZBECK  | BBHA 9120 D | 2816         | 2023.01.12       | 2024.01.11       | 1 year             |
| 6    | Horn Ant              | Schwarzbeck  | BBHA 9170   | 9170-181     | 2022.11.07       | 2023.11.06       | 1 year             |
| 7    | Amplifier             | EM           | EM-30180    | 060538       | 2022.06.17       | 2023.06.16       | 1 year             |
| 8    | Loop Antenna          | ARA          | PLA-1030/B  | 1029         | 2022.11.04       | 2023.11.05       | 1 year             |
| 9    | Power Meter           | R&S          | NRVS        | 100696       | 2022.06.17       | 2023.06.16       | 1 year             |
| 10   | Power Sensor          | R&S          | URV5-Z4     | 0395.1619.05 | 2022.06.17       | 2023.06.16       | 1 year             |
| 11   | Test Cable            | N/A          | R-01        | N/A          | 2022.06.17       | 2025.06.16       | 3 year             |
| 12   | Test Cable            | N/A          | R-02        | N/A          | 2022.06.17       | 2025.06.16       | 3 year             |
| 13   | Test Cable            | N/A          | R-03        | N/A          | 2022.06.17       | 2025.06.16       | 3 year             |
| 14   | Test Receiver         | R&S          | ESCI        | 101160       | 2023.03.27       | 2024.03.26       | 1 year             |
| 15   | LISN                  | R&S          | ENV216      | 101313       | 2023.03.27       | 2024.03.26       | 1 year             |
| 16   | LISN                  | EMCO         | 3816/2      | 00042990     | 2023.03.27       | 2024.03.26       | 1 year             |
| 17   | 50Ω Coaxial Switch    | Anritsu      | MP59B       | 6200264417   | 2023.03.27       | 2024.03.27       | 1 year             |
| 18   | Passive Voltage Probe | R&S          | ESH2-Z3     | 100196       | 2023.03.27       | 2024.03.26       | 1 year             |
| 19   | Test Cable            | N/A          | C01         | N/A          | 2020.05.11       | 2023.05.10       | 3 year             |
| 20   | Test Cable            | N/A          | C02         | N/A          | 2020.05.11       | 2023.05.10       | 3 year             |
| 21   | Test Cable            | N/A          | C03         | N/A          | 2020.05.11       | 2023.05.10       | 3 year             |
| 22   | Spectrum Analyzer     | agilent      | e4440a      | us44300399   | 2023.03.27       | 2024.03.26       | 1 year             |
| 23   | test receiver         | R&S          | ESCI        | a0304218     | 2022.06.16       | 2023.06.15       | 1 year             |
| 24   | Communication Tester  | R&S          | CMU200      | A0304247     | 2022.06.16       | 2023.06.15       | 1 year             |
| 25   | Thermal Chamber       | Ten Billion  | TTC-B3C     | TBN-960502   | 2023.03.27       | 2024.03.26       | 1 year             |

|    |                             |         |          |                 |            |            |        |
|----|-----------------------------|---------|----------|-----------------|------------|------------|--------|
| 26 | DC Power Source             | N/A     | PS-6005D | 2017040292<br>3 | 2020.05.11 | 2023.05.10 | 3 year |
| 27 | MXG Vector Signal Generator | Agilent | N5182A   | MY47070317      | 2022.06.16 | 2023.06.15 | 1 year |
| 28 | Communication Tester        | R&S     | CMW500   | 148500          | 2022.06.16 | 2023.06.15 | 1 year |

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& DC Power Source which is scheduled for calibration every 3 years.

## 4. OUTPUT POWER

### 4.1 OUTPUT POWER MEASUREMENT

#### LTE Measurement Procedure:

All LTE bands conducted power peak and average are obtained from the CMW500 telecommunication test set. The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3**

| Modulation | Channel bandwidth / Transmission bandwidth (RB) |         |       |        |        |        | MPR (dB) |
|------------|-------------------------------------------------|---------|-------|--------|--------|--------|----------|
|            | 1.4 MHz                                         | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |          |
| QPSK       | > 5                                             | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 1      |
| 16 QAM     | ≤ 5                                             | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18   | ≤ 1      |
| 16 QAM     | > 5                                             | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 2      |

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS\_01".<sup>3</sup>

**Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)**

| Network Signalling value | Requirements (sub-clause) | E-UTRA Band              | Channel bandwidth (MHz) | Resources Blocks ( $N_{RB}$ ) | A-MPR (dB)    |
|--------------------------|---------------------------|--------------------------|-------------------------|-------------------------------|---------------|
| NS_01                    | 6.6.2.1.1                 | Table 5.5-1              | 1.4, 3, 5, 10, 15, 20   | Table 5.6-1                   | NA            |
| NS_03                    | 6.6.2.2.1                 | 2, 4, 10, 23, 25, 35, 36 | 3                       | >5                            | $\leq 1$      |
|                          |                           |                          | 5                       | >6                            | $\leq 1$      |
|                          |                           |                          | 10                      | >6                            | $\leq 1$      |
|                          |                           |                          | 15                      | >8                            | $\leq 1$      |
|                          |                           |                          | 20                      | >10                           | $\leq 1$      |
| NS_04                    | 6.6.2.2.2                 | 41                       | 5                       | >6                            | $\leq 1$      |
|                          |                           |                          | 10, 15, 20              | See Table 6.2.4-4             |               |
| NS_05                    | 6.6.3.3.1                 | 1                        | 10, 15, 20              | $\geq 50$                     | $\leq 1$      |
| NS_06                    | 6.6.2.2.3                 | 12, 13, 14, 17           | 1.4, 3, 5, 10           | Table 5.6-1                   | n/a           |
| NS_07                    | 6.6.2.2.3<br>6.6.3.3.2    | 13                       | 10                      | Table 6.2.4-2                 | Table 6.2.4-2 |
| NS_08                    | 6.6.3.3.3                 | 19                       | 10, 15                  | > 44                          | $\leq 3$      |
| NS_09                    | 6.6.3.3.4                 | 21                       | 10, 15                  | > 40                          | $\leq 1$      |
|                          |                           |                          |                         | > 55                          | $\leq 2$      |
| NS_10                    |                           | 20                       | 15, 20                  | Table 6.2.4-3                 | Table 6.2.4-3 |
| NS_11                    | 6.6.2.2.1                 | 23 <sup>1</sup>          | 1.4, 3, 5, 10           | Table 6.2.4-5                 | Table 6.2.4-5 |
| ..                       |                           |                          |                         |                               |               |
| NS_32                    | -                         | -                        | -                       | -                             | -             |

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Test data reference attachment.

## 5. OCCUPIED BANDWIDTH

### RULE PART(S)

FCC: §2.1049

### LIMITS

For reporting purposes only

### TEST PROCEDURE

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

### MODES TESTED



LTE Band 2/4/5/7/12/13/14/17/25/26/38/41/66/71

### RESULTS

**PASS**

Test data reference attachment.

## 6. BANDEDGE AND EMISSION MASK

### RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53, and §90.691

FCC: §22.359

### LIMITS

FCC: §22.917, §24.238, §27.53

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.

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

(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.



**TEST PROCEDURE**

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

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

Set a marker to point the corresponding band edge frequency in each test case.

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

**MODES TESTED**

LTE Band 2/4/5/7/12/13/14/17/25/26/38/41/66/71

**RESULTS**

Test data reference attachment.

## 7. OUT OF BAND EMISSIONS

### RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53 and §90.691

### LIMITS

1. 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.
2. The Band 7/41 emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $55 + 10 \log (P)$  dB.

### TEST PROCEDURE

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

For each out of band emissions measurement:

- ☐
- ☐ Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

### **MODES TESTED**

- ☐ LTE Band 2/4/5/7/12/13/14/17/25/26/38/41/66/71
- ☐

### 7.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

Test data reference attachment.

## 8. RADIATED MEASUREMENT

### 8.1. RADIATED POWER (ERP & EIRP)

#### RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635

#### LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.

27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

90.635(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

#### TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

KDB 971168 v02r01 RF power output using broadband peak and average power meter method.

KDB 971168 D01 Power Meas License Digital Systems v02r01, "Measurement Guidance for Certification of Licensed Digital Transmitters"

#### MODES TESTED

LTE Band 2/4/5/7/12/13/14/17/25/26/38/41/66/71

#### RESULTS

Pass

## 8.2 LTE BAND 2

| Radiated Power (EIRP) for Band 2 |            |           |                |                  |             |                         |           |                          |            |
|----------------------------------|------------|-----------|----------------|------------------|-------------|-------------------------|-----------|--------------------------|------------|
| Mode                             | RB/RB SIZE | Frequency | Result         |                  |             |                         |           |                          | Conclusion |
|                                  |            |           | SG Level (dBm) | Cable Loss (dBm) | Factor (dB) | Max. EIRP Average (dBm) | Max. EIRP | Polarization Of Max. ERP |            |
|                                  |            |           |                |                  |             |                         | Average   |                          |            |
|                                  |            |           |                |                  |             |                         | (mW)      |                          |            |
| 1.4MHz Band QPSK                 | 1/#Mid     | 1850.7    | -1.68          | 3.76             | 28.24       | 22.80                   | 190.546   | Horizontal               | Pass       |
|                                  |            | 1880      | -1.59          | 3.91             | 28.22       | 22.72                   | 187.068   | Horizontal               | Pass       |
|                                  |            | 1909.3    | -1.48          | 3.93             | 28.20       | 22.79                   | 190.108   | Horizontal               | Pass       |
| 3.0MHz Band QPSK                 | 1/#Mid     | 1851.5    | -1.76          | 3.77             | 28.23       | 22.70                   | 186.209   | Horizontal               | Pass       |
|                                  |            | 1880      | -1.60          | 3.91             | 28.24       | 22.73                   | 187.499   | Horizontal               | Pass       |
|                                  |            | 1908.5    | -1.55          | 3.94             | 28.25       | 22.76                   | 188.799   | Horizontal               | Pass       |
| 5.0MHz Band QPSK                 | 1/#Mid     | 1852.5    | -1.88          | 3.77             | 28.31       | 22.66                   | 184.502   | Horizontal               | Pass       |
|                                  |            | 1880      | -1.61          | 3.91             | 28.22       | 22.70                   | 186.209   | Horizontal               | Pass       |
|                                  |            | 1907.5    | -1.50          | 3.94             | 28.20       | 22.76                   | 188.799   | Horizontal               | Pass       |
| 10.0MHz Band QPSK                | 1/#Mid     | 1855      | -1.74          | 3.79             | 28.33       | 22.80                   | 190.546   | Horizontal               | Pass       |
|                                  |            | 1880      | -1.49          | 3.95             | 28.22       | 22.78                   | 189.671   | Horizontal               | Pass       |
|                                  |            | 1905      | -1.43          | 3.97             | 28.19       | 22.79                   | 190.108   | Horizontal               | Pass       |
| 15.0MHz Band QPSK                | 1/#Mid     | 1857.5    | -1.91          | 3.79             | 28.34       | 22.64                   | 183.654   | Horizontal               | Pass       |
|                                  |            | 1880      | -1.52          | 3.95             | 28.22       | 22.75                   | 188.365   | Horizontal               | Pass       |
|                                  |            | 1902.5    | -1.42          | 3.97             | 28.18       | 22.79                   | 190.108   | Horizontal               | Pass       |
| 20.0MHz Band QPSK                | 1/#Mid     | 1860      | -1.88          | 3.81             | 28.35       | 22.66                   | 184.502   | Horizontal               | Pass       |
|                                  |            | 1880      | -1.49          | 3.96             | 28.22       | 22.77                   | 189.234   | Horizontal               | Pass       |
|                                  |            | 1900      | -1.52          | 4.00             | 28.16       | 22.64                   | 183.654   | Horizontal               | Pass       |
| 1.4MHz Band QPSK                 | 1/#Mid     | 1850.7    | -1.74          | 3.76             | 28.24       | 22.74                   | 187.932   | Vertical                 | Pass       |
|                                  |            | 1880      | -1.62          | 3.91             | 28.22       | 22.69                   | 185.780   | Vertical                 | Pass       |
|                                  |            | 1909.3    | -1.48          | 3.93             | 28.20       | 22.79                   | 190.108   | Vertical                 | Pass       |
| 3.0MHz Band QPSK                 | 1/#Mid     | 1851.5    | -1.80          | 3.77             | 28.23       | 22.66                   | 184.502   | Vertical                 | Pass       |
|                                  |            | 1880      | -1.67          | 3.91             | 28.24       | 22.66                   | 184.502   | Vertical                 | Pass       |
|                                  |            | 1908.5    | -1.65          | 3.94             | 28.25       | 22.66                   | 184.502   | Vertical                 | Pass       |
| 5.0MHz Band QPSK                 | 1/#Mid     | 1852.5    | -1.84          | 3.77             | 28.31       | 22.70                   | 186.209   | Vertical                 | Pass       |
|                                  |            | 1880      | -1.57          | 3.91             | 28.22       | 22.74                   | 187.932   | Vertical                 | Pass       |
|                                  |            | 1907.5    | -1.49          | 3.94             | 28.20       | 22.77                   | 189.234   | Vertical                 | Pass       |
| 10.0MHz Band QPSK                | 1/#Mid     | 1855      | -1.82          | 3.79             | 28.33       | 22.72                   | 187.068   | Vertical                 | Pass       |
|                                  |            | 1880      | -1.53          | 3.95             | 28.22       | 22.74                   | 187.932   | Vertical                 | Pass       |
|                                  |            | 1905      | -1.49          | 3.97             | 28.19       | 22.73                   | 187.499   | Vertical                 | Pass       |

|         |        |        |       |      |       |       |         |          |      |
|---------|--------|--------|-------|------|-------|-------|---------|----------|------|
| 15.0MHz | 1/#Mid | 1857.5 | -1.80 | 3.79 | 28.34 | 22.75 | 188.365 | Vertical | Pass |
| Band    |        | 1880   | -1.57 | 3.95 | 28.22 | 22.70 | 186.209 | Vertical | Pass |
| QPSK    |        | 1902.5 | -1.55 | 3.97 | 28.18 | 22.66 | 184.502 | Vertical | Pass |
| 20.0MHz | 1/#Mid | 1860   | -1.73 | 3.81 | 28.35 | 22.81 | 190.985 | Vertical | Pass |
| Band    |        | 1880   | -1.44 | 3.96 | 28.22 | 22.82 | 191.426 | Vertical | Pass |
| QPSK    |        | 1900   | -1.33 | 4.00 | 28.16 | 22.83 | 191.867 | Vertical | Pass |

| Radiated Power (EIRP) for Band 2 |               |           |                      |                        |                |                                  |              |                                |            |
|----------------------------------|---------------|-----------|----------------------|------------------------|----------------|----------------------------------|--------------|--------------------------------|------------|
| Mode                             | RB/RB<br>SIZE | Frequency | Result               |                        |                |                                  |              |                                | Conclusion |
|                                  |               |           | SG<br>Level<br>(dBm) | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Max.<br>EIRP<br>Average<br>(dBm) | Max.<br>EIRP | Polarization<br>Of Max.<br>ERP |            |
|                                  |               |           |                      |                        |                |                                  | Average      |                                |            |
|                                  |               |           |                      |                        |                |                                  | (mW)         |                                |            |
| 1.4MHz<br>Band 16<br>QAM         | 1/#Mid        | 1850.7    | -2.47                | 3.76                   | 28.24          | 22.01                            | 158.855      | Horizontal                     | Pass       |
|                                  |               | 1880      | -2.32                | 3.91                   | 28.22          | 21.99                            | 158.125      | Horizontal                     | Pass       |
|                                  |               | 1909.3    | -2.28                | 3.93                   | 28.20          | 21.99                            | 158.125      | Horizontal                     | Pass       |
| 3.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1851.5    | -2.40                | 3.77                   | 28.23          | 22.06                            | 160.694      | Horizontal                     | Pass       |
|                                  |               | 1880      | -2.27                | 3.91                   | 28.24          | 22.06                            | 160.694      | Horizontal                     | Pass       |
|                                  |               | 1908.5    | -2.25                | 3.94                   | 28.25          | 22.06                            | 160.694      | Horizontal                     | Pass       |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1852.5    | -2.60                | 3.77                   | 28.31          | 21.94                            | 156.315      | Horizontal                     | Pass       |
|                                  |               | 1880      | -2.33                | 3.91                   | 28.22          | 21.98                            | 157.761      | Horizontal                     | Pass       |
|                                  |               | 1907.5    | -2.31                | 3.94                   | 28.20          | 21.95                            | 156.675      | Horizontal                     | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid        | 1855      | -2.44                | 3.79                   | 28.33          | 22.10                            | 162.181      | Horizontal                     | Pass       |
|                                  |               | 1880      | -2.23                | 3.95                   | 28.22          | 22.04                            | 159.956      | Horizontal                     | Pass       |
|                                  |               | 1905      | -2.21                | 3.97                   | 28.19          | 22.01                            | 158.855      | Horizontal                     | Pass       |
| 15.0MHz<br>Band 16<br>QAM        | 1/#Mid        | 1857.5    | -2.47                | 3.79                   | 28.34          | 22.08                            | 161.436      | Horizontal                     | Pass       |
|                                  |               | 1880      | -2.33                | 3.95                   | 28.22          | 21.94                            | 156.315      | Horizontal                     | Pass       |
|                                  |               | 1902.5    | -2.13                | 3.97                   | 28.18          | 22.08                            | 161.436      | Horizontal                     | Pass       |
| 20.0MHz<br>Band 16<br>QAM        | 1/#Mid        | 1860      | -2.49                | 3.81                   | 28.35          | 22.05                            | 160.325      | Horizontal                     | Pass       |
|                                  |               | 1880      | -2.28                | 3.96                   | 28.22          | 21.98                            | 157.761      | Horizontal                     | Pass       |
|                                  |               | 1900      | -2.22                | 4.00                   | 28.16          | 21.94                            | 156.315      | Horizontal                     | Pass       |
| 1.4MHz<br>Band 16<br>QAM         | 1/#Mid        | 1850.7    | -2.50                | 3.76                   | 28.24          | 21.98                            | 157.761      | Vertical                       | Pass       |
|                                  |               | 1880      | -2.28                | 3.91                   | 28.22          | 22.03                            | 159.588      | Vertical                       | Pass       |
|                                  |               | 1909.3    | -2.27                | 3.93                   | 28.20          | 22.00                            | 158.489      | Vertical                       | Pass       |
| 3.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1851.5    | -2.49                | 3.77                   | 28.23          | 21.97                            | 157.398      | Vertical                       | Pass       |
|                                  |               | 1880      | -2.33                | 3.91                   | 28.24          | 22.00                            | 158.489      | Vertical                       | Pass       |
|                                  |               | 1908.5    | -2.36                | 3.94                   | 28.25          | 21.95                            | 156.675      | Vertical                       | Pass       |
| 5.0MHz                           | 1/#Mid        | 1852.5    | -2.53                | 3.77                   | 28.31          | 22.01                            | 158.855      | Vertical                       | Pass       |

|         |        |        |       |      |       |       |         |          |      |
|---------|--------|--------|-------|------|-------|-------|---------|----------|------|
| Band 16 |        | 1880   | -2.24 | 3.91 | 28.22 | 22.07 | 161.065 | Vertical | Pass |
| QAM     |        | 1907.5 | -2.33 | 3.94 | 28.20 | 21.93 | 155.955 | Vertical | Pass |
| 10.0MHz | 1/#Mid | 1855   | -2.48 | 3.79 | 28.33 | 22.06 | 160.694 | Vertical | Pass |
| Band 16 |        | 1880   | -2.30 | 3.95 | 28.22 | 21.97 | 157.398 | Vertical | Pass |
| QAM     |        | 1905   | -2.27 | 3.97 | 28.19 | 21.95 | 156.675 | Vertical | Pass |
| 15.0MHz | 1/#Mid | 1857.5 | -2.60 | 3.79 | 28.34 | 21.95 | 156.675 | Vertical | Pass |
| Band 16 |        | 1880   | -2.18 | 3.95 | 28.22 | 22.09 | 161.808 | Vertical | Pass |
| QAM     |        | 1902.5 | -2.27 | 3.97 | 28.18 | 21.94 | 156.315 | Vertical | Pass |
| 20.0MHz | 1/#Mid | 1860   | -2.40 | 3.81 | 28.35 | 22.14 | 163.682 | Vertical | Pass |
| Band 16 |        | 1880   | -2.15 | 3.96 | 28.22 | 22.11 | 162.555 | Vertical | Pass |
| QAM     |        | 1900   | -2.04 | 4.00 | 28.16 | 22.12 | 162.930 | Vertical | Pass |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

### 8.3 LTE BAND 4

| Radiated Power (EIRP) for Band 4 |               |           |             |                        |                |              |              |                                |            |
|----------------------------------|---------------|-----------|-------------|------------------------|----------------|--------------|--------------|--------------------------------|------------|
| Mode                             | RB/RB<br>SIZE | Frequency | Result      |                        |                |              |              |                                | Conclusion |
|                                  |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Max.<br>EIRP | Max.<br>EIRP | Polarization<br>Of Max.<br>ERP |            |
|                                  |               |           |             |                        |                | Average      | Average      |                                |            |
|                                  |               |           |             |                        |                | (dBm)        | (mW)         |                                |            |
| 1.4MHz<br>Band<br>QPSK           | 1/#Mid        | 1710.7    | -2.12       | 3.12                   | 27.58          | 22.34        | 171.396      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -1.96       | 3.27                   | 27.61          | 22.38        | 172.982      | Horizontal                     | Pass       |
|                                  |               | 1754.3    | -2.00       | 3.29                   | 27.63          | 22.34        | 171.396      | Horizontal                     | Pass       |
| 3.0MHz<br>Band<br>QPSK           | 1/#Mid        | 1711.5    | -2.08       | 3.13                   | 27.61          | 22.40        | 173.780      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.02       | 3.27                   | 27.61          | 22.32        | 170.608      | Horizontal                     | Pass       |
|                                  |               | 1753.5    | -1.94       | 3.30                   | 27.62          | 22.38        | 172.982      | Horizontal                     | Pass       |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid        | 1712.5    | -2.16       | 3.13                   | 27.63          | 22.34        | 171.396      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.06       | 3.27                   | 27.61          | 22.28        | 169.044      | Horizontal                     | Pass       |
|                                  |               | 1752.5    | -2.07       | 3.30                   | 27.60          | 22.23        | 167.109      | Horizontal                     | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid        | 1715      | -2.23       | 3.15                   | 27.64          | 22.26        | 168.267      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.03       | 3.31                   | 27.61          | 22.27        | 168.655      | Horizontal                     | Pass       |
|                                  |               | 1750      | -1.86       | 3.33                   | 27.59          | 22.40        | 173.780      | Horizontal                     | Pass       |
| 15.0MHz<br>Band<br>QPSK          | 1/#Mid        | 1717.5    | -2.21       | 3.15                   | 27.65          | 22.29        | 169.434      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.01       | 3.31                   | 27.61          | 22.29        | 169.434      | Horizontal                     | Pass       |
|                                  |               | 1747.5    | -1.99       | 3.33                   | 27.57          | 22.25        | 167.880      | Horizontal                     | Pass       |
| 20.0MHz<br>Band<br>QPSK          | 1/#Mid        | 1720      | -2.12       | 3.17                   | 27.66          | 22.37        | 172.584      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -1.91       | 3.32                   | 27.61          | 22.38        | 172.982      | Horizontal                     | Pass       |
|                                  |               | 1745      | -1.92       | 3.36                   | 27.56          | 22.28        | 169.044      | Horizontal                     | Pass       |
| 1.4MHz<br>Band<br>QPSK           | 1/#Mid        | 1710.7    | -2.17       | 3.12                   | 27.58          | 22.29        | 169.434      | Vertical                       | Pass       |
|                                  |               | 1732.5    | -1.95       | 3.27                   | 27.61          | 22.39        | 173.380      | Vertical                       | Pass       |
|                                  |               | 1754.3    | -2.09       | 3.29                   | 27.63          | 22.25        | 167.880      | Vertical                       | Pass       |
| 3.0MHz<br>Band<br>QPSK           | 1/#Mid        | 1711.5    | -2.08       | 3.13                   | 27.61          | 22.40        | 173.780      | Vertical                       | Pass       |
|                                  |               | 1732.5    | -1.96       | 3.27                   | 27.61          | 22.38        | 172.982      | Vertical                       | Pass       |
|                                  |               | 1753.5    | -1.99       | 3.30                   | 27.62          | 22.33        | 171.002      | Vertical                       | Pass       |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid        | 1712.5    | -2.19       | 3.13                   | 27.63          | 22.31        | 170.216      | Vertical                       | Pass       |
|                                  |               | 1732.5    | -2.03       | 3.27                   | 27.61          | 22.31        | 170.216      | Vertical                       | Pass       |
|                                  |               | 1752.5    | -2.00       | 3.30                   | 27.60          | 22.30        | 169.824      | Vertical                       | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid        | 1715      | -2.20       | 3.15                   | 27.64          | 22.29        | 169.434      | Vertical                       | Pass       |
|                                  |               | 1732.5    | -2.05       | 3.31                   | 27.61          | 22.25        | 167.880      | Vertical                       | Pass       |
|                                  |               | 1750      | -2.00       | 3.33                   | 27.59          | 22.26        | 168.267      | Vertical                       | Pass       |

|                         |        |        |       |      |       |       |         |          |      |
|-------------------------|--------|--------|-------|------|-------|-------|---------|----------|------|
| 15.0MHz<br>Band<br>QPSK | 1/#Mid | 1717.5 | -2.17 | 3.15 | 27.65 | 22.33 | 171.002 | Vertical | Pass |
|                         |        | 1732.5 | -2.01 | 3.31 | 27.61 | 22.29 | 169.434 | Vertical | Pass |
|                         |        | 1747.5 | -1.86 | 3.33 | 27.57 | 22.38 | 172.982 | Vertical | Pass |
| 20.0MHz<br>Band<br>QPSK | 1/#Mid | 1720   | -2.05 | 3.17 | 27.66 | 22.44 | 175.388 | Vertical | Pass |
|                         |        | 1732.5 | -1.85 | 3.32 | 27.61 | 22.44 | 175.388 | Vertical | Pass |
|                         |        | 1745   | -1.77 | 3.36 | 27.56 | 22.43 | 174.985 | Vertical | Pass |

| Radiated Power (EIRP) for Band 4 |               |           |             |                        |                |              |              |                                |            |
|----------------------------------|---------------|-----------|-------------|------------------------|----------------|--------------|--------------|--------------------------------|------------|
| Mode                             | RB/RB<br>SIZE | Frequency | Result      |                        |                |              |              | Polarization<br>Of Max.<br>ERP | Conclusion |
|                                  |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Max.<br>EIRP | Max.<br>EIRP |                                |            |
|                                  |               |           | (dBm)       |                        |                | Average      | Average      |                                |            |
|                                  |               |           |             |                        |                | (dBm)        | (mW)         |                                |            |
| 1.4MHz<br>Band 16<br>QAM         | 1/#Mid        | 1710.7    | -2.92       | 3.12                   | 27.58          | 21.54        | 142.561      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.80       | 3.27                   | 27.61          | 21.54        | 142.561      | Horizontal                     | Pass       |
|                                  |               | 1754.3    | -2.78       | 3.29                   | 27.63          | 21.56        | 143.219      | Horizontal                     | Pass       |
| 3.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1711.5    | -2.89       | 3.13                   | 27.61          | 21.59        | 144.212      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.83       | 3.27                   | 27.61          | 21.51        | 141.579      | Horizontal                     | Pass       |
|                                  |               | 1753.5    | -2.80       | 3.30                   | 27.62          | 21.52        | 141.906      | Horizontal                     | Pass       |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1712.5    | -3.01       | 3.13                   | 27.63          | 21.49        | 140.929      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.80       | 3.27                   | 27.61          | 21.54        | 142.561      | Horizontal                     | Pass       |
|                                  |               | 1752.5    | -2.82       | 3.30                   | 27.60          | 21.48        | 140.605      | Horizontal                     | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid        | 1715      | -3.01       | 3.15                   | 27.64          | 21.48        | 140.605      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.73       | 3.31                   | 27.61          | 21.57        | 143.549      | Horizontal                     | Pass       |
|                                  |               | 1750      | -2.70       | 3.33                   | 27.59          | 21.56        | 143.219      | Horizontal                     | Pass       |
| 15.0MHz<br>Band 16<br>QAM        | 1/#Mid        | 1717.5    | -2.95       | 3.15                   | 27.65          | 21.55        | 142.889      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.83       | 3.31                   | 27.61          | 21.47        | 140.281      | Horizontal                     | Pass       |
|                                  |               | 1747.5    | -2.66       | 3.33                   | 27.57          | 21.58        | 143.880      | Horizontal                     | Pass       |
| 20.0MHz<br>Band 16<br>QAM        | 1/#Mid        | 1720      | -2.96       | 3.17                   | 27.66          | 21.53        | 142.233      | Horizontal                     | Pass       |
|                                  |               | 1732.5    | -2.86       | 3.32                   | 27.61          | 21.43        | 138.995      | Horizontal                     | Pass       |
|                                  |               | 1745      | -2.69       | 3.36                   | 27.56          | 21.51        | 141.579      | Horizontal                     | Pass       |
| 1.4MHz<br>Band 16<br>QAM         | 1/#Mid        | 1710.7    | -2.98       | 3.12                   | 27.58          | 21.48        | 140.605      | Vertical                       | Pass       |
|                                  |               | 1732.5    | -2.85       | 3.27                   | 27.61          | 21.49        | 140.929      | Vertical                       | Pass       |
|                                  |               | 1754.3    | -2.74       | 3.29                   | 27.63          | 21.60        | 144.544      | Vertical                       | Pass       |
| 3.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1711.5    | -3.00       | 3.13                   | 27.61          | 21.48        | 140.605      | Vertical                       | Pass       |
|                                  |               | 1732.5    | -2.79       | 3.27                   | 27.61          | 21.55        | 142.889      | Vertical                       | Pass       |
|                                  |               | 1753.5    | -2.84       | 3.30                   | 27.62          | 21.48        | 140.605      | Vertical                       | Pass       |
| 5.0MHz                           | 1/#Mid        | 1712.5    | -2.96       | 3.13                   | 27.63          | 21.54        | 142.561      | Vertical                       | Pass       |



|                           |        |        |       |      |       |       |         |          |      |
|---------------------------|--------|--------|-------|------|-------|-------|---------|----------|------|
| Band 16<br>QAM            |        | 1732.5 | -2.76 | 3.27 | 27.61 | 21.58 | 143.880 | Vertical | Pass |
|                           |        | 1752.5 | -2.85 | 3.30 | 27.60 | 21.45 | 139.637 | Vertical | Pass |
| 10.0MHz<br>Band 16<br>QAM | 1/#Mid | 1715   | -3.03 | 3.15 | 27.64 | 21.46 | 139.959 | Vertical | Pass |
|                           |        | 1732.5 | -2.84 | 3.31 | 27.61 | 21.46 | 139.959 | Vertical | Pass |
|                           |        | 1750   | -2.71 | 3.33 | 27.59 | 21.55 | 142.889 | Vertical | Pass |
| 15.0MHz<br>Band 16<br>QAM | 1/#Mid | 1717.5 | -2.97 | 3.15 | 27.65 | 21.53 | 142.233 | Vertical | Pass |
|                           |        | 1732.5 | -2.76 | 3.31 | 27.61 | 21.54 | 142.561 | Vertical | Pass |
|                           |        | 1747.5 | -2.65 | 3.33 | 27.57 | 21.59 | 144.212 | Vertical | Pass |
| 20.0MHz<br>Band 16<br>QAM | 1/#Mid | 1720   | -2.85 | 3.17 | 27.66 | 21.64 | 145.881 | Vertical | Pass |
|                           |        | 1732.5 | -2.69 | 3.32 | 27.61 | 21.60 | 144.544 | Vertical | Pass |
|                           |        | 1745   | -2.57 | 3.36 | 27.56 | 21.63 | 145.546 | Vertical | Pass |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

## 8.4 LTE BAND 5

| Radiated Power (ERP) for Band 5 |               |           |             |                        |                |            |             |             |                             |            |
|---------------------------------|---------------|-----------|-------------|------------------------|----------------|------------|-------------|-------------|-----------------------------|------------|
| Mode                            | RB/RB<br>SIZE | Frequency | Result      |                        |                |            |             |             |                             | Conclusion |
|                                 |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Correction | Max.<br>ERP | Max.<br>ERP | Polarization<br>Of Max. ERP |            |
|                                 |               |           | (dBm)       |                        |                | (dB)       | Average     | Average     |                             |            |
|                                 |               |           |             |                        |                |            | (dBm)       | (mW)        |                             |            |
| 1.4MHz<br>Band<br>QPSK          | 1/#Mid        | 824.7     | 6.86        | 2.01                   | 19.68          | 2.15       | 22.38       | 172.982     | Horizontal                  | Pass       |
|                                 |               | 836.5     | 6.65        | 2.01                   | 19.77          | 2.15       | 22.26       | 168.267     | Horizontal                  | Pass       |
|                                 |               | 848.3     | 6.67        | 2.02                   | 19.82          | 2.15       | 22.32       | 170.608     | Horizontal                  | Pass       |
| 3.0MHz<br>Band<br>QPSK          | 1/#Mid        | 825.5     | 6.74        | 2.01                   | 19.70          | 2.15       | 22.28       | 169.044     | Horizontal                  | Pass       |
|                                 |               | 836.5     | 6.73        | 2.01                   | 19.77          | 2.15       | 22.34       | 171.396     | Horizontal                  | Pass       |
|                                 |               | 847.5     | 6.73        | 2.02                   | 19.81          | 2.15       | 22.37       | 172.584     | Horizontal                  | Pass       |
| 5.0MHz<br>Band<br>QPSK          | 1/#Mid        | 826.5     | 6.70        | 2.01                   | 19.71          | 2.15       | 22.25       | 167.880     | Horizontal                  | Pass       |
|                                 |               | 836.5     | 6.72        | 2.01                   | 19.77          | 2.15       | 22.33       | 171.002     | Horizontal                  | Pass       |
|                                 |               | 846.5     | 6.71        | 2.02                   | 19.79          | 2.15       | 22.33       | 171.002     | Horizontal                  | Pass       |
| 10.0MHz<br>Band<br>QPSK         | 1/#Mid        | 829       | 6.77        | 2.01                   | 19.73          | 2.15       | 22.34       | 171.396     | Horizontal                  | Pass       |
|                                 |               | 836.5     | 6.72        | 2.01                   | 19.77          | 2.15       | 22.33       | 171.002     | Horizontal                  | Pass       |
|                                 |               | 844       | 6.71        | 2.02                   | 19.78          | 2.15       | 22.32       | 170.608     | Horizontal                  | Pass       |
| 1.4MHz<br>Band<br>QPSK          | 1/#Mid        | 824.7     | 6.82        | 2.01                   | 19.68          | 2.15       | 22.34       | 171.396     | Vertical                    | Pass       |
|                                 |               | 836.5     | 6.76        | 2.01                   | 19.77          | 2.15       | 22.37       | 172.584     | Vertical                    | Pass       |
|                                 |               | 848.3     | 6.66        | 2.02                   | 19.82          | 2.15       | 22.31       | 170.216     | Vertical                    | Pass       |
| 3.0MHz<br>Band<br>QPSK          | 1/#Mid        | 825.5     | 6.72        | 2.01                   | 19.70          | 2.15       | 22.26       | 168.267     | Vertical                    | Pass       |
|                                 |               | 836.5     | 6.77        | 2.01                   | 19.77          | 2.15       | 22.38       | 172.982     | Vertical                    | Pass       |
|                                 |               | 847.5     | 6.67        | 2.02                   | 19.81          | 2.15       | 22.31       | 170.216     | Vertical                    | Pass       |
| 5.0MHz<br>Band<br>QPSK          | 1/#Mid        | 826.5     | 6.81        | 2.01                   | 19.71          | 2.15       | 22.36       | 172.187     | Vertical                    | Pass       |
|                                 |               | 836.5     | 6.71        | 2.01                   | 19.77          | 2.15       | 22.32       | 170.608     | Vertical                    | Pass       |
|                                 |               | 846.5     | 6.63        | 2.02                   | 19.79          | 2.15       | 22.25       | 167.880     | Vertical                    | Pass       |
| 10.0MHz<br>Band<br>QPSK         | 1/#Mid        | 829       | 6.87        | 2.01                   | 19.73          | 2.15       | 22.44       | 175.388     | Vertical                    | Pass       |
|                                 |               | 836.5     | 6.83        | 2.01                   | 19.77          | 2.15       | 22.44       | 175.388     | Vertical                    | Pass       |
|                                 |               | 844       | 6.82        | 2.02                   | 19.78          | 2.15       | 22.43       | 174.985     | Vertical                    | Pass       |

| Radiated Power (ERP) for Band 5 |            |           |          |                  |             |            |          |          |                          |             |
|---------------------------------|------------|-----------|----------|------------------|-------------|------------|----------|----------|--------------------------|-------------|
| Mode                            | RB/RB SIZE | Frequency | Result   |                  |             |            |          |          |                          | Conclu sion |
|                                 |            |           | SG Level | Cable Loss (dBm) | Factor (dB) | Correction | Max. ERP | Max. ERP | Polarization Of Max. ERP |             |
|                                 |            |           | (dBm)    |                  |             | (dB)       | Average  | Average  |                          |             |
|                                 |            |           |          |                  |             |            | (dBm)    | (mW)     |                          |             |
| 1.4MHz<br>Band 16<br>QAM        | 1/#Mid     | 824.7     | 6.14     | 2.01             | 19.68       | 2.15       | 21.66    | 146.555  | Horizontal               | Pass        |
|                                 |            | 836.5     | 6.07     | 2.01             | 19.77       | 2.15       | 21.68    | 147.231  | Horizontal               | Pass        |
|                                 |            | 848.3     | 5.99     | 2.02             | 19.82       | 2.15       | 21.64    | 145.881  | Horizontal               | Pass        |
| 3.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 825.5     | 6.14     | 2.01             | 19.70       | 2.15       | 21.68    | 147.231  | Horizontal               | Pass        |
|                                 |            | 836.5     | 5.97     | 2.01             | 19.77       | 2.15       | 21.58    | 143.880  | Horizontal               | Pass        |
|                                 |            | 847.5     | 5.98     | 2.02             | 19.81       | 2.15       | 21.62    | 145.211  | Horizontal               | Pass        |
| 5.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 826.5     | 6.01     | 2.01             | 19.71       | 2.15       | 21.56    | 143.219  | Horizontal               | Pass        |
|                                 |            | 836.5     | 6.03     | 2.01             | 19.77       | 2.15       | 21.64    | 145.881  | Horizontal               | Pass        |
|                                 |            | 846.5     | 5.92     | 2.02             | 19.79       | 2.15       | 21.54    | 142.561  | Horizontal               | Pass        |
| 10.0MH<br>z Band<br>16 QAM      | 1/#Mid     | 829       | 6.07     | 2.01             | 19.73       | 2.15       | 21.64    | 145.881  | Horizontal               | Pass        |
|                                 |            | 836.5     | 6.06     | 2.01             | 19.77       | 2.15       | 21.67    | 146.893  | Horizontal               | Pass        |
|                                 |            | 844       | 6.04     | 2.02             | 19.78       | 2.15       | 21.65    | 146.218  | Horizontal               | Pass        |
| 1.4MHz<br>Band 16<br>QAM        | 1/#Mid     | 824.7     | 6.10     | 2.01             | 19.68       | 2.15       | 21.62    | 145.211  | Vertical                 | Pass        |
|                                 |            | 836.5     | 5.96     | 2.01             | 19.77       | 2.15       | 21.57    | 143.549  | Vertical                 | Pass        |
|                                 |            | 848.3     | 6.01     | 2.02             | 19.82       | 2.15       | 21.66    | 146.555  | Vertical                 | Pass        |
| 3.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 825.5     | 6.07     | 2.01             | 19.70       | 2.15       | 21.61    | 144.877  | Vertical                 | Pass        |
|                                 |            | 836.5     | 5.99     | 2.01             | 19.77       | 2.15       | 21.60    | 144.544  | Vertical                 | Pass        |
|                                 |            | 847.5     | 5.94     | 2.02             | 19.81       | 2.15       | 21.58    | 143.880  | Vertical                 | Pass        |
| 5.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 826.5     | 6.08     | 2.01             | 19.71       | 2.15       | 21.63    | 145.546  | Vertical                 | Pass        |
|                                 |            | 836.5     | 5.95     | 2.01             | 19.77       | 2.15       | 21.56    | 143.219  | Vertical                 | Pass        |
|                                 |            | 846.5     | 5.91     | 2.02             | 19.79       | 2.15       | 21.53    | 142.233  | Vertical                 | Pass        |
| 10.0MH<br>z Band<br>16 QAM      | 1/#Mid     | 829       | 6.18     | 2.01             | 19.73       | 2.15       | 21.75    | 149.624  | Vertical                 | Pass        |
|                                 |            | 836.5     | 6.12     | 2.01             | 19.77       | 2.15       | 21.73    | 148.936  | Vertical                 | Pass        |
|                                 |            | 844       | 6.09     | 2.02             | 19.78       | 2.15       | 21.70    | 147.911  | Vertical                 | Pass        |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

## 8.5 LTE BAND 7

| Radiated Power (EIRP) for Band 7 |            |           |          |            |                |           |           |              |            |
|----------------------------------|------------|-----------|----------|------------|----------------|-----------|-----------|--------------|------------|
| Mode                             | RB/RB SIZE | Frequency | Result   |            |                |           |           |              | Conclusion |
|                                  |            |           | SG Level | Cable Loss | Antenna Factor | Max. EIRP | Max. EIRP | Polarization |            |
|                                  |            |           | (dBm)    | (dBm)      | (dB)           | Average   | Average   | Of Max. ERP  |            |
|                                  |            |           |          |            |                | (dBm)     | (mW)      |              |            |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid     | 2502.5    | -0.53    | 4.54       | 27.75          | 22.68     | 185.353   | Horizontal   | Pass       |
|                                  |            | 2535      | -0.36    | 4.69       | 27.72          | 22.67     | 184.927   | Horizontal   | Pass       |
|                                  |            | 2567.5    | -0.21    | 4.71       | 27.71          | 22.79     | 190.108   | Horizontal   | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid     | 2505      | -0.44    | 4.55       | 27.76          | 22.77     | 189.234   | Horizontal   | Pass       |
|                                  |            | 2535      | -0.29    | 4.69       | 27.72          | 22.74     | 187.932   | Horizontal   | Pass       |
|                                  |            | 2565      | -0.31    | 4.72       | 27.70          | 22.67     | 184.927   | Horizontal   | Pass       |
| 15.0MHz<br>Band<br>QPSK          | 1/#Mid     | 2507.5    | -0.57    | 4.55       | 27.77          | 22.65     | 184.077   | Horizontal   | Pass       |
|                                  |            | 2535      | -0.34    | 4.69       | 27.72          | 22.69     | 185.780   | Horizontal   | Pass       |
|                                  |            | 2562.5    | -0.32    | 4.72       | 27.69          | 22.65     | 184.077   | Horizontal   | Pass       |
| 20.0MHz<br>Band<br>QPSK          | 1/#Mid     | 2510      | -0.45    | 4.57       | 27.78          | 22.76     | 188.799   | Horizontal   | Pass       |
|                                  |            | 2535      | -0.33    | 4.73       | 27.72          | 22.66     | 184.502   | Horizontal   | Pass       |
|                                  |            | 2560      | -0.18    | 4.75       | 27.68          | 22.75     | 188.365   | Horizontal   | Pass       |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid     | 2502.5    | -0.48    | 4.54       | 27.75          | 22.73     | 187.499   | Vertical     | Pass       |
|                                  |            | 2535      | -0.36    | 4.69       | 27.72          | 22.67     | 184.927   | Vertical     | Pass       |
|                                  |            | 2567.5    | -0.22    | 4.71       | 27.71          | 22.78     | 189.671   | Vertical     | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid     | 2505      | -0.43    | 4.55       | 27.76          | 22.78     | 189.671   | Vertical     | Pass       |
|                                  |            | 2535      | -0.32    | 4.69       | 27.72          | 22.71     | 186.638   | Vertical     | Pass       |
|                                  |            | 2565      | -0.34    | 4.72       | 27.70          | 22.64     | 183.654   | Vertical     | Pass       |
| 15.0MHz<br>Band<br>QPSK          | 1/#Mid     | 2507.5    | -0.55    | 4.55       | 27.77          | 22.67     | 184.927   | Vertical     | Pass       |
|                                  |            | 2535      | -0.30    | 4.69       | 27.72          | 22.73     | 187.499   | Vertical     | Pass       |
|                                  |            | 2562.5    | -0.24    | 4.72       | 27.69          | 22.73     | 187.499   | Vertical     | Pass       |
| 20.0MHz<br>Band<br>QPSK          | 1/#Mid     | 2510      | -0.38    | 4.57       | 27.78          | 22.83     | 191.867   | Vertical     | Pass       |
|                                  |            | 2535      | -0.18    | 4.73       | 27.72          | 22.81     | 190.985   | Vertical     | Pass       |
|                                  |            | 2560      | -0.10    | 4.75       | 27.68          | 22.83     | 191.867   | Vertical     | Pass       |

| Radiated Power (EIRP) for Band 7 |            |           |          |            |                |           |           |              |            |
|----------------------------------|------------|-----------|----------|------------|----------------|-----------|-----------|--------------|------------|
| Mode                             | RB/RB SIZE | Frequency | Result   |            |                |           |           |              | Conclusion |
|                                  |            |           | SG Level | Cable Loss | Antenna Factor | Max. EIRP | Max. EIRP | Polarization |            |
|                                  |            |           | (dBm)    | (dBm)      | (dB)           | Average   | Average   | Of Max. ERP  |            |
|                                  |            |           |          |            |                | (dBm)     | (mW)      |              |            |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2502.5    | -1.45    | 4.54       | 27.75          | 21.76     | 149.968   | Horizontal   | Pass       |
|                                  |            | 2535      | -1.28    | 4.69       | 27.72          | 21.75     | 149.624   | Horizontal   | Pass       |
|                                  |            | 2567.5    | -1.11    | 4.71       | 27.71          | 21.89     | 154.525   | Horizontal   | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 2505      | -1.31    | 4.55       | 27.76          | 21.90     | 154.882   | Horizontal   | Pass       |
|                                  |            | 2535      | -1.23    | 4.69       | 27.72          | 21.80     | 151.356   | Horizontal   | Pass       |
|                                  |            | 2565      | -1.24    | 4.72       | 27.70          | 21.74     | 149.279   | Horizontal   | Pass       |
| 15.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 2507.5    | -1.39    | 4.55       | 27.77          | 21.83     | 152.405   | Horizontal   | Pass       |
|                                  |            | 2535      | -1.28    | 4.69       | 27.72          | 21.75     | 149.624   | Horizontal   | Pass       |
|                                  |            | 2562.5    | -1.17    | 4.72       | 27.69          | 21.80     | 151.356   | Horizontal   | Pass       |
| 20.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 2510      | -1.35    | 4.57       | 27.78          | 21.86     | 153.462   | Horizontal   | Pass       |
|                                  |            | 2535      | -1.09    | 4.73       | 27.72          | 21.90     | 154.882   | Horizontal   | Pass       |
|                                  |            | 2560      | -1.16    | 4.75       | 27.68          | 21.77     | 150.314   | Horizontal   | Pass       |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2502.5    | -1.31    | 4.54       | 27.75          | 21.90     | 154.882   | Vertical     | Pass       |
|                                  |            | 2535      | -1.26    | 4.69       | 27.72          | 21.77     | 150.314   | Vertical     | Pass       |
|                                  |            | 2567.5    | -1.16    | 4.71       | 27.71          | 21.84     | 152.757   | Vertical     | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 2505      | -1.36    | 4.55       | 27.76          | 21.85     | 153.109   | Vertical     | Pass       |
|                                  |            | 2535      | -1.22    | 4.69       | 27.72          | 21.81     | 151.705   | Vertical     | Pass       |
|                                  |            | 2565      | -1.18    | 4.72       | 27.70          | 21.80     | 151.356   | Vertical     | Pass       |
| 15.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 2507.5    | -1.39    | 4.55       | 27.77          | 21.83     | 152.405   | Vertical     | Pass       |
|                                  |            | 2535      | -1.16    | 4.69       | 27.72          | 21.87     | 153.815   | Vertical     | Pass       |
|                                  |            | 2562.5    | -1.13    | 4.72       | 27.69          | 21.84     | 152.757   | Vertical     | Pass       |
| 20.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 2510      | -1.29    | 4.57       | 27.78          | 21.92     | 155.597   | Vertical     | Pass       |
|                                  |            | 2535      | -1.05    | 4.73       | 27.72          | 21.94     | 156.315   | Vertical     | Pass       |
|                                  |            | 2560      | -1.01    | 4.75       | 27.68          | 21.92     | 155.597   | Vertical     | Pass       |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Factor (dB)+ SG Level (dBm)- Cable Loss(dBm)

## 8.6 LTE BAND 12

| Radiated Power (ERP) for Band 12 |               |           |             |                        |                         |            |              |           |                                    |                |
|----------------------------------|---------------|-----------|-------------|------------------------|-------------------------|------------|--------------|-----------|------------------------------------|----------------|
| Mode                             | RB/RB<br>SIZE | Frequency | Result      |                        |                         |            |              |           |                                    | Conclusi<br>on |
|                                  |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Antenna<br>Gain<br>(dB) | Correction | Max.<br>EIRP | Max. EIRP | Polarization<br><br>Of Max.<br>ERP |                |
|                                  |               |           | (dBm)       |                        |                         | (dB)       | Average      | Average   |                                    |                |
|                                  |               |           |             |                        |                         |            | (dBm)        | (mW)      |                                    |                |
| 1.4MHz                           | 1/#Mid        | 699.7     | 8.15        | 1.91                   | 19.21                   | 2.15       | 23.30        | 213.796   | Vertical                           | Pass           |
| Band                             |               | 707.5     | 8.09        | 1.91                   | 19.26                   | 2.15       | 23.29        | 213.304   | Vertical                           | Pass           |
| QPSK                             |               | 715.3     | 8.10        | 1.93                   | 19.34                   | 2.15       | 23.36        | 216.770   | Vertical                           | Pass           |
| 3.0MHz                           | 1/#Mid        | 700.5     | 8.14        | 1.91                   | 19.21                   | 2.15       | 23.29        | 213.304   | Vertical                           | Pass           |
| Band                             |               | 707.5     | 8.10        | 1.91                   | 19.26                   | 2.15       | 23.30        | 213.796   | Vertical                           | Pass           |
| QPSK                             |               | 714.5     | 8.00        | 1.93                   | 19.34                   | 2.15       | 23.26        | 211.836   | Vertical                           | Pass           |
| 5.0MHz                           | 1/#Mid        | 701.5     | 8.07        | 1.91                   | 19.23                   | 2.15       | 23.24        | 210.863   | Vertical                           | Pass           |
| Band                             |               | 707.5     | 8.04        | 1.91                   | 19.26                   | 2.15       | 23.24        | 210.863   | Vertical                           | Pass           |
| QPSK                             |               | 713.5     | 8.08        | 1.92                   | 19.33                   | 2.15       | 23.34        | 215.774   | Vertical                           | Pass           |
| 10.0Hz                           | 1/#Mid        | 704       | 8.11        | 1.91                   | 19.25                   | 2.15       | 23.30        | 213.796   | Vertical                           | Pass           |
| Band                             |               | 707.5     | 8.11        | 1.91                   | 19.26                   | 2.15       | 23.31        | 214.289   | Vertical                           | Pass           |
| QPSK                             |               | 711       | 8.07        | 1.92                   | 19.32                   | 2.15       | 23.32        | 214.783   | Vertical                           | Pass           |
| 1.4MHz                           | 1/#Mid        | 699.7     | 8.24        | 1.91                   | 19.21                   | 2.15       | 23.39        | 218.273   | Horizontal                         | Pass           |
| Band                             |               | 707.5     | 8.19        | 1.91                   | 19.26                   | 2.15       | 23.39        | 218.273   | Horizontal                         | Pass           |
| QPSK                             |               | 715.3     | 8.08        | 1.93                   | 19.34                   | 2.15       | 23.34        | 215.774   | Horizontal                         | Pass           |
| 3.0MHz                           | 1/#Mid        | 700.5     | 8.20        | 1.91                   | 19.21                   | 2.15       | 23.35        | 216.272   | Horizontal                         | Pass           |
| Band                             |               | 707.5     | 8.06        | 1.91                   | 19.26                   | 2.15       | 23.26        | 211.836   | Horizontal                         | Pass           |
| QPSK                             |               | 714.5     | 8.03        | 1.93                   | 19.34                   | 2.15       | 23.29        | 213.304   | Horizontal                         | Pass           |
| 5.0MHz                           | 1/#Mid        | 701.5     | 8.05        | 1.91                   | 19.23                   | 2.15       | 23.22        | 209.894   | Horizontal                         | Pass           |
| Band                             |               | 707.5     | 8.04        | 1.91                   | 19.26                   | 2.15       | 23.24        | 210.863   | Horizontal                         | Pass           |
| QPSK                             |               | 713.5     | 8.07        | 1.92                   | 19.33                   | 2.15       | 23.33        | 215.278   | Horizontal                         | Pass           |
| 10.0Hz                           | 1/#Mid        | 704       | 8.21        | 1.91                   | 19.25                   | 2.15       | 23.40        | 218.776   | Horizontal                         | Pass           |
| Band                             |               | 707.5     | 8.20        | 1.91                   | 19.26                   | 2.15       | 23.40        | 218.776   | Horizontal                         | Pass           |
| QPSK                             |               | 711       | 8.16        | 1.92                   | 19.32                   | 2.15       | 23.41        | 219.280   | Horizontal                         | Pass           |

| Radiated Power (ERP) for Band 12 |                   |               |             |                        |                          |            |              |           |                                    |                |
|----------------------------------|-------------------|---------------|-------------|------------------------|--------------------------|------------|--------------|-----------|------------------------------------|----------------|
| Mode                             | RB/R<br>B<br>SIZE | Frequenc<br>y | Result      |                        |                          |            |              |           |                                    | Conclusi<br>on |
|                                  |                   |               | SG<br>Level | Cable<br>Loss<br>(dBm) | Antenn<br>a Gain<br>(dB) | Correction | Max.<br>EIRP | Max. EIRP | Polarization<br><br>Of Max.<br>ERP |                |
|                                  |                   |               | (dBm)       |                        |                          | (dB)       | Average      | Average   |                                    |                |
|                                  |                   |               |             |                        |                          |            | (dBm)        | (mW)      |                                    |                |
| 1.4MHz<br>Band 16<br>QAM         | 1/#Mi<br>d        | 699.7         | 6.48        | 1.91                   | 19.21                    | 2.15       | 21.63        | 145.546   | Vertical                           | Pass           |
|                                  |                   | 707.5         | 6.48        | 1.91                   | 19.26                    | 2.15       | 21.68        | 147.231   | Vertical                           | Pass           |
|                                  |                   | 715.3         | 6.30        | 1.93                   | 19.34                    | 2.15       | 21.56        | 143.219   | Vertical                           | Pass           |
| 3.0MHz<br>Band 16<br>QAM         | 1/#Mi<br>d        | 700.5         | 6.52        | 1.91                   | 19.21                    | 2.15       | 21.67        | 146.893   | Vertical                           | Pass           |
|                                  |                   | 707.5         | 6.49        | 1.91                   | 19.26                    | 2.15       | 21.69        | 147.571   | Vertical                           | Pass           |
|                                  |                   | 714.5         | 6.35        | 1.93                   | 19.34                    | 2.15       | 21.61        | 144.877   | Vertical                           | Pass           |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mi<br>d        | 701.5         | 6.44        | 1.91                   | 19.23                    | 2.15       | 21.61        | 144.877   | Vertical                           | Pass           |
|                                  |                   | 707.5         | 6.45        | 1.91                   | 19.26                    | 2.15       | 21.65        | 146.218   | Vertical                           | Pass           |
|                                  |                   | 713.5         | 6.42        | 1.92                   | 19.33                    | 2.15       | 21.68        | 147.231   | Vertical                           | Pass           |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mi<br>d        | 704           | 6.44        | 1.91                   | 19.25                    | 2.15       | 21.63        | 145.546   | Vertical                           | Pass           |
|                                  |                   | 707.5         | 6.33        | 1.91                   | 19.26                    | 2.15       | 21.53        | 142.233   | Vertical                           | Pass           |
|                                  |                   | 711           | 6.26        | 1.92                   | 19.32                    | 2.15       | 21.51        | 141.579   | Vertical                           | Pass           |
| 1.4MHz<br>Band 16<br>QAM         | 1/#Mi<br>d        | 699.7         | 6.51        | 1.91                   | 19.21                    | 2.15       | 21.66        | 146.555   | Horizontal                         | Pass           |
|                                  |                   | 707.5         | 6.35        | 1.91                   | 19.26                    | 2.15       | 21.55        | 142.889   | Horizontal                         | Pass           |
|                                  |                   | 715.3         | 6.30        | 1.93                   | 19.34                    | 2.15       | 21.56        | 143.219   | Horizontal                         | Pass           |
| 3.0MHz<br>Band 16<br>QAM         | 1/#Mi<br>d        | 700.5         | 6.52        | 1.91                   | 19.21                    | 2.15       | 21.67        | 146.893   | Horizontal                         | Pass           |
|                                  |                   | 707.5         | 6.38        | 1.91                   | 19.26                    | 2.15       | 21.58        | 143.880   | Horizontal                         | Pass           |
|                                  |                   | 714.5         | 6.35        | 1.93                   | 19.34                    | 2.15       | 21.61        | 144.877   | Horizontal                         | Pass           |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mi<br>d        | 701.5         | 6.53        | 1.91                   | 19.23                    | 2.15       | 21.70        | 147.911   | Horizontal                         | Pass           |
|                                  |                   | 707.5         | 6.45        | 1.91                   | 19.26                    | 2.15       | 21.65        | 146.218   | Horizontal                         | Pass           |
|                                  |                   | 713.5         | 6.42        | 1.92                   | 19.33                    | 2.15       | 21.68        | 147.231   | Horizontal                         | Pass           |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mi<br>d        | 704           | 6.56        | 1.91                   | 19.25                    | 2.15       | 21.75        | 149.624   | Horizontal                         | Pass           |
|                                  |                   | 707.5         | 6.55        | 1.91                   | 19.26                    | 2.15       | 21.75        | 149.624   | Horizontal                         | Pass           |
|                                  |                   | 711           | 6.48        | 1.92                   | 19.32                    | 2.15       | 21.73        | 148.936   | Horizontal                         | Pass           |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

### 8.7 LTE BAND 13

| Radiated Power (ERP) for Band 13 |               |           |             |                        |                |            |             |             |                                 |            |
|----------------------------------|---------------|-----------|-------------|------------------------|----------------|------------|-------------|-------------|---------------------------------|------------|
| Mode                             | RB/RB<br>SIZE | Frequency | Result      |                        |                |            |             |             |                                 | Conclusion |
|                                  |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Correction | Max.<br>EPR | Max.<br>EPR | Polarization<br><br>Of Max. ERP |            |
|                                  |               |           | (dBm)       |                        |                |            | Average     | Average     |                                 |            |
|                                  |               |           |             |                        |                |            | (dBm)       | (mW)        |                                 |            |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid        | 779.5     | 7.13        | 1.95                   | 19.23          | 2.15       | 22.26       | 168.267     | Vertical                        | Pass       |
|                                  |               | 782       | 7.23        | 1.95                   | 19.26          | 2.15       | 22.39       | 173.380     | Vertical                        | Pass       |
|                                  |               | 784.5     | 7.05        | 1.96                   | 19.33          | 2.15       | 22.27       | 168.655     | Vertical                        | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid        | 782       | 7.23        | 1.95                   | 19.25          | 2.15       | 22.38       | 172.982     | Vertical                        | Pass       |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid        | 779.5     | 7.24        | 1.95                   | 19.23          | 2.15       | 22.37       | 172.584     | Horizontal                      | Pass       |
|                                  |               | 782       | 7.16        | 1.95                   | 19.26          | 2.15       | 22.32       | 170.608     | Horizontal                      | Pass       |
|                                  |               | 784.5     | 7.07        | 1.96                   | 19.33          | 2.15       | 22.29       | 169.434     | Horizontal                      | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid        | 782       | 7.3         | 1.95                   | 19.25          | 2.15       | 22.45       | 175.792     | Horizontal                      | Pass       |



| Radiated Power (ERP) for Band 13 |               |           |             |                        |                |            |             |             |                             |            |
|----------------------------------|---------------|-----------|-------------|------------------------|----------------|------------|-------------|-------------|-----------------------------|------------|
| Mode                             | RB/RB<br>SIZE | Frequency | Result      |                        |                |            |             |             |                             | Conclusion |
|                                  |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Correction | Max.<br>EPR | Max.<br>EPR | Polarization<br>Of Max. ERP |            |
|                                  |               |           | (dBm)       |                        |                |            | Average     | Average     |                             |            |
|                                  |               |           |             |                        |                |            | (dBm)       | (mW)        |                             |            |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 779.5     | 6.27        | 1.95                   | 19.23          | 2.15       | 21.40       | 138.038     | Vertical                    | Pass       |
|                                  |               | 782       | 6.29        | 1.95                   | 19.26          | 2.15       | 21.45       | 139.637     | Vertical                    | Pass       |
|                                  |               | 784.5     | 6.24        | 1.96                   | 19.33          | 2.15       | 21.46       | 139.959     | Vertical                    | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid        | 782       | 6.18        | 1.95                   | 19.25          | 2.15       | 21.33       | 135.831     | Vertical                    | Pass       |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 779.5     | 6.35        | 1.95                   | 19.23          | 2.15       | 21.48       | 140.605     | Horizontal                  | Pass       |
|                                  |               | 782       | 6.25        | 1.95                   | 19.26          | 2.15       | 21.41       | 138.357     | Horizontal                  | Pass       |
|                                  |               | 784.5     | 6.26        | 1.96                   | 19.33          | 2.15       | 21.48       | 140.605     | Horizontal                  | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid        | 782       | 6.37        | 1.95                   | 19.25          | 2.15       | 21.52       | 141.906     | Horizontal                  | Pass       |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

### 8.7 LTE BAND 14

| Radiated Power (ERP) for Band 14 |               |           |             |                        |                |                    |             |             |                             |            |
|----------------------------------|---------------|-----------|-------------|------------------------|----------------|--------------------|-------------|-------------|-----------------------------|------------|
| Mode                             | RB/RB<br>SIZE | Frequency | Result      |                        |                |                    |             |             |                             | Conclusion |
|                                  |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Correction<br>(dB) | Max.<br>EPR | Max.<br>EPR | Polarization<br>Of Max. ERP |            |
|                                  |               |           | (dBm)       |                        |                |                    | Average     | Average     |                             |            |
|                                  |               |           |             |                        |                |                    | (dBm)       | (mW)        |                             |            |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid        | 790.5     | 7.04        | 1.91                   | 19.23          | 2.15               | 22.21       | 166.341     | Vertical                    | Pass       |
|                                  |               | 793       | 7.06        | 1.91                   | 19.26          | 2.15               | 22.26       | 168.267     | Vertical                    | Pass       |
|                                  |               | 795.5     | 6.91        | 1.92                   | 19.33          | 2.15               | 22.17       | 164.816     | Vertical                    | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid        | 793       | 7.07        | 1.91                   | 19.25          | 2.15               | 22.26       | 168.267     | Vertical                    | Pass       |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid        | 790.5     | 7.06        | 1.91                   | 19.23          | 2.15               | 22.23       | 167.109     | Horizontal                  | Pass       |
|                                  |               | 793       | 7.03        | 1.91                   | 19.26          | 2.15               | 22.23       | 167.109     | Horizontal                  | Pass       |
|                                  |               | 795.5     | 6.98        | 1.92                   | 19.33          | 2.15               | 22.24       | 167.494     | Horizontal                  | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid        | 793       | 7.15        | 1.91                   | 19.25          | 2.15               | 22.34       | 171.396     | Horizontal                  | Pass       |

| Radiated Power (ERP) for Band 14 |            |           |          |                  |             |                 |          |          |                          |            |
|----------------------------------|------------|-----------|----------|------------------|-------------|-----------------|----------|----------|--------------------------|------------|
| Mode                             | RB/RB SIZE | Frequency | Result   |                  |             |                 |          |          |                          | Conclusion |
|                                  |            |           | SG Level | Cable Loss (dBm) | Factor (dB) | Correction (dB) | Max. EPR | Max. EPR | Polarization Of Max. ERP |            |
|                                  |            |           | (dBm)    |                  |             |                 | Average  | Average  |                          |            |
|                                  |            |           |          |                  |             |                 | (dBm)    | (mW)     |                          |            |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 790.5     | 6.21     | 1.91             | 19.23       | 2.15            | 21.38    | 137.404  | Vertical                 | Pass       |
|                                  |            | 793       | 6.16     | 1.91             | 19.26       | 2.15            | 21.36    | 136.773  | Vertical                 | Pass       |
|                                  |            | 795.5     | 6.21     | 1.92             | 19.33       | 2.15            | 21.47    | 140.281  | Vertical                 | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 793       | 6.31     | 1.91             | 19.25       | 2.15            | 21.5     | 141.254  | Vertical                 | Pass       |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 790.5     | 6.22     | 1.91             | 19.23       | 2.15            | 21.39    | 137.721  | Horizontal               | Pass       |
|                                  |            | 793       | 6.25     | 1.91             | 19.26       | 2.15            | 21.45    | 139.637  | Horizontal               | Pass       |
|                                  |            | 795.5     | 6.11     | 1.92             | 19.33       | 2.15            | 21.37    | 137.088  | Horizontal               | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 793       | 6.34     | 1.91             | 19.25       | 2.15            | 21.53    | 142.233  | Horizontal               | Pass       |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

## 8.8 LTE BAND 17

| Radiated Power (ERP) for Band 17 |            |           |        |       |         |            |         |         |              |            |
|----------------------------------|------------|-----------|--------|-------|---------|------------|---------|---------|--------------|------------|
| Mode                             | RB/RB SIZE | Frequency | Result |       |         |            |         |         |              | Conclusion |
|                                  |            |           | SG     | Cable | Antenna | Correction | Max.    | Max.    | Polarization |            |
|                                  |            |           | Level  | Loss  | Factor  |            | EIRP    | EIRP    | Of Max.      |            |
|                                  |            |           | (dBm)  | (dBm) | (dB)    |            | Average | Average | ERP          |            |
|                                  |            |           |        |       |         | (dB)       | (dBm)   | (mW)    |              |            |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid     | 706.5     | 7.02   | 1.91  | 19.23   | 2.15       | 22.19   | 165.577 | Vertical     | Pass       |
|                                  |            | 710       | 7.09   | 1.91  | 19.26   | 2.15       | 22.29   | 169.434 | Vertical     | Pass       |
|                                  |            | 713.5     | 6.92   | 1.92  | 19.33   | 2.15       | 22.18   | 165.196 | Vertical     | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid     | 709       | 6.98   | 1.91  | 19.25   | 2.15       | 22.17   | 164.816 | Vertical     | Pass       |
|                                  |            | 710       | 7.05   | 1.91  | 19.26   | 2.15       | 22.25   | 167.880 | Vertical     | Pass       |
|                                  |            | 711       | 6.98   | 1.92  | 19.32   | 2.15       | 22.23   | 167.109 | Vertical     | Pass       |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid     | 706.5     | 7.06   | 1.91  | 19.23   | 2.15       | 22.23   | 167.109 | Horizontal   | Pass       |
|                                  |            | 710       | 7.09   | 1.91  | 19.26   | 2.15       | 22.29   | 169.434 | Horizontal   | Pass       |
|                                  |            | 713.5     | 6.93   | 1.92  | 19.33   | 2.15       | 22.19   | 165.577 | Horizontal   | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid     | 709       | 7.12   | 1.91  | 19.25   | 2.15       | 22.31   | 170.216 | Horizontal   | Pass       |
|                                  |            | 710       | 7.14   | 1.91  | 19.26   | 2.15       | 22.34   | 171.396 | Horizontal   | Pass       |
|                                  |            | 711       | 7.07   | 1.92  | 19.32   | 2.15       | 22.32   | 170.608 | Horizontal   | Pass       |

| Radiated Power (ERP) for Band 17 |            |           |          |            |                |            |               |              |                          |            |
|----------------------------------|------------|-----------|----------|------------|----------------|------------|---------------|--------------|--------------------------|------------|
| Mode                             | RB/RB SIZE | Frequency | Result   |            |                |            |               |              |                          | Conclusion |
|                                  |            |           | SG Level | Cable Loss | Antenna Factor | Correction | Max. EIRP     | Max. EIRP    | Polarization Of Max. ERP |            |
|                                  |            |           | (dBm)    | (dBm)      | (dB)           | (dB)       | Average (dBm) | Average (mW) |                          |            |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 706.5     | 6.35     | 1.91       | 19.23          | 2.15       | 21.52         | 141.906      | Vertical                 | Pass       |
|                                  |            | 710       | 6.33     | 1.91       | 19.26          | 2.15       | 21.53         | 142.233      | Vertical                 | Pass       |
|                                  |            | 713.5     | 6.28     | 1.92       | 19.33          | 2.15       | 21.54         | 142.561      | Vertical                 | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 709       | 6.39     | 1.91       | 19.25          | 2.15       | 21.58         | 143.880      | Vertical                 | Pass       |
|                                  |            | 710       | 6.38     | 1.91       | 19.26          | 2.15       | 21.58         | 143.880      | Vertical                 | Pass       |
|                                  |            | 711       | 6.33     | 1.92       | 19.32          | 2.15       | 21.58         | 143.880      | Vertical                 | Pass       |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 706.5     | 6.37     | 1.91       | 19.23          | 2.15       | 21.54         | 142.561      | Horizontal               | Pass       |
|                                  |            | 710       | 6.27     | 1.91       | 19.26          | 2.15       | 21.47         | 140.281      | Horizontal               | Pass       |
|                                  |            | 713.5     | 6.22     | 1.92       | 19.33          | 2.15       | 21.48         | 140.605      | Horizontal               | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 709       | 6.44     | 1.91       | 19.25          | 2.15       | 21.63         | 145.546      | Horizontal               | Pass       |
|                                  |            | 710       | 6.43     | 1.91       | 19.26          | 2.15       | 21.63         | 145.546      | Horizontal               | Pass       |
|                                  |            | 711       | 6.39     | 1.92       | 19.32          | 2.15       | 21.64         | 145.881      | Horizontal               | Pass       |

Note:

ERP=EIRP-2.15

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Factor (dB)+ SG Level (dBm)- Cable Loss(dBm)

## 8.9 LTE BAND 25

| Radiated Power (EIRP) for Band 25 |            |           |          |                  |             |           |           |                          |            |
|-----------------------------------|------------|-----------|----------|------------------|-------------|-----------|-----------|--------------------------|------------|
| Mode                              | RB/RB SIZE | Frequency | Result   |                  |             |           |           |                          | Conclusion |
|                                   |            |           | SG Level | Cable Loss (dBm) | Factor (dB) | Max. EIRP | Max. EIRP | Polarization Of Max. ERP |            |
|                                   |            |           | (dBm)    |                  |             | Average   | Average   |                          |            |
|                                   |            |           |          |                  |             | (dBm)     | (mW)      |                          |            |
| 1.4MHz Band QPSK                  | 1/#Mid     | 1850.7    | -1.86    | 3.12             | 27.58       | 22.60     | 181.970   | Horizontal               | Pass       |
|                                   |            | 1882.5    | -1.65    | 3.27             | 27.61       | 22.69     | 185.780   | Horizontal               | Pass       |
|                                   |            | 1914.3    | -1.75    | 3.29             | 27.63       | 22.59     | 181.552   | Horizontal               | Pass       |
| 3.0MHz Band QPSK                  | 1/#Mid     | 1851.5    | -1.79    | 3.13             | 27.61       | 22.69     | 185.780   | Horizontal               | Pass       |
|                                   |            | 1882.5    | -1.68    | 3.27             | 27.61       | 22.66     | 184.502   | Horizontal               | Pass       |
|                                   |            | 1753.5    | -1.74    | 3.30             | 27.62       | 22.58     | 181.134   | Horizontal               | Pass       |
| 5.0MHz Band QPSK                  | 1/#Mid     | 1852.5    | -1.87    | 3.13             | 27.63       | 22.63     | 183.231   | Horizontal               | Pass       |
|                                   |            | 1882.5    | -1.72    | 3.27             | 27.61       | 22.62     | 182.810   | Horizontal               | Pass       |
|                                   |            | 1912.5    | -1.62    | 3.30             | 27.60       | 22.68     | 185.353   | Horizontal               | Pass       |
| 10.0MHz Band QPSK                 | 1/#Mid     | 1855      | -1.88    | 3.15             | 27.64       | 22.61     | 182.390   | Horizontal               | Pass       |
|                                   |            | 1882.5    | -1.62    | 3.31             | 27.61       | 22.68     | 185.353   | Horizontal               | Pass       |
|                                   |            | 1910      | -1.66    | 3.33             | 27.59       | 22.60     | 181.970   | Horizontal               | Pass       |
| 15.0MHz Band QPSK                 | 1/#Mid     | 1857.5    | -1.92    | 3.15             | 27.65       | 22.58     | 181.134   | Horizontal               | Pass       |
|                                   |            | 1882.5    | -1.68    | 3.31             | 27.61       | 22.62     | 182.810   | Horizontal               | Pass       |
|                                   |            | 1907.5    | -1.60    | 3.33             | 27.57       | 22.64     | 183.654   | Horizontal               | Pass       |
| 20.0MHz Band QPSK                 | 1/#Mid     | 1860      | -1.97    | 3.17             | 27.66       | 22.52     | 178.649   | Horizontal               | Pass       |
|                                   |            | 1882.5    | -1.69    | 3.32             | 27.61       | 22.60     | 181.970   | Horizontal               | Pass       |
|                                   |            | 1905      | -1.56    | 3.36             | 27.56       | 22.64     | 183.654   | Horizontal               | Pass       |
| 1.4MHz Band QPSK                  | 1/#Mid     | 1850.7    | -1.91    | 3.12             | 27.58       | 22.55     | 179.887   | Vertical                 | Pass       |
|                                   |            | 1882.5    | -1.77    | 3.27             | 27.61       | 22.57     | 180.717   | Vertical                 | Pass       |
|                                   |            | 1914.3    | -1.72    | 3.29             | 27.63       | 22.62     | 182.810   | Vertical                 | Pass       |
| 3.0MHz Band QPSK                  | 1/#Mid     | 1851.5    | -1.89    | 3.13             | 27.61       | 22.59     | 181.552   | Vertical                 | Pass       |
|                                   |            | 1882.5    | -1.77    | 3.27             | 27.61       | 22.57     | 180.717   | Vertical                 | Pass       |
|                                   |            | 1753.5    | -1.75    | 3.30             | 27.62       | 22.57     | 180.717   | Vertical                 | Pass       |
| 5.0MHz Band QPSK                  | 1/#Mid     | 1852.5    | -1.88    | 3.13             | 27.63       | 22.62     | 182.810   | Vertical                 | Pass       |
|                                   |            | 1882.5    | -1.82    | 3.27             | 27.61       | 22.52     | 178.649   | Vertical                 | Pass       |
|                                   |            | 1912.5    | -1.63    | 3.30             | 27.60       | 22.67     | 184.927   | Vertical                 | Pass       |
| 10.0MHz Band                      | 1/#Mid     | 1855      | -1.80    | 3.15             | 27.64       | 22.69     | 185.780   | Vertical                 | Pass       |
|                                   |            | 1882.5    | -1.71    | 3.31             | 27.61       | 22.59     | 181.552   | Vertical                 | Pass       |

|         |        |        |       |      |       |       |         |          |      |
|---------|--------|--------|-------|------|-------|-------|---------|----------|------|
| QPSK    |        | 1910   | -1.58 | 3.33 | 27.59 | 22.68 | 185.353 | Vertical | Pass |
| 15.0MHz | 1/#Mid | 1857.5 | -1.82 | 3.15 | 27.65 | 22.68 | 185.353 | Vertical | Pass |
| Band    |        | 1882.5 | -1.73 | 3.31 | 27.61 | 22.57 | 180.717 | Vertical | Pass |
| QPSK    |        | 1907.5 | -1.59 | 3.33 | 27.57 | 22.65 | 184.077 | Vertical | Pass |
| 20.0MHz | 1/#Mid | 1860   | -1.78 | 3.17 | 27.66 | 22.71 | 186.638 | Vertical | Pass |
| Band    |        | 1882.5 | -1.56 | 3.32 | 27.61 | 22.73 | 187.499 | Vertical | Pass |
| QPSK    |        | 1905   | -1.47 | 3.36 | 27.56 | 22.73 | 187.499 | Vertical | Pass |

| Radiated Power (EIRP) for Band 25 |               |           |        |                        |                |              |              |                                |            |
|-----------------------------------|---------------|-----------|--------|------------------------|----------------|--------------|--------------|--------------------------------|------------|
| Mode                              | RB/RB<br>SIZE | Frequency | Result |                        |                |              |              |                                | Conclusion |
|                                   |               |           | SG     | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Max.<br>EIRP | Max.<br>EIRP | Polarization<br>Of Max.<br>ERP |            |
|                                   |               |           | (dBm)  |                        |                | Average      | Average      |                                |            |
|                                   |               |           |        |                        |                | (dBm)        | (mW)         |                                |            |
| 1.4MHz<br>Band 16<br>QAM          | 1/#Mid        | 1850.7    | -2.96  | 3.12                   | 27.58          | 21.50        | 141.254      | Horizontal                     | Pass       |
|                                   |               | 1882.5    | -2.94  | 3.27                   | 27.61          | 21.40        | 138.038      | Horizontal                     | Pass       |
|                                   |               | 1914.3    | -2.91  | 3.29                   | 27.63          | 21.43        | 138.995      | Horizontal                     | Pass       |
| 3.0MHz<br>Band 16<br>QAM          | 1/#Mid        | 1851.5    | -3.03  | 3.13                   | 27.61          | 21.45        | 139.637      | Horizontal                     | Pass       |
|                                   |               | 1882.5    | -2.92  | 3.27                   | 27.61          | 21.42        | 138.676      | Horizontal                     | Pass       |
|                                   |               | 1753.5    | -2.85  | 3.30                   | 27.62          | 21.47        | 140.281      | Horizontal                     | Pass       |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid        | 1852.5    | -3.14  | 3.13                   | 27.63          | 21.36        | 136.773      | Horizontal                     | Pass       |
|                                   |               | 1882.5    | -2.88  | 3.27                   | 27.61          | 21.46        | 139.959      | Horizontal                     | Pass       |
|                                   |               | 1912.5    | -2.82  | 3.30                   | 27.60          | 21.48        | 140.605      | Horizontal                     | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1855      | -3.07  | 3.15                   | 27.64          | 21.42        | 138.676      | Horizontal                     | Pass       |
|                                   |               | 1882.5    | -2.87  | 3.31                   | 27.61          | 21.43        | 138.995      | Horizontal                     | Pass       |
|                                   |               | 1910      | -2.84  | 3.33                   | 27.59          | 21.42        | 138.676      | Horizontal                     | Pass       |
| 15.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1857.5    | -3.10  | 3.15                   | 27.65          | 21.40        | 138.038      | Horizontal                     | Pass       |
|                                   |               | 1882.5    | -2.80  | 3.31                   | 27.61          | 21.50        | 141.254      | Horizontal                     | Pass       |
|                                   |               | 1907.5    | -2.74  | 3.33                   | 27.57          | 21.50        | 141.254      | Horizontal                     | Pass       |
| 20.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 1860      | -3.11  | 3.17                   | 27.66          | 21.38        | 137.404      | Horizontal                     | Pass       |
|                                   |               | 1882.5    | -2.87  | 3.32                   | 27.61          | 21.42        | 138.676      | Horizontal                     | Pass       |
|                                   |               | 1905      | -2.78  | 3.36                   | 27.56          | 21.42        | 138.676      | Horizontal                     | Pass       |
| 1.4MHz<br>Band 16<br>QAM          | 1/#Mid        | 1850.7    | -3.00  | 3.12                   | 27.58          | 21.46        | 139.959      | Vertical                       | Pass       |
|                                   |               | 1882.5    | -2.95  | 3.27                   | 27.61          | 21.39        | 137.721      | Vertical                       | Pass       |
|                                   |               | 1914.3    | -2.91  | 3.29                   | 27.63          | 21.43        | 138.995      | Vertical                       | Pass       |
| 3.0MHz<br>Band 16<br>QAM          | 1/#Mid        | 1851.5    | -3.12  | 3.13                   | 27.61          | 21.36        | 136.773      | Vertical                       | Pass       |
|                                   |               | 1882.5    | -2.91  | 3.27                   | 27.61          | 21.43        | 138.995      | Vertical                       | Pass       |
|                                   |               | 1753.5    | -2.82  | 3.30                   | 27.62          | 21.50        | 141.254      | Vertical                       | Pass       |

|         |        |        |       |      |       |       |         |          |      |
|---------|--------|--------|-------|------|-------|-------|---------|----------|------|
| 5.0MHz  | 1/#Mid | 1852.5 | -3.11 | 3.13 | 27.63 | 21.39 | 137.721 | Vertical | Pass |
| Band 16 |        | 1882.5 | -3.01 | 3.27 | 27.61 | 21.33 | 135.831 | Vertical | Pass |
| QAM     |        | 1912.5 | -2.96 | 3.30 | 27.60 | 21.34 | 136.144 | Vertical | Pass |
| 10.0MHz | 1/#Mid | 1855   | -3.06 | 3.15 | 27.64 | 21.43 | 138.995 | Vertical | Pass |
| Band 16 |        | 1882.5 | -2.88 | 3.31 | 27.61 | 21.42 | 138.676 | Vertical | Pass |
| QAM     |        | 1910   | -2.82 | 3.33 | 27.59 | 21.44 | 139.316 | Vertical | Pass |
| 15.0MHz | 1/#Mid | 1857.5 | -3.16 | 3.15 | 27.65 | 21.34 | 136.144 | Vertical | Pass |
| Band 16 |        | 1882.5 | -2.85 | 3.31 | 27.61 | 21.45 | 139.637 | Vertical | Pass |
| QAM     |        | 1907.5 | -2.81 | 3.33 | 27.57 | 21.43 | 138.995 | Vertical | Pass |
| 20.0MHz | 1/#Mid | 1860   | -2.97 | 3.17 | 27.66 | 21.52 | 141.906 | Vertical | Pass |
| Band 16 |        | 1882.5 | -2.78 | 3.32 | 27.61 | 21.51 | 141.579 | Vertical | Pass |
| QAM     |        | 1905   | -2.67 | 3.36 | 27.56 | 21.53 | 142.233 | Vertical | Pass |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)



## 8.10 LTE BAND 26 A

| Radiated Power (ERP) for Band 26a |               |           |             |                        |                |            |             |             |                             |            |
|-----------------------------------|---------------|-----------|-------------|------------------------|----------------|------------|-------------|-------------|-----------------------------|------------|
| Mode                              | RB/RB<br>SIZE | Frequency | Result      |                        |                |            |             |             |                             | Conclusion |
|                                   |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Correction | Max.<br>EPR | Max.<br>EPR | Polarization<br>Of Max. ERP |            |
|                                   |               |           | (dBm)       |                        |                | (dB)       | Average     | Average     |                             |            |
|                                   |               |           |             |                        |                |            | (dBm)       | (mW)        |                             |            |
| 1.4MHz<br>Band<br>QPSK            | 1/#Mid        | 814.7     | 7.54        | 1.91                   | 19.21          | 2.15       | 22.69       | 185.780     | Vertical                    | Pass       |
|                                   |               | 819       | 7.56        | 1.91                   | 19.26          | 2.15       | 22.76       | 188.799     | Vertical                    | Pass       |
|                                   |               | 823.3     | 7.52        | 1.93                   | 19.34          | 2.15       | 22.78       | 189.671     | Vertical                    | Pass       |
| 3.0MHz<br>Band<br>QPSK            | 1/#Mid        | 815.5     | 7.62        | 1.91                   | 19.21          | 2.15       | 22.77       | 189.234     | Vertical                    | Pass       |
|                                   |               | 819       | 7.47        | 1.91                   | 19.26          | 2.15       | 22.67       | 184.927     | Vertical                    | Pass       |
|                                   |               | 822.5     | 7.41        | 1.93                   | 19.34          | 2.15       | 22.67       | 184.927     | Vertical                    | Pass       |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid        | 816.5     | 7.51        | 1.91                   | 19.23          | 2.15       | 22.68       | 185.353     | Vertical                    | Pass       |
|                                   |               | 819       | 7.60        | 1.91                   | 19.26          | 2.15       | 22.80       | 190.546     | Vertical                    | Pass       |
|                                   |               | 821.5     | 7.38        | 1.92                   | 19.33          | 2.15       | 22.64       | 183.654     | Vertical                    | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid        | 819       | 7.54        | 1.93                   | 19.25          | 2.15       | 22.71       | 186.638     | Vertical                    | Pass       |
| 1.4MHz<br>Band<br>QPSK            | 1/#Mid        | 814.7     | 7.58        | 1.91                   | 19.21          | 2.15       | 22.73       | 187.499     | Horizontal                  | Pass       |
|                                   |               | 819       | 7.50        | 1.91                   | 19.26          | 2.15       | 22.70       | 186.209     | Horizontal                  | Pass       |
|                                   |               | 823.3     | 7.41        | 1.93                   | 19.34          | 2.15       | 22.67       | 184.927     | Horizontal                  | Pass       |
| 3.0MHz<br>Band<br>QPSK            | 1/#Mid        | 815.5     | 7.61        | 1.91                   | 19.21          | 2.15       | 22.76       | 188.799     | Horizontal                  | Pass       |
|                                   |               | 819       | 7.50        | 1.91                   | 19.26          | 2.15       | 22.70       | 186.209     | Horizontal                  | Pass       |
|                                   |               | 822.5     | 7.42        | 1.93                   | 19.34          | 2.15       | 22.68       | 185.353     | Horizontal                  | Pass       |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid        | 816.5     | 7.46        | 1.91                   | 19.23          | 2.15       | 22.63       | 183.231     | Horizontal                  | Pass       |
|                                   |               | 819       | 7.47        | 1.91                   | 19.26          | 2.15       | 22.67       | 184.927     | Horizontal                  | Pass       |
|                                   |               | 821.5     | 7.37        | 1.92                   | 19.33          | 2.15       | 22.63       | 183.231     | Horizontal                  | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid        | 819       | 7.67        | 1.93                   | 19.25          | 2.15       | 22.84       | 192.309     | Horizontal                  | Pass       |

| Radiated Power (ERP) for Band 26a |               |           |             |                        |                |            |             |             |                             |            |
|-----------------------------------|---------------|-----------|-------------|------------------------|----------------|------------|-------------|-------------|-----------------------------|------------|
| Mode                              | RB/RB<br>SIZE | Frequency | Result      |                        |                |            |             |             |                             | Conclusion |
|                                   |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Correction | Max.<br>EPR | Max.<br>EPR | Polarization<br>Of Max. ERP |            |
|                                   |               |           | (dBm)       |                        |                | (dB)       | Average     | Average     |                             |            |
|                                   |               |           |             |                        |                |            | (dBm)       | (mW)        |                             |            |
| 1.4MHz<br>Band 16<br>QAM          | 1/#Mid        | 814.7     | 6.62        | 1.91                   | 19.21          | 2.15       | 21.77       | 150.314     | Vertical                    | Pass       |
|                                   |               | 819       | 6.65        | 1.91                   | 19.26          | 2.15       | 21.85       | 153.109     | Vertical                    | Pass       |
|                                   |               | 823.3     | 6.57        | 1.93                   | 19.34          | 2.15       | 21.83       | 152.405     | Vertical                    | Pass       |
| 3.0MHz<br>Band 16<br>QAM          | 1/#Mid        | 815.5     | 6.65        | 1.91                   | 19.21          | 2.15       | 21.80       | 151.356     | Vertical                    | Pass       |
|                                   |               | 819       | 6.70        | 1.91                   | 19.26          | 2.15       | 21.90       | 154.882     | Vertical                    | Pass       |
|                                   |               | 822.5     | 6.55        | 1.93                   | 19.34          | 2.15       | 21.81       | 151.705     | Vertical                    | Pass       |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid        | 816.5     | 6.72        | 1.91                   | 19.23          | 2.15       | 21.89       | 154.525     | Vertical                    | Pass       |
|                                   |               | 819       | 6.64        | 1.91                   | 19.26          | 2.15       | 21.84       | 152.757     | Vertical                    | Pass       |
|                                   |               | 821.5     | 6.48        | 1.92                   | 19.33          | 2.15       | 21.74       | 149.279     | Vertical                    | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 819       | 6.69        | 1.93                   | 19.25          | 2.15       | 21.86       | 153.462     | Vertical                    | Pass       |
| 1.4MHz<br>Band 16<br>QAM          | 1/#Mid        | 814.7     | 6.69        | 1.91                   | 19.21          | 2.15       | 21.84       | 152.757     | Horizontal                  | Pass       |
|                                   |               | 819       | 6.62        | 1.91                   | 19.26          | 2.15       | 21.82       | 152.055     | Horizontal                  | Pass       |
|                                   |               | 823.3     | 6.50        | 1.93                   | 19.34          | 2.15       | 21.76       | 149.968     | Horizontal                  | Pass       |
| 3.0MHz<br>Band 16<br>QAM          | 1/#Mid        | 815.5     | 6.65        | 1.91                   | 19.21          | 2.15       | 21.80       | 151.356     | Horizontal                  | Pass       |
|                                   |               | 819       | 6.68        | 1.91                   | 19.26          | 2.15       | 21.88       | 154.170     | Horizontal                  | Pass       |
|                                   |               | 822.5     | 6.59        | 1.93                   | 19.34          | 2.15       | 21.85       | 153.109     | Horizontal                  | Pass       |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid        | 816.5     | 6.63        | 1.91                   | 19.23          | 2.15       | 21.80       | 151.356     | Horizontal                  | Pass       |
|                                   |               | 819       | 6.68        | 1.91                   | 19.26          | 2.15       | 21.88       | 154.170     | Horizontal                  | Pass       |
|                                   |               | 821.5     | 6.48        | 1.92                   | 19.33          | 2.15       | 21.74       | 149.279     | Horizontal                  | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid        | 819       | 6.74        | 1.93                   | 19.25          | 2.15       | 21.91       | 155.239     | Horizontal                  | Pass       |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

## 8.11 LTE BAND 26B

| Radiated Power (ERP) for Band 26B |               |           |             |                        |                |            |             |             |                                |            |
|-----------------------------------|---------------|-----------|-------------|------------------------|----------------|------------|-------------|-------------|--------------------------------|------------|
| Mode                              | RB/RB<br>SIZE | Frequency | Result      |                        |                |            |             |             |                                | Conclusion |
|                                   |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Correction | Max.<br>ERP | Max.<br>ERP | Polarization<br>Of Max.<br>ERP |            |
|                                   |               |           | (dBm)       |                        |                | (dB)       | Average     | Average     |                                |            |
|                                   |               |           |             |                        |                | (dBm)      | (mW)        |             |                                |            |
| 1.4MHz<br>Band<br>QPSK            | 1/#Mid        | 824.7     | 6.64        | 2.02                   | 19.72          | 2.15       | 22.19       | 165.577     | Horizontal                     | Pass       |
|                                   |               | 836.5     | 6.45        | 2.02                   | 19.83          | 2.15       | 22.11       | 162.555     | Horizontal                     | Pass       |
|                                   |               | 848.3     | 6.30        | 2.03                   | 19.95          | 2.15       | 22.07       | 161.065     | Horizontal                     | Pass       |
| 3.0MHz<br>Band<br>QPSK            | 1/#Mid        | 825.5     | 6.47        | 2.02                   | 19.84          | 2.15       | 22.14       | 163.682     | Horizontal                     | Pass       |
|                                   |               | 836.5     | 6.29        | 2.02                   | 19.94          | 2.15       | 22.06       | 160.694     | Horizontal                     | Pass       |
|                                   |               | 847.5     | 6.35        | 2.03                   | 19.98          | 2.15       | 22.15       | 164.059     | Horizontal                     | Pass       |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid        | 826.5     | 6.47        | 2.02                   | 19.75          | 2.15       | 22.05       | 160.325     | Horizontal                     | Pass       |
|                                   |               | 836.5     | 6.46        | 2.02                   | 19.83          | 2.15       | 22.12       | 162.930     | Horizontal                     | Pass       |
|                                   |               | 846.5     | 6.32        | 2.03                   | 19.92          | 2.15       | 22.06       | 160.694     | Horizontal                     | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid        | 829       | 6.43        | 2.02                   | 19.84          | 2.15       | 22.10       | 162.181     | Horizontal                     | Pass       |
|                                   |               | 836.5     | 6.46        | 2.02                   | 19.90          | 2.15       | 22.19       | 165.577     | Horizontal                     | Pass       |
|                                   |               | 844       | 6.33        | 2.03                   | 19.96          | 2.15       | 22.11       | 162.555     | Horizontal                     | Pass       |
| 15.0MHz<br>Band<br>QPSK           | 1/#Mid        | 831.5     | 6.87        | 2.02                   | 19.33          | 2.15       | 22.03       | 159.588     | Vertical                       | Pass       |
|                                   |               | 836.5     | 7.00        | 2.02                   | 19.37          | 2.15       | 22.20       | 165.959     | Vertical                       | Pass       |
|                                   |               | 841.5     | 6.68        | 2.03                   | 19.52          | 2.15       | 22.02       | 159.221     | Vertical                       | Pass       |
| 1.4MHz<br>Band<br>QPSK            | 1/#Mid        | 824.7     | 6.50        | 2.02                   | 19.76          | 2.15       | 22.09       | 161.808     | Vertical                       | Pass       |
|                                   |               | 836.5     | 6.47        | 2.02                   | 19.78          | 2.15       | 22.08       | 161.436     | Vertical                       | Pass       |
|                                   |               | 848.3     | 6.30        | 2.03                   | 19.94          | 2.15       | 22.06       | 160.694     | Vertical                       | Pass       |
| 3.0MHz<br>Band<br>QPSK            | 1/#Mid        | 825.5     | 6.50        | 2.02                   | 19.83          | 2.15       | 22.16       | 164.437     | Vertical                       | Pass       |
|                                   |               | 836.5     | 6.35        | 2.02                   | 19.96          | 2.15       | 22.14       | 163.682     | Vertical                       | Pass       |
|                                   |               | 847.5     | 6.47        | 2.03                   | 19.87          | 2.15       | 22.16       | 164.437     | Vertical                       | Pass       |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid        | 826.5     | 6.48        | 2.02                   | 19.86          | 2.15       | 22.17       | 164.816     | Vertical                       | Pass       |
|                                   |               | 836.5     | 6.47        | 2.02                   | 19.81          | 2.15       | 22.11       | 162.555     | Vertical                       | Pass       |
|                                   |               | 846.5     | 6.52        | 2.03                   | 19.83          | 2.15       | 22.17       | 164.816     | Vertical                       | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid        | 829       | 6.64        | 2.02                   | 19.75          | 2.15       | 22.22       | 166.725     | Vertical                       | Pass       |
|                                   |               | 836.5     | 6.55        | 2.02                   | 19.85          | 2.15       | 22.23       | 167.109     | Vertical                       | Pass       |
|                                   |               | 844       | 6.61        | 2.03                   | 19.80          | 2.15       | 22.23       | 167.109     | Vertical                       | Pass       |
| 15.0MHz<br>Band<br>QPSK           | 1/#Mid        | 831.5     | 7.10        | 2.02                   | 19.31          | 2.15       | 22.24       | 167.494     | Horizontal                     | Pass       |
|                                   |               | 836.5     | 7.07        | 2.02                   | 19.33          | 2.15       | 22.23       | 167.109     | Horizontal                     | Pass       |
|                                   |               | 841.5     | 7.01        | 2.03                   | 19.38          | 2.15       | 22.21       | 166.341     | Horizontal                     | Pass       |

| Radiated Power (ERP) for Band 26B |            |           |          |            |        |            |               |              |                          |            |
|-----------------------------------|------------|-----------|----------|------------|--------|------------|---------------|--------------|--------------------------|------------|
| Mode                              | RB/RB SIZE | Frequency | Result   |            |        |            |               |              |                          | Conclusion |
|                                   |            |           | SG Level | Cable Loss | Factor | Correction | Max. EPR      | Max. EPR     | Polarization Of Max. ERP |            |
|                                   |            |           | (dBm)    | (dBm)      | (dB)   | (dB)       | Average (dBm) | Average (mW) |                          |            |
| 1.4MHz<br>Band 16<br>QAM          | 1/#Mid     | 824.7     | 5.93     | 2.02       | 19.72  | 2.15       | 21.48         | 140.605      | Horizontal               | Pass       |
|                                   |            | 836.5     | 5.73     | 2.02       | 19.83  | 2.15       | 21.39         | 137.721      | Horizontal               | Pass       |
|                                   |            | 848.3     | 5.60     | 2.03       | 19.95  | 2.15       | 21.37         | 137.088      | Horizontal               | Pass       |
| 3.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 825.5     | 5.81     | 2.02       | 19.84  | 2.15       | 21.48         | 140.605      | Horizontal               | Pass       |
|                                   |            | 836.5     | 5.67     | 2.02       | 19.94  | 2.15       | 21.44         | 139.316      | Horizontal               | Pass       |
|                                   |            | 847.5     | 5.57     | 2.03       | 19.98  | 2.15       | 21.37         | 137.088      | Horizontal               | Pass       |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 826.5     | 5.78     | 2.02       | 19.75  | 2.15       | 21.36         | 136.773      | Horizontal               | Pass       |
|                                   |            | 836.5     | 5.69     | 2.02       | 19.83  | 2.15       | 21.35         | 136.458      | Horizontal               | Pass       |
|                                   |            | 846.5     | 5.61     | 2.03       | 19.92  | 2.15       | 21.35         | 136.458      | Horizontal               | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 829       | 5.68     | 2.02       | 19.84  | 2.15       | 21.35         | 136.458      | Horizontal               | Pass       |
|                                   |            | 836.5     | 5.64     | 2.02       | 19.90  | 2.15       | 21.37         | 137.088      | Horizontal               | Pass       |
|                                   |            | 844       | 5.52     | 2.03       | 19.96  | 2.15       | 21.30         | 134.896      | Horizontal               | Pass       |
| 15.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 831.5     | 6.20     | 2.02       | 19.33  | 2.15       | 21.36         | 136.773      | Vertical                 | Pass       |
|                                   |            | 836.5     | 6.12     | 2.02       | 19.37  | 2.15       | 21.32         | 135.519      | Vertical                 | Pass       |
|                                   |            | 841.5     | 6.04     | 2.03       | 19.52  | 2.15       | 21.38         | 137.404      | Vertical                 | Pass       |
| 1.4MHz<br>Band 16<br>QAM          | 1/#Mid     | 824.7     | 5.79     | 2.02       | 19.76  | 2.15       | 21.38         | 137.404      | Vertical                 | Pass       |
|                                   |            | 836.5     | 5.82     | 2.02       | 19.78  | 2.15       | 21.43         | 138.995      | Vertical                 | Pass       |
|                                   |            | 848.3     | 5.65     | 2.03       | 19.94  | 2.15       | 21.41         | 138.357      | Vertical                 | Pass       |
| 3.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 825.5     | 5.80     | 2.02       | 19.83  | 2.15       | 21.46         | 139.959      | Vertical                 | Pass       |
|                                   |            | 836.5     | 5.58     | 2.02       | 19.96  | 2.15       | 21.37         | 137.088      | Vertical                 | Pass       |
|                                   |            | 847.5     | 5.72     | 2.03       | 19.87  | 2.15       | 21.41         | 138.357      | Vertical                 | Pass       |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 826.5     | 5.68     | 2.02       | 19.86  | 2.15       | 21.37         | 137.088      | Vertical                 | Pass       |
|                                   |            | 836.5     | 5.82     | 2.02       | 19.81  | 2.15       | 21.46         | 139.959      | Vertical                 | Pass       |
|                                   |            | 846.5     | 5.68     | 2.03       | 19.83  | 2.15       | 21.33         | 135.831      | Vertical                 | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 829       | 5.97     | 2.02       | 19.75  | 2.15       | 21.55         | 142.889      | Vertical                 | Pass       |
|                                   |            | 836.5     | 5.85     | 2.02       | 19.85  | 2.15       | 21.53         | 142.233      | Vertical                 | Pass       |
|                                   |            | 844       | 5.89     | 2.03       | 19.80  | 2.15       | 21.51         | 141.579      | Vertical                 | Pass       |
| 15.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 831.5     | 6.39     | 2.02       | 19.31  | 2.15       | 21.53         | 142.233      | Horizontal               | Pass       |
|                                   |            | 836.5     | 6.41     | 2.02       | 19.33  | 2.15       | 21.57         | 143.549      | Horizontal               | Pass       |
|                                   |            | 841.5     | 6.33     | 2.03       | 19.38  | 2.15       | 21.53         | 142.233      | Horizontal               | Pass       |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

## 8.12 LTE BAND 38

| Radiated Power (EIRP) for Band 38 |            |           |        |       |         |         |         |                             |            |
|-----------------------------------|------------|-----------|--------|-------|---------|---------|---------|-----------------------------|------------|
| Mode                              | RB/RB SIZE | Frequency | Result |       |         |         |         | Polarization<br>Of Max. ERP | Conclusion |
|                                   |            |           | SG     | Cable | Antenna | Max.    | Max.    |                             |            |
|                                   |            |           | Level  | Loss  | Factor  | EIRP    | EIRP    |                             |            |
|                                   |            |           | (dBm)  | (dBm) | (dB)    | Average | Average |                             |            |
|                                   |            |           |        |       |         | (dBm)   | (mW)    |                             |            |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid     | 2572.5    | -1.62  | 4.44  | 27.75   | 21.69   | 147.571 | Horizontal                  | Pass       |
|                                   |            | 2595      | -1.50  | 4.67  | 27.72   | 21.55   | 142.889 | Horizontal                  | Pass       |
|                                   |            | 2617.5    | -1.50  | 4.62  | 27.71   | 21.59   | 144.212 | Horizontal                  | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid     | 2575      | -1.60  | 4.51  | 27.76   | 21.65   | 146.218 | Horizontal                  | Pass       |
|                                   |            | 2595      | -1.49  | 4.60  | 27.72   | 21.63   | 145.546 | Horizontal                  | Pass       |
|                                   |            | 2615      | -1.45  | 4.70  | 27.70   | 21.55   | 142.889 | Horizontal                  | Pass       |
| 15.0MHz<br>Band<br>QPSK           | 1/#Mid     | 2577.5    | -1.61  | 4.47  | 27.77   | 21.69   | 147.571 | Horizontal                  | Pass       |
|                                   |            | 2595      | -1.53  | 4.65  | 27.72   | 21.54   | 142.561 | Horizontal                  | Pass       |
|                                   |            | 2612.5    | -1.43  | 4.66  | 27.69   | 21.60   | 144.544 | Horizontal                  | Pass       |
| 20.0MHz<br>Band<br>QPSK           | 1/#Mid     | 2580      | -1.59  | 4.50  | 27.78   | 21.69   | 147.571 | Horizontal                  | Pass       |
|                                   |            | 2595      | -1.50  | 4.66  | 27.72   | 21.56   | 143.219 | Horizontal                  | Pass       |
|                                   |            | 2610      | -1.44  | 4.68  | 27.68   | 21.56   | 143.219 | Horizontal                  | Pass       |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid     | 2572.5    | -1.63  | 4.48  | 27.75   | 21.64   | 145.881 | Vertical                    | Pass       |
|                                   |            | 2595      | -1.44  | 4.62  | 27.72   | 21.66   | 146.555 | Vertical                    | Pass       |
|                                   |            | 2617.5    | -1.40  | 4.63  | 27.71   | 21.68   | 147.231 | Vertical                    | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid     | 2575      | -1.75  | 4.46  | 27.76   | 21.55   | 142.889 | Vertical                    | Pass       |
|                                   |            | 2595      | -1.52  | 4.65  | 27.72   | 21.55   | 142.889 | Vertical                    | Pass       |
|                                   |            | 2615      | -1.40  | 4.69  | 27.70   | 21.61   | 144.877 | Vertical                    | Pass       |
| 15.0MHz<br>Band<br>QPSK           | 1/#Mid     | 2577.5    | -1.71  | 4.47  | 27.77   | 21.59   | 144.212 | Vertical                    | Pass       |
|                                   |            | 2595      | -1.48  | 4.65  | 27.72   | 21.59   | 144.212 | Vertical                    | Pass       |
|                                   |            | 2612.5    | -1.48  | 4.66  | 27.69   | 21.55   | 142.889 | Vertical                    | Pass       |
| 20.0MHz<br>Band<br>QPSK           | 1/#Mid     | 2580      | -1.51  | 4.53  | 27.78   | 21.74   | 149.279 | Vertical                    | Pass       |
|                                   |            | 2595      | -1.34  | 4.66  | 27.72   | 21.72   | 148.594 | Vertical                    | Pass       |
|                                   |            | 2610      | -1.30  | 4.68  | 27.68   | 21.70   | 147.911 | Vertical                    | Pass       |

| Radiated Power (EIRP) for Band 38 |            |           |        |       |         |         |         |              |            |
|-----------------------------------|------------|-----------|--------|-------|---------|---------|---------|--------------|------------|
| Mode                              | RB/RB SIZE | Frequency | Result |       |         |         |         |              | Conclusion |
|                                   |            |           | SG     | Cable | Antenna | Max.    | Max.    | Polarization |            |
|                                   |            |           | Level  | Loss  | Factor  | EIRP    | EIRP    | Of Max. ERP  |            |
|                                   |            |           | (dBm)  | (dBm) | (dB)    | Average | Average |              |            |
|                                   |            |           |        |       |         | (dBm)   | (mW)    |              |            |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 2572.5    | -2.52  | 4.44  | 27.75   | 20.79   | 119.950 | Horizontal   | Pass       |
|                                   |            | 2595      | -2.33  | 4.67  | 27.72   | 20.72   | 118.032 | Horizontal   | Pass       |
|                                   |            | 2617.5    | -2.40  | 4.62  | 27.71   | 20.69   | 117.220 | Horizontal   | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2575      | -2.55  | 4.51  | 27.76   | 20.70   | 117.490 | Horizontal   | Pass       |
|                                   |            | 2595      | -2.47  | 4.60  | 27.72   | 20.65   | 116.145 | Horizontal   | Pass       |
|                                   |            | 2615      | -2.33  | 4.70  | 27.70   | 20.67   | 116.681 | Horizontal   | Pass       |
| 15.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2577.5    | -2.51  | 4.47  | 27.77   | 20.79   | 119.950 | Horizontal   | Pass       |
|                                   |            | 2595      | -2.42  | 4.65  | 27.72   | 20.65   | 116.145 | Horizontal   | Pass       |
|                                   |            | 2612.5    | -2.36  | 4.66  | 27.69   | 20.67   | 116.681 | Horizontal   | Pass       |
| 20.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2580      | -2.55  | 4.50  | 27.78   | 20.73   | 118.304 | Horizontal   | Pass       |
|                                   |            | 2595      | -2.37  | 4.66  | 27.72   | 20.69   | 117.220 | Horizontal   | Pass       |
|                                   |            | 2610      | -2.25  | 4.68  | 27.68   | 20.75   | 118.850 | Horizontal   | Pass       |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 2572.5    | -2.62  | 4.48  | 27.75   | 20.65   | 116.145 | Vertical     | Pass       |
|                                   |            | 2595      | -2.43  | 4.62  | 27.72   | 20.67   | 116.681 | Vertical     | Pass       |
|                                   |            | 2617.5    | -2.40  | 4.63  | 27.71   | 20.68   | 116.950 | Vertical     | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2575      | -2.60  | 4.46  | 27.76   | 20.70   | 117.490 | Vertical     | Pass       |
|                                   |            | 2595      | -2.32  | 4.65  | 27.72   | 20.75   | 118.850 | Vertical     | Pass       |
|                                   |            | 2615      | -2.33  | 4.69  | 27.70   | 20.68   | 116.950 | Vertical     | Pass       |
| 15.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2577.5    | -2.61  | 4.47  | 27.77   | 20.69   | 117.220 | Vertical     | Pass       |
|                                   |            | 2595      | -2.37  | 4.65  | 27.72   | 20.70   | 117.490 | Vertical     | Pass       |
|                                   |            | 2612.5    | -2.36  | 4.66  | 27.69   | 20.67   | 116.681 | Vertical     | Pass       |
| 20.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2580      | -2.41  | 4.53  | 27.78   | 20.84   | 121.339 | Vertical     | Pass       |
|                                   |            | 2595      | -2.23  | 4.66  | 27.72   | 20.83   | 121.060 | Vertical     | Pass       |
|                                   |            | 2610      | -2.20  | 4.68  | 27.68   | 20.80   | 120.226 | Vertical     | Pass       |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Factor (dB)+ SG Level (dBm)- Cable Loss(dBm)

### 8.13 LTE BAND 41

| Radiated Power (EIRP) for Band 41 |               |           |             |                        |                |              |              |                                |            |
|-----------------------------------|---------------|-----------|-------------|------------------------|----------------|--------------|--------------|--------------------------------|------------|
| Mode                              | RB/RB<br>SIZE | Frequency | Result      |                        |                |              |              |                                | Conclusion |
|                                   |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Max.<br>EIRP | Max.<br>EIRP | Polarization<br>Of Max.<br>ERP |            |
|                                   |               |           | (dBm)       |                        |                | Average      | Average      |                                |            |
|                                   |               |           |             |                        |                | (dBm)        | (mW)         |                                |            |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid        | 2537.5    | 0.38        | 4.54                   | 27.75          | 23.59        | 228.560      | Horizontal                     | Pass       |
|                                   |               | 2595      | 0.46        | 4.69                   | 27.72          | 23.49        | 223.357      | Horizontal                     | Pass       |
|                                   |               | 2652.5    | 0.54        | 4.71                   | 27.71          | 23.54        | 225.944      | Horizontal                     | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid        | 2540      | 0.32        | 4.55                   | 27.76          | 23.53        | 225.424      | Horizontal                     | Pass       |
|                                   |               | 2595      | 0.52        | 4.69                   | 27.72          | 23.55        | 226.464      | Horizontal                     | Pass       |
|                                   |               | 2650      | 0.56        | 4.72                   | 27.70          | 23.54        | 225.944      | Horizontal                     | Pass       |
| 15.0MHz<br>Band<br>QPSK           | 1/#Mid        | 2542.5    | 0.38        | 4.55                   | 27.77          | 23.60        | 229.087      | Horizontal                     | Pass       |
|                                   |               | 2595      | 0.52        | 4.69                   | 27.72          | 23.55        | 226.464      | Horizontal                     | Pass       |
|                                   |               | 2647.5    | 0.55        | 4.72                   | 27.69          | 23.52        | 224.905      | Horizontal                     | Pass       |
| 20.0MHz<br>Band<br>QPSK           | 1/#Mid        | 2545      | 0.29        | 4.57                   | 27.78          | 23.50        | 223.872      | Horizontal                     | Pass       |
|                                   |               | 2595      | 0.49        | 4.73                   | 27.72          | 23.48        | 222.844      | Horizontal                     | Pass       |
|                                   |               | 2645      | 0.67        | 4.75                   | 27.68          | 23.60        | 229.087      | Horizontal                     | Pass       |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid        | 2537.5    | 0.29        | 4.54                   | 27.75          | 23.50        | 223.872      | Vertical                       | Pass       |
|                                   |               | 2595      | 0.44        | 4.69                   | 27.72          | 23.47        | 222.331      | Vertical                       | Pass       |
|                                   |               | 2652.5    | 0.58        | 4.71                   | 27.71          | 23.58        | 228.034      | Vertical                       | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid        | 2540      | 0.38        | 4.55                   | 27.76          | 23.59        | 228.560      | Vertical                       | Pass       |
|                                   |               | 2595      | 0.47        | 4.69                   | 27.72          | 23.50        | 223.872      | Vertical                       | Pass       |
|                                   |               | 2650      | 0.57        | 4.72                   | 27.70          | 23.55        | 226.464      | Vertical                       | Pass       |
| 15.0MHz<br>Band<br>QPSK           | 1/#Mid        | 2542.5    | 0.32        | 4.55                   | 27.77          | 23.54        | 225.944      | Vertical                       | Pass       |
|                                   |               | 2595      | 0.40        | 4.69                   | 27.72          | 23.43        | 220.293      | Vertical                       | Pass       |
|                                   |               | 2647.5    | 0.50        | 4.72                   | 27.69          | 23.47        | 222.331      | Vertical                       | Pass       |
| 20.0MHz<br>Band<br>QPSK           | 1/#Mid        | 2545      | 0.39        | 4.57                   | 27.78          | 23.60        | 229.087      | Vertical                       | Pass       |
|                                   |               | 2595      | 0.62        | 4.73                   | 27.72          | 23.61        | 229.615      | Vertical                       | Pass       |
|                                   |               | 2645      | 0.70        | 4.75                   | 27.68          | 23.63        | 230.675      | Vertical                       | Pass       |

| Radiated Power (EIRP) for Band 41 |            |           |          |                  |             |           |           |                          |            |
|-----------------------------------|------------|-----------|----------|------------------|-------------|-----------|-----------|--------------------------|------------|
| Mode                              | RB/RB SIZE | Frequency | Result   |                  |             |           |           |                          | Conclusion |
|                                   |            |           | SG Level | Cable Loss (dBm) | Factor (dB) | Max. EIRP | Max. EIRP | Polarization Of Max. ERP |            |
|                                   |            |           | (dBm)    |                  |             | Average   | Average   |                          |            |
|                                   |            |           |          |                  |             | (dBm)     | (mW)      |                          |            |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 2537.5    | -0.56    | 4.54             | 27.75       | 22.65     | 184.077   | Horizontal               | Pass       |
|                                   |            | 2595      | -0.34    | 4.69             | 27.72       | 22.69     | 185.780   | Horizontal               | Pass       |
|                                   |            | 2652.5    | -0.20    | 4.71             | 27.71       | 22.80     | 190.546   | Horizontal               | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2540      | -0.53    | 4.55             | 27.76       | 22.68     | 185.353   | Horizontal               | Pass       |
|                                   |            | 2595      | -0.29    | 4.69             | 27.72       | 22.74     | 187.932   | Horizontal               | Pass       |
|                                   |            | 2650      | -0.27    | 4.72             | 27.70       | 22.71     | 186.638   | Horizontal               | Pass       |
| 15.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2542.5    | -0.43    | 4.55             | 27.77       | 22.79     | 190.108   | Horizontal               | Pass       |
|                                   |            | 2595      | -0.25    | 4.69             | 27.72       | 22.78     | 189.671   | Horizontal               | Pass       |
|                                   |            | 2647.5    | -0.24    | 4.72             | 27.69       | 22.73     | 187.499   | Horizontal               | Pass       |
| 20.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2545      | -0.45    | 4.57             | 27.78       | 22.76     | 188.799   | Horizontal               | Pass       |
|                                   |            | 2595      | -0.27    | 4.73             | 27.72       | 22.72     | 187.068   | Horizontal               | Pass       |
|                                   |            | 2645      | -0.16    | 4.75             | 27.68       | 22.77     | 189.234   | Horizontal               | Pass       |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 2537.5    | -0.47    | 4.54             | 27.75       | 22.74     | 187.932   | Vertical                 | Pass       |
|                                   |            | 2595      | -0.33    | 4.69             | 27.72       | 22.70     | 186.209   | Vertical                 | Pass       |
|                                   |            | 2652.5    | -0.26    | 4.71             | 27.71       | 22.74     | 187.932   | Vertical                 | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2540      | -0.47    | 4.55             | 27.76       | 22.74     | 187.932   | Vertical                 | Pass       |
|                                   |            | 2595      | -0.24    | 4.69             | 27.72       | 22.79     | 190.108   | Vertical                 | Pass       |
|                                   |            | 2650      | -0.29    | 4.72             | 27.70       | 22.69     | 185.780   | Vertical                 | Pass       |
| 15.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2542.5    | -0.52    | 4.55             | 27.77       | 22.70     | 186.209   | Vertical                 | Pass       |
|                                   |            | 2595      | -0.33    | 4.69             | 27.72       | 22.70     | 186.209   | Vertical                 | Pass       |
|                                   |            | 2647.5    | -0.27    | 4.72             | 27.69       | 22.70     | 186.209   | Vertical                 | Pass       |
| 20.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 2545      | -0.41    | 4.57             | 27.78       | 22.80     | 190.546   | Vertical                 | Pass       |
|                                   |            | 2595      | -0.14    | 4.73             | 27.72       | 22.85     | 192.752   | Vertical                 | Pass       |
|                                   |            | 2645      | -0.13    | 4.75             | 27.68       | 22.80     | 190.546   | Vertical                 | Pass       |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)



## 8.14 LTE BAND 66

| Radiated Power (EIRP) for Band 66 |               |           |                      |                        |                |                                  |                         |                                |            |
|-----------------------------------|---------------|-----------|----------------------|------------------------|----------------|----------------------------------|-------------------------|--------------------------------|------------|
| Mode                              | RB/RB<br>SIZE | Frequency | Result               |                        |                |                                  |                         |                                | Conclusion |
|                                   |               |           | SG<br>Level<br>(dBm) | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Max.<br>EIRP<br>Average<br>(dBm) | Max.<br>EIRP<br>Average | Polarization<br>Of Max.<br>ERP |            |
|                                   |               |           |                      |                        |                |                                  |                         |                                |            |
|                                   |               |           |                      |                        |                |                                  |                         |                                |            |
| 1.4MHz<br>Band<br>QPSK            | 1/#Mid        | 1710.7    | -3.72                | 3.76                   | 28.24          | 20.76                            | 119.124                 | Horizontal                     | Pass       |
|                                   |               | 1745      | -3.52                | 3.91                   | 28.22          | 20.79                            | 119.950                 | Horizontal                     | Pass       |
|                                   |               | 1779.3    | -3.52                | 3.93                   | 28.2           | 20.75                            | 118.850                 | Horizontal                     | Pass       |
| 3.0MHz<br>Band<br>QPSK            | 1/#Mid        | 1711.5    | -3.78                | 3.77                   | 28.23          | 20.68                            | 116.950                 | Horizontal                     | Pass       |
|                                   |               | 1745      | -3.54                | 3.91                   | 28.24          | 20.79                            | 119.950                 | Horizontal                     | Pass       |
|                                   |               | 1778.5    | -3.57                | 3.94                   | 28.25          | 20.74                            | 118.577                 | Horizontal                     | Pass       |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid        | 1712.5    | -3.88                | 3.77                   | 28.31          | 20.66                            | 116.413                 | Horizontal                     | Pass       |
|                                   |               | 1745      | -3.52                | 3.91                   | 28.22          | 20.79                            | 119.950                 | Horizontal                     | Pass       |
|                                   |               | 1777.5    | -3.54                | 3.94                   | 28.2           | 20.72                            | 118.032                 | Horizontal                     | Pass       |
| 10.0MHz<br>Band<br>QPSK           | 1/#Mid        | 1715      | -3.78                | 3.79                   | 28.33          | 20.76                            | 119.124                 | Horizontal                     | Pass       |
|                                   |               | 1745      | -3.48                | 3.95                   | 28.22          | 20.79                            | 119.950                 | Horizontal                     | Pass       |
|                                   |               | 1775      | -3.47                | 3.97                   | 28.19          | 20.75                            | 118.850                 | Horizontal                     | Pass       |
| 15.0MHz<br>Band<br>QPSK           | 1/#Mid        | 1717.5    | -3.81                | 3.79                   | 28.34          | 20.74                            | 118.577                 | Horizontal                     | Pass       |
|                                   |               | 1745      | -3.52                | 3.95                   | 28.22          | 20.75                            | 118.850                 | Horizontal                     | Pass       |
|                                   |               | 1772.5    | -3.44                | 3.97                   | 28.18          | 20.77                            | 119.399                 | Horizontal                     | Pass       |
| 20.0MHz<br>Band<br>QPSK           | 1/#Mid        | 1720      | -3.84                | 3.81                   | 28.35          | 20.70                            | 117.490                 | Horizontal                     | Pass       |
|                                   |               | 1745      | -3.61                | 3.96                   | 28.22          | 20.65                            | 116.145                 | Horizontal                     | Pass       |
|                                   |               | 1770      | -3.41                | 4                      | 28.16          | 20.75                            | 118.850                 | Horizontal                     | Pass       |
| 1.4MHz<br>Band<br>QPSK            | 1/#Mid        | 1710.7    | -3.79                | 3.76                   | 28.24          | 20.69                            | 117.220                 | Vertical                       | Pass       |
|                                   |               | 1745      | -3.53                | 3.91                   | 28.22          | 20.78                            | 119.674                 | Vertical                       | Pass       |
|                                   |               | 1779.3    | -3.61                | 3.93                   | 28.2           | 20.66                            | 116.413                 | Vertical                       | Pass       |
| 3.0MHz<br>Band<br>QPSK            | 1/#Mid        | 1711.5    | -3.78                | 3.77                   | 28.23          | 20.68                            | 116.950                 | Vertical                       | Pass       |
|                                   |               | 1745      | -3.62                | 3.91                   | 28.24          | 20.71                            | 117.761                 | Vertical                       | Pass       |
|                                   |               | 1778.5    | -3.52                | 3.94                   | 28.25          | 20.79                            | 119.950                 | Vertical                       | Pass       |
| 5.0MHz<br>Band<br>QPSK            | 1/#Mid        | 1712.5    | -3.88                | 3.77                   | 28.31          | 20.66                            | 116.413                 | Vertical                       | Pass       |
|                                   |               | 1745      | -3.52                | 3.91                   | 28.22          | 20.79                            | 119.950                 | Vertical                       | Pass       |
|                                   |               | 1777.5    | -3.48                | 3.94                   | 28.2           | 20.78                            | 119.674                 | Vertical                       | Pass       |
| 10.0MHz                           | 1/#Mid        | 1715      | -3.75                | 3.79                   | 28.34          | 20.80                            | 120.226                 | Vertical                       | Pass       |

|                   |        |        |       |      |       |       |         |          |      |
|-------------------|--------|--------|-------|------|-------|-------|---------|----------|------|
| Band QPSK         |        | 1745   | -3.56 | 3.95 | 28.22 | 20.71 | 117.761 | Vertical | Pass |
|                   |        | 1775   | -3.54 | 3.97 | 28.18 | 20.67 | 116.681 | Vertical | Pass |
| 15.0MHz Band QPSK | 1/#Mid | 1717.5 | -3.76 | 3.81 | 28.35 | 20.78 | 119.674 | Vertical | Pass |
|                   |        | 1745   | -3.55 | 3.96 | 28.22 | 20.71 | 117.761 | Vertical | Pass |
|                   |        | 1772.5 | -3.47 | 4    | 28.16 | 20.69 | 117.220 | Vertical | Pass |
| 20.0MHz Band QPSK | 1/#Mid | 1720   | -3.71 | 3.79 | 28.34 | 20.84 | 121.339 | Vertical | Pass |
|                   |        | 1745   | -3.42 | 3.95 | 28.22 | 20.85 | 121.619 | Vertical | Pass |
|                   |        | 1770   | -3.37 | 3.97 | 28.18 | 20.84 | 121.339 | Vertical | Pass |

| Radiated Power (EIRP) for Band 66 |            |           |                |            |             |                         |                        |                          |            |
|-----------------------------------|------------|-----------|----------------|------------|-------------|-------------------------|------------------------|--------------------------|------------|
| Mode                              | RB/RB SIZE | Frequency | Result         |            |             |                         |                        |                          | Conclusion |
|                                   |            |           | SG Level (dBm) | Cable Loss | Factor (dB) | Max. EIRP Average (dBm) | Max. EIRP Average (mW) | Polarization Of Max. ERP |            |
|                                   |            |           |                | (dBm)      |             |                         |                        |                          |            |
| 1.4MHz<br>Band 16<br>QAM          | 1/#Mid     | 1710.7    | -4.12          | 3.76       | 28.24       | 20.36                   | 108.643                | Horizontal               | Pass       |
|                                   |            | 1745      | -3.91          | 3.91       | 28.22       | 20.40                   | 109.648                | Horizontal               | Pass       |
|                                   |            | 1779.3    | -3.81          | 3.93       | 28.2        | 20.46                   | 111.173                | Horizontal               | Pass       |
| 3.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 1711.5    | -3.97          | 3.77       | 28.23       | 20.49                   | 111.944                | Horizontal               | Pass       |
|                                   |            | 1745      | -3.90          | 3.91       | 28.24       | 20.43                   | 110.408                | Horizontal               | Pass       |
|                                   |            | 1778.5    | -3.90          | 3.94       | 28.25       | 20.41                   | 109.901                | Horizontal               | Pass       |
| 5.0MHz<br>Band 16<br>QAM          | 1/#Mid     | 1712.5    | -4.11          | 3.77       | 28.31       | 20.43                   | 110.408                | Horizontal               | Pass       |
|                                   |            | 1745      | -3.82          | 3.91       | 28.22       | 20.49                   | 111.944                | Horizontal               | Pass       |
|                                   |            | 1777.5    | -3.87          | 3.94       | 28.2        | 20.39                   | 109.396                | Horizontal               | Pass       |
| 10.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 1715      | -4.05          | 3.79       | 28.33       | 20.49                   | 111.944                | Horizontal               | Pass       |
|                                   |            | 1745      | -3.85          | 3.95       | 28.22       | 20.42                   | 110.154                | Horizontal               | Pass       |
|                                   |            | 1775      | -3.77          | 3.97       | 28.19       | 20.45                   | 110.917                | Horizontal               | Pass       |
| 15.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 1717.5    | -4.20          | 3.79       | 28.34       | 20.35                   | 108.393                | Horizontal               | Pass       |
|                                   |            | 1745      | -3.80          | 3.95       | 28.22       | 20.47                   | 111.429                | Horizontal               | Pass       |
|                                   |            | 1772.5    | -3.87          | 3.97       | 28.18       | 20.34                   | 108.143                | Horizontal               | Pass       |
| 20.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 1720      | -4.15          | 3.81       | 28.35       | 20.39                   | 109.396                | Horizontal               | Pass       |
|                                   |            | 1745      | -3.90          | 3.96       | 28.22       | 20.36                   | 108.643                | Horizontal               | Pass       |
|                                   |            | 1770      | -3.77          | 4          | 28.16       | 20.39                   | 109.396                | Horizontal               | Pass       |
| 1.4MHz<br>Band 16<br>QAM          | 1/#Mid     | 1710.7    | -4.12          | 3.76       | 28.24       | 20.36                   | 108.643                | Vertical                 | Pass       |
|                                   |            | 1745      | -3.90          | 3.91       | 28.22       | 20.41                   | 109.901                | Vertical                 | Pass       |
|                                   |            | 1779.3    | -3.88          | 3.93       | 28.2        | 20.39                   | 109.396                | Vertical                 | Pass       |
| 3.0MHz<br>Band 16                 | 1/#Mid     | 1711.5    | -4.08          | 3.77       | 28.23       | 20.38                   | 109.144                | Vertical                 | Pass       |
|                                   |            | 1745      | -3.98          | 3.91       | 28.24       | 20.35                   | 108.393                | Vertical                 | Pass       |

|         |        |        |       |      |       |       |         |          |      |
|---------|--------|--------|-------|------|-------|-------|---------|----------|------|
| QAM     |        | 1778.5 | -3.95 | 3.94 | 28.25 | 20.36 | 108.643 | Vertical | Pass |
| 5.0MHz  | 1/#Mid | 1712.5 | -4.20 | 3.77 | 28.31 | 20.34 | 108.143 | Vertical | Pass |
| Band 16 |        | 1745   | -3.91 | 3.91 | 28.22 | 20.40 | 109.648 | Vertical | Pass |
| QAM     |        | 1777.5 | -3.81 | 3.94 | 28.2  | 20.45 | 110.917 | Vertical | Pass |
| 10.0MHz | 1/#Mid | 1715   | -4.19 | 3.79 | 28.34 | 20.36 | 108.643 | Vertical | Pass |
| Band 16 |        | 1745   | -3.78 | 3.95 | 28.22 | 20.49 | 111.944 | Vertical | Pass |
| QAM     |        | 1775   | -3.71 | 3.97 | 28.18 | 20.50 | 112.202 | Vertical | Pass |
| 15.0MHz | 1/#Mid | 1717.5 | -4.15 | 3.81 | 28.35 | 20.39 | 109.396 | Vertical | Pass |
| Band 16 |        | 1745   | -3.91 | 3.96 | 28.22 | 20.35 | 108.393 | Vertical | Pass |
| QAM     |        | 1772.5 | -3.75 | 4    | 28.16 | 20.41 | 109.901 | Vertical | Pass |
| 20.0MHz | 1/#Mid | 1720   | -4.00 | 3.79 | 28.34 | 20.55 | 113.501 | Vertical | Pass |
| Band 16 |        | 1745   | -3.75 | 3.95 | 28.22 | 20.52 | 112.720 | Vertical | Pass |
| QAM     |        | 1770   | -3.68 | 3.97 | 28.18 | 20.53 | 112.980 | Vertical | Pass |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

### 8.15 LTE BAND 71

| Radiated Power (ERP) for Band 71 |               |           |             |                        |                |            |             |             |                             |            |
|----------------------------------|---------------|-----------|-------------|------------------------|----------------|------------|-------------|-------------|-----------------------------|------------|
| Mode                             | RB/RB<br>SIZE | Frequency | Result      |                        |                |            |             |             |                             | Conclusion |
|                                  |               |           | SG<br>Level | Cable<br>Loss<br>(dBm) | Factor<br>(dB) | Correction | Max.<br>EPR | Max.<br>EPR | Polarization<br>Of Max. ERP |            |
|                                  |               |           |             |                        |                | (dB)       | Average     | Average     |                             |            |
|                                  |               |           |             |                        |                |            | (dBm)       | (mW)        |                             |            |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid        | 665.5     | 6.61        | 1.91                   | 19.21          | 2.15       | 21.76       | 149.968     | Vertical                    | Pass       |
|                                  |               | 680.5     | 6.47        | 1.91                   | 19.26          | 2.15       | 21.67       | 146.893     | Vertical                    | Pass       |
|                                  |               | 695.5     | 6.47        | 1.93                   | 19.34          | 2.15       | 21.73       | 148.936     | Vertical                    | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid        | 668       | 6.53        | 1.91                   | 19.21          | 2.15       | 21.68       | 147.231     | Vertical                    | Pass       |
|                                  |               | 680.5     | 6.52        | 1.91                   | 19.26          | 2.15       | 21.72       | 148.594     | Vertical                    | Pass       |
|                                  |               | 693       | 6.41        | 1.93                   | 19.34          | 2.15       | 21.67       | 146.893     | Vertical                    | Pass       |
| 15.0MHz<br>Band<br>QPSK          | 1/#Mid        | 670.5     | 6.58        | 1.91                   | 19.23          | 2.15       | 21.75       | 149.624     | Vertical                    | Pass       |
|                                  |               | 680.5     | 6.57        | 1.91                   | 19.26          | 2.15       | 21.77       | 150.314     | Vertical                    | Pass       |
|                                  |               | 690.5     | 6.48        | 1.92                   | 19.33          | 2.15       | 21.74       | 149.279     | Vertical                    | Pass       |
| 20.0MHz<br>Band<br>QPSK          | 1/#Mid        | 673       | 6.57        | 1.91                   | 19.25          | 2.15       | 21.76       | 149.968     | Vertical                    | Pass       |
|                                  |               | 683       | 6.45        | 1.91                   | 19.26          | 2.15       | 21.65       | 146.218     | Vertical                    | Pass       |
|                                  |               | 688       | 6.49        | 1.92                   | 19.32          | 2.15       | 21.74       | 149.279     | Vertical                    | Pass       |
| 5.0MHz<br>Band<br>QPSK           | 1/#Mid        | 665.5     | 6.51        | 1.91                   | 19.21          | 2.15       | 21.66       | 146.555     | Horizontal                  | Pass       |
|                                  |               | 680.5     | 6.51        | 1.91                   | 19.26          | 2.15       | 21.71       | 148.252     | Horizontal                  | Pass       |
|                                  |               | 695.5     | 6.48        | 1.93                   | 19.34          | 2.15       | 21.74       | 149.279     | Horizontal                  | Pass       |
| 10.0MHz<br>Band<br>QPSK          | 1/#Mid        | 668       | 6.58        | 1.91                   | 19.21          | 2.15       | 21.73       | 148.936     | Horizontal                  | Pass       |
|                                  |               | 680.5     | 6.49        | 1.91                   | 19.26          | 2.15       | 21.69       | 147.571     | Horizontal                  | Pass       |
|                                  |               | 693       | 6.53        | 1.93                   | 19.34          | 2.15       | 21.79       | 151.008     | Horizontal                  | Pass       |
| 15.0MHz<br>Band<br>QPSK          | 1/#Mid        | 670.5     | 6.62        | 1.91                   | 19.23          | 2.15       | 21.79       | 151.008     | Horizontal                  | Pass       |
|                                  |               | 680.5     | 6.42        | 1.91                   | 19.26          | 2.15       | 21.62       | 145.211     | Horizontal                  | Pass       |
|                                  |               | 690.5     | 6.51        | 1.92                   | 19.33          | 2.15       | 21.77       | 150.314     | Horizontal                  | Pass       |
| 20.0MHz<br>Band<br>QPSK          | 1/#Mid        | 673       | 6.65        | 1.91                   | 19.25          | 2.15       | 21.84       | 152.757     | Horizontal                  | Pass       |
|                                  |               | 683       | 6.62        | 1.91                   | 19.26          | 2.15       | 21.82       | 152.055     | Horizontal                  | Pass       |
|                                  |               | 688       | 6.57        | 1.92                   | 19.32          | 2.15       | 21.82       | 152.055     | Horizontal                  | Pass       |

| Radiated Power (ERP) for Band 71 |            |           |          |            |        |            |          |          |              |            |
|----------------------------------|------------|-----------|----------|------------|--------|------------|----------|----------|--------------|------------|
| Mode                             | RB/RB SIZE | Frequency | Result   |            |        |            |          |          |              | Conclusion |
|                                  |            |           | SG Level | Cable Loss | Factor | Correction | Max. EPR | Max. EPR | Polarization |            |
|                                  |            |           | (dBm)    | (dBm)      | (dB)   | (dB)       | Average  | Average  | Of Max. ERP  |            |
|                                  |            |           |          |            |        |            | (dBm)    | (mW)     |              |            |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 665.5     | 5.61     | 1.91       | 19.21  | 2.15       | 20.76    | 119.124  | Vertical     | Pass       |
|                                  |            | 680.5     | 5.64     | 1.91       | 19.26  | 2.15       | 20.84    | 121.339  | Vertical     | Pass       |
|                                  |            | 695.5     | 5.59     | 1.93       | 19.34  | 2.15       | 20.85    | 121.619  | Vertical     | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 668       | 5.73     | 1.91       | 19.21  | 2.15       | 20.88    | 122.462  | Vertical     | Pass       |
|                                  |            | 680.5     | 5.55     | 1.91       | 19.26  | 2.15       | 20.75    | 118.850  | Vertical     | Pass       |
|                                  |            | 693       | 5.62     | 1.93       | 19.34  | 2.15       | 20.88    | 122.462  | Vertical     | Pass       |
| 15.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 670.5     | 5.68     | 1.91       | 19.23  | 2.15       | 20.85    | 121.619  | Vertical     | Pass       |
|                                  |            | 680.5     | 5.58     | 1.91       | 19.26  | 2.15       | 20.78    | 119.674  | Vertical     | Pass       |
|                                  |            | 690.5     | 5.64     | 1.92       | 19.33  | 2.15       | 20.90    | 123.027  | Vertical     | Pass       |
| 20.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 673       | 5.70     | 1.91       | 19.25  | 2.15       | 20.89    | 122.744  | Vertical     | Pass       |
|                                  |            | 683       | 5.58     | 1.91       | 19.26  | 2.15       | 20.78    | 119.674  | Vertical     | Pass       |
|                                  |            | 688       | 5.58     | 1.92       | 19.32  | 2.15       | 20.83    | 121.060  | Vertical     | Pass       |
| 5.0MHz<br>Band 16<br>QAM         | 1/#Mid     | 665.5     | 5.70     | 1.91       | 19.21  | 2.15       | 20.85    | 121.619  | Horizontal   | Pass       |
|                                  |            | 680.5     | 5.61     | 1.91       | 19.26  | 2.15       | 20.81    | 120.504  | Horizontal   | Pass       |
|                                  |            | 695.5     | 5.52     | 1.93       | 19.34  | 2.15       | 20.78    | 119.674  | Horizontal   | Pass       |
| 10.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 668       | 5.66     | 1.91       | 19.21  | 2.15       | 20.81    | 120.504  | Horizontal   | Pass       |
|                                  |            | 680.5     | 5.69     | 1.91       | 19.26  | 2.15       | 20.89    | 122.744  | Horizontal   | Pass       |
|                                  |            | 693       | 5.55     | 1.93       | 19.34  | 2.15       | 20.81    | 120.504  | Horizontal   | Pass       |
| 15.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 670.5     | 5.67     | 1.91       | 19.23  | 2.15       | 20.84    | 121.339  | Horizontal   | Pass       |
|                                  |            | 680.5     | 5.58     | 1.91       | 19.26  | 2.15       | 20.78    | 119.674  | Horizontal   | Pass       |
|                                  |            | 690.5     | 5.57     | 1.92       | 19.33  | 2.15       | 20.83    | 121.060  | Horizontal   | Pass       |
| 20.0MHz<br>Band 16<br>QAM        | 1/#Mid     | 673       | 5.73     | 1.91       | 19.25  | 2.15       | 20.92    | 123.595  | Horizontal   | Pass       |
|                                  |            | 683       | 5.73     | 1.91       | 19.26  | 2.15       | 20.93    | 123.880  | Horizontal   | Pass       |
|                                  |            | 688       | 5.67     | 1.92       | 19.32  | 2.15       | 20.92    | 123.595  | Horizontal   | Pass       |

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

## 9. SPURIOUS RADIATION EMISSION

### RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691

### LIMIT

§22.917 (e) and §24.238 and §90.691 (a): Out of band emissions. 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.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB.

### TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power,  $P$  (dBW), as follows:

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \log_{10}(p)$ , dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \log_{10}(p)$ , dB at the channel edges and  $55 + 10 \log_{10}(p)$  at 5.5 MHz away and beyond the channel edges where  $p$  in (a) and (b) is the transmitter power measured in watts.

**MODES TESTED**

LTE Band 2/4/5/7/12/13/14/17/25/26/38/41/66/71

**RESULTS**

PASS

## 9.1 LTE BAND 2

### QPSK EIRP POWER FOR LTE BAND 2 (1.4MHZ BANDWIDTH)

| Test Results for Low Channel 1850.7MHz  |               |                |                  |                     |             |             |            |
|-----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                          | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 3701.4                                  | -52.90        | 4.04           | 33.51            | -23.43              | -13         | -10.43      | Horizontal |
| 3701.4                                  | -45.50        | 4.04           | 33.51            | -16.03              | -13         | -3.03       | Vertical   |
| 5552.1                                  | -44.69        | 5.24           | 35.84            | -14.09              | -13         | -1.09       | Vertical   |
| 5552.1                                  | -50.67        | 5.24           | 35.84            | -20.07              | -13         | -7.07       | Horizontal |
| 211.4                                   | -37.37        | 1.43           | 16.02            | -22.78              | -13         | -9.78       | Vertical   |
| 286.4                                   | -40.09        | 1.30           | 17.99            | -23.40              | -13         | -10.40      | Horizontal |
| Test Results for Mid Channel 1880MHz    |               |                |                  |                     |             |             |            |
| 3760.0                                  | -52.60        | 4.04           | 33.56            | -23.08              | -13         | -10.08      | Horizontal |
| 3760.0                                  | -53.64        | 4.04           | 33.56            | -24.12              | -13         | -11.12      | Vertical   |
| 5640.0                                  | -52.25        | 5.24           | 35.91            | -21.58              | -13         | -8.58       | Vertical   |
| 5640.0                                  | -49.42        | 5.24           | 35.91            | -18.75              | -13         | -5.75       | Horizontal |
| 195.0                                   | -40.52        | 1.62           | 16.97            | -25.17              | -13         | -12.17      | Vertical   |
| 404.7                                   | -43.53        | 1.74           | 15.98            | -29.30              | -13         | -16.30      | Horizontal |
| Test Results for High Channel 1909.3MHz |               |                |                  |                     |             |             |            |
| 3818.6                                  | -47.77        | 4.04           | 34.00            | -17.81              | -13         | -4.81       | Horizontal |
| 3818.6                                  | -52.29        | 4.04           | 34.00            | -22.33              | -13         | -9.33       | Vertical   |
| 5727.9                                  | -50.63        | 5.24           | 36.04            | -19.83              | -13         | -6.83       | Vertical   |
| 5727.9                                  | -52.59        | 5.24           | 36.04            | -21.79              | -13         | -8.79       | Horizontal |
| 180.1                                   | -38.74        | 1.42           | 17.29            | -22.87              | -13         | -9.87       | Vertical   |
| 256.0                                   | -41.66        | 1.50           | 17.90            | -25.25              | -13         | -12.25      | Horizontal |



**QPSK EIRP POWER FOR LTE BAND 2 (20.0MHZ BANDWIDTH)**

| Test Results for Low Channel 1860MHz  |               |                |                  |                     |             |             |            |
|---------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                        | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 3720.0                                | -51.95        | 4.07           | 33.54            | -22.48              | -13         | -9.48       | Horizontal |
| 3720.0                                | -52.37        | 4.07           | 33.54            | -22.90              | -13         | -9.90       | Vertical   |
| 5580.0                                | -52.45        | 5.28           | 35.86            | -21.87              | -13         | -8.87       | Vertical   |
| 5580.0                                | -49.99        | 5.28           | 35.86            | -19.41              | -13         | -6.41       | Horizontal |
| 178.7                                 | -39.21        | 1.58           | 16.89            | -23.89              | -13         | -10.89      | Vertical   |
| 298.5                                 | -44.32        | 1.76           | 17.26            | -28.82              | -13         | -15.82      | Horizontal |
| Test Results for Mid Channel 1880MHz  |               |                |                  |                     |             |             |            |
| 3760.0                                | -53.88        | 4.04           | 33.56            | -24.36              | -13         | -11.36      | Horizontal |
| 3760.0                                | -52.12        | 4.04           | 33.56            | -22.60              | -13         | -9.60       | Vertical   |
| 5640.0                                | -48.95        | 5.24           | 35.91            | -18.28              | -13         | -5.28       | Vertical   |
| 5640.0                                | -52.84        | 5.24           | 35.91            | -22.17              | -13         | -9.17       | Horizontal |
| 195.8                                 | -41.05        | 1.46           | 16.27            | -26.24              | -13         | -13.24      | Vertical   |
| 431.8                                 | -41.38        | 1.59           | 15.15            | -27.82              | -13         | -14.82      | Horizontal |
| Test Results for High Channel 1900MHz |               |                |                  |                     |             |             |            |
| 3800.0                                | -47.11        | 4.04           | 34.00            | -17.15              | -13         | -4.15       | Horizontal |
| 3800.0                                | -45.39        | 4.04           | 34.00            | -15.43              | -13         | -2.43       | Vertical   |
| 5700.0                                | -53.87        | 5.24           | 36.04            | -23.07              | -13         | -10.07      | Vertical   |
| 5700.0                                | -50.30        | 5.24           | 36.04            | -19.50              | -13         | -6.50       | Horizontal |
| 183.6                                 | -39.72        | 1.36           | 17.39            | -23.68              | -13         | -10.68      | Vertical   |
| 243.2                                 | -35.01        | 1.66           | 15.39            | -21.28              | -13         | -8.28       | Horizontal |

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

. Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

## 9.2 LTE BAND 4

### QPSK EIRP POWER FOR LTE BAND 4 (1.4MHZ BANDWIDTH)

| Test Results for Low Channel 1710.7MHz  |               |                |                  |                     |             |             |            |
|-----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                          | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 3421.4                                  | -52.47        | 4.02           | 29.80            | -26.69              | -13         | -13.69      | Horizontal |
| 3421.4                                  | -51.42        | 4.02           | 29.80            | -25.64              | -13         | -12.64      | Vertical   |
| 5132.1                                  | -47.13        | 5.24           | 35.84            | -16.53              | -13         | -3.53       | Vertical   |
| 5132.1                                  | -52.16        | 5.24           | 35.84            | -21.56              | -13         | -8.56       | Horizontal |
| 176.0                                   | -41.06        | 1.68           | 16.04            | -26.70              | -13         | -13.70      | Vertical   |
| 440.6                                   | -37.20        | 1.78           | 17.74            | -21.24              | -13         | -8.24       | Horizontal |
| Test Results for Mid Channel 1732.5MHz  |               |                |                  |                     |             |             |            |
| 3465.0                                  | -44.71        | 4.03           | 30.00            | -18.74              | -13         | -5.74       | Horizontal |
| 3465.0                                  | -48.90        | 4.03           | 30.00            | -22.93              | -13         | -9.93       | Vertical   |
| 5197.5                                  | -47.77        | 5.25           | 35.86            | -17.16              | -13         | -4.16       | Vertical   |
| 5197.5                                  | -50.43        | 5.25           | 35.86            | -19.82              | -13         | -6.82       | Horizontal |
| 190.0                                   | -40.24        | 1.72           | 17.69            | -24.27              | -13         | -11.27      | Vertical   |
| 393.9                                   | -36.97        | 1.62           | 16.02            | -22.56              | -13         | -9.56       | Horizontal |
| Test Results for High Channel 1754.3MHz |               |                |                  |                     |             |             |            |
| 3508.6                                  | -45.05        | 4.05           | 30.01            | -19.09              | -13         | -6.09       | Horizontal |
| 3508.6                                  | -52.54        | 4.05           | 30.01            | -26.58              | -13         | -13.58      | Vertical   |
| 5262.9                                  | -52.86        | 5.26           | 35.86            | -22.26              | -13         | -9.26       | Vertical   |
| 5262.9                                  | -49.70        | 5.26           | 35.86            | -19.10              | -13         | -6.10       | Horizontal |
| 182.3                                   | -40.08        | 1.80           | 16.69            | -25.19              | -13         | -12.19      | Vertical   |
| 466.0                                   | -35.98        | 1.75           | 16.66            | -21.08              | -13         | -8.08       | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 4 (20.0MHZ BANDWIDTH)**

| Test Results for Low Channel 1720MHz   |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 3440.0                                 | -49.82        | 4.02           | 29.80            | -24.04              | -13         | -11.04      | Horizontal |
| 3440.0                                 | -45.32        | 4.02           | 29.80            | -19.54              | -13         | -6.54       | Vertical   |
| 5160.0                                 | -45.18        | 5.24           | 35.84            | -14.58              | -13         | -1.58       | Vertical   |
| 5160.0                                 | -53.27        | 5.24           | 35.84            | -22.67              | -13         | -9.67       | Horizontal |
| 203.7                                  | -38.52        | 1.57           | 17.26            | -22.83              | -13         | -9.83       | Vertical   |
| 338.7                                  | -41.91        | 1.78           | 16.35            | -27.34              | -13         | -14.34      | Horizontal |
| Test Results for Mid Channel 1732.5MHz |               |                |                  |                     |             |             |            |
| 3465.0                                 | -49.82        | 4.03           | 30.00            | -23.85              | -13         | -10.85      | Horizontal |
| 3465.0                                 | -46.43        | 4.03           | 30.00            | -20.46              | -13         | -7.46       | Vertical   |
| 5197.5                                 | -44.72        | 5.25           | 35.86            | -14.11              | -13         | -1.11       | Vertical   |
| 5197.5                                 | -49.04        | 5.25           | 35.86            | -18.43              | -13         | -5.43       | Horizontal |
| 185.2                                  | -37.59        | 1.44           | 17.95            | -21.08              | -13         | -8.08       | Vertical   |
| 351.1                                  | -41.80        | 1.65           | 16.09            | -27.36              | -13         | -14.36      | Horizontal |
| Test Results for High Channel 1745MHz  |               |                |                  |                     |             |             |            |
| 3490.0                                 | -48.02        | 4.05           | 27.68            | -24.39              | -13         | -11.39      | Horizontal |
| 3490.0                                 | -45.53        | 4.05           | 27.68            | -21.90              | -13         | -8.90       | Vertical   |
| 5235.0                                 | -50.43        | 5.26           | 35.86            | -19.83              | -13         | -6.83       | Vertical   |
| 5235.0                                 | -52.28        | 5.26           | 35.86            | -21.68              | -13         | -8.68       | Horizontal |
| 192.6                                  | -34.96        | 1.61           | 16.85            | -19.72              | -13         | -6.72       | Vertical   |
| 396.8                                  | -35.86        | 1.61           | 15.19            | -22.28              | -13         | -9.28       | Horizontal |

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

. Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

### 9.3 LTE BAND 5

#### QPSK EIRP POWER FOR LTE BAND 5 (1.4MHZ BANDWIDTH)

| Test Results for Low Channel 824.7MHz  |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1649.4                                 | -51.50        | 2.78           | 27.50            | -26.78              | -13         | -13.78      | Horizontal |
| 1649.4                                 | -52.65        | 2.78           | 27.50            | -27.93              | -13         | -14.93      | Vertical   |
| 2474.1                                 | -47.12        | 2.90           | 27.80            | -22.22              | -13         | -9.22       | Vertical   |
| 2474.1                                 | -50.28        | 2.90           | 27.80            | -25.38              | -13         | -12.38      | Horizontal |
| 206.6                                  | -36.40        | 1.76           | 17.59            | -20.57              | -13         | -7.57       | Vertical   |
| 357.8                                  | -34.02        | 1.63           | 15.87            | -19.78              | -13         | -6.78       | Horizontal |
| Test Results For Mid Channel 836.5MHz  |               |                |                  |                     |             |             |            |
| 1673.0                                 | -52.59        | 2.80           | 27.48            | -27.91              | -13         | -14.91      | Horizontal |
| 1673.0                                 | -47.23        | 2.80           | 27.48            | -22.55              | -13         | -9.55       | Vertical   |
| 2509.5                                 | -45.43        | 2.91           | 27.70            | -20.64              | -13         | -7.64       | Vertical   |
| 2509.5                                 | -51.09        | 2.91           | 27.70            | -26.30              | -13         | -13.30      | Horizontal |
| 188.5                                  | -38.96        | 1.61           | 15.68            | -24.89              | -13         | -11.89      | Vertical   |
| 454.4                                  | -41.72        | 1.59           | 17.52            | -25.80              | -13         | -12.80      | Horizontal |
| Test Results for High Channel 848.3MHz |               |                |                  |                     |             |             |            |
| 1696.6                                 | -46.63        | 2.82           | 27.43            | -22.02              | -13         | -9.02       | Horizontal |
| 1696.6                                 | -46.12        | 2.82           | 27.43            | -21.51              | -13         | -8.51       | Vertical   |
| 2544.9                                 | -52.56        | 2.92           | 27.74            | -27.74              | -13         | -14.74      | Vertical   |
| 2544.9                                 | -50.69        | 2.92           | 27.74            | -25.87              | -13         | -12.87      | Horizontal |
| 186.8                                  | -36.66        | 1.69           | 16.67            | -21.67              | -13         | -8.67       | Vertical   |
| 371.0                                  | -39.49        | 1.70           | 17.18            | -24.01              | -13         | -11.01      | Horizontal |

### QPSK EIRP POWER FOR LTE BAND 5 (10MHZ BANDWIDTH)

| Test Results for Low Channel 829MHz   |               |                |                  |                     |             |             |            |
|---------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                        | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1658.0                                | -44.43        | 2.78           | 27.50            | -19.71              | -13         | -6.71       | Horizontal |
| 1658.0                                | -45.97        | 2.78           | 27.50            | -21.25              | -13         | -8.25       | Vertical   |
| 2487.0                                | -50.25        | 2.90           | 27.80            | -25.35              | -13         | -12.35      | Vertical   |
| 2487.0                                | -53.87        | 2.90           | 27.80            | -28.97              | -13         | -15.97      | Horizontal |
| 177.0                                 | -42.85        | 1.71           | 15.57            | -28.99              | -13         | -15.99      | Vertical   |
| 384.2                                 | -40.82        | 1.34           | 16.40            | -25.76              | -13         | -12.76      | Horizontal |
| Test Results for Mid Channel 836.5MHz |               |                |                  |                     |             |             |            |
| 1673.0                                | -44.85        | 2.80           | 27.48            | -20.17              | -13         | -7.17       | Horizontal |
| 1673.0                                | -53.20        | 2.80           | 27.48            | -28.52              | -13         | -15.52      | Vertical   |
| 2509.5                                | -51.78        | 2.91           | 27.70            | -26.99              | -13         | -13.99      | Vertical   |
| 2509.5                                | -50.38        | 2.91           | 27.70            | -25.59              | -13         | -12.59      | Horizontal |
| 181.2                                 | -35.99        | 1.44           | 17.04            | -20.39              | -13         | -7.39       | Vertical   |
| 404.6                                 | -37.61        | 1.76           | 17.62            | -21.75              | -13         | -8.75       | Horizontal |
| Test Results for High Channel 844MHz  |               |                |                  |                     |             |             |            |
| 1688.0                                | -44.16        | 2.82           | 27.43            | -19.55              | -13         | -6.55       | Horizontal |
| 1688.0                                | -44.99        | 2.82           | 27.43            | -20.38              | -13         | -7.38       | Vertical   |
| 2532.0                                | -53.97        | 2.92           | 27.74            | -29.15              | -13         | -16.15      | Vertical   |
| 2532.0                                | -53.84        | 2.92           | 27.74            | -29.02              | -13         | -16.02      | Horizontal |
| 188.0                                 | -41.93        | 1.74           | 17.70            | -25.97              | -13         | -12.97      | Vertical   |
| 358.0                                 | -40.75        | 1.41           | 17.46            | -24.69              | -13         | -11.69      | Horizontal |

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

. Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

#### 9.4 LTE BAND 7

#### QPSK EIRP POWER FOR LTE BAND 7 (5.0MHZ BANDWIDTH)

| Test Results for Low Channel 2502.5MHz  |               |                |                    |                     |             |             |            |
|-----------------------------------------|---------------|----------------|--------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                          | SG Level(dBm) | Cable Loss(dB) | Antenna Factor(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 5005.0                                  | -63.84        | 5.23           | 35.81              | -33.26              | -25         | -8.26       | Horizontal |
| 5005.0                                  | -61.03        | 5.23           | 35.81              | -30.45              | -25         | -5.45       | Vertical   |
| 7507.5                                  | -61.97        | 5.67           | 36.85              | -30.79              | -25         | -5.79       | Vertical   |
| 7507.5                                  | -60.40        | 5.67           | 36.85              | -29.22              | -25         | -4.22       | Horizontal |
| 176.5                                   | -54.85        | 1.73           | 17.97              | -38.61              | -25         | -13.61      | Vertical   |
| 261.0                                   | -46.00        | 1.38           | 15.11              | -32.27              | -25         | -7.27       | Horizontal |
| Test Results for Mid Channel 2535MHz    |               |                |                    |                     |             |             |            |
| 5070.0                                  | -60.16        | 5.23           | 35.82              | -29.57              | -25         | -4.57       | Horizontal |
| 5070.0                                  | -61.49        | 5.23           | 35.82              | -30.90              | -25         | -5.90       | Vertical   |
| 7605.0                                  | -62.91        | 5.67           | 36.85              | -31.73              | -25         | -6.73       | Vertical   |
| 7605.0                                  | -60.33        | 5.67           | 36.85              | -29.15              | -25         | -4.15       | Horizontal |
| 192.8                                   | -52.75        | 1.77           | 16.17              | -38.34              | -25         | -13.34      | Vertical   |
| 251.7                                   | -53.24        | 1.63           | 15.21              | -39.66              | -25         | -14.66      | Horizontal |
| Test Results for High Channel 2567.5MHz |               |                |                    |                     |             |             |            |
| 5135.0                                  | -62.70        | 5.24           | 35.83              | -32.11              | -25         | -7.11       | Horizontal |
| 5135.0                                  | -62.32        | 5.24           | 35.83              | -31.73              | -25         | -6.73       | Vertical   |
| 7702.5                                  | -63.83        | 5.68           | 36.87              | -32.64              | -25         | -7.64       | Vertical   |
| 7702.5                                  | -64.83        | 5.68           | 36.87              | -33.64              | -25         | -8.64       | Horizontal |
| 183.1                                   | -52.15        | 1.58           | 17.56              | -36.17              | -25         | -11.17      | Vertical   |
| 350.9                                   | -53.35        | 1.45           | 16.58              | -38.22              | -25         | -13.22      | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 7 (20.0MHZ BANDWIDTH)**

| Test Results for Low Channel 2510MHz  |               |                |                    |                     |             |             |            |
|---------------------------------------|---------------|----------------|--------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                        | SG Level(dBm) | Cable Loss(dB) | Antenna Factor(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 5020.0                                | -63.00        | 5.23           | 35.82              | -32.41              | -25         | -7.41       | Horizontal |
| 5020.0                                | -64.83        | 5.23           | 35.82              | -34.24              | -25         | -9.24       | Vertical   |
| 7530.0                                | -60.42        | 5.67           | 36.86              | -29.23              | -25         | -4.23       | Vertical   |
| 7530.0                                | -64.07        | 5.67           | 36.86              | -32.88              | -25         | -7.88       | Horizontal |
| 210.1                                 | -49.11        | 1.63           | 15.76              | -34.98              | -25         | -9.98       | Vertical   |
| 336.0                                 | -49.43        | 1.71           | 15.44              | -35.70              | -25         | -10.70      | Horizontal |
| Test Results for Mid Channel 2535MHz  |               |                |                    |                     |             |             |            |
| 5070.0                                | -64.95        | 5.23           | 35.82              | -34.36              | -25         | -9.36       | Horizontal |
| 5070.0                                | -60.55        | 5.23           | 35.82              | -29.96              | -25         | -4.96       | Vertical   |
| 7605.0                                | -59.74        | 5.67           | 36.85              | -28.56              | -25         | -3.56       | Vertical   |
| 7605.0                                | -59.78        | 5.67           | 36.85              | -28.60              | -25         | -3.60       | Horizontal |
| 178.6                                 | -51.73        | 1.79           | 16.84              | -36.67              | -25         | -11.67      | Vertical   |
| 468.3                                 | -49.88        | 1.71           | 17.64              | -33.95              | -25         | -8.95       | Horizontal |
| Test Results for High Channel 2560MHz |               |                |                    |                     |             |             |            |
| 5120.0                                | -64.77        | 5.24           | 35.83              | -34.18              | -25         | -9.18       | Horizontal |
| 5120.0                                | -60.70        | 5.24           | 35.83              | -30.11              | -25         | -5.11       | Vertical   |
| 7680.0                                | -64.05        | 5.70           | 36.88              | -32.87              | -25         | -7.87       | Vertical   |
| 7680.0                                | -60.79        | 5.70           | 36.88              | -29.61              | -25         | -4.61       | Horizontal |
| 199.2                                 | -45.40        | 1.79           | 16.84              | -30.34              | -25         | -5.34       | Vertical   |
| 326.8                                 | -48.44        | 1.71           | 17.64              | -32.51              | -25         | -7.51       | Horizontal |

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

## 9.5 LTE BAND 12

### QPSK EIRP POWER FOR LTE BAND 12 (1.4MHZ BANDWIDTH)

| Test Results for Low Channel 699.7MHz  |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1399.4                                 | -48.30        | 2.60           | 27.20            | -23.70              | -13         | -10.70      | Horizontal |
| 1399.4                                 | -53.79        | 2.60           | 27.20            | -29.19              | -13         | -16.19      | Vertical   |
| 2099.1                                 | -46.90        | 2.85           | 27.54            | -22.21              | -13         | -9.21       | Vertical   |
| 2099.1                                 | -53.60        | 2.85           | 27.54            | -28.91              | -13         | -15.91      | Horizontal |
| 200.0                                  | -41.52        | 1.49           | 17.78            | -25.23              | -13         | -12.23      | Vertical   |
| 327.9                                  | -43.21        | 1.36           | 17.33            | -27.24              | -13         | -14.24      | Horizontal |
| Test Results For Mid Channel 707.5MHz  |               |                |                  |                     |             |             |            |
| 1415.0                                 | -46.29        | 2.61           | 27.28            | -21.62              | -13         | -8.62       | Horizontal |
| 1415.0                                 | -50.41        | 2.61           | 27.28            | -25.74              | -13         | -12.74      | Vertical   |
| 2122.5                                 | -46.40        | 2.87           | 27.59            | -21.68              | -13         | -8.68       | Vertical   |
| 2122.5                                 | -53.81        | 2.87           | 27.59            | -29.09              | -13         | -16.09      | Horizontal |
| 211.6                                  | -37.00        | 1.73           | 15.74            | -22.99              | -13         | -9.99       | Vertical   |
| 376.7                                  | -38.13        | 1.62           | 15.79            | -23.96              | -13         | -10.96      | Horizontal |
| Test Results for High Channel 715.3MHz |               |                |                  |                     |             |             |            |
| 1430.6                                 | -53.38        | 2.63           | 27.28            | -28.73              | -13         | -15.73      | Horizontal |
| 1430.6                                 | -48.98        | 2.63           | 27.28            | -24.33              | -13         | -11.33      | Vertical   |
| 2145.9                                 | -50.71        | 2.88           | 27.60            | -25.99              | -13         | -12.99      | Vertical   |
| 2145.9                                 | -49.19        | 2.88           | 27.60            | -24.47              | -13         | -11.47      | Horizontal |
| 200.8                                  | -44.69        | 1.61           | 18.00            | -28.30              | -13         | -15.30      | Vertical   |
| 367.8                                  | -34.44        | 1.45           | 15.49            | -20.41              | -13         | -7.41       | Horizontal |



**QPSK EIRP POWER FOR LTE BAND 12 (10MHZ BANDWIDTH)**

| Test Results for Low Channel 704MHz   |               |                |                  |                     |             |             |            |
|---------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                        | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1408.0                                | -53.65        | 2.61           | 27.26            | -29.00              | -13         | -16.00      | Horizontal |
| 1408.0                                | -46.48        | 2.61           | 27.26            | -21.83              | -13         | -8.83       | Vertical   |
| 2112.0                                | -51.81        | 2.87           | 27.58            | -27.10              | -13         | -14.10      | Vertical   |
| 2112.0                                | -52.03        | 2.87           | 27.58            | -27.32              | -13         | -14.32      | Horizontal |
| 184.3                                 | -43.04        | 1.31           | 16.97            | -27.38              | -13         | -14.38      | Vertical   |
| 265.5                                 | -37.00        | 1.65           | 16.70            | -21.95              | -13         | -8.95       | Horizontal |
| Test Results for Mid Channel 707.5MHz |               |                |                  |                     |             |             |            |
| 1415.0                                | -53.17        | 2.61           | 27.28            | -28.50              | -13         | -15.50      | Horizontal |
| 1415.0                                | -52.85        | 2.61           | 27.28            | -28.18              | -13         | -15.18      | Vertical   |
| 2122.5                                | -45.10        | 2.87           | 27.59            | -20.38              | -13         | -7.38       | Vertical   |
| 2122.5                                | -53.30        | 2.87           | 27.59            | -28.58              | -13         | -15.58      | Horizontal |
| 192.8                                 | -43.69        | 1.72           | 17.99            | -27.42              | -13         | -14.42      | Vertical   |
| 241.6                                 | -42.27        | 1.73           | 17.94            | -26.06              | -13         | -13.06      | Horizontal |
| Test Results for High Channel 711MHz  |               |                |                  |                     |             |             |            |
| 1422.0                                | -49.12        | 2.62           | 27.28            | -24.46              | -13         | -11.46      | Horizontal |
| 1422.0                                | -52.08        | 2.62           | 27.28            | -27.42              | -13         | -14.42      | Vertical   |
| 2133.0                                | -53.15        | 2.87           | 27.60            | -28.42              | -13         | -15.42      | Vertical   |
| 2133.0                                | -51.02        | 2.87           | 27.60            | -26.29              | -13         | -13.29      | Horizontal |
| 189.7                                 | -36.19        | 1.58           | 15.93            | -21.84              | -13         | -8.84       | Vertical   |
| 333.3                                 | -37.32        | 1.36           | 15.59            | -23.09              | -13         | -10.09      | Horizontal |

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

. Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

## 9.6 LTE BAND 13

### QPSK EIRP POWER FOR LTE BAND 13 (5MHZ BANDWIDTH)

| Test Results for Low Channel 779.5MHz  |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1559.0                                 | -71.41        | 2.61           | 27.28            | -46.74              | -40         | -6.74       | Horizontal |
| 1559.0                                 | -73.34        | 2.61           | 27.28            | -48.67              | -40         | -8.67       | Vertical   |
| 2338.5                                 | -73.70        | 2.87           | 27.59            | -48.98              | -13         | -35.98      | Vertical   |
| 2338.5                                 | -72.00        | 2.87           | 27.59            | -47.28              | -13         | -34.28      | Horizontal |
| 211.0                                  | -70.80        | 1.71           | 16.15            | -56.36              | -13         | -43.36      | Vertical   |
| 273.2                                  | -67.22        | 1.41           | 17.32            | -51.31              | -13         | -38.31      | Horizontal |
| Test Results For Mid Channel 782MHz    |               |                |                  |                     |             |             |            |
| 1564.0                                 | -67.65        | 2.62           | 27.30            | -42.97              | -40         | -2.97       | Horizontal |
| 1564.0                                 | -73.89        | 2.62           | 27.30            | -49.21              | -40         | -9.21       | Vertical   |
| 2346.0                                 | -71.05        | 2.87           | 27.62            | -46.30              | -13         | -33.30      | Vertical   |
| 2346.0                                 | -73.41        | 2.87           | 27.62            | -48.66              | -13         | -35.66      | Horizontal |
| 201.8                                  | -68.97        | 1.42           | 15.25            | -55.15              | -13         | -42.15      | Vertical   |
| 238.9                                  | -67.53        | 1.36           | 17.19            | -51.70              | -13         | -38.70      | Horizontal |
| Test Results for High Channel 784.5MHz |               |                |                  |                     |             |             |            |
| 1569.0                                 | -76.68        | 2.66           | 27.28            | -52.06              | -40         | -12.06      | Horizontal |
| 1569.0                                 | -69.81        | 2.66           | 27.28            | -45.19              | -40         | -5.19       | Vertical   |
| 2353.5                                 | -72.85        | 2.88           | 27.60            | -48.13              | -13         | -35.13      | Vertical   |
| 2353.5                                 | -72.97        | 2.88           | 27.60            | -48.25              | -13         | -35.25      | Horizontal |
| 175.4                                  | -68.18        | 1.32           | 17.29            | -52.21              | -13         | -39.21      | Vertical   |
| 345.4                                  | -73.43        | 1.72           | 16.89            | -58.26              | -13         | -45.26      | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 13 (10MHZ BANDWIDTH)**

| Test Results for Channel 782MHz |               |                |                  |                     |             |             |            |
|---------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                  | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1564.0                          | -69.57        | 2.62           | 27.30            | -44.89              | -40         | -4.89       | Horizontal |
| 1564.0                          | -67.57        | 2.62           | 27.30            | -42.89              | -40         | -2.89       | Vertical   |
| 2346.0                          | -69.06        | 2.87           | 27.62            | -44.31              | -13         | -31.31      | Vertical   |
| 2346.0                          | -74.81        | 2.87           | 27.62            | -50.06              | -13         | -37.06      | Horizontal |
| 178.3                           | -72.60        | 1.35           | 16.91            | -57.04              | -13         | -44.04      | Vertical   |
| 466.4                           | -74.49        | 1.62           | 16.31            | -59.80              | -13         | -46.80      | Horizontal |

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

. Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

## 9.7 LTE BAND 14

### QPSK EIRP POWER FOR LTE BAND 14 (5MHZ BANDWIDTH)

| Test Results for Low Channel 790.5MHz  |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1581.0                                 | -67.42        | 2.63           | 27.28            | -42.77              | -40         | -2.77       | Horizontal |
| 1581.0                                 | -71.79        | 2.63           | 27.28            | -47.14              | -40         | -7.14       | Vertical   |
| 2371.5                                 | -67.83        | 2.89           | 27.59            | -43.13              | -13         | -30.13      | Vertical   |
| 2371.5                                 | -69.25        | 2.89           | 27.59            | -44.55              | -13         | -31.55      | Horizontal |
| 200.6                                  | -71.28        | 1.71           | 16.15            | -56.84              | -13         | -43.84      | Vertical   |
| 368.9                                  | -74.53        | 1.41           | 17.32            | -58.62              | -13         | -45.62      | Horizontal |
| Test Results For Mid Channel 793MHz    |               |                |                  |                     |             |             |            |
| 1586.0                                 | -69.27        | 2.63           | 27.30            | -44.60              | -40         | -4.60       | Horizontal |
| 1586.0                                 | -77.90        | 2.63           | 27.30            | -53.23              | -40         | -13.23      | Vertical   |
| 2379.0                                 | -73.03        | 2.91           | 27.62            | -48.32              | -13         | -35.32      | Vertical   |
| 2379.0                                 | -72.58        | 2.91           | 27.62            | -47.87              | -13         | -34.87      | Horizontal |
| 197.4                                  | -68.72        | 1.42           | 15.25            | -54.90              | -13         | -41.90      | Vertical   |
| 386.1                                  | -70.43        | 1.36           | 17.19            | -54.60              | -13         | -41.60      | Horizontal |
| Test Results for High Channel 795.5MHz |               |                |                  |                     |             |             |            |
| 1591.0                                 | -72.64        | 2.66           | 27.28            | -48.02              | -40         | -8.02       | Horizontal |
| 1591.0                                 | -71.10        | 2.66           | 27.28            | -46.48              | -40         | -6.48       | Vertical   |
| 2386.5                                 | -67.40        | 2.91           | 27.60            | -42.71              | -13         | -29.71      | Vertical   |
| 2386.5                                 | -70.24        | 2.91           | 27.60            | -45.55              | -13         | -32.55      | Horizontal |
| 189.0                                  | -74.97        | 1.32           | 17.29            | -59.00              | -13         | -46.00      | Vertical   |
| 401.0                                  | -74.79        | 1.72           | 16.89            | -59.62              | -13         | -46.62      | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 14 (10MHZ BANDWIDTH)**

| Test Results for Channel 793MHz |               |                |                  |                     |             |             |            |
|---------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                  | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1586.0                          | -75.34        | 2.63           | 27.30            | -50.67              | -40         | -10.67      | Horizontal |
| 1586.0                          | -76.49        | 2.63           | 27.30            | -51.82              | -40         | -11.82      | Vertical   |
| 2379.0                          | -72.30        | 2.91           | 27.62            | -47.59              | -13         | -34.59      | Vertical   |
| 2379.0                          | -68.67        | 2.91           | 27.62            | -43.96              | -13         | -30.96      | Horizontal |
| 208.9                           | -67.97        | 1.35           | 16.91            | -52.41              | -13         | -39.41      | Vertical   |
| 317.0                           | -70.24        | 1.62           | 16.31            | -55.55              | -13         | -42.55      | Horizontal |

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

. Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

9.8 LTE BAND 17

**QPSK EIRP POWER FOR LTE BAND 17 (5MHZ BANDWIDTH)**

| Test Results for Low Channel 706.5MHz  |               |                |                    |                     |             |             |            |
|----------------------------------------|---------------|----------------|--------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Factor(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1413.0                                 | -53.60        | 2.61           | 27.28              | -28.93              | -13         | -15.93      | Horizontal |
| 1413.0                                 | -47.12        | 2.61           | 27.28              | -22.45              | -13         | -9.45       | Vertical   |
| 2119.5                                 | -53.04        | 2.87           | 27.59              | -28.32              | -13         | -15.32      | Vertical   |
| 2119.5                                 | -53.51        | 2.87           | 27.59              | -28.79              | -13         | -15.79      | Horizontal |
| 205.8                                  | -44.07        | 1.71           | 16.15              | -29.63              | -13         | -16.63      | Vertical   |
| 395.2                                  | -43.73        | 1.41           | 17.32              | -27.82              | -13         | -14.82      | Horizontal |
| Test Results For Mid Channel 710MHz    |               |                |                    |                     |             |             |            |
| 1420.0                                 | -50.27        | 2.62           | 27.30              | -25.59              | -13         | -12.59      | Horizontal |
| 1420.0                                 | -47.63        | 2.62           | 27.30              | -22.95              | -13         | -9.95       | Vertical   |
| 2130.0                                 | -53.25        | 2.87           | 27.62              | -28.50              | -13         | -15.50      | Vertical   |
| 2130.0                                 | -50.28        | 2.87           | 27.62              | -25.53              | -13         | -12.53      | Horizontal |
| 179.9                                  | -35.40        | 1.42           | 15.25              | -21.58              | -13         | -8.58       | Vertical   |
| 387.4                                  | -38.19        | 1.36           | 17.19              | -22.36              | -13         | -9.36       | Horizontal |
| Test Results for High Channel 713.5MHz |               |                |                    |                     |             |             |            |
| 1427.0                                 | -46.51        | 2.66           | 27.28              | -21.89              | -13         | -8.89       | Horizontal |
| 1427.0                                 | -44.73        | 2.66           | 27.28              | -20.11              | -13         | -7.11       | Vertical   |
| 2140.5                                 | -50.87        | 2.88           | 27.60              | -26.15              | -13         | -13.15      | Vertical   |
| 2140.5                                 | -52.79        | 2.88           | 27.60              | -28.07              | -13         | -15.07      | Horizontal |
| 196.6                                  | -42.60        | 1.32           | 17.29              | -26.63              | -13         | -13.63      | Vertical   |
| 264.9                                  | -41.46        | 1.72           | 16.89              | -26.29              | -13         | -13.29      | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 17 (10MHZ BANDWIDTH)**

| Test Results for Low Channel 709MHz  |               |                |                    |                     |             |             |            |
|--------------------------------------|---------------|----------------|--------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                       | SG Level(dBm) | Cable Loss(dB) | Antenna Factor(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1418.0                               | -44.66        | 2.62           | 27.30              | -19.98              | -13         | -6.98       | Horizontal |
| 1418.0                               | -53.89        | 2.62           | 27.30              | -29.21              | -13         | -16.21      | Vertical   |
| 2127.0                               | -53.59        | 2.87           | 27.62              | -28.84              | -13         | -15.84      | Vertical   |
| 2127.0                               | -52.88        | 2.87           | 27.62              | -28.13              | -13         | -15.13      | Horizontal |
| 185.0                                | -43.07        | 1.35           | 16.91              | -27.51              | -13         | -14.51      | Vertical   |
| 269.3                                | -43.60        | 1.62           | 16.31              | -28.91              | -13         | -15.91      | Horizontal |
| Test Results for Mid Channel 710MHz  |               |                |                    |                     |             |             |            |
| 1420.0                               | -51.16        | 2.62           | 27.30              | -26.48              | -13         | -13.48      | Horizontal |
| 1420.0                               | -52.78        | 2.62           | 27.30              | -28.10              | -13         | -15.10      | Vertical   |
| 2130.0                               | -45.12        | 2.87           | 27.62              | -20.37              | -13         | -7.37       | Vertical   |
| 2130.0                               | -49.59        | 2.87           | 27.62              | -24.84              | -13         | -11.84      | Horizontal |
| 211.1                                | -35.52        | 1.51           | 17.14              | -19.89              | -13         | -6.89       | Vertical   |
| 438.8                                | -36.55        | 1.77           | 16.88              | -21.44              | -13         | -8.44       | Horizontal |
| Test Results for High Channel 711MHz |               |                |                    |                     |             |             |            |
| 1422.0                               | -53.40        | 2.62           | 27.30              | -28.72              | -13         | -15.72      | Horizontal |
| 1422.0                               | -44.76        | 2.62           | 27.30              | -20.08              | -13         | -7.08       | Vertical   |
| 2133.0                               | -49.38        | 2.87           | 27.62              | -24.63              | -13         | -11.63      | Vertical   |
| 2133.0                               | -52.36        | 2.87           | 27.62              | -27.61              | -13         | -14.61      | Horizontal |
| 195.0                                | -43.16        | 1.78           | 15.95              | -28.99              | -13         | -15.99      | Vertical   |
| 446.9                                | -39.57        | 1.34           | 17.95              | -22.97              | -13         | -9.97       | Horizontal |

Note: Spurious Emission Level = Spectrum Analyzer Read Value + Cable Loss+ Antenna Factor + 11.74

. Margin = Spurious Emission Level - Limit

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

## 9.9 LTE BAND 25

### QPSK EIRP POWER FOR LTE BAND 25 (1.4MHZ BANDWIDTH)

| Test Results for Low Channel 1850.7MHz  |               |                |                  |                     |             |             |            |
|-----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                          | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 3701.4                                  | -47.36        | 4.26           | 29.80            | -21.82              | -13         | -8.82       | Horizontal |
| 3701.4                                  | -44.31        | 4.26           | 29.80            | -18.77              | -13         | -5.77       | Vertical   |
| 5552.1                                  | -51.08        | 5.36           | 35.84            | -20.60              | -13         | -7.60       | Vertical   |
| 5552.1                                  | -51.45        | 5.36           | 35.84            | -20.97              | -13         | -7.97       | Horizontal |
| 184.5                                   | -38.16        | 1.68           | 16.04            | -23.80              | -13         | -10.80      | Vertical   |
| 315.5                                   | -42.67        | 1.78           | 17.74            | -26.71              | -13         | -13.71      | Horizontal |
| Test Results for Mid Channel 1882.5MHz  |               |                |                  |                     |             |             |            |
| 3765.0                                  | -47.75        | 4.28           | 30.00            | -22.03              | -13         | -9.03       | Horizontal |
| 3765.0                                  | -53.17        | 4.28           | 30.00            | -27.45              | -13         | -14.45      | Vertical   |
| 5647.5                                  | -49.93        | 5.41           | 35.86            | -19.48              | -13         | -6.48       | Vertical   |
| 5647.5                                  | -53.03        | 5.41           | 35.86            | -22.58              | -13         | -9.58       | Horizontal |
| 201.5                                   | -42.52        | 1.72           | 17.69            | -26.55              | -13         | -13.55      | Vertical   |
| 332.4                                   | -44.29        | 1.62           | 16.02            | -29.88              | -13         | -16.88      | Horizontal |
| Test Results for High Channel 1914.3MHz |               |                |                  |                     |             |             |            |
| 3828.6                                  | -48.02        | 4.31           | 30.01            | -22.32              | -13         | -9.32       | Horizontal |
| 3828.6                                  | -52.92        | 4.31           | 30.01            | -27.22              | -13         | -14.22      | Vertical   |
| 5742.9                                  | -50.75        | 5.43           | 35.86            | -20.32              | -13         | -7.32       | Vertical   |
| 5742.9                                  | -50.43        | 5.43           | 35.86            | -20.00              | -13         | -7.00       | Horizontal |
| 193.4                                   | -39.31        | 1.80           | 16.69            | -24.42              | -13         | -11.42      | Vertical   |
| 467.2                                   | -42.75        | 1.75           | 16.66            | -27.85              | -13         | -14.85      | Horizontal |



**QPSK EIRP POWER FOR LTE BAND 25 (20MHZ BANDWIDTH)**

| Test Results for Low Channel 1860MHz   |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 3720.0                                 | -47.52        | 4.29           | 29.80            | -22.01              | -13         | -9.01       | Horizontal |
| 3720.0                                 | -50.95        | 4.29           | 29.80            | -25.44              | -13         | -12.44      | Vertical   |
| 5580.0                                 | -45.43        | 5.38           | 35.84            | -14.97              | -13         | -1.97       | Vertical   |
| 5580.0                                 | -52.37        | 5.38           | 35.84            | -21.91              | -13         | -8.91       | Horizontal |
| 185.0                                  | -34.47        | 1.57           | 17.26            | -18.78              | -13         | -5.78       | Vertical   |
| 438.7                                  | -41.62        | 1.78           | 16.35            | -27.05              | -13         | -14.05      | Horizontal |
| Test Results for Mid Channel 1882.5MHz |               |                |                  |                     |             |             |            |
| 3765.0                                 | -52.17        | 4.28           | 30.00            | -26.45              | -13         | -13.45      | Horizontal |
| 3765.0                                 | -48.55        | 4.28           | 30.00            | -22.83              | -13         | -9.83       | Vertical   |
| 5647.5                                 | -47.31        | 5.41           | 35.86            | -16.86              | -13         | -3.86       | Vertical   |
| 5647.5                                 | -49.61        | 5.41           | 35.86            | -19.16              | -13         | -6.16       | Horizontal |
| 194.9                                  | -41.88        | 1.44           | 17.95            | -25.37              | -13         | -12.37      | Vertical   |
| 357.9                                  | -37.64        | 1.65           | 16.09            | -23.20              | -13         | -10.20      | Horizontal |
| Test Results for High Channel 1905MHz  |               |                |                  |                     |             |             |            |
| 3810.0                                 | -51.64        | 4.35           | 27.68            | -28.31              | -13         | -15.31      | Horizontal |
| 3810.0                                 | -46.16        | 4.35           | 27.68            | -22.83              | -13         | -9.83       | Vertical   |
| 5715.0                                 | -49.21        | 5.42           | 35.86            | -18.77              | -13         | -5.77       | Vertical   |
| 5715.0                                 | -50.14        | 5.42           | 35.86            | -19.70              | -13         | -6.70       | Horizontal |
| 180.6                                  | -38.74        | 1.61           | 16.85            | -23.50              | -13         | -10.50      | Vertical   |
| 324.0                                  | -36.71        | 1.61           | 15.19            | -23.13              | -13         | -10.13      | Horizontal |

### 9.10 LTE BAND 26A

#### QPSK EIRP POWER FOR LTE BAND 26A(814MHz~824MHz) (1.4MHZ BANDWIDTH)

| Test Results for Low Channel 814.7MHz  |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1629.4                                 | -52.48        | 4.26           | 29.80            | -26.94              | -13         | -13.94      | Horizontal |
| 1629.4                                 | -48.98        | 4.26           | 29.80            | -23.44              | -13         | -10.44      | Vertical   |
| 2444.1                                 | -45.59        | 5.36           | 35.84            | -15.11              | -13         | -2.11       | Vertical   |
| 2444.1                                 | -52.66        | 5.36           | 35.84            | -22.18              | -13         | -9.18       | Horizontal |
| 187.3                                  | -40.74        | 1.68           | 16.04            | -26.38              | -13         | -13.38      | Vertical   |
| 329.3                                  | -41.28        | 1.78           | 17.74            | -25.32              | -13         | -12.32      | Horizontal |
| Test Results For Mid Channel 819MHz    |               |                |                  |                     |             |             |            |
| 1638.0                                 | -51.22        | 4.28           | 30.00            | -25.50              | -13         | -12.50      | Horizontal |
| 1638.0                                 | -45.54        | 4.28           | 30.00            | -19.82              | -13         | -6.82       | Vertical   |
| 2457.0                                 | -46.20        | 5.41           | 35.86            | -15.75              | -13         | -2.75       | Vertical   |
| 2457.0                                 | -53.65        | 5.41           | 35.86            | -23.20              | -13         | -10.20      | Horizontal |
| 191.6                                  | -40.99        | 1.72           | 17.69            | -25.02              | -13         | -12.02      | Vertical   |
| 439.6                                  | -41.76        | 1.62           | 16.02            | -27.35              | -13         | -14.35      | Horizontal |
| Test Results for High Channel 823.3MHz |               |                |                  |                     |             |             |            |
| 1646.6                                 | -49.21        | 4.31           | 30.01            | -23.51              | -13         | -10.51      | Horizontal |
| 1646.6                                 | -52.95        | 4.31           | 30.01            | -27.25              | -13         | -14.25      | Vertical   |
| 2469.9                                 | -52.58        | 5.43           | 35.86            | -22.15              | -13         | -9.15       | Vertical   |
| 2469.9                                 | -52.29        | 5.43           | 35.86            | -21.86              | -13         | -8.86       | Horizontal |
| 179.8                                  | -36.46        | 1.80           | 16.69            | -21.57              | -13         | -8.57       | Vertical   |
| 417.8                                  | -44.75        | 1.75           | 16.66            | -29.85              | -13         | -16.85      | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 26A(814MHz~824MHz) (1.4MHZ BANDWIDTH)**

| Test Results for Channel 819MHz |               |                |                  |                     |             |             |            |
|---------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                  | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1638.0                          | -45.99        | 4.28           | 30.00            | -20.27              | -13         | -7.27       | Horizontal |
| 1638.0                          | -46.82        | 4.28           | 30.00            | -21.10              | -13         | -8.10       | Vertical   |
| 2457.0                          | -47.50        | 5.41           | 35.86            | -17.05              | -13         | -4.05       | Vertical   |
| 2457.0                          | -50.76        | 5.41           | 35.86            | -20.31              | -13         | -7.31       | Horizontal |
| 199.4                           | -39.06        | 1.44           | 17.95            | -22.55              | -13         | -9.55       | Vertical   |
| 272.8                           | -37.22        | 1.65           | 16.09            | -22.78              | -13         | -9.78       | Horizontal |

### 9.11 LTE BAND 26B

#### QPSK EIRP POWER FOR LTE BAND 26B(824MHz~849MHz) (1.4MHZ BANDWIDTH)

| Test Results for Low Channel 824.7MHz  |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1649.4                                 | -48.68        | 4.26           | 29.80            | -23.14              | -13         | -10.14      | Horizontal |
| 1649.4                                 | -53.43        | 4.26           | 29.80            | -27.89              | -13         | -14.89      | Vertical   |
| 2474.1                                 | -53.71        | 5.36           | 35.84            | -23.23              | -13         | -10.23      | Vertical   |
| 2474.1                                 | -49.43        | 5.36           | 35.84            | -18.95              | -13         | -5.95       | Horizontal |
| 176.7                                  | -35.91        | 1.68           | 16.04            | -21.55              | -13         | -8.55       | Vertical   |
| 362.4                                  | -37.14        | 1.78           | 17.74            | -21.18              | -13         | -8.18       | Horizontal |
| Test Results For Mid Channel 836.5MHz  |               |                |                  |                     |             |             |            |
| 1673.0                                 | -46.06        | 4.28           | 30.00            | -20.34              | -13         | -7.34       | Horizontal |
| 1673.0                                 | -48.72        | 4.28           | 30.00            | -23.00              | -13         | -10.00      | Vertical   |
| 2509.5                                 | -47.43        | 5.41           | 35.86            | -16.98              | -13         | -3.98       | Vertical   |
| 2509.5                                 | -50.36        | 5.41           | 35.86            | -19.91              | -13         | -6.91       | Horizontal |
| 195.7                                  | -38.07        | 1.72           | 17.69            | -22.10              | -13         | -9.10       | Vertical   |
| 325.9                                  | -40.07        | 1.62           | 16.02            | -25.66              | -13         | -12.66      | Horizontal |
| Test Results for High Channel 848.3MHz |               |                |                  |                     |             |             |            |
| 1696.6                                 | -45.36        | 4.31           | 30.01            | -19.66              | -13         | -6.66       | Horizontal |
| 1696.6                                 | -52.26        | 4.31           | 30.01            | -26.56              | -13         | -13.56      | Vertical   |
| 2544.9                                 | -47.35        | 5.43           | 35.86            | -16.92              | -13         | -3.92       | Vertical   |
| 2544.9                                 | -53.33        | 5.43           | 35.86            | -22.90              | -13         | -9.90       | Horizontal |
| 202.3                                  | -42.35        | 1.80           | 16.69            | -27.46              | -13         | -14.46      | Vertical   |
| 244.0                                  | -35.29        | 1.75           | 16.66            | -20.39              | -13         | -7.39       | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 26B(824MHz~849MHz) (15MHZ BANDWIDTH)**

| Test Results for Low Channel 831.5MHz  |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1663.0                                 | -53.47        | 4.29           | 29.80            | -27.96              | -13         | -14.96      | Horizontal |
| 1663.0                                 | -53.43        | 4.29           | 29.80            | -27.92              | -13         | -14.92      | Vertical   |
| 2494.5                                 | -45.20        | 5.38           | 35.84            | -14.74              | -13         | -1.74       | Vertical   |
| 2494.5                                 | -52.19        | 5.38           | 35.84            | -21.73              | -13         | -8.73       | Horizontal |
| 210.5                                  | -36.07        | 1.57           | 17.26            | -20.38              | -13         | -7.38       | Vertical   |
| 466.0                                  | -35.12        | 1.78           | 16.35            | -20.55              | -13         | -7.55       | Horizontal |
| Test Results for Mid Channel 836.5MHz  |               |                |                  |                     |             |             |            |
| 1673.0                                 | -46.67        | 4.28           | 30.00            | -20.95              | -13         | -7.95       | Horizontal |
| 1673.0                                 | -48.51        | 4.28           | 30.00            | -22.79              | -13         | -9.79       | Vertical   |
| 2509.5                                 | -53.79        | 5.41           | 35.86            | -23.34              | -13         | -10.34      | Vertical   |
| 2509.5                                 | -53.81        | 5.41           | 35.86            | -23.36              | -13         | -10.36      | Horizontal |
| 178.7                                  | -38.97        | 1.44           | 17.95            | -22.46              | -13         | -9.46       | Vertical   |
| 451.8                                  | -44.43        | 1.65           | 16.09            | -29.99              | -13         | -16.99      | Horizontal |
| Test Results for High Channel 841.5MHz |               |                |                  |                     |             |             |            |
| 1683.0                                 | -48.46        | 4.35           | 27.68            | -25.13              | -13         | -12.13      | Horizontal |
| 1683.0                                 | -49.84        | 4.35           | 27.68            | -26.51              | -13         | -13.51      | Vertical   |
| 2524.5                                 | -48.66        | 5.42           | 35.86            | -18.22              | -13         | -5.22       | Vertical   |
| 2524.5                                 | -52.47        | 5.42           | 35.86            | -22.03              | -13         | -9.03       | Horizontal |
| 210.6                                  | -44.92        | 1.61           | 16.85            | -29.68              | -13         | -16.68      | Vertical   |
| 392.6                                  | -36.68        | 1.61           | 15.19            | -23.10              | -13         | -10.10      | Horizontal |

### 9.12 LTE BAND 38

#### QPSK EIRP POWER FOR LTE BAND 38 (5MHZ BANDWIDTH)

| Test Results for Low Channel 2572.5MHz  |               |                |                  |                     |             |             |            |
|-----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                          | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 5145.0                                  | -60.57        | 5.13           | 35.81            | -29.89              | -25         | -4.89       | Horizontal |
| 5145.0                                  | -61.38        | 5.13           | 35.81            | -30.70              | -25         | -5.70       | Vertical   |
| 7717.5                                  | -62.03        | 5.42           | 36.85            | -30.60              | -25         | -5.60       | Vertical   |
| 7717.5                                  | -64.13        | 5.42           | 36.85            | -32.70              | -25         | -7.70       | Horizontal |
| 212.1                                   | -44.89        | 1.56           | 17.97            | -28.48              | -25         | -3.48       | Vertical   |
| 375.8                                   | -53.64        | 1.33           | 15.11            | -39.86              | -25         | -14.86      | Horizontal |
| Test Results For Mid Channel 2595MHz    |               |                |                  |                     |             |             |            |
| 5190.0                                  | -61.22        | 5.16           | 35.82            | -30.56              | -25         | -5.56       | Horizontal |
| 5190.0                                  | -60.07        | 5.16           | 35.82            | -29.41              | -25         | -4.41       | Vertical   |
| 7785.0                                  | -64.52        | 5.53           | 36.85            | -33.20              | -25         | -8.20       | Vertical   |
| 7785.0                                  | -62.89        | 5.53           | 36.85            | -31.57              | -25         | -6.57       | Horizontal |
| 202.5                                   | -53.73        | 1.77           | 16.17            | -39.32              | -25         | -14.32      | Vertical   |
| 422.0                                   | -53.23        | 1.63           | 15.21            | -39.65              | -25         | -14.65      | Horizontal |
| Test Results for High Channel 2617.5MHz |               |                |                  |                     |             |             |            |
| 5235.0                                  | -59.52        | 5.23           | 35.83            | -28.92              | -25         | -3.92       | Horizontal |
| 5235.0                                  | -64.61        | 5.23           | 35.83            | -34.01              | -25         | -9.01       | Vertical   |
| 7852.5                                  | -62.57        | 5.62           | 36.87            | -31.32              | -25         | -6.32       | Vertical   |
| 7852.5                                  | -62.88        | 5.62           | 36.87            | -31.63              | -25         | -6.63       | Horizontal |
| 184.6                                   | -46.52        | 1.58           | 17.56            | -30.54              | -25         | -5.54       | Vertical   |
| 329.0                                   | -51.41        | 1.45           | 16.58            | -36.28              | -25         | -11.28      | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 38 (20MHZ BANDWIDTH)**

| Test Results for Low Channel 2580MHz  |               |                |                  |                     |             |             |            |
|---------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                        | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 5160.0                                | -63.92        | 5.23           | 35.82            | -33.33              | -25         | -8.33       | Horizontal |
| 5160.0                                | -59.16        | 5.23           | 35.82            | -28.57              | -25         | -3.57       | Vertical   |
| 7740.0                                | -64.94        | 5.67           | 36.86            | -33.75              | -25         | -8.75       | Vertical   |
| 7740.0                                | -60.91        | 5.67           | 36.86            | -29.72              | -25         | -4.72       | Horizontal |
| 192.7                                 | -51.76        | 1.55           | 15.76            | -37.55              | -25         | -12.55      | Vertical   |
| 361.5                                 | -44.36        | 1.62           | 15.44            | -30.54              | -25         | -5.54       | Horizontal |
| Test Results for Mid Channel 2595MHz  |               |                |                  |                     |             |             |            |
| 5190.0                                | -63.41        | 5.16           | 35.82            | -32.75              | -25         | -7.75       | Horizontal |
| 5190.0                                | -60.78        | 5.16           | 35.82            | -30.12              | -25         | -5.12       | Vertical   |
| 7785.0                                | -61.17        | 5.53           | 36.85            | -29.85              | -25         | -4.85       | Vertical   |
| 7785.0                                | -61.82        | 5.53           | 36.85            | -30.50              | -25         | -5.50       | Horizontal |
| 194.9                                 | -49.89        | 1.58           | 16.84            | -34.63              | -25         | -9.63       | Vertical   |
| 234.6                                 | -52.58        | 1.61           | 17.64            | -36.55              | -25         | -11.55      | Horizontal |
| Test Results for High Channel 2610MHz |               |                |                  |                     |             |             |            |
| 5220.0                                | -60.15        | 5.24           | 35.83            | -29.56              | -25         | -4.56       | Horizontal |
| 5220.0                                | -60.77        | 5.24           | 35.83            | -30.18              | -25         | -5.18       | Vertical   |
| 7830.0                                | -61.90        | 5.70           | 36.88            | -30.72              | -25         | -5.72       | Vertical   |
| 7830.0                                | -59.33        | 5.70           | 36.88            | -28.15              | -25         | -3.15       | Horizontal |
| 204.9                                 | -47.84        | 1.48           | 16.84            | -32.48              | -25         | -7.48       | Vertical   |
| 243.4                                 | -47.03        | 1.59           | 17.64            | -30.98              | -25         | -5.98       | Horizontal |

### 9.13 LTE BAND 41

#### QPSK EIRP POWER FOR LTE BAND 41 (5MHZ BANDWIDTH)

| Test Results for Low Channel 2498.5MHz  |               |                |                  |                     |             |             |            |
|-----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                          | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 4997.0                                  | -59.35        | 5.13           | 35.81            | -28.67              | -25         | -3.67       | Horizontal |
| 4997.0                                  | -59.19        | 5.13           | 35.81            | -28.51              | -25         | -3.51       | Vertical   |
| 7495.5                                  | -61.52        | 5.42           | 36.85            | -30.09              | -25         | -5.09       | Vertical   |
| 7495.5                                  | -62.96        | 5.42           | 36.85            | -31.53              | -25         | -6.53       | Horizontal |
| 190.4                                   | -45.05        | 1.56           | 17.97            | -28.64              | -25         | -3.64       | Vertical   |
| 272.8                                   | -52.55        | 1.33           | 15.11            | -38.77              | -25         | -13.77      | Horizontal |
| Test Results for Mid Channel 2593MHz    |               |                |                  |                     |             |             |            |
| 5186.0                                  | -60.98        | 5.16           | 35.82            | -30.32              | -25         | -5.32       | Horizontal |
| 5186.0                                  | -60.66        | 5.16           | 35.82            | -30.00              | -25         | -5.00       | Vertical   |
| 7779.0                                  | -60.14        | 5.53           | 36.85            | -28.82              | -25         | -3.82       | Vertical   |
| 7779.0                                  | -60.07        | 5.53           | 36.85            | -28.75              | -25         | -3.75       | Horizontal |
| 179.6                                   | -50.00        | 1.77           | 16.17            | -35.59              | -25         | -10.59      | Vertical   |
| 423.2                                   | -44.13        | 1.63           | 15.21            | -30.55              | -25         | -5.55       | Horizontal |
| Test Results for High Channel 2687.5MHz |               |                |                  |                     |             |             |            |
| 5375.0                                  | -62.31        | 5.23           | 35.83            | -31.71              | -25         | -6.71       | Horizontal |
| 5375.0                                  | -61.65        | 5.23           | 35.83            | -31.05              | -25         | -6.05       | Vertical   |
| 8062.5                                  | -60.12        | 5.62           | 36.87            | -28.87              | -25         | -3.87       | Vertical   |
| 8062.5                                  | -63.71        | 5.62           | 36.87            | -32.46              | -25         | -7.46       | Horizontal |
| 176.8                                   | -49.84        | 1.58           | 17.56            | -33.86              | -25         | -8.86       | Vertical   |
| 361.4                                   | -45.22        | 1.45           | 16.58            | -30.09              | -25         | -5.09       | Horizontal |



**QPSK EIRP POWER FOR LTE BAND 41 (20MHZ BANDWIDTH)**

| Test Results for Low Channel 2506MHz  |               |                |                  |                     |             |             |            |
|---------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                        | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 5012.0                                | -63.05        | 5.23           | 35.82            | -32.46              | -25         | -7.46       | Horizontal |
| 5012.0                                | -62.68        | 5.23           | 35.82            | -32.09              | -25         | -7.09       | Vertical   |
| 7518.0                                | -63.10        | 5.67           | 36.86            | -31.91              | -25         | -6.91       | Vertical   |
| 7518.0                                | -62.04        | 5.67           | 36.86            | -30.85              | -25         | -5.85       | Horizontal |
| 184.0                                 | -47.02        | 1.55           | 15.76            | -32.81              | -25         | -7.81       | Vertical   |
| 430.4                                 | -45.10        | 1.62           | 15.44            | -31.28              | -25         | -6.28       | Horizontal |
| Test Results for Mid Channel 2593MHz  |               |                |                  |                     |             |             |            |
| 5186.0                                | -59.47        | 5.16           | 35.82            | -28.81              | -25         | -3.81       | Horizontal |
| 5186.0                                | -61.06        | 5.16           | 35.82            | -30.40              | -25         | -5.40       | Vertical   |
| 7779.0                                | -60.77        | 5.53           | 36.85            | -29.45              | -25         | -4.45       | Vertical   |
| 7779.0                                | -62.21        | 5.53           | 36.85            | -30.89              | -25         | -5.89       | Horizontal |
| 179.2                                 | -48.95        | 1.58           | 16.84            | -33.69              | -25         | -8.69       | Vertical   |
| 247.5                                 | -50.54        | 1.61           | 17.64            | -34.51              | -25         | -9.51       | Horizontal |
| Test Results for High Channel 2680MHz |               |                |                  |                     |             |             |            |
| 5360.0                                | -61.93        | 5.24           | 35.83            | -31.34              | -25         | -6.34       | Horizontal |
| 5360.0                                | -64.96        | 5.24           | 35.83            | -34.37              | -25         | -9.37       | Vertical   |
| 8040.0                                | -62.69        | 5.70           | 36.88            | -31.51              | -25         | -6.51       | Vertical   |
| 8040.0                                | -63.12        | 5.70           | 36.88            | -31.94              | -25         | -6.94       | Horizontal |
| 203.6                                 | -49.76        | 1.48           | 16.84            | -34.40              | -25         | -9.40       | Vertical   |
| 327.6                                 | -49.83        | 1.59           | 17.64            | -33.78              | -25         | -8.78       | Horizontal |

## 9.14 LTE BAND 66

### QPSK EIRP POWER FOR LTE BAND 66 (1.4MHZ BANDWIDTH)

| Test Results for Low Channel 1710.7MHz  |               |                |                  |                     |             |             |            |
|-----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                          | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 3421.4                                  | -61.11        | 3.84           | 35.81            | -29.14              | -13         | -16.14      | Horizontal |
| 3421.4                                  | -63.43        | 3.84           | 35.81            | -31.46              | -13         | -18.46      | Vertical   |
| 5132.1                                  | -63.87        | 5.18           | 36.85            | -32.20              | -13         | -19.20      | Vertical   |
| 5132.1                                  | -59.08        | 5.18           | 36.85            | -27.41              | -13         | -14.41      | Horizontal |
| 203.5                                   | -45.77        | 1.56           | 17.97            | -29.36              | -13         | -16.36      | Vertical   |
| 331.1                                   | -44.81        | 1.33           | 15.11            | -31.03              | -13         | -18.03      | Horizontal |
| Test Results for Mid Channel 1745MHz    |               |                |                  |                     |             |             |            |
| 3490.0                                  | -59.00        | 3.85           | 35.82            | -27.03              | -13         | -14.03      | Horizontal |
| 3490.0                                  | -63.92        | 3.85           | 35.82            | -31.95              | -13         | -18.95      | Vertical   |
| 5235.0                                  | -60.18        | 5.21           | 36.85            | -28.54              | -13         | -15.54      | Vertical   |
| 5235.0                                  | -64.79        | 5.21           | 36.85            | -33.15              | -13         | -20.15      | Horizontal |
| 196.0                                   | -46.10        | 1.77           | 16.17            | -31.69              | -13         | -18.69      | Vertical   |
| 462.5                                   | -44.91        | 1.63           | 15.21            | -31.33              | -13         | -18.33      | Horizontal |
| Test Results for High Channel 1779.3MHz |               |                |                  |                     |             |             |            |
| 3558.6                                  | -60.63        | 3.86           | 35.83            | -28.66              | -13         | -15.66      | Horizontal |
| 3558.6                                  | -59.85        | 3.86           | 35.83            | -27.88              | -13         | -14.88      | Vertical   |
| 5337.9                                  | -60.38        | 5.24           | 36.87            | -28.75              | -13         | -15.75      | Vertical   |
| 5337.9                                  | -59.28        | 5.24           | 36.87            | -27.65              | -13         | -14.65      | Horizontal |
| 183.6                                   | -46.55        | 1.58           | 17.56            | -30.57              | -13         | -17.57      | Vertical   |
| 419.9                                   | -47.94        | 1.45           | 16.58            | -32.81              | -13         | -19.81      | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 66 (20MHZ BANDWIDTH)**

| Test Results for Low Channel 1720MHz  |               |                |                  |                     |             |             |            |
|---------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                        | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 3440.0                                | -63.08        | 3.84           | 35.82            | -31.10              | -13         | -18.10      | Horizontal |
| 3440.0                                | -62.38        | 3.84           | 35.82            | -30.40              | -13         | -17.40      | Vertical   |
| 5160.0                                | -59.55        | 5.18           | 36.86            | -27.87              | -13         | -14.87      | Vertical   |
| 5160.0                                | -60.81        | 5.18           | 36.86            | -29.13              | -13         | -16.13      | Horizontal |
| 181.2                                 | -47.01        | 1.56           | 15.76            | -32.81              | -13         | -19.81      | Vertical   |
| 417.0                                 | -49.77        | 1.33           | 15.44            | -35.66              | -13         | -22.66      | Horizontal |
| Test Results for Mid Channel 1745MHz  |               |                |                  |                     |             |             |            |
| 3490.0                                | -60.79        | 3.85           | 35.82            | -28.82              | -13         | -15.82      | Horizontal |
| 3490.0                                | -62.62        | 3.85           | 35.82            | -30.65              | -13         | -17.65      | Vertical   |
| 5235.0                                | -63.13        | 5.21           | 36.85            | -31.49              | -13         | -18.49      | Vertical   |
| 5235.0                                | -63.48        | 5.21           | 36.85            | -31.84              | -13         | -18.84      | Horizontal |
| 187.3                                 | -48.33        | 1.77           | 16.84            | -33.25              | -13         | -20.25      | Vertical   |
| 366.2                                 | -44.12        | 1.63           | 17.64            | -28.11              | -13         | -15.11      | Horizontal |
| Test Results for High Channel 1770MHz |               |                |                  |                     |             |             |            |
| 3540.0                                | -60.97        | 3.86           | 35.83            | -29.00              | -13         | -16.00      | Horizontal |
| 3540.0                                | -59.88        | 3.86           | 35.83            | -27.91              | -13         | -14.91      | Vertical   |
| 5310.0                                | -63.79        | 5.24           | 36.88            | -32.15              | -13         | -19.15      | Vertical   |
| 5310.0                                | -61.31        | 5.24           | 36.88            | -29.67              | -13         | -16.67      | Horizontal |
| 185.7                                 | -44.81        | 1.58           | 16.84            | -29.54              | -13         | -16.54      | Vertical   |
| 444.8                                 | -45.89        | 1.45           | 17.64            | -29.70              | -13         | -16.70      | Horizontal |

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

We test both H direction and V direction, recorded worst case direction.

Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

### 9.15 LTE BAND 71

#### QPSK EIRP POWER FOR LTE BAND 71 (5MHZ BANDWIDTH)

| Test Results for Low Channel 665.5MHz  |               |                |                  |                     |             |             |            |
|----------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                         | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1331.0                                 | -62.72        | 2.16           | 35.81            | -29.07              | -13         | -16.07      | Horizontal |
| 1331.0                                 | -64.99        | 2.16           | 35.81            | -31.34              | -13         | -18.34      | Vertical   |
| 1996.5                                 | -63.35        | 2.89           | 36.85            | -29.39              | -13         | -16.39      | Vertical   |
| 1996.5                                 | -60.13        | 2.89           | 36.85            | -26.17              | -13         | -13.17      | Horizontal |
| 181.1                                  | -46.85        | 1.56           | 17.97            | -30.44              | -13         | -17.44      | Vertical   |
| 462.1                                  | -52.47        | 1.33           | 15.11            | -38.69              | -13         | -25.69      | Horizontal |
| Test Results for Mid Channel 680.5MHz  |               |                |                  |                     |             |             |            |
| 1361.0                                 | -63.48        | 2.17           | 35.82            | -29.83              | -13         | -16.83      | Horizontal |
| 1361.0                                 | -62.99        | 2.17           | 35.82            | -29.34              | -13         | -16.34      | Vertical   |
| 2041.5                                 | -63.91        | 2.90           | 36.85            | -29.96              | -13         | -16.96      | Vertical   |
| 2041.5                                 | -64.72        | 2.90           | 36.85            | -30.77              | -13         | -17.77      | Horizontal |
| 208.6                                  | -50.04        | 1.77           | 16.17            | -35.63              | -13         | -22.63      | Vertical   |
| 431.2                                  | -48.05        | 1.63           | 15.21            | -34.47              | -13         | -21.47      | Horizontal |
| Test Results for High Channel 695.5MHz |               |                |                  |                     |             |             |            |
| 1391.0                                 | -61.99        | 2.19           | 35.83            | -28.35              | -13         | -15.35      | Horizontal |
| 1391.0                                 | -63.49        | 2.19           | 35.83            | -29.85              | -13         | -16.85      | Vertical   |
| 2086.5                                 | -60.99        | 2.95           | 36.87            | -27.07              | -13         | -14.07      | Vertical   |
| 2086.5                                 | -62.42        | 2.95           | 36.87            | -28.50              | -13         | -15.50      | Horizontal |
| 205.7                                  | -51.66        | 1.58           | 17.56            | -35.68              | -13         | -22.68      | Vertical   |
| 451.0                                  | -52.48        | 1.45           | 16.58            | -37.35              | -13         | -24.35      | Horizontal |

**QPSK EIRP POWER FOR LTE BAND 71 (20MHZ BANDWIDTH)**

| Test Results for Low Channel 673MHz  |               |                |                  |                     |             |             |            |
|--------------------------------------|---------------|----------------|------------------|---------------------|-------------|-------------|------------|
| Frequency(MHz)                       | SG Level(dBm) | Cable Loss(dB) | Antenna Gain(dB) | Absolute Level(dBm) | Limit (dBm) | Margin(dBm) | Polarity   |
| 1346.0                               | -62.11        | 2.16           | 35.82            | -28.45              | -13         | -15.45      | Horizontal |
| 1346.0                               | -64.78        | 2.16           | 35.82            | -31.12              | -13         | -18.12      | Vertical   |
| 2019.0                               | -59.58        | 2.89           | 36.86            | -25.61              | -13         | -12.61      | Vertical   |
| 2019.0                               | -61.06        | 2.89           | 36.86            | -27.09              | -13         | -14.09      | Horizontal |
| 204.9                                | -51.63        | 1.56           | 15.76            | -37.43              | -13         | -24.43      | Vertical   |
| 403.7                                | -46.33        | 1.33           | 15.44            | -32.22              | -13         | -19.22      | Horizontal |
| Test Results for Mid Channel 683MHz  |               |                |                  |                     |             |             |            |
| 1366.0                               | -62.79        | 2.17           | 35.82            | -29.14              | -13         | -16.14      | Horizontal |
| 1366.0                               | -61.51        | 2.17           | 35.82            | -27.86              | -13         | -14.86      | Vertical   |
| 2049.0                               | -64.27        | 2.90           | 36.85            | -30.32              | -13         | -17.32      | Vertical   |
| 2049.0                               | -61.31        | 2.90           | 36.85            | -27.36              | -13         | -14.36      | Horizontal |
| 206.9                                | -49.13        | 1.77           | 16.84            | -34.05              | -13         | -21.05      | Vertical   |
| 388.1                                | -54.30        | 1.63           | 17.64            | -38.29              | -13         | -25.29      | Horizontal |
| Test Results for High Channel 688MHz |               |                |                  |                     |             |             |            |
| 1376.0                               | -59.37        | 2.19           | 35.83            | -25.73              | -13         | -12.73      | Horizontal |
| 1376.0                               | -59.49        | 2.19           | 35.83            | -25.85              | -13         | -12.85      | Vertical   |
| 2064.0                               | -62.06        | 2.95           | 36.88            | -28.13              | -13         | -15.13      | Vertical   |
| 2064.0                               | -59.91        | 2.95           | 36.88            | -25.98              | -13         | -12.98      | Horizontal |
| 177.9                                | -48.52        | 1.58           | 16.84            | -33.25              | -13         | -20.25      | Vertical   |
| 342.8                                | -47.32        | 1.45           | 17.64            | -31.13              | -13         | -18.13      | Horizontal |

Note: P<sub>Mea</sub>(dBm)= Power(dBm)+ AR<sub>pl</sub> (dBm)

Over Limit= : P<sub>Mea</sub>(dBm)-Limit(dBm)

We test both H direction and V direction, recorded worst case direction.

Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

## 10. FREQUENCY STABILITY

### RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54, §90.213

### LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

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

### TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- ☐ Temp. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$
- ☐ Voltage = low voltage, DC 3.5V, Normal, DC 4.0V and High voltage, DC 4.4V.

### Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to  $-30^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

### Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

### MODES TESTED

LTE Band 2/4/5/7/12/13/14/17/25/26/38/41/66/71

### RESULTS

See the following pages.

## 10.1 LTE BAND 2

### Band 2 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

#### Frequency error vs. Voltage

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 1880            | 12.9                 | 0.006850             | 2.5         |
| 4.0           | 1880            | 13.5                 | 0.007158             | 2.5         |
| 4.4           | 1880            | 13.6                 | 0.007213             | 2.5         |

#### Frequency error vs. Temperature

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 1880            | 13.0                 | 0.006937             | 2.5         |
| Extreme (50C)    | 1880            | 12.1                 | 0.006419             | 2.5         |
| Extreme (40C)    | 1880            | 13.5                 | 0.007178             | 2.5         |
| Extreme (30C)    | 1880            | 13.9                 | 0.007415             | 2.5         |
| Extreme (10C)    | 1880            | 14.3                 | 0.007595             | 2.5         |
| Extreme (0C)     | 1880            | 12.6                 | 0.006686             | 2.5         |
| Extreme (-10C)   | 1880            | 13.3                 | 0.007090             | 2.5         |
| Extreme (-20C)   | 1880            | 13.8                 | 0.007342             | 2.5         |
| Extreme (-30C)   | 1880            | 14.5                 | 0.007690             | 2.5         |

**Band 2 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 1880            | 9.6                  | 0.005108             | 2.5         |
| 4.0           | 1880            | 8.5                  | 0.004506             | 2.5         |
| 4.4           | 1880            | 7.6                  | 0.004065             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 1880            | 9.3                  | 0.004952             | 2.5         |
| Extreme (50C)    | 1880            | 9.2                  | 0.004874             | 2.5         |
| Extreme (40C)    | 1880            | 8.6                  | 0.004567026          | 2.5         |
| Extreme (30C)    | 1880            | 8.6                  | 0.004552975          | 2.5         |
| Extreme (10C)    | 1880            | 8.8                  | 0.00467868           | 2.5         |
| Extreme (0C)     | 1880            | 8.2                  | 0.004357926          | 2.5         |
| Extreme (-10C)   | 1880            | 9.0                  | 0.004770719          | 2.5         |
| Extreme (-20C)   | 1880            | 9.1                  | 0.004813898          | 2.5         |
| Extreme (-30C)   | 1880            | 8.5                  | 0.004532478          | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.



## 10.2 LTE BAND 4

### Band 4 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

#### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 1732.5             | 8.4                     | 0.004871                | 2.5            |
| 4.0              | 1732.5             | 9.0                     | 0.005213                | 2.5            |
| 4.4              | 1732.5             | 8.5                     | 0.004904                | 2.5            |

#### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 1732.5             | 8.3                     | 0.004802                | 2.5            |
| Extreme (50C)       | 1732.5             | 8.9                     | 0.005121                | 2.5            |
| Extreme (40C)       | 1732.5             | 7.8                     | 0.004476                | 2.5            |
| Extreme (30C)       | 1732.5             | 6.1                     | 0.003518                | 2.5            |
| Extreme (10C)       | 1732.5             | 6.7                     | 0.003880                | 2.5            |
| Extreme (0C)        | 1732.5             | 9.2                     | 0.005287                | 2.5            |
| Extreme (-10C)      | 1732.5             | 8.0                     | 0.004637                | 2.5            |
| Extreme (-20C)      | 1732.5             | 6.6                     | 0.003816                | 2.5            |
| Extreme (-30C)      | 1732.5             | 8.7                     | 0.005009                | 2.5            |

**Band 4 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 1732.5             | 9.5                     | 0.005509                | 2.5            |
| 4.0              | 1732.5             | 8.7                     | 0.005047                | 2.5            |
| 4.4              | 1732.5             | 8.4                     | 0.004836                | 2.5            |

**Frequency error vs. Temperature**

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 1732.5             | 9.7                     | 0.005581                | 2.5            |
| Extreme (50C)       | 1732.5             | 8.7                     | 0.005000                | 2.5            |
| Extreme (40C)       | 1732.5             | 7.9                     | 0.004531                | 2.5            |
| Extreme (30C)       | 1732.5             | 9.2                     | 0.005283                | 2.5            |
| Extreme (10C)       | 1732.5             | 9.0                     | 0.005221                | 2.5            |
| Extreme (0C)        | 1732.5             | 7.8                     | 0.004524                | 2.5            |
| Extreme (-10C)      | 1732.5             | 8.7                     | 0.005027                | 2.5            |
| Extreme (-20C)      | 1732.5             | 9.1                     | 0.005249                | 2.5            |
| Extreme (-30C)      | 1732.5             | 7.8                     | 0.004521                | 2.5            |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

### 10.3 LTE BAND 5

#### Band 5 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

##### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 836.5              | 5.6                     | 0.006717                | 2.5            |
| 4.0              | 836.5              | 6.6                     | 0.007856                | 2.5            |
| 4.4              | 836.5              | 4.6                     | 0.005549                | 2.5            |

##### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 836.5              | 6.4                     | 0.007675                | 2.5            |
| Extreme (50C)       | 836.5              | 5.5                     | 0.006630                | 2.5            |
| Extreme (40C)       | 836.5              | 6.2                     | 0.007445                | 2.5            |
| Extreme (30C)       | 836.5              | 6.8                     | 0.008157                | 2.5            |
| Extreme (10C)       | 836.5              | 5.4                     | 0.006508                | 2.5            |
| Extreme (0C)        | 836.5              | 5.4                     | 0.006453                | 2.5            |
| Extreme (-10C)      | 836.5              | 5.9                     | 0.007015                | 2.5            |
| Extreme (-20C)      | 836.5              | 6.3                     | 0.007538                | 2.5            |
| Extreme (-30C)      | 836.5              | 6.3                     | 0.007477                | 2.5            |

**Band 5 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 836.5              | 5.4                     | 0.006425                | 2.5            |
| 4.0              | 836.5              | 6.8                     | 0.008132                | 2.5            |
| 4.4              | 836.5              | 4.7                     | 0.005624                | 2.5            |

**Frequency error vs. Temperature**

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 836.5              | 5.8                     | 0.006895                | 2.5            |
| Extreme (50C)       | 836.5              | 6.3                     | 0.007590                | 2.5            |
| Extreme (40C)       | 836.5              | 6.1                     | 0.007296                | 2.5            |
| Extreme (30C)       | 836.5              | 6.7                     | 0.008008                | 2.5            |
| Extreme (10C)       | 836.5              | 4.9                     | 0.005898                | 2.5            |
| Extreme (0C)        | 836.5              | 4.9                     | 0.005841                | 2.5            |
| Extreme (-10C)      | 836.5              | 5.6                     | 0.006703                | 2.5            |
| Extreme (-20C)      | 836.5              | 6.5                     | 0.007780                | 2.5            |
| Extreme (-30C)      | 836.5              | 6.2                     | 0.007443                | 2.5            |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

#### 10.4 LTE BAND 7

##### Band 7 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

##### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 2535               | 10.3                    | 0.004082                | 2.5            |
| 4.0              | 2535               | 8.9                     | 0.003492                | 2.5            |
| 4.4              | 2535               | 8.4                     | 0.003295                | 2.5            |

##### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 2535               | 9.6                     | 0.003800                | 2.5            |
| Extreme (50C)       | 2535               | 8.8                     | 0.003461                | 2.5            |
| Extreme (40C)       | 2535               | 7.9                     | 0.003123                | 2.5            |
| Extreme (30C)       | 2535               | 8.5                     | 0.003342                | 2.5            |
| Extreme (10C)       | 2535               | 8.0                     | 0.003138                | 2.5            |
| Extreme (0C)        | 2535               | 8.4                     | 0.003330                | 2.5            |
| Extreme (-10C)      | 2535               | 9.9                     | 0.003904                | 2.5            |
| Extreme (-20C)      | 2535               | 8.8                     | 0.003473                | 2.5            |
| Extreme (-30C)      | 2535               | 8.5                     | 0.003354                | 2.5            |

**Band 7 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 2535            | 6.9                  | 0.002722             | 2.5         |
| 4.0           | 2535            | 6.7                  | 0.002626             | 2.5         |
| 4.4           | 2535            | 5.6                  | 0.002220             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 2535            | 6.9                  | 0.002722             | 2.5         |
| Extreme (50C)    | 2535            | 5.7                  | 0.002236             | 2.5         |
| Extreme (40C)    | 2535            | 5.8                  | 0.002300             | 2.5         |
| Extreme (30C)    | 2535            | 6.7                  | 0.002636             | 2.5         |
| Extreme (10C)    | 2535            | 6.2                  | 0.002436             | 2.5         |
| Extreme (0C)     | 2535            | 4.6                  | 0.001833             | 2.5         |
| Extreme (-10C)   | 2535            | 4.9                  | 0.001949             | 2.5         |
| Extreme (-20C)   | 2535            | 5.6                  | 0.002198             | 2.5         |
| Extreme (-30C)   | 2535            | 5.7                  | 0.002251             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

# 10.5 LTE BAND 12

## Band 12 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0

### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 707.5              | 8.6                     | 0.012096                | 2.5            |
| 4.0              | 707.5              | 10.4                    | 0.014747                | 2.5            |
| 4.4              | 707.5              | 9.0                     | 0.012752                | 2.5            |

### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 707.5              | 8.6                     | 0.012092                | 2.5            |
| Extreme (50C)       | 707.5              | 7.8                     | 0.011012                | 2.5            |
| Extreme (40C)       | 707.5              | 7.4                     | 0.010402                | 2.5            |
| Extreme (30C)       | 707.5              | 8.3                     | 0.011700                | 2.5            |
| Extreme (10C)       | 707.5              | 7.4                     | 0.010465                | 2.5            |
| Extreme (0C)        | 707.5              | 8.5                     | 0.012038                | 2.5            |
| Extreme (-10C)      | 707.5              | 7.9                     | 0.011224                | 2.5            |
| Extreme (-20C)      | 707.5              | 8.6                     | 0.012085                | 2.5            |
| Extreme (-30C)      | 707.5              | 8.3                     | 0.011663                | 2.5            |

**Band 12 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 707.5           | 7.1                  | 0.009999             | 2.5         |
| 4.0           | 707.5           | 8.7                  | 0.012254             | 2.5         |
| 4.4           | 707.5           | 7.0                  | 0.009937             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 707.5           | 8.5                  | 0.012044             | 2.5         |
| Extreme (50C)    | 707.5           | 8.1                  | 0.011514             | 2.5         |
| Extreme (40C)    | 707.5           | 9.1                  | 0.012921             | 2.5         |
| Extreme (30C)    | 707.5           | 8.2                  | 0.011630             | 2.5         |
| Extreme (10C)    | 707.5           | 8.6                  | 0.012112             | 2.5         |
| Extreme (0C)     | 707.5           | 7.3                  | 0.010264             | 2.5         |
| Extreme (-10C)   | 707.5           | 7.3                  | 0.010307             | 2.5         |
| Extreme (-20C)   | 707.5           | 8.7                  | 0.012367             | 2.5         |
| Extreme (-30C)   | 707.5           | 8.0                  | 0.011363             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.



### 10.6 LTE BAND 13

#### Band 13 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

##### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 782.0              | 12.4                    | 0.015898                | 2.5            |
| 4.0              | 782.0              | 14.2                    | 0.018186                | 2.5            |
| 4.4              | 782.0              | 13.7                    | 0.017510                | 2.5            |

##### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 782.0              | 13.8                    | 0.017678                | 2.5            |
| Extreme (50C)       | 782.0              | 13.8                    | 0.017657                | 2.5            |
| Extreme (40C)       | 782.0              | 15.0                    | 0.019161                | 2.5            |
| Extreme (30C)       | 782.0              | 14.2                    | 0.018186                | 2.5            |
| Extreme (10C)       | 782.0              | 13.9                    | 0.017818                | 2.5            |
| Extreme (0C)        | 782.0              | 14.5                    | 0.018605                | 2.5            |
| Extreme (-10C)      | 782.0              | 13.9                    | 0.017721                | 2.5            |
| Extreme (-20C)      | 782.0              | 14.2                    | 0.018183                | 2.5            |
| Extreme (-30C)      | 782.0              | 13.3                    | 0.016999                | 2.5            |

**Band 13 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 782.0              | 12.4                    | 0.015900                | 2.5            |
| 4.0              | 782.0              | 13.6                    | 0.017434                | 2.5            |
| 4.4              | 782.0              | 12.9                    | 0.016489                | 2.5            |

**Frequency error vs. Temperature**

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 782.0              | 12.8                    | 0.016355                | 2.5            |
| Extreme (50C)       | 782.0              | 11.7                    | 0.014937                | 2.5            |
| Extreme (40C)       | 782.0              | 13.9                    | 0.017755                | 2.5            |
| Extreme (30C)       | 782.0              | 13.2                    | 0.016864                | 2.5            |
| Extreme (10C)       | 782.0              | 13.4                    | 0.017161                | 2.5            |
| Extreme (0C)        | 782.0              | 12.4                    | 0.015836                | 2.5            |
| Extreme (-10C)      | 782.0              | 12.9                    | 0.016555                | 2.5            |
| Extreme (-20C)      | 782.0              | 14.1                    | 0.018039                | 2.5            |
| Extreme (-30C)      | 782.0              | 14.5                    | 0.018587                | 2.5            |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.7 LTE BAND 14

### Band 14 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

#### Frequency error vs. Voltage

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 793.0           | 12.4                 | 0.015622             | 2.5         |
| 4.0           | 793.0           | 14.1                 | 0.017810             | 2.5         |
| 4.4           | 793.0           | 13.4                 | 0.016891             | 2.5         |

#### Frequency error vs. Temperature

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 793.0           | 14.1                 | 0.017758             | 2.5         |
| Extreme (50C)    | 793.0           | 13.6                 | 0.017103             | 2.5         |
| Extreme (40C)    | 793.0           | 14.6                 | 0.018457             | 2.5         |
| Extreme (30C)    | 793.0           | 14.2                 | 0.017955             | 2.5         |
| Extreme (10C)    | 793.0           | 14.3                 | 0.018094             | 2.5         |
| Extreme (0C)     | 793.0           | 13.9                 | 0.017515             | 2.5         |
| Extreme (-10C)   | 793.0           | 13.8                 | 0.017348             | 2.5         |
| Extreme (-20C)   | 793.0           | 14.5                 | 0.018296             | 2.5         |
| Extreme (-30C)   | 793.0           | 13.7                 | 0.017278             | 2.5         |

**Band 14 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 793.0              | 12.8                    | 0.016113                | 2.5            |
| 4.0              | 793.0              | 14.3                    | 0.017980                | 2.5            |
| 4.4              | 793.0              | 13.7                    | 0.017332                | 2.5            |

**Frequency error vs. Temperature**

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 793.0              | 12.8                    | 0.016096                | 2.5            |
| Extreme (50C)       | 793.0              | 11.5                    | 0.014503                | 2.5            |
| Extreme (40C)       | 793.0              | 13.4                    | 0.016957                | 2.5            |
| Extreme (30C)       | 793.0              | 13.2                    | 0.016607                | 2.5            |
| Extreme (10C)       | 793.0              | 13.8                    | 0.017377                | 2.5            |
| Extreme (0C)        | 793.0              | 11.8                    | 0.014825                | 2.5            |
| Extreme (-10C)      | 793.0              | 13.3                    | 0.016724                | 2.5            |
| Extreme (-20C)      | 793.0              | 13.8                    | 0.017440                | 2.5            |
| Extreme (-30C)      | 793.0              | 14.9                    | 0.018808                | 2.5            |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.8 LTE BAND 17

### Band 17 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

#### Frequency error vs. Voltage

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 710.0           | 10.3                 | 0.014465             | 2.5         |
| 4.0           | 710.0           | 8.9                  | 0.012483             | 2.5         |
| 4.4           | 710.0           | 7.9                  | 0.011119             | 2.5         |

#### Frequency error vs. Temperature

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 710.0           | 9.5                  | 0.013317             | 2.5         |
| Extreme (50C)    | 710.0           | 9.2                  | 0.012960             | 2.5         |
| Extreme (40C)    | 710.0           | 8.0                  | 0.011246             | 2.5         |
| Extreme (30C)    | 710.0           | 9.4                  | 0.013309             | 2.5         |
| Extreme (10C)    | 710.0           | 9.0                  | 0.012640             | 2.5         |
| Extreme (0C)     | 710.0           | 8.0                  | 0.011218             | 2.5         |
| Extreme (-10C)   | 710.0           | 9.4                  | 0.013268             | 2.5         |
| Extreme (-20C)   | 710.0           | 8.5                  | 0.011904             | 2.5         |
| Extreme (-30C)   | 710.0           | 8.3                  | 0.011686             | 2.5         |

**Band 17 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 710.0              | 9.7                     | 0.013637                | 2.5            |
| 4.0              | 710.0              | 8.6                     | 0.012082                | 2.5            |
| 4.4              | 710.0              | 8.8                     | 0.012399                | 2.5            |

**Frequency error vs. Temperature**

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 710.0              | 9.0                     | 0.012624                | 2.5            |
| Extreme (50C)       | 710.0              | 9.3                     | 0.013032                | 2.5            |
| Extreme (40C)       | 710.0              | 8.0                     | 0.011218                | 2.5            |
| Extreme (30C)       | 710.0              | 8.9                     | 0.012535                | 2.5            |
| Extreme (10C)       | 710.0              | 7.9                     | 0.011121                | 2.5            |
| Extreme (0C)        | 710.0              | 8.7                     | 0.012189                | 2.5            |
| Extreme (-10C)      | 710.0              | 9.1                     | 0.012818                | 2.5            |
| Extreme (-20C)      | 710.0              | 8.8                     | 0.012362                | 2.5            |
| Extreme (-30C)      | 710.0              | 8.1                     | 0.011358                | 2.5            |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.9 LTE BAND 25

### Band 25 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

#### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 1882.5             | 9.5                     | 0.005022                | 2.5            |
| 4.0              | 1882.5             | 9.2                     | 0.004889                | 2.5            |
| 4.4              | 1882.5             | 8.2                     | 0.004346                | 2.5            |

#### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 1882.5             | 10.1                    | 0.005342                | 2.5            |
| Extreme (50C)       | 1882.5             | 8.9                     | 0.004748                | 2.5            |
| Extreme (40C)       | 1882.5             | 7.8                     | 0.004127                | 2.5            |
| Extreme (30C)       | 1882.5             | 9.1                     | 0.004827                | 2.5            |
| Extreme (10C)       | 1882.5             | 8.8                     | 0.004674                | 2.5            |
| Extreme (0C)        | 1882.5             | 8.0                     | 0.004265                | 2.5            |
| Extreme (-10C)      | 1882.5             | 8.9                     | 0.004702                | 2.5            |
| Extreme (-20C)      | 1882.5             | 8.6                     | 0.004570                | 2.5            |
| Extreme (-30C)      | 1882.5             | 8.2                     | 0.004365                | 2.5            |

**Band 25 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 1882.5          | 9.9                  | 0.005261             | 2.5         |
| 4.0           | 1882.5          | 8.9                  | 0.004729             | 2.5         |
| 4.4           | 1882.5          | 8.3                  | 0.004402             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 1882.5          | 9.6                  | 0.005086             | 2.5         |
| Extreme (50C)    | 1882.5          | 9.3                  | 0.004935             | 2.5         |
| Extreme (40C)    | 1882.5          | 8.8                  | 0.004686             | 2.5         |
| Extreme (30C)    | 1882.5          | 9.0                  | 0.004796             | 2.5         |
| Extreme (10C)    | 1882.5          | 8.2                  | 0.004358             | 2.5         |
| Extreme (0C)     | 1882.5          | 8.0                  | 0.004224             | 2.5         |
| Extreme (-10C)   | 1882.5          | 9.5                  | 0.005021             | 2.5         |
| Extreme (-20C)   | 1882.5          | 9.1                  | 0.004812             | 2.5         |
| Extreme (-30C)   | 1882.5          | 8.6                  | 0.004573             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.



## 10.10 LTE BAND 26A

### Band 26A QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

#### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 819.0              | 9.4                     | 0.011423                | 2.5            |
| 4.0              | 819.0              | 8.7                     | 0.010604                | 2.5            |
| 4.4              | 819.0              | 7.9                     | 0.009634                | 2.5            |

#### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 819.0              | 9.4                     | 0.011538                | 2.5            |
| Extreme (50C)       | 819.0              | 9.2                     | 0.011256                | 2.5            |
| Extreme (40C)       | 819.0              | 8.4                     | 0.010203                | 2.5            |
| Extreme (30C)       | 819.0              | 8.7                     | 0.010590                | 2.5            |
| Extreme (10C)       | 819.0              | 9.2                     | 0.011199                | 2.5            |
| Extreme (0C)        | 819.0              | 7.9                     | 0.009673                | 2.5            |
| Extreme (-10C)      | 819.0              | 9.4                     | 0.011423                | 2.5            |
| Extreme (-20C)      | 819.0              | 9.3                     | 0.011374                | 2.5            |
| Extreme (-30C)      | 819.0              | 8.1                     | 0.009926                | 2.5            |

**Band 26A 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 819.0           | 10.2                 | 0.012418             | 2.5         |
| 4.0           | 819.0           | 9.1                  | 0.011156             | 2.5         |
| 4.4           | 819.0           | 8.9                  | 0.010860             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 819.0           | 9.4                  | 0.011501             | 2.5         |
| Extreme (50C)    | 819.0           | 8.7                  | 0.010662             | 2.5         |
| Extreme (40C)    | 819.0           | 8.8                  | 0.010762             | 2.5         |
| Extreme (30C)    | 819.0           | 9.3                  | 0.011387             | 2.5         |
| Extreme (10C)    | 819.0           | 8.0                  | 0.009807             | 2.5         |
| Extreme (0C)     | 819.0           | 8.2                  | 0.009973             | 2.5         |
| Extreme (-10C)   | 819.0           | 9.1                  | 0.011154             | 2.5         |
| Extreme (-20C)   | 819.0           | 8.6                  | 0.010558             | 2.5         |
| Extreme (-30C)   | 819.0           | 8.6                  | 0.010493             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 10.11 LTE BAND 26B

### Band 26B QPSK, (15MHz BANDWIDTH RB size 75 RB Offset 0)

#### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 836.5              | 9.8                     | 0.011728                | 2.5            |
| 4.0              | 836.5              | 8.8                     | 0.010552                | 2.5            |
| 4.4              | 836.5              | 8.1                     | 0.009644                | 2.5            |

#### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 836.5              | 9.4                     | 0.011252                | 2.5            |
| Extreme (50C)       | 836.5              | 9.3                     | 0.011072                | 2.5            |
| Extreme (40C)       | 836.5              | 8.5                     | 0.010143                | 2.5            |
| Extreme (30C)       | 836.5              | 9.0                     | 0.010793                | 2.5            |
| Extreme (10C)       | 836.5              | 9.3                     | 0.011122                | 2.5            |
| Extreme (0C)        | 836.5              | 8.5                     | 0.010142                | 2.5            |
| Extreme (-10C)      | 836.5              | 8.8                     | 0.010513                | 2.5            |
| Extreme (-20C)      | 836.5              | 9.3                     | 0.011075                | 2.5            |
| Extreme (-30C)      | 836.5              | 8.2                     | 0.009793                | 2.5            |

**Band 26B 16QAM, (15MHz BANDWIDTH RB size 75 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 836.5           | 10.3                 | 0.012367             | 2.5         |
| 4.0           | 836.5           | 8.8                  | 0.010572             | 2.5         |
| 4.4           | 836.5           | 8.2                  | 0.009826             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 836.5           | 8.9                  | 0.010646             | 2.5         |
| Extreme (50C)    | 836.5           | 8.8                  | 0.010462             | 2.5         |
| Extreme (40C)    | 836.5           | 8.0                  | 0.009562             | 2.5         |
| Extreme (30C)    | 836.5           | 9.4                  | 0.011191             | 2.5         |
| Extreme (10C)    | 836.5           | 7.7                  | 0.009213             | 2.5         |
| Extreme (0C)     | 836.5           | 8.5                  | 0.010102             | 2.5         |
| Extreme (-10C)   | 836.5           | 9.7                  | 0.011537             | 2.5         |
| Extreme (-20C)   | 836.5           | 8.6                  | 0.010323             | 2.5         |
| Extreme (-30C)   | 836.5           | 7.9                  | 0.009446             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication

## 10.12 LTE BAND 38

### Band 38 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

#### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 2595               | 9.9                     | 0.003832                | 2.5            |
| 4.0              | 2595               | 9.4                     | 0.003609                | 2.5            |
| 4.4              | 2595               | 8.7                     | 0.003334                | 2.5            |

#### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 2595               | 9.4                     | 0.003607                | 2.5            |
| Extreme (50C)       | 2595               | 8.5                     | 0.003257                | 2.5            |
| Extreme (40C)       | 2595               | 8.4                     | 0.003255                | 2.5            |
| Extreme (30C)       | 2595               | 9.3                     | 0.003577                | 2.5            |
| Extreme (10C)       | 2595               | 8.3                     | 0.003186                | 2.5            |
| Extreme (0C)        | 2595               | 8.7                     | 0.003358                | 2.5            |
| Extreme (-10C)      | 2595               | 9.8                     | 0.003761                | 2.5            |
| Extreme (-20C)      | 2595               | 8.4                     | 0.003242                | 2.5            |
| Extreme (-30C)      | 2595               | 8.8                     | 0.003387                | 2.5            |

**Band 38 16QAM, (15MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 2595            | 6.9                  | 0.002659             | 2.5         |
| 4.0           | 2595            | 6.2                  | 0.002375             | 2.5         |
| 4.4           | 2595            | 5.8                  | 0.002231             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 2595            | 6.9                  | 0.002659             | 2.5         |
| Extreme (50C)    | 2595            | 5.1                  | 0.001974             | 2.5         |
| Extreme (40C)    | 2595            | 5.1                  | 0.001956             | 2.5         |
| Extreme (30C)    | 2595            | 6.3                  | 0.002444             | 2.5         |
| Extreme (10C)    | 2595            | 5.9                  | 0.002274             | 2.5         |
| Extreme (0C)     | 2595            | 5.4                  | 0.002062             | 2.5         |
| Extreme (-10C)   | 2595            | 4.8                  | 0.001832             | 2.5         |
| Extreme (-20C)   | 2595            | 6.0                  | 0.002315             | 2.5         |
| Extreme (-30C)   | 2595            | 5.9                  | 0.002292             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication

### 10.13 LTE BAND 41

#### Band 41 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

##### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 2593               | 10.2                    | 0.003916                | 2.5            |
| 4.0              | 2593               | 9.0                     | 0.003478                | 2.5            |
| 4.4              | 2593               | 8.2                     | 0.003166                | 2.5            |

##### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 2593               | 9.3                     | 0.003585                | 2.5            |
| Extreme (50C)       | 2593               | 8.9                     | 0.003425                | 2.5            |
| Extreme (40C)       | 2593               | 8.8                     | 0.003402                | 2.5            |
| Extreme (30C)       | 2593               | 8.5                     | 0.003277                | 2.5            |
| Extreme (10C)       | 2593               | 8.1                     | 0.003116                | 2.5            |
| Extreme (0C)        | 2593               | 8.6                     | 0.003328                | 2.5            |
| Extreme (-10C)      | 2593               | 9.0                     | 0.003459                | 2.5            |
| Extreme (-20C)      | 2593               | 8.9                     | 0.003424                | 2.5            |
| Extreme (-30C)      | 2593               | 8.6                     | 0.003326                | 2.5            |

**Band 41 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 2593            | 6.9                  | 0.002661             | 2.5         |
| 4.0           | 2593            | 6.6                  | 0.002533             | 2.5         |
| 4.4           | 2593            | 5.6                  | 0.002155             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 2593            | 6.9                  | 0.002661             | 2.5         |
| Extreme (50C)    | 2593            | 5.3                  | 0.002056             | 2.5         |
| Extreme (40C)    | 2593            | 5.3                  | 0.002031             | 2.5         |
| Extreme (30C)    | 2593            | 6.2                  | 0.002403             | 2.5         |
| Extreme (10C)    | 2593            | 5.3                  | 0.002034             | 2.5         |
| Extreme (0C)     | 2593            | 5.1                  | 0.001981             | 2.5         |
| Extreme (-10C)   | 2593            | 5.5                  | 0.002130             | 2.5         |
| Extreme (-20C)   | 2593            | 6.0                  | 0.002328             | 2.5         |
| Extreme (-30C)   | 2593            | 5.3                  | 0.002030             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.



# 10.14 LTE BAND 66

## Band 66 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 1745               | 6.5                     | 0.003714                | 2.5            |
| 4.0              | 1745               | 7.0                     | 0.004019                | 2.5            |
| 4.4              | 1745               | 7.8                     | 0.004444                | 2.5            |

### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 1745               | 5.1                     | 0.002929                | 2.5            |
| Extreme (50C)       | 1745               | 7.8                     | 0.004464                | 2.5            |
| Extreme (40C)       | 1745               | 6.6                     | 0.003801                | 2.5            |
| Extreme (30C)       | 1745               | 7.1                     | 0.004041                | 2.5            |
| Extreme (10C)       | 1745               | 7.7                     | 0.004424                | 2.5            |
| Extreme (0C)        | 1745               | 6.5                     | 0.003708                | 2.5            |
| Extreme (-10C)      | 1745               | 5.0                     | 0.002880                | 2.5            |
| Extreme (-20C)      | 1745               | 6.8                     | 0.003873                | 2.5            |
| Extreme (-30C)      | 1745               | 5.1                     | 0.002917                | 2.5            |

**Band 66 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 1745            | 8.1                  | 0.004663             | 2.5         |
| 4.0           | 1745            | 7.9                  | 0.004551             | 2.5         |
| 4.4           | 1745            | 9.3                  | 0.005338             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 1745            | 8.4                  | 0.004791             | 2.5         |
| Extreme (50C)    | 1745            | 8.0                  | 0.004589             | 2.5         |
| Extreme (40C)    | 1745            | 9.0                  | 0.005142             | 2.5         |
| Extreme (30C)    | 1745            | 8.5                  | 0.004851             | 2.5         |
| Extreme (10C)    | 1745            | 8.7                  | 0.004973             | 2.5         |
| Extreme (0C)     | 1745            | 6.6                  | 0.003802             | 2.5         |
| Extreme (-10C)   | 1745            | 8.4                  | 0.004821             | 2.5         |
| Extreme (-20C)   | 1745            | 8.4                  | 0.004816             | 2.5         |
| Extreme (-30C)   | 1745            | 5.4                  | 0.003111             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

# 10.15 LTE BAND 71

## Band 71 QPSK, (20MHz BANDWIDTH RB size 100 RB Offset 0)

### Frequency error vs. Voltage

| Voltage<br>[Vdc] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|------------------|--------------------|-------------------------|-------------------------|----------------|
| 3.5              | 1745               | 6.7                     | 0.003832                | 2.5            |
| 4.0              | 1745               | 6.6                     | 0.003759                | 2.5            |
| 4.4              | 1745               | 7.7                     | 0.004412                | 2.5            |

### Frequency error vs. Temperature

| Temperature<br>[°C] | Frequency<br>[MHz] | Frequency*<br>Error[Hz] | Frequency<br>Error[ppm] | Limit<br>[ppm] |
|---------------------|--------------------|-------------------------|-------------------------|----------------|
| Normal (25C)        | 1745               | 5.9                     | 0.003392                | 2.5            |
| Extreme (50C)       | 1745               | 7.6                     | 0.004328                | 2.5            |
| Extreme (40C)       | 1745               | 6.0                     | 0.003452                | 2.5            |
| Extreme (30C)       | 1745               | 7.3                     | 0.004165                | 2.5            |
| Extreme (10C)       | 1745               | 7.0                     | 0.004015                | 2.5            |
| Extreme (0C)        | 1745               | 6.7                     | 0.003855                | 2.5            |
| Extreme (-10C)      | 1745               | 5.7                     | 0.003276                | 2.5            |
| Extreme (-20C)      | 1745               | 7.0                     | 0.003990                | 2.5            |
| Extreme (-30C)      | 1745               | 6.0                     | 0.003426                | 2.5            |

**Band 71 16QAM, (20MHz BANDWIDTH RB size 100 RB Offset 0)**

**Frequency error vs. Voltage**

| Voltage [Vdc] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|---------------|-----------------|----------------------|----------------------|-------------|
| 3.5           | 1745            | 8.6                  | 0.004906             | 2.5         |
| 4.0           | 1745            | 7.8                  | 0.004494             | 2.5         |
| 4.4           | 1745            | 10.0                 | 0.005717             | 2.5         |

**Frequency error vs. Temperature**

| Temperature [°C] | Frequency [MHz] | Frequency* Error[Hz] | Frequency Error[ppm] | Limit [ppm] |
|------------------|-----------------|----------------------|----------------------|-------------|
| Normal (25C)     | 1745            | 8.9                  | 0.005083             | 2.5         |
| Extreme (50C)    | 1745            | 7.9                  | 0.004550             | 2.5         |
| Extreme (40C)    | 1745            | 8.0                  | 0.004600             | 2.5         |
| Extreme (30C)    | 1745            | 8.4                  | 0.004839             | 2.5         |
| Extreme (10C)    | 1745            | 8.5                  | 0.004894             | 2.5         |
| Extreme (0C)     | 1745            | 6.3                  | 0.003600             | 2.5         |
| Extreme (-10C)   | 1745            | 8.7                  | 0.004959             | 2.5         |
| Extreme (-20C)   | 1745            | 8.2                  | 0.004722             | 2.5         |
| Extreme (-30C)   | 1745            | 5.1                  | 0.002934             | 2.5         |

**\*Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

## 11. Peak-to-Average Ratio

### 11.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

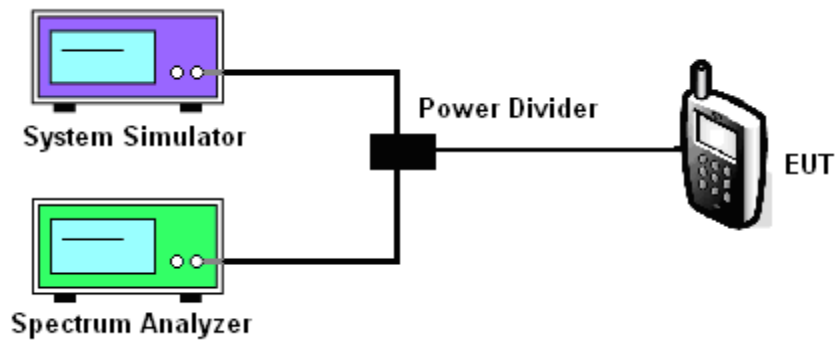
### 11.2 Measuring Instruments

See list of measuring instruments of this test report.

### 11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For LTE operating modes:
  - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
  - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

#### 11.4 Test Setup



#### MODES TESTED

LTE Band 2/4/5/7/12/13/14/17/25/26/38/41/66/71

Test data reference attachment.

-----END OF REPORT-----