



# TEST REPORT

No. I17N00063-LTE

for

**Power Idea Technology (Shenzhen) Co., Ltd.**

**TD-LTE digital mobile phone**

**Model Name: MD501**

**FCC ID: ZLE-MD501**

with

**Hardware Version: 1.04**

**Software Version: MD501\_US\_1.003.00\_20170103**

**Issued Date: 2017-03-06**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

**Test Laboratory:**

**FCC 2.948 Listed: No. 342690**

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## **REPORT HISTORY**

| <b>Report Number</b> | <b>Revision</b> | <b>Description</b> | <b>Issue Date</b> |
|----------------------|-----------------|--------------------|-------------------|
| I17N00063-LTE        | Rev.0           | 1st edition        | 2017-03-06        |



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## **1. Test Laboratory**

### **1.1. Testing Location**

Company Name: CTTL ShenZhen, Telecommunication Technology Labs, Academy of  
Telecommunication Research, MIIT  
Address: TCL International E city No. 1001 Zhongshanyuan Road, Nanshan  
District, Shenzhen, Guangdong, China  
Postal Code: 518048  
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### **1.2. Testing Environment**

Normal Temperature: 15-35°C  
Relative Humidity: 20-75%  
Air pressure 980 - 1040 hPa

The climatic requirements above are general exclude the special requirements for dedicated test environments listed in section 5 and some specific test cases in other parts of this report.

### **1.3. Project data**

Testing Start Date: 2017-01-18  
Testing End Date: 2017-02-28

### **1.4. Signature**

Lai Minghua

(Prepared this test report)

Yang Zi'an

(Reviewed this test report)

Zhang Bojun

Deputy Director of the laboratory  
(Approved this test report)



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: Power Idea Technology (Shenzhen) Co., Ltd.  
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### **2.2. Manufacturer Information**

Company Name: Power Idea Technology (Shenzhen) Co., Ltd.  
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P.R.C.  
Contact Person: alex.ma  
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Fax: /

### **3. Equipment Under Test (EUT) and Ancillary Equipment (AE)**

#### **3.1. About EUT**

|                         |                                               |
|-------------------------|-----------------------------------------------|
| Description             | TD-LTE digital mobile phone                   |
| Model Name              | MD501                                         |
| FCC ID                  | ZLE-MD501                                     |
| Antenna                 | Integrated                                    |
| Output power            | 26.43dBm maximum EIRP measured for LTE Band 7 |
| Extreme vol. Limits     | 3.6VDC to 4.35VDC (nominal: 3.8VDC)           |
| Extreme temp. Tolerance | -30°C to +50°C                                |

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

#### **3.2. Internal Identification of EUT used during the test**

| EUT ID* | IMEI            | HW Version | SW Version                     | Sample Arrival Date |
|---------|-----------------|------------|--------------------------------|---------------------|
| S01     | 867453021949642 | 1.04       | MD501_US_1.003.00<br>_20170103 | 2017-01-18          |

\*EUT ID: is used to identify the test sample in the lab internally.

#### **3.3. Internal Identification of AE used during the test**

##### **AE ID\*    Description**

|     |         |
|-----|---------|
| AE1 | Battery |
| AE2 | Charger |

##### **AE1**

|              |                                            |
|--------------|--------------------------------------------|
| Model        | Li-ion Rechargeable Battery                |
| Manufacturer | Springpower Technology (Shenzhen) Co., LTD |
| Capacitance  | 3950mAh                                    |

##### **AE2**

|              |                                    |
|--------------|------------------------------------|
| Model        | HKC0055010-2D                      |
| Manufacturer | SHENZHEN HUNTKEY ELECTRIC CO., LTD |

\*AE ID: is used to identify the test sample in the lab internally.

#### **3.4. General Description**

The Equipment Under Test (EUT) is a model TD-LTE mobile phone with integrated antenna. It consists of normal options: lithium battery, charger. Manual and specifications of the EUT were provided to fulfil the test.



## **4. Reference Documents**

### **4.1. Reference Documents for testing**

The following documents listed in this section are referred for testing.

| <b>Reference</b> | <b>Title</b>                                                                                                                         | <b>Version</b>     |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| FCC Part 22      | PUBLIC MOBILE SERVICES                                                                                                               | 10-1-15<br>Edition |
| FCC Part 24      | PERSONAL COMMUNICATIONS SERVICES                                                                                                     | 10-1-15<br>Edition |
| FCC Part 2       | FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS                                                        | 10-1-15<br>Edition |
| FCC Part 27      | MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES                                                                                       | 10-1-15<br>Edition |
| FCC Part 90      | PRIVATE LAND MOBILE RADIO SERVICES                                                                                                   | 10-1-15<br>Edition |
| ANSI/TIA-603-D   | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards                                                  | 2010               |
| ANSI C63.4       | Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | 2014               |
| KDB 971168 D01   | Power Meas License Digital Systems                                                                                                   | v02r02             |

## 5. LABORATORY ENVIRONMENT

**Control room / conducted chamber** did not exceed following limits along the EMC testing:

|                          |                            |
|--------------------------|----------------------------|
| Temperature              | Min. = 15 °C, Max. = 35 °C |
| Relative humidity        | Min. = 20 %, Max. = 80 %   |
| Shielding effectiveness  | > 110 dB                   |
| Electrical insulation    | > 2 MΩ                     |
| Ground system resistance | < 0.5 Ω                    |

**Fully-anechoic chamber 2** (8.6 meters×6.1 meters×3.85 meters) did not exceed following limits along the EMC testing:

|                                                 |                                         |
|-------------------------------------------------|-----------------------------------------|
| Temperature                                     | Min. = 15 °C, Max. = 30 °C              |
| Relative humidity                               | Min. = 35 %, Max. = 60 %                |
| Shielding effectiveness                         | > 110 dB                                |
| Electrical insulation                           | > 2 MΩ                                  |
| Ground system resistance                        | < 1 Ω                                   |
| Site voltage standing-wave ratio ( $S_{VSWR}$ ) | Between 0 and 6 dB, from 1GHz to 18GHz  |
| Uniformity of field strength                    | Between 0 and 6 dB, from 80 to 4000 MHz |

**Semi-anechoic chamber 2 / Fully-anechoic chamber 3** (10 meters×6.7 meters×6.15 meters) did not exceed following limits along the EMC testing:

|                                                 |                                         |
|-------------------------------------------------|-----------------------------------------|
| Temperature                                     | Min. = 15 °C, Max. = 30 °C              |
| Relative humidity                               | Min. = 35 %, Max. = 60 %                |
| Shielding effectiveness                         | > 100 dB                                |
| Electrical insulation                           | > 2 MΩ                                  |
| Ground system resistance                        | < 0.5 Ω                                 |
| Normalised site attenuation (NSA)               | < ±3.5 dB, 3 m distance                 |
| Site voltage standing-wave ratio ( $S_{VSWR}$ ) | Between 0 and 6 dB, from 1GHz to 18GHz  |
| Uniformity of field strength                    | Between 0 and 6 dB, from 80 to 3000 MHz |

## 6. SUMMARY OF TEST RESULTS

### 6.1. Summary of test results

| Abbreviations used in this clause: |         |                                                                                                       |
|------------------------------------|---------|-------------------------------------------------------------------------------------------------------|
| Verdict Column                     | P       | Pass                                                                                                  |
|                                    | F       | Fail                                                                                                  |
|                                    | NA      | Not applicable                                                                                        |
|                                    | NM      | Not measured                                                                                          |
| Location Column                    | A/B/C/D | The test is performed in test location A, B, C or D which are described in section 1.1 of this report |

#### LTE Band 2

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 24.232(c)           | A.1                    | P       |
| 2     | Emission Limit              | 24.238(a), 2.1051   | A.2                    | P       |
| 3     | Frequency Stability         | 24.235, 2.1055      | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)        | A.4                    | P       |
| 5     | Emission Bandwidth          | 24.238(a)           | A.5                    | P       |
| 6     | Band Edge Compliance        | 24.238(a)           | A.6                    | P       |
| 7     | Conducted Spurious Emission | 24.238, 2.1057      | A.7                    | P       |
| 8     | Peak to Average Power Ratio | 24.232 (d)          | A.8                    | P       |

#### LTE Band 4

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 27.50(d)(4)         | A.1                    | P       |
| 2     | Emission Limit              | 27.53(h), 2.1051    | A.2                    | P       |
| 3     | Frequency Stability         | 27.54, 2.1055       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)        | A.4                    | P       |
| 5     | Emission Bandwidth          | 27.53(h)            | A.5                    | P       |
| 6     | Band Edge Compliance        | 27.53(h)            | A.6                    | P       |
| 7     | Conducted Spurious Emission | 27.53(h), 2.1057    | A.7                    | P       |
| 8     | Peak to Average Power Ratio | 27.50(a)            | A.8                    | P       |

**LTE Band 5**

| Items | Test Name                   | Clause in FCC rules  | Section in this report | Verdict |
|-------|-----------------------------|----------------------|------------------------|---------|
| 1     | Output Power                | 2.1046(a), 22.913(a) | A.1                    | P       |
| 2     | Emission Limit              | 22.917, 2.1051       | A.2                    | P       |
| 3     | Frequency Stability         | 22.235, 2.1055       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)         | A.4                    | P       |
| 5     | Emission Bandwidth          | 22.917(b)            | A.5                    | P       |
| 6     | Band Edge Compliance        | 22.917(b)            | A.6                    | P       |
| 7     | Conducted Spurious Emission | 22.917, 2.1057       | A.7                    | P       |

**LTE Band 7**

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 27.50(h)(2)         | A.1                    | P       |
| 2     | Emission Limit              | 27.53(m), 2.1051    | A.2                    | P       |
| 3     | Frequency Stability         | 27.54, 2.1055       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)        | A.4                    | P       |
| 5     | Emission Bandwidth          | 27.53(m)            | A.5                    | P       |
| 6     | Band Edge Compliance        | 27.53(m)            | A.6                    | P       |
| 7     | Conducted Spurious Emission | 27.53(m), 2.1057    | A.7                    | P       |
| 8     | Peak to Average Power Ratio | 27.50(a)            | A.8                    | P       |

**LTE Band 12**

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 27.50(c)(10)        | A.1                    | P       |
| 2     | Emission Limit              | 27.53(g), 2.1051    | A.2                    | P       |
| 3     | Frequency Stability         | 27.54, 2.1055       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)        | A.4                    | P       |
| 5     | Emission Bandwidth          | 27.53(g)            | A.5                    | P       |
| 6     | Band Edge Compliance        | 27.53(g)            | A.6                    | P       |
| 7     | Conducted Spurious Emission | 27.53(g), 2.1057    | A.7                    | P       |
| 8     | Peak to Average Power Ratio | 27.50(a)            | A.8                    | P       |



**LTE Band 13**

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 27.50(b)(10)        | A.1                    | P       |
| 2     | Emission Limit              | 27.53(f), 2.1051    | A.2                    | P       |
| 3     | Frequency Stability         | 27.54, 2.1055       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)        | A.4                    | P       |
| 5     | Emission Bandwidth          | 27.53(f)            | A.5                    | P       |
| 6     | Band Edge Compliance        | 27.53(f)            | A.6                    | P       |
| 7     | Conducted Spurious Emission | 27.53(f), 2.1057    | A.7                    | P       |
| 8     | Peak to Average Power Ratio | 27.50(a)            | A.8                    | P       |

**LTE Band 17**

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 27.50(c)(10)        | A.1                    | P       |
| 2     | Emission Limit              | 27.53(g), 2.1051    | A.2                    | P       |
| 3     | Frequency Stability         | 27.54, 2.1055       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)        | A.4                    | P       |
| 5     | Emission Bandwidth          | 27.53(g)            | A.5                    | P       |
| 6     | Band Edge Compliance        | 27.53(g)            | A.6                    | P       |
| 7     | Conducted Spurious Emission | 27.53(g), 2.1057    | A.7                    | P       |
| 8     | Peak to Average Power Ratio | 27.50(a)            | A.8                    | P       |

**LTE Band 25**

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 24.232(c)           | A.1                    | P       |
| 2     | Emission Limit              | 24.238(a), 2.1051   | A.2                    | P       |
| 3     | Frequency Stability         | 24.235, 2.1055      | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)        | A.4                    | P       |
| 5     | Emission Bandwidth          | 24.238(a)           | A.5                    | P       |
| 6     | Band Edge Compliance        | 24.238(a)           | A.6                    | P       |
| 7     | Conducted Spurious Emission | 24.238, 2.1057      | A.7                    | P       |
| 8     | Peak to Average Power Ratio | 24.232 (d)          | A.8                    | P       |



**LTE Band 26**

| Items | Test Name                   | Clause in FCC rules     | Section in this report | Verdict |
|-------|-----------------------------|-------------------------|------------------------|---------|
| 1     | Output Power                | 2.1046(a),<br>22.913(a) | A.1                    | P       |
| 2     | Emission Limit              | 22.917,<br>2.1051       | A.2                    | P       |
| 3     | Frequency Stability         | 22.235,<br>2.1055       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)            | A.4                    | P       |
| 5     | Emission Bandwidth          | 22.917(b)               | A.5                    | P       |
| 6     | Band Edge Compliance        | 22.917(b)               | A.6                    | P       |
| 7     | Conducted Spurious Emission | 22.917,<br>2.1057       | A.7                    | P       |

**LTE Band 38**

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 27.50(h)(2)         | A.1                    | P       |
| 2     | Emission Limit              | 27.53(m),<br>2.1051 | A.2                    | P       |
| 3     | Frequency Stability         | 27.54, 2.1055       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049(h)(i)        | A.4                    | P       |
| 5     | Emission Bandwidth          | 27.53(m)            | A.5                    | P       |
| 6     | Band Edge Compliance        | 27.53(m)            | A.6                    | P       |
| 7     | Conducted Spurious Emission | 27.53(m),<br>2.1057 | A.7                    | P       |
| 8     | Peak to Average Power Ratio | 27.50(a)            | A.8                    | P       |

## **6.2. Statements**

The test cases listed in section 6.1 of this report for the EUT specified in section 3 were performed by CTTL according to the standards or reference documents in section 4.1

The EUT met all applicable requirements of the standards or reference documents in section 4.1.

This report only deals with the LTE functions among the features described in section 3.

## 7. Test Equipments Utilized

| NO. | Description                          | TYPE      | Manufacture          | series number | CAL DUE DATE |
|-----|--------------------------------------|-----------|----------------------|---------------|--------------|
| 1   | Test Receiver                        | ESR7      | R&S                  | 101675        | 2017-07-21   |
| 2   | BiLog Antenna                        | VULB9163  | Schwarzbeck          | 9163330       | 2017-04-22   |
| 3   | Horn Antenna                         | 3117      | ETS-Lindgren         | 00066585      | 2019-03-05   |
| 4   | Antenna                              | SBA 9113  | 814                  | Schwarzbeck   | /            |
| 5   | Antenna                              | SBA 9112  | 302                  | Schwarzbeck   | /            |
| 6   | Antenna                              | 3160-09   | LM4750/00118388      | ETS-Lindgren  | 2018.07.14   |
| 7   | preamplifier                         | 83017A    | MY39501110           | Agilent       | /            |
| 8   | Signal Generator                     | SMR40     | R&S                  | 100541        | 2017-06-27   |
| 9   | Fully Anechoic Chamber               | FACT5-2.0 | ETS-Lindgren         | 4166          | 2018-05-13   |
| 10  | Spectrum Analyzer                    | FSP40     | R&S                  | 100378        | 2017-12-15   |
| 11  | Universal Radio Communication Tester | CMU200    | R&S                  | 114544        | 2017-09-09   |
| 12  | Universal Radio Communication Tester | CMW500    | R&S                  | 158344        | 2017-07-21   |
| 13  | Universal Radio Communication Tester | CMU200    | R&S                  | 123210        | 2017-12-25   |
| 14  | Spectrum Analyzer                    | FSU       | R&S                  | 200679        | 2017-12-25   |
| 15  | Temperature Chamber                  | SH-241    | ESPECs               | 92007516      | 2017-11-29   |
| 16  | DC Power Supply                      | U3606A    | Agilent Technologies | MY50450012    | 2017-11-22   |

### Test software

| Item     | Name  | Vesion           |
|----------|-------|------------------|
| Radiated | EMC32 | Version 10.01.00 |

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 OUTPUT POWER**

#### **Reference**

FCC: 22.913(a), 24.232(c), 27.50(h)(2).

#### **A.1.1 Summary**

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMW500) to ensure max power transmission and proper modulation.

This result contains peak output power and ERP/EIRP measurements for the EUT.

In all cases, output power is within the specified limits.

#### **A.1.2 Conducted**

##### **A.1.2.1 Method of Measurements**

The EUT was set up for the max output power with pseudo random data modulation.

These measurements were done at 3 frequencies (bottom, middle and top of operational frequency range) for each bandwidth.

##### **A.1.2.2 Measurement result**

#### **LTE band 2**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 1.4MHz    | 1 RB high      | 1909.3          | 22.53      | 21.81 |
|           |                | 1880.0          | 22.22      | 21.51 |
|           |                | 1850.7          | 22.48      | 21.65 |
|           | 1 RB low       | 1909.3          | 22.53      | 21.84 |
|           |                | 1880.0          | 22.20      | 21.51 |
|           |                | 1850.7          | 22.42      | 21.62 |
|           | 50% RB mid     | 1909.3          | 22.59      | 21.63 |
|           |                | 1880.0          | 22.25      | 21.26 |
|           |                | 1850.7          | 22.40      | 21.48 |
|           | 100% RB        | 1909.3          | 21.67      | 20.75 |
|           |                | 1880.0          | 21.26      | 20.40 |
|           |                | 1850.7          | 21.58      | 20.65 |
| 3MHz      | 1 RB high      | 1908.5          | 22.51      | 21.82 |
|           |                | 1880.0          | 22.17      | 21.46 |
|           |                | 1851.5          | 22.50      | 21.65 |
|           | 1 RB low       | 1908.5          | 22.51      | 21.84 |
|           |                | 1880.0          | 22.19      | 21.48 |
|           |                | 1851.5          | 22.46      | 21.60 |
|           | 50% RB mid     | 1908.5          | 21.64      | 20.74 |
|           |                | 1880.0          | 21.25      | 20.38 |
|           |                | 1851.5          | 21.59      | 20.61 |

|       |            |        |       |       |
|-------|------------|--------|-------|-------|
|       | 100% RB    | 1908.5 | 21.65 | 20.69 |
|       |            | 1880.0 | 21.25 | 20.33 |
|       |            | 1851.5 | 21.62 | 20.61 |
| 5MHz  | 1 RB high  | 1907.5 | 22.55 | 21.87 |
|       |            | 1880.0 | 22.23 | 21.54 |
|       |            | 1852.5 | 22.53 | 21.72 |
|       | 1 RB low   | 1907.5 | 22.54 | 21.82 |
|       |            | 1880.0 | 22.27 | 21.58 |
|       |            | 1852.5 | 22.56 | 21.70 |
|       | 50% RB mid | 1907.5 | 21.29 | 20.39 |
|       |            | 1880.0 | 21.29 | 20.38 |
|       |            | 1852.5 | 21.43 | 20.59 |
|       | 100% RB    | 1907.5 | 21.35 | 20.46 |
|       |            | 1880.0 | 21.24 | 20.30 |
|       |            | 1852.5 | 21.48 | 20.58 |
| 10MHz | 1 RB high  | 1905.0 | 22.32 | 21.56 |
|       |            | 1880.0 | 22.21 | 21.52 |
|       |            | 1855.0 | 22.27 | 21.60 |
|       | 1 RB low   | 1905.0 | 21.82 | 21.13 |
|       |            | 1880.0 | 22.29 | 21.61 |
|       |            | 1855.0 | 22.06 | 21.37 |
|       | 50% RB mid | 1905.0 | 21.00 | 20.30 |
|       |            | 1880.0 | 21.24 | 20.30 |
|       |            | 1855.0 | 21.53 | 20.57 |
|       | 100% RB    | 1905.0 | 21.10 | 20.38 |
|       |            | 1880.0 | 21.27 | 20.34 |
|       |            | 1855.0 | 21.53 | 20.60 |
| 15MHz | 1 RB high  | 1902.5 | 22.24 | 21.41 |
|       |            | 1880.0 | 22.29 | 21.62 |
|       |            | 1857.5 | 22.58 | 21.81 |
|       | 1 RB low   | 1902.5 | 22.41 | 21.71 |
|       |            | 1880.0 | 22.34 | 21.66 |
|       |            | 1857.5 | 22.41 | 21.69 |
|       | 50% RB mid | 1902.5 | 22.39 | 21.34 |
|       |            | 1880.0 | 22.36 | 21.38 |
|       |            | 1857.5 | 22.57 | 21.58 |
|       | 100% RB    | 1902.5 | 21.34 | 20.39 |
|       |            | 1880.0 | 21.30 | 20.37 |
|       |            | 1857.5 | 21.62 | 20.64 |
| 20MHz | 1 RB high  | 1900.0 | 22.50 | 21.88 |



|  |            |        |       |       |
|--|------------|--------|-------|-------|
|  |            | 1880.0 | 22.22 | 21.51 |
|  |            | 1860.0 | 22.26 | 21.56 |
|  | 1 RB low   | 1900.0 | 22.32 | 21.63 |
|  |            | 1880.0 | 22.35 | 21.64 |
|  |            | 1860.0 | 22.64 | 21.76 |
|  | 50% RB mid | 1900.0 | 21.44 | 20.44 |
|  |            | 1880.0 | 21.21 | 20.30 |
|  |            | 1860.0 | 21.49 | 20.55 |
|  | 100% RB    | 1900.0 | 21.43 | 20.50 |
|  |            | 1880.0 | 21.23 | 20.30 |
|  |            | 1860.0 | 21.48 | 20.52 |

**LTE band 4**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 1.4MHz    | 1 RB high      | 1754.3          | 21.96      | 21.24 |
|           |                | 1732.5          | 22.52      | 21.69 |
|           |                | 1710.7          | 22.74      | 21.87 |
|           | 1 RB low       | 1754.3          | 21.99      | 21.33 |
|           |                | 1732.5          | 22.54      | 21.70 |
|           |                | 1710.7          | 22.74      | 21.85 |
|           | 50% RB mid     | 1754.3          | 21.86      | 21.01 |
|           |                | 1732.5          | 22.60      | 21.56 |
|           |                | 1710.7          | 22.81      | 21.70 |
|           | 100% RB        | 1754.3          | 21.05      | 20.30 |
|           |                | 1732.5          | 21.61      | 20.64 |
|           |                | 1710.7          | 21.81      | 20.82 |
| 3MHz      | 1 RB high      | 1753.5          | 21.93      | 21.22 |
|           |                | 1732.5          | 22.48      | 21.65 |
|           |                | 1711.5          | 22.68      | 21.80 |
|           | 1 RB low       | 1753.5          | 22.18      | 21.54 |
|           |                | 1732.5          | 22.51      | 21.68 |
|           |                | 1711.5          | 22.71      | 21.83 |
|           | 50% RB mid     | 1753.5          | 21.17      | 20.35 |
|           |                | 1732.5          | 21.60      | 20.62 |
|           |                | 1711.5          | 21.81      | 20.80 |
|           | 100% RB        | 1753.5          | 21.18      | 20.35 |
|           |                | 1732.5          | 21.60      | 20.58 |
|           |                | 1711.5          | 21.81      | 20.77 |
| 5MHz      | 1 RB high      | 1752.5          | 21.87      | 21.18 |
|           |                | 1732.5          | 22.53      | 21.73 |
|           |                | 1712.5          | 22.75      | 21.87 |
|           | 1 RB low       | 1752.5          | 22.55      | 21.72 |
|           |                | 1732.5          | 22.52      | 21.76 |
|           |                | 1712.5          | 22.79      | 21.91 |
|           | 50% RB mid     | 1752.5          | 21.00      | 20.19 |
|           |                | 1732.5          | 21.61      | 20.61 |
|           |                | 1712.5          | 21.83      | 20.78 |
|           | 100% RB        | 1752.5          | 21.08      | 20.36 |
|           |                | 1732.5          | 21.58      | 20.56 |
|           |                | 1712.5          | 21.79      | 20.74 |
| 10MHz     | 1 RB high      | 1750.0          | 21.41      | 20.72 |
|           |                | 1732.5          | 22.55      | 21.72 |

|       |            |        |       |       |
|-------|------------|--------|-------|-------|
|       | 1 RB low   | 1715.0 | 21.91 | 21.32 |
|       |            | 1750.0 | 22.69 | 21.84 |
|       |            | 1732.5 | 21.82 | 21.24 |
|       |            | 1715.0 | 22.84 | 21.95 |
|       | 50% RB mid | 1750.0 | 21.53 | 20.57 |
|       |            | 1732.5 | 21.61 | 20.58 |
|       |            | 1715.0 | 21.80 | 20.75 |
|       | 100% RB    | 1750.0 | 21.61 | 20.61 |
|       |            | 1732.5 | 21.60 | 20.59 |
|       |            | 1715.0 | 21.80 | 20.76 |
| 15MHz | 1 RB high  | 1747.5 | 22.68 | 21.83 |
|       |            | 1732.5 | 22.30 | 21.65 |
|       |            | 1717.5 | 22.81 | 21.91 |
|       | 1 RB low   | 1747.5 | 22.68 | 21.84 |
|       |            | 1732.5 | 22.02 | 21.40 |
|       |            | 1717.5 | 22.86 | 21.95 |
|       | 50% RB mid | 1747.5 | 22.75 | 21.64 |
|       |            | 1732.5 | 22.06 | 21.22 |
|       |            | 1717.5 | 22.89 | 21.77 |
|       | 100% RB    | 1747.5 | 21.69 | 20.65 |
|       |            | 1732.5 | 21.20 | 20.42 |
|       |            | 1717.5 | 21.84 | 20.78 |
| 20MHz | 1 RB high  | 1745.0 | 21.88 | 20.99 |
|       |            | 1732.5 | 22.60 | 21.74 |
|       |            | 1720.0 | 21.97 | 21.32 |
|       | 1 RB low   | 1745.0 | 22.63 | 21.82 |
|       |            | 1732.5 | 22.30 | 21.61 |
|       |            | 1720.0 | 22.86 | 21.96 |
|       | 50% RB mid | 1745.0 | 21.66 | 20.64 |
|       |            | 1732.5 | 21.62 | 20.61 |
|       |            | 1720.0 | 21.55 | 20.73 |
|       | 100% RB    | 1745.0 | 21.62 | 20.59 |
|       |            | 1732.5 | 21.61 | 20.58 |
|       |            | 1720.0 | 21.77 | 20.74 |

**LTE band 5**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 1.4MHz    | 1 RB high      | 848.3           | 22.17      | 21.52 |
|           |                | 836.5           | 22.47      | 21.88 |
|           |                | 824.7           | 22.50      | 21.81 |
|           | 1 RB low       | 848.3           | 22.14      | 21.46 |
|           |                | 836.5           | 22.48      | 21.90 |
|           |                | 824.7           | 22.49      | 21.76 |
|           | 50% RB mid     | 848.3           | 22.20      | 21.27 |
|           |                | 836.5           | 22.52      | 21.66 |
|           |                | 824.7           | 22.54      | 21.58 |
|           | 100% RB        | 848.3           | 21.28      | 20.40 |
|           |                | 836.5           | 21.59      | 20.73 |
|           |                | 824.7           | 21.59      | 20.67 |
| 3MHz      | 1 RB high      | 847.5           | 22.14      | 21.51 |
|           |                | 836.5           | 22.43      | 21.85 |
|           |                | 825.5           | 22.49      | 21.77 |
|           | 1 RB low       | 847.5           | 22.11      | 21.39 |
|           |                | 836.5           | 22.47      | 21.89 |
|           |                | 825.5           | 22.47      | 21.76 |
|           | 50% RB mid     | 847.5           | 21.27      | 20.38 |
|           |                | 836.5           | 21.65      | 20.76 |
|           |                | 825.5           | 21.62      | 20.69 |
|           | 100% RB        | 847.5           | 21.24      | 20.34 |
|           |                | 836.5           | 21.63      | 20.70 |
|           |                | 825.5           | 21.61      | 20.64 |
| 5MHz      | 1 RB high      | 846.5           | 22.19      | 21.57 |
|           |                | 836.5           | 22.47      | 21.87 |
|           |                | 826.5           | 22.56      | 21.89 |
|           | 1 RB low       | 846.5           | 22.30      | 21.61 |
|           |                | 836.5           | 22.54      | 21.94 |
|           |                | 826.5           | 22.56      | 21.81 |
|           | 50% RB mid     | 846.5           | 21.33      | 20.36 |
|           |                | 836.5           | 21.65      | 20.73 |
|           |                | 826.5           | 21.66      | 20.68 |
|           | 100% RB        | 846.5           | 21.27      | 20.30 |
|           |                | 836.5           | 21.58      | 20.65 |
|           |                | 826.5           | 21.62      | 20.64 |
| 10MHz     | 1 RB high      | 844.0           | 22.23      | 21.62 |
|           |                | 836.5           | 22.48      | 21.84 |



|  |            |       |       |       |
|--|------------|-------|-------|-------|
|  | 1 RB low   | 829.0 | 22.59 | 21.99 |
|  |            | 844.0 | 22.50 | 21.90 |
|  |            | 836.5 | 22.59 | 21.94 |
|  |            | 829.0 | 22.56 | 21.87 |
|  | 50% RB mid | 844.0 | 21.42 | 20.43 |
|  |            | 836.5 | 21.59 | 20.66 |
|  |            | 829.0 | 21.66 | 20.68 |
|  | 100% RB    | 844.0 | 21.43 | 20.46 |
|  |            | 836.5 | 21.59 | 20.64 |
|  |            | 829.0 | 21.68 | 20.69 |

**LTE band 7**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 5MHz      | 1 RB high      | 2567.5          | 21.30      | 20.50 |
|           |                | 2535.0          | 22.93      | 22.12 |
|           |                | 2502.5          | 22.71      | 21.88 |
|           | 1 RB low       | 2567.5          | 22.07      | 21.34 |
|           |                | 2535.0          | 22.91      | 22.09 |
|           |                | 2502.5          | 22.81      | 21.96 |
|           | 50% RB mid     | 2567.5          | 20.42      | 20.46 |
|           |                | 2535.0          | 22.05      | 21.04 |
|           |                | 2502.5          | 21.83      | 20.85 |
|           | 100% RB        | 2567.5          | 20.48      | 20.38 |
|           |                | 2535.0          | 22.02      | 20.99 |
|           |                | 2502.5          | 21.87      | 20.83 |
| 10MHz     | 1 RB high      | 2565.0          | 21.10      | 20.36 |
|           |                | 2535.0          | 22.89      | 22.11 |
|           |                | 2505.0          | 22.74      | 21.99 |
|           | 1 RB low       | 2565.0          | 22.53      | 21.72 |
|           |                | 2535.0          | 22.95      | 22.14 |
|           |                | 2505.0          | 22.70      | 21.98 |
|           | 50% RB mid     | 2565.0          | 21.12      | 20.33 |
|           |                | 2535.0          | 22.08      | 21.04 |
|           |                | 2505.0          | 21.92      | 20.86 |
|           | 100% RB        | 2565.0          | 21.12      | 20.36 |
|           |                | 2535.0          | 22.12      | 21.08 |
|           |                | 2505.0          | 21.95      | 20.90 |
| 15MHz     | 1 RB high      | 2562.5          | 22.97      | 22.12 |
|           |                | 2535.0          | 23.09      | 22.28 |
|           |                | 2507.5          | 22.93      | 22.10 |
|           | 1 RB low       | 2562.5          | 23.07      | 22.23 |
|           |                | 2535.0          | 22.98      | 22.19 |
|           |                | 2507.5          | 22.94      | 22.07 |
|           | 50% RB mid     | 2562.5          | 23.05      | 22.01 |
|           |                | 2535.0          | 23.08      | 22.03 |
|           |                | 2507.5          | 22.98      | 21.90 |
|           | 100% RB        | 2562.5          | 22.09      | 21.07 |
|           |                | 2535.0          | 22.11      | 21.05 |
|           |                | 2507.5          | 22.04      | 20.95 |
| 20MHz     | 1 RB high      | 2560.0          | 22.86      | 21.47 |



|  |            |        |       |       |
|--|------------|--------|-------|-------|
|  |            | 2535.0 | 23.32 | 22.54 |
|  |            | 2510.0 | 23.05 | 22.29 |
|  | 1 RB low   | 2560.0 | 23.22 | 22.45 |
|  |            | 2535.0 | 23.04 | 22.25 |
|  |            | 2510.0 | 23.07 | 22.18 |
|  | 50% RB mid | 2560.0 | 22.19 | 21.18 |
|  |            | 2535.0 | 22.25 | 21.21 |
|  |            | 2510.0 | 22.09 | 21.01 |
|  | 100% RB    | 2560.0 | 22.18 | 21.15 |
|  |            | 2535.0 | 22.23 | 21.19 |
|  |            | 2510.0 | 22.09 | 21.02 |

**LTE band 12**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 1.4MHz    | 1 RB high      | 715.3           | 22.66      | 22.00 |
|           |                | 707.5           | 22.49      | 21.86 |
|           |                | 699.7           | 22.81      | 22.16 |
|           | 1 RB low       | 715.3           | 22.63      | 21.95 |
|           |                | 707.5           | 22.48      | 21.85 |
|           |                | 699.7           | 22.78      | 22.14 |
|           | 50% RB mid     | 715.3           | 22.72      | 21.79 |
|           |                | 707.5           | 22.54      | 21.66 |
|           |                | 699.7           | 22.84      | 21.94 |
|           | 100% RB        | 715.3           | 21.80      | 20.91 |
|           |                | 707.5           | 21.61      | 20.71 |
|           |                | 699.7           | 21.93      | 21.03 |
| 3MHz      | 1 RB high      | 714.5           | 22.64      | 21.99 |
|           |                | 707.5           | 22.47      | 21.87 |
|           |                | 700.5           | 23.20      | 22.52 |
|           | 1 RB low       | 714.5           | 22.78      | 22.10 |
|           |                | 707.5           | 22.46      | 21.86 |
|           |                | 700.5           | 22.75      | 22.12 |
|           | 50% RB mid     | 714.5           | 21.77      | 20.87 |
|           |                | 707.5           | 21.63      | 20.74 |
|           |                | 700.5           | 22.06      | 21.16 |
|           | 100% RB        | 714.5           | 21.80      | 20.84 |
|           |                | 707.5           | 21.60      | 20.65 |
|           |                | 700.5           | 22.08      | 21.11 |
| 5MHz      | 1 RB high      | 713.5           | 22.69      | 22.05 |
|           |                | 707.5           | 22.54      | 21.93 |
|           |                | 701.5           | 22.63      | 22.01 |
|           | 1 RB low       | 713.5           | 22.53      | 21.90 |
|           |                | 707.5           | 22.52      | 21.90 |
|           |                | 701.5           | 22.78      | 22.15 |
|           | 50% RB mid     | 713.5           | 21.91      | 20.95 |
|           |                | 707.5           | 21.66      | 20.70 |
|           |                | 701.5           | 21.99      | 21.20 |
|           | 100% RB        | 713.5           | 21.77      | 20.80 |
|           |                | 707.5           | 21.60      | 20.64 |
|           |                | 701.5           | 22.00      | 21.05 |
| 10MHz     | 1 RB high      | 711.0           | 22.69      | 22.08 |
|           |                | 707.5           | 22.68      | 22.03 |



|  |            |       |       |       |
|--|------------|-------|-------|-------|
|  |            | 704.0 | 22.62 | 21.97 |
|  | 1 RB low   | 711.0 | 22.52 | 21.90 |
|  |            | 707.5 | 22.62 | 21.96 |
|  |            | 704.0 | 22.78 | 22.15 |
|  | 50% RB mid | 711.0 | 21.74 | 20.73 |
|  |            | 707.5 | 21.63 | 20.64 |
|  |            | 704.0 | 21.78 | 20.85 |
|  | 100% RB    | 711.0 | 21.75 | 20.75 |
|  |            | 707.5 | 21.69 | 20.69 |
|  |            | 704.0 | 21.85 | 20.86 |
|  |            |       |       |       |
|  |            |       |       |       |

**LTE band 13**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 5MHz      | 1 RB high      | 784.5           | 22.50      | 21.81 |
|           |                | 782.0           | 22.30      | 21.66 |
|           |                | 779.5           | 22.24      | 21.49 |
|           | 1 RB low       | 784.5           | 22.29      | 21.59 |
|           |                | 782.0           | 22.26      | 21.62 |
|           |                | 779.5           | 22.34      | 21.53 |
|           | 50% RB mid     | 784.5           | 21.48      | 20.55 |
|           |                | 782.0           | 21.37      | 20.39 |
|           |                | 779.5           | 21.41      | 20.40 |
|           | 100% RB        | 784.5           | 21.48      | 20.56 |
|           |                | 782.0           | 21.36      | 20.38 |
|           |                | 779.5           | 21.35      | 20.33 |
| 10MHz     | 1 RB high      | 782.0           | 22.49      | 21.85 |
|           |                | 782.0           | 22.51      | 21.83 |
|           |                | 782.0           | 22.53      | 21.85 |
|           | 1 RB low       | 782.0           | 22.29      | 21.57 |
|           |                | 782.0           | 22.30      | 21.58 |
|           |                | 782.0           | 22.31      | 21.58 |
|           | 50% RB mid     | 782.0           | 21.33      | 20.37 |
|           |                | 782.0           | 21.33      | 20.38 |
|           |                | 782.0           | 21.34      | 20.38 |
|           | 100% RB        | 782.0           | 21.43      | 20.47 |
|           |                | 782.0           | 21.38      | 20.47 |
|           |                | 782.0           | 21.38      | 20.47 |

**LTE band 17**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 5MHz      | 1 RB high      | 713.5           | 22.54      | 21.92 |
|           |                | 710.0           | 22.45      | 21.81 |
|           |                | 706.5           | 22.39      | 21.77 |
|           | 1 RB low       | 713.5           | 22.42      | 21.82 |
|           |                | 710.0           | 22.38      | 21.77 |
|           |                | 706.5           | 22.47      | 21.86 |
|           | 50% RB mid     | 713.5           | 21.65      | 20.67 |
|           |                | 710.0           | 21.56      | 20.58 |
|           |                | 706.5           | 21.94      | 20.98 |
|           | 100% RB        | 713.5           | 21.60      | 20.61 |
|           |                | 710.0           | 21.50      | 20.52 |
|           |                | 706.5           | 21.67      | 20.70 |
| 10MHz     | 1 RB high      | 711.0           | 22.61      | 21.98 |
|           |                | 710.0           | 22.59      | 21.94 |
|           |                | 709.0           | 22.55      | 21.90 |
|           | 1 RB low       | 711.0           | 22.94      | 22.32 |
|           |                | 710.0           | 22.61      | 22.01 |
|           |                | 709.0           | 22.44      | 21.85 |
|           | 50% RB mid     | 711.0           | 21.53      | 20.54 |
|           |                | 710.0           | 21.50      | 20.51 |
|           |                | 709.0           | 21.55      | 20.57 |
|           | 100% RB        | 711.0           | 21.60      | 20.61 |
|           |                | 710.0           | 21.64      | 20.65 |
|           |                | 709.0           | 21.63      | 20.64 |

**LTE band 25**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 1.4MHz    | 1 RB high      | 1914.3          | 21.90      | 21.16 |
|           |                | 1882.5          | 22.11      | 21.35 |
|           |                | 1850.7          | 22.46      | 21.50 |
|           | 1 RB low       | 1914.3          | 22.23      | 21.34 |
|           |                | 1882.5          | 22.11      | 21.35 |
|           |                | 1850.7          | 22.46      | 21.49 |
|           | 50% RB mid     | 1914.3          | 22.00      | 21.15 |
|           |                | 1882.5          | 22.17      | 21.13 |
|           |                | 1850.7          | 22.49      | 21.37 |
|           | 100% RB        | 1914.3          | 21.25      | 20.34 |
|           |                | 1882.5          | 21.17      | 20.39 |
|           |                | 1850.7          | 21.53      | 20.51 |
| 3MHz      | 1 RB high      | 1913.5          | 21.85      | 21.16 |
|           |                | 1882.5          | 22.07      | 21.32 |
|           |                | 1851.5          | 22.39      | 21.48 |
|           | 1 RB low       | 1913.5          | 22.35      | 21.46 |
|           |                | 1882.5          | 22.09      | 21.32 |
|           |                | 1851.5          | 22.45      | 21.47 |
|           | 50% RB mid     | 1913.5          | 21.37      | 20.37 |
|           |                | 1882.5          | 21.15      | 20.34 |
|           |                | 1851.5          | 21.51      | 20.49 |
|           | 100% RB        | 1913.5          | 21.38      | 20.38 |
|           |                | 1882.5          | 21.16      | 20.31 |
|           |                | 1851.5          | 21.52      | 20.48 |
| 5MHz      | 1 RB high      | 1912.5          | 21.83      | 21.14 |
|           |                | 1882.5          | 22.07      | 21.29 |
|           |                | 1852.5          | 22.39      | 21.51 |
|           | 1 RB low       | 1912.5          | 22.49      | 21.66 |
|           |                | 1882.5          | 22.17      | 21.40 |
|           |                | 1852.5          | 22.52      | 21.53 |
|           | 50% RB mid     | 1912.5          | 21.44      | 20.45 |
|           |                | 1882.5          | 21.19      | 20.34 |
|           |                | 1852.5          | 21.53      | 20.49 |
|           | 100% RB        | 1912.5          | 21.43      | 20.41 |
|           |                | 1882.5          | 21.17      | 20.37 |
|           |                | 1852.5          | 21.51      | 20.46 |
| 10MHz     | 1 RB high      | 1910.0          | 21.46      | 20.79 |
|           |                | 1882.5          | 22.14      | 21.36 |

|       |            |        |       |       |
|-------|------------|--------|-------|-------|
|       | 1 RB low   | 1855.0 | 22.35 | 21.53 |
|       |            | 1910.0 | 22.31 | 21.62 |
|       |            | 1882.5 | 22.19 | 21.45 |
|       |            | 1855.0 | 22.14 | 21.48 |
|       | 50% RB mid | 1910.0 | 21.52 | 20.54 |
|       |            | 1882.5 | 21.16 | 20.30 |
|       |            | 1855.0 | 21.50 | 20.47 |
|       | 100% RB    | 1910.0 | 21.52 | 20.55 |
|       |            | 1882.5 | 21.20 | 20.34 |
|       |            | 1855.0 | 21.51 | 20.49 |
| 15MHz | 1 RB high  | 1907.5 | 22.48 | 21.70 |
|       |            | 1882.5 | 22.21 | 21.46 |
|       |            | 1857.5 | 22.54 | 21.70 |
|       | 1 RB low   | 1907.5 | 22.40 | 21.65 |
|       |            | 1882.5 | 22.24 | 21.49 |
|       |            | 1857.5 | 22.38 | 21.61 |
|       | 50% RB mid | 1907.5 | 22.37 | 21.35 |
|       |            | 1882.5 | 22.24 | 21.23 |
|       |            | 1857.5 | 22.58 | 21.47 |
|       | 100% RB    | 1907.5 | 21.33 | 20.43 |
|       |            | 1882.5 | 21.20 | 20.35 |
|       |            | 1857.5 | 21.58 | 20.55 |
| 20MHz | 1 RB high  | 1905.0 | 21.93 | 21.18 |
|       |            | 1882.5 | 22.15 | 21.37 |
|       |            | 1860.0 | 22.18 | 21.42 |
|       | 1 RB low   | 1905.0 | 22.33 | 21.57 |
|       |            | 1882.5 | 22.26 | 21.52 |
|       |            | 1860.0 | 22.52 | 21.62 |
|       | 50% RB mid | 1905.0 | 21.48 | 20.54 |
|       |            | 1882.5 | 21.16 | 20.31 |
|       |            | 1860.0 | 21.45 | 20.47 |
|       | 100% RB    | 1905.0 | 21.44 | 20.49 |
|       |            | 1882.5 | 21.19 | 20.32 |
|       |            | 1860.0 | 21.42 | 20.43 |

**LTE band 26**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 1.4MHz    | 1 RB high      | 848.3           | 22.15      | 21.47 |
|           |                | 831.5           | 22.50      | 21.83 |
|           |                | 814.7           | 22.41      | 21.70 |
|           | 1 RB low       | 848.3           | 22.13      | 21.45 |
|           |                | 831.5           | 22.50      | 21.83 |
|           |                | 814.7           | 22.40      | 21.70 |
|           | 50% RB mid     | 848.3           | 22.21      | 21.29 |
|           |                | 831.5           | 22.57      | 21.63 |
|           |                | 814.7           | 22.47      | 21.51 |
|           | 100% RB        | 848.3           | 21.30      | 20.41 |
|           |                | 831.5           | 21.65      | 20.76 |
|           |                | 814.7           | 21.53      | 20.62 |
| 3MHz      | 1 RB high      | 847.5           | 22.11      | 21.47 |
|           |                | 831.5           | 22.46      | 21.80 |
|           |                | 815.5           | 22.95      | 22.07 |
|           | 1 RB low       | 847.5           | 22.11      | 21.41 |
|           |                | 831.5           | 22.47      | 21.76 |
|           |                | 815.5           | 22.99      | 22.06 |
|           | 50% RB mid     | 847.5           | 21.26      | 20.37 |
|           |                | 831.5           | 21.64      | 20.76 |
|           |                | 815.5           | 22.07      | 21.08 |
|           | 100% RB        | 847.5           | 21.26      | 20.31 |
|           |                | 831.5           | 21.62      | 20.68 |
|           |                | 815.5           | 22.09      | 21.06 |
| 5MHz      | 1 RB high      | 846.5           | 22.13      | 21.47 |
|           |                | 831.5           | 22.45      | 21.83 |
|           |                | 816.5           | 22.41      | 21.77 |
|           | 1 RB low       | 846.5           | 22.26      | 21.56 |
|           |                | 831.5           | 22.53      | 21.83 |
|           |                | 816.5           | 22.43      | 21.73 |
|           | 50% RB mid     | 846.5           | 21.31      | 20.34 |
|           |                | 831.5           | 21.68      | 20.73 |
|           |                | 816.5           | 21.57      | 20.60 |
|           | 100% RB        | 846.5           | 21.28      | 20.30 |
|           |                | 831.5           | 21.63      | 20.67 |
|           |                | 816.5           | 21.52      | 20.55 |
| 10MHz     | 1 RB high      | 844.0           | 22.19      | 21.52 |
|           |                | 831.5           | 22.54      | 21.93 |

|       |            |       |       |       |
|-------|------------|-------|-------|-------|
|       | 1 RB low   | 820.0 | 22.53 | 21.83 |
|       |            | 844.0 | 22.54 | 21.90 |
|       |            | 831.5 | 22.56 | 21.83 |
|       |            | 820.0 | 22.45 | 21.77 |
|       | 50% RB mid | 844.0 | 21.37 | 20.38 |
|       |            | 831.5 | 21.64 | 20.69 |
|       |            | 820.0 | 21.55 | 20.56 |
|       | 100% RB    | 844.0 | 21.41 | 20.44 |
|       |            | 831.5 | 21.66 | 20.70 |
|       |            | 820.0 | 21.59 | 20.59 |
| 15MHz | 1 RB high  | 841.5 | 22.60 | 21.98 |
|       |            | 831.5 | 22.62 | 21.92 |
|       |            | 822.5 | 22.55 | 21.84 |
|       | 1 RB low   | 841.5 | 22.59 | 21.96 |
|       |            | 831.5 | 22.57 | 21.88 |
|       |            | 822.5 | 22.48 | 21.78 |
|       | 50% RB mid | 841.5 | 22.67 | 21.76 |
|       |            | 831.5 | 22.67 | 21.68 |
|       |            | 822.5 | 22.58 | 21.62 |
|       | 100% RB    | 841.5 | 21.66 | 20.73 |
|       |            | 831.5 | 21.69 | 20.68 |
|       |            | 822.5 | 21.57 | 20.57 |

**LTE band 38**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 5MHz      | 1 RB high      | 2617.5          | 22.22      | 21.47 |
|           |                | 2595.0          | 22.26      | 21.48 |
|           |                | 2572.5          | 22.31      | 21.47 |
|           | 1 RB low       | 2617.5          | 22.17      | 21.51 |
|           |                | 2595.0          | 22.25      | 21.44 |
|           |                | 2572.5          | 22.32      | 21.46 |
|           | 50% RB mid     | 2617.5          | 21.38      | 20.53 |
|           |                | 2595.0          | 21.31      | 20.48 |
|           |                | 2572.5          | 21.39      | 20.42 |
|           | 100% RB        | 2617.5          | 21.32      | 20.46 |
|           |                | 2595.0          | 21.29      | 20.43 |
|           |                | 2572.5          | 21.35      | 20.41 |
| 10MHz     | 1 RB high      | 2615.0          | 22.27      | 21.53 |
|           |                | 2595.0          | 22.24      | 21.51 |
|           |                | 2575.0          | 22.33      | 21.48 |
|           | 1 RB low       | 2615.0          | 22.19      | 21.45 |
|           |                | 2595.0          | 22.25      | 21.44 |
|           |                | 2575.0          | 22.35      | 21.50 |
|           | 50% RB mid     | 2615.0          | 21.26      | 20.50 |
|           |                | 2595.0          | 21.32      | 20.42 |
|           |                | 2575.0          | 21.39      | 20.42 |
|           | 100% RB        | 2615.0          | 21.34      | 20.53 |
|           |                | 2595.0          | 21.31      | 20.45 |
|           |                | 2575.0          | 21.37      | 20.40 |
| 15MHz     | 1 RB high      | 2612.5          | 22.19      | 21.51 |
|           |                | 2595.0          | 22.26      | 21.46 |
|           |                | 2577.5          | 22.35      | 21.50 |
|           | 1 RB low       | 2612.5          | 22.19      | 21.50 |
|           |                | 2595.0          | 22.27      | 21.47 |
|           |                | 2577.5          | 22.35      | 21.50 |
|           | 50% RB mid     | 2612.5          | 22.24      | 21.39 |
|           |                | 2595.0          | 22.31      | 21.34 |
|           |                | 2577.5          | 22.36      | 21.37 |
|           | 100% RB        | 2612.5          | 21.31      | 20.44 |
|           |                | 2595.0          | 21.33      | 20.50 |
|           |                | 2577.5          | 21.40      | 20.42 |
| 20MHz     | 1 RB high      | 2610.0          | 22.28      | 21.56 |



|  |            |        |       |       |
|--|------------|--------|-------|-------|
|  |            | 2595.0 | 22.29 | 21.57 |
|  |            | 2580.0 | 22.30 | 21.51 |
|  | 1 RB low   | 2610.0 | 22.21 | 21.48 |
|  |            | 2595.0 | 22.31 | 21.48 |
|  |            | 2580.0 | 22.36 | 21.51 |
|  | 50% RB mid | 2610.0 | 21.30 | 20.46 |
|  |            | 2595.0 | 21.36 | 20.46 |
|  |            | 2580.0 | 21.37 | 20.41 |
|  | 100% RB    | 2610.0 | 21.27 | 20.39 |
|  |            | 2595.0 | 21.38 | 20.50 |
|  |            | 2580.0 | 21.40 | 20.41 |

### A.1.3 Radiated

#### A.1.3.1 Description

This is the test for the maximum radiated power from the EUT.

Rule Part 22.913(a) specifies "Mobile stations are limited to 2.0 watts EIRP."

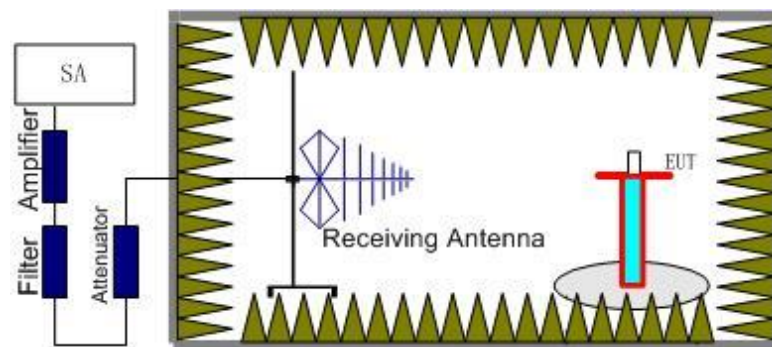
Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Rule Part 27.50(h)(2) specifies "Mobile stations are limited to 2.0 watts EIRP."

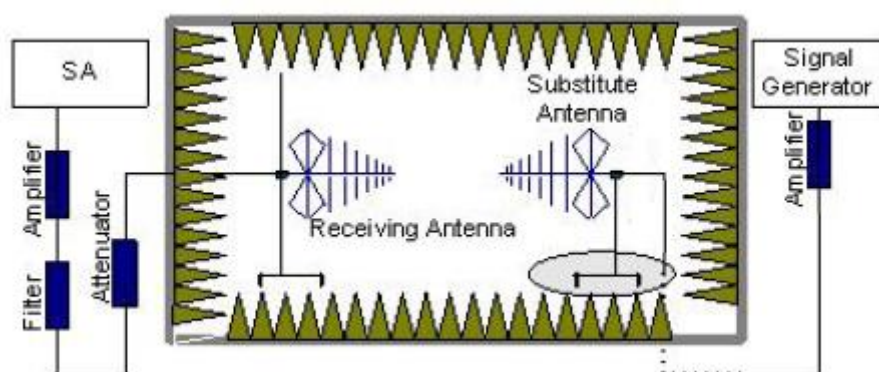
#### A.1.3.2 Method of Measurement

The measurements procedures in TIA-603-D-2010 are used.

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as ( $P_r$ ).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power ( $P_{Mea}$ ) is applied to the input of the

substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded ( $P_r$ ). The power of signal source ( $P_{Mea}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. An amplifier should be connected to the Signal Source output port. And the cable should be connected between the amplifier and the substitution antenna.  
The cable loss ( $P_{cl}$ ), the substitution antenna Gain ( $G_a$ ) and the amplifier Gain ( $P_{Ag}$ ) should be recorded after test.

The measurement results are obtained as described below:

$$\text{Power (EIRP)} = P_{Mea} - P_{Ag} - P_{cl} + G_a$$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15$ .

### A.1.3.3 Measurement result

#### LTE Band 2- EIRP 24. 232(c)

Limits: ≤33dBm (2W)

#### LTE Band 2\_1.4MHz\_QPSK

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1850.70        | -7.3                   | -29.4                                      | 0.15                            | 22.25     | 33.00      | H            |
| 1880.00        | -7.73                  | -29.3                                      | 0.25                            | 21.82     | 33.00      | H            |
| 1909.30        | -7.36                  | -29.3                                      | 0.35                            | 22.29     | 33.00      | H            |

#### LTE Band 2\_3MHz\_QPSK

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1851.50        | -6.53                  | -29.4                                      | 0.15                            | 23.02     | 33.00      | H            |
| 1880.00        | -7.84                  | -29.3                                      | 0.25                            | 21.71     | 33.00      | H            |
| 1908.50        | -7.48                  | -29.3                                      | 0.35                            | 22.17     | 33.00      | H            |

#### LTE Band 2\_5MHz\_QPSK

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm)    | Limit(dBm)   | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|--------------|--------------|--------------|
| 1852.50        | -7.25                  | -29.4                                      | 0.15                            | 22.30        | 33.00        | H            |
| 1880.00        | -6.91                  | -29.3                                      | 0.25                            | 22.64        | 33.00        | H            |
| <b>1907.50</b> | <b>-4.87</b>           | <b>-29.3</b>                               | <b>0.35</b>                     | <b>24.78</b> | <b>33.00</b> | <b>H</b>     |

#### LTE Band 2\_10MHz\_QPSK

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1855.00        | -7.28                  | -29.4                                      | 0.15                            | 22.27     | 33.00      | H            |
| 1880.00        | -6.33                  | -29.3                                      | 0.25                            | 23.22     | 33.00      | H            |
| 1905.00        | -5.52                  | -29.3                                      | 0.35                            | 24.13     | 33.00      | H            |

#### LTE Band 2\_15MHz\_QPSK

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1857.50        | -7.4                   | -29.4                                      | 0.15                            | 22.15     | 33.00      | H            |
| 1880.00        | -7.31                  | -29.3                                      | 0.25                            | 22.24     | 33.00      | H            |
| 1902.50        | -5.85                  | -29.3                                      | 0.35                            | 23.80     | 33.00      | H            |

#### LTE Band 2\_20 MHz\_QPSK

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1860.00        | -7.3                   | -29.4                                      | 0.15                            | 22.25     | 33.00      | H            |
| 1880.00        | -6.88                  | -29.3                                      | 0.25                            | 22.67     | 33.00      | H            |
| 1900.00        | -6.78                  | -29.3                                      | 0.35                            | 22.87     | 33.00      | H            |

#### LTE Band 2\_1.4MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1850.70        | -7.14                  | -29.4                                      | 0.15                            | 22.41     | 33.00      | H            |
| 1880.00        | -7.28                  | -29.3                                      | 0.25                            | 22.27     | 33.00      | H            |
| 1909.30        | -7.55                  | -29.3                                      | 0.35                            | 22.10     | 33.00      | H            |

#### LTE Band 2\_3MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1851.50        | -7.14                  | -29.4                                      | 0.15                            | 22.41     | 33.00      | H            |
| 1880.00        | -7.16                  | -29.3                                      | 0.25                            | 22.39     | 33.00      | H            |
| 1908.50        | -7.4                   | -29.3                                      | 0.35                            | 22.25     | 33.00      | H            |

#### LTE Band 2\_5MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1852.50        | -7.35                  | -29.4                                      | 0.15                            | 22.20     | 33.00      | H            |
| 1880.00        | -7.2                   | -29.3                                      | 0.25                            | 22.35     | 33.00      | H            |
| 1907.50        | -7.38                  | -29.3                                      | 0.35                            | 22.27     | 33.00      | H            |

#### LTE Band 2\_10MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1855.00        | -7.39                  | -29.4                                      | 0.15                            | 22.16     | 33.00      | H            |
| 1880.00        | -7.28                  | -29.3                                      | 0.25                            | 22.27     | 33.00      | H            |
| 1905.00        | -7.28                  | -29.3                                      | 0.35                            | 22.37     | 33.00      | H            |

#### LTE Band 2\_15MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1857.50        | -7.24                  | -29.4                                      | 0.15                            | 22.31     | 33.00      | H            |
| 1880.00        | -7.65                  | -29.3                                      | 0.25                            | 21.90     | 33.00      | H            |
| 1902.50        | -7.61                  | -29.3                                      | 0.35                            | 22.04     | 33.00      | H            |

#### LTE Band 2\_20 MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1860.00        | -7.08                  | -29.4                                      | 0.15                            | 22.47     | 33.00      | H            |
| 1880.00        | -8.15                  | -29.3                                      | 0.25                            | 21.40     | 33.00      | H            |
| 1900.00        | -6.75                  | -29.3                                      | 0.35                            | 22.90     | 33.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-4.87dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-29.30dB)+G<sub>a</sub>(0.35dB) =24.78dBm

**LTE Band 4- EIRP 27.50(d)**

**Limits:** ≤30dBm (1W)

**LTE Band 4\_1.4MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1710.70        | -7.74                  | -29.60                                     | 0.39                            | 22.25     | 30.00      | H            |
| 1732.50        | -7.10                  | -29.60                                     | 0.27                            | 22.78     | 30.00      | H            |
| 1754.30        | -5.65                  | -29.50                                     | 0.17                            | 24.03     | 30.00      | H            |

**LTE Band 4\_3MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1711.50        | -7.86                  | -29.60                                     | 0.39                            | 22.13     | 30.00      | H            |
| 1732.50        | -5.85                  | -29.60                                     | 0.27                            | 24.03     | 30.00      | H            |
| 1753.50        | -6.57                  | -29.50                                     | 0.17                            | 23.11     | 30.00      | H            |

**LTE Band 4\_5MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1712.50        | -7.59                  | -29.60                                     | 0.39                            | 22.40     | 30.00      | H            |
| 1732.50        | -6.12                  | -29.60                                     | 0.27                            | 23.75     | 30.00      | H            |
| 1752.50        | -6.17                  | -29.50                                     | 0.17                            | 23.50     | 30.00      | H            |

**LTE Band 4\_10MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1715.00        | -7.93                  | -29.60                                     | 0.39                            | 22.06     | 30.00      | H            |
| 1732.50        | -6.93                  | -29.60                                     | 0.27                            | 22.94     | 30.00      | H            |
| 1750.50        | -6.45                  | -29.50                                     | 0.17                            | 23.22     | 30.00      | H            |

**LTE Band 4\_15MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1717.50        | -7.87                  | -29.60                                     | 0.39                            | 22.13     | 30.00      | H            |
| 1732.50        | -7.63                  | -29.60                                     | 0.27                            | 22.24     | 30.00      | H            |
| 1747.50        | -6.85                  | -29.50                                     | 0.17                            | 22.82     | 30.00      | H            |

**LTE Band 4\_20MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1720.00        | -7.50                  | -29.60                                     | 0.39                            | 22.49     | 30.00      | H            |
| 1732.50        | -7.60                  | -29.60                                     | 0.27                            | 22.27     | 30.00      | H            |
| 1745.00        | -7.13                  | -29.50                                     | 0.17                            | 22.54     | 30.00      | H            |

**LTE Band 4\_1.4MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1710.70        | -7.77                  | -29.60                                     | 0.39                            | 22.22     | 30.00      | H            |
| 1732.50        | -5.89                  | -29.60                                     | 0.27                            | 23.98     | 30.00      | H            |
| 1754.30        | -6.24                  | -29.50                                     | 0.17                            | 23.43     | 30.00      | H            |

**LTE Band 4\_3MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm)    | Limit(dBm)   | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|--------------|--------------|--------------|
| 1711.50        | -7.71                  | -29.60                                     | 0.39                            | 22.28        | 30.00        | H            |
| <b>1732.50</b> | <b>-5.59</b>           | <b>-29.60</b>                              | <b>0.27</b>                     | <b>24.28</b> | <b>30.00</b> | <b>H</b>     |
| 1753.50        | -6.37                  | -29.50                                     | 0.17                            | 23.30        | 30.00        | H            |

**LTE Band 4\_5MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1712.50        | -7.70                  | -29.60                                     | 0.39                            | 22.29     | 30.00      | H            |
| 1732.50        | -6.35                  | -29.60                                     | 0.27                            | 23.52     | 30.00      | H            |
| 1752.50        | -6.50                  | -29.50                                     | 0.17                            | 23.17     | 30.00      | H            |

**LTE Band 4\_10MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1715.00        | -8.05                  | -29.60                                     | 0.39                            | 21.94     | 30.00      | H            |
| 1732.50        | -6.69                  | -29.60                                     | 0.27                            | 23.18     | 30.00      | H            |
| 1750.50        | -6.37                  | -29.50                                     | 0.17                            | 23.30     | 30.00      | H            |

**LTE Band 4\_15MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1717.50        | -8.09                  | -29.60                                     | 0.39                            | 21.90     | 30.00      | H            |
| 1732.50        | -7.36                  | -29.60                                     | 0.27                            | 22.51     | 30.00      | H            |
| 1747.50        | -7.04                  | -29.50                                     | 0.17                            | 22.63     | 30.00      | H            |

**LTE Band 4\_20MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1720.00        | -8.47                  | -29.60                                     | 0.39                            | 21.52     | 30.00      | H            |
| 1732.50        | -7.23                  | -29.60                                     | 0.27                            | 22.64     | 30.00      | H            |
| 1745.00        | -7.40                  | -29.50                                     | 0.17                            | 22.27     | 30.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-5.59dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-29.60dB)+G<sub>a</sub>(0.27dB) =24.28dBm

**LTE Band 5- ERP 22.913(a)**

**Limits:** ≤38.45dBm (7W)

**LTE Band 5\_1.4MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 824.70         | -10.56                 | -33.60                                        | 0.28                               | 2.15               | 21.17    | 38.45      | H            |
| 836.50         | -9.05                  | -33.50                                        | 0.25                               | 2.15               | 22.55    | 38.45      | H            |
| 848.30         | -8.62                  | -33.50                                        | 0.21                               | 2.15               | 22.95    | 38.45      | H            |

**LTE Band 5\_3MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 825.50         | -9.80                  | -33.60                                        | 0.28                               | 2.15               | 21.93    | 38.45      | H            |
| 836.50         | -9.38                  | -33.50                                        | 0.25                               | 2.15               | 22.22    | 38.45      | H            |
| 847.50         | -8.55                  | -33.50                                        | 0.21                               | 2.15               | 23.01    | 38.45      | H            |

**LTE Band 5\_5MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 826.50         | -10.16                 | -33.60                                        | 0.28                               | 2.15               | 21.57    | 38.45      | H            |
| 836.50         | -9.83                  | -33.50                                        | 0.25                               | 2.15               | 21.77    | 38.45      | H            |
| 846.50         | -9.27                  | -33.50                                        | 0.21                               | 2.15               | 22.29    | 38.45      | H            |

**LTE Band 5\_10MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 829.00         | -9.84                  | -33.60                                        | 0.28                               | 2.15               | 21.89    | 38.45      | H            |
| 836.50         | -9.79                  | -33.50                                        | 0.25                               | 2.15               | 21.81    | 38.45      | H            |
| 844.00         | -9.79                  | -33.50                                        | 0.21                               | 2.15               | 21.35    | 38.45      | H            |

**LTE Band 5\_1.4MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 824.70         | -10.59                 | -33.60                                        | 0.28                               | 2.15               | 21.15    | 38.45      | H            |
| 836.50         | -9.67                  | -33.50                                        | 0.25                               | 2.15               | 21.93    | 38.45      | H            |
| 848.30         | -8.89                  | -33.50                                        | 0.21                               | 2.15               | 22.67    | 38.45      | H            |

**LTE Band 5\_3MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm)     | Limit(dBm)   | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|--------------|--------------|--------------|
| 825.50         | -10.24                 | -33.60                                        | 0.28                               | 2.15               | 21.49        | 38.45        | H            |
| 836.50         | -9.61                  | -33.50                                        | 0.25                               | 2.15               | 21.99        | 38.45        | H            |
| <b>847.50</b>  | <b>-8.54</b>           | <b>-33.50</b>                                 | <b>0.21</b>                        | <b>2.15</b>        | <b>23.02</b> | <b>38.45</b> | <b>H</b>     |

**LTE Band 5\_5MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 826.50         | -9.90                  | -33.60                                        | 0.28                               | 2.15               | 21.83    | 38.45      | H            |
| 836.50         | -9.27                  | -33.50                                        | 0.25                               | 2.15               | 22.33    | 38.45      | H            |
| 846.50         | -8.54                  | -33.50                                        | 0.21                               | 2.15               | 23.02    | 38.45      | H            |

**LTE Band 5\_10MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 829.00         | -10.70                 | -33.60                                        | 0.28                               | 2.15               | 21.03    | 38.45      | H            |
| 836.50         | -8.85                  | -33.50                                        | 0.25                               | 2.15               | 22.75    | 38.45      | H            |
| 844.00         | -9.72                  | -33.50                                        | 0.21                               | 2.15               | 21.84    | 38.45      | H            |

Peak ERP (dBm)=P<sub>Mea</sub>(-8.54dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-33.50dB)+G<sub>a</sub>(0.21dB) -2.15dB =23.02dBm



**LTE Band 7- EIRP 27.50(h)(2)**

**Limits:** ≤33 dBm (2W)

**LTE Band 7\_5MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm)    | Limit(dBm)   | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|--------------|--------------|--------------|
| 2502.50        | -4.86                  | -28.70                                     | 0.59                            | 24.43        | 33.00        | H            |
| 2535.00        | -3.38                  | -28.60                                     | 0.45                            | 25.67        | 33.00        | H            |
| <b>2567.50</b> | <b>-2.16</b>           | <b>-28.60</b>                              | <b>-0.01</b>                    | <b>26.43</b> | <b>33.00</b> | <b>H</b>     |

**LTE Band 7\_10MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2505.00        | -5.12                  | -28.70                                     | 0.59                            | 24.17     | 33.00      | H            |
| 2535.00        | -3.72                  | -28.60                                     | 0.45                            | 25.33     | 33.00      | H            |
| 2565.00        | -2.81                  | -28.60                                     | -0.01                           | 25.78     | 33.00      | H            |

**LTE Band 7\_15MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2507.50        | -5.52                  | -28.70                                     | 0.59                            | 23.77     | 33.00      | H            |
| 2535.00        | -4.29                  | -28.60                                     | 0.45                            | 24.76     | 33.00      | H            |
| 2562.50        | -4.26                  | -28.60                                     | -0.01                           | 24.33     | 33.00      | H            |

**LTE Band 7\_20MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2510.00        | -6.28                  | -28.70                                     | 0.59                            | 23.01     | 33.00      | H            |
| 2535.00        | -5.97                  | -28.60                                     | 0.45                            | 23.08     | 33.00      | H            |
| 2560.00        | -4.64                  | -28.60                                     | -0.01                           | 23.96     | 33.00      | H            |

#### LTE Band 7\_5MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2502.50        | -4.73                  | -28.70                                     | 0.59                            | 24.56     | 33.00      | H            |
| 2535.00        | -3.05                  | -28.60                                     | 0.45                            | 26.00     | 33.00      | H            |
| 2567.50        | -2.42                  | -28.60                                     | -0.01                           | 26.17     | 33.00      | H            |

#### LTE Band 7\_10MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2505.00        | -4.98                  | -28.70                                     | 0.59                            | 24.31     | 33.00      | H            |
| 2535.00        | -3.29                  | -28.60                                     | 0.45                            | 25.76     | 33.00      | H            |
| 2565.00        | -2.95                  | -28.60                                     | -0.01                           | 25.64     | 33.00      | H            |

#### LTE Band 7\_15MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2507.50        | -6.38                  | -28.70                                     | 0.59                            | 22.91     | 33.00      | H            |
| 2535.00        | -4.84                  | -28.60                                     | 0.45                            | 24.22     | 33.00      | H            |
| 2562.50        | -3.73                  | -28.60                                     | -0.01                           | 24.86     | 33.00      | H            |

#### LTE Band 7\_20MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2510.00        | -6.31                  | -28.70                                     | 0.59                            | 22.99     | 33.00      | H            |
| 2535.00        | -5.32                  | -28.60                                     | 0.45                            | 23.73     | 33.00      | H            |
| 2560.00        | -4.52                  | -28.60                                     | -0.01                           | 24.07     | 33.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-2.16dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-28.60dB)+G<sub>a</sub>(-0.01dB) -2.15dB =26.43dBm

**LTE Band 12 - ERP 27.50(c)(10)**

**Limits:** ≤34.77dBm (3W)

**LTE Band 12\_1.4MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub><br>Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 699.70         | -23.40                 | 1.90           | -44.66                                        | -0.77                                 | 2.15               | 17.98    | 34.77      | H            |
| 707.50         | -23.95                 | 1.91           | -44.94                                        | -0.62                                 | 2.15               | 17.55    | 34.77      | H            |
| 715.30         | -24.16                 | 1.92           | -45.26                                        | -0.50                                 | 2.15               | 17.53    | 34.77      | H            |

**LTE Band 12\_3MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub><br>Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 700.50         | -23.58                 | 1.90           | -44.68                                        | -0.76                                 | 2.15               | 17.81    | 34.77      | H            |
| 707.50         | -23.72                 | 1.91           | -44.94                                        | -0.62                                 | 2.15               | 17.78    | 34.77      | H            |
| 714.50         | -24.08                 | 1.92           | -45.26                                        | -0.50                                 | 2.15               | 17.61    | 34.77      | H            |

**LTE Band 12\_5MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub><br>Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 701.50         | -23.98                 | 1.90           | -44.81                                        | -0.74                                 | 2.15               | 17.52    | 34.77      | H            |
| 707.50         | -24.20                 | 1.91           | -44.94                                        | -0.62                                 | 2.15               | 17.30    | 34.77      | H            |
| 713.50         | -23.64                 | 1.92           | -45.22                                        | -0.50                                 | 2.15               | 18.01    | 34.77      | H            |

**LTE Band 12\_10MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub><br>Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm)     | Limit(dBm)   | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------------|--------------------|--------------|--------------|--------------|
| 704.00         | -24.92                 | 1.91           | -44.93                                        | -0.70                                 | 2.15               | 16.65        | 34.77        | H            |
| 707.50         | -24.43                 | 1.91           | -44.94                                        | -0.62                                 | 2.15               | 17.07        | 34.77        | H            |
| <b>711.00</b>  | <b>-22.88</b>          | <b>1.92</b>    | <b>-45.19</b>                                 | <b>-0.53</b>                          | <b>2.15</b>        | <b>18.77</b> | <b>34.77</b> | <b>H</b>     |

**LTE Band 12\_1.4MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub><br>Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 699.70         | -24.25                 | 1.90           | -44.66                                        | -0.77                                 | 2.15               | 17.13    | 34.77      | H            |
| 707.50         | -24.90                 | 1.91           | -44.94                                        | -0.62                                 | 2.15               | 16.60    | 34.77      | H            |
| 715.30         | -25.05                 | 1.92           | -45.26                                        | -0.50                                 | 2.15               | 16.64    | 34.77      | H            |

**LTE Band 12\_3MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub><br>Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 700.50         | -24.50                 | 1.90           | -44.68                                        | -0.76                                 | 2.15               | 16.89    | 34.77      | H            |
| 707.50         | -24.52                 | 1.91           | -44.94                                        | -0.62                                 | 2.15               | 16.98    | 34.77      | H            |
| 714.50         | -24.93                 | 1.92           | -45.26                                        | -0.50                                 | 2.15               | 16.76    | 34.77      | H            |

**LTE Band 12\_5MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub><br>Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 701.50         | -24.76                 | 1.90           | -44.81                                        | -0.74                                 | 2.15               | 16.74    | 34.77      | H            |
| 707.50         | -25.09                 | 1.91           | -44.94                                        | -0.62                                 | 2.15               | 16.41    | 34.77      | H            |
| 713.50         | -24.31                 | 1.92           | -45.22                                        | -0.50                                 | 2.15               | 17.34    | 34.77      | H            |

**LTE Band 12\_10MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub><br>Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 704.00         | -25.74                 | 1.91           | -44.93                                        | -0.70                                 | 2.15               | 15.83    | 34.77      | H            |
| 707.50         | -25.21                 | 1.91           | -44.94                                        | -0.62                                 | 2.15               | 16.29    | 34.77      | H            |
| 711.00         | -23.81                 | 1.92           | -45.19                                        | -0.53                                 | 2.15               | 17.84    | 34.77      | H            |

Peak ERP (dBm)=P<sub>Mea</sub>(-22.88dBm)- Cable Loss(1.92) - (P<sub>cl</sub>+P<sub>Ag</sub>) (-45.19dB)-G<sub>a</sub>(-0.53dB) -2.15dB  
=18.77dBm

**LTE Band 13- ERP 27.50(b)(10)**

**Limits:** ≤34.77dBm (3W)

**LTE Band 13\_5MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm)     | Limit(dBm)   | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|--------------|--------------|--------------|
| 779.50         | -9.76                  | -34.00                                        | 0.28                               | 2.15               | 22.38        | 34.77        | H            |
| 782.00         | -9.57                  | -34.00                                        | 0.25                               | 2.15               | 22.53        | 34.77        | H            |
| <b>784.50</b>  | <b>-8.52</b>           | <b>-34.10</b>                                 | <b>0.26</b>                        | <b>2.15</b>        | <b>23.70</b> | <b>34.77</b> | <b>H</b>     |

**LTE Band 13\_10MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 782.00         | -9.51                  | -34.00                                        | 0.25                               | 2.15               | 22.62    | 34.77      | H            |
| 782.00         | -9.48                  | -34.00                                        | 0.25                               | 2.15               | 22.62    | 34.77      | H            |
| 782.00         | -9.49                  | -34.00                                        | 0.25                               | 2.15               | 22.62    | 34.77      | H            |

**LTE Band 13\_5MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 779.50         | -9.54                  | -34.00                                        | 0.28                               | 2.15               | 22.59    | 34.77      | H            |
| 782.00         | -9.81                  | -34.00                                        | 0.25                               | 2.15               | 22.29    | 34.77      | H            |
| 784.50         | -9.80                  | -34.10                                        | 0.26                               | 2.15               | 22.41    | 34.77      | H            |

**LTE Band 13\_10MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 782.00         | -9.88                  | -34.00                                        | 0.25                               | 2.15               | 22.25    | 34.77      | H            |
| 782.00         | -9.85                  | -34.00                                        | 0.25                               | 2.15               | 22.25    | 34.77      | H            |
| 782.00         | -9.86                  | -34.00                                        | 0.25                               | 2.15               | 22.25    | 34.77      | H            |

Peak ERP (dBm)=P<sub>Mea</sub>(-8.52dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-34.10dB)+G<sub>a</sub>(0.26dB) -2.15dB =23.70dBm



### LTE Band 17- ERP 27.50(c)(10)

Limits:  $\leq 34.77\text{dBm}$  (3W)

#### LTE Band 17\_5MHz\_QPSK

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | Correction (dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------|-----------------|----------|------------|--------------|
| 706.50         | -25.66                 | 1.91           | -45.53                                        | -0.66                           | 2.15            | 16.48    | 34.77      | H            |
| 710.00         | -23.52                 | 1.92           | -45.68                                        | -0.54                           | 2.15            | 18.63    | 34.77      | H            |
| 713.50         | -23.64                 | 1.92           | -45.22                                        | -0.50                           | 2.15            | 18.01    | 34.77      | H            |

#### LTE Band 17\_10MHz\_QPSK

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | Correction (dB) | ERP(dBm)     | Limit(dBm)   | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------|-----------------|--------------|--------------|--------------|
| 709.00         | -23.64                 | 1.92           | -45.64                                        | -0.57                           | 2.15            | 18.50        | 34.77        | H            |
| 710.00         | -23.50                 | 1.92           | -45.68                                        | -0.54                           | 2.15            | 18.65        | 34.77        | H            |
| <b>711.00</b>  | <b>-22.88</b>          | <b>1.92</b>    | <b>-45.19</b>                                 | <b>-0.53</b>                    | <b>2.15</b>     | <b>18.77</b> | <b>34.77</b> | <b>H</b>     |

#### LTE Band 17\_5MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | Correction (dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------|-----------------|----------|------------|--------------|
| 706.50         | -26.42                 | 1.91           | -45.53                                        | -0.66                           | 2.15            | 15.72    | 34.77      | H            |
| 710.00         | -24.36                 | 1.92           | -45.68                                        | -0.54                           | 2.15            | 17.79    | 34.77      | H            |
| 713.50         | -24.32                 | 1.92           | -45.22                                        | -0.50                           | 2.15            | 17.33    | 34.77      | H            |

#### LTE Band 17\_10MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Cable Loss(dB) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | Correction (dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|----------------|-----------------------------------------------|---------------------------------|-----------------|----------|------------|--------------|
| 709.00         | -24.46                 | 1.92           | -45.64                                        | -0.57                           | 2.15            | 17.68    | 34.77      | H            |
| 710.00         | -24.23                 | 1.92           | -45.68                                        | -0.54                           | 2.15            | 17.92    | 34.77      | H            |
| 711.00         | -23.83                 | 1.92           | -45.19                                        | -0.53                           | 2.15            | 17.82    | 34.77      | H            |

Peak ERP (dBm)=P<sub>Mea</sub>(-22.88dBm)- Cable Loss(1.92) - (P<sub>cl</sub>+P<sub>Ag</sub>) (-45.19dB)-G<sub>a</sub>(-0.53dB) -2.15dB  
=18.77dBm

**LTE Band 25- EIRP 24. 232(c)**

**Limits:** ≤33dBm (2W)

**LTE Band 25\_1.4MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1850.70        | -6.70                  | -29.40                                     | 0.15                            | 22.85     | 33.00      | H            |
| 1882.50        | -6.55                  | -29.30                                     | 0.25                            | 23.01     | 33.00      | H            |
| 1914.30        | -7.31                  | -29.30                                     | 0.35                            | 22.34     | 33.00      | H            |

**LTE Band 25\_3MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1851.50        | -7.08                  | -29.40                                     | 0.15                            | 22.47     | 33.00      | H            |
| 1882.50        | -6.91                  | -29.30                                     | 0.25                            | 22.64     | 33.00      | H            |
| 1913.50        | -7.48                  | -29.30                                     | 0.35                            | 22.17     | 33.00      | H            |

**LTE Band 25\_5MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1852.50        | -7.28                  | -29.40                                     | 0.15                            | 22.27     | 33.00      | H            |
| 1882.50        | -6.45                  | -29.30                                     | 0.25                            | 23.11     | 33.00      | H            |
| 1912.50        | -6.85                  | -29.30                                     | 0.35                            | 22.80     | 33.00      | H            |

**LTE Band 25\_10MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1855.00        | -7.44                  | -29.40                                     | 0.15                            | 22.11     | 33.00      | H            |
| 1882.00        | -6.28                  | -29.30                                     | 0.25                            | 23.27     | 33.00      | H            |
| 1910.00        | -7.16                  | -29.30                                     | 0.35                            | 22.49     | 33.00      | H            |

**LTE Band 25\_15MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1857.50        | -7.21                  | -29.40                                     | 0.15                            | 22.34     | 33.00      | H            |
| 1882.50        | -7.38                  | -29.30                                     | 0.25                            | 22.17     | 33.00      | H            |
| 1907.50        | -7.38                  | -29.30                                     | 0.35                            | 22.27     | 33.00      | H            |

**LTE Band 25\_20 MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1860.00        | -7.95                  | -29.40                                     | 0.15                            | 21.60     | 33.00      | H            |
| 1882.50        | -7.49                  | -29.30                                     | 0.25                            | 22.06     | 33.00      | H            |
| 1905.00        | -7.49                  | -29.30                                     | 0.35                            | 22.16     | 33.00      | H            |

**LTE Band 25\_1.4MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1850.70        | -7.26                  | -29.40                                     | 0.15                            | 22.29     | 33.00      | H            |
| 1882.50        | -5.47                  | -29.30                                     | 0.25                            | 24.08     | 33.00      | H            |
| 1914.30        | -6.71                  | -29.30                                     | 0.35                            | 22.94     | 33.00      | H            |

**LTE Band 25\_3MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm)    | Limit(dBm)   | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|--------------|--------------|--------------|
| 1851.50        | -7.00                  | -29.40                                     | 0.15                            | 22.56        | 33.00        | H            |
| <b>1882.50</b> | <b>-4.88</b>           | <b>-29.30</b>                              | <b>0.25</b>                     | <b>24.67</b> | <b>33.00</b> | <b>H</b>     |
| 1913.50        | -6.44                  | -29.30                                     | 0.35                            | 23.21        | 33.00        | H            |

**LTE Band 25\_5MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1852.50        | -6.86                  | -29.40                                     | 0.15                            | 22.69     | 33.00      | H            |
| 1882.50        | -5.35                  | -29.30                                     | 0.25                            | 24.20     | 33.00      | H            |
| 1912.50        | -6.15                  | -29.30                                     | 0.35                            | 23.50     | 33.00      | H            |

**LTE Band 25\_10MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1855.00        | -6.80                  | -29.40                                     | 0.15                            | 22.75     | 33.00      | H            |
| 1882.00        | -7.10                  | -29.30                                     | 0.25                            | 22.45     | 33.00      | H            |
| 1910.00        | -6.52                  | -29.30                                     | 0.35                            | 23.14     | 33.00      | H            |

**LTE Band 25\_15MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1857.50        | -7.17                  | -29.40                                     | 0.15                            | 22.38     | 33.00      | H            |
| 1882.50        | -7.24                  | -29.30                                     | 0.25                            | 22.31     | 33.00      | H            |
| 1907.50        | -7.01                  | -29.30                                     | 0.35                            | 22.64     | 33.00      | H            |

**LTE Band 25\_20 MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 1860.00        | -8.14                  | -29.40                                     | 0.15                            | 21.41     | 33.00      | H            |
| 1882.50        | -7.85                  | -29.30                                     | 0.25                            | 21.70     | 33.00      | H            |
| 1905.00        | -6.83                  | -29.30                                     | 0.35                            | 22.82     | 33.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-4.88dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-29.30dB)+G<sub>a</sub>(0.25dB) =24.67dBm

**LTE Band 26- ERP 22.913(a)**

**Limits:** ≤38.45dBm (7W)

**LTE Band 26\_1.4MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>Cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 814.70         | -8.62                  | -33.60                                        | 0.28                               | 2.15               | 23.11    | 38.45      | H            |
| 831.50         | -9.16                  | -33.50                                        | 0.25                               | 2.15               | 22.44    | 38.45      | H            |
| 848.30         | -9.89                  | -33.50                                        | 0.21                               | 2.15               | 21.67    | 38.45      | H            |

**LTE Band 26\_3MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>Cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm)     | Limit(dBm)   | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|--------------|--------------|--------------|
| <b>815.50</b>  | <b>-8.50</b>           | <b>-33.60</b>                                 | <b>0.28</b>                        | <b>2.15</b>        | <b>23.23</b> | <b>38.45</b> | <b>H</b>     |
| 831.50         | -8.92                  | -33.50                                        | 0.25                               | 2.15               | 22.68        | 38.45        | H            |
| 847.50         | -9.55                  | -33.50                                        | 0.21                               | 2.15               | 22.01        | 38.45        | H            |

**LTE Band 26\_5MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>Cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 816.50         | -8.81                  | -33.60                                        | 0.28                               | 2.15               | 22.92    | 38.45      | H            |
| 831.50         | -9.00                  | -33.50                                        | 0.25                               | 2.15               | 22.61    | 38.45      | H            |
| 846.50         | -9.22                  | -33.50                                        | 0.21                               | 2.15               | 22.34    | 38.45      | H            |

**LTE Band 26\_10MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>Cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 820.00         | -8.68                  | -33.60                                        | 0.28                               | 2.15               | 23.05    | 38.45      | H            |
| 831.50         | -10.39                 | -33.50                                        | 0.25                               | 2.15               | 21.21    | 38.45      | H            |
| 844.00         | -10.07                 | -33.50                                        | 0.21                               | 2.15               | 21.49    | 38.45      | H            |

**LTE Band 26\_15MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>Cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 822.50         | -11.04                 | -33.60                                        | 0.28                               | 2.15               | 20.69    | 38.45      | H            |
| 831.50         | -11.85                 | -33.50                                        | 0.25                               | 2.15               | 19.75    | 38.45      | H            |
| 841.50         | -12.04                 | -33.50                                        | 0.21                               | 2.15               | 19.52    | 38.45      | H            |

**LTE Band 26\_1.4MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 814.70         | -8.72                  | -33.60                                        | 0.28                               | 2.15               | 23.01    | 38.45      | H            |
| 831.50         | -9.17                  | -33.50                                        | 0.25                               | 2.15               | 22.43    | 38.45      | H            |
| 848.30         | -9.85                  | -33.50                                        | 0.21                               | 2.15               | 21.71    | 38.45      | H            |

**LTE Band 26\_3MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 815.50         | -8.63                  | -33.60                                        | 0.28                               | 2.15               | 23.10    | 38.45      | H            |
| 831.50         | -8.89                  | -33.50                                        | 0.25                               | 2.15               | 22.71    | 38.45      | H            |
| 847.50         | -9.64                  | -33.50                                        | 0.21                               | 2.15               | 21.92    | 38.45      | H            |

**LTE Band 26\_5MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 816.50         | -8.55                  | -33.60                                        | 0.28                               | 2.15               | 23.18    | 38.45      | H            |
| 831.50         | -9.12                  | -33.50                                        | 0.25                               | 2.15               | 22.48    | 38.45      | H            |
| 846.50         | -9.30                  | -33.50                                        | 0.21                               | 2.15               | 22.26    | 38.45      | H            |

**LTE Band 26\_10MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 820.00         | -9.05                  | -33.60                                        | 0.28                               | 2.15               | 22.68    | 38.45      | H            |
| 831.50         | -10.24                 | -33.50                                        | 0.25                               | 2.15               | 21.36    | 38.45      | H            |
| 844.00         | -10.15                 | -33.50                                        | 0.21                               | 2.15               | 21.42    | 38.45      | H            |

**LTE Band 26\_15MHz\_16QAM**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+<br>P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna<br>Gain(dB) | Correction<br>(dB) | ERP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|-----------------------------------------------|------------------------------------|--------------------|----------|------------|--------------|
| 822.50         | -10.63                 | -33.60                                        | 0.28                               | 2.15               | 21.10    | 38.45      | H            |
| 831.50         | -11.64                 | -33.50                                        | 0.25                               | 2.15               | 19.96    | 38.45      | H            |
| 841.50         | -11.96                 | -33.50                                        | 0.21                               | 2.15               | 19.60    | 38.45      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-8.50dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-33.60dB)+G<sub>a</sub>(0.28dB) =23.23dBm

**LTE Band 38- EIRP 27.50(h)(2)**

**Limits:** ≤33dBm (2W)

**LTE Band 38\_5MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2572.50        | -0.92                  | -28.60                                     | 0.38                            | 28.06     | 33.00      | H            |
| 2595.00        | -0.46                  | -28.60                                     | 0.31                            | 28.45     | 33.00      | H            |
| 2617.50        | -0.86                  | -28.60                                     | 0.30                            | 28.04     | 33.00      | H            |

**LTE Band 38\_10MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2575.00        | -1.13                  | -28.60                                     | 0.38                            | 27.86     | 33.00      | H            |
| 2595.00        | -1.18                  | -28.60                                     | 0.31                            | 27.73     | 33.00      | H            |
| 2615.00        | -0.37                  | -28.60                                     | 0.30                            | 28.53     | 33.00      | H            |

**LTE Band 38\_15MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2577.50        | -2.48                  | -28.60                                     | 0.38                            | 26.50     | 33.00      | H            |
| 2595.00        | -2.01                  | -28.60                                     | 0.31                            | 26.90     | 33.00      | H            |
| 2612.50        | -1.48                  | -28.60                                     | 0.30                            | 27.42     | 33.00      | H            |

**LTE Band 38\_20 MHz\_QPSK**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2580.00        | -2.68                  | -28.60                                     | 0.38                            | 26.30     | 33.00      | H            |
| 2595.00        | -2.11                  | -28.60                                     | 0.31                            | 26.80     | 33.00      | H            |
| 2610.00        | -1.97                  | -28.60                                     | 0.30                            | 26.93     | 33.00      | H            |

#### LTE Band 38\_5MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2572.50        | -0.97                  | -28.60                                     | 0.38                            | 28.01     | 33.00      | H            |
| 2595.00        | -0.71                  | -28.60                                     | 0.31                            | 28.20     | 33.00      | H            |
| 2617.50        | -0.75                  | -28.60                                     | 0.30                            | 28.15     | 33.00      | H            |

#### LTE Band 38\_10MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm)    | Limit(dBm)   | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|--------------|--------------|--------------|
| 2575.00        | -0.99                  | -28.60                                     | 0.38                            | 27.99        | 33.00        | H            |
| 2595.00        | -1.29                  | -28.60                                     | 0.31                            | 27.62        | 33.00        | H            |
| <b>2615.00</b> | <b>-0.26</b>           | <b>-28.60</b>                              | <b>0.30</b>                     | <b>28.65</b> | <b>33.00</b> | <b>H</b>     |

#### LTE Band 38\_15MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2577.50        | -2.85                  | -28.60                                     | 0.38                            | 26.13     | 33.00      | H            |
| 2595.00        | -2.01                  | -28.60                                     | 0.31                            | 26.90     | 33.00      | H            |
| 2612.50        | -1.94                  | -28.60                                     | 0.30                            | 26.96     | 33.00      | H            |

#### LTE Band 38\_20 MHz\_16QAM

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2580.00        | -3.07                  | -28.60                                     | 0.38                            | 25.91     | 33.00      | H            |
| 2595.00        | -2.60                  | -28.60                                     | 0.31                            | 26.31     | 33.00      | H            |
| 2610.00        | -1.48                  | -28.60                                     | 0.30                            | 27.42     | 33.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-0.26dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-28.60dB)+G<sub>a</sub>(0.30dB) =28.65dBm

#### ANALYZER SETTINGS:

RBW = VBW = 8MHz for occupied bandwidths equal to or less than 5MHz.

RBW = VBW = 20MHz for occupied bandwidths equal to or greater than 10MHz.

Note: Expanded measurement uncertainty is  $U = 0.96 \text{ dB}$ ,  $k = 2$ .

## A.2 EMISSION LIMIT

### Reference

FCC: CFR 2.1051, 22.917, 24.238(a), 27.53(m).

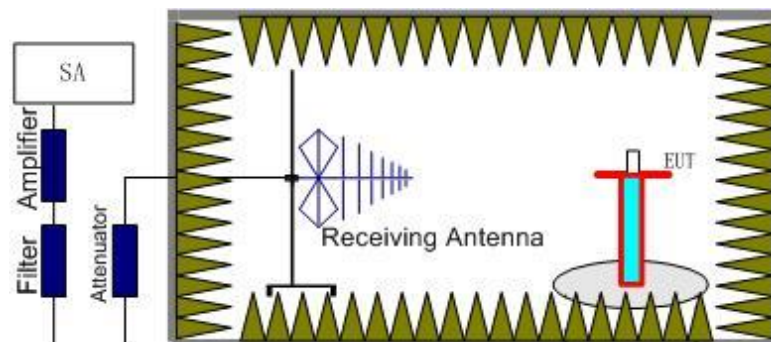
#### A.2.1 Measurement Method

The measurements procedures in TIA-603-D-2010 are used. This measurement is carried out in fully-anechoic chamber FAC-3.

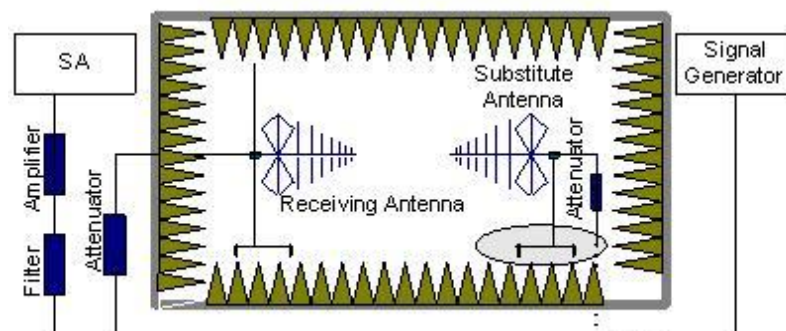
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 22.917, 24.238(a), Part 27.53(m). The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2, 4, 5, 7,12,13,17,25,26,38.

**The procedure of radiated spurious emissions is as follows:**

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the

reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power ( $P_{Mea}$ ) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded ( $P_r$ ). The power of signal source ( $P_{Mea}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss ( $P_{pl}$ ) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain ( $G_a$ ) should be recorded after test.

An amplifier should be connected in for the test.

The Path loss ( $P_{pl}$ ) is the summation of the cable loss and the gain of the amplifier.

The measurement results are obtained as described below:

$$\text{Power (EIRP)} = P_{Mea} - P_{pl} + G_a$$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15\text{dB}$ .

#### **A.2.2 Measurement Limit**

Part 22.917, 24.238(a), 27.53(m) all specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

#### **A.2.3 Measurement Results**

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 2, 4, 5, 7, 12, 13, 17, 25, 26, 38. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands 2, 4, 5, 7, 12, 13, 17, 25, 26, 38 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

**LTE Band 2, 1.4MHz, QPSK, Channel 18607**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5552.25        | -30.54                 | 1.30      | -2.64        | -34.48         | -13.00      | V            |
| 16695.38       | -34.40                 | 2.90      | -0.13        | -37.43         | -13.00      | H            |
| 17148.84       | -34.00                 | 2.90      | -0.79        | -37.69         | -13.00      | H            |
| 17440.88       | -32.73                 | 3.20      | -1.08        | -37.01         | -13.00      | H            |
| 17780.81       | -33.20                 | 3.20      | -0.75        | -37.15         | -13.00      | H            |
| 17849.72       | -32.34                 | 3.20      | -0.84        | -36.38         | -13.00      | H            |

**LTE Band 2, 1.4MHz, QPSK, Channel 18900**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5640.38        | -27.16                 | 1.30      | -2.54        | -31.00         | -13.00      | V            |
| 17185.59       | -32.63                 | 2.90      | -0.79        | -36.32         | -13.00      | H            |
| 17423.81       | -32.03                 | 3.20      | -1.08        | -36.31         | -13.00      | H            |
| 17629.22       | -32.10                 | 3.20      | -1.01        | -36.31         | -13.00      | H            |
| 17798.53       | -31.74                 | 3.20      | -0.75        | -35.69         | -13.00      | V            |
| 17916.66       | -31.82                 | 3.20      | -0.64        | -35.66         | -13.00      | H            |

**LTE Band 2, 1.4MHz, QPSK, Channel 19193**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5728.13        | -26.30                 | 1.50      | -2.73        | -30.53         | -13.00      | V            |
| 17203.97       | -33.77                 | 2.90      | -1.01        | -37.68         | -13.00      | H            |
| 17283.38       | -34.28                 | 2.90      | -1.01        | -38.19         | -13.00      | H            |
| 17400.19       | -33.21                 | 3.20      | -1.08        | -37.49         | -13.00      | H            |
| 17764.41       | -33.97                 | 3.20      | -0.75        | -37.92         | -13.00      | H            |
| 17923.88       | -33.05                 | 3.20      | -0.64        | -36.89         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM, Channel 18607**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5552.63        | -31.28                 | 1.30      | -2.64        | -35.22         | -13.00      | V            |
| 17207.91       | -33.42                 | 2.90      | -1.01        | -37.33         | -13.00      | H            |
| 17400.84       | -31.79                 | 3.20      | -1.08        | -36.07         | -13.00      | H            |
| 17612.81       | -32.18                 | 3.20      | -1.01        | -36.39         | -13.00      | H            |
| 17784.75       | -32.60                 | 3.20      | -0.75        | -36.55         | -13.00      | H            |
| 17923.22       | -32.50                 | 3.20      | -0.64        | -36.34         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM, Channel 18900**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5640.38        | -27.07                 | 1.30      | -2.54        | -30.91         | -13.00      | V            |
| 16824.00       | -33.23                 | 2.90      | -0.26        | -36.39         | -13.00      | H            |
| 17454.66       | -32.31                 | 3.20      | -1.08        | -36.59         | -13.00      | H            |
| 17605.59       | -32.90                 | 3.20      | -1.01        | -37.11         | -13.00      | H            |
| 17779.50       | -32.84                 | 3.20      | -0.75        | -36.79         | -13.00      | H            |
| 17932.41       | -32.37                 | 3.20      | -0.64        | -36.21         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM, Channel 19193**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5728.13        | -25.45                 | 1.50      | -2.73        | -29.68         | -13.00      | V            |
| 17295.84       | -32.64                 | 2.90      | -1.01        | -36.55         | -13.00      | H            |
| 17444.16       | -32.14                 | 3.20      | -1.08        | -36.42         | -13.00      | H            |
| 17616.09       | -32.20                 | 3.20      | -1.01        | -36.41         | -13.00      | H            |
| 17769.66       | -33.12                 | 3.20      | -0.75        | -37.07         | -13.00      | H            |
| 17912.72       | -31.96                 | 3.20      | -0.64        | -35.80         | -13.00      | H            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 4, 1.4MHz QPSK, Channel 19957**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17197.41       | -33.99                 | 2.90      | -0.79        | -37.68         | -13.00      | H            |
| 17274.84       | -33.76                 | 2.90      | -1.01        | -37.67         | -13.00      | H            |
| 17447.44       | -33.04                 | 3.20      | -1.08        | -37.32         | -13.00      | H            |
| 17595.09       | -33.00                 | 3.20      | -0.81        | -37.01         | -13.00      | H            |
| 17776.88       | -33.28                 | 3.20      | -0.75        | -37.23         | -13.00      | H            |
| 17925.84       | -32.29                 | 3.20      | -0.64        | -36.13         | -13.00      | H            |

**LTE Band 4, 1.4MHz, QPSK, Channel 20175**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5197.88        | -33.31                 | 1.20      | -1.95        | -36.46         | -13.00      | V            |
| 16798.41       | -33.91                 | 2.90      | -0.26        | -37.07         | -13.00      | V            |
| 17203.97       | -33.43                 | 2.90      | -1.01        | -37.34         | -13.00      | H            |
| 17398.88       | -33.26                 | 2.90      | -0.98        | -37.14         | -13.00      | H            |
| 17813.63       | -33.05                 | 3.20      | -0.84        | -37.09         | -13.00      | H            |
| 17916.66       | -32.44                 | 3.20      | -0.64        | -36.28         | -13.00      | H            |

**LTE Band 4, 1.4MHz, QPSK, Channel 20393**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5263.13        | -27.45                 | 1.20      | -2.07        | -30.72         | -13.00      | V            |
| 17357.53       | -33.10                 | 2.90      | -0.98        | -36.98         | -13.00      | H            |
| 17459.91       | -32.38                 | 3.20      | -1.08        | -36.66         | -13.00      | H            |
| 17602.97       | -32.69                 | 3.20      | -1.01        | -36.90         | -13.00      | H            |
| 17783.44       | -32.85                 | 3.20      | -0.75        | -36.80         | -13.00      | H            |
| 17924.53       | -31.80                 | 3.20      | -0.64        | -35.64         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM, Channel 19957**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17202.66       | -33.66                 | 2.90      | -1.01        | -37.57         | -13.00      | H            |
| 17352.28       | -32.23                 | 2.90      | -0.98        | -36.11         | -13.00      | H            |
| 17413.97       | -32.47                 | 3.20      | -1.08        | -36.75         | -13.00      | H            |
| 17615.44       | -33.00                 | 3.20      | -1.01        | -37.21         | -13.00      | H            |
| 17741.44       | -32.52                 | 3.20      | -0.75        | -36.47         | -13.00      | H            |
| 17914.69       | -32.88                 | 3.20      | -0.64        | -36.72         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM, Channel 20175**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5197.50        | -33.47                 | 1.20      | -1.95        | -36.62         | -13.00      | H            |
| 17198.06       | -33.89                 | 2.90      | -0.79        | -37.58         | -13.00      | H            |
| 17431.69       | -32.75                 | 3.20      | -1.08        | -37.03         | -13.00      | H            |
| 17601.00       | -33.06                 | 3.20      | -1.01        | -37.27         | -13.00      | H            |
| 17752.59       | -31.59                 | 3.20      | -0.75        | -35.54         | -13.00      | H            |
| 17928.47       | -32.36                 | 3.20      | -0.64        | -36.20         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM, Channel 20393**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5263.13        | -29.97                 | 1.20      | -2.07        | -33.24         | -13.00      | H            |
| 17363.44       | -33.22                 | 2.90      | -0.98        | -37.10         | -13.00      | H            |
| 17417.25       | -32.61                 | 3.20      | -1.08        | -36.89         | -13.00      | V            |
| 17526.19       | -33.28                 | 3.20      | -0.81        | -37.29         | -13.00      | H            |
| 17770.31       | -31.66                 | 3.20      | -0.75        | -35.61         | -13.00      | H            |
| 17920.59       | -32.64                 | 3.20      | -0.64        | -36.48         | -13.00      | H            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 5, 1.4MHz, QPSK, Channel 20407**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7553.50        | -41.03                 | 1.80      | -2.57        | -47.55        | -13.00      | V            |
| 7641.50        | -40.73                 | 1.80      | -2.58        | -47.26        | -13.00      | V            |
| 8032.00        | -41.27                 | 1.80      | -2.18        | -47.40        | -13.00      | V            |
| 8541.00        | -41.70                 | 2.00      | -1.77        | -47.62        | -13.00      | V            |
| 9296.00        | -41.89                 | 2.10      | -1.16        | -47.30        | -13.00      | V            |
| 9331.00        | -42.05                 | 2.10      | -1.12        | -47.42        | -13.00      | V            |

**LTE Band 5, 1.4MHz, QPSK, Channel 20525**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8314.50        | -41.61                 | 1.80      | -2.04        | -47.60        | -13.00      | H            |
| 8542.50        | -41.63                 | 2.00      | -1.77        | -47.55        | -13.00      | H            |
| 8738.00        | -42.04                 | 2.00      | -1.63        | -47.82        | -13.00      | H            |
| 9168.00        | -42.08                 | 2.10      | -1.36        | -47.69        | -13.00      | V            |
| 9201.00        | -42.19                 | 2.10      | -1.16        | -47.60        | -13.00      | V            |
| 9352.50        | -42.39                 | 2.10      | -1.12        | -47.76        | -13.00      | H            |

**LTE Band 5, 1.4MHz, QPSK, Channel 20643**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7632.00        | -41.03                 | 1.80      | -2.58        | -47.56        | -13.00      | V            |
| 8115.50        | -41.70                 | 1.80      | -2.15        | -47.80        | -13.00      | H            |
| 8307.00        | -41.80                 | 1.80      | -2.04        | -47.79        | -13.00      | V            |
| 8732.50        | -41.96                 | 2.00      | -1.63        | -47.74        | -13.00      | V            |
| 9114.50        | -41.36                 | 2.10      | -1.36        | -46.97        | -13.00      | V            |
| 9260.50        | -42.06                 | 2.10      | -1.16        | -47.47        | -13.00      | V            |

**LTE Band 5, 1.4MHz, 16QAM, Channel 20407**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7595.50        | -41.30                 | 1.80      | -2.57        | -47.82        | -13.00      | H            |
| 8067.50        | -41.81                 | 1.80      | -2.18        | -47.94        | -13.00      | V            |
| 8544.50        | -42.04                 | 2.00      | -1.77        | -47.96        | -13.00      | V            |
| 8669.00        | -42.23                 | 2.00      | -1.64        | -48.02        | -13.00      | V            |
| 9120.00        | -41.95                 | 2.10      | -1.36        | -47.56        | -13.00      | V            |
| 9214.50        | -42.70                 | 2.10      | -1.16        | -48.11        | -13.00      | H            |

**LTE Band 5, 1.4MHz, 16QAM, Channel 20525**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8497.00        | -42.48                 | 1.80      | -1.79        | -48.22        | -13.00      | V            |
| 8564.00        | -41.68                 | 2.00      | -1.77        | -47.60        | -13.00      | V            |
| 8733.00        | -42.28                 | 2.00      | -1.63        | -48.06        | -13.00      | V            |
| 9171.00        | -42.41                 | 2.10      | -1.36        | -48.02        | -13.00      | V            |
| 9203.00        | -42.58                 | 2.10      | -1.16        | -47.99        | -13.00      | V            |
| 9388.50        | -42.19                 | 2.10      | -1.12        | -47.56        | -13.00      | V            |

**LTE Band 5, 1.4MHz, 16QAM, Channel 20643**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8527.50        | -42.13                 | 2.00      | -1.77        | -48.05        | -13.00      | V            |
| 8560.00        | -41.87                 | 2.00      | -1.77        | -47.79        | -13.00      | H            |
| 8739.50        | -42.08                 | 2.00      | -1.63        | -47.86        | -13.00      | V            |
| 9009.50        | -42.31                 | 2.10      | -1.42        | -47.98        | -13.00      | H            |
| 9169.50        | -42.52                 | 2.10      | -1.36        | -48.13        | -13.00      | V            |
| 9411.50        | -42.87                 | 2.10      | -0.86        | -47.98        | -13.00      | V            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 7, 5 MHz, QPSK, Channel 20775**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16732.78       | -34.98                 | 2.90      | -0.26        | -38.14         | -13.00      | H            |
| 16799.06       | -34.65                 | 2.90      | -0.26        | -37.81         | -13.00      | V            |
| 17270.25       | -34.35                 | 2.90      | -1.01        | -38.26         | -13.00      | H            |
| 17436.94       | -33.23                 | 3.20      | -1.08        | -37.51         | -13.00      | H            |
| 17769.66       | -33.58                 | 3.20      | -0.75        | -37.53         | -13.00      | H            |
| 17849.72       | -32.36                 | 3.20      | -0.84        | -36.40         | -13.00      | H            |

**LTE Band 7, 5 MHz, QPSK, Channel 21100**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 7601.44        | -33.14                 | 1.80      | -2.58        | -37.52         | -13.00      | V            |
| 16791.19       | -34.46                 | 2.90      | -0.26        | -37.62         | -13.00      | V            |
| 17386.41       | -33.39                 | 2.90      | -0.98        | -37.27         | -13.00      | H            |
| 17597.06       | -32.71                 | 3.20      | -0.81        | -36.72         | -13.00      | H            |
| 17826.75       | -32.58                 | 3.20      | -0.84        | -36.62         | -13.00      | H            |
| 17927.81       | -32.92                 | 3.20      | -0.64        | -36.76         | -13.00      | H            |

**LTE Band 7, 5 MHz, QPSK, Channel 21425**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 7699.31        | -33.31                 | 1.80      | -2.58        | -37.69         | -13.00      | V            |
| 16780.69       | -34.77                 | 2.90      | -0.26        | -37.93         | -13.00      | H            |
| 17444.81       | -33.65                 | 3.20      | -1.08        | -37.93         | -13.00      | H            |
| 17606.25       | -33.87                 | 3.20      | -1.01        | -38.08         | -13.00      | H            |
| 17766.38       | -32.96                 | 3.20      | -0.75        | -36.91         | -13.00      | H            |
| 17926.50       | -32.33                 | 3.20      | -0.64        | -36.17         | -13.00      | H            |

**LTE Band 7, 5 MHz, 16QAM, Channel 20775**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16850.25       | -34.06                 | 2.90      | -0.26        | -37.22         | -13.00      | V            |
| 17143.59       | -33.62                 | 2.90      | -0.79        | -37.31         | -13.00      | H            |
| 17391.00       | -33.18                 | 2.90      | -0.98        | -37.06         | -13.00      | H            |
| 17627.91       | -32.25                 | 3.20      | -1.01        | -36.46         | -13.00      | H            |
| 17772.28       | -32.85                 | 3.20      | -0.75        | -36.80         | -13.00      | H            |
| 17929.13       | -32.59                 | 3.20      | -0.64        | -36.43         | -13.00      | H            |

**LTE Band 7, 5 MHz, 16QAM, Channel 21100**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17205.94       | -33.46                 | 2.90      | -1.01        | -37.37         | -13.00      | H            |
| 17280.09       | -33.04                 | 2.90      | -1.01        | -36.95         | -13.00      | H            |
| 17456.63       | -32.80                 | 3.20      | -1.08        | -37.08         | -13.00      | H            |
| 17599.69       | -31.81                 | 3.20      | -0.81        | -35.82         | -13.00      | H            |
| 17818.88       | -32.80                 | 3.20      | -0.84        | -36.84         | -13.00      | H            |
| 17923.22       | -31.39                 | 3.20      | -0.64        | -35.23         | -13.00      | H            |

**LTE Band 7, 5 MHz, 16QAM, Channel 21425**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17205.94       | -32.83                 | 2.90      | -1.01        | -36.74         | -13.00      | H            |
| 17314.88       | -33.60                 | 2.90      | -0.98        | -37.48         | -13.00      | H            |
| 17451.38       | -32.41                 | 3.20      | -1.08        | -36.69         | -13.00      | H            |
| 17618.06       | -33.07                 | 3.20      | -1.01        | -37.28         | -13.00      | H            |
| 17768.34       | -33.07                 | 3.20      | -0.75        | -37.02         | -13.00      | H            |
| 17922.56       | -32.15                 | 3.20      | -0.64        | -35.99         | -13.00      | H            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 12, 1.4MHz, QPSK, Channel 23017**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 1399.46        | -48.43                 | 3.56      | -4.98        | -49.16        | -13.00      | V            |
| 2099.57        | -52.53                 | 4.40      | -4.90        | -54.18        | -13.00      | V            |
| 2799.19        | -48.50                 | 5.04      | -6.64        | -49.05        | -13.00      | V            |
| 3498.91        | -46.41                 | 5.69      | -8.20        | -46.05        | -13.00      | H            |
| 4198.80        | -54.70                 | 6.23      | -9.10        | -53.98        | -13.00      | V            |
| 4954.21        | -61.17                 | 6.73      | -9.85        | -60.20        | -13.00      | V            |

**LTE Band 12, 1.4MHz, QPSK, Channel 23095**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 2122.77        | -45.28                 | 4.41      | -4.97        | -46.87        | -13.00      | V            |
| 2830.33        | -42.31                 | 5.07      | -6.69        | -42.84        | -13.00      | V            |
| 3537.93        | -43.94                 | 5.75      | -8.25        | -43.59        | -13.00      | H            |
| 4245.46        | -50.85                 | 6.25      | -9.15        | -50.10        | -13.00      | V            |
| 4953.35        | -54.63                 | 6.73      | -9.85        | -53.66        | -13.00      | V            |
| 5660.71        | -51.77                 | 7.19      | -10.57       | -50.54        | -13.00      | H            |

**LTE Band 12, 1.4MHz, QPSK, Channel 23173**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 1430.81        | -55.19                 | 3.61      | -5.14        | -55.81        | -13.00      | V            |
| 2145.91        | -52.88                 | 4.41      | -5.04        | -54.40        | -13.00      | V            |
| 2861.60        | -41.79                 | 5.10      | -6.75        | -42.29        | -13.00      | V            |
| 3576.91        | -44.93                 | 5.70      | -8.31        | -44.47        | -13.00      | H            |
| 4292.13        | -49.10                 | 6.29      | -9.19        | -48.35        | -13.00      | V            |
| 5008.06        | -53.60                 | 6.78      | -9.91        | -52.62        | -13.00      | V            |

**LTE Band 12, 1.4MHz, 16QAM, Channel 23017**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 1399.42        | -47.64                 | 3.56      | -4.98        | -48.37        | -13.00      | V            |
| 2099.55        | -43.16                 | 4.40      | -4.90        | -44.81        | -13.00      | V            |
| 2798.84        | -49.59                 | 5.04      | -6.64        | -50.14        | -13.00      | V            |
| 4198.56        | -56.95                 | 6.23      | -9.10        | -56.23        | -13.00      | H            |
| 4898.18        | -55.35                 | 6.73      | -9.80        | -54.43        | -13.00      | V            |
| 5598.14        | -54.30                 | 7.17      | -10.58       | -53.04        | -13.00      | H            |

**LTE Band 12, 1.4MHz 16QAM, Channel 23095**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 2122.82        | -51.63                 | 4.41      | -4.97        | -53.22        | -13.00      | V            |
| 2830.60        | -43.94                 | 5.07      | -6.70        | -44.46        | -13.00      | V            |
| 3537.91        | -43.78                 | 5.75      | -8.25        | -43.43        | -13.00      | H            |
| 4245.86        | -50.65                 | 6.25      | -9.15        | -49.90        | -13.00      | V            |
| 4952.62        | -53.73                 | 6.73      | -9.85        | -52.76        | -13.00      | V            |
| 5660.76        | -51.51                 | 7.19      | -10.57       | -50.28        | -13.00      | H            |

**LTE Band 12, 1.4MHz, 16QAM, Channel 23173**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 1430.60        | -54.82                 | 3.60      | -5.14        | -55.43        | -13.00      | V            |
| 2146.19        | -51.92                 | 4.41      | -5.04        | -53.44        | -13.00      | V            |
| 2861.85        | -44.48                 | 5.10      | -6.75        | -44.98        | -13.00      | V            |
| 3576.70        | -46.01                 | 5.70      | -8.31        | -45.55        | -13.00      | H            |
| 4292.61        | -51.37                 | 6.28      | -9.19        | -50.61        | -13.00      | V            |
| 5007.75        | -53.93                 | 6.78      | -9.91        | -52.95        | -13.00      | V            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 13, 5 MHz, QPSK, Channel 23205**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8590.50        | -41.41                 | 2.00      | -1.77        | -47.33        | -13.00      | H            |
| 8940.50        | -41.99                 | 2.10      | -1.58        | -47.82        | -13.00      | V            |
| 9072.50        | -42.09                 | 2.10      | -1.42        | -47.76        | -13.00      | V            |
| 9169.00        | -41.80                 | 2.10      | -1.36        | -47.41        | -13.00      | V            |
| 9265.00        | -42.12                 | 2.10      | -1.16        | -47.53        | -13.00      | H            |
| 9370.00        | -41.84                 | 2.10      | -1.12        | -47.21        | -13.00      | V            |

**LTE Band 13, 5 MHz, QPSK, Channel 23230**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8646.00        | -42.02                 | 2.00      | -1.64        | -47.81        | -13.00      | V            |
| 8688.50        | -42.21                 | 2.00      | -1.64        | -48.00        | -13.00      | V            |
| 8792.00        | -42.11                 | 2.00      | -1.63        | -47.89        | -13.00      | H            |
| 9165.00        | -42.29                 | 2.10      | -1.36        | -47.90        | -13.00      | H            |
| 9273.50        | -42.07                 | 2.10      | -1.16        | -47.48        | -13.00      | H            |
| 9626.50        | -43.03                 | 2.10      | -0.66        | -47.94        | -13.00      | V            |

**LTE Band 13, 5 MHz, QPSK, Channel 23255**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8718.50        | -41.88                 | 2.00      | -1.63        | -47.66        | -13.00      | H            |
| 9180.00        | -42.57                 | 2.10      | -1.36        | -48.18        | -13.00      | V            |
| 9219.00        | -41.64                 | 2.10      | -1.16        | -47.05        | -13.00      | H            |
| 9351.00        | -41.96                 | 2.10      | -1.12        | -47.33        | -13.00      | H            |
| 9836.50        | -43.41                 | 2.20      | -0.38        | -48.14        | -13.00      | V            |
| 9978.50        | -43.39                 | 2.20      | -0.40        | -48.14        | -13.00      | V            |

**LTE Band 13, 5 MHz, 16QAM, Channel 23205**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 4663.88        | -41.30                 | 1.30      | -1.44        | -46.19        | -13.00      | V            |
| 5441.25        | -38.66                 | 1.30      | -2.28        | -44.39        | -13.00      | V            |
| 8597.00        | -41.83                 | 2.00      | -1.77        | -47.75        | -13.00      | V            |
| 9164.00        | -42.00                 | 2.10      | -1.36        | -47.61        | -13.00      | V            |
| 9255.50        | -41.81                 | 2.10      | -1.16        | -47.22        | -13.00      | H            |
| 9918.00        | -43.07                 | 2.20      | -0.40        | -47.82        | -13.00      | H            |

**LTE Band 13, 5 MHz, 16QAM, Channel 23230**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8736.00        | -41.64                 | 2.00      | -1.63        | -47.42        | -13.00      | V            |
| 9186.00        | -41.96                 | 2.10      | -1.36        | -47.57        | -13.00      | V            |
| 9200.50        | -40.96                 | 2.10      | -1.16        | -46.37        | -13.00      | V            |
| 9353.00        | -42.20                 | 2.10      | -0.92        | -47.37        | -13.00      | H            |
| 9788.50        | -42.88                 | 2.20      | -0.71        | -47.94        | -13.00      | H            |
| 9910.00        | -43.16                 | 2.20      | -0.40        | -47.91        | -13.00      | V            |

**LTE Band 13, 5 MHz, 16QAM, Channel 23255**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8261.00        | -41.80                 | 1.80      | -1.90        | -47.65        | -13.00      | V            |
| 8736.50        | -41.96                 | 2.00      | -1.63        | -47.74        | -13.00      | V            |
| 8782.00        | -40.99                 | 2.00      | -1.63        | -46.77        | -13.00      | V            |
| 9222.50        | -41.52                 | 2.10      | -1.16        | -46.93        | -13.00      | H            |
| 9409.50        | -42.31                 | 2.10      | -0.86        | -47.42        | -13.00      | V            |
| 9984.00        | -43.09                 | 2.20      | -0.40        | -47.84        | -13.00      | H            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 17, 5 MHz, QPSK, Channel 23755**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 1413.13        | -56.69                 | 3.57      | -5.05        | -57.36        | -13.00      | V            |
| 2119.85        | -53.09                 | 4.39      | -4.96        | -54.67        | -13.00      | V            |
| 2826.73        | -43.91                 | 5.07      | -6.69        | -44.44        | -13.00      | V            |
| 3533.42        | -49.93                 | 5.74      | -8.25        | -49.57        | -13.00      | V            |
| 4279.89        | -61.12                 | 6.29      | -9.18        | -60.38        | -13.00      | H            |
| 4946.85        | -54.69                 | 6.74      | -9.85        | -53.73        | -13.00      | V            |

**LTE Band 17, 5 MHz, QPSK, Channel 23790**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 2130.54        | -48.15                 | 4.40      | -4.99        | -49.71        | -13.00      | V            |
| 2840.65        | -46.08                 | 5.09      | -6.71        | -46.61        | -13.00      | V            |
| 3550.50        | -52.19                 | 5.71      | -8.27        | -51.78        | -13.00      | V            |
| 4261.32        | -53.37                 | 6.26      | -9.16        | -52.62        | -13.00      | V            |
| 4971.41        | -55.31                 | 6.74      | -9.87        | -54.33        | -13.00      | V            |
| 5681.07        | -54.91                 | 7.19      | -10.56       | -53.69        | -13.00      | H            |

**LTE Band 17, 5 MHz, QPSK, Channel 23825**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 1427.29        | -51.42                 | 3.59      | -5.12        | -52.04        | -13.00      | V            |
| 2140.98        | -53.44                 | 4.41      | -5.02        | -54.98        | -13.00      | V            |
| 2854.89        | -44.36                 | 5.11      | -6.74        | -44.88        | -13.00      | V            |
| 3568.84        | -46.72                 | 5.69      | -8.30        | -46.26        | -13.00      | V            |
| 4282.29        | -51.99                 | 6.29      | -9.18        | -51.25        | -13.00      | V            |
| 5001.01        | -61.16                 | 6.79      | -9.90        | -60.20        | -13.00      | V            |

**LTE Band 17, 5 MHz, 16QAM, Channel 23755**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 1413.48        | -59.26                 | 3.56      | -5.05        | -59.92        | -13.00      | V            |
| 2120.03        | -52.08                 | 4.39      | -4.96        | -53.66        | -13.00      | V            |
| 2827.02        | -49.62                 | 5.07      | -6.69        | -50.15        | -13.00      | V            |
| 3533.40        | -51.38                 | 5.74      | -8.25        | -51.02        | -13.00      | H            |
| 3550.50        | -52.19                 | 5.71      | -8.27        | -51.78        | -13.00      | V            |
| 4261.32        | -53.91                 | 6.26      | -9.16        | -53.16        | -13.00      | V            |

**LTE Band 17, 5 MHz, 16QAM, Channel 23790**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 2130.66        | -48.23                 | 4.40      | -4.99        | -49.79        | -13.00      | V            |
| 2840.81        | -49.12                 | 5.09      | -6.71        | -49.65        | -13.00      | V            |
| 3550.84        | -51.90                 | 5.71      | -8.27        | -51.49        | -13.00      | V            |
| 4260.85        | -53.38                 | 6.26      | -9.16        | -52.63        | -13.00      | V            |
| 4970.91        | -55.44                 | 6.74      | -9.87        | -54.46        | -13.00      | V            |
| 5665.32        | -59.93                 | 7.19      | -10.57       | -58.70        | -13.00      | H            |

**LTE Band 17, 5 MHz, 16QAM, Channel 23825**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 1427.30        | -51.52                 | 3.59      | -5.12        | -52.14        | -13.00      | V            |
| 2140.92        | -57.82                 | 4.41      | -5.02        | -59.36        | -13.00      | V            |
| 2854.46        | -43.62                 | 5.11      | -6.74        | -44.14        | -13.00      | V            |
| 3568.30        | -49.87                 | 5.69      | -8.30        | -49.41        | -13.00      | V            |
| 4351.25        | -60.09                 | 6.36      | -9.25        | -59.35        | -13.00      | H            |
| 5062.10        | -60.24                 | 6.75      | -9.99        | -59.15        | -13.00      | V            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 25, 1.4MHz, QPSK, Channel 26047**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5552.63        | -28.92                 | 1.30      | -2.64        | -32.86         | -13.00      | V            |
| 17213.16       | -32.86                 | 2.90      | -1.01        | -36.77         | -13.00      | H            |
| 17415.94       | -32.70                 | 3.20      | -1.08        | -36.98         | -13.00      | H            |
| 17618.72       | -32.68                 | 3.20      | -1.01        | -36.89         | -13.00      | H            |
| 17777.53       | -32.46                 | 3.20      | -0.75        | -36.41         | -13.00      | H            |
| 17849.72       | -32.43                 | 3.20      | -0.84        | -36.47         | -13.00      | H            |

**LTE Band 25, 1.4MHz, QPSK, Channel 26365**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5647.50        | -25.24                 | 1.30      | -2.54        | -29.08         | -13.00      | V            |
| 16956.56       | -34.01                 | 2.90      | -0.50        | -37.41         | -13.00      | H            |
| 17464.50       | -32.81                 | 3.20      | -1.08        | -37.09         | -13.00      | H            |
| 17601.00       | -32.85                 | 3.20      | -1.01        | -37.06         | -13.00      | H            |
| 17795.91       | -32.88                 | 3.20      | -0.75        | -36.83         | -13.00      | H            |
| 17927.81       | -31.96                 | 3.20      | -0.64        | -35.80         | -13.00      | H            |

**LTE Band 25, 1.4MHz, QPSK, Channel 26683**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5742.75        | -23.21                 | 1.50      | -2.73        | -27.44         | -13.00      | V            |
| 16705.88       | -33.83                 | 2.90      | -0.26        | -36.99         | -13.00      | V            |
| 16812.84       | -32.83                 | 2.90      | -0.26        | -35.99         | -13.00      | H            |
| 17438.91       | -32.01                 | 3.20      | -1.08        | -36.29         | -13.00      | V            |
| 17805.75       | -32.55                 | 3.20      | -0.84        | -36.59         | -13.00      | V            |
| 17916.00       | -32.66                 | 3.20      | -0.64        | -36.50         | -13.00      | H            |

**LTE Band 25, 1.4MHz, 16QAM, Channel 26047**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5551.88        | -27.72                 | 1.30      | -2.64        | -31.66         | -13.00      | V            |
| 17353.59       | -33.60                 | 2.90      | -0.98        | -37.48         | -13.00      | H            |
| 17443.50       | -32.56                 | 3.20      | -1.08        | -36.84         | -13.00      | H            |
| 17635.78       | -33.24                 | 3.20      | -1.01        | -37.45         | -13.00      | H            |
| 17773.59       | -33.00                 | 3.20      | -0.75        | -36.95         | -13.00      | H            |
| 17923.88       | -32.18                 | 3.20      | -0.64        | -36.02         | -13.00      | H            |

**LTE Band 25, 1.4MHz, 16QAM, Channel 26365**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5647.88        | -25.77                 | 1.30      | -2.54        | -29.61         | -13.00      | V            |
| 16800.38       | -34.03                 | 2.90      | -0.26        | -37.19         | -13.00      | H            |
| 17200.69       | -32.76                 | 2.90      | -1.01        | -36.67         | -13.00      | H            |
| 17436.28       | -32.85                 | 3.20      | -1.08        | -37.13         | -13.00      | H            |
| 17774.91       | -32.48                 | 3.20      | -0.75        | -36.43         | -13.00      | H            |
| 17922.56       | -31.48                 | 3.20      | -0.64        | -35.32         | -13.00      | H            |

**LTE Band 25, 1.4MHz, 16QAM, Channel 26683**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5742.75        | -23.20                 | 1.50      | -2.73        | -27.43         | -13.00      | V            |
| 17151.47       | -33.11                 | 2.90      | -0.79        | -36.80         | -13.00      | H            |
| 17365.41       | -33.14                 | 2.90      | -0.98        | -37.02         | -13.00      | H            |
| 17379.84       | -33.45                 | 2.90      | -0.98        | -37.33         | -13.00      | H            |
| 17769.66       | -32.70                 | 3.20      | -0.75        | -36.65         | -13.00      | H            |
| 17925.19       | -31.67                 | 3.20      | -0.64        | -35.51         | -13.00      | H            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 26, 1.4MHz, QPSK, Channel 26697**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8635.00        | -42.19                 | 2.00      | -1.64        | -45.83        | -13.00      | V            |
| 8724.00        | -42.03                 | 2.00      | -1.63        | -45.66        | -13.00      | H            |
| 8975.00        | -42.22                 | 2.10      | -1.58        | -45.90        | -13.00      | V            |
| 9201.00        | -42.16                 | 2.10      | -1.16        | -45.42        | -13.00      | V            |
| 9394.00        | -42.10                 | 2.10      | -1.12        | -45.32        | -13.00      | V            |
| 9898.50        | -42.95                 | 2.20      | -0.38        | -45.53        | -13.00      | V            |

**LTE Band 26, 1.4MHz, QPSK, Channel 26865**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8643.50        | -41.27                 | 2.00      | -1.64        | -44.91        | -13.00      | V            |
| 8728.50        | -41.73                 | 2.00      | -1.63        | -45.36        | -13.00      | H            |
| 9163.50        | -42.15                 | 2.10      | -1.36        | -45.61        | -13.00      | V            |
| 9282.00        | -41.98                 | 2.10      | -1.16        | -45.24        | -13.00      | V            |
| 9316.50        | -42.11                 | 2.10      | -1.12        | -45.33        | -13.00      | V            |
| 9930.00        | -43.30                 | 2.20      | -0.40        | -45.90        | -13.00      | V            |

**LTE Band 26, 1.4MHz, QPSK, Channel 27033**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8496.00        | -42.08                 | 1.80      | -1.79        | -45.67        | -13.00      | V            |
| 8680.00        | -41.48                 | 2.00      | -1.64        | -45.12        | -13.00      | H            |
| 9157.00        | -41.69                 | 2.10      | -1.36        | -45.15        | -13.00      | H            |
| 9263.50        | -41.93                 | 2.10      | -1.16        | -45.19        | -13.00      | V            |
| 9328.50        | -42.38                 | 2.10      | -1.12        | -45.60        | -13.00      | V            |
| 9930.50        | -42.70                 | 2.20      | -0.40        | -45.30        | -13.00      | H            |

**LTE Band 26, 1.4MHz, 16QAM, Channel 26697**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8064.50        | -42.02                 | 1.80      | -2.18        | -46.00        | -13.00      | V            |
| 8253.00        | -42.19                 | 1.80      | -1.90        | -45.89        | -13.00      | V            |
| 8499.00        | -42.58                 | 1.80      | -1.79        | -46.17        | -13.00      | H            |
| 8555.00        | -41.81                 | 2.00      | -1.77        | -45.58        | -13.00      | V            |
| 9249.50        | -42.73                 | 2.10      | -1.16        | -45.99        | -13.00      | H            |
| 9419.50        | -42.85                 | 2.10      | -0.86        | -45.81        | -13.00      | H            |

**LTE Band 26, 1.4MHz, 16QAM, Channel 26865**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7579.50        | -41.39                 | 1.80      | -2.57        | -45.76        | -13.00      | V            |
| 7619.00        | -41.51                 | 1.80      | -2.58        | -45.89        | -13.00      | H            |
| 8591.50        | -41.97                 | 2.00      | -1.77        | -45.74        | -13.00      | V            |
| 9167.00        | -42.09                 | 2.10      | -1.36        | -45.55        | -13.00      | V            |
| 9255.50        | -41.93                 | 2.10      | -1.16        | -45.19        | -13.00      | H            |
| 9356.00        | -42.24                 | 2.10      | -1.12        | -45.46        | -13.00      | V            |

**LTE Band 26, 1.4MHz, 16QAM, Channel 27033**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7087.00        | -40.91                 | 1.80      | -2.85        | -45.56        | -13.00      | V            |
| 8262.00        | -41.40                 | 1.80      | -1.90        | -45.10        | -13.00      | V            |
| 9121.00        | -41.68                 | 2.10      | -1.36        | -45.14        | -13.00      | V            |
| 9247.00        | -42.22                 | 2.10      | -1.16        | -45.48        | -13.00      | H            |
| 9743.00        | -42.84                 | 2.10      | -0.71        | -45.65        | -13.00      | V            |
| 9892.00        | -42.90                 | 2.20      | -0.38        | -45.48        | -13.00      | V            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

**LTE Band 38, 5 MHz, QPSK, Channel 37775**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 12851.06       | -32.30                 | 2.50      | 1.51         | -33.29         | -13.00      | V            |
| 17207.25       | -33.52                 | 2.90      | -1.01        | -37.43         | -13.00      | H            |
| 17429.06       | -32.59                 | 3.20      | -1.08        | -36.87         | -13.00      | H            |
| 17620.69       | -32.53                 | 3.20      | -1.01        | -36.74         | -13.00      | H            |
| 17797.22       | -33.05                 | 3.20      | -0.75        | -37.00         | -13.00      | V            |
| 17928.47       | -32.33                 | 3.20      | -0.64        | -36.17         | -13.00      | H            |

**LTE Band 38, 5 MHz, QPSK, Channel 38000**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5185.88        | -32.92                 | 1.20      | -1.95        | -36.07         | -13.00      | V            |
| 7778.63        | -30.84                 | 1.80      | -2.53        | -35.17         | -13.00      | V            |
| 12963.94       | -33.70                 | 2.50      | 1.51         | -34.69         | -13.00      | V            |
| 16804.97       | -34.46                 | 2.90      | -0.26        | -37.62         | -13.00      | H            |
| 17600.34       | -33.47                 | 3.20      | -1.01        | -37.68         | -13.00      | H            |
| 17912.72       | -33.28                 | 3.20      | -0.64        | -37.12         | -13.00      | H            |

**LTE Band 38, 5 MHz, QPSK, Channel 38225**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5230.88        | -32.60                 | 1.20      | -2.07        | -35.87         | -13.00      | H            |
| 7845.28        | -32.42                 | 1.80      | -2.45        | -36.67         | -13.00      | H            |
| 13076.81       | -34.91                 | 2.50      | 1.61         | -35.80         | -13.00      | V            |
| 16802.34       | -34.71                 | 2.90      | -0.26        | -37.87         | -13.00      | H            |
| 17757.84       | -33.22                 | 3.20      | -0.75        | -37.17         | -13.00      | H            |
| 17923.88       | -32.71                 | 3.20      | -0.64        | -36.55         | -13.00      | H            |

**LTE Band 38, 5 MHz, 16QAM, Channel 37775**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 7711.13        | -31.62                 | 1.80      | -2.53        | -35.95         | -13.00      | V            |
| 12851.06       | -34.82                 | 2.50      | 1.51         | -35.81         | -13.00      | H            |
| 17195.44       | -33.14                 | 2.90      | -0.79        | -36.83         | -13.00      | H            |
| 17448.75       | -31.72                 | 3.20      | -1.08        | -36.00         | -13.00      | H            |
| 17615.44       | -32.63                 | 3.20      | -1.01        | -36.84         | -13.00      | H            |
| 17933.06       | -32.35                 | 3.20      | -0.64        | -36.19         | -13.00      | H            |

**LTE Band 38, 5 MHz, 16QAM, Channel 38000**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5185.88        | -32.87                 | 1.20      | -1.95        | -36.02         | -13.00      | H            |
| 7778.63        | -31.63                 | 1.80      | -2.53        | -35.96         | -13.00      | H            |
| 12963.94       | -34.50                 | 2.50      | 1.51         | -35.49         | -13.00      | V            |
| 17620.69       | -32.51                 | 3.20      | -1.01        | -36.72         | -13.00      | H            |
| 17774.91       | -32.50                 | 3.20      | -0.75        | -36.45         | -13.00      | H            |
| 17929.78       | -32.26                 | 3.20      | -0.64        | -36.10         | -13.00      | H            |

**LTE Band 38, 5 MHz, 16QAM, Channel 38225**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5230.88        | -32.65                 | 1.20      | -2.07        | -35.92         | -13.00      | H            |
| 7845.28        | -31.86                 | 1.80      | -2.45        | -36.11         | -13.00      | H            |
| 13076.81       | -34.39                 | 2.50      | 1.61         | -35.28         | -13.00      | V            |
| 17436.28       | -32.89                 | 3.20      | -1.08        | -37.17         | -13.00      | H            |
| 17775.56       | -33.21                 | 3.20      | -0.75        | -37.16         | -13.00      | H            |
| 17925.19       | -32.75                 | 3.20      | -0.64        | -36.59         | -13.00      | H            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.2$  dB,  $k = 2$ .

### **A.3 FREQUENCY STABILITY**

#### **Reference**

FCC: CFR Part 2.1055, 22.235, 24.235, 27.54.

#### **A.4.1 Method of Measurement**

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30°C.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C increments from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

#### **A.4.2 Measurement Limit**

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d) (2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.6VDC and 4.35VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance from -5.4% to 10.8%. For the purposes of measuring frequency stability these voltage limits are to be used.

#### A.4.3 Measurement results

##### LTE Band 2, 1.4MHz bandwidth (worst case of all bandwidths)

###### Frequency Error vs Voltage

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | 18                   | 15    | 0.010                 | 0.008 |
| 3.8            | 6                    | 25    | 0.003                 | 0.013 |
| 4.35           | 10                   | 18    | 0.005                 | 0.010 |

###### Frequency Error vs Temperature

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 22                   | 22    | 0.012                 | 0.012 |
| -20°                | 15                   | 33    | 0.008                 | 0.018 |
| -10°                | 14                   | 24    | 0.007                 | 0.013 |
| 0°                  | 9                    | 11    | 0.005                 | 0.006 |
| 10°                 | 3                    | 8     | 0.002                 | 0.004 |
| 20°                 | -1                   | 5     | 0.001                 | 0.003 |
| 30°                 | -10                  | 16    | 0.005                 | 0.009 |
| 40°                 | 25                   | 28    | 0.013                 | 0.015 |
| 50°                 | 38                   | -8    | 0.020                 | 0.004 |

##### LTE Band 4, 1.4MHz bandwidth (worst case of all bandwidths)

###### Frequency Error vs Voltage

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | -10                  | -8    | 0.006                 | 0.005 |
| 3.8            | 2                    | -6    | 0.001                 | 0.003 |
| 4.35           | 18                   | 11    | 0.010                 | 0.006 |

###### Frequency Error vs Temperature

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | -8                   | 8     | 0.005                 | 0.005 |
| -20°                | 11                   | 24    | 0.006                 | 0.014 |
| -10°                | 25                   | -6    | 0.014                 | 0.003 |
| 0°                  | 26                   | 12    | 0.015                 | 0.007 |
| 10°                 | 33                   | -7    | 0.019                 | 0.004 |
| 20°                 | 7                    | 11    | 0.004                 | 0.006 |
| 30°                 | 11                   | -10   | 0.006                 | 0.006 |
| 40°                 | 6                    | -8    | 0.003                 | 0.005 |
| 50°                 | -24                  | -1    | 0.014                 | 0.001 |

**LTE Band 5, 1.4MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | -11                  | 22    | 0.013                 | 0.026 |
| 3.8            | 8                    | 14    | 0.010                 | 0.017 |
| 4.35           | 22                   | 8     | 0.026                 | 0.010 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 14                   | 5     | 0.017                 | 0.006 |
| -20°                | 25                   | 7     | 0.030                 | 0.008 |
| -10°                | 8                    | 1     | 0.010                 | 0.001 |
| 0°                  | 17                   | -2    | 0.020                 | 0.002 |
| 10°                 | 22                   | 3     | 0.026                 | 0.004 |
| 20°                 | 26                   | 11    | 0.031                 | 0.013 |
| 30°                 | 31                   | 12    | 0.037                 | 0.014 |
| 40°                 | 9                    | 15    | 0.011                 | 0.018 |
| 50°                 | 18                   | 20    | 0.022                 | 0.024 |

**LTE Band 7, 10MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | 36                   | -8    | 0.014                 | 0.003 |
| 3.8            | 11                   | -5    | 0.004                 | 0.002 |
| 4.35           | -15                  | 21    | 0.006                 | 0.008 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 9                    | -3    | 0.004                 | 0.001 |
| -20°                | -6                   | -9    | 0.002                 | 0.004 |
| -10°                | 11                   | 11    | 0.004                 | 0.004 |
| 0°                  | -24                  | 15    | 0.009                 | 0.006 |
| 10°                 | 18                   | 24    | 0.007                 | 0.009 |
| 20°                 | 25                   | -7    | 0.010                 | 0.003 |
| 30°                 | 39                   | -1    | 0.015                 | 0.000 |
| 40°                 | 49                   | 2     | 0.019                 | 0.001 |
| 50°                 | 8                    | -15   | 0.003                 | 0.006 |

**LTE Band 12, 1.4MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | -2                   | 7     | 0.003                 | 0.010 |
| 3.8            | 12                   | 15    | 0.017                 | 0.021 |
| 4.35           | -7                   | 24    | 0.010                 | 0.034 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 6                    | -9    | 0.008                 | 0.013 |
| -20°                | 18                   | 3     | 0.025                 | 0.004 |
| -10°                | 25                   | 6     | 0.035                 | 0.008 |
| 0°                  | 11                   | 14    | 0.016                 | 0.020 |
| 10°                 | 6                    | 11    | 0.008                 | 0.016 |
| 20°                 | 8                    | -1    | 0.011                 | 0.001 |
| 30°                 | 11                   | 2     | 0.016                 | 0.003 |
| 40°                 | -3                   | 15    | 0.004                 | 0.021 |
| 50°                 | -9                   | 19    | 0.013                 | 0.027 |

**LTE Band 13, 10MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | 14                   | 8     | 0.018                 | 0.010 |
| 3.8            | 6                    | 15    | 0.008                 | 0.019 |
| 4.35           | 3                    | 29    | 0.004                 | 0.037 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 11                   | 33    | 0.014                 | 0.042 |
| -20°                | 8                    | 26    | 0.010                 | 0.033 |
| -10°                | 4                    | 15    | 0.005                 | 0.019 |
| 0°                  | 4                    | 9     | 0.005                 | 0.012 |
| 10°                 | 3                    | 4     | 0.004                 | 0.005 |
| 20°                 | 12                   | 15    | 0.015                 | 0.019 |
| 30°                 | 9                    | 11    | 0.012                 | 0.014 |
| 40°                 | 7                    | 24    | 0.009                 | 0.031 |
| 50°                 | 13                   | 38    | 0.017                 | 0.049 |

**LTE Band 17, 10MHz bandwidth (worst case of all bandwidths)**

**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | 22                   | 8     | 0.031                 | 0.011 |
| 3.8            | 35                   | 14    | 0.049                 | 0.020 |
| 4.35           | -6                   | 9     | 0.008                 | 0.013 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 24                   | 22    | 0.034                 | 0.031 |
| -20°                | 33                   | 31    | 0.046                 | 0.044 |
| -10°                | 21                   | 16    | 0.030                 | 0.023 |
| 0°                  | 18                   | 9     | 0.025                 | 0.013 |
| 10°                 | 9                    | 27    | 0.013                 | 0.038 |
| 20°                 | 15                   | 24    | 0.021                 | 0.034 |
| 30°                 | 28                   | 11    | 0.039                 | 0.015 |
| 40°                 | 49                   | 7     | 0.069                 | 0.010 |
| 50°                 | 44                   | 25    | 0.062                 | 0.035 |

**LTE Band 25, 10MHz bandwidth (worst case of all bandwidths)**

**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | 15                   | 9     | 0.008                 | 0.005 |
| 3.8            | 18                   | 17    | 0.010                 | 0.009 |
| 4.35           | 22                   | 5     | 0.012                 | 0.003 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 6                    | 17    | 0.003                 | 0.009 |
| -20°                | -3                   | 23    | 0.002                 | 0.012 |
| -10°                | 17                   | 24    | 0.009                 | 0.013 |
| 0°                  | -8                   | -2    | 0.004                 | 0.001 |
| 10°                 | 12                   | 5     | 0.006                 | 0.003 |
| 20°                 | 15                   | 21    | 0.008                 | 0.011 |
| 30°                 | 29                   | 13    | 0.015                 | 0.007 |
| 40°                 | 37                   | 3     | 0.020                 | 0.002 |
| 50°                 | 51                   | 22    | 0.027                 | 0.012 |

**LTE Band 26, 10MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | 14                   | 14    | 0.017                 | 0.017 |
| 3.8            | 24                   | 9     | 0.029                 | 0.011 |
| 4.35           | 25                   | 28    | 0.030                 | 0.034 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 44                   | 19    | 0.053                 | 0.023 |
| -20°                | 15                   | 5     | 0.018                 | 0.006 |
| -10°                | -3                   | -1    | 0.004                 | 0.001 |
| 0°                  | -9                   | 2     | 0.011                 | 0.002 |
| 10°                 | -15                  | -16   | 0.018                 | 0.019 |
| 20°                 | -11                  | 21    | 0.013                 | 0.025 |
| 30°                 | 5                    | 17    | 0.006                 | 0.020 |
| 40°                 | 7                    | 18    | 0.008                 | 0.022 |
| 50°                 | 14                   | 22    | 0.017                 | 0.026 |

**LTE Band 38, 10MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 3.6            | 11                   | 18    | 0.004                 | 0.007 |
| 3.8            | -4                   | 3     | 0.002                 | 0.001 |
| 4.35           | -10                  | 11    | 0.004                 | 0.004 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 25                   | 11    | 0.010                 | 0.004 |
| -20°                | 33                   | 21    | 0.013                 | 0.008 |
| -10°                | 26                   | 19    | 0.010                 | 0.007 |
| 0°                  | 18                   | 28    | 0.007                 | 0.011 |
| 10°                 | 19                   | 36    | 0.007                 | 0.014 |
| 20°                 | 25                   | 34    | 0.010                 | 0.013 |
| 30°                 | 28                   | 49    | 0.011                 | 0.019 |
| 40°                 | 36                   | 8     | 0.014                 | 0.003 |
| 50°                 | 45                   | 27    | 0.017                 | 0.010 |

Expanded measurement uncertainty for this test item is 10 Hz,  $k = 2$ .

## **A.4 OCCUPIED BANDWIDTH**

### **Reference**

FCC: CFR Part 2.1049(h)(i)

#### **A.4.1 Occupied Bandwidth Results**

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

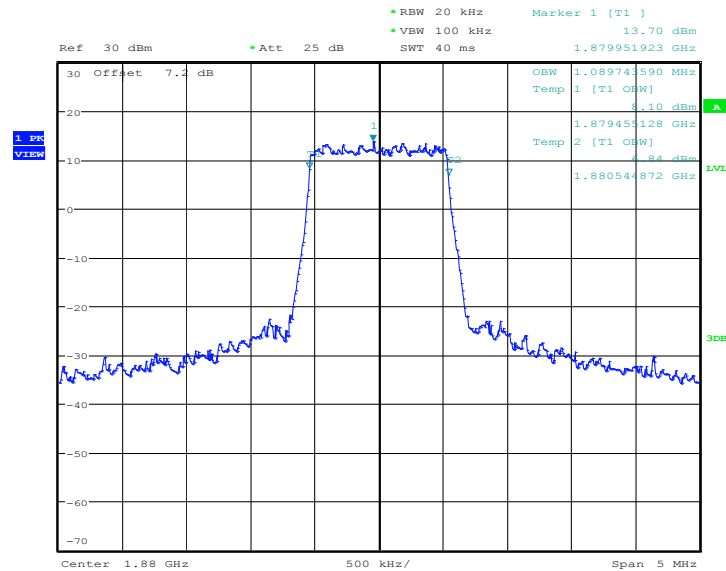
The measurement method is from KDB 971168 4.2:

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least  $10\log(\text{OBW} / \text{RBW})$  below the reference level.
- d) Set the detection mode to peak, and the trace mode to max hold.
- e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

### LTE band 2, 1.4MHz (99%)

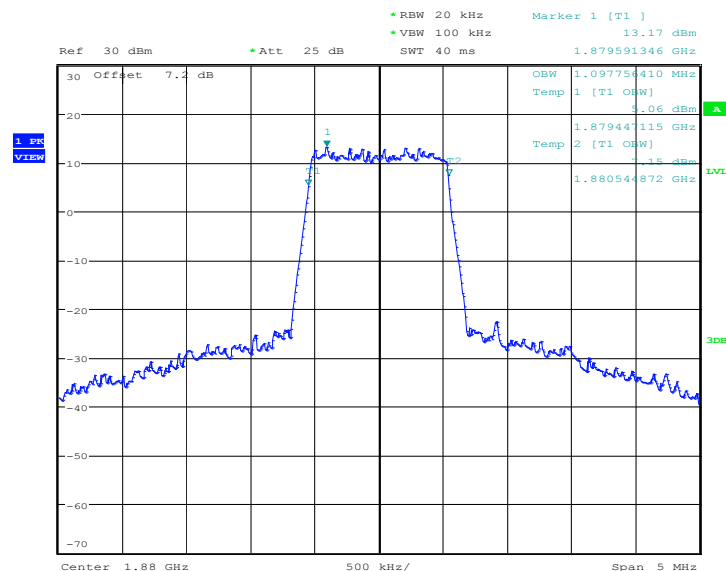
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1880.0         | QPSK                           | 16QAM   |
|                | 1089.74                        | 1097.76 |

### LTE band 2, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 01:31:46

### LTE band 2, 1.4MHz Bandwidth, 16QAM (99% BW)

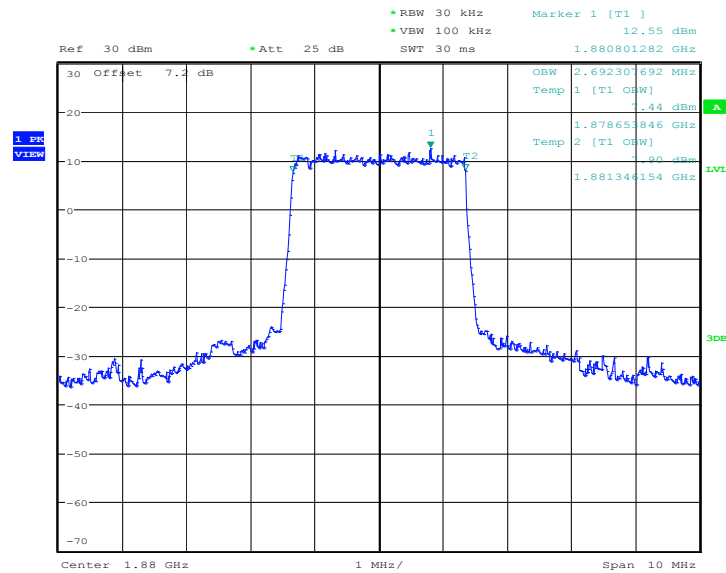


Date: 15.FEB.2017 01:34:12

### LTE band 2, 3MHz (99%)

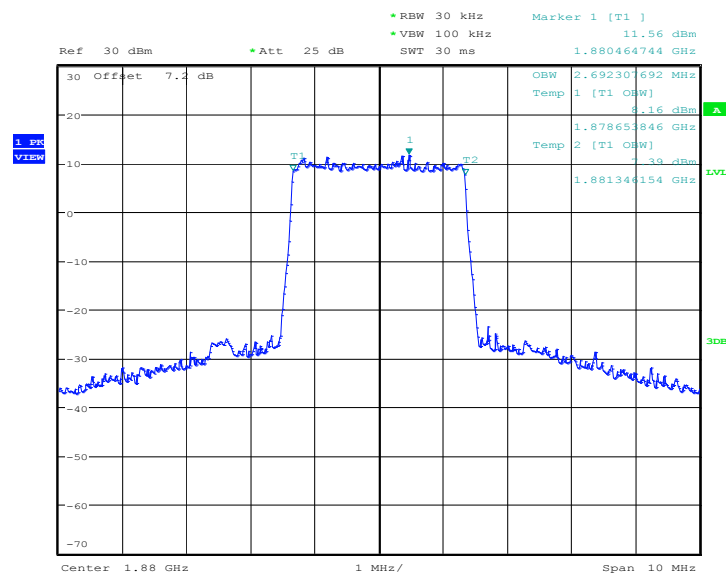
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1880.0         | QPSK                           | 16QAM   |
|                | 2692.31                        | 2692.31 |

### LTE band 2, 3MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 02:18:09

### LTE band 2, 3MHz Bandwidth, 16QAM (99% BW)

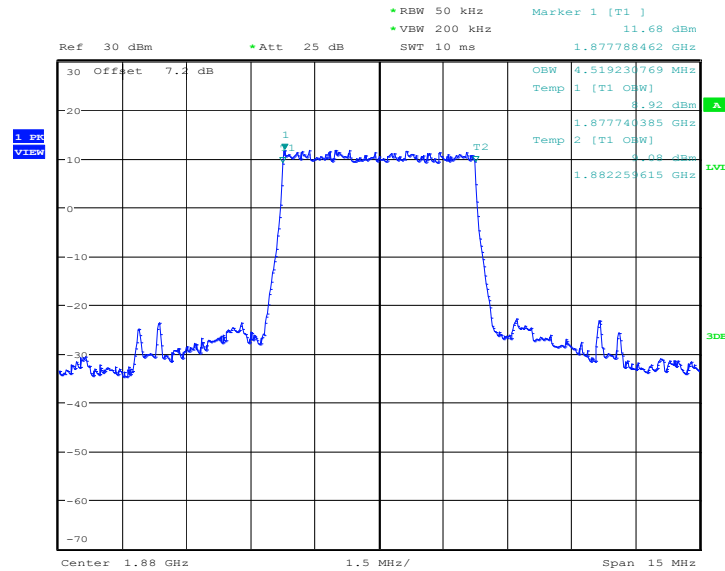


Date: 15.FEB.2017 02:17:39

### LTE band 2, 5MHz (99%)

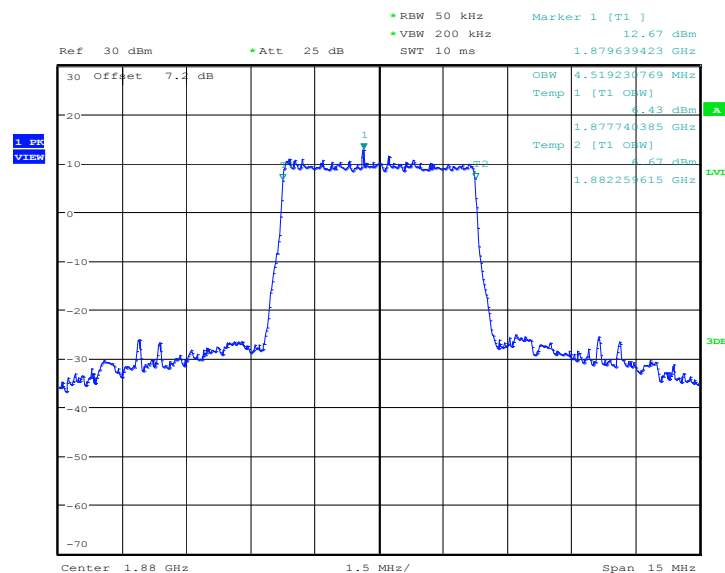
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1880.0         | QPSK                           | 16QAM   |
|                | 4519.23                        | 4519.23 |

### LTE band 2, 5MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 02:27:25

### LTE band 2, 5MHz Bandwidth,16QAM (99% BW)

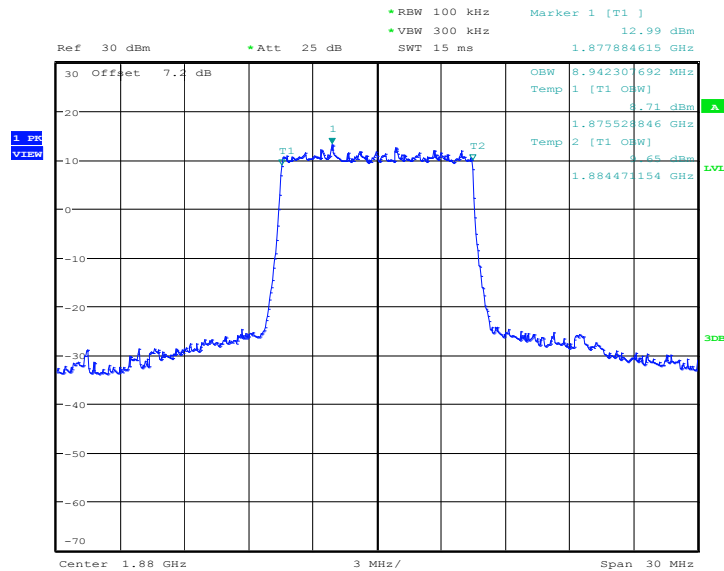


Date: 15.FEB.2017 02:28:06

### LTE band 2, 10MHz (99%)

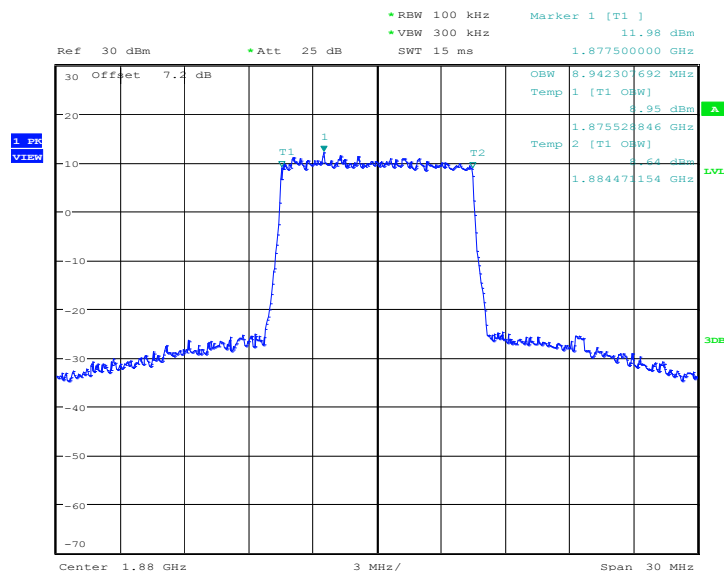
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1880.0         | QPSK                           | 16QAM   |
|                | 8942.31                        | 8942.31 |

### LTE band 2, 10MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 03:36:18

### LTE band 2, 10MHz Bandwidth, 16QAM (99% BW)

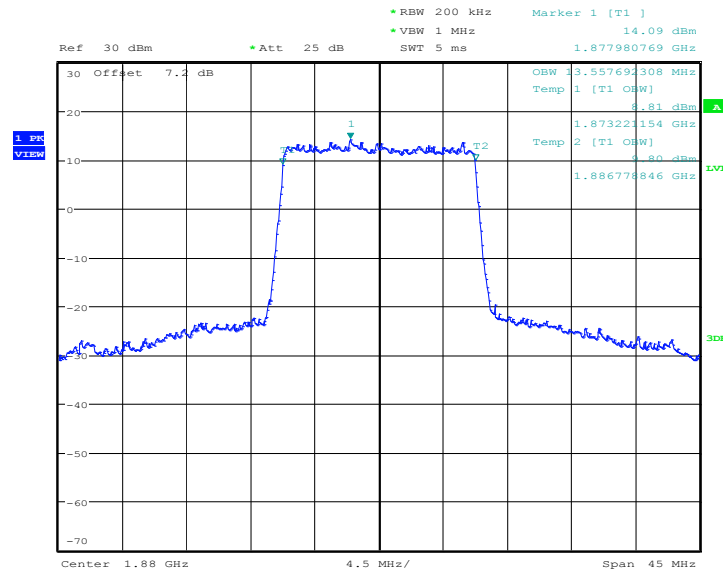


Date: 15.FEB.2017 03:35:29

### LTE band 2, 15MHz (99%)

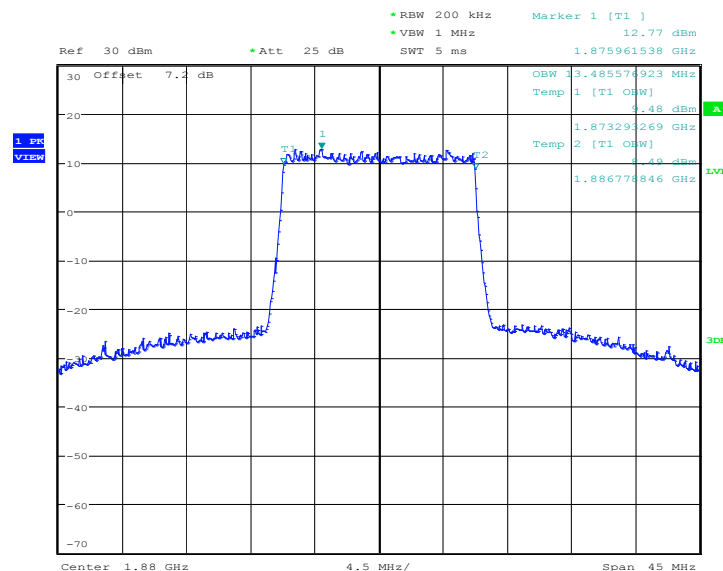
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 1880.0         | QPSK                           | 16QAM    |
|                | 13557.69                       | 13485.58 |

### LTE band 2, 15MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 03:39:35

### LTE band 2, 15MHz Bandwidth, 16QAM (99% BW)

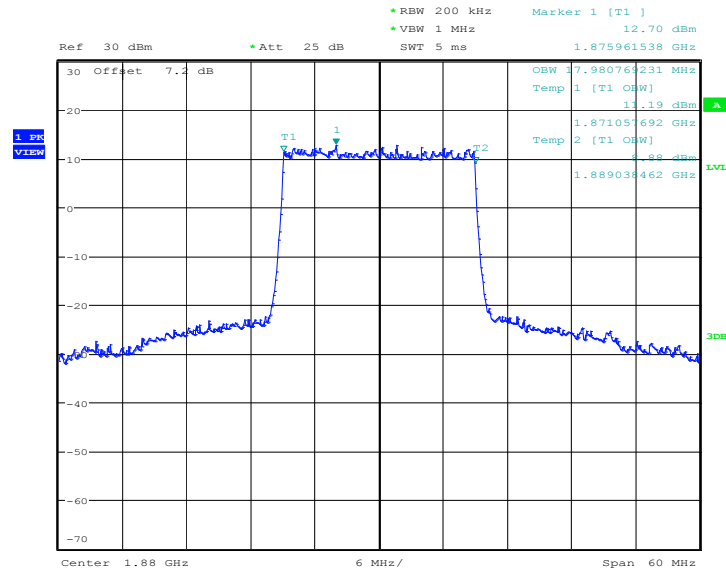


Date: 15.FEB.2017 03:40:12

### LTE band 2, 20MHz (99%)

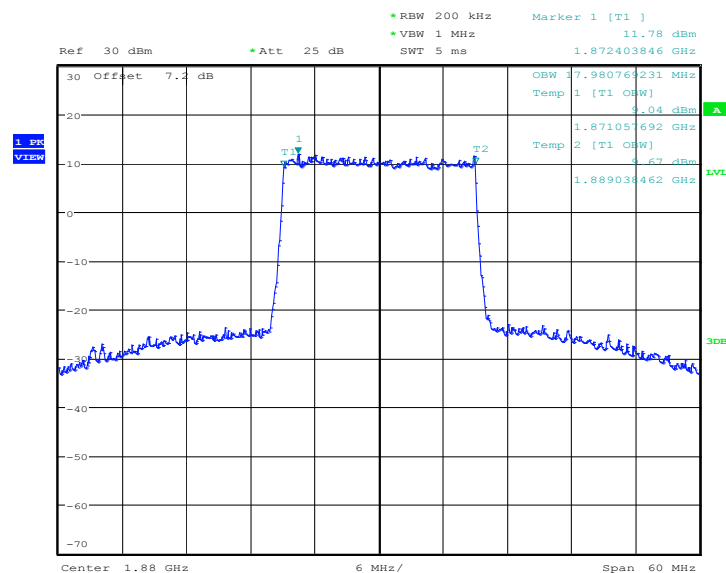
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 1880.0         | QPSK                           | 16QAM    |
|                | 17980.77                       | 17980.77 |

### LTE band 2, 20MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 04:05:04

### LTE band 2, 20MHz Bandwidth, 16QAM (99% BW)

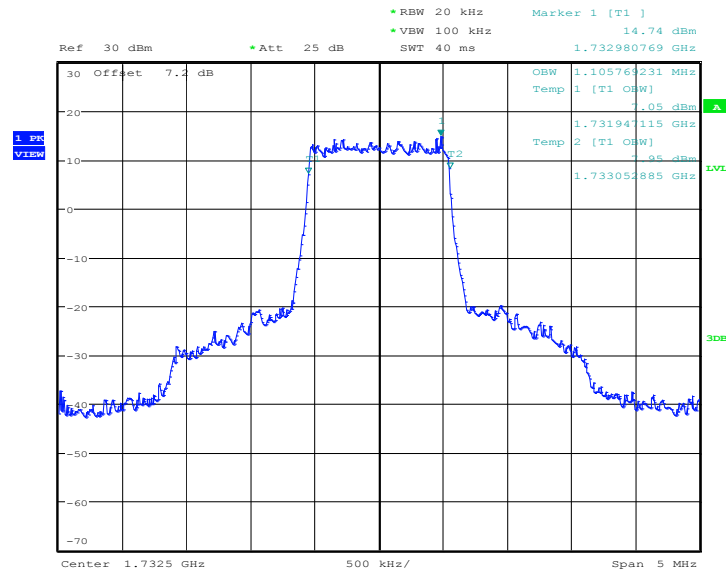


Date: 15.FEB.2017 04:05:51

### LTE band 4, 1.4MHz (99%)

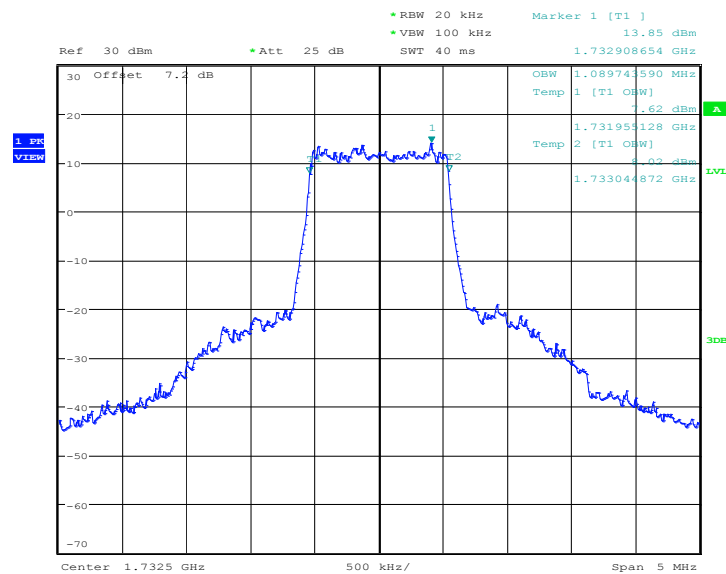
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1732.5         | QPSK                           | 16QAM   |
|                | 1105.77                        | 1089.74 |

### LTE band 4, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 01:40:25

### LTE band 4, 1.4MHz Bandwidth, 16QAM (99% BW)

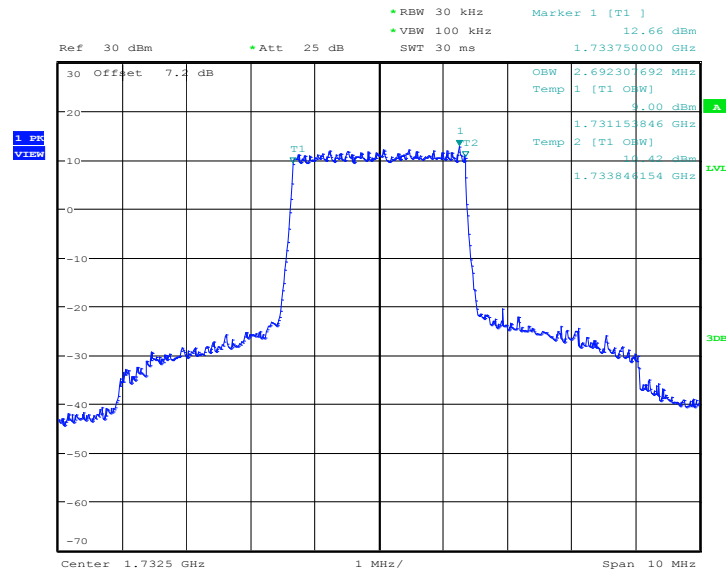


Date: 15.FEB.2017 01:39:56

### LTE band 4, 3MHz (99%)

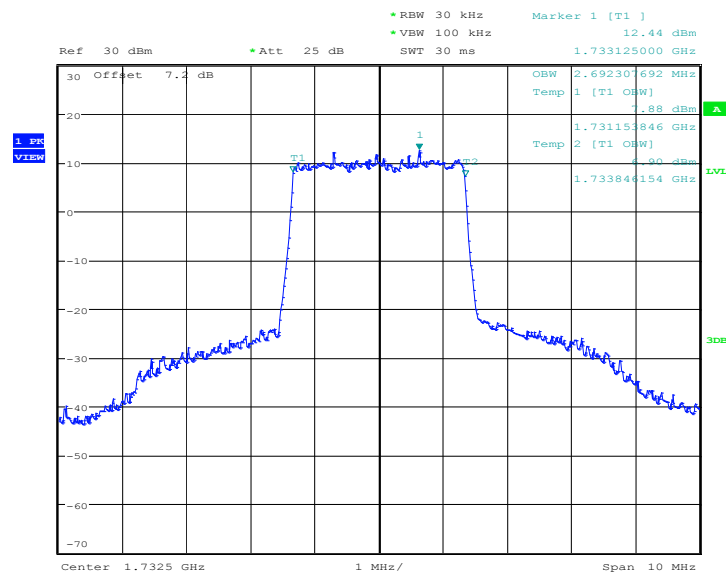
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1732.5         | QPSK                           | 16QAM   |
|                | 2692.31                        | 2692.31 |

### LTE band 4, 3MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 02:12:14

### LTE band 4, 3MHz Bandwidth, 16QAM (99% BW)

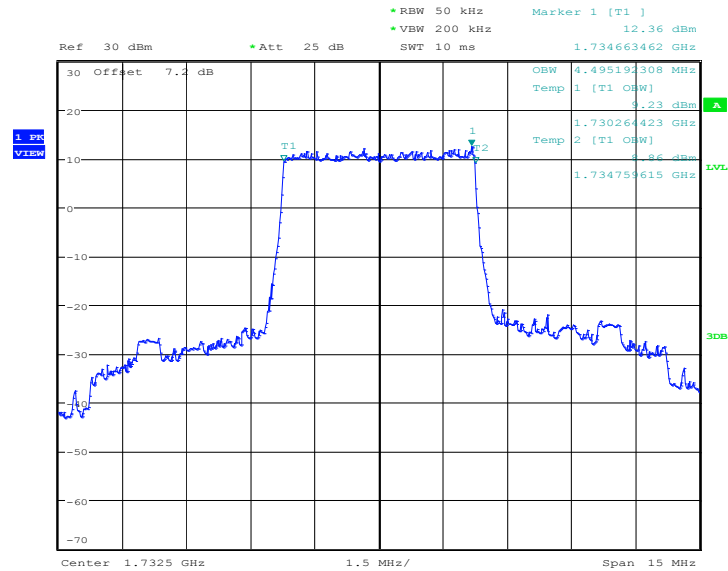


Date: 15.FEB.2017 02:12:46

### LTE band 4, 5MHz (99%)

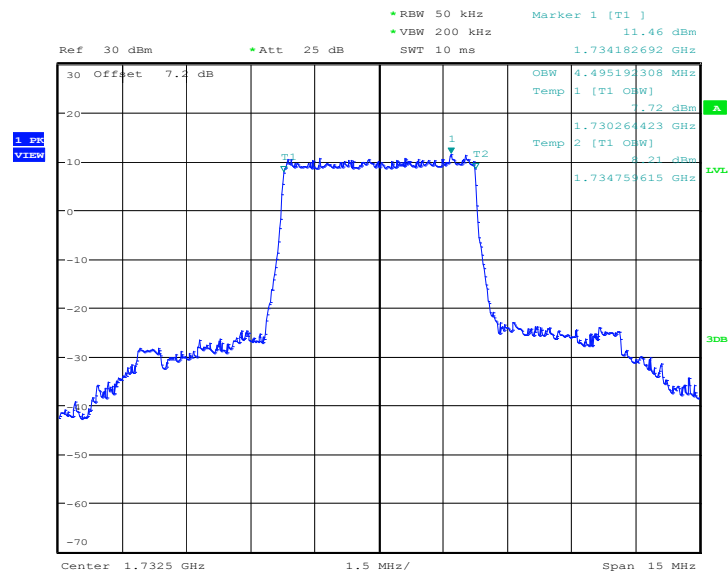
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1732.5         | QPSK                           | 16QAM   |
|                | 4495.19                        | 4495.19 |

### LTE band 4, 5MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 02:33:27

### LTE band 4, 5MHz Bandwidth,16QAM (99% BW)



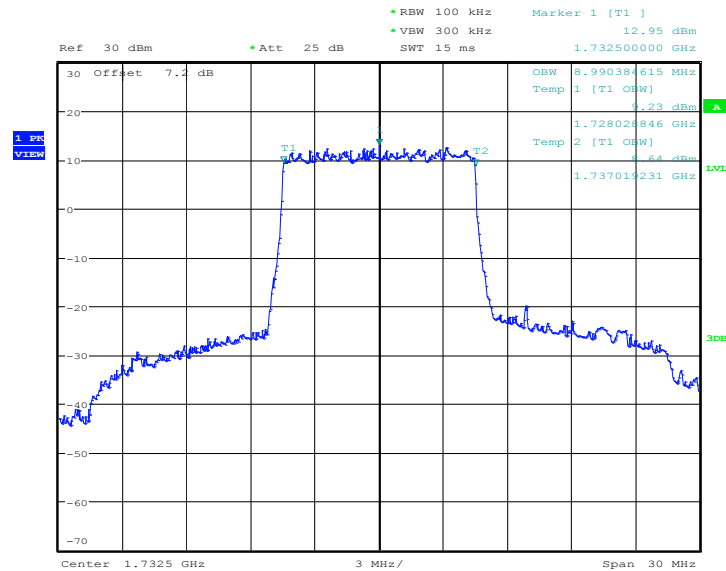
Date: 15.FEB.2017 02:32:52



### LTE band 4, 10MHz (99%)

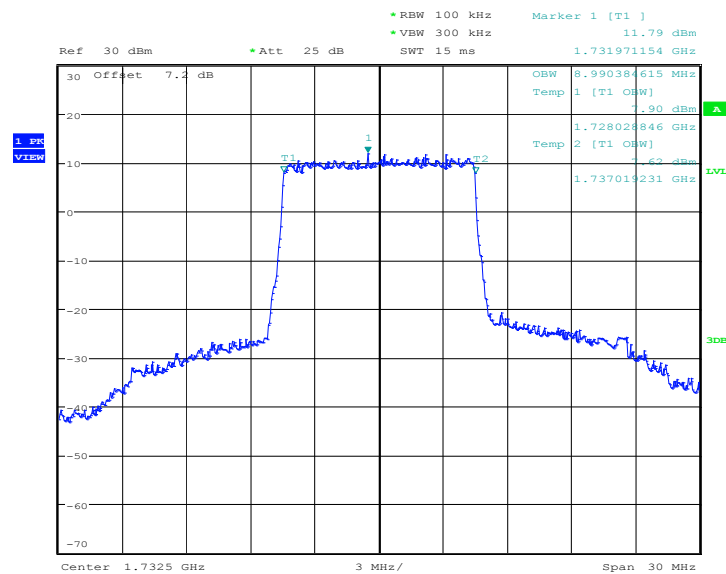
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1732.5         | QPSK                           | 16QAM   |
|                | 8990.38                        | 8990.38 |

### LTE band 4, 10MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 03:31:07

### LTE band 4, 10MHz Bandwidth, 16QAM (99% BW)

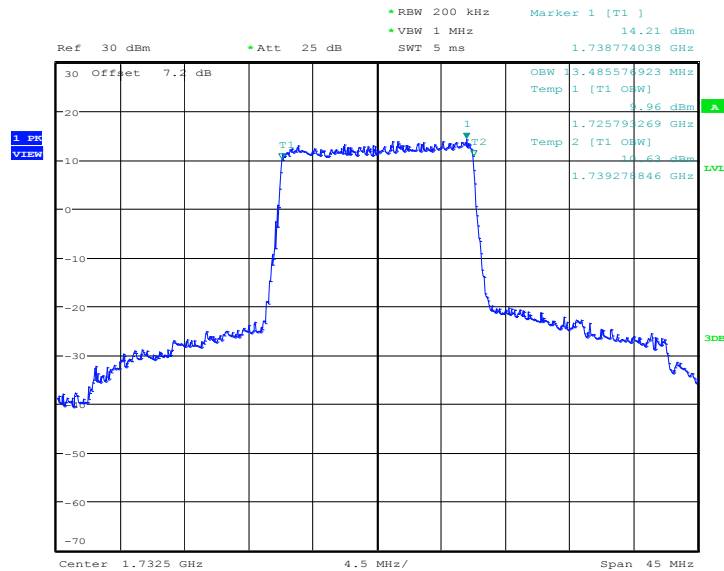


Date: 15.FEB.2017 03:31:42

### LTE band 4, 15MHz (99%)

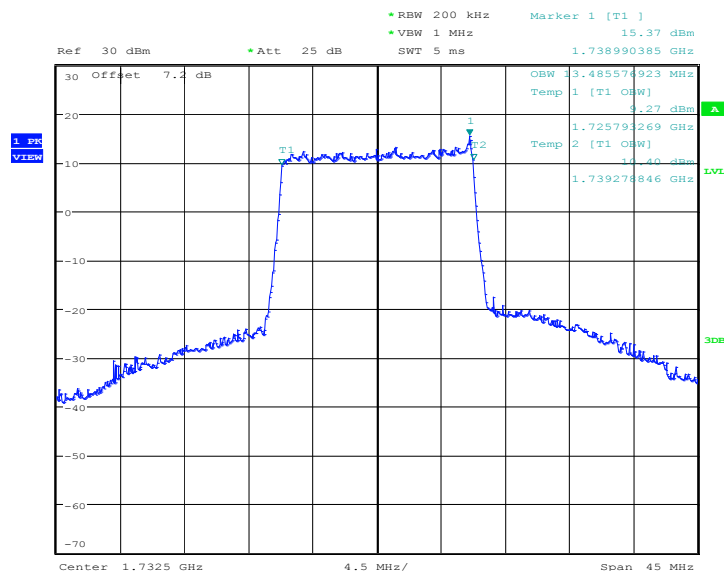
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 1732.5         | QPSK                           | 16QAM    |
|                | 13485.58                       | 13485.58 |

### LTE band 4, 15MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 03:45:04

### LTE band 4, 15MHz Bandwidth, 16QAM (99% BW)

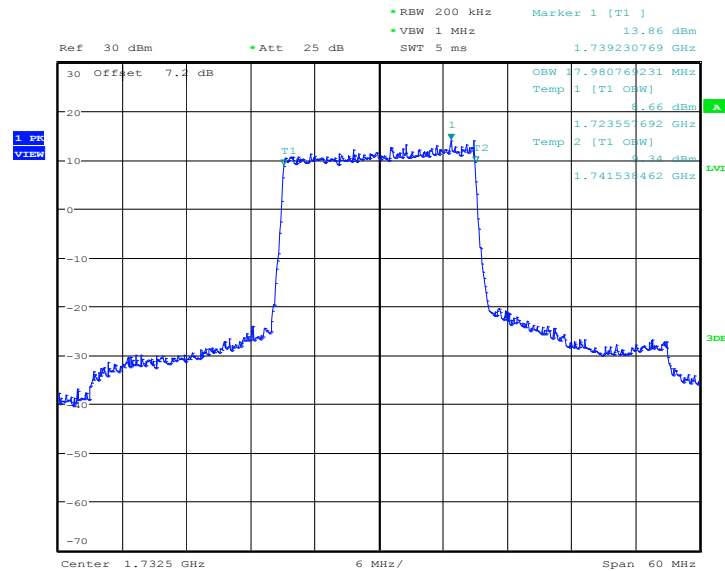


Date: 15.FEB.2017 03:44:37

### LTE band 4, 20MHz (99%)

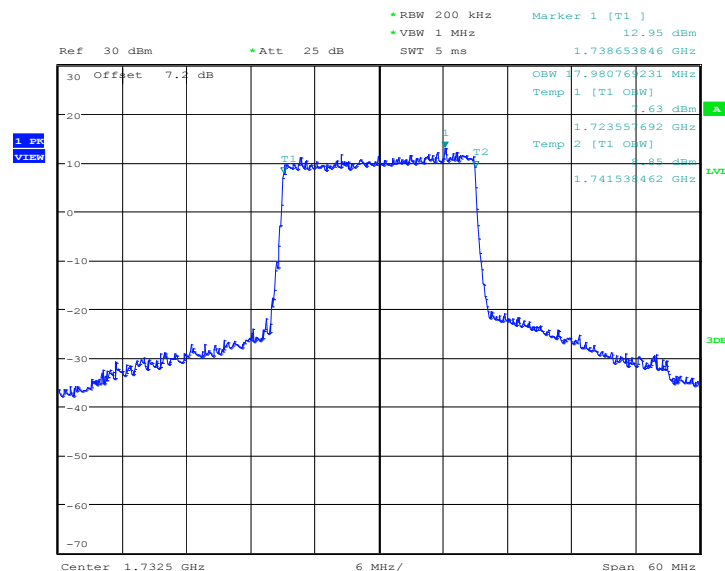
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 1732.5         | QPSK                           | 16QAM    |
|                | 17980.77                       | 17980.77 |

### LTE band 4, 20MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 04:03:48

### LTE band 4, 20MHz Bandwidth, 16QAM (99% BW)

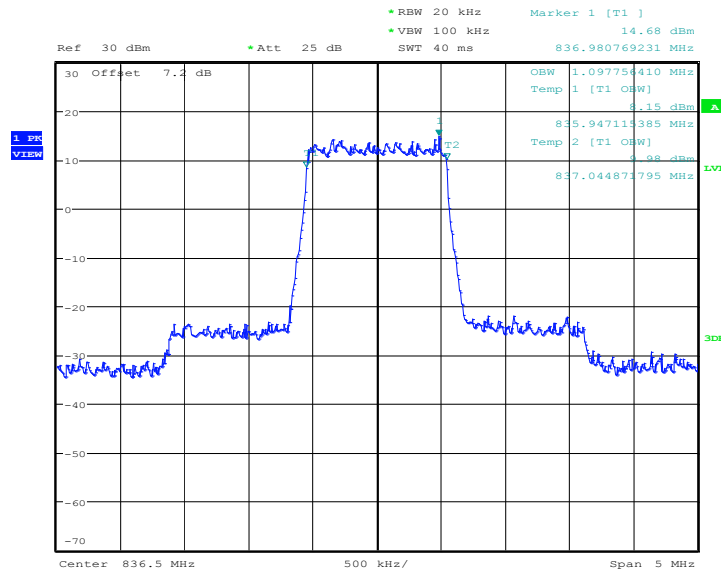


Date: 15.FEB.2017 04:03:22

### LTE band 5, 1.4MHz (99%)

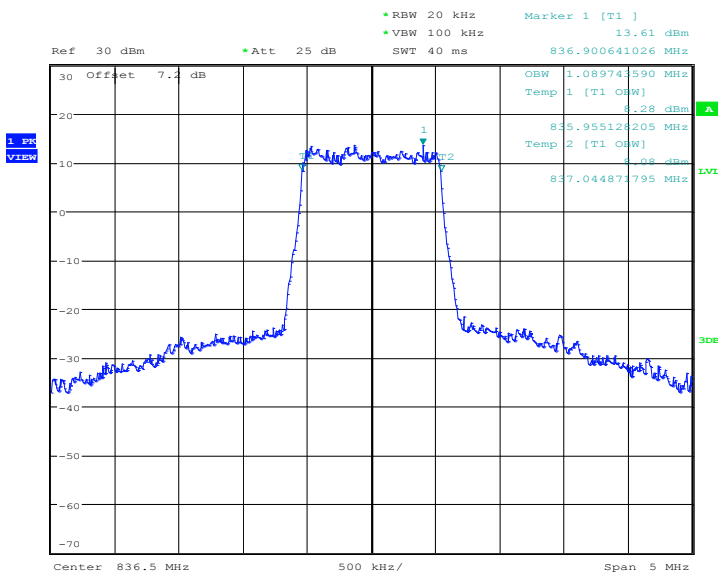
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 836.5          | QPSK                           | 16QAM   |
|                | 1097.76                        | 1089.74 |

### LTE band 5, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 01:41:34

### LTE band 5, 1.4MHz Bandwidth, 16QAM (99% BW)

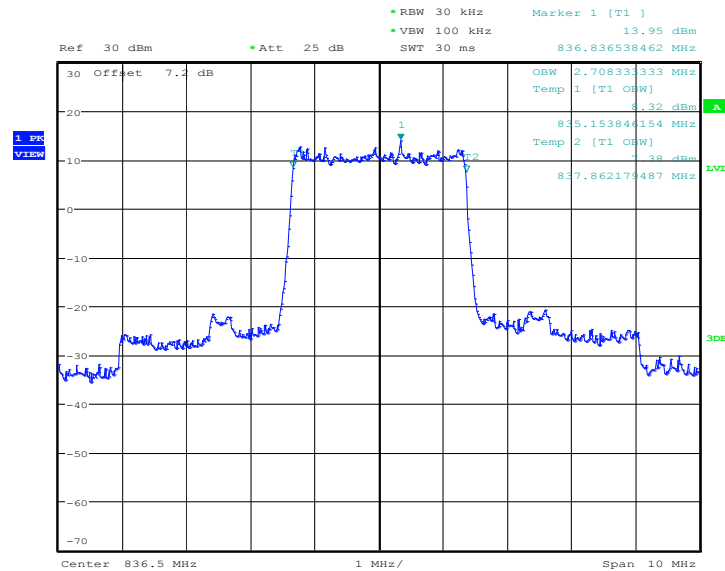


Date: 15.FEB.2017 01:42:20

### LTE band 5, 3MHz (99%)

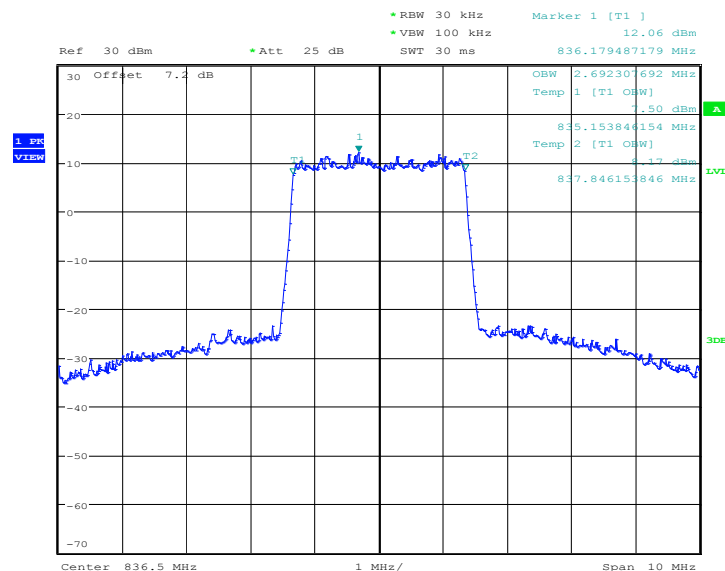
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 836.5          | QPSK                           | 16QAM   |
|                | 2708.33                        | 2692.31 |

### LTE band 5, 3MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 02:11:25

### LTE band 5, 3MHz Bandwidth, 16QAM (99% BW)

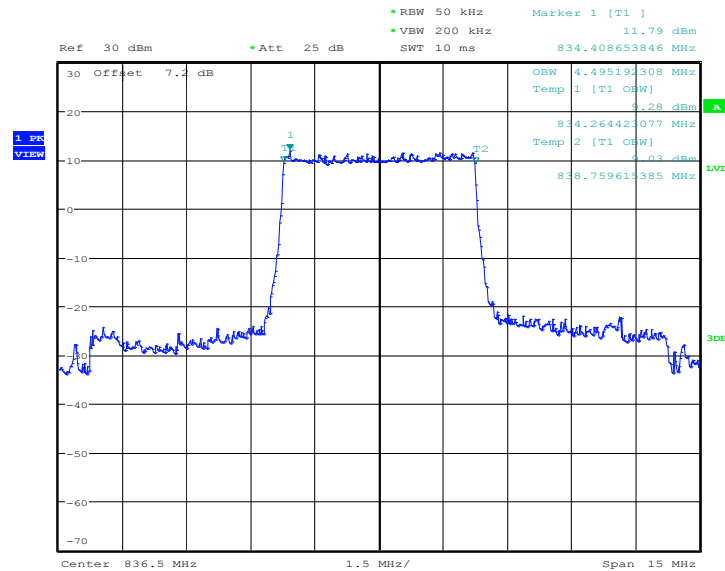


Date: 15.FEB.2017 02:10:29

### LTE band 5, 5MHz (99%)

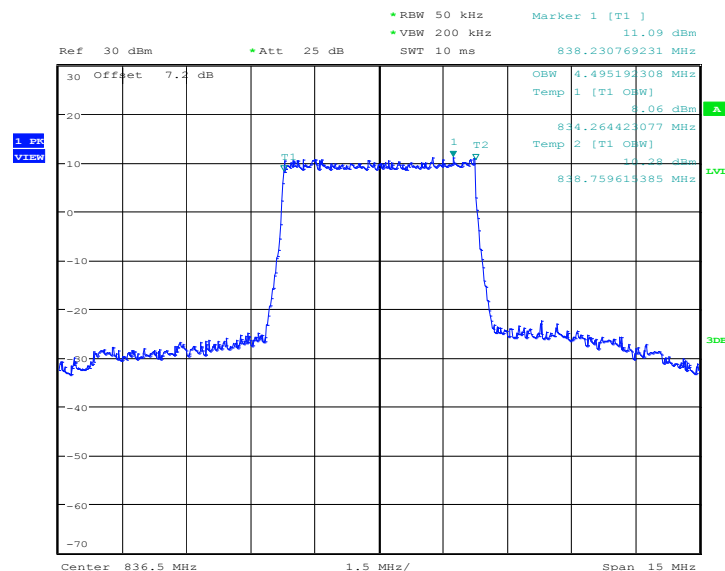
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 836.5          | QPSK                           | 16QAM   |
|                | 4495.19                        | 4495.19 |

### LTE band 5, 5MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 02:34:19

### LTE band 5, 5MHz Bandwidth,16QAM (99% BW)

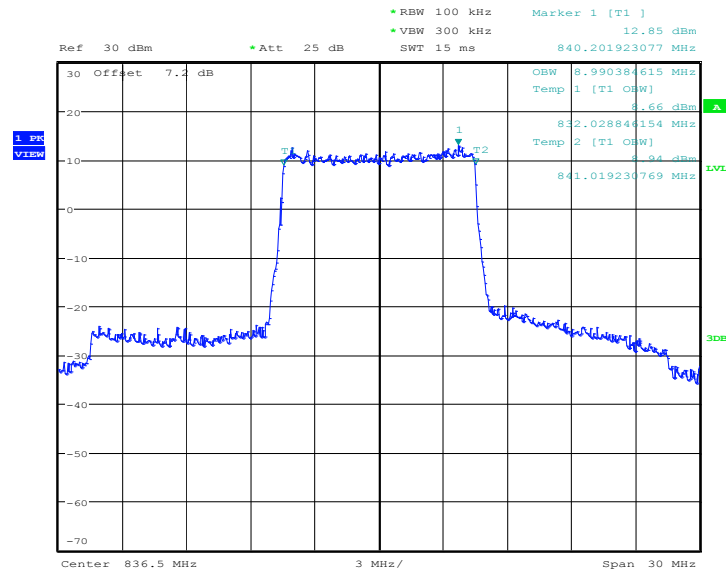


Date: 15.FEB.2017 02:35:00

### LTE band 5, 10MHz (99%)

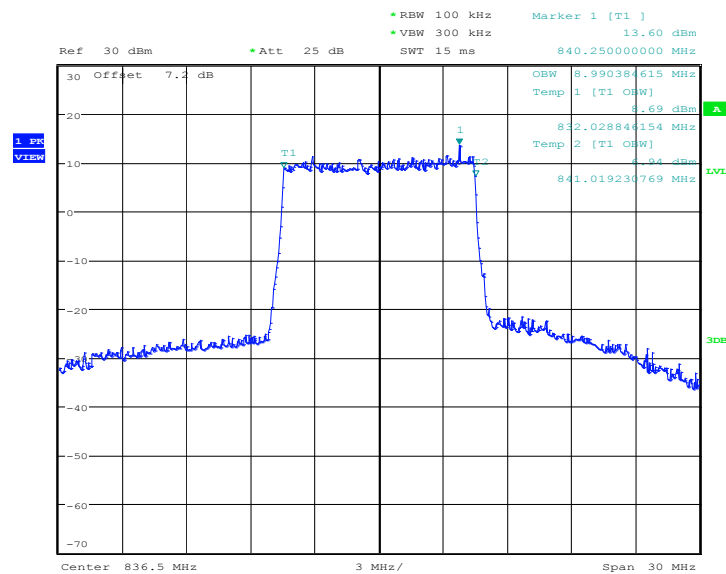
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 836.5          | QPSK                           | 16QAM   |
|                | 8990.38                        | 8990.38 |

### LTE band 5, 10MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 03:30:05

### LTE band 5, 10MHz Bandwidth, 16QAM (99% BW)

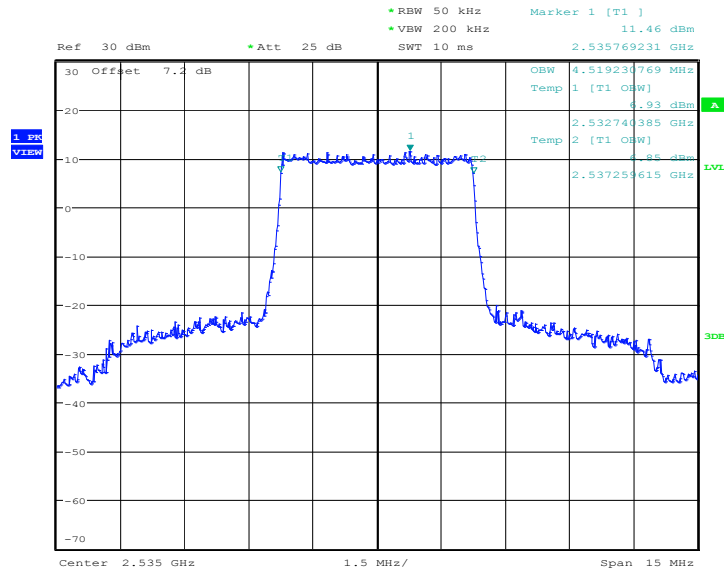


Date: 15.FEB.2017 03:29:13

### LTE band 7, 5MHz (99%)

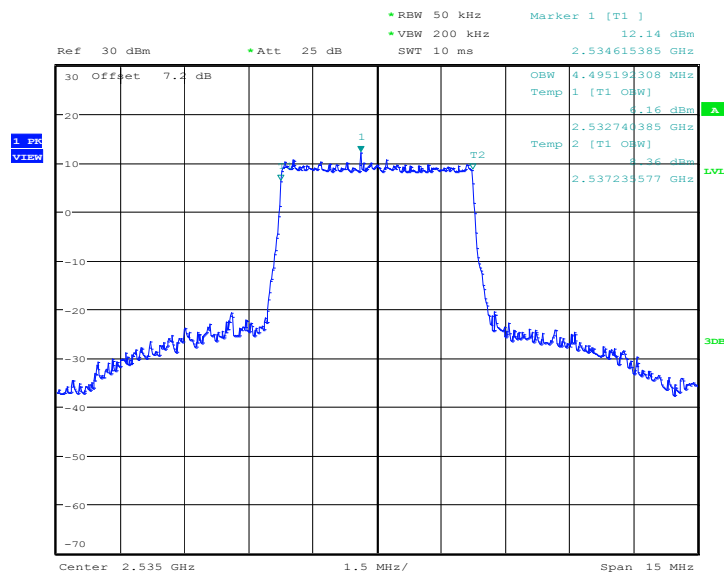
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 2535.0         | QPSK                           | 16QAM   |
|                | 4519.23                        | 4495.19 |

### LTE band 7, 5MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 02:39:44

### LTE band 7, 5MHz Bandwidth,16QAM (99% BW)

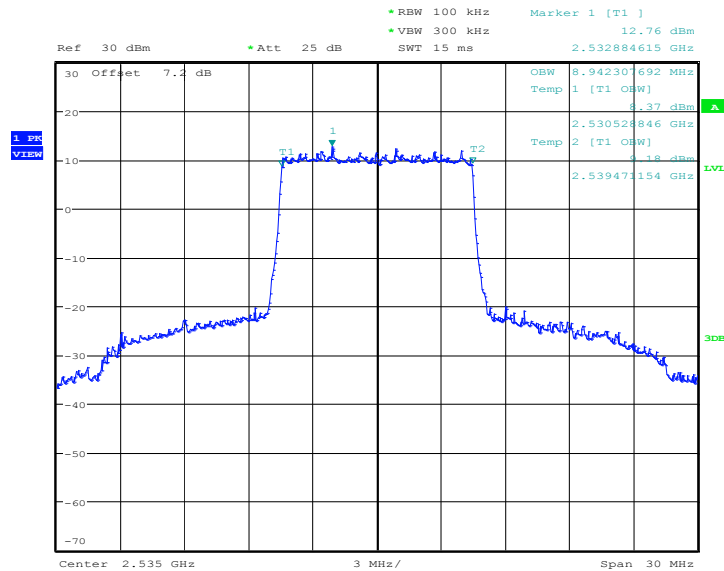


Date: 15.FEB.2017 02:39:07

### LTE band 7, 10MHz (99%)

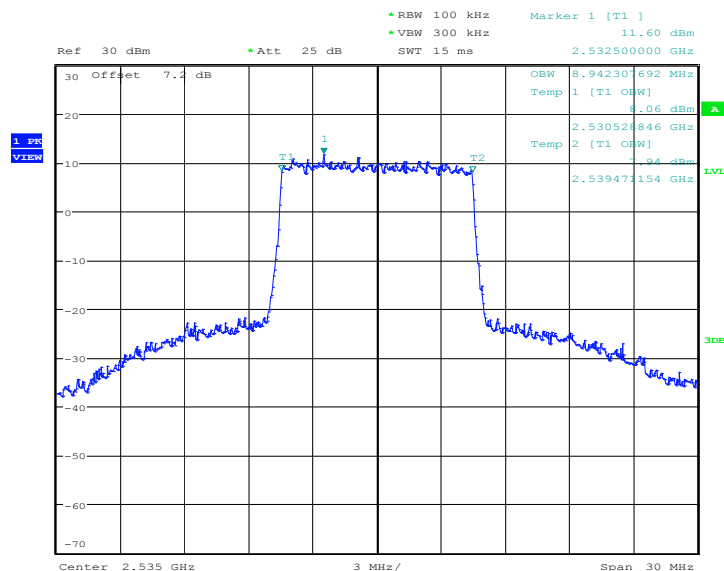
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 2535.0         | QPSK                           | 16QAM   |
|                | 8942.31                        | 8942.31 |

### LTE band 7, 10MHz Bandwidth, QPSK (99% BW)



Date: 15.FEB.2017 03:24:17

### LTE band 7, 10MHz Bandwidth, 16QAM (99% BW)



Date: 15.FEB.2017 03:25:20