



# TEST REPORT

## No. I20Z70045-WMD03

for

**Samsung Electronics. Co., Ltd.**

**Mobile phone**

**Model Name: SM-A115A, SM-A115AZ, SM-A115AP**

**FCC ID: ZCasma115A**

with

**Hardware Version: REV1.0**

**Software Version: A115A.001**

**Issued Date: 2020-04-16**

**Note:**

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

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

**Test Laboratory:**

**CTTL, Telecommunication Technology Labs, CAICT**

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel: +86(0)10-62304633-2512, Fax: +86(0)10-62304633-2504

Email: [ctl\\_terminals@caict.ac.cn](mailto:ctl_terminals@caict.ac.cn), website: [www.caict.ac.cn](http://www.caict.ac.cn)

## **REPORT HISTORY**

| <b>Report Number</b> | <b>Revision</b> | <b>Description</b>                                                           | <b>Issue Date</b> |
|----------------------|-----------------|------------------------------------------------------------------------------|-------------------|
| I20Z70045-WMD03      | Rev.0           | 1 <sup>st</sup> edition                                                      | 2020-04-14        |
| I20Z70045-WMD03      | Rev.1           | 2 <sup>nd</sup> edition<br>Changed the model<br>name and software<br>version | 2020-04-16        |

Note: the latest revision of the test report supersedes all previous version.

## **CONTENTS**

|                                                                         |            |
|-------------------------------------------------------------------------|------------|
| <b>1. TEST LABORATORY .....</b>                                         | <b>4</b>   |
| 1.1. INTRODUCTION & ACCREDITATION .....                                 | 4          |
| 1.2. TESTING LOCATION .....                                             | 4          |
| 1.3. TESTING ENVIRONMENT .....                                          | 5          |
| 1.4. PROJECT DATA .....                                                 | 5          |
| 1.5. SIGNATURE .....                                                    | 5          |
| <b>2. CLIENT INFORMATION .....</b>                                      | <b>6</b>   |
| 2.1. APPLICANT INFORMATION .....                                        | 6          |
| 2.2. MANUFACTURER INFORMATION .....                                     | 6          |
| <b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b> | <b>7</b>   |
| 3.1. ABOUT EUT .....                                                    | 7          |
| 3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST .....          | 7          |
| 3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST .....           | 7          |
| <b>4. REFERENCE DOCUMENTS .....</b>                                     | <b>8</b>   |
| 4.1. REFERENCE DOCUMENTS FOR TESTING .....                              | 8          |
| <b>5. LABORATORY ENVIRONMENT .....</b>                                  | <b>9</b>   |
| <b>6. SUMMARY OF TEST RESULT .....</b>                                  | <b>10</b>  |
| 6.1. SUMMARY OF TEST RESULTS .....                                      | 10         |
| <b>7. TEST EQUIPMENT UTILIZED .....</b>                                 | <b>13</b>  |
| <b>ANNEX A: MEASUREMENT RESULTS .....</b>                               | <b>14</b>  |
| A.1 OUTPUT POWER .....                                                  | 14         |
| A.2 EMISSION LIMIT .....                                                | 53         |
| A.3 FREQUENCY STABILITY .....                                           | 63         |
| A.4 OCCUPIED BANDWIDTH .....                                            | 68         |
| A.5 EMISSION BANDWIDTH .....                                            | 117        |
| A.6 BAND EDGE COMPLIANCE .....                                          | 166        |
| A.7 CONDUCTED SPURIOUS EMISSION .....                                   | 202        |
| A.8 PEAK-TO-AVERAGE POWER RATIO .....                                   | 209        |
| <b>ANNEX B: ACCREDITATION CERTIFICATE .....</b>                         | <b>211</b> |

## **1. Test Laboratory**

### **1.1. Introduction & Accreditation**

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0 and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

### **1.2. Testing Location**

Location 1: CTTL (huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
P. R. China 100191

Location 2: CTTL (Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road,  
Haidian District, Beijing, P. R. China 100191

Location 3: CTTL (BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology  
Development Area, Beijing, P. R. China 100176

### **1.3. Testing Environment**

Normal Temperature: 15-35 °C  
Relative Humidity: 20-75%

### **1.4. Project data**

Testing Start Date: 2020-03-19  
Testing End Date: 2020-04-14

### **1.5. Signature**



---

**Dong Yuan**  
**(Prepared this test report)**



---

**Zhou Yu**  
**(Reviewed this test report)**



---

**Zhao Hui Lin**  
**Deputy Director of the laboratory**  
**(Approved this test report)**

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: Samsung Electronics. Co., Ltd.  
Address /Post: 19 Chapin Rd., Building D Pine Brook, NJ 07058  
Contact: Jenni Chun  
Email: j1.chun@samsung.com  
Telephone: +1-201-937-4203

### **2.2. Manufacturer Information**

Company Name: Samsung Electronics. Co., Ltd  
R5, A Tower 22 Floor A-1, (Maetan dong)  
Address /Post: 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do 16677, Korea  
Contact: JP KIM  
Email: jp426.kim@samsung.com  
Telephone: +82-10-4376-0326

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

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

|                         |                                               |
|-------------------------|-----------------------------------------------|
| Description             | Mobile phone                                  |
| Model Name              | SM-A115A, SM-A115AZ, SM-A115AP                |
| FCC ID                  | ZCasma115A                                    |
| Antenna                 | Embedded                                      |
| Output power            | 24.05dBm maximum EIRP measured for LTE Band 2 |
| Extreme vol. Limits     | 3.6VDC to 4.4VDC (nominal:3.85VDC)            |
| Extreme temp. Tolerance | -10C to +65°C                                 |

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL.

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

| EUT ID* | IMEI            | HW Version | SW Version | Date of receipt |
|---------|-----------------|------------|------------|-----------------|
| UT01a   | 354223110060423 | REV1.0     | A115A.001  | 2019-03-11      |
| UT02a   | 354223110061470 | REV1.0     | A115A.001  | 2020-03-17      |
| UT20a   | 356255110005667 | REV1.0     | A115A.001  | 2020-04-07      |

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

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

##### **AE ID\*    Description**

AE1      Battery

AE1

|              |                                   |
|--------------|-----------------------------------|
| Model        | Secondary Li-ion Battery          |
| Manufacturer | Ningde Amperex Technology Limited |
| Capacitance  | 3900mAh/4000mAh                   |

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

## 4. Reference Documents

### 4.1. Reference Documents for testing

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

| Reference      | Title                                                                                             | Version            |
|----------------|---------------------------------------------------------------------------------------------------|--------------------|
| FCC Part 24    | PERSONAL COMMUNICATIONS SERVICES                                                                  | 10-1-19<br>Edition |
| FCC Part 22    | PUBLIC MOBILE SERVICES                                                                            | 10-1-19<br>Edition |
| FCC Part 27    | MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES                                                    | 10-1-19<br>Edition |
| FCC Part 90    | PRIVATE LAND MOBILE RADIO SERVICES                                                                | 10-1-19<br>Edition |
| ANSI/TIA-603-E | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards               | 2016               |
| ANSI C63.26    | American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services | 2015               |
| KDB 971168 D01 | MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS                           | v03r01             |

## 5. LABORATORY ENVIRONMENT

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

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

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

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

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

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

## 6. SUMMARY OF TEST RESULT

### 6.1. Summary of test results

#### LTE Band 2

| Items | Test Name                   | Clause in FCC rules | Verdict |
|-------|-----------------------------|---------------------|---------|
| 1     | Output Power                | 24.232              | P       |
| 2     | Emission Limit              | 2.1051/24.238       | P       |
| 3     | Frequency Stability         | 2.1055              | P       |
| 4     | Occupied Bandwidth          | 2.1049              | P       |
| 5     | Emission Bandwidth          | 24.238              | P       |
| 6     | Band Edge Compliance        | 24.238              | P       |
| 7     | Conducted Spurious Emission | 24.238              | P       |
| 8     | Peak-to-Average Power Ratio | 24.232              | P       |

#### LTE Band 5

| Items | Test Name                   | Clause in FCC rules | Verdict |
|-------|-----------------------------|---------------------|---------|
| 1     | Output Power                | 22.913              | P       |
| 2     | Emission Limit              | 2.1051/22.917       | P       |
| 3     | Frequency Stability         | 2.1055              | P       |
| 4     | Occupied Bandwidth          | 2.1049              | P       |
| 5     | Emission Bandwidth          | 22.917              | P       |
| 6     | Band Edge Compliance        | 22.917              | P       |
| 7     | Conducted Spurious Emission | 22.917              | P       |

#### LTE Band 7

| Items | Test Name                   | Clause in FCC rules | Verdict |
|-------|-----------------------------|---------------------|---------|
| 1     | Output Power                | 27.50               | P       |
| 2     | Emission Limit              | 2.1051/27.53        | P       |
| 3     | Frequency Stability         | 2.1055              | P       |
| 4     | Occupied Bandwidth          | 2.1049              | P       |
| 5     | Emission Bandwidth          | 27.53               | P       |
| 6     | Band Edge Compliance        | 27.53               | P       |
| 7     | Conducted Spurious Emission | 27.53               | P       |
| 8     | Peak-to-Average Power Ratio | 27.50               | P       |

#### LTE Band 12

| Items | Test Name                   | Clause in FCC rules | Verdict |
|-------|-----------------------------|---------------------|---------|
| 1     | Output Power                | 27.50               | P       |
| 2     | Emission Limit              | 2.1051/27.53        | P       |
| 3     | Frequency Stability         | 2.1055              | P       |
| 4     | Occupied Bandwidth          | 2.1049              | P       |
| 5     | Emission Bandwidth          | 27.53               | P       |
| 6     | Band Edge Compliance        | 27.53               | P       |
| 7     | Conducted Spurious Emission | 27.53               | P       |
| 8     | Peak-to-Average Power Ratio | 27.50               | P       |

#### LTE Band 14

| Items | Test Name                   | Clause in FCC rules | Verdict |
|-------|-----------------------------|---------------------|---------|
| 1     | Output Power                | 90.542              | P       |
| 2     | Emission Limit              | 2.1051/90.543       | P       |
| 3     | Frequency Stability         | 2.1055              | P       |
| 4     | Occupied Bandwidth          | 2.1049              | P       |
| 5     | Emission Bandwidth          | 2.1049              | P       |
| 6     | Band Edge Compliance        | 90.543              | P       |
| 7     | Conducted Spurious Emission | 90.543              | P       |

#### LTE Band 30

| Items | Test Name                   | Clause in FCC rules | Verdict |
|-------|-----------------------------|---------------------|---------|
| 1     | Output Power                | 27.50               | P       |
| 2     | Emission Limit              | 2.1051/27.53        | P       |
| 3     | Frequency Stability         | 2.1055              | P       |
| 4     | Occupied Bandwidth          | 2.1049              | P       |
| 5     | Emission Bandwidth          | 27.53               | P       |
| 6     | Band Edge Compliance        | 27.53               | P       |
| 7     | Conducted Spurious Emission | 27.53               | P       |
| 8     | Peak-to-Average Power Ratio | 27.50               | P       |

#### LTE Band 41

| Items | Test Name                   | Clause in FCC rules | Verdict |
|-------|-----------------------------|---------------------|---------|
| 1     | Output Power                | 27.50               | P       |
| 2     | Emission Limit              | 2.1051/27.53        | P       |
| 3     | Frequency Stability         | 2.1055              | P       |
| 4     | Occupied Bandwidth          | 2.1049              | P       |
| 5     | Emission Bandwidth          | 27.53               | P       |
| 6     | Band Edge Compliance        | 27.53               | P       |
| 7     | Conducted Spurious Emission | 27.53               | P       |
| 8     | Peak-to-Average Power Ratio | 27.50               | P       |

#### LTE Band 66

| Items | Test Name                   | Clause in FCC rules | Verdict |
|-------|-----------------------------|---------------------|---------|
| 1     | Output Power                | 27.50               | P       |
| 2     | Emission Limit              | 2.1051/27.53        | P       |
| 3     | Frequency Stability         | 2.1055              | P       |
| 4     | Occupied Bandwidth          | 2.1049              | P       |
| 5     | Emission Bandwidth          | 27.53               | P       |
| 6     | Band Edge Compliance        | 27.53               | P       |
| 7     | Conducted Spurious Emission | 27.53               | P       |
| 8     | Peak-to-Average Power Ratio | 27.50               | P       |

#### Terms used in Verdict column

|    |                                                                                |
|----|--------------------------------------------------------------------------------|
| P  | Pass. The EUT complies with the essential requirements in the standard.        |
| NP | Not Performed. The test was not performed by CTTL.                             |
| NA | Not Applicable. The test was not applicable.                                   |
| BR | Re-use test data from basic model report.                                      |
| F  | Fail. The EUT does not comply with the essential requirements in the standard. |

#### Explanation of worst-case configuration

The worst-case scenario for all measurements is based on the conducted output power measurement investigation results. Output power was measured on QPSK,16QAM and 64QAM modulations. It was found that QPSK was the worst case. All testing was performed using QPSK modulations to represent the worst case unless otherwise stated. The test results shown in the following sections represent the worst case emission.

## 7. Test Equipment Utilized

| NO. | Description                          | TYPE     | series number | MANUFACTURE  | CAL DUE DATE | Calibration interval |
|-----|--------------------------------------|----------|---------------|--------------|--------------|----------------------|
| 1   | EMI Antenna                          | VULB9163 | 9163-483      | Schwarzbeck  | 2020-09-16   | 1 year               |
| 2   | EMI Antenna                          | 3117     | 00058889      | ETS-Lindgren | 2020-11-18   | 1 year               |
| 3   | EMI Antenna                          | 3117     | 00119021      | ETS-Lindgren | 2021-01-14   | 1 year               |
| 4   | Universal Radio Communication Tester | CMW500   | 159082        | R&S          | 2020-12-24   | 1 year               |
| 5   | Spectrum Analyzer                    | FSU26    | 200030        | R&S          | 2020-06-03   | 1 year               |
| 6   | EMI Antenna                          | 9117     | 167           | Schwarzbeck  | 2020-05-27   | 1 year               |
| 7   | Signal Generator                     | N5183A   | MY49060052    | R&S          | 2020-06-24   | 1 year               |
| 8   | Climate chamber                      | SH-242   | 93008556      | ESPEC        | 2020-12-21   | 3 year               |
| 9   | Test Receiver                        | E4440A   | MY48250642    | Agilent      | 2021-03-13   | 1 year               |
| 10  | Universal Radio Communication Tester | CMW500   | 143008        | R&S          | 2020-11-26   | 1 year               |
| 11  | Universal Radio Communication Tester | E5515C   | MY48363198    | Agilent      | 2020-06-23   | 1 year               |
| 12  | Power Amplifier                      | 5S1G4    | 0341863       | AR           | /            |                      |
| 13  | Universal Radio Communication Tester | MT8821C  | 6201623363    | Auritsu      | 2020-07-11   | 1 year               |

## **ANNEX A: MEASUREMENT RESULTS**

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

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

During the process of testing, the EUT was controlled via Rhode & Schwarz Universal Radio Communication Tester (CMW500) or Anritsu Radio Communication Analyzer (MT8821C) to ensure max power transmission and proper modulation.

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 | 64QAM |
| 1.4MHz    | 1 RB high      | 1909.3          | 23.79       | 22.81 | 22.55 |
|           |                | 1880.0          | 24.08       | 23.13 | 22.44 |
|           |                | 1850.7          | 23.96       | 23.36 | 22.21 |
|           | 1 RB low       | 1909.3          | 23.79       | 22.92 | 22.60 |
|           |                | 1880.0          | 24.10       | 23.11 | 22.71 |
|           |                | 1850.7          | 23.98       | 23.32 | 22.45 |
|           | 50% RB mid     | 1909.3          | 23.79       | 23.07 | 22.32 |
|           |                | 1880.0          | 23.99       | 23.06 | 22.56 |
|           |                | 1850.7          | 23.96       | 23.17 | 22.72 |
|           | 100% RB        | 1909.3          | 22.96       | 22.12 | 21.27 |
|           |                | 1880.0          | 23.01       | 22.17 | 21.34 |
|           |                | 1850.7          | 23.02       | 22.07 | 21.32 |
| 3MHz      | 1 RB high      | 1908.5          | 23.90       | 22.71 | 22.57 |
|           |                | 1880.0          | 23.99       | 23.35 | 22.45 |
|           |                | 1851.5          | 24.29       | 23.13 | 22.22 |
|           | 1 RB low       | 1908.5          | 23.96       | 22.90 | 22.66 |
|           |                | 1880.0          | 24.05       | 23.39 | 22.47 |
|           |                | 1851.5          | 24.40       | 23.28 | 22.62 |
|           | 50% RB mid     | 1908.5          | 23.14       | 22.27 | 21.45 |
|           |                | 1880.0          | 23.15       | 22.15 | 21.29 |

|       |            |        |       |       |       |
|-------|------------|--------|-------|-------|-------|
|       | 100% RB    | 1851.5 | 23.19 | 22.22 | 21.65 |
|       |            | 1908.5 | 23.03 | 22.10 | 21.37 |
|       |            | 1880.0 | 23.07 | 22.17 | 21.45 |
|       |            | 1851.5 | 23.23 | 22.15 | 21.39 |
| 5MHz  | 1 RB high  | 1907.5 | 23.84 | 22.89 | 22.40 |
|       |            | 1880.0 | 24.18 | 23.59 | 22.42 |
|       |            | 1852.5 | 24.10 | 23.13 | 22.60 |
|       | 1 RB low   | 1907.5 | 24.16 | 23.19 | 22.63 |
|       |            | 1880.0 | 24.49 | 23.68 | 22.66 |
|       |            | 1852.5 | 24.13 | 23.16 | 22.95 |
|       | 50% RB mid | 1907.5 | 23.09 | 22.13 | 21.46 |
|       |            | 1880.0 | 23.15 | 22.37 | 21.56 |
|       |            | 1852.5 | 23.23 | 22.14 | 21.69 |
|       | 100% RB    | 1907.5 | 23.13 | 22.16 | 21.55 |
|       |            | 1880.0 | 23.09 | 22.18 | 21.46 |
|       |            | 1852.5 | 23.18 | 22.12 | 21.58 |
| 10MHz | 1 RB high  | 1905.0 | 23.60 | 22.31 | 22.86 |
|       |            | 1880.0 | 23.68 | 23.09 | 22.74 |
|       |            | 1855.0 | 24.35 | 23.33 | 22.84 |
|       | 1 RB low   | 1905.0 | 24.25 | 23.23 | 22.30 |
|       |            | 1880.0 | 24.28 | 23.54 | 22.78 |
|       |            | 1855.0 | 24.53 | 23.50 | 22.89 |
|       | 50% RB mid | 1905.0 | 23.13 | 22.19 | 21.50 |
|       |            | 1880.0 | 23.13 | 22.20 | 21.64 |
|       |            | 1855.0 | 23.23 | 22.32 | 21.32 |
|       | 100% RB    | 1905.0 | 23.08 | 22.21 | 21.42 |
|       |            | 1880.0 | 23.21 | 22.29 | 21.54 |
|       |            | 1855.0 | 23.25 | 22.29 | 21.48 |
| 15MHz | 1 RB high  | 1902.5 | 23.84 | 23.02 | 22.59 |
|       |            | 1880.0 | 23.84 | 22.78 | 22.55 |
|       |            | 1857.5 | 24.55 | 23.98 | 22.69 |
|       | 1 RB low   | 1902.5 | 24.68 | 23.79 | 22.74 |
|       |            | 1880.0 | 24.45 | 23.42 | 22.71 |
|       |            | 1857.5 | 24.56 | 23.64 | 22.61 |
|       | 50% RB mid | 1902.5 | 23.34 | 22.40 | 21.45 |
|       |            | 1880.0 | 23.33 | 22.20 | 21.32 |
|       |            | 1857.5 | 23.10 | 22.22 | 21.34 |
|       | 100% RB    | 1902.5 | 23.20 | 22.24 | 21.53 |
|       |            | 1880.0 | 23.20 | 22.28 | 21.30 |

|       |            |        |       |       |       |
|-------|------------|--------|-------|-------|-------|
|       |            | 1857.5 | 23.14 | 22.33 | 21.57 |
| 20MHz | 1 RB high  | 1900.0 | 24.25 | 23.34 | 22.87 |
|       |            | 1880.0 | 24.11 | 23.39 | 22.73 |
|       |            | 1860.0 | 24.51 | 24.00 | 22.85 |
|       | 1 RB low   | 1900.0 | 24.28 | 23.73 | 22.81 |
|       |            | 1880.0 | 24.26 | 23.67 | 22.70 |
|       |            | 1860.0 | 24.95 | 23.81 | 22.73 |
|       | 50% RB mid | 1900.0 | 23.33 | 22.34 | 21.53 |
|       |            | 1880.0 | 23.21 | 22.17 | 21.32 |
|       |            | 1860.0 | 23.27 | 22.27 | 21.39 |
|       | 100% RB    | 1900.0 | 23.37 | 22.35 | 21.51 |
|       |            | 1880.0 | 23.23 | 22.24 | 21.30 |
|       |            | 1860.0 | 23.32 | 22.36 | 21.54 |

# LTE band 5

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) |       |       |
|-----------|----------------|-----------------|-------------|-------|-------|
|           |                |                 | QPSK        | 16QAM | 64QAM |
| 1.4MHz    | 1 RB high      | 848.3           | 24.28       | 23.78 | 23.36 |
|           |                | 836.5           | 24.31       | 23.41 | 23.35 |
|           |                | 824.7           | 24.28       | 23.35 | 23.21 |
|           | 1 RB low       | 848.3           | 24.31       | 23.89 | 23.50 |
|           |                | 836.5           | 24.37       | 23.41 | 23.38 |
|           |                | 824.7           | 24.38       | 23.42 | 23.08 |
|           | 50% RB mid     | 848.3           | 24.36       | 23.6  | 23.38 |
|           |                | 836.5           | 24.27       | 23.48 | 23.25 |
|           |                | 824.7           | 24.34       | 23.42 | 22.94 |
|           | 100% RB        | 848.3           | 23.34       | 22.32 | 22.12 |
|           |                | 836.5           | 23.30       | 22.49 | 22.06 |
|           |                | 824.7           | 23.38       | 22.54 | 22.10 |
| 3MHz      | 1 RB high      | 847.5           | 24.40       | 23.88 | 23.40 |
|           |                | 836.5           | 24.22       | 23.36 | 23.29 |
|           |                | 825.5           | 24.29       | 23.19 | 22.82 |
|           | 1 RB low       | 847.5           | 24.45       | 23.88 | 23.61 |
|           |                | 836.5           | 24.38       | 23.49 | 23.47 |
|           |                | 825.5           | 24.37       | 23.26 | 22.90 |
|           | 50% RB mid     | 847.5           | 23.44       | 22.54 | 22.17 |
|           |                | 836.5           | 23.35       | 22.43 | 22.23 |

|       |            |       |       |       |       |
|-------|------------|-------|-------|-------|-------|
|       | 100% RB    | 825.5 | 23.39 | 22.49 | 22.26 |
|       |            | 847.5 | 23.45 | 22.49 | 22.24 |
|       |            | 836.5 | 23.46 | 22.41 | 22.18 |
|       |            | 825.5 | 23.43 | 22.42 | 22.23 |
| 5MHz  | 1 RB high  | 846.5 | 24.36 | 23.52 | 23.51 |
|       |            | 836.5 | 24.31 | 23.44 | 23.27 |
|       |            | 826.5 | 24.33 | 23.83 | 23.09 |
|       | 1 RB low   | 846.5 | 24.33 | 23.48 | 23.40 |
|       |            | 836.5 | 24.34 | 23.48 | 23.32 |
|       |            | 826.5 | 24.38 | 23.87 | 22.87 |
|       | 50% RB mid | 846.5 | 23.52 | 22.53 | 22.25 |
|       |            | 836.5 | 23.37 | 22.42 | 22.23 |
|       |            | 826.5 | 23.42 | 22.66 | 22.32 |
|       | 100% RB    | 846.5 | 23.42 | 22.32 | 22.38 |
|       |            | 836.5 | 23.41 | 22.47 | 22.24 |
|       |            | 826.5 | 23.44 | 22.58 | 22.32 |
| 10MHz | 1 RB high  | 844.0 | 24.81 | 24.23 | 22.97 |
|       |            | 836.5 | 24.63 | 23.77 | 23.13 |
|       |            | 829.0 | 24.65 | 23.58 | 23.67 |
|       | 1 RB low   | 844.0 | 24.61 | 23.97 | 23.33 |
|       |            | 836.5 | 24.34 | 23.60 | 23.44 |

|  |            |       |       |       |       |
|--|------------|-------|-------|-------|-------|
|  |            | 829.0 | 24.46 | 23.6  | 22.40 |
|  | 50% RB mid | 844.0 | 23.53 | 22.52 | 22.35 |
|  |            | 836.5 | 23.60 | 22.62 | 22.16 |
|  |            | 829.0 | 23.46 | 22.45 | 22.23 |
|  | 100% RB    | 844.0 | 23.62 | 22.55 | 22.08 |
|  |            | 836.5 | 23.60 | 22.52 | 22.22 |
|  |            | 829.0 | 23.6  | 22.45 | 22.22 |

**LTE band 7**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) |       |       |
|-----------|----------------|-----------------|-------------|-------|-------|
|           |                |                 | QPSK        | 16QAM | 64QAM |
| 5MHz      | 1 RB high      | 2567.5          | 22.99       | 22.04 | 21.48 |
|           |                | 2535            | 22.85       | 21.93 | 21.39 |
|           |                | 2502.5          | 23.08       | 22.43 | 21.17 |
|           | 1 RB low       | 2567.5          | 23.14       | 22.16 | 21.60 |
|           |                | 2535            | 22.99       | 22.06 | 21.50 |
|           |                | 2502.5          | 23.23       | 22.58 | 21.40 |
|           | 50% RB mid     | 2567.5          | 22.01       | 21.00 | 20.34 |
|           |                | 2535            | 21.91       | 20.93 | 20.28 |
|           |                | 2502.5          | 22.01       | 21.19 | 20.26 |
|           | 100% RB        | 2567.5          | 22.03       | 20.94 | 20.34 |
|           |                | 2535            | 21.89       | 20.92 | 20.28 |
|           |                | 2502.5          | 21.87       | 20.98 | 20.11 |
| 10MHz     | 1 RB high      | 2565            | 23.03       | 22.03 | 21.60 |
|           |                | 2535            | 23.11       | 21.96 | 21.51 |
|           |                | 2505            | 23.10       | 22.42 | 21.39 |
|           | 1 RB low       | 2565            | 23.20       | 22.17 | 21.70 |
|           |                | 2535            | 23.19       | 22.06 | 21.67 |
|           |                | 2505            | 23.26       | 22.42 | 21.40 |
|           | 50% RB mid     | 2565            | 22.06       | 21.11 | 20.41 |
|           |                | 2535            | 21.87       | 20.88 | 20.40 |

|       |            |        |       |       |       |
|-------|------------|--------|-------|-------|-------|
|       | 100% RB    | 2505   | 21.98 | 20.95 | 20.14 |
|       |            | 2565   | 22.03 | 20.99 | 20.36 |
|       |            | 2535   | 21.97 | 20.92 | 20.32 |
|       |            | 2505   | 21.96 | 20.99 | 20.21 |
| 15MHz | 1 RB high  | 2562.5 | 22.91 | 22.21 | 21.17 |
|       |            | 2535   | 22.80 | 21.76 | 21.25 |
|       |            | 2507.5 | 22.98 | 22.18 | 21.37 |
|       | 1 RB low   | 2562.5 | 22.92 | 22.24 | 21.43 |
|       |            | 2535   | 22.76 | 21.75 | 21.28 |
|       |            | 2507.5 | 23.10 | 22.21 | 21.41 |
|       | 50% RB mid | 2562.5 | 21.96 | 20.91 | 20.32 |
|       |            | 2535   | 21.92 | 20.88 | 20.30 |
|       |            | 2507.5 | 21.92 | 20.98 | 20.12 |
|       | 100% RB    | 2562.5 | 21.85 | 20.83 | 20.29 |
|       |            | 2535   | 21.87 | 20.91 | 20.23 |
|       |            | 2507.5 | 21.94 | 20.93 | 20.06 |
| 20MHz | 1 RB high  | 2560   | 22.92 | 22.30 | 21.32 |
|       |            | 2535   | 22.96 | 22.25 | 21.43 |
|       |            | 2510   | 23.08 | 22.42 | 21.27 |
|       | 1 RB low   | 2560   | 22.99 | 22.32 | 21.35 |
|       |            | 2535   | 22.91 | 22.20 | 21.51 |

|  |            |      |       |       |       |
|--|------------|------|-------|-------|-------|
|  |            | 2510 | 23.30 | 22.57 | 21.22 |
|  | 50% RB mid | 2560 | 22.01 | 21.02 | 20.31 |
|  |            | 2535 | 21.93 | 20.90 | 20.23 |
|  |            | 2510 | 22.03 | 21.02 | 20.21 |
|  | 100% RB    | 2560 | 22.00 | 20.94 | 20.24 |
|  |            | 2535 | 21.89 | 20.88 | 20.26 |
|  |            | 2510 | 21.98 | 21.06 | 20.15 |

# LTE band 12

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) |       |       |
|-----------|----------------|-----------------|-------------|-------|-------|
|           |                |                 | QPSK        | 16QAM | 64QAM |
| 1.4MHz    | 1 RB high      | 715.3           | 24.07       | 23.23 | 23.16 |
|           |                | 707.5           | 24.05       | 23.17 | 23.47 |
|           |                | 699.7           | 24.06       | 23.13 | 23.34 |
|           | 1 RB low       | 715.3           | 23.96       | 23.05 | 23.07 |
|           |                | 707.5           | 24.08       | 23.12 | 23.37 |
|           |                | 699.7           | 23.97       | 23.10 | 23.07 |
|           | 50% RB mid     | 715.3           | 24.36       | 23.25 | 23.30 |
|           |                | 707.5           | 24.09       | 23.04 | 22.98 |
|           |                | 699.7           | 23.97       | 23.10 | 23.07 |
|           | 100% RB        | 715.3           | 23.08       | 22.13 | 22.10 |
|           |                | 707.5           | 22.96       | 22.16 | 21.88 |
|           |                | 699.7           | 23.08       | 22.29 | 21.97 |
| 3MHz      | 1 RB high      | 714.5           | 24.17       | 23.23 | 23.61 |
|           |                | 707.5           | 24.11       | 22.95 | 23.24 |
|           |                | 700.5           | 24.05       | 23.47 | 23.08 |
|           | 1 RB low       | 714.5           | 24.20       | 23.30 | 23.32 |
|           |                | 707.5           | 24.01       | 23.01 | 23.03 |
|           |                | 700.5           | 24.02       | 23.48 | 23.11 |
|           | 50% RB mid     | 714.5           | 23.27       | 22.21 | 21.95 |
|           |                | 707.5           | 23.12       | 22.25 | 22.16 |
|           |                | 700.5           | 23.05       | 22.23 | 22.20 |
|           | 100% RB        | 714.5           | 23.24       | 22.10 | 22.22 |
|           |                | 707.5           | 23.14       | 22.19 | 22.03 |
|           |                | 700.5           | 23.13       | 22.13 | 21.91 |
| 5MHz      | 1 RB high      | 713.5           | 24.20       | 23.25 | 23.28 |
|           |                | 707.5           | 24.22       | 23.25 | 23.37 |
|           |                | 701.5           | 24.25       | 23.63 | 23.13 |
|           | 1 RB low       | 713.5           | 24.35       | 23.48 | 23.38 |
|           |                | 707.5           | 24.15       | 22.99 | 23.07 |
|           |                | 701.5           | 24.15       | 23.52 | 23.11 |
|           | 50% RB mid     | 713.5           | 23.21       | 22.24 | 22.00 |
|           |                | 707.5           | 23.07       | 22.17 | 22.11 |
|           |                | 701.5           | 22.94       | 22.19 | 22.08 |
|           | 100% RB        | 713.5           | 23.24       | 22.09 | 22.07 |
|           |                | 707.5           | 23.08       | 22.13 | 22.13 |
|           |                | 701.5           | 23.22       | 22.13 | 22.01 |
| 10MHz     | 1 RB high      | 711.0           | 24.40       | 23.16 | 23.45 |
|           |                | 707.5           | 24.45       | 23.92 | 23.24 |

|  |            |       |       |       |       |
|--|------------|-------|-------|-------|-------|
|  |            | 704.0 | 24.38 | 23.18 | 23.29 |
|  | 1 RB low   | 711.0 | 24.25 | 23.26 | 23.51 |
|  |            | 707.5 | 24.39 | 23.72 | 23.46 |
|  |            | 704.0 | 24.48 | 23.51 | 23.15 |
|  | 50% RB mid | 711.0 | 23.23 | 22.22 | 22.08 |
|  |            | 707.5 | 23.06 | 22.16 | 22.11 |
|  |            | 704.0 | 23.06 | 22.24 | 21.96 |
|  | 100% RB    | 711.0 | 23.23 | 22.22 | 22.15 |
|  |            | 707.5 | 23.16 | 22.23 | 22.03 |
|  |            | 704.0 | 23.20 | 22.16 | 22.12 |

**LTE band 14**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) |       |       |
|-----------|----------------|-----------------|-------------|-------|-------|
|           |                |                 | QPSK        | 16QAM | 64QAM |
| 5MHz      | 1 RB high      | 795.5           | 24.33       | 23.01 | 22.95 |
|           |                | 793.0           | 24.22       | 23.31 | 23.20 |
|           |                | 790.5           | 24.22       | 23.6  | 23.29 |
|           | 1 RB low       | 795.5           | 24.36       | 23.28 | 23.27 |
|           |                | 793.0           | 24.14       | 23.18 | 23.29 |
|           |                | 790.5           | 24.16       | 23.52 | 23.25 |
|           | 50% RB mid     | 795.5           | 23.19       | 22.23 | 22.17 |
|           |                | 793.0           | 23.14       | 22.18 | 22.11 |
|           |                | 790.5           | 23.02       | 22.15 | 22.15 |
|           | 100% RB        | 795.5           | 23.17       | 22.16 | 22.19 |
|           |                | 793.0           | 23.14       | 22.20 | 21.99 |
|           |                | 790.5           | 23.07       | 22.18 | 22.14 |
| 10MHz     | 1 RB high      | 793.0           | 24.21       | 23.26 | 23.35 |
|           | 1 RB low       | 793.0           | 24.29       | 23.38 | 23.58 |
|           | 50% RB mid     | 793.0           | 23.14       | 22.27 | 22.09 |
|           | 100% RB        | 793.0           | 23.17       | 22.26 | 22.12 |

**LTE band 30**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) |       |       |
|-----------|----------------|-----------------|-------------|-------|-------|
|           |                |                 | QPSK        | 16QAM | 64QAM |
| 5MHz      | 1 RB high      | 2312.5          | 24.06       | 22.98 | 22.81 |
|           |                | 2310.0          | 24.05       | 23.16 | 22.39 |
|           |                | 2307.5          | 24.03       | 23.59 | 22.46 |
|           | 1 RB low       | 2312.5          | 24.13       | 23.17 | 22.61 |
|           |                | 2310.0          | 24.23       | 23.29 | 22.56 |
|           |                | 2307.5          | 24.05       | 23.63 | 22.42 |
|           | 50% RB mid     | 2312.5          | 23.07       | 21.97 | 21.32 |
|           |                | 2310.0          | 23.11       | 22.10 | 21.44 |
|           |                | 2307.5          | 22.95       | 22.17 | 21.36 |
|           | 100% RB        | 2312.5          | 23.10       | 21.95 | 21.37 |
|           |                | 2310.0          | 23.10       | 22.03 | 21.41 |
|           |                | 2307.5          | 23.05       | 22.10 | 21.29 |
| 10MHz     | 1 RB high      | 2310.0          | 24.23       | 23.23 | 22.55 |
|           | 1 RB low       | 2310.0          | 24.21       | 23.35 | 22.75 |
|           | 50% RB mid     | 2310.0          | 23.45       | 22.16 | 21.45 |
|           | 100% RB        | 2310.0          | 23.17       | 22.17 | 21.45 |

**LTE band 41**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) |       |       |
|-----------|----------------|-----------------|-------------|-------|-------|
|           |                |                 | QPSK        | 16QAM | 64QAM |
| 5MHz      | 1 RB high      | 2687.5          | 23.61       | 22.63 | 21.88 |
|           |                | 2593.0          | 23.66       | 22.49 | 21.71 |
|           |                | 2498.5          | 23.84       | 22.83 | 21.56 |
|           | 1 RB low       | 2687.5          | 23.72       | 22.69 | 21.94 |
|           |                | 2593.0          | 23.79       | 22.63 | 21.94 |
|           |                | 2498.5          | 23.87       | 22.81 | 21.84 |
|           | 50% RB mid     | 2687.5          | 22.61       | 21.70 | 20.92 |
|           |                | 2593.0          | 22.67       | 21.68 | 20.89 |
|           |                | 2498.5          | 22.71       | 21.73 | 20.75 |
|           | 100% RB        | 2687.5          | 22.64       | 21.73 | 20.86 |
|           |                | 2593.0          | 22.66       | 21.70 | 20.96 |
|           |                | 2498.5          | 22.85       | 21.84 | 20.92 |
| 10MHz     | 1 RB high      | 2685.0          | 23.82       | 22.69 | 21.91 |
|           |                | 2593.0          | 23.75       | 22.70 | 21.80 |
|           |                | 2501.0          | 23.83       | 22.93 | 21.71 |
|           | 1 RB low       | 2685.0          | 23.71       | 22.62 | 21.88 |
|           |                | 2593.0          | 23.71       | 22.61 | 21.82 |
|           |                | 2501.0          | 23.60       | 22.84 | 21.64 |
|           | 50% RB mid     | 2685.0          | 22.80       | 21.80 | 21.10 |
|           |                | 2593.0          | 22.72       | 21.74 | 20.87 |
|           |                | 2501.0          | 22.81       | 21.92 | 21.00 |
|           | 100% RB        | 2685.0          | 22.79       | 21.82 | 20.94 |
|           |                | 2593.0          | 22.73       | 21.71 | 20.86 |
|           |                | 2501.0          | 22.77       | 21.79 | 20.73 |
| 15MHz     | 1 RB high      | 2682.5          | 23.78       | 22.93 | 22.13 |
|           |                | 2593.0          | 24.11       | 23.02 | 22.22 |
|           |                | 2503.5          | 23.87       | 22.97 | 21.96 |
|           | 1 RB low       | 2682.5          | 23.83       | 22.99 | 22.29 |
|           |                | 2593.0          | 23.76       | 22.70 | 21.94 |
|           |                | 2503.5          | 23.97       | 22.98 | 21.96 |
|           | 50% RB mid     | 2682.5          | 22.83       | 21.93 | 21.08 |
|           |                | 2593.0          | 22.92       | 21.88 | 20.98 |
|           |                | 2503.5          | 23.06       | 22.13 | 21.08 |
|           | 100% RB        | 2682.5          | 22.72       | 21.89 | 21.13 |
|           |                | 2593.0          | 22.84       | 21.82 | 20.97 |
|           |                | 2503.5          | 23.02       | 22.04 | 21.10 |

|       |            |        |       |       |       |
|-------|------------|--------|-------|-------|-------|
| 20MHz | 1 RB high  | 2680.0 | 24.12 | 22.97 | 22.15 |
|       |            | 2593.0 | 24.09 | 23.27 | 22.12 |
|       |            | 2506.0 | 23.99 | 22.71 | 21.98 |
|       | 1 RB low   | 2680.0 | 24.13 | 22.90 | 22.17 |
|       |            | 2593.0 | 23.78 | 22.96 | 21.95 |
|       |            | 2506.0 | 24.07 | 22.67 | 21.82 |
|       | 50% RB mid | 2680.0 | 22.90 | 21.92 | 21.15 |
|       |            | 2593.0 | 22.95 | 21.97 | 20.99 |
|       |            | 2506.0 | 22.96 | 21.93 | 20.93 |
|       | 100% RB    | 2680.0 | 22.91 | 21.98 | 21.10 |
|       |            | 2593.0 | 22.96 | 22.01 | 21.05 |
|       |            | 2506.0 | 23.05 | 22.05 | 21.07 |

# LTE band 66

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) |       |       |
|-----------|----------------|-----------------|-------------|-------|-------|
|           |                |                 | QPSK        | 16QAM | 64QAM |
| 1.4MHz    | 1 RB high      | 1779.3          | 23.72       | 23.10 | 22.29 |
|           |                | 1745.0          | 24.07       | 23.05 | 22.28 |
|           |                | 1710.7          | 24.08       | 23.39 | 22.71 |
|           | 1 RB low       | 1779.3          | 23.86       | 23.05 | 22.40 |
|           |                | 1745.0          | 24.23       | 23.14 | 22.45 |
|           |                | 1710.7          | 23.98       | 23.50 | 22.69 |
|           | 50% RB mid     | 1779.3          | 24.50       | 22.93 | 22.53 |
|           |                | 1745.0          | 24.12       | 22.88 | 22.71 |
|           |                | 1710.7          | 24.04       | 23.33 | 22.68 |
|           | 100% RB        | 1779.3          | 22.89       | 22.09 | 21.24 |
|           |                | 1745.0          | 22.89       | 22.18 | 21.28 |
|           |                | 1710.7          | 23.12       | 22.29 | 21.51 |
| 3MHz      | 1 RB high      | 1778.5          | 23.79       | 23.06 | 22.40 |
|           |                | 1745.0          | 23.74       | 22.70 | 22.60 |
|           |                | 1711.5          | 24.07       | 23.36 | 22.58 |
|           | 1 RB low       | 1778.5          | 24.04       | 23.14 | 22.42 |
|           |                | 1745.0          | 23.78       | 22.81 | 22.48 |
|           |                | 1711.5          | 24.29       | 23.50 | 22.77 |
|           | 50% RB mid     | 1778.5          | 23.03       | 22.10 | 21.29 |
|           |                | 1745.0          | 23.13       | 22.38 | 21.75 |
|           |                | 1711.5          | 23.41       | 22.29 | 21.73 |
|           | 100% RB        | 1778.5          | 22.96       | 21.98 | 21.19 |
|           |                | 1745.0          | 23.03       | 22.09 | 21.29 |
|           |                | 1711.5          | 23.29       | 22.37 | 21.67 |
| 5MHz      | 1 RB high      | 1777.5          | 23.96       | 22.94 | 22.34 |
|           |                | 1745.0          | 23.91       | 23.02 | 22.20 |
|           |                | 1712.5          | 23.87       | 23.64 | 22.61 |
|           | 1 RB low       | 1777.5          | 24.34       | 23.25 | 22.56 |
|           |                | 1745.0          | 23.98       | 23.09 | 22.62 |
|           |                | 1712.5          | 24.52       | 23.71 | 22.76 |
|           | 50% RB mid     | 1777.5          | 22.96       | 22.15 | 21.36 |
|           |                | 1745.0          | 23.16       | 22.16 | 21.37 |
|           |                | 1712.5          | 23.28       | 22.53 | 21.66 |
|           | 100% RB        | 1777.5          | 23.13       | 21.98 | 21.35 |
|           |                | 1745.0          | 23.13       | 22.18 | 21.15 |
|           |                | 1712.5          | 23.34       | 22.55 | 21.44 |
| 10MHz     | 1 RB high      | 1775.0          | 24.34       | 23.66 | 22.79 |
|           |                | 1745.0          | 24.73       | 23.43 | 22.71 |

|       |            |        |       |       |       |
|-------|------------|--------|-------|-------|-------|
|       | 1 RB low   | 1715.0 | 24.62 | 23.64 | 22.74 |
|       |            | 1775.0 | 23.59 | 22.57 | 22.26 |
|       |            | 1745.0 | 23.57 | 22.55 | 21.55 |
|       |            | 1715.0 | 23.58 | 22.89 | 22.22 |
|       | 50% RB mid | 1775.0 | 23.08 | 22.26 | 21.47 |
|       |            | 1745.0 | 23.14 | 22.22 | 21.14 |
|       |            | 1715.0 | 23.31 | 22.35 | 21.61 |
|       | 100% RB    | 1775.0 | 23.12 | 22.10 | 21.33 |
|       |            | 1745.0 | 23.18 | 22.19 | 21.03 |
|       |            | 1715.0 | 23.25 | 22.44 | 21.26 |
| 15MHz | 1 RB high  | 1772.5 | 24.03 | 23.26 | 22.03 |
|       |            | 1745.0 | 24.06 | 23.00 | 22.72 |
|       |            | 1717.5 | 24.03 | 23.66 | 22.40 |
|       | 1 RB low   | 1772.5 | 24.06 | 23.34 | 22.79 |
|       |            | 1745.0 | 24.21 | 23.06 | 22.67 |
|       |            | 1717.5 | 24.76 | 23.61 | 22.69 |
|       | 50% RB mid | 1772.5 | 23.07 | 21.97 | 21.07 |
|       |            | 1745.0 | 23.09 | 21.90 | 21.26 |
|       |            | 1717.5 | 23.22 | 22.49 | 21.53 |
|       | 100% RB    | 1772.5 | 22.82 | 21.98 | 21.18 |
|       |            | 1745.0 | 23.01 | 22.08 | 21.24 |
|       |            | 1717.5 | 23.26 | 22.37 | 21.50 |
| 20MHz | 1 RB high  | 1770.0 | 24.45 | 23.77 | 22.74 |
|       |            | 1745.0 | 24.47 | 23.79 | 22.80 |
|       |            | 1720.0 | 24.51 | 23.69 | 22.74 |
|       | 1 RB low   | 1770.0 | 24.18 | 23.39 | 22.69 |
|       |            | 1745.0 | 23.94 | 23.13 | 22.60 |
|       |            | 1720.0 | 24.12 | 23.19 | 22.67 |
|       | 50% RB mid | 1770.0 | 22.95 | 21.73 | 21.08 |
|       |            | 1745.0 | 23.14 | 22.18 | 21.25 |
|       |            | 1720.0 | 23.03 | 22.26 | 21.49 |
|       | 100% RB    | 1770.0 | 22.83 | 22.04 | 21.08 |
|       |            | 1745.0 | 23.12 | 22.15 | 21.19 |
|       |            | 1720.0 | 23.30 | 22.41 | 21.33 |

### A.1.3 Radiated

#### A.1.3.1 Description

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

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

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

Rule Part 27.50(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".

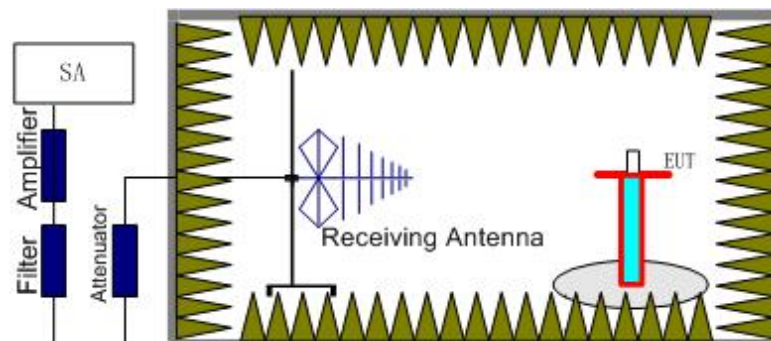
Rule Part 27.50(a)(3) specifies "For mobile and portable stations transmitting in the 2305–2315 MHz band or the 2350–2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards 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."

Rule Part 90.542(a)(7) Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

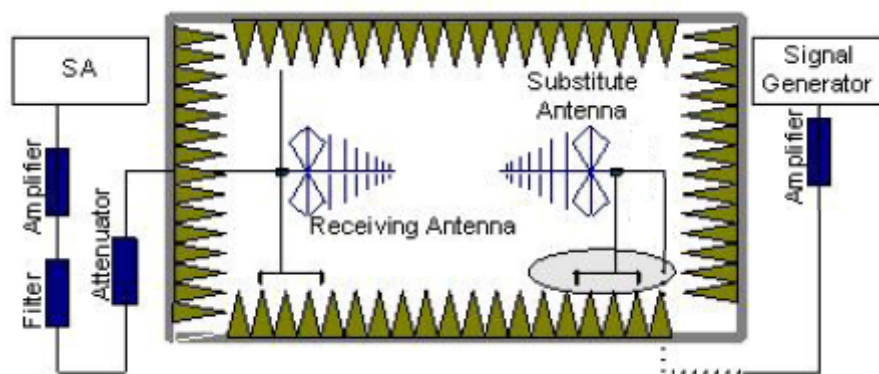
#### A.1.3.2 Method of Measurement

The measurements procedures in TIA-603E-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 rms 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,  $ERP = EIRP - 2.15$ .

### A.1.3.3 Measurement result

#### LTE Band 2- EIRP

Limits:  $\leq 33\text{dBm}$  (2W)

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

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1850.70            | -22.74                    | 2.92                    | 43.75                   | 4.87                    | 22.96         | 33.00          | 10.04          | H            |
| 1880.00            | -22.61                    | 2.85                    | 43.75                   | 4.82                    | 23.11         | 33.00          | 9.89           | H            |
| 1909.30            | -21.61                    | 2.87                    | 43.77                   | 4.76                    | 24.05         | 33.00          | 8.95           | H            |

#### LTE Band 2\_3MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1851.50            | -22.92                    | 2.87                    | 43.75                   | 4.87                    | 22.83         | 33.00          | 10.17          | H            |
| 1880.00            | -22.66                    | 2.85                    | 43.75                   | 4.82                    | 23.06         | 33.00          | 9.94           | H            |
| 1908.50            | -21.64                    | 2.89                    | 43.78                   | 4.76                    | 24.01         | 33.00          | 8.99           | H            |

#### LTE Band 2\_5MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1852.50            | -22.93                    | 2.87                    | 43.75                   | 4.87                    | 22.82         | 33.00          | 10.18          | H            |
| 1880.00            | -22.67                    | 2.85                    | 43.75                   | 4.82                    | 23.05         | 33.00          | 9.95           | H            |
| 1907.50            | -21.89                    | 2.84                    | 43.77                   | 4.77                    | 23.81         | 33.00          | 9.19           | H            |

#### LTE Band 2\_10MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1855.00            | -22.60                    | 2.88                    | 43.74                   | 4.86                    | 23.12         | 33.00          | 9.88           | H            |
| 1880.00            | -22.58                    | 2.85                    | 43.75                   | 4.82                    | 23.14         | 33.00          | 9.86           | H            |
| 1905.00            | -22.13                    | 2.87                    | 43.77                   | 4.77                    | 23.54         | 33.00          | 9.46           | H            |

#### LTE Band 2\_15MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1857.50            | -22.68                    | 2.87                    | 43.75                   | 4.86                    | 23.06         | 33.00          | 9.94           | H            |
| 1880.00            | -22.66                    | 2.85                    | 43.75                   | 4.82                    | 23.06         | 33.00          | 9.94           | V            |
| 1902.50            | -21.90                    | 2.86                    | 43.77                   | 4.78                    | 23.79         | 33.00          | 9.21           | H            |

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

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1860.00            | -22.21                    | 2.86                    | 43.75                   | 4.85                    | 23.53         | 33.00          | 9.47           | H            |
| 1880.00            | -22.53                    | 2.85                    | 43.75                   | 4.82                    | 23.19         | 33.00          | 9.81           | H            |
| 1900.00            | -22.17                    | 2.87                    | 43.77                   | 4.78                    | 23.51         | 33.00          | 9.49           | H            |

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

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1850.70            | -23.81                    | 2.92                    | 43.75                   | 4.87                    | 21.89         | 33.00          | 11.11          | H            |
| 1880.00            | -23.60                    | 2.85                    | 43.75                   | 4.82                    | 22.12         | 33.00          | 10.88          | H            |
| 1909.30            | -22.63                    | 2.87                    | 43.77                   | 4.76                    | 23.03         | 33.00          | 9.97           | H            |

### LTE Band 2\_3MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1851.50            | -23.72                    | 2.87                    | 43.75                   | 4.87                    | 22.03         | 33.00          | 10.97          | H            |
| 1880.00            | -23.52                    | 2.85                    | 43.75                   | 4.82                    | 22.20         | 33.00          | 10.80          | V            |
| 1908.50            | -22.73                    | 2.89                    | 43.78                   | 4.76                    | 22.92         | 33.00          | 10.08          | H            |

### LTE Band 2\_5MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1852.50            | -23.57                    | 2.87                    | 43.75                   | 4.87                    | 22.18         | 33.00          | 10.82          | H            |
| 1880.00            | -23.48                    | 2.85                    | 43.75                   | 4.82                    | 22.24         | 33.00          | 10.76          | H            |
| 1907.50            | -22.69                    | 2.84                    | 43.77                   | 4.77                    | 23.01         | 33.00          | 9.99           | H            |

### LTE Band 2\_10MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1855.00            | -23.63                    | 2.88                    | 43.74                   | 4.86                    | 22.09         | 33.00          | 10.91          | H            |
| 1880.00            | -23.49                    | 2.85                    | 43.75                   | 4.82                    | 22.23         | 33.00          | 10.77          | V            |
| 1905.00            | -23.06                    | 2.87                    | 43.77                   | 4.77                    | 22.61         | 33.00          | 10.39          | H            |

### LTE Band 2\_15MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1857.50            | -23.58                    | 2.87                    | 43.75                   | 4.86                    | 22.16         | 33.00          | 10.84          | H            |
| 1880.00            | -23.46                    | 2.85                    | 43.75                   | 4.82                    | 22.26         | 33.00          | 10.74          | H            |
| 1902.50            | -22.39                    | 2.86                    | 43.77                   | 4.78                    | 23.30         | 33.00          | 9.70           | H            |

### LTE Band 2\_20 MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1860.00            | -23.55                    | 2.86                    | 43.75                   | 4.85                    | 22.19         | 33.00          | 10.81          | H            |
| 1880.00            | -23.33                    | 2.85                    | 43.75                   | 4.82                    | 22.39         | 33.00          | 10.61          | V            |
| 1900.00            | -22.84                    | 2.87                    | 43.77                   | 4.78                    | 22.84         | 33.00          | 10.16          | H            |

### LTE Band 2\_1.4MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1850.70            | -24.08                    | 2.92                    | 43.75                   | 4.87                    | 21.62         | 33.00          | 11.38          | H            |
| 1880.00            | -23.89                    | 2.85                    | 43.75                   | 4.82                    | 21.83         | 33.00          | 11.17          | H            |
| 1909.30            | -22.85                    | 2.87                    | 43.77                   | 4.76                    | 22.81         | 33.00          | 10.19          | H            |

### LTE Band 2\_3MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1851.50            | -23.94                    | 2.87                    | 43.75                   | 4.87                    | 21.81         | 33.00          | 11.19          | H            |
| 1880.00            | -23.75                    | 2.85                    | 43.75                   | 4.82                    | 21.97         | 33.00          | 11.03          | H            |
| 1908.50            | -22.99                    | 2.89                    | 43.78                   | 4.76                    | 22.66         | 33.00          | 10.34          | H            |

### LTE Band 2\_5MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1852.50            | -23.85                    | 2.87                    | 43.75                   | 4.87                    | 21.90         | 33.00          | 11.10          | H            |
| 1880.00            | -23.69                    | 2.85                    | 43.75                   | 4.82                    | 22.03         | 33.00          | 10.97          | H            |
| 1907.50            | -22.92                    | 2.84                    | 43.77                   | 4.77                    | 22.78         | 33.00          | 10.22          | H            |

### LTE Band 2\_10MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1855.00            | -23.88                    | 2.88                    | 43.74                   | 4.86                    | 21.84         | 33.00          | 11.16          | H            |
| 1880.00            | -23.74                    | 2.85                    | 43.75                   | 4.82                    | 21.98         | 33.00          | 11.02          | V            |
| 1905.00            | -23.29                    | 2.87                    | 43.77                   | 4.77                    | 22.38         | 33.00          | 10.62          | H            |

### LTE Band 2\_15MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1857.50            | -23.81                    | 2.87                    | 43.75                   | 4.86                    | 21.93         | 33.00          | 11.07          | H            |
| 1880.00            | -23.68                    | 2.85                    | 43.75                   | 4.82                    | 22.04         | 33.00          | 10.96          | H            |
| 1902.50            | -22.74                    | 2.86                    | 43.77                   | 4.78                    | 22.95         | 33.00          | 10.05          | H            |

### LTE Band 2\_20 MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1860.00            | -23.83                    | 2.86                    | 43.75                   | 4.85                    | 21.91         | 33.00          | 11.09          | H            |
| 1880.00            | -23.59                    | 2.85                    | 43.75                   | 4.82                    | 22.13         | 33.00          | 10.87          | V            |
| 1900.00            | -23.13                    | 2.87                    | 43.77                   | 4.78                    | 22.55         | 33.00          | 10.45          | H            |

## LTE Band 5- ERP

Limits:  $\leq 38.45\text{dBm}$  (7W)

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

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 824.70             | -21.37                    | 2.26                    | 45.79                   | 0.95                    | 2.15               | 20.96        | 38.45          | 17.49          | H            |
| 836.50             | -20.64                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 21.43        | 38.45          | 17.02          | H            |
| 848.30             | -21.48                    | 2.27                    | 45.55                   | 0.80                    | 2.15               | 20.45        | 38.45          | 18.00          | H            |

### LTE Band 5\_3MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 825.50             | -21.26                    | 2.26                    | 45.79                   | 0.94                    | 2.15               | 21.06        | 38.45          | 17.39          | H            |
| 836.50             | -20.58                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 21.49        | 38.45          | 16.96          | H            |
| 847.50             | -21.36                    | 2.27                    | 45.56                   | 0.81                    | 2.15               | 20.59        | 38.45          | 17.86          | H            |

### LTE Band 5\_5MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 826.50             | -21.19                    | 2.25                    | 45.77                   | 0.93                    | 2.15               | 21.11        | 38.45          | 17.34          | H            |
| 836.50             | -20.56                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 21.51        | 38.45          | 16.94          | H            |
| 846.50             | -21.29                    | 2.26                    | 45.56                   | 0.82                    | 2.15               | 20.68        | 38.45          | 17.77          | H            |

### LTE Band 5\_10MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 829.00             | -21.20                    | 2.13                    | 45.74                   | 0.90                    | 2.15               | 21.16        | 38.45          | 17.29          | H            |
| 836.50             | -20.62                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 21.45        | 38.45          | 17.00          | H            |
| 844.00             | -21.14                    | 2.26                    | 45.59                   | 0.82                    | 2.15               | 20.86        | 38.45          | 17.59          | H            |

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

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 824.70             | -21.78                    | 2.26                    | 45.79                   | 0.95                    | 2.15               | 20.55        | 38.45          | 17.90          | H            |
| 836.50             | -20.40                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 21.67        | 38.45          | 16.78          | H            |
| 848.30             | -21.34                    | 2.27                    | 45.55                   | 0.80                    | 2.15               | 20.59        | 38.45          | 17.86          | H            |

### LTE Band 5\_3MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 825.50             | -21.09                    | 2.26                    | 45.79                   | 0.94                    | 2.15               | 21.23        | 38.45          | 17.22          | H            |
| 836.50             | -20.53                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 21.54        | 38.45          | 16.91          | H            |
| 847.50             | -21.19                    | 2.27                    | 45.56                   | 0.81                    | 2.15               | 20.76        | 38.45          | 17.69          | H            |

### LTE Band 5\_5MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 826.50             | -20.81                    | 2.25                    | 45.77                   | 0.93                    | 2.15               | 21.49        | 38.45          | 16.96          | H            |
| 836.50             | -20.48                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 21.59        | 38.45          | 16.86          | H            |
| 846.50             | -21.02                    | 2.26                    | 45.56                   | 0.82                    | 2.15               | 20.95        | 38.45          | 17.50          | H            |

### LTE Band 5\_10MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 829.00             | -21.07                    | 2.13                    | 45.74                   | 0.90                    | 2.15               | 21.29        | 38.45          | 17.16          | H            |
| 836.50             | -20.22                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 21.85        | 38.45          | 16.60          | H            |
| 844.00             | -21.08                    | 2.26                    | 45.59                   | 0.82                    | 2.15               | 20.92        | 38.45          | 17.53          | H            |

### LTE Band 5\_1.4MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 824.70             | -22.89                    | 2.26                    | 45.79                   | 0.95                    | 2.15               | 19.44        | 38.45          | 19.01          | H            |
| 836.50             | -22.55                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 19.52        | 38.45          | 18.93          | V            |
| 848.30             | -22.47                    | 2.27                    | 45.55                   | 0.80                    | 2.15               | 19.46        | 38.45          | 18.99          | H            |

### LTE Band 5\_3MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 825.50             | -22.21                    | 2.26                    | 45.79                   | 0.94                    | 2.15               | 20.11        | 38.45          | 18.34          | H            |
| 836.50             | -21.66                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 20.41        | 38.45          | 18.04          | H            |
| 847.50             | -22.25                    | 2.27                    | 45.56                   | 0.81                    | 2.15               | 19.70        | 38.45          | 18.75          | H            |

### LTE Band 5\_5MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 826.50             | -22.06                    | 2.25                    | 45.77                   | 0.93                    | 2.15               | 20.24        | 38.45          | 18.21          | H            |
| 836.50             | -21.77                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 20.30        | 38.45          | 18.15          | H            |
| 846.50             | -22.34                    | 2.26                    | 45.56                   | 0.82                    | 2.15               | 19.63        | 38.45          | 18.82          | H            |

### LTE Band 5\_10MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 829.00             | -22.28                    | 2.13                    | 45.74                   | 0.90                    | 2.15               | 20.08        | 38.45          | 18.37          | H            |
| 836.50             | -21.85                    | 2.26                    | 45.66                   | 0.82                    | 2.15               | 20.22        | 38.45          | 18.23          | H            |
| 844.00             | -22.22                    | 2.26                    | 45.59                   | 0.82                    | 2.15               | 19.78        | 38.45          | 18.67          | H            |

### LTE Band 7- EIRP

Limits:  $\leq 33$  dBm (2W)

#### LTE Band 7\_5MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2502.50            | -26.86                    | 3.58                    | 45.68                   | 6.10                    | 21.34         | 33.00          | 11.66          | H            |
| 2535.00            | -26.23                    | 3.63                    | 44.82                   | 6.16                    | 21.12         | 33.00          | 11.88          | H            |
| 2567.50            | -27.82                    | 3.65                    | 44.92                   | 6.22                    | 19.67         | 33.00          | 13.33          | H            |

#### LTE Band 7\_10MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2505.00            | -26.87                    | 3.59                    | 45.64                   | 6.11                    | 21.29         | 33.00          | 11.71          | H            |
| 2535.00            | -26.26                    | 3.63                    | 44.82                   | 6.16                    | 21.09         | 33.00          | 11.91          | H            |
| 2565.00            | -28.08                    | 3.65                    | 44.97                   | 6.22                    | 19.46         | 33.00          | 13.54          | H            |

#### LTE Band 7\_15MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2507.50            | -27.08                    | 3.59                    | 44.92                   | 6.11                    | 20.36         | 33.00          | 12.64          | H            |
| 2535.00            | -27.00                    | 3.63                    | 44.82                   | 6.16                    | 20.35         | 33.00          | 12.65          | H            |
| 2562.50            | -29.11                    | 3.65                    | 45.67                   | 6.21                    | 19.12         | 33.00          | 13.88          | H            |

#### LTE Band 7\_20 MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2510.00            | -27.49                    | 3.58                    | 45.36                   | 6.12                    | 20.41         | 33.00          | 12.59          | H            |
| 2535.00            | -26.92                    | 3.63                    | 44.82                   | 6.16                    | 20.43         | 33.00          | 12.57          | H            |
| 2560.00            | -29.43                    | 3.64                    | 45.98                   | 6.21                    | 19.12         | 33.00          | 13.88          | H            |

### LTE Band 7\_5MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2502.50            | -27.82                    | 3.58                    | 45.68                   | 6.10                    | 20.38         | 33.00          | 12.62          | H            |
| 2535.00            | -27.02                    | 3.63                    | 44.82                   | 6.16                    | 20.33         | 33.00          | 12.67          | H            |
| 2567.50            | -28.65                    | 3.65                    | 44.92                   | 6.22                    | 18.84         | 33.00          | 14.16          | H            |

### LTE Band 7\_10MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2505.00            | -27.98                    | 3.59                    | 45.64                   | 6.11                    | 20.18         | 33.00          | 12.82          | H            |
| 2535.00            | -27.24                    | 3.63                    | 44.82                   | 6.16                    | 20.11         | 33.00          | 12.89          | H            |
| 2565.00            | -28.97                    | 3.65                    | 44.97                   | 6.22                    | 18.57         | 33.00          | 14.43          | H            |

### LTE Band 7\_15MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2507.50            | -28.05                    | 3.59                    | 44.92                   | 6.11                    | 19.39         | 33.00          | 13.61          | H            |
| 2535.00            | -27.89                    | 3.63                    | 44.82                   | 6.16                    | 19.46         | 33.00          | 13.54          | H            |
| 2562.50            | -30.04                    | 3.65                    | 45.67                   | 6.21                    | 18.19         | 33.00          | 14.81          | H            |

### LTE Band 7\_20 MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2510.00            | -28.52                    | 3.58                    | 45.36                   | 6.12                    | 19.38         | 33.00          | 13.62          | H            |
| 2535.00            | -27.71                    | 3.63                    | 44.82                   | 6.16                    | 19.64         | 33.00          | 13.36          | H            |
| 2560.00            | -30.53                    | 3.64                    | 45.98                   | 6.21                    | 18.02         | 33.00          | 14.98          | H            |

### LTE Band 7\_5MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2502.50            | -28.94                    | 3.58                    | 45.68                   | 6.10                    | 19.26         | 33.00          | 13.74          | H            |
| 2535.00            | -28.10                    | 3.63                    | 44.82                   | 6.16                    | 19.25         | 33.00          | 13.75          | H            |
| 2567.50            | -29.86                    | 3.65                    | 44.92                   | 6.22                    | 17.63         | 33.00          | 15.37          | H            |

### LTE Band 7\_10MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2505.00            | -29.15                    | 3.59                    | 45.64                   | 6.11                    | 19.01         | 33.00          | 13.99          | H            |
| 2535.00            | -28.44                    | 3.63                    | 44.82                   | 6.16                    | 18.91         | 33.00          | 14.09          | H            |
| 2565.00            | -30.19                    | 3.65                    | 44.97                   | 6.22                    | 17.35         | 33.00          | 15.65          | H            |

### LTE Band 7\_15MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2507.50            | -29.31                    | 3.59                    | 44.92                   | 6.11                    | 18.13         | 33.00          | 14.87          | H            |
| 2535.00            | -29.05                    | 3.63                    | 44.82                   | 6.16                    | 18.30         | 33.00          | 14.70          | H            |
| 2562.50            | -31.25                    | 3.65                    | 45.67                   | 6.21                    | 16.98         | 33.00          | 16.02          | H            |

### LTE Band 7\_20 MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2510.00            | -29.65                    | 3.58                    | 45.36                   | 6.12                    | 18.25         | 33.00          | 14.75          | H            |
| 2535.00            | -28.92                    | 3.63                    | 44.82                   | 6.16                    | 18.43         | 33.00          | 14.57          | H            |
| 2560.00            | -31.81                    | 3.64                    | 45.98                   | 6.21                    | 16.74         | 33.00          | 16.26          | H            |

## LTE Band 12 - ERP

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

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

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 699.70             | -28.16                    | 1.90                    | 44.66                   | 0.77                    | 2.15               | 13.22        | 34.77          | 21.55          | H            |
| 707.50             | -27.71                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 13.79        | 34.77          | 20.98          | V            |
| 715.30             | -27.86                    | 1.92                    | 45.26                   | 0.50                    | 2.15               | 13.83        | 34.77          | 20.94          | V            |

### LTE Band 12\_3MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 700.50             | -25.72                    | 1.90                    | 44.68                   | 0.76                    | 2.15               | 15.67        | 34.77          | 19.10          | V            |
| 707.50             | -26.13                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 15.37        | 34.77          | 19.40          | V            |
| 714.50             | -26.68                    | 1.92                    | 45.26                   | 0.50                    | 2.15               | 15.01        | 34.77          | 19.76          | H            |

### LTE Band 12\_5MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 701.50             | -25.17                    | 1.90                    | 44.81                   | 0.74                    | 2.15               | 16.33        | 34.77          | 18.44          | V            |
| 707.50             | -25.43                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 16.07        | 34.77          | 18.70          | H            |
| 713.50             | -25.79                    | 1.92                    | 45.22                   | 0.50                    | 2.15               | 15.86        | 34.77          | 18.91          | V            |

### LTE Band 12\_10MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 704.00             | -25.61                    | 1.91                    | 44.93                   | 0.70                    | 2.15               | 15.96        | 34.77          | 18.81          | V            |
| 707.50             | -25.16                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 16.34        | 34.77          | 18.43          | H            |
| 711.00             | -25.59                    | 1.92                    | 45.19                   | 0.53                    | 2.15               | 16.06        | 34.77          | 18.71          | H            |

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

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 699.70             | -28.10                    | 1.90                    | 44.66                   | 0.77                    | 2.15               | 13.28        | 34.77          | 21.49          | V            |
| 707.50             | -28.59                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 12.91        | 34.77          | 21.86          | H            |
| 715.30             | -28.96                    | 1.92                    | 45.26                   | 0.50                    | 2.15               | 12.73        | 34.77          | 22.04          | V            |

### LTE Band 12\_3MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 700.50             | -27.00                    | 1.90                    | 44.68                   | 0.76                    | 2.15               | 14.39        | 34.77          | 20.38          | H            |
| 707.50             | -26.87                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 14.63        | 34.77          | 20.14          | H            |
| 714.50             | -25.65                    | 1.92                    | 45.26                   | 0.50                    | 2.15               | 16.04        | 34.77          | 18.73          | V            |

### LTE Band 12\_5MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 701.50             | -25.43                    | 1.90                    | 44.81                   | 0.74                    | 2.15               | 16.07        | 34.77          | 18.70          | V            |
| 707.50             | -25.30                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 16.20        | 34.77          | 18.57          | V            |
| 713.50             | -25.01                    | 1.92                    | 45.22                   | 0.50                    | 2.15               | 16.64        | 34.77          | 18.13          | V            |

### LTE Band 12\_10MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 704.00             | -25.31                    | 1.91                    | 44.93                   | 0.70                    | 2.15               | 16.26        | 34.77          | 18.51          | H            |
| 707.50             | -24.53                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 16.97        | 34.77          | 17.80          | H            |
| 711.00             | -25.15                    | 1.92                    | 45.19                   | 0.53                    | 2.15               | 16.50        | 34.77          | 18.27          | H            |

### LTE Band 12\_1.4MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 699.70             | -28.36                    | 1.90                    | 44.66                   | 0.77                    | 2.15               | 13.02        | 34.77          | 21.75          | V            |
| 707.50             | -28.81                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 12.69        | 34.77          | 22.08          | H            |
| 715.30             | -29.18                    | 1.92                    | 45.26                   | 0.50                    | 2.15               | 12.51        | 34.77          | 22.26          | V            |

### LTE Band 12\_3MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 700.50             | -27.38                    | 1.90                    | 44.68                   | 0.76                    | 2.15               | 14.01        | 34.77          | 20.76          | H            |
| 707.50             | -27.26                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 14.24        | 34.77          | 20.53          | H            |
| 714.50             | -26.92                    | 1.92                    | 45.26                   | 0.50                    | 2.15               | 14.77        | 34.77          | 20.00          | V            |

### LTE Band 12\_5MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 701.50             | -25.96                    | 1.90                    | 44.81                   | 0.74                    | 2.15               | 15.54        | 34.77          | 19.23          | V            |
| 707.50             | -25.71                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 15.79        | 34.77          | 18.98          | V            |
| 713.50             | -25.39                    | 1.92                    | 45.22                   | 0.50                    | 2.15               | 16.26        | 34.77          | 18.51          | V            |

### LTE Band 12\_10MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 704.00             | -25.92                    | 1.91                    | 44.93                   | 0.70                    | 2.15               | 15.65        | 34.77          | 19.12          | V            |
| 707.50             | -25.31                    | 1.91                    | 44.94                   | 0.62                    | 2.15               | 16.19        | 34.77          | 18.58          | H            |
| 711.00             | -25.93                    | 1.92                    | 45.19                   | 0.53                    | 2.15               | 15.72        | 34.77          | 19.05          | H            |

LTE Band 14- ERP

**Limits:** ≤34.77 dBm (3W)

#### LTE Band 14\_5MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 790.50             | -20.87                    | 2.02                    | 45.71                   | 0.18                    | 2.15               | 20.85        | 34.77          | 13.92          | V            |
| 793.00             | -21.07                    | 2.03                    | 45.72                   | 0.19                    | 2.15               | 20.66        | 34.77          | 14.11          | V            |
| 795.50             | -21.43                    | 2.03                    | 45.74                   | 0.20                    | 2.15               | 20.33        | 34.77          | 14.44          | V            |

#### LTE Band 14\_10MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 793.00             | -21.14                    | 2.03                    | 45.72                   | 0.19                    | 2.15               | 20.59        | 34.77          | 14.18          | V            |

#### LTE Band 14\_5MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 790.50             | -20.79                    | 2.02                    | 45.71                   | 0.18                    | 2.15               | 20.93        | 34.77          | 13.84          | V            |
| 793.00             | -21.06                    | 2.03                    | 45.72                   | 0.19                    | 2.15               | 20.67        | 34.77          | 14.10          | V            |
| 795.50             | -21.09                    | 2.03                    | 45.74                   | 0.20                    | 2.15               | 20.67        | 34.77          | 14.10          | V            |

#### LTE Band 14\_10MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 793.00             | -20.93                    | 2.03                    | 45.72                   | 0.19                    | 2.15               | 20.80        | 34.77          | 13.97          | V            |

#### LTE Band 14\_5MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 790.50             | -22.05                    | 2.02                    | 45.71                   | 0.18                    | 2.15               | 19.67        | 34.77          | 15.10          | V            |
| 793.00             | -22.13                    | 2.03                    | 45.72                   | 0.19                    | 2.15               | 19.60        | 34.77          | 15.17          | V            |
| 795.50             | -22.48                    | 2.03                    | 45.74                   | 0.20                    | 2.15               | 19.28        | 34.77          | 15.49          | V            |

#### LTE Band 14\_10MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | Correction<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------|--------------|----------------|----------------|--------------|
| 793.00             | -22.20                    | 2.03                    | 45.72                   | 0.19                    | 2.15               | 19.53        | 34.77          | 15.24          | V            |

### LTE Band 30- EIRP

Limits: ≤24 dBm (250mW)

#### LTE Band 30\_5MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2307.50            | -25.27                    | 3.48                    | 44.55                   | 5.52                    | 21.31         | 24.00          | 2.69           | V            |
| 2310.00            | -25.02                    | 3.48                    | 44.55                   | 5.53                    | 21.58         | 24.00          | 2.42           | V            |
| 2312.50            | -26.36                    | 3.48                    | 44.56                   | 5.54                    | 20.25         | 24.00          | 3.75           | H            |

#### LTE Band 30\_10MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2310.00            | -26.55                    | 3.48                    | 44.55                   | 5.53                    | 20.06         | 24.00          | 3.94           | H            |

#### LTE Band 30\_5MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2307.50            | -25.55                    | 3.48                    | 44.55                   | 5.52                    | 21.03         | 24.00          | 2.97           | V            |
| 2310.00            | -25.46                    | 3.48                    | 44.55                   | 5.53                    | 21.14         | 24.00          | 2.86           | V            |
| 2312.50            | -26.58                    | 3.48                    | 44.56                   | 5.54                    | 20.03         | 24.00          | 3.97           | H            |

#### LTE Band 30\_10MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2310.00            | -26.84                    | 3.48                    | 44.55                   | 5.53                    | 19.77         | 24.00          | 4.23           | H            |

#### LTE Band 30\_5MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2307.50            | -26.43                    | 3.48                    | 44.55                   | 5.52                    | 20.15         | 24.00          | 3.85           | V            |
| 2310.00            | -26.11                    | 3.48                    | 44.55                   | 5.53                    | 20.49         | 24.00          | 3.51           | V            |
| 2312.50            | -27.47                    | 3.48                    | 44.56                   | 5.54                    | 19.14         | 24.00          | 4.86           | H            |

#### LTE Band 30\_10MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2310.00            | -27.64                    | 3.48                    | 44.55                   | 5.53                    | 18.97         | 24.00          | 5.03           | H            |

### LTE Band 41- EIRP

**Limits:** ≤33dBm (2W)

#### LTE Band 41\_5MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2498.50            | -27.24                    | 3.58                    | 45.59                   | 6.10                    | 20.87         | 33.00          | 12.13          | H            |
| 2593.00            | -29.09                    | 3.69                    | 44.93                   | 6.27                    | 18.42         | 33.00          | 14.58          | H            |
| 2687.50            | -30.02                    | 3.73                    | 44.98                   | 6.44                    | 17.67         | 33.00          | 15.33          | H            |

#### LTE Band 41\_10MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2501.00            | -26.95                    | 3.58                    | 45.65                   | 6.10                    | 21.22         | 33.00          | 11.78          | H            |
| 2593.00            | -29.10                    | 3.69                    | 44.93                   | 6.27                    | 18.41         | 33.00          | 14.59          | H            |
| 2685.00            | -28.72                    | 3.73                    | 44.98                   | 6.43                    | 18.96         | 33.00          | 14.04          | H            |

#### LTE Band 41\_15MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2503.50            | -25.91                    | 3.58                    | 45.65                   | 6.11                    | 22.27         | 33.00          | 10.73          | H            |
| 2593.00            | -28.78                    | 3.69                    | 44.93                   | 6.27                    | 18.73         | 33.00          | 14.27          | H            |
| 2682.50            | -28.68                    | 3.73                    | 44.98                   | 6.43                    | 19.00         | 33.00          | 14.00          | H            |

#### LTE Band 41\_20MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2506.00            | -25.90                    | 3.59                    | 45.15                   | 6.11                    | 21.77         | 33.00          | 11.23          | H            |
| 2593.00            | -28.52                    | 3.69                    | 44.93                   | 6.27                    | 18.99         | 33.00          | 14.01          | H            |
| 2680.00            | -28.74                    | 3.73                    | 44.97                   | 6.42                    | 18.92         | 33.00          | 14.08          | H            |

### LTE Band 41\_5MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2498.50            | -27.41                    | 3.58                    | 45.59                   | 6.10                    | 20.70         | 33.00          | 12.30          | H            |
| 2593.00            | -30.01                    | 3.69                    | 44.93                   | 6.27                    | 17.50         | 33.00          | 15.50          | H            |
| 2687.50            | -30.28                    | 3.73                    | 44.98                   | 6.44                    | 17.41         | 33.00          | 15.59          | H            |

### LTE Band 41\_10MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2501.00            | -27.04                    | 3.58                    | 45.65                   | 6.10                    | 21.13         | 33.00          | 11.87          | H            |
| 2593.00            | -29.43                    | 3.69                    | 44.93                   | 6.27                    | 18.08         | 33.00          | 14.92          | H            |
| 2685.00            | -29.58                    | 3.73                    | 44.98                   | 6.43                    | 18.10         | 33.00          | 14.90          | H            |

### LTE Band 41\_15MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2503.50            | -26.70                    | 3.58                    | 45.65                   | 6.11                    | 21.48         | 33.00          | 11.52          | H            |
| 2593.00            | -29.16                    | 3.69                    | 44.93                   | 6.27                    | 18.35         | 33.00          | 14.65          | H            |
| 2682.50            | -29.17                    | 3.73                    | 44.98                   | 6.43                    | 18.51         | 33.00          | 14.49          | H            |

### LTE Band 41\_20MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2506.00            | -26.00                    | 3.59                    | 45.15                   | 6.11                    | 21.67         | 33.00          | 11.33          | H            |
| 2593.00            | -28.56                    | 3.69                    | 44.93                   | 6.27                    | 18.95         | 33.00          | 14.05          | H            |
| 2680.00            | -29.04                    | 3.73                    | 44.97                   | 6.42                    | 18.62         | 33.00          | 14.38          | H            |

### LTE Band 41\_5MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2498.50            | -28.33                    | 3.58                    | 45.59                   | 6.10                    | 19.78         | 33.00          | 13.22          | H            |
| 2593.00            | -30.32                    | 3.69                    | 44.93                   | 6.27                    | 17.19         | 33.00          | 15.81          | H            |
| 2687.50            | -31.33                    | 3.73                    | 44.98                   | 6.44                    | 16.36         | 33.00          | 16.64          | H            |

### LTE Band 41\_10MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2501.00            | -28.13                    | 3.58                    | 45.65                   | 6.10                    | 20.04         | 33.00          | 12.96          | H            |
| 2593.00            | -30.37                    | 3.69                    | 44.93                   | 6.27                    | 17.14         | 33.00          | 15.86          | H            |
| 2685.00            | -29.91                    | 3.73                    | 44.98                   | 6.43                    | 17.77         | 33.00          | 15.23          | H            |

### LTE Band 41\_15MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2503.50            | -27.23                    | 3.58                    | 45.65                   | 6.11                    | 20.95         | 33.00          | 12.05          | H            |
| 2593.00            | -29.96                    | 3.69                    | 44.93                   | 6.27                    | 17.55         | 33.00          | 15.45          | H            |
| 2682.50            | -29.65                    | 3.73                    | 44.98                   | 6.43                    | 18.03         | 33.00          | 14.97          | H            |

### LTE Band 41\_20MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>Cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 2506.00            | -27.07                    | 3.59                    | 45.15                   | 6.11                    | 20.60         | 33.00          | 12.40          | H            |
| 2593.00            | -29.67                    | 3.69                    | 44.93                   | 6.27                    | 17.84         | 33.00          | 15.16          | H            |
| 2680.00            | -29.36                    | 3.73                    | 44.97                   | 6.42                    | 18.30         | 33.00          | 14.70          | H            |

## LTE Band 66- EIRP

Limits:  $\leq 30\text{dBm}$  (1W)

### LTE Band 66\_1.4MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1710.70            | -31.97                    | 3.17                    | 44.10                   | 5.12                    | 20.42         | 30.00          | 9.58           | H            |
| 1745.00            | -31.20                    | 3.68                    | 44.16                   | 5.06                    | 21.70         | 30.00          | 8.30           | H            |
| 1779.30            | -29.40                    | 3.04                    | 44.03                   | 5.00                    | 22.67         | 30.00          | 7.33           | H            |

### LTE Band 66\_3MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1711.50            | -31.85                    | 3.40                    | 44.10                   | 5.12                    | 20.77         | 30.00          | 9.23           | H            |
| 1745.00            | -31.29                    | 3.68                    | 44.16                   | 5.06                    | 21.61         | 30.00          | 8.39           | H            |
| 1778.50            | -29.14                    | 3.04                    | 44.03                   | 5.00                    | 22.93         | 30.00          | 7.07           | H            |

### LTE Band 66\_5MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1712.50            | -25.29                    | 3.66                    | 44.10                   | 5.12                    | 20.27         | 30.00          | 9.73           | H            |
| 1745.00            | -24.18                    | 3.68                    | 44.16                   | 5.06                    | 21.36         | 30.00          | 8.64           | H            |
| 1777.50            | -23.52                    | 3.04                    | 44.04                   | 5.00                    | 22.48         | 30.00          | 7.52           | H            |

### LTE Band 66\_10MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1715.00            | -24.80                    | 3.56                    | 44.10                   | 5.11                    | 20.85         | 30.00          | 9.15           | H            |
| 1745.00            | -23.17                    | 3.68                    | 44.16                   | 5.06                    | 22.37         | 30.00          | 7.63           | H            |
| 1775.00            | -23.36                    | 3.05                    | 44.05                   | 5.01                    | 22.64         | 30.00          | 7.36           | H            |

### LTE Band 66\_15MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1717.50            | -25.06                    | 3.47                    | 44.11                   | 5.11                    | 20.69         | 30.00          | 9.31           | H            |
| 1745.00            | -24.10                    | 3.68                    | 44.16                   | 5.06                    | 21.44         | 30.00          | 8.56           | H            |
| 1772.50            | -23.82                    | 3.05                    | 44.06                   | 5.01                    | 22.20         | 30.00          | 7.80           | H            |

### LTE Band 66\_20MHz\_QPSK

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1720.00            | -25.17                    | 3.37                    | 44.11                   | 5.10                    | 20.67         | 30.00          | 9.33           | H            |
| 1745.00            | -24.25                    | 3.68                    | 44.16                   | 5.06                    | 21.29         | 30.00          | 8.71           | H            |
| 1770.00            | -24.11                    | 3.05                    | 44.07                   | 5.01                    | 21.93         | 30.00          | 8.07           | H            |

### LTE Band 66\_1.4MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1710.70            | -33.11                    | 3.17                    | 44.10                   | 5.12                    | 19.28         | 30.00          | 10.72          | H            |
| 1745.00            | -32.41                    | 3.68                    | 44.16                   | 5.06                    | 20.49         | 30.00          | 9.51           | H            |
| 1779.30            | -29.68                    | 3.04                    | 44.03                   | 5.00                    | 22.39         | 30.00          | 7.61           | H            |

### LTE Band 66\_3MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1711.50            | -33.08                    | 3.40                    | 44.10                   | 5.12                    | 19.54         | 30.00          | 10.46          | H            |
| 1745.00            | -32.24                    | 3.68                    | 44.16                   | 5.06                    | 20.66         | 30.00          | 9.34           | H            |
| 1778.50            | -30.19                    | 3.04                    | 44.03                   | 5.00                    | 21.88         | 30.00          | 8.12           | H            |

### LTE Band 66\_5MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1712.50            | -26.10                    | 3.66                    | 44.10                   | 5.12                    | 19.46         | 30.00          | 10.54          | H            |
| 1745.00            | -24.55                    | 3.68                    | 44.16                   | 5.06                    | 20.99         | 30.00          | 9.01           | V            |
| 1777.50            | -24.43                    | 3.04                    | 44.04                   | 5.00                    | 21.57         | 30.00          | 8.43           | H            |

### LTE Band 66\_10MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1715.00            | -26.87                    | 3.56                    | 44.10                   | 5.11                    | 18.78         | 30.00          | 11.22          | V            |
| 1745.00            | -24.88                    | 3.68                    | 44.16                   | 5.06                    | 20.66         | 30.00          | 9.34           | H            |
| 1775.00            | -24.25                    | 3.05                    | 44.05                   | 5.01                    | 21.75         | 30.00          | 8.25           | H            |

### LTE Band 66\_15MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1717.50            | -26.28                    | 3.47                    | 44.11                   | 5.11                    | 19.47         | 30.00          | 10.53          | H            |
| 1745.00            | -24.79                    | 3.68                    | 44.16                   | 5.06                    | 20.75         | 30.00          | 9.25           | H            |
| 1772.50            | -24.68                    | 3.05                    | 44.06                   | 5.01                    | 21.34         | 30.00          | 8.66           | H            |

### LTE Band 66\_20MHz\_16QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1720.00            | -25.46                    | 3.37                    | 44.11                   | 5.10                    | 20.38         | 30.00          | 9.62           | H            |
| 1745.00            | -23.46                    | 3.68                    | 44.16                   | 5.06                    | 22.08         | 30.00          | 7.92           | H            |
| 1770.00            | -24.55                    | 3.05                    | 44.07                   | 5.01                    | 21.49         | 30.00          | 8.51           | H            |

### LTE Band 66\_1.4MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1710.70            | -34.21                    | 3.17                    | 44.10                   | 5.12                    | 18.18         | 30.00          | 11.82          | H            |
| 1745.00            | -33.70                    | 3.68                    | 44.16                   | 5.06                    | 19.20         | 30.00          | 10.80          | H            |
| 1779.30            | -30.78                    | 3.04                    | 44.03                   | 5.00                    | 21.29         | 30.00          | 8.71           | H            |

### LTE Band 66\_3MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1711.50            | -34.14                    | 3.40                    | 44.10                   | 5.12                    | 18.48         | 30.00          | 11.52          | H            |
| 1745.00            | -33.32                    | 3.68                    | 44.16                   | 5.06                    | 19.58         | 30.00          | 10.42          | H            |
| 1778.50            | -31.27                    | 3.04                    | 44.03                   | 5.00                    | 20.80         | 30.00          | 9.20           | H            |

### LTE Band 66\_5MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1712.50            | -27.27                    | 3.66                    | 44.10                   | 5.12                    | 18.29         | 30.00          | 11.71          | H            |
| 1745.00            | -25.74                    | 3.68                    | 44.16                   | 5.06                    | 19.80         | 30.00          | 10.20          | V            |
| 1777.50            | -25.62                    | 3.04                    | 44.04                   | 5.00                    | 20.38         | 30.00          | 9.62           | H            |

### LTE Band 66\_10MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1715.00            | -27.31                    | 3.56                    | 44.10                   | 5.11                    | 18.34         | 30.00          | 11.66          | H            |
| 1745.00            | -26.00                    | 3.68                    | 44.16                   | 5.06                    | 19.54         | 30.00          | 10.46          | H            |
| 1775.00            | -25.37                    | 3.05                    | 44.05                   | 5.01                    | 20.63         | 30.00          | 9.37           | H            |

### LTE Band 66\_15MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1717.50            | -27.42                    | 3.47                    | 44.11                   | 5.11                    | 18.33         | 30.00          | 11.67          | H            |
| 1745.00            | -25.93                    | 3.68                    | 44.16                   | 5.06                    | 19.61         | 30.00          | 10.39          | H            |
| 1772.50            | -25.90                    | 3.05                    | 44.06                   | 5.01                    | 20.12         | 30.00          | 9.88           | H            |

### LTE Band 66\_20MHz\_64QAM

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | P <sub>cl</sub><br>(dB) | P <sub>Ag</sub><br>(dB) | G <sub>a</sub><br>(dBi) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|-------------------------|-------------------------|-------------------------|---------------|----------------|----------------|--------------|
| 1720.00            | -26.63                    | 3.37                    | 44.11                   | 5.10                    | 19.21         | 30.00          | 10.79          | H            |
| 1745.00            | -24.60                    | 3.68                    | 44.16                   | 5.06                    | 20.94         | 30.00          | 9.06           | H            |
| 1770.00            | -25.79                    | 3.05                    | 44.07                   | 5.01                    | 20.25         | 30.00          | 9.75           | H            |

Peak EIRP (dBm) = P<sub>Mea</sub>(-21.61dBm) - G<sub>a</sub> (-4.76dBi) - P<sub>Ag</sub> (-43.77dB) - P<sub>cl</sub> (2.87dB) = 24.05dBm

Note: Expanded measurement uncertainty is  $U = 2.84 \text{ dB}$ ,  $k = 2$ .

## A.2 EMISSION LIMIT

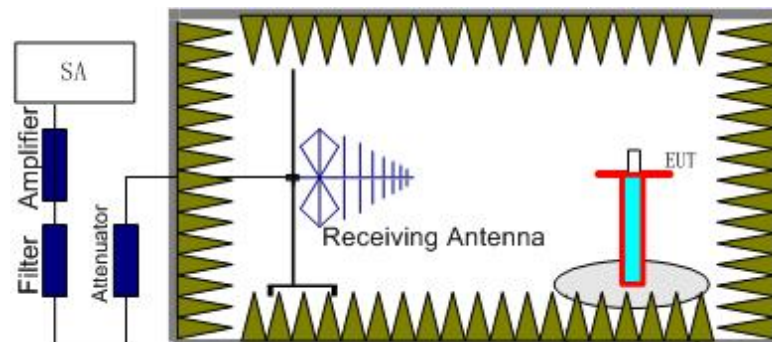
### A.2.1 Measurement Method

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

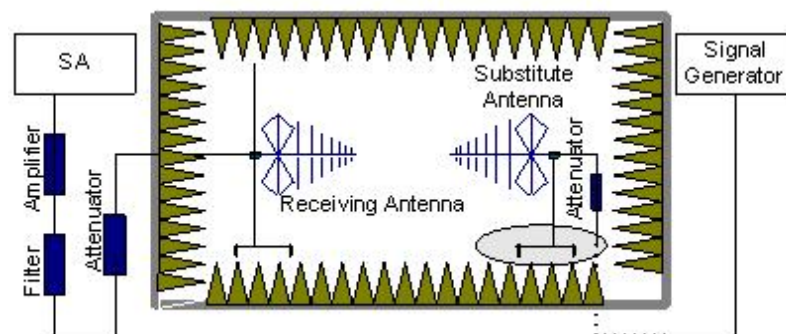
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2,5,7,12,14,30,41,66.

**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 /rms 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. 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, Part 24.238 and Part 27.53(h) 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.

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 27.53(a) states for mobile and portable stations operating in the 2305–2315 MHz and 2350–2360 MHz bands: By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337 MHz; By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305 MHz, 55

+ 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz; By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

Part 90.543 states that For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following: (1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations. (2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations. (3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB. (4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment. (5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

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

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 2,5,7,12,14,30,41,66. 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 2,5,7,12,14,30,41,66 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. The range of evaluated frequency is from 30MHz to 26GHz.

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 3701.02         | -51.84                 | 6.42          | 8.48              | -49.78          | -13.00      | 36.78       | H            |
| 5555.02         | -51.19                 | 7.19          | 10.59             | -47.79          | -13.00      | 34.79       | H            |
| 7407.01         | -36.71                 | 8.14          | 12.09             | -32.76          | -13.00      | 19.76       | H            |
| 9259.01         | -44.90                 | 9.06          | 13.26             | -40.70          | -13.00      | 27.70       | V            |
| 11126.01        | -51.76                 | 9.72          | 13.17             | -48.31          | -13.00      | 35.31       | H            |
| 12971.01        | -48.45                 | 10.48         | 13.48             | -45.45          | -13.00      | 32.45       | H            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 3760.02         | -53.10                 | 6.26          | 8.56              | -50.80          | -13.00      | 37.80       | H            |
| 5643.02         | -48.17                 | 7.27          | 10.57             | -44.87          | -13.00      | 31.87       | V            |
| 7525.01         | -39.92                 | 8.29          | 12.22             | -35.99          | -13.00      | 22.99       | H            |
| 9406.01         | -50.09                 | 9.07          | 13.34             | -45.82          | -13.00      | 32.82       | V            |
| 11242.01        | -51.36                 | 9.65          | 13.15             | -47.86          | -13.00      | 34.86       | H            |
| 13208.01        | -47.64                 | 10.50         | 13.79             | -44.35          | -13.00      | 31.35       | H            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 3819.02         | -52.14                 | 6.08          | 8.65              | -49.57          | -13.00      | 36.57       | H            |
| 5731.02         | -44.54                 | 7.29          | 10.55             | -41.28          | -13.00      | 28.28       | H            |
| 7641.01         | -38.08                 | 8.16          | 12.31             | -33.93          | -13.00      | 20.93       | H            |
| 9553.01         | -49.25                 | 9.35          | 13.35             | -45.25          | -13.00      | 32.25       | V            |
| 11446.01        | -49.72                 | 9.95          | 13.11             | -46.56          | -13.00      | 33.56       | H            |
| 13386.01        | -42.87                 | 10.57         | 14.04             | -39.40          | -13.00      | 26.40       | H            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1664.01         | -59.98                 | 3.57          | 5.20              | 2.15            | -60.50         | -13.00      | 47.50       | H            |
| 2477.00         | -53.73                 | 4.60          | 6.03              | 2.15            | -54.45         | -13.00      | 41.45       | V            |
| 3309.02         | -55.67                 | 5.29          | 7.74              | 2.15            | -55.37         | -13.00      | 42.37       | H            |
| 4121.02         | -56.76                 | 6.04          | 9.02              | 2.15            | -55.93         | -13.00      | 42.93       | H            |
| 4953.01         | -56.01                 | 6.68          | 9.85              | 2.15            | -54.99         | -13.00      | 41.99       | H            |
| 5766.01         | -54.94                 | 7.24          | 10.55             | 2.15            | -53.78         | -13.00      | 40.78       | H            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1660.01         | -59.62                 | 3.57          | 5.21              | 2.15            | -60.13         | -13.00      | 47.13       | H            |
| 2518.00         | -52.38                 | 4.64          | 6.13              | 2.15            | -53.04         | -13.00      | 40.04       | H            |
| 3360.02         | -54.50                 | 5.33          | 7.86              | 2.15            | -54.12         | -13.00      | 41.12       | V            |
| 4169.02         | -55.86                 | 6.14          | 9.07              | 2.15            | -55.08         | -13.00      | 42.08       | V            |
| 5008.01         | -56.20                 | 6.59          | 9.91              | 2.15            | -55.03         | -13.00      | 42.03       | V            |
| 5857.01         | -53.17                 | 7.26          | 10.53             | 2.15            | -52.05         | -13.00      | 39.05       | V            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1697.01         | -60.36                 | 3.60          | 5.15              | 2.15            | -60.96         | -13.00      | 47.96       | V            |
| 2539.00         | -52.99                 | 4.66          | 6.17              | 2.15            | -53.63         | -13.00      | 40.63       | V            |
| 3388.02         | -56.16                 | 5.35          | 7.93              | 2.15            | -55.73         | -13.00      | 42.73       | V            |
| 4232.02         | -56.43                 | 6.26          | 9.13              | 2.15            | -55.71         | -13.00      | 42.71       | H            |
| 5076.01         | -55.70                 | 6.70          | 10.01             | 2.15            | -54.54         | -13.00      | 41.54       | H            |
| 5950.01         | -53.40                 | 7.47          | 10.51             | 2.15            | -52.51         | -13.00      | 39.51       | H            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 5010.02         | -54.19                 | 6.59          | 9.91              | -50.87          | -25.00      | 25.87       | V            |
| 7510.01         | -51.03                 | 8.35          | 12.21             | -47.17          | -25.00      | 22.17       | V            |
| 10023.01        | -51.49                 | 9.25          | 12.91             | -47.83          | -25.00      | 22.83       | V            |
| 12528.01        | -48.04                 | 10.26         | 13.22             | -45.08          | -25.00      | 20.08       | H            |
| 15009.00        | -45.84                 | 11.23         | 13.99             | -43.08          | -25.00      | 18.08       | V            |
| 17501.00        | -44.06                 | 12.73         | 14.90             | -41.89          | -25.00      | 16.89       | V            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 5075.02         | -54.48                 | 6.70          | 10.01             | -51.17          | -25.00      | 26.17       | H            |
| 7609.01         | -52.62                 | 8.01          | 12.29             | -48.34          | -25.00      | 23.34       | V            |
| 10148.01        | -52.26                 | 9.38          | 12.96             | -48.68          | -25.00      | 23.68       | V            |
| 12693.01        | -48.20                 | 10.31         | 13.32             | -45.19          | -25.00      | 20.19       | H            |
| 15215.00        | -45.59                 | 11.38         | 13.87             | -43.10          | -25.00      | 18.10       | H            |
| 17750.00        | -43.35                 | 12.46         | 15.25             | -40.56          | -25.00      | 15.56       | H            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 5147.02         | -56.05                 | 6.88          | 10.11             | -52.82          | -25.00      | 27.82       | H            |
| 7691.01         | -54.40                 | 8.39          | 12.35             | -50.44          | -25.00      | 25.44       | H            |
| 10263.01        | -51.44                 | 9.52          | 13.01             | -47.95          | -25.00      | 22.95       | V            |
| 12823.01        | -48.39                 | 10.71         | 13.39             | -45.71          | -25.00      | 20.71       | H            |
| 15387.00        | -44.61                 | 11.38         | 13.77             | -42.22          | -25.00      | 17.22       | V            |
| 17969.00        | -43.75                 | 12.89         | 15.56             | -41.08          | -25.00      | 16.08       | H            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1390.01         | -60.13                 | 3.22          | 4.93              | 2.15            | -60.57         | -13.00      | 47.57       | H            |
| 2105.00         | -55.56                 | 4.20          | 4.92              | 2.15            | -56.99         | -13.00      | 43.99       | H            |
| 2809.00         | -52.16                 | 4.93          | 6.66              | 2.15            | -52.58         | -13.00      | 39.58       | H            |
| 3512.02         | -56.44                 | 5.54          | 8.22              | 2.15            | -55.91         | -13.00      | 42.91       | H            |
| 4193.02         | -55.14                 | 6.19          | 9.09              | 2.15            | -54.39         | -13.00      | 41.39       | V            |
| 4911.01         | -55.09                 | 6.73          | 9.81              | 2.15            | -54.16         | -13.00      | 41.16       | H            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1407.01         | -58.81                 | 3.24          | 5.02              | 2.15            | -59.18         | -13.00      | 46.18       | V            |
| 2129.00         | -55.50                 | 4.22          | 4.99              | 2.15            | -56.88         | -13.00      | 43.88       | V            |
| 2815.00         | -52.49                 | 4.93          | 6.67              | 2.15            | -52.90         | -13.00      | 39.90       | H            |
| 3544.02         | -56.10                 | 5.76          | 8.26              | 2.15            | -55.75         | -13.00      | 42.75       | V            |
| 4254.02         | -55.70                 | 6.24          | 9.15              | 2.15            | -54.94         | -13.00      | 41.94       | H            |
| 4957.01         | -55.79                 | 6.68          | 9.86              | 2.15            | -54.76         | -13.00      | 41.76       | V            |

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

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1429.01         | -53.29                 | 3.27          | 5.13              | 2.15            | -53.58         | -13.00      | 40.58       | V            |
| 2139.00         | -55.77                 | 4.23          | 5.02              | 2.15            | -57.13         | -13.00      | 44.13       | V            |
| 2876.00         | -52.35                 | 4.97          | 6.78              | 2.15            | -52.69         | -13.00      | 39.69       | V            |
| 3577.02         | -54.95                 | 6.10          | 8.31              | 2.15            | -54.89         | -13.00      | 41.89       | V            |
| 4297.02         | -55.40                 | 6.20          | 9.20              | 2.15            | -54.55         | -13.00      | 41.55       | H            |
| 5008.01         | -55.96                 | 6.59          | 9.91              | 2.15            | -54.79         | -13.00      | 41.79       | V            |

### LTE Band 14, 5 MHz, QPSK, Channel 23305

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1581.01         | -61.05                 | 3.50          | 5.35              | 2.15            | -61.35         | -13.00      | 48.35       | V            |
| 2383.00         | -53.35                 | 4.50          | 5.75              | 2.15            | -54.25         | -13.00      | 41.25       | V            |
| 3148.02         | -54.41                 | 5.37          | 7.36              | 2.15            | -54.57         | -13.00      | 41.57       | H            |
| 3954.02         | -55.63                 | 6.10          | 8.84              | 2.15            | -55.04         | -13.00      | 42.04       | H            |
| 4736.02         | -54.67                 | 6.55          | 9.64              | 2.15            | -53.73         | -13.00      | 40.73       | H            |
| 5522.01         | -55.10                 | 7.14          | 10.60             | 2.15            | -53.79         | -13.00      | 40.79       | H            |

### LTE Band 14, 5 MHz, QPSK, Channel 23330

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1595.01         | -61.43                 | 3.51          | 5.33              | 2.15            | -61.76         | -13.00      | 48.76       | V            |
| 2374.00         | -53.74                 | 4.49          | 5.72              | 2.15            | -54.66         | -13.00      | 41.66       | H            |
| 3170.02         | -54.76                 | 5.34          | 7.41              | 2.15            | -54.84         | -13.00      | 41.84       | V            |
| 3958.02         | -55.91                 | 6.10          | 8.84              | 2.15            | -55.32         | -13.00      | 42.32       | H            |
| 4770.01         | -55.27                 | 6.61          | 9.67              | 2.15            | -54.36         | -13.00      | 41.36       | V            |
| 5561.01         | -55.43                 | 7.19          | 10.59             | 2.15            | -54.18         | -13.00      | 41.18       | H            |

### LTE Band 14, 5 MHz, QPSK, Channel 23355

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|----------------|-------------|-------------|--------------|
| 1580.01         | -61.11                 | 3.50          | 5.36              | 2.15            | -61.40         | -13.00      | 48.40       | V            |
| 2387.00         | -53.73                 | 4.50          | 5.76              | 2.15            | -54.62         | -13.00      | 41.62       | V            |
| 3184.02         | -54.99                 | 5.32          | 7.44              | 2.15            | -55.02         | -13.00      | 42.02       | H            |
| 3989.02         | -56.16                 | 6.08          | 8.88              | 2.15            | -55.51         | -13.00      | 42.51       | H            |
| 4761.01         | -55.97                 | 6.59          | 9.66              | 2.15            | -55.05         | -13.00      | 42.05       | H            |
| 5554.01         | -55.76                 | 7.19          | 10.59             | 2.15            | -54.51         | -13.00      | 41.51       | H            |

### LTE Band 30, 5 MHz, QPSK, Channel 27685

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | RMS EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|----------------|-------------|-------------|--------------|
| 4617.02         | -49.35                 | 6.45          | 9.52              | -46.28         | -40.00      | 6.28        | V            |
| 6928.01         | -62.53                 | 7.74          | 11.51             | -58.76         | -40.00      | 18.76       | H            |
| 9235.01         | -49.31                 | 9.01          | 13.24             | -45.08         | -40.00      | 5.08        | V            |
| 11547.01        | -59.51                 | 9.81          | 13.09             | -56.23         | -40.00      | 16.23       | V            |
| 13852.01        | -50.36                 | 10.71         | 14.41             | -46.66         | -40.00      | 6.66        | V            |
| 16148.00        | -53.71                 | 11.79         | 13.67             | -51.83         | -40.00      | 11.83       | H            |

### LTE Band 30, 5 MHz, QPSK, Channel 27710

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | RMS EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|----------------|-------------|-------------|--------------|
| 4623.02         | -50.47                 | 6.45          | 9.52              | -47.40         | -40.00      | 7.40        | V            |
| 6935.01         | -61.91                 | 7.80          | 11.52             | -58.19         | -40.00      | 18.19       | V            |
| 9246.01         | -50.12                 | 9.03          | 13.25             | -45.90         | -40.00      | 5.90        | V            |
| 11560.01        | -59.20                 | 9.80          | 13.09             | -55.91         | -40.00      | 15.91       | V            |
| 13866.01        | -51.02                 | 10.74         | 14.42             | -47.34         | -40.00      | 7.34        | V            |
| 16157.00        | -53.44                 | 11.78         | 13.67             | -51.55         | -40.00      | 11.55       | H            |

### LTE Band 30, 5 MHz, QPSK, Channel 27735

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | RMS EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|----------------|-------------|-------------|--------------|
| 4627.02         | -51.05                 | 6.45          | 9.53              | -47.97         | -40.00      | 7.97        | V            |
| 6944.01         | -60.38                 | 7.87          | 11.53             | -56.72         | -40.00      | 16.72       | V            |
| 9255.01         | -49.25                 | 9.05          | 13.25             | -45.05         | -40.00      | 5.05        | V            |
| 11567.01        | -58.84                 | 9.80          | 13.09             | -55.55         | -40.00      | 15.55       | V            |
| 13879.01        | -51.64                 | 10.76         | 14.43             | -47.97         | -40.00      | 7.97        | V            |
| 16194.00        | -53.72                 | 11.74         | 13.66             | -51.80         | -40.00      | 11.80       | H            |

### LTE Band 41, 5MHz, QPSK, Channel 39675

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 5000.02         | -53.09                 | 6.60          | 9.90              | -49.79          | -25.00      | 24.79       | V            |
| 7499.01         | -54.03                 | 8.39          | 12.20             | -50.22          | -25.00      | 25.22       | V            |
| 9997.01         | -49.74                 | 9.18          | 12.90             | -46.02          | -25.00      | 21.02       | V            |
| 12488.01        | -48.73                 | 10.21         | 13.20             | -45.74          | -25.00      | 20.74       | V            |
| 14987.00        | -46.31                 | 11.21         | 14.01             | -43.51          | -25.00      | 18.51       | V            |
| 17491.00        | -44.31                 | 12.70         | 14.88             | -42.13          | -25.00      | 17.13       | V            |

### LTE Band 41, 5MHz, QPSK, Channel 40620

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 6512.02         | -54.63                 | 7.51          | 11.01             | -51.13          | -25.00      | 26.13       | H            |
| 9099.01         | -53.53                 | 8.94          | 13.16             | -49.31          | -25.00      | 24.31       | V            |
| 11642.01        | -50.13                 | 9.72          | 13.07             | -46.78          | -25.00      | 21.78       | H            |
| 14281.00        | -46.22                 | 10.96         | 14.44             | -42.74          | -25.00      | 17.74       | V            |
| 15544.00        | -43.50                 | 11.51         | 13.70             | -41.31          | -25.00      | 16.31       | V            |
| 16859.00        | -42.05                 | 12.04         | 13.74             | -40.35          | -25.00      | 15.35       | H            |

### LTE Band 41, 5MHz, QPSK, Channel 41565

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 5381.02         | -54.72                 | 6.87          | 10.43             | -51.16          | -25.00      | 26.16       | H            |
| 8066.01         | -53.76                 | 8.32          | 12.65             | -49.43          | -25.00      | 24.43       | H            |
| 10769.01        | -51.37                 | 9.47          | 13.15             | -47.69          | -25.00      | 22.69       | H            |
| 13448.01        | -44.59                 | 10.60         | 14.13             | -41.06          | -25.00      | 16.06       | V            |
| 16148.00        | -42.85                 | 11.79         | 13.67             | -40.97          | -25.00      | 15.97       | H            |
| 17467.00        | -44.30                 | 12.65         | 14.83             | -42.12          | -25.00      | 17.12       | H            |

### LTE Band 66, 1.4MHz QPSK, Channel 131979

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 3422.02         | -48.14                 | 5.38          | 8.01              | -45.51          | -13.00      | 32.51       | V            |
| 5134.02         | -51.74                 | 6.86          | 10.09             | -48.51          | -13.00      | 35.51       | V            |
| 6845.01         | -33.26                 | 7.83          | 11.41             | -29.68          | -13.00      | 16.68       | V            |
| 8557.01         | -45.32                 | 8.57          | 13.01             | -40.88          | -13.00      | 27.88       | V            |
| 10308.01        | -52.25                 | 9.66          | 13.02             | -48.89          | -13.00      | 35.89       | H            |
| 13696.01        | -32.40                 | 10.61         | 14.32             | -28.69          | -13.00      | 15.69       | V            |

### LTE Band 66, 1.4MHz, QPSK, Channel 132322

| Frequency (MHz) | P <sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|------------------------|---------------|-------------------|-----------------|-------------|-------------|--------------|
| 3490.02         | -51.75                 | 5.50          | 8.18              | -49.07          | -13.00      | 36.07       | H            |
| 5240.02         | -56.11                 | 7.00          | 10.24             | -52.87          | -13.00      | 39.87       | H            |
| 6984.01         | -33.38                 | 8.17          | 11.58             | -29.97          | -13.00      | 16.97       | H            |
| 8729.01         | -50.27                 | 8.45          | 13.05             | -45.67          | -13.00      | 32.67       | H            |
| 10520.01        | -51.27                 | 9.58          | 13.10             | -47.75          | -13.00      | 34.75       | H            |
| 13976.01        | -34.43                 | 10.84         | 14.49             | -30.78          | -13.00      | 17.78       | H            |

**LTE Band 66, 1.4MHz, QPSK, Channel 132665**

| Frequency<br>(MHz) | P <sub>Mea</sub><br>(dBm) | Path<br>Loss(dB) | Antenna<br>Gain(dBi) | Peak EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Polarization |
|--------------------|---------------------------|------------------|----------------------|--------------------|----------------|----------------|--------------|
| 3559.02            | -49.33                    | 5.92             | 8.28                 | -46.97             | -13.00         | 33.97          | H            |
| 5343.02            | -49.60                    | 6.95             | 10.38                | -46.17             | -13.00         | 33.17          | H            |
| 7119.01            | -31.85                    | 8.16             | 11.74                | -28.27             | -13.00         | 15.27          | V            |
| 8900.01            | -45.62                    | 8.85             | 13.08                | -41.39             | -13.00         | 28.39          | V            |
| 12415.01           | -49.25                    | 10.40            | 13.17                | -46.48             | -13.00         | 33.48          | V            |
| 14253.00           | -33.75                    | 10.93            | 14.45                | -30.23             | -13.00         | 17.23          | V            |

Note: The maximum value of expanded measurement uncertainty for this test item is  $U = 5.16$  dB,  $k = 2$ .

## **A.3 FREQUENCY STABILITY**

### **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 and Anritsu MT8821C Radio Communication Analyzer.

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 or MT8821C, and in a simulated call on middle channel for LTE band 2,5,7,12,14,30,41,66, 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 center 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 -30°C to +50°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.

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.6VDC and 4.4VDC, with a nominal voltage of 3.85VDC. 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.

### A.3.2 Measurement results

#### LTE Band 2, 20MHz bandwidth QPSK (worst case of all bandwidths)

##### Frequency Error vs Temperature

| Temperature(°C) | Voltage(V) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|-----------------|------------|----------------------|----------------------|------------|----------------------|
| 20              | 3.85       | 1850.849             | 1909.151             |            |                      |
| 50              |            |                      |                      | -0.35      | 0.0002               |
| 40              |            |                      |                      | 9.57       | 0.0051               |
| 30              |            |                      |                      | 11.23      | 0.0060               |
| 10              |            |                      |                      | 11.04      | 0.0059               |
| 0               |            |                      |                      | -0.09      | 0.0000               |
| -10             |            |                      |                      | 9.27       | 0.0049               |
| -20             |            |                      |                      | 10.22      | 0.0054               |
| -10             |            |                      |                      | 10.00      | 0.0053               |

##### Frequency Error vs Voltage

| Voltage(V) | Temperature(°C) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|------------|-----------------|----------------------|----------------------|------------|----------------------|
| 3.6        | 20              | 1850.849             | 1909.151             | 10.42      | 0.0055               |
| 4.4        |                 |                      |                      | -7.53      | 0.0040               |

#### LTE Band 5, 10MHz bandwidth QPSK (worst case of all bandwidths)

##### Frequency Error vs Temperature

| Temperature(°C) | Voltage(V) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|-----------------|------------|----------------------|----------------------|------------|----------------------|
| 20              | 3.85       | 824.433              | 848.583              |            |                      |
| 50              |            |                      |                      | -1.30      | 0.0016               |
| 40              |            |                      |                      | -0.82      | 0.0010               |
| 30              |            |                      |                      | -1.52      | 0.0018               |
| 10              |            |                      |                      | -2.03      | 0.0024               |
| 0               |            |                      |                      | -0.16      | 0.0002               |
| -10             |            |                      |                      | -1.42      | 0.0017               |
| -20             |            |                      |                      | -0.72      | 0.0009               |
| -10             |            |                      |                      | -0.20      | 0.0002               |

##### Frequency Error vs Voltage

| Voltage(V) | Temperature(°C) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|------------|-----------------|----------------------|----------------------|------------|----------------------|
| 3.6        | 20              | 824.433              | 848.583              | -0.83      | 0.0010               |
| 4.4        |                 |                      |                      | -1.12      | 0.0013               |

### LTE Band 7, 20MHz bandwidth QPSK (worst case of all bandwidths)

#### Frequency Error vs Temperature

| Temperature(°C) | Voltage(V) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|-----------------|------------|----------------------|----------------------|------------|----------------------|
| 20              | 3.85       | 2500.609             | 2569.327             |            |                      |
| 50              |            |                      |                      | 0.37       | 0.0002               |
| 40              |            |                      |                      | -3.21      | 0.0014               |
| 30              |            |                      |                      | -0.79      | 0.0003               |
| 10              |            |                      |                      | 1.51       | 0.0006               |
| 0               |            |                      |                      | -2.26      | 0.0010               |
| -10             |            |                      |                      | -0.89      | 0.0004               |
| -20             |            |                      |                      | 0.38       | 0.0002               |
| -10             |            |                      |                      | 0.43       | 0.0002               |

#### Frequency Error vs Voltage

| Voltage(V) | Temperature(°C) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|------------|-----------------|----------------------|----------------------|------------|----------------------|
| 3.6        | 20              | 2500.609             | 2569.327             | -1.58      | 0.0007               |
| 4.4        |                 |                      |                      | -1.01      | 0.0004               |

### LTE Band 12, 10MHz bandwidth QPSK (worst case of all bandwidths)

#### Frequency Error vs Temperature

| Temperature(°C) | Voltage(V) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|-----------------|------------|----------------------|----------------------|------------|----------------------|
| 20              | 3.85       | 699.481              | 715.519              |            |                      |
| 50              |            |                      |                      | 7.37       | 0.0104               |
| 40              |            |                      |                      | 0.89       | 0.0013               |
| 30              |            |                      |                      | 1.02       | 0.0014               |
| 10              |            |                      |                      | -0.24      | 0.0003               |
| 0               |            |                      |                      | 2.79       | 0.0039               |
| -10             |            |                      |                      | 7.93       | 0.0112               |
| -20             |            |                      |                      | 7.39       | 0.0104               |
| -10             |            |                      |                      | 1.28       | 0.0018               |

#### Frequency Error vs Voltage

| Voltage(V) | Temperature(°C) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|------------|-----------------|----------------------|----------------------|------------|----------------------|
| 3.6        | 20              | 699.481              | 715.519              | 7.67       | 0.0108               |
| 4.4        |                 |                      |                      | -0.71      | 0.0010               |

# **LTE Band 14, 10MHz bandwidth QPSK (worst case of all bandwidths)**

## **Frequency Error vs Temperature**

| Temperature(°C) | Voltage(V) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|-----------------|------------|----------------------|----------------------|------------|----------------------|
| 20              | 3.85       | 788.433              | 797.583              |            |                      |
| 50              |            |                      |                      | -0.85      | 0.0011               |
| 40              |            |                      |                      | 0.43       | 0.0005               |
| 30              |            |                      |                      | -0.45      | 0.0006               |
| 10              |            |                      |                      | 1.24       | 0.0016               |
| 0               |            |                      |                      | 5.48       | 0.0069               |
| -10             |            |                      |                      | 0.50       | 0.0006               |
| -20             |            |                      |                      | 6.05       | 0.0076               |
| -10             |            |                      |                      | 1.19       | 0.0015               |

## **Frequency Error vs Voltage**

| Voltage(V) | Temperature(°C) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|------------|-----------------|----------------------|----------------------|------------|----------------------|
| 3.6        | 20              | 788.433              | 797.583              | -0.30      | 0.0004               |
| 4.4        |                 |                      |                      | -0.97      | 0.0012               |

# **LTE Band 30, 10MHz bandwidth QPSK (worst case of all bandwidths)**

## **Frequency Error vs Temperature**

| Temperature(°C) | Voltage(V) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|-----------------|------------|----------------------|----------------------|------------|----------------------|
| 20              | 3.85       | 2305.433             | 2314.567             |            |                      |
| 50              |            |                      |                      | 0.35       | 0.0002               |
| 40              |            |                      |                      | 0.18       | 0.0001               |
| 30              |            |                      |                      | 0.75       | 0.0003               |
| 10              |            |                      |                      | 2.96       | 0.0013               |
| 0               |            |                      |                      | 0.85       | 0.0004               |
| -10             |            |                      |                      | 0.21       | 0.0001               |
| -20             |            |                      |                      | 1.44       | 0.0006               |
| -10             |            |                      |                      | 0.73       | 0.0003               |

## **Frequency Error vs Voltage**

| Voltage(V) | Temperature(°C) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|------------|-----------------|----------------------|----------------------|------------|----------------------|
| 3.6        | 20              | 2305.433             | 2314.567             | 0.78       | 0.0003               |
| 4.4        |                 |                      |                      | 2.07       | 0.0009               |

# **LTE Band 41, 20MHz bandwidth QPSK (worst case of all bandwidths)**

## **Frequency Error vs Temperature**

| Temperature(°C) | Voltage(V) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|-----------------|------------|----------------------|----------------------|------------|----------------------|
| 20              | 3.85       | 2496.256             | 2689.631             |            |                      |
| 50              |            |                      |                      | -1.32      | 0.0005               |
| 40              |            |                      |                      | -0.64      | 0.0002               |
| 30              |            |                      |                      | 1.79       | 0.0007               |
| 10              |            |                      |                      | -2.02      | 0.0008               |
| 0               |            |                      |                      | -2.09      | 0.0008               |
| -10             |            |                      |                      | 0.93       | 0.0004               |
| -20             |            |                      |                      | 3.32       | 0.0013               |
| -10             |            |                      |                      | -2.80      | 0.0011               |

## **Frequency Error vs Voltage**

| Voltage(V) | Temperature(°C) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|------------|-----------------|----------------------|----------------------|------------|----------------------|
| 3.6        | 20              | 2496.256             | 2689.631             | -1.32      | 0.0005               |
| 4.4        |                 |                      |                      | 1.79       | 0.0007               |

# **LTE Band 66, 20MHz bandwidth QPSK (worst case of all bandwidths)**

## **Frequency Error vs Temperature**

| Temperature(°C) | Voltage(V) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|-----------------|------------|----------------------|----------------------|------------|----------------------|
| 20              | 3.85       | 1710.849             | 1779.151             |            |                      |
| 50              |            |                      |                      | -0.81      | 0.0005               |
| 40              |            |                      |                      | 0.20       | 0.0001               |
| 30              |            |                      |                      | 0.50       | 0.0003               |
| 10              |            |                      |                      | -0.44      | 0.0003               |
| 0               |            |                      |                      | -0.83      | 0.0005               |
| -10             |            |                      |                      | -1.41      | 0.0008               |
| -20             |            |                      |                      | -0.58      | 0.0003               |
| -10             |            |                      |                      | -1.59      | 0.0009               |

## **Frequency Error vs Voltage**

| Voltage(V) | Temperature(°C) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Offset(Hz) | Frequency error(ppm) |
|------------|-----------------|----------------------|----------------------|------------|----------------------|
| 3.6        | 20              | 1710.849             | 1779.151             | -0.81      | 0.0005               |
| 4.4        |                 |                      |                      | 0.50       | 0.0003               |

## **A.4 OCCUPIED BANDWIDTH**

### **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 frequency. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

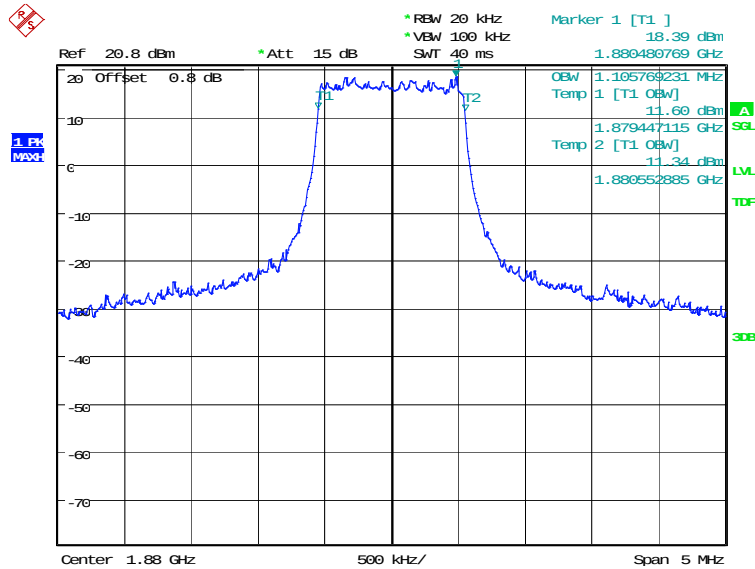
The measurement method is from ANSI C63.26:

- 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.
- b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set  $\geq 3 \times \text{RBW}$ .
- c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
- d) Set the detection mode to peak, and the trace mode to max-hold.

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

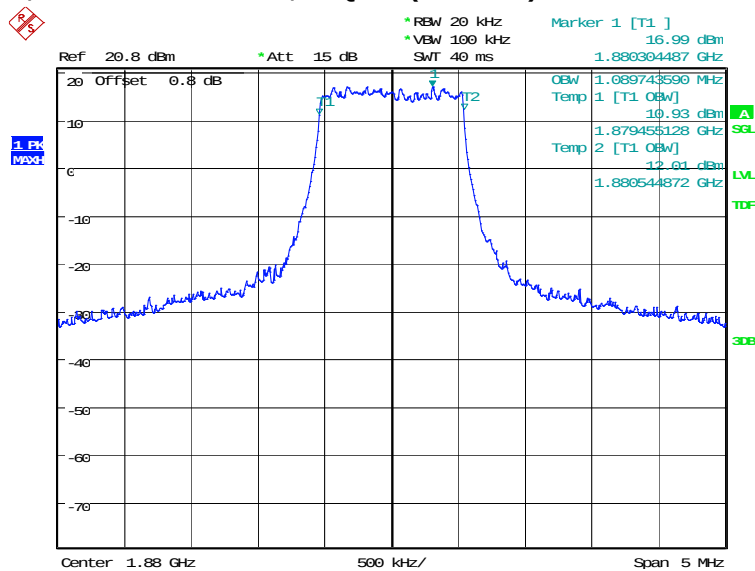
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 1880.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 1105.77                        | 1089.74 | 1089.74 |

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



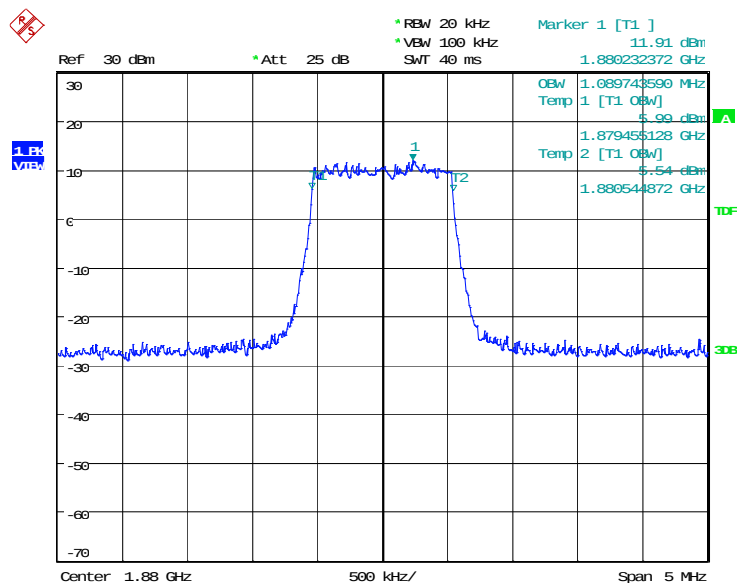
Date: 26.MAR.2020 11:36:35

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



Date: 26.MAR.2020 11:38:00

### LTE band 2, 1.4MHz Bandwidth, 64QAM (99% BW)

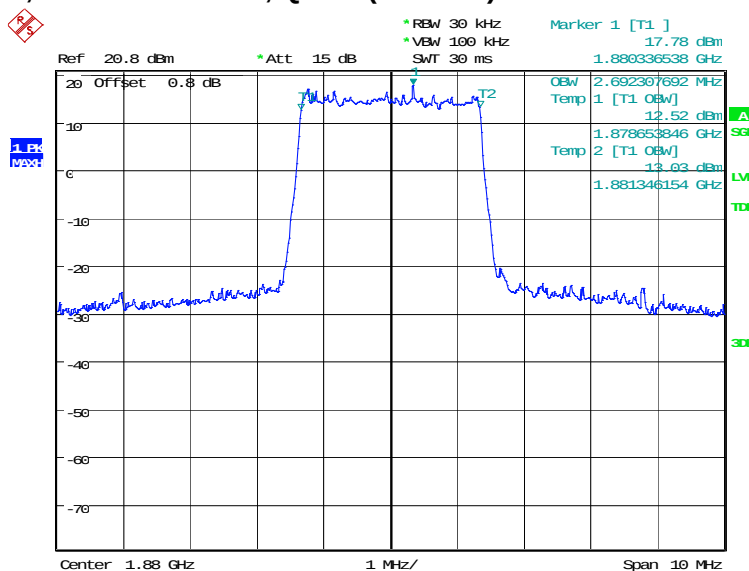


Date: 28.MAR.2020 09:13:17

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

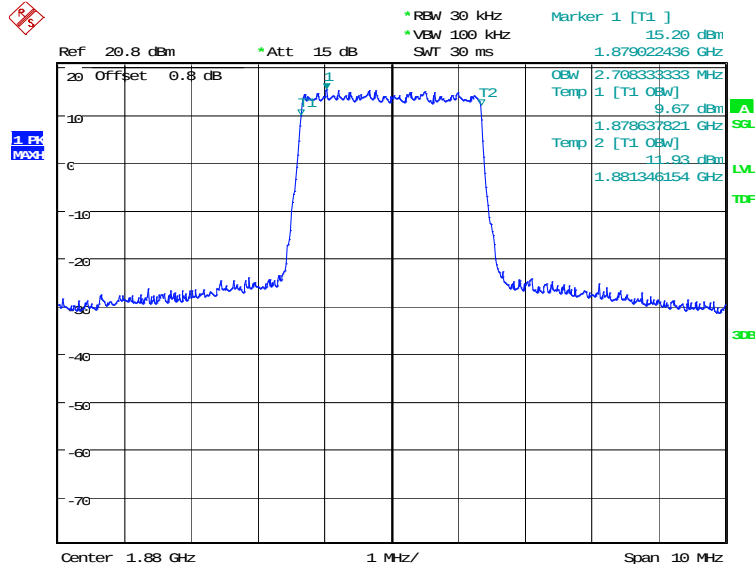
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 1880.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 2692.31                        | 2708.33 | 2692.31 |

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



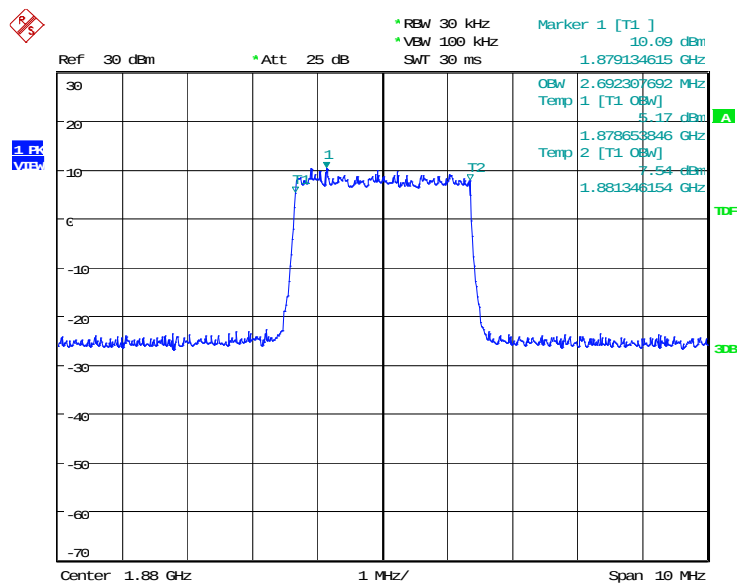
Date: 26.MAR.2020 11:39:26

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



Date: 26.MAR.2020 11:40:50

## LTE band 2, 3MHz Bandwidth, 64QAM (99% BW)

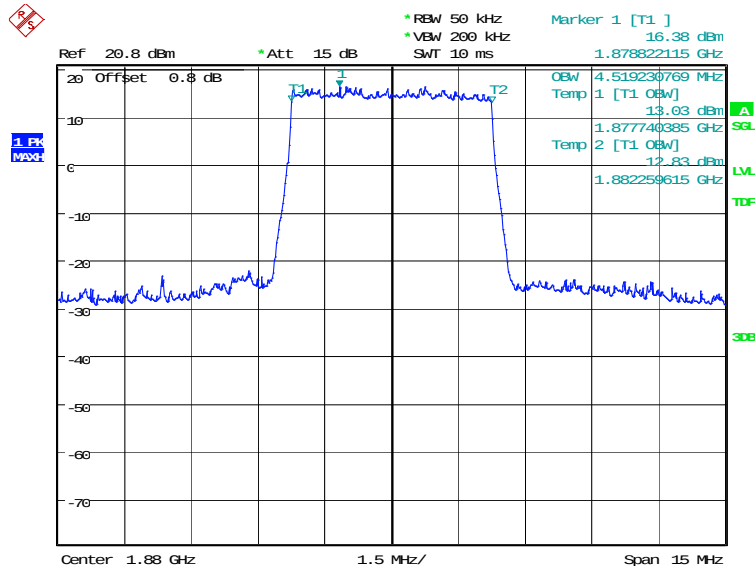


Date: 28.MAR.2020 09:17:44

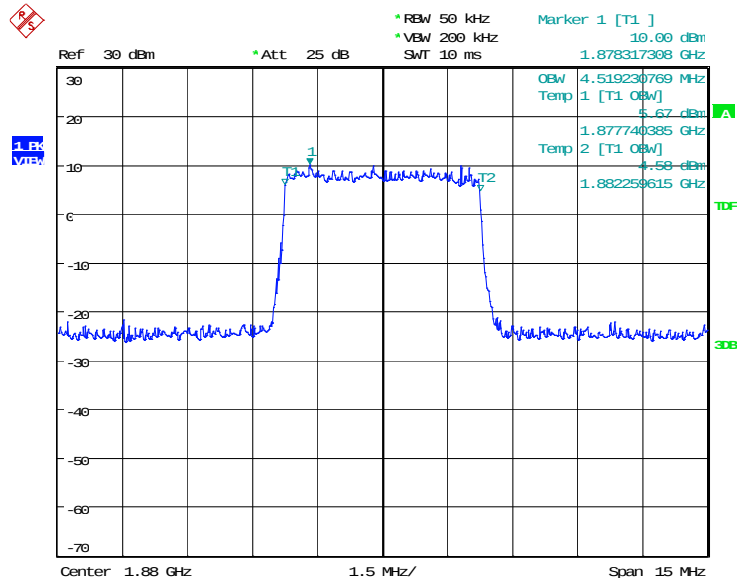
### LTE band 2, 5MHz (99%)

| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 1880.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 4519.23                        | 4519.23 | 4519.23 |

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



### LTE band 2, 5MHz Bandwidth,64QAM (99% BW)

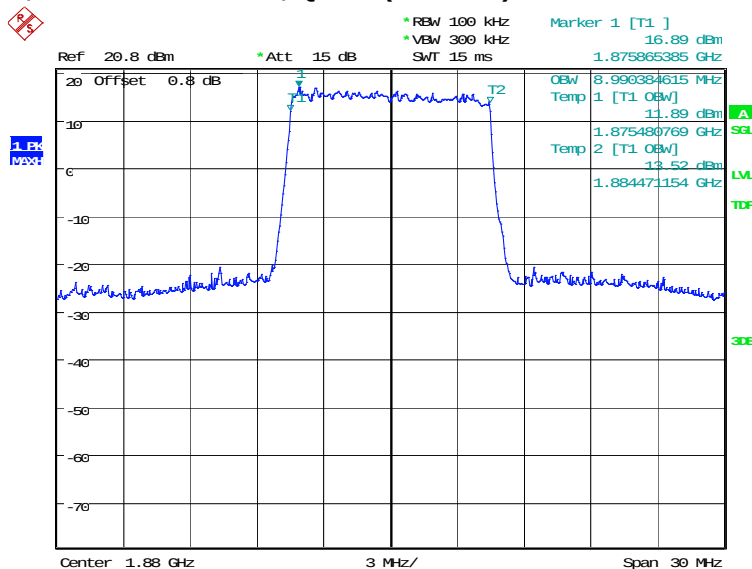


Date: 28.MAR.2020 09:19:12

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

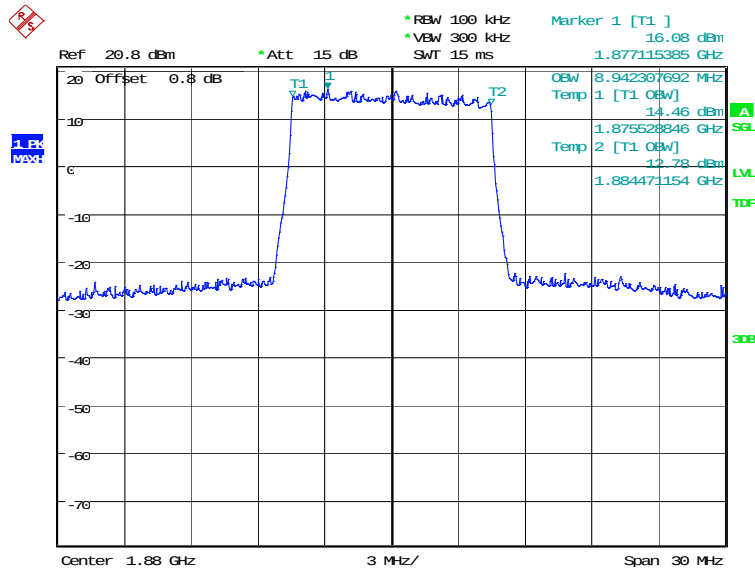
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 1880.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 8990.38                        | 8942.31 | 8990.38 |

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



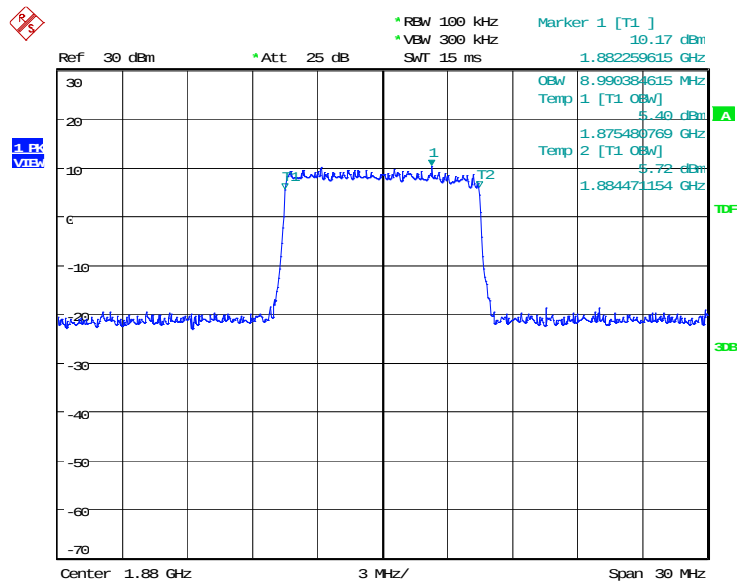
Date: 26.MAR.2020 11:45:06

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



Date: 26.MAR.2020 11:46:30

## LTE band 2, 10MHz Bandwidth, 64QAM (99% BW)

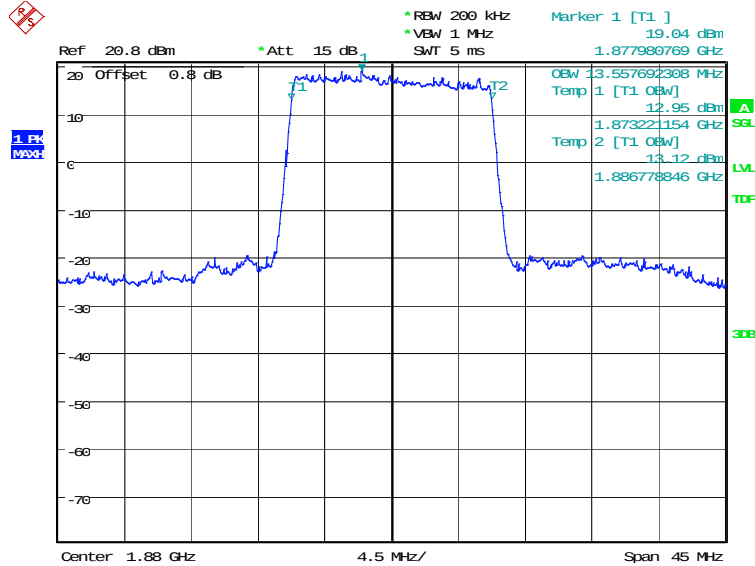


Date: 28.MAR.2020 09:21:39

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

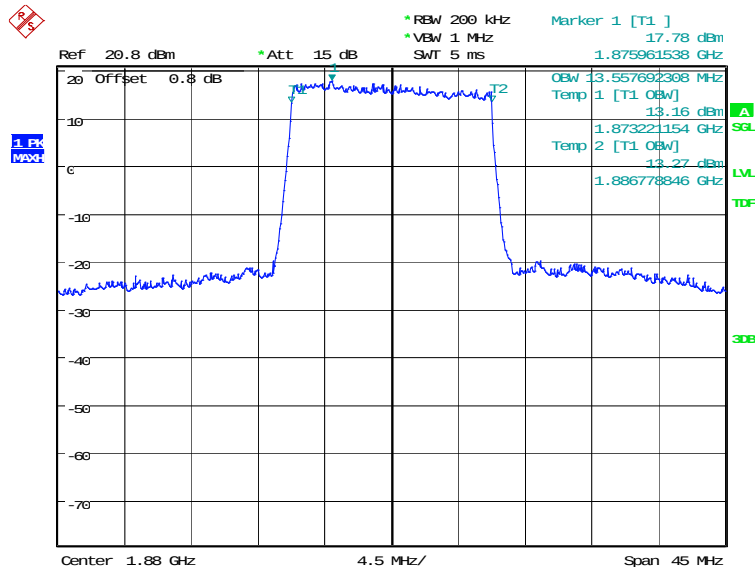
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |          |          |
|-----------------|--------------------------------|----------|----------|
| 1880.0          | QPSK                           | 16QAM    | 64QAM    |
|                 | 13557.69                       | 13557.69 | 13485.58 |

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



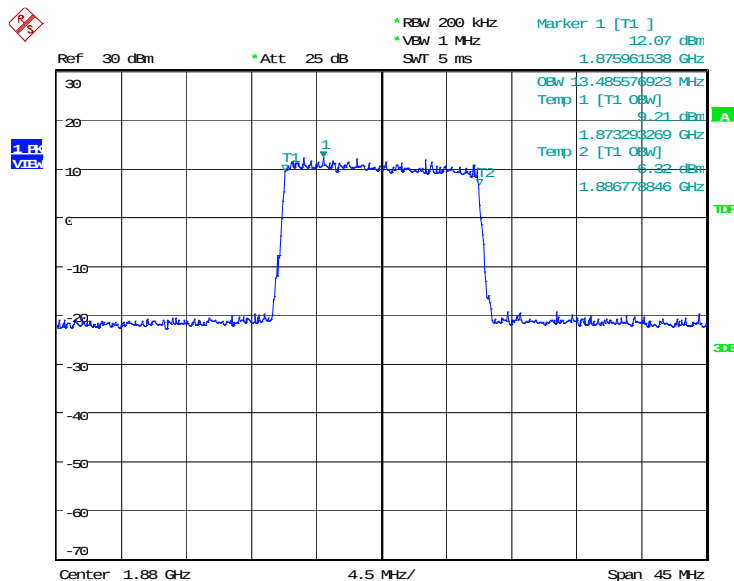
Date: 26.MAR.2020 11:47:56

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



Date: 26.MAR.2020 11:49:21

### LTE band 2, 15MHz Bandwidth, 64QAM (99% BW)

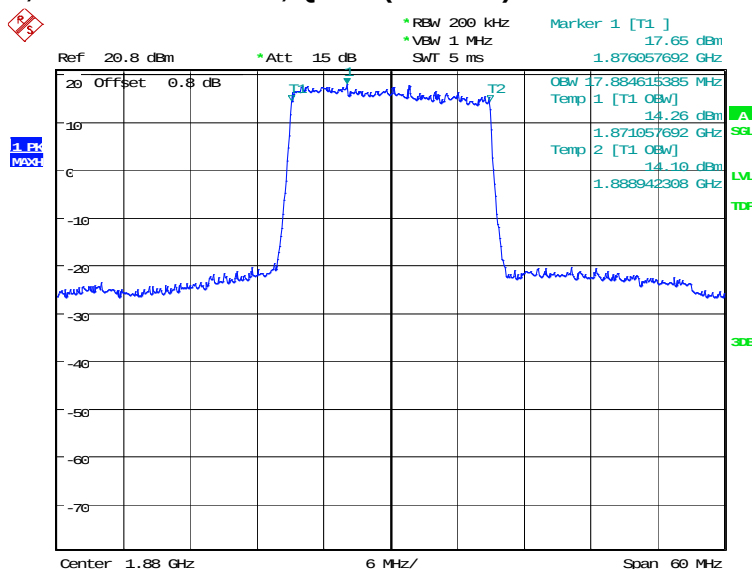


Date: 28.MAR.2020 09:23:14

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

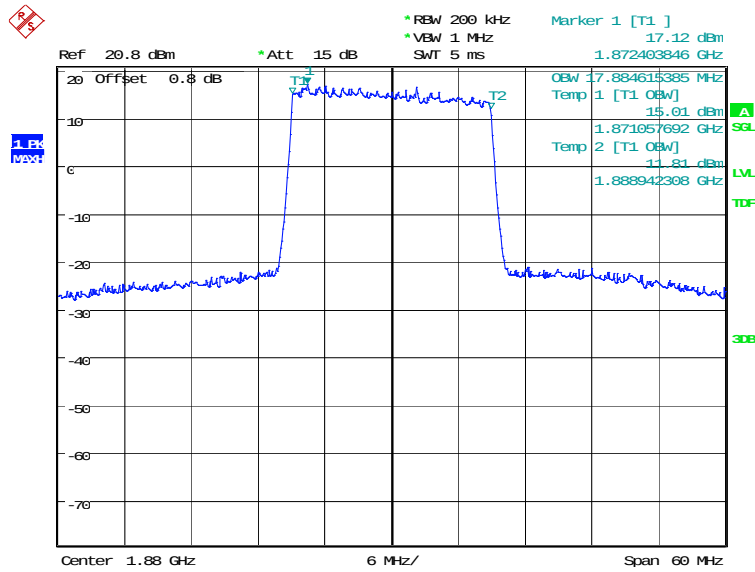
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |          |          |
|-----------------|--------------------------------|----------|----------|
| 1880.0          | QPSK                           | 16QAM    | 64QAM    |
|                 | 17884.62                       | 17884.62 | 17884.62 |

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



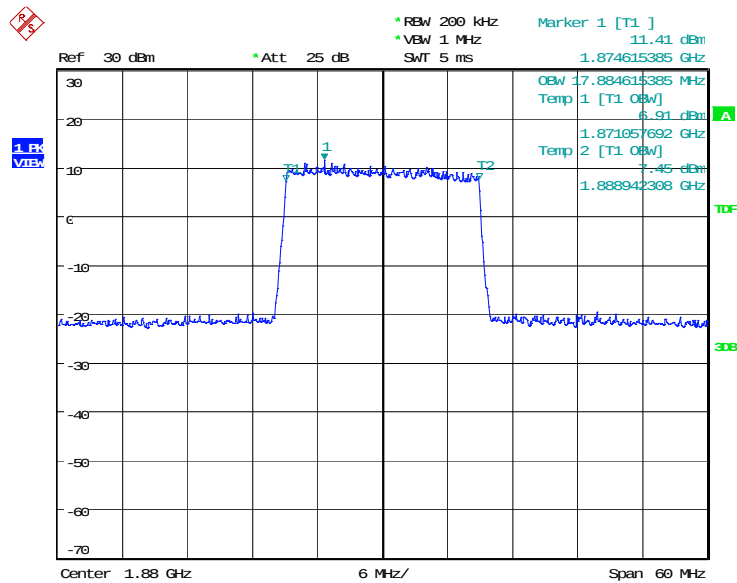
Date: 26.MAR.2020 11:50:46

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



Date: 26.MAR.2020 11:52:11

### LTE band 2, 20MHz Bandwidth, 64QAM (99% BW)

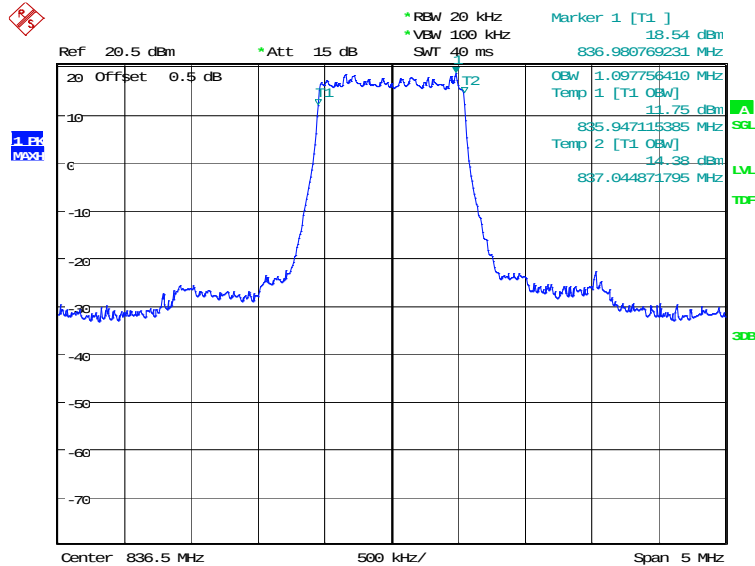


Date: 28.MAR.2020 09:24:51

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

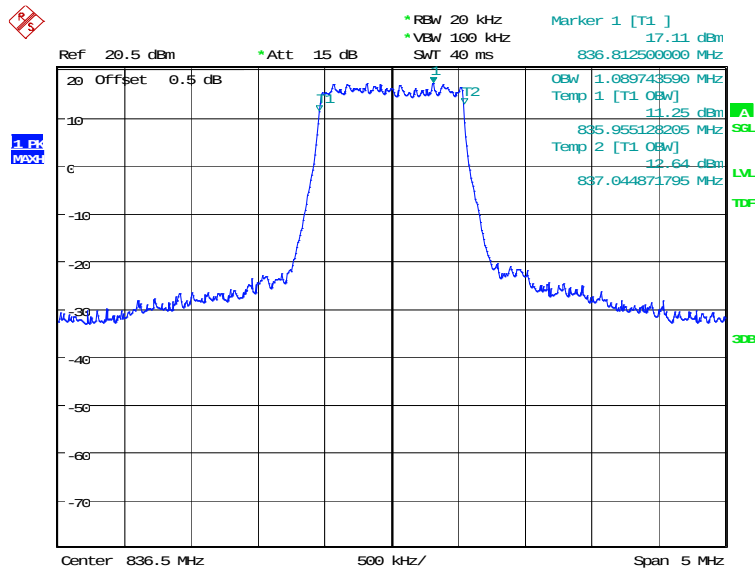
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 836.5           | QPSK                           | 16QAM   | 64QAM   |
|                 | 1097.76                        | 1089.74 | 1089.74 |

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



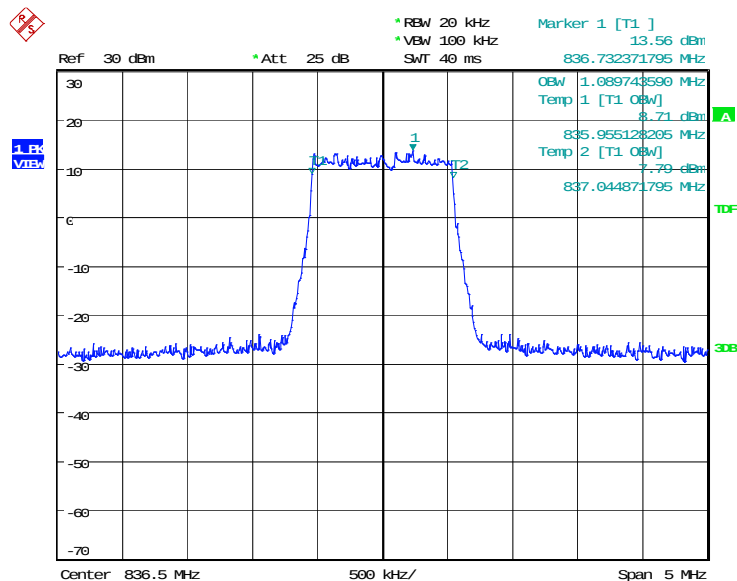
Date: 25.MAR.2020 18:06:10

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



Date: 25.MAR.2020 18:07:34

### LTE band 5, 1.4MHz Bandwidth, 64QAM (99% BW)

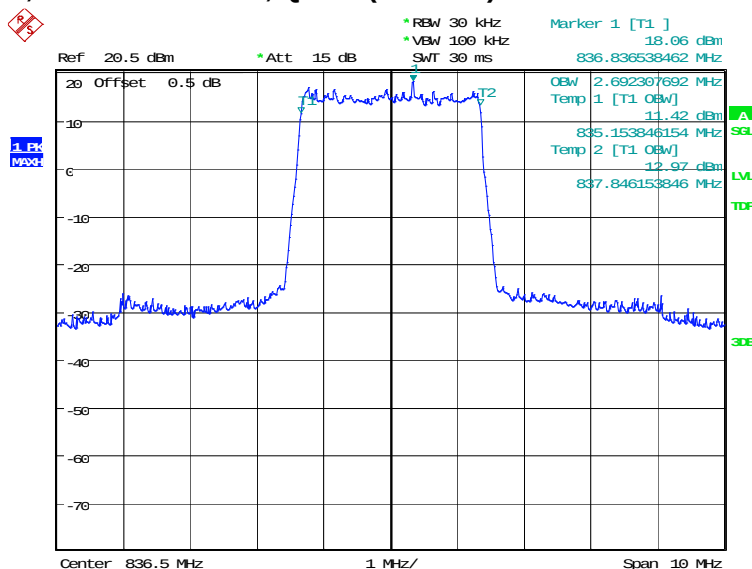


Date: 28.MAR.2020 09:45:10

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

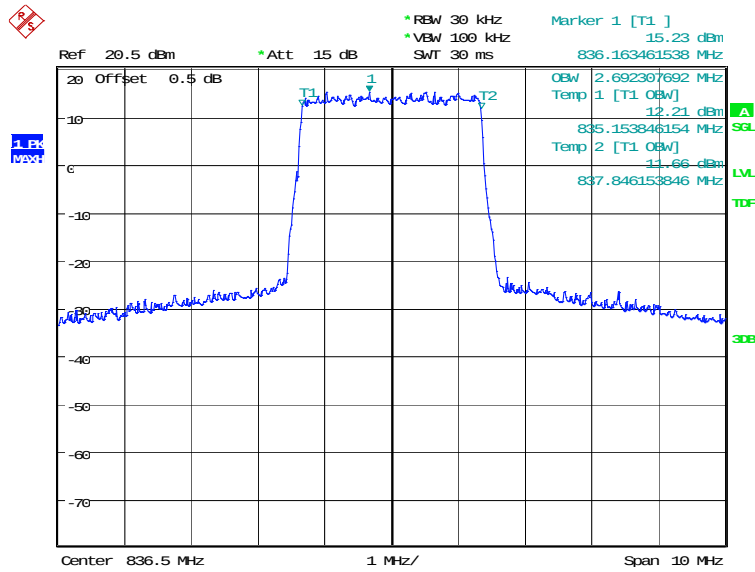
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 836.5           | QPSK                           | 16QAM   | 64QAM   |
|                 | 2692.31                        | 2692.31 | 2692.31 |

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



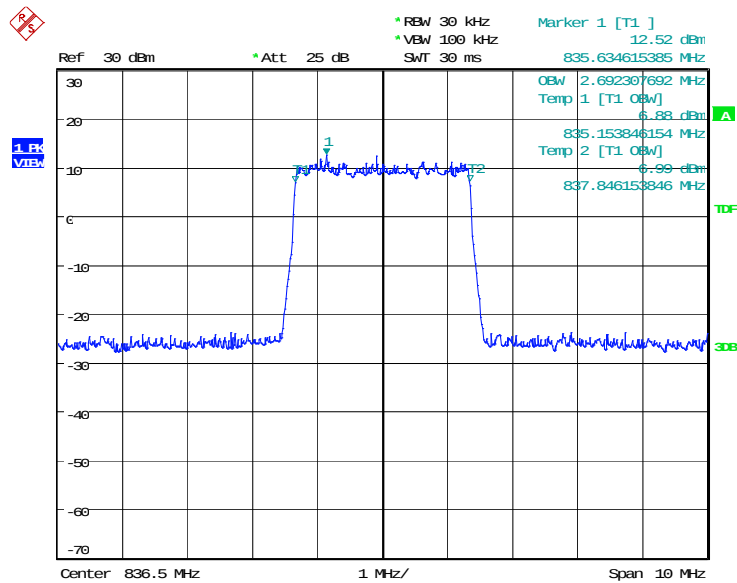
Date: 25.MAR.2020 18:09:00

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



Date: 25.MAR.2020 18:10:25

### LTE band 5, 3MHz Bandwidth, 64QAM (99% BW)

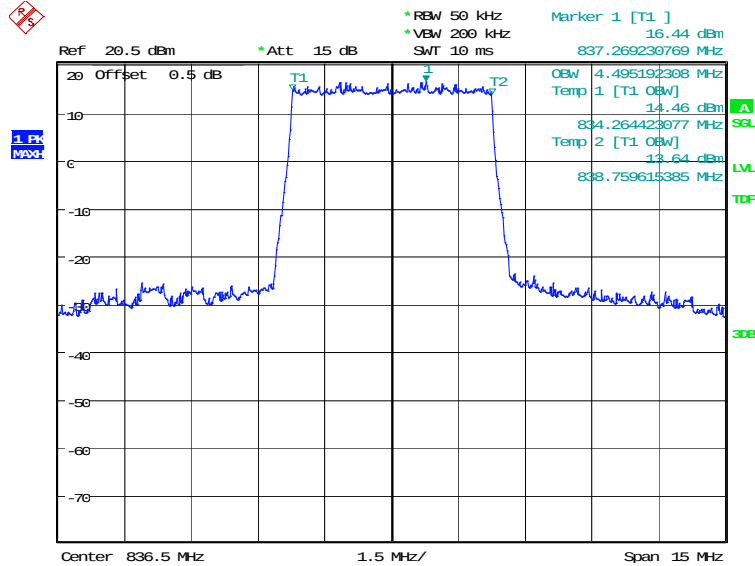


Date: 28.MAR.2020 09:46:38

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

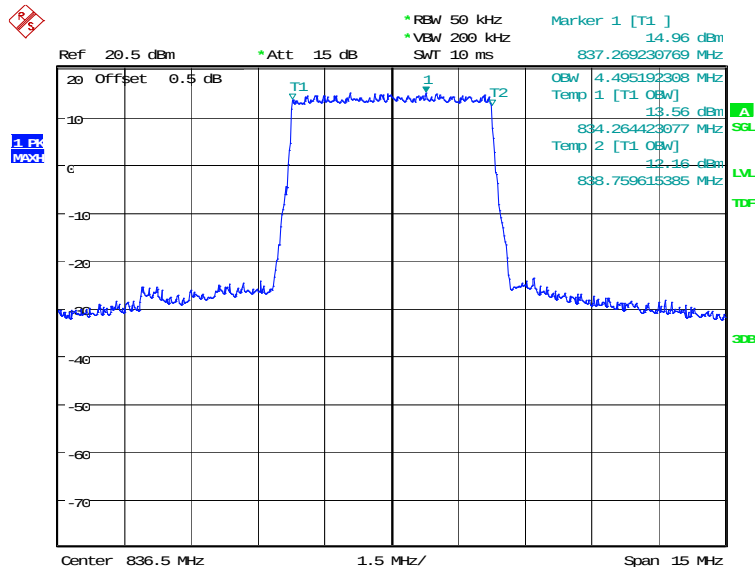
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 836.5           | QPSK                           | 16QAM   | 64QAM   |
|                 | 4495.19                        | 4495.19 | 4495.19 |

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



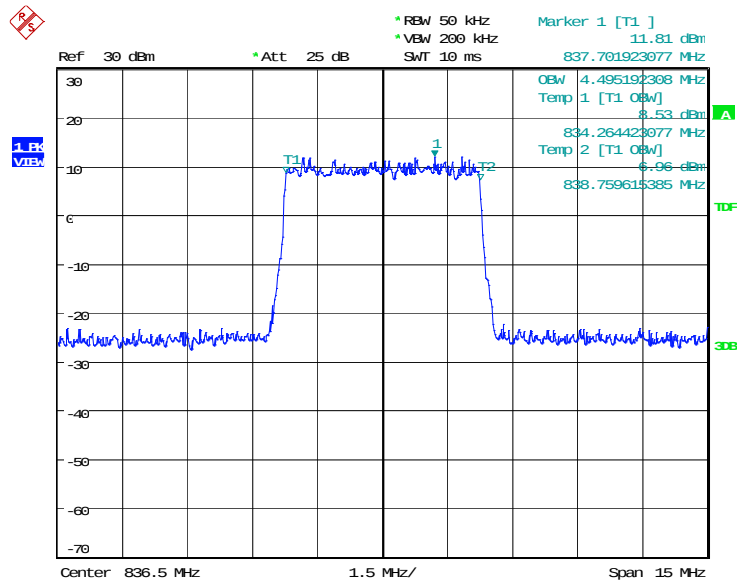
Date: 25.MAR.2020 18:11:51

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



Date: 25.MAR.2020 18:13:15

### LTE band 5, 5MHz Bandwidth, 64QAM (99% BW)

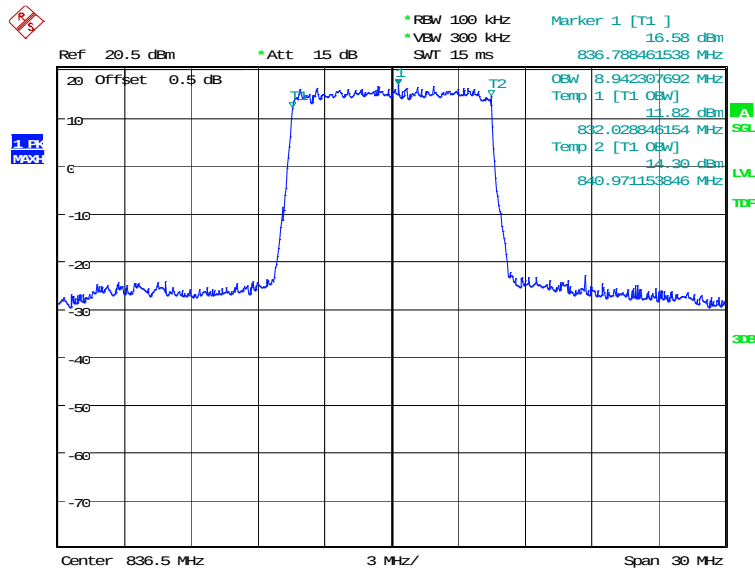


Date: 28.MAR.2020 09:48:26

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

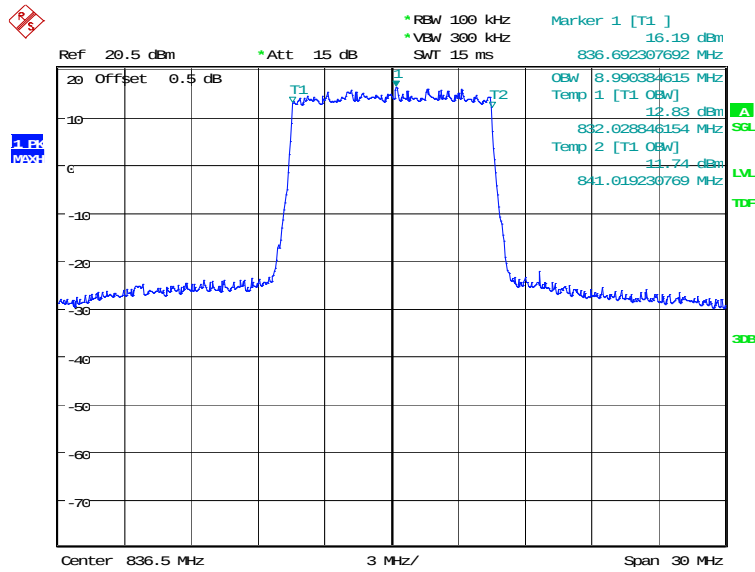
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 836.5           | QPSK                           | 16QAM   | 64QAM   |
|                 | 8942.31                        | 8990.38 | 8990.38 |

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



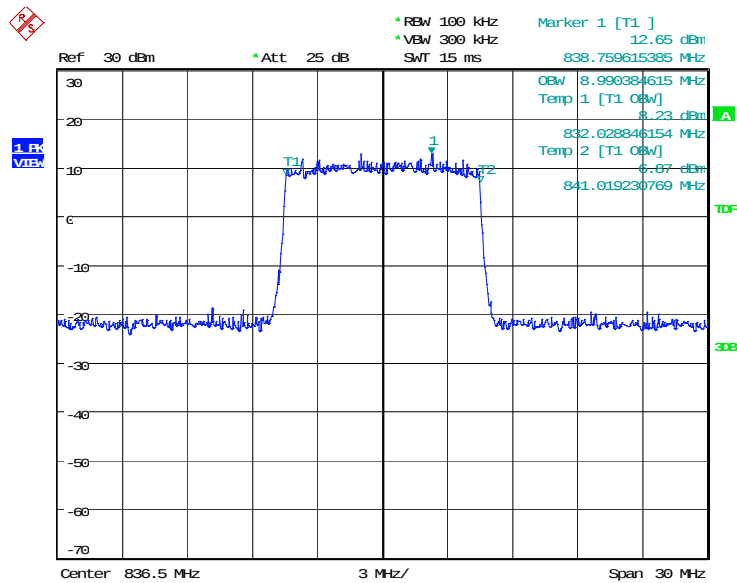
Date: 25.MAR.2020 18:14:41

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



Date: 25.MAR.2020 18:16:06

### LTE band 5, 10MHz Bandwidth, 64QAM (99% BW)

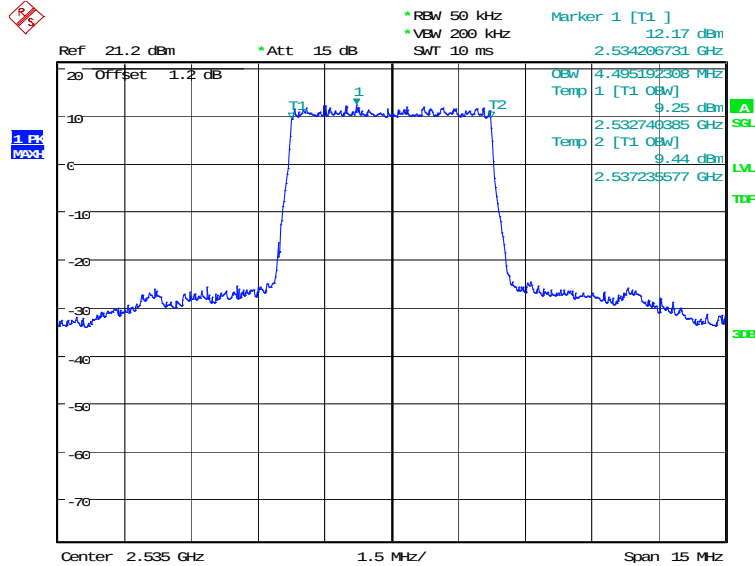


Date: 28.MAR.2020 09:49:47

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

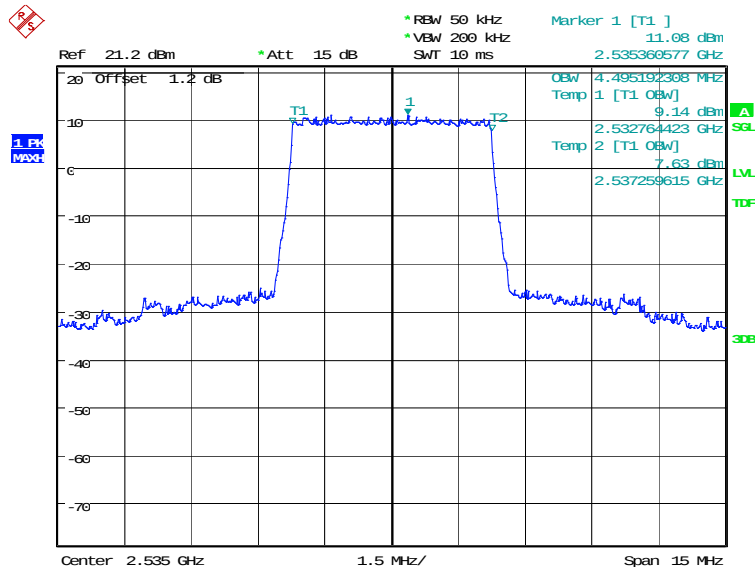
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 2535.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 4495.19                        | 4495.19 | 4519.23 |

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



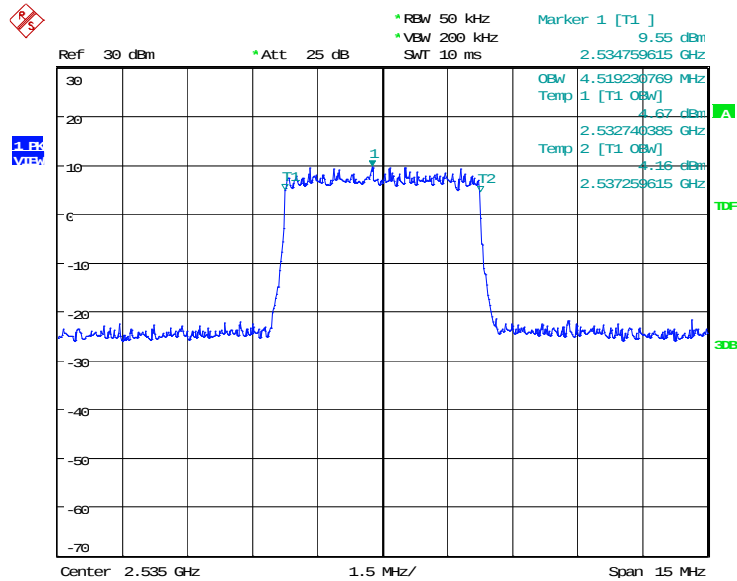
Date: 25.MAR.2020 18:17:33

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



Date: 25.MAR.2020 18:18:58

### LTE band 7, 5MHz Bandwidth, 64QAM (99% BW)

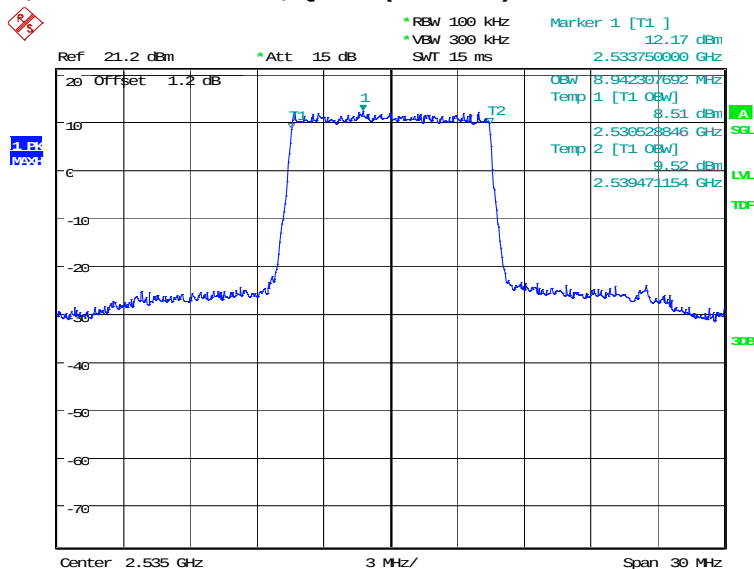


Date: 28.MAR.2020 09:55:27

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

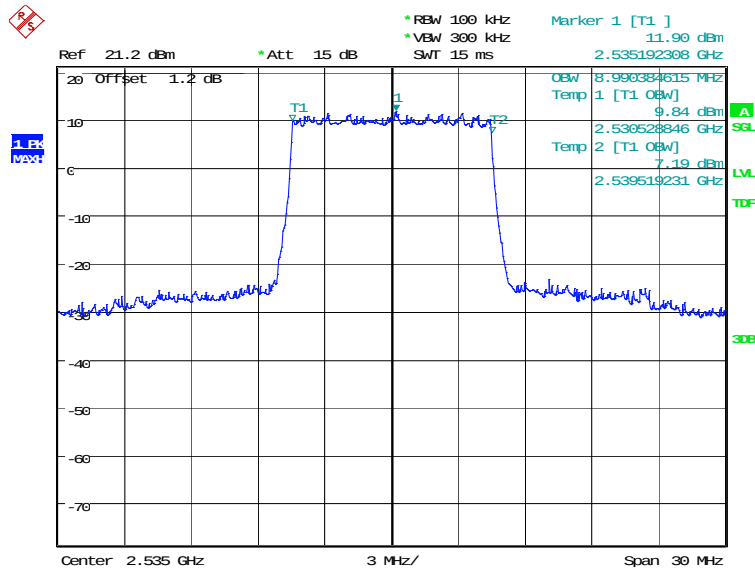
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 2535.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 8942.31                        | 8990.38 | 8990.38 |

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



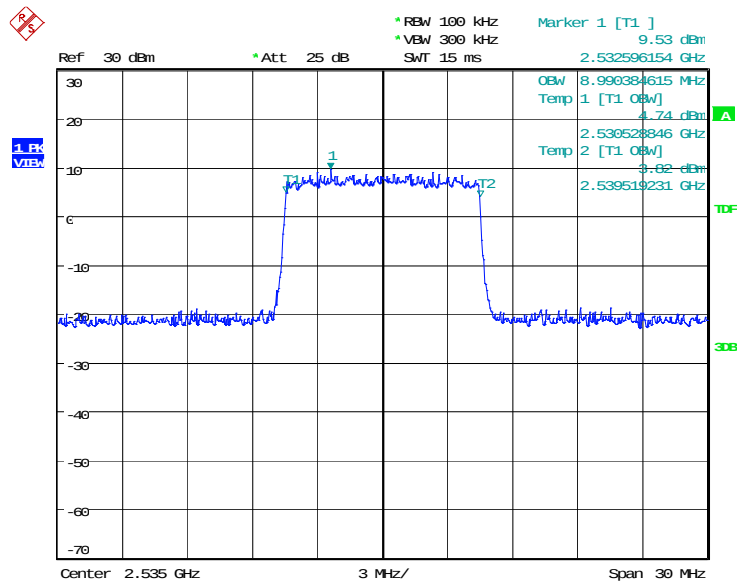
Date: 25.MAR.2020 18:20:24

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



Date: 25.MAR.2020 18:21:48

### LTE band 7, 10MHz Bandwidth, 64QAM (99% BW)

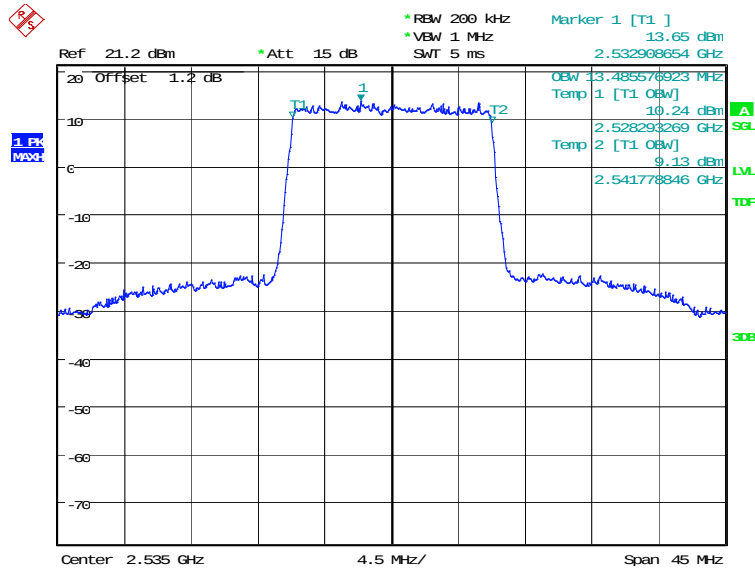


Date: 28.MAR.2020 09:56:42

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

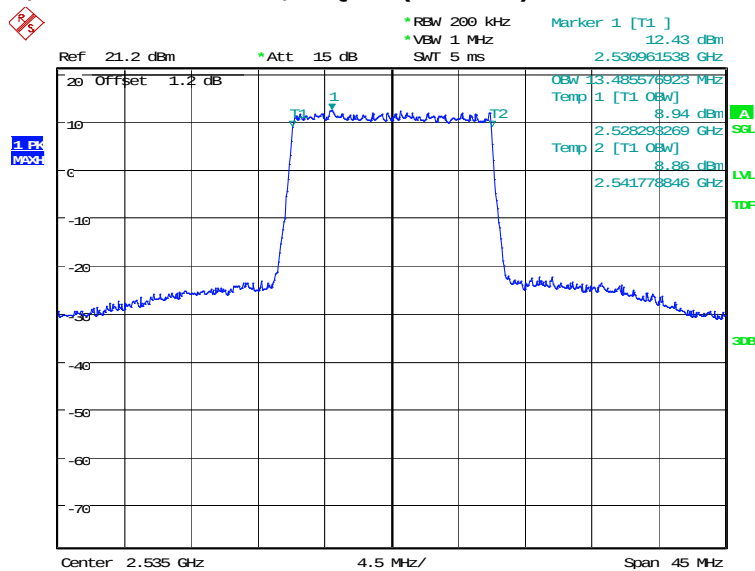
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |          |          |
|-----------------|--------------------------------|----------|----------|
| 2535.0          | QPSK                           | 16QAM    | 64QAM    |
|                 | 13485.58                       | 13485.58 | 13485.58 |

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



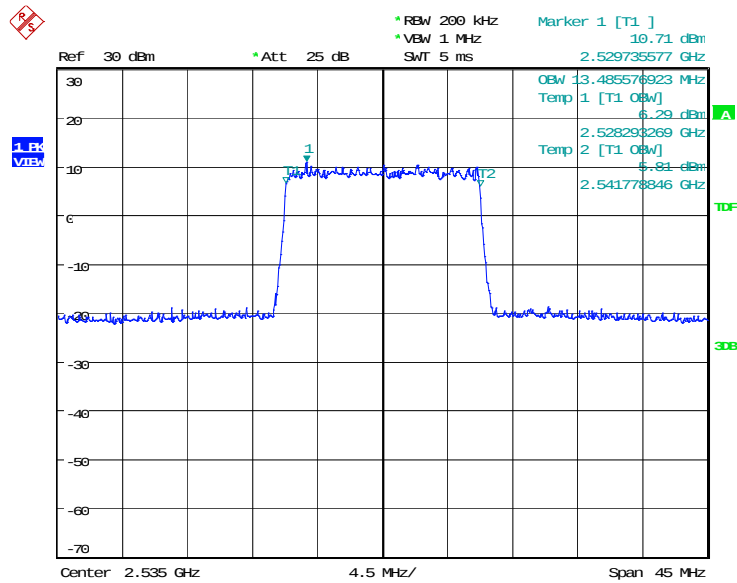
Date: 25.MAR.2020 18:23:14

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



Date: 25.MAR.2020 18:24:39

### LTE band 7, 15MHz Bandwidth, 64QAM (99% BW)

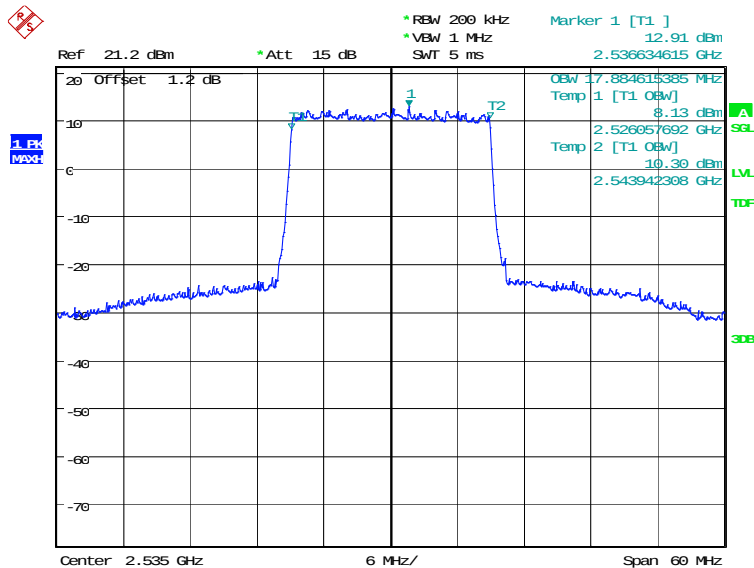


Date: 28.MAR.2020 09:59:16

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

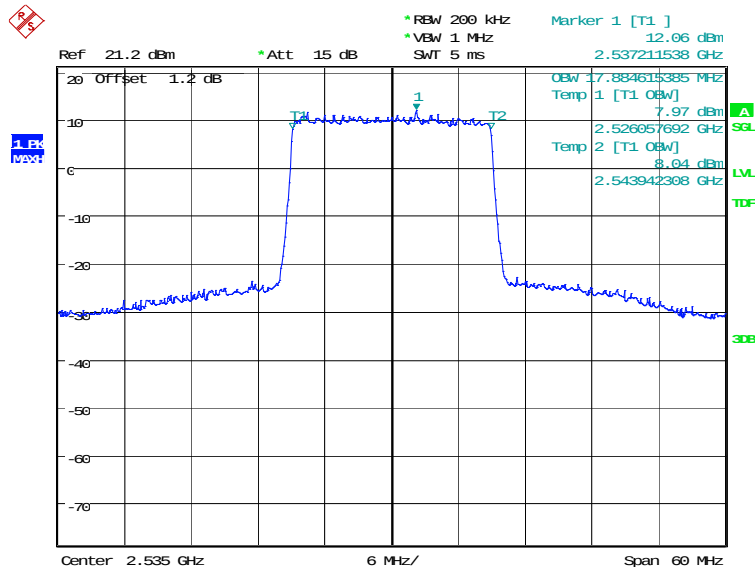
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |          |          |
|-----------------|--------------------------------|----------|----------|
| 2535.0          | QPSK                           | 16QAM    | 64QAM    |
|                 | 17884.62                       | 17884.62 | 17980.77 |

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



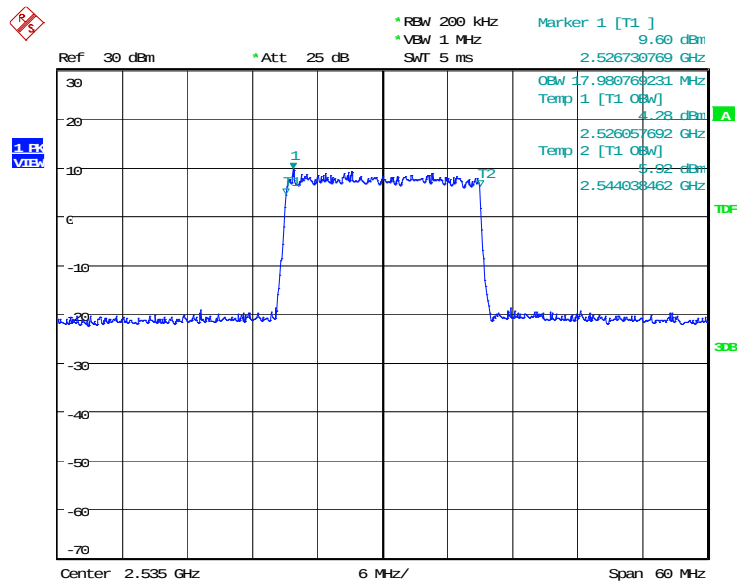
Date: 25.MAR.2020 18:26:05

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



Date: 25.MAR.2020 18:27:30

### LTE band 7, 20MHz Bandwidth, 64QAM (99% BW)

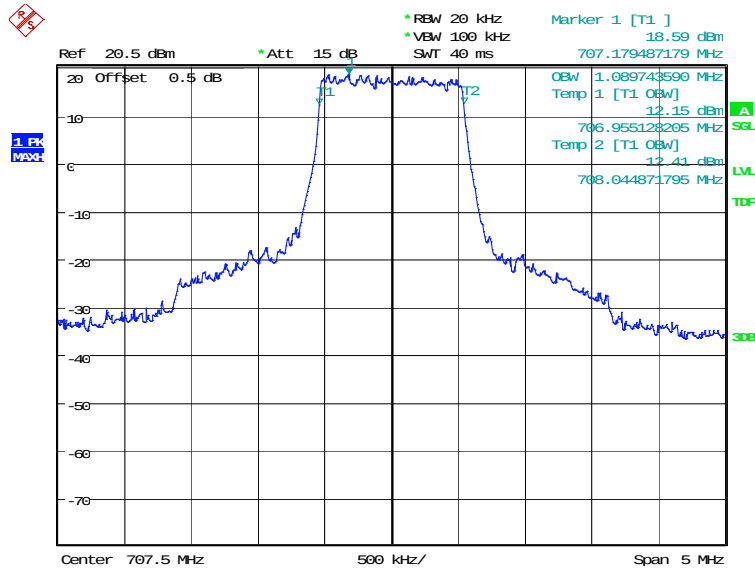


Date: 28.MAR.2020 10:01:59

### LTE band 12, 1.4MHz (99%)

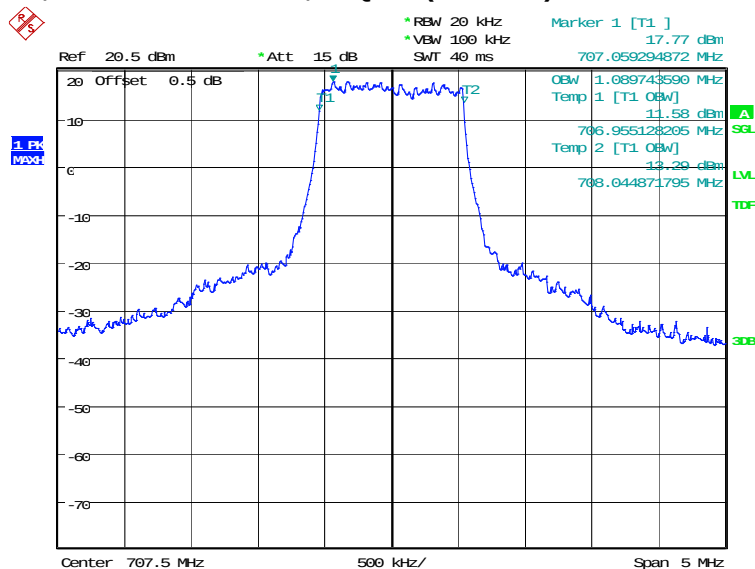
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 707.5           | QPSK                           | 16QAM   | 64QAM   |
|                 | 1089.74                        | 1089.74 | 1089.74 |

### LTE band 12, 1.4MHz Bandwidth, QPSK (99% BW)



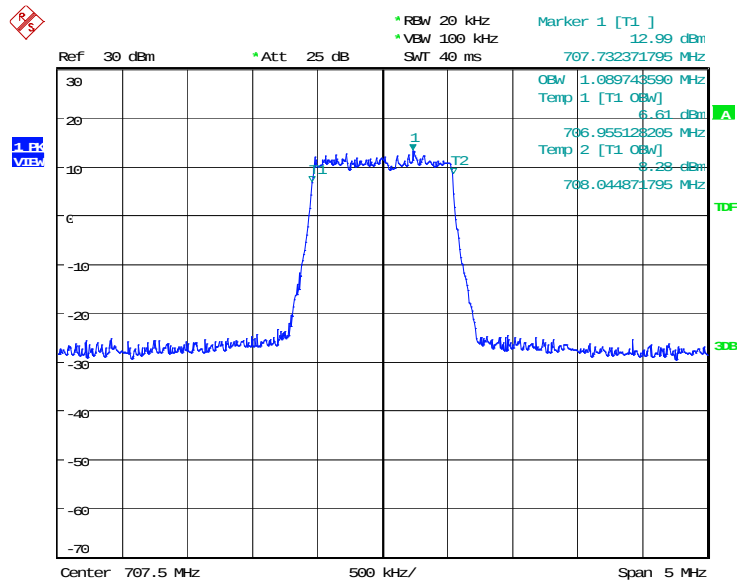
Date: 25.MAR.2020 18:29:49

### LTE band 12, 1.4MHz Bandwidth, 16QAM (99% BW)



Date: 25.MAR.2020 18:31:13

### LTE band 12, 1.4MHz Bandwidth, 64QAM (99% BW)

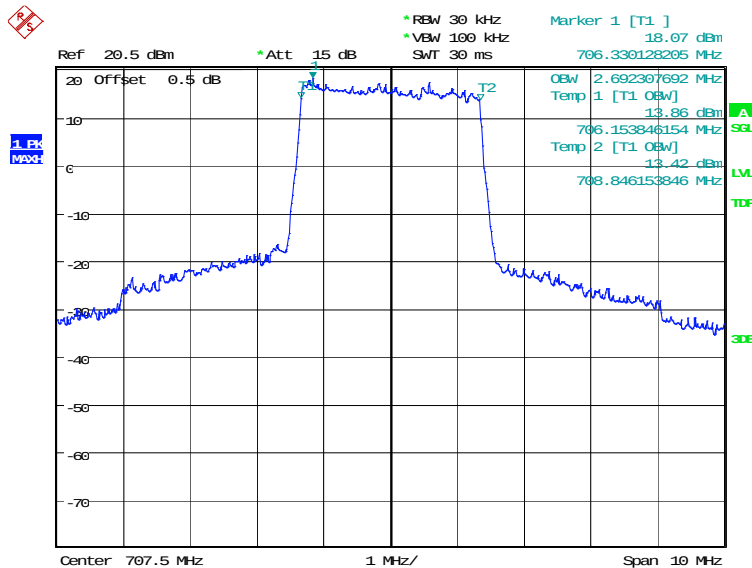


Date: 28.MAR.2020 10:11:13

### LTE band 12, 3MHz (99%)

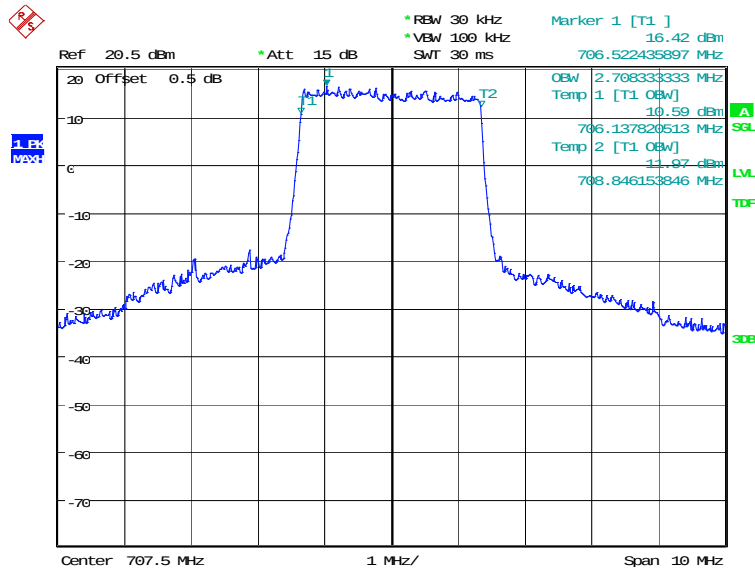
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 707.5           | QPSK                           | 16QAM   | 64QAM   |
|                 | 2692.31                        | 2708.33 | 2692.31 |

### LTE band 12, 3MHz Bandwidth, QPSK (99% BW)



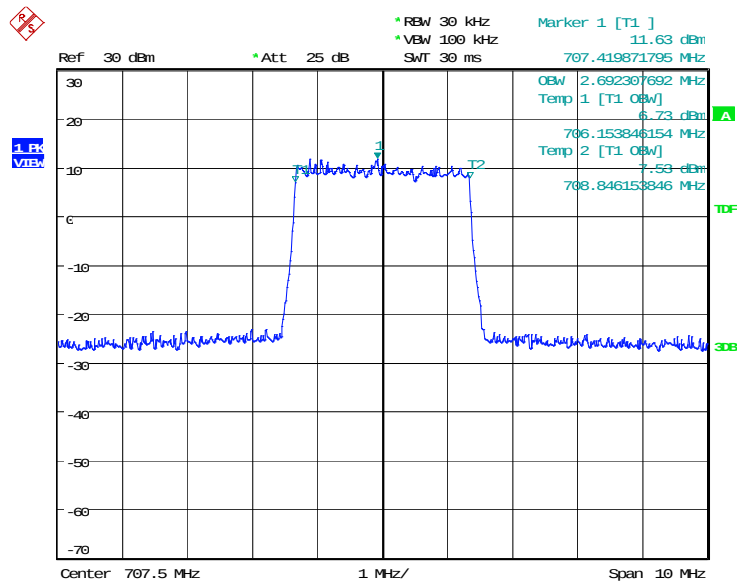
Date: 25.MAR.2020 18:32:39

### LTE band 12, 3MHz Bandwidth, 16QAM (99% BW)



Date: 25.MAR.2020 18:34:04

### LTE band 12, 3MHz Bandwidth, 64QAM (99% BW)

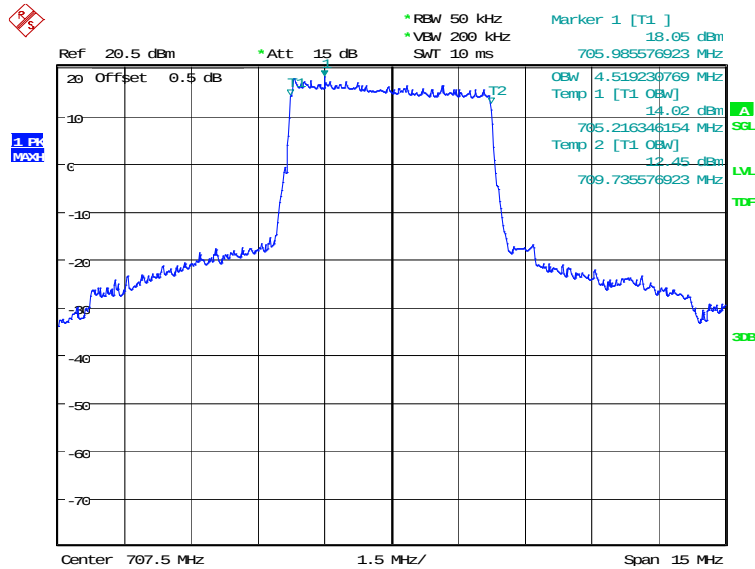


Date: 28.MAR.2020 10:16:27

### LTE band 12, 5MHz (99%)

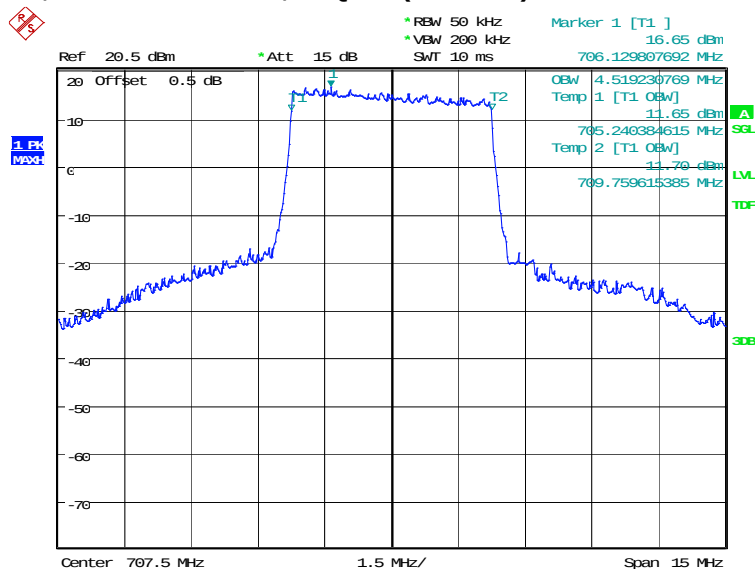
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 707.5           | QPSK                           | 16QAM   | 64QAM   |
|                 | 4519.23                        | 4519.23 | 4495.19 |

### LTE band 12, 5MHz Bandwidth, QPSK (99% BW)



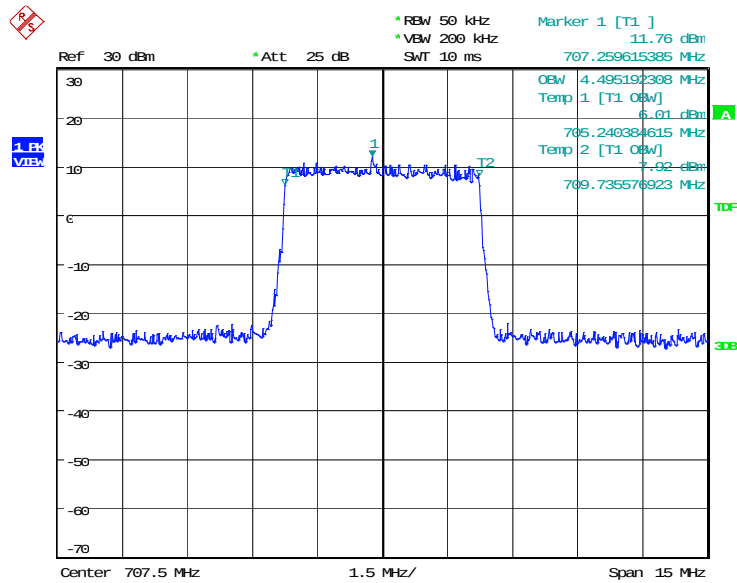
Date: 25.MAR.2020 18:35:30

### LTE band 12, 5MHz Bandwidth, 16QAM (99% BW)



Date: 25.MAR.2020 18:36:54

### LTE band 12, 5MHz Bandwidth, 64QAM (99% BW)

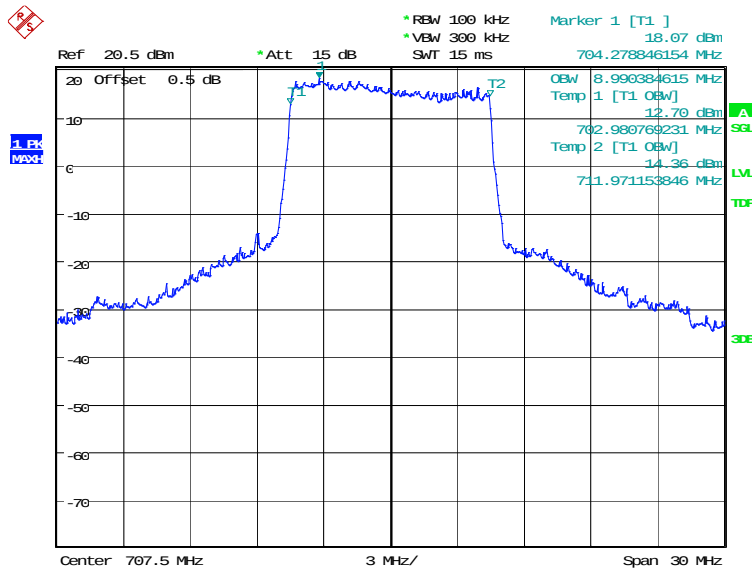


Date: 28.MAR.2020 10:18:17

### LTE band 12, 10MHz (99%)

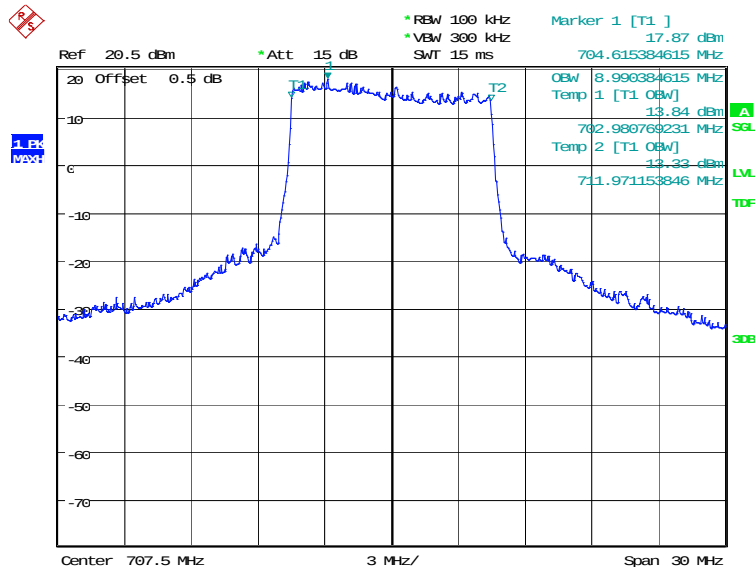
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 707.5           | QPSK                           | 16QAM   | 64QAM   |
|                 | 8990.38                        | 8990.38 | 8942.31 |

### LTE band 12, 10MHz Bandwidth, QPSK (99% BW)



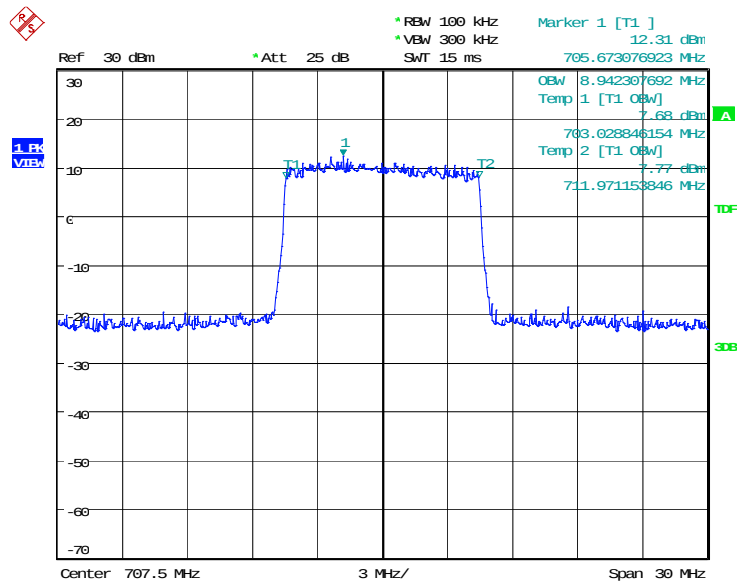
Date: 25.MAR.2020 18:38:20

### LTE band 12, 10MHz Bandwidth, 16QAM (99% BW)



Date: 25.MAR.2020 18:39:45

### LTE band 12, 10MHz Bandwidth, 64QAM (99% BW)

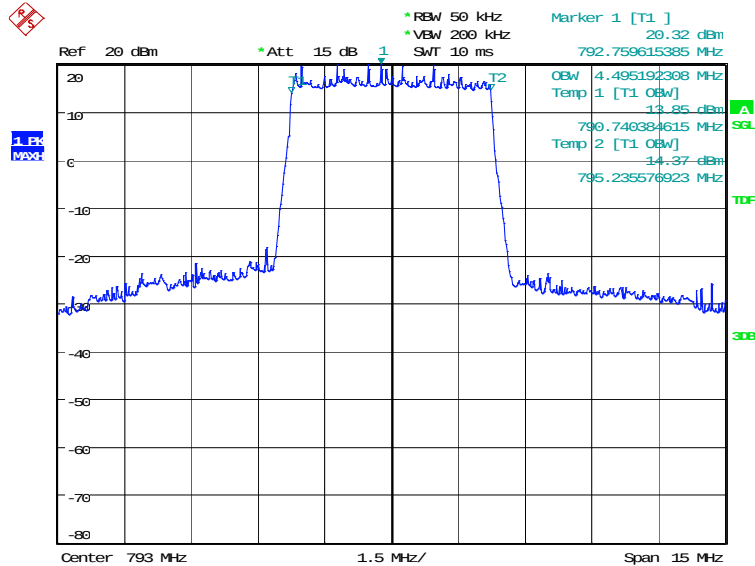


Date: 28.MAR.2020 10:20:21

### LTE band 14, 5MHz (99%)

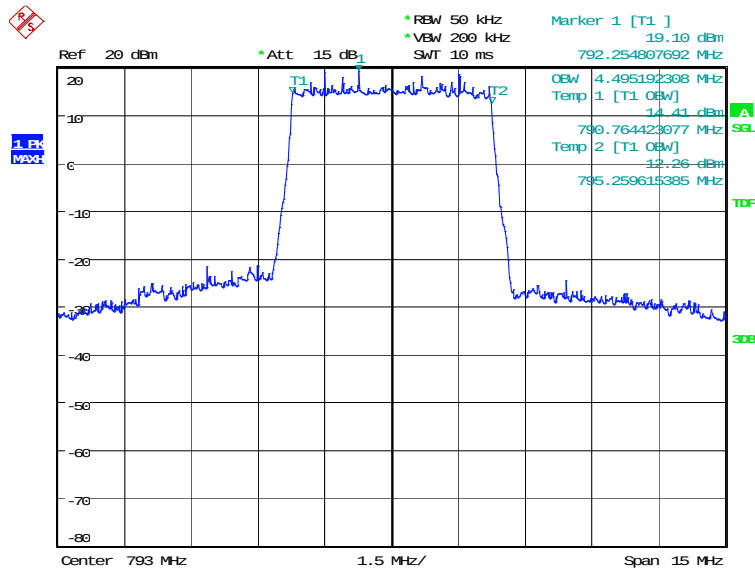
| Frequency (MHz) | Occupied Bandwidth (99%)( kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 793.0           | QPSK                           | 16QAM   | 64QAM   |
|                 | 4495.19                        | 4495.19 | 4495.19 |

### LTE band 14, 5MHz Bandwidth, QPSK (99% BW)



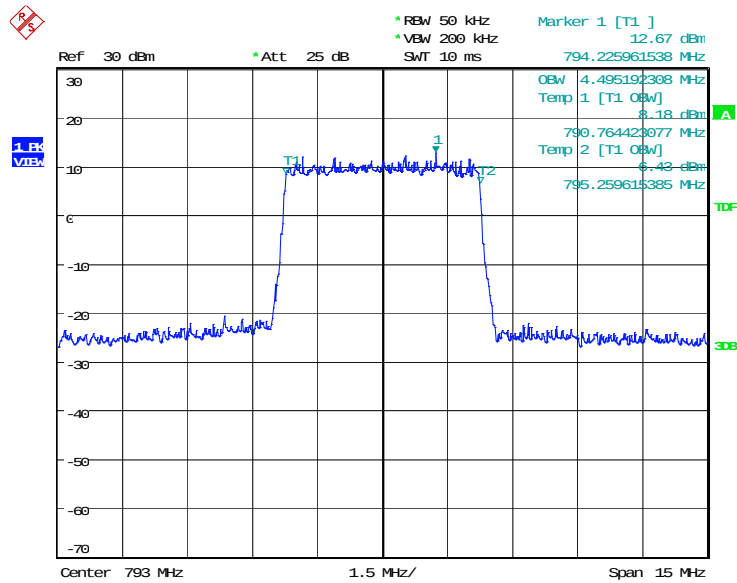
Date: 25.MAR.2020 18:41:12

### LTE band 14, 5MHz Bandwidth, 16QAM (99% BW)



Date: 25.MAR.2020 18:42:37

### LTE band 14, 5MHz Bandwidth, 64QAM (99% BW)

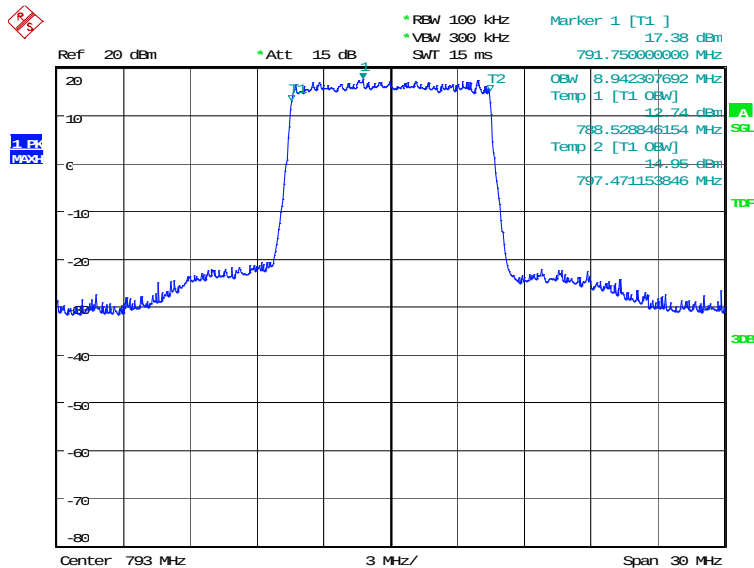


Date: 28.MAR.2020 10:22:45

### LTE band 14, 10MHz (99%)

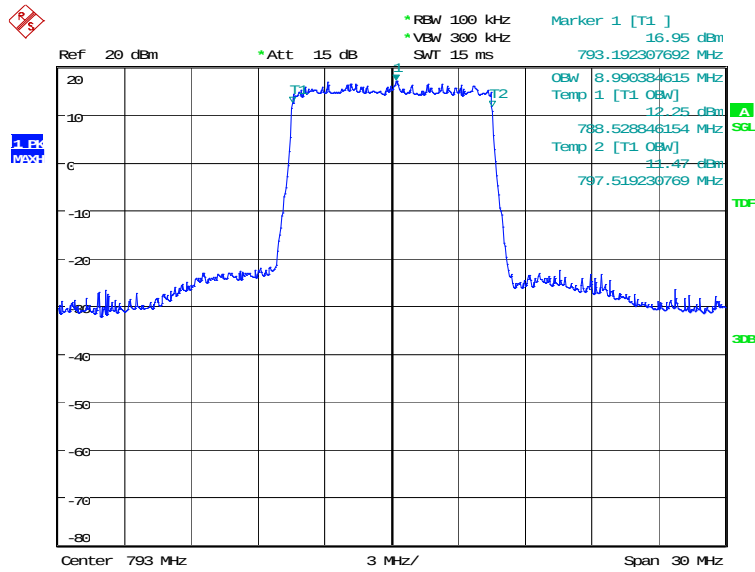
| Frequency (MHz) | Occupied Bandwidth (99%)( kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 793.0           | QPSK                           | 16QAM   | 64QAM   |
|                 | 8942.31                        | 8990.38 | 8990.38 |

### LTE band 14, 10MHz Bandwidth, QPSK (99% BW)



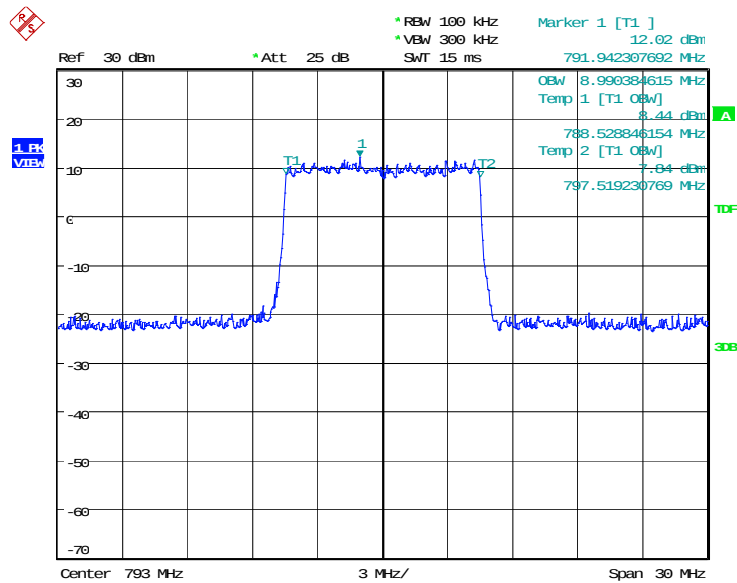
Date: 25.MAR.2020 18:44:03

### LTE band 14, 10MHz Bandwidth,16QAM (99% BW)



Date: 25.MAR.2020 18:45:28

### LTE band 14, 10MHz Bandwidth, 64QAM (99% BW)

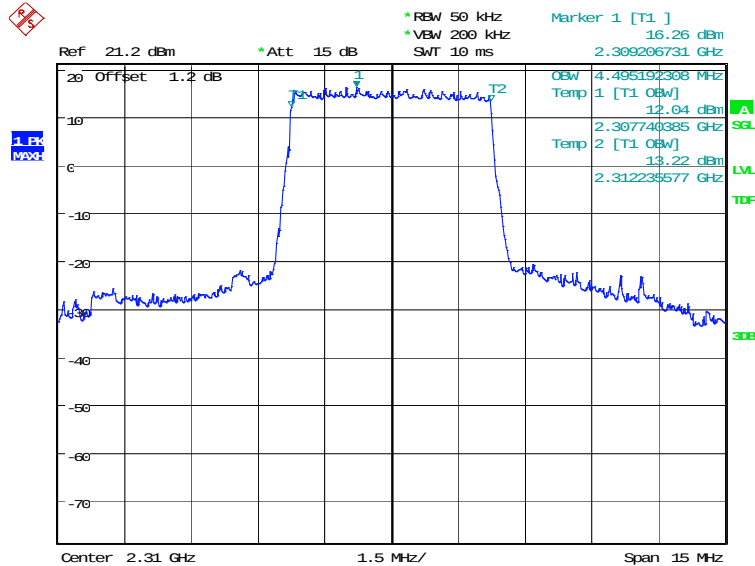


Date: 28.MAR.2020 10:25:18

### LTE band 30, 5MHz (99%)

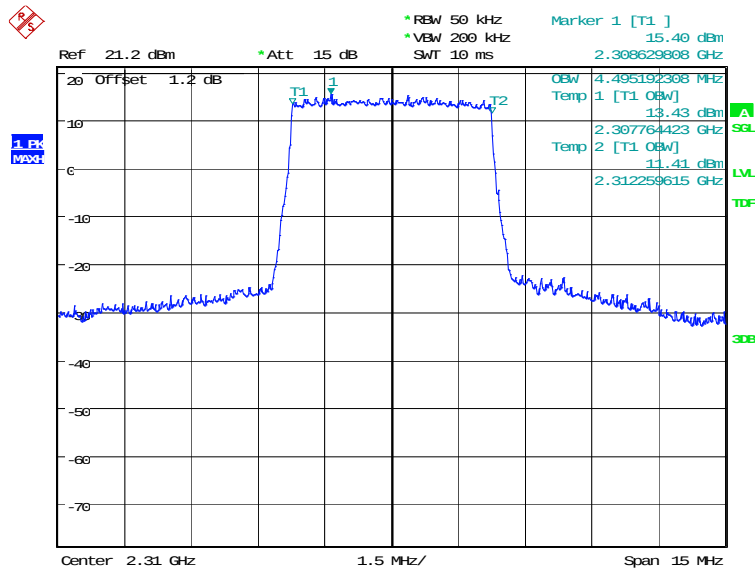
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 2310.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 4495.19                        | 4495.19 | 4495.19 |

### LTE band 30, 5MHz Bandwidth, QPSK (99% BW)



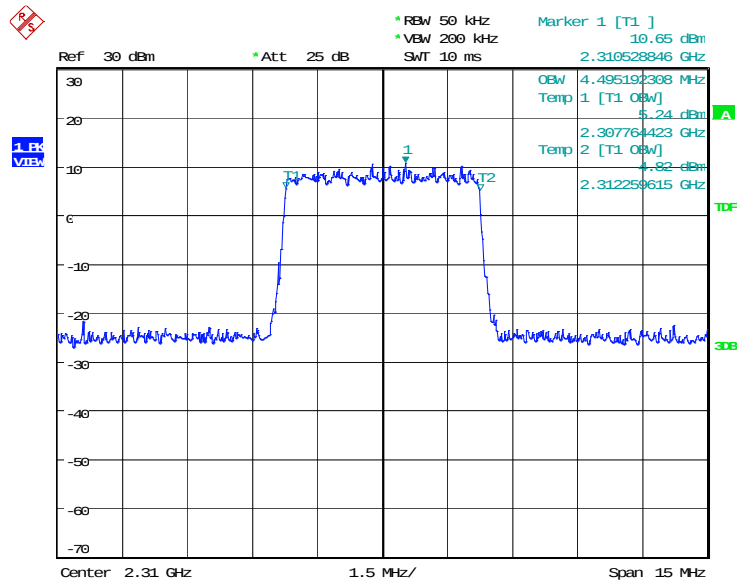
Date: 25.MAR.2020 18:46:55

### LTE band 30, 5MHz Bandwidth, 16QAM (99% BW)



Date: 25.MAR.2020 18:48:20

### LTE band 30, 5MHz Bandwidth, 64QAM (99% BW)

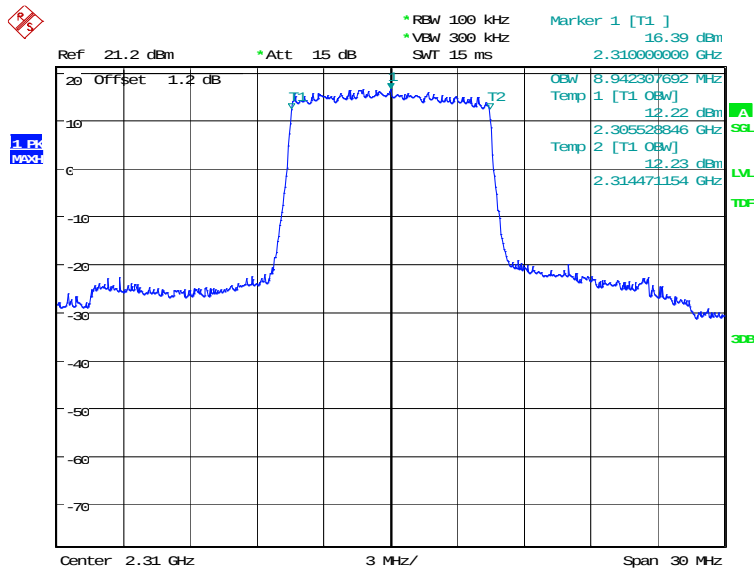


Date: 28.MAR.2020 10:28:09

### LTE band 30, 10MHz (99%)

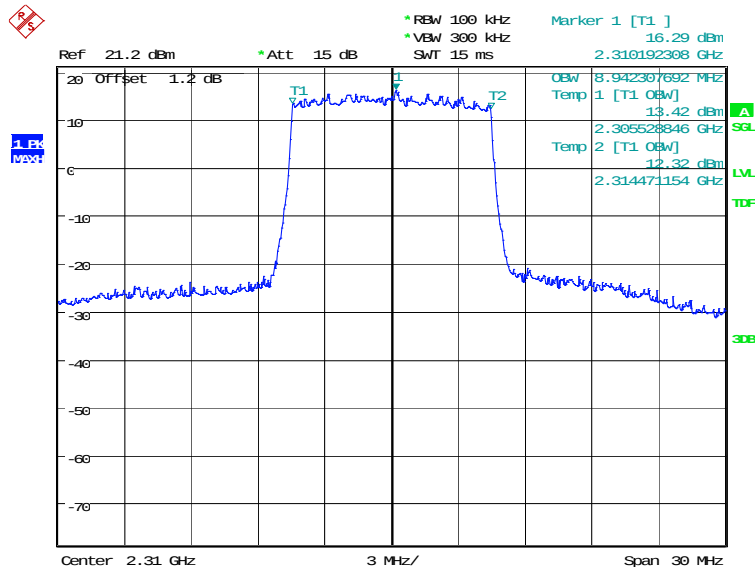
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 2310.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 8942.31                        | 8942.31 | 8990.38 |

### LTE band 30, 10MHz Bandwidth, QPSK (99% BW)



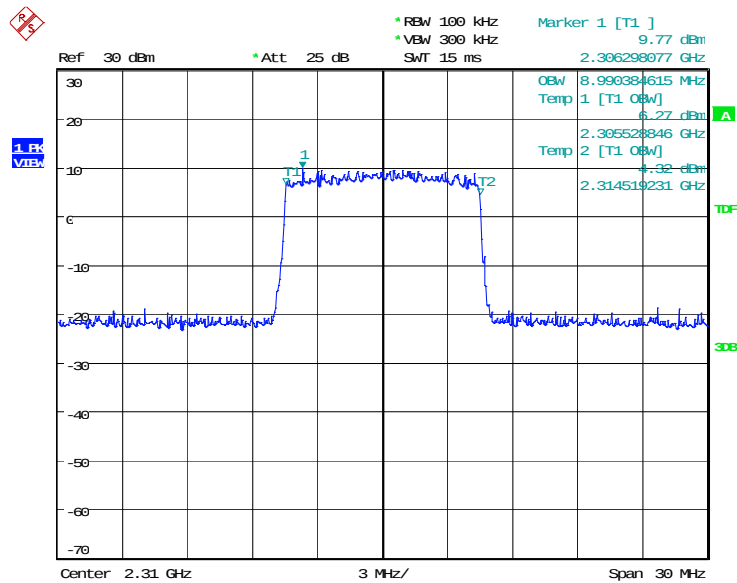
Date: 25.MAR.2020 18:49:46

### LTE band 30, 10MHz Bandwidth, 16QAM (99% BW)



Date: 25.MAR.2020 18:51:11

### LTE band 30, 10MHz Bandwidth, 64QAM (99% BW)

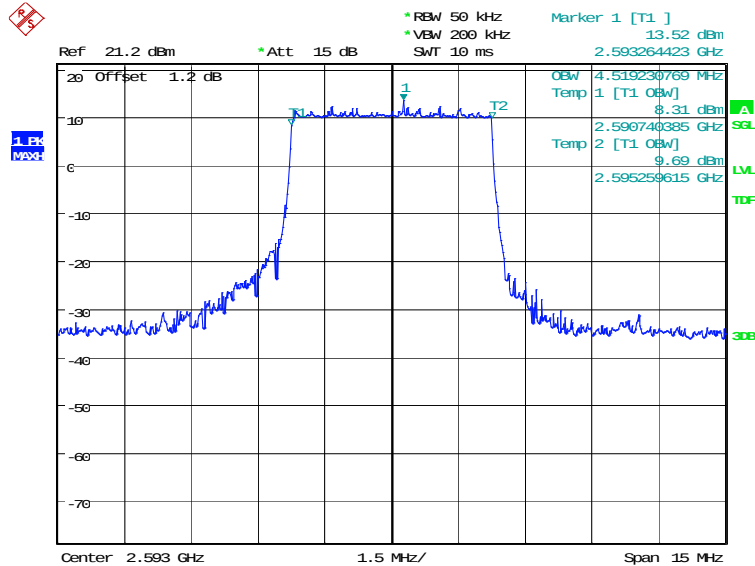


Date: 28.MAR.2020 10:29:29

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

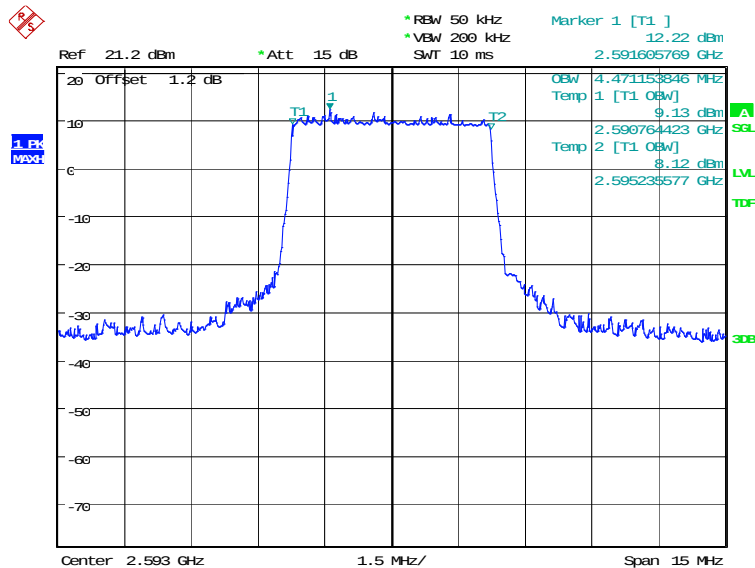
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 2593.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 4519.23                        | 4471.15 | 4495.19 |

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



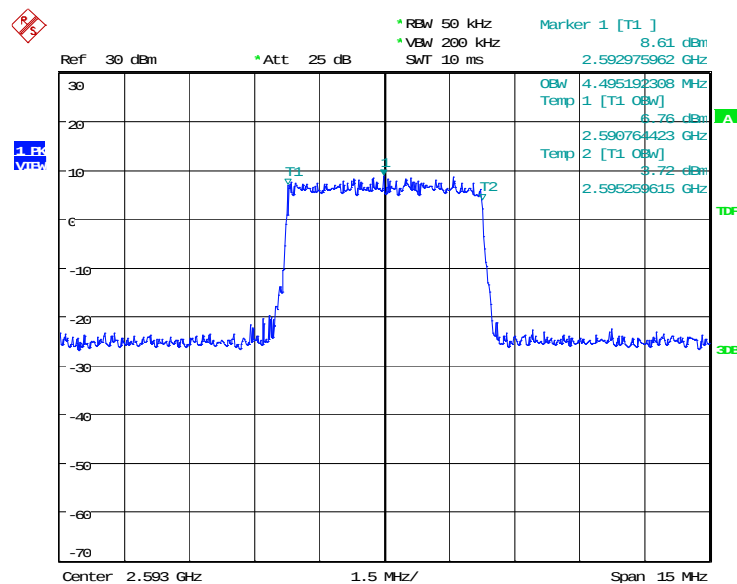
Date: 25.MAR.2020 18:53:16

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



Date: 25.MAR.2020 18:54:40

# LTE band 41, 5MHz Bandwidth,64QAM (99% BW)

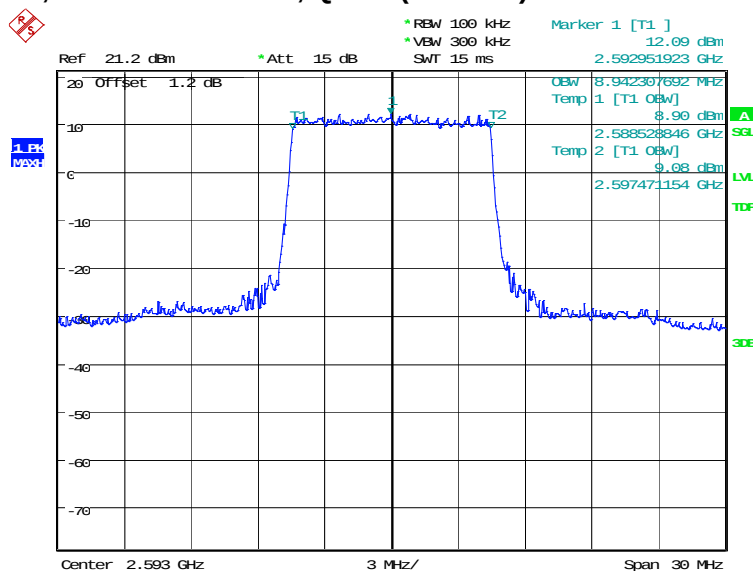


Date: 28.MAR.2020 10:32:51

# LTE band 41, 10MHz (99%)

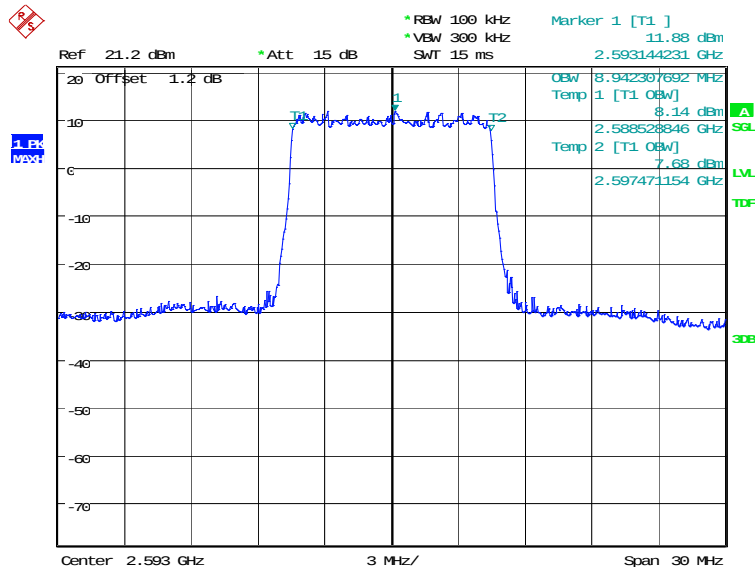
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 2593.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 8942.31                        | 8942.31 | 8990.38 |

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



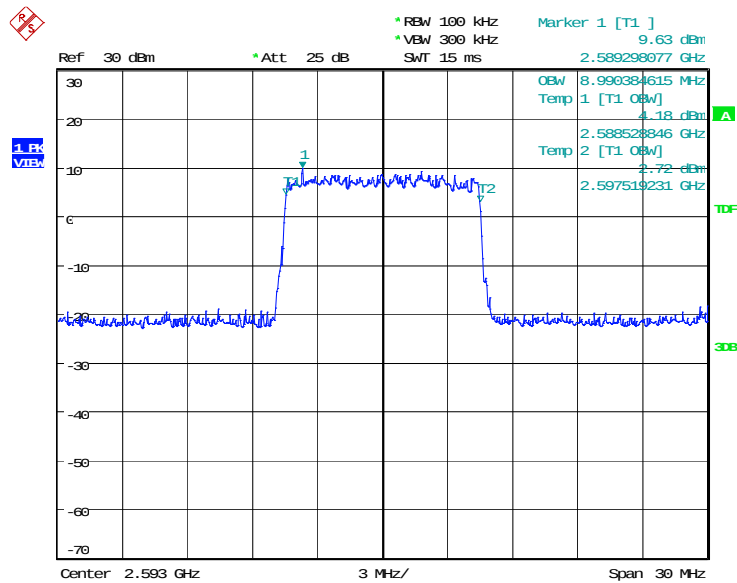
Date: 25.MAR.2020 18:56:07

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



Date: 25.MAR.2020 18:57:31

### LTE band 41, 10MHz Bandwidth, 64QAM (99% BW)

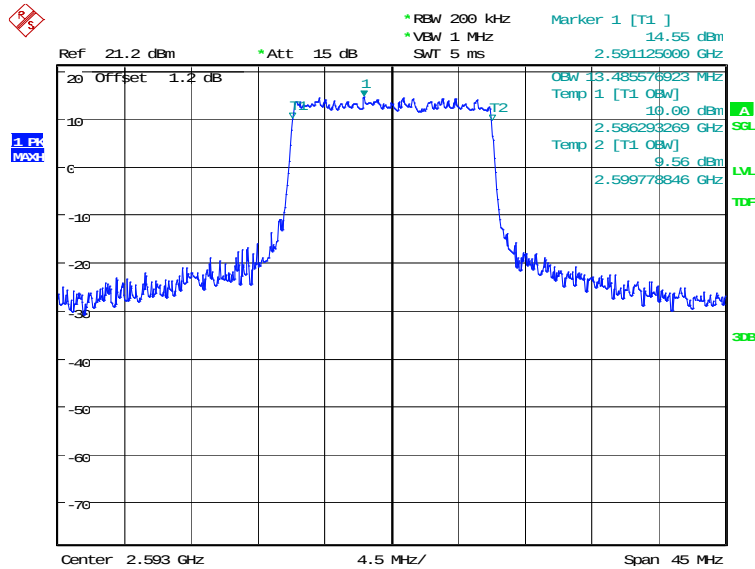


Date: 28.MAR.2020 10:34:27

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

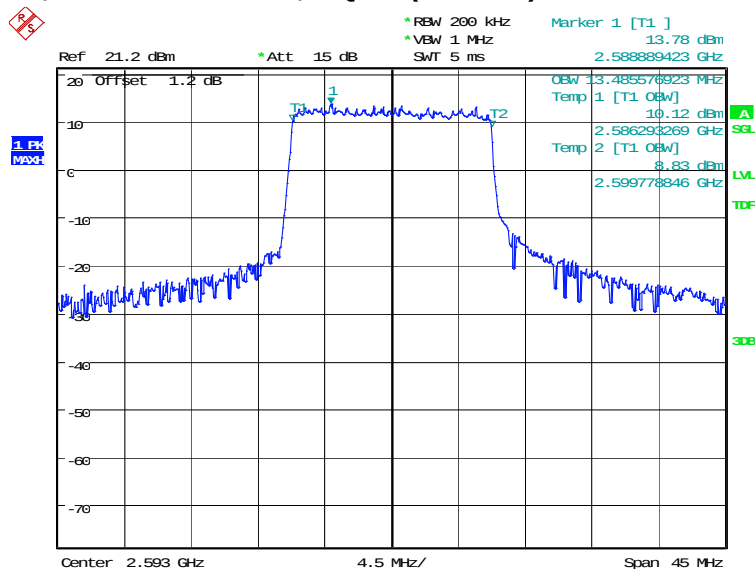
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |          |          |
|-----------------|--------------------------------|----------|----------|
| 2593.0          | QPSK                           | 16QAM    | 64QAM    |
|                 | 13485.58                       | 13485.58 | 13485.58 |

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



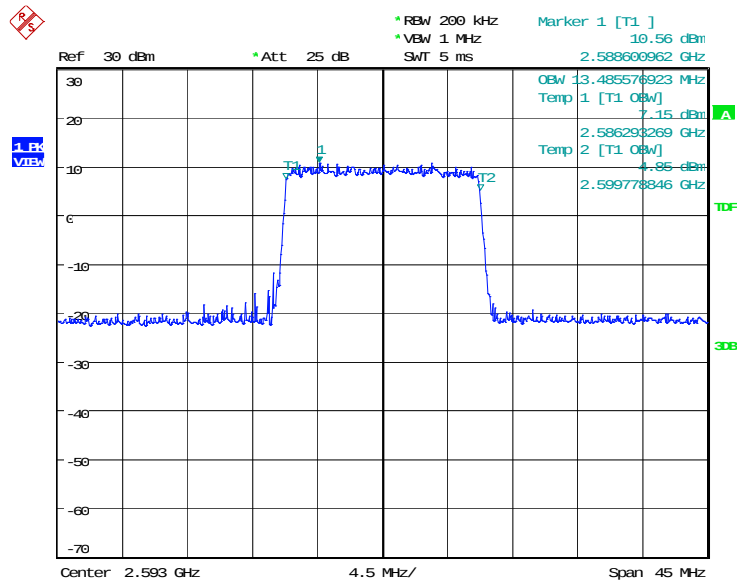
Date: 25.MAR.2020 18:58:58

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



Date: 25.MAR.2020 19:00:23

### LTE band 41, 15MHz Bandwidth, 64QAM (99% BW)

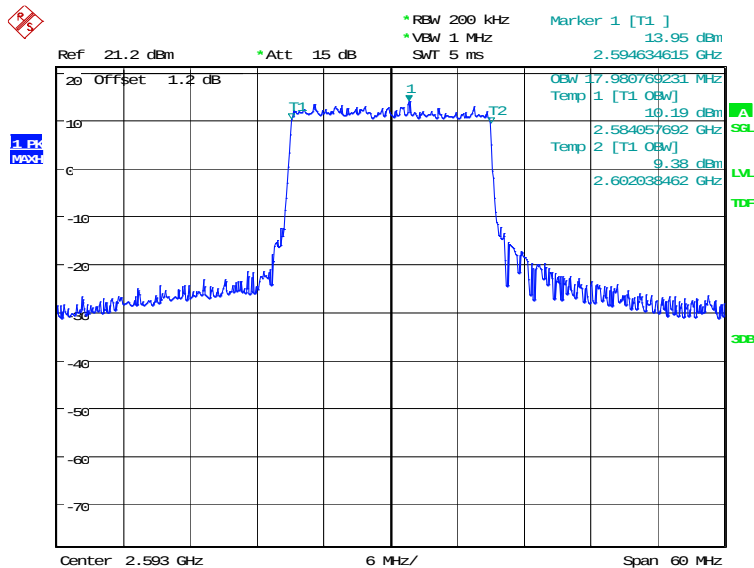


Date: 28.MAR.2020 10:35:44

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

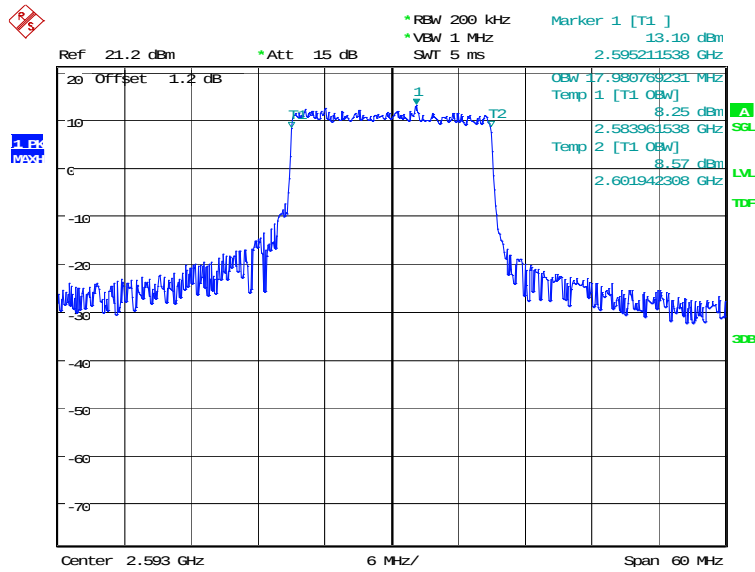
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |          |          |
|-----------------|--------------------------------|----------|----------|
| 2593.0          | QPSK                           | 16QAM    | 64QAM    |
|                 | 17980.77                       | 17980.77 | 18076.92 |

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



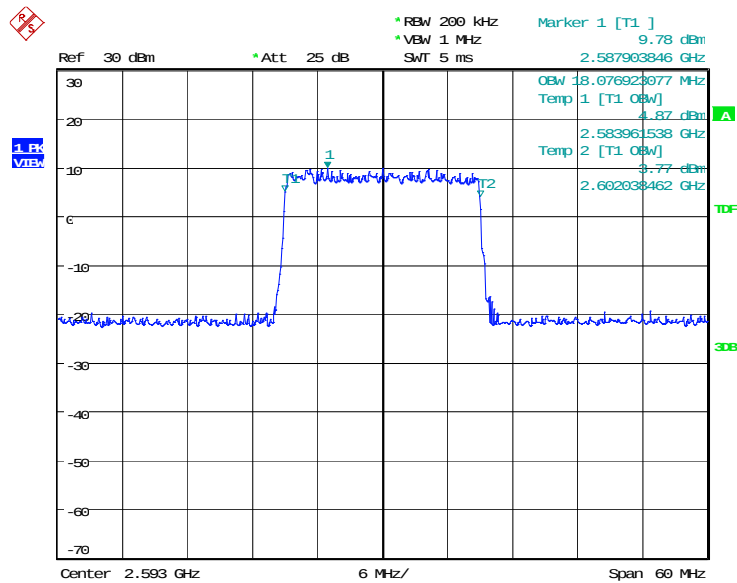
Date: 25.MAR.2020 19:01:50

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



Date: 25.MAR.2020 19:03:14

### LTE band 41, 20MHz Bandwidth, 64QAM (99% BW)

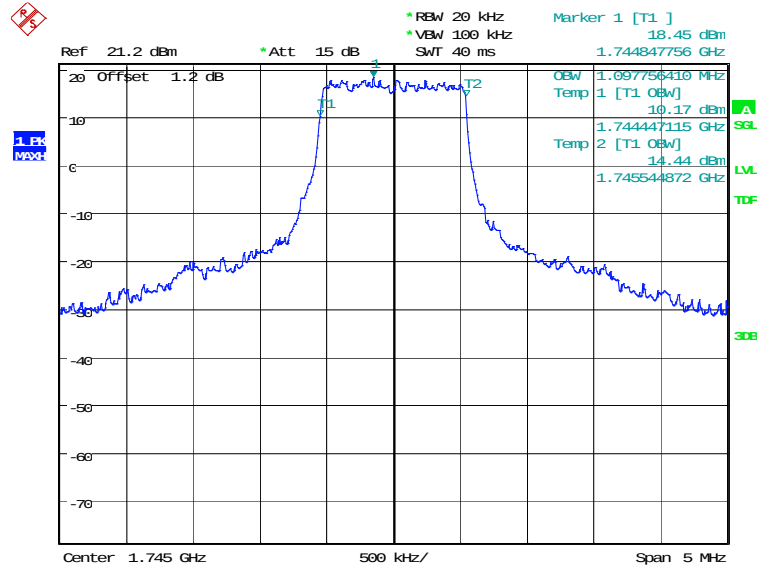


Date: 28.MAR.2020 10:37:05

### LTE band 66, 1.4MHz (99%)

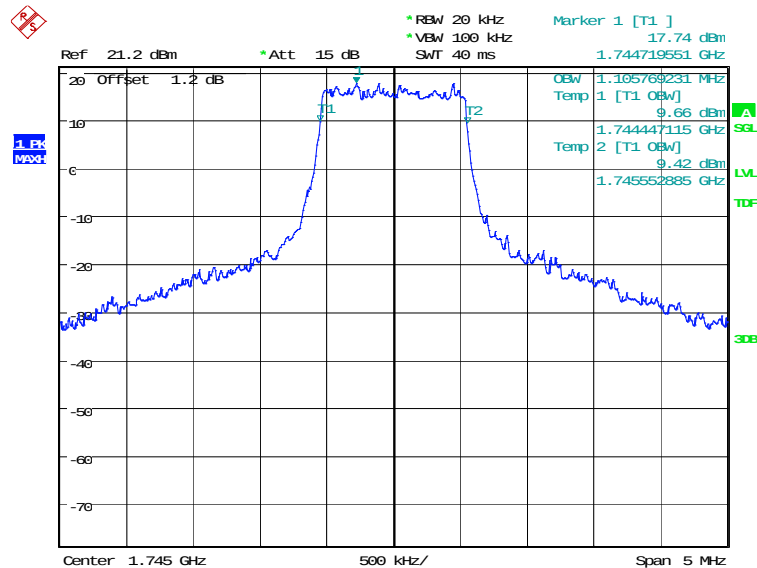
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 1745.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 1097.76                        | 1105.77 | 1089.74 |

### LTE band 66, 1.4MHz Bandwidth, QPSK (99% BW)



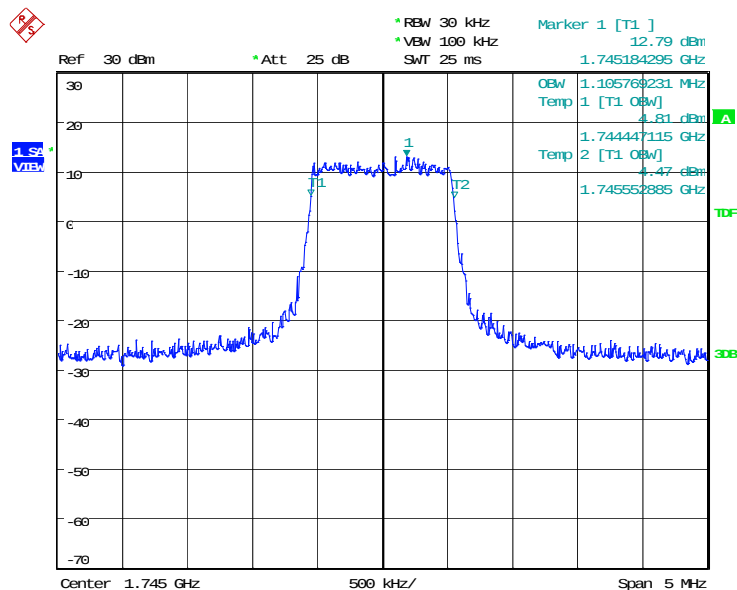
Date: 26.MAR.2020 11:53:40

### LTE band 66, 1.4MHz Bandwidth, 16QAM (99% BW)



Date: 26.MAR.2020 11:55:05

### LTE band 66, 1.4MHz Bandwidth, 64QAM (99% BW)

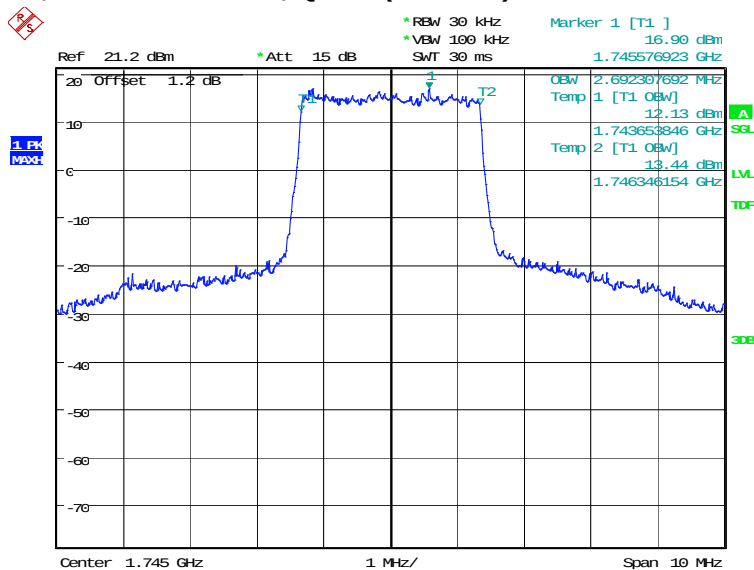


Date: 10.APR.2020 16:22:02

### LTE band 66, 3MHz (99%)

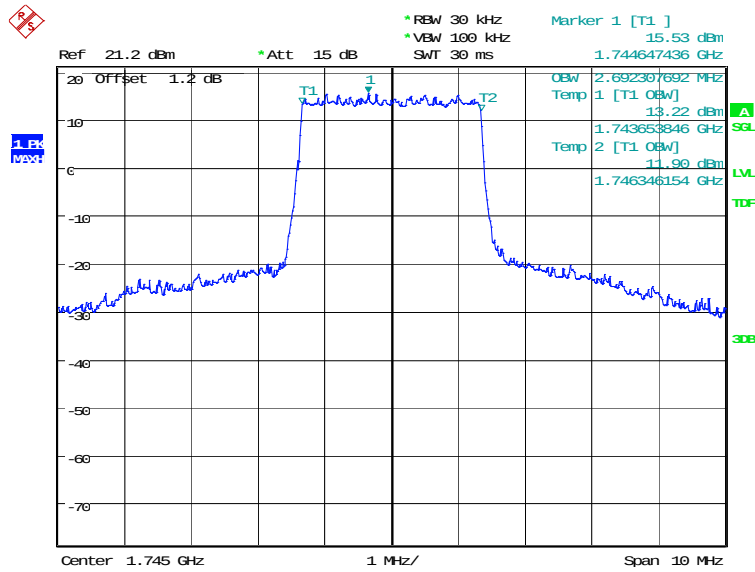
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 1745.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 2692.31                        | 2692.31 | 2692.31 |

### LTE band 66, 3MHz Bandwidth, QPSK (99% BW)



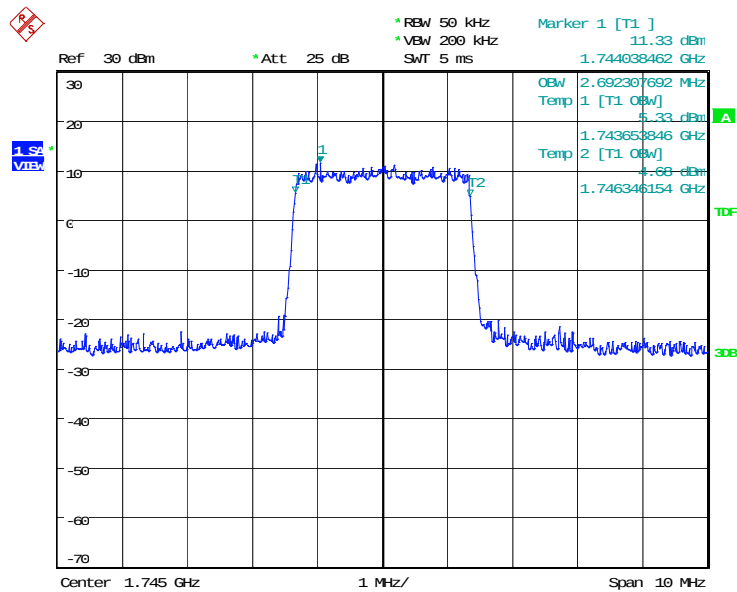
Date: 26.MAR.2020 11:56:30

### LTE band 66, 3MHz Bandwidth, 16QAM (99% BW)



Date: 26.MAR.2020 11:57:55

### LTE band 66, 3MHz Bandwidth, 64QAM (99% BW)

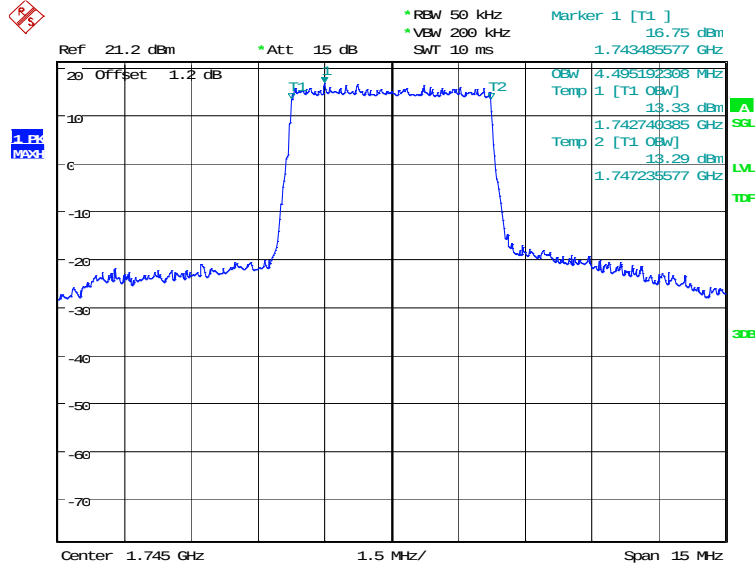


Date: 10.APR.2020 16:23:12

### LTE band 66, 5MHz (99%)

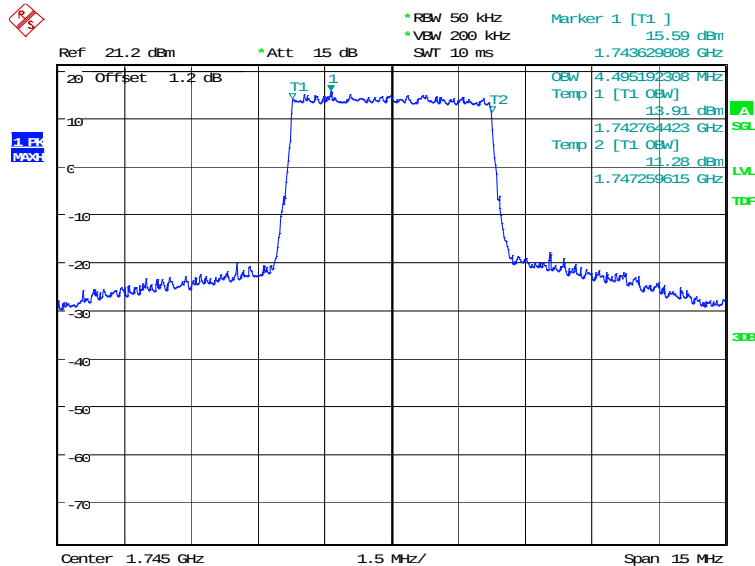
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 1745.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 4495.19                        | 4495.19 | 4519.23 |

### LTE band 66, 5MHz Bandwidth, QPSK (99% BW)



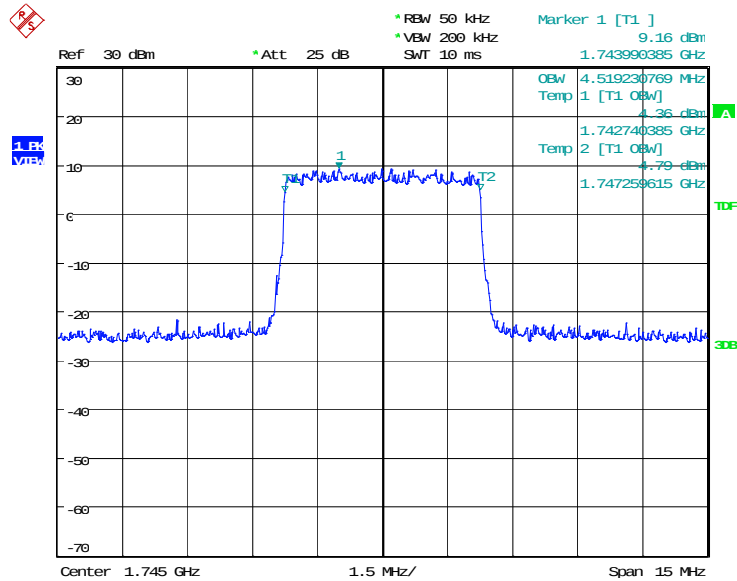
Date: 26.MAR.2020 11:59:21

### LTE band 66, 5MHz Bandwidth, 16QAM (99% BW)



Date: 26.MAR.2020 12:00:45

### LTE band 66, 5MHz Bandwidth, 64QAM (99% BW)

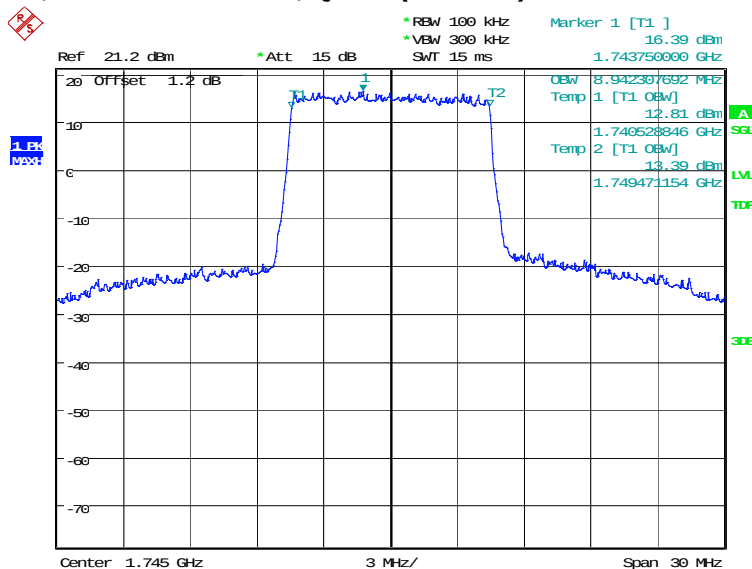


Date: 28.MAR.2020 09:36:38

### LTE band 66, 10MHz (99%)

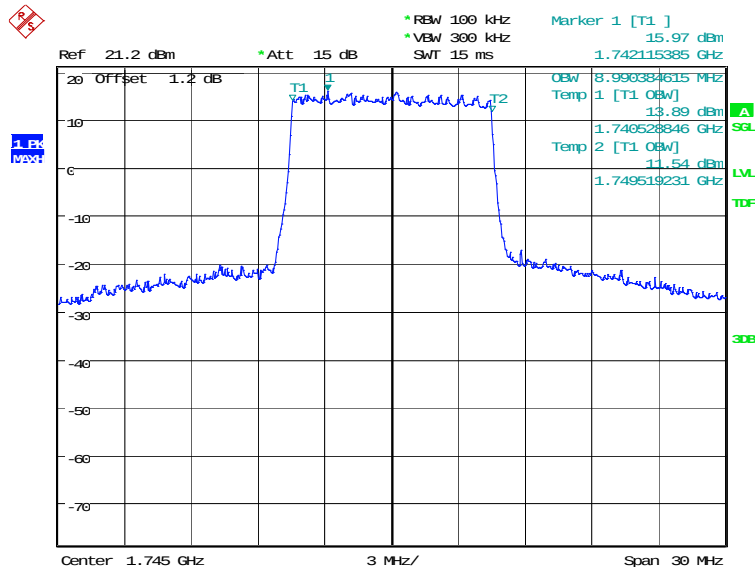
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |         |         |
|-----------------|--------------------------------|---------|---------|
| 1745.0          | QPSK                           | 16QAM   | 64QAM   |
|                 | 8942.31                        | 8990.38 | 8990.38 |

### LTE band 66, 10MHz Bandwidth, QPSK (99% BW)



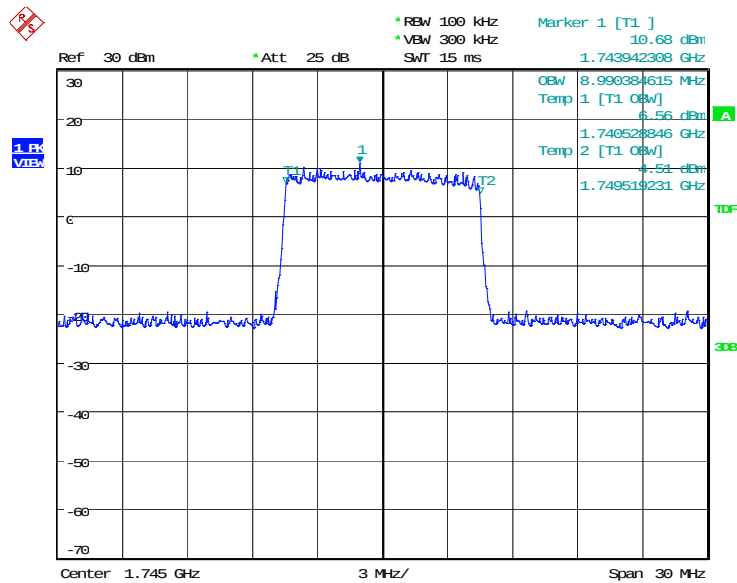
Date: 26.MAR.2020 12:02:11

## LTE band 66, 10MHz Bandwidth, 16QAM (99% BW)



Date: 26.MAR.2020 12:03:35

## LTE band 66, 10MHz Bandwidth, 64QAM (99% BW)

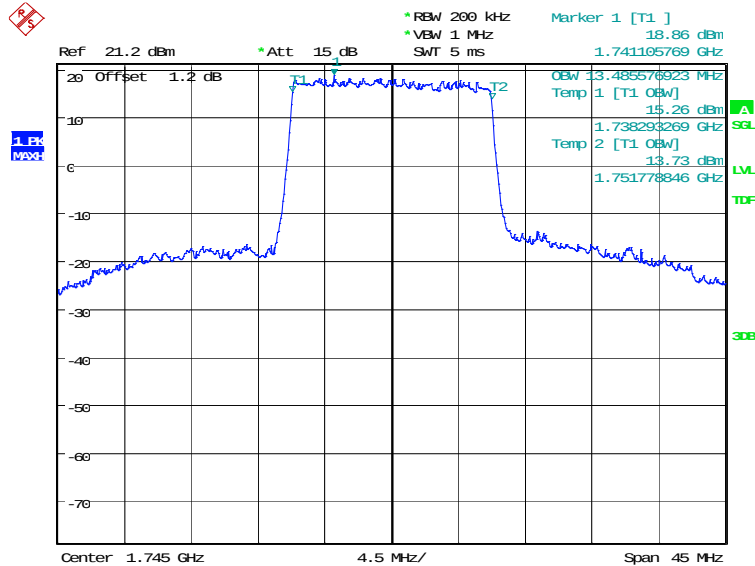


Date: 28.MAR.2020 09:38:31

### LTE band 66, 15MHz (99%)

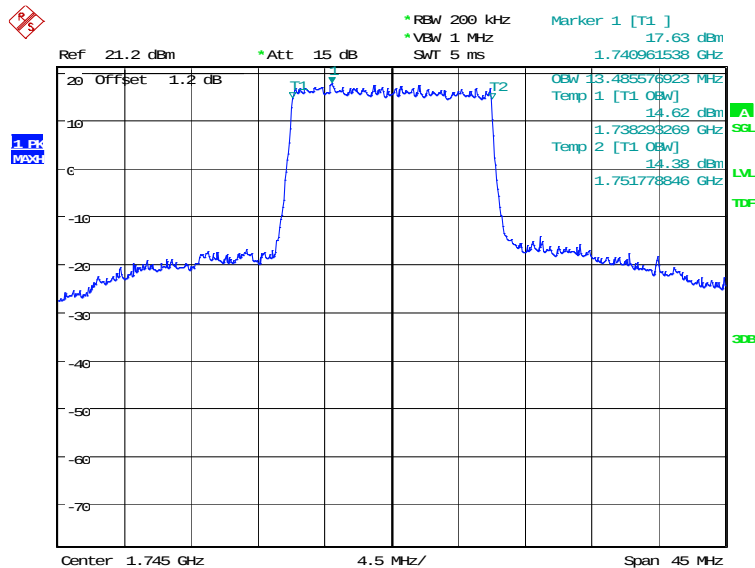
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |          |          |
|-----------------|--------------------------------|----------|----------|
|                 | QPSK                           | 16QAM    | 64QAM    |
| 1745.0          | 13485.58                       | 13485.58 | 13485.58 |

### LTE band 66, 15MHz Bandwidth, QPSK (99% BW)



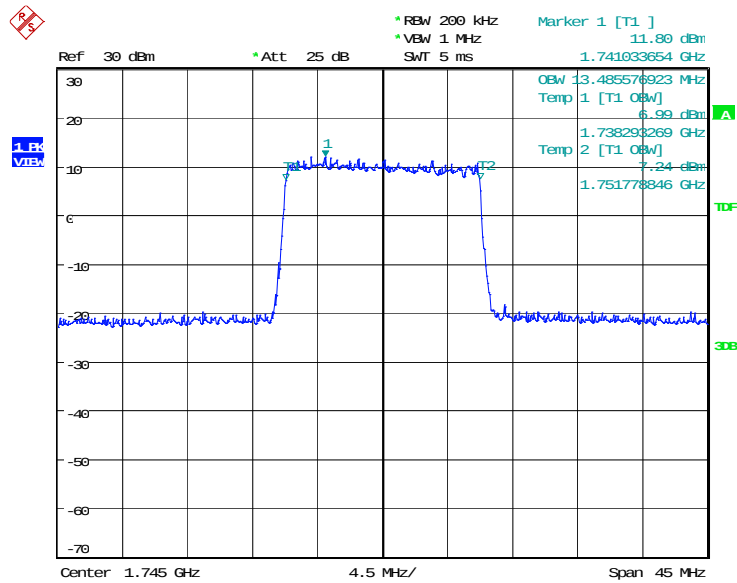
Date: 26.MAR.2020 12:05:01

### LTE band 66, 15MHz Bandwidth, 16QAM (99% BW)



Date: 26.MAR.2020 12:06:26

### LTE band 66, 15MHz Bandwidth, 64QAM (99% BW)

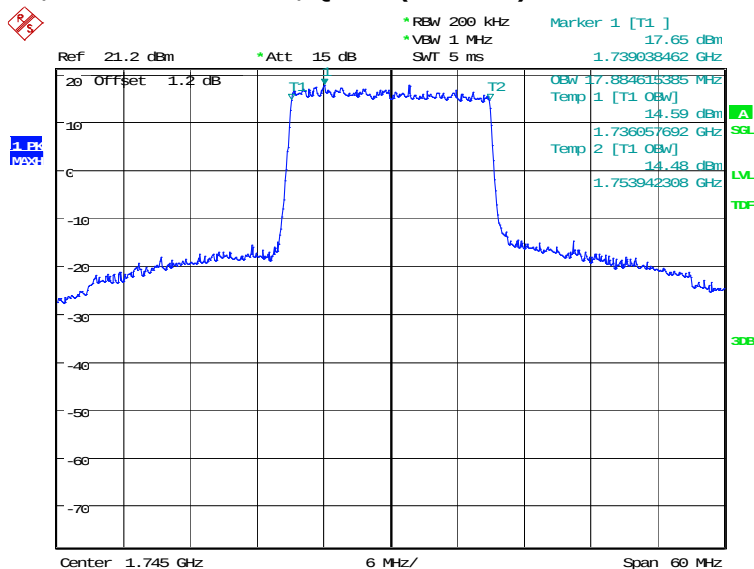


Date: 28.MAR.2020 09:39:44

### LTE band 66, 20MHz (99%)

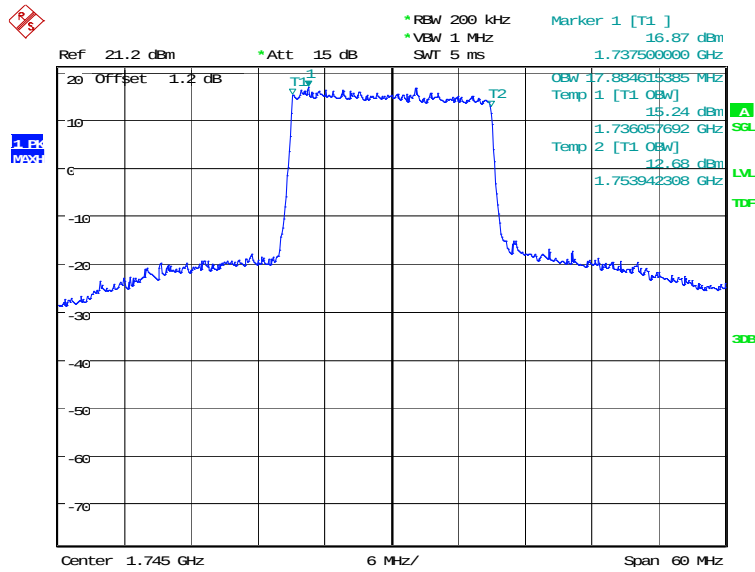
| Frequency (MHz) | Occupied Bandwidth (99%) (kHz) |          |          |
|-----------------|--------------------------------|----------|----------|
| 1745.0          | QPSK                           | 16QAM    | 64QAM    |
|                 | 17884.62                       | 17884.62 | 17980.77 |

### LTE band 66, 20MHz Bandwidth, QPSK (99% BW)



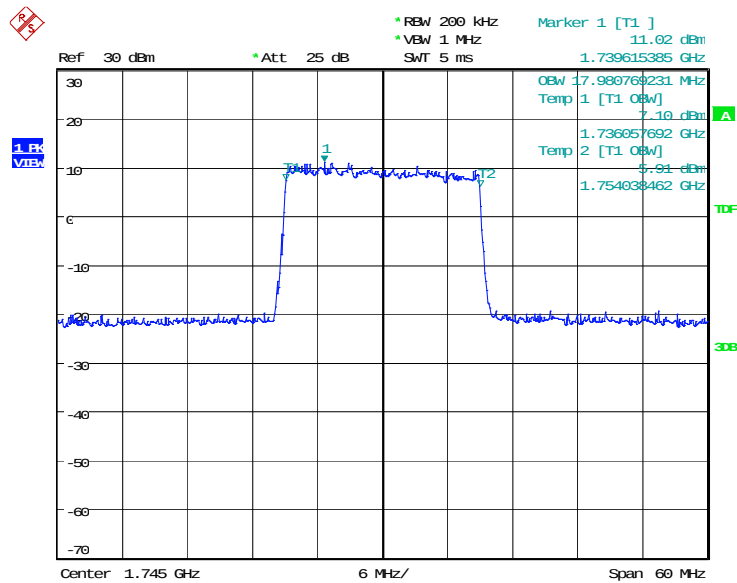
Date: 26.MAR.2020 12:07:52

## LTE band 66, 20MHz Bandwidth, 16QAM (99% BW)



Date: 26.MAR.2020 12:09:16

## LTE band 66, 20MHz Bandwidth, 64QAM (99% BW)



Date: 28.MAR.2020 09:41:40

## **A.5 EMISSION BANDWIDTH**

### **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.

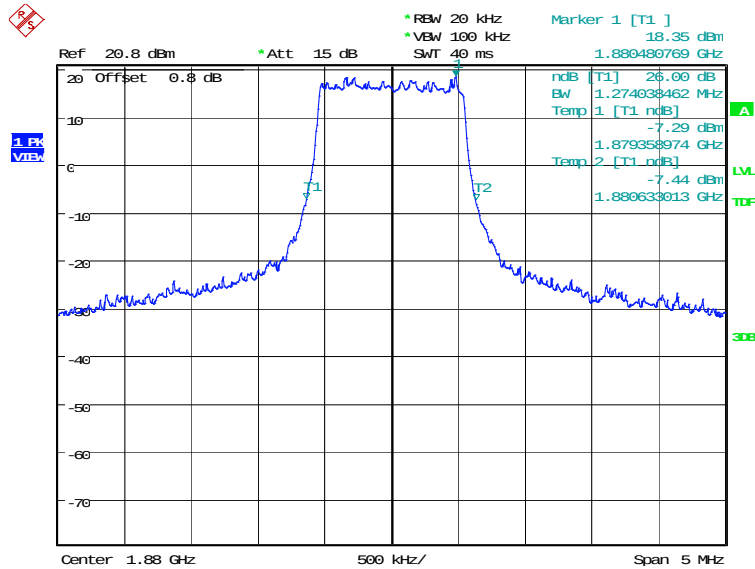
The measurement method is from ANSI C63.26:

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set  $\geq 3 \times \text{RBW}$ .
- c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
- d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.

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

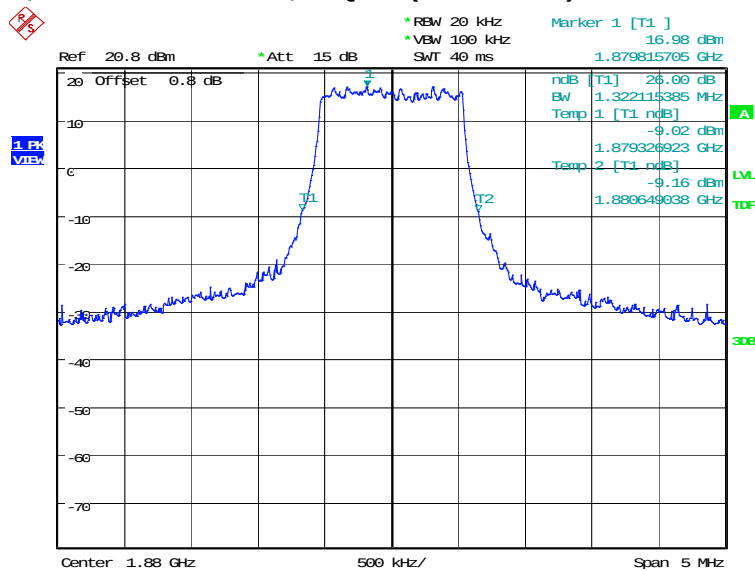
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
| 1880.0          | QPSK                              | 16QAM   | 64QAM   |
|                 | 1274.04                           | 1322.12 | 1290.06 |

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



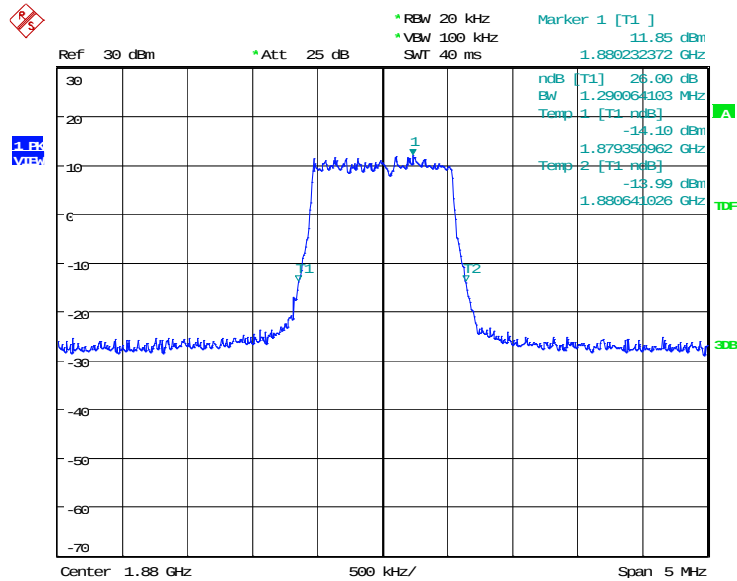
Date: 26.MAR.2020 12:11:23

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



Date: 26.MAR.2020 12:12:48

## LTE band 2, 1.4MHz Bandwidth, 64QAM (-26dBc BW)

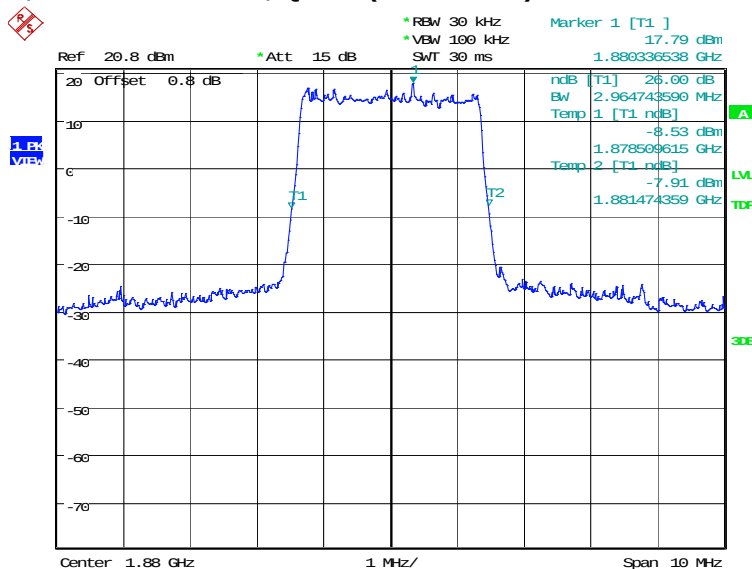


Date: 28.MAR.2020 09:13:38

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

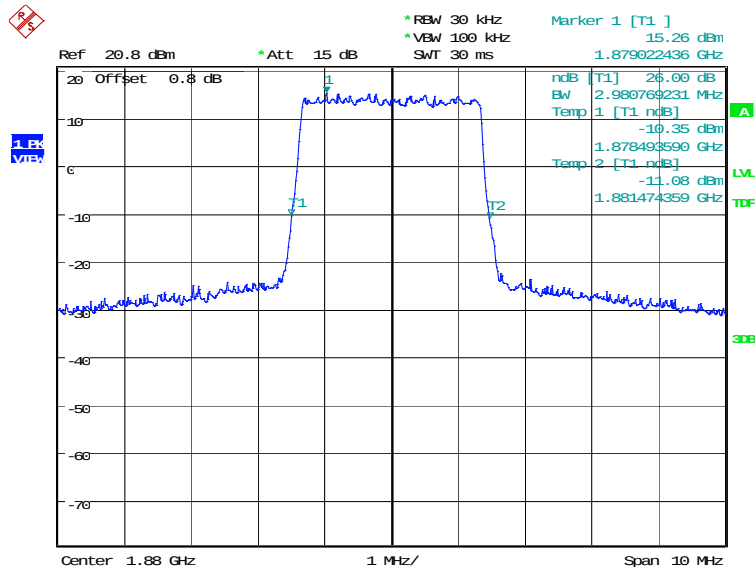
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
|                 | QPSK                              | 16QAM   | 64QAM   |
| 1880.0          | 2964.74                           | 2980.77 | 2932.69 |

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



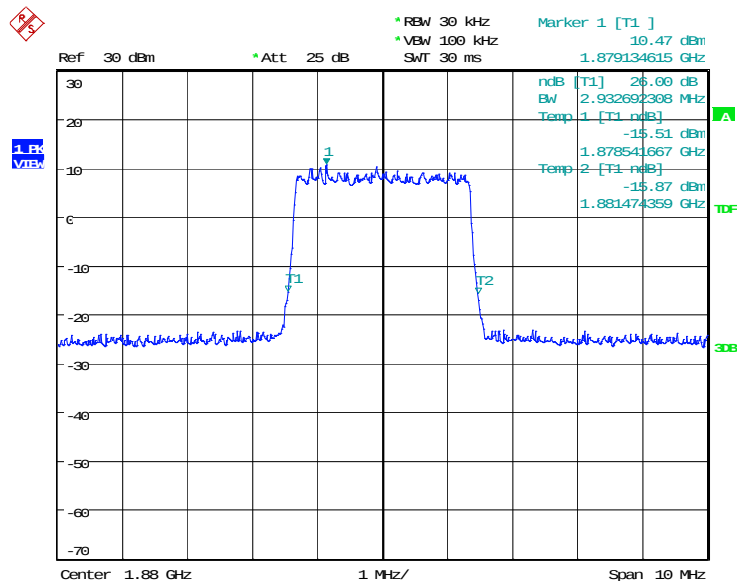
Date: 26.MAR.2020 12:14:14

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



Date: 26.MAR.2020 12:15:38

## LTE band 2, 3MHz Bandwidth, 64QAM (-26dBc BW)

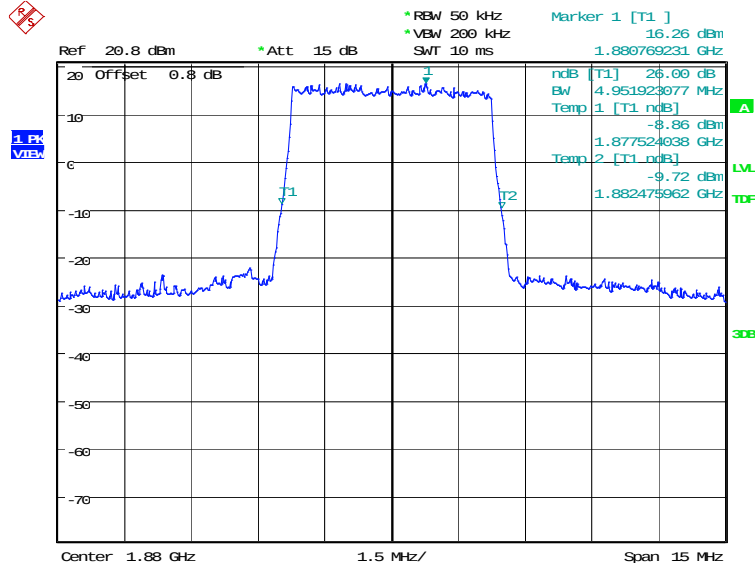


Date: 28.MAR.2020 09:18:24

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

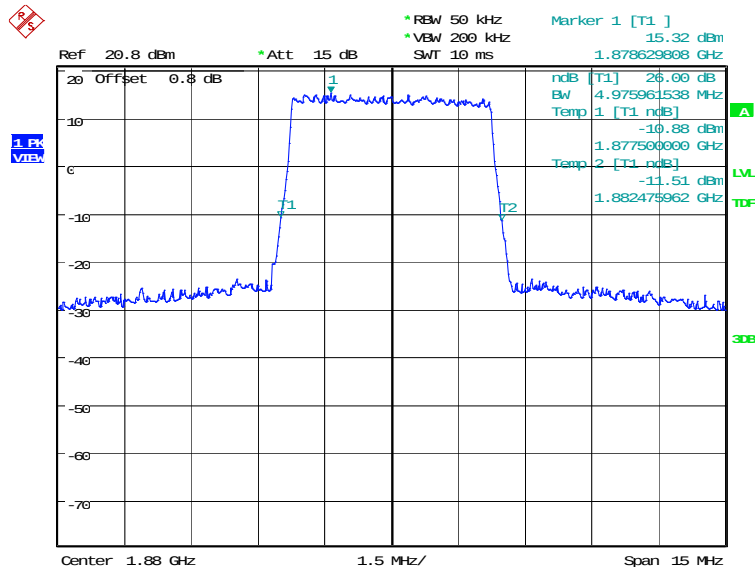
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
| 1880.0          | QPSK                              | 16QAM   | 64QAM   |
|                 | 4951.92                           | 4975.96 | 4927.88 |

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



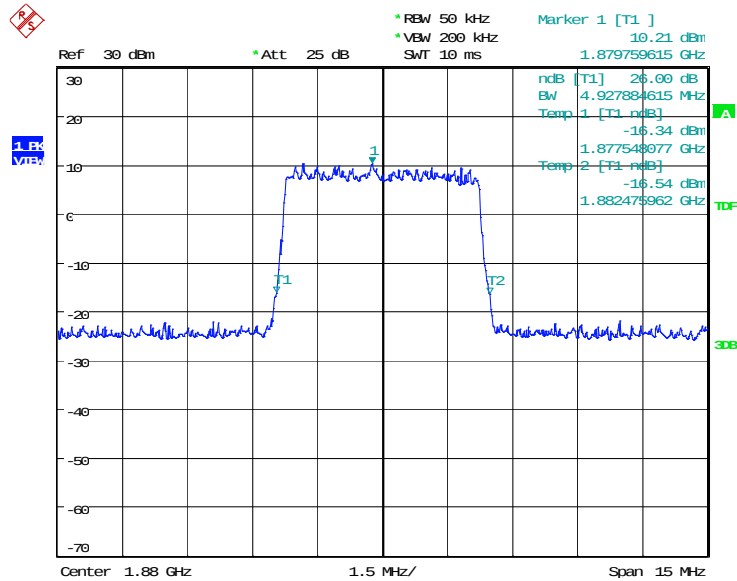
Date: 26.MAR.2020 12:17:05

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



Date: 26.MAR.2020 12:18:29

### LTE band 2, 5MHz Bandwidth,64QAM (-26dBc BW)

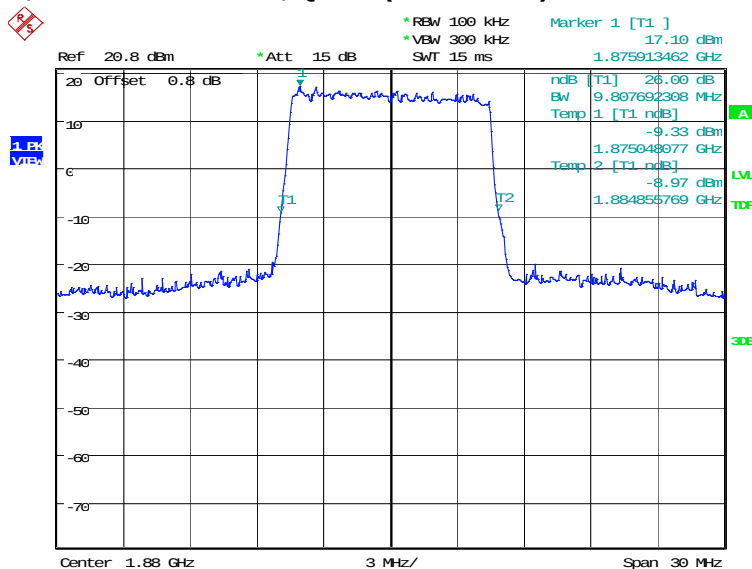


Date: 28.MAR.2020 09:20:42

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

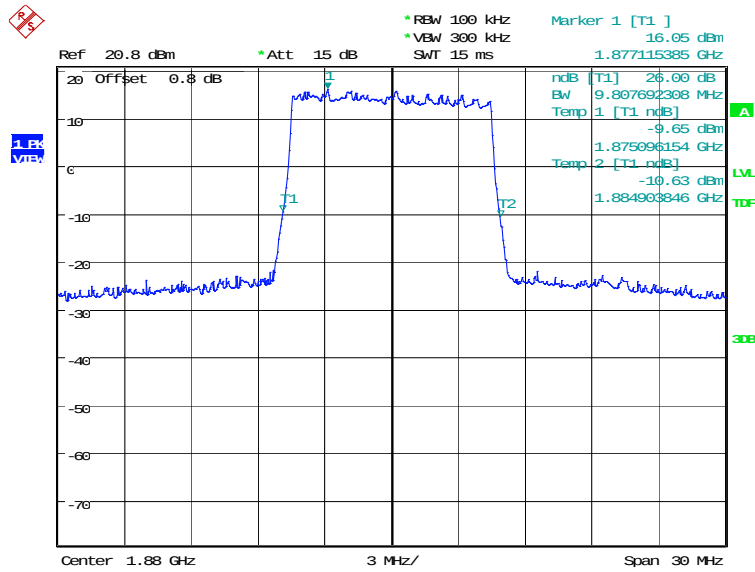
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
|                 | QPSK                              | 16QAM   | 64QAM   |
| 1880.0          | 9807.69                           | 9807.69 | 9759.62 |

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



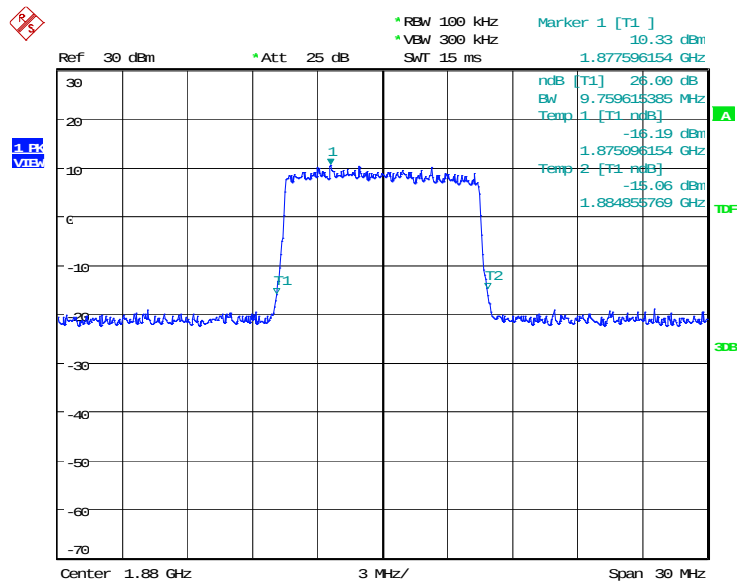
Date: 26.MAR.2020 12:19:56

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



Date: 26.MAR.2020 12:21:20

### LTE band 2, 10MHz Bandwidth, 64QAM (-26dBc BW)

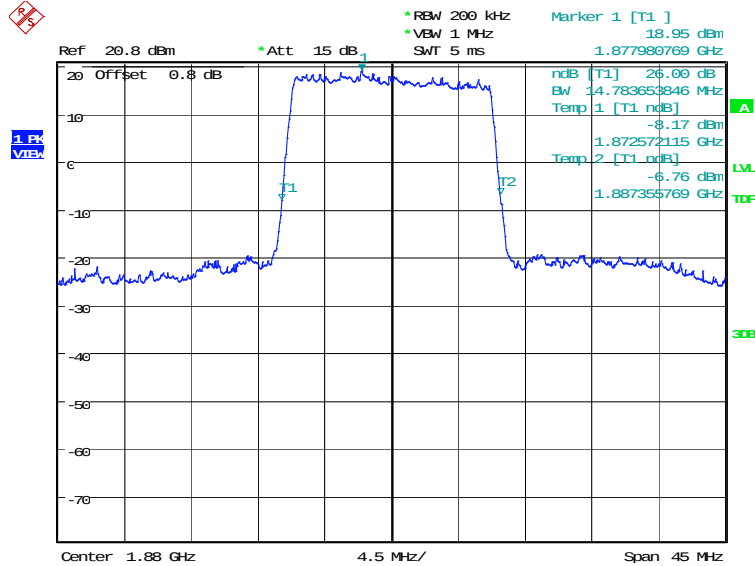


Date: 28.MAR.2020 09:22:04

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

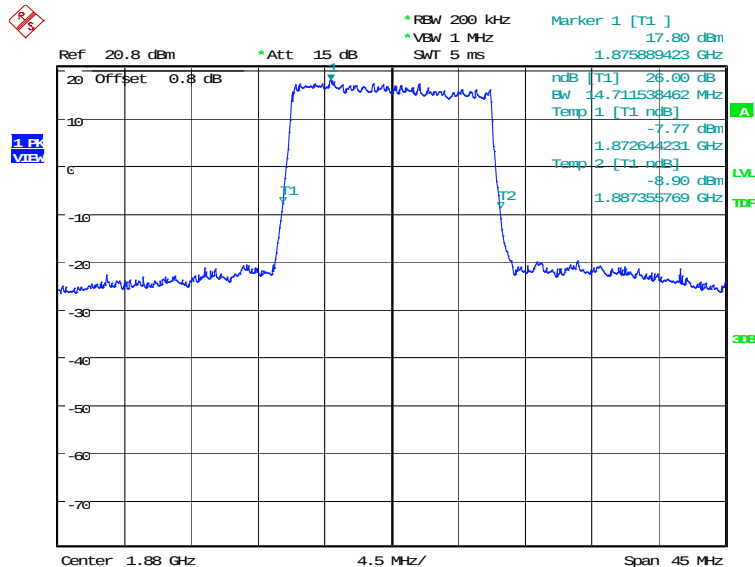
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |          |          |
|-----------------|-----------------------------------|----------|----------|
| 1880.0          | QPSK                              | 16QAM    | 64QAM    |
|                 | 14783.65                          | 14711.54 | 14639.42 |

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



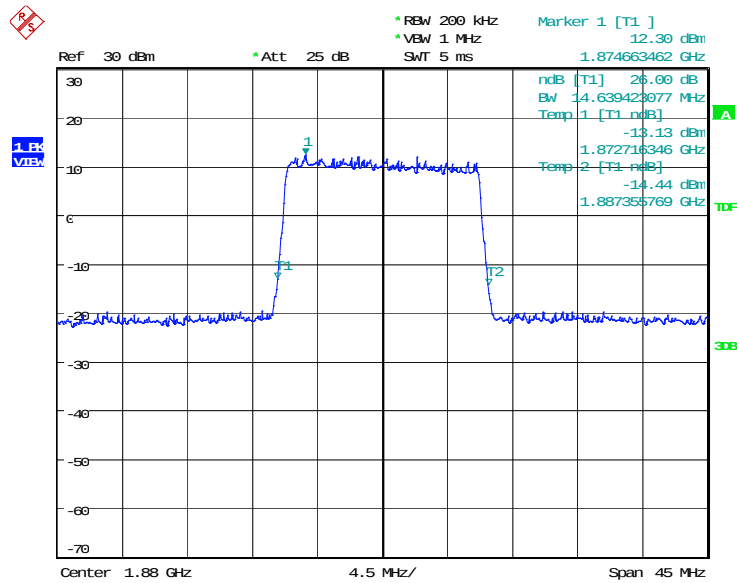
Date: 26.MAR.2020 12:22:47

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



Date: 26.MAR.2020 12:24:11

### LTE band 2, 15MHz Bandwidth, 64QAM (-26dBc BW)

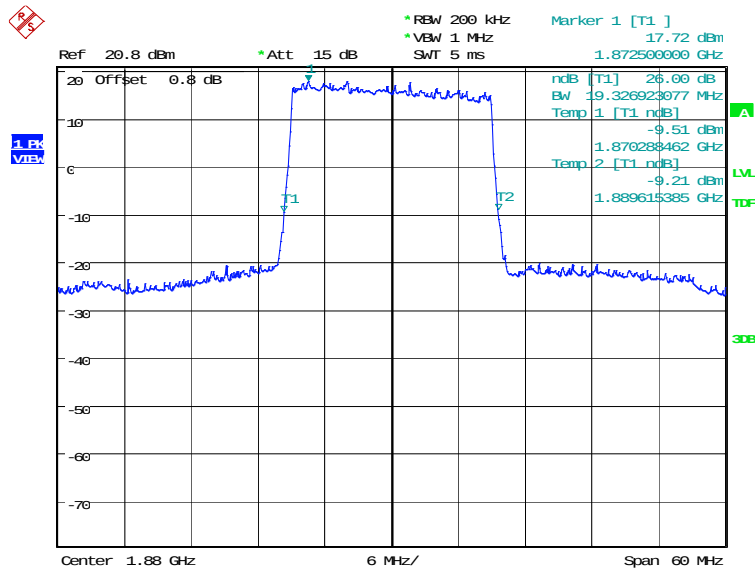


Date: 28.MAR.2020 09:23:35

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

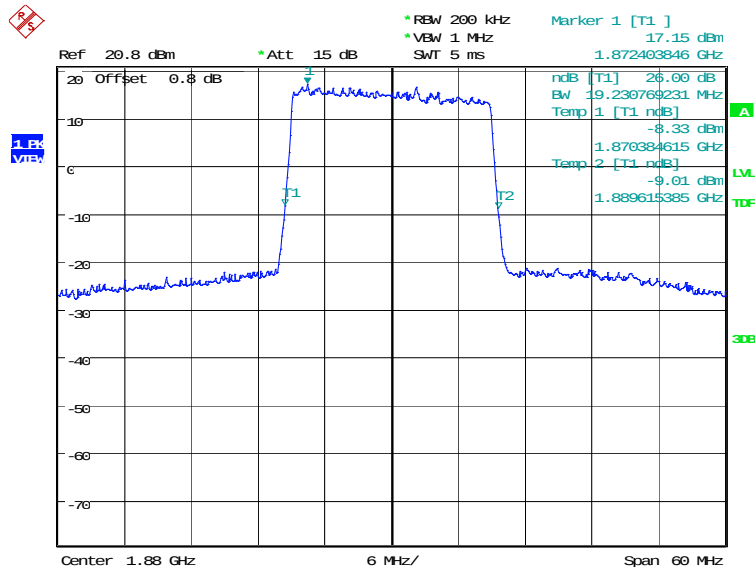
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |          |          |
|-----------------|-----------------------------------|----------|----------|
|                 | QPSK                              | 16QAM    | 64QAM    |
| 1880.0          | 19326.92                          | 19230.77 | 19326.92 |

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



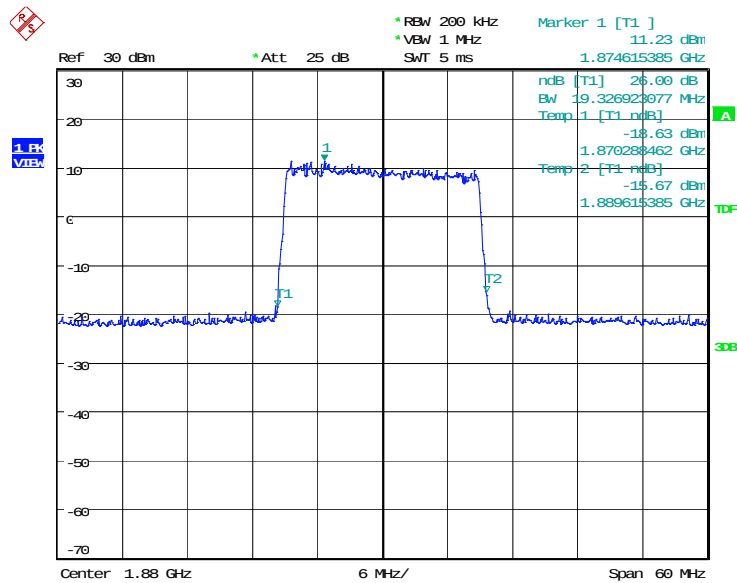
Date: 26.MAR.2020 12:25:38

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



Date: 26.MAR.2020 12:27:02

### LTE band 2, 20MHz Bandwidth, 64QAM (-26dBc BW)

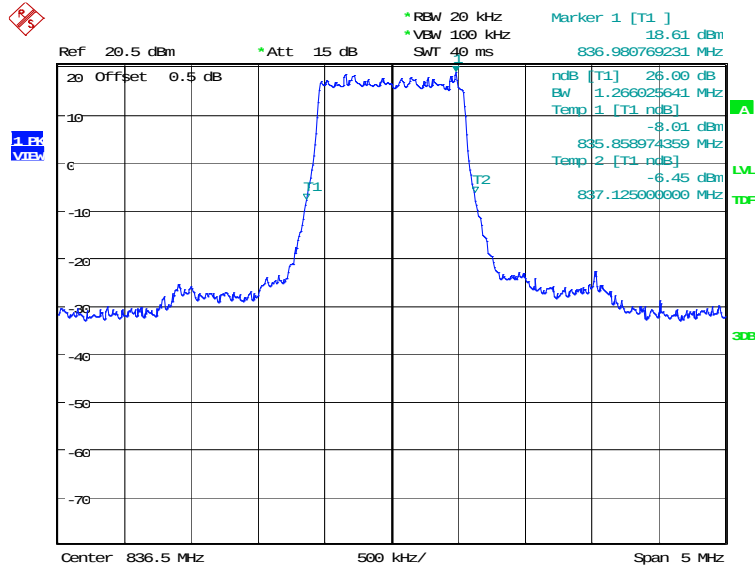


Date: 28.MAR.2020 09:25:24

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

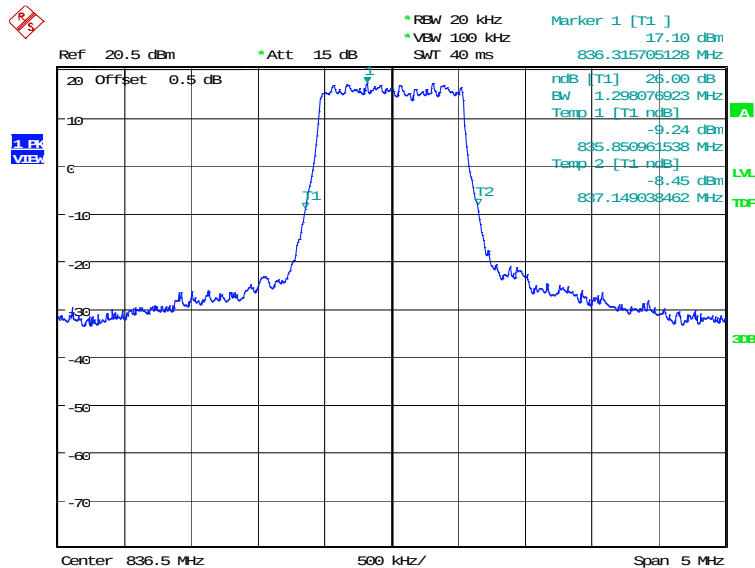
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
| 836.5           | QPSK                              | 16QAM   | 64QAM   |
|                 | 1266.03                           | 1298.08 | 1274.04 |

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



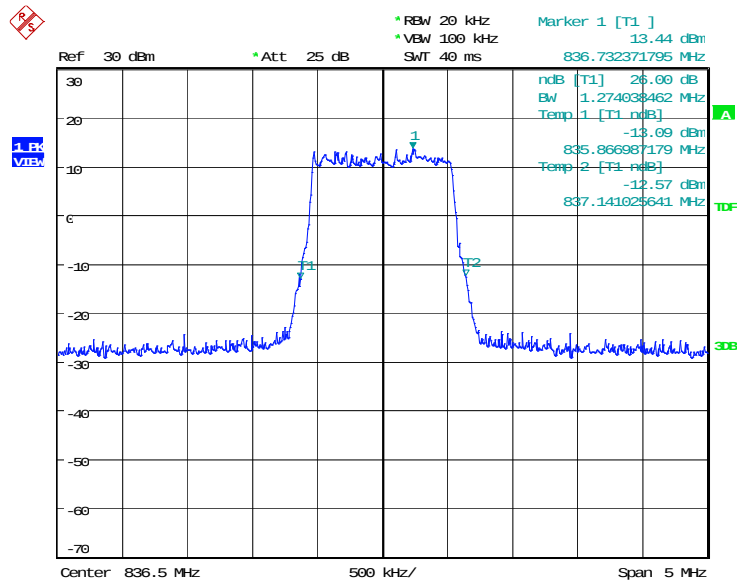
Date: 25.MAR.2020 19:05:17

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



Date: 25.MAR.2020 19:06:42

### LTE band 5, 1.4MHz Bandwidth, 64QAM (-26dBc BW)

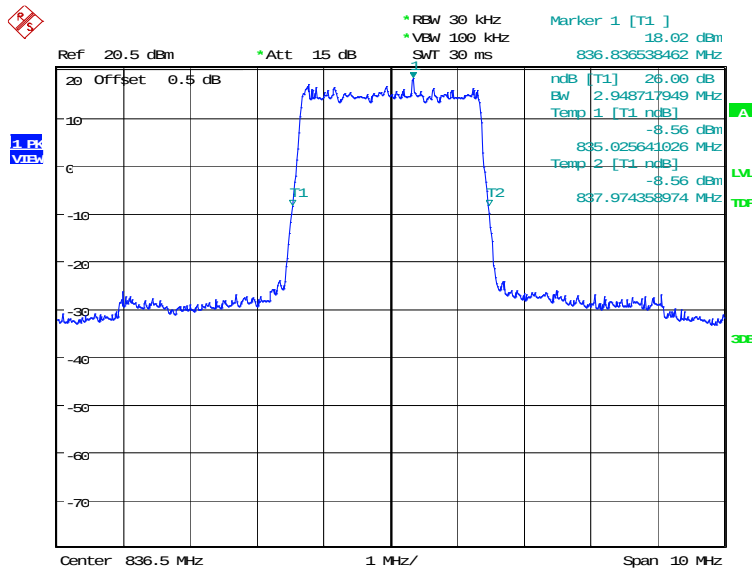


Date: 28.MAR.2020 09:45:36

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

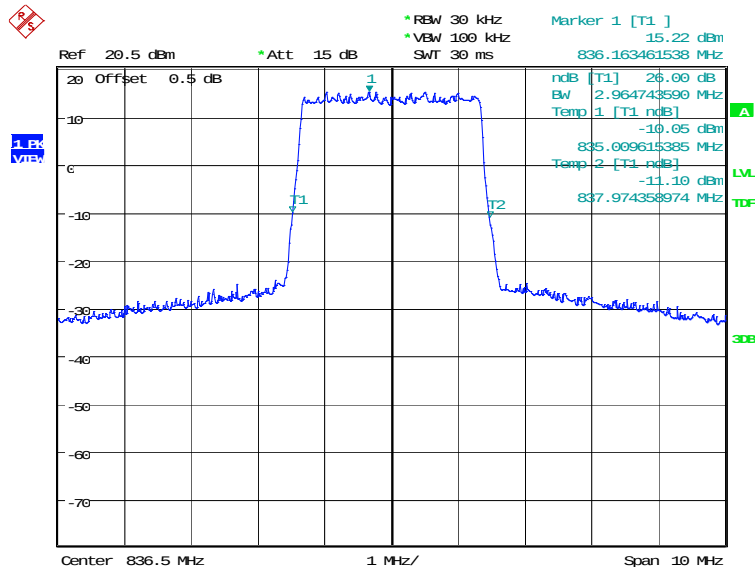
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
|                 | QPSK                              | 16QAM   | 64QAM   |
| 836.5           | 2948.72                           | 2964.74 | 2916.67 |

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



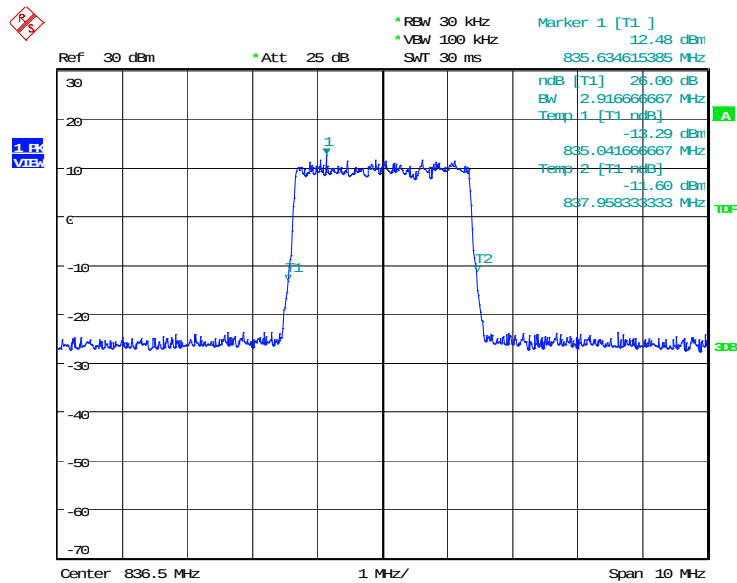
Date: 25.MAR.2020 19:08:09

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



Date: 25.MAR.2020 19:09:34

### LTE band 5, 3MHz Bandwidth, 64QAM (-26dBc BW)

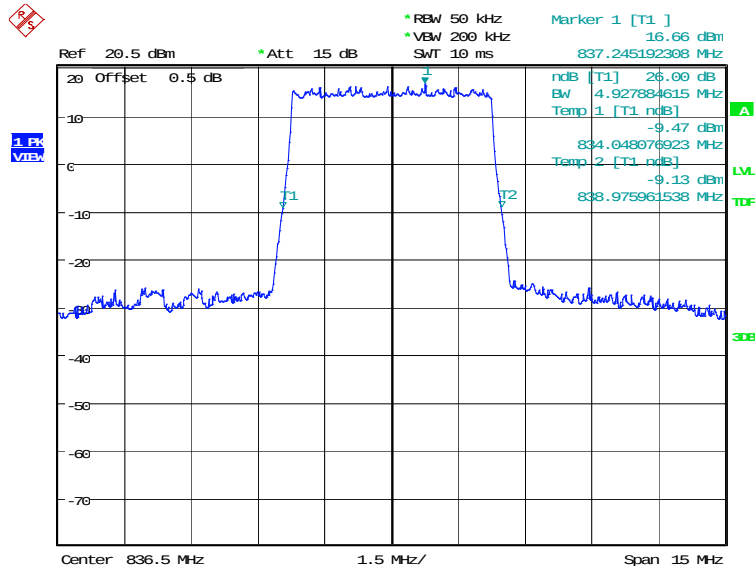


Date: 28.MAR.2020 09:47:04

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

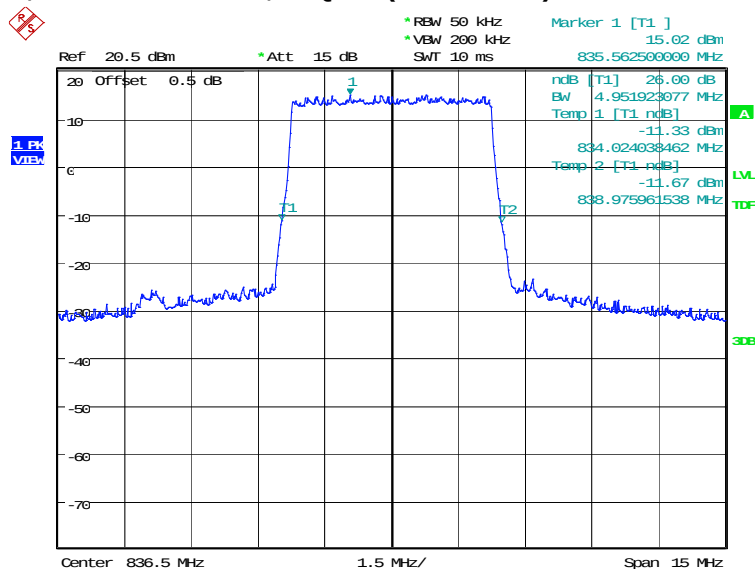
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
| 836.5           | QPSK                              | 16QAM   | 64QAM   |
|                 | 4927.88                           | 4951.92 | 4879.81 |

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



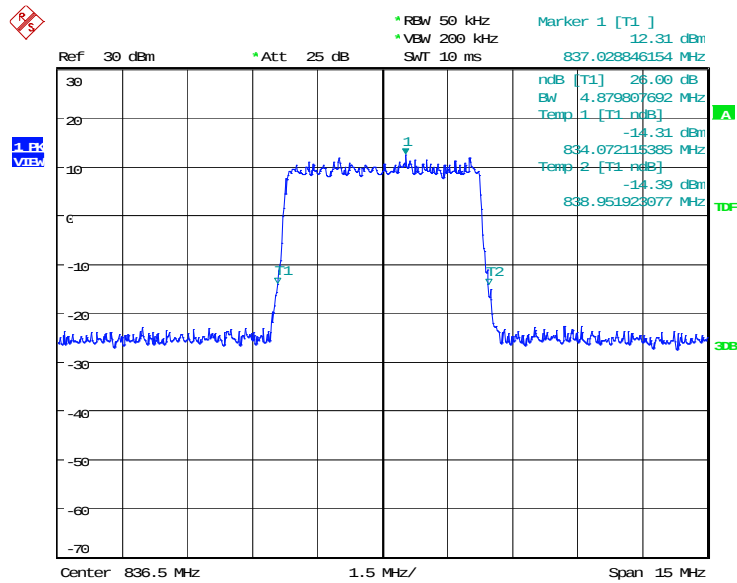
Date: 25.MAR.2020 19:11:00

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



Date: 25.MAR.2020 19:12:25

### LTE band 5, 5MHz Bandwidth,64QAM (-26dBc BW)

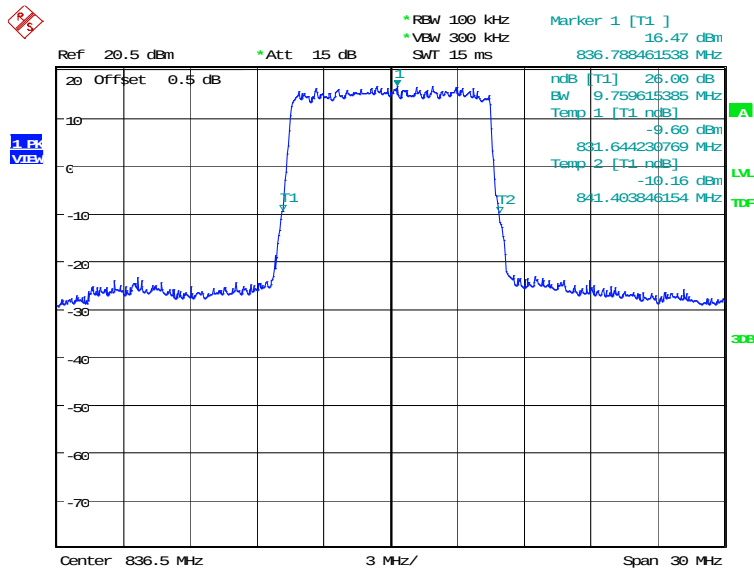


Date: 28.MAR.2020 09:48:52

### LTE band 5, 10MHz (-26dBc)

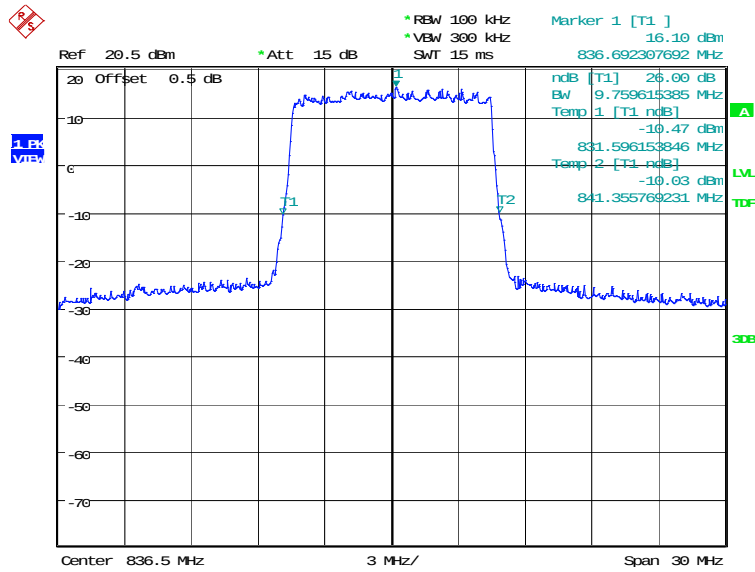
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
| 836.5           | QPSK                              | 16QAM   | 64QAM   |
|                 | 9759.62                           | 9759.62 | 9711.54 |

### LTE band 5, 10MHz Bandwidth, QPSK (-26dBc BW)



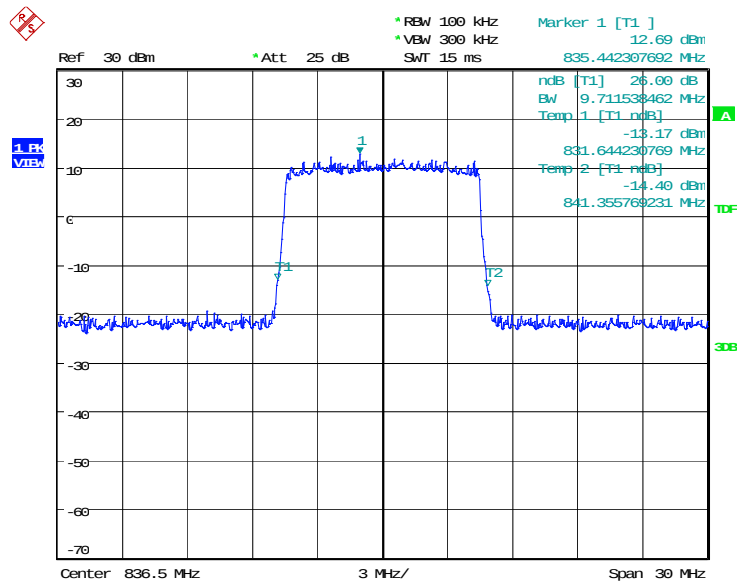
Date: 25.MAR.2020 19:13:52

## LTE band 5, 10MHz Bandwidth, 16QAM (-26dBc BW)



Date: 25.MAR.2020 19:15:16

## LTE band 5, 10MHz Bandwidth, 64QAM (-26dBc BW)

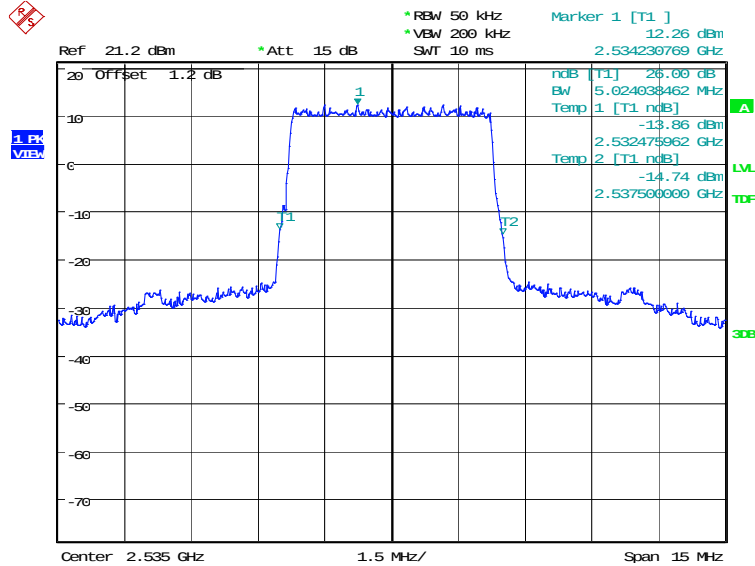


Date: 28.MAR.2020 09:50:04

### LTE band 7, 5MHz (-26dBc)

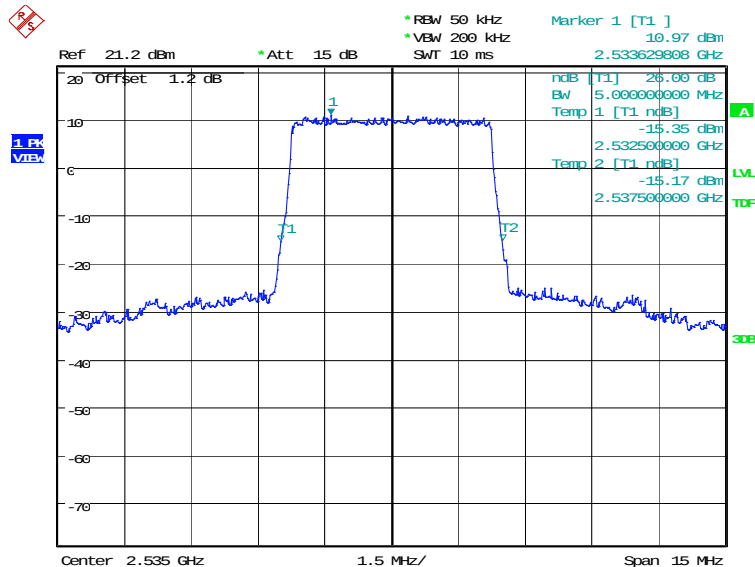
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
| 2535.0          | QPSK                              | 16QAM   | 64QAM   |
|                 | 5024.04                           | 5000.00 | 4951.92 |

### LTE band 7, 5MHz Bandwidth, QPSK (-26dBc BW)



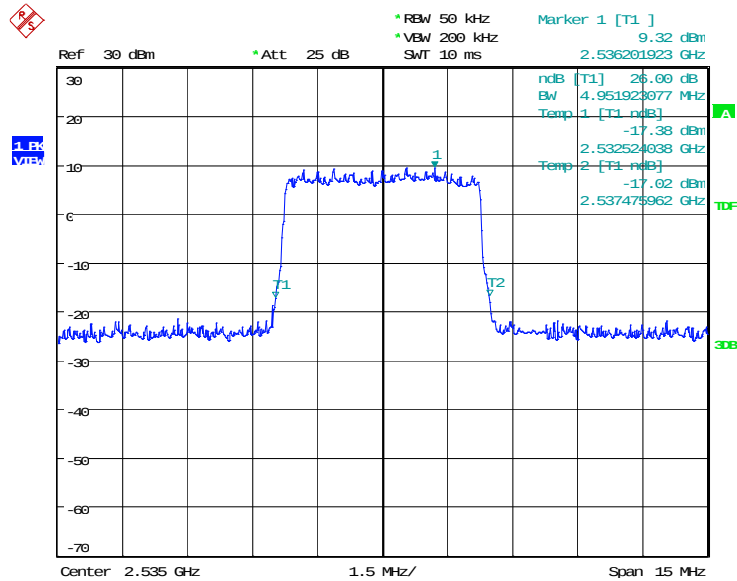
Date: 25.MAR.2020 19:16:44

### LTE band 7, 5MHz Bandwidth, 16QAM (-26dBc BW)



Date: 25.MAR.2020 19:18:09

### LTE band 7, 5MHz Bandwidth,64QAM (-26dBc BW)

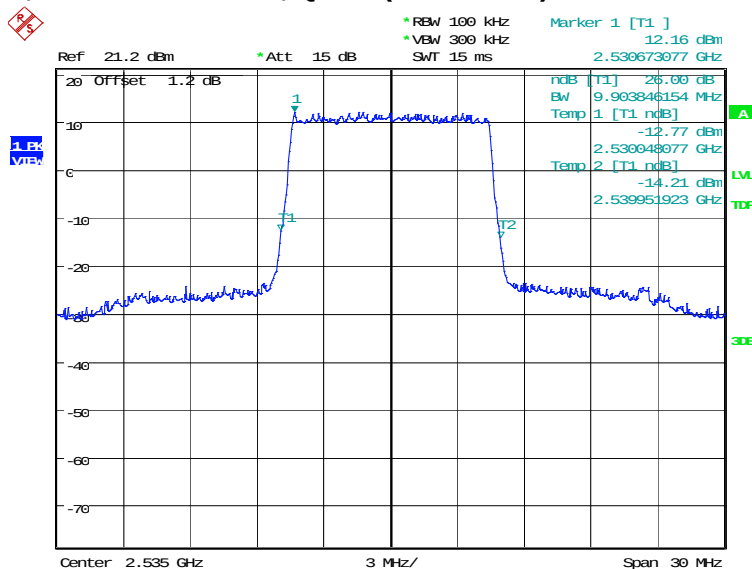


Date: 28.MAR.2020 09:55:50

### LTE band 7, 10MHz (-26dBc)

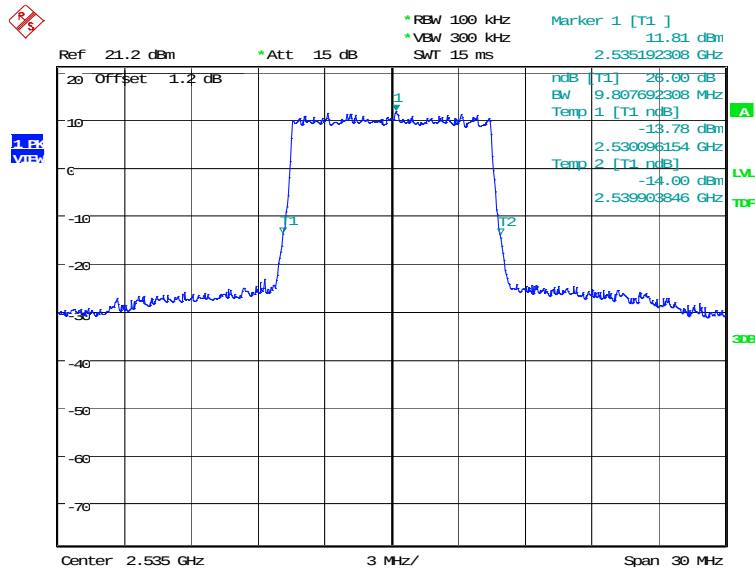
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
|                 | QPSK                              | 16QAM   | 64QAM   |
| 2535.0          | 9903.85                           | 9807.69 | 9807.69 |

### LTE band 7, 10MHz Bandwidth, QPSK (-26dBc BW)



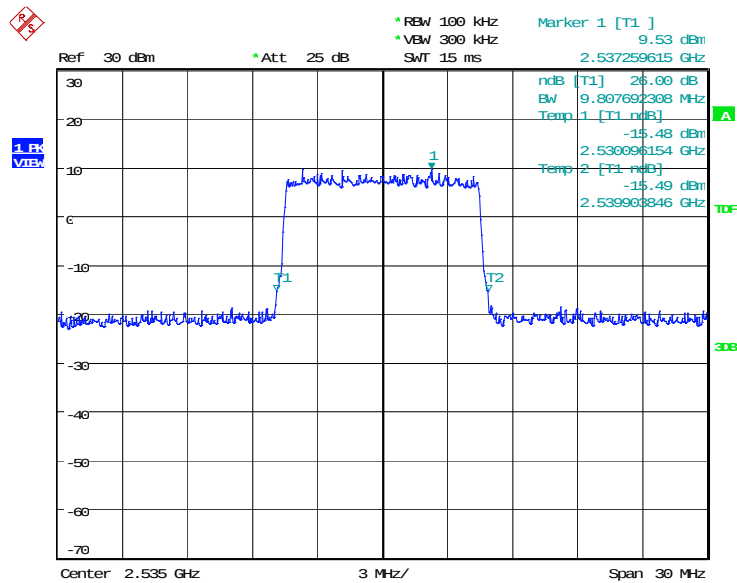
Date: 25.MAR.2020 19:19:36

### LTE band 7, 10MHz Bandwidth,16QAM (-26dBc BW)



Date: 25.MAR.2020 19:21:01

### LTE band 7, 10MHz Bandwidth, 64QAM (-26dBc BW)

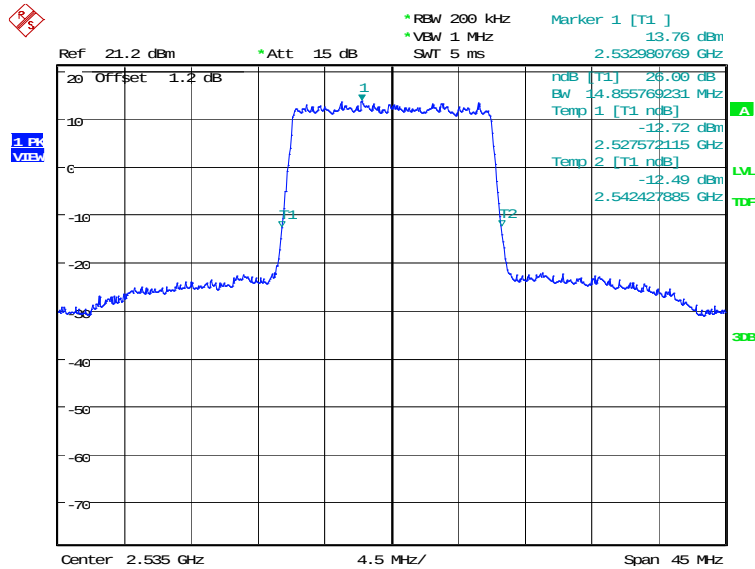


Date: 28.MAR.2020 09:57:29

### LTE band 7, 15MHz (-26dBc)

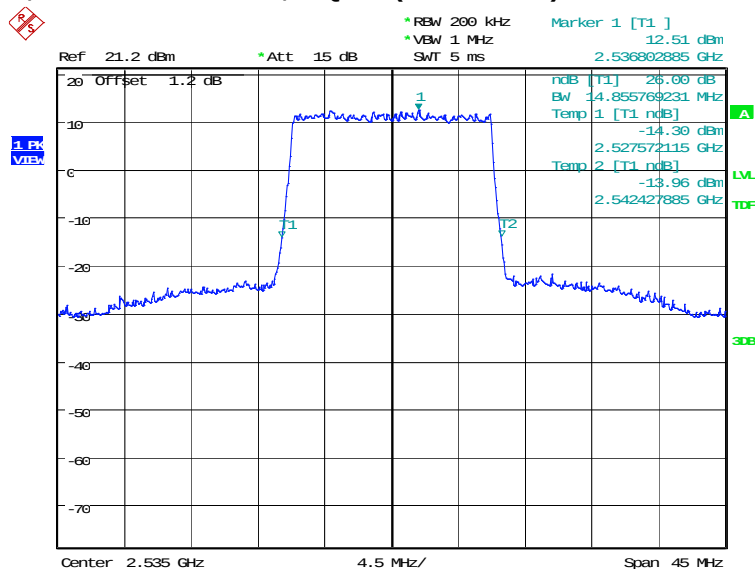
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |          |          |
|-----------------|-----------------------------------|----------|----------|
| 2535.0          | QPSK                              | 16QAM    | 64QAM    |
|                 | 14855.77                          | 14855.77 | 14783.65 |

### LTE band 7, 15MHz Bandwidth, QPSK (-26dBc BW)



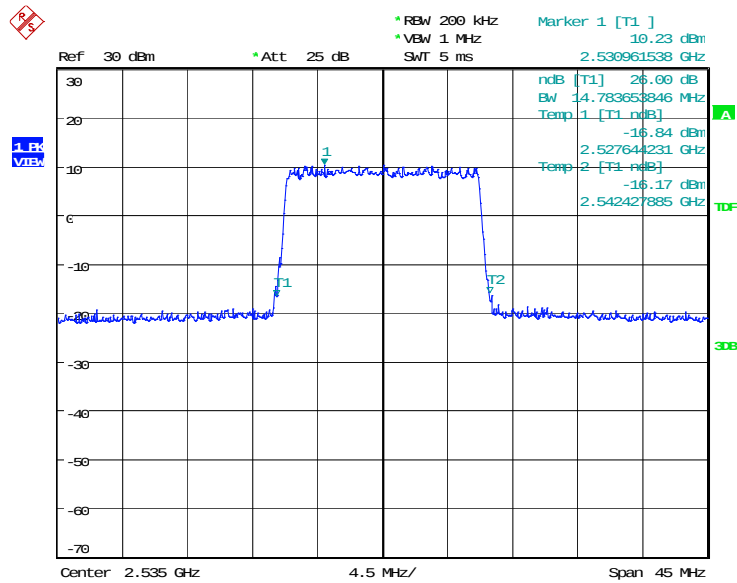
Date: 25.MAR.2020 19:22:27

### LTE band 7, 15MHz Bandwidth, 16QAM (-26dBc BW)



Date: 25.MAR.2020 19:23:52

### LTE band 7, 15MHz Bandwidth, 64QAM (-26dBc BW)

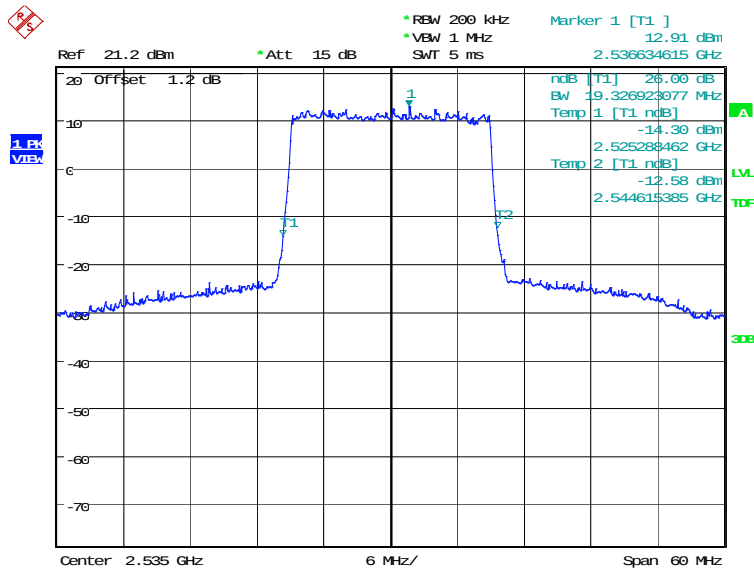


Date: 28.MAR.2020 10:01:11

### LTE band 7, 20MHz (-26dBc)

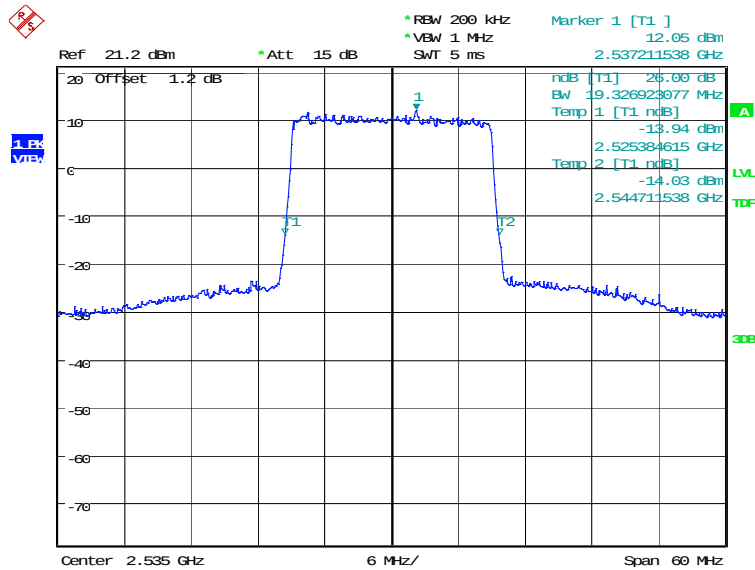
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |          |          |
|-----------------|-----------------------------------|----------|----------|
| 2535.0          | QPSK                              | 16QAM    | 64QAM    |
|                 | 19326.92                          | 19326.92 | 19423.08 |

### LTE band 7, 20MHz Bandwidth, QPSK (-26dBc BW)



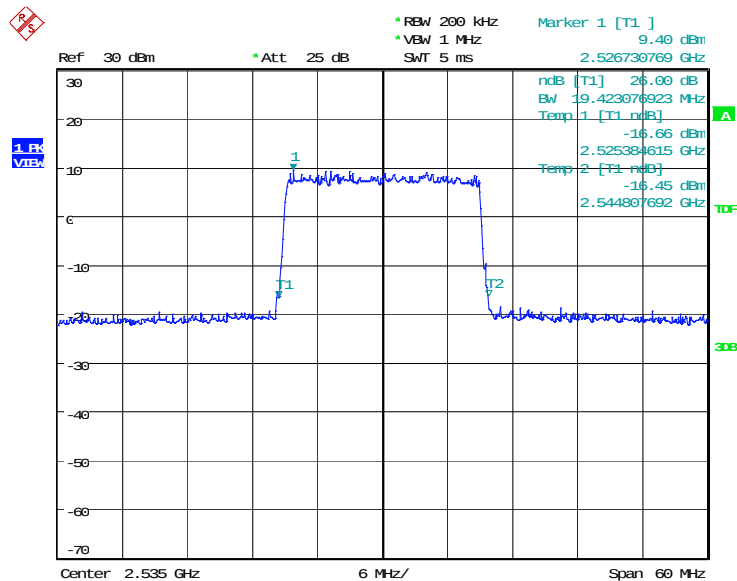
Date: 25.MAR.2020 19:25:19

### LTE band 7, 20MHz Bandwidth,16QAM (-26dBc BW)



Date: 25.MAR.2020 19:26:44

### LTE band 7, 20MHz Bandwidth, 64QAM (-26dBc BW)

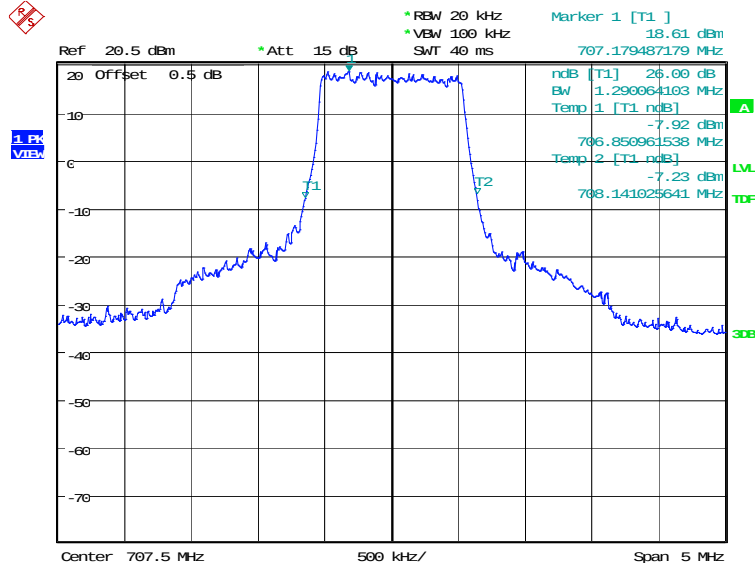


Date: 28.MAR.2020 10:02:33

### LTE band 12, 1.4MHz (-26dBc)

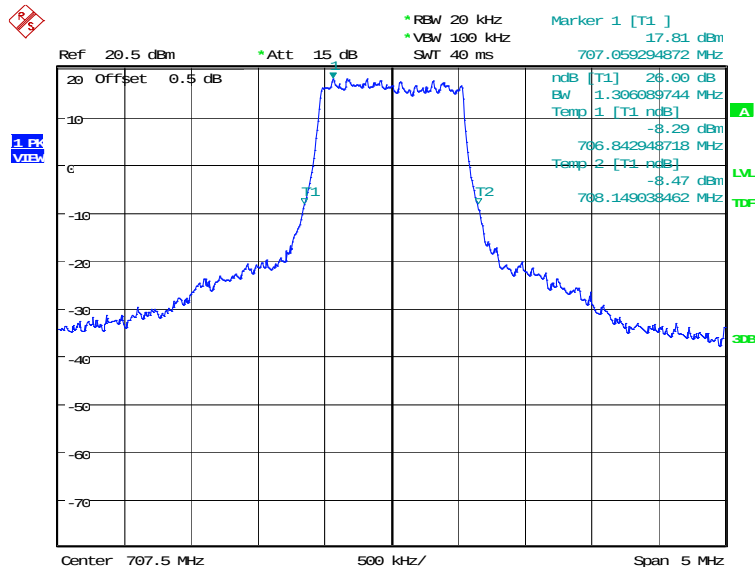
| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
| 707.5           | QPSK                              | 16QAM   | 64QAM   |
|                 | 1290.06                           | 1306.09 | 1290.06 |

### LTE band 12, 1.4MHz Bandwidth, QPSK (-26dBc BW)



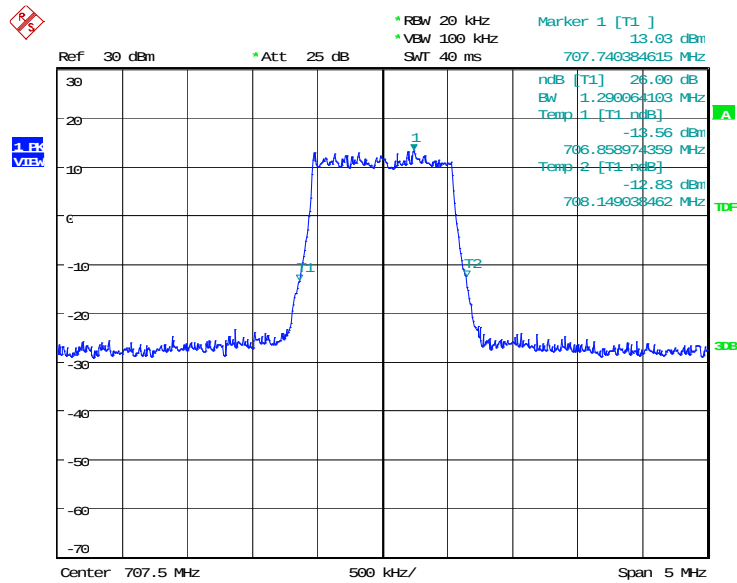
Date: 25.MAR.2020 19:29:01

### LTE band 12, 1.4MHz Bandwidth, 16QAM (-26dBc BW)



Date: 25.MAR.2020 19:30:26

### LTE band 12, 1.4MHz Bandwidth, 64QAM (-26dBc BW)

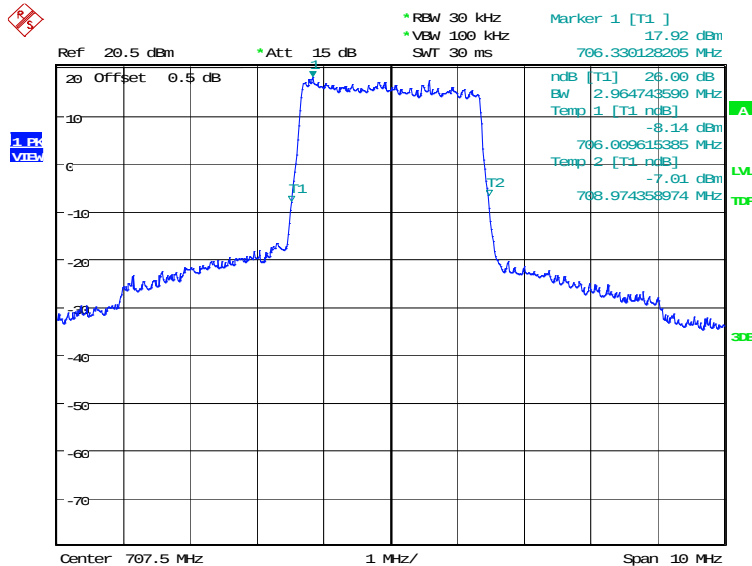


Date: 28.MAR.2020 10:11:57

### LTE band 12, 3MHz (-26dBc)

| Frequency (MHz) | Occupied Bandwidth (-26dBc) (kHz) |         |         |
|-----------------|-----------------------------------|---------|---------|
|                 | QPSK                              | 16QAM   | 64QAM   |
| 707.5           | 2964.74                           | 2964.74 | 2948.72 |

### LTE band 12, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 25.MAR.2020 19:31:52