



## TEST REPORT

**No. I18N00754-LTE**

for

**Huawei Technologies Co.,Ltd.**

**LTE CPE**

**Model Name: B612s-52d**

**FCC ID: QISB612S-52D**

with

**Hardware Version: WL1B612M04**

**Software Version: B612\_UPDATE\_11.196.00.00.00**

**Issued Date: 2018-05-28**

**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 SAICT.

**Test Laboratory:**

Designation Number: CN1210

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**REPORT HISTORY**

| Report Number | Revision | Description             | Issue Date |
|---------------|----------|-------------------------|------------|
| I18N00754-LTE | Rev.0    | 1 <sup>st</sup> edition | 2018-05-28 |

NOTE: The EUT is a variant model of B612s-51d. All the original values of this report are quoted directly from I17N00107-LTE.

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## 1. Test Laboratory

### 1.1. Testing Location

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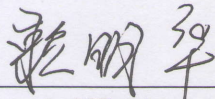
### 1.2. Testing Environment

Normal Temperature: 15-35℃  
Relative Humidity: 20-75%

### 1.3. Project data

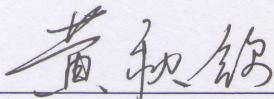
Testing Start Date: 2017-02-16  
Testing End Date: 2017-03-22

### 1.4. Signature



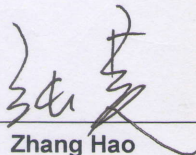
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(Reviewed this test report)



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Deputy Director of the laboratory

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## **2. Client Information**

### **2.1. Applicant Information**

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### **2.2. Manufacturer Information**

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Fax: /

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

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

|                         |                                       |
|-------------------------|---------------------------------------|
| Description             | LTE CPE                               |
| Model Name              | B612s-52d                             |
| FCC ID                  | QISB612S-52D                          |
| Frequency Bands         | LTE Band 2,4,5,7,41                   |
| Antenna                 | Integrated                            |
| Extreme vol. Limits     | 10.8VDC to 13.2VDC (nominal: 12.0VDC) |
| Extreme temp. Tolerance | -30°C to +50°C                        |

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

| EUT ID* | IMEI | HW Version | SW Version                      | Sample Arrival Date |
|---------|------|------------|---------------------------------|---------------------|
| S01     | /    | WL1B612M04 | B612_UPDATE_11<br>.196.00.00.00 | 2017-02-16          |
| S02     | /    | WL1B612M04 | B612_UPDATE_11<br>.196.00.00.00 | 2017-02-16          |

\*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    | Charger1    |
| AE2    | Charger2    |

AE1

|              |                                    |
|--------------|------------------------------------|
| Model        | HW-120100U01                       |
| Manufacturer | SHENZHEN HONOR ELECTRONIC CO.,LTD. |

AE2

|              |                                           |
|--------------|-------------------------------------------|
| Model        | HW-120100U01                              |
| Manufacturer | DONGUAN SHILONG FUHUA ELECTRONIC 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

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

| Reference      | Title                                                                                                                                      | Version            |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| FCC Part 22    | PUBLIC MOBILE SERVICES                                                                                                                     | 10-1-16<br>Edition |
| FCC Part 24    | PERSONAL COMMUNICATIONS SERVICES                                                                                                           | 10-1-16<br>Edition |
| FCC Part 2     | FREQUENCY ALLOCATIONS AND RADIO TREATY<br>MATTERS; GENERAL RULES AND REGULATIONS                                                           | 10-1-16<br>Edition |
| FCC Part 27    | MISCELLANEOUS WIRELESS COMMUNICATIONS<br>SERVICES                                                                                          | 10-1-16<br>Edition |
| ANSI/TIA-603-E | Land Mobile FM or PM Communications Equipment<br>Measurement and Performance Standards                                                     | 2016               |
| ANSI C63.4     | Methods of Measurement of Radio-Noise Emissions from<br>Low-Voltage Electrical and Electronic Equipment in the<br>Range of 9 kHz to 40 GHz | 2014               |
| KDB 971168 D01 | Measurement Guidance for Certification of Licensed Digital<br>Transmitters                                                                 | v03                |

## 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 X 6.1 meters X 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 X 6.7 meters X 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

| 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                | 2.1046/24.232               | A.1                    | P       |
| 2     | EMISSION LIMIT              | 2.1053/24.238               | A.2                    | P       |
| 3     | Frequency Stability         | 2.1055/24.235               | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049/24.238               | A.4                    | P       |
| 5     | Emission Bandwidth          | 2.1049/24.238               | A.5                    | P       |
| 6     | Band Edge Compliance        | 2.1051/24.238               | A.6                    | P       |
| 7     | Conducted Spurious Emission | 2.1051/24.238               | A.7                    | P       |
| 8     | Peak to Average Ratio       | 24.232/KDB971168 D01(5.7.1) | A.8                    | P       |

### LTE Band 4

| Items | Test Name                   | Clause in FCC rules           | Section in this report | Verdict |
|-------|-----------------------------|-------------------------------|------------------------|---------|
| 1     | Output Power                | 2.1046/27.50(d)               | A.1                    | P       |
| 2     | EMISSION LIMIT              | 2.1053/27.53(h)               | A.2                    | P       |
| 3     | Frequency Stability         | 2.1055/27.54                  | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049/27.53(g)               | A.4                    | P       |
| 5     | Emission Bandwidth          | 2.1049/27.53(g)               | A.5                    | P       |
| 6     | Band Edge Compliance        | 2.1051/27.53(h)               | A.6                    | P       |
| 7     | Conducted Spurious Emission | 2.1051/27.53(h)               | A.7                    | P       |
| 8     | Peak to Average Ratio       | 27.50(d)/KDB971168 D01(5.7.1) | A.8                    | P       |

**LTE Band 5**

| Items | Test Name                   | Clause in FCC rules | Section in this report | Verdict |
|-------|-----------------------------|---------------------|------------------------|---------|
| 1     | Output Power                | 2.1046/22.913       | A.1                    | P       |
| 2     | EMISSION LIMIT              | 2.1053/22.917       | A.2                    | P       |
| 3     | Frequency Stability         | 2.1055/22.355       | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049/22.917       | A.4                    | P       |
| 5     | Emission Bandwidth          | 2.1049/22.917       | A.5                    | P       |
| 6     | Band Edge Compliance        | 2.1051/22.917       | A.6                    | P       |
| 7     | Conducted Spurious Emission | 2.1051/22.917       | A.7                    | P       |

**LTE Band 7**

| Items | Test Name                   | Clause in FCC rules              | Section in this report | Verdict |
|-------|-----------------------------|----------------------------------|------------------------|---------|
| 1     | Output Power                | 2.1046/27.50(d)                  | A.1                    | P       |
| 2     | EMISSION LIMIT              | 2.1053/27.53(h)                  | A.2                    | P       |
| 3     | Frequency Stability         | 2.1055/27.54                     | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049/27.53(g)                  | A.4                    | P       |
| 5     | Emission Bandwidth          | 2.1049/27.53(g)                  | A.5                    | P       |
| 6     | Band Edge Compliance        | 2.1051/27.53(h)                  | A.6                    | P       |
| 7     | Conducted Spurious Emission | 2.1051/27.53(h)                  | A.7                    | P       |
| 8     | Peak to Average Ratio       | 27.50(d)/KDB971168<br>D01(5.7.1) | A.8                    | P       |

**LTE Band 41**

| Items | Test Name                   | Clause in FCC rules              | Section in this report | Verdict |
|-------|-----------------------------|----------------------------------|------------------------|---------|
| 1     | Output Power                | 2.1046/27.50(h)                  | A.1                    | P       |
| 2     | EMISSION LIMIT              | 2.1053/27.53(m)                  | A.2                    | P       |
| 3     | Frequency Stability         | 2.1055/27.54                     | A.3                    | P       |
| 4     | Occupied Bandwidth          | 2.1049/27.53(m)                  | A.4                    | P       |
| 5     | Emission Bandwidth          | 2.1049/27.53(m)                  | A.5                    | P       |
| 6     | Band Edge Compliance        | 2.1051/27.53(m)                  | A.6                    | P       |
| 7     | Conducted Spurious Emission | 2.1051/27.53(m)                  | A.7                    | P       |
| 8     | Peak to Average Ratio       | 27.50(a)/KDB971168<br>D01(5.7.1) | A.8                    | P       |

## 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   | Signal Generator                     | SMR40     | R&S                  | 100541        | 2017-06-27   |
| 5   | Fully Anechoic Chamber               | FACT5-2.0 | ETS-Lindgren         | 4166          | 2018-05-13   |
| 6   | Spectrum Analyzer                    | FSP40     | R&S                  | 100378        | 2017-12-15   |
| 7   | Universal Radio Communication Tester | CMU200    | R&S                  | 114544        | 2017-09-09   |
| 8   | Universal Radio Communication Tester | CMW500    | R&S                  | 158344        | 2017-07-21   |
| 9   | Universal Radio Communication Tester | CMU200    | R&S                  | 123210        | 2017-12-25   |
| 10  | Spectrum Analyzer                    | FSU       | R&S                  | 200679        | 2017-12-25   |
| 11  | Temperature Chamber                  | SH-241    | ESPECs               | 92007516      | 2017-11-29   |
| 12  | 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: CFR Part 2.1046, 22.913, 24.232, 27.50(d)

#### **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          | 21.66      | 21.40 |
|           |                | 1880.0          | 22.51      | 22.26 |
|           |                | 1850.7          | 23.08      | 22.76 |
|           | 1 RB low       | 1909.3          | 22.03      | 21.75 |
|           |                | 1880.0          | 22.66      | 22.38 |
|           |                | 1850.7          | 23.14      | 22.87 |
|           | 50% RB mid     | 1909.3          | 21.94      | 21.49 |
|           |                | 1880.0          | 22.66      | 22.21 |
|           |                | 1850.7          | 23.18      | 22.72 |
|           | 100% RB        | 1909.3          | 21.60      | 20.66 |
|           |                | 1880.0          | 22.20      | 21.35 |
|           |                | 1850.7          | 22.70      | 21.82 |
| 3MHz      | 1 RB high      | 1908.5          | 21.55      | 21.34 |
|           |                | 1880.0          | 22.31      | 22.11 |
|           |                | 1851.5          | 22.95      | 22.68 |
|           | 1 RB low       | 1908.5          | 22.33      | 22.08 |
|           |                | 1880.0          | 22.61      | 22.34 |
|           |                | 1851.5          | 23.08      | 22.77 |
|           | 50% RB mid     | 1908.5          | 21.68      | 20.85 |
|           |                | 1880.0          | 22.20      | 21.34 |
|           |                | 1851.5          | 22.73      | 21.82 |
|           | 100% RB        | 1908.5          | 21.69      | 20.83 |

|       |            |        |       |       |
|-------|------------|--------|-------|-------|
|       |            | 1880.0 | 22.19 | 21.28 |
|       |            | 1851.5 | 22.70 | 21.73 |
| 5MHz  | 1 RB high  | 1907.5 | 22.09 | 21.82 |
|       |            | 1880.0 | 22.95 | 22.65 |
|       |            | 1852.5 | 23.44 | 23.13 |
|       | 1 RB low   | 1907.5 | 22.68 | 22.38 |
|       |            | 1880.0 | 22.60 | 22.32 |
|       |            | 1852.5 | 23.10 | 22.83 |
|       | 50% RB mid | 1907.5 | 22.08 | 21.21 |
|       |            | 1880.0 | 22.29 | 21.44 |
|       |            | 1852.5 | 22.86 | 21.90 |
|       | 100% RB    | 1907.5 | 21.91 | 21.01 |
|       |            | 1880.0 | 22.24 | 21.31 |
|       |            | 1852.5 | 22.69 | 21.69 |
| 10MHz | 1 RB high  | 1905.0 | 22.16 | 21.92 |
|       |            | 1880.0 | 22.87 | 22.60 |
|       |            | 1855.0 | 23.34 | 23.04 |
|       | 1 RB low   | 1905.0 | 22.86 | 22.60 |
|       |            | 1880.0 | 22.70 | 22.41 |
|       |            | 1855.0 | 23.06 | 22.79 |
|       | 50% RB mid | 1905.0 | 22.35 | 21.39 |
|       |            | 1880.0 | 22.28 | 21.39 |
|       |            | 1855.0 | 22.76 | 21.76 |
|       | 100% RB    | 1905.0 | 22.26 | 21.34 |
|       |            | 1880.0 | 22.19 | 21.26 |
|       |            | 1855.0 | 22.66 | 21.58 |
| 15MHz | 1 RB high  | 1902.5 | 22.97 | 22.75 |
|       |            | 1880.0 | 22.78 | 22.52 |
|       |            | 1857.5 | 23.14 | 22.85 |
|       | 1 RB low   | 1902.5 | 22.54 | 22.28 |
|       |            | 1880.0 | 22.57 | 22.26 |
|       |            | 1857.5 | 22.94 | 22.65 |
|       | 50% RB mid | 1902.5 | 22.93 | 22.47 |
|       |            | 1880.0 | 22.76 | 22.25 |
|       |            | 1857.5 | 23.12 | 22.63 |
|       | 100% RB    | 1902.5 | 22.51 | 21.51 |
|       |            | 1880.0 | 22.30 | 21.38 |
|       |            | 1857.5 | 22.64 | 21.67 |
| 20MHz | 1 RB high  | 1900.0 | 22.05 | 21.85 |

|  |            |        |       |       |
|--|------------|--------|-------|-------|
|  |            | 1880.0 | 22.59 | 22.32 |
|  |            | 1860.0 | 22.87 | 22.61 |
|  | 1 RB low   | 1900.0 | 22.30 | 22.09 |
|  |            | 1880.0 | 22.58 | 22.34 |
|  |            | 1860.0 | 22.97 | 22.63 |
|  | 50% RB mid | 1900.0 | 22.57 | 21.54 |
|  |            | 1880.0 | 22.18 | 21.31 |
|  |            | 1860.0 | 22.57 | 21.49 |
|  | 100% RB    | 1900.0 | 22.15 | 21.17 |
|  |            | 1880.0 | 22.07 | 21.11 |
|  |            | 1860.0 | 22.50 | 21.42 |

**LTE band 4**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 1.4MHz    | 1 RB high      | 1754.3          | 23.36      | 23.03 |
|           |                | 1732.5          | 22.38      | 22.13 |
|           |                | 1710.7          | 22.49      | 22.31 |
|           | 1 RB low       | 1754.3          | 23.40      | 23.08 |
|           |                | 1732.5          | 22.40      | 22.12 |
|           |                | 1710.7          | 22.50      | 22.35 |
|           | 50% RB mid     | 1754.3          | 23.42      | 22.95 |
|           |                | 1732.5          | 22.46      | 22.01 |
|           |                | 1710.7          | 22.53      | 22.21 |
|           | 100% RB        | 1754.3          | 22.98      | 21.98 |
|           |                | 1732.5          | 22.09      | 21.18 |
|           |                | 1710.7          | 22.12      | 21.22 |
| 3MHz      | 1 RB high      | 1753.5          | 23.20      | 22.91 |
|           |                | 1732.5          | 22.26      | 21.98 |
|           |                | 1711.5          | 22.36      | 22.32 |
|           | 1 RB low       | 1753.5          | 23.11      | 22.88 |
|           |                | 1732.5          | 22.31      | 22.03 |
|           |                | 1711.5          | 22.40      | 22.33 |
|           | 50% RB mid     | 1753.5          | 22.95      | 21.97 |
|           |                | 1732.5          | 22.14      | 21.20 |
|           |                | 1711.5          | 22.21      | 21.34 |
|           | 100% RB        | 1753.5          | 22.87      | 21.88 |
|           |                | 1732.5          | 22.11      | 21.17 |
|           |                | 1711.5          | 22.17      | 21.23 |
| 5MHz      | 1 RB high      | 1752.5          | 23.48      | 23.27 |
|           |                | 1732.5          | 22.66      | 22.38 |
|           |                | 1712.5          | 22.63      | 22.36 |
|           | 1 RB low       | 1752.5          | 23.38      | 23.09 |
|           |                | 1732.5          | 22.49      | 22.20 |
|           |                | 1712.5          | 22.59      | 22.37 |
|           | 50% RB mid     | 1752.5          | 22.95      | 21.97 |
|           |                | 1732.5          | 22.24      | 21.32 |
|           |                | 1712.5          | 22.32      | 21.39 |
|           | 100% RB        | 1752.5          | 22.78      | 21.80 |
|           |                | 1732.5          | 22.14      | 21.20 |
|           |                | 1712.5          | 22.25      | 21.30 |
| 10MHz     | 1 RB high      | 1750.0          | 23.26      | 23.03 |
|           |                | 1732.5          | 22.59      | 22.32 |

|       |            |        |       |       |
|-------|------------|--------|-------|-------|
|       | 1 RB low   | 1715.0 | 22.15 | 22.07 |
|       |            | 1750.0 | 23.01 | 22.64 |
|       |            | 1732.5 | 22.36 | 22.12 |
|       |            | 1715.0 | 22.58 | 22.31 |
|       | 50% RB mid | 1750.0 | 22.70 | 21.66 |
|       |            | 1732.5 | 22.19 | 21.26 |
|       |            | 1715.0 | 22.25 | 21.25 |
|       | 100% RB    | 1750.0 | 22.62 | 21.59 |
|       |            | 1732.5 | 22.07 | 21.14 |
|       |            | 1715.0 | 22.15 | 21.15 |
| 15MHz | 1 RB high  | 1747.5 | 23.33 | 22.84 |
|       |            | 1732.5 | 22.67 | 22.11 |
|       |            | 1717.5 | 22.76 | 22.08 |
|       | 1 RB low   | 1747.5 | 22.81 | 22.22 |
|       |            | 1732.5 | 22.45 | 21.94 |
|       |            | 1717.5 | 22.56 | 22.12 |
|       | 50% RB mid | 1747.5 | 22.41 | 21.54 |
|       |            | 1732.5 | 22.32 | 21.34 |
|       |            | 1717.5 | 22.18 | 21.23 |
|       | 100% RB    | 1747.5 | 22.45 | 21.53 |
|       |            | 1732.5 | 22.11 | 21.45 |
|       |            | 1717.5 | 22.25 | 21.18 |
| 20MHz | 1 RB high  | 1745.0 | 23.39 | 23.25 |
|       |            | 1732.5 | 22.53 | 22.42 |
|       |            | 1720.0 | 22.72 | 22.41 |
|       | 1 RB low   | 1745.0 | 22.80 | 22.54 |
|       |            | 1732.5 | 22.38 | 22.10 |
|       |            | 1720.0 | 22.53 | 22.41 |
|       | 50% RB mid | 1745.0 | 22.45 | 21.51 |
|       |            | 1732.5 | 22.19 | 21.27 |
|       |            | 1720.0 | 22.22 | 21.27 |
|       | 100% RB    | 1745.0 | 22.46 | 21.52 |
|       |            | 1732.5 | 22.06 | 21.19 |
|       |            | 1720.0 | 22.14 | 21.22 |

**LTE band 5**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 1.4MHz    | 1 RB high      | 848.3           | 22.61      | 22.42 |
|           |                | 836.5           | 22.54      | 22.36 |
|           |                | 824.7           | 22.89      | 22.71 |
|           | 1 RB low       | 848.3           | 22.91      | 22.73 |
|           |                | 836.5           | 22.66      | 22.40 |
|           |                | 824.7           | 22.79      | 22.64 |
|           | 50% RB mid     | 848.3           | 22.89      | 22.48 |
|           |                | 836.5           | 22.68      | 22.30 |
|           |                | 824.7           | 22.95      | 22.54 |
|           | 100% RB        | 848.3           | 22.47      | 21.54 |
|           |                | 836.5           | 22.26      | 21.25 |
|           |                | 824.7           | 22.49      | 21.51 |
| 3MHz      | 1 RB high      | 847.5           | 22.47      | 22.33 |
|           |                | 836.5           | 22.45      | 22.28 |
|           |                | 825.5           | 22.86      | 22.68 |
|           | 1 RB low       | 847.5           | 23.11      | 22.85 |
|           |                | 836.5           | 22.65      | 22.42 |
|           |                | 825.5           | 22.69      | 22.59 |
|           | 50% RB mid     | 847.5           | 22.64      | 21.58 |
|           |                | 836.5           | 22.30      | 21.22 |
|           |                | 825.5           | 22.69      | 21.64 |
|           | 100% RB        | 847.5           | 22.58      | 21.50 |
|           |                | 836.5           | 22.27      | 21.15 |
|           |                | 825.5           | 22.59      | 21.50 |
| 5MHz      | 1 RB high      | 846.5           | 22.91      | 22.60 |
|           |                | 836.5           | 22.73      | 22.49 |
|           |                | 826.5           | 23.44      | 23.26 |
|           | 1 RB low       | 846.5           | 23.03      | 22.79 |
|           |                | 836.5           | 22.62      | 22.40 |
|           |                | 826.5           | 22.63      | 22.42 |
|           | 50% RB mid     | 846.5           | 22.86      | 21.82 |
|           |                | 836.5           | 22.35      | 21.30 |
|           |                | 826.5           | 22.69      | 21.70 |
|           | 100% RB        | 846.5           | 22.68      | 21.61 |
|           |                | 836.5           | 22.28      | 21.21 |
|           |                | 826.5           | 22.63      | 21.62 |
| 10MHz     | 1 RB high      | 844.0           | 22.80      | 22.50 |
|           |                | 836.5           | 22.85      | 22.62 |

|  |            |       |       |       |
|--|------------|-------|-------|-------|
|  | 1 RB low   | 829.0 | 22.71 | 22.41 |
|  |            | 844.0 | 22.37 | 22.19 |
|  |            | 836.5 | 22.75 | 22.46 |
|  |            | 829.0 | 22.50 | 22.24 |
|  | 50% RB mid | 844.0 | 22.62 | 21.51 |
|  |            | 836.5 | 22.30 | 21.21 |
|  |            | 829.0 | 22.72 | 21.71 |
|  | 100% RB    | 844.0 | 22.43 | 21.30 |
|  |            | 836.5 | 22.31 | 21.19 |
|  |            | 829.0 | 22.49 | 21.45 |

**LTE band 7**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 5MHz      | 1 RB high      | 2567.5          | 22.54      | 22.27 |
|           |                | 2535.0          | 22.24      | 22.00 |
|           |                | 2502.5          | 22.19      | 21.94 |
|           | 1 RB low       | 2567.5          | 22.85      | 22.56 |
|           |                | 2535.0          | 22.41      | 22.20 |
|           |                | 2502.5          | 22.53      | 22.28 |
|           | 50% RB mid     | 2567.5          | 22.74      | 21.85 |
|           |                | 2535.0          | 22.27      | 21.41 |
|           |                | 2502.5          | 22.33      | 21.37 |
|           | 100% RB        | 2567.5          | 22.59      | 21.68 |
|           |                | 2535.0          | 22.24      | 21.38 |
|           |                | 2502.5          | 22.24      | 21.27 |
| 10MHz     | 1 RB high      | 2565.0          | 22.56      | 22.29 |
|           |                | 2535.0          | 22.37      | 22.14 |
|           |                | 2505.0          | 22.38      | 22.17 |
|           | 1 RB low       | 2565.0          | 22.74      | 22.45 |
|           |                | 2535.0          | 22.38      | 22.16 |
|           |                | 2505.0          | 22.38      | 22.20 |
|           | 50% RB mid     | 2565.0          | 22.65      | 21.74 |
|           |                | 2535.0          | 22.22      | 21.34 |
|           |                | 2505.0          | 22.28      | 21.30 |
|           | 100% RB        | 2565.0          | 22.61      | 21.70 |
|           |                | 2535.0          | 22.26      | 21.38 |
|           |                | 2505.0          | 22.31      | 21.34 |
| 15MHz     | 1 RB high      | 2562.5          | 22.91      | 22.65 |
|           |                | 2535.0          | 22.48      | 22.27 |
|           |                | 2507.5          | 22.53      | 22.33 |
|           | 1 RB low       | 2562.5          | 22.47      | 22.20 |
|           |                | 2535.0          | 22.21      | 22.00 |
|           |                | 2507.5          | 22.13      | 21.93 |
|           | 50% RB mid     | 2562.5          | 22.77      | 22.31 |
|           |                | 2535.0          | 22.39      | 22.00 |
|           |                | 2507.5          | 22.34      | 21.86 |
|           | 100% RB        | 2562.5          | 22.47      | 21.48 |
|           |                | 2535.0          | 22.07      | 21.17 |
|           |                | 2507.5          | 22.17      | 21.13 |
| 20MHz     | 1 RB high      | 2560.0          | 22.17      | 22.74 |

|  |            |        |       |       |
|--|------------|--------|-------|-------|
|  |            | 2535.0 | 22.83 | 22.62 |
|  |            | 2510.0 | 22.99 | 22.75 |
|  | 1 RB low   | 2560.0 | 22.13 | 22.83 |
|  |            | 2535.0 | 22.90 | 22.62 |
|  |            | 2510.0 | 22.76 | 22.49 |
|  | 50% RB mid | 2560.0 | 22.21 | 22.28 |
|  |            | 2535.0 | 22.70 | 21.84 |
|  |            | 2510.0 | 22.77 | 21.75 |
|  | 100% RB    | 2560.0 | 22.09 | 22.25 |
|  |            | 2535.0 | 22.68 | 21.84 |
|  |            | 2510.0 | 22.73 | 21.86 |

**LTE band 41**

| Bandwidth | RB size/offset | Frequency (MHz) | Power(dBm) |       |
|-----------|----------------|-----------------|------------|-------|
|           |                |                 | QPSK       | 16QAM |
| 5MHz      | 1 RB high      | 2652.5          | 22.59      | 22.32 |
|           |                | 2600.0          | 22.36      | 21.94 |
|           |                | 2547.5          | 22.21      | 21.98 |
|           | 1 RB low       | 2652.5          | 22.88      | 22.45 |
|           |                | 2600.0          | 22.59      | 21.86 |
|           |                | 2547.5          | 22.64      | 21.78 |
|           | 50% RB mid     | 2652.5          | 22.81      | 21.88 |
|           |                | 2600.0          | 22.35      | 21.45 |
|           |                | 2547.5          | 22.48      | 21.53 |
|           | 100% RB        | 2652.5          | 22.71      | 21.78 |
|           |                | 2600.0          | 22.33      | 21.36 |
|           |                | 2547.5          | 22.27      | 21.31 |
| 10MHz     | 1 RB high      | 2650.0          | 22.25      | 21.67 |
|           |                | 2600.0          | 22.48      | 22.01 |
|           |                | 2550.0          | 22.44      | 22.04 |
|           | 1 RB low       | 2650.0          | 22.88      | 21.96 |
|           |                | 2600.0          | 22.35      | 21.46 |
|           |                | 2550.0          | 22.36      | 21.56 |
|           | 50% RB mid     | 2650.0          | 22.78      | 21.81 |
|           |                | 2600.0          | 22.24      | 21.28 |
|           |                | 2550.0          | 22.34      | 21.30 |
|           | 100% RB        | 2650.0          | 22.64      | 21.68 |
|           |                | 2600.0          | 22.23      | 21.32 |
|           |                | 2550.0          | 22.45      | 21.49 |
| 15MHz     | 1 RB high      | 2647.5          | 22.83      | 22.43 |
|           |                | 2600.0          | 22.45      | 22.27 |
|           |                | 2552.5          | 22.67      | 22.12 |
|           | 1 RB low       | 2647.5          | 22.55      | 22.08 |
|           |                | 2600.0          | 22.21      | 21.35 |
|           |                | 2552.5          | 22.34      | 21.87 |
|           | 50% RB mid     | 2647.5          | 22.83      | 22.12 |
|           |                | 2600.0          | 22.46      | 21.54 |
|           |                | 2552.5          | 22.45      | 21.65 |
|           | 100% RB        | 2647.5          | 22.49      | 21.51 |
|           |                | 2600.0          | 22.21      | 21.17 |
|           |                | 2552.5          | 22.25      | 21.18 |
| 20MHz     | 1 RB high      | 2645.0          | 22.19      | 21.49 |

|  |            |        |       |       |
|--|------------|--------|-------|-------|
|  |            | 2600.0 | 22.83 | 22.36 |
|  |            | 2555.0 | 22.98 | 22.18 |
|  | 1 RB low   | 2645.0 | 22.19 | 21.36 |
|  |            | 2600.0 | 22.96 | 22.21 |
|  |            | 2555.0 | 22.87 | 22.03 |
|  | 50% RB mid | 2645.0 | 22.32 | 21.45 |
|  |            | 2600.0 | 22.76 | 21.72 |
|  |            | 2555.0 | 22.77 | 21.81 |
|  | 100% RB    | 2645.0 | 22.19 | 21.31 |
|  |            | 2600.0 | 22.68 | 21.65 |
|  |            | 2555.0 | 22.41 | 21.53 |

Note: Expanded measurement uncertainty is  $U = 0.488$  dB,  $k = 1.96$

### A.1.3 Radiated

#### A.1.3.1 Description

##### A.1.3.1 Description

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

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(d) specifies "Fixed, mobile, and portable (handheld) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP".

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

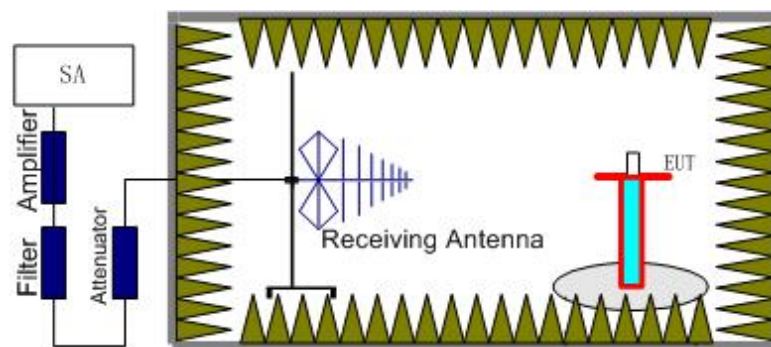
Rule Part 27.50(c) specifies "Portable stations (hand-held de-vices) are limited to 3 watts ERP".

Rule Part 27.50(a)(3) specifies "For mobile and portable stations transmitting in the 2305–2315 MHz band or the 2350–2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth."

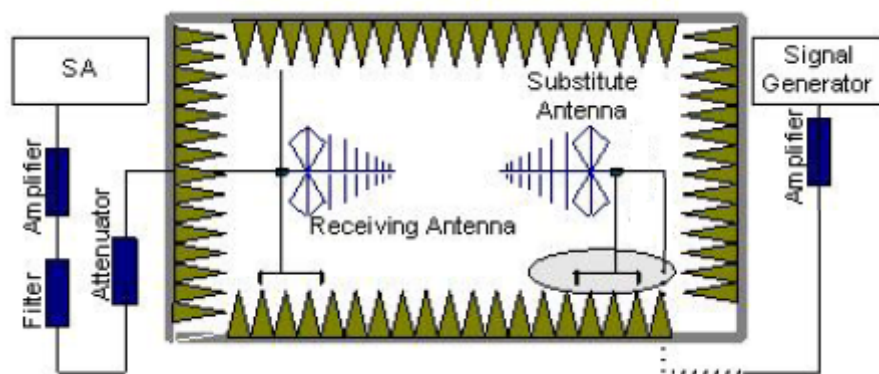
##### A.1.3.2 Method of Measurement

The measurements procedures in TIA-603-E-2016 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 (Pr).
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,  $ERP = EIRP - 2.15\text{dB}$ .

### A.1.3.3 Measurement result

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

Limits: ≤33dBm (2W)

#### LTE Band 2\_1.4MHz\_QPSK-Internal Antenna

| 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        | -3.11                  | -29.40                                     | 0.15                            | 26.44        | 33.00        | H            |
| <b>1880.00</b> | <b>-0.79</b>           | <b>-29.30</b>                              | <b>0.25</b>                     | <b>28.76</b> | <b>33.00</b> | <b>H</b>     |
| 1909.30        | -1.47                  | -29.30                                     | 0.35                            | 28.18        | 33.00        | H            |

#### LTE Band 2\_3MHz\_QPSK-Internal Antenna

| 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        | -3.74                  | -29.40                                     | 0.15                            | 25.81     | 33.00      | H            |
| 1880.00        | -2.32                  | -29.30                                     | 0.25                            | 27.23     | 33.00      | H            |
| 1908.50        | -2.40                  | -29.30                                     | 0.35                            | 27.25     | 33.00      | H            |

#### LTE Band 2\_5MHz\_QPSK-Internal Antenna

| 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        | -3.85                  | -29.40                                     | 0.15                            | 25.70     | 33.00      | H            |
| 1880.00        | -2.20                  | -29.30                                     | 0.25                            | 27.35     | 33.00      | H            |
| 1907.50        | -2.42                  | -29.30                                     | 0.35                            | 27.23     | 33.00      | H            |

#### LTE Band 2\_10MHz\_QPSK-Internal Antenna

| 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        | -4.48                  | -29.40                                     | 0.15                            | 25.07     | 33.00      | H            |
| 1880.00        | -3.16                  | -29.30                                     | 0.25                            | 26.39     | 33.00      | H            |
| 1905.00        | -3.06                  | -29.30                                     | 0.35                            | 26.59     | 33.00      | H            |

#### LTE Band 2\_15MHz\_QPSK-Internal Antenna

| 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        | -5.83                  | -29.40                                     | 0.15                            | 23.72     | 33.00      | H            |
| 1880.00        | -4.48                  | -29.30                                     | 0.25                            | 25.07     | 33.00      | H            |
| 1902.50        | -5.97                  | -29.30                                     | 0.35                            | 23.68     | 33.00      | H            |

#### LTE Band 2\_20 MHz\_QPSK-Internal Antenna

| 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        | -6.62                  | -29.40                                     | 0.15                            | 22.93     | 33.00      | H            |
| 1880.00        | -5.11                  | -29.30                                     | 0.25                            | 24.44     | 33.00      | H            |
| 1900.00        | -5.22                  | -29.30                                     | 0.35                            | 24.43     | 33.00      | H            |

**LTE Band 2\_1.4MHz\_16QAM-Internal Antenna**

| 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        | -1.72                  | -29.40                                     | 0.15                            | 27.83     | 33.00      | H            |
| 1880.00        | -1.42                  | -29.30                                     | 0.25                            | 28.14     | 33.00      | H            |
| 1909.30        | -5.22                  | -29.30                                     | 0.35                            | 24.43     | 33.00      | H            |

**LTE Band 2\_3MHz\_16QAM-Internal Antenna**

| 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        | -1.56                  | -29.40                                     | 0.15                            | 27.99     | 33.00      | H            |
| 1880.00        | -1.07                  | -29.30                                     | 0.25                            | 28.48     | 33.00      | H            |
| 1908.50        | -1.82                  | -29.30                                     | 0.35                            | 27.83     | 33.00      | H            |

**LTE Band 2\_5MHz\_16QAM-Internal Antenna**

| 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        | -4.51                  | -29.40                                     | 0.15                            | 25.04     | 33.00      | H            |
| 1880.00        | -2.30                  | -29.30                                     | 0.25                            | 27.25     | 33.00      | H            |
| 1907.50        | -4.42                  | -29.30                                     | 0.35                            | 25.23     | 33.00      | H            |

**LTE Band 2\_10MHz\_16QAM-Internal Antenna**

| 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        | -4.16                  | -29.40                                     | 0.15                            | 25.39     | 33.00      | H            |
| 1880.00        | -2.81                  | -29.30                                     | 0.25                            | 26.74     | 33.00      | H            |
| 1905.00        | -3.17                  | -29.30                                     | 0.35                            | 26.48     | 33.00      | H            |

**LTE Band 2\_15MHz\_16QAM-Internal Antenna**

| 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        | -5.94                  | -29.40                                     | 0.15                            | 23.61     | 33.00      | H            |
| 1880.00        | -4.58                  | -29.30                                     | 0.25                            | 24.97     | 33.00      | H            |
| 1902.50        | -4.80                  | -29.30                                     | 0.35                            | 24.86     | 33.00      | H            |

**LTE Band 2\_20 MHz\_16QAM-Internal Antenna**

| 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        | -5.94                  | -29.40                                     | 0.15                            | 23.61     | 33.00      | H            |
| 1880.00        | -4.58                  | -29.30                                     | 0.25                            | 24.97     | 33.00      | H            |
| 1900.00        | -4.80                  | -29.30                                     | 0.35                            | 24.86     | 33.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-0.79dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-29.30dB)+G<sub>a</sub>(0.25dB) =28.76dBm

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

Limits: ≤30dBm (1W)

##### LTE Band 4\_1.4MHz\_QPSK-Internal Antenna

| 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        | -2.35                  | -29.60                                     | 0.39                            | 27.64        | 30.00        | H            |
| 1732.50        | -0.52                  | -29.60                                     | 0.27                            | 29.35        | 30.00        | H            |
| 1754.30        | 0.10                   | -29.50                                     | 0.17                            | <b>29.77</b> | <b>30.00</b> | H            |

##### LTE Band 4\_3MHz\_QPSK-Internal Antenna

| 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        | -1.66                  | -29.60                                     | 0.39                            | 28.33     | 30.00      | H            |
| 1732.50        | -0.32                  | -29.60                                     | 0.27                            | 29.55     | 30.00      | H            |
| 1753.50        | -0.11                  | -29.50                                     | 0.17                            | 29.56     | 30.00      | H            |

##### LTE Band 4\_5MHz\_QPSK-Internal Antenna

| 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        | -1.95                  | -29.60                                     | 0.39                            | 28.04     | 30.00      | H            |
| 1732.50        | -0.65                  | -29.60                                     | 0.27                            | 29.22     | 30.00      | H            |
| 1752.50        | -0.08                  | -29.50                                     | 0.17                            | 29.59     | 30.00      | H            |

##### LTE Band 4\_10MHz\_QPSK-Internal Antenna

| 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        | -2.78                  | -29.60                                     | 0.39                            | 27.21     | 30.00      | H            |
| 1732.50        | -1.15                  | -29.60                                     | 0.27                            | 28.72     | 30.00      | H            |
| 1750.50        | -0.61                  | -29.50                                     | 0.17                            | 29.06     | 30.00      | H            |

##### LTE Band 4\_15MHz\_QPSK-Internal Antenna

| 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        | -4.37                  | -29.60                                     | 0.39                            | 25.62     | 30.00      | H            |
| 1732.50        | -2.39                  | -29.60                                     | 0.27                            | 27.48     | 30.00      | H            |
| 1747.50        | -1.65                  | -29.50                                     | 0.17                            | 28.02     | 30.00      | H            |

##### LTE Band 4\_20MHz\_QPSK-Internal Antenna

| 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        | -5.77                  | -29.60                                     | 0.39                            | 24.22     | 30.00      | H            |
| 1732.50        | -3.36                  | -29.60                                     | 0.27                            | 26.51     | 30.00      | H            |
| 1745.00        | -2.57                  | -29.50                                     | 0.17                            | 27.10     | 30.00      | H            |

**LTE Band 4 1.4MHz 16QAM-Internal Antenna**

| 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        | -1.99                  | -29.60                                     | 0.39                            | 28.00     | 30.00      | H            |
| 1732.50        | -0.58                  | -29.60                                     | 0.27                            | 29.29     | 30.00      | H            |
| 1754.30        | 0.01                   | -29.50                                     | 0.17                            | 29.68     | 30.00      | H            |

**LTE Band 4 3MHz 16QAM-Internal Antenna**

| 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        | -1.89                  | -29.60                                     | 0.39                            | 28.11     | 30.00      | H            |
| 1732.50        | -0.25                  | -29.60                                     | 0.27                            | 29.62     | 30.00      | H            |
| 1753.50        | -0.01                  | -29.50                                     | 0.17                            | 29.67     | 30.00      | H            |

**LTE Band 4 5MHz 16QAM-Internal Antenna**

| 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        | -2.02                  | -29.60                                     | 0.39                            | 27.98     | 30.00      | H            |
| 1732.50        | -0.23                  | -29.60                                     | 0.27                            | 29.64     | 30.00      | H            |
| 1752.50        | -0.01                  | -29.50                                     | 0.17                            | 29.67     | 30.00      | H            |

**LTE Band 4 10MHz 16QAM-Internal Antenna**

| 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        | -2.75                  | -29.60                                     | 0.39                            | 27.24     | 30.00      | H            |
| 1732.50        | -1.05                  | -29.60                                     | 0.27                            | 28.82     | 30.00      | H            |
| 1750.50        | -0.96                  | -29.50                                     | 0.17                            | 28.71     | 30.00      | H            |

**LTE Band 4 15MHz 16QAM-Internal Antenna**

| 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        | -3.76                  | -29.60                                     | 0.39                            | 26.23     | 30.00      | H            |
| 1732.50        | -2.06                  | -29.60                                     | 0.27                            | 27.81     | 30.00      | H            |
| 1747.50        | -2.10                  | -29.50                                     | 0.17                            | 27.57     | 30.00      | H            |

**LTE Band 4 20MHz 16QAM-Internal Antenna**

| 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        | -4.53                  | -29.60                                     | 0.39                            | 25.46     | 30.00      | H            |
| 1732.50        | -2.30                  | -29.60                                     | 0.27                            | 27.57     | 30.00      | H            |
| 1745.00        | -2.17                  | -29.50                                     | 0.17                            | 27.50     | 30.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(0.10dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-29.50dB)+G<sub>a</sub>(0.17dB) =29.77dBm

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

**Limits:** ≤38.45dBm (7W)

**LTE Band 5\_1.4MHz\_QPSK-Internal Antenna**

| 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         | -7.75                  | -33.60                                        | 0.28                               | 2.15               | 23.98    | 38.45      | H            |
| 836.50         | -9.08                  | -33.50                                        | 0.25                               | 2.15               | 22.52    | 38.45      | H            |
| 848.30         | -8.62                  | -33.50                                        | 0.21                               | 2.15               | 22.94    | 38.45      | H            |

**LTE Band 5\_3MHz\_QPSK-Internal Antenna**

| 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         | -7.35                  | -33.60                                        | 0.28                               | 2.15               | 24.38    | 38.45      | H            |
| 836.50         | -9.00                  | -33.50                                        | 0.25                               | 2.15               | 22.60    | 38.45      | H            |
| 847.50         | -8.13                  | -33.50                                        | 0.21                               | 2.15               | 23.43    | 38.45      | H            |

**LTE Band 5\_5MHz\_QPSK-Internal Antenna**

| 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         | -7.19                  | -33.60                                        | 0.28                               | 2.15               | 24.54    | 38.45      | H            |
| 836.50         | -8.92                  | -33.50                                        | 0.25                               | 2.15               | 22.68    | 38.45      | H            |
| 846.50         | -8.13                  | -33.50                                        | 0.21                               | 2.15               | 23.43    | 38.45      | H            |

**LTE Band 5\_10MHz\_QPSK-Internal Antenna**

| 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         | -8.80                  | -33.60                                        | 0.28                               | 2.15               | 22.93    | 38.45      | H            |
| 836.50         | -9.58                  | -33.50                                        | 0.25                               | 2.15               | 22.02    | 38.45      | H            |
| 844.00         | -9.22                  | -33.50                                        | 0.21                               | 2.15               | 22.34    | 38.45      | H            |

**LTE Band 5\_1.4MHz\_16QAM-Internal Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | 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 |
|----------------|------------------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 824.70         | -7.55                  | -33.60                                        | 0.28                                  | 2.15               | 24.19    | 38.45      | H            |
| 836.50         | -8.66                  | -33.50                                        | 0.25                                  | 2.15               | 22.94    | 38.45      | H            |
| 848.30         | -7.83                  | -33.50                                        | 0.21                                  | 2.15               | 23.73    | 38.45      | H            |

**LTE Band 5\_3MHz\_16QAM-Internal Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | 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 |
|----------------|------------------------|-----------------------------------------------|---------------------------------------|--------------------|--------------|--------------|--------------|
| <b>825.50</b>  | <b>-7.11</b>           | <b>-33.60</b>                                 | <b>0.28</b>                           | <b>2.15</b>        | <b>24.62</b> | <b>38.45</b> | <b>H</b>     |
| 836.50         | -8.81                  | -33.50                                        | 0.25                                  | 2.15               | 22.79        | 38.45        | H            |
| 847.50         | -7.39                  | -33.50                                        | 0.21                                  | 2.15               | 24.17        | 38.45        | H            |

**LTE Band 5\_5MHz\_16QAM-Internal Antenna**

| 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         | -7.41                  | -33.60                                        | 0.28                               | 2.15               | 24.32    | 38.45      | H            |
| 836.50         | -9.13                  | -33.50                                        | 0.25                               | 2.15               | 22.47    | 38.45      | H            |
| 846.50         | -7.74                  | -33.50                                        | 0.21                               | 2.15               | 23.82    | 38.45      | H            |

**LTE Band 5\_10MHz\_16QAM-Internal Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | 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 |
|----------------|------------------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 829.00         | -8.11                  | -33.60                                        | 0.28                                  | 2.15               | 23.62    | 38.45      | H            |
| 836.50         | -9.10                  | -33.50                                        | 0.25                                  | 2.15               | 22.50    | 38.45      | H            |
| 844.00         | -8.33                  | -33.50                                        | 0.21                                  | 2.15               | 23.23    | 38.45      | H            |

Peak ERP (dBm)=P<sub>Mea</sub>(-7.11dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-33.60dB)+G<sub>a</sub>(0.28dB) -2.15dB =24.62dBm

**LTE Band 7- EIRP 27.50(h)(2)**
**Limits:** ≤33 dBm (2W)

**LTE Band 7\_5MHz\_QPSK-Internal Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>ci</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm)    | Limit(dBm)   | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|--------------|--------------|--------------|
| 2502.50        | -2.04                  | -28.70                                     | 0.59                            | 27.25        | 33.00        | H            |
| 2535.00        | -1.40                  | -28.60                                     | 0.45                            | 27.65        | 33.00        | H            |
| <b>2567.50</b> | <b>0.39</b>            | <b>-28.60</b>                              | <b>0.38</b>                     | <b>29.37</b> | <b>33.00</b> | <b>H</b>     |

**LTE Band 7\_10MHz\_QPSK-Internal Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>ci</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2505.00        | -2.10                  | -28.70                                     | 0.59                            | 27.19     | 33.00      | H            |
| 2535.00        | -2.38                  | -28.60                                     | 0.45                            | 26.67     | 33.00      | H            |
| 2565.00        | -0.49                  | -28.60                                     | 0.38                            | 28.49     | 33.00      | H            |

**LTE Band 7\_15MHz\_QPSK-Internal Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>ci</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2507.50        | -2.40                  | -28.70                                     | 0.59                            | 26.89     | 33.00      | H            |
| 2535.00        | -3.88                  | -28.60                                     | 0.45                            | 25.17     | 33.00      | H            |
| 2562.50        | -1.97                  | -28.60                                     | 0.38                            | 27.01     | 33.00      | H            |

**LTE Band 7\_20MHz\_QPSK-Internal Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>ci</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2510.00        | -2.58                  | -28.70                                     | 0.59                            | 26.71     | 33.00      | H            |
| 2535.00        | -3.62                  | -28.60                                     | 0.45                            | 25.43     | 33.00      | H            |
| 2560.00        | -2.22                  | -28.60                                     | 0.38                            | 26.76     | 33.00      | H            |

**LTE Band 7\_5MHz\_16QAM-Internal Antenna**

| 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        | -1.83                  | -28.70                                     | 0.59                            | 27.46     | 33.00      | H            |
| 2535.00        | -1.42                  | -28.60                                     | 0.45                            | 27.63     | 33.00      | H            |
| 2567.50        | 0.20                   | -28.60                                     | 0.38                            | 29.18     | 33.00      | H            |

**LTE Band 7\_10MHz\_16QAM-Internal Antenna**

| 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        | -1.46                  | -28.70                                     | 0.59                            | 27.84     | 33.00      | H            |
| 2535.00        | -2.33                  | -28.60                                     | 0.45                            | 26.73     | 33.00      | H            |
| 2565.00        | -0.50                  | -28.60                                     | 0.38                            | 28.48     | 33.00      | H            |

**LTE Band 7\_15MHz\_16QAM-Internal Antenna**

| 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        | -2.26                  | -28.70                                     | 0.59                            | 27.03     | 33.00      | H            |
| 2535.00        | -3.34                  | -28.60                                     | 0.45                            | 25.71     | 33.00      | H            |
| 2562.50        | -1.67                  | -28.60                                     | 0.38                            | 27.31     | 33.00      | H            |

**LTE Band 7\_20MHz\_16QAM-Internal Antenna**

| 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        | -2.42                  | -28.70                                     | 0.59                            | 26.87     | 33.00      | H            |
| 2535.00        | -3.23                  | -28.60                                     | 0.45                            | 25.82     | 33.00      | H            |
| 2560.00        | -1.67                  | -28.60                                     | 0.38                            | 27.31     | 33.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(0.39dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-28.60dB)+G<sub>a</sub>(0.38dB) -2.15dB =29.37dBm

**LTE Band 41- EIRP Part 27.50(h)(2)**

**Limits:** ≤33dBm (2W)

**LTE Band 41\_5MHz\_QPSK-Internal Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|--------------|--------------|--------------|
| 2547.50        | -0.47                  | -28.60                                     | 0.38                            | 28.51        | 33.00        | H            |
| <b>2600.00</b> | <b>0.75</b>            | <b>-28.60</b>                              | <b>0.30</b>                     | <b>29.65</b> | <b>33.00</b> | <b>H</b>     |
| 2652.50        | 0.51                   | -28.60                                     | -0.01                           | 29.10        | 33.00        | H            |

**LTE Band 41\_10MHz\_QPSK-Internal Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2550.00        | -0.78                  | -28.60                                     | 0.38                            | 28.20     | 33.00      | H            |
| 2600.00        | 0.62                   | -28.60                                     | 0.30                            | 29.52     | 33.00      | H            |
| 2650.00        | 0.38                   | -28.60                                     | -0.01                           | 28.97     | 33.00      | H            |

**LTE Band 41\_15MHz\_QPSK-Internal Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2552.50        | -2.48                  | -28.60                                     | 0.38                            | 26.50     | 33.00      | H            |
| 2600.00        | -0.89                  | -28.60                                     | 0.30                            | 28.01     | 33.00      | H            |
| 2647.50        | -0.88                  | -28.60                                     | -0.01                           | 27.71     | 33.00      | H            |

**LTE Band 41\_20MHz\_QPSK-Internal Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2555.00        | -2.39                  | -28.60                                     | 0.38                            | 26.59     | 33.00      | H            |
| 2600.00        | -1.05                  | -28.60                                     | 0.30                            | 27.85     | 33.00      | H            |
| 2645.00        | -0.96                  | -28.60                                     | -0.01                           | 27.63     | 33.00      | H            |

**LTE Band 41\_5MHz\_16QAM-Internal Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2547.50        | -0.91                  | -28.60                                     | 0.38                            | 28.07     | 33.00      | H            |
| 2600.00        | 0.70                   | -28.60                                     | 0.30                            | 29.60     | 33.00      | H            |
| 2652.50        | 0.95                   | -28.60                                     | -0.01                           | 29.54     | 33.00      | H            |

**LTE Band 41\_10MHz\_16QAM-Internal Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2550.00        | -0.99                  | -28.60                                     | 0.38                            | 27.99     | 33.00      | H            |
| 2600.00        | 0.39                   | -28.60                                     | 0.30                            | 29.30     | 33.00      | H            |
| 2650.00        | 0.52                   | -28.60                                     | -0.01                           | 29.11     | 33.00      | H            |

**LTE Band 41\_15MHz\_16QAM-Internal Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2552.50        | -1.86                  | -28.60                                     | 0.38                            | 27.12     | 33.00      | H            |
| 2600.00        | -0.71                  | -28.60                                     | 0.30                            | 28.20     | 33.00      | H            |
| 2647.50        | -0.49                  | -28.60                                     | -0.01                           | 28.10     | 33.00      | H            |

**LTE Band 41\_20 MHz\_16QAM-Internal Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2555.00        | -2.58                  | -28.60                                     | 0.38                            | 26.40     | 33.00      | H            |
| 2600.00        | -0.45                  | -28.60                                     | 0.30                            | 28.45     | 33.00      | H            |
| 2645.00        | -1.21                  | -28.60                                     | -0.01                           | 27.38     | 33.00      | H            |

Peak EIRP (dBm)=P<sub>Mea</sub>(0.75dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-28.60dB)+G<sub>a</sub>(0.30dB) =29.65dBm

**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: The maximum value of expanded measurement uncertainty for this test item is  $U =$

4.92dB(30MHz-3GHz)/4.88dB(3GHz-18GHz)/5.66dB(18GHz-40GHz),  $k = 2$

**LTE Band 2- EIRP 24. 232(b)**

**Limits:** ≤33dBm (2W)

**LTE Band 2 1.4MHz\_QPSK-External Antenna**

| 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        | -2.41                  | -29.40                                     | 0.15                            | 27.14     | 33.00      | V            |
| 1880.00        | -0.64                  | -29.30                                     | 0.25                            | 28.92     | 33.00      | V            |
| 1909.30        | -0.80                  | -29.30                                     | 0.35                            | 28.85     | 33.00      | V            |

**LTE Band 2 3MHz\_QPSK-External Antenna**

| 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        | -2.29                  | -29.40                                     | 0.15                            | 27.26     | 33.00      | V            |
| 1880.00        | -0.75                  | -29.30                                     | 0.25                            | 28.80     | 33.00      | V            |
| 1908.50        | -0.41                  | -29.30                                     | 0.35                            | 29.24     | 33.00      | V            |

**LTE Band 2 5MHz\_QPSK-External Antenna**

| 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        | -2.12                  | -29.40                                     | 0.15                            | 27.43     | 33.00      | V            |
| 1880.00        | -0.49                  | -29.30                                     | 0.25                            | 29.06     | 33.00      | V            |
| 1907.50        | -3.02                  | -29.30                                     | 0.35                            | 26.63     | 33.00      | V            |

**LTE Band 2 10MHz\_QPSK-External Antenna**

| 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        | -2.54                  | -29.40                                     | 0.15                            | 27.01     | 33.00      | V            |
| 1880.00        | -1.42                  | -29.30                                     | 0.25                            | 28.13     | 33.00      | V            |
| 1905.00        | -0.85                  | -29.30                                     | 0.35                            | 28.80     | 33.00      | V            |

**LTE Band 2 15MHz\_QPSK-External Antenna**

| 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        | -3.39                  | -29.40                                     | 0.15                            | 26.16     | 33.00      | V            |
| 1880.00        | -2.35                  | -29.30                                     | 0.25                            | 27.20     | 33.00      | V            |
| 1902.50        | -2.08                  | -29.30                                     | 0.35                            | 27.57     | 33.00      | V            |

**LTE Band 2 20 MHz\_QPSK-External Antenna**

| 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        | -2.36                  | -29.40                                     | 0.15                            | 27.19     | 33.00      | V            |
| 1880.00        | -0.45                  | -29.30                                     | 0.25                            | 29.10     | 33.00      | V            |
| 1900.00        | -0.53                  | -29.30                                     | 0.35                            | 29.12     | 33.00      | V            |

**LTE Band 2\_1.4MHz\_16QAM-External Antenna**

| 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        | -2.70                  | -29.40                                     | 0.15                            | 26.85     | 33.00      | V            |
| 1880.00        | -0.77                  | -29.30                                     | 0.25                            | 28.78     | 33.00      | V            |
| 1909.30        | -1.41                  | -29.30                                     | 0.35                            | 28.24     | 33.00      | V            |

**LTE Band 2\_3MHz\_16QAM-External Antenna**

| 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        | -2.33                  | -29.40                                     | 0.15                            | 27.22     | 33.00      | V            |
| 1880.00        | -0.52                  | -29.30                                     | 0.25                            | 29.03     | 33.00      | V            |
| 1908.50        | -0.72                  | -29.30                                     | 0.35                            | 28.93     | 33.00      | V            |

**LTE Band 2\_5MHz\_16QAM-External Antenna**

| 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        | -2.18                  | -29.40                                     | 0.15                            | 27.37     | 33.00      | V            |
| 1880.00        | -1.03                  | -29.30                                     | 0.25                            | 28.52     | 33.00      | V            |
| 1907.50        | -0.46                  | -29.30                                     | 0.35                            | 29.20     | 33.00      | V            |

**LTE Band 2\_10MHz\_16QAM-External Antenna**

| 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        | -2.33                  | -29.40                                     | 0.15                            | 27.22     | 33.00      | V            |
| 1880.00        | -1.46                  | -29.30                                     | 0.25                            | 28.09     | 33.00      | V            |
| 1905.00        | -0.50                  | -29.30                                     | 0.35                            | 29.15     | 33.00      | V            |

**LTE Band 2\_15MHz\_16QAM-External Antenna**

| 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        | -3.15                  | -29.40                                     | 0.15                            | 26.40     | 33.00      | V            |
| 1880.00        | -2.56                  | -29.30                                     | 0.25                            | 26.99     | 33.00      | V            |
| 1902.50        | -1.56                  | -29.30                                     | 0.35                            | 28.09     | 33.00      | V            |

**LTE Band 2\_20 MHz\_16QAM-External Antenna**

| 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        | -2.39                  | -29.40                                     | 0.15                            | 27.16        | 33.00        | V            |
| 1880.00        | -2.10                  | -29.30                                     | 0.25                            | 27.46        | 33.00        | V            |
| <b>1900.00</b> | <b>-0.21</b>           | <b>-29.30</b>                              | <b>0.35</b>                     | <b>29.44</b> | <b>33.00</b> | <b>V</b>     |

Peak EIRP (dBm)=P<sub>Mea</sub>(-0.21dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-29.30dB)+G<sub>a</sub>(0.35dB) =29.44dBm

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

Limits: ≤30dBm (1W)

##### LTE Band 4 1.4MHz\_QPSK-External Antenna

| 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        | -3.89                  | -29.60                                     | 0.39                            | 26.10     | 30.00      | V            |
| 1732.50        | -4.10                  | -29.60                                     | 0.27                            | 25.77     | 30.00      | V            |
| 1754.30        | -2.90                  | -29.50                                     | 0.17                            | 26.77     | 30.00      | V            |

##### LTE Band 4 3MHz\_QPSK-External Antenna

| 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        | -3.38                  | -29.60                                     | 0.39                            | 26.61     | 30.00      | V            |
| 1732.50        | -4.25                  | -29.60                                     | 0.27                            | 25.62     | 30.00      | V            |
| 1753.50        | -2.78                  | -29.50                                     | 0.17                            | 26.89     | 30.00      | V            |

##### LTE Band 4 5MHz\_QPSK-External Antenna

| 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        | -3.62                  | -29.60                                     | 0.39                            | 26.37     | 30.00      | V            |
| 1732.50        | -4.21                  | -29.60                                     | 0.27                            | 25.66     | 30.00      | V            |
| 1752.50        | -3.35                  | -29.50                                     | 0.17                            | 26.32     | 30.00      | V            |

##### LTE Band 4 10MHz\_QPSK-External Antenna

| 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        | -4.96                  | -29.60                                     | 0.39                            | 25.04     | 30.00      | V            |
| 1732.50        | -5.22                  | -29.60                                     | 0.27                            | 24.65     | 30.00      | V            |
| 1750.50        | -3.51                  | -29.50                                     | 0.17                            | 26.16     | 30.00      | V            |

##### LTE Band 4 15MHz\_QPSK-External Antenna

| 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        | -5.22                  | -29.60                                     | 0.39                            | 24.77     | 30.00      | V            |
| 1732.50        | -5.21                  | -29.60                                     | 0.27                            | 24.66     | 30.00      | V            |
| 1747.50        | -4.62                  | -29.50                                     | 0.17                            | 25.05     | 30.00      | V            |

##### LTE Band 4 20MHz\_QPSK-External Antenna

| 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        | -3.42                  | -29.60                                     | 0.39                            | 26.57     | 30.00      | V            |
| 1732.50        | -4.85                  | -29.60                                     | 0.27                            | 25.02     | 30.00      | V            |
| 1745.00        | -3.16                  | -29.50                                     | 0.17                            | 26.52     | 30.00      | V            |

**LTE Band 4 1.4MHz 16QAM-External Antenna**

| 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        | -3.38                  | -29.60                                     | 0.39                            | 26.61        | 30.00        | V            |
| 1732.50        | -4.85                  | -29.60                                     | 0.27                            | 25.02        | 30.00        | V            |
| <b>1754.30</b> | <b>-2.62</b>           | <b>-29.50</b>                              | <b>0.17</b>                     | <b>27.05</b> | <b>30.00</b> | <b>V</b>     |

**LTE Band 4 3MHz 16QAM-External Antenna**

| 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        | -3.50                  | -29.60                                     | 0.39                            | 26.49     | 30.00      | V            |
| 1732.50        | -4.38                  | -29.60                                     | 0.27                            | 25.49     | 30.00      | V            |
| 1753.50        | -2.73                  | -29.50                                     | 0.17                            | 26.94     | 30.00      | V            |

**LTE Band 4 5MHz 16QAM-External Antenna**

| 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        | -3.66                  | -29.60                                     | 0.39                            | 26.33     | 30.00      | V            |
| 1732.50        | -4.38                  | -29.60                                     | 0.27                            | 25.49     | 30.00      | V            |
| 1752.50        | -2.73                  | -29.50                                     | 0.17                            | 26.94     | 30.00      | V            |

**LTE Band 4 10MHz 16QAM-External Antenna**

| 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        | -4.53                  | -29.60                                     | 0.39                            | 25.46     | 30.00      | V            |
| 1732.50        | -4.75                  | -29.60                                     | 0.27                            | 25.12     | 30.00      | V            |
| 1750.50        | -3.24                  | -29.50                                     | 0.17                            | 26.43     | 30.00      | V            |

**LTE Band 4 15MHz 16QAM-External Antenna**

| 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        | -6.09                  | -29.60                                     | 0.39                            | 23.90     | 30.00      | V            |
| 1732.50        | -6.03                  | -29.60                                     | 0.27                            | 23.84     | 30.00      | V            |
| 1747.50        | -4.78                  | -29.50                                     | 0.17                            | 24.89     | 30.00      | V            |

**LTE Band 4 20MHz 16QAM-External Antenna**

| 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        | -3.28                  | -29.60                                     | 0.39                            | 26.71     | 30.00      | V            |
| 1732.50        | -4.92                  | -29.60                                     | 0.27                            | 24.95     | 30.00      | V            |
| 1745.00        | -2.78                  | -29.50                                     | 0.17                            | 26.89     | 30.00      | V            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-2.62dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-29.50dB)+G<sub>a</sub>(0.17dB) =27.05dBm

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

**Limits:** ≤38.45dBm (7W)

**LTE Band 5\_1.4MHz\_QPSK-External Antenna**

| 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         | -4.48                  | -33.60                                        | 0.28                               | 2.15               | 27.25    | 38.45      | V            |
| 836.50         | -5.81                  | -33.50                                        | 0.25                               | 2.15               | 25.79    | 38.45      | V            |
| 848.30         | -5.20                  | -33.50                                        | 0.21                               | 2.15               | 26.36    | 38.45      | V            |

**LTE Band 5\_3MHz\_QPSK-External Antenna**

| 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         | -4.17                  | -33.60                                        | 0.28                               | 2.15               | 27.56    | 38.45      | V            |
| 836.50         | -5.48                  | -33.50                                        | 0.25                               | 2.15               | 26.12    | 38.45      | V            |
| 847.50         | -5.11                  | -33.50                                        | 0.21                               | 2.15               | 26.45    | 38.45      | V            |

**LTE Band 5\_5MHz\_QPSK-External Antenna**

| 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         | -3.83                  | -33.60                                        | 0.28                               | 2.15               | 27.90    | 38.45      | V            |
| 836.50         | -5.48                  | -33.50                                        | 0.25                               | 2.15               | 26.12    | 38.45      | V            |
| 846.50         | -4.90                  | -33.50                                        | 0.21                               | 2.15               | 26.66    | 38.45      | V            |

**LTE Band 5\_10MHz\_QPSK-External Antenna**

| 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         | -4.79                  | -33.60                                        | 0.28                               | 2.15               | 26.94    | 38.45      | V            |
| 836.50         | -5.26                  | -33.50                                        | 0.25                               | 2.15               | 26.34    | 38.45      | V            |
| 844.00         | -5.39                  | -33.50                                        | 0.21                               | 2.15               | 26.17    | 38.45      | V            |

**LTE Band 5\_1.4MHz\_16QAM-External Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | 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 |
|----------------|------------------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 824.70         | -3.76                  | -33.60                                        | 0.28                                  | 2.15               | 27.97    | 38.45      | V            |
| 836.50         | -4.97                  | -33.50                                        | 0.25                                  | 2.15               | 26.63    | 38.45      | V            |
| 848.30         | -4.19                  | -33.50                                        | 0.21                                  | 2.15               | 27.37    | 38.45      | V            |

**LTE Band 5\_3MHz\_16QAM-External Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | 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 |
|----------------|------------------------|-----------------------------------------------|---------------------------------------|--------------------|--------------|--------------|--------------|
| <b>825.50</b>  | <b>-3.21</b>           | <b>-33.60</b>                                 | <b>0.28</b>                           | <b>2.15</b>        | <b>28.52</b> | <b>38.45</b> | <b>V</b>     |
| 836.50         | -4.47                  | -33.50                                        | 0.25                                  | 2.15               | 27.14        | 38.45        | V            |
| 847.50         | -4.30                  | -33.50                                        | 0.21                                  | 2.15               | 27.26        | 38.45        | V            |

**LTE Band 5\_5MHz\_16QAM-External Antenna**

| 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         | -3.71                  | -33.60                                        | 0.28                               | 2.15               | 28.02    | 38.45      | V            |
| 836.50         | -4.60                  | -33.50                                        | 0.25                               | 2.15               | 27.00    | 38.45      | V            |
| 846.50         | -4.11                  | -33.50                                        | 0.21                               | 2.15               | 27.46    | 38.45      | V            |

**LTE Band 5\_10MHz\_16QAM-External Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | 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 |
|----------------|------------------------|-----------------------------------------------|---------------------------------------|--------------------|----------|------------|--------------|
| 829.00         | -4.14                  | -33.60                                        | 0.28                                  | 2.15               | 27.59    | 38.45      | V            |
| 836.50         | -4.71                  | -33.50                                        | 0.25                                  | 2.15               | 26.90    | 38.45      | V            |
| 844.00         | -5.11                  | -33.50                                        | 0.21                                  | 2.15               | 26.45    | 38.45      | V            |

Peak ERP (dBm)=P<sub>Mea</sub>(-3.21dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-33.60dB)+G<sub>a</sub>(0.28dB) -2.15dB =28.52dBm

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

**Limits:** ≤33 dBm (2W)

**LTE Band 7\_5MHz\_QPSK-External Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>ci</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2502.50        | -2.62                  | -28.70                                     | 0.59                            | 26.67     | 33.00      | V            |
| 2535.00        | -4.36                  | -28.60                                     | 0.45                            | 24.69     | 33.00      | V            |
| 2567.50        | -1.47                  | -28.60                                     | 0.38                            | 27.51     | 33.00      | V            |

**LTE Band 7\_10MHz\_QPSK-External Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>ci</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2505.00        | -2.52                  | -28.70                                     | 0.59                            | 26.77     | 33.00      | V            |
| 2535.00        | -4.99                  | -28.60                                     | 0.45                            | 24.06     | 33.00      | V            |
| 2565.00        | -2.21                  | -28.60                                     | 0.38                            | 26.77     | 33.00      | V            |

**LTE Band 7\_15MHz\_QPSK-External Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>ci</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2507.50        | -3.37                  | -28.70                                     | 0.59                            | 25.92     | 33.00      | V            |
| 2535.00        | -6.57                  | -28.60                                     | 0.45                            | 22.48     | 33.00      | V            |
| 2562.50        | -2.76                  | -28.60                                     | 0.38                            | 26.22     | 33.00      | V            |

**LTE Band 7\_20MHz\_QPSK-External Antenna**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | P <sub>ci</sub> (dB)+ P <sub>Ag</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Polarization |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2510.00        | -2.36                  | -28.70                                     | 0.59                            | 26.93     | 33.00      | V            |
| 2535.00        | -2.23                  | -28.60                                     | 0.45                            | 26.82     | 33.00      | V            |
| 2560.00        | -1.97                  | -28.60                                     | 0.38                            | 27.01     | 33.00      | V            |

**LTE Band 7\_5MHz\_16QAM-External Antenna**

| 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        | -2.19                  | -28.70                                     | 0.59                            | 27.10        | 33.00        | V            |
| 2535.00        | -4.24                  | -28.60                                     | 0.45                            | 24.81        | 33.00        | V            |
| <b>2567.50</b> | <b>-1.40</b>           | <b>-28.60</b>                              | <b>0.38</b>                     | <b>27.58</b> | <b>33.00</b> | <b>V</b>     |

**LTE Band 7\_10MHz\_16QAM-External Antenna**

| 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        | -3.15                  | -28.70                                     | 0.59                            | 26.14     | 33.00      | V            |
| 2535.00        | -4.77                  | -28.60                                     | 0.45                            | 24.28     | 33.00      | V            |
| 2565.00        | -1.90                  | -28.60                                     | 0.38                            | 27.09     | 33.00      | V            |

**LTE Band 7\_15MHz\_16QAM-External Antenna**

| 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        | -2.92                  | -28.70                                     | 0.59                            | 26.37     | 33.00      | V            |
| 2535.00        | -5.64                  | -28.60                                     | 0.45                            | 23.41     | 33.00      | V            |
| 2562.50        | -2.92                  | -28.60                                     | 0.38                            | 26.07     | 33.00      | V            |

**LTE Band 7\_20MHz\_16QAM-External Antenna**

| 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        | -2.35                  | -28.70                                     | 0.59                            | 26.94     | 33.00      | V            |
| 2535.00        | -3.17                  | -28.60                                     | 0.45                            | 25.88     | 33.00      | V            |
| 2560.00        | -1.79                  | -28.60                                     | 0.38                            | 27.19     | 33.00      | V            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-1.40dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-28.60dB)+G<sub>a</sub>(0.38dB) -2.15dB =27.58dBm

**LTE Band 41- EIRP Part 27.50(h)(2)**

**Limits:** ≤33dBm (2W)

**LTE Band 41\_5MHz\_QPSK-External Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|--------------|--------------|--------------|
| 2547.50        | -2.35                  | -28.60                                     | 0.38                            | 26.64        | 33.00        | V            |
| <b>2600.00</b> | <b>-0.87</b>           | <b>-28.60</b>                              | <b>0.30</b>                     | <b>28.03</b> | <b>33.00</b> | <b>V</b>     |
| 2652.50        | -1.89                  | -28.60                                     | -0.01                           | 26.70        | 33.00        | V            |

**LTE Band 41\_10MHz\_QPSK-External Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2550.00        | -2.71                  | -28.60                                     | 0.38                            | 26.27     | 33.00      | V            |
| 2600.00        | -1.71                  | -28.60                                     | 0.30                            | 27.19     | 33.00      | V            |
| 2650.00        | -2.27                  | -28.60                                     | -0.01                           | 26.32     | 33.00      | V            |

**LTE Band 41\_15MHz\_QPSK-External Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2552.00        | -3.77                  | -28.60                                     | 0.38                            | 25.22     | 33.00      | V            |
| 2600.00        | -3.63                  | -28.60                                     | 0.30                            | 25.27     | 33.00      | V            |
| 2647.50        | -3.61                  | -28.60                                     | -0.01                           | 24.99     | 33.00      | V            |

**LTE Band 41\_20MHz\_QPSK-External Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2555.00        | -2.48                  | -28.60                                     | 0.38                            | 26.50     | 33.00      | V            |
| 2600.00        | -1.67                  | -28.60                                     | 0.30                            | 27.23     | 33.00      | V            |
| 2645.00        | -0.68                  | -28.60                                     | -0.01                           | 27.91     | 33.00      | V            |

**LTE Band 41\_5MHz\_16QAM-External Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2547.50        | -2.67                  | -28.60                                     | 0.38                            | 26.31     | 33.00      | V            |
| 2600.00        | -1.04                  | -28.60                                     | 0.30                            | 27.86     | 33.00      | V            |
| 2652.50        | -1.84                  | -28.60                                     | -0.01                           | 26.75     | 33.00      | V            |

**LTE Band 41\_10MHz\_16QAM-External Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2550.00        | -2.57                  | -28.60                                     | 0.38                            | 26.41     | 33.00      | V            |
| 2600.00        | -1.92                  | -28.60                                     | 0.30                            | 26.98     | 33.00      | V            |
| 2650.00        | -2.41                  | -28.60                                     | -0.01                           | 26.18     | 33.00      | V            |

**LTE Band 41\_15MHz\_16QAM-External Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2552.00        | -3.63                  | -28.60                                     | 0.38                            | 25.36     | 33.00      | V            |
| 2600.00        | -3.46                  | -28.60                                     | 0.30                            | 25.44     | 33.00      | V            |
| 2647.50        | -3.79                  | -28.60                                     | -0.01                           | 24.80     | 33.00      | V            |

**LTE Band 41\_20 MHz\_16QAM-External Antenna**

| 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 |
|----------------|------------------------|--------------------------------------------|---------------------------------|-----------|------------|--------------|
| 2555.00        | -2.61                  | -28.60                                     | 0.38                            | 26.37     | 33.00      | V            |
| 2600.00        | -1.51                  | -28.60                                     | 0.30                            | 27.39     | 33.00      | V            |
| 2645.00        | -1.64                  | -28.60                                     | -0.01                           | 26.95     | 33.00      | V            |

Peak EIRP (dBm)=P<sub>Mea</sub>(-0.87dBm)- (P<sub>cl</sub>+P<sub>Ag</sub>) (-28.60dB)+G<sub>a</sub>(0.30dB) =28.03dBm

**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: The maximum value of expanded measurement uncertainty for this test item is  $U =$

4.92dB(30MHz-3GHz)/4.88dB(3GHz-18GHz)/5.66dB(18GHz-40GHz),  $k = 2$

## **A.2 EMISSION LIMIT**

### **Reference**

FCC: CFR 2.1053, 22.917, 24.238, 27.53(h).

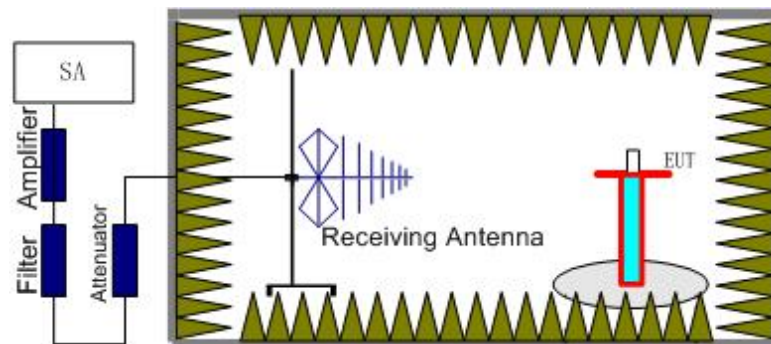
### **A.2.1 Measurement Method**

The measurements procedures in TIA-603-E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.

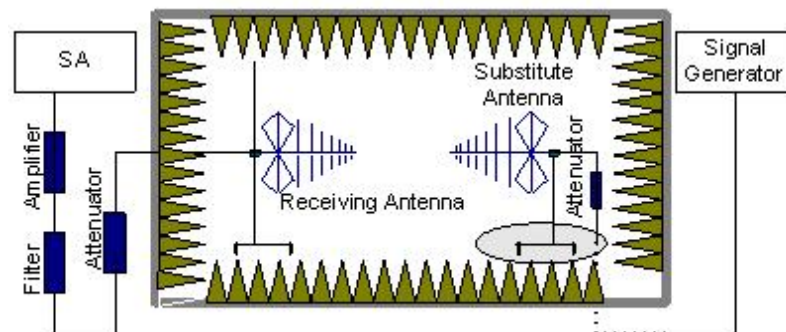
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 22.917, 24.238, Part 27.53(h). The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2, 4, 5, 7, 41

**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, 41. 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, 41 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-Internal Antenna, Channel 18607**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16818.09       | -34.06                 | 2.90      | -0.26        | -37.22         | -13.00      | H            |
| 17219.06       | -33.15                 | 2.90      | -1.01        | -37.06         | -13.00      | H            |
| 17444.16       | -32.29                 | 3.20      | -1.08        | -36.57         | -13.00      | H            |
| 17597.06       | -32.53                 | 3.20      | -0.81        | -36.54         | -13.00      | H            |
| 17763.09       | -33.22                 | 3.20      | -0.75        | -37.17         | -13.00      | H            |
| 17928.47       | -33.07                 | 3.20      | -0.64        | -36.91         | -13.00      | H            |

**LTE Band 2, 1.4MHz, QPSK-Internal Antenna, Channel 18900**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17198.72       | -33.17                 | 2.90      | -0.79        | -36.86         | -13.00      | H            |
| 17361.47       | -33.71                 | 2.90      | -0.98        | -37.59         | -13.00      | H            |
| 17406.09       | -32.29                 | 3.20      | -1.08        | -36.57         | -13.00      | H            |
| 17602.31       | -32.74                 | 3.20      | -1.01        | -36.95         | -13.00      | H            |
| 17799.84       | -32.96                 | 3.20      | -0.75        | -36.91         | -13.00      | H            |
| 17927.16       | -32.13                 | 3.20      | -0.64        | -35.97         | -13.00      | H            |

**LTE Band 2, 1.4MHz, QPSK-Internal Antenna, Channel 19193**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17143.59       | -33.73                 | 2.90      | -0.79        | -37.42         | -13.00      | H            |
| 17274.19       | -33.71                 | 2.90      | -1.01        | -37.62         | -13.00      | H            |
| 17463.84       | -33.06                 | 3.20      | -1.08        | -37.34         | -13.00      | H            |
| 17606.91       | -33.14                 | 3.20      | -1.01        | -37.35         | -13.00      | H            |
| 17793.28       | -33.46                 | 3.20      | -0.75        | -37.41         | -13.00      | H            |
| 17925.19       | -32.54                 | 3.20      | -0.64        | -36.38         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM-Internal Antenna, Channel 18607**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17198.06       | -33.67                 | 2.90      | -0.79        | -37.36         | -13.00      | H            |
| 17362.78       | -33.75                 | 2.90      | -0.98        | -37.63         | -13.00      | H            |
| 17452.69       | -32.79                 | 3.20      | -1.08        | -37.07         | -13.00      | H            |
| 17600.34       | -32.70                 | 3.20      | -1.01        | -36.91         | -13.00      | H            |
| 17747.34       | -32.97                 | 3.20      | -0.75        | -36.92         | -13.00      | H            |
| 17922.56       | -32.17                 | 3.20      | -0.64        | -36.01         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM-Internal Antenna, Channel 18900**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16734.09       | -34.27                 | 2.90      | -0.26        | -37.43         | -13.00      | H            |
| 16814.16       | -34.78                 | 2.90      | -0.26        | -37.94         | -13.00      | H            |
| 17450.72       | -32.54                 | 3.20      | -1.08        | -36.82         | -13.00      | H            |
| 17618.72       | -33.22                 | 3.20      | -1.01        | -37.43         | -13.00      | H            |
| 17805.75       | -32.82                 | 3.20      | -0.84        | -36.86         | -13.00      | H            |
| 17938.31       | -32.29                 | 3.20      | -0.64        | -36.13         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM-Internal Antenna, Channel 19193**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16787.25       | -34.05                 | 2.90      | -0.26        | -37.21         | -13.00      | H            |
| 17136.38       | -33.73                 | 2.90      | -0.79        | -37.42         | -13.00      | H            |
| 17441.53       | -32.60                 | 3.20      | -1.08        | -36.88         | -13.00      | H            |
| 17599.69       | -31.41                 | 3.20      | -0.81        | -35.42         | -13.00      | H            |
| 17778.84       | -32.30                 | 3.20      | -0.75        | -36.25         | -13.00      | H            |
| 17933.06       | -32.60                 | 3.20      | -0.64        | -36.44         | -13.00      | H            |

**LTE Band 4, 1.4MHz QPSK-Internal Antenna, Channel 19957**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16877.16       | -34.63                 | 2.90      | -0.26        | -37.79         | -13.00      | H            |
| 17211.19       | -33.87                 | 2.90      | -1.01        | -37.78         | -13.00      | H            |
| 17397.56       | -32.84                 | 2.90      | -0.98        | -36.72         | -13.00      | H            |
| 17604.94       | -33.31                 | 3.20      | -1.01        | -37.52         | -13.00      | H            |
| 17770.31       | -33.53                 | 3.20      | -0.75        | -37.48         | -13.00      | H            |
| 17922.56       | -32.59                 | 3.20      | -0.64        | -36.43         | -13.00      | H            |

**LTE Band 4, 1.4MHz, QPSK-Internal Antenna, Channel 20175**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16948.69       | -34.79                 | 2.90      | -0.50        | -38.19         | -13.00      | H            |
| 17211.19       | -33.37                 | 2.90      | -1.01        | -37.28         | -13.00      | H            |
| 17457.94       | -33.54                 | 3.20      | -1.08        | -37.82         | -13.00      | H            |
| 17608.88       | -33.15                 | 3.20      | -1.01        | -37.36         | -13.00      | H            |
| 17767.69       | -32.82                 | 3.20      | -0.75        | -36.77         | -13.00      | H            |
| 17918.63       | -32.17                 | 3.20      | -0.64        | -36.01         | -13.00      | H            |

**LTE Band 4, 1.4MHz, QPSK-Internal Antenna, Channel 20393**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17207.25       | -33.78                 | 2.90      | -1.01        | -37.69         | -13.00      | H            |
| 17305.03       | -33.73                 | 2.90      | -0.98        | -37.61         | -13.00      | H            |
| 17454.00       | -32.41                 | 3.20      | -1.08        | -36.69         | -13.00      | H            |
| 17620.03       | -32.80                 | 3.20      | -1.01        | -37.01         | -13.00      | H            |
| 17777.53       | -32.15                 | 3.20      | -0.75        | -36.10         | -13.00      | H            |
| 17847.75       | -32.80                 | 3.20      | -0.84        | -36.84         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM-Internal Antenna, Channel 19957**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16810.88       | -34.31                 | 2.90      | -0.26        | -37.47         | -13.00      | H            |
| 17303.06       | -33.89                 | 2.90      | -0.98        | -37.77         | -13.00      | H            |
| 17392.31       | -33.23                 | 2.90      | -0.98        | -37.11         | -13.00      | H            |
| 17545.88       | -33.41                 | 3.20      | -0.81        | -37.42         | -13.00      | H            |
| 17835.28       | -32.94                 | 3.20      | -0.84        | -36.98         | -13.00      | H            |
| 17917.31       | -32.51                 | 3.20      | -0.64        | -36.35         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM-Internal Antenna, Channel 20175**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16724.25       | -34.22                 | 2.90      | -0.26        | -37.38         | -13.00      | H            |
| 16874.53       | -34.50                 | 2.90      | -0.26        | -37.66         | -13.00      | H            |
| 17371.97       | -33.11                 | 2.90      | -0.98        | -36.99         | -13.00      | H            |
| 17622.66       | -32.87                 | 3.20      | -1.01        | -37.08         | -13.00      | H            |
| 17756.53       | -33.11                 | 3.20      | -0.75        | -37.06         | -13.00      | H            |
| 17927.81       | -32.40                 | 3.20      | -0.64        | -36.24         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM-Internal Antenna, Channel 20393**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 5212.88        | -32.56                 | 1.20      | -2.07        | -35.83         | -13.00      | V            |
| 17187.56       | -33.54                 | 2.90      | -0.79        | -37.23         | -13.00      | H            |
| 17423.16       | -33.11                 | 3.20      | -1.08        | -37.39         | -13.00      | H            |
| 17612.81       | -32.15                 | 3.20      | -1.01        | -36.36         | -13.00      | H            |
| 17774.25       | -33.50                 | 3.20      | -0.75        | -37.45         | -13.00      | H            |
| 17922.56       | -31.74                 | 3.20      | -0.64        | -35.58         | -13.00      | H            |

**LTE Band 5, 1.4MHz, QPSK-Internal Antenna, Channel 20407**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8264.00        | -42.37                 | 1.80      | -1.90        | -48.22        | -13.00      | V            |
| 9159.00        | -41.97                 | 2.10      | -1.36        | -47.58        | -13.00      | V            |
| 9221.00        | -42.34                 | 2.10      | -1.16        | -47.75        | -13.00      | H            |
| 9404.50        | -42.55                 | 2.10      | -0.86        | -47.66        | -13.00      | V            |
| 9694.50        | -43.00                 | 2.10      | -0.66        | -47.91        | -13.00      | H            |
| 9910.50        | -43.38                 | 2.20      | -0.40        | -48.13        | -13.00      | V            |

**LTE Band 5, 1.4MHz, QPSK-Internal Antenna, Channel 20525**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8643.50        | -42.01                 | 2.00      | -1.64        | -47.80        | -13.00      | V            |
| 8769.50        | -42.45                 | 2.00      | -1.63        | -48.23        | -13.00      | H            |
| 9169.50        | -41.93                 | 2.10      | -1.36        | -47.54        | -13.00      | H            |
| 9193.00        | -42.42                 | 2.10      | -1.36        | -48.03        | -13.00      | V            |
| 9325.50        | -42.69                 | 2.10      | -1.12        | -48.06        | -13.00      | V            |
| 9919.50        | -42.89                 | 2.20      | -0.40        | -47.64        | -13.00      | H            |

**LTE Band 5, 1.4MHz, QPSK-Internal Antenna, Channel 20643**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8168.00        | -42.33                 | 1.80      | -2.15        | -48.43        | -13.00      | V            |
| 8616.50        | -42.55                 | 2.00      | -1.64        | -48.34        | -13.00      | V            |
| 9160.50        | -42.44                 | 2.10      | -1.36        | -48.05        | -13.00      | V            |
| 9249.50        | -42.78                 | 2.10      | -1.16        | -48.19        | -13.00      | H            |
| 9305.50        | -41.98                 | 2.10      | -1.12        | -47.35        | -13.00      | V            |
| 9501.00        | -43.10                 | 2.10      | -0.92        | -48.27        | -13.00      | H            |

**LTE Band 5, 1.4MHz, 16QAM-Internal Antenna, Channel 20407**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8544.00        | -42.37                 | 2.00      | -1.77        | -48.29        | -13.00      | V            |
| 8755.50        | -42.19                 | 2.00      | -1.63        | -47.97        | -13.00      | V            |
| 8789.50        | -42.37                 | 2.00      | -1.63        | -48.15        | -13.00      | H            |
| 9256.00        | -42.29                 | 2.10      | -1.16        | -47.70        | -13.00      | H            |
| 9408.00        | -42.94                 | 2.10      | -0.86        | -48.05        | -13.00      | V            |
| 9921.00        | -43.62                 | 2.20      | -0.40        | -48.37        | -13.00      | H            |

**LTE Band 5, 1.4MHz, 16QAM-Internal Antenna, Channel 20525**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 3169.88        | -30.94                 | 1.10      | -12.34       | -46.53        | -13.00      | H            |
| 8244.00        | -42.66                 | 1.80      | -1.90        | -48.51        | -13.00      | V            |
| 8640.50        | -42.51                 | 2.00      | -1.64        | -48.30        | -13.00      | V            |
| 9162.00        | -42.41                 | 2.10      | -1.36        | -48.02        | -13.00      | V            |
| 9204.50        | -41.63                 | 2.10      | -1.16        | -47.04        | -13.00      | V            |
| 9350.50        | -43.00                 | 2.10      | -1.12        | -48.37        | -13.00      | V            |

**LTE Band 5, 1.4MHz, 16QAM-Internal Antenna, Channel 20643**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8544.50        | -41.84                 | 2.00      | -1.77        | -47.76        | -13.00      | H            |
| 8601.00        | -41.98                 | 2.00      | -1.64        | -47.77        | -13.00      | V            |
| 8680.00        | -42.15                 | 2.00      | -1.64        | -47.94        | -13.00      | H            |
| 9170.00        | -42.46                 | 2.10      | -1.36        | -48.07        | -13.00      | V            |
| 9204.00        | -42.05                 | 2.10      | -1.16        | -47.46        | -13.00      | V            |
| 9416.50        | -42.88                 | 2.10      | -0.86        | -47.99        | -13.00      | H            |

**LTE Band 7, 5 MHz, QPSK-Internal Antenna, Channel 20775**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16810.22       | -33.14                 | 2.90      | -0.26        | -36.30         | -25.00      | H            |
| 17368.03       | -33.36                 | 2.90      | -0.98        | -37.24         | -25.00      | H            |
| 17452.03       | -32.02                 | 3.20      | -1.08        | -36.30         | -25.00      | H            |
| 17625.28       | -31.84                 | 3.20      | -1.01        | -36.05         | -25.00      | H            |
| 17765.72       | -32.89                 | 3.20      | -0.75        | -36.84         | -25.00      | H            |
| 17922.56       | -32.23                 | 3.20      | -0.64        | -36.07         | -25.00      | H            |

**LTE Band 7, 5 MHz, QPSK-Internal Antenna, Channel 21100**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16732.13       | -33.98                 | 2.90      | -0.26        | -37.14         | -25.00      | H            |
| 17201.34       | -31.80                 | 2.90      | -1.01        | -35.71         | -25.00      | H            |
| 17414.63       | -32.60                 | 3.20      | -1.08        | -36.88         | -25.00      | H            |
| 17600.34       | -31.64                 | 3.20      | -1.01        | -35.85         | -25.00      | H            |
| 17833.31       | -32.45                 | 3.20      | -0.84        | -36.49         | -25.00      | H            |
| 17921.25       | -32.08                 | 3.20      | -0.64        | -35.92         | -25.00      | H            |

**LTE Band 7, 5 MHz, QPSK-Internal Antenna, Channel 21425**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16790.53       | -33.26                 | 2.90      | -0.26        | -36.42         | -25.00      | H            |
| 17202.00       | -32.59                 | 2.90      | -1.01        | -36.50         | -25.00      | H            |
| 17440.88       | -31.51                 | 3.20      | -1.08        | -35.79         | -25.00      | H            |
| 17604.94       | -31.76                 | 3.20      | -1.01        | -35.97         | -25.00      | H            |
| 17749.31       | -32.41                 | 3.20      | -0.75        | -36.36         | -25.00      | H            |
| 17915.34       | -31.73                 | 3.20      | -0.64        | -35.57         | -25.00      | H            |

**LTE Band 7, 5 MHz, 16QAM-Internal Antenna, Channel 20775**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17199.38       | -32.85                 | 2.90      | -0.79        | -36.54         | -25.00      | H            |
| 17284.03       | -33.13                 | 2.90      | -1.01        | -37.04         | -25.00      | H            |
| 17409.38       | -32.15                 | 3.20      | -1.08        | -36.43         | -25.00      | H            |
| 17595.09       | -32.48                 | 3.20      | -0.81        | -36.49         | -25.00      | H            |
| 17761.78       | -31.12                 | 3.20      | -0.75        | -35.07         | -25.00      | H            |
| 17845.13       | -31.60                 | 3.20      | -0.84        | -35.64         | -25.00      | H            |

**LTE Band 7, 5 MHz, 16QAM-Internal Antenna, Channel 21100**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17196.75       | -32.94                 | 2.90      | -0.79        | -36.63         | -25.00      | H            |
| 17299.78       | -32.84                 | 2.90      | -1.01        | -36.75         | -25.00      | H            |
| 17385.09       | -32.06                 | 2.90      | -0.98        | -35.94         | -25.00      | H            |
| 17600.34       | -32.00                 | 3.20      | -1.01        | -36.21         | -25.00      | H            |
| 17755.22       | -31.47                 | 3.20      | -0.75        | -35.42         | -25.00      | H            |
| 17853.66       | -30.92                 | 3.20      | -0.84        | -34.96         | -25.00      | H            |

**LTE Band 7, 5 MHz, 16QAM-Internal Antenna, Channel 21425**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16180.22       | -34.40                 | 2.90      | 0.59         | -36.71         | -25.00      | H            |
| 17203.31       | -32.24                 | 2.90      | -1.01        | -36.15         | -25.00      | H            |
| 17438.25       | -30.78                 | 3.20      | -1.08        | -35.06         | -25.00      | H            |
| 17602.31       | -32.09                 | 3.20      | -1.01        | -36.30         | -25.00      | H            |
| 17782.78       | -32.24                 | 3.20      | -0.75        | -36.19         | -25.00      | H            |
| 17909.44       | -30.65                 | 3.20      | -0.64        | -34.49         | -25.00      | H            |

**LTE Band 41, 5MHz, QPSK-Internal Antenna, Channel 40165**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16716.38       | -34.54                 | 2.90      | -0.26        | -37.70         | -25.00      | H            |
| 16810.22       | -34.66                 | 2.90      | -0.26        | -37.82         | -25.00      | H            |
| 17395.59       | -33.38                 | 2.90      | -0.98        | -37.26         | -25.00      | H            |
| 17586.56       | -32.92                 | 3.20      | -0.81        | -36.93         | -25.00      | H            |
| 17780.16       | -33.80                 | 3.20      | -0.75        | -37.75         | -25.00      | H            |
| 17928.47       | -31.88                 | 3.20      | -0.64        | -35.72         | -25.00      | H            |

**LTE Band 41, 5MHz, QPSK-Internal Antenna, Channel 40690**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16954.59       | -34.13                 | 2.90      | -0.50        | -37.53         | -25.00      | H            |
| 17206.59       | -33.24                 | 2.90      | -1.01        | -37.15         | -25.00      | H            |
| 17440.88       | -33.01                 | 3.20      | -1.08        | -37.29         | -25.00      | H            |
| 17607.56       | -33.05                 | 3.20      | -1.01        | -37.26         | -25.00      | H            |
| 17800.50       | -32.80                 | 3.20      | -0.84        | -36.84         | -25.00      | V            |
| 17927.81       | -32.79                 | 3.20      | -0.64        | -36.63         | -25.00      | H            |

**LTE Band 41, 5MHz, QPSK-Internal Antenna, Channel 41215**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16841.06       | -34.45                 | 2.90      | -0.26        | -37.61         | -25.00      | V            |
| 17203.97       | -33.69                 | 2.90      | -1.01        | -37.60         | -25.00      | H            |
| 17459.25       | -33.15                 | 3.20      | -1.08        | -37.43         | -25.00      | H            |
| 17625.28       | -33.75                 | 3.20      | -1.01        | -37.96         | -25.00      | H            |
| 17773.59       | -31.79                 | 3.20      | -0.75        | -35.74         | -25.00      | H            |
| 17929.13       | -32.66                 | 3.20      | -0.64        | -36.50         | -25.00      | H            |

**LTE Band 41, 5MHz, 16QAM-Internal Antenna, Channel 40165**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16705.88       | -34.76                 | 2.90      | -0.26        | -37.92         | -25.00      | H            |
| 17274.19       | -33.07                 | 2.90      | -1.01        | -36.98         | -25.00      | H            |
| 17437.59       | -33.08                 | 3.20      | -1.08        | -37.36         | -25.00      | H            |
| 17602.31       | -33.50                 | 3.20      | -1.01        | -37.71         | -25.00      | H            |
| 17770.97       | -33.01                 | 3.20      | -0.75        | -36.96         | -25.00      | H            |
| 17856.28       | -32.46                 | 3.20      | -0.84        | -36.50         | -25.00      | H            |

**LTE Band 41, 5MHz, 16QAM-Internal Antenna, Channel 40690**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16820.72       | -34.91                 | 2.90      | -0.26        | -38.07         | -25.00      | H            |
| 17237.44       | -33.96                 | 2.90      | -1.01        | -37.87         | -25.00      | H            |
| 17512.41       | -32.80                 | 3.20      | -0.81        | -36.81         | -25.00      | V            |
| 17620.03       | -33.03                 | 3.20      | -1.01        | -37.24         | -25.00      | H            |
| 17770.97       | -32.68                 | 3.20      | -0.75        | -36.63         | -25.00      | H            |
| 17925.19       | -32.63                 | 3.20      | -0.64        | -36.47         | -25.00      | H            |

**LTE Band 41, 5MHz, 16QAM-Internal Antenna, Channel 41215**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17213.81       | -33.75                 | 2.90      | -1.01        | -37.66         | -25.00      | H            |
| 17366.72       | -33.42                 | 2.90      | -0.98        | -37.30         | -25.00      | H            |
| 17400.19       | -32.87                 | 3.20      | -1.08        | -37.15         | -25.00      | H            |
| 17607.56       | -32.07                 | 3.20      | -1.01        | -36.28         | -25.00      | H            |
| 17793.28       | -33.47                 | 3.20      | -0.75        | -37.42         | -25.00      | H            |
| 17935.69       | -32.46                 | 3.20      | -0.64        | -36.30         | -25.00      | H            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.92\text{dB}(30\text{MHz}-3\text{GHz})/4.88\text{dB}(3\text{GHz}-18\text{GHz})/5.66\text{dB}(18\text{GHz}-40\text{GHz})$ ,  $k = 2$

**LTE Band 2, 1.4MHz, QPSK-External Antenna, Channel 18607**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17198.72       | -33.41                 | 2.90      | -0.79        | -37.10         | -13.00      | H            |
| 17299.78       | -33.55                 | 2.90      | -1.01        | -37.46         | -13.00      | H            |
| 17440.88       | -32.89                 | 3.20      | -1.08        | -37.17         | -13.00      | H            |
| 17622.00       | -33.30                 | 3.20      | -1.01        | -37.51         | -13.00      | H            |
| 17780.16       | -32.84                 | 3.20      | -0.75        | -36.79         | -13.00      | H            |
| 17927.81       | -32.17                 | 3.20      | -0.64        | -36.01         | -13.00      | H            |

**LTE Band 2, 1.4MHz, QPSK-External Antenna, Channel 18900**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16831.88       | -34.26                 | 2.90      | -0.26        | -37.42         | -13.00      | H            |
| 17295.84       | -33.45                 | 2.90      | -1.01        | -37.36         | -13.00      | H            |
| 17449.41       | -32.85                 | 3.20      | -1.08        | -37.13         | -13.00      | H            |
| 17625.28       | -33.20                 | 3.20      | -1.01        | -37.41         | -13.00      | H            |
| 17777.53       | -32.85                 | 3.20      | -0.75        | -36.80         | -13.00      | H            |
| 17992.78       | -31.47                 | 3.20      | -0.64        | -35.31         | -13.00      | H            |

**LTE Band 2, 1.4MHz, QPSK-External Antenna, Channel 19193**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17123.25       | -33.75                 | 2.90      | -0.79        | -37.44         | -13.00      | H            |
| 17350.97       | -33.25                 | 2.90      | -0.98        | -37.13         | -13.00      | H            |
| 17402.81       | -31.96                 | 3.20      | -1.08        | -36.24         | -13.00      | H            |
| 17623.31       | -33.17                 | 3.20      | -1.01        | -37.38         | -13.00      | H            |
| 17773.59       | -32.79                 | 3.20      | -0.75        | -36.74         | -13.00      | H            |
| 17927.81       | -31.36                 | 3.20      | -0.64        | -35.20         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM-External Antenna, Channel 18607**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17144.25       | -34.52                 | 2.90      | -0.79        | -38.21         | -13.00      | H            |
| 17230.22       | -34.61                 | 2.90      | -1.01        | -38.52         | -13.00      | H            |
| 17415.28       | -33.69                 | 3.20      | -1.08        | -37.97         | -13.00      | H            |
| 17586.56       | -33.89                 | 3.20      | -0.81        | -37.90         | -13.00      | H            |
| 17796.56       | -33.74                 | 3.20      | -0.75        | -37.69         | -13.00      | V            |
| 17925.19       | -31.93                 | 3.20      | -0.64        | -35.77         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM-External Antenna, Channel 18900**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16846.97       | -34.74                 | 2.90      | -0.26        | -37.90         | -13.00      | V            |
| 17203.97       | -34.38                 | 2.90      | -1.01        | -38.29         | -13.00      | H            |
| 17395.59       | -32.89                 | 2.90      | -0.98        | -36.77         | -13.00      | H            |
| 17607.56       | -33.45                 | 3.20      | -1.01        | -37.66         | -13.00      | H            |
| 17776.22       | -33.01                 | 3.20      | -0.75        | -36.96         | -13.00      | H            |
| 17919.94       | -32.78                 | 3.20      | -0.64        | -36.62         | -13.00      | H            |

**LTE Band 2, 1.4MHz, 16QAM-External Antenna, Channel 19193**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16747.88       | -35.48                 | 2.90      | -0.26        | -38.64         | -13.00      | V            |
| 17194.13       | -34.24                 | 2.90      | -0.79        | -37.93         | -13.00      | H            |
| 17283.38       | -34.60                 | 2.90      | -1.01        | -38.51         | -13.00      | H            |
| 17423.16       | -33.09                 | 3.20      | -1.08        | -37.37         | -13.00      | H            |
| 17800.50       | -32.94                 | 3.20      | -0.84        | -36.98         | -13.00      | V            |
| 17912.06       | -32.52                 | 3.20      | -0.64        | -36.36         | -13.00      | H            |

**LTE Band 4, 1.4MHz QPSK-External Antenna, Channel 19957**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17198.72       | -33.93                 | 2.90      | -0.79        | -37.62         | -13.00      | H            |
| 17274.19       | -33.50                 | 2.90      | -1.01        | -37.41         | -13.00      | H            |
| 17435.63       | -33.36                 | 3.20      | -1.08        | -37.64         | -13.00      | H            |
| 17603.63       | -33.06                 | 3.20      | -1.01        | -37.27         | -13.00      | H            |
| 17777.53       | -32.77                 | 3.20      | -0.75        | -36.72         | -13.00      | H            |
| 17925.19       | -32.52                 | 3.20      | -0.64        | -36.36         | -13.00      | H            |

**LTE Band 4, 1.4MHz, QPSK-External Antenna, Channel 20175**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16960.50       | -33.70                 | 2.90      | -0.50        | -37.10         | -13.00      | H            |
| 17197.41       | -33.23                 | 2.90      | -0.79        | -36.92         | -13.00      | H            |
| 17307.66       | -32.84                 | 2.90      | -0.98        | -36.72         | -13.00      | H            |
| 17394.28       | -32.56                 | 2.90      | -0.98        | -36.44         | -13.00      | H            |
| 17599.69       | -31.90                 | 3.20      | -0.81        | -35.91         | -13.00      | H            |
| 17887.13       | -32.16                 | 3.20      | -0.84        | -36.20         | -13.00      | V            |

**LTE Band 4, 1.4MHz, QPSK-External Antenna, Channel 20393**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16950.66       | -34.67                 | 2.90      | -0.50        | -38.07         | -13.00      | H            |
| 17192.81       | -33.56                 | 2.90      | -0.79        | -37.25         | -13.00      | H            |
| 17221.69       | -33.99                 | 2.90      | -1.01        | -37.90         | -13.00      | H            |
| 17457.28       | -32.67                 | 3.20      | -1.08        | -36.95         | -13.00      | H            |
| 17809.03       | -33.56                 | 3.20      | -0.84        | -37.60         | -13.00      | V            |
| 17927.81       | -33.39                 | 3.20      | -0.64        | -37.23         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM-External Antenna, Channel 19957**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16940.16       | -34.68                 | 2.90      | -0.50        | -38.08         | -13.00      | H            |
| 17213.81       | -34.22                 | 2.90      | -1.01        | -38.13         | -13.00      | H            |
| 17385.09       | -33.83                 | 2.90      | -0.98        | -37.71         | -13.00      | H            |
| 17618.72       | -33.93                 | 3.20      | -1.01        | -38.14         | -13.00      | H            |
| 17761.13       | -33.41                 | 3.20      | -0.75        | -37.36         | -13.00      | H            |
| 17922.56       | -32.62                 | 3.20      | -0.64        | -36.46         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM-External Antenna, Channel 20175**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17199.38       | -33.87                 | 2.90      | -0.79        | -37.56         | -13.00      | H            |
| 17369.34       | -34.64                 | 2.90      | -0.98        | -38.52         | -13.00      | H            |
| 17438.25       | -33.99                 | 3.20      | -1.08        | -38.27         | -13.00      | H            |
| 17559.00       | -34.32                 | 3.20      | -0.81        | -38.33         | -13.00      | H            |
| 17765.72       | -33.56                 | 3.20      | -0.75        | -37.51         | -13.00      | H            |
| 17929.78       | -33.05                 | 3.20      | -0.64        | -36.89         | -13.00      | H            |

**LTE Band 4, 1.4MHz, 16QAM-External Antenna, Channel 20393**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16796.44       | -34.93                 | 2.90      | -0.26        | -38.09         | -13.00      | V            |
| 17361.47       | -34.48                 | 2.90      | -0.98        | -38.36         | -13.00      | V            |
| 17454.00       | -33.79                 | 3.20      | -1.08        | -38.07         | -13.00      | H            |
| 17625.28       | -33.84                 | 3.20      | -1.01        | -38.05         | -13.00      | H            |
| 17795.25       | -33.56                 | 3.20      | -0.75        | -37.51         | -13.00      | V            |
| 17930.44       | -32.13                 | 3.20      | -0.64        | -35.97         | -13.00      | H            |

**LTE Band 5, 1.4MHz, QPSK-External Antenna, Channel 20407**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7071.00        | -41.39                 | 1.80      | -2.85        | -48.19        | -13.00      | V            |
| 8251.00        | -41.69                 | 1.80      | -1.90        | -47.54        | -13.00      | V            |
| 8515.00        | -42.00                 | 2.00      | -1.77        | -47.92        | -13.00      | V            |
| 8568.00        | -42.21                 | 2.00      | -1.77        | -48.13        | -13.00      | H            |
| 9184.50        | -41.89                 | 2.10      | -1.36        | -47.50        | -13.00      | V            |
| 9247.50        | -42.79                 | 2.10      | -1.16        | -48.20        | -13.00      | H            |

**LTE Band 5, 1.4MHz, QPSK-External Antenna, Channel 20525**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7651.50        | -41.57                 | 1.80      | -2.58        | -48.10        | -13.00      | H            |
| 7971.00        | -41.82                 | 1.80      | -2.34        | -48.11        | -13.00      | V            |
| 8157.00        | -41.34                 | 1.80      | -2.15        | -47.44        | -13.00      | H            |
| 8671.50        | -42.16                 | 2.00      | -1.64        | -47.95        | -13.00      | V            |
| 9159.00        | -41.50                 | 2.10      | -1.36        | -47.11        | -13.00      | V            |
| 9206.00        | -42.51                 | 2.10      | -1.16        | -47.92        | -13.00      | H            |

**LTE Band 5, 1.4MHz, QPSK-External Antenna, Channel 20643**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8538.00        | -42.04                 | 2.00      | -1.77        | -47.96        | -13.00      | H            |
| 8632.50        | -42.06                 | 2.00      | -1.64        | -47.85        | -13.00      | H            |
| 8984.50        | -41.95                 | 2.10      | -1.58        | -47.78        | -13.00      | H            |
| 9163.50        | -41.71                 | 2.10      | -1.36        | -47.32        | -13.00      | H            |
| 9210.50        | -42.20                 | 2.10      | -1.16        | -47.61        | -13.00      | H            |
| 9353.50        | -42.71                 | 2.10      | -1.12        | -48.08        | -13.00      | V            |

**LTE Band 5, 1.4MHz, 16QAM-External Antenna, Channel 20407**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7059.00        | -41.59                 | 1.80      | -2.85        | -48.39        | -13.00      | V            |
| 7592.00        | -41.00                 | 1.80      | -2.57        | -47.52        | -13.00      | V            |
| 8411.50        | -42.64                 | 1.80      | -1.79        | -48.38        | -13.00      | H            |
| 8581.00        | -42.52                 | 2.00      | -1.77        | -48.44        | -13.00      | H            |
| 8978.50        | -42.60                 | 2.10      | -1.58        | -48.43        | -13.00      | V            |
| 9164.50        | -42.85                 | 2.10      | -1.36        | -48.46        | -13.00      | V            |

**LTE Band 5, 1.4MHz, 16QAM-External Antenna, Channel 20525**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 8110.50        | -42.34                 | 1.80      | -2.15        | -48.44        | -13.00      | V            |
| 8217.00        | -42.29                 | 1.80      | -1.90        | -48.14        | -13.00      | H            |
| 8548.00        | -42.43                 | 2.00      | -1.77        | -48.35        | -13.00      | V            |
| 8595.00        | -42.32                 | 2.00      | -1.77        | -48.24        | -13.00      | H            |
| 9067.00        | -42.55                 | 2.10      | -1.42        | -48.22        | -13.00      | V            |
| 9215.50        | -43.10                 | 2.10      | -1.16        | -48.51        | -13.00      | H            |

**LTE Band 5, 1.4MHz, 16QAM-External Antenna, Channel 20643**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak ERP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|---------------|-------------|--------------|
| 7599.00        | -41.43                 | 1.80      | -2.57        | -47.95        | -13.00      | H            |
| 8108.50        | -41.14                 | 1.80      | -2.15        | -47.24        | -13.00      | H            |
| 8310.00        | -41.50                 | 1.80      | -2.04        | -47.49        | -13.00      | H            |
| 8643.50        | -41.66                 | 2.00      | -1.64        | -47.45        | -13.00      | V            |
| 8678.50        | -42.34                 | 2.00      | -1.64        | -48.13        | -13.00      | H            |
| 9349.50        | -42.55                 | 2.10      | -1.12        | -47.92        | -13.00      | H            |

**LTE Band 7, 5 MHz, QPSK-External Antenna, Channel 20775**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17205.94       | -33.68                 | 2.90      | -1.01        | -37.59         | -25.00      | H            |
| 17277.47       | -33.20                 | 2.90      | -1.01        | -37.11         | -25.00      | H            |
| 17392.31       | -33.61                 | 2.90      | -0.98        | -37.49         | -25.00      | H            |
| 17599.69       | -34.13                 | 3.20      | -0.81        | -38.14         | -25.00      | H            |
| 17797.22       | -32.46                 | 3.20      | -0.75        | -36.41         | -25.00      | H            |
| 17926.50       | -32.58                 | 3.20      | -0.64        | -36.42         | -25.00      | H            |

**LTE Band 7, 5 MHz, QPSK-External Antenna, Channel 21100**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17208.56       | -33.07                 | 2.90      | -1.01        | -36.98         | -25.00      | H            |
| 17267.63       | -33.22                 | 2.90      | -1.01        | -37.13         | -25.00      | V            |
| 17427.75       | -31.77                 | 3.20      | -1.08        | -36.05         | -25.00      | H            |
| 17608.22       | -32.91                 | 3.20      | -1.01        | -37.12         | -25.00      | H            |
| 17795.91       | -32.47                 | 3.20      | -0.75        | -36.42         | -25.00      | V            |
| 17921.25       | -31.33                 | 3.20      | -0.64        | -35.17         | -25.00      | H            |

**LTE Band 7, 5 MHz, QPSK-External Antenna, Channel 21425**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17195.44       | -34.43                 | 2.90      | -0.79        | -38.12         | -25.00      | H            |
| 17299.78       | -34.21                 | 2.90      | -1.01        | -38.12         | -25.00      | H            |
| 17396.25       | -33.95                 | 2.90      | -0.98        | -37.83         | -25.00      | H            |
| 17622.66       | -33.58                 | 3.20      | -1.01        | -37.79         | -25.00      | H            |
| 17759.81       | -32.95                 | 3.20      | -0.75        | -36.90         | -25.00      | H            |
| 17940.94       | -32.34                 | 3.20      | -0.64        | -36.18         | -25.00      | H            |

**LTE Band 7, 5 MHz, 16QAM-External Antenna, Channel 20775**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17203.31       | -34.28                 | 2.90      | -1.01        | -38.19         | -25.00      | H            |
| 17281.41       | -34.48                 | 2.90      | -1.01        | -38.39         | -25.00      | H            |
| 17413.97       | -34.10                 | 3.20      | -1.08        | -38.38         | -25.00      | H            |
| 17604.94       | -34.02                 | 3.20      | -1.01        | -38.23         | -25.00      | H            |
| 17776.22       | -33.60                 | 3.20      | -0.75        | -37.55         | -25.00      | H            |
| 17929.13       | -32.77                 | 3.20      | -0.64        | -36.61         | -25.00      | H            |

**LTE Band 7, 5 MHz, 16QAM-External Antenna, Channel 21100**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16807.59       | -35.03                 | 2.90      | -0.26        | -38.19         | -25.00      | H            |
| 17310.94       | -34.15                 | 2.90      | -0.98        | -38.03         | -25.00      | H            |
| 17445.47       | -32.80                 | 3.20      | -1.08        | -37.08         | -25.00      | H            |
| 17551.13       | -34.51                 | 3.20      | -0.81        | -38.52         | -25.00      | H            |
| 17799.19       | -33.67                 | 3.20      | -0.75        | -37.62         | -25.00      | H            |
| 17925.19       | -32.58                 | 3.20      | -0.64        | -36.42         | -25.00      | H            |

**LTE Band 7, 5 MHz, 16QAM-External Antenna, Channel 21425**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17197.41       | -33.85                 | 2.90      | -0.79        | -37.54         | -25.00      | H            |
| 17354.25       | -33.69                 | 2.90      | -0.98        | -37.57         | -25.00      | H            |
| 17438.25       | -33.21                 | 3.20      | -1.08        | -37.49         | -25.00      | H            |
| 17629.22       | -33.54                 | 3.20      | -1.01        | -37.75         | -25.00      | H            |
| 17769.00       | -33.66                 | 3.20      | -0.75        | -37.61         | -25.00      | H            |
| 17917.31       | -33.28                 | 3.20      | -0.64        | -37.12         | -25.00      | H            |

**LTE Band 41, 5MHz, QPSK-External Antenna, Channel 40165**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16801.69       | -33.98                 | 2.90      | -0.26        | -37.14         | -25.00      | V            |
| 17209.22       | -32.20                 | 2.90      | -1.01        | -36.11         | -25.00      | H            |
| 17357.53       | -32.77                 | 2.90      | -0.98        | -36.65         | -25.00      | H            |
| 17429.06       | -32.03                 | 3.20      | -1.08        | -36.31         | -25.00      | H            |
| 17791.31       | -32.31                 | 3.20      | -0.75        | -36.26         | -25.00      | V            |
| 17924.53       | -32.05                 | 3.20      | -0.64        | -35.89         | -25.00      | H            |

**LTE Band 41, 5MHz, QPSK-External Antenna, Channel 40690**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16738.03       | -34.04                 | 2.90      | -0.26        | -37.20         | -25.00      | H            |
| 16824.00       | -33.52                 | 2.90      | -0.26        | -36.68         | -25.00      | H            |
| 17201.34       | -32.93                 | 2.90      | -1.01        | -36.84         | -25.00      | H            |
| 17408.72       | -31.27                 | 3.20      | -1.08        | -35.55         | -25.00      | H            |
| 17791.97       | -32.44                 | 3.20      | -0.75        | -36.39         | -25.00      | V            |
| 17927.16       | -31.98                 | 3.20      | -0.64        | -35.82         | -25.00      | H            |

**LTE Band 41, 5MHz, QPSK-External Antenna, Channel 41215**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16840.41       | -34.13                 | 2.90      | -0.26        | -37.29         | -25.00      | V            |
| 17209.88       | -33.12                 | 2.90      | -1.01        | -37.03         | -25.00      | H            |
| 17452.03       | -33.38                 | 3.20      | -1.08        | -37.66         | -25.00      | H            |
| 17613.47       | -33.15                 | 3.20      | -1.01        | -37.36         | -25.00      | H            |
| 17807.72       | -33.44                 | 3.20      | -0.84        | -37.48         | -25.00      | V            |
| 17849.06       | -32.64                 | 3.20      | -0.84        | -36.68         | -25.00      | H            |

**LTE Band 41, 5MHz, 16QAM-External Antenna, Channel 40165**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 17199.38       | -33.14                 | 2.90      | -0.79        | -36.83         | -25.00      | H            |
| 17290.59       | -33.92                 | 2.90      | -1.01        | -37.83         | -25.00      | H            |
| 17434.31       | -33.16                 | 3.20      | -1.08        | -37.44         | -25.00      | H            |
| 17624.63       | -33.31                 | 3.20      | -1.01        | -37.52         | -25.00      | H            |
| 17782.78       | -33.37                 | 3.20      | -0.75        | -37.32         | -25.00      | H            |
| 17920.59       | -32.53                 | 3.20      | -0.64        | -36.37         | -25.00      | H            |

**LTE Band 41, 5MHz, 16QAM-External Antenna, Channel 40690**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16827.28       | -34.55                 | 2.90      | -0.26        | -37.71         | -25.00      | H            |
| 17154.75       | -33.84                 | 2.90      | -0.79        | -37.53         | -25.00      | H            |
| 17284.69       | -33.46                 | 2.90      | -1.01        | -37.37         | -25.00      | H            |
| 17442.19       | -33.49                 | 3.20      | -1.08        | -37.77         | -25.00      | H            |
| 17793.94       | -33.33                 | 3.20      | -0.75        | -37.28         | -25.00      | H            |
| 17924.53       | -32.85                 | 3.20      | -0.64        | -36.69         | -25.00      | H            |

**LTE Band 41, 5MHz, 16QAM-External Antenna, Channel 41215**

| Frequency(MHz) | P <sub>Mea</sub> (dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit (dBm) | Polarization |
|----------------|------------------------|-----------|--------------|----------------|-------------|--------------|
| 16836.47       | -34.98                 | 2.90      | -0.26        | -38.14         | -25.00      | H            |
| 17200.03       | -33.46                 | 2.90      | -1.01        | -37.37         | -25.00      | H            |
| 17266.31       | -33.64                 | 2.90      | -1.01        | -37.55         | -25.00      | H            |
| 17400.84       | -32.90                 | 3.20      | -1.08        | -37.18         | -25.00      | V            |
| 17793.94       | -33.25                 | 3.20      | -0.75        | -37.20         | -25.00      | H            |
| 17925.84       | -32.39                 | 3.20      | -0.64        | -36.23         | -25.00      | H            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 4.92\text{dB}(30\text{MHz}-3\text{GHz})/4.88\text{dB}(3\text{GHz}-18\text{GHz})/5.66\text{dB}(18\text{GHz}-40\text{GHz})$ ,  $k = 2$

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

#### **Reference**

FCC: CFR Part 2.1055, 22.355, 24.235, 27.54.

#### **A.3.1 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.3.2 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 10.8VDC and 13.2VDC, with a nominal voltage of 12.0VDC. 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 |
| 10.8           | 32                   | -8    | 0.017                 | 0.004 |
| 12.0           | 11                   | 15    | 0.006                 | 0.008 |
| 13.2           | 25                   | -3    | 0.013                 | 0.002 |

###### Frequency Error vs Temperature

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 26                   | 25    | 0.014                 | 0.013 |
| -20°                | 35                   | 16    | 0.019                 | 0.009 |
| -10°                | 14                   | 11    | 0.007                 | 0.006 |
| 0°                  | 27                   | 34    | 0.014                 | 0.018 |
| 10°                 | 16                   | 22    | 0.009                 | 0.012 |
| 20°                 | 11                   | -9    | 0.006                 | 0.005 |
| 30°                 | 9                    | 5     | 0.005                 | 0.003 |
| 40°                 | 25                   | 18    | 0.013                 | 0.010 |
| 50°                 | 18                   | 22    | 0.010                 | 0.012 |

##### 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 |
| 10.8           | -19                  | 16    | 0.011                 | 0.009 |
| 12.0           | -6                   | 25    | 0.003                 | 0.014 |
| 13.2           | -23                  | 4     | 0.013                 | 0.002 |

###### Frequency Error vs Temperature

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | -17                  | 9     | 0.010                 | 0.005 |
| -20°                | -26                  | 15    | 0.015                 | 0.009 |
| -10°                | -35                  | 27    | 0.020                 | 0.016 |
| 0°                  | -15                  | 11    | 0.009                 | 0.006 |
| 10°                 | -16                  | 14    | 0.009                 | 0.008 |
| 20°                 | -8                   | 5     | 0.005                 | 0.003 |
| 30°                 | -5                   | 7     | 0.003                 | 0.004 |
| 40°                 | -26                  | 24    | 0.015                 | 0.014 |
| 50°                 | -33                  | 19    | 0.019                 | 0.011 |

**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 |
| 10.8           | 9                    | 8     | 0.011                 | 0.010 |
| 12.0           | 25                   | 5     | 0.030                 | 0.006 |
| 13.2           | 18                   | 11    | 0.022                 | 0.013 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 18                   | 22    | 0.022                 | 0.026 |
| -20°                | 15                   | 15    | 0.018                 | 0.018 |
| -10°                | 34                   | 11    | 0.041                 | 0.013 |
| 0°                  | 27                   | 9     | 0.032                 | 0.011 |
| 10°                 | 19                   | 10    | 0.023                 | 0.012 |
| 20°                 | 15                   | 7     | 0.018                 | 0.008 |
| 30°                 | 22                   | 13    | 0.026                 | 0.016 |
| 40°                 | 28                   | 26    | 0.033                 | 0.031 |
| 50°                 | 36                   | 18    | 0.043                 | 0.022 |

**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 |
| 10.8           | 33                   | -9    | 0.013                 | 0.004 |
| 12.0           | 29                   | -18   | 0.011                 | 0.007 |
| 13.2           | 45                   | 35    | 0.018                 | 0.014 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | 61                   | 36    | 0.024                 | 0.014 |
| -20°                | 52                   | 29    | 0.021                 | 0.011 |
| -10°                | 33                   | 41    | 0.013                 | 0.016 |
| 0°                  | 18                   | 16    | 0.007                 | 0.006 |
| 10°                 | 42                   | 18    | 0.017                 | 0.007 |
| 20°                 | 25                   | 22    | 0.010                 | 0.009 |
| 30°                 | 38                   | 27    | 0.015                 | 0.011 |
| 40°                 | 54                   | 38    | 0.021                 | 0.015 |
| 50°                 | 66                   | 49    | 0.026                 | 0.019 |

**LTE Band 41, 20MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

| Voltage<br>(V) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|----------------|----------------------|-------|-----------------------|-------|
|                | QPSK                 | 16QAM | QPSK                  | 16QAM |
| 10.8           | -18                  | -9    | 0.007                 | 0.003 |
| 12.0           | -24                  | -48   | 0.009                 | 0.018 |
| 13.2           | -33                  | 3     | 0.013                 | 0.001 |

**Frequency Error vs Temperature**

| Temperature<br>(°C) | Frequency error (Hz) |       | Frequency error (ppm) |       |
|---------------------|----------------------|-------|-----------------------|-------|
|                     | QPSK                 | 16QAM | QPSK                  | 16QAM |
| -30°                | -11                  | -16   | 0.004                 | 0.006 |
| -20°                | -29                  | -41   | 0.011                 | 0.016 |
| -10°                | -8                   | -33   | 0.003                 | 0.013 |
| 0°                  | -15                  | -26   | 0.006                 | 0.010 |
| 10°                 | -26                  | -37   | 0.010                 | 0.014 |
| 20°                 | -13                  | -9    | 0.005                 | 0.003 |
| 30°                 | -8                   | 3     | 0.003                 | 0.001 |
| 40°                 | -16                  | -25   | 0.006                 | 0.010 |
| 50°                 | -21                  | -29   | 0.008                 | 0.011 |

Expanded measurement uncertainty is 10Hz,  $k = 2$

#### **A.4 OCCUPIED BANDWIDTH**

##### **Reference**

FCC: CFR Part 2.1049, 22.917, 24.238, 27.53(g).

##### **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.

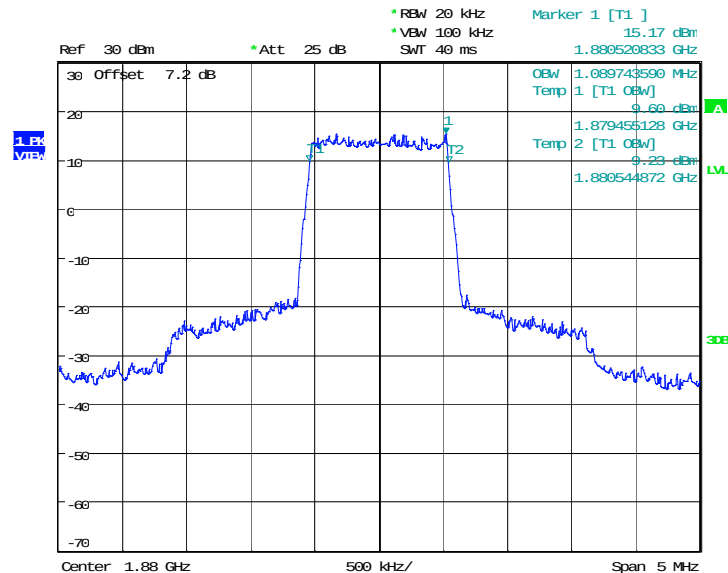
The measurement method is from KDB 971168 D01 4.2:

- 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  $10\log (OBW / RBW)$  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%)

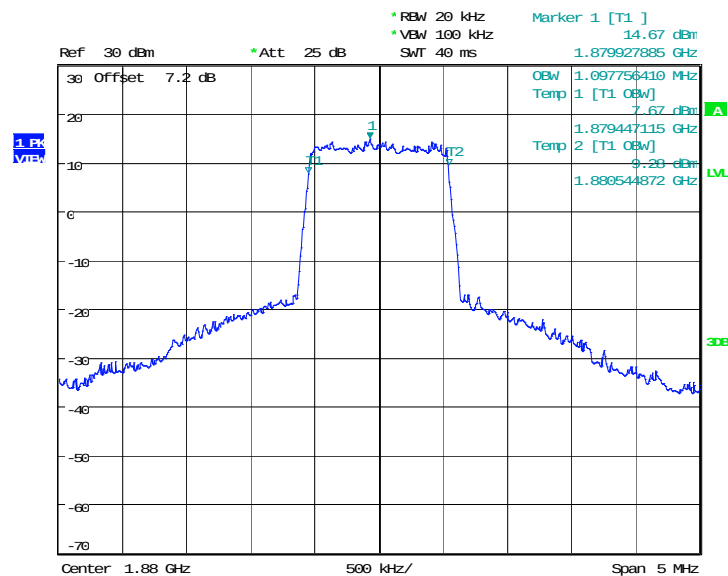
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1880.0         | QPSK                           | 16QAM   |
|                | 1089.74                        | 1097.76 |

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



Date: 6.MAR.2017 18:19:22

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

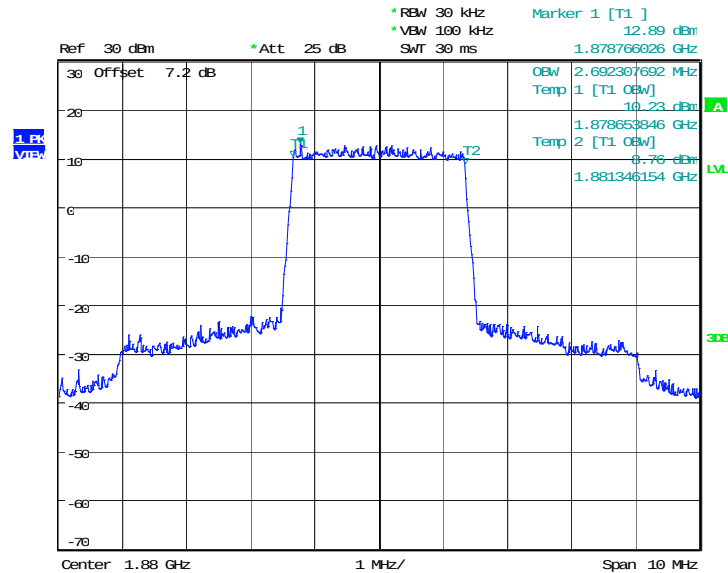


Date: 6.MAR.2017 18:20:25

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

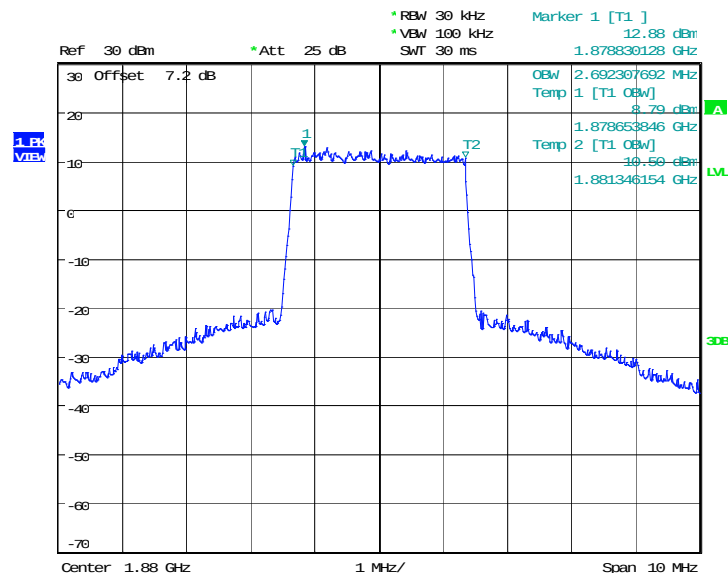
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1880.0         | QPSK                           | 16QAM   |
|                | 2692.31                        | 2692.31 |

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



Date: 6.MAR.2017 18:36:42

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

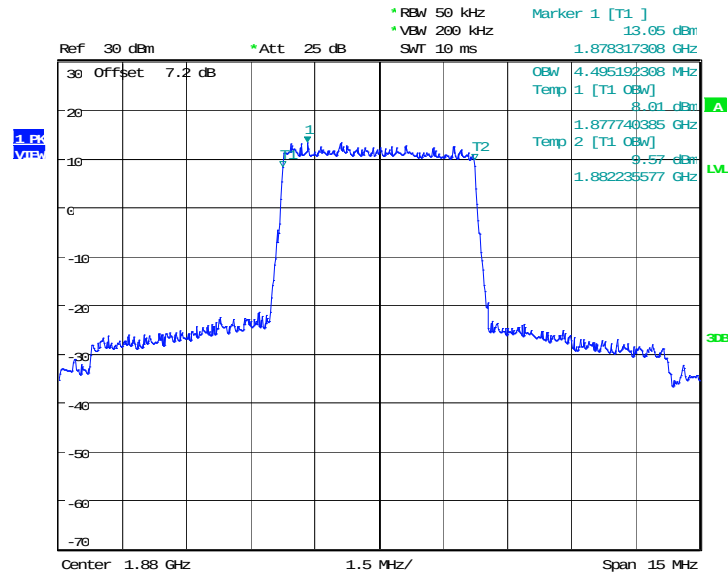


Date: 6.MAR.2017 18:35:35

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

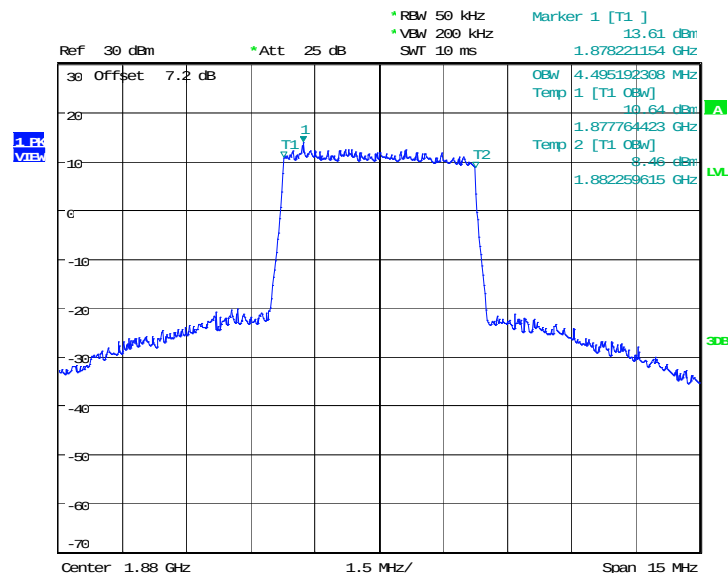
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1880.0         | QPSK                           | 16QAM   |
|                | 4495.19                        | 4495.19 |

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



Date: 6.MAR.2017 18:37:32

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

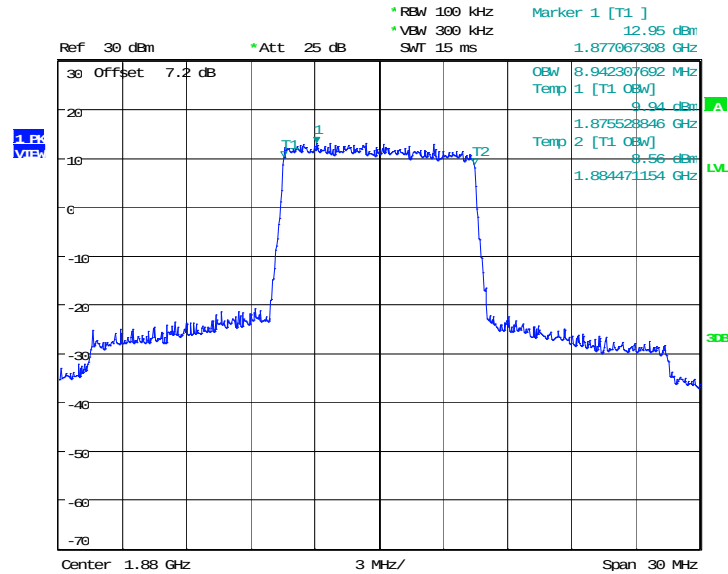


Date: 6.MAR.2017 18:38:33

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

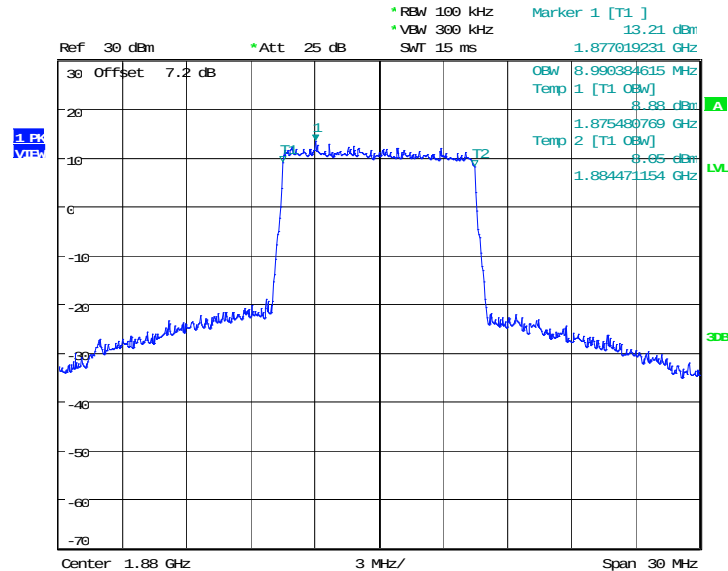
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1880.0         | QPSK                           | 16QAM   |
|                | 8942.31                        | 8990.38 |

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



Date: 6.MAR.2017 19:01:07

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

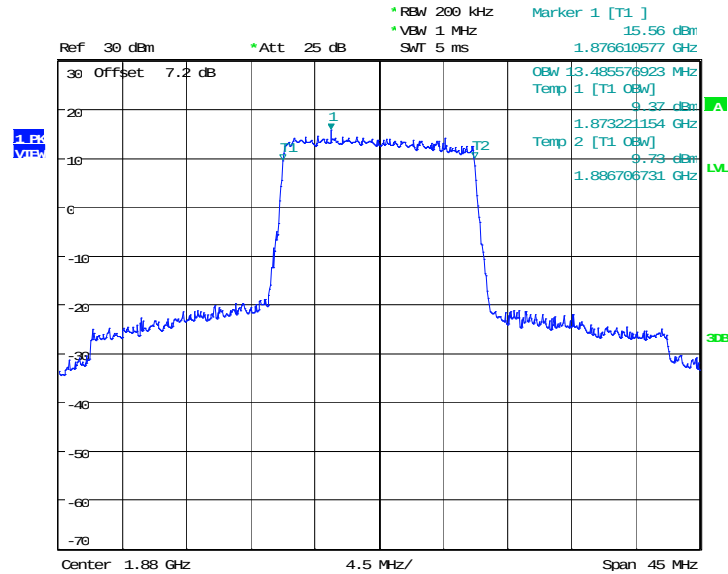


Date: 6.MAR.2017 19:01:54

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

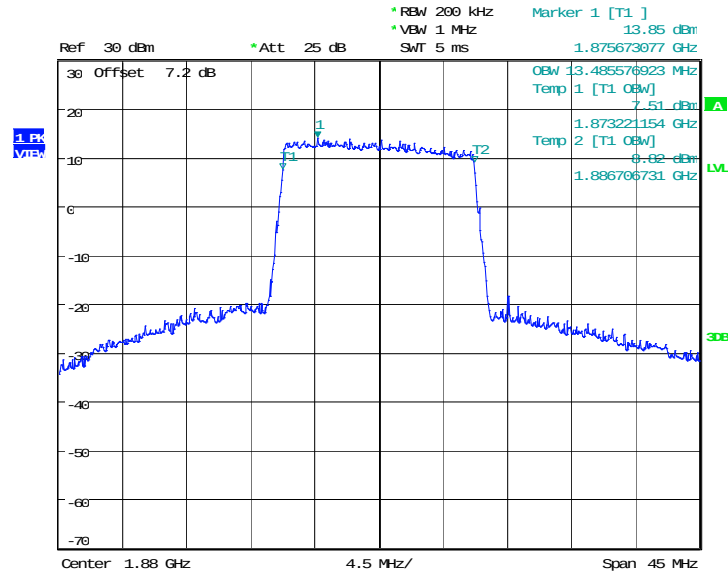
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 1880.0         | QPSK                           | 16QAM    |
|                | 13485.58                       | 13485.58 |

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



Date: 6.MAR.2017 19:06:56

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

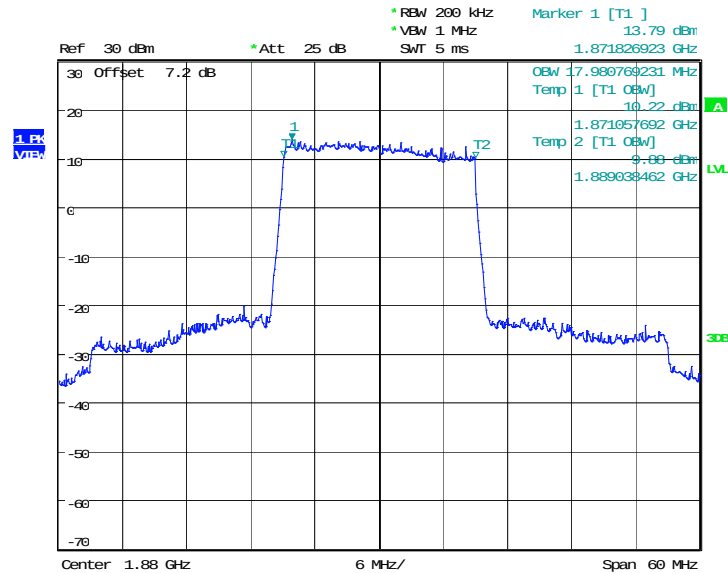


Date: 6.MAR.2017 19:06:14

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

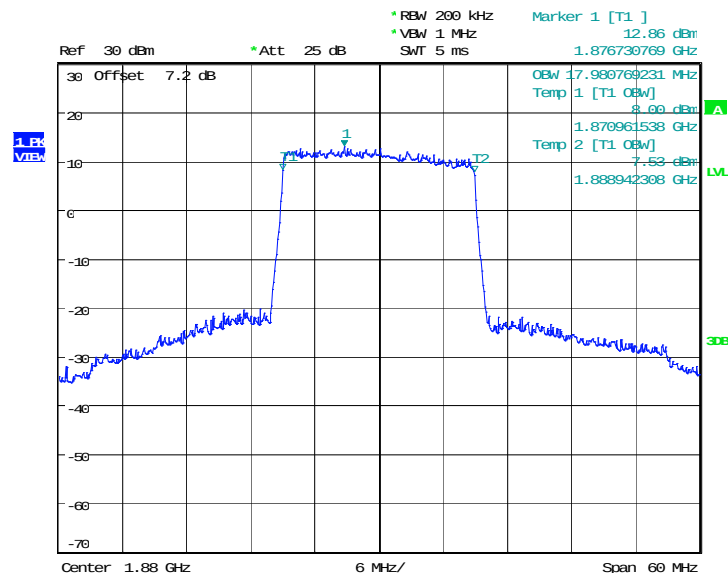
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 1880.0         | QPSK                           | 16QAM    |
|                | 17980.77                       | 17980.77 |

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



Date: 6.MAR.2017 19:18:18

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

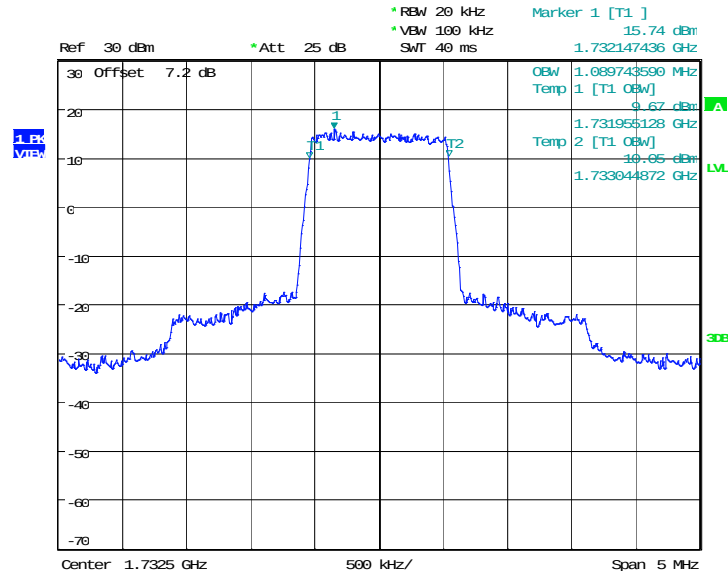


Date: 6.MAR.2017 19:19:02

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

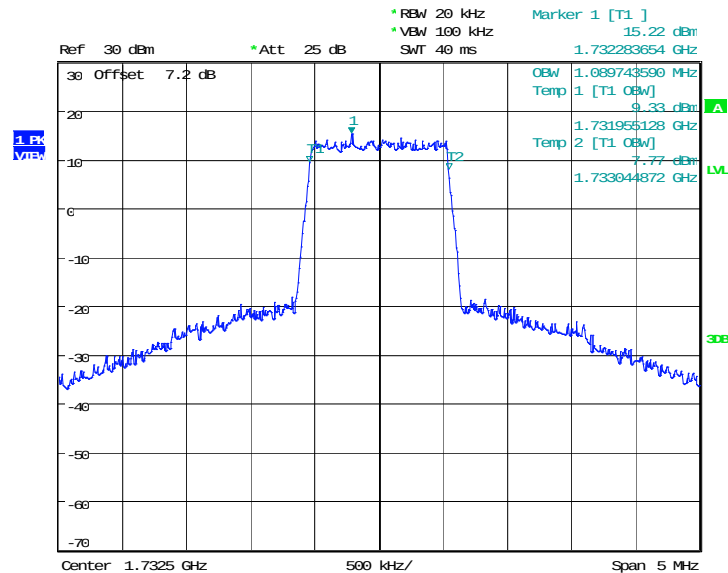
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1732.5         | QPSK                           | 16QAM   |
|                | 1089.74                        | 1089.74 |

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



Date: 6.MAR.2017 18:24:33

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

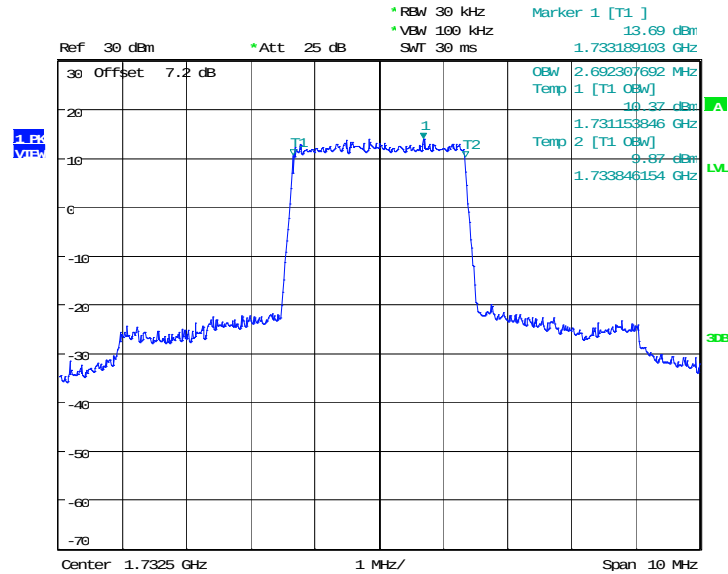


Date: 6.MAR.2017 18:23:45

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

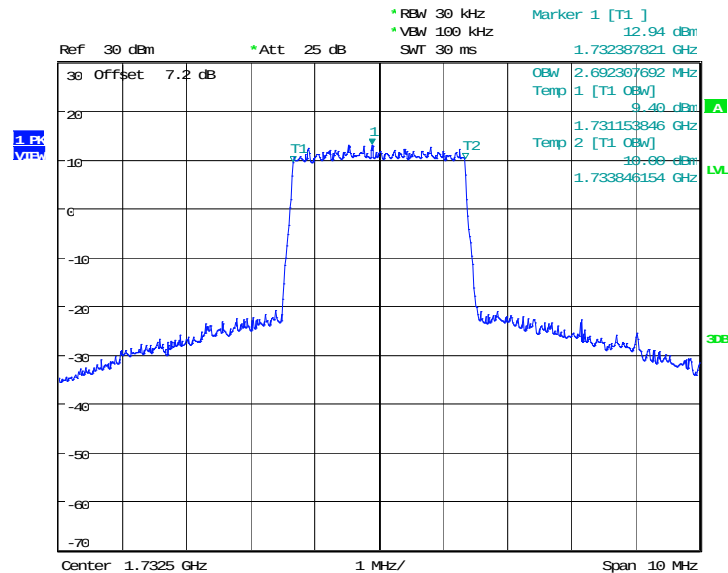
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1732.5         | QPSK                           | 16QAM   |
|                | 2692.31                        | 2692.31 |

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



Date: 6.MAR.2017 18:31:43

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

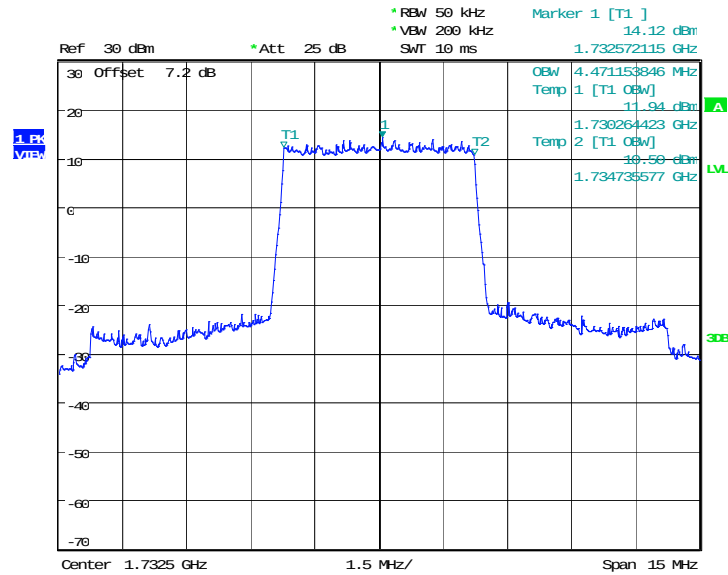


Date: 6.MAR.2017 18:32:24

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

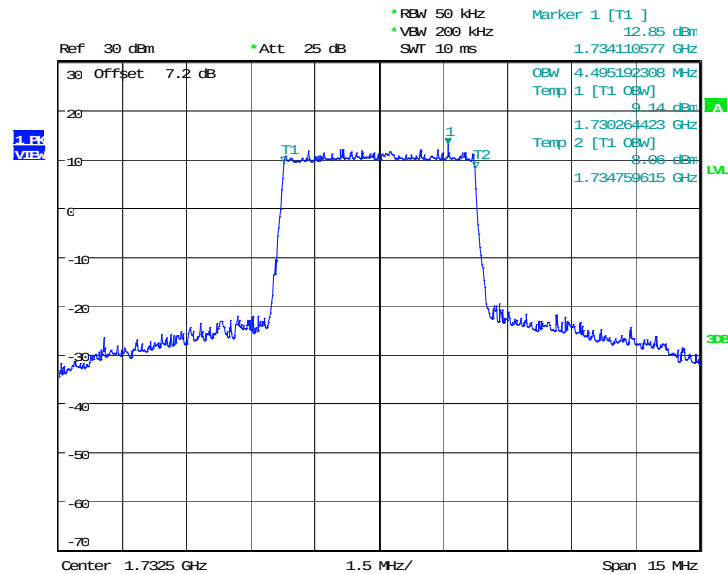
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1732.5         | QPSK                           | 16QAM   |
|                | 4471.15                        | 4495.19 |

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



Date: 6.MAR.2017 18:43:23

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

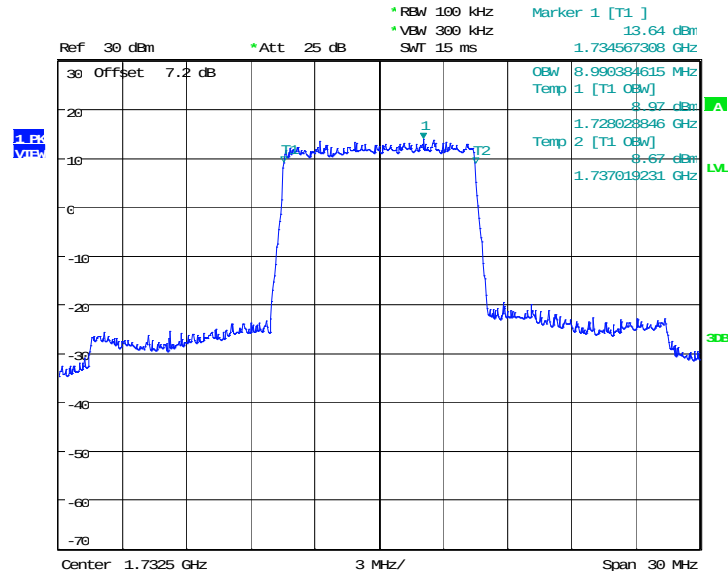


Date: 6.MAR.2017 18:42:40

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

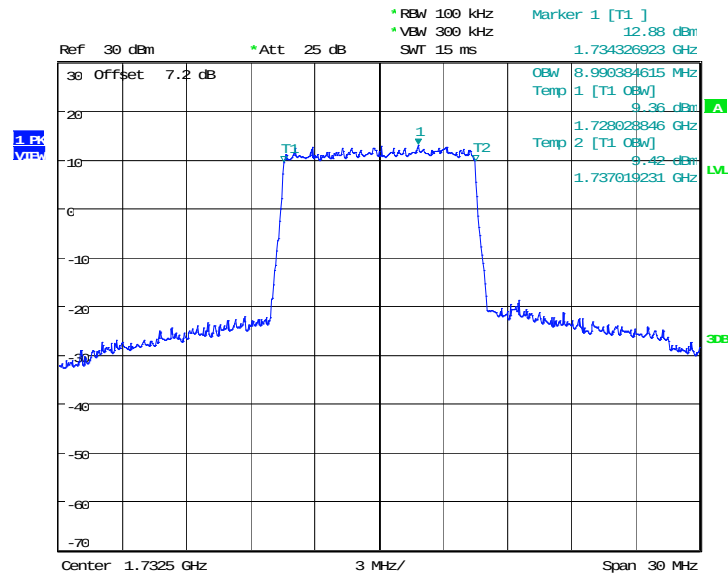
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 1732.5         | QPSK                           | 16QAM   |
|                | 8990.38                        | 8990.38 |

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



Date: 6.MAR.2017 19:00:31

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

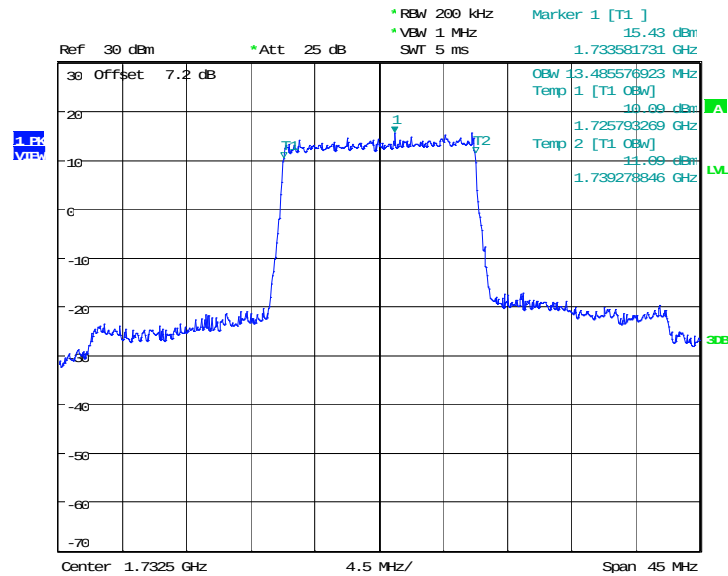


Date: 6.MAR.2017 19:00:01

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

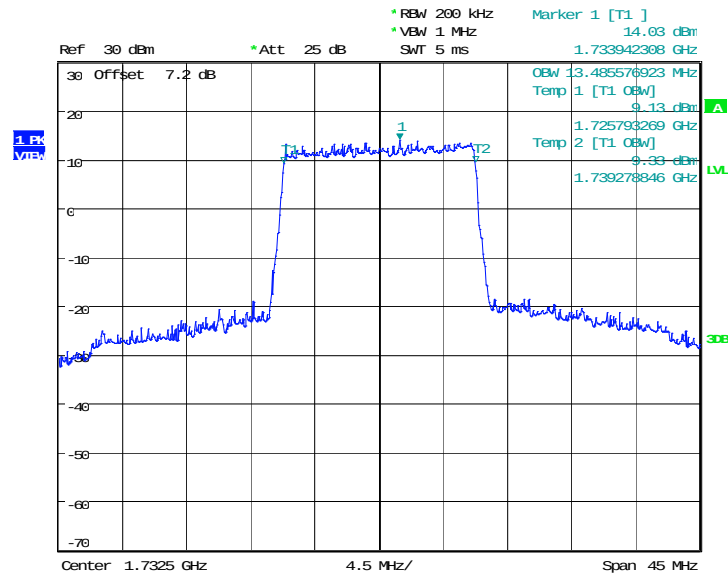
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 1732.5         | QPSK                           | 16QAM    |
|                | 13485.58                       | 13485.58 |

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



Date: 6.MAR.2017 19:07:35

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

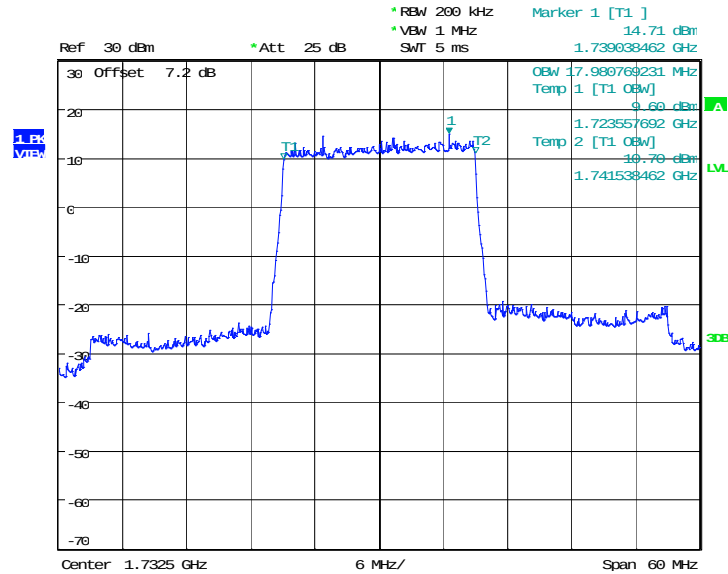


Date: 6.MAR.2017 19:07:56

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

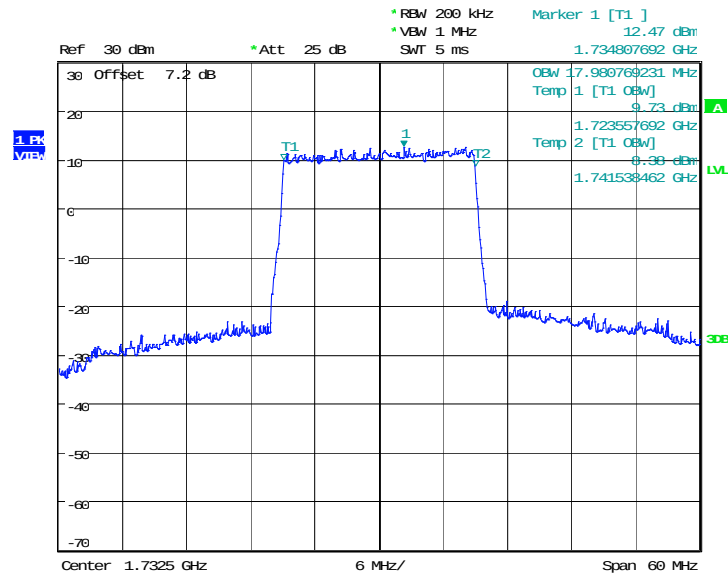
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 1732.5         | QPSK                           | 16QAM    |
|                | 17980.77                       | 17980.77 |

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



Date: 6.MAR.2017 19:17:31

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

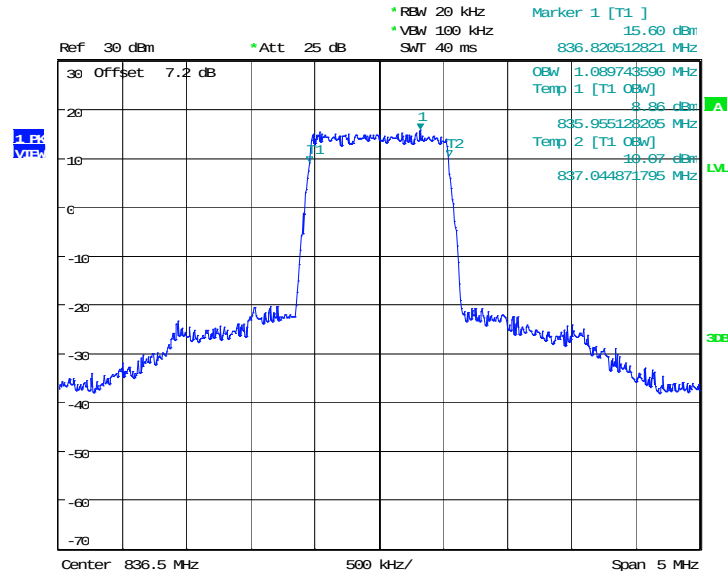


Date: 6.MAR.2017 19:17:10

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

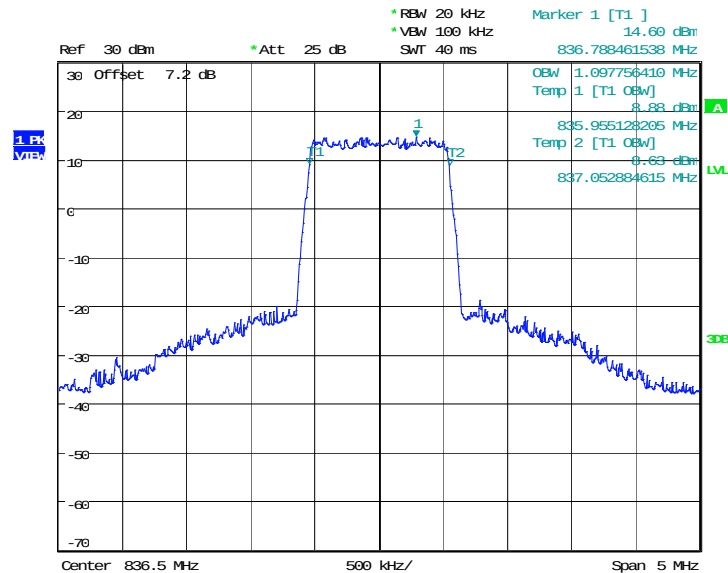
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 836.5          | QPSK                           | 16QAM   |
|                | 1089.74                        | 1097.76 |

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



Date: 6.MAR.2017 18:25:28

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

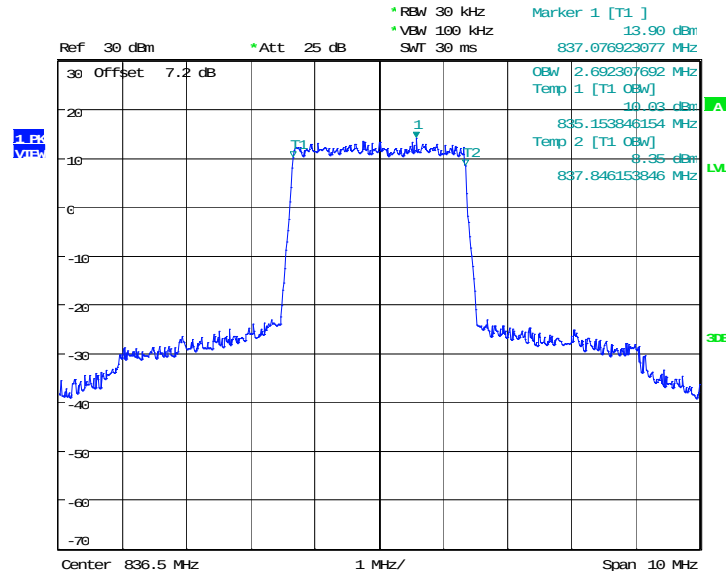


Date: 6.MAR.2017 18:26:11

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

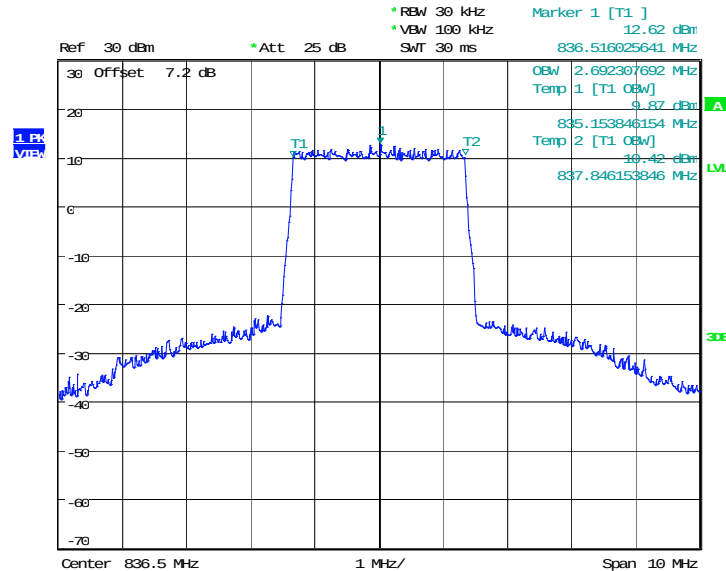
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 836.5          | QPSK                           | 16QAM   |
|                | 2692.31                        | 2692.31 |

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



Date: 6.MAR.2017 18:30:55

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

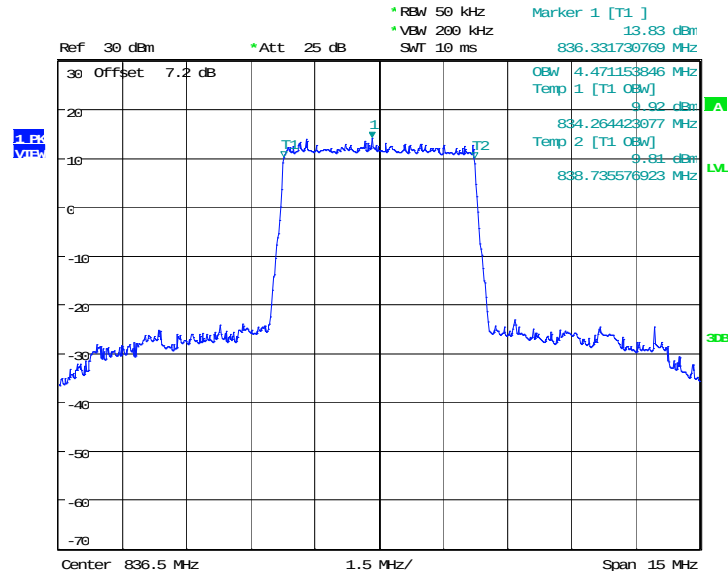


Date: 6.MAR.2017 18:30:30

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

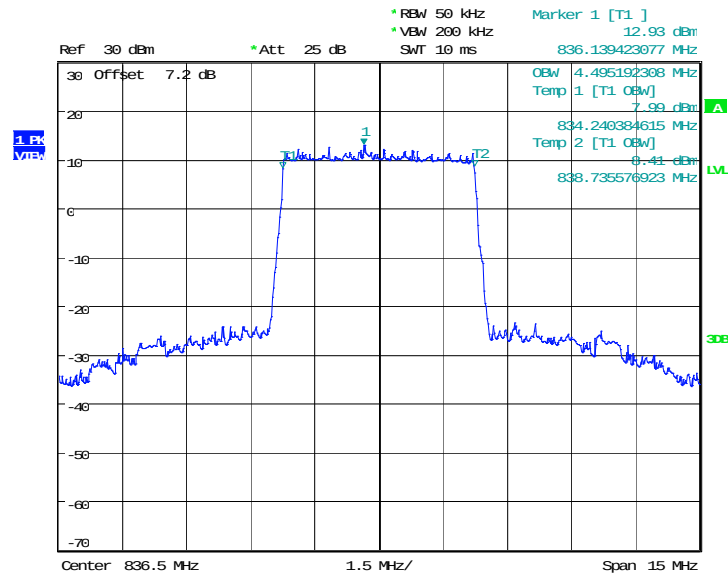
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 836.5          | QPSK                           | 16QAM   |
|                | 4471.15                        | 4495.19 |

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



Date: 6.MAR.2017 18:47:21

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

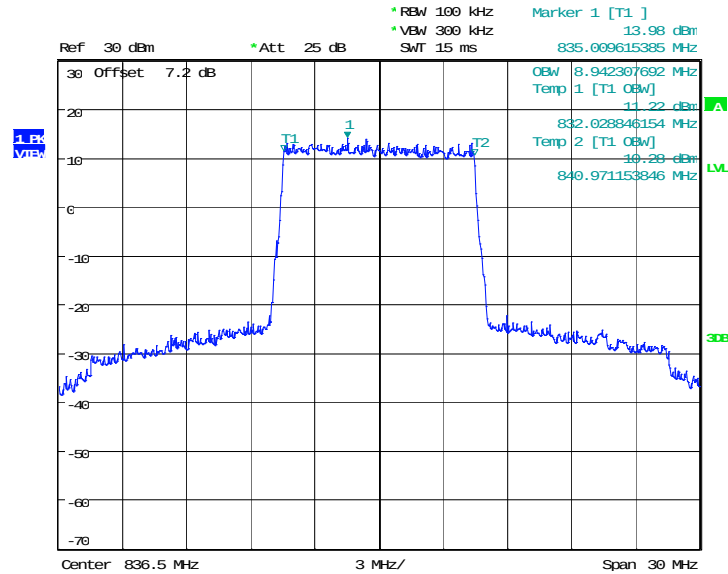


Date: 6.MAR.2017 18:46:34

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

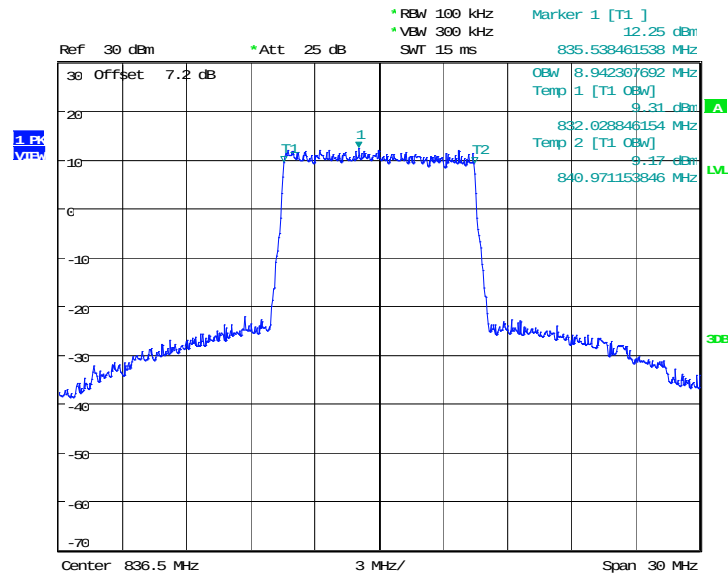
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 836.5          | QPSK                           | 16QAM   |
|                | 8942.31                        | 8942.31 |

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



Date: 6.MAR.2017 18:54:05

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

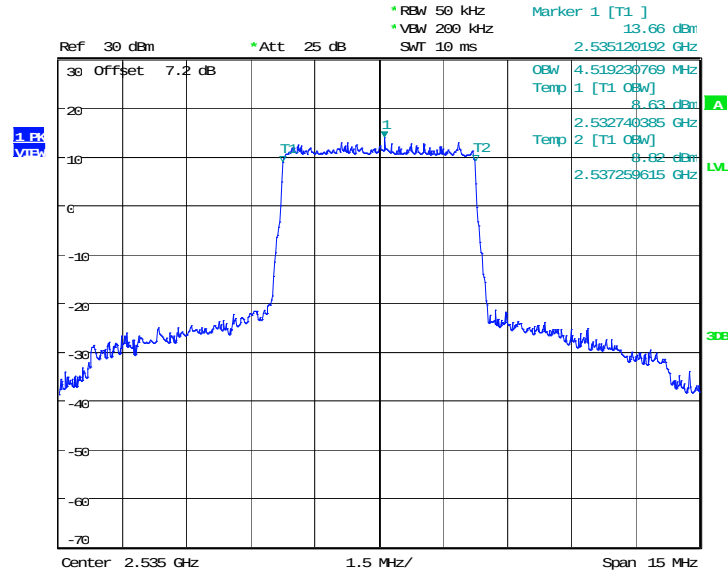


Date: 6.MAR.2017 18:54:35

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

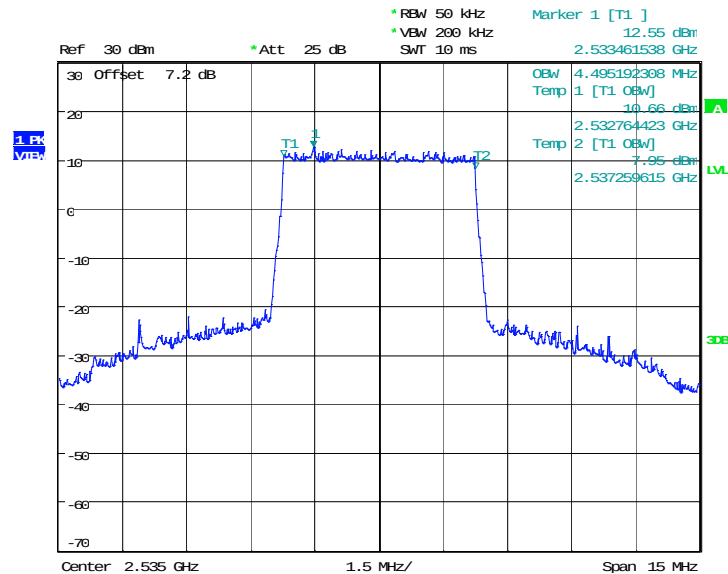
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 2535.0         | QPSK                           | 16QAM   |
|                | 4519.23                        | 4495.19 |

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



Date: 6.MAR.2017 18:48:10

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

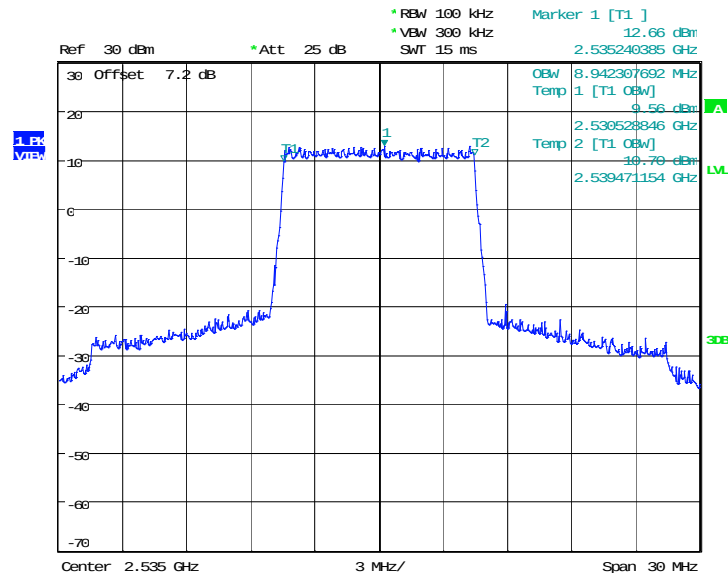


Date: 6.MAR.2017 18:48:54

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

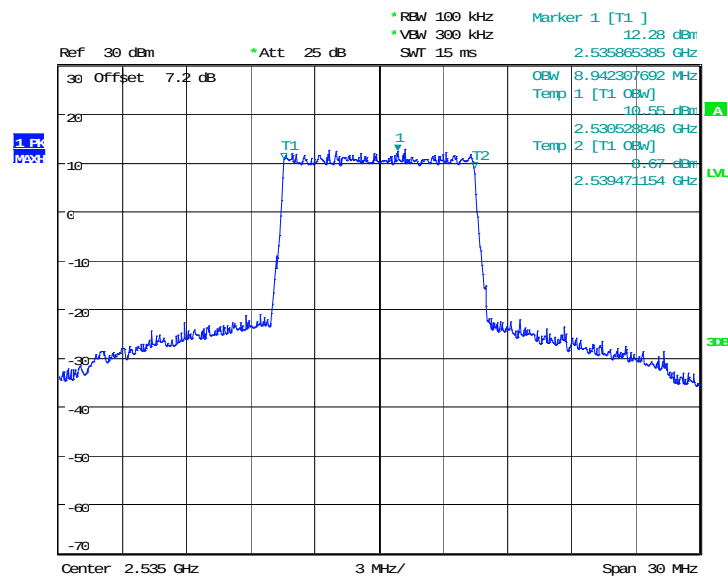
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 2535.0         | QPSK                           | 16QAM   |
|                | 8942.31                        | 8942.31 |

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



Date: 6.MAR.2017 18:53:23

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

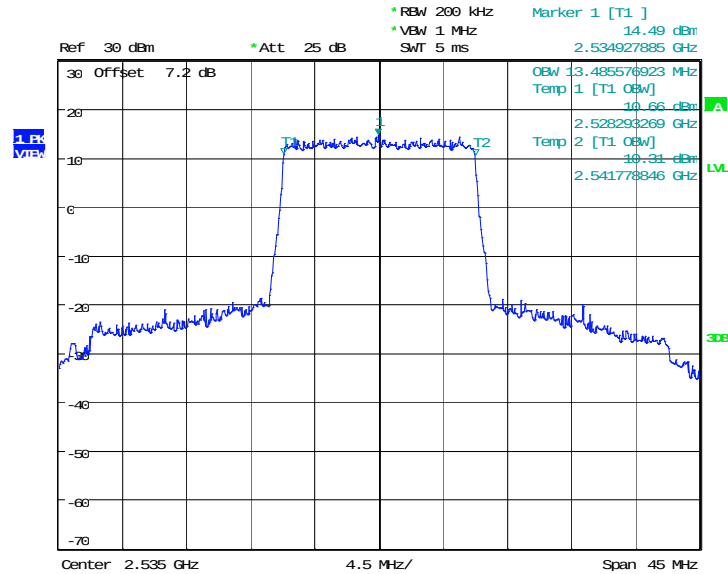


Date: 6.MAR.2017 18:52:47

### LTE band 7, 15MHz (99%)

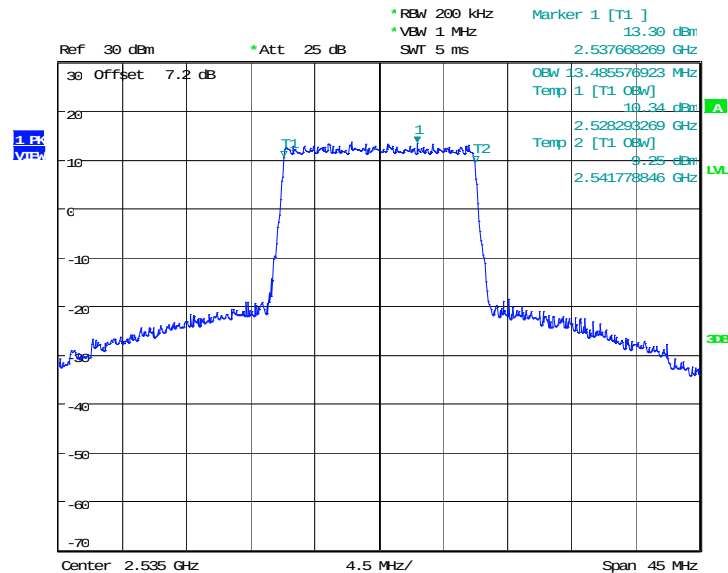
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 2535.0         | QPSK                           | 16QAM    |
|                | 13485.58                       | 13485.58 |

### LTE band 7, 15MHz Bandwidth, QPSK (99% BW)



Date: 6.MAR.2017 19:11:38

### LTE band 7, 15MHz Bandwidth, 16QAM (99% BW)

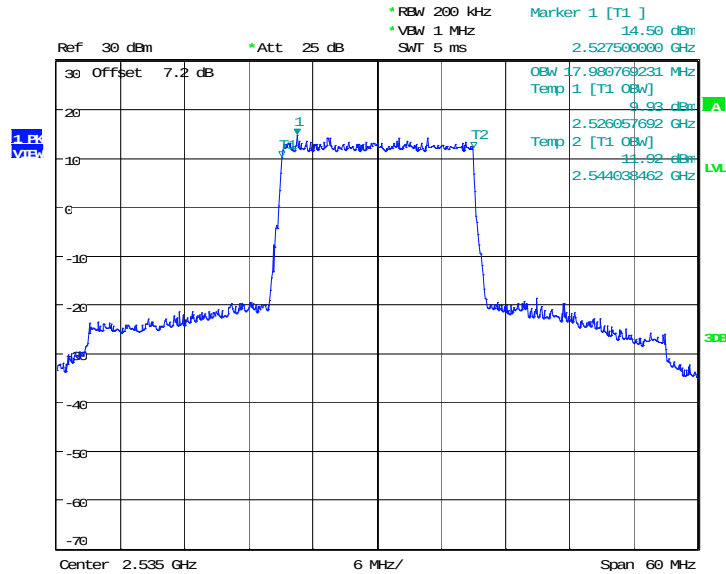


Date: 6.MAR.2017 19:11:18

### LTE band 7, 20MHz (99%)

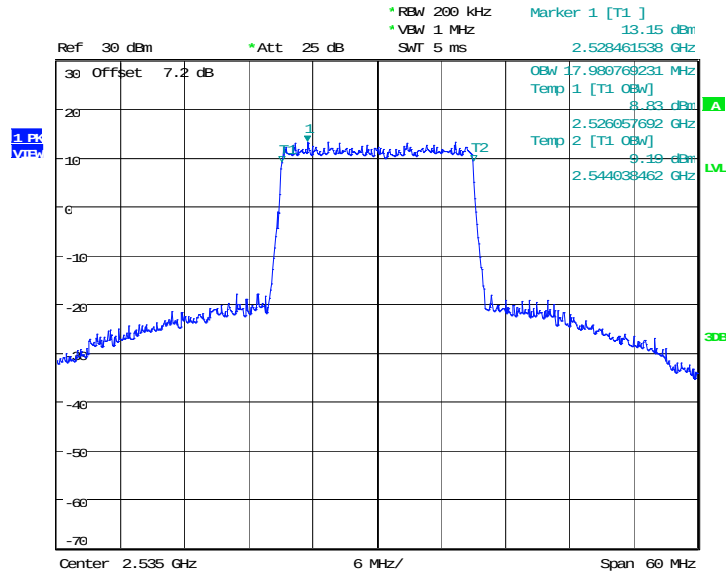
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 2535.0         | QPSK                           | 16QAM    |
|                | 17980.77                       | 17980.77 |

### LTE band 7, 20MHz Bandwidth, QPSK (99% BW)



Date: 6.MAR.2017 19:12:56

### LTE band 7, 20MHz Bandwidth, 16QAM (99% BW)

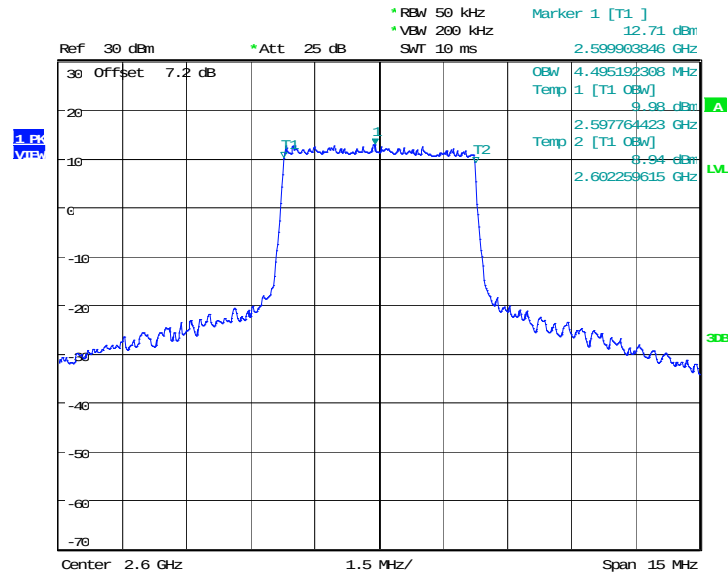


Date: 6.MAR.2017 19:13:24

### LTE band 41, 5MHz (99%)

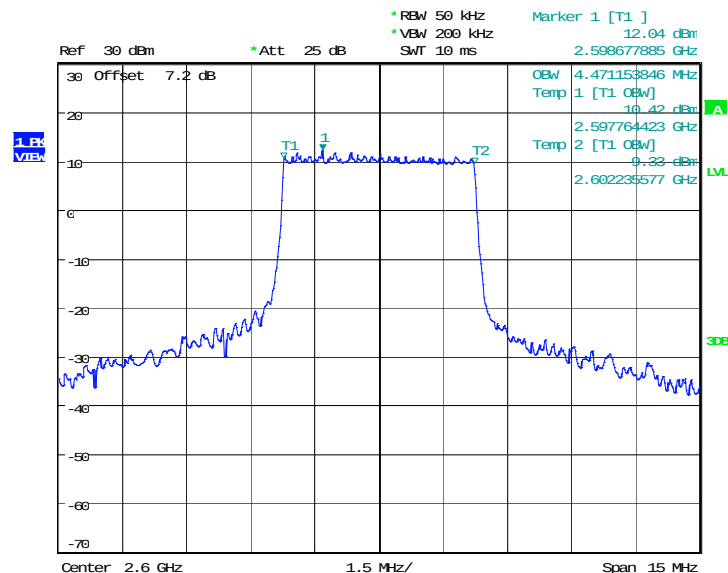
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 2600.0         | QPSK                           | 16QAM   |
|                | 4495.19                        | 4471.15 |

### LTE band 41, 5MHz Bandwidth, QPSK (99% BW)



Date: 6.MAR.2017 19:43:22

### LTE band 41, 5MHz Bandwidth,16QAM (99% BW)

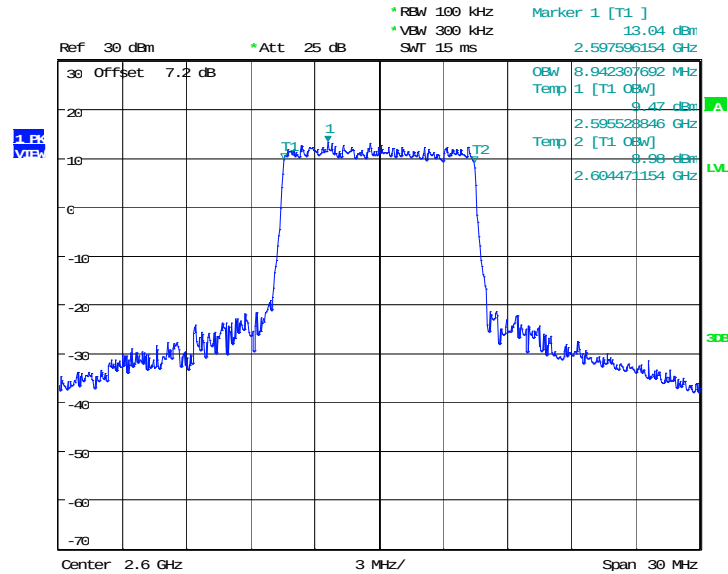


Date: 6.MAR.2017 19:41:44

### LTE band 41, 10MHz (99%)

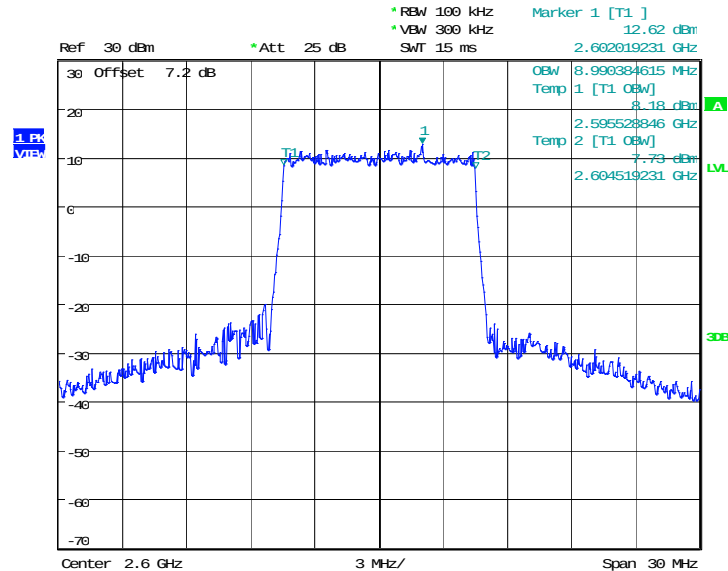
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |         |
|----------------|--------------------------------|---------|
| 2600.0         | QPSK                           | 16QAM   |
|                | 8942.31                        | 8990.38 |

### LTE band 41, 10MHz Bandwidth, QPSK (99% BW)



Date: 6.MAR.2017 19:39:45

### LTE band 41, 10MHz Bandwidth, 16QAM (99% BW)

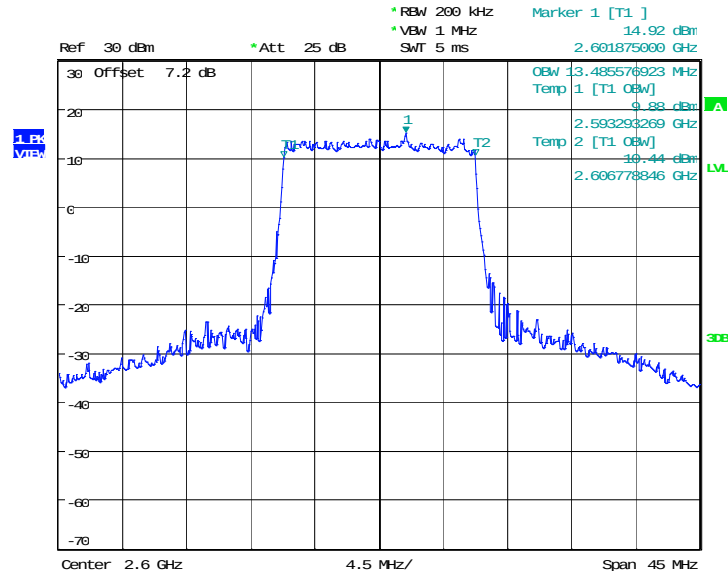


Date: 6.MAR.2017 19:39:07

### LTE band 41, 15MHz (99%)

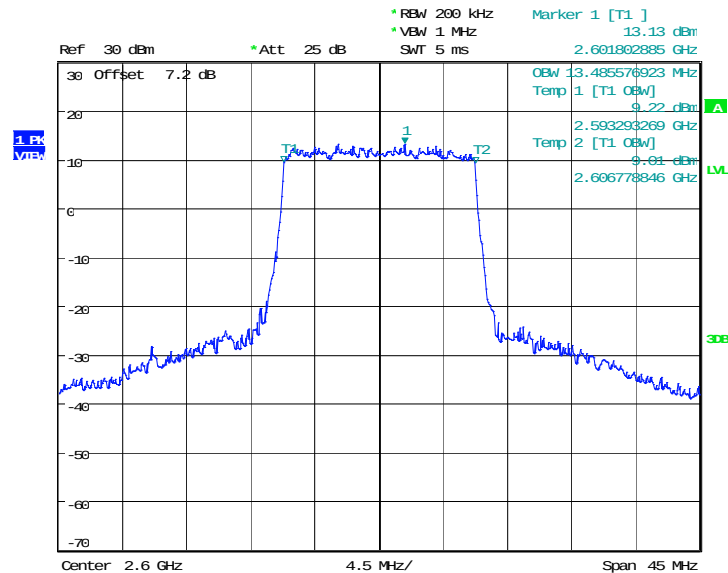
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 2600.0         | QPSK                           | 16QAM    |
|                | 13485.58                       | 13485.58 |

### LTE band 41, 15MHz Bandwidth, QPSK (99% BW)



Date: 6.MAR.2017 19:35:15

### LTE band 41, 15MHz Bandwidth, 16QAM (99% BW)

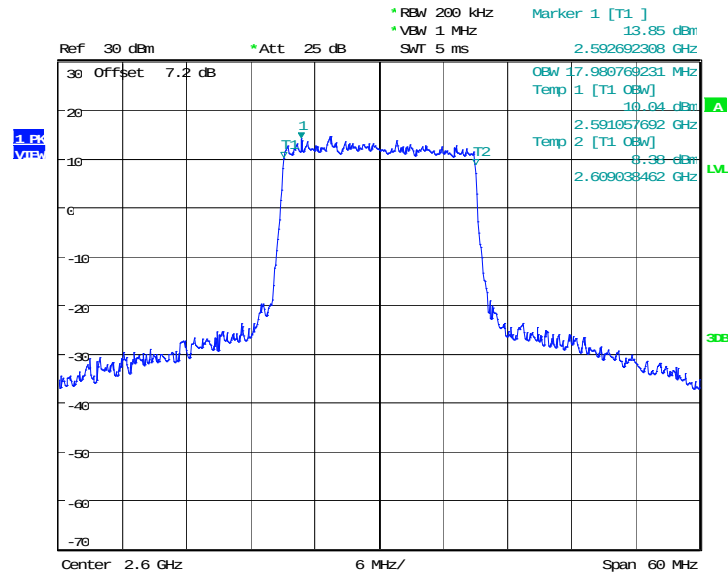


Date: 6.MAR.2017 19:35:52

### LTE band 41, 20MHz (99%)

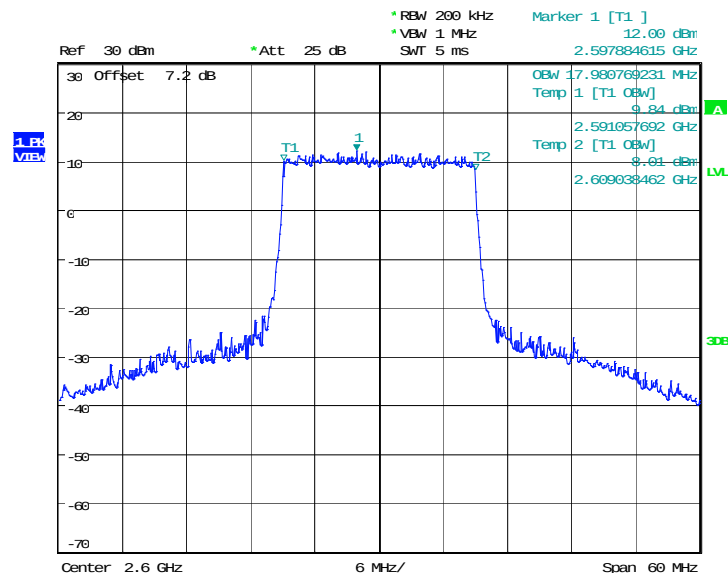
| Frequency(MHz) | Occupied Bandwidth (99%)( kHz) |          |
|----------------|--------------------------------|----------|
| 2600.0         | QPSK                           | 16QAM    |
|                | 17980.77                       | 17980.77 |

### LTE band 41, 20MHz Bandwidth, QPSK (99% BW)



Date: 6.MAR.2017 19:33:35

### LTE band 41, 20MHz Bandwidth, 16QAM (99% BW)



Date: 6.MAR.2017 19:32:51

Note: Expanded measurement uncertainty is  $U = 3428\text{Hz}$ ,  $k = 2$

## A.5 EMISSION BANDWIDTH

### Reference

FCC: CFR Part 2.1049, 22.917, 24.238, 27.53(g)

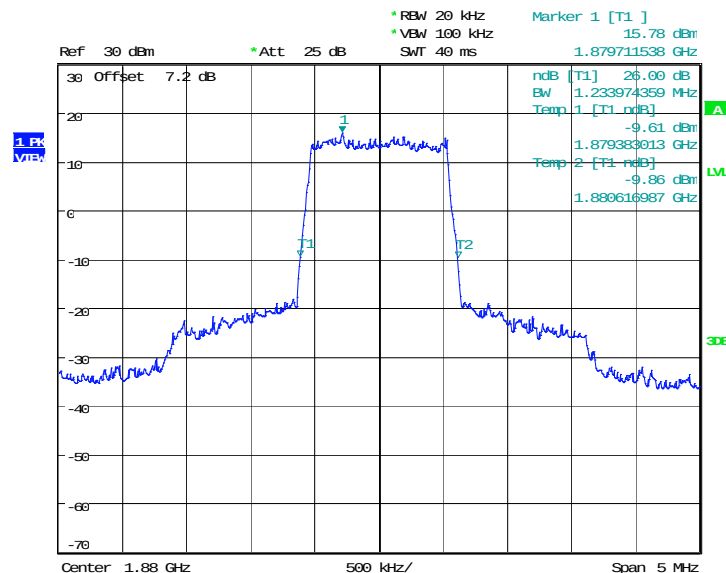
### A.5.1 Emission Bandwidth Results

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

#### LTE band 2, 1.4MHz (-26dBc)

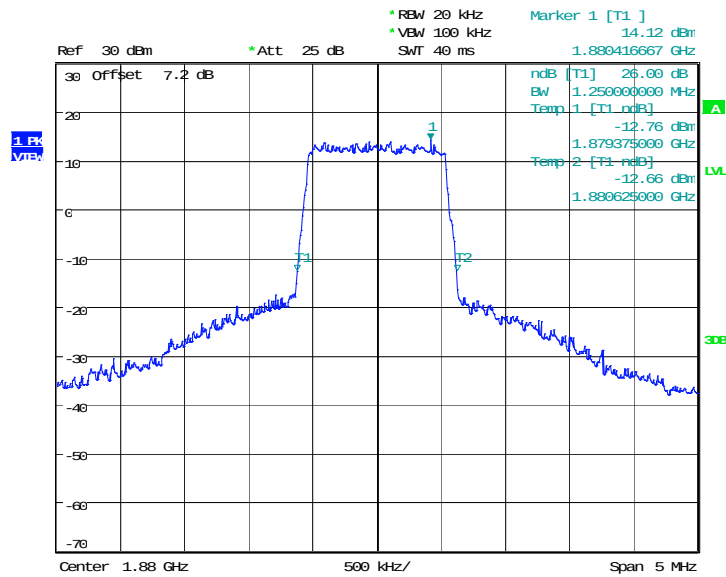
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 1880.0         | QPSK                              | 16QAM   |
|                | 1233.97                           | 1250.00 |

#### LTE band 2, 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 18:21:32

LTE band 2, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

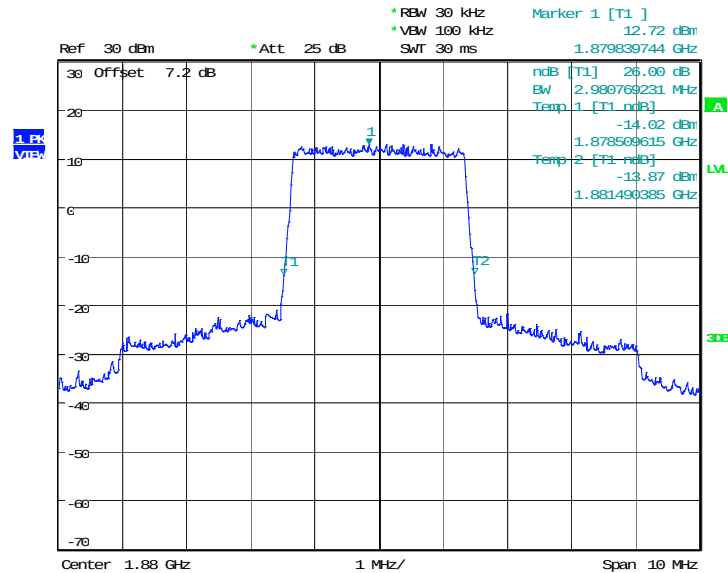


Date: 6.MAR.2017 18:20:57

### LTE band 2, 3MHz (-26dBc)

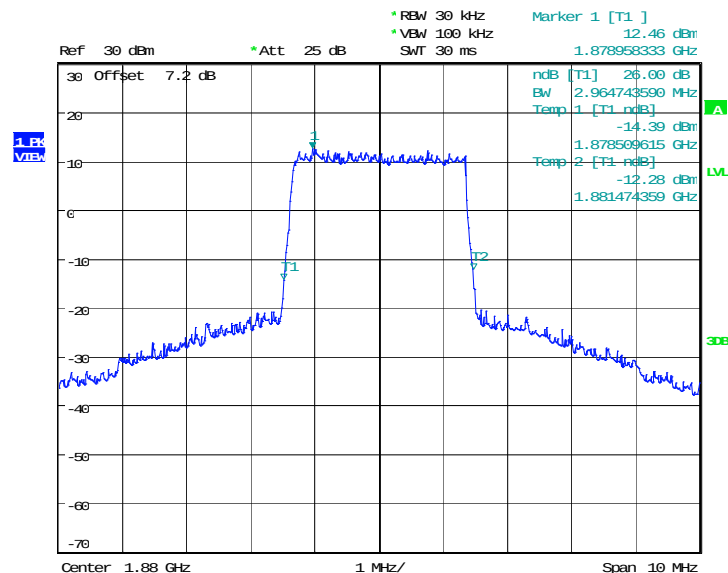
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 1880.0         | QPSK                              | 16QAM   |
|                | 2980.77                           | 2964.74 |

### LTE band 2, 3MHz Bandwidth, QPSK (-26dB BW)



Date: 6.MAR.2017 18:34:17

### LTE band 2, 3MHz Bandwidth, 16QAM (-26dB BW)

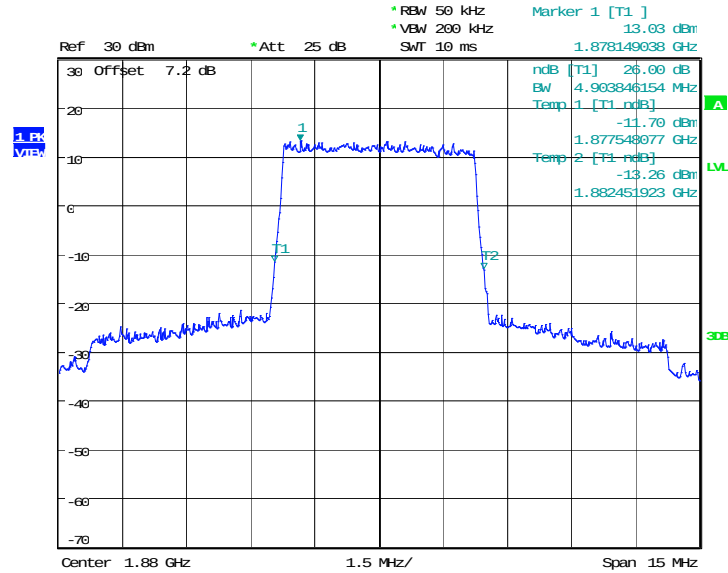


Date: 6.MAR.2017 18:34:50

### LTE band 2, 5MHz (-26dBc)

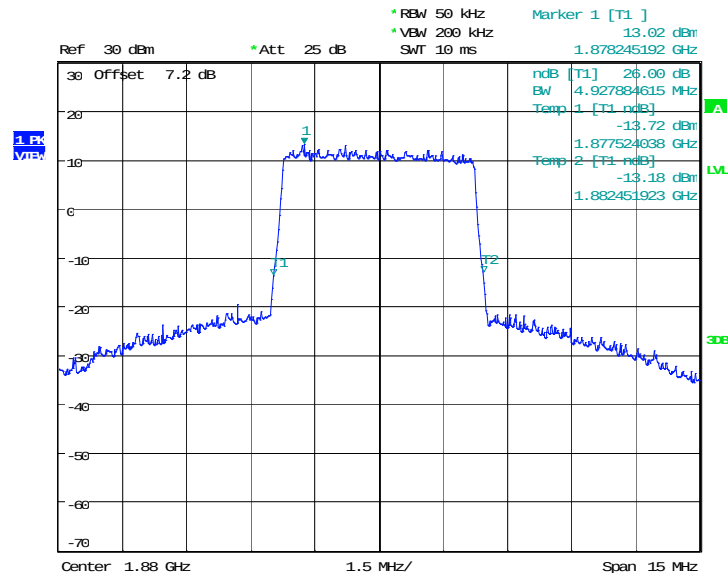
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 1880.0         | QPSK                              | 16QAM   |
|                | 4903.85                           | 4927.88 |

### LTE band 2, 5MHz Bandwidth, QPSK (-26dB BW)



Date: 6.MAR.2017 18:40:39

### LTE band 2, 5MHz Bandwidth,16QAM (-26dB BW)

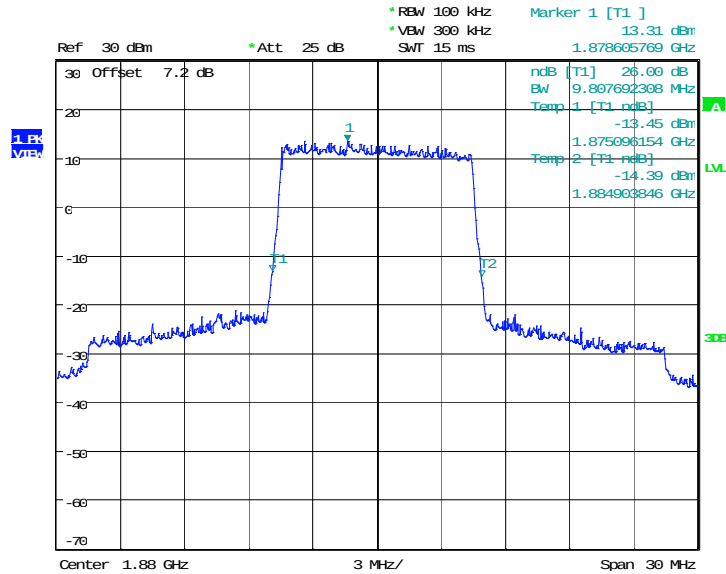


Date: 6.MAR.2017 18:39:42

### LTE band 2, 10MHz (-26dBc)

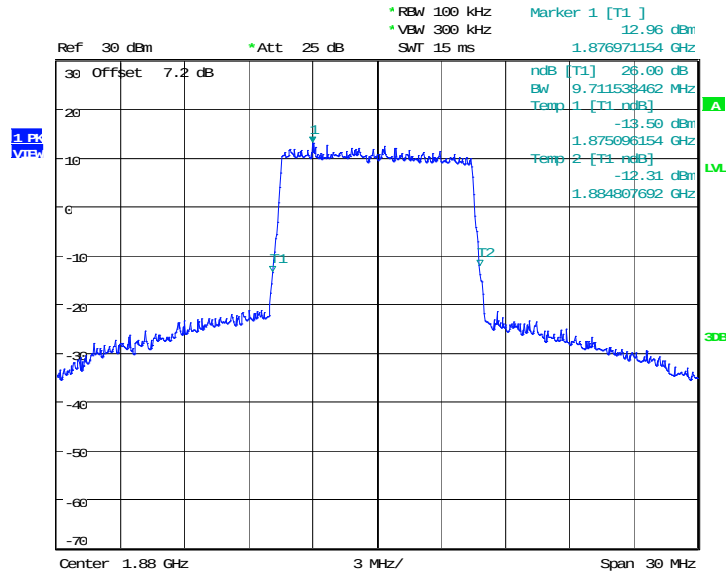
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 1880.0         | QPSK                              | 16QAM   |
|                | 9807.69                           | 9711.54 |

### LTE band 2, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 19:03:16

### LTE band 2, 10MHz Bandwidth, 16QAM (-26dBc BW)

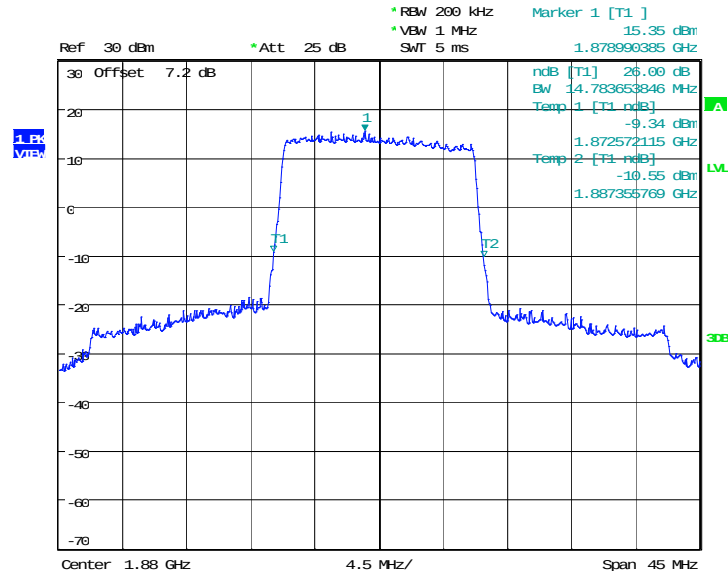


Date: 6.MAR.2017 19:02:45

### LTE band 2, 15MHz (-26dBc)

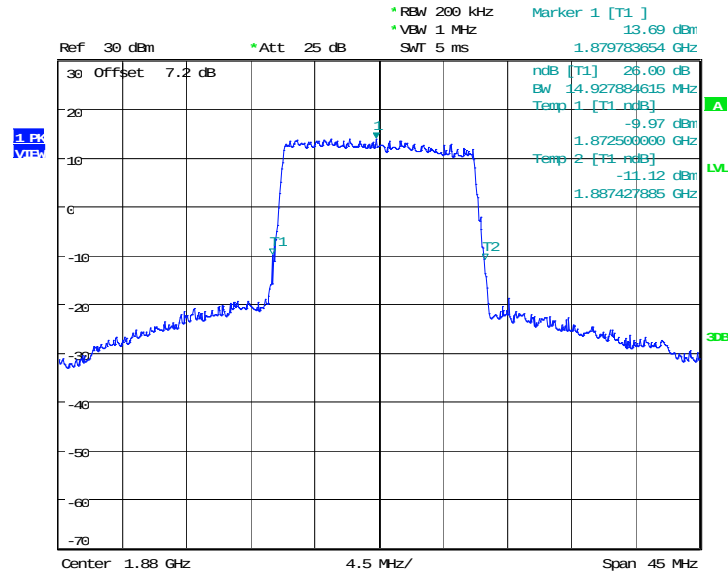
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |          |
|----------------|-----------------------------------|----------|
| 1880.0         | QPSK                              | 16QAM    |
|                | 14783.65                          | 14927.88 |

### LTE band 2, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 19:04:50

### LTE band 2, 15MHz Bandwidth, 16QAM (-26dBc BW)

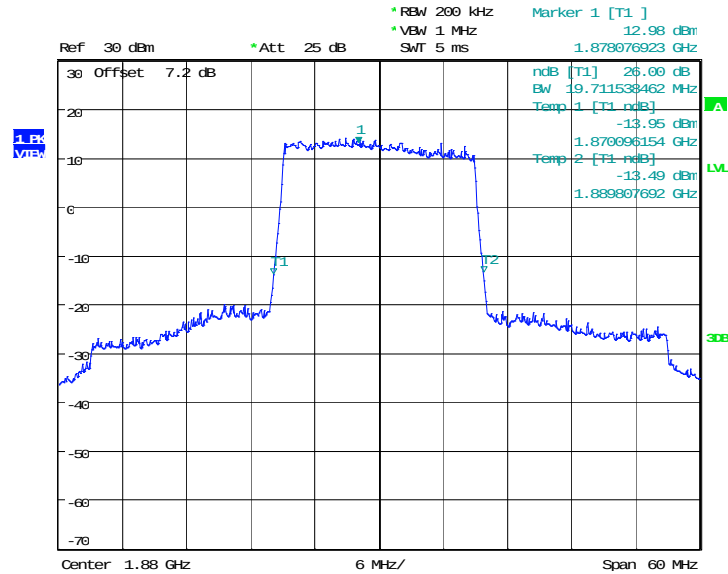


Date: 6.MAR.2017 19:05:39

### LTE band 2, 20MHz (-26dBc)

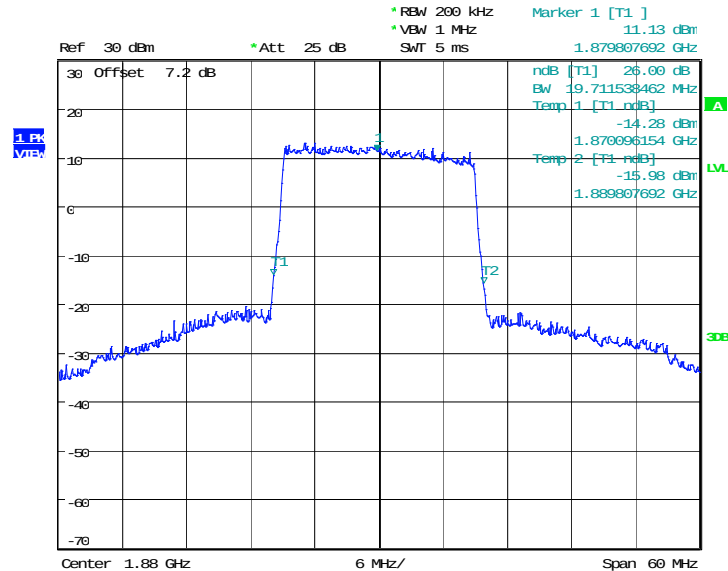
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |          |
|----------------|-----------------------------------|----------|
| 1880.0         | QPSK                              | 16QAM    |
|                | 19711.54                          | 19711.54 |

### LTE band 2, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 19:20:50

### LTE band 2, 20MHz Bandwidth, 16QAM (-26dBc BW)

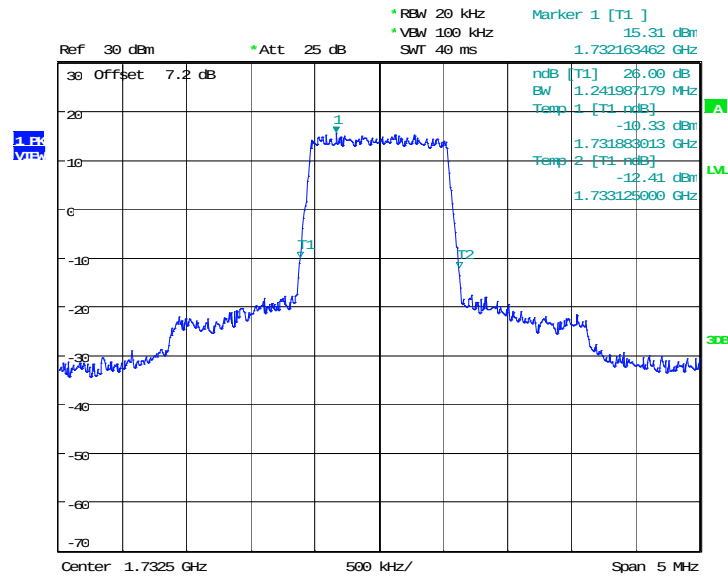


Date: 6.MAR.2017 19:19:52

### LTE band 4, 1.4MHz (-26dBc)

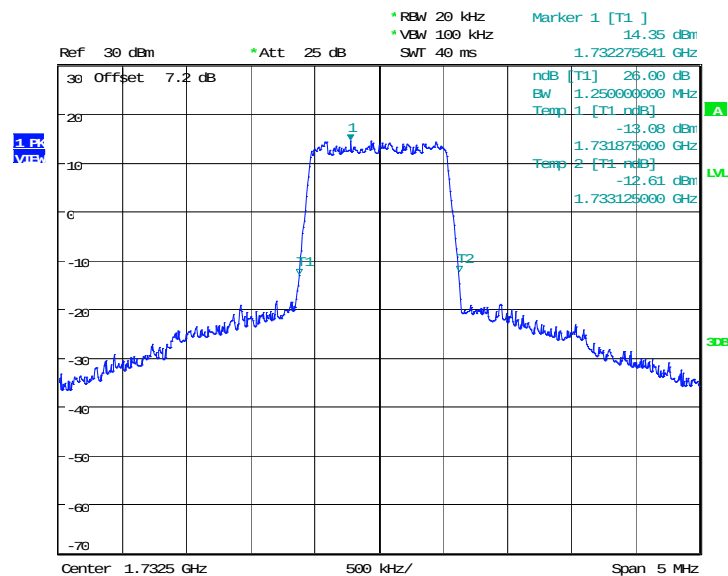
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 1732.5         | QPSK                              | 16QAM   |
|                | 1241.99                           | 1250.00 |

### LTE band 4, 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 18:22:40

### LTE band 4, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

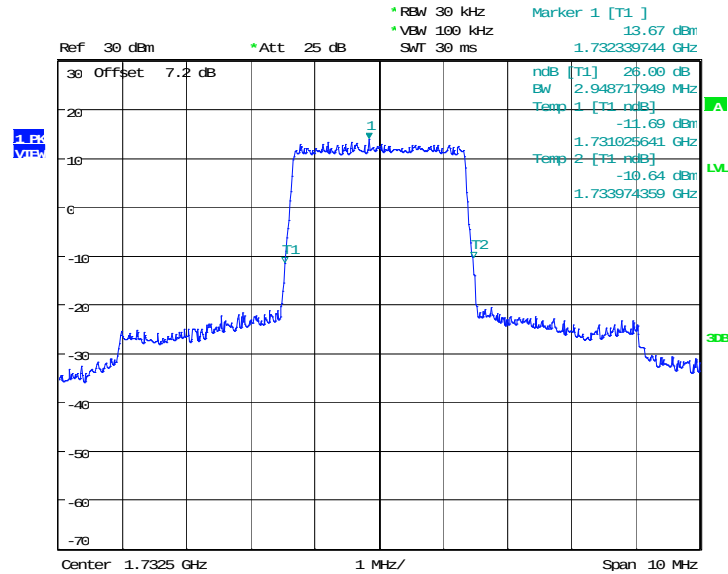


Date: 6.MAR.2017 18:23:12

### LTE band 4, 3MHz (-26dBc)

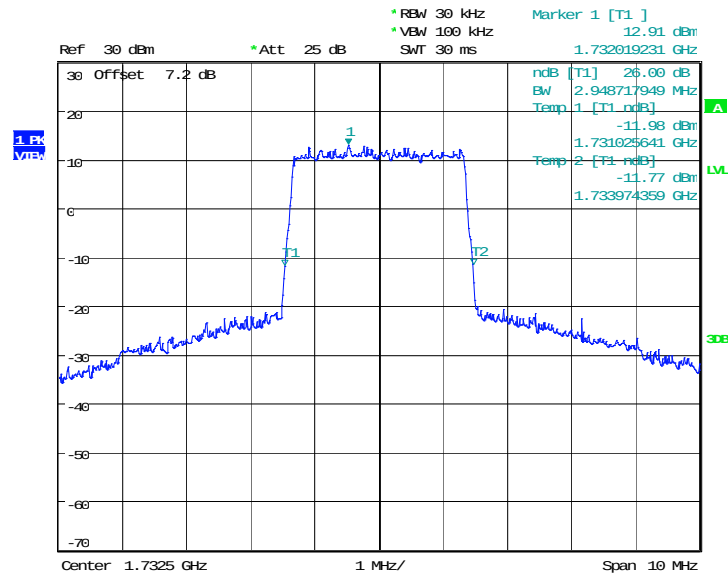
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 1732.5         | QPSK                              | 16QAM   |
|                | 2948.72                           | 2948.72 |

### LTE band 4, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 18:33:30

### LTE band 4, 3MHz Bandwidth, 16QAM (-26dBc BW)

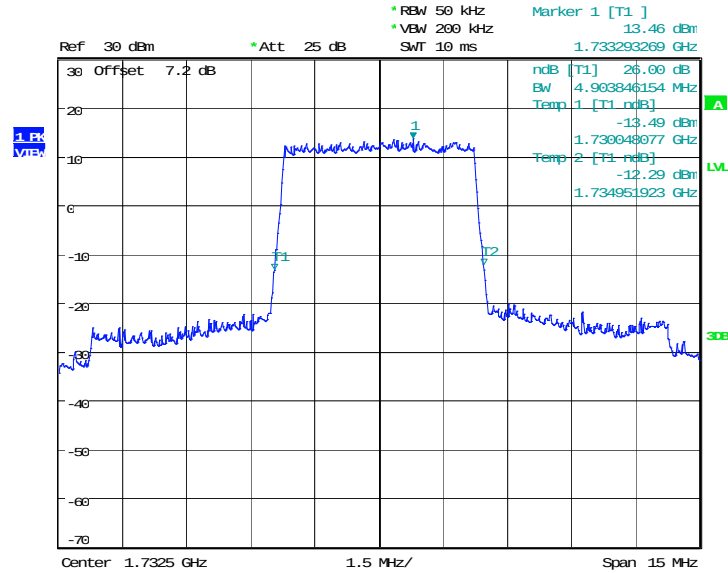


Date: 6.MAR.2017 18:33:01

### LTE band 4, 5MHz (-26dBc)

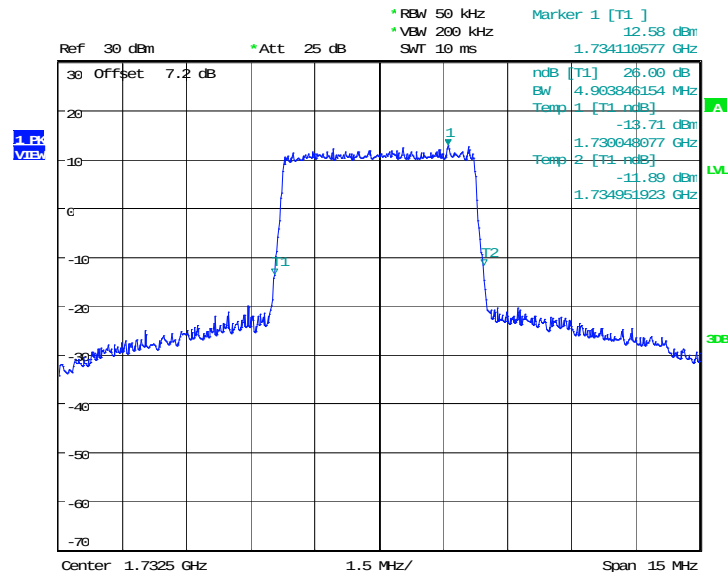
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 1732.5         | QPSK                              | 16QAM   |
|                | 4903.85                           | 4903.85 |

### LTE band 4, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 18:41:31

### LTE band 4, 5MHz Bandwidth,16QAM (-26dBc BW)

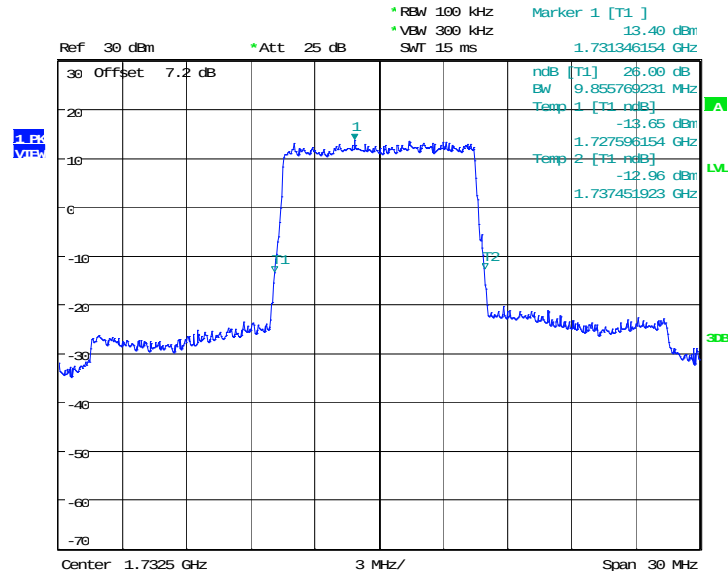


Date: 6.MAR.2017 18:42:05

### LTE band 4, 10MHz (-26dBc)

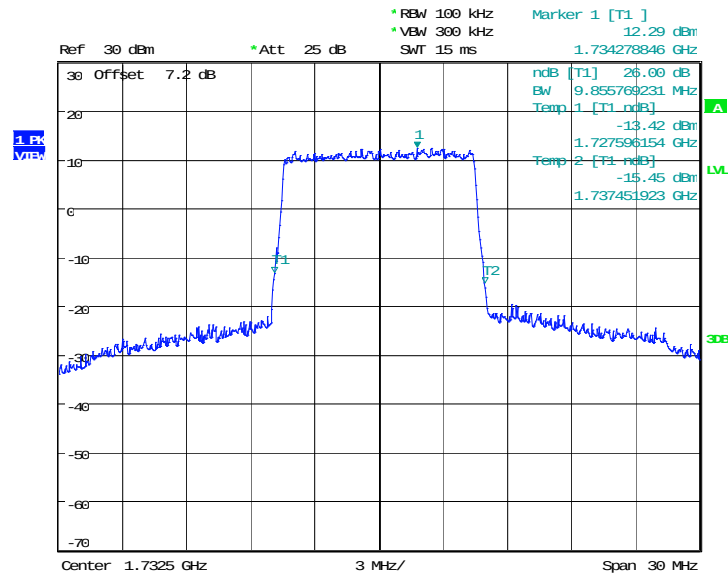
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 1732.5         | QPSK                              | 16QAM   |
|                | 9855.77                           | 9855.77 |

### LTE band 4, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 18:56:46

### LTE band 4, 10MHz Bandwidth, 16QAM (-26dBc BW)

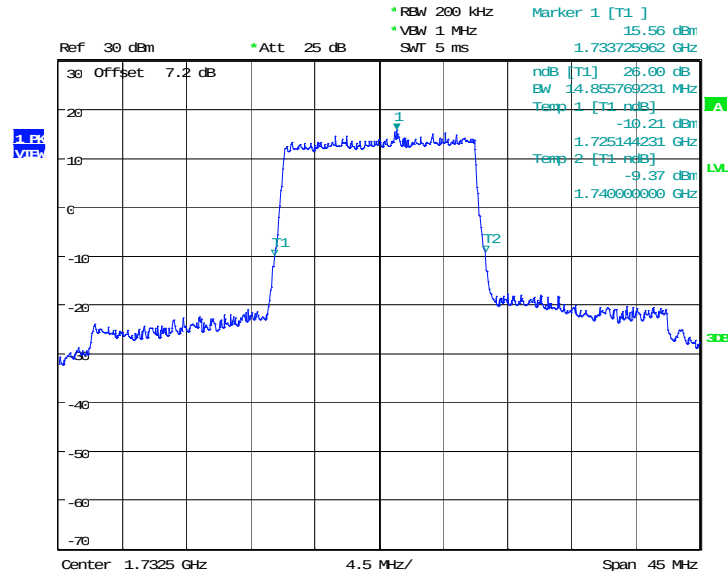


Date: 6.MAR.2017 18:57:57

### LTE band 4, 15MHz (-26dBc)

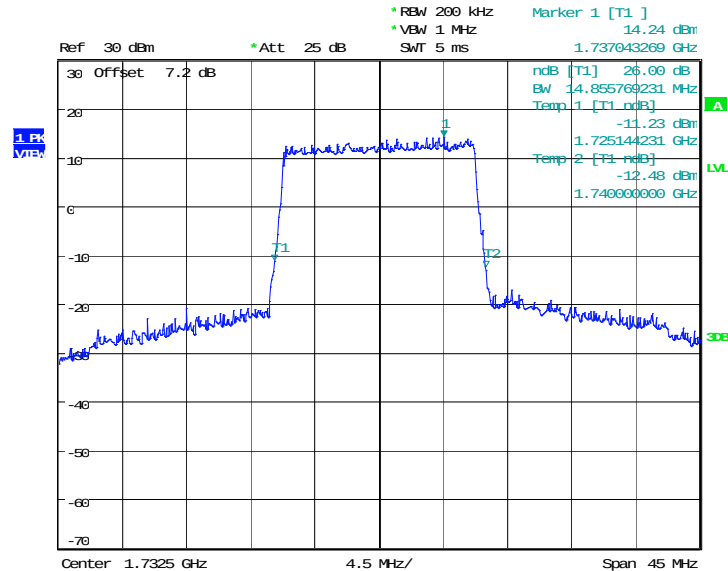
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |          |
|----------------|-----------------------------------|----------|
| 1732.5         | QPSK                              | 16QAM    |
|                | 14855.77                          | 14855.77 |

### LTE band 4, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 19:08:45

### LTE band 4, 15MHz Bandwidth, 16QAM (-26dBc BW)

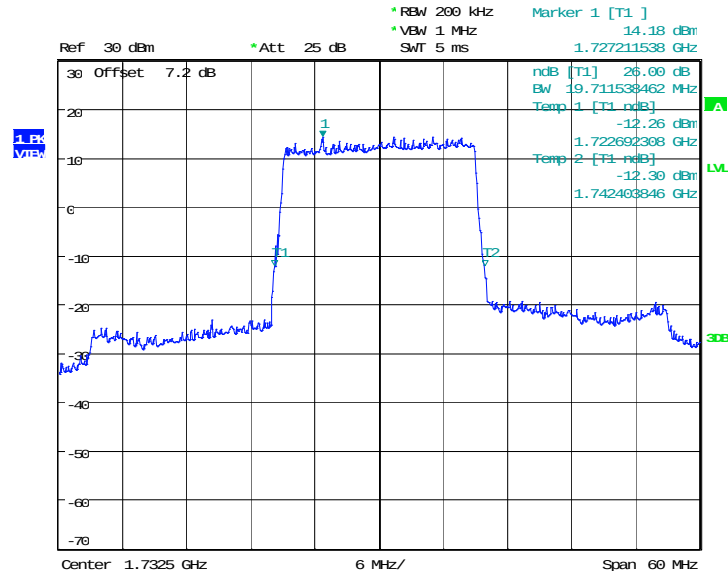


Date: 6.MAR.2017 19:08:22

### LTE band 4, 20MHz (-26dBc)

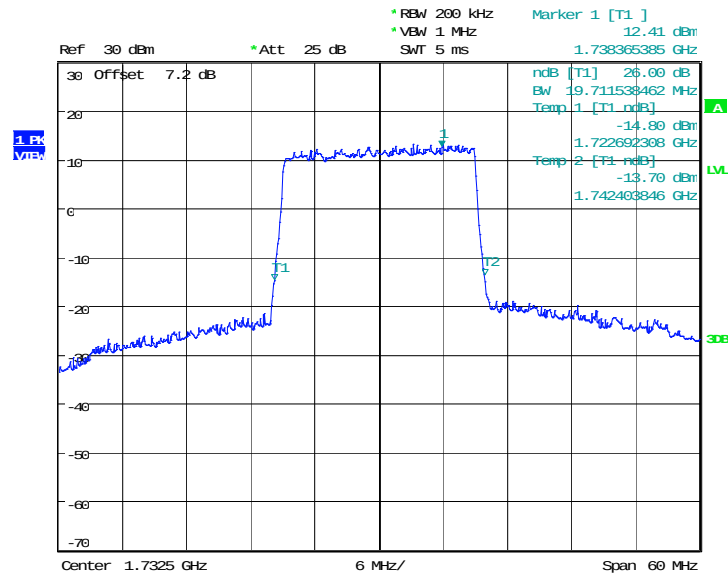
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |          |
|----------------|-----------------------------------|----------|
| 1732.5         | QPSK                              | 16QAM    |
|                | 19711.54                          | 19711.54 |

### LTE band 4, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 19:15:41

### LTE band 4, 20MHz Bandwidth, 16QAM (-26dBc BW)

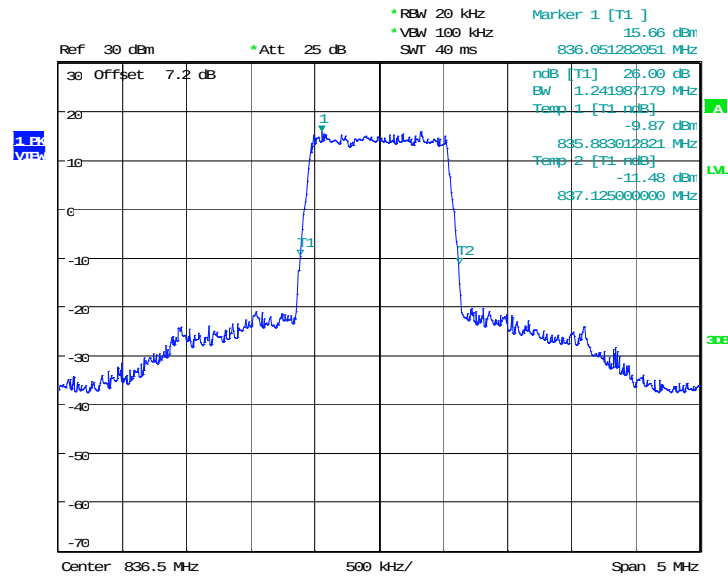


Date: 6.MAR.2017 19:16:45

### LTE band 5, 1.4MHz (-26dBc)

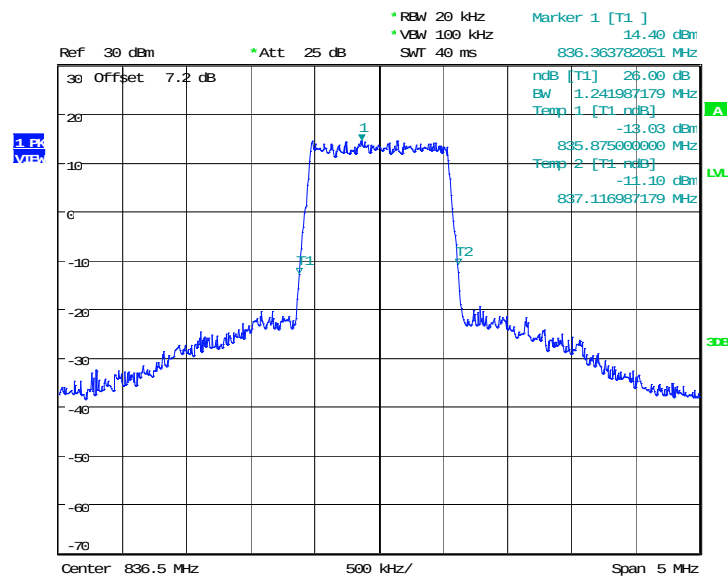
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 836.5          | QPSK                              | 16QAM   |
|                | 1241.99                           | 1241.99 |

### LTE band 5, 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 18:27:20

### LTE band 5, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

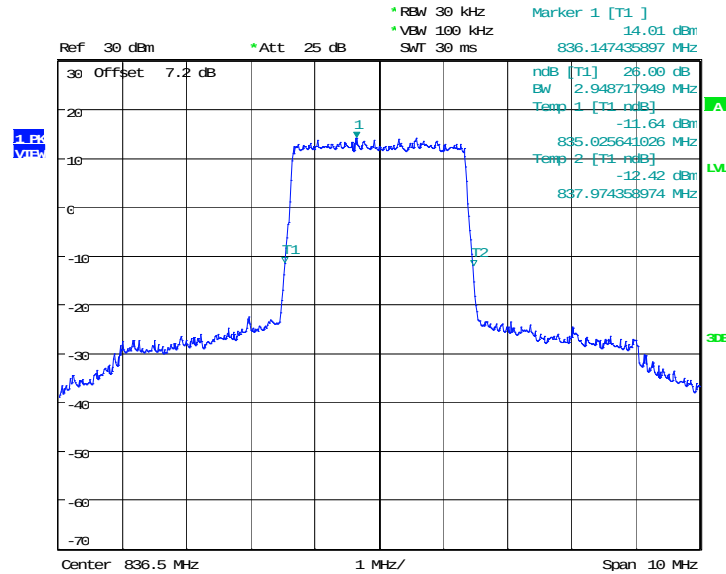


Date: 6.MAR.2017 18:26:42

### LTE band 5, 3MHz (-26dBc)

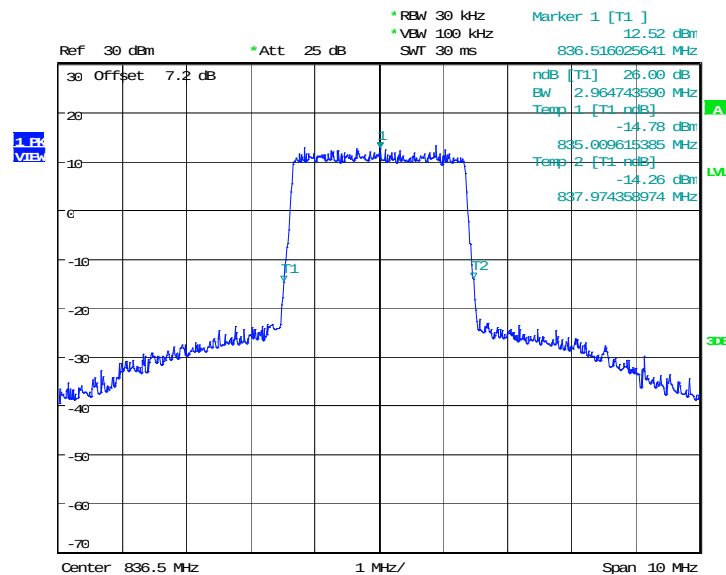
| Frequency(MHz) | Occupied Bandwidth (-26dBc)( kHz) |         |
|----------------|-----------------------------------|---------|
| 836.5          | QPSK                              | 16QAM   |
|                | 2948.72                           | 2964.74 |

### LTE band 5, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 6.MAR.2017 18:29:25

### LTE band 5, 3MHz Bandwidth, 16QAM (-26dBc BW)



Date: 6.MAR.2017 18:29:55