



FCC ID: P4Q-N635A  
Report No.: T191105W01-RP11

IC: 2420C-N635A

Page: 1 / 118  
Rev.: 00

**FCC 47 CFR PART 27 SUBPART C, L  
&  
INDUSTRY CANADA RSS-130**

**TEST REPORT**

**For**

**Chiron pro**

**Model No.: N635**

**Trade Name: Mitac, Mio, Navman, Magellan**

*Issued to*

|             |                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------|
| <b>FCC:</b> | <b>Mitac Digital Technology Corporation<br/>No.200, Wen Hwa 2nd Rd.,Kuei Shan Dist. Taoyuan, 33383 Taiwan</b> |
| <b>IC:</b>  | <b>MiTAC Digital Technology Corporation<br/>No.200, Wenhua 2nd Rd., Guishan Dist. Taoyuan City 333 Taiwan</b> |

*Issued by*

**Compliance Certification Services Inc.  
Wugu Laboratory  
No.11, Wugong 6th Rd., Wugu Dist.,  
New Taipei City 24891, Taiwan. (R.O.C.)  
Issued Date: January 17, 2020**

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.  
除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部分複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at [www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm) and for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Report No.: T191105W01-RP11

Page: 2 / 118

Rev.: 00

### **Revision History**

| Rev. | Issue Date       | Revisions     | Effect Page | Revised By   |
|------|------------------|---------------|-------------|--------------|
| 00   | January 17, 2020 | Initial Issue | ALL         | Allison Chen |

**TABLE OF CONTENTS**

|           |                                                  |            |
|-----------|--------------------------------------------------|------------|
| <b>1.</b> | <b>TEST RESULT CERTIFICATION.....</b>            | <b>4</b>   |
| <b>2.</b> | <b>EUT DESCRIPTION .....</b>                     | <b>6</b>   |
| <b>3.</b> | <b>TEST METHODOLOGY .....</b>                    | <b>7</b>   |
| 3.1       | DESCRIPTION OF TEST TYPE .....                   | 7          |
| 3.2       | THE WORST MODE OF MEASUREMENT .....              | 8          |
| <b>4.</b> | <b>TEST SUMMARY .....</b>                        | <b>9</b>   |
| <b>5.</b> | <b>INSTRUMENT CALIBRATION.....</b>               | <b>10</b>  |
| 5.1       | MEASURING INSTRUMENT CALIBRATION .....           | 10         |
| 5.2       | MEASUREMENT EQUIPMENT USED .....                 | 10         |
| 5.3       | MEASUREMENT UNCERTAINTY .....                    | 11         |
| <b>6.</b> | <b>FACILITIES AND ACCREDITATIONS.....</b>        | <b>12</b>  |
| 6.1       | FACILITIES.....                                  | 12         |
| 6.2       | EQUIPMENT .....                                  | 12         |
| <b>7.</b> | <b>SETUP OF EQUIPMENT UNDER TEST.....</b>        | <b>13</b>  |
| 7.1       | SETUP CONFIGURATION OF EUT .....                 | 13         |
| 7.2       | SUPPORT EQUIPMENT .....                          | 13         |
| <b>8.</b> | <b>TEST PROCEDURE AND RESULT .....</b>           | <b>14</b>  |
| 8.1       | ERP & EIRP MEASUREMENT .....                     | 14         |
| 8.2       | FREQUENCY STABILITY MEASUREMENT .....            | 27         |
| 8.3       | OCCUPIED BANDWIDTH MEASUREMENT .....             | 32         |
| 8.4       | PEAK TO AVERAGE POWER RATIO.....                 | 40         |
| 8.5       | BAND EDGE MEASUREMENT .....                      | 56         |
| 8.6       | CONDUCTED SPURIOUS EMISSIONS .....               | 81         |
| 8.7       | RADIATED EMISSION MEASUREMENT .....              | 106        |
|           | <b>APPENDIX A PHOTOGRAPHS OF TEST SETUP.....</b> | <b>A-1</b> |

## 1. TEST RESULT CERTIFICATION

**FCC Applicant:** Mitac Digital Technology Corporation  
No.200, Wen Hwa 2nd Rd.,Kuei Shan Dist. Taoyuan, 33383  
Taiwan

**IC Applicant:** MiTAC Digital Technology Corporation  
No.200, Wenhua 2nd Rd., Guishan Dist. Taoyuan City 333  
Taiwan

**Manufacturer:** MITAC COMPUTER (KUNSHAN) CO., LTD.  
No. 269, 2nd Avenue, District A, Comprehensive Free Trade  
Zone, Kunshan, Jiangsu, P.R. China

**Equipment Under Test:** Chiron pro

**Trade Name:** Mitac, Mio, Navman, Magellan

**Model No.:** N635

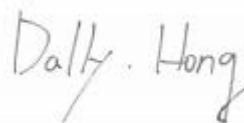
**Date of Test:** December 6 ~ 18, 2019

| APPLICABLE STANDARDS                                                                                                                                |                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Standard                                                                                                                                            | TEST RESULT             |
| FCC Part 27, Subpart C, L, FCC Part 2<br>&<br>RSS-130 Issue 2 February 2019                                                                         | No non-compliance noted |
| Statements of Conformity                                                                                                                            |                         |
| Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty. |                         |

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Tested by:



---

Kevin Tsai  
Deputy Manager  
Compliance Certification Services Inc.

---

Dally Hong  
Engineer  
Compliance Certification Services Inc.

## 2. EUT DESCRIPTION

|                                   |                                                                                                                                                                      |                     |           |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|
| <b>Product</b>                    | Chiron pro                                                                                                                                                           |                     |           |
| <b>Model No.</b>                  | N635                                                                                                                                                                 |                     |           |
| <b>Model Discrepancy</b>          | Difference of the those trade names (list on this report) are just for marketing purpose only.                                                                       |                     |           |
| <b>Trade</b>                      | Mitac, Mio, Navman, Magellan                                                                                                                                         |                     |           |
| <b>Received Date</b>              | November 5, 2019                                                                                                                                                     |                     |           |
| <b>Power Supply</b>               | 1. Power from Rechargeable Li-ion Polymer Battery.<br>Rating: 3.7VDC, 4000mAh, 14.8Wh<br>2. Power from Adapter.<br>I/P: 100-240VAC, 50/60Hz, 0.5A<br>O/P: 5.0VDC, 2A |                     |           |
| <b>Modulation Technology</b>      | LTE Band 12                                                                                                                                                          | QPSK, 16QAM         |           |
|                                   | LTE Band 17                                                                                                                                                          | QPSK, 16QAM         |           |
| <b>Frequency Range</b>            | LTE Band 12<br>Channel Bandwidth: 1.4MHz                                                                                                                             | 669.7MHz ~ 715.3MHz |           |
|                                   | LTE Band 12<br>Channel Bandwidth: 3MHz                                                                                                                               | 700.5MHz ~ 714.5MHz |           |
|                                   | LTE Band 12<br>Channel Bandwidth: 5MHz                                                                                                                               | 701.5MHz ~ 713.5MHz |           |
|                                   | LTE Band 12<br>Channel Bandwidth: 10MHz                                                                                                                              | 704MHz ~ 711MHz     |           |
|                                   | LTE Band 17<br>Channel Bandwidth: 5MHz                                                                                                                               | 706.5MHz ~ 713.5MHz |           |
|                                   | LTE Band 17<br>Channel Bandwidth: 10MHz                                                                                                                              | 709MHz ~ 711MHz     |           |
| <b>Transmit Power (ERP Power)</b> | LTE Band 12<br>Channel Bandwidth: 1.4MHz                                                                                                                             | QPSK                | 18.54 dBm |
|                                   |                                                                                                                                                                      | 16QAM               | 17.94 dBm |
|                                   | LTE Band 12<br>Channel Bandwidth: 3MHz                                                                                                                               | QPSK                | 18.67 dBm |
|                                   |                                                                                                                                                                      | 16QAM               | 18.02 dBm |
|                                   | LTE Band 12<br>Channel Bandwidth: 5MHz                                                                                                                               | QPSK                | 18.87 dBm |
|                                   |                                                                                                                                                                      | 16QAM               | 18.13 dBm |
|                                   | LTE Band 12<br>Channel Bandwidth: 10MHz                                                                                                                              | QPSK                | 19.04 dBm |
|                                   |                                                                                                                                                                      | 16QAM               | 18.23 dBm |
|                                   | LTE Band 17<br>Channel Bandwidth: 5MHz                                                                                                                               | QPSK:               | 18.96 dBm |
|                                   |                                                                                                                                                                      | 16QAM:              | 18.13 dBm |
|                                   | LTE Band 17<br>Channel Bandwidth: 10MHz                                                                                                                              | QPSK:               | 19.04 dBm |
|                                   |                                                                                                                                                                      | 16QAM:              | 18.23 dBm |
| <b>Antenna Specification</b>      | Antenna type: Integral<br>Band 12: -1.58 dBi<br>Band 17: -1.58 dBi                                                                                                   |                     |           |

**Note:** 1. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3. TEST METHODOLOGY

#### 3.1 DESCRIPTION OF TEST TYPE

The EUT (model: N635) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

#### LTE Band 12: 699 MHz ~ 716 MHz

Three channels had been tested for each channel bandwidth.

| Channel Bandwidth | 1.4MHz  |                 | 3MHz    |                 | 5MHz    |                 | 10MHz   |                 |
|-------------------|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
|                   | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| Low CH            | 23017   | 699.7           | 23025   | 700.5           | 23035   | 701.5           | 23060   | 704             |
| Middle CH         | 23095   | 707.5           | 23095   | 707.5           | 23095   | 707.5           | 23095   | 707.5           |
| High CH           | 23173   | 715.3           | 23165   | 714.5           | 23155   | 713.5           | 23130   | 711             |

#### LTE Band 17: 704 MHz ~ 716 MHz

Three channels had been tested for each channel bandwidth.

| Channel Bandwidth  | 5MHz    |                | 10MHz   |                |
|--------------------|---------|----------------|---------|----------------|
|                    | Channel | Frequency(MHz) | Channel | Frequency(MHz) |
| Low channel (L)    | 23755   | 706.5          | 23780   | 709.0          |
| Middle channel (M) | 23790   | 710.0          | 23790   | 710.0          |
| High channel (H)   | 23825   | 713.5          | 23800   | 711.0          |

## 3.2 THE WORST MODE OF MEASUREMENT

### 3.2.1 The worst mode of measurement

| Radiated Emission Measurement |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Condition                | Band edge, Emission for Unwanted and Fundamental                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Power supply Mode             | Mode1: EUT Power by Battery (DC 3V)<br>Mode2: EUT Power by Adapter + Type C USB<br>Mode3: EUT Power by Type C USB+ CarCharge (DC12V)<br>Mode4: EUT Power by Cradle(N564)+Micro USB+Adapter<br>Mode5: EUT Power by Cradle(N564)+Micro USB+ CarCharge (DC12V)<br>Mode6: EUT Power by Cradle(N564) + Cable(DC 12V)<br>Mode7: EUT Power by Cradle(N564_TN)+Micro USB+Adapter<br>Mode8: EUT Power by Cradle(N564_TN)+Micro USB+ CarCharge (DC12V)<br>Mode9: EUT Power by Cradle(N564_TN) + Cable(DC 12V)<br>Mode10: EUT Power by Cradle(N635_V)+Micro USB+Adapter<br>Mode11: EUT Power by Cradle(N635_V)+Micro USB+ CarCharge (DC12V)<br>Mode12: EUT Power by Cradle(N635_V) + Cable(DC 12V)<br>Mode13: EUT Power by Cradle(N635_VL)+Micro USB+Adapter<br>Mode14: EUT Power by Cradle(N635_VL)+Micro USB+ CarCharge (DC12V)<br>Mode15: EUT Power by Cradle(N635_VL) + Cable(DC 12V)<br>Mode16: EUT Power by Cradle(N635_VHG) + Cable(DC 12V) |
| Worst Mode                    | <input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Worst Position                | <input type="checkbox"/> Placed in fixed position.<br><input type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane)<br><input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane)<br><input checked="" type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Radiated Emission Measurement Below 1G |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Condition                         | Radiated Emission Below 1G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Power supply Mode                      | Mode1: EUT Power by Battery (DC 3V)<br>Mode2: EUT Power by Adapter + Type C USB<br>Mode3: EUT Power by Type C USB+ CarCharge (DC12V)<br>Mode4: EUT Power by Cradle(N564)+Micro USB+Adapter<br>Mode5: EUT Power by Cradle(N564)+Micro USB+ CarCharge (DC12V)<br>Mode6: EUT Power by Cradle(N564) + Cable(DC 12V)<br>Mode7: EUT Power by Cradle(N564_TN)+Micro USB+Adapter<br>Mode8: EUT Power by Cradle(N564_TN)+Micro USB+ CarCharge (DC12V)<br>Mode9: EUT Power by Cradle(N564_TN) + Cable(DC 12V)<br>Mode10: EUT Power by Cradle(N635_V)+Micro USB+Adapter<br>Mode11: EUT Power by Cradle(N635_V)+Micro USB+ CarCharge (DC12V)<br>Mode12: EUT Power by Cradle(N635_V) + Cable(DC 12V)<br>Mode13: EUT Power by Cradle(N635_VL)+Micro USB+Adapter<br>Mode14: EUT Power by Cradle(N635_VL)+Micro USB+ CarCharge (DC12V)<br>Mode15: EUT Power by Cradle(N635_VL) + Cable(DC 12V)<br>Mode16: EUT Power by Cradle(N635_VHG) + Cable(DC 12V) |
| Worst Mode                             | <input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Remark:**

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(Z-Plane) were recorded in this report



Report No.: T191105W01-RP11

Page: 9 / 118

Rev.: 00

## 4. TEST SUMMARY

| FCC Standard Section | IC Standard Section  | Report Section | Test Item                                           | Result |
|----------------------|----------------------|----------------|-----------------------------------------------------|--------|
| -                    | -                    | 2              | Antenna Requirement                                 | Pass   |
| 27.50(c)             | RSS-130, section 4.6 | 8.1            | ERP and EIRP Measurement                            | Pass   |
| 2.1055,<br>27.54     | RSS-130 section 4.3  | 8.2            | Frequency Stability v.s.<br>temperature measurement | Pass   |
| 2.1049               | RSS-GEN 6.7          | 8.3            | Occupied Bandwidth<br>Measurement                   | Pass   |
| 27.50(b)             | RSS-130 section 4.4  | 8.4            | Peak to Average Ratio                               | Pass   |
| 27.53(g)             | RSS-130 section 4.6  | 8.5            | Conducted Band Edge                                 | Pass   |
| 27.53(g)             | RSS-130 section 4.6  | 8.6            | Conducted Spurious Emission                         | Pass   |
| 27.53(g)             | RSS-130 section 4.6  | 8.7            | Spurious Radiation<br>Measurement                   | Pass   |

## 5. INSTRUMENT CALIBRATION

### 5.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 5.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

**Remark:** Each piece of equipment is scheduled for calibration once a year.

| RF Conducted Test Site              |                    |            |        |            |            |
|-------------------------------------|--------------------|------------|--------|------------|------------|
| Equipment                           | Manufacturer       | Model      | S/N    | Cal Date   | Cal Due    |
| Coaxial Cable                       | Woken              | WC12       | CC003  | 06/28/2019 | 06/27/2020 |
| Power Divider                       | Solvang Technology | STI08-0015 | 008    | 08/06/2019 | 08/05/2020 |
| Signal Analyzer                     | R&S                | FSV 40     | 101073 | 09/25/2019 | 09/24/2020 |
| Wideband Radio Communication Tester | R&S                | CMW 500    | 116875 | 07/29/2019 | 07/28/2020 |
| Software                            | N/A                |            |        |            |            |

| 3M 966 Chamber Test Site            |                  |                 |              |            |            |
|-------------------------------------|------------------|-----------------|--------------|------------|------------|
| Equipment                           | Manufacturer     | Model           | S/N          | Cal Date   | Cal Due    |
| Band Reject Filters                 | MICRO TRONICS    | BRM 50702       | 120          | 02/26/2019 | 02/25/2020 |
| Bilog Antenna                       | Sunol Sciences   | JB3             | A030105      | 07/26/2019 | 07/25/2020 |
| Coaxial Cable                       | HUBER SUHNER     | SUCOFLEX 104PEA | 20995        | 02/26/2019 | 02/25/2020 |
| Coaxial Cable                       | EMCI             | EMC105          | 190914+25111 | 09/20/2019 | 09/19/2020 |
| Digital Thermo-Hygro Meter          | WISEWIND         | 1206            | D07          | 01/30/2019 | 01/29/2020 |
| double Ridged Guide Horn Antenna    | ETC              | MCTD 1209       | DRH13M02003  | 10/04/2019 | 10/03/2020 |
| Loop Ant                            | COM-POWER        | AL-130          | 121051       | 03/22/2019 | 03/21/2020 |
| Pre-Amplifier                       | EMEC             | EM330           | 060609       | 02/26/2019 | 02/25/2020 |
| Pre-Amplifier                       | HP               | 8449B           | 3008A00965   | 02/26/2019 | 02/25/2020 |
| Wideband Radio Communication Tester | R&S              | CMW 500         | 116875       | 07/29/2019 | 07/28/2020 |
| PSA Series Spectrum Analyzer        | Agilent          | E4446A          | MY46180323   | 05/29/2019 | 05/28/2020 |
| Antenna Tower                       | CCS              | CC-A-1F         | N/A          | N.C.R      | N.C.R      |
| Controller                          | CCS              | CC-C-1F         | N/A          | N.C.R      | N.C.R      |
| Turn Table                          | CCS              | CC-T-1F         | N/A          | N.C.R      | N.C.R      |
| Software                            | e3 6.11-20180413 |                 |              |            |            |

### 5.3 MEASUREMENT UNCERTAINTY

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| AC Powerline Conducted Emission       | +/- 1.2575  |
| Emission bandwidth, 20dB bandwidth    | +/- 0.0014  |
| RF output power, conducted            | +/- 1.14    |
| Power density, conducted              | +/- 1.40    |
| 3M Semi Anechoic Chamber / 30M~200M   | +/- 4.12    |
| 3M Semi Anechoic Chamber / 200M~1000M | +/- 4.68    |
| 3M Semi Anechoic Chamber / 1G~8G      | +/- 5.18    |
| 3M Semi Anechoic Chamber / 8G~18G     | +/- 5.47    |
| 3M Semi Anechoic Chamber / 18G~26G    | +/- 3.81    |
| 3M Semi Anechoic Chamber / 26G~40G    | +/- 3.87    |

**Remark:** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

## 6. FACILITIES AND ACCREDITATIONS

### 6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10: 2013 and CISPR Publication 22.

### 6.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



Report No.: T191105W01-RP11

Page: 13 / 118

Rev.: 00

## 7. SETUP OF EQUIPMENT UNDER TEST

### 7.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

### 7.2 SUPPORT EQUIPMENT

| No | Equipment | Brand | Model | Series No. | FCC ID |
|----|-----------|-------|-------|------------|--------|
|    | N/A       |       |       |            |        |

**Remark:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 8. TEST PROCEDURE AND RESULT

### 8.1 ERP & EIRP MEASUREMENT

#### LIMIT

**According to FCC §2.1046**

**FCC 27.50 (c) (10):** The portable stations (hand-held devices) in the 600MHz uplink band and the 698-746MHz band, and fixed and mobile stations in the 600MHz uplink band are limited to 3 Watts ERP.

RSS-130 § 4.6,

The e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

#### TEST PROCEDURES

##### **CONDUCTED POWER MEASUREMENT:**

1. The transmitter output power was connected to the call box.
2. Set EUT at maximum output power via call box.
3. Set Call box at lowest, middle and highest channels for each band and modulation.

#### TEST RESULTS

*No non-compliance noted.*

**TEST RESULTS****LTE Band 12**

| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | ERP (dBm)    |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|--------------|-------|
| 10      | QPSK       | 1 RB    | 0         | 704             | 23060   | 22.68                 | 18.95        |       |
|         |            |         |           | 707.5           | 23095   | <b>22.77</b>          | 19.04        |       |
|         |            |         |           | 711             | 23130   | 22.55                 | 18.82        |       |
|         |            |         | 25        | 704             | 23060   | 22.28                 | 18.55        |       |
|         |            |         |           | 707.5           | 23095   | 22.23                 | 18.50        |       |
|         |            |         |           | 711             | 23130   | 22.37                 | 18.64        |       |
|         |            |         | 49        | 704             | 23060   | 22.63                 | 18.90        |       |
|         |            |         |           | 707.5           | 23095   | 22.53                 | 18.80        |       |
|         |            |         |           | 711             | 23130   | 22.51                 | 18.78        |       |
|         |            | 25 RB   | 0         | 704             | 23060   | 21.63                 | 17.90        |       |
|         |            |         |           | 707.5           | 23095   | 21.41                 | 17.68        |       |
|         |            |         |           | 711             | 23130   | 21.53                 | 17.80        |       |
|         |            |         | 12        | 704             | 23060   | 21.55                 | 17.82        |       |
|         |            |         |           | 707.5           | 23095   | 21.37                 | 17.64        |       |
|         |            |         |           | 711             | 23130   | 21.55                 | 17.82        |       |
|         |            |         | 25        | 704             | 23060   | 21.5                  | 17.77        |       |
|         |            |         |           | 707.5           | 23095   | <b>21.64</b>          | 17.91        |       |
|         |            |         |           | 711             | 23130   | 21.44                 | 17.71        |       |
|         |            | 50RB    |           |                 | 704     | 23060                 | 21.56        | 17.83 |
|         |            |         |           |                 | 707.5   | 23095                 | <b>21.57</b> | 17.84 |
|         |            |         |           |                 | 711     | 23130                 | 21.46        | 17.73 |
| 10      | 16-QAM     | 1 RB    | 0         | 704             | 23060   | 21.94                 | 18.21        |       |
|         |            |         |           | 707.5           | 23095   | 21.92                 | 18.19        |       |
|         |            |         |           | 711             | 23130   | 21.96                 | 18.23        |       |
|         |            |         | 25        | 704             | 23060   | 21.79                 | 18.06        |       |
|         |            |         |           | 707.5           | 23095   | 21.66                 | 17.93        |       |
|         |            |         |           | 711             | 23130   | 21.79                 | 18.06        |       |
|         |            |         | 49        | 704             | 23060   | 21.94                 | 18.21        |       |
|         |            |         |           | 707.5           | 23095   | 21.89                 | 18.16        |       |
|         |            |         |           | 711             | 23130   | 21.88                 | 18.15        |       |
|         |            | 25 RB   | 0         | 704             | 23060   | 20.6                  | 16.87        |       |
|         |            |         |           | 707.5           | 23095   | 20.44                 | 16.71        |       |
|         |            |         |           | 711             | 23130   | 20.54                 | 16.81        |       |
|         |            |         | 12        | 704             | 23060   | 20.5                  | 16.77        |       |
|         |            |         |           | 707.5           | 23095   | 20.4                  | 16.67        |       |
|         |            |         |           | 711             | 23130   | 20.5                  | 16.77        |       |
|         |            |         | 25        | 704             | 23060   | 20.52                 | 16.79        |       |
|         |            |         |           | 707.5           | 23095   | 20.43                 | 16.70        |       |
|         |            |         |           | 711             | 23130   | 20.57                 | 16.84        |       |
|         |            | 50RB    |           |                 | 704     | 23060                 | 20.62        | 16.89 |
|         |            |         |           |                 | 707.5   | 23095                 | 20.53        | 16.80 |
|         |            |         |           |                 | 711     | 23130                 | 20.56        | 16.83 |



Report No.: T191105W01-RP11

Page: 16 / 118

Rev.: 00

|    |        |       |    |       |       |       |       |
|----|--------|-------|----|-------|-------|-------|-------|
| 10 | 64-QAM | 1 RB  | 0  | 704   | 23060 | 20.93 | 17.20 |
|    |        |       |    | 707.5 | 23095 | 20.75 | 17.02 |
|    |        |       |    | 711   | 23130 | 20.8  | 17.07 |
|    |        |       | 25 | 704   | 23060 | 20.61 | 16.88 |
|    |        |       |    | 707.5 | 23095 | 20.46 | 16.73 |
|    |        |       |    | 711   | 23130 | 20.67 | 16.94 |
|    |        |       | 49 | 704   | 23060 | 20.94 | 17.21 |
|    |        |       |    | 707.5 | 23095 | 20.78 | 17.05 |
|    |        |       |    | 711   | 23130 | 20.92 | 17.19 |
|    |        | 25 RB | 0  | 704   | 23060 | 19.59 | 15.86 |
|    |        |       |    | 707.5 | 23095 | 19.44 | 15.71 |
|    |        |       |    | 711   | 23130 | 19.56 | 15.83 |
|    |        |       | 12 | 704   | 23060 | 19.5  | 15.77 |
|    |        |       |    | 707.5 | 23095 | 19.4  | 15.67 |
|    |        |       |    | 711   | 23130 | 19.5  | 15.77 |
|    |        |       | 25 | 704   | 23060 | 19.55 | 15.82 |
|    |        |       |    | 707.5 | 23095 | 19.48 | 15.75 |
|    |        |       |    | 711   | 23130 | 19.59 | 15.86 |
|    |        | 50RB  |    | 704   | 23060 | 19.52 | 15.79 |
|    |        |       |    | 707.5 | 23095 | 19.5  | 15.77 |
|    |        |       |    | 711   | 23130 | 19.53 | 15.80 |

| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | ERP (dBm) |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-----------|-------|
| 5       | QPSK       | 1 RB    | 0         | 701.5           | 23035   | 22.60                 | 18.87     |       |
|         |            |         |           | 707.5           | 23095   | 22.44                 | 18.71     |       |
|         |            |         |           | 713.5           | 23155   | 22.53                 | 18.80     |       |
|         |            |         | 12        | 701.5           | 23035   | 22.05                 | 18.32     |       |
|         |            |         |           | 707.5           | 23095   | 22.15                 | 18.42     |       |
|         |            |         |           | 713.5           | 23155   | 22.18                 | 18.45     |       |
|         |            |         | 24        | 701.5           | 23035   | 22.48                 | 18.75     |       |
|         |            |         |           | 707.5           | 23095   | 22.39                 | 18.66     |       |
|         |            |         |           | 713.5           | 23155   | 22.30                 | 18.57     |       |
|         |            | 12 RB   | 0         | 701.5           | 23035   | 21.43                 | 17.70     |       |
|         |            |         |           | 707.5           | 23095   | 21.29                 | 17.56     |       |
|         |            |         |           | 713.5           | 23155   | 21.41                 | 17.68     |       |
|         |            |         | 6         | 701.5           | 23035   | 21.44                 | 17.71     |       |
|         |            |         |           | 707.5           | 23095   | 21.23                 | 17.50     |       |
|         |            |         |           | 713.5           | 23155   | 21.43                 | 17.70     |       |
|         |            |         | 13        | 701.5           | 23035   | 21.29                 | 17.56     |       |
|         |            |         |           | 707.5           | 23095   | 21.20                 | 17.47     |       |
|         |            |         |           | 713.5           | 23155   | 21.55                 | 17.82     |       |
|         |            | 25RB    |           |                 | 701.5   | 23035                 | 21.49     | 17.76 |
|         |            |         |           |                 | 707.5   | 23095                 | 21.41     | 17.68 |
|         |            |         |           |                 | 713.5   | 23155                 | 21.48     | 17.75 |
| 5       | 16-QAM     | 1 RB    | 0         | 701.5           | 23035   | 21.86                 | 18.13     |       |
|         |            |         |           | 707.5           | 23095   | 21.77                 | 18.04     |       |
|         |            |         |           | 713.5           | 23155   | 21.83                 | 18.10     |       |
|         |            |         | 12        | 701.5           | 23035   | 21.70                 | 17.97     |       |
|         |            |         |           | 707.5           | 23095   | 21.52                 | 17.79     |       |
|         |            |         |           | 713.5           | 23155   | 21.65                 | 17.92     |       |
|         |            |         | 24        | 701.5           | 23035   | 21.86                 | 18.13     |       |
|         |            |         |           | 707.5           | 23095   | 21.84                 | 18.11     |       |
|         |            |         |           | 713.5           | 23155   | 21.67                 | 17.94     |       |
|         |            | 12 RB   | 0         | 701.5           | 23035   | 20.41                 | 16.68     |       |
|         |            |         |           | 707.5           | 23095   | 20.23                 | 16.50     |       |
|         |            |         |           | 713.5           | 23155   | 20.39                 | 16.66     |       |
|         |            |         | 6         | 701.5           | 23035   | 20.31                 | 16.58     |       |
|         |            |         |           | 707.5           | 23095   | 20.30                 | 16.57     |       |
|         |            |         |           | 713.5           | 23155   | 20.37                 | 16.64     |       |
|         |            |         | 13        | 701.5           | 23035   | 20.31                 | 16.58     |       |
|         |            |         |           | 707.5           | 23095   | 20.29                 | 16.56     |       |
|         |            |         |           | 713.5           | 23155   | 20.44                 | 16.71     |       |
|         |            | 25RB    |           |                 | 701.5   | 23035                 | 20.50     | 16.77 |
|         |            |         |           |                 | 707.5   | 23095                 | 20.35     | 16.62 |
|         |            |         |           |                 | 713.5   | 23155                 | 20.40     | 16.67 |



Report No.: T191105W01-RP11

Page: 18 / 118

Rev.: 00

|   |        |       |    |       |       |       |       |
|---|--------|-------|----|-------|-------|-------|-------|
| 5 | 64-QAM | 1 RB  | 0  | 701.5 | 23035 | 20.85 | 17.12 |
|   |        |       |    | 707.5 | 23095 | 20.52 | 16.79 |
|   |        |       |    | 713.5 | 23155 | 20.62 | 16.89 |
|   |        |       | 12 | 701.5 | 23035 | 20.44 | 16.71 |
|   |        |       |    | 707.5 | 23095 | 20.28 | 16.55 |
|   |        |       |    | 713.5 | 23155 | 20.60 | 16.87 |
|   |        |       | 24 | 701.5 | 23035 | 20.70 | 16.97 |
|   |        |       |    | 707.5 | 23095 | 20.69 | 16.96 |
|   |        |       |    | 713.5 | 23155 | 20.79 | 17.06 |
|   |        | 12 RB | 0  | 701.5 | 23035 | 19.38 | 15.65 |
|   |        |       |    | 707.5 | 23095 | 19.34 | 15.61 |
|   |        |       |    | 713.5 | 23155 | 19.44 | 15.71 |
|   |        |       | 6  | 701.5 | 23035 | 19.37 | 15.64 |
|   |        |       |    | 707.5 | 23095 | 19.16 | 15.43 |
|   |        |       |    | 713.5 | 23155 | 19.43 | 15.70 |
|   |        |       | 13 | 701.5 | 23035 | 19.40 | 15.67 |
|   |        |       |    | 707.5 | 23095 | 19.42 | 15.69 |
|   |        |       |    | 713.5 | 23155 | 19.45 | 15.72 |
|   |        | 25RB  |    | 701.5 | 23035 | 19.42 | 15.69 |
|   |        |       |    | 707.5 | 23095 | 19.30 | 15.57 |
|   |        |       |    | 713.5 | 23155 | 19.46 | 15.73 |

| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | ERP (dBm) |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-----------|
| 3       | QPSK       | 1 RB    | 0         | 700.5           | 23025   | 22.40                 | 18.67     |
|         |            |         |           | 707.5           | 23095   | 22.25                 | 18.52     |
|         |            |         |           | 714.5           | 23165   | 22.32                 | 18.59     |
|         |            |         | 7         | 700.5           | 23025   | 21.91                 | 18.18     |
|         |            |         |           | 707.5           | 23095   | 21.99                 | 18.26     |
|         |            |         |           | 714.5           | 23165   | 22.12                 | 18.39     |
|         |            |         | 14        | 700.5           | 23025   | 22.25                 | 18.52     |
|         |            |         |           | 707.5           | 23095   | 22.33                 | 18.60     |
|         |            |         |           | 714.5           | 23165   | 22.25                 | 18.52     |
|         |            | 8 RB    | 0         | 700.5           | 23025   | 21.24                 | 17.51     |
|         |            |         |           | 707.5           | 23095   | 21.23                 | 17.50     |
|         |            |         |           | 714.5           | 23165   | 21.35                 | 17.62     |
|         |            |         | 4         | 700.5           | 23025   | 21.28                 | 17.55     |
|         |            |         |           | 707.5           | 23095   | 21.17                 | 17.44     |
|         |            |         |           | 714.5           | 23165   | 21.24                 | 17.51     |
|         |            |         | 7         | 700.5           | 23025   | 21.06                 | 17.33     |
|         |            |         |           | 707.5           | 23095   | 21.03                 | 17.30     |
|         |            |         |           | 714.5           | 23165   | 21.36                 | 17.63     |
|         |            | 15RB    |           | 700.5           | 23025   | 21.28                 | 17.55     |
|         |            |         |           | 707.5           | 23095   | 21.29                 | 17.56     |
|         |            |         |           | 714.5           | 23165   | 21.28                 | 17.55     |
| 3       | 16-QAM     | 1 RB    | 0         | 700.5           | 23025   | 21.63                 | 17.90     |
|         |            |         |           | 707.5           | 23095   | 21.66                 | 17.93     |
|         |            |         |           | 714.5           | 23165   | 21.68                 | 17.95     |
|         |            |         | 7         | 700.5           | 23025   | 21.65                 | 17.92     |
|         |            |         |           | 707.5           | 23095   | 21.40                 | 17.67     |
|         |            |         |           | 714.5           | 23165   | 21.54                 | 17.81     |
|         |            |         | 14        | 700.5           | 23025   | 21.75                 | 18.02     |
|         |            |         |           | 707.5           | 23095   | 21.62                 | 17.89     |
|         |            |         |           | 714.5           | 23165   | 21.48                 | 17.75     |
|         |            | 8 RB    | 0         | 700.5           | 23025   | 20.29                 | 16.56     |
|         |            |         |           | 707.5           | 23095   | 20.04                 | 16.31     |
|         |            |         |           | 714.5           | 23165   | 20.30                 | 16.57     |
|         |            |         | 4         | 700.5           | 23025   | 20.17                 | 16.44     |
|         |            |         |           | 707.5           | 23095   | 20.15                 | 16.42     |
|         |            |         |           | 714.5           | 23165   | 20.22                 | 16.49     |
|         |            |         | 7         | 700.5           | 23025   | 20.20                 | 16.47     |
|         |            |         |           | 707.5           | 23095   | 20.11                 | 16.38     |
|         |            |         |           | 714.5           | 23165   | 20.30                 | 16.57     |
|         |            | 15RB    |           | 700.5           | 23025   | 20.29                 | 16.56     |
|         |            |         |           | 707.5           | 23095   | 20.14                 | 16.41     |
|         |            |         |           | 714.5           | 23165   | 20.27                 | 16.54     |



Report No.: T191105W01-RP11

Page: 20 / 118

Rev.: 00

|   |        |      |    |       |       |       |       |
|---|--------|------|----|-------|-------|-------|-------|
| 3 | 64-QAM | 1 RB | 0  | 700.5 | 23025 | 20.78 | 17.05 |
|   |        |      |    | 707.5 | 23095 | 20.30 | 16.57 |
|   |        |      |    | 714.5 | 23165 | 20.40 | 16.67 |
|   |        |      | 7  | 700.5 | 23025 | 20.28 | 16.55 |
|   |        |      |    | 707.5 | 23095 | 20.08 | 16.35 |
|   |        |      |    | 714.5 | 23165 | 20.51 | 16.78 |
|   |        |      | 14 | 700.5 | 23025 | 20.62 | 16.89 |
|   |        |      |    | 707.5 | 23095 | 20.58 | 16.85 |
|   |        |      |    | 714.5 | 23165 | 20.57 | 16.84 |
|   |        | 8 RB | 0  | 700.5 | 23025 | 19.27 | 15.54 |
|   |        |      |    | 707.5 | 23095 | 19.20 | 15.47 |
|   |        |      |    | 714.5 | 23165 | 19.31 | 15.58 |
|   |        |      | 4  | 700.5 | 23025 | 19.32 | 15.59 |
|   |        |      |    | 707.5 | 23095 | 18.94 | 15.21 |
|   |        |      |    | 714.5 | 23165 | 19.19 | 15.46 |
|   |        |      | 7  | 700.5 | 23025 | 19.33 | 15.60 |
|   |        |      |    | 707.5 | 23095 | 19.37 | 15.64 |
|   |        |      |    | 714.5 | 23165 | 19.24 | 15.51 |
|   |        | 15RB |    | 700.5 | 23025 | 19.32 | 15.59 |
|   |        |      |    | 707.5 | 23095 | 19.25 | 15.52 |
|   |        |      |    | 714.5 | 23165 | 19.33 | 15.60 |

| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | ERP (dBm) |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-----------|
| 1.4     | QPSK       | 1 RB    | 0         | 699.7           | 23017   | 22.23                 | 18.50     |
|         |            |         |           | 707.5           | 23095   | 22.05                 | 18.32     |
|         |            |         |           | 715.3           | 23173   | 22.27                 | 18.54     |
|         |            |         | 2         | 699.7           | 23017   | 21.68                 | 17.95     |
|         |            |         |           | 707.5           | 23095   | 21.88                 | 18.15     |
|         |            |         |           | 715.3           | 23173   | 21.92                 | 18.19     |
|         |            |         | 5         | 699.7           | 23017   | 22.15                 | 18.42     |
|         |            |         |           | 707.5           | 23095   | 22.18                 | 18.45     |
|         |            |         |           | 715.3           | 23173   | 22.03                 | 18.30     |
|         |            | 3 RB    | 0         | 699.7           | 23017   | 21.16                 | 17.43     |
|         |            |         |           | 707.5           | 23095   | 21.18                 | 17.45     |
|         |            |         |           | 715.3           | 23173   | 21.21                 | 17.48     |
|         |            |         | 2         | 699.7           | 23017   | 21.14                 | 17.41     |
|         |            |         |           | 707.5           | 23095   | 20.97                 | 17.24     |
|         |            |         |           | 715.3           | 23173   | 21.11                 | 17.38     |
|         |            |         | 3         | 699.7           | 23017   | 20.99                 | 17.26     |
|         |            |         |           | 707.5           | 23095   | 20.81                 | 17.08     |
|         |            |         |           | 715.3           | 23173   | 21.16                 | 17.43     |
|         |            | 6RB     |           | 699.7           | 23017   | 21.21                 | 17.48     |
|         |            |         |           | 707.5           | 23095   | 21.24                 | 17.51     |
|         |            |         |           | 715.3           | 23173   | 21.15                 | 17.42     |
| 1.4     | 16-QAM     | 1 RB    | 0         | 699.7           | 23017   | 21.53                 | 17.80     |
|         |            |         |           | 707.5           | 23095   | 21.52                 | 17.79     |
|         |            |         |           | 715.3           | 23173   | 21.46                 | 17.73     |
|         |            |         | 2         | 699.7           | 23017   | 21.49                 | 17.76     |
|         |            |         |           | 707.5           | 23095   | 21.35                 | 17.62     |
|         |            |         |           | 715.3           | 23173   | 21.36                 | 17.63     |
|         |            |         | 5         | 699.7           | 23017   | 21.67                 | 17.94     |
|         |            |         |           | 707.5           | 23095   | 21.42                 | 17.69     |
|         |            |         |           | 715.3           | 23173   | 21.30                 | 17.57     |
|         |            | 3 RB    | 0         | 699.7           | 23017   | 20.10                 | 16.37     |
|         |            |         |           | 707.5           | 23095   | 19.83                 | 16.10     |
|         |            |         |           | 715.3           | 23173   | 20.21                 | 16.48     |
|         |            |         | 2         | 699.7           | 23017   | 20.07                 | 16.34     |
|         |            |         |           | 707.5           | 23095   | 19.92                 | 16.19     |
|         |            |         |           | 715.3           | 23173   | 20.09                 | 16.36     |
|         |            |         | 3         | 699.7           | 23017   | 20.09                 | 16.36     |
|         |            |         |           | 707.5           | 23095   | 19.90                 | 16.17     |
|         |            |         |           | 715.3           | 23173   | 20.18                 | 16.45     |
|         |            | 6RB     |           | 699.7           | 23017   | 20.21                 | 16.48     |
|         |            |         |           | 707.5           | 23095   | 20.02                 | 16.29     |
|         |            |         |           | 715.3           | 23173   | 20.04                 | 16.31     |



Report No.: T191105W01-RP11

Page: 22 / 118

Rev.: 00

|     |        |      |   |       |       |       |       |
|-----|--------|------|---|-------|-------|-------|-------|
| 1.4 | 64-QAM | 1 RB | 0 | 699.7 | 23017 | 20.71 | 16.98 |
|     |        |      |   | 707.5 | 23095 | 20.11 | 16.38 |
|     |        |      |   | 715.3 | 23173 | 20.33 | 16.60 |
|     |        |      | 2 | 699.7 | 23017 | 20.12 | 16.39 |
|     |        |      |   | 707.5 | 23095 | 19.92 | 16.19 |
|     |        |      |   | 715.3 | 23173 | 20.33 | 16.60 |
|     |        |      | 5 | 699.7 | 23017 | 20.47 | 16.74 |
|     |        |      |   | 707.5 | 23095 | 20.53 | 16.80 |
|     |        |      |   | 715.3 | 23173 | 20.49 | 16.76 |
|     |        | 3 RB | 0 | 699.7 | 23017 | 19.10 | 15.37 |
|     |        |      |   | 707.5 | 23095 | 19.06 | 15.33 |
|     |        |      |   | 715.3 | 23173 | 19.09 | 15.36 |
|     |        |      | 2 | 699.7 | 23017 | 19.08 | 15.35 |
|     |        |      |   | 707.5 | 23095 | 19.15 | 15.42 |
|     |        |      |   | 715.3 | 23173 | 19.14 | 15.41 |
|     |        |      | 3 | 699.7 | 23017 | 19.10 | 15.37 |
|     |        |      |   | 707.5 | 23095 | 19.21 | 15.48 |
|     |        |      |   | 715.3 | 23173 | 19.04 | 15.31 |
|     |        | 6RB  |   | 699.7 | 23017 | 19.13 | 15.40 |
|     |        |      |   | 707.5 | 23095 | 19.02 | 15.29 |
|     |        |      |   | 715.3 | 23173 | 19.18 | 15.45 |

**LTE Band 17**

| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | ERP (dBm)    |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|--------------|-------|
| 10      | QPSK       | 1 RB    | 0         | 709             | 23780   | 22.64                 | 18.91        |       |
|         |            |         |           | 710             | 23790   | 22.63                 | 18.9         |       |
|         |            |         |           | 711             | 23800   | 22.66                 | 18.93        |       |
|         |            |         | 25        | 709             | 23780   | 22.37                 | 18.64        |       |
|         |            |         |           | 710             | 23790   | 22.38                 | 18.65        |       |
|         |            |         |           | 711             | 23800   | 22.47                 | 18.74        |       |
|         |            |         | 49        | 709             | 23780   | 22.75                 | 19.02        |       |
|         |            |         |           | 710             | 23790   | <b>22.77</b>          | 19.04        |       |
|         |            |         |           | 711             | 23800   | 22.74                 | 19.01        |       |
|         |            | 25 RB   | 0         | 709             | 23780   | 21.49                 | 17.76        |       |
|         |            |         |           | 710             | 23790   | 21.49                 | 17.76        |       |
|         |            |         |           | 711             | 23800   | 21.47                 | 17.74        |       |
|         |            |         | 12        | 709             | 23780   | 21.47                 | 17.74        |       |
|         |            |         |           | 710             | 23790   | 21.45                 | 17.72        |       |
|         |            |         |           | 711             | 23800   | 21.54                 | 17.81        |       |
|         |            |         | 25        | 709             | 23780   | 21.51                 | 17.78        |       |
|         |            |         |           | 710             | 23790   | <b>21.58</b>          | 17.85        |       |
|         |            |         |           | 711             | 23800   | 21.55                 | 17.82        |       |
|         |            | 50RB    |           |                 | 709     | 23780                 | 21.42        | 17.69 |
|         |            |         |           |                 | 710     | 23790                 | 21.43        | 17.7  |
|         |            |         |           |                 | 711     | 23800                 | <b>21.52</b> | 17.79 |
| 10      | 16-QAM     | 1 RB    | 0         | 709             | 23780   | 21.91                 | 18.18        |       |
|         |            |         |           | 710             | 23790   | 21.91                 | 18.18        |       |
|         |            |         |           | 711             | 23800   | 21.92                 | 18.19        |       |
|         |            |         | 25        | 709             | 23780   | 21.7                  | 17.97        |       |
|         |            |         |           | 710             | 23790   | 21.72                 | 17.99        |       |
|         |            |         |           | 711             | 23800   | 21.72                 | 17.99        |       |
|         |            |         | 49        | 709             | 23780   | 21.92                 | 18.19        |       |
|         |            |         |           | 710             | 23790   | 21.93                 | 18.2         |       |
|         |            |         |           | 711             | 23800   | 21.96                 | 18.23        |       |
|         |            | 25 RB   | 0         | 709             | 23780   | 20.42                 | 16.69        |       |
|         |            |         |           | 710             | 23790   | 20.44                 | 16.71        |       |
|         |            |         |           | 711             | 23800   | 20.47                 | 16.74        |       |
|         |            |         | 12        | 709             | 23780   | 20.43                 | 16.7         |       |
|         |            |         |           | 710             | 23790   | 20.48                 | 16.75        |       |
|         |            |         |           | 711             | 23800   | 20.46                 | 16.73        |       |
|         |            |         | 25        | 709             | 23780   | 20.43                 | 16.7         |       |
|         |            |         |           | 710             | 23790   | 20.43                 | 16.7         |       |
|         |            |         |           | 711             | 23800   | 20.51                 | 16.78        |       |
|         |            | 50RB    |           |                 | 709     | 23780                 | 20.5         | 16.77 |
|         |            |         |           |                 | 710     | 23790                 | 20.47        | 16.74 |
|         |            |         |           |                 | 711     | 23800                 | 20.51        | 16.78 |



Report No.: T191105W01-RP11

Page: 24 / 118

Rev.: 00

|    |        |       |    |     |       |       |       |
|----|--------|-------|----|-----|-------|-------|-------|
| 10 | 64-QAM | 1 RB  | 0  | 709 | 23780 | 20.92 | 17.19 |
|    |        |       |    | 710 | 23790 | 20.89 | 17.16 |
|    |        |       |    | 711 | 23800 | 20.81 | 17.08 |
|    |        |       | 25 | 709 | 23780 | 20.63 | 16.9  |
|    |        |       |    | 710 | 23790 | 20.58 | 16.85 |
|    |        |       |    | 711 | 23800 | 20.62 | 16.89 |
|    |        |       | 49 | 709 | 23780 | 20.93 | 17.2  |
|    |        |       |    | 710 | 23790 | 20.95 | 17.22 |
|    |        |       |    | 711 | 23800 | 20.93 | 17.2  |
|    |        | 25 RB | 0  | 709 | 23780 | 19.48 | 15.75 |
|    |        |       |    | 710 | 23790 | 19.49 | 15.76 |
|    |        |       |    | 711 | 23800 | 19.48 | 15.75 |
|    |        |       | 12 | 709 | 23780 | 19.42 | 15.69 |
|    |        |       |    | 710 | 23790 | 19.49 | 15.76 |
|    |        |       |    | 711 | 23800 | 19.49 | 15.76 |
|    |        |       | 25 | 709 | 23780 | 19.5  | 15.77 |
|    |        |       |    | 710 | 23790 | 19.5  | 15.77 |
|    |        |       |    | 711 | 23800 | 19.56 | 15.83 |
|    |        | 50RB  |    | 709 | 23780 | 19.43 | 15.7  |
|    |        |       |    | 710 | 23790 | 19.43 | 15.7  |
|    |        |       |    | 711 | 23800 | 19.48 | 15.75 |

| BW(MHz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | ERP (dBm) |       |
|---------|------------|---------|-----------|-----------------|---------|-----------------------|-----------|-------|
| 5       | QPSK       | 1 RB    | 0         | 706.5           | 23755   | 22.42                 | 18.69     |       |
|         |            |         |           | 710             | 23790   | 22.51                 | 18.78     |       |
|         |            |         |           | 713.5           | 23825   | 22.43                 | 18.7      |       |
|         |            |         | 12        | 706.5           | 23755   | 22.16                 | 18.43     |       |
|         |            |         |           | 710             | 23790   | 22.28                 | 18.55     |       |
|         |            |         |           | 713.5           | 23825   | 22.27                 | 18.54     |       |
|         |            |         | 24        | 706.5           | 23755   | 22.61                 | 18.88     |       |
|         |            |         |           | 710             | 23790   | 22.69                 | 18.96     |       |
|         |            |         |           | 713.5           | 23825   | 22.56                 | 18.83     |       |
|         |            | 12 RB   | 0         | 706.5           | 23755   | 21.38                 | 17.65     |       |
|         |            |         |           | 710             | 23790   | 21.44                 | 17.71     |       |
|         |            |         |           | 713.5           | 23825   | 21.32                 | 17.59     |       |
|         |            |         | 6         | 706.5           | 23755   | 21.40                 | 17.67     |       |
|         |            |         |           | 710             | 23790   | 21.22                 | 17.49     |       |
|         |            |         |           | 713.5           | 23825   | 21.32                 | 17.59     |       |
|         |            |         | 13        | 706.5           | 23755   | 21.34                 | 17.61     |       |
|         |            |         |           | 710             | 23790   | 21.39                 | 17.66     |       |
|         |            |         |           | 713.5           | 23825   | 21.51                 | 17.78     |       |
|         |            | 25RB    |           |                 | 706.5   | 23755                 | 21.37     | 17.64 |
|         |            |         |           |                 | 710     | 23790                 | 21.38     | 17.65 |
|         |            |         |           |                 | 713.5   | 23825                 | 21.28     | 17.55 |
| 5       | 16-QAM     | 1 RB    | 0         | 706.5           | 23755   | 21.83                 | 18.1      |       |
|         |            |         |           | 710             | 23790   | 21.69                 | 17.96     |       |
|         |            |         |           | 713.5           | 23825   | 21.84                 | 18.11     |       |
|         |            |         | 12        | 706.5           | 23755   | 21.63                 | 17.9      |       |
|         |            |         |           | 710             | 23790   | 21.55                 | 17.82     |       |
|         |            |         |           | 713.5           | 23825   | 21.52                 | 17.79     |       |
|         |            |         | 24        | 706.5           | 23755   | 21.69                 | 17.96     |       |
|         |            |         |           | 710             | 23790   | 21.86                 | 18.13     |       |
|         |            |         |           | 713.5           | 23825   | 21.81                 | 18.08     |       |
|         |            | 12 RB   | 0         | 706.5           | 23755   | 20.24                 | 16.51     |       |
|         |            |         |           | 710             | 23790   | 20.37                 | 16.64     |       |
|         |            |         |           | 713.5           | 23825   | 20.32                 | 16.59     |       |
|         |            |         | 6         | 706.5           | 23755   | 20.21                 | 16.48     |       |
|         |            |         |           | 710             | 23790   | 20.37                 | 16.64     |       |
|         |            |         |           | 713.5           | 23825   | 20.36                 | 16.63     |       |
|         |            |         | 13        | 706.5           | 23755   | 20.30                 | 16.57     |       |
|         |            |         |           | 710             | 23790   | 20.31                 | 16.58     |       |
|         |            |         |           | 713.5           | 23825   | 20.28                 | 16.55     |       |
|         |            | 25RB    |           |                 | 706.5   | 23755                 | 20.26     | 16.53 |
|         |            |         |           |                 | 710     | 23790                 | 20.40     | 16.67 |
|         |            |         |           |                 | 713.5   | 23825                 | 20.38     | 16.65 |



Report No.: T191105W01-RP11

Page: 26 / 118

Rev.: 00

|   |        |       |    |       |       |       |       |
|---|--------|-------|----|-------|-------|-------|-------|
| 5 | 64-QAM | 1 RB  | 0  | 706.5 | 23755 | 20.75 | 17.02 |
|   |        |       |    | 710   | 23790 | 20.74 | 17.01 |
|   |        |       |    | 713.5 | 23825 | 20.70 | 16.97 |
|   |        |       | 12 | 706.5 | 23755 | 20.41 | 16.68 |
|   |        |       |    | 710   | 23790 | 20.44 | 16.71 |
|   |        |       |    | 713.5 | 23825 | 20.44 | 16.71 |
|   |        |       | 24 | 706.5 | 23755 | 20.69 | 16.96 |
|   |        |       |    | 710   | 23790 | 20.80 | 17.07 |
|   |        |       |    | 713.5 | 23825 | 20.76 | 17.03 |
|   |        | 12 RB | 0  | 706.5 | 23755 | 19.24 | 15.51 |
|   |        |       |    | 710   | 23790 | 19.41 | 15.68 |
|   |        |       |    | 713.5 | 23825 | 19.28 | 15.55 |
|   |        |       | 6  | 706.5 | 23755 | 19.26 | 15.53 |
|   |        |       |    | 710   | 23790 | 19.30 | 15.57 |
|   |        |       |    | 713.5 | 23825 | 19.28 | 15.55 |
|   |        |       | 13 | 706.5 | 23755 | 19.30 | 15.57 |
|   |        |       |    | 710   | 23790 | 19.27 | 15.54 |
|   |        |       |    | 713.5 | 23825 | 19.49 | 15.76 |
|   |        | 25RB  |    | 706.5 | 23755 | 19.22 | 15.49 |
|   |        |       |    | 710   | 23790 | 19.19 | 15.46 |
|   |        |       |    | 713.5 | 23825 | 19.28 | 15.55 |

## 8.2 FREQUENCY STABILITY MEASUREMENT

### LIMIT

According to the FCC part 27.54 shall be tested the frequency stability. The rule is defined that "The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### According to RSS -133 section 6.3.

The carrier frequency shall not depart from the reference frequency, in excess of  $\pm 2.5$  ppm for mobile stations and  $\pm 1.0$  ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

### TEST PROCEDURE

Use Anritsu 8820 with frequency Error measurement capability.

Temp =  $-35$  to  $+65^{\circ}\text{C}$

Voltage= 85% to 115% of the nominal value for AC powered equipment.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

**TEST RESULTS****FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT:  
LTE Band 12**

| Reference Frequency: LTE Band 12 Max Bandwidth QPSK, 707.5 MHz |                  |                 |                 |             |
|----------------------------------------------------------------|------------------|-----------------|-----------------|-------------|
| Limit: $\pm 2.5$ ppm = 1768.75 Hz                              |                  |                 |                 |             |
| Power Supply                                                   | Environment      | Frequency Error | Frequency Error | Limit (ppm) |
| Vdc                                                            | Temperature (°C) | (Hz)            | (ppm)           | (ppm)       |
| 120                                                            | 65               | 0.03            | 0.000042        | +/- 2.5     |
| 120                                                            | 50               | 0.01            | 0.000014        |             |
| 120                                                            | 40               | 0.01            | 0.000014        |             |
| 120                                                            | 30               | 0.00            | 0.000000        |             |
| 120                                                            | 20               | 0.01            | 0.000014        |             |
| 120                                                            | 10               | 0.02            | 0.000028        |             |
| 120                                                            | 0                | 0.00            | 0.000000        |             |
| 120                                                            | -10              | -0.01           | -0.000014       |             |
| 120                                                            | -20              | 0.00            | 0.000000        |             |
| 120                                                            | -35              | 0.01            | 0.000014        |             |

| Reference Frequency: LTE Band 12 Max Bandwidth 16QAM, 707.5 MHz |                  |                 |                 |             |
|-----------------------------------------------------------------|------------------|-----------------|-----------------|-------------|
| Limit: $\pm 2.5$ ppm = 1768.75 Hz                               |                  |                 |                 |             |
| Power Supply                                                    | Environment      | Frequency Error | Frequency Error | Limit (ppm) |
| Vdc                                                             | Temperature (°C) | (Hz)            | (ppm)           | (ppm)       |
| 120                                                             | 65               | 0.02            | 0.000028        | +/- 2.5     |
| 120                                                             | 50               | 0.01            | 0.000014        |             |
| 120                                                             | 40               | -0.01           | -0.000014       |             |
| 120                                                             | 30               | 0.02            | 0.000028        |             |
| 120                                                             | 20               | 0.02            | 0.000028        |             |
| 120                                                             | 10               | 0.03            | 0.000042        |             |
| 120                                                             | 0                | 0.02            | 0.000028        |             |
| 120                                                             | -10              | 0.01            | 0.000014        |             |
| 120                                                             | -20              | -0.01           | -0.000014       |             |
| 120                                                             | -35              | 0.00            | 0.000000        |             |

**LTE Band 17**

| Reference Frequency: LTE Band 17 Max Bandwidth QPSK, 710 MHz |                  |                 |                 |             |
|--------------------------------------------------------------|------------------|-----------------|-----------------|-------------|
| Limit: $\pm 2.5$ ppm = 1775 Hz                               |                  |                 |                 |             |
| Power Supply                                                 | Environment      | Frequency Error | Frequency Error | Limit (ppm) |
| Vdc                                                          | Temperature (°C) | (Hz)            | (ppm)           | (ppm)       |
| 120                                                          | 65               | -0.01           | -0.000014       | +/- 2.5     |
| 120                                                          | 50               | 0.01            | 0.000014        |             |
| 120                                                          | 40               | 0.00            | 0.000000        |             |
| 120                                                          | 30               | 0.01            | 0.000014        |             |
| 120                                                          | 20               | 0.02            | 0.000028        |             |
| 120                                                          | 10               | 0.00            | 0.000000        |             |
| 120                                                          | 0                | -0.01           | -0.000014       |             |
| 120                                                          | -10              | 0.01            | 0.000014        |             |
| 120                                                          | -20              | 0.00            | 0.000000        |             |
| 120                                                          | -35              | 0.00            | 0.000000        |             |

| Reference Frequency: LTE Band 17 Max Bandwidth 16QAM, 710 MHz |                  |                 |                 |             |
|---------------------------------------------------------------|------------------|-----------------|-----------------|-------------|
| Limit: $\pm 2.5$ ppm = 1775 Hz                                |                  |                 |                 |             |
| Power Supply                                                  | Environment      | Frequency Error | Frequency Error | Limit (ppm) |
| Vdc                                                           | Temperature (°C) | (Hz)            | (ppm)           | (ppm)       |
| 120                                                           | 65               | 0.02            | 0.000028        | +/- 2.5     |
| 120                                                           | 50               | 0.01            | 0.000014        |             |
| 120                                                           | 40               | 0.01            | 0.000014        |             |
| 120                                                           | 30               | 0.02            | 0.000028        |             |
| 120                                                           | 20               | 0.01            | 0.000014        |             |
| 120                                                           | 10               | 0.02            | 0.000028        |             |
| 120                                                           | 0                | 0.01            | 0.000014        |             |
| 120                                                           | -10              | -0.01           | -0.000014       |             |
| 120                                                           | -20              | 0.01            | 0.000014        |             |
| 120                                                           | -35              | -0.01           | -0.000014       |             |



Report No.: T191105W01-RP11

Page: 30 / 118  
Rev.: 00

**FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:  
LTE Band 12**

| Reference Frequency: LTE Band 12 Max Bandwidth QPSK, 707.5 MHz |                  |                 |                 |             |
|----------------------------------------------------------------|------------------|-----------------|-----------------|-------------|
| Limit: $\pm 2.5$ ppm = 1768.75 Hz                              |                  |                 |                 |             |
| Power Supply                                                   | Environment      | Frequency Error | Frequency Error | Limit (ppm) |
| Vdc                                                            | Temperature (°C) | (Hz)            | (ppm)           | (ppm)       |
| 102                                                            | 20               | 0.00            | 0.000000        | +/- 2.5     |
| 120                                                            | 20               | 0.02            | 0.000028        |             |
| 138                                                            | 20               | -0.01           | -0.000014       |             |

| Reference Frequency: LTE Band 12 Max Bandwidth 16QAM, 707.5 MHz |                  |                 |                 |             |
|-----------------------------------------------------------------|------------------|-----------------|-----------------|-------------|
| Limit: $\pm 2.5$ ppm = 1768.75 Hz                               |                  |                 |                 |             |
| Power Supply                                                    | Environment      | Frequency Error | Frequency Error | Limit (ppm) |
| Vdc                                                             | Temperature (°C) | (Hz)            | (ppm)           | (ppm)       |
| 102                                                             | 20               | 0.01            | 0.000014        | +/- 2.5     |
| 120                                                             | 20               | -0.01           | -0.000014       |             |
| 138                                                             | 20               | 0.01            | 0.000014        |             |



Report No.: T191105W01-RP11

Page: 31 / 118

Rev.: 00

### LTE Band 17

| Reference Frequency: LTE Band 17 Max Bandwidth QPSK, 710 MHz |                  |                 |                 |             |
|--------------------------------------------------------------|------------------|-----------------|-----------------|-------------|
| Limit: $\pm 2.5$ ppm = 1775 Hz                               |                  |                 |                 |             |
| Power Supply                                                 | Environment      | Frequency Error | Frequency Error | Limit (ppm) |
| Vdc                                                          | Temperature (°C) | (Hz)            | (ppm)           | (ppm)       |
| 102                                                          | 20               | 0.00            | 0.000000        | +/- 2.5     |
| 120                                                          | 20               | 0.01            | 0.000014        |             |
| 138                                                          | 20               | 0.02            | 0.000028        |             |

| Reference Frequency: LTE Band 17 Max Bandwidth 16QAM, 710 MHz |                  |                 |                 |             |
|---------------------------------------------------------------|------------------|-----------------|-----------------|-------------|
| Limit: $\pm 2.5$ ppm = 1775 Hz                                |                  |                 |                 |             |
| Power Supply                                                  | Environment      | Frequency Error | Frequency Error | Limit (ppm) |
| Vdc                                                           | Temperature (°C) | (Hz)            | (ppm)           | (ppm)       |
| 102                                                           | 20               | 0.00            | 0.000000        | +/- 2.5     |
| 120                                                           | 20               | -0.01           | -0.000014       |             |
| 138                                                           | 20               | 0.01            | 0.000014        |             |

### 8.3 OCCUPIED BANDWIDTH MEASUREMENT

#### LIMITS

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

#### TEST PROCEDURES

KDB 971168 D01 Power Meas License Digital Systems – Section 4.2

1. The occupied bandwidth was measured with the spectrum analyzer at the lowest, middle and highest channels in each band and different modulation. The 99% and -26dB bandwidth was measured and recorded.
2. RBW = 1-5% of the expected OBW
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max. hold

**TEST RESULTS****LTE Band 12**

| Band | BW (MHz) | Channel | Frequency (MHz) | Mode  | OBW(99%)(MHz) | 26 dB Bandwidth(MHz) |
|------|----------|---------|-----------------|-------|---------------|----------------------|
| 12   | 1.4      | Middle  | 707.5           | QPSK  | 1.1027        | 1.3068               |
|      |          | Middle  | 707.5           | 16QAM | 1.0940        | 1.3111               |
|      | 3        | Middle  | 707.5           | QPSK  | 2.6830        | 2.9262               |
|      |          | Middle  | 707.5           | 16QAM | 2.6830        | 2.9349               |
|      | 5        | Middle  | 707.5           | QPSK  | 4.5007        | 4.923                |
|      |          | Middle  | 707.5           | 16QAM | 4.4717        | 4.909                |
|      | 10       | Middle  | 707.5           | QPSK  | 8.9435        | 9.713                |
|      |          | Middle  | 707.5           | 16QAM | 8.9435        | 9.569                |

**LTE Band 17**

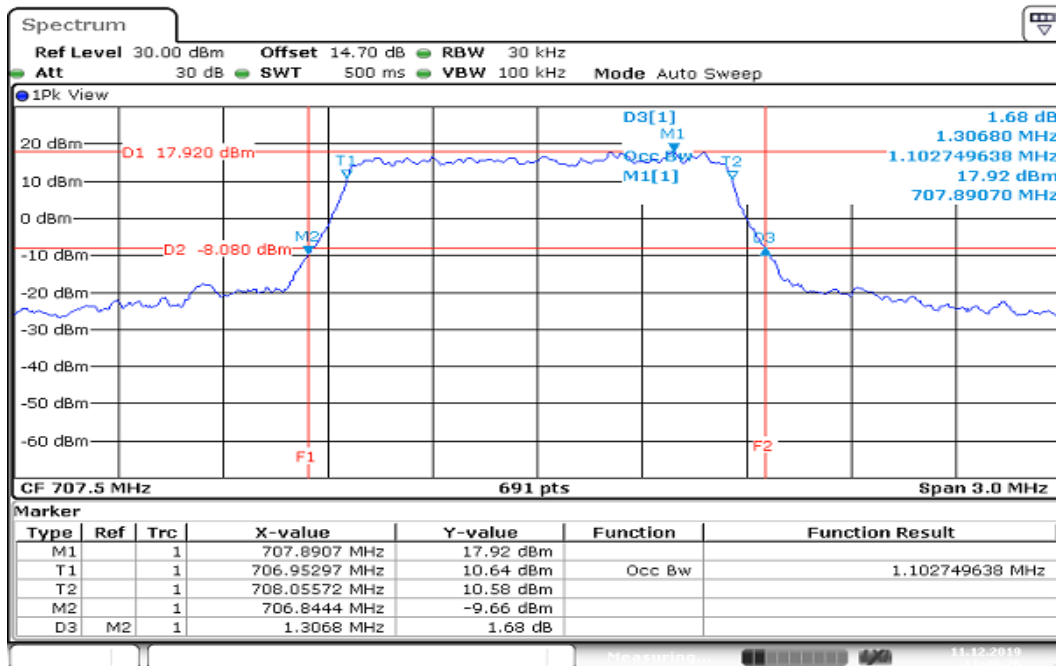
| Band | BW (MHz) | Channel | Frequency (MHz) | Mode  | OBW(99%)(MHz) | 26 dB Bandwidth(MHz) |
|------|----------|---------|-----------------|-------|---------------|----------------------|
| 17   | 5        | Middle  | 710.0           | QPSK  | 4.4862        | 4.92                 |
|      |          | Middle  | 710.0           | 16QAM | 4.4573        | 4.863                |
|      | 10       | Middle  | 710.0           | QPSK  | 8.914         | 9.696                |
|      |          | Middle  | 710.0           | 16QAM | 8.914         | 9.638                |

Report No.: T191105W01-RP11

## LTE Band 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK

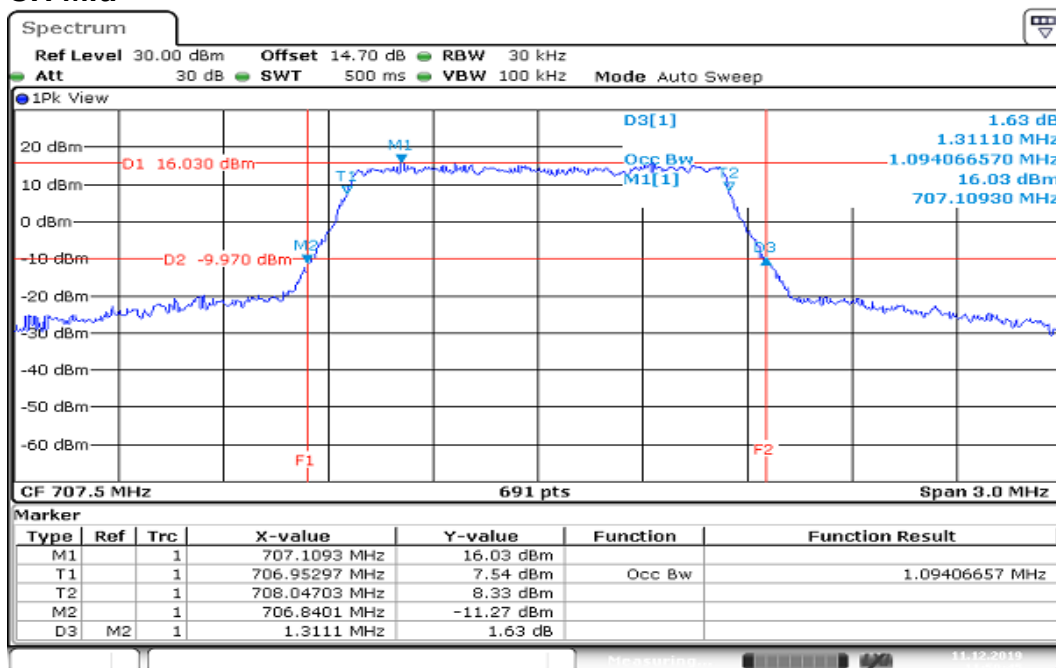
CH Mid



Date: 11.DEC.2019 11:49:27

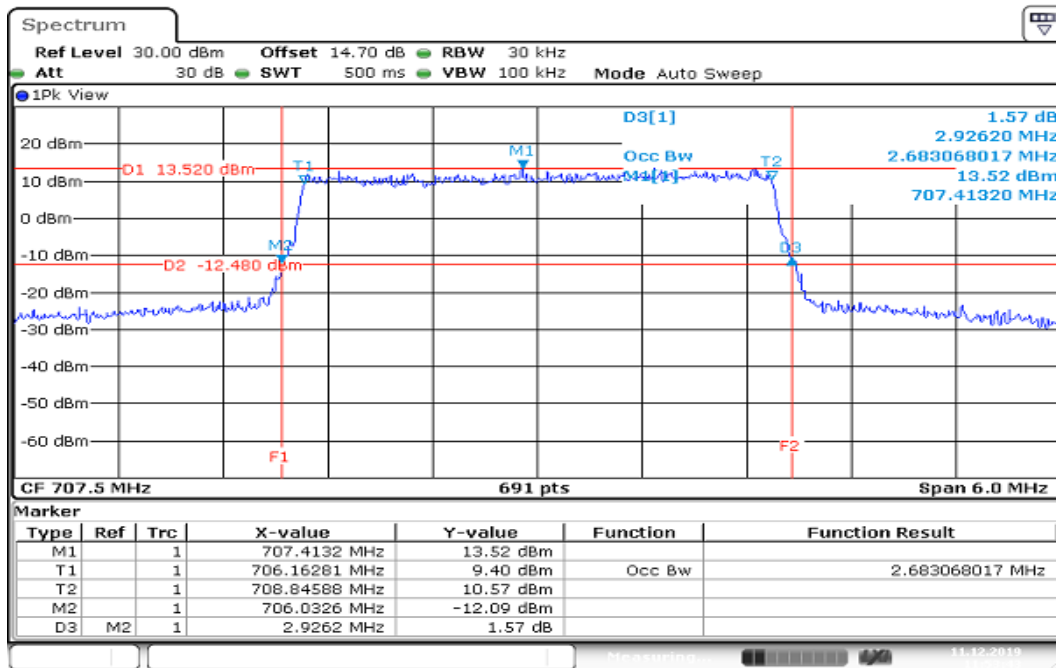
## CHANNEL BANDWIDTH: 1.4MHz / 16QAM

CH Mid

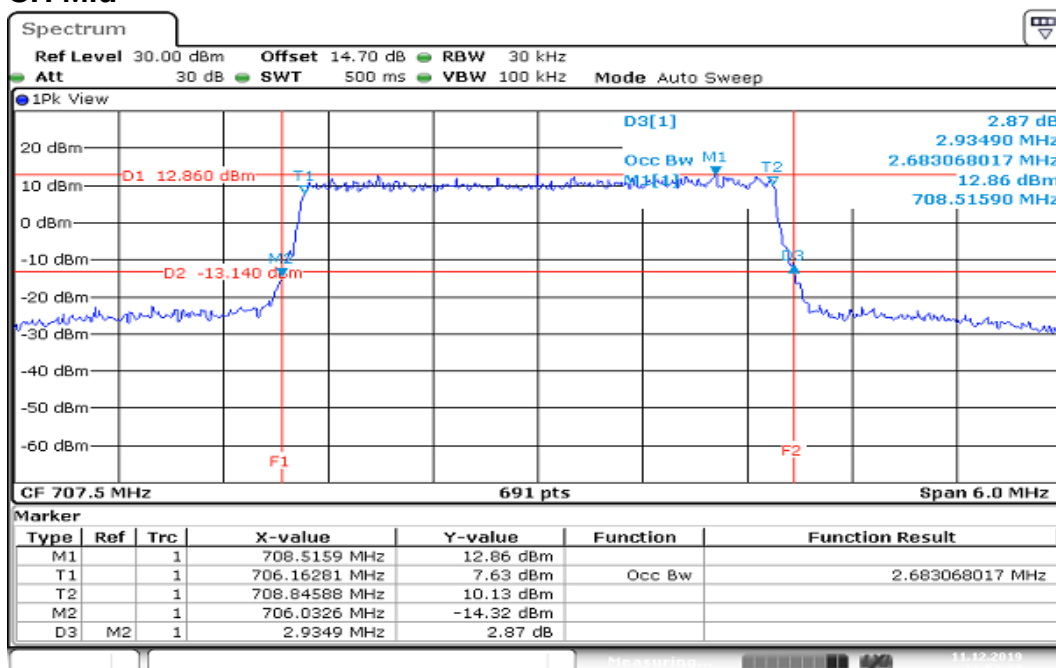


Date: 11.DEC.2019 11:50:46

Report No.: T191105W01-RP11

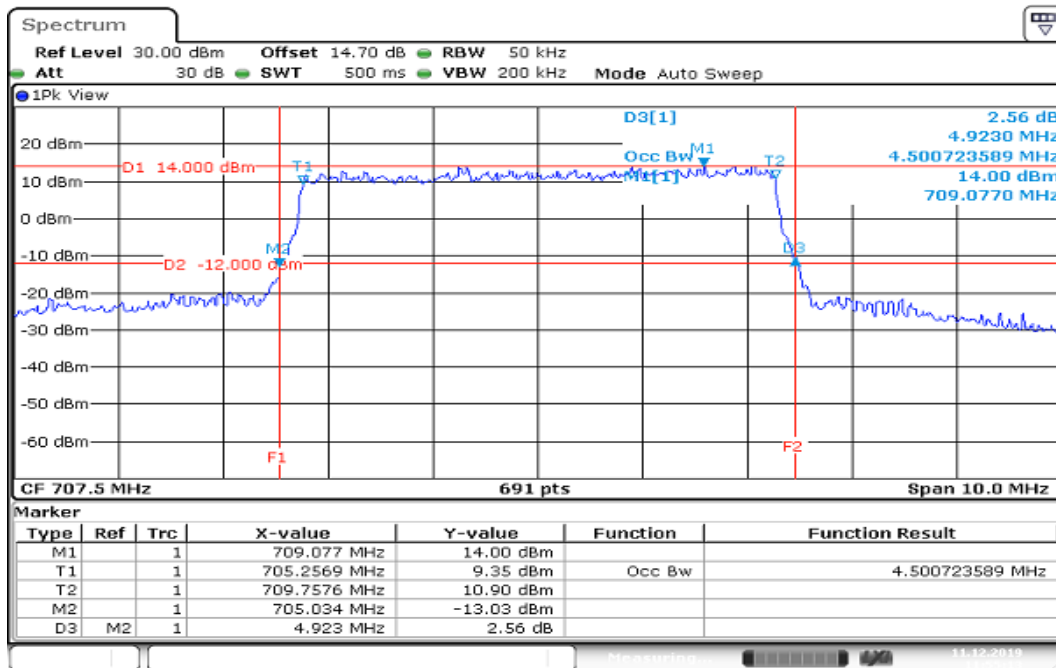
**CHANNEL BANDWIDTH: 3MHz / QPSK**  
**CH Mid**

Date: 11.DEC.2019 11:53:43

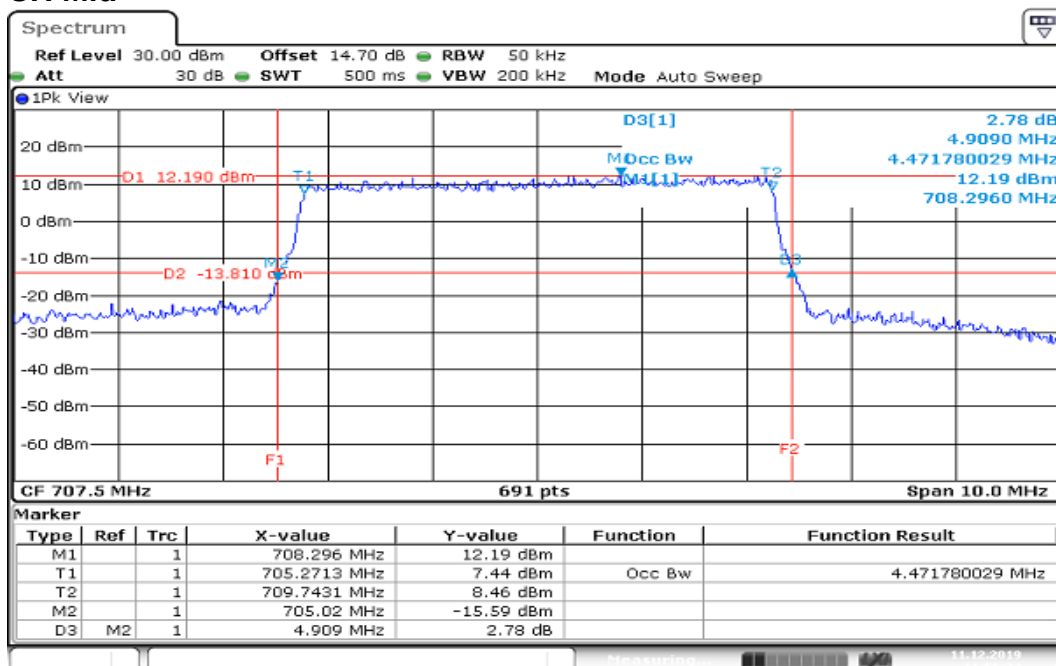
**CHANNEL BANDWIDTH: 3MHz / 16QAM**  
**CH Mid**

Date: 11.DEC.2019 11:52:29

Report No.: T191105W01-RP11

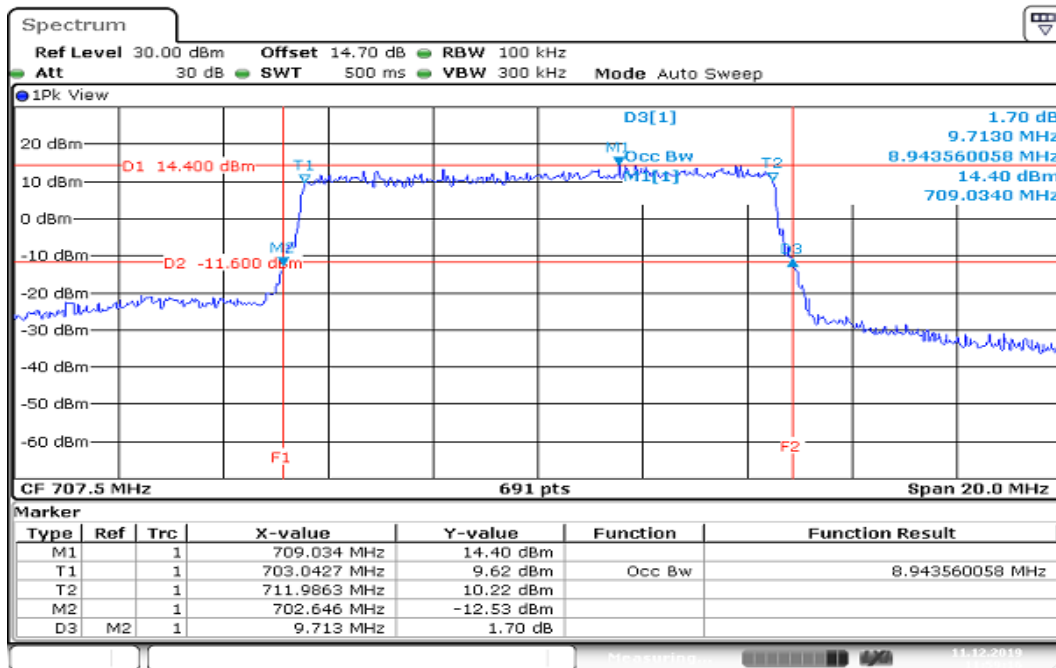
**CHANNEL BANDWIDTH: 5MHz / QPSK**  
**CH Mid**

Date: 11.DEC.2019 11:55:14

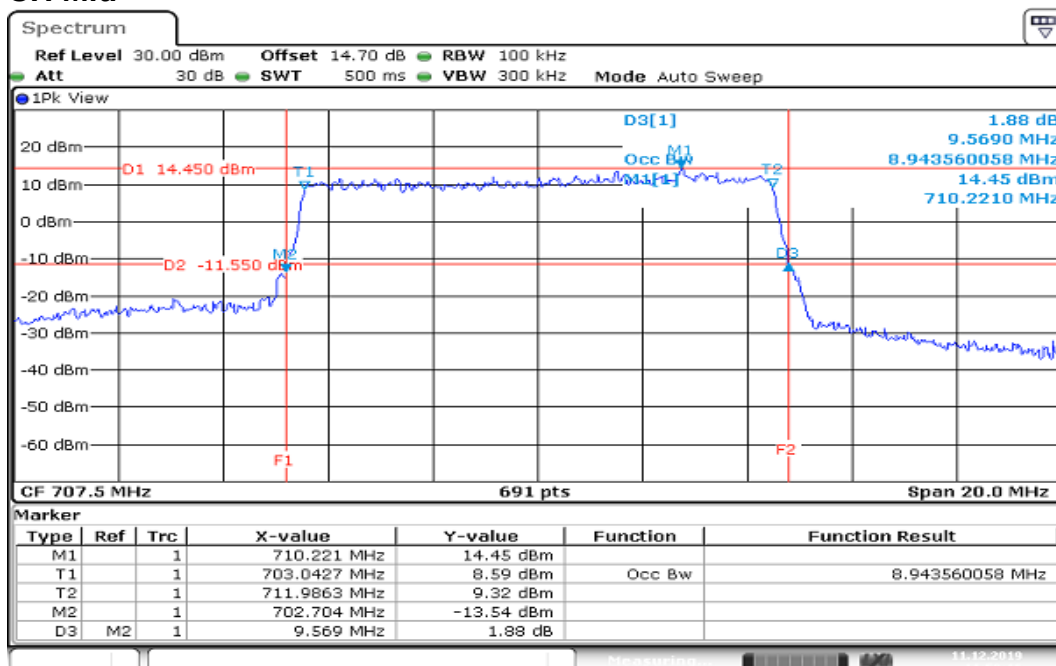
**CHANNEL BANDWIDTH: 5MHz / 16QAM**  
**CH Mid**

Date: 11.DEC.2019 11:56:24

Report No.: T191105W01-RP11

**CHANNEL BANDWIDTH: 10MHz / QPSK**  
**CH Mid**

Date: 11.DEC.2019 11:59:17

**CHANNEL BANDWIDTH: 10MHz / 16QAM**  
**CH Mid**

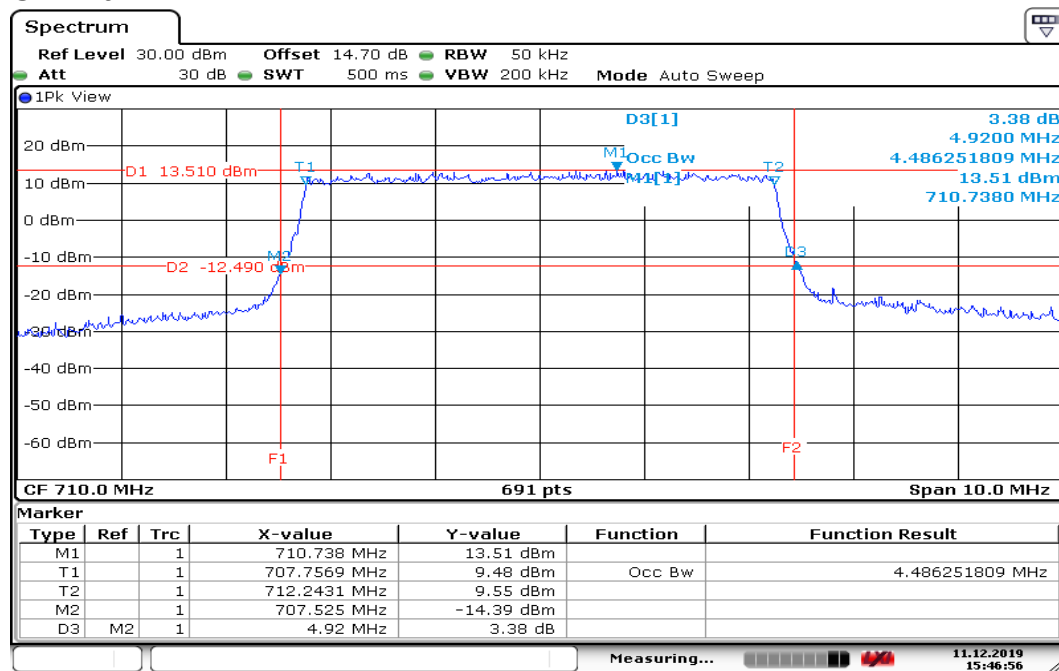
Date: 11.DEC.2019 11:58:17

Report No.: T191105W01-RP11

## LTE Band 17

CHANNEL BANDWIDTH: 5MHz / QPSK

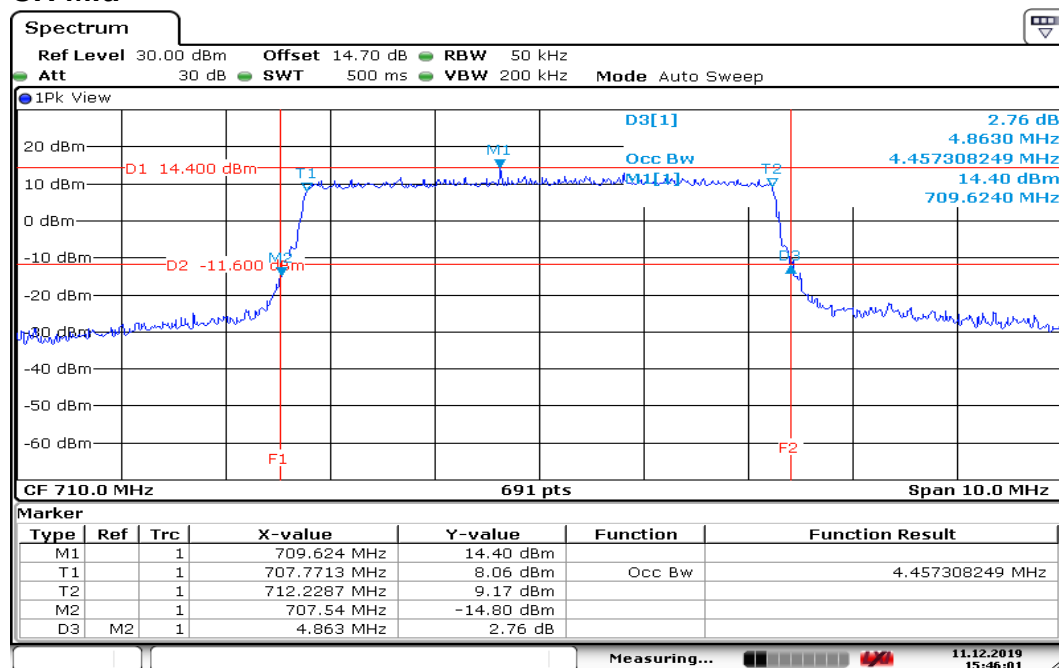
CH Mid



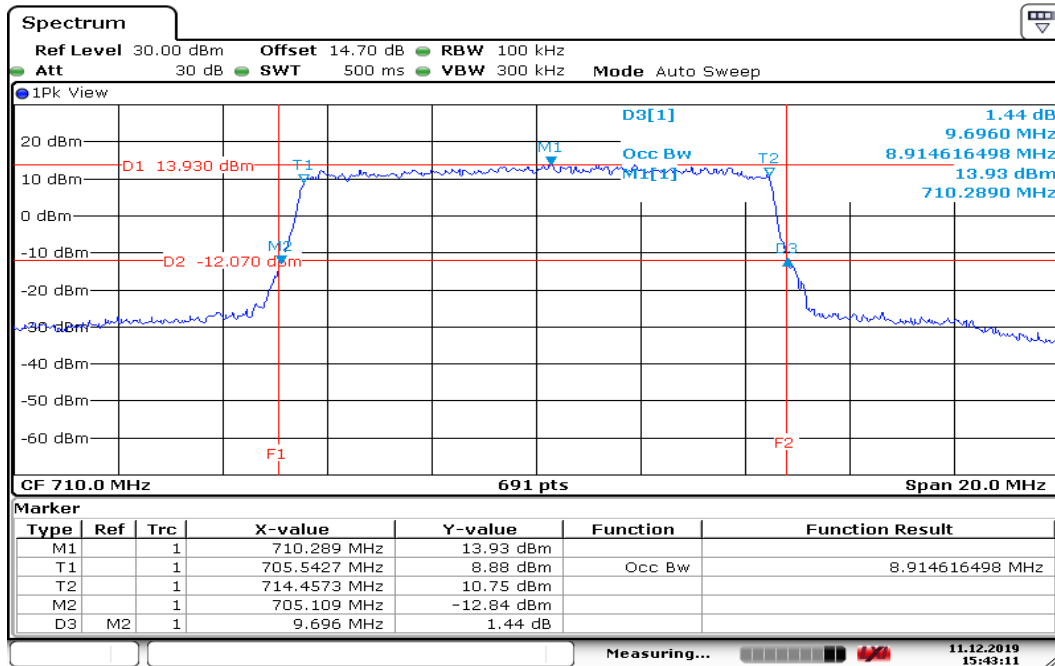
Date: 11.DEC.2019 15:46:57

## CHANNEL BANDWIDTH: 5MHz / 16QAM

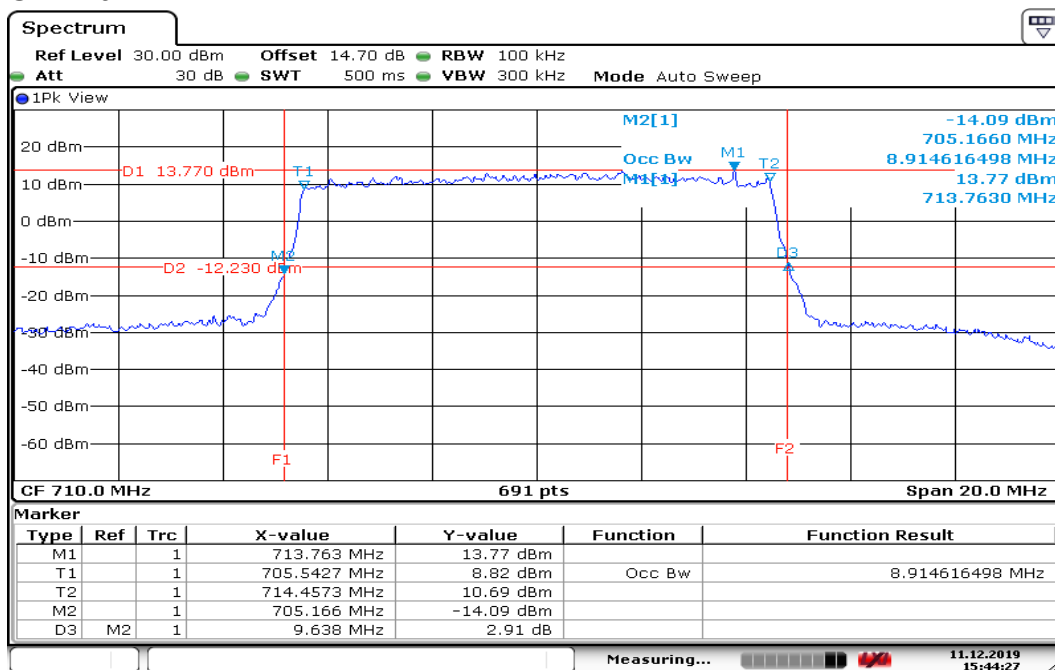
CH Mid



Date: 11.DEC.2019 15:46:02

**CHANNEL BANDWIDTH: 10MHz / QPSK**  
**CH Mid**

Date: 11.DEC.2019 15:43:12

**CHANNEL BANDWIDTH: 10MHz / 16QAM**  
**CH Mid**

Date: 11.DEC.2019 15:44:28

## 8.4 PEAK TO AVERAGE POWER RATIO

### LIMIT

In measuring transmissions in this band using an average power technique, peak-to-average power ratio (PAPR) of the transmission may not exceed 13 dB.

### TEST PROCEDURES

1. According to KDB 971168D01.
2. The EUT was connect to spectrum analyzer and call box.
3. Set the CCDF function in spectrum analyzer.
4. The highest RF output power were measured and recorded the maximum PAPR level associated with a probability of 0.1%.
5. Record the Peak to Average Power Ratio.

**TEST RESULTS****LTE Band 12****CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 4.87                          |

**CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 4.84                          |

**CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 4.06                          |

**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 3.88                          |

**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 5.45                          |

**CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 5.07                          |

**CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 5.30                          |

**CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 5.16                          |

**Note:** We selected worst case to performed test in middle channel, the results can be meet other channel.

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 5.88                          |

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 5.88                          |

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 4.96                          |

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 4.58                          |

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 6.23                          |

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 6.29                          |

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 6.32                          |

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23095   | 707.5              | 6.17                          |

**Note:** We selected worst case to performed test in middle channel, the results can be meet other channel.

**LTE Band 17****CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23790   | 710.0              | 4.78                          |

**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23790   | 710.0              | 5.07                          |

**CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23790   | 710.0              | 4.20                          |

**CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23790   | 710.0              | 4.67                          |

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23790   | 710.0              | 5.48                          |

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23790   | 710.0              | 5.94                          |

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23790   | 710.0              | 5.22                          |

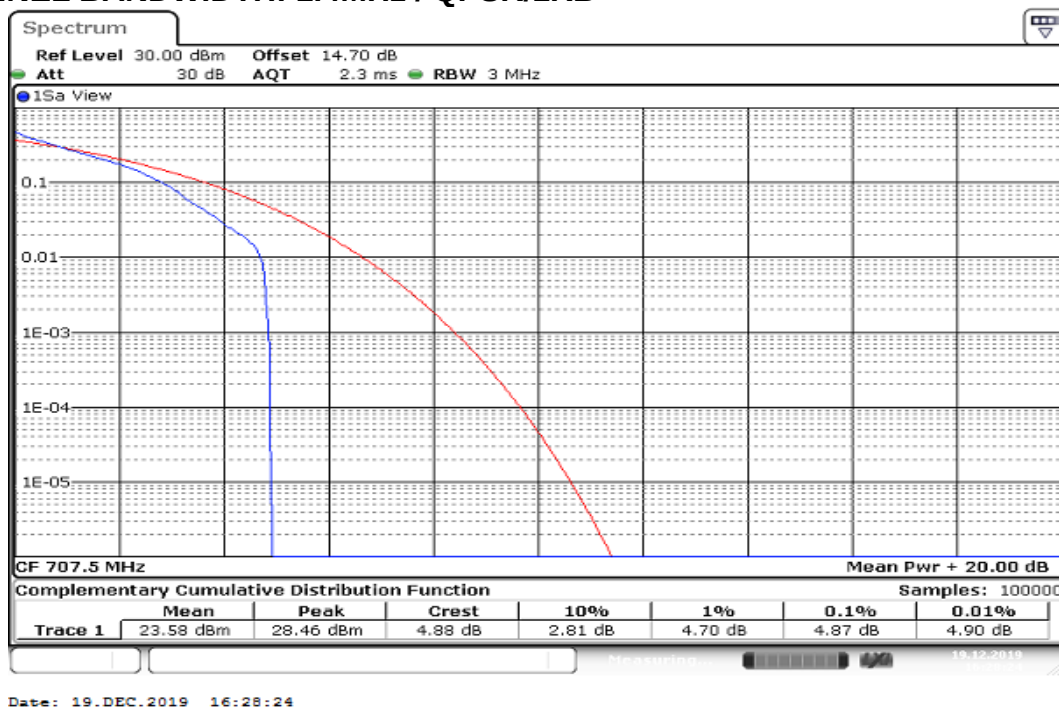
**CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB**

| Channel | FREQUENCY<br>(MHz) | PEAK TO AVERAGE RATIO<br>(dB) |
|---------|--------------------|-------------------------------|
| 23790   | 710.0              | 5.71                          |

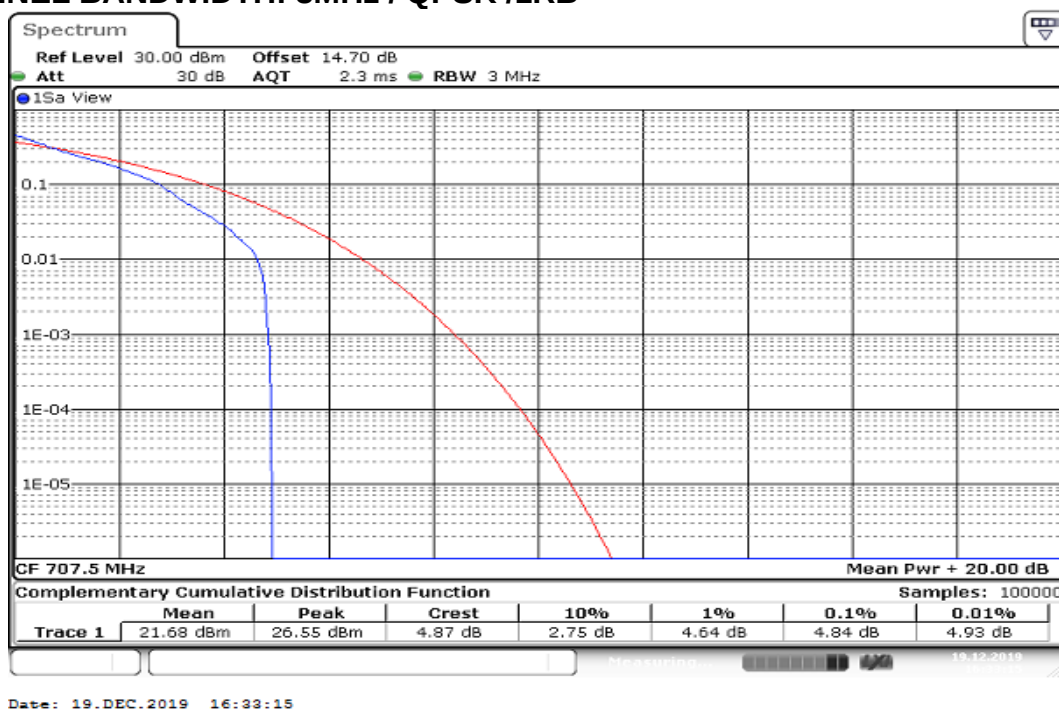
**Note:** We selected worst case to performed test in middle channel, the results can be meet other channel.

## LTE Band 12

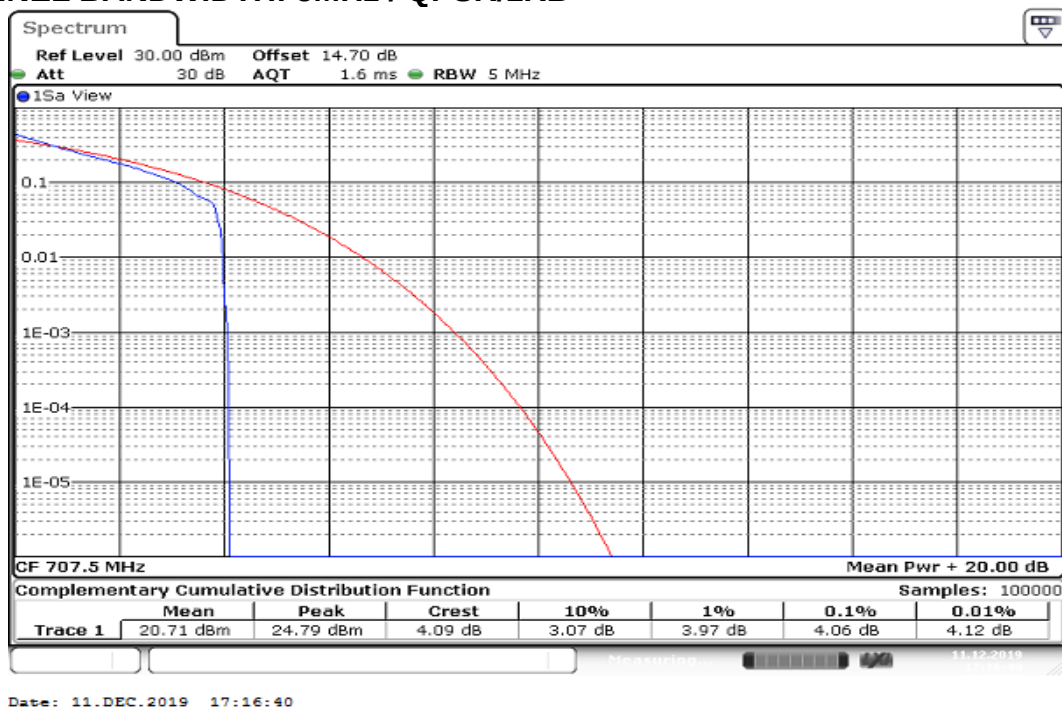
### CHANNEL BANDWIDTH: 1.4MHz / QPSK/1RB



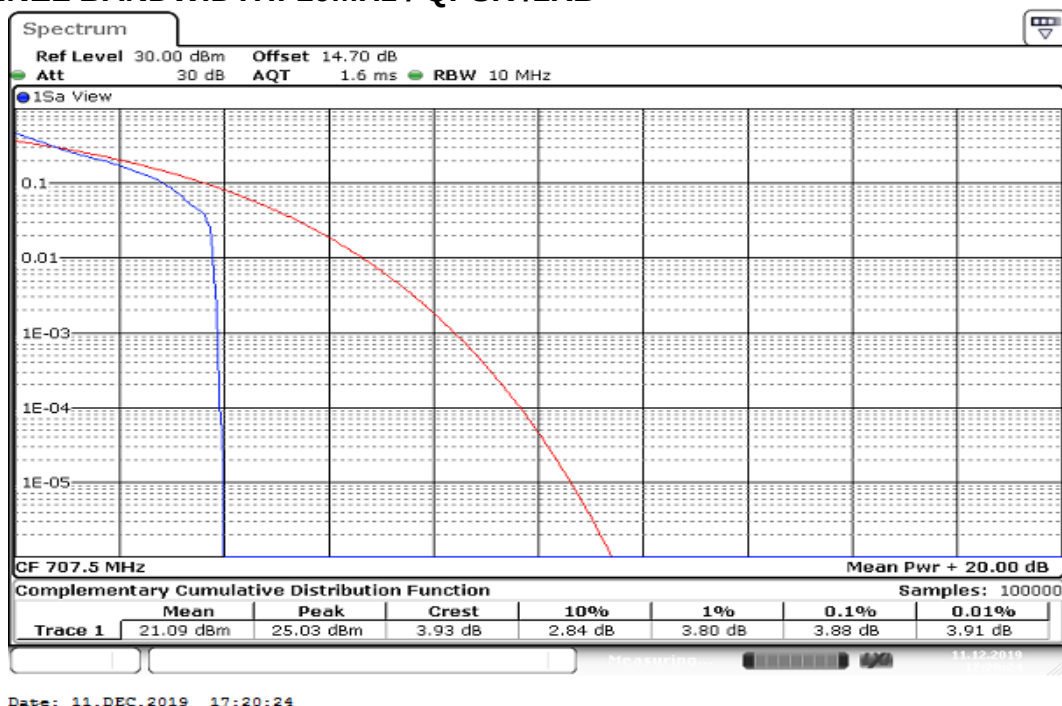
### CHANNEL BANDWIDTH: 3MHz / QPSK /1RB



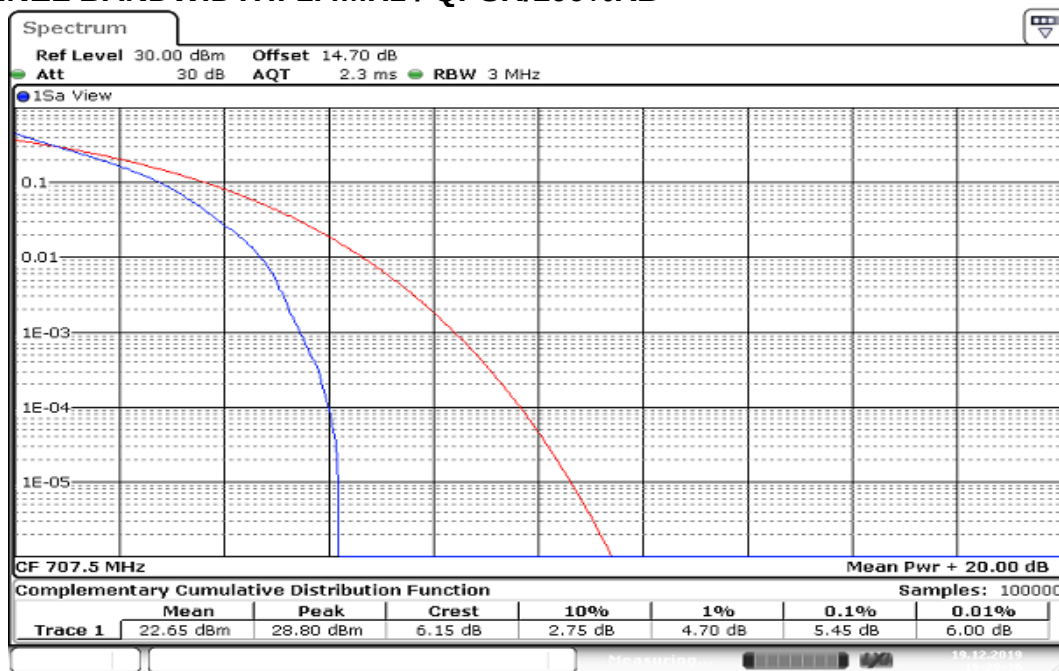
### CHANNEL BANDWIDTH: 5MHz / QPSK/1RB



### CHANNEL BANDWIDTH: 10MHz / QPSK /1RB

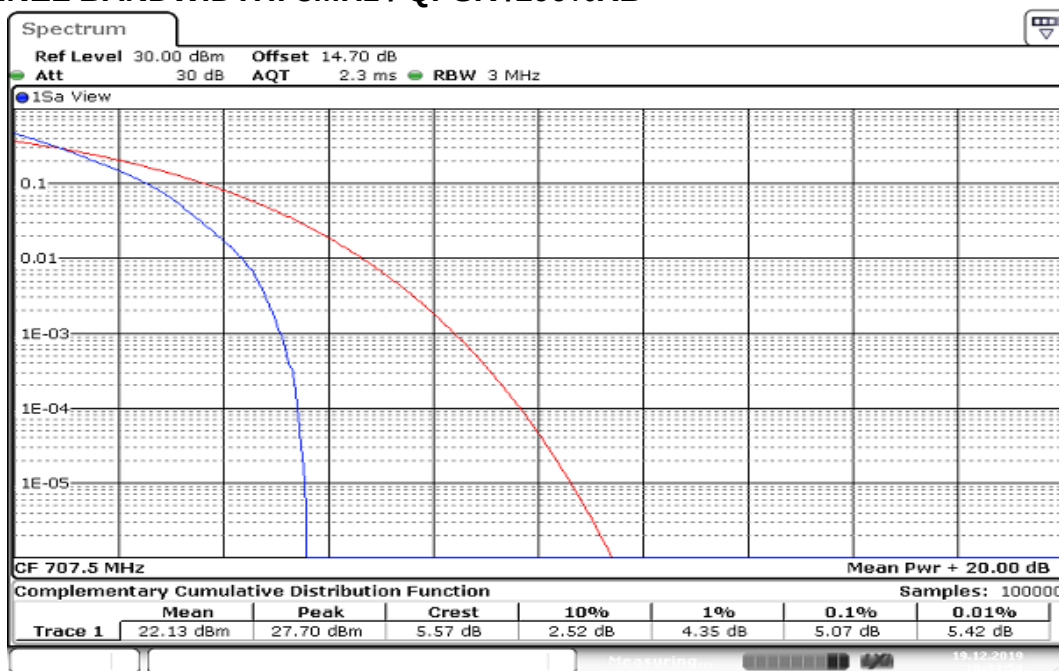


### CHANNEL BANDWIDTH: 1.4MHz / QPSK/100%RB



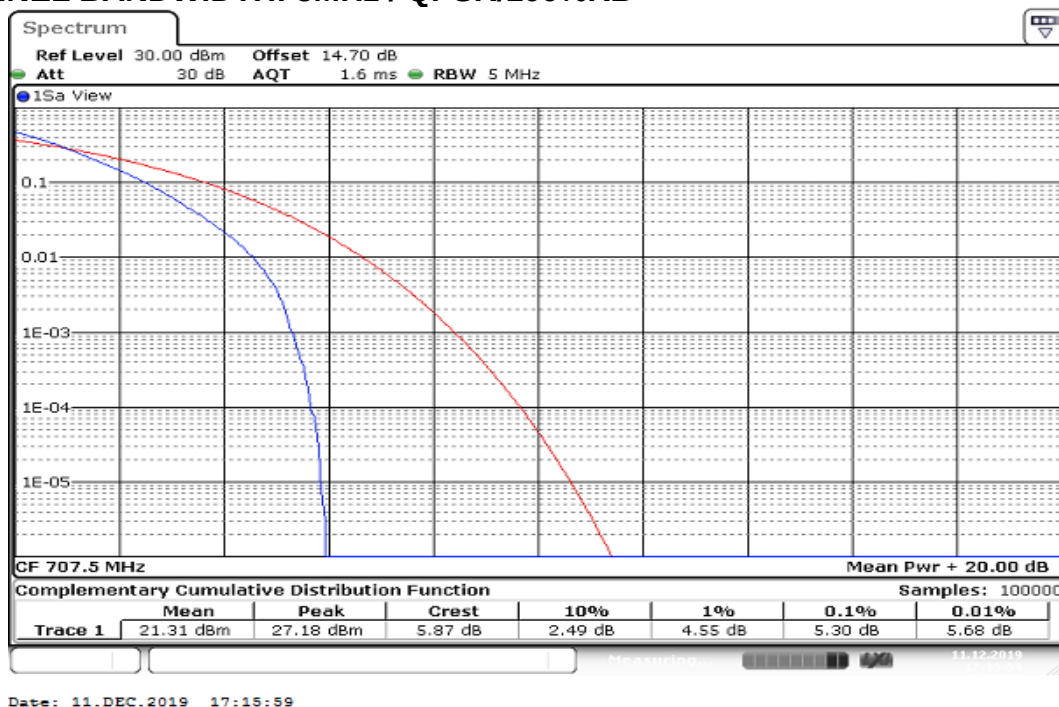
Date: 19.DEC.2019 16:29:37

### CHANNEL BANDWIDTH: 3MHz / QPSK /100%RB

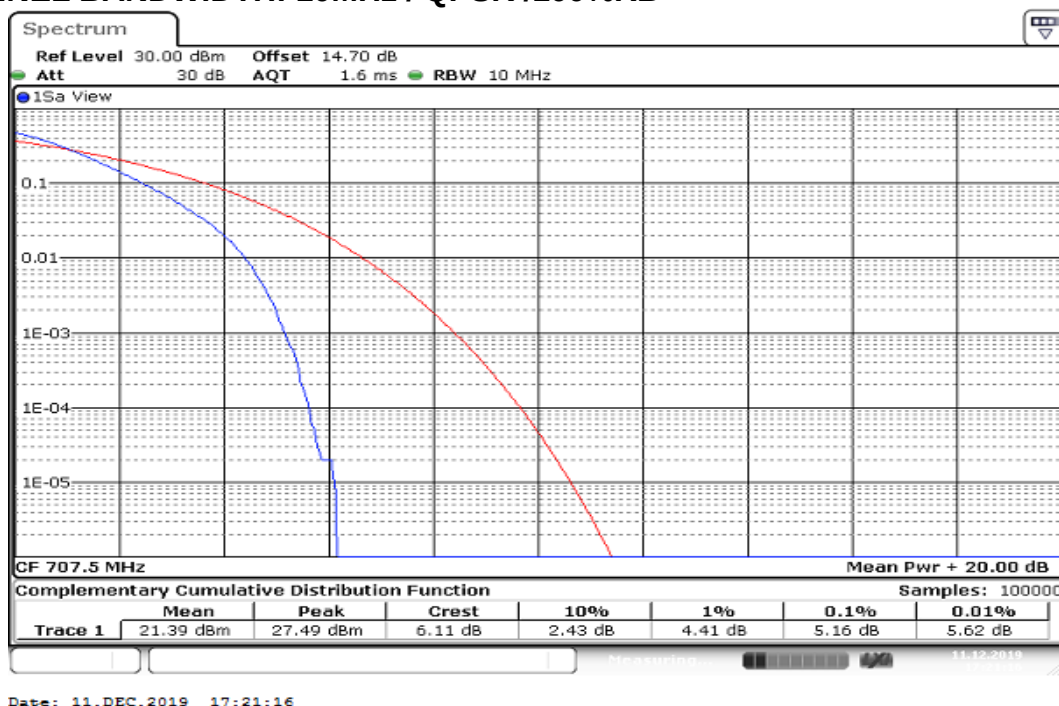


Date: 19.DEC.2019 16:33:59

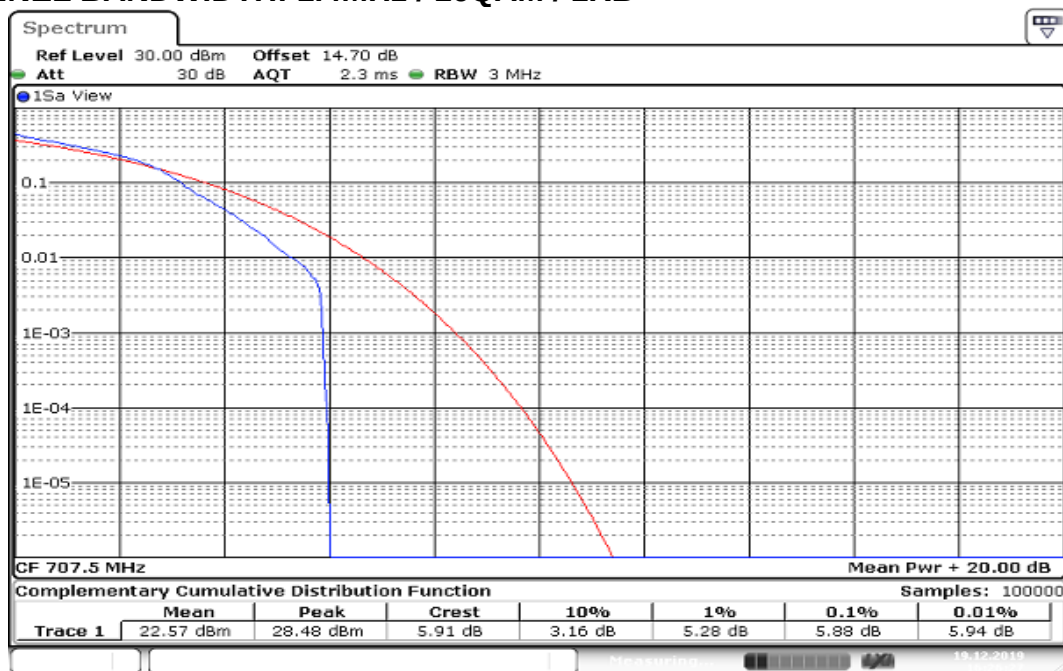
### CHANNEL BANDWIDTH: 5MHz / QPSK/100%RB



### CHANNEL BANDWIDTH: 10MHz / QPSK /100%RB

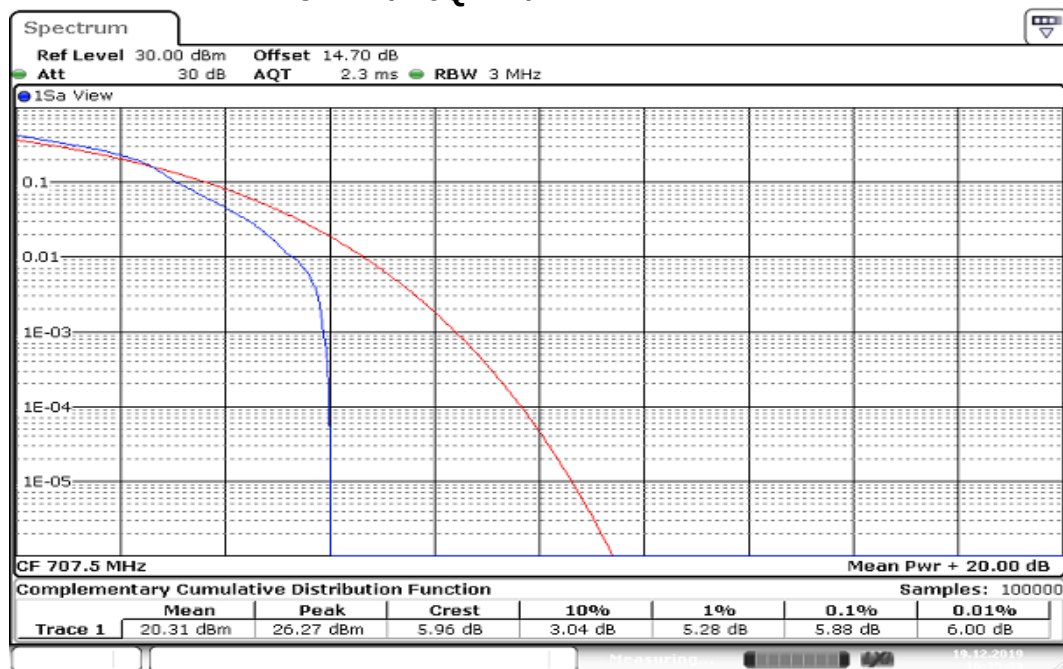


### CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB



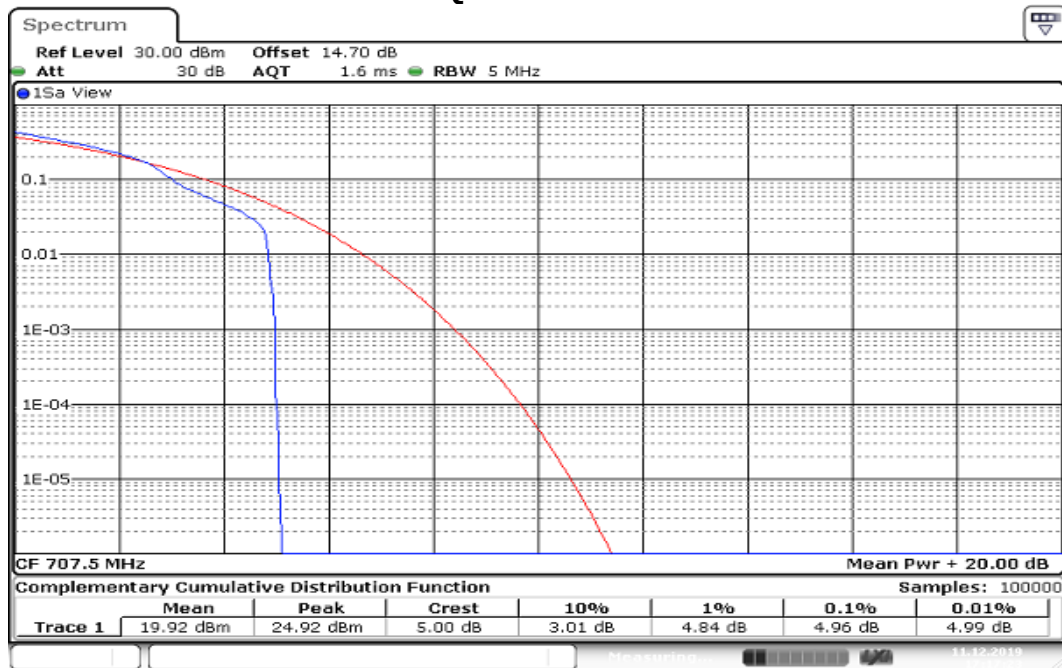
Date: 19.DEC.2019 16:26:27

### CHANNEL BANDWIDTH: 3MHz / 16QAM /1RB



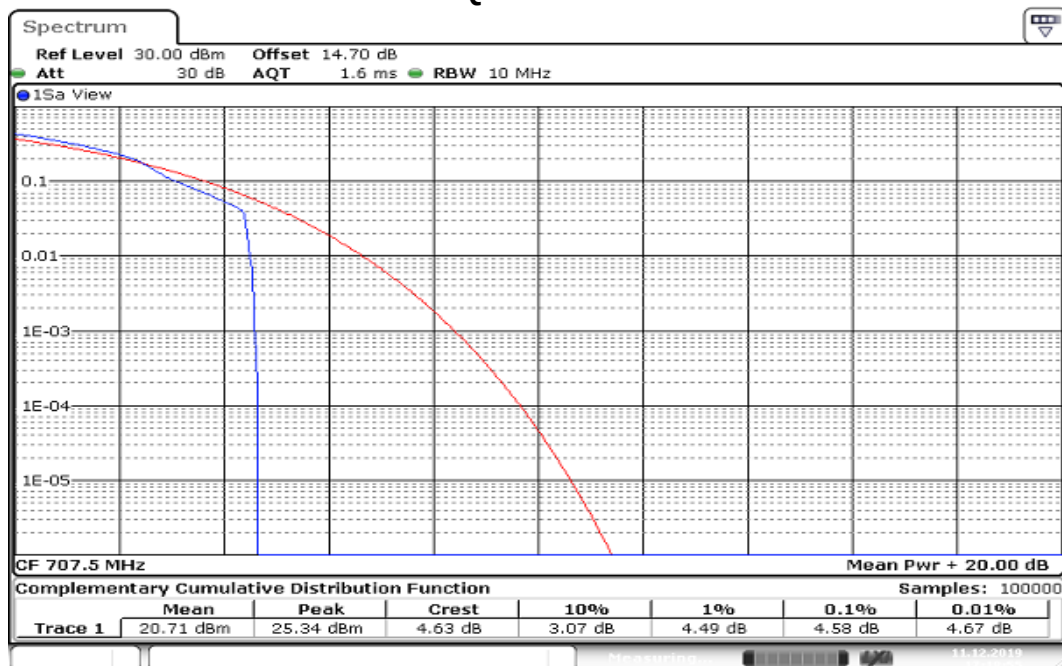
Date: 19.DEC.2019 16:35:40

### CHANNEL BANDWIDTH: 5MHz / 16QAM /1RB



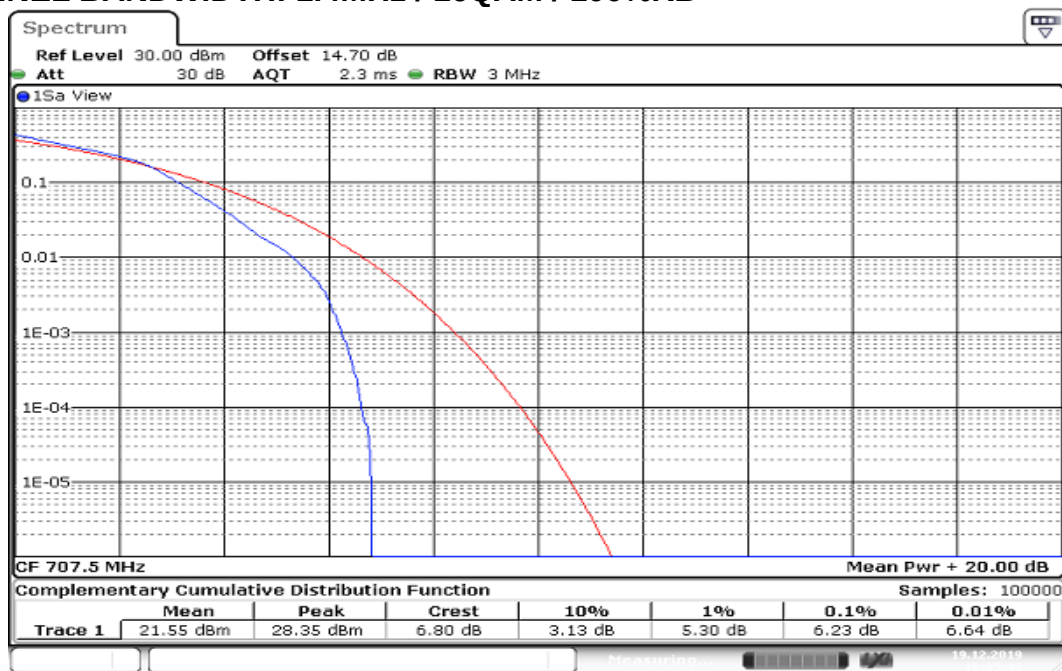
Date: 11.DEC.2019 17:17:23

### CHANNEL BANDWIDTH: 10MHz / 16QAM /1RB



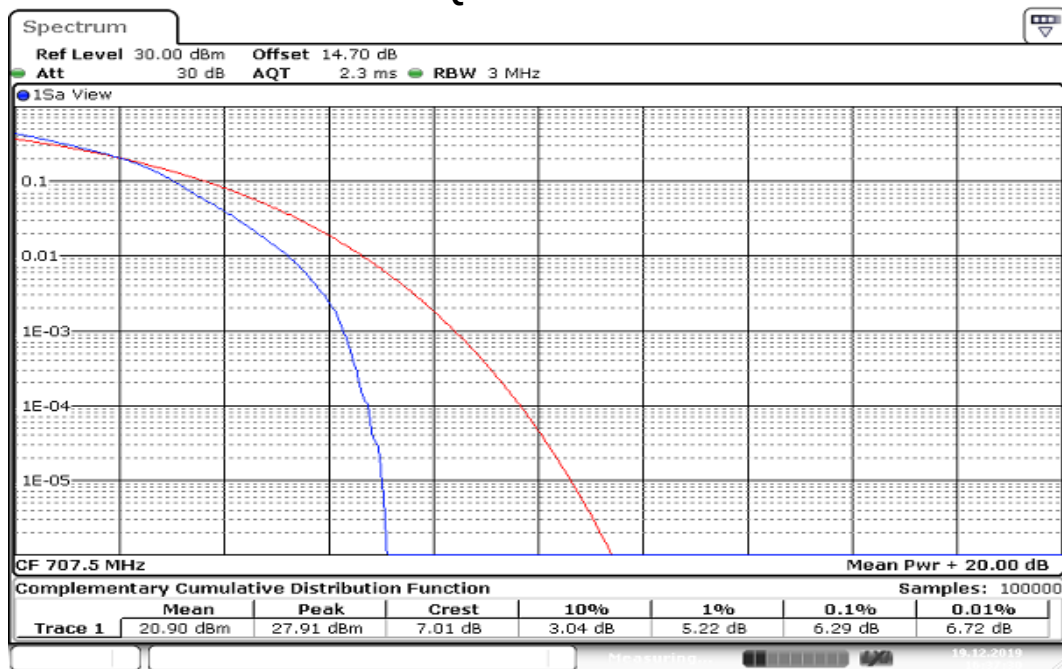
Date: 11.DEC.2019 17:18:55

### CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100%RB



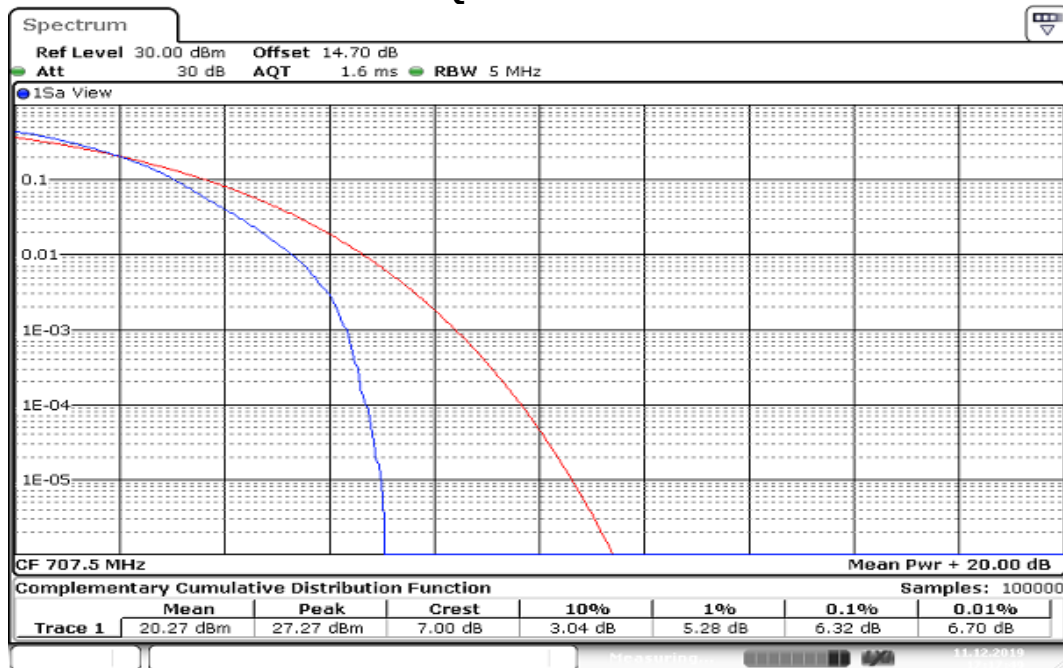
Date: 19.DEC.2019 16:25:43

### CHANNEL BANDWIDTH: 3MHz / 16QAM / 100%RB



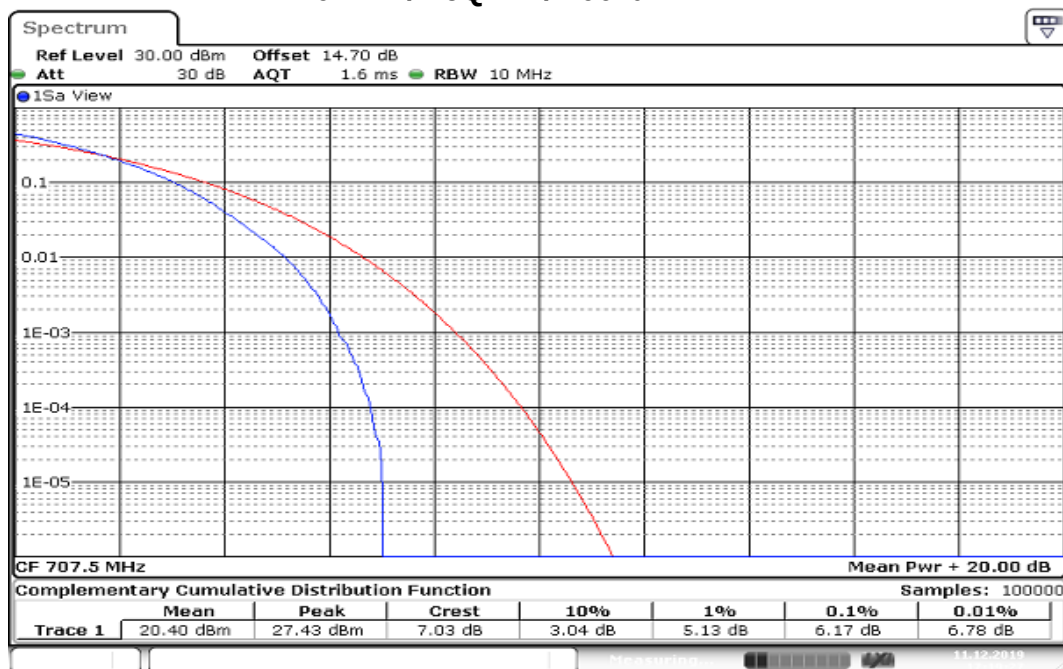
Date: 19.DEC.2019 16:37:30

## CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB



Date: 11.DEC.2019 17:17:49

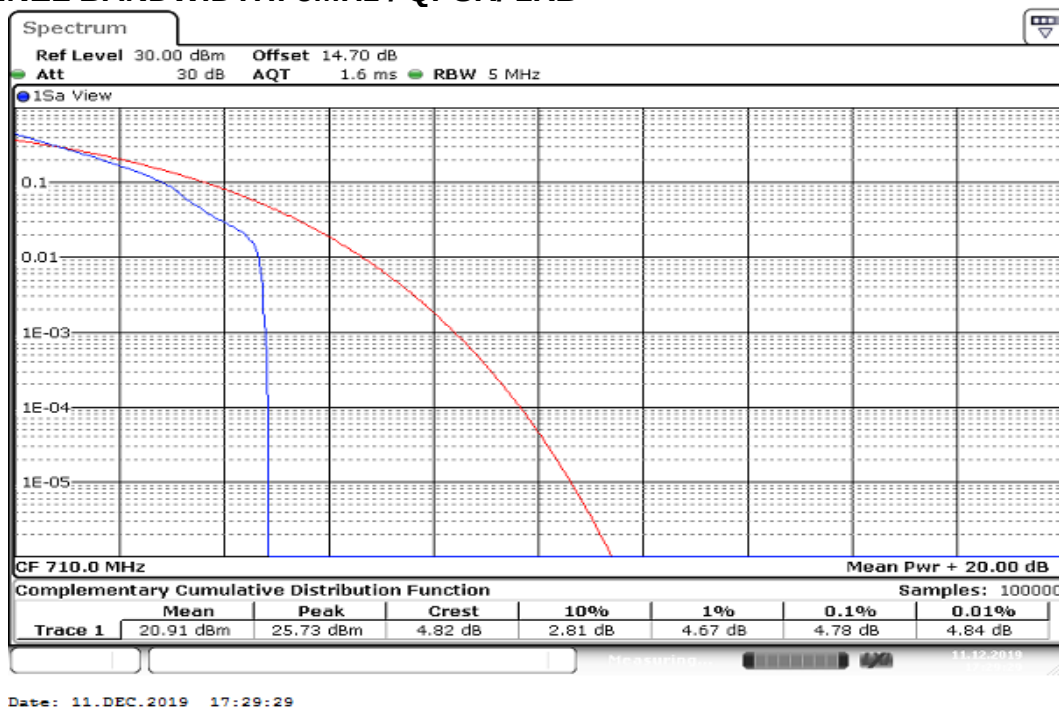
## CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB



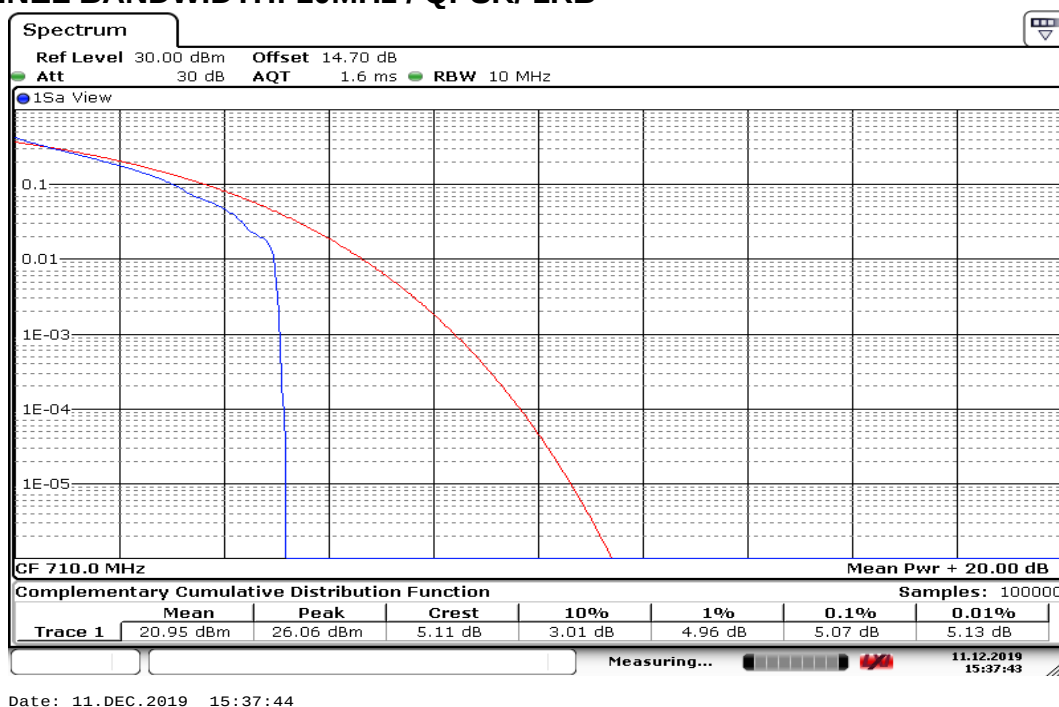
Date: 11.DEC.2019 17:19:27

## LTE Band 17

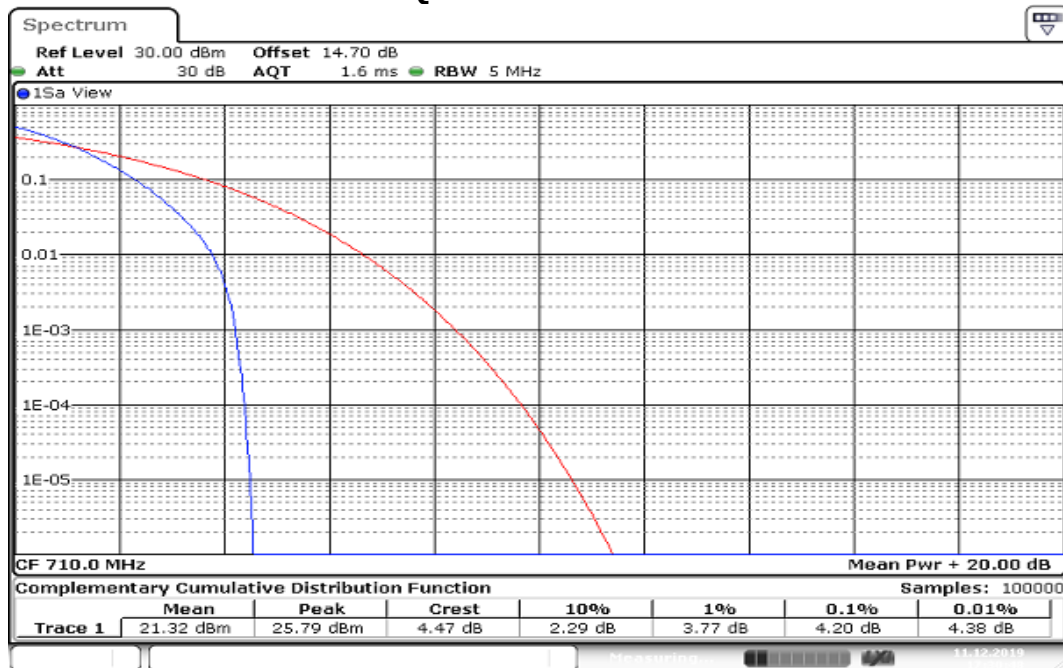
### CHANNEL BANDWIDTH: 5MHz / QPSK/ 1RB



### CHANNEL BANDWIDTH: 10MHz / QPSK/ 1RB

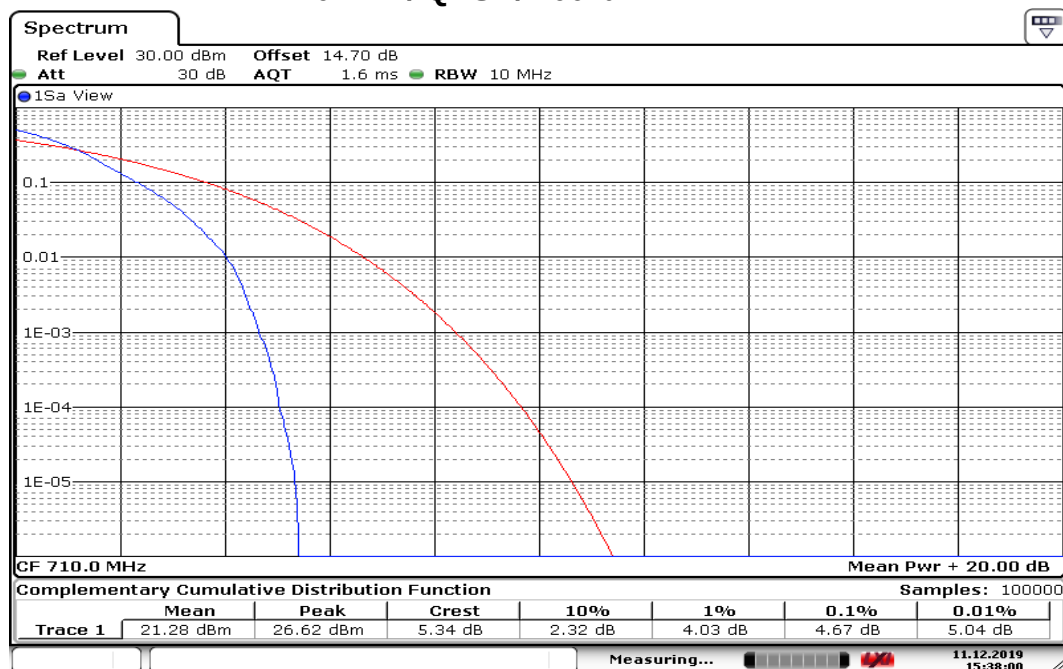


### CHANNEL BANDWIDTH: 5MHz / QPSK/ 100%RB



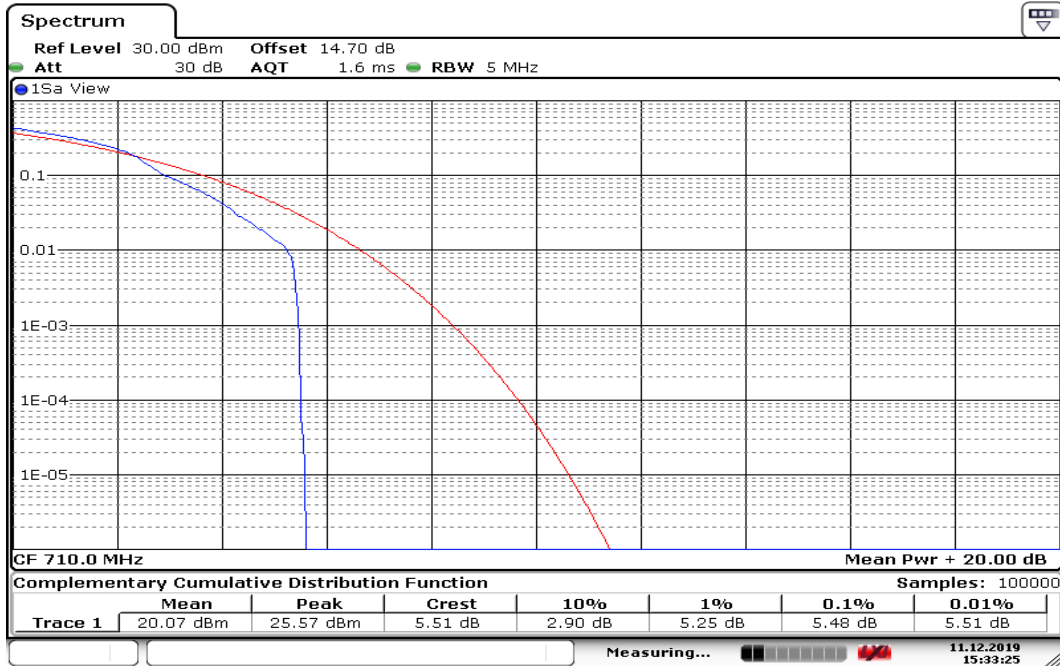
Date: 11.DEC.2019 17:30:48

### CHANNEL BANDWIDTH: 10MHz / QPSK/ 100%RB



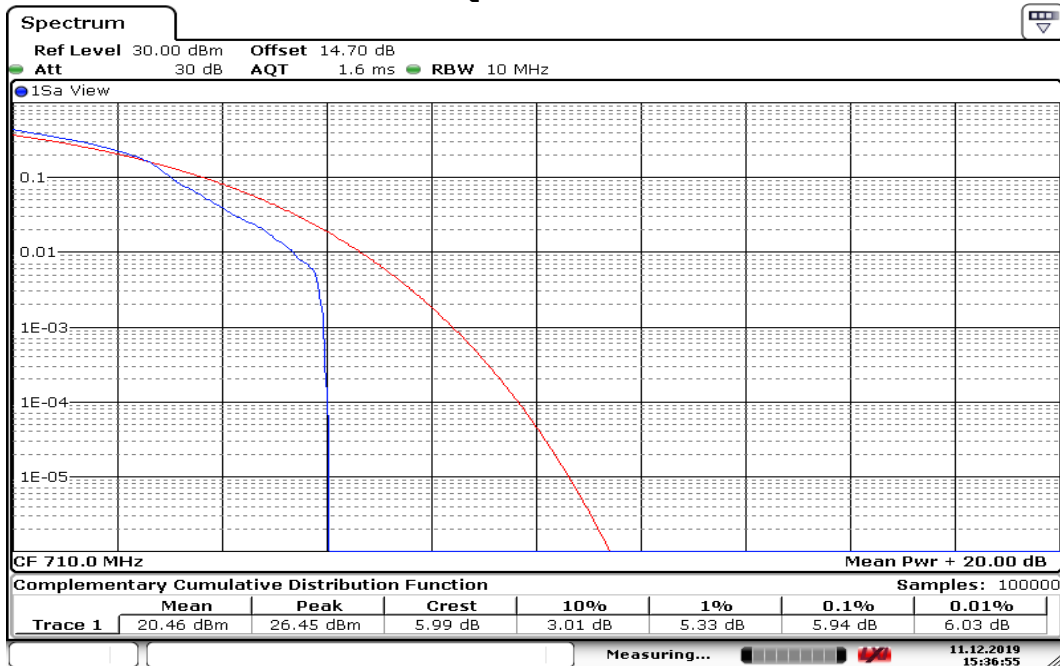
Date: 11.DEC.2019 15:38:00

### CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB



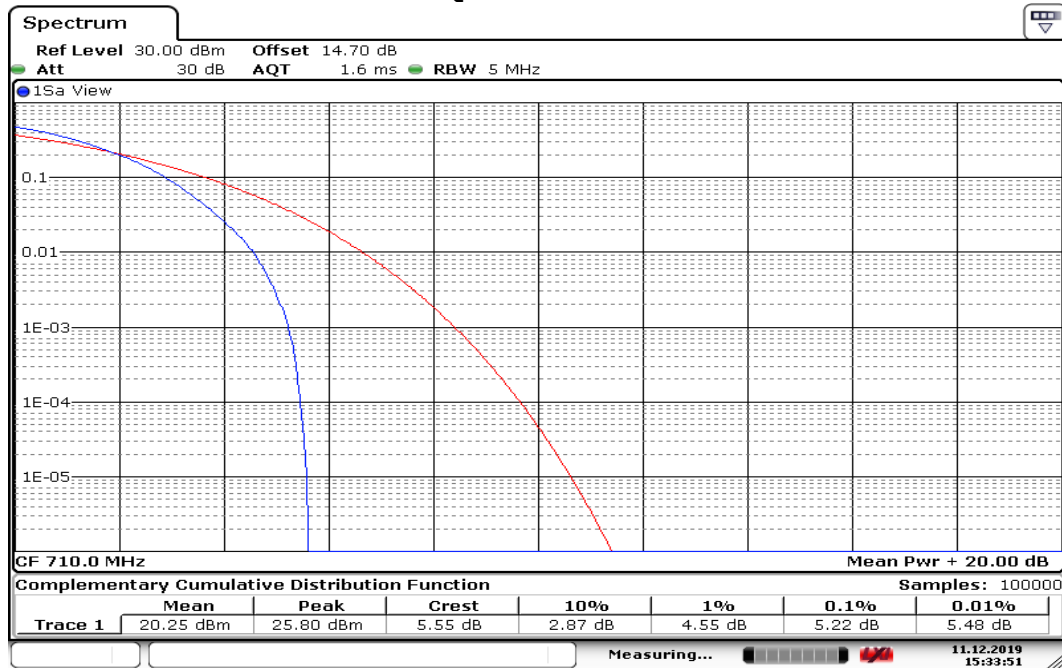
Date: 11.DEC.2019 15:33:25

### CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB



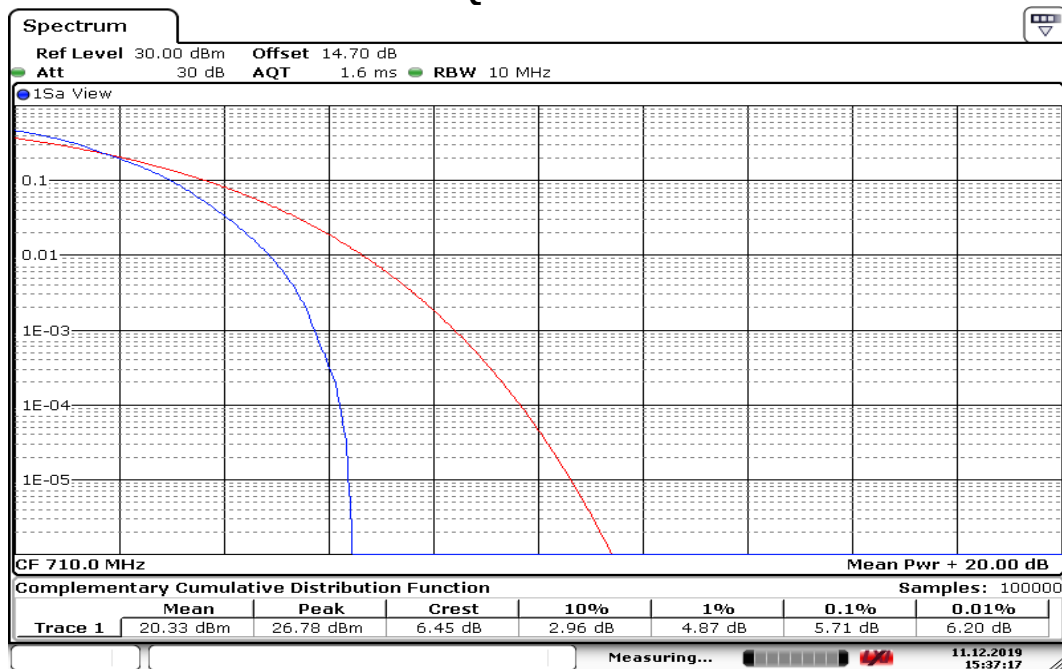
Date: 11.DEC.2019 15:36:56

### CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB



Date: 11.DEC.2019 15:33:51

### CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB



Date: 11.DEC.2019 15:37:18

## 8.5 BAND EDGE MEASUREMENT

### LIMIT

#### **Part 27.53 (g), Band 12 & Band 17**

For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

#### **According to RSS-130, Band 12 & Band 17**

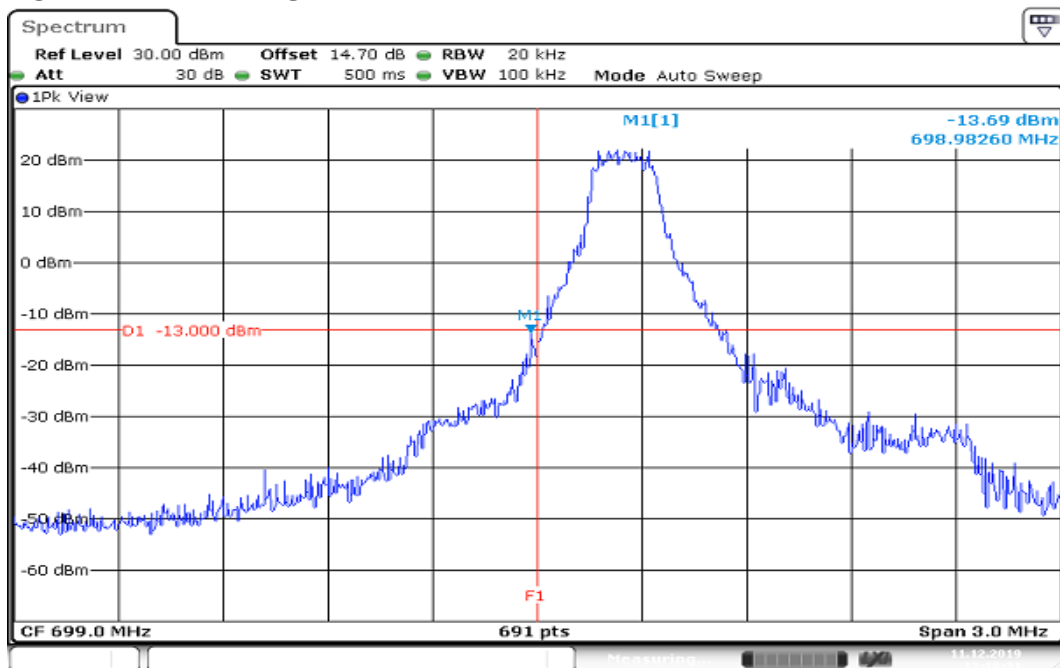
The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least  $43 + 10 \log_{10} p$  (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

### TEST PROCEDURES

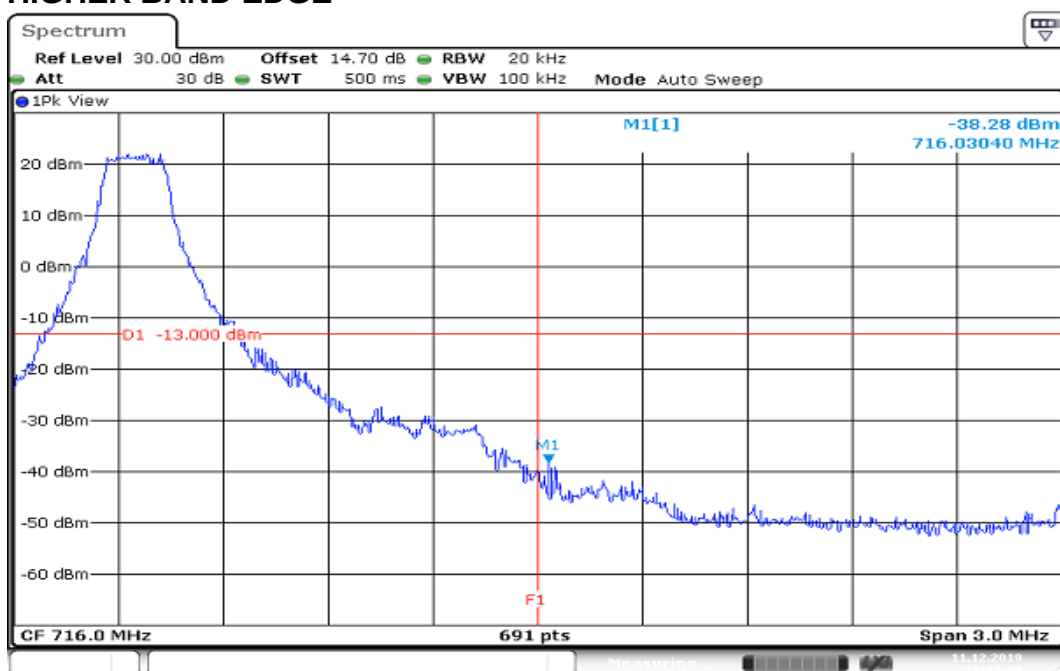
KDB 971168 D01 Power Meas License Digital Systems – Section 6.0

1. RBW  $\geq 1\%$  of the emission bandwidth
2. VBW  $\geq 3 \times$  RBW
3. Span was set large enough so as to capture all out of emissions near the band edge.

Report No.: T191105W01-RP11

**TEST RESULTS:****LTE Band 12****CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB ALLOCATION****LOWER BAND EDGE**

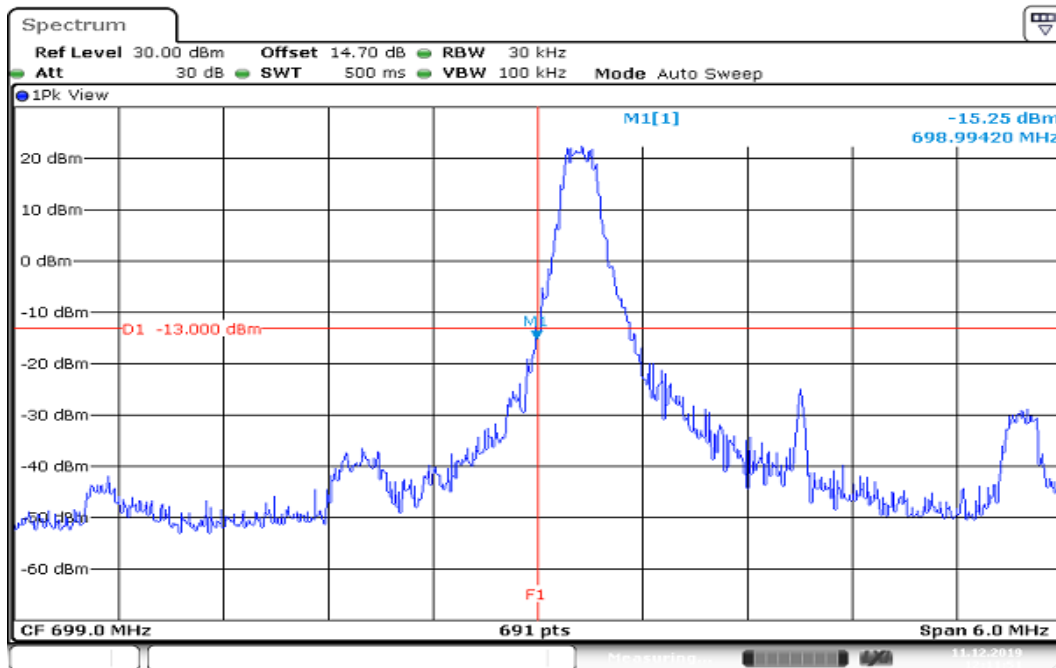
Date: 11.DEC.2019 12:18:32

**HIGHER BAND EDGE**

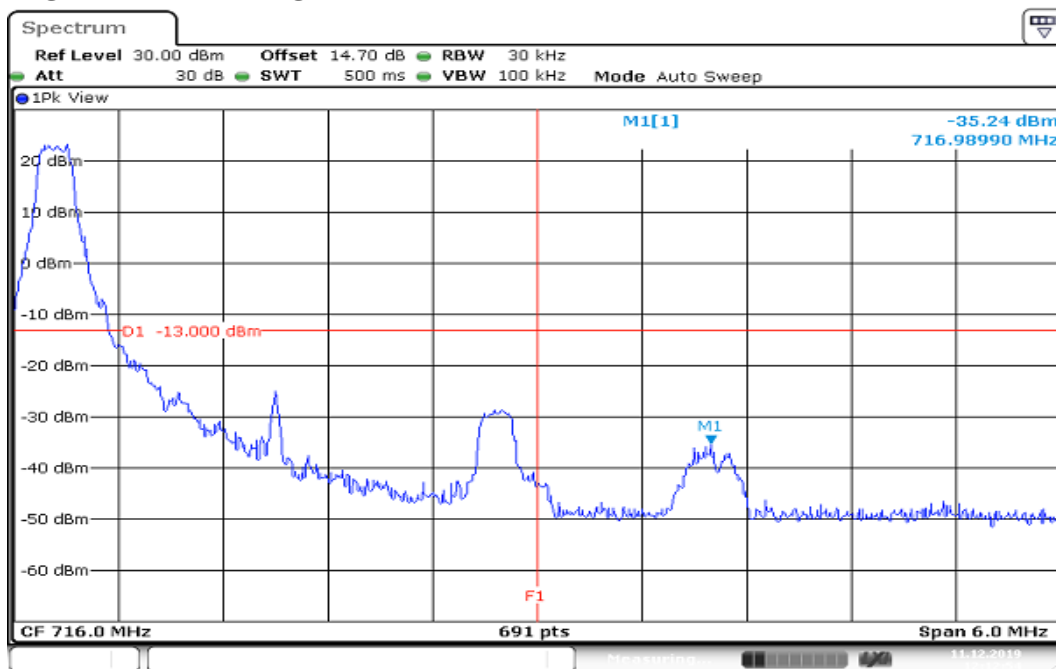
Date: 11.DEC.2019 12:17:39

Report No.: T191105W01-RP11

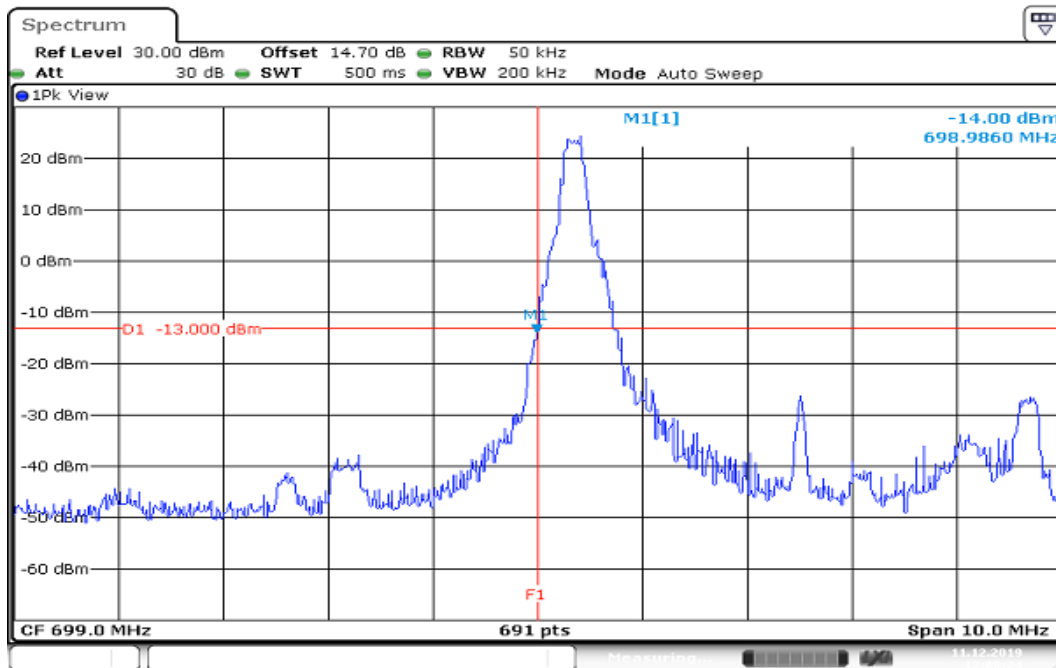
## CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB ALLOCATION LOWER BAND EDGE



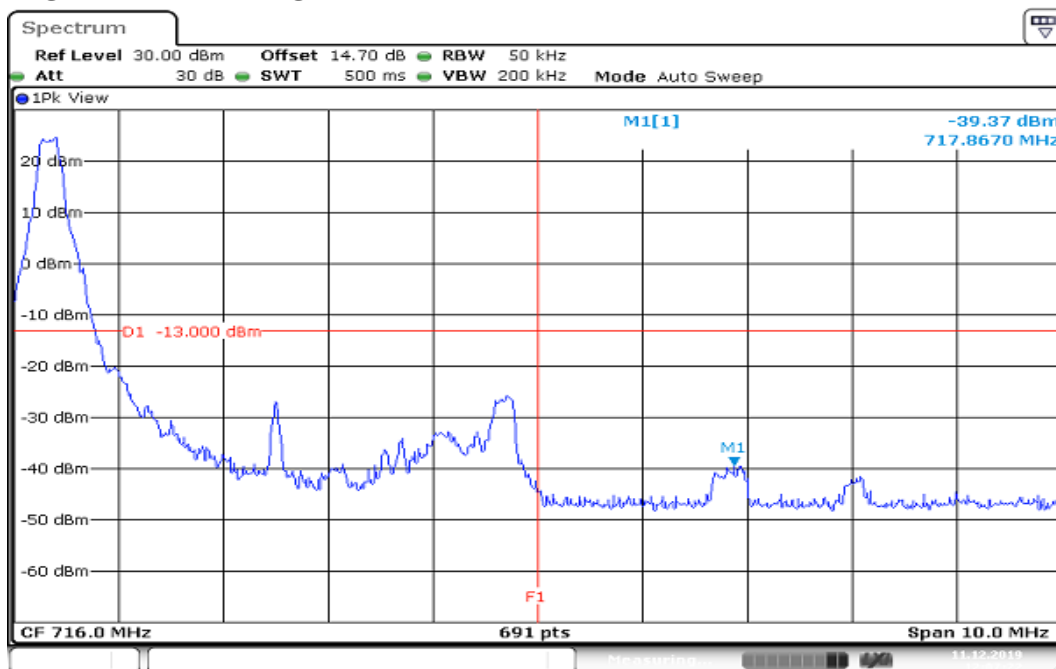
## HIGHER BAND EDGE



Report No.: T191105W01-RP11

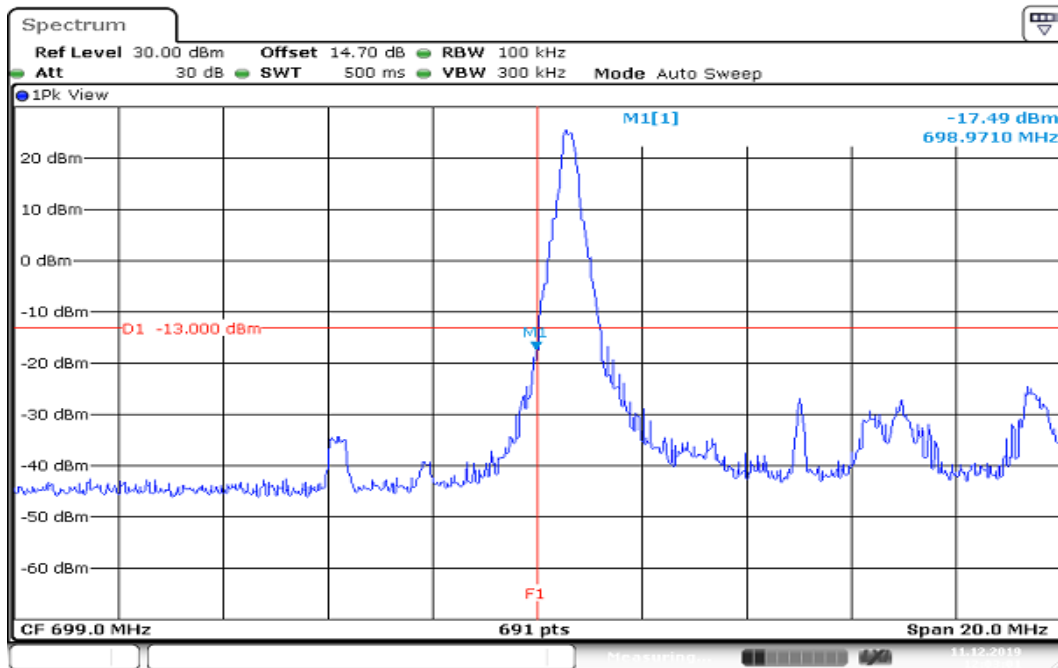
**CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB ALLOCATION  
LOWER BAND EDGE**

Date: 11.DEC.2019 12:08:25

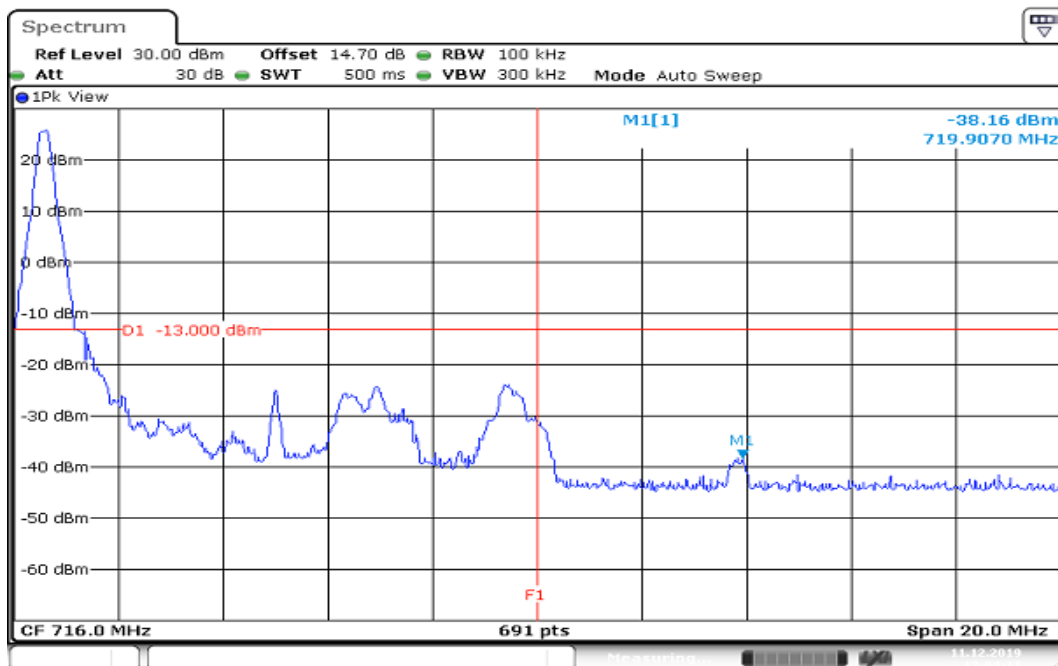
**HIGHER BAND EDGE**

Date: 11.DEC.2019 12:07:23

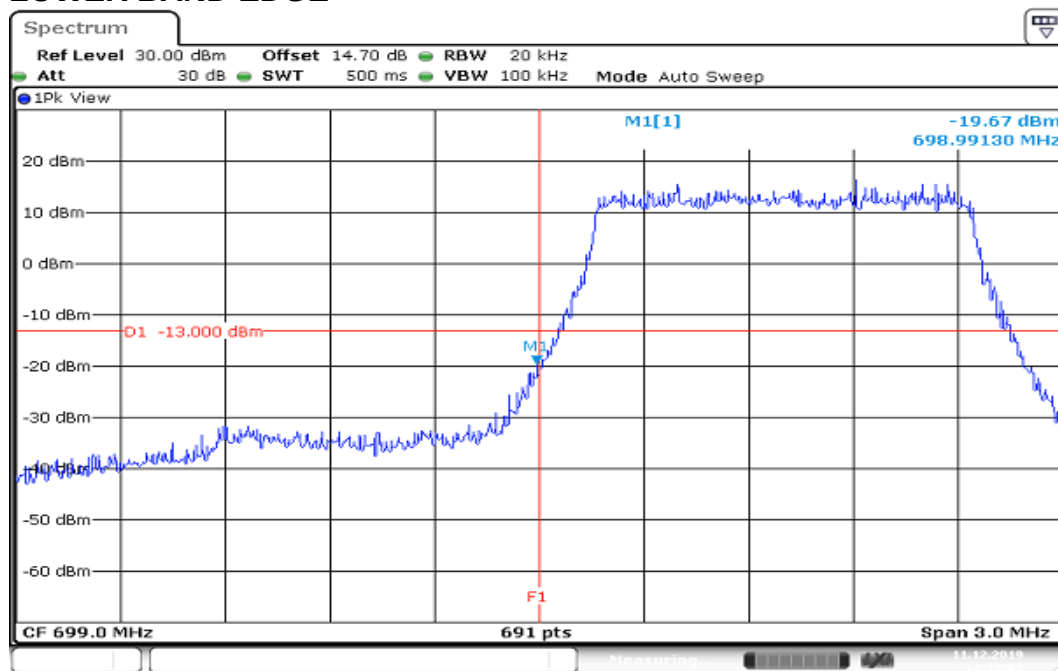
Report No.: T191105W01-RP11

**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB ALLOCATION  
LOWER BAND EDGE**

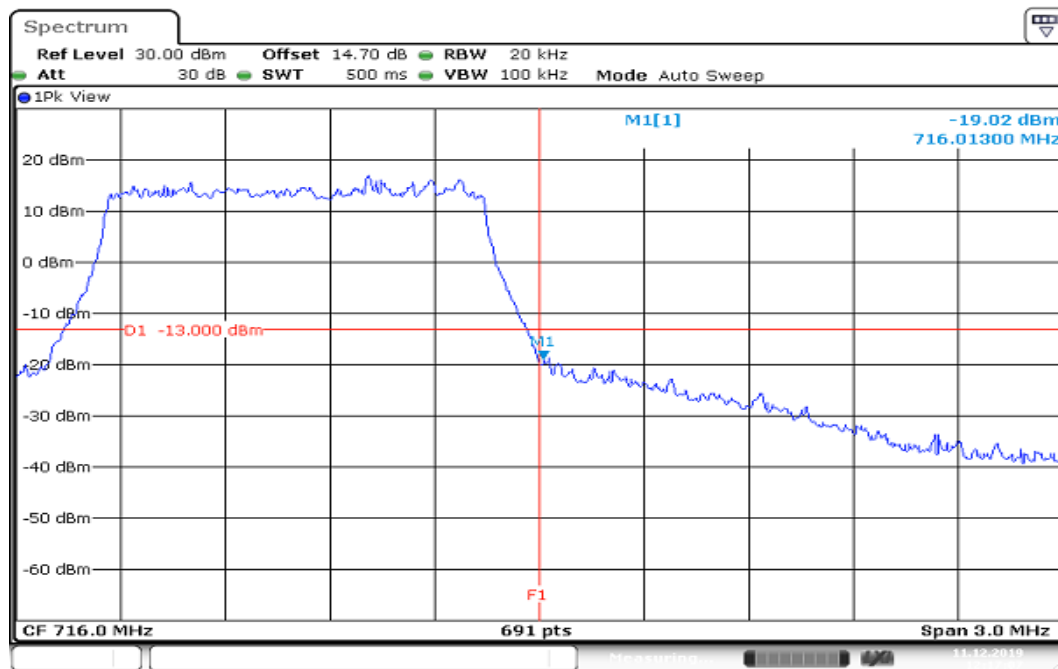
Date: 11.DEC.2019 12:03:02

**HIGHER BAND EDGE**

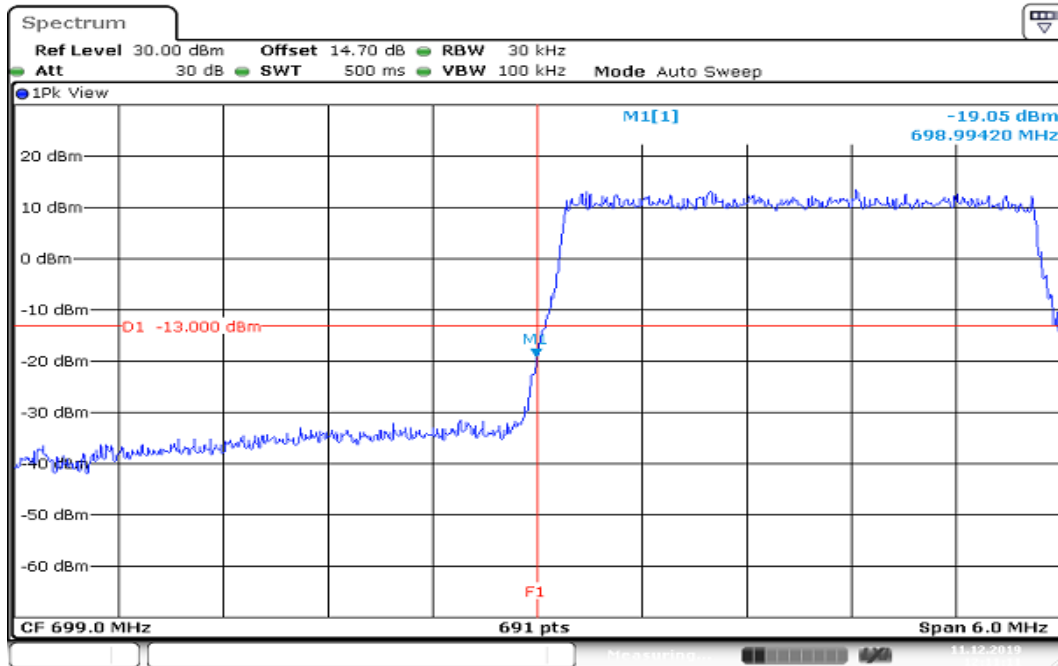
Date: 11.DEC.2019 12:04:18

**CHANNEL BANDWIDTH: 1.4MHz / QPSK / FULLRB ALLOCATION  
LOWER BAND EDGE**

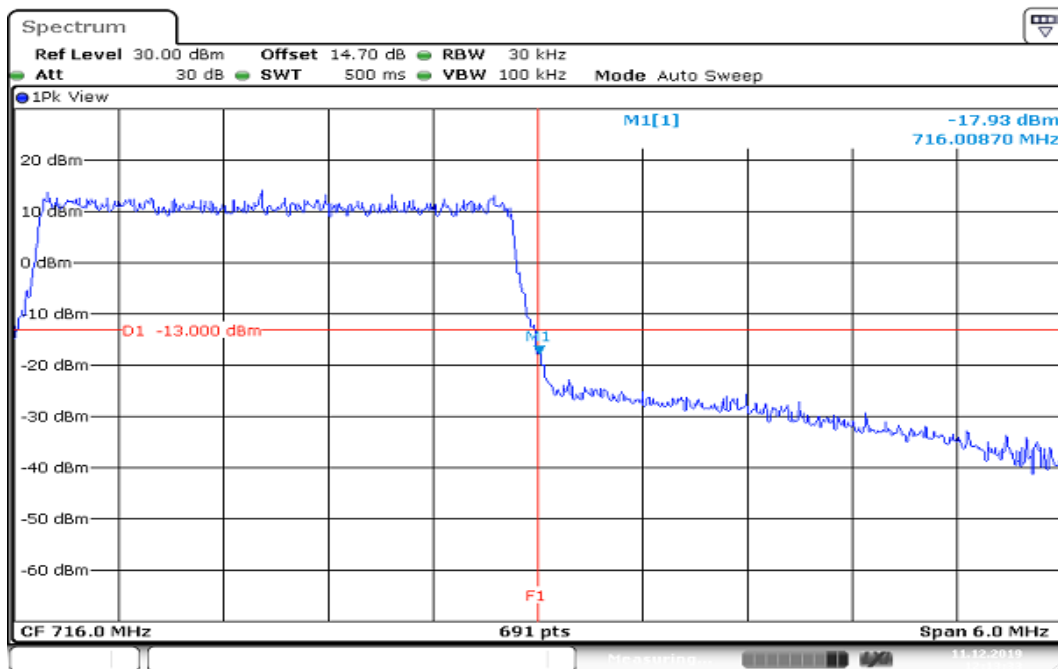
Date: 11.DEC.2019 12:19:03

**HIGHER BAND EDGE**

Date: 11.DEC.2019 12:17:07

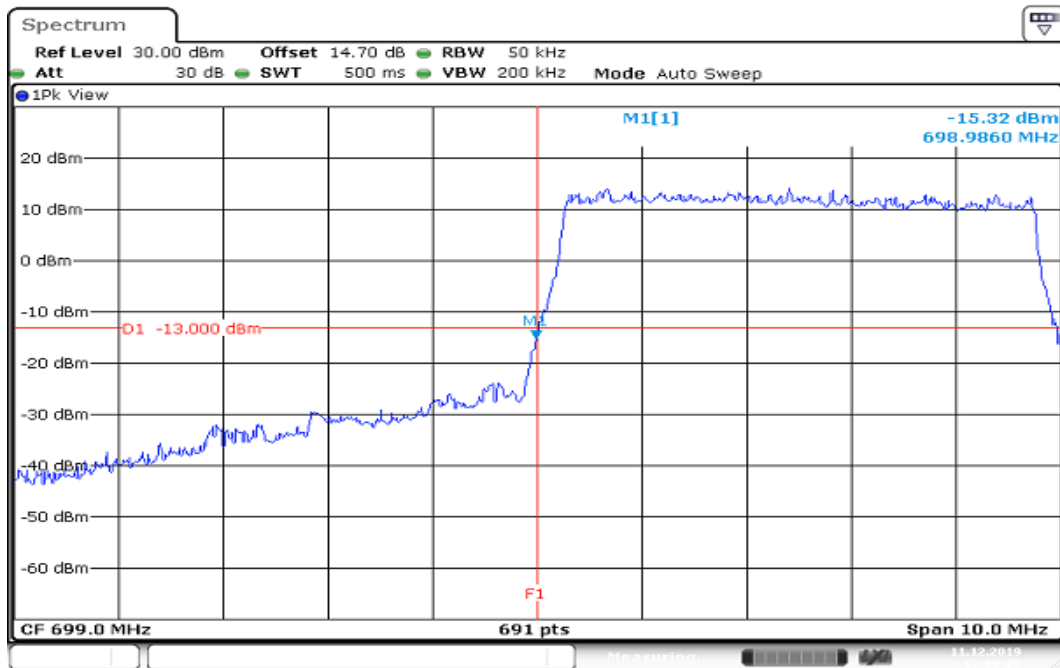
**CHANNEL BANDWIDTH: 3MHz / QPSK / FULLRB ALLOCATION  
LOWER BAND EDGE**

Date: 11.DEC.2019 12:11:12

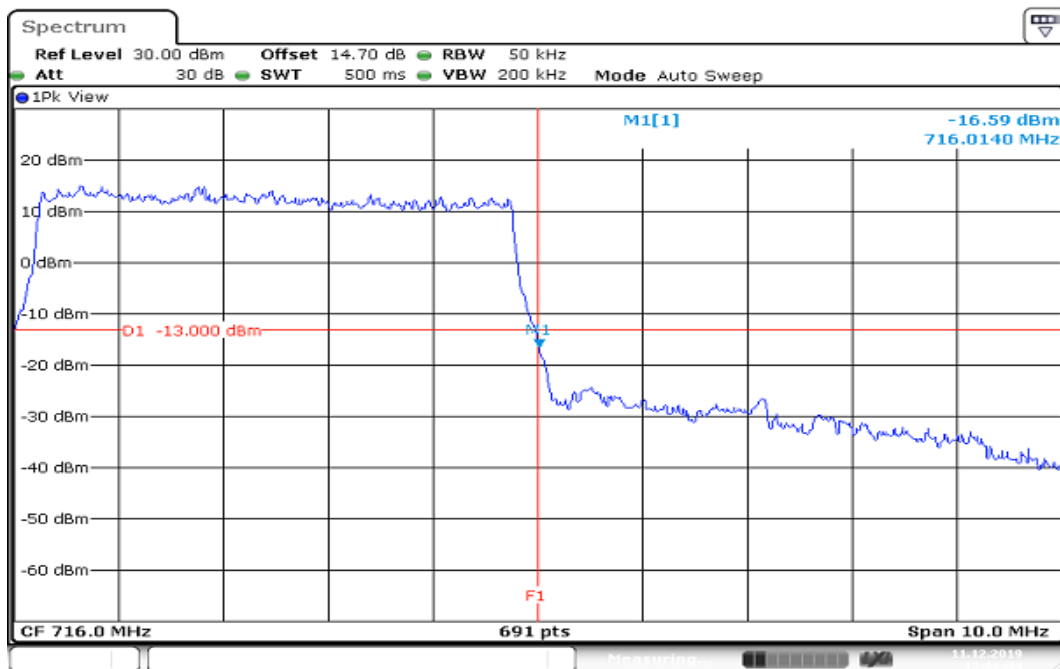
**HIGHER BAND EDGE**

Date: 11.DEC.2019 12:13:33

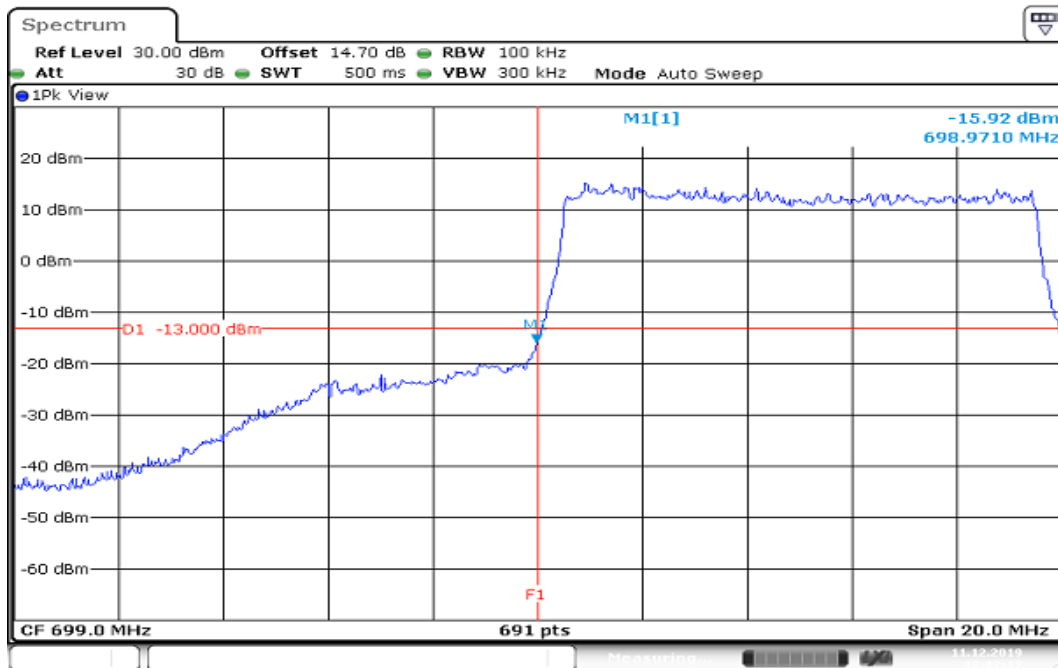
Report No.: T191105W01-RP11

**CHANNEL BANDWIDTH: 5MHz / QPSK / FULLRB ALLOCATION  
LOWER BAND EDGE**

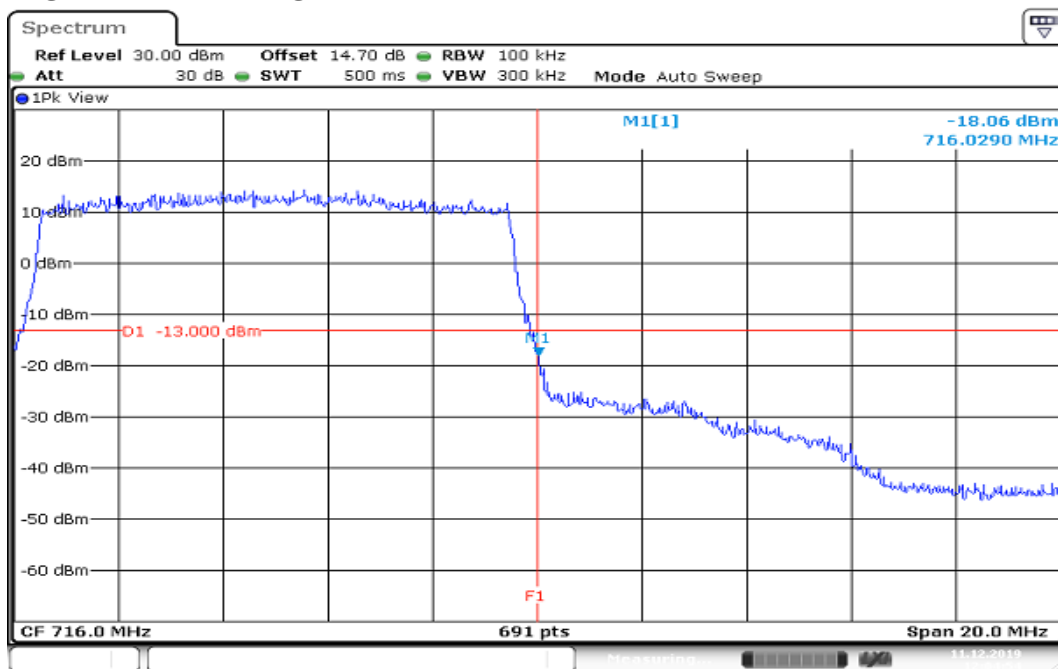
Date: 11.DEC.2019 12:09:23

**HIGHER BAND EDGE**

Date: 11.DEC.2019 12:06:45

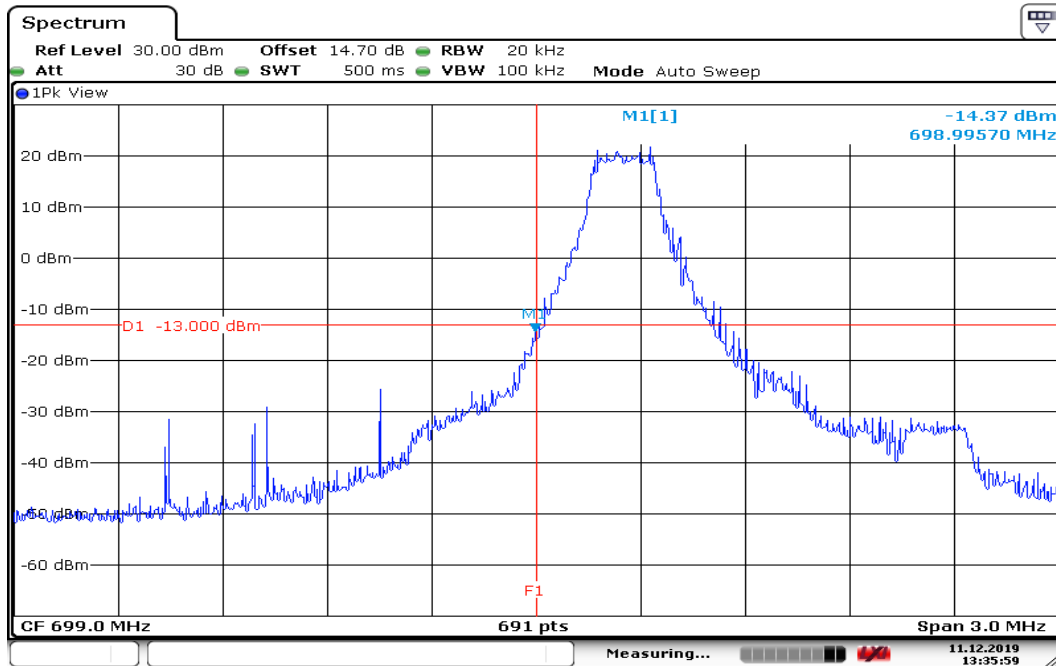
**CHANNEL BANDWIDTH: 10MHz / QPSK / FULLRB ALLOCATION  
LOWER BAND EDGE**

Date: 11.DEC.2019 12:02:18

**HIGHER BAND EDGE**

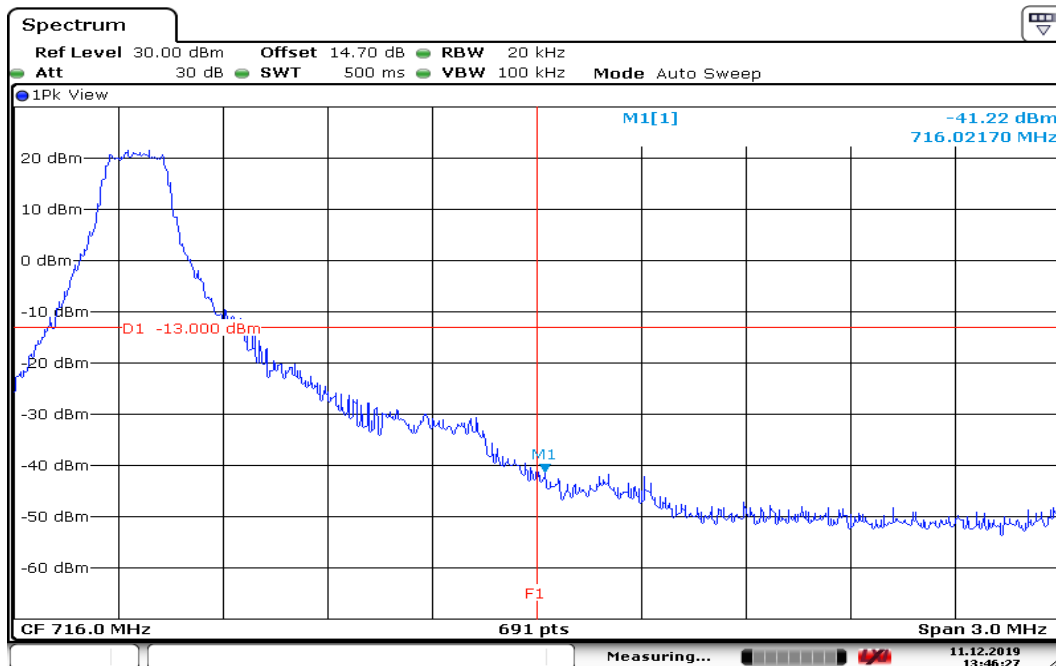
Date: 11.DEC.2019 12:04:54

## CHANNEL BANDWIDTH: 1.4MHz / 16QAM/ 1RB ALLOCATION LOWER BAND EDGE



Date: 11.DEC.2019 13:36:00

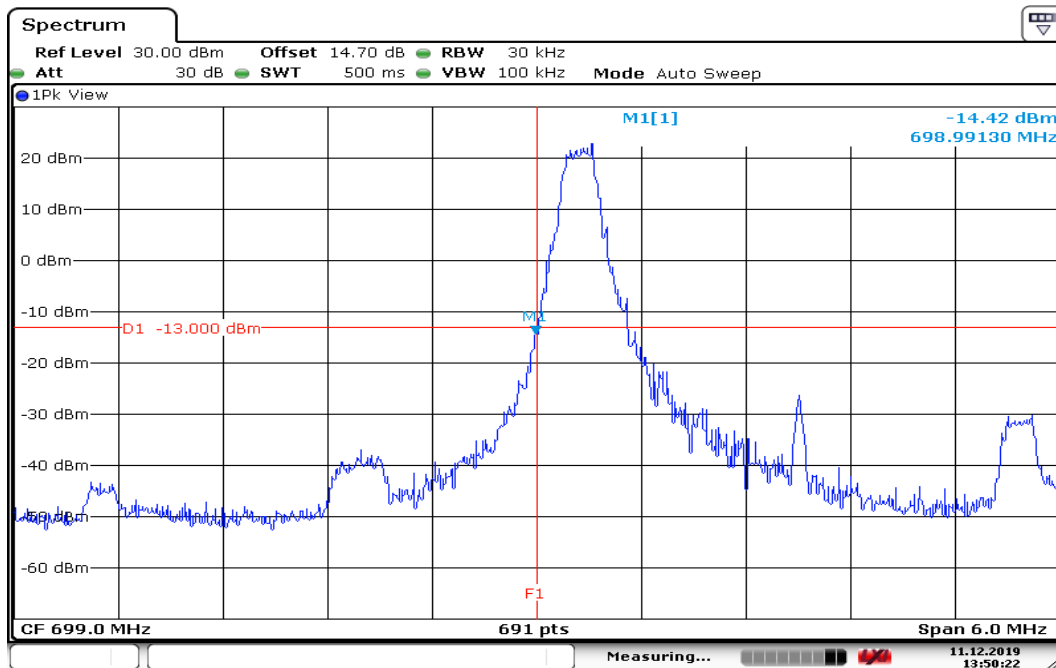
## HIGHER BAND EDGE



Date: 11.DEC.2019 13:46:27

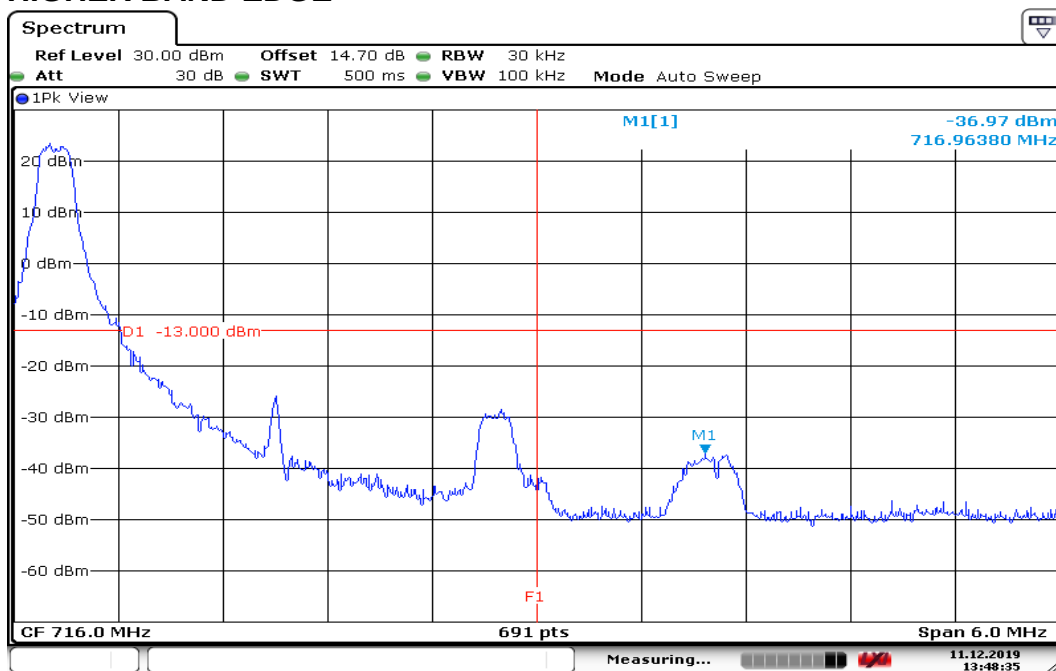
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 3MHz / 16QAM/ 1RB ALLOCATION LOWER BAND EDGE



Date: 11.DEC.2019 13:50:23

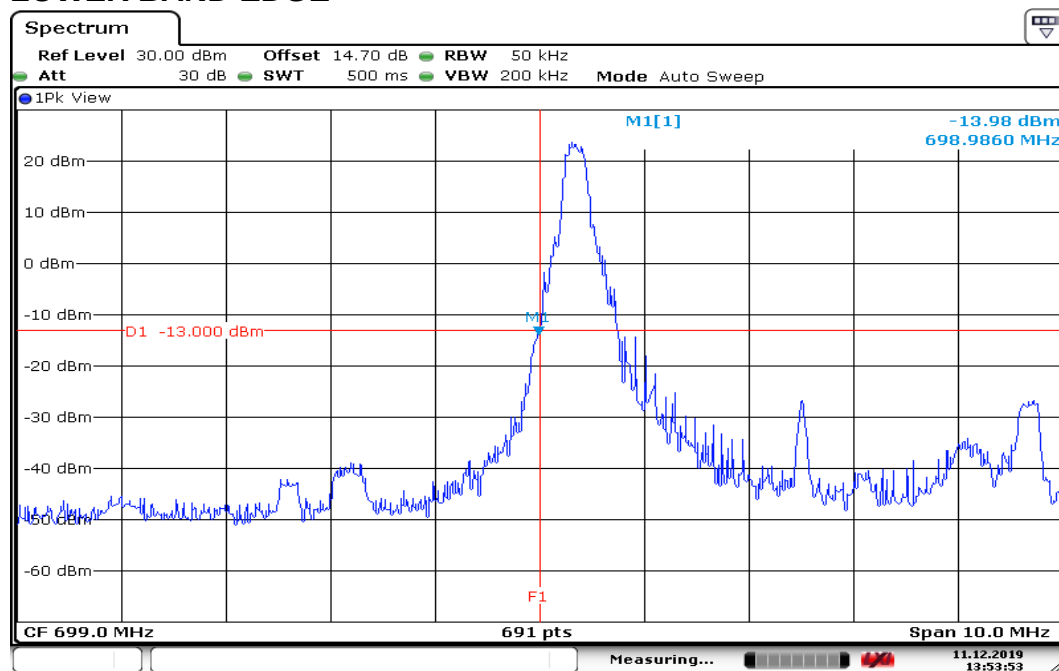
## HIGHER BAND EDGE



Date: 11.DEC.2019 13:48:35

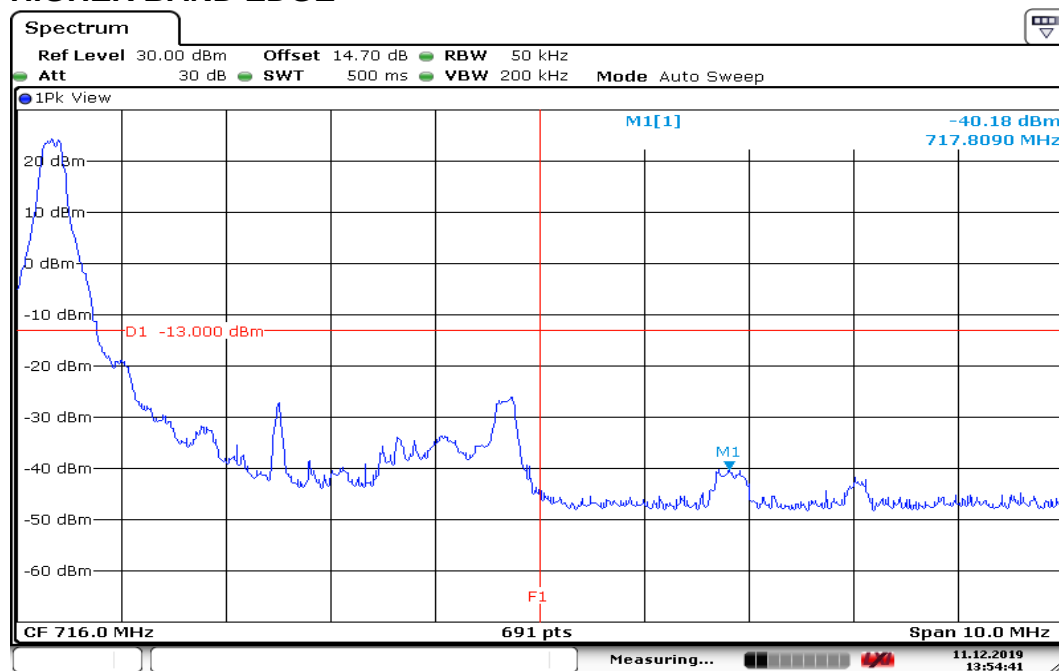
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 5MHz / 16QAM/ 1RB ALLOCATION LOWER BAND EDGE



Date: 11.DEC.2019 13:53:53

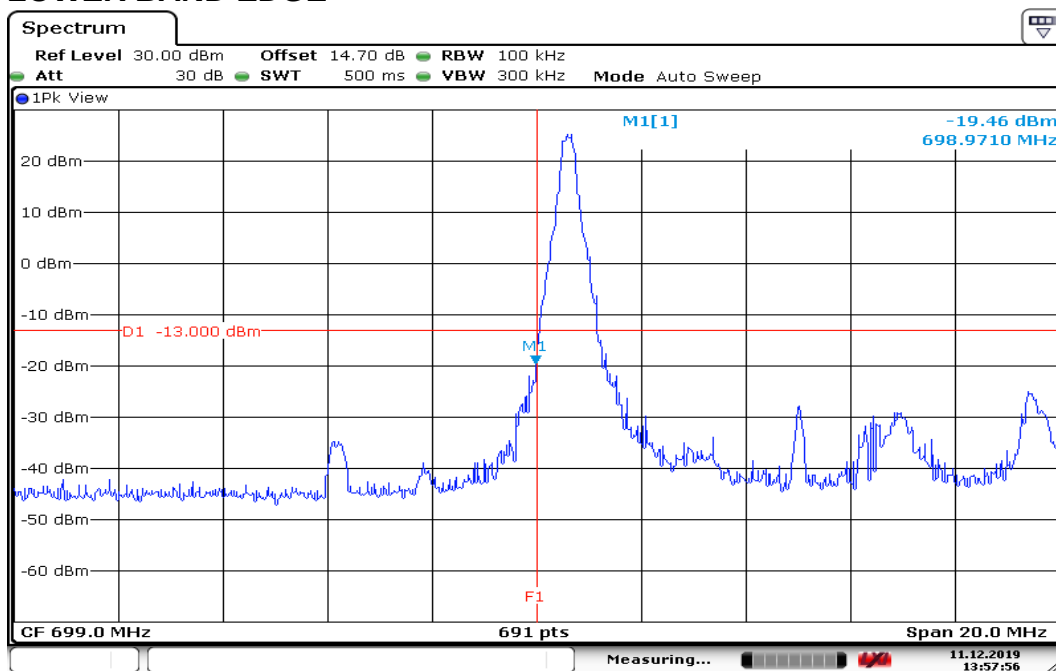
## HIGHER BAND EDGE



Date: 11.DEC.2019 13:54:42

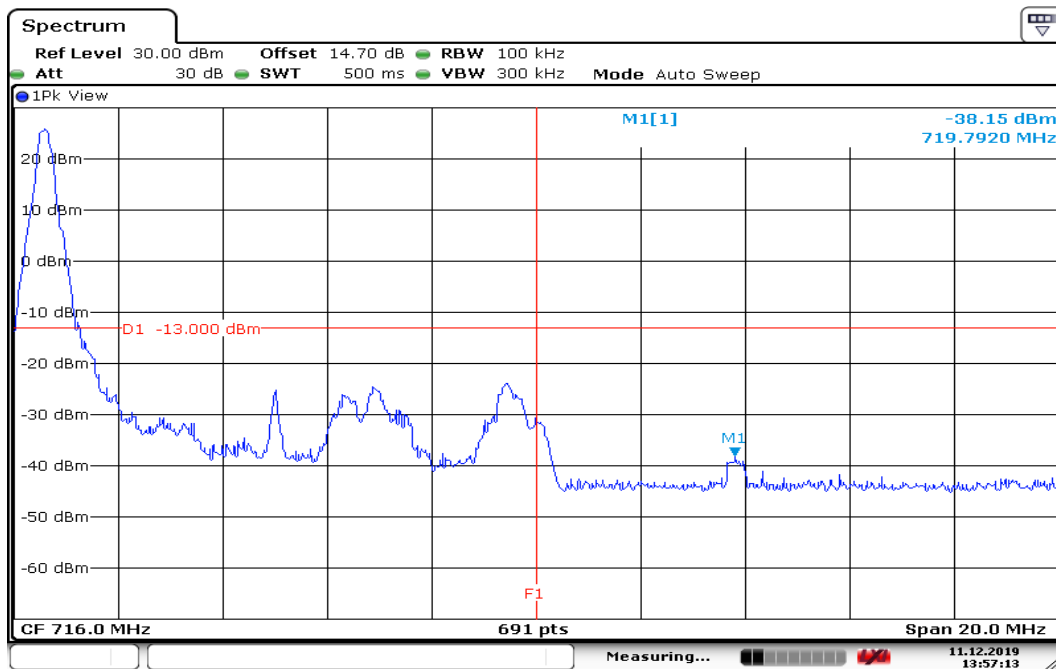
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 10MHz / 16QAM/ 1RB ALLOCATION LOWER BAND EDGE



Date: 11.DEC.2019 13:57:56

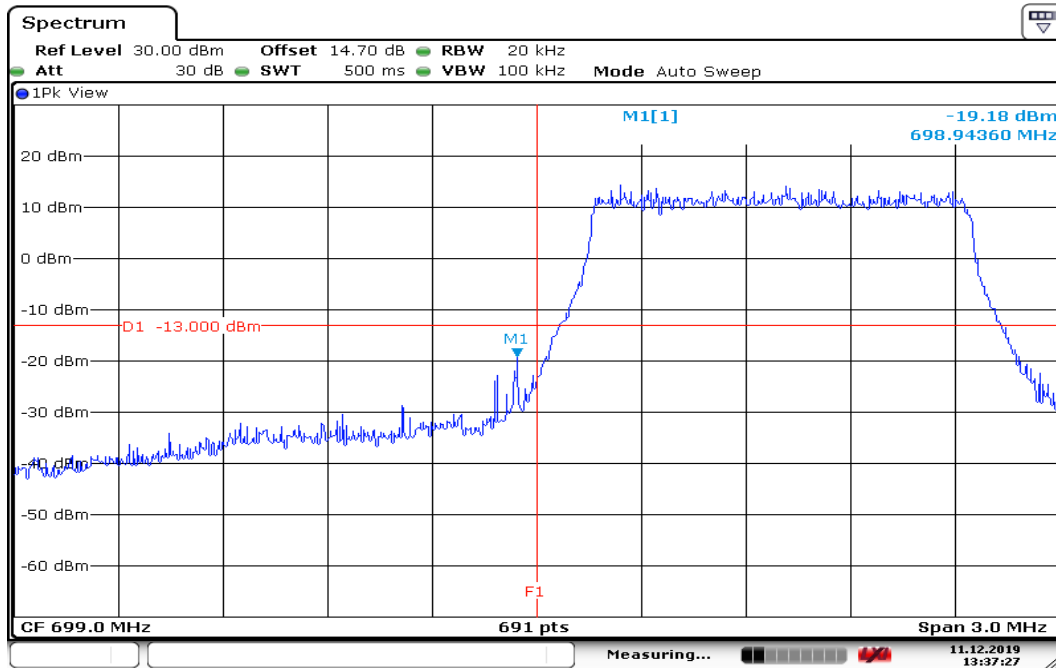
## HIGHER BAND EDGE



Date: 11.DEC.2019 13:57:14

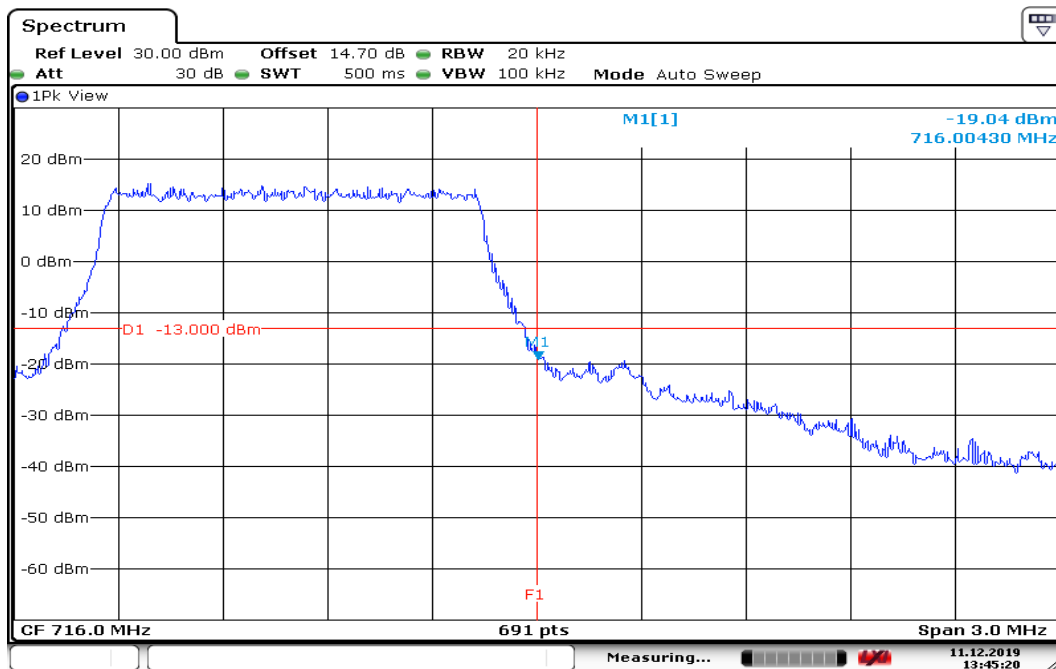
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 1.4MHz / 16QAM/ FULLRB ALLOCATION LOWER BAND EDGE



Date: 11.DEC.2019 13:37:27

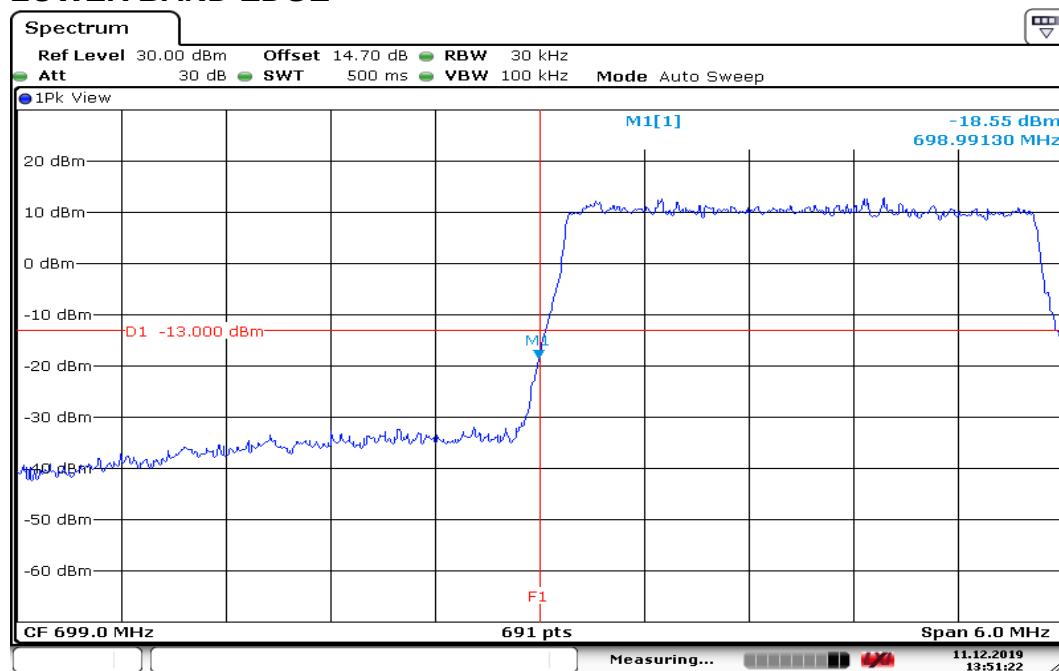
## HIGHER BAND EDGE



Date: 11.DEC.2019 13:45:20

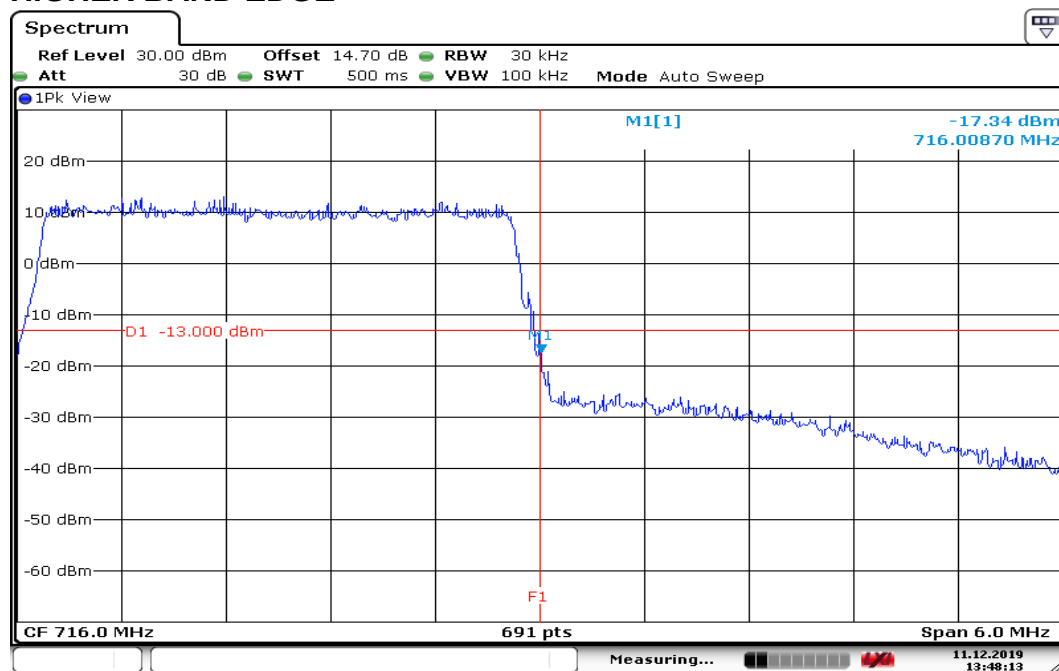
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 3MHz / 16QAM/ FULLRB ALLOCATION LOWER BAND EDGE



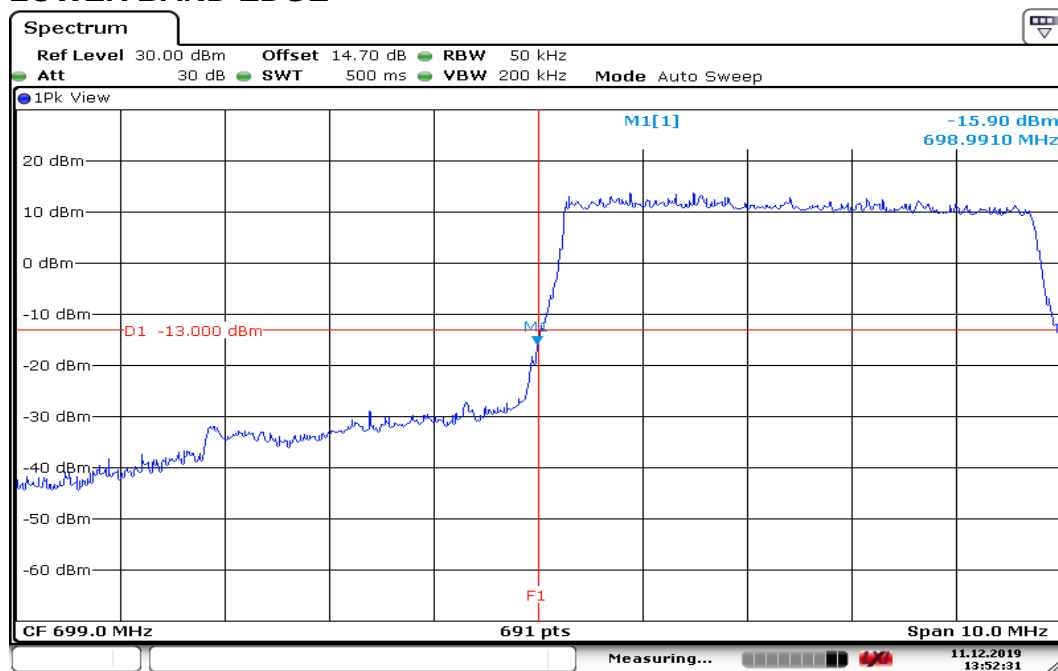
Date: 11.DEC.2019 13:51:22

## HIGHER BAND EDGE



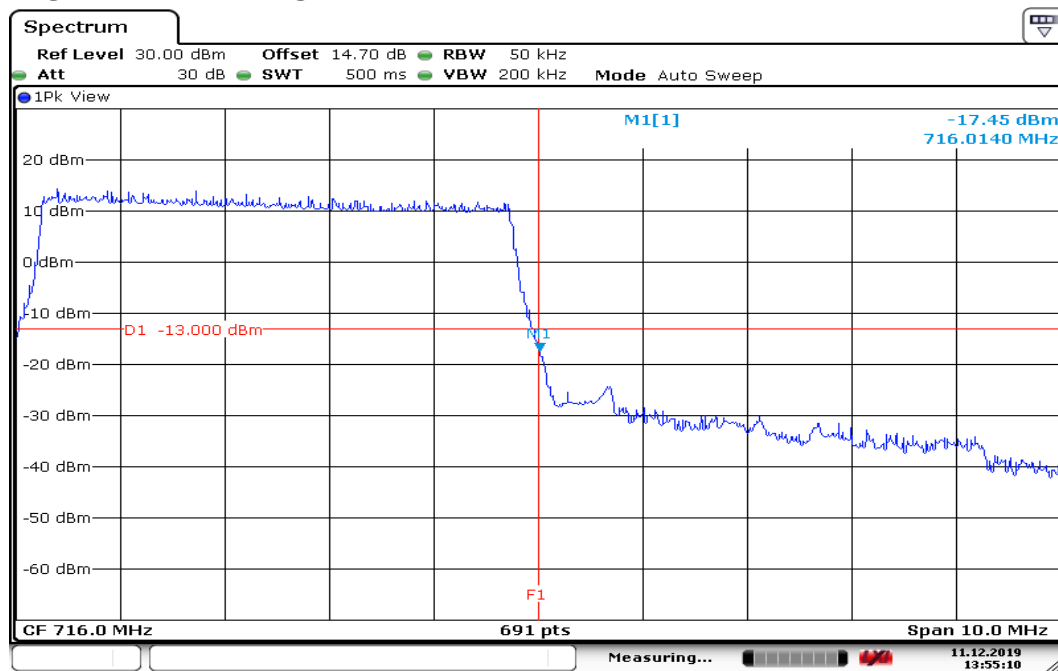
Date: 11.DEC.2019 13:48:13

## CHANNEL BANDWIDTH: 5MHz / 16QAM/ FULLRB ALLOCATION LOWER BAND EDGE



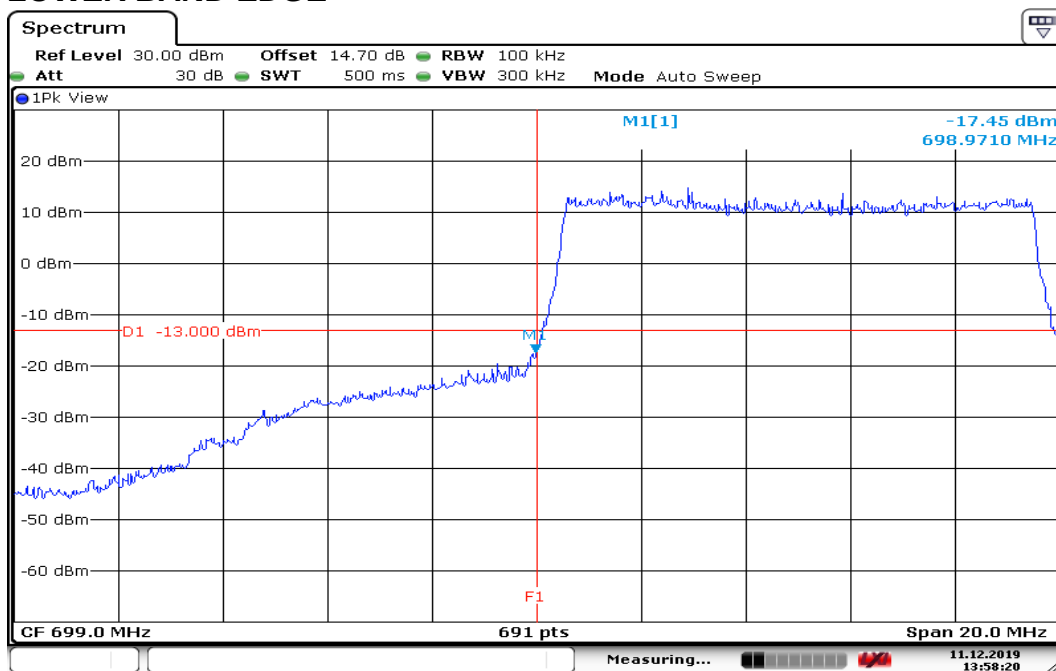
Date: 11.DEC.2019 13:52:31

## HIGHER BAND EDGE



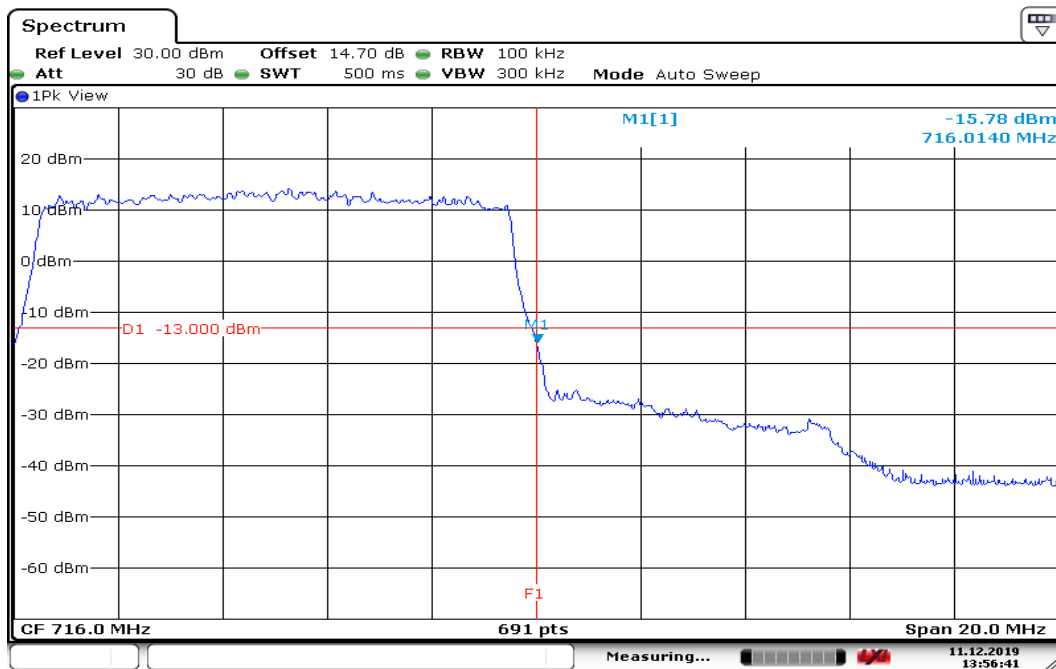
Date: 11.DEC.2019 13:55:11

## CHANNEL BANDWIDTH: 10MHz / 16QAM/ FULLRB ALLOCATION LOWER BAND EDGE



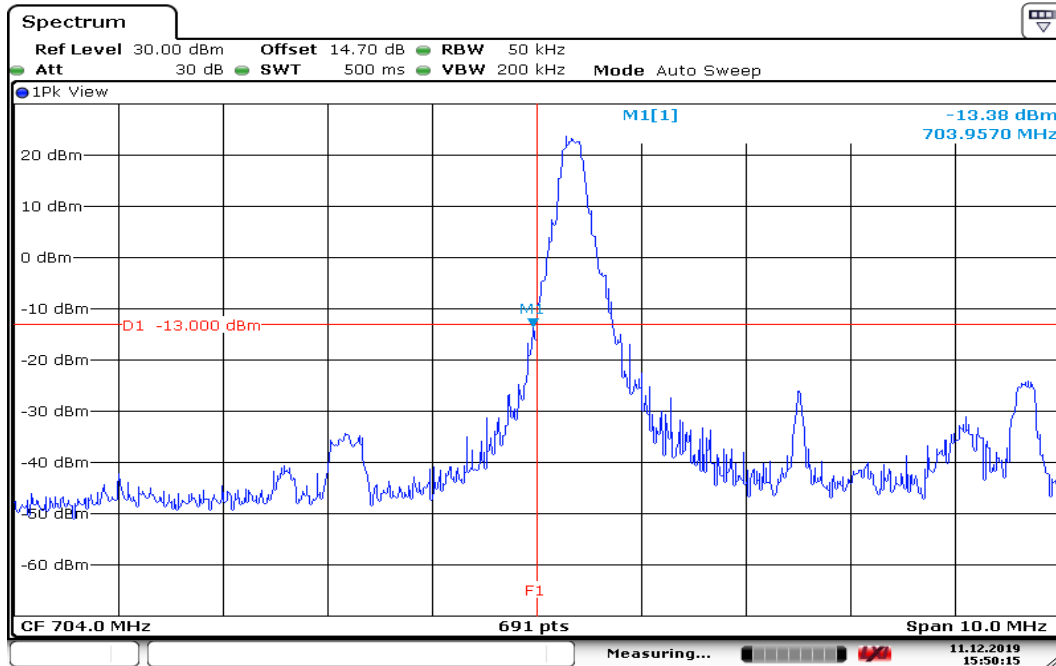
Date: 11.DEC.2019 13:58:20

## HIGHER BAND EDGE

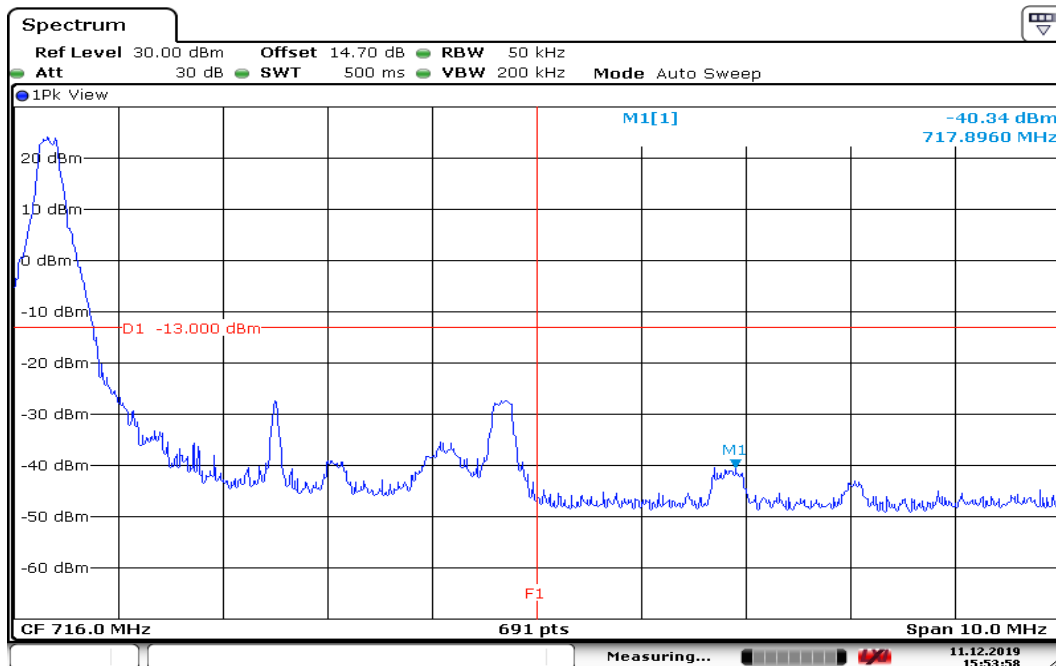


Date: 11.DEC.2019 13:56:41

Report No.: T191105W01-RP11

**LTE Band 17****CHANNEL BANDWIDTH: 5MHz / QPSK / 1 RB ALLOCATED****LOWER BAND EDGE**

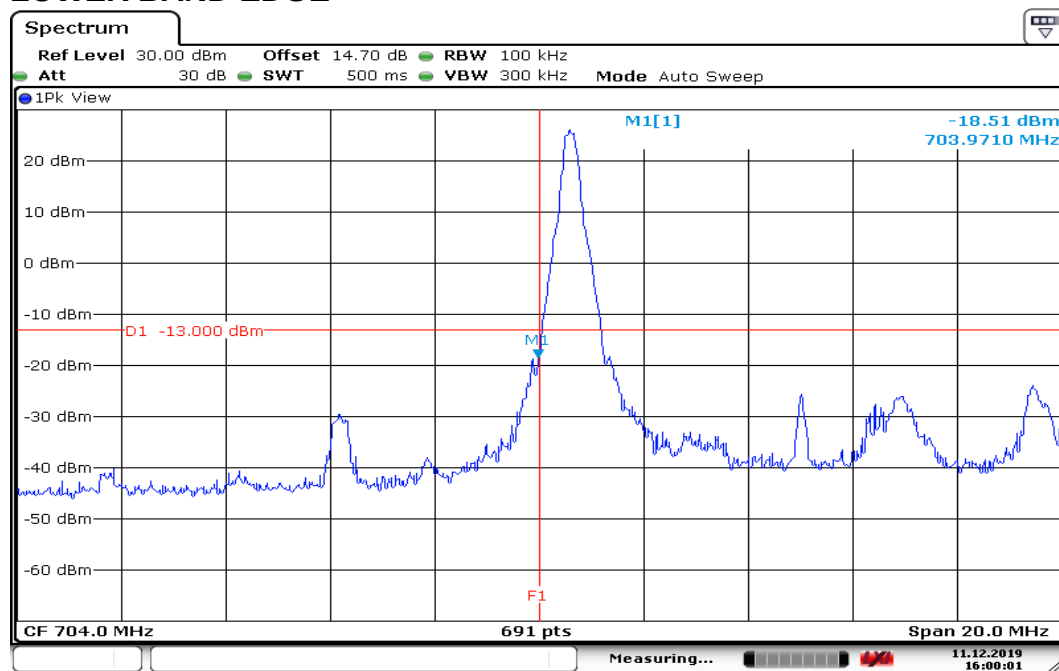
Date: 11.DEC.2019 15:50:16

**HIGHER BAND EDGE**

Date: 11.DEC.2019 15:53:59

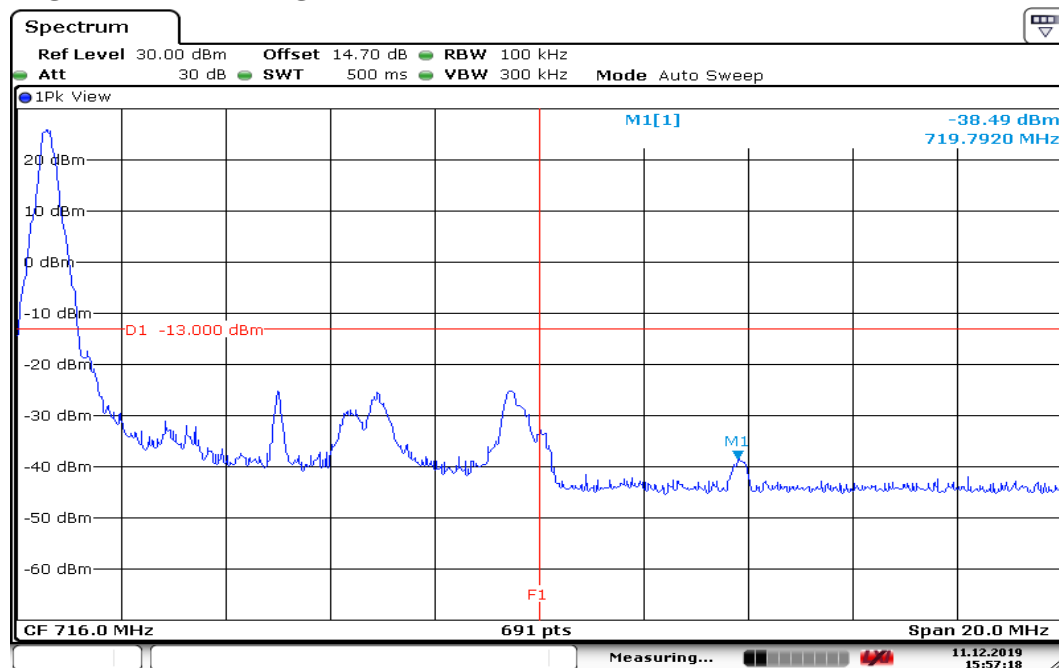
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 10MHz / QPSK / 1 RB ALLOCATED LOWER BAND EDGE

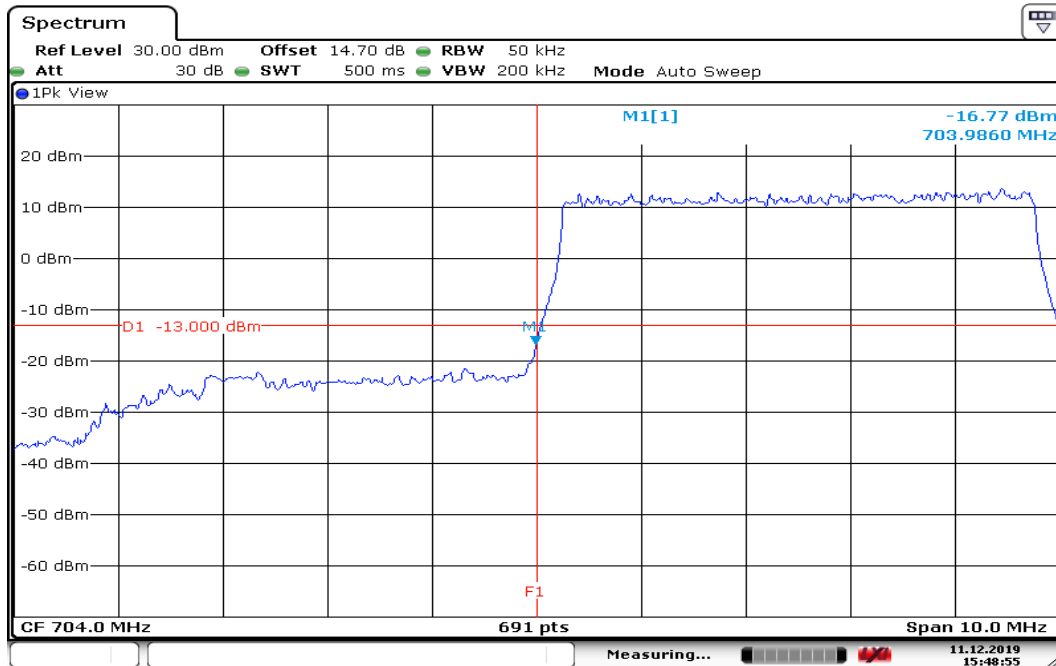


Date: 11.DEC.2019 16:00:02

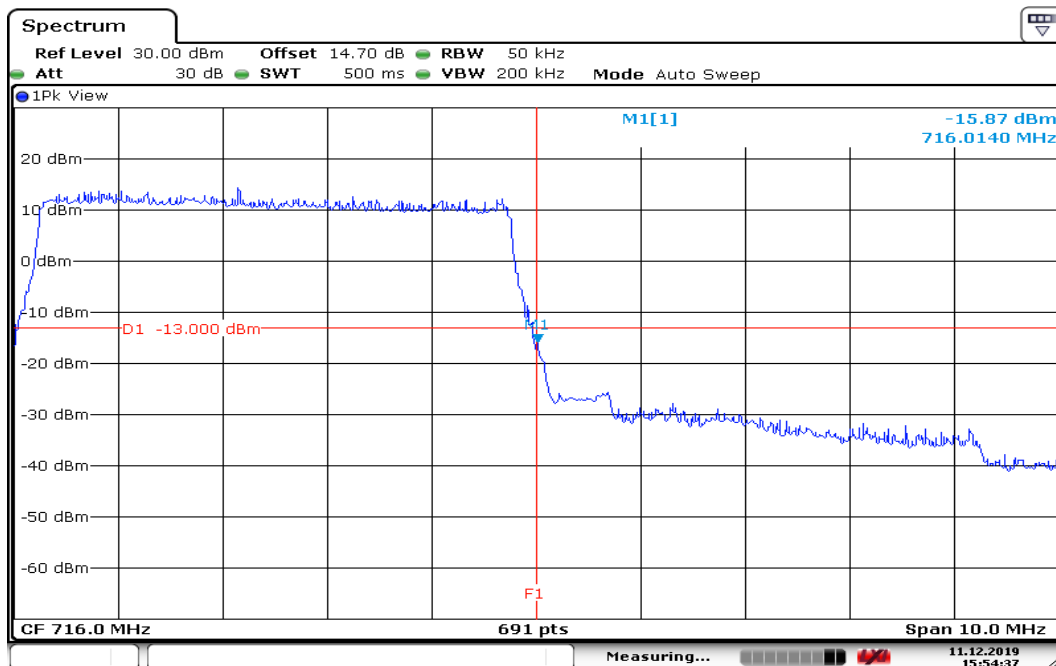
## HIGHER BAND EDGE



Date: 11.DEC.2019 15:57:19

**CHANNEL BANDWIDTH: 5MHz / QPSK / FULL RB ALLOCATED**  
**LOWER BAND EDGE**

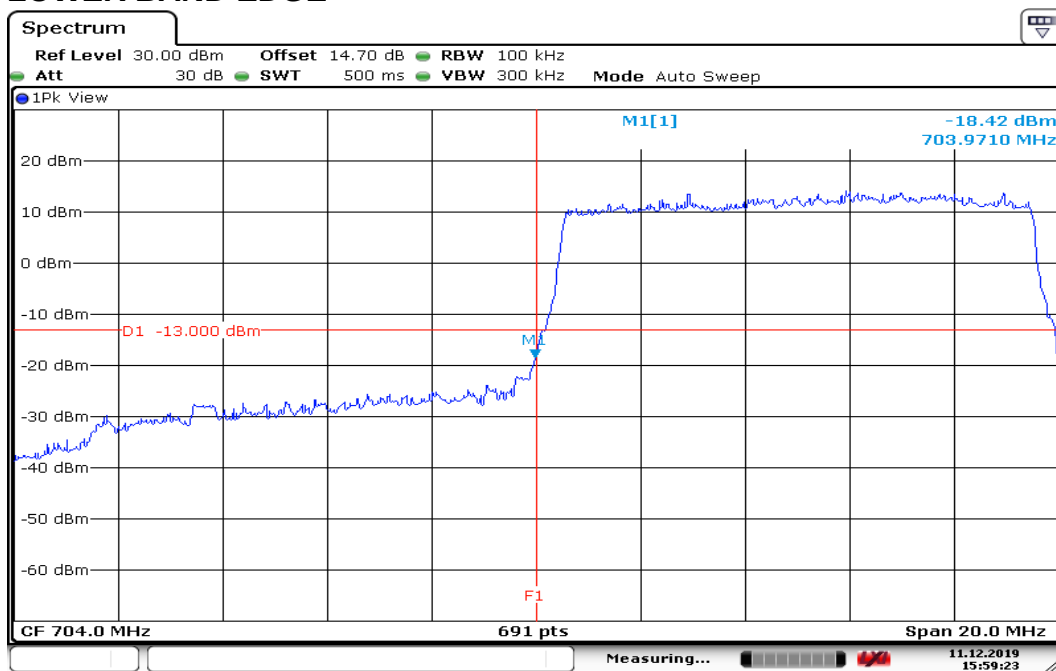
Date: 11.DEC.2019 15:48:55

**HIGHER BAND EDGE**

Date: 11.DEC.2019 15:54:38

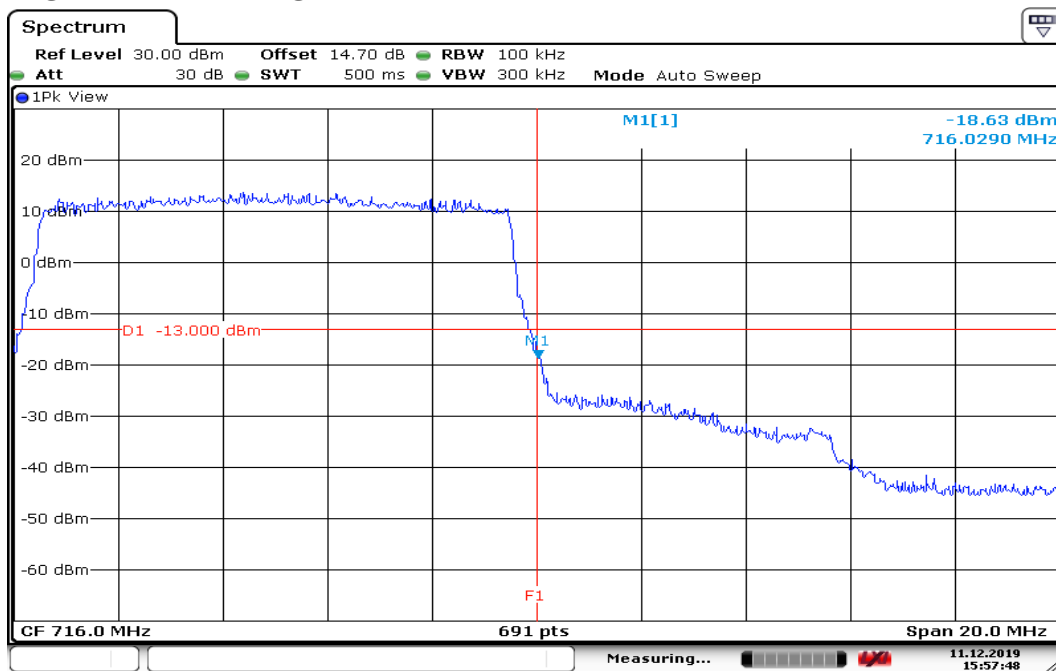
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 10MHz / QPSK / FULL RB ALLOCATED LOWER BAND EDGE



Date: 11.DEC.2019 15:59:24

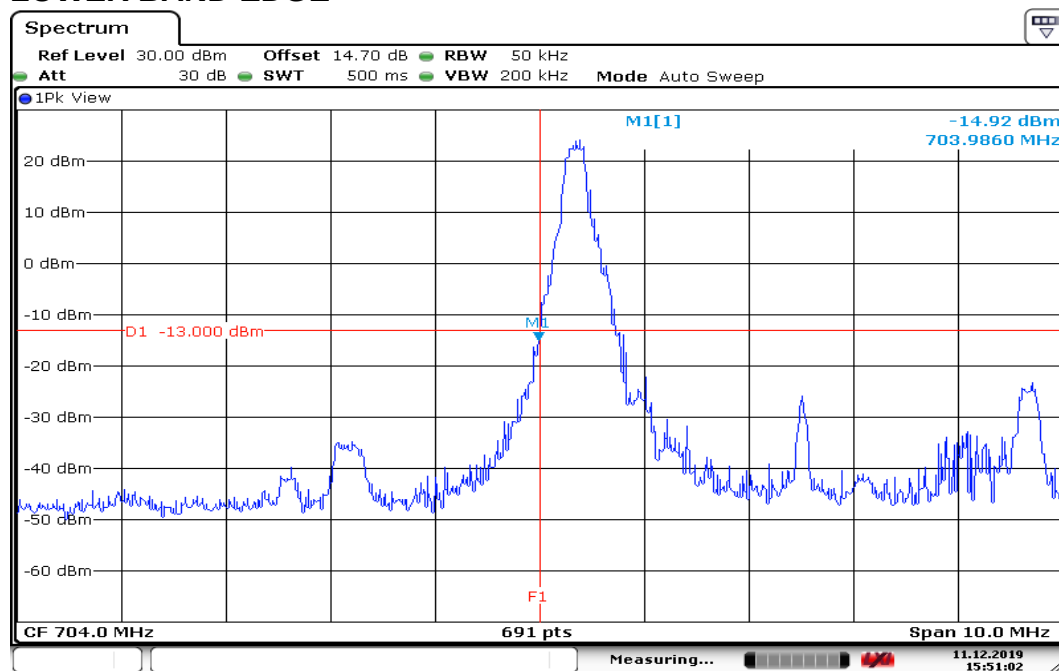
## HIGHER BAND EDGE



Date: 11.DEC.2019 15:57:48

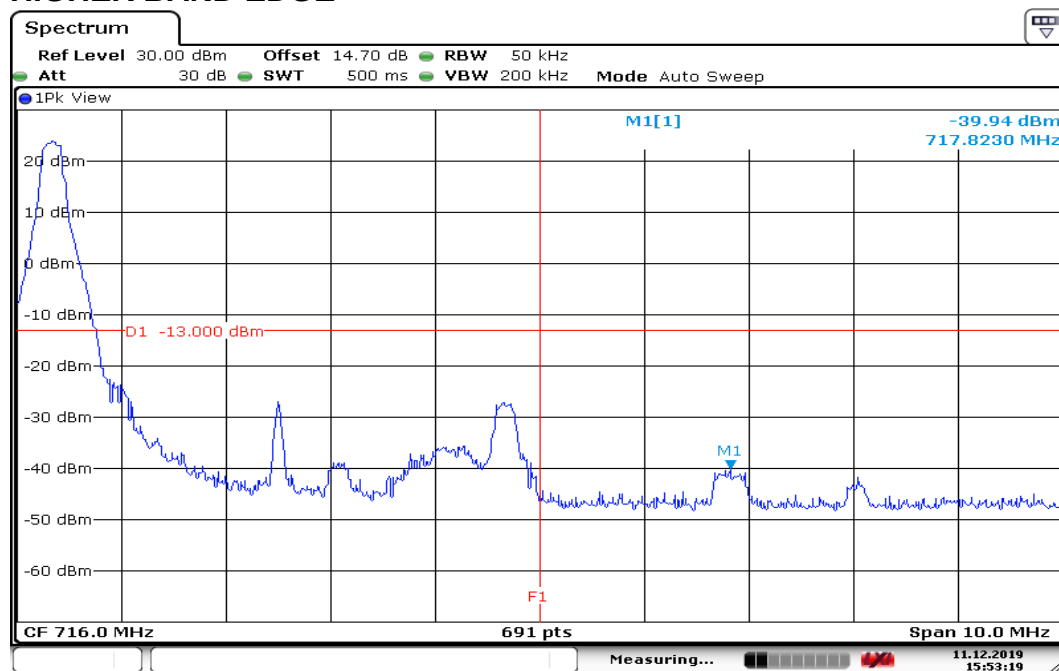
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB ALLOCATED LOWER BAND EDGE



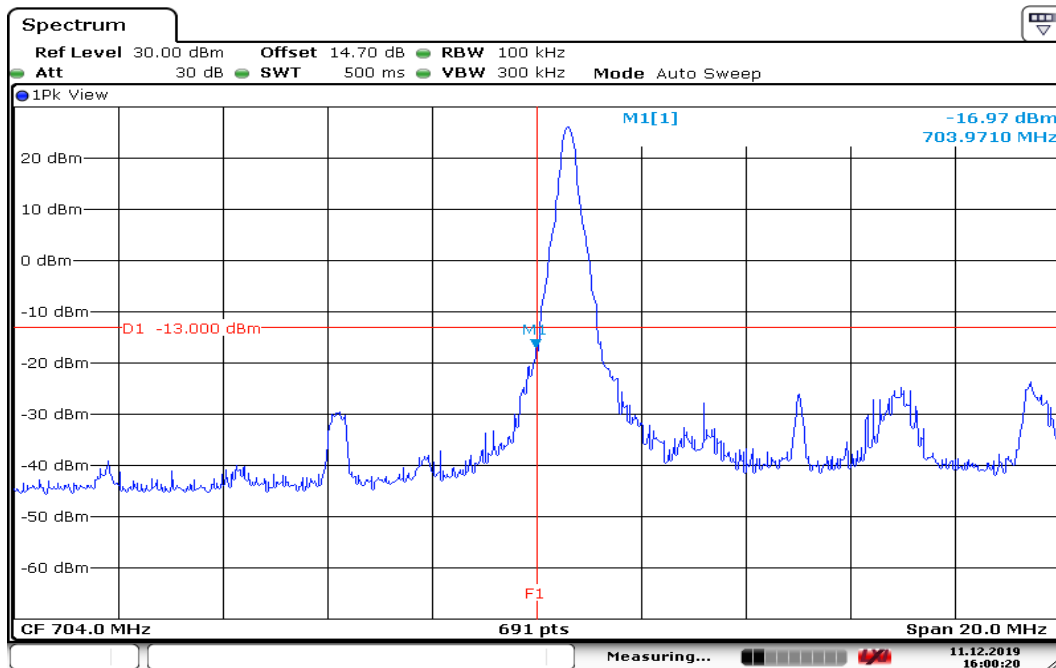
Date: 11.DEC.2019 15:51:03

## HIGHER BAND EDGE



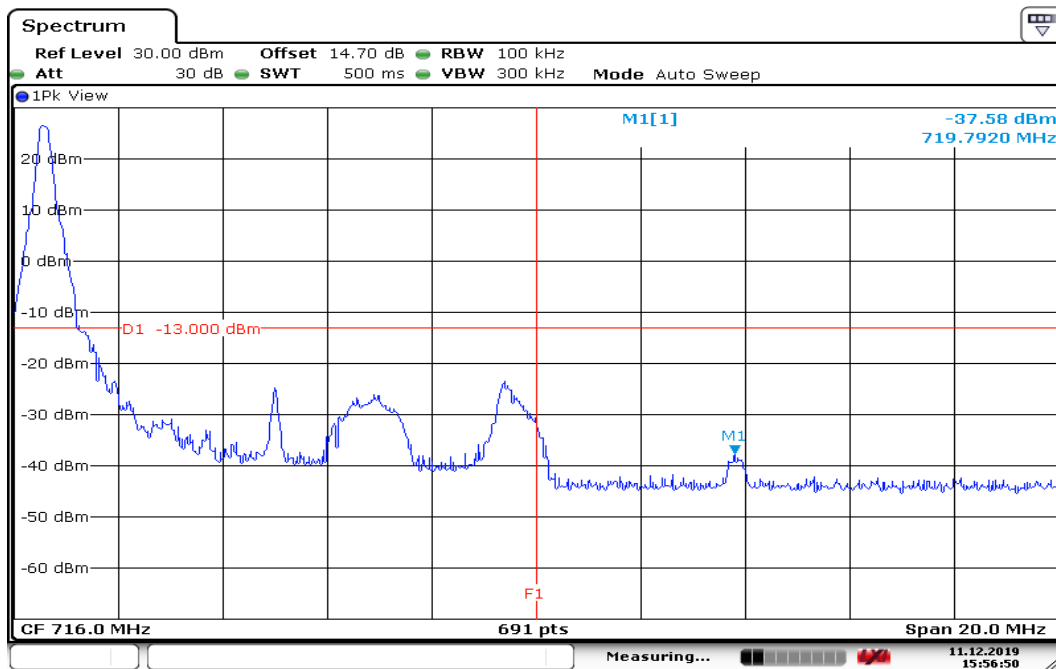
Date: 11.DEC.2019 15:53:20

## CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB ALLOCATED LOWER BAND EDGE



Date: 11.DEC.2019 16:00:21

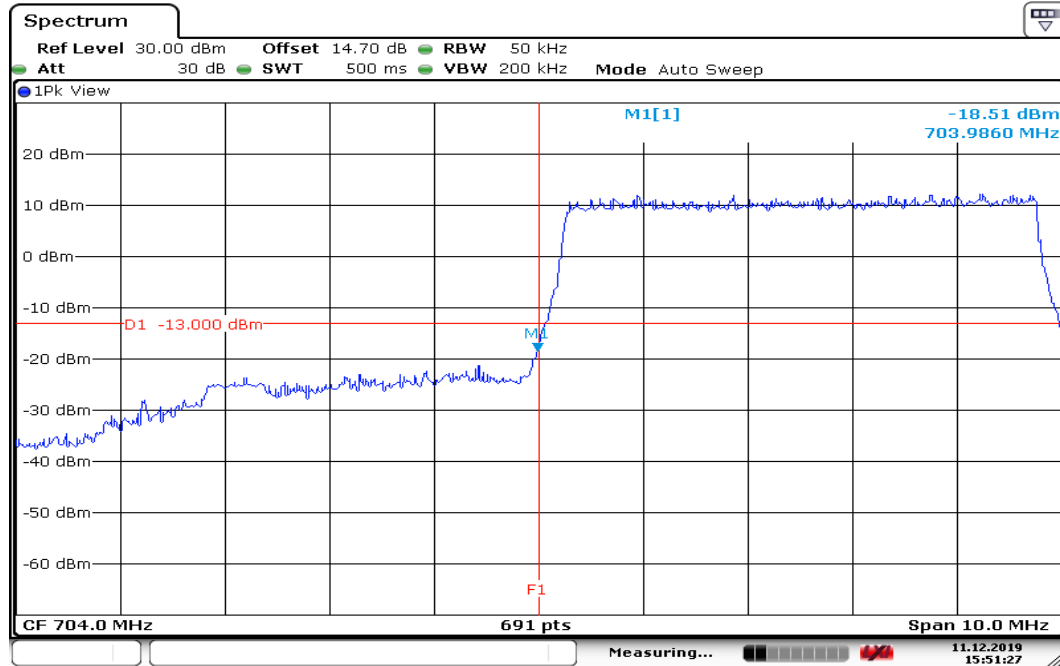
## HIGHER BAND EDGE



Date: 11.DEC.2019 15:56:51

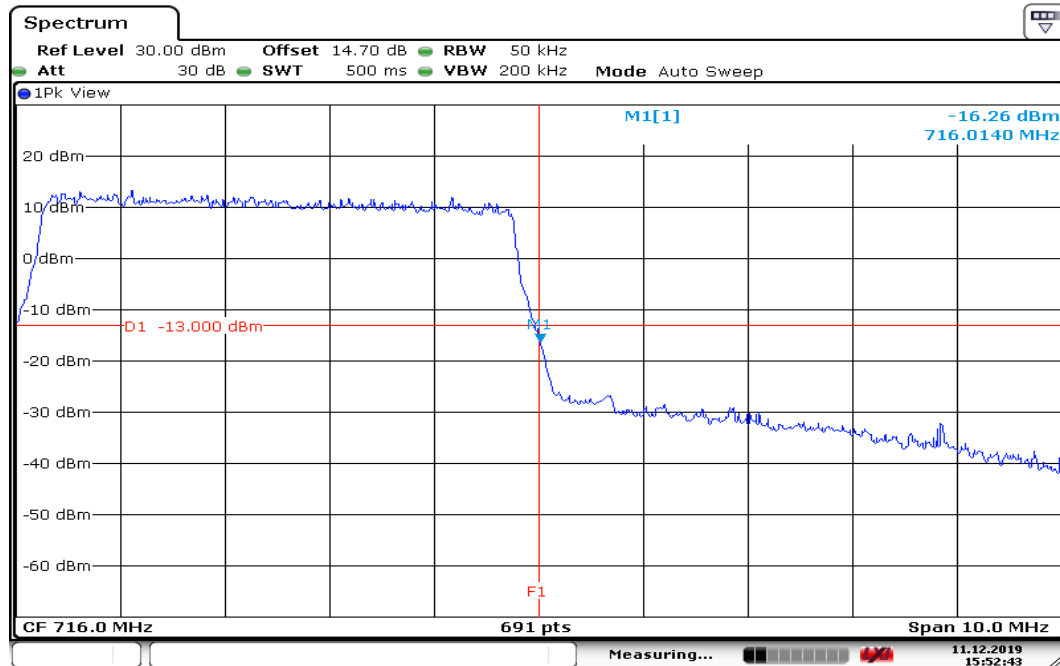
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 5MHz / 16QAM / FULLRB ALLOCATED LOWER BAND EDGE



Date: 11.DEC.2019 15:51:28

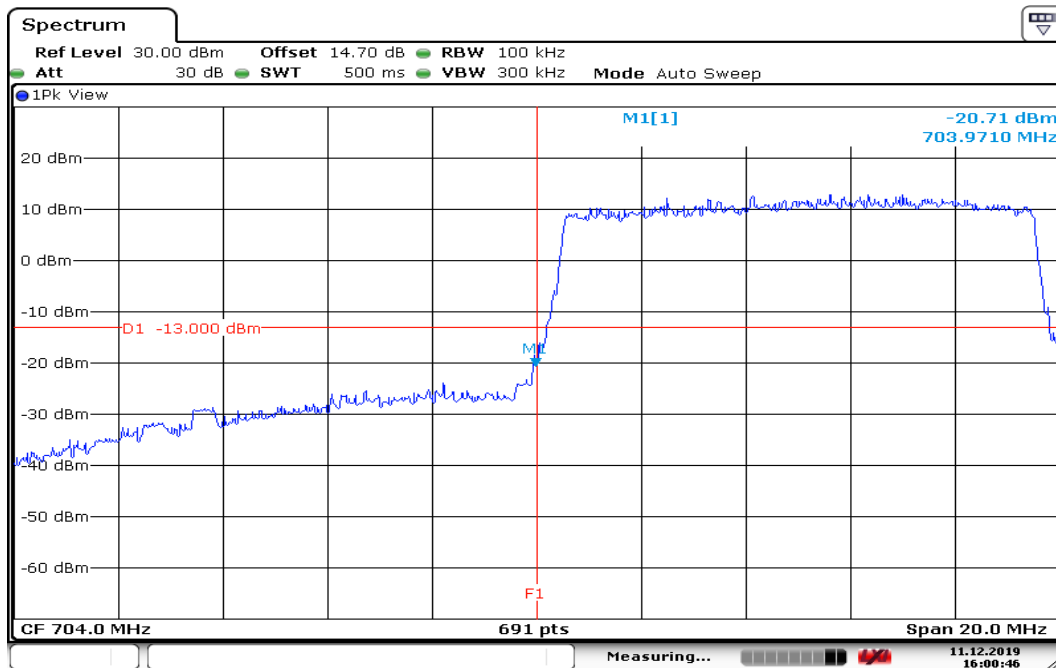
## HIGHER BAND EDGE



Date: 11.DEC.2019 15:52:43

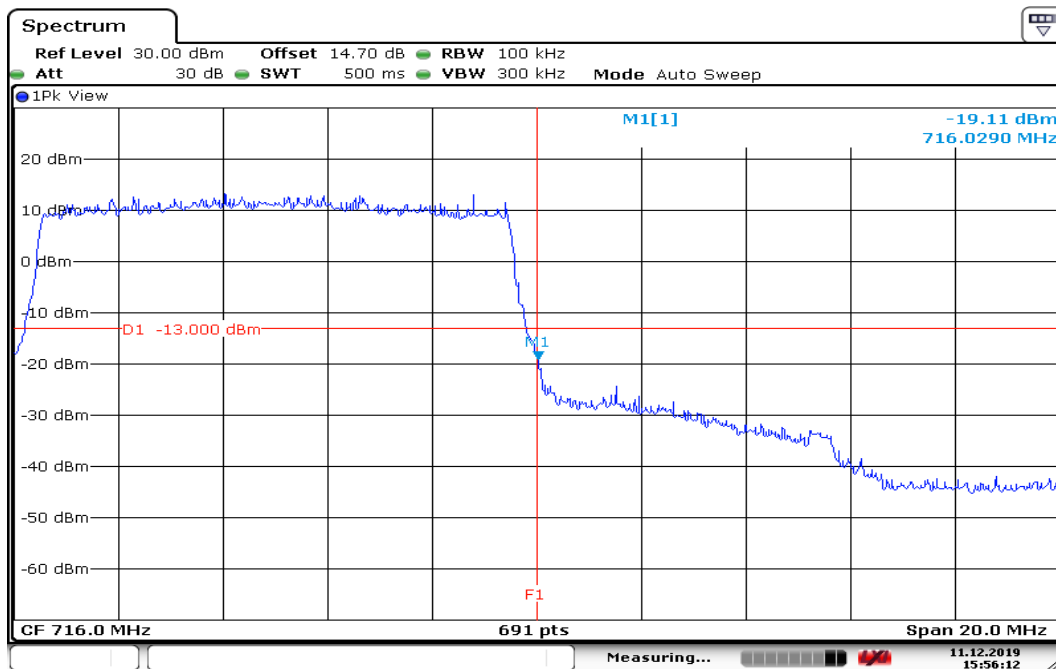
Report No.: T191105W01-RP11

## CHANNEL BANDWIDTH: 10MHz / 16QAM / FULLRB ALLOCATED LOWER BAND EDGE



Date: 11.DEC.2019 16:00:47

## HIGHER BAND EDGE



Date: 11.DEC.2019 15:56:13

## 8.6 CONDUCTED SPURIOUS EMISSIONS

### LIMITS

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB. The limit of emission equal to  $-13\text{dBm}$

### TEST PROCEDURES

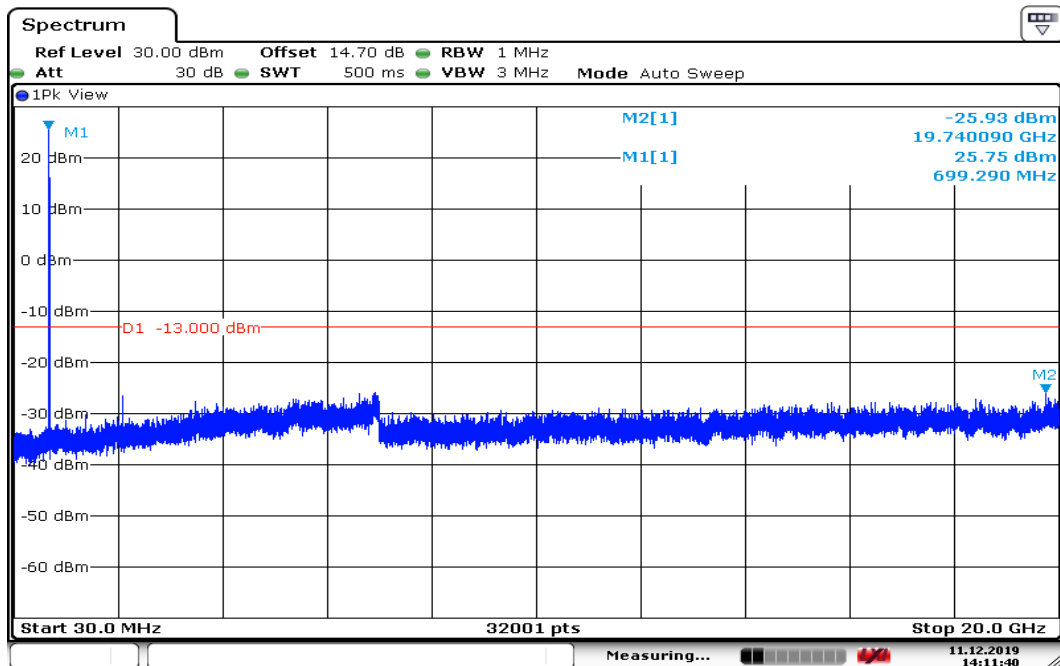
1. According to KDB 971168D01, photograph 6.0
2. The EUT was connect to spectrum analyzer and call box.
3. The RF output of EUT was connected to the spectrum analyzer.
4. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
5. Record the maximum spurious emission.
6. The fundamental frequency should be excluded against the limit in operating band.

## TEST RESULTS

### LTE Band 12

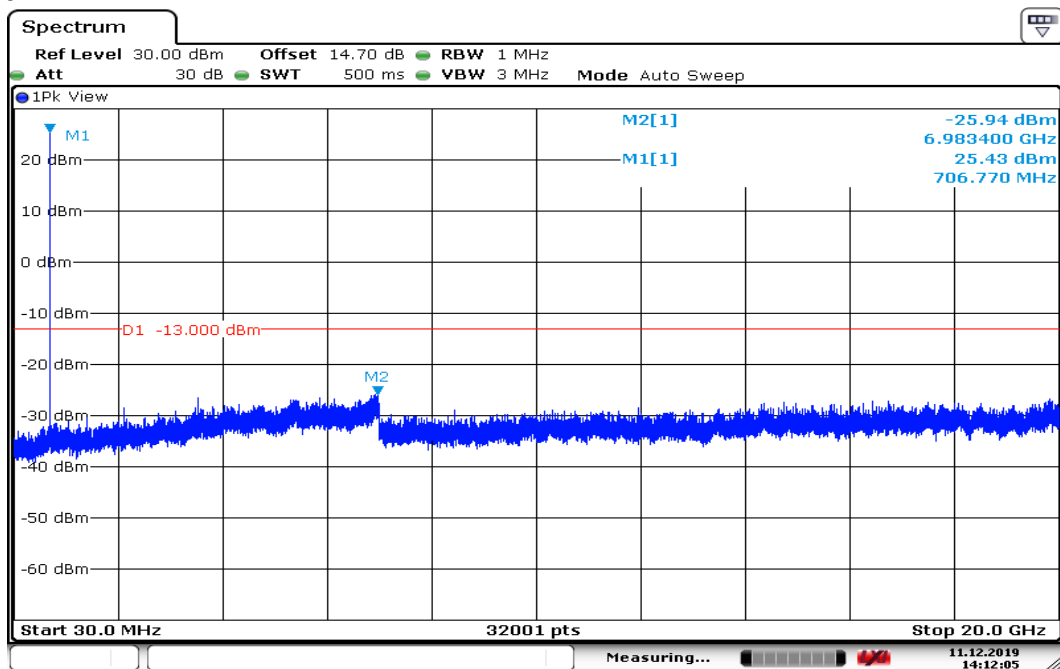
CHANNEL BANDWIDTH: 1.4MHz /QPSK

CH Low



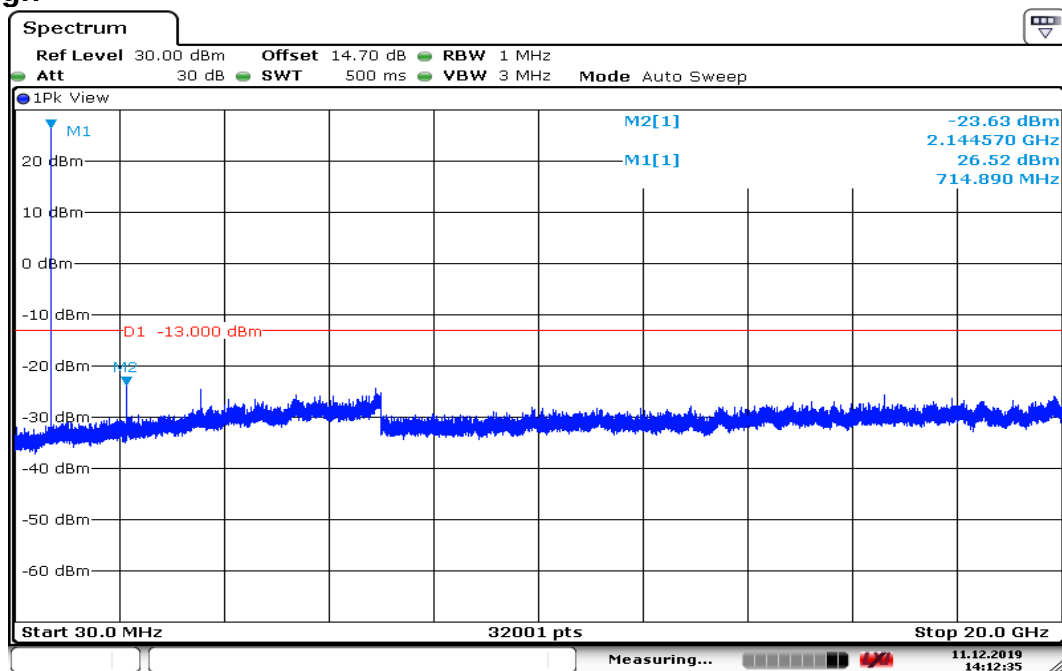
Date: 11.DEC.2019 14:11:41

CH Mid



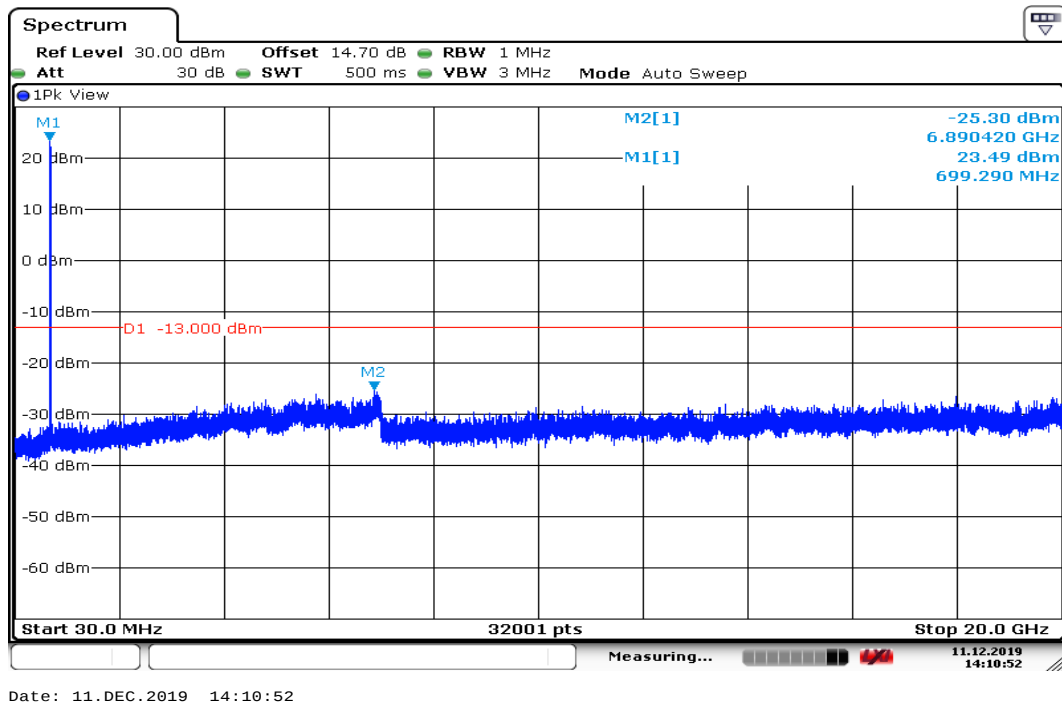
Date: 11.DEC.2019 14:12:05

## CH High

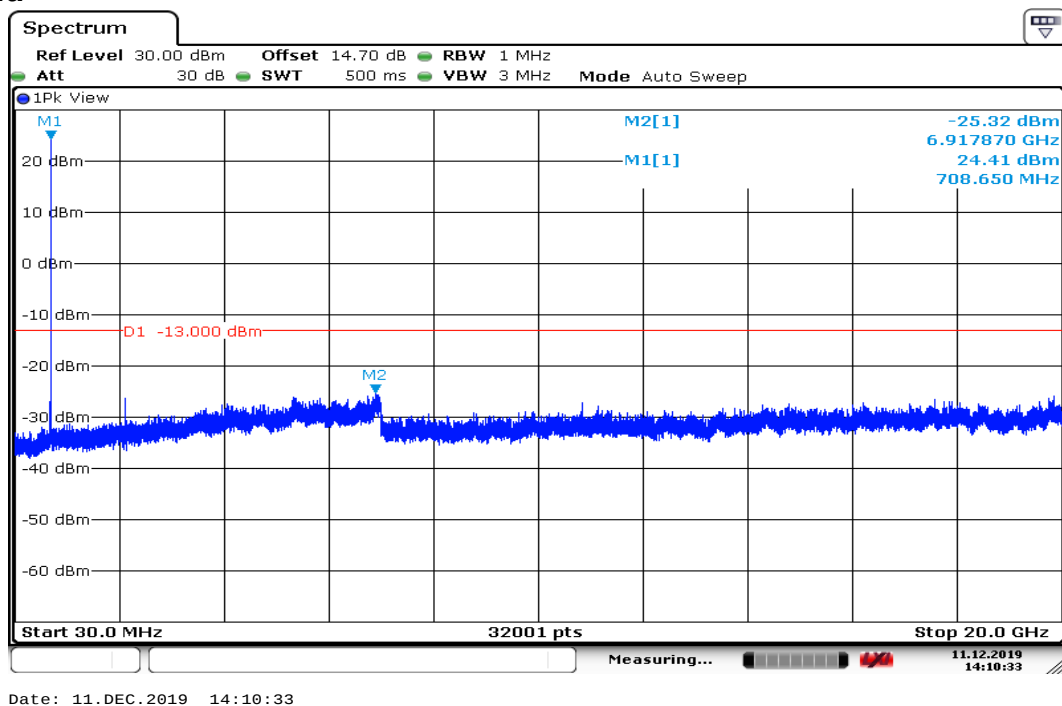


Date: 11.DEC.2019 14:12:36

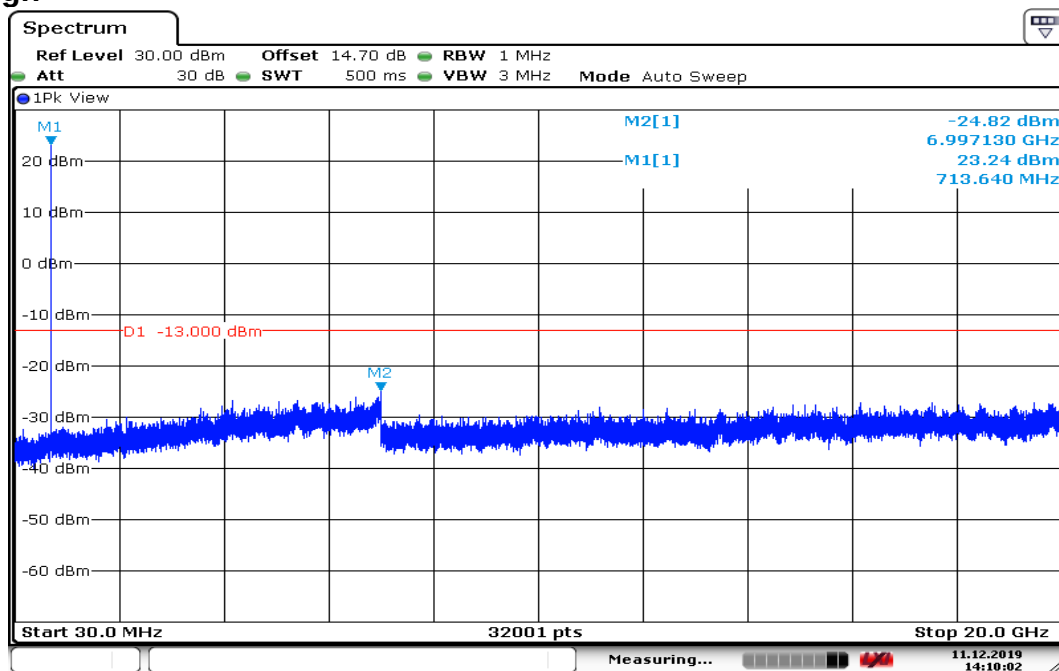
## CHANNEL BANDWIDTH: 3MHz /QPSK CH Low



## CH Mid

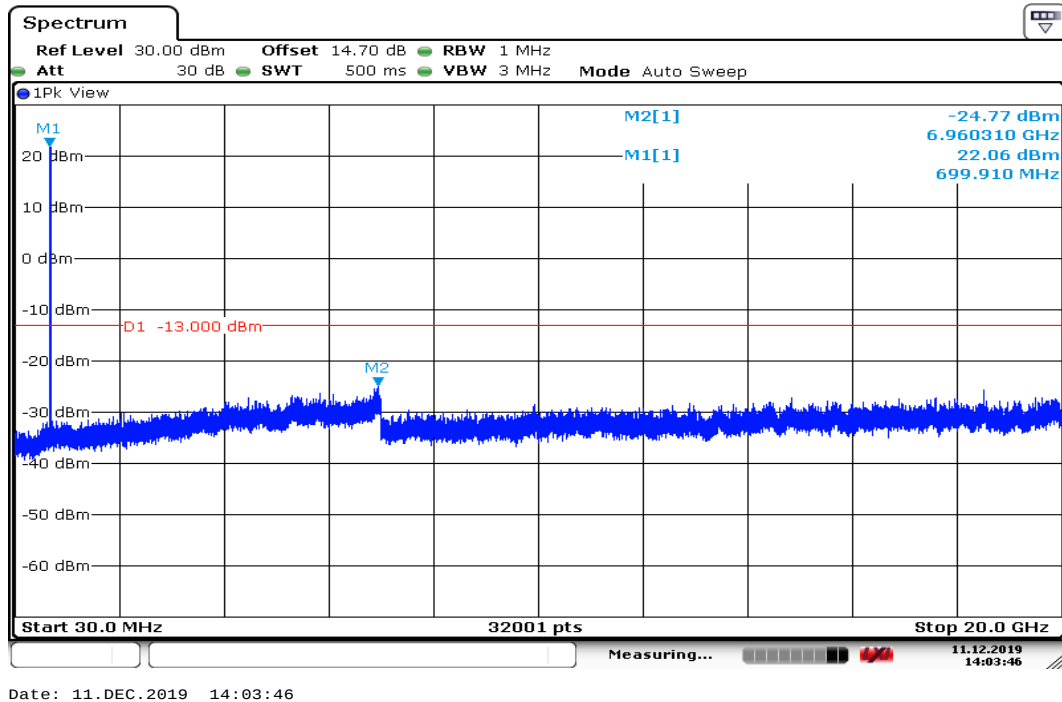


## CH High

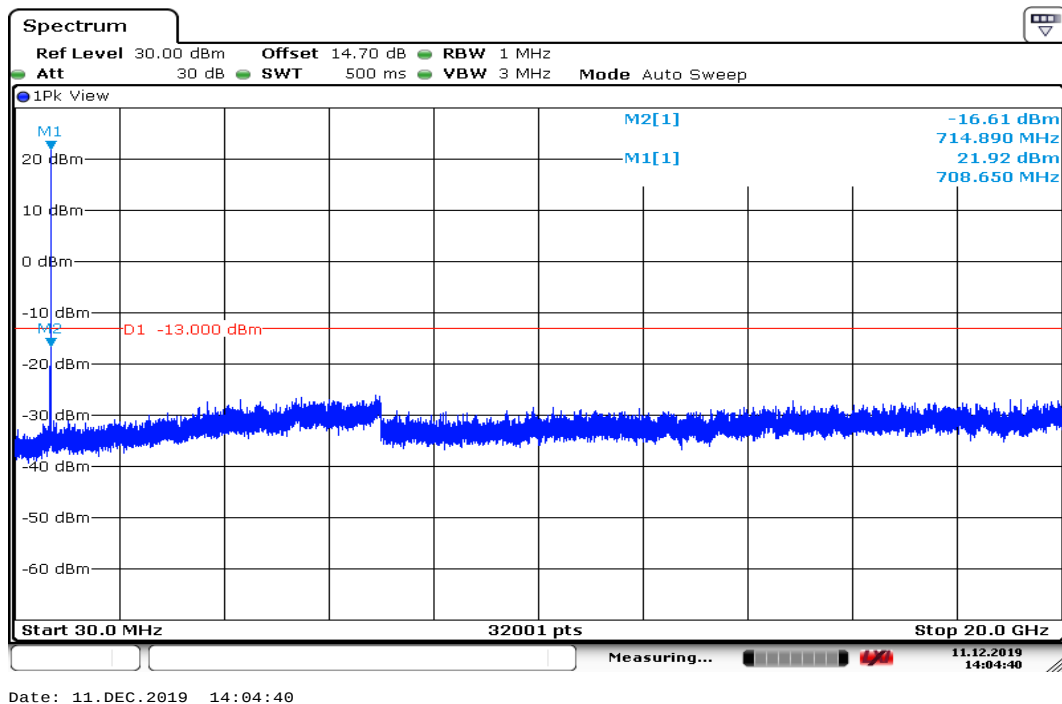


Date: 11.DEC.2019 14:10:02

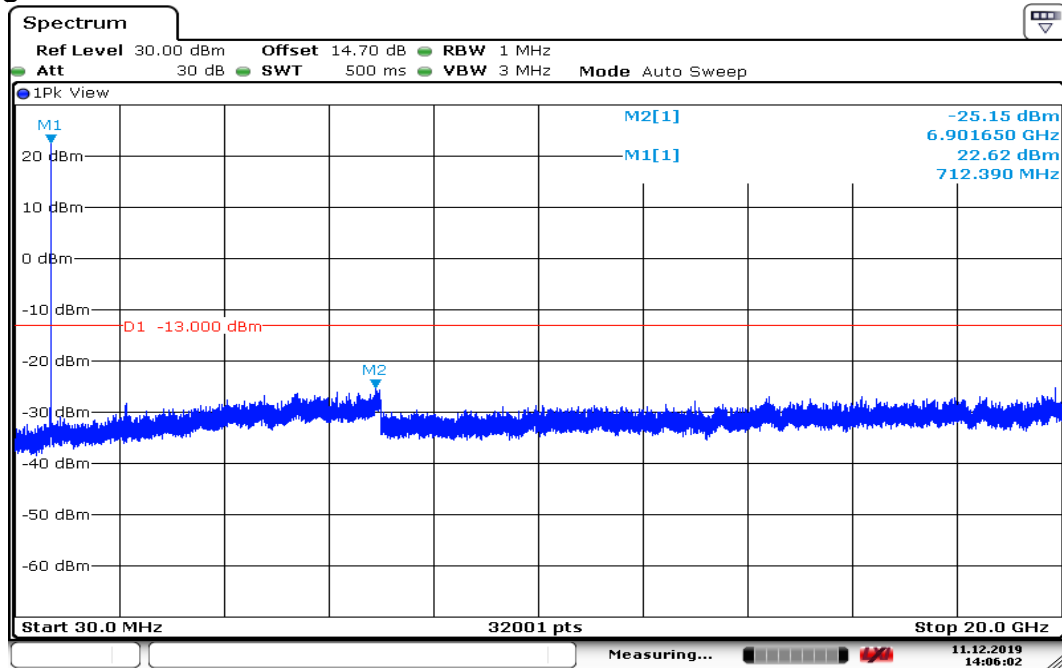
## CHANNEL BANDWIDTH: 5MHz /QPSK CH Low



## CH Mid

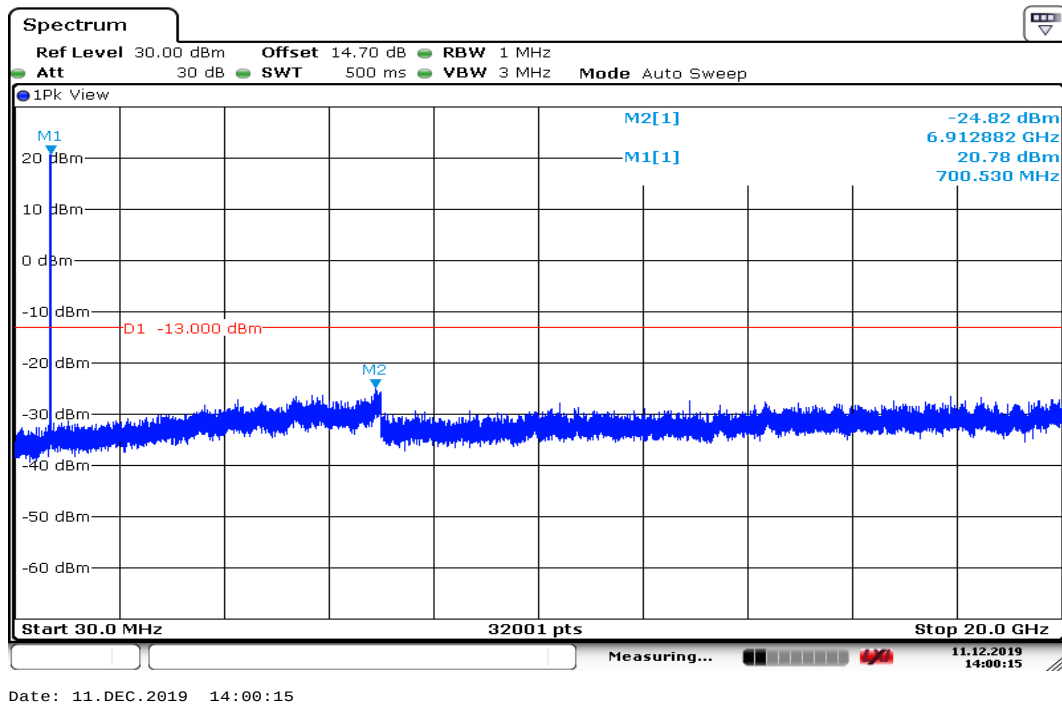


## CH High

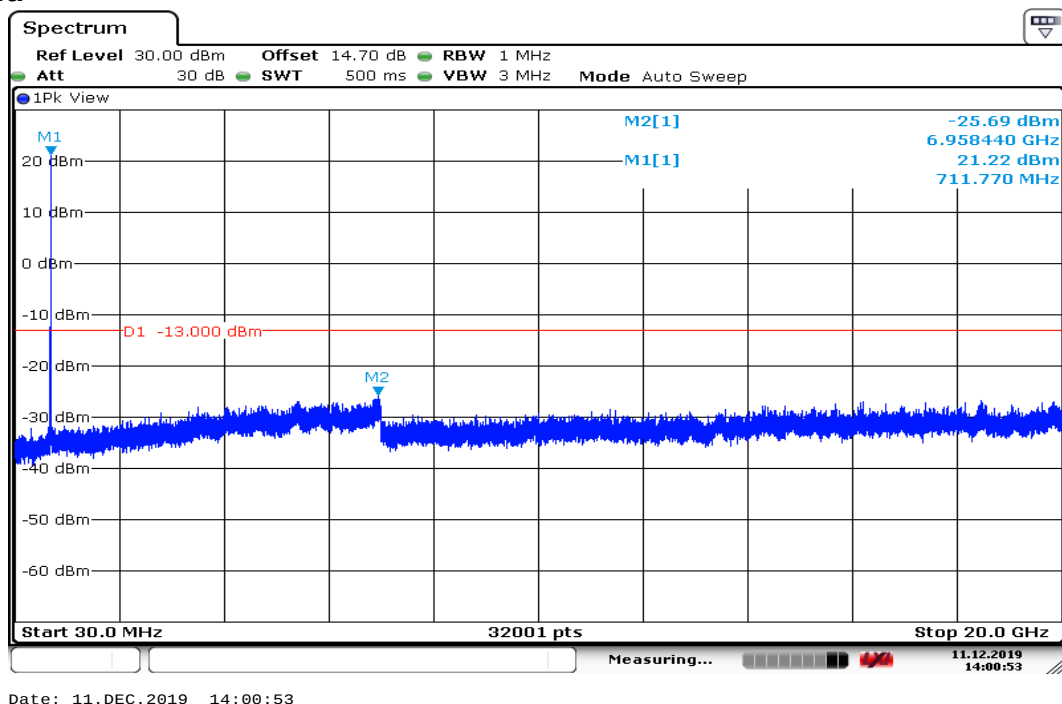


Date: 11.DEC.2019 14:06:03

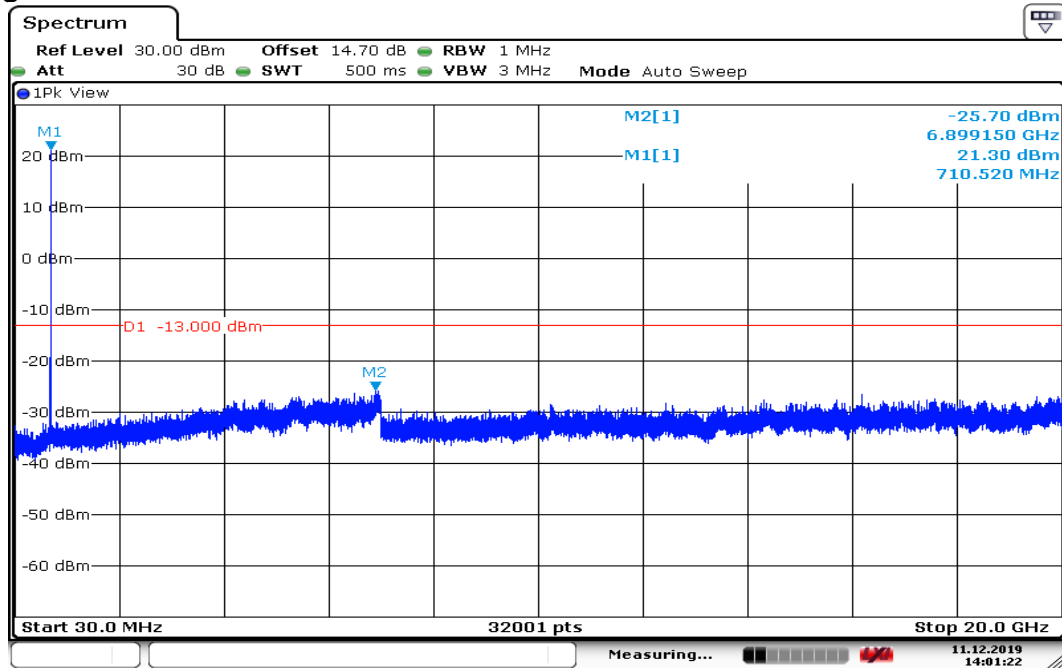
## CHANNEL BANDWIDTH: 10MHz /QPSK CH Low



## CH Mid

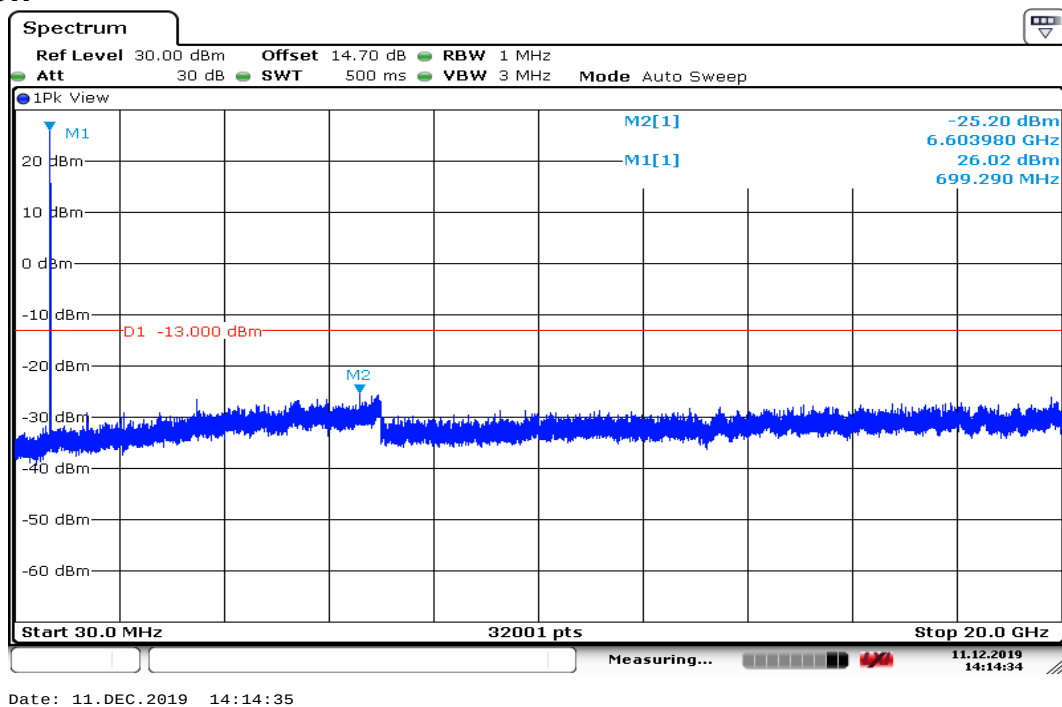


## CH High

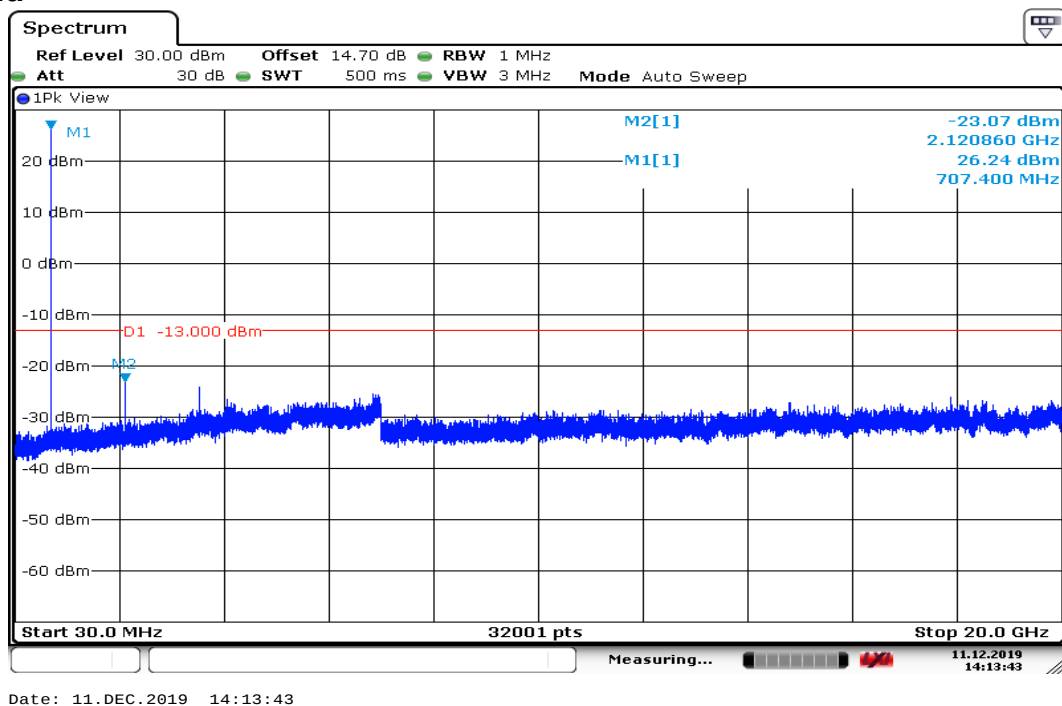


Date: 11.DEC.2019 14:01:22

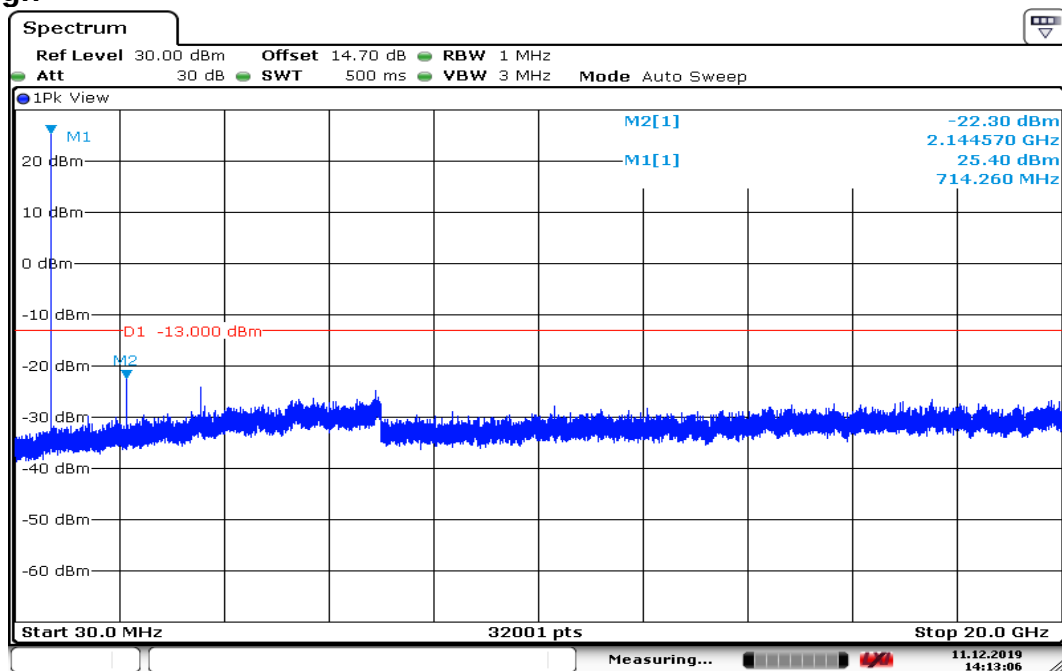
## CHANNEL BANDWIDTH: 1.4MHz /16QAM CH Low



## CH Mid

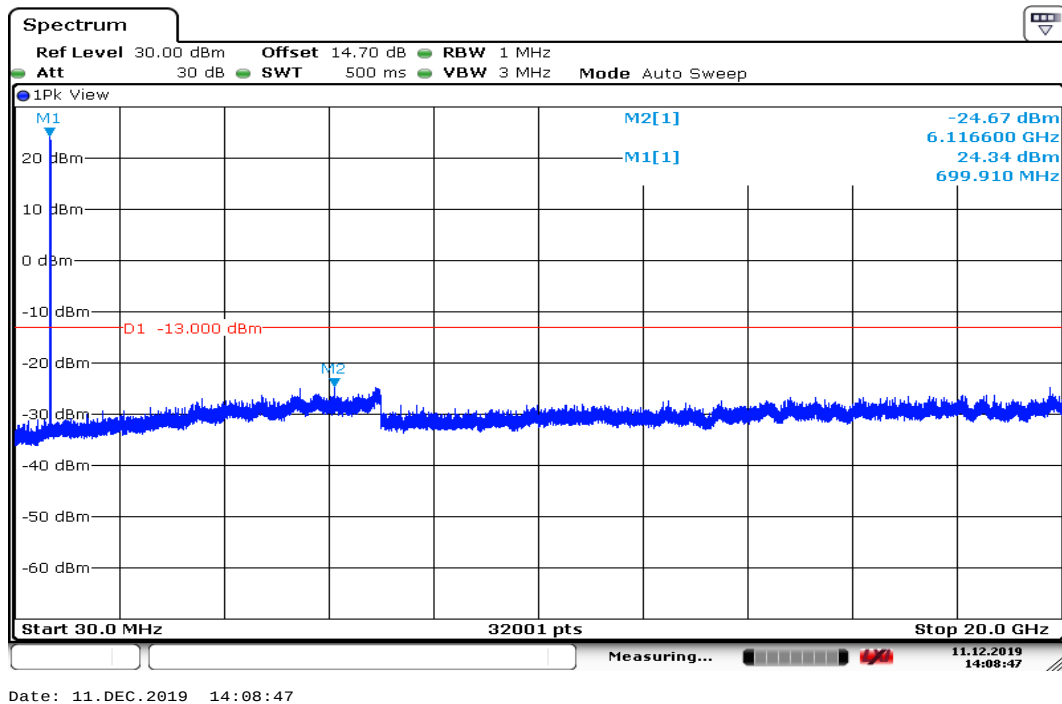


## CH High

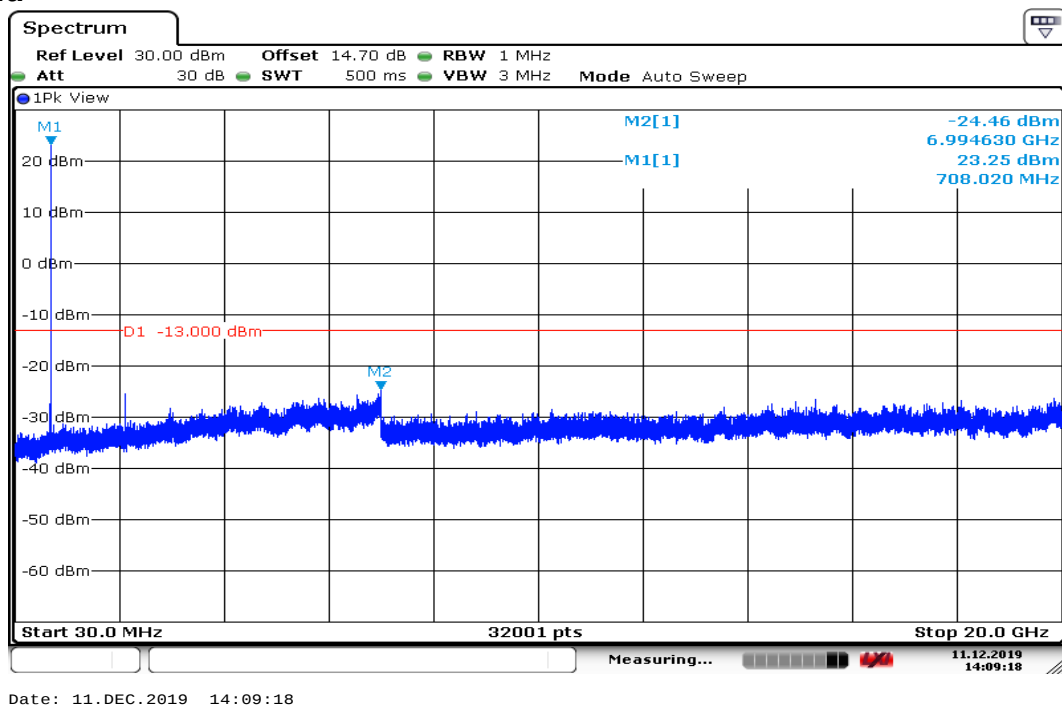


Date: 11.DEC.2019 14:13:06

## CHANNEL BANDWIDTH: 3MHz /16QAM CH Low



## CH Mid



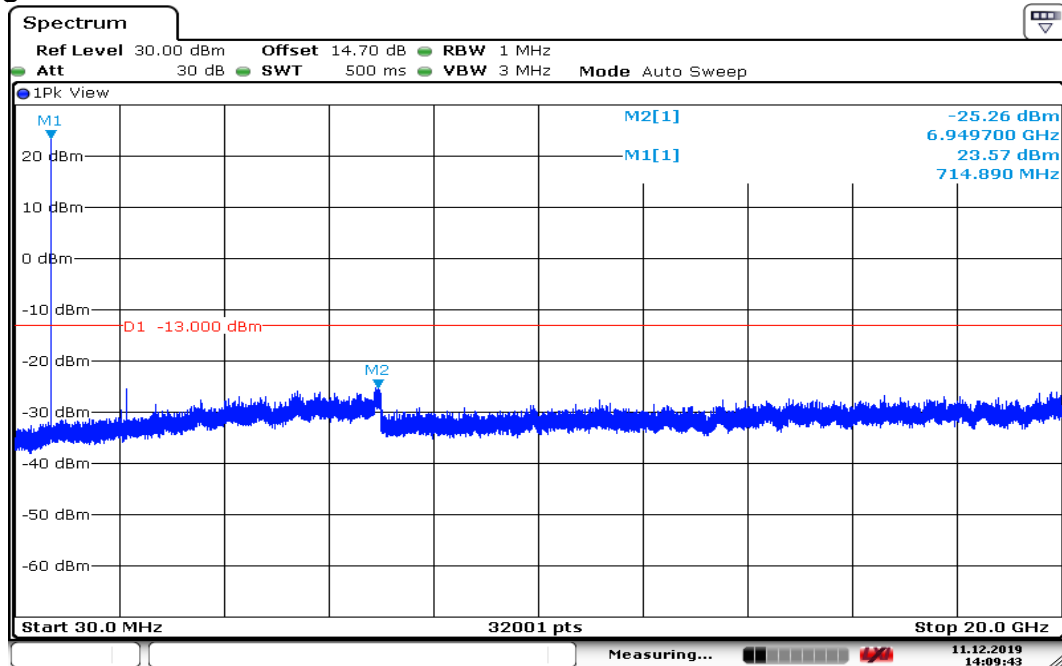


Report No.: T191105W01-RP11

Page: 93 / 118

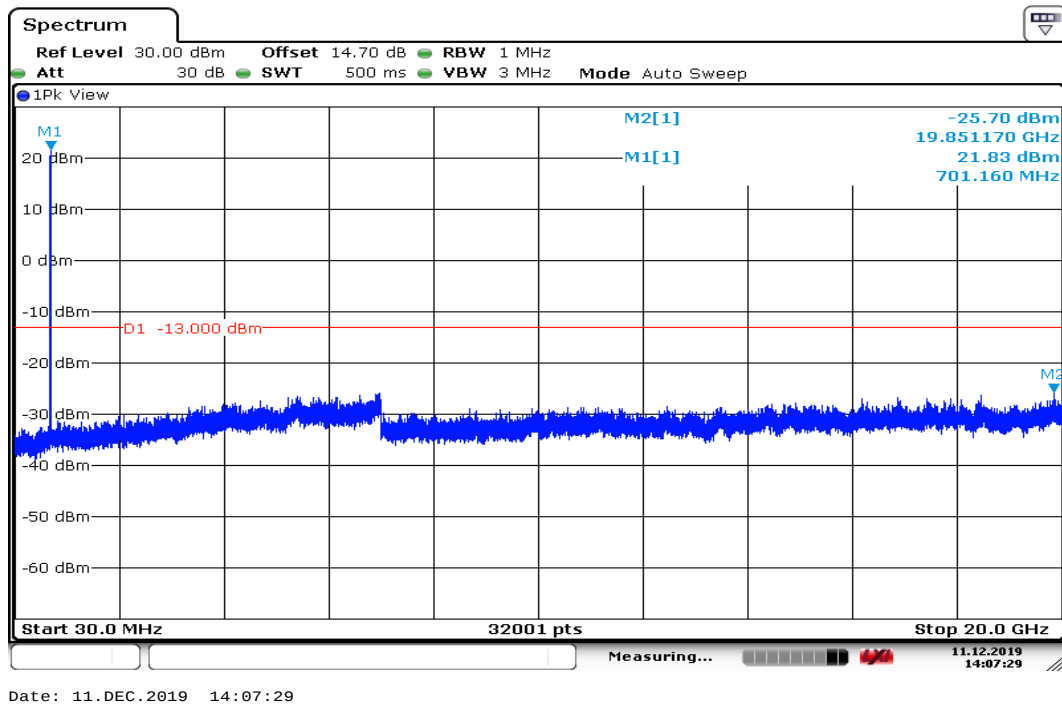
Rev.: 00

## CH High

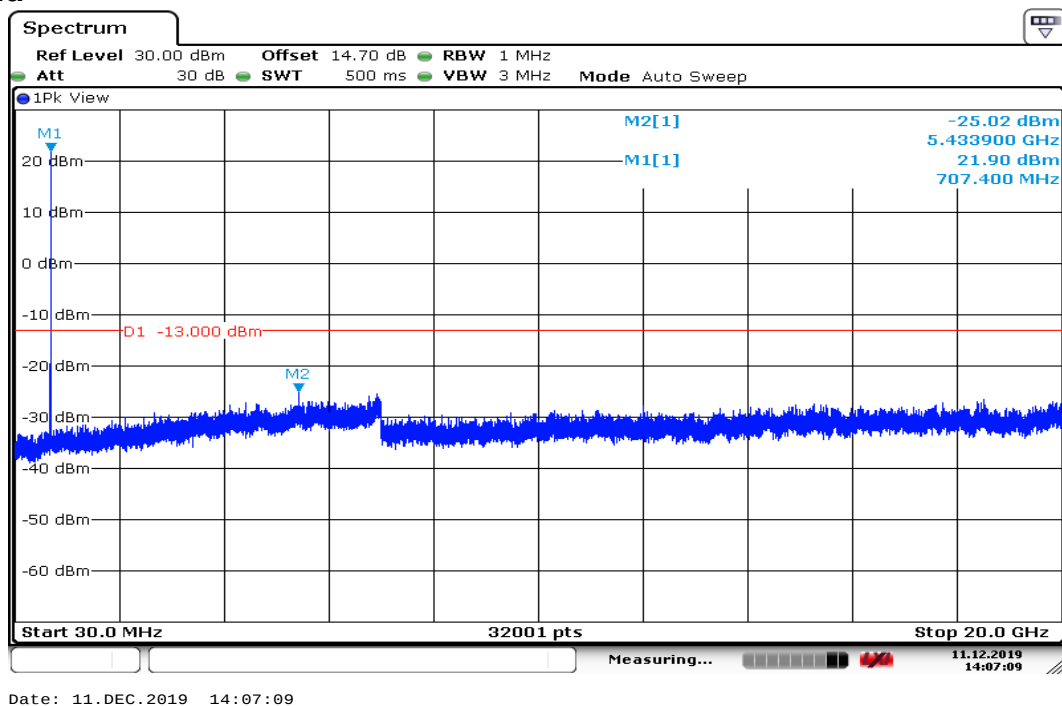


Date: 11.DEC.2019 14:09:43

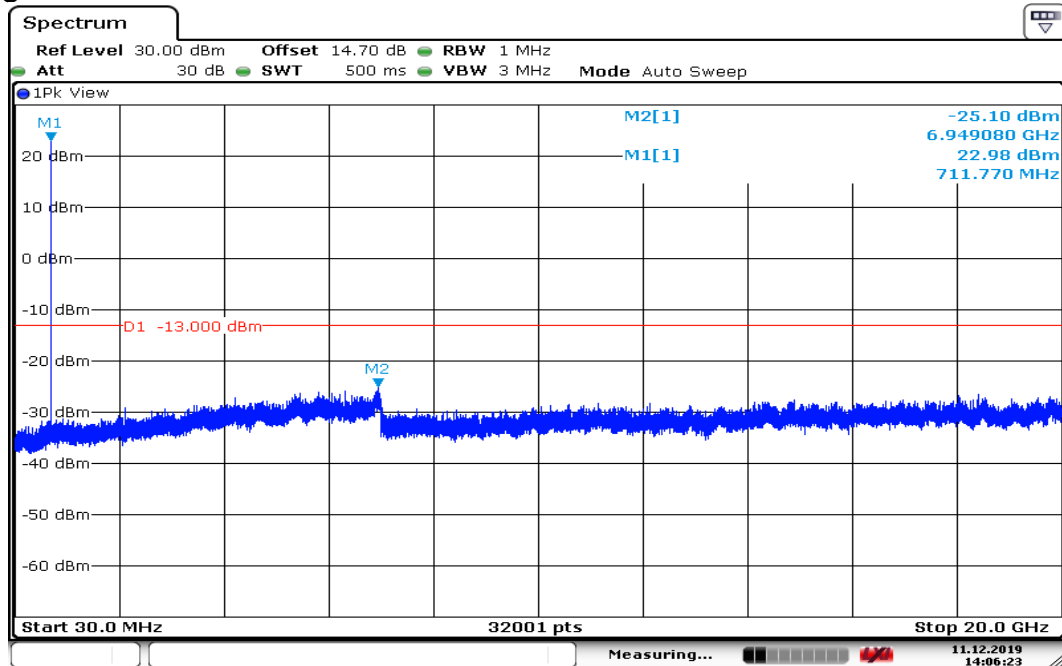
## CHANNEL BANDWIDTH:5MHz /16QAM CH Low



## CH Mid

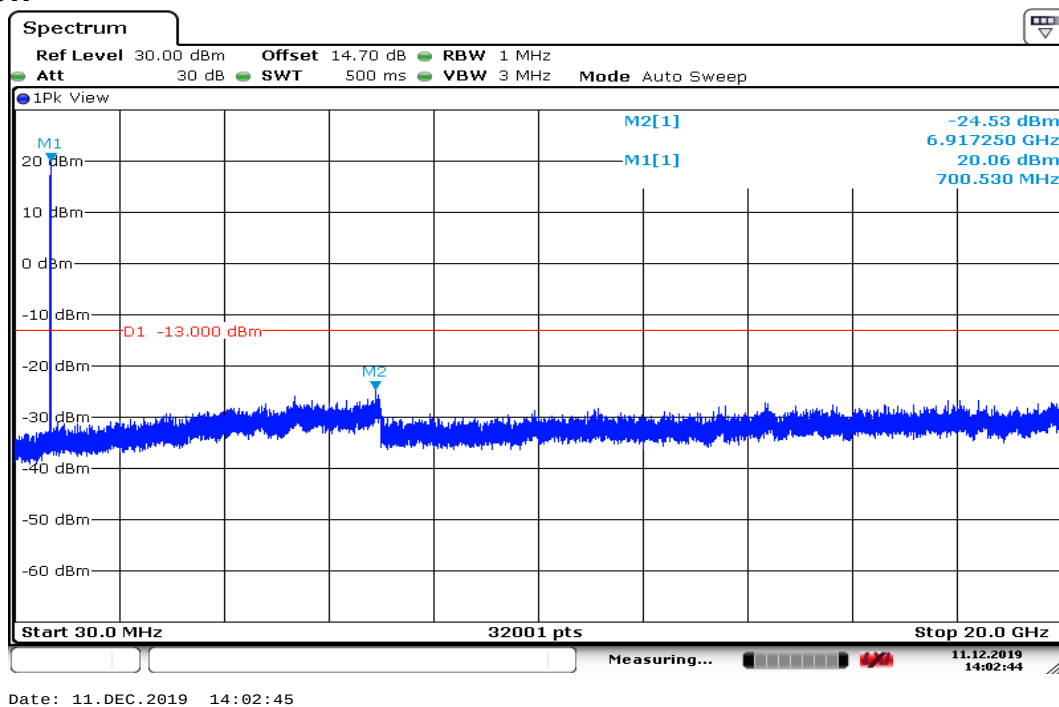


## CH High

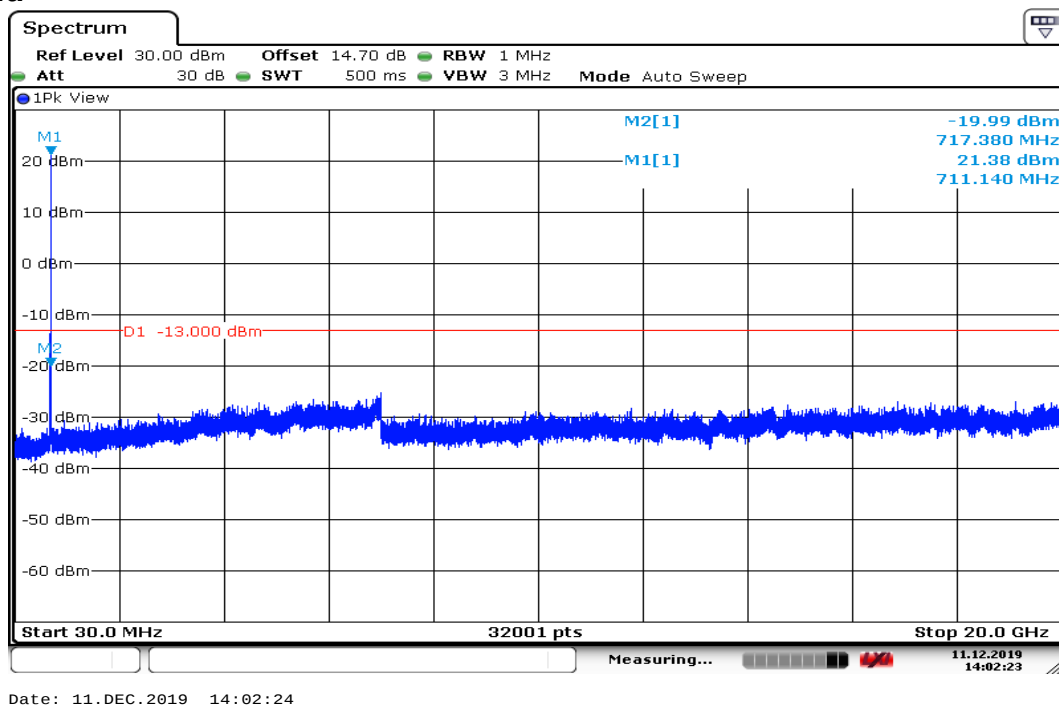


Date: 11.DEC.2019 14:06:23

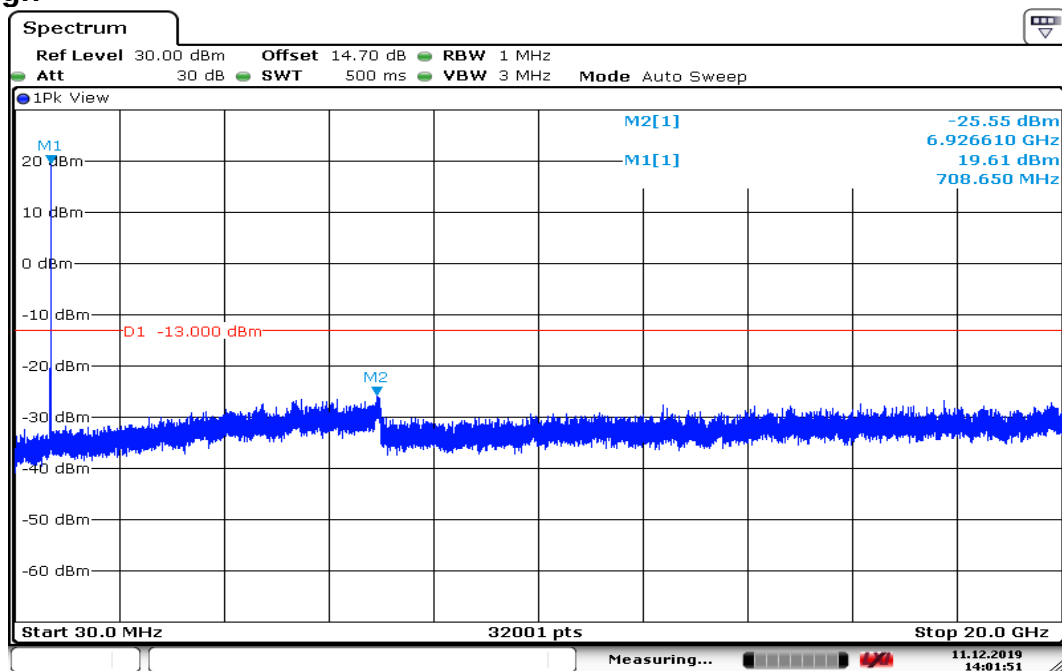
## CHANNEL BANDWIDTH:10MHz /16QAM CH Low



## CH Mid



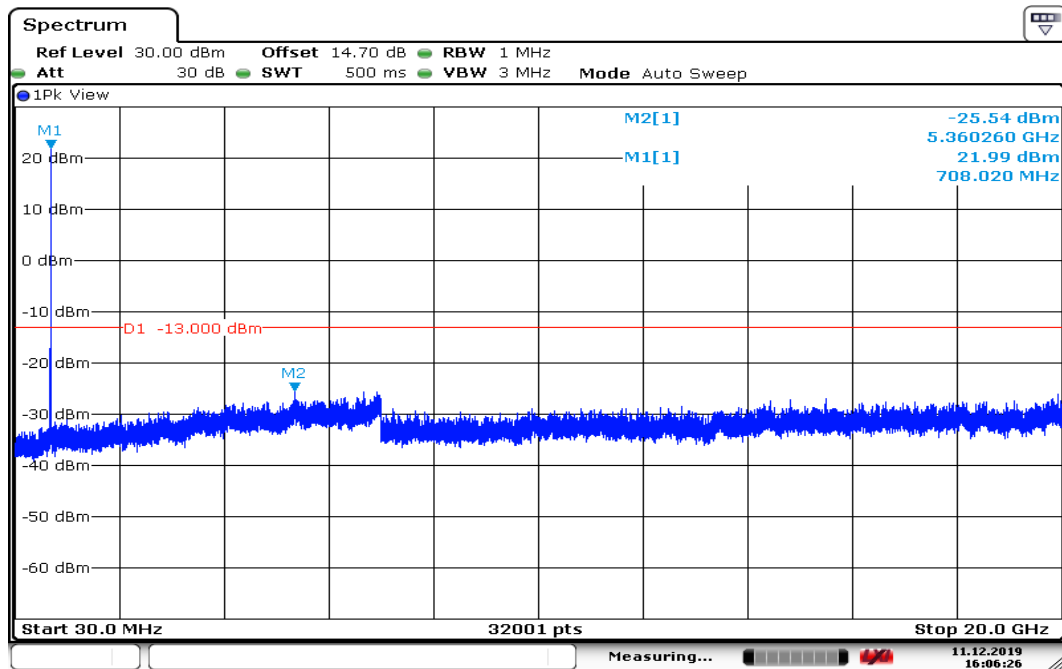
## CH High



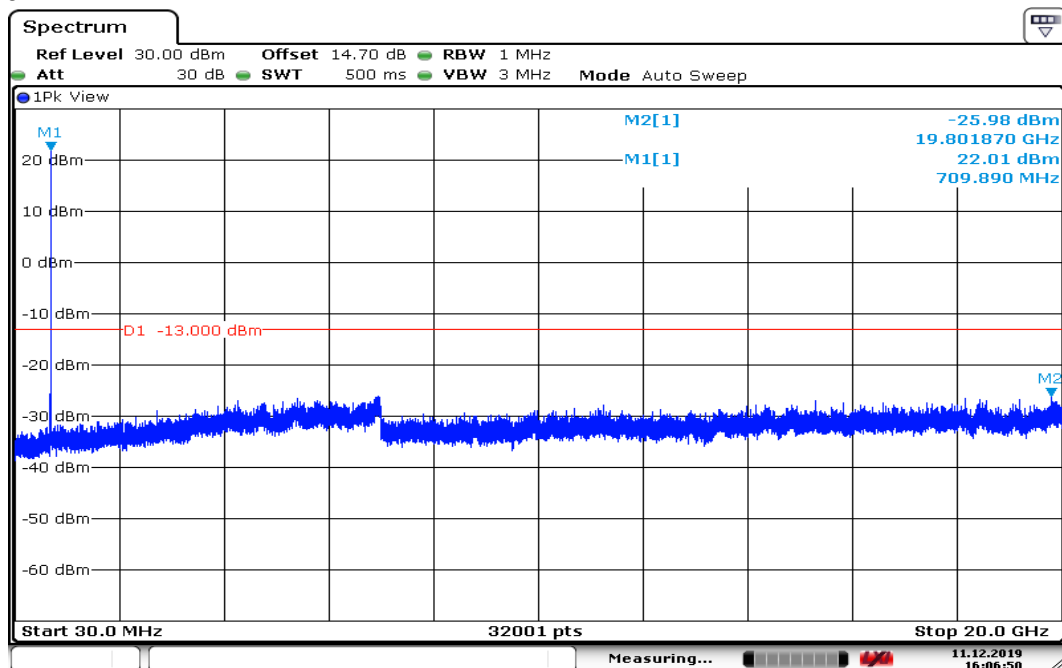
Date: 11.DEC.2019 14:01:51



Report No.: T191105W01-RP11

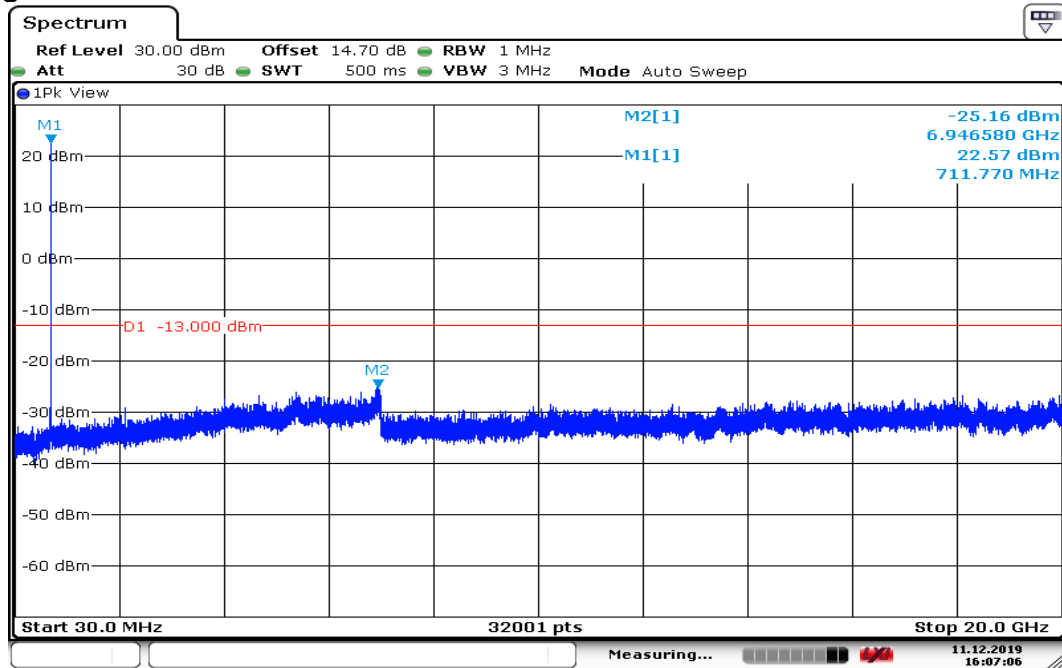
**LTE Band 17****CHANNEL BANDWIDTH: 5MHz / QPSK****CH Low**

Date: 11.DEC.2019 16:06:27

**CH Mid**

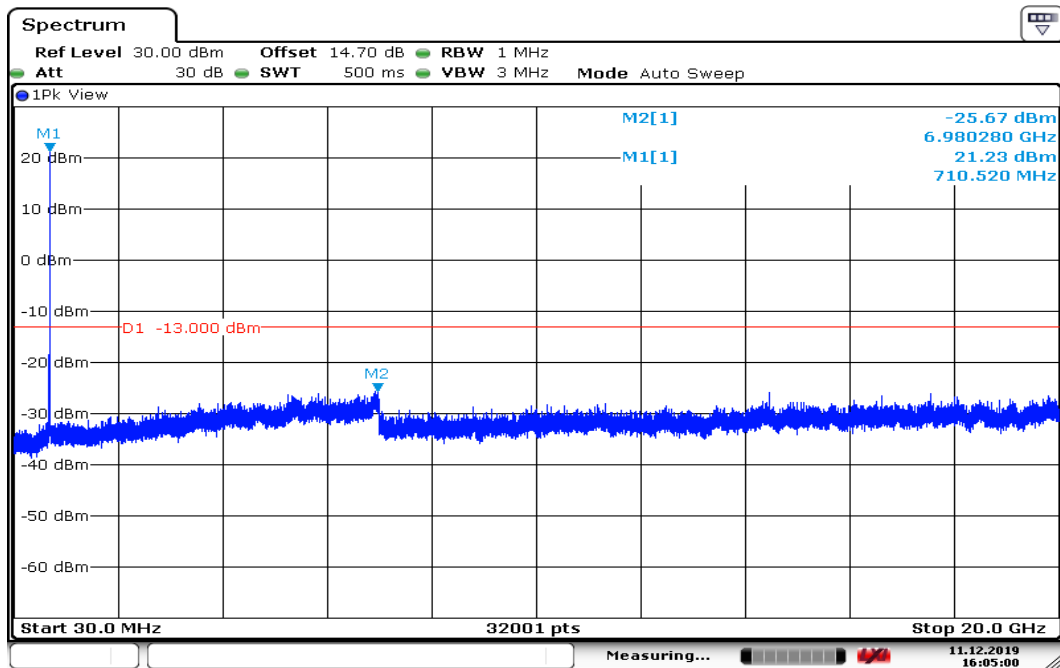
Date: 11.DEC.2019 16:06:51

## CH High



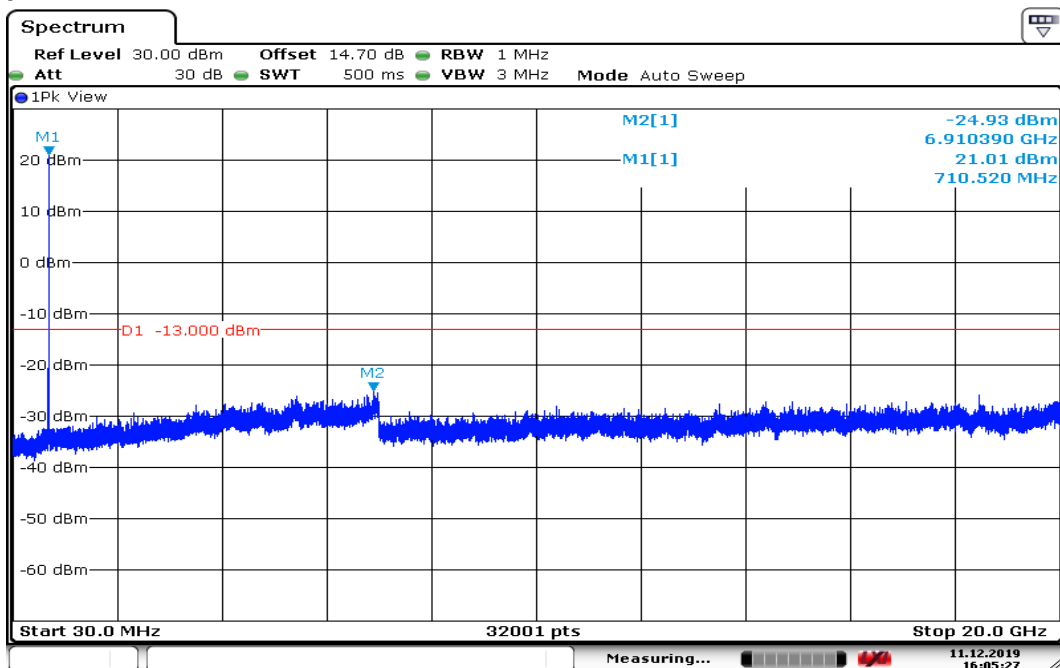
Date: 11.DEC.2019 16:07:07

## CHANNEL BANDWIDTH: 10MHz / QPSK CH Low



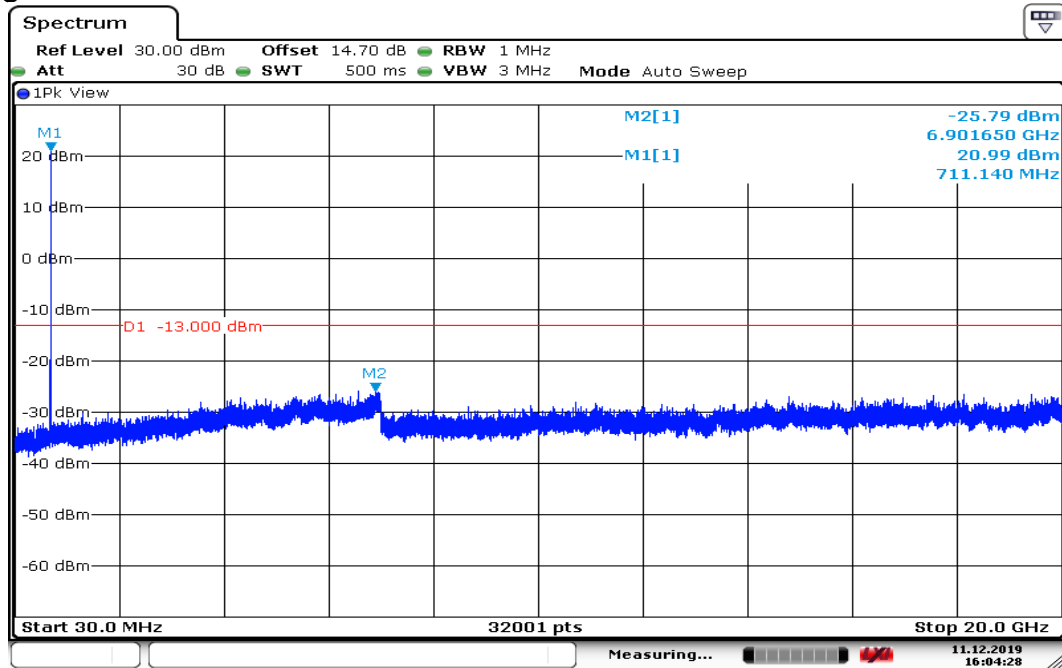
Date: 11.DEC.2019 16:05:01

## CH Mid



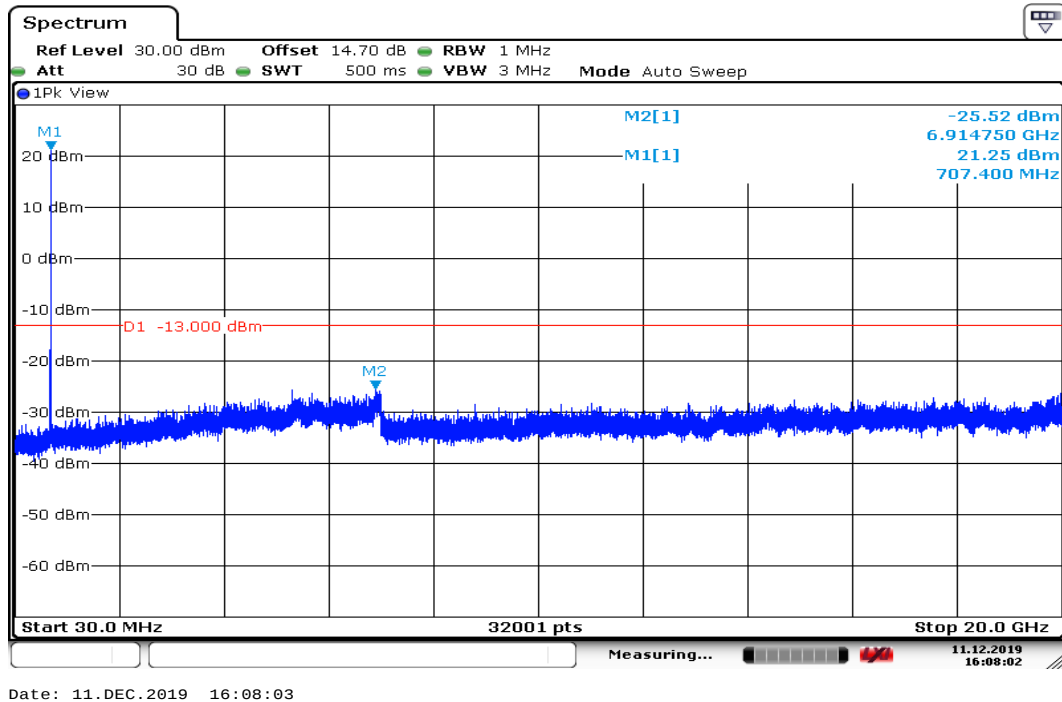
Date: 11.DEC.2019 16:05:27

## CH High

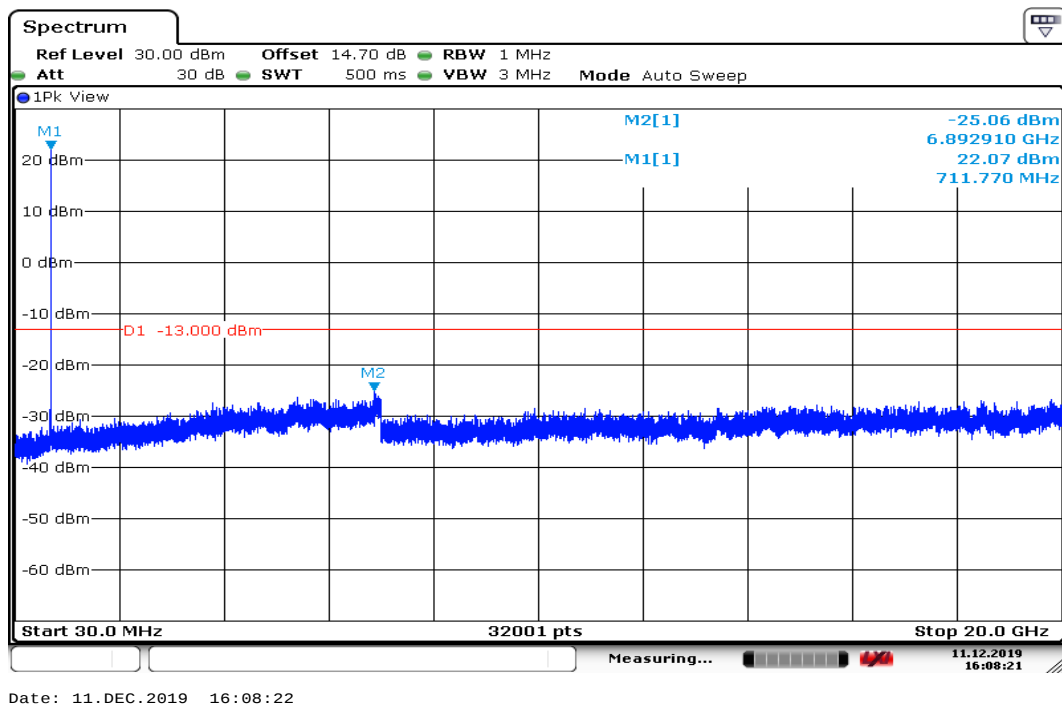


Date: 11.DEC.2019 16:04:29

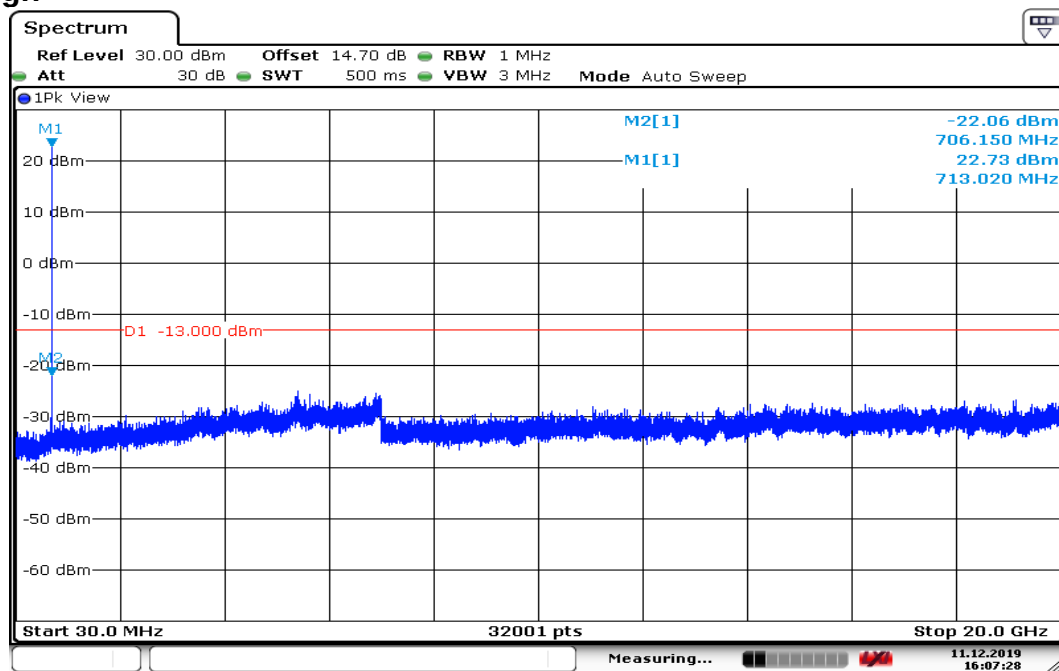
## CHANNEL BANDWIDTH: 5MHz / 16QAM CH Low



## CH Mid

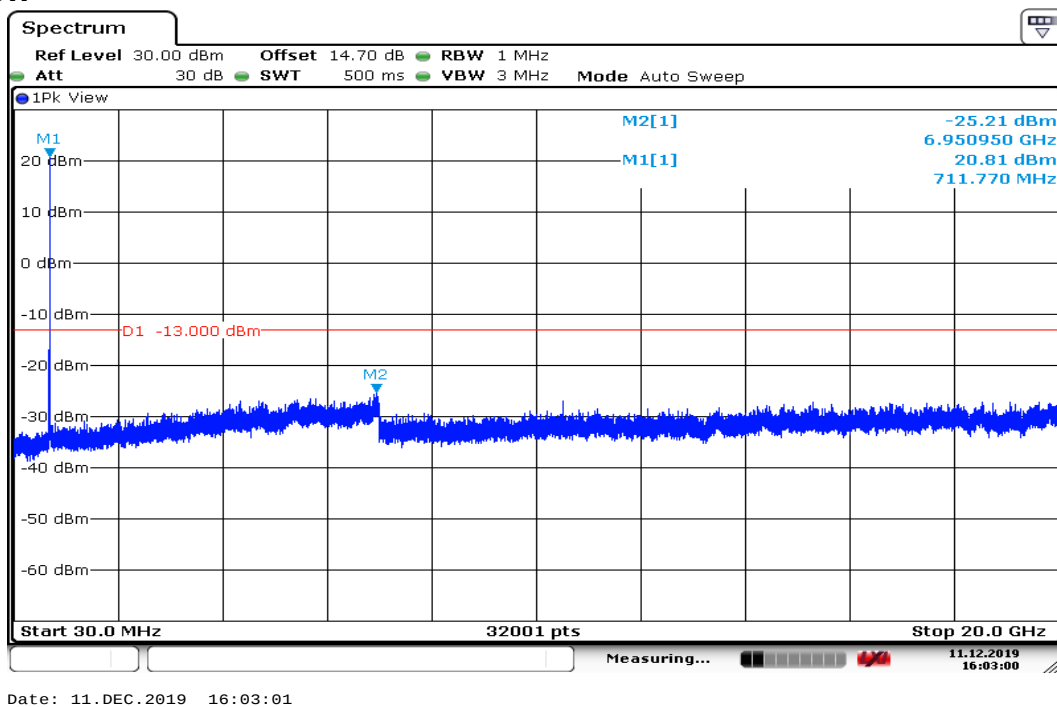


## CH High

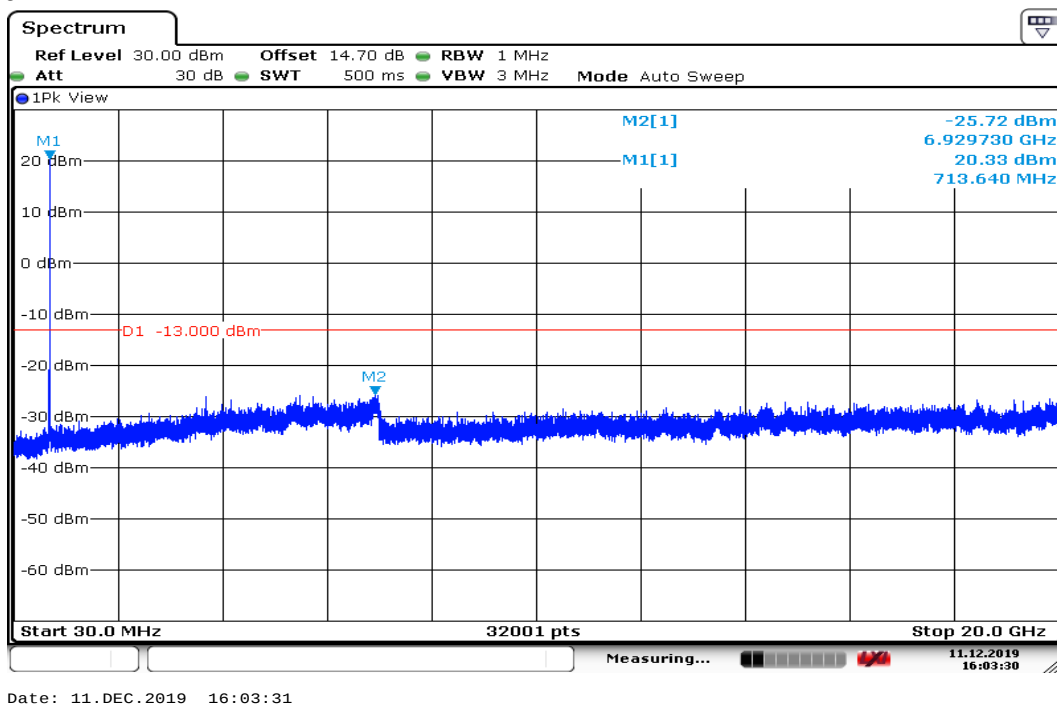


Date: 11.DEC.2019 16:07:29

## CHANNEL BANDWIDTH: 10MHz / 16QAM CH Low



## CH Mid



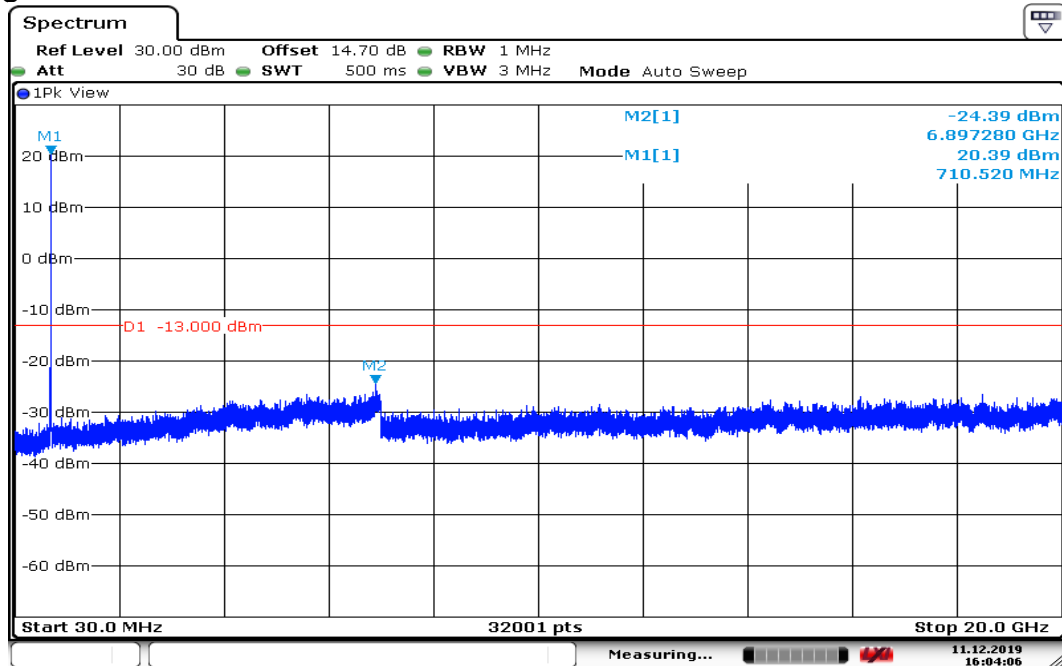


Report No.: T191105W01-RP11

Page: 105 / 118

Rev.: 00

## CH High



Date: 11.DEC.2019 16:04:07

## 8.7 RADIATED EMISSION MEASUREMENT

### LIMITS

#### **FCC §27.53(g), Band 12 & Band 17**

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

#### **According to RSS-130, Band 12 & Band 17**

The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least  $43 + 10 \log_{10} p$  (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

### TEST PROCEDURES

1. According to KDB 971168 D01 and TIA-603-E.
2. The EUT was placed on a turntable
  - (1) Below 1G : 0.8m
  - (2) Above 1G : 1.5m
  - (3) EUT set 3m from the receiving antenna
  - (4) The table was rotated 360 degrees of the highest spurious emission to determine the position.
3. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
4. A horn antenna was driven by a signal generator.
5. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

**Test Results****LTE Band 17 / BW: 10MHz / QPSK / RB =1, RB Offset = 0****Operation Mode:** Tx / Low CH**Test Date:**

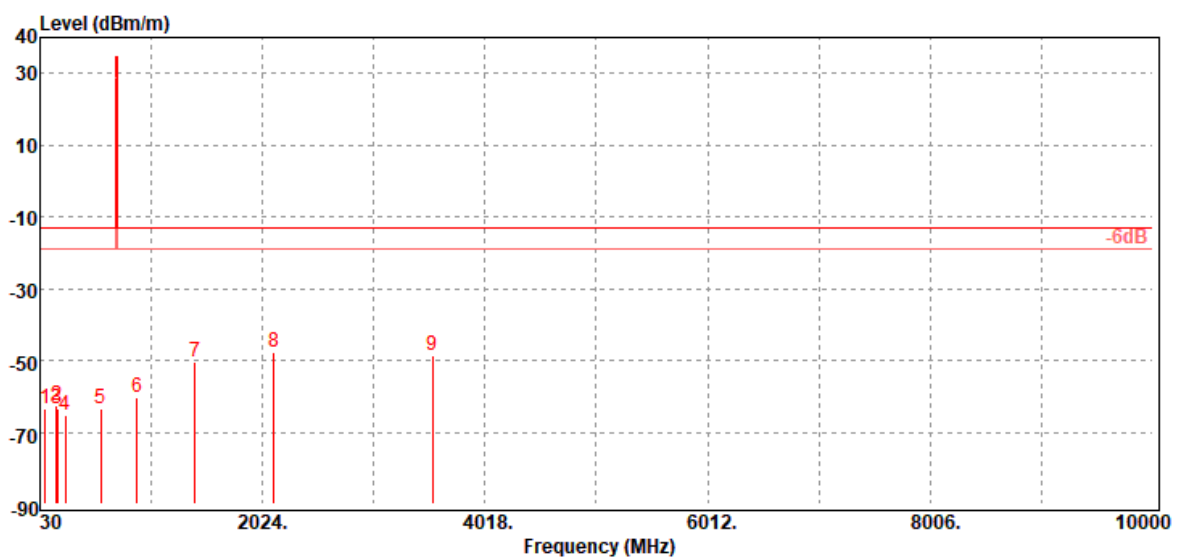
December 18, 2019

**Temperature:** 18.6°C**Tested by:**

Jerry Chang

**Humidity:** 59% RH**Polarity:**

Ver.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 78.50        | -63.58          | -54.3                     | -8.55                      | -0.73               | -13.00       | -50.58       | V                                |
| 178.41       | -62.69          | -57.03                    | -4.56                      | -1.10               | -13.00       | -49.69       | V                                |
| 187.14       | -63.37          | -58.25                    | -3.99                      | -1.13               | -13.00       | -50.37       | V                                |
| 255.04       | -65.28          | -62.37                    | -1.60                      | -1.31               | -13.00       | -52.28       | V                                |
| 575.14       | -63.50          | -60.09                    | -1.40                      | -2.01               | -13.00       | -50.50       | V                                |
| 898.15       | -60.26          | -56.48                    | -1.24                      | -2.54               | -13.00       | -47.26       | V                                |
| 1418.00      | -50.35          | -55.2                     | 8.11                       | -3.26               | -13.00       | -37.35       | V                                |
| 2127.00      | -47.71          | -53.16                    | 9.58                       | -4.13               | -13.00       | -34.71       | V                                |
| 3545.00      | -48.78          | -55.6                     | 12.41                      | -5.59               | -13.00       | -35.78       | V                                |

Operation Mode: Tx / Low CH

Test Date:

December 18, 2019

Temperature: 18.6°C

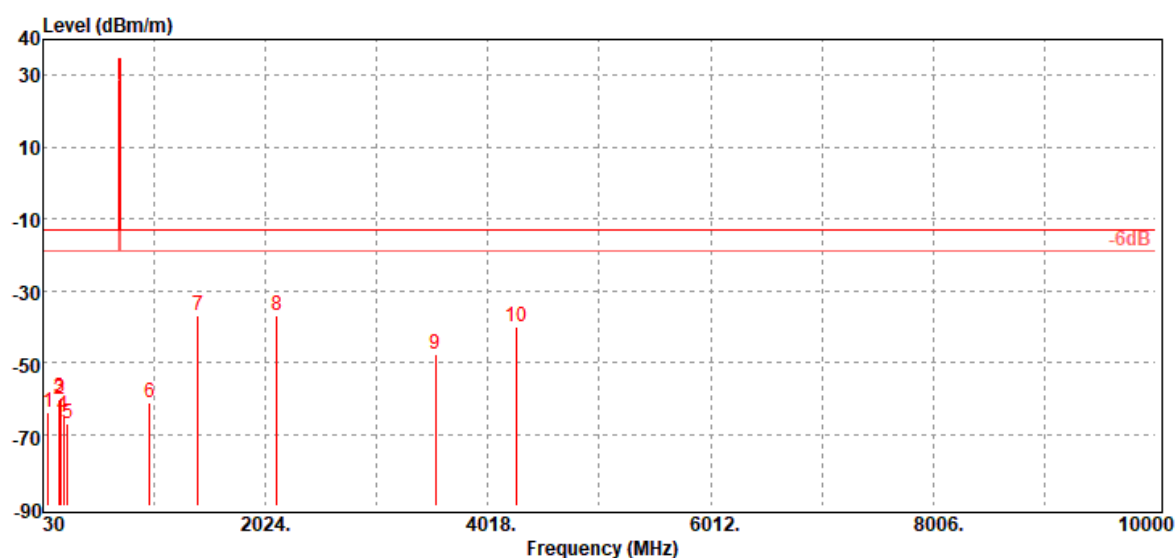
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Hor.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 80.44        | -64.09          | -54.9                     | -8.46                      | -0.73               | -13.00       | -51.09       | H                                |
| 177.44       | -60.36          | -54.61                    | -4.66                      | -1.09               | -13.00       | -47.36       | H                                |
| 188.11       | -59.95          | -54.92                    | -3.90                      | -1.13               | -13.00       | -46.95       | H                                |
| 216.24       | -64.71          | -61.42                    | -2.08                      | -1.21               | -13.00       | -51.71       | H                                |
| 253.10       | -67.07          | -64.08                    | -1.68                      | -1.31               | -13.00       | -54.07       | H                                |
| 985.45       | -61.01          | -56.95                    | -1.40                      | -2.66               | -13.00       | -48.01       | H                                |
| 1418.00      | -37.10          | -41.95                    | 8.11                       | -3.26               | -13.00       | -24.10       | H                                |
| 2127.00      | -37.13          | -42.58                    | 9.58                       | -4.13               | -13.00       | -24.13       | H                                |
| 3545.00      | -47.63          | -54.45                    | 12.41                      | -5.59               | -13.00       | -34.63       | H                                |
| 4276.00      | -39.96          | -46.62                    | 12.80                      | -6.14               | -13.00       | -26.96       | H                                |

Operation Mode: Tx / Mid CH

Test Date:

December 18, 2019

Temperature: 18.6°C

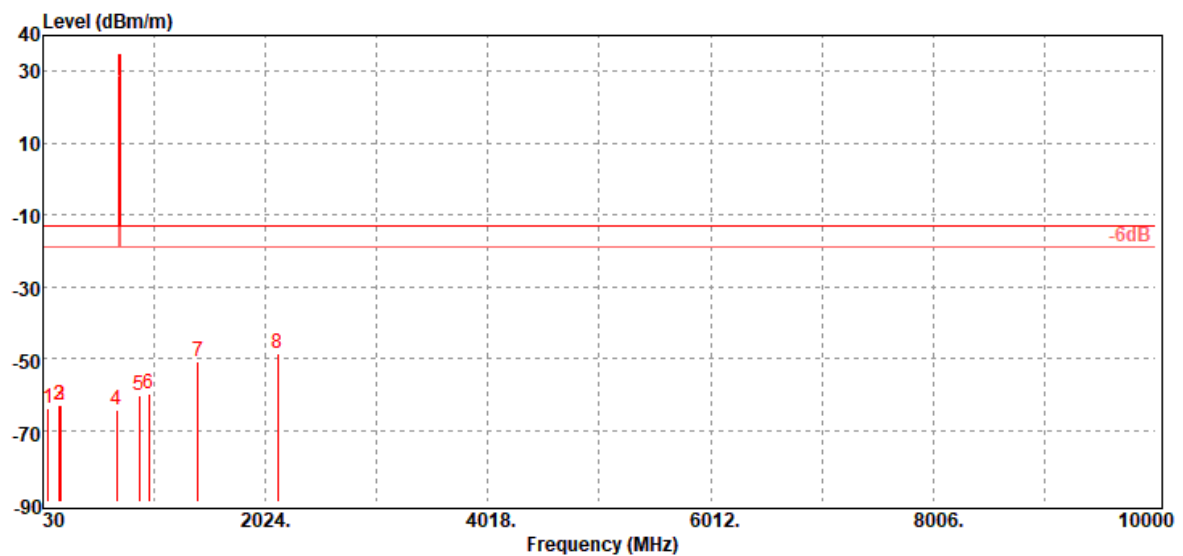
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Ver.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 80.44        | -64.11          | -54.92                    | -8.46                      | -0.73               | -13.00       | -51.11       | V                                |
| 178.41       | -62.94          | -57.28                    | -4.56                      | -1.10               | -13.00       | -49.94       | V                                |
| 188.11       | -62.86          | -57.83                    | -3.90                      | -1.13               | -13.00       | -49.86       | V                                |
| 686.69       | -64.39          | -60.85                    | -1.33                      | -2.21               | -13.00       | -51.39       | V                                |
| 890.39       | -60.15          | -56.41                    | -1.21                      | -2.53               | -13.00       | -47.15       | V                                |
| 980.60       | -59.88          | -55.92                    | -1.31                      | -2.65               | -13.00       | -46.88       | V                                |
| 1420.00      | -50.99          | -55.85                    | 8.12                       | -3.26               | -13.00       | -37.99       | V                                |
| 2130.00      | -48.62          | -54.05                    | 9.56                       | -4.13               | -13.00       | -35.62       | V                                |

Operation Mode: Tx / Mid CH

Test Date:

December 18, 2019

Temperature: 18.6°C

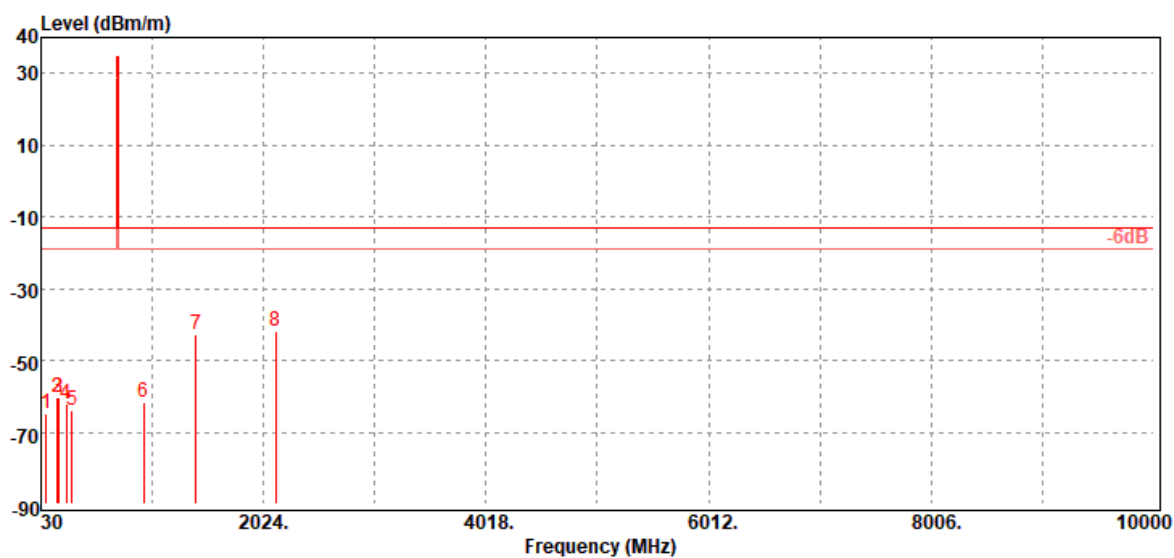
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Hor.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 80.44        | -64.71          | -55.52                    | -8.46                      | -0.73               | -13.00       | -51.71       | H                                |
| 178.41       | -60.37          | -54.71                    | -4.56                      | -1.10               | -13.00       | -47.37       | H                                |
| 188.11       | -60.20          | -55.17                    | -3.90                      | -1.13               | -13.00       | -47.20       | H                                |
| 259.89       | -62.17          | -59.04                    | -1.80                      | -1.33               | -13.00       | -49.17       | H                                |
| 306.45       | -63.96          | -60.58                    | -1.93                      | -1.45               | -13.00       | -50.96       | H                                |
| 949.56       | -61.62          | -57.81                    | -1.20                      | -2.61               | -13.00       | -48.62       | H                                |
| 1420.00      | -42.95          | -47.81                    | 8.12                       | -3.26               | -13.00       | -29.95       | H                                |
| 2130.00      | -42.00          | -47.43                    | 9.56                       | -4.13               | -13.00       | -29.00       | H                                |

Operation Mode: Tx / High CH

Test Date:

December 18, 2019

Temperature: 18.6°C

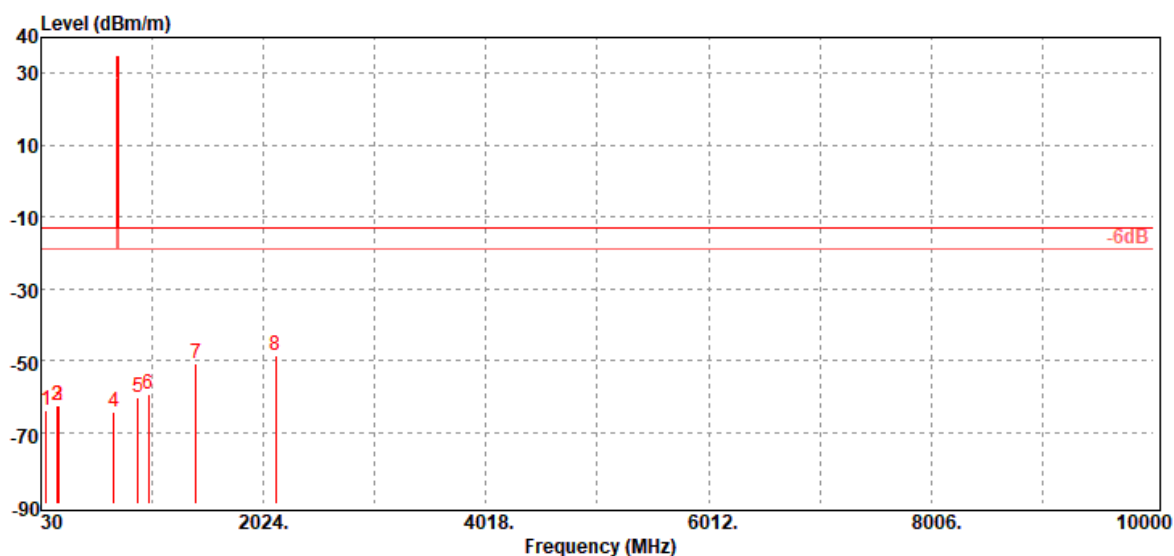
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Ver.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 78.50        | -63.85          | -54.57                    | -8.55                      | -0.73               | -13.00       | -50.85       | V                                |
| 177.44       | -62.76          | -57.01                    | -4.66                      | -1.09               | -13.00       | -49.76       | V                                |
| 188.11       | -62.48          | -57.45                    | -3.90                      | -1.13               | -13.00       | -49.48       | V                                |
| 679.90       | -64.16          | -60.66                    | -1.30                      | -2.20               | -13.00       | -51.16       | V                                |
| 896.21       | -60.36          | -56.54                    | -1.28                      | -2.54               | -13.00       | -47.36       | V                                |
| 995.15       | -59.41          | -55.34                    | -1.40                      | -2.67               | -13.00       | -46.41       | V                                |
| 1422.00      | -50.85          | -55.72                    | 8.13                       | -3.26               | -13.00       | -37.85       | V                                |
| 2133.00      | -48.67          | -54.07                    | 9.54                       | -4.14               | -13.00       | -35.67       | V                                |

Operation Mode: Tx / High CH

Test Date:

December 18, 2019

Temperature: 18.6°C

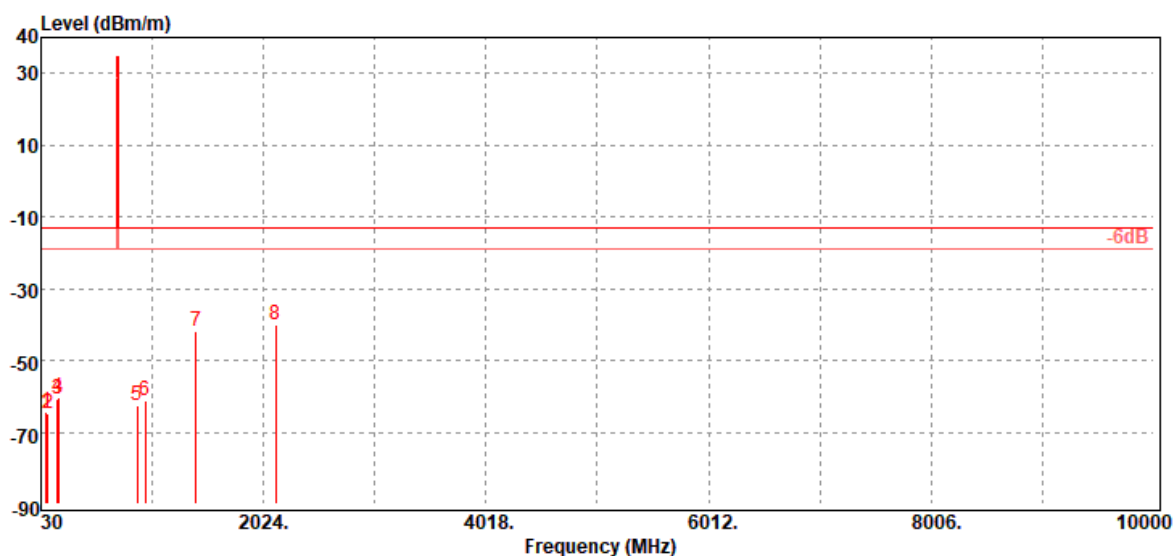
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Hor.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 80.44        | -64.50          | -55.31                    | -8.46                      | -0.73               | -13.00       | -51.50       | H                                |
| 91.11        | -64.78          | -57.09                    | -6.91                      | -0.78               | -13.00       | -51.78       | H                                |
| 178.41       | -60.80          | -55.14                    | -4.56                      | -1.10               | -13.00       | -47.80       | H                                |
| 187.14       | -60.44          | -55.32                    | -3.99                      | -1.13               | -13.00       | -47.44       | H                                |
| 890.39       | -62.59          | -58.85                    | -1.21                      | -2.53               | -13.00       | -49.59       | H                                |
| 966.05       | -61.01          | -57.08                    | -1.30                      | -2.63               | -13.00       | -48.01       | H                                |
| 1422.00      | -41.67          | -46.54                    | 8.13                       | -3.26               | -13.00       | -28.67       | H                                |
| 2133.00      | -40.15          | -45.55                    | 9.54                       | -4.14               | -13.00       | -27.15       | H                                |

**LTE Band 12 / BW: 20MHz / QPSK / RB =1, RB Offset = 0****Operation Mode:** Tx / Low CH**Test Date:**

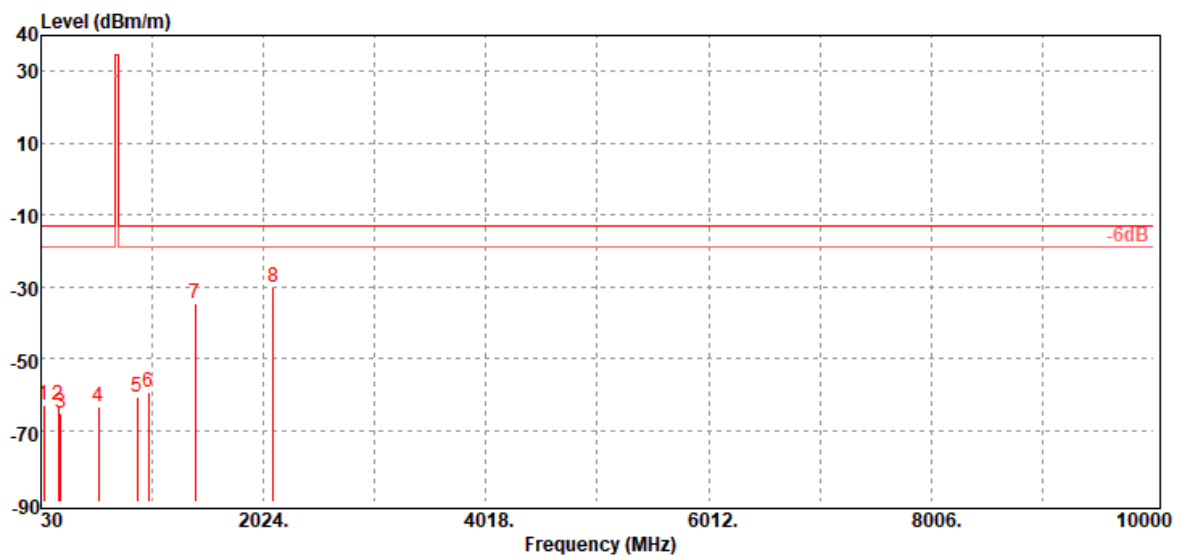
December 18, 2019

**Temperature:** 18.6°C**Tested by:**

Jerry Chang

**Humidity:** 59% RH**Polarity:**

Ver.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 56.19        | -63.03          | -51.92                    | -10.50                     | -0.61               | -13.00       | -50.03       | V                                |
| 185.20       | -63.19          | -57.99                    | -4.08                      | -1.12               | -13.00       | -50.19       | V                                |
| 207.51       | -65.21          | -61.58                    | -2.45                      | -1.18               | -13.00       | -52.21       | V                                |
| 547.01       | -63.41          | -60.27                    | -1.20                      | -1.94               | -13.00       | -50.41       | V                                |
| 890.39       | -60.76          | -57.02                    | -1.21                      | -2.53               | -13.00       | -47.76       | V                                |
| 990.30       | -59.25          | -55.19                    | -1.40                      | -2.66               | -13.00       | -46.25       | V                                |
| 1408.00      | -34.70          | -39.5                     | 8.05                       | -3.25               | -13.00       | -21.70       | V                                |
| 2112.00      | -30.20          | -35.79                    | 9.70                       | -4.11               | -13.00       | -17.20       | V                                |

Operation Mode: Tx / Low CH

Test Date:

December 18, 2019

Temperature: 18.6°C

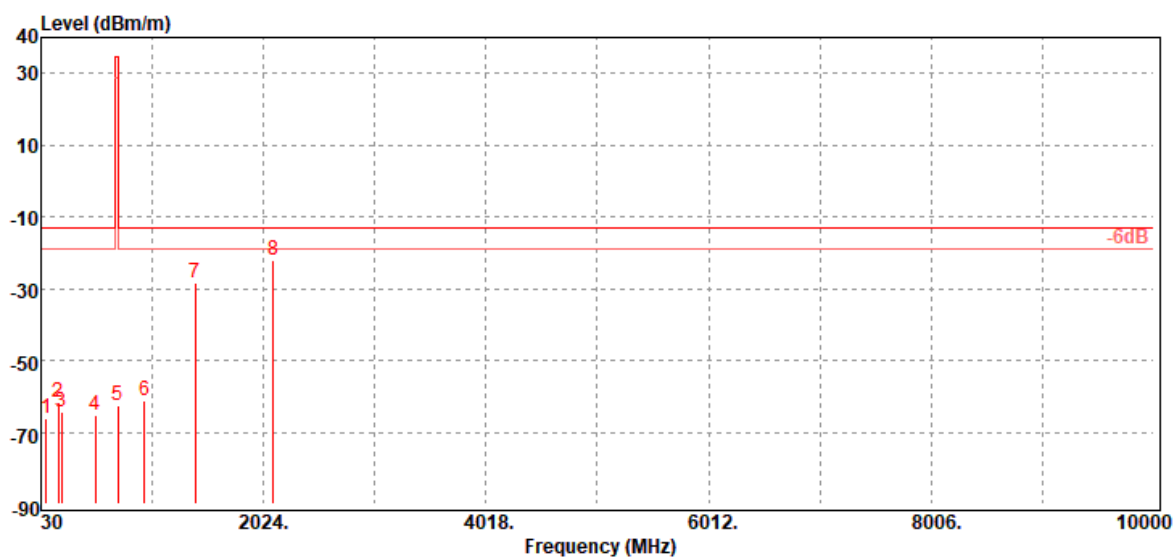
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Hor.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 75.59        | -65.97          | -56.28                    | -8.98                      | -0.71               | -13.00       | -52.97       | H                                |
| 185.20       | -61.88          | -56.68                    | -4.08                      | -1.12               | -13.00       | -48.88       | H                                |
| 216.24       | -64.56          | -61.27                    | -2.08                      | -1.21               | -13.00       | -51.56       | H                                |
| 517.91       | -65.48          | -62.14                    | -1.44                      | -1.90               | -13.00       | -52.48       | H                                |
| 716.76       | -62.65          | -59                       | -1.40                      | -2.25               | -13.00       | -49.65       | H                                |
| 956.35       | -61.35          | -57.5                     | -1.23                      | -2.62               | -13.00       | -48.35       | H                                |
| 1408.00      | -28.58          | -33.38                    | 8.05                       | -3.25               | -13.00       | -15.58       | H                                |
| 2112.00      | -21.88          | -27.47                    | 9.70                       | -4.11               | -13.00       | -8.88        | H                                |

Operation Mode: Tx / Mid CH

Test Date:

December 18, 2019

Temperature: 18.6°C

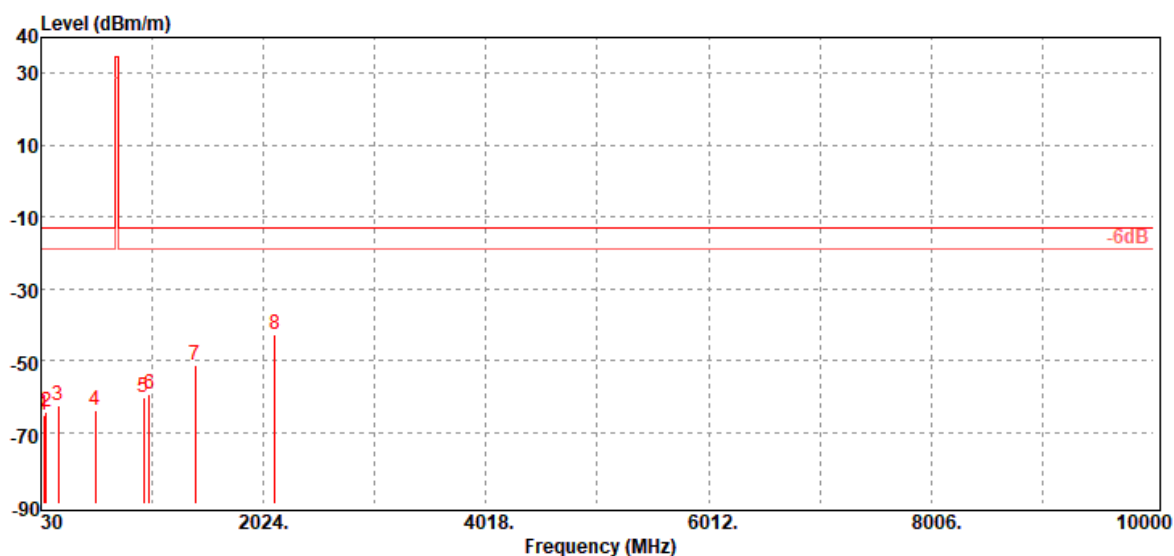
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Ver.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 57.16        | -65.08          | -54                       | -10.47                     | -0.61               | -13.00       | -52.08       | V                                |
| 79.47        | -64.56          | -55.33                    | -8.50                      | -0.73               | -13.00       | -51.56       | V                                |
| 185.20       | -62.65          | -57.45                    | -4.08                      | -1.12               | -13.00       | -49.65       | V                                |
| 519.85       | -63.95          | -60.64                    | -1.40                      | -1.91               | -13.00       | -50.95       | V                                |
| 951.50       | -60.09          | -56.27                    | -1.20                      | -2.62               | -13.00       | -47.09       | V                                |
| 997.09       | -59.56          | -55.48                    | -1.40                      | -2.68               | -13.00       | -46.56       | V                                |
| 1415.00      | -51.28          | -56.12                    | 8.09                       | -3.25               | -13.00       | -38.28       | V                                |
| 2122.50      | -42.65          | -48.15                    | 9.62                       | -4.12               | -13.00       | -29.65       | V                                |

**Operation Mode:** Tx / Mid CH

**Test Date:**

December 18, 2019

**Temperature:** 18.6°C

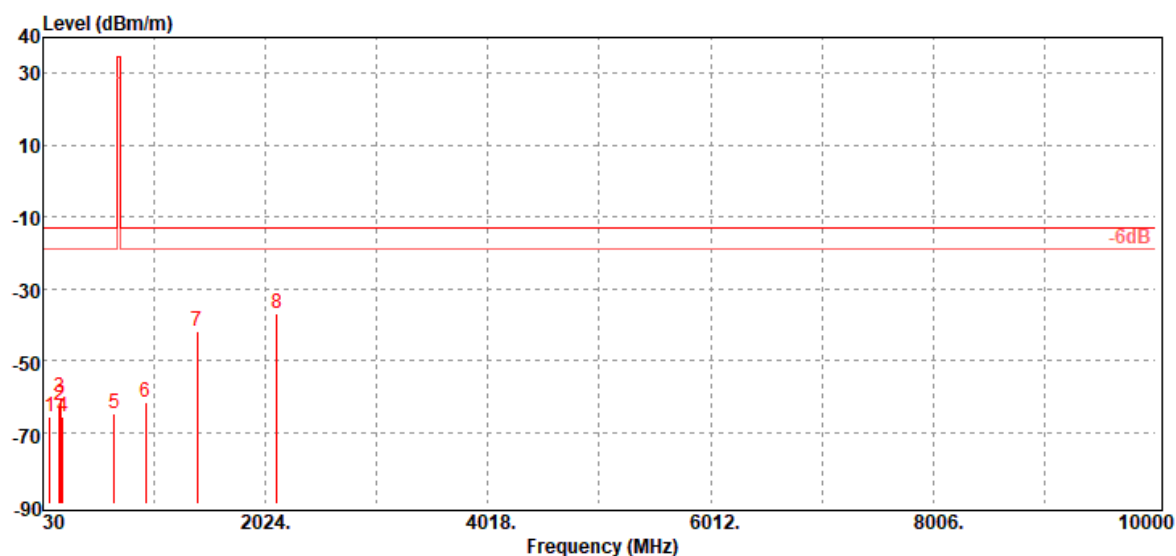
**Tested by:**

Jerry Chang

**Humidity:** 59% RH

**Polarity:**

Hor.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 91.11        | -65.71          | -58.02                    | -6.91                      | -0.78               | -13.00       | -52.71       | H                                |
| 177.44       | -62.60          | -56.85                    | -4.66                      | -1.09               | -13.00       | -49.60       | H                                |
| 185.20       | -60.09          | -54.89                    | -4.08                      | -1.12               | -13.00       | -47.09       | H                                |
| 206.54       | -65.66          | -61.9                     | -2.58                      | -1.18               | -13.00       | -52.66       | H                                |
| 670.20       | -64.95          | -61.37                    | -1.40                      | -2.18               | -13.00       | -51.95       | H                                |
| 946.65       | -61.66          | -57.85                    | -1.20                      | -2.61               | -13.00       | -48.66       | H                                |
| 1415.00      | -42.09          | -46.93                    | 8.09                       | -3.25               | -13.00       | -29.09       | H                                |
| 2122.50      | -36.75          | -42.25                    | 9.62                       | -4.12               | -13.00       | -23.75       | H                                |

Operation Mode: Tx / High CH

Test Date:

December 18, 2019

Temperature: 18.6°C

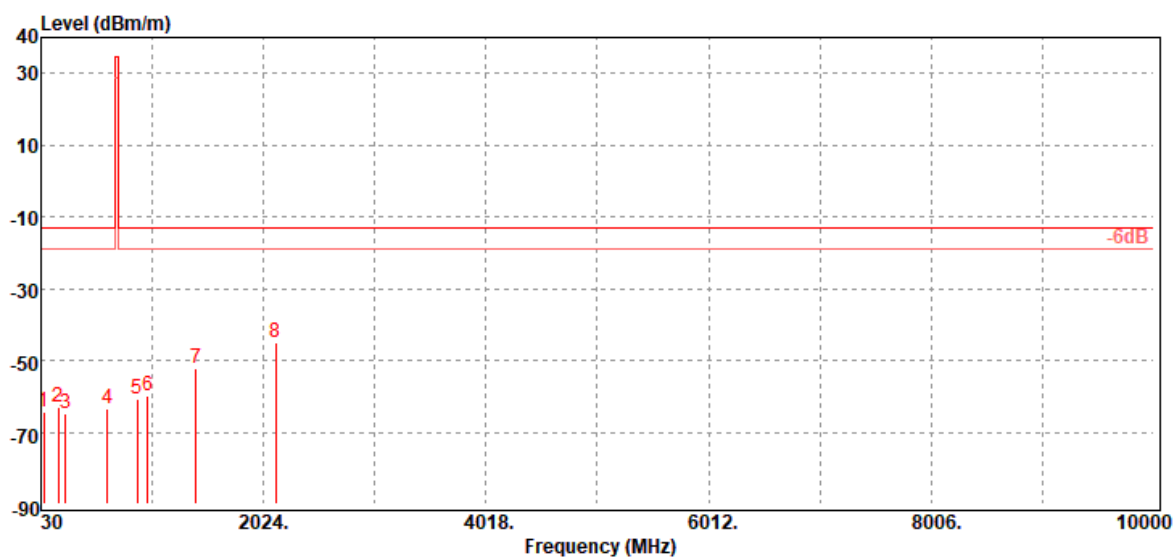
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Ver.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 56.19        | -64.15          | -53.04                    | -10.50                     | -0.61               | -13.00       | -51.15       | V                                |
| 188.11       | -62.91          | -57.88                    | -3.90                      | -1.13               | -13.00       | -49.91       | V                                |
| 248.25       | -64.97          | -61.84                    | -1.83                      | -1.30               | -13.00       | -51.97       | V                                |
| 621.70       | -63.68          | -60.18                    | -1.40                      | -2.10               | -13.00       | -50.68       | V                                |
| 890.39       | -60.84          | -57.1                     | -1.21                      | -2.53               | -13.00       | -47.84       | V                                |
| 988.36       | -59.84          | -55.78                    | -1.40                      | -2.66               | -13.00       | -46.84       | V                                |
| 1422.00      | -52.31          | -57.18                    | 8.13                       | -3.26               | -13.00       | -39.31       | V                                |
| 2133.00      | -44.82          | -50.22                    | 9.54                       | -4.14               | -13.00       | -31.82       | V                                |

Operation Mode: Tx / High CH

Test Date:

December 18, 2019

Temperature: 18.6°C

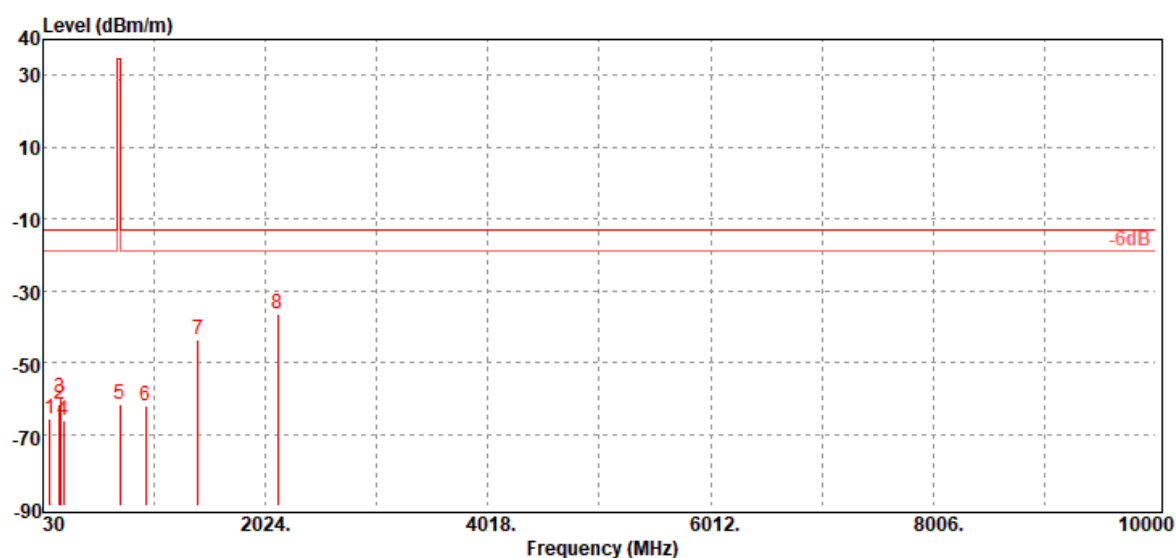
Tested by:

Jerry Chang

Humidity: 59% RH

Polarity:

Hor.



| Freq.<br>MHz | ERP/EIRP<br>dBm | SG<br>Output Level<br>dBm | Antenna<br>Gain<br>dBd/dBi | Cable<br>Loss<br>dB | Limit<br>dBm | Margin<br>dB | Antenna<br>Polarization<br>(V/H) |
|--------------|-----------------|---------------------------|----------------------------|---------------------|--------------|--------------|----------------------------------|
| 91.11        | -65.73          | -58.04                    | -6.91                      | -0.78               | -13.00       | -52.73       | H                                |
| 175.50       | -61.70          | -55.76                    | -4.85                      | -1.09               | -13.00       | -48.70       | H                                |
| 188.11       | -59.69          | -54.66                    | -3.90                      | -1.13               | -13.00       | -46.69       | H                                |
| 216.24       | -65.98          | -62.69                    | -2.08                      | -1.21               | -13.00       | -52.98       | H                                |
| 721.61       | -61.76          | -58.1                     | -1.40                      | -2.26               | -13.00       | -48.76       | H                                |
| 949.56       | -61.92          | -58.11                    | -1.20                      | -2.61               | -13.00       | -48.92       | H                                |
| 1422.00      | -43.63          | -48.5                     | 8.13                       | -3.26               | -13.00       | -30.63       | H                                |
| 2133.00      | -36.39          | -41.79                    | 9.54                       | -4.14               | -13.00       | -23.39       | H                                |

- End of Test Report -