# TEST REPORT
## No. I19Z61867-WMD03

**for**

**TCL Communication Ltd.**

**LTE/UMTS/GSM mobile phone**

**Model Name: A508DL**

**FCC ID: 2ACCJH112**

**with**

**Hardware Version: PIO**

**Software Version: vC41**

**Issued Date: 2019-11-07**

**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.

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## REPORT HISTORY

| Report Number | Revision | Description | Issue Date |
|---|---|---|---|
| I19Z61867-WMD03 | Rev.0 | 1$^{st}$ edition | 2019-11-07 |

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

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# 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

### 1.3. Testing Environment

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

### 1.4. Project data

Testing Start Date: 2019-10-18
Testing End Date: 2019-11-07

### 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: | TCL Communication Ltd. |
| Address /Post: | 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong |
| Contact: | Gong Zhizhou |
| Email: | zhizhou.gong@tcl.com |
| Telephone: | 0086-755-36611722 |
| Fax: | 0086-755-36612000-81722 |

### 2.2.  Manufacturer Information

| | |
|---|---|
| Company Name: | TCL Communication Ltd. |
| Address /Post: | 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong |
| Contact: | Gong Zhizhou |
| Email: | zhizhou.gong@tcl.com |
| Telephone: | 0086-755-36611722 |
| Fax: | 0086-755-36612000-81722 |

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

### 3.1. About EUT

| | |
|---|---|
| Description | LTE/UMTS/GSM mobile phone |
| Model Name | A508DL |
| FCC ID | 2ACCJH112 |
| Antenna | Embedded |
| Output power | 26.79dBm maximum EIRP measured for LTE Band 66 |
| Extreme vol. Limits | 3.5VDC to 4.4VDC (nominal: 3.8VDC) |
| Extreme temp. Tolerance | -10C to +55°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 | 015592000018068 | PIO | vC41 | 2019-10-04 |
| UT12a | 015592000014810 | PIO | vC41 | 2019-10-04 |

*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 | CAC3400011C1 |
| Manufacturer | BYD |
| Capacitance | 3400mAh |

*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 | 10-1-18 Edition |
| FCC Part 22 | PUBLIC MOBILE SERVICES | 10-1-18 Edition |
| FCC Part 27 | MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES | 10-1-18 Edition |
| FCC Part 90 | PRIVATE LAND MOBILE RADIO SERVICES | 10-1-18 Edition |
| ANSI/TIA-603-E | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards | 2016 |
| ANSI/TIA-102.CAAA-E | DIGITAL C4FMCQPSK TRANSCEIVER MEASUREMENT METHODS | 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

**Fully-anechoic chamber FAC-3** (9 meters×6.5 meters×4 meters) did not exceed following limits along the EMC testing:

| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
|---|---|
| Relative humidity | Min. = 15 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB. |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 4 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 |

## 6. SUMMARY OF TEST RESULT

### 6.1. Summary of test results

**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 13**

| 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 25**

| 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 26(814MHz~824MHz)**

| Items | Test Name | Clause in FCC rules | Verdict |
|---|---|---|---|
| 1 | Output Power | 90.635 | P |
| 2 | Emission Limit | 2.1051/90.691 | P |
| 3 | Frequency Stability | 2.1055 | P |
| 4 | Occupied Bandwidth | 2.1049 | P |
| 5 | Emission Bandwidth | 2.1049 | P |
| 6 | Band Edge Compliance | 90.691 | P |
| 7 | Conducted Spurious Emission | 90.691 | P |

**LTE Band 26(824MHz~849MHz)**

| 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 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 |

**LTE Band 71**

| 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. |

# 7. Test Equipment Utilized

| NO. | Description | TYPE | series number | MANUFACTURE | CAL DUE DATE | Calibration interval |
|-----|-------------|------|---------------|-------------|--------------|----------------------|
| 1 | Universal Radio Communication Tester | CMW500 | 143008 | R&S | 2019-11-26 | 1 year |
| 2 | Test Receiver | E4440A | MY48250642 | Agilent | 2020-03-18 | 1 year |
| 3 | EMI Antenna | VULB9163 | 9163-235 | Schwarzbeck | 2019-11-20 | 1 year |
| 4 | Universal Radio Communication Tester | CMW500 | 159082 | R&S | 2019-12-25 | 1 year |
| 5 | Spectrum Analyzer | FSU26 | 200030 | R&S | 2020-06-03 | 1 year |
| 6 | EMI Antenna | 3117 | 00058889 | ETS-Lindgren | 2020-01-02 | 1 year |
| 7 | EMI Antenna | 3117 | 00119024 | ETS-Lindgren | 2020-02-25 | 1 year |
| 8 | Climate chamber | SH-242 | 93008556 | ESPEC | 2019-12-21 | 2 year |
| 9 | EMI Antenna | 9117 | 167 | Schwarzbeck | 2020-05-27 | 1 year |
| 10 | Wireless Communication Test Set | E5515E | MY53211012 | Agilent | 2020-08-06 | 1 year |
| 11 | Signal Generator | N5183A | MY49060052 | Agilent | 2020-06-24 | 1 year |
| 12 | Power Amplifier | 5S1G4 | 0341863 | AR | / | / |

# ANNEX A: MEASUREMENT RESULTS

## A.1  OUTPUT POWER

### A.1.1 Summary

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

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 12**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) | |
|---|---|---|---|---|
| | | | QPSK | 16QAM |
| 1.4MHz | 1 RB high | 715.3 | 23.19 | 22.27 |
| | | 707.5 | 23.03 | 22.16 |
| | | 699.7 | 22.96 | 22.07 |
| | 1 RB low | 715.3 | 23.12 | 22.17 |
| | | 707.5 | 23.02 | 22.16 |
| | | 699.7 | 22.91 | 22.02 |
| | 50% RB mid | 715.3 | 23.31 | 22.22 |
| | | 707.5 | 23.19 | 22.13 |
| | | 699.7 | 23.08 | 22.03 |
| | 100% RB | 715.3 | 22.24 | 21.19 |
| | | 707.5 | 22.14 | 21.12 |
| | | 699.7 | 22.04 | 20.97 |
| 3MHz | 1 RB high | 714.5 | 23.22 | 22.29 |
| | | 707.5 | 23.09 | 22.20 |
| | | 700.5 | 22.94 | 22.03 |
| | 1 RB low | 714.5 | 23.04 | 22.18 |
| | | 707.5 | 22.97 | 22.09 |
| | | 700.5 | 22.92 | 21.99 |
| | 50% RB mid | 714.5 | 22.20 | 21.14 |
| | | 707.5 | 22.09 | 21.08 |
| | | 700.5 | 22.01 | 20.98 |

| | | 714.5 | 22.15 | 21.09 |
|---|---|---|---|---|
| | 100% RB | 707.5 | 22.05 | 21.01 |
| | | 700.5 | 21.98 | 20.91 |
| 5MHz | 1 RB high | 713.5 | 23.09 | 22.19 |
| | | 707.5 | 23.01 | 22.15 |
| | | 701.5 | 22.86 | 21.99 |
| | 1 RB low | 713.5 | 22.94 | 22.08 |
| | | 707.5 | 22.88 | 22.00 |
| | | 701.5 | 22.79 | 21.95 |
| | 50% RB mid | 713.5 | 22.15 | 21.08 |
| | | 707.5 | 22.09 | 21.01 |
| | | 701.5 | 22.06 | 20.98 |
| | 100% RB | 713.5 | 22.12 | 21.10 |
| | | 707.5 | 22.09 | 21.05 |
| | | 701.5 | 21.96 | 20.93 |
| 10MHz | 1 RB high | 711.0 | 23.17 | 22.29 |
| | | 707.5 | 23.08 | 22.25 |
| | | 704.0 | 23.02 | 22.20 |
| | 1 RB low | 711.0 | 22.91 | 22.03 |
| | | 707.5 | 22.86 | 21.98 |
| | | 704.0 | 22.84 | 21.98 |
| | 50% RB mid | 711.0 | 22.14 | 21.10 |
| | | 707.5 | 22.11 | 21.10 |
| | | 704.0 | 22.09 | 21.05 |
| | 100% RB | 711.0 | 22.06 | 21.06 |
| | | 707.5 | 22.14 | 21.10 |
| | | 704.0 | 22.13 | 21.08 |

**LTE band 13**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) | |
|---|---|---|---|---|
| | | | QPSK | 16QAM |
| 5MHz | 1 RB high | 784.5 | 22.82 | 21.98 |
| | | 782 | 22.85 | 22.03 |
| | | 779.5 | 22.89 | 22.38 |
| | 1 RB low | 784.5 | 22.85 | 21.99 |
| | | 782 | 22.86 | 22.03 |
| | | 779.5 | 22.92 | 22.24 |
| | 50% RB mid | 784.5 | 22.04 | 21.10 |
| | | 782 | 22.04 | 21.07 |
| | | 779.5 | 22.00 | 21.14 |
| | 100% RB | 784.5 | 21.95 | 20.93 |
| | | 782 | 21.92 | 20.96 |
| | | 779.5 | 21.94 | 21.00 |
| 10MHz | 1 RB high | 782.0 | 23.04 | 22.33 |
| | 1 RB low | 782.0 | 22.99 | 22.23 |
| | 50% RB mid | 782.0 | 22.03 | 21.07 |
| | 100% RB | 782.0 | 21.92 | 20.93 |

**LTE band 25**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) | |
|---|---|---|---|---|
| | | | QPSK | 16QAM |
| 1.4MHz | 1 RB high | 1914.3 | 22.64 | 21.78 |
| | | 1882.5 | 22.64 | 21.85 |
| | | 1850.7 | 22.76 | 22.18 |
| | 1 RB low | 1914.3 | 22.67 | 21.75 |
| | | 1882.5 | 22.63 | 21.82 |
| | | 1850.7 | 22.74 | 22.15 |
| | 50% RB mid | 1914.3 | 22.87 | 22.05 |
| | | 1882.5 | 22.79 | 21.86 |
| | | 1850.7 | 22.95 | 22.09 |
| | 100% RB | 1914.3 | 21.77 | 20.95 |
| | | 1882.5 | 21.70 | 20.84 |
| | | 1850.7 | 21.75 | 20.68 |
| 3MHz | 1 RB high | 1913.5 | 22.76 | 22.18 |
| | | 1882.5 | 22.68 | 21.78 |
| | | 1851.5 | 22.83 | 21.79 |
| | 1 RB low | 1913.5 | 22.78 | 22.19 |
| | | 1882.5 | 22.71 | 21.85 |
| | | 1851.5 | 22.82 | 21.77 |
| | 50% RB mid | 1913.5 | 21.86 | 20.94 |
| | | 1882.5 | 21.78 | 20.84 |
| | | 1851.5 | 21.82 | 20.95 |
| | 100% RB | 1913.5 | 21.80 | 20.82 |
| | | 1882.5 | 21.77 | 20.73 |
| | | 1851.5 | 21.84 | 20.91 |
| 5MHz | 1 RB high | 1912.5 | 22.73 | 21.84 |
| | | 1882.5 | 22.71 | 21.85 |
| | | 1852.5 | 22.75 | 22.34 |
| | 1 RB low | 1912.5 | 22.72 | 21.80 |
| | | 1882.5 | 22.73 | 21.87 |
| | | 1852.5 | 22.72 | 22.29 |
| | 50% RB mid | 1912.5 | 21.86 | 20.87 |
| | | 1882.5 | 21.79 | 20.89 |
| | | 1852.5 | 21.86 | 21.07 |
| | 100% RB | 1912.5 | 21.79 | 20.72 |
| | | 1882.5 | 21.73 | 20.78 |
| | | 1852.5 | 21.81 | 20.92 |
| 10MHz | 1 RB high | 1910.0 | 22.70 | 21.76 |
| | | 1882.5 | 22.64 | 21.65 |

| | | 1855.0 | 22.83 | 22.19 |
|---|---|---|---|---|
| | 1 RB low | 1910.0 | 22.63 | 21.80 |
| | | 1882.5 | 22.67 | 21.69 |
| | | 1855.0 | 22.76 | 22.16 |
| | 50% RB mid | 1910.0 | 21.79 | 20.93 |
| | | 1882.5 | 21.85 | 20.83 |
| | | 1855.0 | 21.93 | 20.97 |
| | 100% RB | 1910.0 | 21.75 | 20.84 |
| | | 1882.5 | 21.82 | 20.79 |
| | | 1855.0 | 21.91 | 20.94 |
| 15MHz | 1 RB high | 1907.5 | 22.67 | 22.12 |
| | | 1882.5 | 22.63 | 21.55 |
| | | 1857.5 | 22.72 | 22.05 |
| | 1 RB low | 1907.5 | 22.71 | 22.20 |
| | | 1882.5 | 22.63 | 21.66 |
| | | 1857.5 | 22.78 | 22.12 |
| | 50% RB mid | 1907.5 | 21.82 | 20.77 |
| | | 1882.5 | 21.77 | 20.75 |
| | | 1857.5 | 21.84 | 20.92 |
| | 100% RB | 1907.5 | 21.78 | 20.75 |
| | | 1882.5 | 21.76 | 20.75 |
| | | 1857.5 | 21.87 | 20.91 |
| 20MHz | 1 RB high | 1905.0 | 22.60 | 22.08 |
| | | 1882.5 | 22.49 | 21.99 |
| | | 1860.0 | 22.55 | 22.21 |
| | 1 RB low | 1905.0 | 22.56 | 22.13 |
| | | 1882.5 | 22.53 | 22.03 |
| | | 1860.0 | 22.56 | 22.18 |
| | 50% RB mid | 1905.0 | 21.80 | 20.89 |
| | | 1882.5 | 21.77 | 20.74 |
| | | 1860.0 | 21.85 | 20.93 |
| | 100% RB | 1905.0 | 21.77 | 20.78 |
| | | 1882.5 | 21.74 | 20.76 |
| | | 1860.0 | 21.80 | 20.84 |

**LTE band 26(814MHz~824MHz)**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) | |
|---|---|---|---|---|
| | | | QPSK | 16QAM |
| 1.4MHz | 1 RB high | 823.3 | 22.83 | 21.90 |
| | | 819.0 | 22.85 | 21.92 |
| | | 814.7 | 22.83 | 21.87 |
| | 1 RB low | 823.3 | 22.87 | 21.86 |
| | | 819.0 | 22.84 | 21.86 |
| | | 814.7 | 22.85 | 21.86 |
| | 50% RB mid | 823.3 | 23.00 | 22.22 |
| | | 819.0 | 23.03 | 22.18 |
| | | 814.7 | 23.00 | 22.17 |
| | 100% RB | 823.3 | 21.95 | 21.09 |
| | | 819.0 | 21.93 | 20.86 |
| | | 814.7 | 21.92 | 21.08 |
| 3MHz | 1 RB high | 822.5 | 22.86 | 21.86 |
| | | 819.0 | 22.89 | 22.00 |
| | | 815.5 | 22.88 | 21.86 |
| | 1 RB low | 822.5 | 22.88 | 21.92 |
| | | 819.0 | 22.87 | 22.01 |
| | | 815.5 | 22.91 | 21.91 |
| | 50% RB mid | 822.5 | 21.90 | 21.01 |
| | | 819.0 | 21.89 | 21.00 |
| | | 815.5 | 21.84 | 20.97 |
| | 100% RB | 822.5 | 21.82 | 20.88 |
| | | 819.0 | 21.83 | 20.88 |
| | | 815.5 | 21.82 | 20.85 |
| 5MHz | 1 RB high | 821.5 | 22.80 | 21.88 |
| | | 819.0 | 22.84 | 22.11 |
| | | 816.5 | 22.81 | 21.90 |
| | 1 RB low | 821.5 | 22.80 | 21.90 |
| | | 819.0 | 22.80 | 22.08 |
| | | 816.5 | 22.78 | 21.87 |
| | 50% RB mid | 821.5 | 21.96 | 21.07 |
| | | 819.0 | 21.93 | 21.06 |
| | | 816.5 | 21.92 | 21.03 |
| | 100% RB | 821.5 | 21.90 | 20.98 |
| | | 819.0 | 21.88 | 20.96 |
| | | 816.5 | 21.86 | 20.96 |
| 10MHz | 1 RB high | 819.0 | 22.89 | 22.04 |
| | 1 RB low | 819.0 | 22.85 | 22.00 |

| | 50% RB mid | 819.0 | 21.90 | 20.95 |
| | 100% RB | 819.0 | 21.93 | 20.93 |

**LTE band 26(824MHz~849MHz)**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) | |
|---|---|---|---|---|
| | | | QPSK | 16QAM |
| 1.4MHz | 1 RB high | 848.3 | 23.00 | 21.99 |
| | | 836.5 | 22.92 | 22.02 |
| | | 824.7 | 22.83 | 21.88 |
| | 1 RB low | 848.3 | 23.00 | 21.95 |
| | | 836.5 | 22.90 | 22.03 |
| | | 824.7 | 22.85 | 21.87 |
| | 50% RB mid | 848.3 | 23.13 | 22.21 |
| | | 836.5 | 23.03 | 22.17 |
| | | 824.7 | 22.99 | 22.20 |
| | 100% RB | 848.3 | 22.11 | 20.95 |
| | | 836.5 | 21.92 | 20.86 |
| | | 824.7 | 21.93 | 21.09 |
| 3MHz | 1 RB high | 847.5 | 23.01 | 21.96 |
| | | 836.5 | 22.93 | 22.07 |
| | | 825.5 | 22.90 | 21.90 |
| | 1 RB low | 847.5 | 23.03 | 22.02 |
| | | 836.5 | 22.94 | 22.08 |
| | | 825.5 | 22.91 | 21.97 |
| | 50% RB mid | 847.5 | 22.04 | 21.09 |
| | | 836.5 | 21.92 | 21.03 |
| | | 825.5 | 21.91 | 21.00 |
| | 100% RB | 847.5 | 22.02 | 21.02 |
| | | 836.5 | 21.94 | 20.96 |
| | | 825.5 | 21.85 | 20.89 |
| 5MHz | 1 RB high | 846.5 | 22.94 | 21.99 |
| | | 836.5 | 22.89 | 22.15 |
| | | 826.5 | 22.83 | 21.93 |
| | 1 RB low | 846.5 | 22.88 | 21.95 |
| | | 836.5 | 22.87 | 22.12 |
| | | 826.5 | 22.79 | 21.89 |
| | 50% RB mid | 846.5 | 22.06 | 21.15 |
| | | 836.5 | 22.01 | 21.10 |
| | | 826.5 | 21.94 | 21.11 |
| | 100% RB | 846.5 | 22.02 | 21.04 |
| | | 836.5 | 21.97 | 21.00 |
| | | 826.5 | 21.89 | 20.96 |
| 10MHz | 1 RB high | 844.0 | 23.06 | 22.01 |
| | | 836.5 | 22.98 | 22.10 |

| | | 829.0 | 22.92 | 21.93 |
|---|---|---|---|---|
| | 1 RB low | 844.0 | 22.95 | 21.92 |
| | | 836.5 | 22.90 | 22.01 |
| | | 829.0 | 22.90 | 21.89 |
| | 50% RB mid | 844.0 | 22.00 | 21.05 |
| | | 836.5 | 21.98 | 21.00 |
| | | 829.0 | 21.92 | 20.97 |
| | 100% RB | 844.0 | 22.00 | 20.98 |
| | | 836.5 | 21.99 | 20.97 |
| | | 829.0 | 21.93 | 20.96 |
| 15MHz | 1 RB high | 841.5 | 23.00 | 22.30 |
| | | 836.5 | 22.91 | 22.07 |
| | | 831.5 | 22.86 | 21.99 |
| | 1 RB low | 841.5 | 22.88 | 22.25 |
| | | 836.5 | 22.85 | 21.97 |
| | | 831.5 | 22.85 | 21.99 |
| | 50% RB mid | 841.5 | 22.08 | 21.07 |
| | | 836.5 | 22.04 | 21.03 |
| | | 831.5 | 21.99 | 21.01 |
| | 100% RB | 841.5 | 22.05 | 21.01 |
| | | 836.5 | 22.02 | 21.00 |
| | | 831.5 | 21.94 | 20.94 |

**LTE band 41(PC2)**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) | |
|---|---|---|---|---|
| | | | QPSK | 16QAM |
| 5MHz | 1 RB high | 2687.5 | 25.95 | 25.06 |
| | | 2593.0 | 26.17 | 25.28 |
| | | 2498.5 | 25.89 | 24.97 |
| | 1 RB low | 2687.5 | 26.02 | 25.13 |
| | | 2593.0 | 26.15 | 25.32 |
| | | 2498.5 | 25.95 | 25.04 |
| | 50% RB mid | 2687.5 | 25.10 | 24.08 |
| | | 2593.0 | 25.28 | 24.21 |
| | | 2498.5 | 25.02 | 23.91 |
| | 100% RB | 2687.5 | 25.07 | 24.15 |
| | | 2593.0 | 25.25 | 24.29 |
| | | 2498.5 | 25.08 | 24.03 |
| 10MHz | 1 RB high | 2685.0 | 25.93 | 25.07 |
| | | 2593.0 | 26.20 | 25.29 |
| | | 2501.0 | 25.87 | 24.98 |
| | 1 RB low | 2685.0 | 26.09 | 25.16 |
| | | 2593.0 | 26.20 | 25.33 |
| | | 2501.0 | 25.95 | 25.08 |
| | 50% RB mid | 2685.0 | 25.17 | 24.25 |
| | | 2593.0 | 25.31 | 24.35 |
| | | 2501.0 | 25.04 | 24.08 |
| | 100% RB | 2685.0 | 25.13 | 24.14 |
| | | 2593.0 | 25.34 | 24.25 |
| | | 2501.0 | 25.04 | 23.97 |
| 15MHz | 1 RB high | 2682.5 | 25.89 | 25.00 |
| | | 2593.0 | 26.14 | 25.26 |
| | | 2503.5 | 25.84 | 24.95 |
| | 1 RB low | 2682.5 | 26.04 | 25.17 |
| | | 2593.0 | 26.13 | 25.21 |
| | | 2503.5 | 25.91 | 25.01 |
| | 50% RB mid | 2682.5 | 25.13 | 24.14 |
| | | 2593.0 | 25.31 | 24.24 |
| | | 2503.5 | 25.04 | 23.98 |
| | 100% RB | 2682.5 | 25.12 | 24.15 |
| | | 2593.0 | 25.28 | 24.26 |
| | | 2503.5 | 25.09 | 23.95 |

| 20MHz | 1 RB high | 2680.0 | 25.87 | 24.87 |
| | | 2593.0 | 26.15 | 25.25 |
| | | 2506.0 | 25.81 | 24.89 |
| | 1 RB low | 2680.0 | 26.11 | 25.23 |
| | | 2593.0 | 26.12 | 25.19 |
| | | 2506.0 | 25.90 | 25.04 |
| | 50% RB mid | 2680.0 | 25.15 | 24.14 |
| | | 2593.0 | 25.29 | 24.22 |
| | | 2506.0 | 25.02 | 23.93 |
| | 100% RB | 2680.0 | 25.15 | 24.21 |
| | | 2593.0 | 25.29 | 24.30 |
| | | 2506.0 | 25.06 | 23.98 |

**LTE band 41(PC3)**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) | |
|---|---|---|---|---|
| | | | QPSK | 16QAM |
| 5MHz | 1 RB high | 2687.5 | 23.11 | 21.94 |
| | | 2593.0 | 23.30 | 22.18 |
| | | 2498.5 | 23.03 | 21.88 |
| | 1 RB low | 2687.5 | 23.17 | 22.00 |
| | | 2593.0 | 23.31 | 22.15 |
| | | 2498.5 | 23.08 | 21.77 |
| | 50% RB mid | 2687.5 | 22.21 | 21.10 |
| | | 2593.0 | 22.40 | 21.32 |
| | | 2498.5 | 22.12 | 21.09 |
| | 100% RB | 2687.5 | 22.18 | 21.15 |
| | | 2593.0 | 22.37 | 21.39 |
| | | 2498.5 | 22.13 | 21.17 |
| 10MHz | 1 RB high | 2685.0 | 23.11 | 21.95 |
| | | 2593.0 | 23.37 | 22.21 |
| | | 2501.0 | 22.99 | 21.82 |
| | 1 RB low | 2685.0 | 23.23 | 22.06 |
| | | 2593.0 | 23.32 | 22.14 |
| | | 2501.0 | 23.11 | 21.93 |
| | 50% RB mid | 2685.0 | 22.25 | 21.24 |
| | | 2593.0 | 22.43 | 21.45 |
| | | 2501.0 | 22.16 | 21.22 |
| | 100% RB | 2685.0 | 22.22 | 21.12 |
| | | 2593.0 | 22.41 | 21.34 |
| | | 2501.0 | 22.14 | 21.10 |
| 15MHz | 1 RB high | 2682.5 | 23.07 | 21.88 |
| | | 2593.0 | 23.33 | 22.18 |
| | | 2503.5 | 22.98 | 21.83 |
| | 1 RB low | 2682.5 | 23.21 | 22.03 |
| | | 2593.0 | 23.27 | 22.13 |
| | | 2503.5 | 23.05 | 21.89 |
| | 50% RB mid | 2682.5 | 22.21 | 21.17 |
| | | 2593.0 | 22.40 | 21.36 |
| | | 2503.5 | 22.11 | 21.07 |
| | 100% RB | 2682.5 | 22.19 | 21.16 |
| | | 2593.0 | 22.37 | 21.36 |
| | | 2503.5 | 22.07 | 21.07 |

| 20MHz | 1 RB high | 2680.0 | 23.03 | 21.85 |
| | | 2593.0 | 23.33 | 22.17 |
| | | 2506.0 | 22.89 | 21.76 |
| | 1 RB low | 2680.0 | 23.24 | 22.04 |
| | | 2593.0 | 23.25 | 22.02 |
| | | 2506.0 | 22.98 | 21.83 |
| | 50% RB mid | 2680.0 | 22.23 | 21.15 |
| | | 2593.0 | 22.38 | 21.32 |
| | | 2506.0 | 22.10 | 21.04 |
| | 100% RB | 2680.0 | 22.26 | 21.25 |
| | | 2593.0 | 22.41 | 21.40 |
| | | 2506.0 | 22.05 | 21.06 |

**LTE band 66**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) | |
|---|---|---|---|---|
| | | | QPSK | 16QAM |
| 1.4MHz | 1 RB high | 1779.3 | 22.94 | 22.16 |
| | | 1745.0 | 22.66 | 22.05 |
| | | 1710.7 | 22.43 | 21.48 |
| | 1 RB low | 1779.3 | 22.99 | 22.15 |
| | | 1745.0 | 22.62 | 22.02 |
| | | 1710.7 | 22.39 | 21.47 |
| | 50% RB mid | 1779.3 | 23.13 | 22.17 |
| | | 1745.0 | 22.80 | 22.02 |
| | | 1710.7 | 22.59 | 21.69 |
| | 100% RB | 1779.3 | 22.02 | 21.21 |
| | | 1745.0 | 21.66 | 20.62 |
| | | 1710.7 | 21.52 | 20.70 |
| 3MHz | 1 RB high | 1778.5 | 22.96 | 21.92 |
| | | 1745.0 | 22.69 | 22.01 |
| | | 1711.5 | 22.41 | 21.46 |
| | 1 RB low | 1778.5 | 22.91 | 21.91 |
| | | 1745.0 | 22.66 | 22.01 |
| | | 1711.5 | 22.42 | 21.57 |
| | 50% RB mid | 1778.5 | 22.04 | 21.17 |
| | | 1745.0 | 21.67 | 20.80 |
| | | 1711.5 | 21.52 | 20.52 |
| | 100% RB | 1778.5 | 22.03 | 21.04 |
| | | 1745.0 | 21.62 | 20.65 |
| | | 1711.5 | 21.45 | 20.41 |
| 5MHz | 1 RB high | 1777.5 | 22.90 | 22.06 |
| | | 1745.0 | 22.55 | 22.04 |
| | | 1712.5 | 22.37 | 21.44 |
| | 1 RB low | 1777.5 | 22.88 | 22.02 |
| | | 1745.0 | 22.52 | 22.03 |
| | | 1712.5 | 22.37 | 21.47 |
| | 50% RB mid | 1777.5 | 22.01 | 21.13 |
| | | 1745.0 | 21.69 | 20.81 |
| | | 1712.5 | 21.50 | 20.54 |
| | 100% RB | 1777.5 | 21.99 | 21.01 |
| | | 1745.0 | 21.65 | 20.71 |
| | | 1712.5 | 21.44 | 20.38 |
| 10MHz | 1 RB high | 1775.0 | 22.91 | 21.90 |
| | | 1745.0 | 22.69 | 21.99 |

| | | 1715.0 | 22.32 | 21.42 |
|---|---|---|---|---|
| | 1 RB low | 1775.0 | 22.80 | 21.81 |
| | | 1745.0 | 22.58 | 21.98 |
| | | 1715.0 | 22.36 | 21.41 |
| | 50% RB mid | 1775.0 | 22.03 | 21.04 |
| | | 1745.0 | 21.72 | 20.76 |
| | | 1715.0 | 21.51 | 20.57 |
| | 100% RB | 1775.0 | 21.99 | 20.96 |
| | | 1745.0 | 21.67 | 20.67 |
| | | 1715.0 | 21.49 | 20.49 |
| 15MHz | 1 RB high | 1772.5 | 22.84 | 21.83 |
| | | 1745.0 | 22.60 | 21.94 |
| | | 1717.5 | 22.39 | 21.84 |
| | 1 RB low | 1772.5 | 22.76 | 21.67 |
| | | 1745.0 | 22.58 | 21.91 |
| | | 1717.5 | 22.39 | 21.77 |
| | 50% RB mid | 1772.5 | 22.00 | 20.97 |
| | | 1745.0 | 21.65 | 20.66 |
| | | 1717.5 | 21.50 | 20.43 |
| | 100% RB | 1772.5 | 22.01 | 20.97 |
| | | 1745.0 | 21.65 | 20.63 |
| | | 1717.5 | 21.51 | 20.42 |
| 20MHz | 1 RB high | 1770.0 | 22.79 | 22.31 |
| | | 1745.0 | 22.52 | 21.96 |
| | | 1720.0 | 22.40 | 21.93 |
| | 1 RB low | 1770.0 | 22.56 | 22.06 |
| | | 1745.0 | 22.36 | 21.88 |
| | | 1720.0 | 22.28 | 21.78 |
| | 50% RB mid | 1770.0 | 21.94 | 20.95 |
| | | 1745.0 | 21.66 | 20.57 |
| | | 1720.0 | 21.48 | 20.47 |
| | 100% RB | 1770.0 | 21.92 | 20.93 |
| | | 1745.0 | 21.60 | 20.63 |
| | | 1720.0 | 21.44 | 20.49 |

**LTE band 71**

| Bandwidth | RB size/offset | Frequency (MHz) | Power (dBm) QPSK | Power (dBm) 16QAM |
|---|---|---|---|---|
| 5MHz | 1 RB high | 695.5 | 23.01 | 22.11 |
| | | 680.5 | 22.97 | 22.09 |
| | | 665.5 | 23.28 | 22.74 |
| | 1 RB low | 695.5 | 22.98 | 22.09 |
| | | 680.5 | 23.01 | 22.10 |
| | | 665.5 | 23.27 | 22.98 |
| | 50% RB mid | 695.5 | 22.08 | 21.12 |
| | | 680.5 | 22.06 | 21.14 |
| | | 665.5 | 22.52 | 21.65 |
| | 100% RB | 695.5 | 22.07 | 21.03 |
| | | 680.5 | 22.01 | 21.03 |
| | | 665.5 | 22.41 | 21.48 |
| 10MHz | 1 RB high | 693 | 23.12 | 22.46 |
| | | 680.5 | 23.00 | 22.01 |
| | | 668 | 23.22 | 22.10 |
| | 1 RB low | 693 | 23.41 | 22.94 |
| | | 680.5 | 23.06 | 22.16 |
| | | 668 | 23.28 | 22.49 |
| | 50% RB mid | 693 | 22.33 | 21.50 |
| | | 680.5 | 22.11 | 21.19 |
| | | 668 | 22.44 | 21.45 |
| | 100% RB | 693 | 22.44 | 21.42 |
| | | 680.5 | 22.04 | 21.07 |
| | | 668 | 22.40 | 21.37 |
| 15MHz | 1 RB high | 690.5 | 23.04 | 22.01 |
| | | 680.5 | 23.06 | 22.37 |
| | | 670.5 | 23.06 | 22.49 |
| | 1 RB low | 690.5 | 22.95 | 21.91 |
| | | 680.5 | 23.13 | 22.44 |
| | | 670.5 | 23.26 | 22.88 |
| | 50% RB mid | 690.5 | 22.11 | 21.08 |
| | | 680.5 | 22.11 | 21.13 |
| | | 670.5 | 22.44 | 21.29 |
| | 100% RB | 690.5 | 22.21 | 21.18 |
| | | 680.5 | 22.06 | 21.06 |
| | | 670.5 | 22.49 | 21.43 |

| 20MHz | 1 RB high | 688 | 22.93 | 22.49 |
| | | 680.5 | 22.86 | 22.34 |
| | | 673 | 22.86 | 22.27 |
| | 1 RB low | 688 | 22.86 | 22.39 |
| | | 680.5 | 22.89 | 22.39 |
| | | 673 | 23.41 | 22.73 |
| | 50% RB mid | 688 | 22.00 | 21.06 |
| | | 680.5 | 21.99 | 21.00 |
| | | 673 | 22.17 | 21.18 |
| | 100% RB | 688 | 22.11 | 21.17 |
| | | 680.5 | 21.86 | 20.90 |
| | | 673 | 22.25 | 21.28 |

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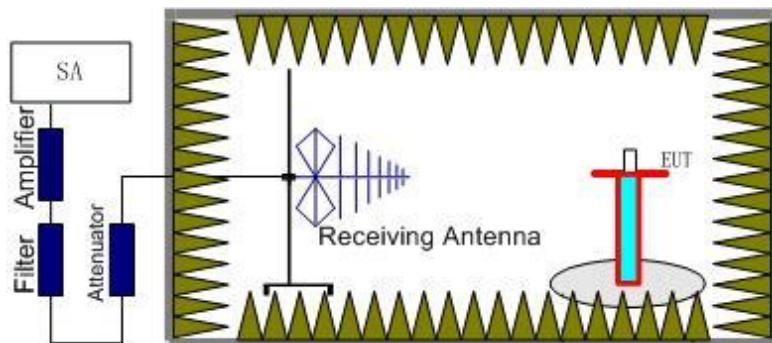
Rule Part 27.50(c) specifies "Portable stations (hand-held de-vices) are limited to 3 watts ERP.".

Rule Part 90.635(b) specifies "The maximum output power of the transmitter for mobile stations is 100 watts(50dBm)".
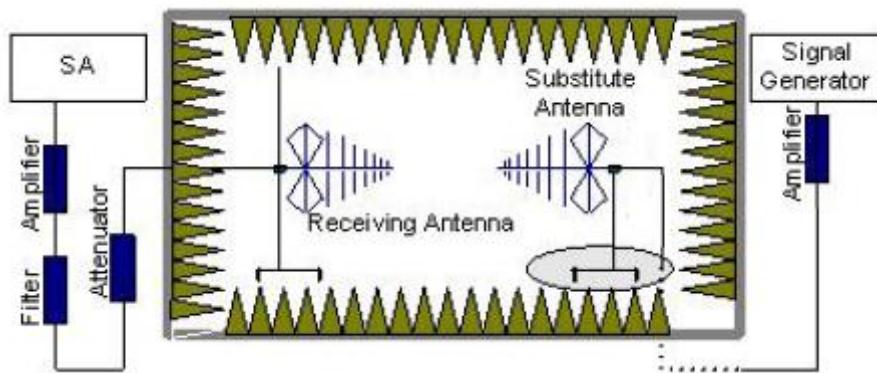
**A.1.3.2 Method of Measurement**

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 peak detector.



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

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

4. An amplifier should be connected to the Signal Source output port. And the cable should be connected between the amplifier and the substitution antenna.

   The cable loss ($P_{cl}$), the substitution antenna Gain ($G_a$) and the amplifier Gain ($P_{Ag}$) should be recorded after test.

   The measurement results are obtained as described below:

   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 12 - ERP**

**Limits:** ≤34.77dBm (3W)

#### LTE Band 12_1.4MHz_QPSK

| Frequency (MHz) | Pmea (dBm) | Cable Loss(dB) | PAg(dB) | Antenna Gain(dBi) | Correction (dB) | RMS ERP(dBm) | Limit(dBm) | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 699.70 | -22.79 | 1.90 | 44.66 | 0.77 | 2.15 | 18.59 | 34.77 | 16.18 | H |
| 707.50 | -22.72 | 1.91 | 44.94 | 0.62 | 2.15 | 18.78 | 34.77 | 15.99 | H |
| 715.30 | -22.39 | 1.92 | 45.26 | 0.50 | 2.15 | 19.30 | 34.77 | 15.47 | V |

#### LTE Band 12_3MHz_QPSK

| Frequency (MHz) | Pmea (dBm) | Cable Loss(dB) | PAg(dB) | Antenna Gain(dBi) | Correction (dB) | RMS ERP(dBm) | Limit(dBm) | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 700.50 | -22.82 | 1.90 | 44.68 | 0.76 | 2.15 | 18.57 | 34.77 | 16.20 | H |
| 707.50 | -22.87 | 1.91 | 44.94 | 0.62 | 2.15 | 18.63 | 34.77 | 16.14 | V |
| 714.50 | -22.52 | 1.92 | 45.26 | 0.50 | 2.15 | 19.17 | 34.77 | 15.60 | V |

#### LTE Band 12_5MHz_QPSK

| Frequency (MHz) | Pmea (dBm) | Cable Loss(dB) | PAg(dB) | Antenna Gain(dBi) | Correction (dB) | RMS ERP(dBm) | Limit(dBm) | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 701.50 | -22.81 | 1.90 | 44.81 | 0.74 | 2.15 | 18.69 | 34.77 | 16.08 | H |
| 707.50 | -22.87 | 1.91 | 44.94 | 0.62 | 2.15 | 18.63 | 34.77 | 16.14 | H |
| 713.50 | -22.51 | 1.92 | 45.22 | 0.50 | 2.15 | 19.14 | 34.77 | 15.63 | V |

#### LTE Band 12_10MHz_QPSK

| Frequency (MHz) | Pmea (dBm) | Cable Loss(dB) | PAg(dB) | Antenna Gain(dBi) | Correction (dB) | RMS ERP(dBm) | Limit(dBm) | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 704.00 | -22.58 | 1.91 | 44.93 | 0.70 | 2.15 | 18.99 | 34.77 | 15.78 | H |
| 707.50 | -22.74 | 1.91 | 44.94 | 0.62 | 2.15 | 18.76 | 34.77 | 16.01 | H |
| 711.00 | -22.63 | 1.92 | 45.19 | 0.53 | 2.15 | 19.02 | 34.77 | 15.75 | V |

**LTE Band 12_1.4MHz_16QAM**

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | P<sub>cl</sub> (dB) | P<sub>Ag</sub> (dB) | G<sub>a</sub> (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 699.70 | -23.78 | 1.90 | 44.66 | 0.77 | 2.15 | 17.60 | 34.77 | 17.17 | H |
| 707.50 | -23.80 | 1.91 | 44.94 | 0.62 | 2.15 | 17.70 | 34.77 | 17.07 | H |
| 715.30 | -23.45 | 1.92 | 45.26 | 0.50 | 2.15 | 18.24 | 34.77 | 16.53 | V |

**LTE Band 12_3MHz_16QAM**

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | P<sub>cl</sub> (dB) | P<sub>Ag</sub> (dB) | G<sub>a</sub> (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 700.50 | -23.83 | 1.90 | 44.68 | 0.76 | 2.15 | 17.56 | 34.77 | 17.21 | H |
| 707.50 | -23.81 | 1.91 | 44.94 | 0.62 | 2.15 | 17.69 | 34.77 | 17.08 | H |
| 714.50 | -23.51 | 1.92 | 45.26 | 0.50 | 2.15 | 18.18 | 34.77 | 16.59 | V |

**LTE Band 12_5MHz_16QAM**

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | P<sub>cl</sub> (dB) | P<sub>Ag</sub> (dB) | G<sub>a</sub> (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 701.50 | -23.66 | 1.90 | 44.81 | 0.74 | 2.15 | 17.84 | 34.77 | 16.93 | H |
| 707.50 | -23.79 | 1.91 | 44.94 | 0.62 | 2.15 | 17.71 | 34.77 | 17.06 | H |
| 713.50 | -23.47 | 1.92 | 45.22 | 0.50 | 2.15 | 18.18 | 34.77 | 16.59 | V |

**LTE Band 12_10MHz_16QAM**

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | P<sub>cl</sub> (dB) | P<sub>Ag</sub> (dB) | G<sub>a</sub> (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 704.00 | -23.72 | 1.91 | 44.93 | 0.70 | 2.15 | 17.85 | 34.77 | 16.92 | H |
| 707.50 | -23.70 | 1.91 | 44.94 | 0.62 | 2.15 | 17.80 | 34.77 | 16.97 | H |
| 711.00 | -23.56 | 1.92 | 45.19 | 0.53 | 2.15 | 18.09 | 34.77 | 16.68 | V |

**LTE Band 13- ERP**

**Limits:** ≤34.77 dBm (3W)


**LTE Band 13_5MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 779.50 | -21.06 | 2.01 | 45.64 | 0.04 | 2.15 | 20.46 | 34.77 | 14.31 | V |
| 782.00 | -21.12 | 2.01 | 45.65 | 0.09 | 2.15 | 20.46 | 34.77 | 14.31 | V |
| 784.50 | -21.15 | 2.01 | 45.67 | 0.16 | 2.15 | 20.52 | 34.77 | 14.25 | V |

**LTE Band 13_10MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 782.00 | -21.02 | 2.01 | 45.65 | 0.09 | 2.15 | 20.56 | 34.77 | 14.21 | V |


**LTE Band 13_5MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 779.50 | -21.96 | 2.01 | 45.64 | 0.04 | 2.15 | 19.56 | 34.77 | 15.21 | V |
| 782.00 | -22.09 | 2.01 | 45.65 | 0.09 | 2.15 | 19.49 | 34.77 | 15.28 | V |
| 784.50 | -22.28 | 2.01 | 45.67 | 0.16 | 2.15 | 19.39 | 34.77 | 15.38 | V |

**LTE Band 13_10MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 782.00 | -22.11 | 2.01 | 45.65 | 0.09 | 2.15 | 19.47 | 34.77 | 15.30 | V |

## LTE Band 25- EIRP

**Limits:** ≤33dBm (2W)

### LTE Band 25_1.4MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1850.70 | -22.38 | 2.92 | 43.75 | 4.87 | 23.32 | 33.00 | 9.68 | H |
| 1882.50 | -21.27 | 3.13 | 43.75 | 4.81 | 24.16 | 33.00 | 8.84 | H |
| 1914.30 | -20.78 | 2.89 | 43.78 | 4.75 | 24.86 | 33.00 | 8.14 | H |

### LTE Band 25_3MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1851.50 | -22.42 | 2.87 | 43.75 | 4.87 | 23.33 | 33.00 | 9.67 | H |
| 1882.50 | -21.25 | 3.13 | 43.75 | 4.81 | 24.18 | 33.00 | 8.82 | H |
| 1913.50 | -20.73 | 2.88 | 43.78 | 4.76 | 24.93 | 33.00 | 8.07 | H |

### LTE Band 25_5MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1852.50 | -22.49 | 2.87 | 43.75 | 4.87 | 23.26 | 33.00 | 9.74 | H |
| 1882.50 | -21.32 | 3.13 | 43.75 | 4.81 | 24.11 | 33.00 | 8.89 | H |
| 1912.50 | -20.73 | 2.86 | 43.77 | 4.76 | 24.94 | 33.00 | 8.06 | H |

### LTE Band 25_10MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1855.00 | -22.52 | 2.88 | 43.74 | 4.86 | 23.20 | 33.00 | 9.80 | H |
| 1882.50 | -21.34 | 3.13 | 43.75 | 4.81 | 24.09 | 33.00 | 8.91 | H |
| 1910.00 | -20.94 | 2.88 | 43.77 | 4.76 | 24.71 | 33.00 | 8.29 | H |

### LTE Band 25_15MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1857.50 | -22.42 | 2.87 | 43.75 | 4.86 | 23.32 | 33.00 | 9.68 | H |
| 1882.50 | -21.14 | 3.13 | 43.75 | 4.81 | 24.29 | 33.00 | 8.71 | H |
| 1907.50 | -21.04 | 2.84 | 43.77 | 4.77 | 24.66 | 33.00 | 8.34 | H |

### LTE Band 25_20 MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1860.00 | -22.67 | 2.86 | 43.75 | 4.85 | 23.07 | 33.00 | 9.93 | H |
| 1882.50 | -21.58 | 3.13 | 43.75 | 4.81 | 23.85 | 33.00 | 9.15 | H |
| 1905.00 | -21.06 | 2.87 | 43.77 | 4.77 | 24.61 | 33.00 | 8.39 | H |

**LTE Band 25_1.4MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1850.70 | -23.28 | 2.92 | 43.75 | 4.87 | 22.42 | 33.00 | 10.58 | H |
| 1882.50 | -22.16 | 3.13 | 43.75 | 4.81 | 23.27 | 33.00 | 9.73 | H |
| 1914.30 | -21.70 | 2.89 | 43.78 | 4.75 | 23.94 | 33.00 | 9.06 | H |

**LTE Band 25_3MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1851.50 | -23.30 | 2.87 | 43.75 | 4.87 | 22.45 | 33.00 | 10.55 | H |
| 1882.50 | -22.12 | 3.13 | 43.75 | 4.81 | 23.31 | 33.00 | 9.69 | H |
| 1913.50 | -21.59 | 2.88 | 43.78 | 4.76 | 24.07 | 33.00 | 8.93 | H |

**LTE Band 25_5MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1852.50 | -23.37 | 2.87 | 43.75 | 4.87 | 22.38 | 33.00 | 10.62 | H |
| 1882.50 | -22.20 | 3.13 | 43.75 | 4.81 | 23.23 | 33.00 | 9.77 | H |
| 1912.50 | -21.61 | 2.86 | 43.77 | 4.76 | 24.06 | 33.00 | 8.94 | H |

**LTE Band 25_10MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1855.00 | -23.40 | 2.88 | 43.74 | 4.86 | 22.32 | 33.00 | 10.68 | H |
| 1882.50 | -22.23 | 3.13 | 43.75 | 4.81 | 23.20 | 33.00 | 9.80 | H |
| 1910.00 | -21.85 | 2.88 | 43.77 | 4.76 | 23.80 | 33.00 | 9.20 | H |

**LTE Band 25_15MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1857.50 | -23.32 | 2.87 | 43.75 | 4.86 | 22.42 | 33.00 | 10.58 | H |
| 1882.50 | -22.05 | 3.13 | 43.75 | 4.81 | 23.38 | 33.00 | 9.62 | H |
| 1907.50 | -21.96 | 2.84 | 43.77 | 4.77 | 23.74 | 33.00 | 9.26 | H |

**LTE Band 25_20 MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1860.00 | -23.56 | 2.86 | 43.75 | 4.85 | 22.18 | 33.00 | 10.82 | H |
| 1882.50 | -22.46 | 3.13 | 43.75 | 4.81 | 22.97 | 33.00 | 10.03 | H |
| 1905.00 | -21.95 | 2.87 | 43.77 | 4.77 | 23.72 | 33.00 | 9.28 | H |

**LTE Band 26(814MHz~824MHz)- ERP**

**Limits:** ≤50dBm (100W)

### LTE Band 26_1.4MHz_QPSK

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | P<sub>cl</sub> (dB) | P<sub>Ag</sub> (dB) | G<sub>a</sub> (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 814.70 | -22.33 | 2.13 | 45.86 | 0.89 | 2.15 | 20.14 | 50.00 | 29.86 | H |
| 819.00 | -22.08 | 2.19 | 45.84 | 1.05 | 2.15 | 20.47 | 50.00 | 29.53 | H |
| 823.30 | -21.01 | 2.24 | 45.79 | 0.55 | 2.15 | 20.94 | 50.00 | 29.06 | H |

### LTE Band 26_3MHz_QPSK

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | P<sub>cl</sub> (dB) | P<sub>Ag</sub> (dB) | G<sub>a</sub> (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 815.50 | -22.37 | 2.14 | 45.87 | 0.93 | 2.15 | 20.14 | 50.00 | 29.86 | H |
| 819.00 | -22.10 | 2.19 | 45.84 | 1.05 | 2.15 | 20.45 | 50.00 | 29.55 | H |
| 822.50 | -20.93 | 2.23 | 45.81 | 0.33 | 2.15 | 20.83 | 50.00 | 29.17 | H |

### LTE Band 26_5MHz_QPSK

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | P<sub>cl</sub> (dB) | P<sub>Ag</sub> (dB) | G<sub>a</sub> (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 816.50 | -22.31 | 2.16 | 45.88 | 0.98 | 2.15 | 20.24 | 50.00 | 29.76 | H |
| 819.00 | -22.02 | 2.19 | 45.84 | 1.05 | 2.15 | 20.53 | 50.00 | 29.47 | H |
| 821.50 | -21.58 | 2.22 | 45.82 | 0.71 | 2.15 | 20.58 | 50.00 | 29.42 | H |

### LTE Band 26_10MHz_QPSK

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | P<sub>cl</sub> (dB) | P<sub>Ag</sub> (dB) | G<sub>a</sub> (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 819.00 | -22.17 | 2.19 | 45.84 | 1.05 | 2.15 | 20.38 | 50.00 | 29.62 | H |

**LTE Band 26_1.4MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 814.70 | -23.29 | 2.13 | 45.86 | 0.89 | 2.15 | 19.18 | 50.00 | 30.82 | H |
| 819.00 | -23.07 | 2.19 | 45.84 | 1.05 | 2.15 | 19.48 | 50.00 | 30.52 | H |
| 823.30 | -21.94 | 2.24 | 45.79 | 0.55 | 2.15 | 20.01 | 50.00 | 29.99 | H |

**LTE Band 26_3MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 815.50 | -23.34 | 2.14 | 45.87 | 0.93 | 2.15 | 19.17 | 50.00 | 30.83 | H |
| 819.00 | -23.11 | 2.19 | 45.84 | 1.05 | 2.15 | 19.44 | 50.00 | 30.56 | H |
| 822.50 | -21.88 | 2.23 | 45.81 | 0.33 | 2.15 | 19.88 | 50.00 | 30.12 | H |

**LTE Band 26_5MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 816.50 | -23.27 | 2.16 | 45.88 | 0.98 | 2.15 | 19.28 | 50.00 | 30.72 | H |
| 819.00 | -22.99 | 2.19 | 45.84 | 1.05 | 2.15 | 19.56 | 50.00 | 30.44 | H |
| 821.50 | -22.70 | 2.22 | 45.82 | 0.71 | 2.15 | 19.46 | 50.00 | 30.54 | H |

**LTE Band 26_10MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 819.00 | -23.05 | 2.19 | 45.84 | 1.05 | 2.15 | 19.50 | 50.00 | 30.50 | H |

### LTE Band 26(824MHz~849MHz)- ERP

**Limits:** ≤38.45dBm (7W)

### LTE Band 26_1.4MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 824.70 | -21.43 | 2.26 | 45.79 | 0.95 | 2.15 | 20.90 | 38.45 | 17.55 | H |
| 836.50 | -20.86 | 2.26 | 45.66 | 0.82 | 2.15 | 21.21 | 38.45 | 17.24 | H |
| 848.30 | -21.60 | 2.27 | 45.55 | 0.80 | 2.15 | 20.33 | 38.45 | 18.12 | H |

### LTE Band 26_3MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 825.50 | -21.41 | 2.26 | 45.79 | 0.94 | 2.15 | 20.91 | 38.45 | 17.54 | H |
| 836.50 | -20.84 | 2.26 | 45.66 | 0.82 | 2.15 | 21.23 | 38.45 | 17.22 | H |
| 847.50 | -21.51 | 2.27 | 45.56 | 0.81 | 2.15 | 20.44 | 38.45 | 18.01 | H |

### LTE Band 26_5MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 826.50 | -21.53 | 2.25 | 45.77 | 0.93 | 2.15 | 20.77 | 38.45 | 17.68 | H |
| 836.50 | -20.92 | 2.26 | 45.66 | 0.82 | 2.15 | 21.15 | 38.45 | 17.30 | H |
| 846.50 | -21.62 | 2.26 | 45.56 | 0.82 | 2.15 | 20.35 | 38.45 | 18.10 | H |

### LTE Band 26_10MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 829.00 | -21.69 | 2.13 | 45.74 | 0.90 | 2.15 | 20.67 | 38.45 | 17.78 | H |
| 836.50 | -20.94 | 2.26 | 45.66 | 0.82 | 2.15 | 21.13 | 38.45 | 17.32 | H |
| 844.00 | -21.66 | 2.26 | 45.59 | 0.82 | 2.15 | 20.34 | 38.45 | 18.11 | H |

### LTE Band 26_15MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 831.50 | -21.62 | 2.12 | 45.71 | 0.87 | 2.15 | 20.69 | 38.45 | 17.76 | H |
| 836.50 | -21.11 | 2.26 | 45.66 | 0.82 | 2.15 | 20.96 | 38.45 | 17.49 | H |
| 841.50 | -21.76 | 2.26 | 45.61 | 0.82 | 2.15 | 20.26 | 38.45 | 18.19 | H |

**LTE Band 26_1.4MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 824.70 | -22.36 | 2.26 | 45.79 | 0.95 | 2.15 | 19.97 | 38.45 | 18.48 | H |
| 836.50 | -21.83 | 2.26 | 45.66 | 0.82 | 2.15 | 20.24 | 38.45 | 18.21 | H |
| 848.30 | -22.62 | 2.27 | 45.55 | 0.80 | 2.15 | 19.31 | 38.45 | 19.14 | H |

**LTE Band 26_3MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 825.50 | -22.36 | 2.26 | 45.79 | 0.94 | 2.15 | 19.96 | 38.45 | 18.49 | H |
| 836.50 | -21.81 | 2.26 | 45.66 | 0.82 | 2.15 | 20.26 | 38.45 | 18.19 | H |
| 847.50 | -22.56 | 2.27 | 45.56 | 0.81 | 2.15 | 19.39 | 38.45 | 19.06 | H |

**LTE Band 26_5MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 826.50 | -22.42 | 2.25 | 45.77 | 0.93 | 2.15 | 19.88 | 38.45 | 18.57 | H |
| 836.50 | -21.90 | 2.26 | 45.66 | 0.82 | 2.15 | 20.17 | 38.45 | 18.28 | H |
| 846.50 | -22.65 | 2.26 | 45.56 | 0.82 | 2.15 | 19.32 | 38.45 | 19.13 | H |

**LTE Band 26_10MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 829.00 | -22.71 | 2.13 | 45.74 | 0.90 | 2.15 | 19.65 | 38.45 | 18.80 | H |
| 836.50 | -21.91 | 2.26 | 45.66 | 0.82 | 2.15 | 20.16 | 38.45 | 18.29 | H |
| 844.00 | -22.74 | 2.26 | 45.59 | 0.82 | 2.15 | 19.26 | 38.45 | 19.19 | H |

**LTE Band 26_15MHz_16QAM**

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 831.50 | -22.47 | 2.12 | 45.71 | 0.87 | 2.15 | 19.84 | 38.45 | 18.61 | H |
| 836.50 | -22.05 | 2.26 | 45.66 | 0.82 | 2.15 | 20.02 | 38.45 | 18.43 | H |
| 841.50 | -22.60 | 2.26 | 45.61 | 0.82 | 2.15 | 19.42 | 38.45 | 19.03 | H |

**LTE Band 41(PC2)- EIRP**

**Limits:** ≤33dBm (2W)

**LTE Band 41_5MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2498.50 | -26.59 | 3.58 | 45.59 | 6.10 | 21.52 | 33.00 | 11.48 | H |
| 2593.00 | -24.81 | 3.69 | 44.93 | 6.27 | 22.70 | 33.00 | 10.30 | H |
| 2687.50 | -25.49 | 3.73 | 44.98 | 6.44 | 22.20 | 33.00 | 10.80 | H |

**LTE Band 41_10MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2501.00 | -26.24 | 3.58 | 45.65 | 6.10 | 21.93 | 33.00 | 11.07 | H |
| 2593.00 | -24.47 | 3.69 | 44.93 | 6.27 | 23.04 | 33.00 | 9.96 | V |
| 2685.00 | -25.50 | 3.73 | 44.98 | 6.43 | 22.18 | 33.00 | 10.82 | H |

**LTE Band 41_15MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2503.50 | -26.19 | 3.58 | 45.65 | 6.11 | 21.99 | 33.00 | 11.01 | H |
| 2593.00 | -24.84 | 3.69 | 44.93 | 6.27 | 22.67 | 33.00 | 10.33 | H |
| 2682.50 | -25.67 | 3.73 | 44.98 | 6.43 | 22.01 | 33.00 | 10.99 | H |

**LTE Band 41_20MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2506.00 | -25.46 | 3.59 | 45.15 | 6.11 | 22.21 | 33.00 | 10.79 | H |
| 2593.00 | -24.75 | 3.69 | 44.93 | 6.27 | 22.76 | 33.00 | 10.24 | H |
| 2680.00 | -25.36 | 3.73 | 44.97 | 6.42 | 22.30 | 33.00 | 10.70 | H |

**LTE Band 41_5MHz_16QAM**

| Frequency (MHz) | P$_{Mea}$ (dBm) | P$_{cl}$ (dB) | P$_{Ag}$ (dB) | G$_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2498.50 | -27.50 | 3.58 | 45.59 | 6.10 | 20.61 | 33.00 | 12.39 | H |
| 2593.00 | -25.82 | 3.69 | 44.93 | 6.27 | 21.69 | 33.00 | 11.31 | H |
| 2687.50 | -26.36 | 3.73 | 44.98 | 6.44 | 21.33 | 33.00 | 11.67 | H |

**LTE Band 41_10MHz_16QAM**

| Frequency (MHz) | P$_{Mea}$ (dBm) | P$_{cl}$ (dB) | P$_{Ag}$ (dB) | G$_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2501.00 | -27.20 | 3.58 | 45.65 | 6.10 | 20.97 | 33.00 | 12.03 | H |
| 2593.00 | -25.63 | 3.69 | 44.93 | 6.27 | 21.88 | 33.00 | 11.12 | V |
| 2685.00 | -26.45 | 3.73 | 44.98 | 6.43 | 21.23 | 33.00 | 11.77 | H |

**LTE Band 41_15MHz_16QAM**

| Frequency (MHz) | P$_{Mea}$ (dBm) | P$_{cl}$ (dB) | P$_{Ag}$ (dB) | G$_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2503.50 | -27.25 | 3.58 | 45.65 | 6.11 | 20.93 | 33.00 | 12.07 | H |
| 2593.00 | -25.96 | 3.69 | 44.93 | 6.27 | 21.55 | 33.00 | 11.45 | H |
| 2682.50 | -26.61 | 3.73 | 44.98 | 6.43 | 21.07 | 33.00 | 11.93 | H |

**LTE Band 41_20MHz_16QAM**

| Frequency (MHz) | P$_{Mea}$ (dBm) | P$_{cl}$ (dB) | P$_{Ag}$ (dB) | G$_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2506.00 | -26.44 | 3.59 | 45.15 | 6.11 | 21.23 | 33.00 | 11.77 | H |
| 2593.00 | -25.79 | 3.69 | 44.93 | 6.27 | 21.72 | 33.00 | 11.28 | H |
| 2680.00 | -26.37 | 3.73 | 44.97 | 6.42 | 21.29 | 33.00 | 11.71 | H |

## LTE Band 66- EIRP

**Limits:** ≤30dBm (1W)

### LTE Band 66_1.4MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1710.70 | -28.34 | 3.17 | 44.10 | 5.12 | 24.05 | 33.00 | 8.95 | H |
| 1745.00 | -27.39 | 3.68 | 44.16 | 5.06 | 25.51 | 33.00 | 7.49 | H |
| 1779.30 | -25.37 | 3.04 | 44.03 | 5.00 | 26.70 | 33.00 | 6.30 | H |

### LTE Band 66_3MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1711.50 | -28.61 | 3.40 | 44.10 | 5.12 | 24.01 | 33.00 | 8.99 | H |
| 1745.00 | -27.43 | 3.68 | 44.16 | 5.06 | 25.47 | 33.00 | 7.53 | H |
| 1778.50 | -25.44 | 3.04 | 44.03 | 5.00 | 26.63 | 33.00 | 6.37 | H |

### LTE Band 66_5MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1712.50 | -21.52 | 3.66 | 44.10 | 5.12 | 24.04 | 33.00 | 8.96 | H |
| 1745.00 | -20.15 | 3.68 | 44.16 | 5.06 | 25.39 | 33.00 | 7.61 | H |
| 1777.50 | -19.34 | 3.04 | 44.04 | 5.00 | 26.66 | 33.00 | 6.34 | H |

### LTE Band 66_10MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1715.00 | -21.44 | 3.56 | 44.10 | 5.11 | 24.21 | 33.00 | 8.79 | H |
| 1745.00 | -19.98 | 3.68 | 44.16 | 5.06 | 25.56 | 33.00 | 7.44 | H |
| 1775.00 | -19.21 | 3.05 | 44.05 | 5.01 | 26.79 | 33.00 | 6.21 | H |

### LTE Band 66_15MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1717.50 | -21.58 | 3.47 | 44.11 | 5.11 | 24.17 | 33.00 | 8.83 | H |
| 1745.00 | -20.02 | 3.68 | 44.16 | 5.06 | 25.52 | 33.00 | 7.48 | H |
| 1772.50 | -19.71 | 3.05 | 44.06 | 5.01 | 26.31 | 33.00 | 6.69 | H |

### LTE Band 66_20MHz_QPSK

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1720.00 | -21.88 | 3.37 | 44.11 | 5.10 | 23.96 | 33.00 | 9.04 | H |
| 1745.00 | -20.19 | 3.68 | 44.16 | 5.06 | 25.35 | 33.00 | 7.65 | H |
| 1770.00 | -19.56 | 3.05 | 44.07 | 5.01 | 26.48 | 33.00 | 6.52 | H |

**LTE Band 66_1.4MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1710.70 | -29.24 | 3.17 | 44.10 | 5.12 | 23.15 | 33.00 | 9.85 | H |
| 1745.00 | -28.31 | 3.68 | 44.16 | 5.06 | 24.59 | 33.00 | 8.41 | H |
| 1779.30 | -26.32 | 3.04 | 44.03 | 5.00 | 25.75 | 33.00 | 7.25 | H |

**LTE Band 66_3MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1711.50 | -29.53 | 3.40 | 44.10 | 5.12 | 23.09 | 33.00 | 9.91 | H |
| 1745.00 | -28.34 | 3.68 | 44.16 | 5.06 | 24.56 | 33.00 | 8.44 | H |
| 1778.50 | -26.41 | 3.04 | 44.03 | 5.00 | 25.66 | 33.00 | 7.34 | H |

**LTE Band 66_5MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1712.50 | -22.42 | 3.66 | 44.10 | 5.12 | 23.14 | 33.00 | 9.86 | H |
| 1745.00 | -21.06 | 3.68 | 44.16 | 5.06 | 24.48 | 33.00 | 8.52 | H |
| 1777.50 | -20.30 | 3.04 | 44.04 | 5.00 | 25.70 | 33.00 | 7.30 | H |

**LTE Band 66_10MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1715.00 | -22.38 | 3.56 | 44.10 | 5.11 | 23.27 | 33.00 | 9.73 | H |
| 1745.00 | -20.93 | 3.68 | 44.16 | 5.06 | 24.61 | 33.00 | 8.39 | H |
| 1775.00 | -20.25 | 3.05 | 44.05 | 5.01 | 25.75 | 33.00 | 7.25 | H |

**LTE Band 66_15MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1717.50 | -22.57 | 3.47 | 44.11 | 5.11 | 23.18 | 33.00 | 9.82 | H |
| 1745.00 | -20.94 | 3.68 | 44.16 | 5.06 | 24.60 | 33.00 | 8.40 | H |
| 1772.50 | -20.69 | 3.05 | 44.06 | 5.01 | 25.33 | 33.00 | 7.67 | H |

**LTE Band 66_20MHz_16QAM**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1720.00 | -22.77 | 3.37 | 44.11 | 5.10 | 23.07 | 33.00 | 9.93 | H |
| 1745.00 | -21.10 | 3.68 | 44.16 | 5.06 | 24.44 | 33.00 | 8.56 | H |
| 1770.00 | -20.44 | 3.05 | 44.07 | 5.01 | 25.60 | 33.00 | 7.40 | H |

**LTE Band 71- ERP**

**Limits:** ≤34.77 dBm (3W)

**LTE Band 71_5MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 665.50 | -22.04 | 1.87 | 44.73 | 0.78 | 2.15 | 19.45 | 34.77 | 15.32 | V |
| 680.50 | -23.08 | 1.88 | 44.72 | 0.78 | 2.15 | 18.38 | 34.77 | 16.39 | V |
| 695.50 | -23.49 | 1.89 | 44.67 | 0.77 | 2.15 | 17.91 | 34.77 | 16.86 | V |

**LTE Band 71_10MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 668.00 | -22.01 | 1.87 | 44.75 | 0.78 | 2.15 | 19.51 | 34.77 | 15.26 | V |
| 680.50 | -23.10 | 1.88 | 44.72 | 0.78 | 2.15 | 18.36 | 34.77 | 16.41 | V |
| 693.00 | -23.38 | 1.89 | 44.67 | 0.77 | 2.15 | 18.02 | 34.77 | 16.75 | V |

**LTE Band 71_15MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 670.50 | -22.22 | 1.88 | 44.75 | 0.78 | 2.15 | 19.28 | 34.77 | 15.49 | V |
| 680.50 | -23.11 | 1.88 | 44.72 | 0.78 | 2.15 | 18.35 | 34.77 | 16.42 | V |
| 690.50 | -23.18 | 1.89 | 44.73 | 0.77 | 2.15 | 18.29 | 34.77 | 16.48 | V |

**LTE Band 71_20MHz_QPSK**

| Frequency (MHz) | $P_{Mea}$ (dBm) | $P_{cl}$ (dB) | $P_{Ag}$ (dB) | $G_a$ (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 673.00 | -22.42 | 1.88 | 44.71 | 0.78 | 2.15 | 19.04 | 34.77 | 15.73 | V |
| 680.50 | -23.02 | 1.88 | 44.72 | 0.78 | 2.15 | 18.44 | 34.77 | 16.33 | V |
| 688.00 | -23.27 | 1.89 | 44.72 | 0.77 | 2.15 | 18.19 | 34.77 | 16.58 | V |

### LTE Band 71_5MHz_16QAM

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 665.50 | -23.10 | 1.87 | 44.73 | 0.78 | 2.15 | 18.39 | 34.77 | 16.38 | V |
| 680.50 | -23.89 | 1.88 | 44.72 | 0.78 | 2.15 | 17.57 | 34.77 | 17.20 | V |
| 695.50 | -24.23 | 1.89 | 44.67 | 0.77 | 2.15 | 17.17 | 34.77 | 17.60 | V |

### LTE Band 71_10MHz_16QAM

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 668.00 | -23.16 | 1.87 | 44.75 | 0.78 | 2.15 | 18.36 | 34.77 | 16.41 | V |
| 680.50 | -23.92 | 1.88 | 44.72 | 0.78 | 2.15 | 17.54 | 34.77 | 17.23 | V |
| 693.00 | -24.12 | 1.89 | 44.67 | 0.77 | 2.15 | 17.28 | 34.77 | 17.49 | V |

### LTE Band 71_15MHz_16QAM

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 670.50 | -23.29 | 1.88 | 44.75 | 0.78 | 2.15 | 18.21 | 34.77 | 16.56 | V |
| 680.50 | -23.93 | 1.88 | 44.72 | 0.78 | 2.15 | 17.53 | 34.77 | 17.24 | V |
| 690.50 | -23.92 | 1.89 | 44.73 | 0.77 | 2.15 | 17.55 | 34.77 | 17.22 | V |

### LTE Band 71_20MHz_16QAM

| Frequency (MHz) | P_Mea (dBm) | P_cl (dB) | P_Ag (dB) | G_a (dBi) | Correction (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 673.00 | -23.37 | 1.88 | 44.71 | 0.78 | 2.15 | 18.09 | 34.77 | 16.68 | V |
| 680.50 | -23.84 | 1.88 | 44.72 | 0.78 | 2.15 | 17.62 | 34.77 | 17.15 | V |
| 688.00 | -24.03 | 1.89 | 44.72 | 0.77 | 2.15 | 17.43 | 34.77 | 17.34 | V |

Peak EIRP(dBm) = $P_{Mea}$(-19.21dBm) - $G_a$ (-5.01dBi) - $P_{Ag}$ (-44.05dB) - $P_{cl}$ (3.05dB) = 26.79dBm

**ANALYZER SETTINGS:**

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

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

Note: Expanded measurement uncertainty is $U$ = 2.84 dB, $k$ = 2.

## A.2   EMISSION LIMIT
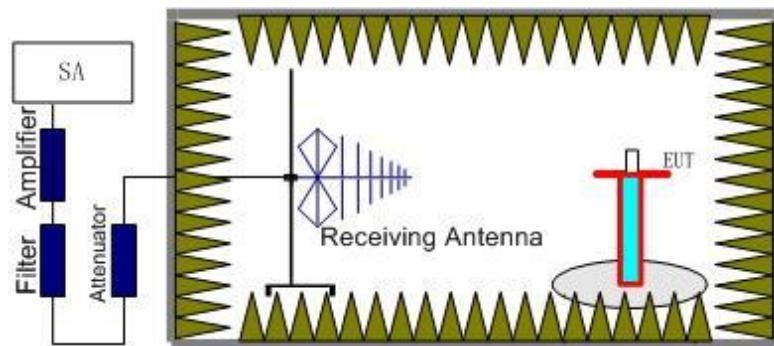
### A.2.1 Measurement Method

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.
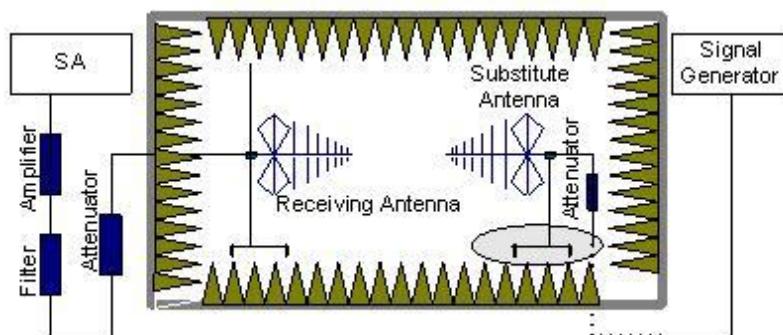
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 12,13,25,26,41,66,71.

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

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



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



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere

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

4. The Path loss ($P_{pl}$) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain ($G_a$) should be recorded after test.
   An amplifier should be connected in for the test.
   The Path loss ($P_{pl}$) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   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 -2.15dB.


**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 that 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(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, 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 any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 +

10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Part 90.691 states that out-of-band emission requirement shall apply only to the ''outer'' channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116Log_{10}(f/6.1)$ decibels or $50 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

### A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 12,13,25,26,41,66,71. 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 12,13,25,26,41,66,71 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 evaluated frequency range is from 30MHz to 26GHz.

### 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 |
|---|---|---|---|---|---|---|---|---|
| 1400.01 | -45.24 | 3.24 | 4.98 | 2.15 | -45.65 | -13.00 | 32.65 | V |
| 2100.00 | -52.77 | 4.19 | 4.90 | 2.15 | -54.21 | -13.00 | 41.21 | H |
| 2799.00 | -52.05 | 4.91 | 6.64 | 2.15 | -52.47 | -13.00 | 39.47 | V |
| 3493.02 | -56.09 | 5.51 | 8.18 | 2.15 | -55.57 | -13.00 | 42.57 | H |
| 4204.02 | -43.83 | 6.22 | 9.10 | 2.15 | -43.10 | -13.00 | 30.10 | H |
| 4903.01 | -55.44 | 6.73 | 9.80 | 2.15 | -54.52 | -13.00 | 41.52 | V |

### 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 |
|---|---|---|---|---|---|---|---|---|
| 1415.01 | -44.44 | 3.25 | 5.06 | 2.15 | -44.78 | -13.00 | 31.78 | H |
| 2123.00 | -50.79 | 4.21 | 4.97 | 2.15 | -52.18 | -13.00 | 39.18 | H |
| 2820.00 | -52.46 | 4.94 | 6.68 | 2.15 | -52.87 | -13.00 | 39.87 | H |
| 3536.02 | -55.59 | 5.68 | 8.25 | 2.15 | -55.17 | -13.00 | 42.17 | V |
| 4251.02 | -49.36 | 6.24 | 9.15 | 2.15 | -48.60 | -13.00 | 35.60 | H |
| 4953.01 | -54.58 | 6.68 | 9.85 | 2.15 | -53.56 | -13.00 | 40.56 | 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 |
|---|---|---|---|---|---|---|---|---|
| 1431.01 | -57.62 | 3.28 | 5.14 | 2.15 | -57.91 | -13.00 | 44.91 | H |
| 2138.00 | -52.66 | 4.23 | 5.01 | 2.15 | -54.03 | -13.00 | 41.03 | V |
| 2877.00 | -51.59 | 4.97 | 6.78 | 2.15 | -51.93 | -13.00 | 38.93 | V |
| 3600.02 | -53.70 | 6.34 | 8.34 | 2.15 | -53.85 | -13.00 | 40.85 | V |
| 4297.02 | -45.25 | 6.20 | 9.20 | 2.15 | -44.40 | -13.00 | 31.40 | H |
| 4978.01 | -54.62 | 6.64 | 9.88 | 2.15 | -53.53 | -13.00 | 40.53 | V |

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

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1554.01 | -62.88 | 3.47 | 5.40 | 2.15 | -63.10 | -13.00 | 50.10 | H |
| 2346.00 | -54.58 | 4.45 | 5.64 | 2.15 | -55.54 | -13.00 | 42.54 | H |
| 3121.02 | -54.14 | 5.39 | 7.29 | 2.15 | -54.39 | -13.00 | 41.39 | H |
| 3898.02 | -54.25 | 6.11 | 8.76 | 2.15 | -53.75 | -13.00 | 40.75 | H |
| 4679.02 | -54.68 | 6.49 | 9.58 | 2.15 | -53.74 | -13.00 | 40.74 | V |
| 5461.01 | -54.41 | 6.91 | 10.55 | 2.15 | -52.92 | -13.00 | 39.92 | H |

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

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1564.01 | -60.97 | 3.48 | 5.38 | 2.15 | -61.22 | -13.00 | 48.22 | H |
| 2347.00 | -54.20 | 4.45 | 5.64 | 2.15 | -55.16 | -13.00 | 42.16 | V |
| 3140.02 | -53.89 | 5.38 | 7.34 | 2.15 | -54.08 | -13.00 | 41.08 | H |
| 3918.02 | -55.40 | 6.12 | 8.79 | 2.15 | -54.88 | -13.00 | 41.88 | H |
| 4695.02 | -55.26 | 6.50 | 9.60 | 2.15 | -54.31 | -13.00 | 41.31 | V |
| 5462.01 | -55.03 | 6.92 | 10.55 | 2.15 | -53.55 | -13.00 | 40.55 | V |

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

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1569.01 | -61.98 | 3.48 | 5.38 | 2.15 | -62.23 | -13.00 | 49.23 | H |
| 2357.00 | -54.37 | 4.47 | 5.67 | 2.15 | -55.32 | -13.00 | 42.32 | V |
| 3144.02 | -54.31 | 5.38 | 7.35 | 2.15 | -54.49 | -13.00 | 41.49 | H |
| 3921.02 | -55.50 | 6.12 | 8.79 | 2.15 | -54.98 | -13.00 | 41.98 | V |
| 4694.02 | -54.86 | 6.50 | 9.59 | 2.15 | -53.92 | -13.00 | 40.92 | H |
| 5496.01 | -54.96 | 7.04 | 10.59 | 2.15 | -53.56 | -13.00 | 40.56 | H |

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

| Frequency (MHz) | P_Mea (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 5556.02 | -53.02 | 7.19 | 10.59 | -49.62 | -13.00 | 36.62 | H |
| 9722.01 | -53.87 | 8.86 | 13.18 | -49.55 | -13.00 | 36.55 | H |
| 11564.01 | -50.43 | 9.80 | 13.09 | -47.14 | -13.00 | 34.14 | H |
| 13619.01 | -47.88 | 10.80 | 14.27 | -44.41 | -13.00 | 31.41 | V |
| 14813.00 | -44.59 | 11.13 | 14.15 | -41.57 | -13.00 | 28.57 | H |
| 16682.00 | -41.72 | 11.78 | 13.67 | -39.83 | -13.00 | 26.83 | H |

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

| Frequency (MHz) | P_Mea (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 7574.01 | -54.66 | 8.08 | 12.26 | -50.48 | -13.00 | 37.48 | V |
| 9376.01 | -54.59 | 9.06 | 13.33 | -50.32 | -13.00 | 37.32 | H |
| 11254.01 | -50.43 | 9.72 | 13.15 | -47.00 | -13.00 | 34.00 | H |
| 13196.01 | -47.54 | 10.51 | 13.77 | -44.28 | -13.00 | 31.28 | H |
| 15028.00 | -45.15 | 11.25 | 13.98 | -42.42 | -13.00 | 29.42 | H |
| 16981.00 | -41.38 | 12.30 | 13.79 | -39.89 | -13.00 | 26.89 | H |

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

| Frequency (MHz) | P_Mea (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 7627.01 | -54.04 | 8.10 | 12.30 | -49.84 | -13.00 | 36.84 | H |
| 9538.01 | -53.82 | 9.40 | 13.36 | -49.86 | -13.00 | 36.86 | H |
| 11518.01 | -50.97 | 9.81 | 13.10 | -47.68 | -13.00 | 34.68 | H |
| 13426.01 | -48.22 | 10.59 | 14.10 | -44.71 | -13.00 | 31.71 | H |
| 15356.00 | -45.65 | 11.34 | 13.79 | -43.20 | -13.00 | 30.20 | V |
| 17275.00 | -42.39 | 12.37 | 14.41 | -40.35 | -13.00 | 27.35 | V |

**LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26697**

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2454.00 | -42.87 | 4.58 | 5.96 | 2.15 | -43.64 | -13.00 | 30.64 | V |
| 6505.01 | -53.60 | 7.51 | 11.01 | 2.15 | -52.25 | -13.00 | 39.25 | V |
| 7341.01 | -52.88 | 8.11 | 12.01 | 2.15 | -51.13 | -13.00 | 38.13 | H |
| 8164.01 | -51.86 | 8.44 | 12.73 | 2.15 | -49.72 | -13.00 | 36.72 | H |
| 8967.00 | -51.15 | 9.08 | 13.09 | 2.15 | -49.29 | -13.00 | 36.29 | H |
| 9765.00 | -52.16 | 8.96 | 13.13 | 2.15 | -50.14 | -13.00 | 37.14 | H |

**LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26740**

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1638.01 | -61.39 | 3.56 | 5.25 | 2.15 | -61.85 | -13.00 | 48.85 | H |
| 2446.00 | -42.75 | 4.57 | 5.94 | 2.15 | -43.53 | -13.00 | 30.53 | V |
| 3273.02 | -54.63 | 5.28 | 7.66 | 2.15 | -54.40 | -13.00 | 41.40 | V |
| 4095.02 | -55.81 | 6.04 | 9.00 | 2.15 | -55.00 | -13.00 | 42.00 | V |
| 4924.01 | -55.76 | 6.73 | 9.82 | 2.15 | -54.82 | -13.00 | 41.82 | H |
| 5733.01 | -54.35 | 7.29 | 10.55 | 2.15 | -53.24 | -13.00 | 40.24 | H |

**LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26783**

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2468.00 | -49.98 | 4.59 | 6.00 | 2.15 | -50.72 | -13.00 | 37.72 | V |
| 6443.01 | -52.59 | 7.55 | 10.94 | 2.15 | -51.35 | -13.00 | 38.35 | H |
| 7531.01 | -52.24 | 8.26 | 12.22 | 2.15 | -50.43 | -13.00 | 37.43 | V |
| 8213.01 | -51.94 | 8.53 | 12.77 | 2.15 | -49.85 | -13.00 | 36.85 | H |
| 9037.00 | -50.71 | 9.10 | 13.12 | 2.15 | -48.84 | -13.00 | 35.84 | H |
| 9986.00 | -50.70 | 9.17 | 12.91 | 2.15 | -49.11 | -13.00 | 36.11 | V |

### LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 26797

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1663.01 | -61.77 | 3.57 | 5.21 | 2.15 | -62.28 | -13.00 | 49.28 | H |
| 2464.00 | -50.70 | 4.59 | 5.99 | 2.15 | -51.45 | -13.00 | 38.45 | V |
| 3302.02 | -55.65 | 5.29 | 7.72 | 2.15 | -55.37 | -13.00 | 42.37 | H |
| 4125.02 | -54.33 | 6.04 | 9.03 | 2.15 | -53.49 | -13.00 | 40.49 | H |
| 4938.01 | -55.15 | 6.71 | 9.84 | 2.15 | -54.17 | -13.00 | 41.17 | H |
| 5791.01 | -55.06 | 7.20 | 10.54 | 2.15 | -53.87 | -13.00 | 40.87 | V |

### LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 26915

| Frequency (MHz) | P<sub>Mea</sub> (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1673.01 | -56.66 | 3.58 | 5.19 | 2.15 | -57.20 | -13.00 | 44.20 | H |
| 2525.00 | -52.12 | 4.65 | 6.15 | 2.15 | -52.77 | -13.00 | 39.77 | H |
| 3338.02 | -54.79 | 5.31 | 7.81 | 2.15 | -54.44 | -13.00 | 41.44 | H |
| 4185.02 | -54.71 | 6.17 | 9.09 | 2.15 | -53.94 | -13.00 | 40.94 | V |
| 5008.01 | -55.42 | 6.59 | 9.91 | 2.15 | -54.25 | -13.00 | 41.25 | V |
| 5850.01 | -53.83 | 7.23 | 10.53 | 2.15 | -52.68 | -13.00 | 39.68 | H |

### LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 27033

| 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 | -59.79 | 3.60 | 5.15 | 2.15 | -60.39 | -13.00 | 47.39 | H |
| 2550.00 | -52.79 | 4.67 | 6.19 | 2.15 | -53.42 | -13.00 | 40.42 | H |
| 3390.02 | -55.41 | 5.35 | 7.94 | 2.15 | -54.97 | -13.00 | 41.97 | V |
| 4244.02 | -53.32 | 6.25 | 9.14 | 2.15 | -52.58 | -13.00 | 39.58 | H |
| 5095.01 | -55.83 | 6.76 | 10.03 | 2.15 | -54.71 | -13.00 | 41.71 | H |
| 5936.01 | -53.07 | 7.47 | 10.51 | 2.15 | -52.18 | -13.00 | 39.18 | H |

**LTE Band 41(PC2), 5MHz, QPSK, Channel 39675**

| Frequency (MHz) | P_Mea (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 4998.02 | -46.29 | 6.61 | 9.90 | -43.00 | -25.00 | 18.00 | V |
| 7500.01 | -47.65 | 8.39 | 12.20 | -43.84 | -25.00 | 18.84 | V |
| 9995.01 | -52.88 | 9.18 | 12.90 | -49.16 | -25.00 | 24.16 | H |
| 12488.01 | -50.01 | 10.21 | 13.20 | -47.02 | -25.00 | 22.02 | V |
| 14988.00 | -46.12 | 11.21 | 14.01 | -43.32 | -25.00 | 18.32 | V |
| 17494.00 | -43.30 | 12.71 | 14.89 | -41.12 | -25.00 | 16.12 | H |

**LTE Band 41(PC2), 5MHz, QPSK, Channel 40620**

| Frequency (MHz) | P_Mea (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 6468.02 | -55.63 | 7.54 | 10.97 | -52.20 | -25.00 | 27.20 | H |
| 7780.01 | -42.85 | 8.31 | 12.42 | -38.74 | -25.00 | 13.74 | H |
| 9079.01 | -54.33 | 8.99 | 13.15 | -50.17 | -25.00 | 25.17 | H |
| 10382.01 | -50.04 | 9.77 | 13.05 | -46.76 | -25.00 | 21.76 | H |
| 11650.01 | -50.33 | 9.70 | 13.07 | -46.96 | -25.00 | 21.96 | H |
| 12935.01 | -48.72 | 10.49 | 13.46 | -45.75 | -25.00 | 20.75 | H |

**LTE Band 41(PC2), 5MHz, QPSK, Channel 41565**

| Frequency (MHz) | P_Mea (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 5377.02 | -35.56 | 6.88 | 10.43 | -32.01 | -25.00 | 7.01 | H |
| 8064.01 | -48.94 | 8.32 | 12.65 | -44.61 | -25.00 | 19.61 | H |
| 10762.01 | -51.03 | 9.46 | 13.15 | -47.34 | -25.00 | 22.34 | H |
| 13460.01 | -47.68 | 10.61 | 14.14 | -44.15 | -25.00 | 19.15 | V |
| 16149.00 | -45.51 | 11.79 | 13.67 | -43.63 | -25.00 | 18.63 | H |
| 17477.00 | -43.14 | 12.67 | 14.85 | -40.96 | -25.00 | 15.96 | H |

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

| Frequency (MHz) | P$_{Mea}$ (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3422.02 | -50.33 | 5.38 | 8.01 | -47.70 | -13.00 | 34.70 | H |
| 5135.02 | -57.57 | 6.86 | 10.09 | -54.34 | -13.00 | 41.34 | H |
| 6844.01 | -55.15 | 7.83 | 11.41 | -51.57 | -13.00 | 38.57 | H |
| 8552.01 | -55.07 | 8.58 | 13.01 | -50.64 | -13.00 | 37.64 | H |
| 10260.01 | -53.20 | 9.51 | 13.00 | -49.71 | -13.00 | 36.71 | H |
| 11976.01 | -49.67 | 10.16 | 13.00 | -46.83 | -13.00 | 33.83 | V |

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

| Frequency (MHz) | P$_{Mea}$ (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3490.02 | -48.22 | 5.50 | 8.18 | -45.54 | -13.00 | 32.54 | H |
| 5239.02 | -56.17 | 7.00 | 10.23 | -52.94 | -13.00 | 39.94 | H |
| 6975.01 | -55.06 | 8.11 | 11.57 | -51.60 | -13.00 | 38.60 | H |
| 8720.01 | -55.09 | 8.42 | 13.04 | -50.47 | -13.00 | 37.47 | H |
| 10472.01 | -51.95 | 9.69 | 13.09 | -48.55 | -13.00 | 35.55 | V |
| 12214.01 | -49.37 | 10.05 | 13.09 | -46.33 | -13.00 | 33.33 | V |

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

| Frequency (MHz) | P$_{Mea}$ (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3559.02 | -49.01 | 5.92 | 8.28 | -46.65 | -13.00 | 33.65 | H |
| 5342.02 | -55.04 | 6.95 | 10.38 | -51.61 | -13.00 | 38.61 | H |
| 7114.01 | -55.56 | 8.16 | 11.74 | -51.98 | -13.00 | 38.98 | V |
| 8894.01 | -54.19 | 8.83 | 13.08 | -49.94 | -13.00 | 36.94 | H |
| 10678.01 | -50.95 | 9.30 | 13.14 | -47.11 | -13.00 | 34.11 | H |
| 12451.01 | -49.42 | 10.30 | 13.18 | -46.54 | -13.00 | 33.54 | H |

**LTE Band 71, 5MHz, QPSK, Channel 133147**

| Frequency (MHz) | P$_{Mea}$ (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1331.01 | -49.15 | 3.15 | 4.62 | 2.15 | -49.83 | -13.00 | 36.83 | V |
| 2000.01 | -55.20 | 4.05 | 4.60 | 2.15 | -56.80 | -13.00 | 43.80 | V |
| 2690.00 | -52.25 | 4.78 | 6.44 | 2.15 | -52.74 | -13.00 | 39.74 | H |
| 3327.02 | -54.64 | 5.30 | 7.78 | 2.15 | -54.31 | -13.00 | 41.31 | H |
| 3974.02 | -54.88 | 6.09 | 8.86 | 2.15 | -54.26 | -13.00 | 41.26 | H |
| 4685.02 | -53.92 | 6.49 | 9.59 | 2.15 | -52.97 | -13.00 | 39.97 | V |

**LTE Band 71, 5MHz, QPSK, Channel 133297**

| Frequency (MHz) | P$_{Mea}$ (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1361.01 | -50.04 | 3.19 | 4.78 | 2.15 | -50.60 | -13.00 | 37.60 | H |
| 2046.00 | -56.03 | 4.14 | 4.74 | 2.15 | -57.58 | -13.00 | 44.58 | V |
| 2709.00 | -51.64 | 4.79 | 6.48 | 2.15 | -52.10 | -13.00 | 39.10 | H |
| 3406.02 | -55.01 | 5.37 | 7.97 | 2.15 | -54.56 | -13.00 | 41.56 | V |
| 4069.02 | -55.28 | 6.04 | 8.97 | 2.15 | -54.50 | -13.00 | 41.50 | H |
| 4755.01 | -54.75 | 6.58 | 9.66 | 2.15 | -53.82 | -13.00 | 40.82 | V |

**LTE Band 71, 5MHz, QPSK, Channel 133447**

| Frequency (MHz) | P$_{Mea}$ (dBm) | Path Loss(dB) | Antenna Gain(dBi) | Correction (dB) | Peak ERP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1391.01 | -55.62 | 3.22 | 4.93 | 2.15 | -56.06 | -13.00 | 43.06 | V |
| 2060.00 | -55.59 | 4.16 | 4.78 | 2.15 | -57.12 | -13.00 | 44.12 | V |
| 2809.00 | -52.25 | 4.93 | 6.66 | 2.15 | -52.67 | -13.00 | 39.67 | V |
| 3469.02 | -55.96 | 5.46 | 8.13 | 2.15 | -55.44 | -13.00 | 42.44 | H |
| 4170.02 | -55.03 | 6.14 | 9.07 | 2.15 | -54.25 | -13.00 | 41.25 | V |
| 4855.01 | -54.81 | 6.72 | 9.76 | 2.15 | -53.92 | -13.00 | 40.92 | H |

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.

1.  Measure the carrier frequency at room temperature.
2.  Subject the EUT to overnight soak at -10℃.
3.  With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE Bands 12,13,25,26,41,66,71, 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℃ increments from -10℃ to +50℃. 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℃.
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 ℃increments from -10℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9.  At all temperature levels hold the temperature to +/- 0.5℃ 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 3.5VDC and 4.4VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress.

## A.3.2 Measurement results

**LTE Band 12, 5MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

| Voltage (V) | Temperature (℃) | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| | | QPSK | 16QAM | QPSK | 16QAM |
| 3.5 | | -7.97 | -5.44 | -7.97 | -5.44 |
| 3.8 | 20 | -14.29 | -7.45 | -14.29 | -7.45 |
| 4.4 | | -11.23 | -6.81 | -11.23 | -6.81 |

**Frequency Error vs Temperature**

| Temperature (℃) | Voltage (V) | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| | | QPSK | 16QAM | QPSK | 16QAM |
| 50 | | -10.20 | -7.24 | 0.0144 | 0.0102 |
| 40 | | -10.16 | 8.14 | 0.0144 | 0.0115 |
| 30 | | -8.24 | -8.55 | 0.0116 | 0.0121 |
| 20 | 3.8 | -12.46 | -6.77 | 0.0176 | 0.0096 |
| 10 | | -12.32 | -7.22 | 0.0174 | 0.0102 |
| 0 | | -11.07 | 8.65 | 0.0156 | 0.0122 |
| -10 | | -11.87 | -9.07 | 0.0168 | 0.0128 |

**LTE Band 13, 5MHz bandwidth (worst case of all bandwidths)**

| Voltage (V) | Temperature (℃) | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| | | QPSK | 16QAM | QPSK | 16QAM |
| 3.5 | | -10.14 | -11.03 | 0.0130 | 0.0141 |
| 3.8 | 20 | -10.41 | -9.36 | 0.0133 | 0.0120 |
| 4.4 | | -11.82 | -7.38 | 0.0151 | 0.0094 |

**Frequency Error vs Temperature**

| Temperature (℃) | Voltage (V) | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| | | QPSK | 16QAM | QPSK | 16QAM |
| 50 | | -13.80 | -6.19 | 0.0176 | 0.0079 |
| 40 | | -14.36 | -10.30 | 0.0184 | 0.0132 |
| 30 | | 21.14 | -6.58 | 0.0270 | 0.0084 |
| 20 | 3.8 | -11.74 | -8.15 | 0.0150 | 0.0104 |
| 10 | | -12.26 | -5.38 | 0.0157 | 0.0069 |
| 0 | | -13.45 | -9.93 | 0.0172 | 0.0127 |
| -10 | | -10.94 | -8.35 | 0.0140 | 0.0107 |

**LTE Band 25, 1.4MHz bandwidth (worst case of all bandwidths)**

**Frequency Error vs Voltage**

| Voltage | Temperature | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| (V) | (℃) | QPSK | 16QAM | QPSK | 16QAM |
| 3.5 | | -9.68 | 19.63 | 0.0051 | 0.0104 |
| 3.8 | 20 | -15.68 | 22.06 | 0.0083 | 0.0117 |
| 4.4 | | -14.31 | 19.01 | 0.0076 | 0.0101 |

**Frequency Error vs Temperature**

| Temperature | Voltage | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| (℃) | (V) | QPSK | 16QAM | QPSK | 16QAM |
| 50 | | -17.61 | -14.61 | 0.0094 | 0.0078 |
| 40 | | -15.31 | 20.10 | 0.0081 | 0.0107 |
| 30 | | -16.99 | 25.16 | 0.0090 | 0.0134 |
| 20 | 3.8 | -13.69 | 23.73 | 0.0073 | 0.0126 |
| 10 | | -16.31 | 19.31 | 0.0087 | 0.0103 |
| 0 | | -18.21 | 17.08 | 0.0097 | 0.0091 |
| -10 | | -9.86 | 19.66 | 0.0052 | 0.0104 |

**LTE Band 26(814MHz~824MHz), 1.4MHz bandwidth (worst case of all bandwidths)**

**Frequency Error vs Voltage**

| Voltage | Temperature | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| (V) | (℃) | QPSK | 16QAM | QPSK | 16QAM |
| 3.5 | | -11.49 | -27.42 | 0.0140 | 0.0335 |
| 3.8 | 20 | -9.61 | -31.14 | 0.0117 | 0.0380 |
| 4.4 | | -13.13 | -35.16 | 0.0160 | 0.0429 |

**Frequency Error vs Temperature**

| Temperature | Voltage | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| (℃) | (V) | QPSK | 16QAM | QPSK | 16QAM |
| 50 | | -11.04 | -37.31 | 0.0135 | 0.0456 |
| 40 | | -12.00 | -33.09 | 0.0147 | 0.0404 |
| 30 | | -9.14 | -27.69 | 0.0112 | 0.0338 |
| 20 | 3.8 | -10.57 | -27.68 | 0.0129 | 0.0338 |
| 10 | | -11.07 | -29.51 | 0.0135 | 0.0360 |
| 0 | | -9.84 | -30.81 | 0.0120 | 0.0376 |
| -10 | | -13.06 | -32.30 | 0.0159 | 0.0394 |


**LTE Band 26(824MHz~849MHz), 1.4MHz bandwidth (worst case of all bandwidths)**

**Frequency Error vs Voltage**

| Voltage | Temperature | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| (V) | (℃) | QPSK | 16QAM | QPSK | 16QAM |
| 3.5 | | -8.48 | -27.58 | 0.0101 | 0.0330 |
| 3.8 | 20 | -15.18 | -24.62 | 0.0181 | 0.0294 |
| 4.4 | | -8.15 | -25.08 | 0.0097 | 0.0300 |

**Frequency Error vs Temperature**

| Temperature | Voltage | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| (℃) | (V) | QPSK | 16QAM | QPSK | 16QAM |
| 50 | | -13.16 | -23.90 | 0.0157 | 0.0286 |
| 40 | | -9.21 | -22.90 | 0.0110 | 0.0274 |
| 30 | | -11.83 | -26.05 | 0.0141 | 0.0311 |
| 20 | 3.8 | -13.02 | -27.37 | 0.0156 | 0.0327 |
| 10 | | -9.30 | -17.94 | 0.0111 | 0.0214 |
| 0 | | -10.90 | -18.28 | 0.0130 | 0.0219 |
| -10 | | -13.05 | -24.60 | 0.0156 | 0.0294 |

**LTE Band 41(PC2), 5MHz bandwidth (worst case of all bandwidths)**

**Frequency Error vs Voltage**

| Voltage (V) | Temperature (℃) | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| | | QPSK | 16QAM | QPSK | 16QAM |
| 3.5 | | -16.24 | -18.93 | 0.0063 | 0.0073 |
| 3.8 | 20 | -22.04 | -18.97 | 0.0085 | 0.0073 |
| 4.4 | | -20.56 | -15.74 | 0.0079 | 0.0061 |

**Frequency Error vs Temperature**

| Temperature (℃) | Voltage (V) | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| | | QPSK | 16QAM | QPSK | 16QAM |
| 50 | | -16.24 | -18.93 | 0.0063 | 0.0073 |
| 40 | | -22.04 | -18.97 | 0.0085 | 0.0073 |
| 30 | | -20.56 | -15.74 | 0.0079 | 0.0061 |
| 20 | 3.8 | -23.12 | -24.20 | 0.0089 | 0.0093 |
| 10 | | -24.63 | -19.44 | 0.0095 | 0.0075 |
| 0 | | -18.90 | -20.70 | 0.0073 | 0.0080 |
| -10 | | -17.81 | -23.98 | 0.0069 | 0.0092 |

**LTE Band 66, 1.4MHz bandwidth (worst case of all bandwidths)**

**Frequency Error vs Voltage**

| Voltage (V) | Temperature (℃) | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| | | QPSK | 16QAM | QPSK | 16QAM |
| 3.5 | | -16.24 | -18.93 | 0.0063 | 0.0073 |
| 3.8 | 20 | -22.04 | -18.97 | 0.0085 | 0.0073 |
| 4.4 | | -20.56 | -15.74 | 0.0079 | 0.0061 |

**Frequency Error vs Temperature**

| Temperature (℃) | Voltage (V) | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| | | QPSK | 16QAM | QPSK | 16QAM |
| 50 | | -16.24 | -18.93 | 0.0063 | 0.0073 |
| 40 | | -22.04 | -18.97 | 0.0085 | 0.0073 |
| 30 | | -20.56 | -15.74 | 0.0079 | 0.0061 |
| 20 | 3.8 | -23.12 | -24.20 | 0.0089 | 0.0093 |
| 10 | | -24.63 | -19.44 | 0.0095 | 0.0075 |
| 0 | | -18.90 | -20.70 | 0.0073 | 0.0080 |
| -10 | | -17.81 | -23.98 | 0.0069 | 0.0092 |

**LTE Band 71, 10MHz bandwidth (worst case of all bandwidths)**

**Frequency Error vs Voltage**

| Voltage | Temperature | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| (V) | (℃) | QPSK | 16QAM | QPSK | 16QAM |
| 3.5 | | -15.85 | -8.71 | 0.0233 | 0.0128 |
| 3.8 | 20 | -11.96 | -6.74 | 0.0176 | 0.0099 |
| 4.4 | | -12.95 | -12.72 | 0.0190 | 0.0187 |

**Frequency Error vs Temperature**

| Temperature | Voltage | Frequency error (Hz) | | Frequency error (ppm) | |
|---|---|---|---|---|---|
| (℃) | (V) | QPSK | 16QAM | QPSK | 16QAM |
| 50 | | -14.72 | -8.91 | 0.0216 | 0.0131 |
| 40 | | -14.20 | -10.70 | 0.0209 | 0.0157 |
| 30 | | -13.48 | -7.75 | 0.0198 | 0.0114 |
| 20 | 3.8 | -12.30 | 5.32 | 0.0181 | 0.0078 |
| 10 | | -16.47 | 8.45 | 0.0242 | 0.0124 |
| 0 | | -15.45 | -9.66 | 0.0227 | 0.0142 |
| -10 | | -14.82 | -9.83 | 0.0218 | 0.0144 |

## 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 frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.
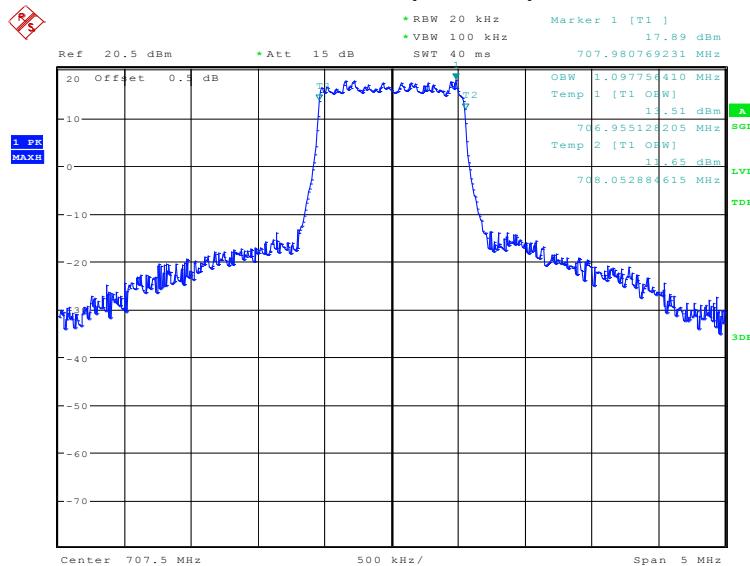
The measurement method is from ANSI C63.26:

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 ≥ 3 × 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 12, 1.4MHz (99%)**

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 707.5 | 1097.76 | 1089.74 |

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



Date: 21.OCT.2019  11:48:51

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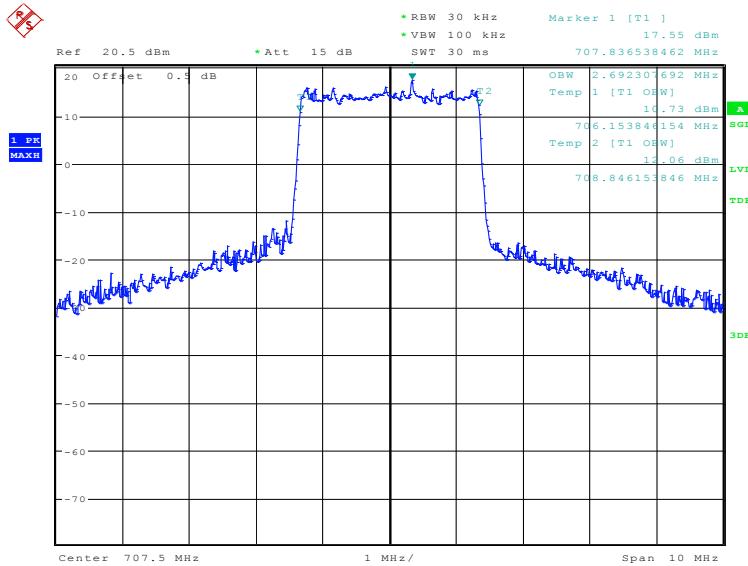


Date: 21.OCT.2019  11:50:16

**LTE band 12, 3MHz (99%)**
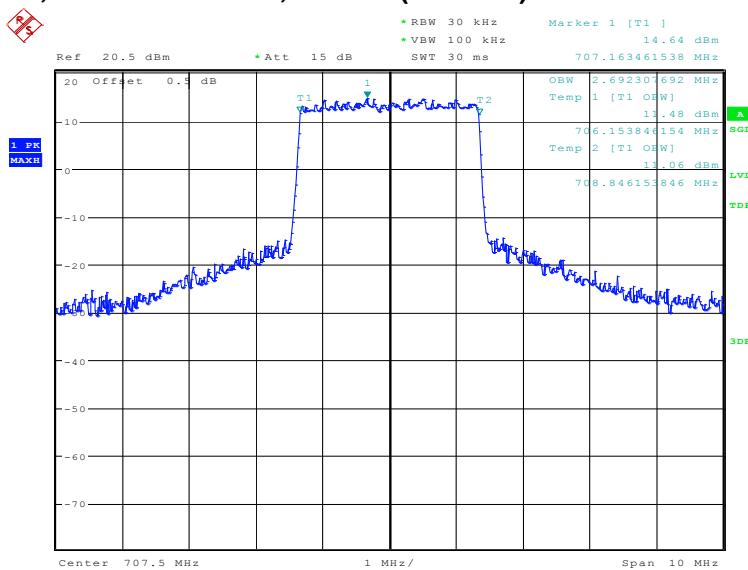
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 707.5 | 2692.31 | 2692.31 |

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



Date: 21.OCT.2019  11:52:31

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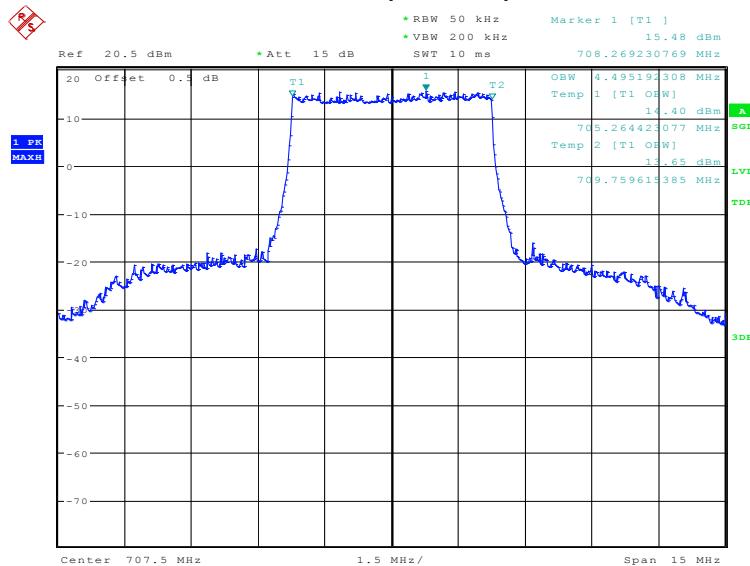


Date: 21.OCT.2019  11:53:56

## LTE band 12, 5MHz (99%)
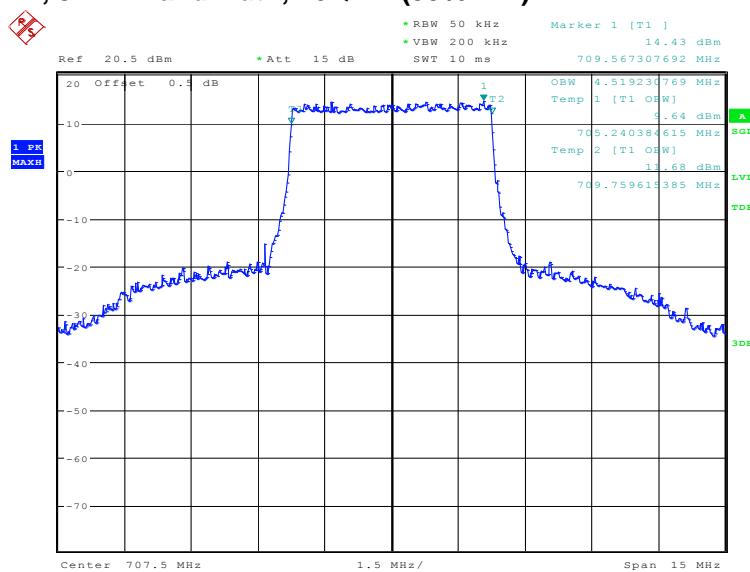
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| 707.5 | QPSK | 16QAM |
| | 4495.19 | 4519.23 |

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



Date: 21.OCT.2019  11:56:10

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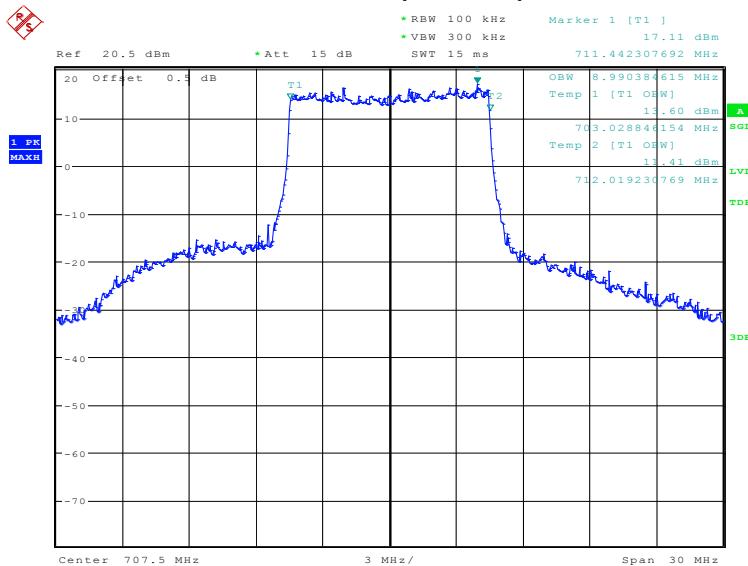


Date: 21.OCT.2019  11:57:35

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

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

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



Date: 21.OCT.2019  11:59:50

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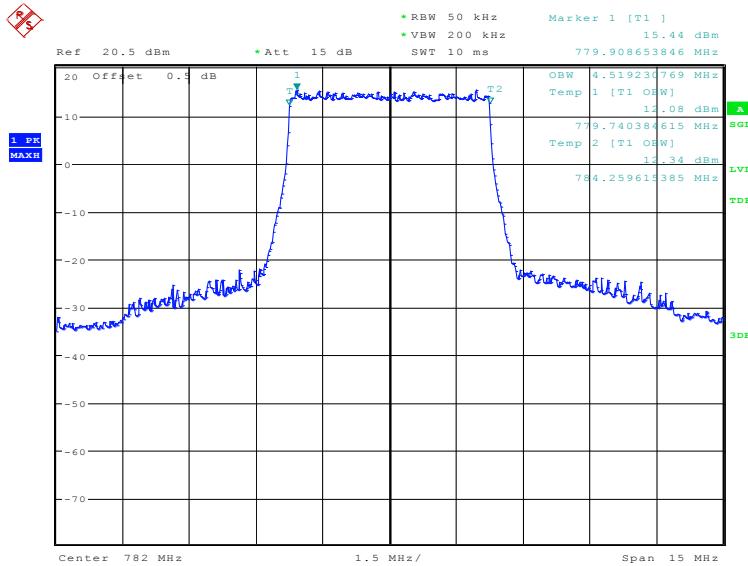


Date: 21.OCT.2019  12:01:15

**LTE band 13, 5MHz (99%)**
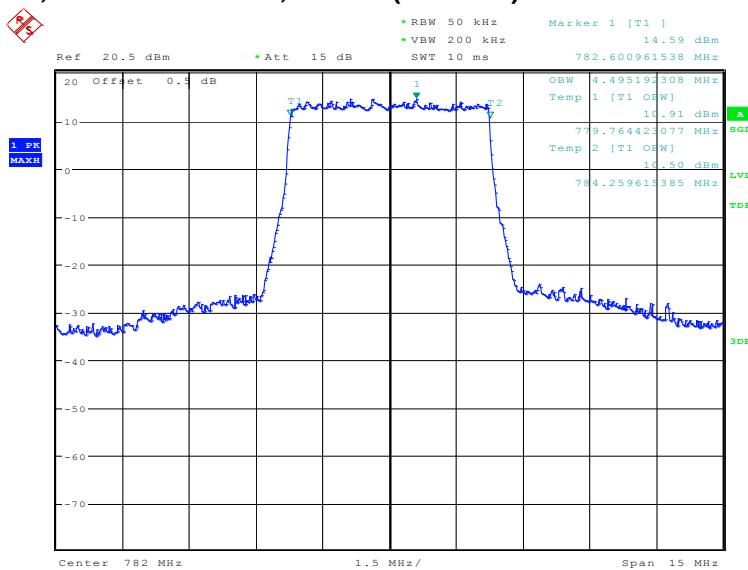
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| 782.0 | QPSK | 16QAM |
| | 4519.23 | 4495.19 |

**LTE band 13, 5MHz Bandwidth, QPSK (99% BW)**



Date: 17.OCT.2019  21:55:45

**LTE band 13, 5MHz Bandwidth,16QAM (99% BW)**
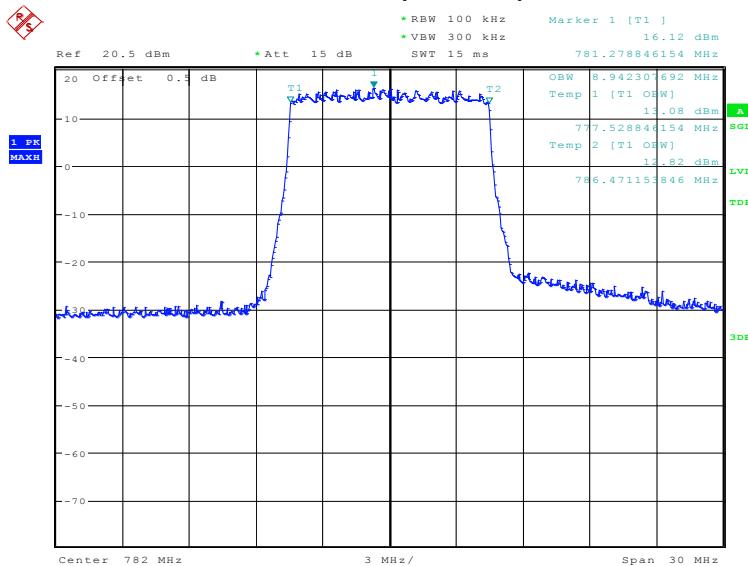


Date: 17.OCT.2019  21:57:09

**LTE band 13, 10MHz (99%)**

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 782.0 | 8942.31 | 8990.38 |

**LTE band 13, 10MHz Bandwidth, QPSK (99% BW)**



Date: 17.OCT.2019  21:59:23

**LTE band 13, 10MHz Bandwidth,16QAM (99% BW)**
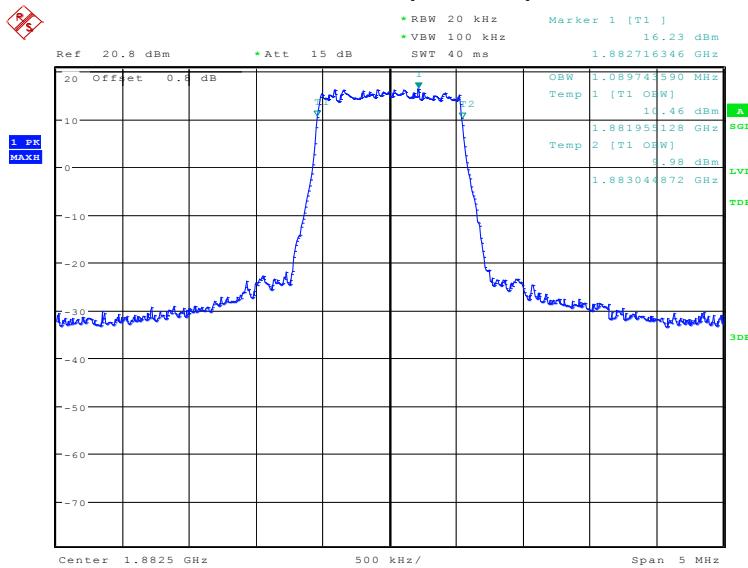


Date: 17.OCT.2019  22:00:48

**LTE band 25, 1.4MHz (99%)**
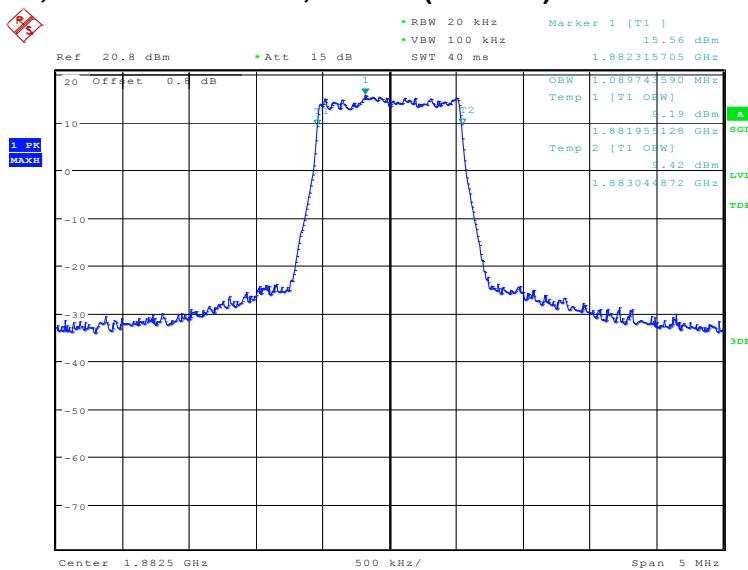
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1882.5 | 1089.74 | 1089.74 |

**LTE band 25, 1.4MHz Bandwidth, QPSK (99% BW)**



Date: 17.OCT.2019  22:03:02

**LTE band 25, 1.4MHz Bandwidth, 16QAM (99% BW)**
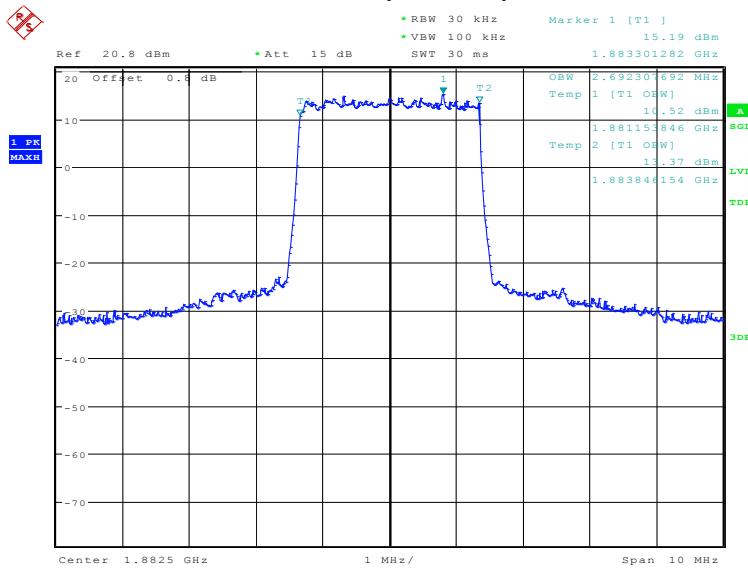


Date: 17.OCT.2019  22:04:27

**LTE band 25, 3MHz (99%)**
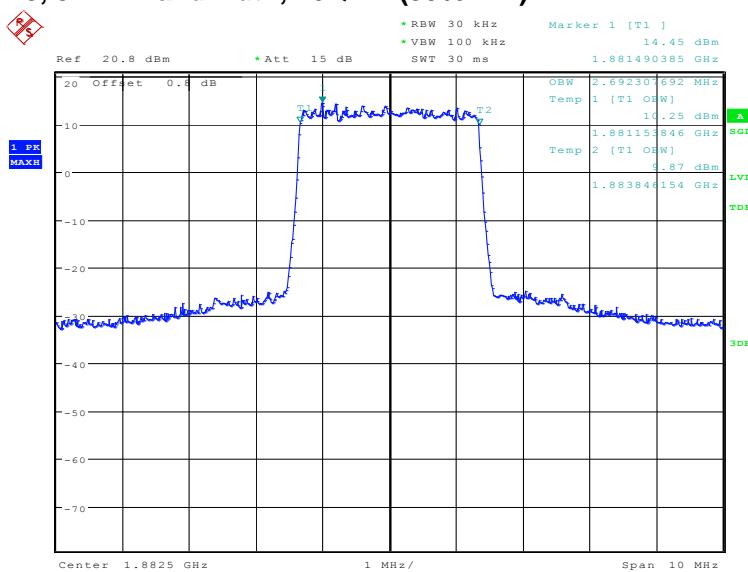
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| 1882.5 | QPSK | 16QAM |
| | 2692.31 | 2692.31 |

**LTE band 25, 3MHz Bandwidth, QPSK (99% BW)**



Date: 17.OCT.2019  22:06:41

**LTE band 25, 3MHz Bandwidth, 16QAM (99% BW)**
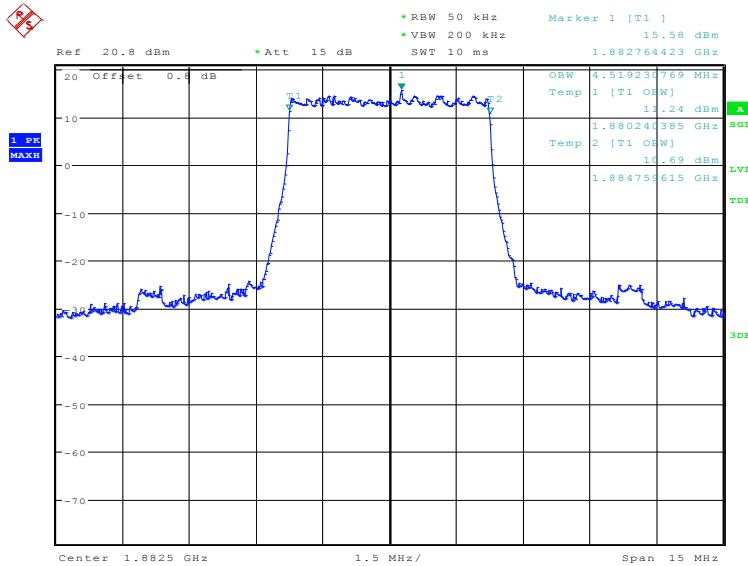


Date: 17.OCT.2019  22:08:05

**LTE band 25, 5MHz (99%)**
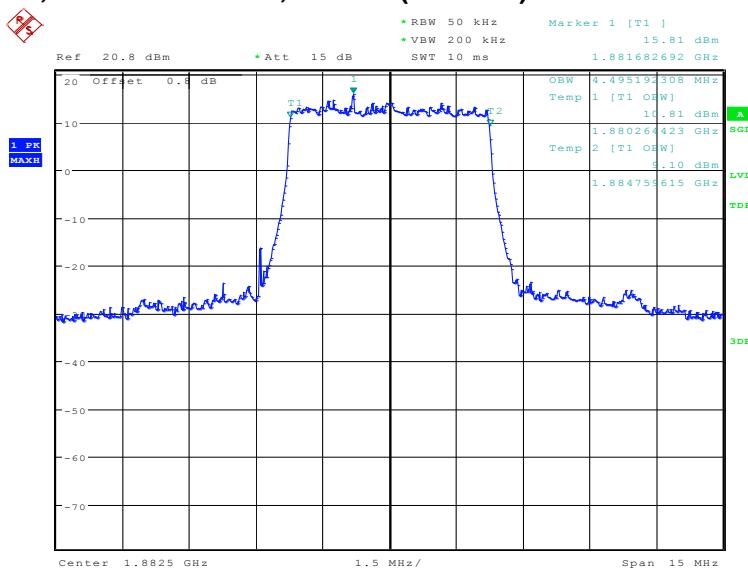
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| 1882.5 | QPSK | 16QAM |
| | 4519.23 | 4495.19 |

**LTE band 25, 5MHz Bandwidth, QPSK (99% BW)**



Date: 17.OCT.2019  22:10:19

**LTE band 25, 5MHz Bandwidth, 16QAM (99% BW)**
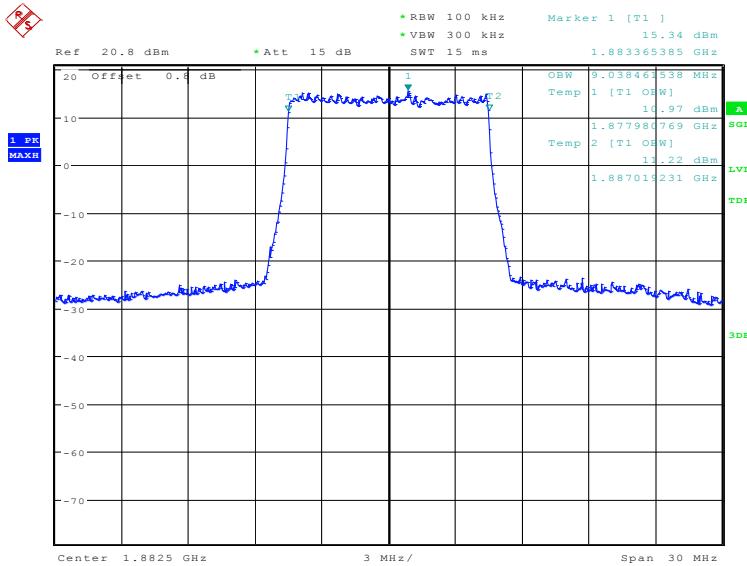


Date: 17.OCT.2019  22:11:44

## LTE band 25, 10MHz (99%)
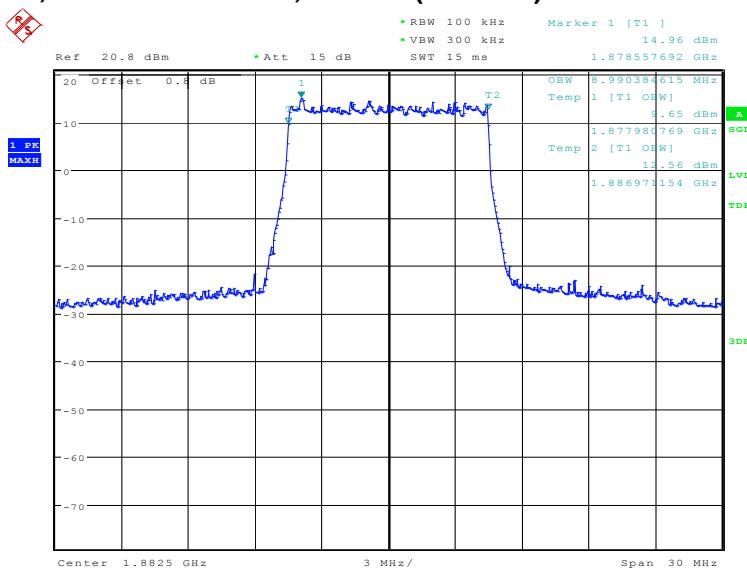
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1882.5 | 9038.46 | 8990.38 |

### LTE band 25, 10MHz Bandwidth, QPSK (99% BW)

Date: 17.OCT.2019  22:13:58

### LTE band 25, 10MHz Bandwidth, 16QAM (99% BW)
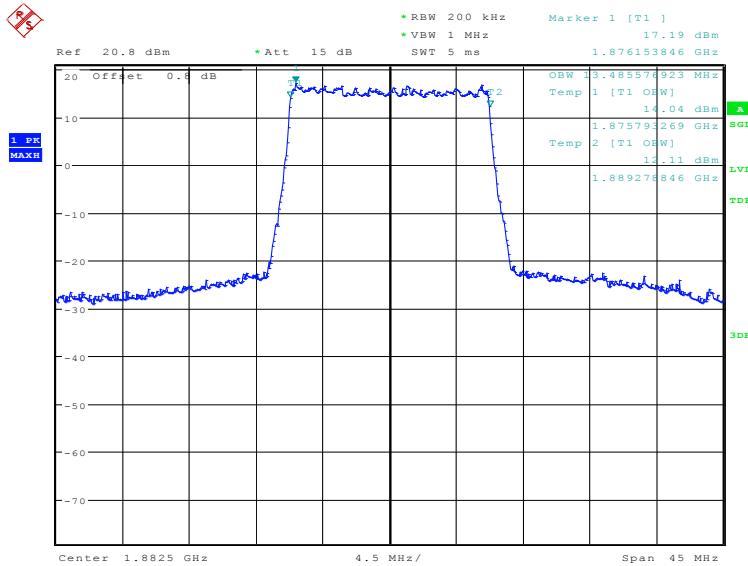
Date: 17.OCT.2019  22:15:22

**LTE band 25, 15MHz (99%)**
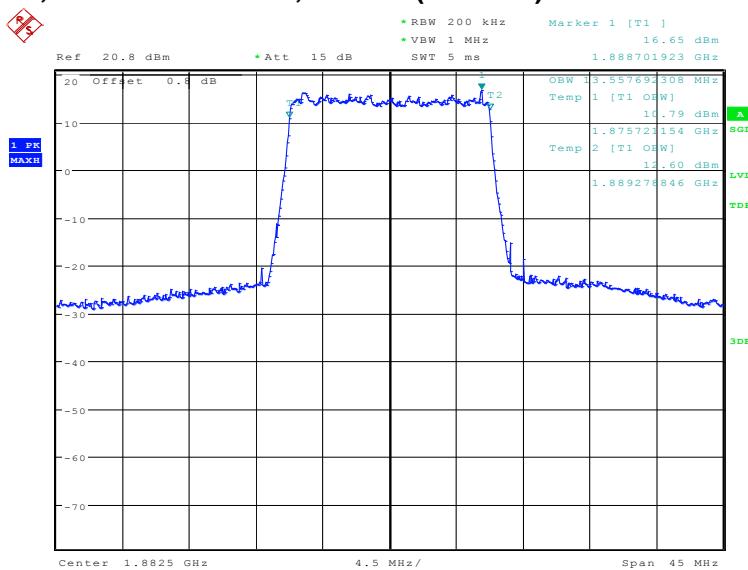
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1882.5 | 13485.58 | 13557.69 |

**LTE band 25, 15MHz Bandwidth, QPSK (99% BW)**



Date: 17.OCT.2019  22:17:36

**LTE band 25, 15MHz Bandwidth, 16QAM (99% BW)**
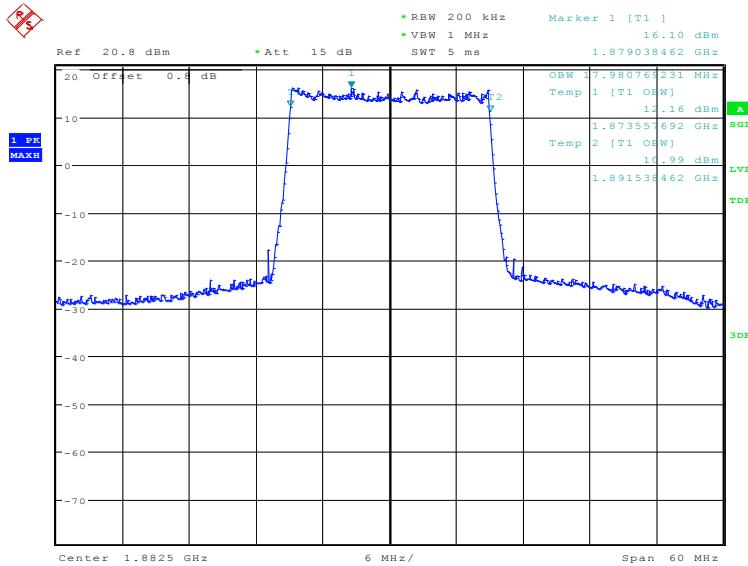


Date: 17.OCT.2019  22:19:01

**LTE band 25, 20MHz (99%)**
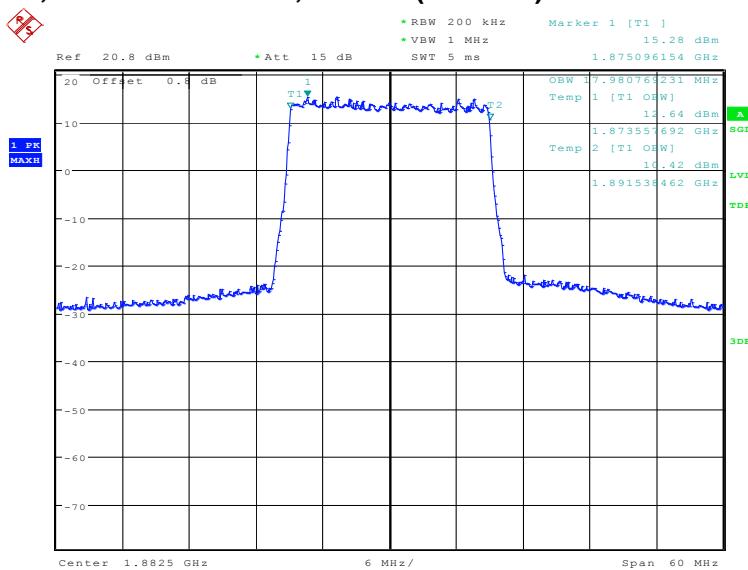
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1882.5 | 17980.77 | 17980.77 |

**LTE band 25, 20MHz Bandwidth, QPSK (99% BW)**



Date: 17.OCT.2019  22:21:15
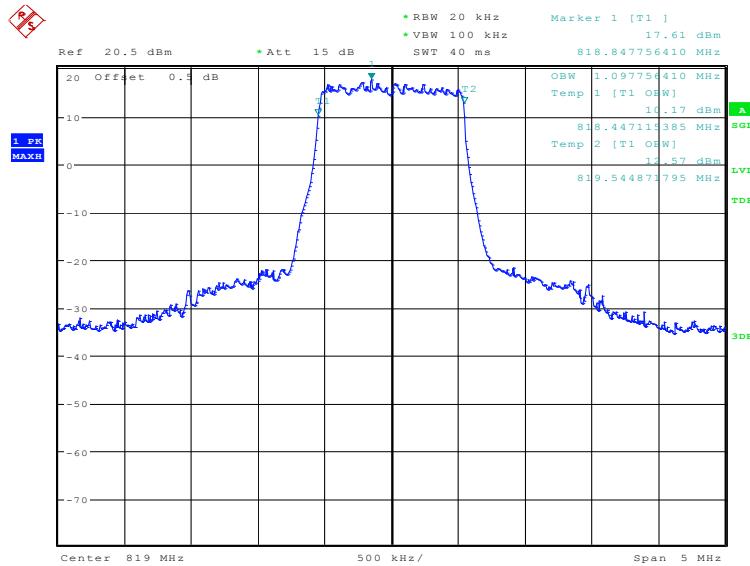
**LTE band 25, 20MHz Bandwidth, 16QAM (99% BW)**
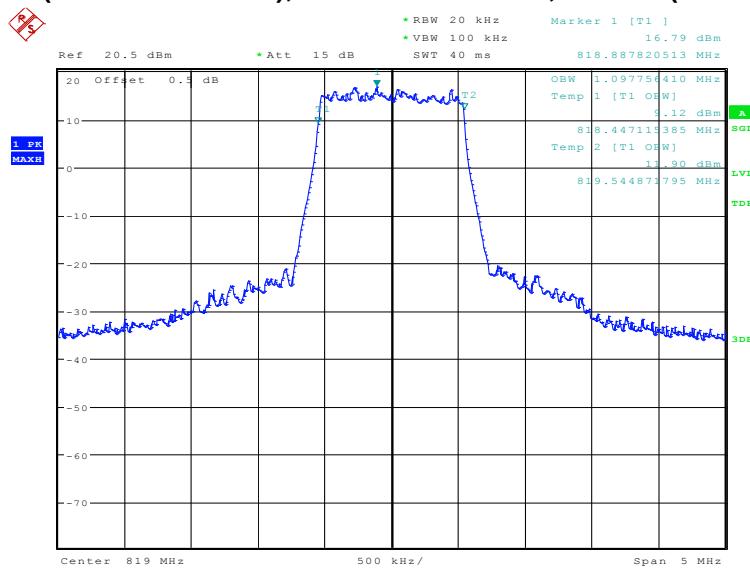


Date: 17.OCT.2019  22:22:40

## LTE band 26(814MHz~824MHz), 1.4MHz (99%)

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|:---:|:---:|:---:|
| 819.0 | QPSK | 16QAM |
| | 1097.76 | 1097.76 |

### LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, QPSK (99% BW)
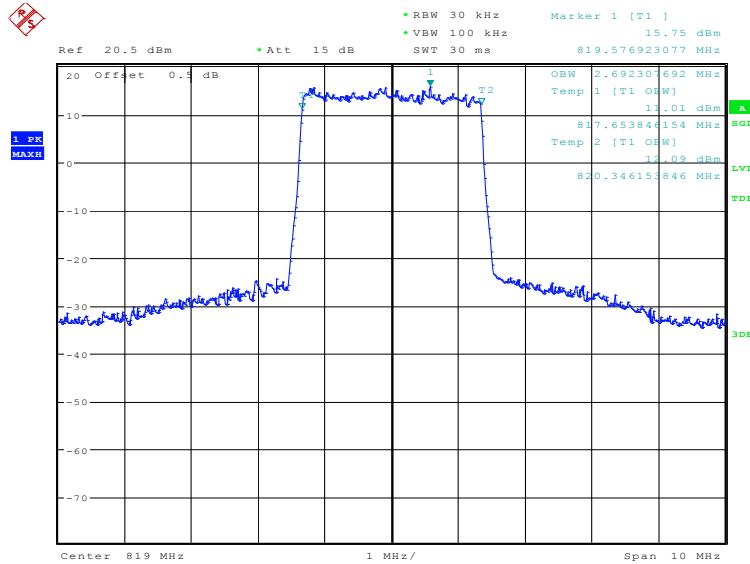


Date: 21.OCT.2019  12:21:00

### LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (99% BW)
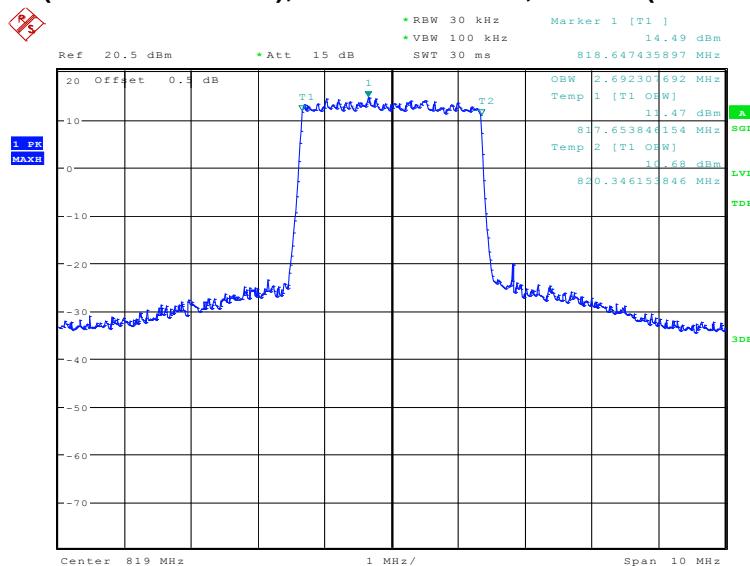


Date: 21.OCT.2019  12:22:25

## LTE band 26(814MHz~824MHz), 3MHz (99%)

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 819.0 | 2692.31 | 2692.31 |

## LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (99% BW)
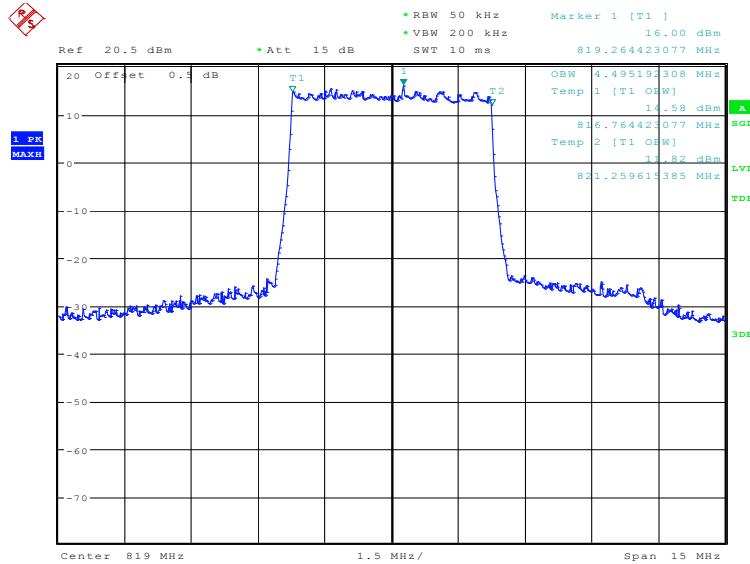


Date: 21.OCT.2019  12:24:40

## LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (99% BW)
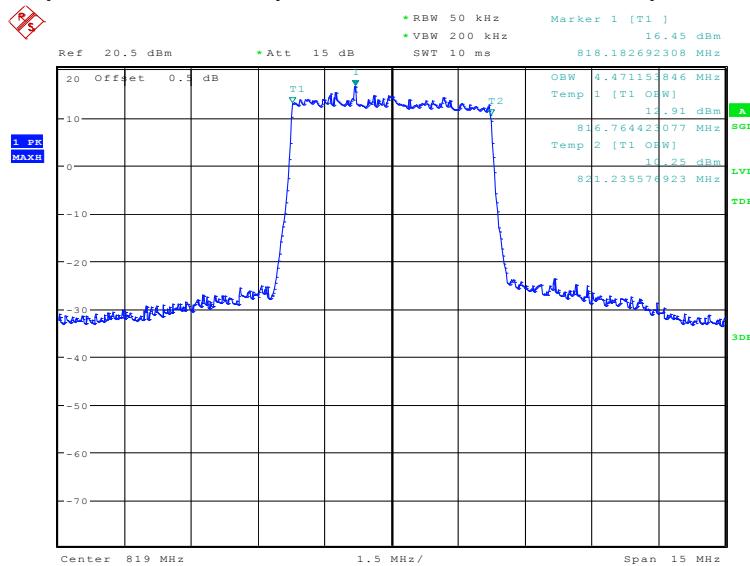


Date: 21.OCT.2019  12:26:05

## LTE band 26(814MHz~824MHz), 5MHz (99%)

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 819.0 | 4495.19 | 4471.15 |

### LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (99% BW)



Date: 21.OCT.2019  12:28:19
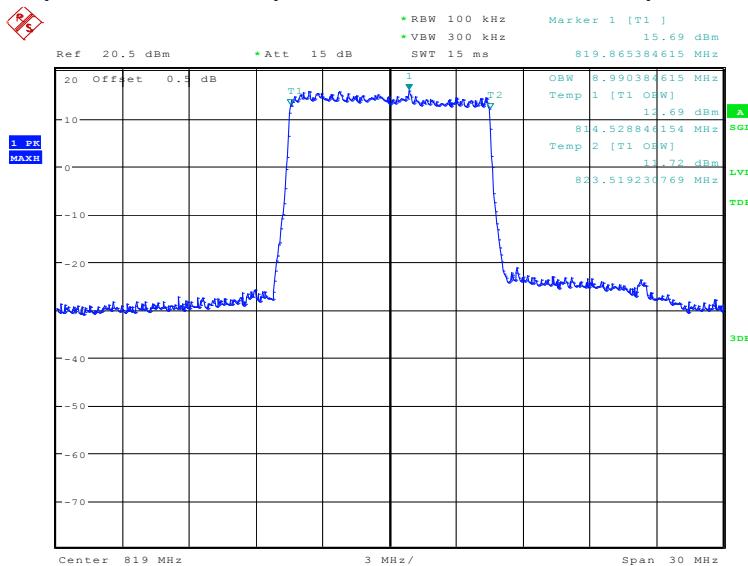
### LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (99% BW)



Date: 21.OCT.2019  12:29:44

**LTE band 26(814MHz~824MHz), 10MHz (99%)**
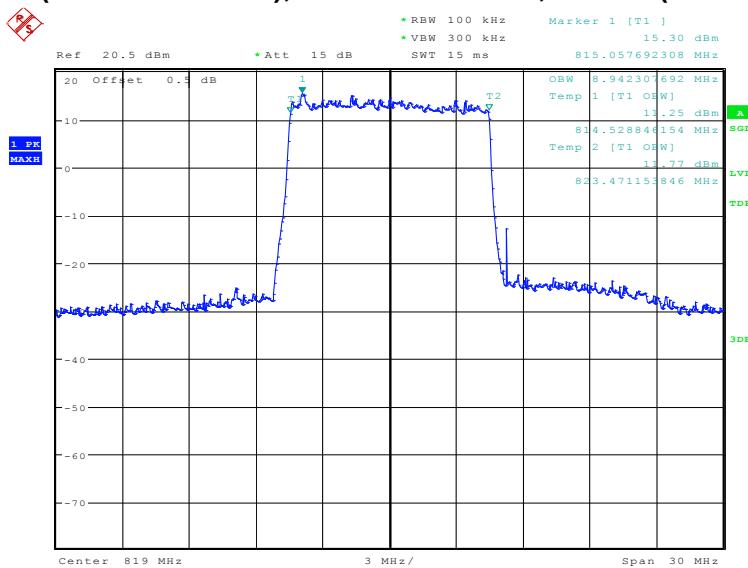
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 819.0 | 8990.38 | 8942.31 |

**LTE band 26(814MHz~824MHz), 10MHz Bandwidth, QPSK (99% BW)**



Date: 21.OCT.2019  12:31:58
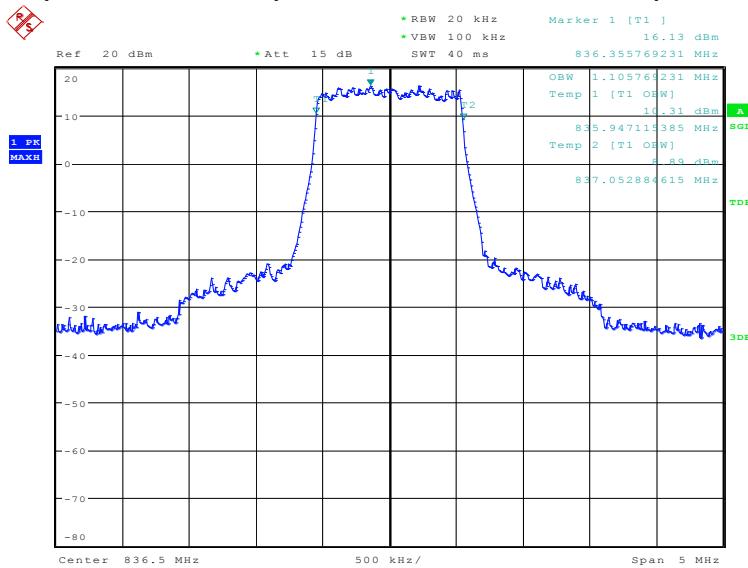
**LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (99% BW)**
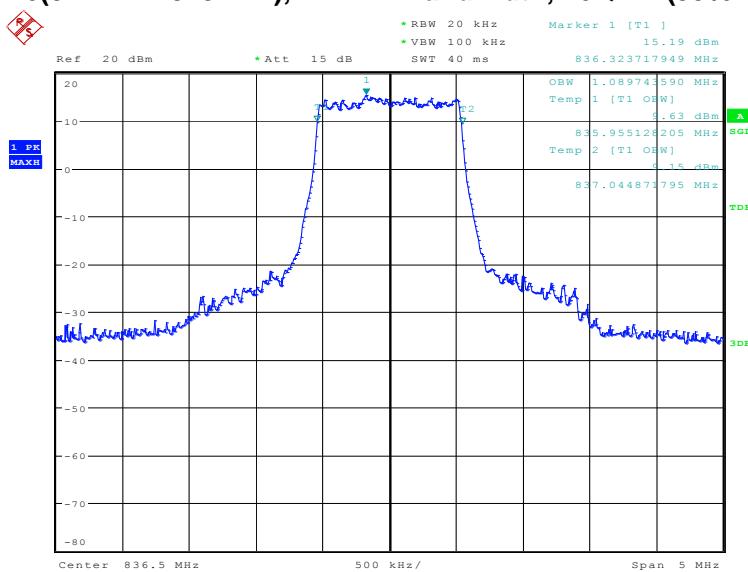


Date: 21.OCT.2019  12:33:23

## LTE band 26(824MHz~849MHz), 1.4MHz (99%)

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 836.5 | 1105.77 | 1089.74 |

## LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (99% BW)



Date: 21.OCT.2019  12:02:53
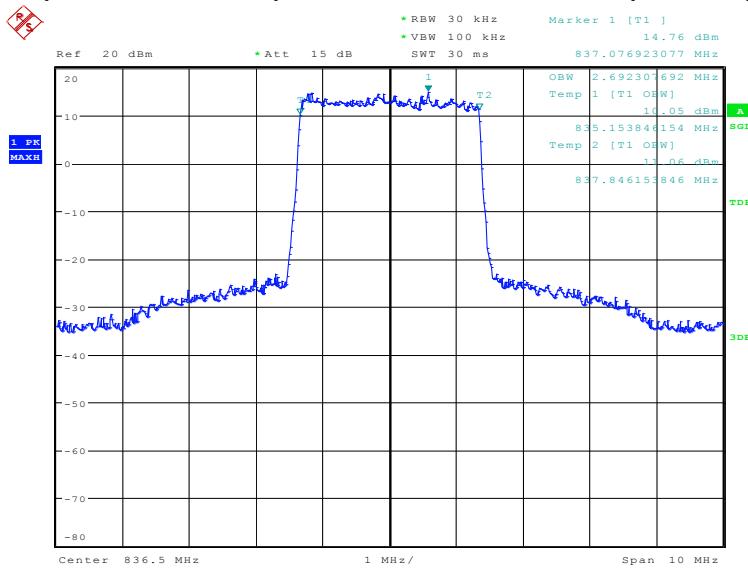
## LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (99% BW)



Date: 21.OCT.2019  12:04:18

## LTE band 26(824MHz~849MHz), 3MHz (99%)
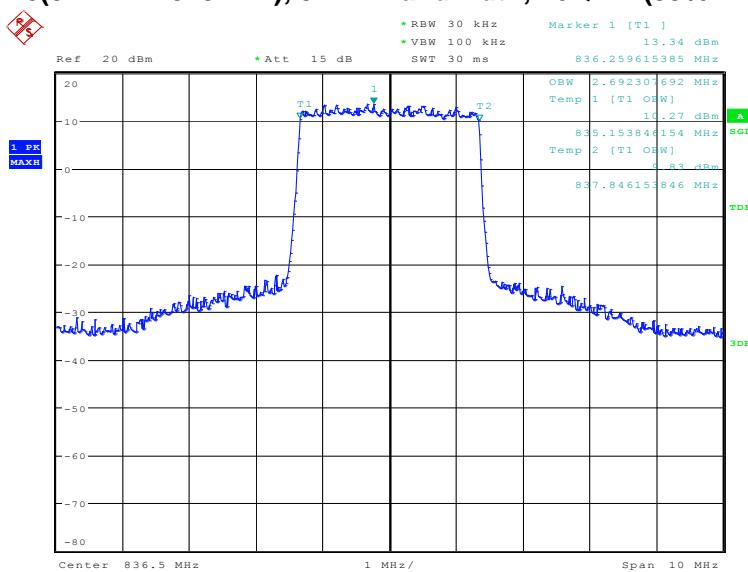
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 836.5 | 2692.31 | 2692.31 |

### LTE band 26(824MHz~849MHz), 3MHz Bandwidth, QPSK (99% BW)



Date: 21.OCT.2019  12:06:32
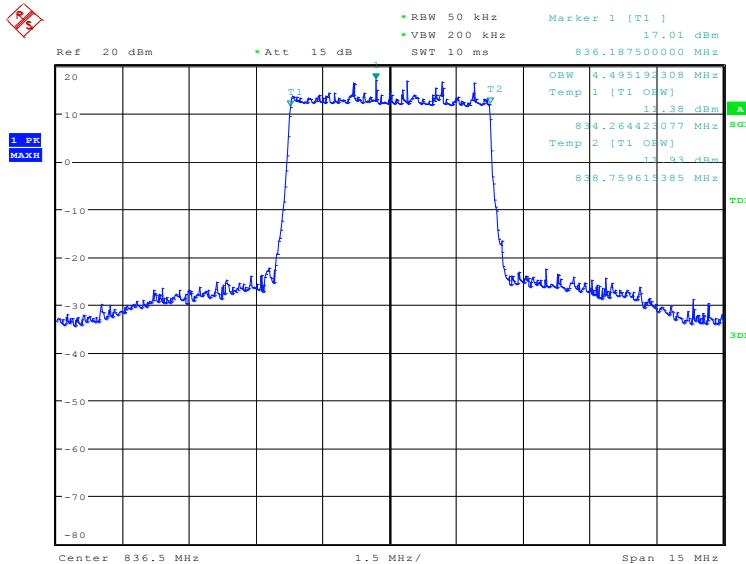
### LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (99% BW)
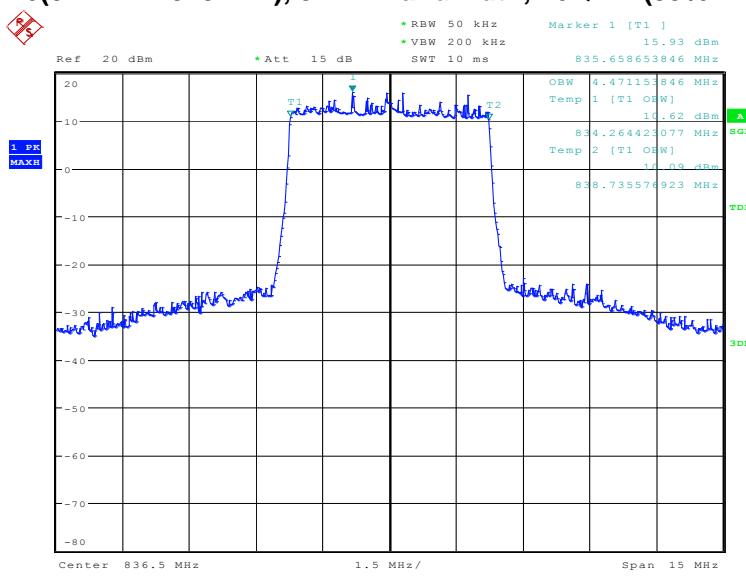


Date: 21.OCT.2019  12:07:57

**LTE band 26(824MHz~849MHz), 5MHz (99%)**

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

**LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (99% BW)**



Date: 21.OCT.2019  12:10:12
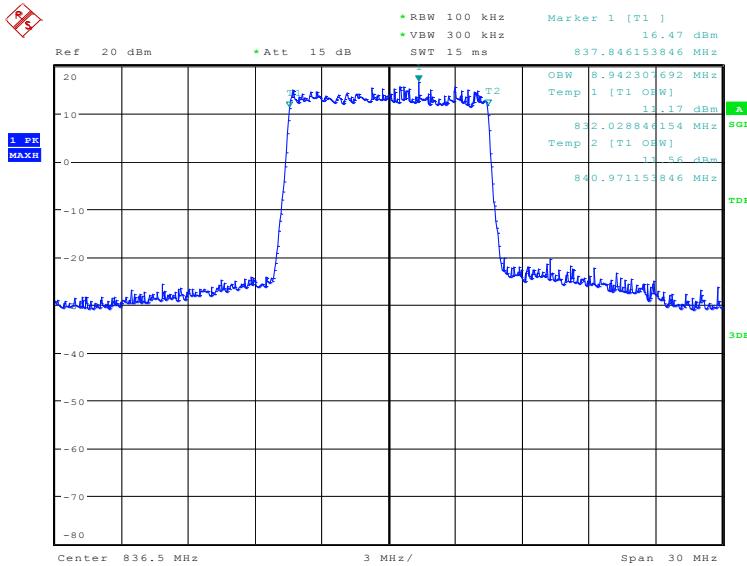
**LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (99% BW)**



Date: 21.OCT.2019  12:11:37

**LTE band 26(824MHz~849MHz), 10MHz (99%)**
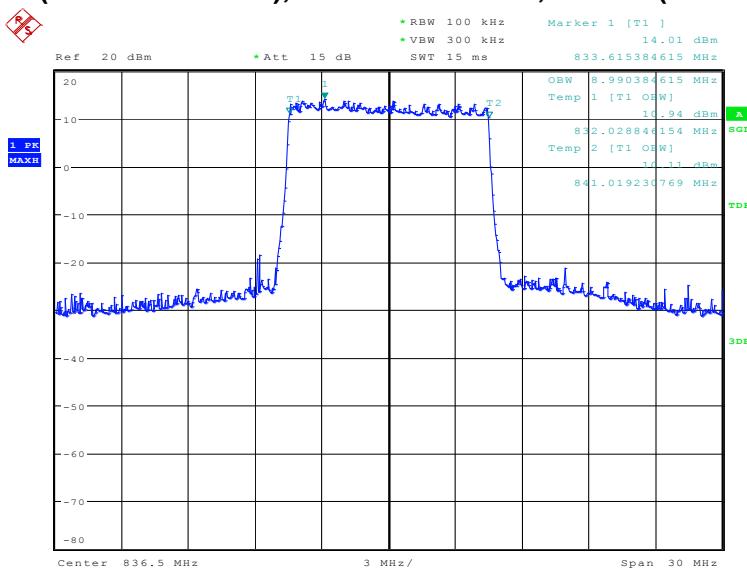
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 836.5 | 8942.31 | 8990.38 |

**LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (99% BW)**



Date: 21.OCT.2019  12:13:51

**LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (99% BW)**
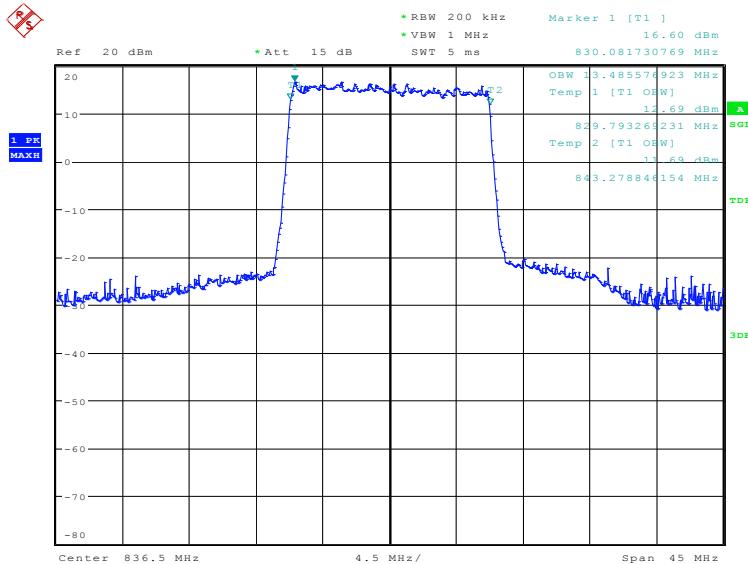


Date: 21.OCT.2019  12:15:16

**LTE band 26(824MHz~849MHz), 15MHz (99%)**
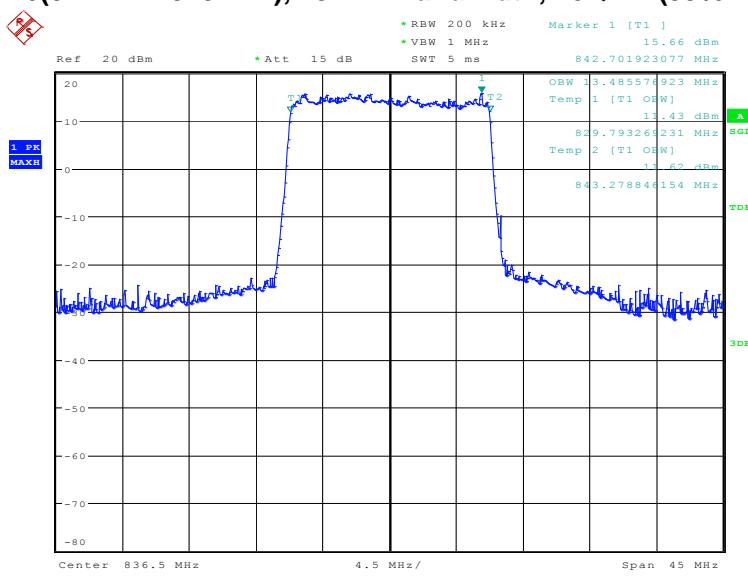
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 836.5 | 13485.58 | 13485.58 |

**LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (99% BW)**



Date: 21.OCT.2019  12:17:31

**LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (99% BW)**
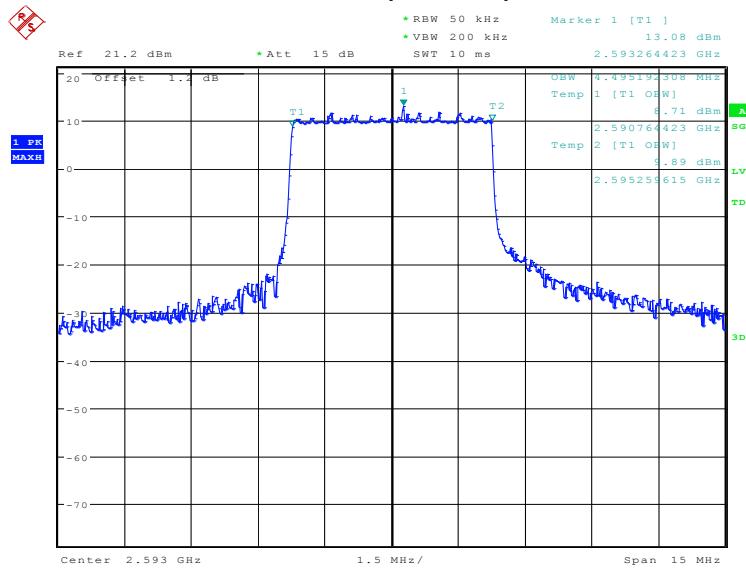


Date: 21.OCT.2019  12:18:56

## LTE band 41(PC2), 5MHz (99%)
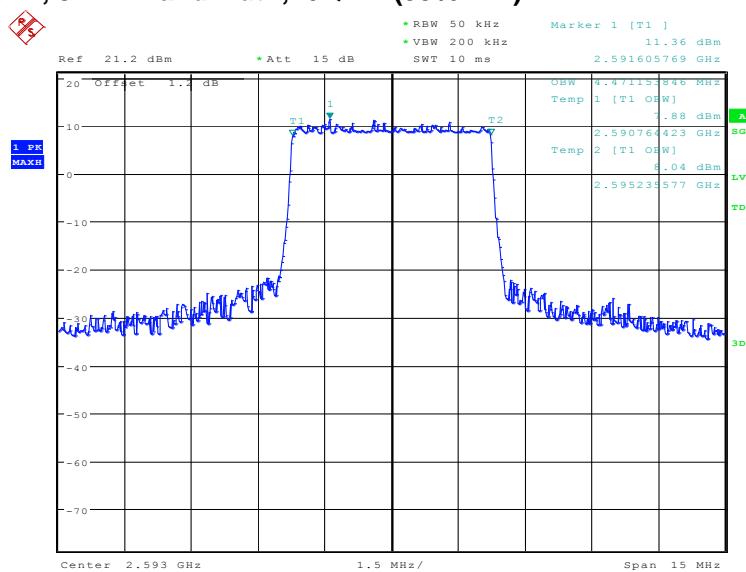
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|:---:|:---:|:---:|
| | QPSK | 16QAM |
| 2593.0 | 4495.19 | 4471.15 |

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



Date: 17.OCT.2019  22:46:54

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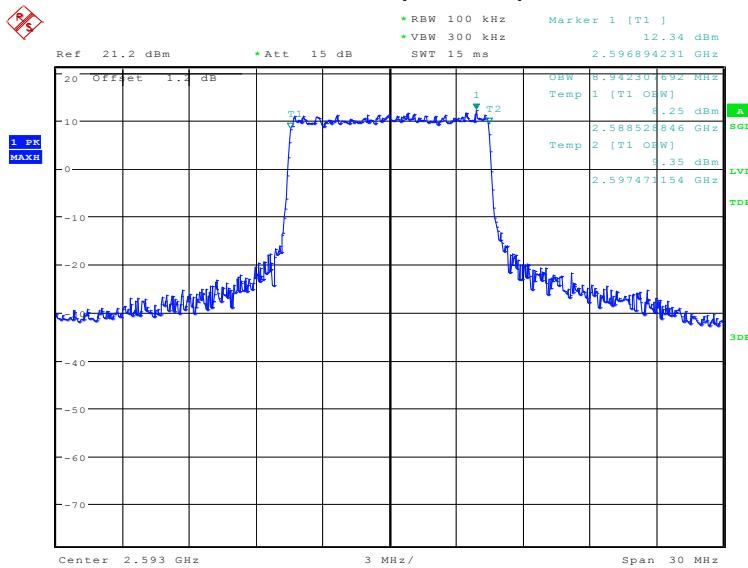


Date: 17.OCT.2019  22:48:18

**LTE band 41(PC2), 10MHz (99%)**
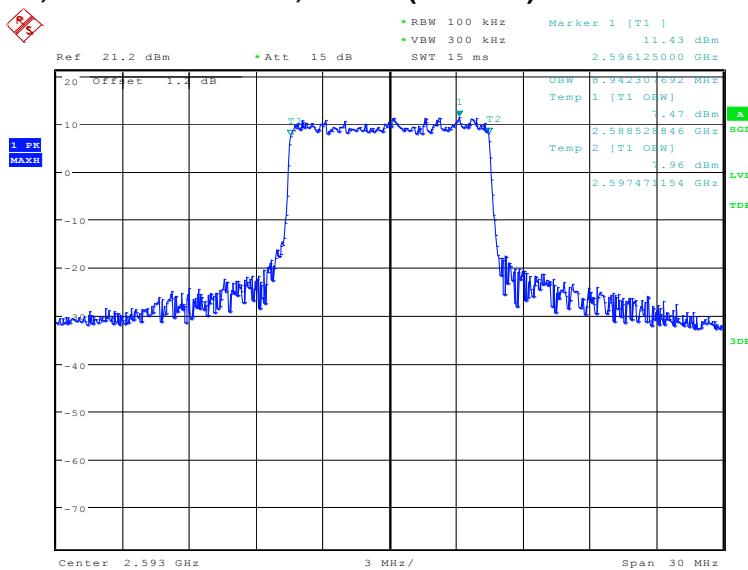
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|:---:|:---:|:---:|
| | QPSK | 16QAM |
| 2593.0 | 8942.31 | 8942.31 |

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



Date: 17.OCT.2019  22:49:45

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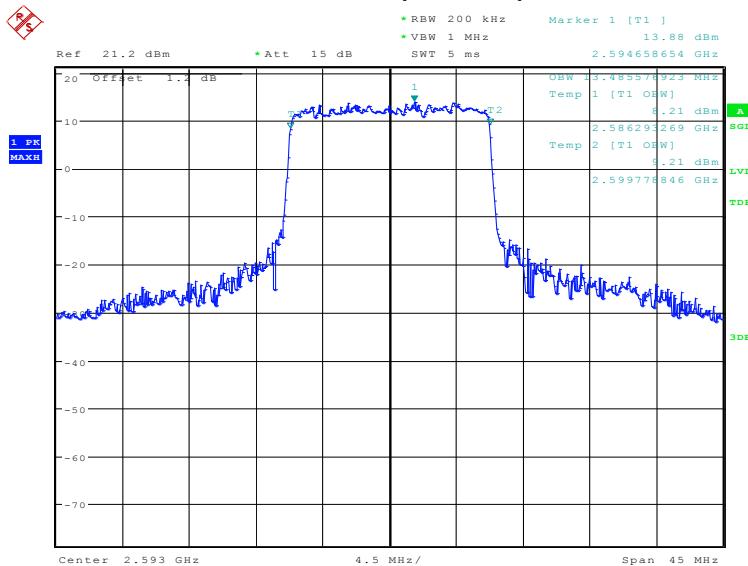


Date: 17.OCT.2019  22:51:10

**LTE band 41(PC2), 15MHz (99%)**
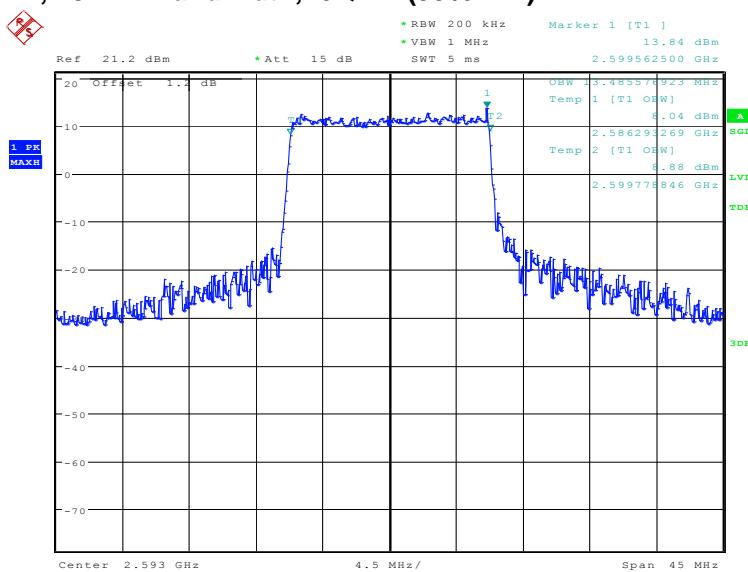
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 2593.0 | 13485.58 | 13485.58 |

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



Date: 17.OCT.2019  22:53:24

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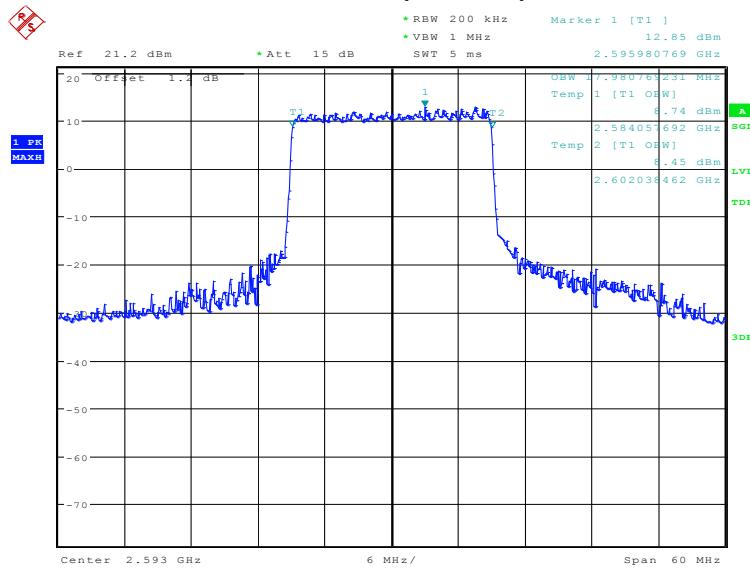


Date: 17.OCT.2019  22:54:49
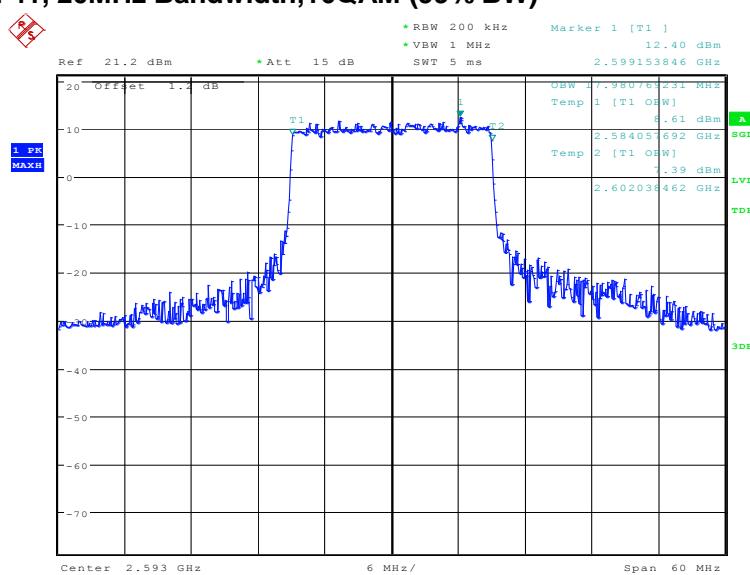
**LTE band 41(PC2), 20MHz (99%)**

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

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



Date: 17.OCT.2019  22:57:03

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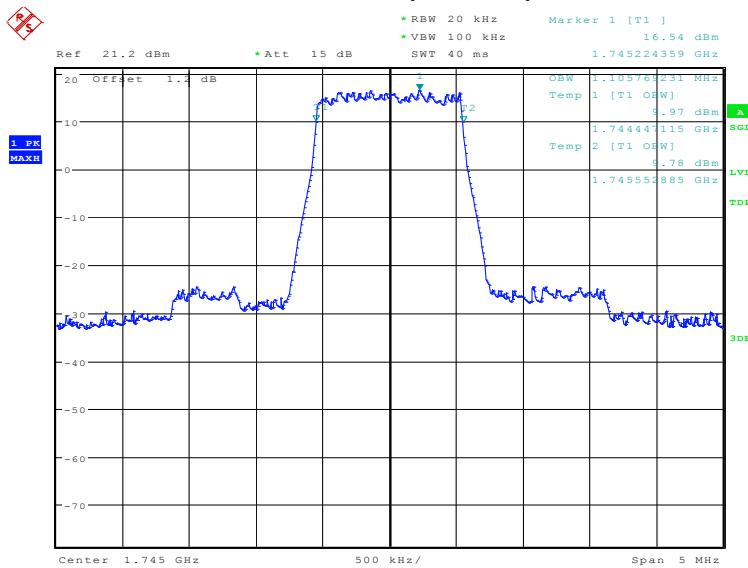


Date: 17.OCT.2019  22:58:28
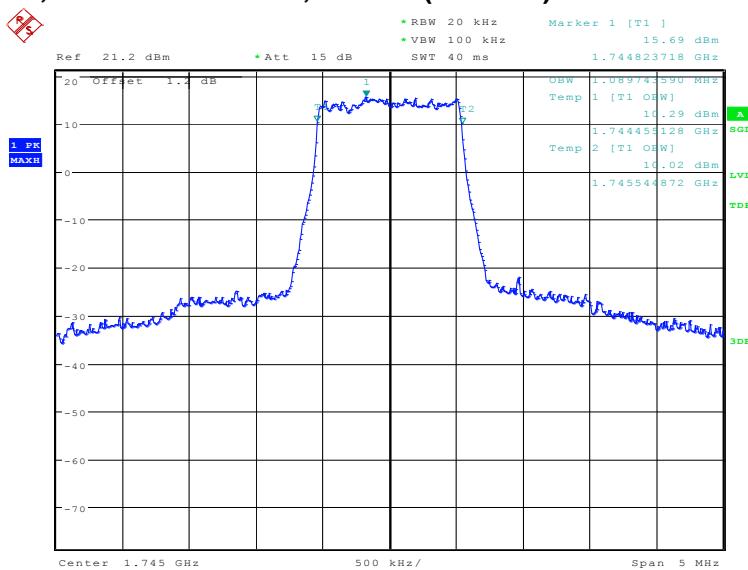
**LTE band 66, 1.4MHz (99%)**

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

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



Date: 17.OCT.2019  22:24:55
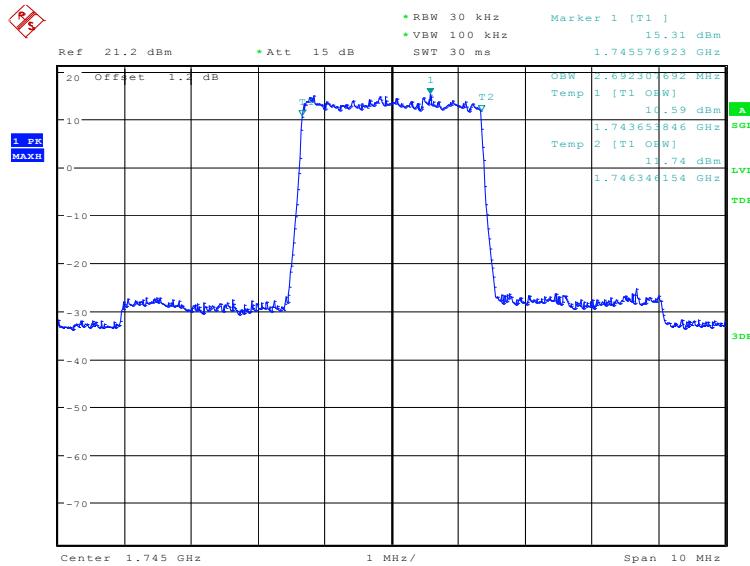
**LTE band 66, 1.4MHz Bandwidth, 16QAM (99% BW)**



Date: 17.OCT.2019  22:26:19

**LTE band 66, 3MHz (99%)**
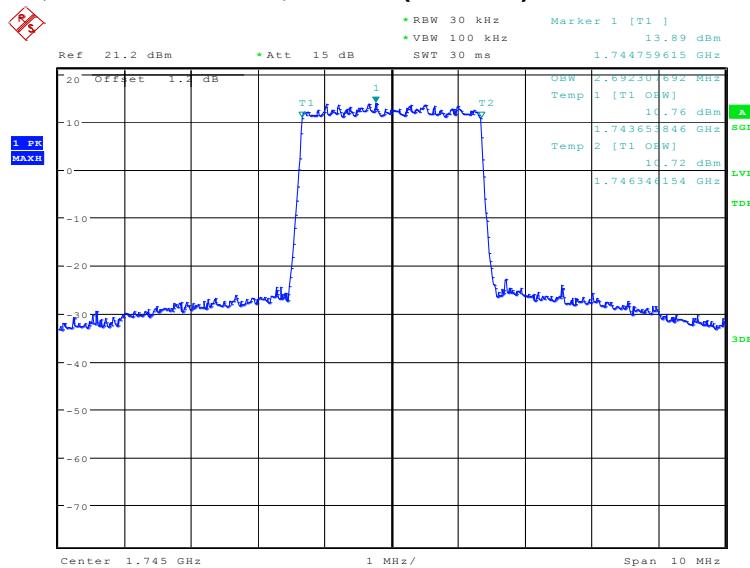
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| 1745.0 | QPSK | 16QAM |
| | 2692.31 | 2692.31 |

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



Date: 17.OCT.2019  22:28:33

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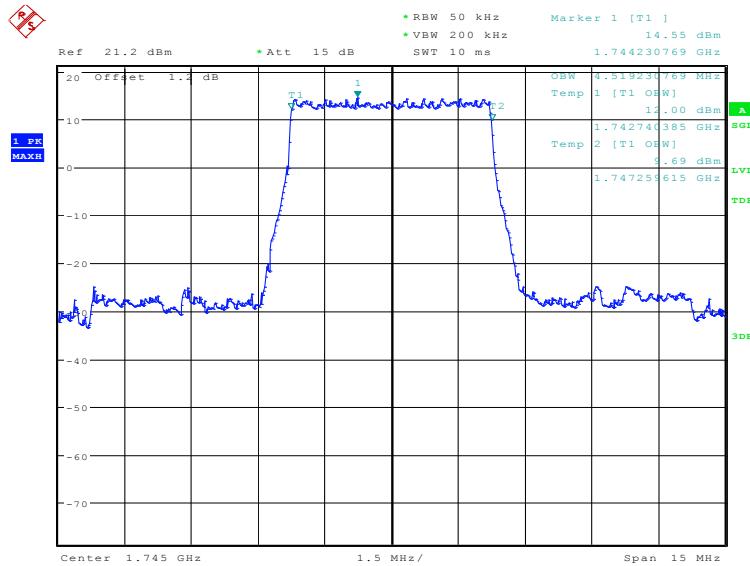


Date: 17.OCT.2019  22:29:58

## LTE band 66, 5MHz (99%)
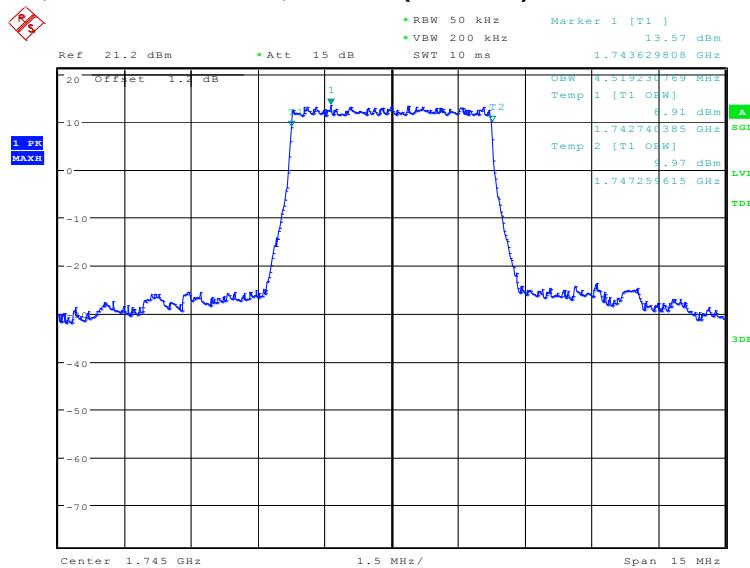
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1745.0 | 4519.23 | 4519.23 |

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



Date: 17.OCT.2019  22:32:12

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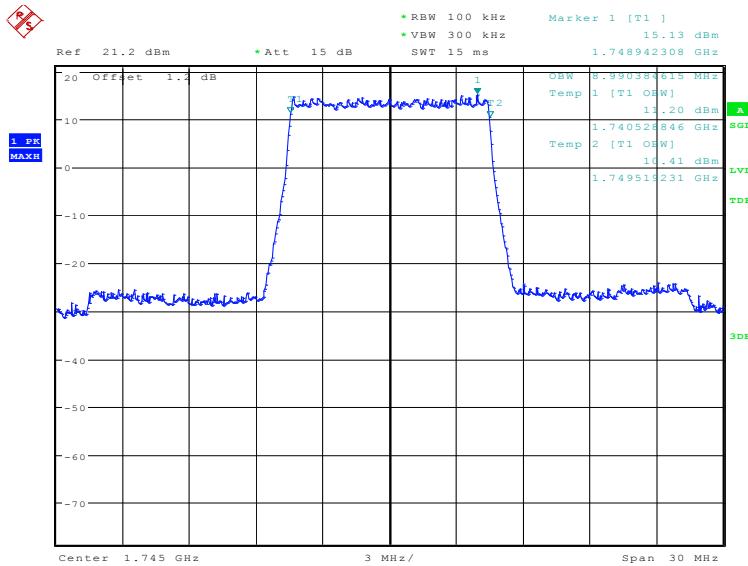


Date: 17.OCT.2019  22:33:37

## LTE band 66, 10MHz (99%)
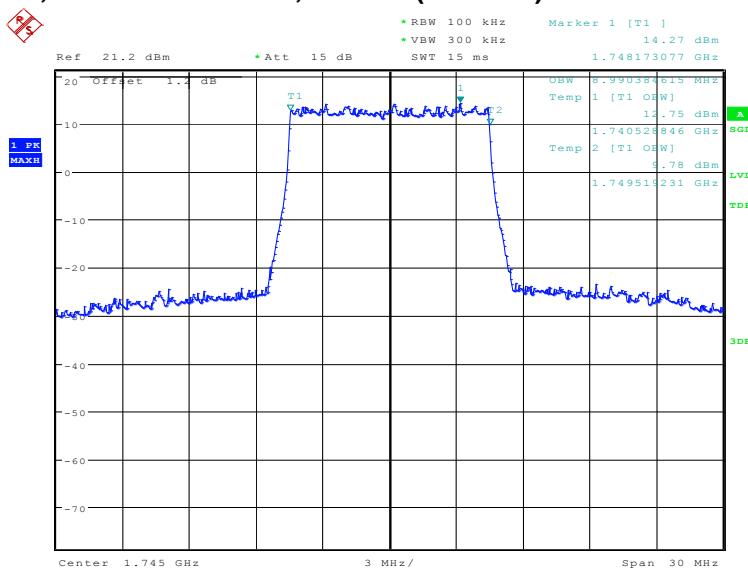
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1745.0 | | |
| | 8990.38 | 8990.38 |

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



Date: 17.OCT.2019  22:35:50

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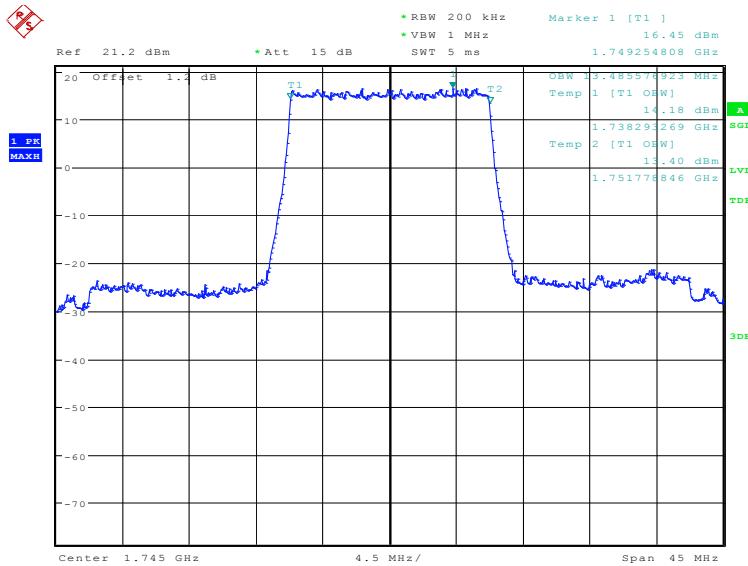


Date: 17.OCT.2019  22:37:15

**LTE band 66, 15MHz (99%)**
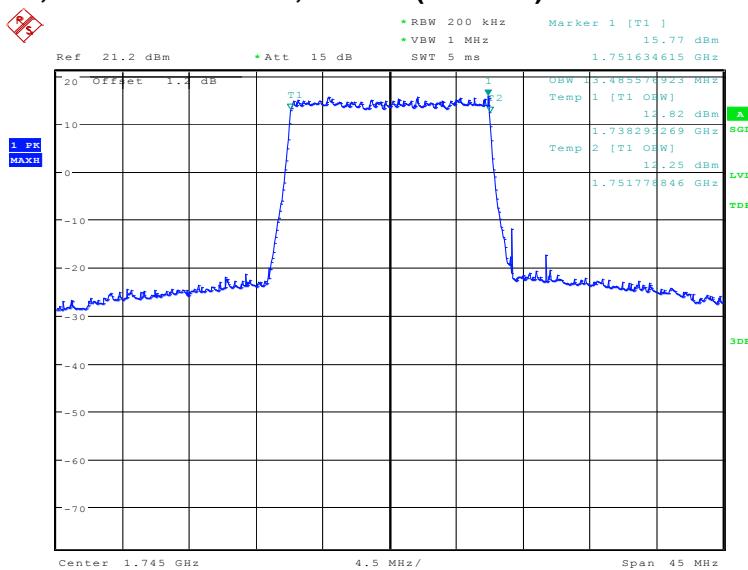
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 13485.58 | 13485.58 |

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



Date: 17.OCT.2019  22:39:29

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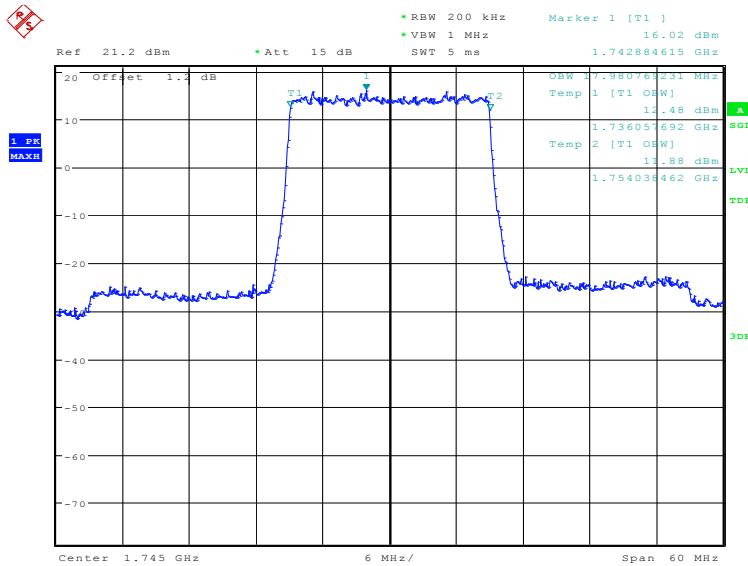


Date: 17.OCT.2019  22:40:54

## LTE band 66, 20MHz (99%)
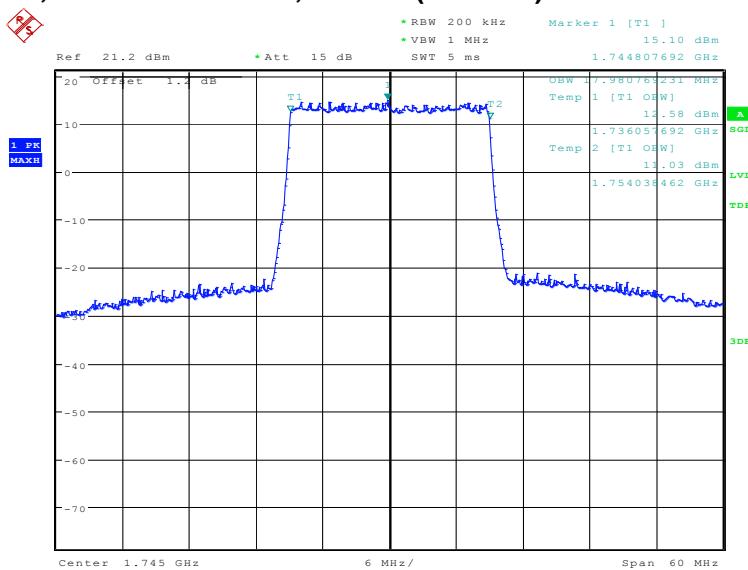
| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 17980.77 | 17980.77 |

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



Date: 17.OCT.2019  22:43:08

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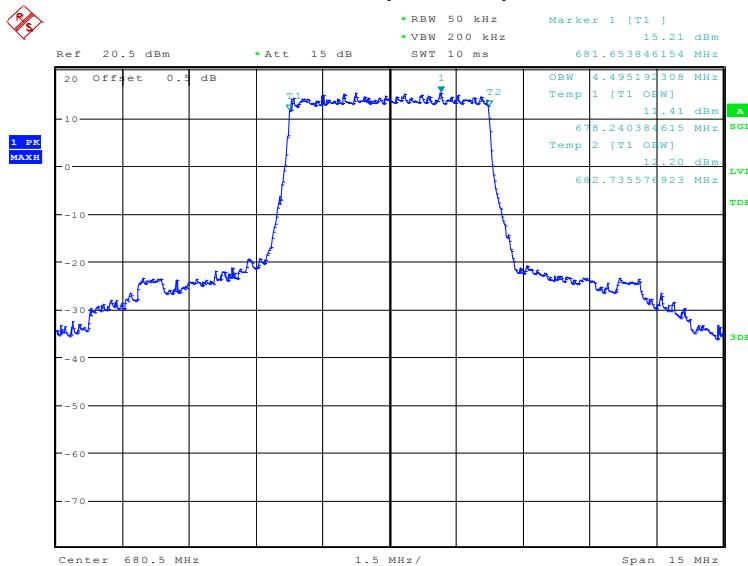


Date: 17.OCT.2019  22:44:33
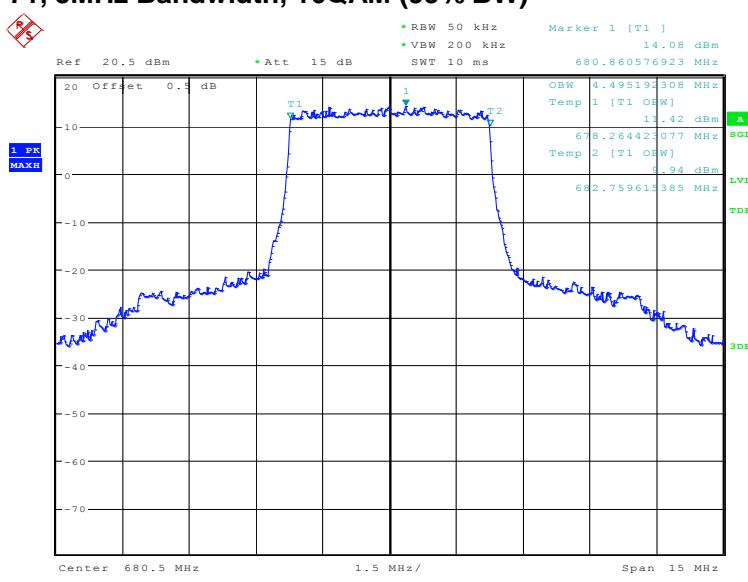
**LTE band 71, 5MHz (99%)**

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 680.5 | 4495.19 | 4495.19 |

**LTE band 71, 5MHz Bandwidth, QPSK (99% BW)**



Date: 21.OCT.2019  12:35:45

**LTE band 71, 5MHz Bandwidth, 16QAM (99% BW)**
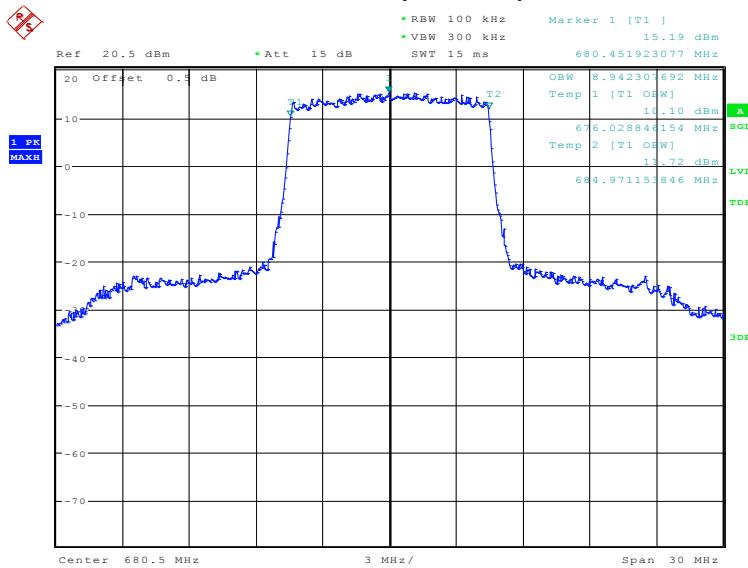


Date: 21.OCT.2019  12:37:10
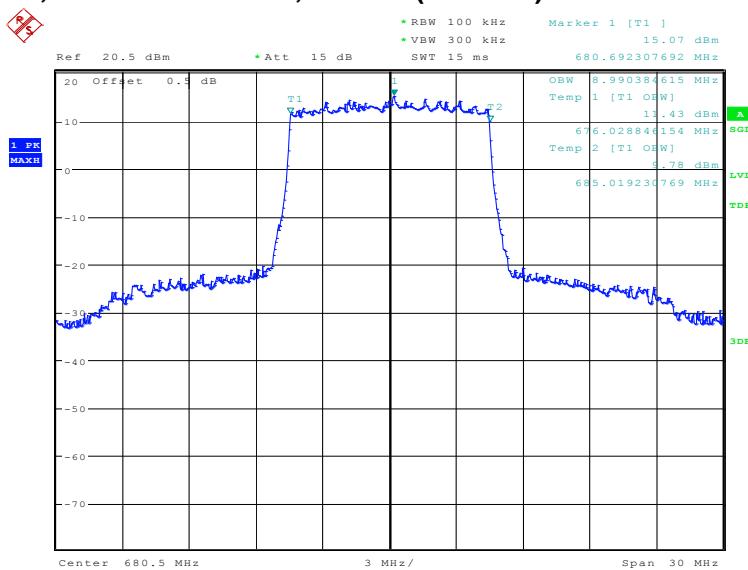
**LTE band 71, 10MHz (99%)**

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 680.5 | 8942.31 | 8990.38 |

**LTE band 71, 10MHz Bandwidth, QPSK (99% BW)**



Date: 21.OCT.2019  12:39:25

**LTE band 71, 10MHz Bandwidth, 16QAM (99% BW)**
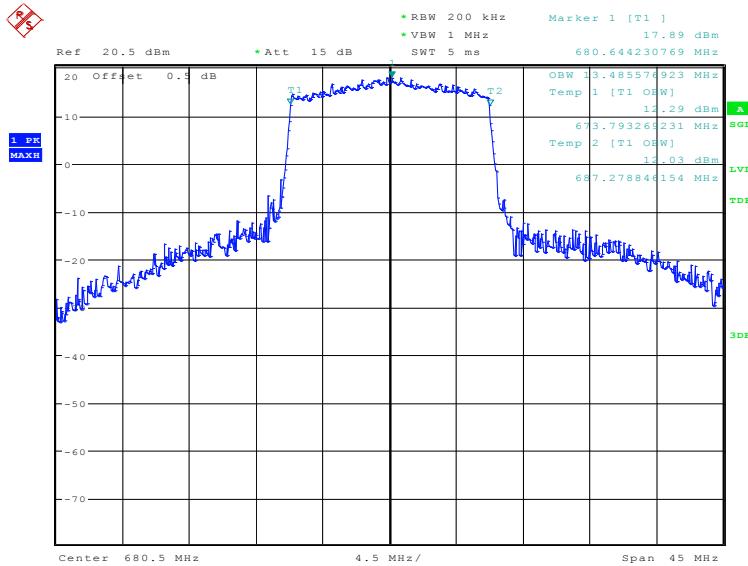


Date: 21.OCT.2019  12:40:50
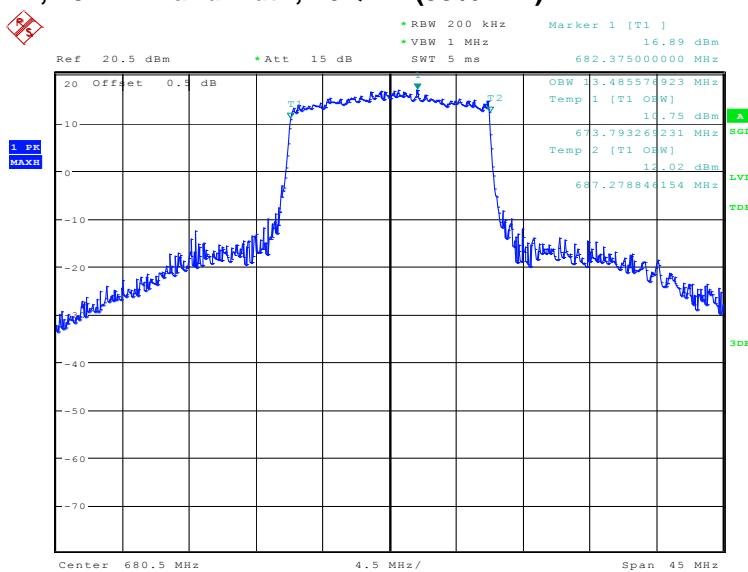
**LTE band 71, 15MHz (99%)**

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|:---:|:---:|:---:|
| | QPSK | 16QAM |
| 680.5 | 13485.58 | 13485.58 |

**LTE band 71, 15MHz Bandwidth, QPSK (99% BW)**



Date: 21.OCT.2019  12:43:04

**LTE band 71, 15MHz Bandwidth, 16QAM (99% BW)**



Date: 21.OCT.2019  12:44:29
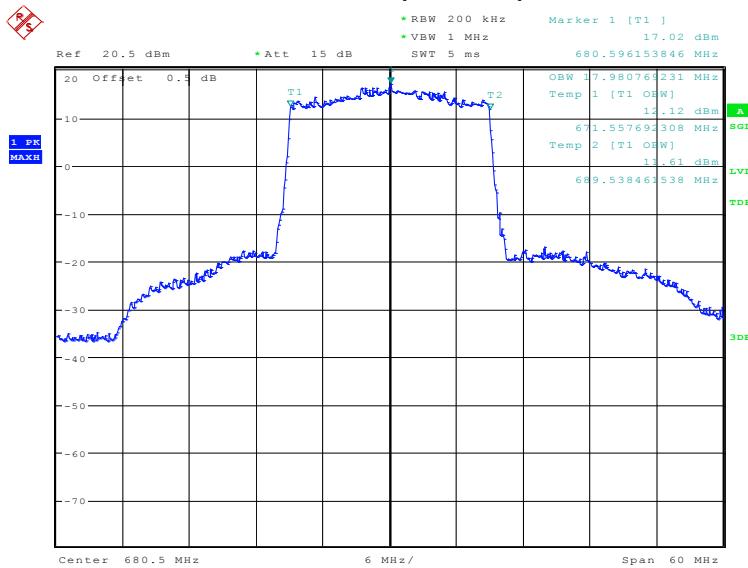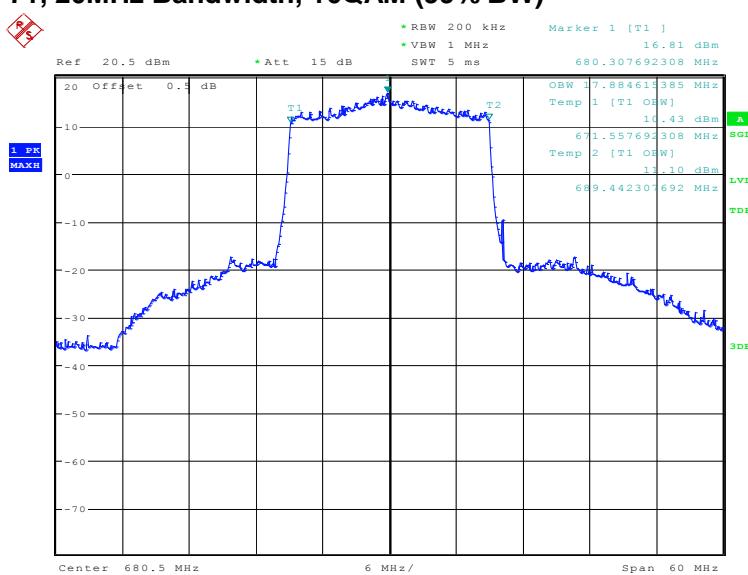
## LTE band 71, 20MHz (99%)

| Frequency(MHz) | Occupied Bandwidth (99%) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 680.5 | 17980.77 | 17884.62 |

**LTE band 71, 20MHz Bandwidth, QPSK (99% BW)**



Date: 21.OCT.2019  12:46:44

**LTE band 71, 20MHz Bandwidth, 16QAM (99% BW)**



Date: 21.OCT.2019  12:48:09

## A.5 EMISSION BANDWIDTH

**A.5.1Emission Bandwidth Results**
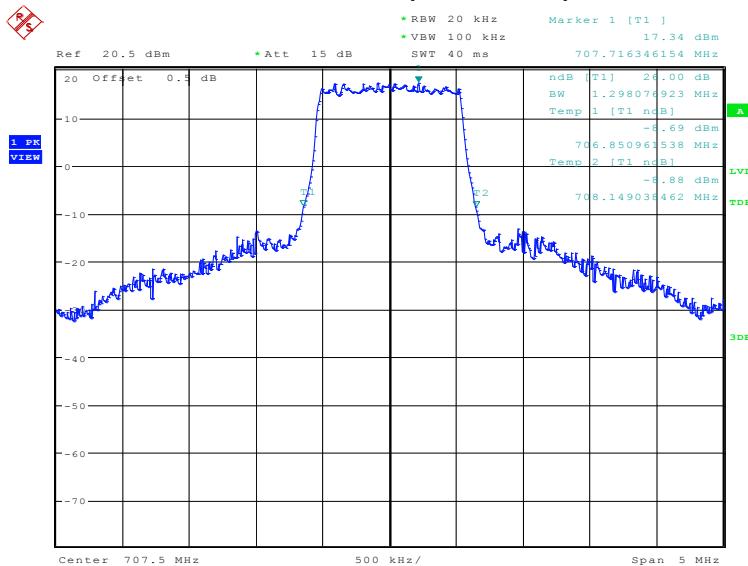
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The measurement method is from ANSI C63.26:
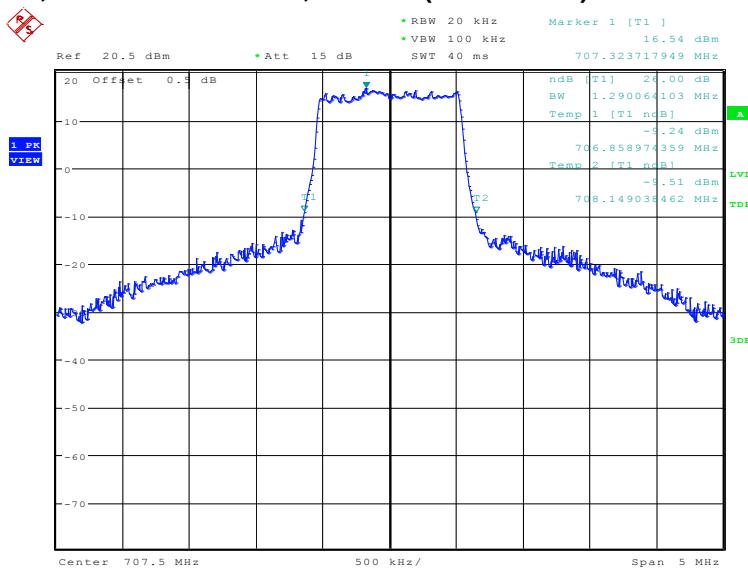
a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.

b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × 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 12, 1.4MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 707.5 | 1298.08 | 1290.06 |

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



Date: 21.OCT.2019  12:50:09
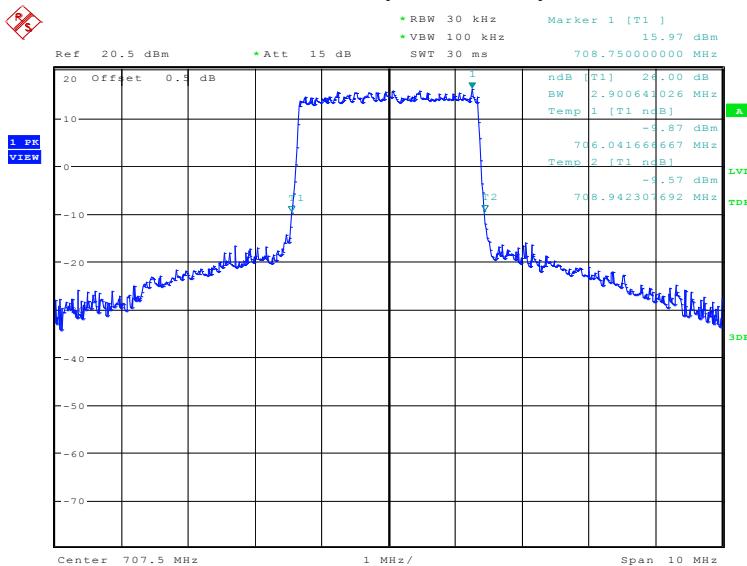
**LTE band 12, 1.4MHz Bandwidth, 16QAM (-26dBc BW)**



Date: 21.OCT.2019  12:51:35

**LTE band 12, 3MHz (-26dBc)**
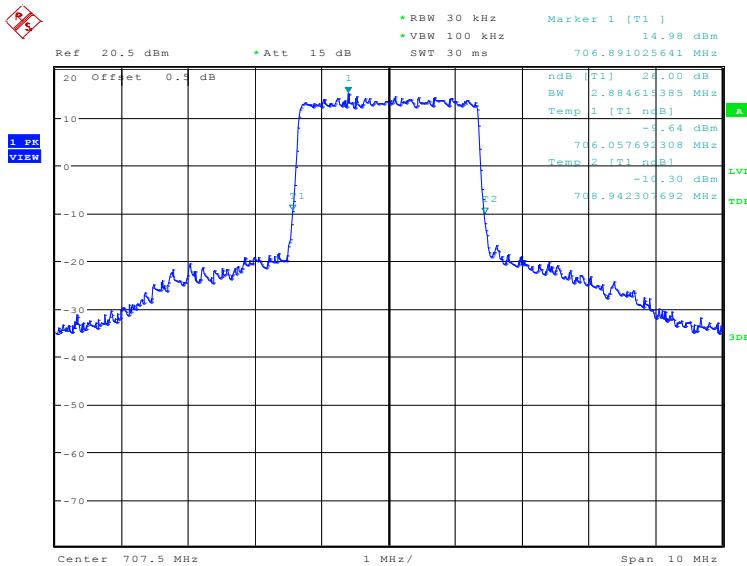
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 707.5 | 2900.64 | 2884.62 |

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



Date: 21.OCT.2019  12:53:49

**LTE band 12, 3MHz Bandwidth, 16QAM (-26dBc BW)**
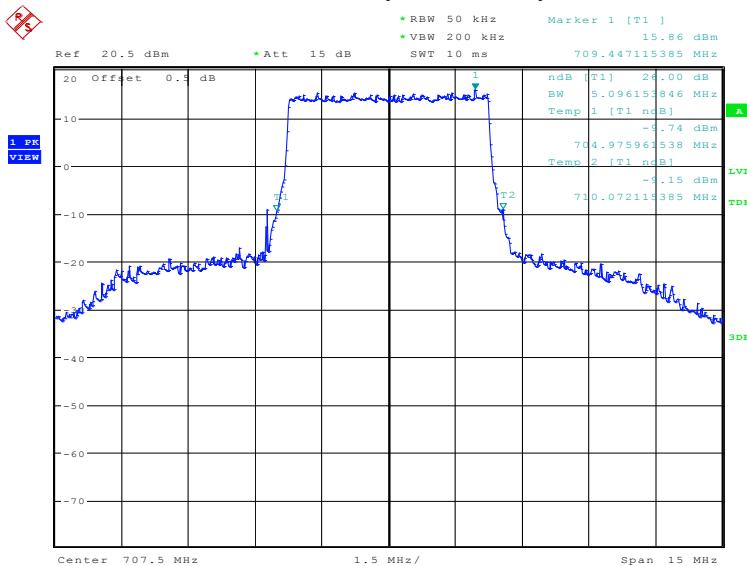


Date: 21.OCT.2019  12:55:15

**LTE band 12, 5MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 707.5 | 5096.15 | 5072.12 |

**LTE band 12, 5MHz Bandwidth, QPSK (-26dBc BW)**



Date: 21.OCT.2019  12:57:29

**LTE band 12, 5MHz Bandwidth, 16QAM (-26dBc BW)**
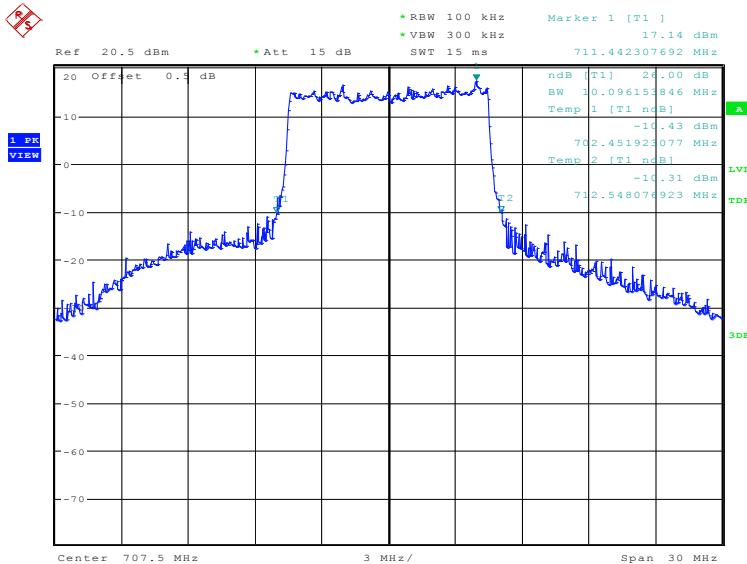


Date: 21.OCT.2019  12:58:55

**LTE band 12, 10MHz (-26dBc)**
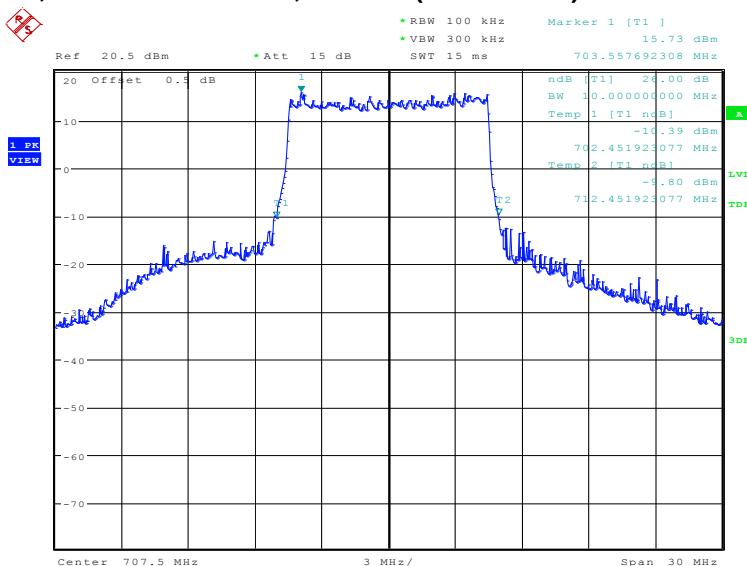
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 707.5 | 10096.15 | 10000.00 |

**LTE band 12, 10MHz Bandwidth, QPSK (-26dBc BW)**



Date: 21.OCT.2019  13:01:09
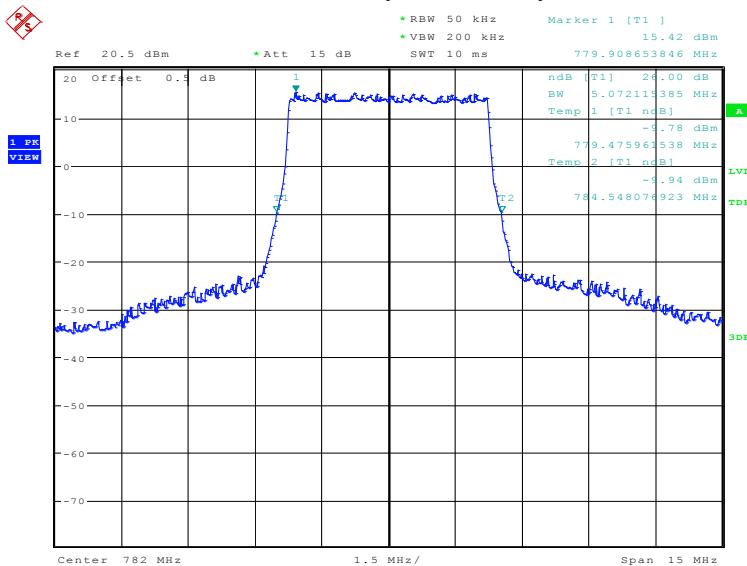
**LTE band 12, 10MHz Bandwidth, 16QAM (-26dBc BW)**
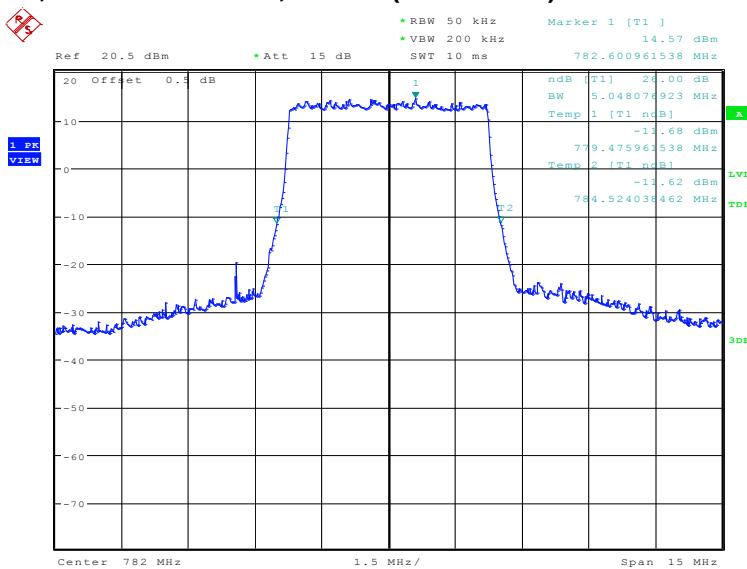


Date: 21.OCT.2019  13:02:35

**LTE band 13, 5MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 782.0 | 5072.12 | 5048.08 |

**LTE band 13, 5MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019  23:00:28
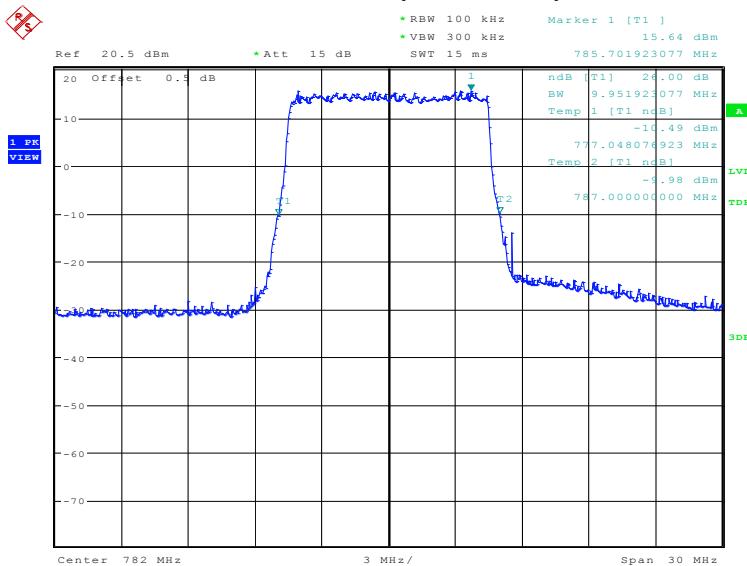
**LTE band 13, 5MHz Bandwidth,16QAM (-26dBc BW)**



Date: 17.OCT.2019  23:01:53

**LTE band 13, 10MHz (-26dBc)**
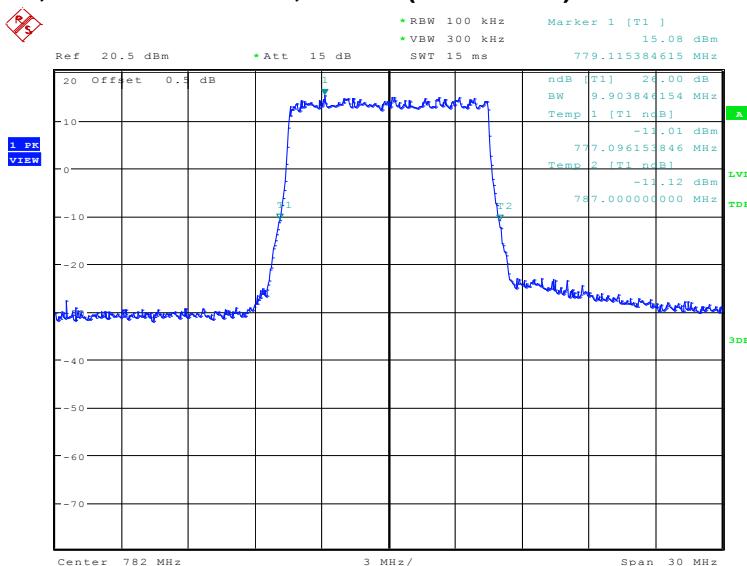
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 782.0 | 9951.92 | 9903.85 |

**LTE band 13, 10MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019  23:04:07
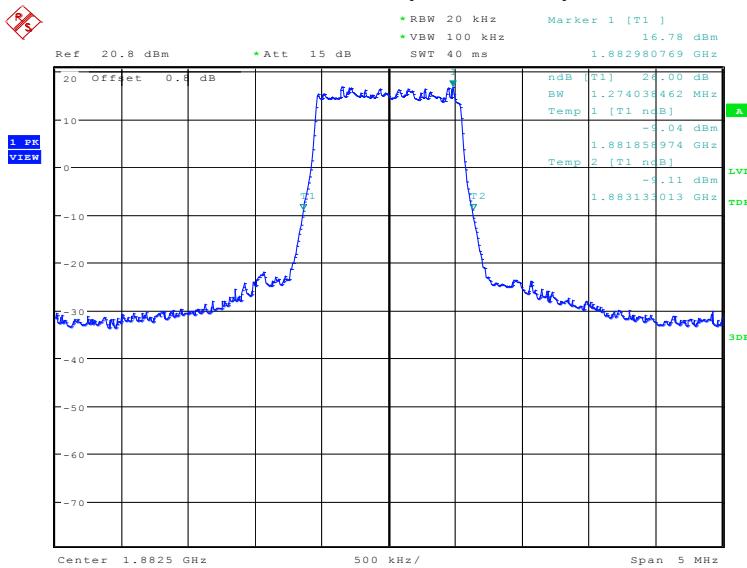
**LTE band 13, 10MHz Bandwidth,16QAM (-26dBc BW)**
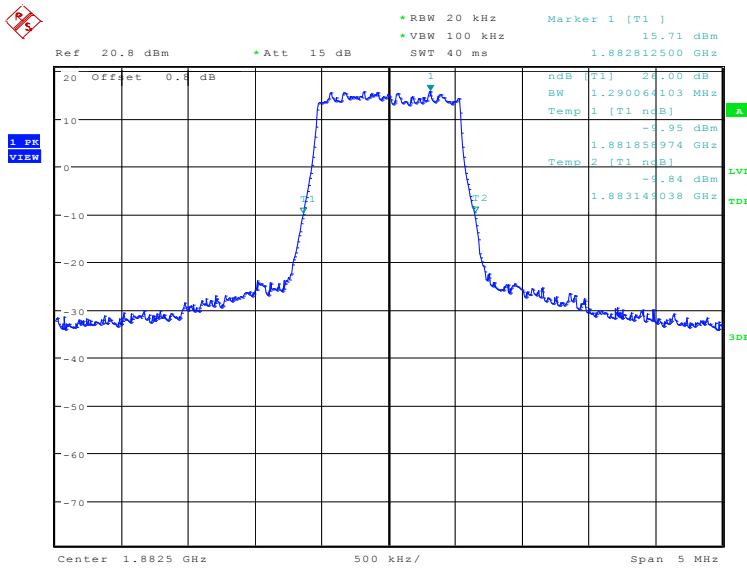


Date: 17.OCT.2019  23:05:32

**LTE band 25, 1.4MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|----------------|------|------|
| | QPSK | 16QAM |
| 1882.5 | 1274.04 | 1290.06 |

**LTE band 25, 1.4MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019 23:07:48
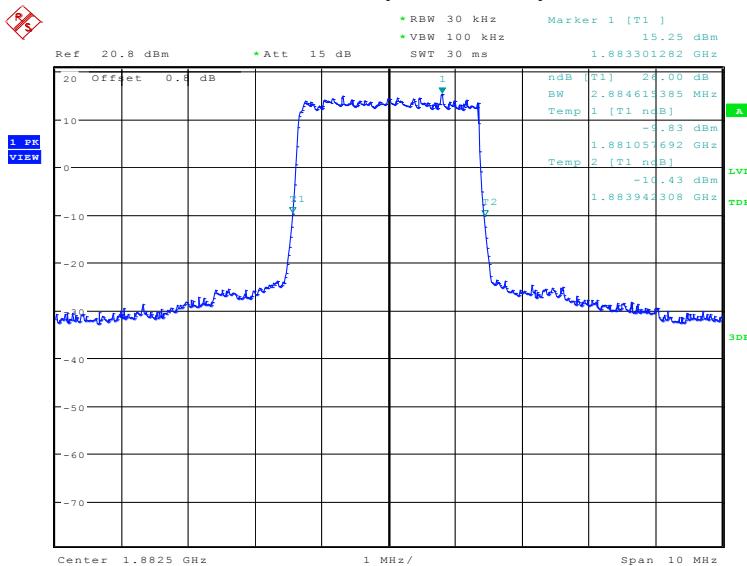
**LTE band 25, 1.4MHz Bandwidth, 16QAM (-26dBc BW)**



Date: 17.OCT.2019 23:09:13

**LTE band 25, 3MHz (-26dBc)**
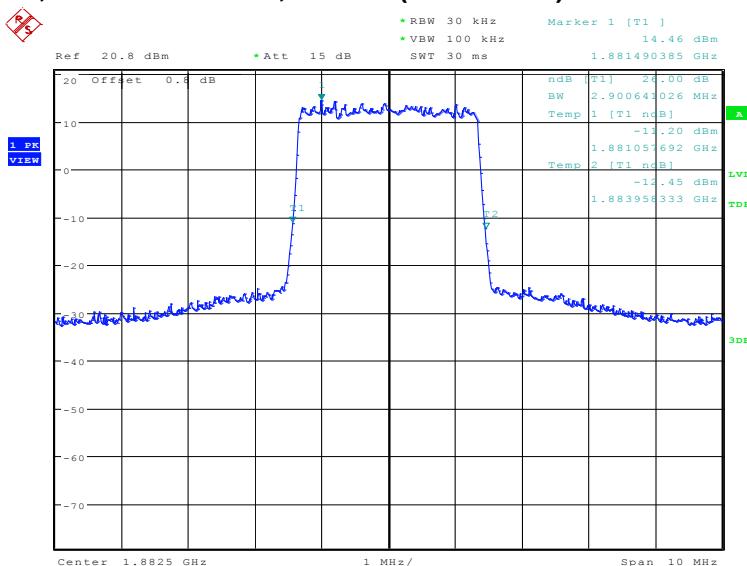
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1882.5 | 2884.62 | 2900.64 |

**LTE band 25, 3MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019  23:11:27

**LTE band 25, 3MHz Bandwidth, 16QAM (-26dBc BW)**
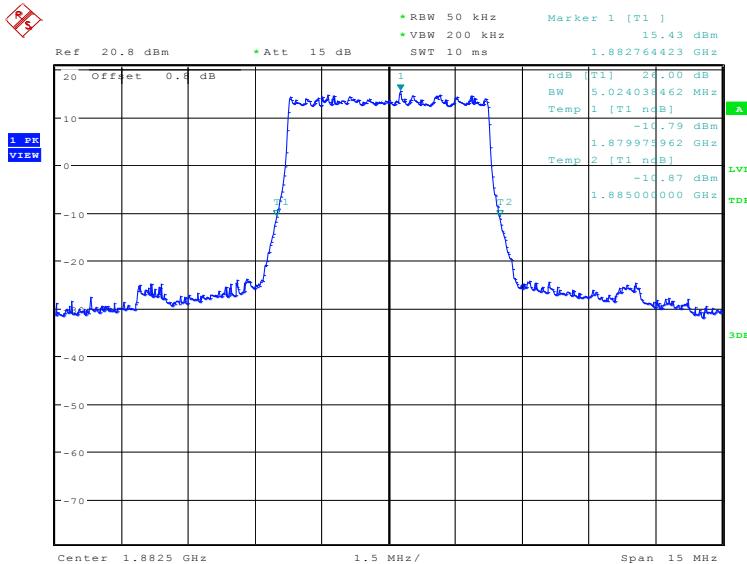


Date: 17.OCT.2019  23:12:52

**LTE band 25, 5MHz (-26dBc)**
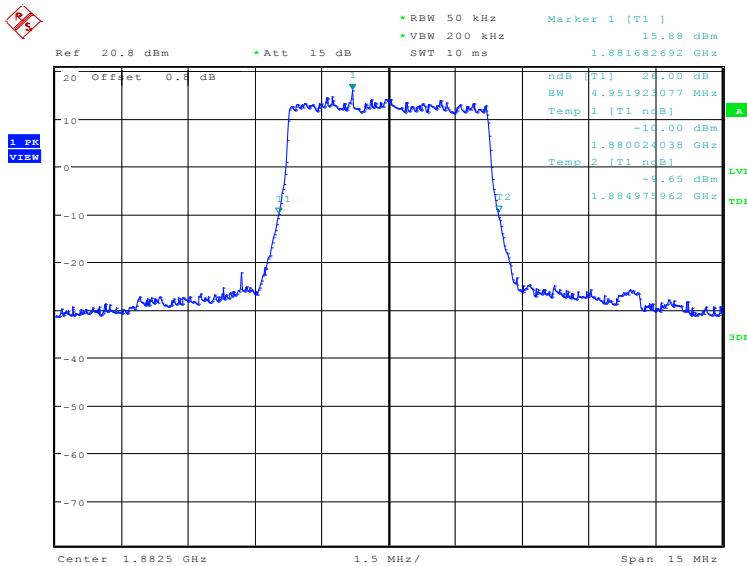
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1882.5 | 5024.04 | 4951.92 |

**LTE band 25, 5MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019  23:15:07

**LTE band 25, 5MHz Bandwidth, 16QAM (-26dBc BW)**
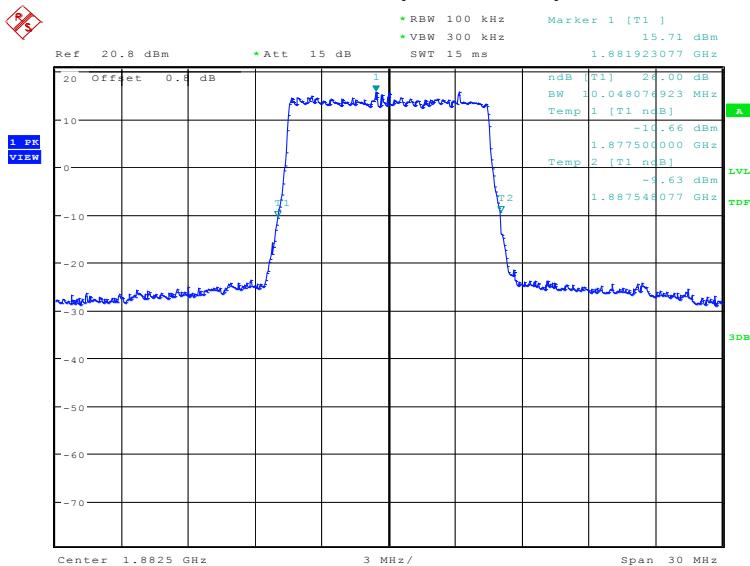


Date: 17.OCT.2019  23:16:32

**LTE band 25, 10MHz (-26dBc)**
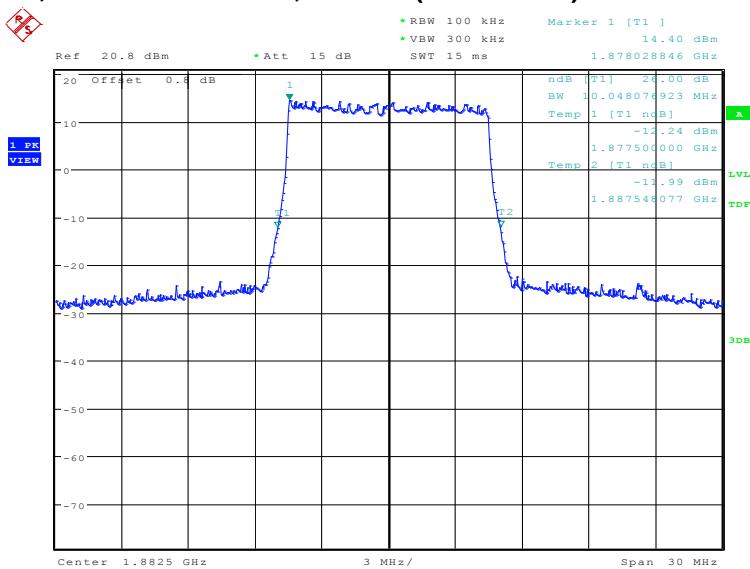
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1882.5 | 10048.08 | 10048.08 |

**LTE band 25, 10MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019  23:18:46
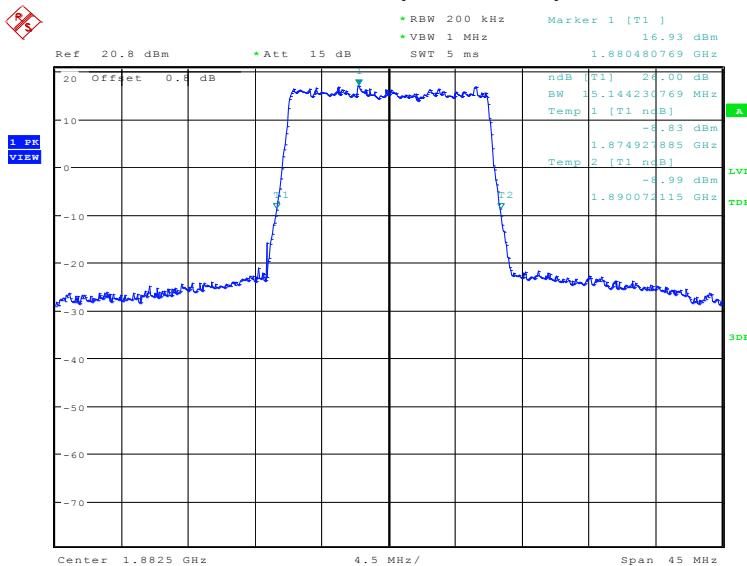
**LTE band 25, 10MHz Bandwidth, 16QAM (-26dBc BW)**
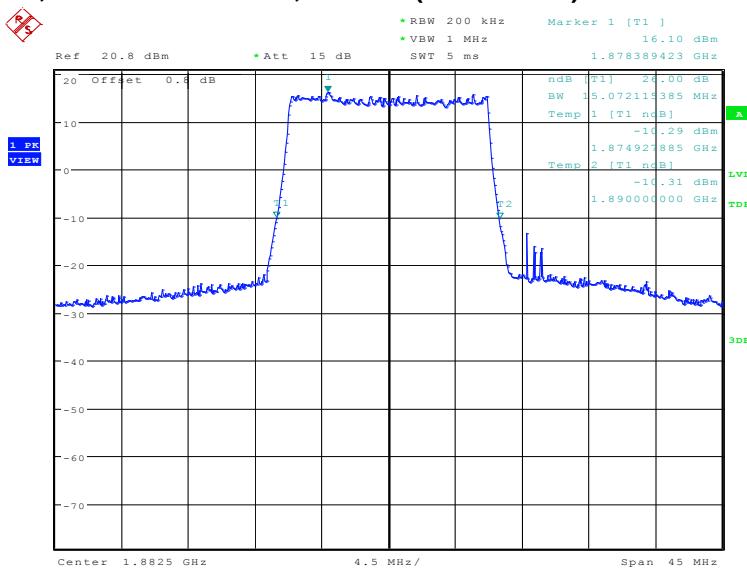


Date: 17.OCT.2019  23:20:11

**LTE band 25, 15MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1882.5 | 15144.23 | 15072.12 |

**LTE band 25, 15MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019  23:22:26
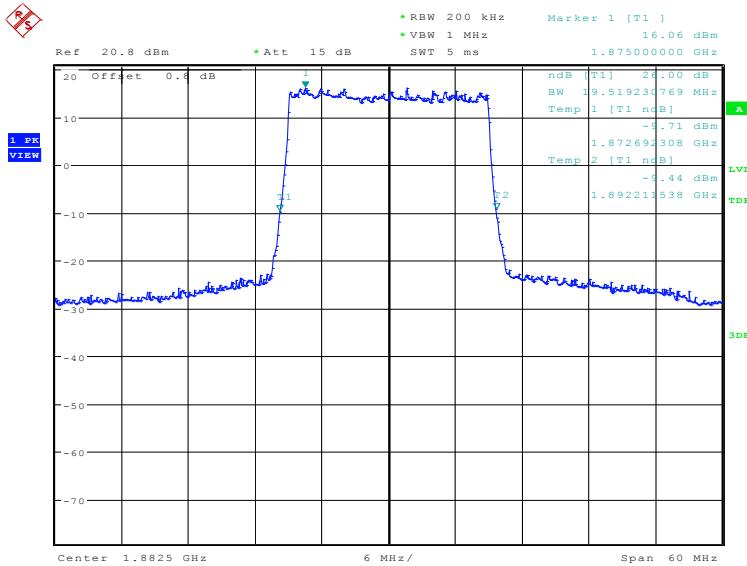
**LTE band 25, 15MHz Bandwidth, 16QAM (-26dBc BW)**



Date: 17.OCT.2019  23:23:51

## LTE band 25, 20MHz (-26dBc)
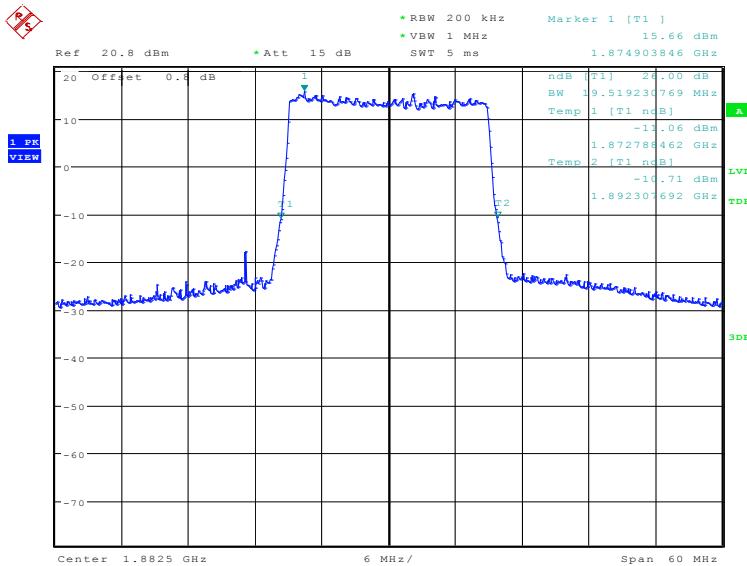
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1882.5 | 19519.23 | 19519.23 |

## LTE band 25, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 17.OCT.2019  23:26:05

## LTE band 25, 20MHz Bandwidth, 16QAM (-26dBc BW)
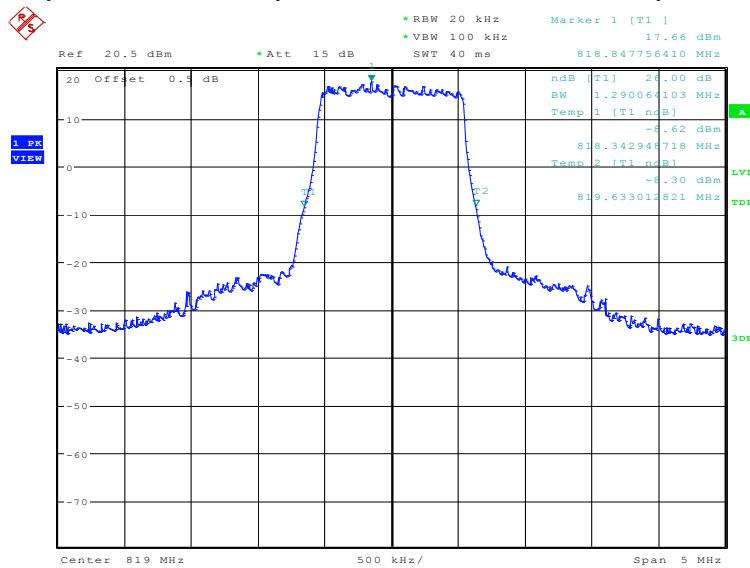


Date: 17.OCT.2019  23:27:31

## LTE band 26(814MHz~824MHz), 1.4MHz (-26dBc)
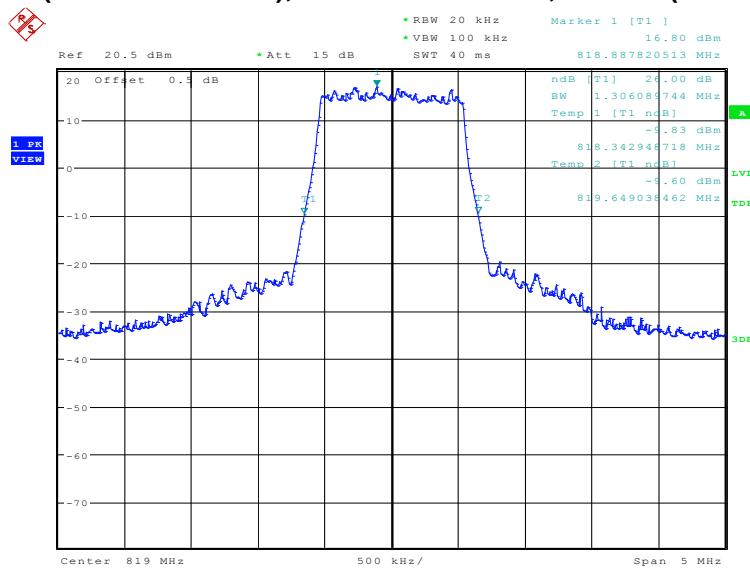
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 819.0 | 1290.06 | 1306.09 |

## LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.OCT.2019  13:22:23
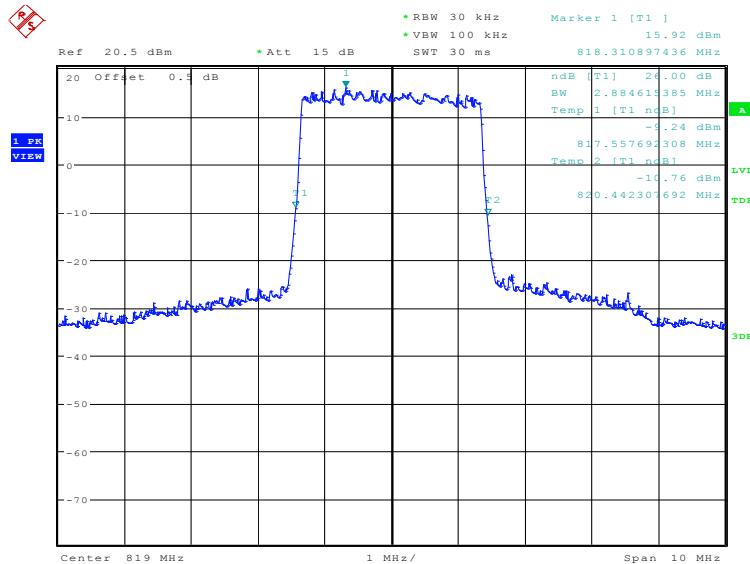
## LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)
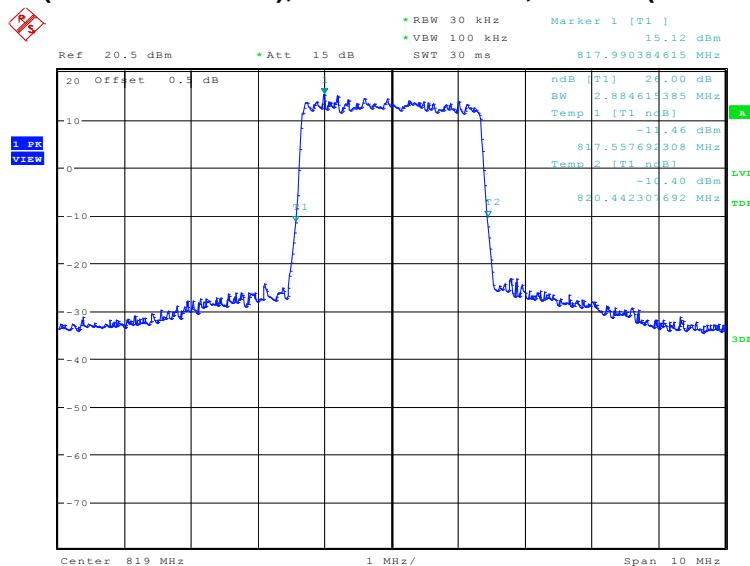


Date: 21.OCT.2019  13:23:49

## LTE band 26(814MHz~824MHz), 3MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 819.0 | 2884.62 | 2884.62 |

## LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (-26dBc BW)
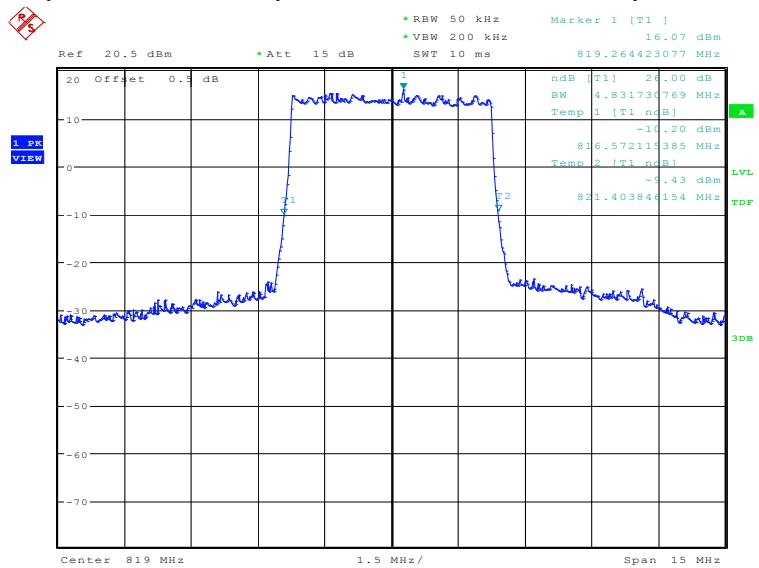


Date: 21.OCT.2019  13:26:04

## LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)
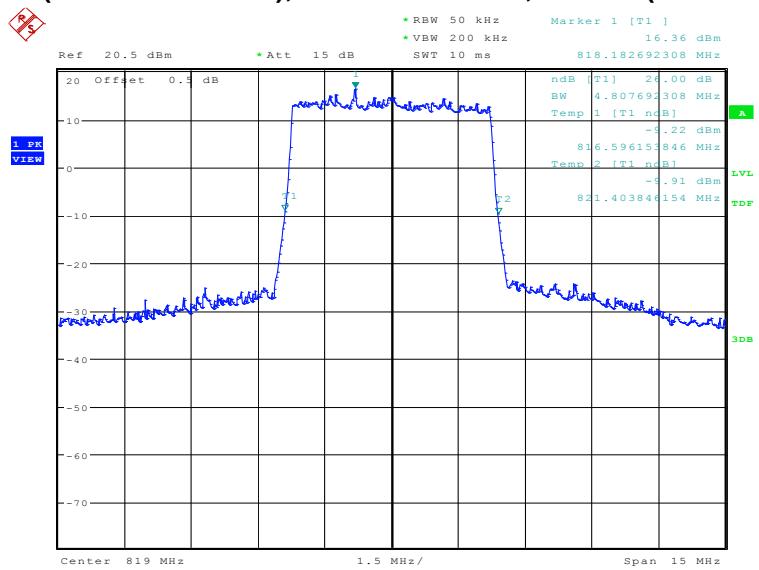


Date: 21.OCT.2019  13:27:29

## LTE band 26(814MHz~824MHz), 5MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 819.0 | 4831.73 | 4807.69 |

## LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (-26dBc BW)
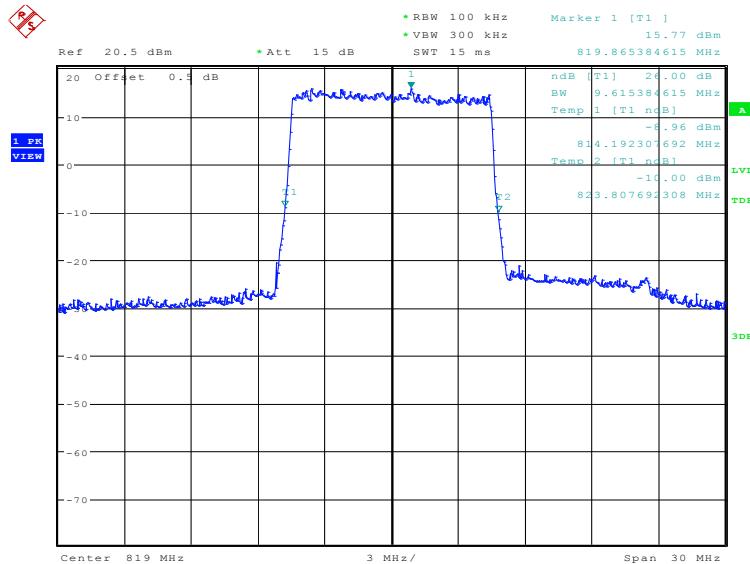


Date: 21.OCT.2019  13:29:44

## LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)
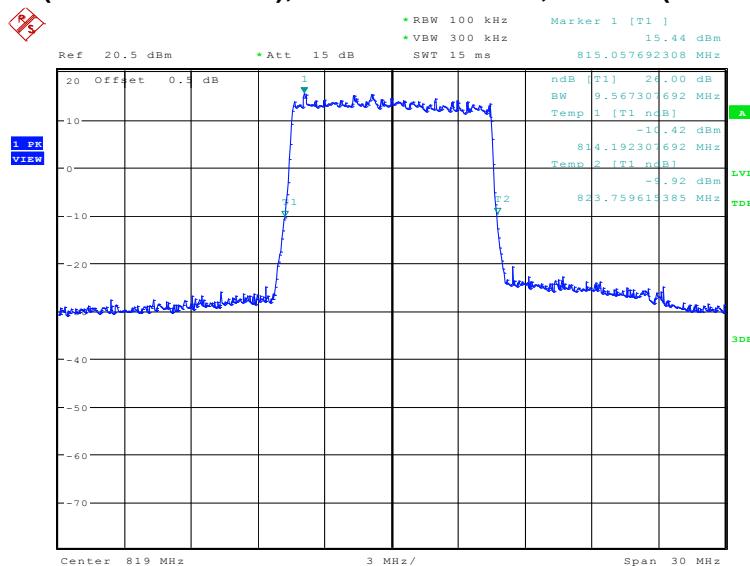


Date: 21.OCT.2019  13:31:09

## LTE band 26(814MHz~824MHz), 10MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 819.0 | 9615.38 | 9567.31 |

## LTE band 26(814MHz~824MHz), 10MHz Bandwidth, QPSK (-26dBc BW)
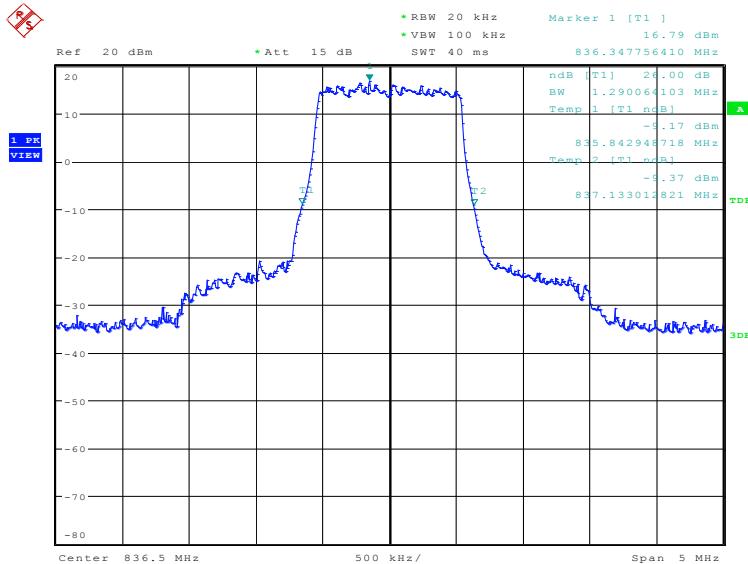


Date: 21.OCT.2019  13:33:24

## LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)
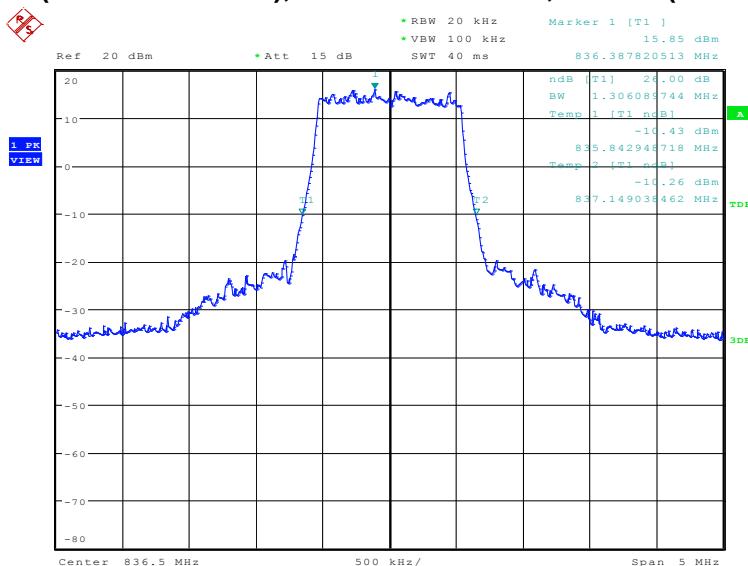


Date: 21.OCT.2019  13:34:49

**LTE band 26(824MHz~849MHz), 1.4MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 836.5 | 1290.06 | 1306.09 |

**LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (-26dBc BW)**
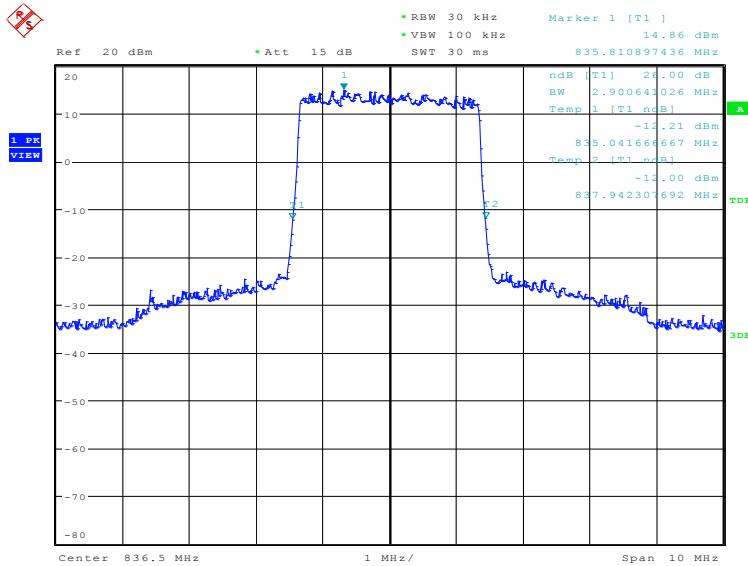


Date: 21.OCT.2019  13:04:13

**LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)**
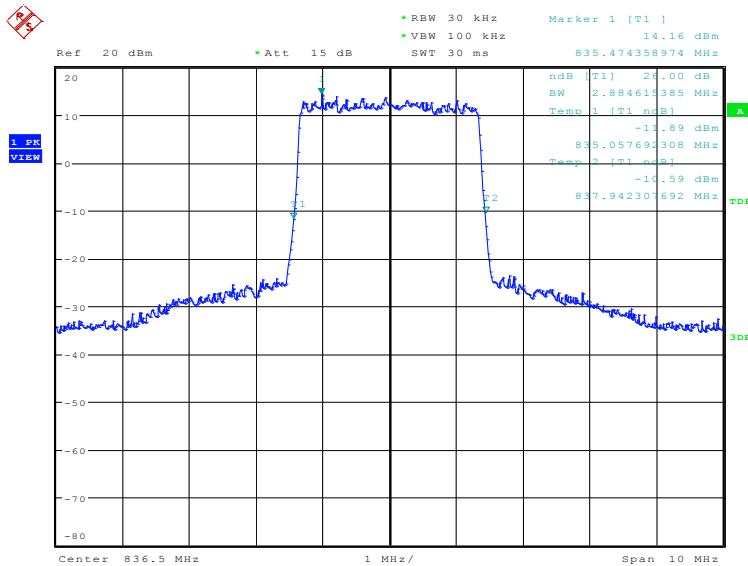


Date: 21.OCT.2019  13:05:38

## LTE band 26(824MHz~849MHz), 3MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 836.5 | 2900.64 | 2884.62 |

### LTE band 26(824MHz~849MHz), 3MHz Bandwidth, QPSK (-26dBc BW)
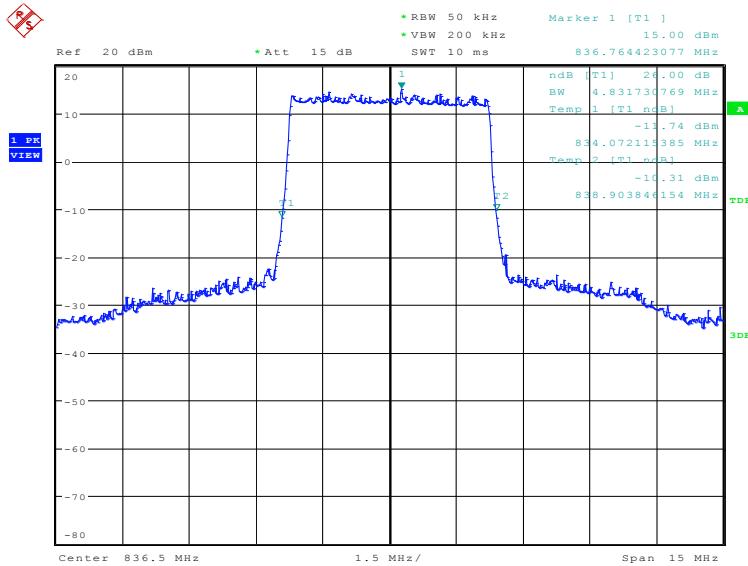


Date: 21.OCT.2019  13:07:53

### LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)
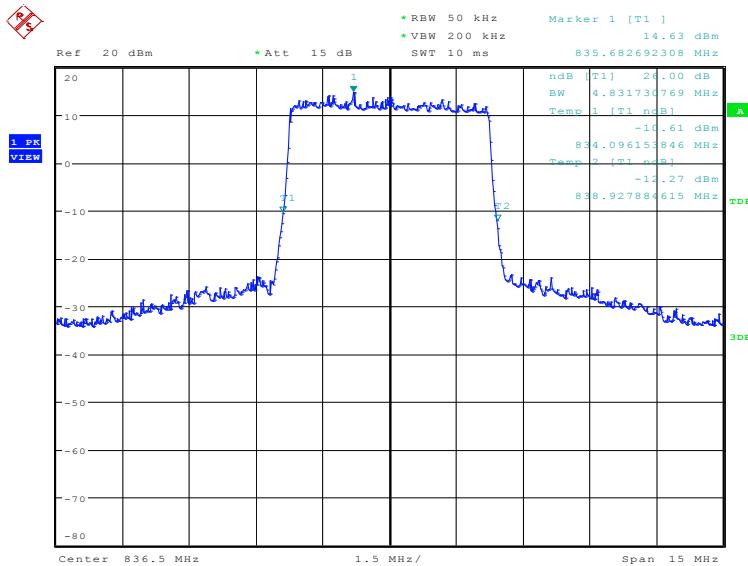


Date: 21.OCT.2019  13:09:18

**LTE band 26(824MHz~849MHz), 5MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 836.5 | 4831.73 | 4831.73 |

**LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (-26dBc BW)**
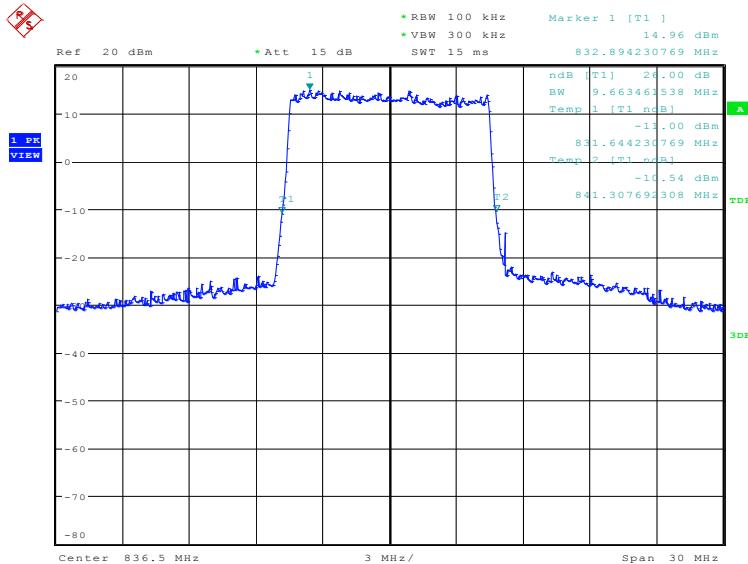


Date: 21.OCT.2019  13:11:33

**LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)**
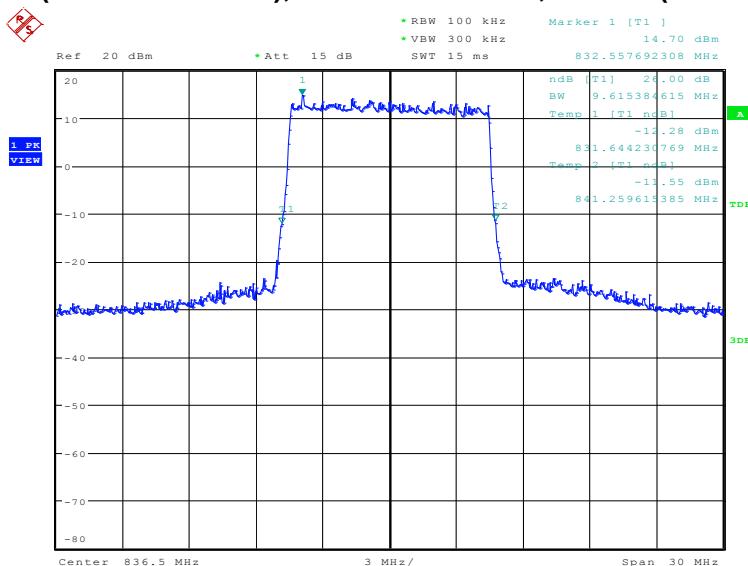


Date: 21.OCT.2019  13:12:58

## LTE band 26(824MHz~849MHz), 10MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 836.5 | 9663.46 | 9615.38 |

## LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (-26dBc BW)
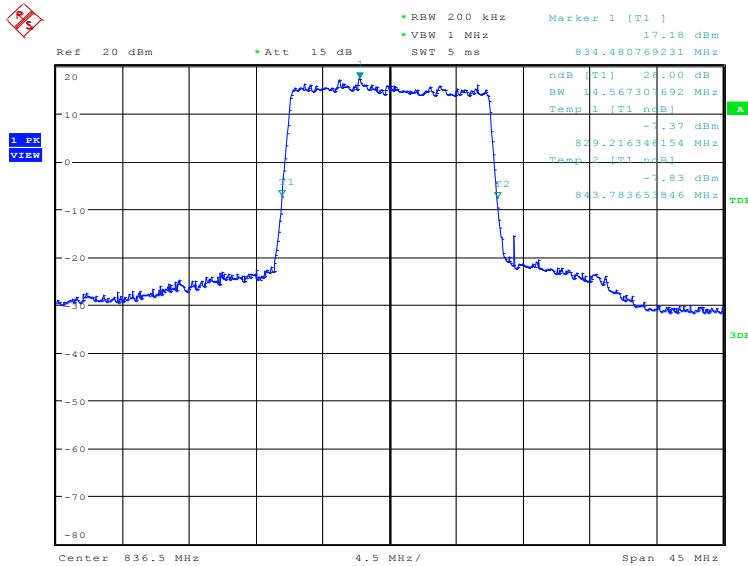


Date: 21.OCT.2019  13:15:13

## LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)
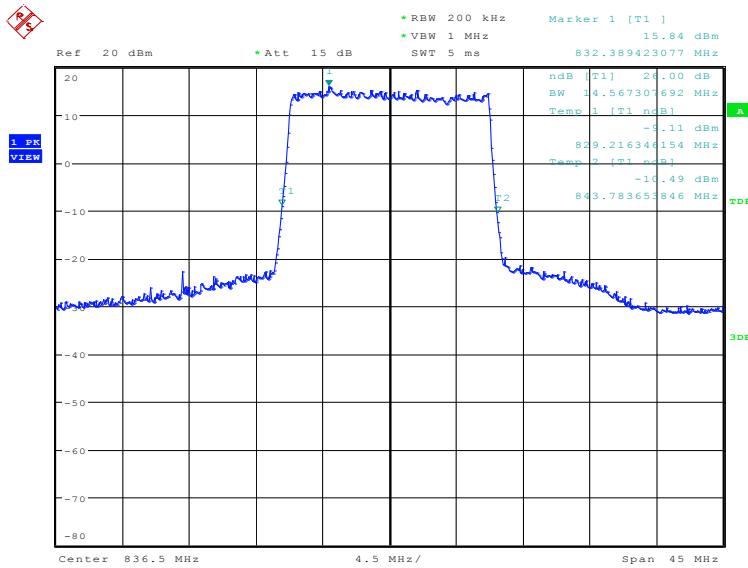


Date: 21.OCT.2019  13:16:38

**LTE band 26(824MHz~849MHz), 15MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| 836.5 | QPSK | 16QAM |
| | 14567.31 | 14567.31 |

**LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (-26dBc BW)**
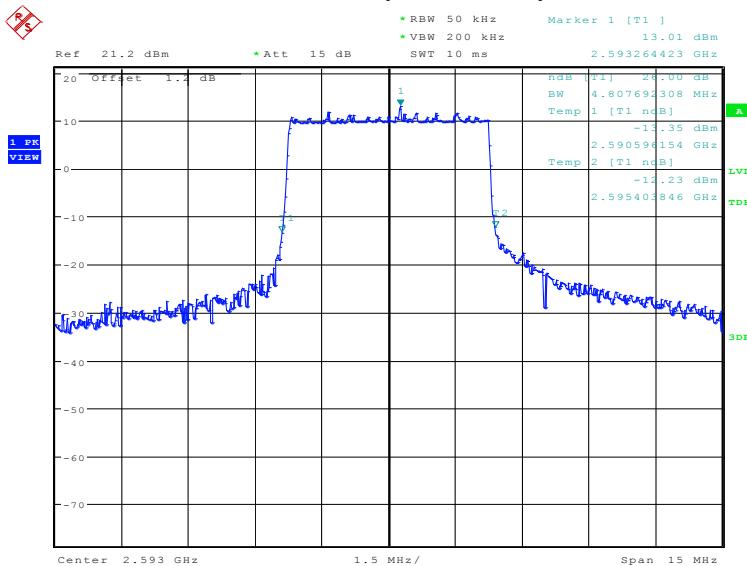


Date: 21.OCT.2019  13:18:53

**LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (-26dBc BW)**
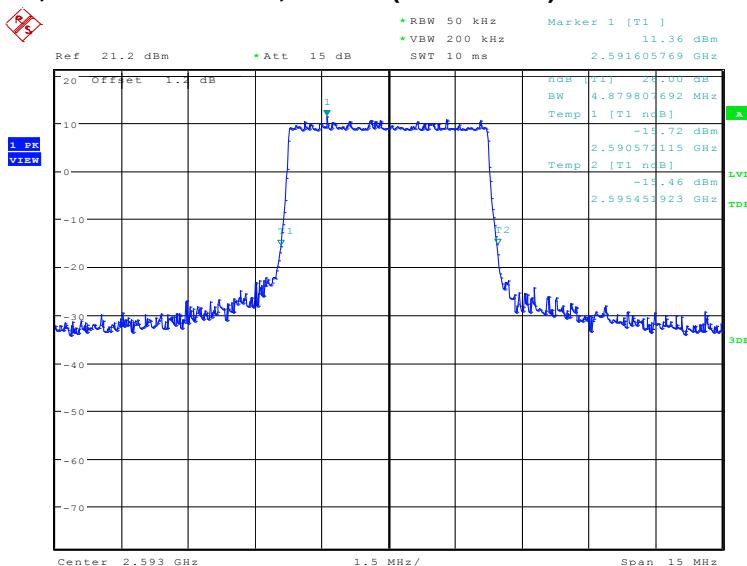


Date: 21.OCT.2019  13:20:18

## LTE band 41(PC2), 5MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 2593.0 | 4807.69 | 4879.81 |

## LTE band 41, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 17.OCT.2019  23:51:53
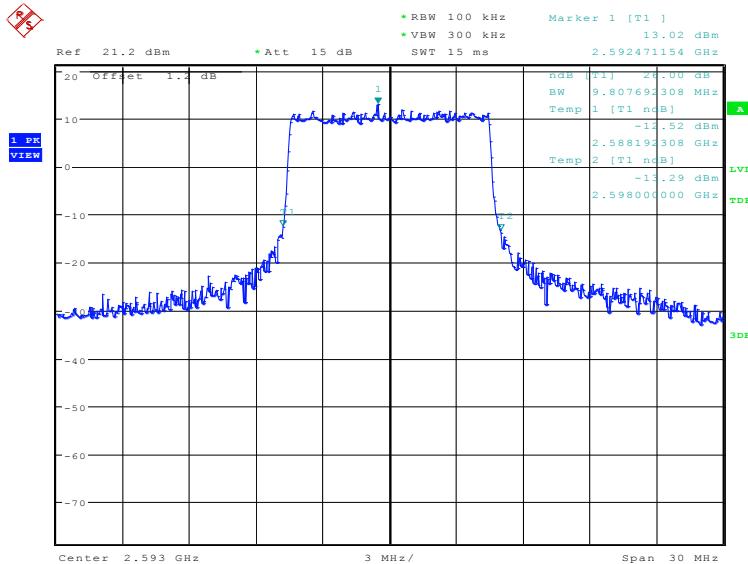
## LTE band 41, 5MHz Bandwidth,16QAM (-26dBc BW)



Date: 17.OCT.2019  23:53:18

## LTE band 41(PC2), 10MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 2593.0 | 9807.69 | 9855.77 |

### LTE band 41, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 17.OCT.2019  23:55:32
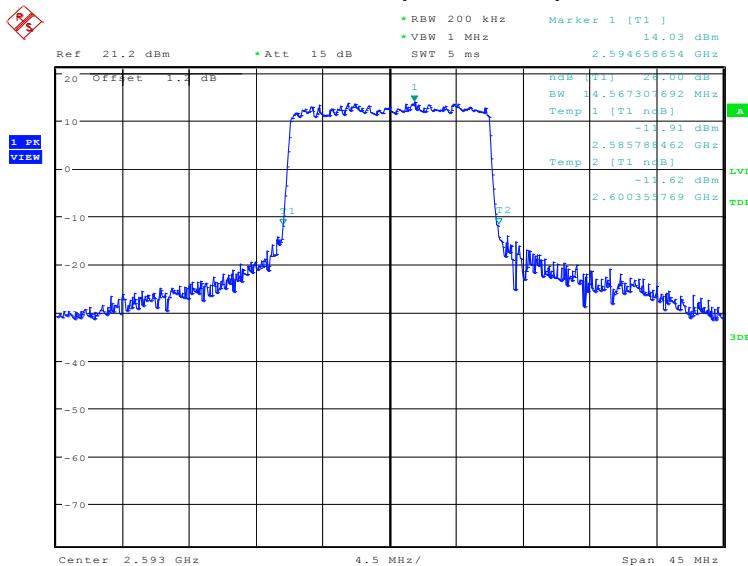
### LTE band 41, 10MHz Bandwidth,16QAM (-26dBc BW)
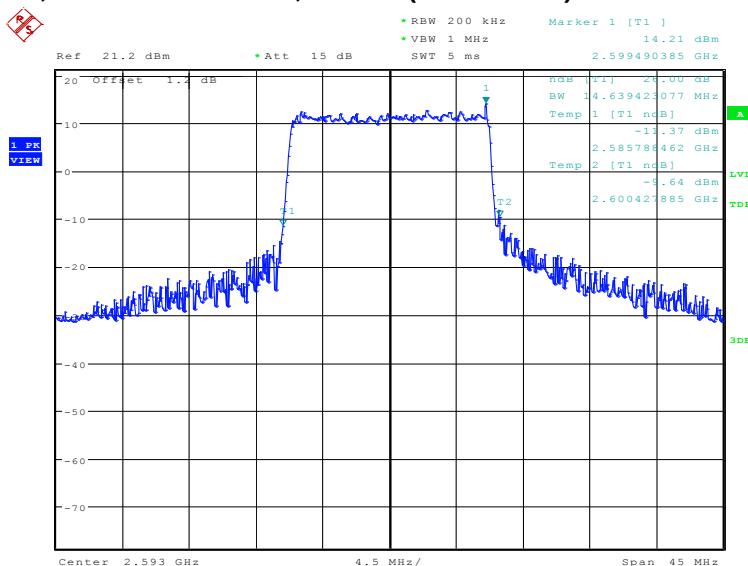


Date: 17.OCT.2019  23:56:58

**LTE band 41(PC2), 15MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| 2593.0 | QPSK | 16QAM |
| | 14567.31 | 14639.42 |

**LTE band 41, 15MHz Bandwidth, QPSK (-26dBc BW)**
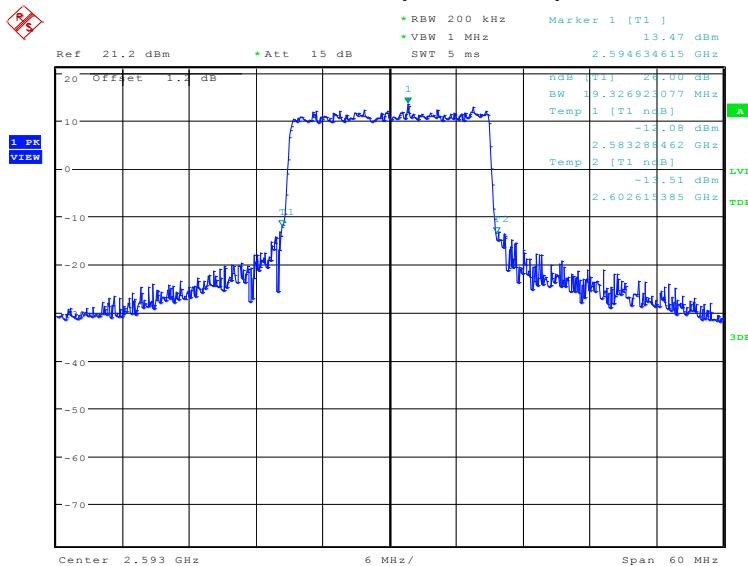


Date: 17.OCT.2019  23:59:12

**LTE band 41, 15MHz Bandwidth,16QAM (-26dBc BW)**
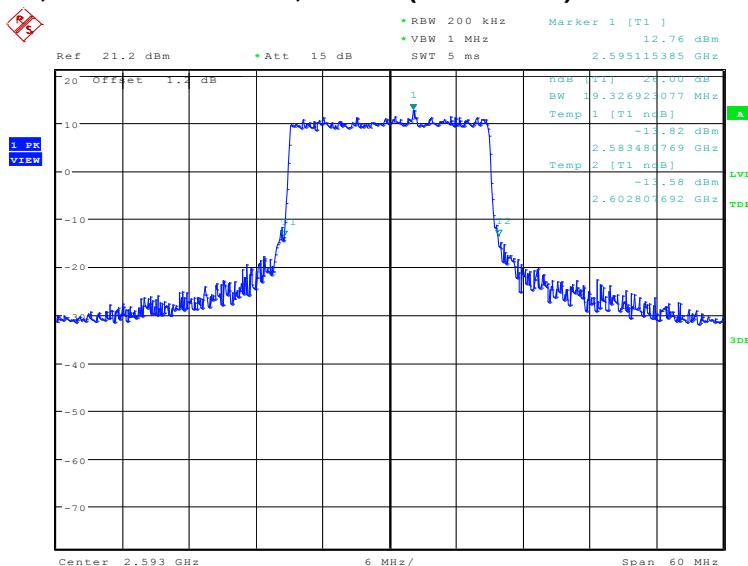


Date: 18.OCT.2019  00:00:38

## LTE band 41(PC2), 20MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 2593.0 | 19326.92 | 19326.92 |

### LTE band 41, 20MHz Bandwidth, QPSK (-26dBc BW)
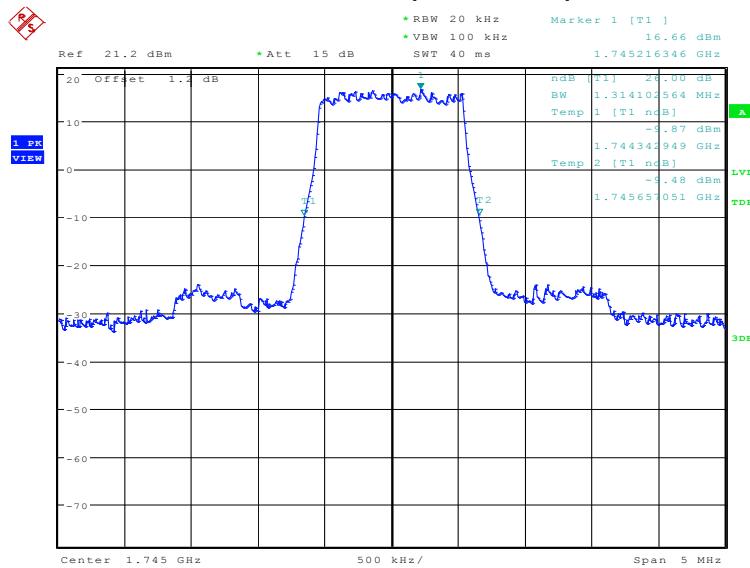


Date: 18.OCT.2019  00:02:53

### LTE band 41, 20MHz Bandwidth,16QAM (-26dBc BW)
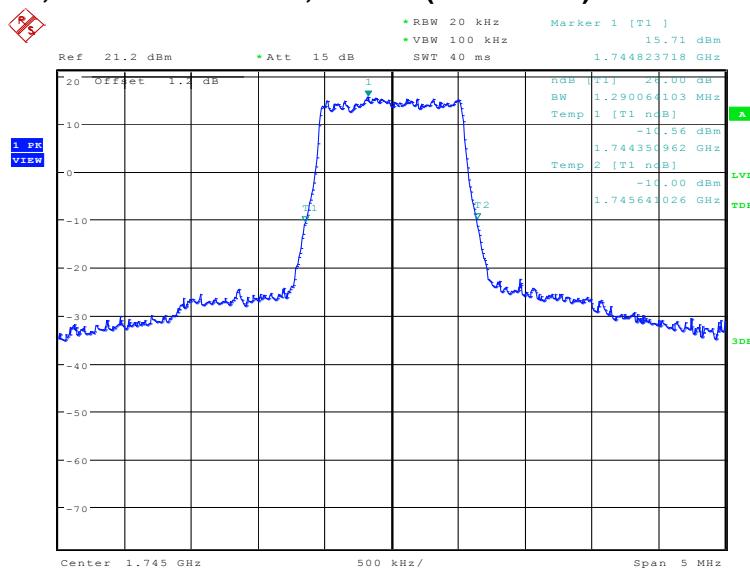


Date: 18.OCT.2019  00:04:18

**LTE band 66, 1.4MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 1314.10 | 1290.06 |

**LTE band 66, 1.4MHz Bandwidth, QPSK (-26dBc BW)**
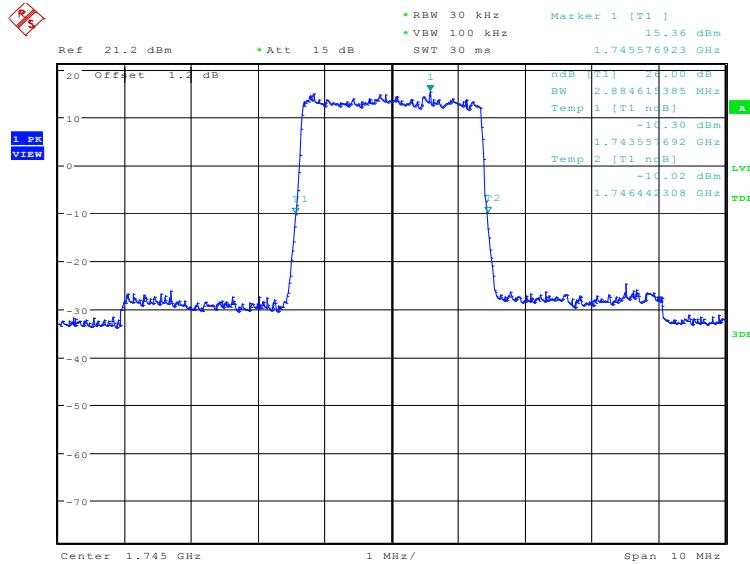


Date: 17.OCT.2019  23:29:47

**LTE band 66, 1.4MHz Bandwidth, 16QAM (-26dBc BW)**
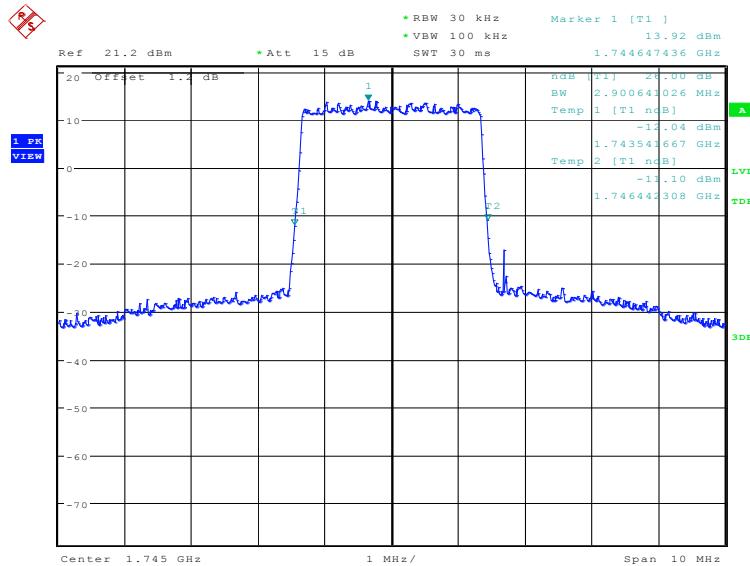


Date: 17.OCT.2019  23:31:12

**LTE band 66, 3MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 2884.62 | 2900.64 |

**LTE band 66, 3MHz Bandwidth, QPSK (-26dBc BW)**
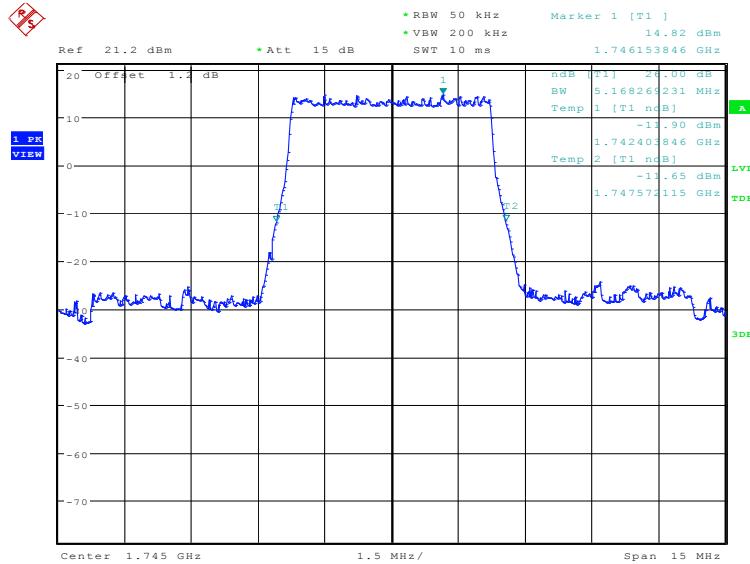


Date: 17.OCT.2019  23:33:26

**LTE band 66, 3MHz Bandwidth, 16QAM (-26dBc BW)**
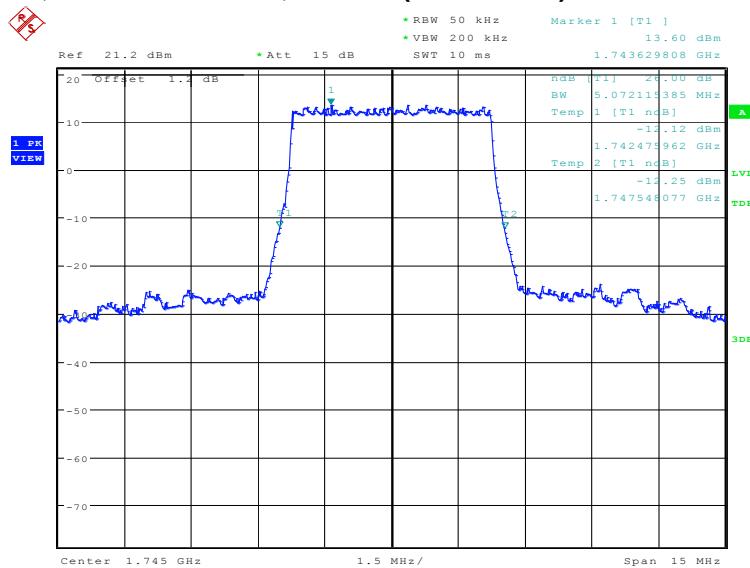


Date: 17.OCT.2019  23:34:52

**LTE band 66, 5MHz (-26dBc)**

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 5168.27 | 5072.12 |

**LTE band 66, 5MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019  23:37:06
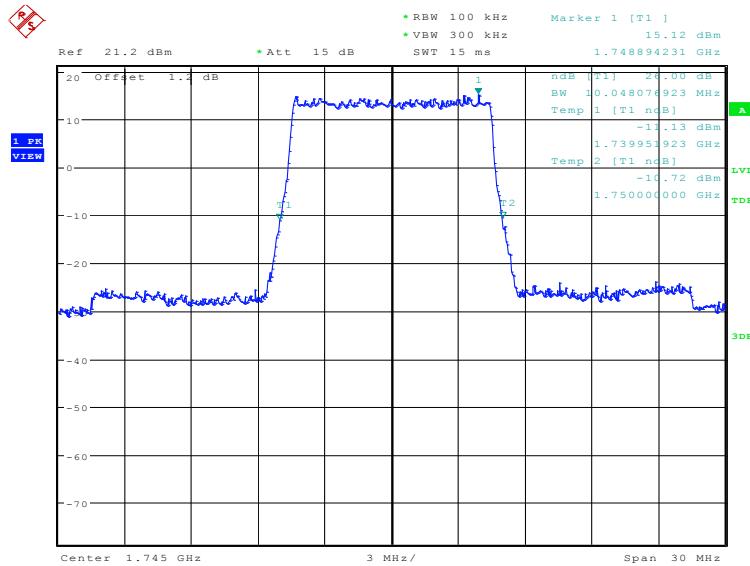
**LTE band 66, 5MHz Bandwidth, 16QAM (-26dBc BW)**



Date: 17.OCT.2019  23:38:31

**LTE band 66, 10MHz (-26dBc)**
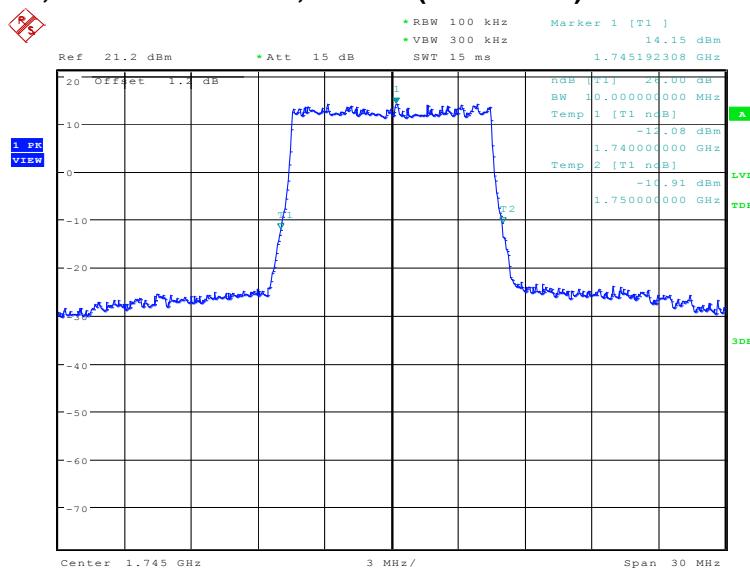
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 10048.08 | 10000.00 |

**LTE band 66, 10MHz Bandwidth, QPSK (-26dBc BW)**



Date: 17.OCT.2019  23:40:46
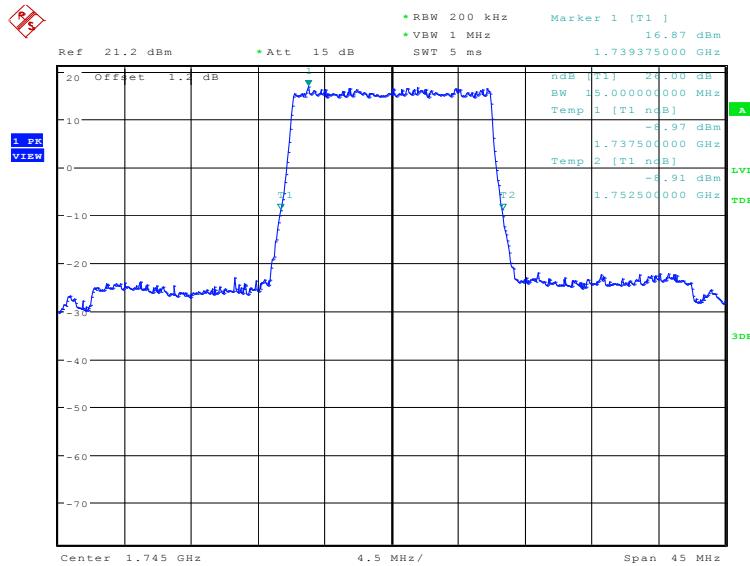
**LTE band 66, 10MHz Bandwidth, 16QAM (-26dBc BW)**
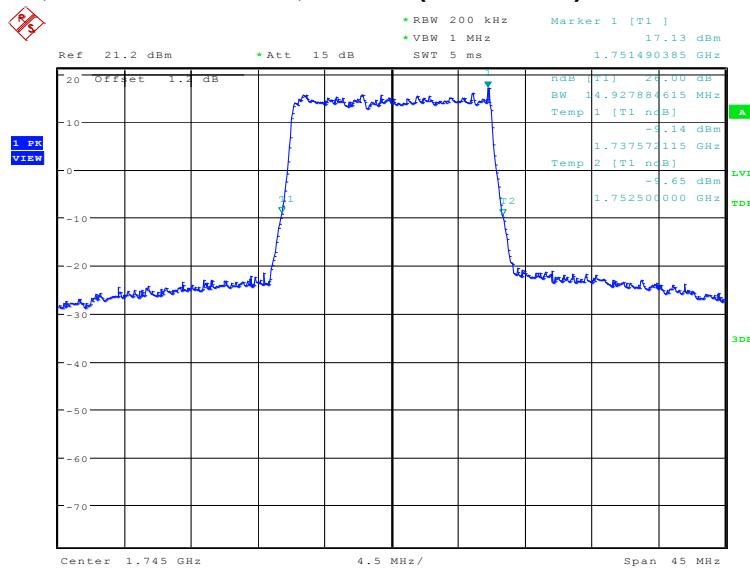


Date: 17.OCT.2019  23:42:11

## LTE band 66, 15MHz (-26dBc)

| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 15000.00 | 14927.88 |

### LTE band 66, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 17.OCT.2019  23:44:26
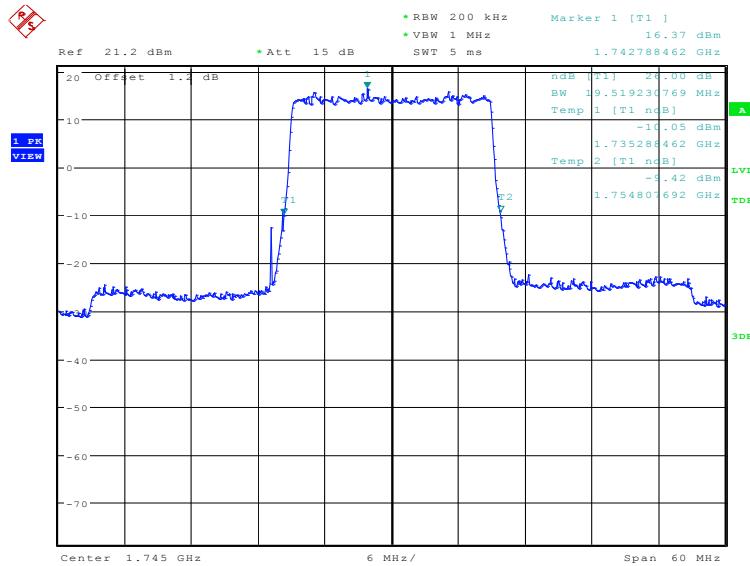
### LTE band 66, 15MHz Bandwidth, 16QAM (-26dBc BW)



Date: 17.OCT.2019  23:45:51

## LTE band 66, 20MHz (-26dBc)
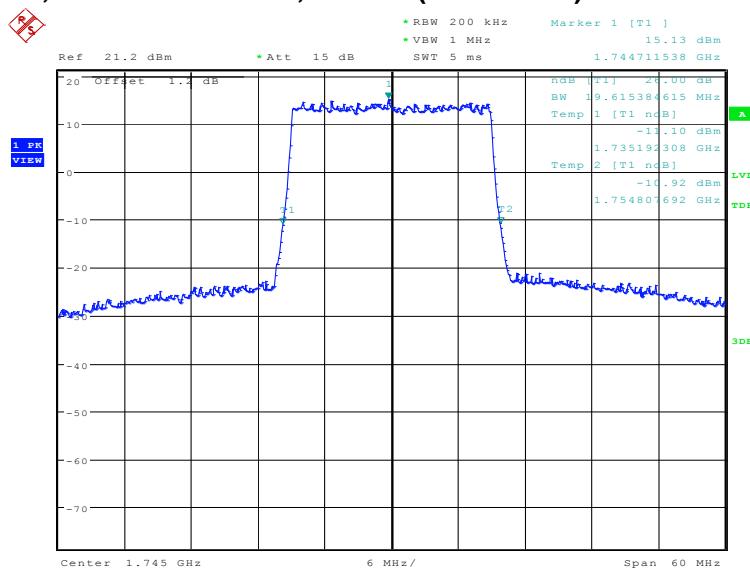
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 19519.23 | 19615.38 |

### LTE band 66, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 17.OCT.2019  23:48:05

### LTE band 66, 20MHz Bandwidth, 16QAM (-26dBc BW)
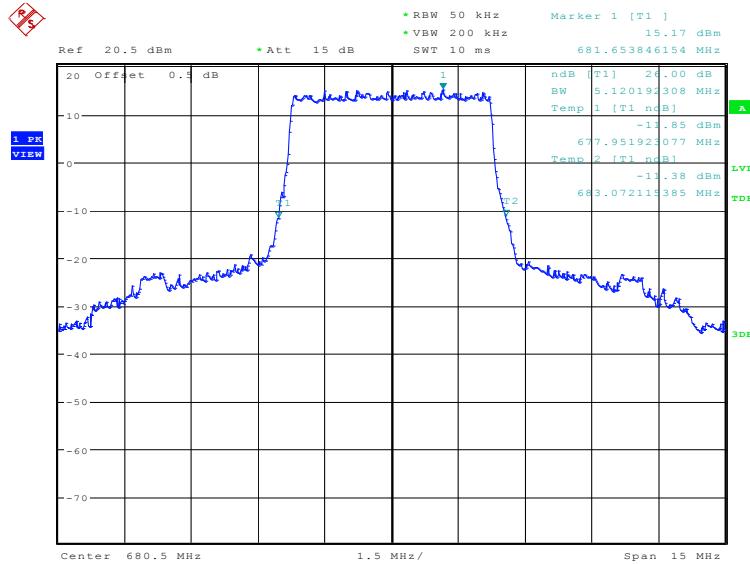


Date: 17.OCT.2019  23:49:31

**LTE band 71, 5MHz (-26dBc)**
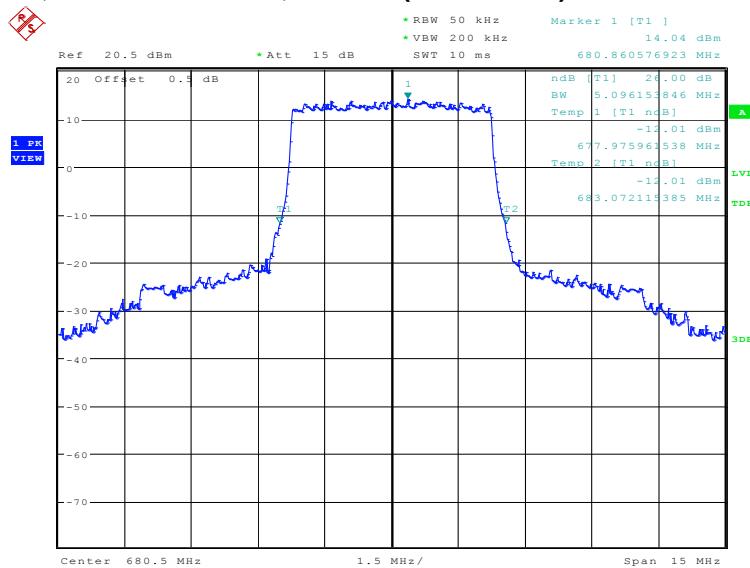
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 680.5 | 5120.19 | 5096.15 |

**LTE band 71, 5MHz Bandwidth, QPSK (-26dBc BW)**



Date: 21.OCT.2019  13:37:12

**LTE band 71, 5MHz Bandwidth, 16QAM (-26dBc BW)**
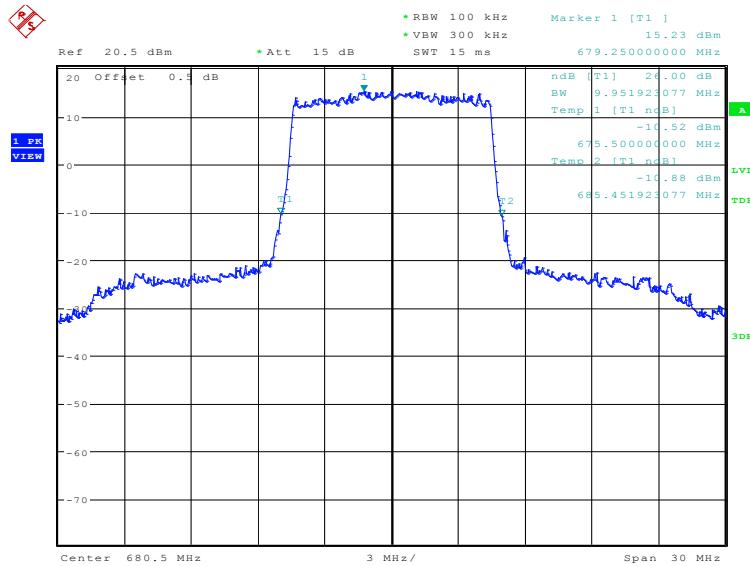


Date: 21.OCT.2019  13:38:37

## LTE band 71, 10MHz (-26dBc)
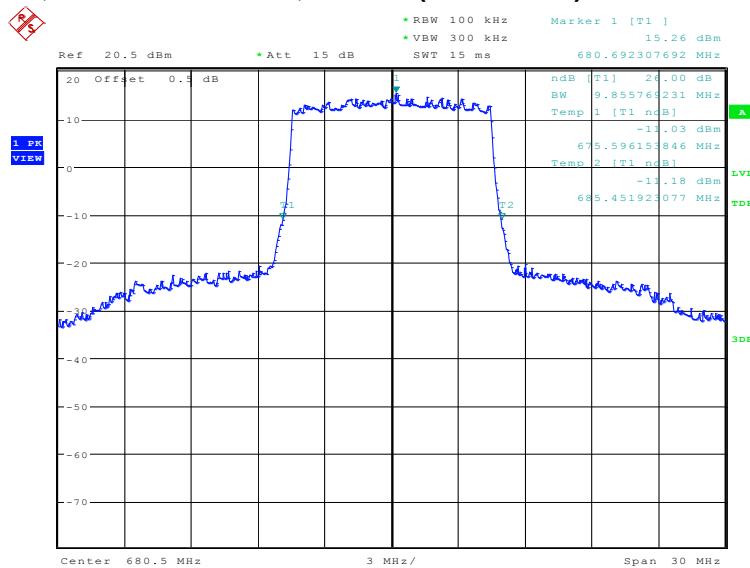
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 680.5 | 9951.92 | 9855.77 |

### LTE band 71, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.OCT.2019  13:40:52

### LTE band 71, 10MHz Bandwidth, 16QAM (-26dBc BW)
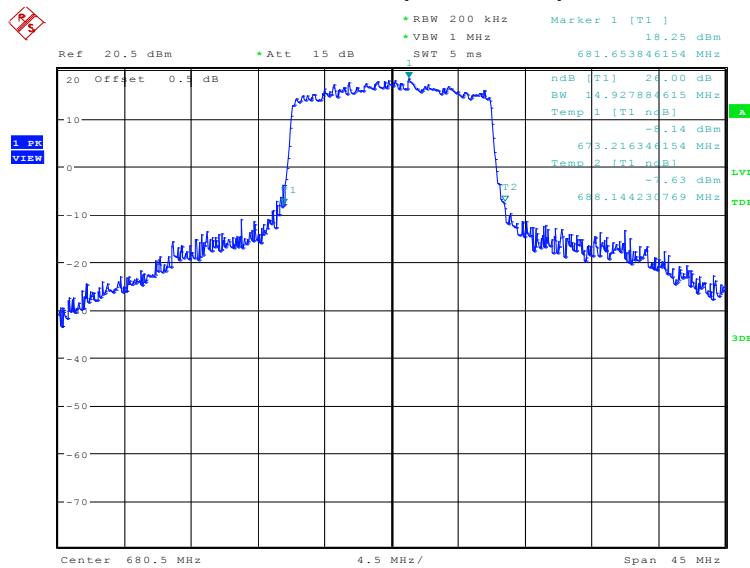


Date: 21.OCT.2019  13:42:17

### LTE band 71, 15MHz (-26dBc)
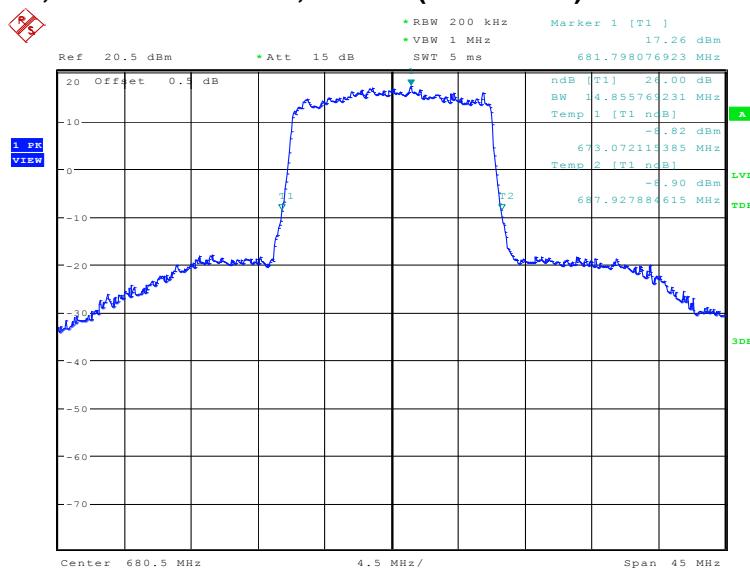
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 680.5 | 14927.88 | 14855.77 |

### LTE band 71, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.OCT.2019  13:44:32

### LTE band 71, 15MHz Bandwidth, 16QAM (-26dBc BW)
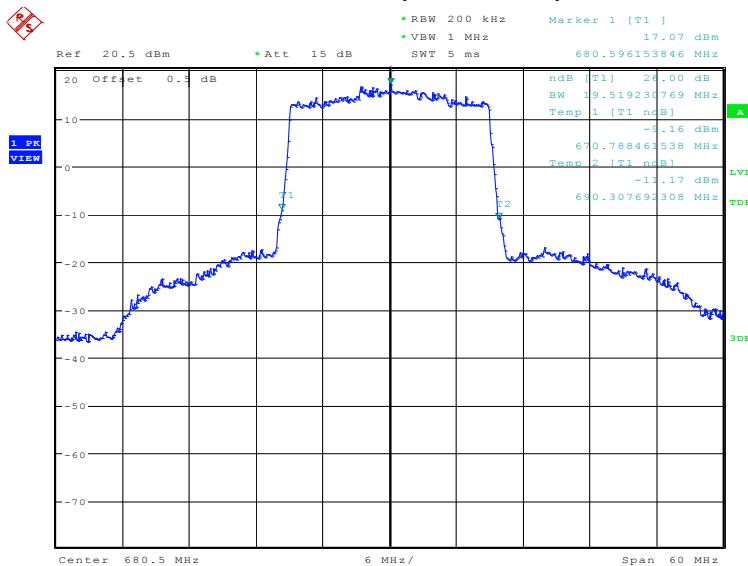


Date: 21.OCT.2019  13:45:57

## LTE band 71, 20MHz (-26dBc)
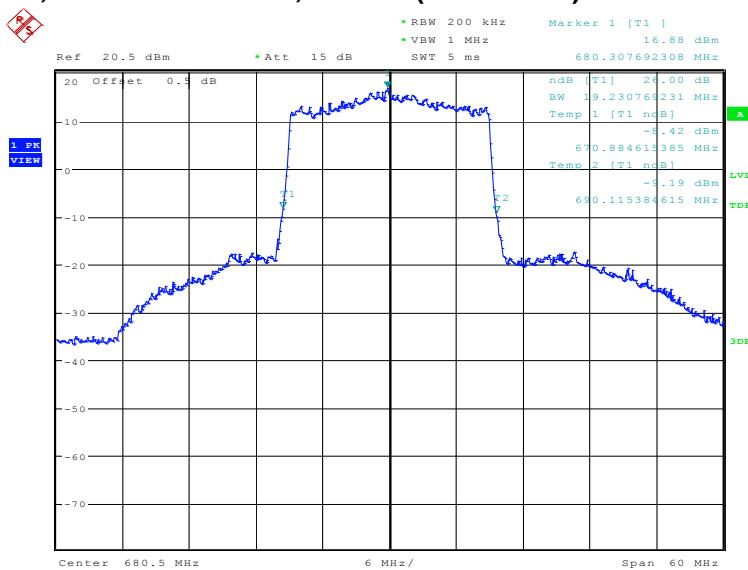
| Frequency(MHz) | Occupied Bandwidth (-26dBc) (kHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 680.5 | 19519.23 | 19230.77 |

## LTE band 71, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.OCT.2019  13:48:12

## LTE band 71, 20MHz Bandwidth, 16QAM (-26dBc BW)



Date: 21.OCT.2019  13:49:38

## A.6   BAND EDGE COMPLIANCE

### A.6.1 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.

According to KDB 971168, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

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 that 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(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, 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 any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Part 90.691 states that out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 Log_{10}(f/6.1)$ decibels or $50 + 10 Log_{10}(P)$

decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

## A.6.2 Measurement result
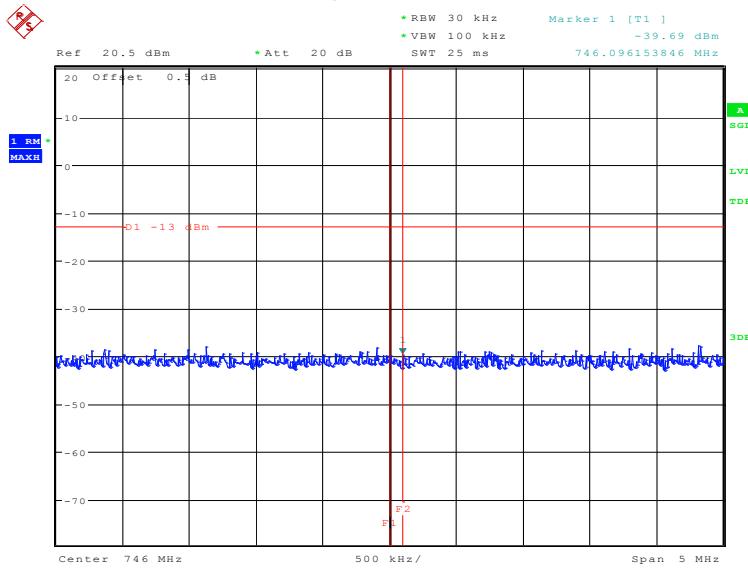
**Only the worst case result is given below**

**OBW: 1RB-high_offset**

```
                                    * RBW  5 kHz      Marker 1 [T1 ]
                                    * VBW  20 kHz              19.23 dBm
    Ref  20.5 dBm    * Att  15 dB   SWT 1.4 s        715.790064103 MHz
   20  Offset  0.5 dB                               OBW224.358974359 kHz
                                                    Temp 1 [T1 OBW]
  -10                                                        2.68 dBm
1 PK                                                715.621794872 MHz
MAXH                                                Temp 2 [T1 OBW]
   0                                                        17.06 dBm
                                                    715.846153846 MHz
 -10

 -20

 -30

 -40

 -50

 -60

 -70

   Center  714.5 MHz          3.5 MHz/           Span  35 MHz
```
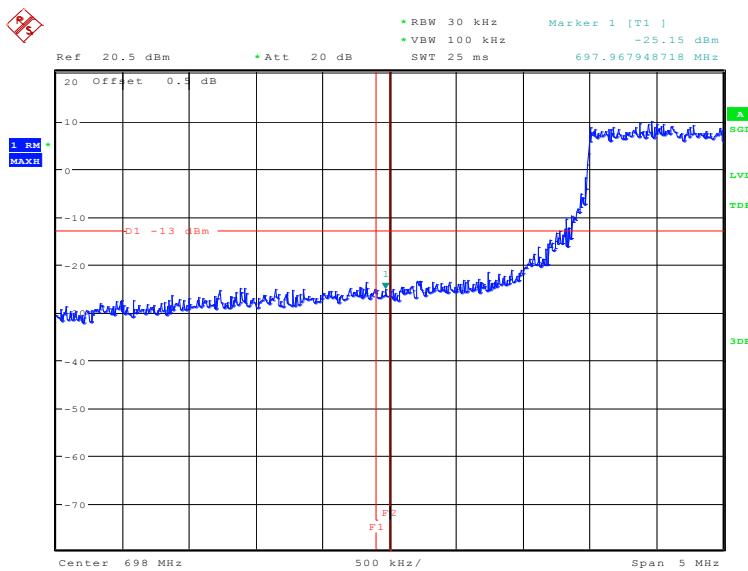
Date: 5.NOV.2019  09:22:00

## HIGH BAND EDGE BLOCK-1RB-high_offset

```
                                    * RBW  30 kHz     Marker 1 [T1 ]
                                    * VBW  100 kHz            -39.69 dBm
    Ref  20.5 dBm    * Att  20 dB   SWT 25 ms       746.096153846 MHz
   20  Offset  0.5 dB

  -10

1 RM
MAXH
   0

 -10
      D1 -13 dBm

 -20

 -30

 -50

 -60

 -70
                              F2
                              F1

   Center  746 MHz            500 kHz/           Span  5 MHz
```
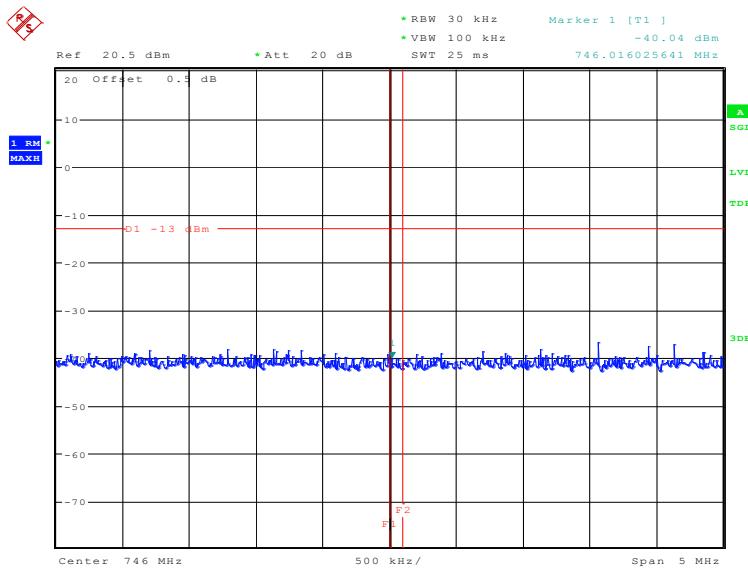
Date: 5.NOV.2019  09:22:16

## LOW BAND EDGE BLOCK-10MHz-100%RB



Date: 5.NOV.2019  09:20:02
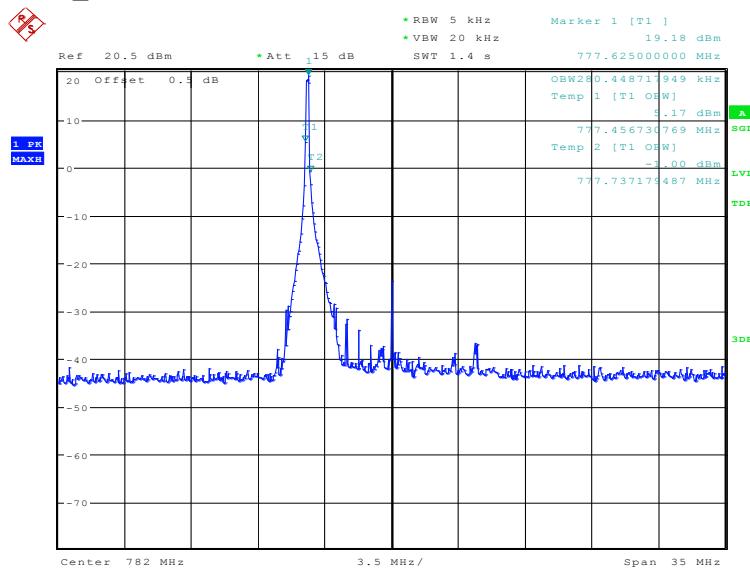
## HIGH BAND EDGE BLOCK-10MHz-100%RB



Date: 5.NOV.2019  09:22:57
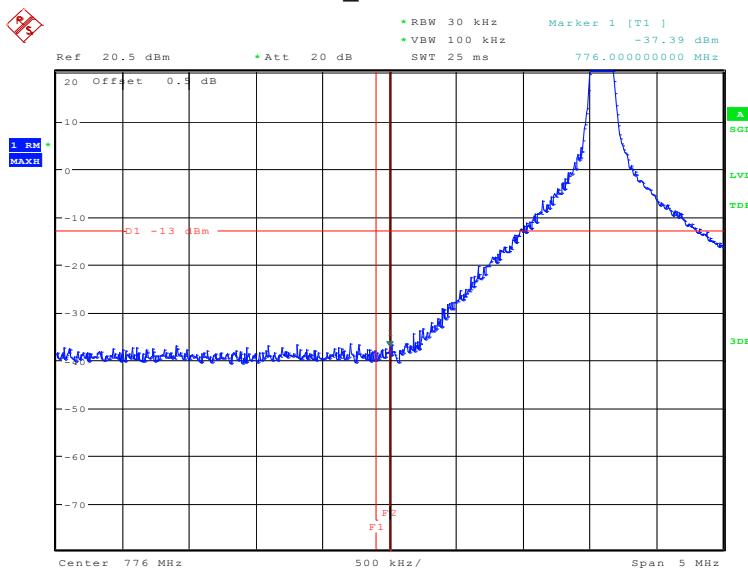
**LTE band 13**
**OBW: 1RB-low_offset**
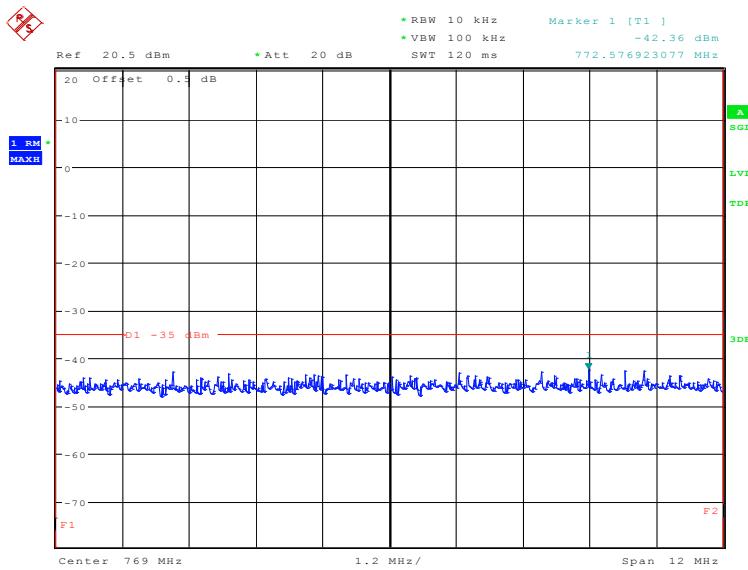


Date: 5.NOV.2019  10:25:03

**LOW BAND EDGE BLOCK-1RB-low_offset**
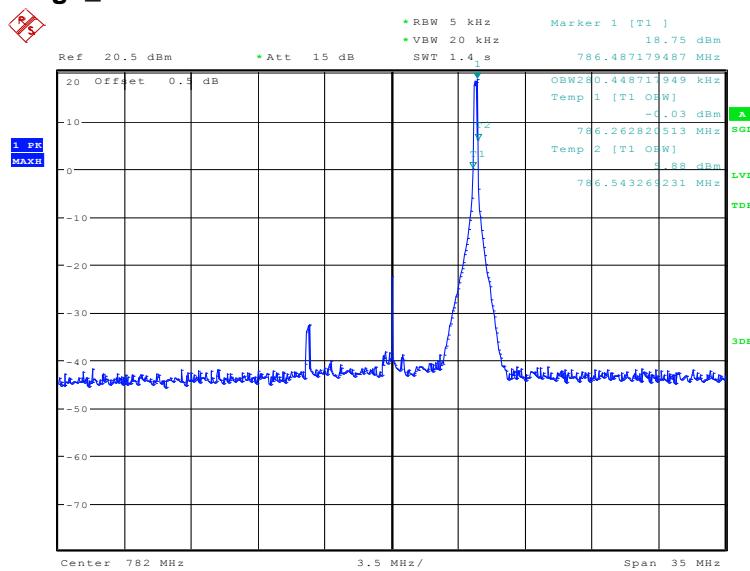


Date: 5.NOV.2019  10:25:19
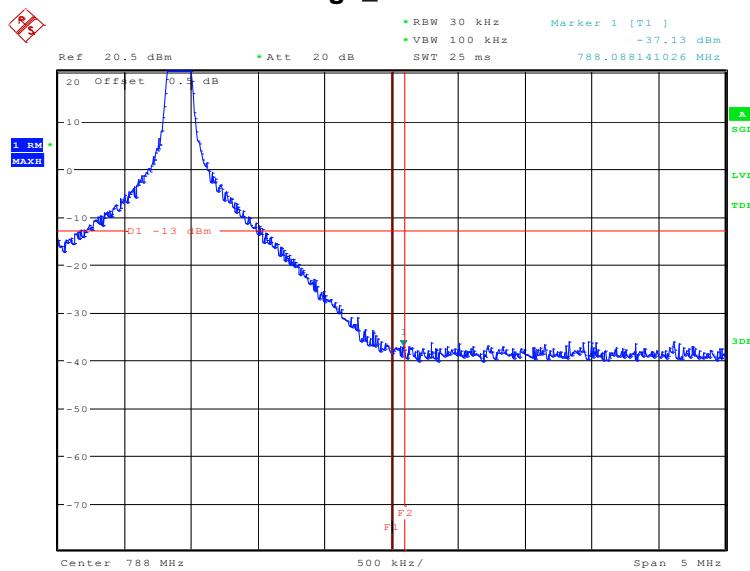


Date: 5.NOV.2019  10:25:33

## OBW: 1RB-high_offset
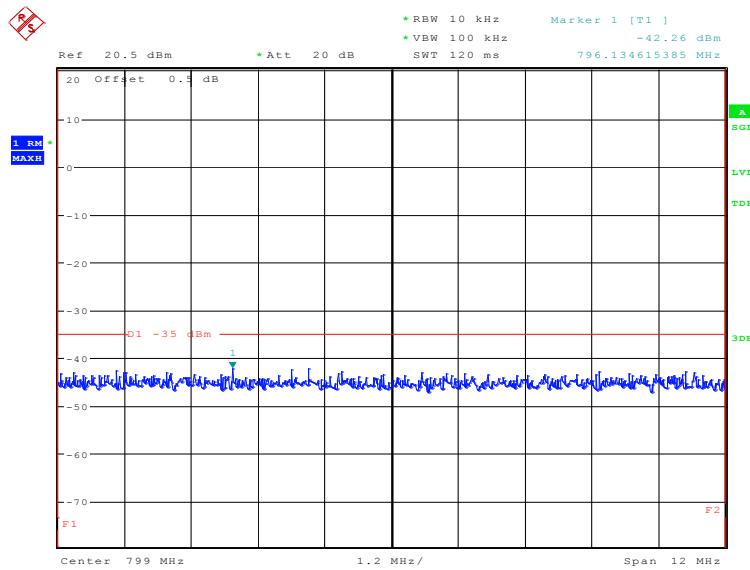


Date: 5.NOV.2019 10:27:36

## HIGH BAND EDGE BLOCK-1RB-high_offset
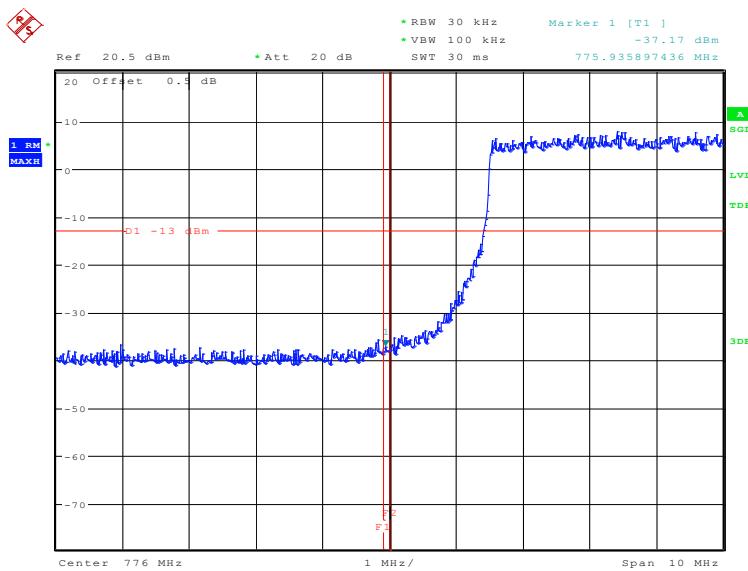


Date: 5.NOV.2019  10:27:52
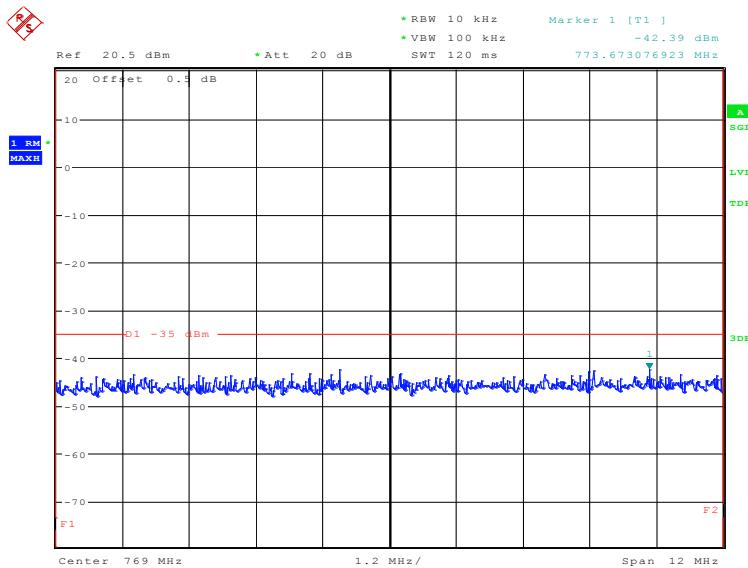


Date: 5.NOV.2019  10:28:07

## LOW BAND EDGE BLOCK-10MHz-100%RB



```
                                    * RBW 30 kHz        Marker 1 [T1 ]
                                    * VBW 100 kHz               -37.17 dBm
    Ref  20.5 dBm       * Att  20 dB  SWT 30 ms         775.935897436 MHz
    20  Offset  0.5  dB                                              A
                                                                     SGL
     10
1 RM*
MAXH  0                                                              LVL
                                                                     TDF
    -10
      D1 -13 dBm
    -20

    -30
                                                                     3DB
    -40

    -50

    -60

    -70
                          F2
                          F1
    Center  776 MHz            1 MHz/              Span  10 MHz
```

Date: 5.NOV.2019  10:26:02



```
                                    * RBW 10 kHz        Marker 1 [T1 ]
                                    * VBW 100 kHz               -42.39 dBm
    Ref  20.5 dBm       * Att  20 dB  SWT 120 ms        773.673076923 MHz
    20  Offset  0.5  dB                                              A
                                                                     SGL
     10
1 RM*
MAXH  0                                                              LVL
                                                                     TDF
    -10

    -20

    -30
      D1 -35 dBm                                                     3DB
    -40

    -50

    -60

    -70                                                         F2
    F1
    Center  769 MHz           1.2 MHz/             Span  12 MHz
```
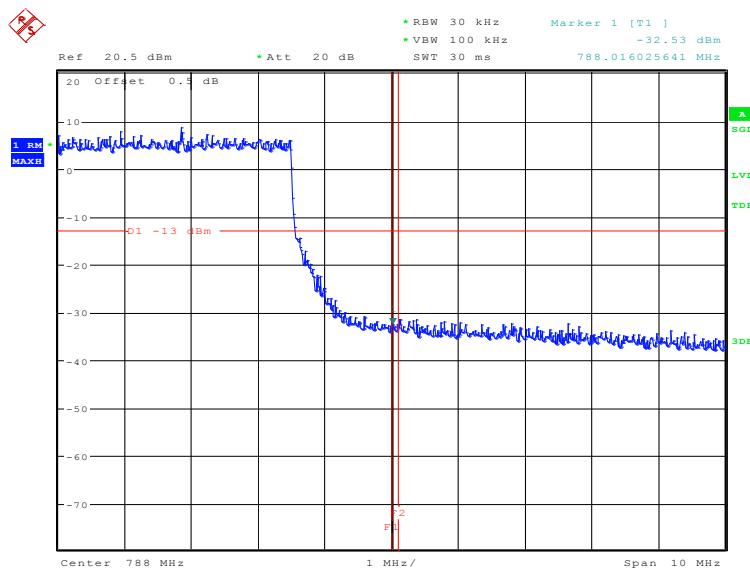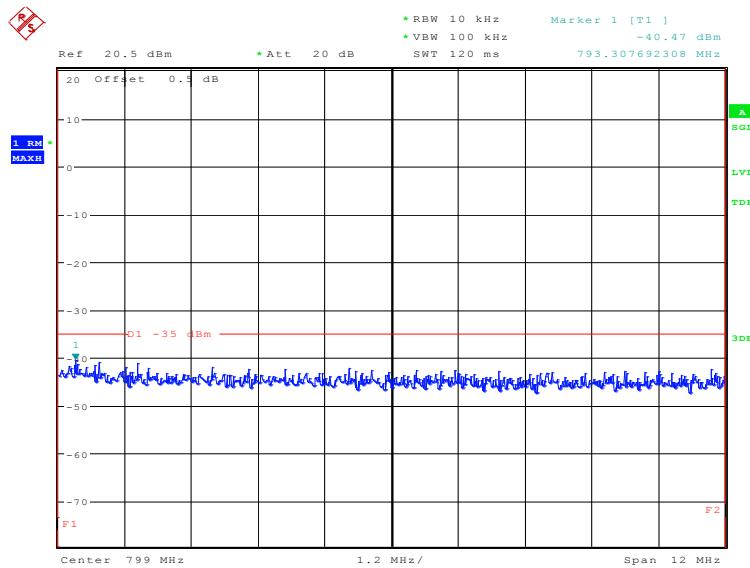
Date: 5.NOV.2019  10:26:17

## HIGH BAND EDGE BLOCK-10MHz-100%RB
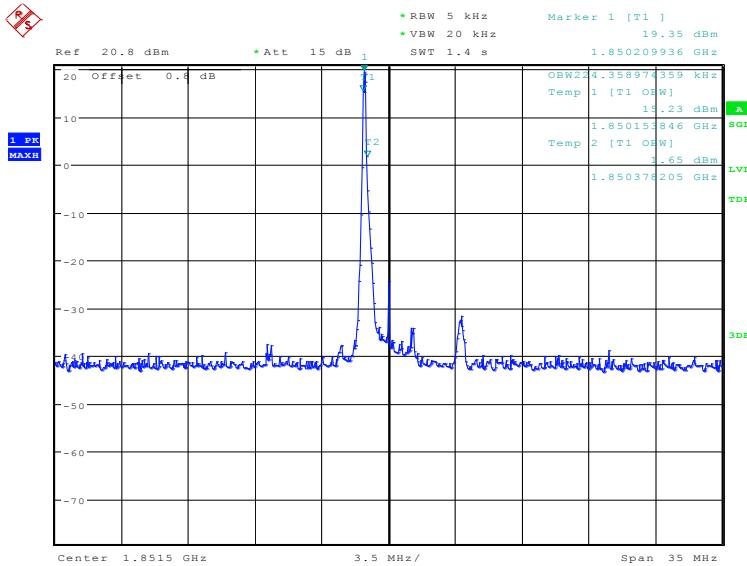


Date: 5.NOV.2019  10:28:36



Date: 5.NOV.2019  10:28:50
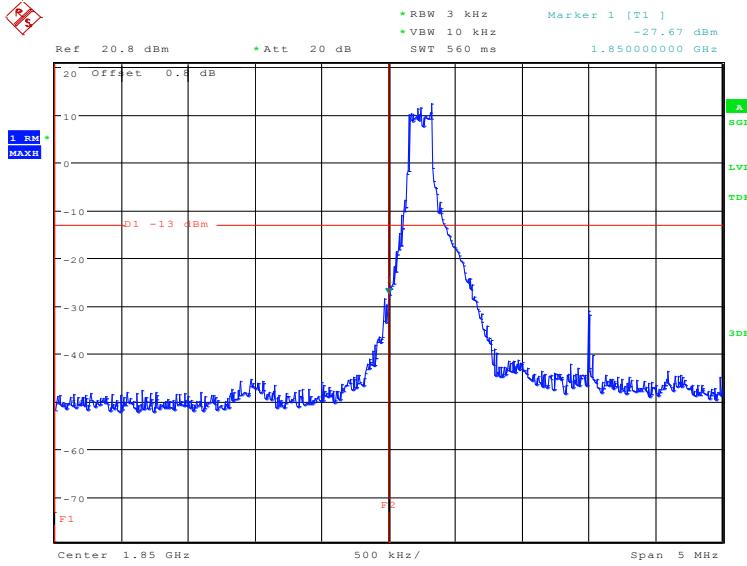
**LTE band 25**
**OBW: 1RB-low_offset**
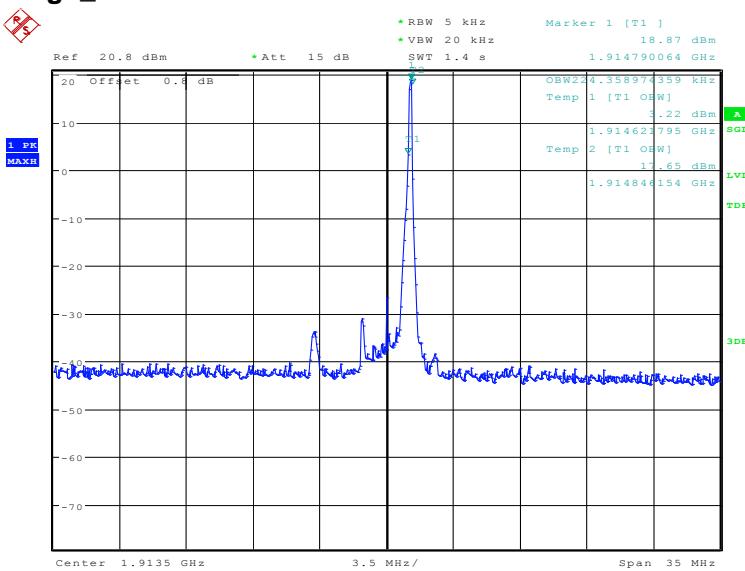


Date: 5.NOV.2019  10:35:40

**LOW BAND EDGE BLOCK-1RB-low_offset**
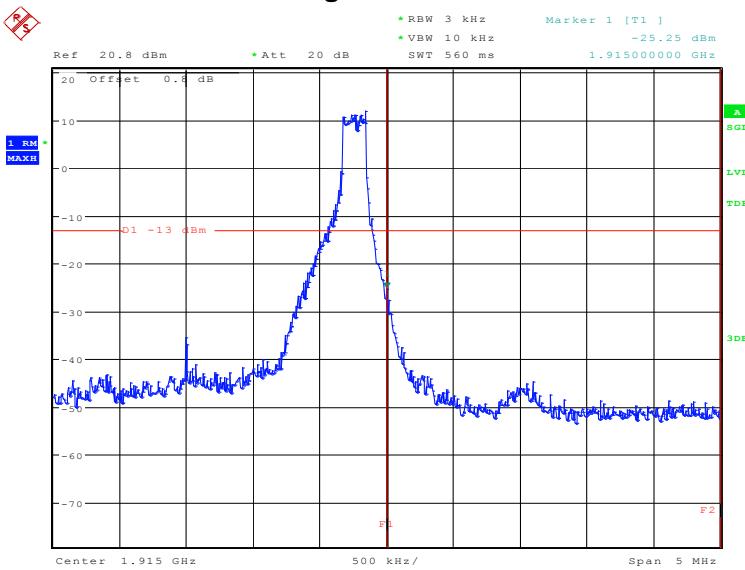


Date: 5.NOV.2019  10:35:56

## OBW: 1RB-high_offset
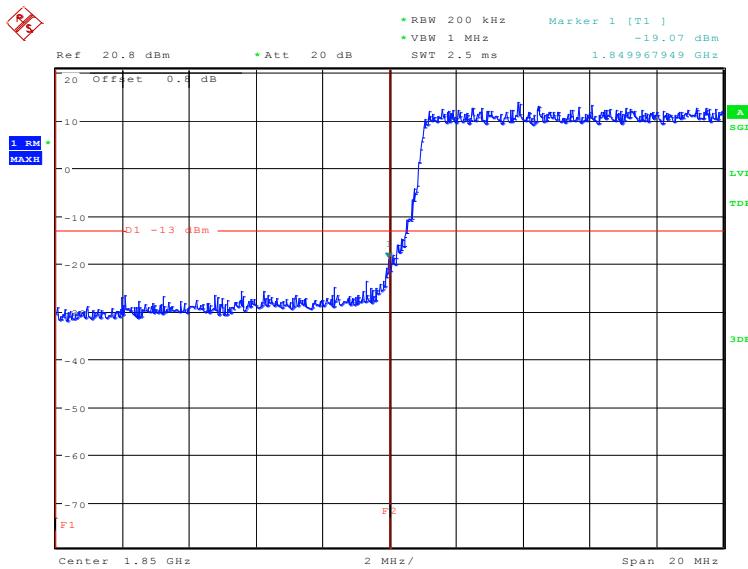


Date: 5.NOV.2019  10:38:36

## HIGH BAND EDGE BLOCK-1RB-high_offset
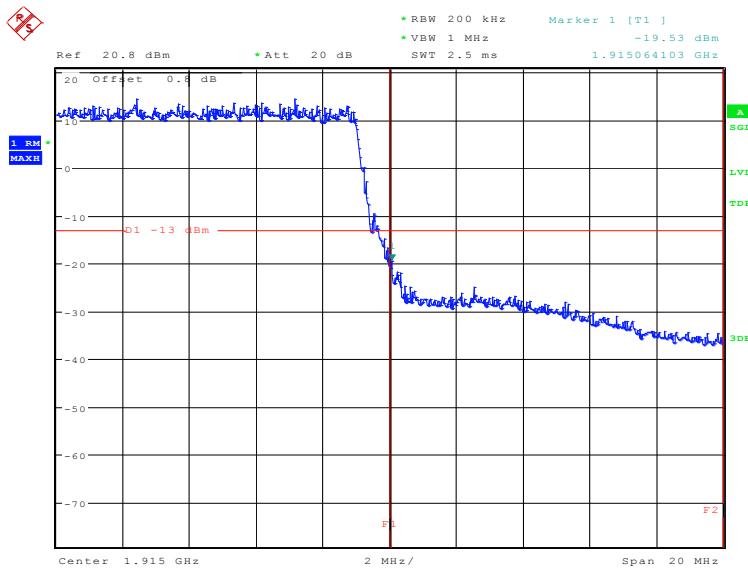


Date: 5.NOV.2019  10:38:51

## LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 5.NOV.2019  10:36:37
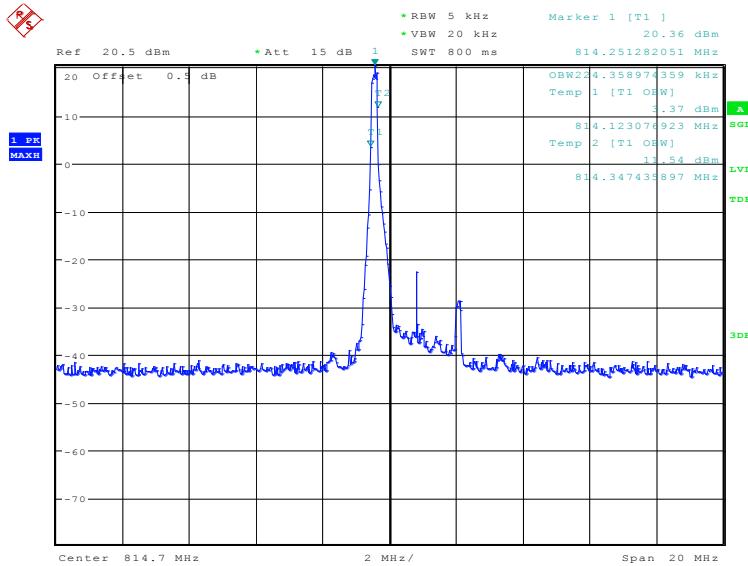
## HIGH BAND EDGE BLOCK-20MHz-100%RB



Date: 5.NOV.2019  10:39:32
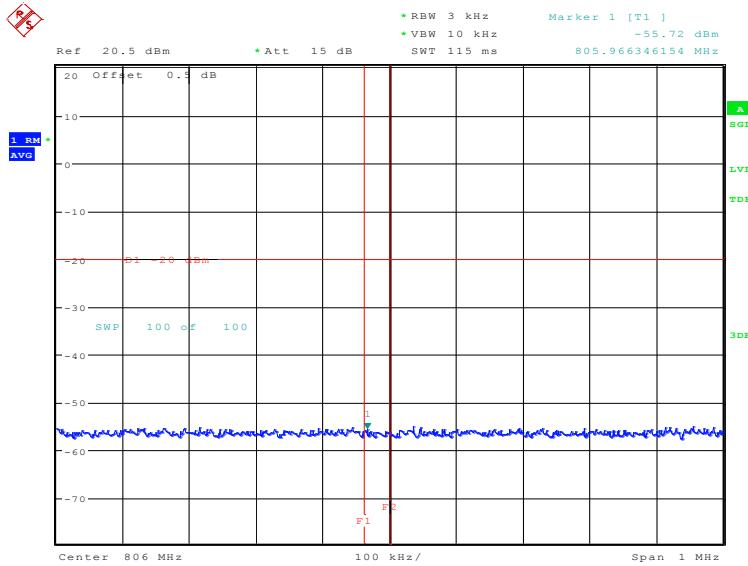
**LTE band 26(814MHz~824MHz)**

**OBW: 1RB-low_offset**
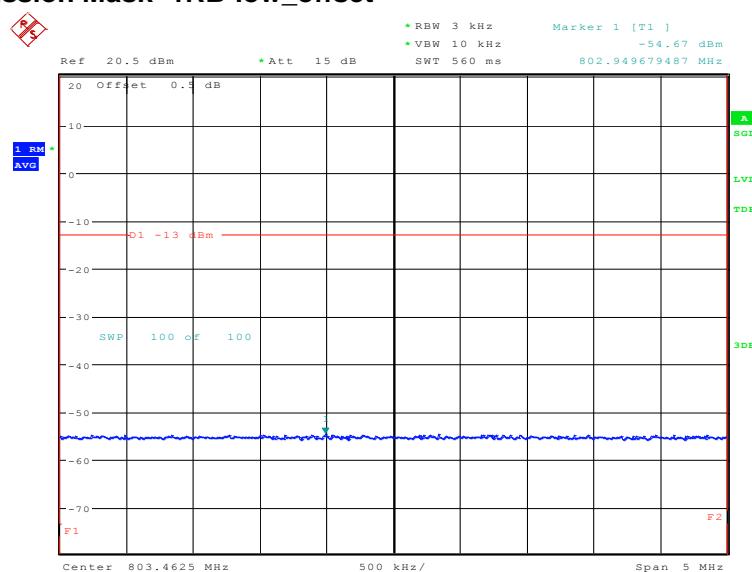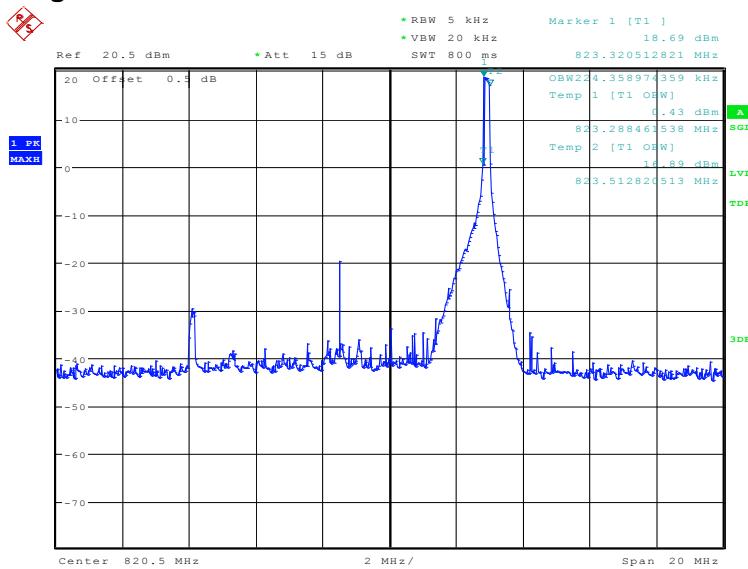
**LOW BAND EDGE BLOCK-1RB-low_offset**

## LOW Emission Mask -1RB-low_offset



Date: 5.NOV.2019  10:04:36
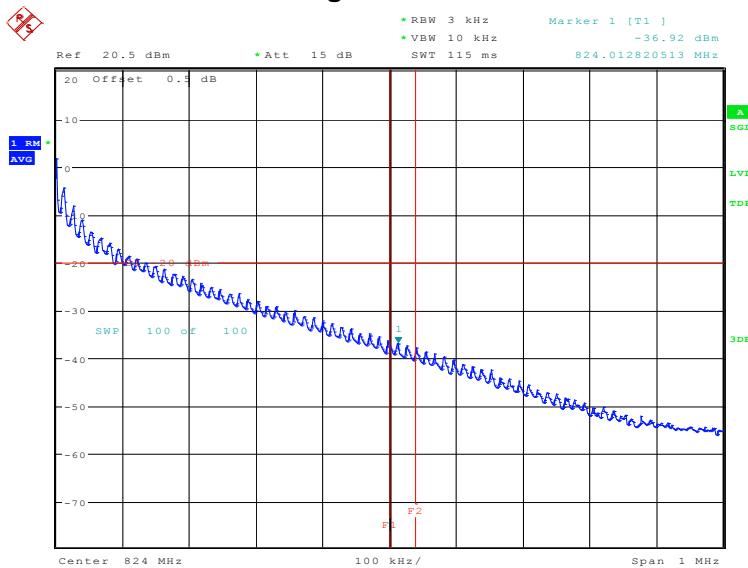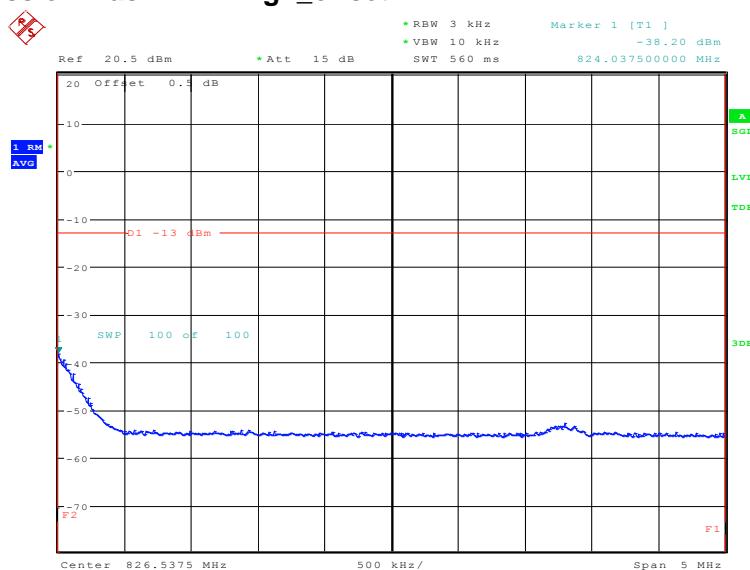
## OBW: 1RB-high_offset



Date: 5.NOV.2019  10:06:55

## HIGH BAND EDGE BLOCK-1RB-high_offset
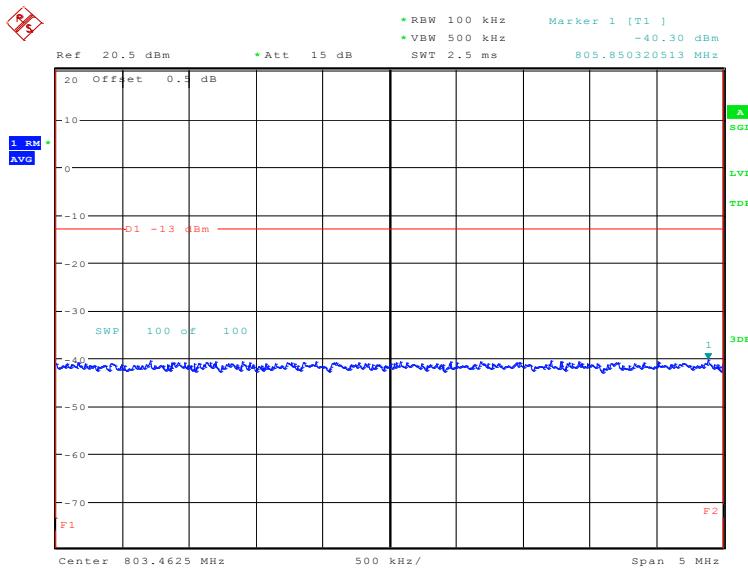


Date: 5.NOV.2019  10:07:21

## HIGH Emission Mask -1RB-high_offset

```
                                          * RBW  3 kHz        Marker 1 [T1 ]
                                          * VBW 10 kHz                 -38.20 dBm
       Ref  20.5 dBm          * Att  15 dB   SWT 560 ms      824.037500000 MHz

       20  Offset  0.5  dB                                                   A
                                                                            SGL
        -10

                                                                            LVL
         0

        -10                                                                 TDF
              D1 -13 dBm

        -20

        -30
              SWP   100 of   100                                            3DB
        -40

        -50

        -60

        -70
       F2                                                                    F1

       Center  826.5375 MHz          500 kHz/              Span 5 MHz
```
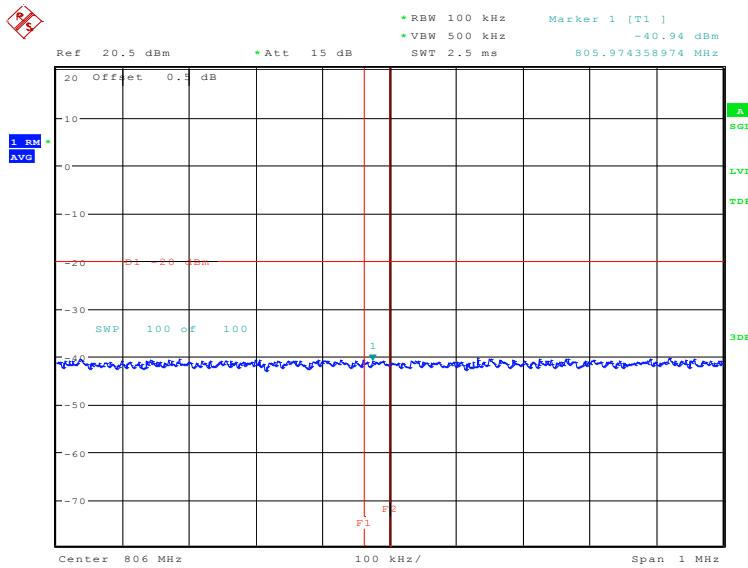
Date: 5.NOV.2019  10:08:32

## LOW Emission Mask -10MHz-100%RB



```
                              * RBW  100 kHz      Marker 1 [T1 ]
                              * VBW  500 kHz              -40.30 dBm
   Ref  20.5 dBm       * Att  15 dB    SWT 2.5 ms   805.850320513 MHz
   20  Offset  0.5  dB
    10                                                         A
                                                               SGL
     0                                                         LVL
                                                               TDF
   -10
        D1 -13 dBm
   -20
   -30
        SWP  100 of  100                                       3DB
                                                          1
   -40
   -50
   -60
   -70
   F1                                                     F2
   Center  803.4625 MHz        500 kHz/           Span  5 MHz
```
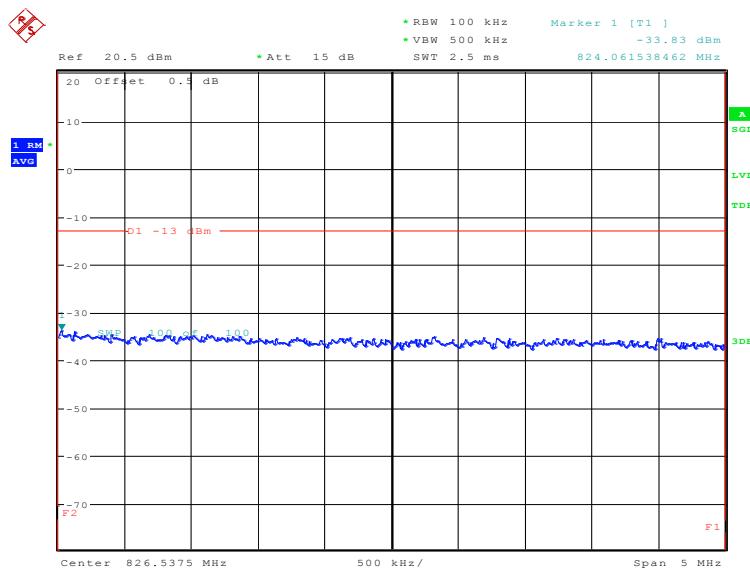
Date: 5.NOV.2019  10:05:36


## LOW BAND EDGE BLOCK-10MHz-100%RB



```
                              * RBW  100 kHz      Marker 1 [T1 ]
                              * VBW  500 kHz              -40.94 dBm
   Ref  20.5 dBm       * Att  15 dB    SWT 2.5 ms   805.974358974 MHz
   20  Offset  0.5  dB
    10                                                         A
                                                               SGL
     0                                                         LVL
                                                               TDF
   -10
   -20    D1 -20 dBm
   -30
        SWP  100 of   100                                      3DB
                                      1
   -40
   -50
   -60
   -70                          F2
                              F1
   Center  806 MHz            100 kHz/            Span  1 MHz
```
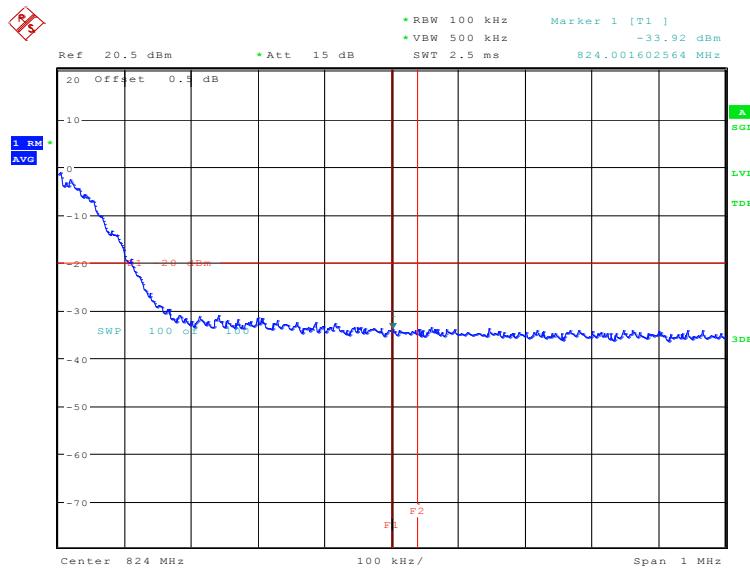
Date: 5.NOV.2019  10:05:17

## HIGH Emission Mask -10MHz-100%RB



Date: 5.NOV.2019  10:09:18
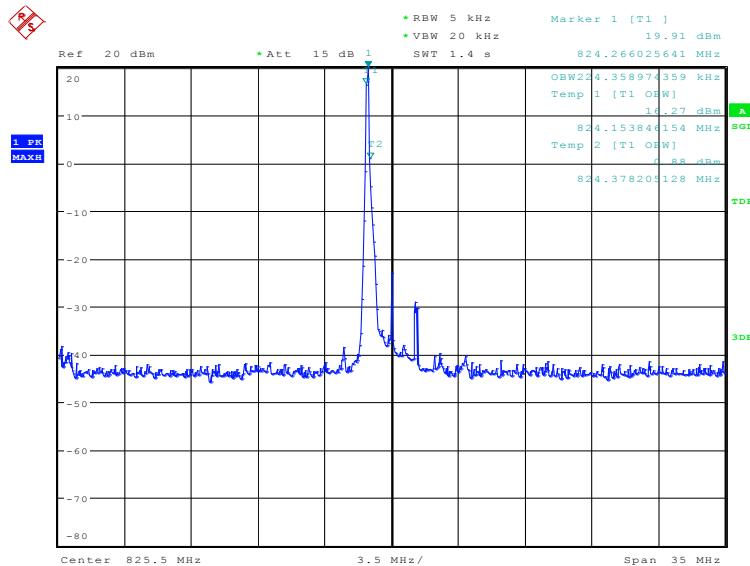
## HIGH BAND EDGE BLOCK-10MHz-100%RB



Date: 5.NOV.2019  10:09:02
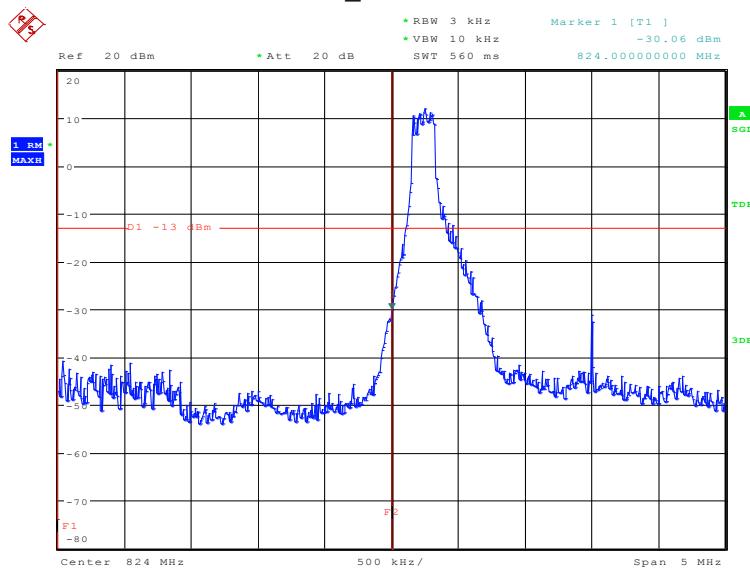
**LTE band 26(824MHz~849MHz)**

**OBW: 1RB-low_offset**
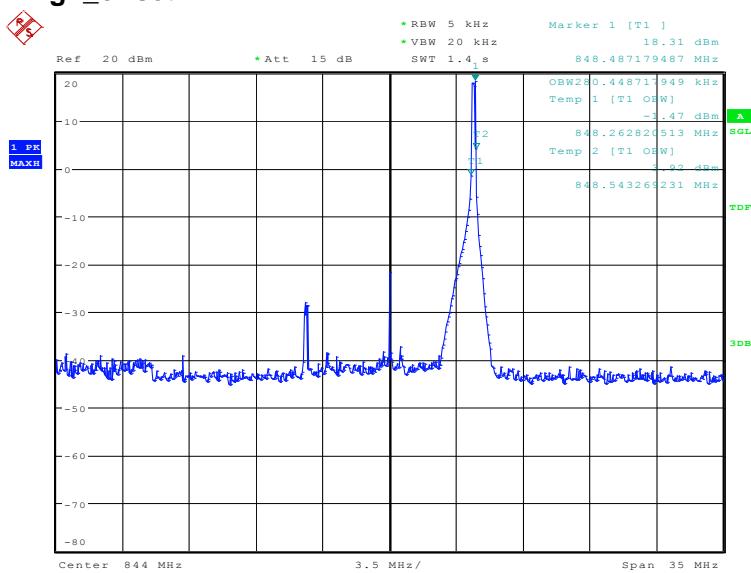


Date: 5.NOV.2019  10:14:58

**LOW BAND EDGE BLOCK-1RB-low_offset**
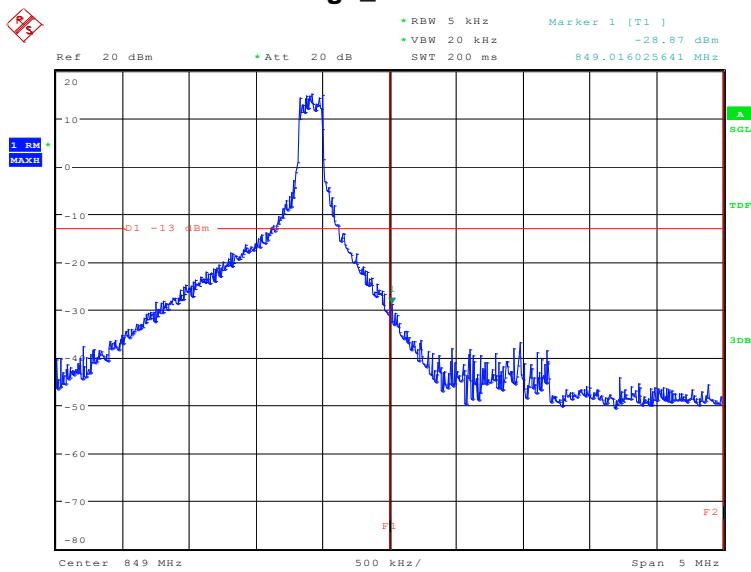


Date: 5.NOV.2019  10:15:13

## OBW: 1RB-high_offset
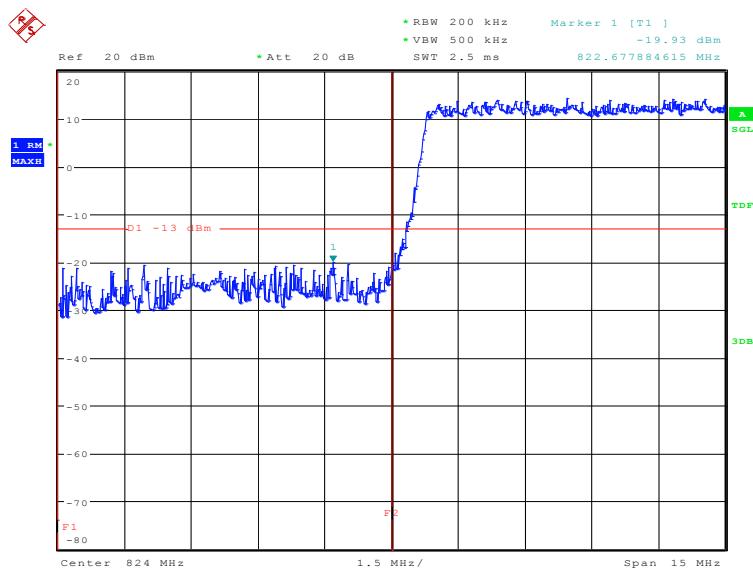


Date: 5.NOV.2019  10:17:53

## HIGH BAND EDGE BLOCK-1RB-high_offset
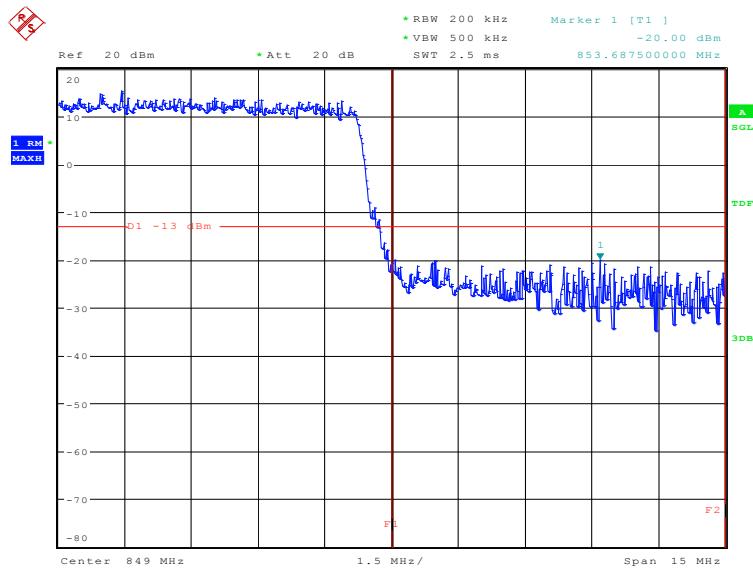


Date: 5.NOV.2019  10:18:08

## LOW BAND EDGE BLOCK-15MHz-100%RB



```
                              *RBW  200 kHz    Marker 1 [T1 ]
                              *VBW  500 kHz              -19.93 dBm
Ref  20 dBm      *Att  20 dB   SWT  2.5 ms      822.677884615 MHz
```

```
Center  824 MHz          1.5 MHz/              Span  15 MHz
```
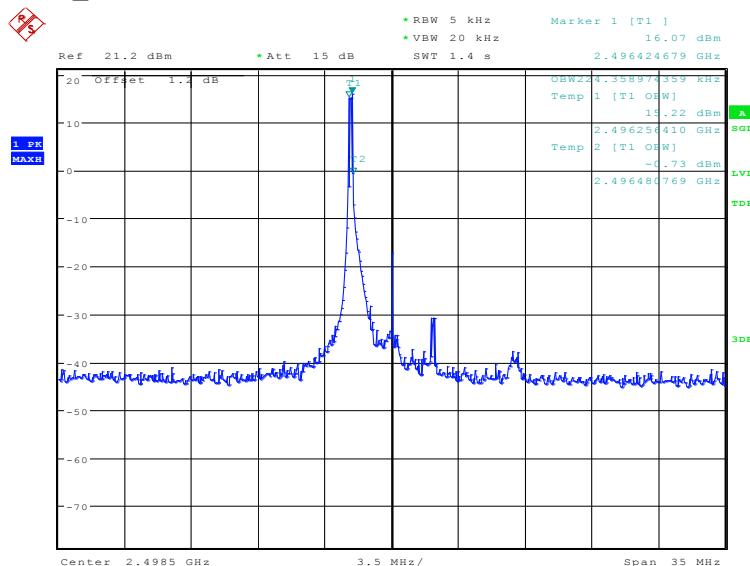
Date: 5.NOV.2019  10:15:54

## HIGH BAND EDGE BLOCK-15MHz-100%RB



```
                              *RBW  200 kHz    Marker 1 [T1 ]
                              *VBW  500 kHz              -20.00 dBm
Ref  20 dBm      *Att  20 dB   SWT  2.5 ms      853.687500000 MHz
```

```
Center  849 MHz          1.5 MHz/              Span  15 MHz
```
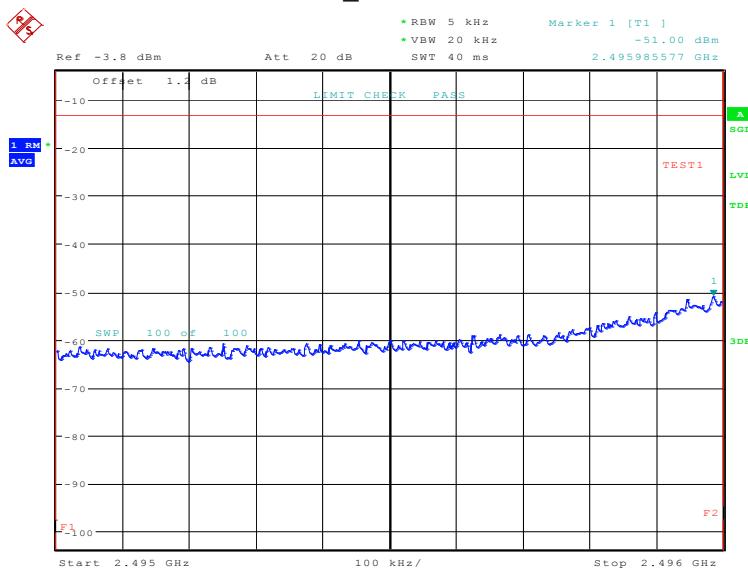
Date: 5.NOV.2019  10:18:49

**LTE band 41(PC2)**

**OBW: 1RB-low_offset**
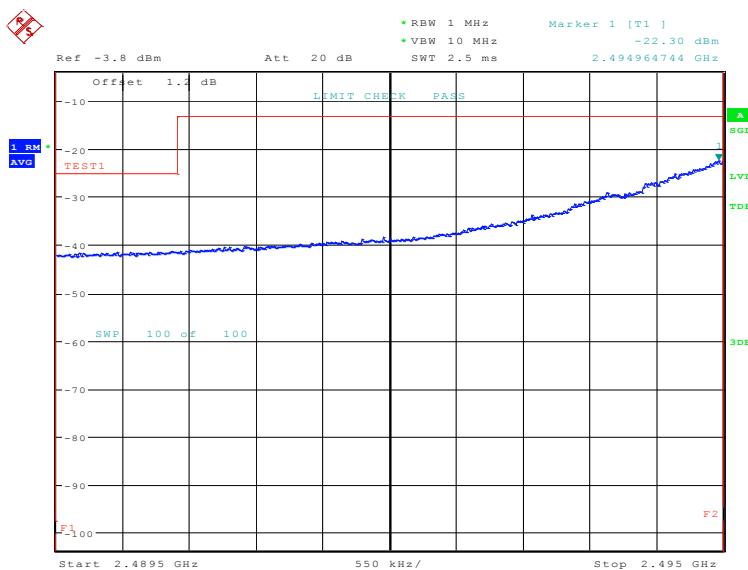
## LOW BAND EDGE BLOCK-1RB-low_offset
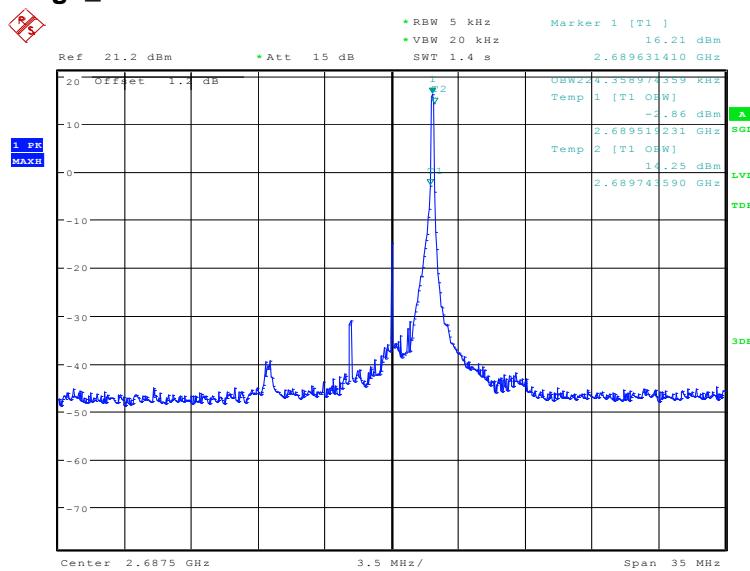


Date: 5.NOV.2019  10:47:06
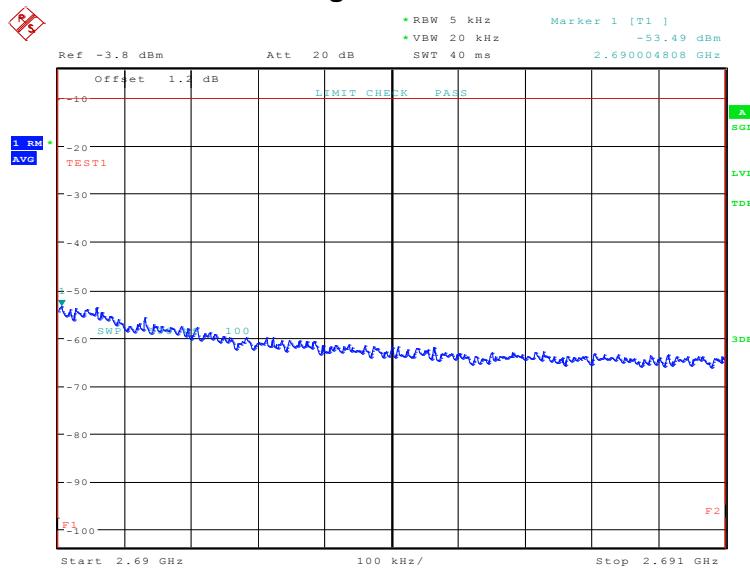


Date: 5.NOV.2019  10:47:21

## OBW: 1RB-high_offset
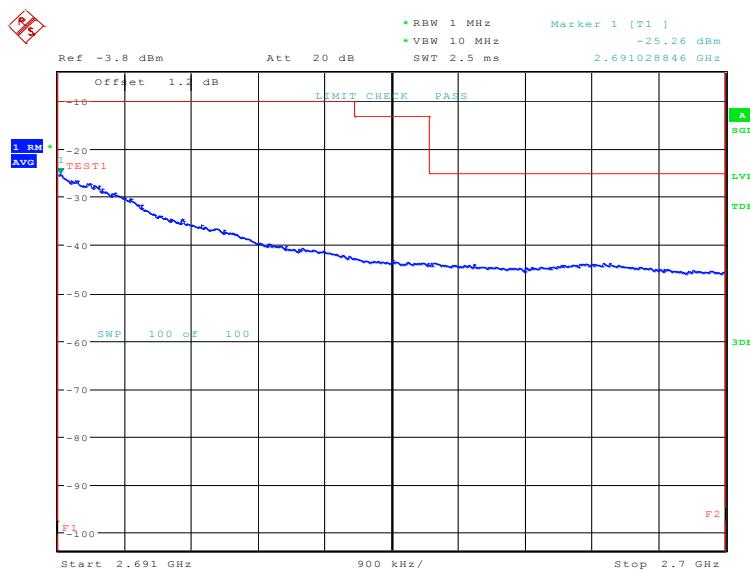


Date: 5.NOV.2019  10:50:22

## HIGH BAND EDGE BLOCK-1RB-high_offset
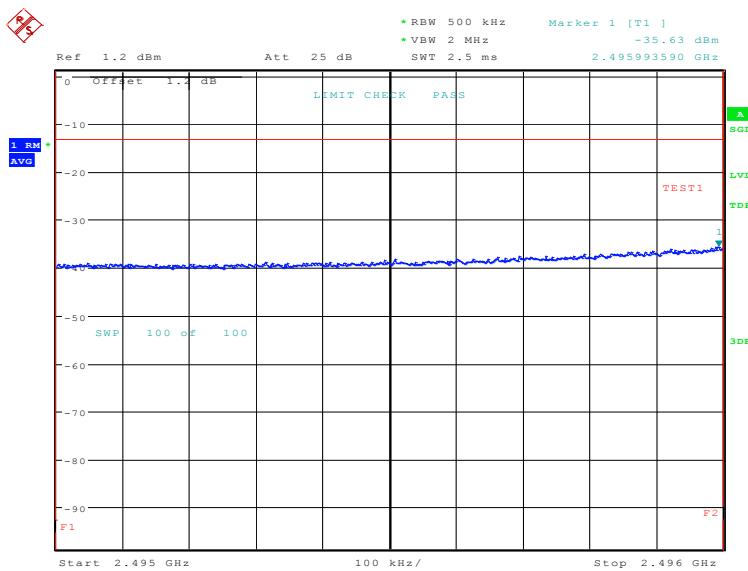


Date: 5.NOV.2019  10:50:43
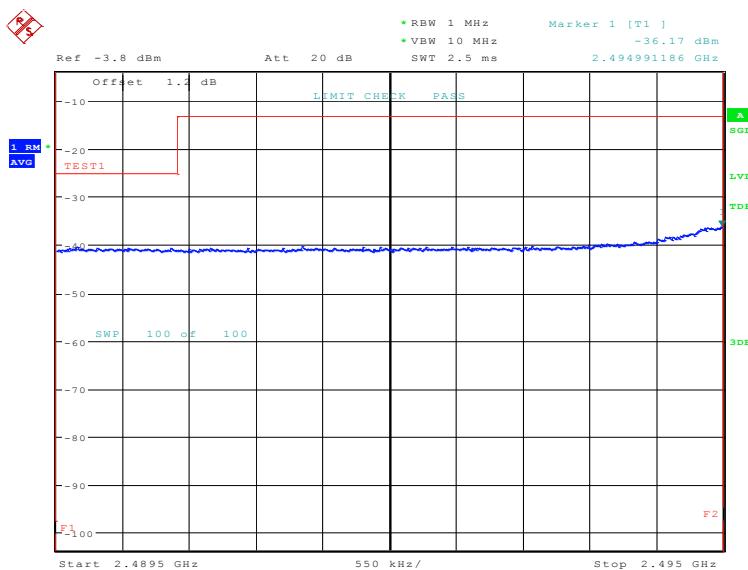


Date: 5.NOV.2019  10:50:58

## LOW BAND EDGE BLOCK-20MHz-100%RB



```
                                            *RBW  500 kHz      Marker 1 [T1 ]
                                            *VBW  2 MHz                  -35.63 dBm
        Ref  1.2 dBm          Att  25 dB    SWT 2.5 ms         2.495993590 GHz
     0   Offset  1.2 dB
                                      LIMIT CHECK   PASS                          A
   -10                                                                            SGL
 1 RM
 AVG
   -20                                                           TEST1            LVL
                                                                                 TDF
   -30                                                                          1
   -40
   -50
        SWP   100 of  100                                                        3DB
   -60
   -70
   -80
   -90
     F1                                                                       F2
        Start 2.495 GHz            100 kHz/              Stop 2.496 GHz
```

Date: 5.NOV.2019  10:48:06



```
                                            *RBW  1 MHz       Marker 1 [T1 ]
                                            *VBW  10 MHz                 -36.17 dBm
        Ref -3.8 dBm          Att  20 dB    SWT 2.5 ms        2.494991186 GHz
        Offset  1.2 dB
   -10                                 LIMIT CHECK   PASS                         A
                                                                                 SGL
 1 RM
 AVG
   -20   TEST1                                                                   LVL
                                                                                 TDF
   -30
   -40
   -50
        SWP   100 of  100                                                        3DB
   -60
   -70
   -80
   -90
     F1                                                                       F2
  -100
        Start 2.4895 GHz           550 kHz/             Stop 2.495 GHz
```

Date: 5.NOV.2019  10:48:21

## HIGH BAND EDGE BLOCK-20MHz-100%RB
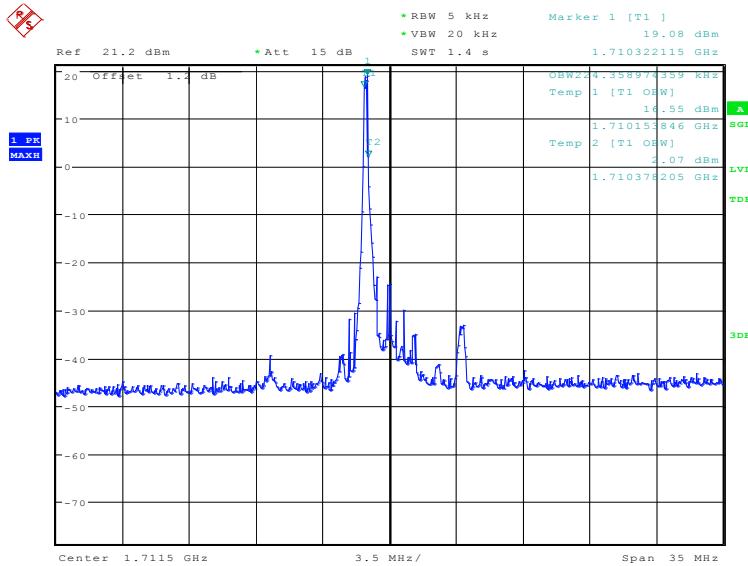


Date: 5.NOV.2019  10:51:44



Date: 5.NOV.2019  10:51:59
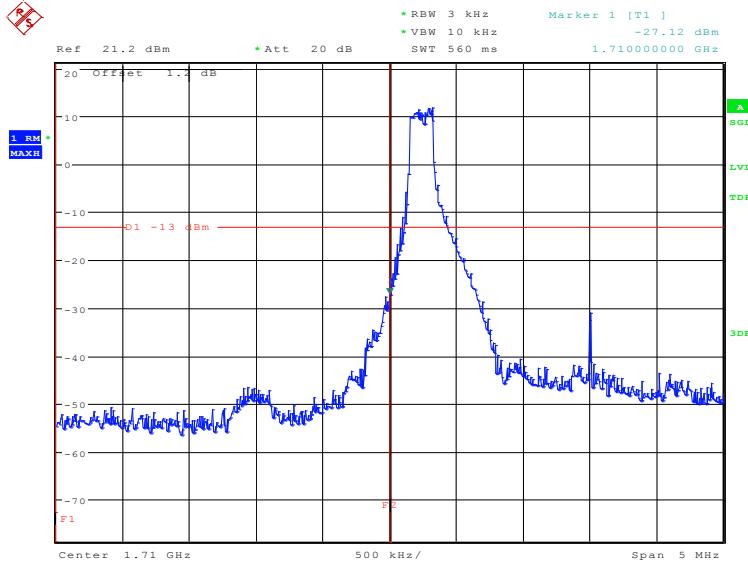
**LTE band 66**
**OBW: 1RB-low_offset**
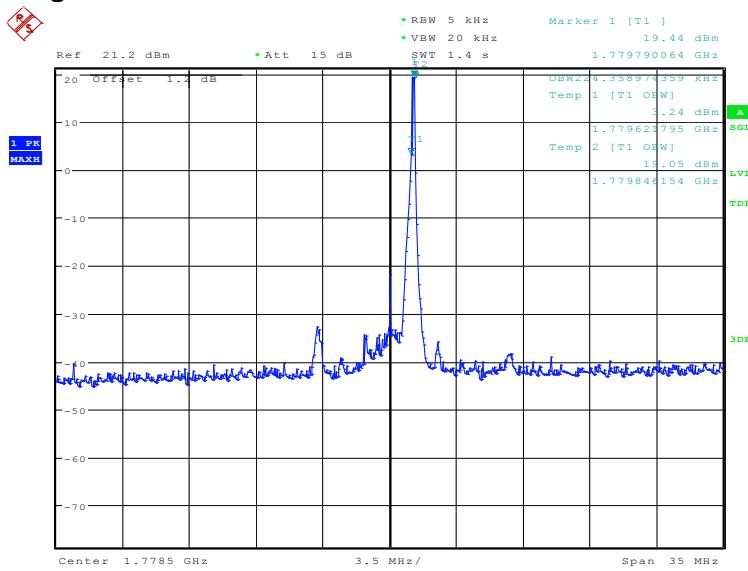


Date: 5.NOV.2019  10:59:11

**LOW BAND EDGE BLOCK-1RB-low_offset**
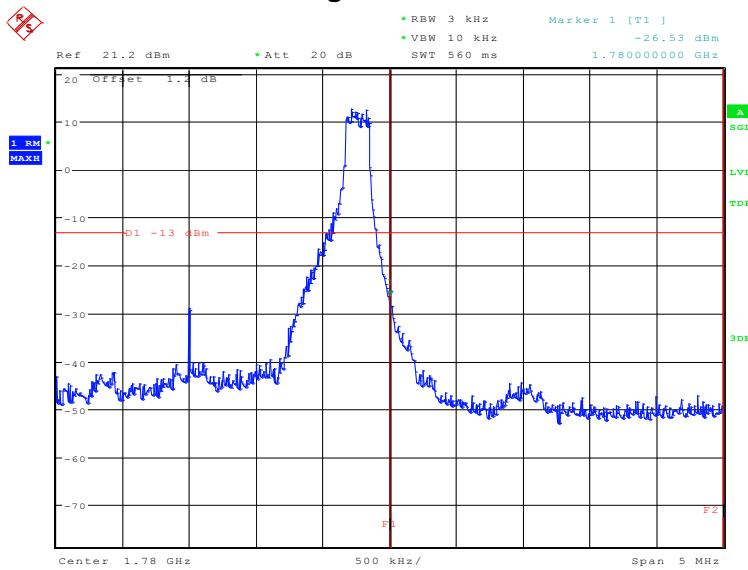


Date: 5.NOV.2019  10:59:26

## OBW: 1RB-high_offset
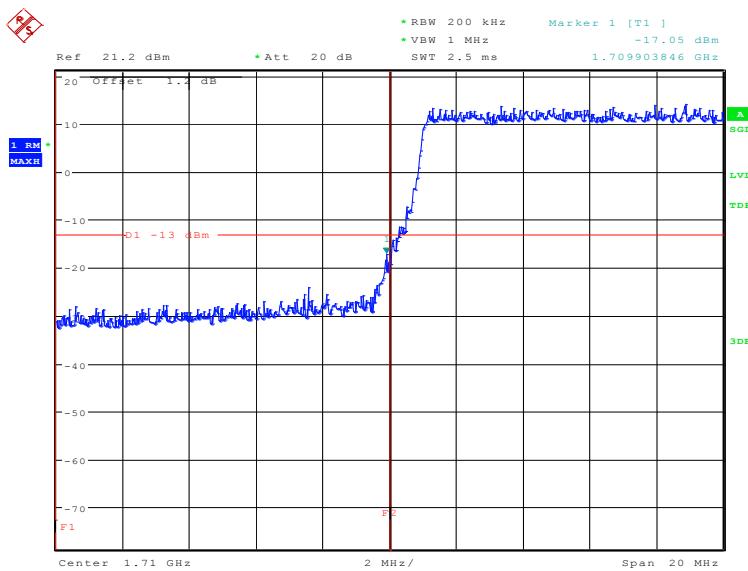


Date: 5.NOV.2019  11:01:29

## HIGH BAND EDGE BLOCK-1RB-high_offset
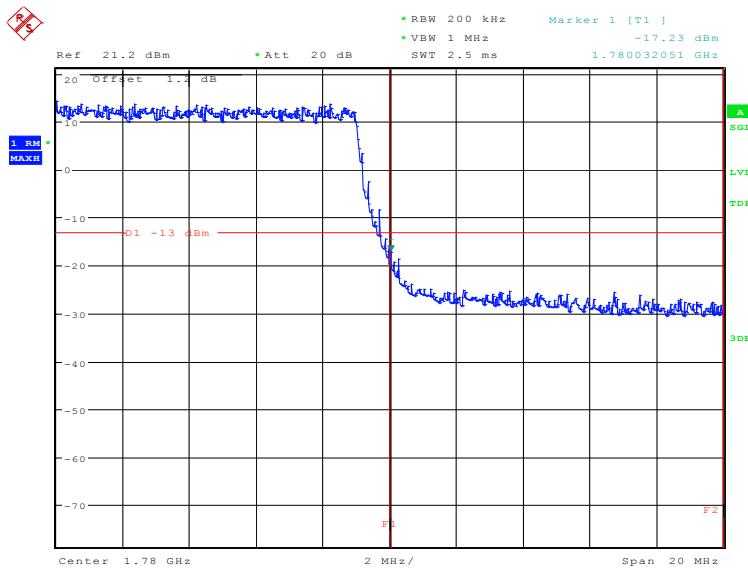


Date: 5.NOV.2019  11:01:44

## LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 5.NOV.2019  11:00:08
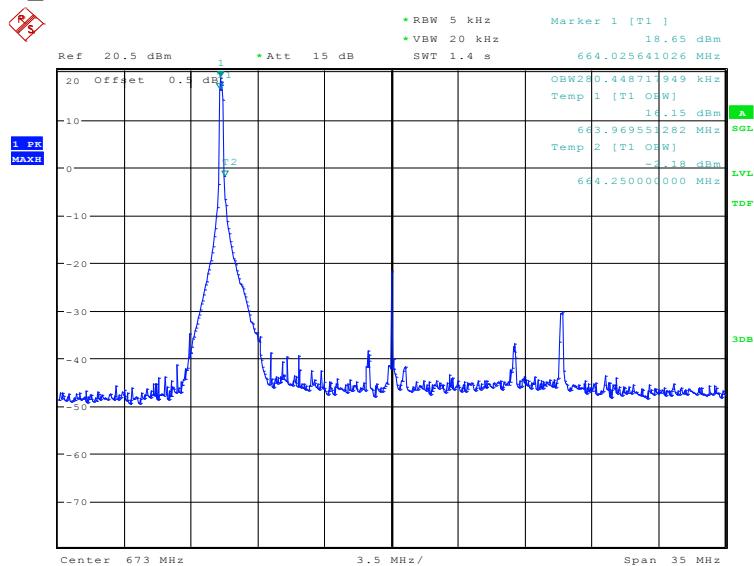
## HIGH BAND EDGE BLOCK-20MHz-100%RB



Date: 5.NOV.2019  11:02:25
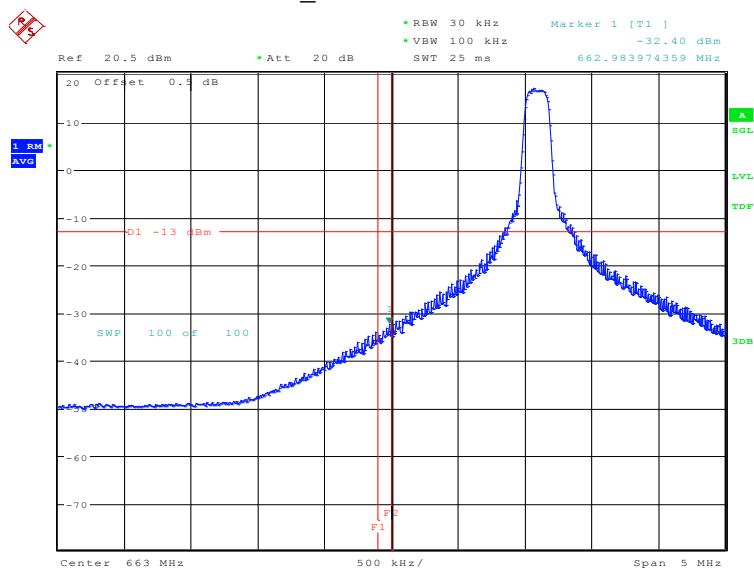
**LTE band 71**

**OBW: 1RB-low_offset**
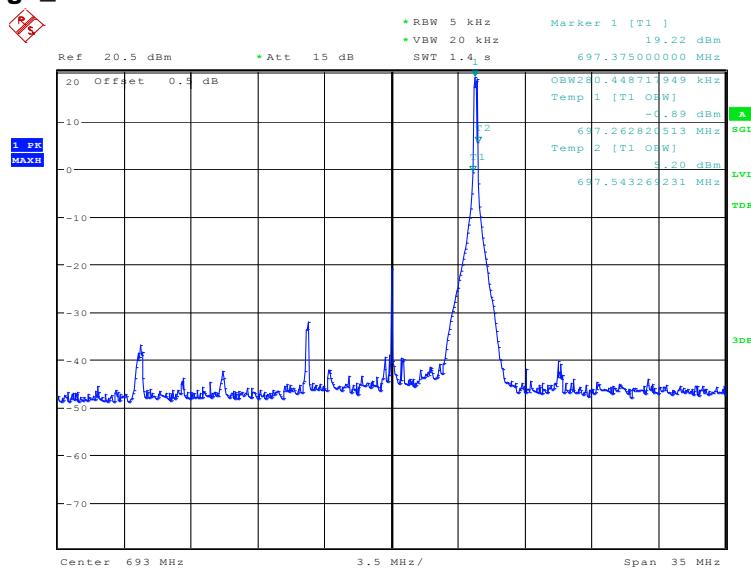


Date: 7.NOV.2019  13:12:09

**LOW BAND EDGE BLOCK-1RB-low_offset**
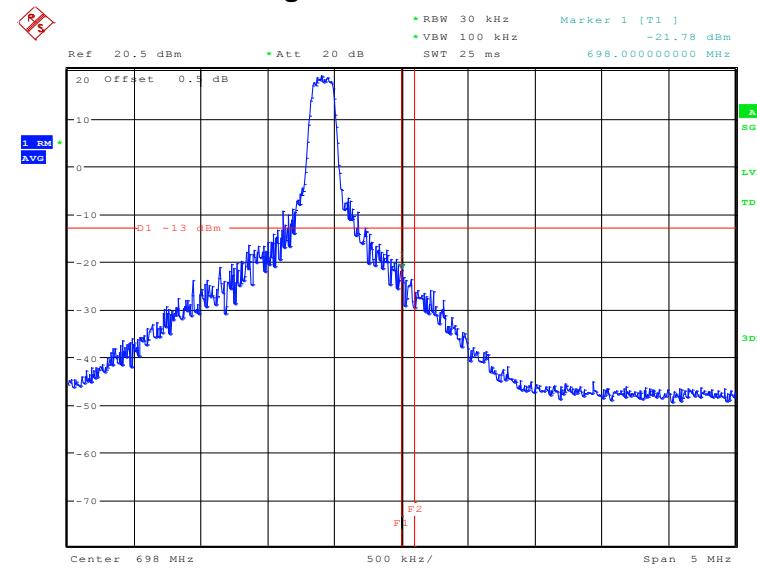


Date: 7.NOV.2019  13:14:53

## OBW: 1RB-high_offset
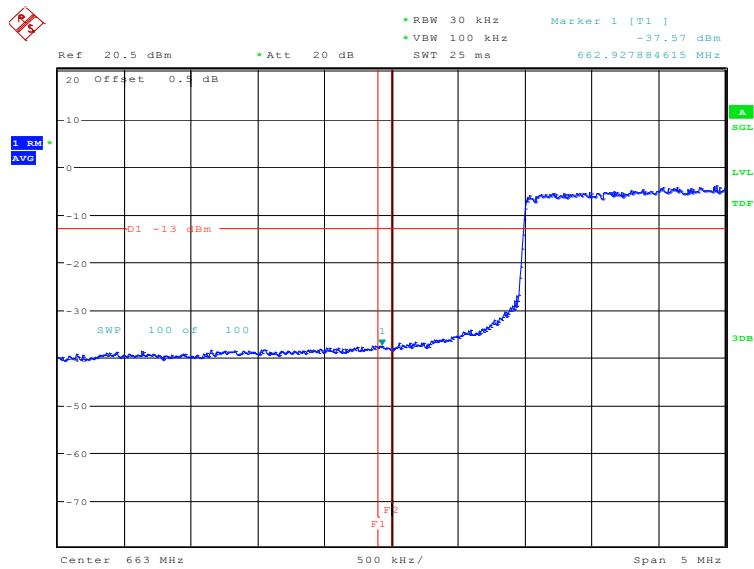


Date: 7.NOV.2019  13:17:56

## HIGH BAND EDGE BLOCK-1RB-high_offset
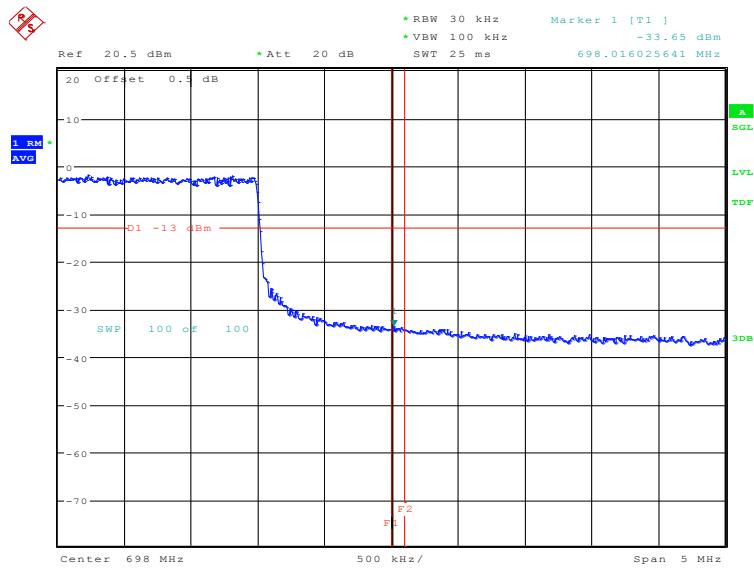


Date: 7.NOV.2019  13:20:00

## LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 7.NOV.2019  13:15:58

## HIGH BAND EDGE BLOCK-20MHz-100%RB



Date: 7.NOV.2019  13:21:01

## A.7   CONDUCTED SPURIOUS EMISSION

### A.7.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is set to 30001 which is greater than span/RBW.

### A. 7.2 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 that 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(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, 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 any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 +

10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Part 90.691 states that out-of-band emission requirement shall apply only to the ''outer'' channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 Log_{10}(f/6.1)$ decibels or $50 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

## A. 7.2 Measurement result
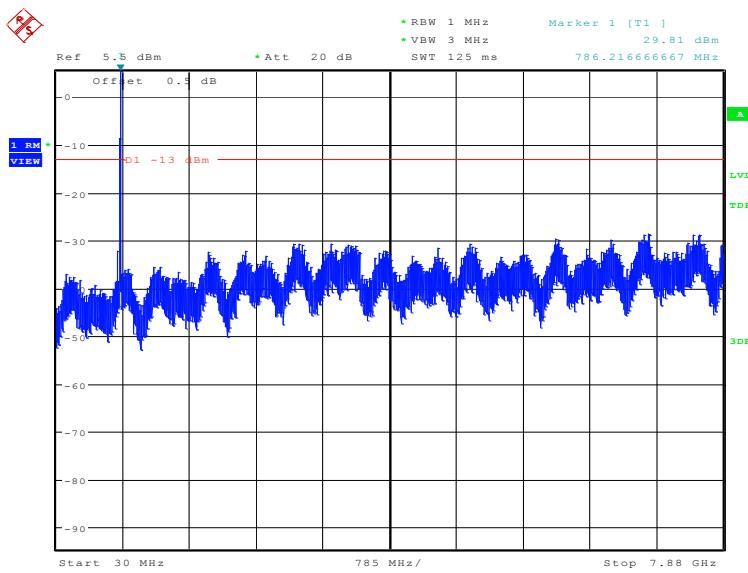
### Only the worst case result is given below

**LTE band 12: 30MHz – 7.46GHz**



```
                                    *RBW  100 kHz      Marker 1 [T1 ]
                                    *VBW  300 kHz                24.68 dBm
          Ref   5.5 dBm     *Att  20 dB    SWT  760 ms    714.798333333 MHz
              Offset  0.5 dB
```
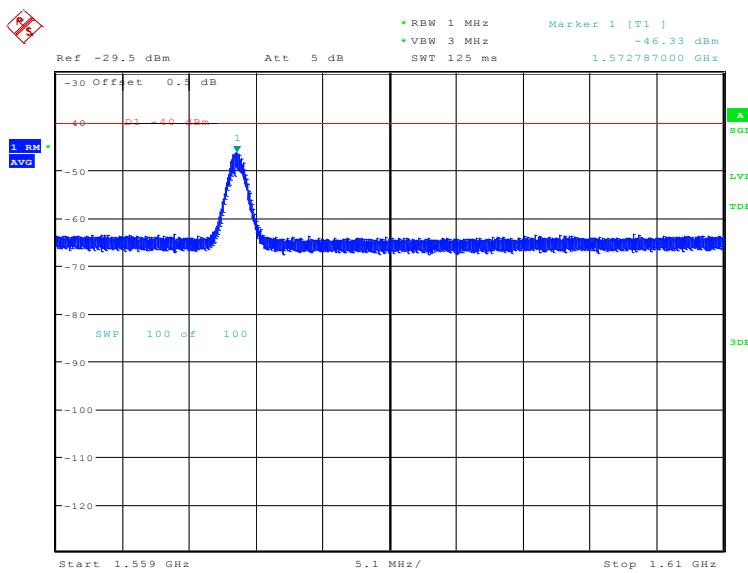
Date: 5.NOV.2019  09:23:58

## LTE band 13: 30MHz – 7.88GHz
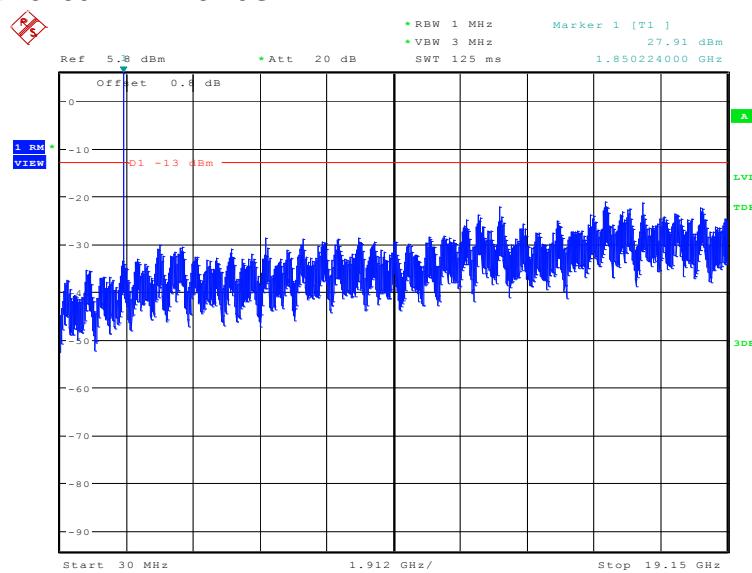


Date: 5.NOV.2019  10:29:51

## LTE band 13: 1559MHz – 1610MHz
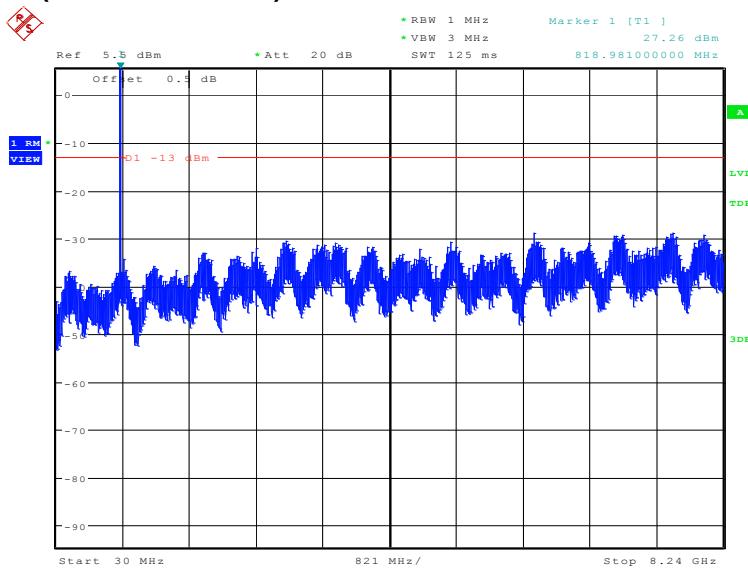


Date: 5.NOV.2019  10:30:25

**LTE band 25: 30MHz – 19.15GHz**
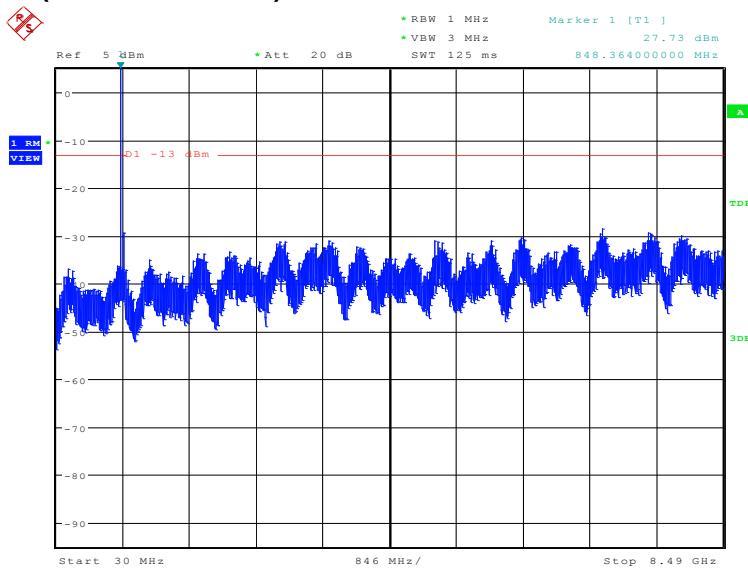


Date: 5.NOV.2019  10:40:33

## LTE band 26(814MHz~824MHz): 30MHz – 8.24GHz
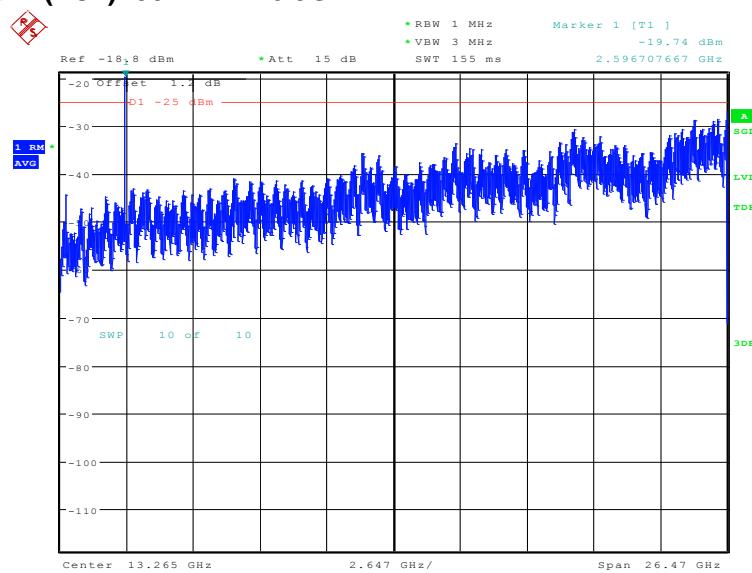


Date: 5.NOV.2019  10:01:02

## LTE band 26(824MHz~849MHz): 30MHz – 8.49GHz
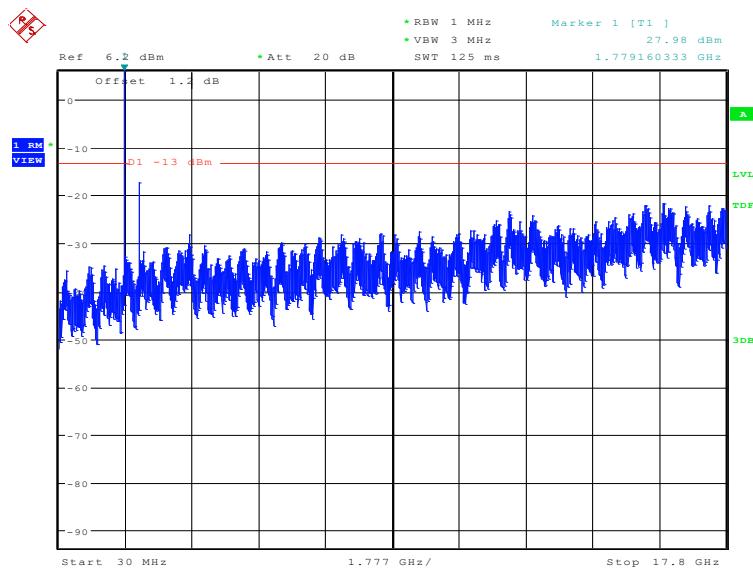


Date: 5.NOV.2019  10:19:50

## LTE band 41(PC2): 30MHz – 26.5GHz

```
                                              * RBW  1 MHz         Marker 1 [T1 ]
                                              * VBW  3 MHz                  -19.74 dBm
  Ref  -18.8 dBm            * Att  15 dB      SWT  155 ms          2.596707667 GHz
  -20 Offset   1.2 dB
          D1 -25 dBm
  -30
1 RM
AVG
  -40
  -70
          SWP    10 of    10
  -80
  -90
  -100
  -110

  Center  13.265 GHz              2.647 GHz/              Span  26.47 GHz
```
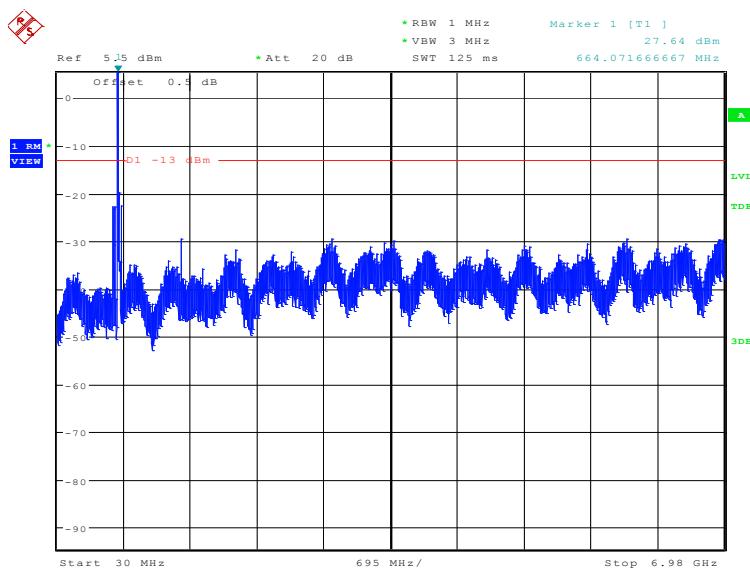
Date: 5.NOV.2019  11:10:01

## LTE band 66: 30MHz – 17.8GHz



Date: 7.NOV.2019  11:13:31

## LTE band 71: 30MHz – 6.98GHz



Date: 7.NOV.2019  11:05:46

## A.8  PEAK-TO-AVERAGE POWER RATIO

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168 5.7.1:

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval to 1 ms

e) Record the maximum PAPR level associated with a probability of 0.1%

### A.8.1 Measurement limit

not exceed 13 dB

### A.8.2 Measurement results

**LTE band 12, 10MHz**

| Frequency(MHz) | PAPR(dB) | |
|---|---|---|
| | QPSK | 16QAM |
| 707.5 | 5.58 | 6.38 |

**LTE band 13, 10MHz**

| Frequency(MHz) | PAPR(dB) | |
|---|---|---|
| | QPSK | 16QAM |
| 782.0 | 5.45 | 6.31 |

**LTE band 25, 20MHz**

| Frequency(MHz) | PAPR(dB) | |
|---|---|---|
| | QPSK | 16QAM |
| 1882.5 | 6.86 | 7.40 |

**LTE band 41(PC2), 20MHz**

| Frequency(MHz) | PAPR(dB) | |
|---|---|---|
| | QPSK | 16QAM |
| 2593.0 | 8.17 | 8.91 |

**LTE band 66, 20MHz**

| Frequency(MHz) | PAPR(dB) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745.0 | 6.60 | 7.31 |

**LTE band 71, 20MHz**

| Frequency(MHz) | PAPR(dB) | |
|---|---|---|
| | QPSK | 16QAM |
| 680.5 | 6.19 | 7.18 |

## ANNEX B: Accreditation Certificate

**United States Department of Commerce**
**National Institute of Standards and Technology**

**NVLAP®**

## Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

**Telecommunication Technology Labs, CAICT**

Beijing

China

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,*
*listed on the Scope of Accreditation, for:*

**Electromagnetic Compatibility & Telecommunications**
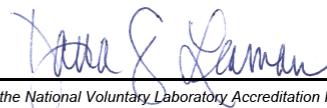
*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.*
*This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality*
*management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2019-09-26 through 2020-09-30

*Effective Dates*

*For the National Voluntary Laboratory Accreditation Program*

**\*\*\*END OF REPORT\*\*\***