



TESTING LABORATORY
CERTIFICATE #4820.01



FCC PART 22H, PART 24E
FCC PART 27
MEASUREMENT AND TEST REPORT
For
MAXWEST INTERNATIONAL LIMITED.

No.1,Longgang Road,Buji, Longgang,Shenzhen,China

FCC ID: 2AEN3GRAVITY55GO

| | |
|---|---|
| Report Type: Original Report | Product Type: Mobile Phone |
| Report Number: RDG181210002-00D | |
| Report Date: 2019-01-31 | |
| Reviewed By: | Jerry Zhang EMC Manager <i>Jerry Zhang</i> |
| Test Laboratory: Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn | |

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

| | | |
|-----------------------------|----------------|--|
| EUT Name: | | Mobile Phone |
| EUT Model: | | Gravity 55 GO |
| Rated Input Voltage: | | DC3.7V from Battery or DC5V from adapter |
| Adapter Information | Model: | XCM23-U05100XYF |
| | Input: | AC 100-240V, 50/60Hz, 0.3A |
| | Output: | DC5V, 1A |
| External Dimension: | | 151mm(L)*71.7mm(W)*8.9mm(H) |
| Serial Number: | | 181210002 |
| EUT Received Date: | | 2018-12-12 |

Objective

This report is prepared on behalf of **MAXWEST INTERNATIONAL LIMITED.** in accordance with: Part 2-Subpart J, Part 22-Subpart H, and Part 24-Subpart E Part 27 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Rules for output power, modulation characteristic, occupied bandwidth, spurious emissions at antenna terminal, spurious radiated emission, frequency stability and band edge.

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: 2AEN3GRAVITY55GO.
FCC Part 15C DSS submissions with FCC ID: 2AEN3GRAVITY55GO.

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

Applicable Standards: TIA/EIA 603-D-2010.

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

Measurement Uncertainty

| Parameter | Measurement Uncertainty |
|-------------------------------|--|
| Occupied Channel Bandwidth | ±5 % |
| RF output power, conducted | ±0.61dB |
| Unwanted Emissions, radiated | 30MHz ~ 1GHz: 5.85 dB 1G~26.5GHz: 5.23 dB |
| Unwanted Emissions, conducted | ±1.5 dB |
| Temperature | ±1 °C |
| Humidity | ±5% |
| DC and low frequency voltages | ±0.4% |
| Duty Cycle | 1% |

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.

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-D 2010.

The test items were performed with the EUT operating at testing mode. The device supports GSM/GPRS/EDGE 850/1900 band,WCDMA/HSUPA/HPDPA Band 2 and band 5, LTE band 2, 4, 5, 7,12 and 17.

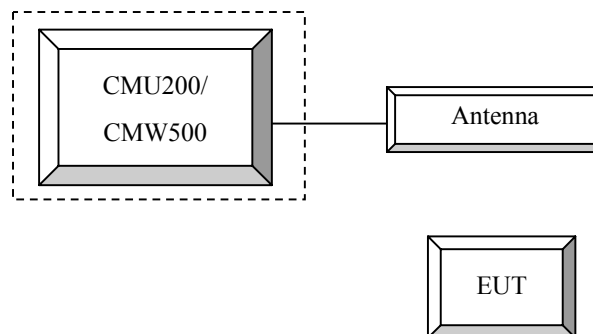
Equipment Modifications

No modification was made to the EUT.

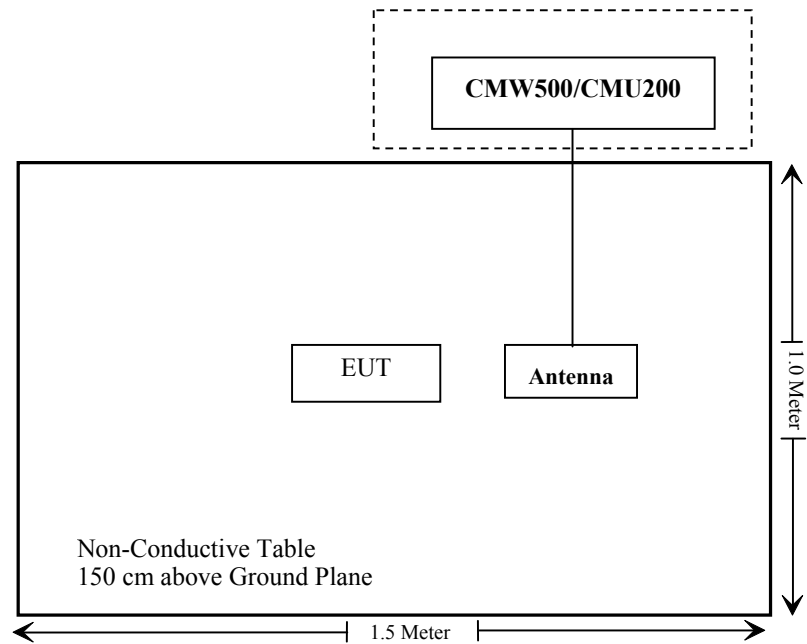
Support Equipment List and Details

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

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

FCC §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: RDG181210002-20A.

FCC §2.1047 - MODULATION CHARACTERISTIC

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.

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

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 §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).

| | | |
|-----------------------------------|----------------------------|--------------|
| WCDMA General Settings | Loopback Mode | Test Mode 1 |
| | Rel99 RMC | 12.2kbps RMC |
| | Power Control Algorithm | Algorithm2 |
| | β_c / β_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 General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1 | | | |
| | Power Control Algorithm | Algorithm2 | | | |
| | β_c | 2/15 | 12/15 | 15/15 | 15/15 |
| | β_d | 15/15 | 15/15 | 8/15 | 4/15 |
| | β_d (SF) | 64 | | | |
| | β_c / β_d | 2/15 | 12/15 | 15/8 | 15/4 |
| | β_{hs} | 4/15 | 24/15 | 30/15 | 30/15 |
| | MPR(dB) | 0 | 0 | 0.5 | 0.5 |
| HSDPA Specific 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 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | Rel99 RMC | 12.2kbps RMC | | | | |
| | HSDPA FRC | H-Set1 | | | | |
| | HSUPA Test | HSUPA Loopback | | | | |
| | Power Control Algorithm | Algorithm2 | | | | |
| | β_c | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | β_d | 15/15 | 15/15 | 9/15 | 15/15 | 0 |
| | β_{ec} | 209/225 | 12/15 | 30/15 | 2/15 | 5/15 |
| | β_c/β_d | 11/15 | 6/15 | 15/9 | 2/15 | - |
| | β_{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 |
| HSDPA Specific 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 | | | | |
| HSUPA Specific Settings | 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 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27 | E-TFCI 11 E-TFCI PO4 E-TFCI 92 E-TFCI PO 18 | E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27 | E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27 | E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 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 | β_c (Note 3) | β_d | β_{HS} (Note 1) | β_{ec} | β_{ed} (2xSF2) (Note 4) | β_{ed} (2xSF4) (Note 4) | CM (dB) (Note 2) | MPR (dB) (Note 2) | AG Index (Note 4) | E-TFCI (Note 5) | E-TFCI (boost) |
|----------|-----------------------|-----------|--------------------------|--------------|--|--|------------------------|-------------------------|-------------------------|--------------------|-------------------|
| 1 | 1 | 0 | 30/15 | 30/15 | β_{ed1} : 30/15 β_{ed2} : 30/15 | β_{ed3} : 24/15 β_{ed4} : 24/15 | 3.5 | 2.5 | 14 | 105 | 105 |

Note 1: Δ_{ACK} , Δ_{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 β_c is set to 1 and $\beta_d = 0$ by default.

Note 4: β_{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 ¹ | 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:

ANSI/TIA-603-D section 2.2.17

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|----------------|--------------------------------------|----------------------|------------------|------------------|----------------------|
| R&S | EMI Test Receiver | ESCI | 100035 | 2018-08-03 | 2019-08-03 |
| Sunol Sciences | Antenna | JB3 | A060611-3 | 2017-07-21 | 2019-07-21 |
| EMCO | Adjustable Dipole Antenna | 3121C | 9109-753 | N/A | N/A |
| Unknown | Coaxial Cable | C-NJNJ-50 | C-1000-01 | 2018-09-05 | 2019-09-05 |
| Unknown | Coaxial Cable | C-NJNJ-50 | C-0400-02 | 2018-09-05 | 2019-09-05 |
| Unknown | Coaxial Cable | C-NJNJ-50 | C-0530-01 | 2018-09-24 | 2019-09-24 |
| Unknown | Coaxial Cable | C-NJNJ-50 | C-0200-02 | 2018-09-05 | 2019-09-05 |
| R&S | Spectrum Analyzer | FSP 38 | 100478 | 2018-12-10 | 2019-12-10 |
| TDK RF | Horn Antenna | HRN-0118 | 130 084 | 2016-01-05 | 2019-01-04 |
| ETS-Lindgren | Horn Antenna | 3115 | 000 527 35 | 2016-01-05 | 2019-01-04 |
| MICRO-COAX | Coaxial Cable | UFA147-1-2362-100100 | 64639 231029-001 | 2018-02-24 | 2019-02-28 |
| Agilent | Signal Generator | E8247C | MY43321350 | 2018-12-10 | 2019-12-10 |
| R&S | Universal Radio Communication Tester | CMU200 | 106 891 | 2018-12-14 | 2019-12-14 |
| R&S | Wideband Radio Communication Tester | CMW500 | 147473 | 2018-08-03 | 2019-08-03 |

* **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: | 19.6~21.3°C |
| Relative Humidity: | 31~52 % |
| ATM Pressure: | 99.7~99.8 kPa |

* The testing was performed by Sunny Cen, Neil Liao, Tiago Huang and Vern Shen on 2018-12-17~2018-12-18.

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

| Band | Channel No. | Conducted Peak Output Power (dBm) | | | | | | | | |
|----------|-------------|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | GSM | GPRS 1 TX Slot | GPRS 2 TX Slot | GPRS 3 TX Slot | GPRS 4 TX Slot | EDGE 1 TX Slot | EDGE 2 TX Slot | EDGE 3 TX Slot | EDGE 4 TX Slot |
| Cellular | 128 | 31.6 | 31.56 | 29.88 | 28.36 | 26.47 | 24.27 | 24.12 | 23.46 | 21.56 |
| | 190 | 32 | 31.98 | 29.92 | 28.42 | 26.52 | 24.36 | 24.24 | 23.34 | 21.34 |
| | 251 | 31.9 | 31.87 | 29.92 | 28.41 | 26.57 | 24.35 | 24.25 | 23.33 | 21.36 |
| PCS | 512 | 28.8 | 28.78 | 27.34 | 26.15 | 24.26 | 25.18 | 25.57 | 24.88 | 23.42 |
| | 661 | 29.1 | 29.15 | 27.45 | 26.21 | 24.31 | 24.75 | 25.14 | 24.52 | 23.51 |
| | 810 | 29.6 | 29.64 | 27.34 | 25.99 | 24.15 | 24.48 | 24.77 | 23.32 | 22.18 |

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 | 22.98 | 2.96 | 22.98 | 2.76 | 23.11 | 3.00 |
| HSDPA | 1 | 20.98 | 3.48 | 21.23 | 3.44 | 21.23 | 3.72 |
| | 2 | 20.56 | 4.52 | 21.03 | 4.31 | 21.05 | 4.35 |
| | 3 | 20.43 | 4.61 | 20.69 | 4.54 | 20.74 | 4.58 |
| | 4 | 20.32 | 4.59 | 20.39 | 4.49 | 20.63 | 4.88 |
| HSUPA | 1 | 21.09 | 4.52 | 21.89 | 4.08 | 21.59 | 3.72 |
| | 2 | 20.84 | 4.48 | 20.63 | 4.42 | 20.84 | 4.57 |
| | 3 | 20.56 | 4.35 | 20.79 | 4.33 | 20.64 | 4.57 |
| | 4 | 20.45 | 4.87 | 20.51 | 4.87 | 20.24 | 4.90 |
| | 5 | 20.41 | 4.78 | 20.22 | 4.62 | 20.38 | 4.79 |

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 | 23.24 | 2.88 | 23.18 | 3.00 | 23.13 | 2.92 |
| HSDPA | 1 | 22.25 | 3.04 | 22.41 | 3.84 | 22.29 | 3.76 |
| | 2 | 21.16 | 4.52 | 21.21 | 4.44 | 21.24 | 4.46 |
| | 3 | 21.49 | 4.49 | 21.22 | 4.78 | 21.56 | 4.84 |
| | 4 | 20.79 | 4.84 | 20.97 | 4.81 | 20.90 | 4.86 |
| HSUPA | 1 | 22.45 | 3.72 | 22.56 | 3.36 | 22.54 | 4.16 |
| | 2 | 21.95 | 4.40 | 21.98 | 4.62 | 21.80 | 4.31 |
| | 3 | 21.36 | 4.57 | 21.32 | 4.49 | 21.42 | 4.27 |
| | 4 | 21.05 | 4.86 | 20.83 | 4.80 | 21.04 | 4.89 |
| | 5 | 20.68 | 4.60 | 20.66 | 4.80 | 20.63 | 4.52 |

LTE Band 2

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 1.4MHz | QPSK | RB1#0 | 21.81 | 22.18 | 20.60 |
| | | RB1#3 | 21.81 | 22.25 | 20.42 |
| | | RB1#5 | 21.47 | 21.94 | 20.00 |
| | | RB3#0 | 21.74 | 22.27 | 20.47 |
| | | RB3#3 | 21.61 | 22.13 | 20.16 |
| | | RB6#0 | 20.69 | 21.20 | 19.26 |
| | 16QAM | RB1#0 | 20.66 | 21.19 | 19.54 |
| | | RB1#3 | 20.77 | 21.28 | 19.46 |
| | | RB1#5 | 20.48 | 20.98 | 19.07 |
| | | RB3#0 | 20.86 | 21.49 | 19.45 |
| | | RB3#3 | 20.72 | 21.36 | 19.18 |
| | | RB6#0 | 19.83 | 20.29 | 18.36 |
| 3MHz | QPSK | RB1#0 | 21.51 | 22.29 | 22.23 |
| | | RB1#8 | 21.33 | 22.15 | 21.43 |
| | | RB1#14 | 20.98 | 21.82 | 20.60 |
| | | RB6#0 | 20.59 | 21.34 | 20.84 |
| | | RB6#9 | 20.28 | 21.87 | 19.87 |
| | | RB15#0 | 20.47 | 22.01 | 20.38 |
| | 16QAM | RB1#0 | 21.20 | 22.54 | 21.09 |
| | | RB1#8 | 21.06 | 22.46 | 20.37 |
| | | RB1#14 | 20.70 | 22.04 | 19.60 |
| | | RB6#0 | 19.88 | 21.07 | 19.81 |
| | | RB6#9 | 19.57 | 20.72 | 18.88 |
| | | RB15#0 | 19.78 | 20.92 | 19.30 |
| 5MHz | QPSK | RB1#0 | 21.60 | 22.29 | 22.43 |
| | | RB1#13 | 21.66 | 22.51 | 21.72 |
| | | RB1#24 | 20.68 | 21.52 | 19.99 |
| | | RB15#0 | 20.72 | 21.54 | 21.14 |
| | | RB15#10 | 20.37 | 21.21 | 20.14 |
| | | RB25#0 | 20.50 | 21.34 | 20.60 |
| | 16QAM | RB1#0 | 20.49 | 21.58 | 21.38 |
| | | RB1#13 | 20.57 | 21.81 | 20.69 |
| | | RB1#24 | 19.61 | 20.83 | 19.00 |
| | | RB15#0 | 19.94 | 20.57 | 20.15 |
| | | RB15#10 | 19.58 | 20.24 | 19.17 |
| | | RB25#0 | 19.73 | 20.38 | 19.66 |

| | | | | | |
|-------|-------|---------|-------|-------|-------|
| 10MHz | QPSK | RB1#0 | 21.99 | 22.32 | 22.42 |
| | | RB1#25 | 21.47 | 22.29 | 22.73 |
| | | RB1#49 | 21.18 | 21.37 | 20.48 |
| | | RB25#0 | 20.83 | 21.56 | 21.89 |
| | | RB25#25 | 20.39 | 21.00 | 20.82 |
| | | RB50#0 | 20.59 | 21.30 | 21.40 |
| | 16QAM | RB1#0 | 21.50 | 21.53 | 21.36 |
| | | RB1#25 | 21.03 | 21.45 | 21.68 |
| | | RB1#49 | 20.80 | 20.53 | 19.46 |
| | | RB25#0 | 19.76 | 20.61 | 20.98 |
| | | RB25#25 | 19.35 | 20.05 | 19.94 |
| | | RB50#0 | 19.52 | 20.34 | 20.45 |
| 15MHz | QPSK | RB1#0 | 21.75 | 22.19 | 20.74 |
| | | RB1#38 | 20.87 | 22.06 | 22.34 |
| | | RB1#74 | 20.94 | 20.25 | 19.43 |
| | | RB36#0 | 20.41 | 21.51 | 20.71 |
| | | RB36#39 | 19.97 | 20.33 | 20.48 |
| | | RB75#0 | 20.17 | 21.00 | 20.64 |
| | 16QAM | RB1#0 | 21.31 | 21.42 | 20.11 |
| | | RB1#38 | 20.50 | 21.26 | 21.71 |
| | | RB1#74 | 20.60 | 19.43 | 18.86 |
| | | RB36#0 | 19.37 | 20.60 | 19.71 |
| | | RB36#39 | 18.96 | 19.42 | 19.49 |
| | | RB75#0 | 19.16 | 20.09 | 19.66 |
| 20MHz | QPSK | RB1#0 | 21.99 | 22.21 | 20.81 |
| | | RB1#50 | 21.15 | 21.97 | 21.85 |
| | | RB1#99 | 22.62 | 20.84 | 20.38 |
| | | RB50#0 | 20.26 | 21.32 | 20.01 |
| | | RB50#50 | 20.87 | 20.29 | 20.97 |
| | | RB100#0 | 20.55 | 20.86 | 20.53 |
| | 16QAM | RB1#0 | 21.18 | 21.49 | 20.37 |
| | | RB1#50 | 20.40 | 21.23 | 21.42 |
| | | RB1#99 | 21.97 | 20.12 | 20.02 |
| | | RB50#0 | 19.31 | 20.42 | 19.02 |
| | | RB50#50 | 19.92 | 19.38 | 20.01 |
| | | RB100#0 | 19.63 | 19.96 | 19.58 |

LTE Band 4

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 1.4MHz | QPSK | RB1#0 | 22.86 | 22.93 | 22.64 |
| | | RB1#3 | 22.84 | 22.95 | 22.60 |
| | | RB1#5 | 23.00 | 22.92 | 22.58 |
| | | RB3#0 | 22.91 | 22.86 | 22.55 |
| | | RB3#3 | 22.96 | 22.80 | 22.57 |
| | | RB6#0 | 22.01 | 21.92 | 21.52 |
| | 16QAM | RB1#0 | 22.18 | 21.89 | 22.60 |
| | | RB1#3 | 22.21 | 21.86 | 22.51 |
| | | RB1#5 | 22.82 | 21.89 | 22.53 |
| | | RB3#0 | 21.95 | 22.12 | 21.86 |
| | | RB3#3 | 22.00 | 22.04 | 21.83 |
| | | RB6#0 | 21.27 | 21.25 | 20.82 |
| 3MHz | QPSK | RB1#0 | 22.75 | 22.66 | 22.59 |
| | | RB1#8 | 22.76 | 22.66 | 22.59 |
| | | RB1#14 | 22.71 | 22.66 | 22.47 |
| | | RB6#0 | 22.02 | 21.95 | 21.68 |
| | | RB6#9 | 22.02 | 21.87 | 21.66 |
| | | RB15#0 | 21.94 | 21.83 | 21.72 |
| | 16QAM | RB1#0 | 22.54 | 22.46 | 21.42 |
| | | RB1#8 | 22.52 | 22.38 | 21.38 |
| | | RB1#14 | 22.48 | 22.41 | 21.35 |
| | | RB6#0 | 21.07 | 21.22 | 20.92 |
| | | RB6#9 | 21.03 | 21.20 | 20.88 |
| | | RB15#0 | 21.22 | 21.03 | 20.83 |
| 5MHz | QPSK | RB1#0 | 22.80 | 22.79 | 22.61 |
| | | RB1#13 | 22.74 | 22.75 | 22.56 |
| | | RB1#24 | 22.68 | 22.80 | 22.54 |
| | | RB15#0 | 22.08 | 21.95 | 21.77 |
| | | RB15#10 | 22.08 | 21.95 | 21.74 |
| | | RB25#0 | 22.00 | 21.85 | 21.73 |
| | 16QAM | RB1#0 | 21.74 | 21.20 | 21.59 |
| | | RB1#13 | 21.79 | 21.17 | 21.60 |
| | | RB1#24 | 21.77 | 21.23 | 21.54 |
| | | RB15#0 | 21.27 | 21.17 | 20.71 |
| | | RB15#10 | 21.18 | 21.11 | 20.72 |
| | | RB25#0 | 21.06 | 21.17 | 20.84 |

| | | | | | |
|-------|-------|---------|-------|-------|-------|
| 10MHz | QPSK | RB1#0 | 22.76 | 22.86 | 22.70 |
| | | RB1#25 | 22.70 | 22.72 | 22.61 |
| | | RB1#49 | 22.82 | 22.77 | 22.57 |
| | | RB25#0 | 21.91 | 21.94 | 21.63 |
| | | RB25#25 | 21.98 | 21.94 | 21.75 |
| | | RB50#0 | 22.03 | 21.89 | 21.72 |
| | 16QAM | RB1#0 | 22.53 | 22.68 | 21.38 |
| | | RB1#25 | 22.52 | 22.63 | 21.36 |
| | | RB1#49 | 22.55 | 22.71 | 21.36 |
| | | RB25#0 | 21.12 | 21.12 | 20.99 |
| | | RB25#25 | 21.13 | 21.22 | 20.98 |
| | | RB50#0 | 21.12 | 21.07 | 20.87 |
| 15MHz | QPSK | RB1#0 | 22.76 | 22.79 | 22.73 |
| | | RB1#38 | 22.79 | 22.80 | 22.68 |
| | | RB1#74 | 22.84 | 22.87 | 22.62 |
| | | RB36#0 | 21.97 | 21.95 | 21.71 |
| | | RB36#39 | 22.01 | 21.89 | 21.77 |
| | | RB75#0 | 21.94 | 21.92 | 21.71 |
| | 16QAM | RB1#0 | 22.34 | 22.64 | 22.21 |
| | | RB1#38 | 22.29 | 22.60 | 22.09 |
| | | RB1#74 | 22.32 | 22.72 | 21.88 |
| | | RB36#0 | 21.19 | 21.10 | 21.03 |
| | | RB36#39 | 21.36 | 21.11 | 21.01 |
| | | RB75#0 | 21.25 | 21.05 | 20.88 |
| 20MHz | QPSK | RB1#0 | 22.99 | 22.83 | 22.85 |
| | | RB1#50 | 23.09 | 22.79 | 22.74 |
| | | RB1#99 | 23.11 | 23.15 | 22.69 |
| | | RB50#0 | 21.88 | 22.02 | 21.78 |
| | | RB50#50 | 22.05 | 21.85 | 21.82 |
| | | RB100#0 | 22.06 | 21.89 | 21.80 |
| | 16QAM | RB1#0 | 22.06 | 22.18 | 22.82 |
| | | RB1#50 | 22.12 | 22.08 | 22.39 |
| | | RB1#99 | 22.09 | 22.17 | 22.43 |
| | | RB50#0 | 21.18 | 21.17 | 20.91 |
| | | RB50#50 | 21.29 | 21.04 | 20.87 |
| | | RB100#0 | 21.18 | 21.02 | 21.01 |

LTE Band 5

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 1.4MHz | QPSK | RB1#0 | 23.30 | 23.04 | 22.98 |
| | | RB1#3 | 23.32 | 23.12 | 23.04 |
| | | RB1#5 | 23.33 | 23.08 | 23.06 |
| | | RB3#0 | 23.24 | 23.33 | 23.07 |
| | | RB3#3 | 23.30 | 23.34 | 23.17 |
| | | RB6#0 | 22.22 | 22.29 | 22.17 |
| | 16QAM | RB1#0 | 22.75 | 22.94 | 21.99 |
| | | RB1#3 | 22.76 | 22.93 | 21.96 |
| | | RB1#5 | 22.77 | 22.94 | 22.09 |
| | | RB3#0 | 22.37 | 22.15 | 22.27 |
| | | RB3#3 | 22.44 | 22.19 | 22.37 |
| 3MHz | QPSK | RB1#0 | 23.06 | 23.07 | 22.98 |
| | | RB1#8 | 23.08 | 23.12 | 23.03 |
| | | RB1#14 | 23.03 | 23.10 | 23.07 |
| | | RB6#0 | 22.25 | 22.28 | 22.12 |
| | | RB6#9 | 22.26 | 22.24 | 22.25 |
| | | RB15#0 | 22.31 | 22.21 | 22.17 |
| | 16QAM | RB1#0 | 22.38 | 22.46 | 22.04 |
| | | RB1#8 | 22.36 | 22.45 | 22.01 |
| | | RB1#14 | 22.39 | 22.44 | 22.06 |
| | | RB6#0 | 21.47 | 21.51 | 21.25 |
| | | RB6#9 | 21.44 | 21.45 | 21.26 |
| 5MHz | QPSK | RB1#0 | 23.20 | 23.24 | 23.06 |
| | | RB1#13 | 23.19 | 23.20 | 23.06 |
| | | RB1#24 | 23.06 | 23.18 | 23.16 |
| | | RB15#0 | 22.26 | 22.24 | 22.24 |
| | | RB15#10 | 22.23 | 22.27 | 22.12 |
| | 16QAM | RB25#0 | 22.26 | 22.21 | 22.14 |
| | | RB1#0 | 21.50 | 22.42 | 21.77 |
| | | RB1#13 | 21.56 | 22.32 | 21.83 |
| | | RB1#24 | 21.50 | 22.13 | 21.93 |
| | | RB15#0 | 21.56 | 21.26 | 21.32 |
| 10MHz | QPSK | RB15#10 | 21.43 | 21.25 | 21.29 |
| | | RB25#0 | 21.49 | 21.28 | 21.21 |
| | | RB1#0 | 23.10 | 23.11 | 23.12 |
| | | RB1#25 | 23.04 | 23.20 | 23.13 |
| | | RB1#49 | 23.21 | 23.22 | 23.07 |
| | | RB25#0 | 22.32 | 22.24 | 22.27 |
| | 16QAM | RB25#25 | 22.20 | 22.18 | 22.24 |
| | | RB50#0 | 22.31 | 22.21 | 22.19 |
| | | RB1#0 | 22.60 | 22.26 | 21.67 |
| | | RB1#25 | 22.57 | 22.41 | 21.66 |
| | | RB1#49 | 22.70 | 22.39 | 21.73 |
| | 16QAM | RB25#0 | 21.36 | 21.44 | 21.39 |
| | | RB25#25 | 21.35 | 21.39 | 21.33 |
| | | RB50#0 | 21.32 | 21.40 | 21.36 |

LTE Band 7

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 5MHz | QPSK | RB1#0 | 21.56 | 22.59 | 22.19 |
| | | RB1#13 | 21.25 | 22.61 | 22.18 |
| | | RB1#24 | 20.17 | 22.37 | 22.24 |
| | | RB15#0 | 21.21 | 21.50 | 21.20 |
| | | RB15#10 | 20.71 | 21.31 | 21.26 |
| | | RB25#0 | 20.85 | 21.30 | 21.28 |
| | 16QAM | RB1#0 | 20.97 | 22.27 | 21.65 |
| | | RB1#13 | 20.88 | 22.20 | 21.66 |
| | | RB1#24 | 19.90 | 22.30 | 21.83 |
| | | RB15#0 | 20.95 | 20.81 | 20.53 |
| | | RB15#10 | 20.69 | 20.85 | 20.63 |
| | | RB25#0 | 20.87 | 21.05 | 20.79 |
| 10MHz | QPSK | RB1#0 | 21.24 | 22.46 | 22.13 |
| | | RB1#25 | 20.28 | 22.43 | 21.99 |
| | | RB1#49 | 20.11 | 22.61 | 22.21 |
| | | RB25#0 | 20.61 | 21.32 | 21.34 |
| | | RB25#25 | 20.16 | 21.39 | 21.37 |
| | | RB50#0 | 20.34 | 21.35 | 21.31 |
| | 16QAM | RB1#0 | 21.39 | 22.08 | 22.06 |
| | | RB1#25 | 20.76 | 21.90 | 21.98 |
| | | RB1#49 | 21.21 | 22.01 | 22.05 |
| | | RB25#0 | 20.80 | 21.10 | 20.69 |
| | | RB25#25 | 20.83 | 21.09 | 20.63 |
| | | RB50#0 | 20.91 | 21.04 | 20.70 |
| 15MHz | QPSK | RB1#0 | 21.25 | 22.30 | 22.31 |
| | | RB1#38 | 20.07 | 22.14 | 22.44 |
| | | RB1#74 | 20.49 | 21.81 | 22.65 |
| | | RB36#0 | 20.55 | 21.39 | 21.20 |
| | | RB36#39 | 20.24 | 21.42 | 21.31 |
| | | RB75#0 | 20.34 | 21.39 | 21.28 |
| | 16QAM | RB1#0 | 21.51 | 23.35 | 22.59 |
| | | RB1#38 | 20.57 | 23.19 | 22.39 |
| | | RB1#74 | 21.07 | 21.98 | 22.53 |
| | | RB36#0 | 20.49 | 20.92 | 20.72 |
| | | RB36#39 | 20.25 | 20.86 | 20.84 |
| | | RB75#0 | 20.33 | 20.94 | 20.66 |
| 20MHz | QPSK | RB1#0 | 20.44 | 23.10 | 22.56 |
| | | RB1#50 | 20.36 | 23.13 | 23.21 |
| | | RB1#99 | 22.56 | 23.17 | 23.25 |
| | | RB50#0 | 19.93 | 22.11 | 21.91 |
| | | RB50#50 | 19.99 | 21.99 | 21.91 |
| | | RB100#0 | 19.89 | 22.09 | 22.00 |
| | 16QAM | RB1#0 | 20.47 | 23.50 | 23.12 |
| | | RB1#50 | 19.65 | 22.66 | 23.28 |
| | | RB1#99 | 20.61 | 22.62 | 23.23 |
| | | RB50#0 | 21.08 | 22.10 | 21.92 |
| | | RB50#50 | 21.78 | 22.12 | 21.87 |
| | | RB100#0 | 21.49 | 21.56 | 21.54 |

LTE Band 12

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 1.4MHz | QPSK | RB1#0 | 22.94 | 23.20 | 23.13 |
| | | RB1#3 | 22.95 | 23.29 | 23.14 |
| | | RB1#5 | 23.01 | 23.37 | 23.24 |
| | | RB3#0 | 23.08 | 23.22 | 23.13 |
| | | RB3#3 | 23.05 | 23.24 | 23.22 |
| | | RB6#0 | 22.17 | 22.33 | 22.21 |
| | 16QAM | RB1#0 | 22.72 | 22.15 | 22.37 |
| | | RB1#3 | 22.75 | 22.27 | 22.39 |
| | | RB1#5 | 22.74 | 22.24 | 22.36 |
| | | RB3#0 | 22.13 | 22.15 | 22.11 |
| | | RB3#3 | 22.15 | 22.16 | 22.15 |
| 3MHz | QPSK | RB1#0 | 22.86 | 23.09 | 23.26 |
| | | RB1#8 | 22.97 | 23.12 | 23.25 |
| | | RB1#14 | 23.04 | 23.12 | 23.31 |
| | | RB6#0 | 22.06 | 22.12 | 22.22 |
| | | RB6#9 | 22.13 | 22.35 | 22.34 |
| | | RB15#0 | 22.21 | 22.33 | 22.36 |
| | 16QAM | RB1#0 | 22.21 | 22.81 | 21.93 |
| | | RB1#8 | 22.23 | 22.89 | 21.86 |
| | | RB1#14 | 22.32 | 22.88 | 21.96 |
| | | RB6#0 | 21.14 | 21.22 | 21.43 |
| | | RB6#9 | 21.14 | 21.23 | 21.40 |
| 5MHz | QPSK | RB1#0 | 22.87 | 23.14 | 23.17 |
| | | RB1#13 | 23.08 | 23.25 | 23.13 |
| | | RB1#24 | 23.02 | 23.19 | 23.14 |
| | | RB15#0 | 22.25 | 22.13 | 22.34 |
| | | RB15#10 | 22.19 | 22.25 | 22.37 |
| | | RB25#0 | 22.28 | 22.27 | 22.30 |
| | 16QAM | RB1#0 | 21.38 | 22.13 | 21.93 |
| | | RB1#13 | 21.39 | 22.30 | 21.89 |
| | | RB1#24 | 21.32 | 22.18 | 21.88 |
| | | RB15#0 | 21.24 | 21.11 | 21.37 |
| | | RB15#10 | 21.29 | 21.19 | 21.22 |
| 10MHz | QPSK | RB25#0 | 21.37 | 21.28 | 21.18 |
| | | RB1#0 | 22.92 | 23.07 | 23.38 |
| | | RB1#25 | 23.01 | 23.18 | 23.30 |
| | | RB1#49 | 23.27 | 23.16 | 23.52 |
| | | RB25#0 | 22.25 | 22.20 | 22.38 |
| | 16QAM | RB25#25 | 22.30 | 22.29 | 22.34 |
| | | RB50#0 | 22.28 | 22.33 | 22.20 |
| | | RB1#0 | 22.22 | 22.45 | 21.76 |
| | | RB1#25 | 22.21 | 22.56 | 21.79 |
| | | RB1#49 | 22.40 | 23.12 | 21.91 |
| | QPSK | RB25#0 | 21.23 | 21.29 | 21.38 |
| | | RB25#25 | 21.29 | 21.39 | 21.39 |
| | | RB50#0 | 21.29 | 21.38 | 21.34 |

LTE Band 17

| Channel Bandwidth | Modulation | Resource Block & RB offset | Low Channel (dBm) | Middle Channel (dBm) | High Channel (dBm) |
|-------------------|------------|----------------------------|-------------------|----------------------|--------------------|
| 5MHz | QPSK | RB1#0 | 23.12 | 23.08 | 23.27 |
| | | RB1#13 | 23.18 | 23.03 | 23.20 |
| | | RB1#24 | 23.23 | 23.14 | 23.22 |
| | | RB15#0 | 22.22 | 22.25 | 22.28 |
| | | RB15#10 | 22.29 | 22.26 | 22.29 |
| | | RB25#0 | 22.27 | 22.20 | 22.33 |
| | 16QAM | RB1#0 | 22.25 | 21.80 | 21.39 |
| | | RB1#13 | 22.19 | 21.72 | 21.44 |
| | | RB1#24 | 22.34 | 21.90 | 21.49 |
| | | RB15#0 | 21.13 | 21.40 | 21.35 |
| | | RB15#10 | 21.24 | 21.29 | 21.28 |
| | | RB25#0 | 21.26 | 21.23 | 21.41 |
| 10MHz | QPSK | RB1#0 | 23.04 | 23.09 | 23.31 |
| | | RB1#25 | 23.20 | 23.04 | 23.33 |
| | | RB1#49 | 23.24 | 23.13 | 23.44 |
| | | RB25#0 | 22.25 | 22.23 | 22.33 |
| | | RB25#25 | 22.26 | 22.38 | 22.21 |
| | | RB50#0 | 22.21 | 22.32 | 22.23 |
| | 16QAM | RB1#0 | 22.19 | 22.94 | 21.75 |
| | | RB1#25 | 22.35 | 23.08 | 21.82 |
| | | RB1#49 | 22.37 | 23.07 | 21.91 |
| | | RB25#0 | 21.24 | 21.30 | 21.39 |
| | | RB25#25 | 21.37 | 21.38 | 21.37 |
| | | RB50#0 | 21.37 | 21.29 | 21.37 |

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 | 5.80 | 4.28 | 4.92 | 13 |
| | 100 RB | | 6.32 | 6.16 | 6.48 | 13 |
| 16QAM | 1 RB | 20 MHz | 6.04 | 5.16 | 5.68 | 13 |
| | 100 RB | | 7.12 | 7.00 | 7.20 | 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 | 4.24 | 4.32 | 4.80 | 13 |
| | 100 RB | | 6.40 | 6.12 | 6.32 | 13 |
| 16QAM | 1 RB | 20 MHz | 5.16 | 5.44 | 5.32 | 13 |
| | 100 RB | | 7.16 | 7.04 | 7.12 | 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 | 3.88 | 4.28 | 3.96 | 13 |
| | 50 RB | | 5.16 | 5.28 | 5.24 | 13 |
| 16QAM | 1 RB | 10 MHz | 5.24 | 5.36 | 4.96 | 13 |
| | 50 RB | | 6.12 | 6.20 | 6.12 | 13 |

PAR, Band 7

| Test Modulation | | Channel Bandwidth | Low Channel PAR (dB) | Middle Channel PAR (dB) | High Channel PAR (dB) | Limit (dB) |
|-----------------|--------|-------------------|----------------------|-------------------------|-----------------------|------------|
| QPSK | 1 RB | 20 MHz | 5.92 | 4.16 | 4.04 | 13 |
| | 100 RB | | 6.20 | 6.12 | 6.36 | 13 |
| 16QAM | 1 RB | 20 MHz | 5.88 | 5.04 | 4.76 | 13 |
| | 100 RB | | 7.24 | 7.08 | 7.12 | 13 |

PAR, 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 | 4.64 | 4.48 | 4.16 | 13 |
| | 50 RB | | 5.52 | 5.40 | 5.20 | 13 |
| 16QAM | 1 RB | 10 MHz | 5.52 | 5.48 | 4.56 | 13 |
| | 50 RB | | 6.40 | 6.36 | 6.16 | 13 |

PAR, 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 | 4.24 | 4.24 | 4.20 | 13 |
| | 50 RB | | 5.20 | 5.24 | 5.36 | 13 |
| 16QAM | 1 RB | 10 MHz | 5.48 | 4.72 | 5.54 | 13 |
| | 50 RB | | 6.28 | 6.08 | 6.24 | 13 |

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

ERP & EIRP**Part 22H**

Part 221

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| GSM 850 Middle Channel | | | | | | | | |
| 836.60 | H | 89.03 | 14.80 | 0.00 | 0.50 | 14.30 | 38.45 | 24.15 |
| 836.60 | V | 99.61 | 28.35 | 0.00 | 0.50 | 27.85 | 38.45 | 10.60 |
| EDGE 850 Middle Channel | | | | | | | | |
| 836.60 | H | 83.64 | 9.41 | 0.00 | 0.50 | 8.91 | 38.45 | 29.54 |
| 836.60 | V | 94.15 | 22.89 | 0.00 | 0.50 | 22.39 | 38.45 | 16.06 |
| WCDMA Band V Middle Channel | | | | | | | | |
| 836.60 | H | 81.59 | 7.36 | 0.00 | 0.50 | 6.86 | 38.45 | 31.59 |
| 836.60 | V | 95.52 | 24.26 | 0.00 | 0.50 | 23.76 | 38.45 | 14.69 |

Part 24E

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| PCS 1900 Middle Channel | | | | | | | | |
| 1880.00 | H | 94.22 | 19.44 | 11.14 | 1.56 | 29.02 | 33.00 | 3.98 |
| 1880.00 | V | 94.16 | 19.19 | 11.14 | 1.56 | 28.77 | 33.00 | 4.23 |
| EDGE 1900 Middle Channel | | | | | | | | |
| 1880.00 | H | 90.03 | 15.25 | 11.14 | 1.56 | 24.83 | 33.00 | 8.17 |
| 1880.00 | V | 89.91 | 14.94 | 11.14 | 1.56 | 24.52 | 33.00 | 8.48 |
| WCDMA Band II Middle Channel | | | | | | | | |
| 1880.00 | H | 87.43 | 12.65 | 11.14 | 1.56 | 22.23 | 33.00 | 10.77 |
| 1880.00 | V | 86.76 | 11.79 | 11.14 | 1.56 | 21.37 | 33.00 | 11.63 |

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 (MHz) | BW (MHz) | Modulation | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
| | | | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| 1880.00 | 1.40 | QPSK | H | 87.94 | 13.16 | 11.14 | 1.56 | 22.74 | 33.00 | 10.26 |
| 1880.00 | | | V | 85.71 | 10.74 | 11.14 | 1.56 | 20.32 | 33.00 | 12.68 |
| 1880.00 | 3.00 | | H | 87.87 | 13.09 | 11.14 | 1.56 | 22.67 | 33.00 | 10.33 |
| 1880.00 | | | V | 86.10 | 11.13 | 11.14 | 1.56 | 20.71 | 33.00 | 12.29 |
| 1880.00 | 5.00 | | H | 87.79 | 13.01 | 11.14 | 1.56 | 22.59 | 33.00 | 10.41 |
| 1880.00 | | | V | 85.83 | 10.86 | 11.14 | 1.56 | 20.44 | 33.00 | 12.56 |
| 1880.00 | 10.00 | | H | 86.90 | 12.12 | 11.14 | 1.56 | 21.70 | 33.00 | 11.30 |
| 1880.00 | | | V | 85.18 | 10.21 | 11.14 | 1.56 | 19.79 | 33.00 | 13.21 |
| 1880.00 | 15.00 | | H | 87.87 | 13.09 | 11.14 | 1.56 | 22.67 | 33.00 | 10.33 |
| 1880.00 | | | V | 86.10 | 11.13 | 11.14 | 1.56 | 20.71 | 33.00 | 12.29 |
| 1880.00 | 20.00 | | H | 89.66 | 14.88 | 11.14 | 1.56 | 24.46 | 33.00 | 8.54 |
| 1880.00 | | | V | 87.97 | 13.00 | 11.14 | 1.56 | 22.58 | 33.00 | 10.42 |
| 1880.00 | 1.40 | 16QAM | H | 88.09 | 13.31 | 11.14 | 1.56 | 22.89 | 33.00 | 10.11 |
| 1880.00 | | | V | 86.66 | 11.69 | 11.14 | 1.56 | 21.27 | 33.00 | 11.73 |
| 1880.00 | 3.00 | | H | 88.08 | 13.30 | 11.14 | 1.56 | 22.88 | 33.00 | 10.12 |
| 1880.00 | | | V | 86.82 | 11.85 | 11.14 | 1.56 | 21.43 | 33.00 | 11.57 |
| 1880.00 | 5.00 | | H | 88.06 | 13.28 | 11.14 | 1.56 | 22.86 | 33.00 | 10.14 |
| 1880.00 | | | V | 86.59 | 11.62 | 11.14 | 1.56 | 21.20 | 33.00 | 11.80 |
| 1880.00 | 10.00 | | H | 87.51 | 12.73 | 11.14 | 1.56 | 22.31 | 33.00 | 10.69 |
| 1880.00 | | | V | 85.92 | 10.95 | 11.14 | 1.56 | 20.53 | 33.00 | 12.47 |
| 1880.00 | 15.00 | | H | 87.66 | 12.88 | 11.14 | 1.56 | 22.46 | 33.00 | 10.54 |
| 1880.00 | | | V | 87.97 | 13.00 | 11.14 | 1.56 | 22.58 | 33.00 | 10.42 |
| 1880.00 | 20.00 | | H | 88.40 | 13.62 | 11.14 | 1.56 | 23.20 | 33.00 | 9.80 |
| 1880.00 | | | V | 87.63 | 12.66 | 11.14 | 1.56 | 22.24 | 33.00 | 10.76 |

LTE Band 4

| Frequency (MHz) | BW (MHz) | Modulation | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
| | | | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| 1732.50 | 1.40 | QPSK | H | 87.29 | 12.08 | 10.70 | 1.52 | 21.26 | 30.00 | 8.74 |
| 1732.50 | | | V | 85.46 | 9.95 | 10.70 | 1.52 | 19.13 | 30.00 | 10.87 |
| 1732.50 | 3.00 | | H | 86.67 | 11.46 | 10.70 | 1.52 | 20.64 | 30.00 | 9.36 |
| 1732.50 | | | V | 85.43 | 9.92 | 10.70 | 1.52 | 19.10 | 30.00 | 10.90 |
| 1732.50 | 5.00 | | H | 86.29 | 11.08 | 10.70 | 1.52 | 20.26 | 30.00 | 9.74 |
| 1732.50 | | | V | 84.79 | 9.28 | 10.70 | 1.52 | 18.46 | 30.00 | 11.54 |
| 1732.50 | 10.00 | | H | 85.16 | 9.95 | 10.70 | 1.52 | 19.13 | 30.00 | 10.87 |
| 1732.50 | | | V | 84.08 | 8.57 | 10.70 | 1.52 | 17.75 | 30.00 | 12.25 |
| 1732.50 | 15.00 | | H | 87.93 | 12.72 | 10.70 | 1.52 | 21.90 | 30.00 | 8.10 |
| 1732.50 | | | V | 85.98 | 10.47 | 10.70 | 1.52 | 19.65 | 30.00 | 10.35 |
| 1732.50 | 20.00 | | H | 87.93 | 12.72 | 10.70 | 1.52 | 21.90 | 30.00 | 8.10 |
| 1732.50 | | | V | 85.98 | 10.47 | 10.70 | 1.52 | 19.65 | 30.00 | 10.35 |
| 1732.50 | 1.40 | 16QAM | H | 86.25 | 11.04 | 10.70 | 1.52 | 20.22 | 30.00 | 9.78 |
| 1732.50 | | | V | 85.10 | 9.59 | 10.70 | 1.52 | 18.77 | 30.00 | 11.23 |
| 1732.50 | 3.00 | | H | 87.20 | 11.99 | 10.70 | 1.52 | 21.17 | 30.00 | 8.83 |
| 1732.50 | | | V | 85.45 | 9.94 | 10.70 | 1.52 | 19.12 | 30.00 | 10.88 |
| 1732.50 | 5.00 | | H | 87.11 | 11.90 | 10.70 | 1.52 | 21.08 | 30.00 | 8.92 |
| 1732.50 | | | V | 85.62 | 10.11 | 10.70 | 1.52 | 19.29 | 30.00 | 10.71 |
| 1732.50 | 10.00 | | H | 85.95 | 10.74 | 10.70 | 1.52 | 19.92 | 30.00 | 10.08 |
| 1732.50 | | | V | 84.70 | 9.19 | 10.70 | 1.52 | 18.37 | 30.00 | 11.63 |
| 1732.50 | 15.00 | | H | 85.95 | 10.74 | 10.70 | 1.52 | 19.92 | 30.00 | 10.08 |
| 1732.50 | | | V | 84.70 | 9.19 | 10.70 | 1.52 | 18.37 | 30.00 | 11.63 |
| 1732.50 | 20.00 | | H | 88.38 | 13.17 | 10.70 | 1.52 | 22.35 | 30.00 | 7.65 |
| 1732.50 | | | V | 86.92 | 11.41 | 10.70 | 1.52 | 20.59 | 30.00 | 9.41 |

LTE Band 5

| Frequency (MHz) | BW (MHz) | Modulation | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
| | | | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| 836.50 | 1.40 | QPSK | H | 86.96 | 12.73 | 0.00 | 0.50 | 12.23 | 38.45 | 26.22 |
| 836.50 | | | V | 94.54 | 23.28 | 0.00 | 0.50 | 22.78 | 38.45 | 15.67 |
| 836.50 | 3.00 | | H | 86.17 | 11.94 | 0.00 | 0.50 | 11.44 | 38.45 | 27.01 |
| 836.50 | | | V | 93.83 | 22.57 | 0.00 | 0.50 | 22.07 | 38.45 | 16.38 |
| 836.50 | 5.00 | | H | 85.48 | 11.25 | 0.00 | 0.50 | 10.75 | 38.45 | 27.70 |
| 836.50 | | | V | 94.39 | 23.13 | 0.00 | 0.50 | 22.63 | 38.45 | 15.82 |
| 836.50 | 10.00 | | H | 85.74 | 11.51 | 0.00 | 0.50 | 11.01 | 38.45 | 27.44 |
| 836.50 | | | V | 93.64 | 22.38 | 0.00 | 0.50 | 21.88 | 38.45 | 16.57 |
| 836.50 | 1.40 | 16QAM | H | 86.73 | 12.50 | 0.00 | 0.50 | 12.00 | 38.45 | 26.45 |
| 836.50 | | | V | 94.08 | 22.82 | 0.00 | 0.50 | 22.32 | 38.45 | 16.13 |
| 836.50 | 3.00 | | H | 86.02 | 11.79 | 0.00 | 0.50 | 11.29 | 38.45 | 27.16 |
| 836.50 | | | V | 93.65 | 22.39 | 0.00 | 0.50 | 21.89 | 38.45 | 16.56 |
| 836.50 | 5.00 | | H | 85.32 | 11.09 | 0.00 | 0.50 | 10.59 | 38.45 | 27.86 |
| 836.50 | | | V | 94.14 | 22.88 | 0.00 | 0.50 | 22.38 | 38.45 | 16.07 |
| 836.50 | 10.00 | | H | 85.58 | 11.35 | 0.00 | 0.50 | 10.85 | 38.45 | 27.60 |
| 836.50 | | | V | 93.35 | 22.09 | 0.00 | 0.50 | 21.59 | 38.45 | 16.86 |

LTE Band 7

| Frequency (MHz) | BW (MHz) | Modulation | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
| | | | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| 2535.00 | 5.00 | QPSK | H | 86.03 | 12.94 | 12.21 | 1.79 | 23.36 | 33.00 | 9.64 |
| 2535.00 | | | V | 80.64 | 7.26 | 12.21 | 1.79 | 17.68 | 33.00 | 15.32 |
| 2535.00 | 10.00 | | H | 86.03 | 12.94 | 12.21 | 1.79 | 23.36 | 33.00 | 9.64 |
| 2535.00 | | | V | 79.28 | 5.90 | 12.21 | 1.79 | 16.32 | 33.00 | 16.68 |
| 2535.00 | 15.00 | | H | 85.28 | 12.19 | 12.21 | 1.79 | 22.61 | 33.00 | 10.39 |
| 2535.00 | | | V | 80.52 | 7.14 | 12.21 | 1.79 | 17.56 | 33.00 | 15.44 |
| 2535.00 | 20.00 | | H | 85.18 | 12.09 | 12.21 | 1.79 | 22.51 | 33.00 | 10.49 |
| 2535.00 | | | V | 80.72 | 7.34 | 12.21 | 1.79 | 17.76 | 33.00 | 15.24 |
| 2535.00 | 5.00 | 16QAM | H | 86.15 | 13.06 | 12.21 | 1.79 | 23.48 | 33.00 | 9.52 |
| 2535.00 | | | V | 81.11 | 7.73 | 12.21 | 1.79 | 18.15 | 33.00 | 14.85 |
| 2535.00 | 10.00 | | H | 86.15 | 13.06 | 12.21 | 1.79 | 23.48 | 33.00 | 9.52 |
| 2535.00 | | | V | 80.41 | 7.03 | 12.21 | 1.79 | 17.45 | 33.00 | 15.55 |
| 2535.00 | 15.00 | | H | 85.58 | 12.49 | 12.21 | 1.79 | 22.91 | 33.00 | 10.09 |
| 2535.00 | | | V | 80.98 | 7.60 | 12.21 | 1.79 | 18.02 | 33.00 | 14.98 |
| 2535.00 | 20.00 | | H | 85.84 | 12.75 | 12.21 | 1.79 | 23.17 | 33.00 | 9.83 |
| 2535.00 | | | V | 81.70 | 8.32 | 12.21 | 1.79 | 18.74 | 33.00 | 14.26 |

LTE Band 12

| Frequency (MHz) | BW (MHz) | Modulation | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
| | | | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| 707.50 | 1.40 | QPSK | H | 80.98 | 5.05 | 0.00 | 0.39 | 4.66 | 34.77 | 30.11 |
| 707.50 | | | V | 90.76 | 17.73 | 0.00 | 0.39 | 17.34 | 34.77 | 17.43 |
| 707.50 | 3.00 | | H | 80.63 | 4.70 | 0.00 | 0.39 | 4.31 | 34.77 | 30.46 |
| 707.50 | | | V | 90.61 | 17.58 | 0.00 | 0.39 | 17.19 | 34.77 | 17.58 |
| 707.50 | 5.00 | | H | 80.64 | 4.71 | 0.00 | 0.39 | 4.32 | 34.77 | 30.45 |
| 707.50 | | | V | 90.72 | 17.69 | 0.00 | 0.39 | 17.30 | 34.77 | 17.47 |
| 707.50 | 10.00 | | H | 81.34 | 5.41 | 0.00 | 0.39 | 5.02 | 34.77 | 29.75 |
| 707.50 | | | V | 91.26 | 18.23 | 0.00 | 0.39 | 17.84 | 34.77 | 16.93 |
| 707.50 | 1.40 | 16QAM | H | 79.94 | 4.01 | 0.00 | 0.39 | 3.62 | 34.77 | 31.15 |
| 707.50 | | | V | 90.45 | 17.42 | 0.00 | 0.39 | 17.03 | 34.77 | 17.74 |
| 707.50 | 3.00 | | H | 81.15 | 5.22 | 0.00 | 0.39 | 4.83 | 34.77 | 29.94 |
| 707.50 | | | V | 91.14 | 18.11 | 0.00 | 0.39 | 17.72 | 34.77 | 17.05 |
| 707.50 | 5.00 | | H | 80.87 | 4.94 | 0.00 | 0.39 | 4.55 | 34.77 | 30.22 |
| 707.50 | | | V | 90.98 | 17.95 | 0.00 | 0.39 | 17.56 | 34.77 | 17.21 |
| 707.50 | 10.00 | | H | 81.35 | 5.42 | 0.00 | 0.39 | 5.03 | 34.77 | 29.74 |
| 707.50 | | | V | 91.46 | 18.43 | 0.00 | 0.39 | 18.04 | 34.77 | 16.73 |

LTE Band 17

| Frequency (MHz) | BW (MHz) | Modulation | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|--------------------|-------------|------------|----------------|-------------------------------|-------------------------------|------------------------------|-----------------------|----------------------------|----------------|----------------|
| | | | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| 710.00 | 5 | QPSK | H | 82.23 | 6.33 | 0.00 | 0.39 | 5.94 | 34.77 | 28.83 |
| 710.00 | | | V | 91.26 | 18.26 | 0.00 | 0.39 | 17.87 | 34.77 | 16.90 |
| 710.00 | 10 | | H | 82.34 | 6.44 | 0.00 | 0.39 | 6.05 | 34.77 | 28.72 |
| 710.00 | | | V | 91.35 | 18.35 | 0.00 | 0.39 | 17.96 | 34.77 | 16.81 |
| 710.00 | 5 | 16QAM | H | 82.69 | 6.79 | 0.00 | 0.39 | 6.40 | 34.77 | 28.37 |
| 710.00 | | | V | 91.33 | 18.33 | 0.00 | 0.39 | 17.94 | 34.77 | 16.83 |
| 710.00 | 10 | | H | 82.79 | 6.89 | 0.00 | 0.39 | 6.50 | 34.77 | 28.27 |
| 710.00 | | | V | 91.58 | 18.58 | 0.00 | 0.39 | 18.19 | 34.77 | 16.58 |

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

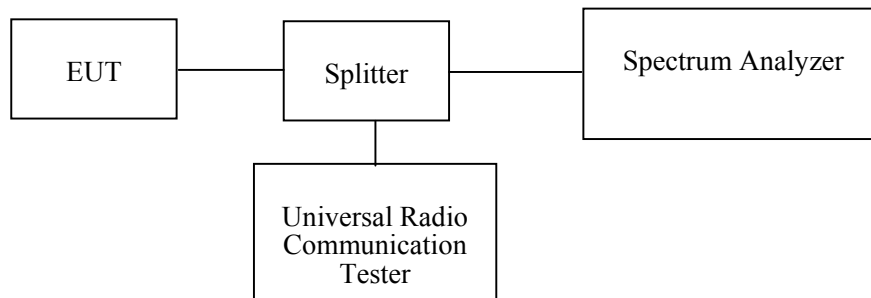
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH**Applicable Standard**

FCC §2.1049, §22.917, §22.905, §24.238 and §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 |
|-----------------|------------------|---------------|---------------|------------------|----------------------|
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 831929/005 | 2018-08-03 | 2019-08-03 |
| yzjingcheng | Coaxial Cable | KTRFBU-141-50 | 41005012 | Each time | N/A |
| Unknown | Coaxial Cable | C-SJ00-0010 | C0010/01 | Each time | N/A |
| E-Microwave | Two-way Splitter | ODP-1-6-2S | OE0120142 | 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**

| | |
|---------------------------|----------------|
| Temperature: | 24.5~25.5°C |
| Relative Humidity: | 41~49 % |
| ATM Pressure: | 99.7~100.6 kPa |

The testing was performed by Tiago Huang from 2018-12-19 to 2019-01-31.

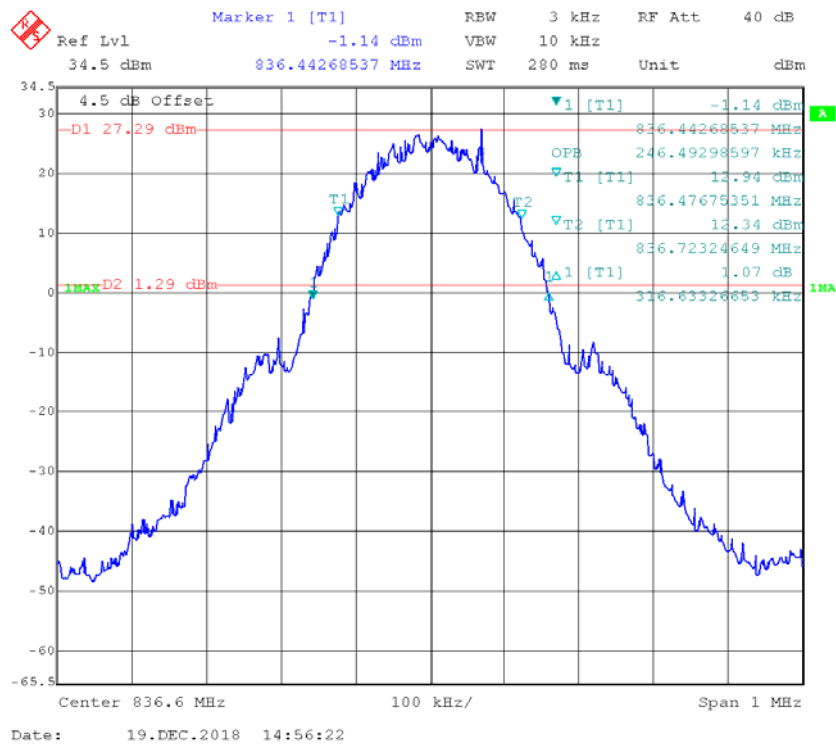
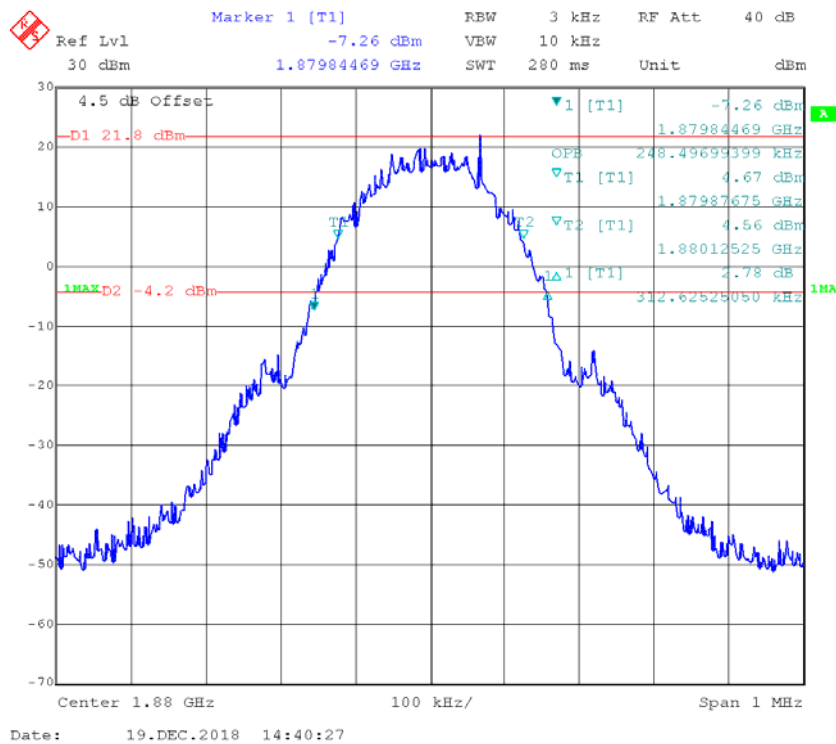
Test Mode: Transmitting

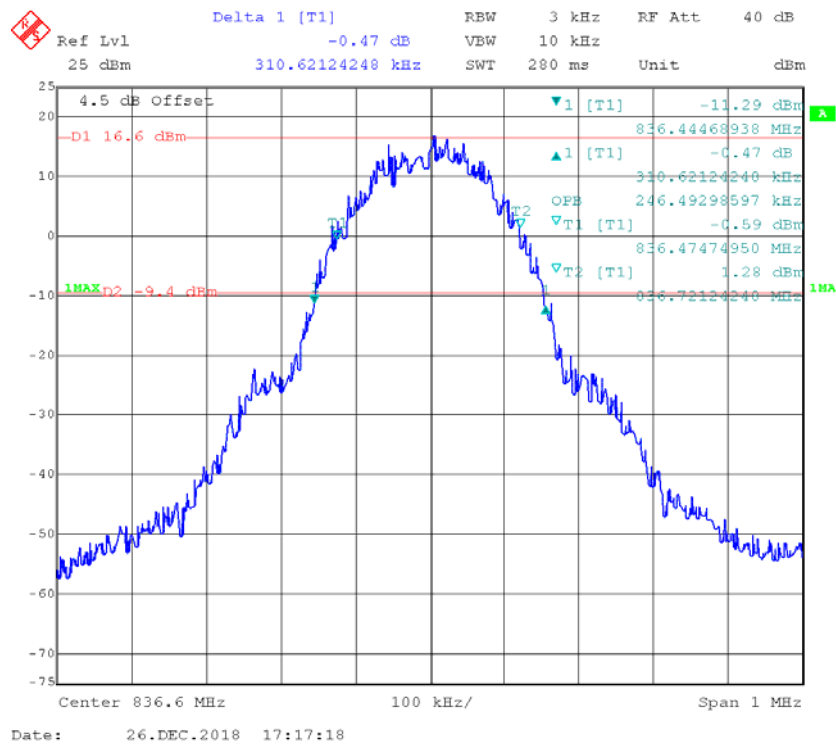
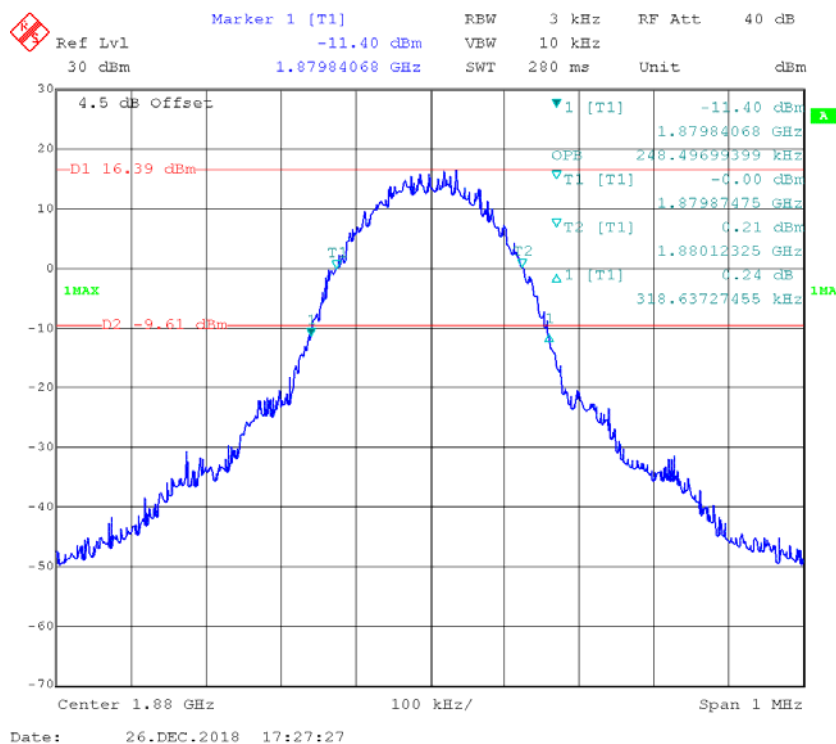
Test Result: Compliant. Please refer to the following table and plots.

| Band | Test Channel | Mode | 99% Occupied Bandwidth (MHz) | 26 dB Occupied Bandwidth (MHz) |
|--------------|--------------|---------------|------------------------------|--------------------------------|
| Cellular | M | GSM | 0.246 | 0.316 |
| PCS | | EDGE | 0.246 | 0.311 |
| | | PCS | 0.248 | 0.313 |
| | | EDGE | 0.248 | 0.319 |
| | | WCDMA Band II | Rel 99 | 4.168 |
| HSDPA | | | 4.168 | 4.689 |
| HSUPA | | | 4.148 | 4.649 |
| WCDMA Band V | | Rel 99 | 4.168 | 4.669 |
| | | HSDPA | 4.148 | 4.709 |
| | | HSUPA | 4.168 | 4.709 |

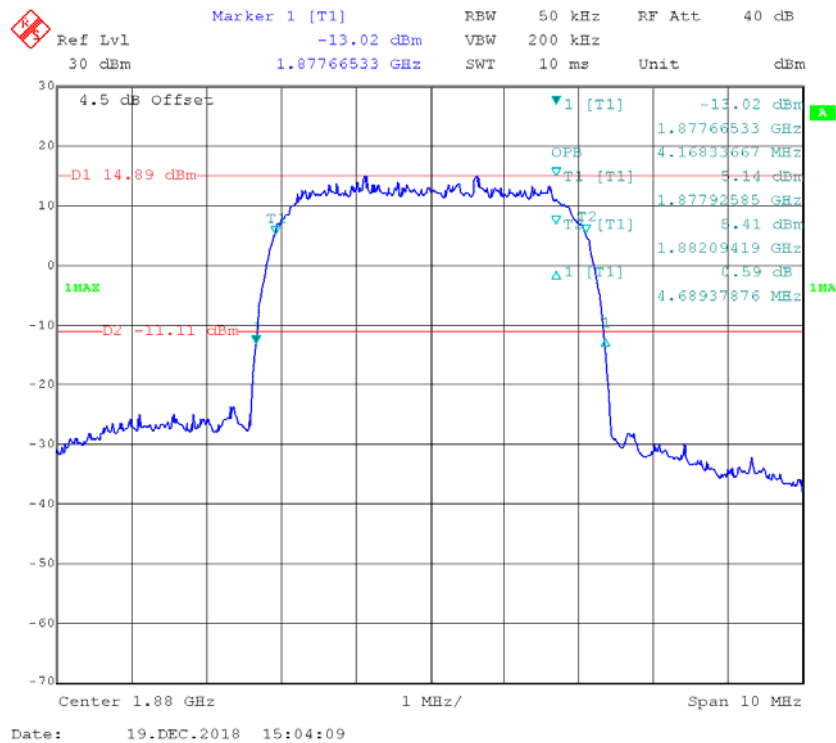
| Band | Bandwidth | Modulation | 99% occupied bandwidth (MHz) | 26 dB bandwidth (MHz) |
|------------|-----------|------------|------------------------------|-----------------------|
| LTE Band 2 | 1.4 MHz | QPSK | 1.100 | 1.305 |
| | | 16QAM | 1.106 | 1.401 |
| | 3 MHz | QPSK | 2.705 | 3.018 |
| | | 16QAM | 2.705 | 3.042 |
| | 5 MHz | QPSK | 4.549 | 5.351 |
| | | 16QAM | 4.529 | 5.291 |
| | 10 MHz | QPSK | 8.978 | 9.860 |
| | | 16QAM | 8.978 | 9.820 |
| | 15 MHz | QPSK | 13.527 | 15.271 |
| | | 16QAM | 13.467 | 15.090 |
| LTE Band 4 | 1.4 MHz | QPSK | 1.100 | 1.323 |
| | | 16QAM | 1.118 | 1.299 |
| | 3 MHz | QPSK | 2.705 | 3.018 |
| | | 16QAM | 2.693 | 3.066 |
| | 5 MHz | QPSK | 4.569 | 5.371 |
| | | 16QAM | 4.549 | 5.271 |
| | 10 MHz | QPSK | 8.978 | 9.940 |
| | | 16QAM | 8.978 | 9.820 |
| | 15 MHz | QPSK | 13.527 | 15.451 |
| | | 16QAM | 13.527 | 14.970 |
| LTE Band 5 | 1.4 MHz | QPSK | 1.112 | 1.407 |
| | | 16QAM | 1.112 | 1.287 |
| | 3 MHz | QPSK | 2.705 | 3.018 |
| | | 16QAM | 2.705 | 3.030 |
| | 5 MHz | QPSK | 4.549 | 5.371 |
| | | 16QAM | 4.549 | 5.230 |
| | 10 MHz | QPSK | 8.978 | 9.820 |
| | | 16QAM | 8.978 | 9.900 |

| Band | Bandwidth | Modulation | 99% occupied bandwidth (MHz) | 26 dB bandwidth (MHz) |
|-------------|-----------|------------|------------------------------|-----------------------|
| LTE Band 7 | 5 MHz | QPSK | 4.569 | 5.291 |
| | | 16QAM | 4.549 | 5.271 |
| | 10 MHz | QPSK | 8.978 | 9.900 |
| | | 16QAM | 8.978 | 9.900 |
| | 15 MHz | QPSK | 13.527 | 15.511 |
| | | 16QAM | 13.527 | 15.090 |
| | 20 MHz | QPSK | 17.956 | 19.639 |
| | | 16QAM | 17.956 | 20.040 |
| LTE Band 12 | 1.4 MHz | QPSK | 1.106 | 1.311 |
| | | 16QAM | 1.112 | 1.317 |
| | 3 MHz | QPSK | 2.693 | 3.018 |
| | | 16QAM | 2.693 | 3.066 |
| | 5 MHz | QPSK | 4.569 | 5.451 |
| | | 16QAM | 4.549 | 5.431 |
| | 10 MHz | QPSK | 8.978 | 9.780 |
| | | 16QAM | 8.978 | 9.860 |
| LTE Band 17 | 5 MHz | QPSK | 4.549 | 5.251 |
| | | 16QAM | 4.549 | 5.210 |
| | 10 MHz | QPSK | 8.938 | 9.699 |
| | | 16QAM | 8.938 | 9.860 |

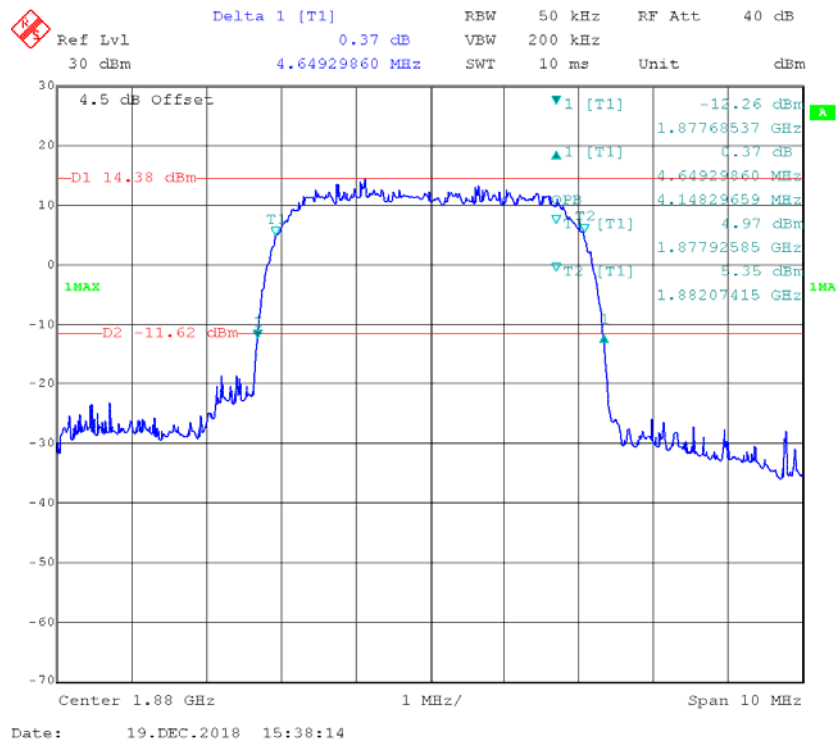
GSM 850 Cellular Band**GSM PCS1900 Cellular Band**

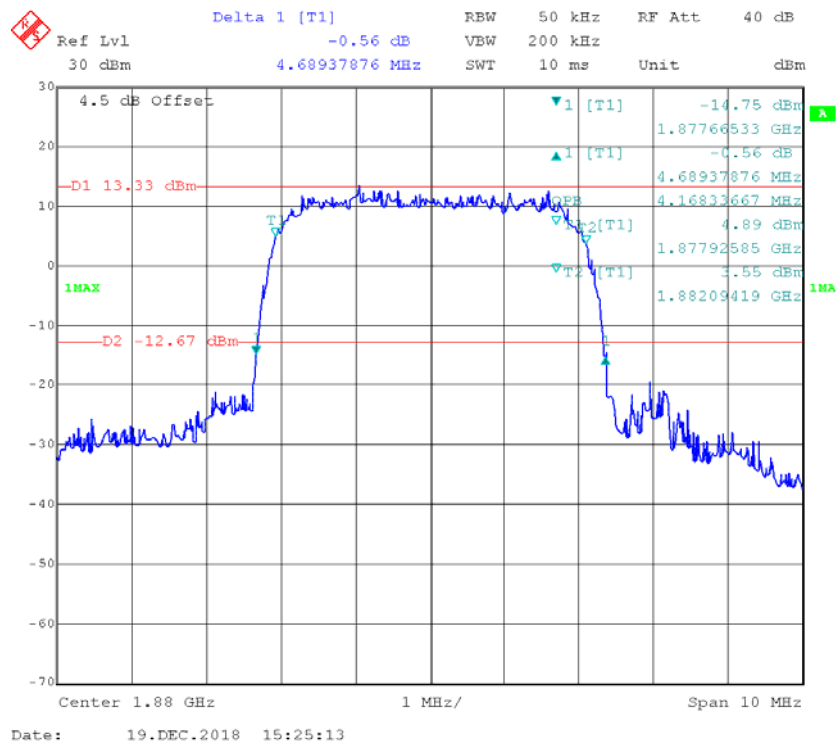
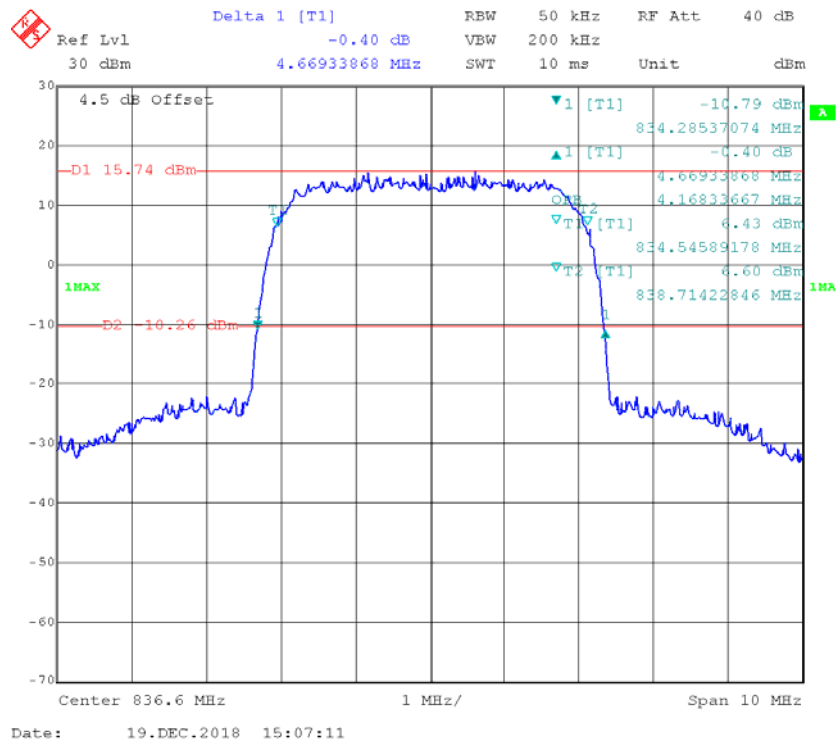
EDGE 850 Cellular Band**EDGE PCS1900 Cellular Band**

WCDMA Band II, Rel 99

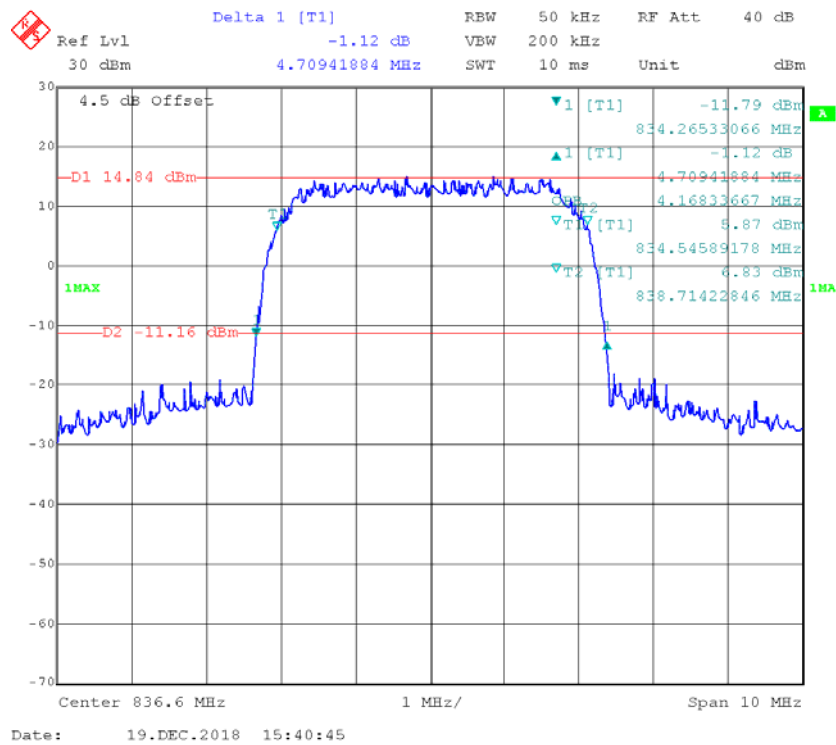


WCDMA Band II, HSUPA

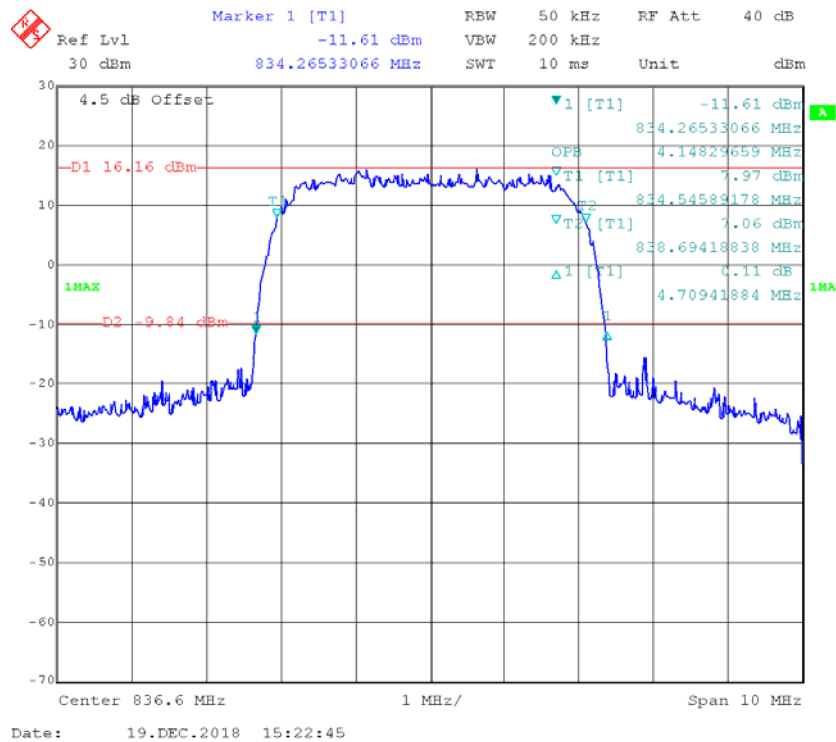


WCDMA Band II, HSDPA**WCDMA Band V, Rel 99**

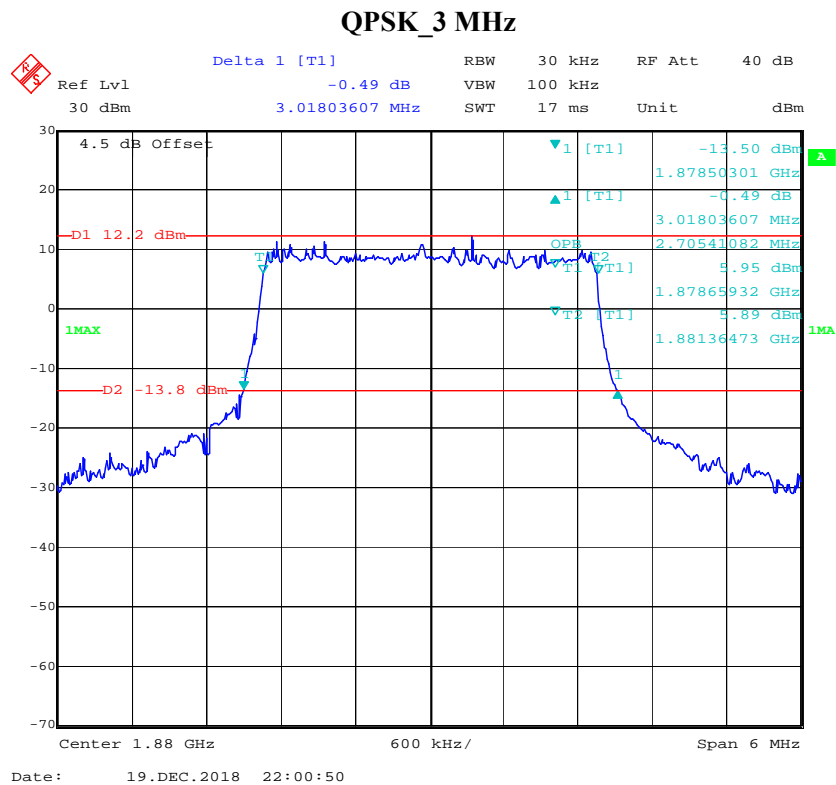
WCDMA Band V, HSUPA



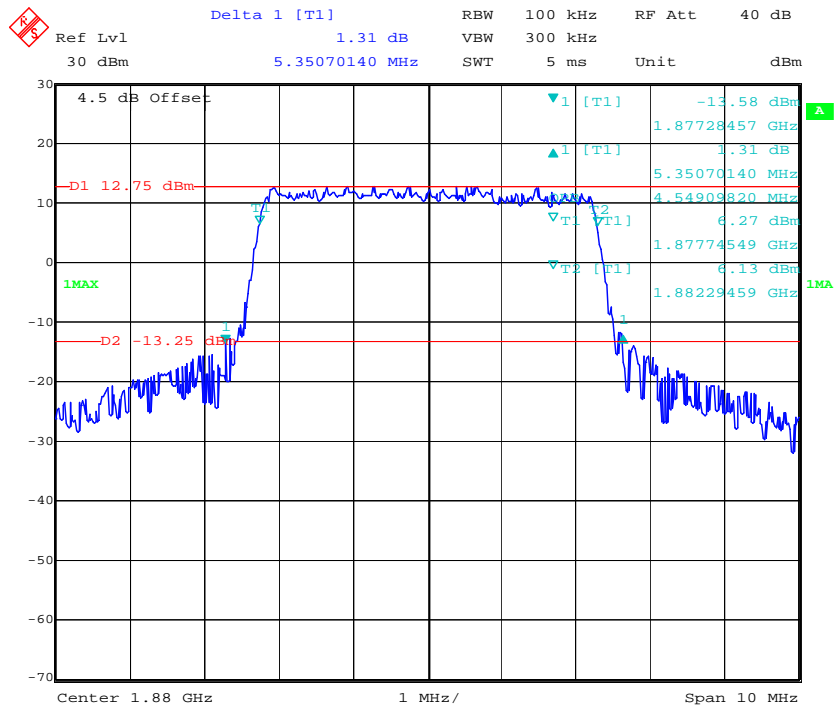
WCDMA Band V, HSDPA



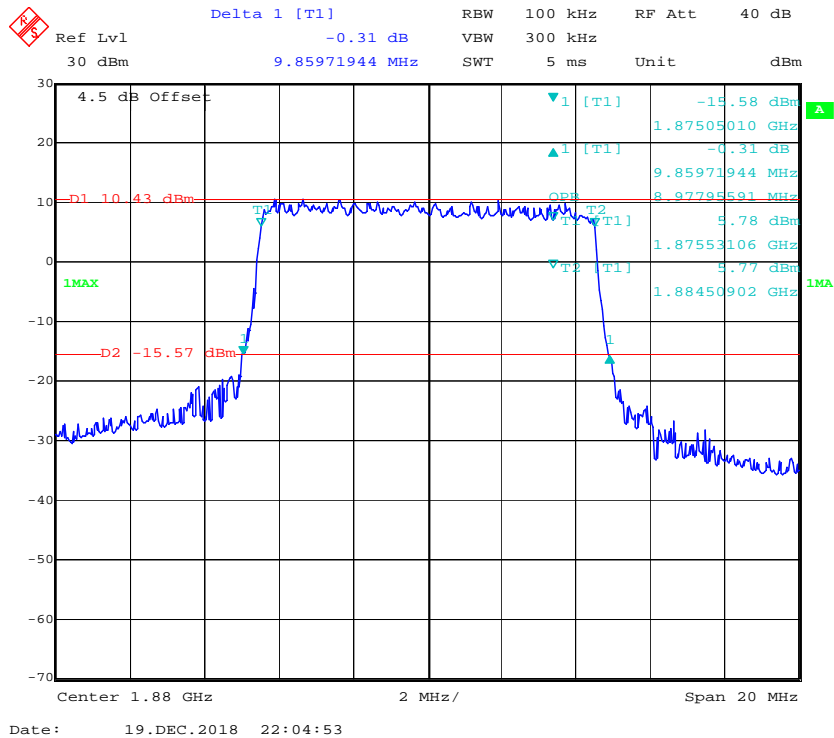
QPSK_1.4 MHz



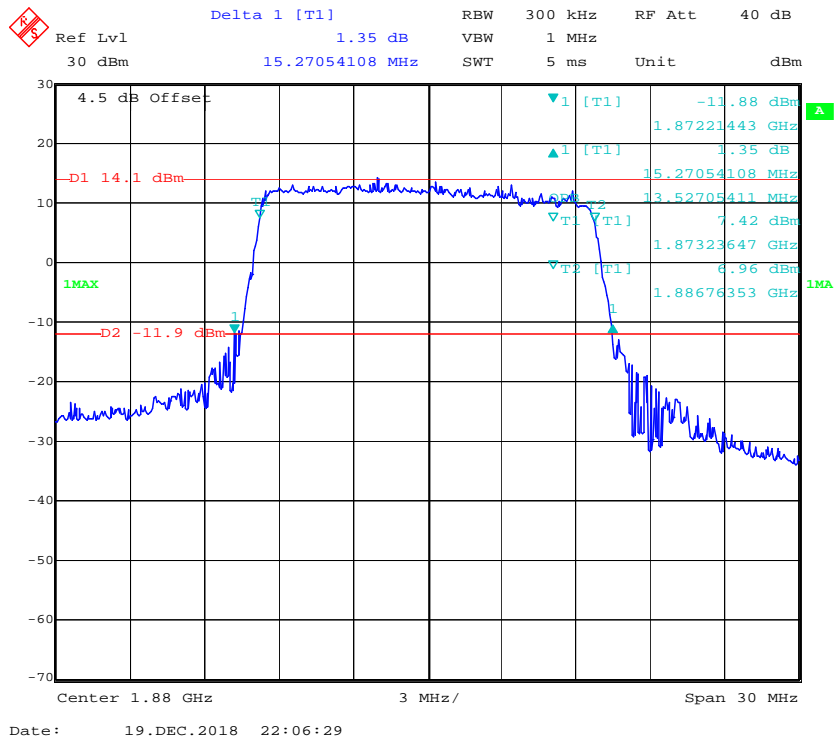
QPSK_5 MHz



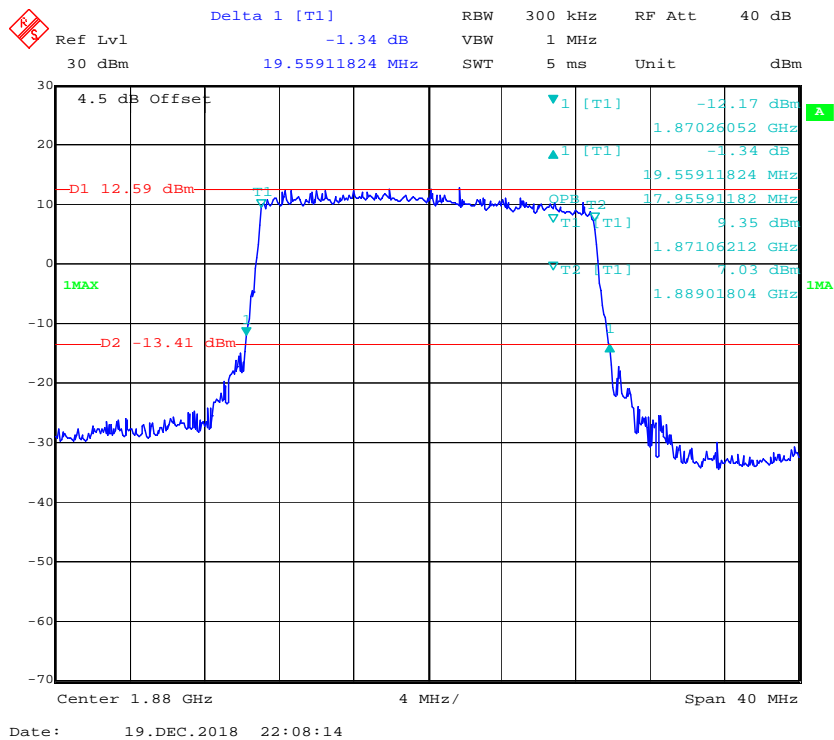
QPSK_10 MHz

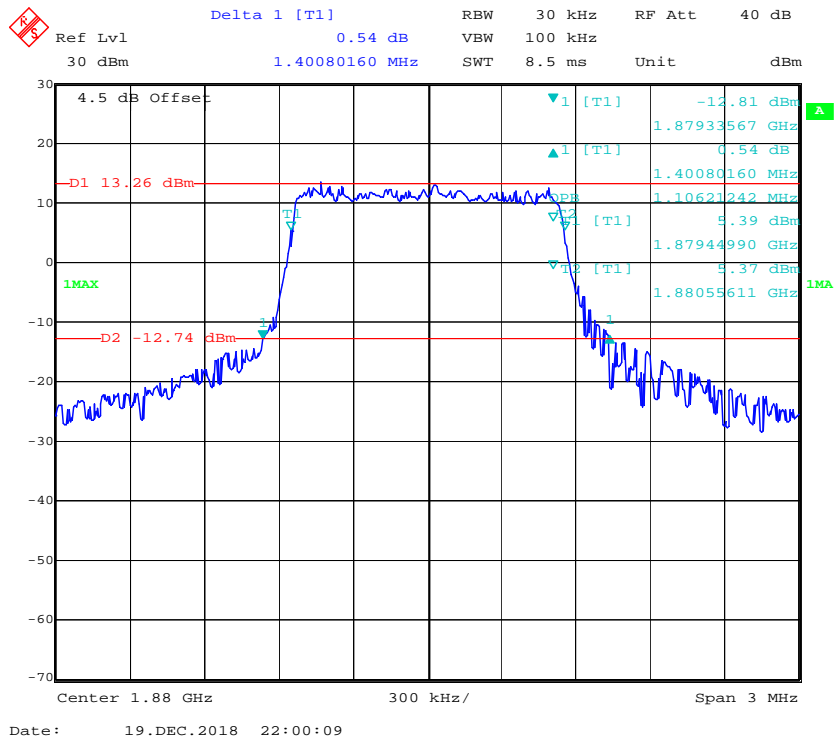
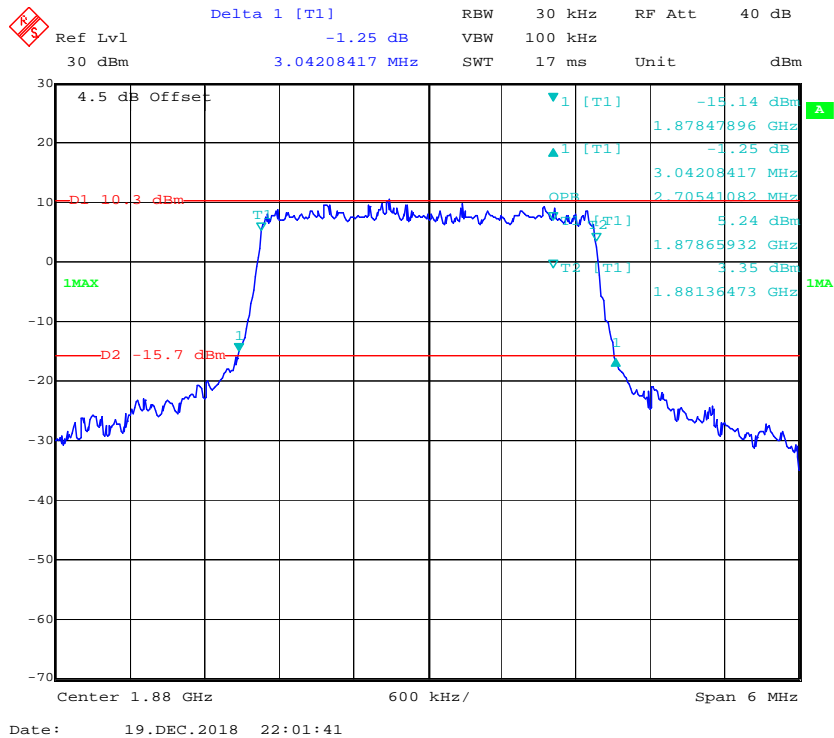


QPSK_15 MHz

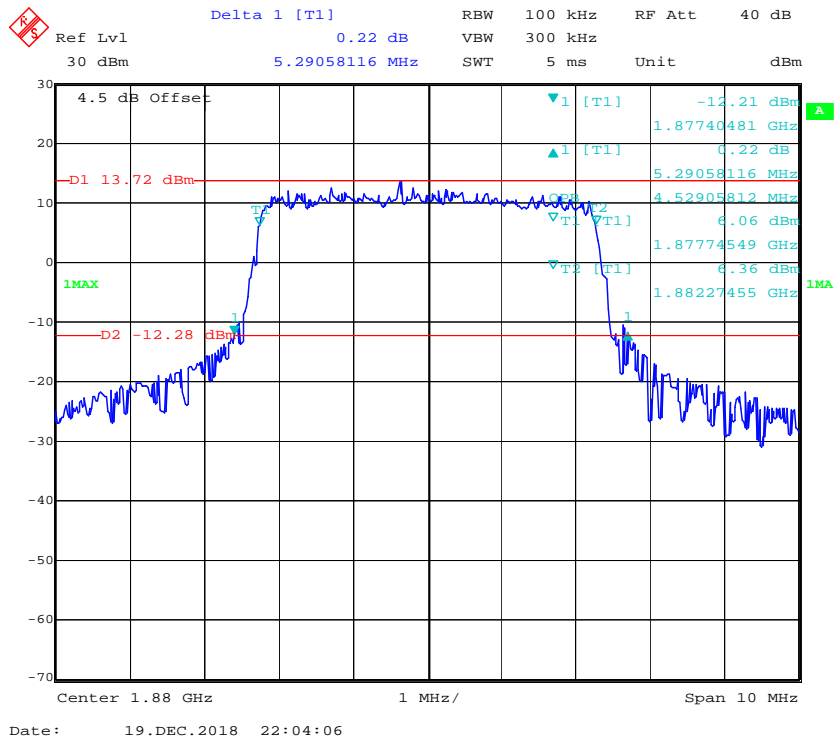


QPSK_20 MHz

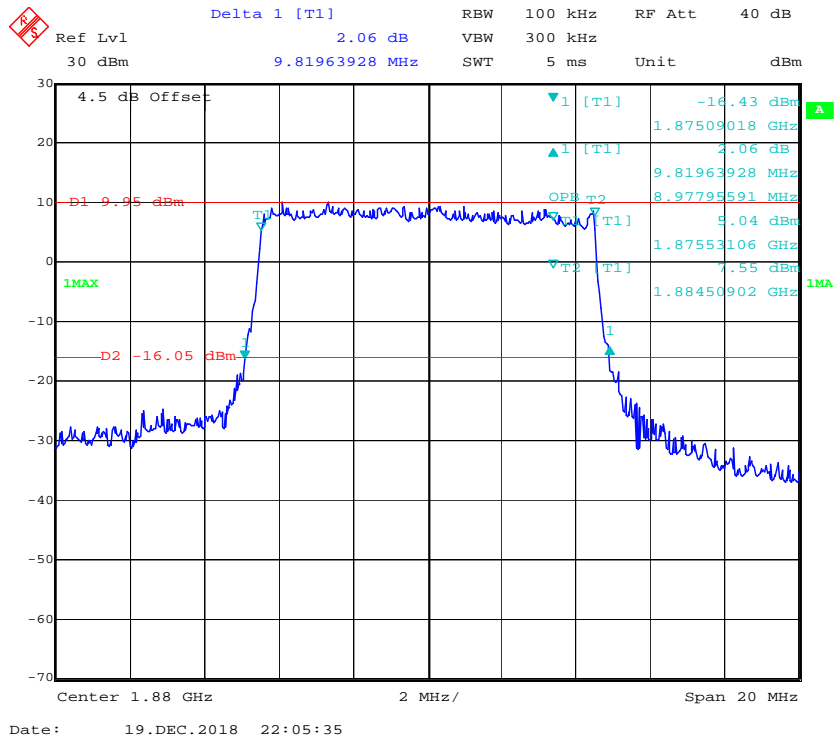


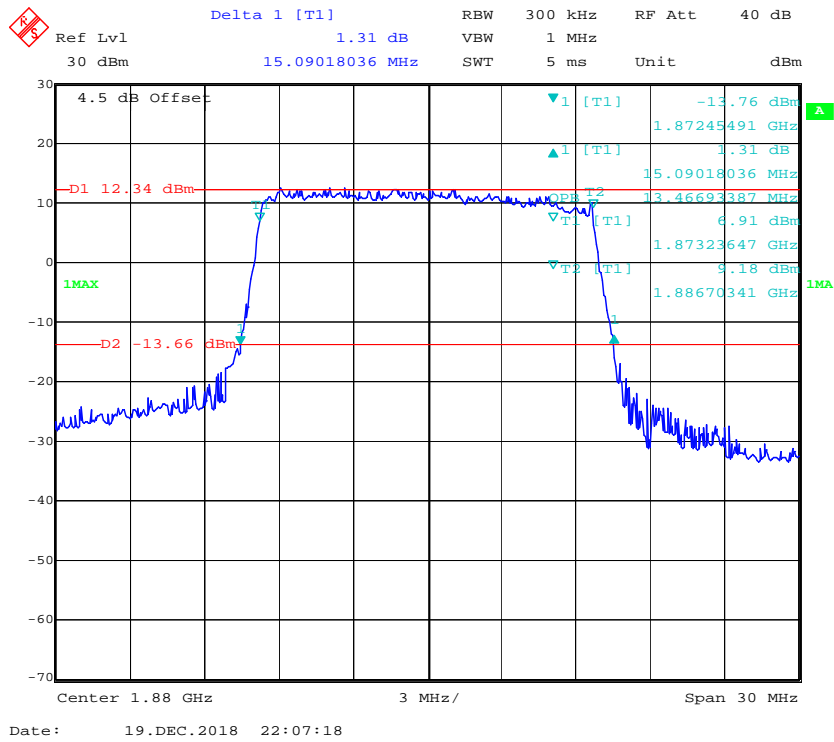
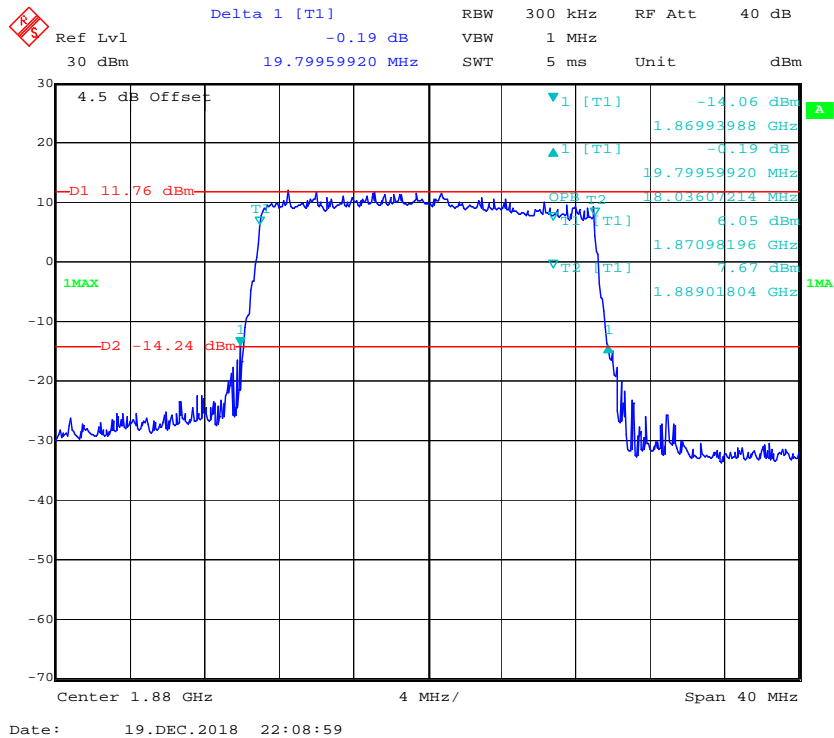
16QAM_1.4 MHz**16QAM_3 MHz**

16QAM_5 MHz



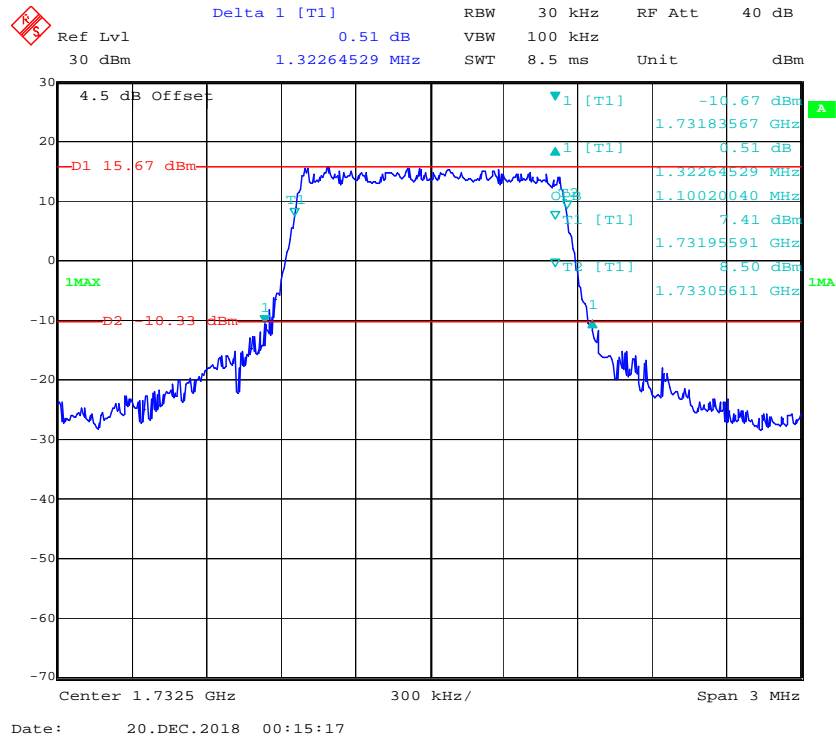
16QAM_10 MHz



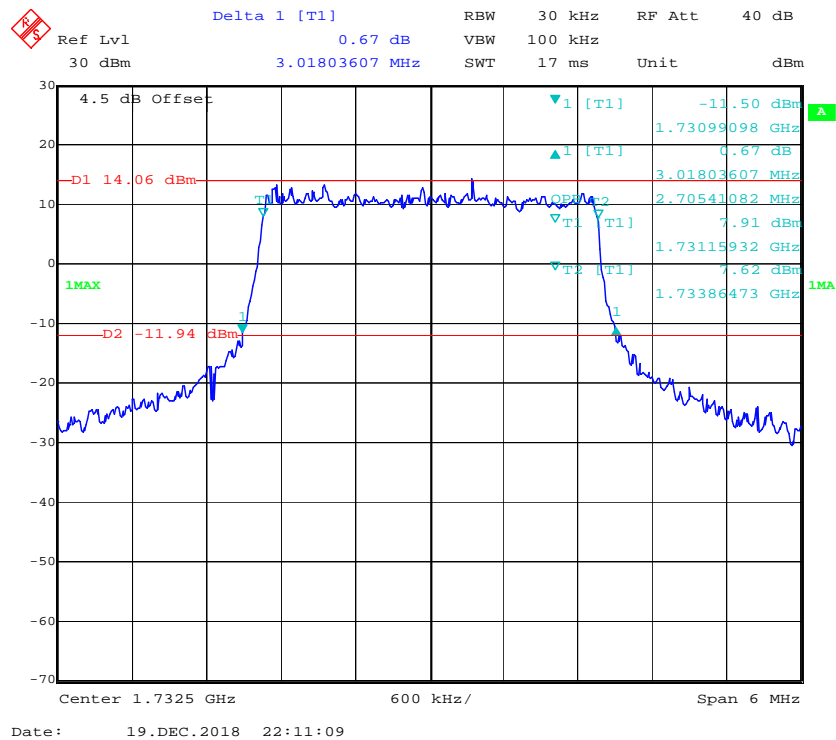
16QAM_15 MHz**16QAM_20 MHz**

LTE Band 4

QPSK_1.4 MHz



QPSK_3 MHz



Delta 1 [T1] -0.03 dB RBW 100 kHz RF Att 40 dB

Ref Lvl 30 dBm 5.37074148 MHz SWT 5 ms Unit dBm

4.5 dB Offset

D1 15.52 dBm

1MAX

1 [T1] -9.37 dBm 1.72972445 GHz

OPN T2 4.56913828 MHz

T1 [T1] 9.46 dBm

T2 [T1] 9.12 dBm

1 [T1] 1.73022545 GHz

1 [T1] 1.73479459 GHz

1MAX

Center 1.7325 GHz 1 MHz/ Span 10 MHz

Date: 19.DEC.2018 22:12:41

Ref Lvl 30 dBm Delta 1 [T1] 0.08 dB RBW 100 kHz RF Att 40 dB
 30 dBm 9.93987976 MHz SWT 5 ms Unit dBm

4.5 dB Offset

D1 12.44 dBm

D2 -13.56 dBm

1MAX

1 [T1] -12.49 dBm

1 [T1] 1.72751002 GHz

1 [T1] 0.08 dB

1 [T1] 9.93987976 MHz

1 [T1] 8.97795591 MHz

1 [T1] 8.83 dBm

1 [T1] 1.72803106 GHz

1 [T1] 8.49 dBm

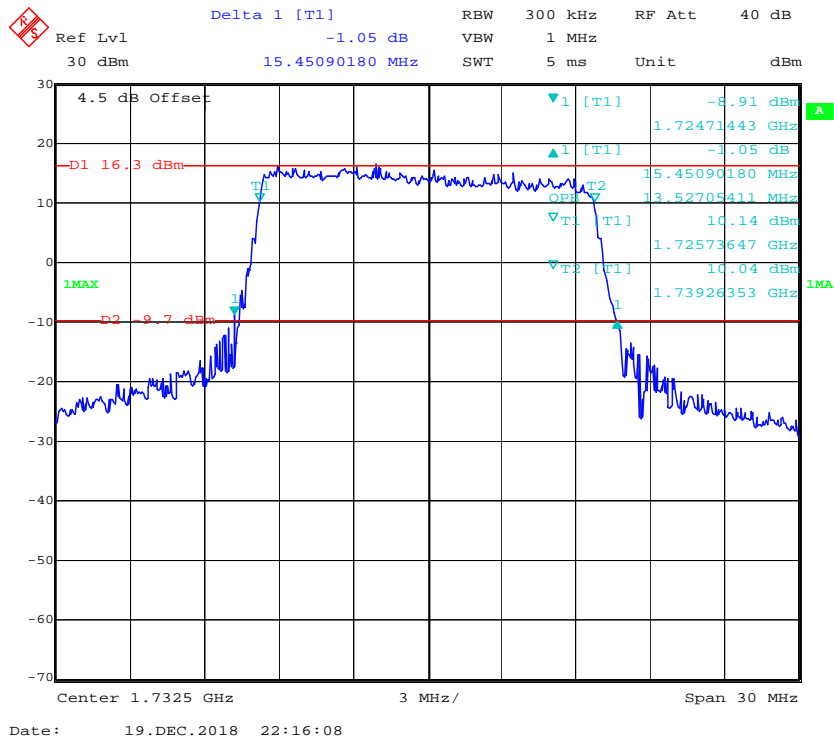
1 [T1] 1.73700902 GHz

1MAX

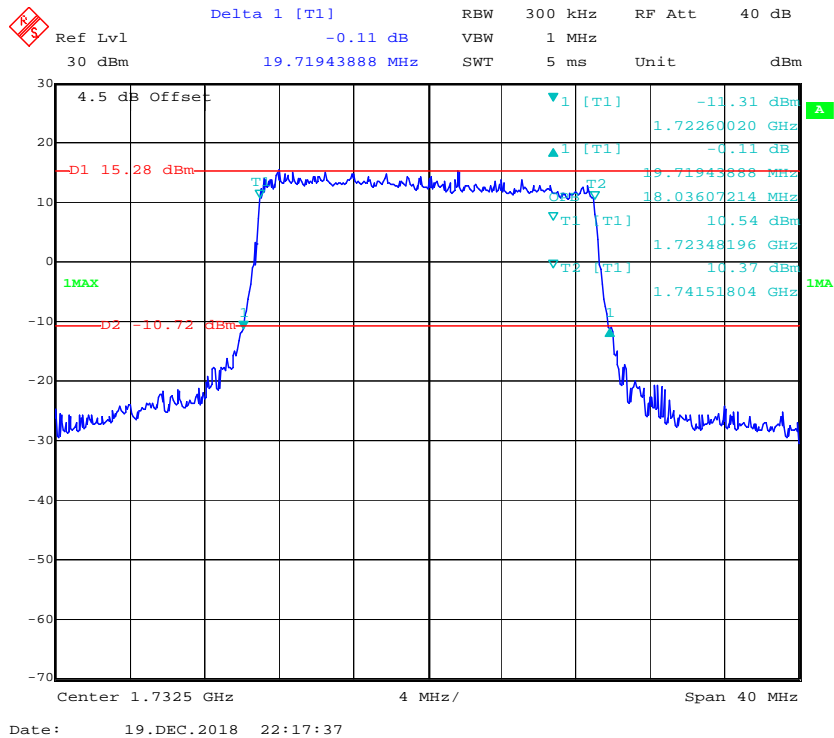
Center 1.7325 GHz 2 MHz/ Span 20 MHz

Date: 19.DEC.2018 22:14:26

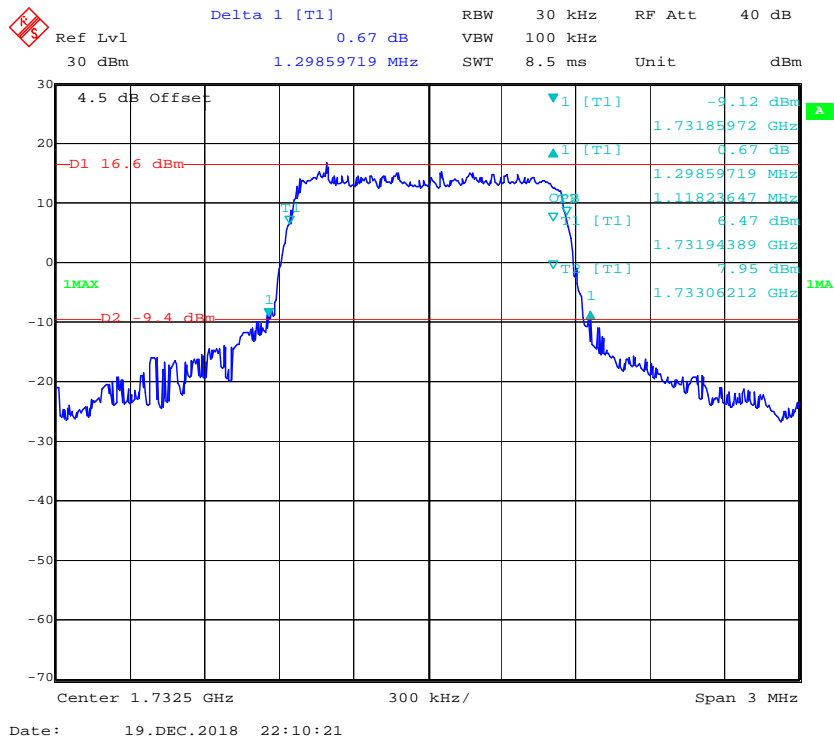
QPSK_15 MHz



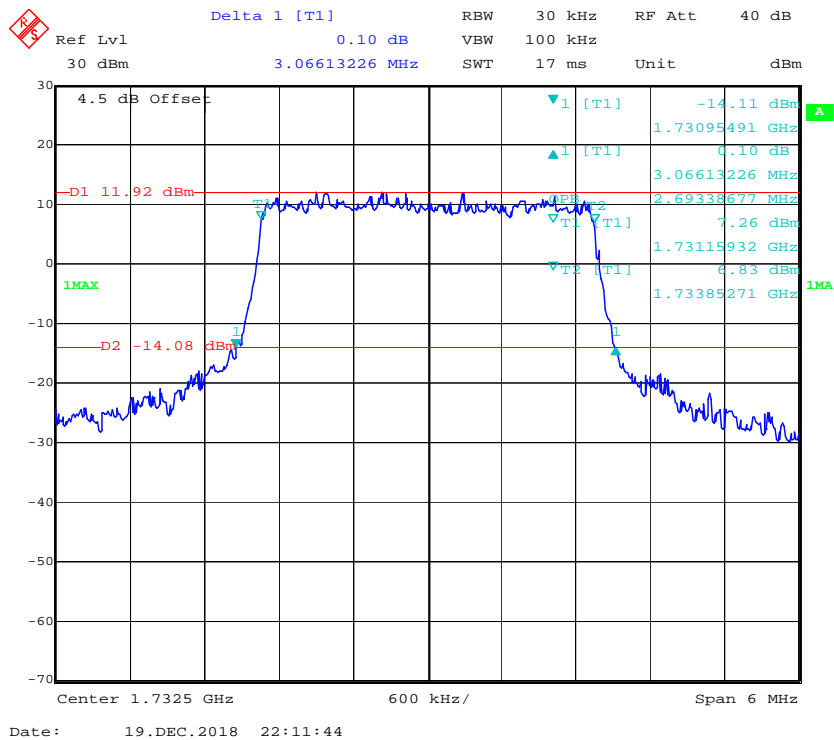
QPSK_20 MHz



16QAM_1.4 MHz



16QAM_3 MHz



Delta 1 [T1] 1.40 dB

RBW 100 kHz

VBW 300 kHz

RF Att 40 dB

Ref Lvl 30 dBm

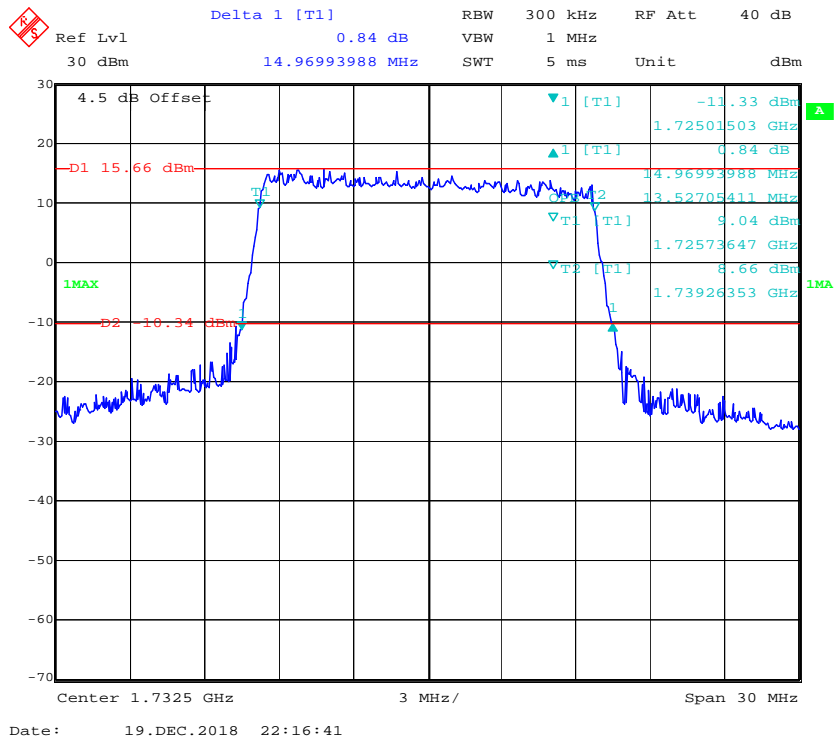
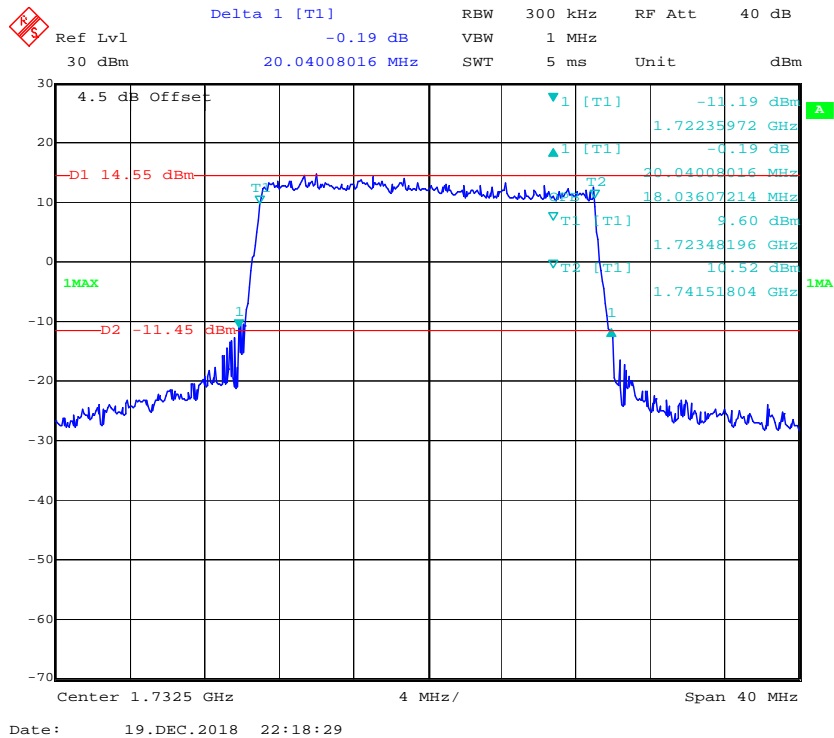
Unit dBm

Center 1.7325 GHz

Span 10 MHz

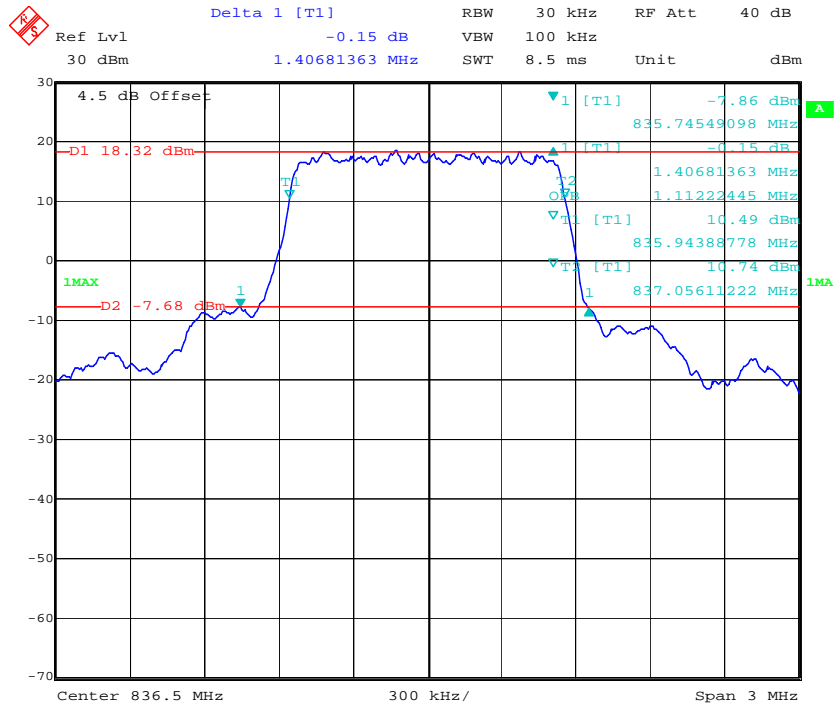
Date: 19.DEC.2018 22:13:27

[illegible]

16QAM_15 MHz**16QAM_20 MHz**

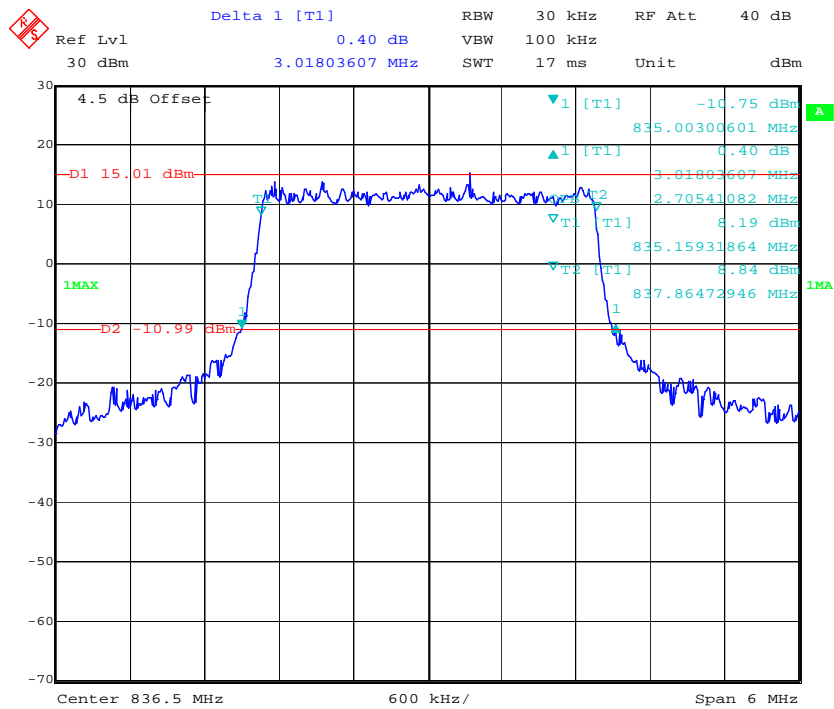
LTE Band 5:

QPSK_1.4 MHz



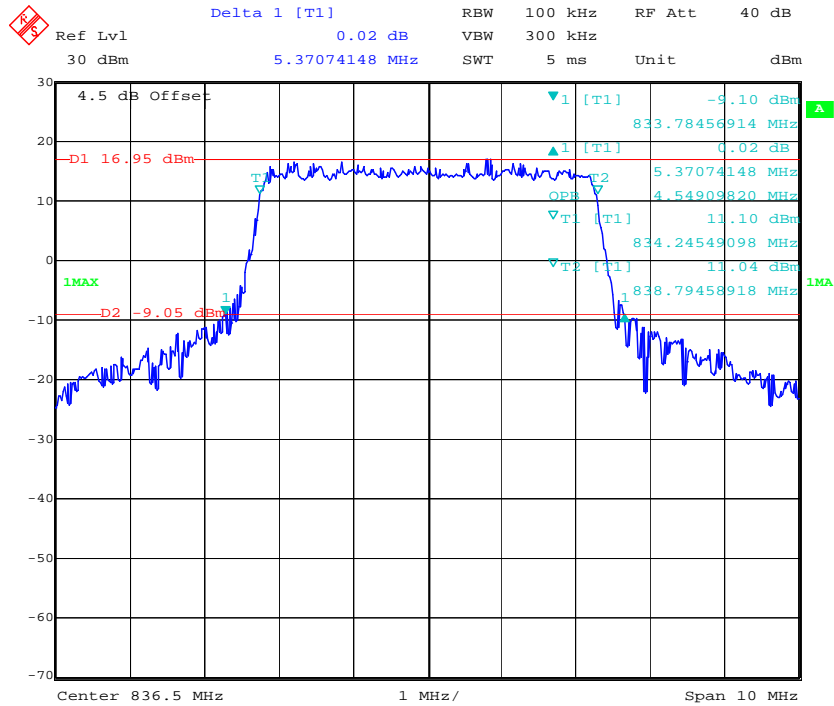
Date: 31.JAN.2019 16:35:28

QPSK_3 MHz

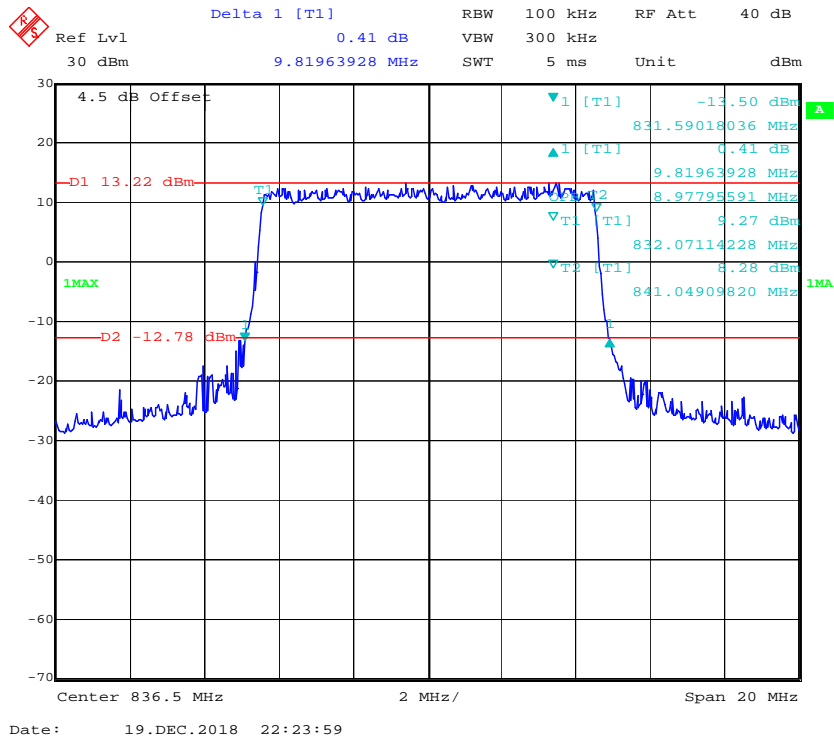


Date: 19.DEC.2018 22:20:39

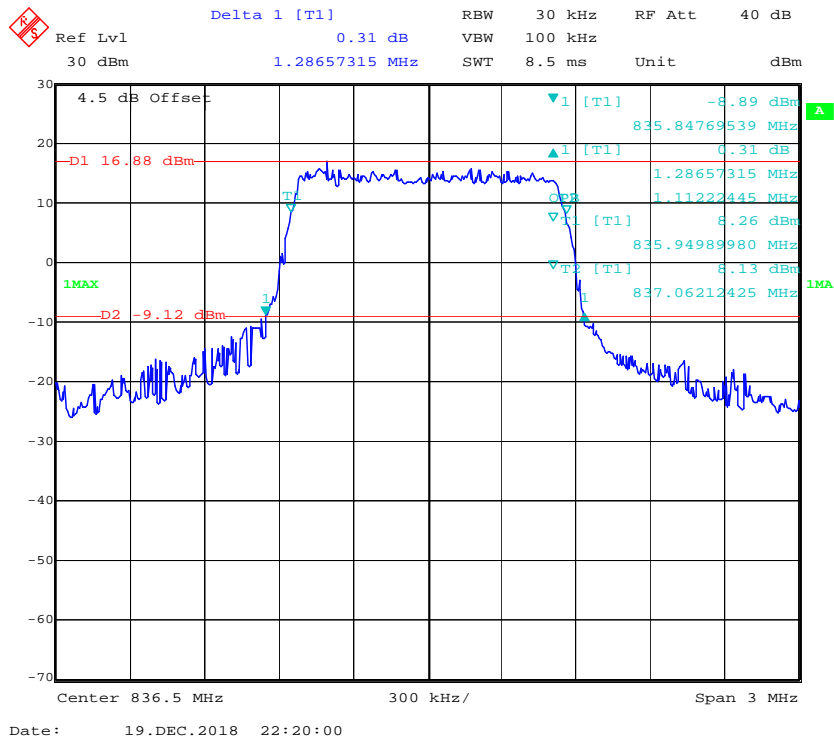
QPSK_5 MHz



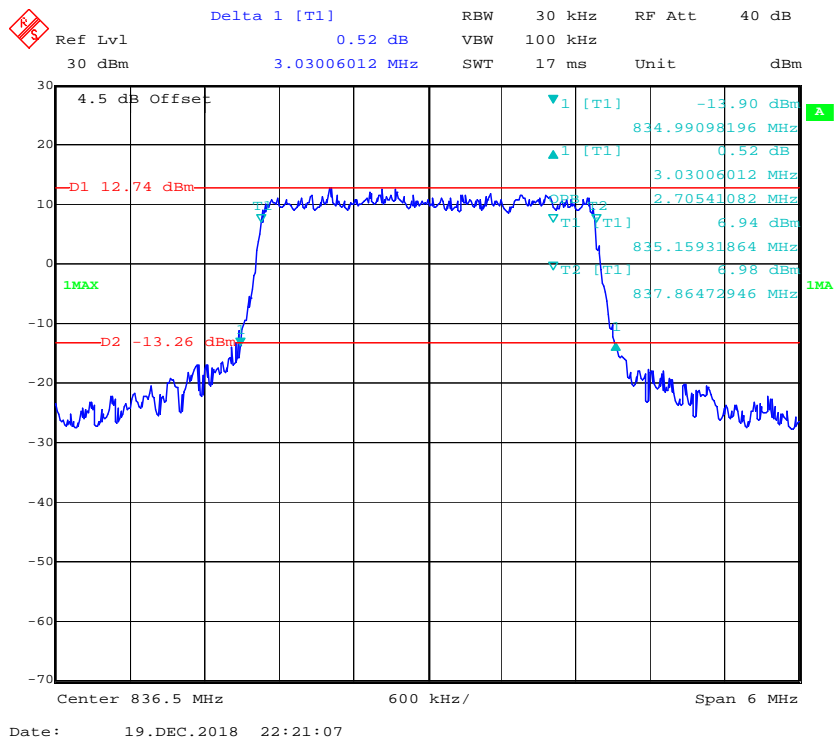
QPSK_10 MHz



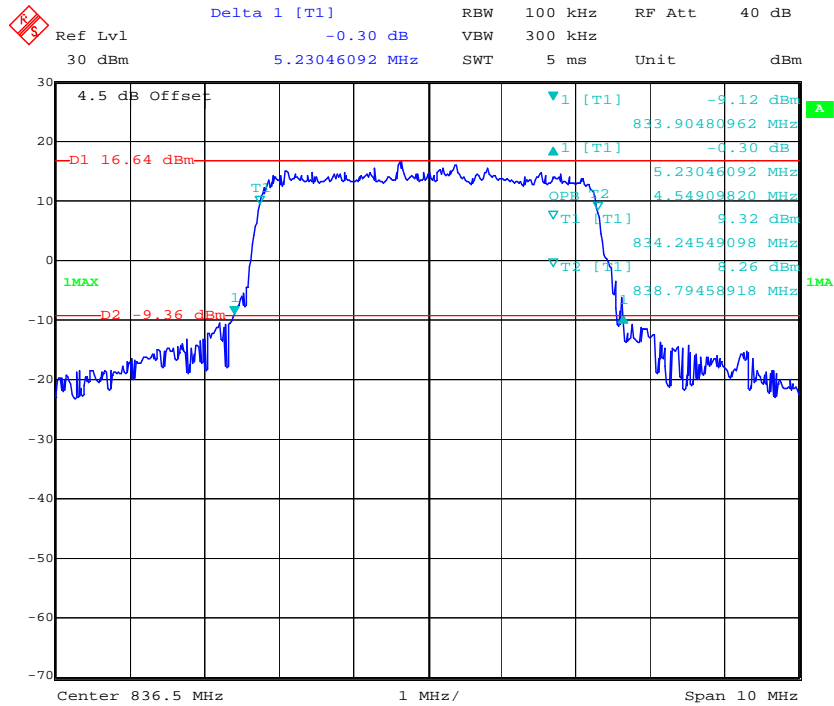
16QAM_1.4 MHz



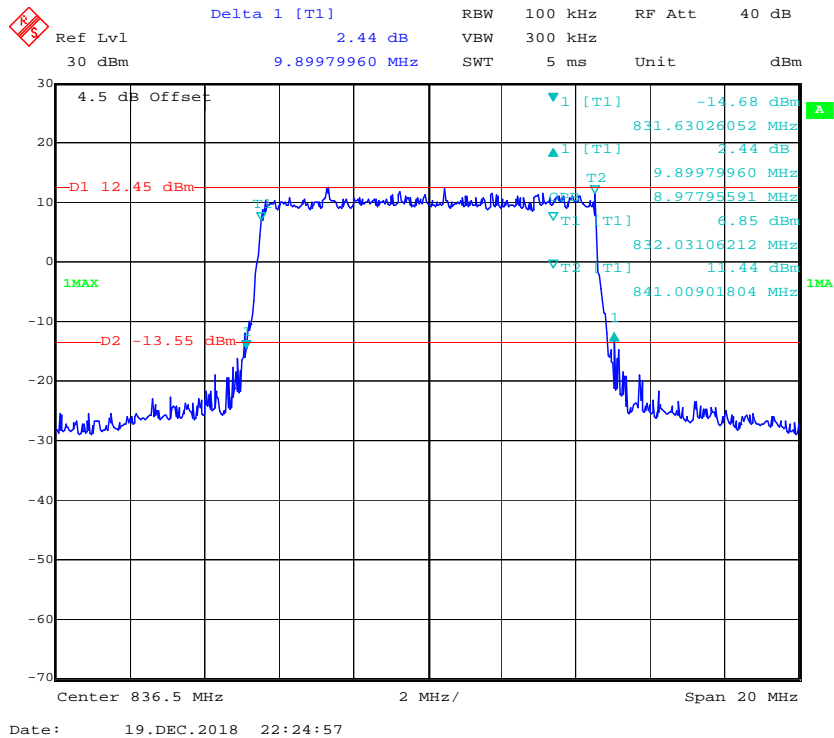
16QAM_3 MHz



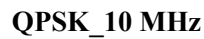
16QAM_5 MHz



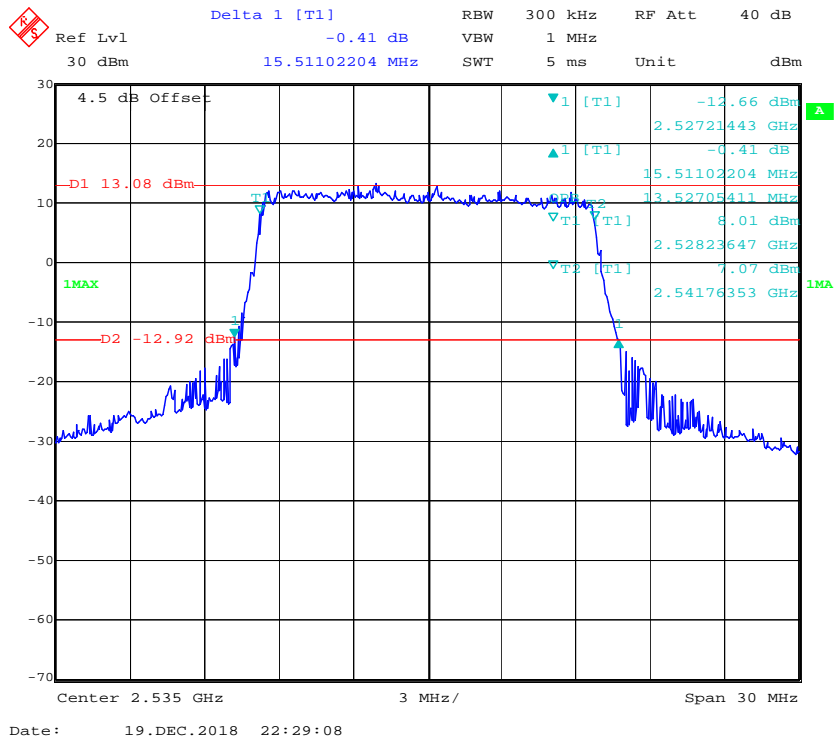
16QAM_10 MHz



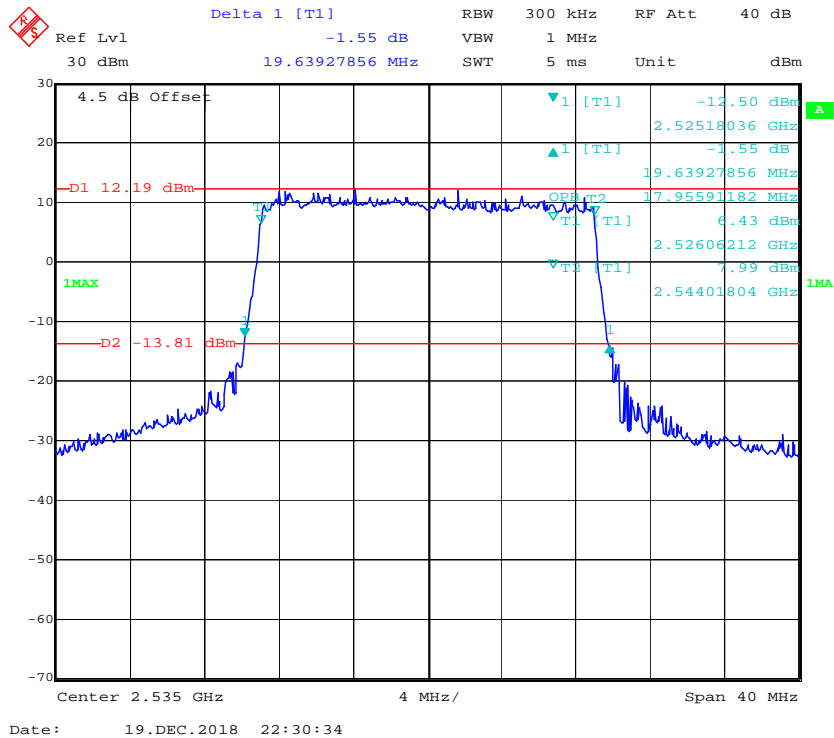
QPSK_5 MHz



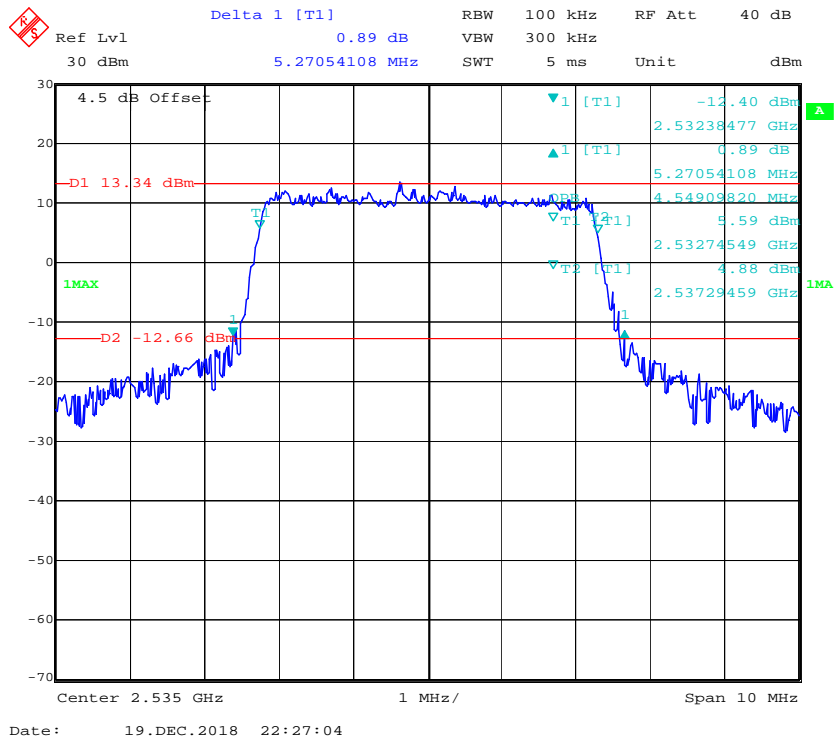
QPSK_15 MHz



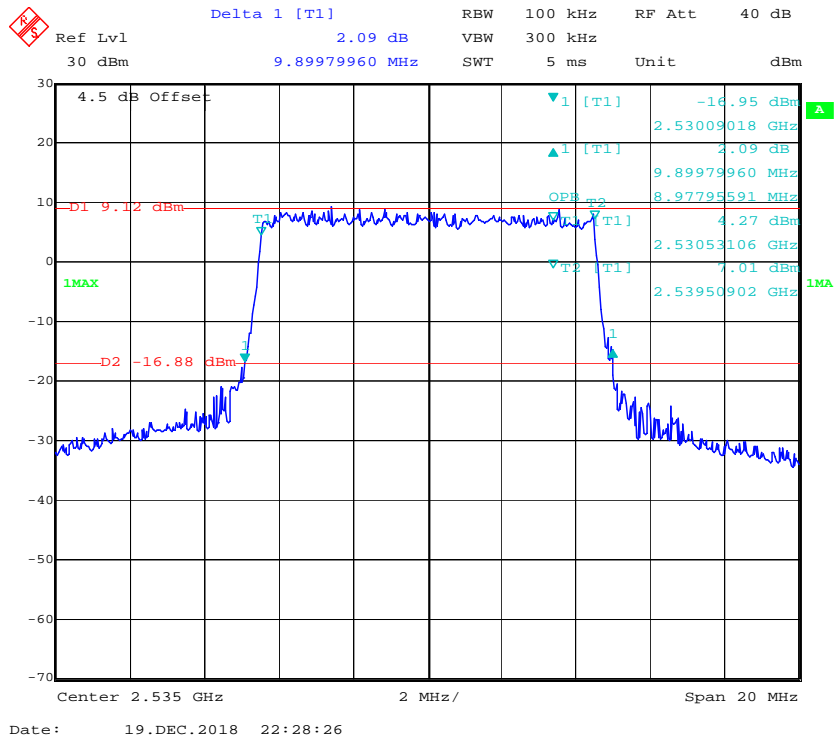
QPSK_20 MHz



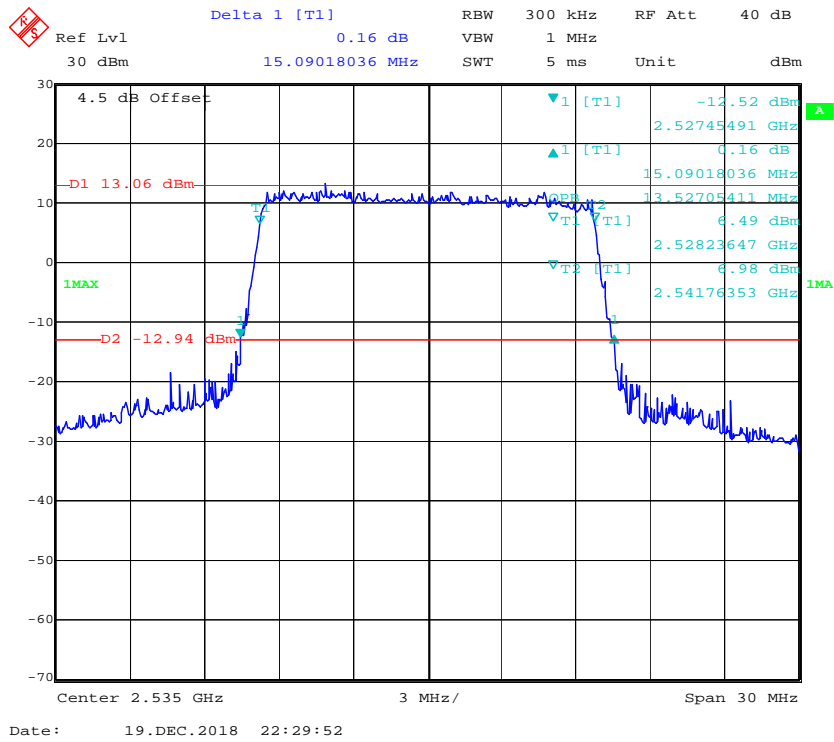
16QAM_5 MHz



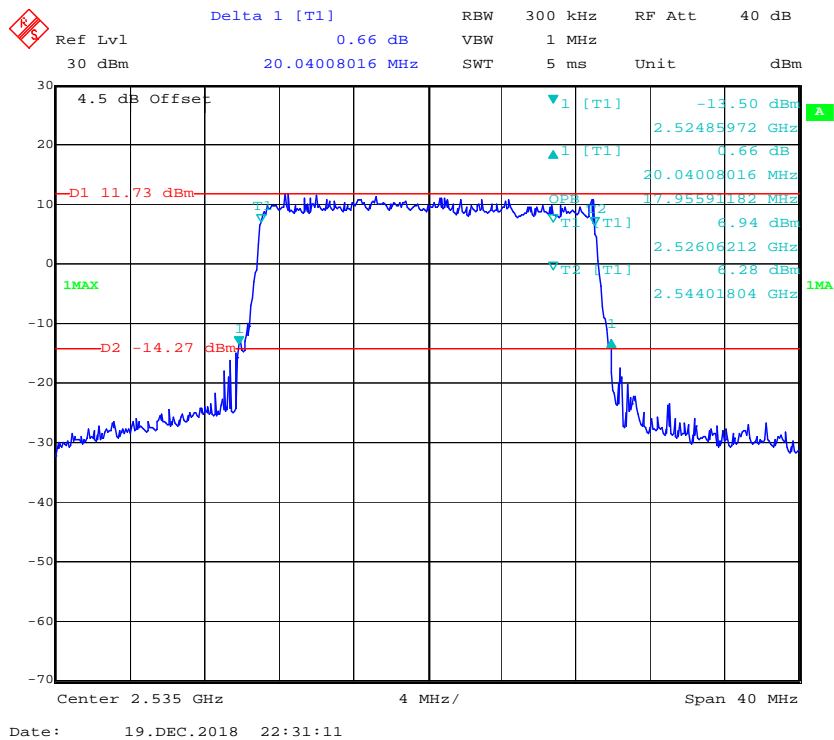
16QAM_10 MHz

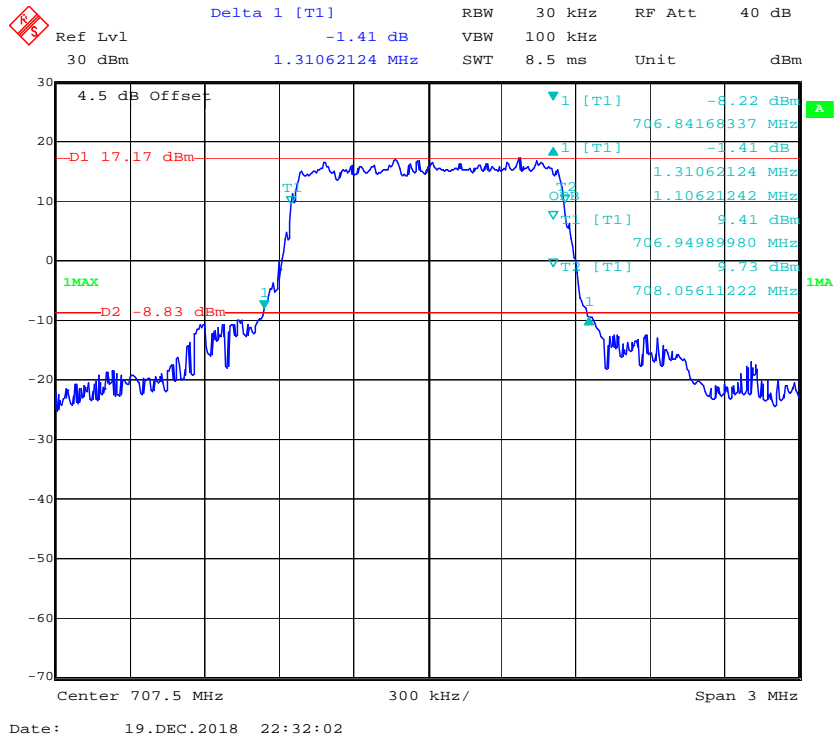
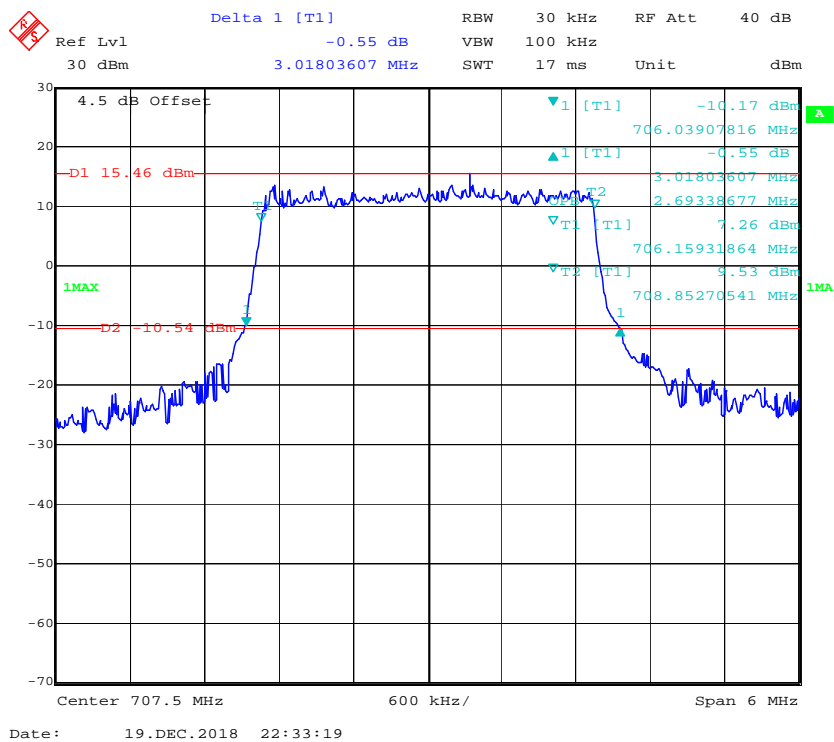


16QAM_15 MHz



16QAM_20 MHz



LTE Band 12:**QPSK_1.4 MHz****QPSK_3 MHz**

Delta 1 [T1] -0.35 dB RBW 100 kHz RF Att 40 dB

Ref Lvl 30 dBm VBW 300 kHz

Unit dBm

4.5 dB Offset

D1 17.53 dBm

D2 -8.47 dBm

1MAX

1 [T1] -7.93 dBm

1 [T1] -6.35 dBm

OPB 2 5.45090180 MHz

2 4.56913828 MHz

1 [T1] 10.31 dBm

705.24549098 MHz

T2 [A1] 9.66 dBm

709.81462926 MHz

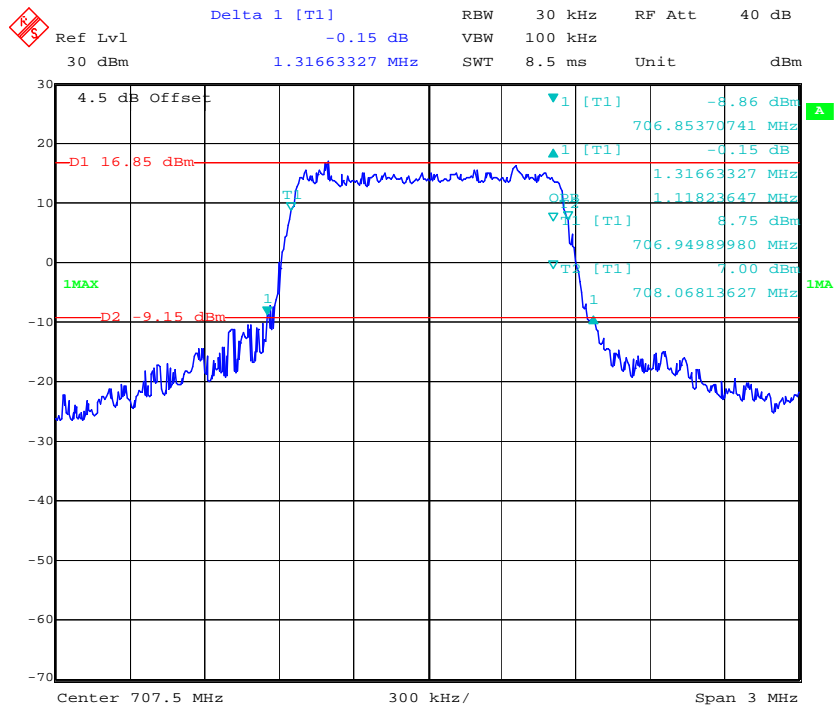
1MAX

Center 707.5 MHz 1 MHz/ Span 10 MHz

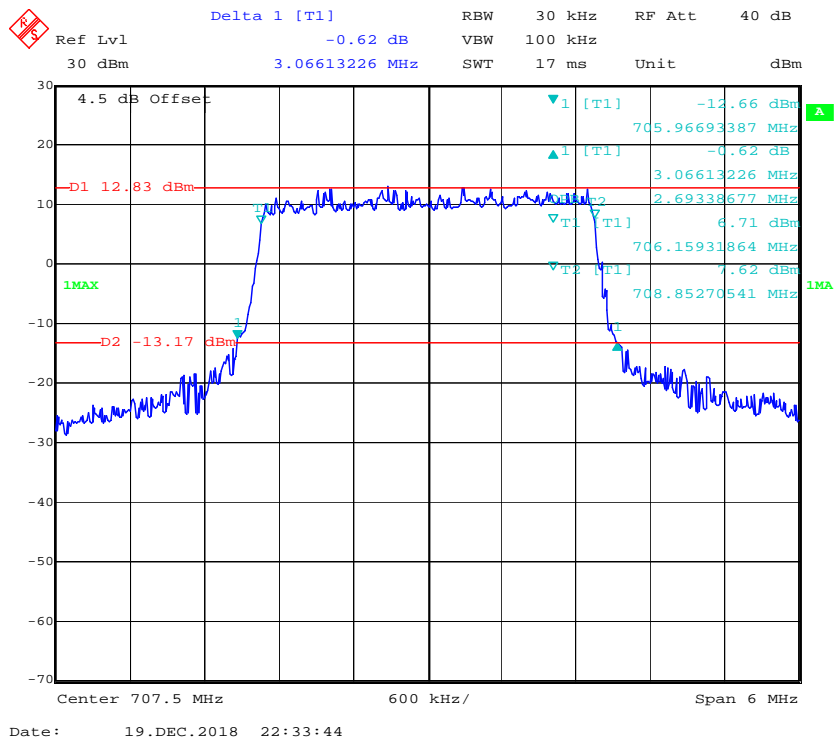
Date: 19.DEC.2018 22:34:50

[illegible]

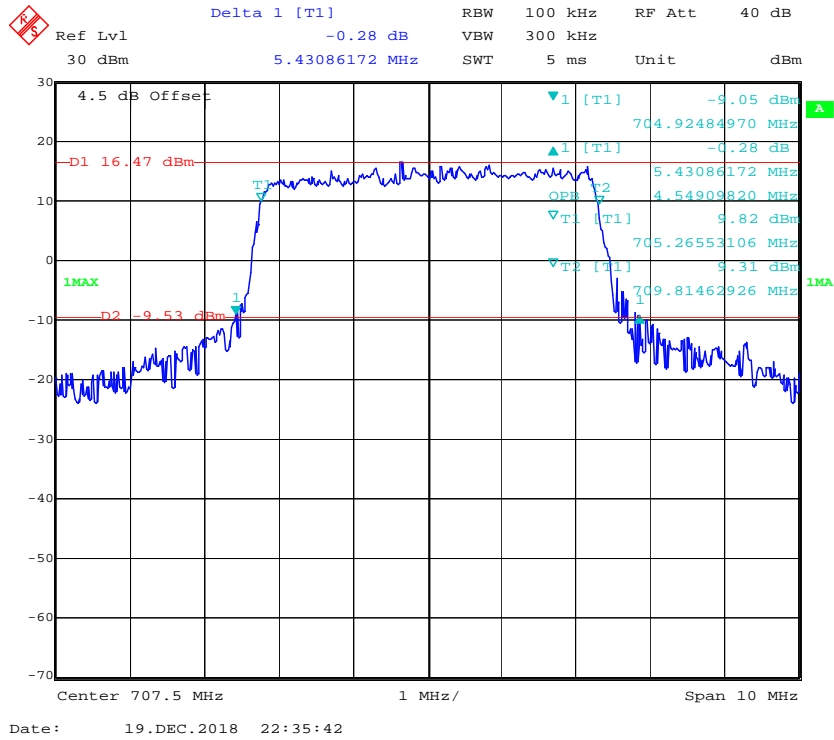
16QAM_1.4 MHz



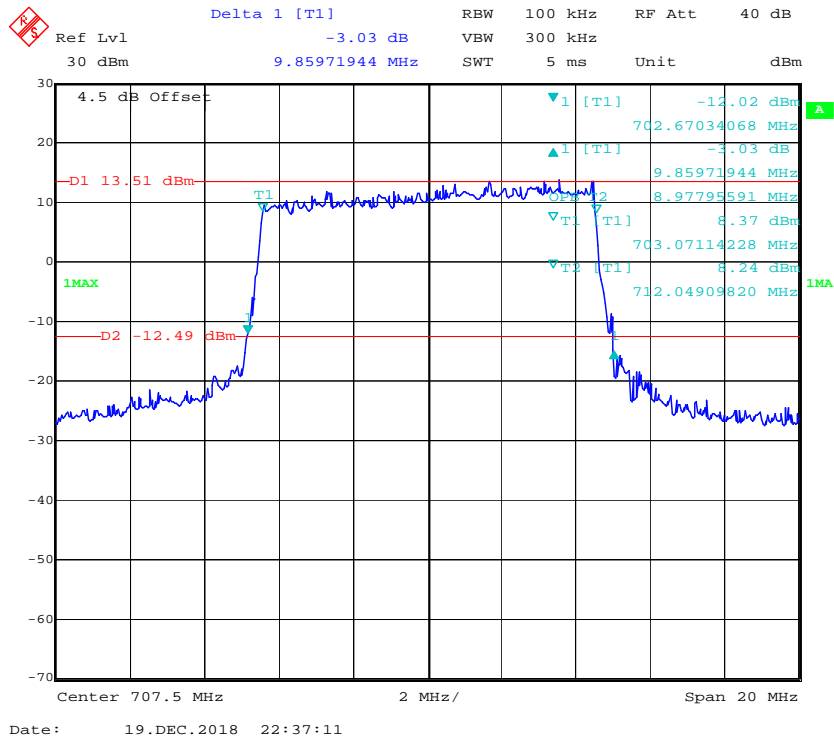
16QAM_3 MHz

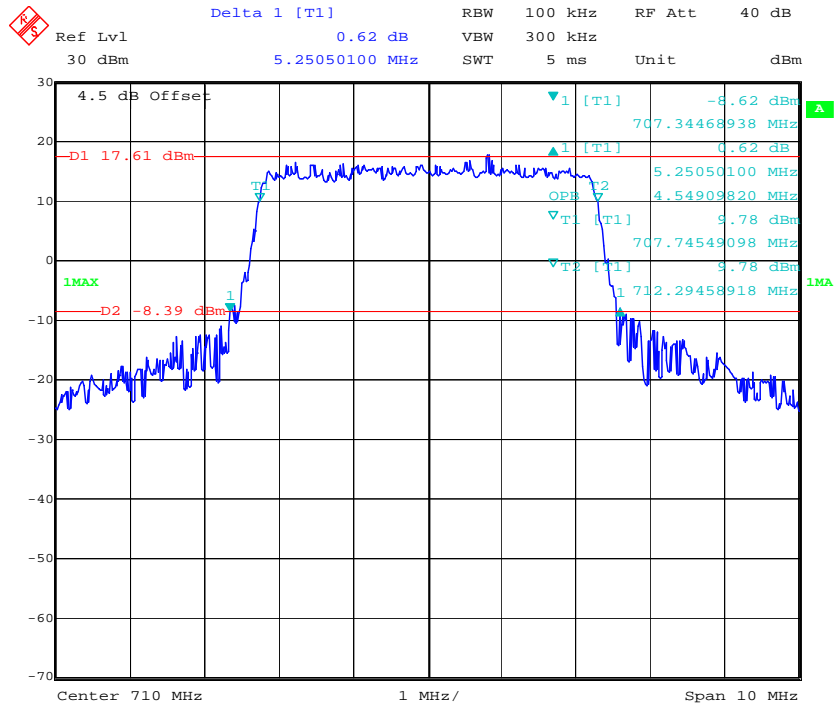
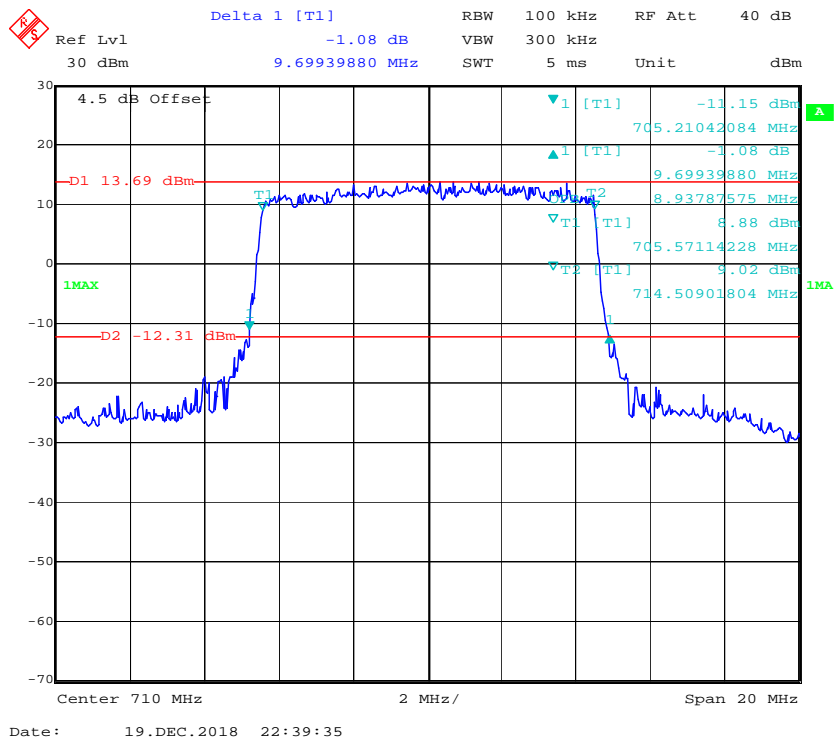


16QAM_5 MHz

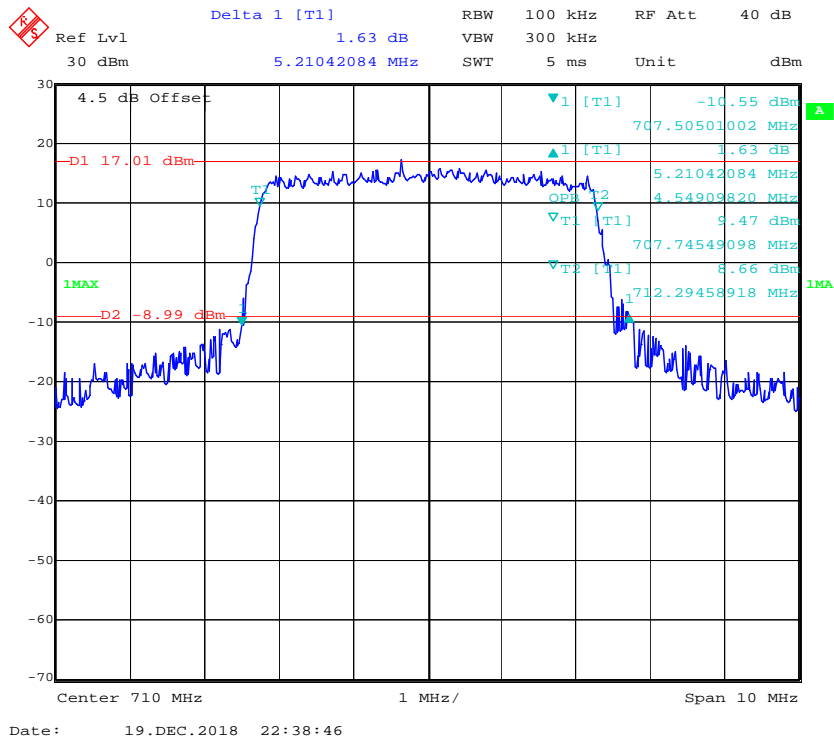


16QAM_10 MHz

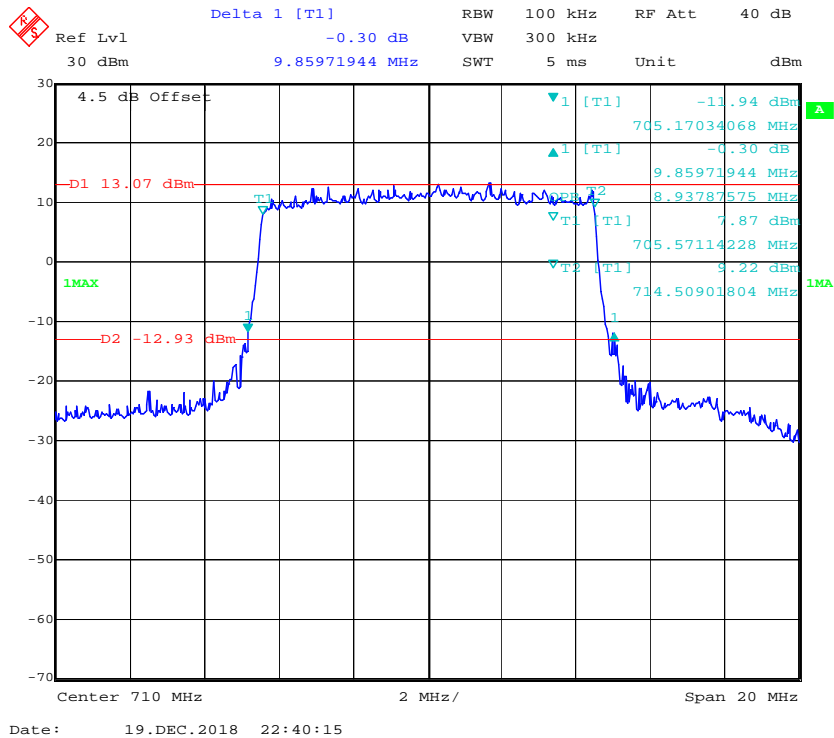


LTE Band 17:**QPSK_5 MHz****QPSK_10 MHz**

16QAM_5 MHz



16QAM_10 MHz



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

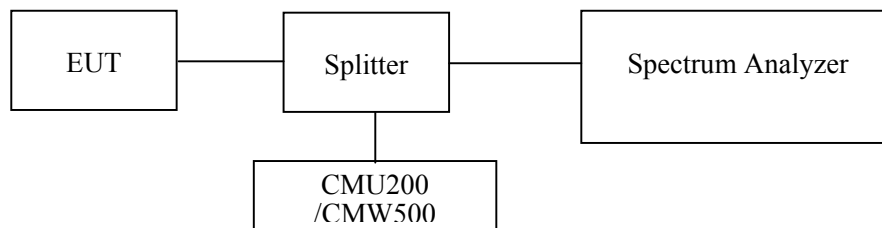
Applicable Standard

FCC §2.1051, §22.917(a) , §24.238(a) and §27.53.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

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 10th harmonic.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|------------------|---------------|---------------|------------------|----------------------|
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 831929/005 | 2018-08-03 | 2019-08-03 |
| yzjingcheng | Coaxial Cable | KTRFBU-141-50 | 41005012 | Each time | N/A |
| Unknown | Coaxial Cable | C-SJ00-0010 | C0010/01 | Each time | N/A |
| E-Microwave | Two-way Splitter | ODP-1-6-2S | OE0120142 | 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

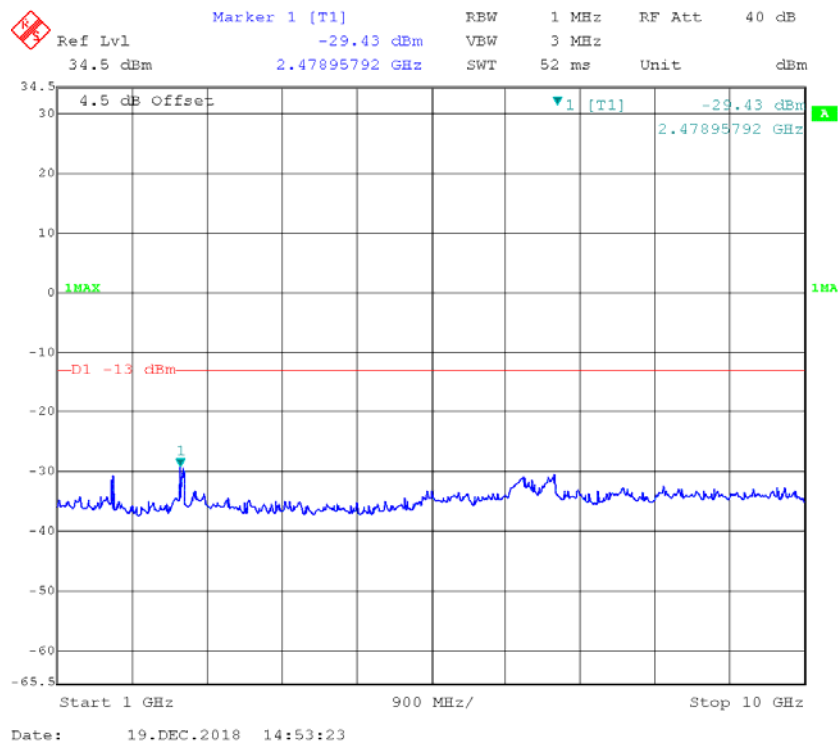
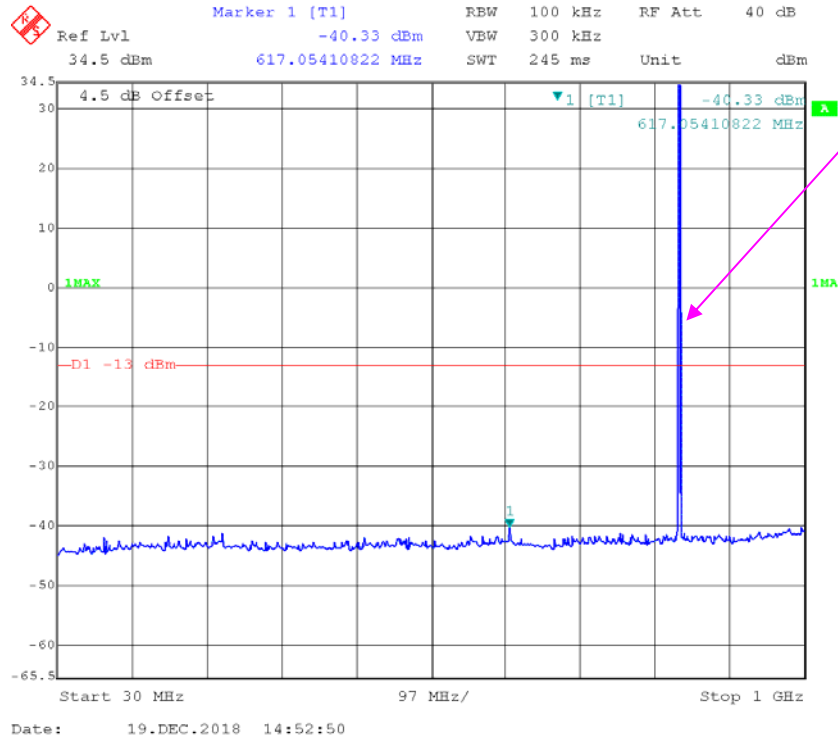
Environmental Conditions

| | |
|--------------------|---------------|
| Temperature: | 24.5~25.2°C |
| Relative Humidity: | 41~49 % |
| ATM Pressure: | 99.7~99.8 kPa |

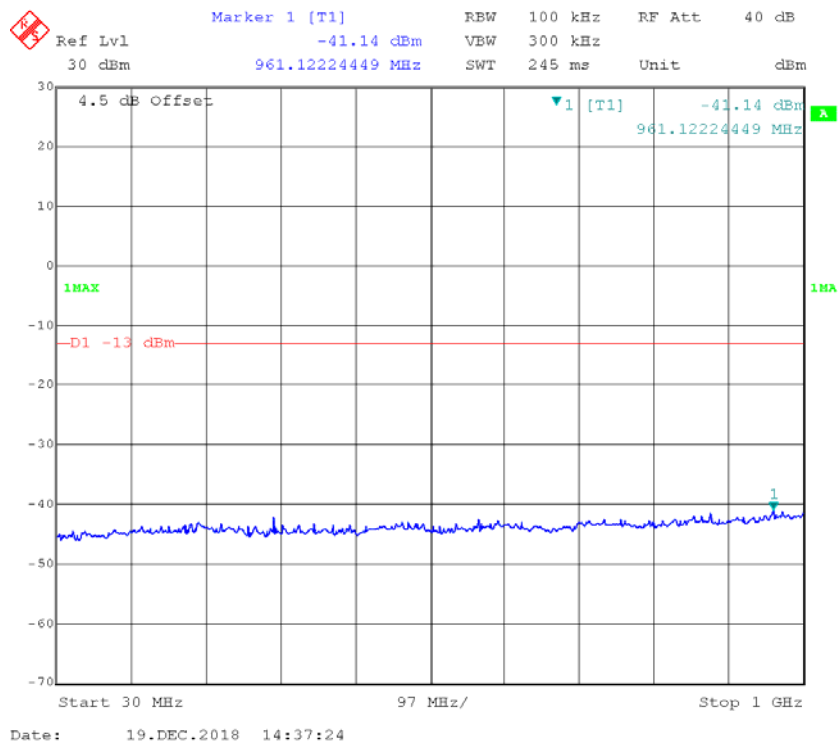
The testing was performed by Tiago Huang from 2018-12-19 to 2018-12-20.

Please refer to the following plots.

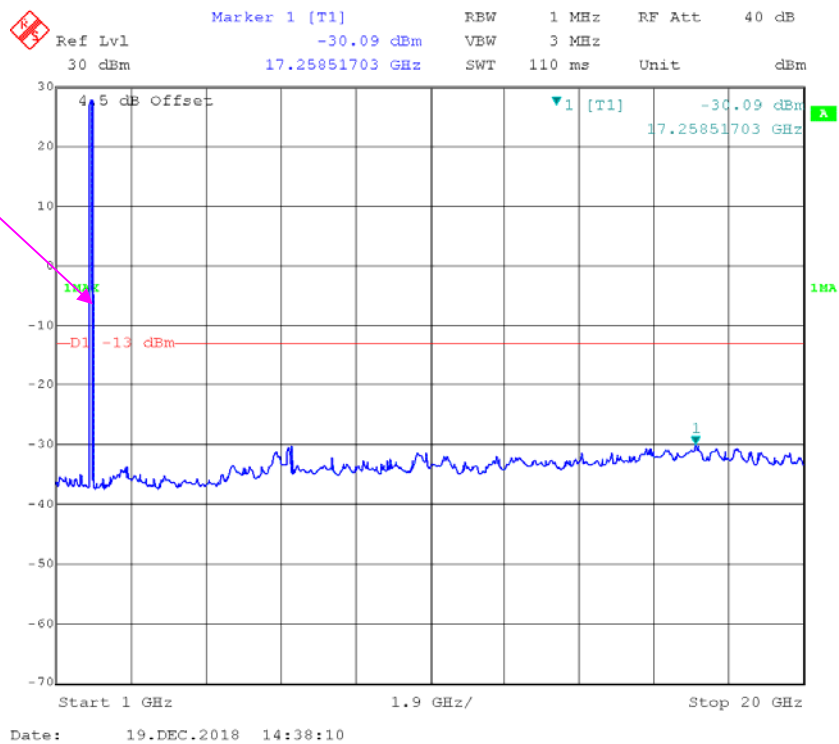
GSM850_Middle Channel



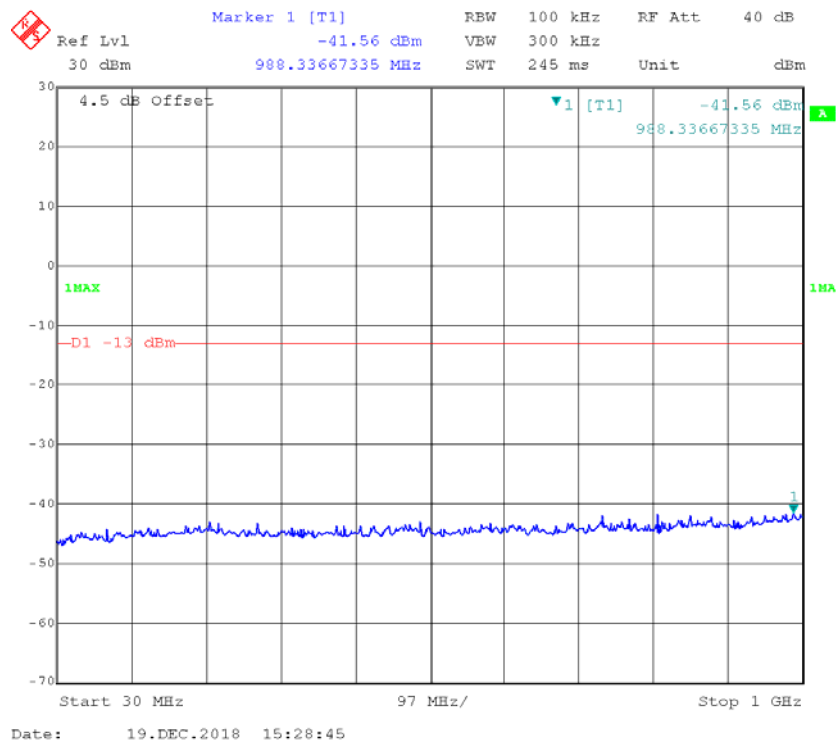
PCS 1900_ Middle Channel



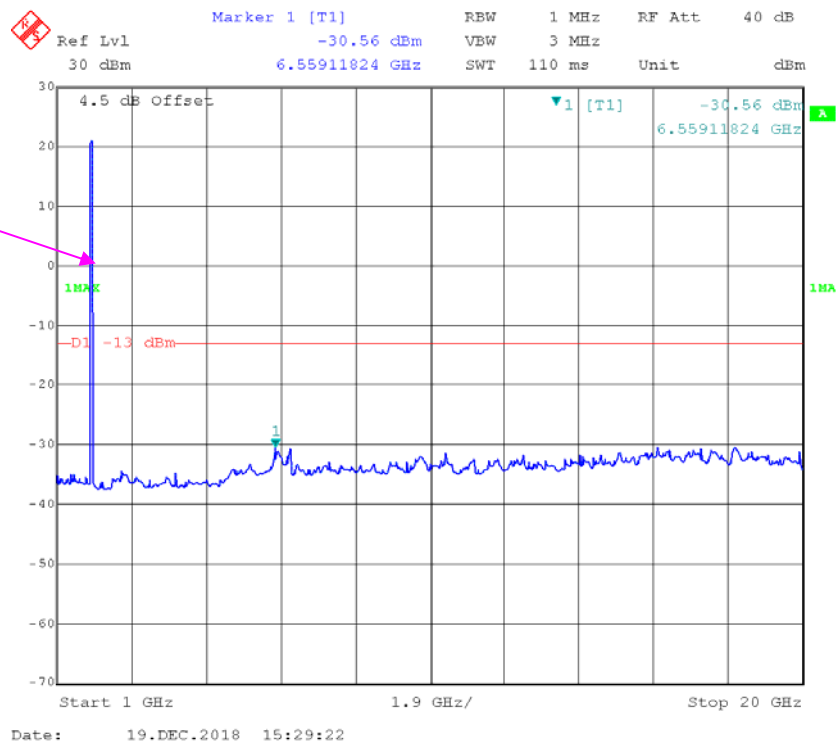
Fundamental



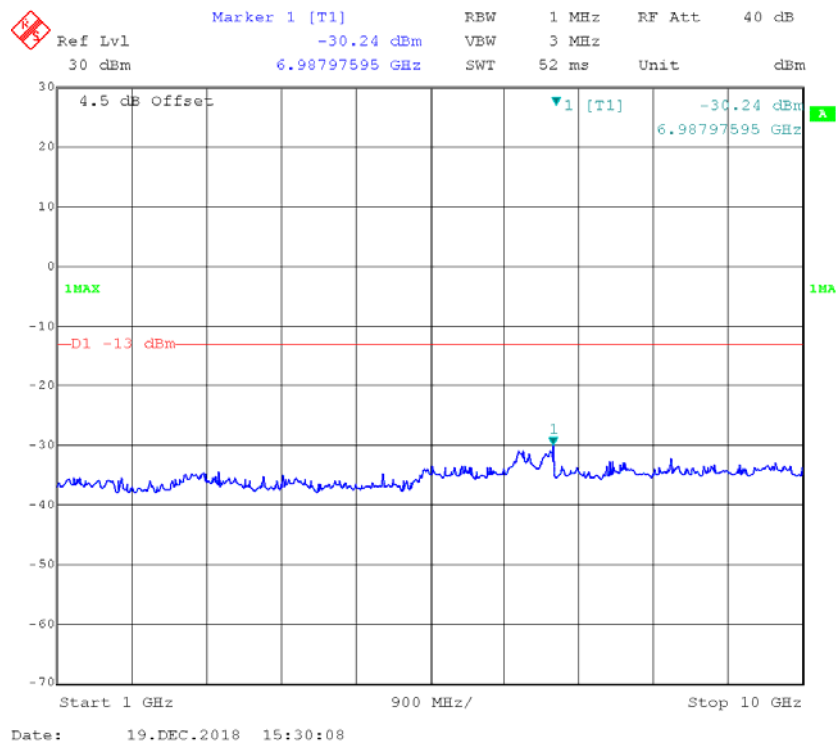
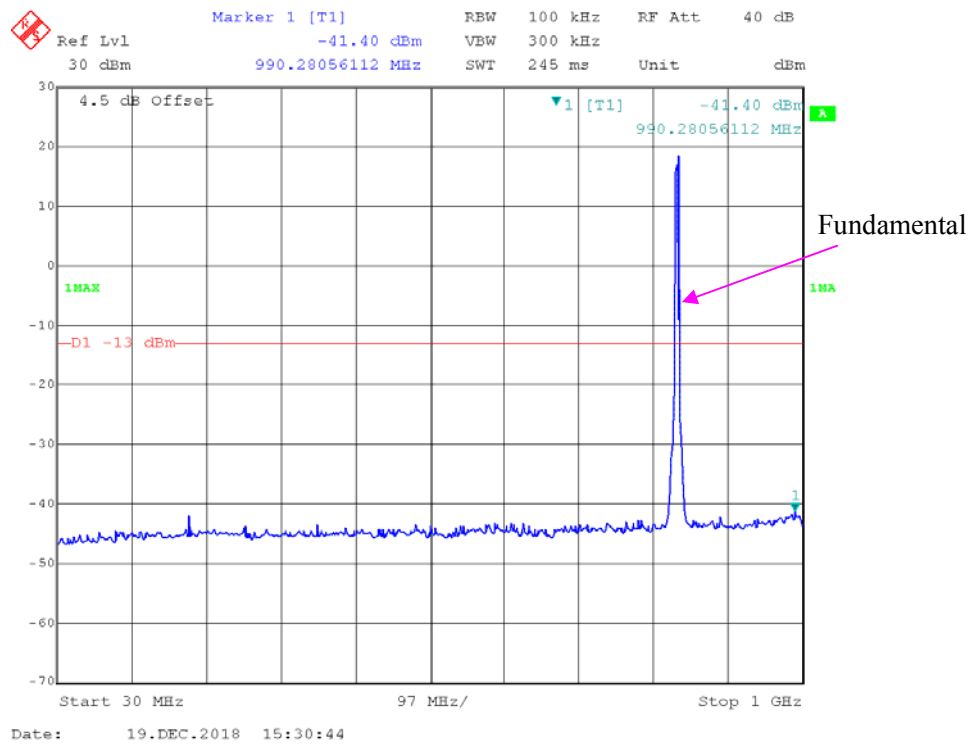
WCDMA Band II, Rel99



Fundamental

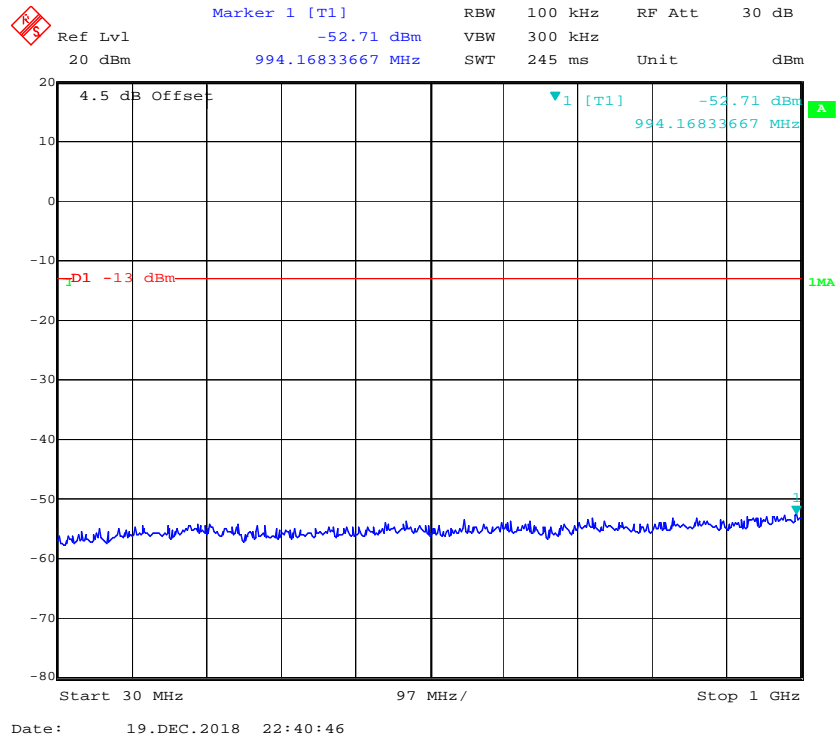


WCDMA Band V, Rel99

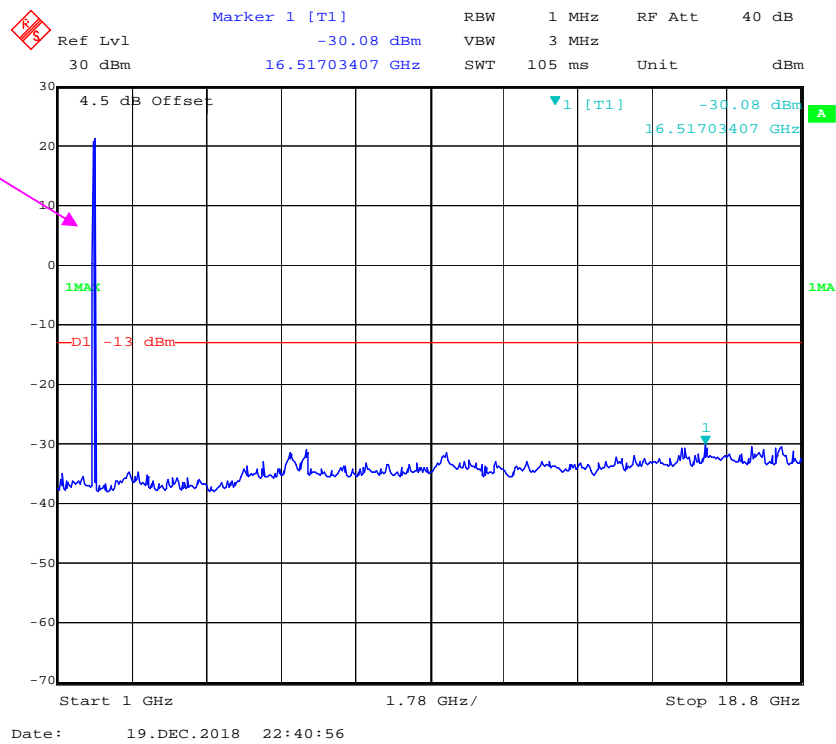


LTE Band 2 (Middle Channel)

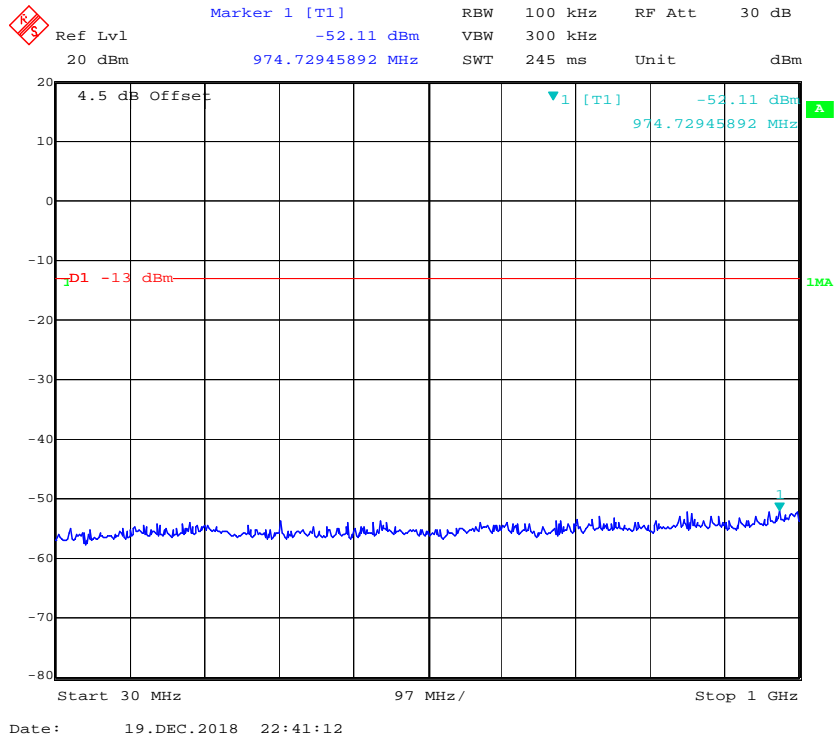
QPSK_1.4 MHz



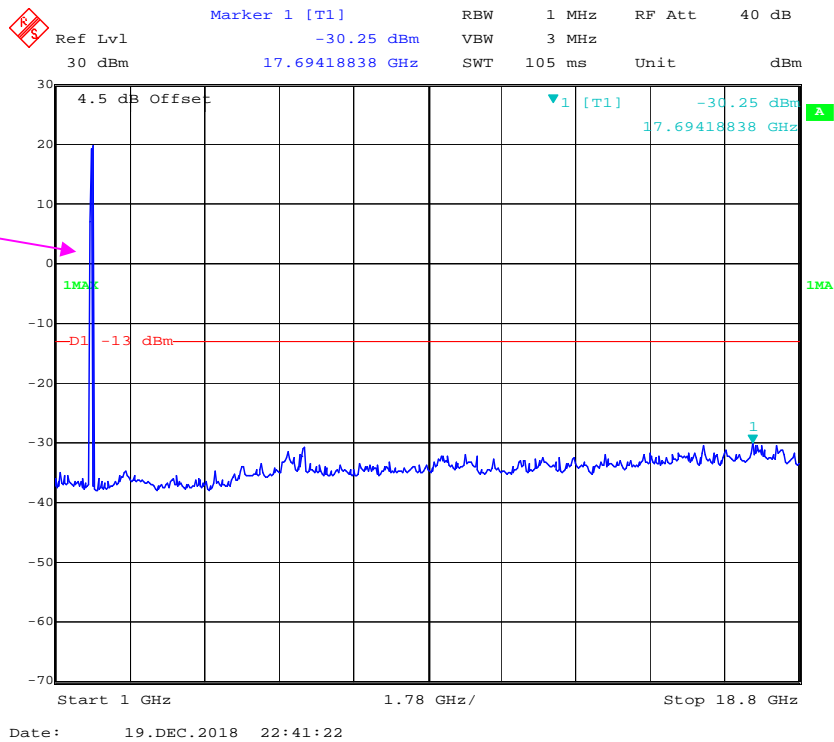
Fundamental



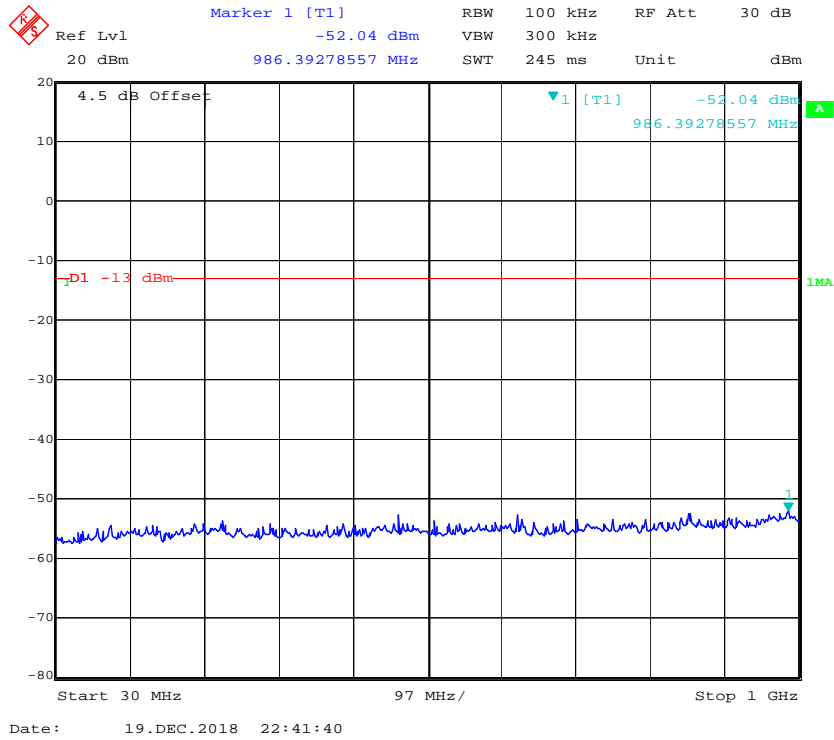
QPSK_3 MHz



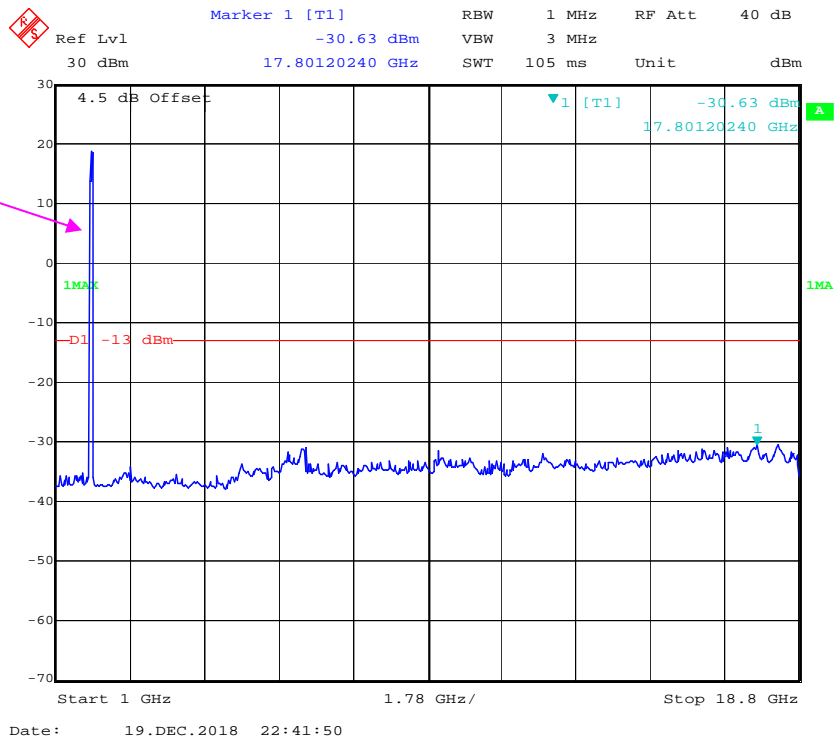
Fundamental



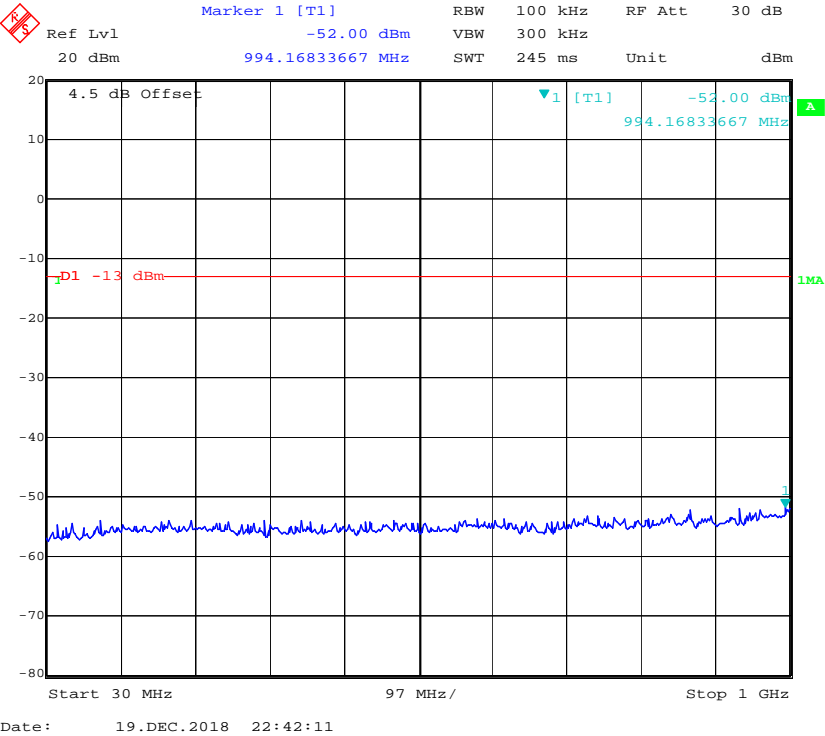
QPSK_5 MHz



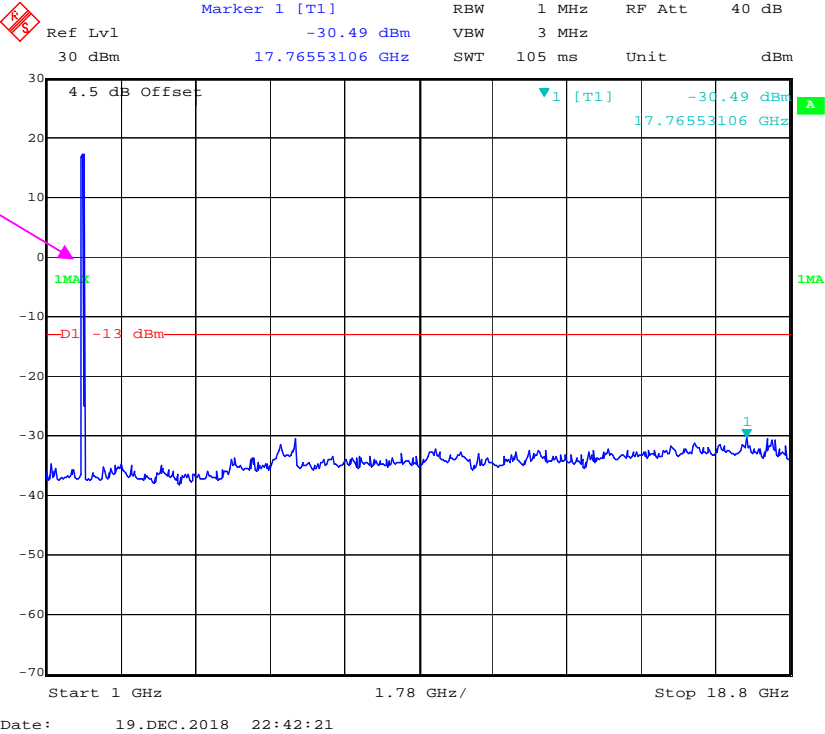
Fundamental



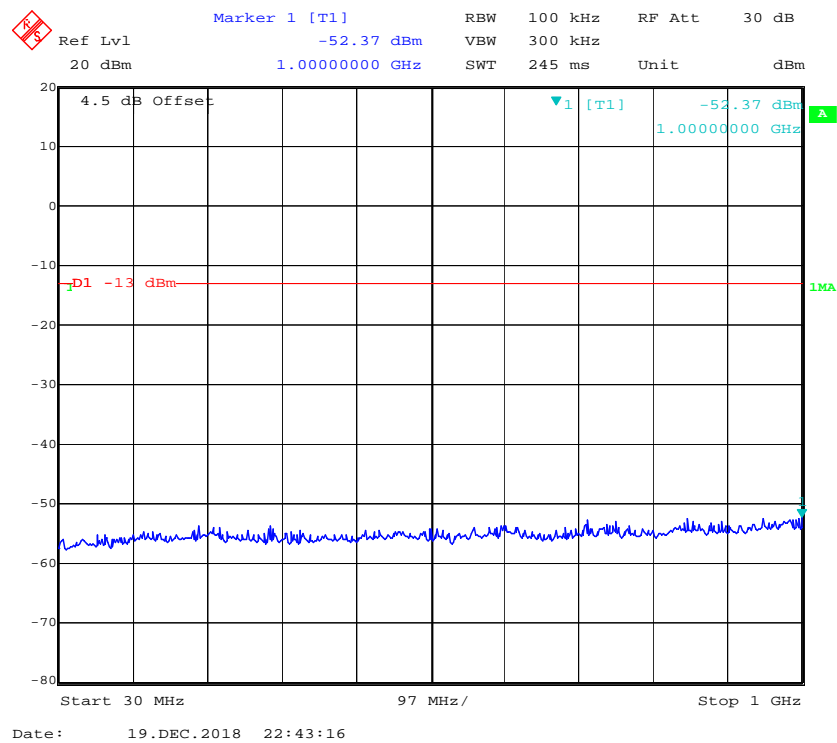
QPSK_10 MHz



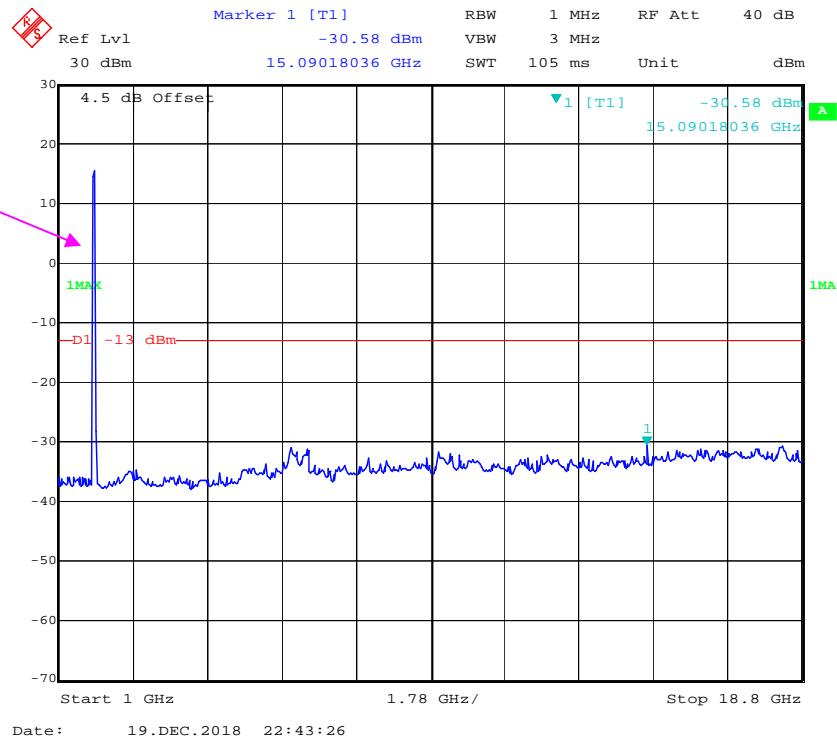
Fundamental



QPSK_20 MHz

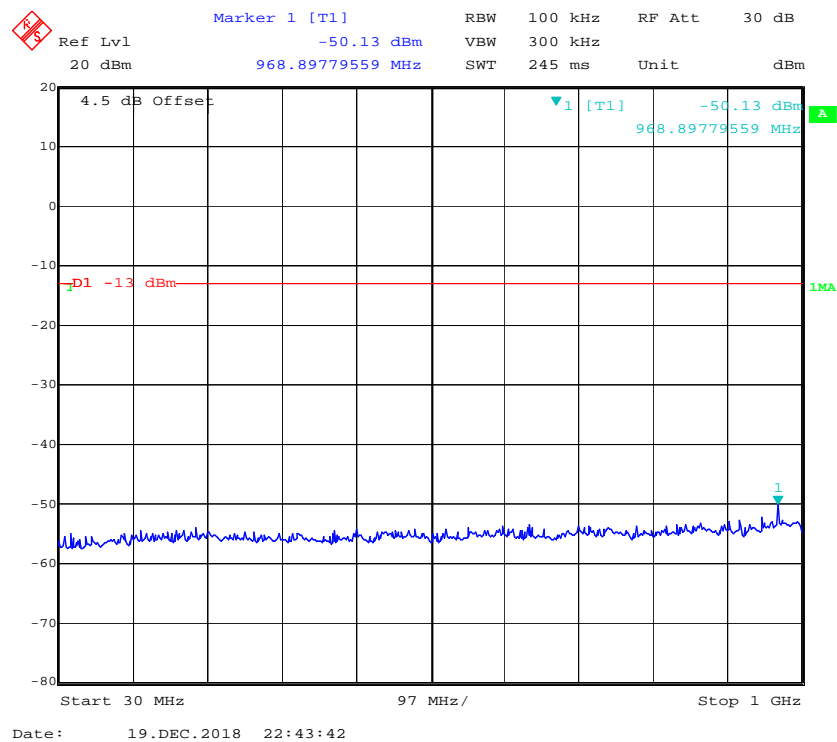


Fundamental

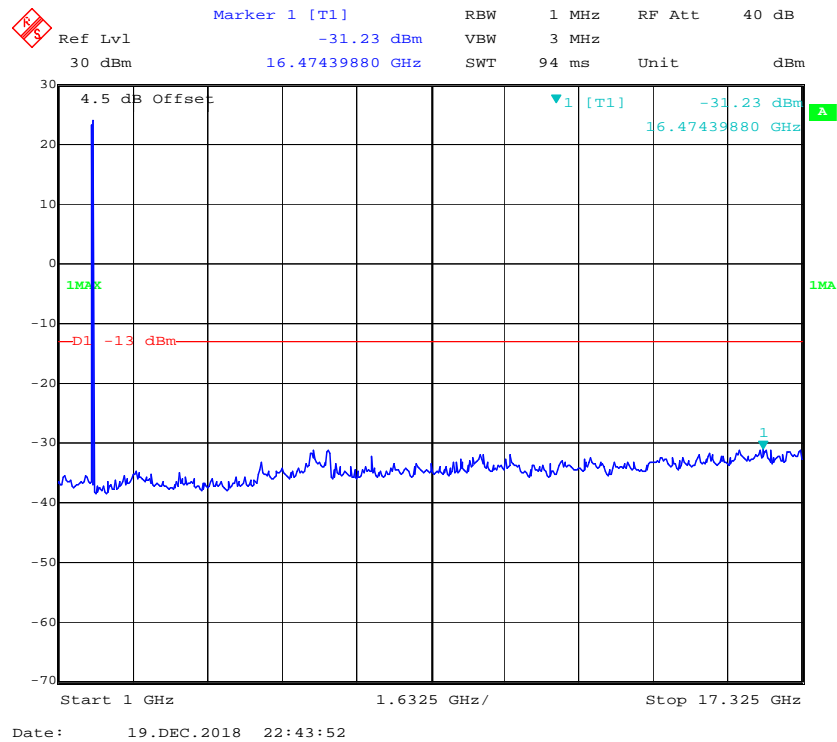


LTE Band 4 (Middle Channel)

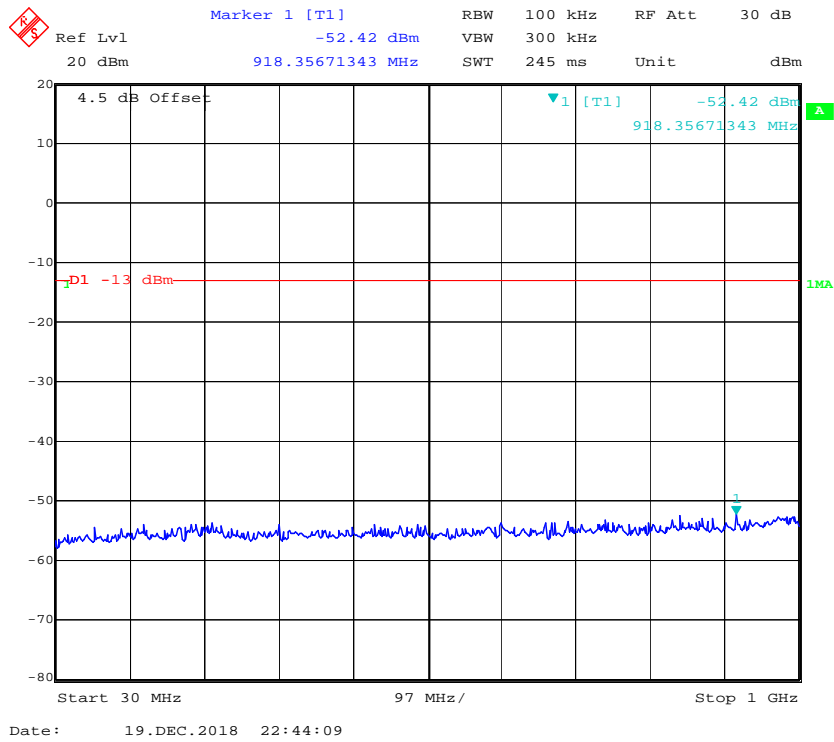
QPSK_1.4 MHz



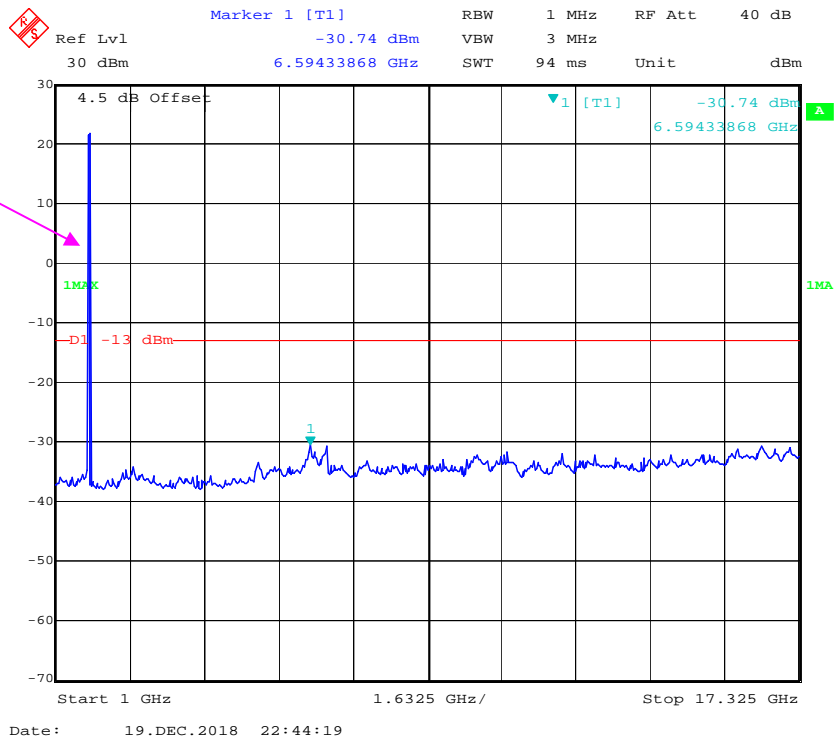
Fundamental



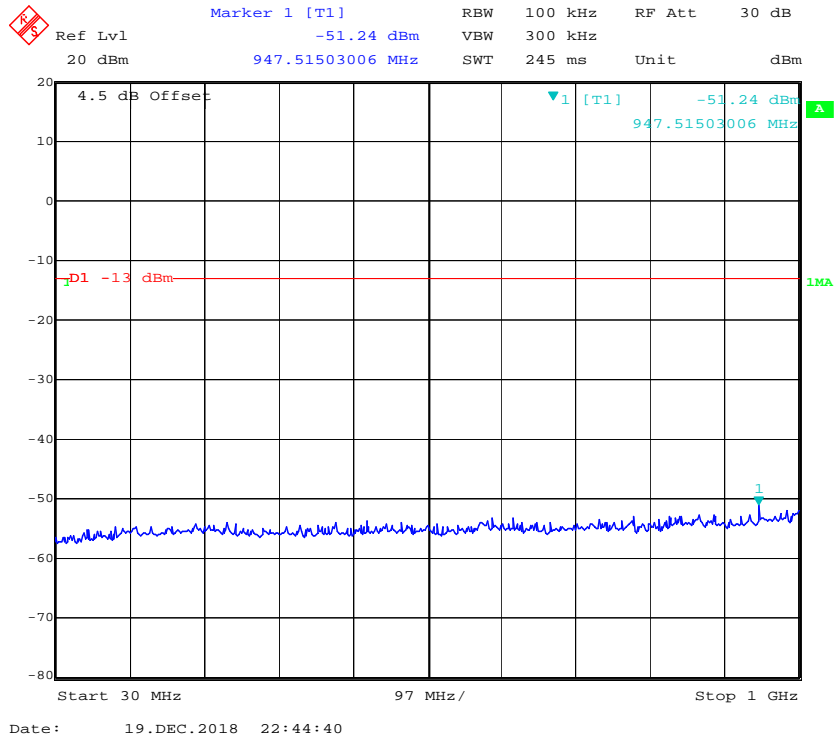
QPSK_3 MHz



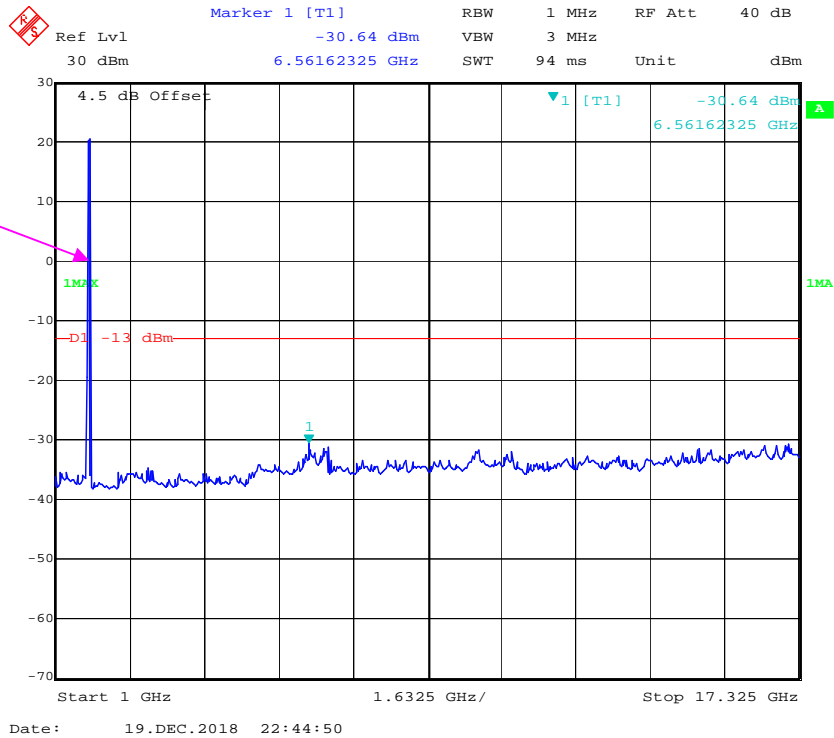
Fundamental



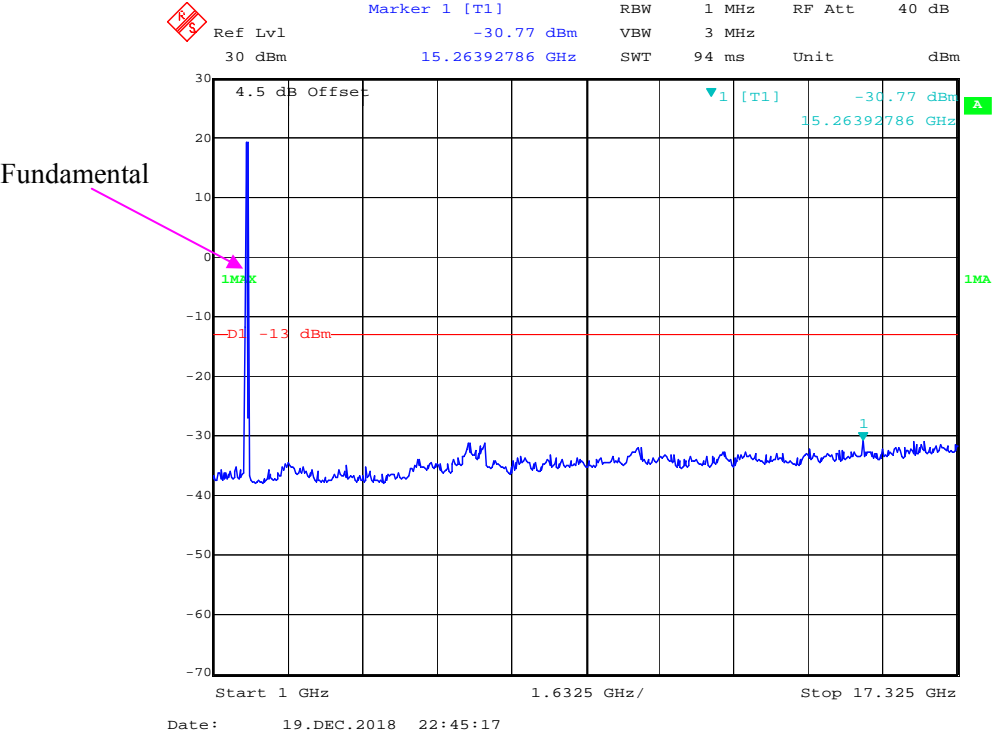
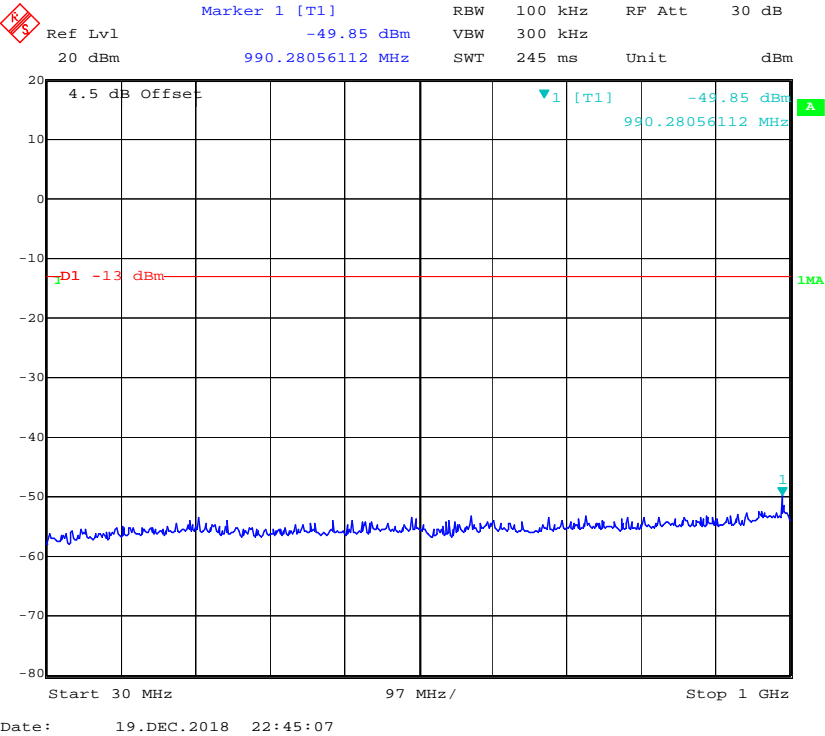
QPSK_5 MHz



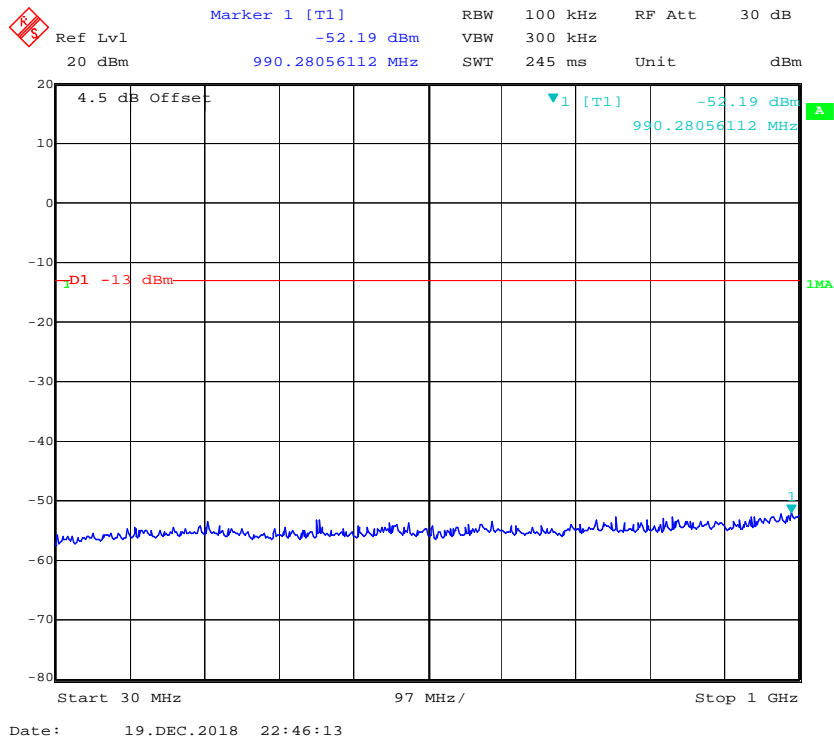
Fundamental



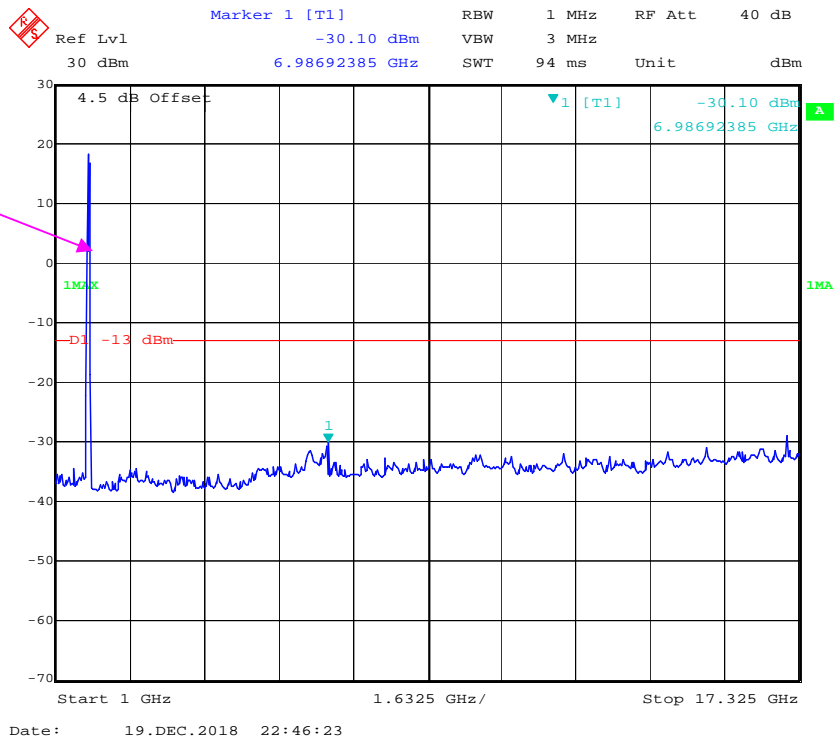
QPSK_10 MHz



QPSK_20 MHz

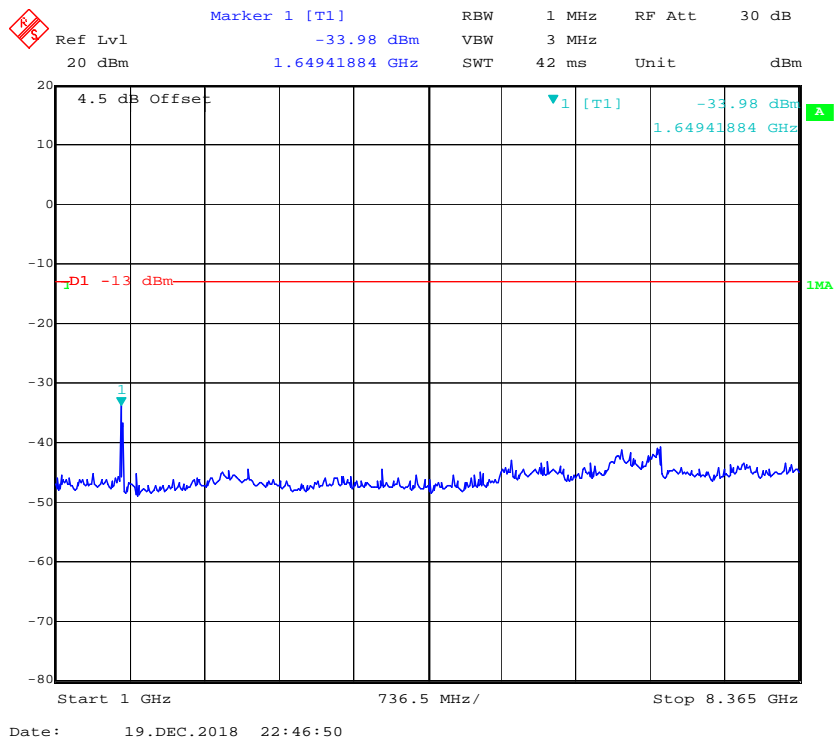
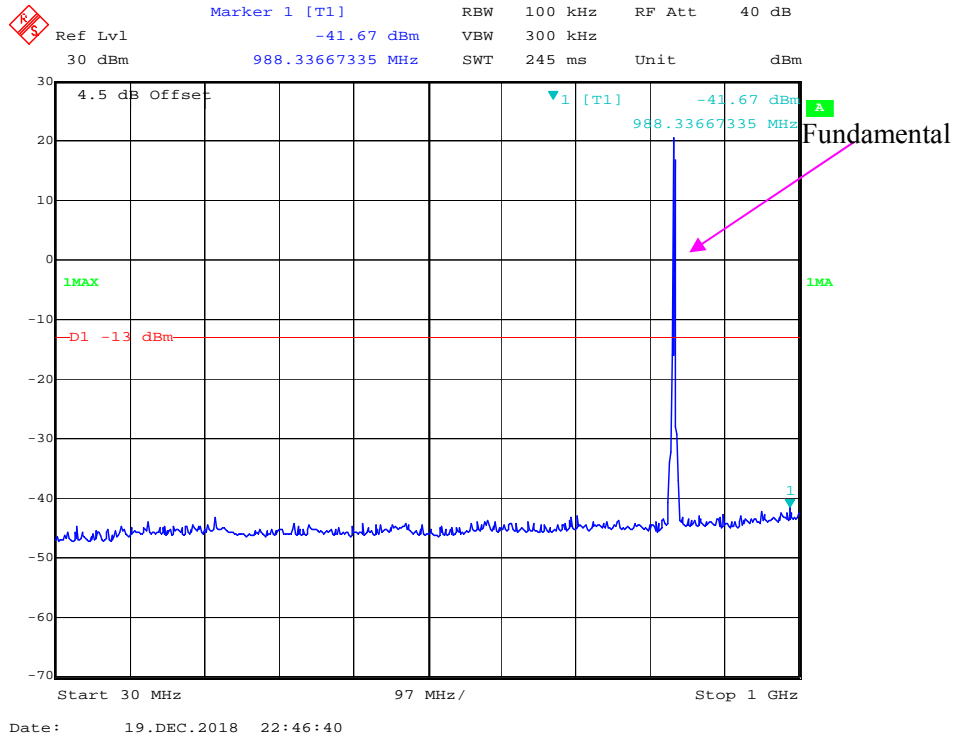


Fundamental

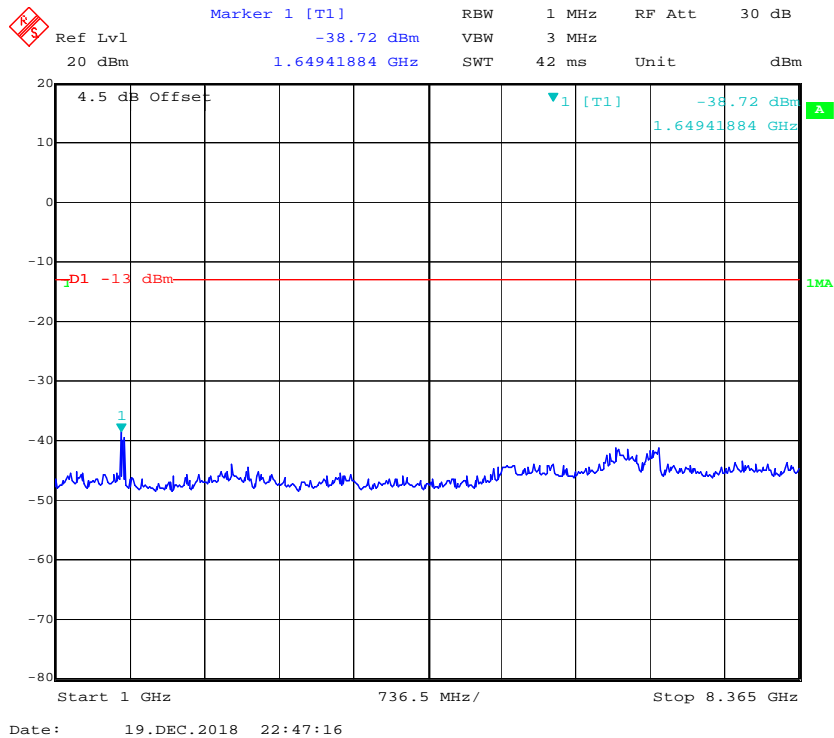
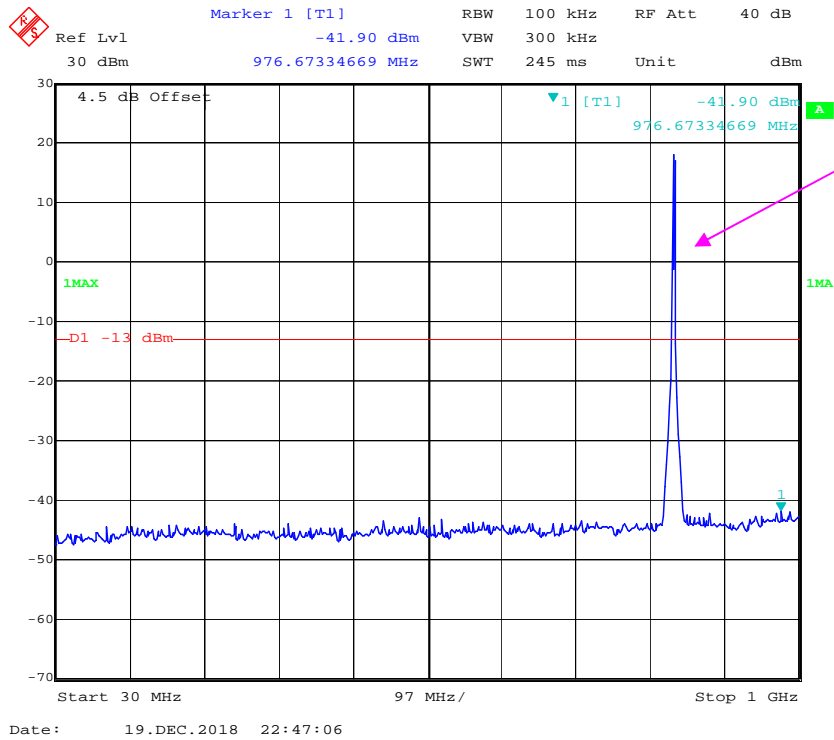


LTE Band 5 (Middle Channel)

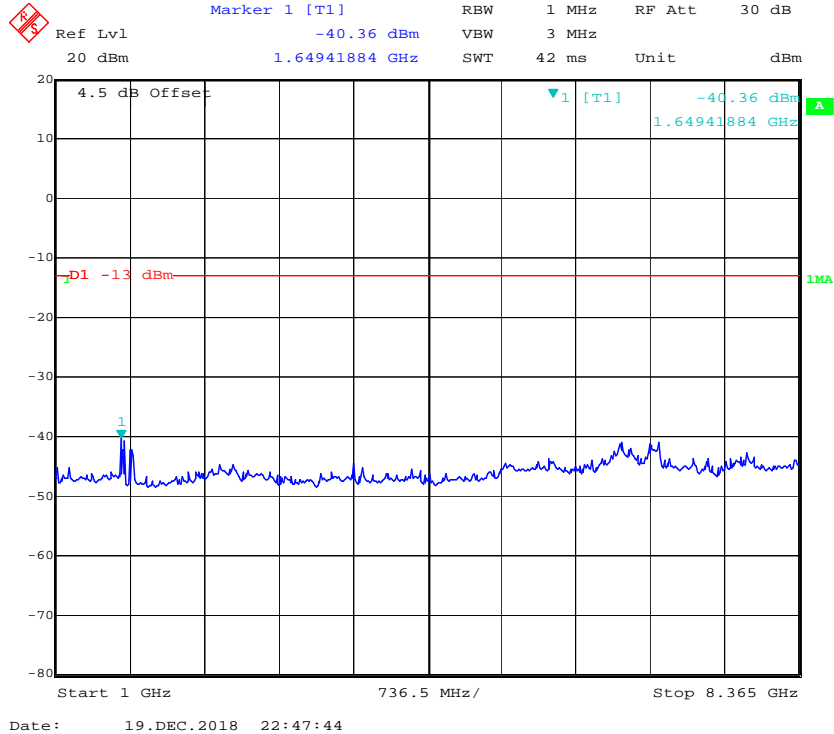
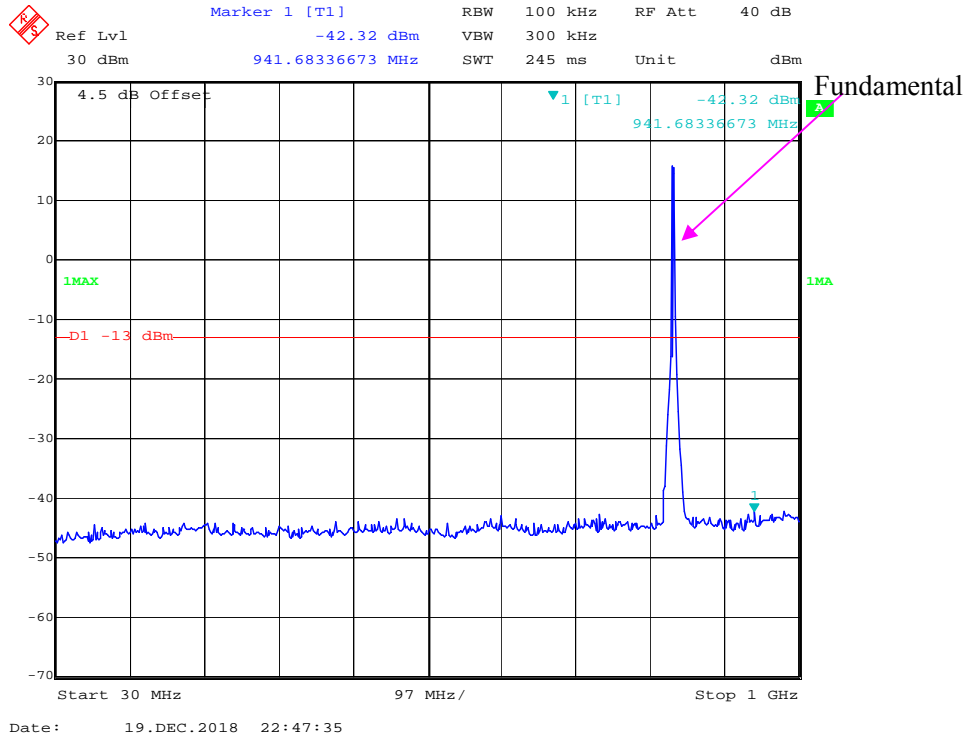
QPSK_1.4 MHz



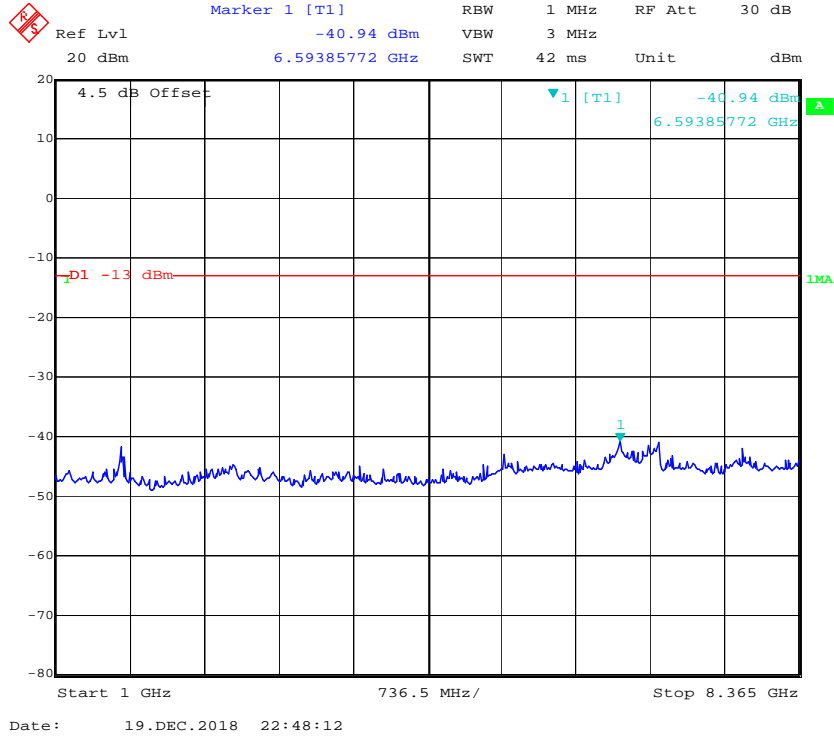
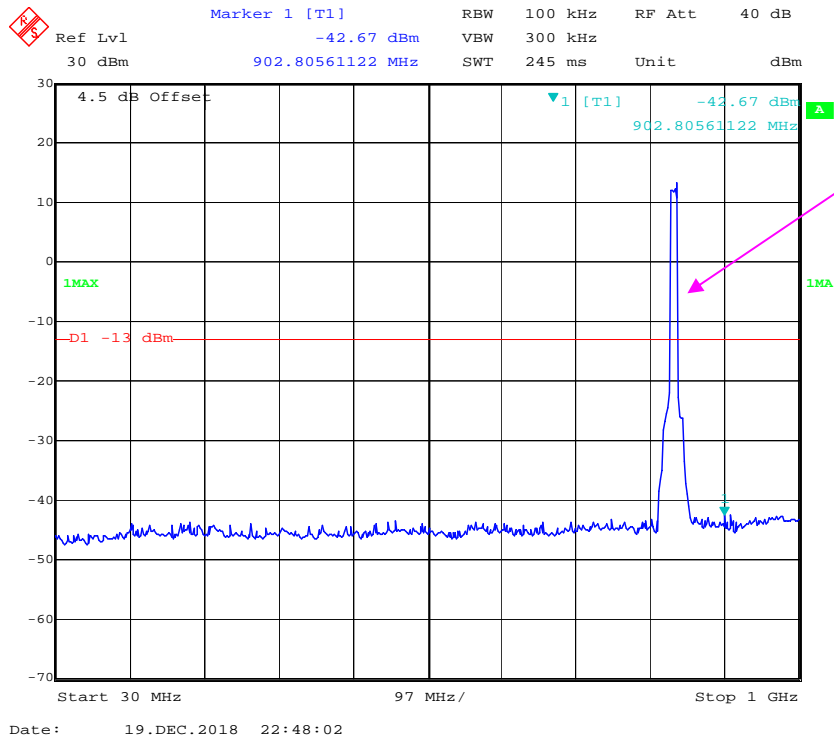
QPSK_3 MHz



QPSK_5 MHz

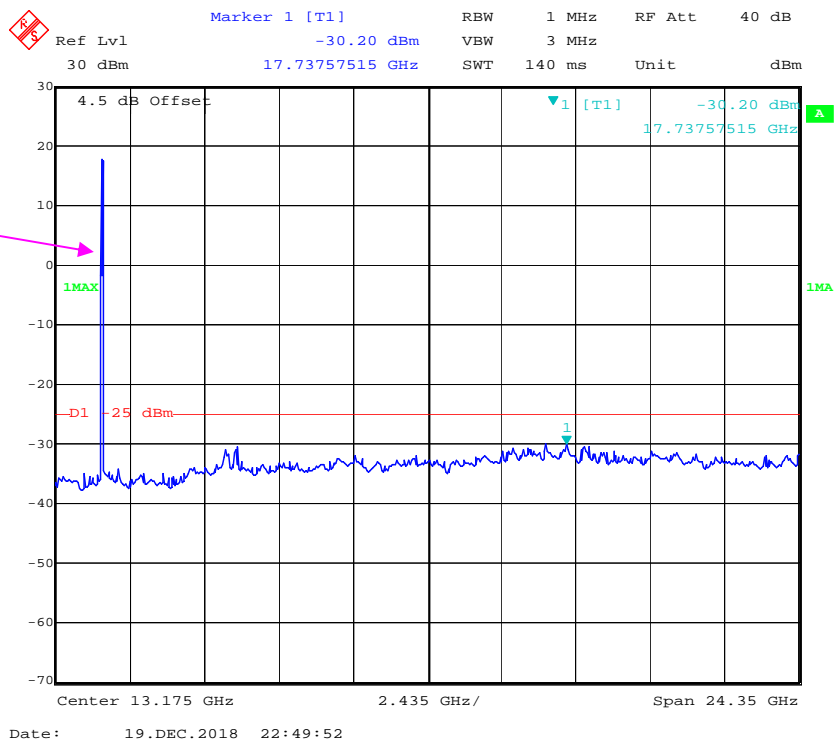
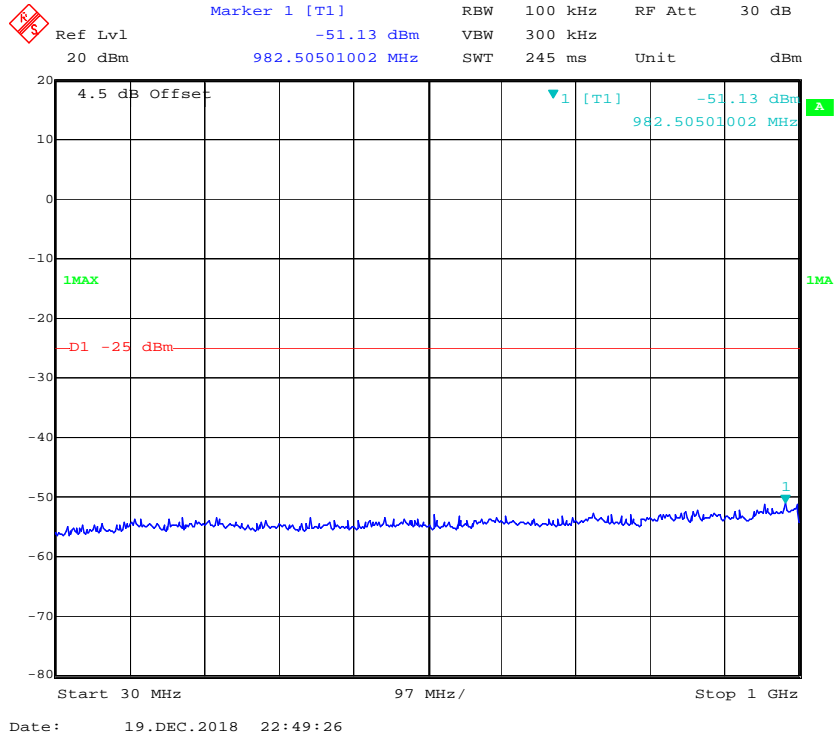


QPSK_10 MHz



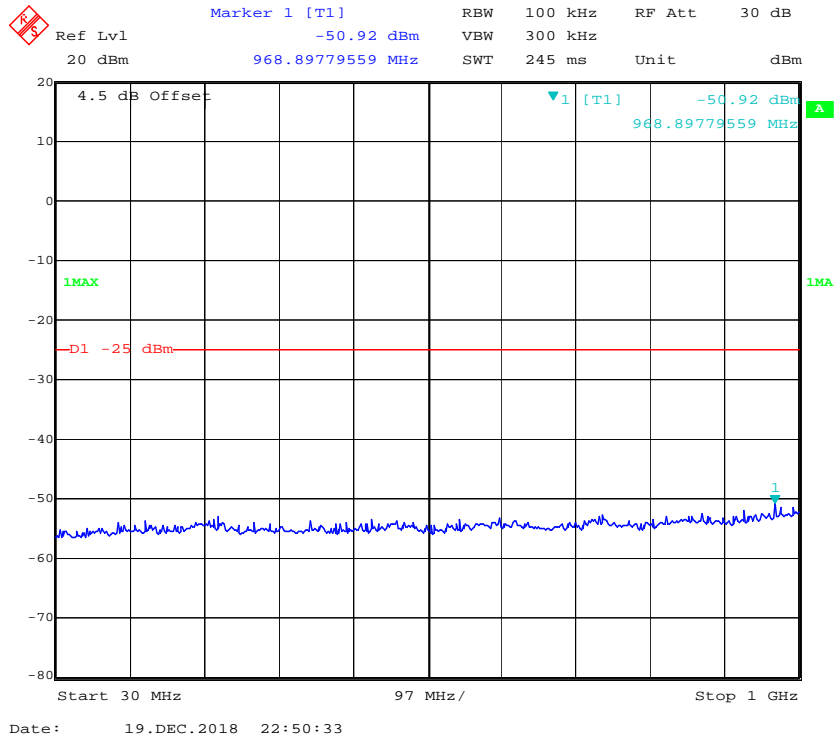
LTE Band 7 (Middle Channel)

QPSK_5 MHz

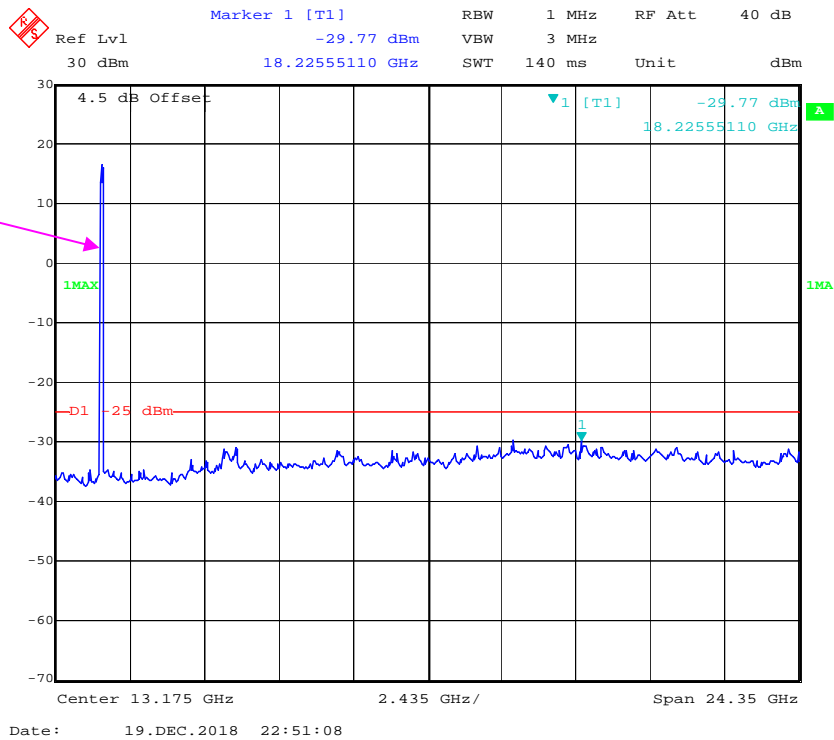


Fundamental

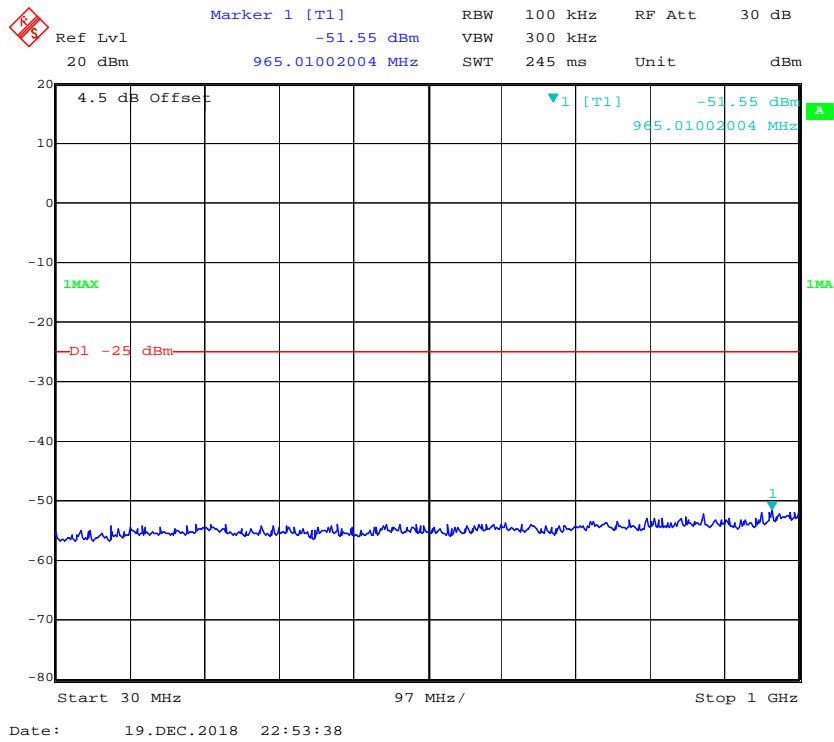
QPSK_10 MHz



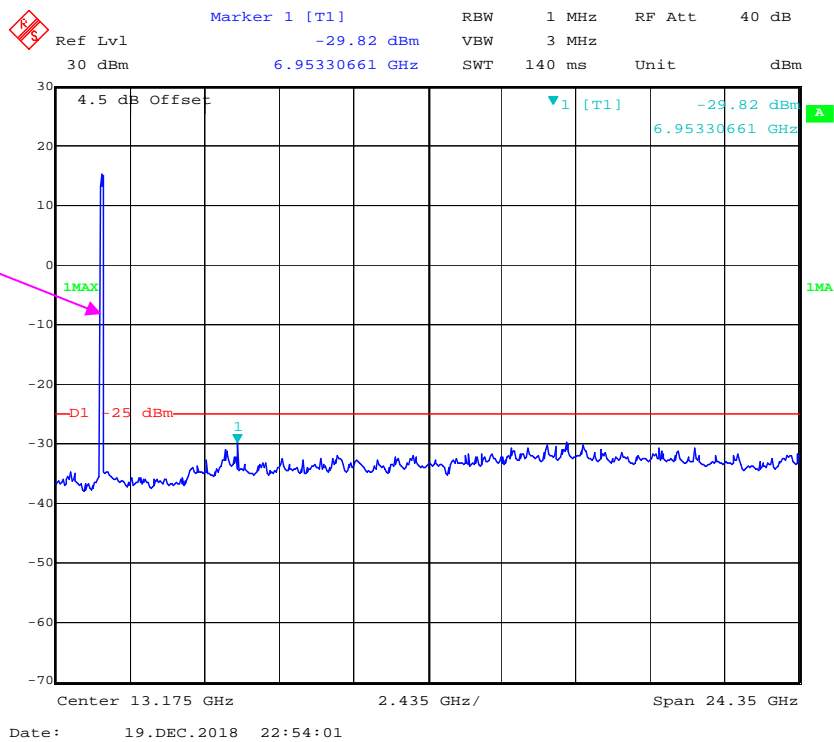
Fundamental



QPSK_20 MHz

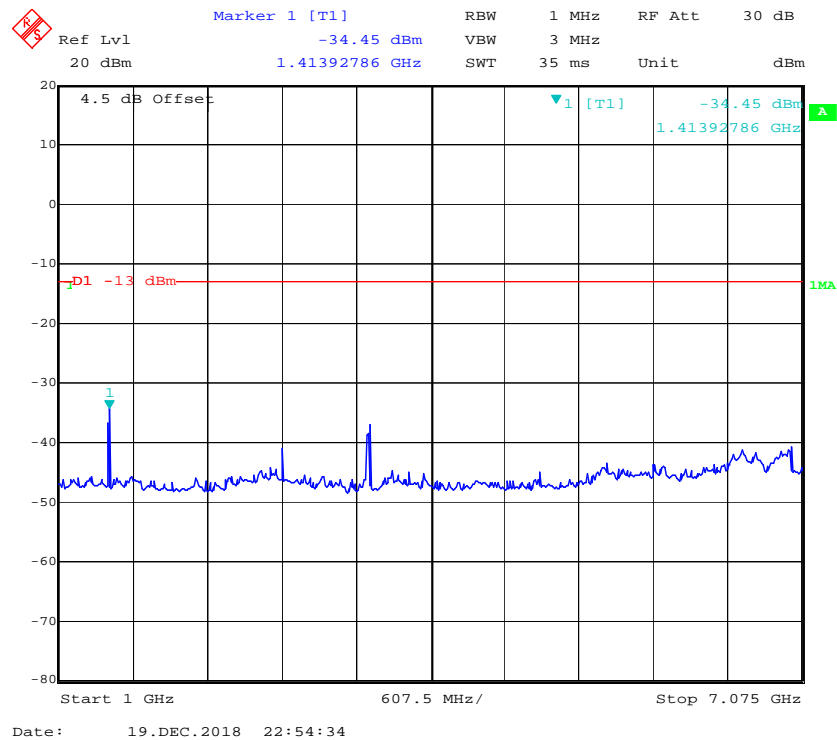
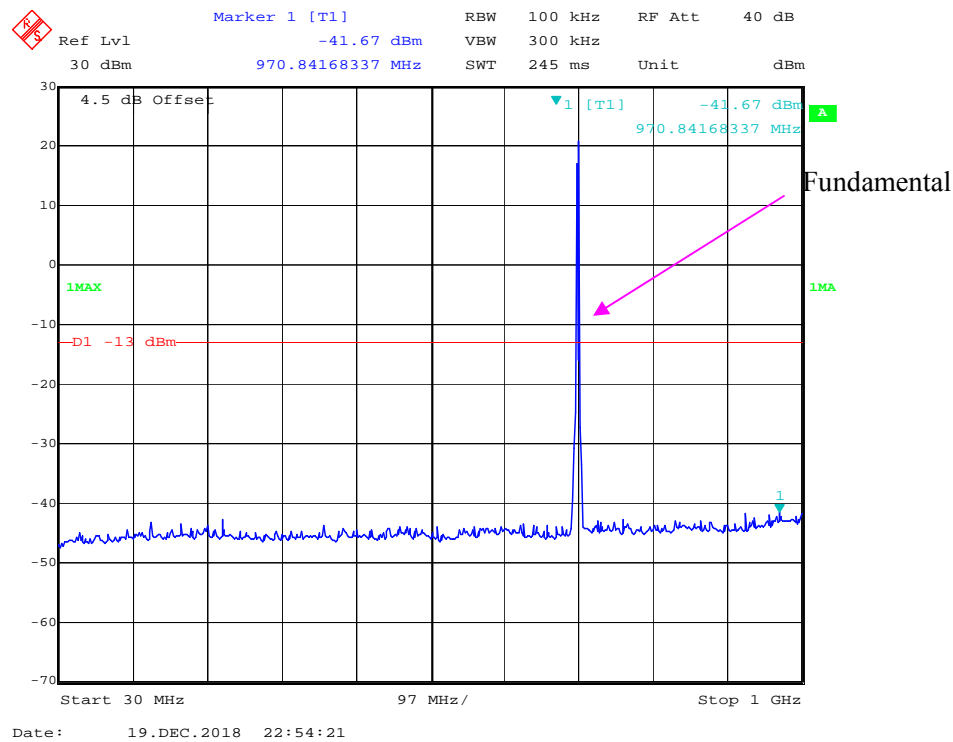


Fundamental

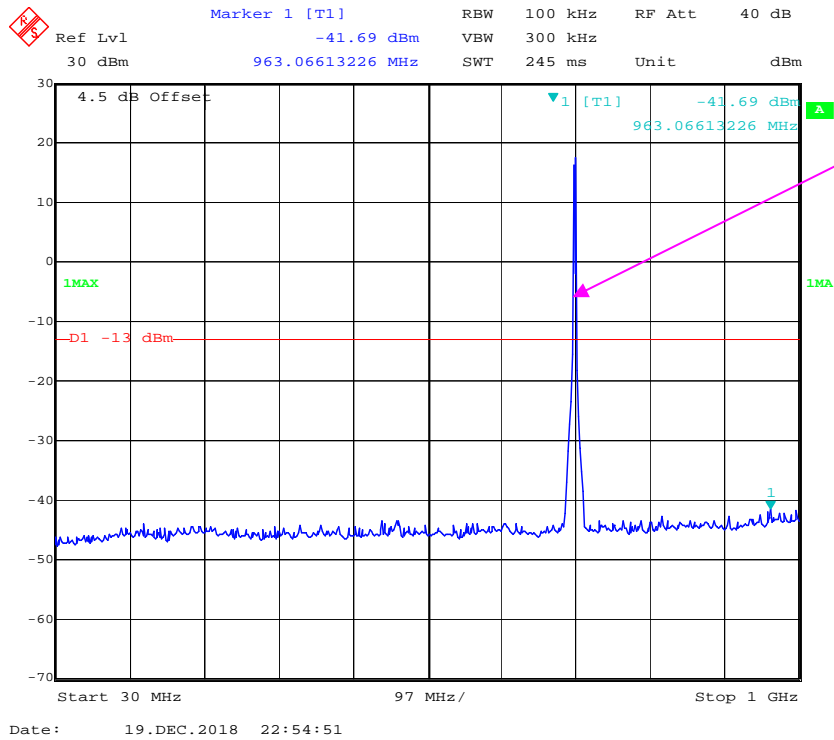


LTE Band 12 (Middle Channel)

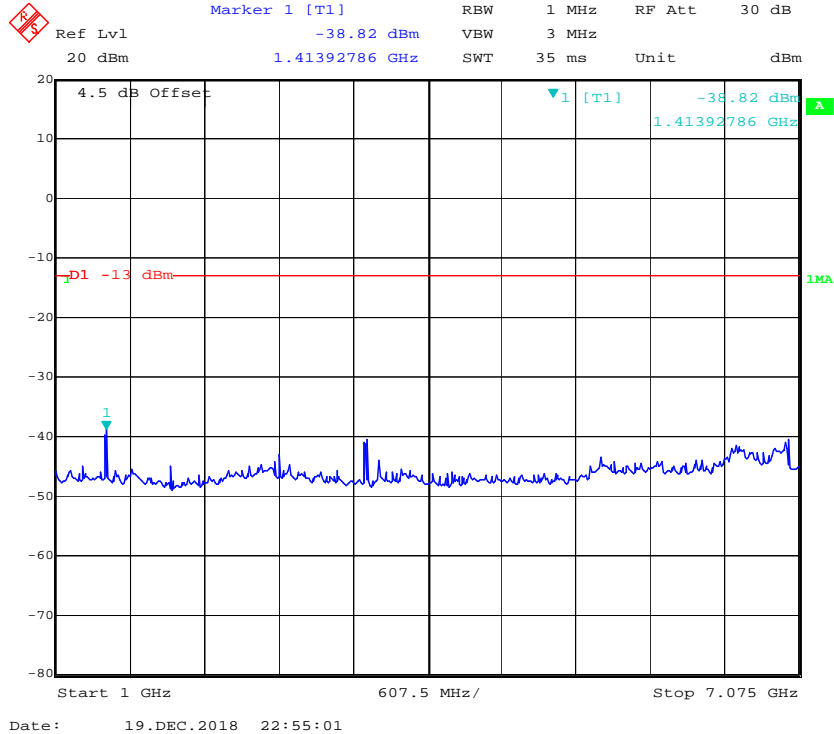
QPSK_1.4 MHz



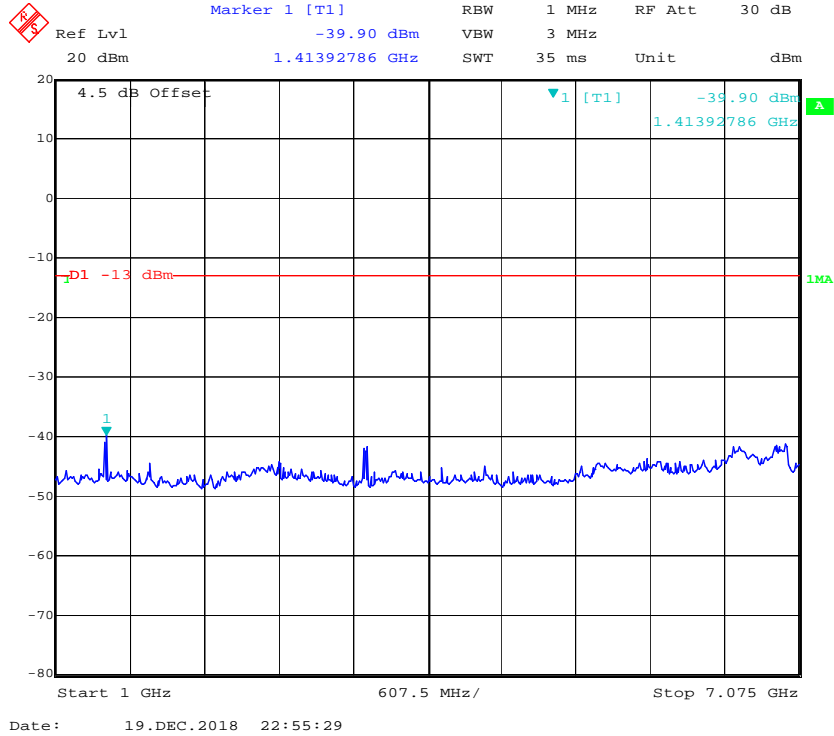
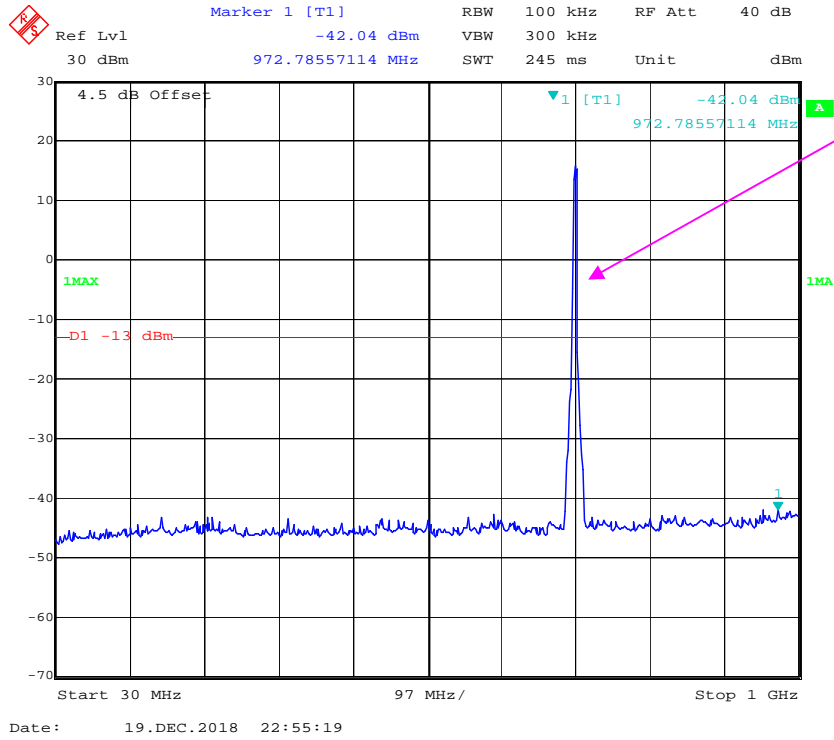
QPSK_3 MHz



Fundamental

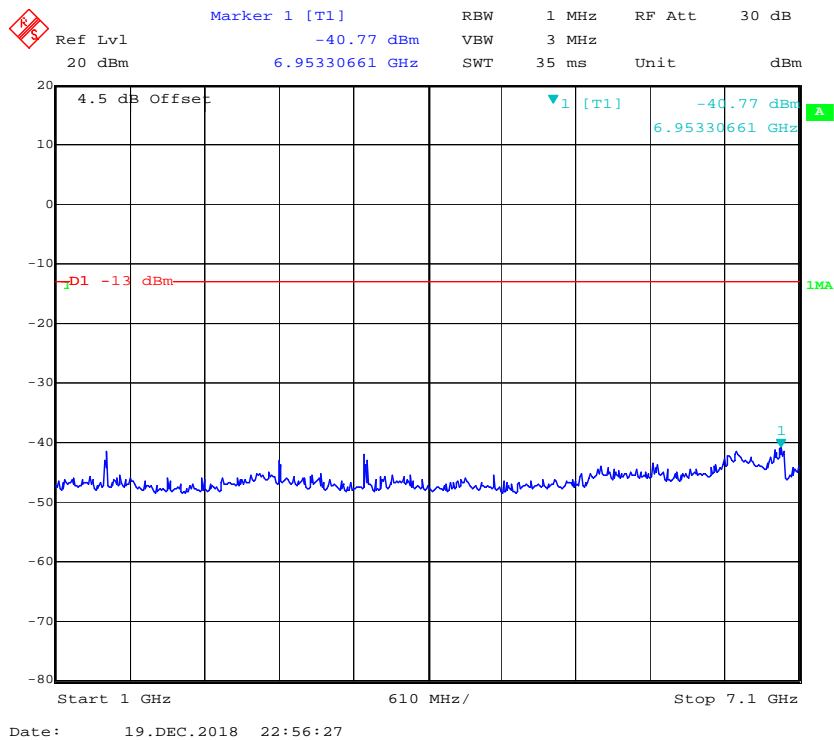
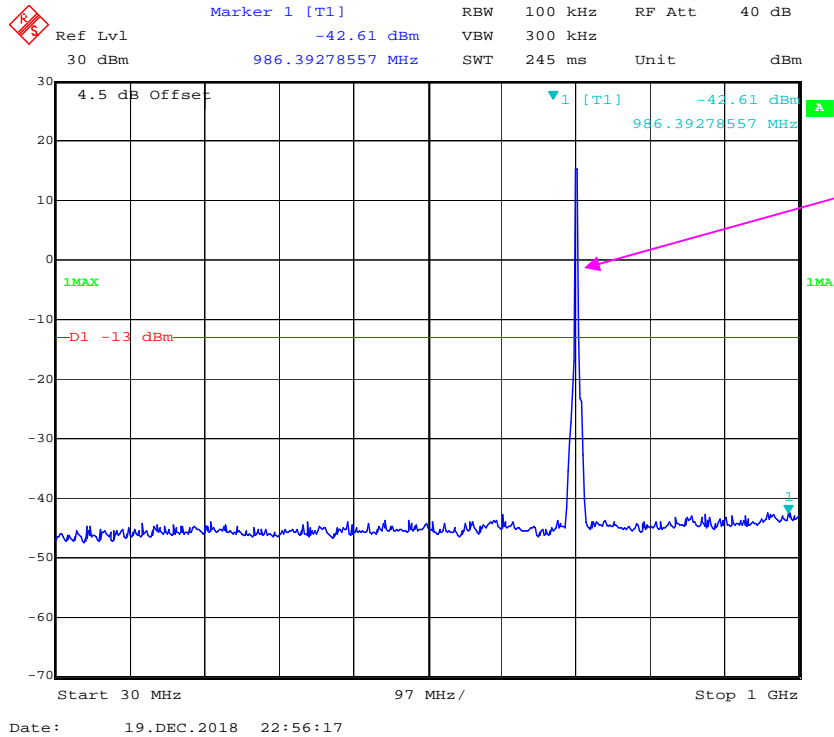


QPSK_5 MHz

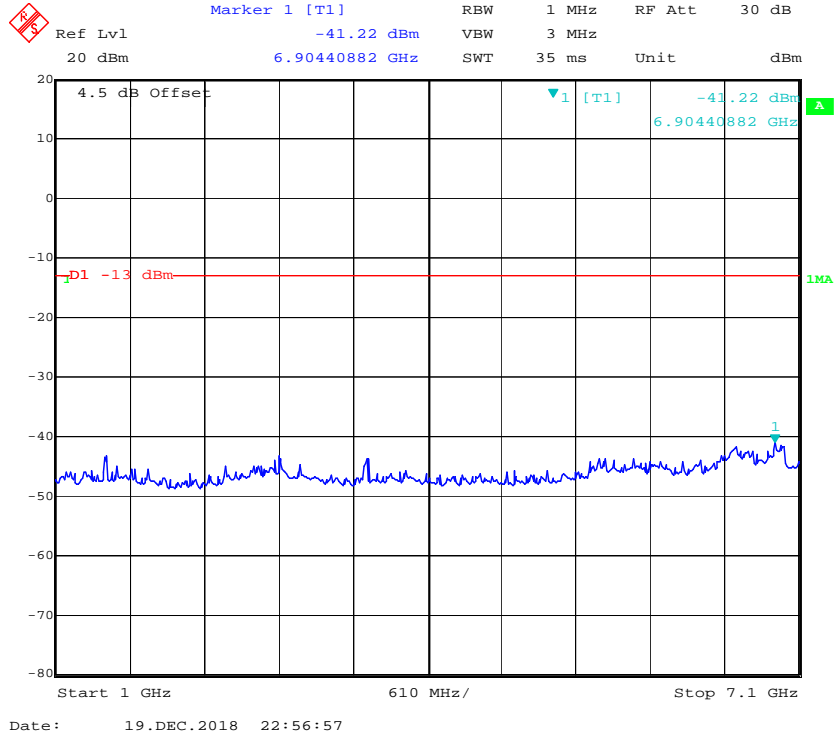
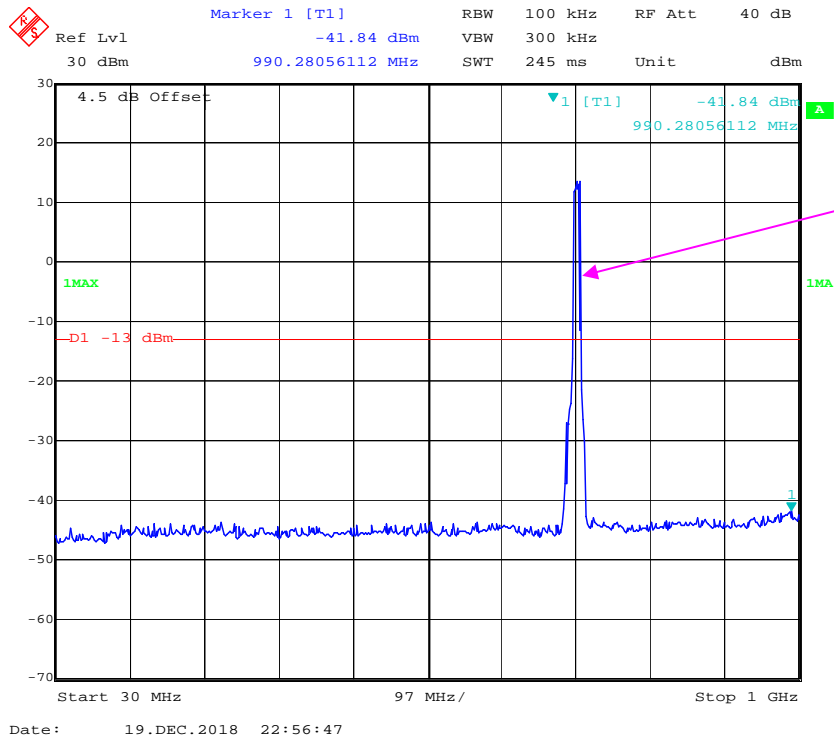


LTE Band 17 (Middle Channel)

QPSK_5 MHz



QPSK_10 MHz



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

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 | ESCI | 100035 | 2018-08-03 | 2019-08-03 |
| Sunol Sciences | Antenna | JB3 | A060611-3 | 2017-07-21 | 2019-07-21 |
| EMCO | Adjustable Dipole Antenna | 3121C | 9109-753 | N/A | N/A |
| Unknown | Coaxial Cable | C-NJNJ-50 | C-1000-01 | 2018-09-05 | 2019-09-05 |
| Unknown | Coaxial Cable | C-NJNJ-50 | C-0400-02 | 2018-09-05 | 2019-09-05 |
| Unknown | Coaxial Cable | C-NJNJ-50 | C-0530-01 | 2018-09-24 | 2019-09-24 |
| Unknown | Coaxial Cable | C-NJNJ-50 | C-0200-02 | 2018-09-05 | 2019-09-05 |
| Sonoma | Amplifier | 310N | 185914 | 2018-10-13 | 2019-10-13 |
| R&S | Spectrum Analyzer | FSP 38 | 100478 | 2018-12-10 | 2019-12-10 |
| TDK RF | Horn Antenna | HRN-0118 | 130 084 | 2016-01-05 | 2019-01-04 |
| ETS-Lindgren | Horn Antenna | 3115 | 000 527 35 | 2016-01-05 | 2019-01-04 |
| MICRO-COAX | Coaxial Cable | UFA147-1-2362-100100 | 64639 231029-001 | 2018-02-24 | 2019-02-28 |
| Mini | Pre-amplifier | ZVA-183-S+ | 5969001149 | 2018-09-05 | 2019-09-05 |
| Agilent | Signal Generator | E8247C | MY43321350 | 2018-12-10 | 2019-12-10 |
| Quinstar | Amplifier | QLW-18405536-JO | 15964001001 | 2018-06-27 | 2019-06-27 |
| Ducommun Technologies | Horn Antenna | ARH-4223-02 | 1007726-01 1304 | 2016-11-18 | 2019-11-18 |
| Ducommun Technologies | Horn Antenna | ARH-4223-02 | 1007726-02 1304 | 2016-11-18 | 2019-11-18 |
| Sinoscite | Band-stop filter | BSF1850-1910MS-0935V2 | 0935V2 | 2018-06-16 | 2019-06-16 |
| Sinoscite | Band-stop filter | BSF1710-1785MN-0383-003 | 0383003 | 2018-06-16 | 2019-06-16 |
| Sinoscite | Band-stop filter | BSF824-862MS-1438-001 | 1438001 | 2018-06-16 | 2019-06-16 |
| Sinoscite | Band-stop filter | BSF2500-2750MS-1439-001 | 1437001 | 2018-06-16 | 2019-06-16 |

* **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**

| | |
|---------------------------|---------------|
| Temperature: | 19.7~21.1°C |
| Relative Humidity: | 31~53 % |
| ATM Pressure: | 99.7~99.8 kPa |

* The testing was performed by Sunny Cen, Neil Liao, Tiago Huang and Vern Shen on 2018-12-17~2018-12-19.

EUT Operation Mode: Transmitting

Cellular Band (PART 22H)**30 MHz-10 GHz:**

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|---|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| GSM850, Frequency:836.600 MHz | | | | | | | | |
| 1673.200 | H | 52.50 | -51.88 | 10.5 | 1.27 | -42.6 | -13.0 | 29.6 |
| 1673.200 | V | 53.53 | -50.78 | 10.5 | 1.27 | -41.5 | -13.0 | 28.5 |
| 2509.800 | H | 43.58 | -59.19 | 12.2 | 1.25 | -48.2 | -13.0 | 35.2 |
| 2509.800 | V | 40.12 | -64.04 | 12.2 | 1.25 | -53.1 | -13.0 | 40.1 |
| 3346.400 | H | 40.05 | -61.14 | 12.3 | 1.58 | -50.5 | -13.0 | 37.5 |
| 3346.400 | V | 40.72 | -59.4 | 12.3 | 1.58 | -48.7 | -13.0 | 35.7 |
| 326.000 | H | 46.52 | -61.65 | 0.0 | 0.33 | -62.0 | -13.0 | 49.0 |
| 326.000 | V | 47.98 | -58.27 | 0.0 | 0.33 | -58.6 | -13.0 | 45.6 |
| WCDMA Band V R99, Frequency:836.600 MHz | | | | | | | | |
| 1673.200 | H | 40.03 | -64.35 | 10.5 | 1.27 | -55.1 | -13.0 | 42.1 |
| 1673.200 | V | 37.80 | -66.51 | 10.5 | 1.27 | -57.3 | -13.0 | 44.3 |
| 2509.800 | H | 42.31 | -60.46 | 12.2 | 1.25 | -49.5 | -13.0 | 36.5 |
| 2509.800 | V | 38.18 | -65.98 | 12.2 | 1.25 | -55.0 | -13.0 | 42.0 |
| 3346.400 | H | 37.22 | -63.97 | 12.3 | 1.58 | -53.3 | -13.0 | 40.3 |
| 3346.400 | V | 37.36 | -62.76 | 12.3 | 1.58 | -52.1 | -13.0 | 39.1 |
| 497.000 | H | 44.51 | -60.94 | 0.0 | 0.35 | -61.3 | -25.0 | 36.3 |
| 497.000 | V | 48.73 | -54.03 | 0.0 | 0.35 | -54.4 | -25.0 | 29.4 |

PCS Band (PART 24E)**30 MHz-20 GHz:**

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|---|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| GSM1900, Frequency:1880.000 MHz | | | | | | | | |
| 3760.000 | H | 47.84 | -52.37 | 12.3 | 1.53 | -41.7 | -13.0 | 28.7 |
| 3760.000 | V | 46.24 | -53.67 | 12.3 | 1.53 | -43.0 | -13.0 | 30.0 |
| 5640.000 | H | 38.22 | -57.08 | 13.0 | 1.28 | -45.4 | -13.0 | 32.4 |
| 5640.000 | V | 38.27 | -57.34 | 13.0 | 1.28 | -45.6 | -13.0 | 32.6 |
| 546.000 | H | 44.15 | -59.89 | 0.0 | 0.35 | -60.2 | -13.0 | 47.2 |
| 546.000 | V | 46.98 | -54.49 | 0.0 | 0.35 | -54.8 | -13.0 | 41.8 |
| WCDMA Band II R99,Frequency: 1880.000 MHz | | | | | | | | |
| 3760.000 | H | 42.46 | -57.75 | 12.3 | 1.53 | -47.0 | -13.0 | 34.0 |
| 3760.000 | V | 41.40 | -58.51 | 12.3 | 1.53 | -47.8 | -13.0 | 34.8 |
| 5640.000 | H | 35.83 | -59.47 | 13.0 | 1.28 | -47.8 | -13.0 | 34.8 |
| 5640.000 | V | 34.91 | -60.7 | 13.0 | 1.28 | -49.0 | -13.0 | 36.0 |
| 387.000 | H | 43.15 | -63.88 | 0.0 | 0.37 | -64.3 | -13.0 | 51.3 |
| 387.000 | V | 46.59 | -57.91 | 0.0 | 0.37 | -58.3 | -13.0 | 45.3 |

LTE Band 2 (30MHz-20GHz):

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| QPSK,Frequency:1880.000 MHz | | | | | | | | |
| 3760.00 | H | 41.70 | -58.51 | 12.25 | 1.53 | -47.79 | -13.00 | 34.79 |
| 3760.00 | V | 41.86 | -58.05 | 12.25 | 1.53 | -47.33 | -13.00 | 34.33 |
| 5640.00 | H | 38.74 | -56.56 | 13.00 | 1.28 | -44.84 | -13.00 | 31.84 |
| 5640.00 | V | 38.51 | -57.10 | 13.00 | 1.28 | -45.38 | -13.00 | 32.38 |
| 478.00 | H | 45.79 | -59.92 | 0.00 | 0.36 | -60.28 | -13.00 | 47.28 |
| 478.00 | V | 47.68 | -55.35 | 0.00 | 0.36 | -55.71 | -13.00 | 42.71 |

LTE Band 4 (30MHz-20GHz):

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| QPSK,Frequency:1732.500 MHz | | | | | | | | |
| 3465.00 | H | 40.60 | -60.37 | 12.21 | 1.60 | -49.76 | -13.00 | 36.76 |
| 3465.00 | V | 44.90 | -54.66 | 12.21 | 1.60 | -44.05 | -13.00 | 31.05 |
| 5197.50 | H | 38.97 | -57.11 | 12.92 | 1.36 | -45.55 | -13.00 | 32.55 |
| 5197.50 | V | 38.98 | -57.07 | 12.92 | 1.36 | -45.51 | -13.00 | 32.51 |
| 349.00 | H | 45.58 | -62.16 | 0.00 | 0.34 | -62.50 | -13.00 | 49.50 |
| 349.00 | V | 48.26 | -57.33 | 0.00 | 0.34 | -57.67 | -13.00 | 44.67 |

LTE Band 5 (30MHz-10GHz):

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| QPSK, Frequency: 836.500 MHz | | | | | | | | |
| 1673.00 | H | 50.59 | -53.79 | 10.52 | 1.27 | -44.54 | -13.00 | 31.54 |
| 1673.00 | V | 44.63 | -59.68 | 10.52 | 1.27 | -50.43 | -13.00 | 37.43 |
| 2509.50 | H | 45.51 | -57.26 | 12.20 | 1.24 | -46.30 | -13.00 | 33.30 |
| 2509.50 | V | 42.41 | -61.75 | 12.20 | 1.24 | -50.79 | -13.00 | 37.79 |
| 3346.00 | H | 42.30 | -58.89 | 12.26 | 1.58 | -48.21 | -13.00 | 35.21 |
| 3346.00 | V | 41.21 | -58.91 | 12.26 | 1.58 | -48.23 | -13.00 | 35.23 |
| 436.00 | H | 45.58 | -60.71 | 0.00 | 0.37 | -61.08 | -13.00 | 48.08 |
| 436.00 | V | 49.78 | -53.84 | 0.00 | 0.37 | -54.21 | -13.00 | 41.21 |

LTE Band 7 (30MHz-26.5GHz):

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| QPSK,Frequency: 2535.000 MHz | | | | | | | | |
| 5070.00 | H | 47.04 | -49.27 | 12.97 | 1.41 | -37.71 | -25.00 | 12.71 |
| 5070.00 | V | 47.41 | -48.67 | 12.97 | 1.41 | -37.11 | -25.00 | 12.11 |
| 7605.00 | H | 47.97 | -43.41 | 12.84 | 1.40 | -31.97 | -25.00 | 6.97 |
| 7605.00 | V | 47.78 | -44.27 | 12.84 | 1.40 | -32.83 | -25.00 | 7.83 |
| 215.00 | H | 43.69 | -66.25 | 0.00 | 0.21 | -66.46 | -25.00 | 41.46 |
| 215.00 | V | 45.22 | -61.71 | 0.00 | 0.21 | -61.92 | -25.00 | 36.92 |

LTE Band 12 (30MHz-10GHz):

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|------------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| QPSK, Frequency: 707.500 MHz | | | | | | | | |
| 1415.00 | H | 38.65 | -65.24 | 9.64 | 1.25 | -56.85 | -13.00 | 43.85 |
| 1415.00 | V | 40.07 | -63.88 | 9.64 | 1.25 | -55.49 | -13.00 | 42.49 |
| 2122.50 | H | 38.36 | -65.37 | 11.67 | 1.16 | -54.86 | -13.00 | 41.86 |
| 2122.50 | V | 38.60 | -65.44 | 11.67 | 1.16 | -54.93 | -13.00 | 41.93 |
| 2830.00 | H | 58.33 | -43.83 | 12.33 | 1.41 | -32.91 | -13.00 | 19.91 |
| 2830.00 | V | 49.87 | -52.70 | 12.33 | 1.41 | -41.78 | -13.00 | 28.78 |
| 3537.50 | H | 53.78 | -47.02 | 12.21 | 1.60 | -36.41 | -13.00 | 23.41 |
| 3537.50 | V | 53.03 | -46.44 | 12.21 | 1.60 | -35.83 | -13.00 | 22.83 |
| 297.00 | H | 46.52 | -62.17 | 0.00 | 0.31 | -62.48 | -13.00 | 49.48 |
| 297.00 | V | 48.53 | -58.52 | 0.00 | 0.31 | -58.83 | -13.00 | 45.83 |

LTE Band 17 (30MHz-10GHz)

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|----------------------------|----------------|-------------------------------|-------------------------------|------------------------------|--------------------|----------------------------|----------------|----------------|
| | | | Substituted Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| QPSK,Frequency:710.000 MHz | | | | | | | | |
| 1420.00 | H | 38.38 | -65.55 | 9.66 | 1.25 | -57.14 | -13.00 | 44.14 |
| 1420.00 | V | 39.42 | -64.57 | 9.66 | 1.25 | -56.16 | -13.00 | 43.16 |
| 2130.00 | H | 38.36 | -65.36 | 11.68 | 1.16 | -54.84 | -13.00 | 41.84 |
| 2130.00 | V | 38.99 | -65.05 | 11.68 | 1.16 | -54.53 | -13.00 | 41.53 |
| 2840.00 | H | 45.48 | -56.66 | 12.34 | 1.42 | -45.74 | -13.00 | 32.74 |
| 2840.00 | V | 44.80 | -57.72 | 12.34 | 1.42 | -46.80 | -13.00 | 33.80 |
| 634.00 | H | 44.39 | -57.52 | 0.00 | 0.37 | -57.89 | -13.00 | 44.89 |
| 634.00 | V | 47.84 | -51.33 | 0.00 | 0.37 | -51.70 | -13.00 | 38.70 |

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

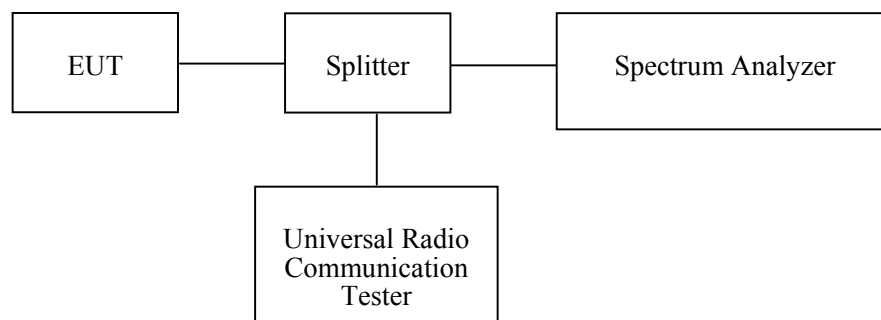
FCC §22.917(a) & §24.238(a) & §27.53 - BAND EDGES**Applicable Standard**

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 |
|-----------------|------------------|---------------|---------------|------------------|----------------------|
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 831929/005 | 2018-08-03 | 2019-08-03 |
| yzjingcheng | Coaxial Cable | KTRFBU-141-50 | 41005012 | Each time | N/A |
| Unknown | Coaxial Cable | C-SJ00-0010 | C0010/01 | Each time | N/A |
| E-Microwave | Two-way Splitter | ODP-1-6-2S | OE0120142 | 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).

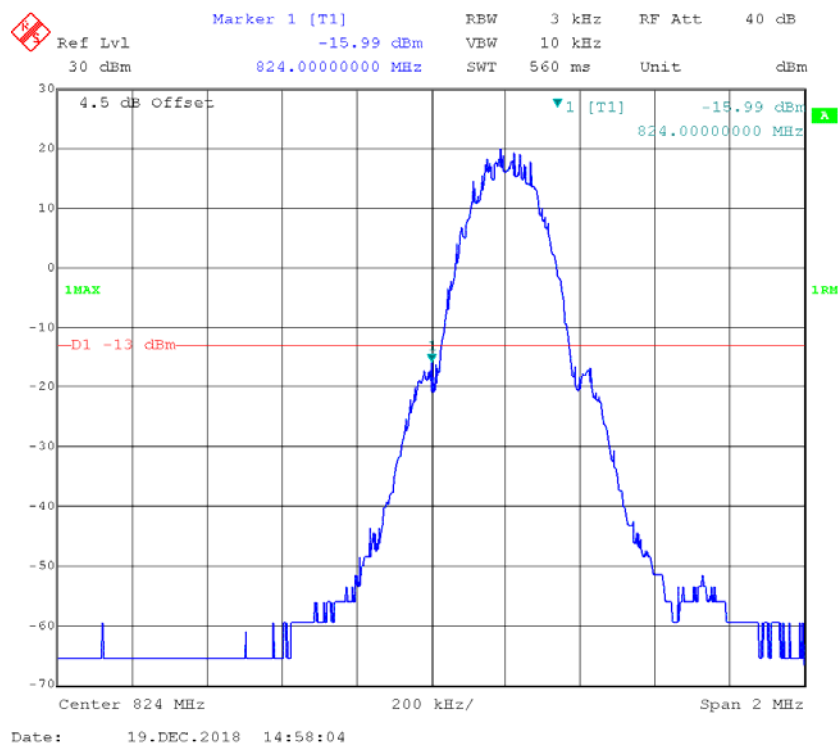
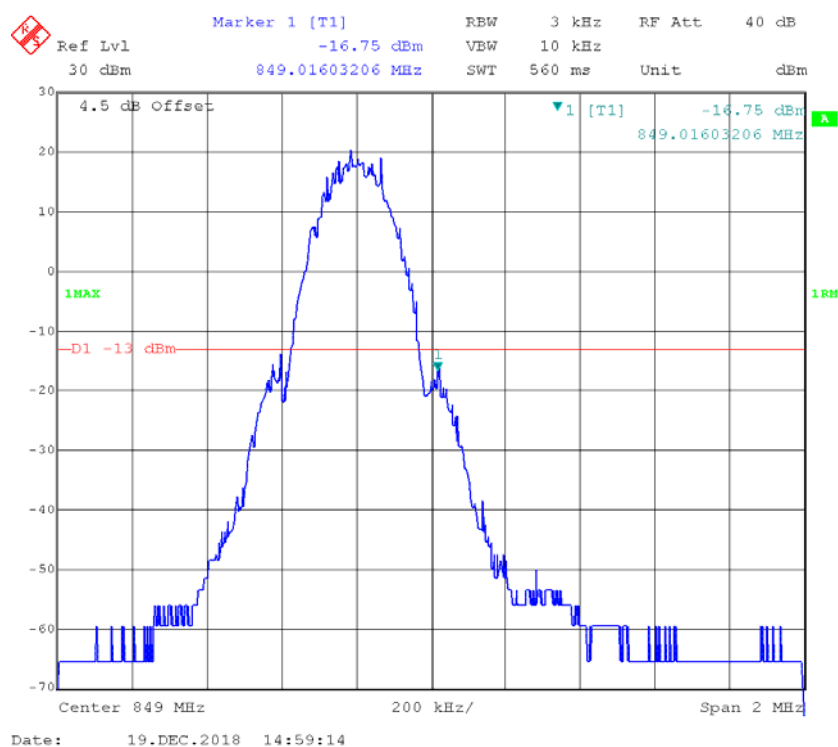
Test Data**Environmental Conditions**

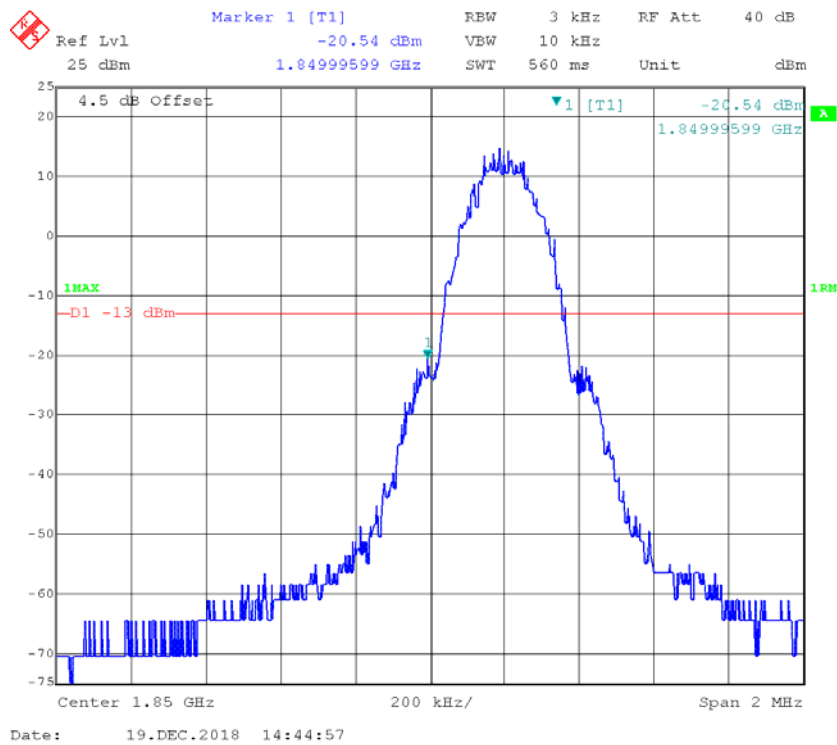
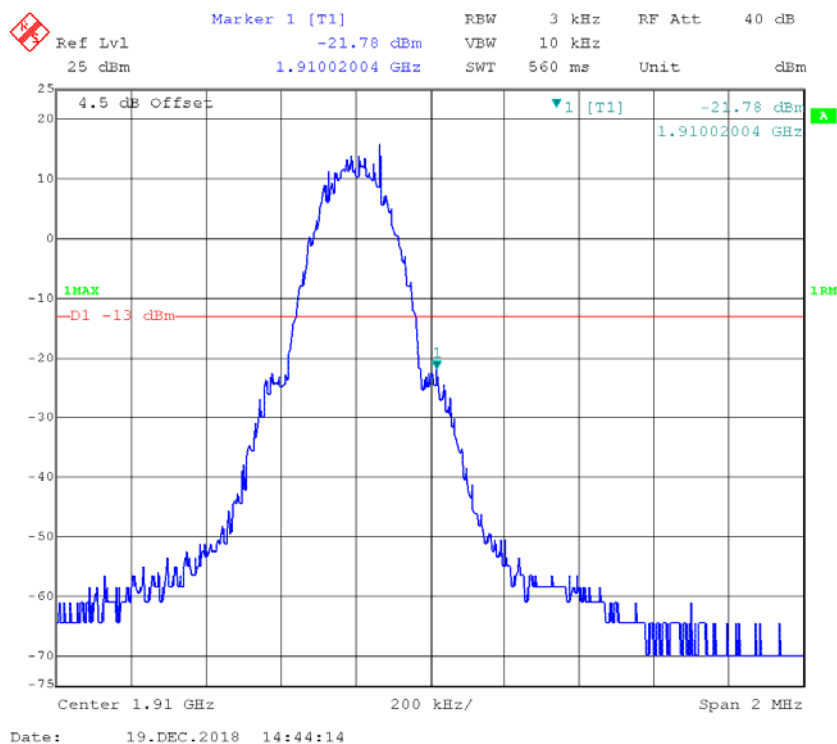
| | |
|---------------------------|----------------|
| Temperature: | 24.5~24.9°C |
| Relative Humidity: | 41~46 % |
| ATM Pressure: | 99.7~100.5 kPa |

The testing was performed by Tiago Huang from 2018-12-19 to 2018-12-26.

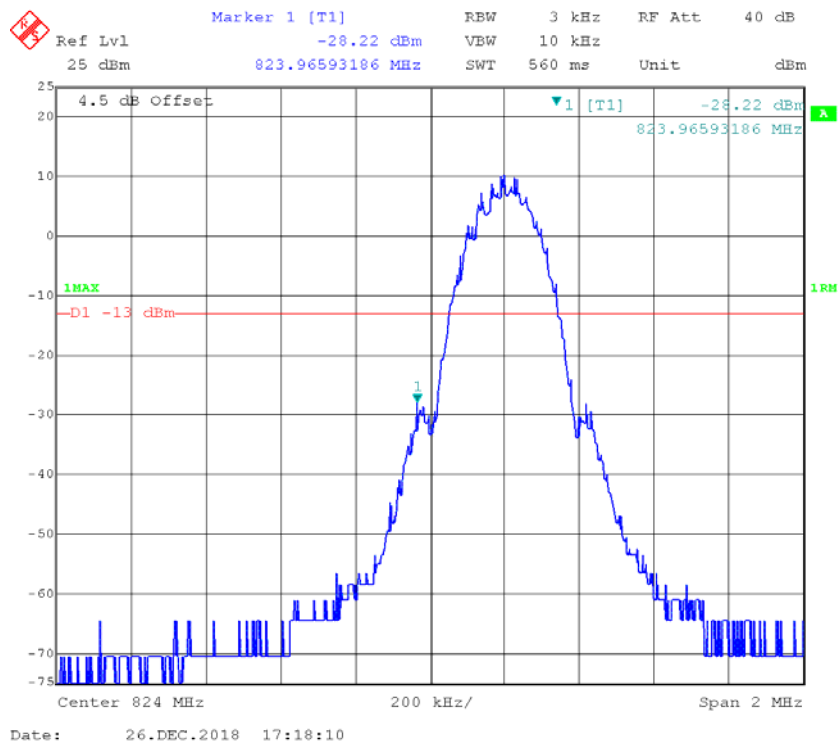
Test Mode: Transmitting

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

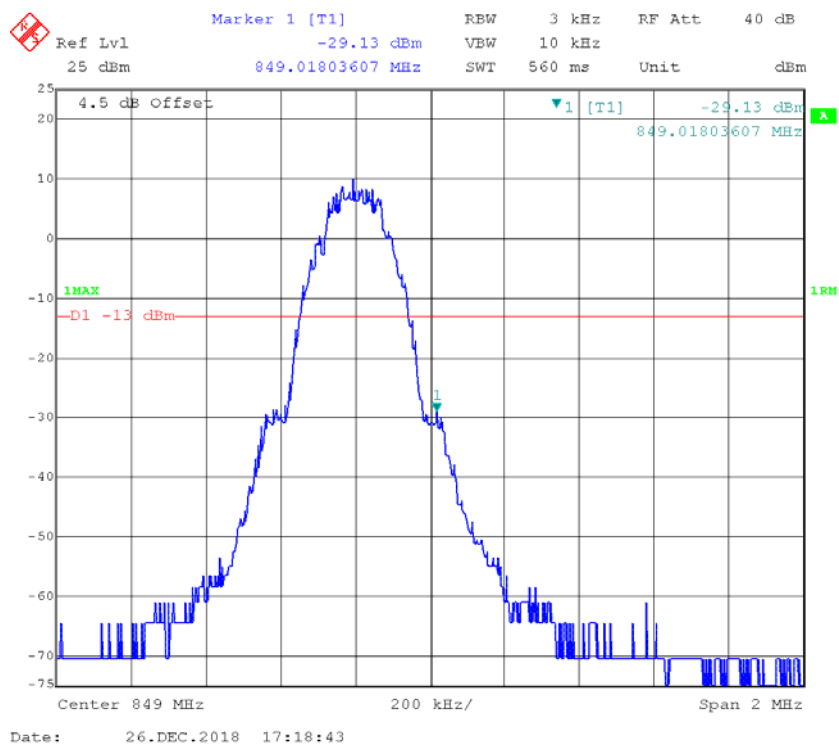
GSM 850, Left Band Edge**GSM 850, Right Band Edge**

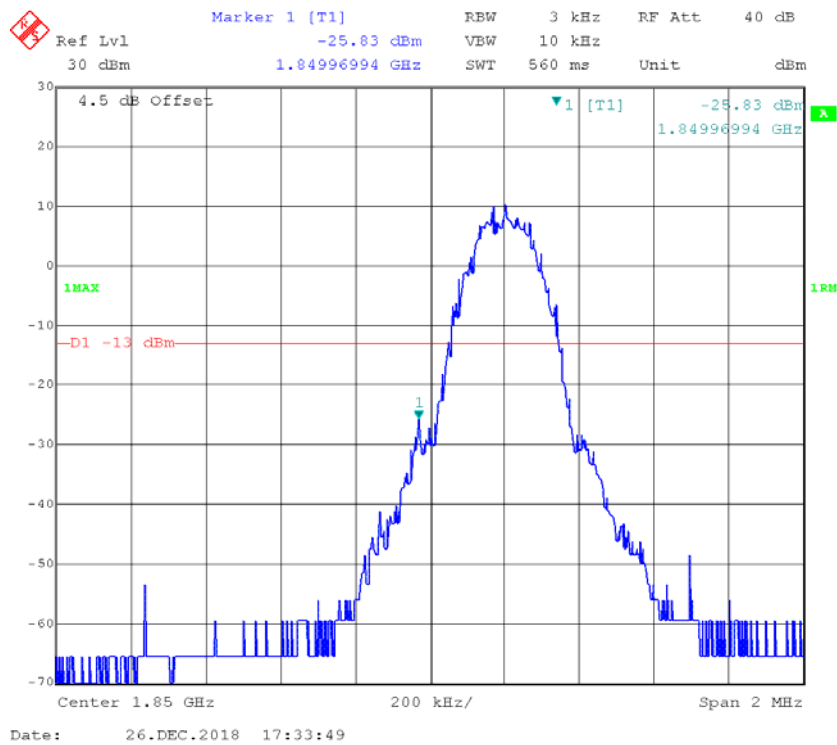
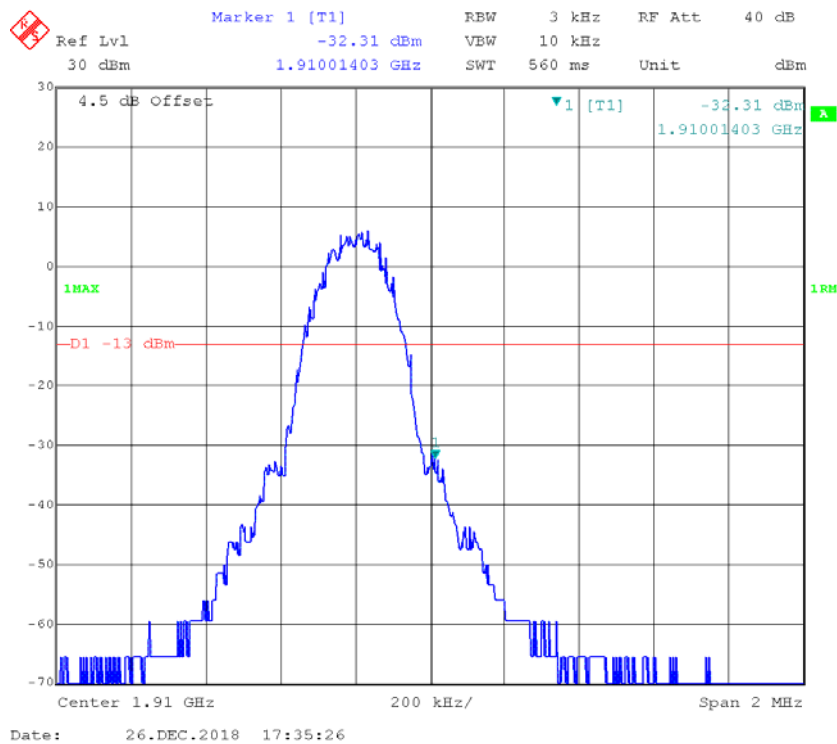
GSM 1900, Left Band Edge**GSM 1900, Right Band Edge**

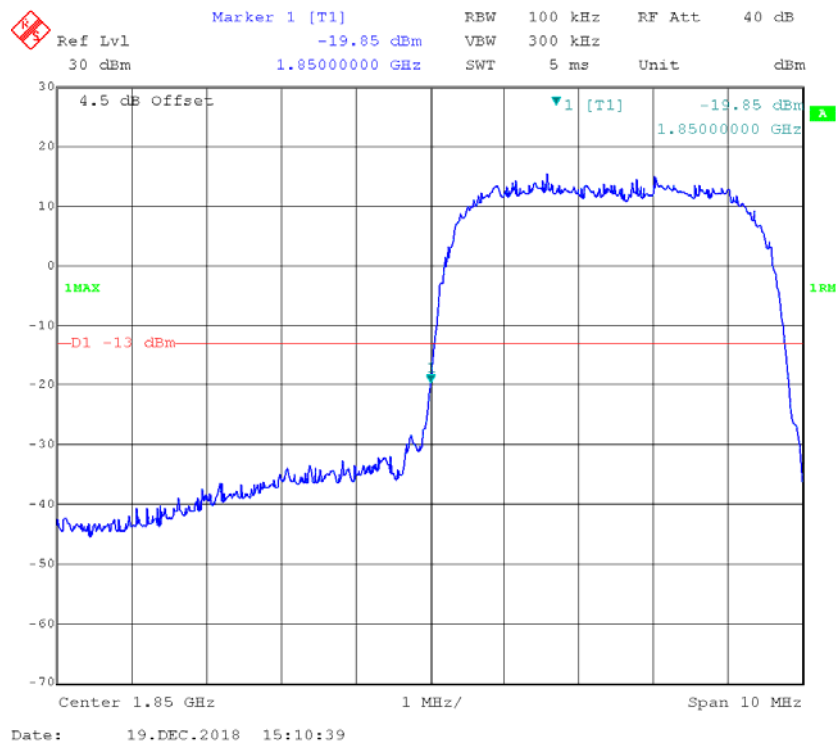
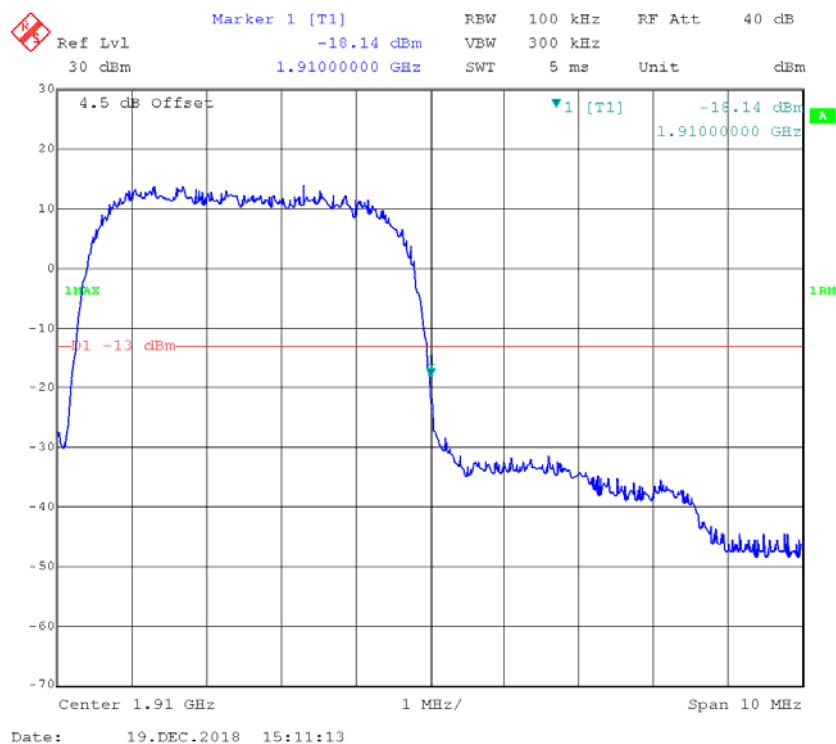
EDGE 850, Left Band Edge

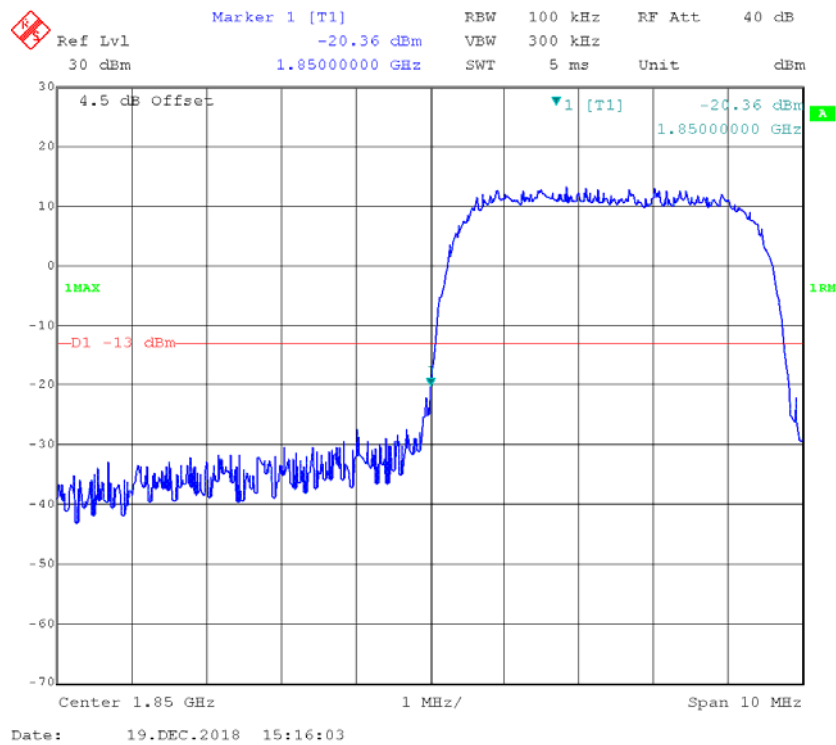
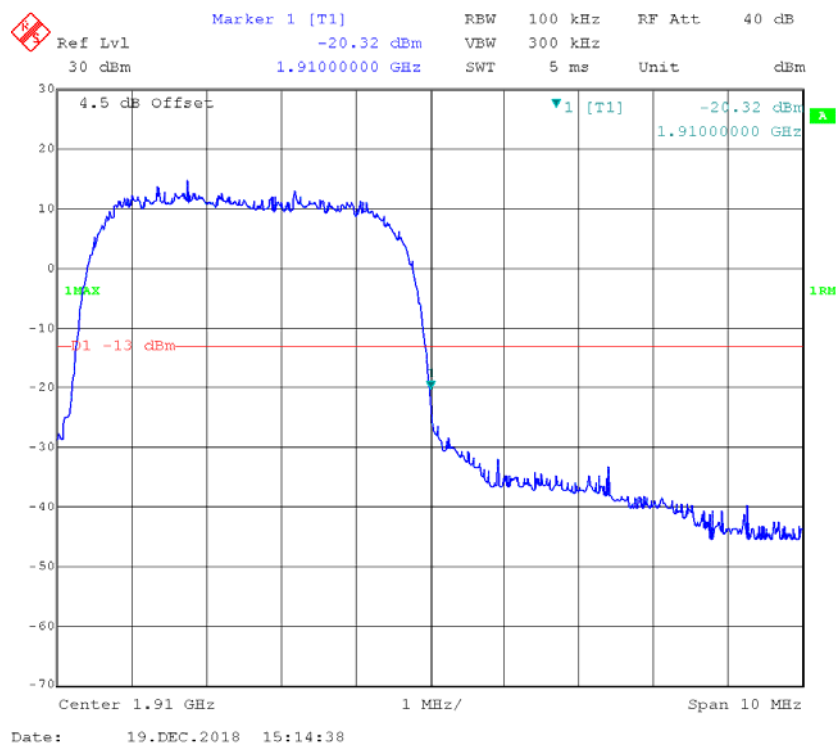


EDGE 850, Right Band Edge

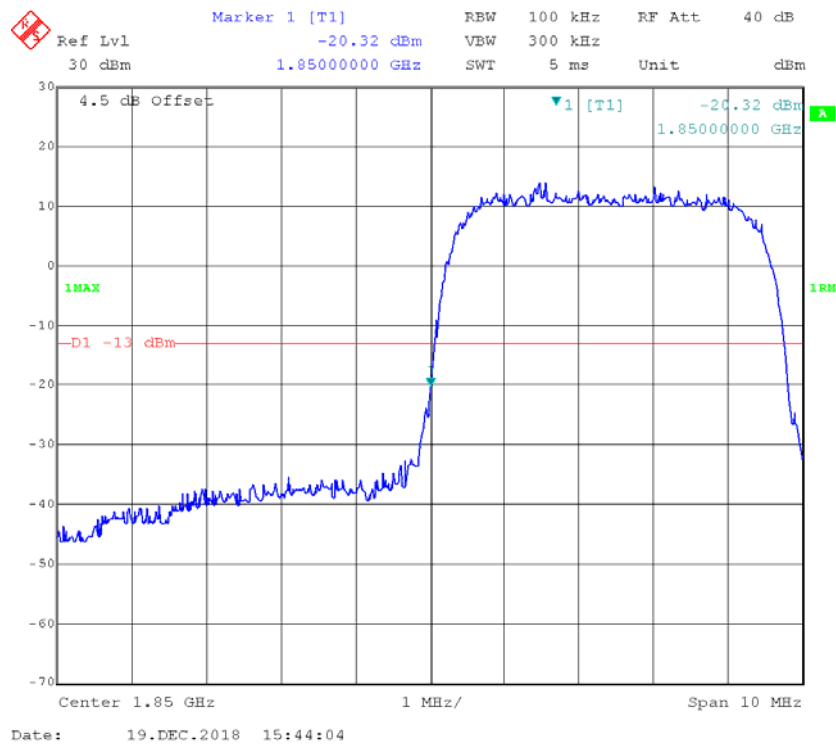


EDGE 1900, Left Band Edge**EDGE 1900, Right Band Edge**

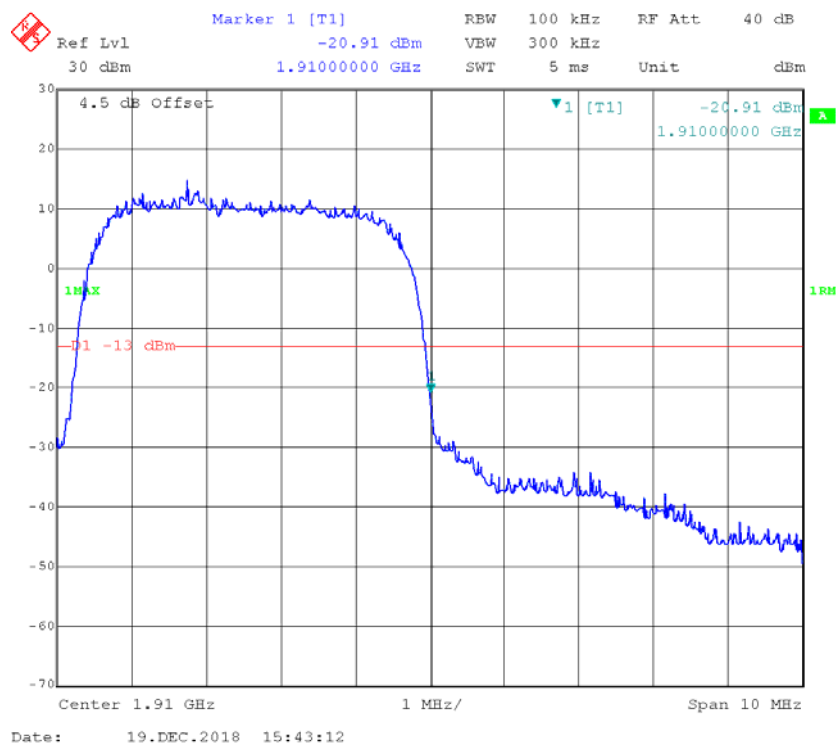
WCDMA Band II Rel 99, Left Band Edge**WCDMA Band II Rel 99, Right Band Edge**

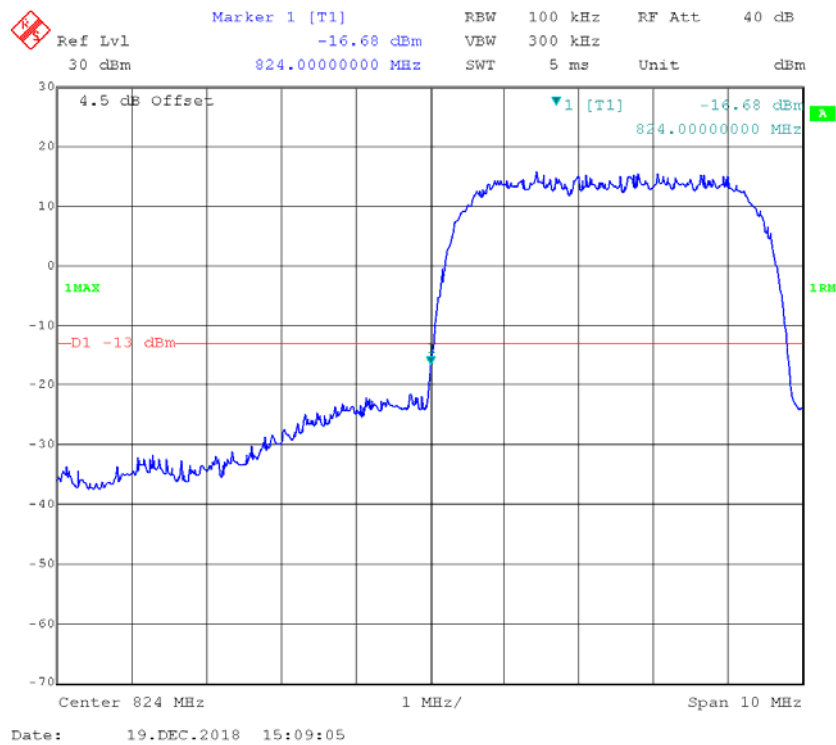
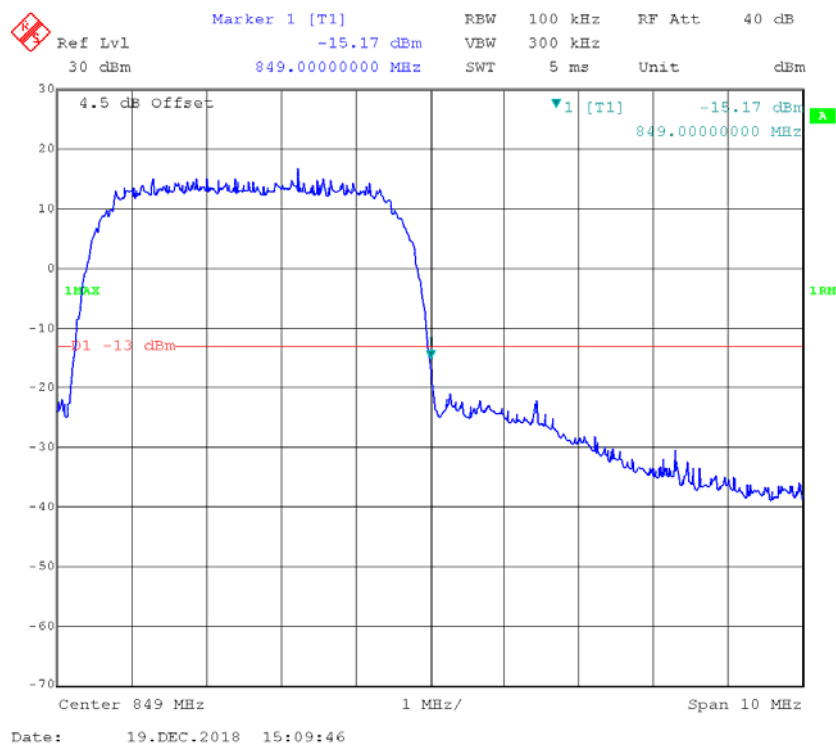
WCDMA Band II HSDPA, Left Band Edge**WCDMA Band II HSDPA, Right Band Edge**

WCDMA Band II HSUPA, Left Band Edge

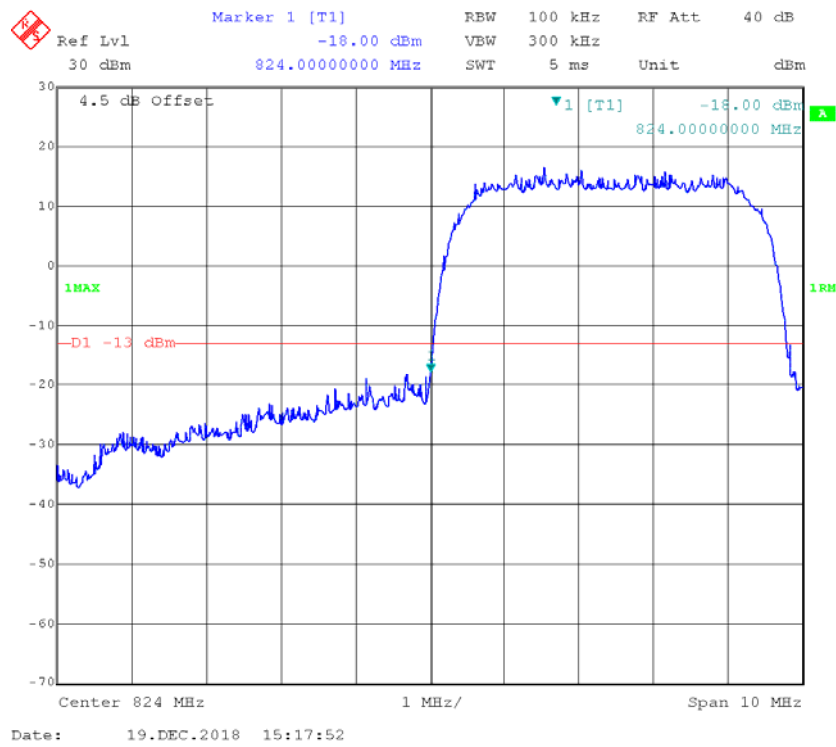


WCDMA Band II HSUPA, Right Band Edge

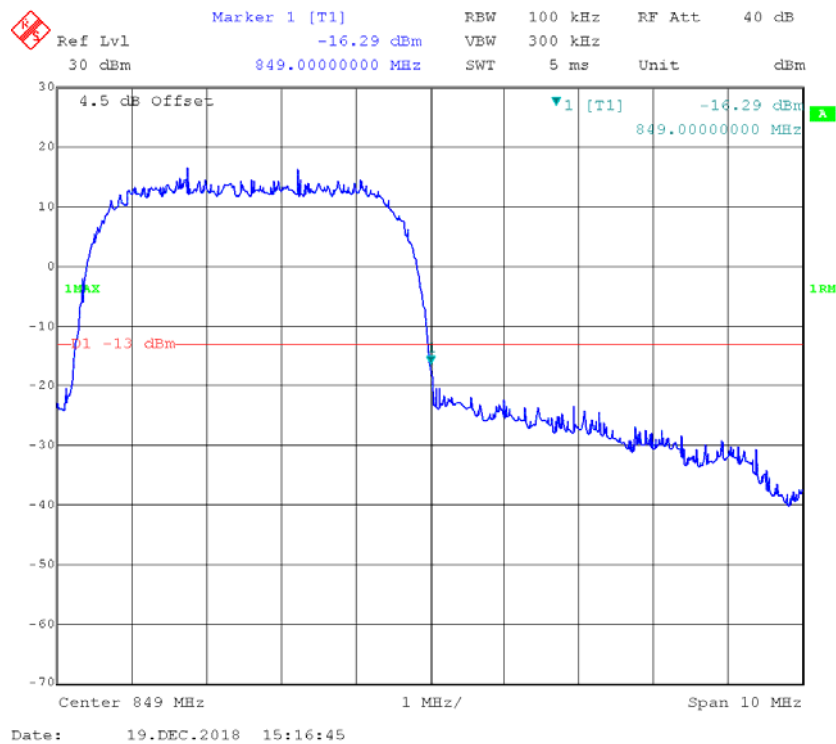


WCDMA Band V Rel 99, Left Band Edge**WCDMA Band V Rel 99, Right Band Edge**

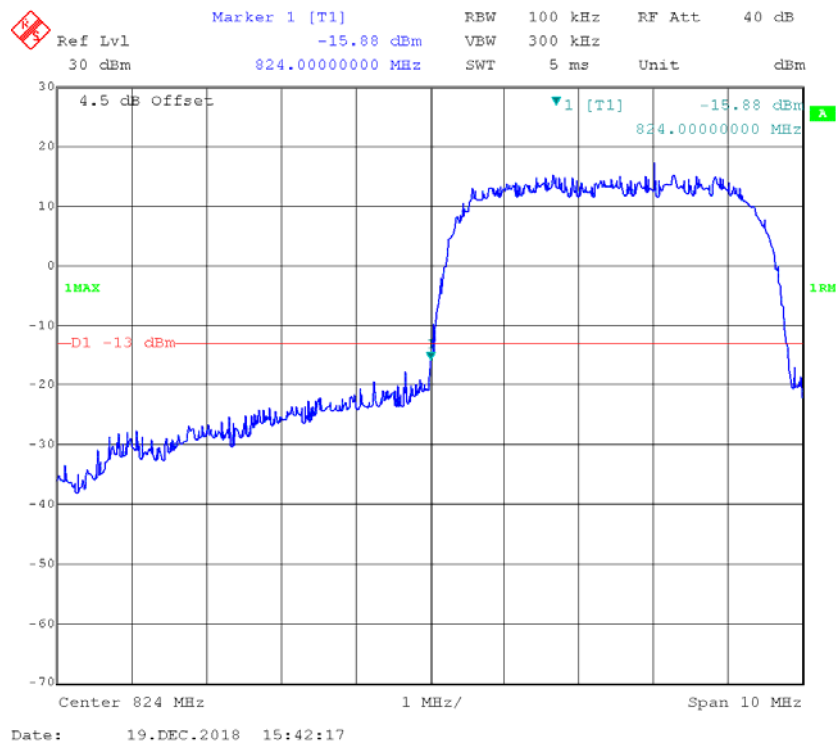
WCDMA Band V HSDPA, Left Band Edge



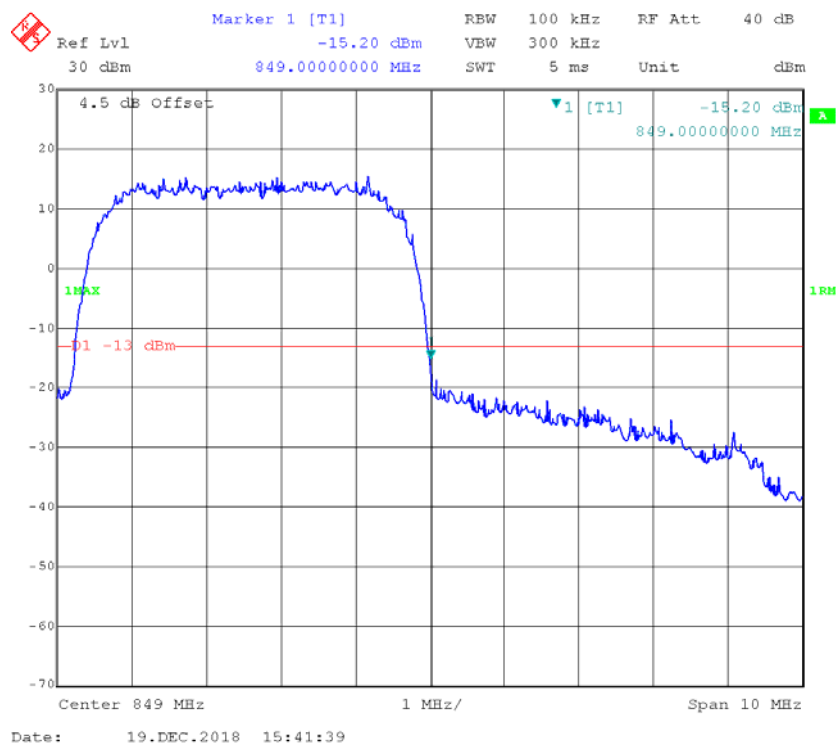
WCDMA Band V HSDPA, Right Band Edge



WCDMA Band V HSUPA, Left Band Edge

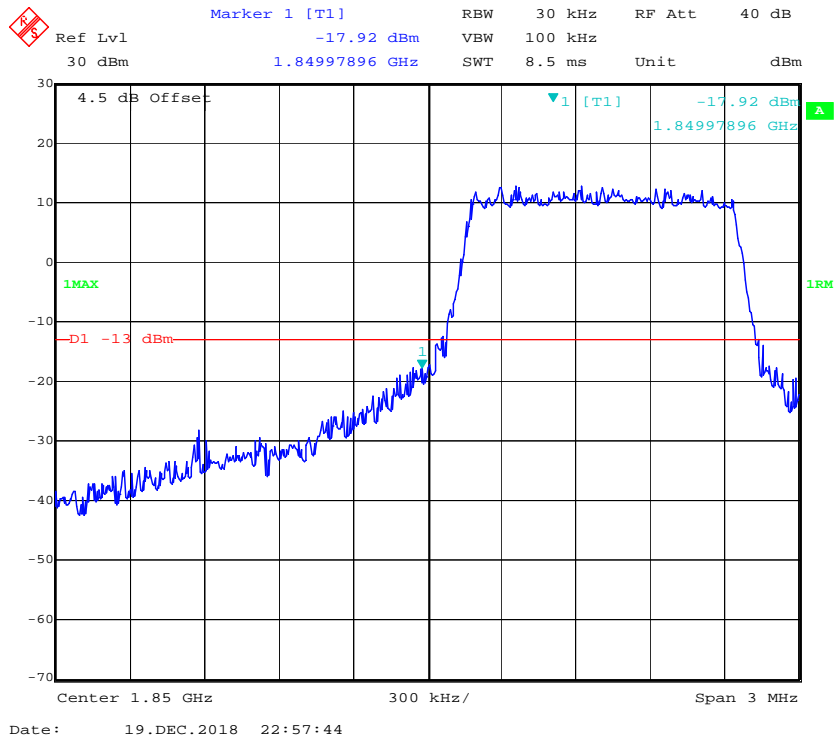


WCDMA Band V HSUPA, Right Band Edge

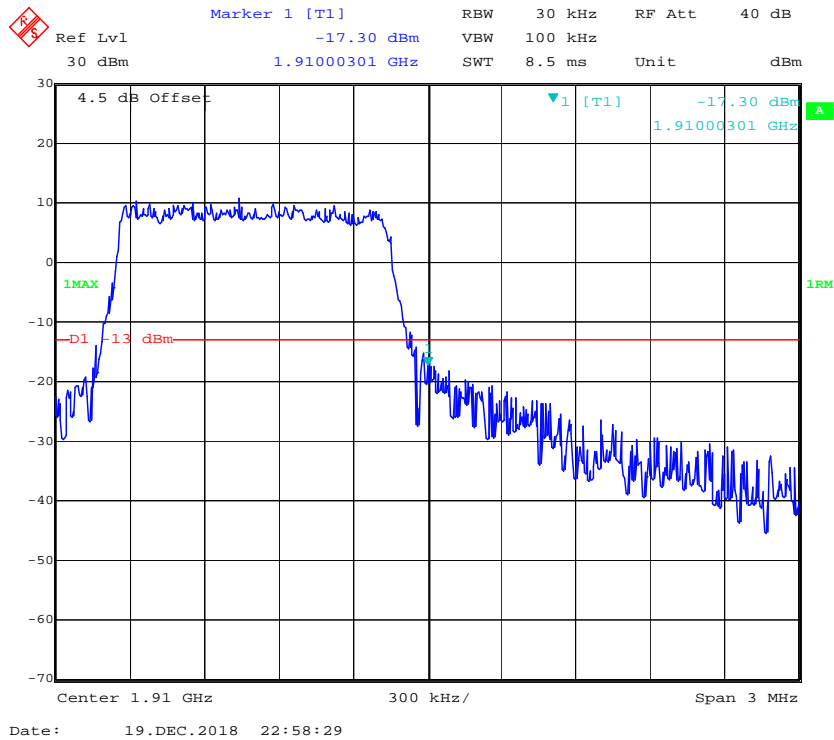


LTE Band 2

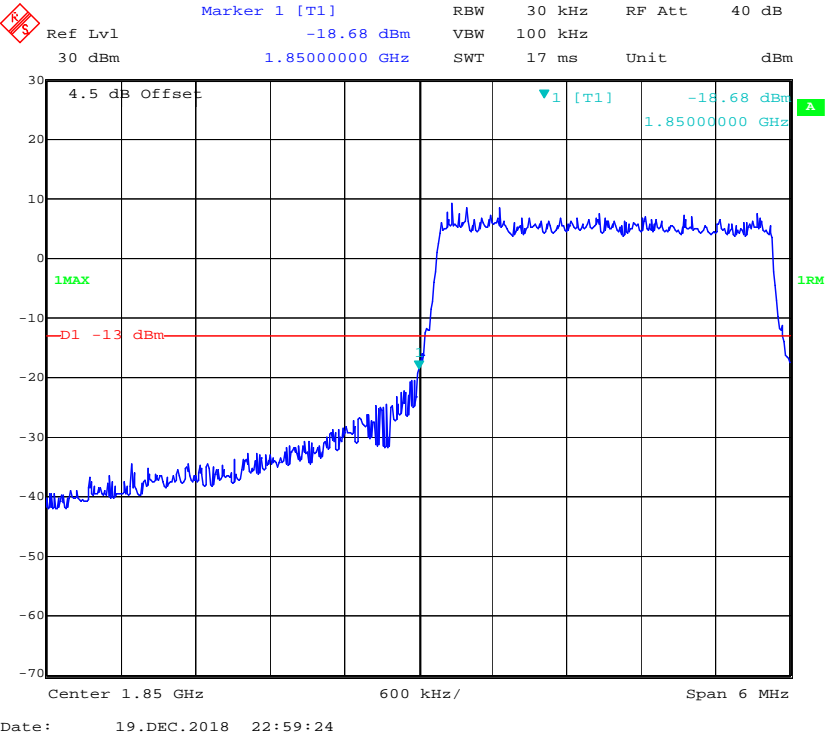
QPSK_1.4MHz_6 RB_ Left



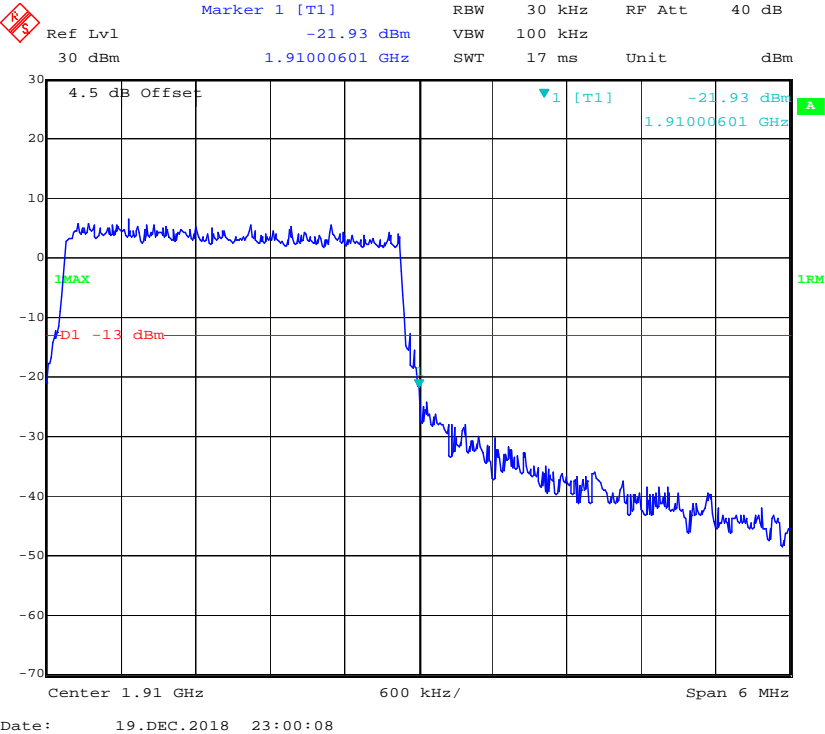
QPSK_1.4MHz_6 RB_ Right



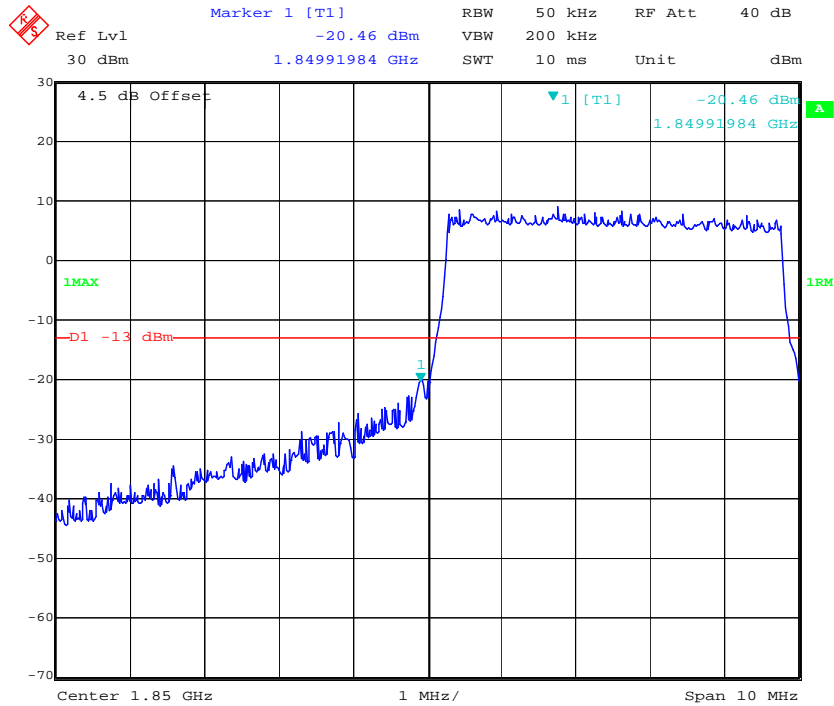
QPSK_3MHz_15 RB_ Left



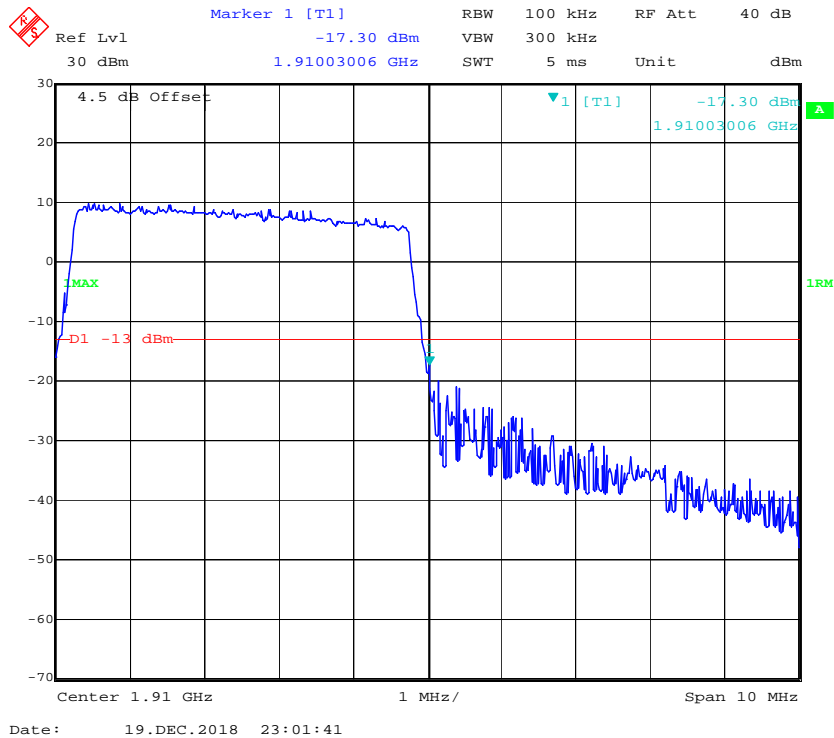
QPSK_3MHz_15 RB_ Right



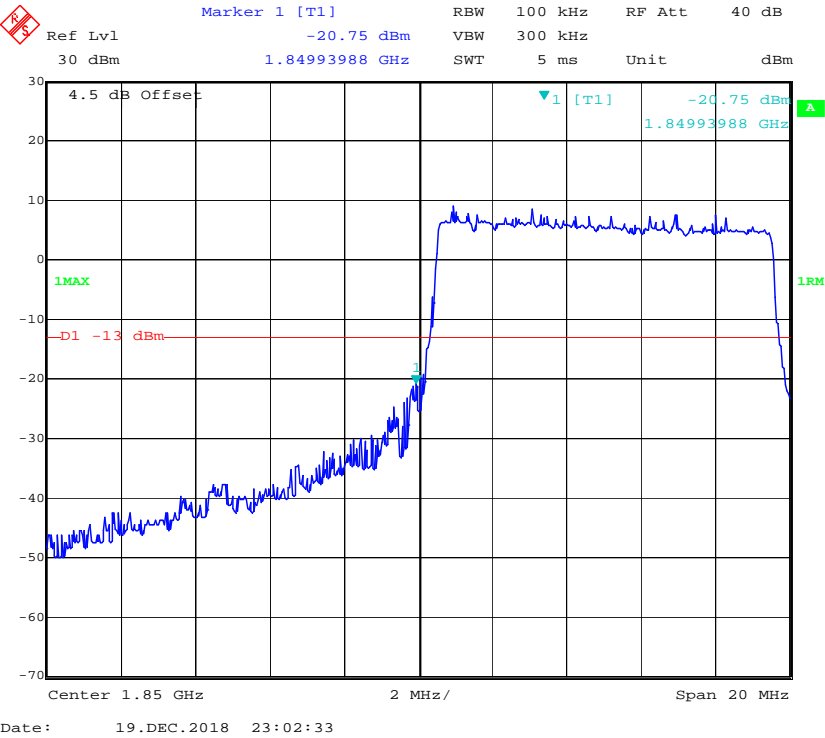
QPSK_5MHz_25 RB_ Left



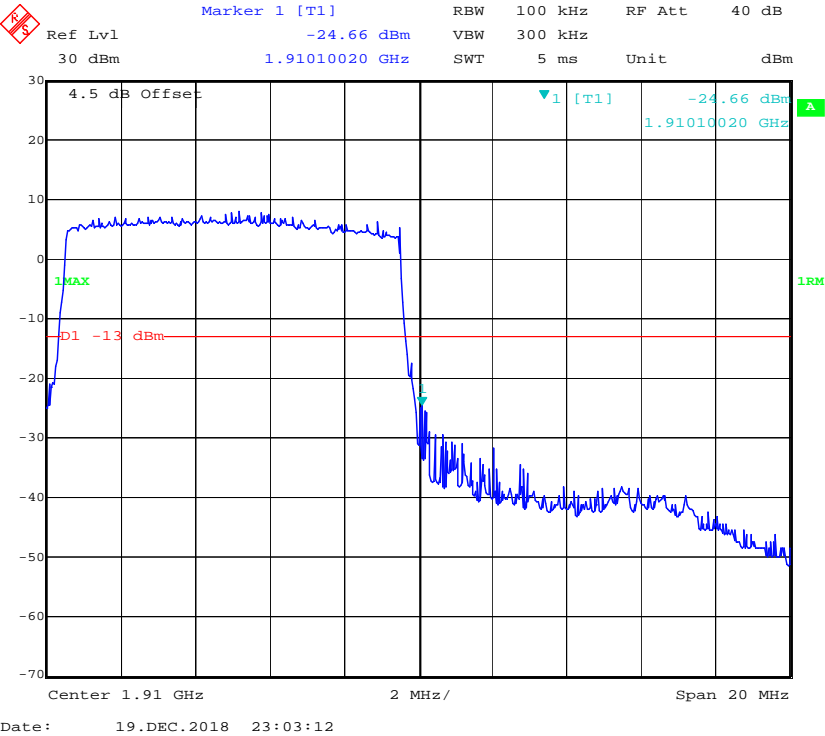
QPSK_5MHz_25 RB_ Right



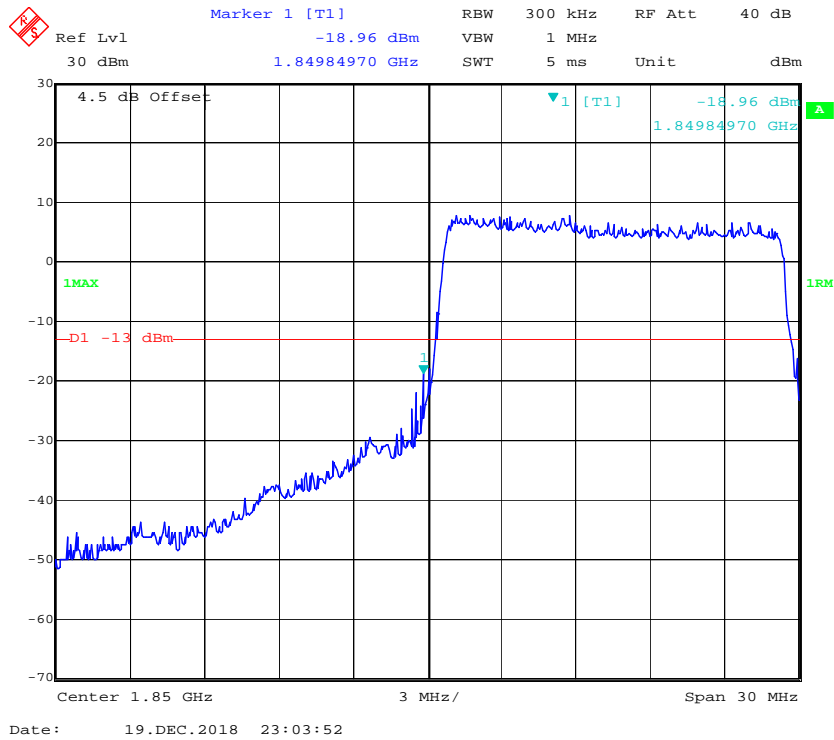
QPSK_10MHz_50 RB_ Left



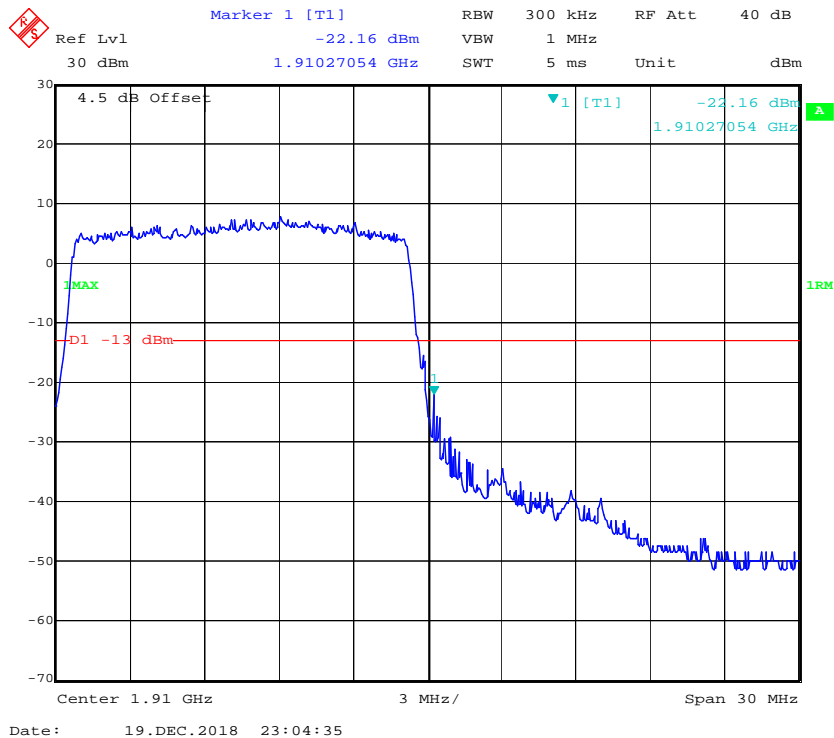
QPSK_10MHz_50 RB_ Right



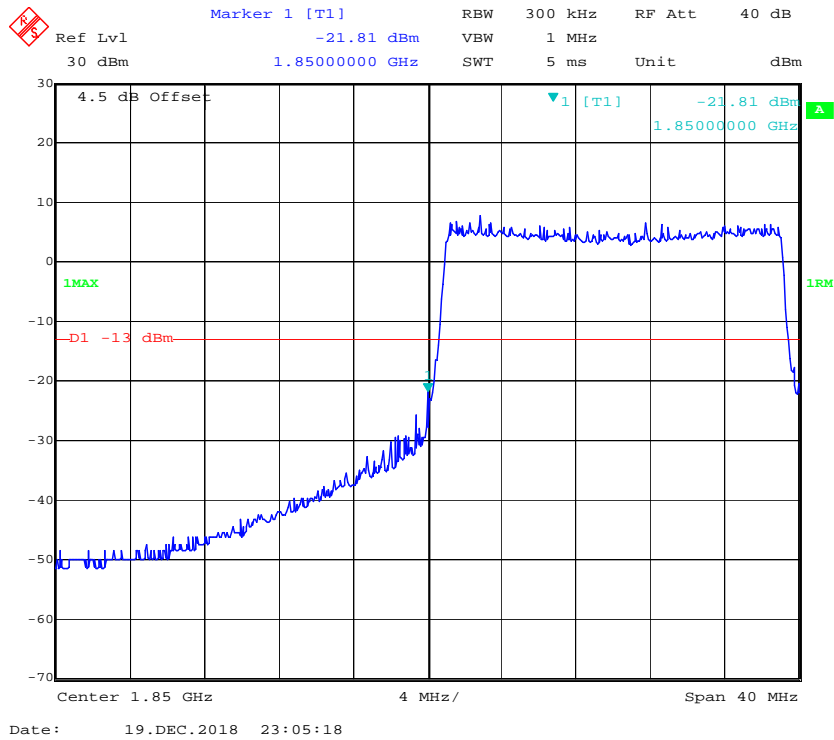
QPSK_15MHz_ 75 RB_ Left



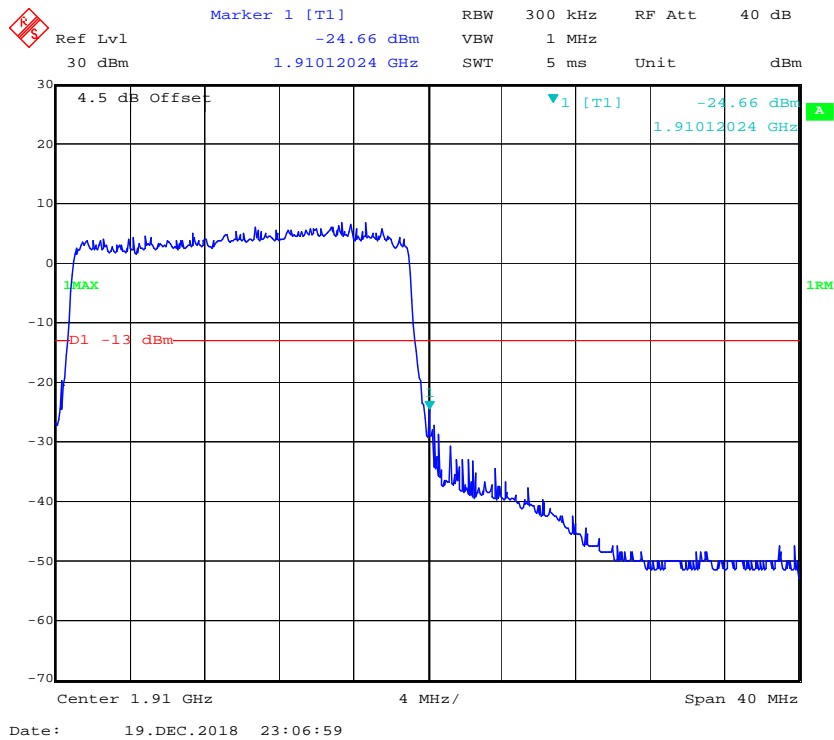
QPSK_15MHz_ 75 RB_ Right



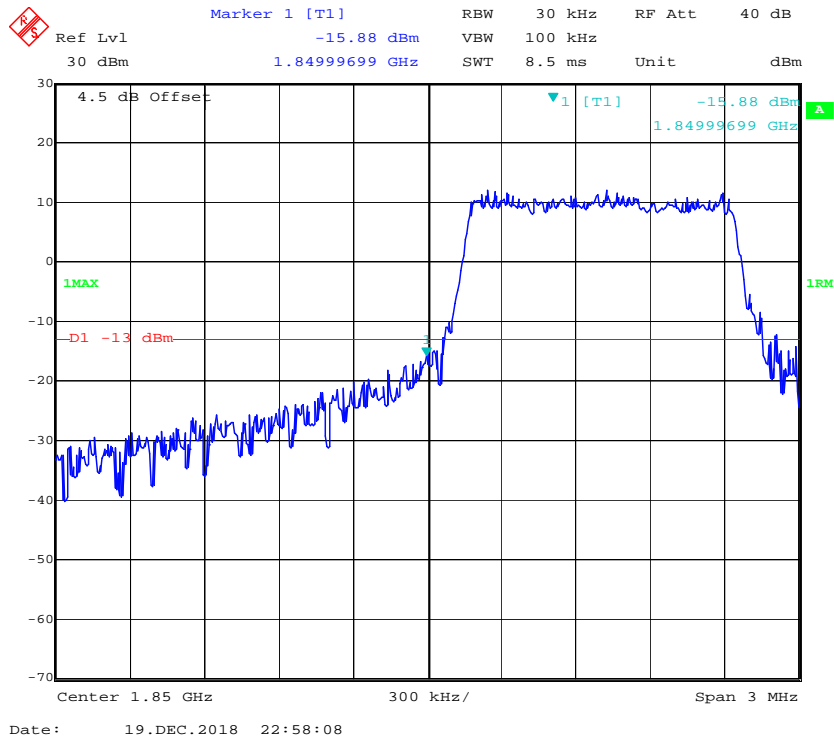
QPSK_20MHz_FULL RB_Left



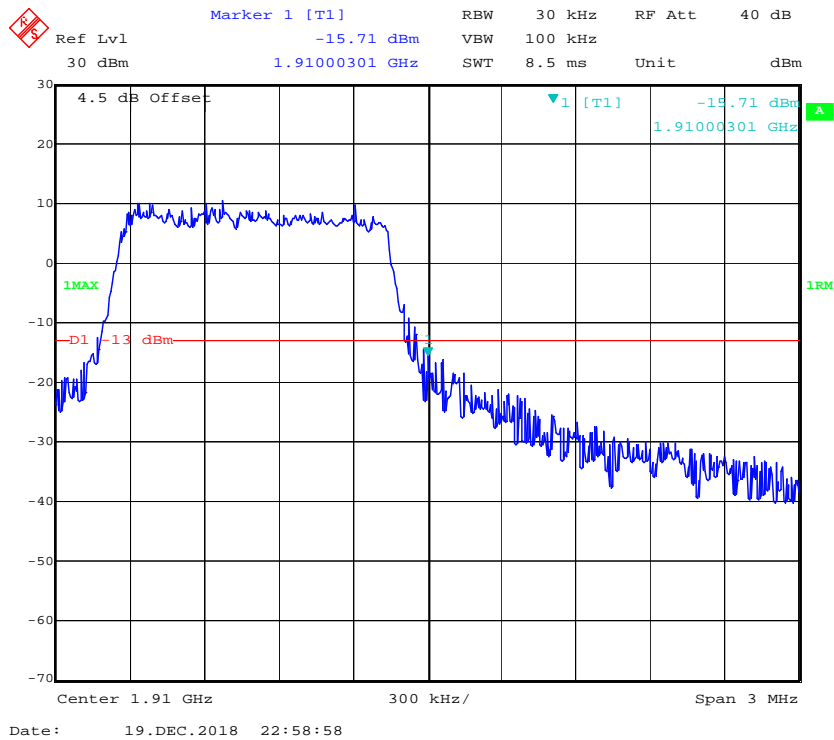
QPSK_20MHz_FULL RB_Right



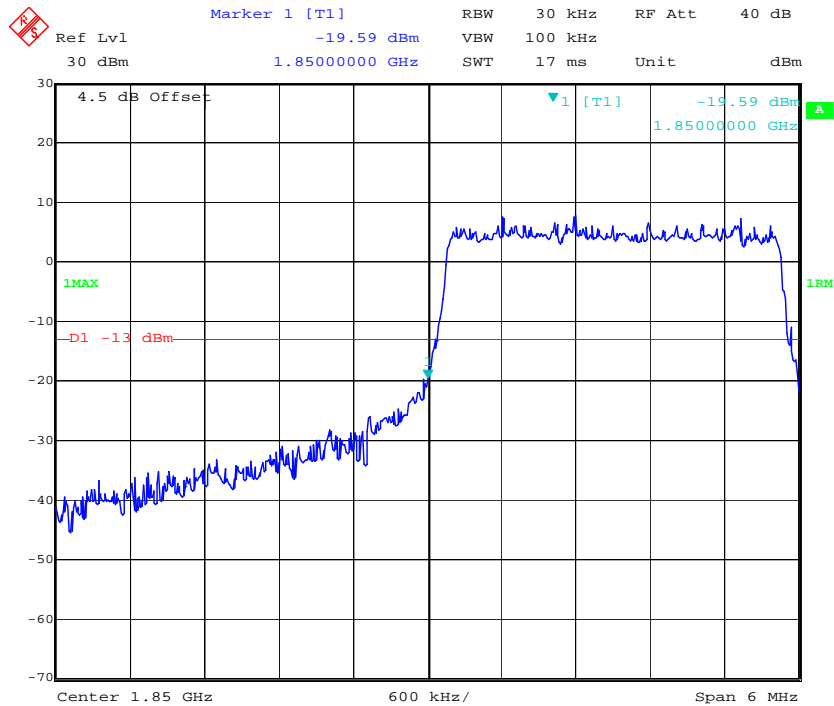
16QAM_1.4MHz_6 RB_ Left



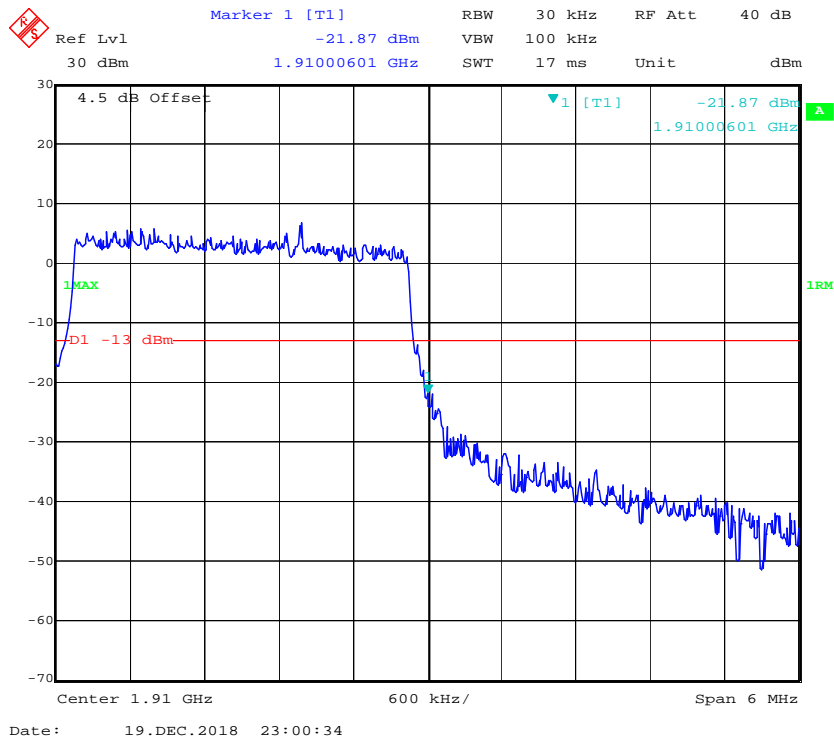
16QAM_1.4MHz_6 RB_ Right



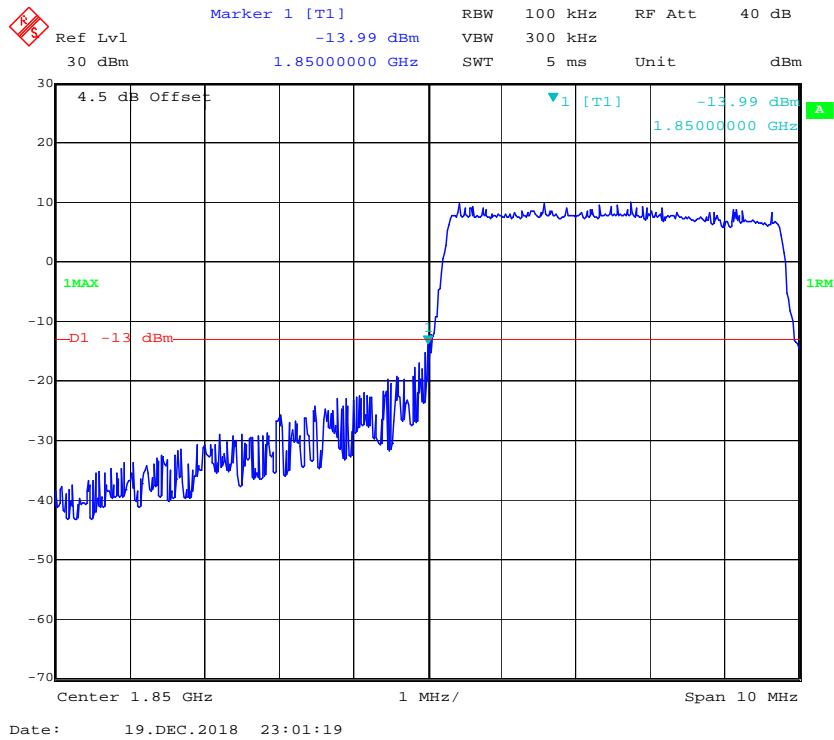
16QAM_3MHz_15 RB_Left



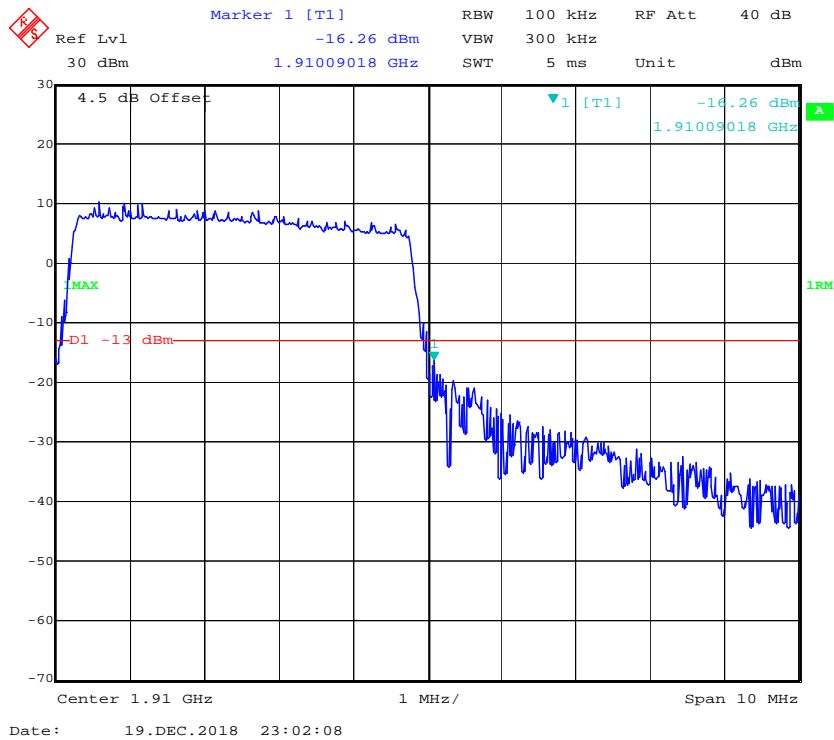
16QAM_3MHz_15 RB_Right



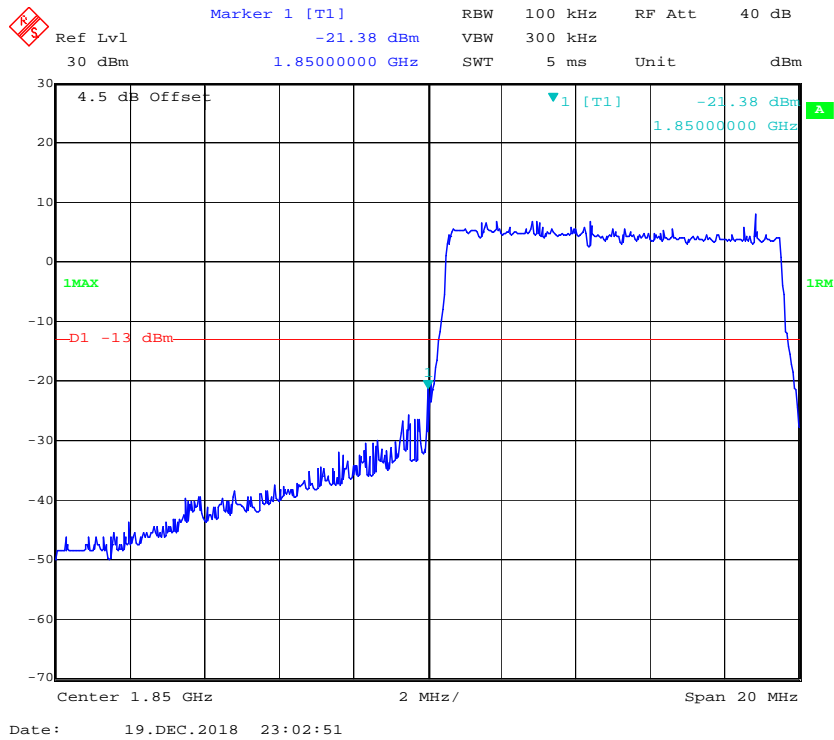
16QAM_5MHz_25 RB_ Left



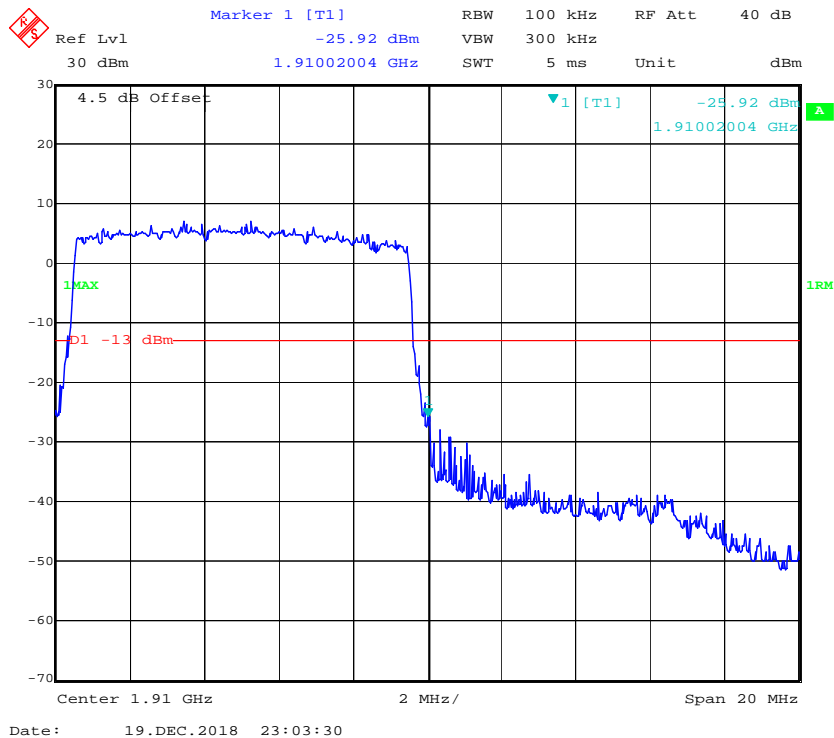
16QAM_5MHz_25 RB_ Right



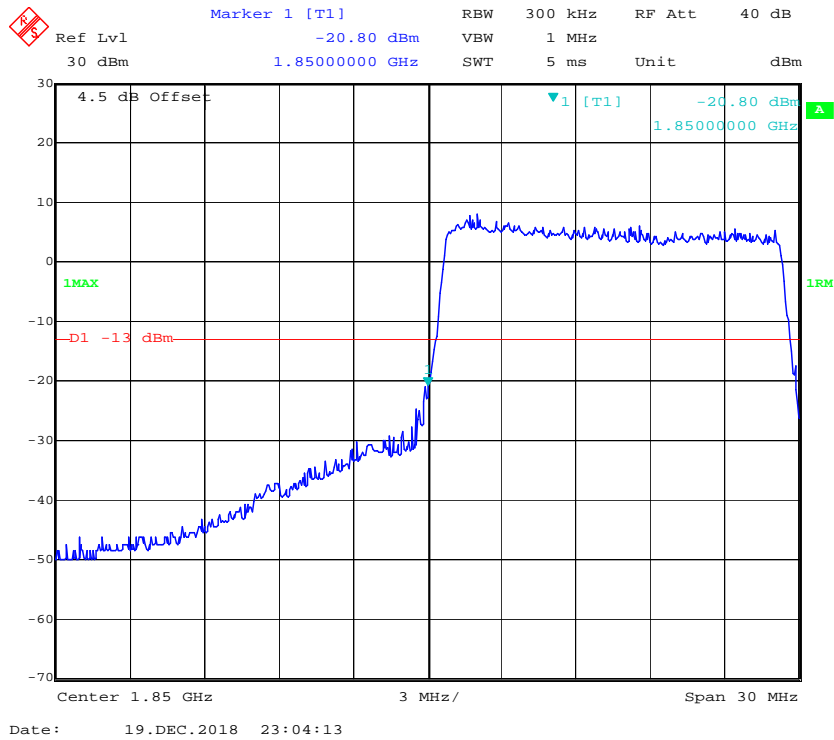
16QAM_10MHz_ 50 RB_ Left



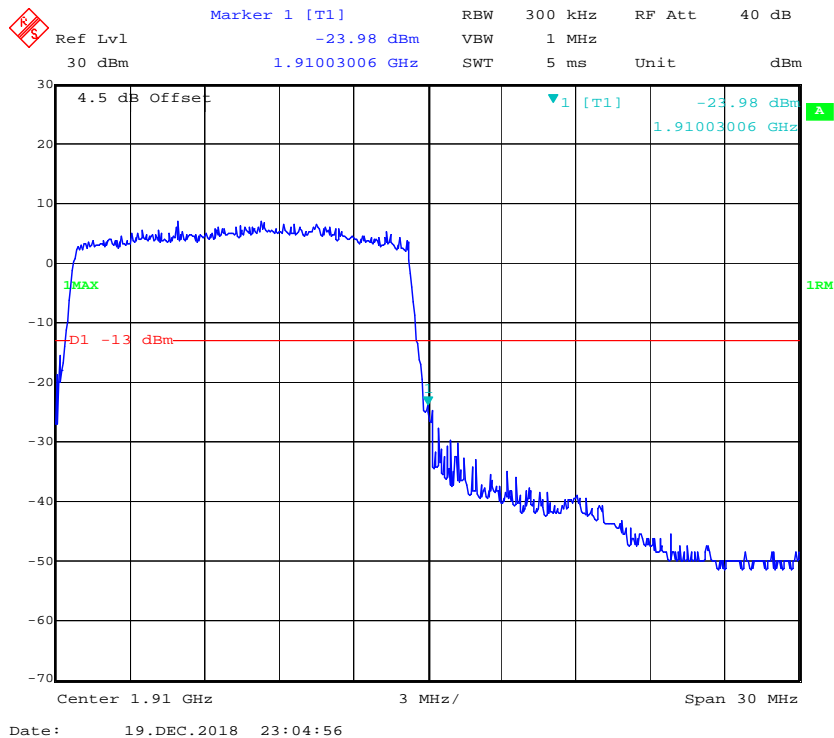
16QAM_10MHz_ 50 RB_ Right



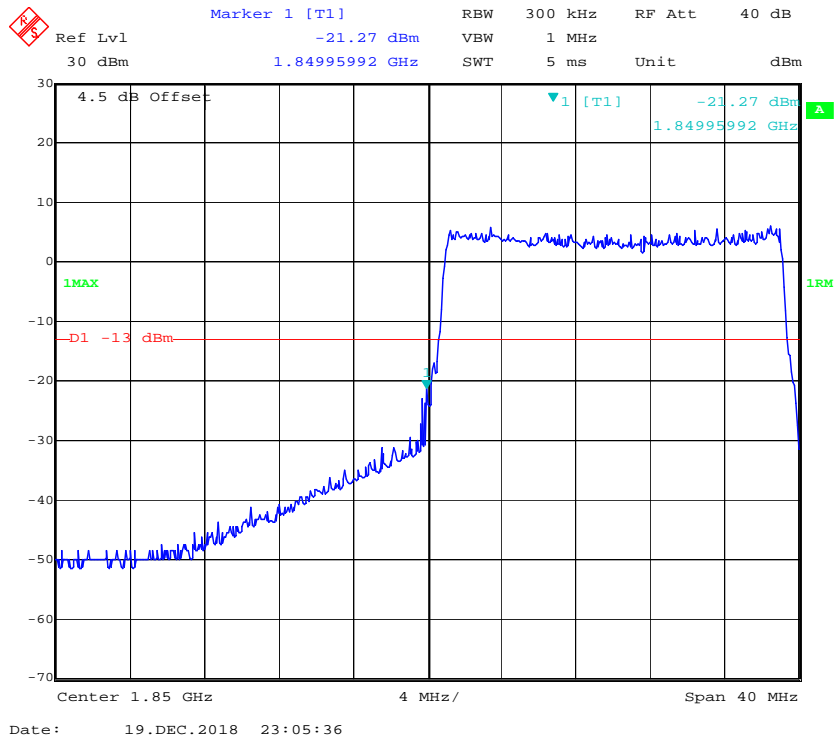
16QAM_15MHz_ 75 RB_ Left



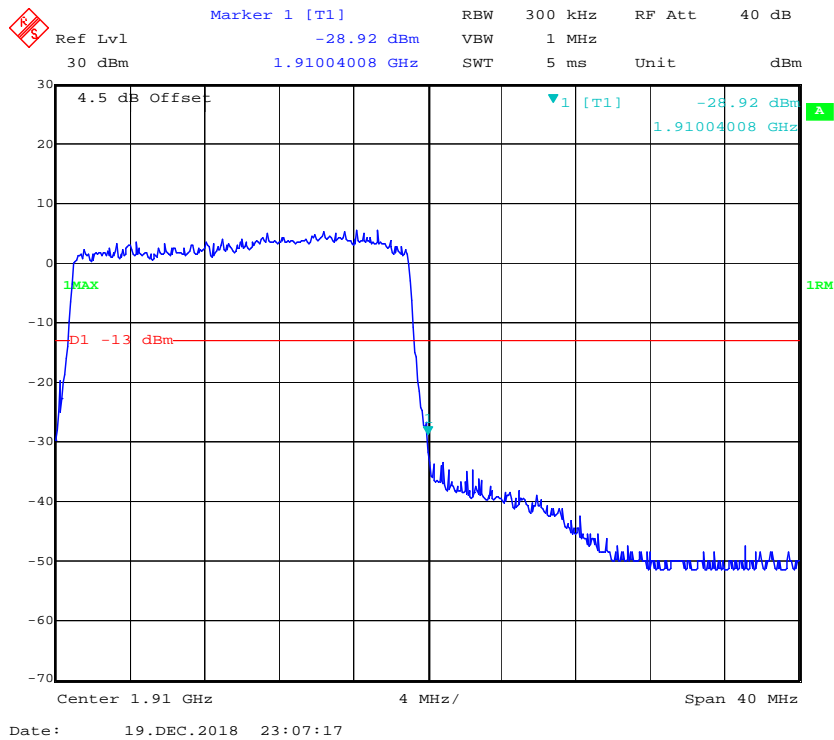
16QAM_15MHz_ 75 RB_ Right



16QAM_20MHz_ FULL RB_ Left

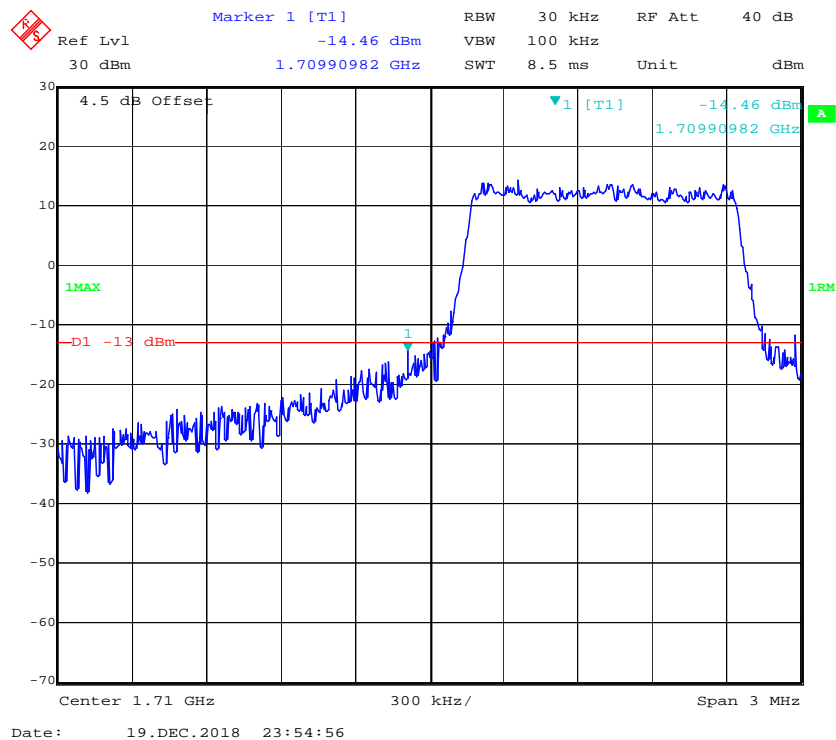


16QAM_20MHz_ FULL RB_ Right

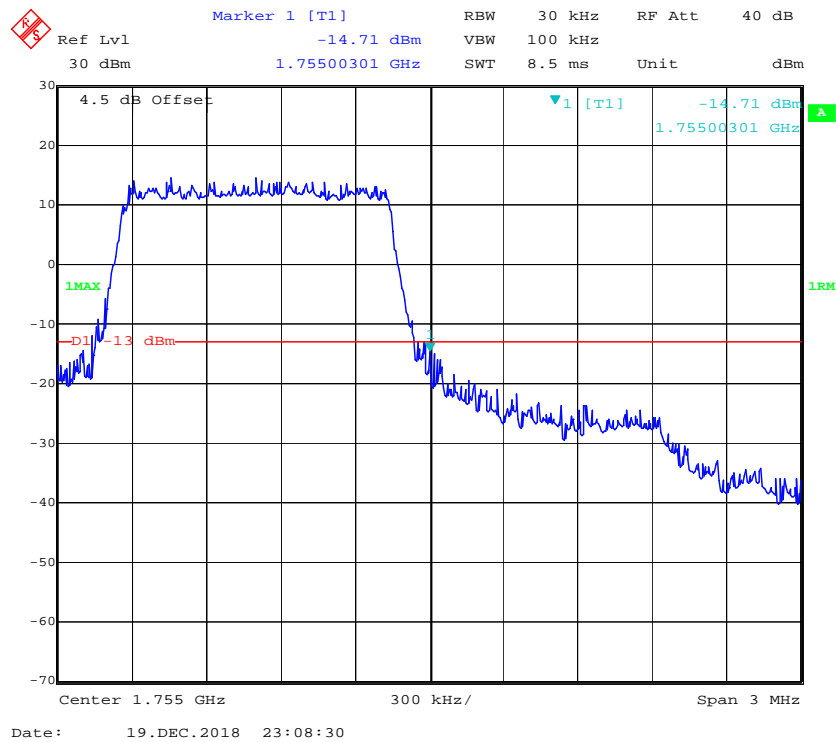


LTE Band 4

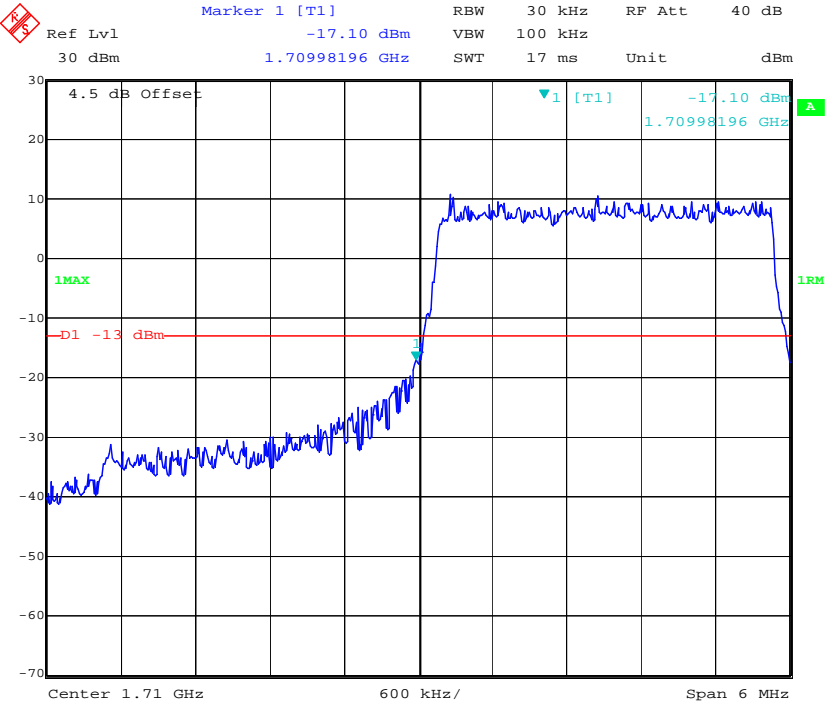
QPSK_1.4MHz_6 RB_Left



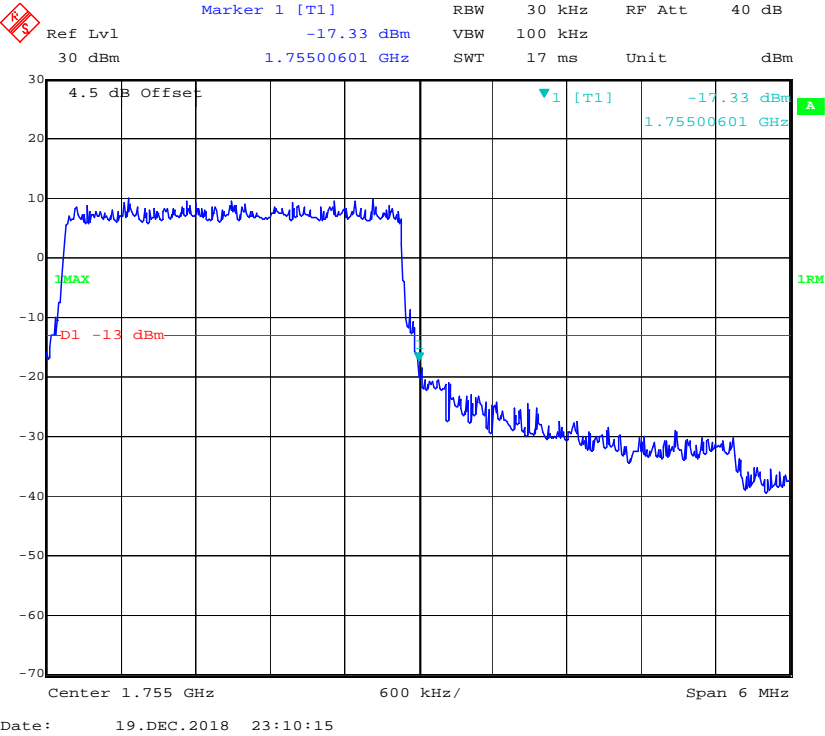
QPSK_1.4MHz_6 RB_Right



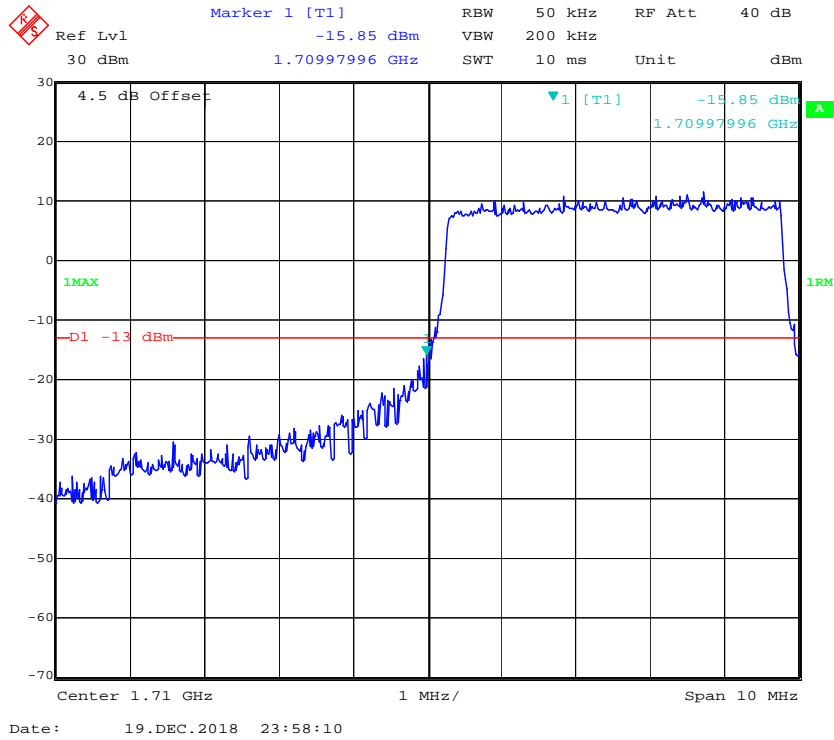
QPSK_3MHz_15 RB_Left



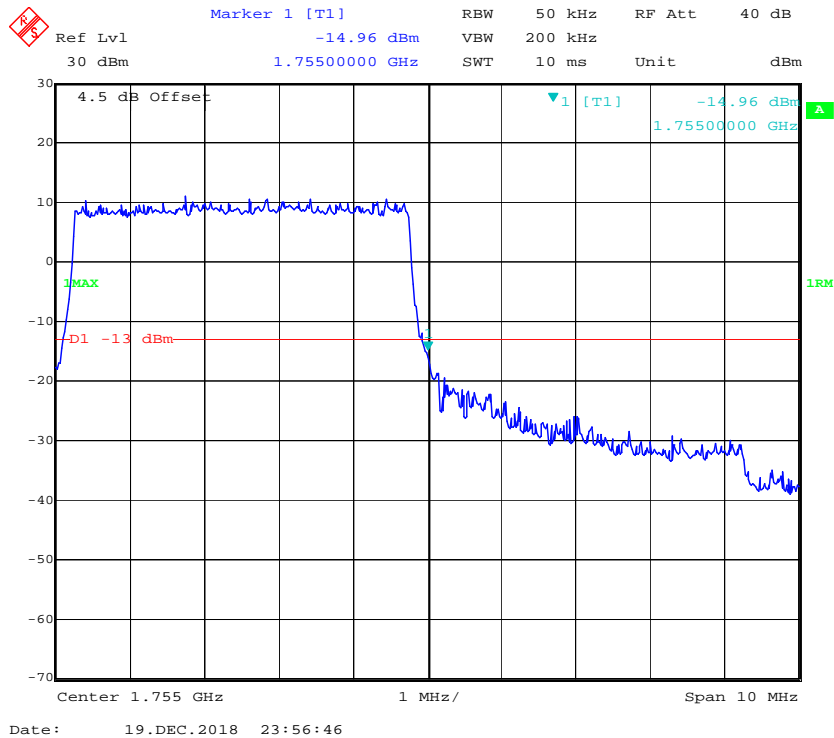
QPSK_3MHz_15 RB_Right



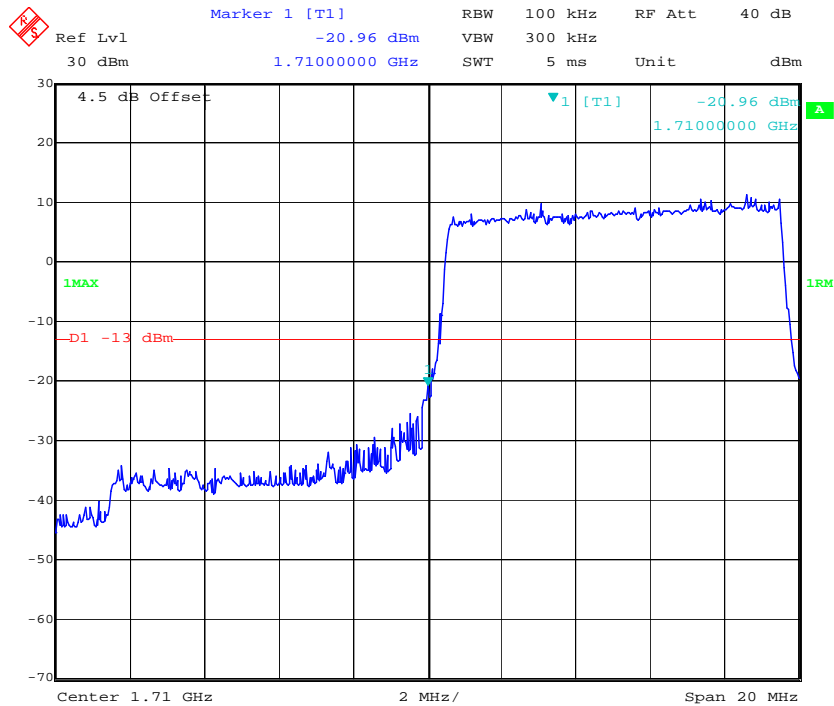
QPSK_5MHz_25 RB_Left



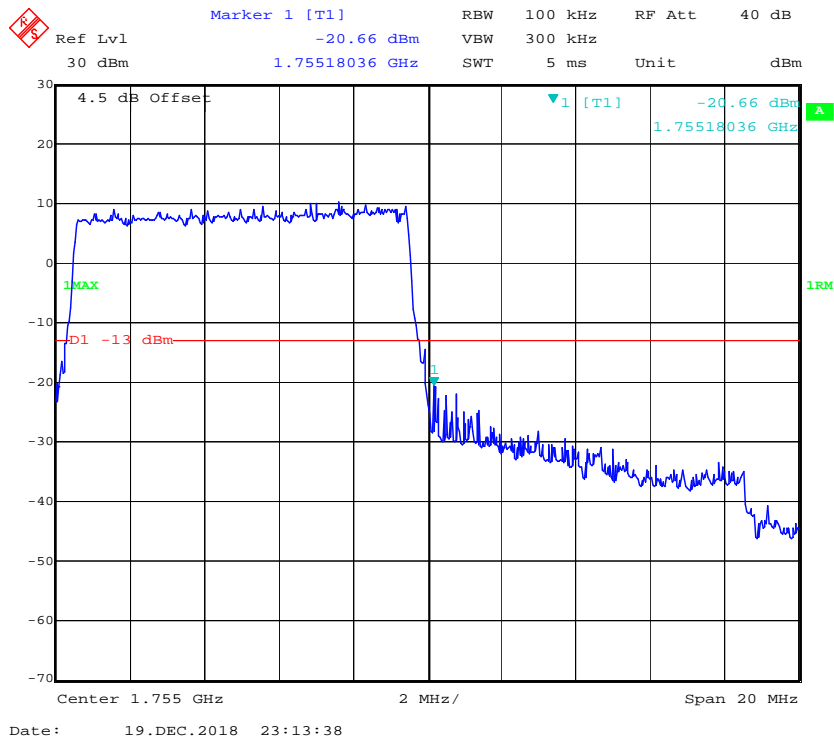
QPSK_5MHz_25 RB_Right



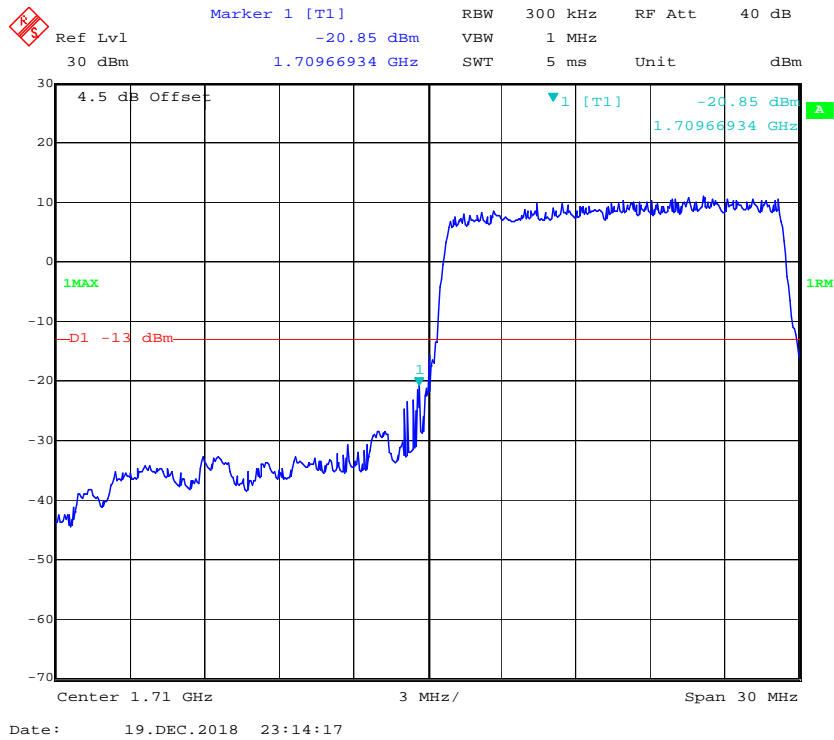
QPSK_10MHz_50 RB_Left



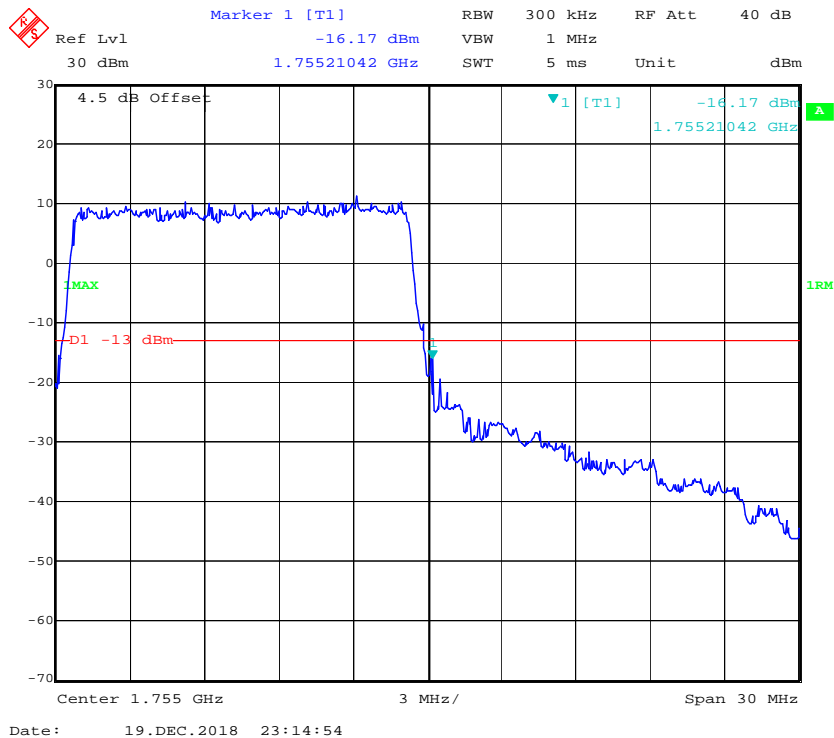
QPSK_10MHz_50 RB_Right



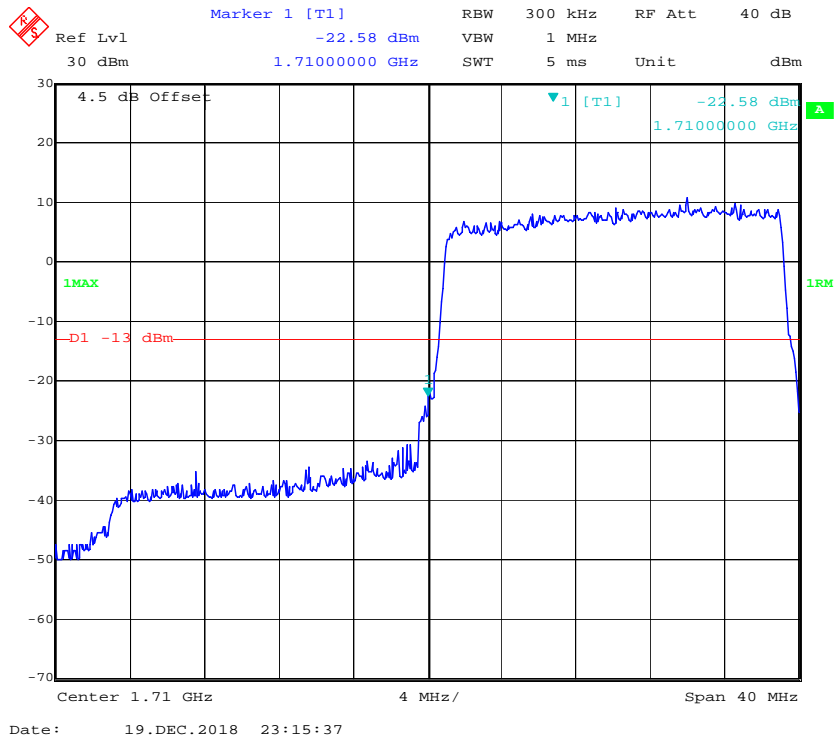
QPSK_15MHz_ 75 RB_ Left



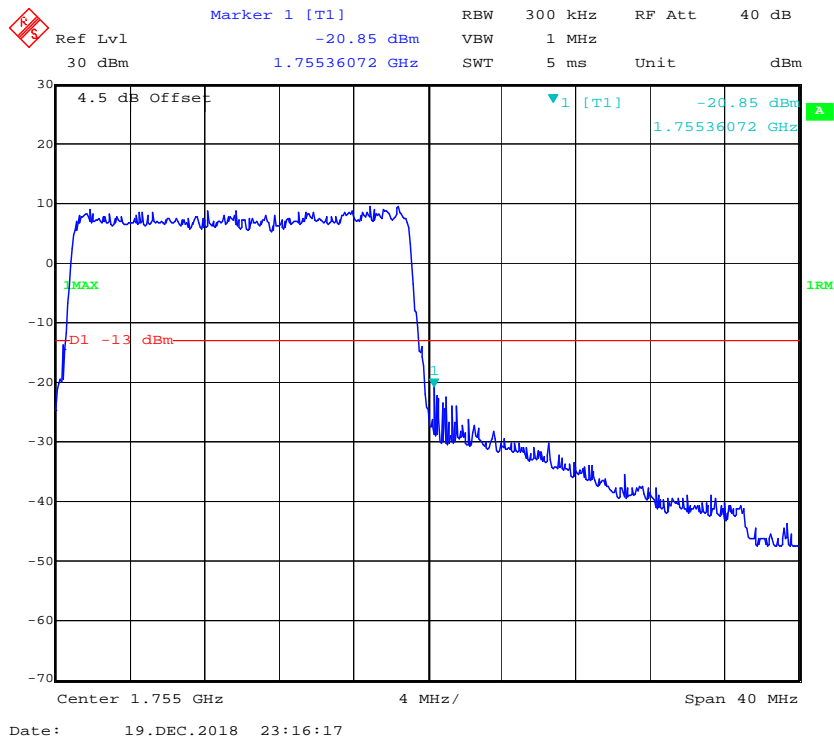
QPSK_15MHz_ 75 RB_ Right



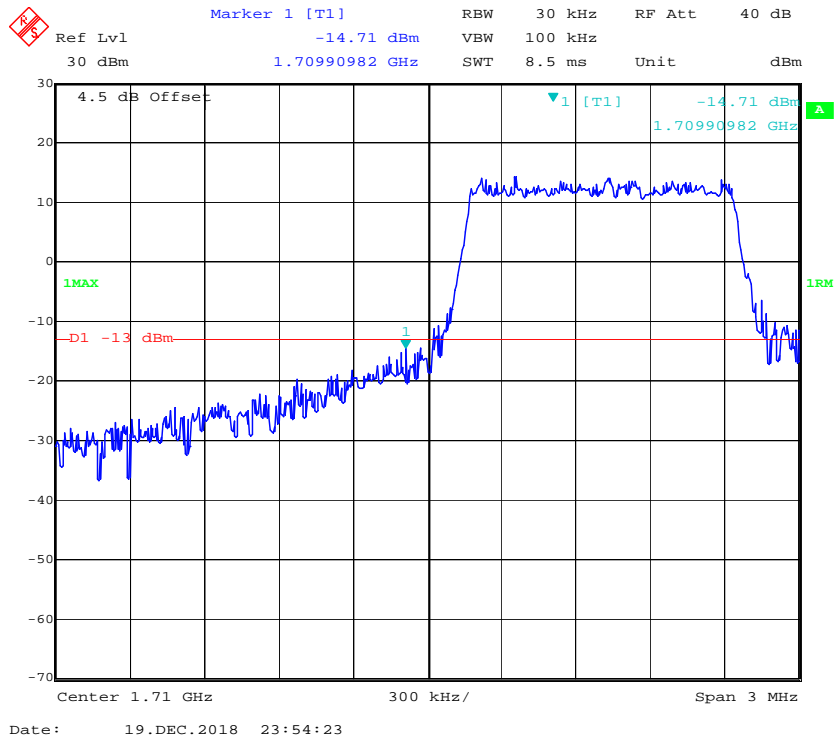
QPSK_20MHz_ FULL RB_ Left



QPSK_20MHz_ FULL RB_ Right



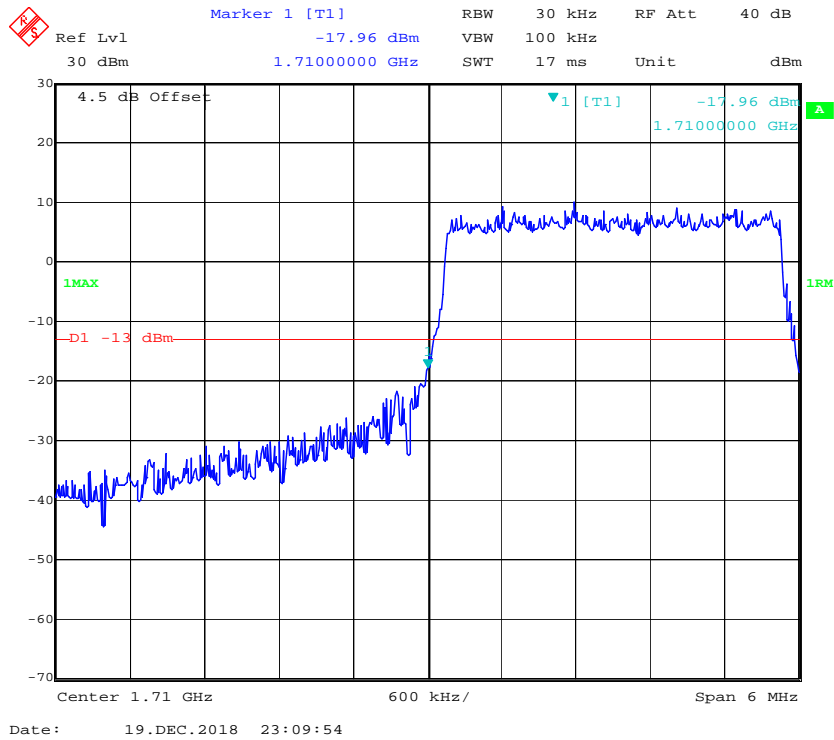
16QAM_1.4MHz_6 RB_ Left



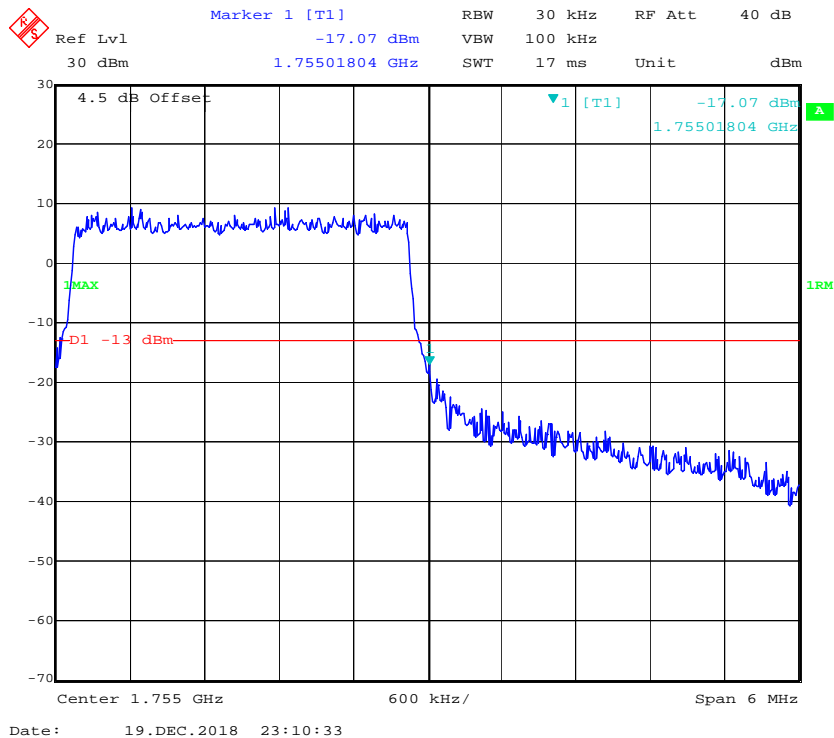
16QAM_1.4MHz_6 RB_ Right



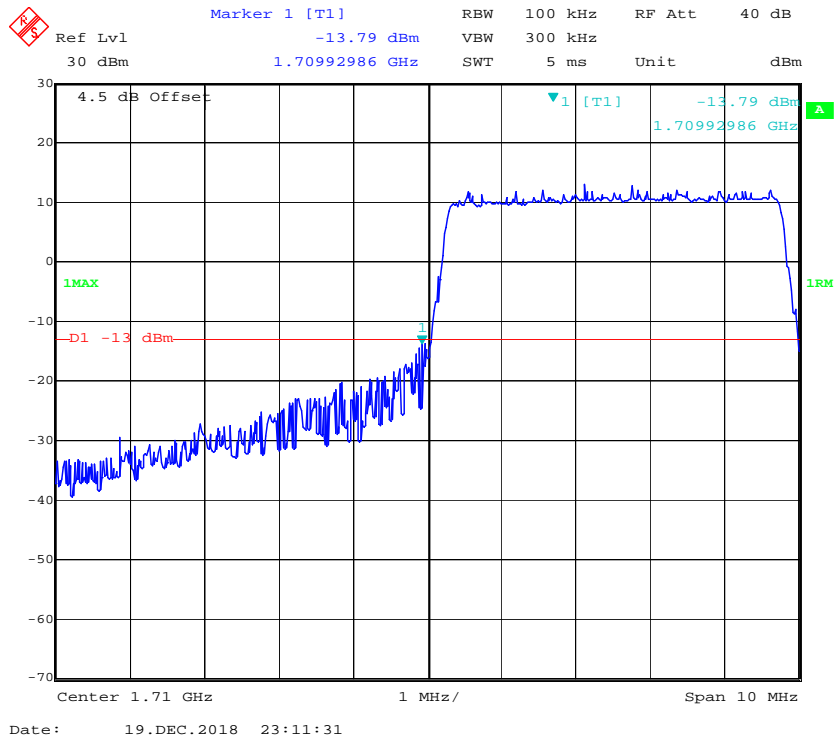
16QAM_3MHz_15 RB_ Left



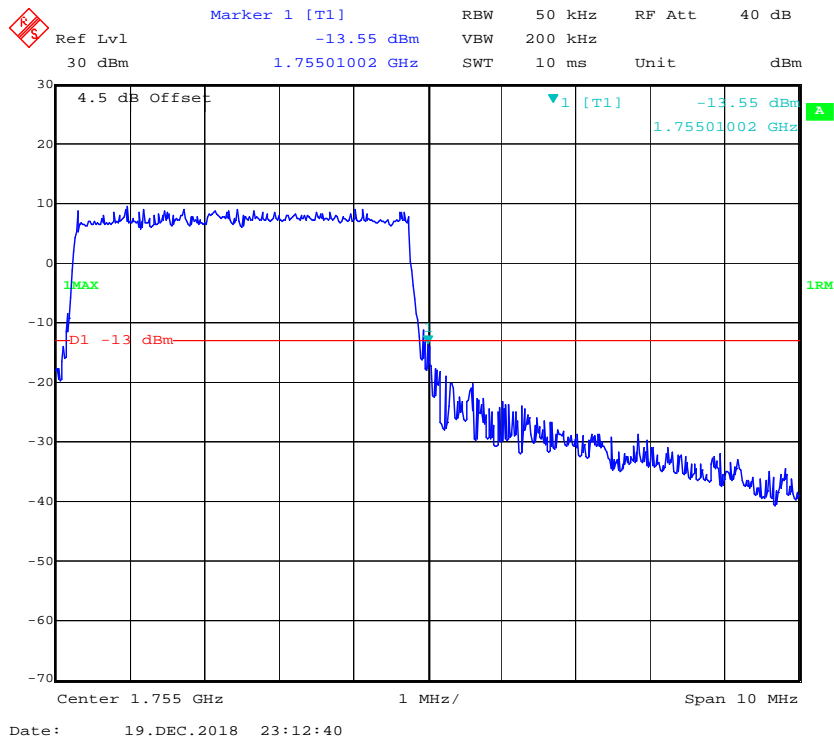
16QAM_3MHz_15 RB_ Right



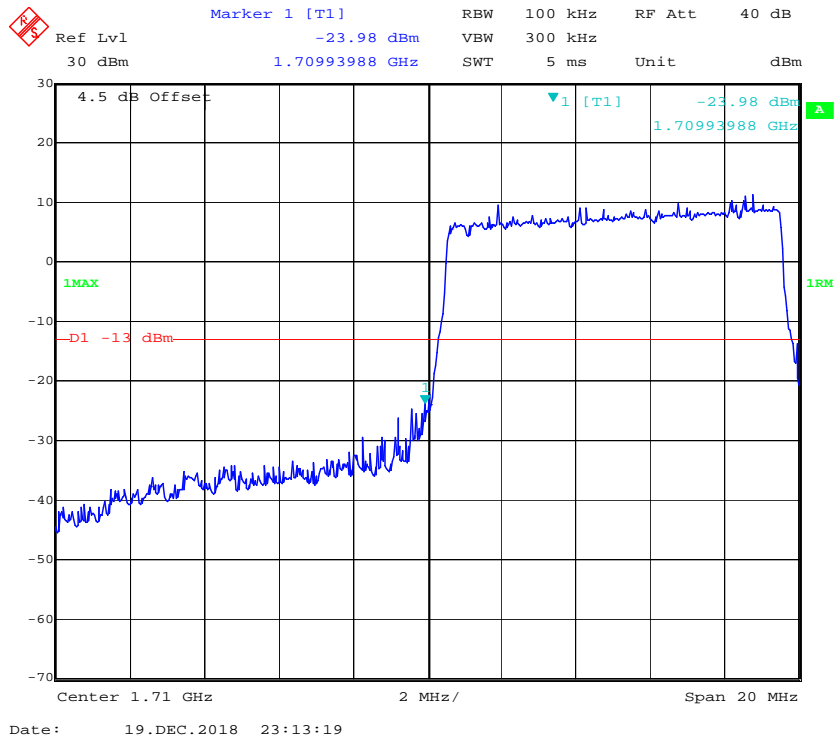
16QAM_5MHz_25 RB_Left



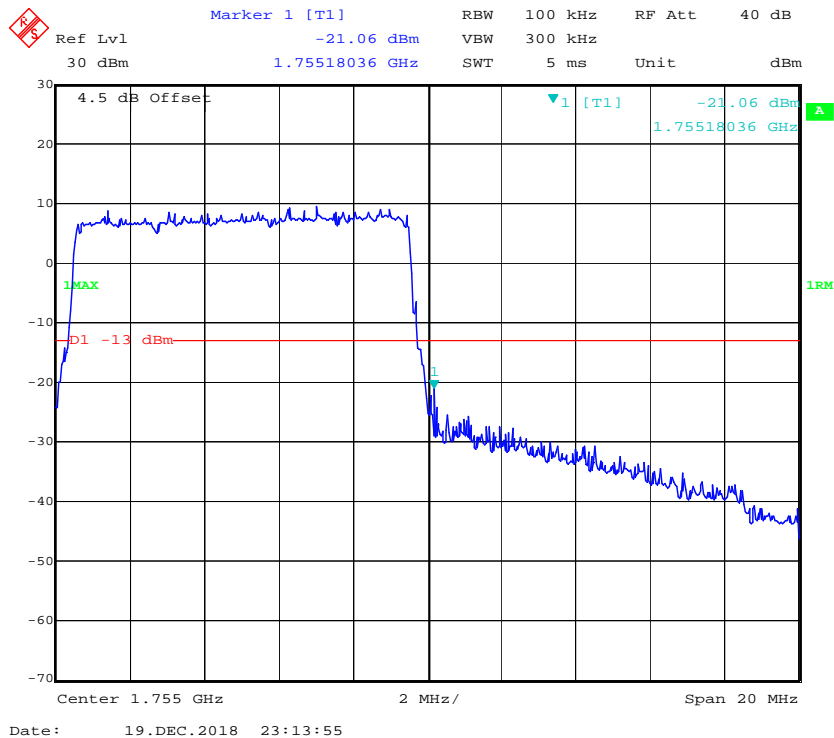
16QAM_5MHz_25 RB_Right



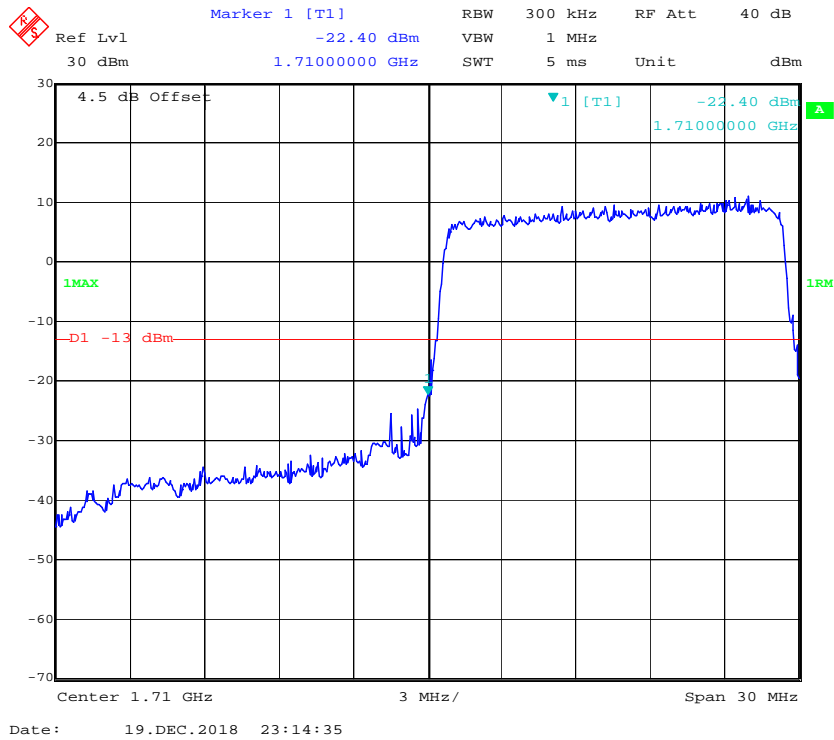
16QAM_10MHz_ 50 RB_ Left



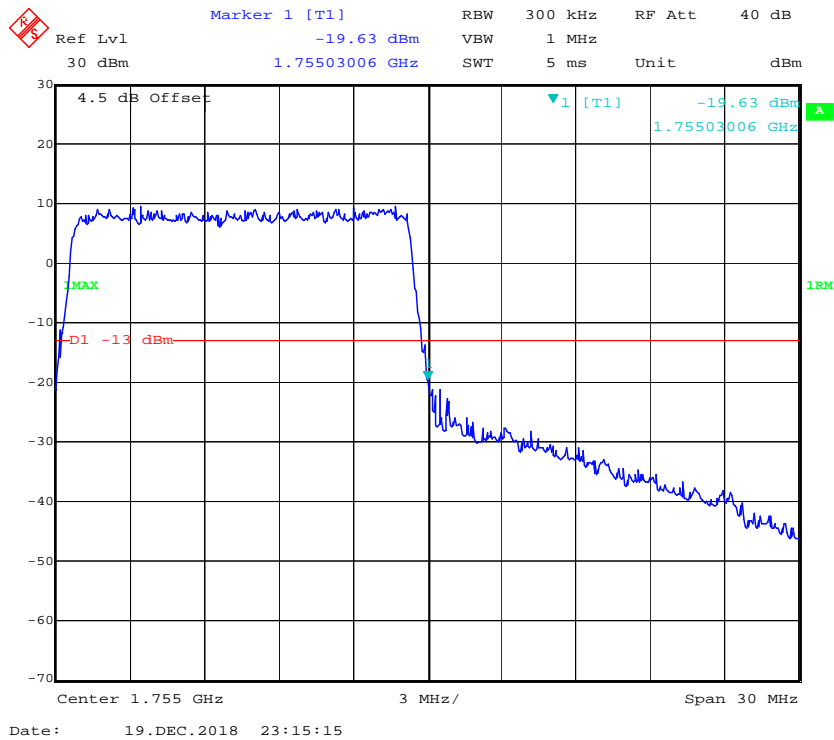
16QAM_10MHz_ 50 RB_ Right



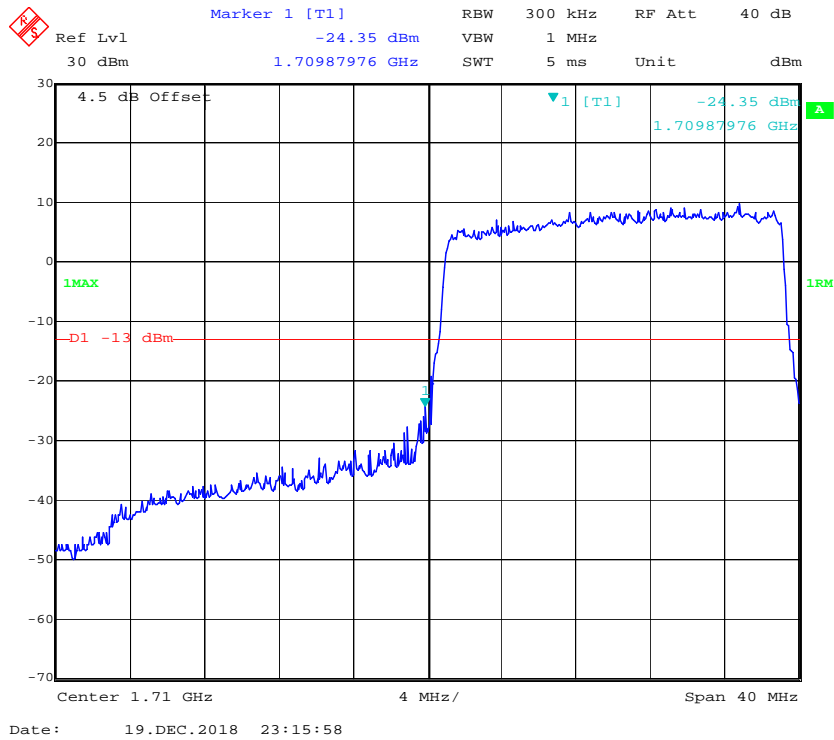
16QAM_15MHz_ 75 RB_ Left



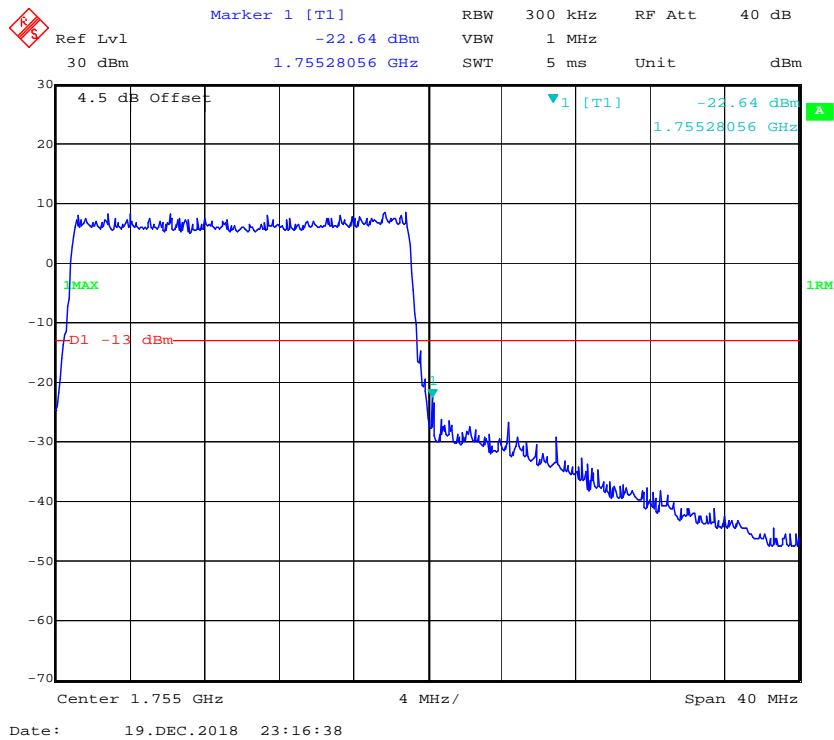
16QAM_15MHz_ 75 RB_ Right



16QAM_20MHz_ FULL RB_ Left

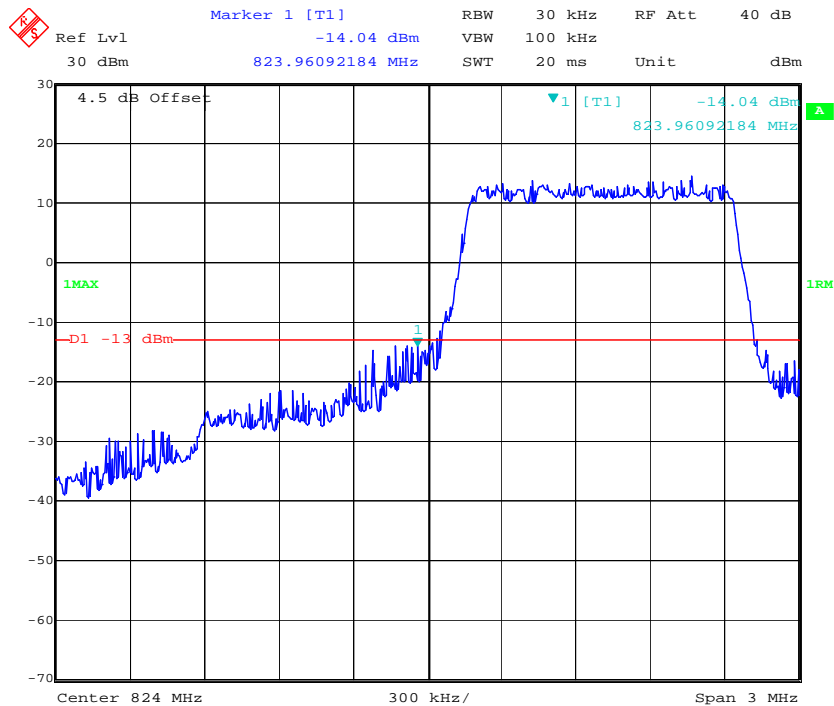


16QAM_20MHz_ FULL RB_ Right

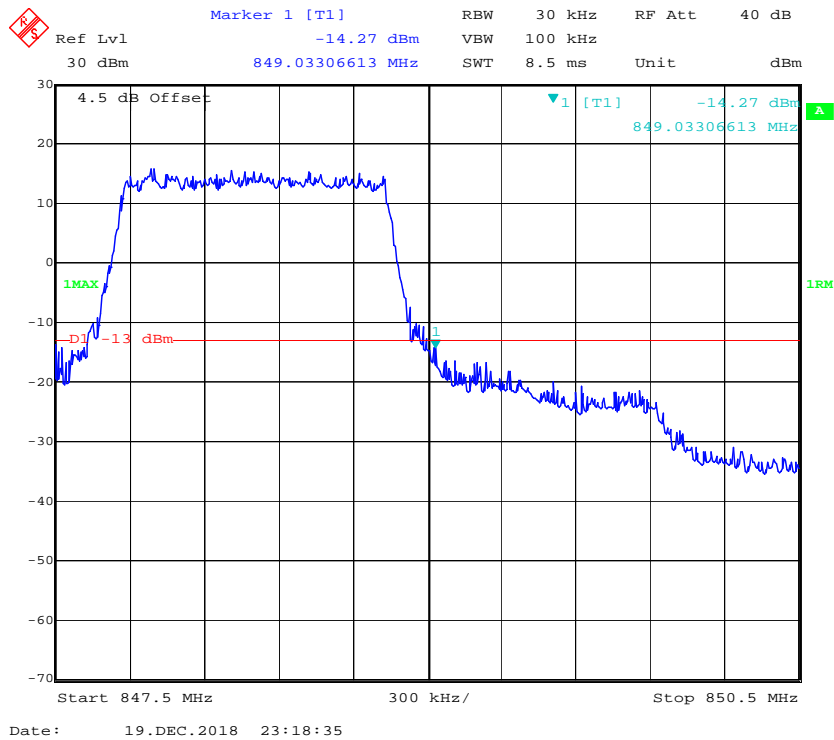


LTE Band 5

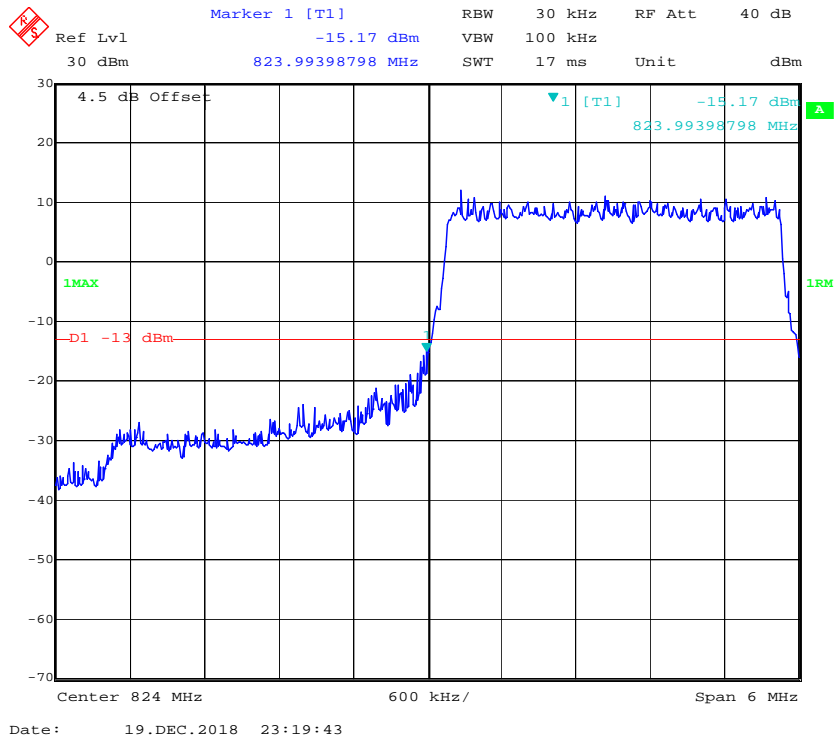
QPSK_1.4MHz_6 RB_ Left



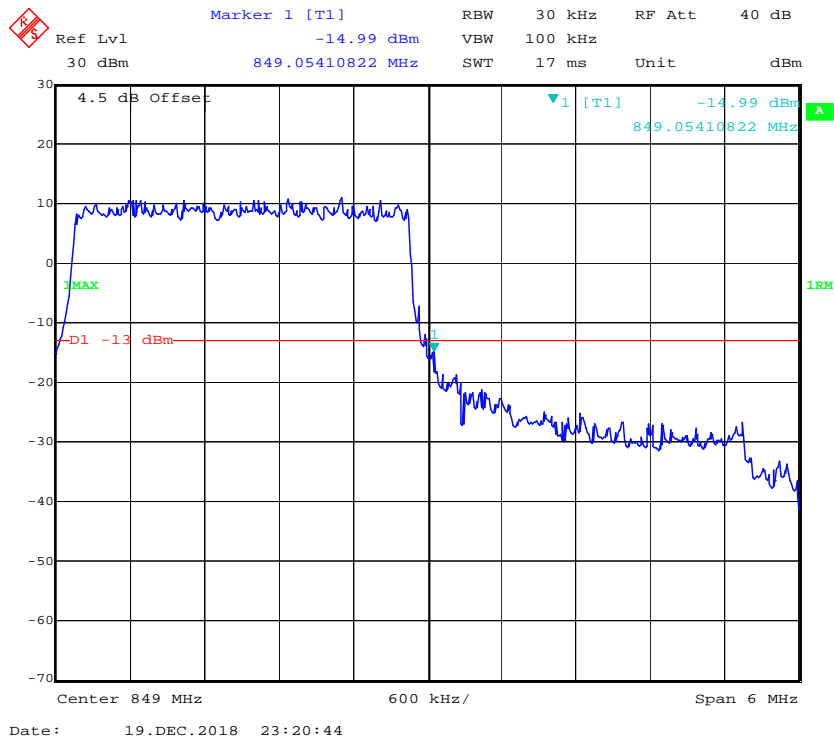
QPSK_1.4MHz_6 RB_ Right



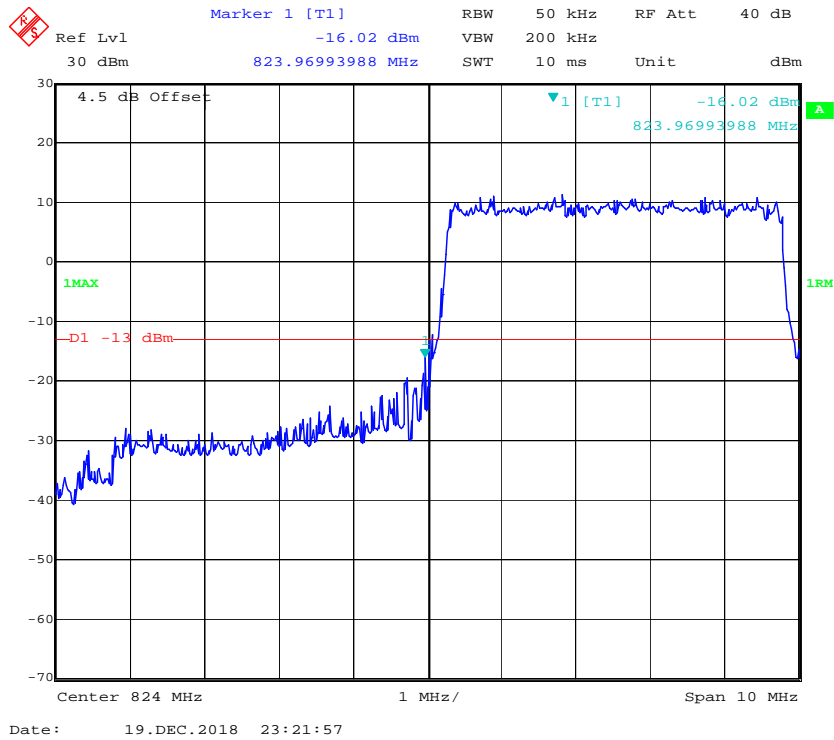
QPSK_3MHz_15 RB_Left



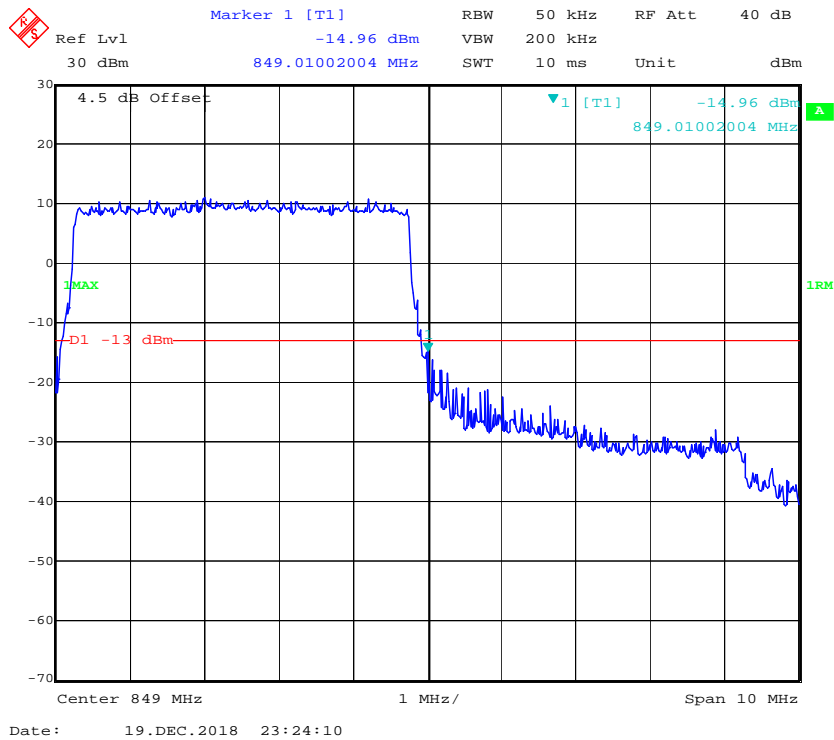
QPSK_3MHz_15 RB_Right



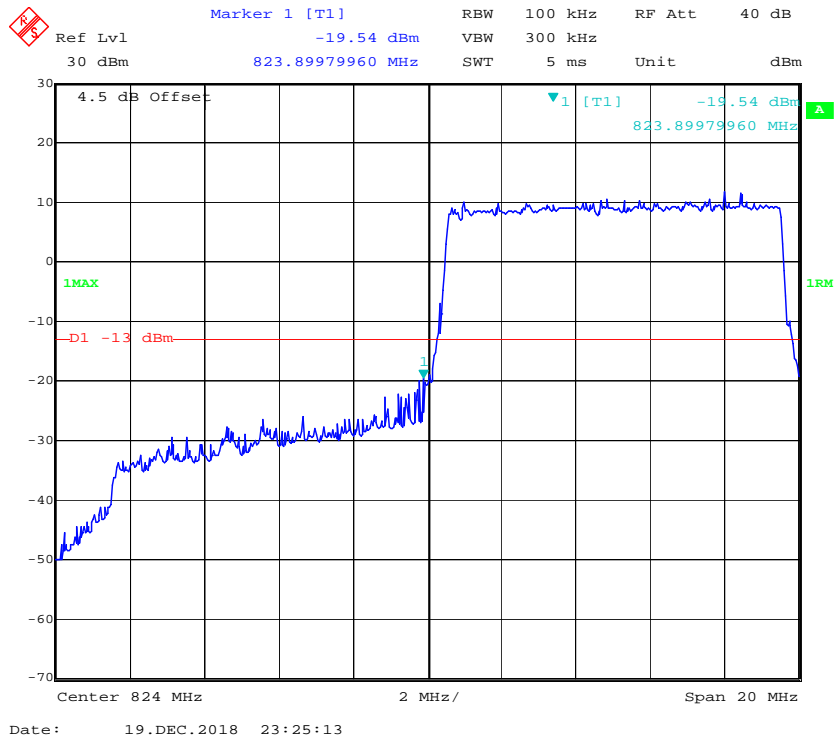
QPSK_5MHz_25 RB_ Left



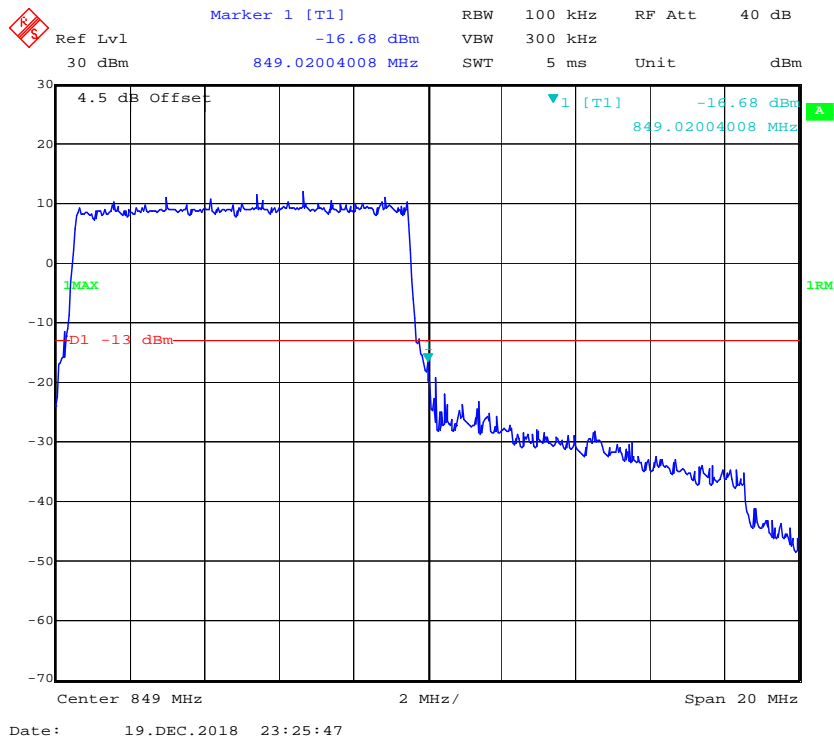
QPSK_5MHz_25 RB_ Right



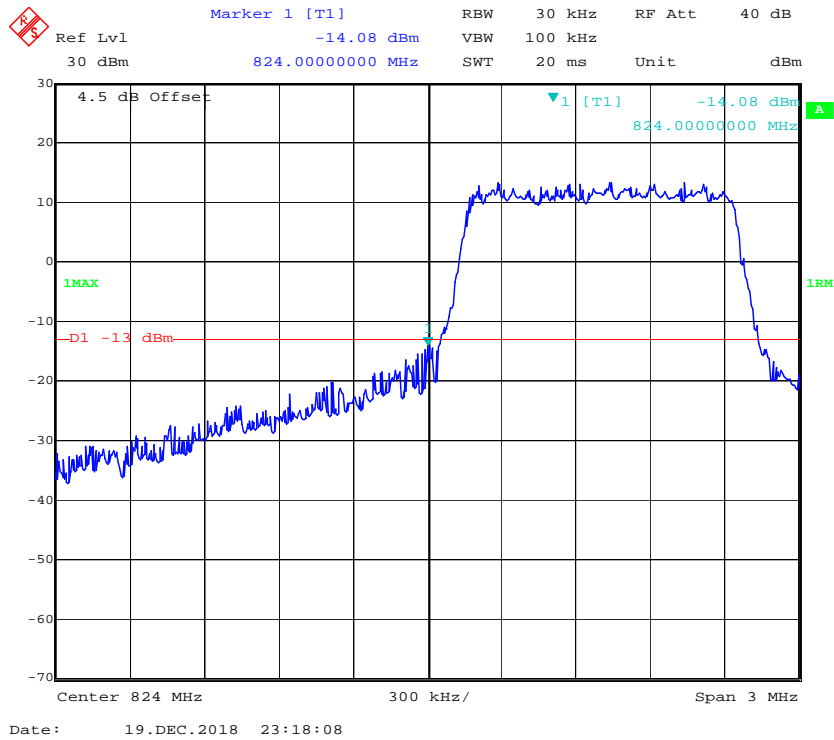
QPSK_10MHz_50 RB_Left



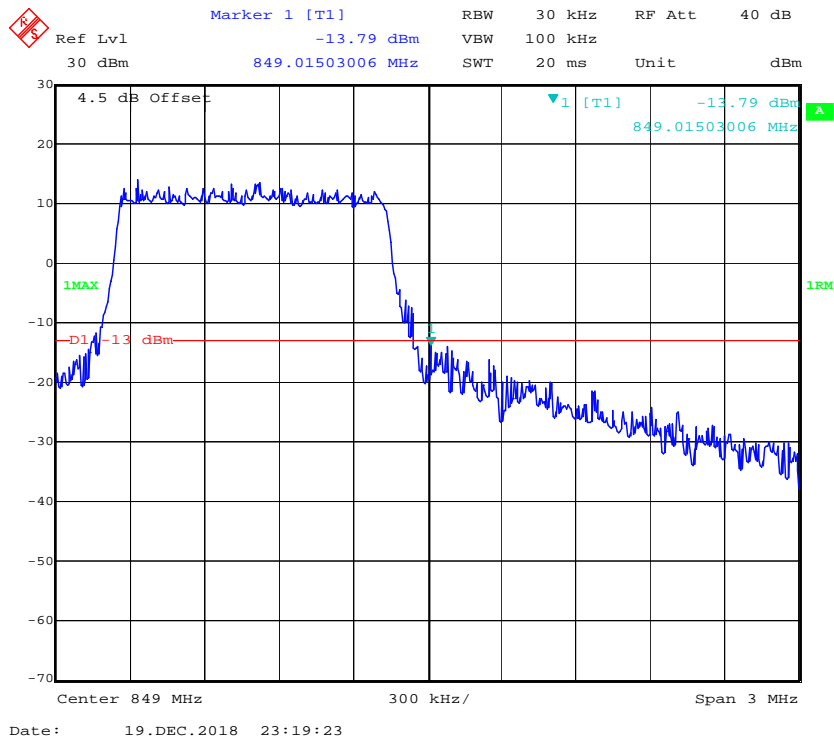
QPSK_10MHz_50 RB_Right



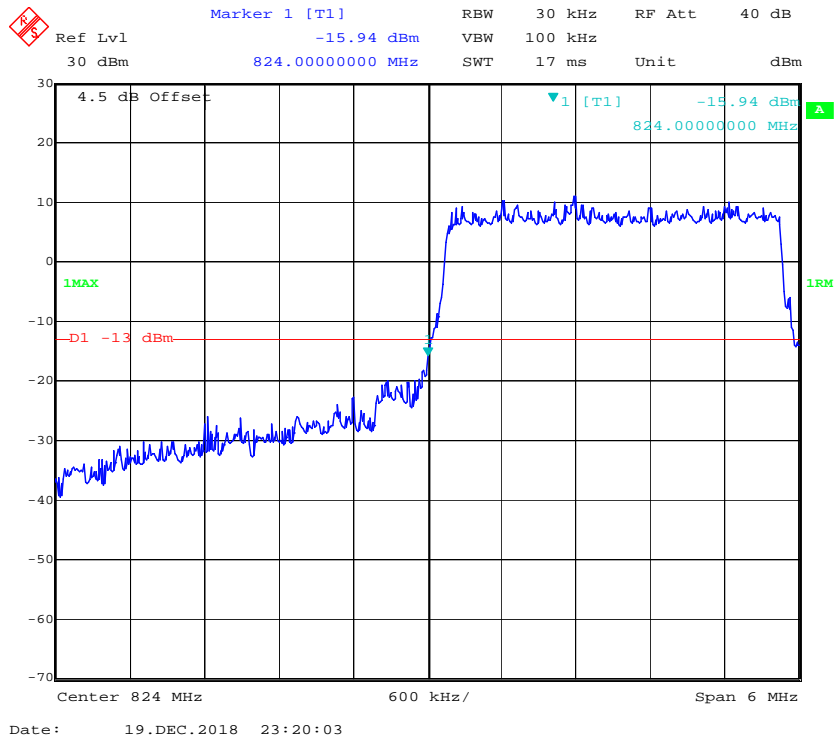
16QAM_1.4MHz_6 RB_ Left



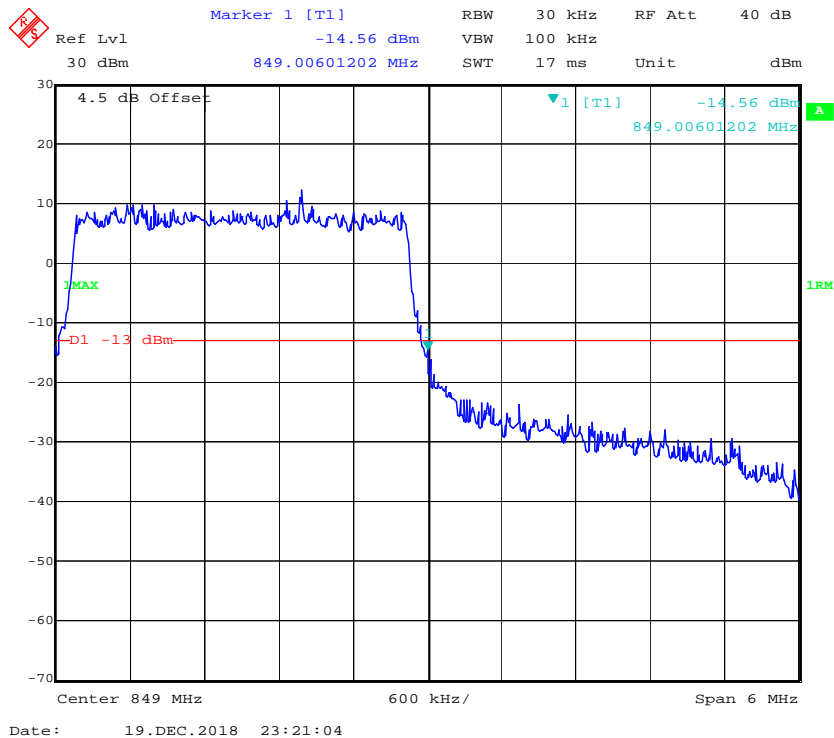
16QAM_1.4MHz_6 RB_ Right



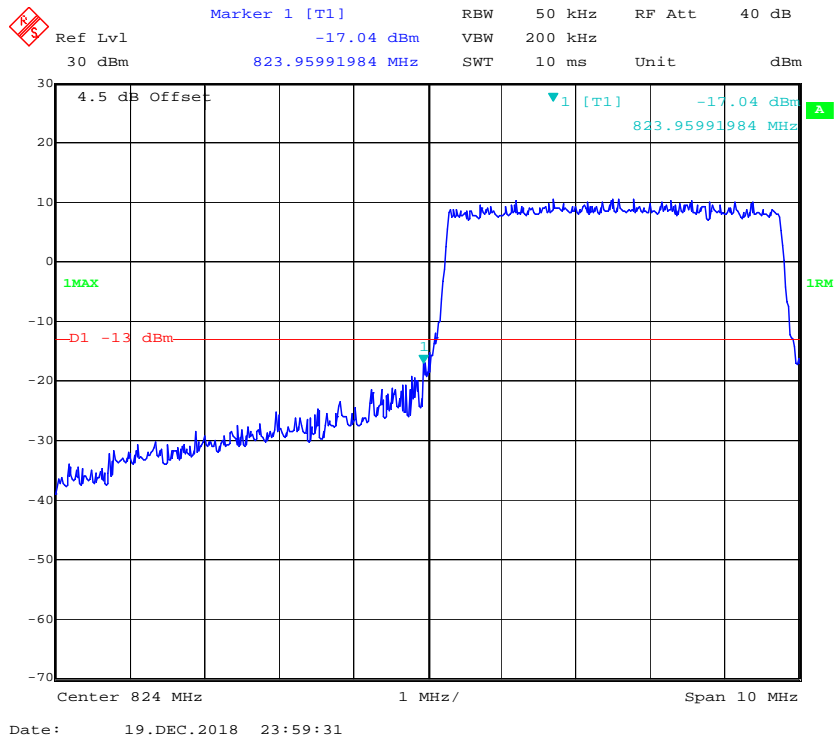
16QAM_3MHz_15 RB_ Left



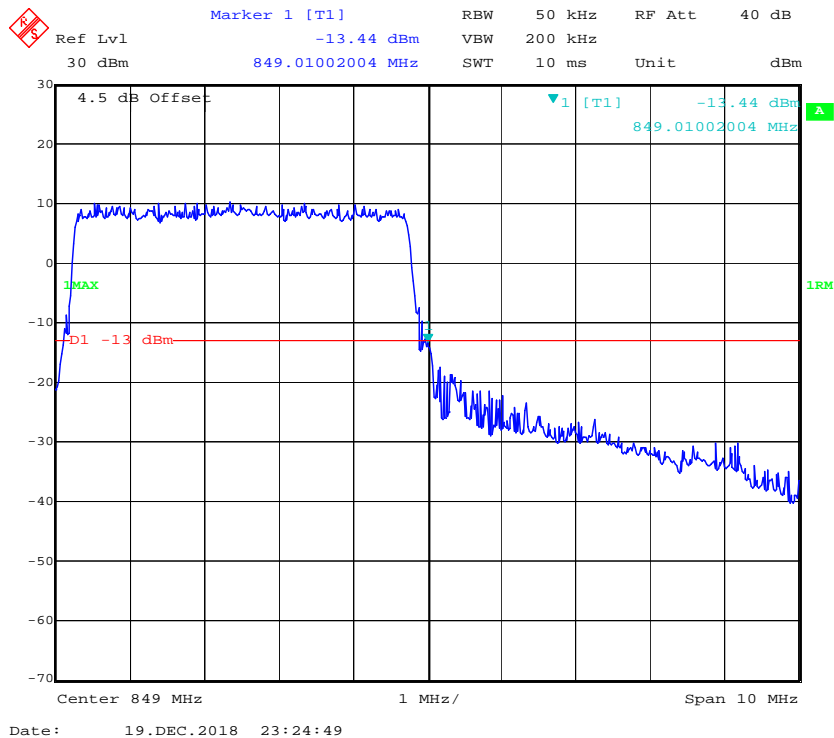
16QAM_3MHz_15 RB_ Right



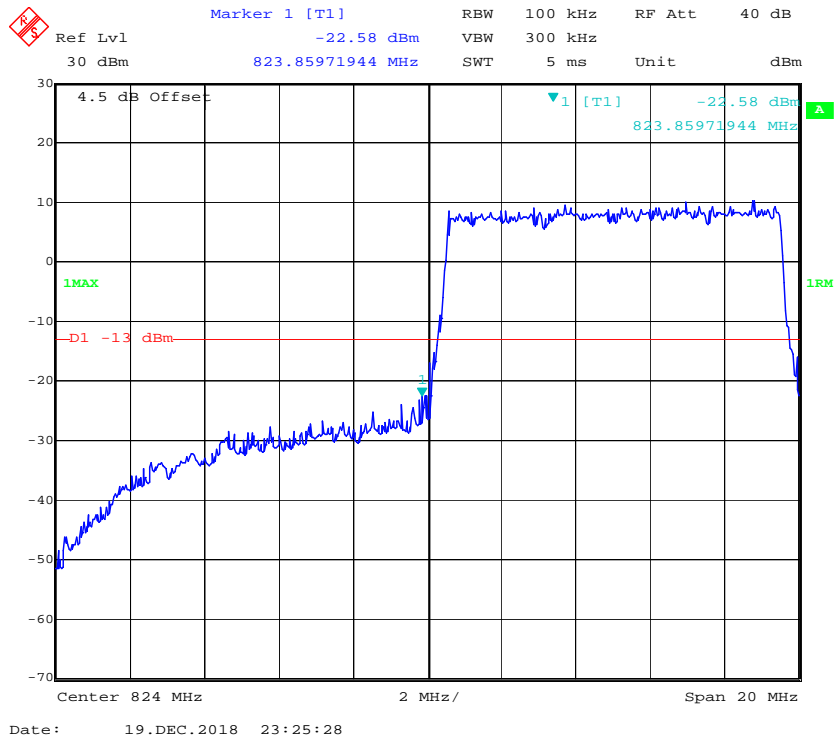
16QAM_5MHz_25 RB_Left



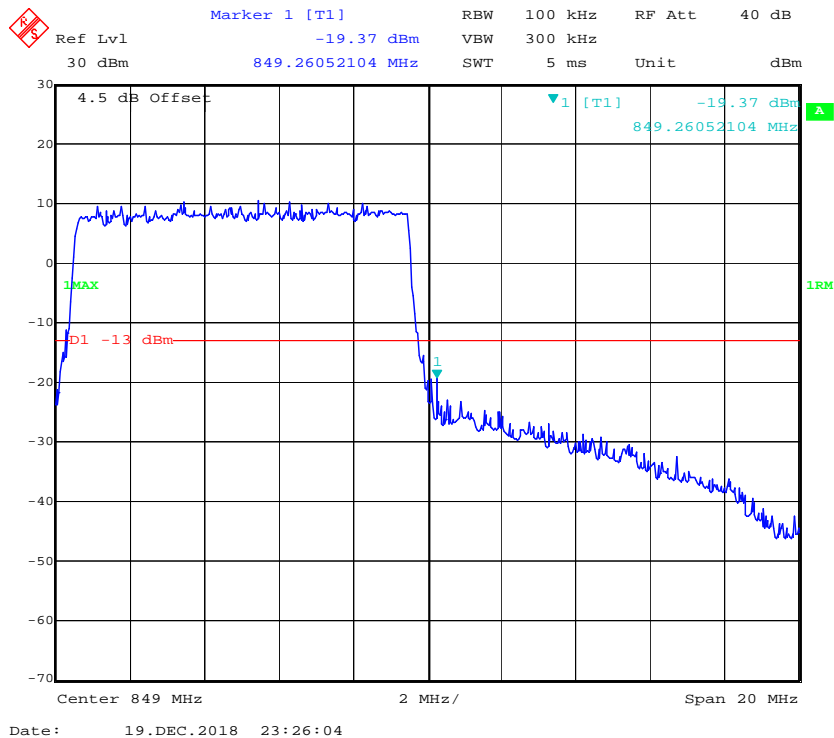
16QAM_5MHz_25 RB_Right



16QAM_10MHz_ 50 RB_ Left

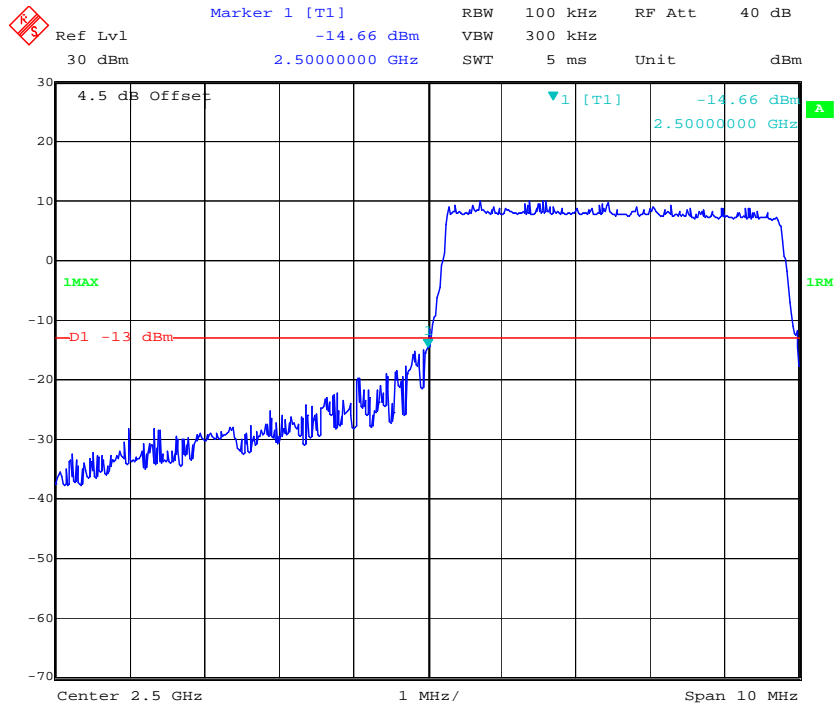


16QAM_10MHz_ 50 RB_ Right

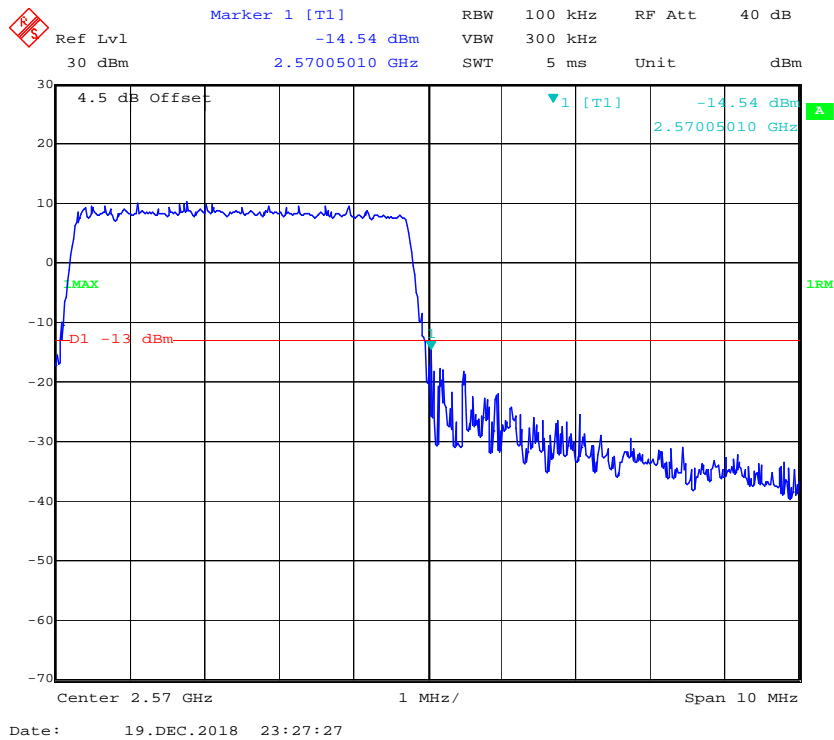


LTE Band 7

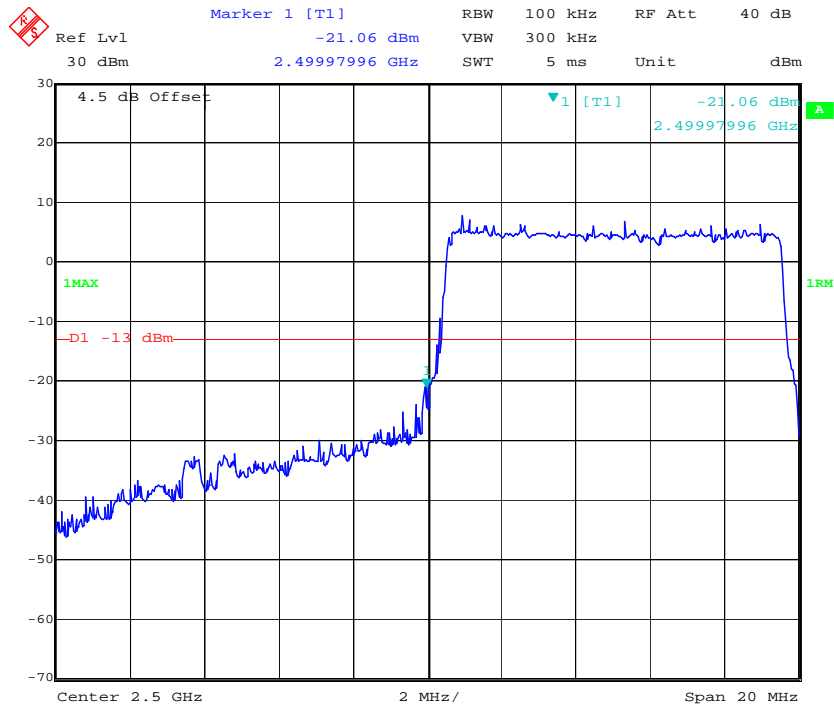
QPSK_5MHz_25 RB_ Left



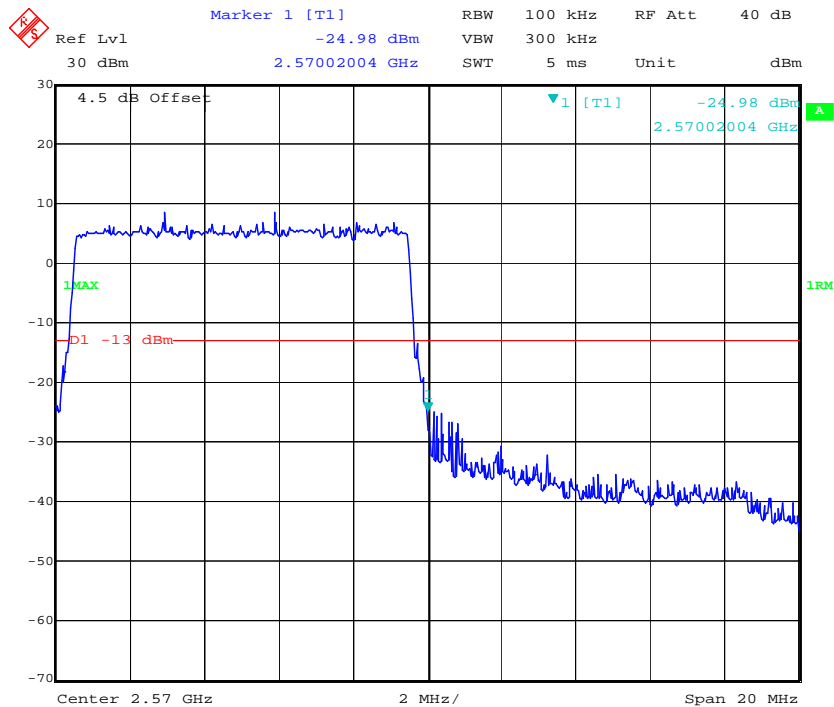
QPSK_5MHz_25 RB_ Right



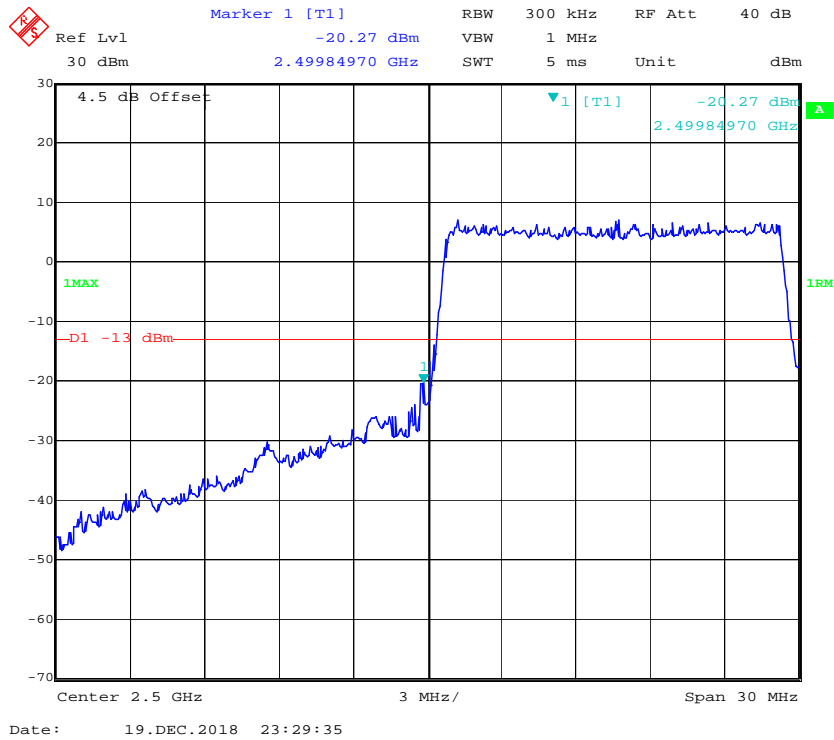
QPSK_10MHz_50 RB_ Left



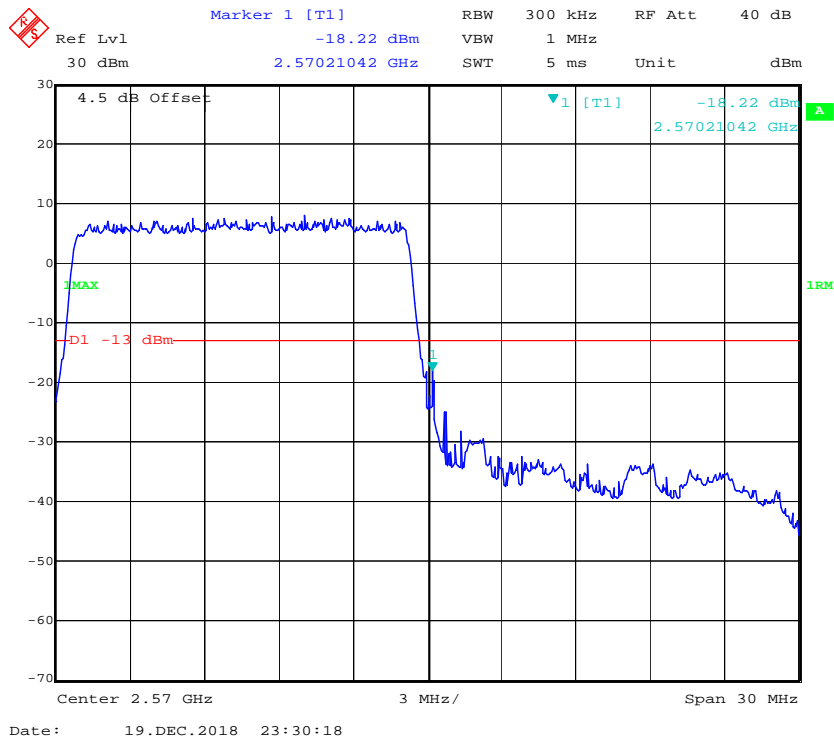
QPSK_10MHz_50 RB_ Right



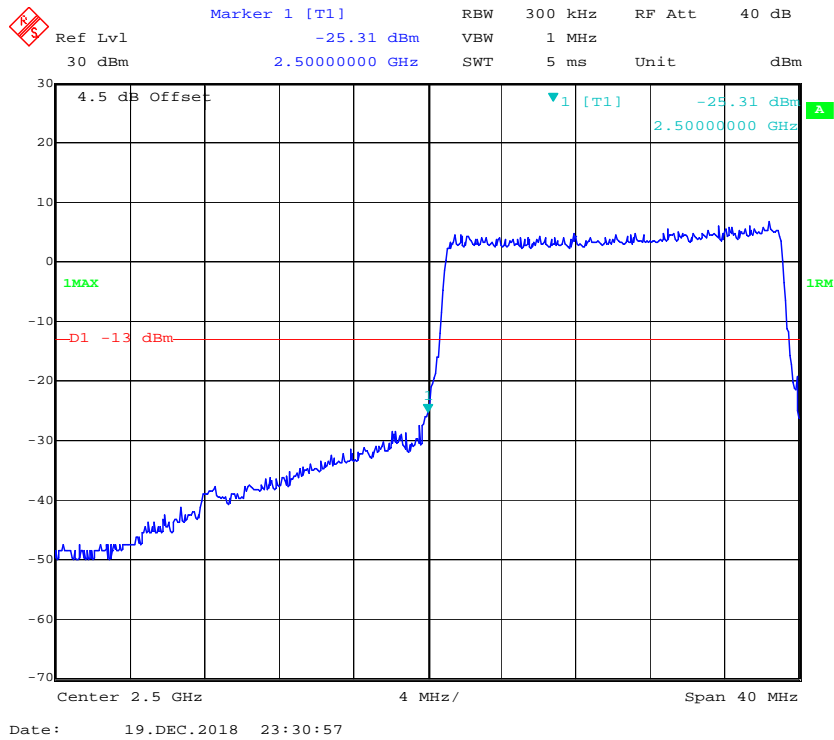
QPSK_15MHz_75 RB_Left



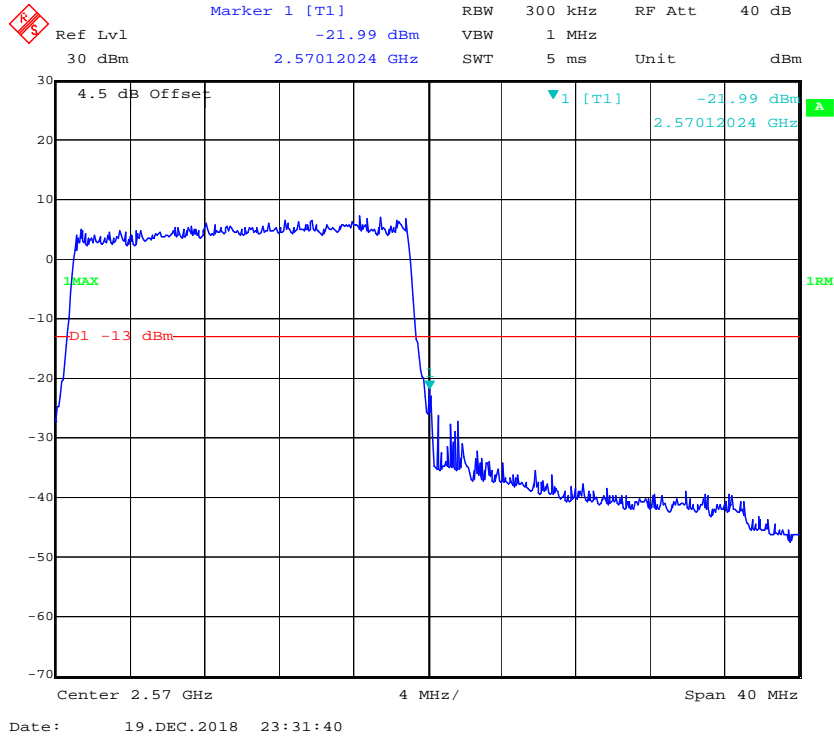
QPSK_15MHz_75 RB_Right



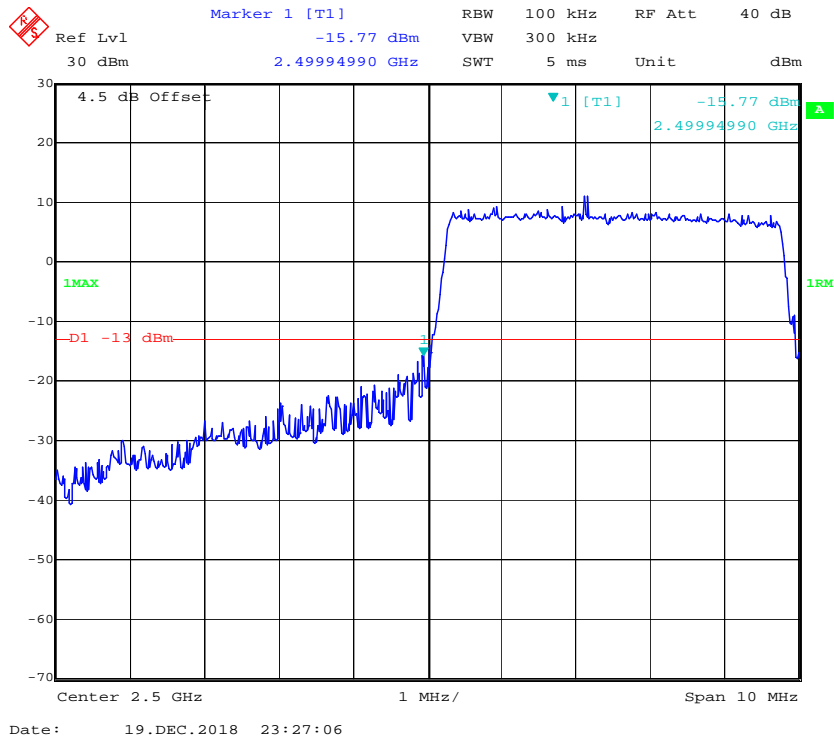
QPSK_20MHz_FULL RB_Left



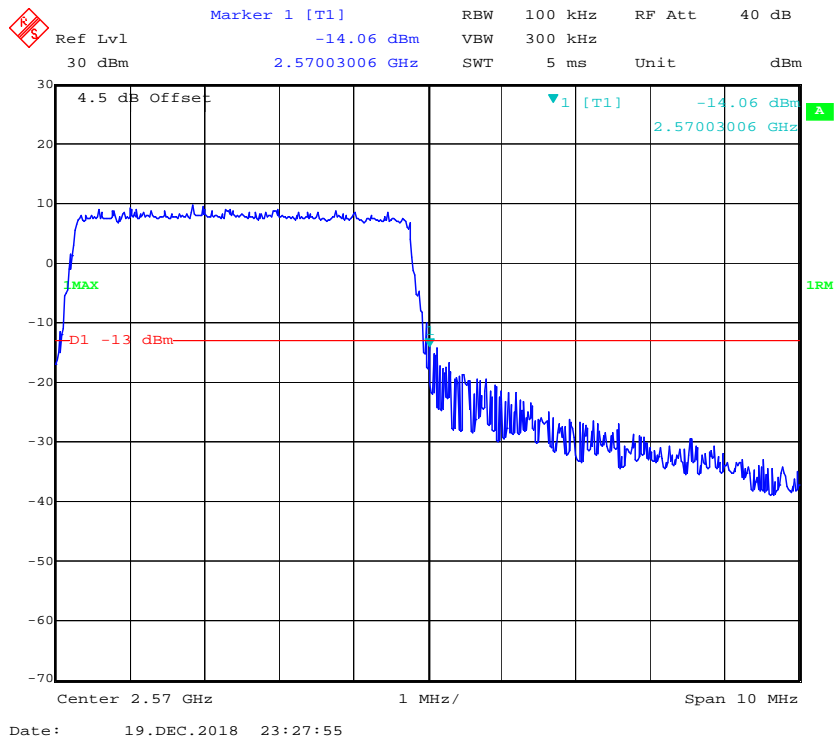
QPSK_20MHz_FULL RB_Right



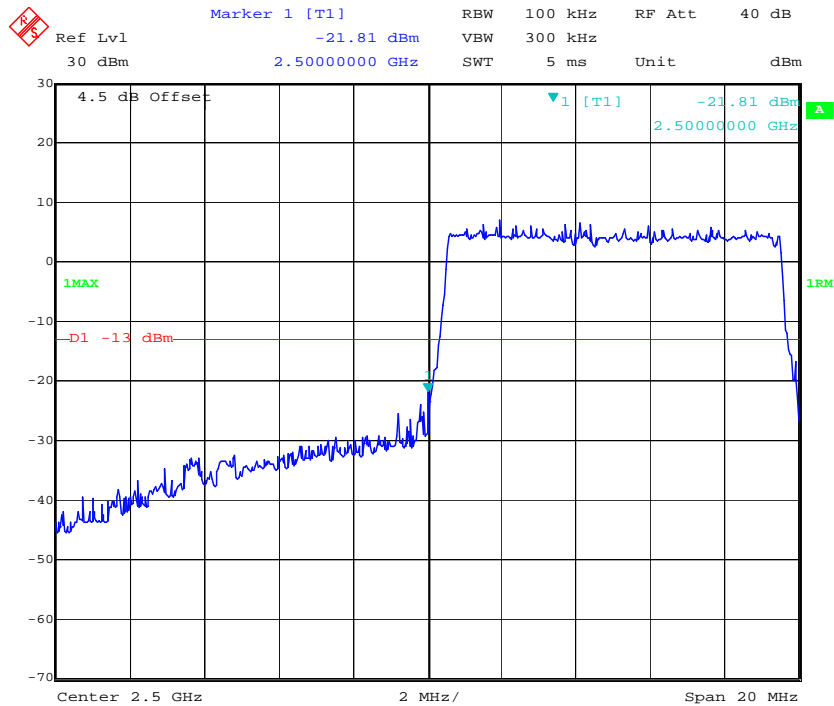
16QAM_5MHz_25 RB_ Left



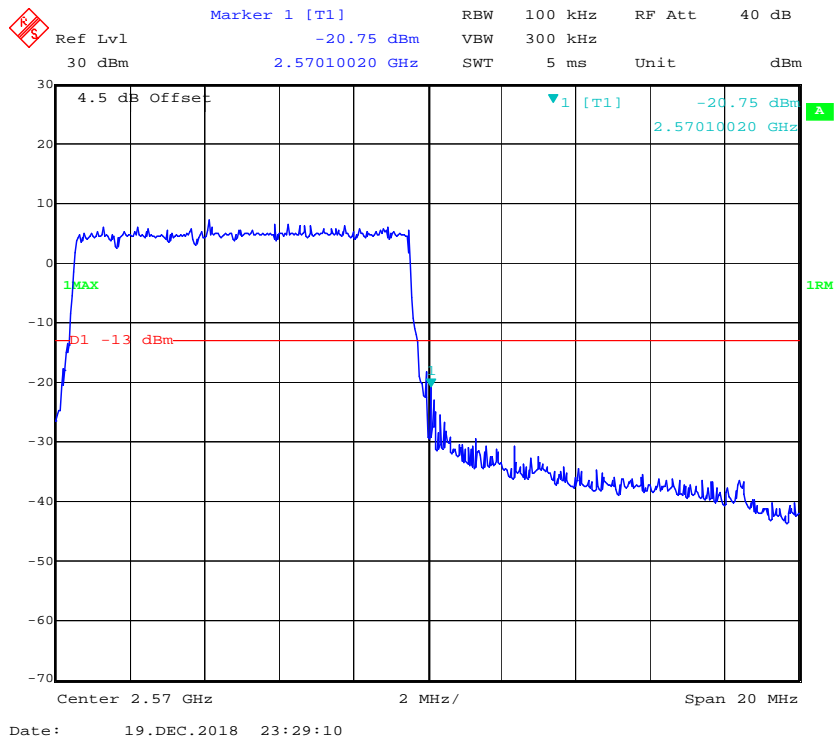
16QAM_5MHz_25 RB_ Right



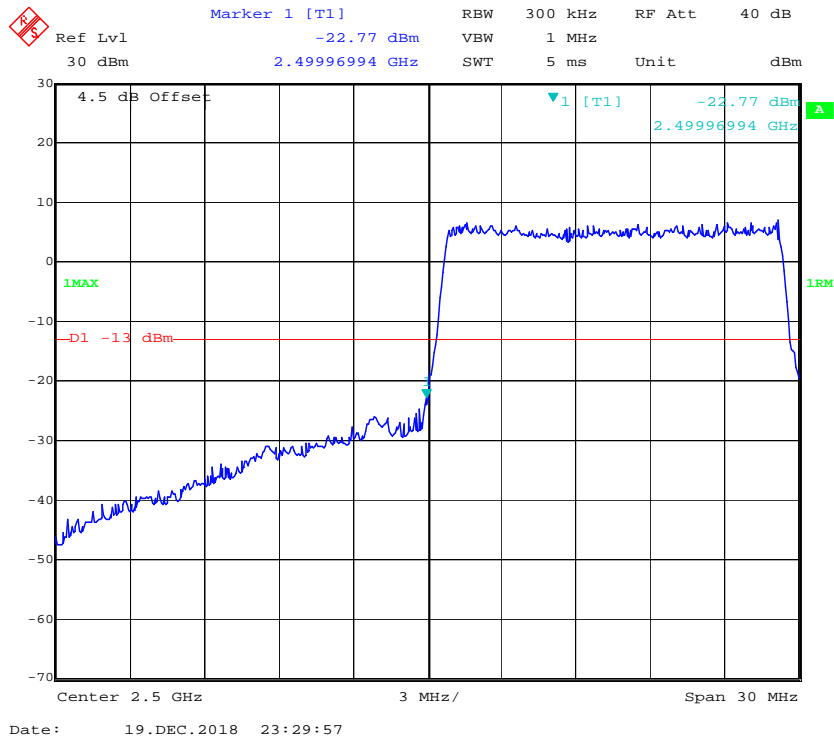
16QAM_10MHz_ 50 RB_ Left



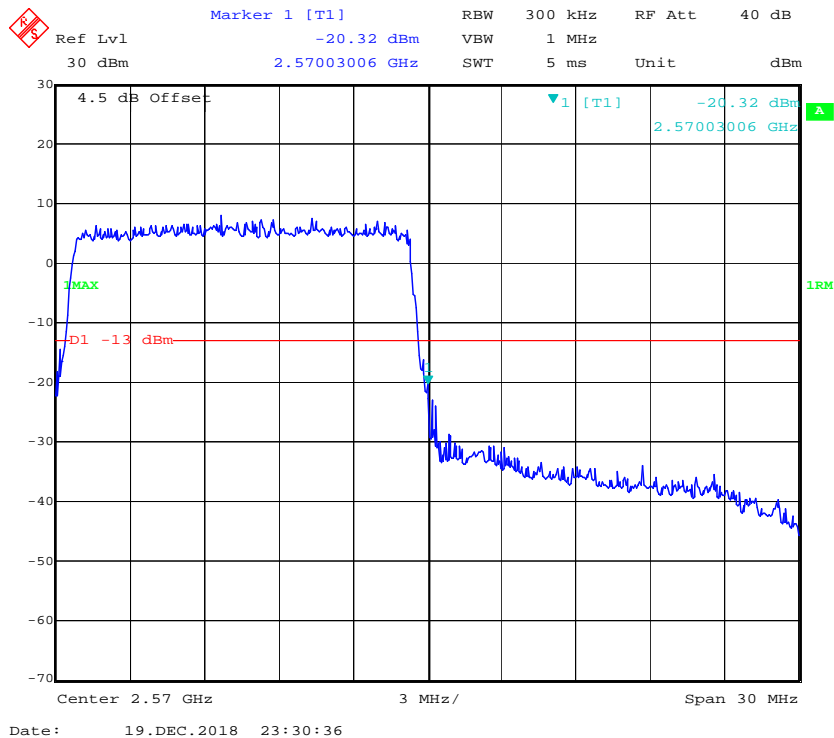
16QAM_10MHz_ 50 RB_ Right



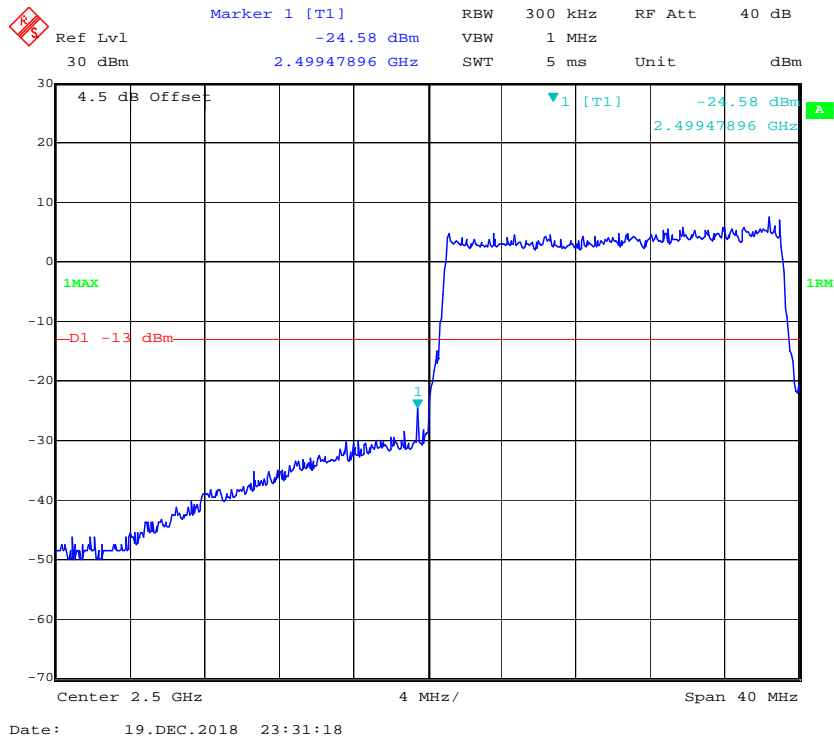
16QAM_15MHz_ 75 RB_ Left



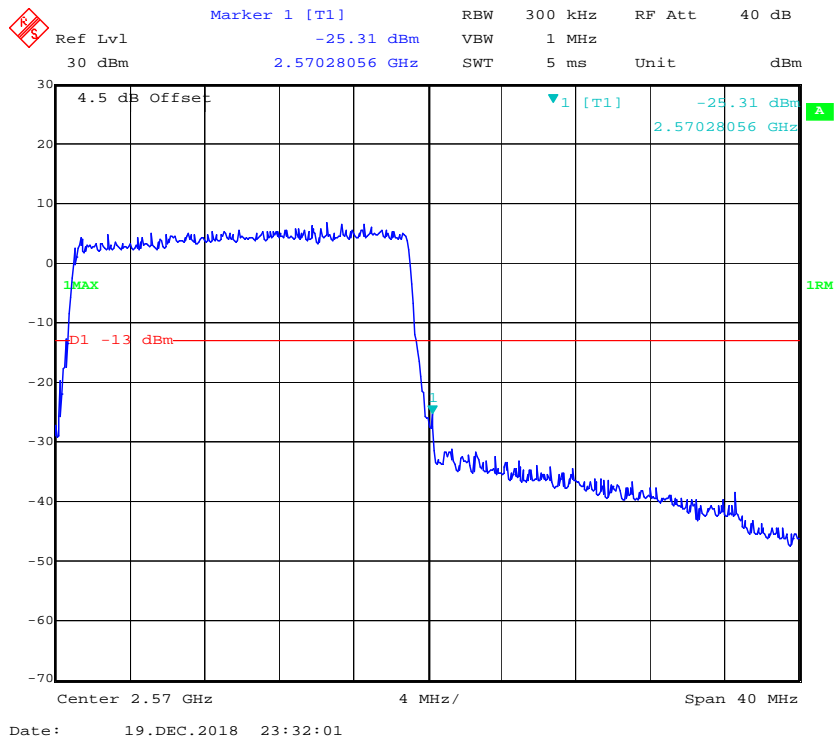
16QAM_15MHz_ 75 RB_ Right



16QAM_20MHz_ FULL RB_ Left

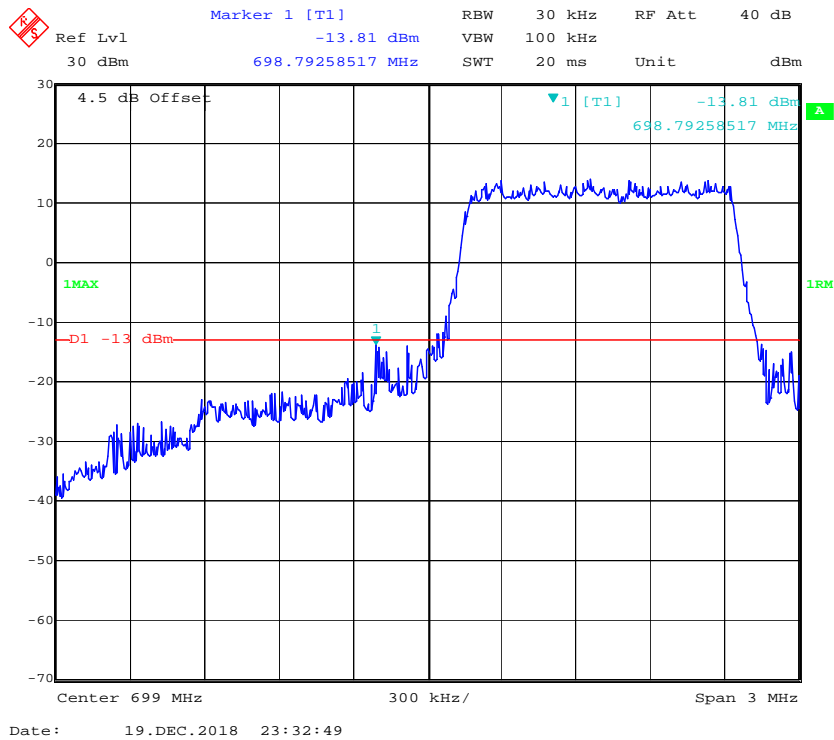


16QAM_20MHz_ FULL RB_ Right

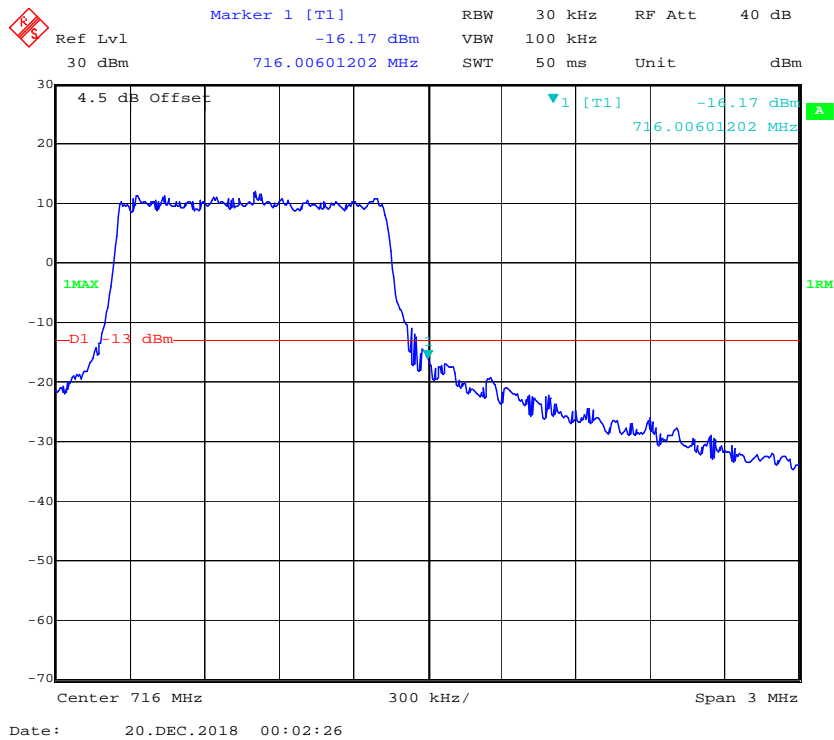


LTE Band 12

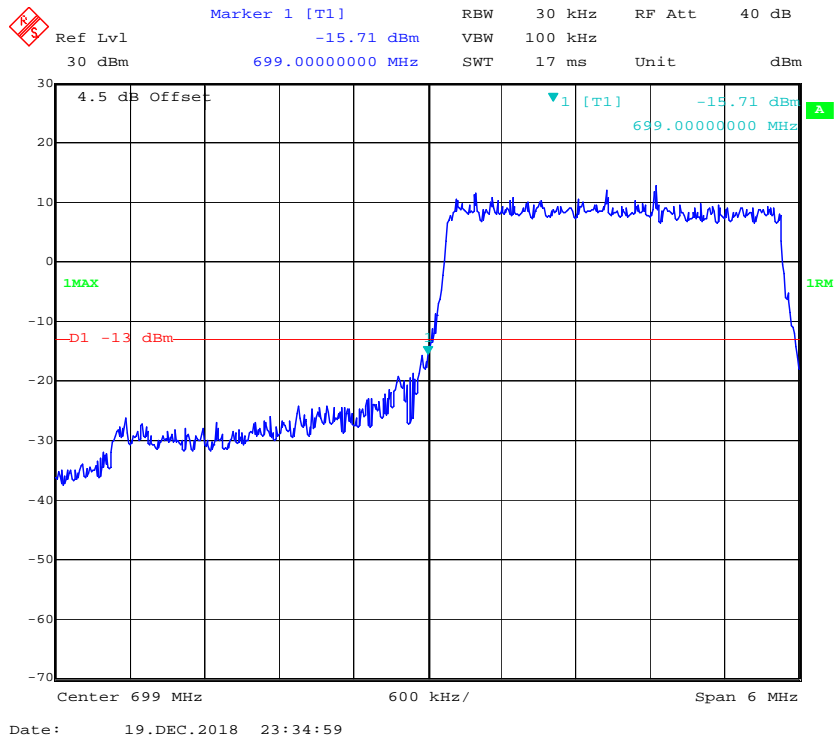
QPSK_1.4MHz_6 RB_ Left



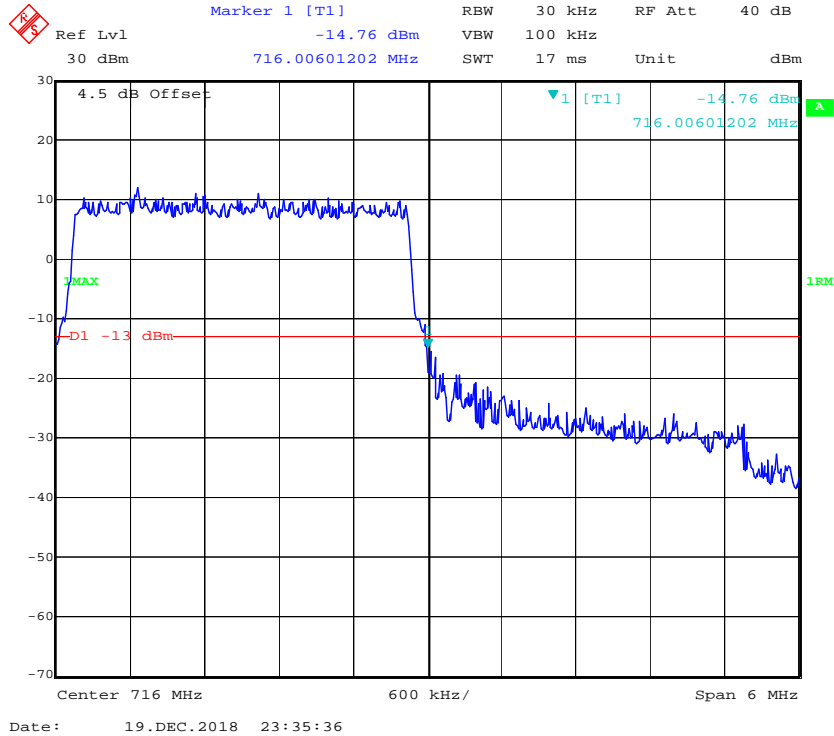
QPSK_1.4MHz_6 RB_ Right



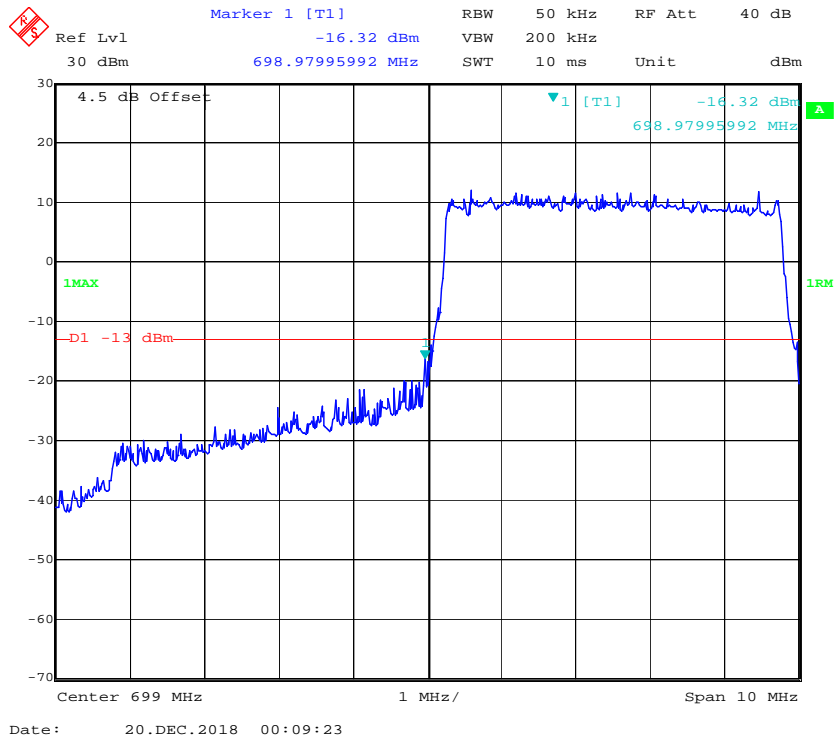
QPSK_3MHz_15 RB_ Left



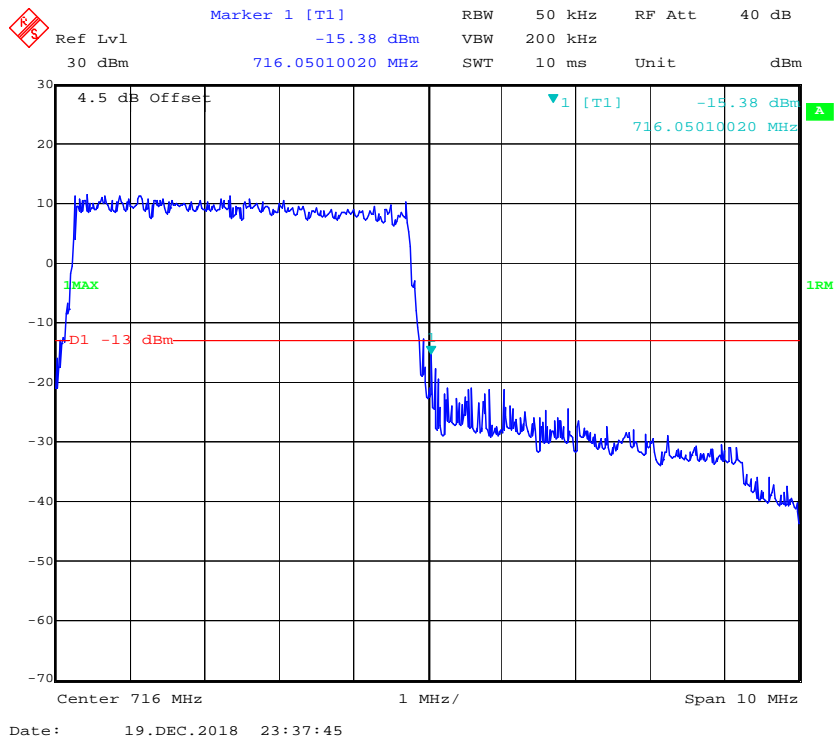
QPSK_3MHz_15 RB_ Right



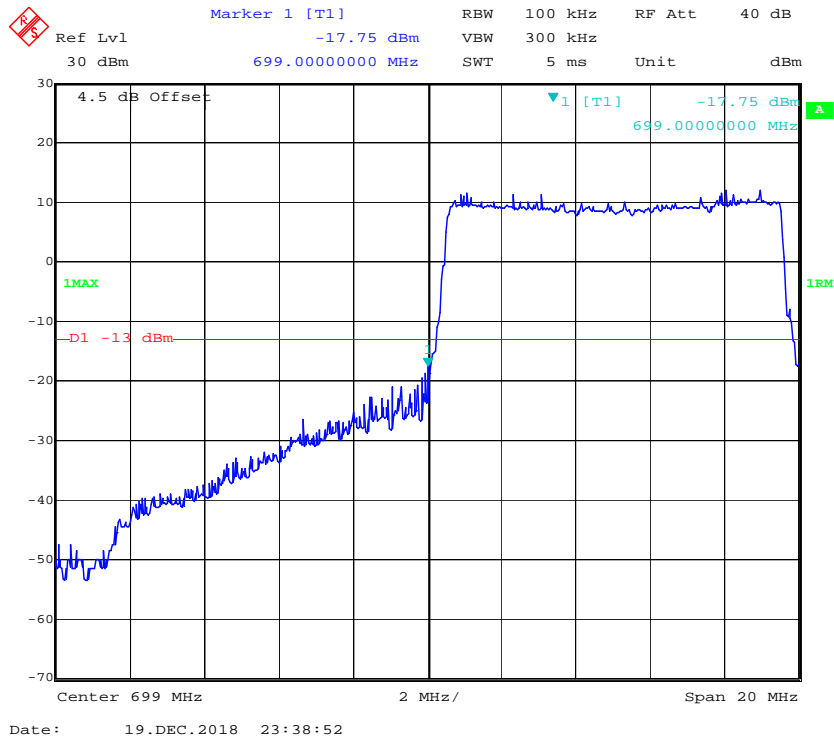
QPSK_5MHz_25 RB_Left



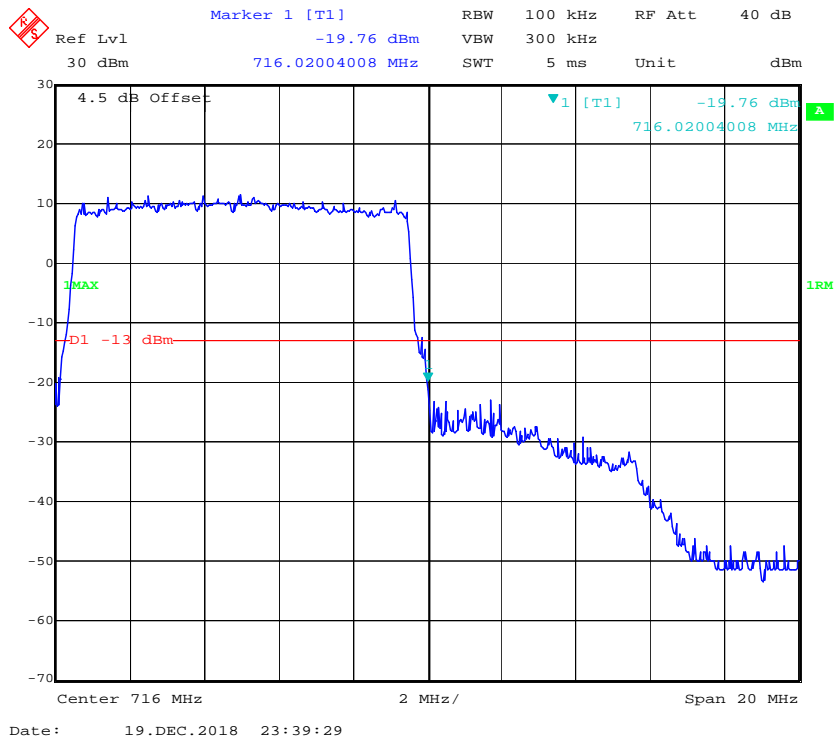
QPSK_5MHz_25 RB_Right



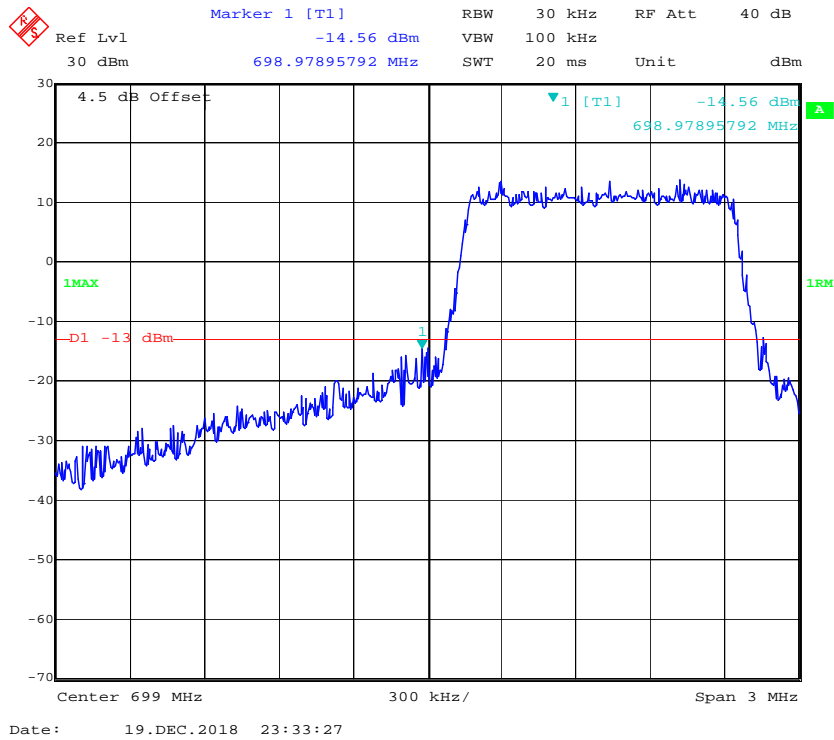
QPSK_10MHz_50 RB_Left



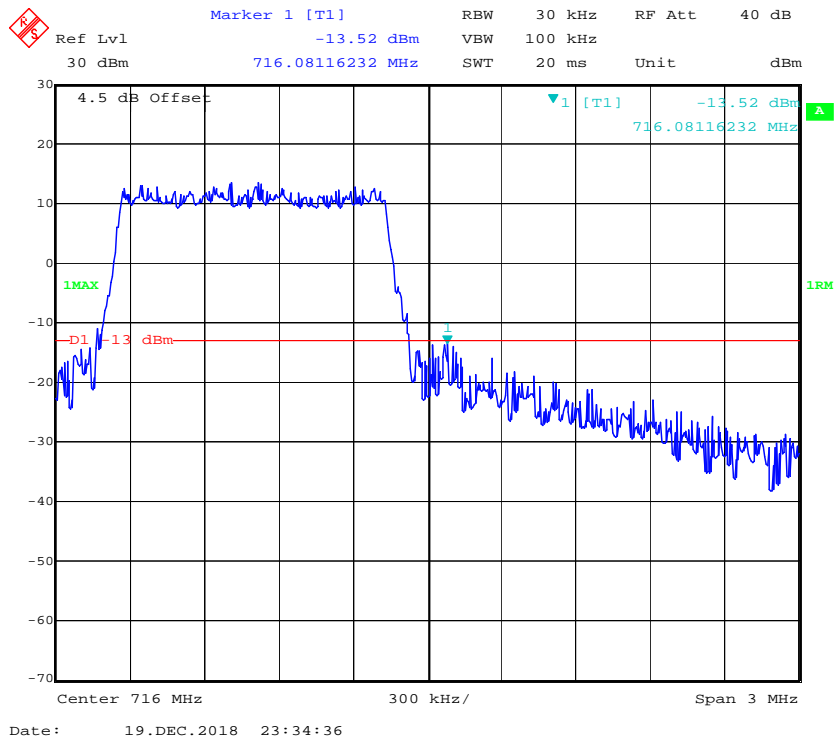
QPSK_10MHz_50 RB_Right



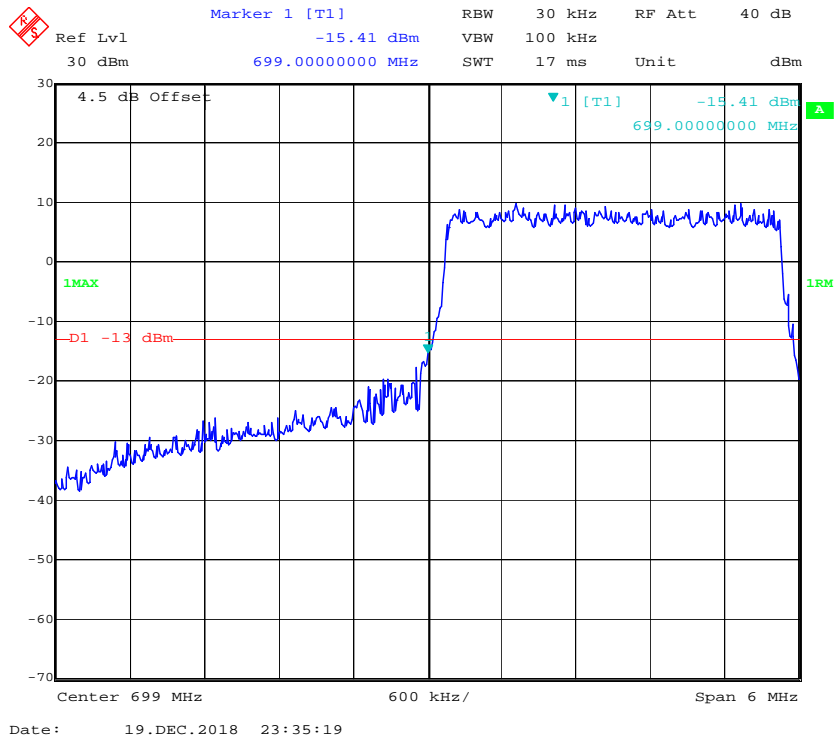
16QAM_1.4MHz_6 RB_ Left



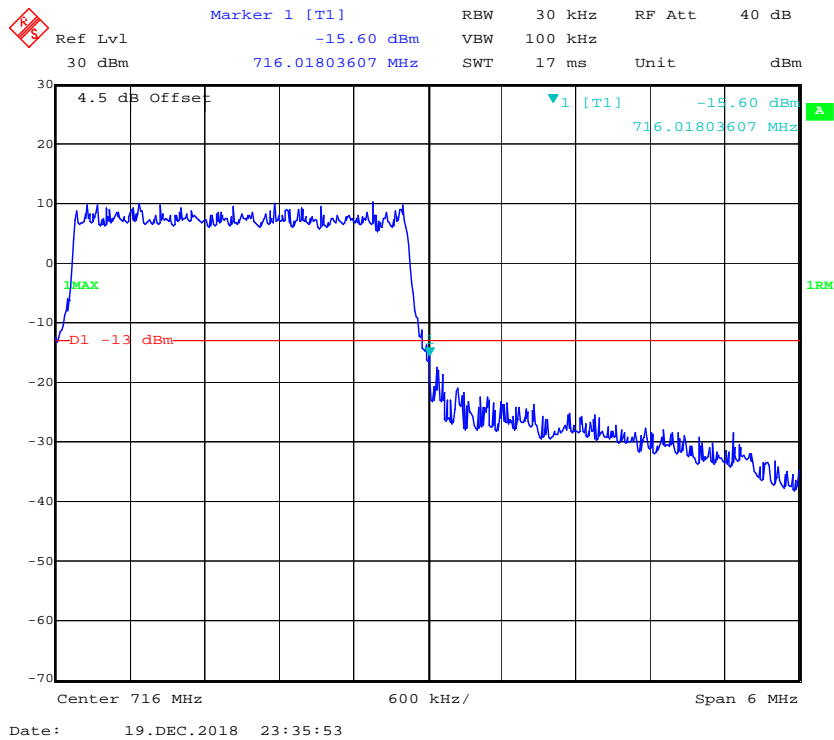
16QAM_1.4MHz_6 RB_ Right



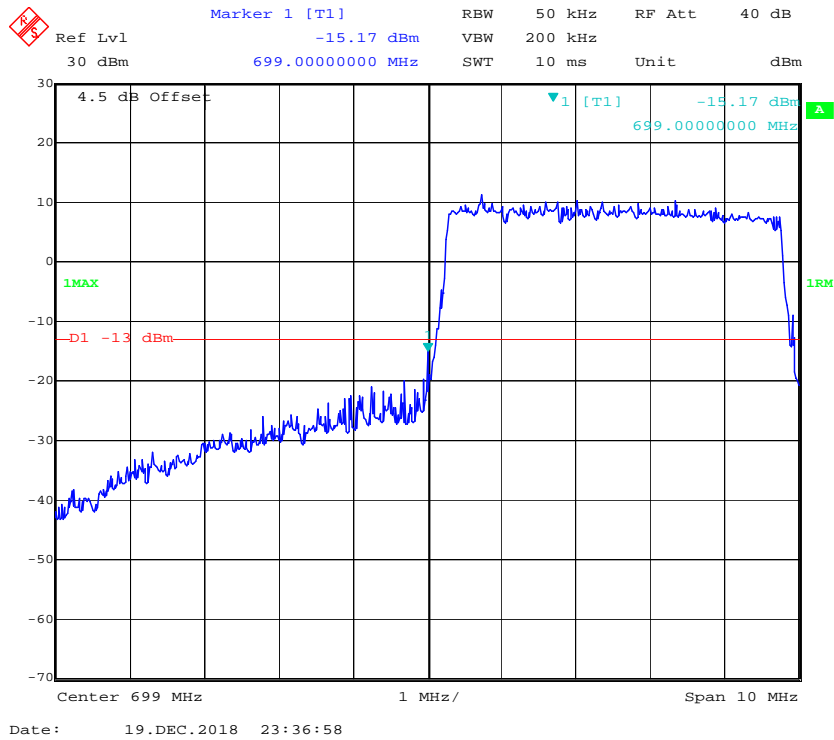
16QAM_3MHz_15 RB_ Left



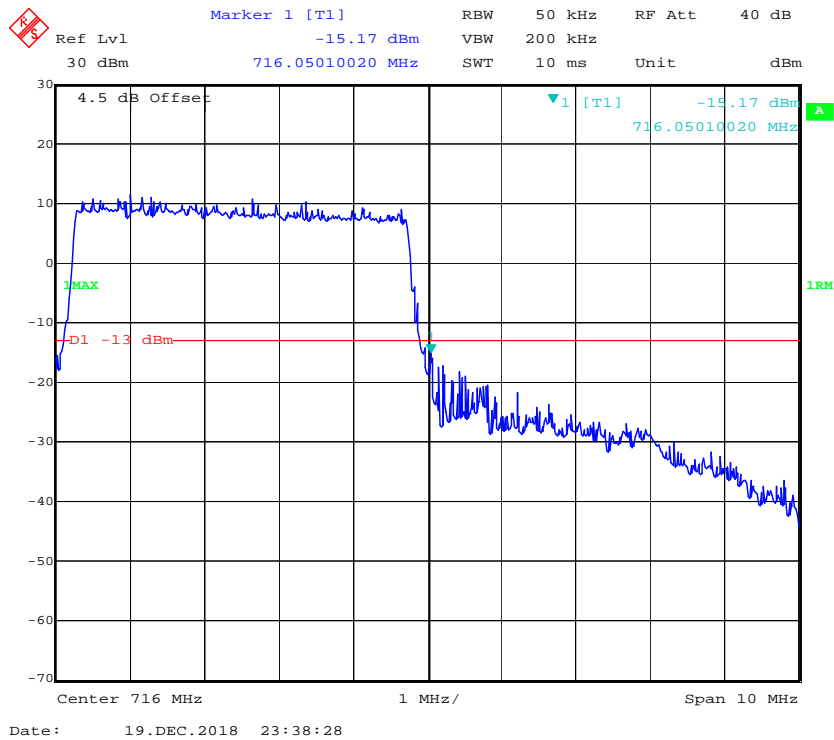
16QAM_3MHz_15 RB_ Right



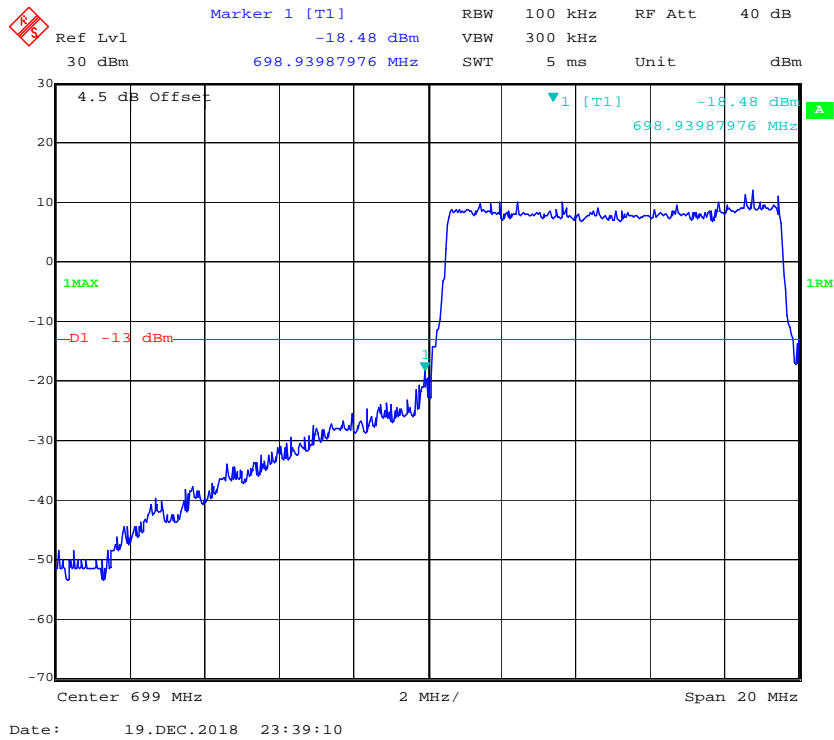
16QAM_5MHz_25 RB_ Left



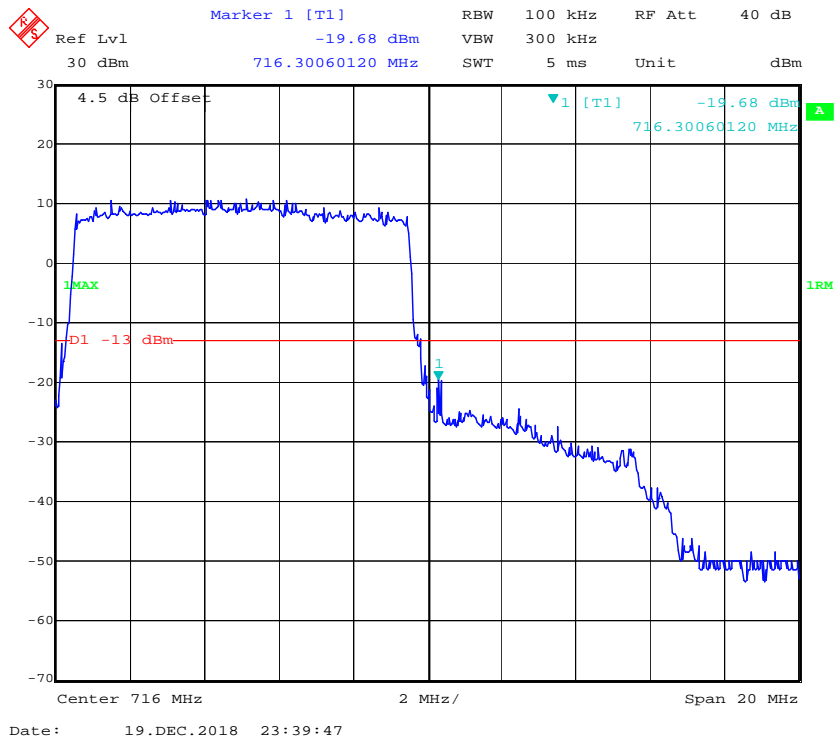
16QAM_5MHz_25 RB_ Right



16QAM_10MHz_ 50 RB_ Left

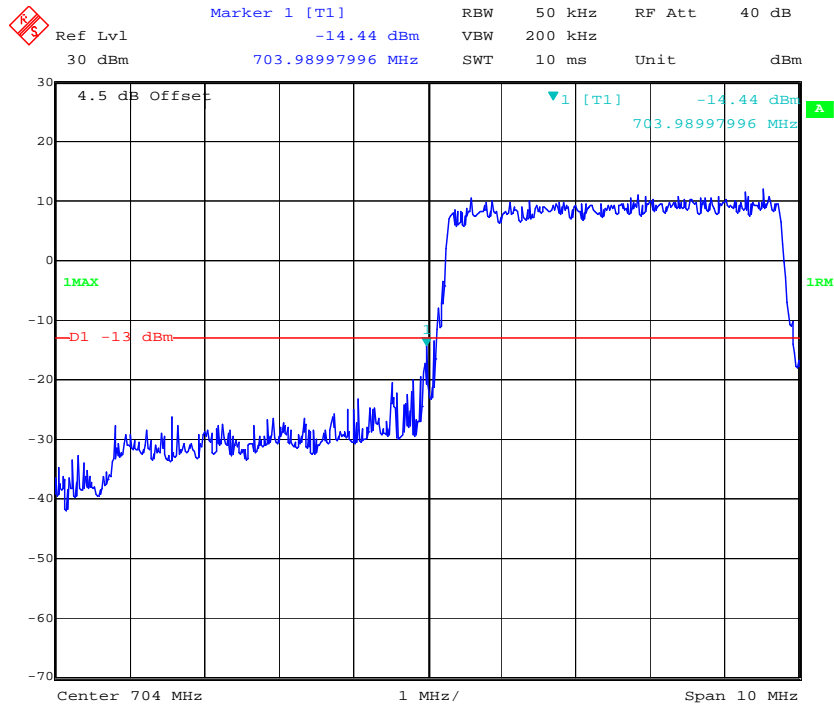


16QAM_10MHz_ 50 RB_ Right

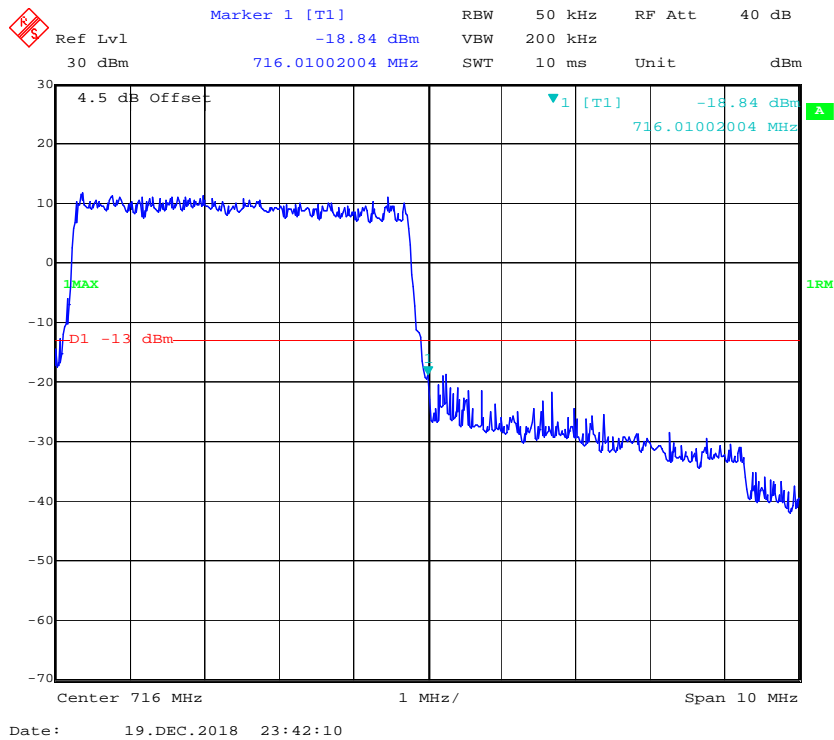


LTE Band 17

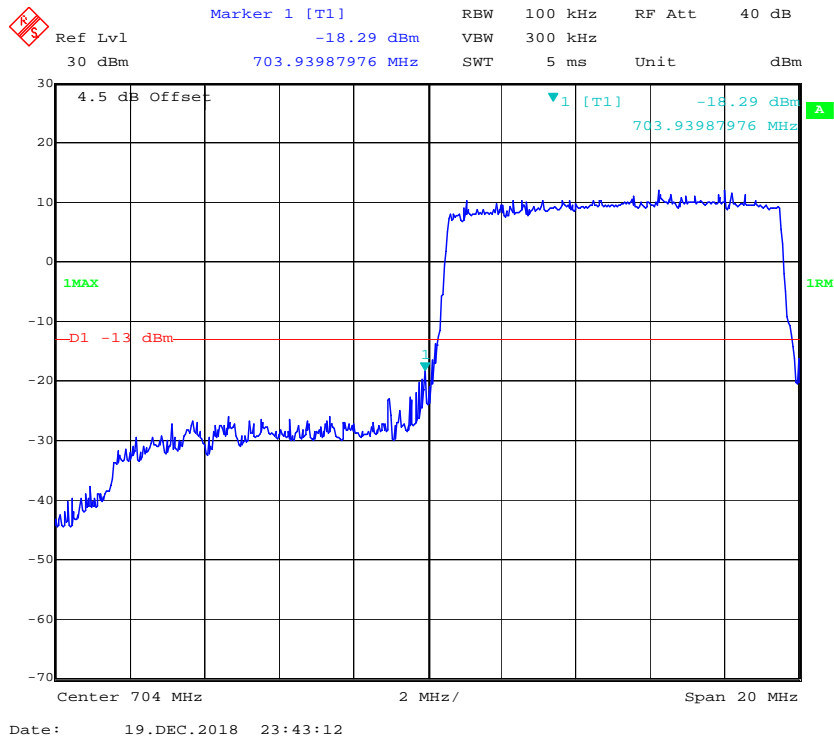
QPSK_5MHz_25 RB_ Left



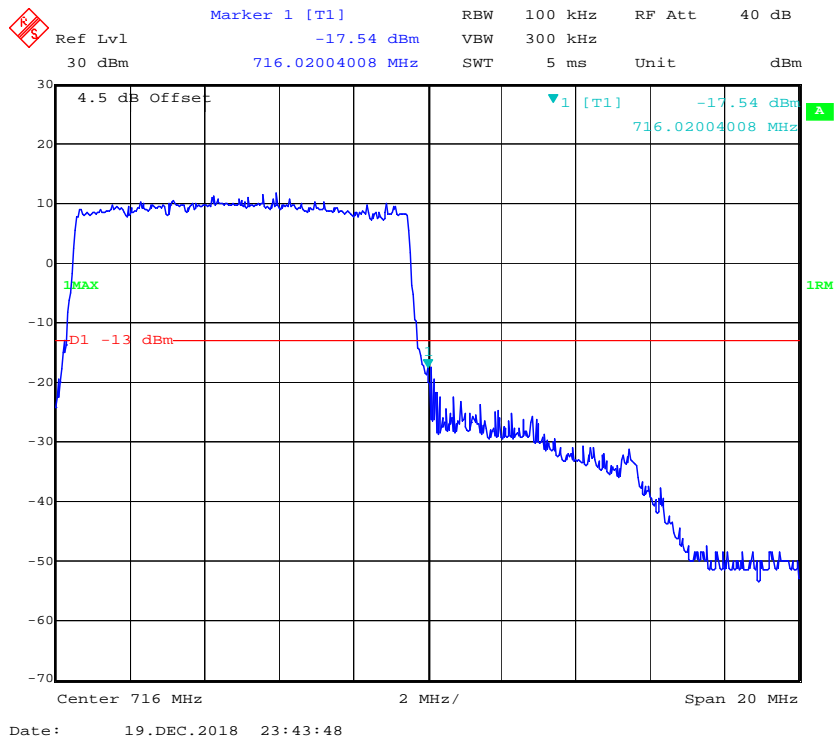
QPSK_5MHz_25 RB_ Right



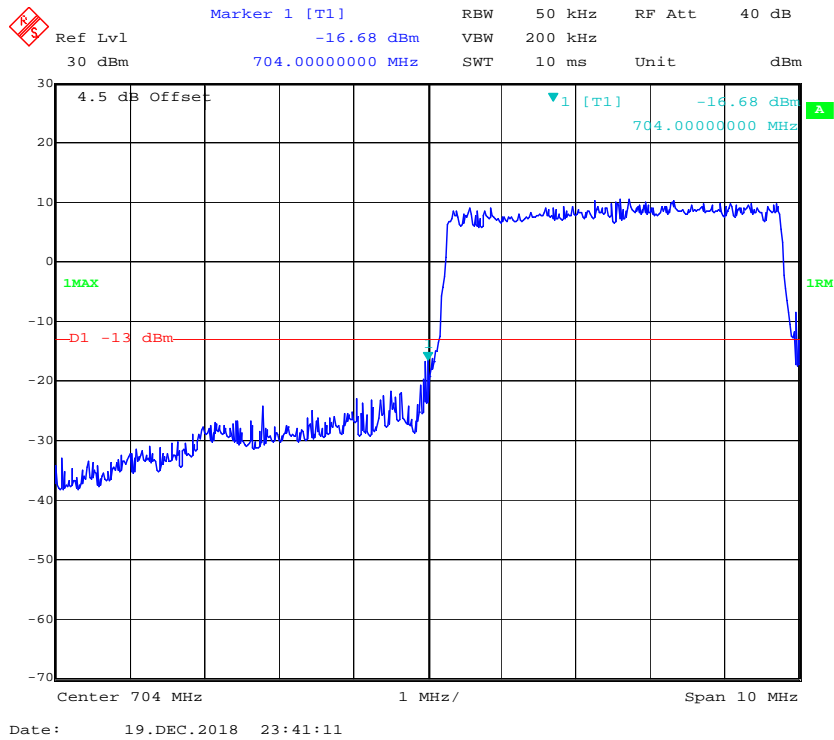
QPSK_10MHz_50 RB_Left



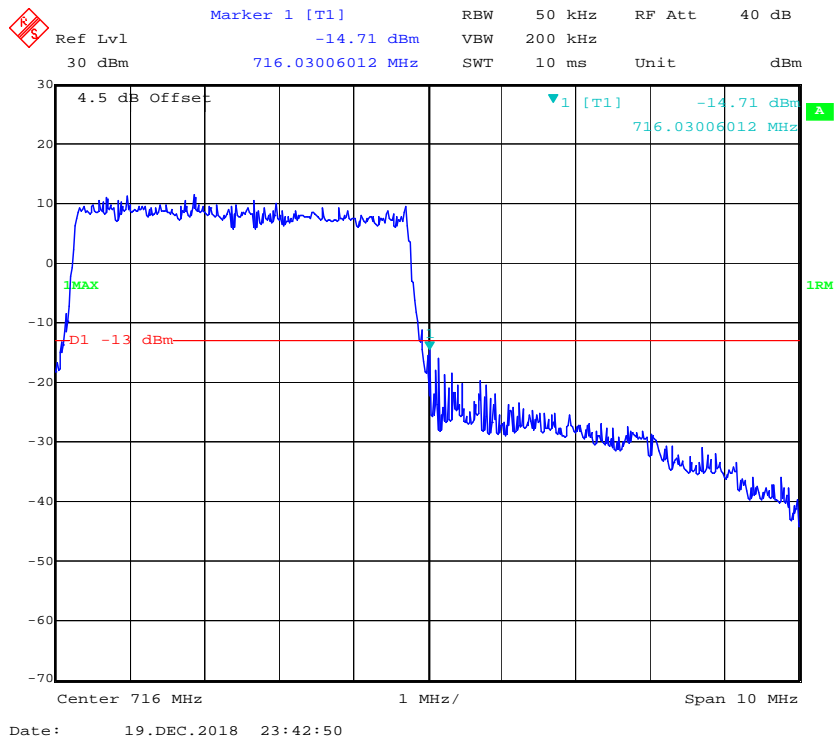
QPSK_10MHz_50 RB_Right



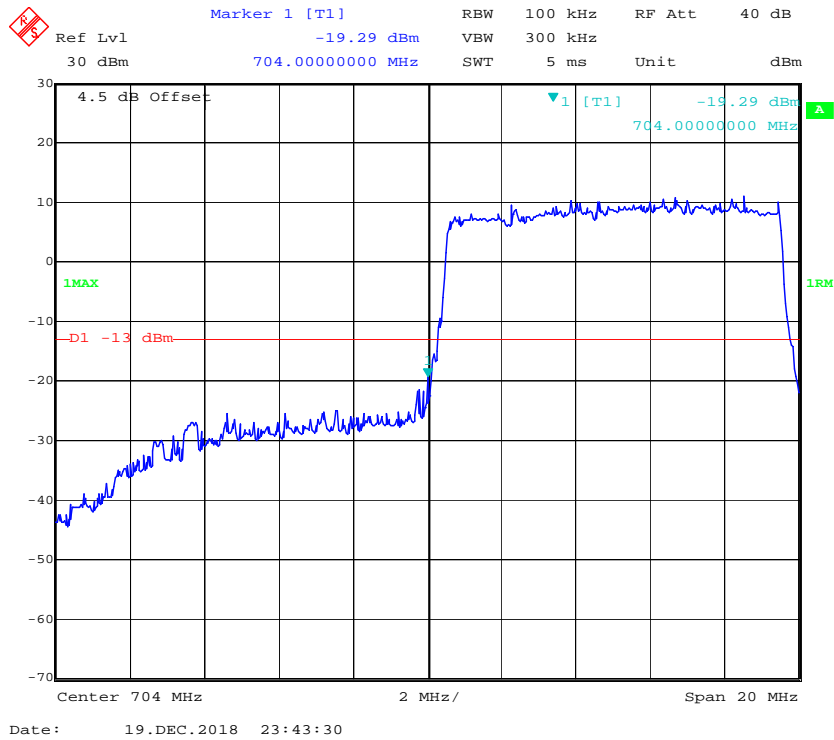
16QAM_5MHz_25 RB_ Left



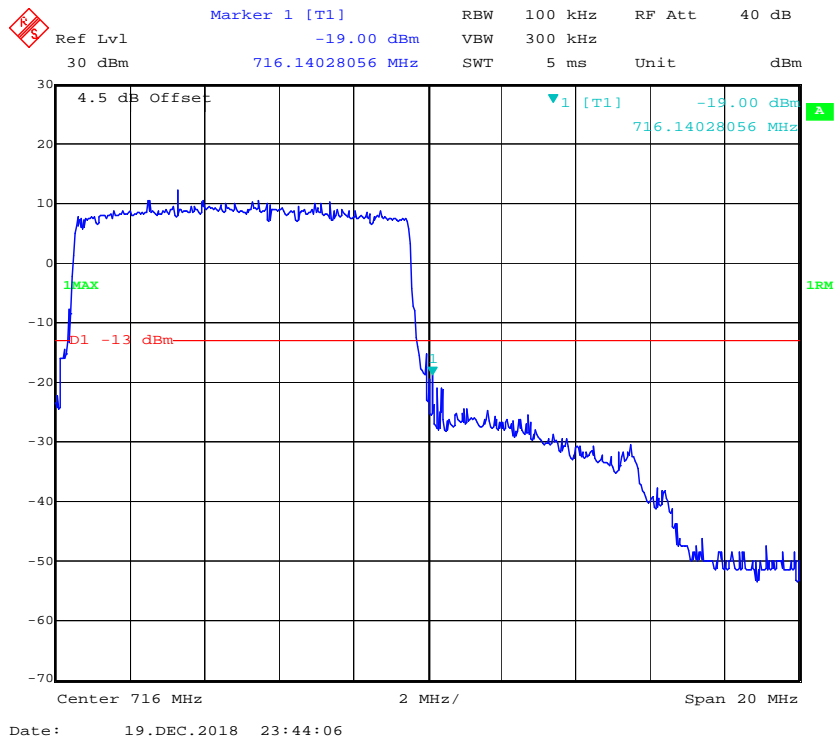
16QAM_5MHz_25 RB_ Right



16QAM_10MHz_ 50 RB_ Left



16QAM_10MHz_ 50 RB_ Right



FCC §2.1055, §22.355 & §24.235 & §27.54 - FREQUENCY STABILITY**Applicable Standard**

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

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

| Frequency Range (MHz) | Base, fixed (ppm) | Mobile > 3 watts (ppm) | Mobile ≤ 3 watts (ppm) |
|-----------------------|-------------------|------------------------|------------------------|
| 25 to 50 | 20.0 | 20.0 | 50.0 |
| 50 to 450 | 5.0 | 5.0 | 50.0 |
| 450 to 512 | 2.5 | 5.0 | 5.0 |
| 821 to 896 | 1.5 | 2.5 | 2.5 |
| 928 to 929. | 5.0 | N/A | N/A |
| 929 to 960. | 1.5 | N/A | N/A |
| 2110 to 2220 | 10.0 | N/A | N/A |

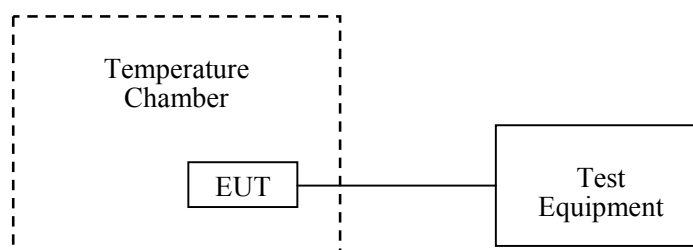
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 |
|-----------------|--|-------------|---------------|------------------|----------------------|
| Unknown | Coaxial Cable | C-SJ00-0010 | C0010/01 | Each time | N/A |
| R&S | Wideband Radio Communication Tester | CMW500 | 147473 | 2018-08-03 | 2019-08-03 |
| R&S | Universal Radio Communication Tester | CMU200 | 110 822 | 2018-12-14 | 2019-12-14 |
| ESPEC | Constant temperature and humidity Tester | ESX-4CA | 018 463 | 2018-03-26 | 2019-03-26 |
| UNI-T | Multimeter | UT39A | M130199938 | 2018-07-24 | 2019-07-24 |
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 831929/005 | 2018-08-03 | 2019-08-03 |
| 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**

| | |
|---------------------------|---------------|
| Temperature: | 23.9~24.2°C |
| Relative Humidity: | 34~36 % |
| ATM Pressure: | 99.7~99.8 kPa |

The testing was performed by Tiago Huang from 2018-12-17 to 2018-12-18.

Cellular Band (Part 22H)

| GMSK, Middle Channel, $f_c = 836.6$ MHz | | | | |
|---|-----------------|-----------------|-----------------|-------|
| Temperature | Voltage | Frequency Error | Frequency Error | Limit |
| °C | V _{DC} | Hz | ppm | ppm |
| -30 | 3.7 | -6 | -0.00717 | 2.5 |
| -20 | | 2 | 0.00239 | |
| -10 | | -11 | -0.01315 | |
| 0 | | -1 | -0.00120 | |
| 10 | | -12 | -0.01434 | |
| 20 | | 3 | 0.00359 | |
| 30 | | -6 | -0.00717 | |
| 40 | | -7 | -0.00837 | |
| 50 | | 4 | 0.00478 | |
| 20 | 3.5 | 7 | 0.00837 | |
| 20 | 4.2 | -12 | -0.01434 | |

| 8PSK, Middle Channel, $f_c = 836.6$ MHz | | | | |
|---|-----------------|-----------------|-----------------|-------|
| Temperature | Voltage | Frequency Error | Frequency Error | Limit |
| °C | V _{DC} | Hz | ppm | ppm |
| -30 | 3.7 | 5 | 0.00598 | 2.5 |
| -20 | | 4 | 0.00478 | |
| -10 | | 3 | 0.00359 | |
| 0 | | 1 | 0.00120 | |
| 10 | | 0 | 0.00000 | |
| 20 | | -3 | -0.00359 | |
| 30 | | -9 | -0.01076 | |
| 40 | | 6 | 0.00717 | |
| 50 | | 8 | 0.00956 | |
| 20 | 3.5 | 0 | 0.00000 | |
| 20 | 4.2 | 6 | 0.00717 | |

PCS Band (Part 24E)

| GMSK, Middle Channel, $f_c = 1880.0$ MHz | | | | |
|--|-----------------------|------------------------|------------------------|----------------|
| Temperature | Voltage | Frequency Error | Frequency Error | Results |
| °C | V_{DC} | Hz | ppm | |
| -30 | 3.7 | -9 | -0.00479 | Pass |
| -20 | | 1 | 0.00053 | |
| -10 | | 1 | 0.00053 | |
| 0 | | 9 | 0.00479 | |
| 10 | | -2 | -0.00106 | |
| 20 | | -13 | -0.00691 | |
| 30 | | -3 | -0.00160 | |
| 40 | | -11 | -0.00585 | |
| 50 | | 0 | 0.00000 | |
| 20 | 3.5 | 5 | 0.00266 | |
| 20 | 4.2 | -7 | -0.00372 | |

| 8PSK, Middle Channel, $f_c = 1880.0$ MHz | | | | |
|--|-----------------------|------------------------|------------------------|----------------|
| Temperature | Voltage | Frequency Error | Frequency Error | Results |
| °C | V_{DC} | Hz | ppm | |
| -30 | 3.7 | 0 | 0.00000 | Pass |
| -20 | | 11 | 0.00585 | |
| -10 | | 5 | 0.00266 | |
| 0 | | -10 | -0.00532 | |
| 10 | | 13 | 0.00691 | |
| 20 | | -10 | -0.00532 | |
| 30 | | 8 | 0.00426 | |
| 40 | | -4 | -0.00213 | |
| 50 | | 3 | 0.00160 | |
| 20 | 3.5 | 21 | 0.01117 | |
| 20 | 4.2 | 21 | 0.01117 | |

WCDMA Band II: R99

| Middle Channel, $f_c = 1880.0$ MHz | | | | |
|------------------------------------|-----------------|-----------------|-----------------|---------|
| Temperature | Voltage | Frequency Error | Frequency Error | Results |
| °C | V _{DC} | Hz | ppm | |
| -30 | 3.7 | -1 | -0.00053 | Pass |
| -20 | | -3 | -0.00160 | |
| -10 | | -6 | -0.00319 | |
| 0 | | -9 | -0.00479 | |
| 10 | | 4 | 0.00213 | |
| 20 | | 7 | 0.00372 | |
| 30 | | -11 | -0.00585 | |
| 40 | | -10 | -0.00532 | |
| 50 | | 11 | 0.00585 | |
| 20 | 3.5 | 6 | 0.00319 | |
| 20 | 4.2 | -11 | -0.00585 | |

WCDMA Band V: R99

| Middle Channel, $f_c = 836.6$ MHz | | | | |
|-----------------------------------|-----------------|-----------------|-----------------|-------|
| Temperature | Voltage | Frequency Error | Frequency Error | Limit |
| °C | V _{DC} | Hz | ppm | ppm |
| -30 | 3.7 | 8 | 0.00956 | 2.5 |
| -20 | | 7 | 0.00837 | |
| -10 | | 10 | 0.01195 | |
| 0 | | 10 | 0.01195 | |
| 10 | | -9 | -0.01076 | |
| 20 | | 9 | 0.01076 | |
| 30 | | -11 | -0.01315 | |
| 40 | | -12 | -0.01434 | |
| 50 | | 10 | 0.01195 | |
| 20 | 3.5 | -6 | -0.00717 | |
| 20 | 4.2 | -10 | -0.01195 | |

LTE Band 2:

| QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz | | | | |
|--|-----------------------|------------------------|------------------------|---------------|
| Temperature | Voltage | Frequency Error | Frequency Error | Result |
| °C | V_{DC} | Hz | ppm | |
| -30 | 3.7 | -20.56 | -0.01094 | Pass |
| -20 | | -11.09 | -0.00590 | |
| -10 | | -9.22 | -0.00490 | |
| 0 | | 0.28 | 0.00015 | |
| 10 | | -7.28 | -0.00387 | |
| 20 | | -15.86 | -0.00844 | |
| 30 | | -4.11 | -0.00219 | |
| 40 | | 13.66 | 0.00727 | |
| 50 | | -9.79 | -0.00521 | |
| 20 | 3.5 | -11.44 | -0.00609 | |
| 20 | 4.2 | -18.50 | -0.00984 | |

| 16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz | | | | |
|---|-----------------------|------------------------|------------------------|---------------|
| Temperature | Voltage | Frequency Error | Frequency Error | Result |
| °C | V_{DC} | Hz | ppm | |
| -30 | 3.7 | -14.94 | -0.0080 | Pass |
| -20 | | 13.05 | 0.0069 | |
| -10 | | -12.84 | -0.0068 | |
| 0 | | -1.68 | -0.0009 | |
| 10 | | -21.78 | -0.0116 | |
| 20 | | 9.39 | 0.0050 | |
| 30 | | 5.69 | 0.0030 | |
| 40 | | -9.61 | -0.0051 | |
| 50 | | 1.62 | 0.0009 | |
| 20 | 3.5 | 6.16 | 0.0033 | |
| 20 | 4.2 | -15.02 | -0.0080 | |

LTE Band 4:

| QPSK, Channel Bandwidth:10MHz | | | | | |
|--------------------------------------|-----------------------|--------------------------|----------------------|----------------------|----------------------|
| Temperature | Voltage | Test Result (MHz) | | Limit (MHz) | |
| °C | V_{DC} | F_L | F_H | F_L | F_H |
| -30 | 3.7 | 1710.571110 | 1754.549180 | 1710 | 1755 |
| -20 | | 1710.571130 | 1754.549240 | 1710 | 1755 |
| -10 | | 1710.571230 | 1754.548960 | 1710 | 1755 |
| 0 | | 1710.571190 | 1754.548990 | 1710 | 1755 |
| 10 | | 1710.571310 | 1754.549080 | 1710 | 1755 |
| 20 | | 1710.571140 | 1754.549100 | 1710 | 1755 |
| 30 | | 1710.570960 | 1754.548940 | 1710 | 1755 |
| 40 | | 1710.571040 | 1754.549210 | 1710 | 1755 |
| 50 | | 1710.571060 | 1754.549070 | 1710 | 1755 |
| 20 | 3.5 | 1710.570920 | 1754.549230 | 1710 | 1755 |
| 20 | 4.2 | 1710.570940 | 1754.549140 | 1710 | 1755 |

| 16QAM, Channel Bandwidth:10MHz | | | | | |
|---------------------------------------|-----------------------|--------------------------|----------------------|----------------------|----------------------|
| Temperature | Voltage | Test Result (MHz) | | Limit (MHz) | |
| °C | V_{DC} | F_L | F_H | F_L | F_H |
| -30 | 3.7 | 1710.571200 | 1754.549050 | 1710 | 1755 |
| -20 | | 1710.571170 | 1754.549020 | 1710 | 1755 |
| -10 | | 1710.571120 | 1754.548910 | 1710 | 1755 |
| 0 | | 1710.571030 | 1754.549160 | 1710 | 1755 |
| 10 | | 1710.571250 | 1754.549020 | 1710 | 1755 |
| 20 | | 1710.571140 | 1754.549100 | 1710 | 1755 |
| 30 | | 1710.570940 | 1754.549230 | 1710 | 1755 |
| 40 | | 1710.571000 | 1754.549030 | 1710 | 1755 |
| 50 | | 1710.571160 | 1754.549090 | 1710 | 1755 |
| 20 | 3.5 | 1710.570940 | 1754.548890 | 1710 | 1755 |
| 20 | 4.2 | 1710.571260 | 1754.549120 | 1710 | 1755 |

LTE Band 5:

| Middle Channel, $f_c = 836.5$ MHz, Channel Bandwidth:10MHz | | | | |
|--|-----------------|-----------------|-----------------|-------|
| Temperature | Voltage | Frequency Error | Frequency Error | Limit |
| °C | V _{DC} | Hz | ppm | ppm |
| -30 | 3.7 | -11.07 | -0.01323 | 2.5 |
| -20 | | 9.25 | 0.01106 | |
| -10 | | 11.89 | 0.01421 | |
| 0 | | -0.31 | -0.00037 | |
| 10 | | 4.35 | 0.00520 | |
| 20 | | 10.04 | 0.01200 | |
| 30 | | 4.68 | 0.00559 | |
| 40 | | -15.49 | -0.01852 | |
| 50 | | 7.44 | 0.00889 | |
| 20 | 3.5 | 1.01 | 0.00121 | |
| 20 | 4.2 | -10.36 | -0.01238 | |

| Middle Channel, $f_c = 836.5$ MHz, Channel Bandwidth:10MHz | | | | |
|--|-----------------|-----------------|-----------------|-------|
| Temperature | Voltage | Frequency Error | Frequency Error | Limit |
| °C | V _{DC} | Hz | ppm | ppm |
| -30 | 3.7 | 6.84 | 0.00818 | 2.5 |
| -20 | | -3.53 | -0.00422 | |
| -10 | | -17.21 | -0.02057 | |
| 0 | | 10.83 | 0.01295 | |
| 10 | | -18.87 | -0.02256 | |
| 20 | | 2.25 | 0.00269 | |
| 30 | | -13.65 | -0.01632 | |
| 40 | | -9.26 | -0.01107 | |
| 50 | | -6.28 | -0.00751 | |
| 20 | 3.5 | -10.58 | -0.01265 | |
| 20 | 4.2 | 6.51 | 0.00778 | |

LTE Band 7:

| QPSK, Channel Bandwidth:10MHz | | | | | |
|--------------------------------------|-----------------|--------------------------|----------------|--------------------|----------------|
| Temperature | Voltage | Test Result (MHz) | | Limit (MHz) | |
| °C | V _{DC} | F _L | F _H | F _L | F _H |
| -30 | 3.7 | 2500.531220 | 2569.508810 | 2500 | 2570 |
| -20 | | 2500.531170 | 2569.509100 | 2500 | 2570 |
| -10 | | 2500.531100 | 2569.508990 | 2500 | 2570 |
| 0 | | 2500.530870 | 2569.509050 | 2500 | 2570 |
| 10 | | 2500.531090 | 2569.509040 | 2500 | 2570 |
| 20 | | 2500.531060 | 2569.509020 | 2500 | 2570 |
| 30 | | 2500.531100 | 2569.508960 | 2500 | 2570 |
| 40 | | 2500.531210 | 2569.508980 | 2500 | 2570 |
| 50 | | 2500.530910 | 2569.508810 | 2500 | 2570 |
| 20 | 3.5 | 2500.530990 | 2569.509190 | 2500 | 2570 |
| 20 | 4.2 | 2500.530840 | 2569.509080 | 2500 | 2570 |

| 16QAM, Channel Bandwidth:10MHz | | | | | |
|---------------------------------------|-----------------|--------------------------|----------------|--------------------|----------------|
| Temperature | Voltage | Test Result (MHz) | | Limit (MHz) | |
| °C | V _{DC} | F _L | F _H | F _L | F _H |
| -30 | 3.7 | 2500.530930 | 2569.509080 | 2500 | 2570 |
| -20 | | 2500.531000 | 2569.508930 | 2500 | 2570 |
| -10 | | 2500.530940 | 2569.509130 | 2500 | 2570 |
| 0 | | 2500.531170 | 2569.508980 | 2500 | 2570 |
| 10 | | 2500.530960 | 2569.508880 | 2500 | 2570 |
| 20 | | 2500.531060 | 2569.509020 | 2500 | 2570 |
| 30 | | 2500.530990 | 2569.509140 | 2500 | 2570 |
| 40 | | 2500.531190 | 2569.508870 | 2500 | 2570 |
| 50 | | 2500.531170 | 2569.509050 | 2500 | 2570 |
| 20 | 3.5 | 2500.530970 | 2569.509060 | 2500 | 2570 |
| 20 | 4.2 | 2500.531020 | 2569.509140 | 2500 | 2570 |

LTE Band 12:

| QPSK, Channel Bandwidth:10MHz | | | | | |
|--------------------------------------|-----------------------|--------------------------|----------------------|----------------------|----------------------|
| Temperature | Voltage | Test Result (MHz) | | Limit (MHz) | |
| °C | V_{DC} | F_L | F_H | F_L | F_H |
| -30 | 3.7 | 699.531132 | 715.509159 | 699 | 716 |
| -20 | | 699.531189 | 715.508839 | 699 | 716 |
| -10 | | 699.531161 | 715.508959 | 699 | 716 |
| 0 | | 699.531151 | 715.508996 | 699 | 716 |
| 10 | | 699.531190 | 715.509153 | 699 | 716 |
| 20 | | 699.531062 | 715.509018 | 699 | 716 |
| 30 | | 699.530937 | 715.509086 | 699 | 716 |
| 40 | | 699.530919 | 715.508832 | 699 | 716 |
| 50 | | 699.531118 | 715.509078 | 699 | 716 |
| 20 | 3.5 | 699.531131 | 715.509156 | 699 | 716 |
| 20 | 4.2 | 699.531092 | 715.508856 | 699 | 716 |

| 16QAM, Channel Bandwidth:10MHz | | | | | |
|---------------------------------------|-----------------------|--------------------------|----------------------|----------------------|----------------------|
| Temperature | Voltage | Test Result (MHz) | | Limit (MHz) | |
| °C | V_{DC} | F_L | F_H | F_L | F_H |
| -30 | 3.7 | 699.531120 | 715.508855 | 699 | 716 |
| -20 | | 699.531225 | 715.508989 | 699 | 716 |
| -10 | | 699.530904 | 715.508855 | 699 | 716 |
| 0 | | 699.530923 | 715.509110 | 699 | 716 |
| 10 | | 699.531194 | 715.509025 | 699 | 716 |
| 20 | | 699.531062 | 715.509018 | 699 | 716 |
| 30 | | 699.530936 | 715.509140 | 699 | 716 |
| 40 | | 699.530879 | 715.509001 | 699 | 716 |
| 50 | | 699.531142 | 715.509031 | 699 | 716 |
| 20 | 3.5 | 699.531192 | 715.508959 | 699 | 716 |
| 20 | 4.2 | 699.531051 | 715.509033 | 699 | 716 |

LTE Band 17:

| QPSK, Channel Bandwidth:10MHz | | | | | |
|--------------------------------------|-----------------------|--------------------------|----------------------|----------------------|----------------------|
| Temperature | Voltage | Test Result (MHz) | | Limit (MHz) | |
| °C | V_{DC} | F_L | F_H | F_L | F_H |
| -30 | 3.7 | 704.571223 | 715.508831 | 704 | 716 |
| -20 | | 704.571179 | 715.509063 | 704 | 716 |
| -10 | | 704.571167 | 715.509038 | 704 | 716 |
| 0 | | 704.571193 | 715.508957 | 704 | 716 |
| 10 | | 704.571079 | 715.508921 | 704 | 716 |
| 20 | | 704.571142 | 715.509018 | 704 | 716 |
| 30 | | 704.571303 | 715.509059 | 704 | 716 |
| 40 | | 704.571131 | 715.509103 | 704 | 716 |
| 50 | | 704.571006 | 715.509102 | 704 | 716 |
| 20 | 3.5 | 704.571256 | 715.508831 | 704 | 716 |
| 20 | 4.2 | 704.571254 | 715.508972 | 704 | 716 |

| 16QAM, Channel Bandwidth:10MHz | | | | | |
|---------------------------------------|-----------------------|--------------------------|----------------------|----------------------|----------------------|
| Temperature | Voltage | Test Result (MHz) | | Limit (MHz) | |
| °C | V_{DC} | F_L | F_H | F_L | F_H |
| -30 | 3.7 | 704.571256 | 715.508925 | 704 | 716 |
| -20 | | 704.571117 | 715.509140 | 704 | 716 |
| -10 | | 704.571174 | 715.509011 | 704 | 716 |
| 0 | | 704.571208 | 715.508843 | 704 | 716 |
| 10 | | 704.571169 | 715.509091 | 704 | 716 |
| 20 | | 704.571142 | 715.509018 | 704 | 716 |
| 30 | | 704.571049 | 715.509031 | 704 | 716 |
| 40 | | 704.571163 | 715.508968 | 704 | 716 |
| 50 | | 704.570961 | 715.509126 | 704 | 716 |
| 20 | 3.5 | 704.571055 | 715.509034 | 704 | 716 |
| 20 | 4.2 | 704.571042 | 715.508829 | 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 *******