



TESTING LABORATORY  
CERTIFICATE #4820.01



# FCC PART 22H, PART 24E,PART 27 MEASUREMENT AND TEST REPORT

For

**Shenzhen Inrico Electronics Co.,Ltd**

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**FCC ID:2AIV6-S200**

|                                                                                                                                                                                                                                                                               |                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>Report Type:</b><br>Original Report                                                                                                                                                                                                                                        | <b>Product Type:</b><br>Intelligent Two Way Radio                                                                   |
| <b>Report Number:</b> RDG200511002-00A                                                                                                                                                                                                                                        |                                                                                                                     |
| <b>Report Date:</b> 2020-06-09                                                                                                                                                                                                                                                |                                                                                                                     |
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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|                             |                |                                            |
|-----------------------------|----------------|--------------------------------------------|
| <b>EUT Name:</b>            |                | Intelligent Two Way Radio                  |
| <b>EUT Model:</b>           |                | S200                                       |
| <b>Rated Input Voltage:</b> |                | DC 3.8V from battery or DC 5V from adapter |
| <b>Adapter Information:</b> | <b>Model:</b>  | HJ-0502000W2-US                            |
|                             | <b>Input:</b>  | 100-240V~50/60Hz 0.3A                      |
|                             | <b>Output:</b> | DC 5V 2000mA                               |
| <b>Serial Number:</b>       |                | RDG200511002-RF-S1                         |
| <b>EUT Received Date:</b>   |                | 2020.05.14                                 |
| <b>EUT Received Status:</b> |                | Good                                       |

### Objective

This report is prepared on behalf of ***Shenzhen Inrico Electronics Co.,Ltd*** in accordance with: Part 2-Subpart J, Part 22-Subpart H, Part 24-Subpart E, Part 27 of the Federal Communication Commissions rules.

### Related Submittal(s)/Grant(s)

No related submittal(s)/grant(s).

### Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services  
Part 24 Subpart E - Personal Communication Services  
Part 27 - Miscellaneous wireless communications services

TIA-603-E-2016.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp.(Dongguan).

## Measurement Uncertainty

| Parameter                     | Measurement Uncertainty                      |
|-------------------------------|----------------------------------------------|
| Occupied Channel Bandwidth    | $\pm 5\%$                                    |
| RF output power, conducted    | $\pm 0.61\text{dB}$                          |
| Unwanted Emissions, radiated  | 30MHz ~ 1GHz: 5.85 dB<br>1G~26.5GHz: 5.23 dB |
| Unwanted Emissions, conducted | $\pm 1.5\text{ dB}$                          |
| Temperature                   | $\pm 1^\circ\text{C}$                        |
| Humidity                      | $\pm 5\%$                                    |
| DC and low frequency voltages | $\pm 0.4\%$                                  |
| Duty Cycle                    | 1%                                           |

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

## Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier : CN0022.

## Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “ $\Delta$ ”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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## SYSTEM TEST CONFIGURATION

### Justification

The EUT was configured for testing according to TIA -603-E-2010.

The test items were performed with the EUT operating at testing mode. The device operates on GSM Band 850/1900MHz, WCDMA Band 2/5, and LTE band 2/4/5/12/13/17, test was performed with channels as below table:

| Frequency Bands   | Bandwidth (MHz) | Test Frequency(MHz) |        |        |
|-------------------|-----------------|---------------------|--------|--------|
|                   |                 | Low                 | Middle | High   |
| GSM/GPRS/EDGE850  | 0.25            | 824.2               | 836.6  | 848.8  |
| GSM/GPRS/EDGE1900 | 0.25            | 1850.2              | 1880   | 1909.8 |
| WCDMA Band 2      | 4.2             | 1852.4              | 1880   | 1907.6 |
| WCDMA Band 5      | 4.2             | 826.4               | 836.6  | 846.6  |
| LTE Band 2        | 1.4             | 1850.7              | 1880   | 1909.3 |
|                   | 3               | 1851.5              | 1880   | 1908.5 |
|                   | 5               | 1852.5              | 1880   | 1907.5 |
|                   | 10              | 1855                | 1880   | 1905   |
|                   | 15              | 1857.5              | 1880   | 1902.5 |
|                   | 20              | 1860                | 1880   | 1900   |
| LTE Band 4        | 1.4             | 1710.7              | 1732.5 | 1754.3 |
|                   | 3               | 1711.5              | 1732.5 | 1753.5 |
|                   | 5               | 1712.5              | 1732.5 | 1752.5 |
|                   | 10              | 1715                | 1732.5 | 1750   |
|                   | 15              | 1717.5              | 1732.5 | 1747.5 |
|                   | 20              | 1720                | 1732.5 | 1745   |
| LTE Band 5        | 1.4             | 824.7               | 836.5  | 848.3  |
|                   | 3               | 825.5               | 836.5  | 847.5  |
|                   | 5               | 826.5               | 836.5  | 846.5  |
|                   | 10              | 829                 | 836.5  | 844    |
| LTE Band 12       | 1.4             | 699.7               | 707.5  | 715.3  |
|                   | 3               | 700.5               | 707.5  | 714.5  |
|                   | 5               | 701.5               | 707.5  | 713.5  |
|                   | 10              | 704                 | 707.5  | 711    |
| LTE Band 13       | 5               | 779.5               | 782    | 784.5  |
|                   | 10              | /                   | 782    | /      |
| LTE Band 17       | 5               | 706.5               | 710    | 713.5  |
|                   | 10              | 709                 | 710    | 711    |

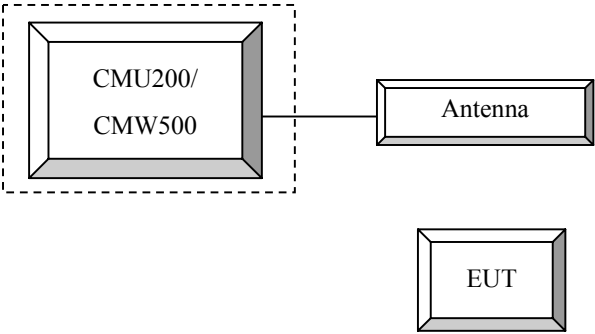
Equipment Modifications

No modification was made to the EUT.

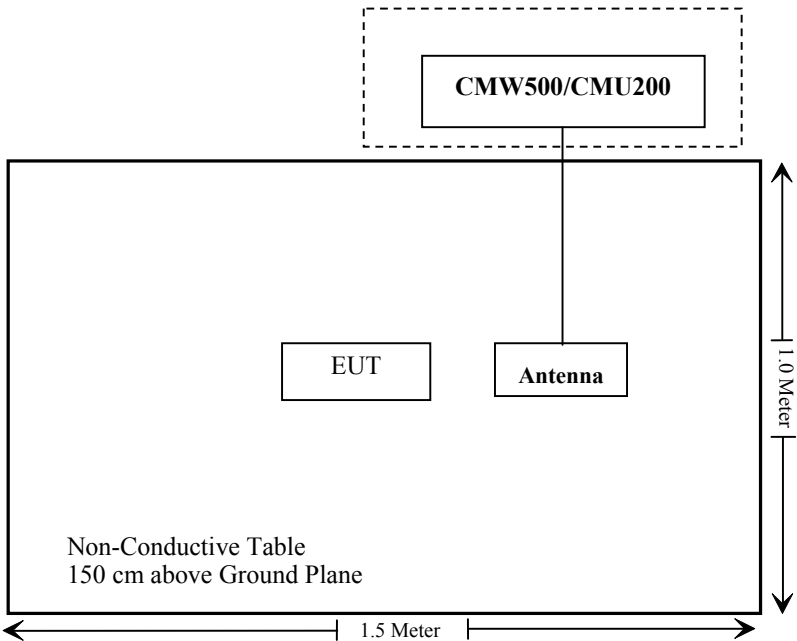
Support Equipment List and Details

| Manufacturer | Description                          | Model   | Serial Number |
|--------------|--------------------------------------|---------|---------------|
| R&S          | Universal Radio Communication Tester | CMU200  | 106 891       |
| R&S          | Wideband Radio Communication Tester  | CMW500  | 147473        |
| Unknown      | ANTENNA                              | Unknown | /             |

Configuration of Test Setup



Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

| <b>FCC Rules</b>                                      | <b>Description of Test</b>                                             | <b>Result</b>  |
|-------------------------------------------------------|------------------------------------------------------------------------|----------------|
| FCC§1.1310, §2.1093                                   | RF Exposure                                                            | Compliance     |
| FCC§2.1046;<br>§ 22.913 (a); § 24.232 (c);<br>§27.50  | RF Output Power                                                        | Compliance     |
| FCC§ 2.1047                                           | Modulation Characteristics                                             | Not Applicable |
| FCC§ 2.1049; § 22.905<br>§ 22.917; § 24.238; §27.53   | Occupied Bandwidth                                                     | Compliance     |
| FCC§ 2.1051,<br>§ 22.917 (a); § 24.238 (a);<br>§27.53 | Spurious Emissions at Antenna Terminal                                 | Compliance     |
| FCC§ 2.1053<br>§ 22.917 (a); § 24.238 (a);<br>§27.53  | Field Strength of Spurious Radiation                                   | Compliance     |
| FCC§ 22.917 (a); § 24.238 (a);<br>§27.53              | Out of band emission, Band Edge                                        | Compliance     |
| FCC§ 2.1055<br>§ 22.355; § 24.235; §27.54             | Frequency stability vs. temperature<br>Frequency stability vs. voltage | Compliance     |



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## **FCC §1.1310 , §2.1093 - RF EXPOSURE**

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### **Applicable Standard**

FCC§1.1310 and §2.1093.

### **Test Result**

Compliant, please refer to the SAR report: RDG200511002-20.

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## **FCC §2.1047 - MODULATION CHARACTERISTIC**

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According to FCC § 2.1047(d), Part 22H & 24E, Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

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**FCC § 2.1046, § 22.913 (a) & § 24.232 (c) & § 27.50 - RF OUTPUT POWER**

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**Applicable Standard**

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §24.232 (d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

According to FCC §2.1046 and §27.50 (d), (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50

(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

(c) (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

(d), (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(h),(2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

## Test Procedure

### GSM/GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/1900

Press Connection control to choose the different menus

Press RESET > choose all the reset all settings

Connection Press Signal Off to turn off the signal and change settings

Network Support > GSM + GPRS or GSM + EGSM

Main Service > Packet Data

Service selection > Test Mode A – Auto Slot Config. off

MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850

> 30 dBm for GPRS 1900

> 27 dBm for EGPRS 850

> 26 dBm for EGPRS 1900

BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

BCCH Level > -85 dBm (May need to adjust if link is not stable)

BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off

P0 > 4 dB

Slot Config > Unchanged (if already set under MS signal)

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3

Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS)

Bit Stream > 2E9-1 PSR Bit Stream

AF/Rf Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input

Connection Press Signal on to turn on the signal and change settings

### WCDMA-Release 99

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification. The EUT has a nominal maximum output power of 24dBm (+1.7/-3.7).

|                                   |                            |              |
|-----------------------------------|----------------------------|--------------|
| <b>WCDMA<br/>General Settings</b> | Loopback Mode              | Test Mode 1  |
|                                   | Rel99 RMC                  | 12.2kbps RMC |
|                                   | Power Control<br>Algorithm | Algorithm2   |
|                                   | $\beta_c / \beta_d$        | 8/15         |

**WCDMA HSDPA**

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

|                               | Mode                            | HSDPA        | HSDPA | HSDPA | HSDPA |
|-------------------------------|---------------------------------|--------------|-------|-------|-------|
|                               | Subset                          | 1            | 2     | 3     | 4     |
| WCDMA<br>General<br>Settings  | Loopback Mode                   | Test Mode 1  |       |       |       |
|                               | Rel99 RMC                       | 12.2kbps RMC |       |       |       |
|                               | HSDPA FRC                       | H-Set1       |       |       |       |
|                               | Power Control Algorithm         | Algorithm2   |       |       |       |
|                               | $\beta_c$                       | 2/15         | 12/15 | 15/15 | 15/15 |
|                               | $\beta_d$                       | 15/15        | 15/15 | 8/15  | 4/15  |
|                               | $\beta_d$ (SF)                  | 64           |       |       |       |
|                               | $\beta_c / \beta_d$             | 2/15         | 12/15 | 15/8  | 15/4  |
|                               | $\beta_{hs}$                    | 4/15         | 24/15 | 30/15 | 30/15 |
|                               | MPR(dB)                         | 0            | 0     | 0.5   | 0.5   |
| HSDPA<br>Specific<br>Settings | DACK                            | 8            |       |       |       |
|                               | DNAK                            | 8            |       |       |       |
|                               | DCQI                            | 8            |       |       |       |
|                               | Ack-Nack repetition factor      | 3            |       |       |       |
|                               | CQI Feedback                    | 4ms          |       |       |       |
|                               | CQI Repetition Factor           | 2            |       |       |       |
|                               | $A_{hs} = \beta_{hs} / \beta_c$ | 30/15        |       |       |       |

**WCDMA HSUPA**

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

|                                | Mode                             | HSUPA                                                                                                                                        | HSUPA                                                | HSUPA                                                                                                                                      | HSUPA                                                                                                                                        | HSUPA                                                                                                                                        |
|--------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                                | Subset                           | 1                                                                                                                                            | 2                                                    | 3                                                                                                                                          | 4                                                                                                                                            | 5                                                                                                                                            |
| <b>WCDMA General Settings</b>  | Loopback Mode                    | Test Mode 1                                                                                                                                  |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | Rel99 RMC                        | 12.2kbps RMC                                                                                                                                 |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | HSDPA FRC                        | H-Set1                                                                                                                                       |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | HSUPA Test                       | HSUPA Loopback                                                                                                                               |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | Power Control Algorithm          | Algorithm2                                                                                                                                   |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | $\beta_c$                        | 11/15                                                                                                                                        | 6/15                                                 | 15/15                                                                                                                                      | 2/15                                                                                                                                         | 15/15                                                                                                                                        |
|                                | $\beta_d$                        | 15/15                                                                                                                                        | 15/15                                                | 9/15                                                                                                                                       | 15/15                                                                                                                                        | 0                                                                                                                                            |
|                                | $\beta_{ec}$                     | 209/225                                                                                                                                      | 12/15                                                | 30/15                                                                                                                                      | 2/15                                                                                                                                         | 5/15                                                                                                                                         |
|                                | $\beta_c/\beta_d$                | 11/15                                                                                                                                        | 6/15                                                 | 15/9                                                                                                                                       | 2/15                                                                                                                                         | -                                                                                                                                            |
|                                | $\beta_{hs}$                     | 22/15                                                                                                                                        | 12/15                                                | 30/15                                                                                                                                      | 4/15                                                                                                                                         | 5/15                                                                                                                                         |
|                                | CM(dB)                           | 1.0                                                                                                                                          | 3.0                                                  | 2.0                                                                                                                                        | 3.0                                                                                                                                          | 1.0                                                                                                                                          |
|                                | MPR(dB)                          | 0                                                                                                                                            | 2                                                    | 1                                                                                                                                          | 2                                                                                                                                            | 0                                                                                                                                            |
| <b>HSDPA Specific Settings</b> | DACK                             | 8                                                                                                                                            |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | DNAK                             | 8                                                                                                                                            |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | DCQI                             | 8                                                                                                                                            |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | Ack-Nack repetition factor       | 3                                                                                                                                            |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | CQI Feedback                     | 4ms                                                                                                                                          |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | CQI Repetition Factor            | 2                                                                                                                                            |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
|                                | $A_{hs}=\beta_{hs}/\beta_c$      | 30/15                                                                                                                                        |                                                      |                                                                                                                                            |                                                                                                                                              |                                                                                                                                              |
| <b>HSUPA Specific Settings</b> | DE-DPCCH                         | 6                                                                                                                                            | 8                                                    | 8                                                                                                                                          | 5                                                                                                                                            | 7                                                                                                                                            |
|                                | DHARQ                            | 0                                                                                                                                            | 0                                                    | 0                                                                                                                                          | 0                                                                                                                                            | 0                                                                                                                                            |
|                                | AG Index                         | 20                                                                                                                                           | 12                                                   | 15                                                                                                                                         | 17                                                                                                                                           | 21                                                                                                                                           |
|                                | ETFCI                            | 75                                                                                                                                           | 67                                                   | 92                                                                                                                                         | 71                                                                                                                                           | 81                                                                                                                                           |
|                                | Associated Max UL Data Rate kbps | 242.1                                                                                                                                        | 174.9                                                | 482.8                                                                                                                                      | 205.8                                                                                                                                        | 308.9                                                                                                                                        |
|                                | Reference E_FCI                  | E-TFCI 11 E<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO23<br>E-TFCI 75<br>E-TFCI PO26<br>E-TFCI 81<br>E-TFCI PO 27 | E-TFCI 11<br>E-TFCI PO4<br>E-TFCI 92<br>E-TFCI PO 18 | E-TFCI 11<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO23<br>E-TFCI 75<br>E-TFCI PO26<br>E-TFCI 81<br>E-TFCI PO 27 | E-TFCI 11 E<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO23<br>E-TFCI 75<br>E-TFCI PO26<br>E-TFCI 81<br>E-TFCI PO 27 | E-TFCI 11 E<br>E-TFCI PO 4<br>E-TFCI 67<br>E-TFCI PO 18<br>E-TFCI 71<br>E-TFCI PO23<br>E-TFCI 75<br>E-TFCI PO26<br>E-TFCI 81<br>E-TFCI PO 27 |

**HSPA+**

The following tests were conducted according to the test requirements in Table C.11.1.4 of 3GPP TS 34.121-1

| Sub-test | $\beta_c$<br>(Note 3) | $\beta_d$ | $\beta_{HS}$<br>(Note 1) | $\beta_{ec}$ | $\beta_{ed}$<br>(2xSF2)<br>(Note 4)            | $\beta_{ed}$<br>(2xSF4)<br>(Note 4)            | CM<br>(dB)<br>(Note 2) | MPR<br>(dB)<br>(Note 2) | AG<br>Index<br>(Note 4) | E-TFCI<br>(Note 5) | E-TFCI<br>(boost) |
|----------|-----------------------|-----------|--------------------------|--------------|------------------------------------------------|------------------------------------------------|------------------------|-------------------------|-------------------------|--------------------|-------------------|
| 1        | 1                     | 0         | 30/15                    | 30/15        | $\beta_{ed1}$ : 30/15<br>$\beta_{ed2}$ : 30/15 | $\beta_{ed3}$ : 24/15<br>$\beta_{ed4}$ : 24/15 | 3.5                    | 2.5                     | 14                      | 105                | 105               |

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ .

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the  $\beta_c$  is set to 1 and  $\beta_d = 0$  by default.

Note 4:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

**DC-HSDPA**

The following tests were conducted according to the test requirements in Table C.8.1.12 of 3GPP TS 34.121-1

**Table C.8.1.12: Fixed Reference Channel H-Set 12**

| Parameter                                                                                                                                              | Unit      | Value |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|
| Nominal Avg. Inf. Bit Rate                                                                                                                             | kbps      | 60    |
| Inter-TTI Distance                                                                                                                                     | TTI's     | 1     |
| Number of HARQ Processes                                                                                                                               | Processes | 6     |
| Information Bit Payload ( $N_{INF}$ )                                                                                                                  | Bits      | 120   |
| Number Code Blocks                                                                                                                                     | Blocks    | 1     |
| Binary Channel Bits Per TTI                                                                                                                            | Bits      | 960   |
| Total Available SML's in UE                                                                                                                            | SML's     | 19200 |
| Number of SML's per HARQ Proc.                                                                                                                         | SML's     | 3200  |
| Coding Rate                                                                                                                                            |           | 0.15  |
| Number of Physical Channel Codes                                                                                                                       | Codes     | 1     |
| Modulation                                                                                                                                             |           | QPSK  |
| Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.               |           |       |
| Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used. |           |       |

**LTE (FDD):**

The following tests were conducted according to the test requirements in 3GPP TS36.101

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3**

| Modulation | Channel bandwidth / Transmission bandwidth (RB) |         |       |        |        |        | MPR (dB) |
|------------|-------------------------------------------------|---------|-------|--------|--------|--------|----------|
|            | 1.4 MHz                                         | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |          |
| QPSK       | > 5                                             | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 1      |
| 16 QAM     | ≤ 5                                             | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18   | ≤ 1      |
| 64 QAM     | > 5                                             | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 2      |

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS\_01".

**Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)**

| Network Signalling value | Requirements (sub-clause) | E-UTRA Band              | Channel bandwidth (MHz) | Resources Blocks ( $N_{RB}$ ) | A-MPR (dB)    |
|--------------------------|---------------------------|--------------------------|-------------------------|-------------------------------|---------------|
| NS_01                    | 6.6.2.1.1                 | Table 5.5-1              | 1.4, 3, 5, 10, 15, 20   | Table 5.6-1                   | NA            |
| NS_03                    | 6.6.2.2.1                 | 2, 4, 10, 23, 25, 35, 36 | 3                       | >5                            | ≤ 1           |
|                          |                           |                          | 5                       | >6                            | ≤ 1           |
|                          |                           |                          | 10                      | >6                            | ≤ 1           |
|                          |                           |                          | 15                      | >8                            | ≤ 1           |
|                          |                           |                          | 20                      | >10                           | ≤ 1           |
| NS_04                    | 6.6.2.2.2                 | 41                       | 5                       | >6                            | ≤ 1           |
|                          |                           |                          | 10, 15, 20              | See Table 6.2.4-4             |               |
| NS_05                    | 6.6.3.3.1                 | 1                        | 10, 15, 20              | ≥ 50                          | ≤ 1           |
| NS_06                    | 6.6.2.2.3                 | 12, 13, 14, 17           | 1.4, 3, 5, 10           | Table 5.6-1                   | n/a           |
| NS_07                    | 6.6.2.2.3                 | 13                       | 10                      | Table 6.2.4-2                 | Table 6.2.4-2 |
|                          | 6.6.3.3.2                 |                          |                         |                               |               |
| NS_08                    | 6.6.3.3.3                 | 19                       | 10, 15                  | > 44                          | ≤ 3           |
| NS_09                    | 6.6.3.3.4                 | 21                       | 10, 15                  | > 40                          | ≤ 1           |
|                          |                           |                          |                         | > 55                          | ≤ 2           |
| NS_10                    |                           | 20                       | 15, 20                  | Table 6.2.4-3                 | Table 6.2.4-3 |
| NS_11                    | 6.6.2.2.1                 | 23 <sup>1</sup>          | 1.4, 3, 5, 10           | Table 6.2.4-5                 | Table 6.2.4-5 |
| ..                       |                           |                          |                         |                               |               |
| NS_32                    | -                         | -                        | -                       | -                             | -             |

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

*Radiated method:*

TIA-603-E section 2.2.17



**Test Equipment List and Details**

| Manufacturer   | Description                          | Model       | Serial Number | Calibration Date | Calibration Due Date |
|----------------|--------------------------------------|-------------|---------------|------------------|----------------------|
| R&S            | EMI Test Receiver                    | ESR3        | 102453        | 2019-06-26       | 2020-06-26           |
| Sunol Sciences | Antenna                              | JB3         | A060611-1     | 2017-11-10       | 2020-11-10           |
| EMCO           | Adjustable Dipole Antenna            | 3121C       | 9109-753      | N/A              | N/A                  |
| Unknown        | Coaxial Cable                        | C-NJNJ-50   | C-0400-01     | 2019-09-05       | 2020-09-05           |
| Unknown        | Coaxial Cable                        | C-NJNJ-50   | C-0075-01     | 2019-09-05       | 2020-09-05           |
| Unknown        | Coaxial Cable                        | C-NJNJ-50   | C-1400-01     | 2020-05-06       | 2021-05-06           |
| Agilent        | Spectrum Analyzer                    | E4440A      | SG43360054    | 2020-05-09       | 2021-05-09           |
| TDK RF         | Horn Antenna                         | HRN-0118    | 130 084       | 2018-10-12       | 2021-10-12           |
| ETS-Lindgren   | Horn Antenna                         | 3115        | 000 527 35    | 2018-10-12       | 2021-10-12           |
| Unknown        | Coaxial Cable                        | C-SJSJ-50   | C-0800-01     | 2019-09-05       | 2020-09-05           |
| Unknown        | Coaxial Cable                        | C-NJNJ-50   | C-0200-02     | 2019-09-05       | 2020-09-05           |
| R&S            | Universal Radio Communication Tester | CMU200      | 106 891       | 2019-12-14       | 2020-12-14           |
| R&S            | Wideband Radio Communication Tester  | CMW500      | 147473        | 2019-08-03       | 2020-08-03           |
| Agilent        | Signal Generator                     | E8247C      | MY43321350    | 2019-12-10       | 2020-12-10           |
| Unknown        | Coaxial Cable                        | C-SJ00-0010 | C0010/01      | Each time        | N/A                  |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Data****Environmental Conditions**

| Test Items:        | Radiation Below 1GHz | Radiation Above 1GHz | Conducted Output Power |
|--------------------|----------------------|----------------------|------------------------|
| Temperature:       | 23.8°C               | 25°C                 | 27.7 °C                |
| Relative Humidity: | 52%                  | 47%                  | 53 %                   |
| ATM Pressure:      | 100.7 kPa            | 100.7 kPa            | 100.1 kPa              |
| Tester:            | Joker Chen           | Felix Wang           | Chris Mo               |
| Test Date:         | 2020-05-15           | 2020-05-15           | 2020-05-18             |

**Conducted Output Power****Cellular Band & PCS Band**

| Band     | Channel No. | Conducted Peak Output Power (dBm) |                |                 |                 |                 | Conducted Peak Output Power (dBm) |                     |                     |                     |
|----------|-------------|-----------------------------------|----------------|-----------------|-----------------|-----------------|-----------------------------------|---------------------|---------------------|---------------------|
|          |             | GSM                               | GPRS 1 TX Slot | GPRS 2 TX Slots | GPRS 3 TX Slots | GPRS 4 TX Slots | EDGE 1 uplink slot                | EDGE 2 uplink slots | EDGE 3 uplink slots | EDGE 4 uplink slots |
| Cellular | 128         | 31.30                             | 31.26          | 30.66           | 29.04           | 28.05           | 26.02                             | 25.09               | 23.29               | 22.30               |
|          | 190         | 31.30                             | 31.25          | 30.69           | 29.12           | 28.10           | 25.98                             | 25.04               | 23.22               | 22.24               |
|          | 251         | 31.30                             | 31.21          | 30.74           | 29.14           | 28.24           | 26.03                             | 25.08               | 23.21               | 22.27               |
| PCS      | 512         | 28.60                             | 28.51          | 27.84           | 26.19           | 25.18           | 25.14                             | 24.34               | 22.48               | 21.43               |
|          | 661         | 28.50                             | 28.47          | 27.82           | 26.24           | 25.27           | 25.44                             | 24.63               | 22.98               | 21.81               |
|          | 810         | 28.50                             | 28.47          | 27.85           | 26.33           | 25.38           | 25.19                             | 24.41               | 22.87               | 21.72               |

**WCDMA Band II**

| Mode          | 3GPP Sub Test | Low Channel      |          | Middle Channel   |          | High Channel     |          |
|---------------|---------------|------------------|----------|------------------|----------|------------------|----------|
|               |               | Ave. Power (dBm) | PAR (dB) | Ave. Power (dBm) | PAR (dB) | Ave. Power (dBm) | PAR (dB) |
| Rel 99        | 1             | 23.38            | 2.47     | 22.76            | 2.85     | 23.86            | 2.18     |
| HSDPA         | 1             | 22.31            | 3.04     | 21.73            | 4.42     | 22.75            | 3.97     |
|               | 2             | 22.30            | 3.01     | 21.71            | 4.41     | 22.74            | 3.96     |
|               | 3             | 22.28            | 3.02     | 21.69            | 4.46     | 22.73            | 3.95     |
|               | 4             | 22.26            | 3.06     | 21.66            | 4.48     | 22.71            | 3.92     |
| HSUPA         | 1             | 22.41            | 3.94     | 21.75            | 3.33     | 22.72            | 3.46     |
|               | 2             | 22.38            | 3.96     | 21.73            | 3.32     | 22.69            | 3.41     |
|               | 3             | 22.36            | 3.95     | 21.72            | 3.30     | 22.68            | 3.42     |
|               | 4             | 22.35            | 3.94     | 21.70            | 3.31     | 22.65            | 3.48     |
|               | 5             | 22.34            | 3.93     | 21.68            | 3.36     | 22.63            | 3.46     |
| DC-HSDPA      | 1             | 22.31            | 3.85     | 21.63            | 3.35     | 22.58            | 3.47     |
|               | 2             | 22.28            | 3.84     | 21.62            | 3.28     | 22.54            | 3.49     |
|               | 3             | 22.25            | 3.82     | 21.60            | 3.26     | 22.53            | 3.45     |
|               | 4             | 22.21            | 3.81     | 21.57            | 3.27     | 22.50            | 3.42     |
| HSPA+ (16QAM) | 1             | 22.20            | 3.80     | 21.52            | 3.25     | 22.46            | 3.37     |

**WCDMA Band V**

| Mode          | 3GPP Sub Test | Low Channel      |          | Middle Channel   |          | High Channel     |          |
|---------------|---------------|------------------|----------|------------------|----------|------------------|----------|
|               |               | Ave. Power (dBm) | PAR (dB) | Ave. Power (dBm) | PAR (dB) | Ave. Power (dBm) | PAR (dB) |
| Rel 99        | 1             | 21.92            | 3.14     | 21.38            | 2.95     | 22.21            | 3.21     |
| HSDPA         | 1             | 20.74            | 3.56     | 20.37            | 3.85     | 21.09            | 3.30     |
|               | 2             | 20.72            | 3.58     | 20.36            | 3.84     | 21.08            | 3.32     |
|               | 3             | 20.71            | 3.57     | 20.34            | 3.82     | 21.06            | 3.35     |
|               | 4             | 20.70            | 3.54     | 20.33            | 3.81     | 21.05            | 3.36     |
| HSUPA         | 1             | 20.82            | 3.85     | 20.41            | 4.01     | 21.07            | 3.43     |
|               | 2             | 20.81            | 3.84     | 20.38            | 4.03     | 21.05            | 3.42     |
|               | 3             | 20.78            | 3.89     | 20.35            | 4.05     | 21.04            | 3.46     |
|               | 4             | 20.77            | 3.87     | 20.32            | 4.02     | 21.06            | 3.41     |
|               | 5             | 20.76            | 3.82     | 20.31            | 4.03     | 21.09            | 3.46     |
| DC-HSDPA      | 1             | 20.65            | 3.81     | 20.28            | 3.98     | 21.07            | 3.42     |
|               | 2             | 20.63            | 3.80     | 20.26            | 3.95     | 21.05            | 3.38     |
|               | 3             | 20.61            | 3.74     | 20.24            | 3.97     | 21.06            | 3.37     |
|               | 4             | 20.60            | 3.81     | 20.23            | 3.96     | 21.03            | 3.39     |
| HSPA+ (16QAM) | 1             | 20.55            | 3.83     | 20.20            | 3.92     | 21.01            | 3.35     |

## LTE Band 2

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 1.4MHz            | QPSK       | RB1#0                      | 21.55             | 22.43                | 22.45              |
|                   |            | RB1#3                      | 21.48             | 22.49                | 22.32              |
|                   |            | RB1#5                      | 21.54             | 22.45                | 22.40              |
|                   |            | RB3#0                      | 21.47             | 22.30                | 22.49              |
|                   |            | RB3#3                      | 21.48             | 22.29                | 22.44              |
|                   |            | RB6#0                      | 20.84             | 21.34                | 21.93              |
|                   | 16QAM      | RB1#0                      | 20.63             | 21.20                | 21.84              |
|                   |            | RB1#3                      | 20.61             | 21.26                | 21.72              |
|                   |            | RB1#5                      | 20.73             | 21.20                | 21.82              |
|                   |            | RB3#0                      | 20.63             | 21.33                | 21.69              |
|                   |            | RB3#3                      | 20.66             | 21.35                | 21.66              |
|                   |            | RB6#0                      | 19.93             | 20.25                | 21.18              |
| 3MHz              | QPSK       | RB1#0                      | 21.41             | 22.40                | 22.62              |
|                   |            | RB1#8                      | 21.30             | 22.45                | 22.43              |
|                   |            | RB1#14                     | 21.26             | 22.41                | 22.33              |
|                   |            | RB6#0                      | 20.71             | 21.34                | 21.97              |
|                   |            | RB6#9                      | 20.75             | 21.35                | 21.89              |
|                   |            | RB15#0                     | 20.81             | 21.33                | 22.01              |
|                   | 16QAM      | RB1#0                      | 20.85             | 21.33                | 21.81              |
|                   |            | RB1#8                      | 20.81             | 21.36                | 21.68              |
|                   |            | RB1#14                     | 20.79             | 21.30                | 21.59              |
|                   |            | RB6#0                      | 19.93             | 20.28                | 21.11              |
|                   |            | RB6#9                      | 19.98             | 20.32                | 21.05              |
|                   |            | RB15#0                     | 20.00             | 20.28                | 21.24              |
| 5MHz              | QPSK       | RB1#0                      | 21.33             | 22.52                | 22.56              |
|                   |            | RB1#13                     | 20.97             | 22.24                | 22.20              |
|                   |            | RB1#24                     | 21.09             | 22.45                | 22.21              |
|                   |            | RB15#0                     | 20.60             | 21.38                | 21.84              |
|                   |            | RB15#10                    | 20.49             | 21.37                | 21.75              |
|                   |            | RB25#0                     | 20.53             | 21.30                | 21.78              |
|                   | 16QAM      | RB1#0                      | 20.45             | 21.53                | 21.83              |
|                   |            | RB1#13                     | 20.08             | 21.49                | 21.50              |
|                   |            | RB1#24                     | 20.33             | 21.57                | 21.58              |
|                   |            | RB15#0                     | 19.75             | 20.35                | 20.99              |
|                   |            | RB15#10                    | 19.64             | 20.31                | 20.93              |
|                   |            | RB25#0                     | 19.74             | 20.32                | 20.99              |

|       |       |         |       |       |       |
|-------|-------|---------|-------|-------|-------|
| 10MHz | QPSK  | RB1#0   | 21.02 | 21.81 | 21.77 |
|       |       | RB1#25  | 20.91 | 22.17 | 22.17 |
|       |       | RB1#49  | 20.65 | 22.20 | 21.89 |
|       |       | RB25#0  | 20.49 | 21.31 | 21.32 |
|       |       | RB25#25 | 20.24 | 21.46 | 21.61 |
|       |       | RB50#0  | 20.37 | 21.32 | 21.50 |
|       | 16QAM | RB1#0   | 20.47 | 21.02 | 20.81 |
|       |       | RB1#25  | 20.41 | 21.40 | 21.29 |
|       |       | RB1#49  | 20.20 | 21.54 | 21.10 |
|       |       | RB25#0  | 19.65 | 20.34 | 20.50 |
|       |       | RB25#25 | 19.41 | 20.37 | 20.82 |
|       |       | RB50#0  | 19.54 | 20.36 | 20.68 |
| 15MHz | QPSK  | RB1#0   | 21.13 | 21.68 | 21.81 |
|       |       | RB1#38  | 20.85 | 22.11 | 21.90 |
|       |       | RB1#74  | 20.80 | 22.23 | 21.99 |
|       |       | RB36#0  | 20.38 | 21.29 | 21.05 |
|       |       | RB36#39 | 20.14 | 21.66 | 21.45 |
|       |       | RB75#0  | 20.23 | 21.47 | 21.25 |
|       | 16QAM | RB1#0   | 20.57 | 20.89 | 21.14 |
|       |       | RB1#38  | 20.34 | 21.39 | 21.24 |
|       |       | RB1#74  | 20.35 | 21.61 | 21.40 |
|       |       | RB36#0  | 19.53 | 20.40 | 20.18 |
|       |       | RB36#39 | 19.28 | 20.48 | 20.59 |
|       |       | RB75#0  | 19.43 | 20.46 | 20.40 |
| 20MHz | QPSK  | RB1#0   | 21.07 | 21.43 | 22.10 |
|       |       | RB1#50  | 20.75 | 22.06 | 21.55 |
|       |       | RB1#99  | 20.95 | 22.01 | 21.89 |
|       |       | RB50#0  | 20.33 | 21.13 | 21.16 |
|       |       | RB50#50 | 20.10 | 21.52 | 21.31 |
|       |       | RB100#0 | 20.23 | 21.34 | 21.21 |
|       | 16QAM | RB1#0   | 20.46 | 20.66 | 21.72 |
|       |       | RB1#50  | 20.16 | 21.33 | 21.20 |
|       |       | RB1#99  | 20.33 | 21.34 | 21.57 |
|       |       | RB50#0  | 19.46 | 20.24 | 20.28 |
|       |       | RB50#50 | 19.21 | 20.41 | 20.42 |
|       |       | RB100#0 | 19.40 | 20.37 | 20.39 |

## LTE Band 4

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 1.4MHz            | QPSK       | RB1#0                      | 22.15             | 22.51                | 23.76              |
|                   |            | RB1#3                      | 22.83             | 22.38                | 23.86              |
|                   |            | RB1#5                      | 22.81             | 22.40                | 23.76              |
|                   |            | RB3#0                      | 22.71             | 22.49                | 23.61              |
|                   |            | RB3#3                      | 22.74             | 22.41                | 23.61              |
|                   |            | RB6#0                      | 21.83             | 21.70                | 22.59              |
|                   | 16QAM      | RB1#0                      | 21.66             | 21.70                | 22.52              |
|                   |            | RB1#3                      | 21.78             | 21.60                | 22.61              |
|                   |            | RB1#5                      | 21.71             | 21.61                | 22.53              |
|                   |            | RB3#0                      | 21.82             | 21.51                | 22.53              |
|                   |            | RB3#3                      | 21.90             | 21.45                | 22.54              |
|                   |            | RB6#0                      | 20.70             | 20.76                | 21.76              |
| 3MHz              | QPSK       | RB1#0                      | 22.93             | 22.57                | 24.14              |
|                   |            | RB1#8                      | 23.07             | 22.31                | 24.14              |
|                   |            | RB1#14                     | 23.11             | 22.38                | 24.07              |
|                   |            | RB6#0                      | 22.08             | 21.81                | 22.96              |
|                   |            | RB6#9                      | 22.16             | 21.67                | 22.95              |
|                   |            | RB15#0                     | 22.12             | 21.74                | 22.95              |
|                   | 16QAM      | RB1#0                      | 22.29             | 21.83                | 22.90              |
|                   |            | RB1#8                      | 22.39             | 21.58                | 22.86              |
|                   |            | RB1#14                     | 22.39             | 21.65                | 22.85              |
|                   |            | RB6#0                      | 20.98             | 20.93                | 21.84              |
|                   |            | RB6#9                      | 21.08             | 20.81                | 21.82              |
|                   |            | RB15#0                     | 21.05             | 20.80                | 21.98              |
| 5MHz              | QPSK       | RB1#0                      | 23.03             | 22.47                | 24.17              |
|                   |            | RB1#13                     | 23.15             | 21.93                | 24.14              |
|                   |            | RB1#24                     | 23.21             | 22.18                | 24.07              |
|                   |            | RB15#0                     | 22.17             | 21.38                | 23.04              |
|                   |            | RB15#10                    | 22.25             | 21.27                | 22.98              |
|                   |            | RB25#0                     | 22.18             | 21.35                | 22.98              |
|                   | 16QAM      | RB1#0                      | 21.78             | 21.88                | 23.03              |
|                   |            | RB1#13                     | 22.02             | 21.35                | 22.99              |
|                   |            | RB1#24                     | 22.10             | 21.62                | 22.93              |
|                   |            | RB15#0                     | 21.10             | 20.50                | 22.03              |
|                   |            | RB15#10                    | 21.16             | 20.39                | 22.00              |
|                   |            | RB25#0                     | 21.13             | 20.51                | 21.98              |

|       |       |         |       |       |       |
|-------|-------|---------|-------|-------|-------|
| 10MHz | QPSK  | RB1#0   | 23.00 | 22.18 | 23.25 |
|       |       | RB1#25  | 23.38 | 21.87 | 23.93 |
|       |       | RB1#49  | 23.15 | 21.72 | 23.98 |
|       |       | RB25#0  | 22.24 | 21.46 | 22.98 |
|       |       | RB25#25 | 22.49 | 21.19 | 22.97 |
|       |       | RB50#0  | 22.39 | 21.32 | 22.99 |
|       | 16QAM | RB1#0   | 22.44 | 21.47 | 22.30 |
|       |       | RB1#25  | 22.65 | 21.19 | 22.91 |
|       |       | RB1#49  | 22.68 | 21.03 | 22.91 |
|       |       | RB25#0  | 21.19 | 20.60 | 22.08 |
|       |       | RB25#25 | 21.41 | 20.36 | 22.04 |
|       |       | RB50#0  | 21.27 | 20.48 | 22.02 |
| 15MHz | QPSK  | RB1#0   | 23.19 | 22.64 | 22.63 |
|       |       | RB1#38  | 23.42 | 21.83 | 23.51 |
|       |       | RB1#74  | 22.62 | 22.06 | 24.09 |
|       |       | RB36#0  | 22.47 | 21.57 | 22.28 |
|       |       | RB36#39 | 22.49 | 21.20 | 23.10 |
|       |       | RB75#0  | 22.65 | 21.36 | 22.76 |
|       | 16QAM | RB1#0   | 22.45 | 21.97 | 21.95 |
|       |       | RB1#38  | 22.78 | 21.14 | 22.87 |
|       |       | RB1#74  | 22.17 | 21.38 | 23.14 |
|       |       | RB36#0  | 21.29 | 20.70 | 21.37 |
|       |       | RB36#39 | 21.64 | 20.37 | 22.01 |
|       |       | RB75#0  | 21.48 | 20.53 | 21.88 |
| 20MHz | QPSK  | RB1#0   | 23.23 | 22.99 | 22.12 |
|       |       | RB1#50  | 23.20 | 21.82 | 22.97 |
|       |       | RB1#99  | 21.89 | 22.31 | 23.95 |
|       |       | RB50#0  | 22.41 | 21.73 | 21.79 |
|       |       | RB50#50 | 21.99 | 21.25 | 23.02 |
|       |       | RB100#0 | 22.48 | 21.51 | 22.41 |
|       | 16QAM | RB1#0   | 22.39 | 22.29 | 21.70 |
|       |       | RB1#50  | 22.68 | 21.11 | 22.56 |
|       |       | RB1#99  | 21.34 | 21.62 | 23.36 |
|       |       | RB50#0  | 21.28 | 20.87 | 20.88 |
|       |       | RB50#50 | 21.14 | 20.40 | 22.00 |
|       |       | RB100#0 | 21.47 | 20.66 | 21.57 |

**LTE Band 5**

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 1.4MHz            | QPSK       | RB1#0                      | 22.90             | 23.01                | 22.70              |
|                   |            | RB1#3                      | 22.82             | 22.71                | 22.78              |
|                   |            | RB1#5                      | 23.01             | 22.77                | 22.56              |
|                   |            | RB3#0                      | 22.91             | 22.93                | 22.67              |
|                   |            | RB3#3                      | 22.94             | 22.75                | 22.66              |
|                   |            | RB6#0                      | 22.05             | 22.02                | 21.73              |
|                   | 16QAM      | RB1#0                      | 22.08             | 22.32                | 21.71              |
|                   |            | RB1#3                      | 22.05             | 22.03                | 21.78              |
|                   |            | RB1#5                      | 22.23             | 22.10                | 21.76              |
|                   |            | RB3#0                      | 22.25             | 22.09                | 21.75              |
|                   |            | RB3#3                      | 22.36             | 21.94                | 21.77              |
| 3MHz              | QPSK       | RB1#0                      | 23.15             | 23.23                | 22.67              |
|                   |            | RB1#8                      | 23.14             | 22.75                | 22.74              |
|                   |            | RB1#14                     | 23.29             | 22.48                | 22.57              |
|                   |            | RB6#0                      | 22.17             | 22.28                | 21.71              |
|                   |            | RB6#9                      | 22.42             | 21.80                | 22.48              |
|                   |            | RB15#0                     | 22.23             | 22.02                | 22.09              |
|                   | 16QAM      | RB1#0                      | 22.66             | 22.42                | 22.07              |
|                   |            | RB1#8                      | 22.75             | 22.05                | 22.07              |
|                   |            | RB1#14                     | 22.87             | 21.80                | 22.08              |
|                   |            | RB6#0                      | 21.37             | 21.25                | 21.06              |
|                   |            | RB6#9                      | 21.57             | 21.00                | 21.07              |
| 5MHz              | QPSK       | RB1#0                      | 22.75             | 23.22                | 23.02              |
|                   |            | RB1#13                     | 22.67             | 22.09                | 22.98              |
|                   |            | RB1#24                     | 23.14             | 22.16                | 22.83              |
|                   |            | RB15#0                     | 21.53             | 21.61                | 22.12              |
|                   |            | RB15#10                    | 21.91             | 21.16                | 22.09              |
|                   |            | RB25#0                     | 21.70             | 21.42                | 22.07              |
|                   | 16QAM      | RB1#0                      | 21.62             | 22.56                | 22.14              |
|                   |            | RB1#13                     | 21.67             | 21.53                | 22.05              |
|                   |            | RB1#24                     | 22.09             | 21.59                | 22.10              |
|                   |            | RB15#0                     | 20.72             | 20.76                | 21.20              |
|                   |            | RB15#10                    | 21.13             | 20.30                | 21.16              |
| 10MHz             | QPSK       | RB25#0                     | 20.92             | 20.59                | 21.20              |
|                   |            | RB1#0                      | 22.72             | 23.11                | 22.16              |
|                   |            | RB1#25                     | 23.13             | 21.89                | 22.80              |
|                   |            | RB1#49                     | 22.87             | 21.77                | 22.40              |
|                   |            | RB25#0                     | 21.94             | 21.92                | 21.39              |
|                   |            | RB25#25                    | 22.29             | 20.81                | 21.90              |
|                   | 16QAM      | RB50#0                     | 22.10             | 21.38                | 21.91              |
|                   |            | RB1#0                      | 22.23             | 22.24                | 21.27              |
|                   |            | RB1#25                     | 22.67             | 21.20                | 21.91              |
|                   |            | RB1#49                     | 22.46             | 20.99                | 21.59              |
|                   |            | RB25#0                     | 21.15             | 21.03                | 20.64              |
|                   |            | RB25#25                    | 21.26             | 19.95                | 21.05              |
|                   |            | RB50#0                     | 21.16             | 20.51                | 21.03              |



## LTE Band 12

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 1.4MHz            | QPSK       | RB1#0                      | 23.49             | 22.94                | 22.87              |
|                   |            | RB1#3                      | 23.15             | 22.77                | 22.62              |
|                   |            | RB1#5                      | 23.24             | 22.78                | 22.63              |
|                   |            | RB3#0                      | 23.21             | 22.91                | 22.81              |
|                   |            | RB3#3                      | 23.18             | 22.82                | 22.69              |
|                   |            | RB6#0                      | 22.29             | 22.00                | 21.97              |
|                   | 16QAM      | RB1#0                      | 22.35             | 22.06                | 21.99              |
|                   |            | RB1#3                      | 22.23             | 21.95                | 21.97              |
|                   |            | RB1#5                      | 22.33             | 21.96                | 21.97              |
|                   |            | RB3#0                      | 22.35             | 22.21                | 21.83              |
|                   |            | RB3#3                      | 22.30             | 22.16                | 21.81              |
| 3MHz              | QPSK       | RB1#0                      | 23.22             | 23.06                | 23.03              |
|                   |            | RB1#8                      | 23.14             | 22.78                | 22.75              |
|                   |            | RB1#14                     | 23.23             | 22.52                | 22.53              |
|                   |            | RB6#0                      | 22.34             | 22.13                | 22.01              |
|                   |            | RB6#9                      | 22.44             | 21.78                | 21.89              |
|                   |            | RB15#0                     | 22.33             | 21.95                | 21.99              |
|                   | 16QAM      | RB1#0                      | 22.68             | 22.34                | 22.04              |
|                   |            | RB1#8                      | 22.69             | 22.06                | 21.88              |
|                   |            | RB1#14                     | 22.79             | 21.80                | 21.74              |
|                   |            | RB6#0                      | 21.51             | 21.31                | 21.00              |
|                   |            | RB6#9                      | 21.64             | 21.00                | 20.91              |
| 5MHz              | QPSK       | RB1#0                      | 22.98             | 23.30                | 22.83              |
|                   |            | RB1#13                     | 22.77             | 22.29                | 22.36              |
|                   |            | RB1#24                     | 23.23             | 22.41                | 22.37              |
|                   |            | RB15#0                     | 21.82             | 21.63                | 21.50              |
|                   |            | RB15#10                    | 22.02             | 21.27                | 21.49              |
|                   |            | RB25#0                     | 21.91             | 21.48                | 21.49              |
|                   | 16QAM      | RB1#0                      | 21.96             | 22.67                | 21.95              |
|                   |            | RB1#13                     | 21.78             | 21.68                | 21.53              |
|                   |            | RB1#24                     | 22.31             | 21.80                | 21.59              |
|                   |            | RB15#0                     | 20.98             | 20.76                | 20.63              |
|                   |            | RB15#10                    | 21.19             | 20.42                | 20.70              |
| 10MHz             | QPSK       | RB25#0                     | 21.10             | 20.67                | 20.64              |
|                   |            | RB1#0                      | 23.05             | 23.41                | 22.88              |
|                   |            | RB1#25                     | 23.08             | 22.29                | 22.29              |
|                   |            | RB1#49                     | 22.11             | 22.25                | 22.11              |
|                   |            | RB25#0                     | 22.18             | 22.18                | 21.57              |
|                   |            | RB25#25                    | 21.74             | 21.30                | 21.47              |
|                   | 16QAM      | RB50#0                     | 21.96             | 21.71                | 21.50              |
|                   |            | RB1#0                      | 22.57             | 22.67                | 21.98              |
|                   |            | RB1#25                     | 22.68             | 21.57                | 21.44              |
|                   |            | RB1#49                     | 21.73             | 21.50                | 21.29              |
|                   |            | RB25#0                     | 21.38             | 21.31                | 20.83              |
|                   |            | RB25#25                    | 20.94             | 20.49                | 20.69              |
|                   |            | RB50#0                     | 21.12             | 20.90                | 20.66              |

**LTE Band 13**

| <b>Channel Bandwidth</b> | <b>Modulation</b> | <b>Resource Block &amp; RB offset</b> | <b>Low Channel (dBm)</b> | <b>Middle Channel (dBm)</b> | <b>High Channel (dBm)</b> |
|--------------------------|-------------------|---------------------------------------|--------------------------|-----------------------------|---------------------------|
| 5MHz                     | QPSK              | RB1#0                                 | 22.45                    | 22.48                       | 22.47                     |
|                          |                   | RB1#13                                | 22.46                    | 22.45                       | 21.30                     |
|                          |                   | RB1#24                                | 22.42                    | 21.82                       | 20.97                     |
|                          |                   | RB15#0                                | 21.57                    | 21.55                       | 21.42                     |
|                          |                   | RB15#10                               | 21.50                    | 21.51                       | 20.33                     |
|                          |                   | RB25#0                                | 21.48                    | 21.53                       | 20.91                     |
|                          | 16QAM             | RB1#0                                 | 21.34                    | 21.76                       | 21.51                     |
|                          |                   | RB1#13                                | 21.39                    | 21.72                       | 20.54                     |
|                          |                   | RB1#24                                | 21.37                    | 21.30                       | 20.22                     |
|                          |                   | RB15#0                                | 20.68                    | 20.54                       | 20.34                     |
|                          |                   | RB15#10                               | 20.62                    | 20.36                       | 19.56                     |
|                          |                   | RB25#0                                | 20.65                    | 20.40                       | 20.14                     |
| 10MHz                    | QPSK              | RB1#0                                 | /                        | 22.44                       | /                         |
|                          |                   | RB1#25                                | /                        | 22.42                       | /                         |
|                          |                   | RB1#49                                | /                        | 20.64                       | /                         |
|                          |                   | RB25#0                                | /                        | 21.54                       | /                         |
|                          |                   | RB25#25                               | /                        | 20.82                       | /                         |
|                          |                   | RB50#0                                | /                        | 21.26                       | /                         |
|                          | 16QAM             | RB1#0                                 | /                        | 21.87                       | /                         |
|                          |                   | RB1#25                                | /                        | 21.87                       | /                         |
|                          |                   | RB1#49                                | /                        | 20.28                       | /                         |
|                          |                   | RB25#0                                | /                        | 20.61                       | /                         |
|                          |                   | RB25#25                               | /                        | 20.00                       | /                         |
|                          |                   | RB50#0                                | /                        | 20.28                       | /                         |

**LTE Band 17**

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 5MHz              | QPSK       | RB1#0                      | 24.20             | 23.59                | 23.12              |
|                   |            | RB1#13                     | 23.17             | 22.24                | 22.77              |
|                   |            | RB1#24                     | 22.80             | 23.06                | 22.52              |
|                   |            | RB15#0                     | 22.94             | 21.74                | 22.12              |
|                   |            | RB15#10                    | 22.18             | 21.47                | 21.79              |
|                   |            | RB25#0                     | 22.57             | 21.64                | 21.92              |
|                   | 16QAM      | RB1#0                      | 22.92             | 22.96                | 22.27              |
|                   |            | RB1#13                     | 22.20             | 21.61                | 21.97              |
|                   |            | RB1#24                     | 21.88             | 22.47                | 21.76              |
|                   |            | RB15#0                     | 22.08             | 20.86                | 21.28              |
|                   |            | RB15#10                    | 21.34             | 20.59                | 20.95              |
|                   |            | RB25#0                     | 21.77             | 20.82                | 21.10              |
| 10MHz             | QPSK       | RB1#0                      | 24.27             | 23.76                | 23.53              |
|                   |            | RB1#25                     | 22.53             | 22.26                | 22.37              |
|                   |            | RB1#49                     | 22.72             | 22.32                | 22.18              |
|                   |            | RB25#0                     | 22.68             | 22.32                | 22.07              |
|                   |            | RB25#25                    | 21.60             | 21.67                | 21.74              |
|                   |            | RB50#0                     | 22.12             | 21.96                | 21.87              |
|                   | 16QAM      | RB1#0                      | 23.45             | 23.07                | 22.66              |
|                   |            | RB1#25                     | 22.11             | 21.51                | 21.48              |
|                   |            | RB1#49                     | 22.29             | 21.56                | 21.36              |
|                   |            | RB25#0                     | 21.85             | 21.47                | 21.29              |
|                   |            | RB25#25                    | 20.78             | 20.85                | 20.97              |
|                   |            | RB50#0                     | 21.27             | 21.11                | 21.05              |

**PAR, Band 2**

| Test Modulation |        | Channel Bandwidth | Low Channel PAR (dB) | Middle Channel PAR (dB) | High Channel PAR (dB) | Limit (dB) |
|-----------------|--------|-------------------|----------------------|-------------------------|-----------------------|------------|
| QPSK            | 1 RB   | 20 MHz            | 2.64                 | 3.16                    | 3.12                  | 13         |
|                 | 100 RB |                   | 5.04                 | 5.04                    | 5.08                  | 13         |
| 16QAM           | 1 RB   | 20 MHz            | 3.64                 | 4.00                    | 4.24                  | 13         |
|                 | 100 RB |                   | 5.84                 | 5.96                    | 5.96                  | 13         |

**PAR, Band 4**

| Test Modulation |        | Channel Bandwidth | Low Channel PAR (dB) | Middle Channel PAR (dB) | High Channel PAR (dB) | Limit (dB) |
|-----------------|--------|-------------------|----------------------|-------------------------|-----------------------|------------|
| QPSK            | 1 RB   | 20 MHz            | 3.32                 | 3.24                    | 3.68                  | 13         |
|                 | 100 RB |                   | 5.00                 | 5.20                    | 5.28                  | 13         |
| 16QAM           | 1 RB   | 20 MHz            | 4.48                 | 4.28                    | 4.52                  | 13         |
|                 | 100 RB |                   | 5.96                 | 6.04                    | 6.24                  | 13         |

**PAR, Band 5**

| Test Modulation |       | Channel Bandwidth | Low Channel PAR (dB) | Middle Channel PAR (dB) | High Channel PAR (dB) | Limit (dB) |
|-----------------|-------|-------------------|----------------------|-------------------------|-----------------------|------------|
| QPSK            | 1 RB  | 10 MHz            | 4.32                 | 4.12                    | 4.64                  | 13         |
|                 | 50 RB |                   | 5.60                 | 5.72                    | 5.64                  | 13         |
| 16QAM           | 1 RB  | 10 MHz            | 5.44                 | 5.12                    | 5.72                  | 13         |
|                 | 50 RB |                   | 6.44                 | 6.56                    | 6.48                  | 13         |

**PAR, LTE Band 12**

| Test Modulation |       | Channel Bandwidth | Low Channel PAR (dB) | Middle Channel PAR (dB) | High Channel PAR (dB) | Limit (dB) |
|-----------------|-------|-------------------|----------------------|-------------------------|-----------------------|------------|
| QPSK            | 1 RB  | 10 MHz            | 4.36                 | 3.36                    | 3.96                  | 13         |
|                 | 50 RB |                   | 5.36                 | 5.56                    | 5.64                  | 13         |
| 16QAM           | 1 RB  | 10 MHz            | 5.52                 | 4.44                    | 4.96                  | 13         |
|                 | 50 RB |                   | 6.16                 | 6.36                    | 6.52                  | 13         |

**PAR, LTE Band 13**

| Test Modulation |       | Channel Bandwidth | Middle Channel (dB) | Limit (dB) |
|-----------------|-------|-------------------|---------------------|------------|
| QPSK            | 1 RB  | 10 MHz            | 3.60                | 13         |
|                 | 50 RB |                   | 5.36                | 13         |
| 16QAM           | 1 RB  | 10 MHz            | 4.72                | 13         |
|                 | 50 RB |                   | 6.20                | 13         |

**PAR, LTE Band 17**

| Test Modulation |       | Channel Bandwidth | Low Channel PAR (dB) | Middle Channel PAR (dB) | High Channel PAR (dB) | Limit (dB) |
|-----------------|-------|-------------------|----------------------|-------------------------|-----------------------|------------|
| QPSK            | 1 RB  | 10 MHz            | 3.04                 | 3.20                    | 3.60                  | 13         |
|                 | 50 RB |                   | 5.68                 | 5.72                    | 5.72                  | 13         |
| 16QAM           | 1 RB  | 10 MHz            | 4.28                 | 4.24                    | 4.64                  | 13         |
|                 | 50 RB |                   | 6.48                 | 6.52                    | 6.52                  | 13         |

Note: peak-to-average ratio (PAR) <13 dB.

**ERP & EIRP:**

| Frequency<br>(MHz)           | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                              |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| GSM 850 Middle Channel       |                |                               |                               |                              |                    |                            |                |                |
| 836.60                       | H              | 93.18                         | 18.26                         | 0.00                         | 0.97               | 17.29                      | 38.45          | 21.16          |
| 836.60                       | V              | 99.67                         | 27.88                         | 0.00                         | 0.97               | 26.91                      | 38.45          | 11.54          |
| EDGE 850 Middle Channel      |                |                               |                               |                              |                    |                            |                |                |
| 836.60                       | H              | 88.66                         | 13.74                         | 0.00                         | 0.97               | 12.77                      | 38.45          | 25.68          |
| 836.60                       | V              | 94.16                         | 22.37                         | 0.00                         | 0.97               | 21.40                      | 38.45          | 17.05          |
| WCDMA Band V Middle Channel  |                |                               |                               |                              |                    |                            |                |                |
| 836.60                       | H              | 79.77                         | 4.85                          | 0.00                         | 0.97               | 3.88                       | 38.45          | 34.57          |
| 836.60                       | V              | 89.45                         | 17.66                         | 0.00                         | 0.97               | 16.69                      | 38.45          | 21.76          |
| GSM 1900 Middle Channel      |                |                               |                               |                              |                    |                            |                |                |
| 1880.00                      | H              | 91.61                         | 19.00                         | 11.66                        | 2.66               | 28.00                      | 33.00          | 5.00           |
| 1880.00                      | V              | 92.68                         | 20.21                         | 11.66                        | 2.66               | 29.21                      | 33.00          | 3.79           |
| EDGE 1900 Middle Channel     |                |                               |                               |                              |                    |                            |                |                |
| 1880.00                      | H              | 89.68                         | 17.07                         | 11.66                        | 2.66               | 26.07                      | 33.00          | 6.93           |
| 1880.00                      | V              | 89.32                         | 16.85                         | 11.66                        | 2.66               | 25.85                      | 33.00          | 7.15           |
| WCDMA Band II Middle Channel |                |                               |                               |                              |                    |                            |                |                |
| 1880.00                      | H              | 87.98                         | 15.37                         | 11.66                        | 2.66               | 24.37                      | 33.00          | 8.63           |
| 1880.00                      | V              | 87.46                         | 14.99                         | 11.66                        | 2.66               | 23.99                      | 33.00          | 9.01           |

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

**LTE Band 2**

| Frequency<br>(MHz) | BW<br>(MHz) | Modulation | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |       |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|-------|
|                    |             |            |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |       |
| 1880.00            | 1.40        | QPSK       | H              | 81.38                         | 8.77                          | 11.66                        | 2.66                  | 17.77                      | 33.00          | 15.23          |       |
| 1880.00            |             |            | V              | 81.95                         | 9.48                          | 11.66                        | 2.66                  | 18.48                      | 33.00          | 14.52          |       |
| 1880.00            | 3.00        |            | H              | 81.02                         | 8.41                          | 11.66                        | 2.66                  | 17.41                      | 33.00          | 15.59          |       |
| 1880.00            |             |            | V              | 81.54                         | 9.07                          | 11.66                        | 2.66                  | 18.07                      | 33.00          | 14.93          |       |
| 1880.00            | 5.00        |            | H              | 81.21                         | 8.60                          | 11.66                        | 2.66                  | 17.60                      | 33.00          | 15.40          |       |
| 1880.00            |             |            | V              | 81.25                         | 8.78                          | 11.66                        | 2.66                  | 17.78                      | 33.00          | 15.22          |       |
| 1880.00            | 10.00       |            | H              | 81.40                         | 8.79                          | 11.66                        | 2.66                  | 17.79                      | 33.00          | 15.21          |       |
| 1880.00            |             |            | V              | 81.79                         | 9.32                          | 11.66                        | 2.66                  | 18.32                      | 33.00          | 14.68          |       |
| 1880.00            | 15.00       |            | H              | 81.42                         | 8.81                          | 11.66                        | 2.66                  | 17.81                      | 33.00          | 15.19          |       |
| 1880.00            |             |            | V              | 81.73                         | 9.26                          | 11.66                        | 2.66                  | 18.26                      | 33.00          | 14.74          |       |
| 1880.00            | 20.00       |            | H              | 81.09                         | 8.48                          | 11.66                        | 2.66                  | 17.48                      | 33.00          | 15.52          |       |
| 1880.00            |             |            | V              | 81.68                         | 9.21                          | 11.66                        | 2.66                  | 18.21                      | 33.00          | 14.79          |       |
| 1880.00            | 1.40        |            | 16QAM          | H                             | 81.91                         | 9.30                         | 11.66                 | 2.66                       | 18.30          | 33.00          | 14.70 |
| 1880.00            |             |            |                | V                             | 80.50                         | 8.03                         | 11.66                 | 2.66                       | 17.03          | 33.00          | 15.97 |
| 1880.00            | 3.00        |            |                | H                             | 80.98                         | 8.37                         | 11.66                 | 2.66                       | 17.37          | 33.00          | 15.63 |
| 1880.00            |             |            |                | V                             | 80.26                         | 7.79                         | 11.66                 | 2.66                       | 16.79          | 33.00          | 16.21 |
| 1880.00            | 5.00        | H          |                | 81.50                         | 8.89                          | 11.66                        | 2.66                  | 17.89                      | 33.00          | 15.11          |       |
| 1880.00            |             | V          |                | 79.88                         | 7.41                          | 11.66                        | 2.66                  | 16.41                      | 33.00          | 16.59          |       |
| 1880.00            | 10.00       | H          |                | 80.05                         | 7.44                          | 11.66                        | 2.66                  | 16.44                      | 33.00          | 16.56          |       |
| 1880.00            |             | V          |                | 79.30                         | 6.83                          | 11.66                        | 2.66                  | 15.83                      | 33.00          | 17.17          |       |
| 1880.00            | 15.00       | H          |                | 81.11                         | 8.50                          | 11.66                        | 2.66                  | 17.50                      | 33.00          | 15.50          |       |
| 1880.00            |             | V          |                | 81.27                         | 8.80                          | 11.66                        | 2.66                  | 17.80                      | 33.00          | 15.20          |       |
| 1880.00            | 20.00       | H          |                | 81.64                         | 9.03                          | 11.66                        | 2.66                  | 18.03                      | 33.00          | 14.97          |       |
| 1880.00            |             | V          |                | 81.19                         | 8.72                          | 11.66                        | 2.66                  | 17.72                      | 33.00          | 15.28          |       |

**LTE Band 4**

| Frequency<br>(MHz) | BW<br>(MHz) | Modulation | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                    |             |            |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| 1732.50            | 1.40        | QPSK       | H              | 85.08                         | 11.03                         | 10.90                        | 2.51                  | 19.42                      | 30.00          | 10.58          |
| 1732.50            |             |            | V              | 83.61                         | 9.24                          | 10.90                        | 2.51                  | 17.63                      | 30.00          | 12.37          |
| 1732.50            | 3.00        |            | H              | 84.97                         | 10.92                         | 10.90                        | 2.51                  | 19.31                      | 30.00          | 10.69          |
| 1732.50            |             |            | V              | 83.52                         | 9.15                          | 10.90                        | 2.51                  | 17.54                      | 30.00          | 12.46          |
| 1732.50            | 5.00        |            | H              | 84.61                         | 10.56                         | 10.90                        | 2.51                  | 18.95                      | 30.00          | 11.05          |
| 1732.50            |             |            | V              | 83.20                         | 8.83                          | 10.90                        | 2.51                  | 17.22                      | 30.00          | 12.78          |
| 1732.50            | 10.00       |            | H              | 83.74                         | 9.69                          | 10.90                        | 2.51                  | 18.08                      | 30.00          | 11.92          |
| 1732.50            |             |            | V              | 82.32                         | 7.95                          | 10.90                        | 2.51                  | 16.34                      | 30.00          | 13.66          |
| 1732.50            | 15.00       |            | H              | 83.42                         | 9.37                          | 10.90                        | 2.51                  | 17.76                      | 30.00          | 12.24          |
| 1732.50            |             |            | V              | 82.02                         | 7.65                          | 10.90                        | 2.51                  | 16.04                      | 30.00          | 13.96          |
| 1732.50            | 20.00       |            | H              | 83.71                         | 9.66                          | 10.90                        | 2.51                  | 18.05                      | 30.00          | 11.95          |
| 1732.50            |             |            | V              | 82.32                         | 7.95                          | 10.90                        | 2.51                  | 16.34                      | 30.00          | 13.66          |
| 1732.50            | 1.40        | 16QAM      | H              | 84.21                         | 10.16                         | 10.90                        | 2.51                  | 18.55                      | 30.00          | 11.45          |
| 1732.50            |             |            | V              | 83.12                         | 8.75                          | 10.90                        | 2.51                  | 17.14                      | 30.00          | 12.86          |
| 1732.50            | 3.00        |            | H              | 84.10                         | 10.05                         | 10.90                        | 2.51                  | 18.44                      | 30.00          | 11.56          |
| 1732.50            |             |            | V              | 83.05                         | 8.68                          | 10.90                        | 2.51                  | 17.07                      | 30.00          | 12.93          |
| 1732.50            | 5.00        |            | H              | 83.61                         | 9.56                          | 10.90                        | 2.51                  | 17.95                      | 30.00          | 12.05          |
| 1732.50            |             |            | V              | 82.58                         | 8.21                          | 10.90                        | 2.51                  | 16.60                      | 30.00          | 13.40          |
| 1732.50            | 10.00       |            | H              | 82.68                         | 8.63                          | 10.90                        | 2.51                  | 17.02                      | 30.00          | 12.98          |
| 1732.50            |             |            | V              | 83.53                         | 9.16                          | 10.90                        | 2.51                  | 17.55                      | 30.00          | 12.45          |
| 1732.50            | 15.00       |            | H              | 82.52                         | 8.47                          | 10.90                        | 2.51                  | 16.86                      | 30.00          | 13.14          |
| 1732.50            |             |            | V              | 83.48                         | 9.11                          | 10.90                        | 2.51                  | 17.50                      | 30.00          | 12.50          |
| 1732.50            | 20.00       |            | H              | 82.83                         | 8.78                          | 10.90                        | 2.51                  | 17.17                      | 30.00          | 12.83          |
| 1732.50            |             |            | V              | 82.75                         | 8.38                          | 10.90                        | 2.51                  | 16.77                      | 30.00          | 13.23          |

**LTE Band 5**

| Frequency<br>(MHz) | BW<br>(MHz) | Modulation | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                    |             |            |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| 836.50             | 1.40        | QPSK       | H              | 83.39                         | 8.46                          | 0.00                         | 0.97                  | 7.49                       | 38.45          | 30.96          |
| 836.50             |             |            | V              | 92.97                         | 21.18                         | 0.00                         | 0.97                  | 20.21                      | 38.45          | 18.24          |
| 836.50             | 3.00        |            | H              | 82.60                         | 7.67                          | 0.00                         | 0.97                  | 6.70                       | 38.45          | 31.75          |
| 836.50             |             |            | V              | 92.18                         | 20.39                         | 0.00                         | 0.97                  | 19.42                      | 38.45          | 19.03          |
| 836.50             | 5.00        |            | H              | 81.24                         | 6.31                          | 0.00                         | 0.97                  | 5.34                       | 38.45          | 33.11          |
| 836.50             |             |            | V              | 90.82                         | 19.03                         | 0.00                         | 0.97                  | 18.06                      | 38.45          | 20.39          |
| 836.50             | 10.00       |            | H              | 82.08                         | 7.15                          | 0.00                         | 0.97                  | 6.18                       | 38.45          | 32.27          |
| 836.50             |             |            | V              | 91.66                         | 19.87                         | 0.00                         | 0.97                  | 18.90                      | 38.45          | 19.55          |
| 836.50             | 1.40        | 16QAM      | H              | 83.78                         | 8.85                          | 0.00                         | 0.97                  | 7.88                       | 38.45          | 30.57          |
| 836.50             |             |            | V              | 93.36                         | 21.57                         | 0.00                         | 0.97                  | 20.60                      | 38.45          | 17.85          |
| 836.50             | 3.00        |            | H              | 82.17                         | 7.24                          | 0.00                         | 0.97                  | 6.27                       | 38.45          | 32.18          |
| 836.50             |             |            | V              | 91.75                         | 19.96                         | 0.00                         | 0.97                  | 18.99                      | 38.45          | 19.46          |
| 836.50             | 5.00        |            | H              | 81.26                         | 6.33                          | 0.00                         | 0.97                  | 5.36                       | 38.45          | 33.09          |
| 836.50             |             |            | V              | 90.84                         | 19.05                         | 0.00                         | 0.97                  | 18.08                      | 38.45          | 20.37          |
| 836.50             | 10.00       |            | H              | 82.00                         | 7.07                          | 0.00                         | 0.97                  | 6.10                       | 38.45          | 32.35          |
| 836.50             |             |            | V              | 91.58                         | 19.79                         | 0.00                         | 0.97                  | 18.82                      | 38.45          | 19.63          |

**LTE Band 12**

| Frequency<br>(MHz) | BW<br>(MHz) | Modulation | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                    |             |            |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| 707.50             | 1.40        | QPSK       | H              | 84.96                         | 8.10                          | 0.00                         | 0.94                  | 7.16                       | 34.77          | 27.61          |
| 707.50             |             |            | V              | 94.40                         | 19.98                         | 0.00                         | 0.94                  | 19.04                      | 34.77          | 15.73          |
| 707.50             | 3.00        |            | H              | 83.72                         | 6.86                          | 0.00                         | 0.94                  | 5.92                       | 34.77          | 28.85          |
| 707.50             |             |            | V              | 93.16                         | 18.74                         | 0.00                         | 0.94                  | 17.80                      | 34.77          | 16.97          |
| 707.50             | 5.00        |            | H              | 82.61                         | 5.75                          | 0.00                         | 0.94                  | 4.81                       | 34.77          | 29.96          |
| 707.50             |             |            | V              | 92.05                         | 17.63                         | 0.00                         | 0.94                  | 16.69                      | 34.77          | 18.08          |
| 707.50             | 10.00       |            | H              | 82.16                         | 5.30                          | 0.00                         | 0.94                  | 4.36                       | 34.77          | 30.41          |
| 707.50             |             |            | V              | 91.60                         | 17.18                         | 0.00                         | 0.94                  | 16.24                      | 34.77          | 18.53          |
| 707.50             | 1.40        | 16QAM      | H              | 84.42                         | 7.56                          | 0.00                         | 0.94                  | 6.62                       | 34.77          | 28.15          |
| 707.50             |             |            | V              | 93.86                         | 19.44                         | 0.00                         | 0.94                  | 18.50                      | 34.77          | 16.27          |
| 707.50             | 3.00        |            | H              | 82.94                         | 6.08                          | 0.00                         | 0.94                  | 5.14                       | 34.77          | 29.63          |
| 707.50             |             |            | V              | 92.38                         | 17.96                         | 0.00                         | 0.94                  | 17.02                      | 34.77          | 17.75          |
| 707.50             | 5.00        |            | H              | 82.42                         | 5.56                          | 0.00                         | 0.94                  | 4.62                       | 34.77          | 30.15          |
| 707.50             |             |            | V              | 91.86                         | 17.44                         | 0.00                         | 0.94                  | 16.50                      | 34.77          | 18.27          |
| 707.50             | 10.00       |            | H              | 82.52                         | 5.66                          | 0.00                         | 0.94                  | 4.72                       | 34.77          | 30.05          |
| 707.50             |             |            | V              | 91.96                         | 17.54                         | 0.00                         | 0.94                  | 16.60                      | 34.77          | 18.17          |



**LTE Band 13**

| Frequency<br>(MHz) | BW<br>(MHz) | Modulation | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                    |             |            |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| 782.00             | 5.00        | QPSK       | H              | 86.92                         | 11.39                         | 0.00                         | 0.93                  | 10.46                      | 34.77          | 24.31          |
| 782.00             |             |            | V              | 90.85                         | 18.24                         | 0.00                         | 0.93                  | 17.31                      | 34.77          | 17.46          |
| 782.00             | 10.00       |            | H              | 87.39                         | 11.86                         | 0.00                         | 0.93                  | 10.93                      | 34.77          | 23.84          |
| 782.00             |             |            | V              | 91.32                         | 18.71                         | 0.00                         | 0.93                  | 17.78                      | 34.77          | 16.99          |
| 782.00             | 5.00        | 16QAM      | H              | 87.55                         | 12.02                         | 0.00                         | 0.93                  | 11.09                      | 34.77          | 23.68          |
| 782.00             |             |            | V              | 91.48                         | 18.87                         | 0.00                         | 0.93                  | 17.94                      | 34.77          | 16.83          |
| 782.00             | 10.00       |            | H              | 87.66                         | 12.13                         | 0.00                         | 0.93                  | 11.20                      | 34.77          | 23.57          |
| 782.00             |             |            | V              | 91.59                         | 18.98                         | 0.00                         | 0.93                  | 18.05                      | 34.77          | 16.72          |

**LTE Band 17**

| Frequency<br>(MHz) | BW<br>(MHz) | Modulation | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                       | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
|                    |             |            |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable<br>Loss<br>(dB) |                            |                |                |
| 710.00             | 5.00        | QPSK       | H              | 83.42                         | 6.61                          | 0.00                         | 0.94                  | 5.67                       | 34.77          | 29.10          |
| 710.00             |             |            | V              | 92.60                         | 18.24                         | 0.00                         | 0.94                  | 17.30                      | 34.77          | 17.47          |
| 710.00             | 10.00       |            | H              | 83.46                         | 6.65                          | 0.00                         | 0.94                  | 5.71                       | 34.77          | 29.06          |
| 710.00             |             |            | V              | 92.64                         | 18.28                         | 0.00                         | 0.94                  | 17.34                      | 34.77          | 17.43          |
| 710.00             | 5.00        | 16QAM      | H              | 83.55                         | 6.74                          | 0.00                         | 0.94                  | 5.80                       | 34.77          | 28.97          |
| 710.00             |             |            | V              | 92.73                         | 18.37                         | 0.00                         | 0.94                  | 17.43                      | 34.77          | 17.34          |
| 710.00             | 10.00       |            | H              | 83.50                         | 6.69                          | 0.00                         | 0.94                  | 5.75                       | 34.77          | 29.02          |
| 710.00             |             |            | V              | 92.68                         | 18.32                         | 0.00                         | 0.94                  | 17.38                      | 34.77          | 17.39          |

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

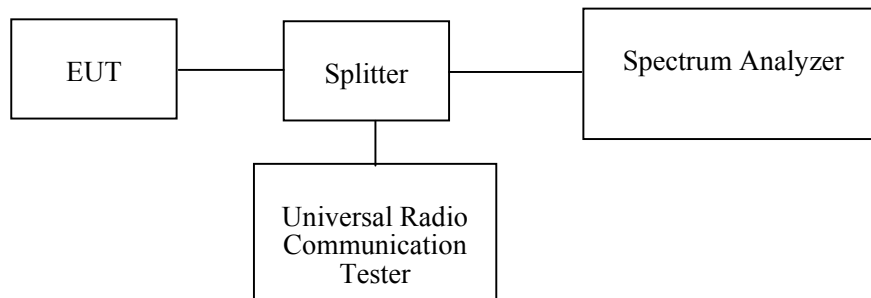
**FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH****Applicable Standard**

FCC §2.1049, §22.917, §22.905, §24.238, §27.53.

**Test Procedure**

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The 26 dB & 99% bandwidth was recorded.

**Test Equipment List and Details**

| Manufacturer | Description         | Model         | Serial Number | Calibration Date | Calibration Due Date |
|--------------|---------------------|---------------|---------------|------------------|----------------------|
| R&S          | Spectrum Analyzer   | FSU 26        | 200256        | 2020-05-09       | 2021-05-09           |
| yzjingcheng  | Coaxial Cable       | KTRFBU-141-50 | 41005011      | Each Time        | /                    |
| E-Microwave  | Two-way Splitter    | ODP-1-6-2S    | OE0120142     | Each Time        | /                    |
| Unknown      | Coaxial Cable       | C-SJ00-0010   | C0010/04      | Each Time        | /                    |
| E-Microwave  | Coaxial Attenuators | EMCA10-5RN-6  | OE01203239    | Each Time        | /                    |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Data****Environmental Conditions**

|                           |                       |
|---------------------------|-----------------------|
| <b>Temperature:</b>       | 26.1~26.9 °C          |
| <b>Relative Humidity:</b> | 55~67 %               |
| <b>ATM Pressure:</b>      | 98.6~100 kPa          |
| <b>Tester:</b>            | Chris Mo              |
| <b>Test Date:</b>         | 2020-05-19~2020-05-22 |

Test Mode: Transmitting

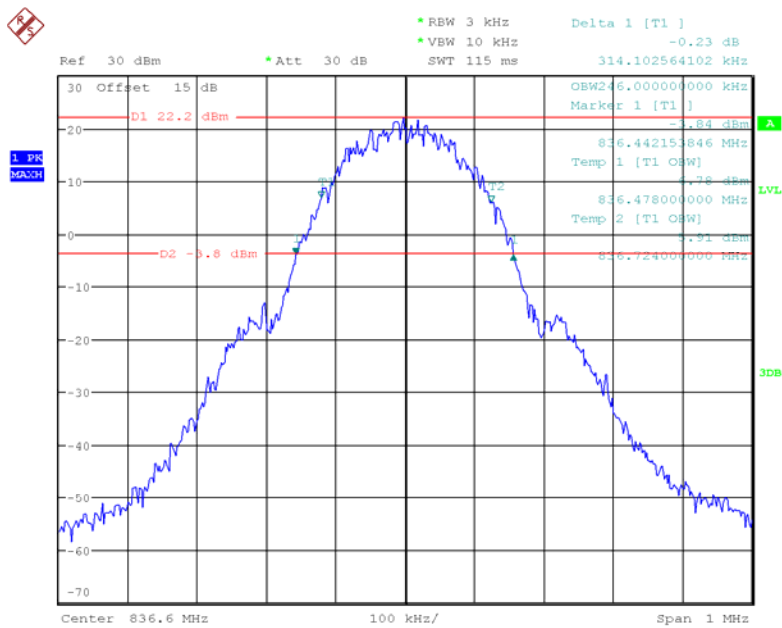
Test Result: Compliant. Please refer to the following table and plots.

| Band          | Test Channel | Mode   | 99% Occupied Bandwidth (MHz) | 26 dB Occupied Bandwidth (MHz) |
|---------------|--------------|--------|------------------------------|--------------------------------|
| Cellular      | M            | GSM    | 0.246                        | 0.314                          |
|               |              | EDGE   | 0.250                        | 0.323                          |
| PCS           |              | GSM    | 0.250                        | 0.315                          |
|               |              | EDGE   | 0.256                        | 0.329                          |
| WCDMA Band II |              | Rel 99 | 4.220                        | 4.872                          |
|               |              | HSDPA  | 4.240                        | 4.897                          |
|               |              | HSUPA  | 4.240                        | 4.894                          |
| WCDMA Band V  |              | Rel 99 | 4.220                        | 4.901                          |
|               |              | HSDPA  | 4.220                        | 4.881                          |
|               |              | HSUPA  | 4.220                        | 4.873                          |

| Band       | Bandwidth | Modulation | 99% occupied bandwidth (MHz) | 26 dB bandwidth (MHz) |
|------------|-----------|------------|------------------------------|-----------------------|
| LTE Band 2 | 1.4 MHz   | QPSK       | 1.098                        | 1.284                 |
|            |           | 16QAM      | 1.110                        | 1.290                 |
|            | 3 MHz     | QPSK       | 2.688                        | 2.916                 |
|            |           | 16QAM      | 2.688                        | 2.916                 |
|            | 5 MHz     | QPSK       | 4.540                        | 5.060                 |
|            |           | 16QAM      | 4.540                        | 5.020                 |
|            | 10 MHz    | QPSK       | 9.000                        | 9.840                 |
|            |           | 16QAM      | 8.960                        | 9.680                 |
|            | 15 MHz    | QPSK       | 13.560                       | 15.000                |
|            |           | 16QAM      | 13.500                       | 15.120                |
| LTE Band 4 | 1.4 MHz   | QPSK       | 1.098                        | 1.308                 |
|            |           | 16QAM      | 1.104                        | 1.290                 |
|            | 3 MHz     | QPSK       | 2.688                        | 2.940                 |
|            |           | 16QAM      | 2.688                        | 2.952                 |
|            | 5 MHz     | QPSK       | 4.540                        | 5.020                 |
|            |           | 16QAM      | 4.540                        | 4.980                 |
|            | 10 MHz    | QPSK       | 9.000                        | 9.800                 |
|            |           | 16QAM      | 9.000                        | 9.720                 |
|            | 15 MHz    | QPSK       | 13.560                       | 14.940                |
|            |           | 16QAM      | 13.620                       | 14.940                |
| LTE Band 5 | 1.4 MHz   | QPSK       | 1.098                        | 1.278                 |
|            |           | 16QAM      | 1.098                        | 1.284                 |
|            | 3 MHz     | QPSK       | 2.688                        | 2.904                 |
|            |           | 16QAM      | 2.688                        | 2.916                 |
|            | 5 MHz     | QPSK       | 4.520                        | 5.060                 |
|            |           | 16QAM      | 4.520                        | 5.100                 |
|            | 10 MHz    | QPSK       | 9.000                        | 9.720                 |
|            |           | 16QAM      | 8.960                        | 9.720                 |

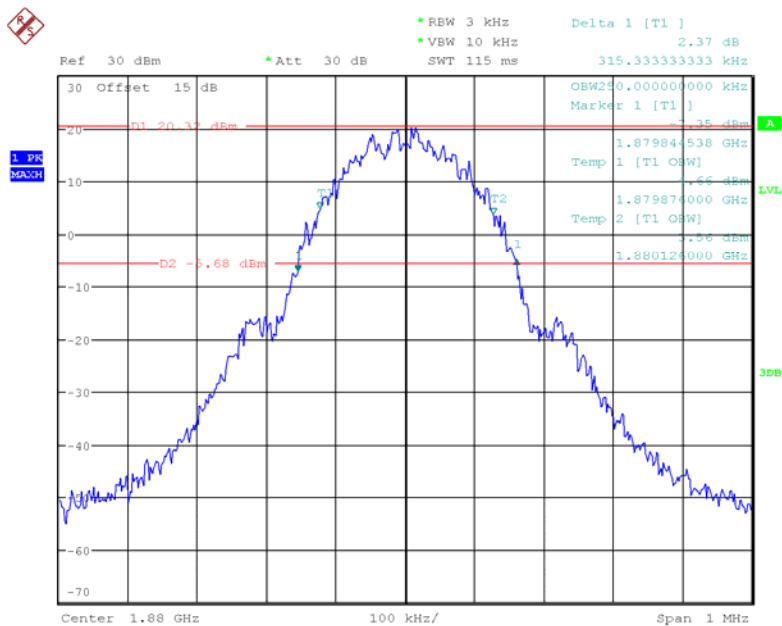
| Band        | Bandwidth | Modulation | 99% occupied bandwidth (MHz) | 26 dB bandwidth (MHz) |
|-------------|-----------|------------|------------------------------|-----------------------|
| LTE Band 12 | 1.4 MHz   | QPSK       | 1.098                        | 1.290                 |
|             |           | 16QAM      | 1.104                        | 1.284                 |
|             | 3 MHz     | QPSK       | 2.688                        | 2.916                 |
|             |           | 16QAM      | 2.700                        | 2.940                 |
|             | 5 MHz     | QPSK       | 4.540                        | 5.040                 |
|             |           | 16QAM      | 4.520                        | 5.060                 |
|             | 10 MHz    | QPSK       | 9.000                        | 9.680                 |
|             |           | 16QAM      | 9.000                        | 9.680                 |
| LTE Band 13 | 5 MHz     | QPSK       | 4.520                        | 5.060                 |
|             |           | 16QAM      | 4.520                        | 5.020                 |
|             | 10 MHz    | QPSK       | 8.960                        | 9.760                 |
|             |           | 16QAM      | 8.960                        | 9.680                 |
| LTE Band 17 | 5 MHz     | QPSK       | 4.560                        | 5.060                 |
|             |           | 16QAM      | 4.520                        | 5.060                 |
|             | 10 MHz    | QPSK       | 9.040                        | 9.920                 |
|             |           | 16QAM      | 9.040                        | 9.640                 |

### GSM 850 Cellular Band



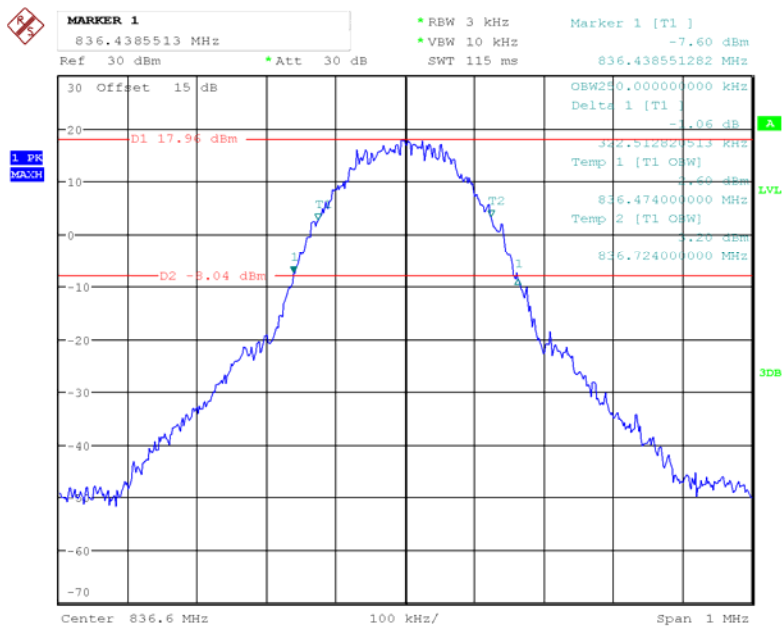
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### GSM1900 Cellular Band



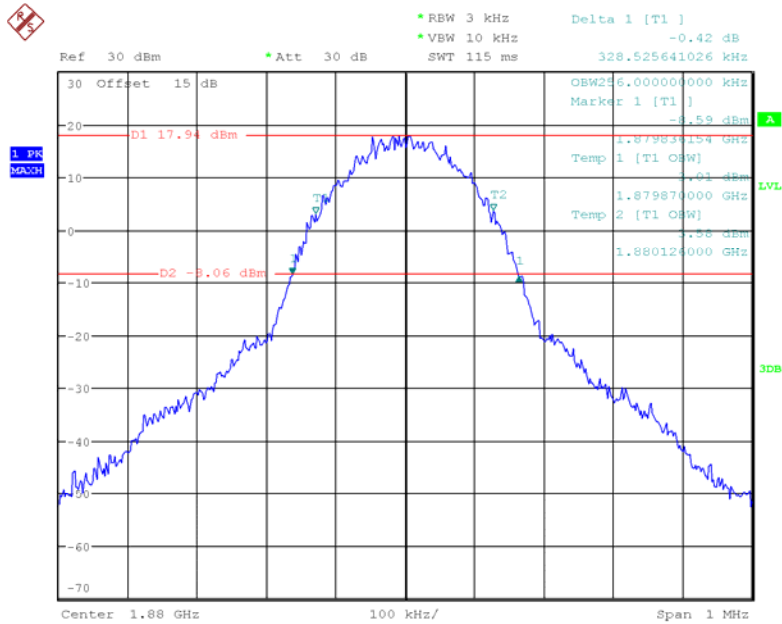
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## EDGE 850 Cellular Band



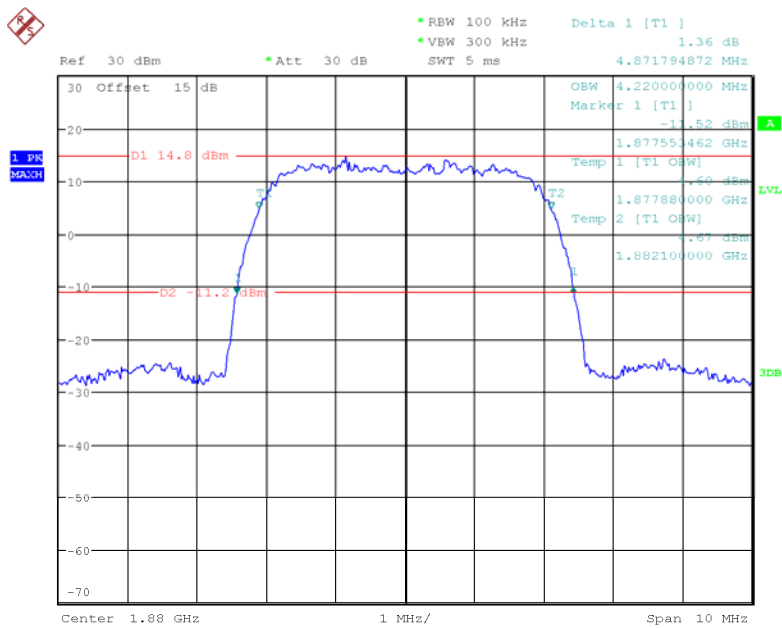
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## EDGE PCS1900 Cellular Band



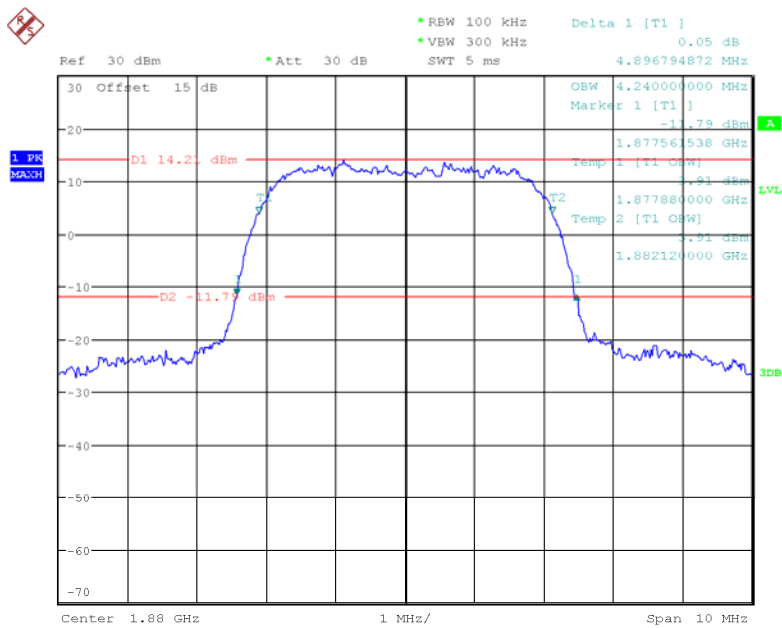
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### WCDMA Band II, Rel 99

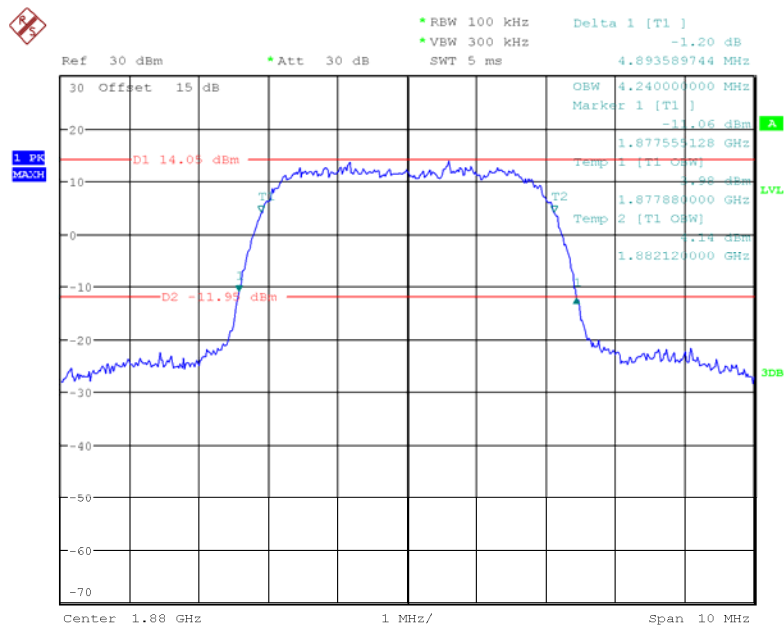


Date: 22.MAY.2020 19:08:41

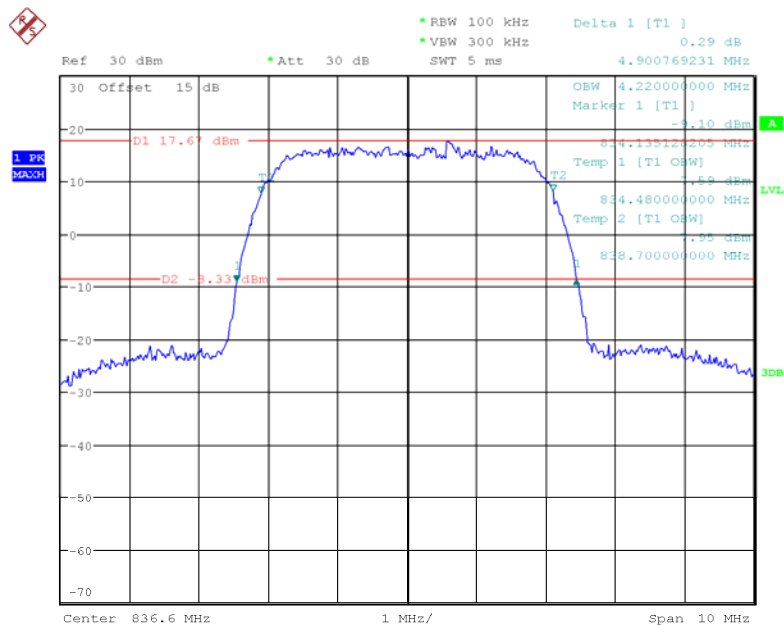
### WCDMA Band II, HSDPA



Date: 22.MAY.2020 18:33:20

**WCDMA Band II, HSUPA**

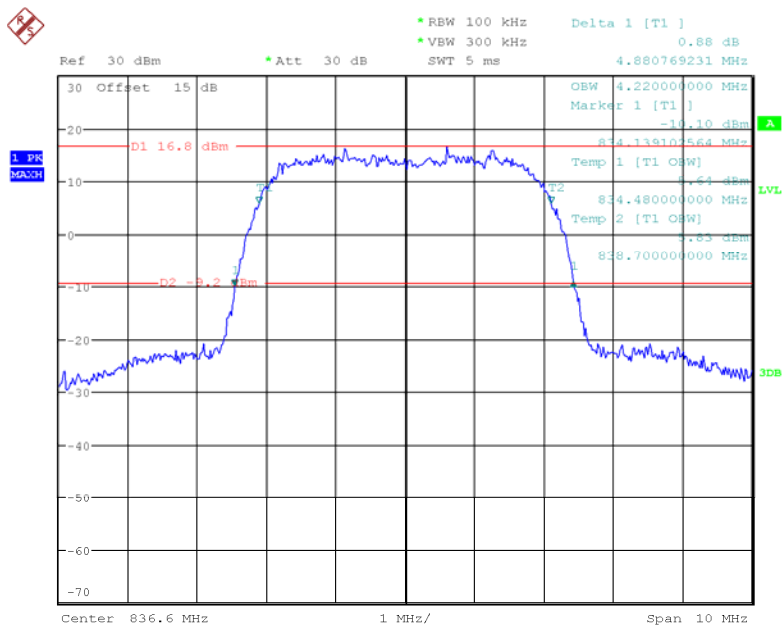
Date: 22.MAY.2020 18:54:26

**WCDMA Band V, Rel 99**

Date: 22.MAY.2020 19:10:19

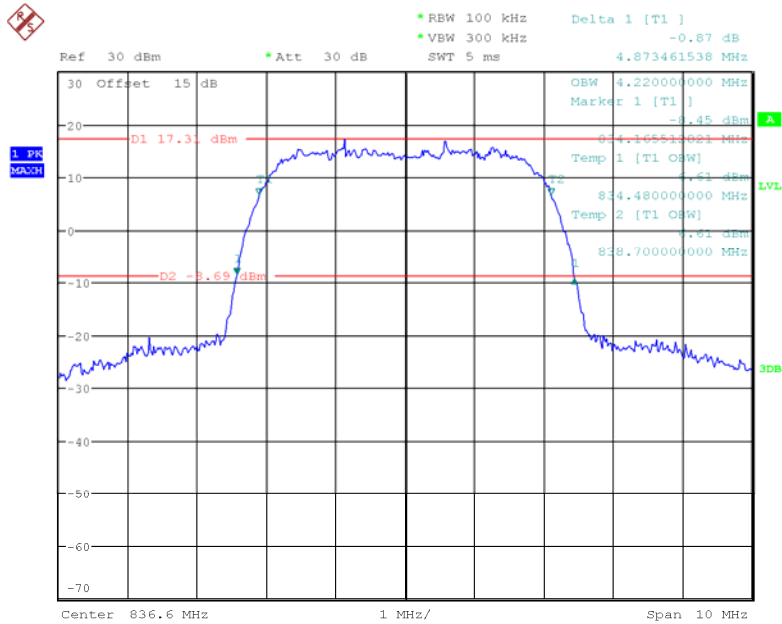


## WCDMA Band V, HSDPA



Date: 22.MAY.2020 18:41:52

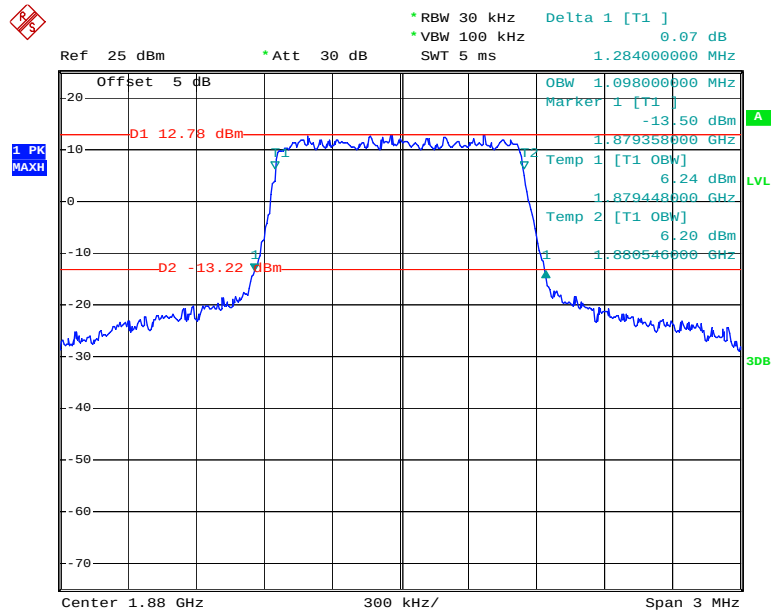
## WCDMA Band V, HSUPA



Date: 22.MAY.2020 18:52:25

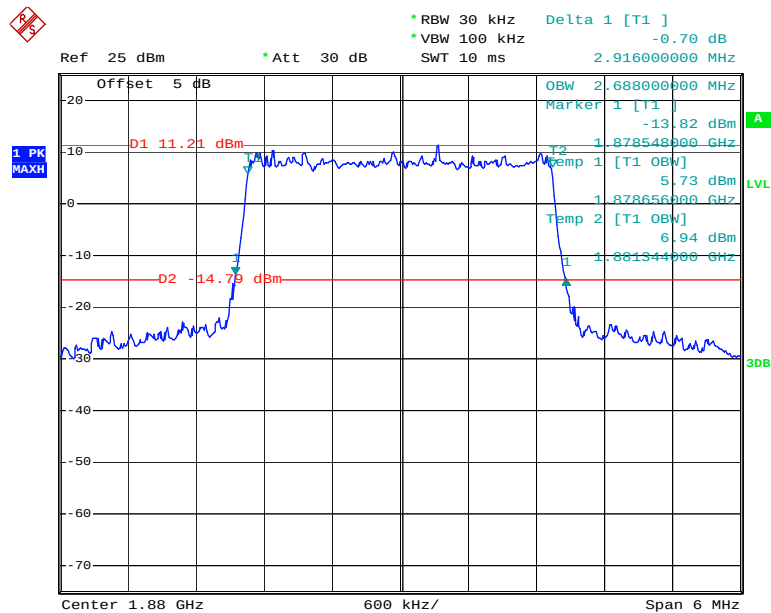
## LTE Band 2

## QPSK\_1.4 MHz



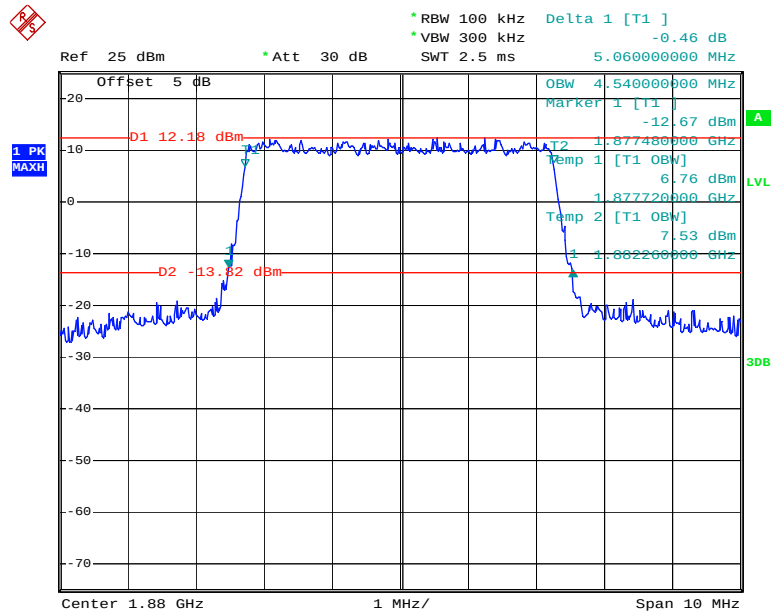
Date: 19.MAY.2020 10:10:04

## QPSK\_3 MHz



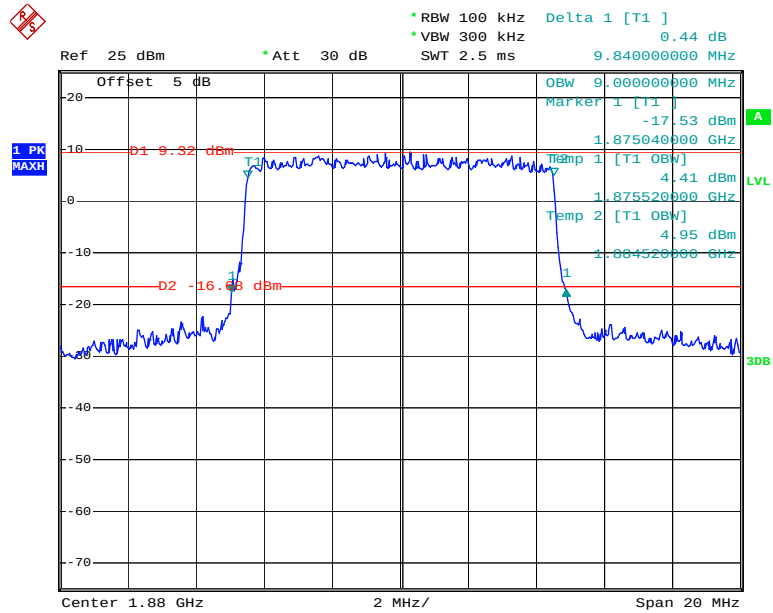
Date: 19.MAY.2020 10:11:25

### QPSK\_5 MHz



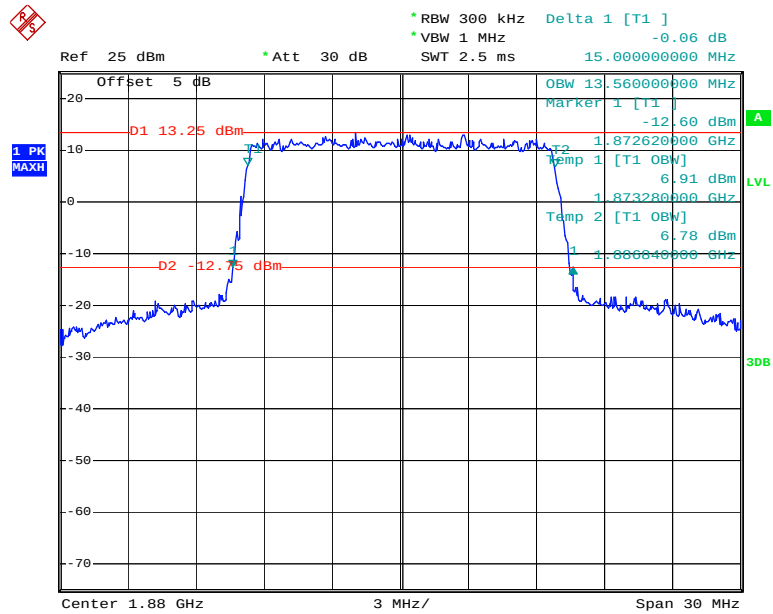
Date: 19.MAY.2020 10:12:09

### QPSK\_10 MHz



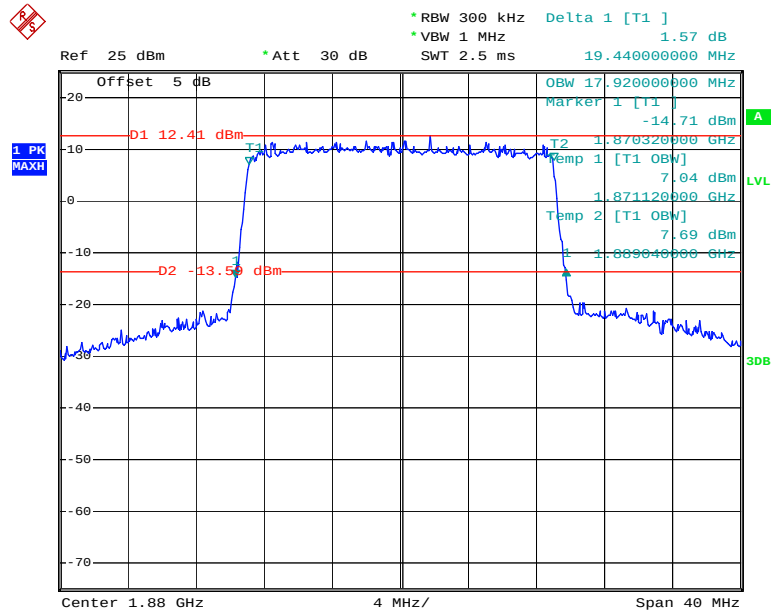
Date: 19.MAY.2020 10:12:52

### QPSK\_15 MHz



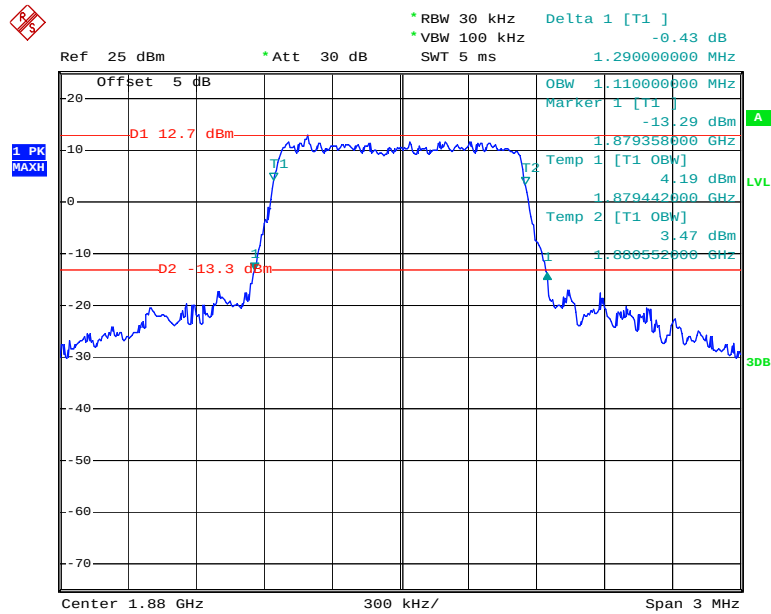
Date: 19.MAY.2020 10:13:45

### QPSK\_20 MHz



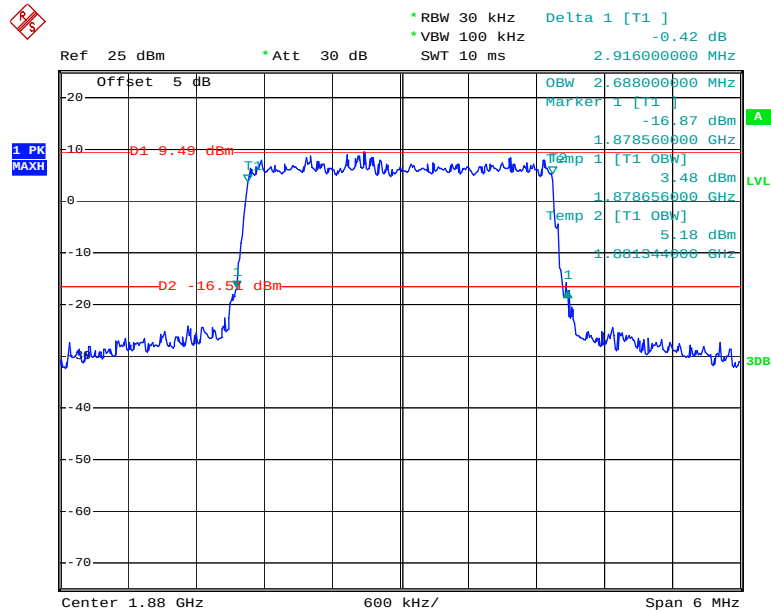
Date: 19.MAY.2020 10:14:35

### 16QAM\_1.4 MHz



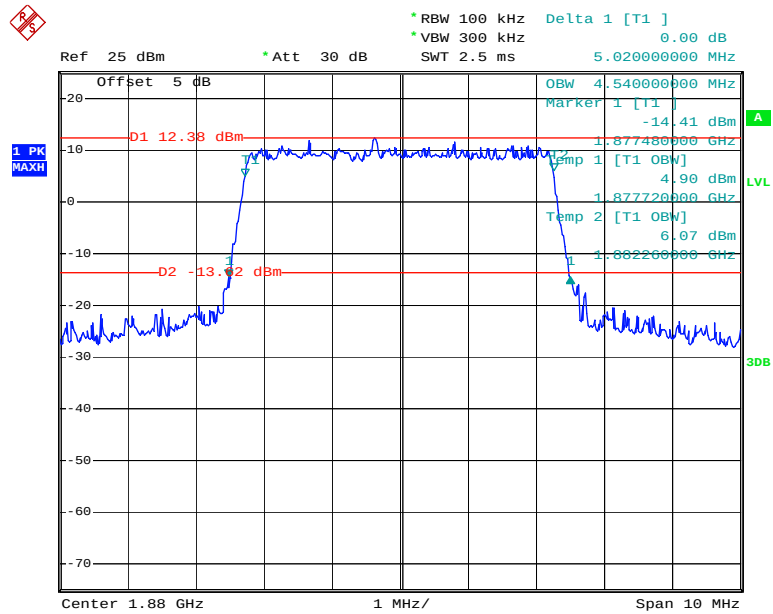
Date: 19.MAY.2020 10:10:33

### 16QAM\_3 MHz



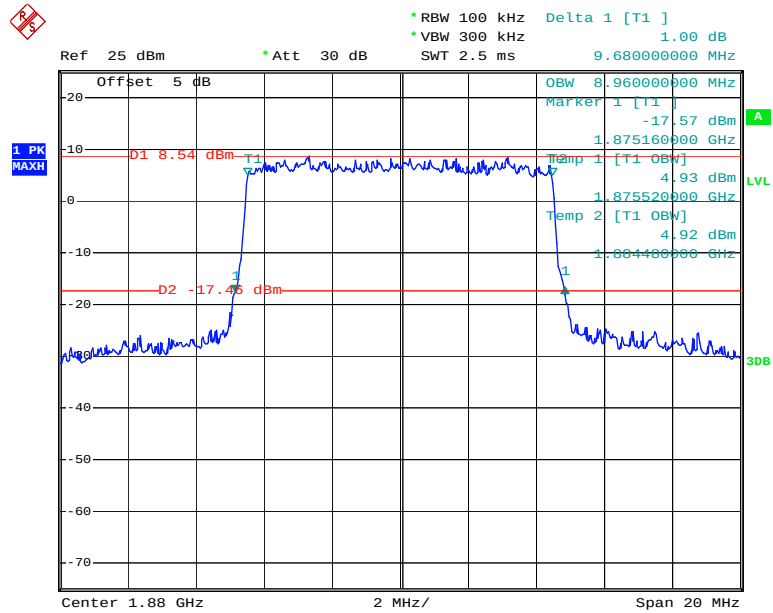
Date: 19.MAY.2020 10:11:42

### 16QAM\_5 MHz



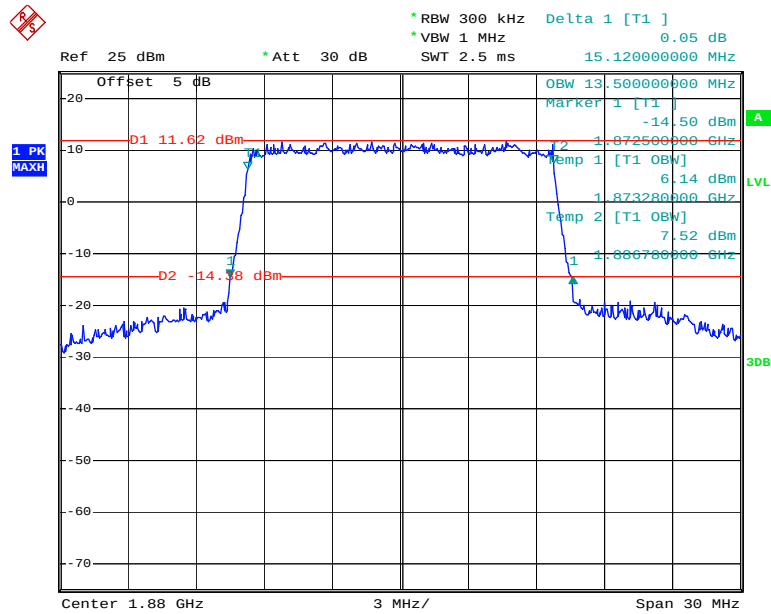
Date: 19.MAY.2020 10:12:31

### 16QAM\_10 MHz



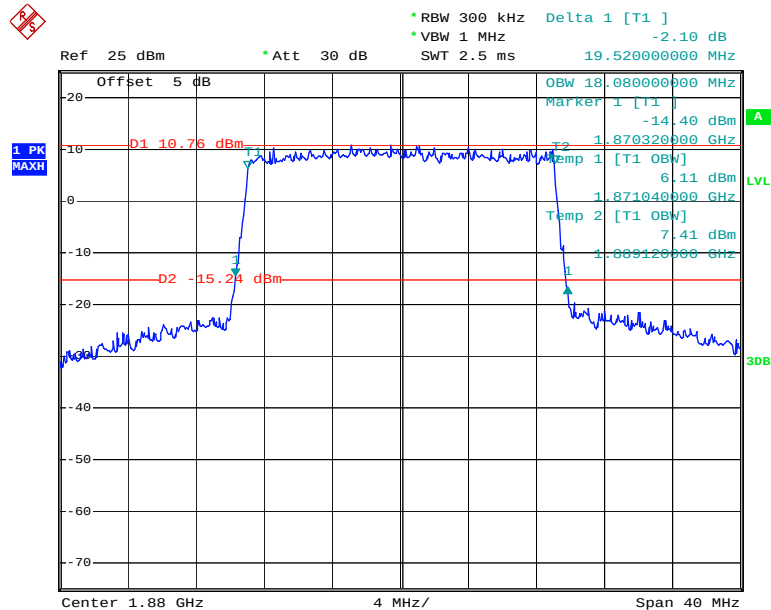
Date: 19.MAY.2020 10:13:16

## 16QAM\_15 MHz



Date: 19.MAY.2020 10:14:07

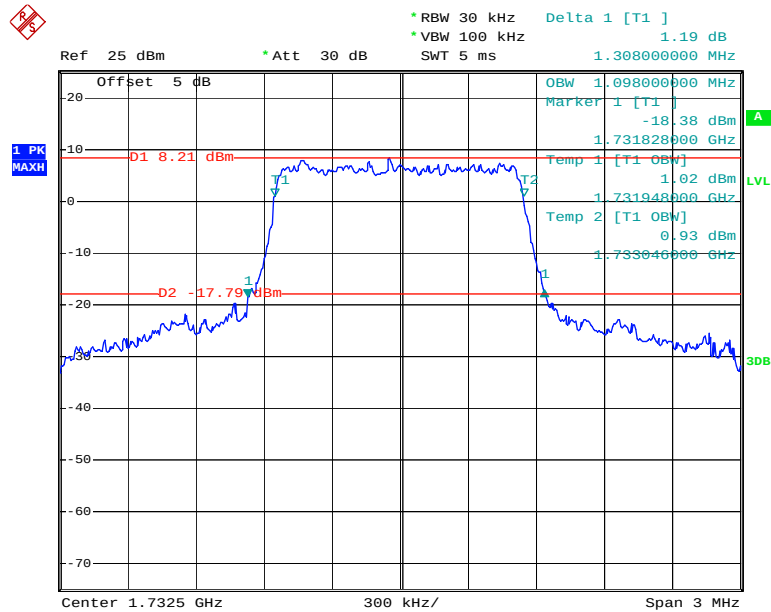
## 16QAM\_20 MHz



Date: 19.MAY.2020 10:15:00

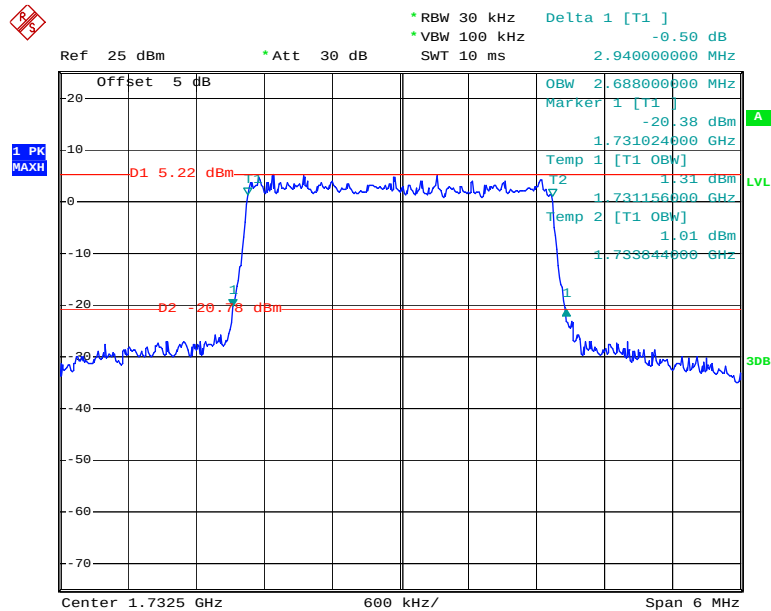
## LTE Band 4

## QPSK\_1.4 MHz



Date: 19.MAY.2020 10:15:24

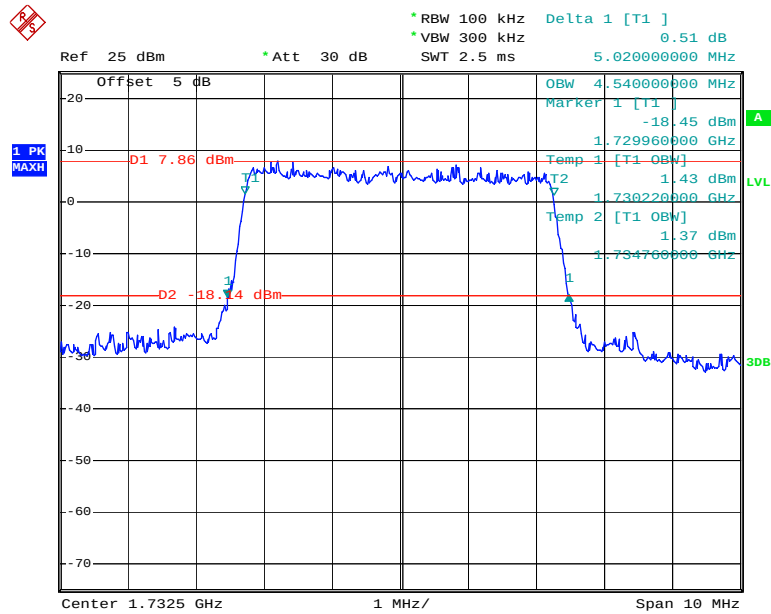
## QPSK\_3 MHz



Date: 19.MAY.2020 10:16:09

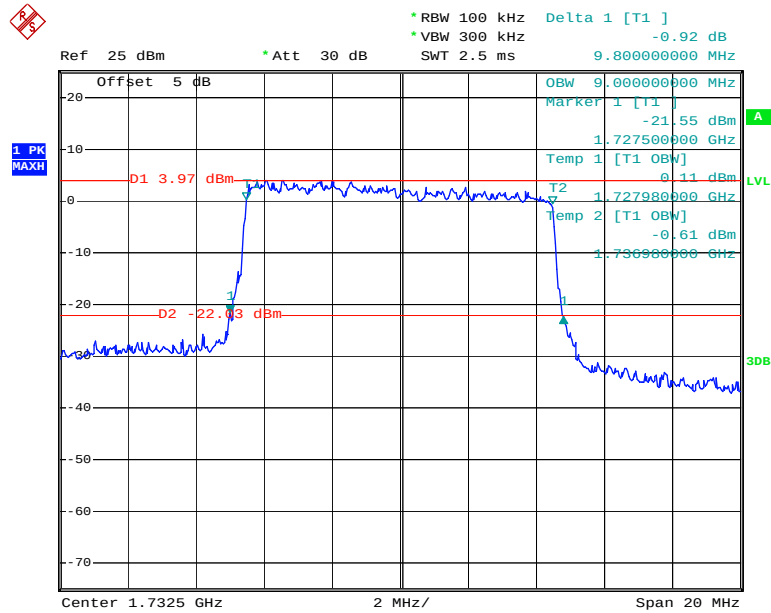


### QPSK\_5 MHz



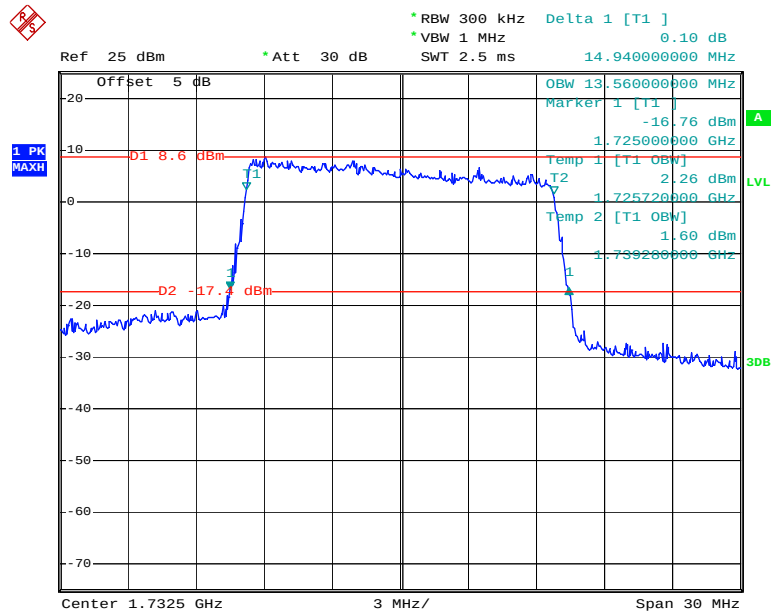
Date: 19.MAY.2020 10:16:53

### QPSK\_10 MHz



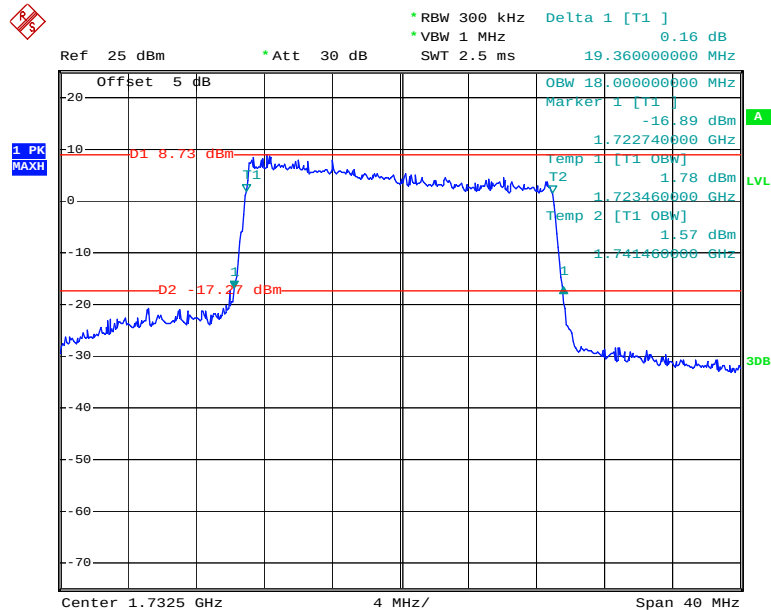
Date: 19.MAY.2020 10:17:39

### QPSK\_15 MHz



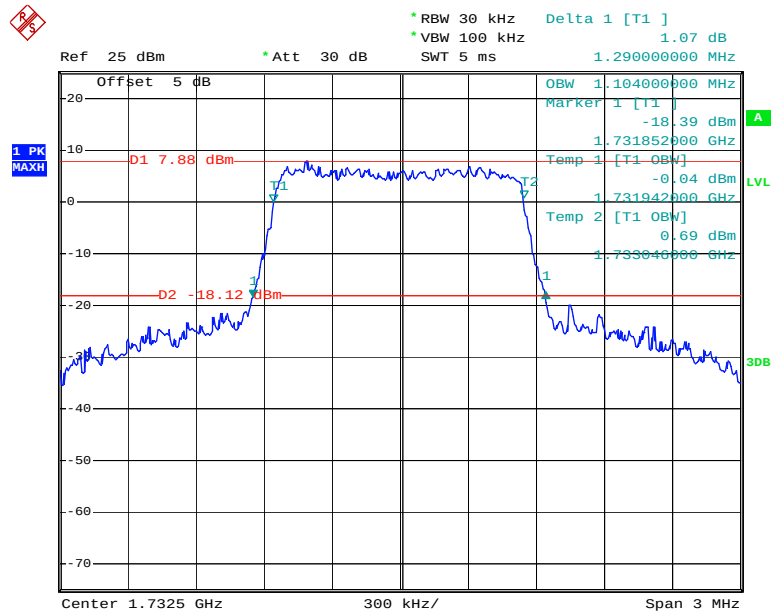
Date: 19.MAY.2020 10:18:28

### QPSK\_20 MHz



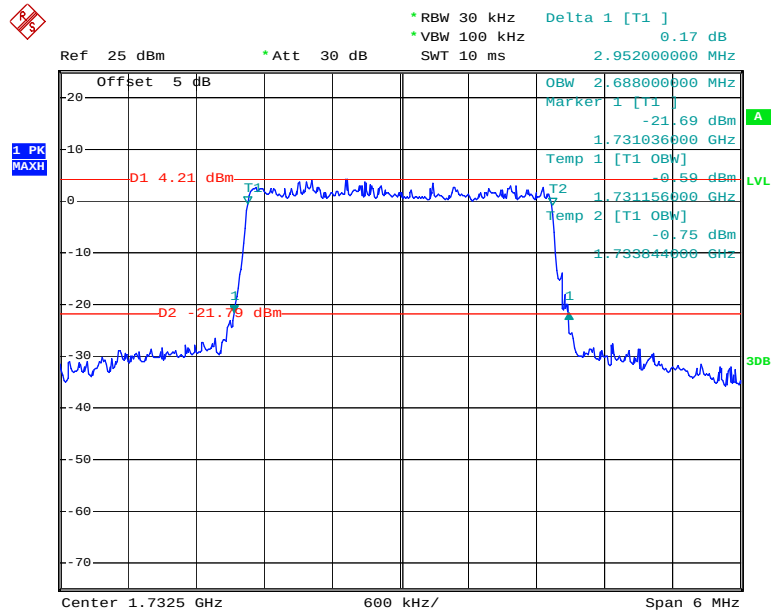
Date: 19.MAY.2020 10:19:20

### 16QAM\_1.4 MHz



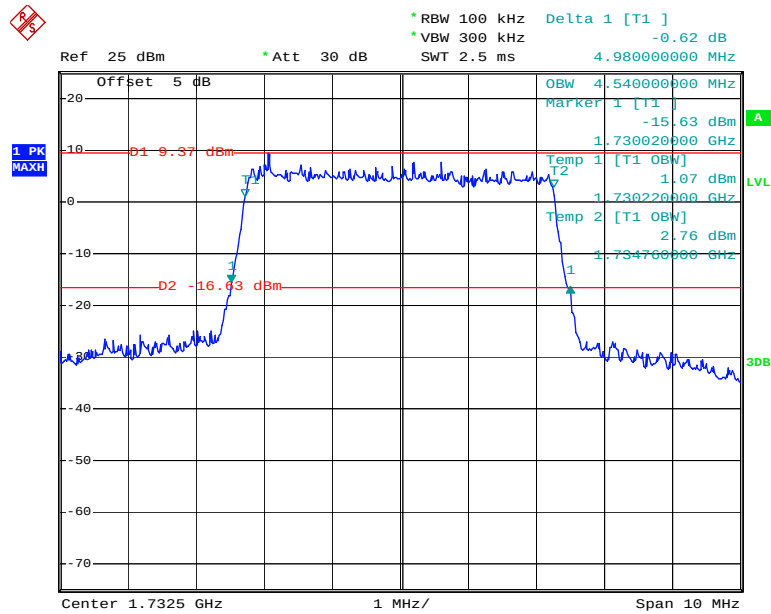
Date: 19.MAY.2020 10:15:45

### 16QAM\_3 MHz



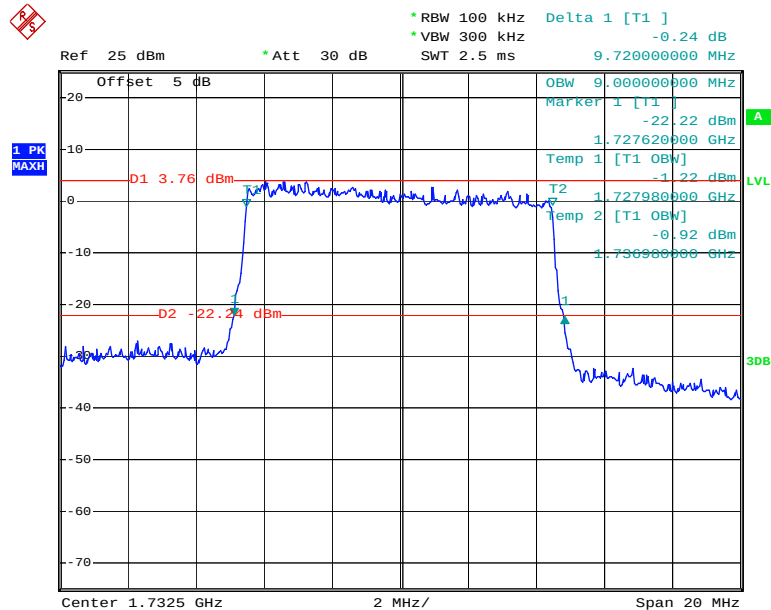
Date: 19.MAY.2020 10:16:30

## 16QAM\_5 MHz



Date: 19.MAY.2020 12:02:16

## 16QAM\_10 MHz



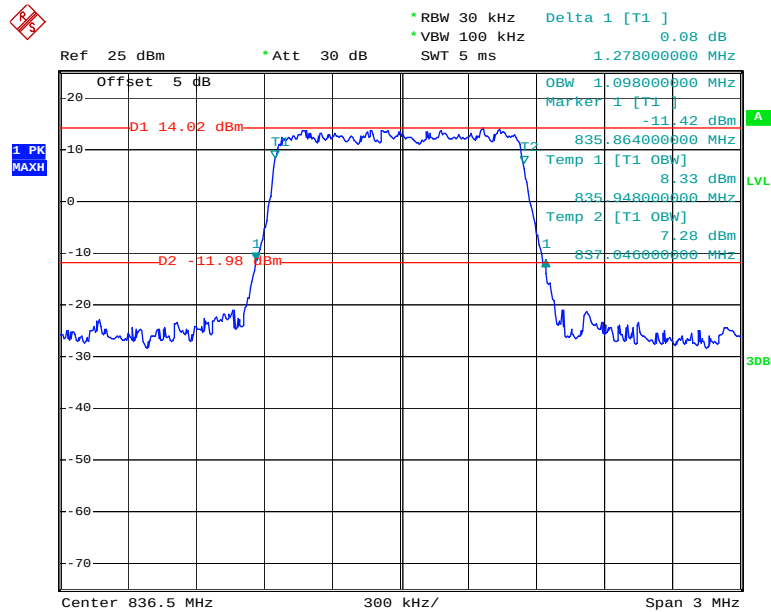
Date: 19.MAY.2020 10:18:01



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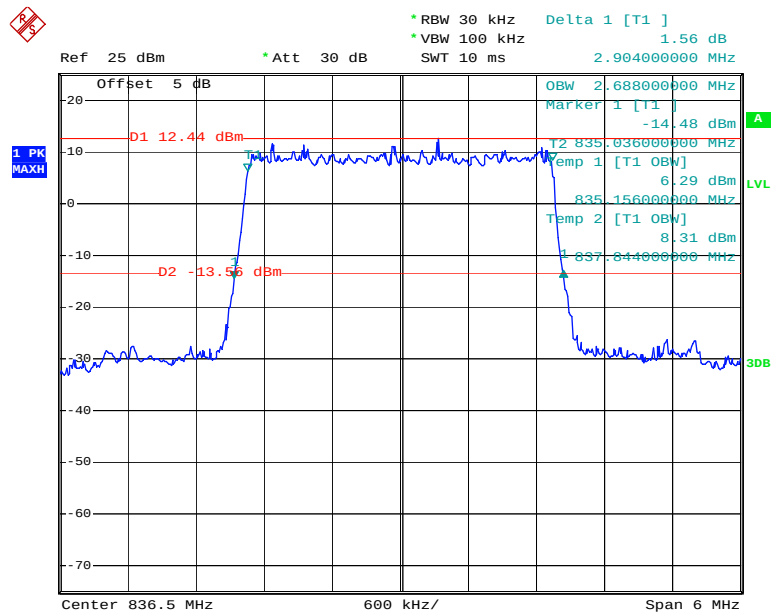
## LTE Band 5:

## QPSK\_1.4 MHz



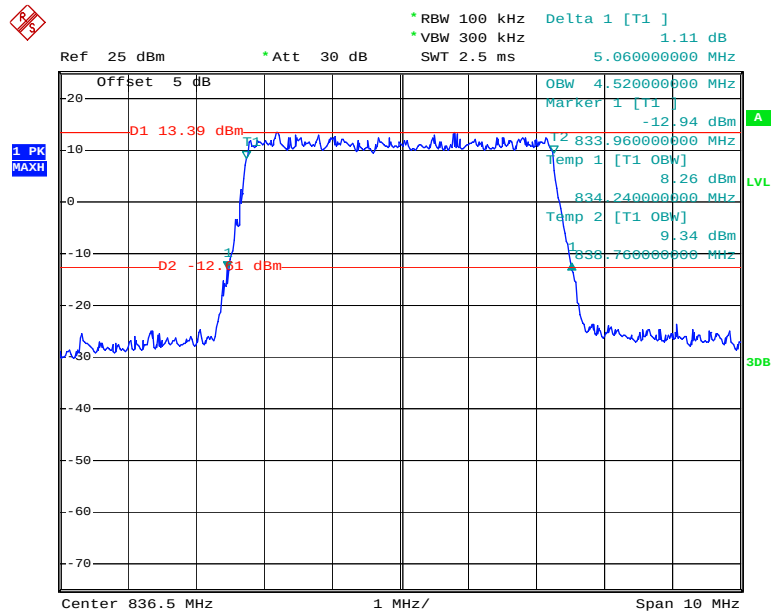
Date: 19.MAY.2020 10:20:07

## QPSK\_3 MHz



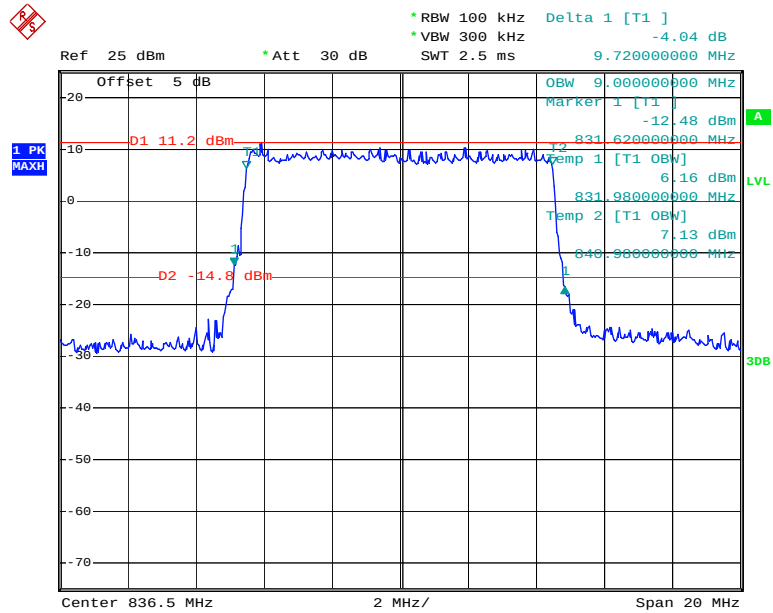
Date: 19.MAY.2020 10:20:55

### QPSK\_5 MHz



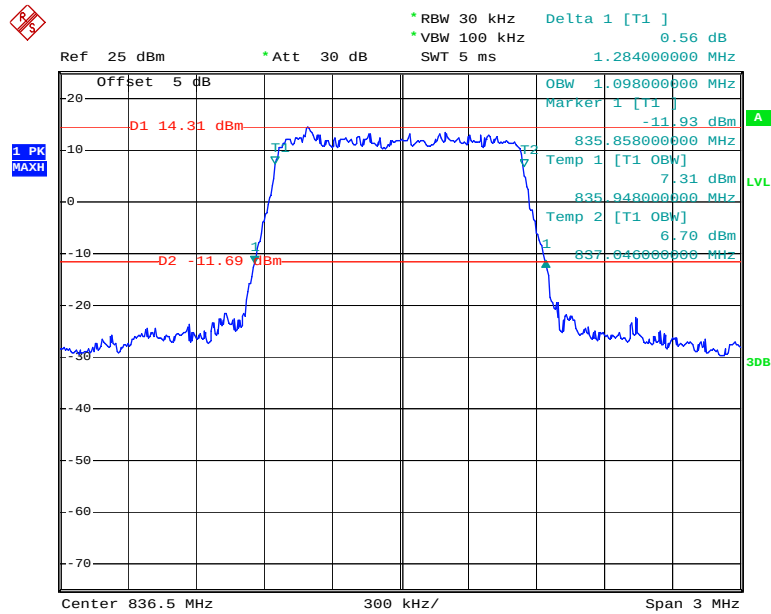
Date: 19.MAY.2020 10:21:39

### QPSK\_10 MHz



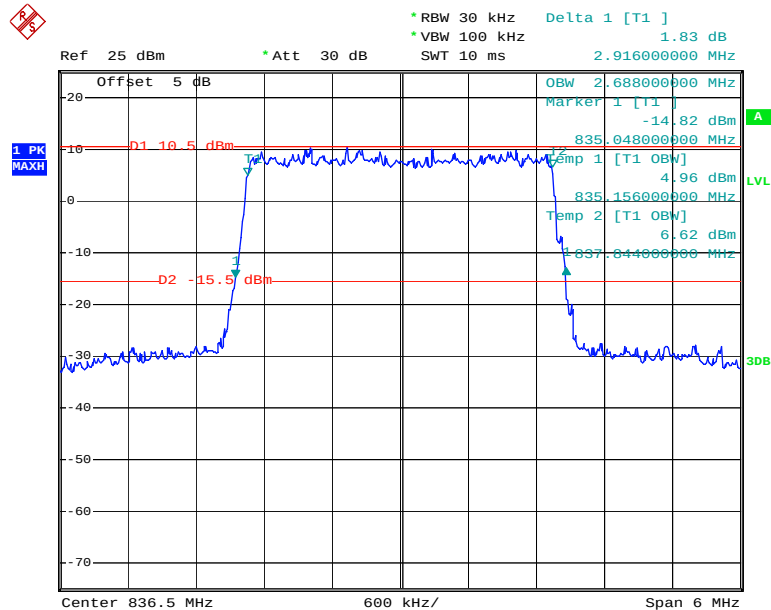
Date: 19.MAY.2020 10:22:28

## 16QAM\_1.4 MHz



Date: 19.MAY.2020 10:20:28

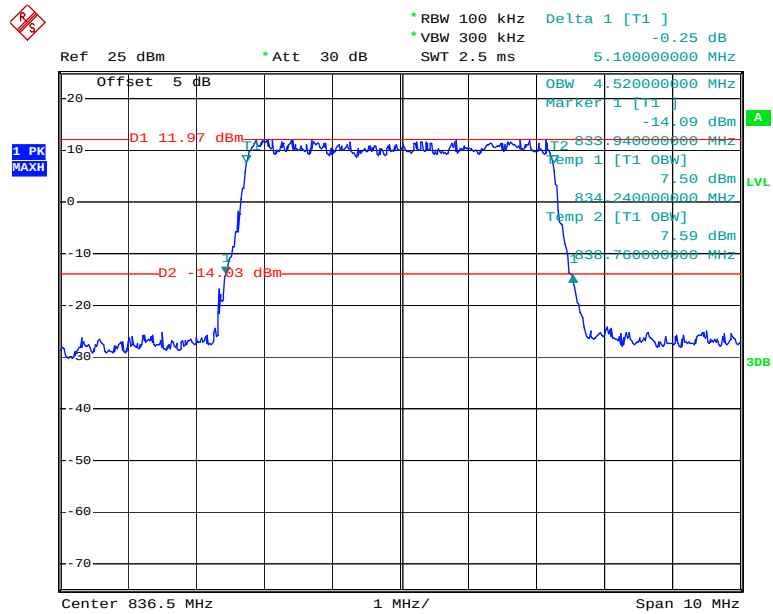
## 16QAM\_3 MHz



Date: 19.MAY.2020 10:21:15

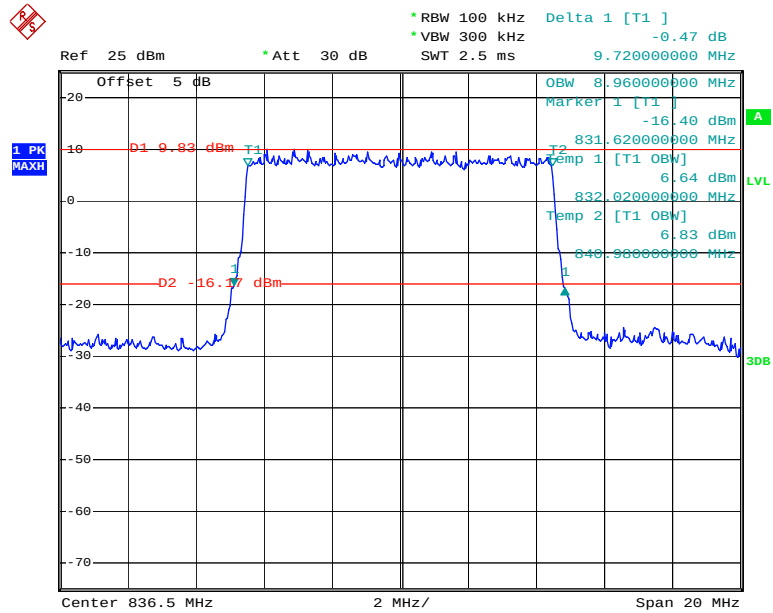


### 16QAM\_5 MHz

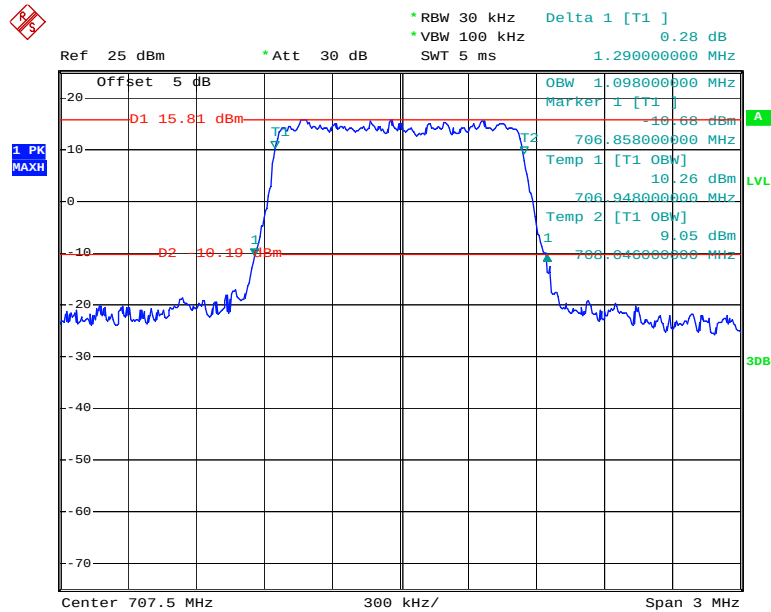


Date: 19.MAY.2020 10:22:03

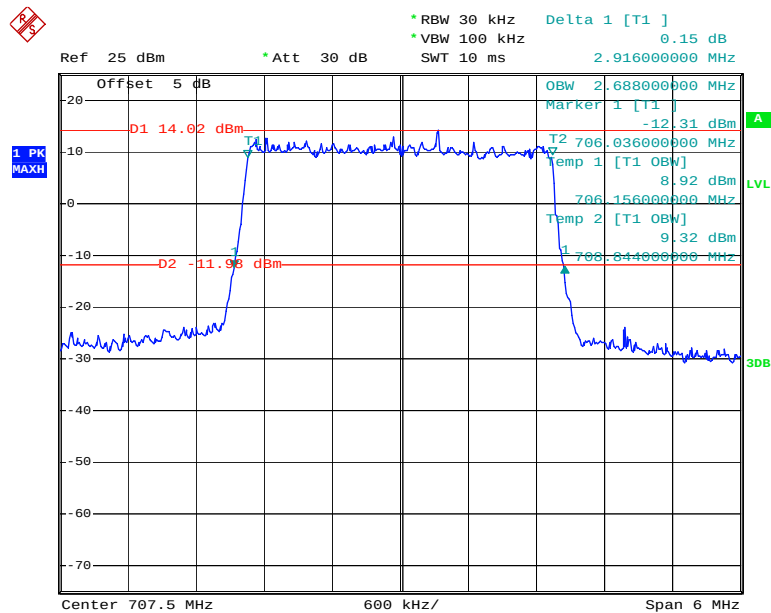
### 16QAM\_10 MHz



Date: 19.MAY.2020 10:22:50

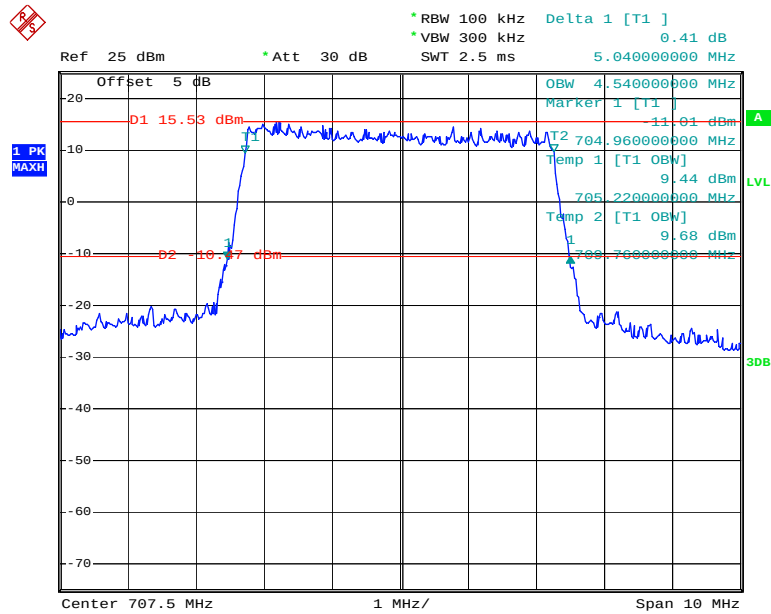
**LTE Band 12:****QPSK\_1.4 MHz**

Date: 19.MAY.2020 10:23:13

**QPSK\_3 MHz**

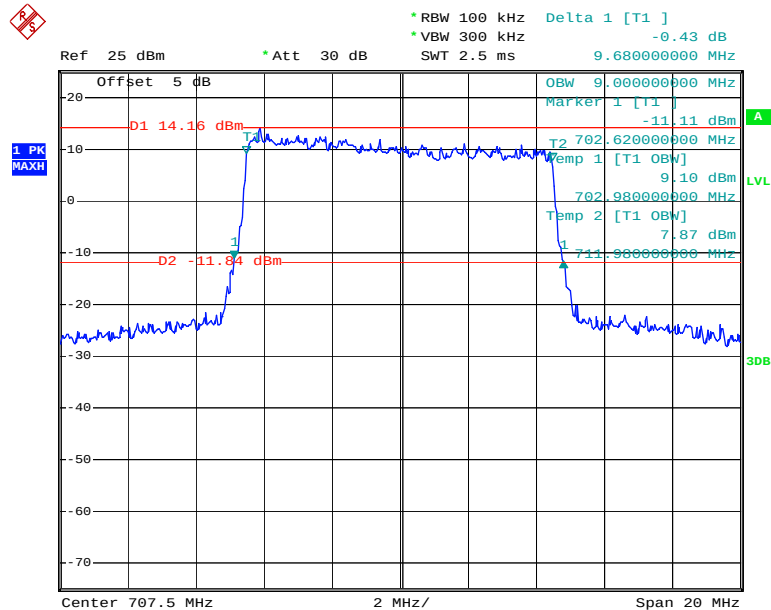
Date: 19.MAY.2020 10:24:02

## QPSK\_5 MHz



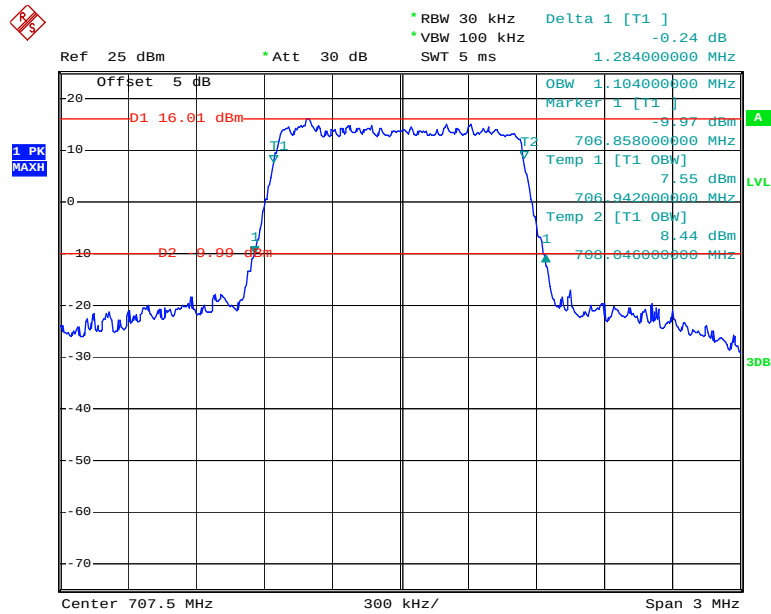
Date: 19.MAY.2020 10:24:47

## QPSK\_10 MHz



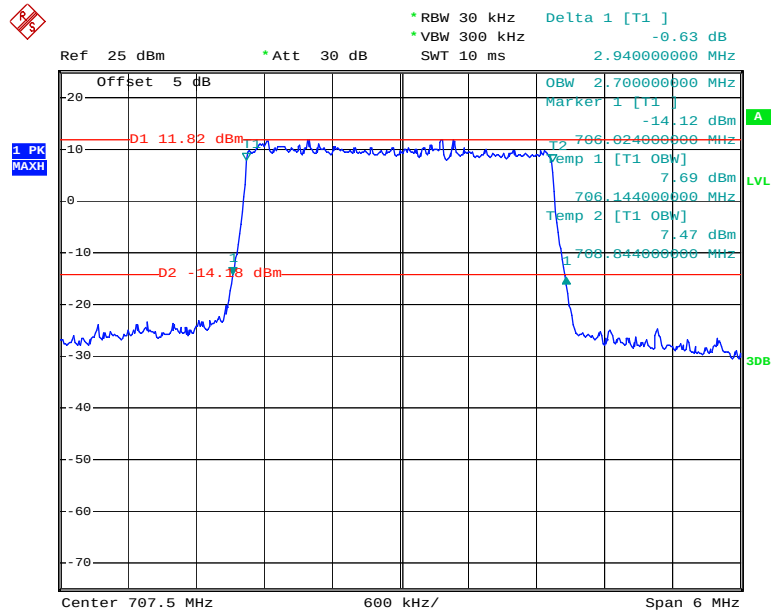
Date: 19.MAY.2020 10:25:32

### 16QAM\_1.4 MHz



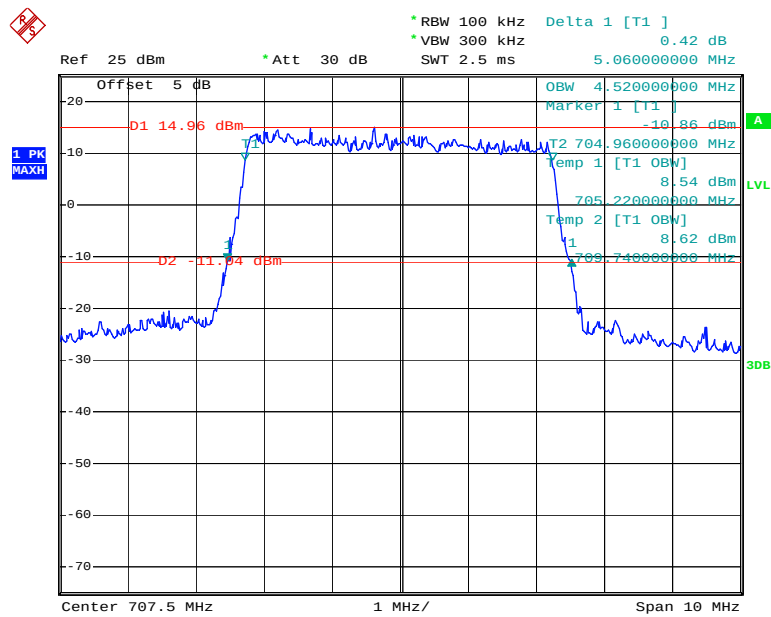
Date: 19.MAY.2020 10:23:38

### 16QAM\_3 MHz



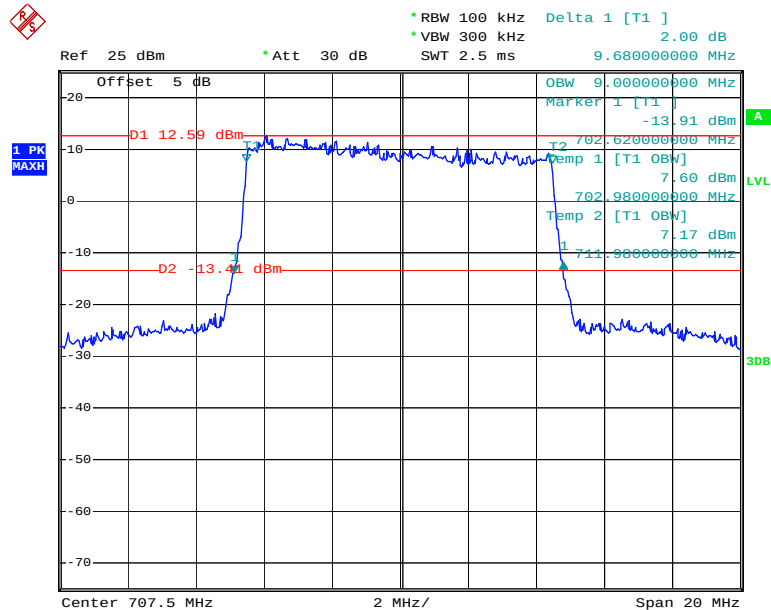
Date: 19.MAY.2020 11:58:58

## 16QAM\_5 MHz



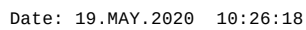
Date: 19.MAY.2020 10:25:08

## 16QAM\_10 MHz



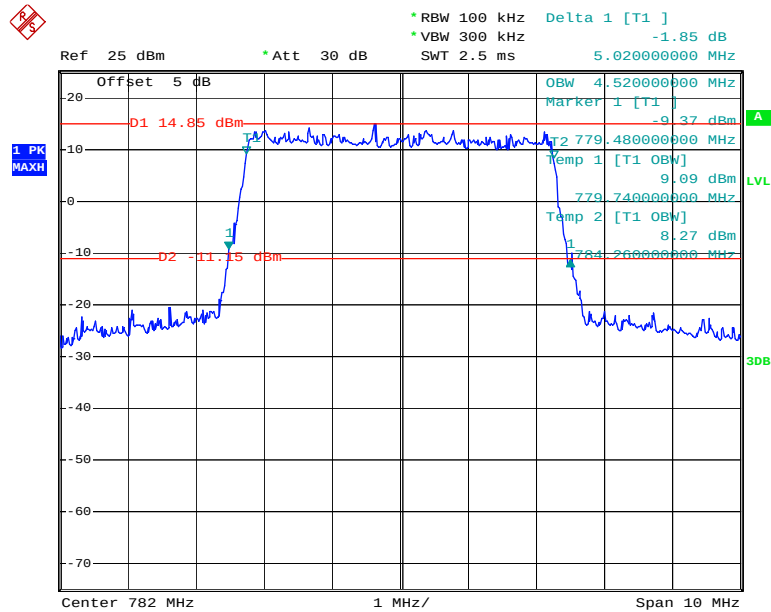
Date: 19.MAY.2020 10:25:55

**QPSK\_5 MHz**



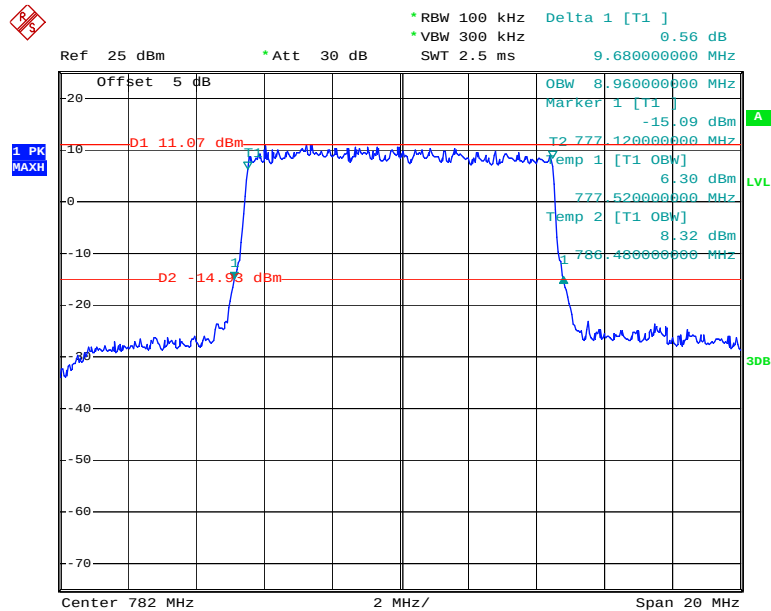
Date: 19.MAY.2020 10:27:04

### 16QAM\_5 MHz

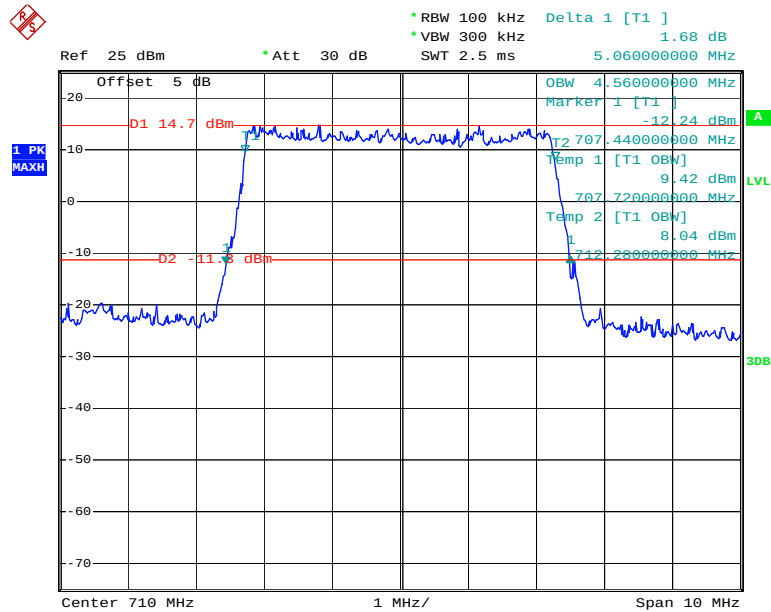


Date: 19.MAY.2020 10:26:39

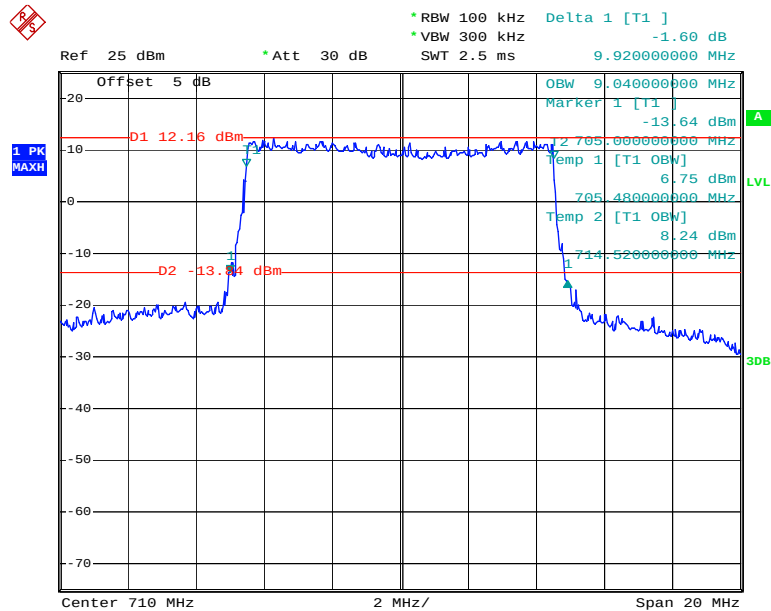
### 16QAM\_10MHz



Date: 19.MAY.2020 10:27:26

**LTE Band 17:****QPSK\_5 MHz**

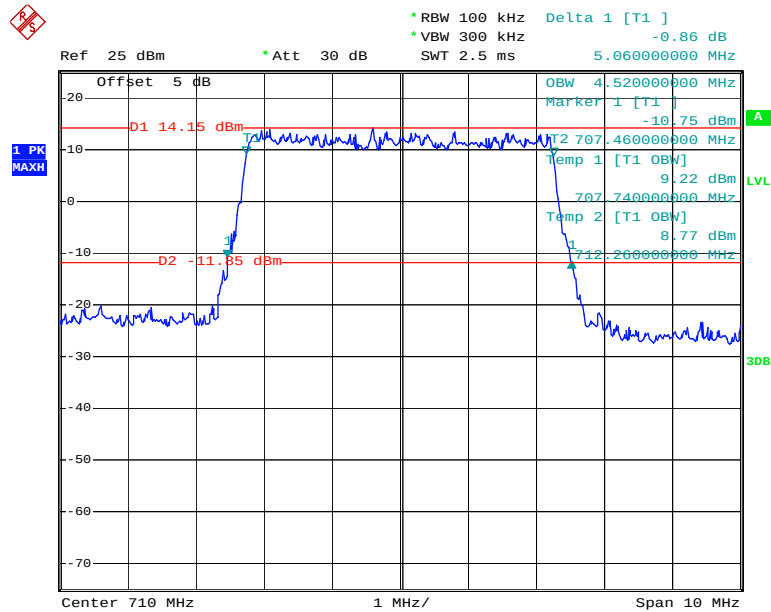
Date: 19.MAY.2020 10:27:50

**QPSK\_10 MHz**

Date: 19.MAY.2020 10:28:36

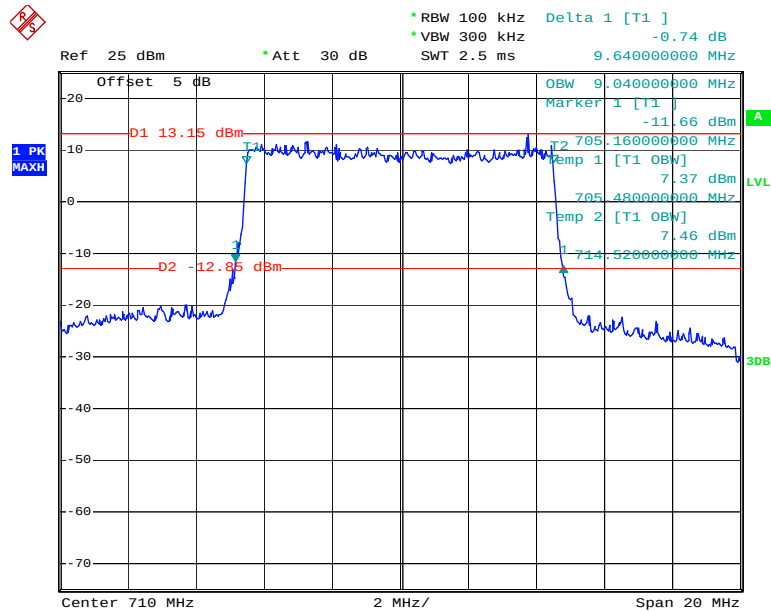


## 16QAM\_5 MHz



Date: 19.MAY.2020 10:28:11

## 16QAM\_10MHz



Date: 19.MAY.2020 10:28:59

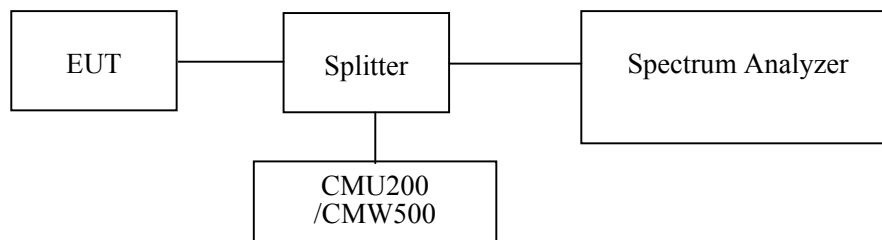
## FCC §2.1051, §22.917(a) & §24.238(a) & §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### Applicable Standard

FCC § 2.1053, §22.917, § 24.238 ,§ 27.53.

### Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. Sufficient scans were taken to show any out of band emissions up to 10<sup>th</sup> harmonic.



### Test Equipment List and Details

| Manufacturer | Description         | Model         | Serial Number | Calibration Date | Calibration Due Date |
|--------------|---------------------|---------------|---------------|------------------|----------------------|
| R&S          | Spectrum Analyzer   | FSU 26        | 200256        | 2020-05-09       | 2021-05-09           |
| yzjingcheng  | Coaxial Cable       | KTRFBU-141-50 | 41005011      | Each Time        | /                    |
| E-Microwave  | Two-way Splitter    | ODP-1-6-2S    | OE0120142     | Each Time        | /                    |
| Unknown      | Coaxial Cable       | C-SJ00-0010   | C0010/04      | Each Time        | /                    |
| E-Microwave  | Coaxial Attenuators | EMCA10-5RN-6  | OE01203239    | Each Time        | /                    |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

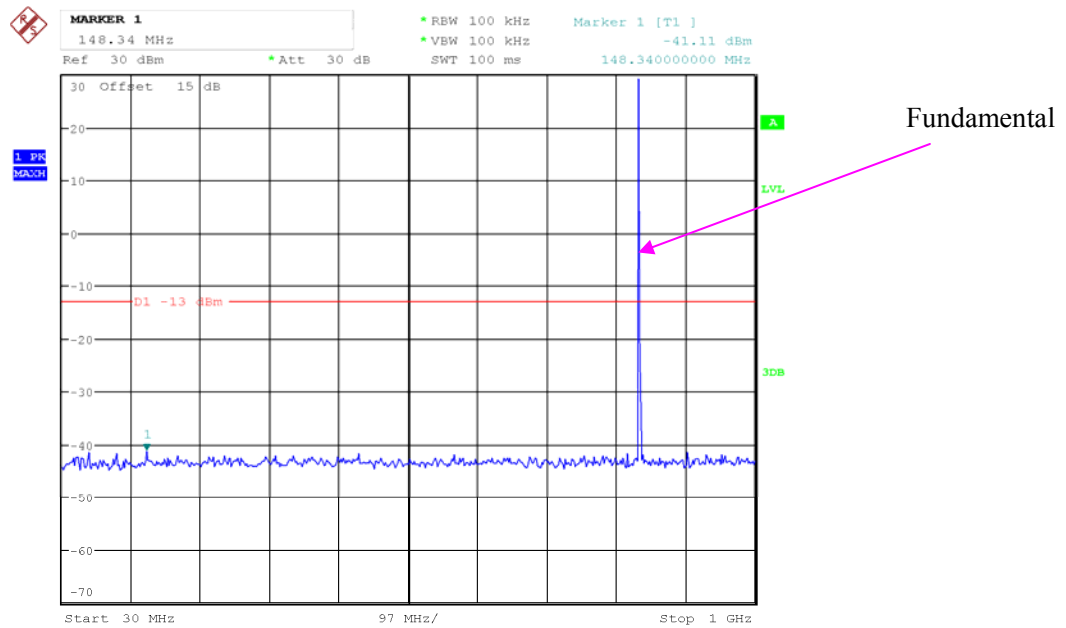
### Test Data

#### Environmental Conditions

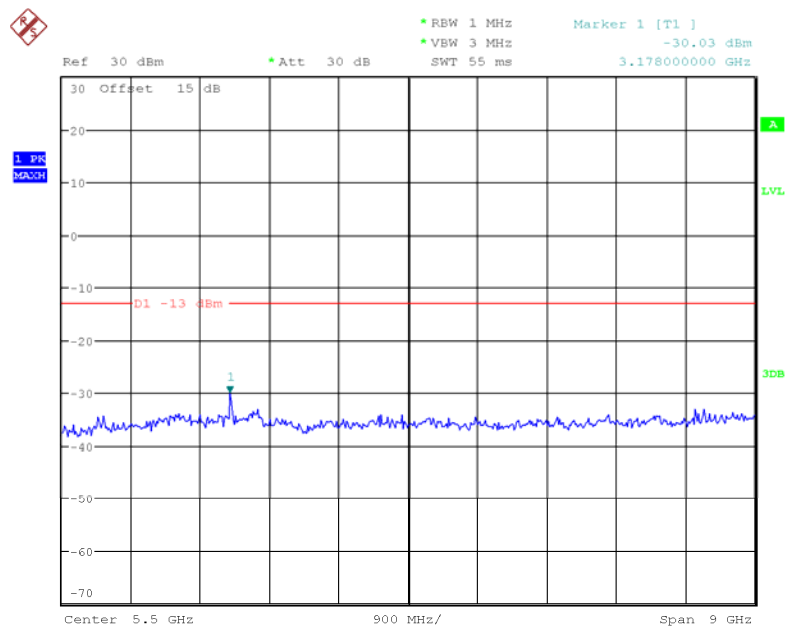
|                    |                       |
|--------------------|-----------------------|
| Temperature:       | 26.1~26.9°C           |
| Relative Humidity: | 59~67 %               |
| ATM Pressure:      | 99.4~100 kPa          |
| Tester:            | Chris Mo              |
| Test Date:         | 2020-05-20~2020-05-22 |

Please refer to the following plots.

### GSM850\_Middle Channel

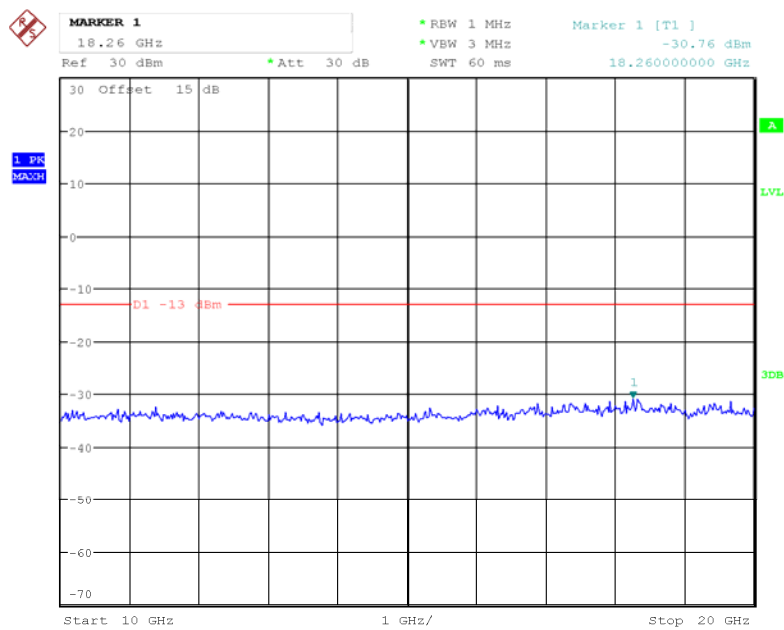


Date: 22.MAY.2020 17:45:09



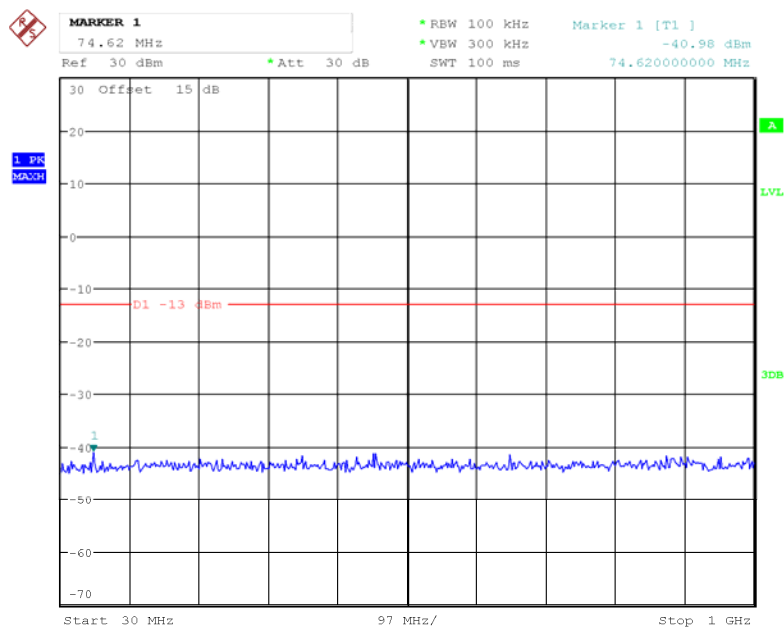
Date: 22.MAY.2020 17:44:32



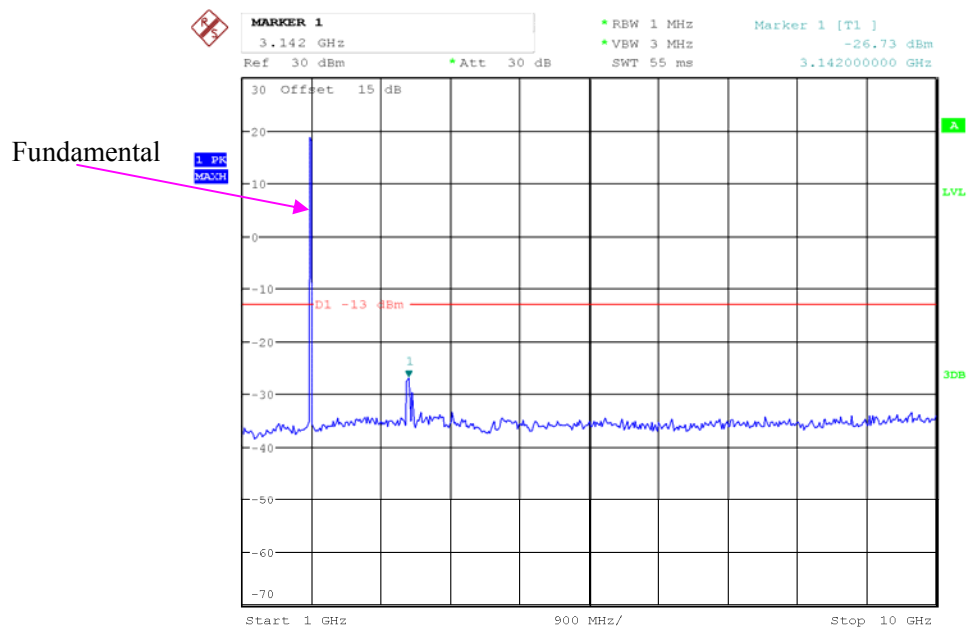


Date: 22.MAY.2020 16:47:20

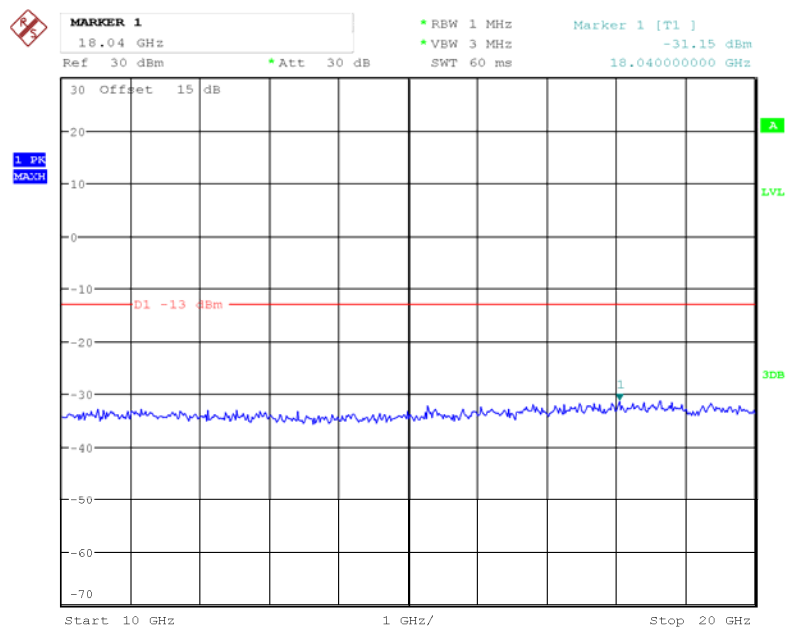
### WCDMA Band II, Rel99



Date: 22.MAY.2020 19:17:57

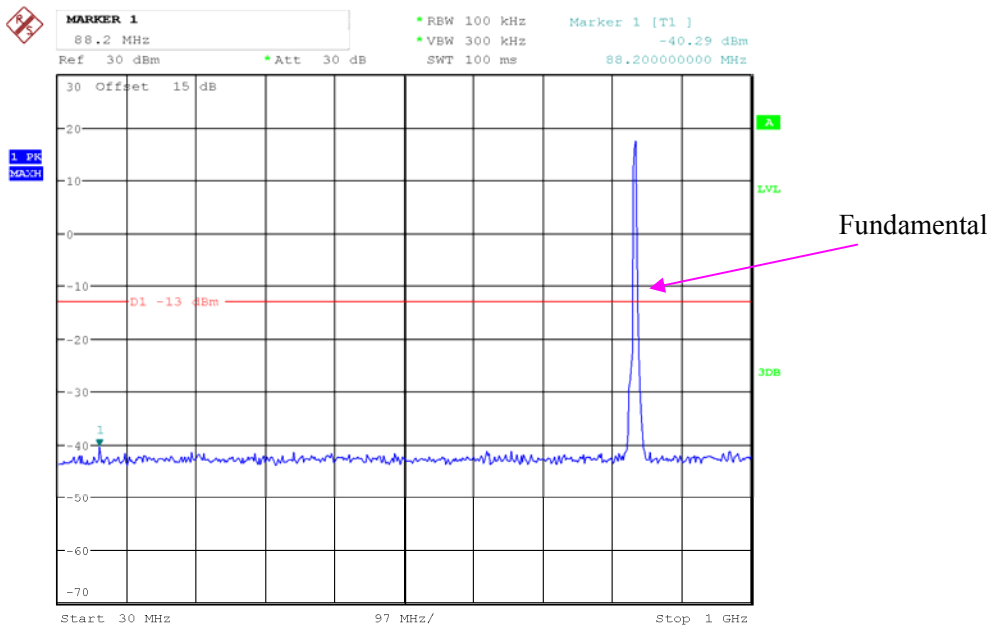


Date: 22.MAY.2020 19:17:31

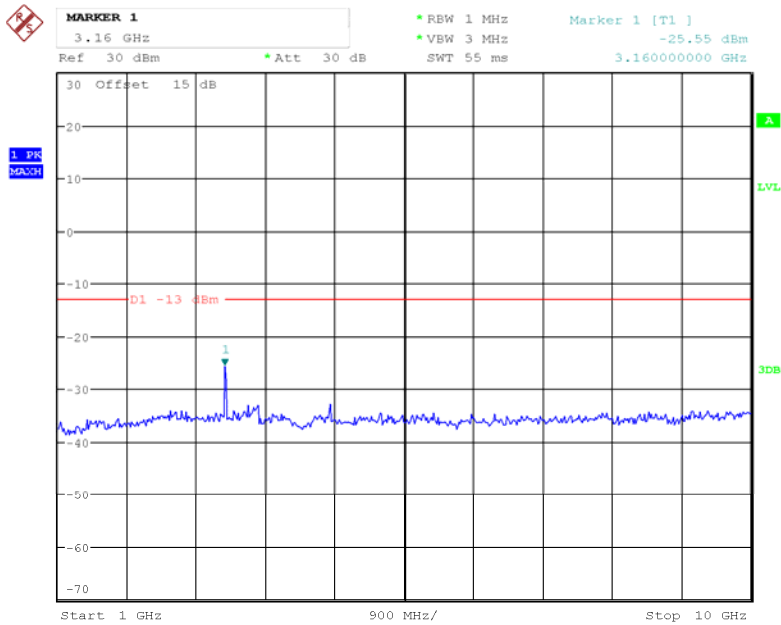


Date: 22.MAY.2020 19:17:09

WCDMA Band V,Rel99



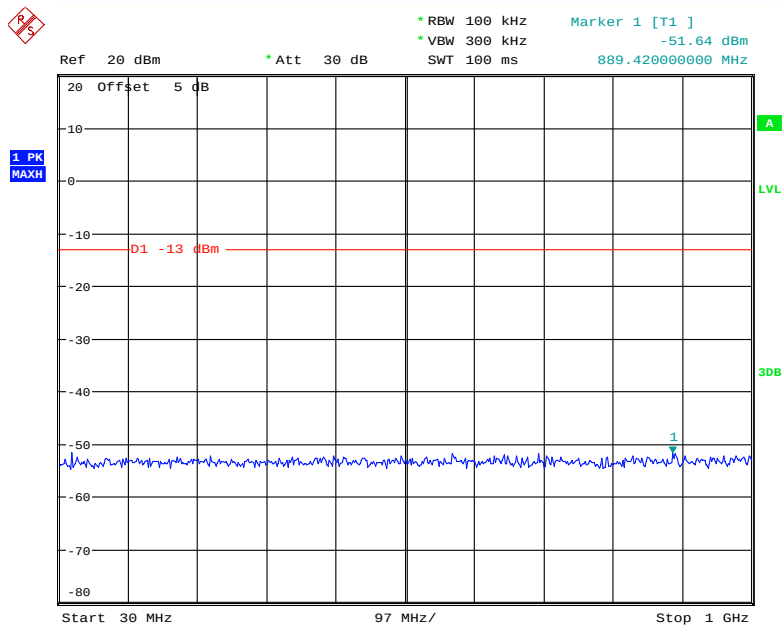
Date: 22.MAY.2020 19:16:00



Date: 22.MAY.2020 19:16:28

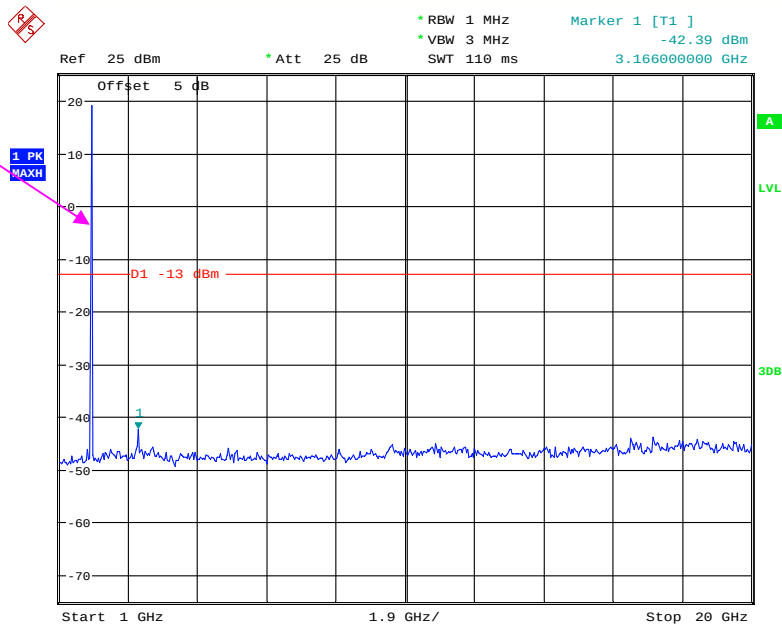
# LTE Band 2 (Middle Channel)

## QPSK\_1.4 MHz



Date: 20.MAY.2020 10:17:49

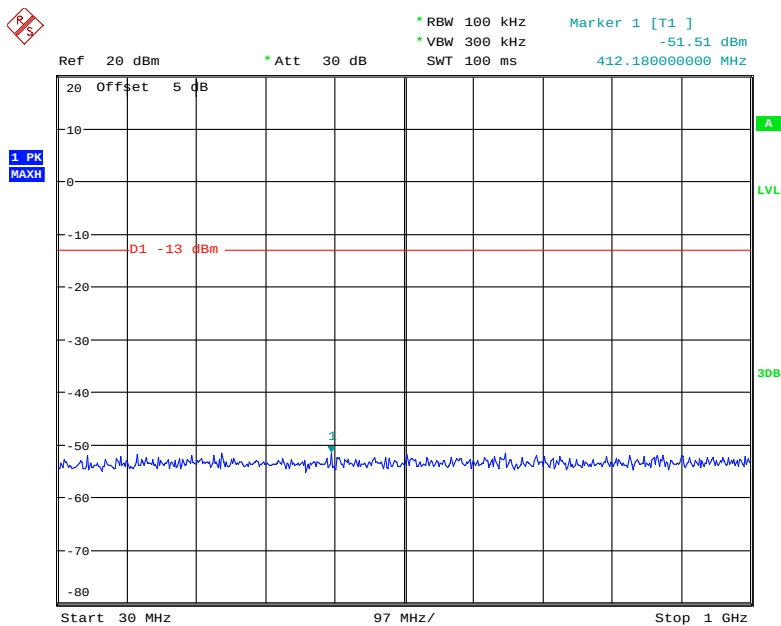
Fundamental



Date: 20.MAY.2020 10:18:01

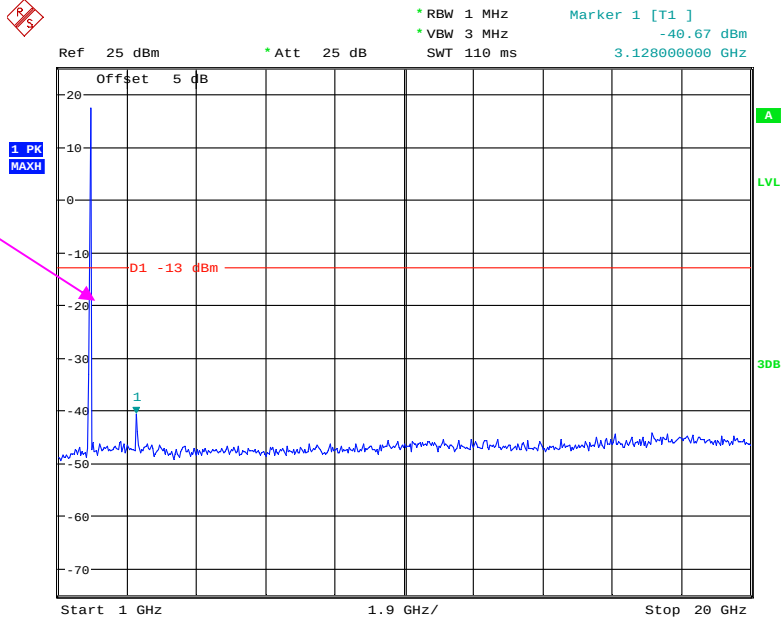


QPSK\_3 MHz



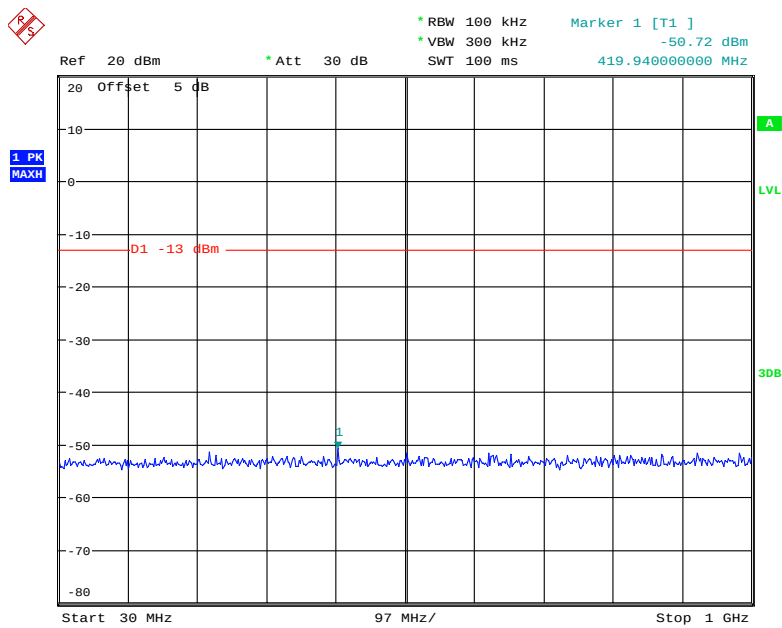
Date: 20.MAY.2020 10:18:20

Fundamental



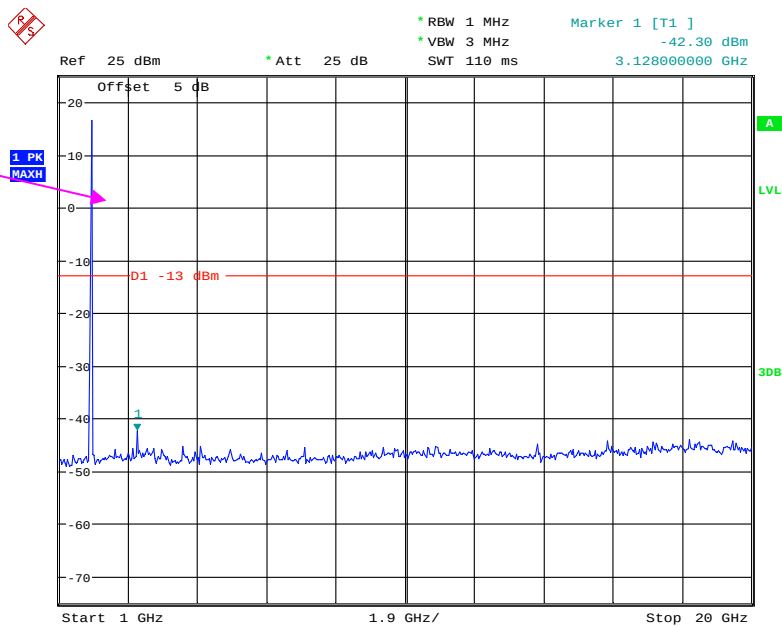
Date: 20.MAY.2020 10:18:32

### QPSK\_5 MHz



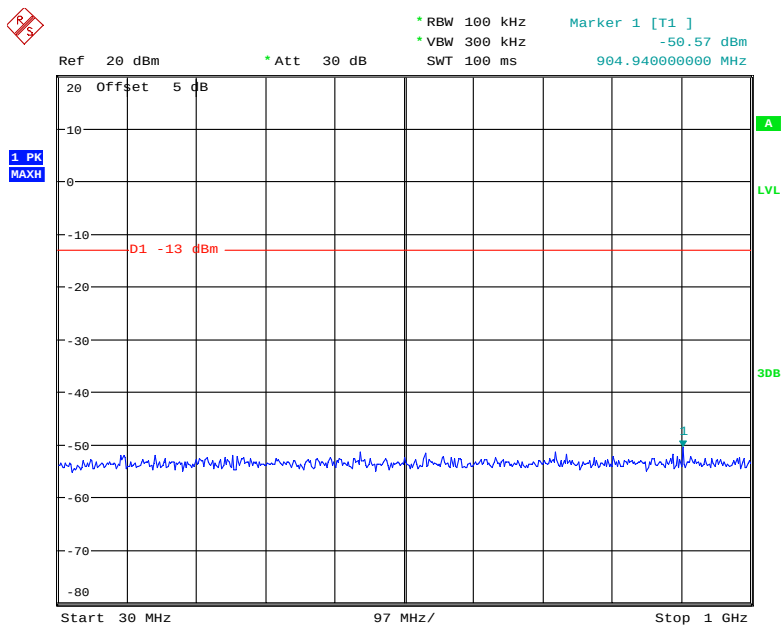
Date: 20.MAY.2020 10:18:54

Fundamental

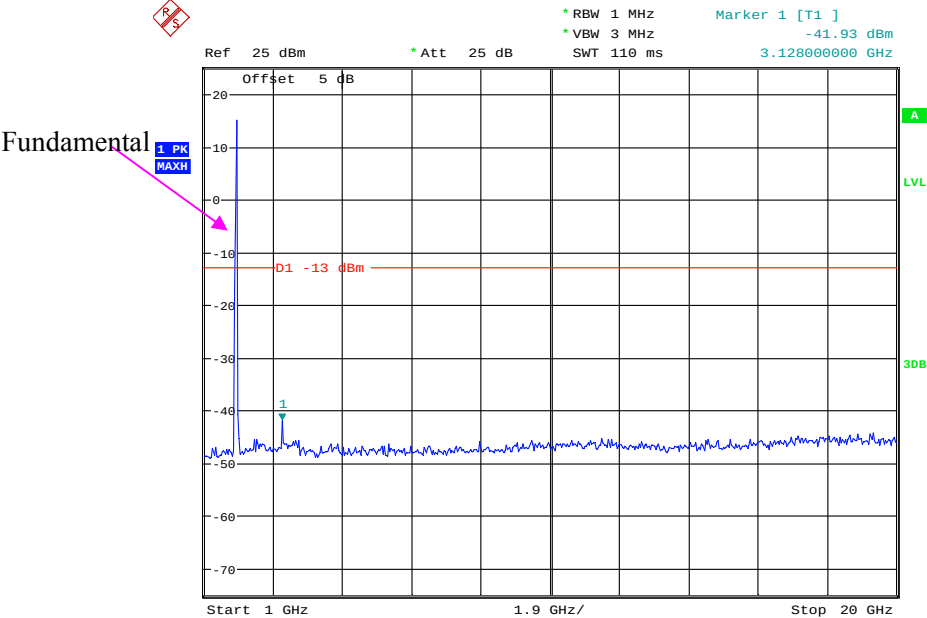


Date: 20.MAY.2020 10:19:06

QPSK\_10 MHz

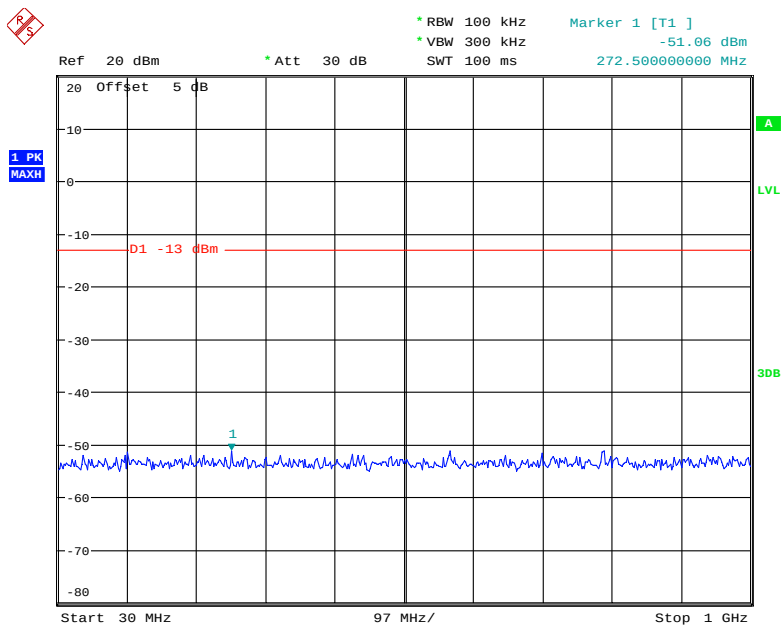


Date: 20.MAY.2020 10:19:26

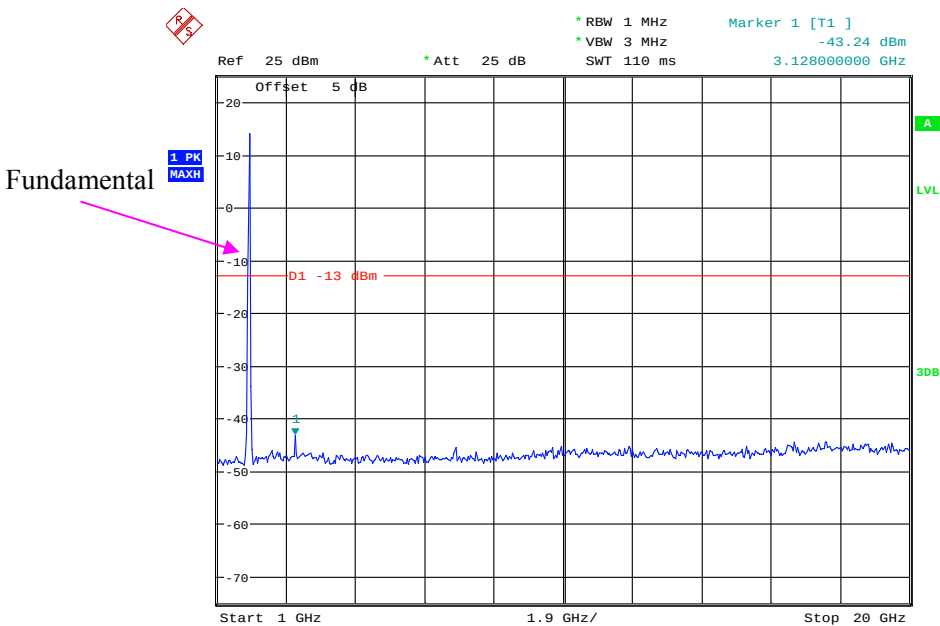


Date: 20.MAY.2020 10:19:38

QPSK\_15 MHz

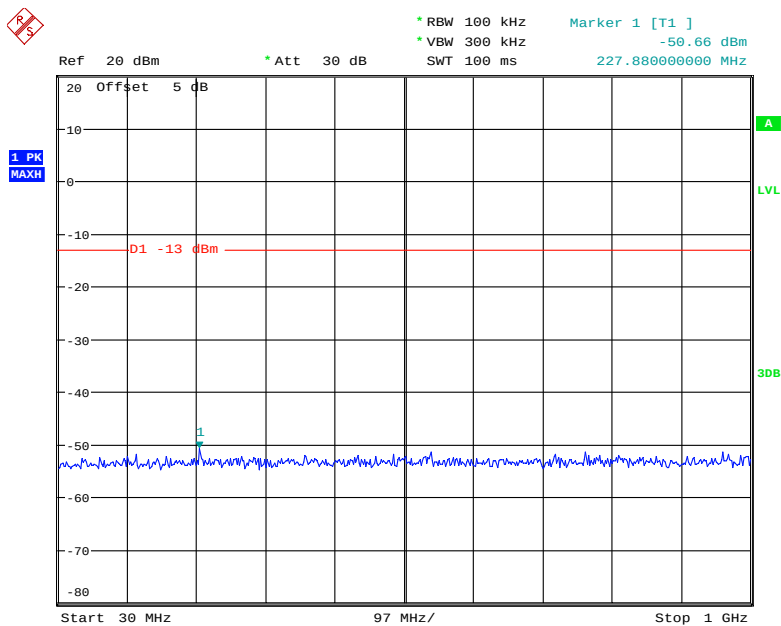


Date: 20.MAY.2020 10:20:01

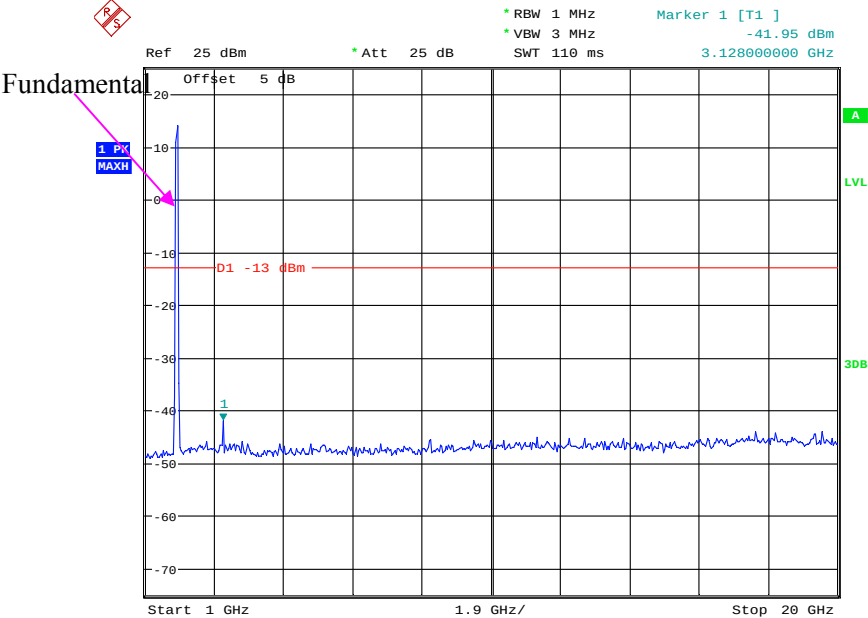


Date: 20.MAY.2020 10:20:13

QPSK\_20 MHz



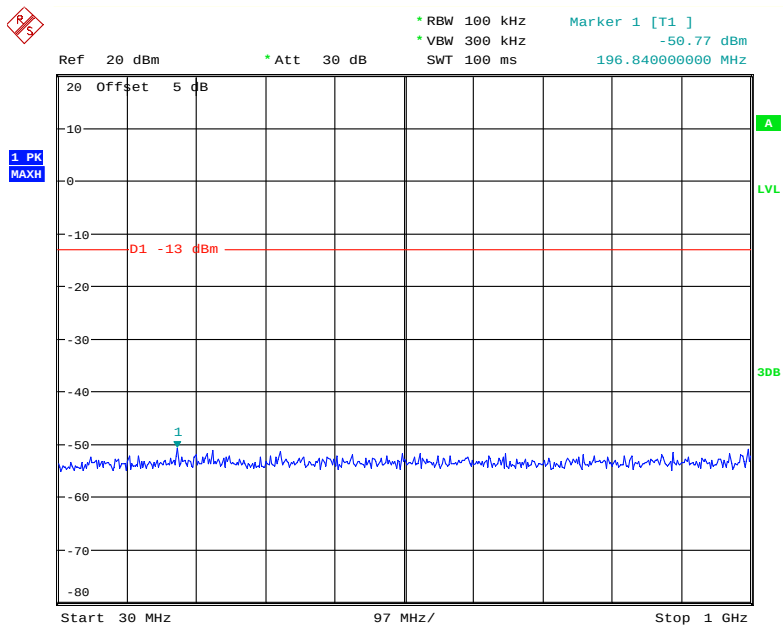
Date: 20.MAY.2020 10:20:39



Date: 20.MAY.2020 10:20:51

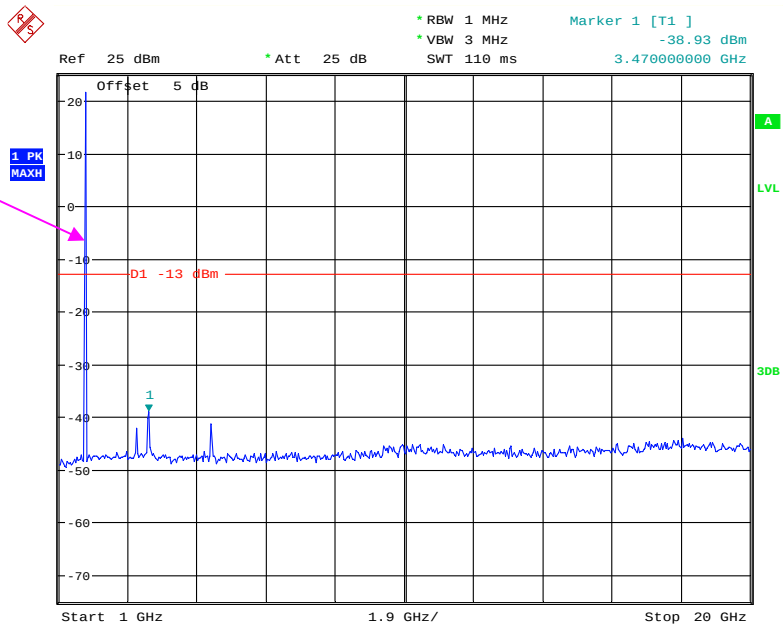
LTE Band 4 (Middle Channel)

QPSK\_1.4 MHz



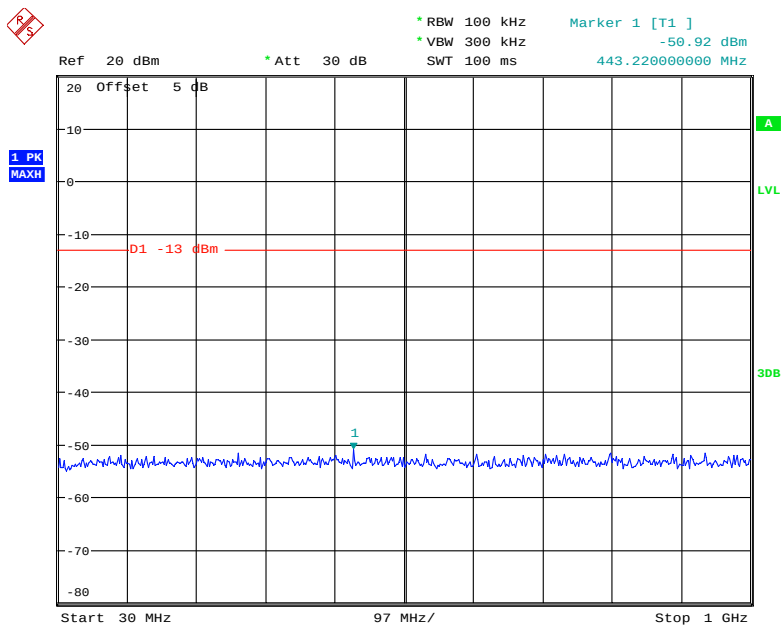
Date: 20.MAY.2020 10:21:10

Fundamental



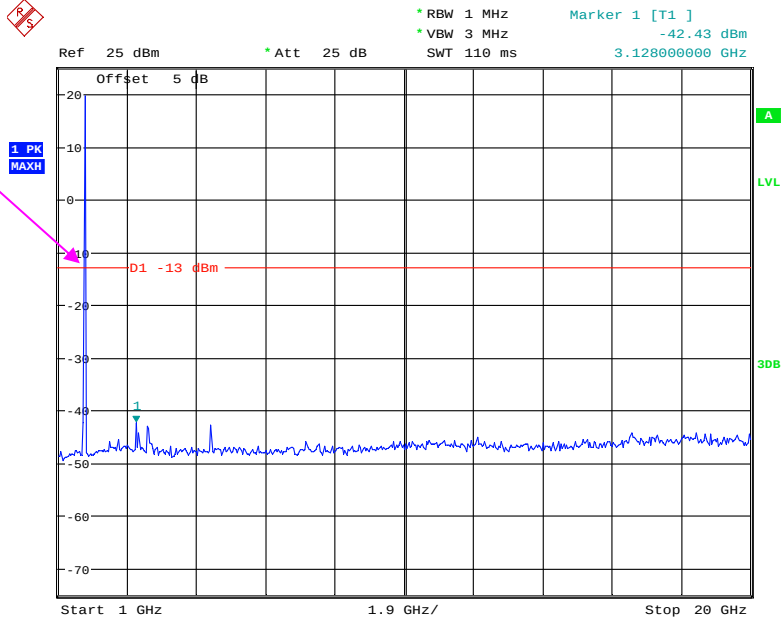
Date: 20.MAY.2020 10:21:22

QPSK\_3 MHz



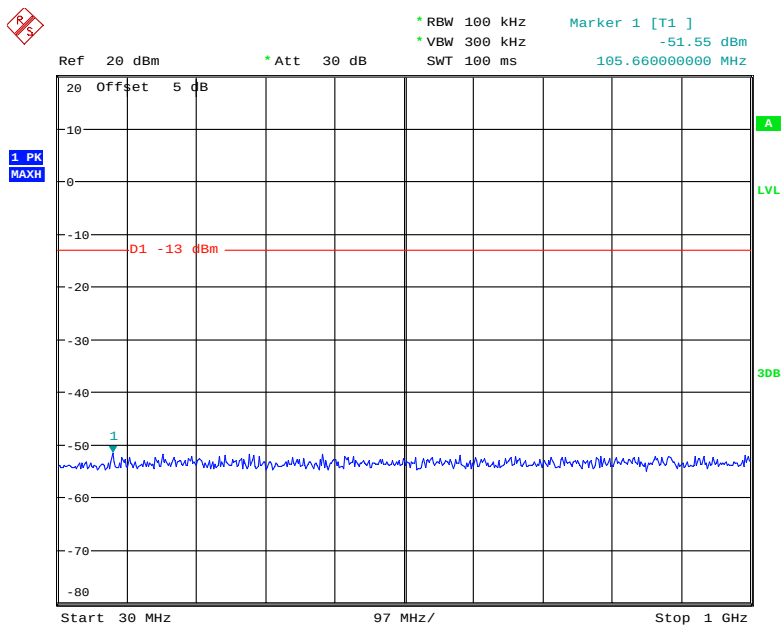
Date: 20.MAY.2020 10:21:44

Fundamental



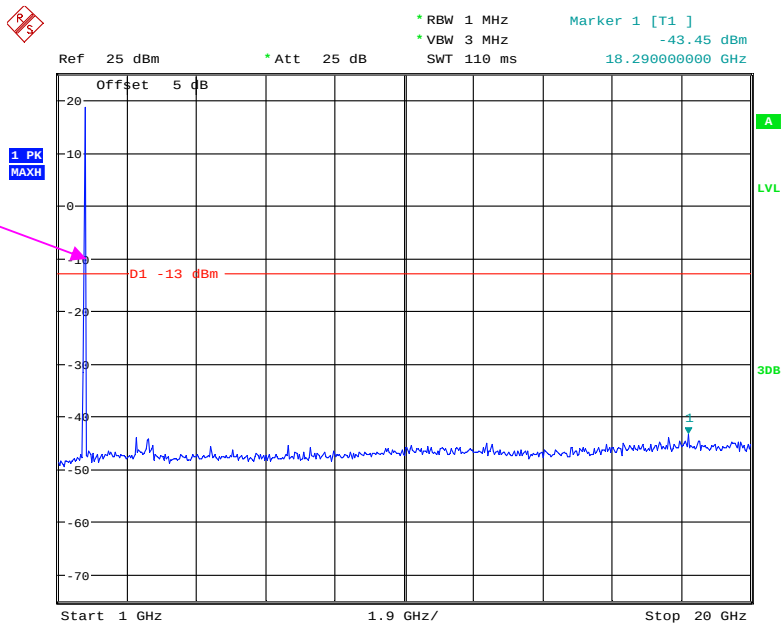
Date: 20.MAY.2020 10:21:56

QPSK\_5 MHz



Date: 20.MAY.2020 10:22:16

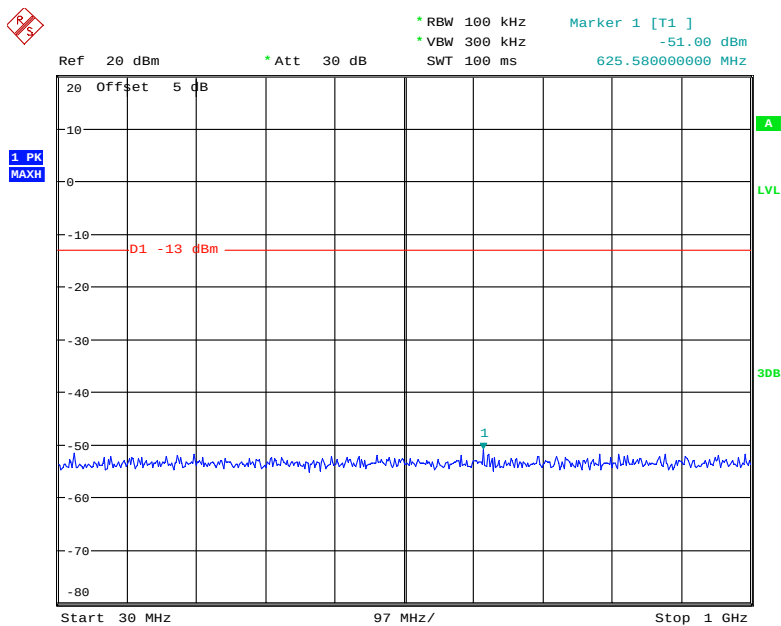
Fundamental



Date: 20.MAY.2020 10:22:27

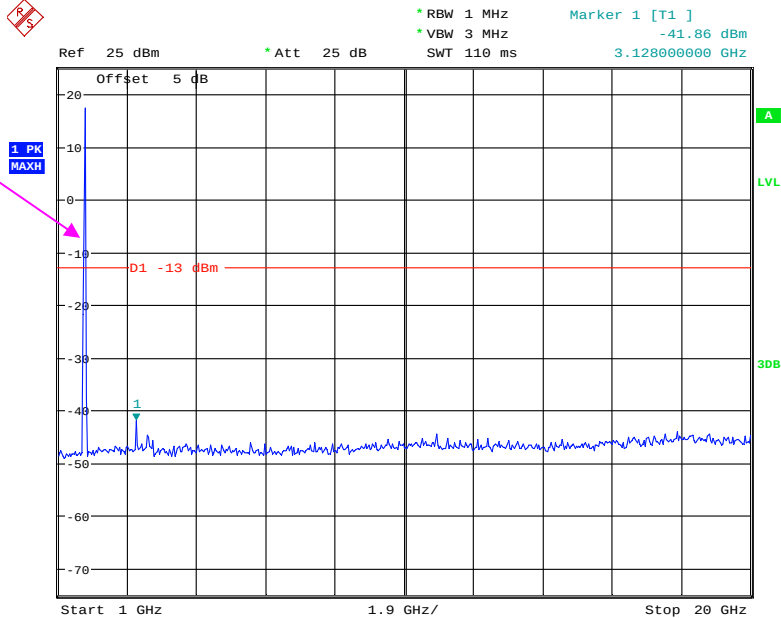


QPSK\_10 MHz



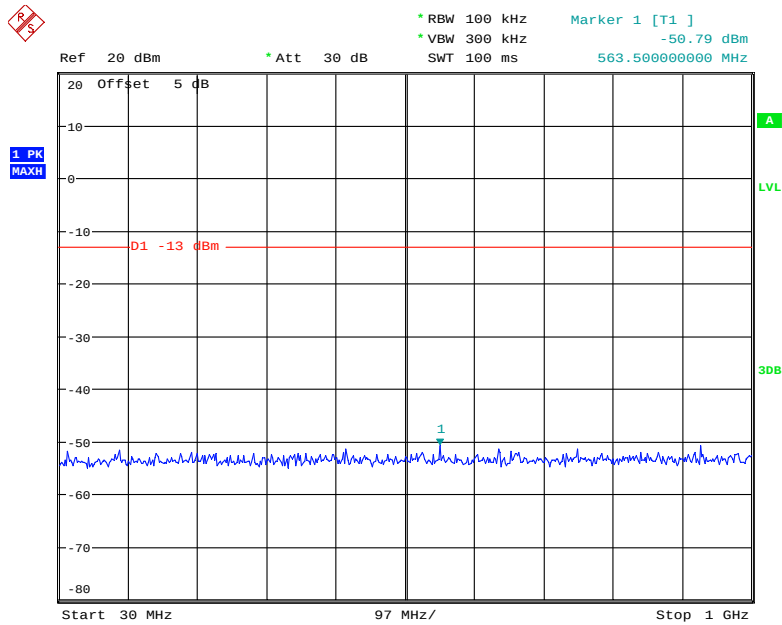
Date: 20.MAY.2020 10:22:48

Fundamental



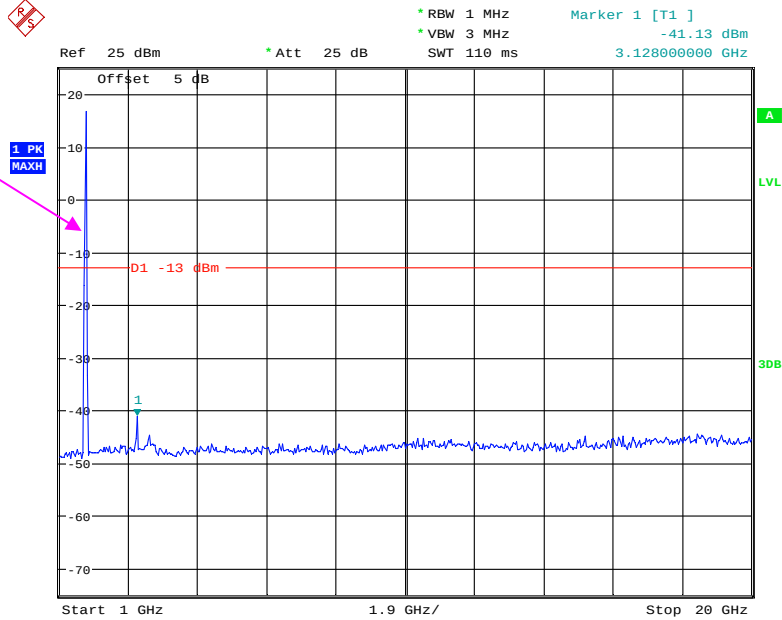
Date: 20.MAY.2020 10:23:00

### QPSK\_15 MHz



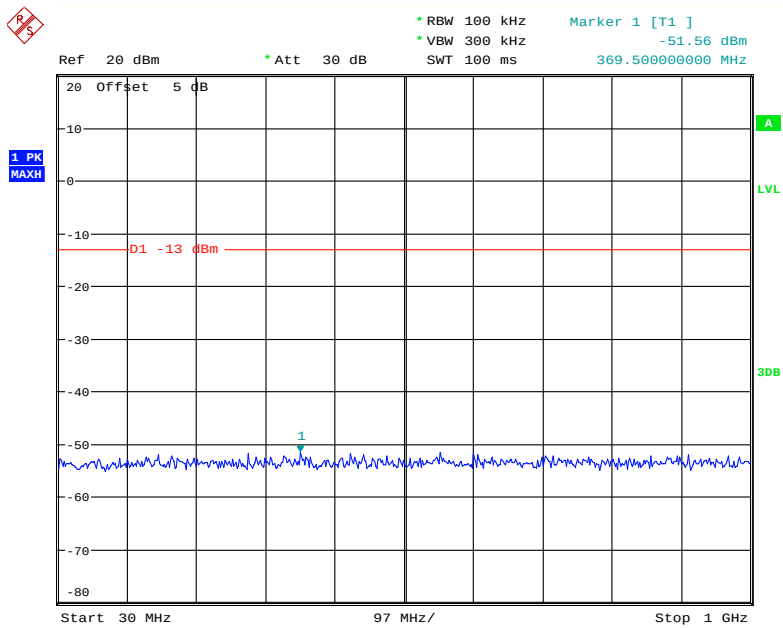
Date: 20.MAY.2020 10:23:22

Fundamental



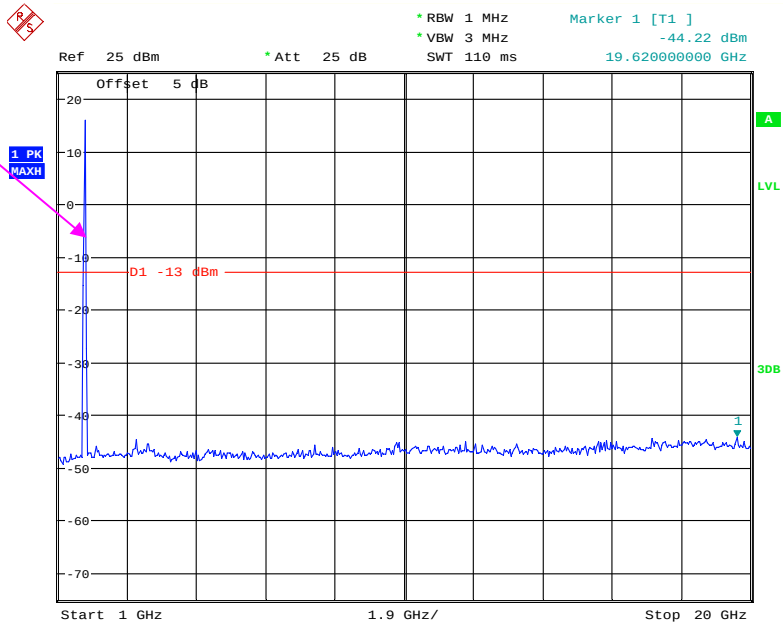
Date: 20.MAY.2020 10:23:34

QPSK\_20 MHz



Date: 20.MAY.2020 10:23:57

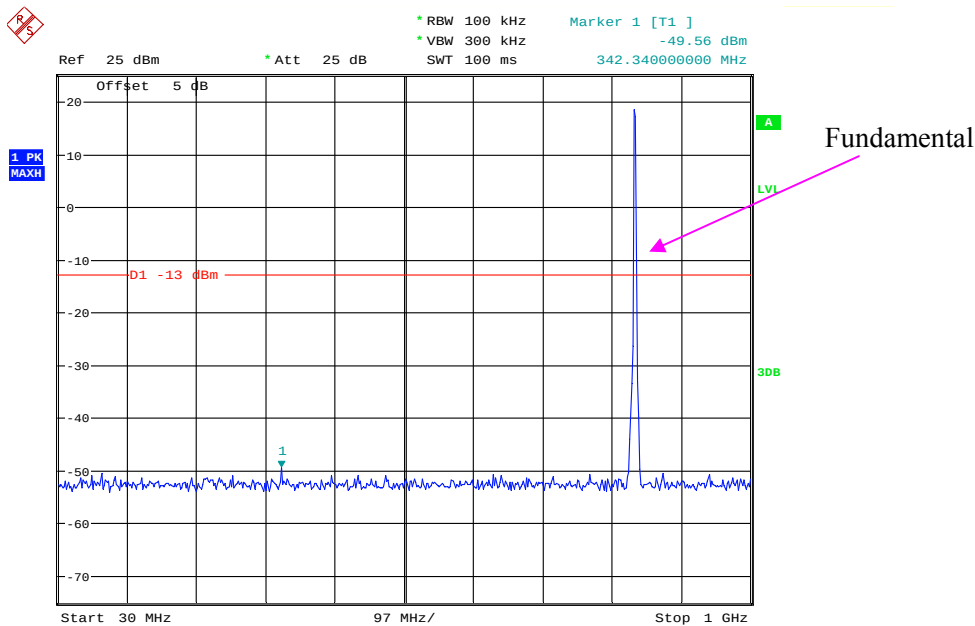
Fundamental



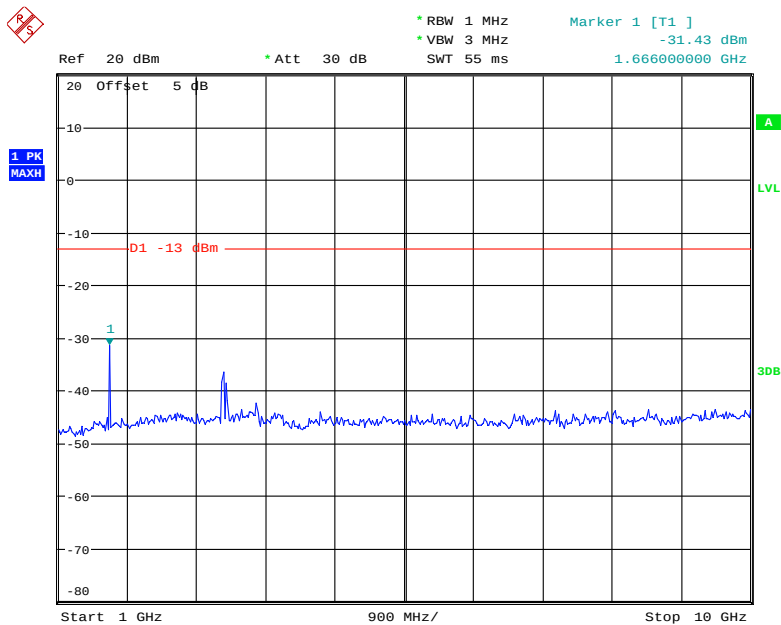
Date: 20.MAY.2020 10:24:09

LTE Band 5 (Middle Channel)

QPSK\_1.4 MHz

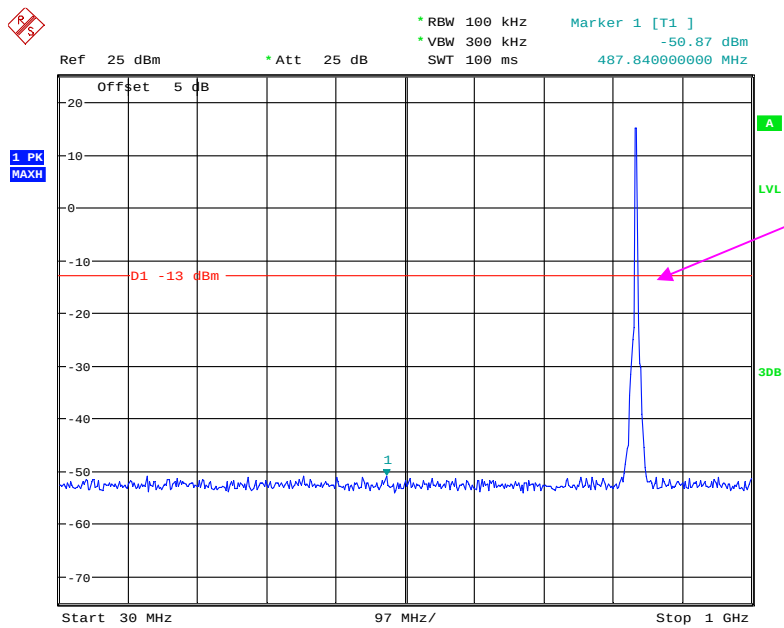


Date: 20.MAY.2020 10:24:28

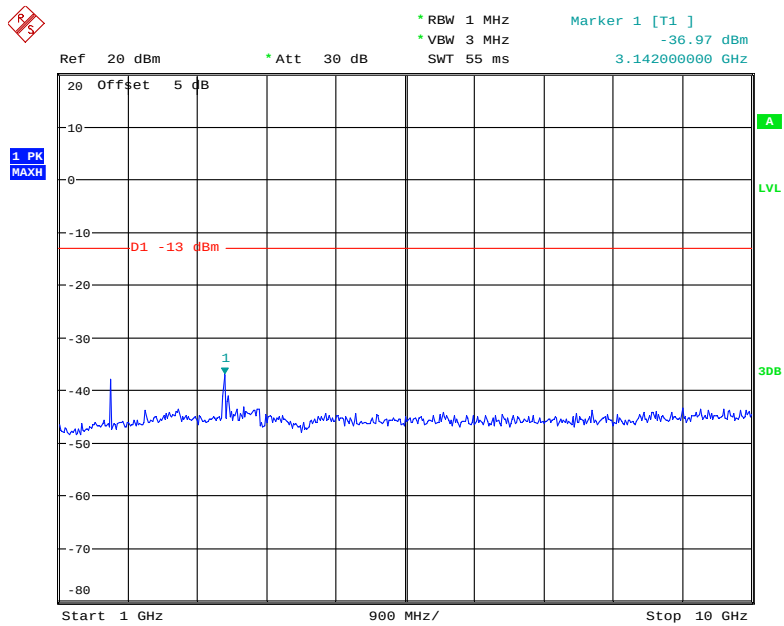


Date: 20.MAY.2020 10:24:40

### QPSK\_3 MHz

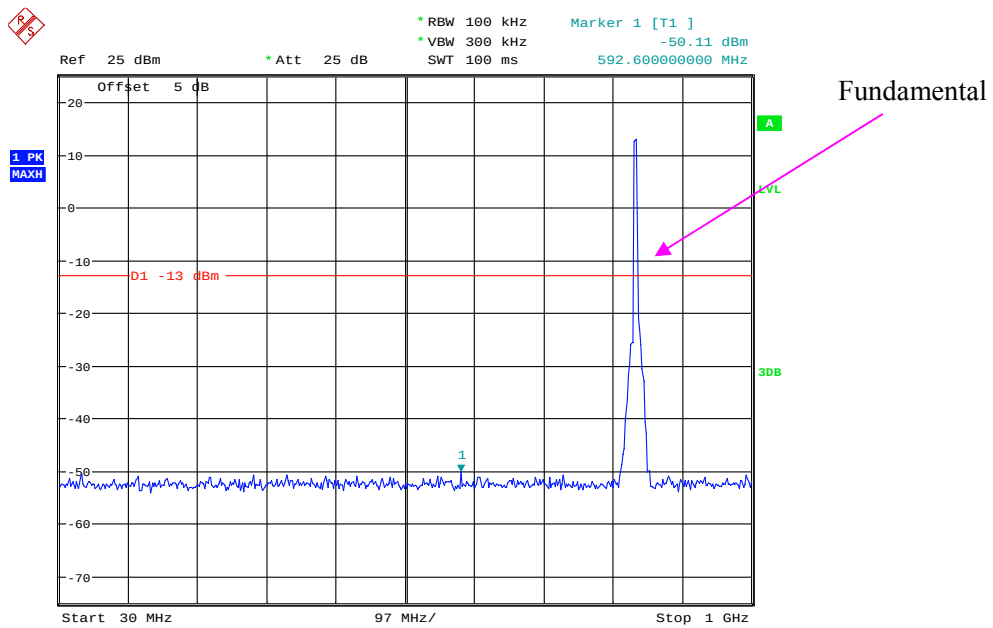


Date: 20.MAY.2020 10:24:59

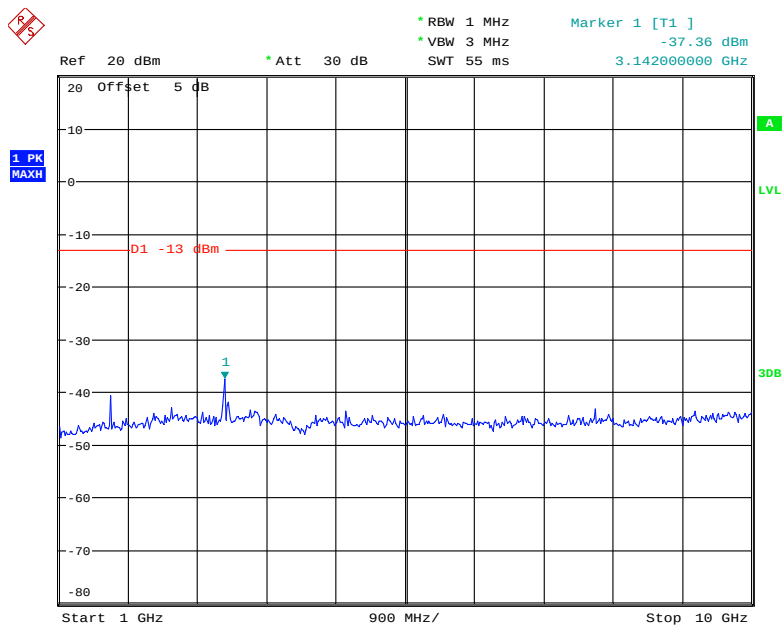


Date: 20.MAY.2020 10:25:11

### QPSK\_5 MHz

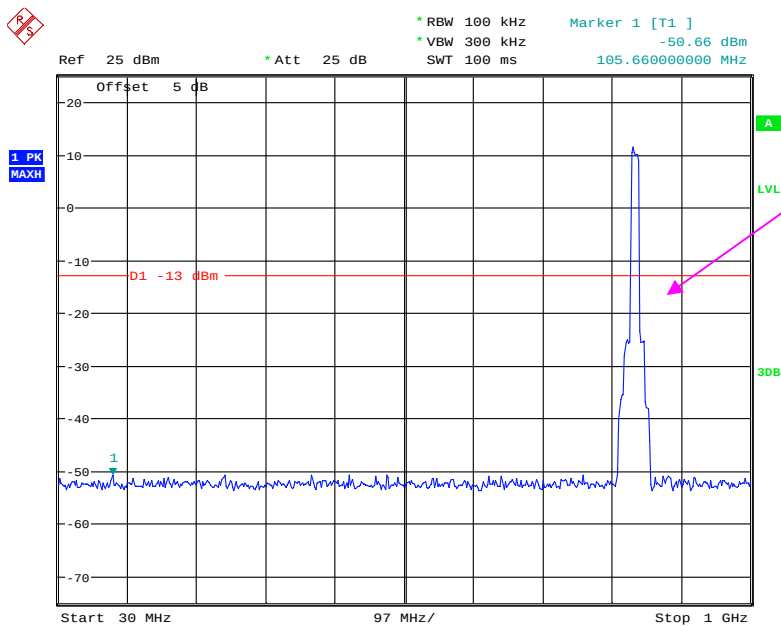


Date: 20.MAY.2020 10:25:34



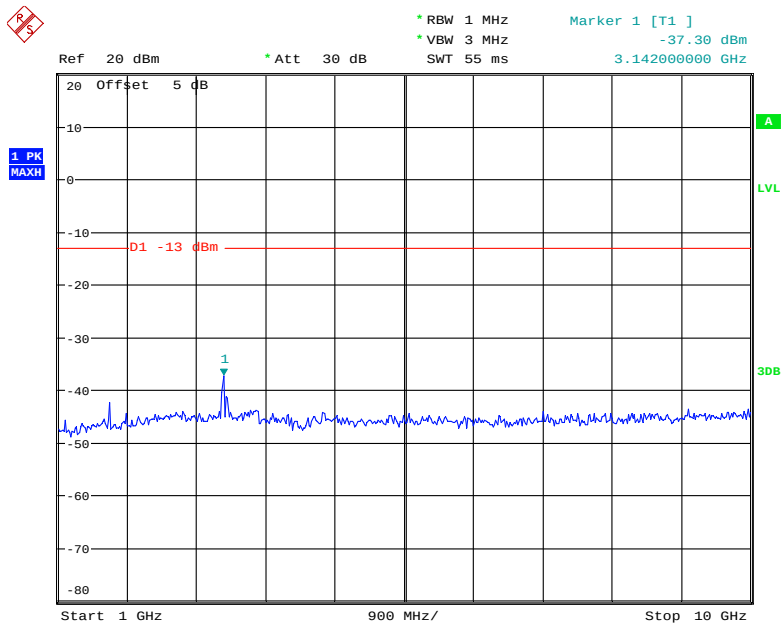
Date: 20.MAY.2020 10:25:45

QPSK\_10 MHz



Fundamental

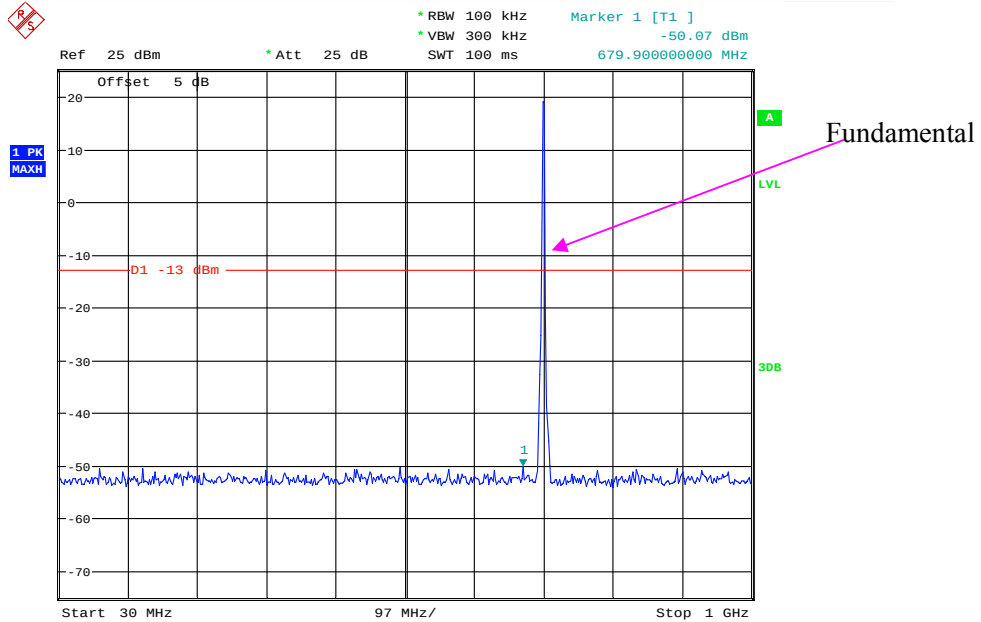
Date: 20.MAY.2020 10:26:09



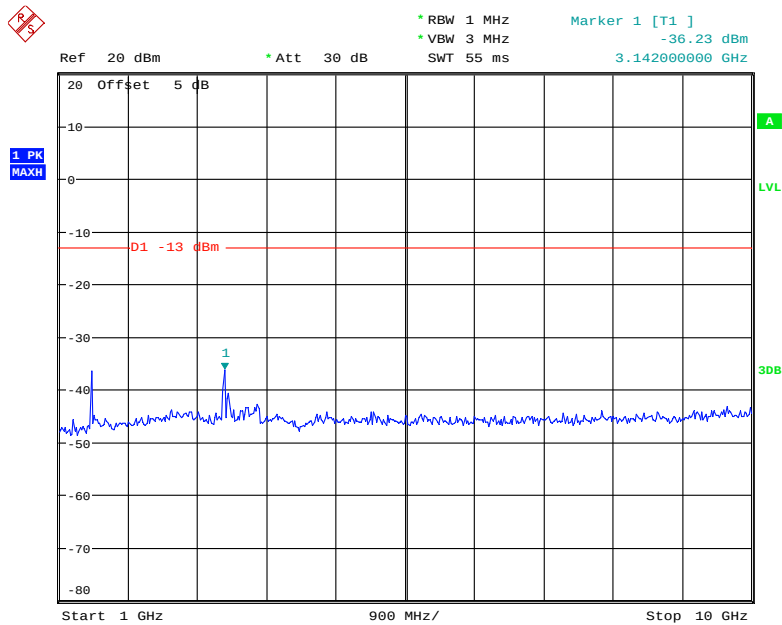
Date: 20.MAY.2020 10:26:21

# LTE Band 12 (Middle Channel)

## QPSK\_1.4 MHz



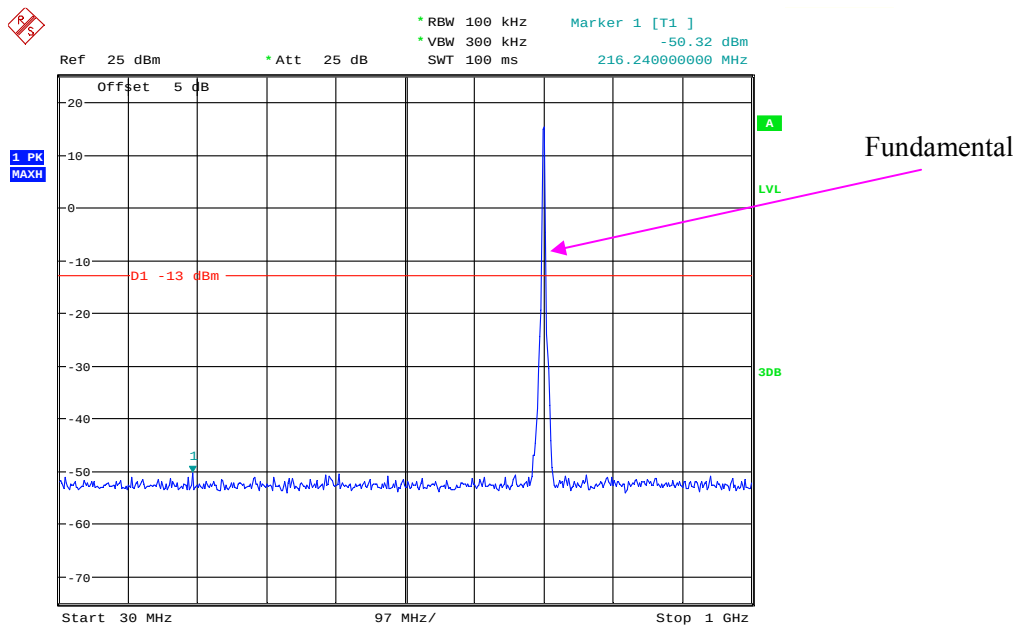
Date: 20.MAY.2020 10:26:40



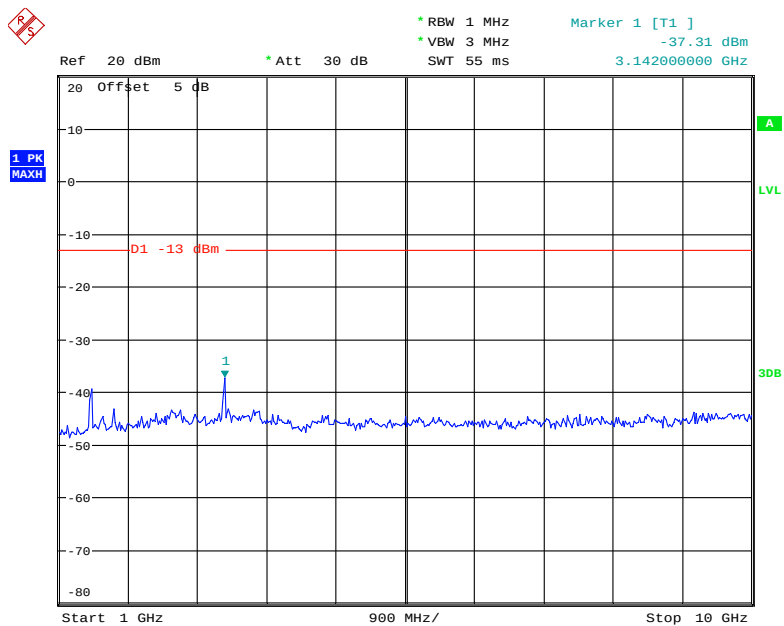
Date: 20.MAY.2020 10:26:52



**QPSK\_3 MHz**



Date: 20.MAY.2020 10:27:11



Date: 20.MAY.2020 10:27:23

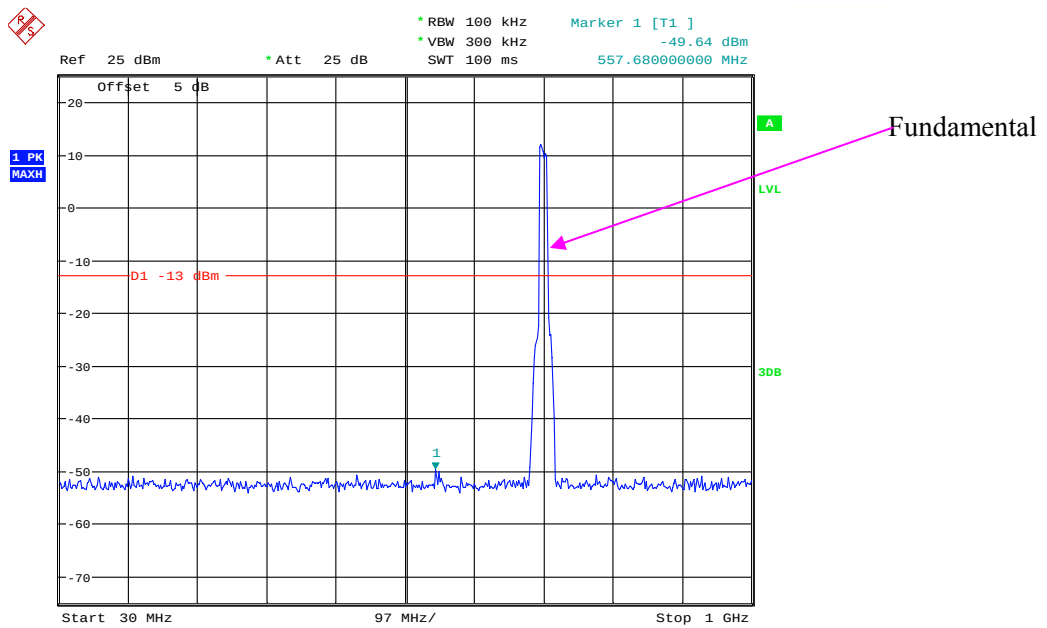


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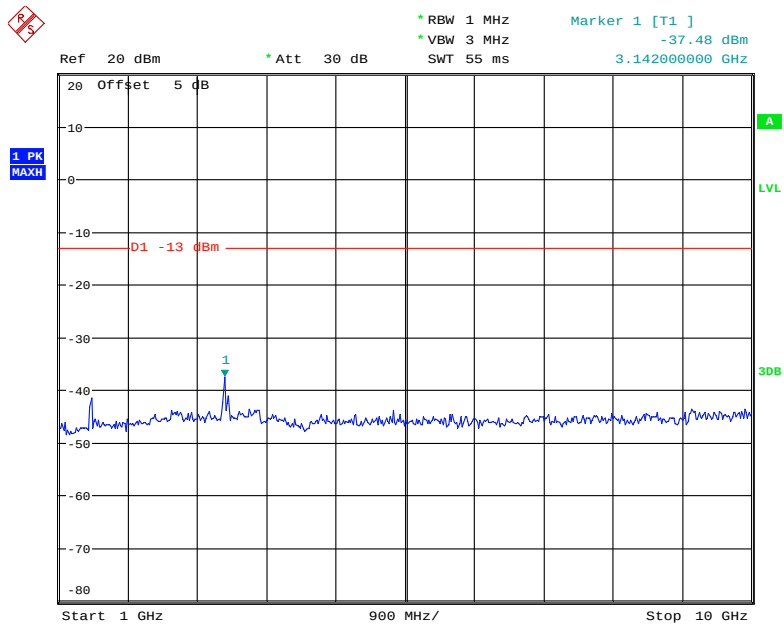
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# QPSK\_10 MHz



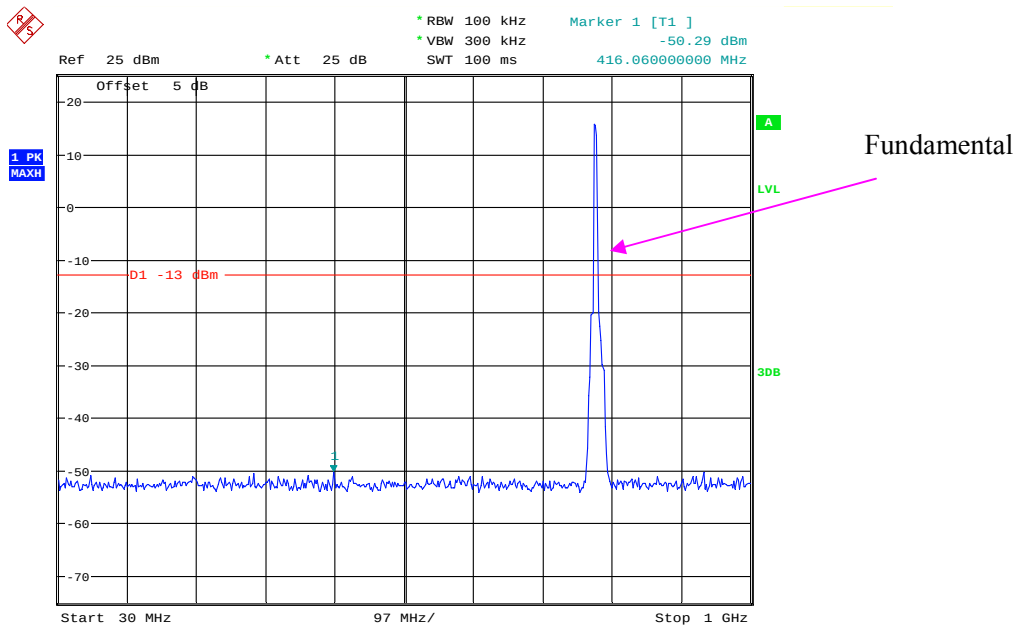
Date: 20.MAY.2020 10:28:14



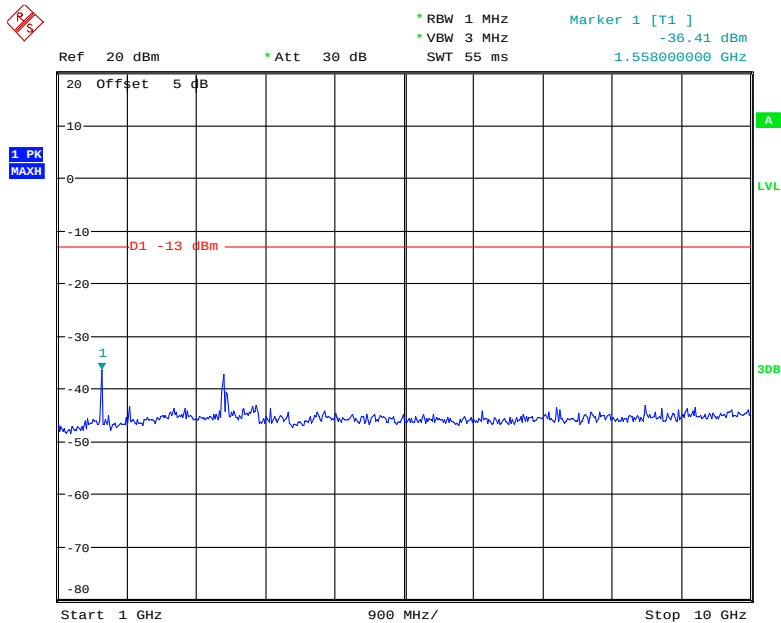
Date: 20.MAY.2020 10:28:26

LTE Band 13 (Middle Channel)

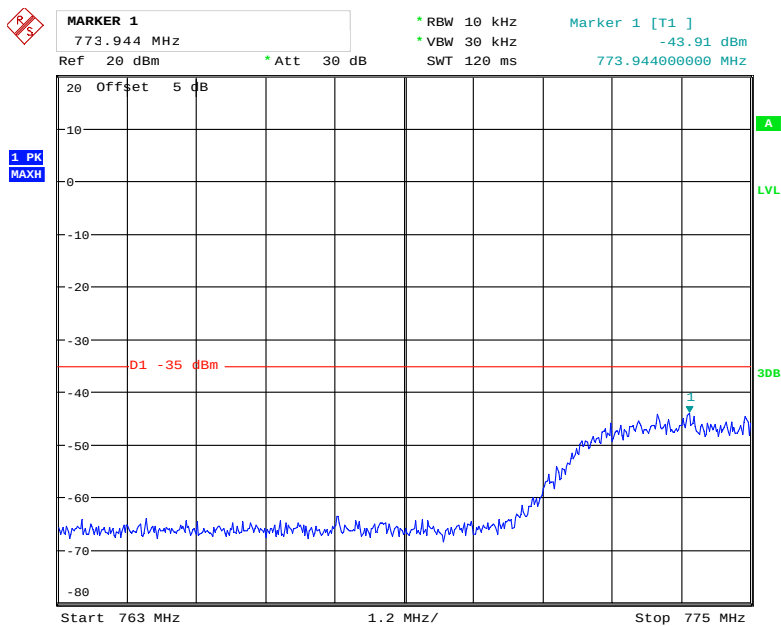
QPSK\_5 MHz



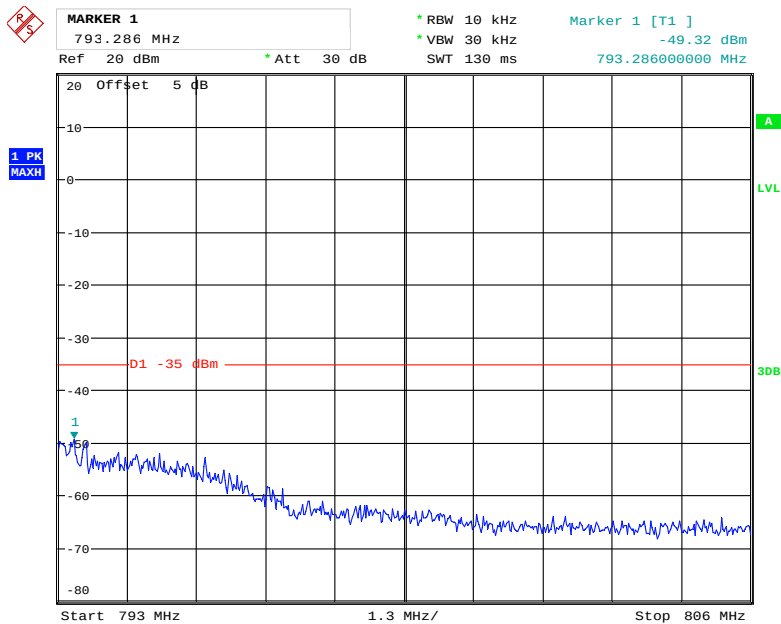
Date: 20.MAY.2020 10:28:46



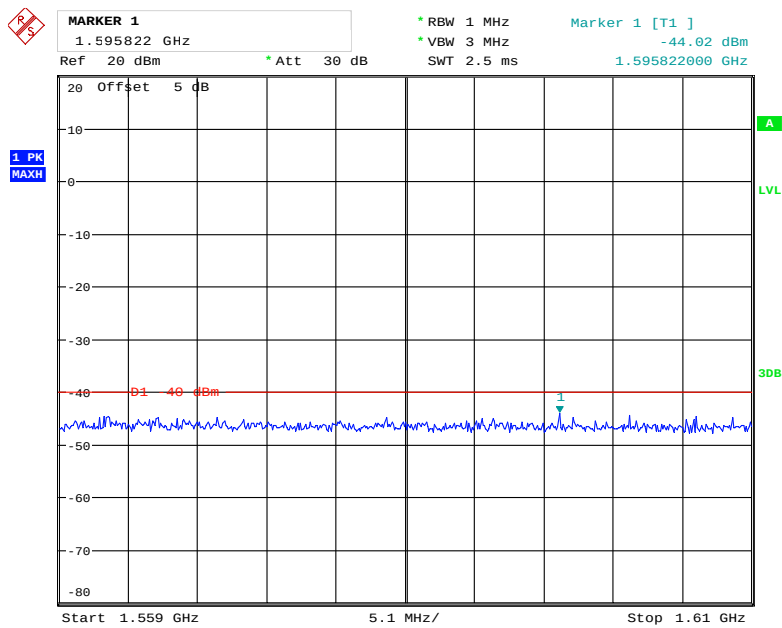
Date: 20.MAY.2020 10:28:57



Date: 20.MAY.2020 10:40:17

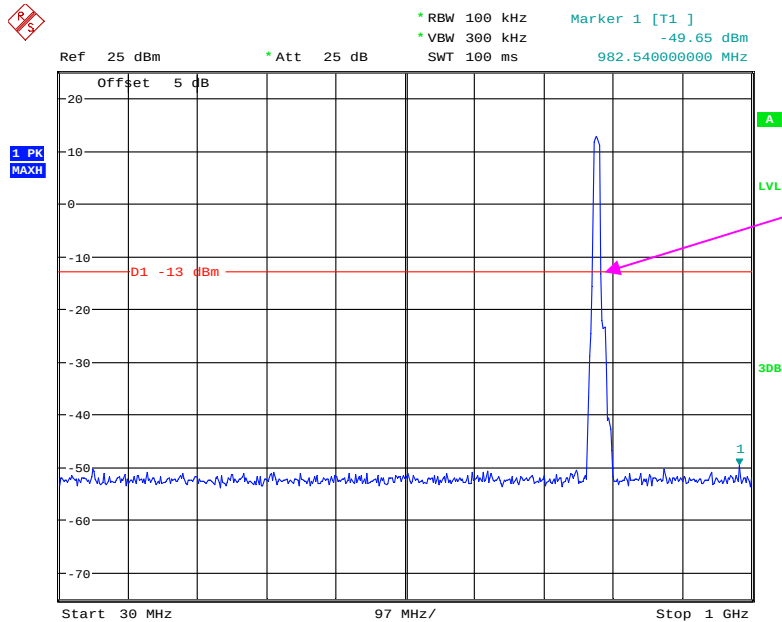


Date: 20.MAY.2020 10:41:02



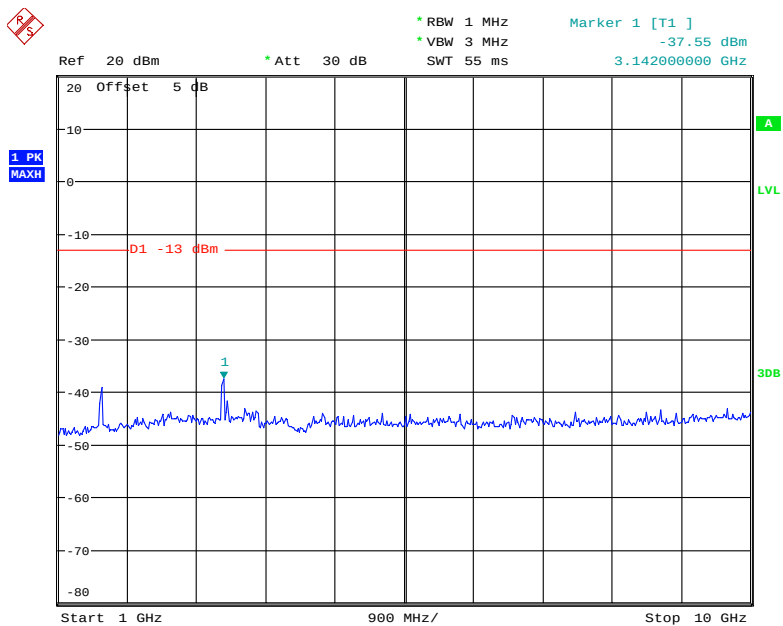
Date: 20.MAY.2020 10:44:31

### QPSK\_10 MHz

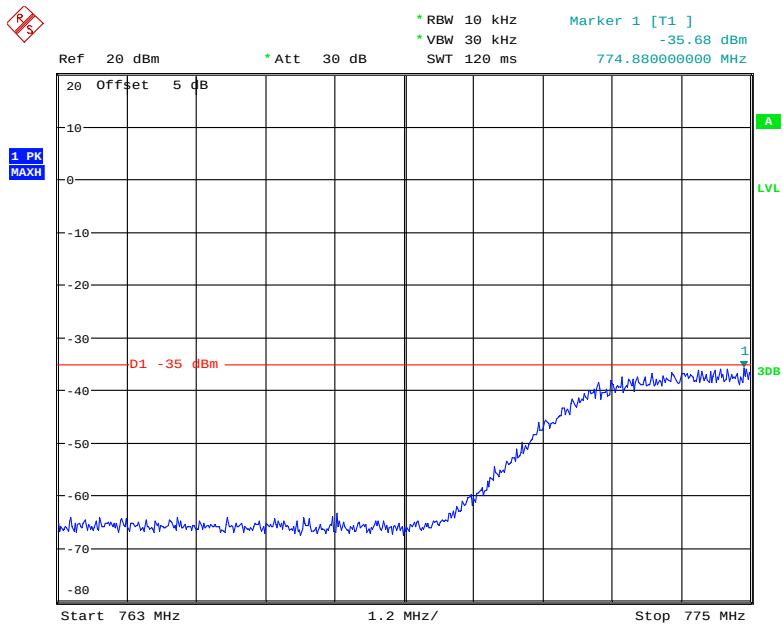


Fundamental

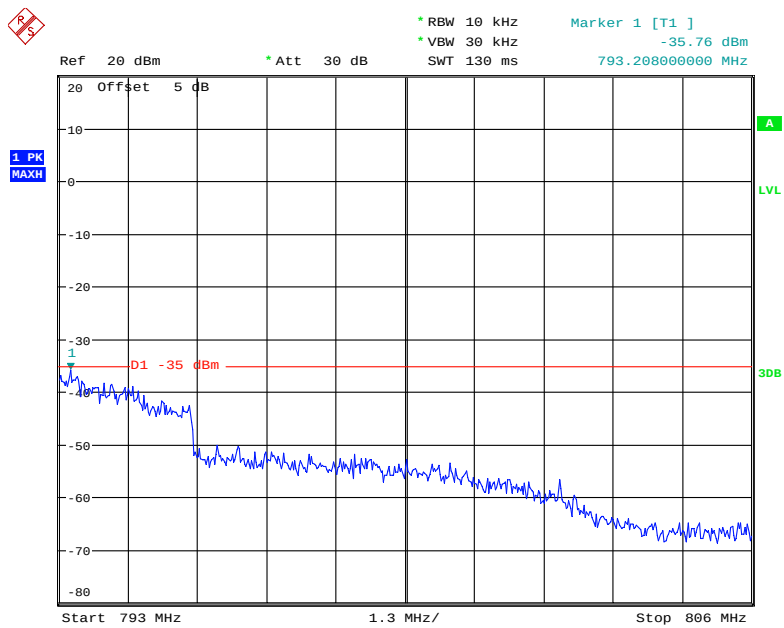
Date: 20.MAY.2020 10:29:21



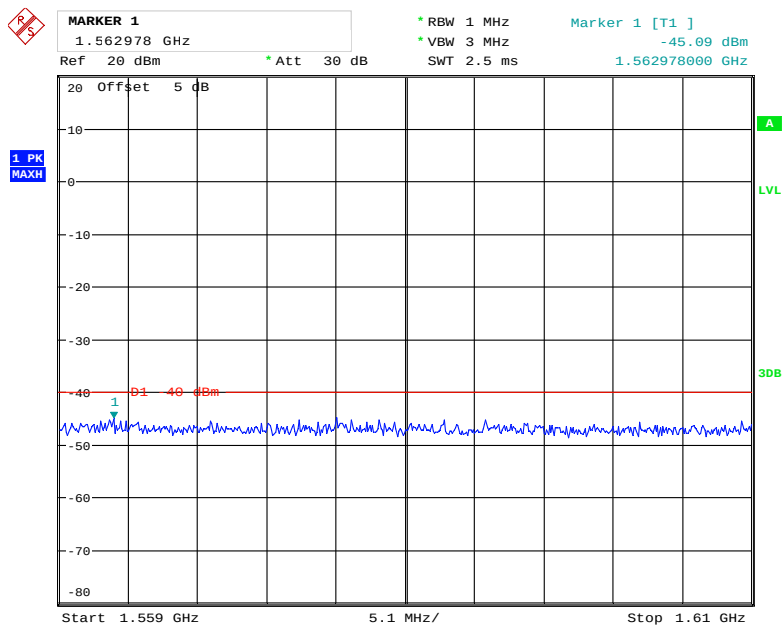
Date: 20.MAY.2020 10:29:33



Date: 20.MAY.2020 10:54:08



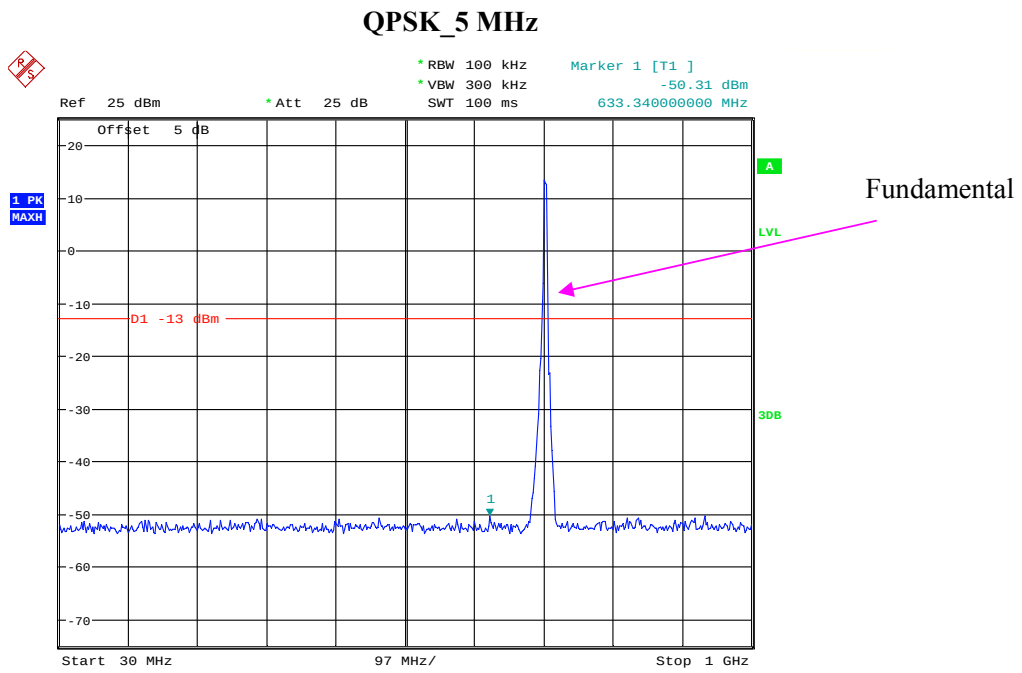
Date: 20.MAY.2020 10:54:42



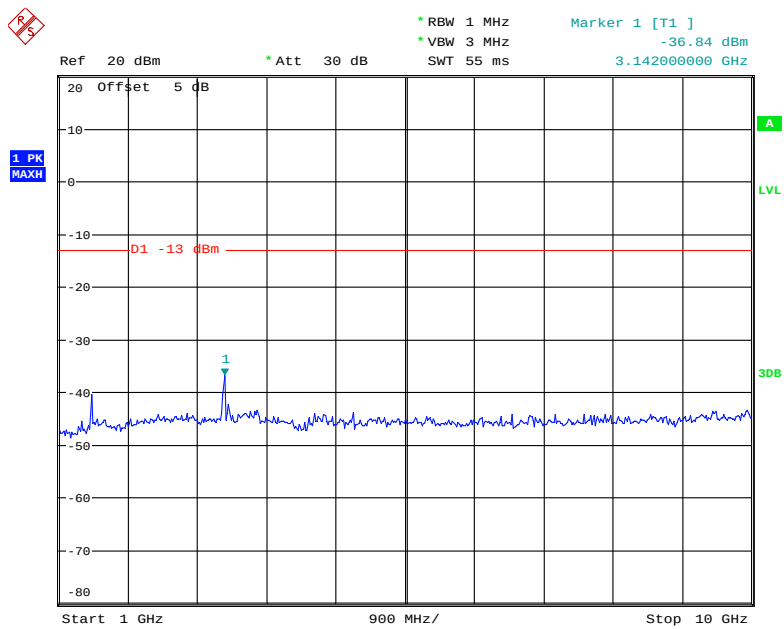
Date: 20.MAY.2020 10:46:10



# LTE Band 17 (Middle Channel)

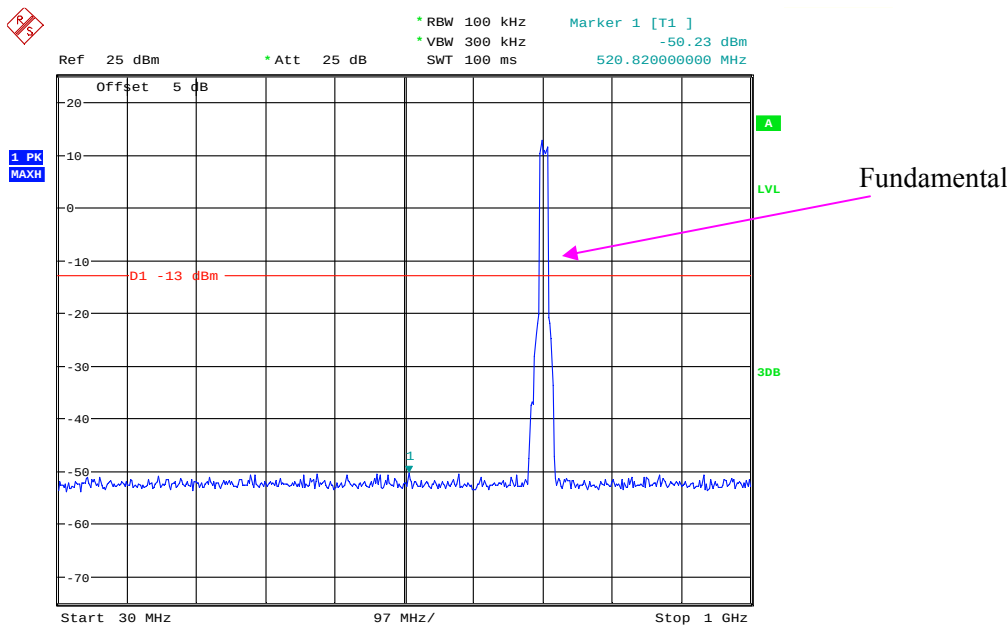


Date: 20.MAY.2020 10:29:55

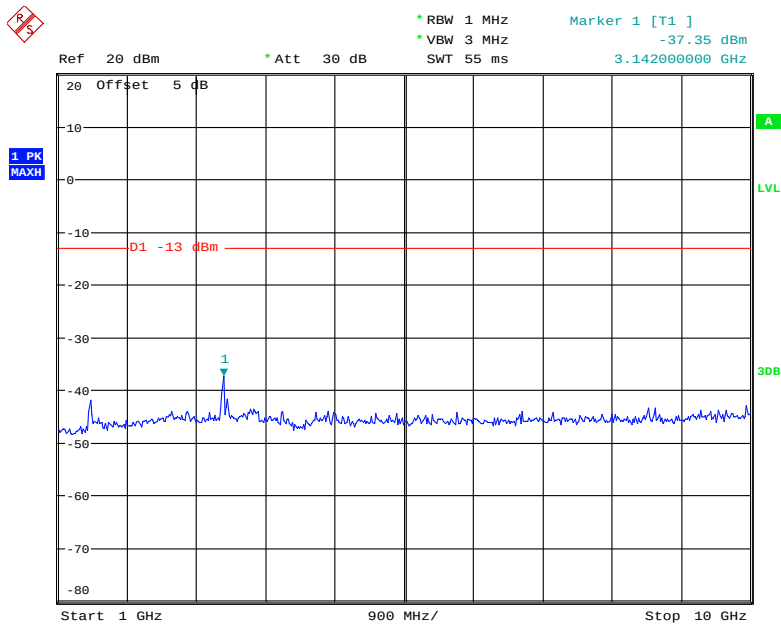


Date: 20.MAY.2020 10:30:10

QPSK\_10 MHz



Date: 20.MAY.2020 10:30:34



Date: 20.MAY.2020 10:30:46

## **FCC §2.1053, §22.917 & §24.238 & §27.53- SPURIOUS RADIATED EMISSIONS**

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### **Applicable Standard**

FCC § 2.1053, §22.917, § 24.238 and § 27.53.

### **Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB =  $10 \lg (\text{TXpwr in Watts}/0.001)$  – the absolute level

Spurious attenuation limit in dB =  $43 + 10 \text{Log}_{10} (\text{power out in Watts})$

**Test Equipment List and Details**

| Manufacturer          | Description               | Model                   | Serial Number      | Calibration Date | Calibration Due Date |
|-----------------------|---------------------------|-------------------------|--------------------|------------------|----------------------|
| R&S                   | EMI Test Receiver         | ESR3                    | 102453             | 2019-06-26       | 2020-06-26           |
| Sunol Sciences        | Antenna                   | JB3                     | A060611-1          | 2017-11-10       | 2020-11-10           |
| EMCO                  | Adjustable Dipole Antenna | 3121C                   | 9109-753           | N/A              | N/A                  |
| Unknown               | Coaxial Cable             | C-NJNJ-50               | C-0400-01          | 2019-09-05       | 2020-09-05           |
| Unknown               | Coaxial Cable             | C-NJNJ-50               | C-0075-01          | 2019-09-05       | 2020-09-05           |
| Unknown               | Coaxial Cable             | C-NJNJ-50               | C-1400-01          | 2020-05-06       | 2021-05-06           |
| Unknown               | Coaxial Cable             | C-NJNJ-50               | C-0200-02          | 2019-09-05       | 2020-09-05           |
| HP                    | Amplifier                 | 8447D                   | 2727A05902         | 2019-09-05       | 2020-09-05           |
| Agilent               | Spectrum Analyzer         | E4440A                  | SG43360054         | 2020-05-09       | 2021-05-09           |
| TDK RF                | Horn Antenna              | HRN-0118                | 130 084            | 2018-10-12       | 2021-10-12           |
| ETS-Lindgren          | Horn Antenna              | 3115                    | 000 527 35         | 2018-10-12       | 2021-10-12           |
| Unknown               | Coaxial Cable             | C-SJSJ-50               | C-0800-01          | 2019-09-05       | 2020-09-05           |
| Unknown               | Coaxial Cable             | C-NJNJ-50               | C-0200-02          | 2019-09-05       | 2020-09-05           |
| MITEQ                 | Amplifier                 | AFS42-00101800-25-S-42  | 2001271            | 2019-09-05       | 2020-09-05           |
| Quinstar              | Amplifier                 | QLW-18405536-JO         | 15964001001        | 2019-06-27       | 2020-06-27           |
| Agilent               | Signal Generator          | E8247C                  | MY43321350         | 2019-12-10       | 2020-12-10           |
| Ducommun Technologies | Horn Antenna              | ARH-4223-02             | 1007726-01<br>1304 | 2019-11-18       | 2022-11-18           |
| Ducommun Technologies | Horn Antenna              | ARH-4223-02             | 1007726-02<br>1304 | 2019-11-18       | 2022-11-18           |
| Sinoscite             | Band-stop filter          | BSF1710-1785MN-0383-003 | 0383003            | 2019-06-16       | 2020-06-16           |
| Sinoscite             | Band-stop filter          | BSF824-862MS-1438-001   | 1438001            | 2019-06-16       | 2020-06-16           |
| Sinoscite             | Band-stop filter          | BSF1850-1910MS-0935V2   | 0935V2             | 2019-06-16       | 2020-06-16           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Data****Environmental Conditions**

|                           |                        |
|---------------------------|------------------------|
| <b>Temperature:</b>       | 23.8~25°C              |
| <b>Relative Humidity:</b> | 47~52 %                |
| <b>ATM Pressure:</b>      | 100.7kPa               |
| <b>Tester:</b>            | Joker Chen, Felix Wang |
| <b>Test Date:</b>         | 2020-05-15             |

*EUT Operation Mode: Transmitting*

**30 MHz-10 GHz:**

| Frequency<br>(MHz)                     | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|----------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                                        |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| GSM850, Frequency:836.600 MHz          |                |                               |                               |                              |                    |                            |                |                |
| 1673.200                               | H              | 60.17                         | -43.77                        | 10.6                         | 0.73               | -33.9                      | -13.0          | 20.9           |
| 1673.200                               | V              | 63.75                         | -40.79                        | 10.6                         | 0.73               | -30.9                      | -13.0          | 17.9           |
| 2509.800                               | H              | 50.32                         | -52.59                        | 13.1                         | 1.25               | -40.7                      | -13.0          | 27.7           |
| 2509.800                               | V              | 54.75                         | -48.19                        | 13.1                         | 1.25               | -36.3                      | -13.0          | 23.3           |
| 3346.400                               | H              | 44.96                         | -54.72                        | 13.8                         | 1.61               | -42.5                      | -13.0          | 29.5           |
| 3346.400                               | V              | 46.15                         | -53.57                        | 13.8                         | 1.61               | -41.4                      | -13.0          | 28.4           |
| 700.300                                | H              | 41.62                         | -59.8                         | 0.0                          | 0.94               | -60.7                      | -13.0          | 47.7           |
| 700.300                                | V              | 37.55                         | -66.35                        | 0.0                          | 0.94               | -67.3                      | -13.0          | 54.3           |
| WCDMA Band V R99,Frequency:836.600 MHz |                |                               |                               |                              |                    |                            |                |                |
| 1673.200                               | H              | 36.74                         | -73.2                         | 10.6                         | 0.73               | -63.3                      | -13.0          | 50.3           |
| 1673.200                               | V              | 34.03                         | -70.51                        | 10.6                         | 0.73               | -60.6                      | -13.0          | 47.6           |
| 2509.800                               | H              | 42.44                         | -60.47                        | 13.1                         | 1.25               | -48.6                      | -13.0          | 35.6           |
| 2509.800                               | V              | 44.48                         | -58.46                        | 13.1                         | 1.25               | -46.6                      | -13.0          | 33.6           |
| 3346.400                               | H              | 38.12                         | -71.56                        | 13.8                         | 1.61               | -59.3                      | -13.0          | 46.3           |
| 3346.400                               | V              | 38.88                         | -70.84                        | 13.8                         | 1.61               | -58.6                      | -13.0          | 45.6           |
| 126.200                                | H              | 44.66                         | -59.54                        | 0.0                          | 0.32               | -59.9                      | -13.0          | 46.9           |
| 176.700                                | V              | 39.92                         | -72.29                        | 0.0                          | 0.44               | -72.7                      | -13.0          | 59.7           |

**30 MHz-20 GHz:**

| Frequency<br>(MHz)                        | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|-------------------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                                           |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| GSM1900, Frequency:1880.000 MHz           |                |                               |                               |                              |                    |                            |                |                |
| 3760.000                                  | H              | 59.09                         | -38.55                        | 13.8                         | 1.63               | -26.4                      | -13.0          | 13.4           |
| 3760.000                                  | V              | 57.49                         | -40.01                        | 13.8                         | 1.63               | -27.9                      | -13.0          | 14.9           |
| 5640.000                                  | H              | 47.49                         | -46.1                         | 14.0                         | 1.31               | -33.4                      | -13.0          | 20.4           |
| 5640.000                                  | V              | 46.43                         | -47.05                        | 14.0                         | 1.31               | -34.3                      | -13.0          | 21.3           |
| 700.300                                   | H              | 43.13                         | -58.29                        | 0.0                          | 0.94               | -59.2                      | -13.0          | 46.2           |
| 700.300                                   | V              | 38.20                         | -65.7                         | 0.0                          | 0.94               | -66.6                      | -13.0          | 53.6           |
| WCDMA Band II R99,Frequency: 1880.000 MHz |                |                               |                               |                              |                    |                            |                |                |
| 3760.000                                  | H              | 36.63                         | -61.01                        | 13.8                         | 1.63               | -48.9                      | -13.0          | 35.9           |
| 3760.000                                  | V              | 36.55                         | -66.95                        | 13.8                         | 1.63               | -54.8                      | -13.0          | 41.8           |
| 5640.000                                  | H              | 26.99                         | -66.6                         | 14.0                         | 1.31               | -53.9                      | -13.0          | 40.9           |
| 5640.000                                  | V              | 26.28                         | -67.2                         | 14.0                         | 1.31               | -54.5                      | -13.0          | 41.5           |
| 126.200                                   | H              | 45.94                         | -58.26                        | 0.0                          | 0.32               | -58.6                      | -13.0          | 45.6           |
| 176.700                                   | V              | 40.44                         | -71.77                        | 0.0                          | 0.44               | -72.2                      | -13.0          | 59.2           |

**LTE Band 2 (30MHz-20GHz):**

| Frequency<br>(MHz)          | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|-----------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                             |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| QPSK,Frequency:1880.000 MHz |                |                               |                               |                              |                    |                            |                |                |
| 3760.00                     | H              | 46.74                         | -50.90                        | 13.76                        | 1.63               | -38.77                     | -13.00         | 25.77          |
| 3760.00                     | V              | 43.45                         | -54.05                        | 13.76                        | 1.63               | -41.92                     | -13.00         | 28.92          |
| 5640.00                     | H              | 43.50                         | -50.09                        | 14.02                        | 1.31               | -37.38                     | -13.00         | 24.38          |
| 5640.00                     | V              | 40.94                         | -52.54                        | 14.02                        | 1.31               | -39.83                     | -13.00         | 26.83          |
| 374.60                      | H              | 40.04                         | -65.74                        | 0.00                         | 0.59               | -66.33                     | -13.00         | 53.33          |
| 374.60                      | V              | 39.35                         | -69.28                        | 0.00                         | 0.59               | -69.87                     | -13.00         | 56.87          |

**LTE Band 4 (30MHz-20GHz):**

| Frequency<br>(MHz)          | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|-----------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                             |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| QPSK,Frequency:1732.500 MHz |                |                               |                               |                              |                    |                            |                |                |
| 3465.00                     | H              | 48.42                         | -50.77                        | 13.91                        | 1.62               | -38.48                     | -13.00         | 25.48          |
| 3465.00                     | V              | 48.83                         | -50.39                        | 13.91                        | 1.62               | -38.10                     | -13.00         | 25.10          |
| 5197.50                     | H              | 42.18                         | -52.51                        | 14.00                        | 1.52               | -40.03                     | -13.00         | 27.03          |
| 5197.50                     | V              | 39.76                         | -55.00                        | 14.00                        | 1.52               | -42.52                     | -13.00         | 29.52          |
| 374.60                      | H              | 40.09                         | -65.69                        | 0.00                         | 0.59               | -66.28                     | -13.00         | 53.28          |
| 374.60                      | V              | 41.53                         | -67.10                        | 0.00                         | 0.59               | -67.69                     | -13.00         | 54.69          |

**LTE Band 5 (30MHz-10GHz):**

| Frequency<br>(MHz)           | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                              |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| QPSK, Frequency: 836.500 MHz |                |                               |                               |                              |                    |                            |                |                |
| 1673.00                      | H              | 34.36                         | -69.58                        | 10.61                        | 0.73               | -59.70                     | -13.00         | 46.70          |
| 1673.00                      | V              | 38.34                         | -66.20                        | 10.61                        | 0.73               | -56.32                     | -13.00         | 43.32          |
| 2509.50                      | H              | 48.11                         | -54.80                        | 13.11                        | 1.25               | -42.94                     | -13.00         | 29.94          |
| 2509.50                      | V              | 48.19                         | -54.75                        | 13.11                        | 1.25               | -42.89                     | -13.00         | 29.89          |
| 3346.00                      | H              | 31.51                         | -68.17                        | 13.83                        | 1.61               | -55.95                     | -13.00         | 42.95          |
| 3346.00                      | V              | 31.98                         | -67.74                        | 13.83                        | 1.61               | -55.52                     | -13.00         | 42.52          |
| 374.60                       | H              | 37.45                         | -68.33                        | 0.00                         | 0.59               | -68.92                     | -13.00         | 55.92          |
| 32.10                        | V              | 38.79                         | -34.15                        | -25.33                       | 0.26               | -59.74                     | -13.00         | 46.74          |

**LTE Band 12 (30MHz-10 GHz):**

| Frequency<br>(MHz)           | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                              |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| QPSK, Frequency: 707.500 MHz |                |                               |                               |                              |                    |                            |                |                |
| 1415.00                      | H              | 36.94                         | -66.67                        | 9.08                         | 1.22               | -58.81                     | -13.00         | 45.81          |
| 1415.00                      | V              | 40.30                         | -63.83                        | 9.08                         | 1.22               | -55.97                     | -13.00         | 42.97          |
| 2122.50                      | H              | 45.28                         | -56.73                        | 11.27                        | 1.11               | -46.57                     | -13.00         | 33.57          |
| 2122.50                      | V              | 45.14                         | -56.85                        | 11.27                        | 1.11               | -46.69                     | -13.00         | 33.69          |
| 2830.00                      | H              | 32.37                         | -69.05                        | 13.34                        | 1.36               | -57.07                     | -13.00         | 44.07          |
| 2830.00                      | V              | 36.54                         | -65.11                        | 13.34                        | 1.36               | -53.13                     | -13.00         | 40.13          |
| 374.60                       | H              | 39.20                         | -66.58                        | 0.00                         | 0.59               | -67.17                     | -13.00         | 54.17          |
| 374.60                       | V              | 41.77                         | -66.86                        | 0.00                         | 0.59               | -67.45                     | -13.00         | 54.45          |

**LTE Band 13 (30MHz-10 GHz):**

| Frequency<br>(MHz)           | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                              |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| QPSK, Frequency: 782.000 MHz |                |                               |                               |                              |                    |                            |                |                |
| 1564.00                      | H              | 37.61                         | -67.11                        | 9.88                         | 0.92               | -58.15                     | -40.00         | 18.15          |
| 1564.00                      | V              | 39.18                         | -65.96                        | 9.88                         | 0.92               | -57.00                     | -40.00         | 17             |
| 2346.00                      | H              | 58.30                         | -43.99                        | 11.71                        | 1.26               | -33.54                     | -13.00         | 20.54          |
| 2346.00                      | V              | 54.19                         | -48.14                        | 11.71                        | 1.26               | -37.69                     | -13.00         | 24.69          |
| 3128.00                      | H              | 31.17                         | -68.41                        | 13.31                        | 1.76               | -56.86                     | -13.00         | 43.86          |
| 3128.00                      | V              | 32.01                         | -67.58                        | 13.31                        | 1.76               | -56.03                     | -13.00         | 43.03          |
| 791.50                       | H              | 48.92                         | -49.97                        | 0.00                         | 0.93               | -50.90                     | -13.00         | 37.90          |
| 791.50                       | V              | 52.68                         | -49.86                        | 0.00                         | 0.93               | -50.79                     | -13.00         | 37.79          |

**LTE Band 17 (30MHz-10GHz):**

| Frequency<br>(MHz)          | Polar<br>(H/V) | Receiver<br>Reading<br>(dBμV) | Substituted Method            |                              |                    | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|-----------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
|                             |                |                               | Substituted<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd/dBi) | Cable Loss<br>(dB) |                            |                |                |
| QPSK, Frequency:710.000 MHz |                |                               |                               |                              |                    |                            |                |                |
| 1420.00                     | H              | 39.94                         | -63.74                        | 9.10                         | 1.23               | -55.87                     | -13.00         | 42.87          |
| 1420.00                     | V              | 37.75                         | -66.43                        | 9.10                         | 1.23               | -58.56                     | -13.00         | 45.56          |
| 2130.00                     | H              | 47.42                         | -54.58                        | 11.22                        | 1.11               | -44.47                     | -13.00         | 31.47          |
| 2130.00                     | V              | 44.93                         | -57.04                        | 11.22                        | 1.11               | -46.93                     | -13.00         | 33.93          |
| 2840.00                     | H              | 46.76                         | -54.56                        | 13.42                        | 1.36               | -42.50                     | -13.00         | 29.50          |
| 2840.00                     | V              | 44.24                         | -57.32                        | 13.42                        | 1.36               | -45.26                     | -13.00         | 32.26          |
| 828.00                      | H              | 42.18                         | -56.05                        | 0.00                         | 0.96               | -57.01                     | -13.00         | 44.01          |
| 374.60                      | V              | 40.27                         | -68.36                        | 0.00                         | 0.59               | -68.95                     | -13.00         | 55.95          |

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

## FCC §22.917(a) & §24.238(a) & §27.53- BAND EDGES

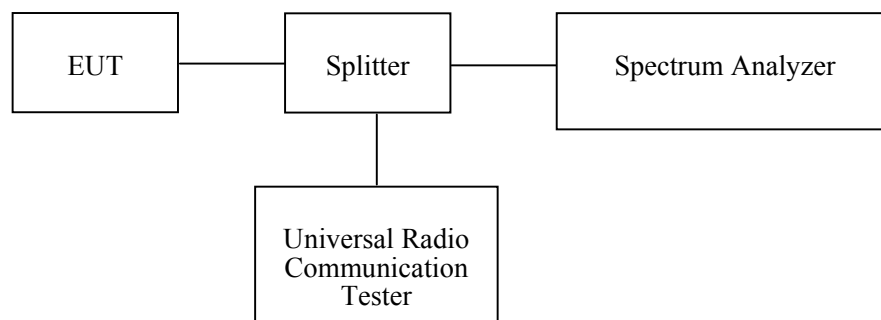
### Applicable Standard

FCC § 2.1053, §22.917, § 24.238 and § 27.53.

### Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency.



### Test Equipment List and Details

| Manufacturer | Description         | Model         | Serial Number | Calibration Date | Calibration Due Date |
|--------------|---------------------|---------------|---------------|------------------|----------------------|
| R&S          | Spectrum Analyzer   | FSU 26        | 200256        | 2020-05-09       | 2021-05-09           |
| yzjingcheng  | Coaxial Cable       | KTRFBU-141-50 | 41005011      | Each Time        | /                    |
| E-Microwave  | Two-way Splitter    | ODP-1-6-2S    | OE0120142     | Each Time        | /                    |
| Unknown      | Coaxial Cable       | C-SJ00-0010   | C0010/04      | Each Time        | /                    |
| E-Microwave  | Coaxial Attenuators | EMCA10-5RN-6  | OE01203239    | Each Time        | /                    |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Data

#### Environmental Conditions

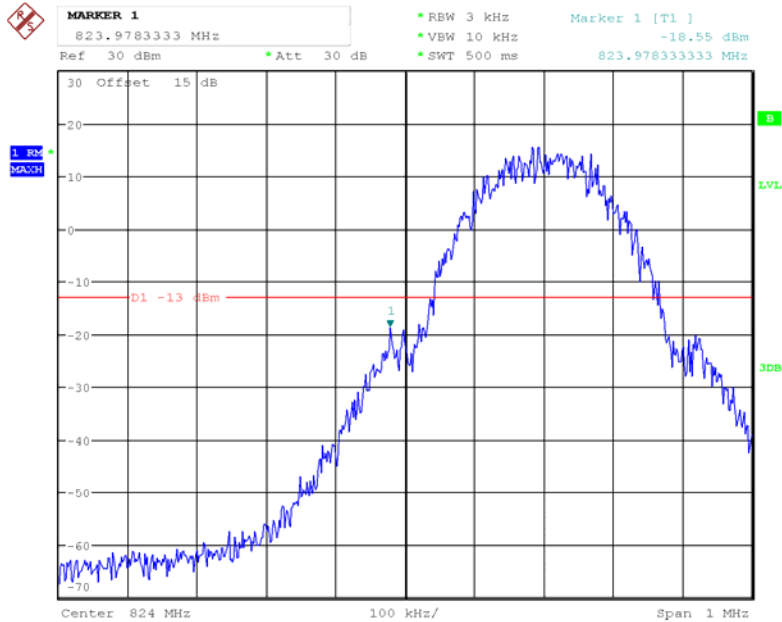
|                    |                       |
|--------------------|-----------------------|
| Temperature:       | 26.1~26.9°C           |
| Relative Humidity: | 55~67 %               |
| ATM Pressure:      | 98.6~100kPa           |
| Tester:            | Chris Mo              |
| Test Date:         | 2020-05-19~2020-05-22 |



Test Mode: Transmitting

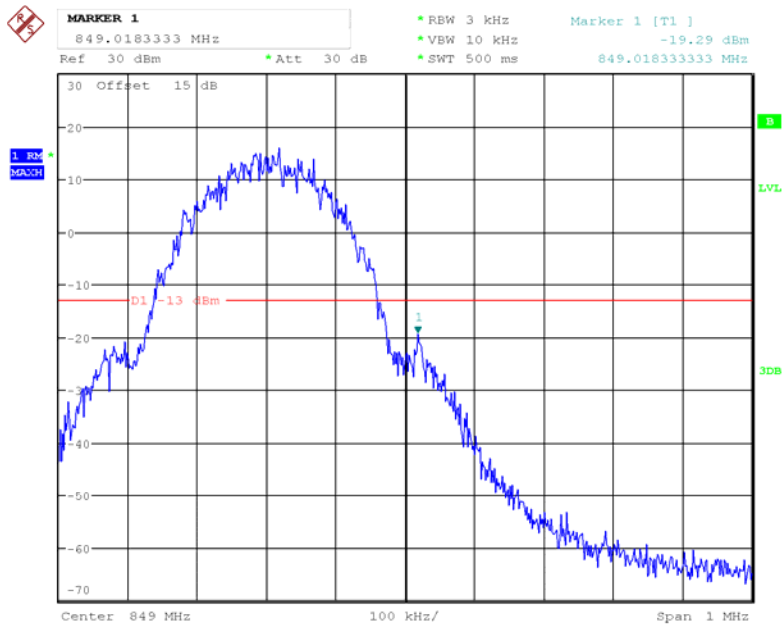
Test Result: Compliant. Please refer to the following plots.

## GSM 850, Left Band Edge



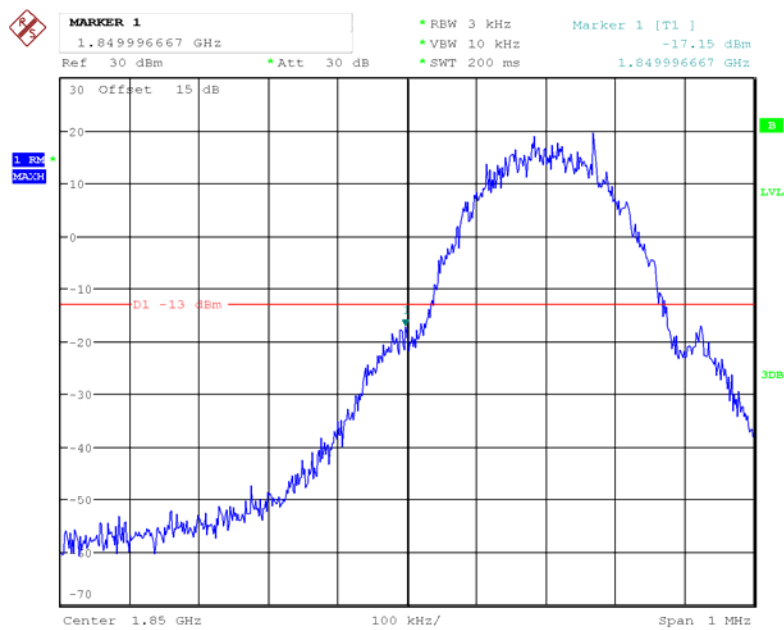
Date: 22.MAY.2020 17:48:01

## GSM 850, Right Band Edge



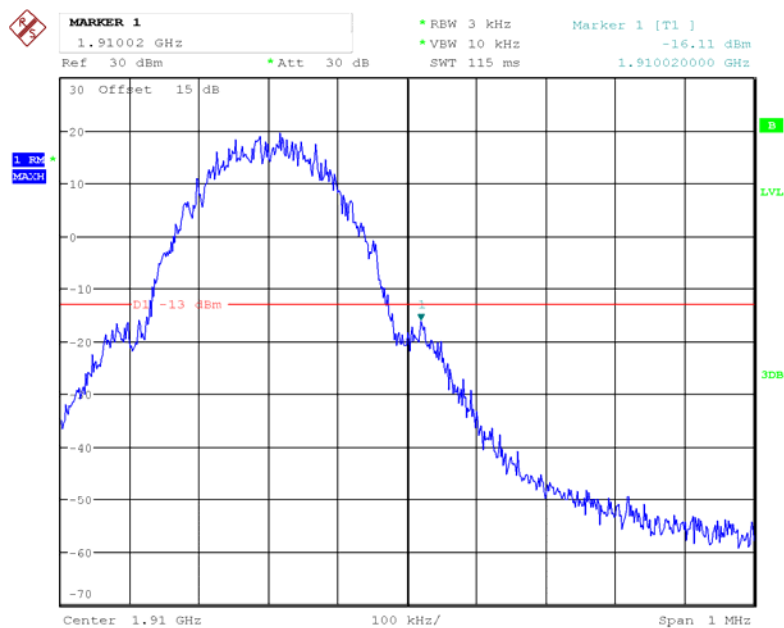
Date: 22.MAY.2020 17:48:35

### GSM 1900, Left Band Edge



Date: 22.MAY.2020 16:40:37

### GSM 1900, Right Band Edge



Date: 22.MAY.2020 16:39:39

MARKER 1  
823.9916667 MHz

Ref 30 dBm Att 30 dB

\* RBW 3 kHz  
\* VBW 10 kHz  
SWT 115 ms

Marker 1 [T1]  
-21.41 dBm  
823.991666667 MHz

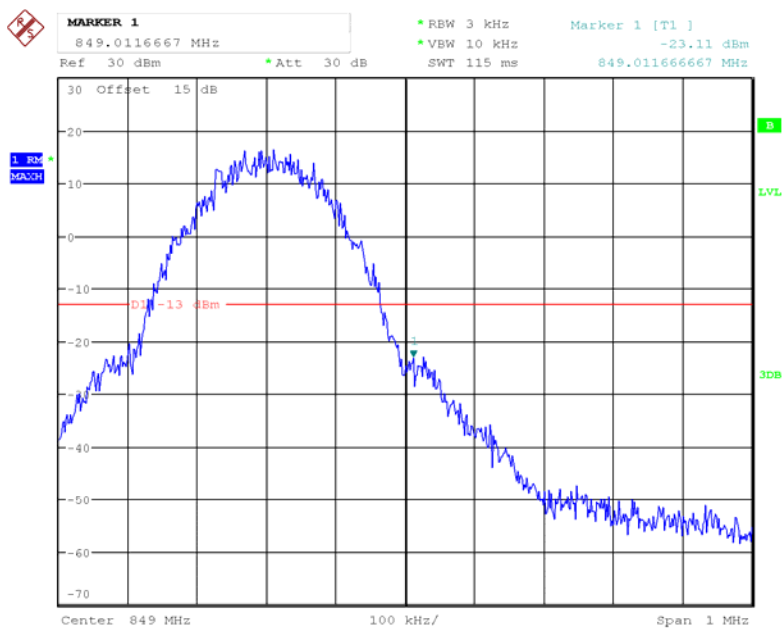
1. RBW  
HATCH

Offset 15 dB

D1 -13 dBm

Center 824 MHz Span 1 MHz

### EDGE 850, Right Band Edge



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MARKER 1  
1.85 GHz

Ref 30 dBm Att 30 dB

\* RBW 3 kHz  
\* VBW 10 kHz  
SWT 115 ms

Marker 1 [T1]  
-21.31 dBm  
1.850000000 GHz

30 Offset 15 dB

1.85 MHz

D1 -13 dBm

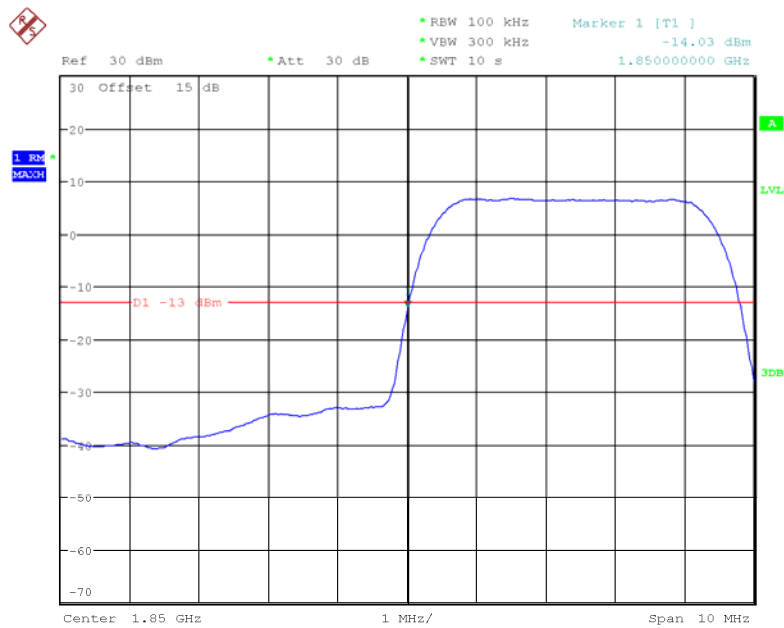
3dB

Center 1.85 GHz Span 1 MHz

**EDGE 1900, Right Band Edge**

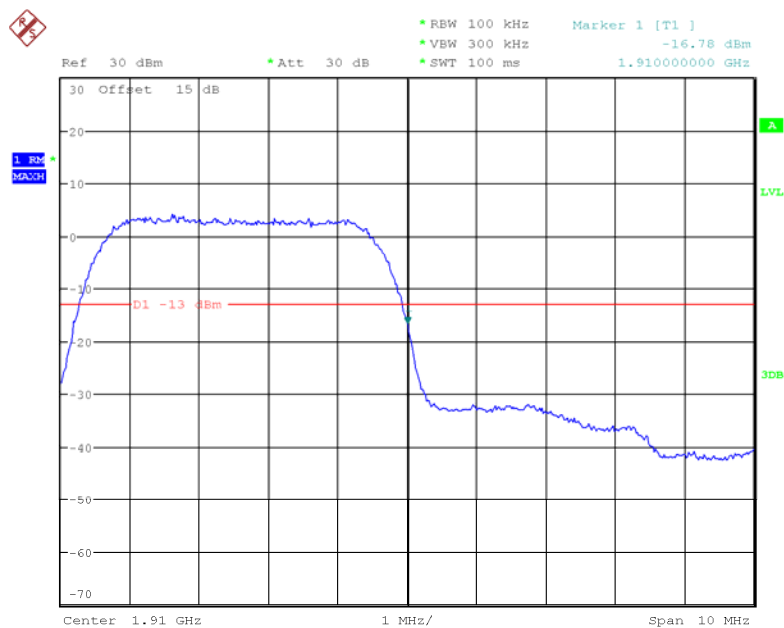


### WCDMA Band II Rel 99, Left Band Edge



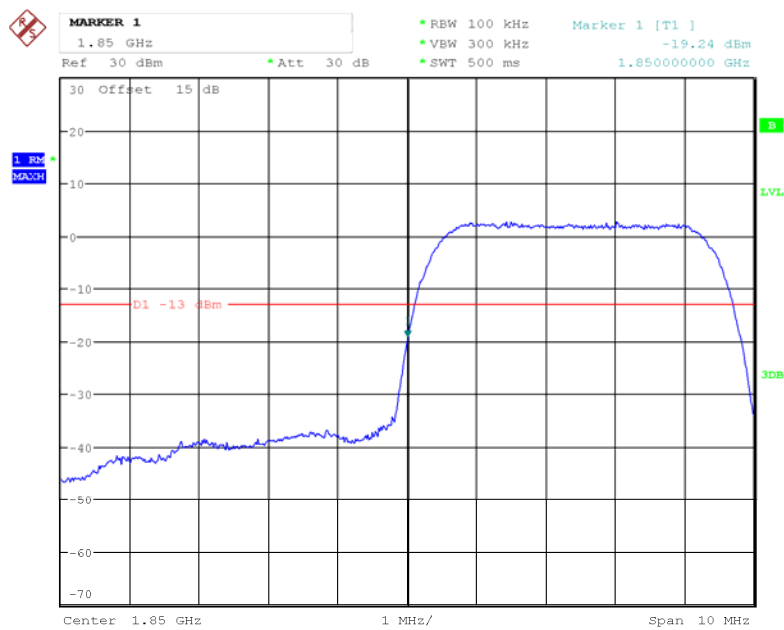
Date: 22.MAY.2020 19:01:44

### WCDMA Band II Rel 99, Right Band Edge



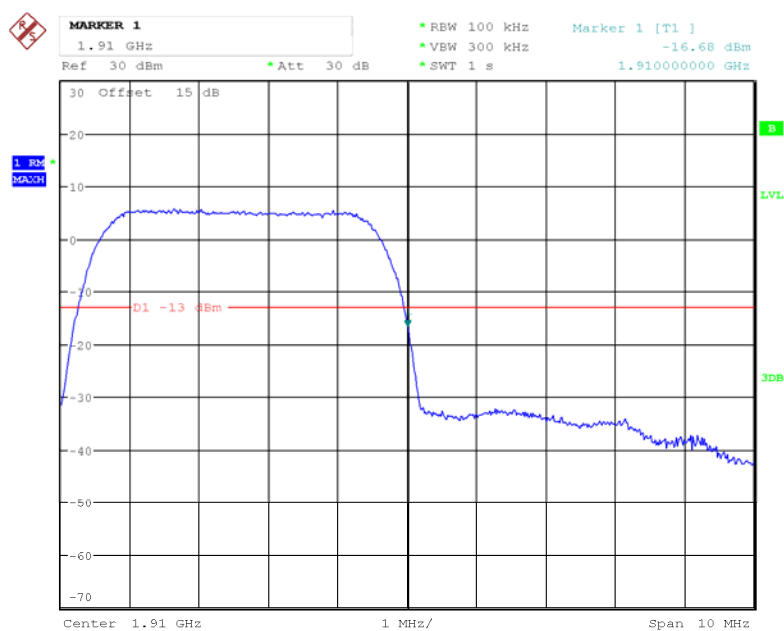
Date: 22.MAY.2020 19:04:16

### WCDMA Band II HSDPA, Left Band Edge



Date: 22.MAY.2020 18:34:54

### WCDMA Band II HSDPA, Right Band Edge

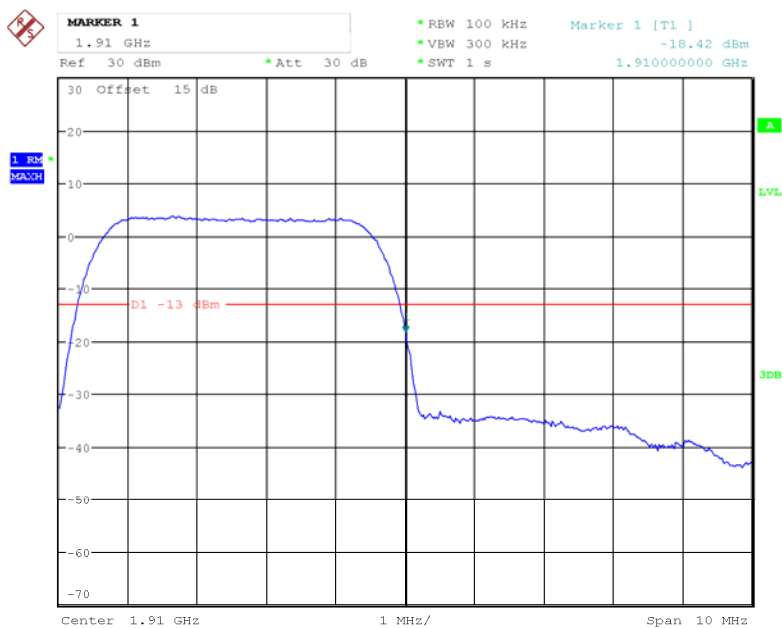


Date: 22.MAY.2020 18:35:38

The screenshot displays a Spectrum Analyzer interface with the following elements:

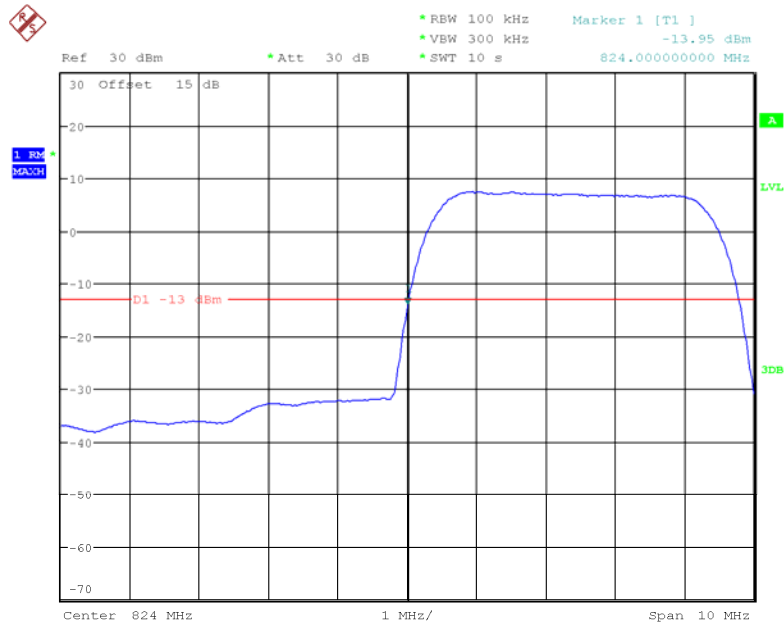
- Top Left:** A red button with a white 'X' icon.
- Marker 1:** A box containing '1.85 GHz'.
- Parameters:**
  - Ref: 30 dBm
  - Att: 30 dB
  - RBW: 100 kHz
  - VBW: 300 kHz
  - SWT: 10 s
- Marker 1 [T1]:** A box containing '-16.21 dBm'.
- Frequency:** 1.850000000 GHz
- Plot Area:**
  - Y-axis: Power in dBm, ranging from -70 to 30.
  - X-axis: Frequency in MHz, ranging from 1.84 to 1.86.
  - Signal: A blue trace showing a signal that rises from approximately -40 dBm at 1.84 MHz to a plateau of about 5 dBm between 1.85 MHz and 1.86 MHz.
  - Reference Line: A red horizontal line at -13 dBm, labeled 'D1 -13 dBm'.
  - Grid: A 10x10 grid is visible.
- Bottom:**
  - Center: 1.85 GHz
  - Span: 10 MHz
- Other Labels:**
  - 'Offset 15 dB' at the top left of the plot area.
  - '1.85 MHz' and '1.85 GHz' labels on the left side.
  - 'A', 'LVL', and '3dB' labels on the right side.

## WCDMA Band II HSUPA, Right Band Edge



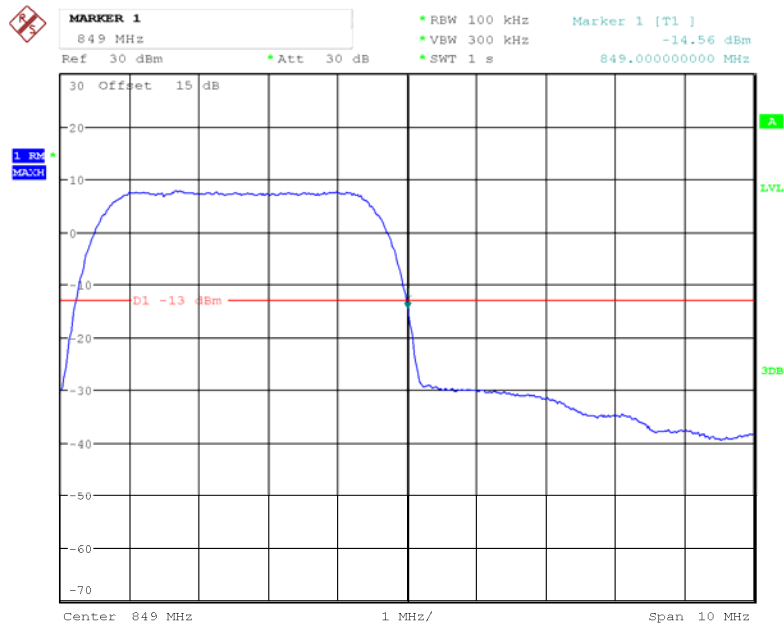
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### WCDMA Band V Rel 99, Left Band Edge



Date: 22.MAY.2020 19:13:48

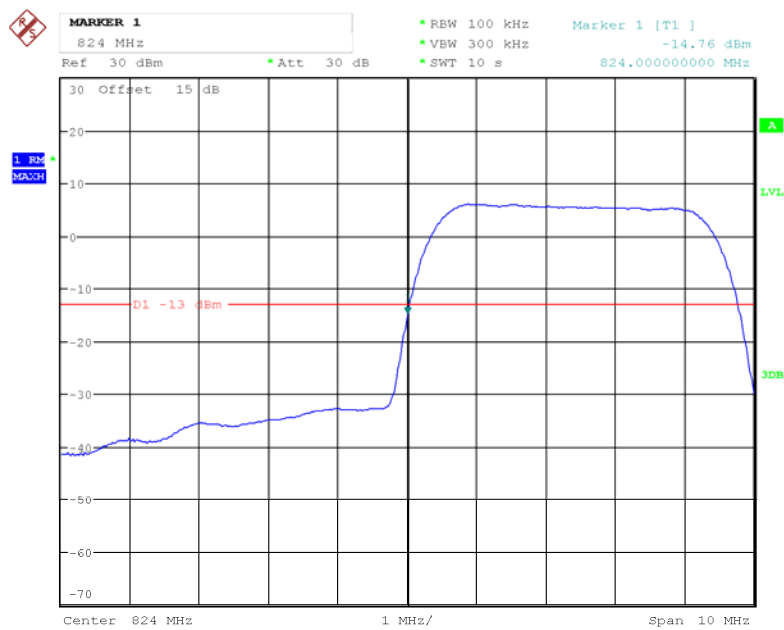
### WCDMA Band V Rel 99, Right Band Edge



Date: 22.MAY.2020 19:13:01

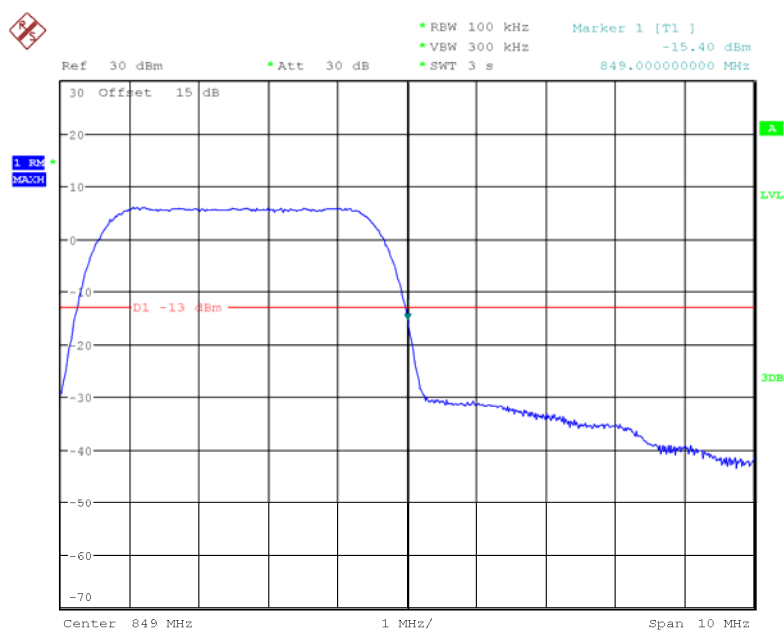


### WCDMA Band V HSDPA, Left Band Edge



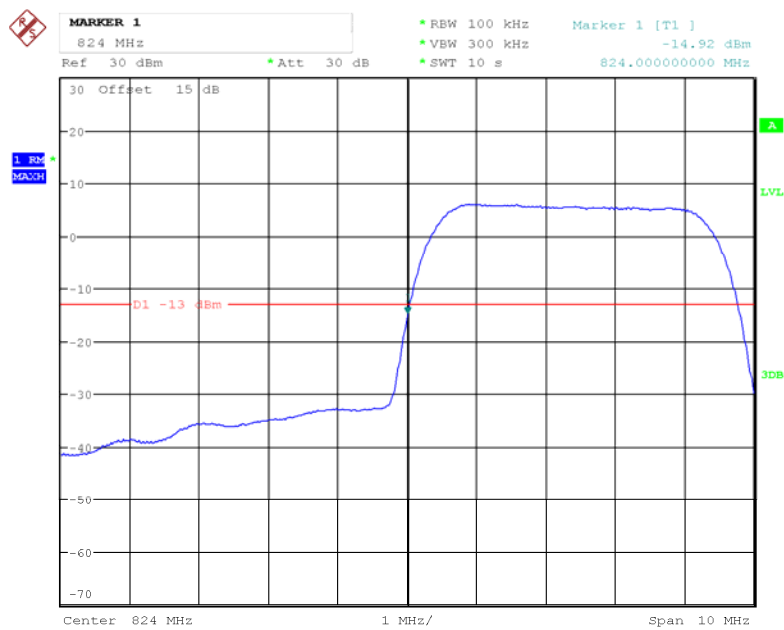
Date: 22.MAY.2020 18:44:11

### WCDMA Band V HSDPA, Right Band Edge



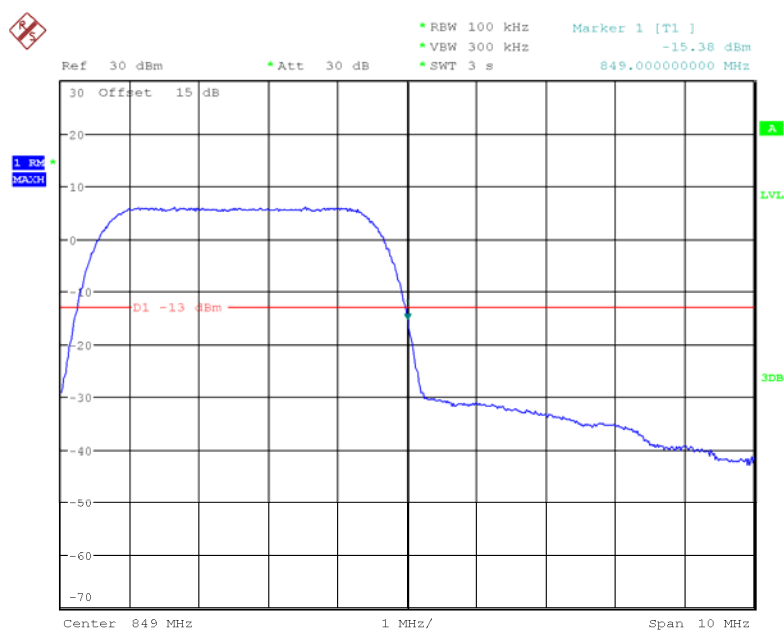
Date: 22.MAY.2020 18:45:07

### WCDMA Band V HSUPA, Left Band Edge



Date: 22.MAY.2020 18:49:19

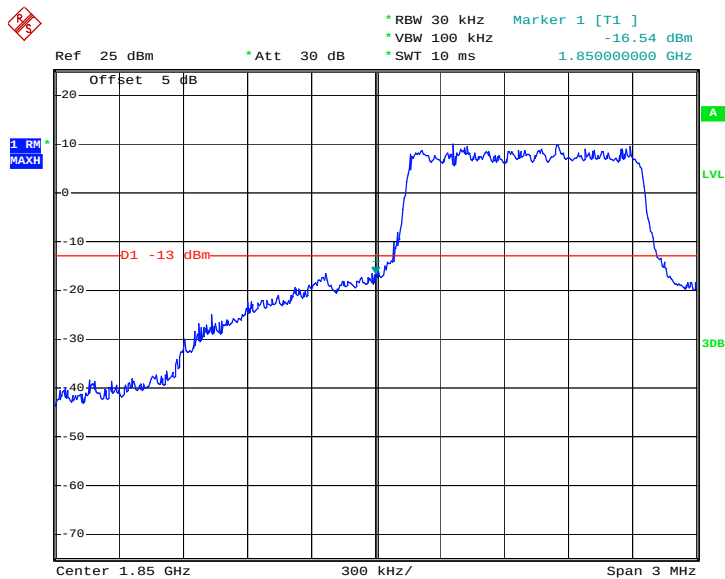
### WCDMA Band V HSUPA, Right Band Edge



Date: 22.MAY.2020 18:46:45

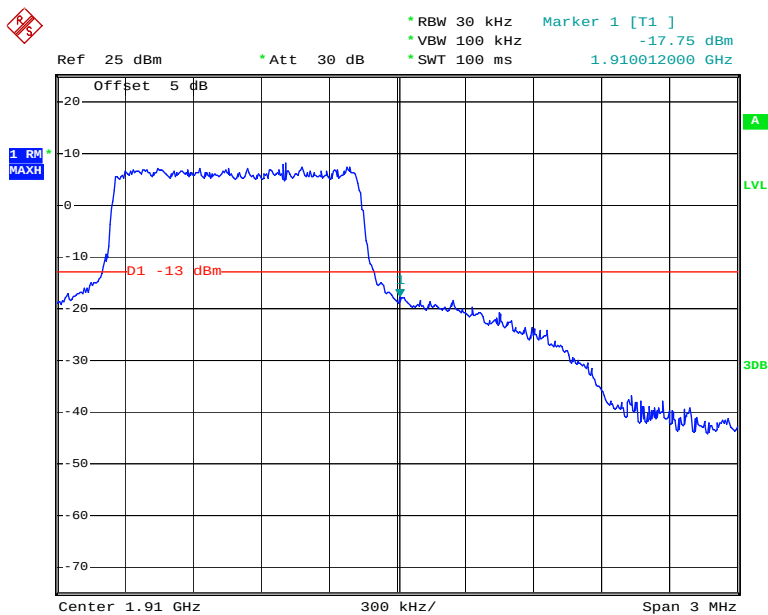
LTE Band 2

QPSK\_1.4MHz\_6 RB\_ Left

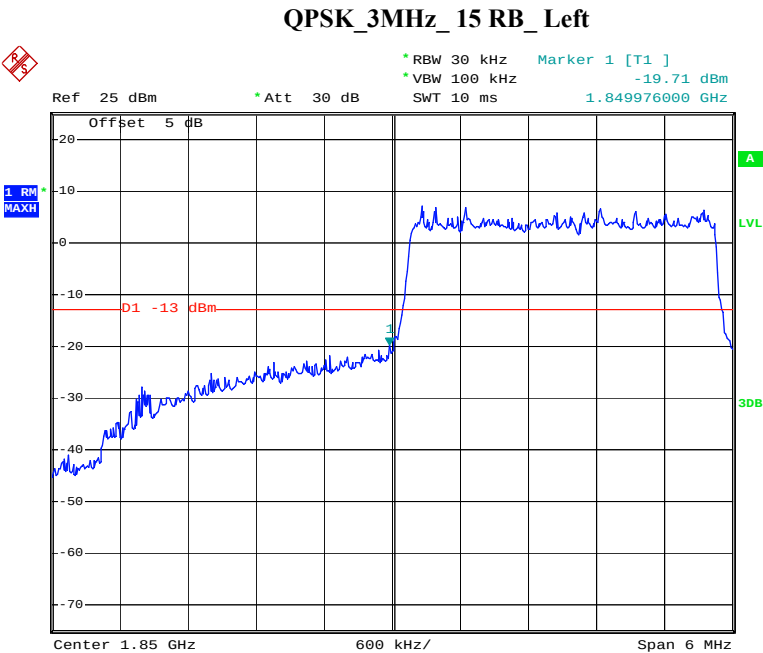


Date: 19.MAY.2020 10:59:19

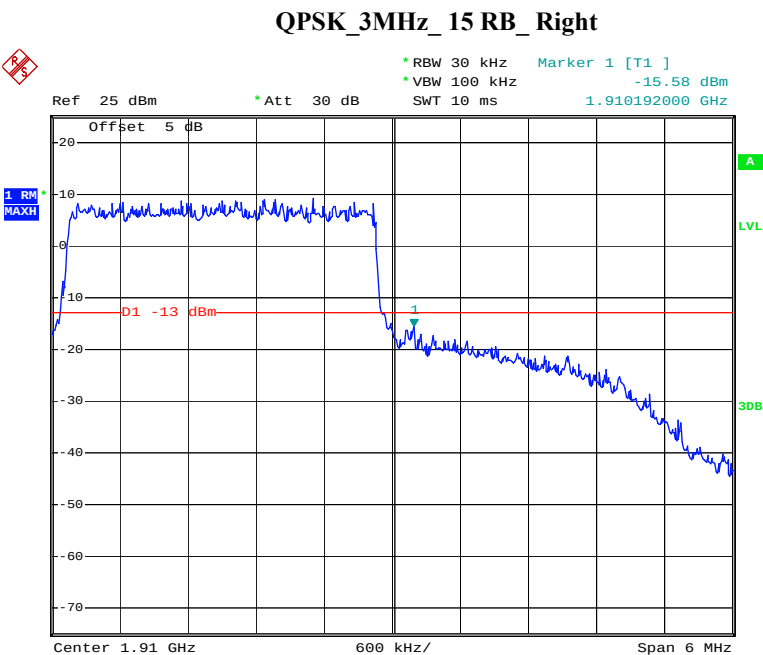
QPSK\_1.4MHz\_6 RB\_ Right



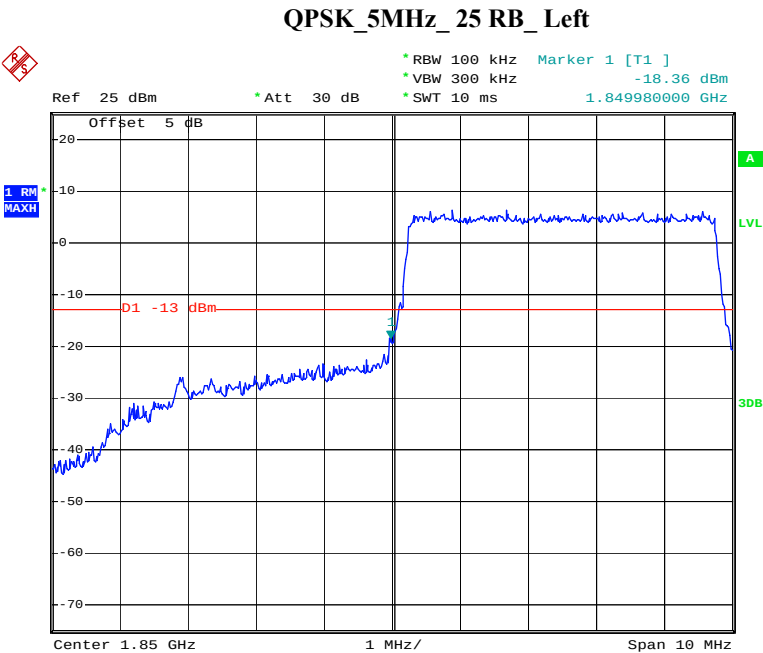
Date: 19.MAY.2020 11:00:10



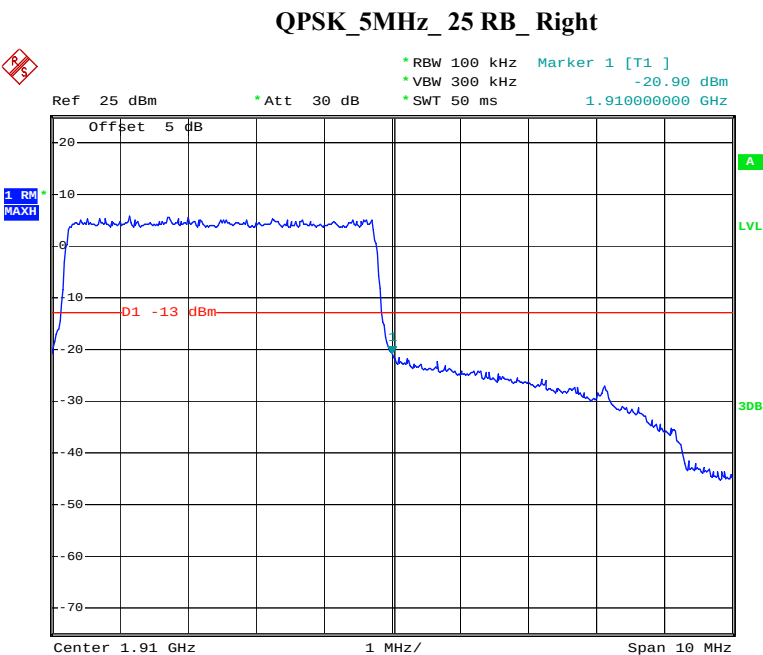
Date: 19.MAY.2020 11:00:58



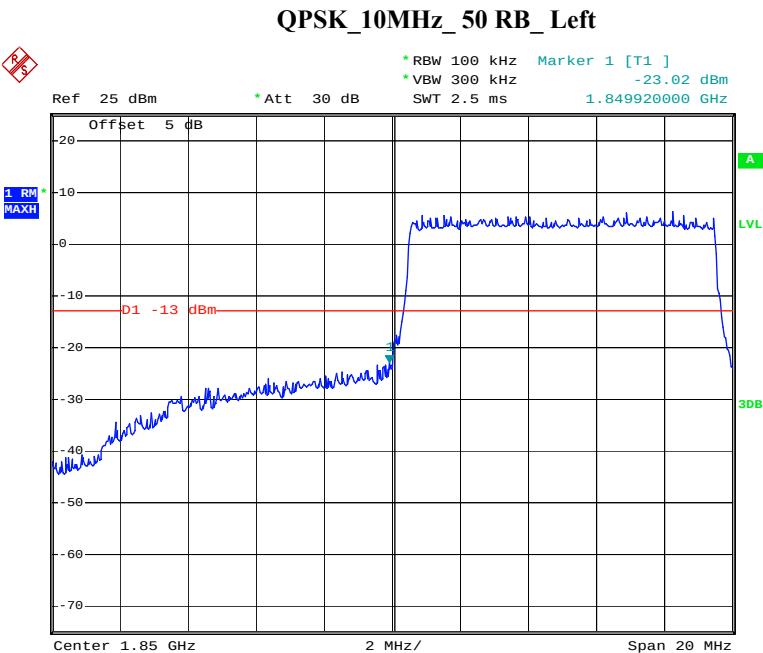
Date: 19.MAY.2020 11:01:33



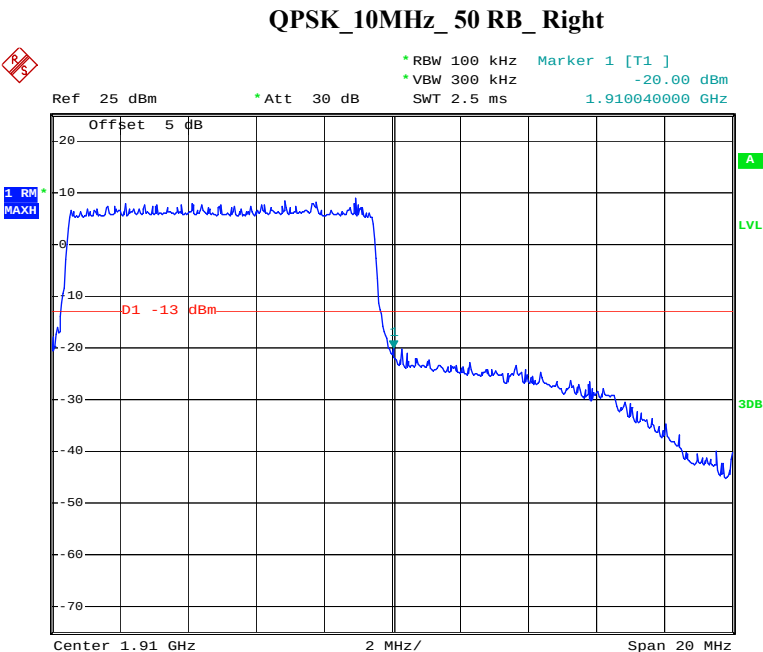
Date: 19.MAY.2020 11:02:29



Date: 19.MAY.2020 11:03:14

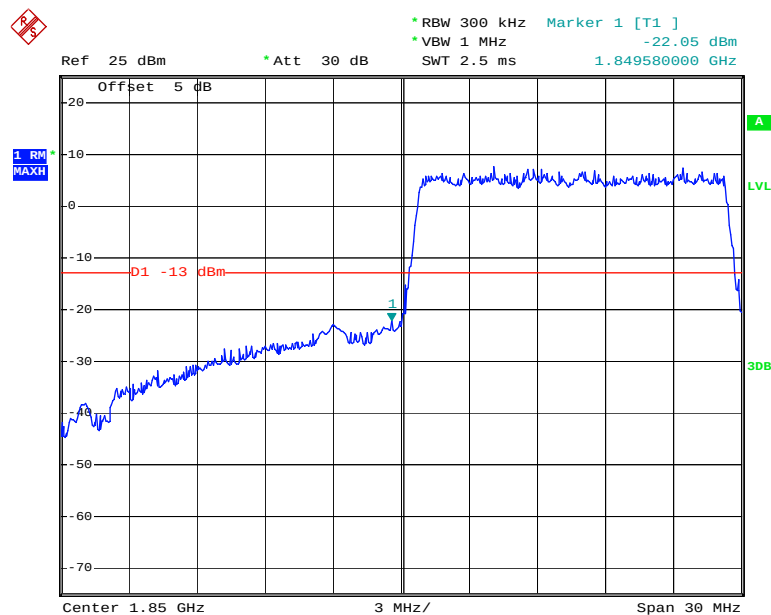


Date: 19.MAY.2020 11:04:05



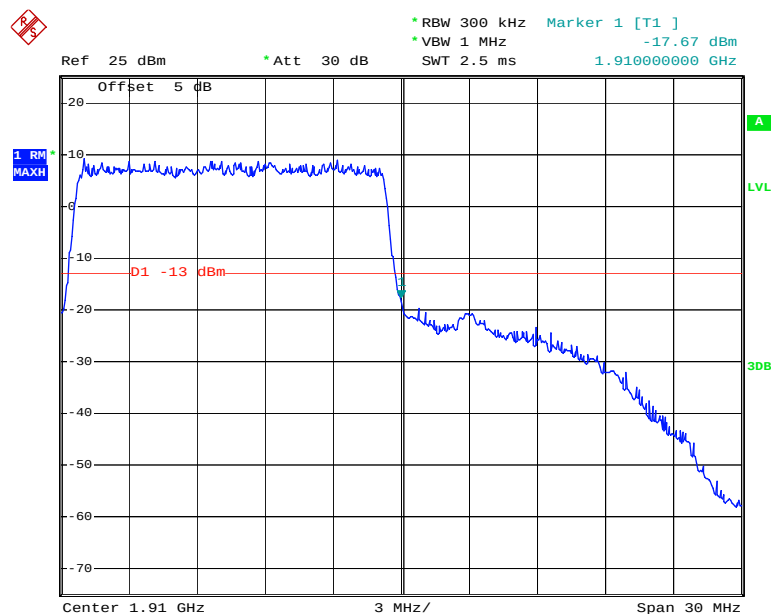
Date: 19.MAY.2020 11:04:47

QPSK\_15MHz\_75 RB\_ Left



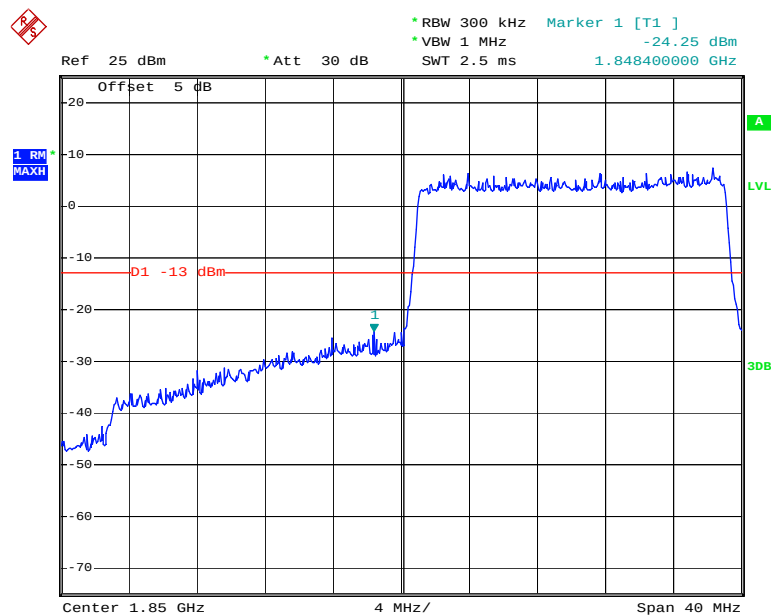
Date: 19.MAY.2020 11:05:28

QPSK\_15MHz\_75 RB\_ Right



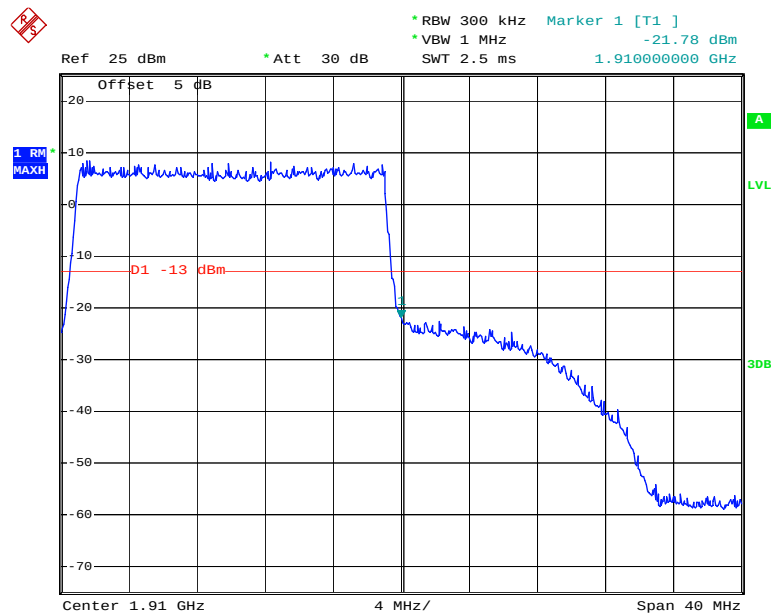
Date: 19.MAY.2020 11:06:13

QPSK\_20MHz\_FULL RB\_Left



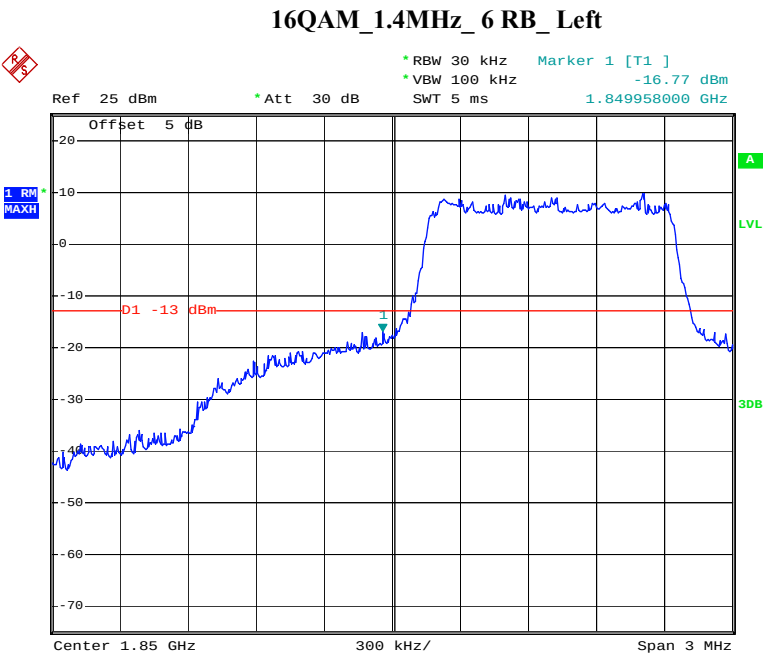
Date: 19.MAY.2020 11:06:57

QPSK\_20MHz\_FULL RB\_Right

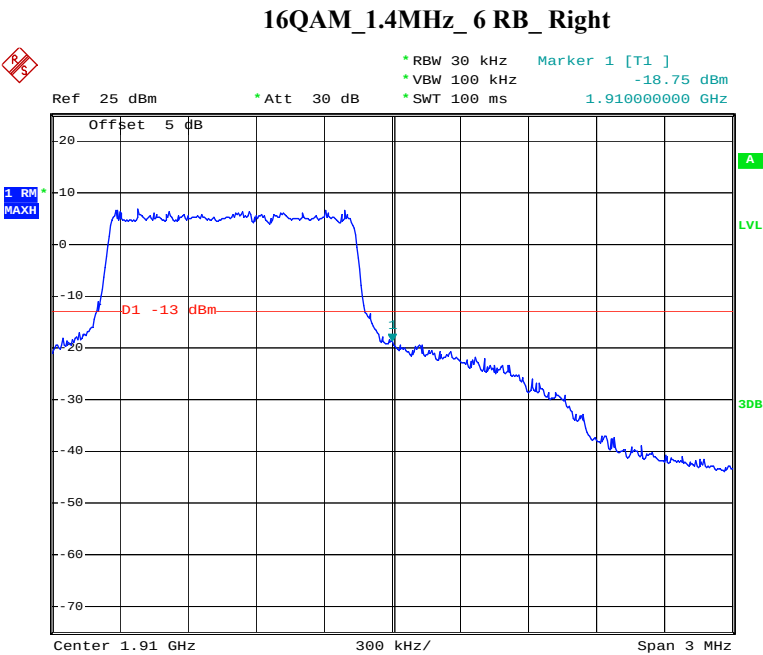


Date: 19.MAY.2020 11:07:42

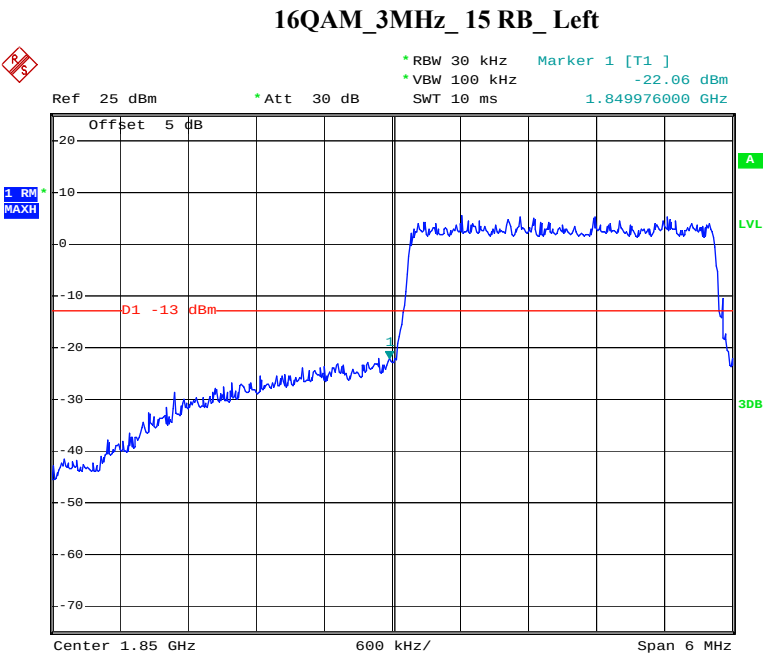




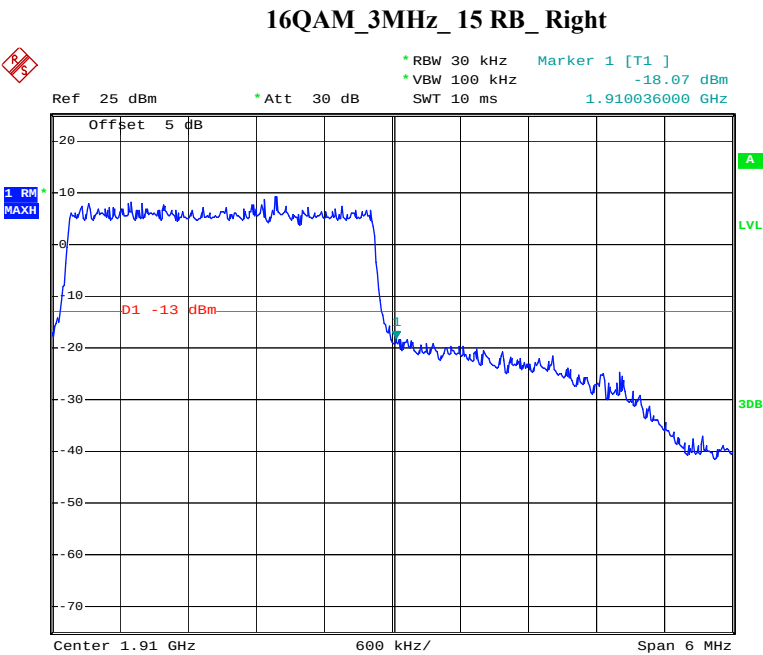
Date: 19.MAY.2020 10:59:36



Date: 19.MAY.2020 11:00:38



Date: 19.MAY.2020 11:01:15

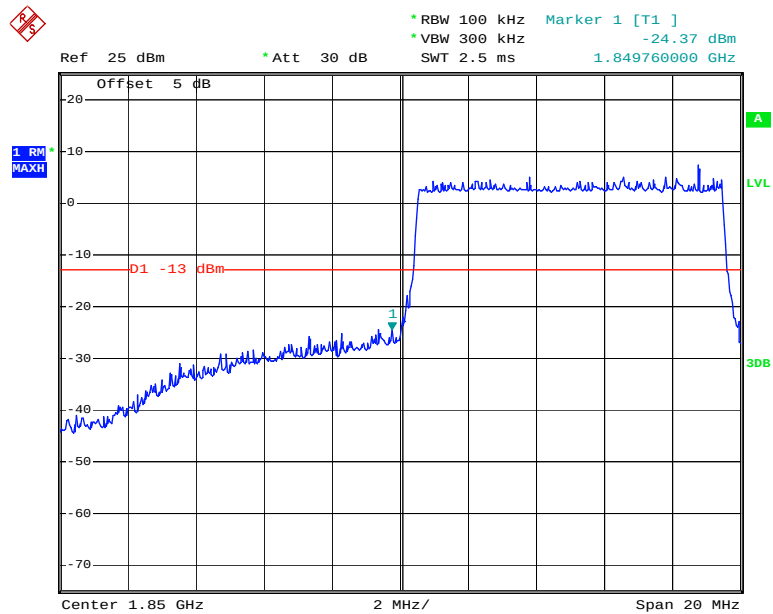


Date: 19.MAY.2020 11:01:54



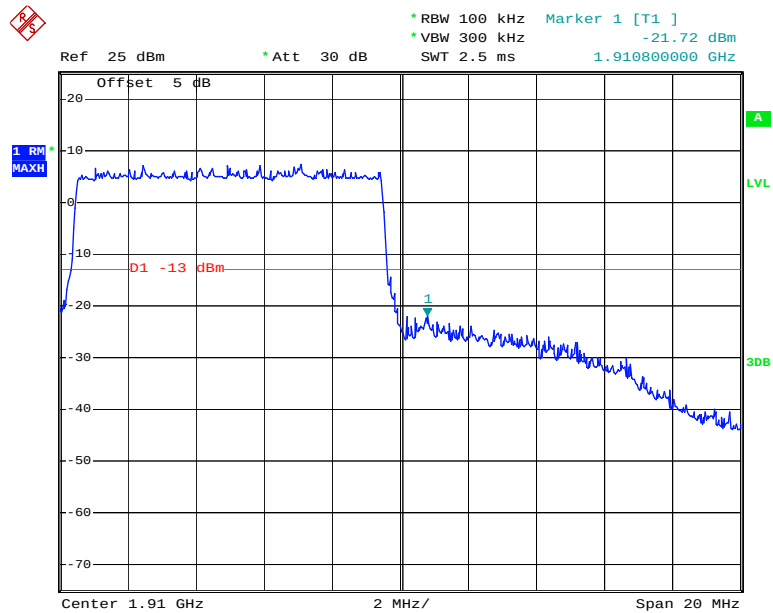
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### 16QAM\_10MHz\_ 50 RB\_ Left

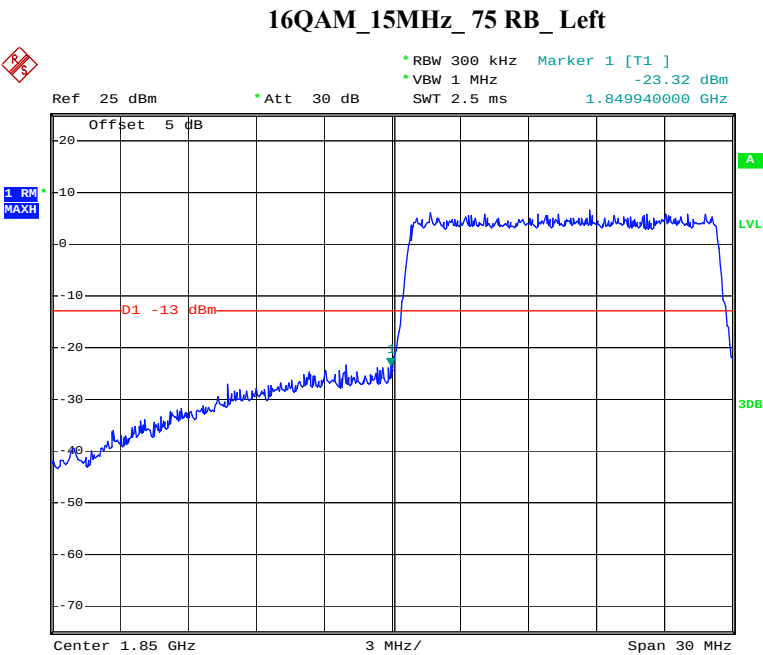


Date: 19.MAY.2020 11:04:23

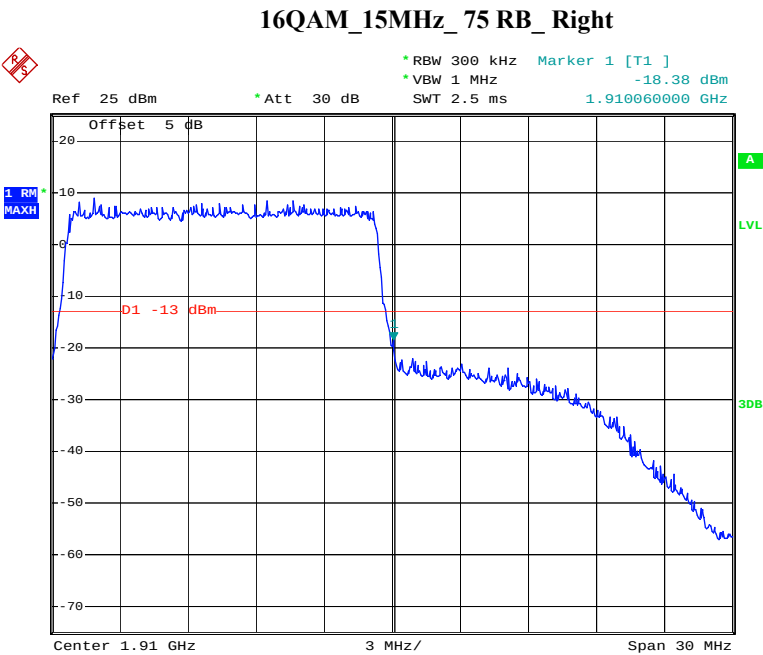
### 16QAM\_10MHz\_ 50 RB\_ Right



Date: 19.MAY.2020 11:05:05

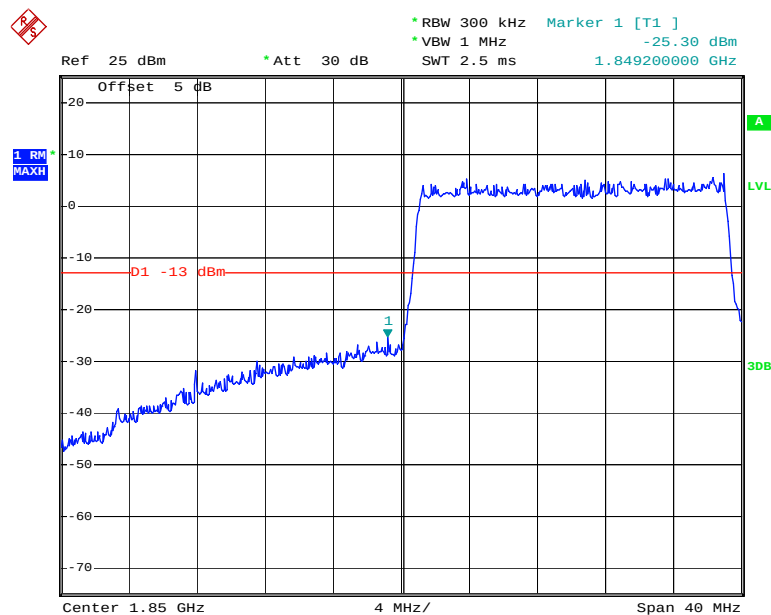


Date: 19.MAY.2020 11:05:52



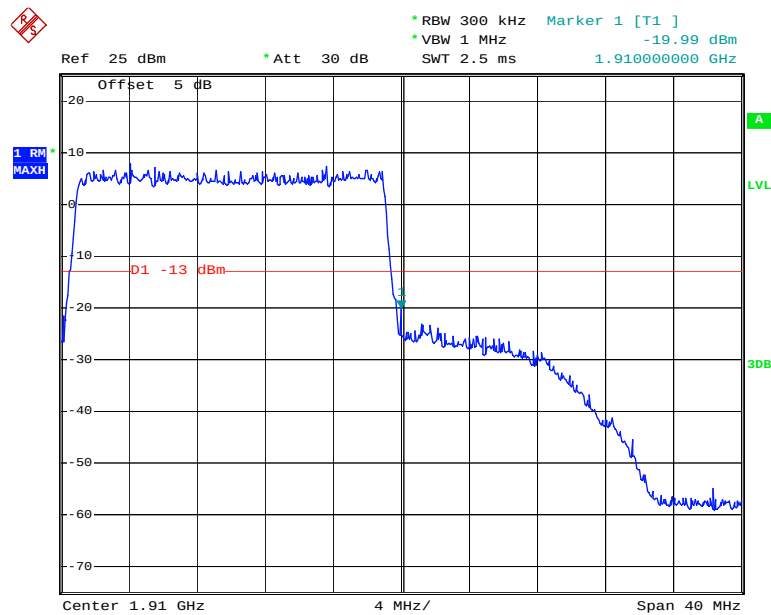
Date: 19.MAY.2020 11:06:33

16QAM\_20MHz\_ FULL RB\_ Left



Date: 19.MAY.2020 11:07:18

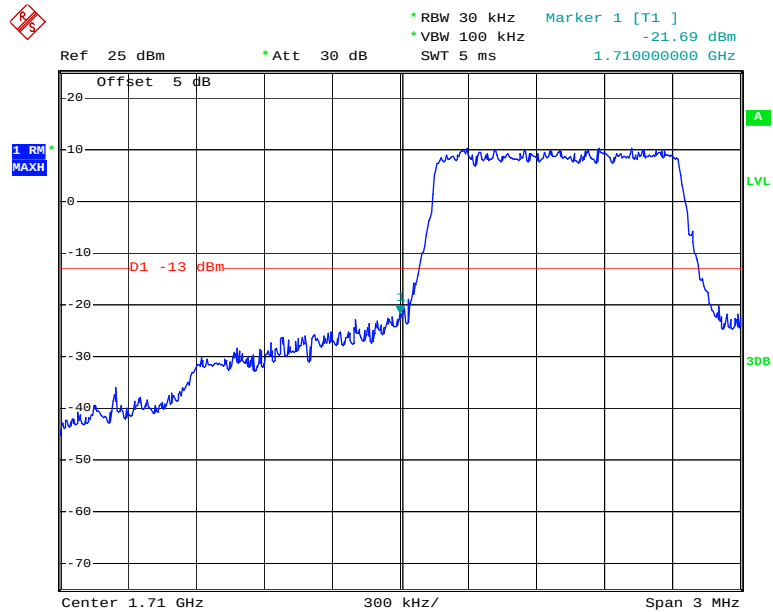
16QAM\_20MHz\_ FULL RB\_ Right



Date: 19.MAY.2020 11:08:03

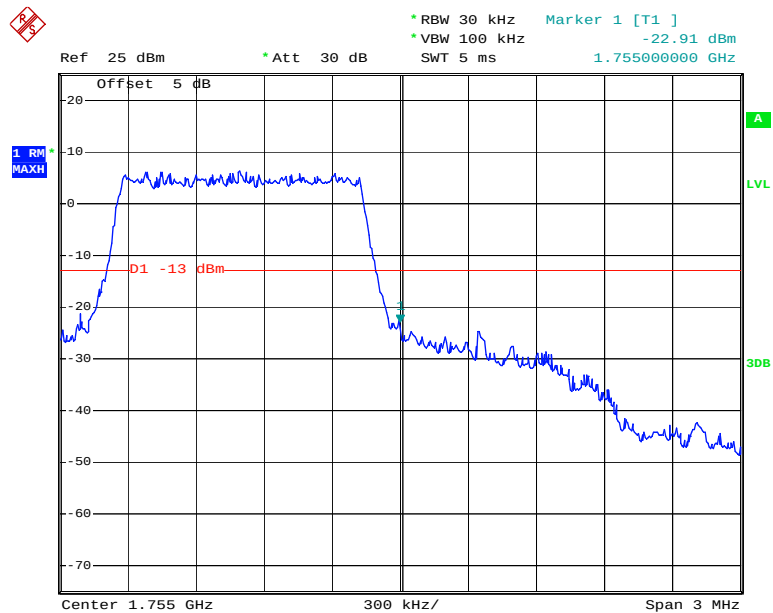
# LTE Band 4

## QPSK\_1.4MHz\_6 RB\_ Left



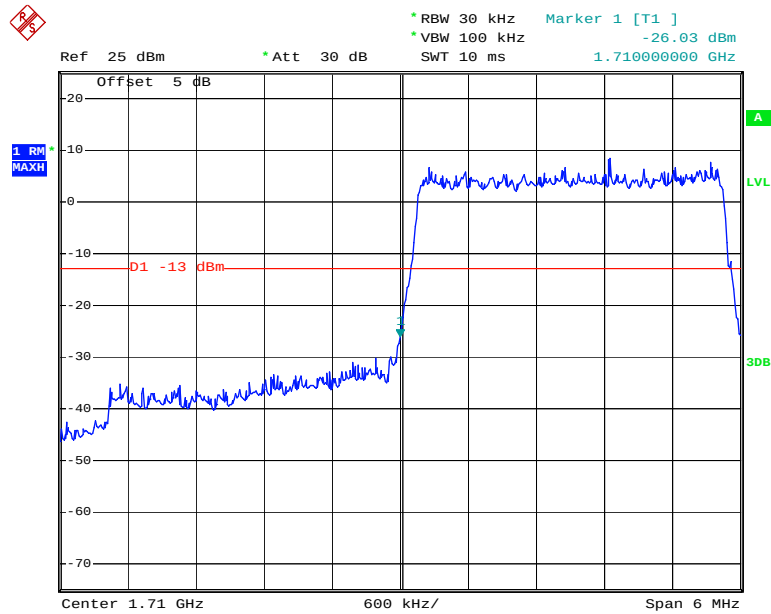
Date: 19.MAY.2020 11:08:26

## QPSK\_1.4MHz\_6 RB\_ Right



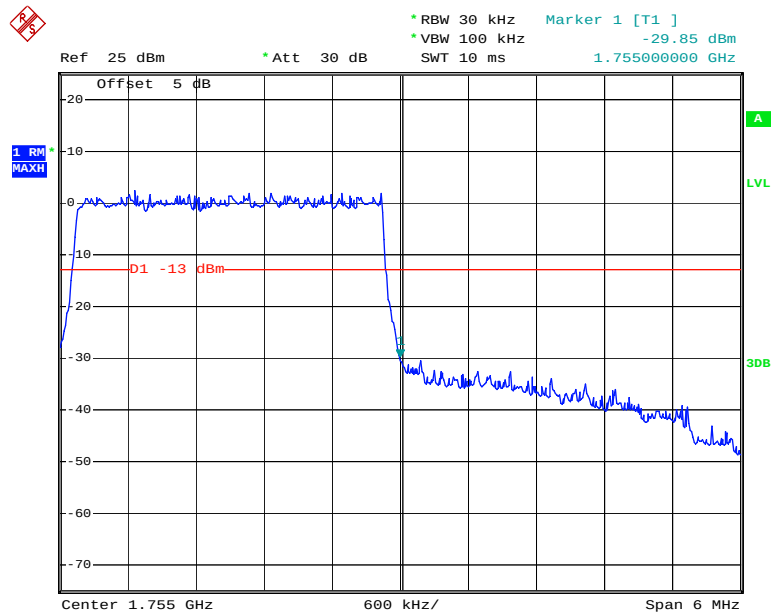
Date: 19.MAY.2020 11:09:07

### QPSK\_3MHz\_15 RB\_Left



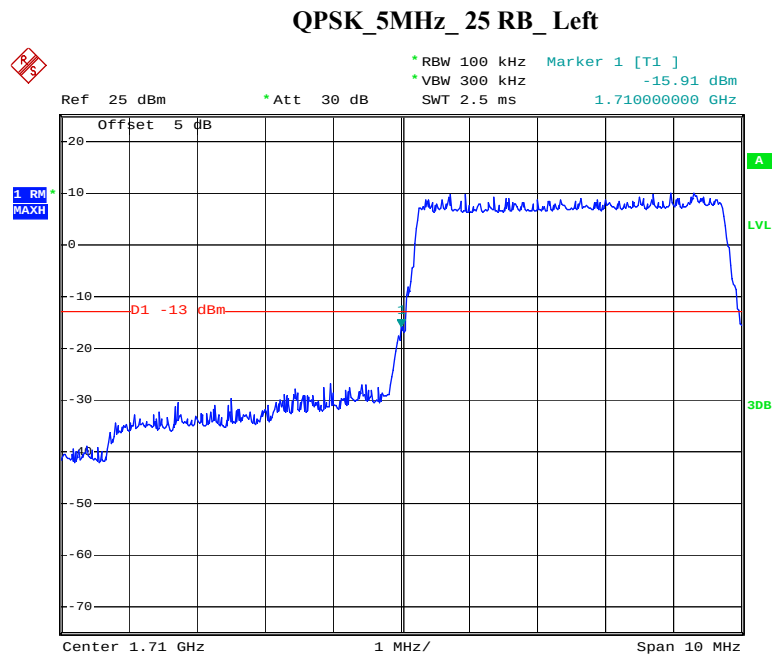
Date: 19.MAY.2020 11:09:47

### QPSK\_3MHz\_15 RB\_Right

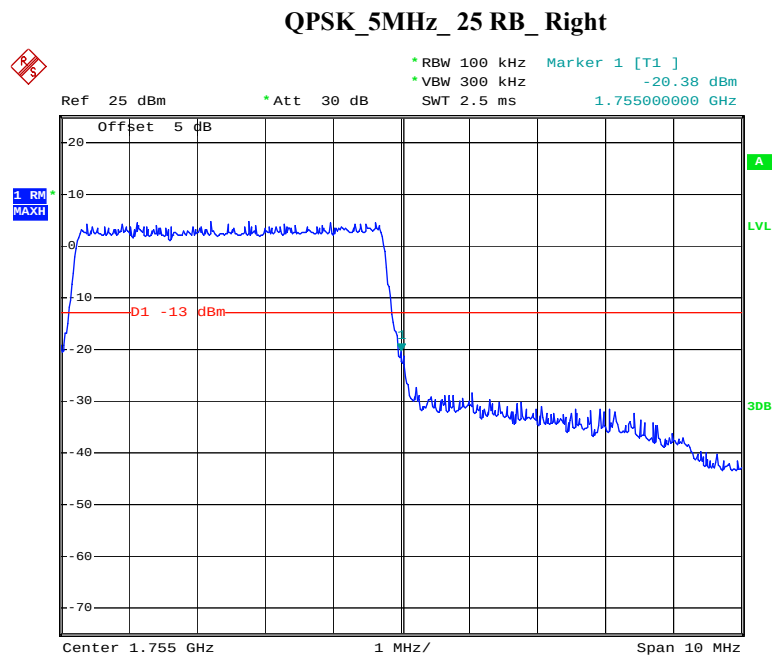


Date: 19.MAY.2020 11:10:28



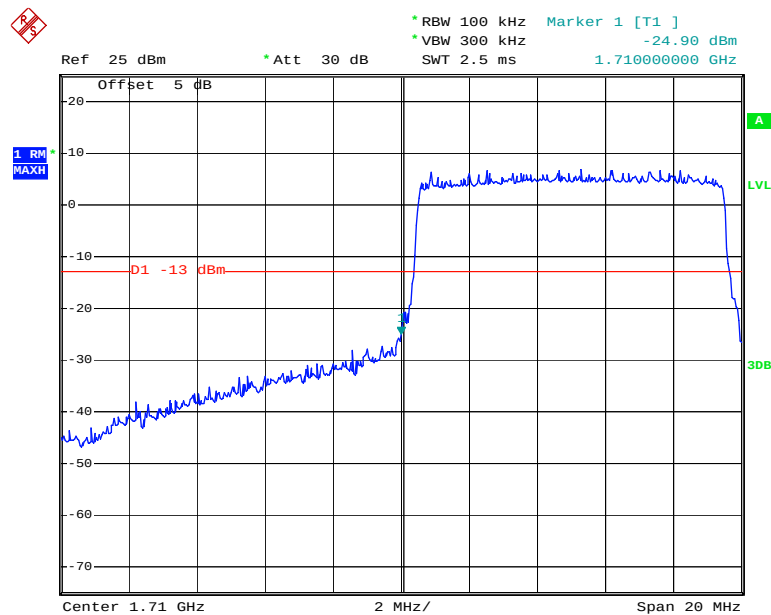


Date: 19.MAY.2020 11:11:12



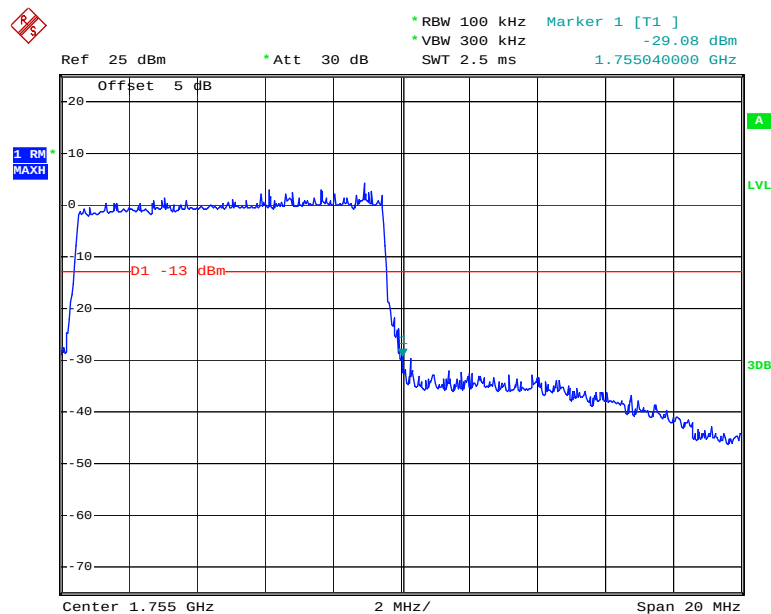
Date: 19.MAY.2020 11:11:53

QPSK\_10MHz\_50 RB\_ Left



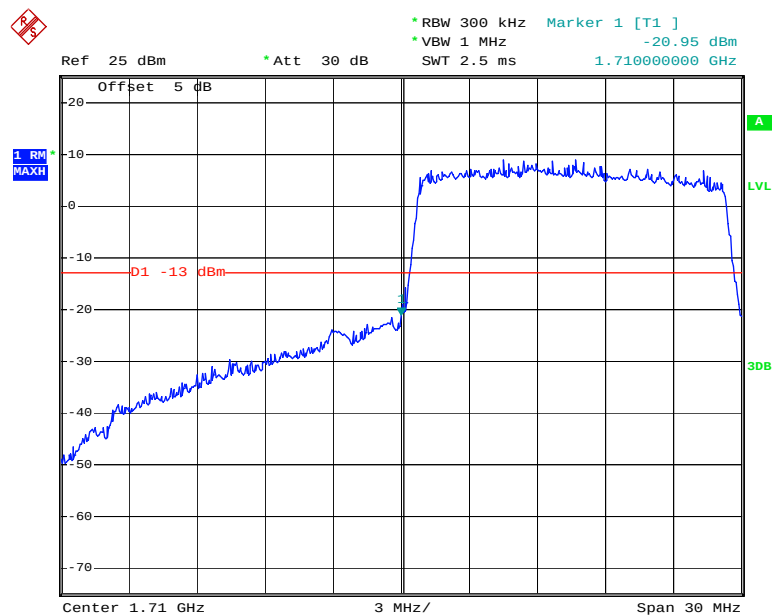
Date: 19.MAY.2020 11:12:34

QPSK\_10MHz\_50 RB\_ Right



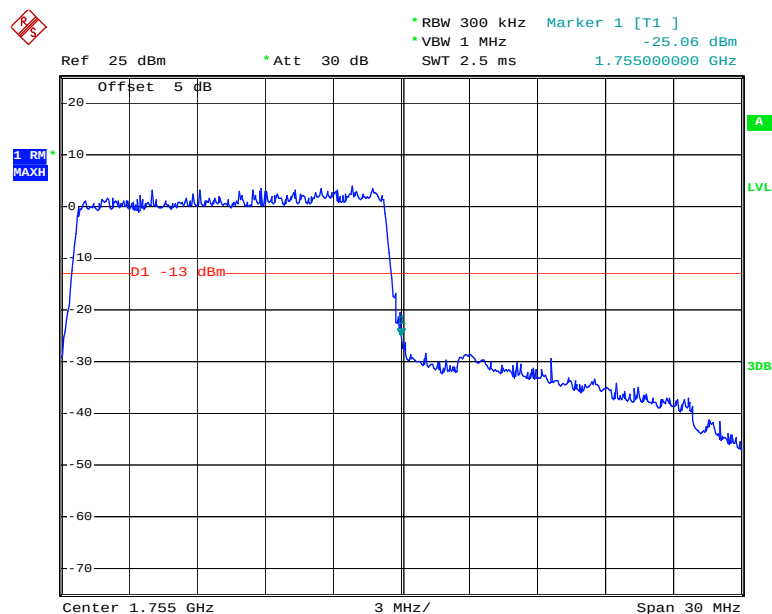
Date: 19.MAY.2020 11:13:12

QPSK\_15MHz\_75 RB\_ Left



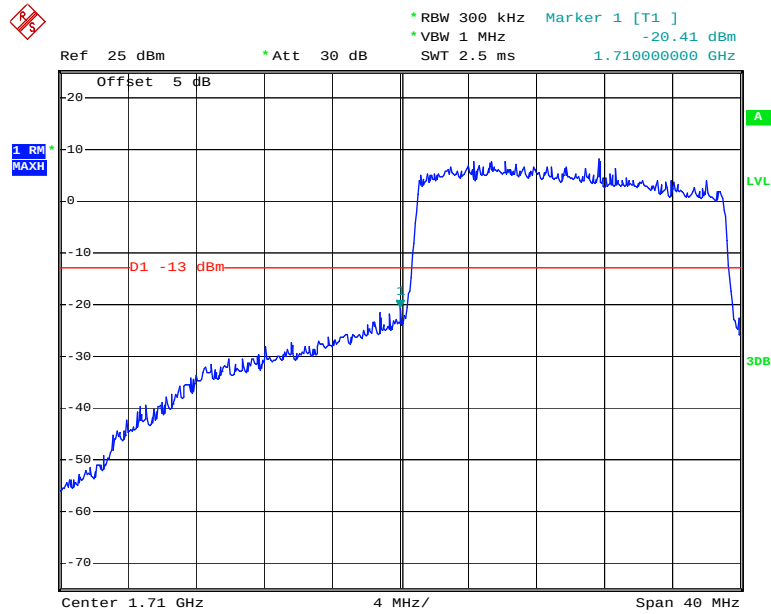
Date: 19.MAY.2020 11:13:57

QPSK\_15MHz\_75 RB\_ Right



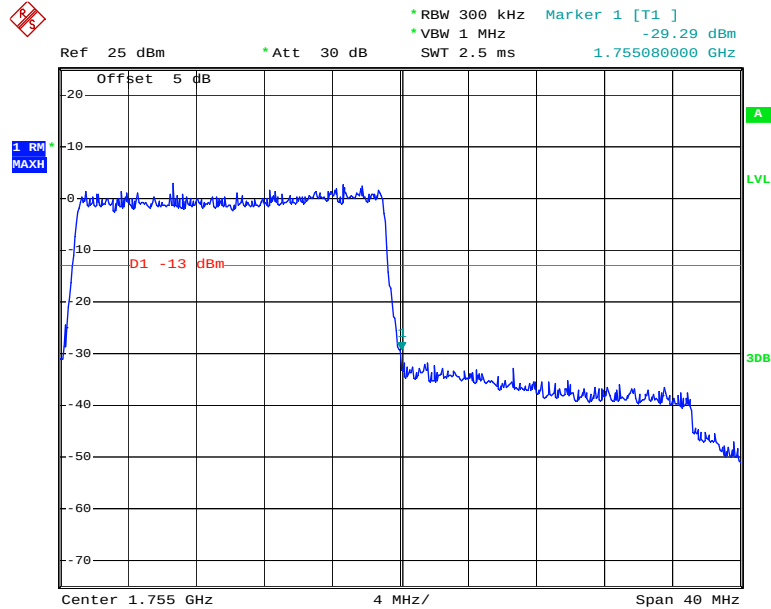
Date: 19.MAY.2020 11:14:38

### QPSK\_20MHz\_FULL RB\_Left

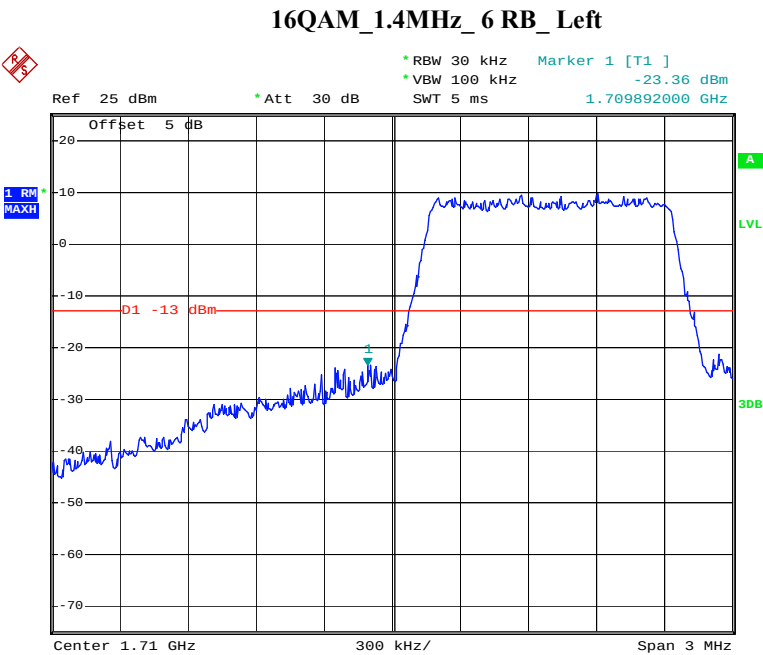


Date: 19.MAY.2020 11:15:22

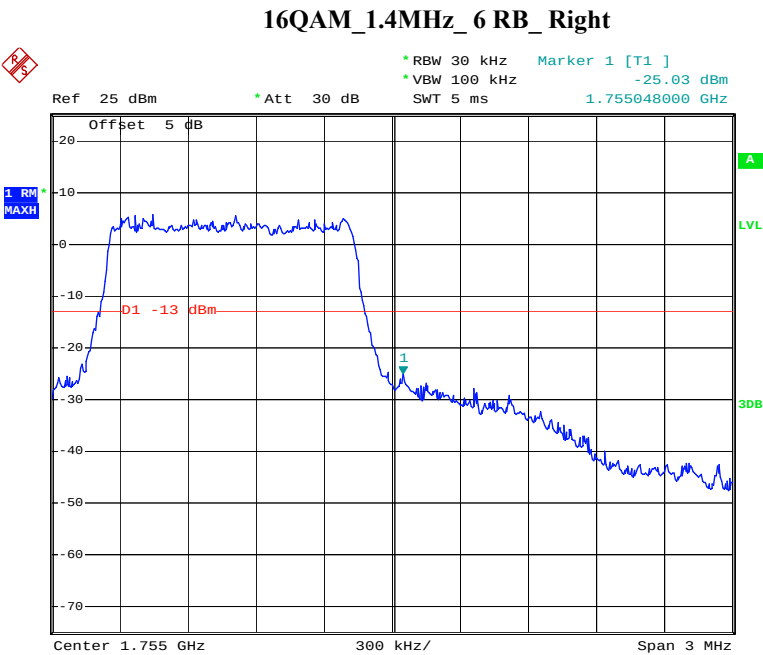
### QPSK\_20MHz\_FULL RB\_Right



Date: 19.MAY.2020 11:16:07

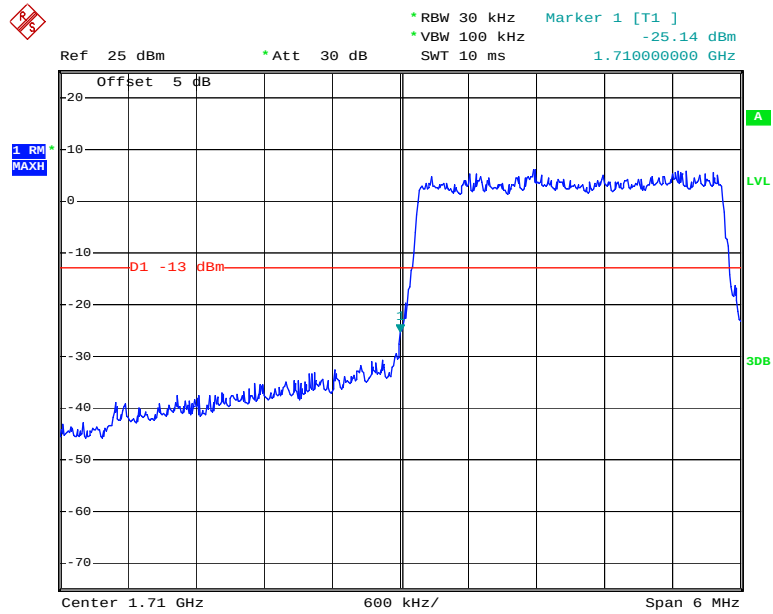


Date: 19.MAY.2020 11:08:46



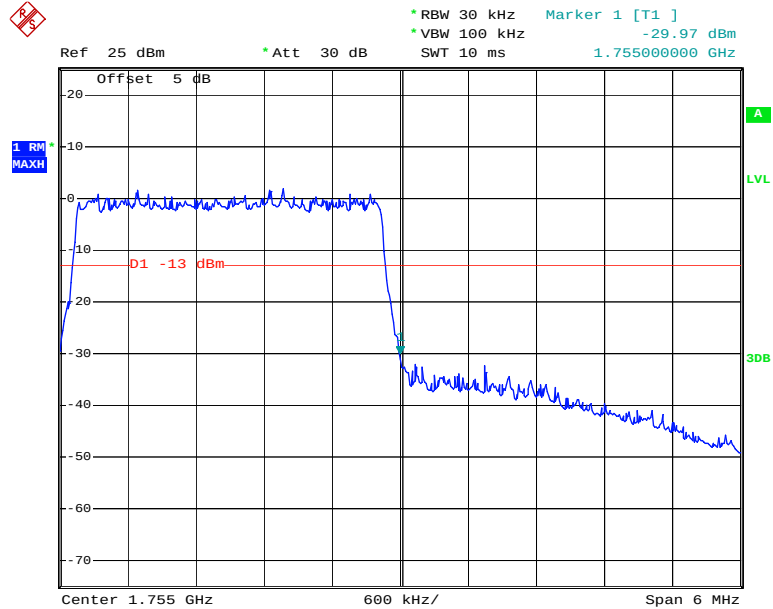
Date: 19.MAY.2020 11:09:27

### 16QAM\_3MHz\_15 RB\_ Left

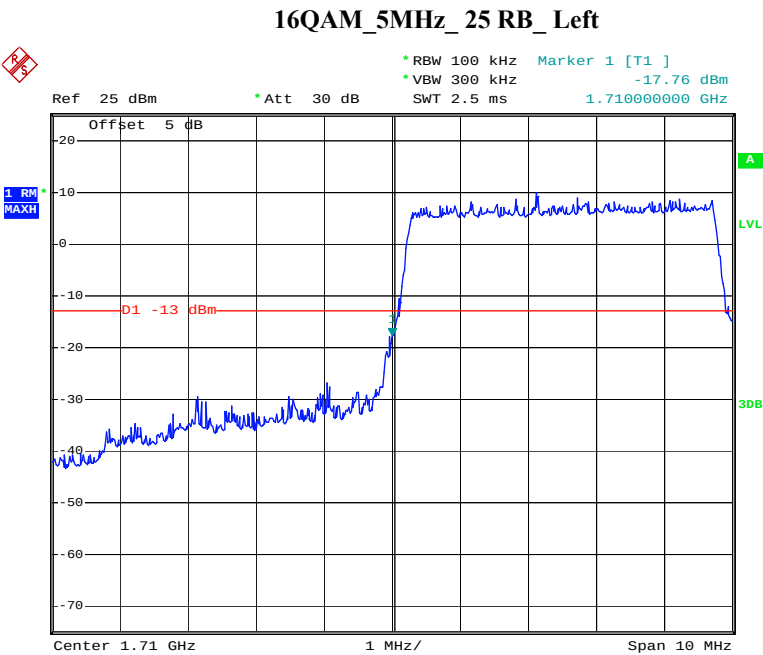


Date: 19.MAY.2020 11:10:07

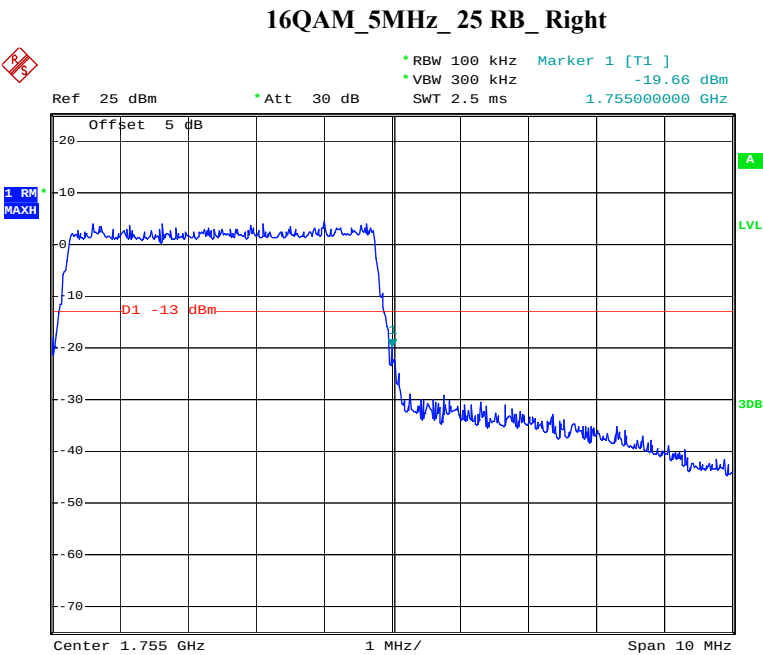
### 16QAM\_3MHz\_15 RB\_ Right



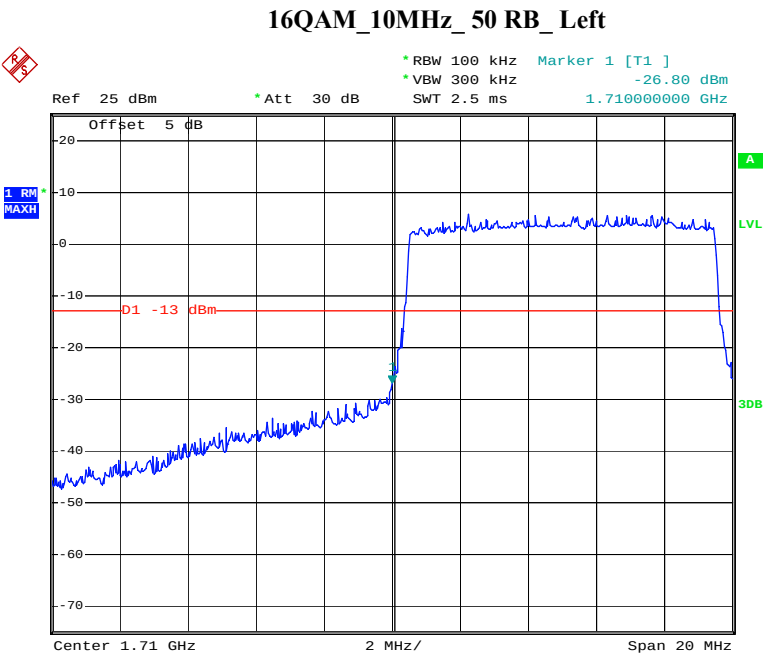
Date: 19.MAY.2020 11:10:48



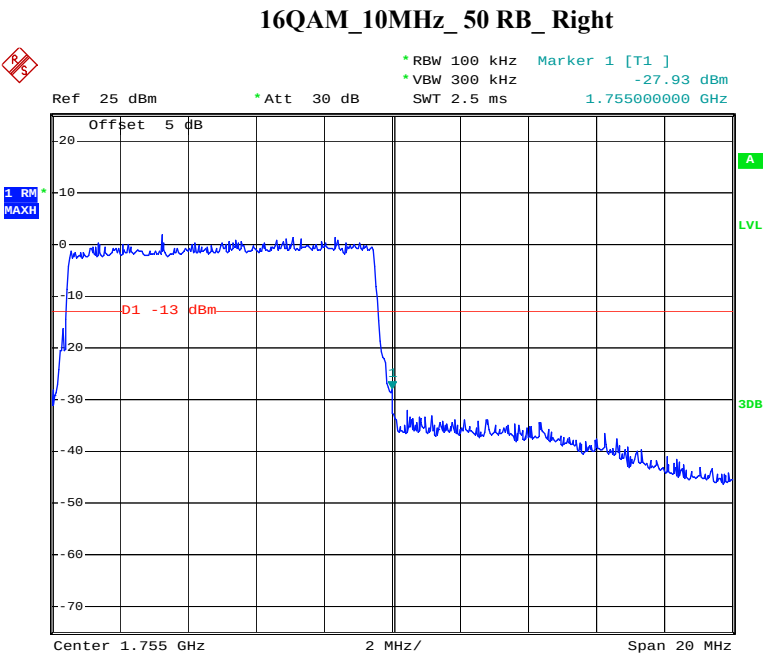
Date: 19.MAY.2020 11:11:32



Date: 19.MAY.2020 11:12:13



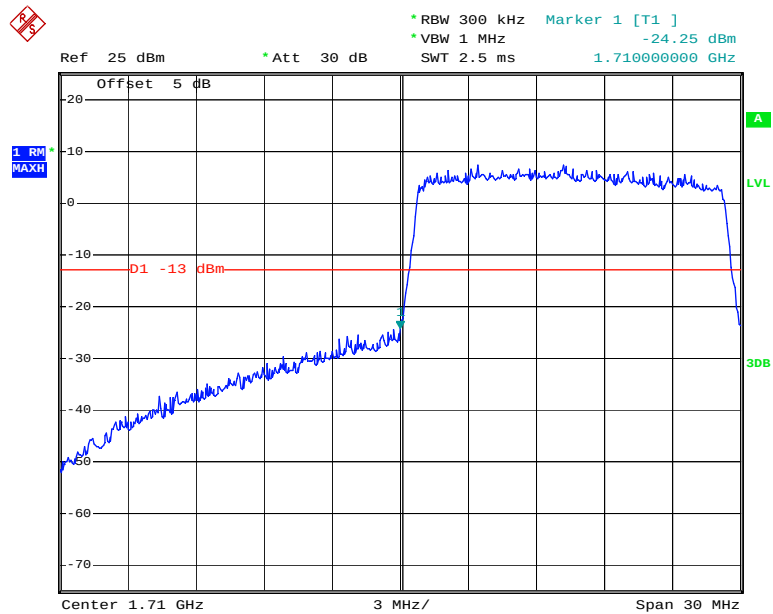
Date: 19.MAY.2020 11:12:53



Date: 19.MAY.2020 11:13:33

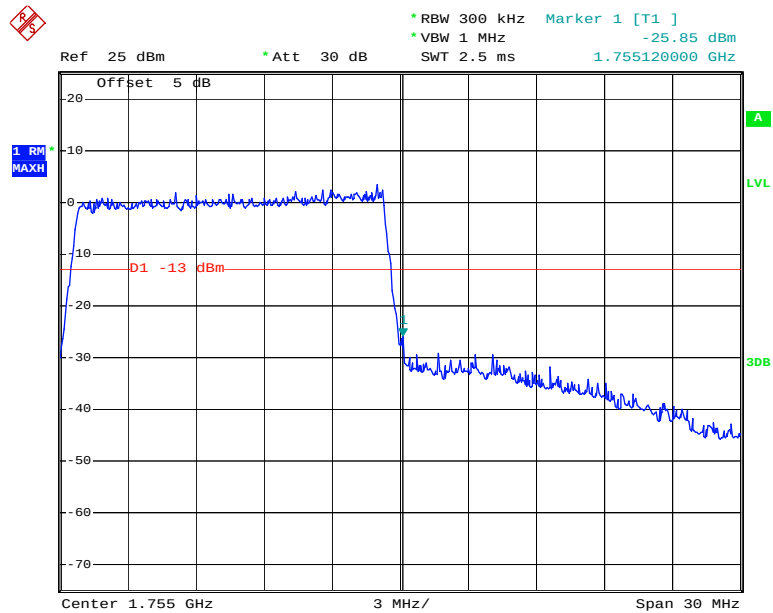


### 16QAM\_15MHz\_ 75 RB\_ Left



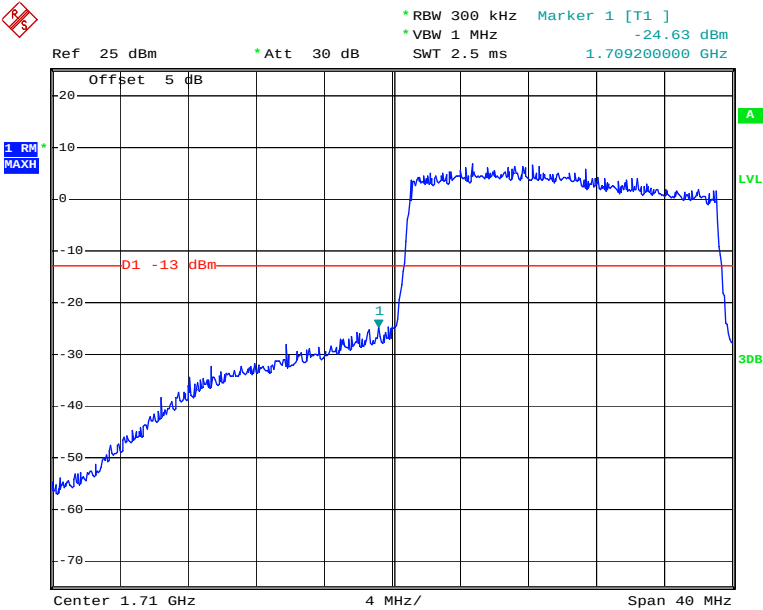
Date: 19.MAY.2020 11:14:17

### 16QAM\_15MHz\_ 75 RB\_ Right



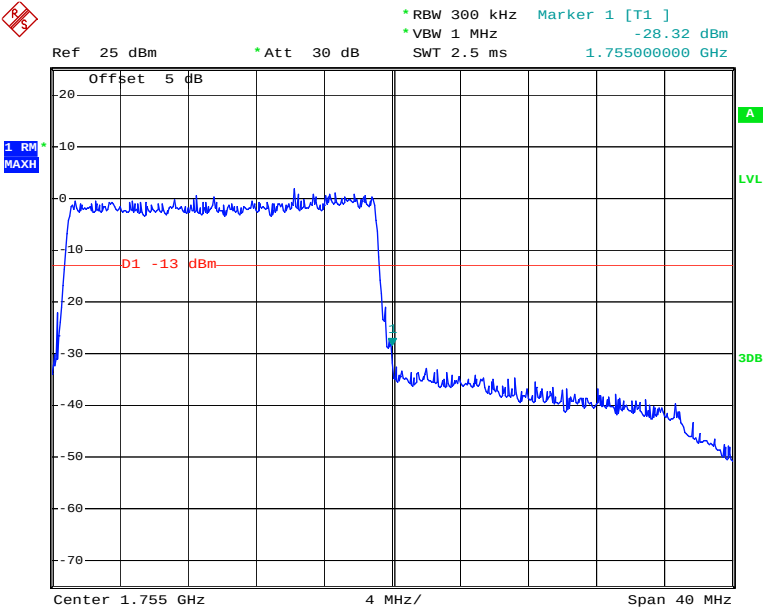
Date: 19.MAY.2020 11:14:59

16QAM\_20MHz\_ FULL RB\_ Left



Date: 19.MAY.2020 11:15:46

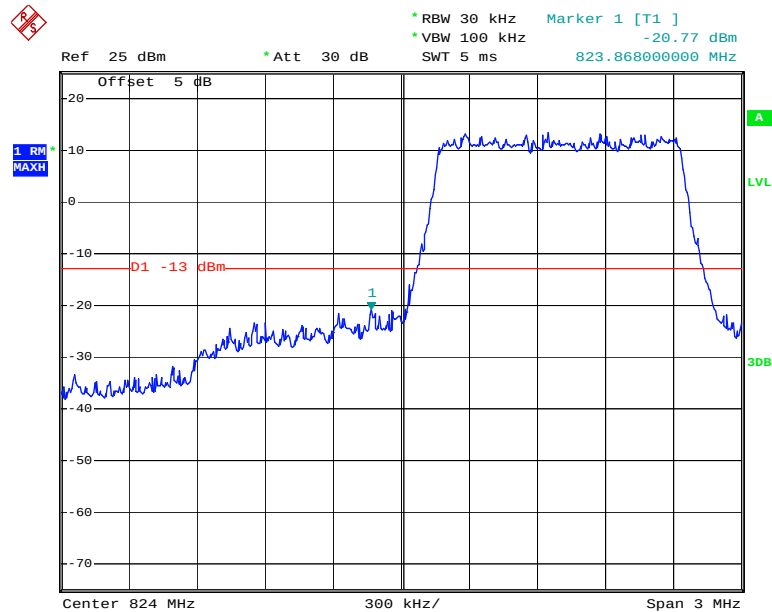
16QAM\_20MHz\_ FULL RB\_ Right



Date: 19.MAY.2020 11:16:27

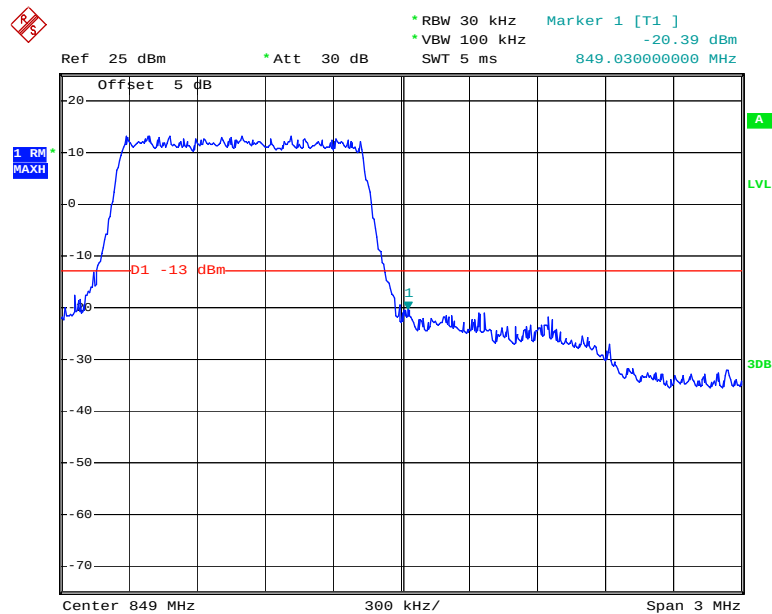
## LTE Band 5

## QPSK\_1.4MHz\_6 RB\_ Left



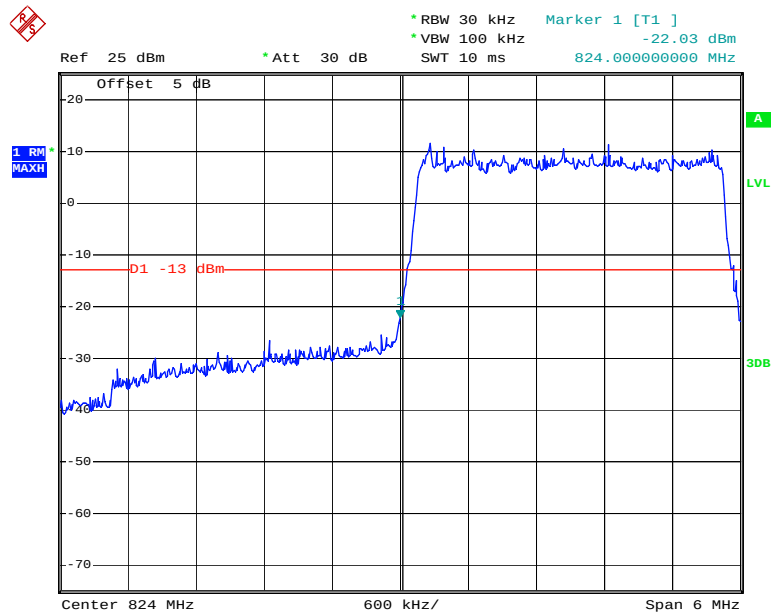
Date: 19.MAY.2020 11:16:47

## QPSK\_1.4MHz\_6 RB\_ Right



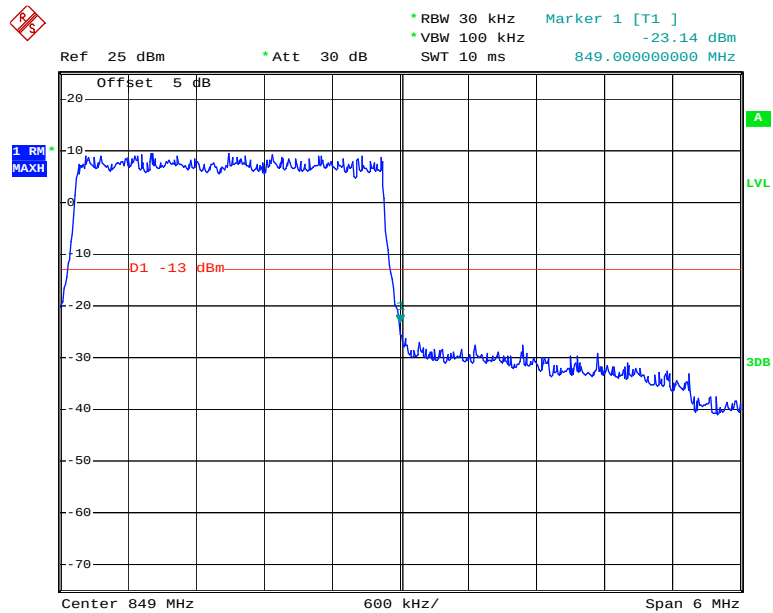
Date: 19.MAY.2020 11:17:29

### QPSK\_3MHz\_15 RB\_ Left



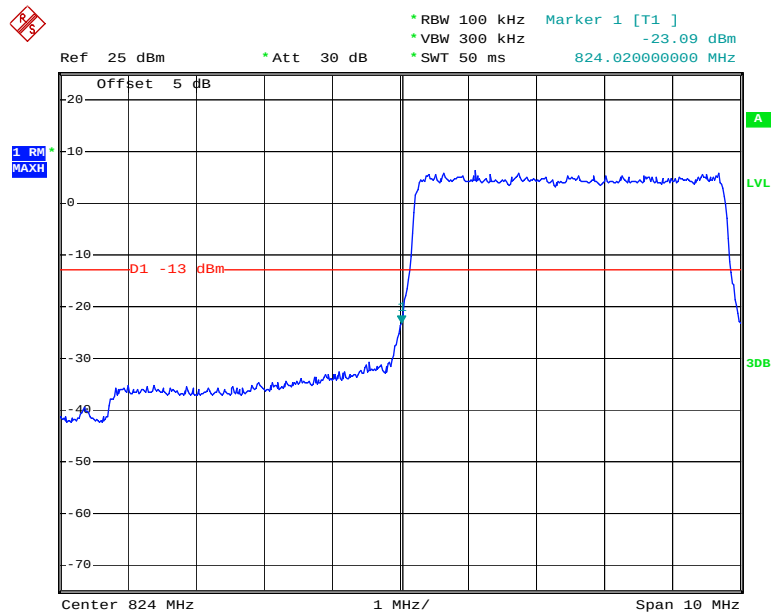
Date: 19.MAY.2020 11:18:12

### QPSK\_3MHz\_15 RB\_ Right



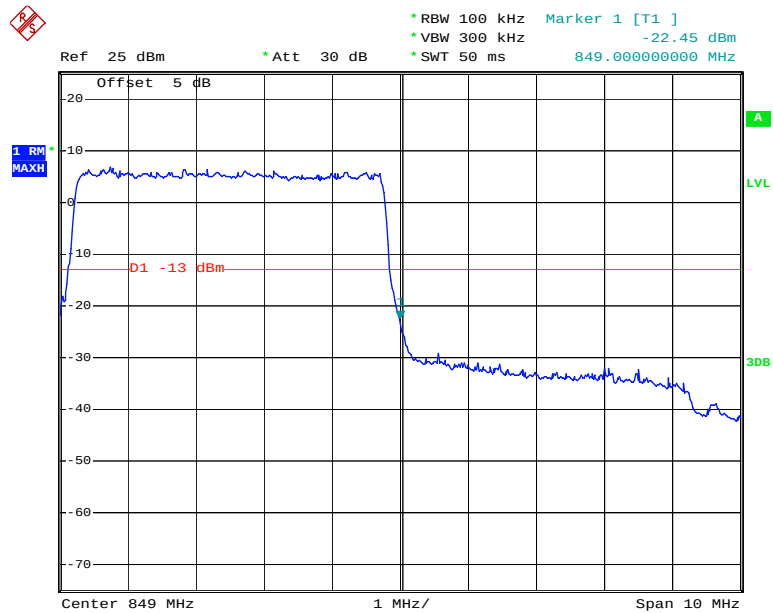
Date: 19.MAY.2020 11:18:53

### QPSK\_5MHz\_25 RB\_Left



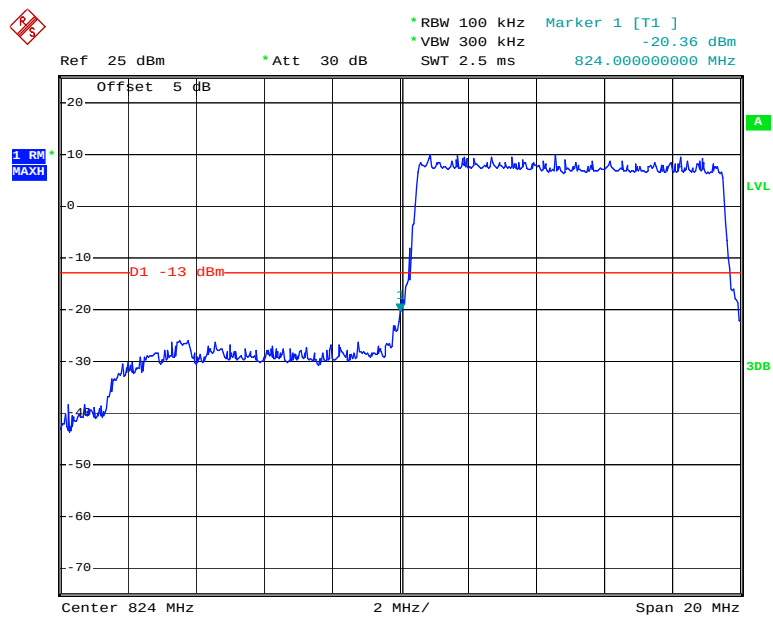
Date: 19.MAY.2020 11:53:52

### QPSK\_5MHz\_25 RB\_Right



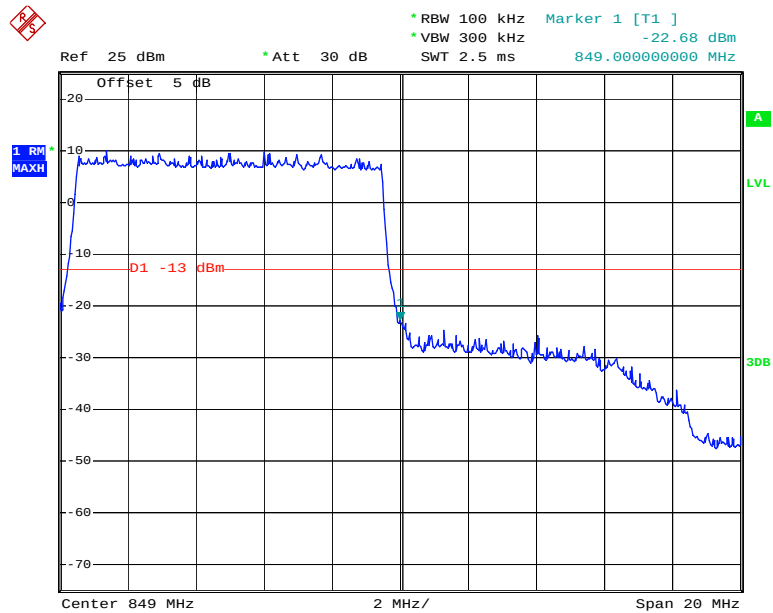
Date: 19.MAY.2020 11:56:00

### QPSK\_10MHz\_50 RB\_Left



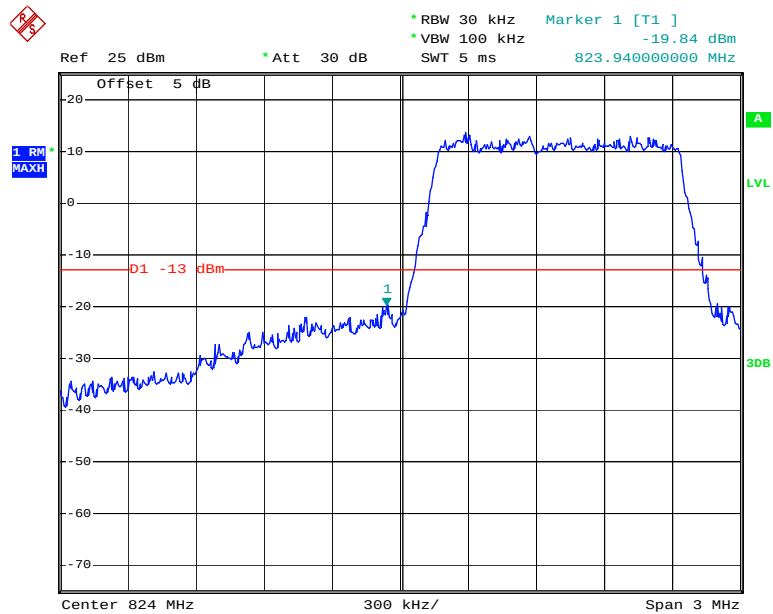
Date: 19.MAY.2020 11:20:55

### QPSK\_10MHz\_50 RB\_Right



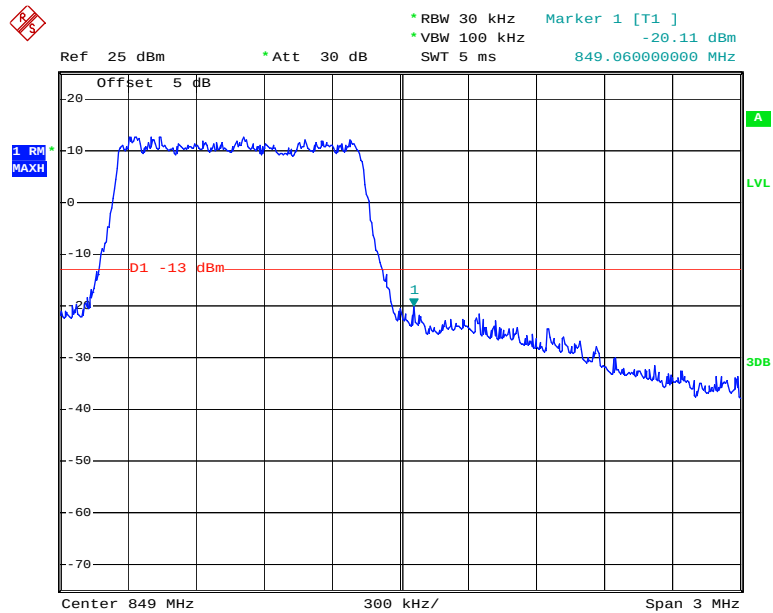
Date: 19.MAY.2020 11:21:36

### 16QAM\_1.4MHz\_6 RB\_ Left



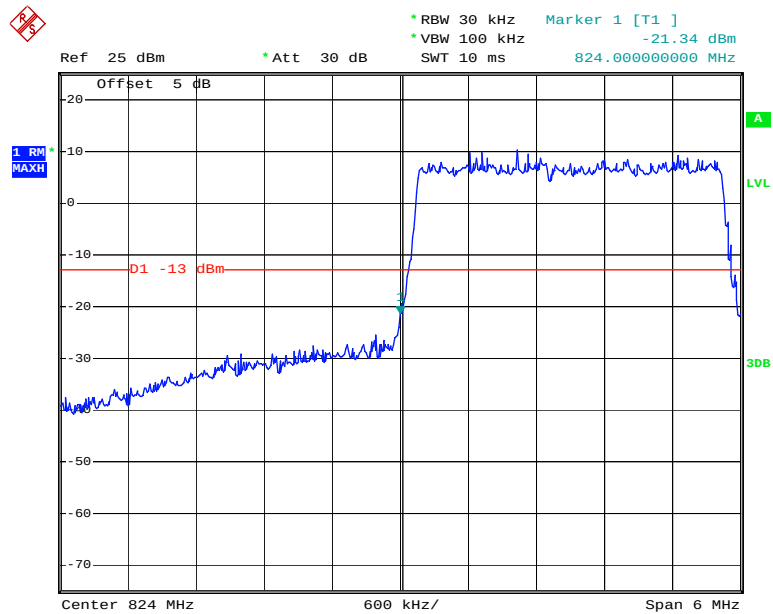
Date: 19.MAY.2020 11:17:08

### 16QAM\_1.4MHz\_6 RB\_ Right



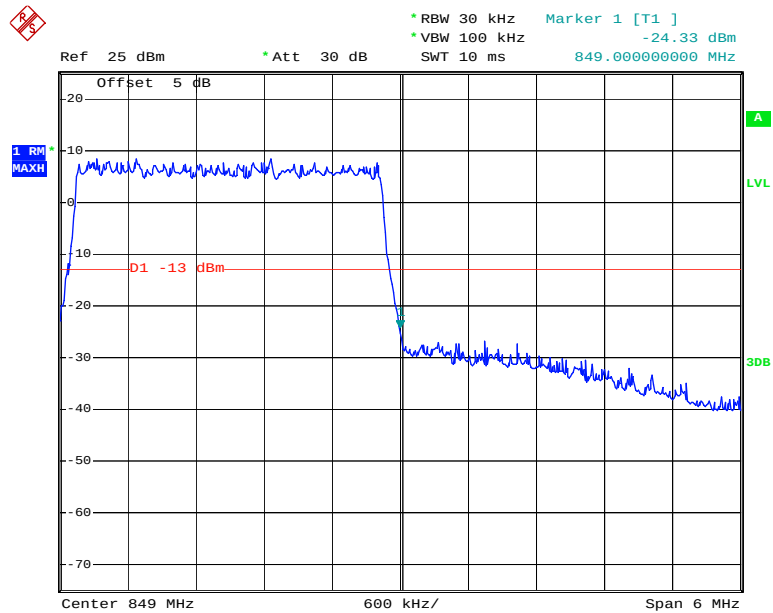
Date: 19.MAY.2020 11:17:49

### 16QAM\_3MHz\_15 RB\_ Left



Date: 19.MAY.2020 11:18:32

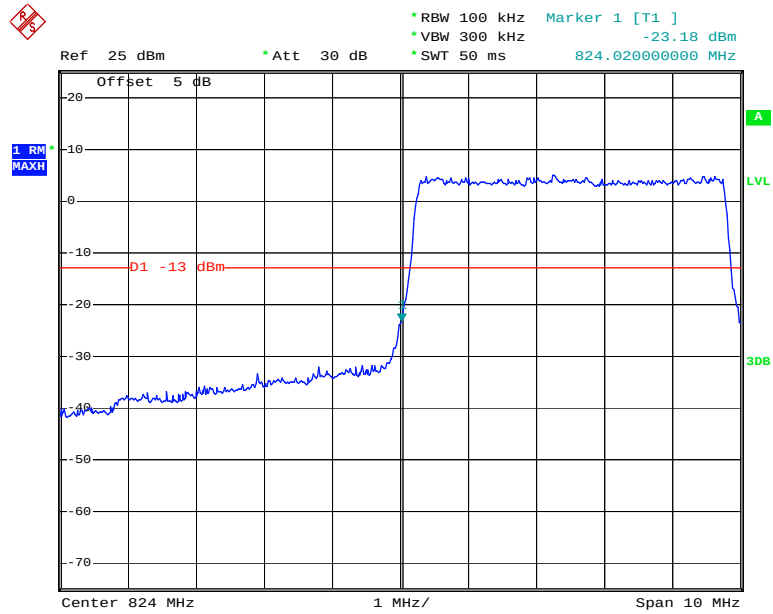
### 16QAM\_3MHz\_15 RB\_ Right



Date: 19.MAY.2020 11:19:13

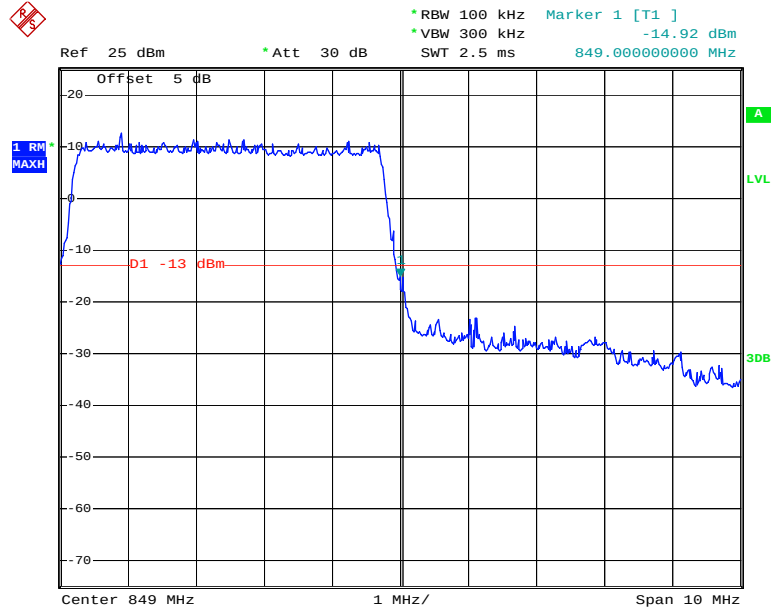


### 16QAM\_5MHz\_25 RB\_ Left

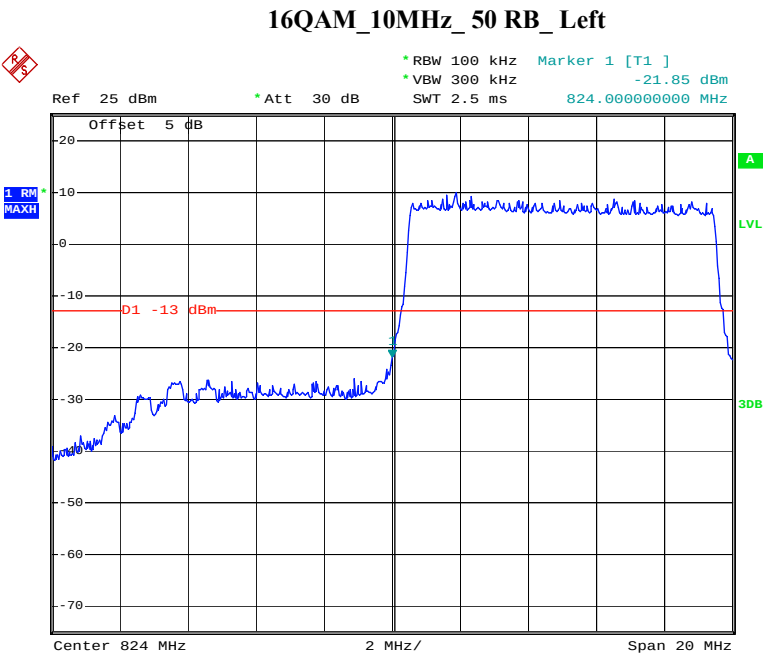


Date: 19.MAY.2020 11:54:41

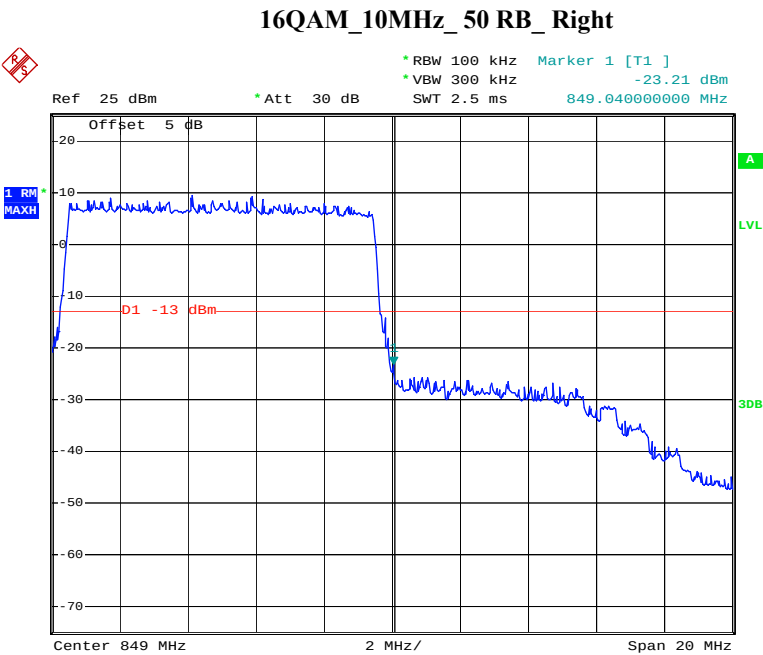
### 16QAM\_5MHz\_25 RB\_ Right



Date: 19.MAY.2020 11:20:32



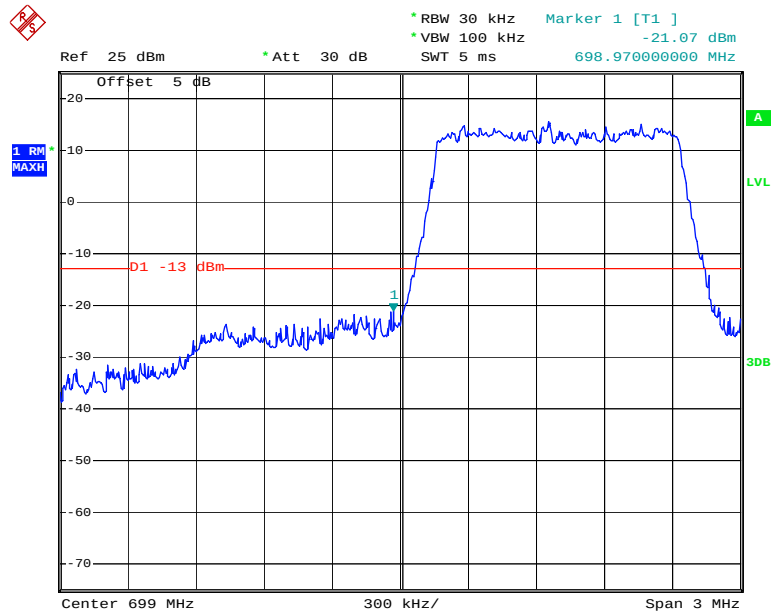
Date: 19.MAY.2020 11:21:17



Date: 19.MAY.2020 11:21:57

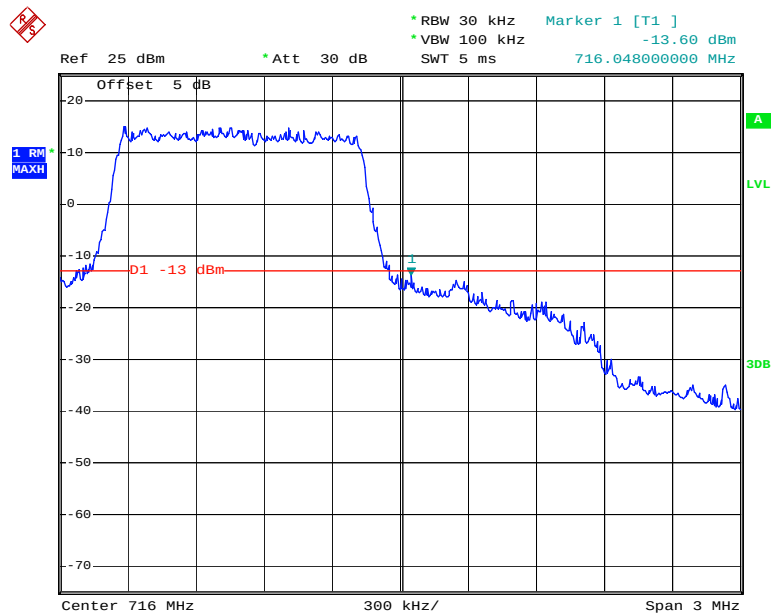
LTE Band 12

QPSK\_1.4MHz\_6 RB\_ Left



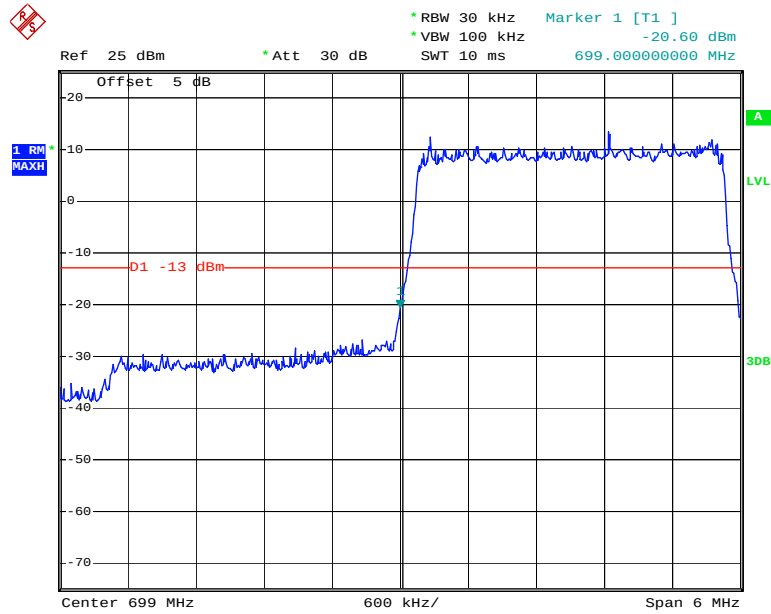
Date: 19.MAY.2020 11:22:17

QPSK\_1.4MHz\_6 RB\_ Right



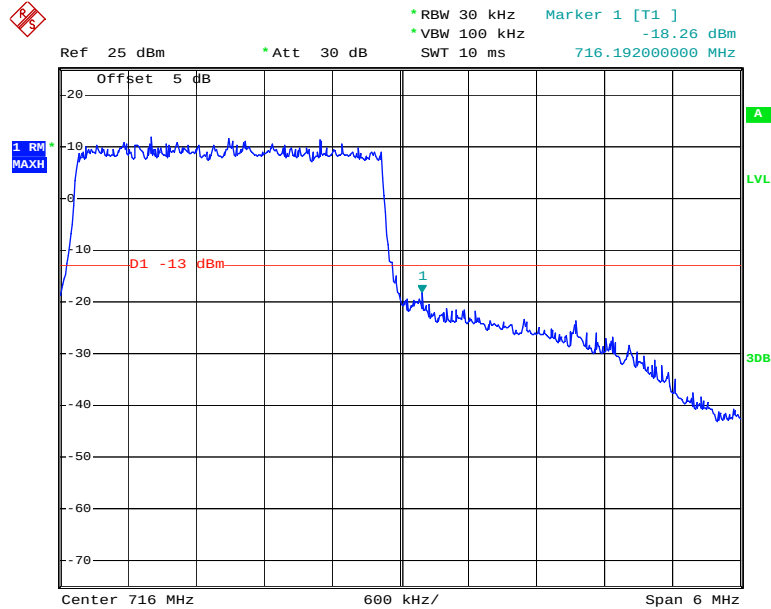
Date: 19.MAY.2020 11:22:55

### QPSK\_3MHz\_15 RB\_Left



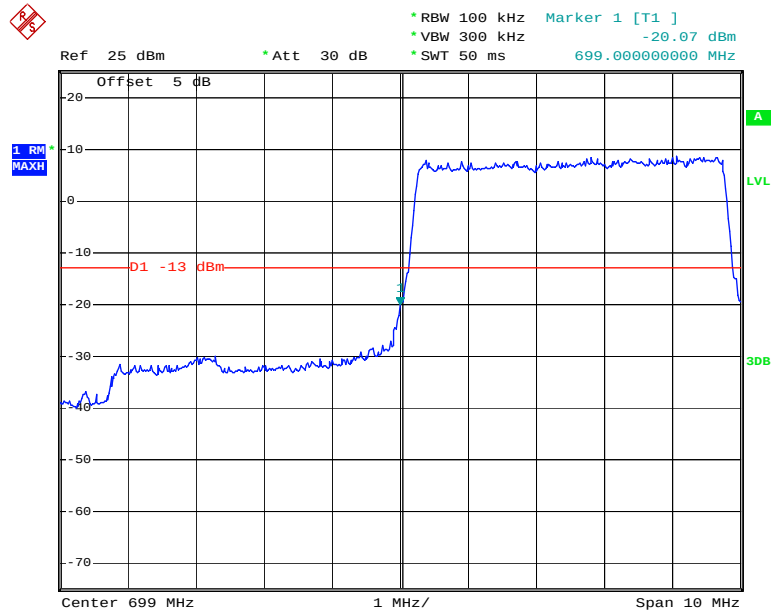
Date: 19.MAY.2020 11:23:55

### QPSK\_3MHz\_15 RB\_Right



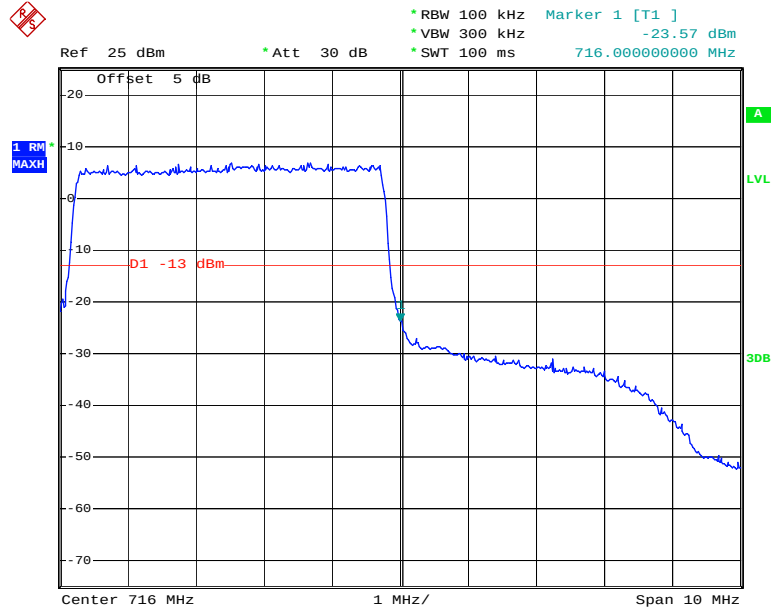
Date: 19.MAY.2020 11:24:33

### QPSK\_5MHz\_25 RB\_Left



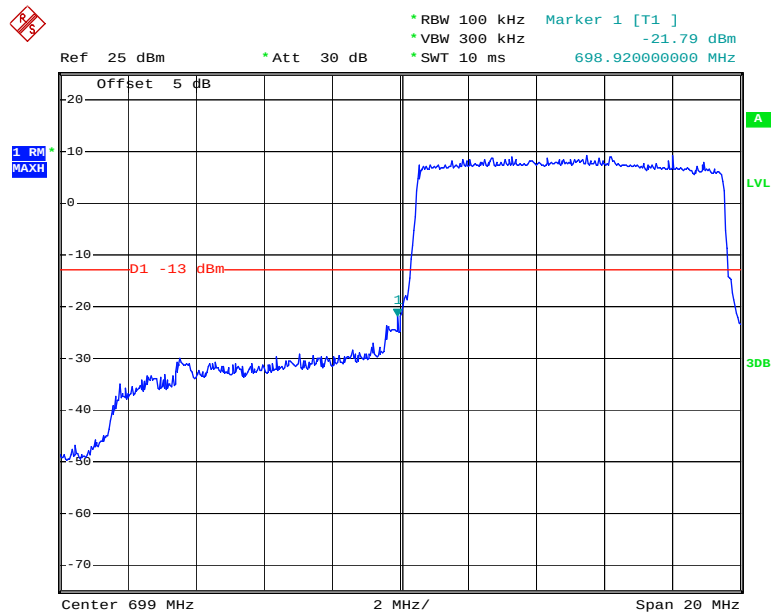
Date: 19.MAY.2020 11:25:25

### QPSK\_5MHz\_25 RB\_Right



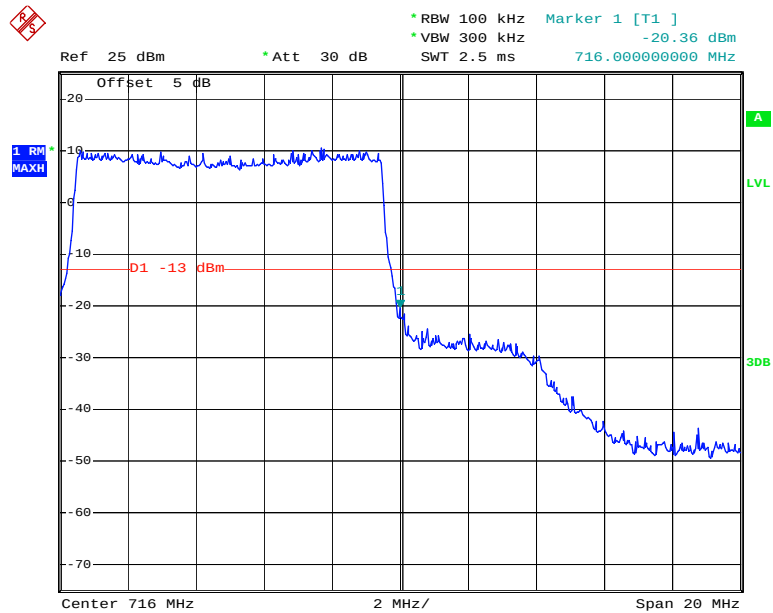
Date: 19.MAY.2020 11:26:26

### QPSK\_10MHz\_50 RB\_ Left

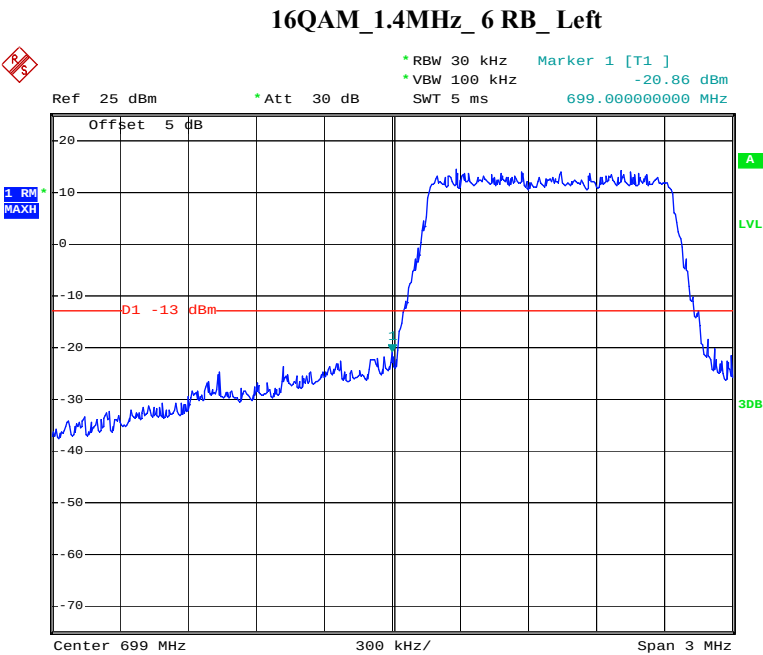


Date: 19.MAY.2020 11:27:47

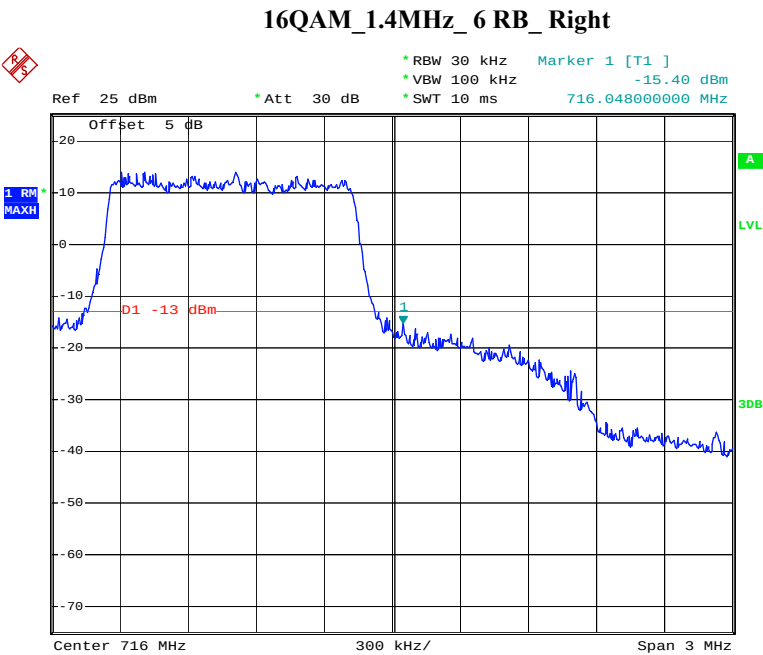
### QPSK\_10MHz\_50 RB\_ Right



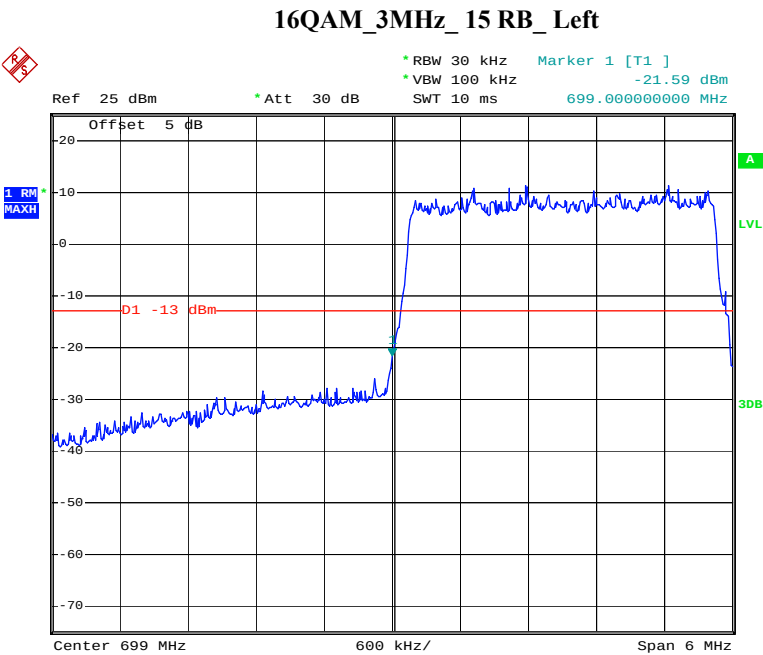
Date: 19.MAY.2020 11:28:24



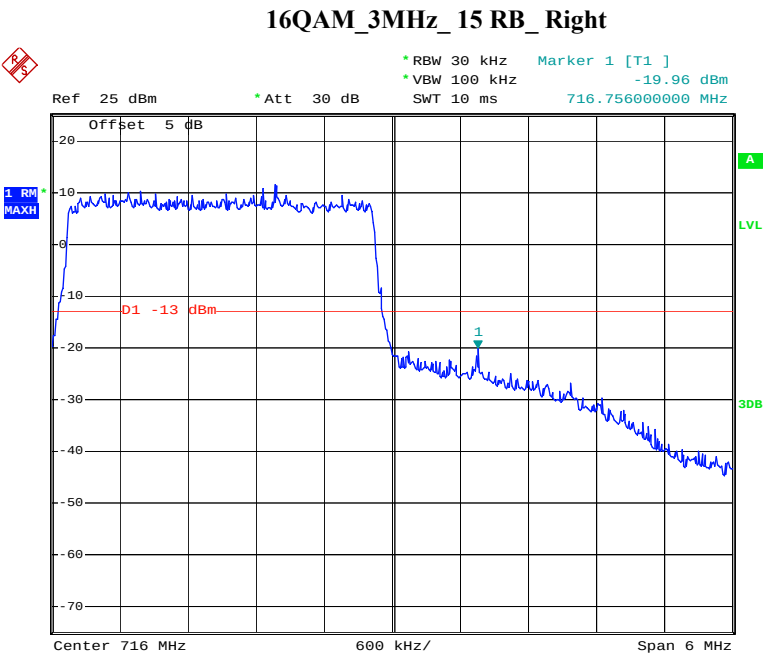
Date: 19.MAY.2020 11:22:37



Date: 19.MAY.2020 11:23:31



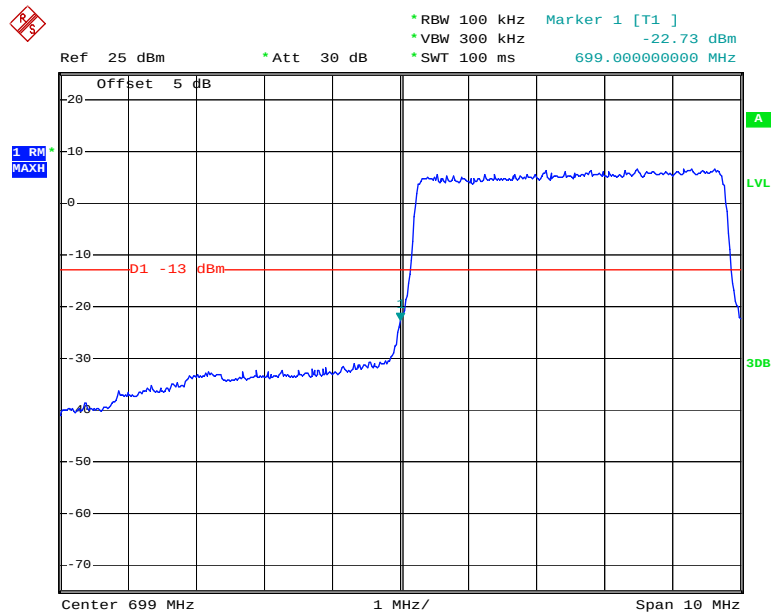
Date: 19.MAY.2020 11:24:12



Date: 19.MAY.2020 11:24:49

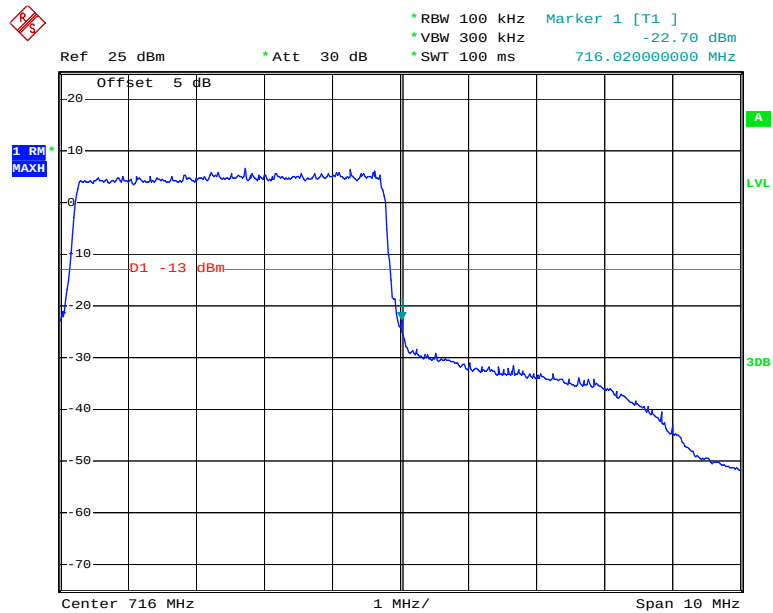


### 16QAM\_5MHz\_25 RB\_Left

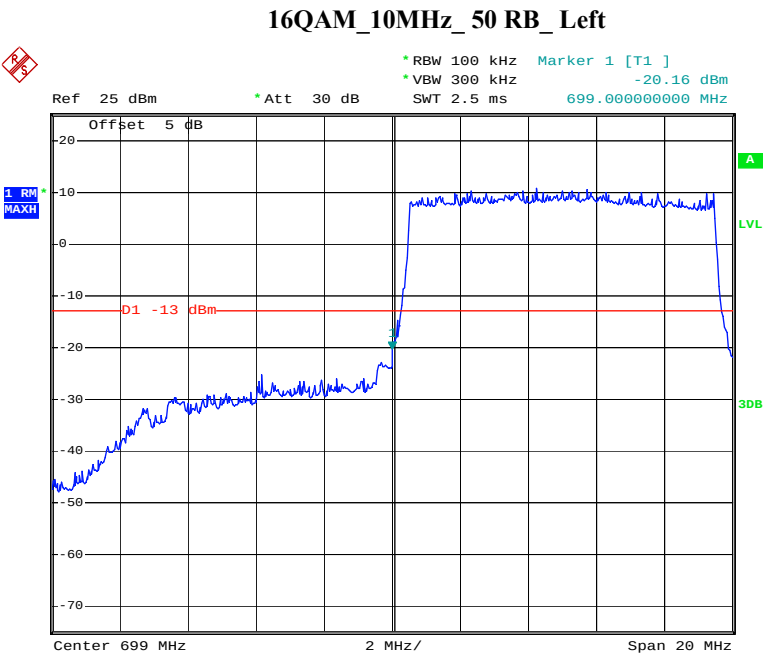


Date: 19.MAY.2020 11:25:56

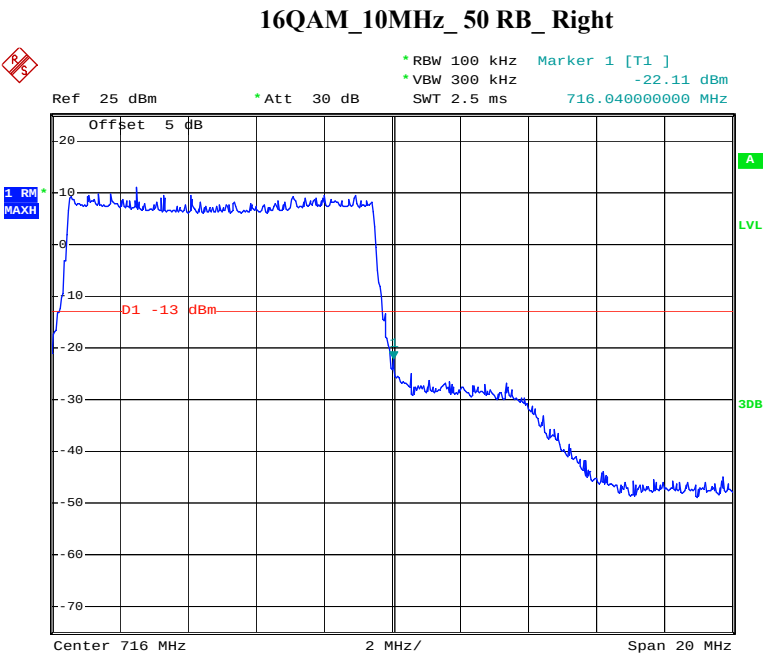
### 16QAM\_5MHz\_25 RB\_Right



Date: 19.MAY.2020 11:27:04



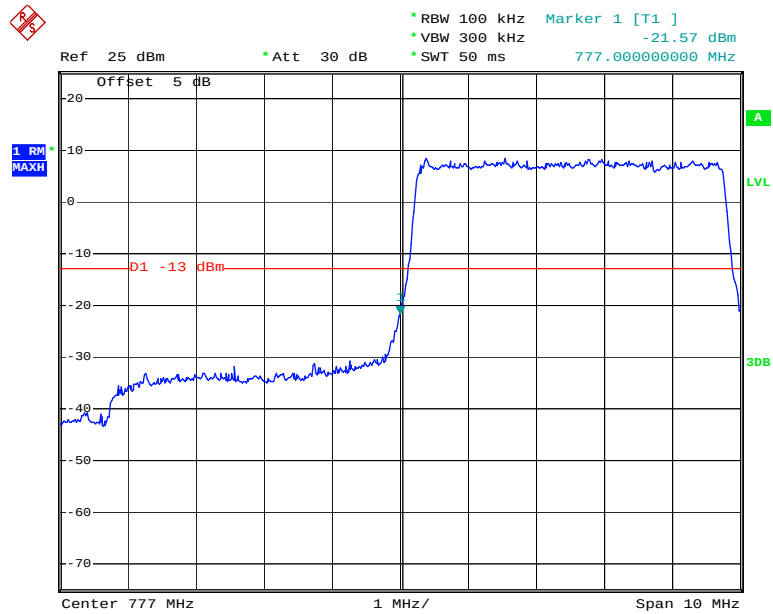
Date: 19.MAY.2020 11:28:05



Date: 19.MAY.2020 11:28:45

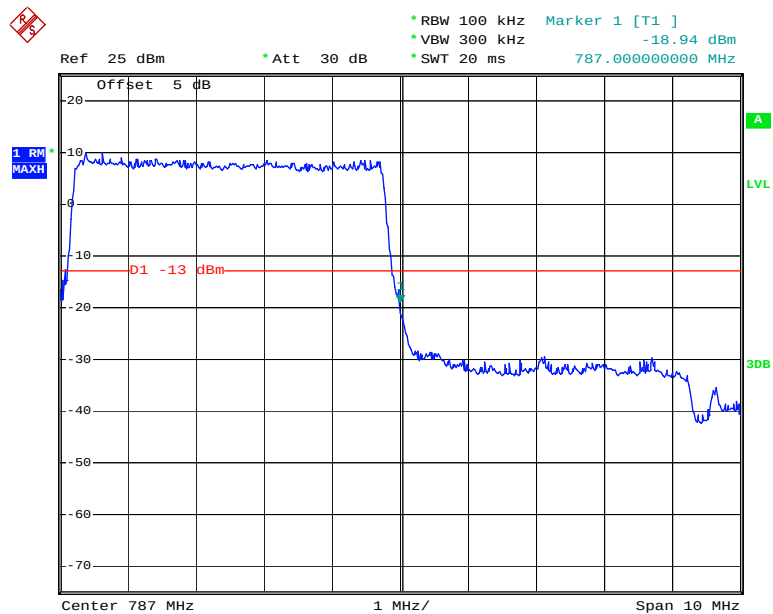
LTE Band 13

QPSK\_5MHz\_25 RB\_ Left



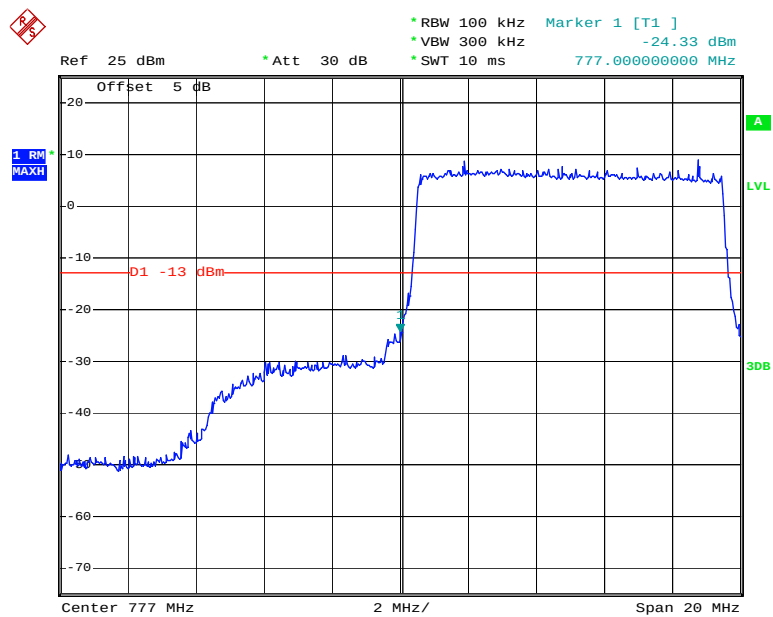
Date: 19.MAY.2020 11:29:26

QPSK\_5MHz\_25 RB\_ Right



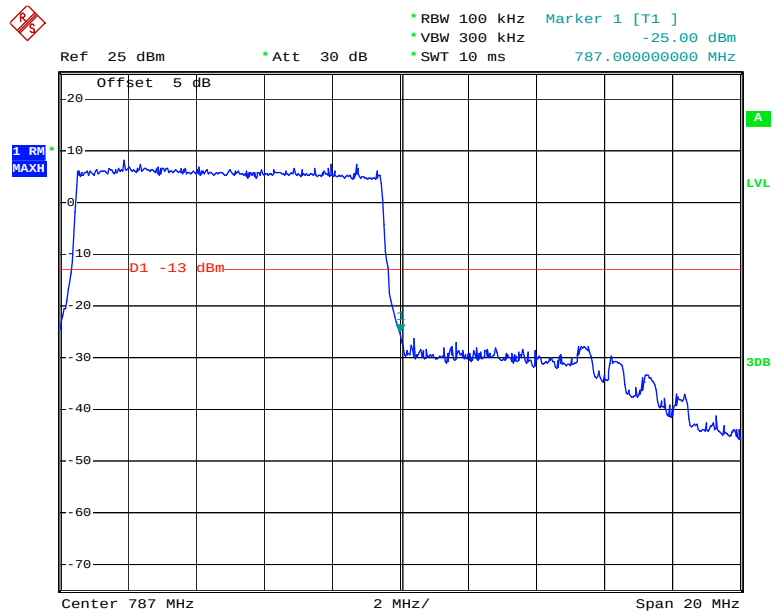
Date: 19.MAY.2020 11:30:37

### QPSK\_10MHz\_50 RB\_Left



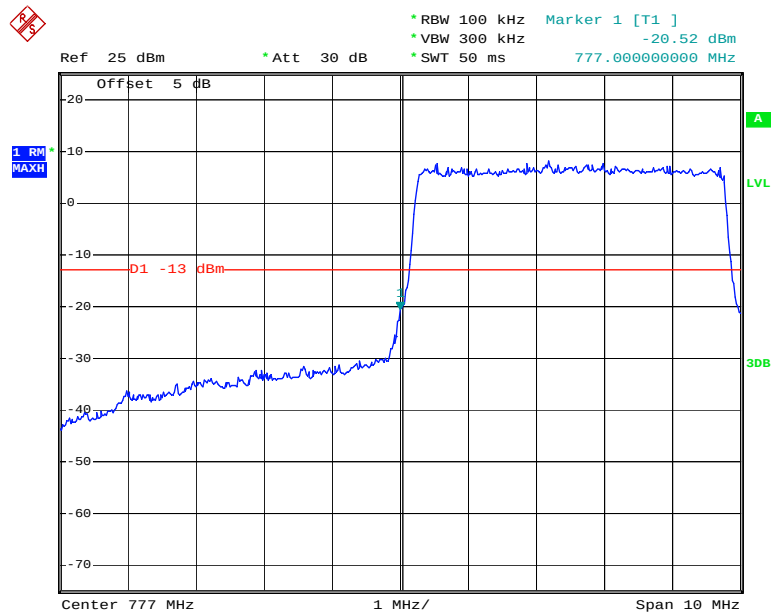
Date: 19.MAY.2020 11:36:14

### QPSK\_10MHz\_50 RB\_Right



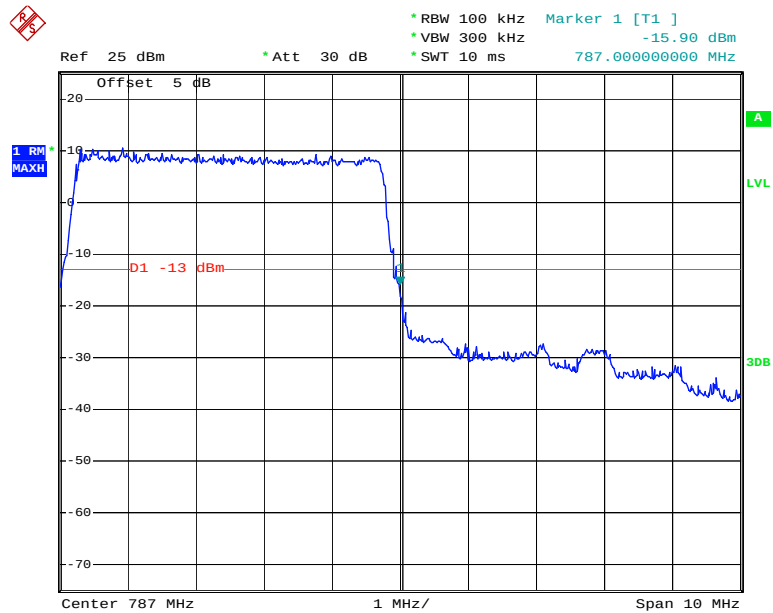
Date: 19.MAY.2020 11:35:53

### 16QAM\_5MHz\_25 RB\_ Left

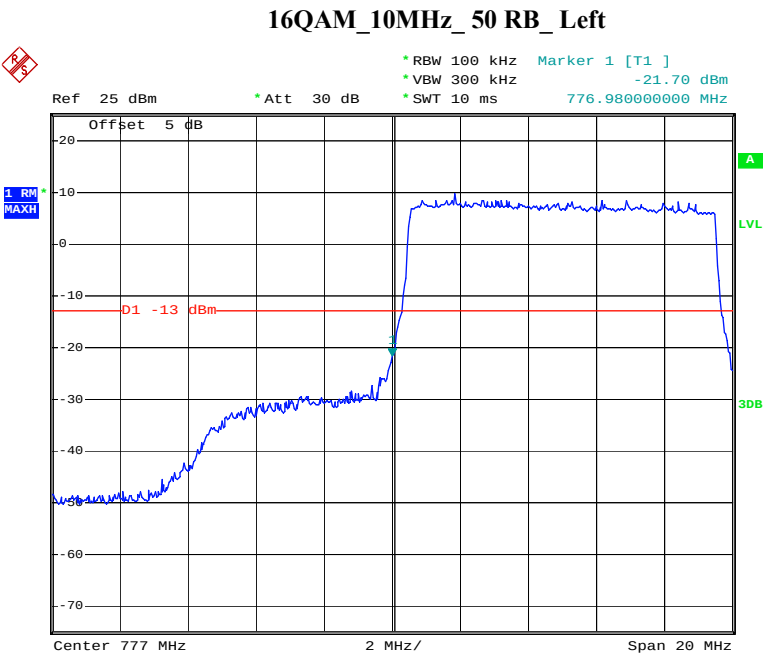


Date: 19.MAY.2020 11:29:59

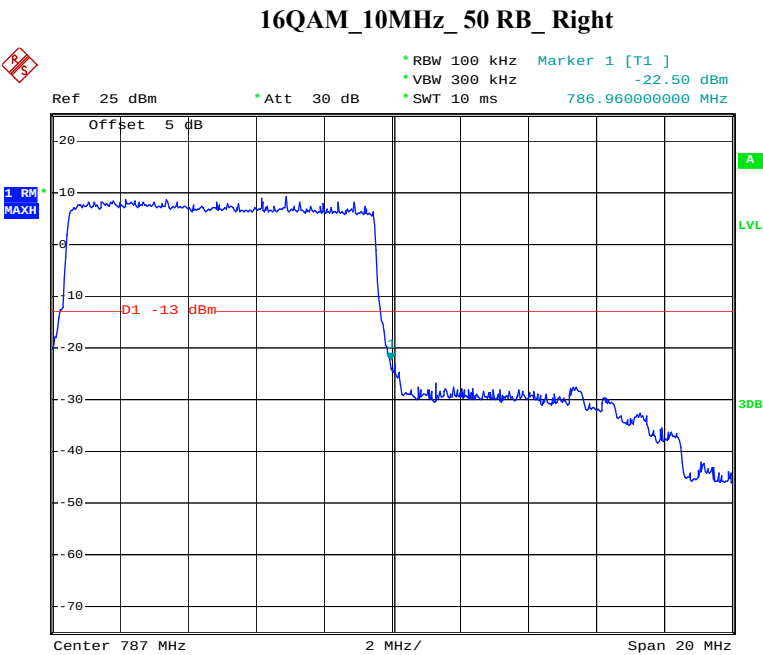
### 16QAM\_5MHz\_25 RB\_ Right



Date: 19.MAY.2020 11:31:04



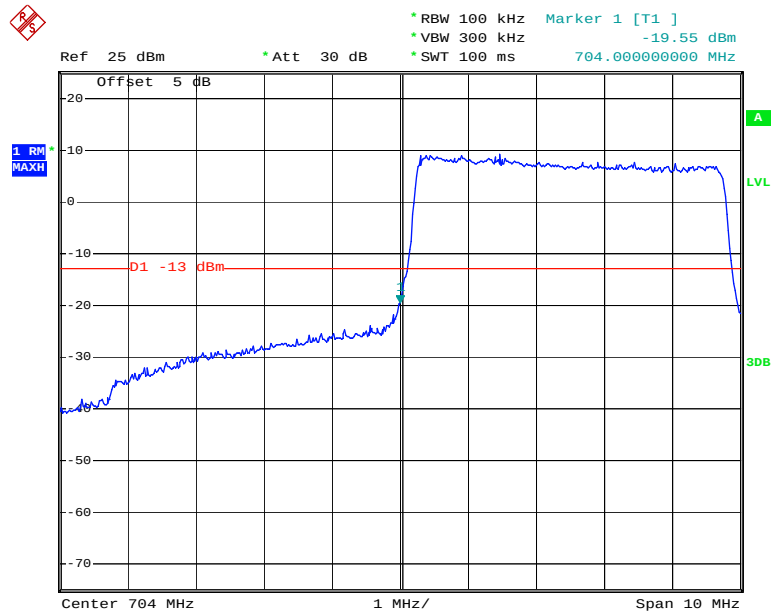
Date: 19.MAY.2020 11:33:57



Date: 19.MAY.2020 11:34:30

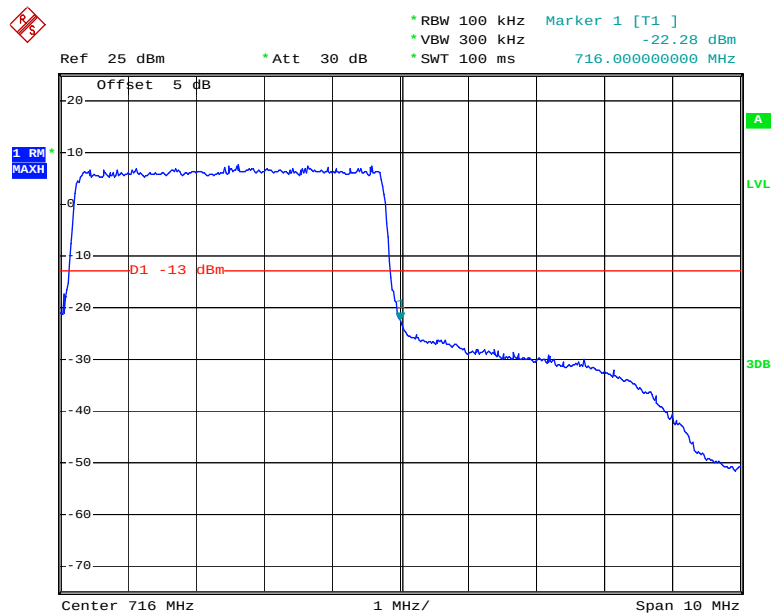
LTE Band 17

QPSK\_5MHz\_25 RB\_ Left



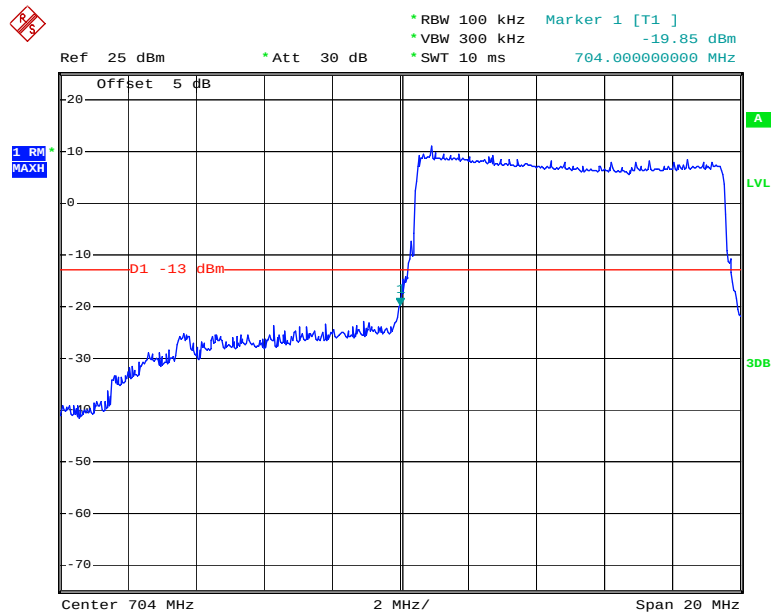
Date: 19.MAY.2020 11:41:09

QPSK\_5MHz\_25 RB\_ Right



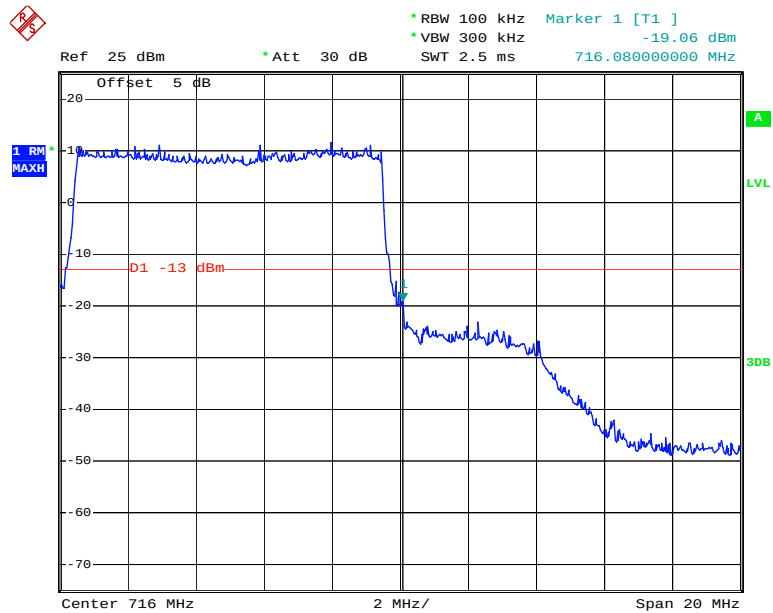
Date: 19.MAY.2020 11:42:00

### QPSK\_10MHz\_50 RB\_Left



Date: 19.MAY.2020 11:43:03

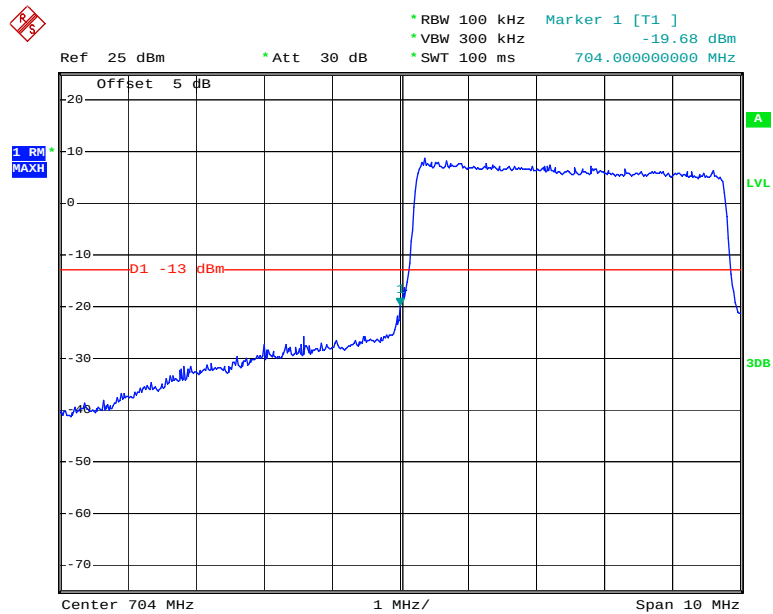
### QPSK\_10MHz\_50 RB\_Right



Date: 19.MAY.2020 11:43:43

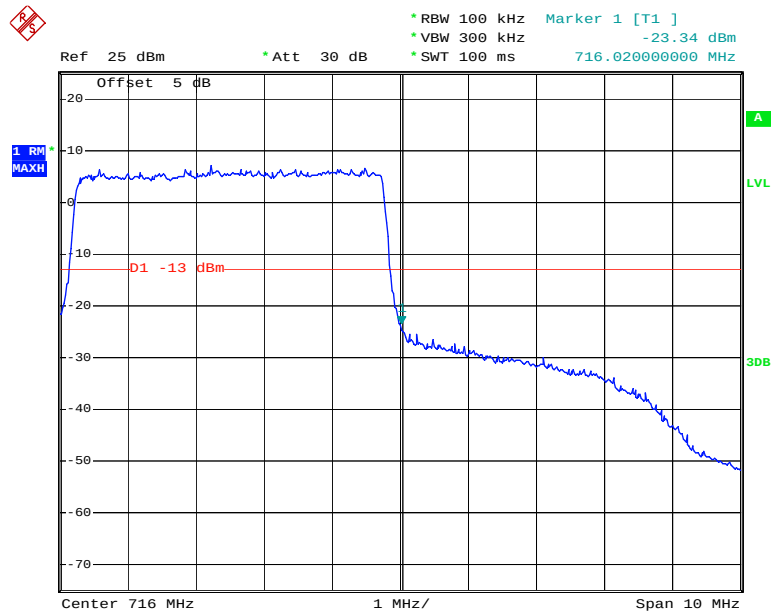


### 16QAM\_5MHz\_25 RB\_ Left



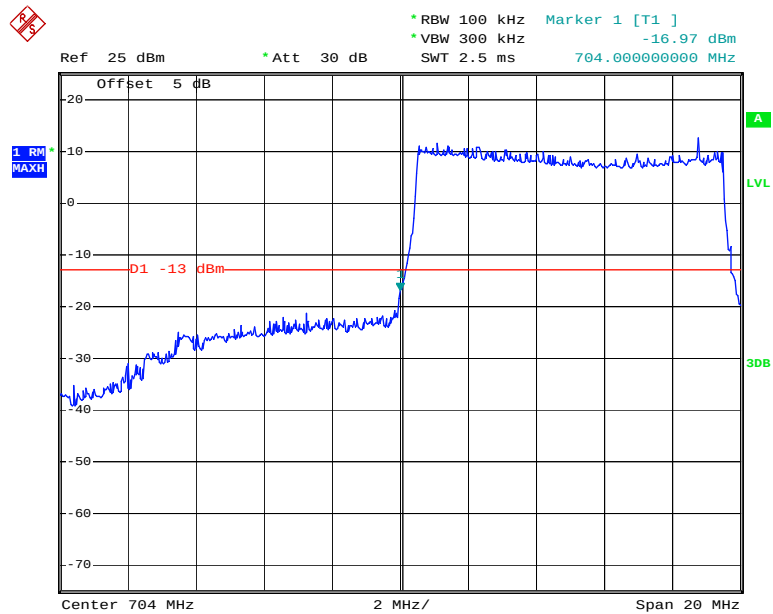
Date: 19.MAY.2020 11:41:33

### 16QAM\_5MHz\_25 RB\_ Right



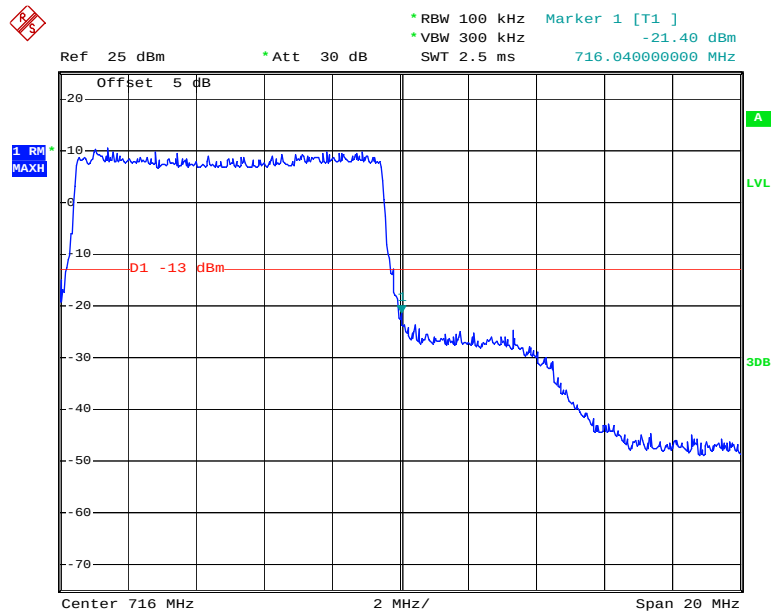
Date: 19.MAY.2020 11:42:26

### 16QAM\_10MHz\_ 50 RB\_ Left



Date: 19.MAY.2020 11:43:24

### 16QAM\_10MHz\_ 50 RB\_ Right



Date: 19.MAY.2020 11:44:04

## FCC §2.1055, §22.355 & §24.235 & §27.54& §90.213 - FREQUENCY STABILITY

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### Applicable Standard

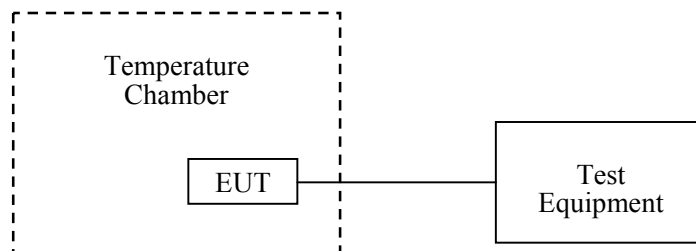
FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54, §90.213.

### Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The AC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable AC power supply was connected to the battery terminals of the equipment under test. The voltage was set from 85% to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



**Test Equipment List and Details**

| Manufacturer   | Description                              | Model         | Serial Number | Calibration Date | Calibration Due Date |
|----------------|------------------------------------------|---------------|---------------|------------------|----------------------|
| R&S            | Spectrum Analyzer                        | FSU 26        | 200256        | 2020-05-09       | 2021-05-09           |
| yzjingcheng    | Coaxial Cable                            | KTRFBU-141-50 | 41005011      | Each time        | N/A                  |
| Unknown        | Coaxial Cable                            | C-SJ00-0010   | C0010/01      | Each time        | N/A                  |
| E-Microwave    | Blocking Control                         | EMDCB-00036   | 0E01201047    | Each time        | N/A                  |
| E-Microwave    | Coaxial Attenuators                      | EMCA10-5RN-6  | OE01203239    | Each time        | N/A                  |
| R&S            | Universal Radio Communication Tester     | CMU200        | 106 891       | 2019-09-12       | 2020-09-12           |
| R&S            | Wideband Radio Communication Tester      | CMW500        | 147473        | 2019-08-03       | 2020-08-03           |
| ESPEC          | Constant temperature and humidity Tester | ESX-4CA       | 018 463       | 2020-03-26       | 2021-03-26           |
| UNI-T          | Multimeter                               | UT39A         | M130199938    | 2019-07-23       | 2020-07-23           |
| Pro instrument | DC Power Supply                          | pps3300       | 3300012       | N/A              | N/A                  |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Data****Environmental Conditions**

|                           |                       |
|---------------------------|-----------------------|
| <b>Temperature:</b>       | 26.1~26.9°C           |
| <b>Relative Humidity:</b> | 55~67 %               |
| <b>ATM Pressure:</b>      | 98.6~100 kPa          |
| <b>Tester:</b>            | Chris Mo              |
| <b>Test Date:</b>         | 2020-05-19~2020-05-22 |

| GSM, Middle Channel, $f_c = 836.6$ MHz |                 |                 |                 |       |
|----------------------------------------|-----------------|-----------------|-----------------|-------|
| Temperature                            | Voltage         | Frequency Error | Frequency Error | Limit |
| °C                                     | V <sub>DC</sub> | Hz              | ppm             | ppm   |
| -30                                    | 3.8             | 6               | 0.00717         | 2.5   |
| -20                                    |                 | 8               | 0.00956         |       |
| -10                                    |                 | 9               | 0.01076         |       |
| 0                                      |                 | 11              | 0.01315         |       |
| 10                                     |                 | 15              | 0.01793         |       |
| 20                                     |                 | 7               | 0.00837         |       |
| 30                                     |                 | 9               | 0.01076         |       |
| 40                                     |                 | 8               | 0.00956         |       |
| 50                                     |                 | 2               | 0.00239         |       |
| 20                                     | 3.6             | 6               | 0.00717         |       |
| 20                                     | 4.3             | 4               | 0.00478         |       |

| EGPRS, Middle Channel, $f_c = 836.6$ MHz |                 |                 |                 |       |
|------------------------------------------|-----------------|-----------------|-----------------|-------|
| Temperature                              | Voltage         | Frequency Error | Frequency Error | Limit |
| °C                                       | V <sub>DC</sub> | Hz              | ppm             | ppm   |
| -30                                      | 3.8             | 12              | 0.01434         | 2.5   |
| -20                                      |                 | 9               | 0.01076         |       |
| -10                                      |                 | 4               | 0.00478         |       |
| 0                                        |                 | 2               | 0.00239         |       |
| 10                                       |                 | 5               | 0.00598         |       |
| 20                                       |                 | 6               | 0.00717         |       |
| 30                                       |                 | 7               | 0.00837         |       |
| 40                                       |                 | 4               | 0.00478         |       |
| 50                                       |                 | 3               | 0.00359         |       |
| 20                                       | 3.6             | 2               | 0.00239         |       |
| 20                                       | 4.3             | 5               | 0.00598         |       |

| GSM1900, Middle Channel, $f_c = 1880.0$ MHz |                 |                 |                 |        |
|---------------------------------------------|-----------------|-----------------|-----------------|--------|
| Temperature                                 | Voltage         | Frequency Error | Frequency Error | Result |
| °C                                          | V <sub>DC</sub> | Hz              | ppm             |        |
| -30                                         | 3.8             | 6               | 0.00319         | Pass   |
| -20                                         |                 | 5               | 0.00266         |        |
| -10                                         |                 | 8               | 0.00426         |        |
| 0                                           |                 | 4               | 0.00213         |        |
| 10                                          |                 | 10              | 0.00532         |        |
| 20                                          |                 | 9               | 0.00479         |        |
| 30                                          |                 | 11              | 0.00585         |        |
| 40                                          |                 | 8               | 0.00426         |        |
| 50                                          |                 | 5               | 0.00266         |        |
| 20                                          | 3.6             | 6               | 0.00319         |        |
| 20                                          | 4.3             | 9               | 0.00479         |        |

| EGPRS1900, Middle Channel, $f_c = 1880.0$ MHz |                 |                 |                 |        |
|-----------------------------------------------|-----------------|-----------------|-----------------|--------|
| Temperature                                   | Voltage         | Frequency Error | Frequency Error | Result |
| $^{\circ}\text{C}$                            | $V_{\text{DC}}$ | Hz              | ppm             |        |
| -30                                           | 3.8             | 6               | 0.00319         | Pass   |
| -20                                           |                 | 9               | 0.00479         |        |
| -10                                           |                 | 7               | 0.00372         |        |
| 0                                             |                 | 5               | 0.00266         |        |
| 10                                            |                 | 9               | 0.00479         |        |
| 20                                            |                 | 11              | 0.00585         |        |
| 30                                            |                 | 12              | 0.00638         |        |
| 40                                            |                 | 10              | 0.00532         |        |
| 50                                            |                 | 6               | 0.00319         |        |
| 20                                            | 3.6             | 3               | 0.00160         |        |
| 20                                            | 4.3             | 1               | 0.00053         |        |

**WCDMA Band II: R99**

| Middle Channel, $f_c = 1880.0$ MHz |                 |                 |                 |        |
|------------------------------------|-----------------|-----------------|-----------------|--------|
| Temperature                        | Voltage         | Frequency Error | Frequency Error | Result |
| $^{\circ}\text{C}$                 | $V_{\text{DC}}$ | Hz              | ppm             |        |
| -30                                | 3.8             | 3               | 0.00160         | Pass   |
| -20                                |                 | 2               | 0.00106         |        |
| -10                                |                 | 8               | 0.00426         |        |
| 0                                  |                 | 4               | 0.00213         |        |
| 10                                 |                 | 2               | 0.00106         |        |
| 20                                 |                 | 3               | 0.00160         |        |
| 30                                 |                 | 4               | 0.00213         |        |
| 40                                 |                 | 6               | 0.00319         |        |
| 50                                 |                 | 11              | 0.00585         |        |
| 20                                 | 3.6             | 10              | 0.00532         |        |
| 20                                 | 4.3             | 2               | 0.00106         |        |

**WCDMA Band V: R99**

| Middle Channel, $f_c = 836.6$ MHz |                 |                 |                 |       |
|-----------------------------------|-----------------|-----------------|-----------------|-------|
| Temperature                       | Voltage         | Frequency Error | Frequency Error | Limit |
| $^{\circ}\text{C}$                | $V_{\text{DC}}$ | Hz              | ppm             | ppm   |
| -30                               | 3.8             | 13              | 0.01554         | 2.5   |
| -20                               |                 | 14              | 0.01673         |       |
| -10                               |                 | 10              | 0.01195         |       |
| 0                                 |                 | 6               | 0.00717         |       |
| 10                                |                 | 2               | 0.00239         |       |
| 20                                |                 | 4               | 0.00478         |       |
| 30                                |                 | 1               | 0.00120         |       |
| 40                                |                 | 0               | 0.00000         |       |
| 50                                |                 | 3               | 0.00359         |       |
| 20                                | 3.6             | 6               | 0.00717         |       |
| 20                                | 4.3             | 5               | 0.00598         |       |

**LTE Band 2:**

| QPSK, Channel Bandwidth:10MHz<br>Middle Channel, $f_c = 1880$ MHz |                 |                 |                 |        |
|-------------------------------------------------------------------|-----------------|-----------------|-----------------|--------|
| Temperature                                                       | Voltage         | Frequency Error | Frequency Error | Result |
| °C                                                                | V <sub>DC</sub> | Hz              | ppm             |        |
| -30                                                               | 3.8             | -11.70          | -0.0062         | Pass   |
| -20                                                               |                 | -9.67           | -0.0051         |        |
| -10                                                               |                 | 7.65            | 0.0041          |        |
| 0                                                                 |                 | 6.50            | 0.0035          |        |
| 10                                                                |                 | -7.83           | -0.0042         |        |
| 20                                                                |                 | -6.15           | -0.0033         |        |
| 30                                                                |                 | -7.20           | -0.0038         |        |
| 40                                                                |                 | -7.12           | -0.0038         |        |
| 50                                                                |                 | -9.06           | -0.0048         |        |
| 20                                                                | 3.6             | -8.02           | -0.0043         |        |
| 20                                                                | 4.3             | 5.18            | 0.0028          |        |

| 16QAM, Channel Bandwidth:10MHz<br>Middle Channel, $f_c = 1880$ MHz |                 |                 |                 |        |
|--------------------------------------------------------------------|-----------------|-----------------|-----------------|--------|
| Temperature                                                        | Voltage         | Frequency Error | Frequency Error | Result |
| °C                                                                 | V <sub>DC</sub> | Hz              | ppm             |        |
| -30                                                                | 3.8             | -1.17           | -0.0006         | Pass   |
| -20                                                                |                 | 6.08            | 0.0032          |        |
| -10                                                                |                 | -8.80           | -0.0047         |        |
| 0                                                                  |                 | -9.10           | -0.0048         |        |
| 10                                                                 |                 | 8.10            | 0.0043          |        |
| 20                                                                 |                 | 5.22            | 0.0028          |        |
| 30                                                                 |                 | -6.96           | -0.0037         |        |
| 40                                                                 |                 | -5.51           | -0.0029         |        |
| 50                                                                 |                 | 5.20            | 0.0028          |        |
| 20                                                                 | 3.6             | 5.16            | 0.0027          |        |
| 20                                                                 | 4.3             | 6.33            | 0.0034          |        |

**LTE Band 4:**

| QPSK, Channel Bandwidth:10MHz |                 |                   |                |                |                |
|-------------------------------|-----------------|-------------------|----------------|----------------|----------------|
| Temperature                   | Voltage         | Test Result (MHz) |                | Limit (MHz)    |                |
| °C                            | V <sub>DC</sub> | F <sub>L</sub>    | F <sub>H</sub> | F <sub>L</sub> | F <sub>H</sub> |
| -30                           | 3.8             | 1710.524772       | 1754.483421    | 1710           | 1755           |
| -20                           |                 | 1710.524972       | 1754.482421    | 1710           | 1755           |
| -10                           |                 | 1710.524272       | 1754.481821    | 1710           | 1755           |
| 0                             |                 | 1710.523872       | 1754.482121    | 1710           | 1755           |
| 10                            |                 | 1710.524327       | 1754.485312    | 1710           | 1755           |
| 20                            |                 | 1710.520000       | 1754.480000    | 1710           | 1755           |
| 30                            |                 | 1710.528072       | 1754.483321    | 1710           | 1755           |
| 40                            |                 | 1710.528672       | 1754.483421    | 1710           | 1755           |
| 50                            |                 | 1710.527972       | 1754.488521    | 1710           | 1755           |
| 20                            | 3.6             | 1710.528272       | 1754.486402    | 1710           | 1755           |
| 20                            | 4.3             | 1710.527772       | 1754.483533    | 1710           | 1755           |

| 16QAM, Channel Bandwidth:10MHz |                 |                   |                |                |                |
|--------------------------------|-----------------|-------------------|----------------|----------------|----------------|
| Temperature                    | Voltage         | Test Result (MHz) |                | Limit (MHz)    |                |
| °C                             | V <sub>DC</sub> | F <sub>L</sub>    | F <sub>H</sub> | F <sub>L</sub> | F <sub>H</sub> |
| -30                            | 3.8             | 1710.524517       | 1754.524526    | 1710           | 1755           |
| -20                            |                 | 1710.528572       | 1754.524520    | 1710           | 1755           |
| -10                            |                 | 1710.525072       | 1754.524510    | 1710           | 1755           |
| 0                              |                 | 1710.524572       | 1754.524508    | 1710           | 1755           |
| 10                             |                 | 1710.523872       | 1754.524502    | 1710           | 1755           |
| 20                             |                 | 1710.520000       | 1754.520000    | 1710           | 1755           |
| 30                             |                 | 1710.524667       | 1754.524507    | 1710           | 1755           |
| 40                             |                 | 1710.524667       | 1754.524516    | 1710           | 1755           |
| 50                             |                 | 1710.523446       | 1754.524511    | 1710           | 1755           |
| 20                             | 3.6             | 1710.523446       | 1754.524501    | 1710           | 1755           |
| 20                             | 4.3             | 1710.523447       | 1754.523449    | 1710           | 1755           |

**LTE Band 5:**

| Middle Channel, f <sub>c</sub> = 836.5 MHz, Channel Bandwidth:10MHz |                 |                 |                 |       |
|---------------------------------------------------------------------|-----------------|-----------------|-----------------|-------|
| Temperature                                                         | Voltage         | Frequency Error | Frequency Error | Limit |
| °C                                                                  | V <sub>DC</sub> | Hz              | ppm             | ppm   |
| -30                                                                 | 3.8             | -0.39           | -0.0005         | 2.5   |
| -20                                                                 |                 | -5.46           | -0.0065         |       |
| -10                                                                 |                 | 8.16            | 0.0098          |       |
| 0                                                                   |                 | -4.93           | -0.0059         |       |
| 10                                                                  |                 | -6.20           | -0.0074         |       |
| 20                                                                  |                 | -5.26           | -0.0063         |       |
| 30                                                                  |                 | 5.76            | 0.0069          |       |
| 40                                                                  |                 | 4.35            | 0.0052          |       |
| 50                                                                  |                 | -7.88           | -0.0094         |       |
| 20                                                                  | 3.6             | 3.27            | 0.0039          |       |
| 20                                                                  | 4.3             | 6.52            | 0.0078          |       |

| Middle Channel, f <sub>c</sub> = 836.5 MHz, Channel Bandwidth:10MHz |                 |                 |                 |       |
|---------------------------------------------------------------------|-----------------|-----------------|-----------------|-------|
| Temperature                                                         | Voltage         | Frequency Error | Frequency Error | Limit |
| °C                                                                  | V <sub>DC</sub> | Hz              | ppm             | ppm   |
| -30                                                                 | 3.8             | 1.52            | 0.0018          | 2.5   |
| -20                                                                 |                 | 2.63            | 0.0031          |       |
| -10                                                                 |                 | 7.05            | 0.0084          |       |
| 0                                                                   |                 | -9.55           | -0.0114         |       |
| 10                                                                  |                 | -10.19          | -0.0122         |       |
| 20                                                                  |                 | -2.24           | -0.0027         |       |
| 30                                                                  |                 | -0.54           | -0.0006         |       |
| 40                                                                  |                 | -4.98           | -0.006          |       |
| 50                                                                  |                 | -1.24           | -0.0015         |       |
| 20                                                                  | 3.6             | 8.62            | 0.0103          |       |
| 20                                                                  | 4.3             | 6.05            | 0.0072          |       |



**LTE Band 12:**

| <b>QPSK, Channel Bandwidth:10MHz</b> |                       |                          |                      |                      |                      |
|--------------------------------------|-----------------------|--------------------------|----------------------|----------------------|----------------------|
| <b>Temperature</b>                   | <b>Voltage</b>        | <b>Test Result (MHz)</b> |                      | <b>Limit (MHz)</b>   |                      |
| <b>°C</b>                            | <b>V<sub>DC</sub></b> | <b>F<sub>L</sub></b>     | <b>F<sub>H</sub></b> | <b>F<sub>L</sub></b> | <b>F<sub>H</sub></b> |
| -30                                  | 3.8                   | 699.520770               | 715.480660           | 699                  | 716                  |
| -20                                  |                       | 699.520990               | 715.481430           | 699                  | 716                  |
| -10                                  |                       | 699.520660               | 715.481430           | 699                  | 716                  |
| 0                                    |                       | 699.520880               | 715.481760           | 699                  | 716                  |
| 10                                   |                       | 699.521210               | 715.482750           | 699                  | 716                  |
| 20                                   |                       | 699.520000               | 715.480000           | 699                  | 716                  |
| 30                                   |                       | 699.519890               | 715.479670           | 699                  | 716                  |
| 40                                   |                       | 699.520660               | 715.479450           | 699                  | 716                  |
| 50                                   |                       | 699.520440               | 715.479780           | 699                  | 716                  |
| 20                                   | 3.6                   | 699.521320               | 715.479450           | 699                  | 716                  |
| 20                                   | 4.3                   | 699.521320               | 715.479010           | 699                  | 716                  |

| <b>16QAM, Channel Bandwidth:10MHz</b> |                       |                          |                      |                      |                      |
|---------------------------------------|-----------------------|--------------------------|----------------------|----------------------|----------------------|
| <b>Temperature</b>                    | <b>Voltage</b>        | <b>Test Result (MHz)</b> |                      | <b>Limit (MHz)</b>   |                      |
| <b>°C</b>                             | <b>V<sub>DC</sub></b> | <b>F<sub>L</sub></b>     | <b>F<sub>H</sub></b> | <b>F<sub>L</sub></b> | <b>F<sub>H</sub></b> |
| -30                                   | 3.8                   | 699.519450               | 715.520110           | 699                  | 716                  |
| -20                                   |                       | 699.520330               | 715.520770           | 699                  | 716                  |
| -10                                   |                       | 699.521100               | 715.520880           | 699                  | 716                  |
| 0                                     |                       | 699.521870               | 715.521540           | 699                  | 716                  |
| 10                                    |                       | 699.522530               | 715.521540           | 699                  | 716                  |
| 20                                    |                       | 699.520000               | 715.520000           | 699                  | 716                  |
| 30                                    |                       | 699.520880               | 715.519780           | 699                  | 716                  |
| 40                                    |                       | 699.521870               | 715.520550           | 699                  | 716                  |
| 50                                    |                       | 699.522200               | 715.520440           | 699                  | 716                  |
| 20                                    | 3.6                   | 699.521760               | 715.520660           | 699                  | 716                  |
| 20                                    | 4.3                   | 699.522420               | 715.520220           | 699                  | 716                  |

**LTE Band 13:**

| QPSK, Channel Bandwidth:10MHz |                 |                   |                |                |                |
|-------------------------------|-----------------|-------------------|----------------|----------------|----------------|
| Temperature                   | Voltage         | Test Result (MHz) |                | Limit (MHz)    |                |
| °C                            | V <sub>DC</sub> | F <sub>L</sub>    | F <sub>H</sub> | F <sub>L</sub> | F <sub>H</sub> |
| -30                           | 3.8             | 777.529700        | 786.480800     | 777            | 787            |
| -20                           |                 | 777.528900        | 786.479800     | 777            | 787            |
| -10                           |                 | 777.528600        | 786.479500     | 777            | 787            |
| 0                             |                 | 777.528300        | 786.478900     | 777            | 787            |
| 10                            |                 | 777.528300        | 786.478400     | 777            | 787            |
| 20                            |                 | 777.520000        | 786.480000     | 777            | 787            |
| 30                            |                 | 777.528300        | 786.480200     | 777            | 787            |
| 40                            |                 | 777.527400        | 786.479900     | 777            | 787            |
| 50                            |                 | 777.527000        | 786.479600     | 777            | 787            |
| 20                            | 3.6             | 777.526200        | 786.479900     | 777            | 787            |
| 20                            | 4.3             | 777.525800        | 786.480600     | 777            | 787            |

| 16QAM, Channel Bandwidth:10MHz |                 |                   |                |                |                |
|--------------------------------|-----------------|-------------------|----------------|----------------|----------------|
| Temperature                    | Voltage         | Test Result (MHz) |                | Limit (MHz)    |                |
| °C                             | V <sub>DC</sub> | F <sub>L</sub>    | F <sub>H</sub> | F <sub>L</sub> | F <sub>H</sub> |
| -30                            | 3.8             | 777.520880        | 786.479450     | 777            | 787            |
| -20                            |                 | 777.521760        | 786.479010     | 777            | 787            |
| -10                            |                 | 777.522200        | 786.478790     | 777            | 787            |
| 0                              |                 | 777.522420        | 786.479670     | 777            | 787            |
| 10                             |                 | 777.521870        | 786.480330     | 777            | 787            |
| 20                             |                 | 777.520000        | 786.480000     | 777            | 787            |
| 30                             |                 | 777.520220        | 786.479450     | 777            | 787            |
| 40                             |                 | 777.519670        | 786.480440     | 777            | 787            |
| 50                             |                 | 777.520220        | 786.480880     | 777            | 787            |
| 20                             | 3.6             | 777.520880        | 786.481870     | 777            | 787            |
| 20                             | 4.3             | 777.521650        | 786.482200     | 777            | 787            |

**LTE Band 17:**

| QPSK, Channel Bandwidth:10MHz |                 |                   |                |                |                |
|-------------------------------|-----------------|-------------------|----------------|----------------|----------------|
| Temperature                   | Voltage         | Test Result (MHz) |                | Limit (MHz)    |                |
| °C                            | V <sub>DC</sub> | F <sub>L</sub>    | F <sub>H</sub> | F <sub>L</sub> | F <sub>H</sub> |
| -30                           | 3.8             | 704.480110        | 715.480550     | 704            | 716            |
| -20                           |                 | 704.479780        | 715.480110     | 704            | 716            |
| -10                           |                 | 704.480220        | 715.480440     | 704            | 716            |
| 0                             |                 | 704.480440        | 715.480550     | 704            | 716            |
| 10                            |                 | 704.481430        | 715.480550     | 704            | 716            |
| 20                            |                 | 704.480000        | 715.480000     | 704            | 716            |
| 30                            |                 | 704.480770        | 715.479780     | 704            | 716            |
| 40                            |                 | 704.481650        | 715.480110     | 704            | 716            |
| 50                            |                 | 704.481650        | 715.480000     | 704            | 716            |
| 20                            | 3.6             | 704.482200        | 715.480770     | 704            | 716            |
| 20                            | 4.3             | 704.483080        | 715.481870     | 704            | 716            |

| 16QAM, Channel Bandwidth:10MHz |                 |                   |                |                |                |
|--------------------------------|-----------------|-------------------|----------------|----------------|----------------|
| Temperature                    | Voltage         | Test Result (MHz) |                | Limit (MHz)    |                |
| °C                             | V <sub>DC</sub> | F <sub>L</sub>    | F <sub>H</sub> | F <sub>L</sub> | F <sub>H</sub> |
| -30                            | 3.8             | 704.480330        | 715.479780     | 704            | 716            |
| -20                            |                 | 704.480770        | 715.480880     | 704            | 716            |
| -10                            |                 | 704.481540        | 715.481870     | 704            | 716            |
| 0                              |                 | 704.482420        | 715.481760     | 704            | 716            |
| 10                             |                 | 704.482970        | 715.481210     | 704            | 716            |
| 20                             |                 | 704.480000        | 715.480000     | 704            | 716            |
| 30                             |                 | 704.481100        | 715.479890     | 704            | 716            |
| 40                             |                 | 704.481760        | 715.480440     | 704            | 716            |
| 50                             |                 | 704.482090        | 715.480660     | 704            | 716            |
| 20                             | 3.6             | 704.483190        | 715.480660     | 704            | 716            |
| 20                             | 4.3             | 704.482640        | 715.480550     | 704            | 716            |

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small, the extreme voltage was declared by applicant.

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