



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

For

SWAGTEK

10205 NW 19th Street, STE101, Miami, Florida, United States, 33172

FCC ID: O55503316

Report Type: Original Report	Product Name: 5 inch LTE smart phone
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Report Number: <u>RDG161003001B</u>	
Report Date: <u>2016-11-21</u>	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The **SWAGTEK** 's product, model number: **L5S (FCC ID: O55503316)** (the "EUT") in this report was a **5 inch LTE smart phone**, which was measured approximately: 14.5 cm (L) × 7.3 cm (W) × 0.9 cm (H), rated input voltage: DC3.8V Li-polymer or DC5V from adapter.

Adapter Information:

Input: AC100-240V 50/60 Hz 0.2A

Output: DC5V/1000mA

Note: The series product, model L5S, PRO, UL502 are electrically identical, the differences between them are the model name and color, we selected L5S for fully testing, the details was explained in the declaration letter.

**All measurement and test data in this report was gathered from final production sample, serial number: 161003001 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2016-10-03, and EUT conformed to test requirement.*

Objective

This report is prepared on behalf of **SWAGTEK** in accordance with: Part 2-Subpart J, Part 22-Subpart H, Part 24-Subpart E and part 27 of the Federal Communications Commission's 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 15B JBP submissions with FCC ID: O55503316.

FCC Part 15C DTS submissions with FCC ID: O55503316.

FCC Part 15C DSS submissions with FCC ID: O55503316.

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, Part 22 Subpart H, Part 24 Subpart E and Part 27.

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

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Chengdu).

Test Facility

The test site used by BACL to collect test data is located in the 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

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.

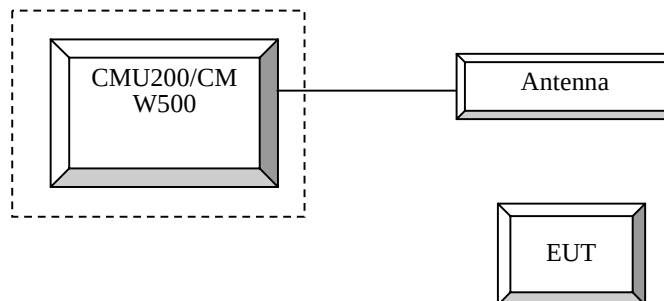
Equipment Modifications

No modification was made to the EUT.

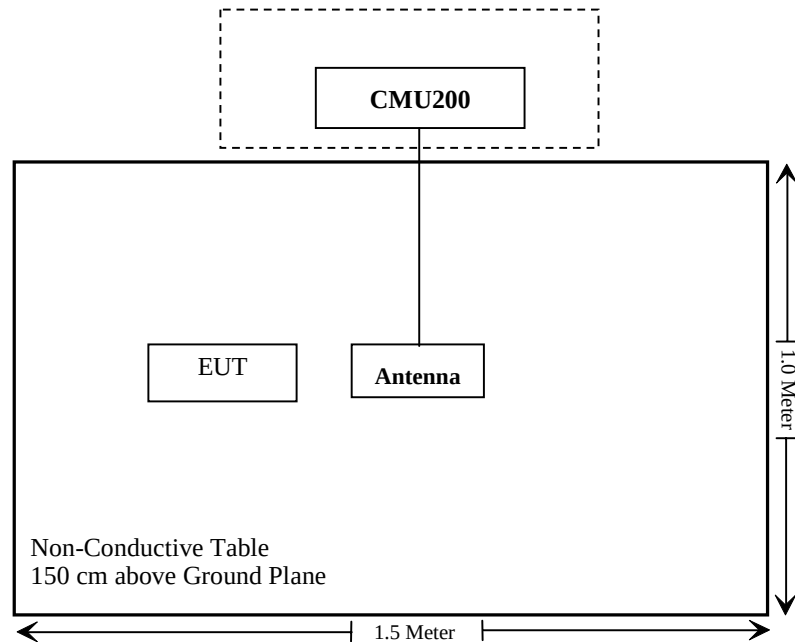
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universal Radio Communication Tester	CMU200	11-9435686-111
R&S	Universal Radio Communication Tester	CMW500	106891
N/A	ANTENNA	N/A	N/A

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	Spurious Radiation Emissions	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: RDG161003001-20.

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

According to §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.

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 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 Number	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2015-12-02	2016-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2015-12-02	2016-12-01
ETS	Horn Antenna	3115	003-6076	2015-12-02	2016-12-01
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113024	2014-06-16	2017-06-15
EMCO	Adjustable Dipole Antenna	3121C	9109-258	N/A	N/A
HP	Signal Generator	8648C	3623A04150	2016-05-23	2017-05-22
WILTRON	SWEPT FREQUENCY SYNTHESIZER	6737	213001	2016-05-23	2017-05-22
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2015-11-10	2016-11-09
N/A	RF Cable (below 1GHz)	NO.1	N/A	2016-11-10	2017-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2015-11-10	2016-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2016-11-10	2017-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2015-11-10	2016-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2016-11-10	2017-11-09
R&S	Universal Radio Communication Tester	CMU200	11-9435686-111	2016-07-28	2017-07-27
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-11-23	2016-11-23

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	28.5~29.8 °C
Relative Humidity:	39~39.5 %
ATM Pressure:	100.7~101.5 kPa

The testing was performed by Tom Tang from 2016-11-09 to 2016-11-19.

Conducted Power

Cellular Band (Part 22H) & PCS Band (Part 24E)

Band	Channel No.	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	32.65	32.66	32.21	30.87	29.79	27.54	26.45	24.50	23.45
	190	32.70	32.69	32.25	30.90	29.83	27.27	26.10	24.27	22.91
	251	32.58	32.57	32.11	30.73	29.65	26.96	25.73	23.85	22.50
PCS	512	29.80	29.72	29.11	27.45	26.34	25.66	24.57	22.47	21.24
	661	29.69	29.56	29.08	27.55	26.52	26.29	25.07	23.16	21.75
	810	29.76	29.61	29.10	27.60	26.57	26.33	24.98	23.06	21.69

WCDMA Band II

Mode	3GPP Sub Test	Average Output Power (dBm)					
		Low Channel (Ave. Power)	Low Channel (PAR)	Middle Channel (Ave. Power)	Middle Channel (PAR)	High Channel (Ave. Power)	High Channel (PAR)
Rel 99 (QPSK)	1	21.80	3.00	22.78	3.00	22.19	3.16
HSDPA (QPSK)	1	21.42	2.93	22.22	3.00	21.63	3.13
	2	21.47	3.14	22.23	2.96	21.60	3.04
	3	21.38	2.88	22.24	3.01	21.64	3.13
	4	21.39	3.07	22.16	3.08	21.60	3.29
HSUPA (QPSK)	1	21.42	2.85	22.21	2.86	21.63	3.14
	2	21.40	3.08	22.16	2.91	21.65	3.13
	3	21.42	3.13	22.26	2.91	21.57	3.26
	4	21.41	2.88	22.23	3.12	21.61	3.14
	5	21.43	2.92	22.26	3.05	21.62	3.00
DC-HSDPA (QPSK)	1	21.45	2.91	22.25	3.05	21.65	3.11
	2	21.46	2.95	22.27	2.90	21.63	3.11
	3	21.41	3.06	22.21	3.07	21.61	3.19
	4	21.47	3.10	22.20	3.10	21.60	3.23
HSPA+ (16QAM)	1	21.44	2.90	22.16	2.91	21.64	3.24

WCDMA Band V

Mode	3GPP Sub Test	Average Output Power (dBm)					
		Low Channel (Ave. Power)	Low Channel (PAR)	Middle Channel (Ave. Power)	Middle Channel (PAR)	High Channel (Ave. Power)	High Channel (PAR)
Rel 99 (QPSK)	1	22.63	3.24	22.67	3.08	22.85	3.52
HSDPA (QPSK)	1	22.09	3.11	22.14	3.05	22.31	3.51
	2	22.12	3.16	22.15	3.12	22.36	3.40
	3	22.03	3.28	22.10	3.15	22.32	3.45
	4	22.04	3.35	22.13	3.00	22.31	3.46
HSUPA (QPSK)	1	22.11	3.13	22.12	3.18	22.27	3.37
	2	22.05	3.10	22.10	3.00	22.29	3.55
	3	22.06	3.33	22.17	3.23	22.35	3.47
	4	22.14	3.36	22.09	3.11	22.36	3.51
DC-HSDPA (QPSK)	1	22.09	3.25	22.12	3.21	22.28	3.37
	2	22.07	3.37	22.10	2.99	22.33	3.54
	3	22.12	3.17	22.16	3.22	22.33	3.42
	4	22.13	3.10	22.19	2.96	22.30	3.55
	5	22.08	3.16	22.15	3.10	22.25	3.34
HSPA+ (16QAM)	1	22.14	3.26	22.08	3.04	22.34	3.49

LTE Band II (PART 24)

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4 MHz	QPSK	1#0	21.67	21.98	21.83
		1#3	21.30	21.06	20.99
		1#5	21.44	21.58	21.19
		3#0	21.74	21.89	21.57
		3#1	21.19	21.03	21.00
		3#3	21.34	21.24	20.89
		6#0	20.96	20.94	20.84
	16QAM	1#0	20.51	20.82	20.81
		1#3	20.76	20.91	20.74
		1#5	21.03	20.90	20.59
		3#0	21.87	21.06	20.88
		3#1	20.26	20.44	20.47
		3#3	20.19	20.65	20.14
		6#0	19.55	19.87	19.98
3 MHz	QPSK	1#0	21.87	21.78	21.76
		1#7	21.56	21.94	21.67
		1#14	21.71	21.62	21.68
		8#0	21.59	21.85	21.69
		8#4	21.37	21.66	21.84
		8#7	21.37	21.68	21.58
		15#0	20.98	20.78	20.92
	16QAM	1#0	20.90	21.11	20.77
		1#7	21.14	21.31	20.96
		1#14	21.06	21.65	21.19
		8#0	20.98	21.41	20.78
		8#4	20.90	21.06	20.87
		8#7	20.45	20.85	20.68
		15#0	19.87	19.89	19.98
5 MHz	QPSK	1#0	21.73	21.83	21.91
		1#12	21.64	21.97	21.79
		1#24	21.45	21.85	21.57
		12#0	21.50	21.71	21.44
		12#6	21.06	21.41	21.24
		12#11	20.94	21.14	21.03
		25#0	20.56	20.72	20.68
	16QAM	1#0	20.78	20.90	21.02
		1#12	20.67	20.87	20.89
		1#24	20.78	20.79	20.95
		12#0	20.99	21.02	20.71
		12#6	20.74	20.57	20.60
		12#11	20.11	20.17	20.44
		25#0	19.61	19.57	19.98

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10 MHz	QPSK	1#0	21.74	21.88	21.84
		1#24	21.68	21.99	21.95
		1#49	21.51	21.62	21.55
		25#0	21.40	21.31	21.35
		25#12	21.03	21.41	21.15
		25#24	20.74	21.08	21.15
		50#0	20.61	20.76	20.78
	16QAM	1#0	20.71	20.78	21.28
		1#24	20.68	20.74	21.02
		1#49	20.45	20.66	20.74
		25#0	20.47	20.67	20.55
		25#12	20.31	20.55	20.39
		25#24	20.22	20.32	20.15
		50#0	19.69	19.87	19.81
15 MHz	QPSK	1#0	21.83	21.89	21.85
		1#37	21.63	21.52	21.68
		1#74	21.39	21.43	21.52
		36#0	21.60	21.54	21.22
		36#17	21.14	21.26	21.32
		36#35	20.95	21.02	21.21
		75#0	20.81	20.95	21.40
	16QAM	1#0	21.67	21.85	21.60
		1#37	21.59	21.75	21.44
		1#74	21.34	21.44	21.26
		36#0	21.20	21.25	21.14
		36#17	20.84	21.11	20.98
		36#35	20.47	20.59	20.31
		75#0	19.80	19.81	20.11
20 MHz	QPSK	1#0	22.67	22.28	22.48
		1#49	22.12	22.05	21.98
		1#99	21.89	21.92	21.74
		50#0	21.71	21.95	21.68
		50#24	21.66	21.78	21.95
		50#49	21.77	21.65	21.74
		100#0	21.23	21.18	21.33
	16QAM	1#0	21.77	21.40	21.76
		1#49	21.36	21.74	21.57
		1#99	21.55	21.62	21.17
		50#0	21.21	21.57	21.20
		50#24	21.19	21.02	21.40
		50#49	21.13	20.98	21.03
		100#0	20.46	20.16	20.40

LTE Band IV (PART 27)

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	1#0	21.75	21.49	21.50
		1#3	21.73	20.97	20.56
		1#5	21.08	20.92	20.45
		3#0	21.31	21.36	21.21
		3#1	20.62	20.81	20.86
		3#3	21.25	21.18	20.96
		6#0	20.76	20.47	20.30
	16QAM	1#0	20.73	20.62	20.55
		1#3	20.46	20.09	19.76
		1#5	20.20	19.62	19.44
		3#0	20.36	20.15	20.14
		3#1	20.38	20.01	19.26
		3#3	19.97	20.43	20.19
		6#0	19.62	19.45	19.34
3 MHz	QPSK	1#0	21.58	21.51	21.45
		1#7	21.15	21.03	20.50
		1#14	21.07	21.26	20.75
		8#0	21.58	20.92	21.39
		8#4	21.22	20.90	21.43
		8#7	21.42	21.10	21.15
		15#0	20.83	20.50	20.49
	16QAM	1#0	20.68	21.03	20.40
		1#7	20.44	20.50	20.09
		1#14	20.63	20.60	19.90
		8#0	20.64	20.60	20.05
		8#4	20.16	21.00	19.66
		8#7	20.25	20.57	20.40
		15#0	19.82	19.67	19.48
5 MHz	QPSK	1#0	21.86	21.54	21.95
		1#12	21.62	21.16	21.59
		1#24	21.04	21.35	21.07
		12#0	21.35	21.31	21.35
		12#6	21.29	21.45	21.75
		12#11	20.73	21.49	21.09
		25#0	20.82	20.63	20.87
	16QAM	1#0	20.98	21.04	20.86
		1#12	20.67	20.17	20.48
		1#24	20.63	20.48	20.57
		12#0	20.40	19.97	20.03
		12#6	20.30	20.25	20.24
		12#11	20.65	20.85	20.35
		25#0	19.81	19.54	19.92

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10 MHz	QPSK	1#0	22.03	21.93	22.03
		1#24	21.48	21.30	21.62
		1#49	21.15	21.27	21.64
		25#0	20.93	21.54	21.49
		25#12	21.84	21.80	21.45
		25#24	21.40	21.06	21.06
		50#0	21.05	20.78	20.98
	16QAM	1#0	21.46	20.91	20.91
		1#24	21.19	20.44	20.07
		1#49	20.56	20.29	20.52
		25#0	20.31	20.89	20.48
		25#12	20.34	20.27	20.71
		25#24	20.25	20.34	20.65
		50#0	20.10	20.03	19.98
15 MHz	QPSK	1#0	21.76	21.65	21.61
		1#37	21.27	20.97	21.06
		1#74	20.88	20.82	21.55
		36#0	21.86	21.55	21.39
		36#17	21.56	21.21	21.30
		36#35	20.89	21.22	21.26
		75#0	20.84	20.51	20.47
	16QAM	1#0	21.13	20.67	21.05
		1#37	19.94	19.78	20.24
		1#74	20.10	20.45	20.07
		36#0	20.73	20.31	20.74
		36#17	20.37	19.82	20.60
		36#35	21.17	19.67	20.12
		75#0	19.86	19.69	19.67
20 MHz	QPSK	1#0	21.82	21.97	21.53
		1#49	21.60	21.47	21.46
		1#99	21.85	21.78	20.71
		50#0	21.61	21.72	20.85
		50#24	21.62	20.73	21.19
		50#49	21.73	20.93	21.22
		100#0	20.70	20.90	20.69
	16QAM	1#0	21.19	21.15	21.17
		1#49	20.11	20.20	20.92
		1#99	21.02	20.73	20.64
		50#0	20.83	20.39	20.31
		50#24	20.10	20.53	20.88
		50#49	21.19	20.59	20.03
		100#0	19.97	19.81	19.80

LTE Band V (PART 22)

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4 MHz	QPSK	1#0	22.16	21.75	22.08
		1#3	21.35	21.84	21.18
		1#5	21.60	21.20	21.13
		3#0	21.62	21.53	21.18
		3#1	22.15	21.95	21.93
		3#3	21.47	21.16	21.99
		6#0	21.24	20.89	21.03
	16QAM	1#0	21.08	20.98	21.25
		1#3	20.57	20.79	20.59
		1#5	20.36	20.18	20.35
		3#0	21.03	20.00	20.64
		3#1	20.95	20.71	20.86
		3#3	20.56	19.98	20.97
		6#0	20.08	20.05	20.08
3 MHz	QPSK	1#0	21.95	21.97	21.93
		1#7	22.03	21.65	21.89
		1#14	22.04	21.58	21.43
		8#0	22.10	21.74	21.59
		8#4	21.32	21.44	21.61
		8#7	21.84	21.54	21.45
		15#0	21.24	21.09	21.17
	16QAM	1#0	21.29	21.25	21.54
		1#7	20.99	20.44	20.89
		1#14	21.23	20.77	21.63
		8#0	20.40	20.63	21.52
		8#4	21.11	20.10	21.45
		8#7	20.50	20.73	21.43
		15#0	20.23	20.26	20.41

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5 MHz	QPSK	1#0	22.73	22.71	22.17
		1#12	22.40	22.04	21.23
		1#24	22.25	21.62	21.14
		12#0	22.39	22.19	21.97
		12#6	22.29	22.37	21.44
		12#11	21.77	22.59	21.99
		25#0	21.64	21.45	21.26
	16QAM	1#0	21.65	22.18	21.52
		1#12	21.38	21.03	20.90
		1#24	21.38	21.84	21.12
		12#0	21.03	21.41	20.50
		12#6	21.34	21.52	20.76
		12#11	21.41	20.90	21.01
		25#0	20.95	20.56	20.20
10 MHz	QPSK	1#0	22.17	22.02	22.84
		1#24	22.17	21.98	21.12
		1#49	21.71	21.72	20.31
		25#0	21.52	21.67	21.61
		25#12	22.23	22.09	22.13
		25#24	22.13	21.92	22.05
		50#0	21.24	21.43	21.72
	16QAM	1#0	21.31	21.51	22.61
		1#24	20.99	20.16	22.30
		1#49	21.15	20.25	22.33
		25#0	21.04	21.25	21.46
		25#12	21.11	20.64	20.82
		25#24	21.31	20.41	22.49
		50#0	20.75	20.24	20.70

LTE Band VII (PART 27)

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5 MHz	QPSK	1#0	23.21	23.48	23.19
		1#12	23.05	22.70	23.13
		1#24	22.49	22.92	22.71
		12#0	22.99	22.55	23.30
		12#6	23.02	23.02	22.84
		12#11	23.09	22.50	23.12
		25#0	22.19	22.46	22.26
	16QAM	1#0	22.47	22.38	22.30
		1#12	22.04	21.88	21.94
		1#24	22.31	21.85	21.44
		12#0	21.86	22.01	21.33
		12#6	21.54	21.71	22.36
		12#11	22.35	22.01	21.07
		25#0	21.17	21.68	21.06
10 MHz	QPSK	1#0	23.28	23.56	23.28
		1#24	22.94	23.07	22.86
		1#49	22.46	23.42	22.37
		25#0	23.16	23.41	22.46
		25#12	22.95	22.99	22.83
		25#24	22.35	22.53	22.10
		50#0	22.35	22.64	22.23
	16QAM	1#0	22.31	22.53	22.76
		1#24	21.80	22.06	21.52
		1#49	22.21	21.74	21.98
		25#0	22.21	21.72	22.45
		25#12	21.39	22.61	21.78
		25#24	21.64	22.57	22.24
		50#0	21.40	21.72	21.34

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15 MHz	QPSK	1#0	23.55	23.50	23.37
		1#37	22.60	22.94	22.81
		1#74	23.29	23.24	22.32
		36#0	22.90	23.17	22.99
		36#17	23.44	22.75	22.17
		36#35	22.49	23.38	22.66
		75#0	22.54	22.54	22.35
	16QAM	1#0	22.98	22.58	22.68
		1#37	22.30	21.60	21.67
		1#74	21.74	22.50	22.17
		36#0	21.47	21.83	22.60
		36#17	21.67	21.86	22.28
		36#35	22.59	22.11	21.63
		75#0	21.56	21.80	21.25
20 MHz	QPSK	1#0	23.43	23.45	23.53
		1#49	22.60	23.46	22.57
		1#99	23.11	23.50	22.36
		50#0	23.29	22.68	22.78
		50#24	22.65	22.72	23.18
		50#49	22.75	22.75	22.59
		100#0	22.40	22.41	22.14
	16QAM	1#0	22.89	22.62	22.69
		1#49	22.05	21.92	21.96
		1#99	22.78	22.04	21.66
		50#0	21.88	22.48	22.09
		50#24	21.92	22.10	22.32
		50#49	22.21	21.97	22.30
		100#0	21.56	21.58	21.40

LTE Band 17 (PART 27)

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5 MHz	QPSK	1#0	22.60	22.59	22.63
		1#12	22.52	22.62	22.55
		1#24	22.53	22.65	22.48
		12#0	22.27	22.41	22.33
		12#6	22.02	22.06	22.25
		12#11	21.85	21.48	21.98
		25#0	21.65	21.64	21.60
	16QAM	1#0	21.94	22.00	22.08
		1#12	21.79	22.02	22.11
		1#24	21.80	21.79	21.91
		12#0	21.56	21.98	21.93
		12#6	22.02	21.96	22.09
		12#11	21.41	21.73	21.59
		25#0	20.96	20.65	20.65
10 MHz	QPSK	1#0	22.71	22.93	22.54
		1#24	22.39	22.71	22.63
		1#49	22.55	22.98	22.48
		25#0	22.77	22.77	22.25
		25#12	22.50	22.75	22.58
		25#24	22.15	22.45	22.42
		50#0	21.73	22.30	21.81
	16QAM	1#0	21.89	22.80	21.89
		1#24	22.21	22.57	21.91
		1#49	21.92	22.64	21.70
		25#0	21.58	22.52	21.90
		25#12	21.23	22.02	21.51
		25#24	21.21	21.39	21.08
		50#0	20.86	21.24	20.78

PAR, Band II

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	3.65	3.13	3.49	13
	100 RB		4.01	3.89	3.85	13
16QAM	1 RB	20 MHz	4.25	3.81	4.25	13
	100 RB		5.61	5.49	5.57	13

PAR, Band IV

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	4.13	4.81	4.37	13
	100 RB		3.81	3.97	3.77	13
16QAM	1 RB	20 MHz	4.69	5.25	5.45	13
	100 RB		5.45	5.69	5.65	13

PAR, Band V

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	4.65	5.61	4.45	13
	50 RB		3.89	3.81	4.09	13
16QAM	1 RB	10 MHz	5.45	6.57	5.33	13
	50 RB		5.81	5.41	5.69	13

PAR, Band VII

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	3.29	4.05	3.45	13
	100 RB		3.97	3.85	3.65	13
16QAM	1 RB	20 MHz	4.61	3.01	4.69	13
	100 RB		5.57	5.65	5.45	13

PAR, Band 17

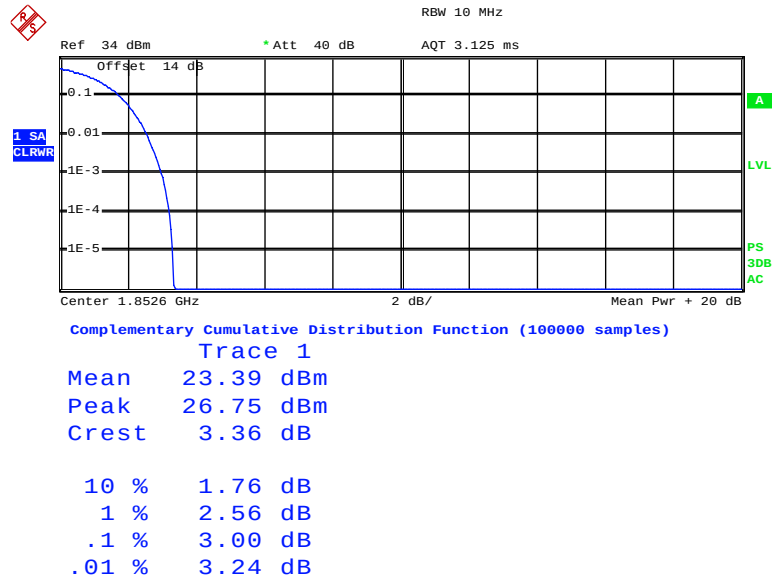
Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	4.81	5.09	4.81	13
	50 RB		3.81	3.73	3.73	13
16QAM	1 RB	10 MHz	5.69	5.61	5.81	13
	50 RB		5.49	5.53	5.45	13

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

Peak-to-average ratio (PAR)

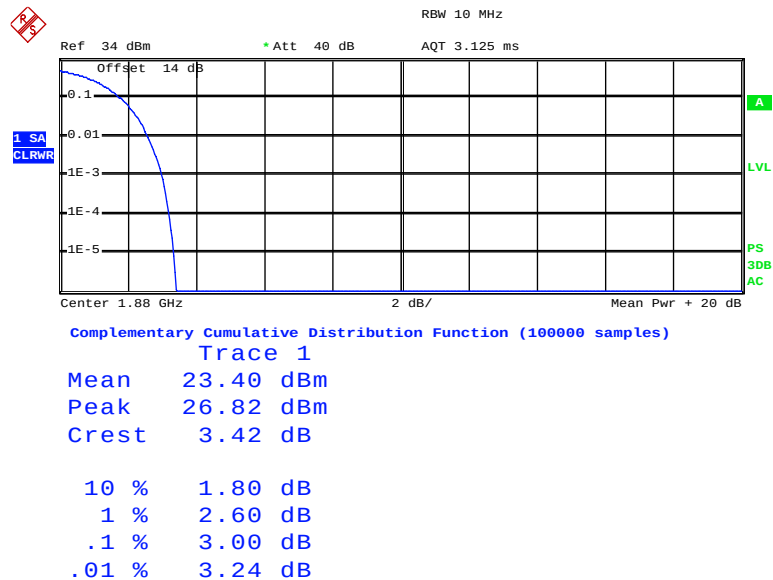
WCDMA Band II

Low Channel



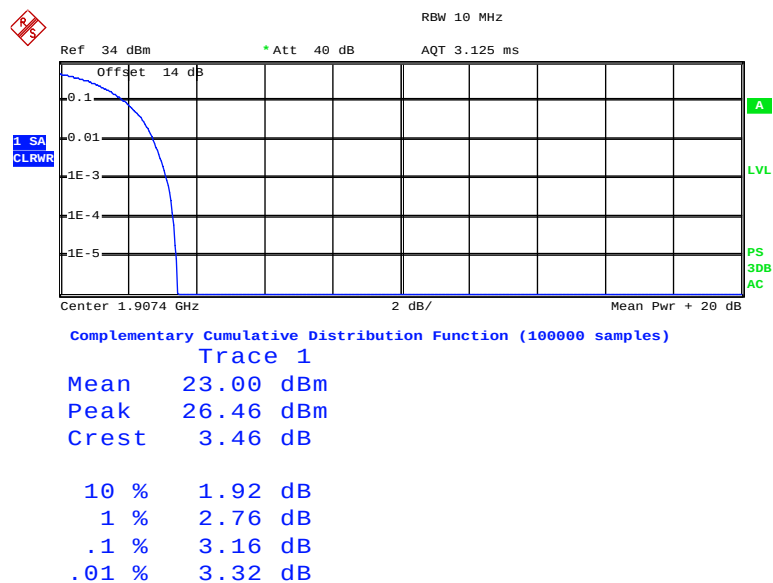
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Middle Channel



Date: 9.NOV.2016 09:21:54

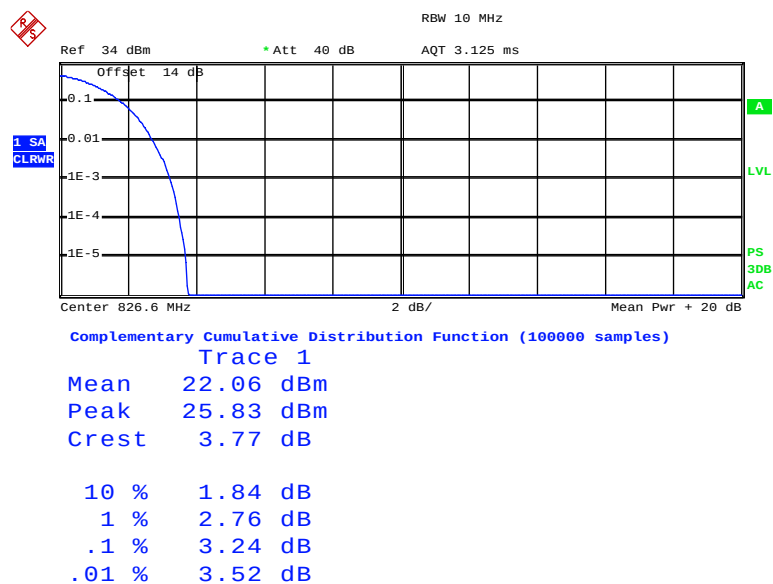
High Channel



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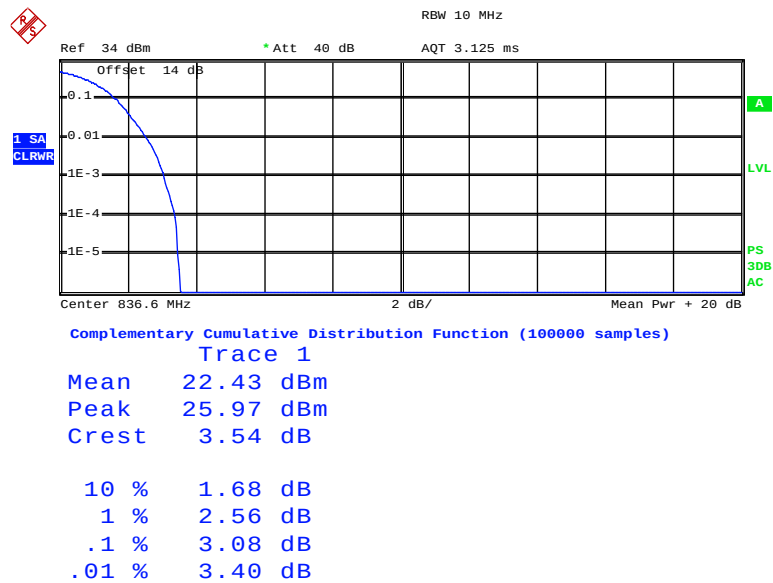
WCDMA Band V

Low Channel



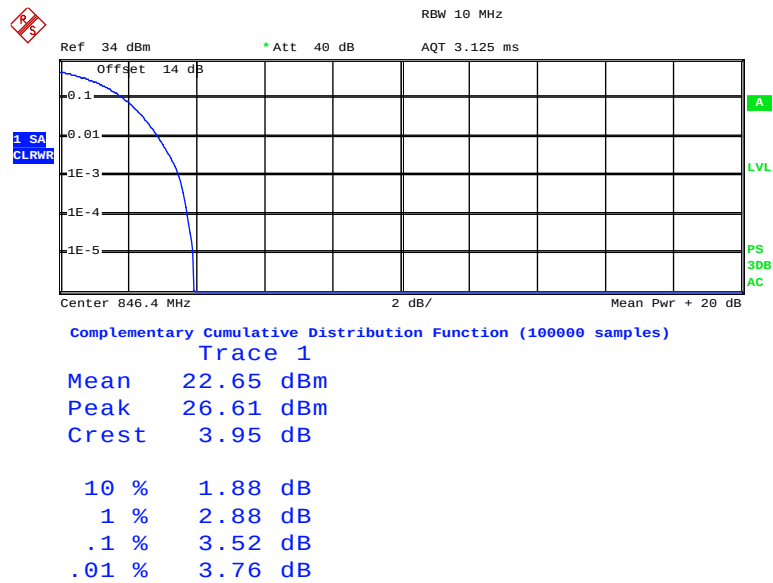
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Middle Channel



Date: 9.NOV.2016 09:19:41

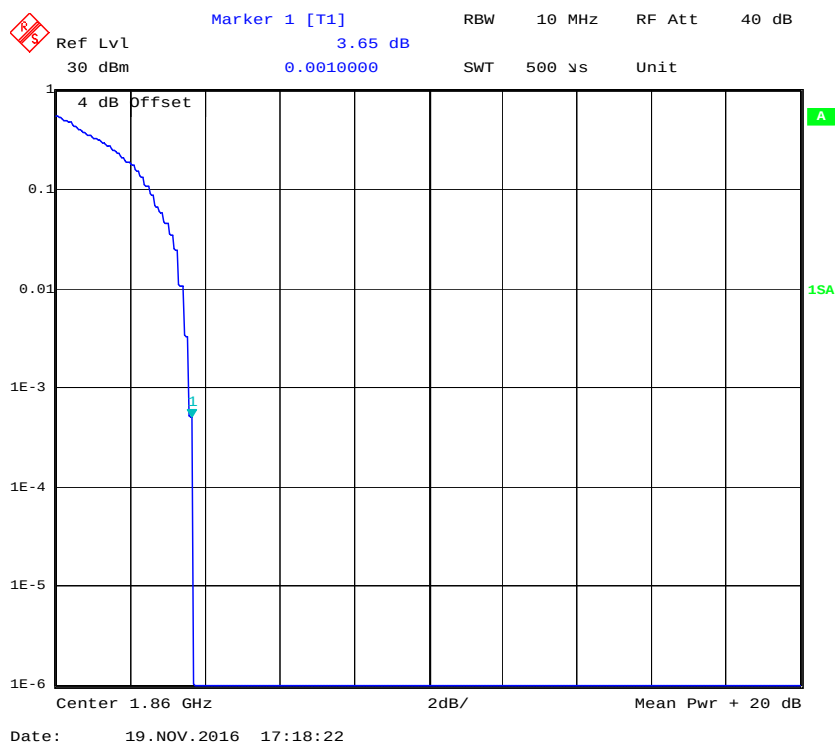
High Channel



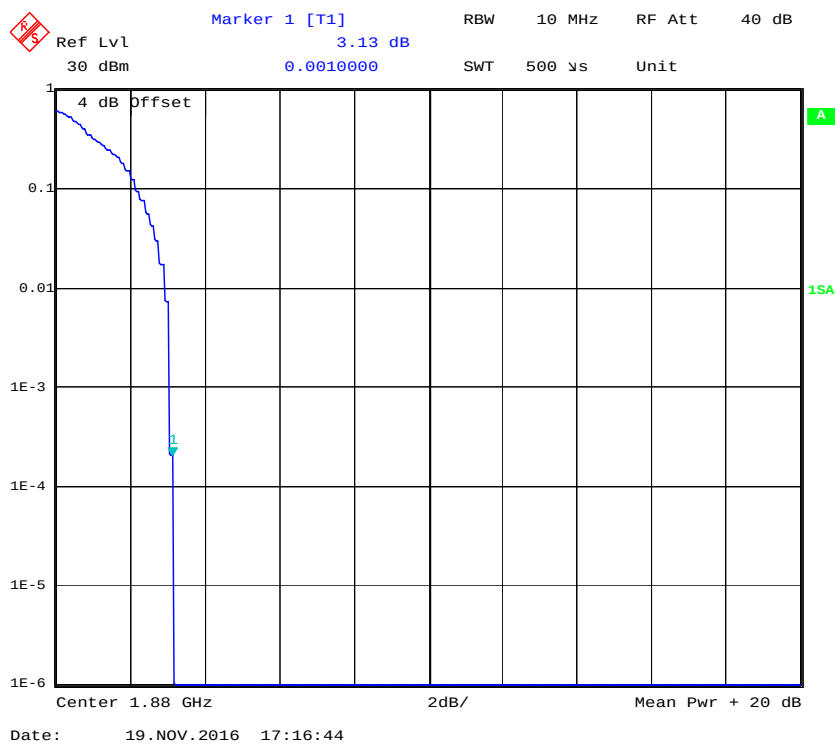
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LTE Band II (PART 22)

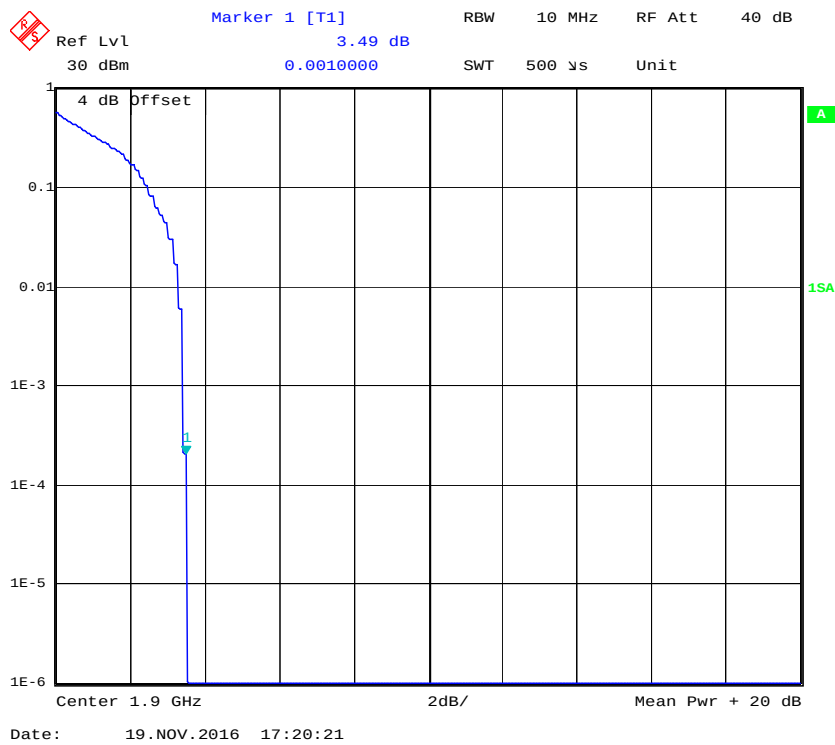
QPSK_20MHz_1RB_Low Channel



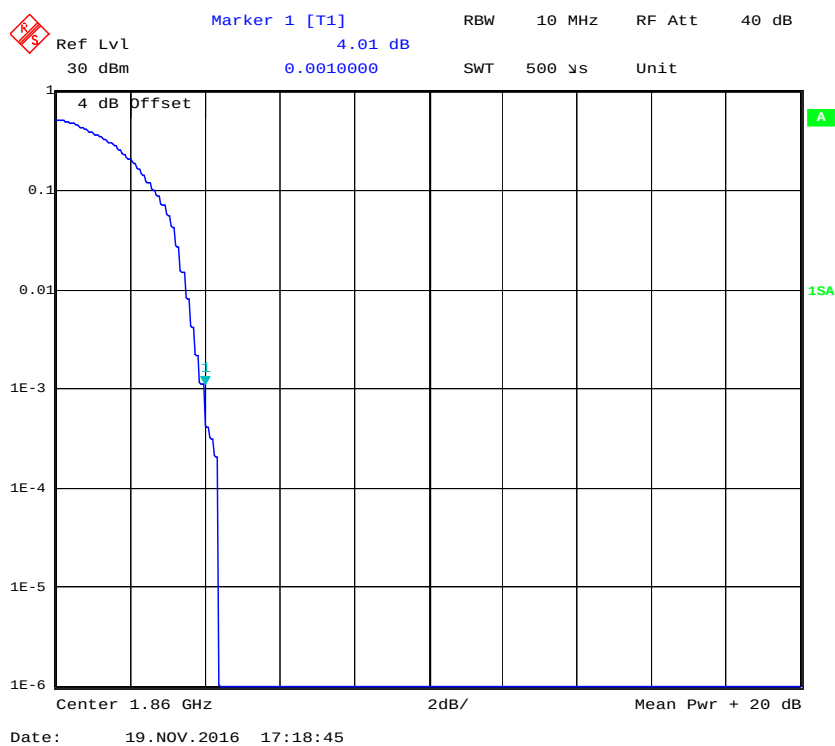
QPSK_20MHz_1RB Middle Channel



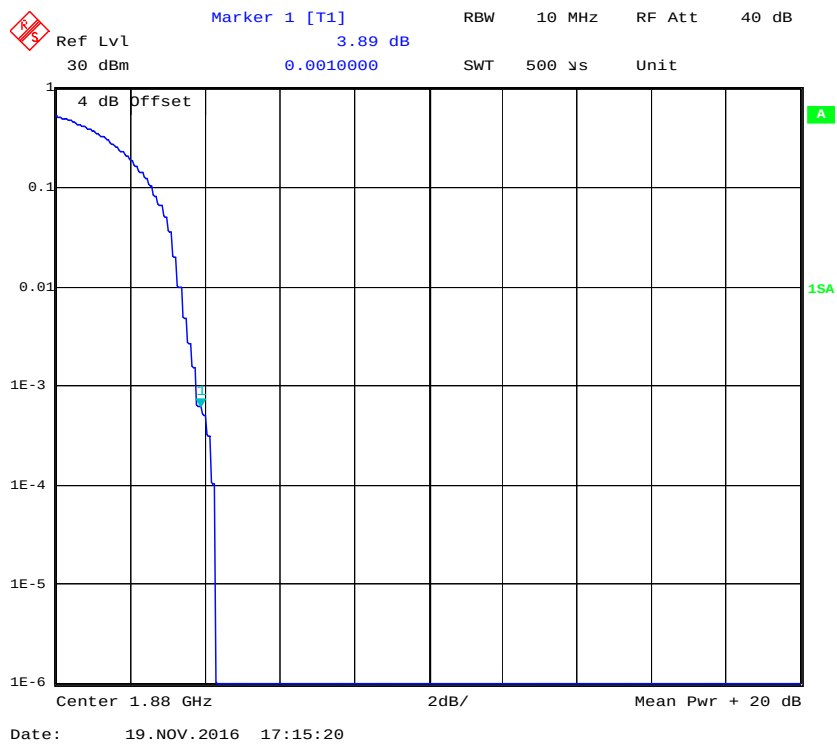
QPSK_20MHz_1RB High Channel



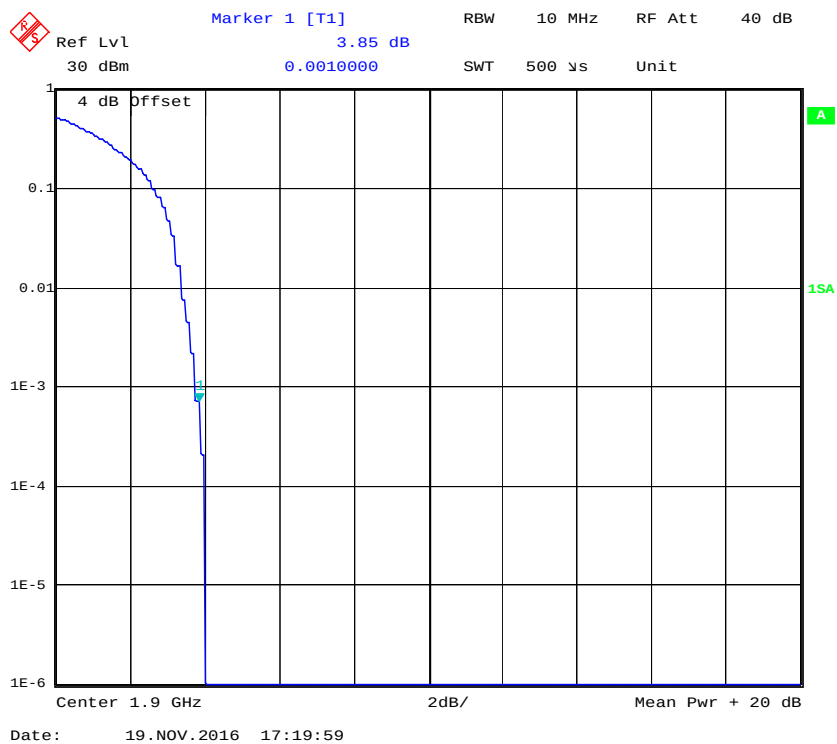
QPSK_20MHz_FULL RB Low Channel



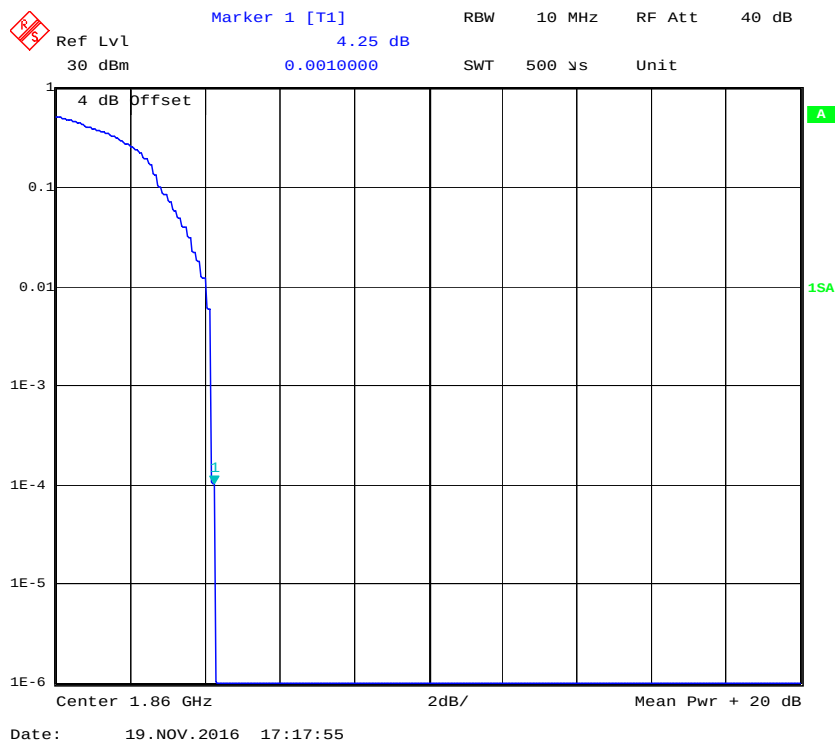
QPSK_20MHz_FULL RB Middle Channel



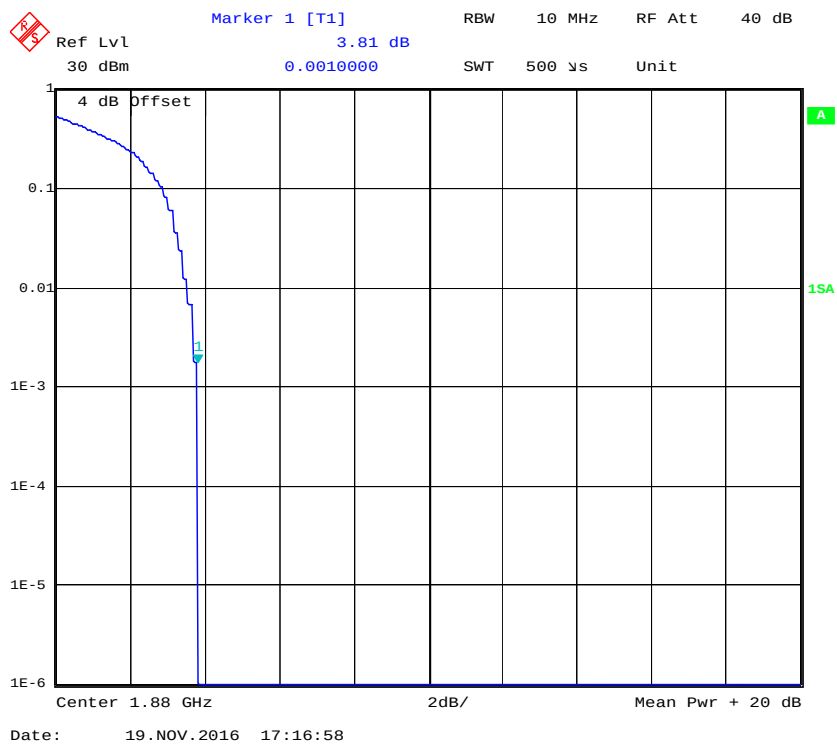
QPSK_20MHz_FULL RB High Channel



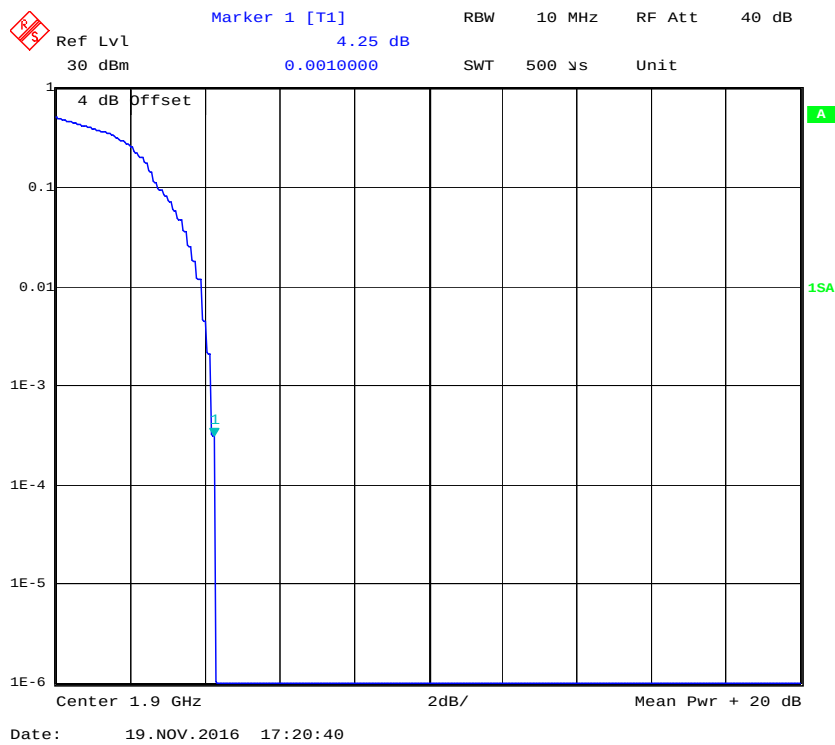
16QAM_20MHz_1RB Low Channel



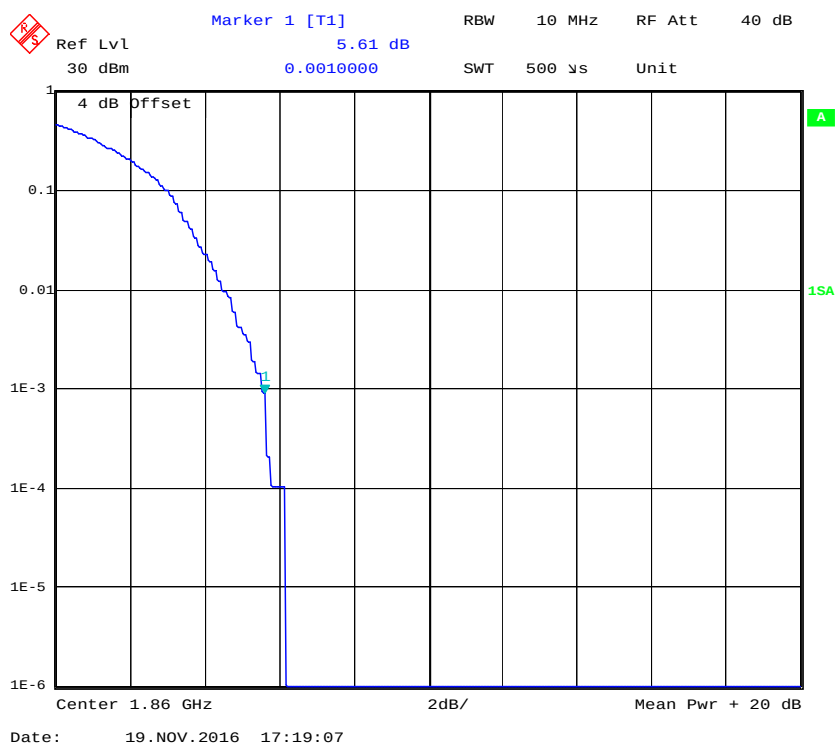
16QAM_20MHz_1RB Middle Channel



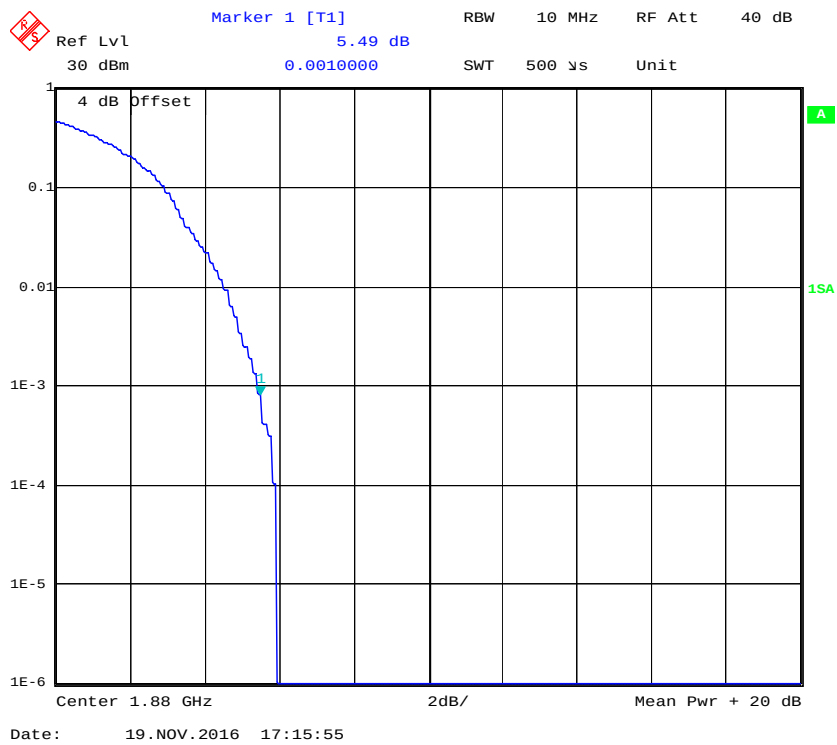
16QAM_20MHz_1RB High Channel



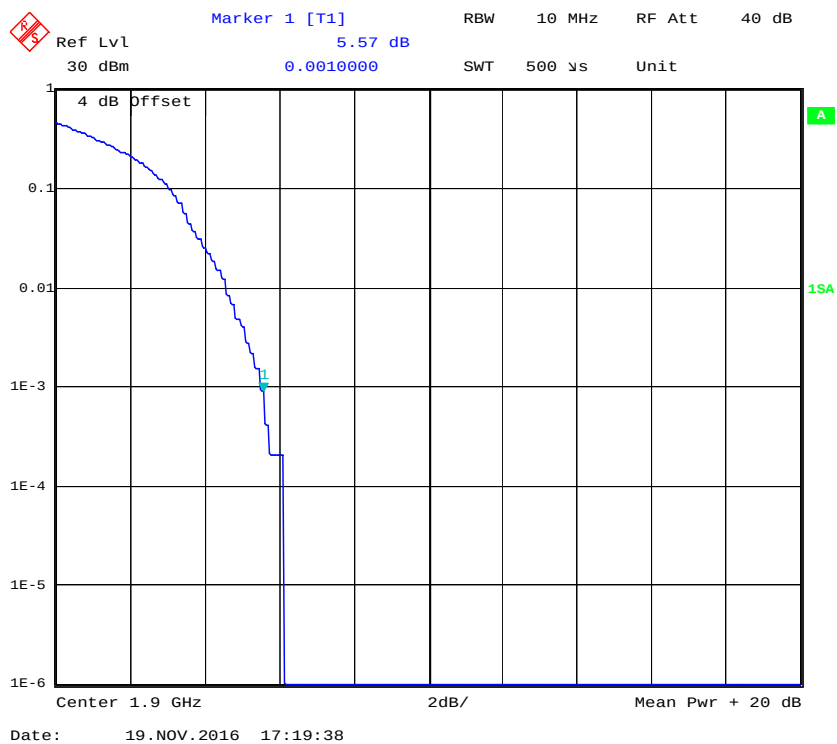
16QAM_20MHz_FULL RB Low Channel



16QAM_20MHz_FULL RB Middle Channel

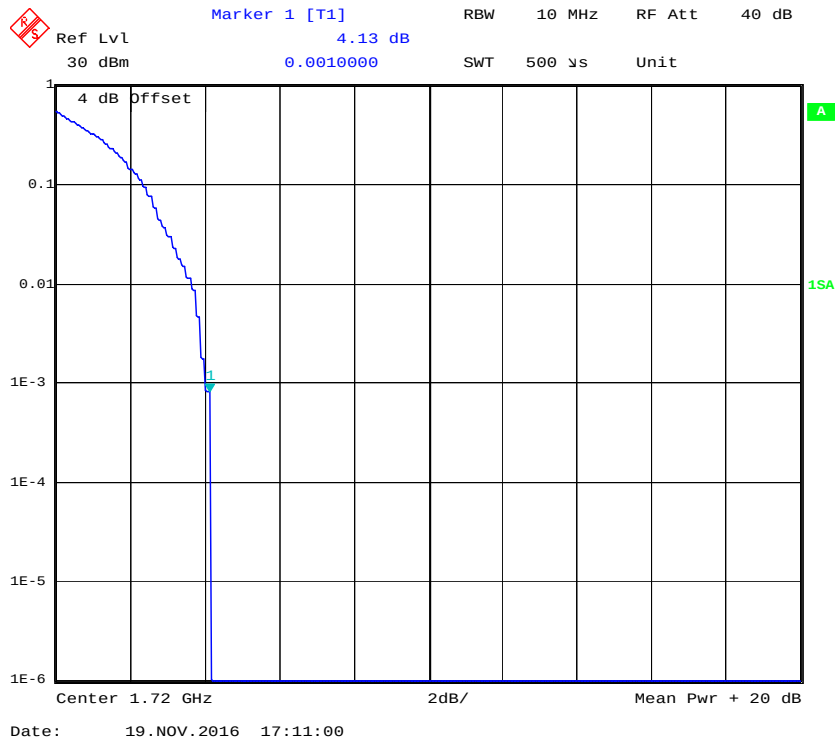


16QAM_20MHz_FULL RB High Channel

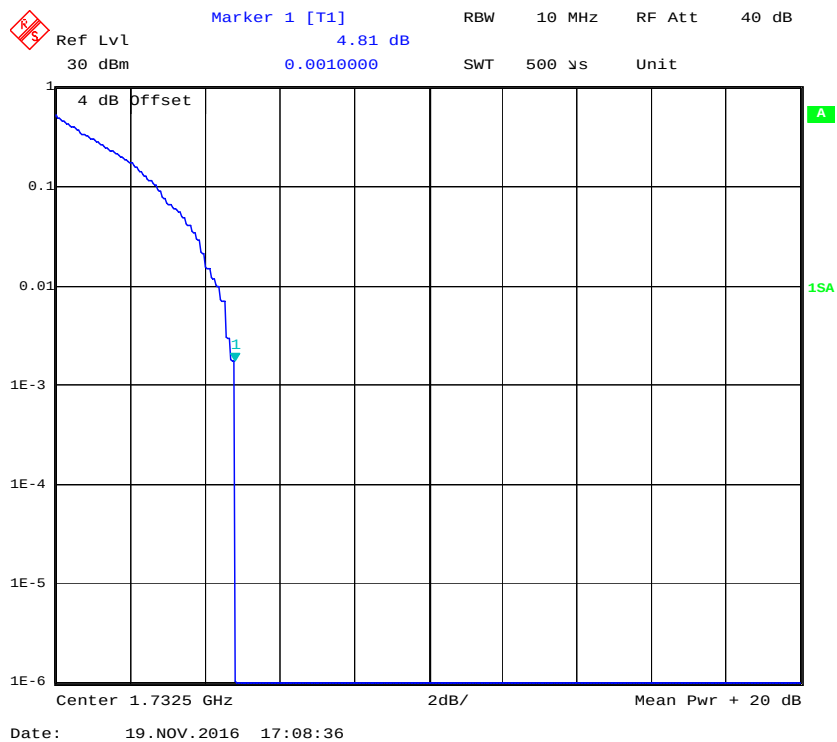


LTE Band IV (PART 27)

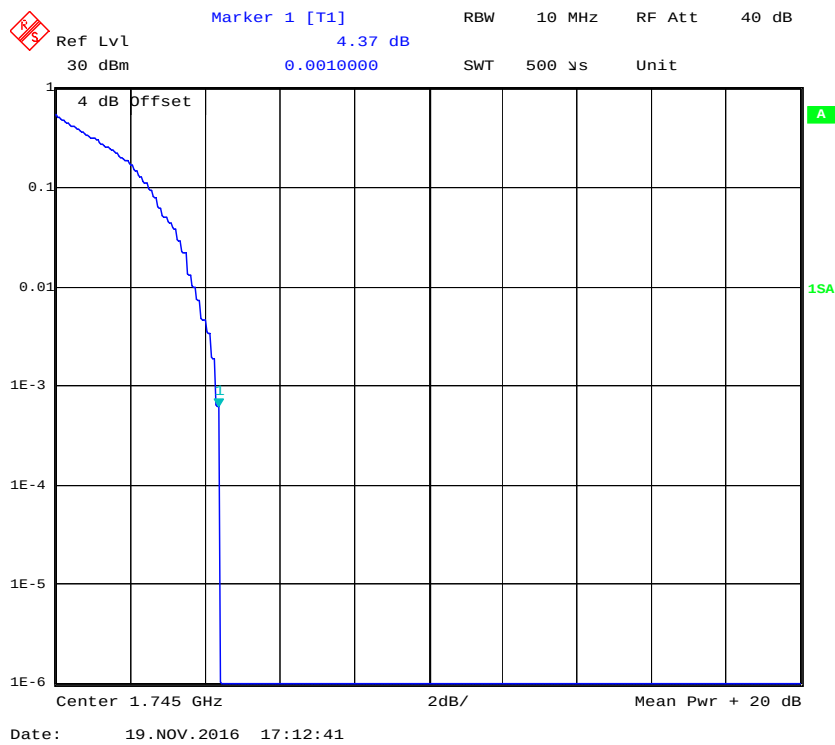
QPSK_20MHz_1RB Low Channel



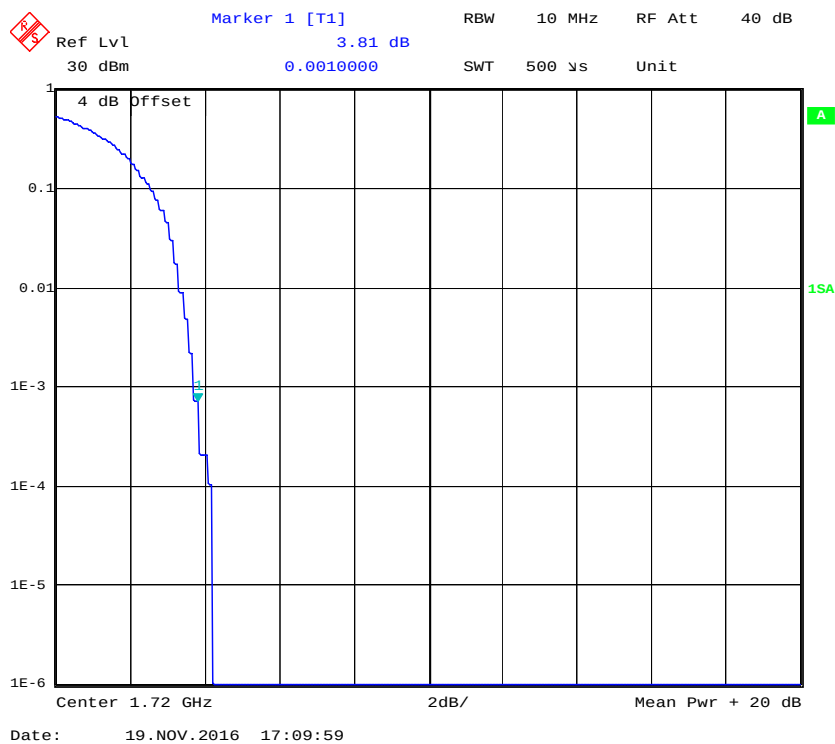
QPSK_20MHz_1RB Middle Channel



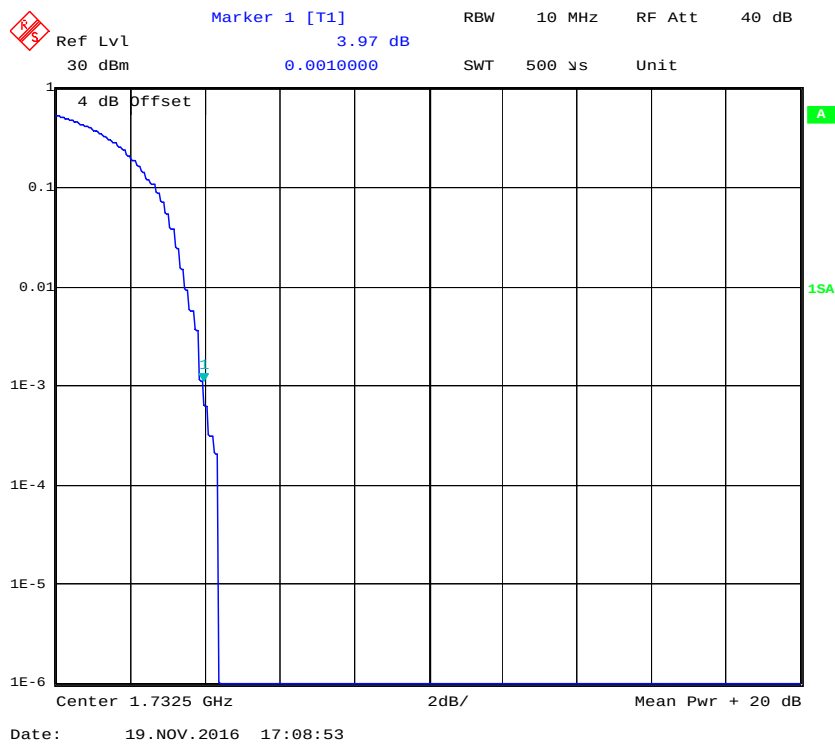
QPSK_20MHz_1RB High Channel



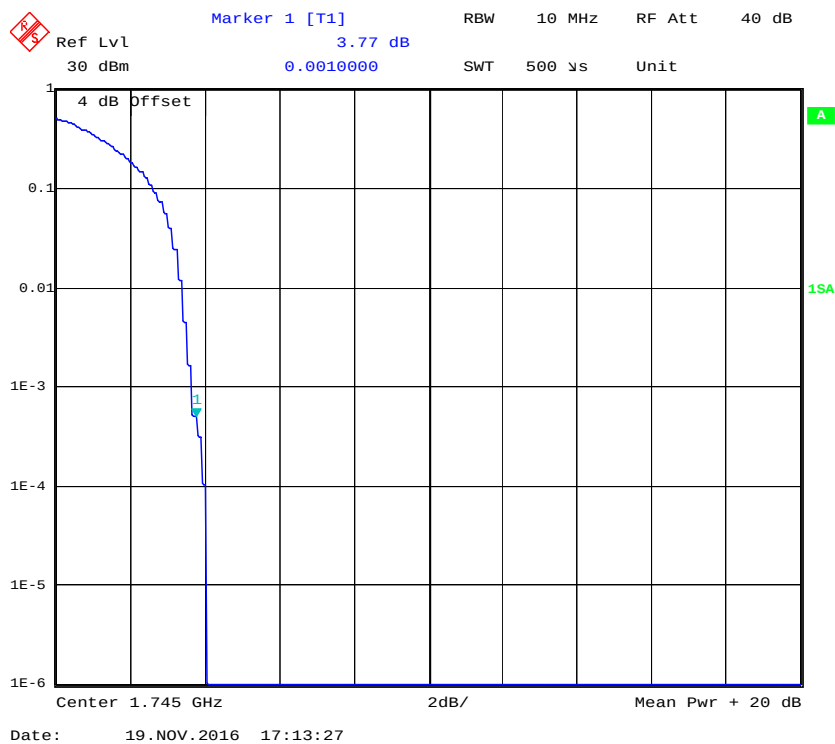
QPSK_20MHz_FULL RB Low Channel



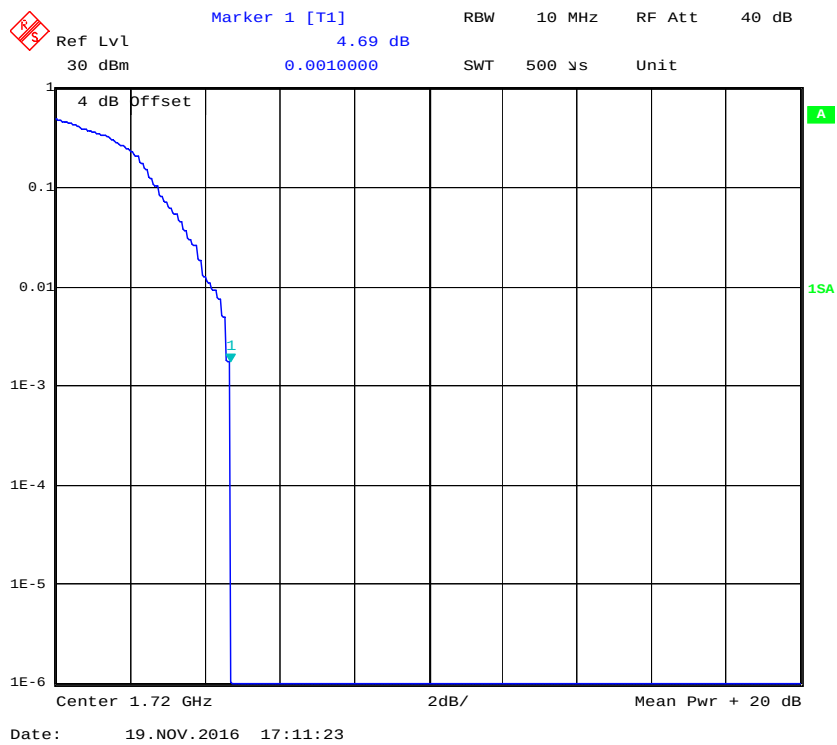
QPSK_20MHz_FULL RB Middle Channel



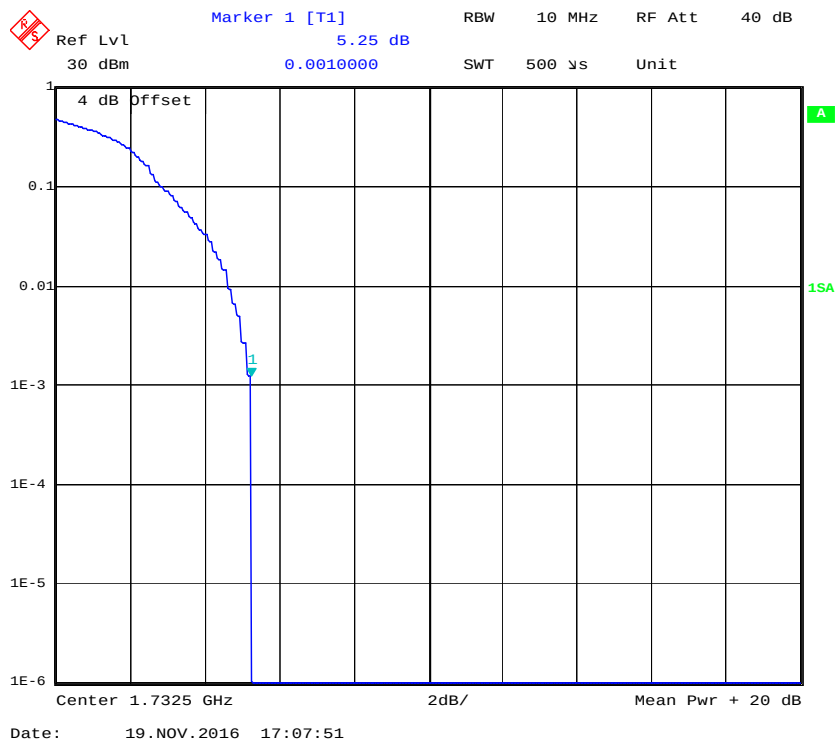
QPSK_20MHz_FULL RB High Channel



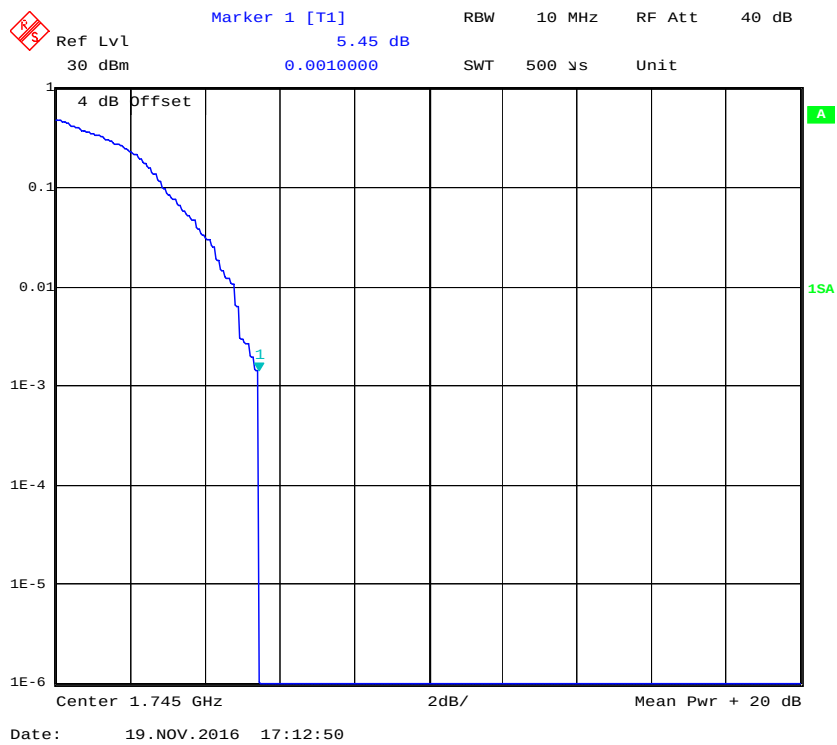
16QAM_20MHz_1RB Low Channel



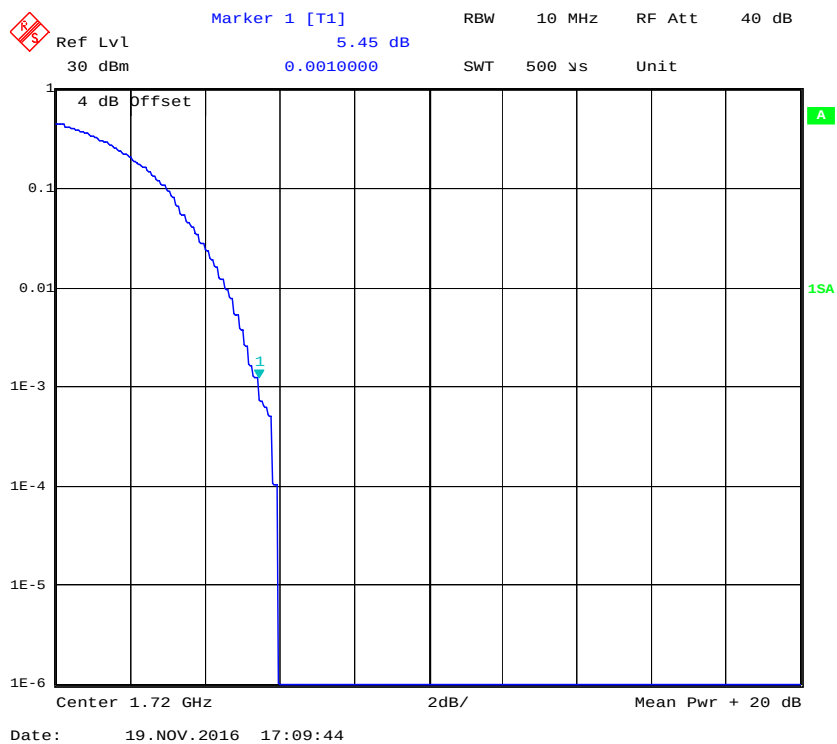
16QAM_20MHz_1RB Middle Channel



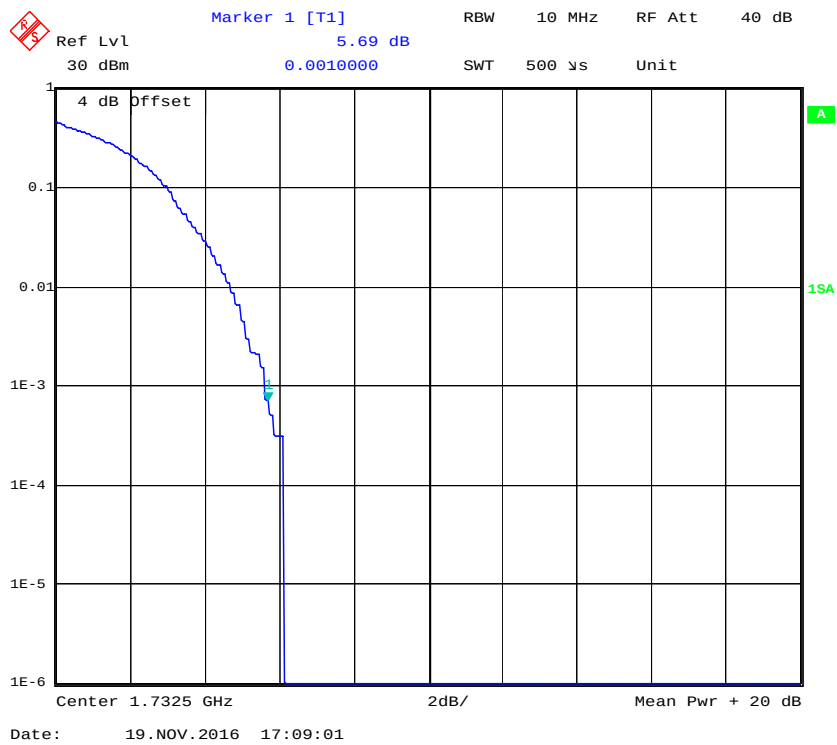
16QAM_20MHz_1RB High Channel



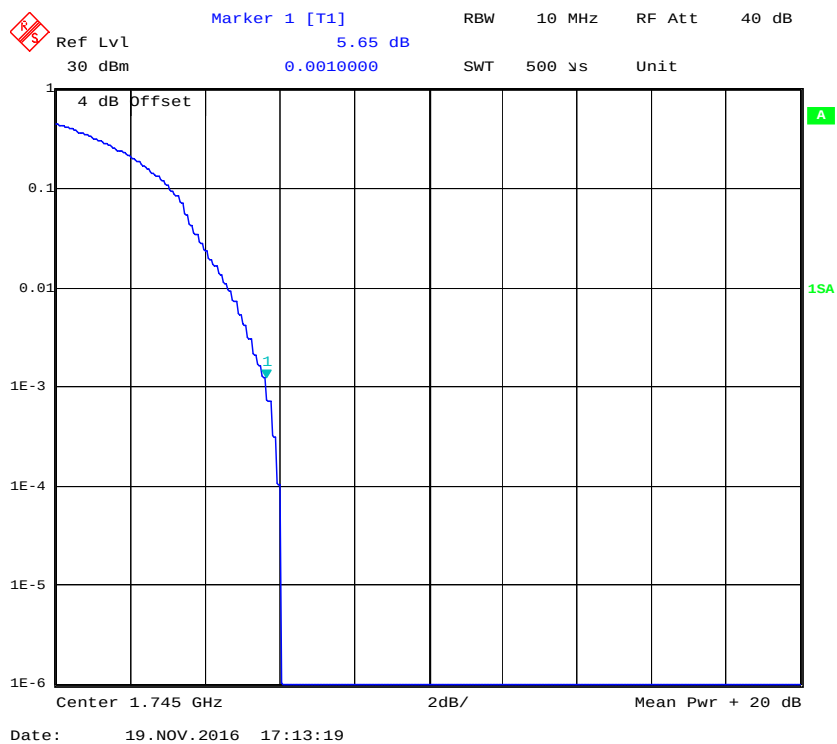
16QAM_20MHz_FULL RB Low Channel



16QAM_20MHz_FULL RB Middle Channel

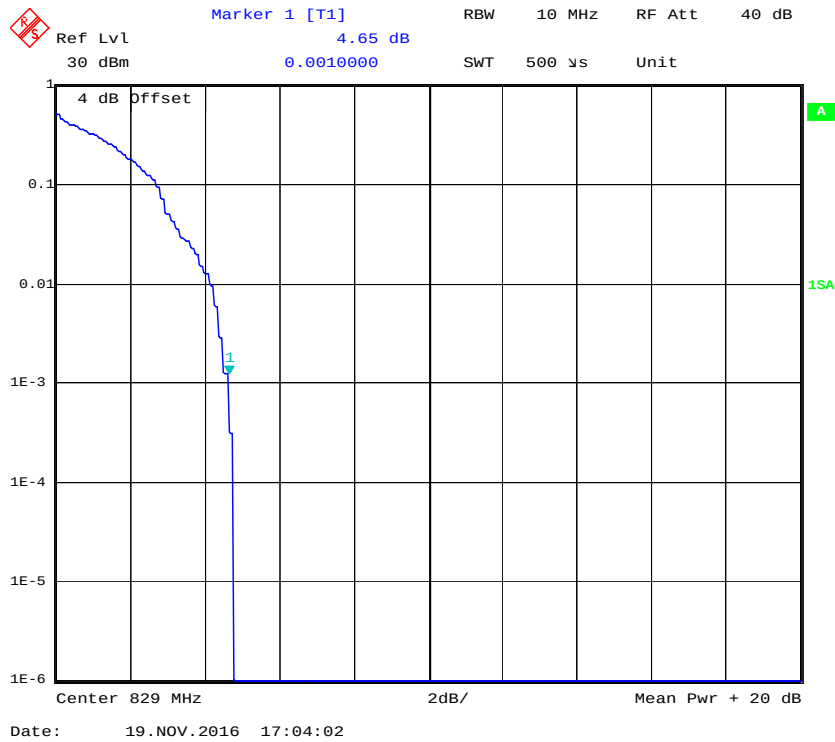


16QAM_20MHz_FULL RB High Channel

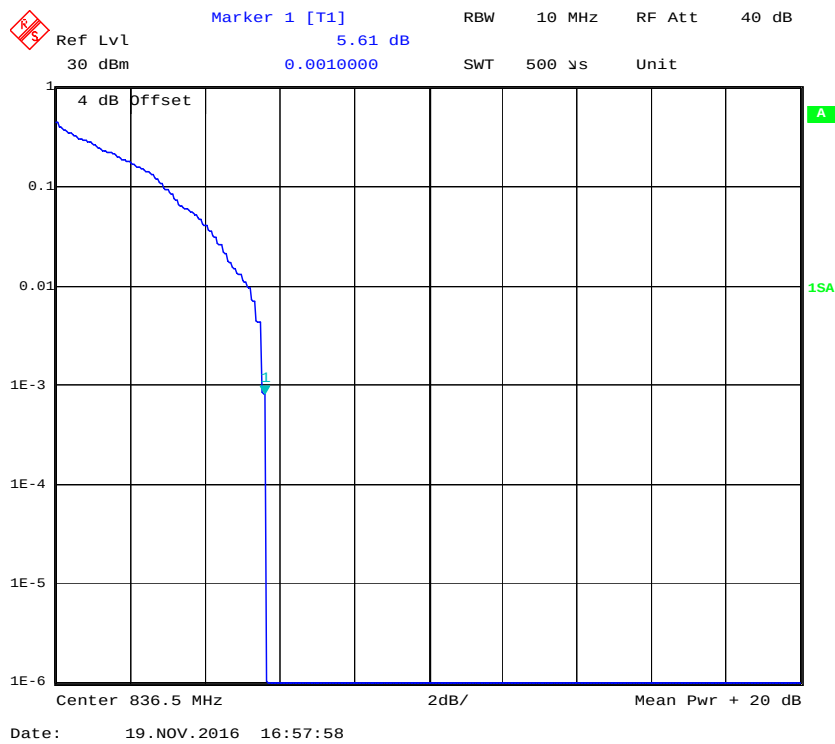


LTE Band V (PART 22)

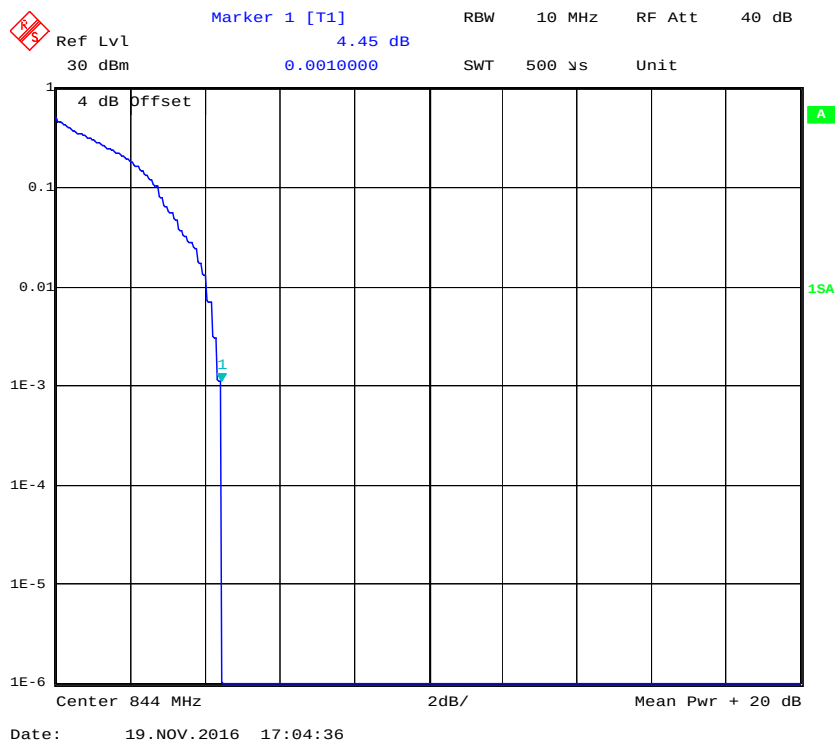
QPSK_10MHz_1RB Low Channel



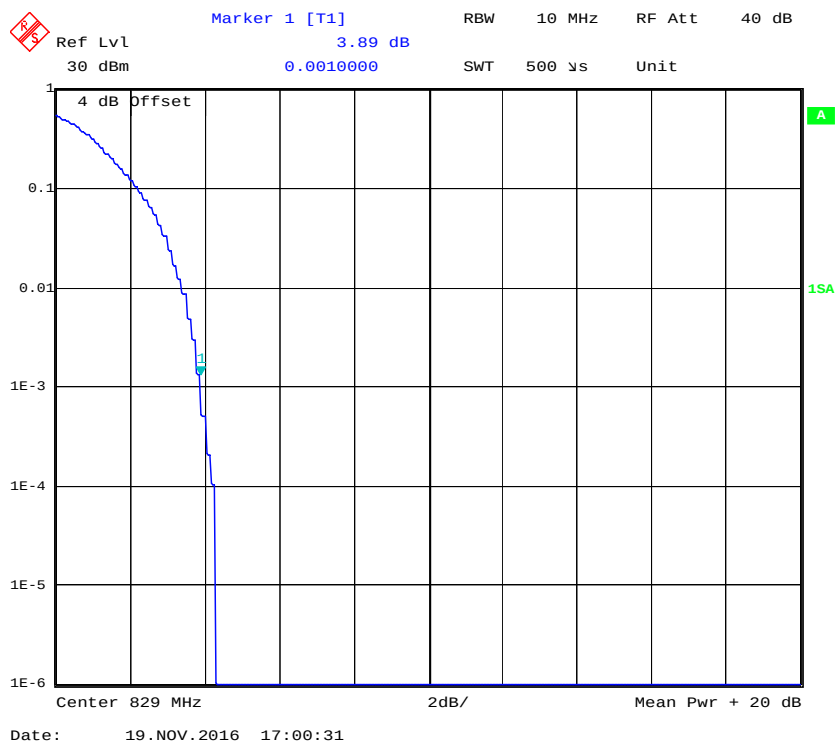
QPSK_10MHz_1RB Middle Channel



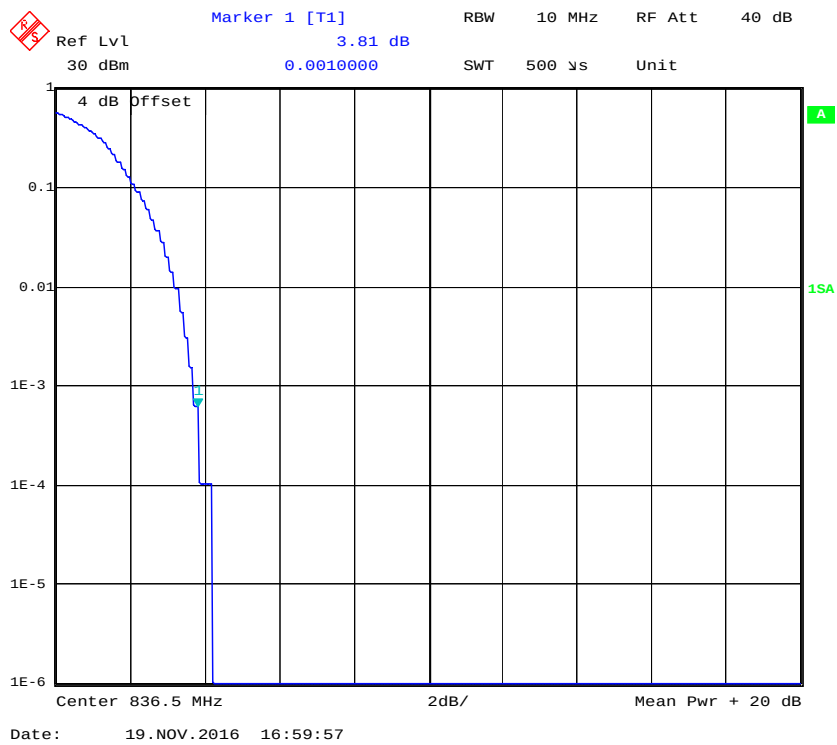
QPSK_10MHz_1RB High Channel



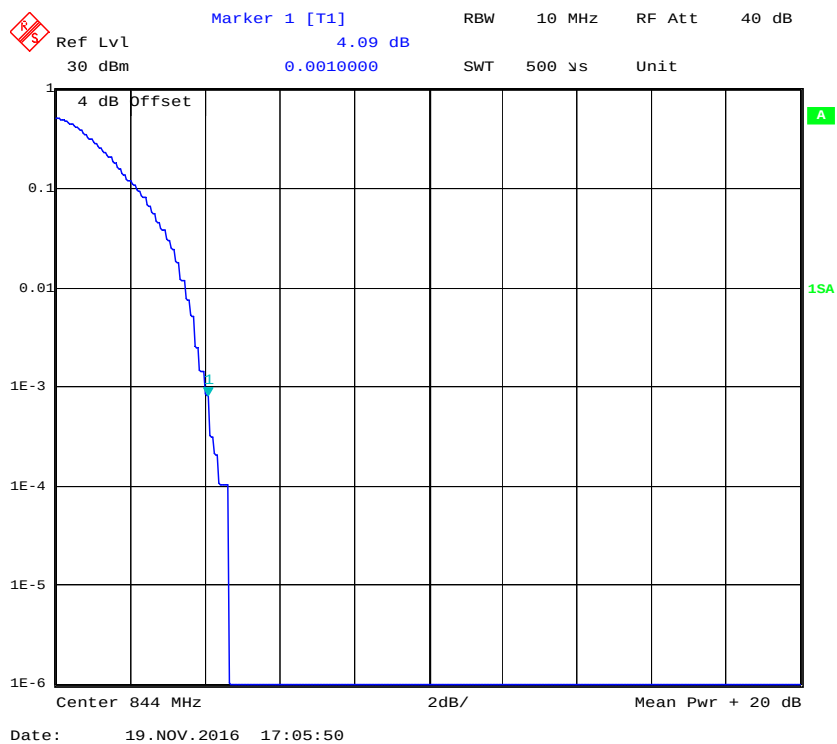
QPSK_10MHz_50 RB Low Channel



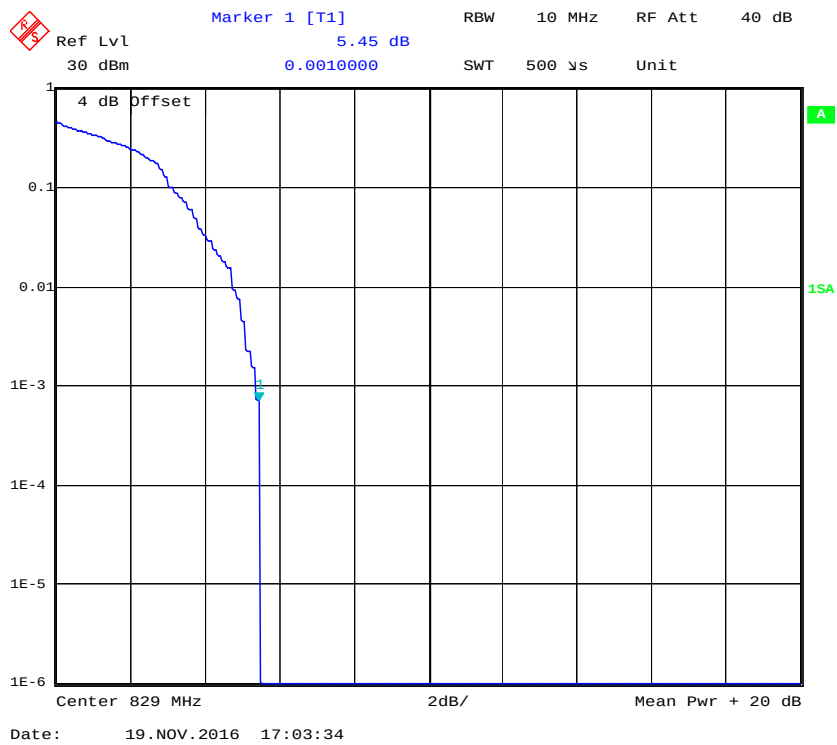
QPSK_10MHz_50 RB Middle Channel



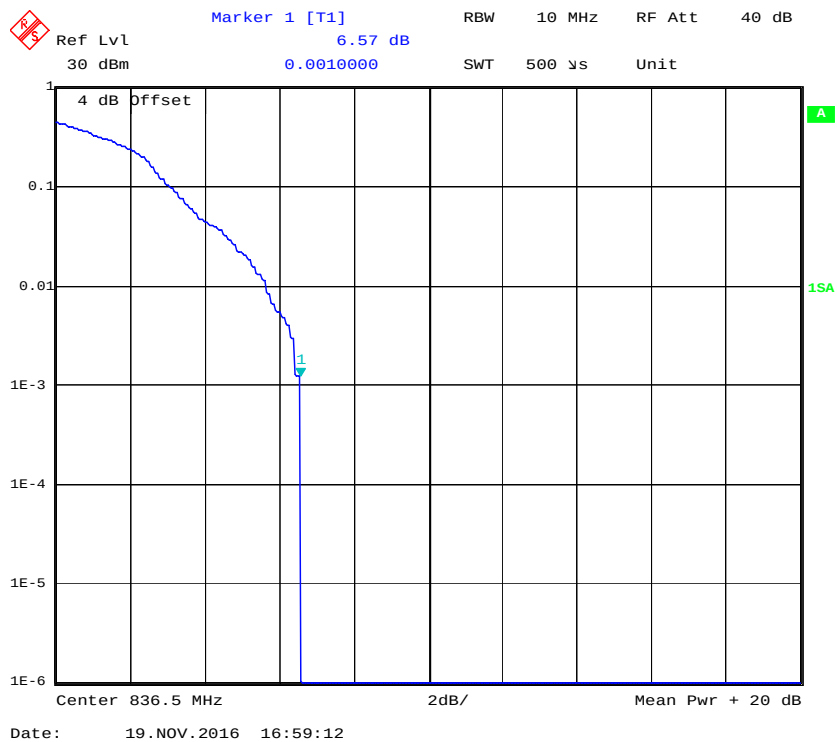
QPSK_10MHz_50 RB High Channel



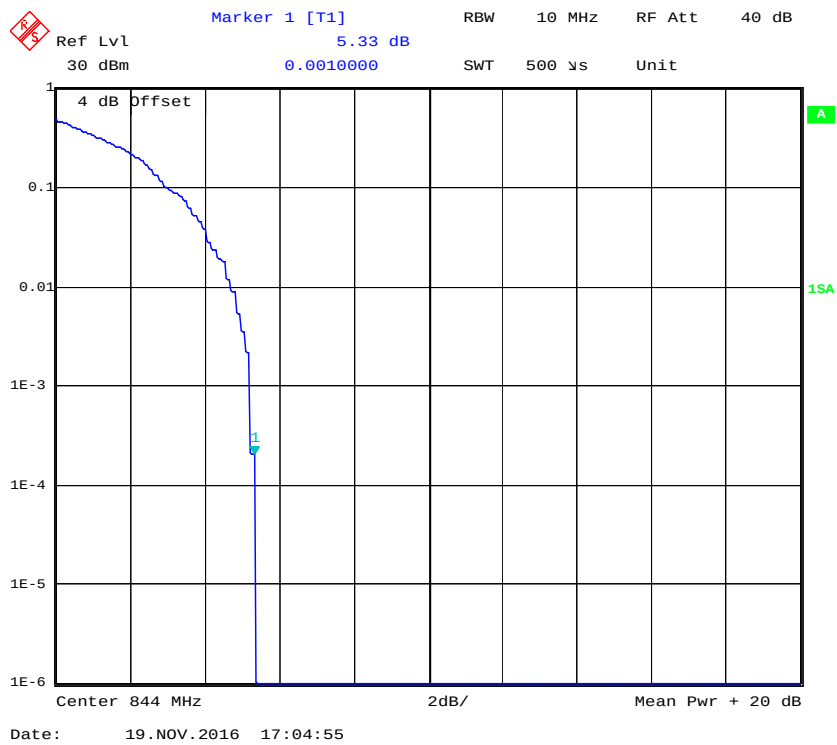
16QAM_10MHz_1RB Low Channel



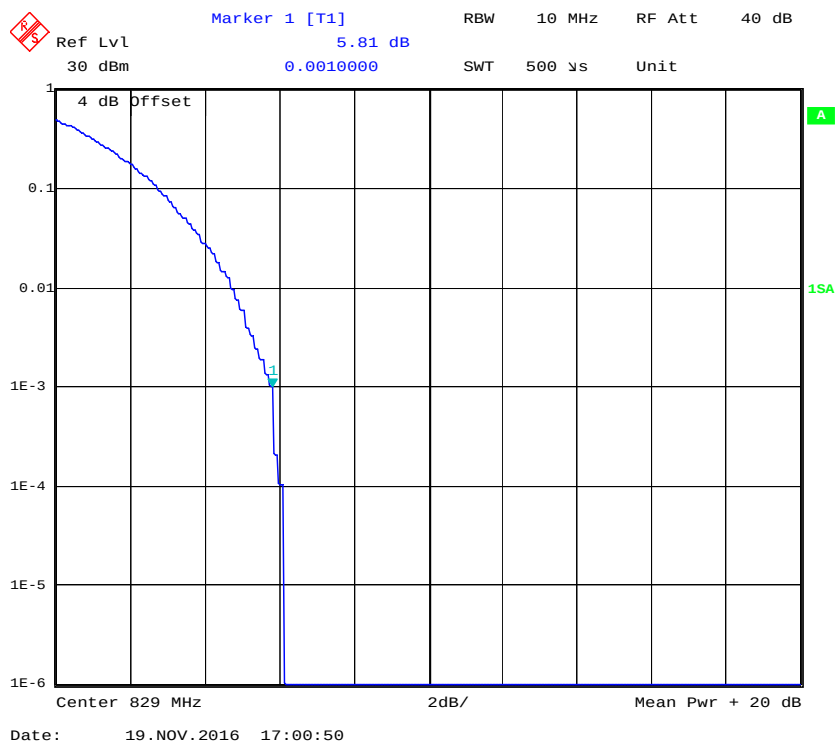
16QAM_10MHz_1RB Middle Channel



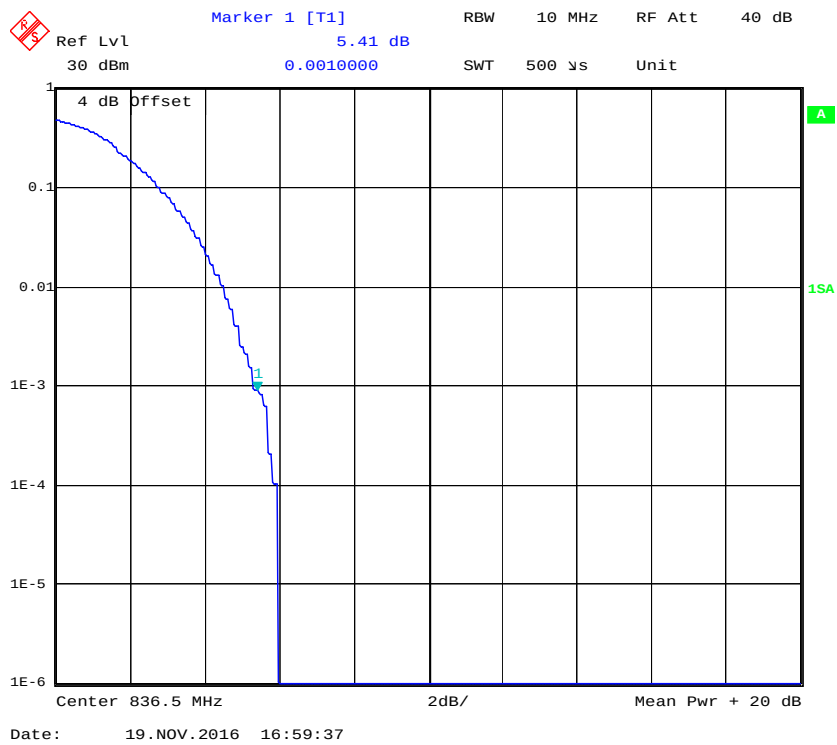
16QAM_10MHz_1RB High Channel



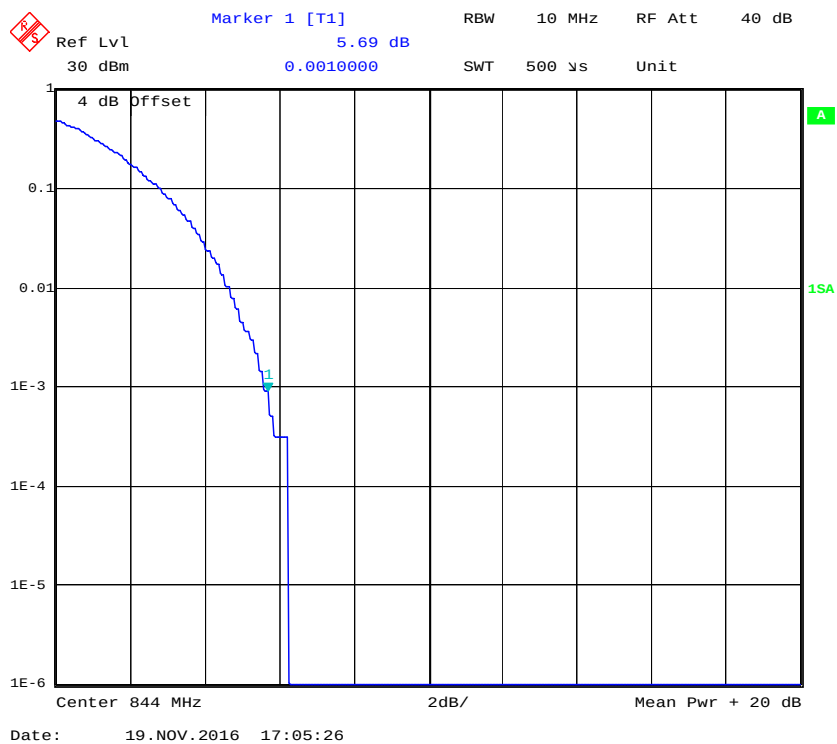
16QAM_10MHz_50 RB Low Channel



16QAM_10MHz_50 RB Middle Channel

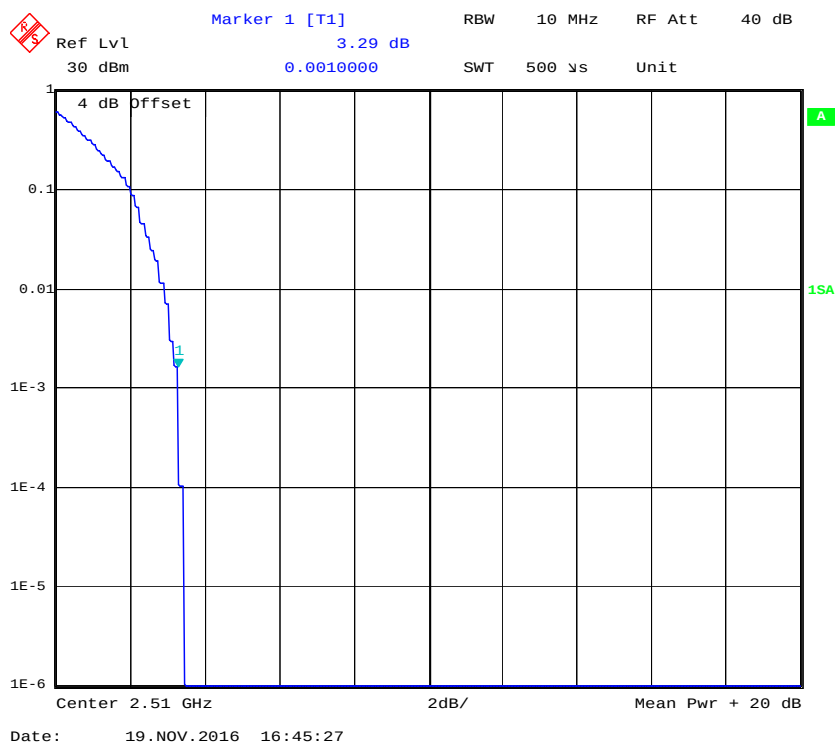


16QAM_10MHz_50 RB High Channel

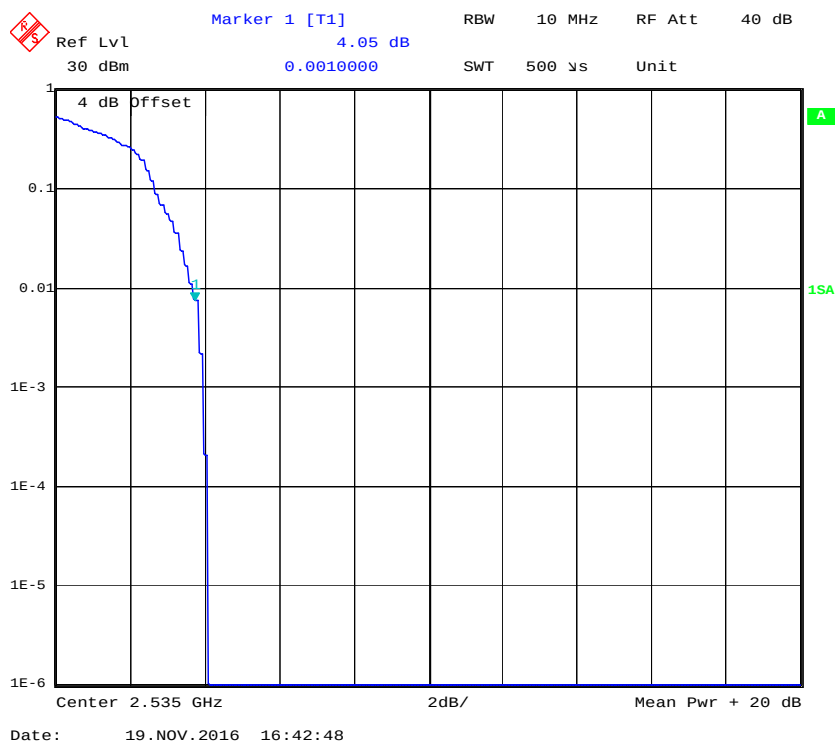


LTE Band VII (PART 27)

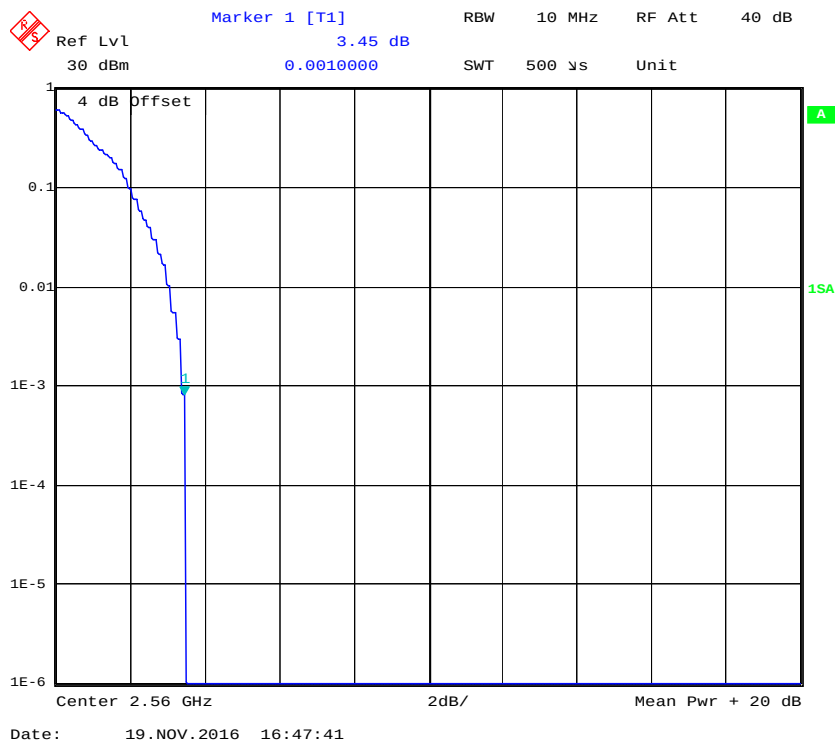
QPSK_20MHz_1RB Low Channel



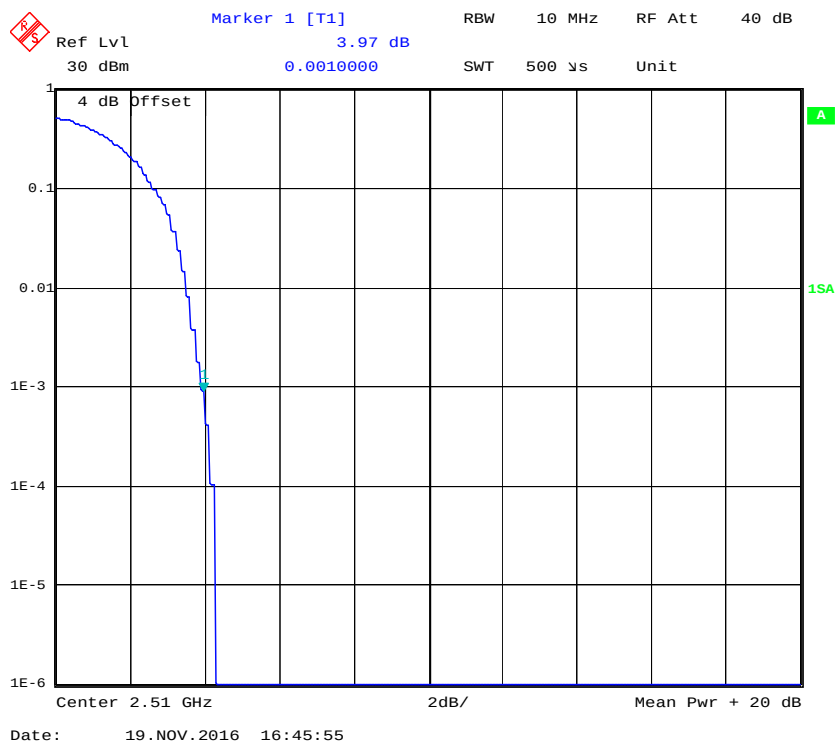
QPSK_20MHz_1RB Middle Channel



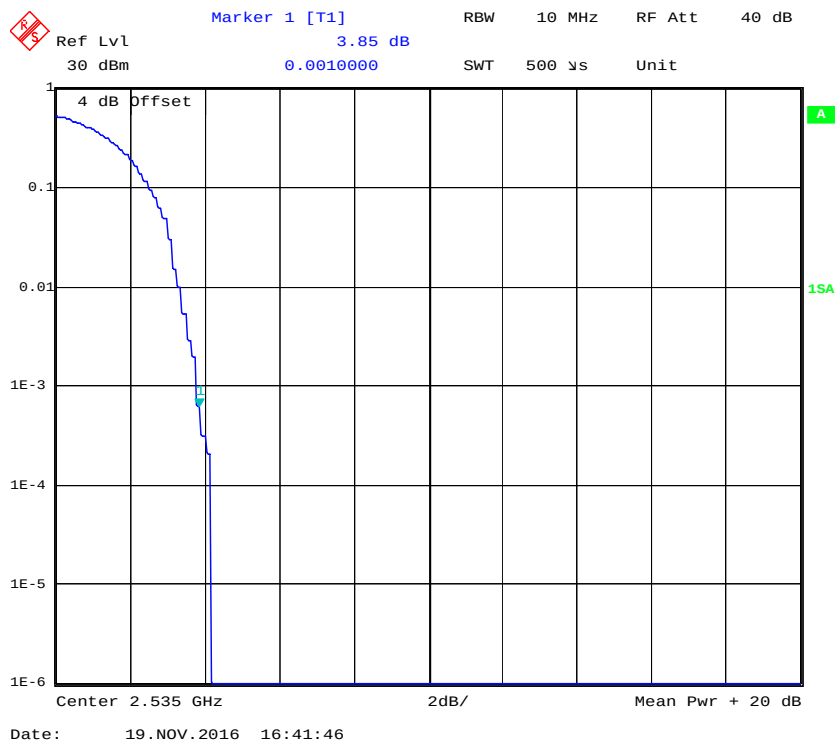
QPSK_20MHz_1RB High Channel



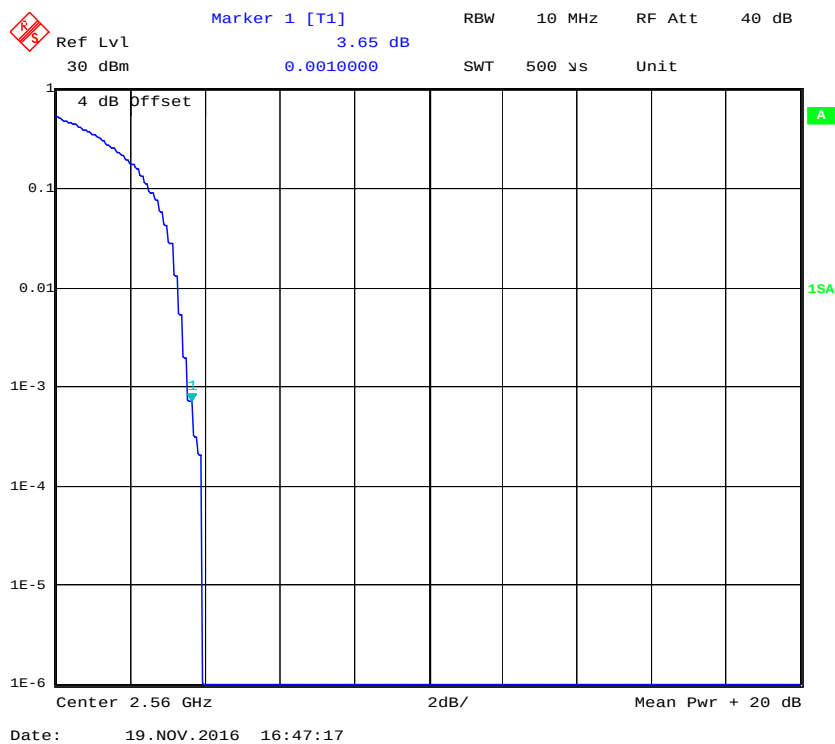
QPSK_20MHz_FULL RB Low Channel



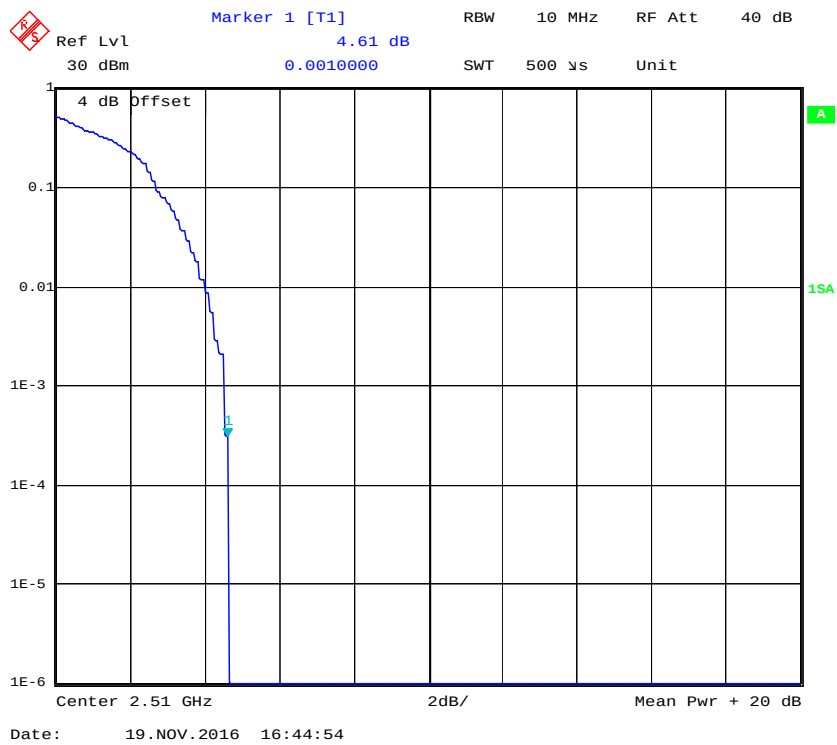
QPSK_20MHz_FULL RB Middle Channel



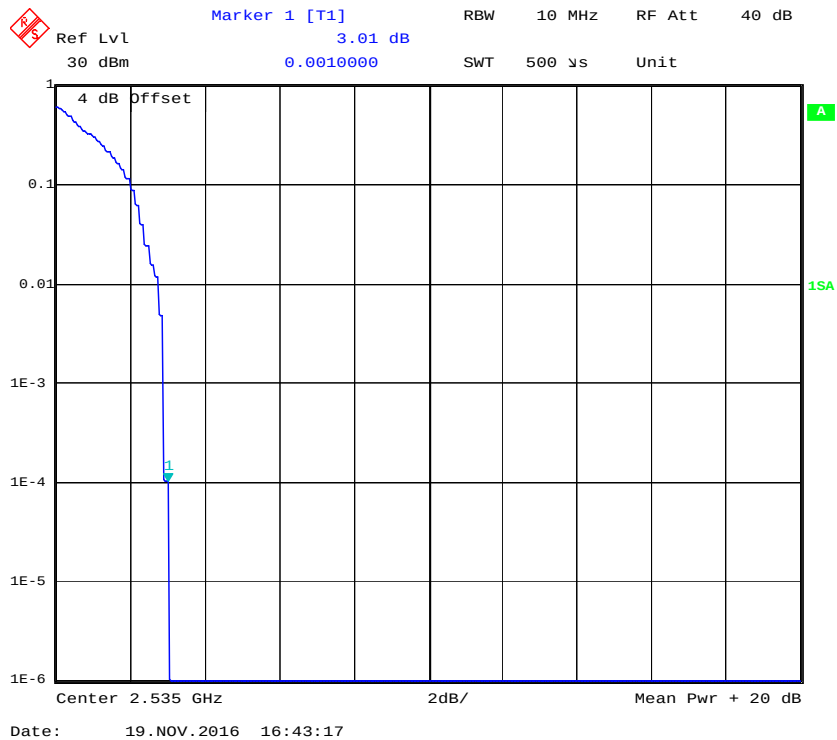
QPSK_20MHz_FULL RB High Channel



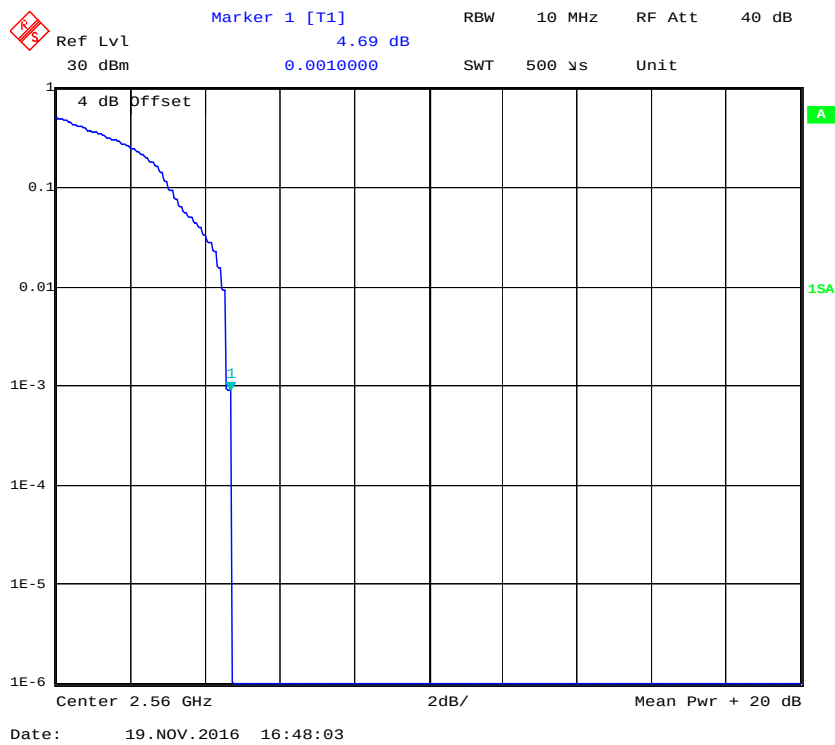
16QAM_20MHz_1RB Low Channel



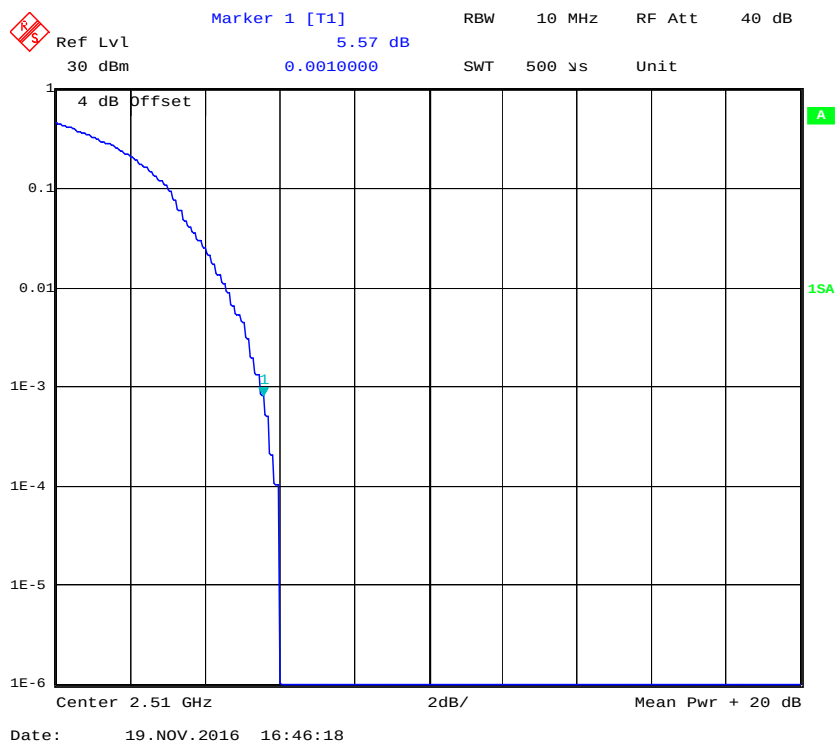
16QAM_20MHz_1RB Middle Channel



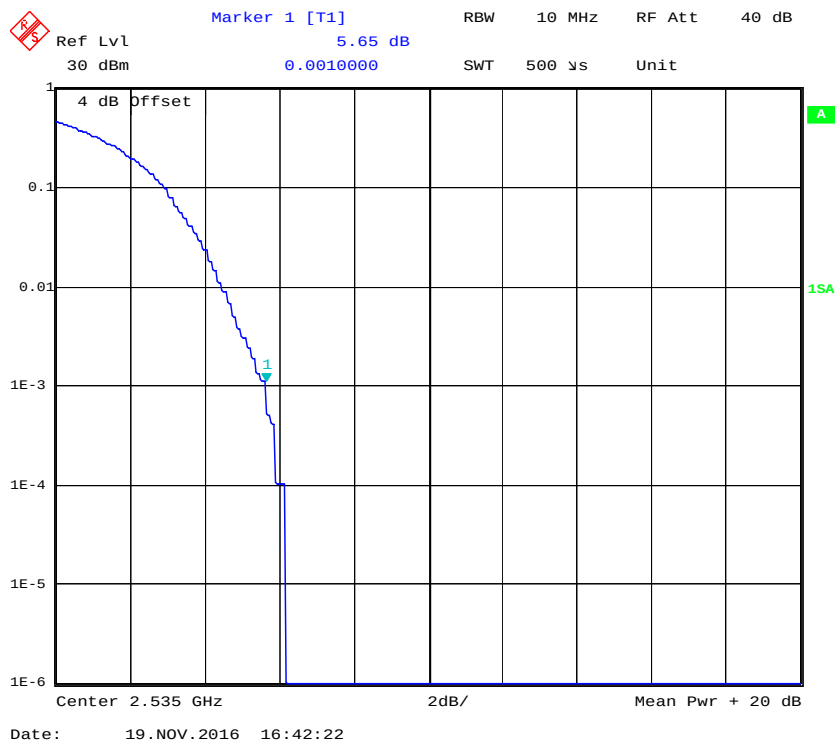
16QAM_20MHz_1RB High Channel



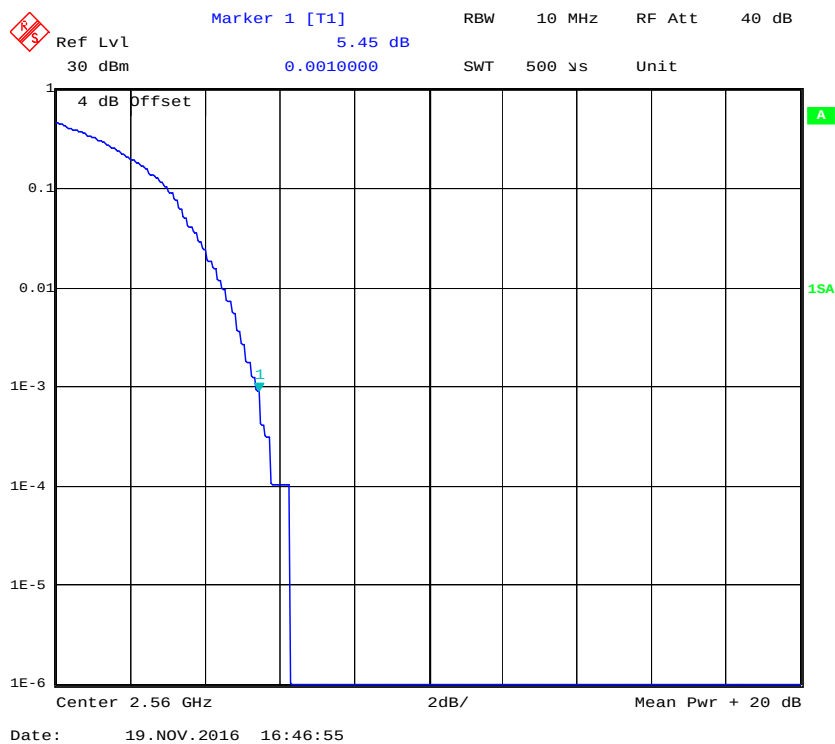
16QAM_20MHz_FULL RB Low Channel



16QAM_20MHz_FULL RB Middle Channel

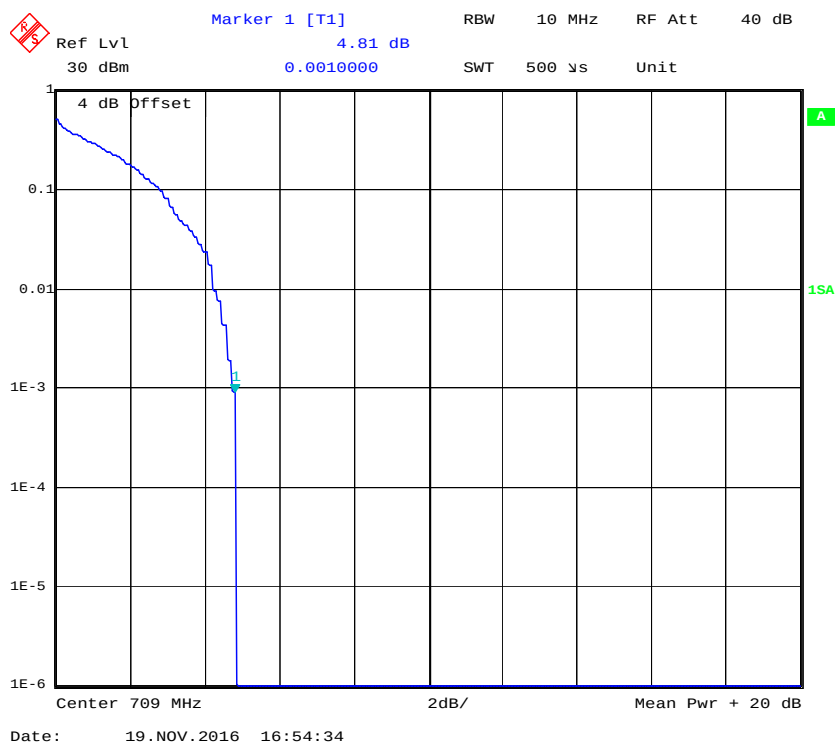


16QAM_20MHz_FULL RB High Channel

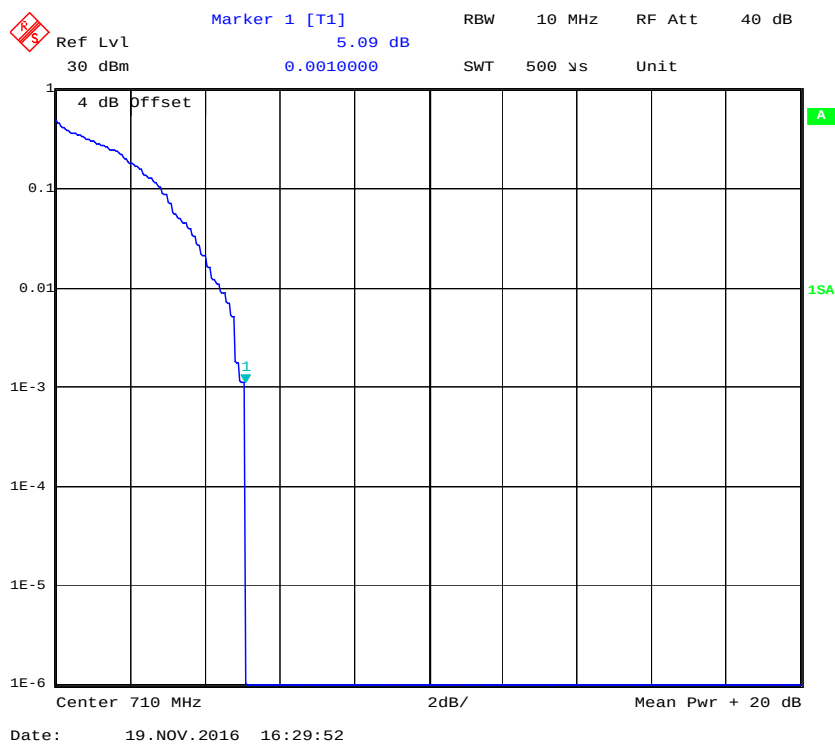


LTE Band 17 (PART 27)

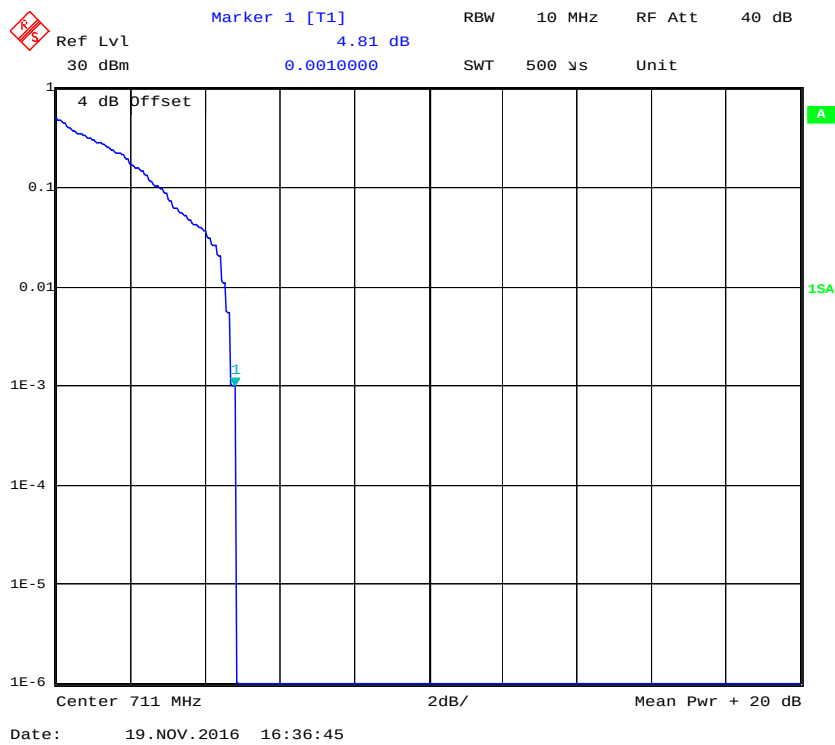
QPSK_10MHz_1RB Low Channel



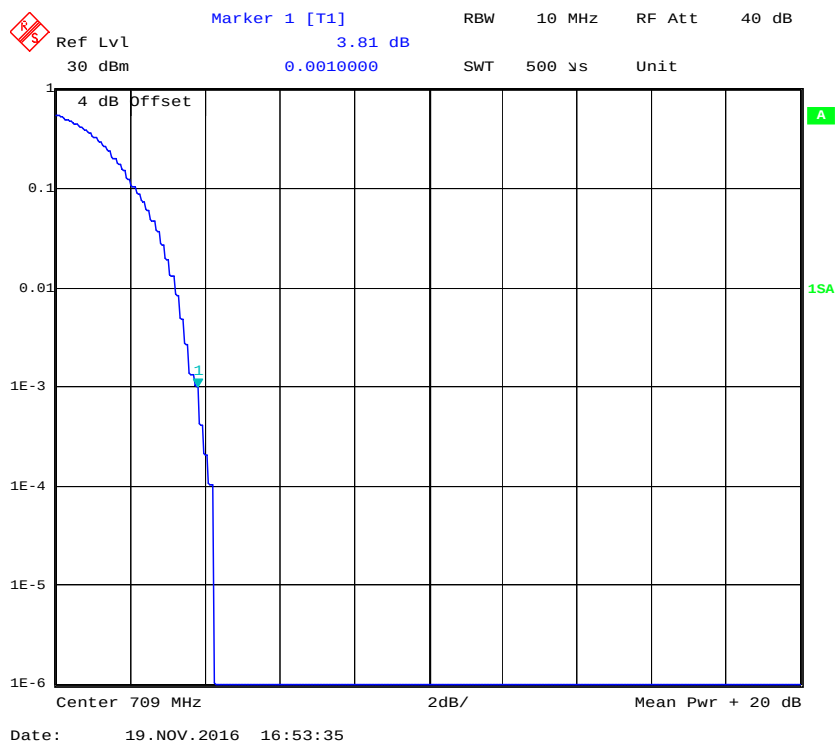
QPSK_10MHz_1RB Middle Channel



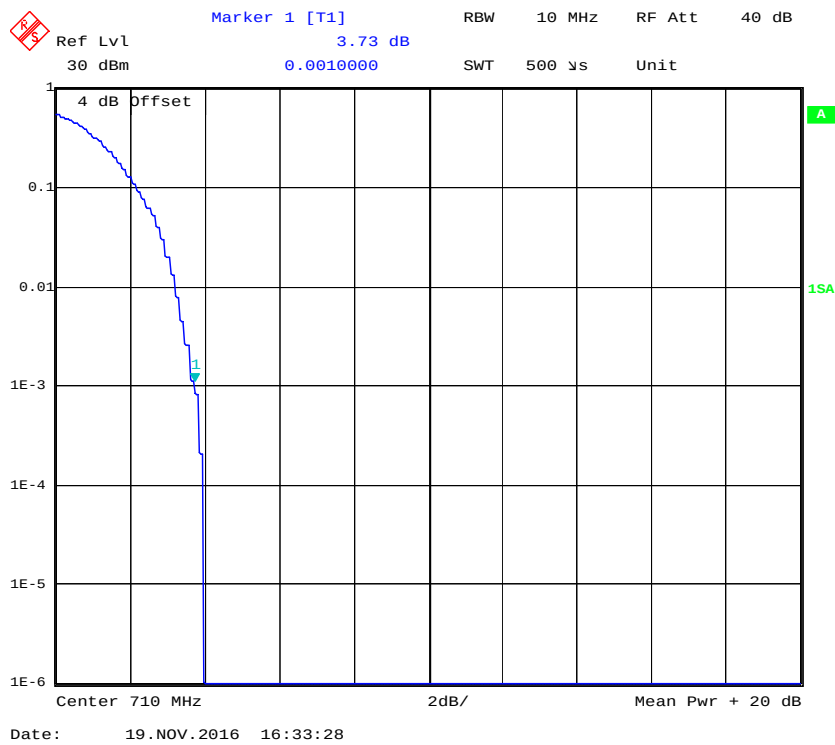
QPSK_10MHz_1RB High Channel



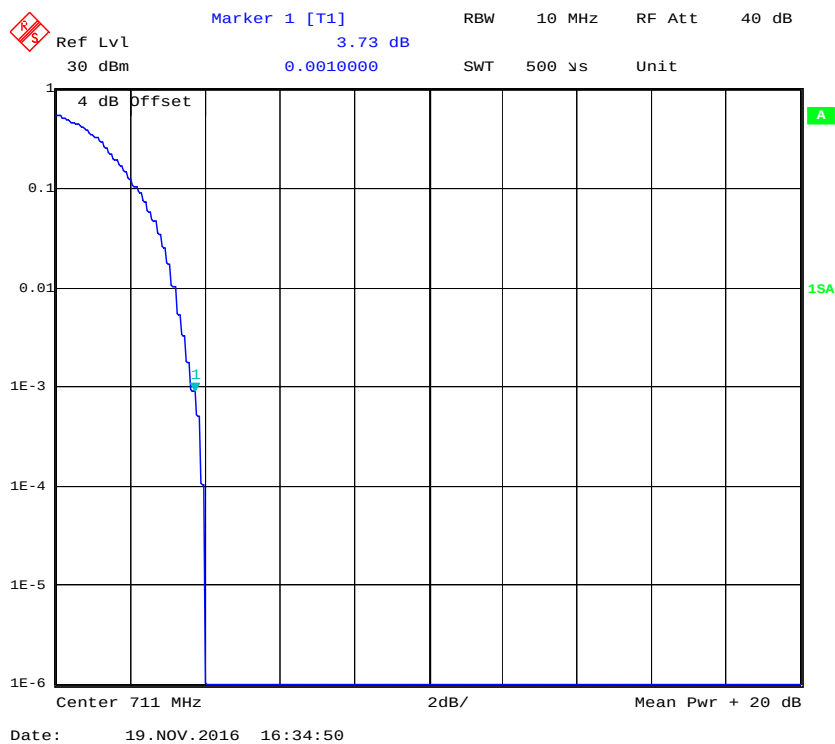
QPSK_10MHz_50 RB Low Channel



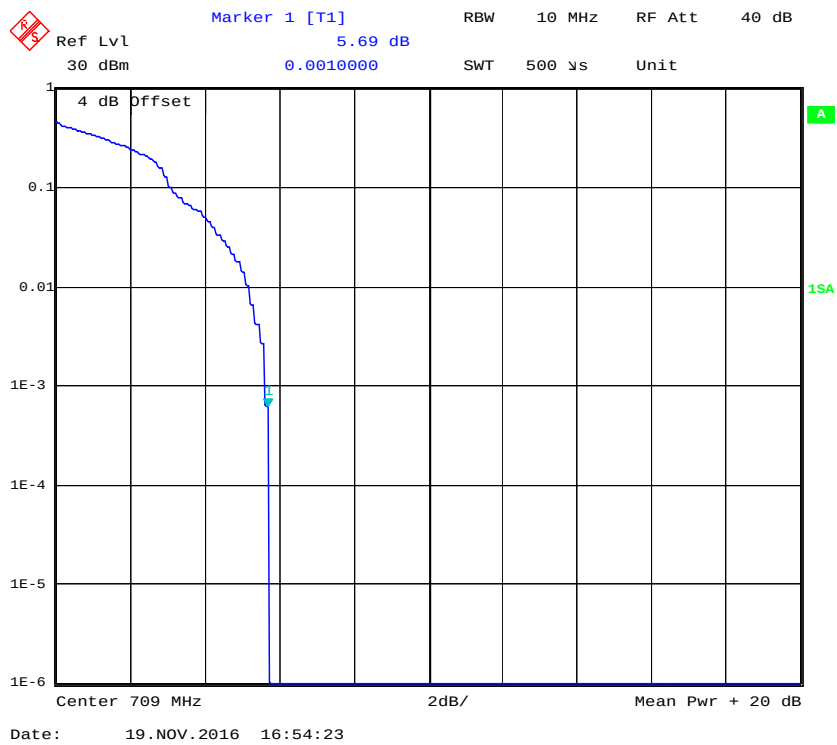
QPSK_10MHz_50 RB Middle Channel



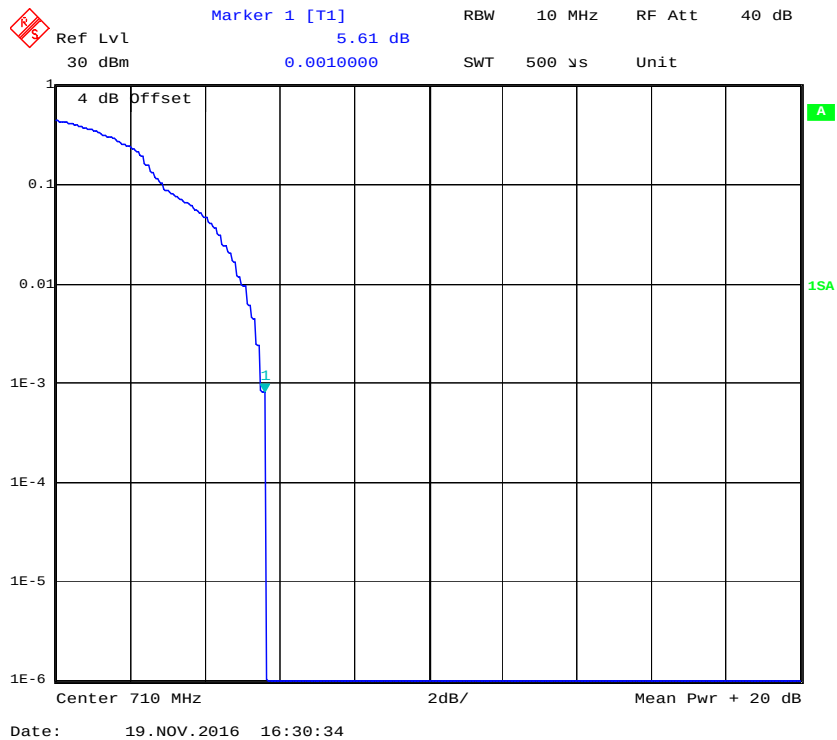
QPSK_10MHz_50 RB High Channel



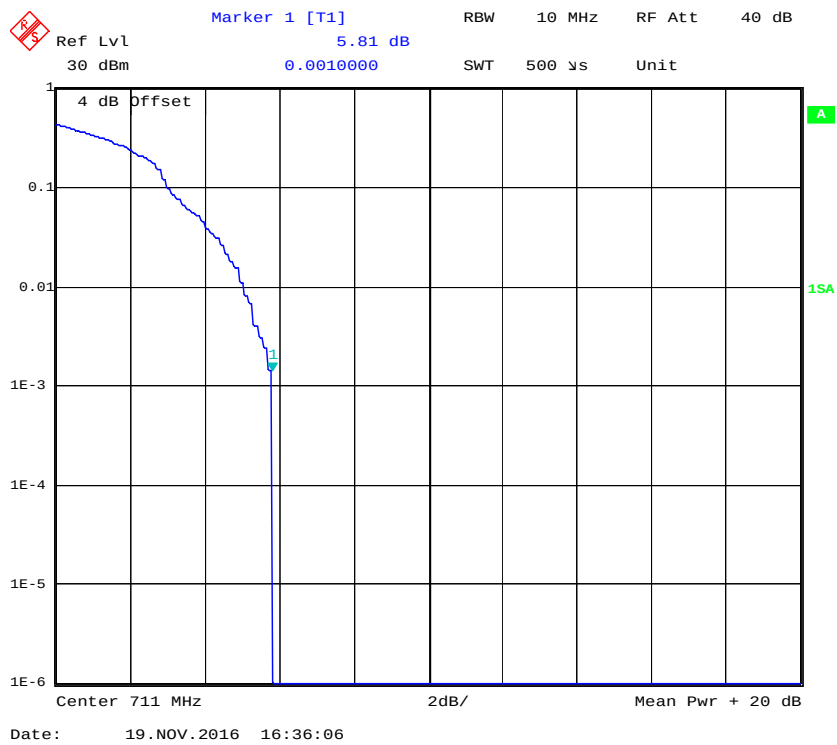
16QAM_10MHz_1RB Low Channel



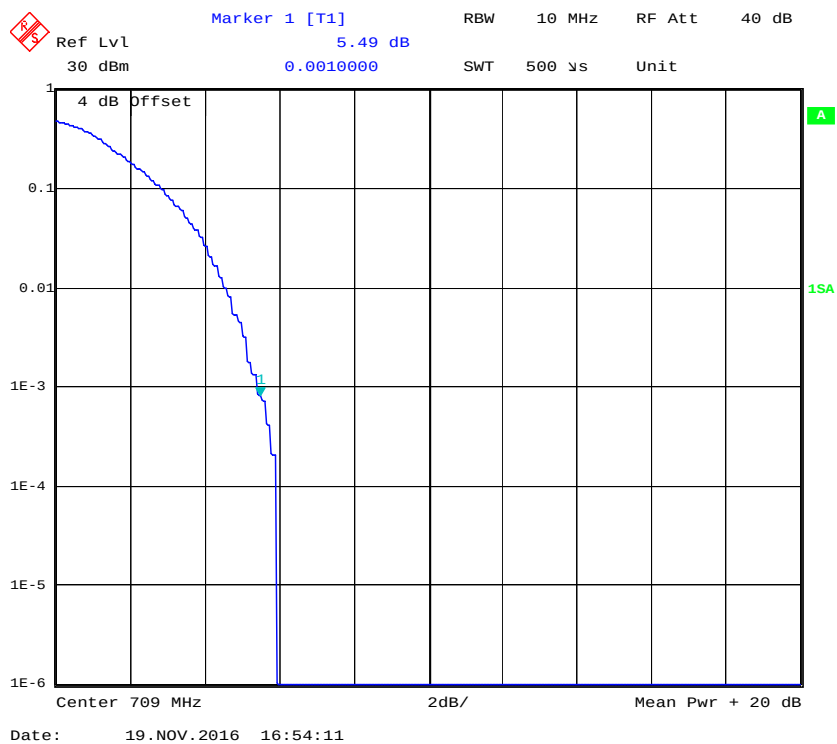
16QAM_10MHz_1RB Middle Channel



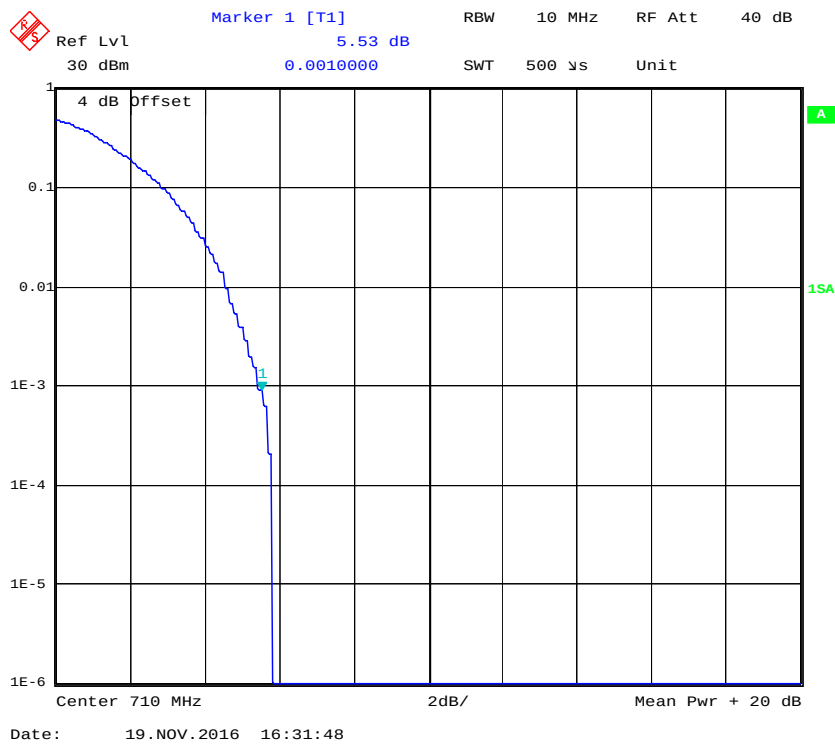
16QAM_10MHz_1RB High Channel



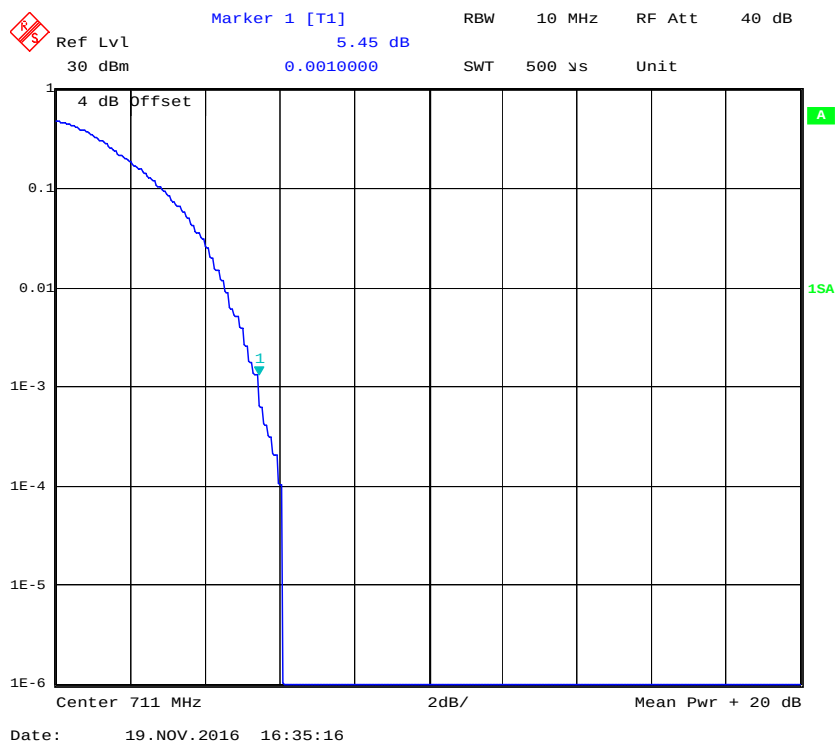
16QAM_10MHz_50 RB Low Channel



16QAM_10MHz_50 RB Middle Channel



16QAM_10MHz_50 RB High Channel



ERP & EIRP

Part 22H

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM 850_Middle Channel								
836.600	H	99.74	22.6	0.0	0.6	22.0	38.5	16.5
836.600	V	105.82	30.8	0.0	0.6	30.2	38.5	8.3
EDGE 850_Middle Channel								
836.600	H	94.02	16.9	0.0	0.6	16.3	38.5	22.2
836.600	V	102.01	27	0.0	0.6	26.4	38.5	12.1
WCDMA Band V Middle Channel								
836.600	H	90.08	13	0.0	0.6	12.4	38.5	26.1
836.600	V	95.93	20.9	0.0	0.6	20.3	38.5	18.2

Part 24E

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
PCS 1900_Middle Channel								
1880.000	H	92.41	18.8	8.0	0.9	25.9	33.0	7.1
1880.000	V	95.73	23.3	8.0	0.9	30.4	33.0	2.6
EDGE 1900_Middle Channel								
1880.000	H	86.93	13.3	8.0	0.9	20.4	33.0	12.6
1880.000	V	91.39	19	8.0	0.9	26.1	33.0	6.9
WCDMA Band II Middle Channel								
1880.000	H	82.56	8.9	8.0	0.9	16.0	33.0	17.0
1880.000	V	85.69	13.3	8.0	0.9	20.4	33.0	12.6

LTE Band II

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4 MHz Middle Channel								
1880	H	86.45	12.8	8.0	0.9	19.9	33.0	13.1
1880	V	88.32	15.9	8.0	0.9	23.0	33.0	10.0
QPSK 3 MHz Middle Channel								
1880	H	85.63	12	8.0	0.9	19.1	33.0	13.9
1880	V	87.86	15.5	8.0	0.9	22.6	33.0	10.4
QPSK 5 MHz Middle Channel								
1880	H	85.52	11.9	8.0	0.9	19.0	33.0	14.0
1880	V	87.89	15.5	8.0	0.9	22.6	33.0	10.4
QPSK 10 MHz Middle Channel								
1880	H	85.34	11.7	8.0	0.9	18.8	33.0	14.2
1880	V	87.74	15.3	8.0	0.9	22.4	33.0	10.6
QPSK 15 MHz Middle Channel								
1880	H	85.3	11.7	8.0	0.9	18.8	33.0	14.2
1880	V	86.34	13.9	8.0	0.9	21.0	33.0	12.0
QPSK 20 MHz Middle Channel								
1880	H	85.19	11.6	8.0	0.9	18.7	33.0	14.3
1880	V	86.44	14	8.0	0.9	21.1	33.0	11.9
16QAM 1.4 MHz Middle Channel								
1880	H	86.36	12.7	8.0	0.9	19.8	33.0	13.2
1880	V	87.98	15.6	8.0	0.9	22.7	33.0	10.3
16QAM 3 MHz Middle Channel								
1880	H	86.03	12.4	8.0	0.9	19.5	33.0	13.5
1880	V	88.01	15.6	8.0	0.9	22.7	33.0	10.3
16QAM 5 MHz Middle Channel								
1880	H	85.25	11.6	8.0	0.9	18.7	33.0	14.3
1880	V	88.03	15.6	8.0	0.9	22.7	33.0	10.3
16QAM 10 MHz Middle Channel								
1880	H	85.67	12.1	8.0	0.9	19.2	33.0	13.8
1880	V	88.55	16.2	8.0	0.9	23.3	33.0	9.7
16QAM 15 MHz Middle Channel								
1880	H	85.2	11.6	8.0	0.9	18.7	33.0	14.3
1880	V	86.14	13.7	8.0	0.9	20.8	33.0	12.2
16QAM 20 MHz Middle Channel								
1880	H	85.24	11.6	8.0	0.9	18.7	33.0	14.3
1880	V	86.41	14	8.0	0.9	21.1	33.0	11.9

LTE Band IV

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4 MHz Middle Channel								
1732.5	H	86.44	11	7.9	0.9	18.0	30.0	12.0
1732.5	V	87.97	13.6	7.9	0.9	20.6	30.0	9.4
QPSK 3 MHz Middle Channel								
1732.5	H	85.25	9.8	7.9	0.9	16.8	30.0	13.2
1732.5	V	86.53	12.2	7.9	0.9	19.2	30.0	10.8
QPSK 5 MHz Middle Channel								
1732.5	H	86.24	10.8	7.9	0.9	17.8	30.0	12.2
1732.5	V	87.01	12.7	7.9	0.9	19.7	30.0	10.3
QPSK 10 MHz Middle Channel								
1732.5	H	84.03	8.6	7.9	0.9	15.6	30.0	14.4
1732.5	V	85.22	10.9	7.9	0.9	17.9	30.0	12.1
QPSK 15 MHz Middle Channel								
1732.5	H	84.32	8.9	7.9	0.9	15.9	30.0	14.1
1732.5	V	85.21	10.9	7.9	0.9	17.9	30.0	12.1
QPSK 20 MHz Middle Channel								
1732.5	H	83.24	7.8	7.9	0.9	14.8	30.0	15.2
1732.5	V	84.32	10	7.9	0.9	17.0	30.0	13.0
16QAM 1.4 MHz Middle Channel								
1732.5	H	86.83	11.4	7.9	0.9	18.4	30.0	11.6
1732.5	V	88.64	14.3	7.9	0.9	21.3	30.0	8.7
16QAM 3 MHz Middle Channel								
1732.5	H	86.34	10.9	7.9	0.9	17.9	30.0	12.1
1732.5	V	87.13	12.8	7.9	0.9	19.8	30.0	10.2
16QAM 5 MHz Middle Channel								
1732.5	H	85.57	10.1	7.9	0.9	17.1	30.0	12.9
1732.5	V	86.65	12.3	7.9	0.9	19.3	30.0	10.7
16QAM 10 MHz Middle Channel								
1732.5	H	84.69	9.2	7.9	0.9	16.2	30.0	13.8
1732.5	V	85.25	10.9	7.9	0.9	17.9	30.0	12.1
16QAM 15 MHz Middle Channel								
1732.5	H	83.59	8.1	7.9	0.9	15.1	30.0	14.9
1732.5	V	84.85	10.5	7.9	0.9	17.5	30.0	12.5
16QAM 20 MHz Middle Channel								
1732.5	H	81.25	5.8	7.9	0.9	12.8	30.0	17.2
1732.5	V	83.94	9.6	7.9	0.9	16.6	30.0	13.4

LTE Band V

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4 MHz Middle Channel								
836.5	H	94.97	17.9	0.0	0.6	17.3	38.5	21.2
836.5	V	97.92	22.9	0.0	0.6	22.3	38.5	16.2
QPSK 3 MHz Middle Channel								
836.5	H	92.91	15.8	0.0	0.6	15.2	38.5	23.3
836.5	V	97.92	22.9	0.0	0.6	22.3	38.5	16.2
QPSK 5 MHz Middle Channel								
836.5	H	92.88	15.8	0.0	0.6	15.2	38.5	23.3
836.5	V	97.83	22.8	0.0	0.6	22.2	38.5	16.3
QPSK 10MHz Middle Channel								
836.5	H	92.76	15.7	0.0	0.6	15.1	38.5	23.4
836.5	V	97.76	22.8	0.0	0.6	22.2	38.5	16.3
16QAM 1.4 MHz Middle Channel								
836.5	H	92.79	15.7	0.0	0.6	15.1	38.5	23.4
836.5	V	97.73	22.7	0.0	0.6	22.1	38.5	16.4
16QAM 3 MHz Middle Channel								
836.5	H	92.88	15.8	0.0	0.6	15.2	38.5	23.3
836.5	V	97.86	22.9	0.0	0.6	22.3	38.5	16.2
16QAM 5 MHz Middle Channel								
836.5	H	92.94	15.9	0.0	0.6	15.3	38.5	23.2
836.5	V	97.86	22.9	0.0	0.6	22.3	38.5	16.2
16QAM 10 MHz Middle Channel								
836.5	H	92.76	15.7	0.0	0.6	15.1	38.5	23.4
836.5	V	97.7	22.7	0.0	0.6	22.1	38.5	16.4

LTE Band VII

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 5 MHz Middle Channel								
2535	H	80.85	8	8.9	1.2	15.7	33.0	17.3
2535	V	87.96	15.4	8.9	1.2	23.1	33.0	9.9
QPSK 10 MHz Middle Channel								
2535	H	80.28	7.4	8.9	1.2	15.1	33.0	17.9
2535	V	87.46	14.9	8.9	1.2	22.6	33.0	10.4
QPSK 15 MHz Middle Channel								
2535	H	80.56	7.7	8.9	1.2	15.4	33.0	17.6
2535	V	86.31	13.8	8.9	1.2	21.5	33.0	11.5
QPSK 20MHz Middle Channel								
2535	H	80.03	7.2	8.9	1.2	14.9	33.0	18.1
2535	V	86.65	14.1	8.9	1.2	21.8	33.0	11.2
16QAM 5 MHz Middle Channel								
2535	H	81.6	8.7	8.9	1.2	16.4	33.0	16.6
2535	V	88.12	15.6	8.9	1.2	23.3	33.0	9.7
16QAM 10 MHz Middle Channel								
2535	H	81.03	8.2	8.9	1.2	15.9	33.0	17.1
2535	V	88.58	16	8.9	1.2	23.7	33.0	9.3
16QAM 15 MHz Middle Channel								
2535	H	79.16	6.3	8.9	1.2	14.0	33.0	19.0
2535	V	87.25	14.7	8.9	1.2	22.4	33.0	10.6
16QAM 20 MHz Middle Channel								
2535	H	78.54	5.7	8.9	1.2	13.4	33.0	19.6
2535	V	86.72	14.2	8.9	1.2	21.9	33.0	11.1

LTE Band 17

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 5 MHz Middle Channel								
710	H	90.15	13.5	0.0	0.6	12.9	34.8	21.9
710	V	99.06	21	0.0	0.6	20.4	34.8	14.4
QPSK 10 MHz Middle Channel								
710	H	88.8	12.1	0.0	0.6	11.5	34.8	23.3
710	V	98.5	20.5	0.0	0.6	19.9	34.8	14.9
16QAM 5 MHz Middle Channel								
710	H	91.55	14.9	0.0	0.6	14.3	34.8	20.5
710	V	98.34	20.3	0.0	0.6	19.7	34.8	15.1
16QAM 10MHz Middle Channel								
710	H	90.01	13.4	0.0	0.6	12.8	34.8	22.0
710	V	96.99	18.9	0.0	0.6	18.3	34.8	16.5

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

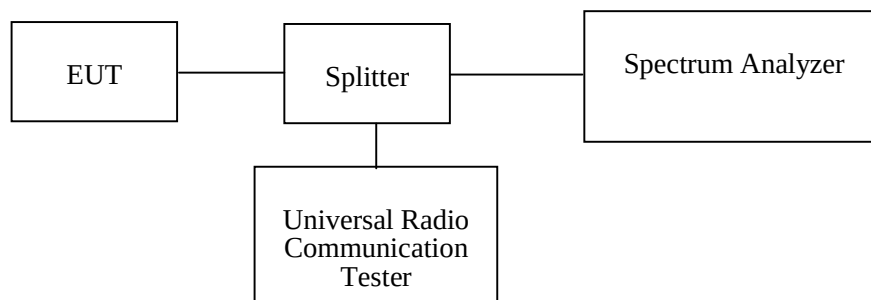
Applicable Standard

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	2016-09-21	2017-09-20
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2015-12-02	2016-12-01
N/A	RF Cable	N/A	N/A	Each Time	/
N/A	Two-way Splitter	N/A	OE0120121	Each Time	/

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26.7~29.8 °C
Relative Humidity:	31~39.5 %
ATM Pressure:	100.7~101.2 kPa

The testing was performed by Tom Tang from 2016-11-08 to 2016-11-19.

Test Mode: Transmitting

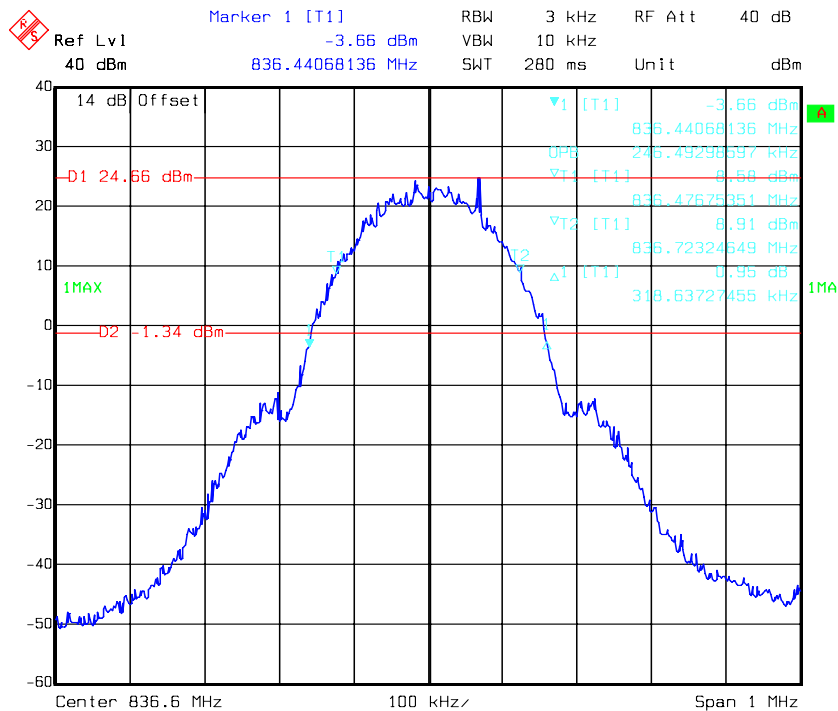
Test Result: Compliant. Please refer to the following table and plots.

Band	Test Channel	Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Cellular	M	GSM	0.246	0.319
		EDGE	0.250	0.321
PCS		PCS	0.248	0.317
		EDGE	0.253	0.323
WCDMA Band II		Rel 99	4.369	5.230
		HSDPA	4.349	5.210
		HSUPA	4.369	5.230
WCDMA Band V		Rel 99	4.208	4.910
		HSDPA	4.208	4.910
		HSUPA	4.208	4.930

Band	Test Modulation	Test Bandwidth (MHz)	Test Channel	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
LTE Band II	QPSK	1.4	M	1.112	1.287
		3		2.754	3.118
		5		4.569	5.110
		10		9.138	10.401
		15		13.587	15.140
		20		18.196	20.120
	16QAM	1.4	M	1.106	1.281
		3		2.778	3.130
		5		4.549	5.130
		10		9.138	10.200
		15		13.587	15.140
		20		18.277	20.120
LTE Band IV	QPSK	1.4	M	1.100	1.269
		3		2.766	3.111
		5		4.569	5.063
		10		9.098	10.404
		15		13.527	14.983
		20		18.116	20.040
	16QAM	1.4	M	1.106	1.305
		3		2.778	3.123
		5		4.549	5.103
		10		9.098	10.243
		15		13.587	15.043
		20		18.196	20.040

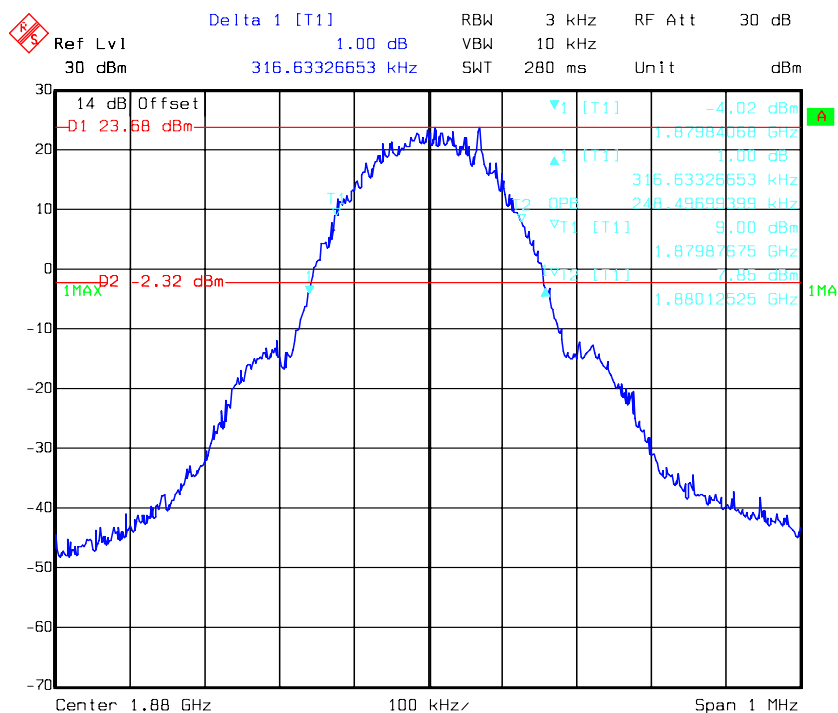
Band	Test Modulation	Test Bandwidth (MHz)	Test Channel	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
LTE Band V	QPSK	1.4	M	1.100	1.269
		3		2.754	3.102
		5		4.529	5.062
		10		9.098	10.341
	16QAM	1.4	M	1.106	1.287
		3		2.778	3.150
		5		4.549	5.142
		10		9.098	10.180
LTE Band VII	QPSK	5	M	4.569	5.090
		10		9.138	10.391
		15		13.647	15.130
		20		18.196	20.271
	16QAM	5	M	4.549	5.090
		10		9.098	10.391
		15		13.587	15.070
		20		18.196	20.271
LTE Band 17	QPSK	5	M	4.549	5.090
		10		9.178	10.341
	16QAM	5	M	4.549	5.150
		10		9.178	10.301

GMSK 850 Cellular Band



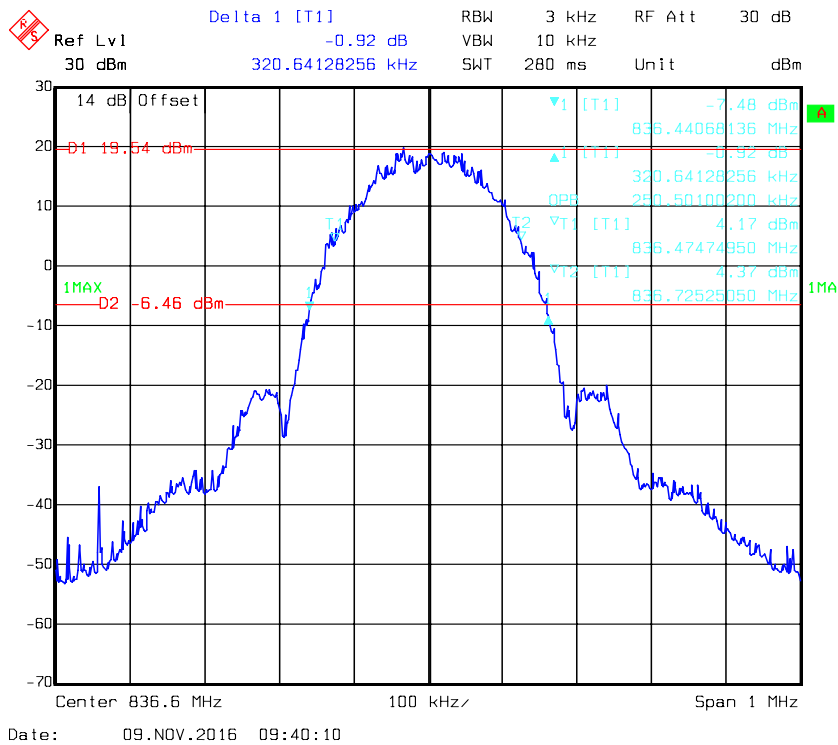
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GMSK PCS Band

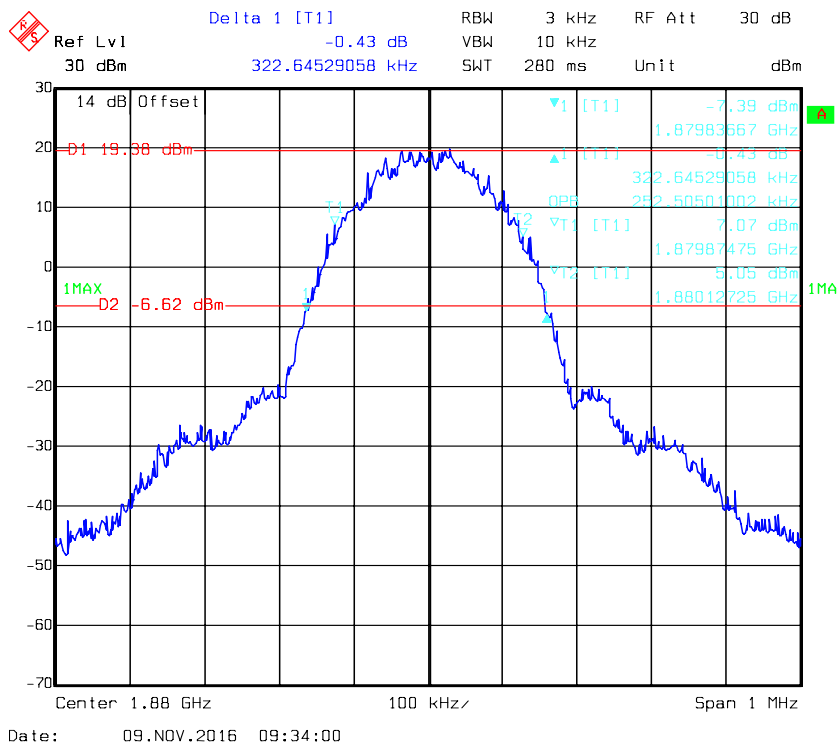


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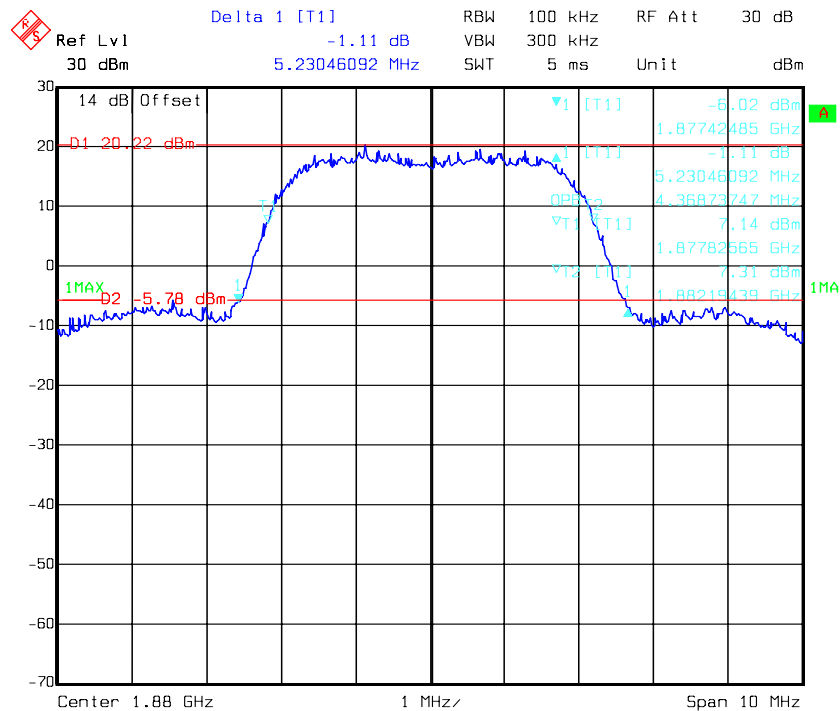
EDGE 850 Cellular Band



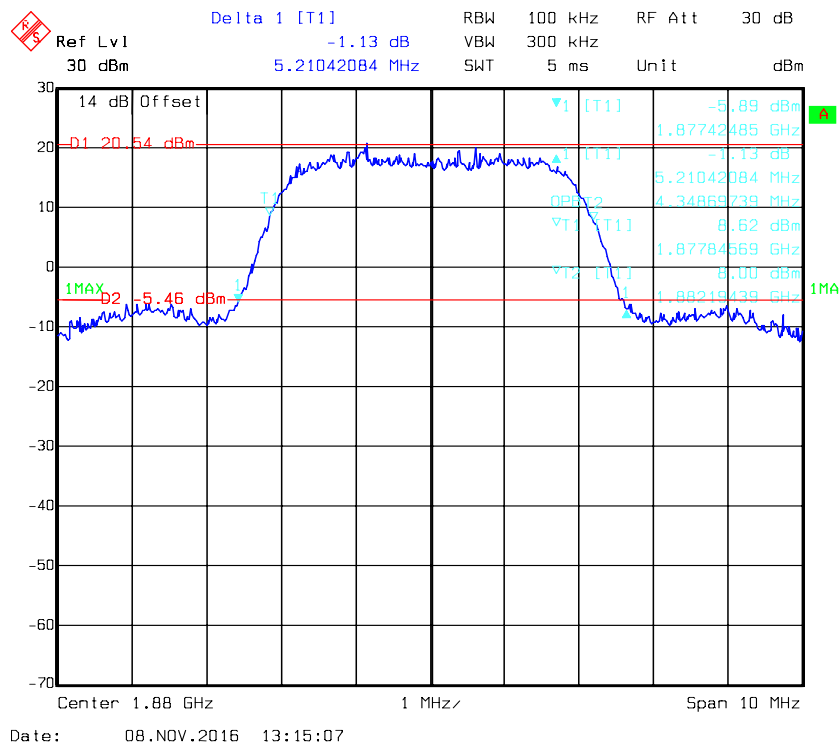
EDGE PCS Band



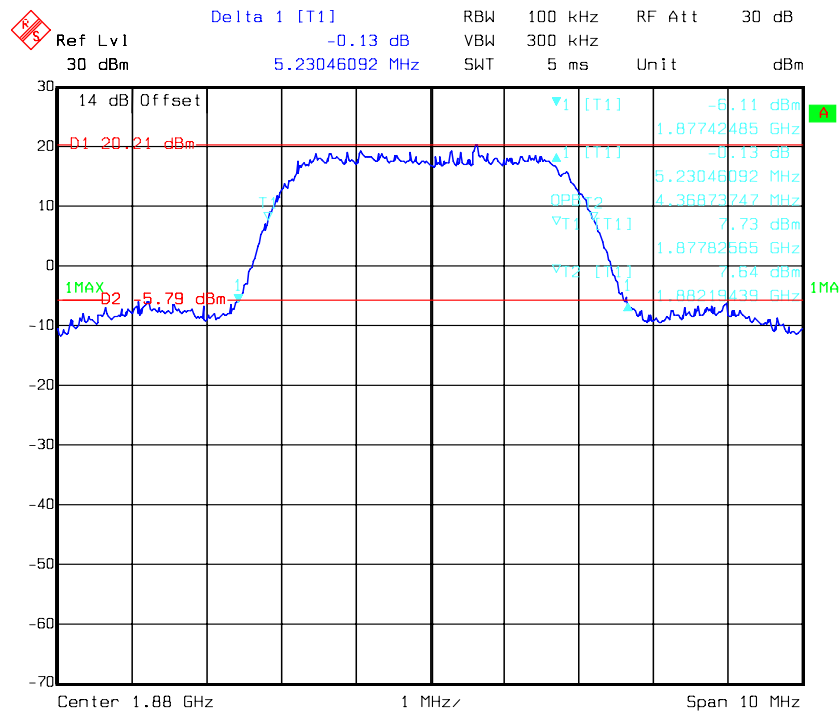
REL99 Band II



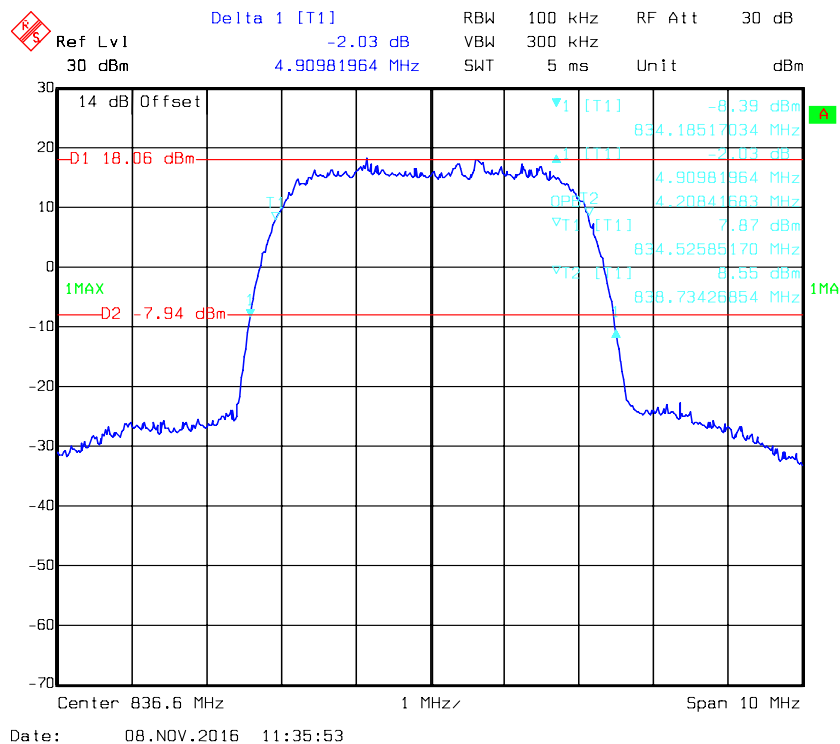
HSDPA Band II



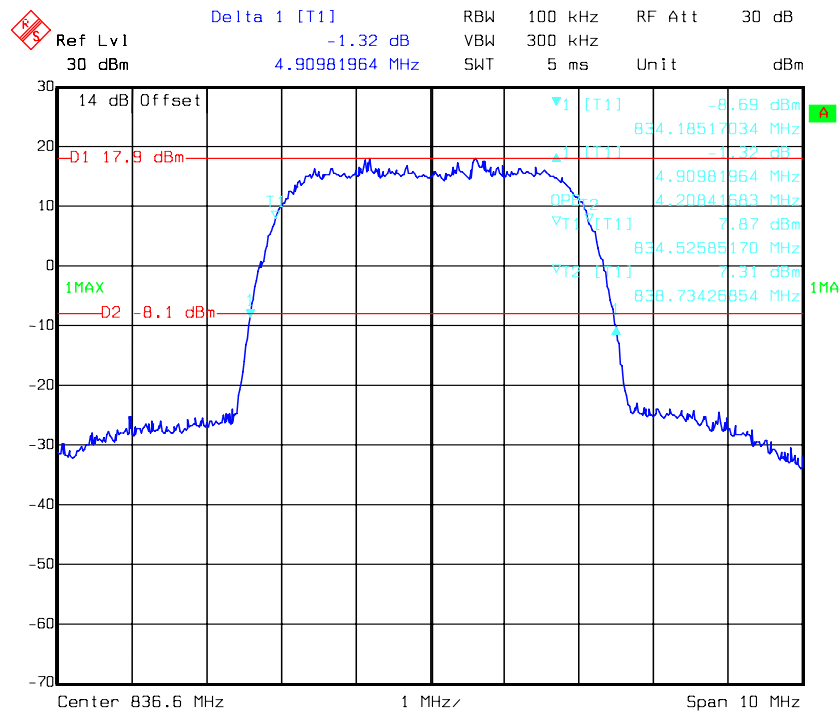
HSUPA Band II



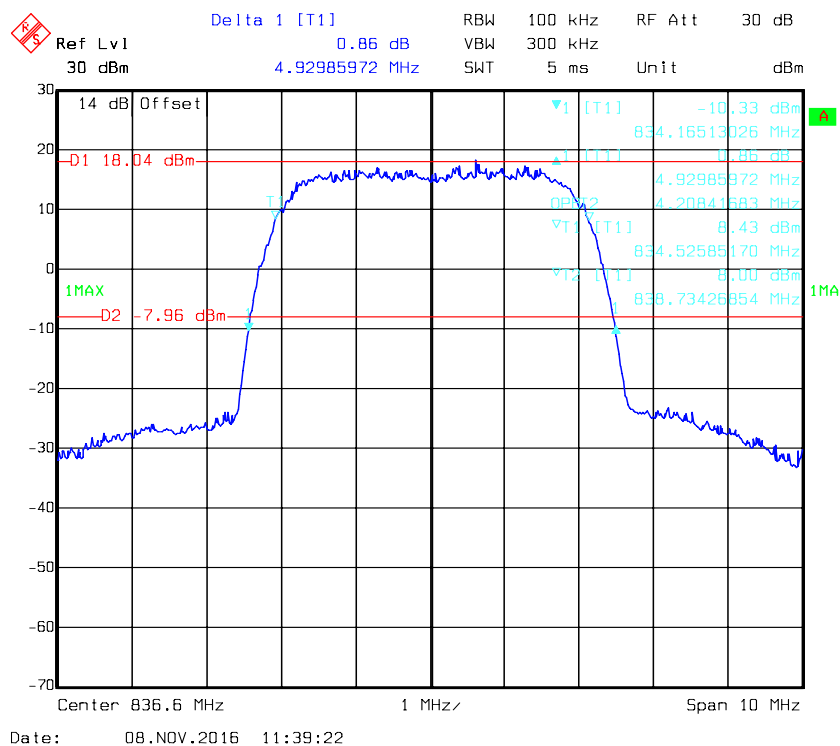
REL99 Band V



HSDPA Band V

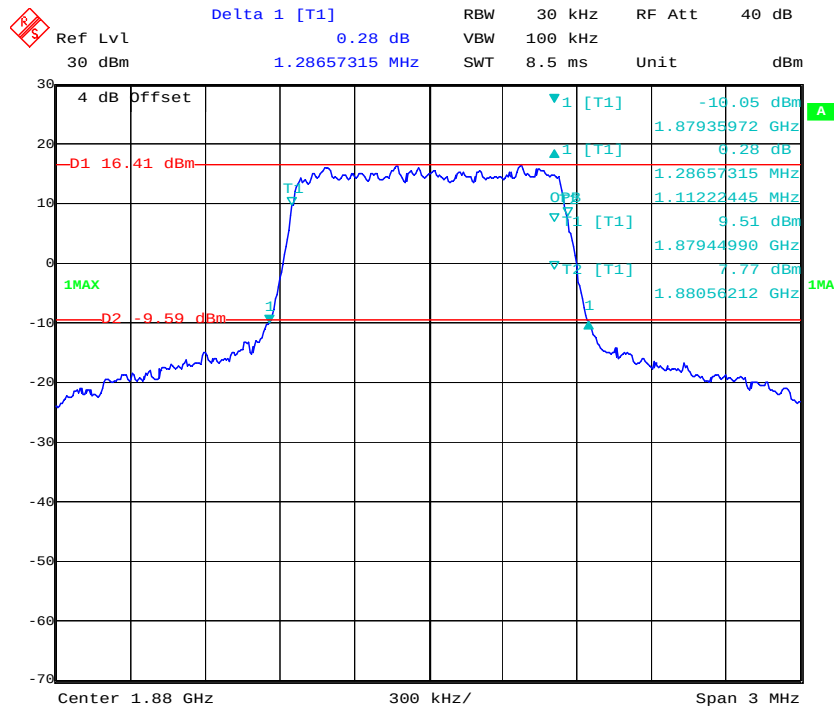


HSUPA Band V



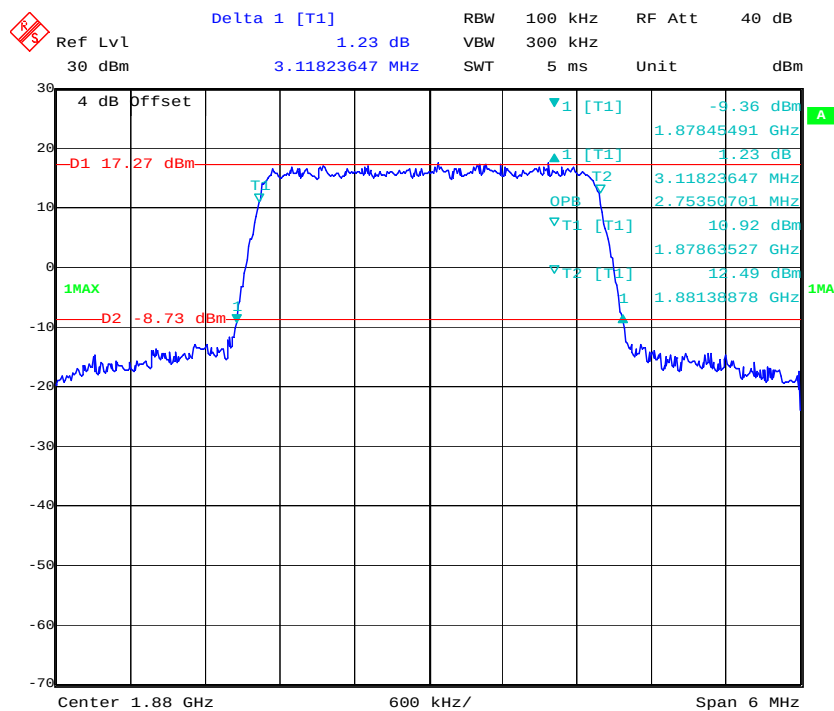
LTE Band II

QPSK_1.4 MHz



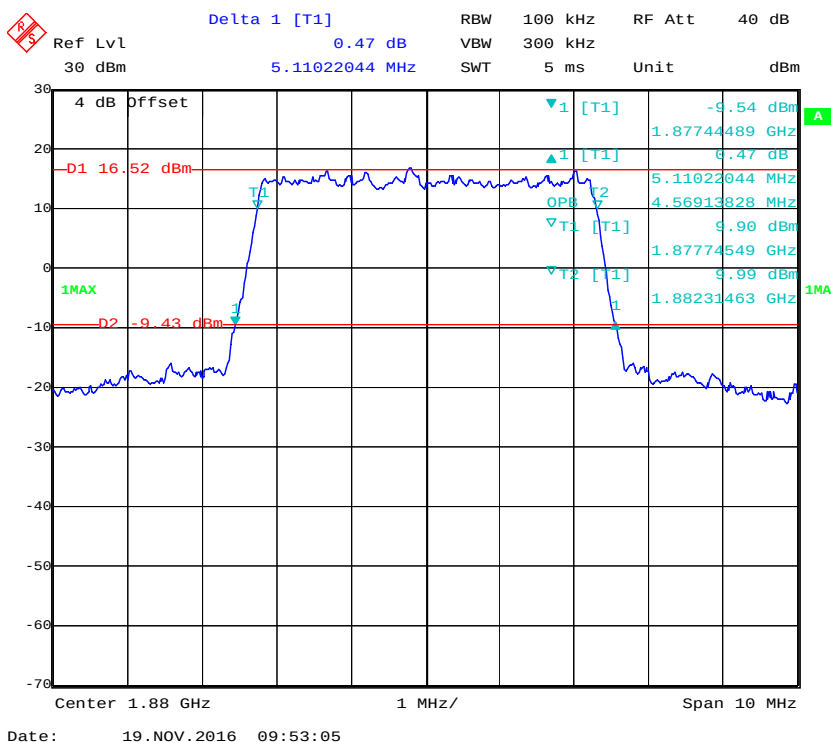
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QPSK_3 MHz

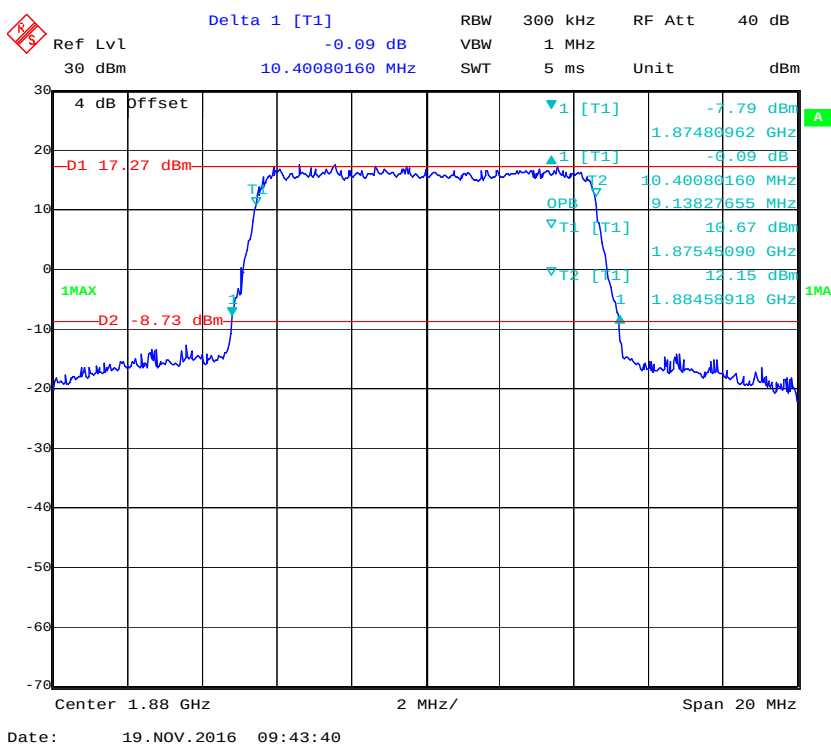


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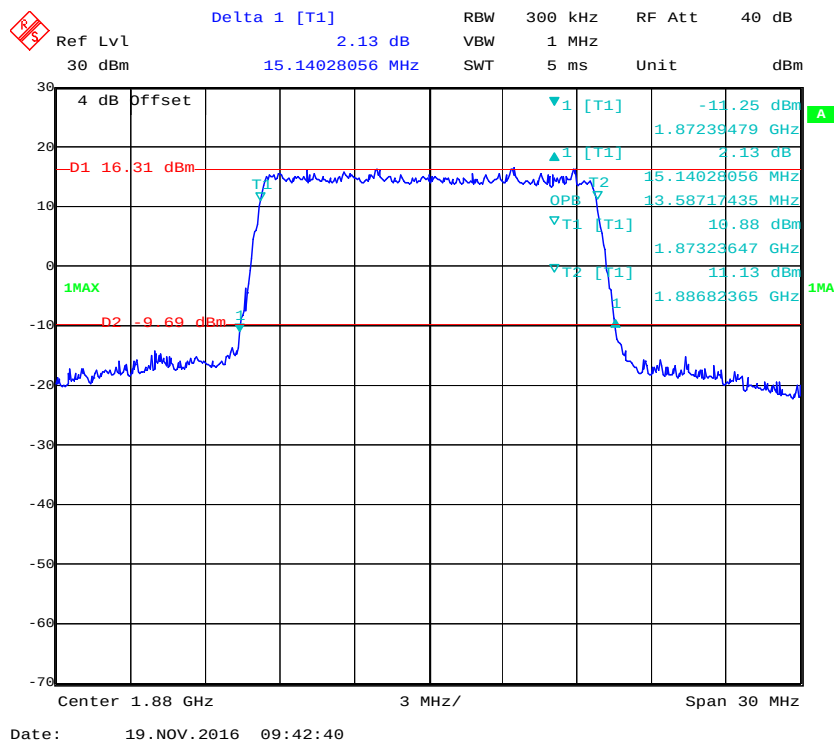
QPSK_5 MHz



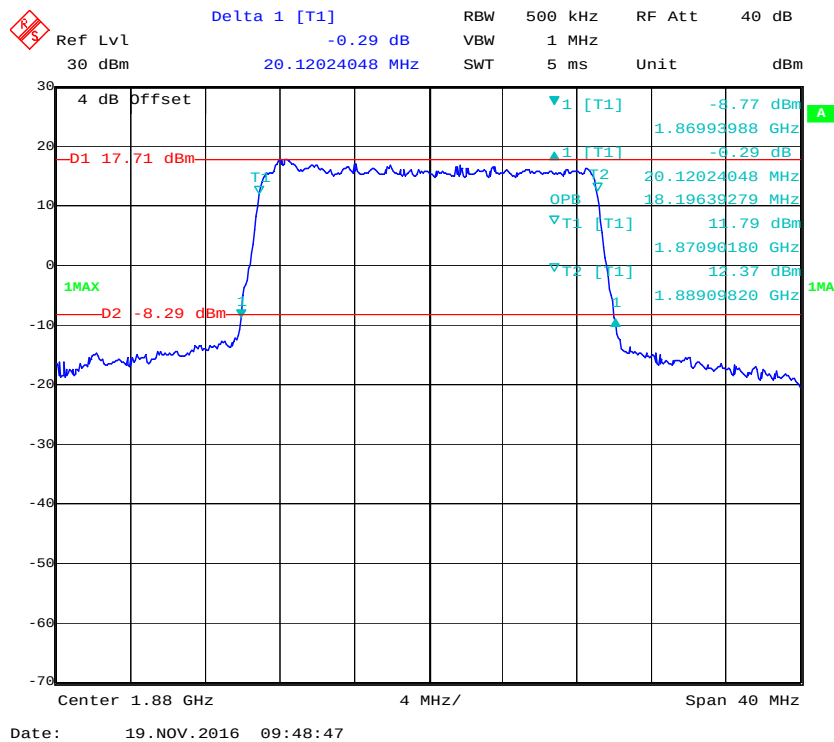
QPSK_10 MHz



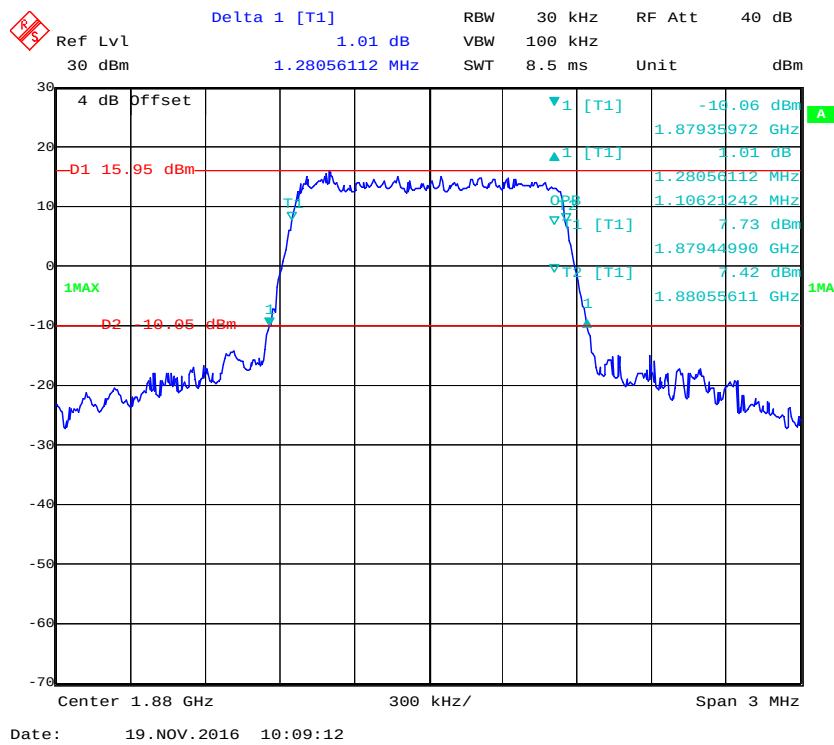
QPSK_15 MHz



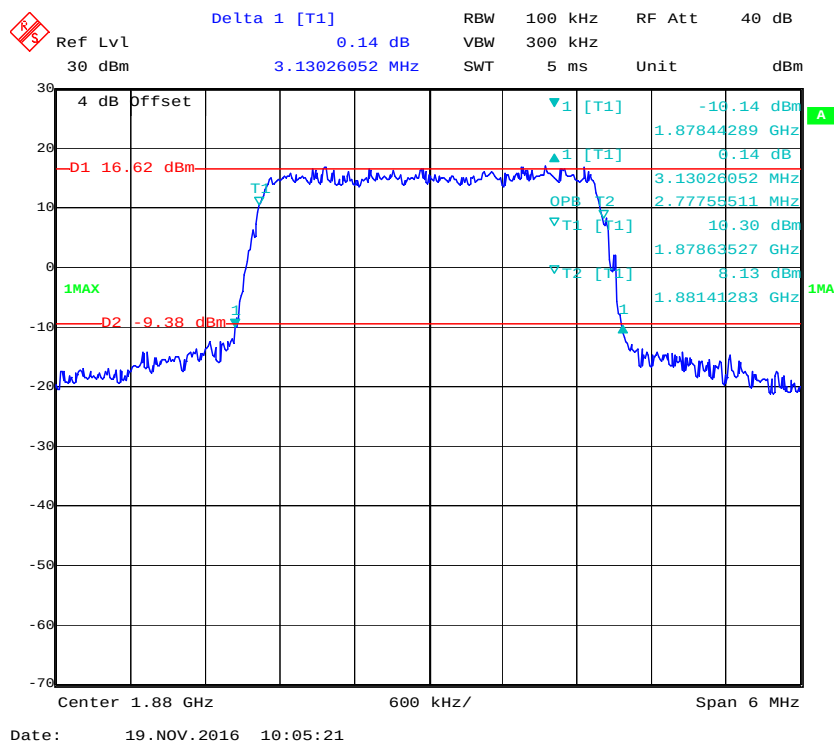
QPSK_20 MHz



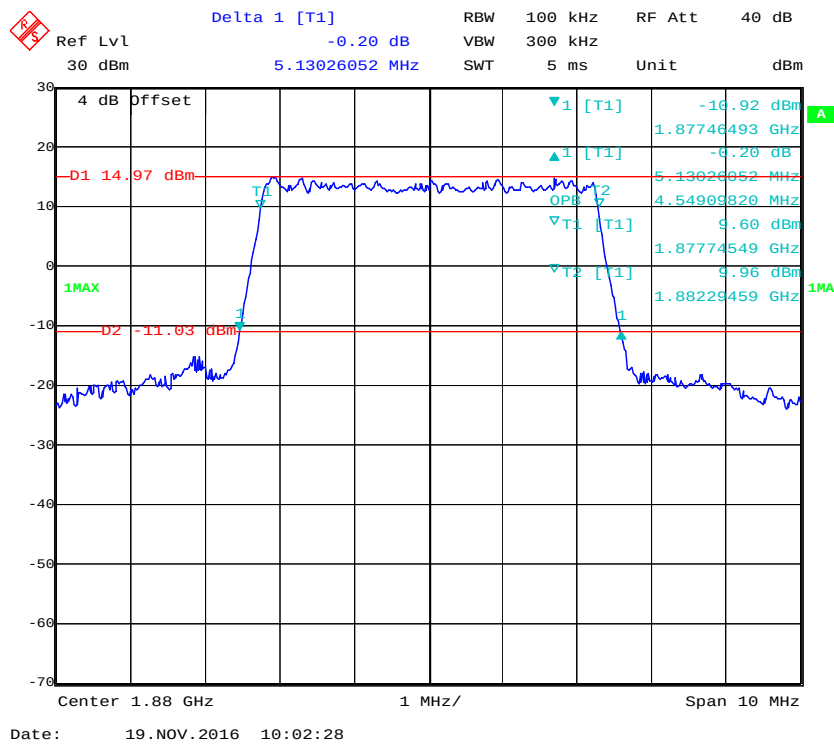
16QAM_1.4 MHz



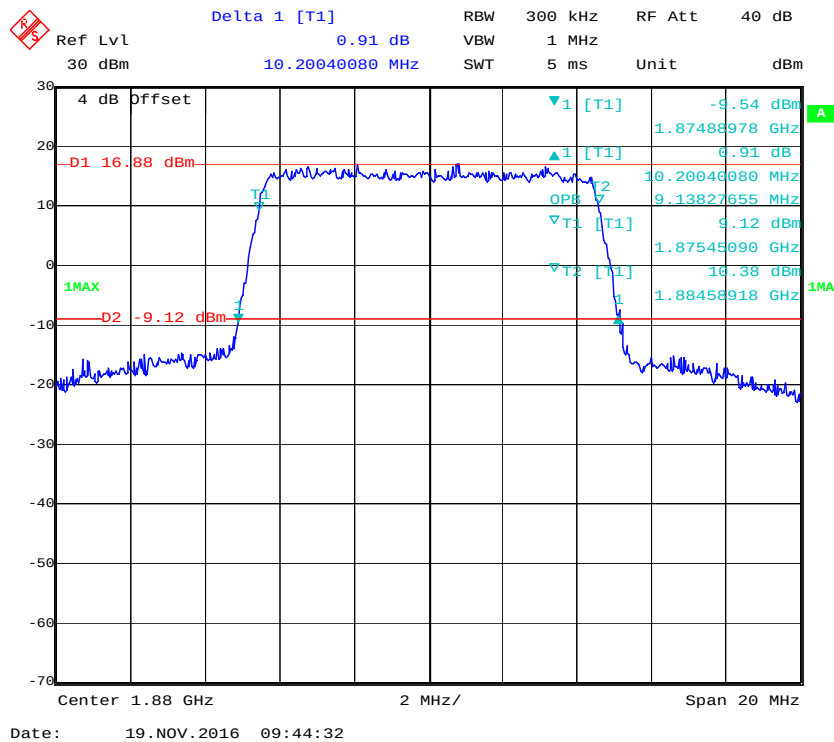
16QAM_3 MHz



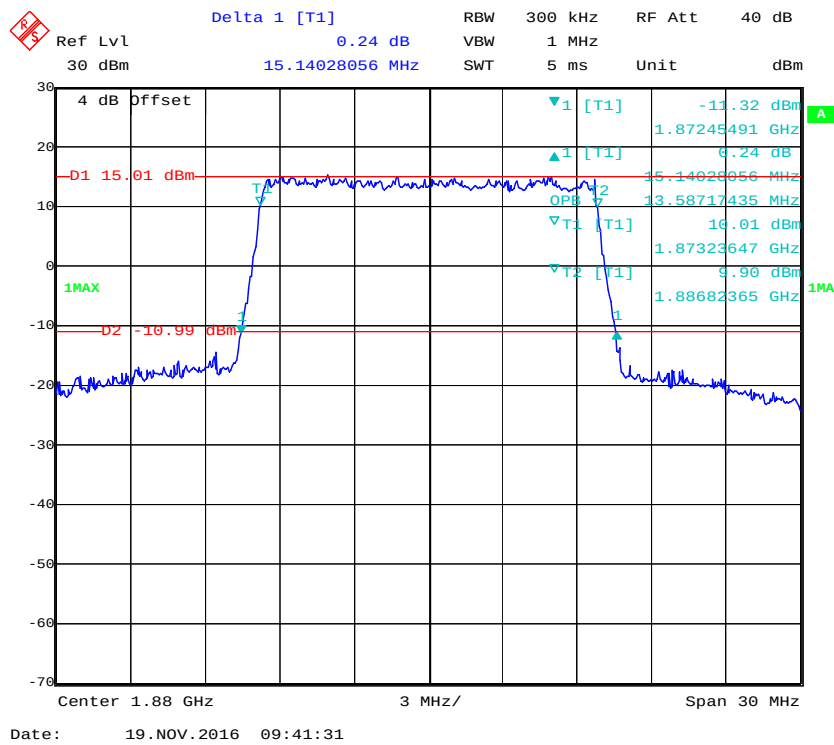
16QAM_5 MHz



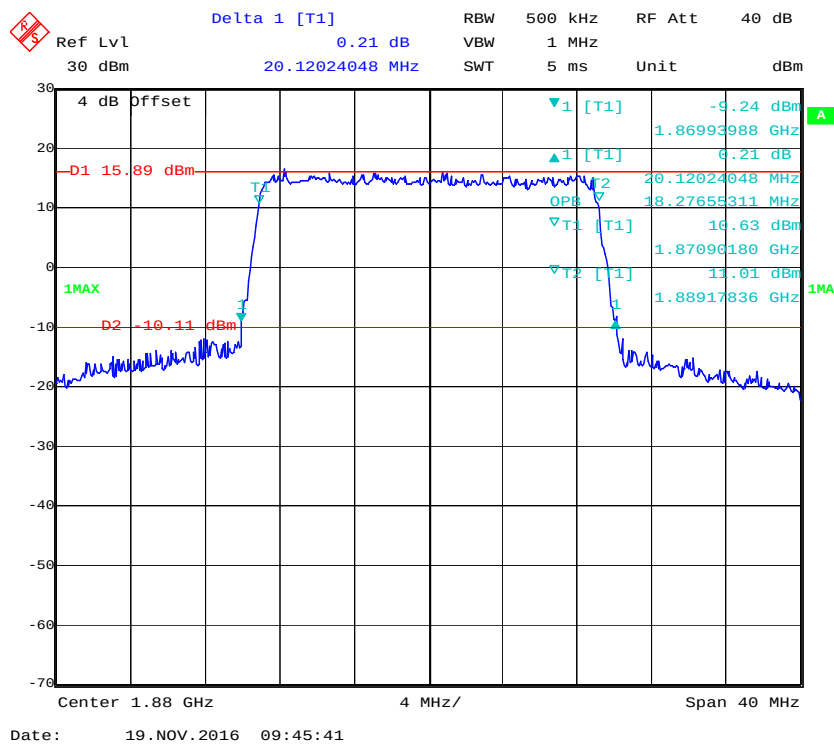
16QAM_10 MHz



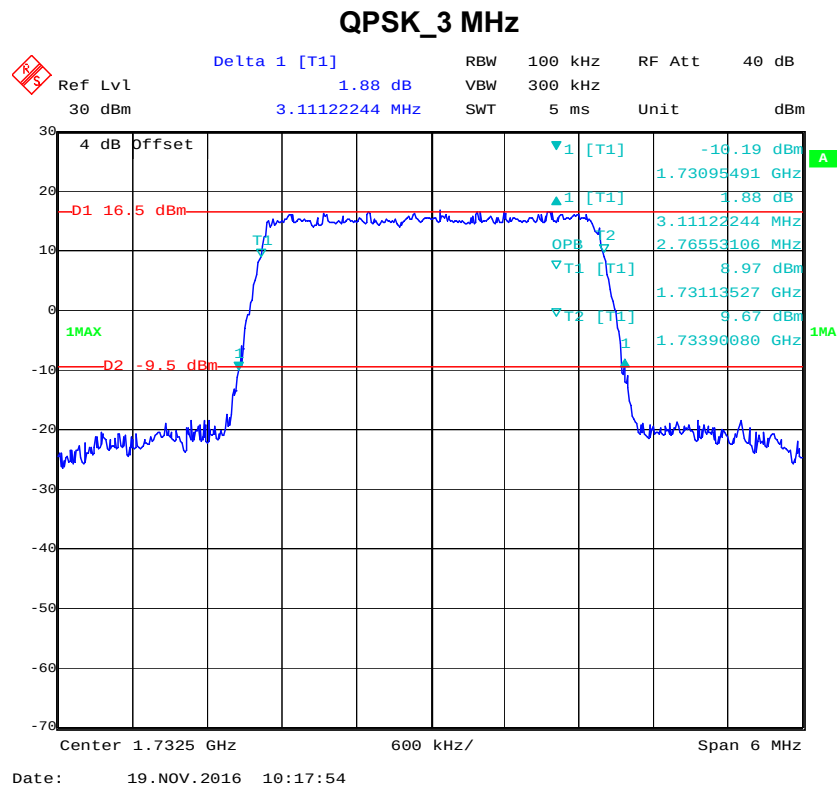
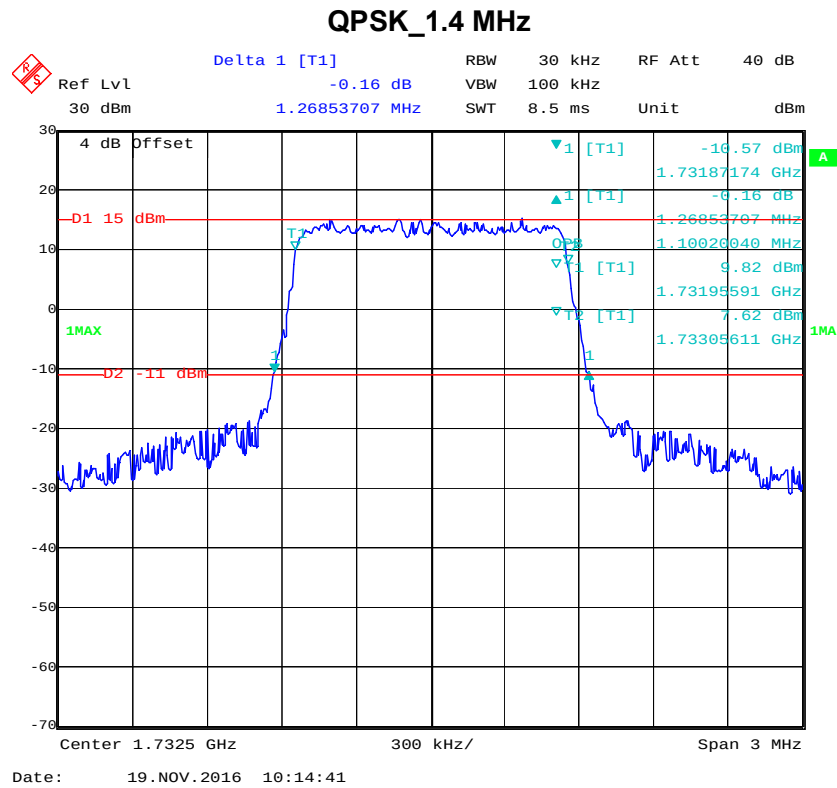
16QAM_15 MHz



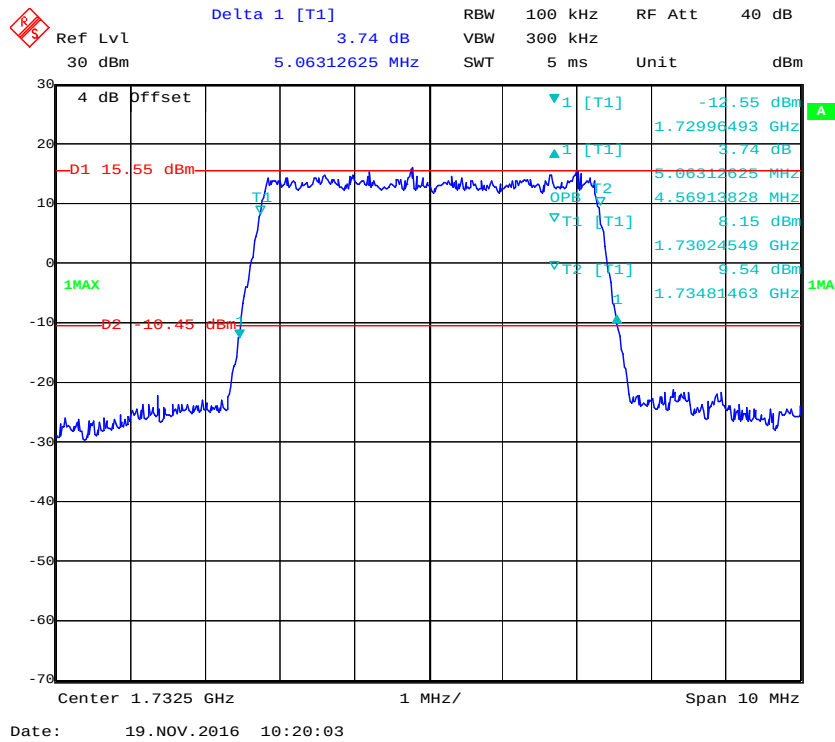
16QAM_20 MHz



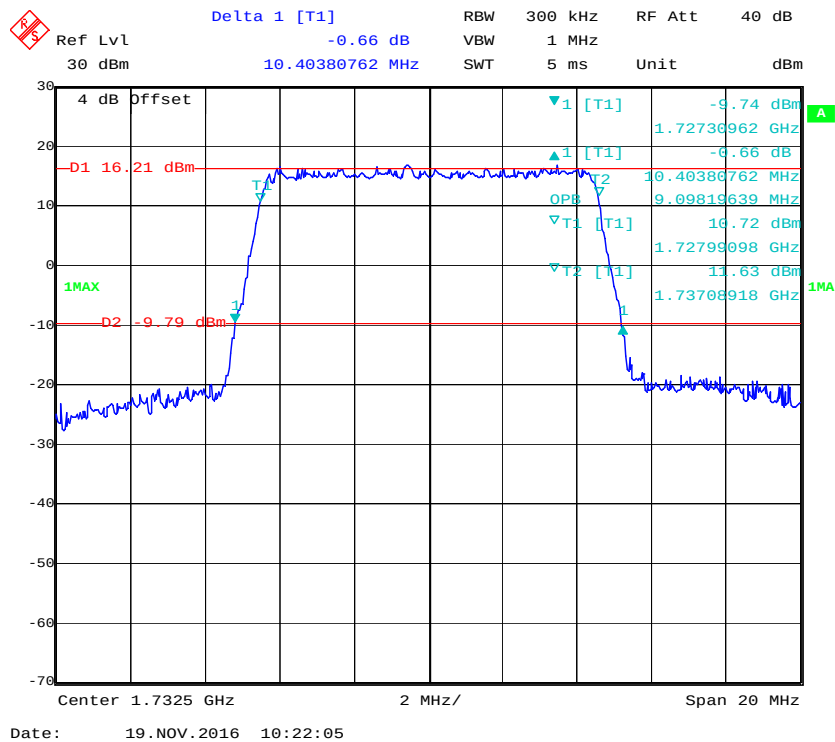
LTE Band IV:



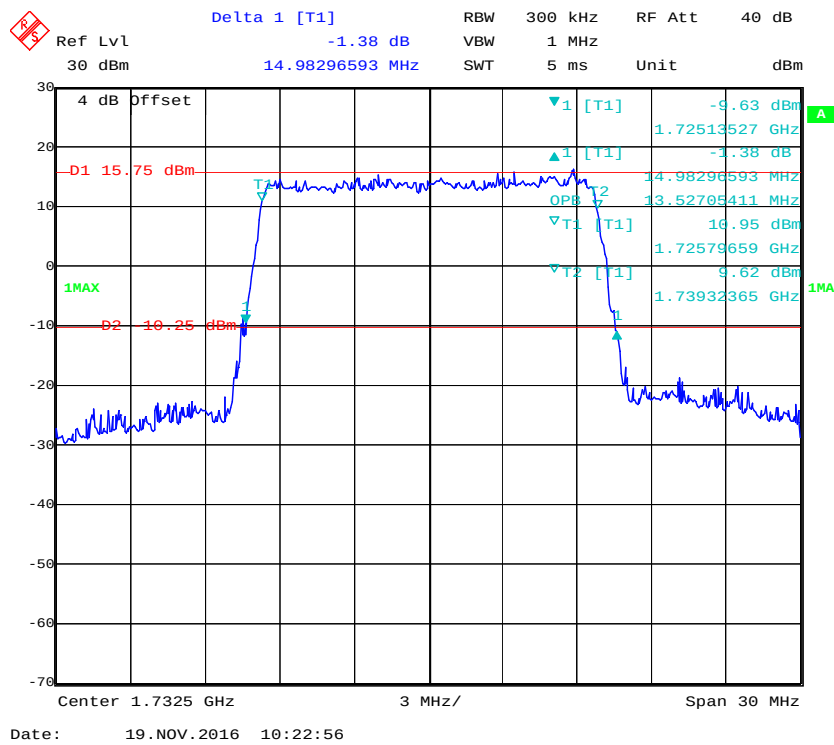
QPSK_5 MHz



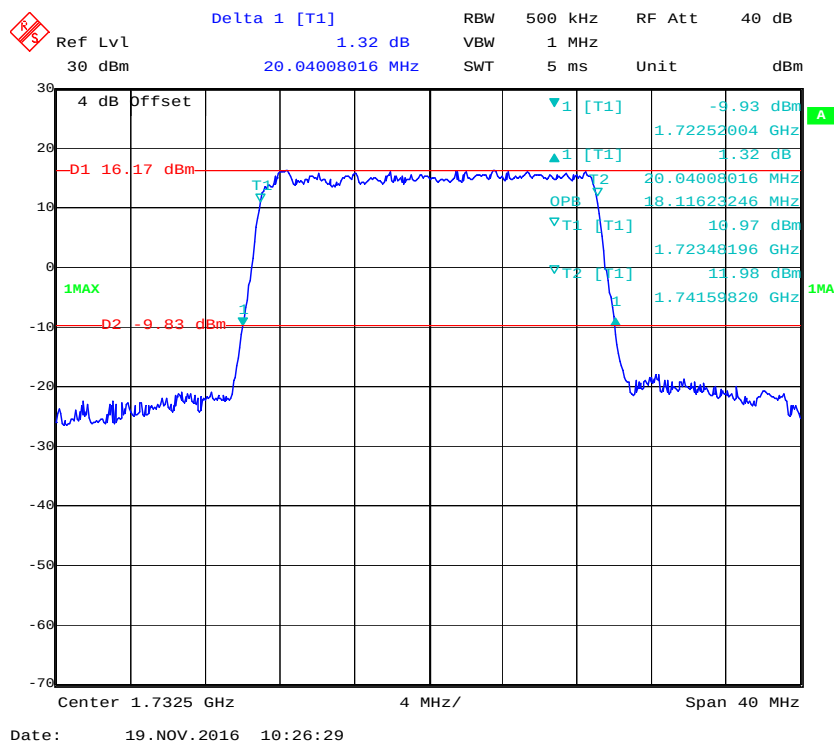
QPSK_10 MHz



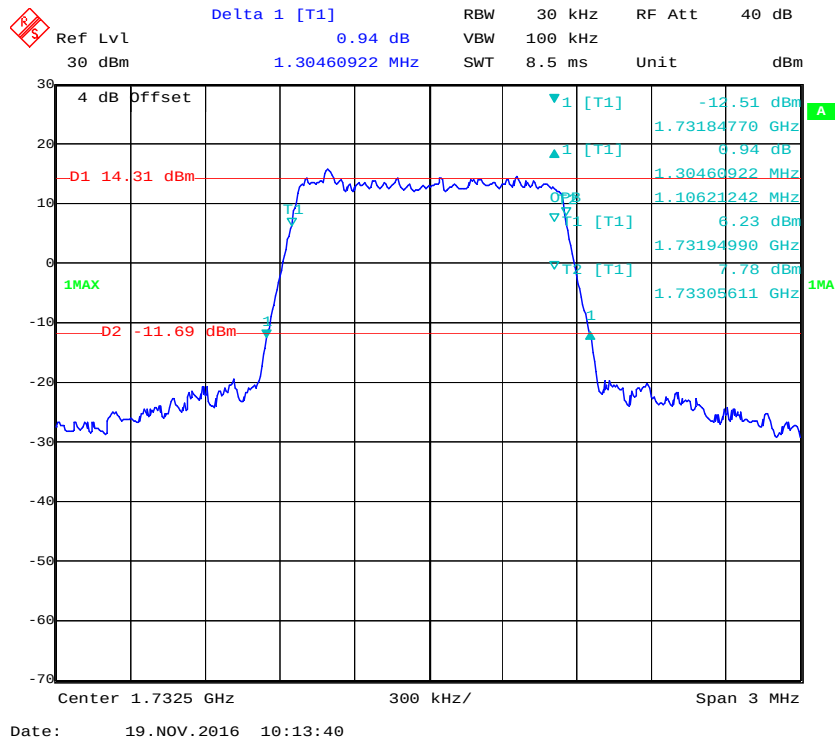
QPSK_15 MHz



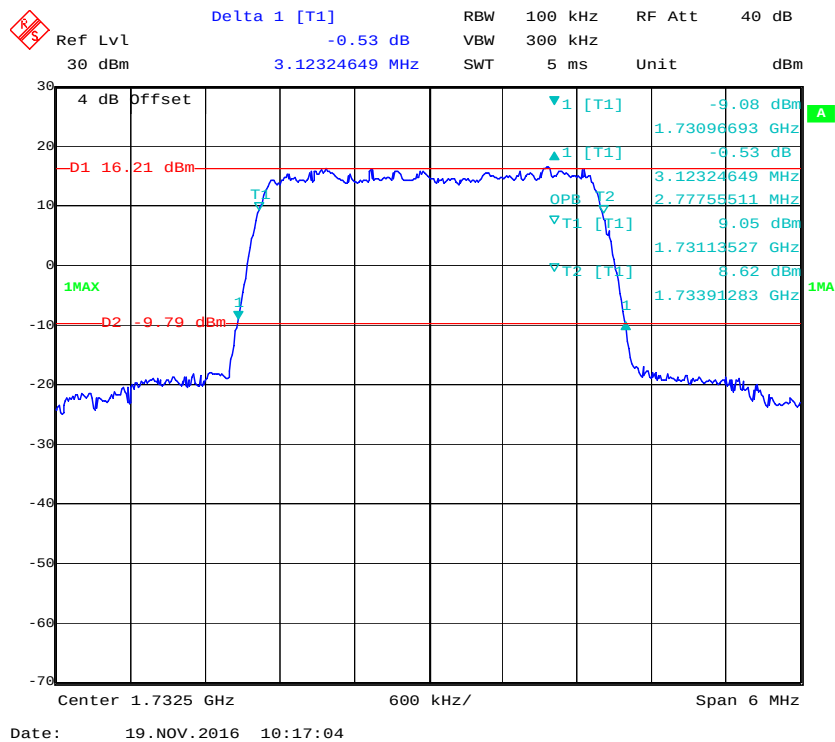
QPSK_20 MHz



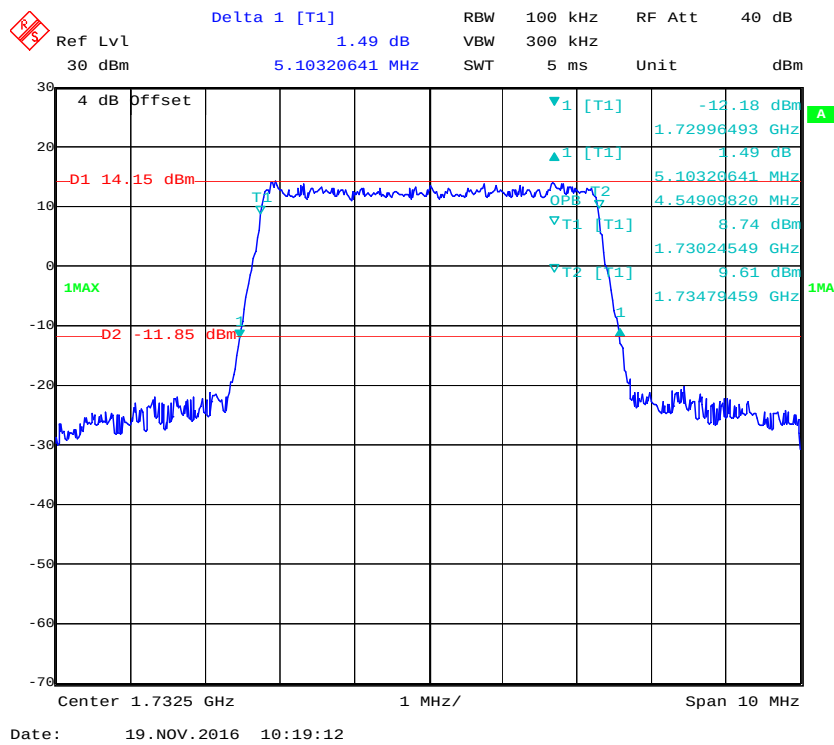
16QAM_1.4 MHz



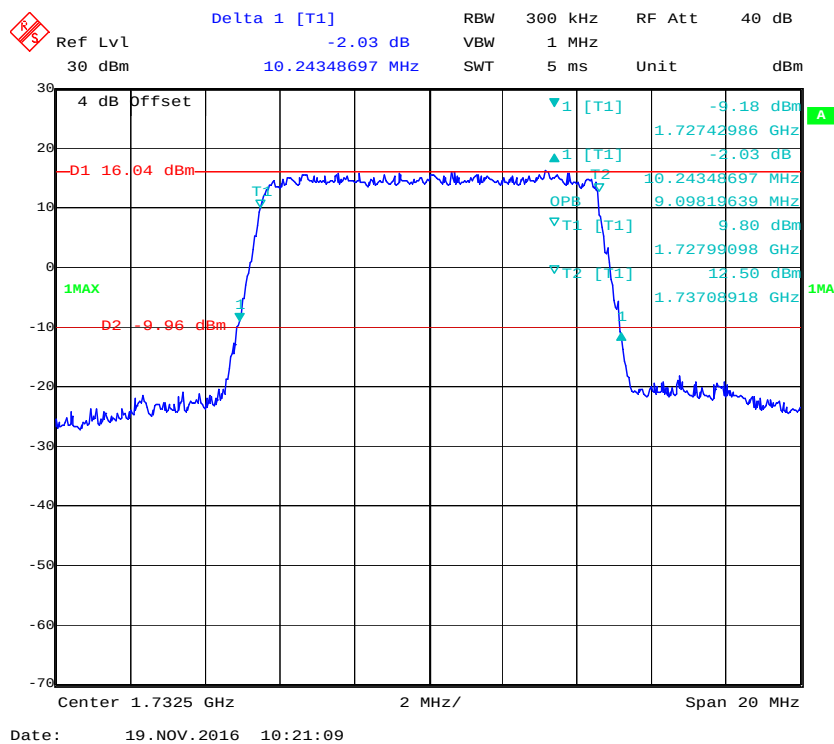
16QAM_3 MHz



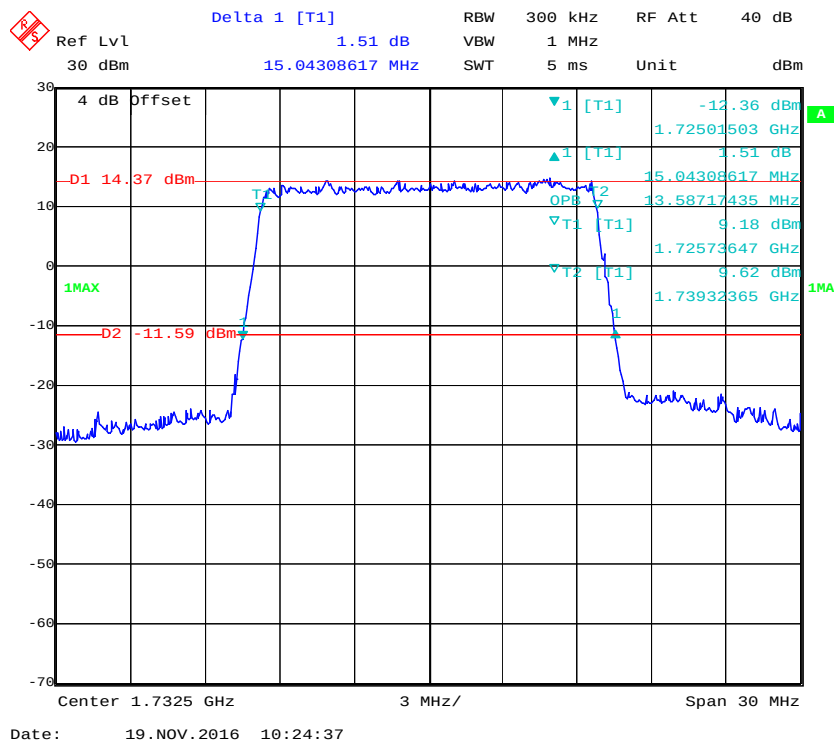
16QAM_5 MHz



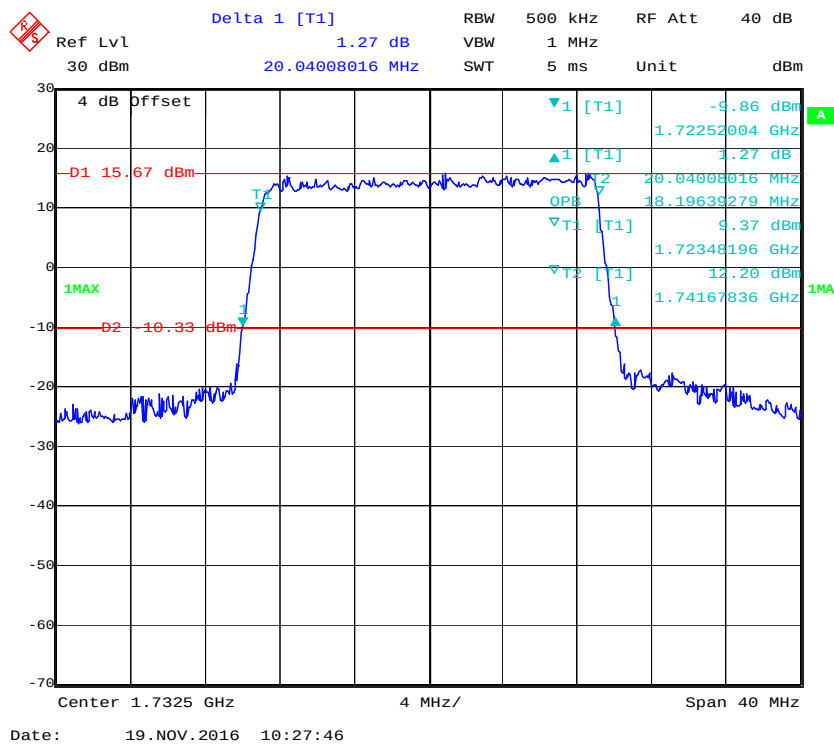
16QAM_10 MHz



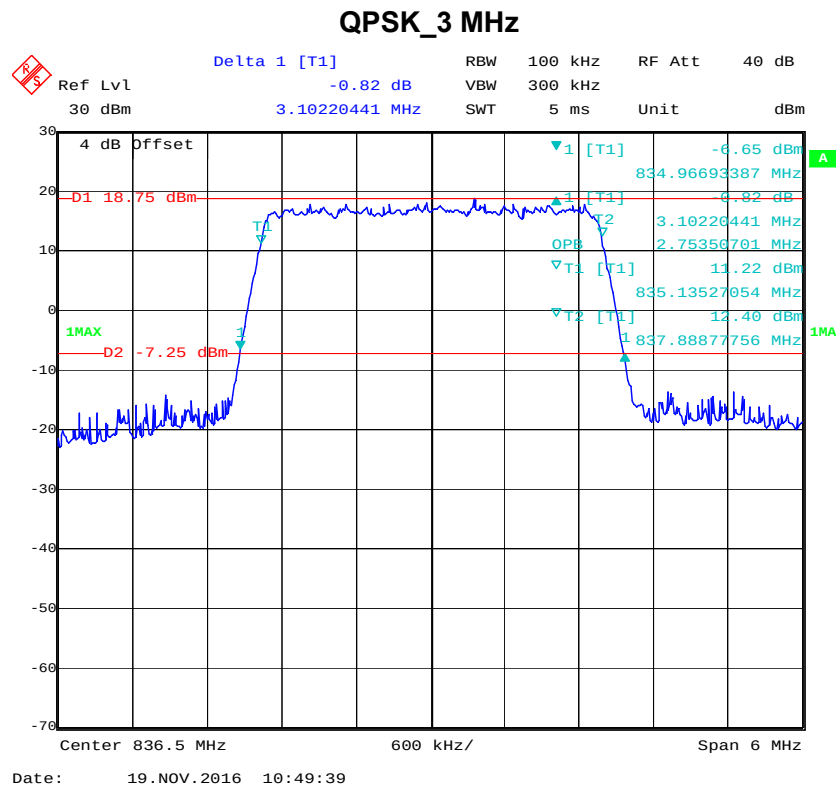
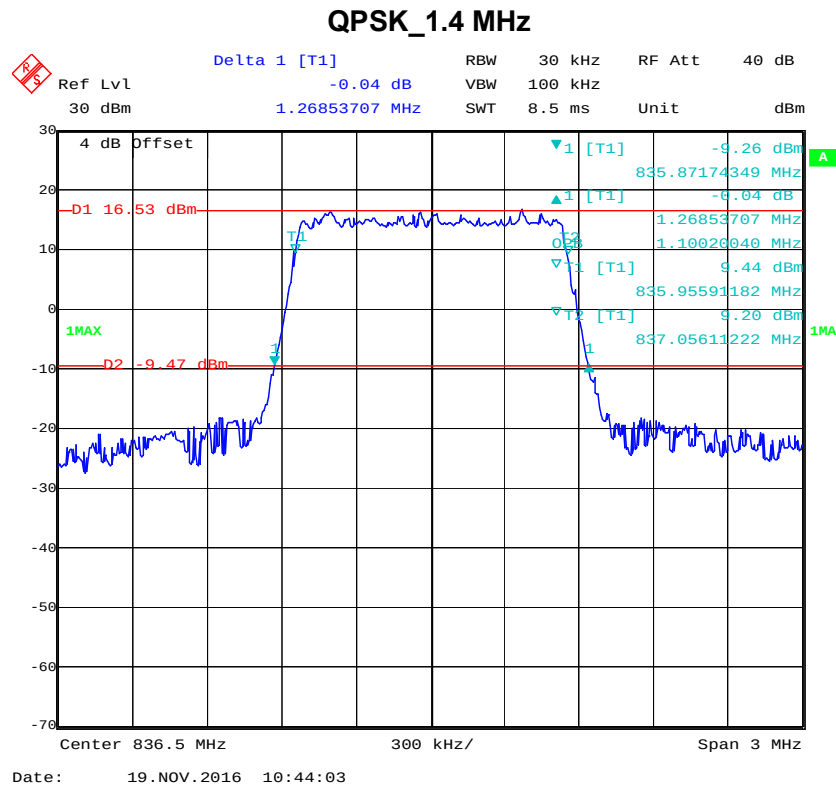
16QAM_15 MHz



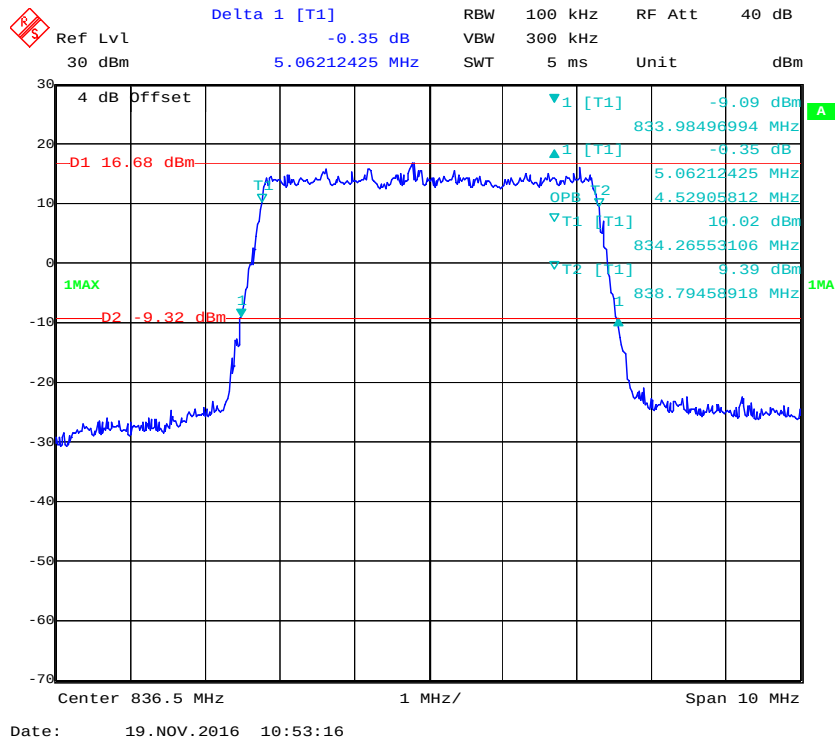
16QAM_20 MHz



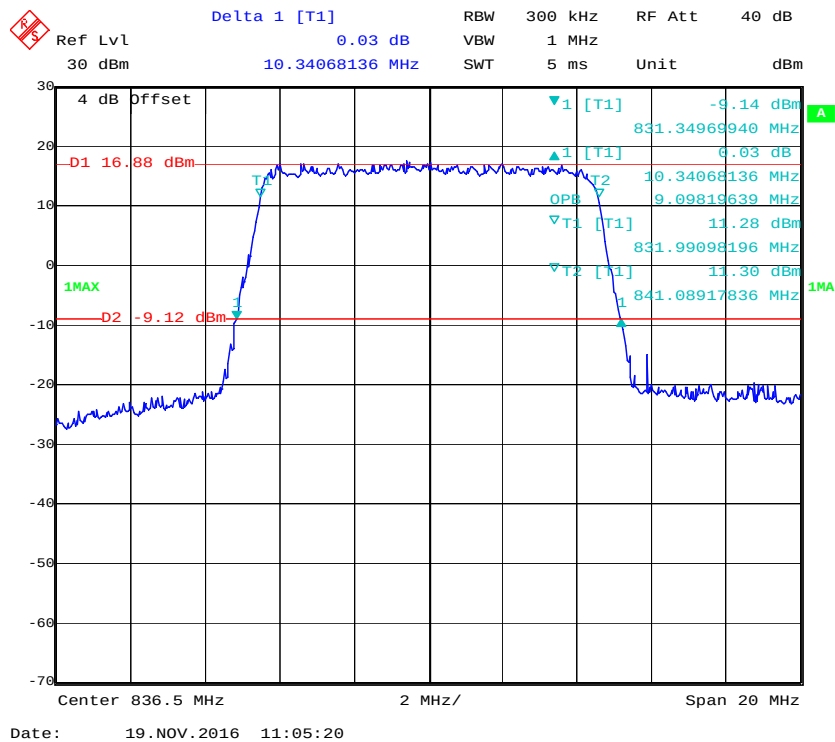
LTE Band V:



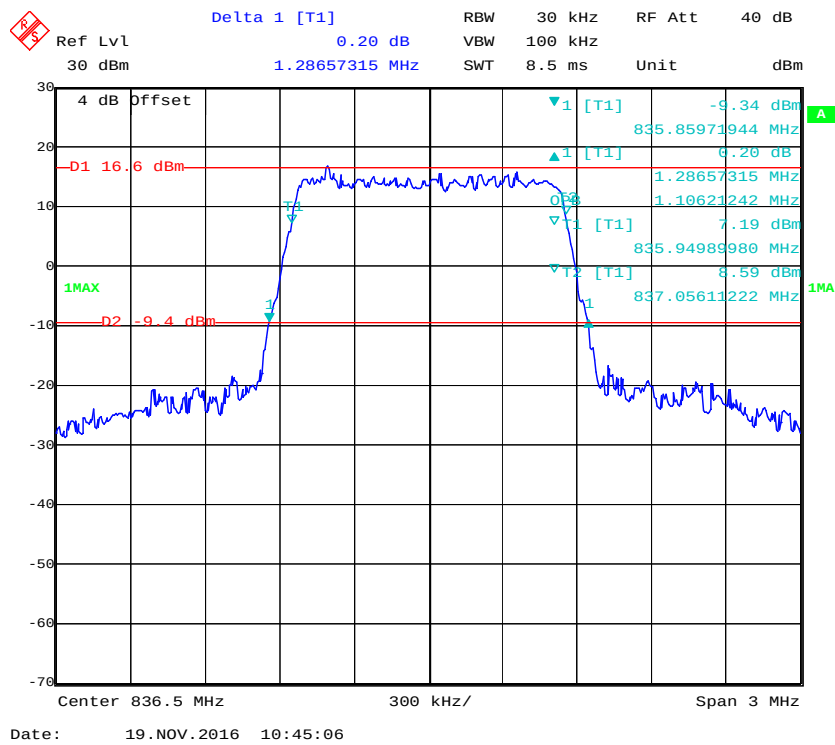
QPSK_5 MHz



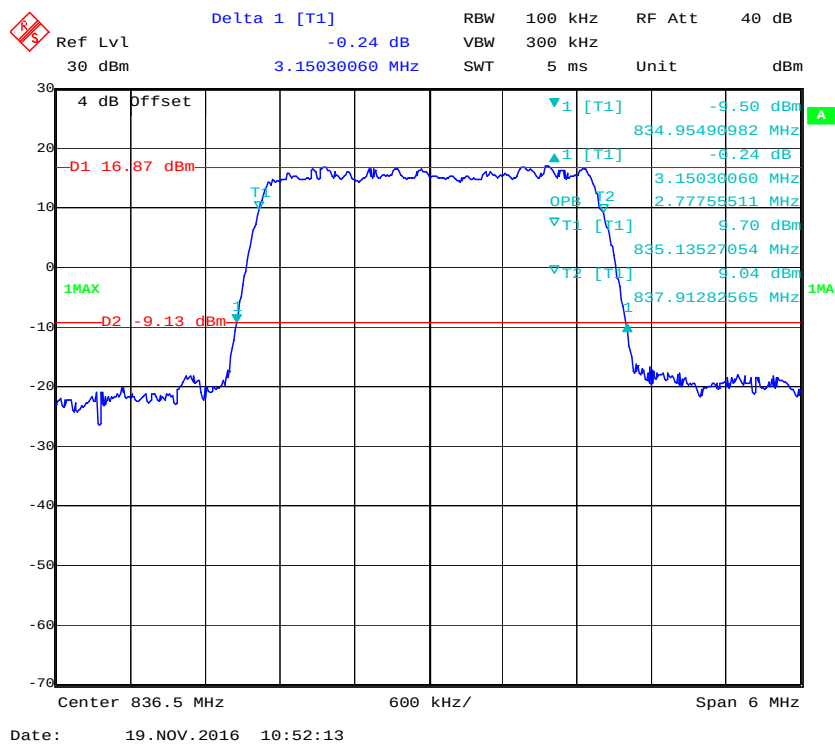
QPSK_10 MHz



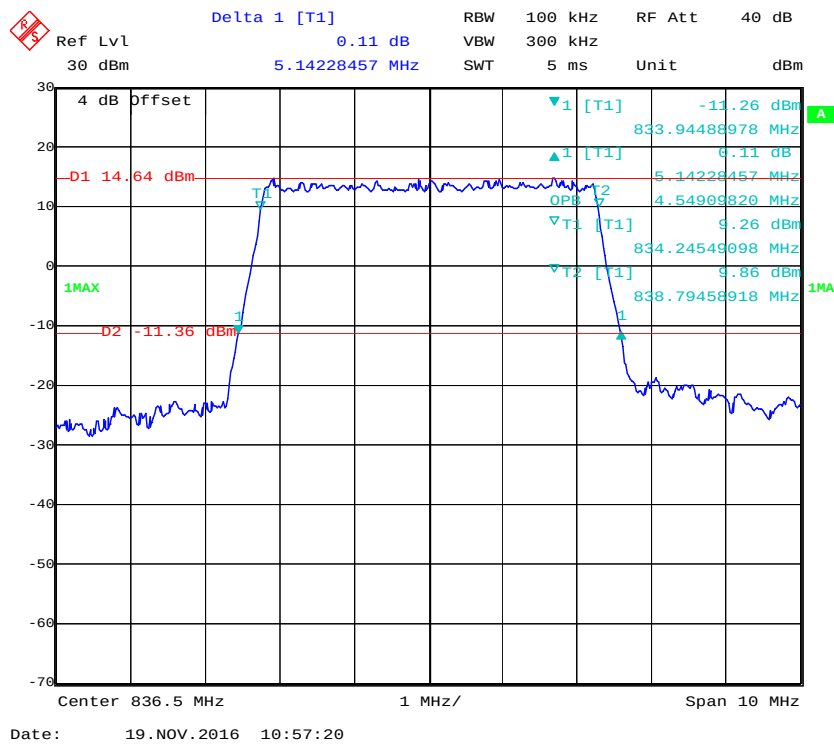
16QAM_1.4 MHz



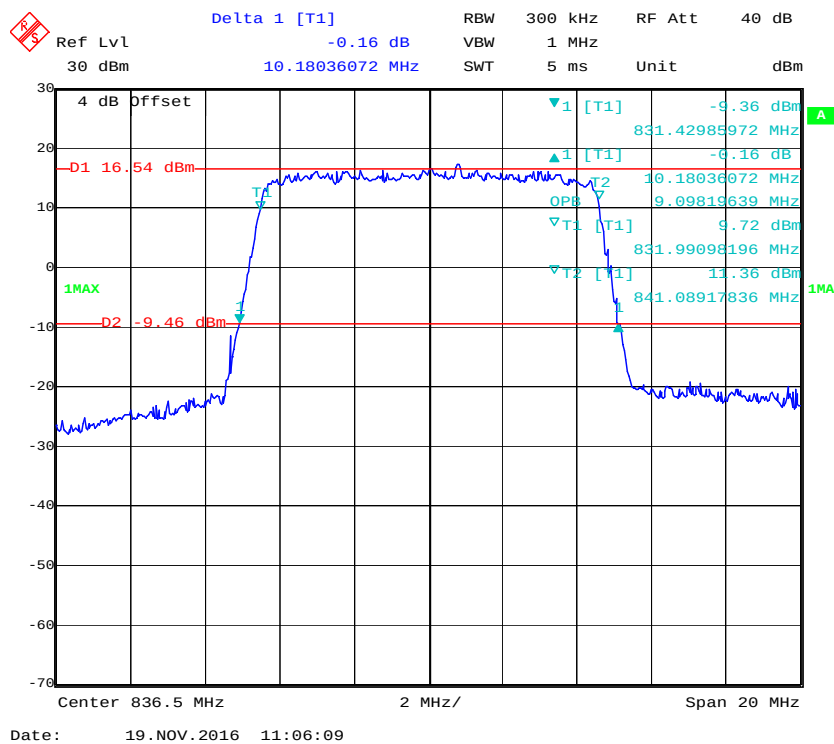
16QAM_3 MHz



16QAM_5 MHz

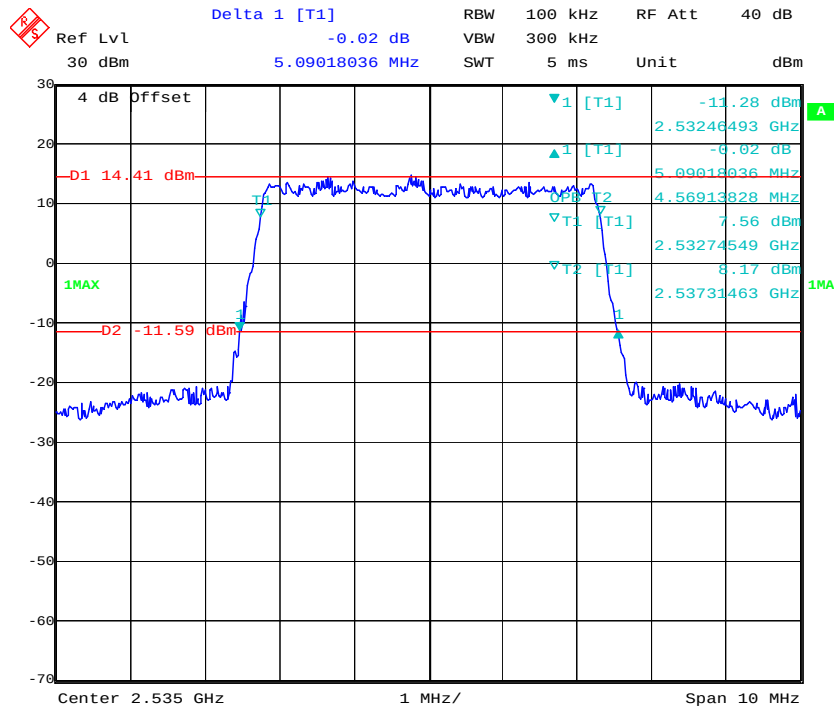


16QAM_10 MHz



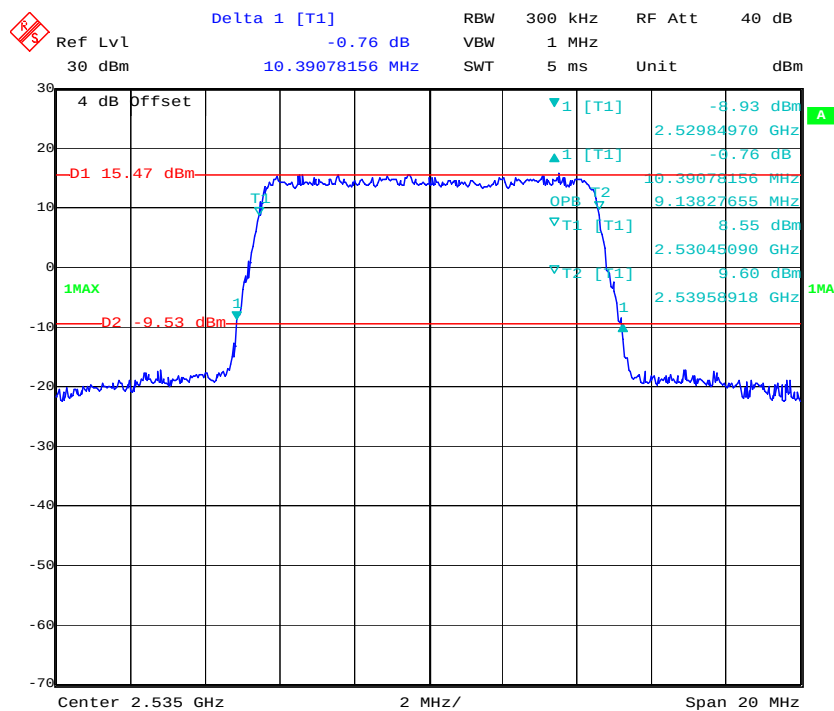
LTE Band VII:

QPSK_5 MHz



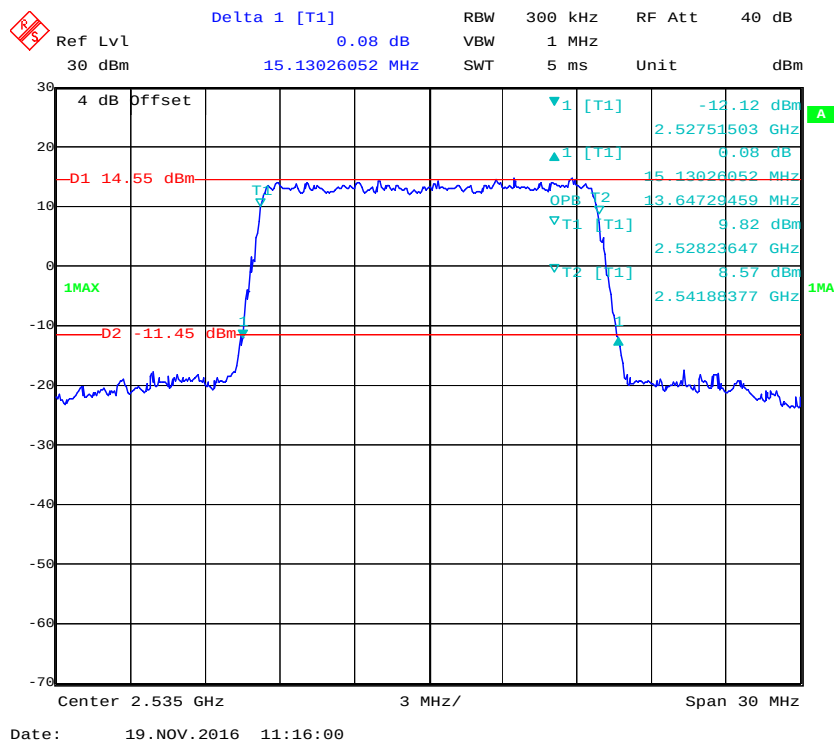
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QPSK_10 MHz

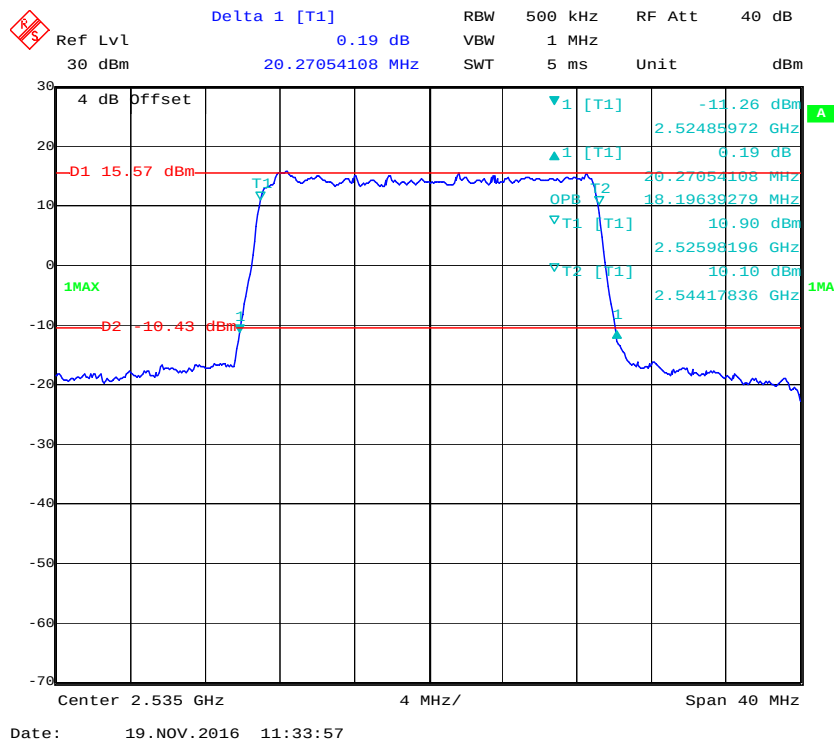


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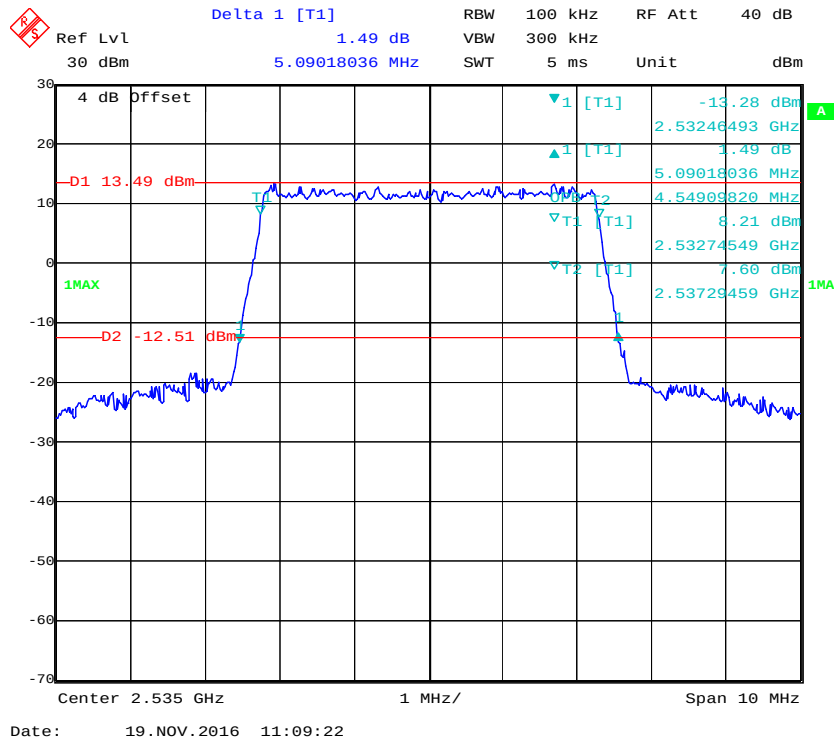
QPSK_15 MHz



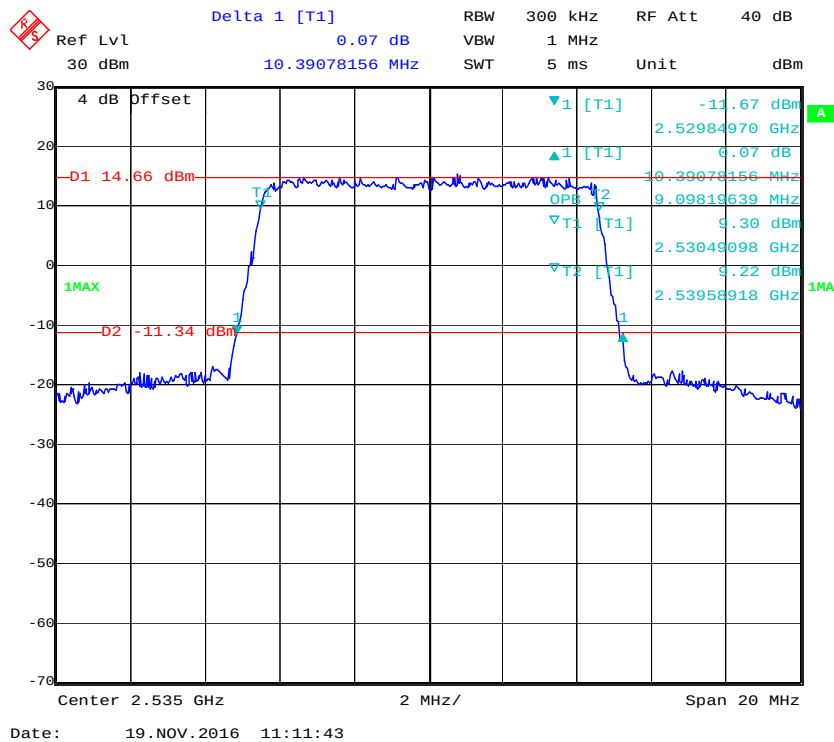
QPSK_20 MHz



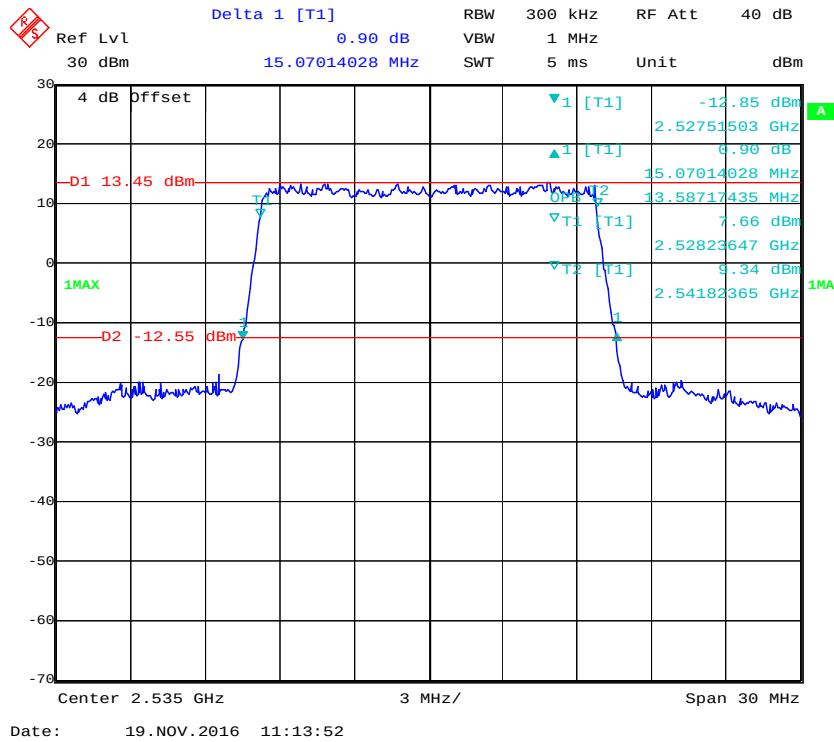
16QAM_5 MHz



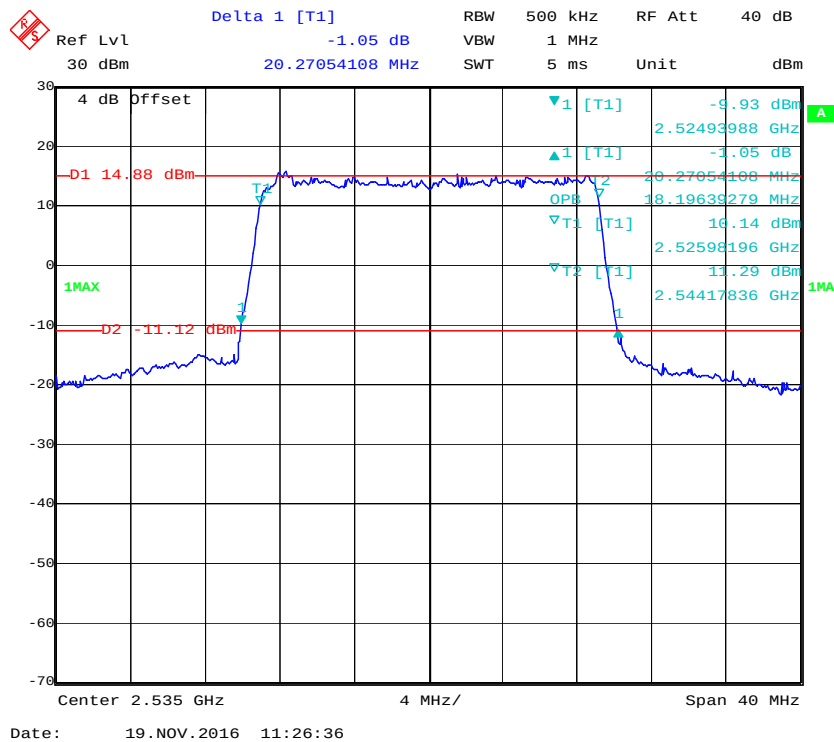
16QAM_10 MHz



16QAM_15 MHz

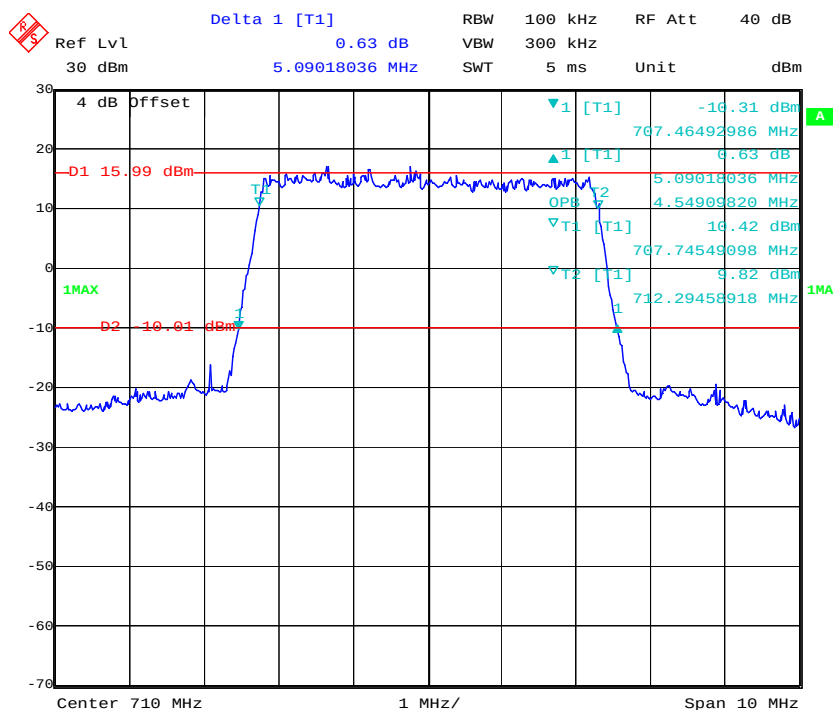


16QAM_20 MHz



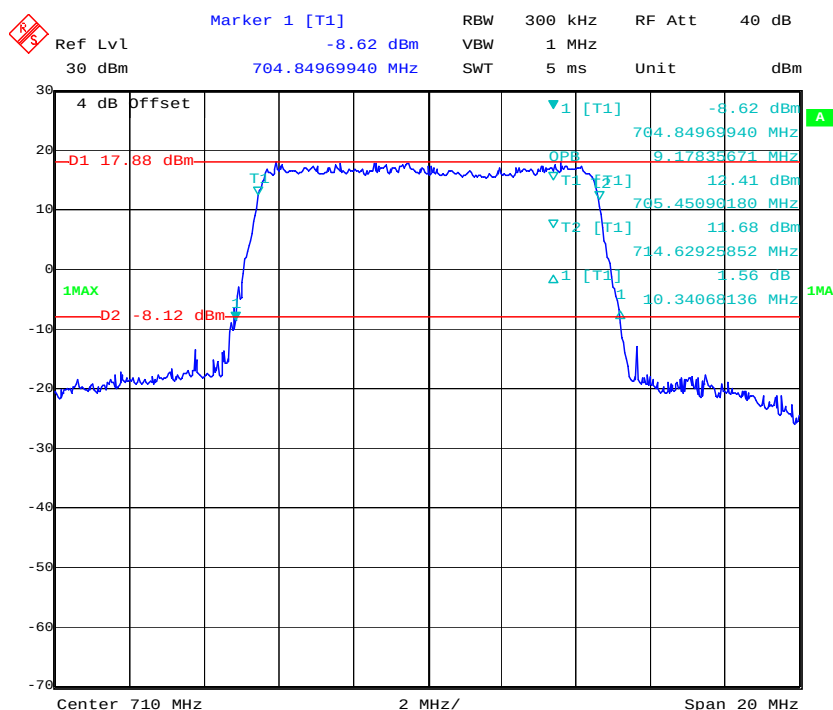
LTE Band 17:

QPSK_5 MHz



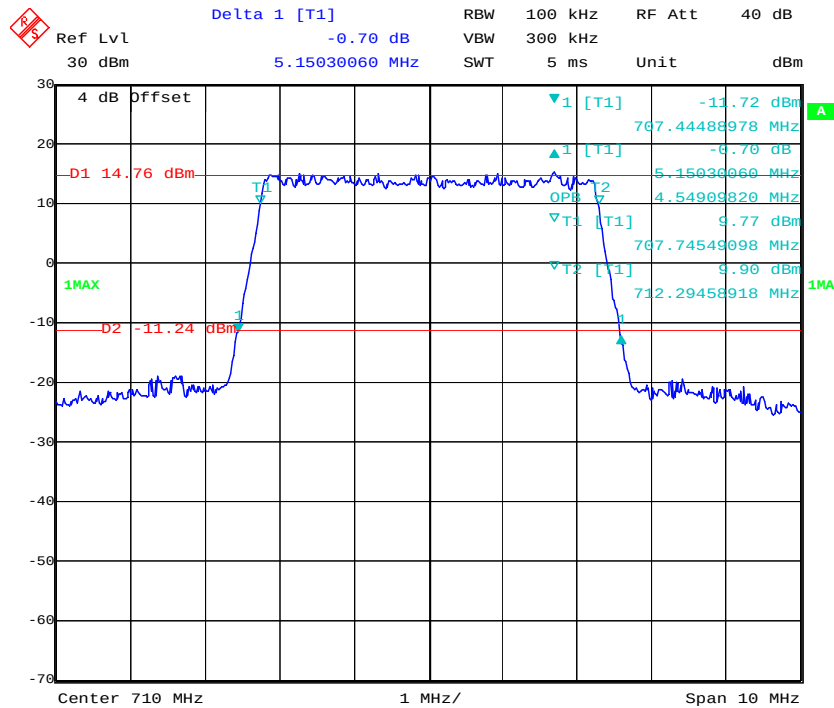
Date: 19.NOV.2016 11:35:57

QPSK_10 MHz

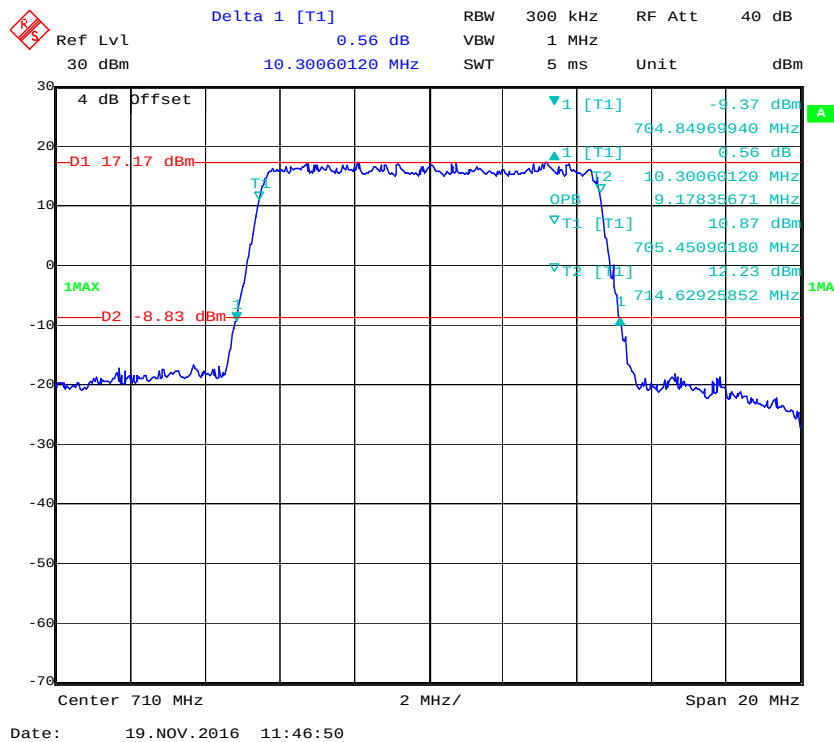


Date: 19.NOV.2016 11:47:59

16QAM_5 MHz



16QAM_10 MHz



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

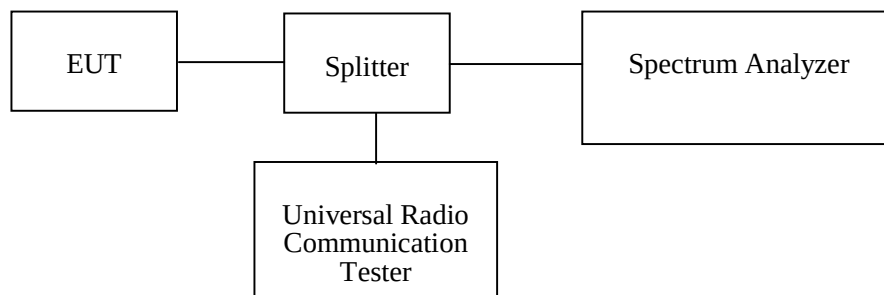
Applicable Standard

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	2016-09-21	2017-09-20
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2015-12-02	2016-12-01
N/A	RF Cable	N/A	N/A	Each Time	/
N/A	Two-way Splitter	N/A	OE0120121	Each Time	/

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

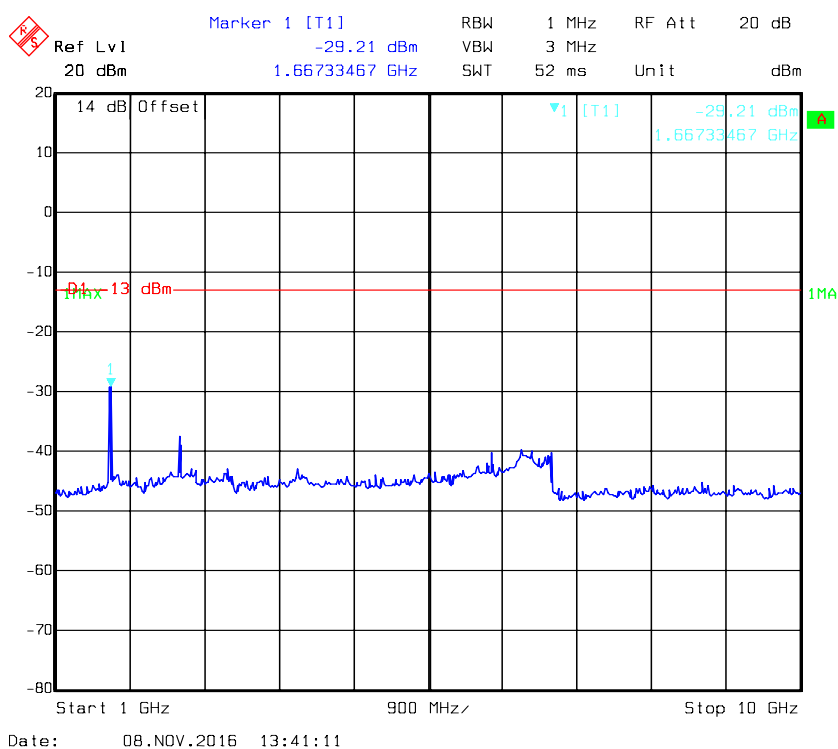
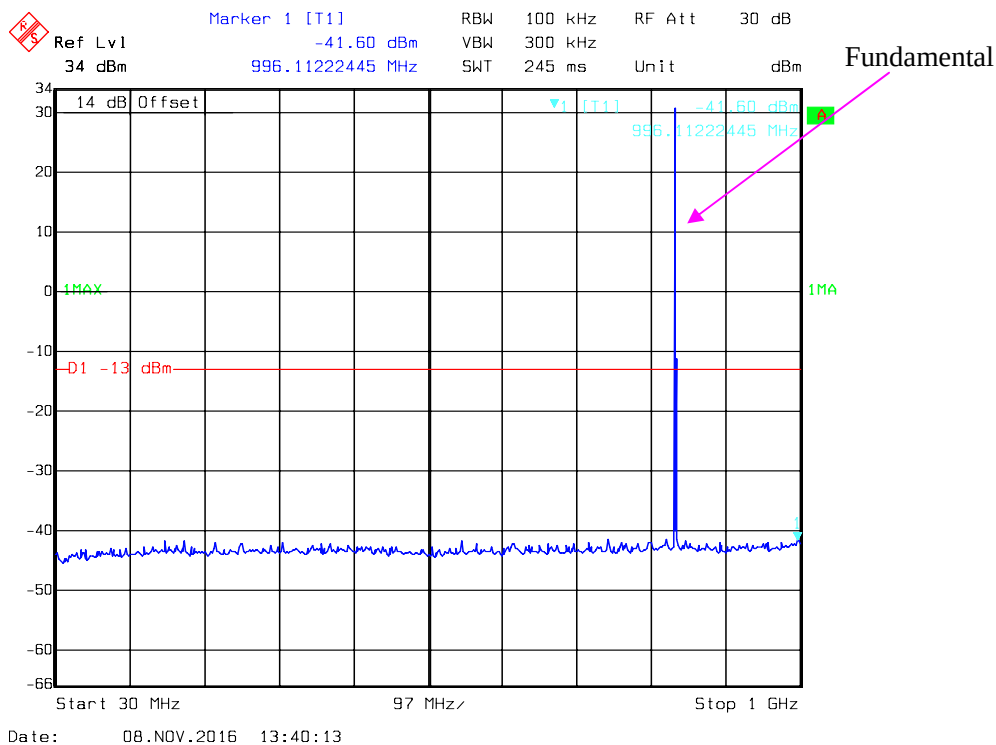
Environmental Conditions

Temperature:	26.7~29.8 °C
Relative Humidity:	31~39.5 %
ATM Pressure:	100.7~101.2 kPa

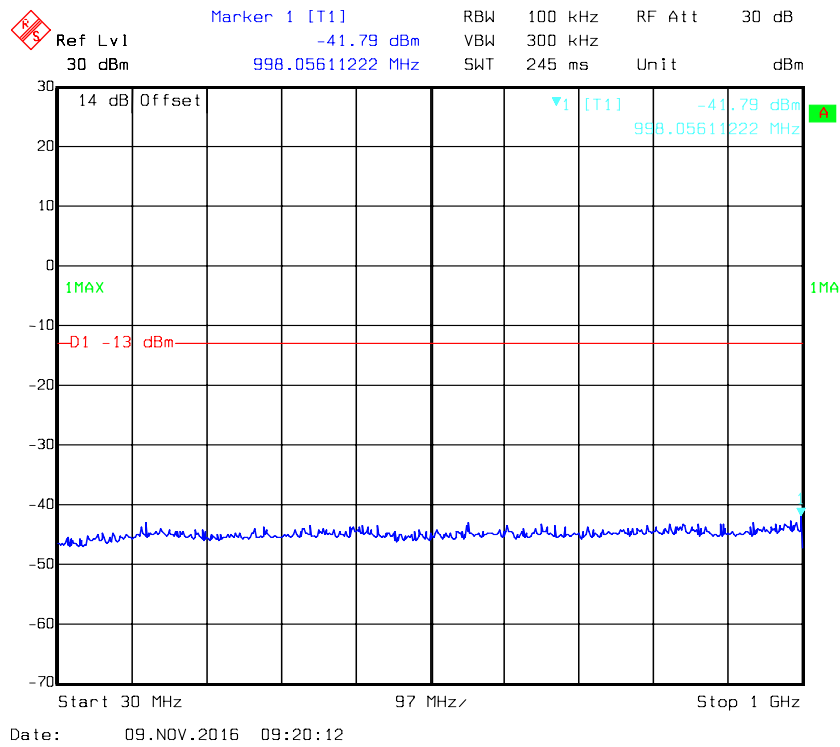
The testing was performed by Tom Tang from 2016-11-08 to 2016-11-19.

Please refer to the following plots.

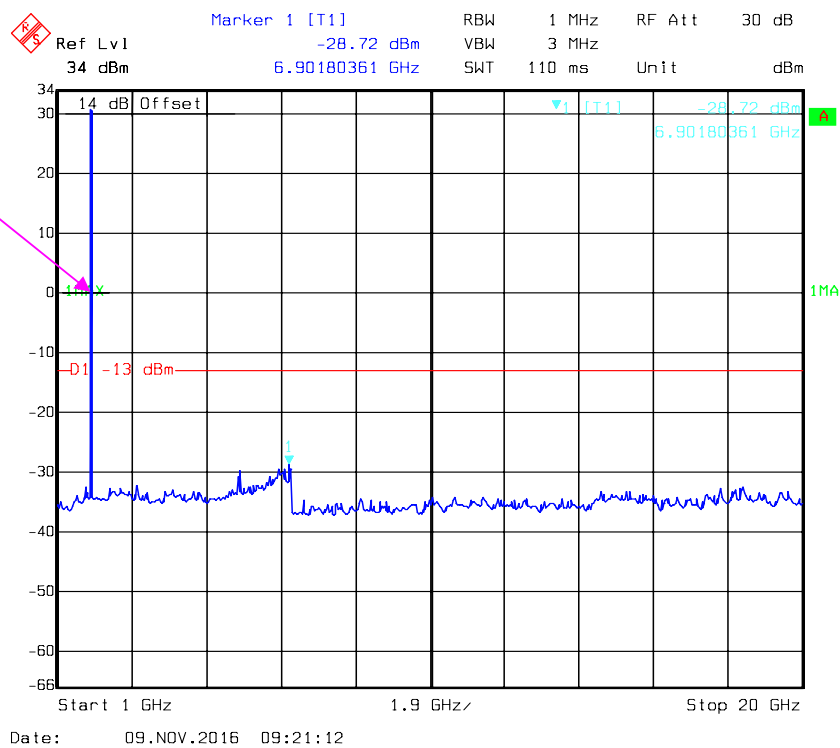
GSM850_Middle Channel



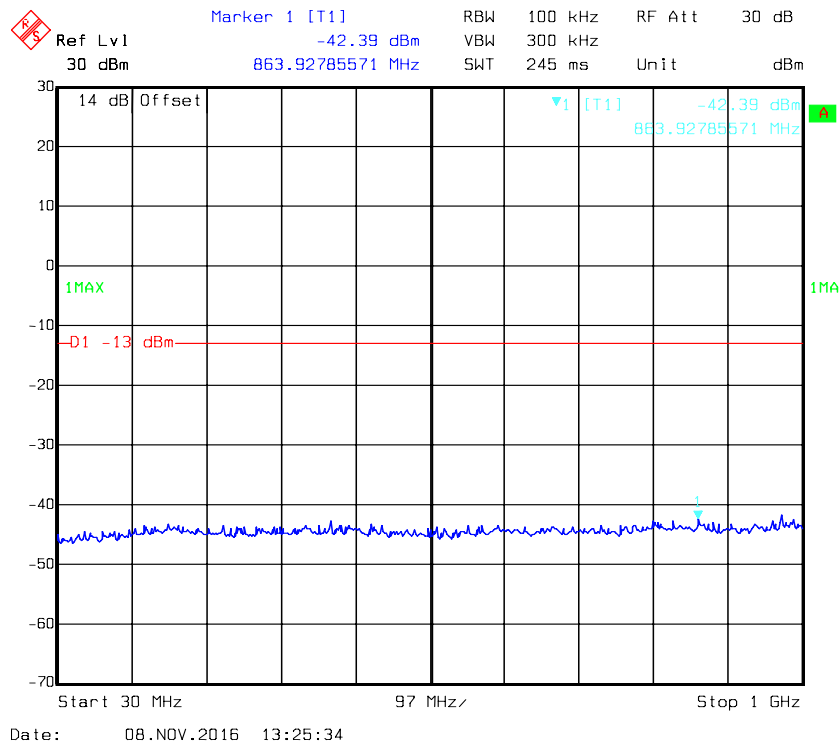
PCS 1900_ High Channel



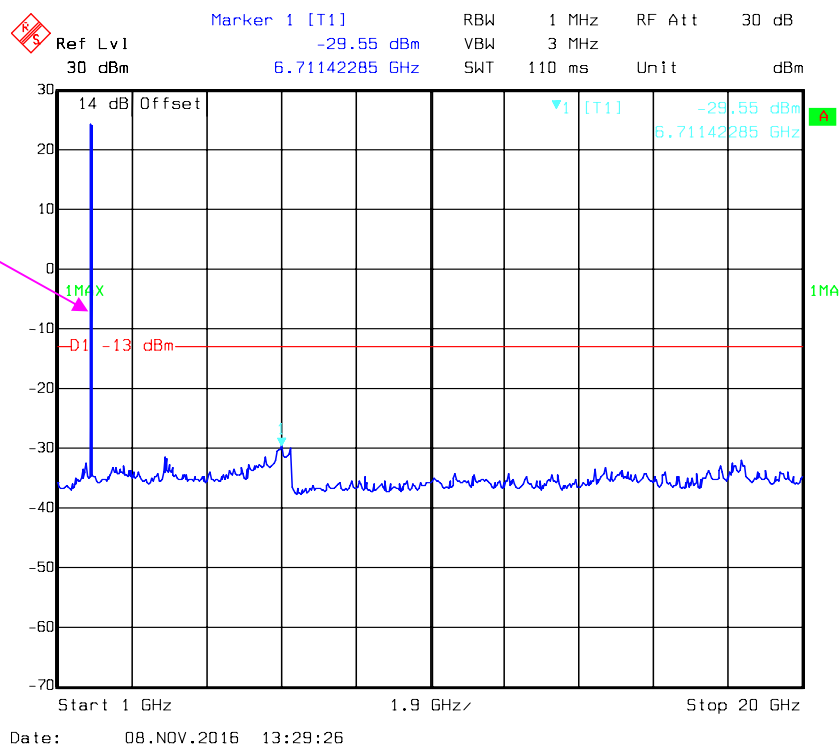
Fundamental



REL99 Band II_ Middle Channel

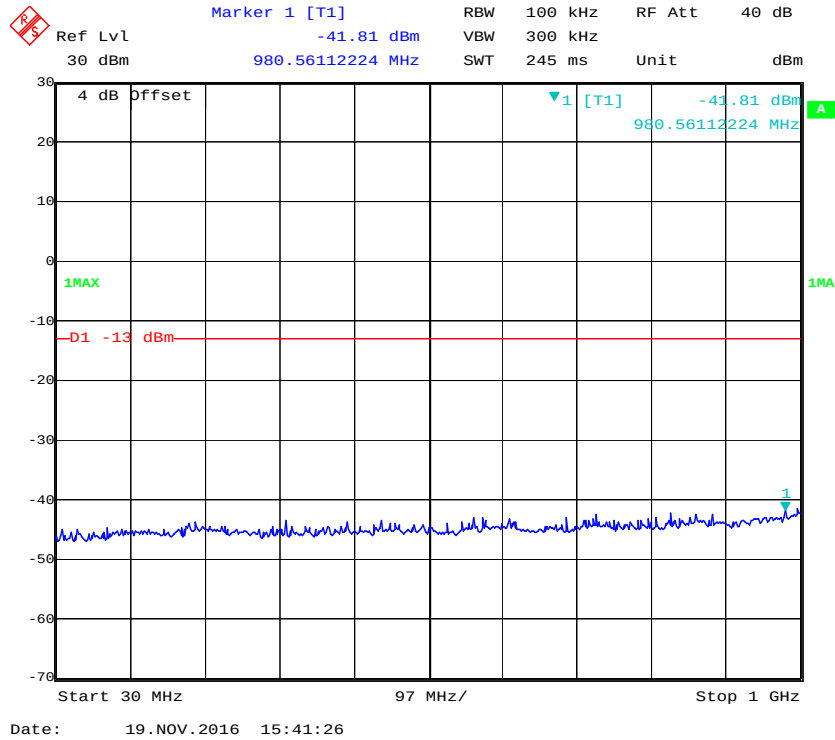


Fundamental

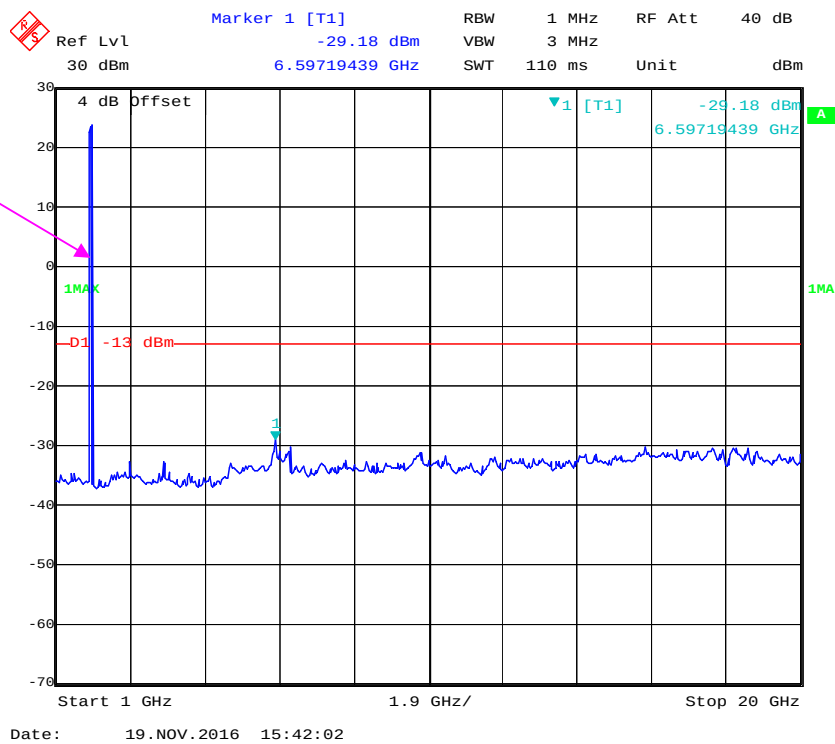


LTE Band II (Middle Channel)

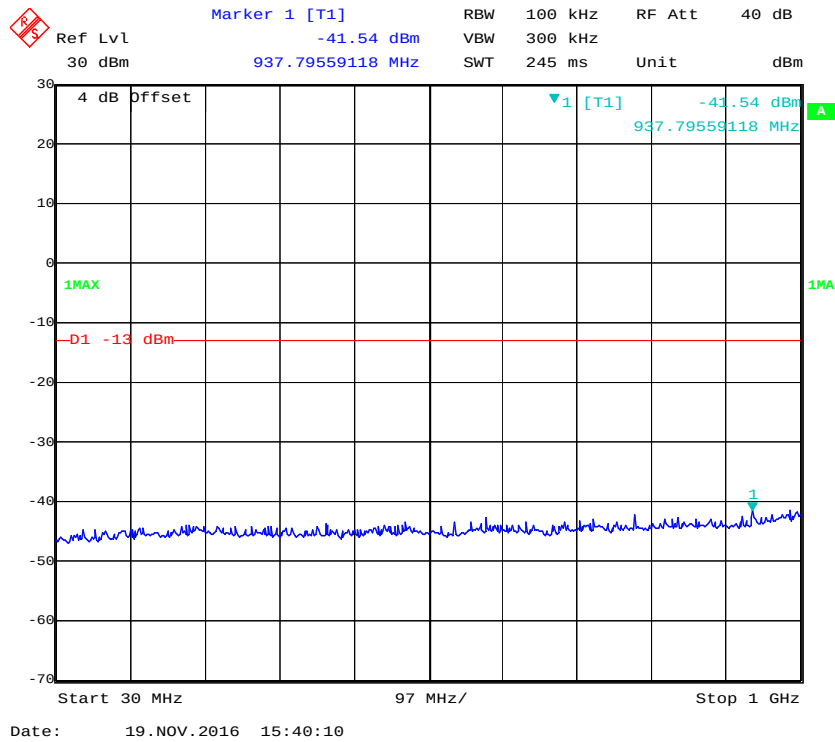
QPSK_1.4 MHz



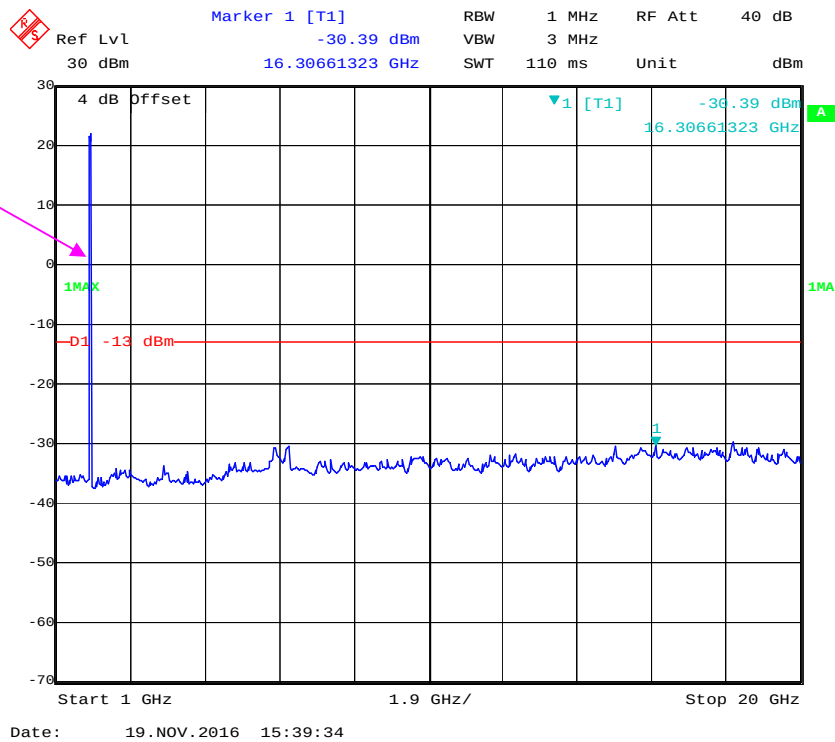
Fundamental



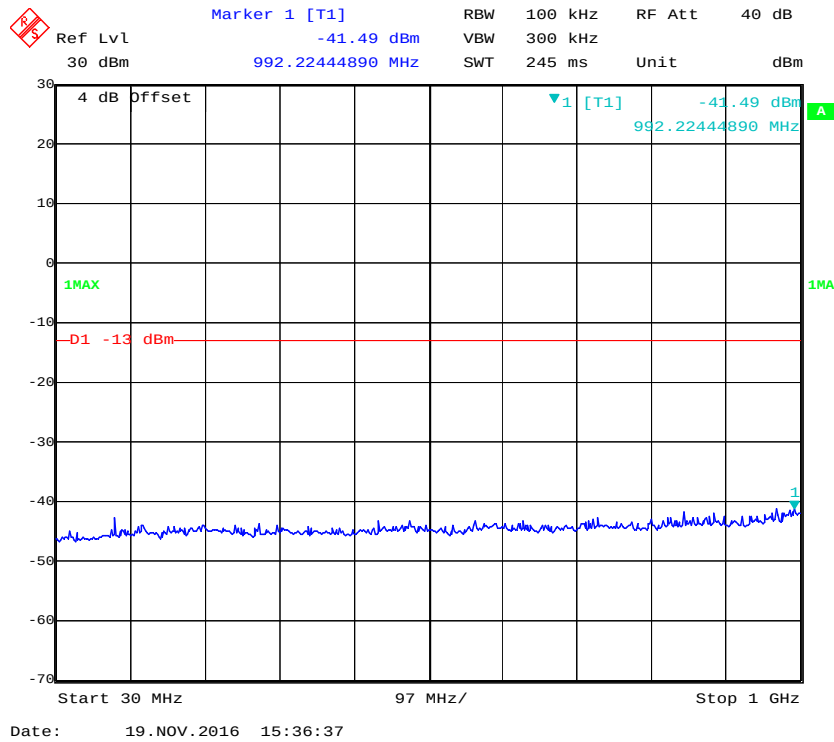
QPSK_3 MHz



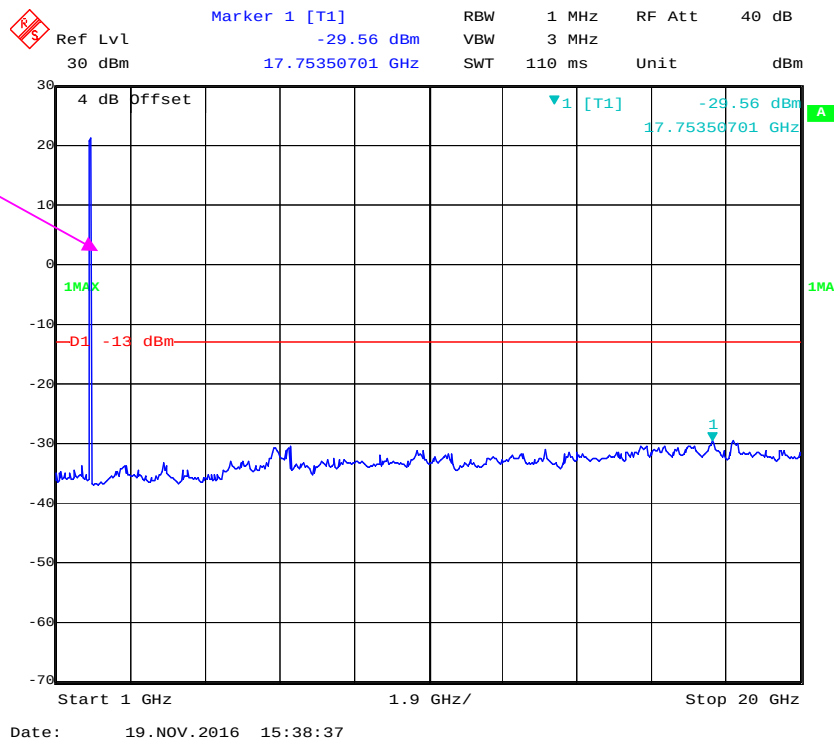
Fundamental



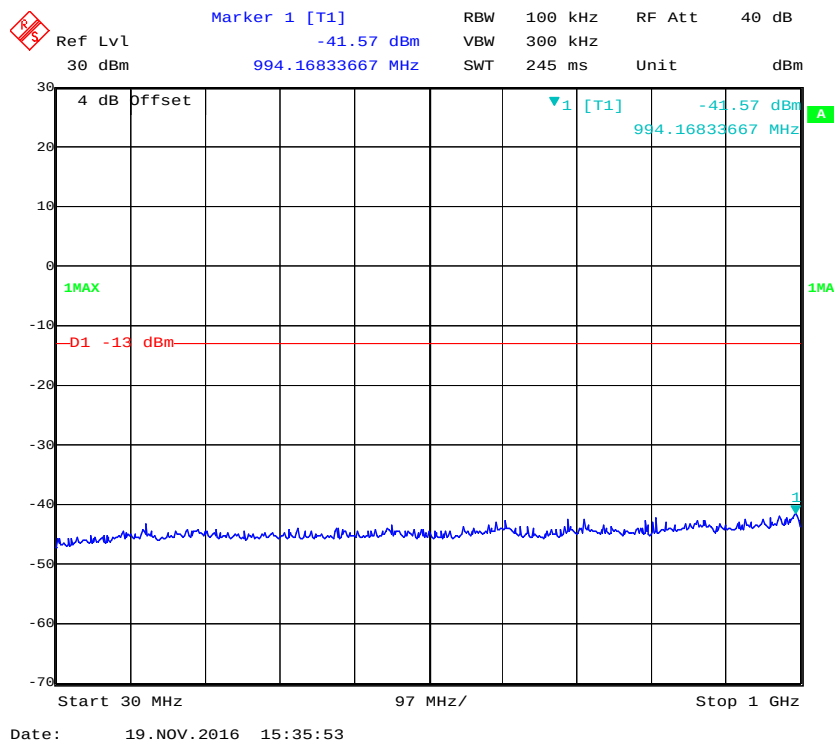
QPSK_5 MHz



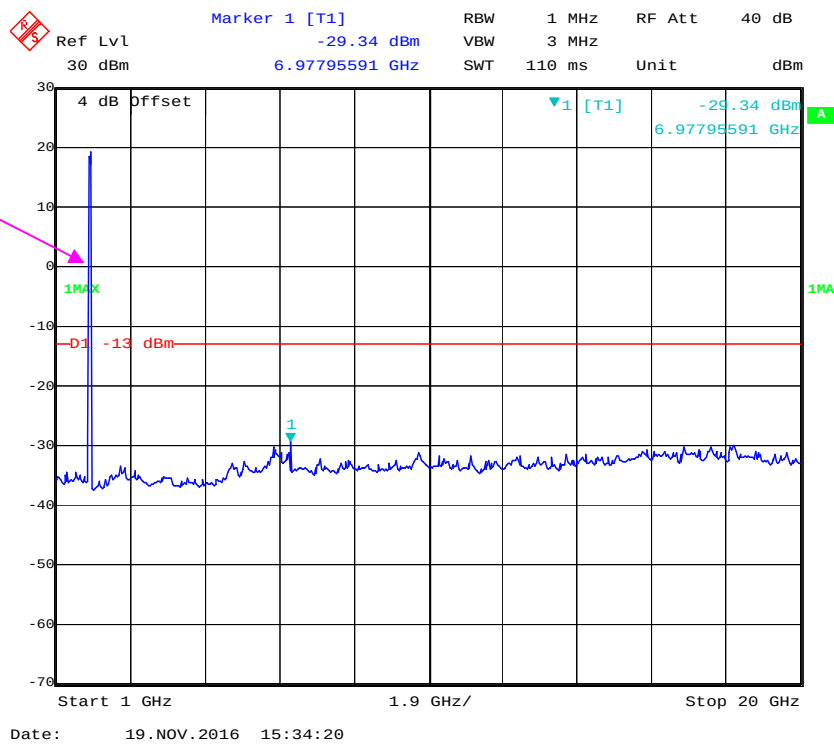
Fundamental



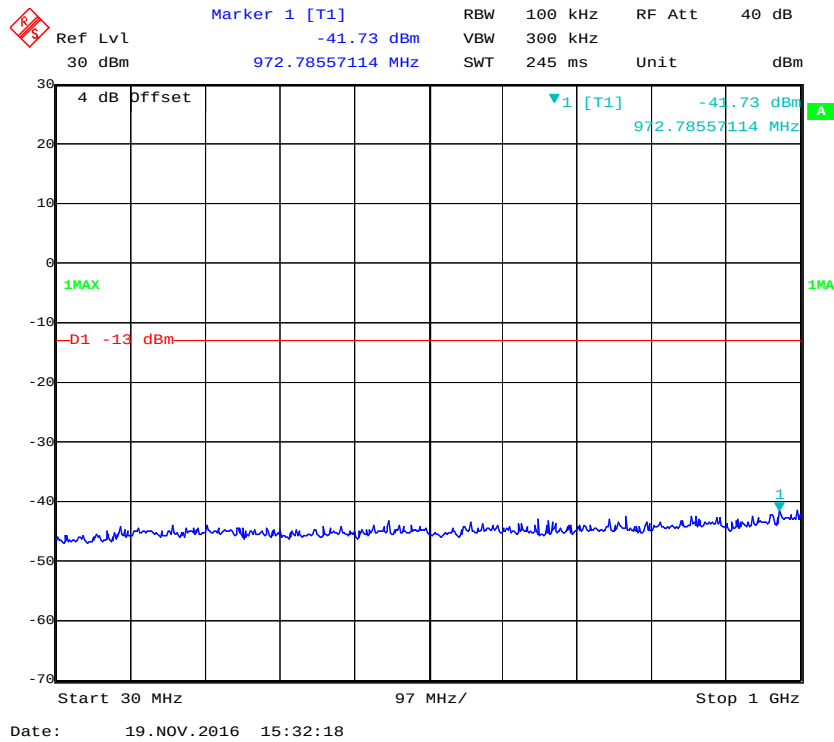
QPSK_10 MHz



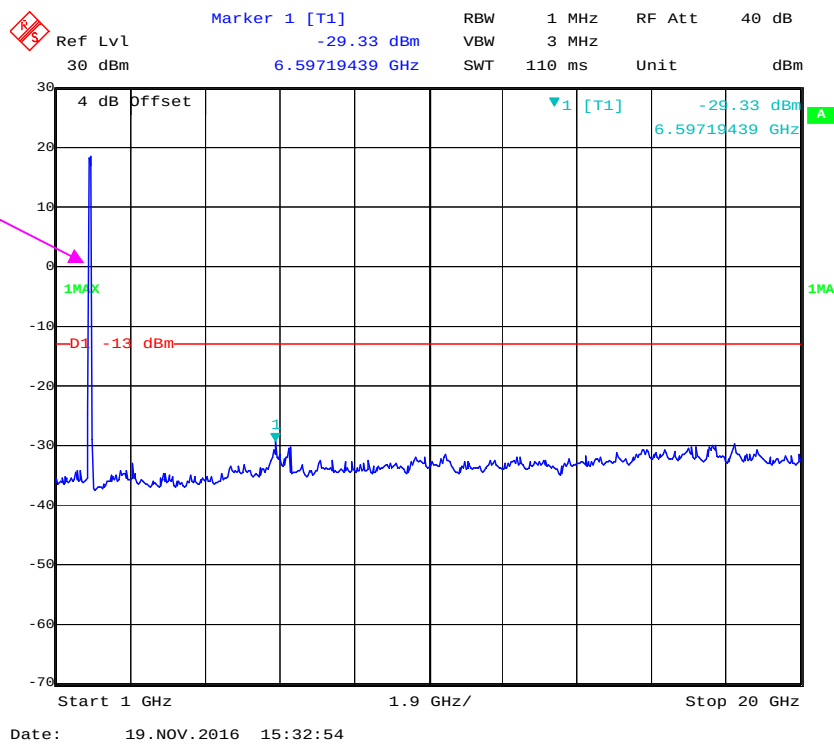
Fundamental



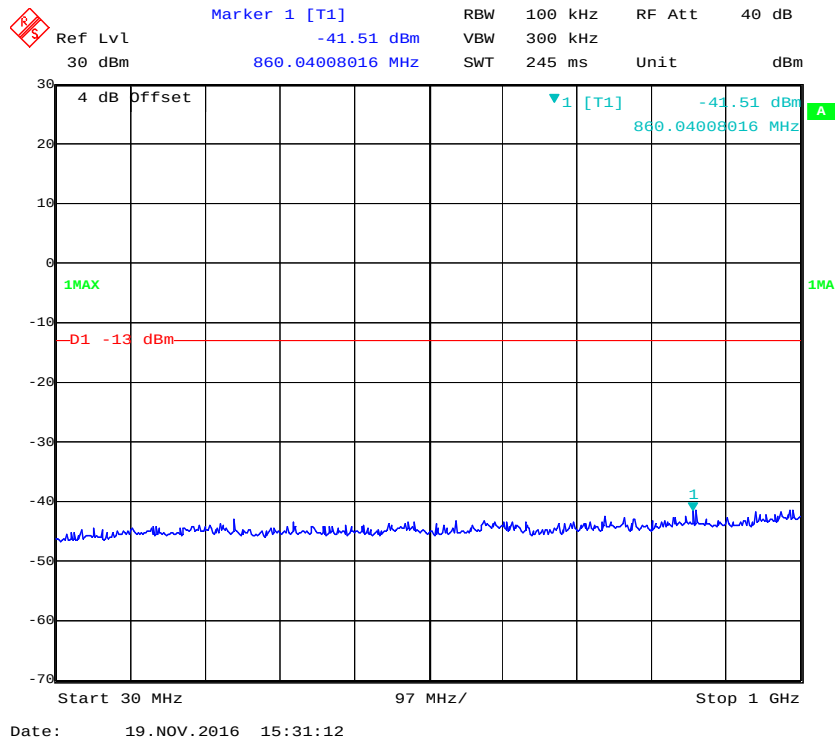
QPSK_15 MHz



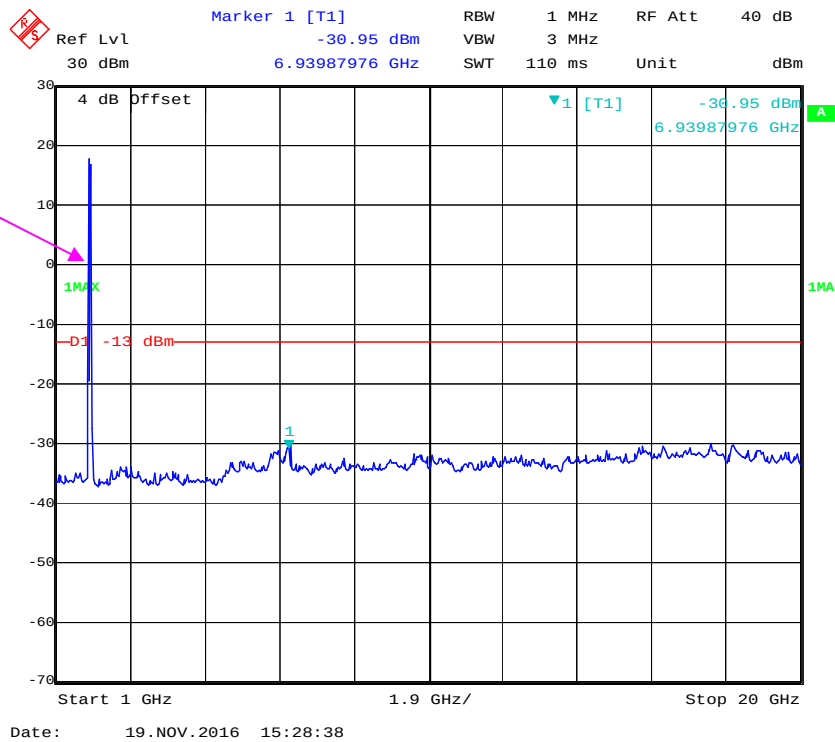
Fundamental

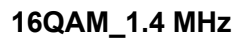


QPSK_20 MHz

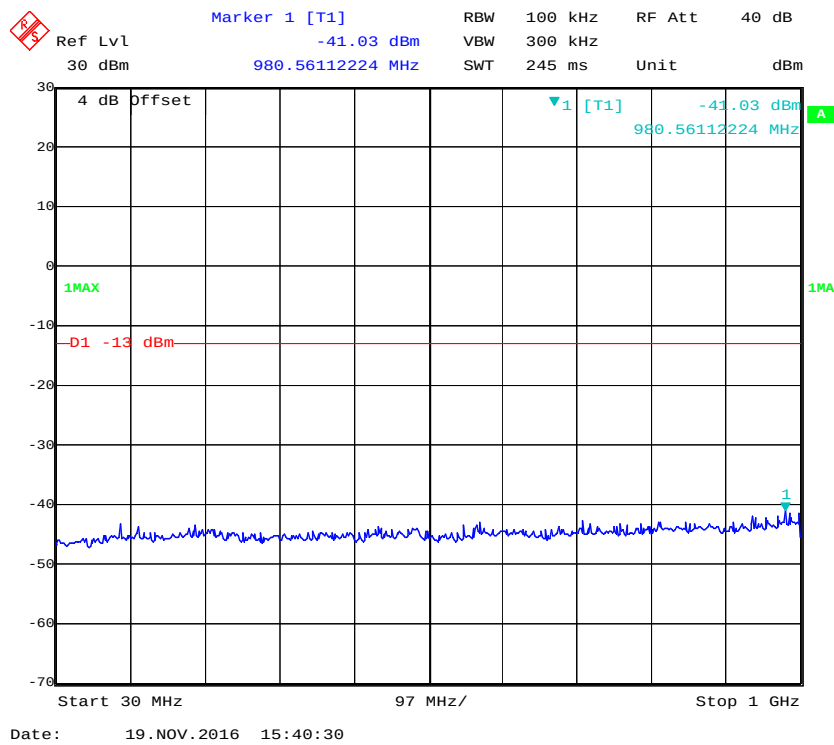


Fundamental

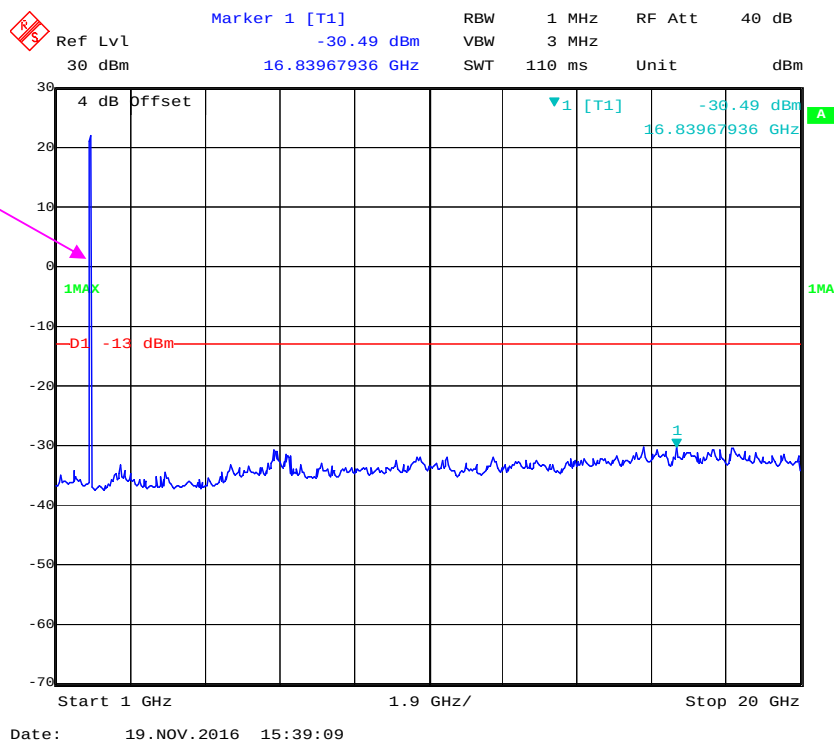




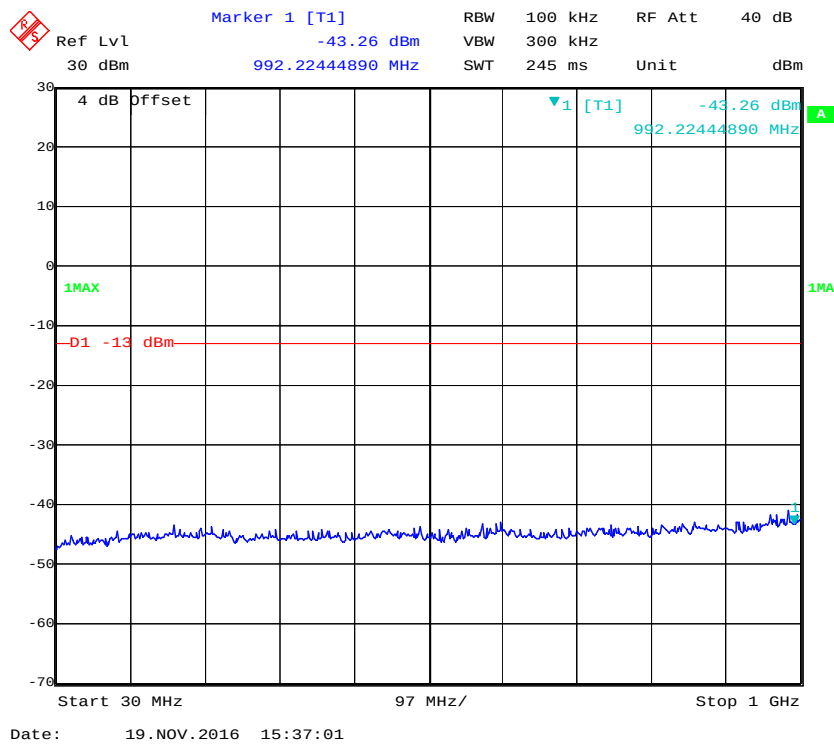
16QAM_3 MHz



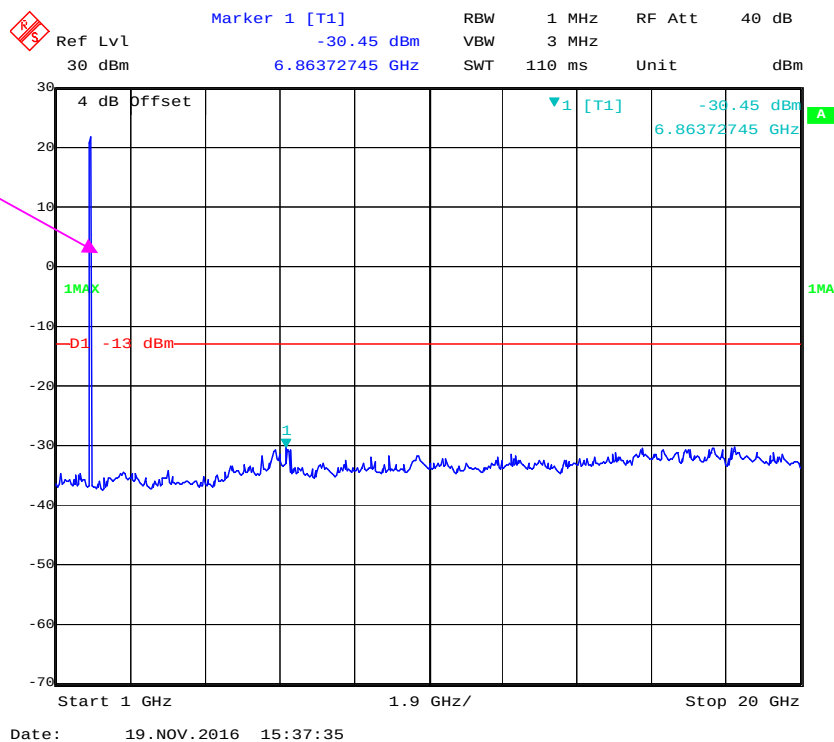
Fundamental



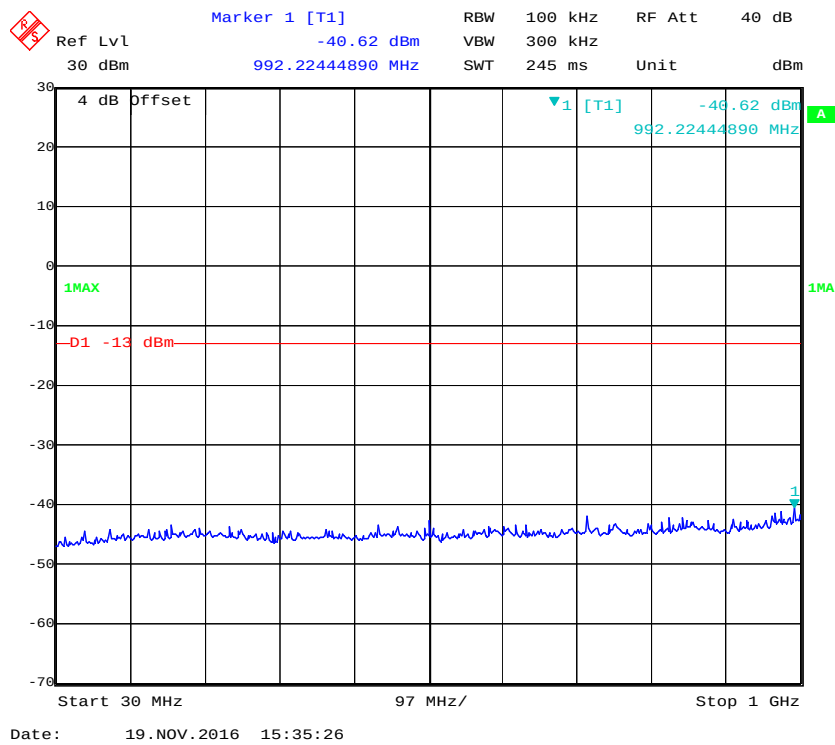
16QAM_5 MHz



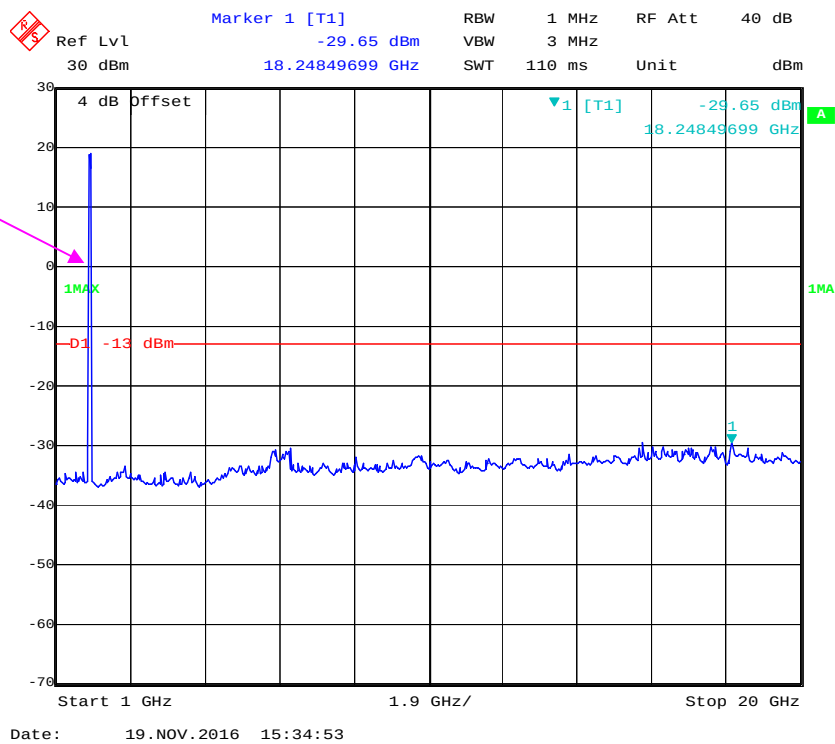
Fundamental



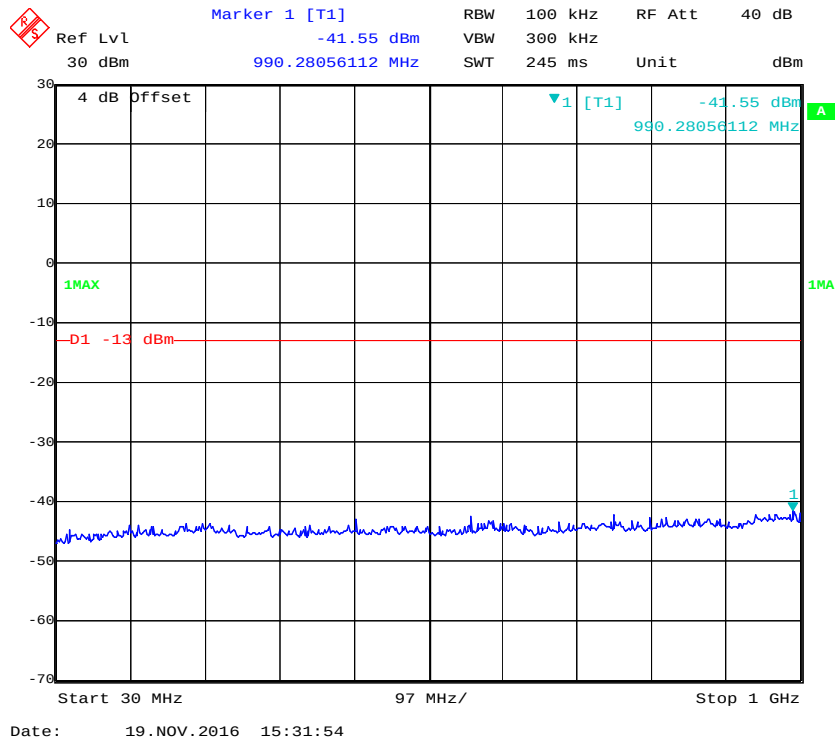
16QAM_10 MHz



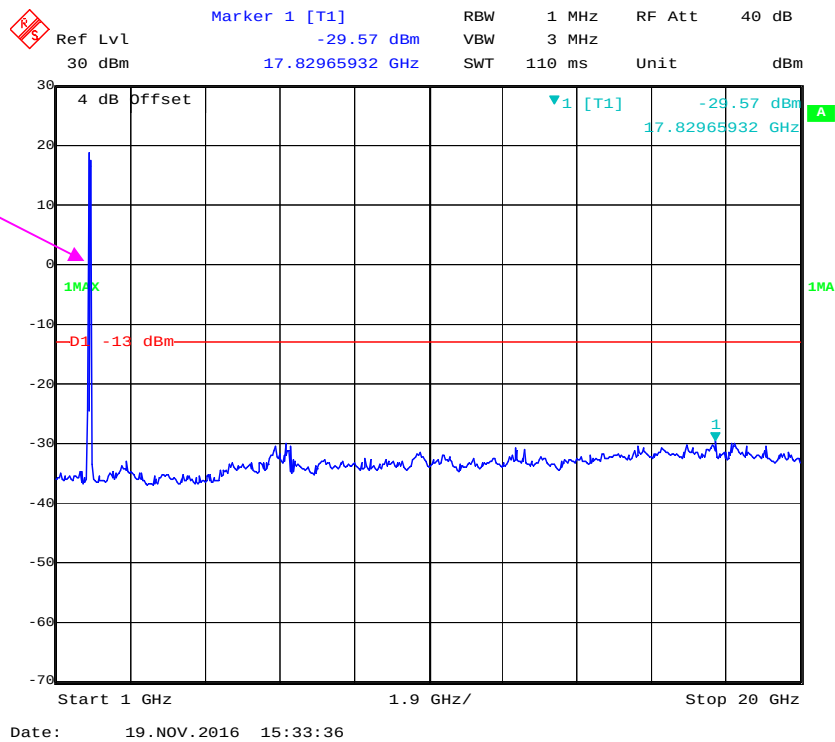
Fundamental



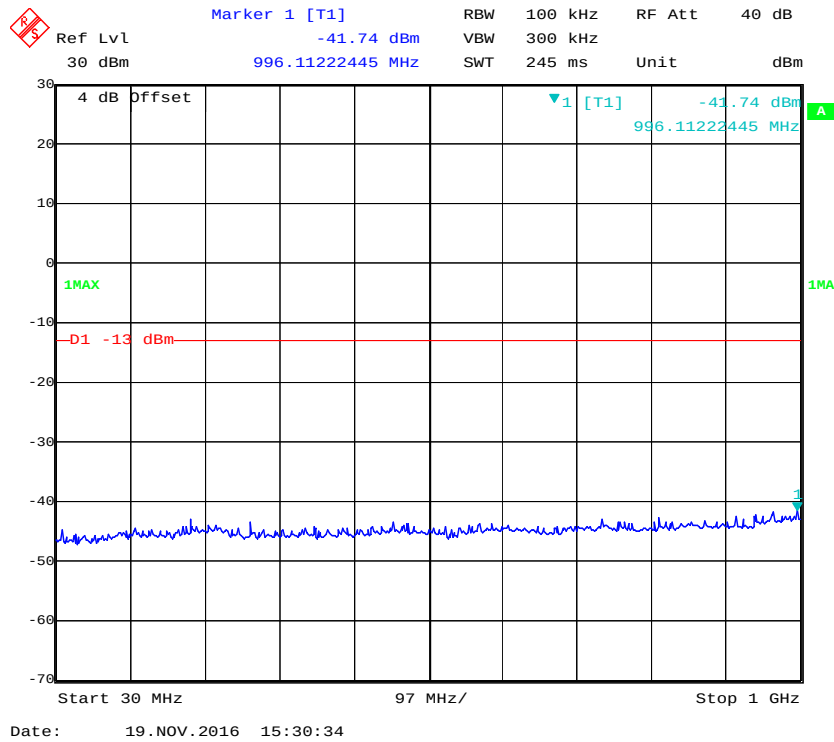
16QAM_15 MHz



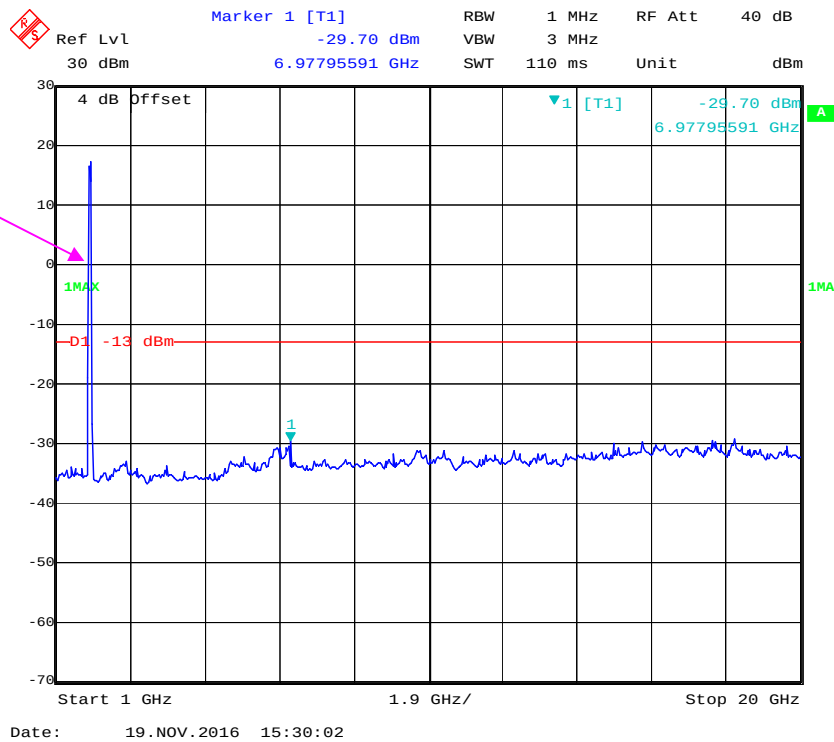
Fundamental



16QAM_20 MHz

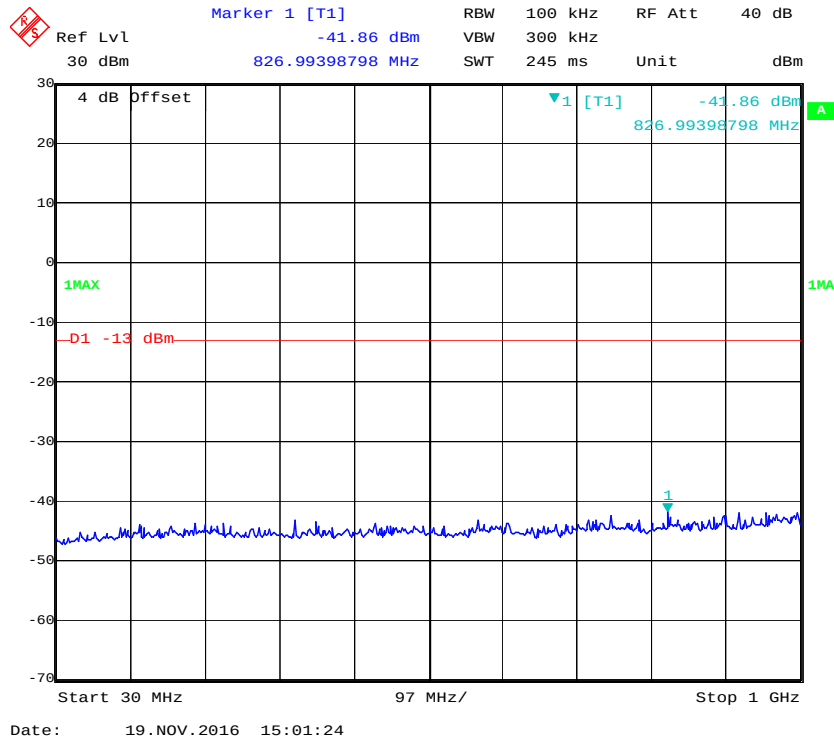


Fundamental

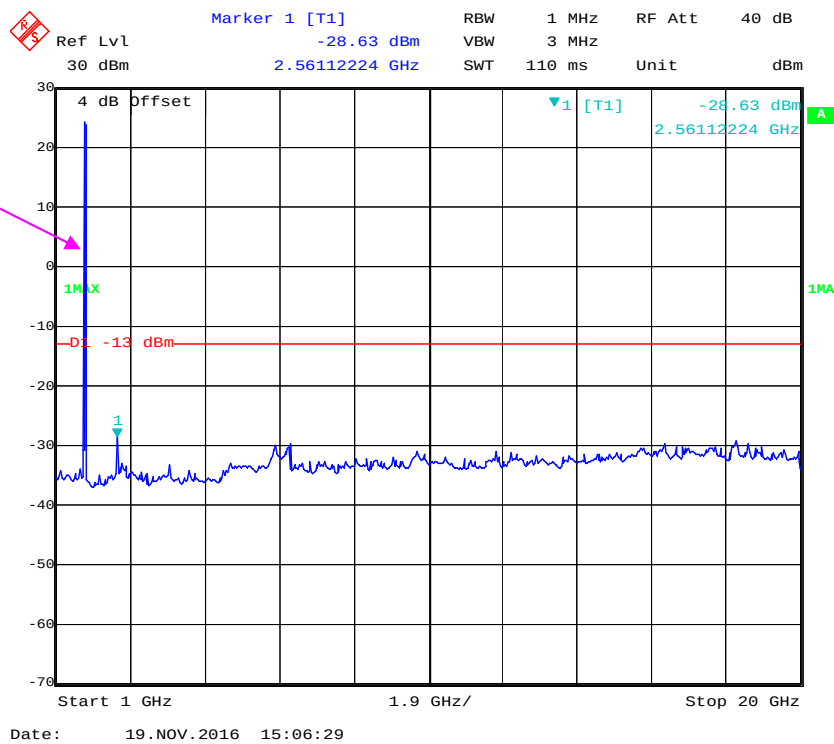


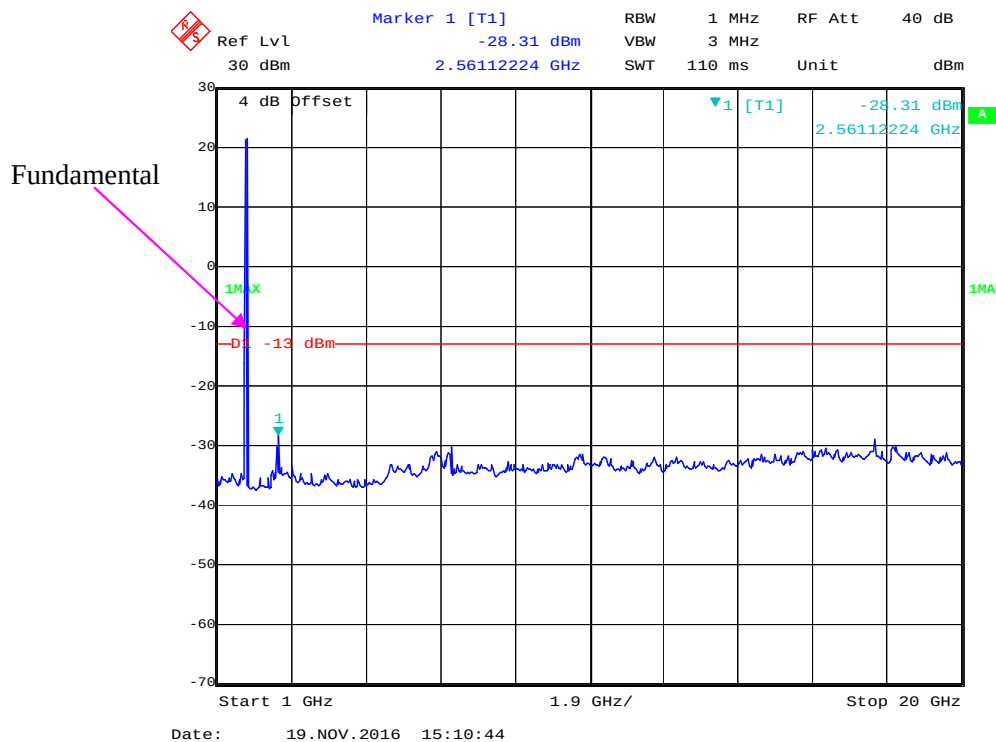
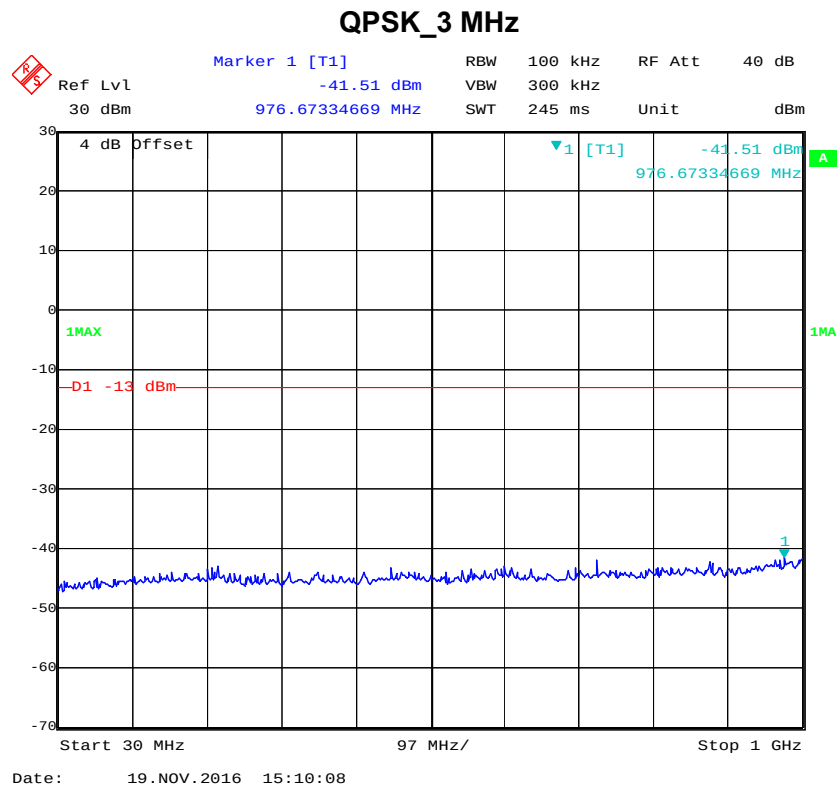
LTE Band IV (Middle Channel)

QPSK_1.4 MHz

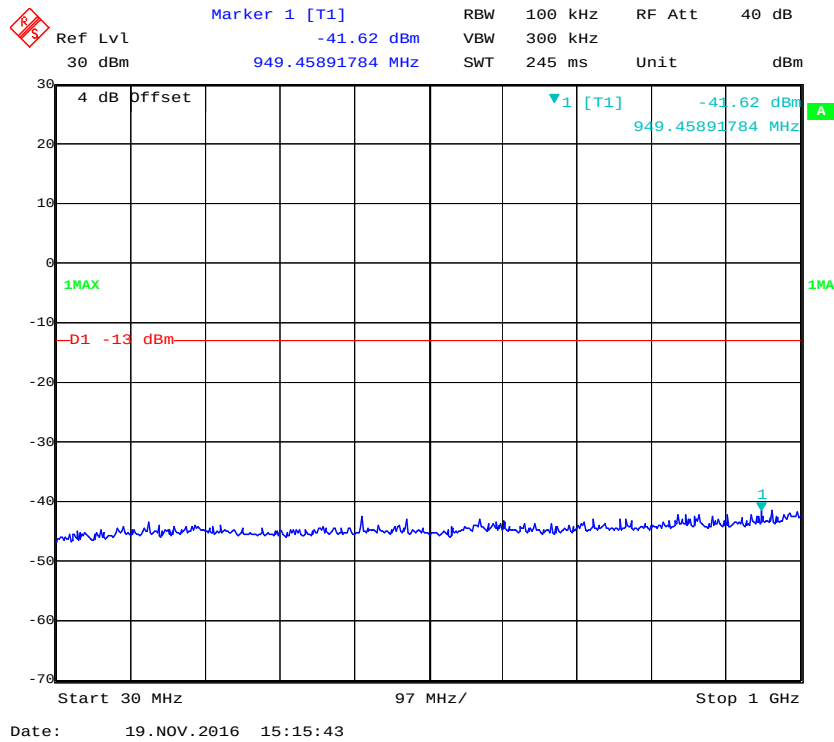


Fundamental

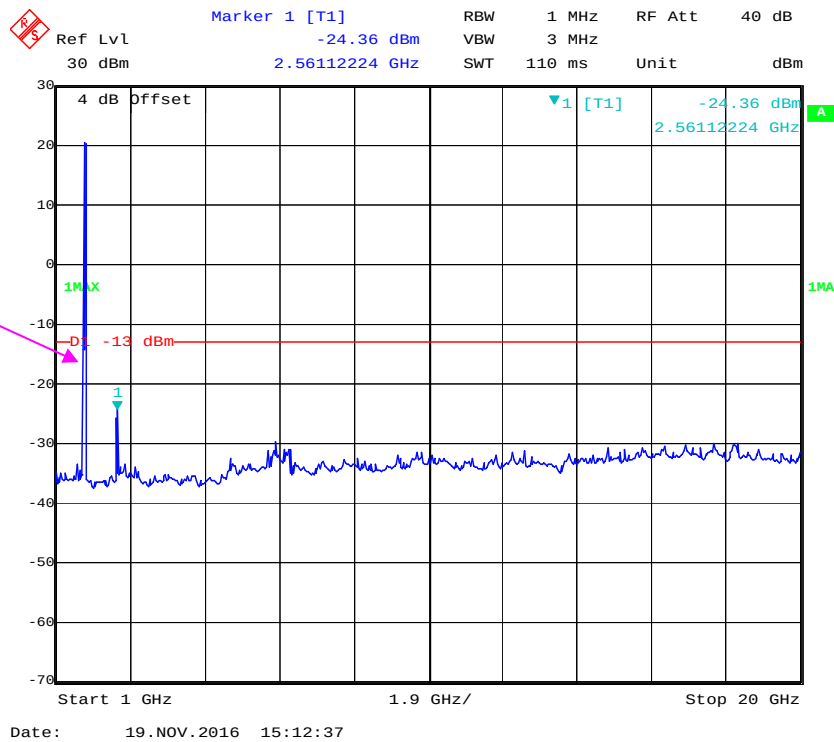




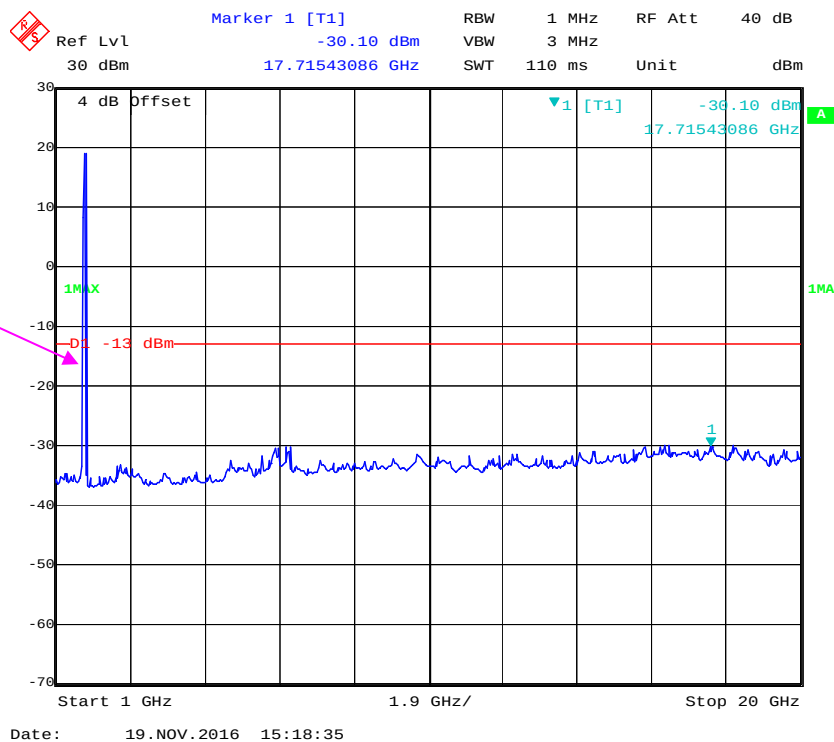
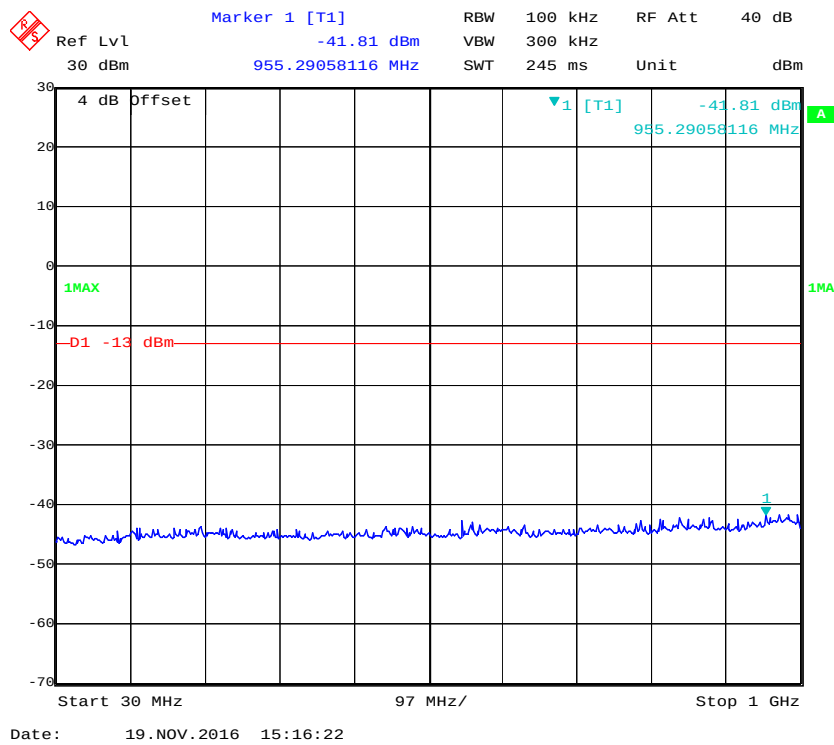
QPSK_5 MHz



Fundamental

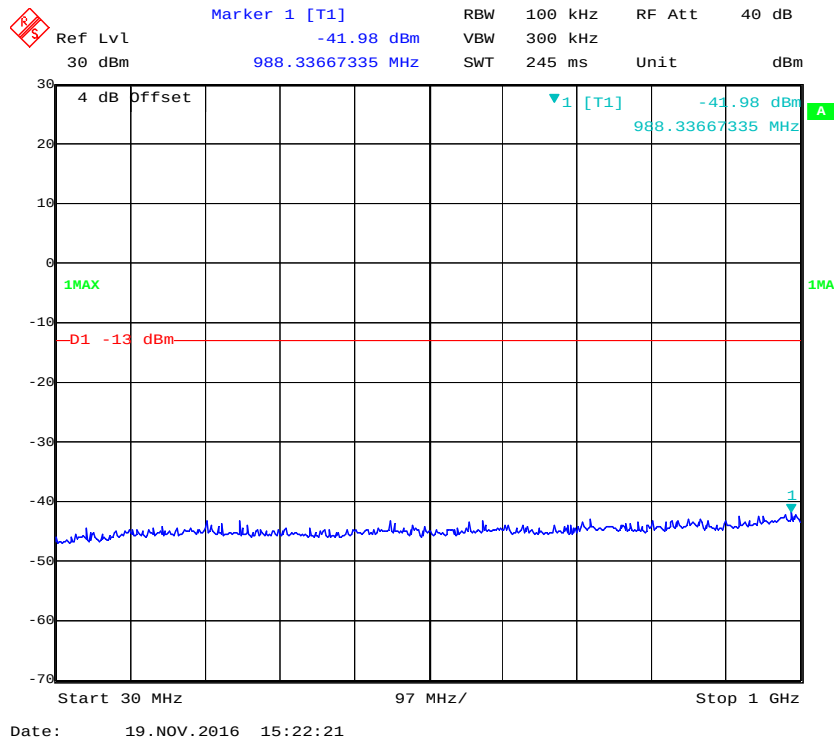


QPSK_10 MHz

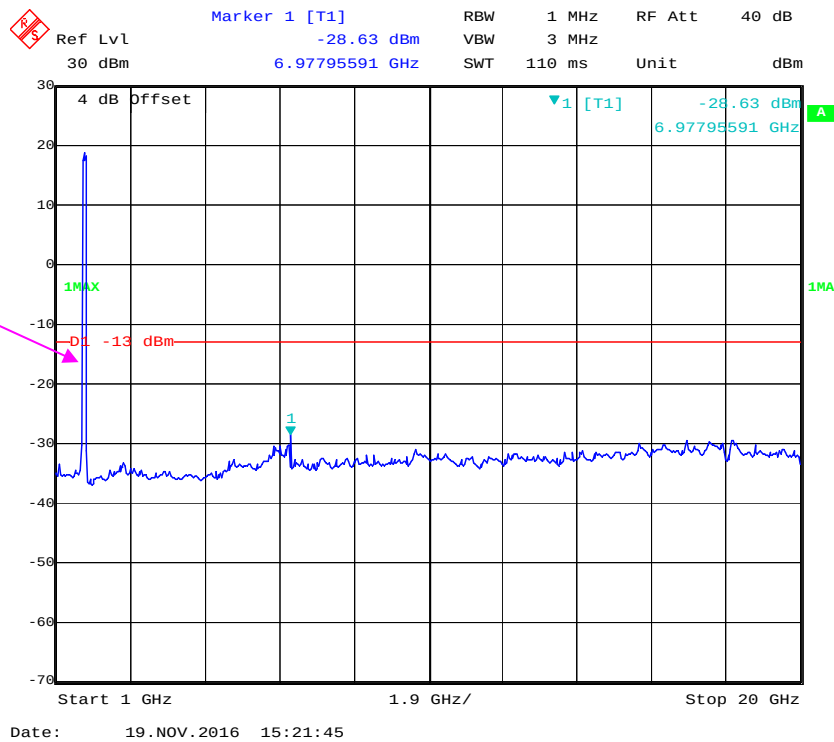


Fundamental

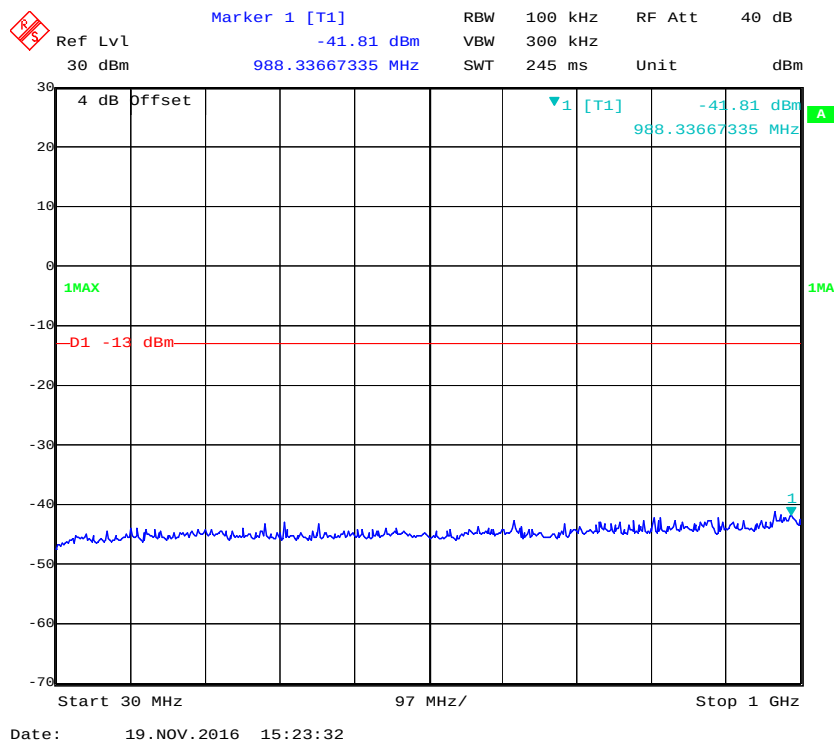
QPSK_15 MHz



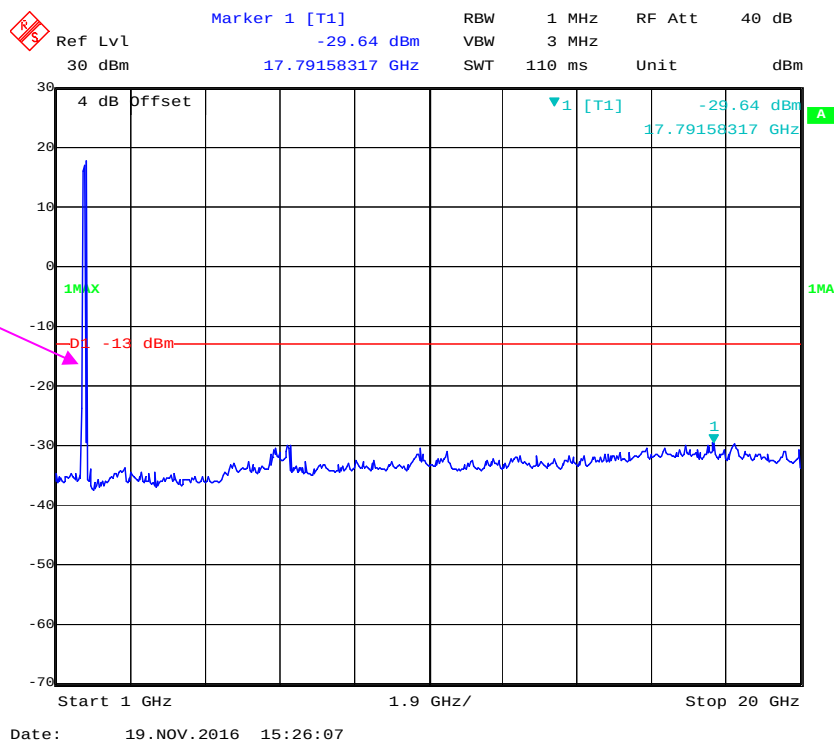
Fundamental



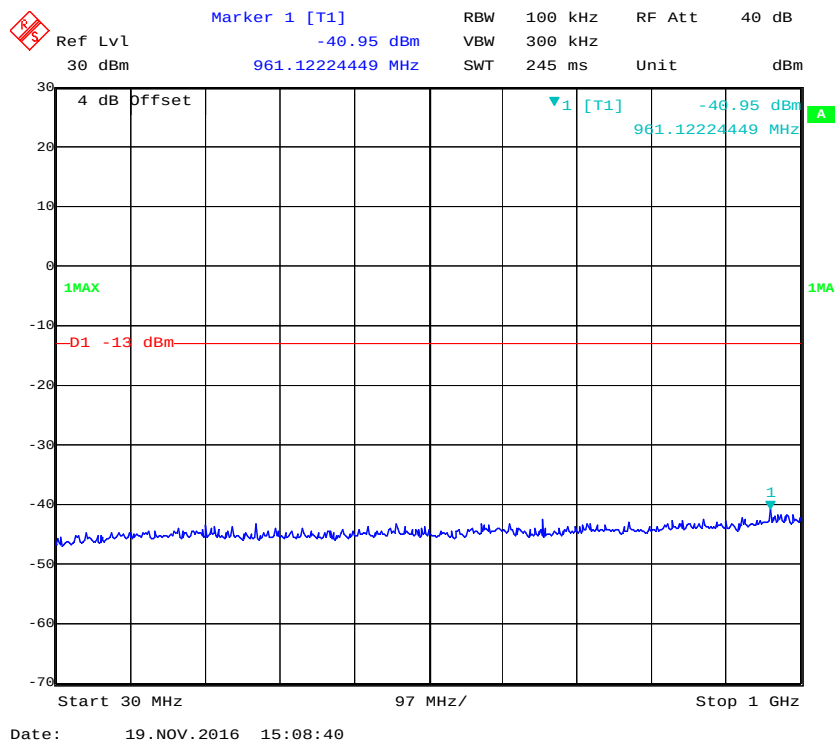
QPSK_20 MHz



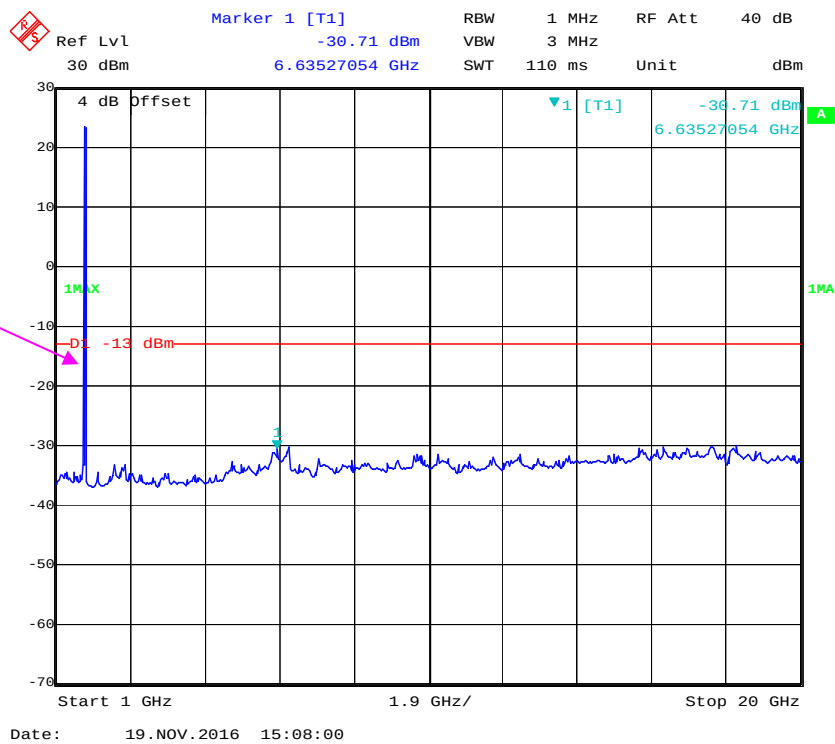
Fundamental



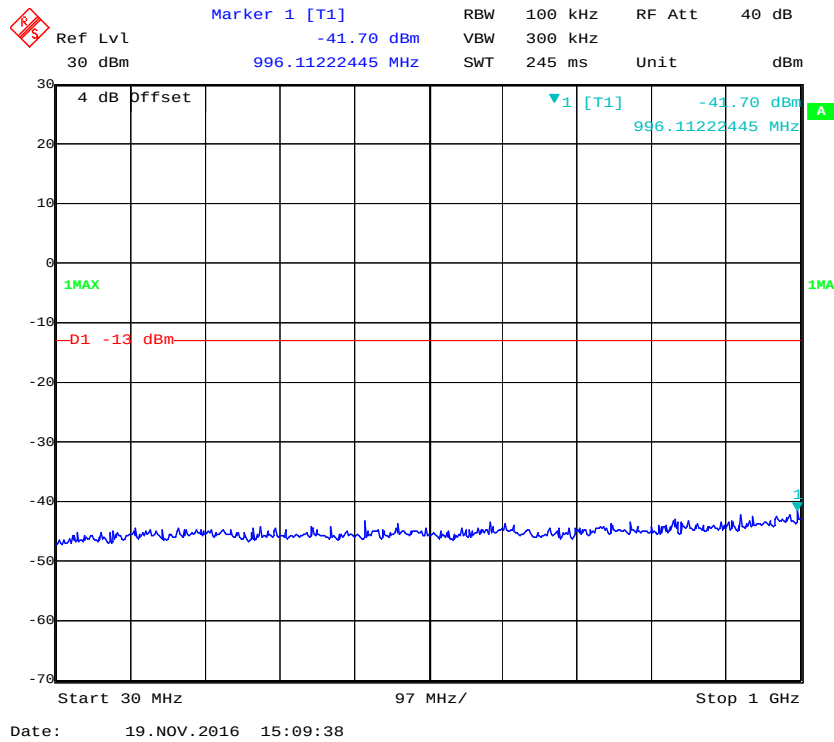
16QAM_1.4 MHz



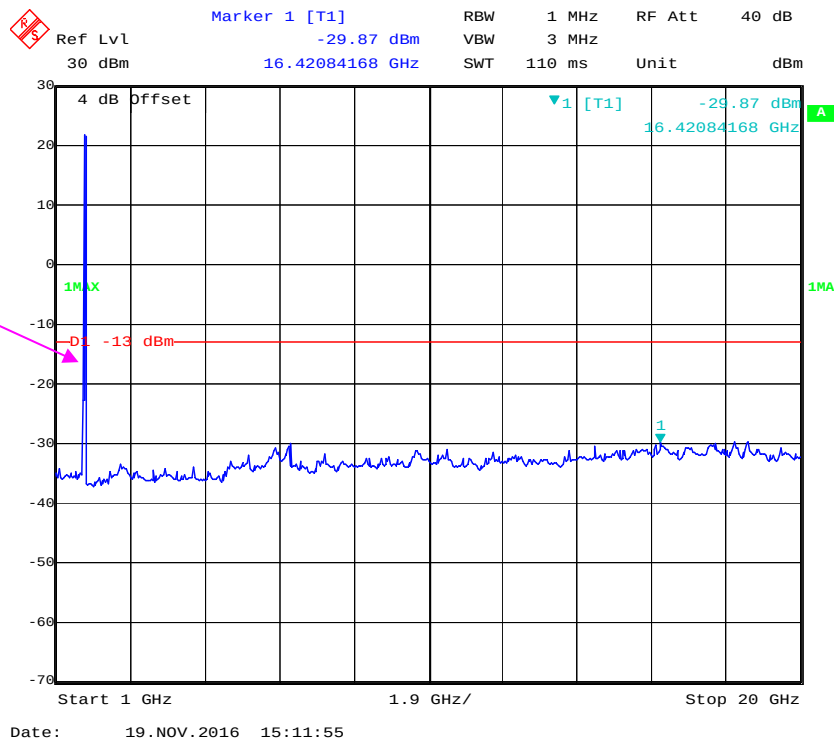
Fundamental



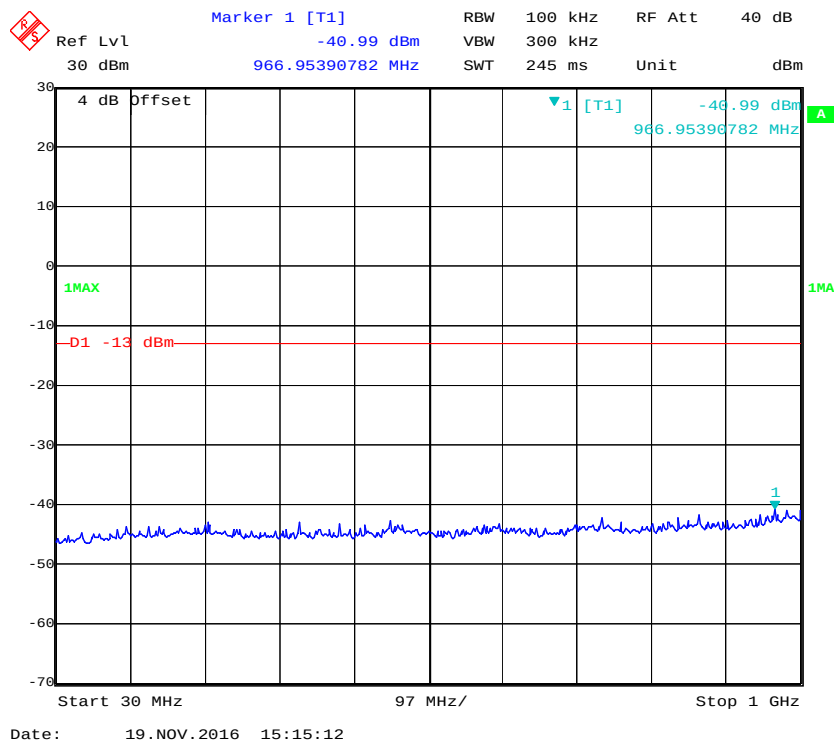
16QAM_3 MHz



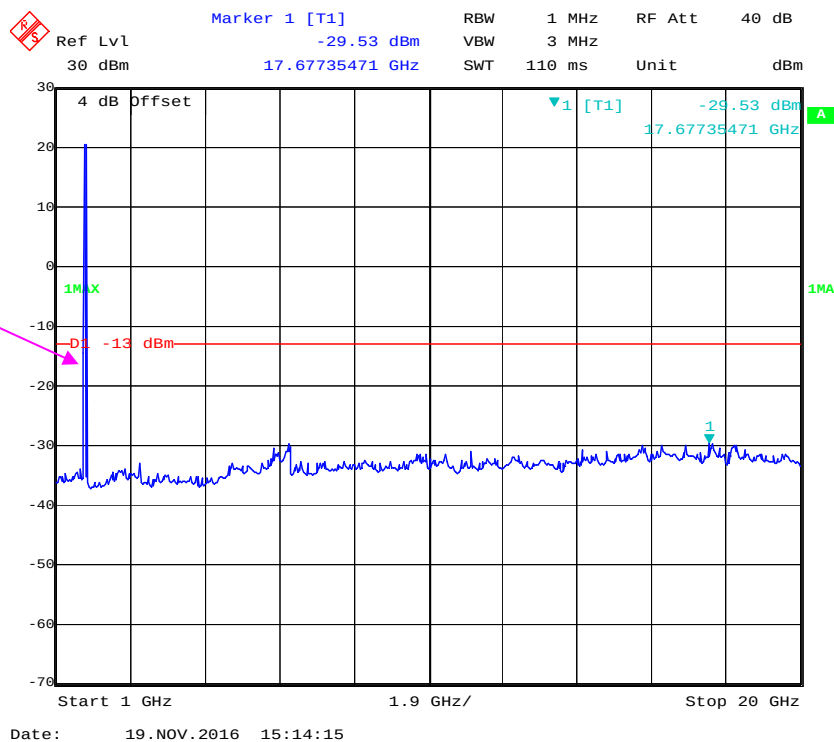
Fundamental



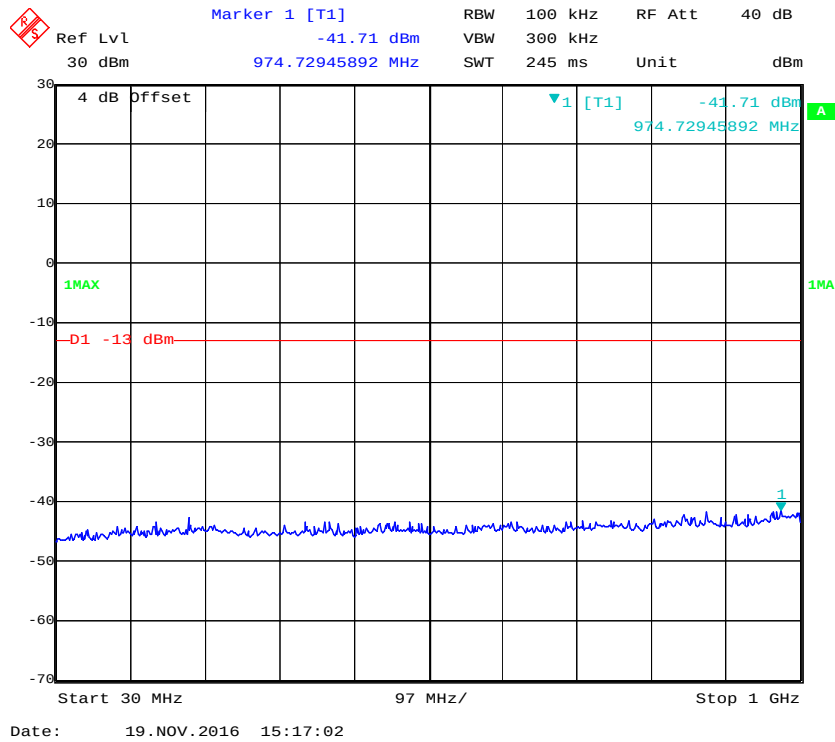
16QAM_5 MHz



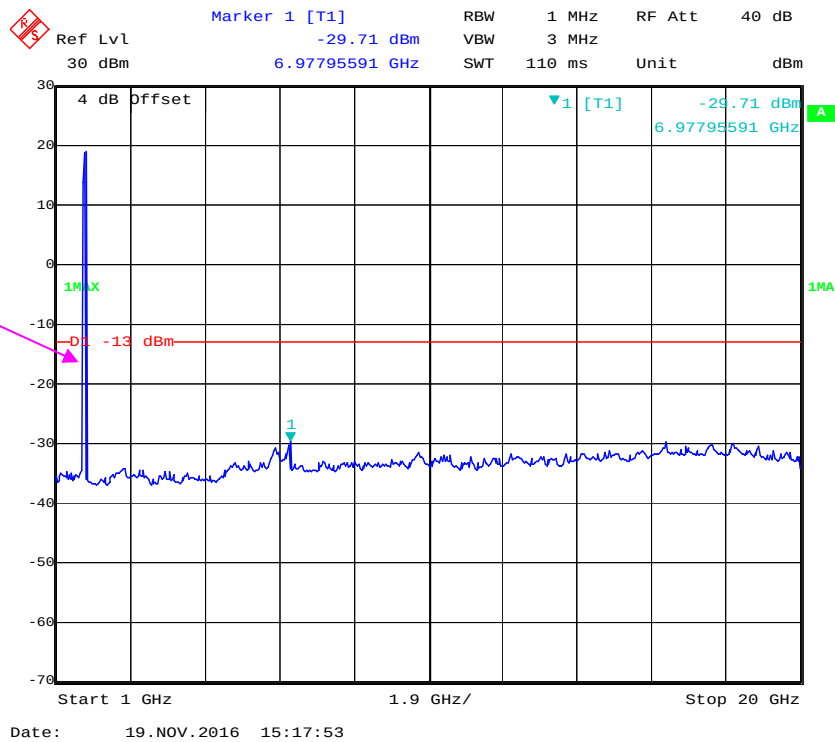
Fundamental



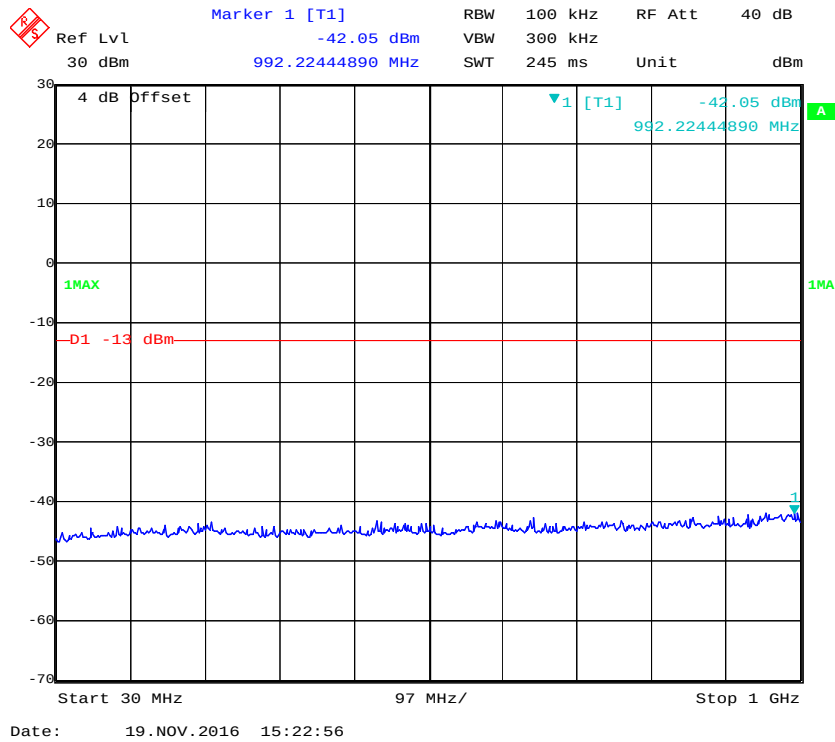
16QAM_10 MHz



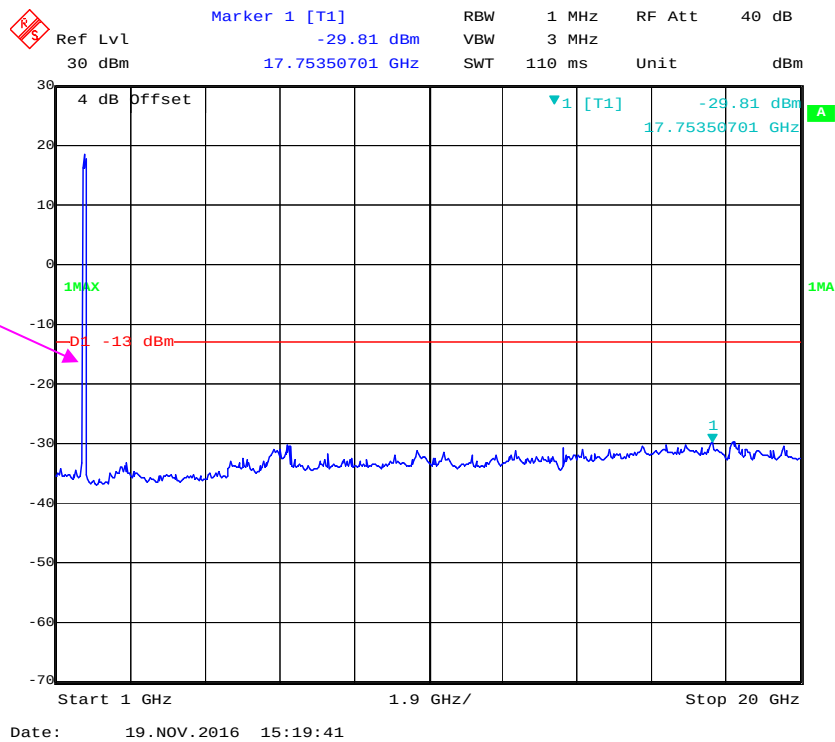
Fundamental



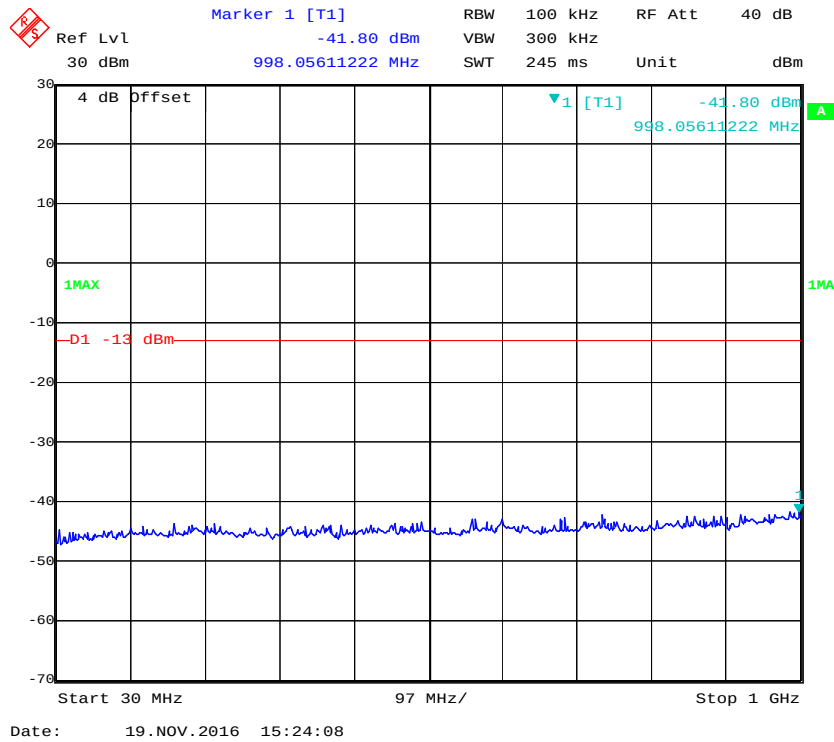
16QAM_15 MHz



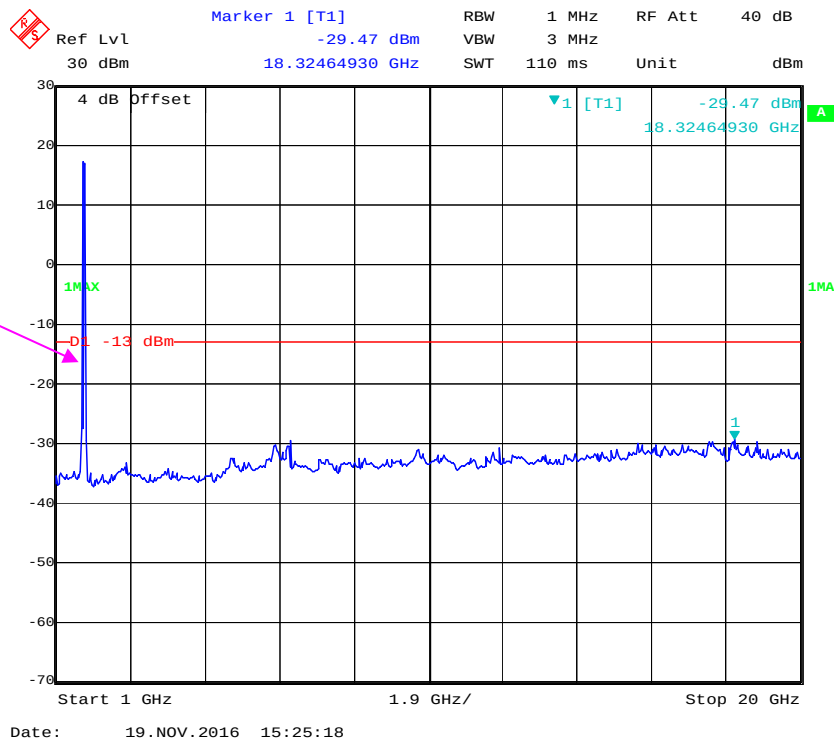
Fundamental



16QAM_20 MHz

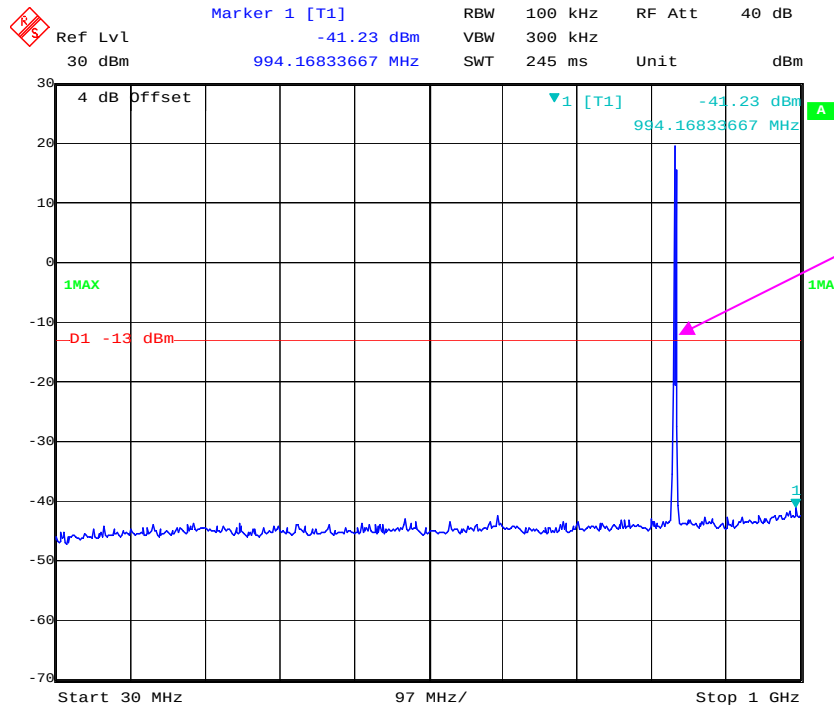


Fundamental

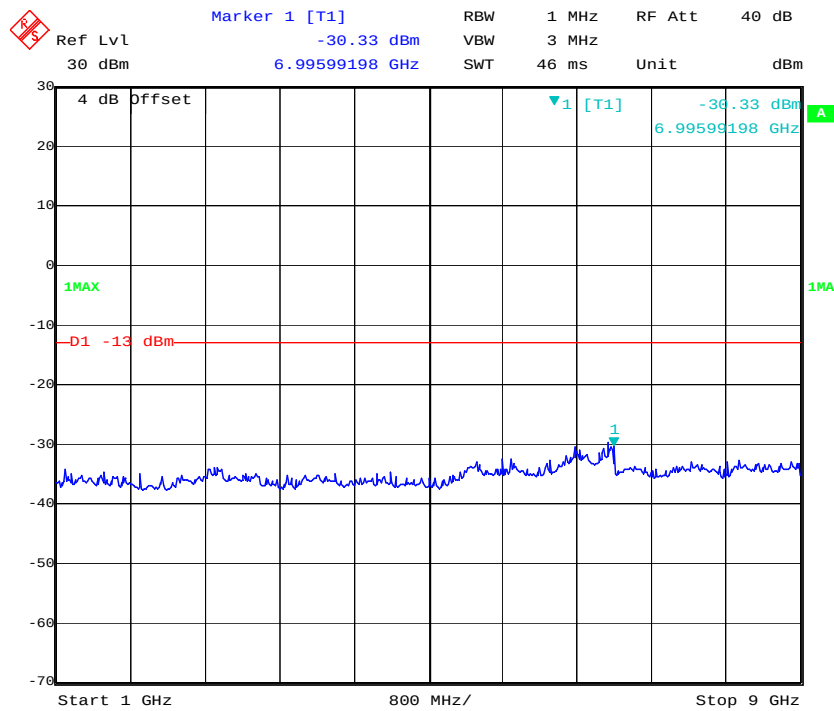


LTE Band V (Middle Channel)

QPSK_1.4 MHz

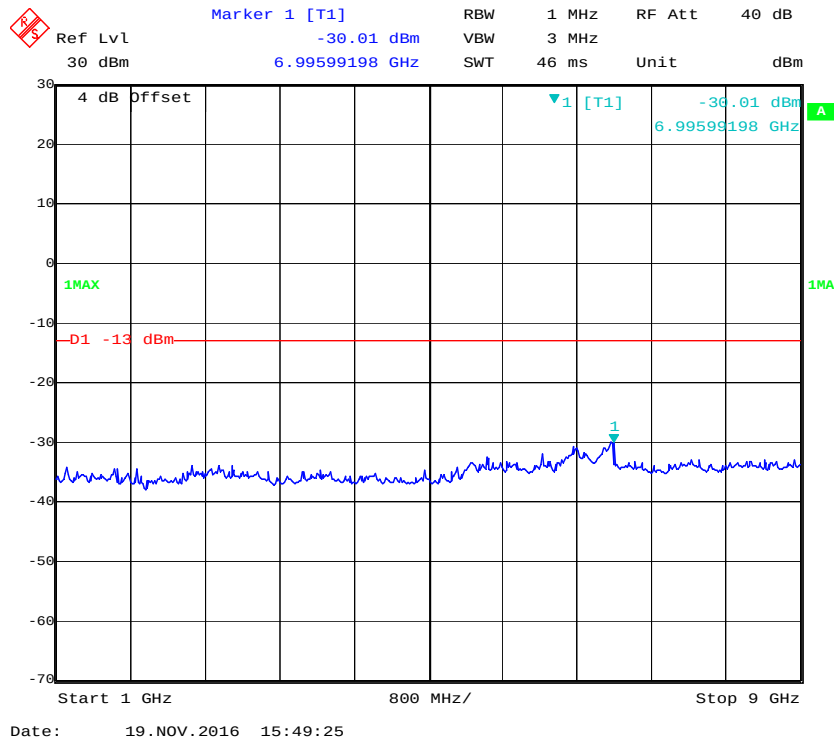
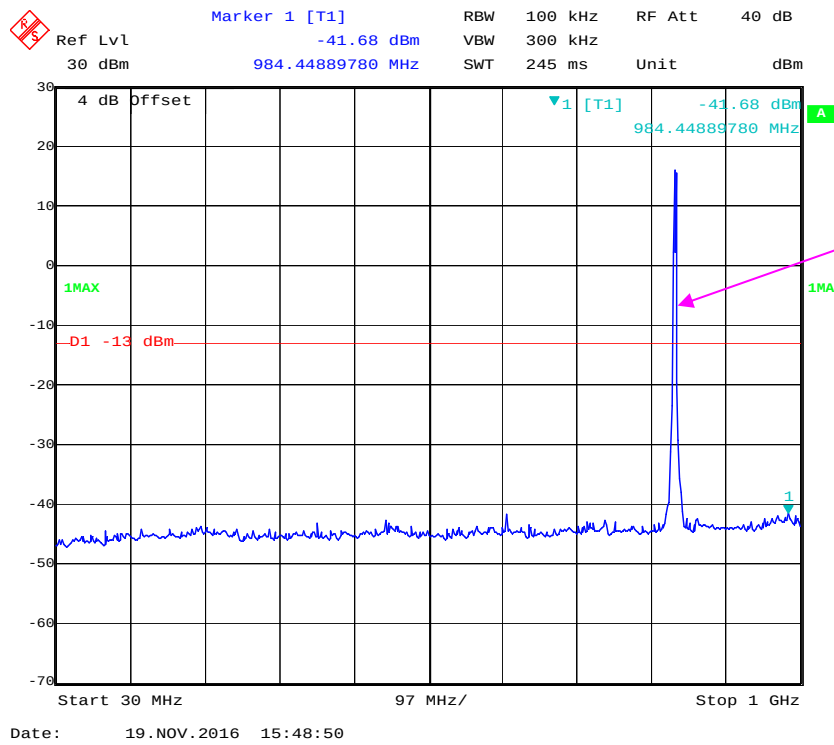


Date: 19.NOV.2016 15:46:14

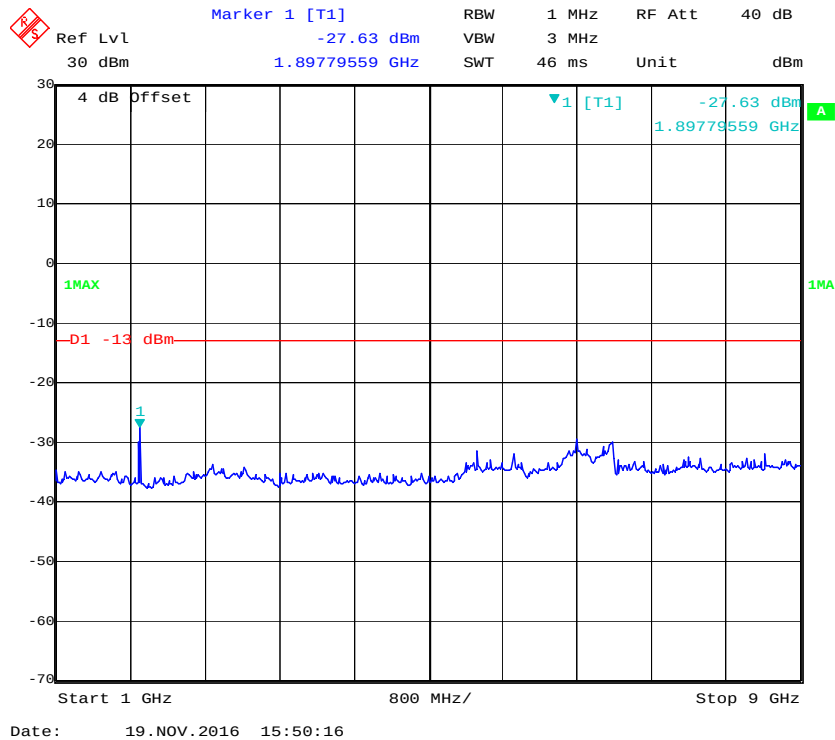
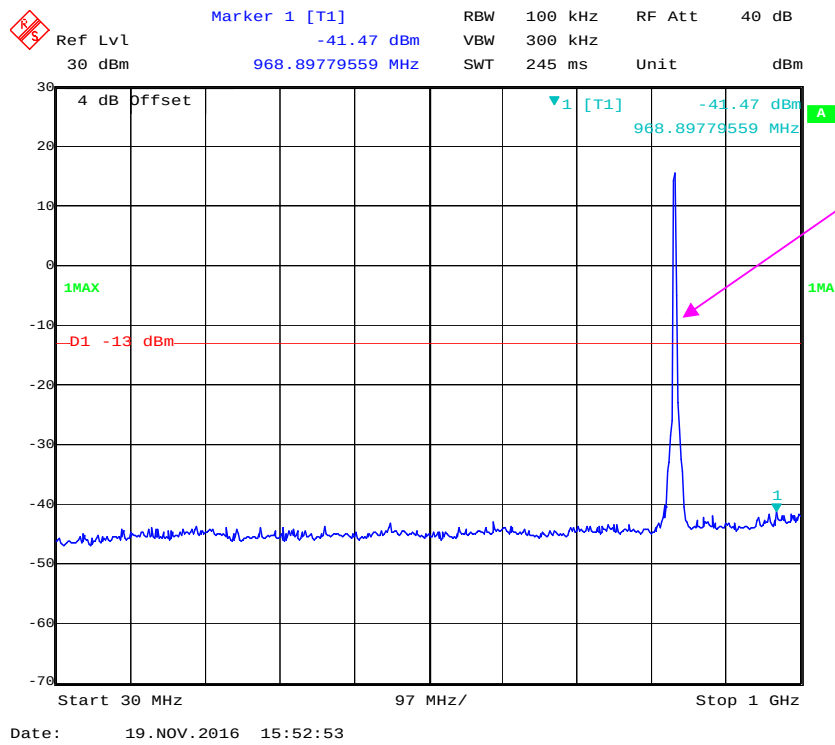


Date: 19.NOV.2016 15:45:18

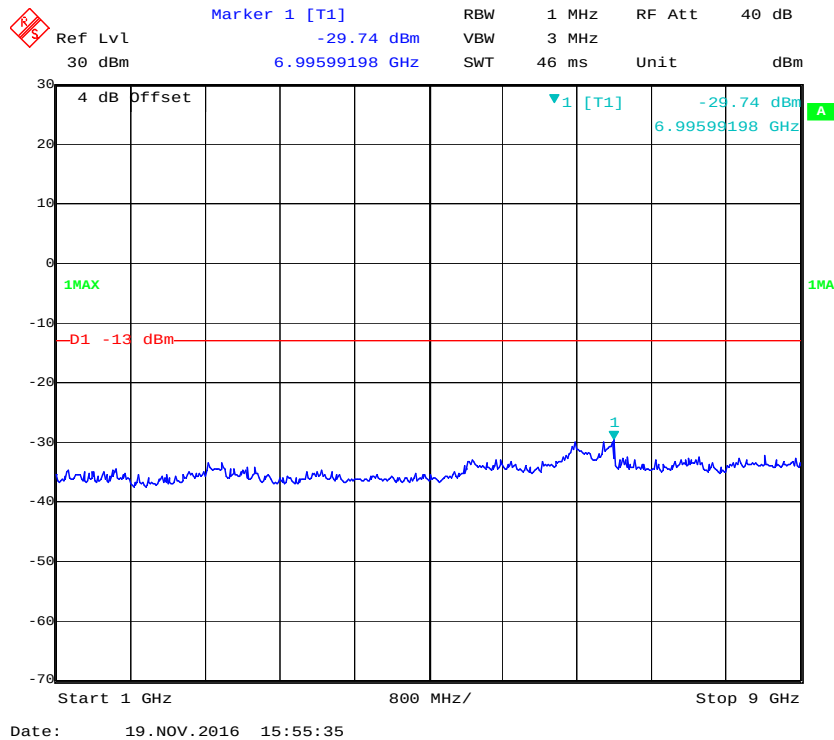
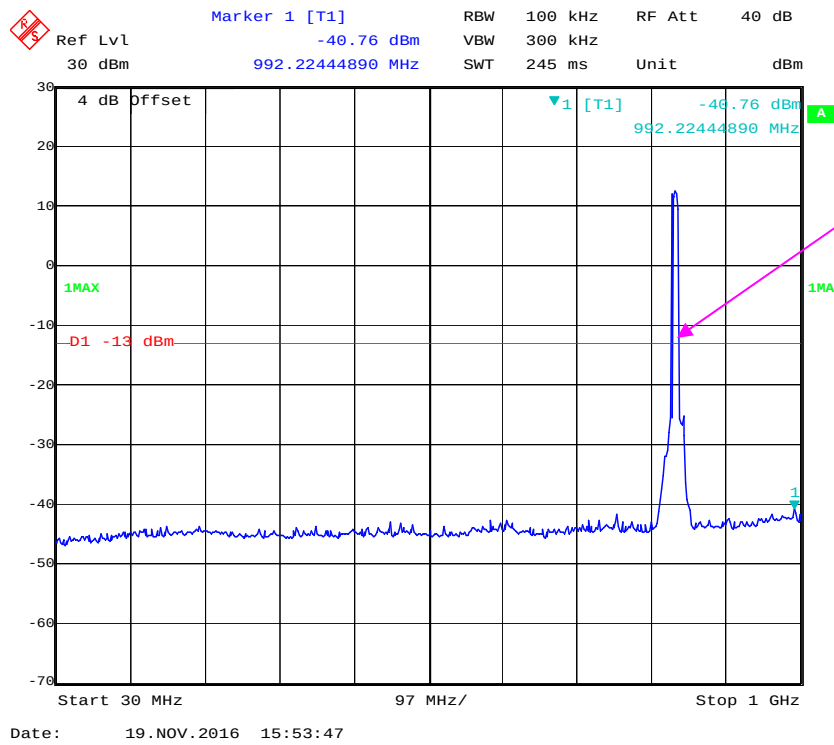
QPSK_3 MHz



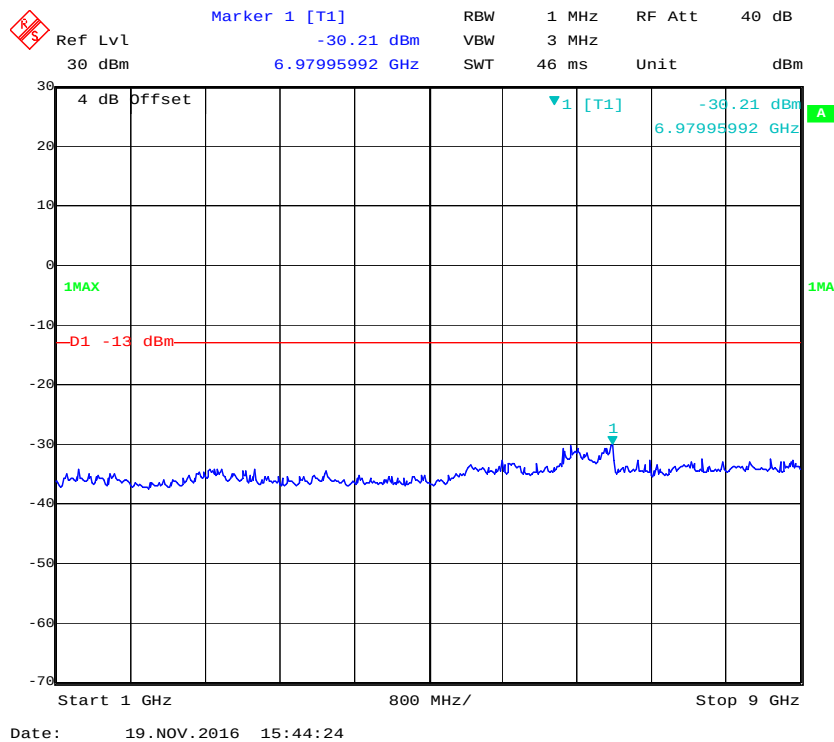
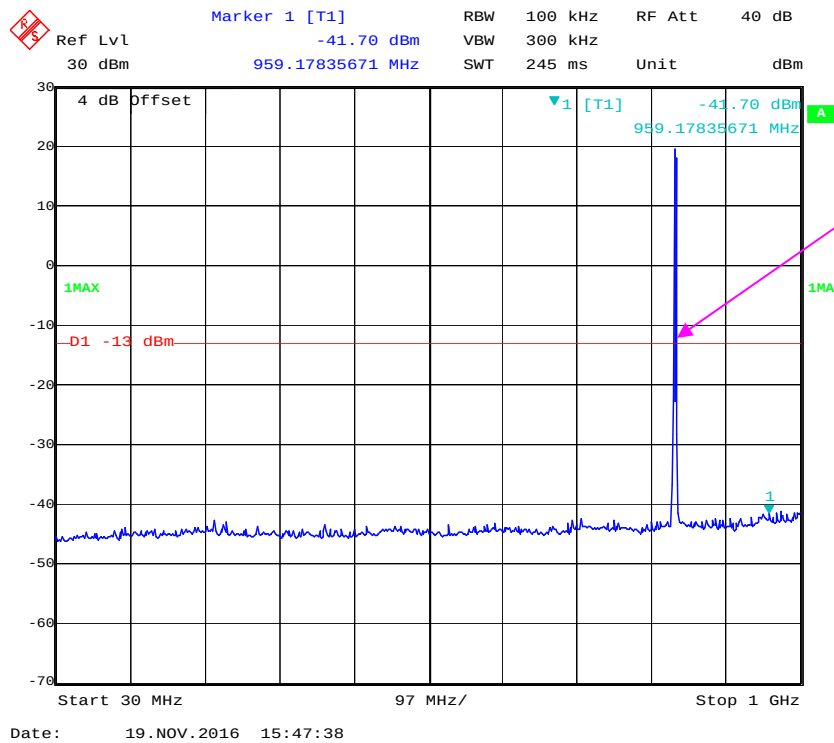
QPSK_5 MHz



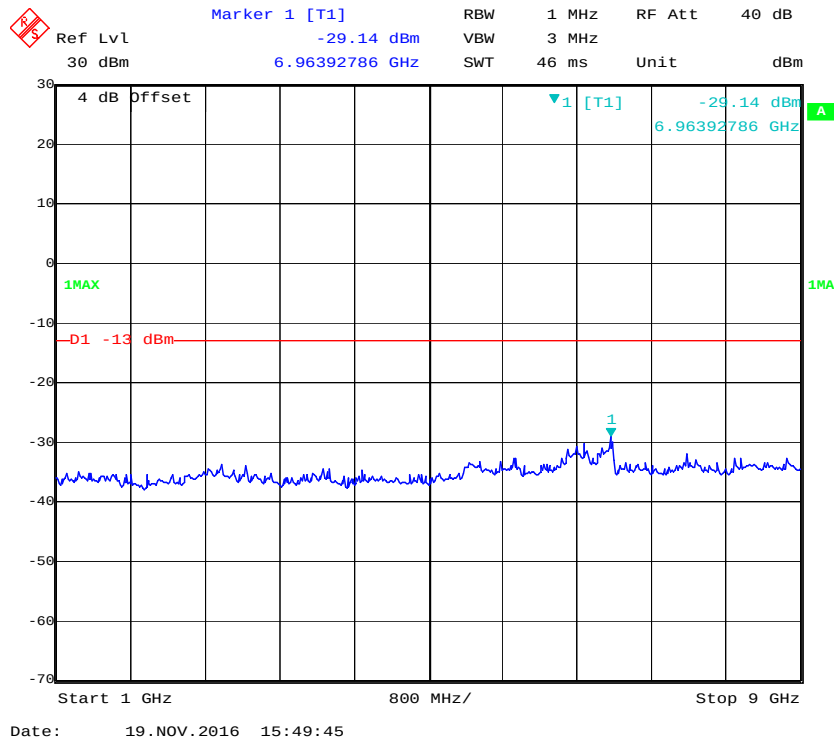
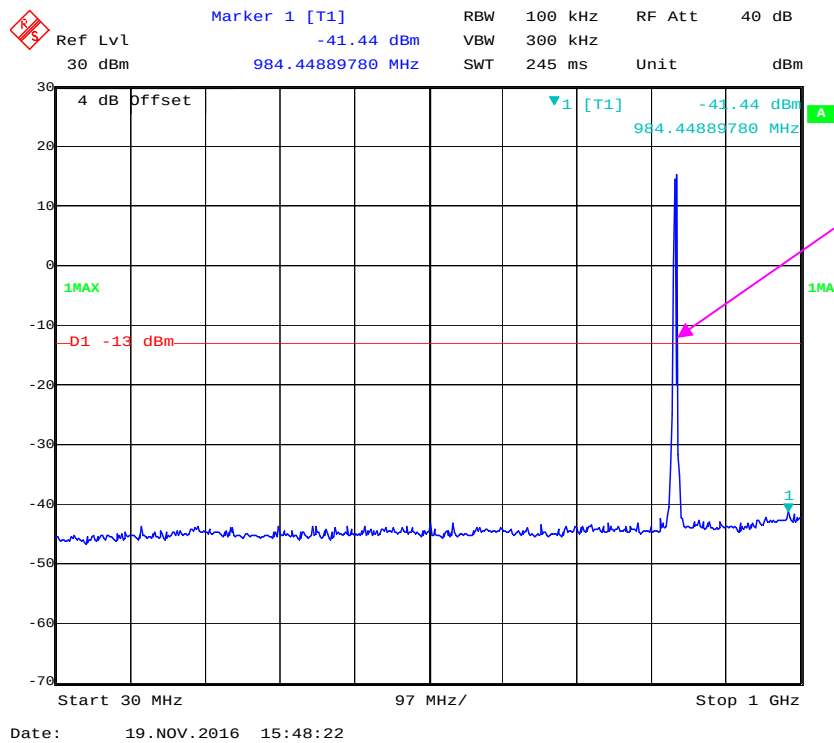
QPSK_10 MHz



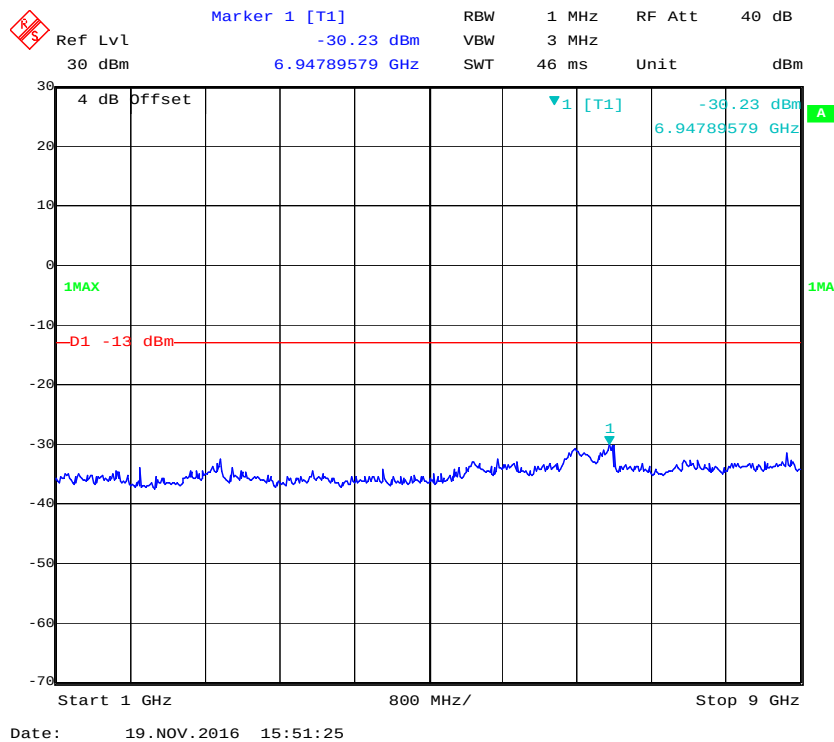
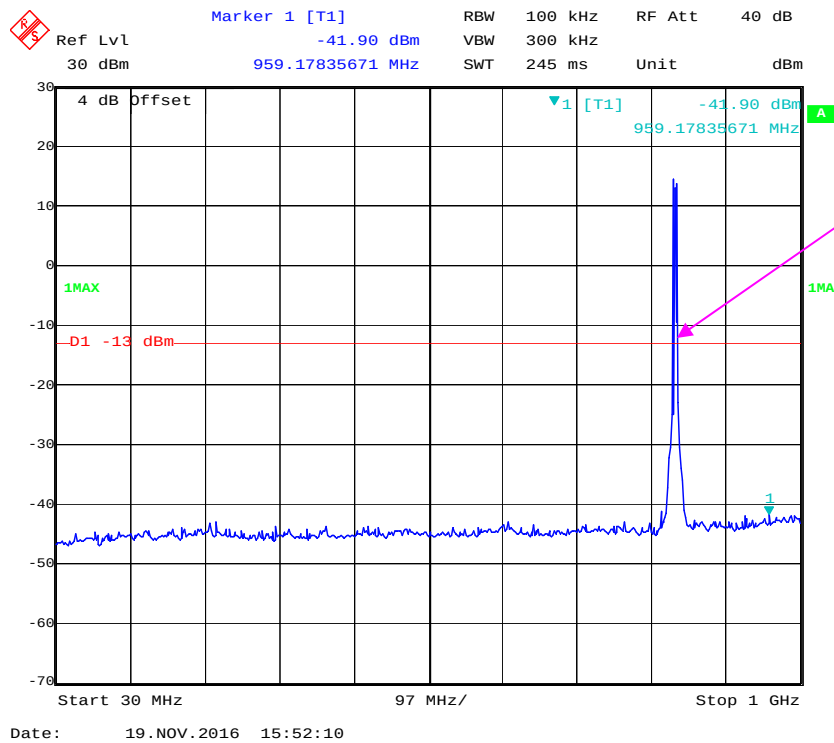
16QAM_1.4 MHz



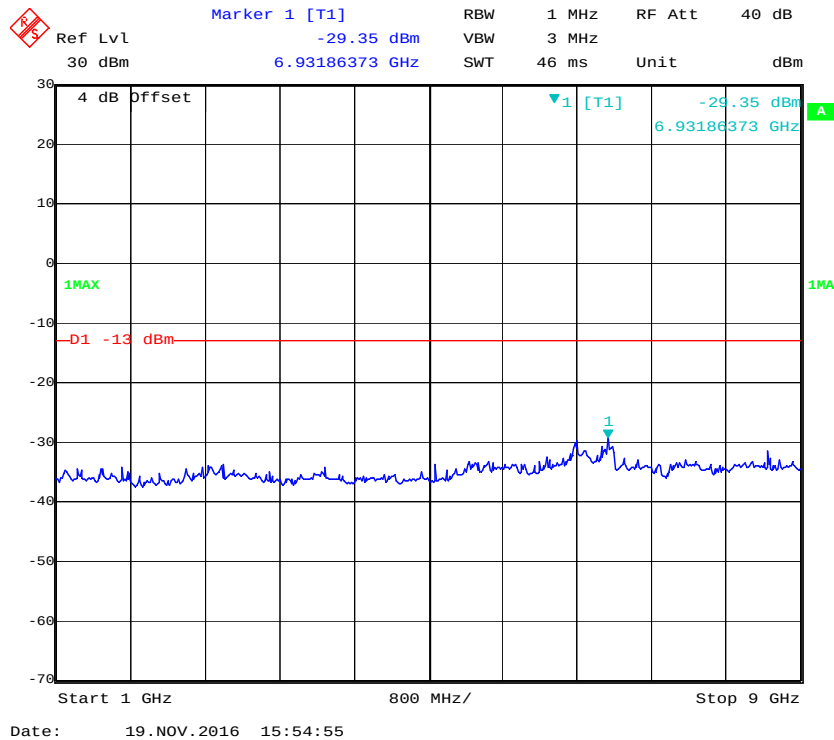
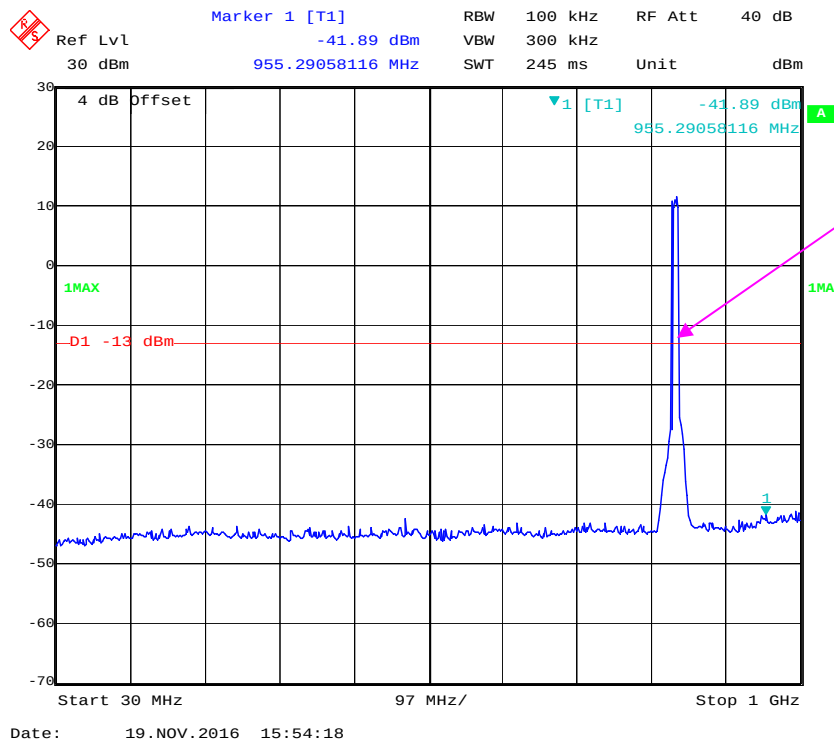
16QAM_3 MHz



16QAM_5 MHz



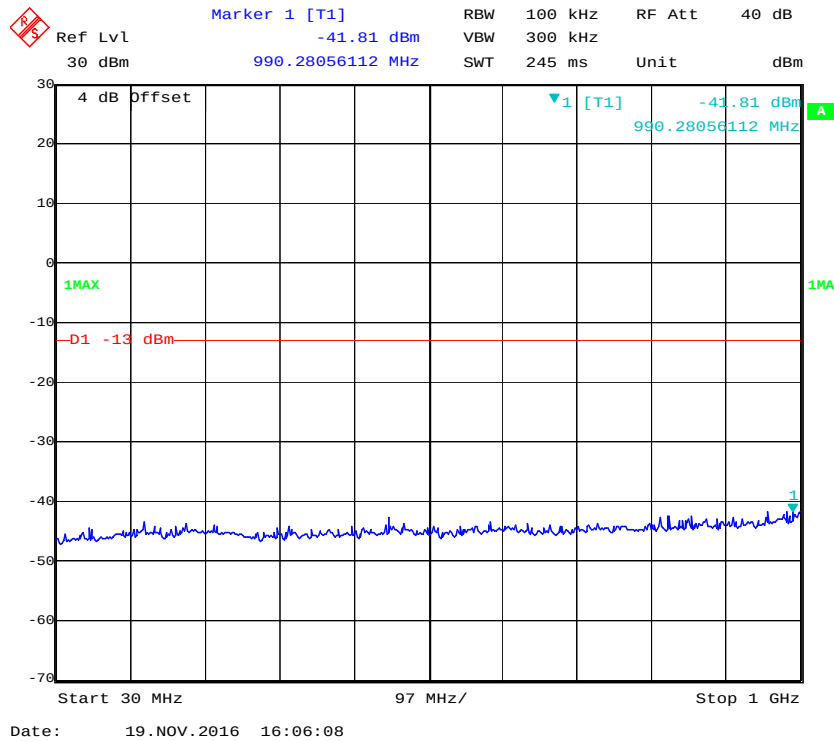
16QAM_10 MHz



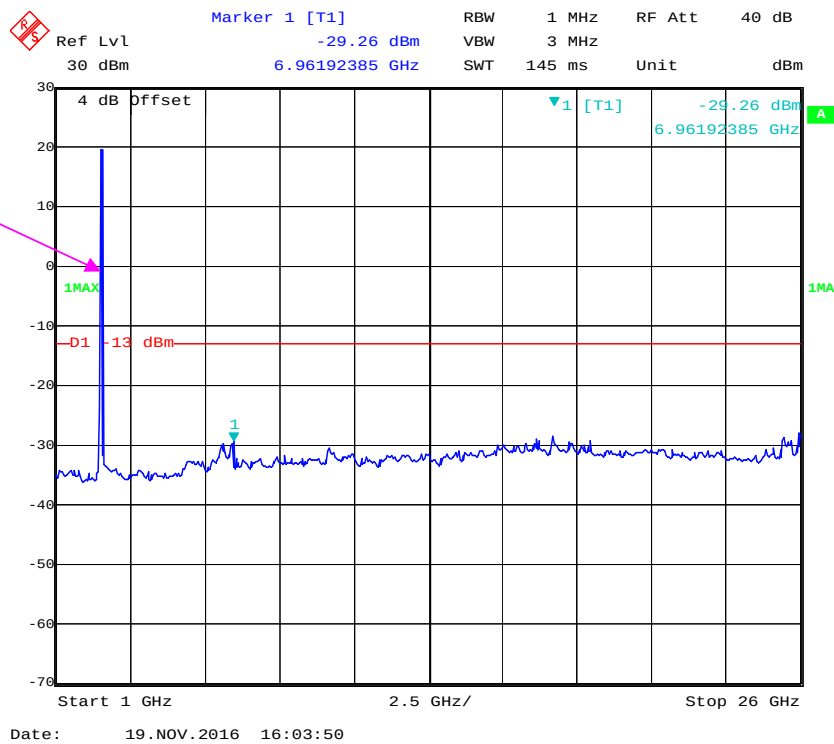
LTE Band VII

Note: the limits was -25dBm, the worst spurious emissions was less than -25dBm.

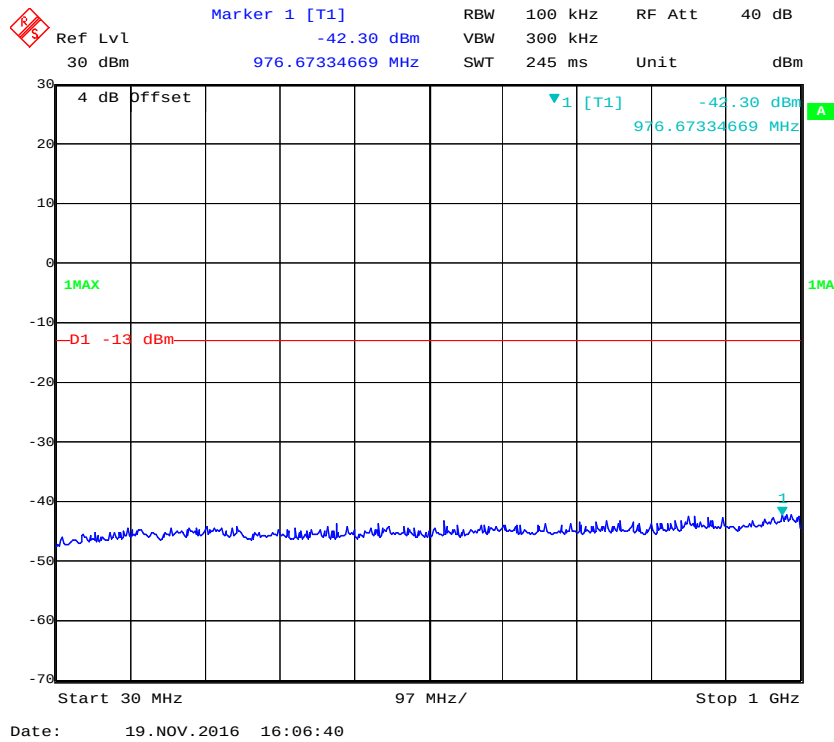
QPSK_5 MHz



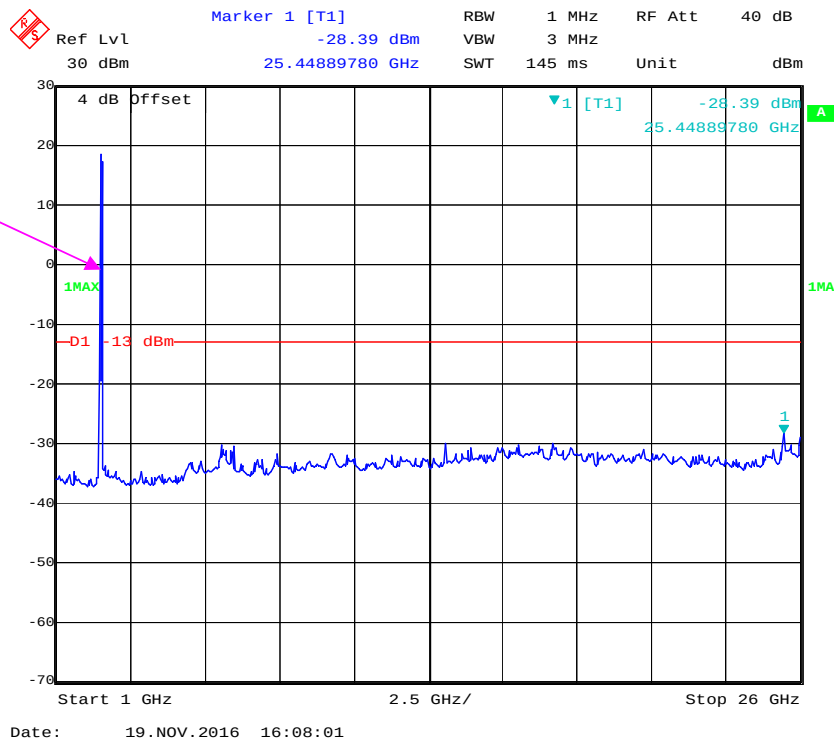
Fundamental



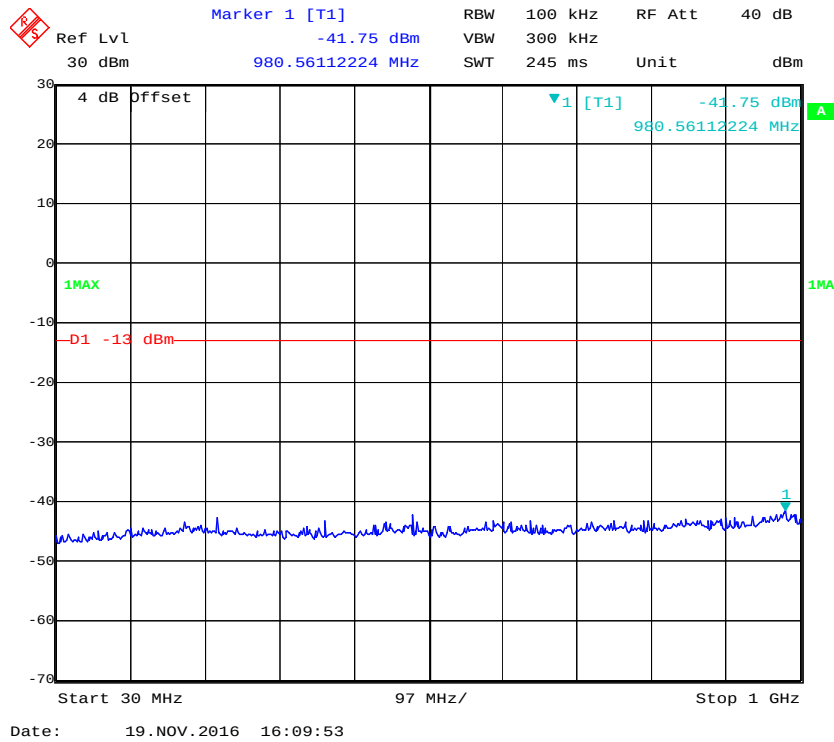
QPSK_10 MHz



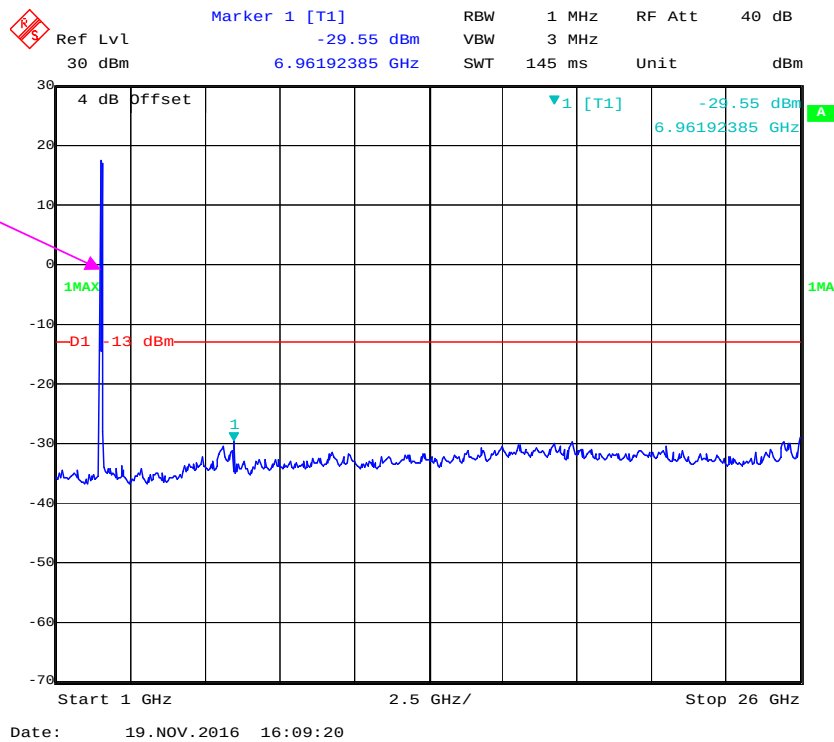
Fundamental



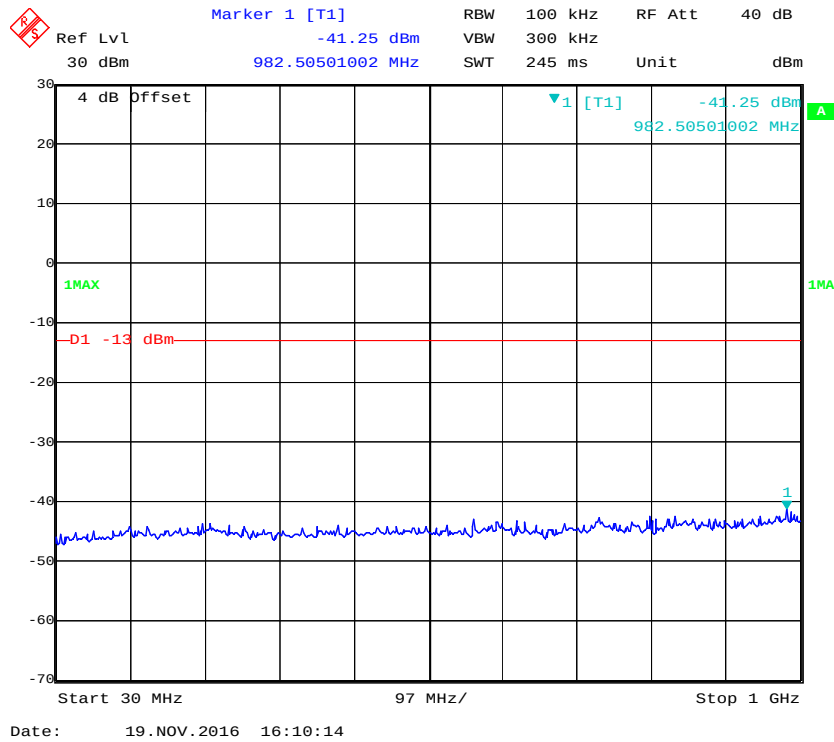
QPSK_15 MHz



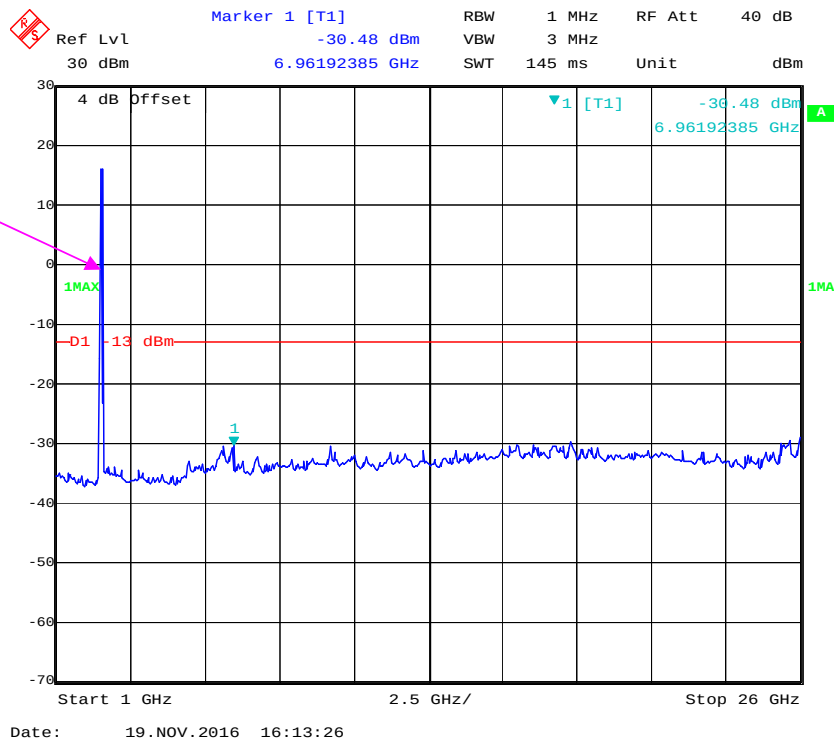
Fundamental



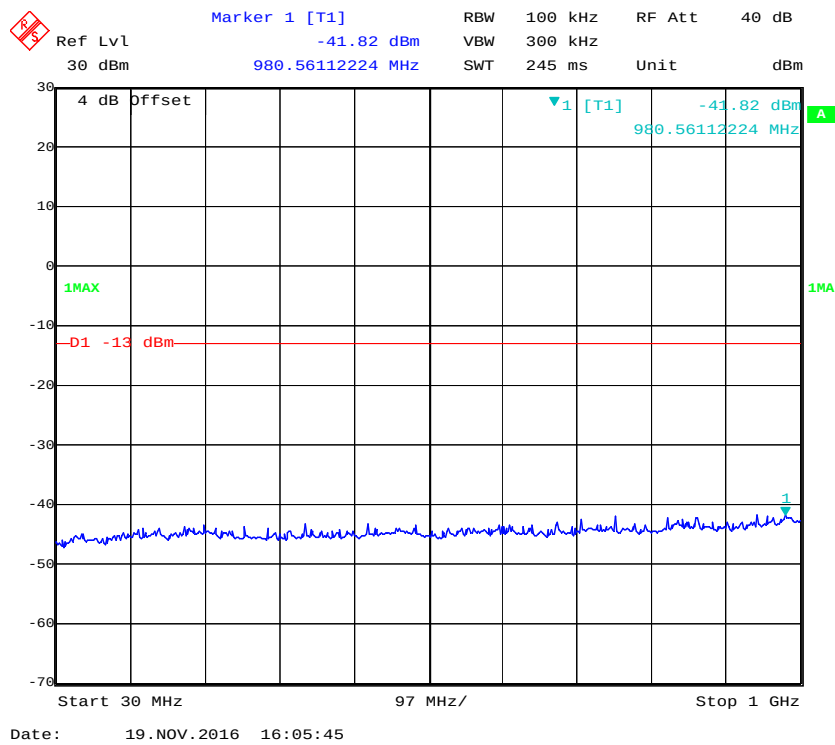
QPSK_20 MHz



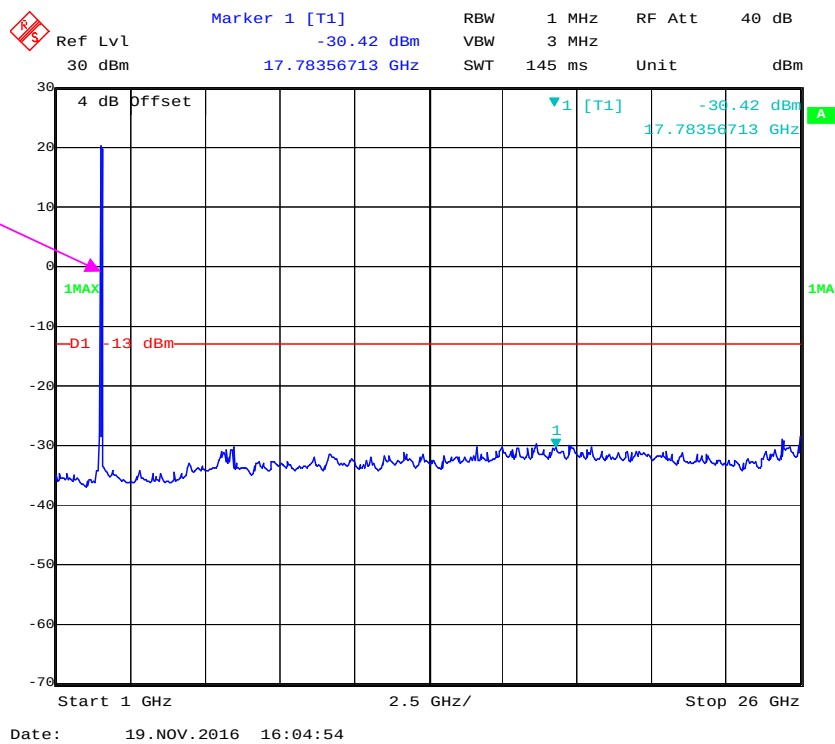
Fundamental



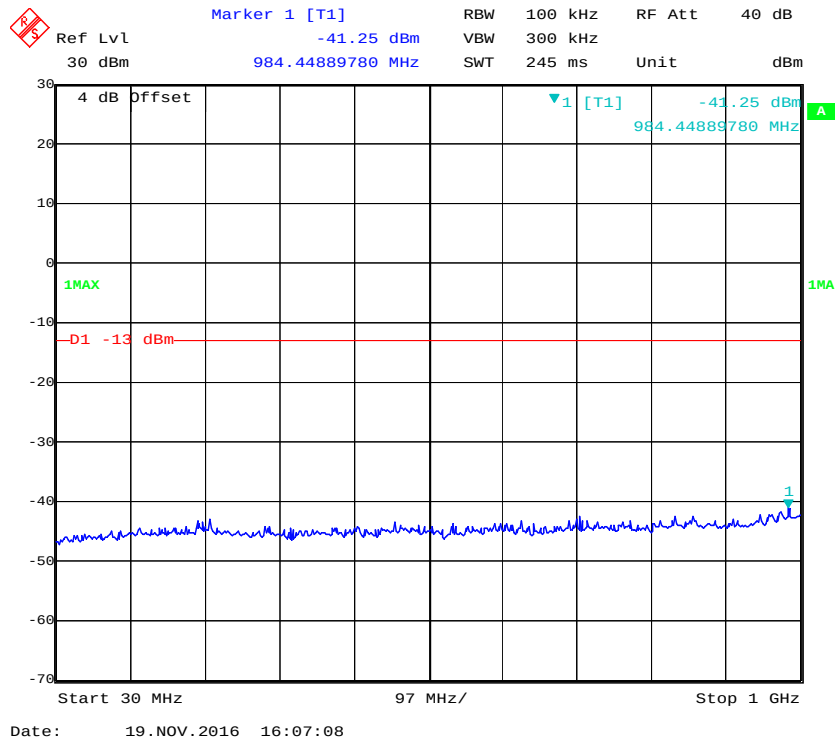
16QAM_5 MHz



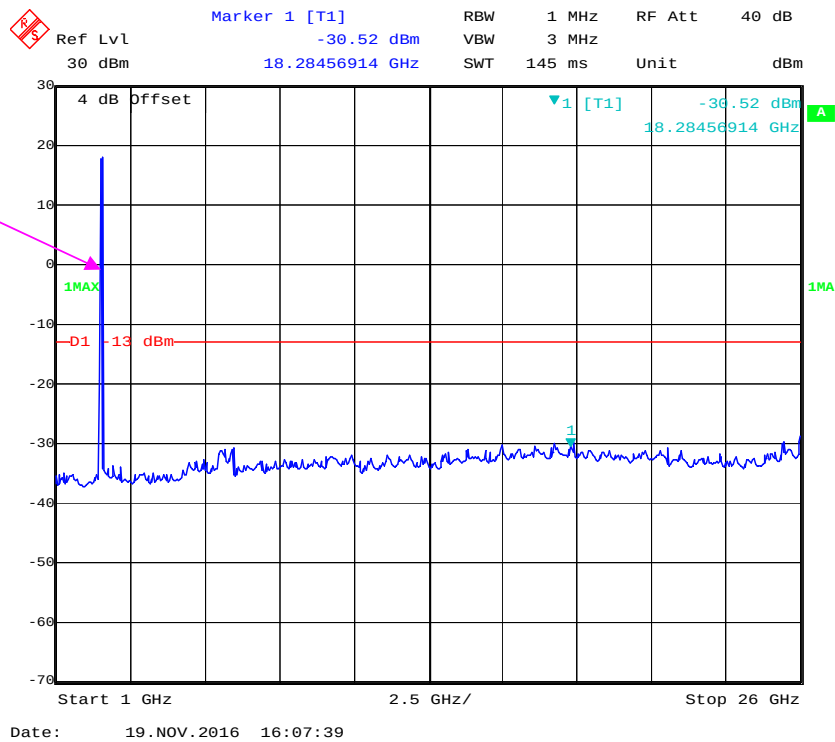
Fundamental



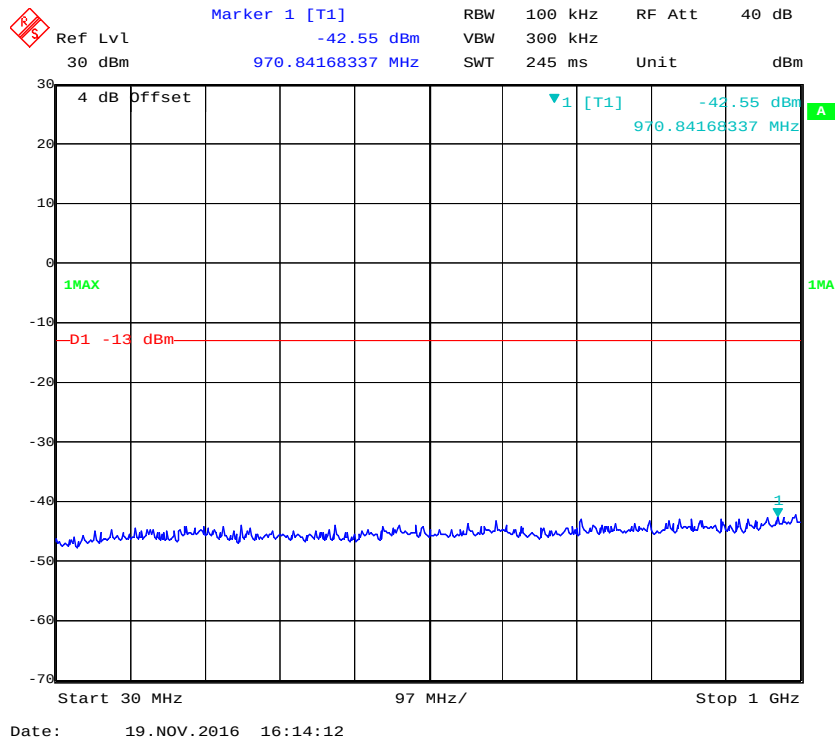
16QAM_10 MHz



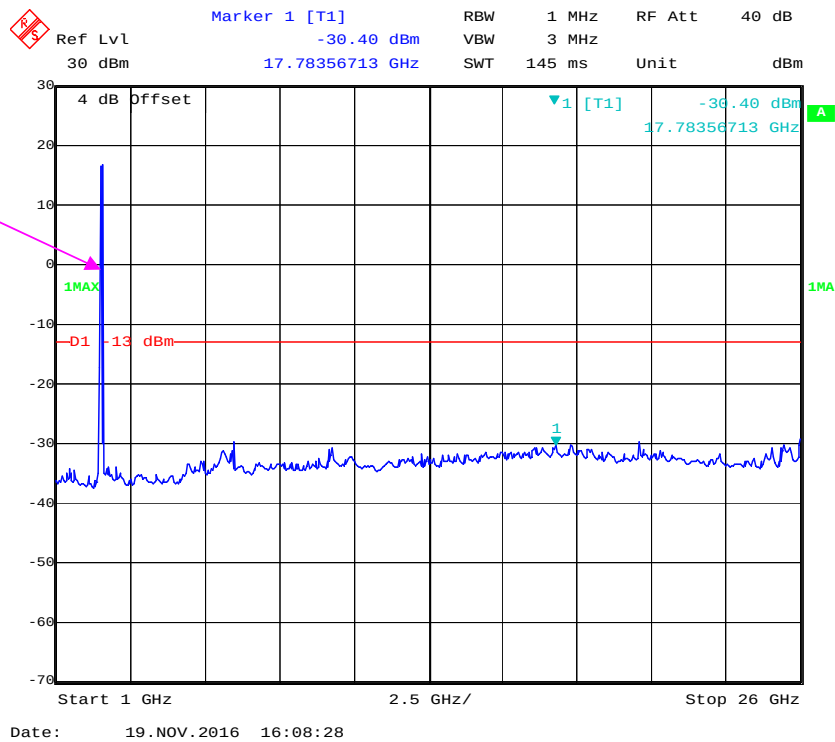
Fundamental



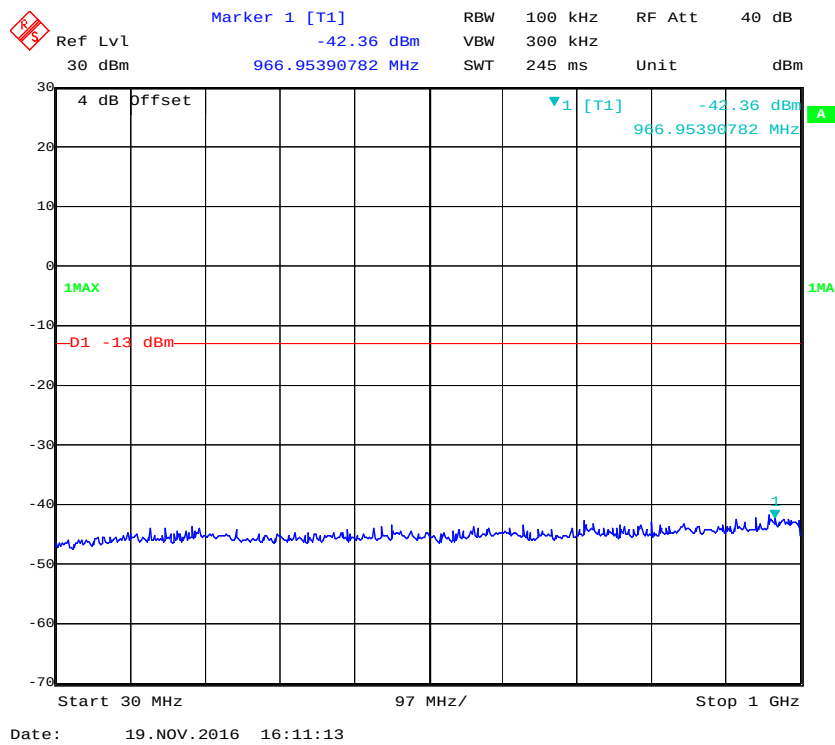
16QAM_15 MHz



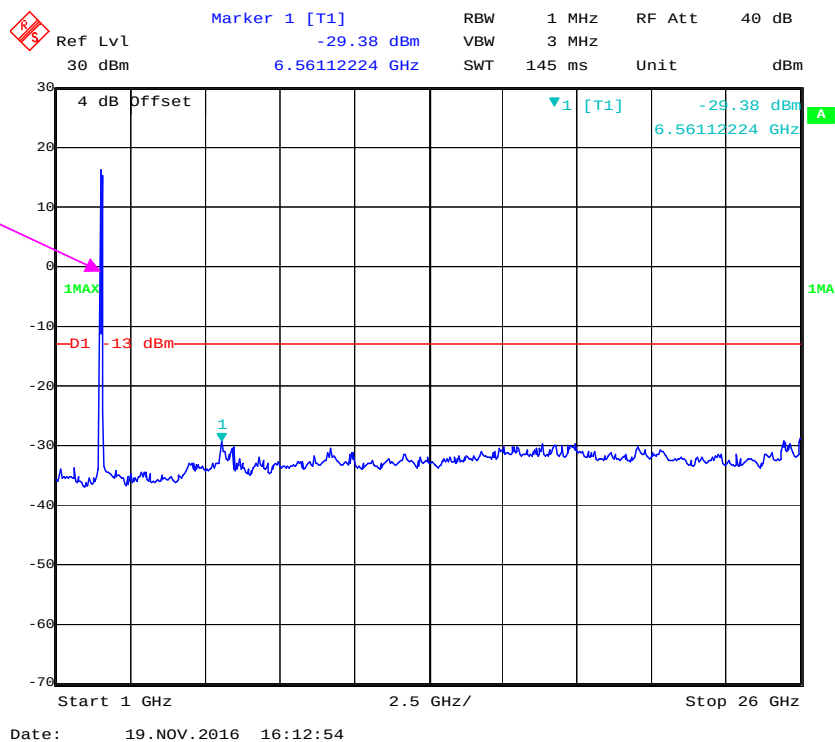
Fundamental



16QAM_20 MHz

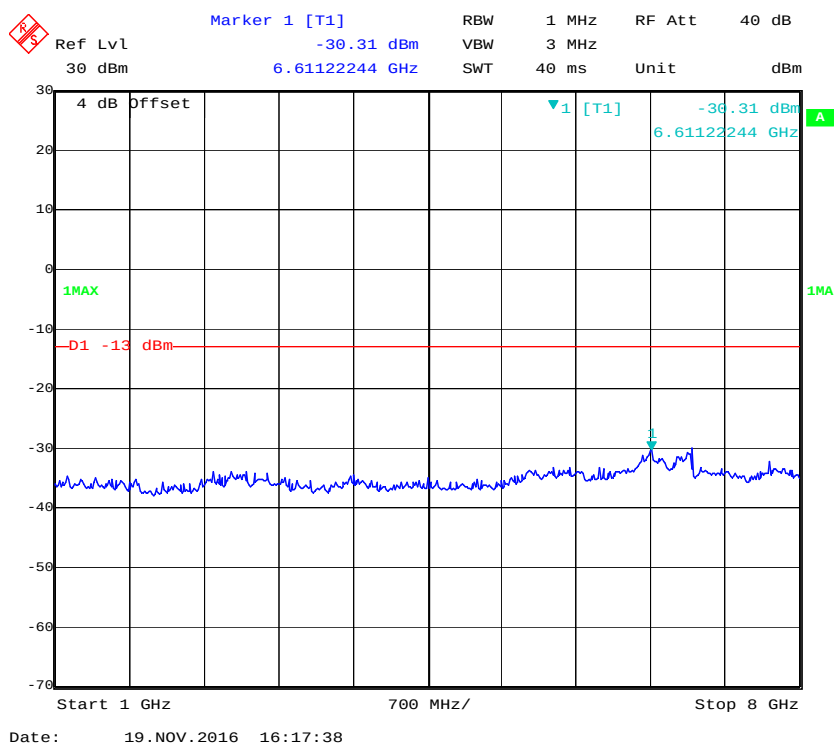
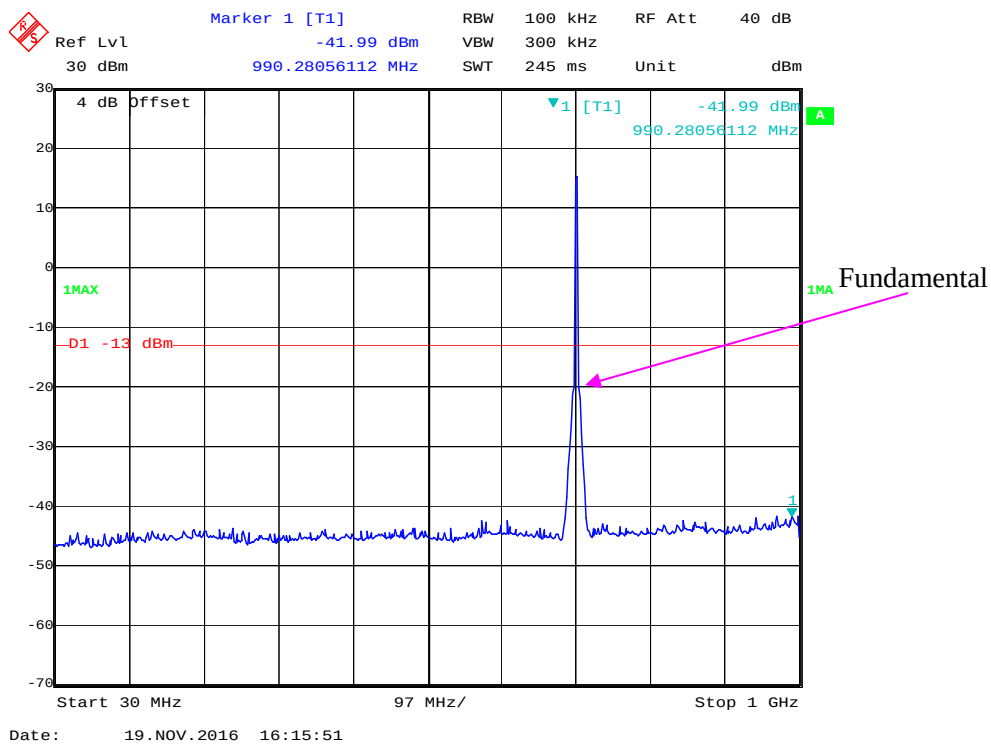


Fundamental

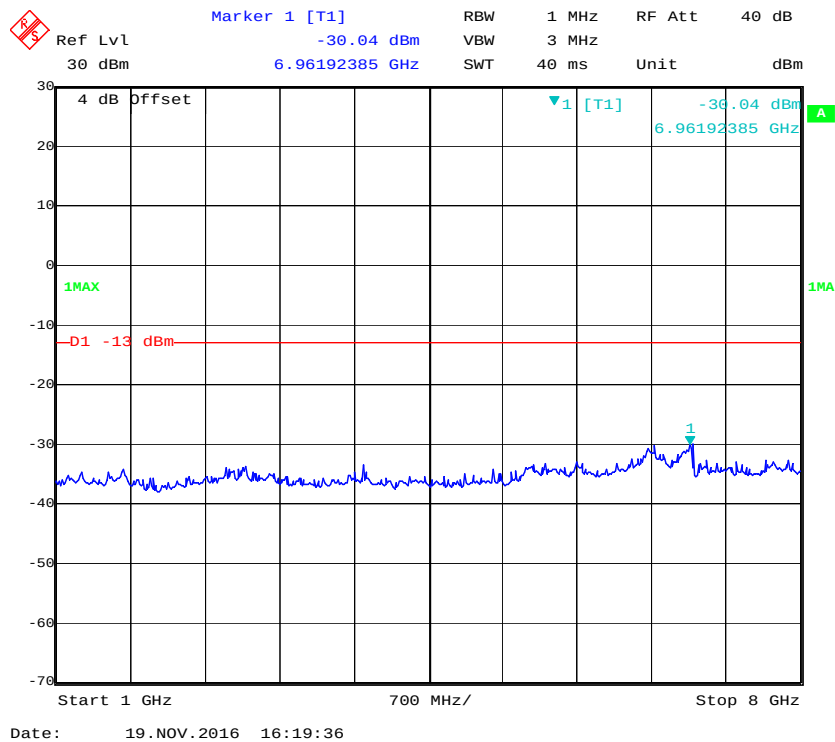
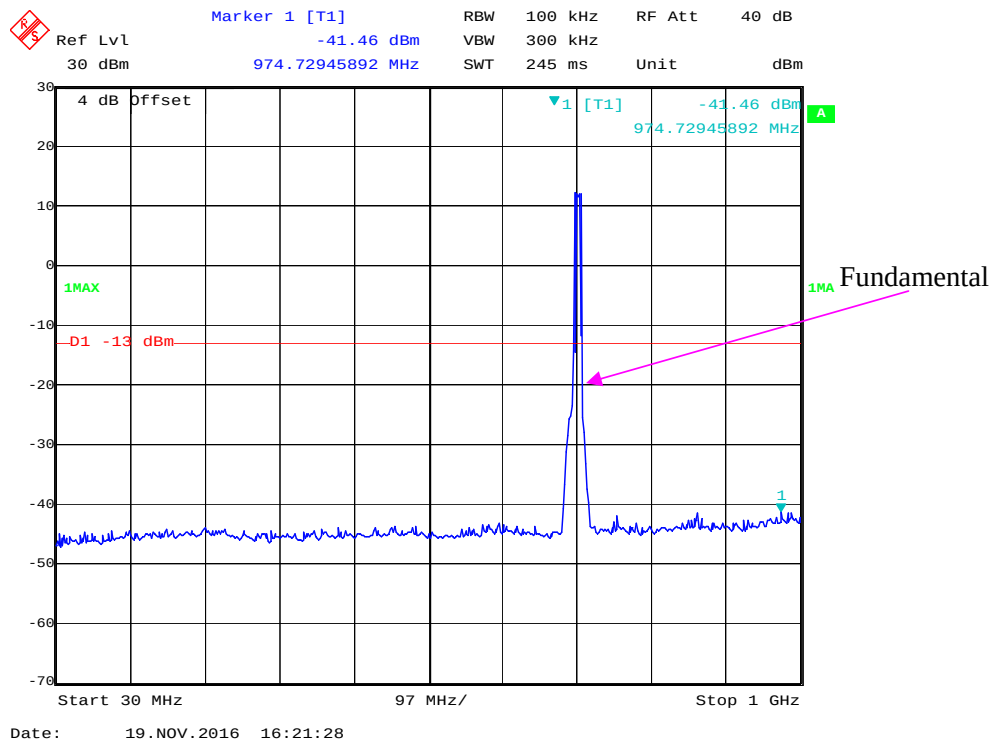


LTE Band 17 (Middle Channel)

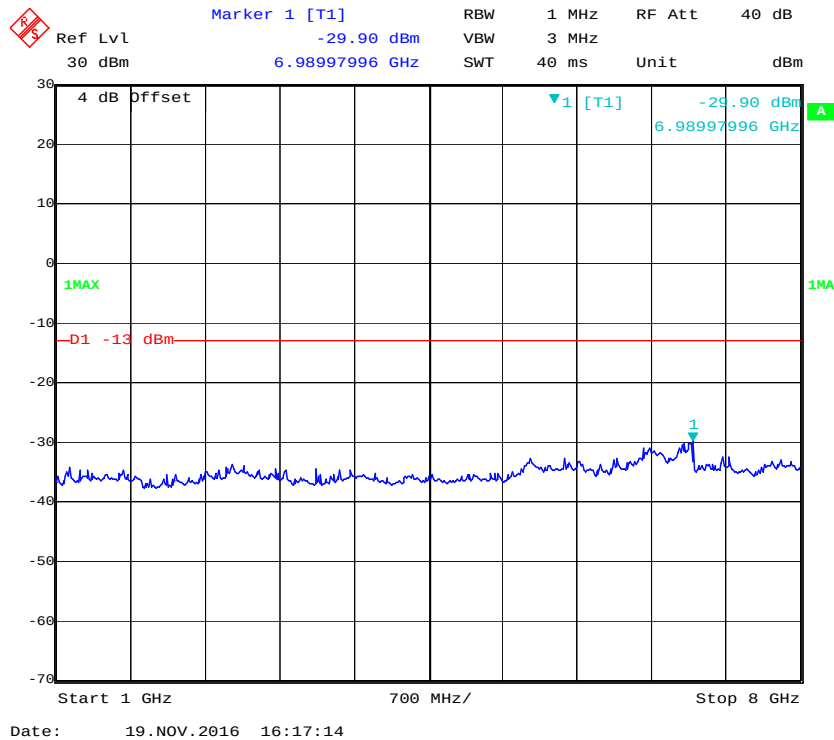
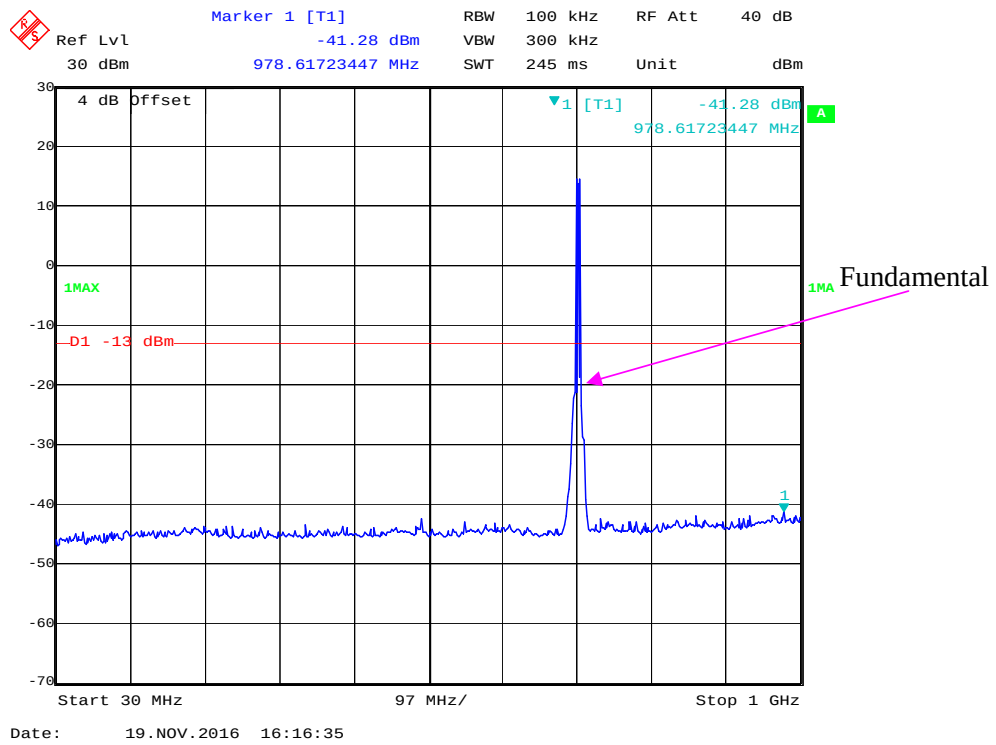
QPSK_5 MHz



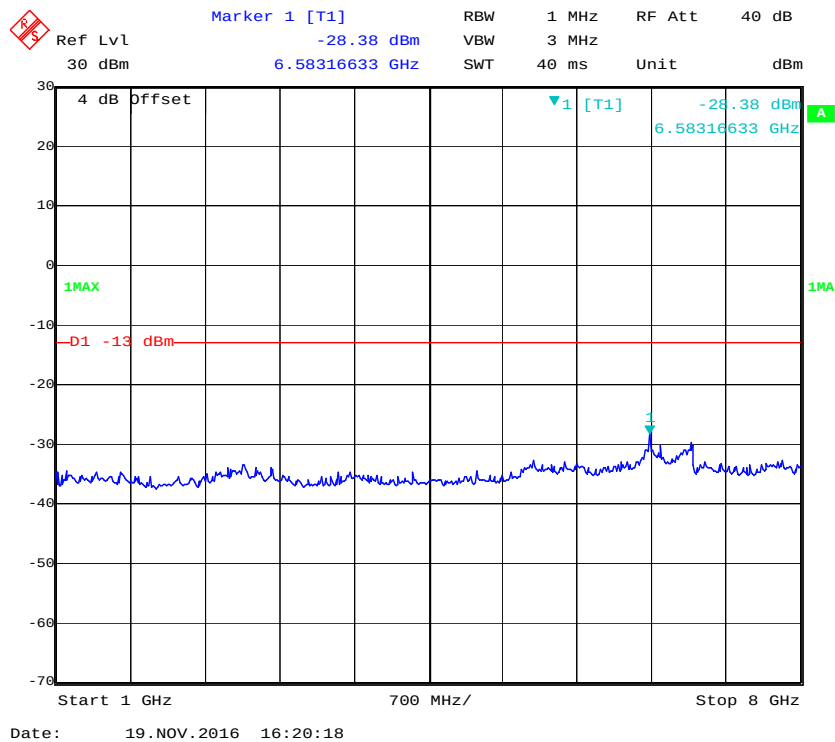
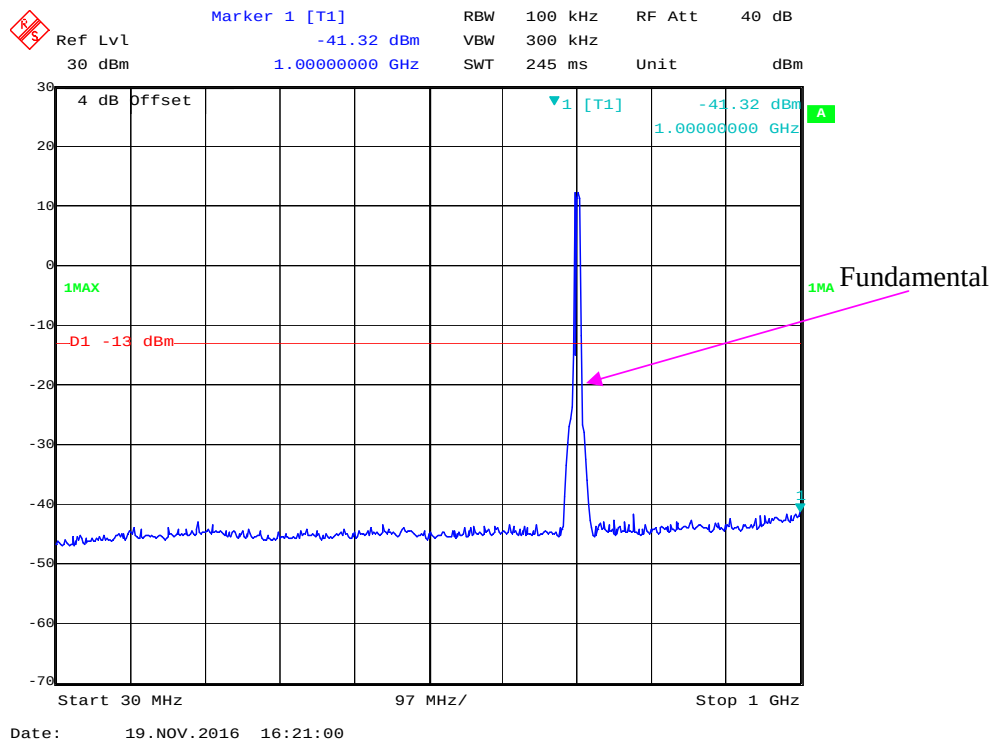
QPSK_10 MHz



16QAM_5 MHz



16QAM_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 Number	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2015-12-02	2016-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2015-12-02	2016-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2015-12-02	2016-12-01
ETS	Horn Antenna	3115	003-6076	2015-12-02	2016-12-01
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113024	2014-06-16	2017-06-15
EMCO	Adjustable Dipole Antenna	3121C	9109-258	N/A	N/A
HP	Signal Generator	8648C	3623A04150	2016-05-23	2017-05-22
WILTRON	SWEPT FREQUENCY SYNTHESIZER	6737	213001	2016-05-23	2017-05-22
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2016-05-20	2017-05-19
HP	Amplifier	8449B	3008A00277	2015-12-02	2016-12-01
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2015-11-10	2016-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2015-11-10	2016-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2015-11-10	2016-11-09
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-011315	2016-08-18	2017-08-18
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-011312	2016-08-18	2017-08-18

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25.6 °C
Relative Humidity:	31 %
ATM Pressure:	100.8 kPa

The testing was performed by Tom Tang on 2016-11-07.

EUT Operation Mode: Transmitting

Cellular Band

30MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM850, Frequency:836.600 MHz								
1673.200	H	46.20	-56.9	7.9	0.8	-49.8	-13.0	36.8
1673.200	V	46.76	-54.6	7.9	0.8	-47.5	-13.0	34.5
2509.800	H	44.42	-55.3	8.9	1.3	-47.7	-13.0	34.7
2509.800	V	47.07	-50.5	8.9	1.3	-42.9	-13.0	29.9
339.450	H	38.64	-73.9	0.0	0.3	-74.2	-13.0	61.2
303.960	V	39.57	-71.4	0.0	0.3	-71.7	-13.0	58.7
WCDMA Band V R99,Frequency:836.600 MHz								
1673.200	H	37.42	-65.7	7.9	0.8	-58.6	-13.0	45.6
1673.200	V	37.47	-63.9	7.9	0.8	-56.8	-13.0	43.8
2509.800	H	35.02	-64.7	8.9	1.3	-57.1	-13.0	44.1
2509.800	V	36.33	-61.2	8.9	1.3	-53.6	-13.0	40.6
339.450	H	38.61	-73.9	0.0	0.3	-74.2	-13.0	61.2
303.960	V	39.43	-71.5	0.0	0.3	-71.8	-13.0	58.8

PCS Band

30MHz-20GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM1900, Frequency:1880.000 MHz								
3760.000	H	35.98	-58.9	8.8	1.4	-51.5	-13.0	38.5
3760.000	V	37.10	-57.8	8.8	1.4	-50.4	-13.0	37.4
5640.000	H	41.53	-51.6	10.3	1.8	-43.1	-13.0	30.1
5640.000	V	37.53	-55.6	10.3	1.8	-47.1	-13.0	34.1
339.450	H	38.52	-74	0.0	0.3	-74.3	-13.0	61.3
303.960	V	39.46	-71.5	0.0	0.3	-71.8	-13.0	58.8
WCDMA Band II, R99, Frequency:1880.000 MHz								
3760.000	H	36.05	-58.8	8.8	1.4	-51.4	-13.0	38.4
3760.000	V	37.89	-57	8.8	1.4	-49.6	-13.0	36.6
5640.000	H	49.53	-43.6	10.3	1.8	-35.1	-13.0	22.1
5640.000	V	47.10	-46	10.3	1.8	-37.5	-13.0	24.5
339.450	H	38.75	-73.8	0.0	0.3	-74.1	-13.0	61.1
303.960	V	39.39	-71.6	0.0	0.3	-71.9	-13.0	58.9

LTE Bands

LTE Band II (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1880.00 MHz								
3760	H	31.82	-63.1	8.8	1.4	-55.7	-13.0	42.7
3760	V	33.04	-61.8	8.8	1.4	-54.4	-13.0	41.4
5640	H	52.25	-40.9	10.3	1.8	-32.4	-13.0	19.4
5640	V	54.38	-38.8	10.3	1.8	-30.3	-13.0	17.3
305.47	H	39.21	-73.6	0.0	0.3	-73.9	-13.0	60.9
385.96	V	37.14	-73.3	0.0	0.4	-73.7	-13.0	60.7
16-QAM,Frequency:1880.00 MHz								
3760	H	31.52	-63.4	8.8	1.4	-56.0	-13.0	43.0
3760	V	32.95	-61.9	8.8	1.4	-54.5	-13.0	41.5
5640	H	52.68	-40.4	10.3	1.8	-31.9	-13.0	18.9
5640	V	53.16	-40	10.3	1.8	-31.5	-13.0	18.5
305.47	H	38.74	-74	0.0	0.3	-74.3	-13.0	61.3
385.96	V	34.51	-75.9	0.0	0.4	-76.3	-13.0	63.3

LTE Band IV (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1732.500 MHz								
3465	H	33.91	-62.7	8.8	1.3	-55.2	-13.0	42.2
3465	V	37.23	-59.5	8.8	1.3	-52.0	-13.0	39.0
5197.5	H	48.63	-44.6	10.0	1.7	-36.3	-13.0	23.3
5197.5	V	50.25	-42.9	10.0	1.7	-34.6	-13.0	21.6
305.47	H	38.99	-73.8	0.0	0.3	-74.1	-13.0	61.1
385.96	V	36.74	-73.7	0.0	0.4	-74.1	-13.0	61.1
16-QAM,Frequency: 1732.500 MHz								
3465	H	34.02	-62.5	8.8	1.3	-55.0	-13.0	42.0
3465	V	36.84	-59.8	8.8	1.3	-52.3	-13.0	39.3
5197.5	H	47.26	-46	10.0	1.7	-37.7	-13.0	24.7
5197.5	V	49.57	-43.6	10.0	1.7	-35.3	-13.0	22.3
305.47	H	39.55	-73.2	0.0	0.3	-73.5	-13.0	60.5
385.96	V	37.22	-73.2	0.0	0.4	-73.6	-13.0	60.6

LTE Band V (30MHz-10GHz)

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:836.500 MHz								
1673	H	35.47	-67.7	7.9	0.8	-60.6	-13.0	47.6
1673	V	37.28	-64.1	7.9	0.8	-57.0	-13.0	44.0
2509.5	H	35.37	-64.4	8.9	1.3	-56.8	-13.0	43.8
2509.5	V	36.52	-61	8.9	1.3	-53.4	-13.0	40.4
3346	H	34.59	-62.1	8.7	1.3	-54.7	-13.0	41.7
3346	V	34.72	-62	8.7	1.3	-54.6	-13.0	41.6
305.47	H	38.47	-74.3	0.0	0.3	-74.6	-13.0	61.6
385.96	V	37.02	-73.4	0.0	0.4	-73.8	-13.0	60.8
16-QAM,Frequency: 836.500 MHz								
1673	H	36.04	-67.1	7.9	0.8	-60.0	-13.0	47.0
1673	V	36.56	-64.8	7.9	0.8	-57.7	-13.0	44.7
2509.5	H	34.44	-65.3	8.9	1.3	-57.7	-13.0	44.7
2509.5	V	36.62	-60.9	8.9	1.3	-53.3	-13.0	40.3
3346	H	33.45	-63.3	8.7	1.3	-55.9	-13.0	42.9
3346	V	35.9	-60.9	8.7	1.3	-53.5	-13.0	40.5
305.47	H	38.14	-74.6	0.0	0.3	-74.9	-13.0	61.9
385.96	V	38.02	-72.4	0.0	0.4	-72.8	-13.0	59.8

LTE Band VII (30MHz-26GHz)

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:2535.000 MHz								
5070	H	47.57	-46.1	9.9	1.7	-37.9	-25.0	12.9
5070	V	42.98	-50.5	9.9	1.7	-42.3	-25.0	17.3
7605	H	46.34	-43.3	10.4	2.3	-35.2	-25.0	10.2
7605	V	45.04	-45.8	10.4	2.3	-37.7	-25.0	12.7
305.47	H	39.02	-73.7	0.0	0.3	-74.0	-25.0	49.0
385.96	V	37	-73.4	0.0	0.4	-73.8	-25.0	48.8
16-QAM,Frequency: 2535.000 MHz								
5070	H	48.02	-45.6	9.9	1.7	-37.4	-25.0	12.4
5070	V	43.26	-50.2	9.9	1.7	-42.0	-25.0	17.0
7605	H	45.47	-44.2	10.4	2.3	-36.1	-25.0	11.1
7605	V	43.58	-47.2	10.4	2.3	-39.1	-25.0	14.1
305.47	H	38.52	-74.2	0.0	0.3	-74.5	-25.0	49.5
385.96	V	36.54	-73.9	0.0	0.4	-74.3	-25.0	49.3

LTE Band 17 (30MHz-10GHz)

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 710.000 MHz								
1420	H	40.4	-62.6	7.4	0.8	-56.0	-13.0	43.0
1420	V	42.39	-60	7.4	0.8	-53.4	-13.0	40.4
2130	H	43.69	-55.4	8.3	1.3	-48.4	-13.0	35.4
2130	V	44.41	-52.4	8.3	1.3	-45.4	-13.0	32.4
305.47	H	38.24	-74.5	0.0	0.3	-74.8	-13.0	61.8
385.96	V	36.74	-73.7	0.0	0.4	-74.1	-13.0	61.1
16-QAM, Frequency: 710.000 MHz								
1420	H	41.52	-61.5	7.4	0.8	-54.9	-13.0	41.9
1420	V	43.05	-59.3	7.4	0.8	-52.7	-13.0	39.7
2130	H	43.85	-55.3	8.3	1.3	-48.3	-13.0	35.3
2130	V	44.76	-52.1	8.3	1.3	-45.1	-13.0	32.1
305.47	H	38.66	-74.1	0.0	0.3	-74.4	-13.0	61.4
385.96	V	36.47	-73.9	0.0	0.4	-74.3	-13.0	61.3

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 = SG Level - Cable loss + Antenna Gain
- 3) Margin = Limit - Absolute Level

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

Applicable Standard

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

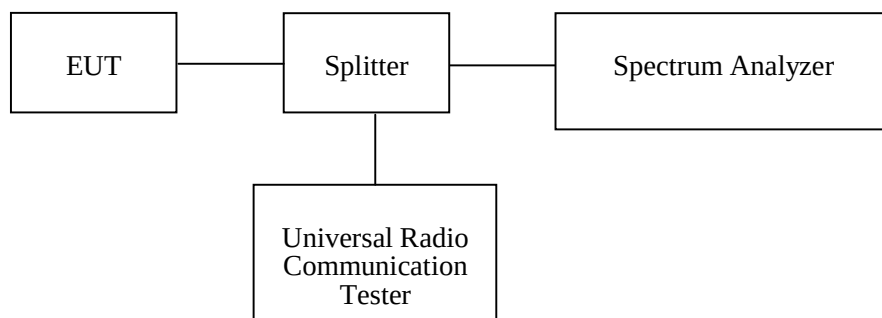
According to §27.53 (h), AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

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

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	2016-09-21	2017-09-20
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2015-12-02	2016-12-01
N/A	RF Cable	N/A	N/A	Each Time	/
N/A	Two-way Splitter	N/A	OE0120121	Each Time	/

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

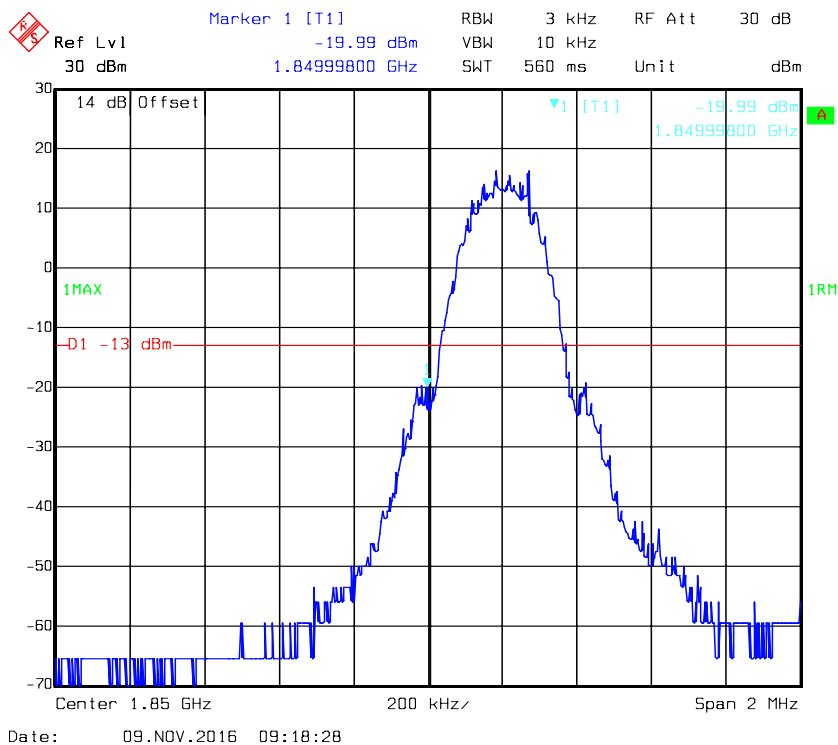
Temperature:	26.7~29.8 °C
Relative Humidity:	31~39.5 %
ATM Pressure:	100.7~101.2 kPa

The testing was performed by Tom Tang from 2016-11-08 to 2016-11-19.

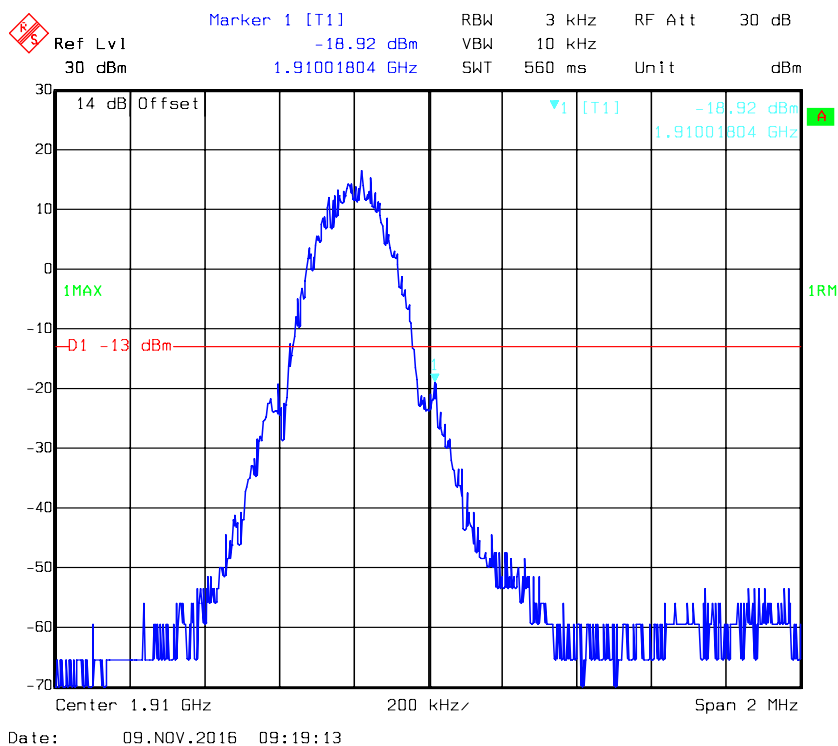
Test Mode: Transmitting

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

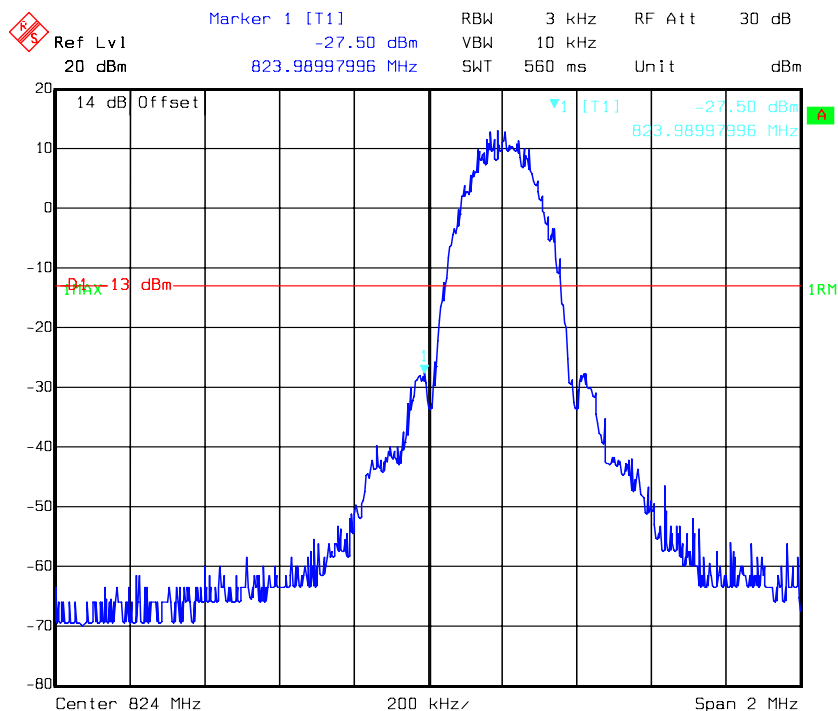
GSM 1900, Left Band Edge



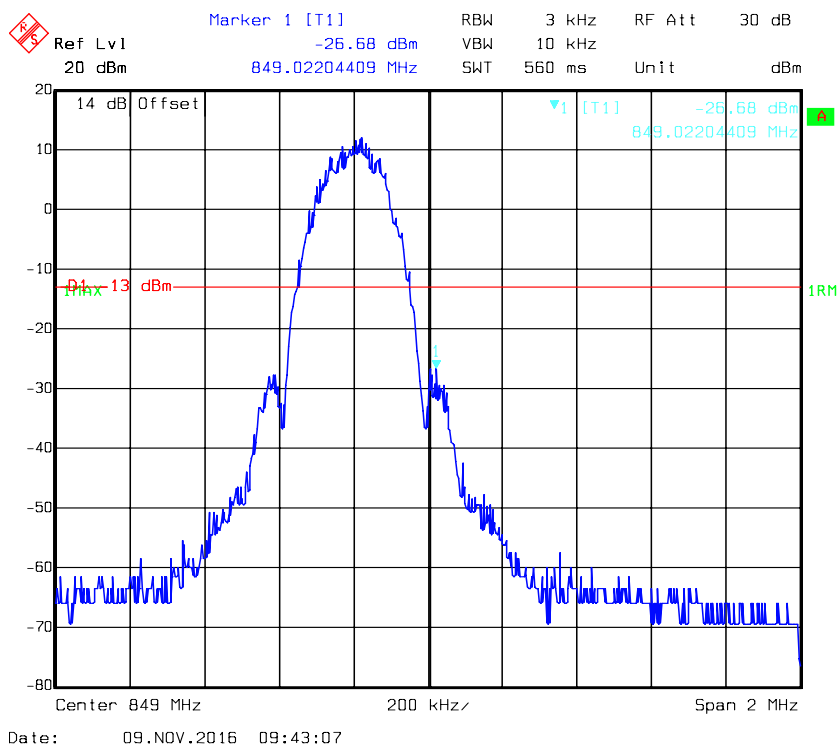
GSM 1900, Right Band Edge



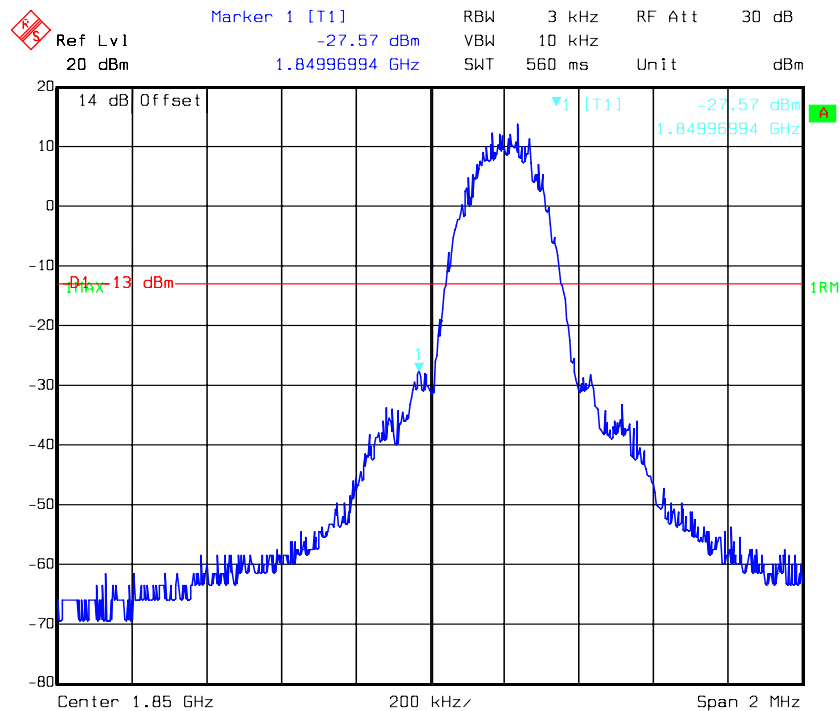
EDGE 850, Left Band Edge



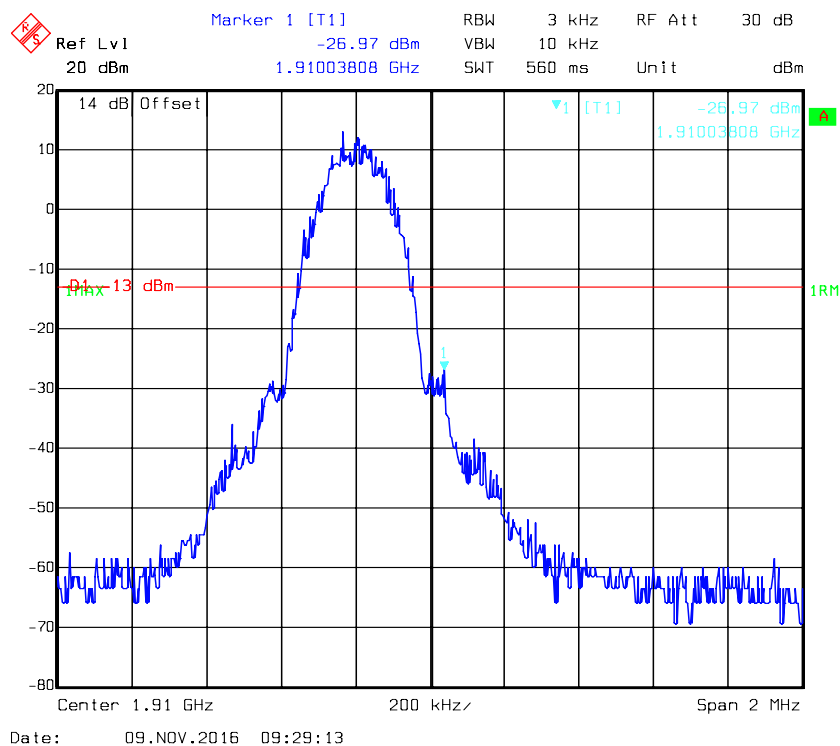
EDGE 850, Right Band Edge



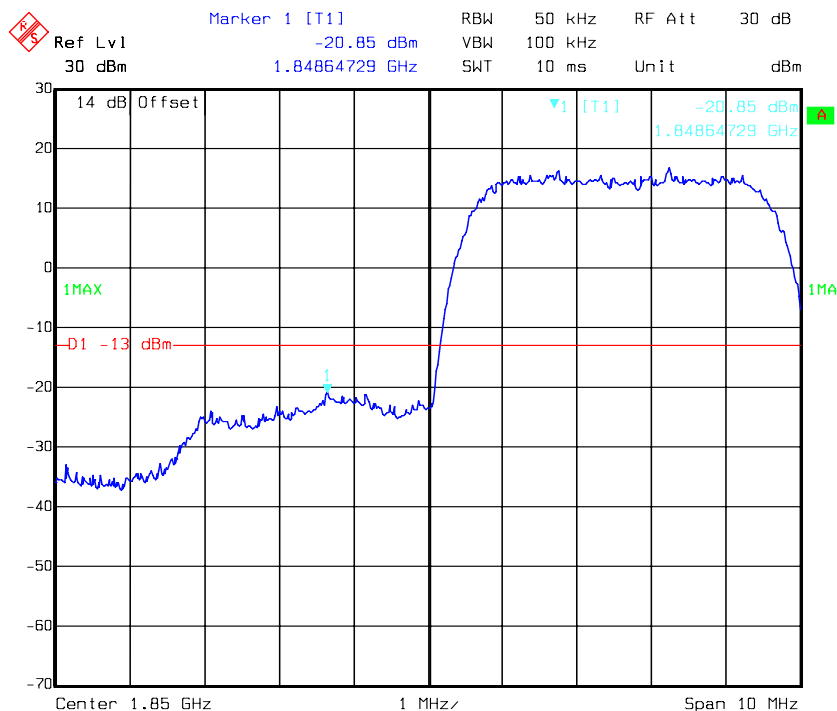
EDGE 1900, Left Band Edge



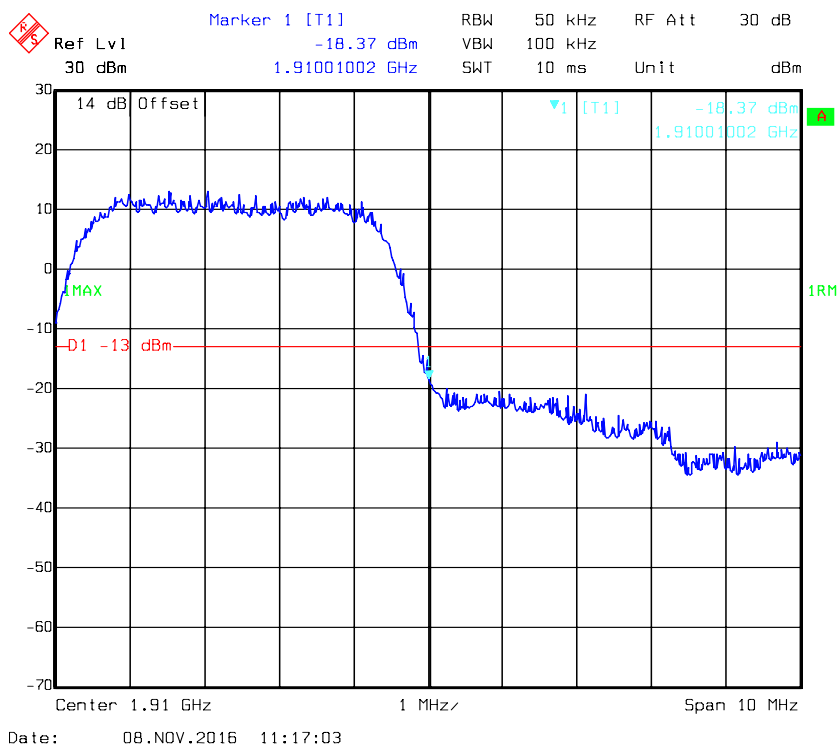
EDGE 1900, Right Band Edge



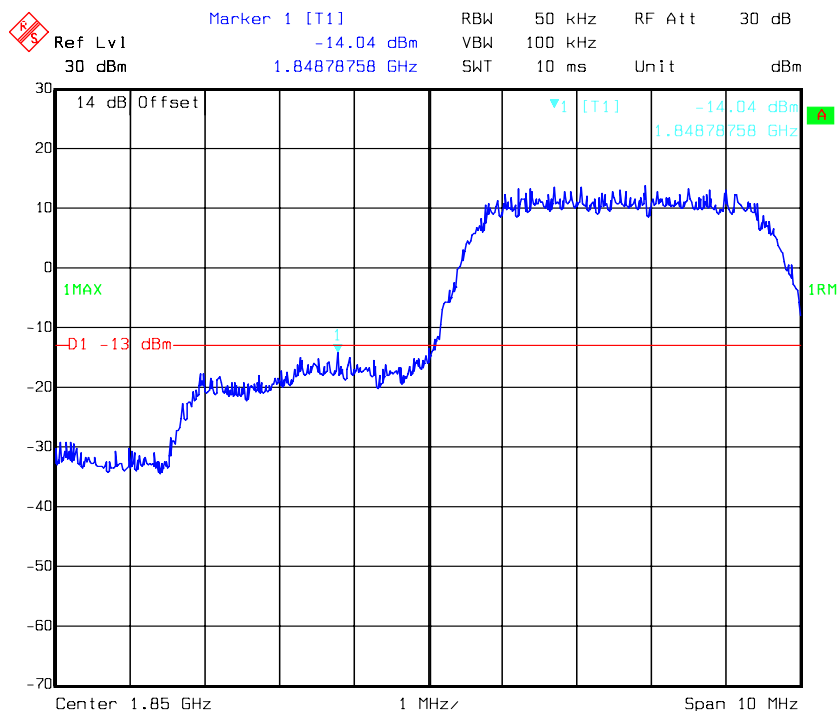
REL99 Band II, Left Band Edge



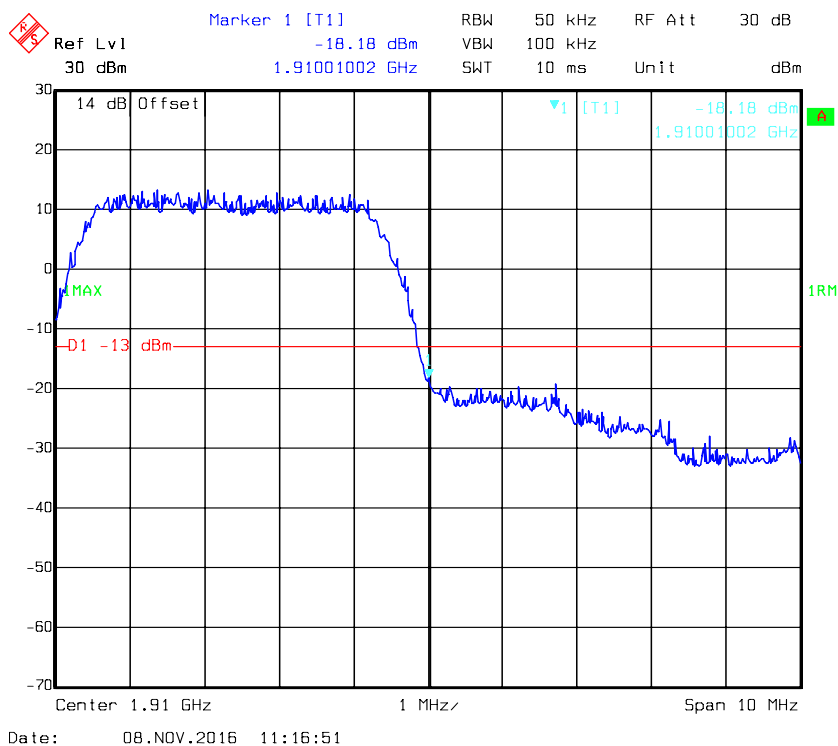
REL99 Band II, Right Band Edge



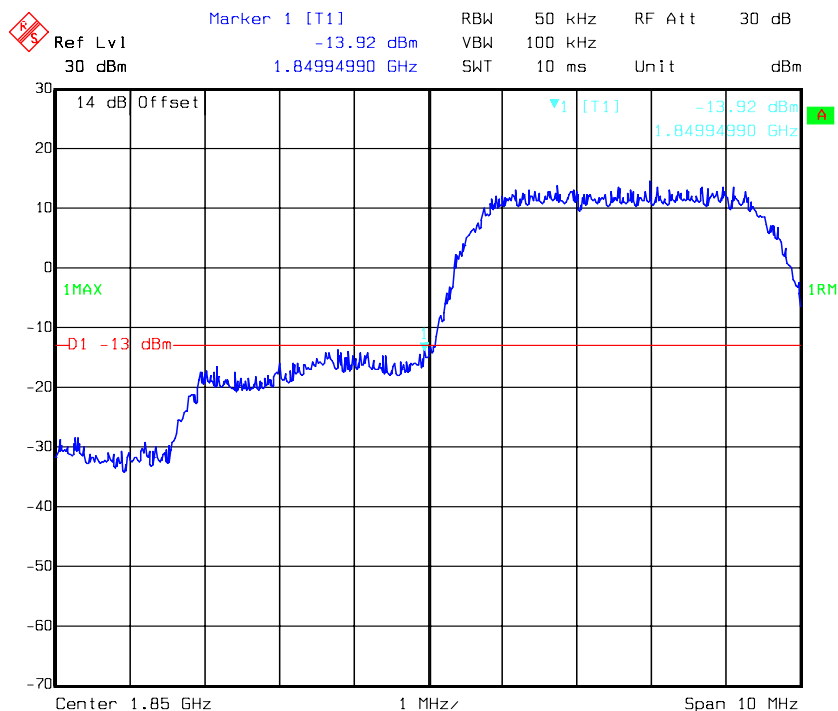
HSDPA Band II, Left Band Edge



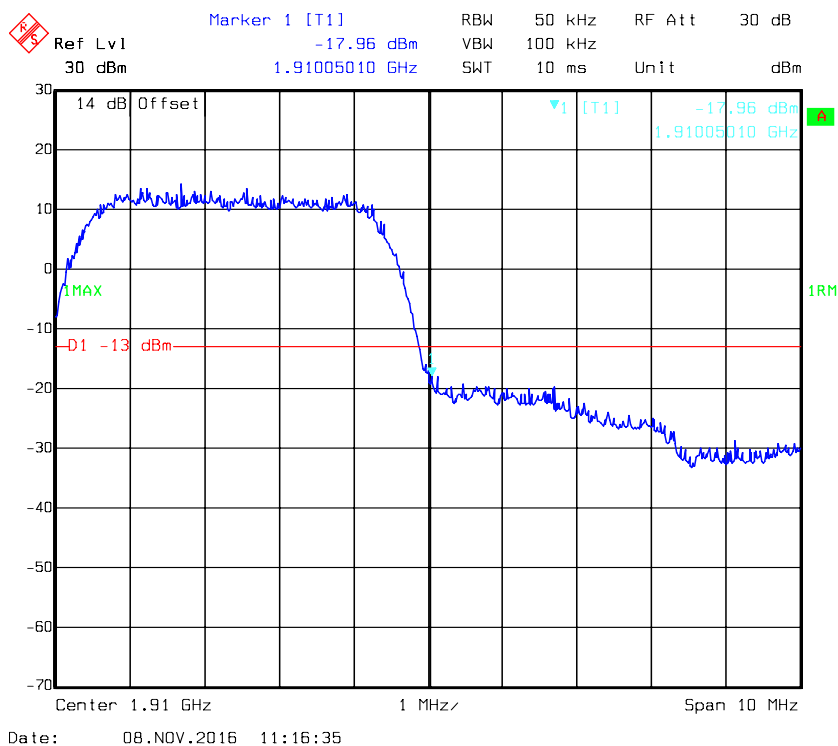
HSDPA Band II, Right Band Edge



HSUPA Band II, Left Band Edge

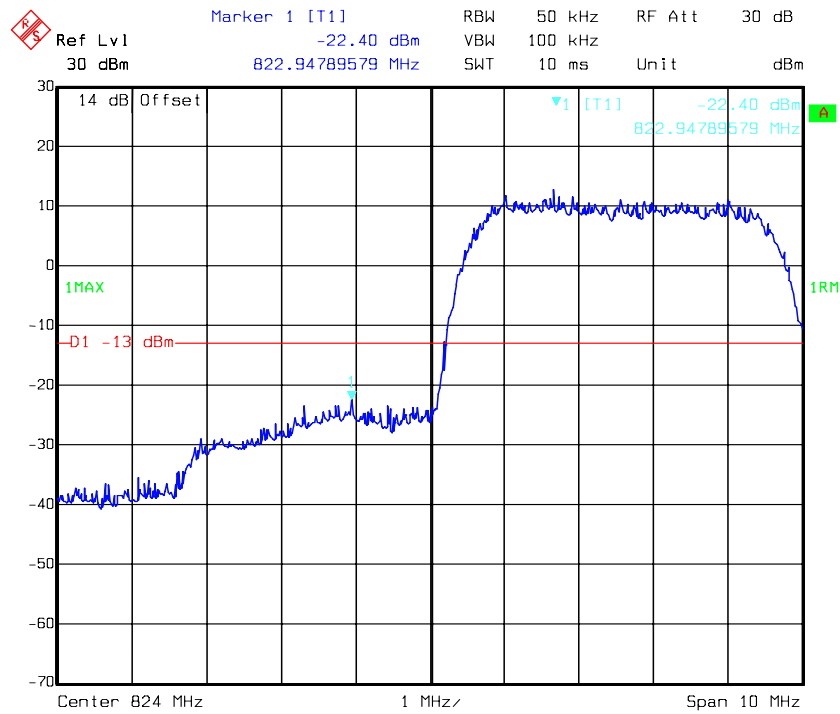


HSUPA Band II, Right Band Edge



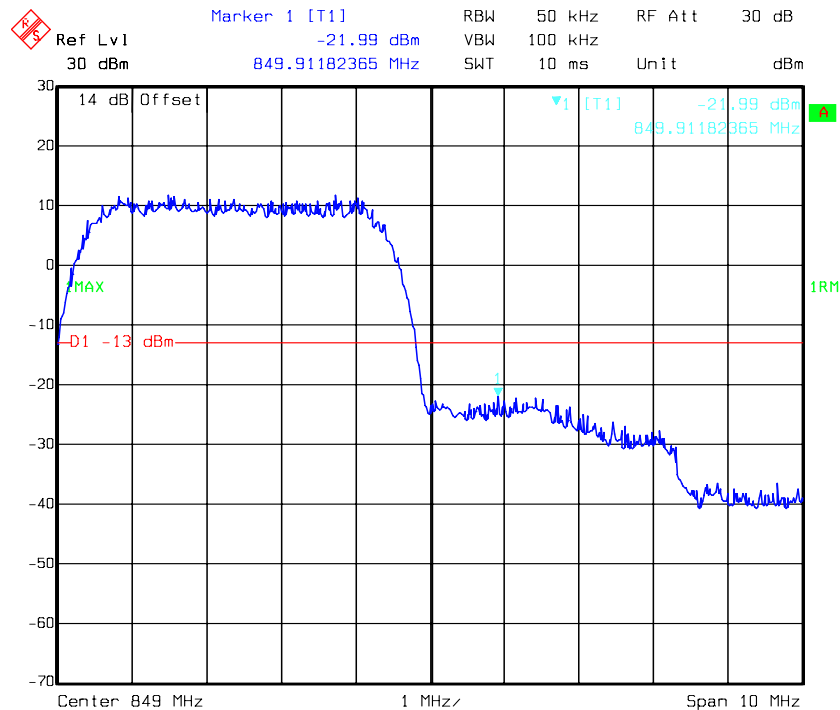
WCDMA Band V

REL99 Band V, Left Band Edge



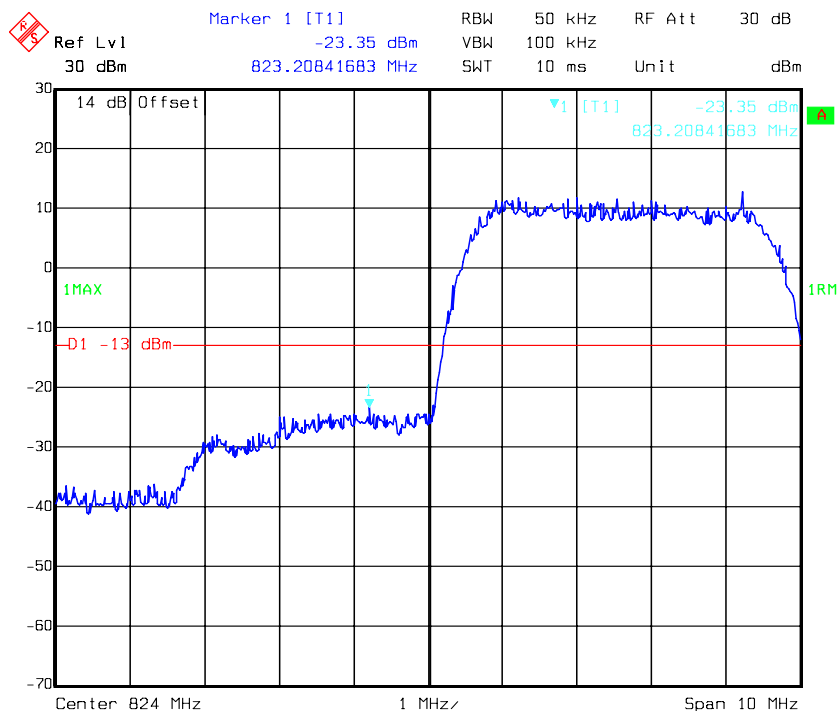
Date: 08.NOV.2016 11:19:35

REL99 Band V Right Band Edge



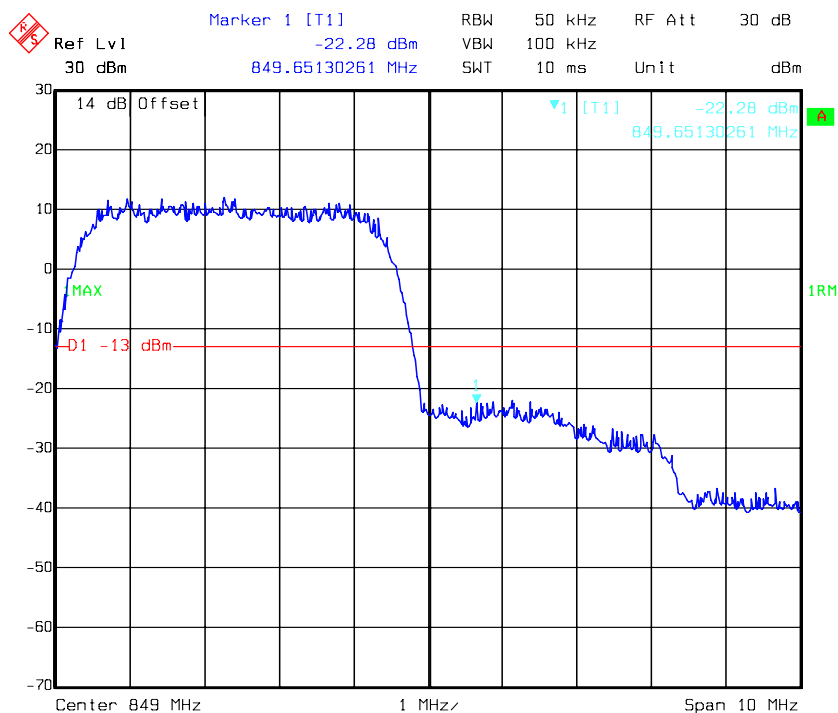
Date: 08.NOV.2016 11:21:27

HSDPA Band V, Left Band Edge



Date: 08.NOV.2016 11:19:55

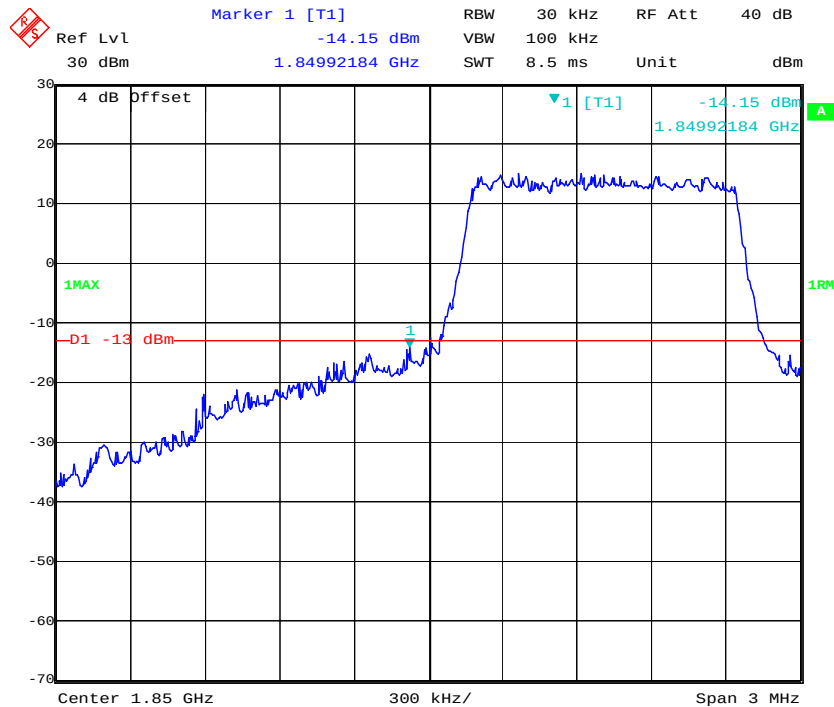
HSDPA Band V, Right Band Edge



Date: 08.NOV.2016 11:21:05

LTE Band II

QPSK_1.4MHz_ FULL RB_ Left



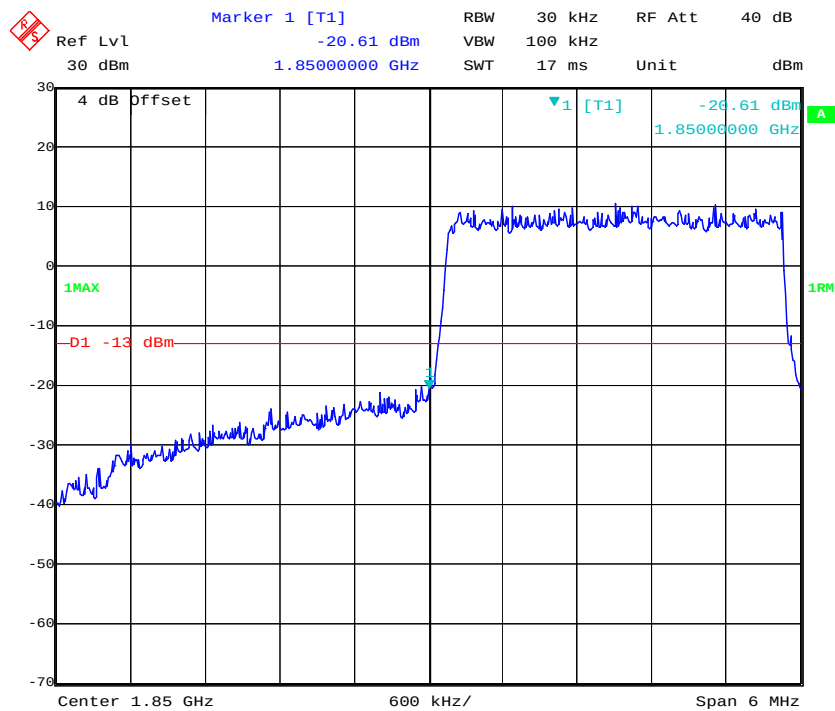
Date: 19.NOV.2016 14:14:25

QPSK_1.4MHz_ FULL RB_ Right

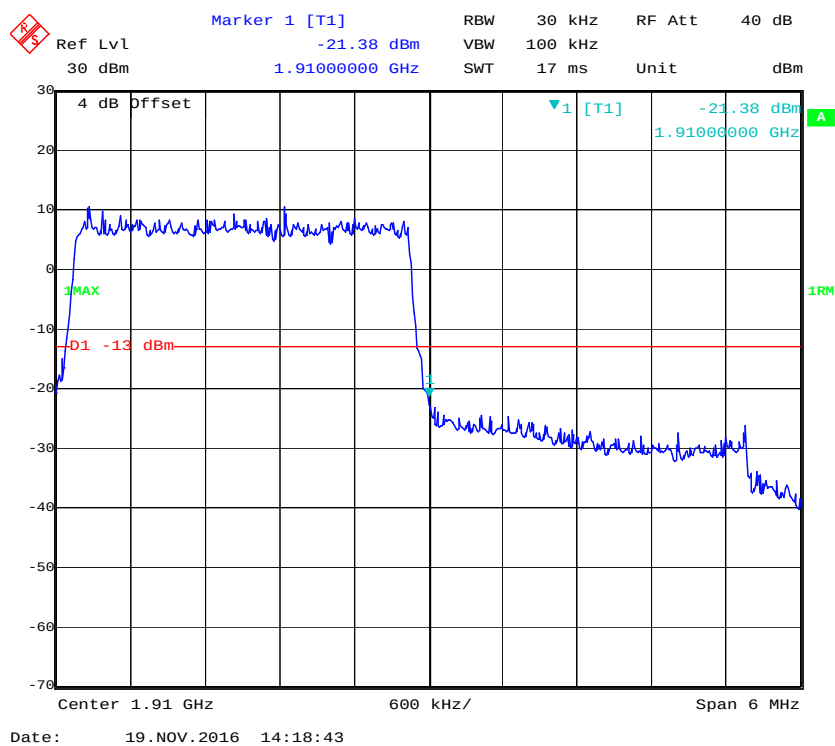


Date: 19.NOV.2016 14:17:17

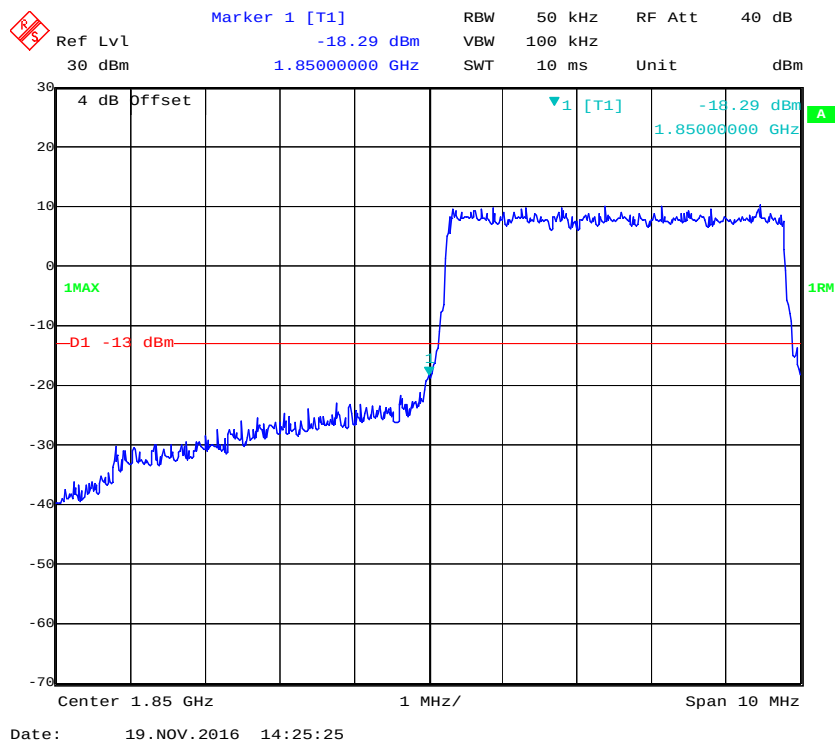
QPSK_3MHz_FULL RB_Left



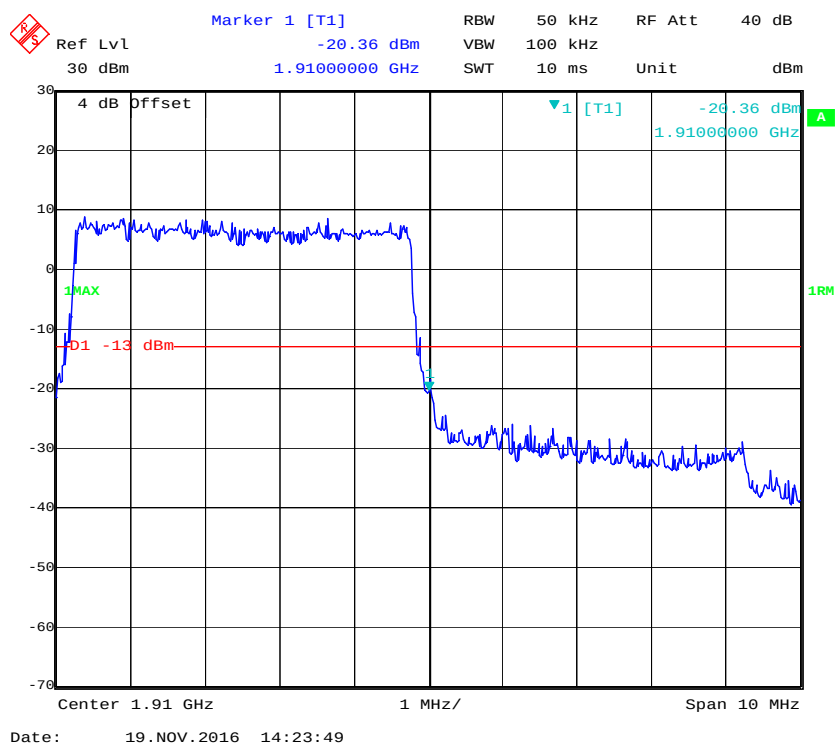
QPSK_3MHz_FULL RB_Right



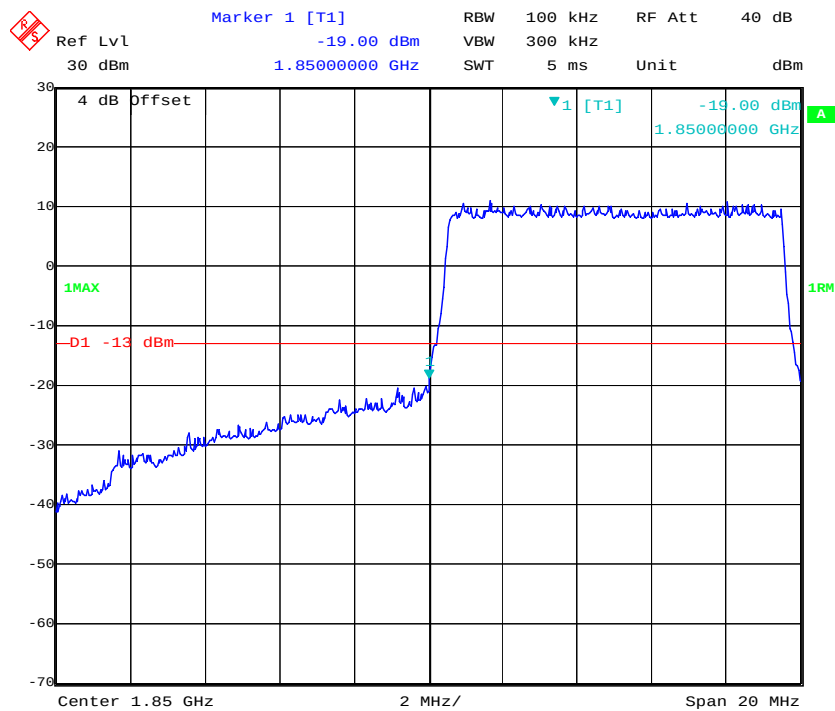
QPSK_5MHz_FULL RB_Left



QPSK_5MHz_FULL RB_Right

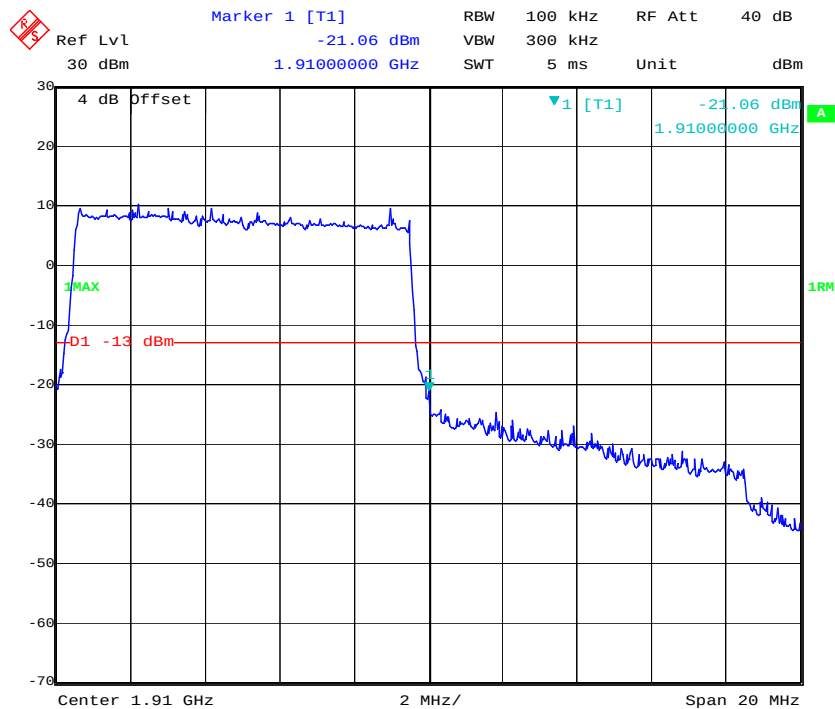


QPSK_10MHz_FULL RB_Left



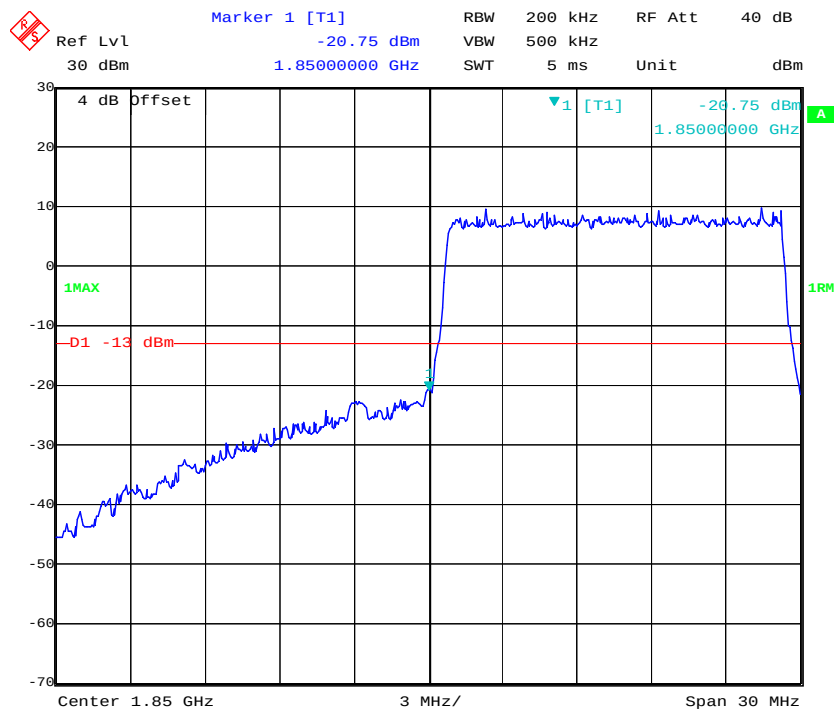
Date: 19.NOV.2016 14:28:19

QPSK_10MHz_FULL RB_Right

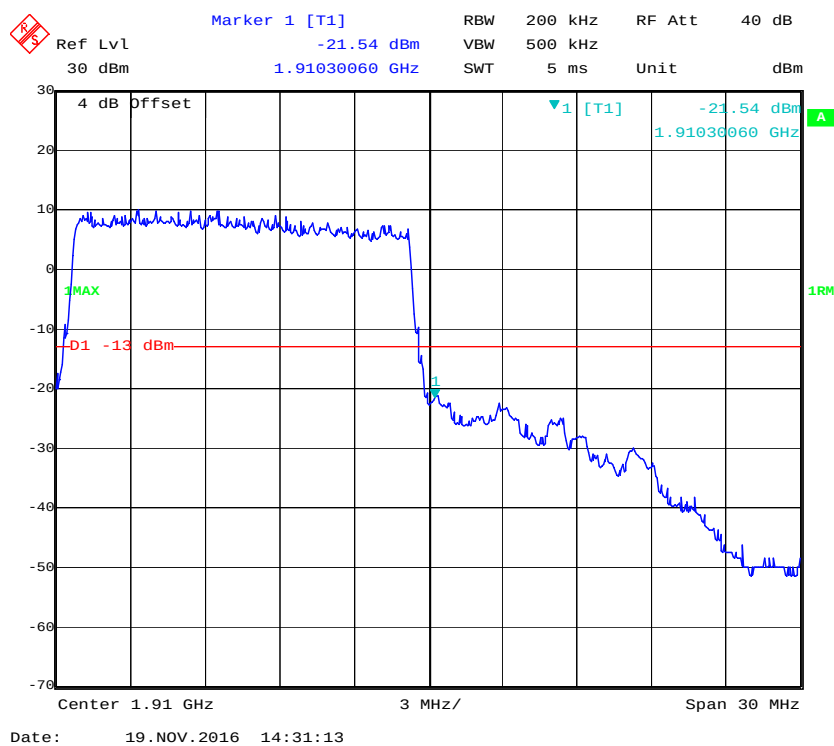


Date: 19.NOV.2016 14:30:01

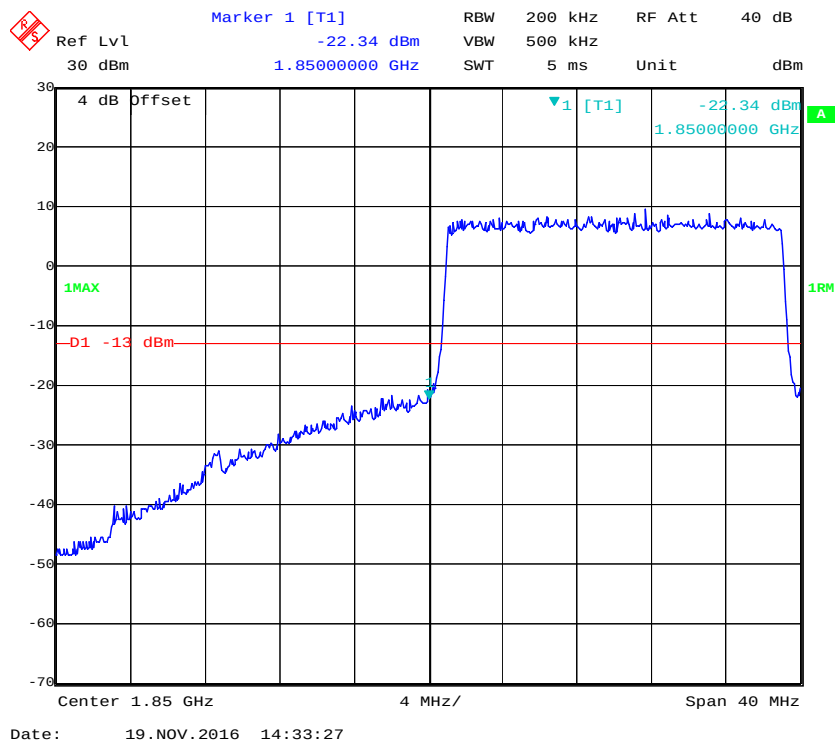
QPSK_15MHz_FULL RB_Left



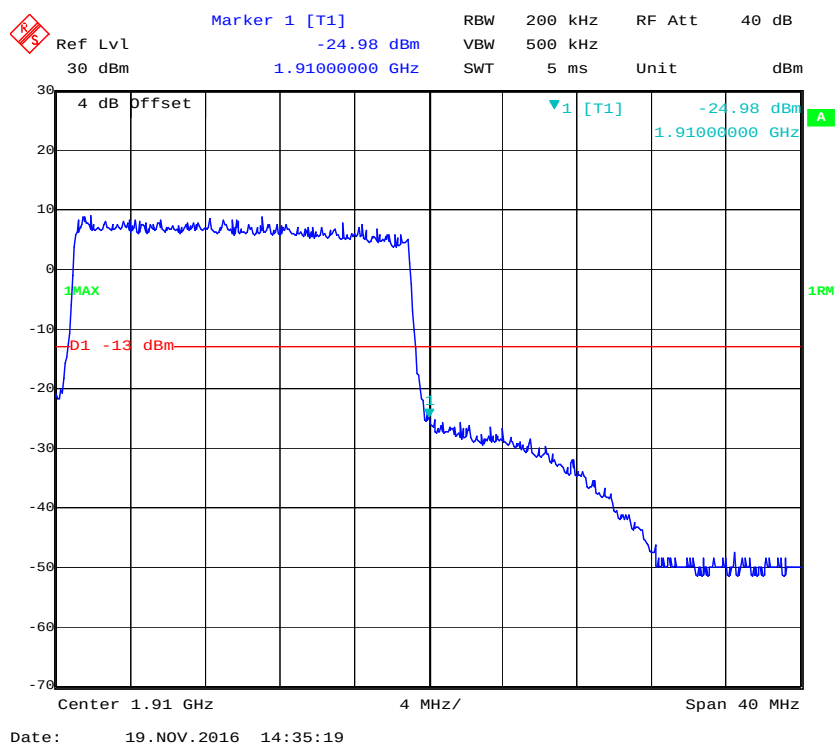
QPSK_15MHz_FULL RB_Right



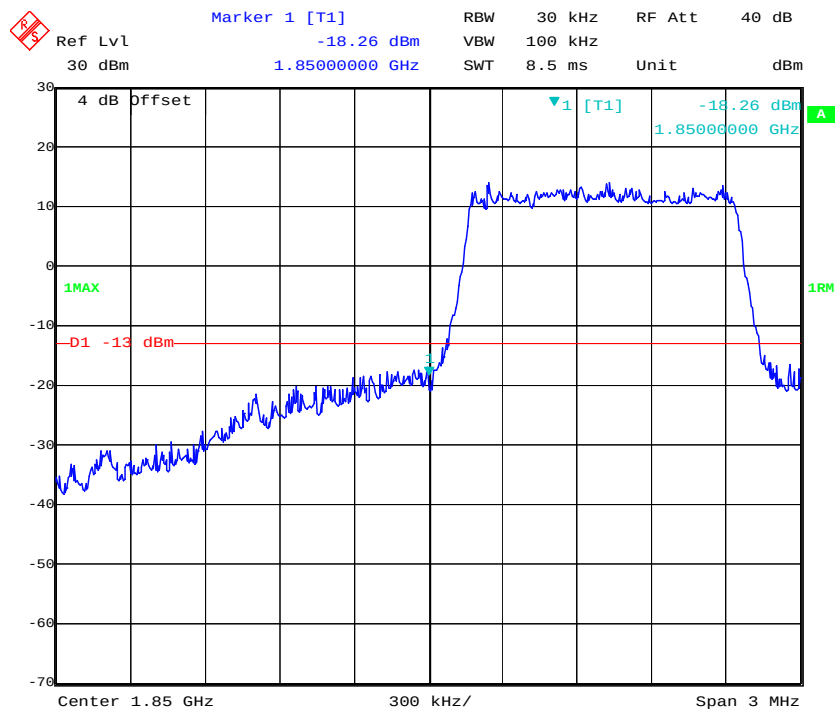
QPSK_20MHz_ FULL RB_ Left



QPSK_20MHz_ FULL RB_ Right



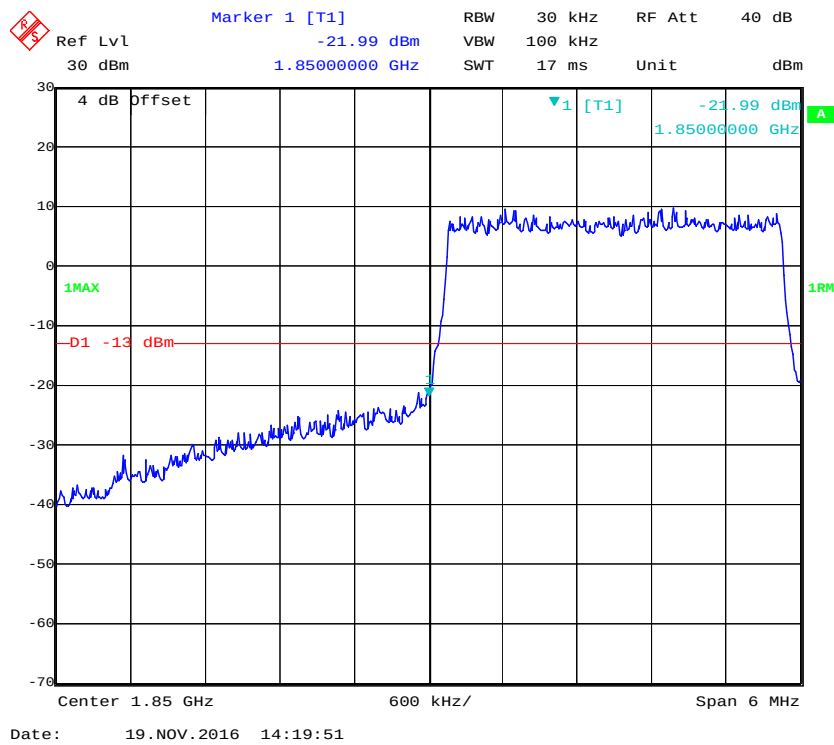
16QAM_1.4MHz_ FULL RB_ Left



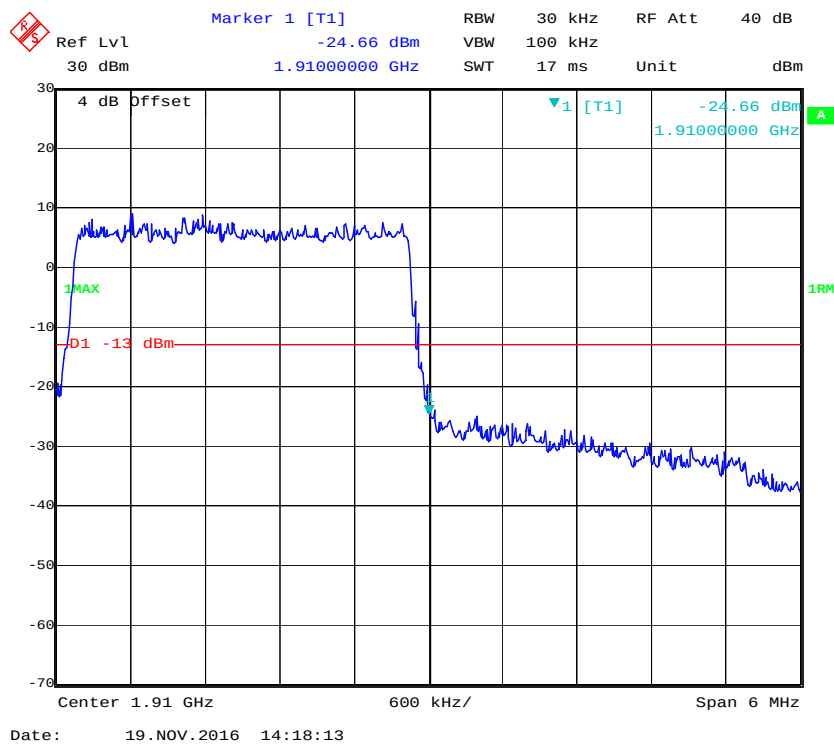
16QAM_1.4MHz_ FULL RB_ Right



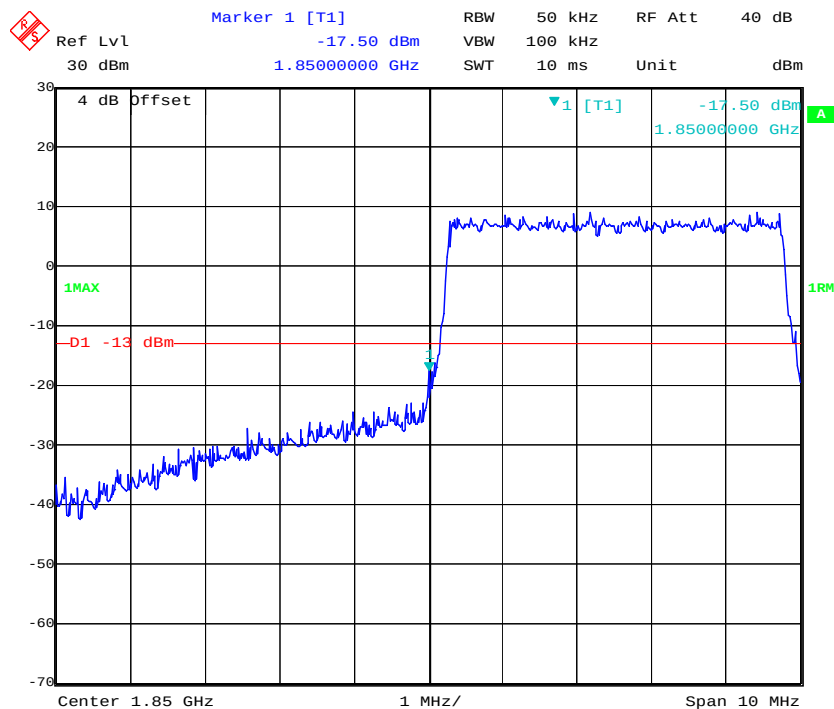
16QAM_3MHz_ FULL RB_ Left



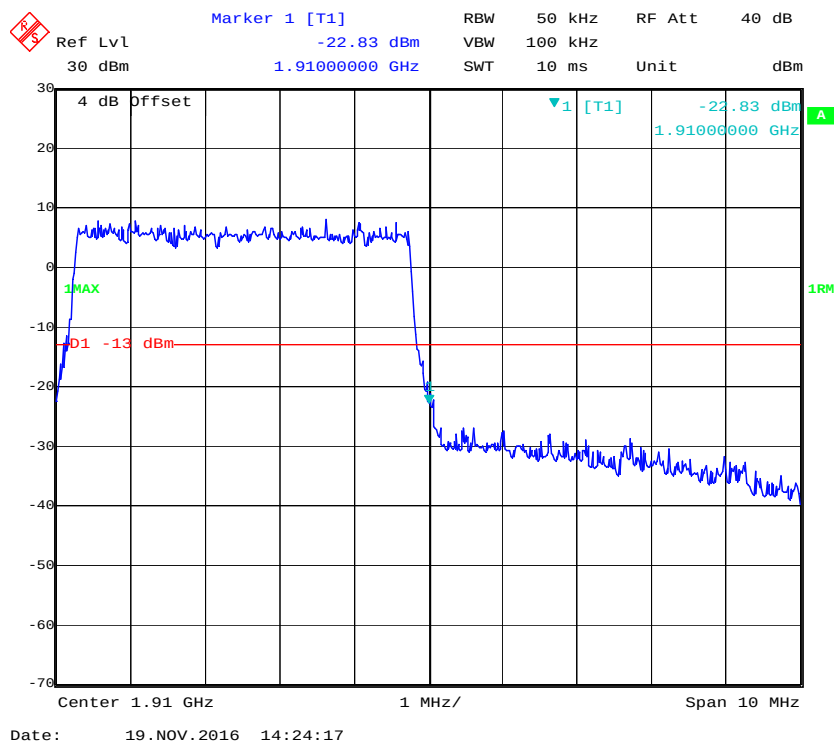
16QAM_3MHz_ FULL RB_ Right



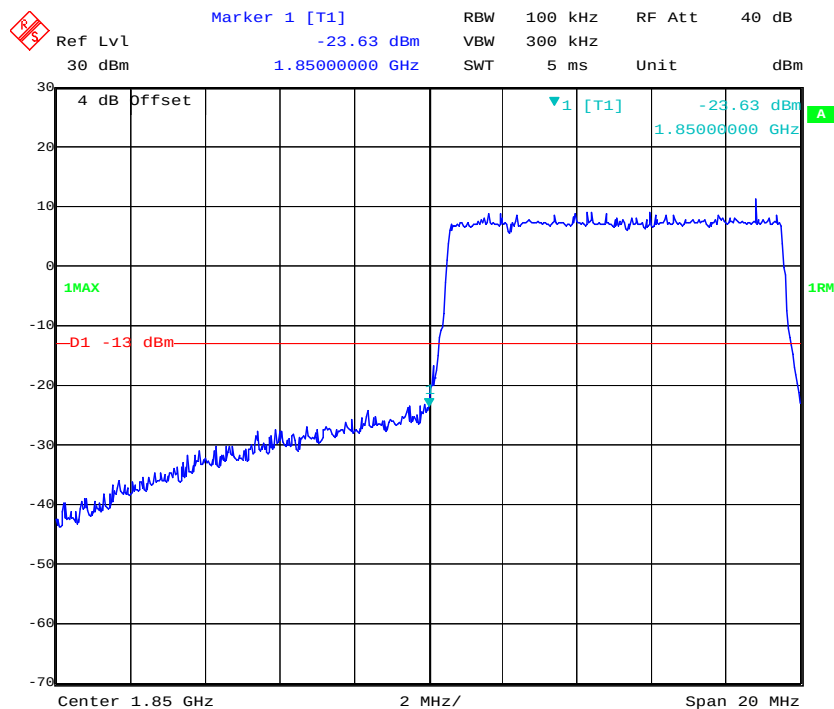
16QAM_5MHz_ FULL RB_ Left



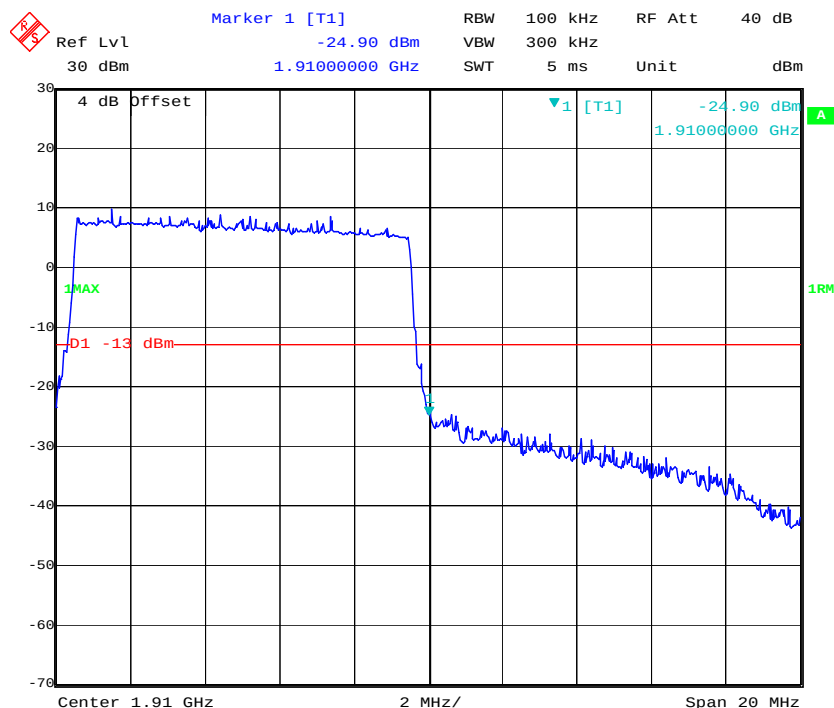
16QAM_5MHz_ FULL RB_ Right



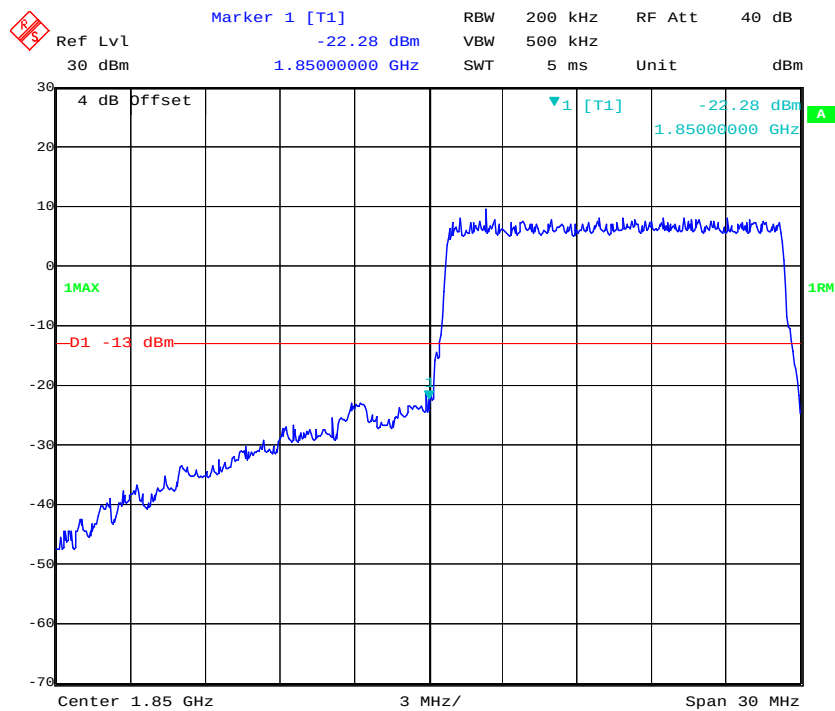
16QAM_10MHz_FULL RB_Left



16QAM_10MHz_FULL RB_Right



16QAM_15MHz_FULL RB_Left



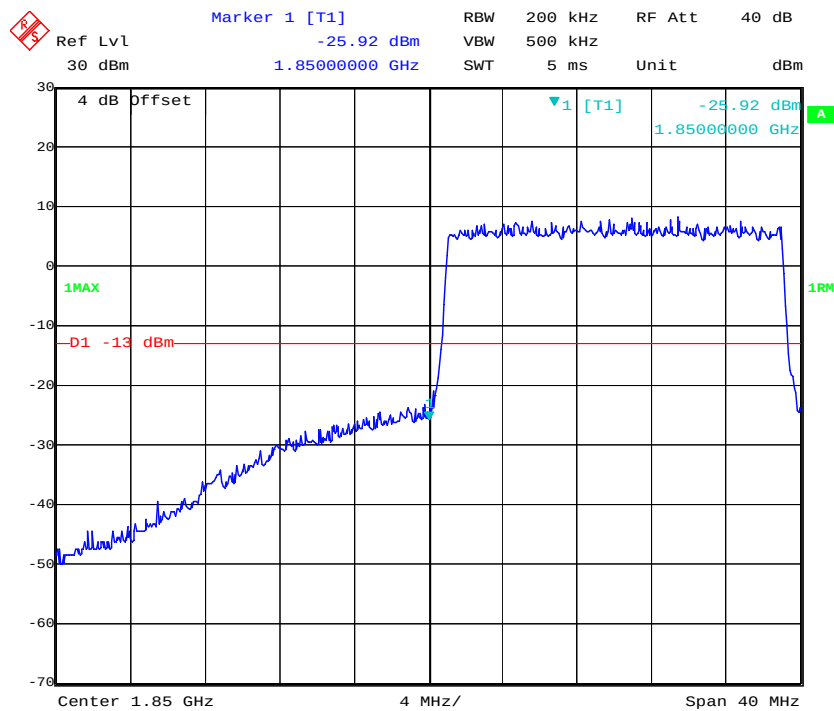
Date: 19.NOV.2016 14:32:06

16QAM_15MHz_FULL RB_Right

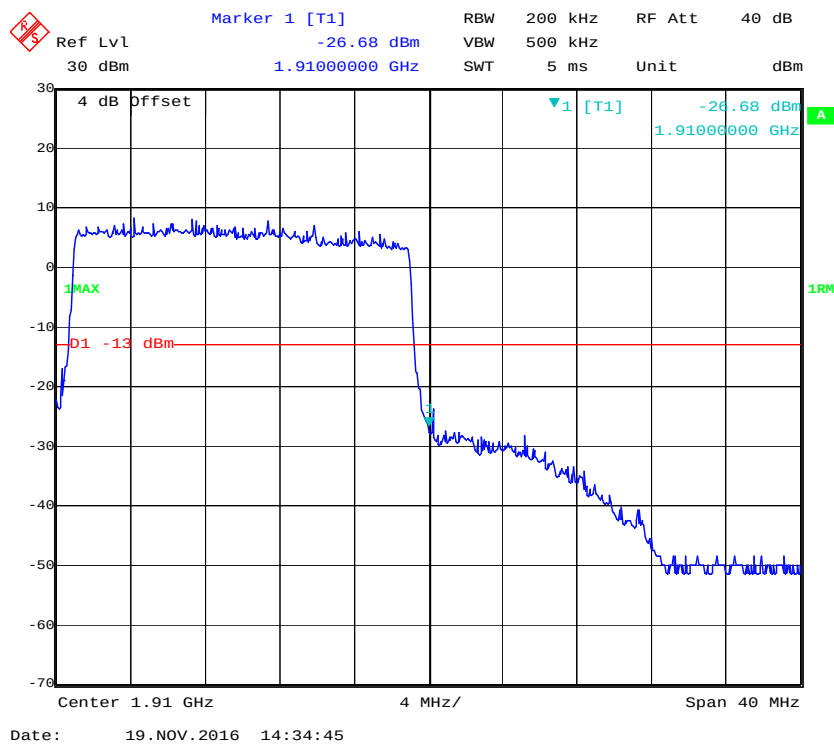


Date: 19.NOV.2016 14:31:41

16QAM_20MHz_FULL RB_Left

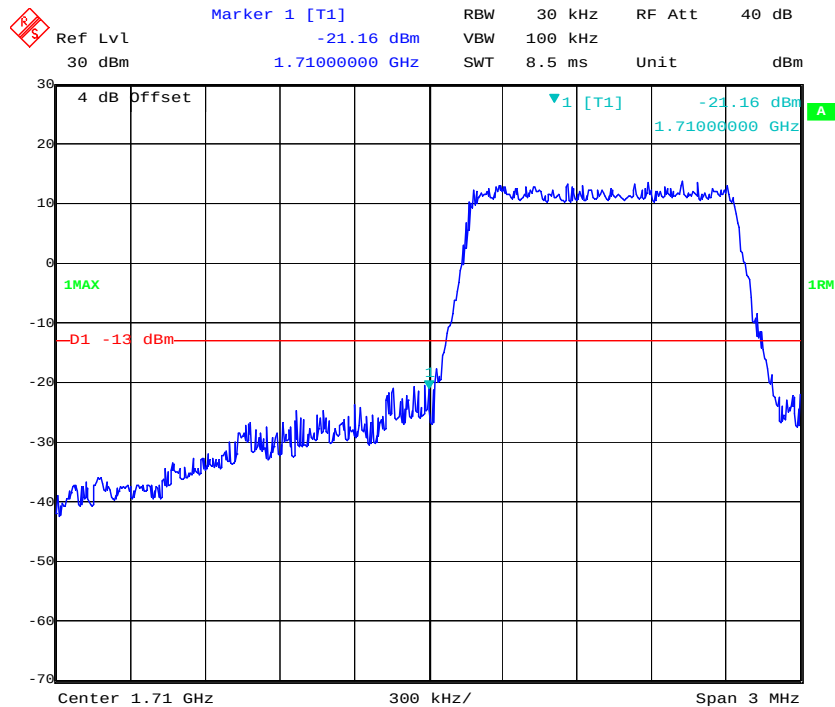


16QAM_20MHz_FULL RB_Right



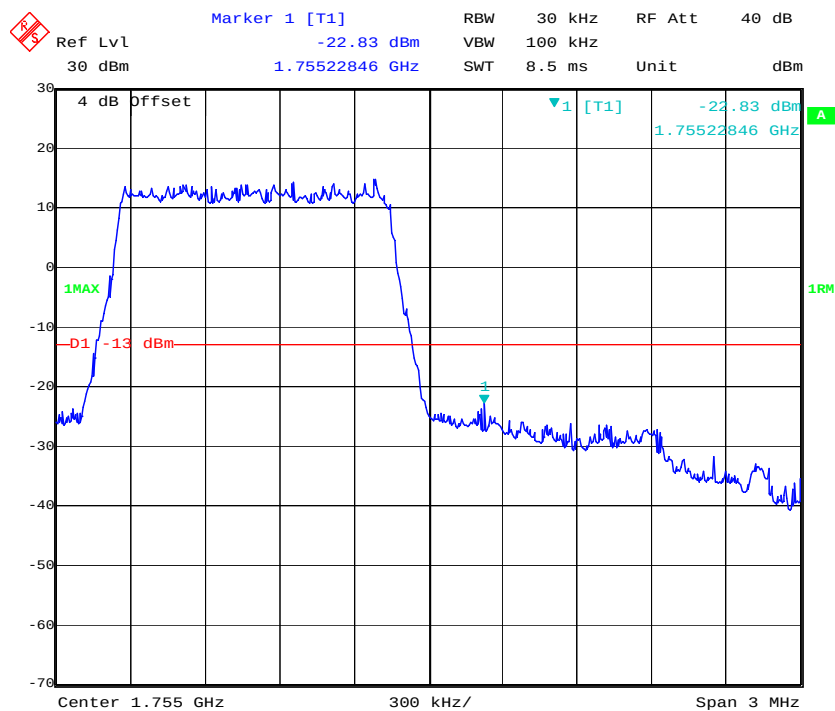
LTE Band IV

QPSK_1.4MHz_ FULL RB_ Left



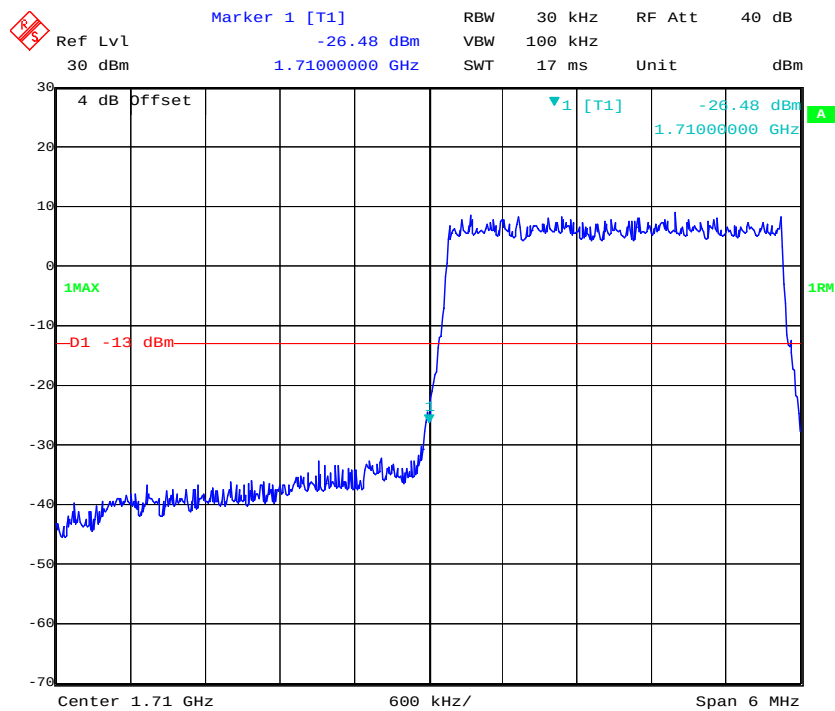
Date: 19.NOV.2016 14:54:05

QPSK_1.4MHz_ FULL RB_ Right

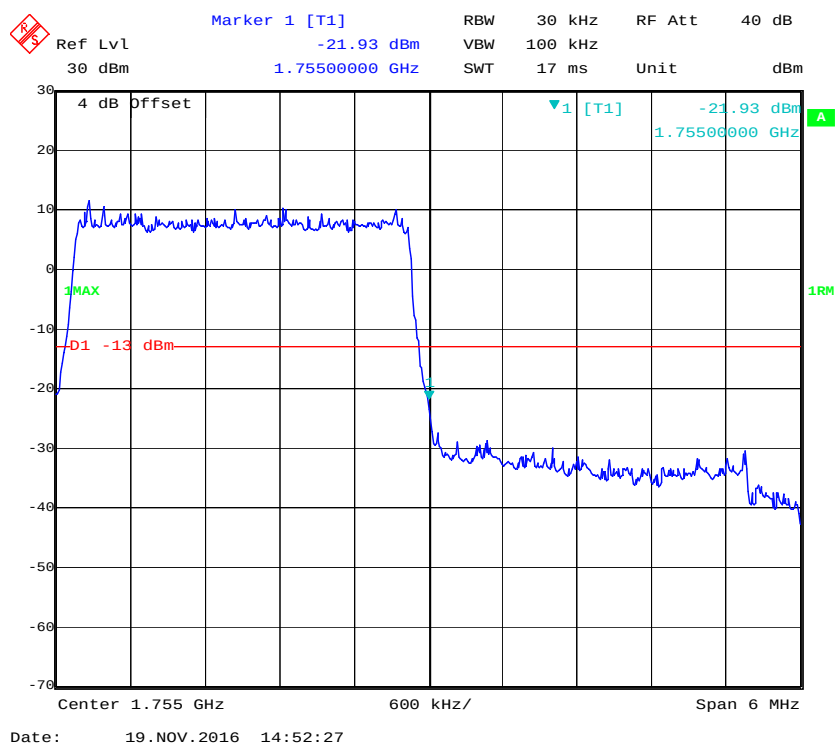


Date: 19.NOV.2016 14:57:51

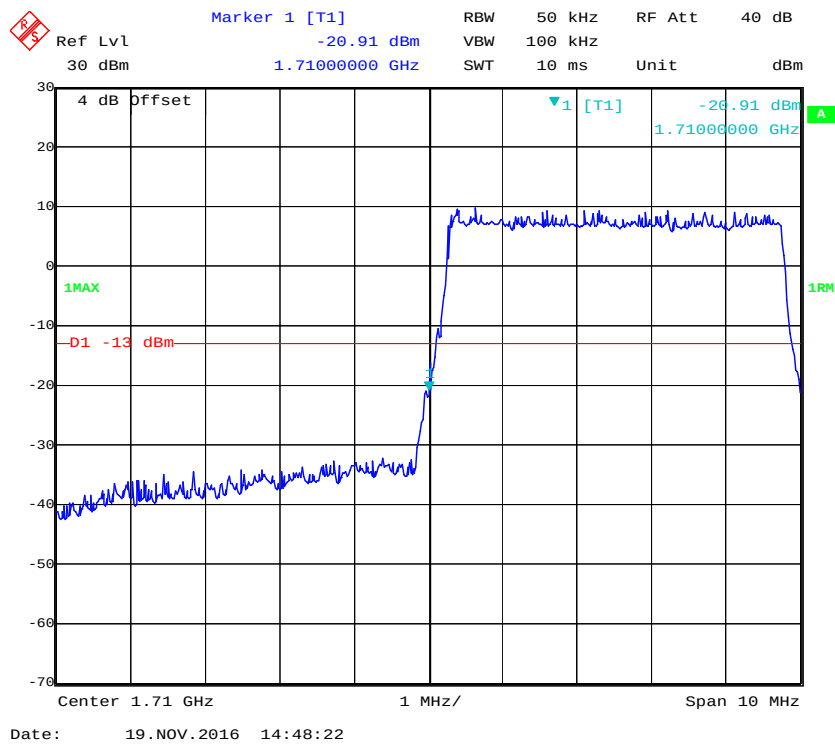
QPSK_3MHz_FULL RB_Left



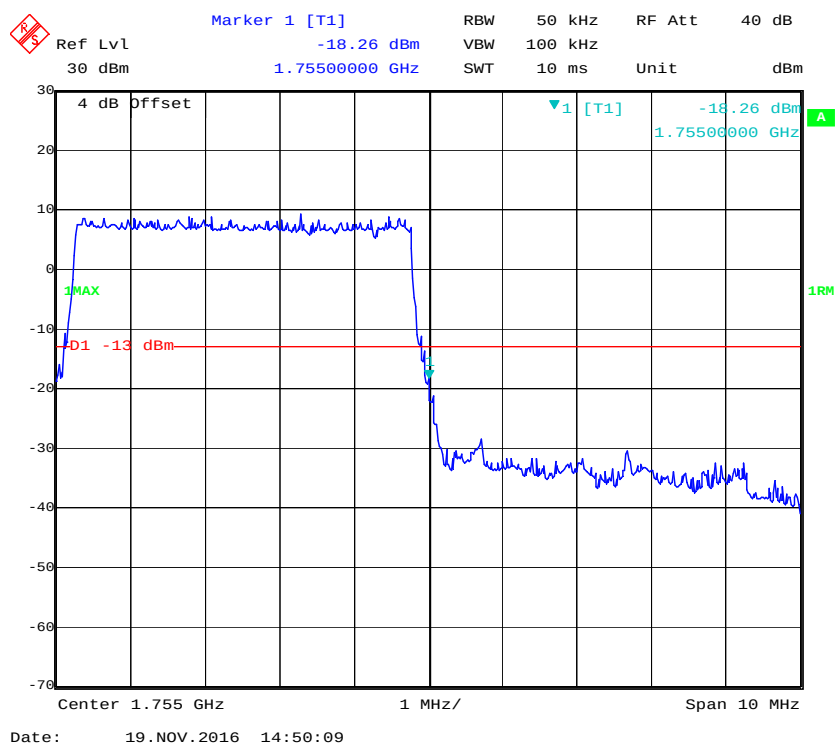
QPSK_3MHz_FULL RB_Right



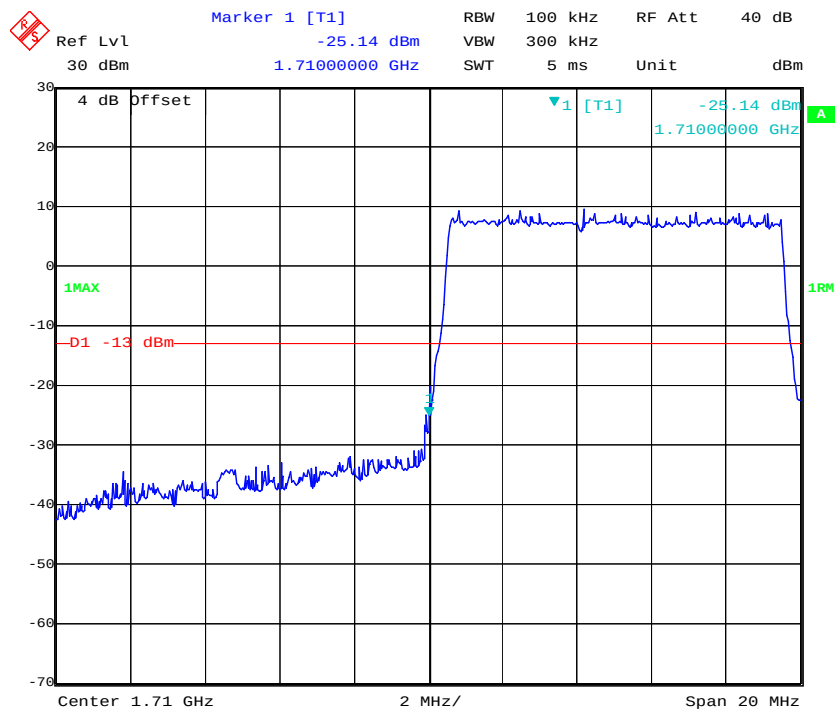
QPSK_5MHz_FULL RB_Left



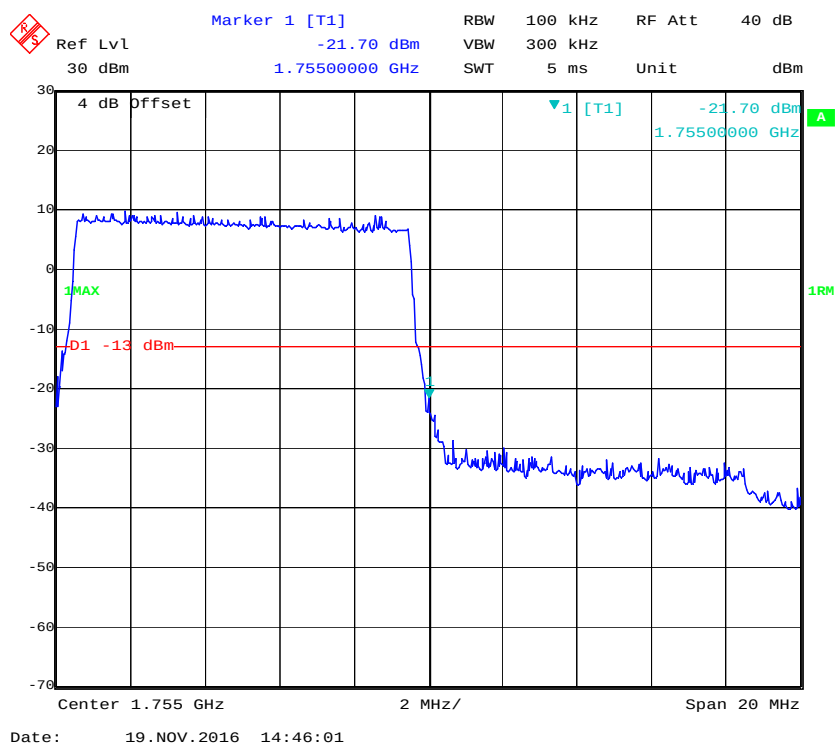
QPSK_5MHz_FULL RB_Right



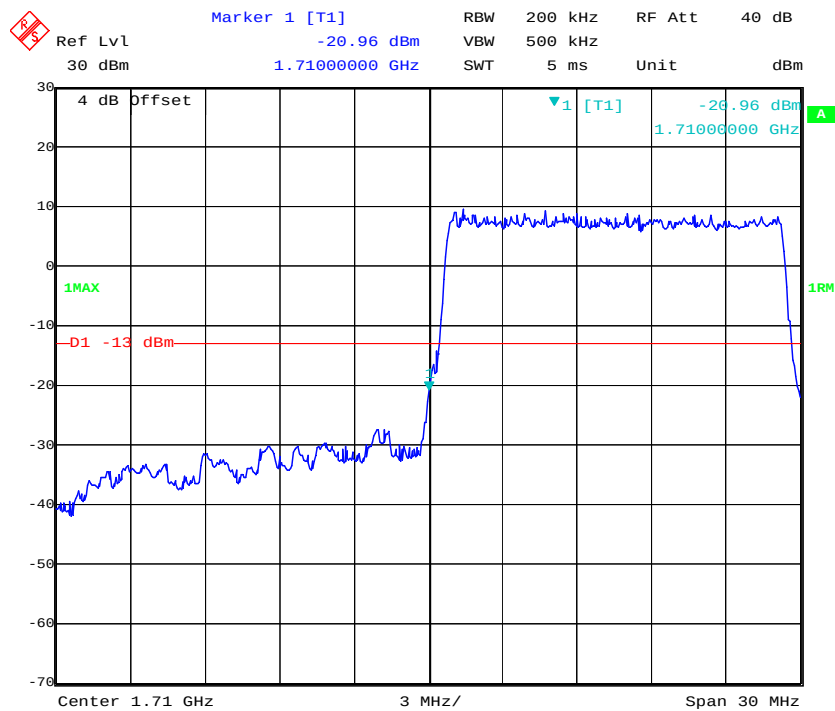
QPSK_10MHz_ FULL RB_ Left



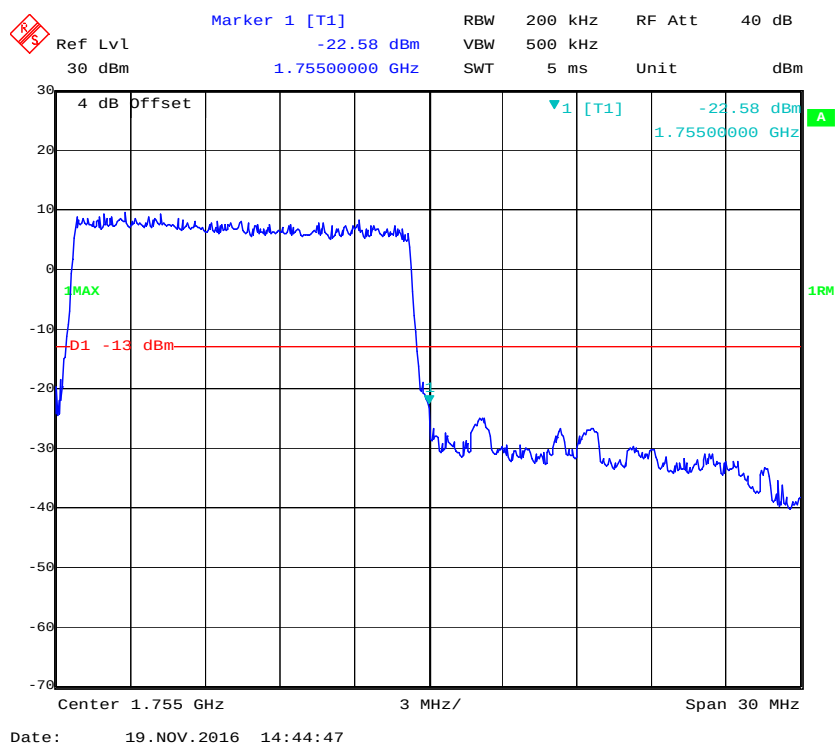
QPSK_10MHz_ FULL RB_ Right



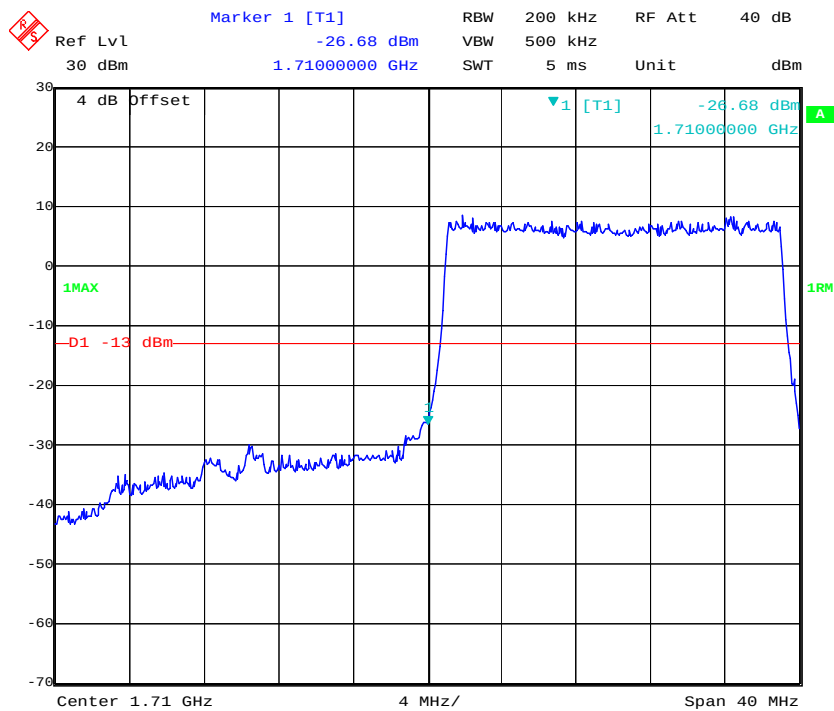
QPSK_15MHz_ FULL RB_ Left



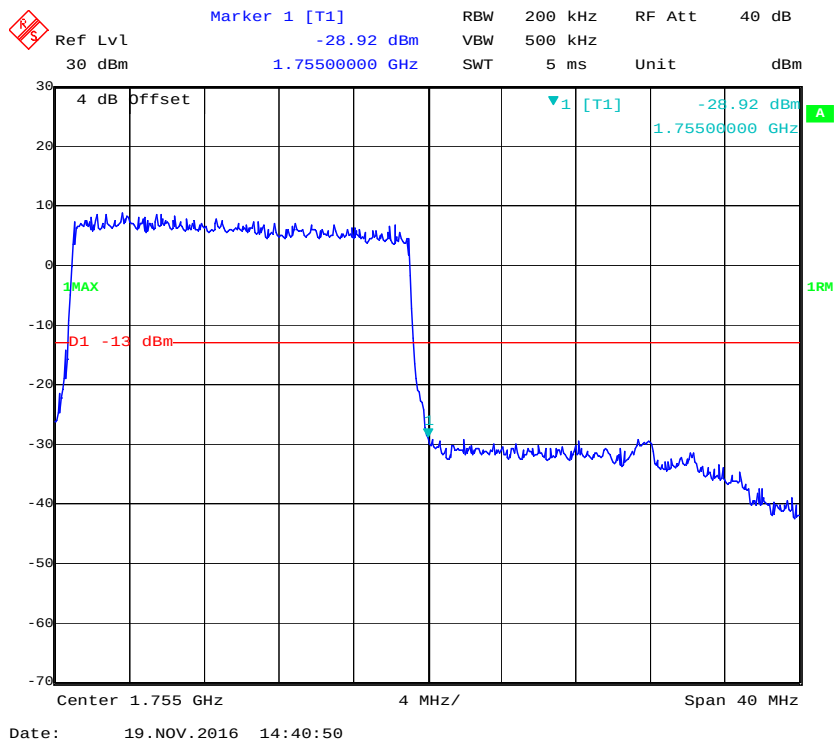
QPSK_15MHz_ FULL RB_ Right



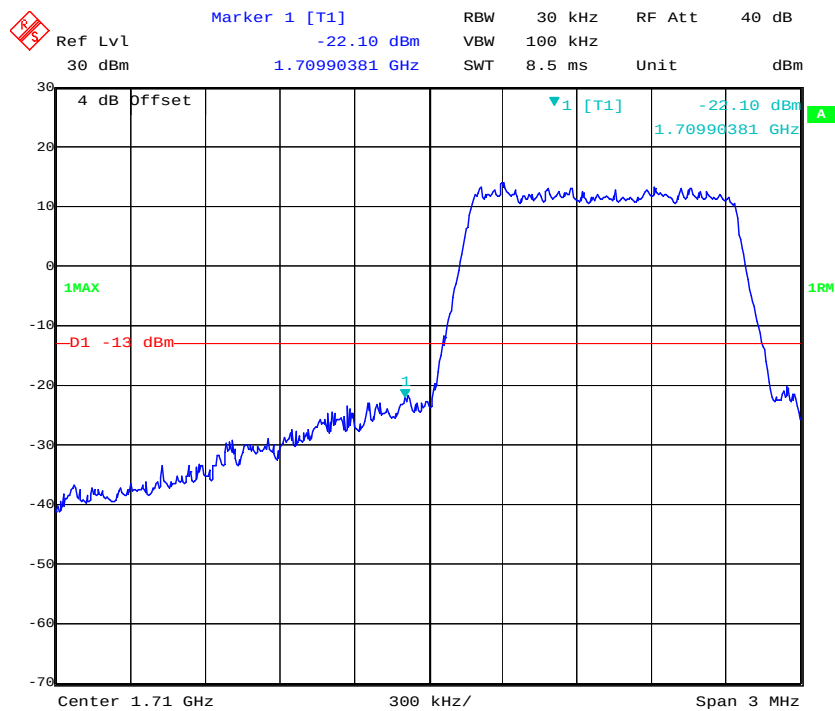
QPSK_20MHz_ FULL RB_ Left



QPSK_20MHz_ FULL RB_ Right

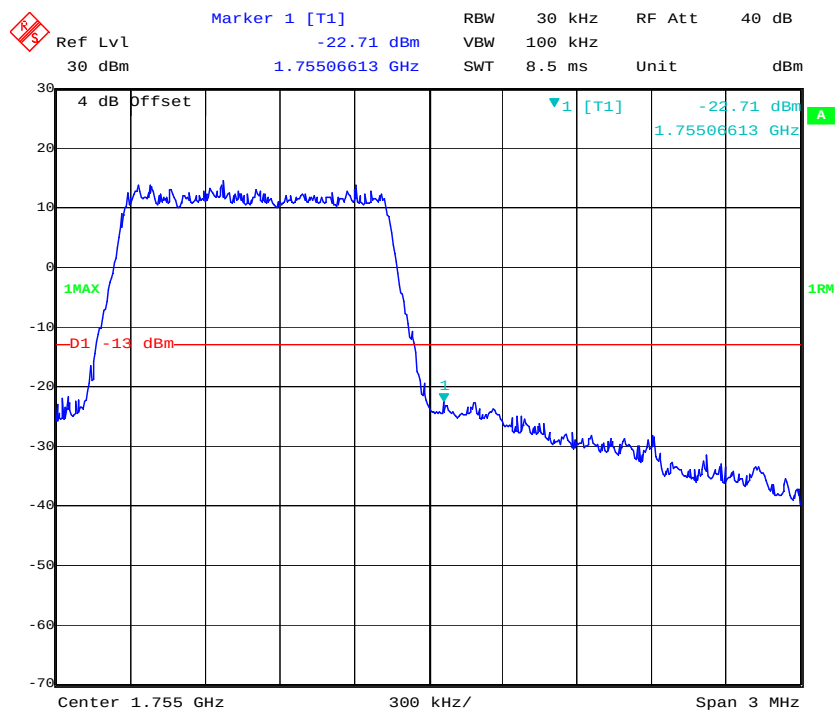


16QAM_1.4MHz_ FULL RB_ Left



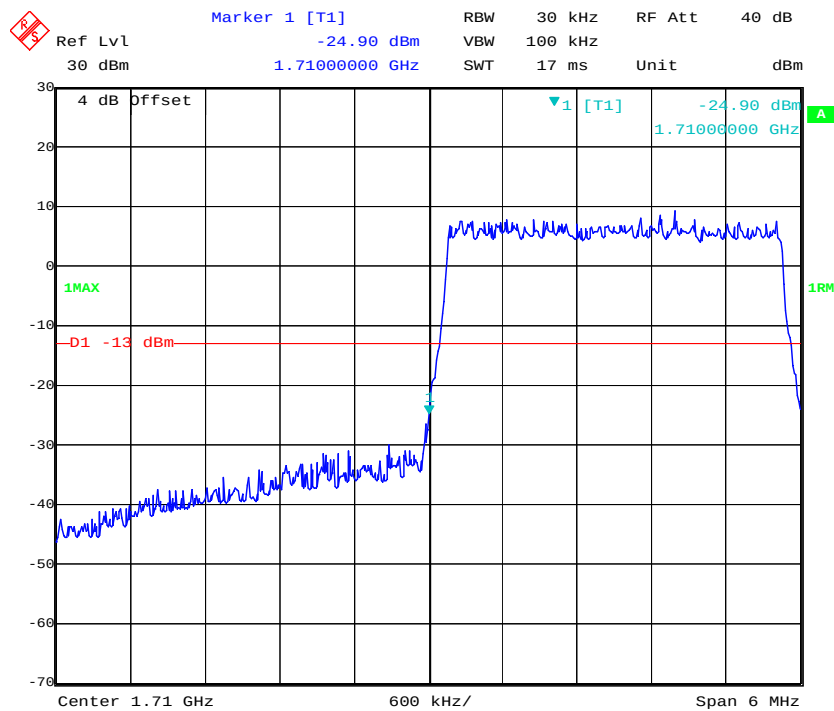
Date: 19.NOV.2016 14:55:48

16QAM_1.4MHz_ FULL RB_ Right



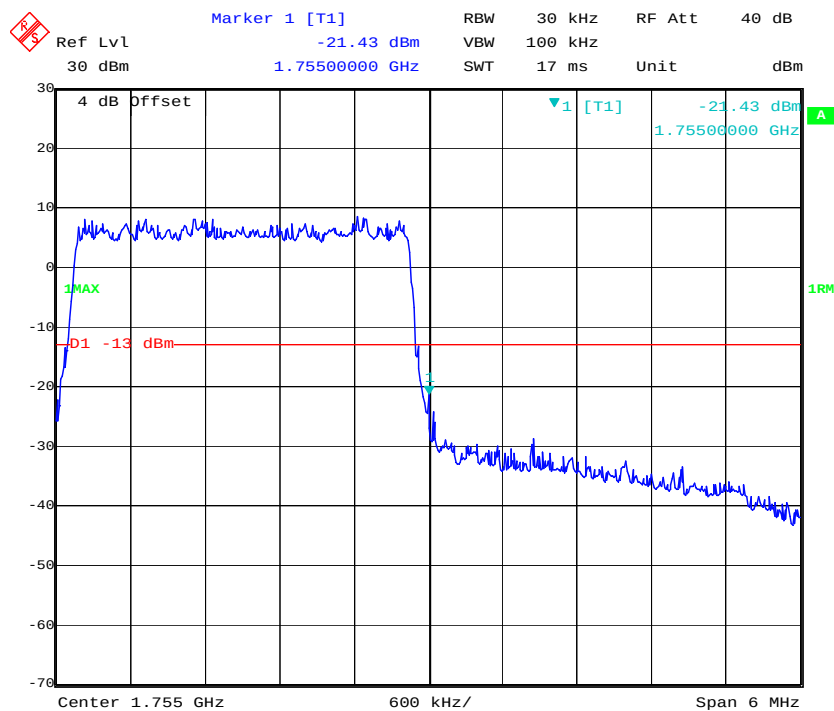
Date: 19.NOV.2016 14:57:18

16QAM_3MHz_ FULL RB_ Left



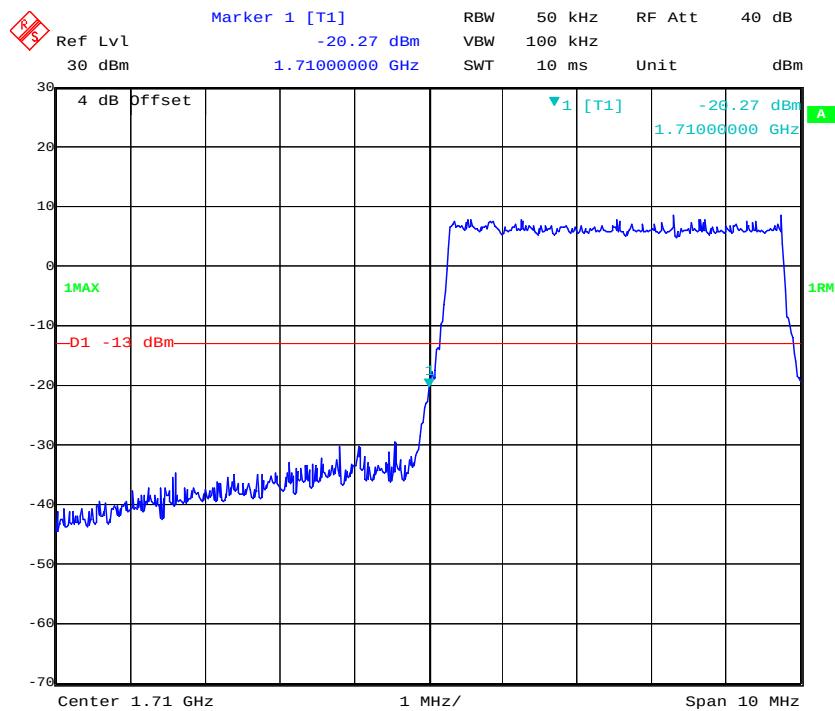
Date: 19.NOV.2016 14:53:25

16QAM_3MHz_ FULL RB_ Right



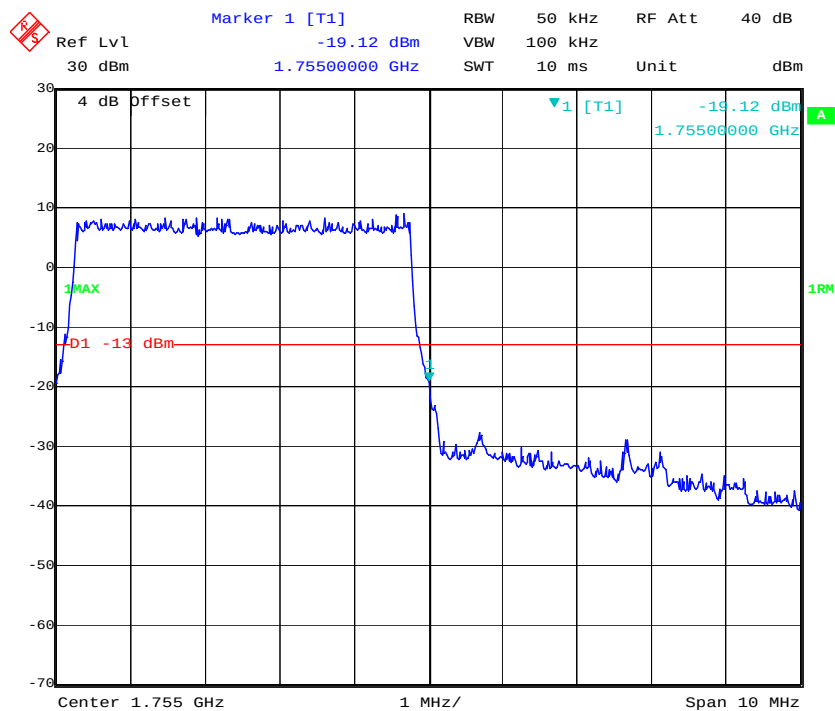
Date: 19.NOV.2016 14:51:34

16QAM_5MHz_ FULL RB_ Left



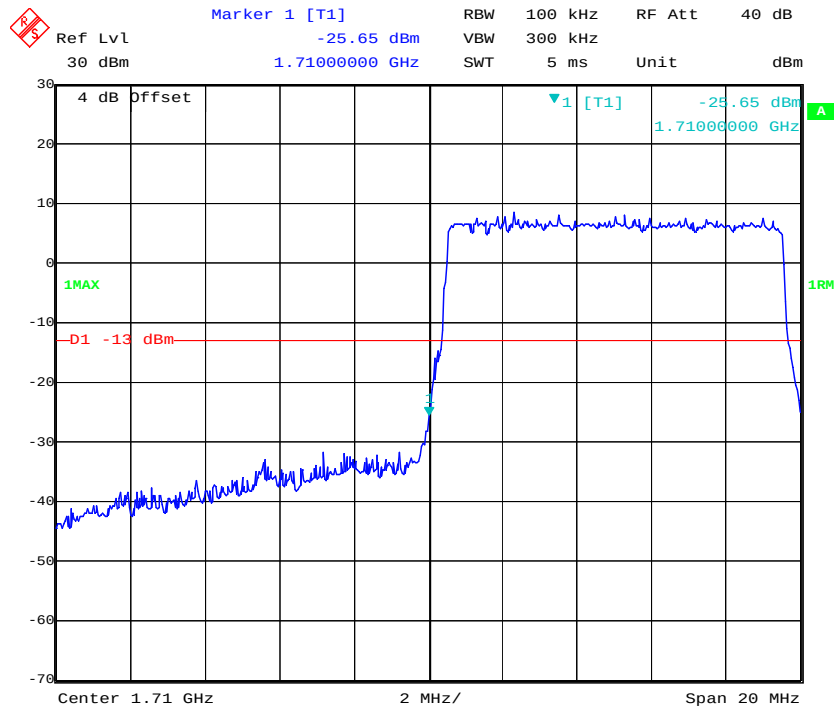
Date: 19.NOV.2016 14:48:42

16QAM_5MHz_ FULL RB_ Right

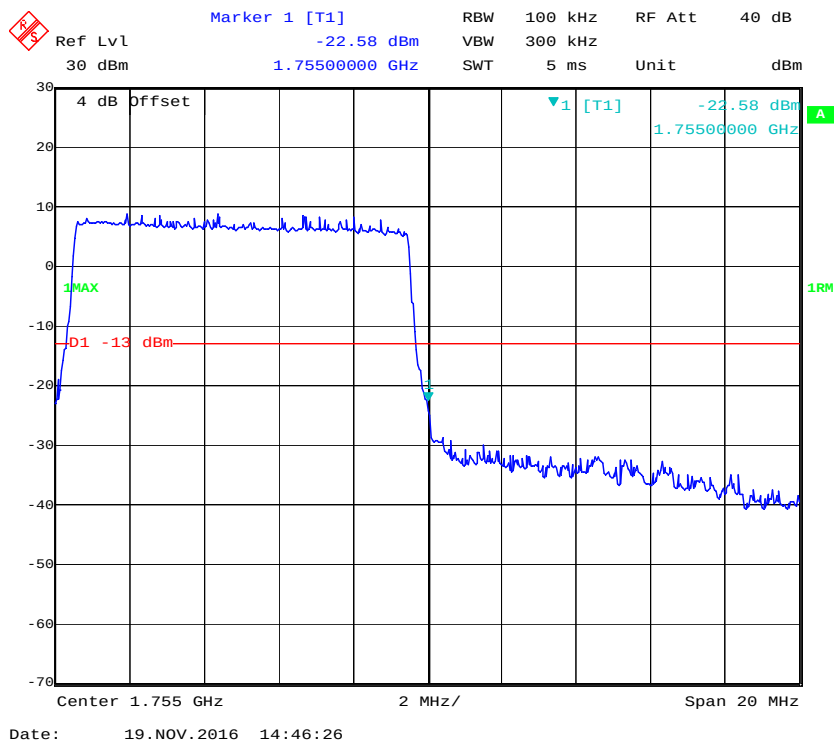


Date: 19.NOV.2016 14:49:47

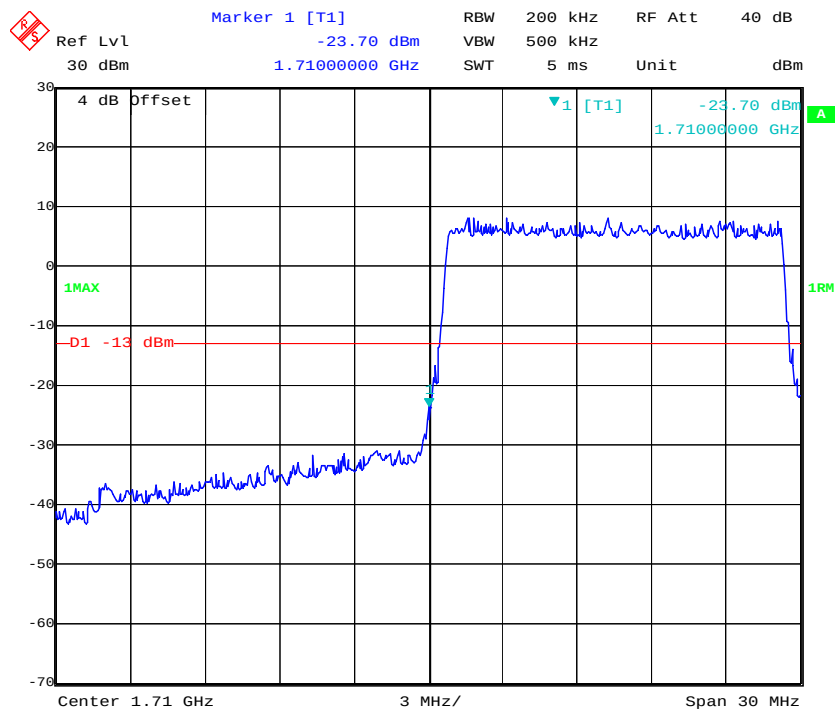
16QAM_10MHz_FULL RB_Left



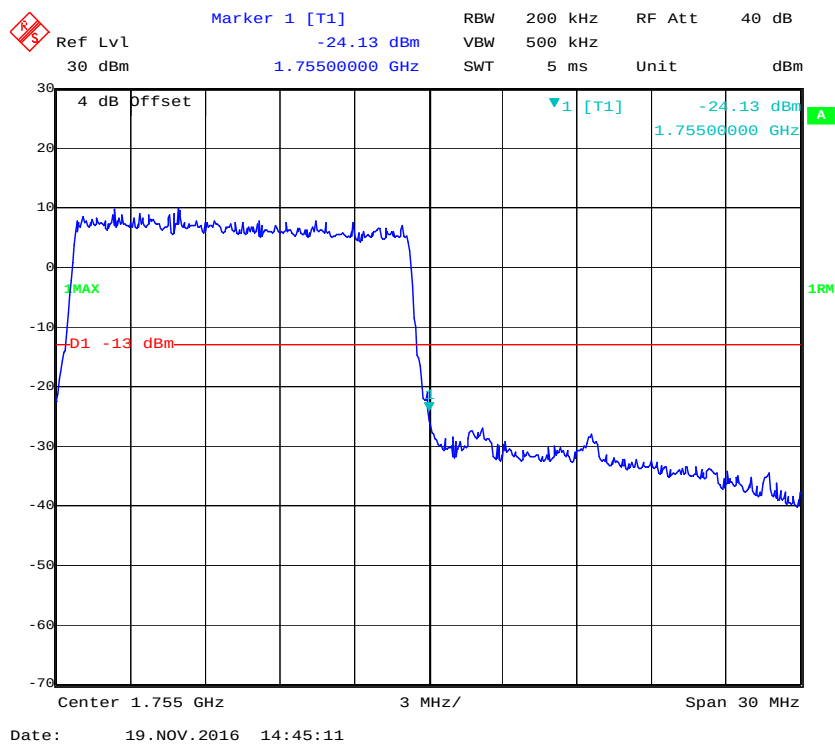
16QAM_10MHz_FULL RB_Right



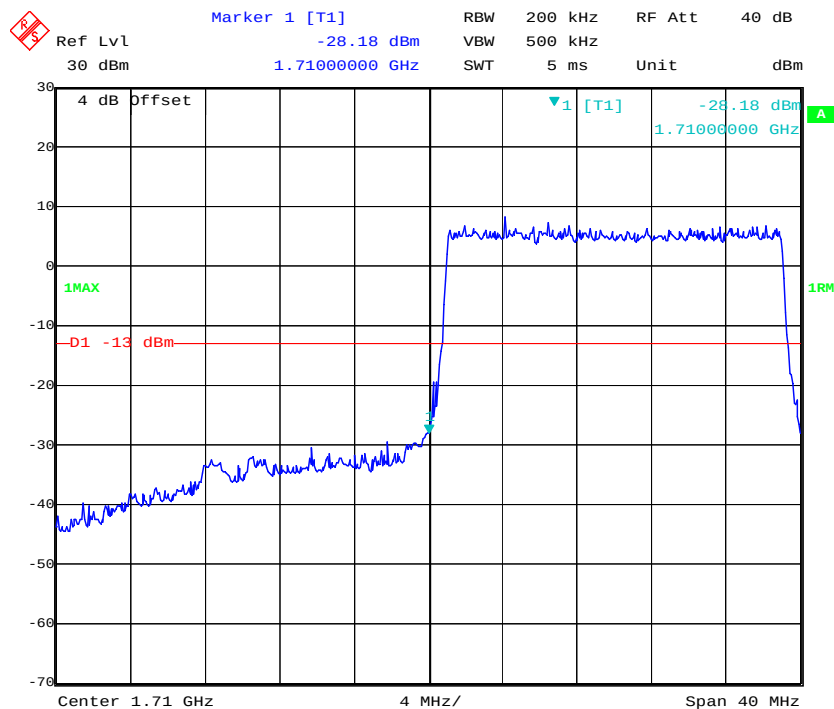
16QAM_15MHz_FULL RB_Left



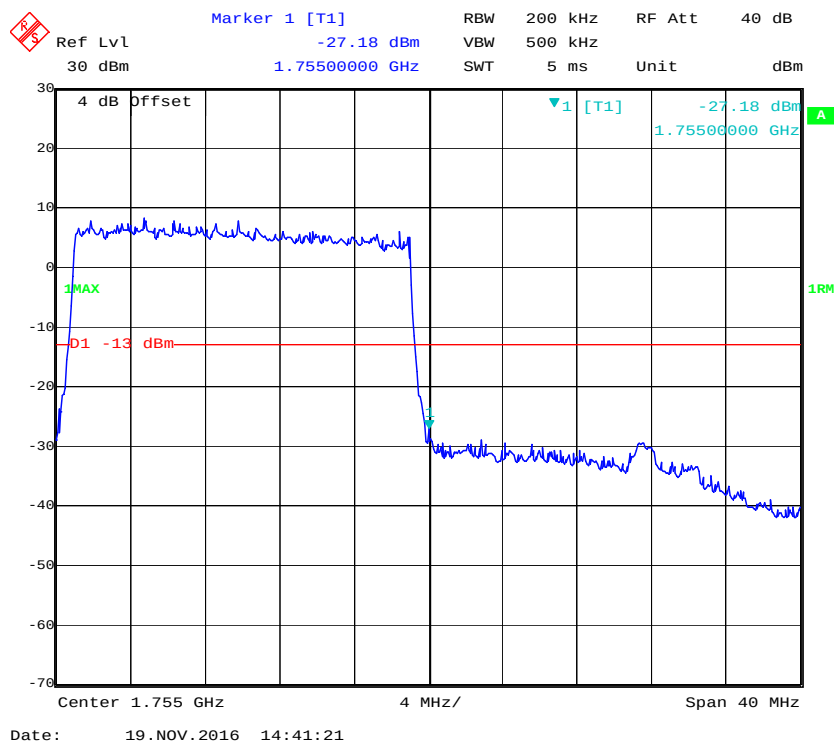
16QAM_15MHz_FULL RB_Right



16QAM_20MHz_FULL RB_Left

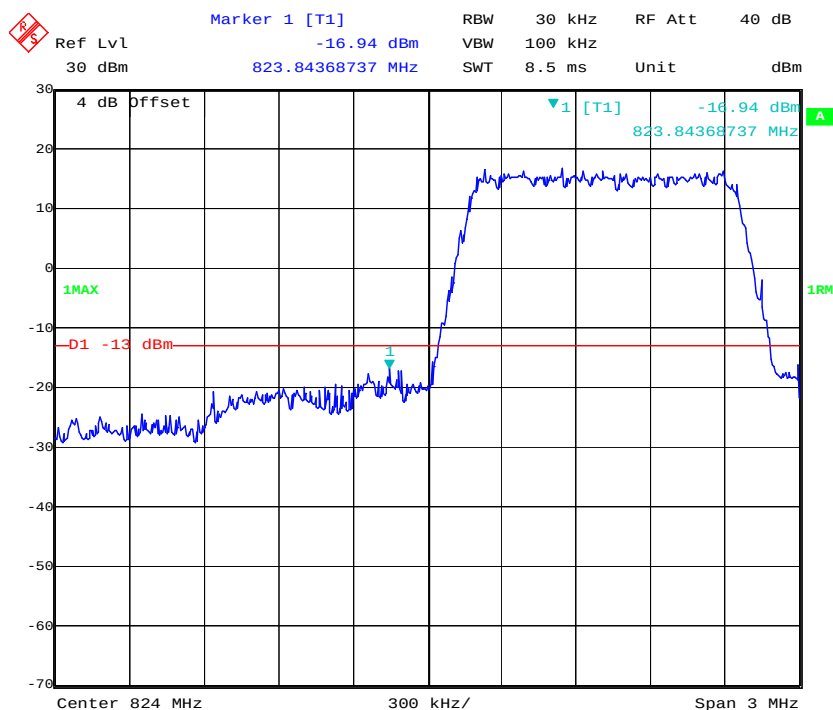


16QAM_20MHz_FULL RB_Right



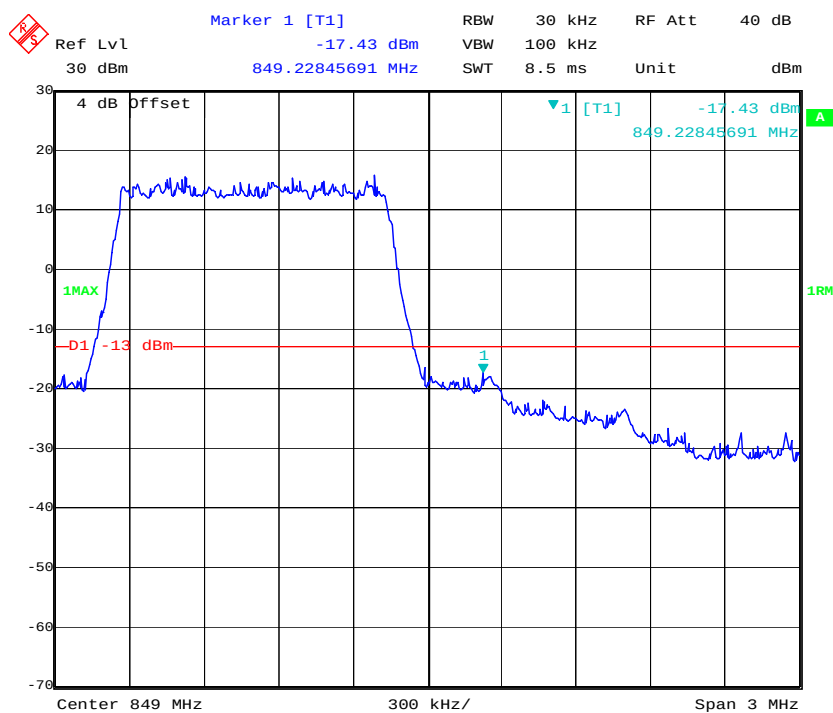
LTE Band V

QPSK_1.4MHz_ FULL RB_ Left



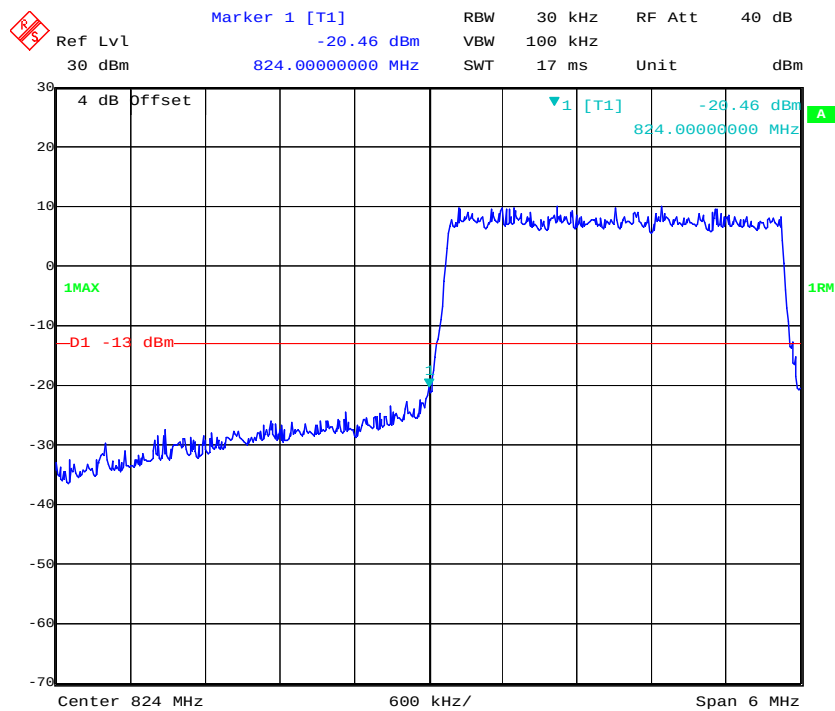
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QPSK_1.4MHz_ FULL RB_ Right

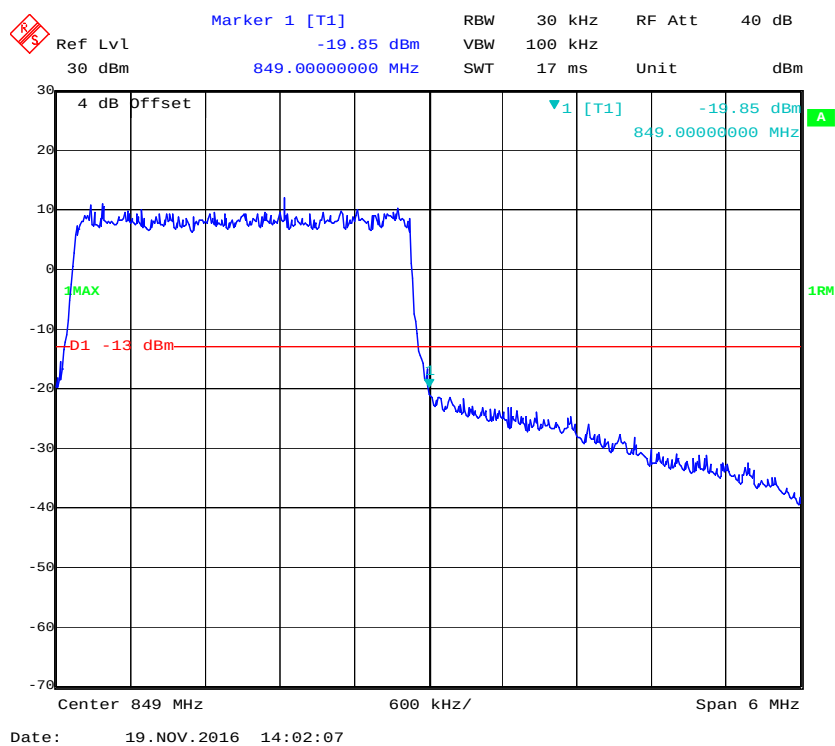


Date: 19.NOV.2016 13:58:33

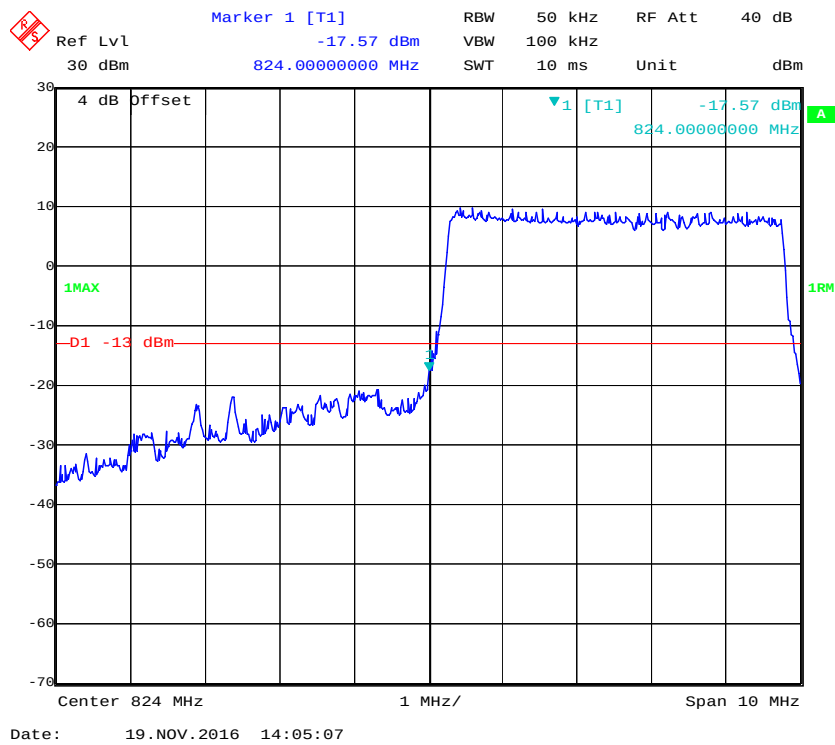
QPSK_3MHz_FULL RB_Left



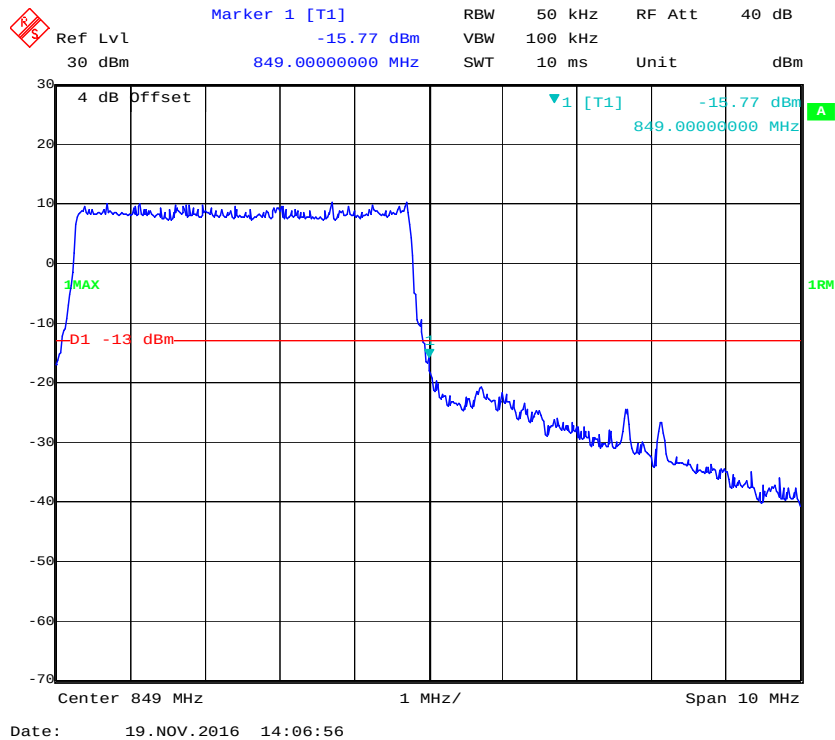
QPSK_3MHz_FULL RB_Right



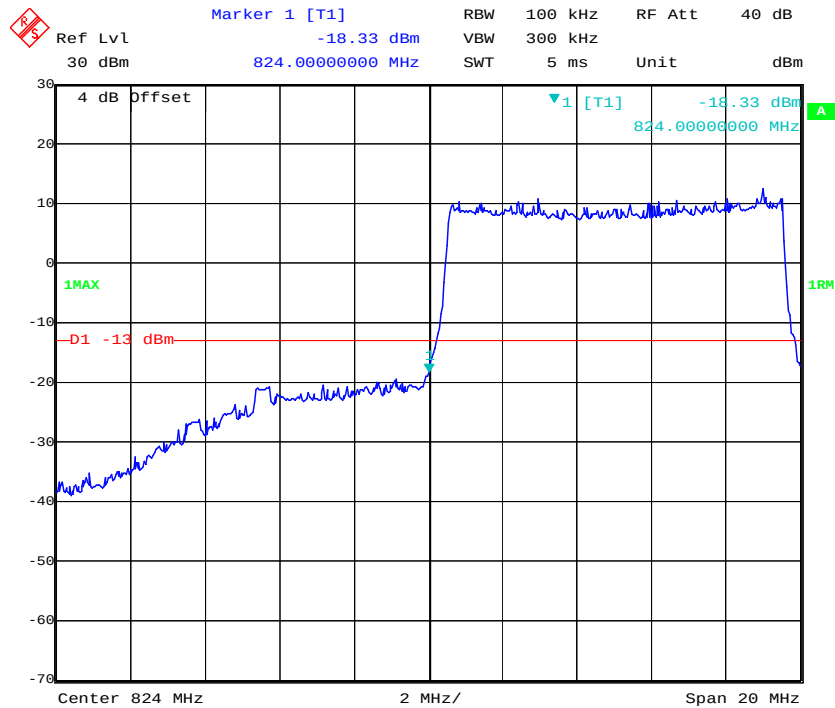
QPSK_5MHz_FULL RB_Left



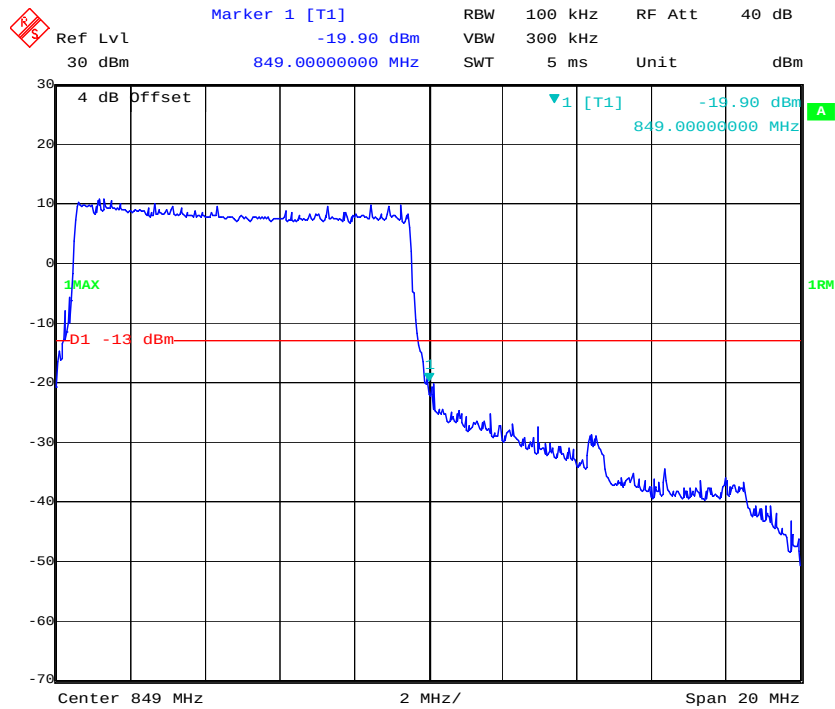
QPSK_5MHz_FULL RB_Right



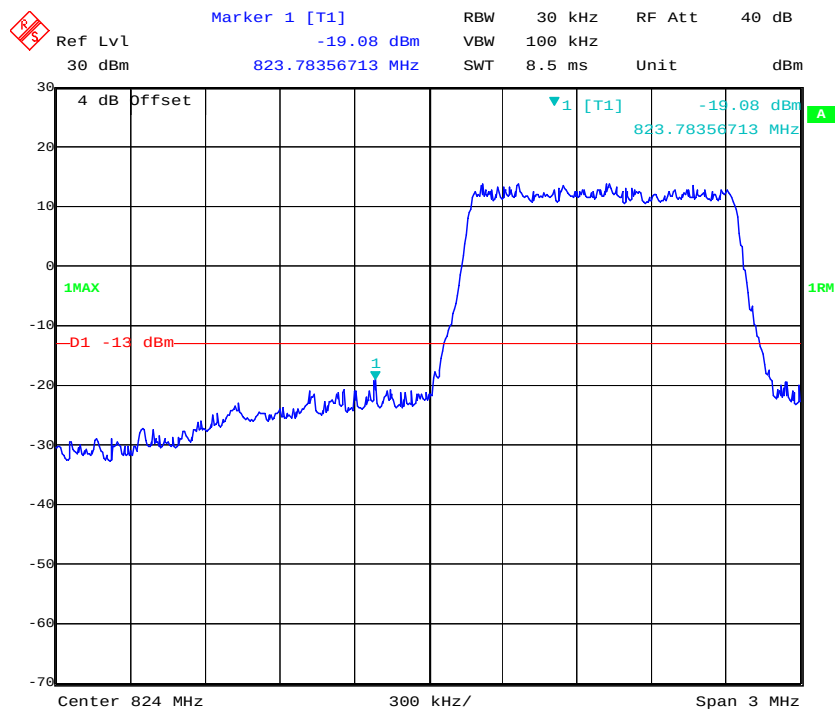
QPSK_10MHz_FULL RB_ Left



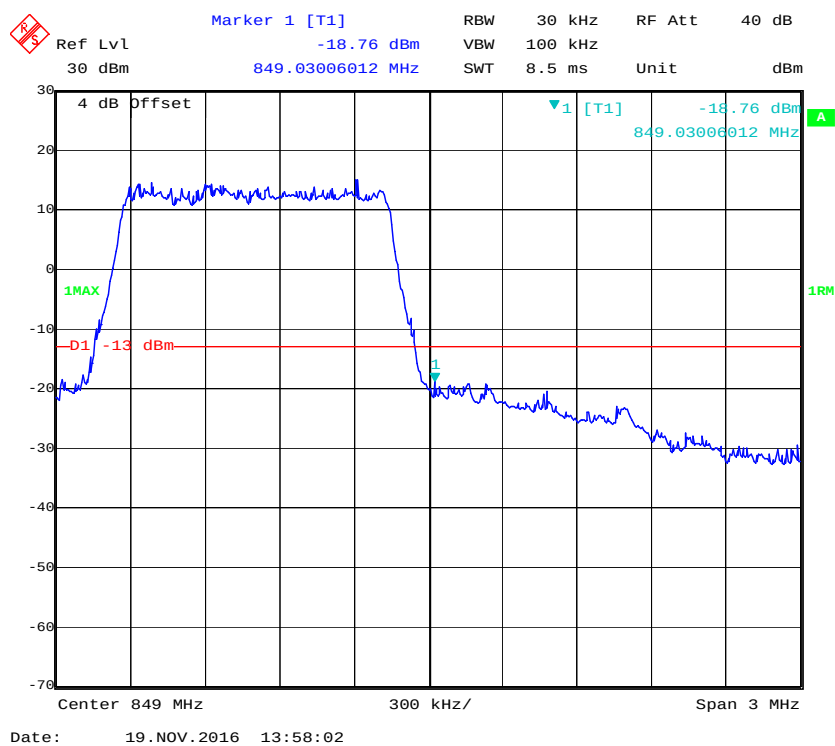
QPSK_10MHz_FULL RB_ Right



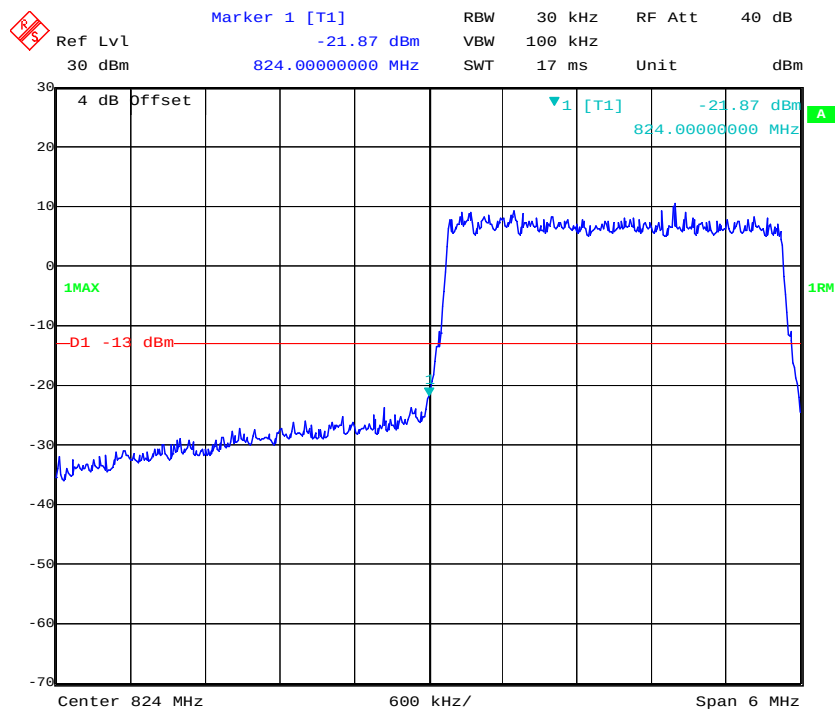
QPSK_1.4MHz_FULL RB_Left



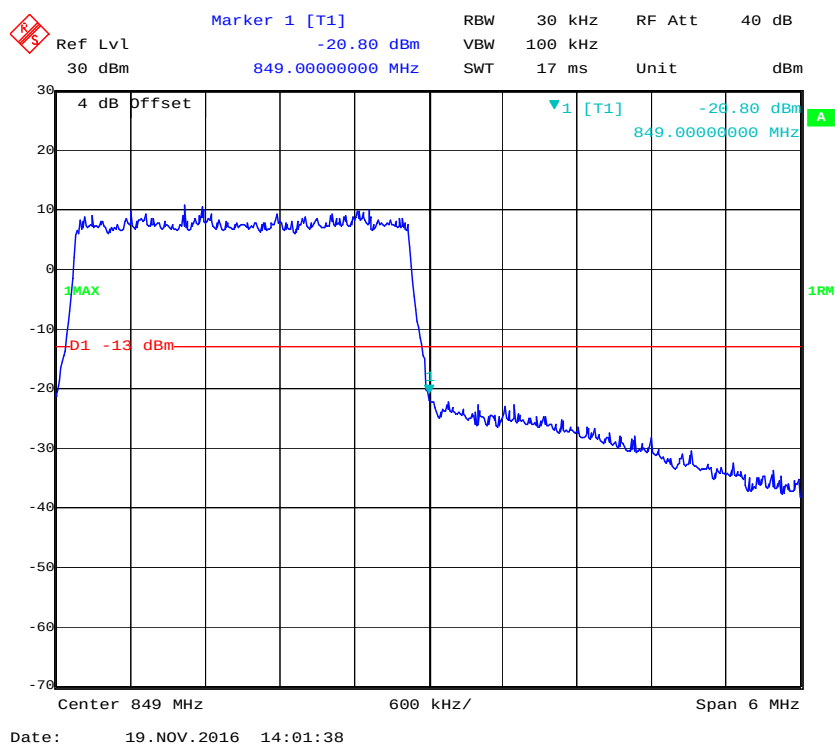
QPSK_1.4MHz_FULL RB_Right



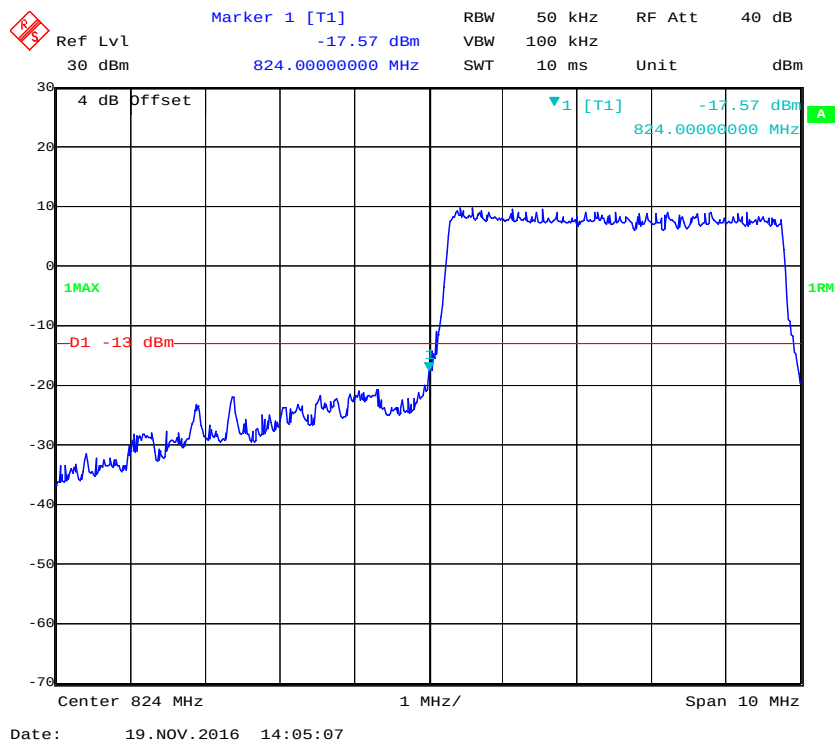
QPSK_3MHz_FULL RB_Left



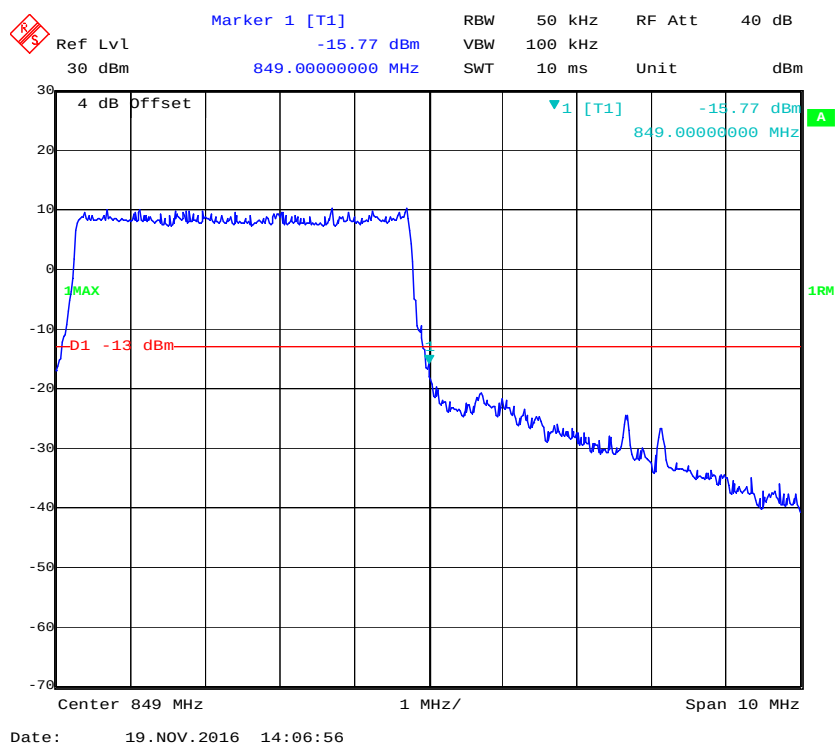
QPSK_3MHz_FULL RB_Right



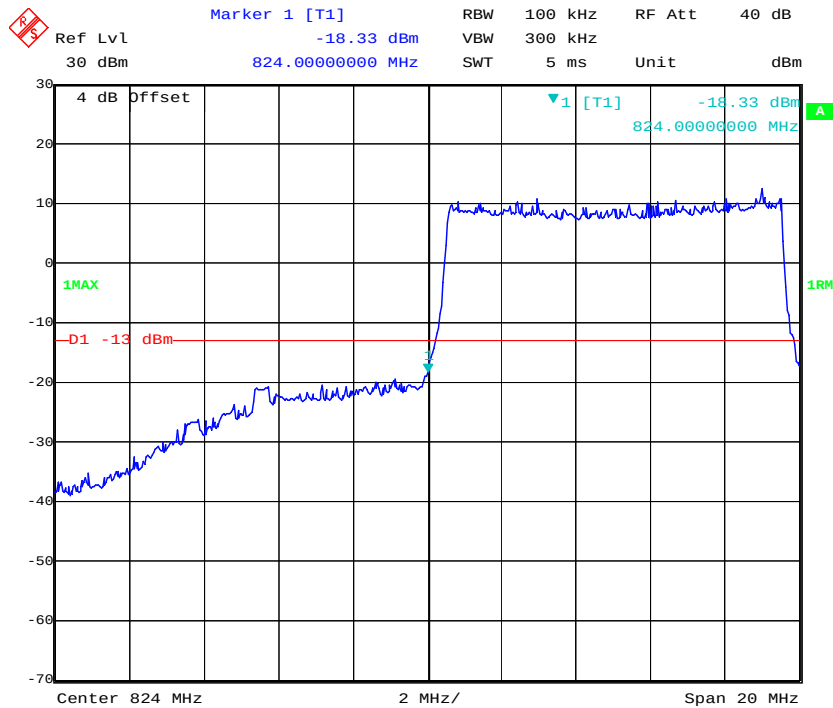
QPSK_5MHz_FULL RB_Left



QPSK_5MHz_FULL RB_Right

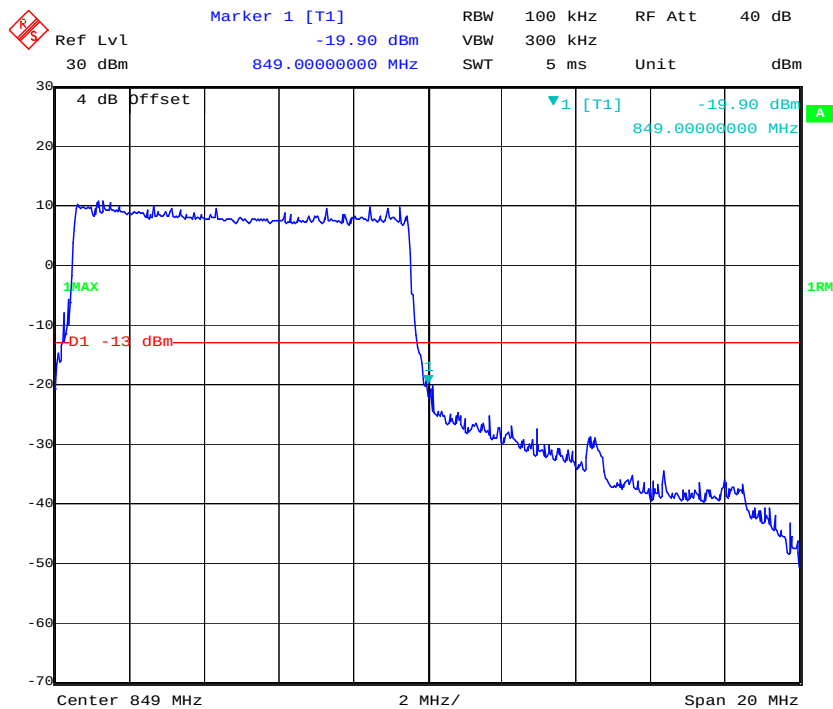


QPSK_10MHz_ FULL RB_ Left



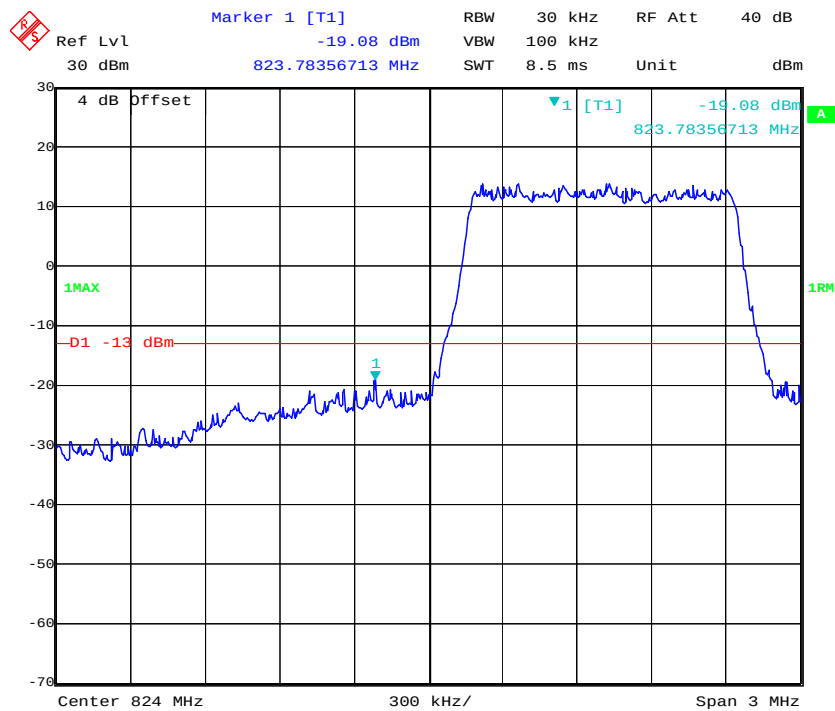
Date: 19.NOV.2016 14:10:57

QPSK_10MHz_ FULL RB_ Right

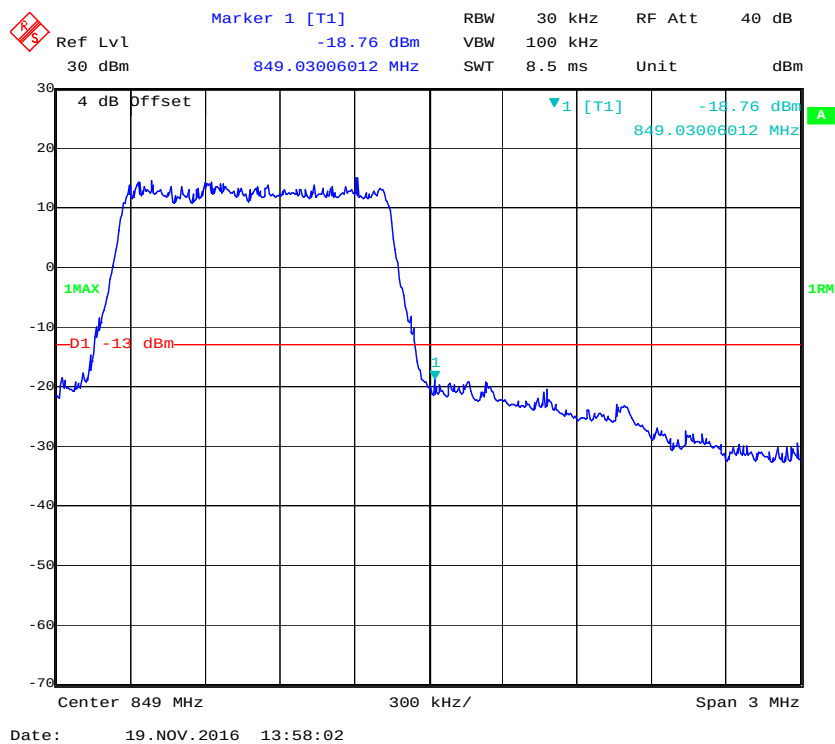


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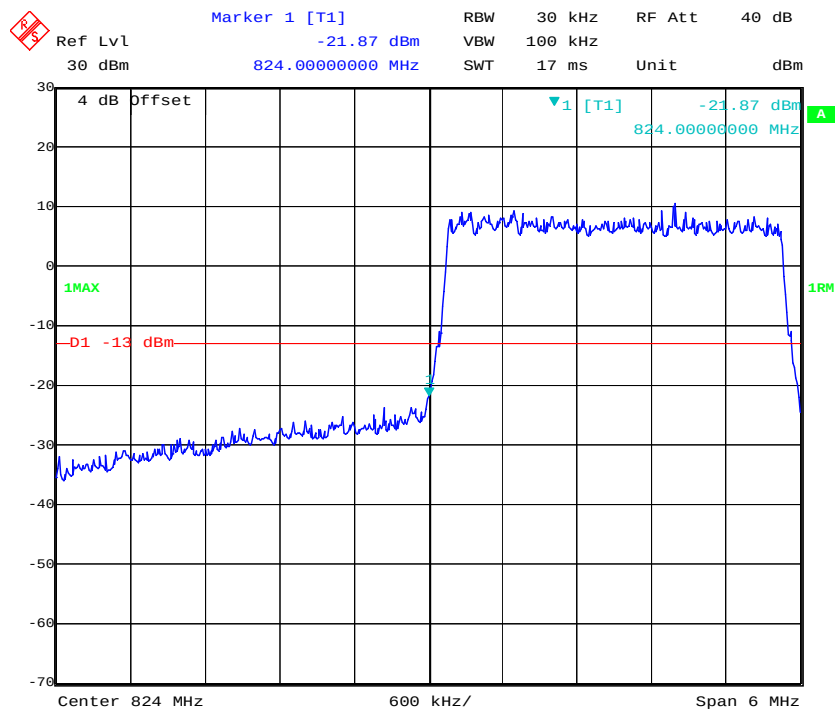
16QAM_1.4MHz_ FULL RB_ Left



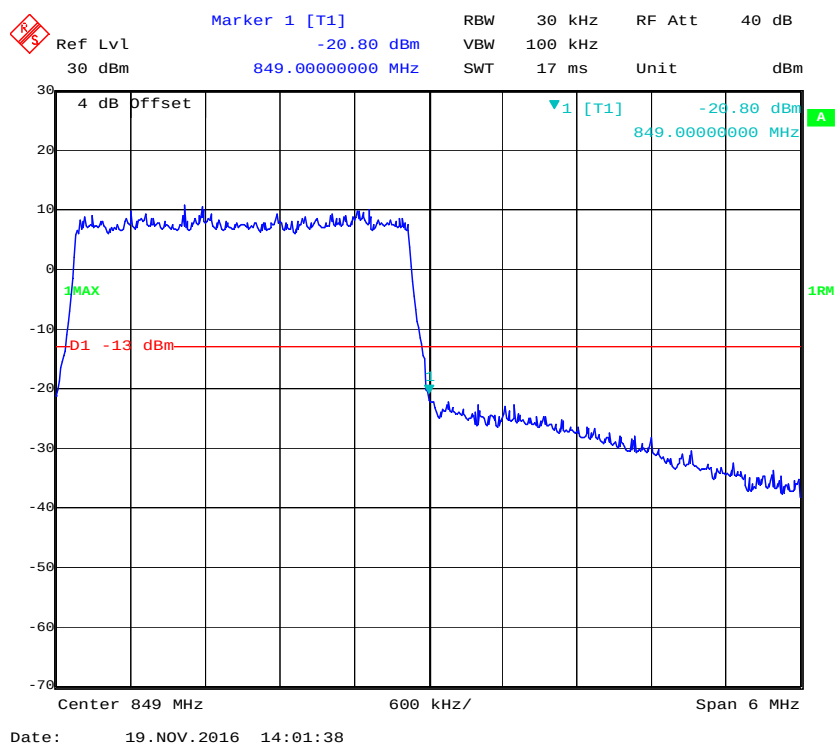
16QAM_1.4MHz_ FULL RB_ Right



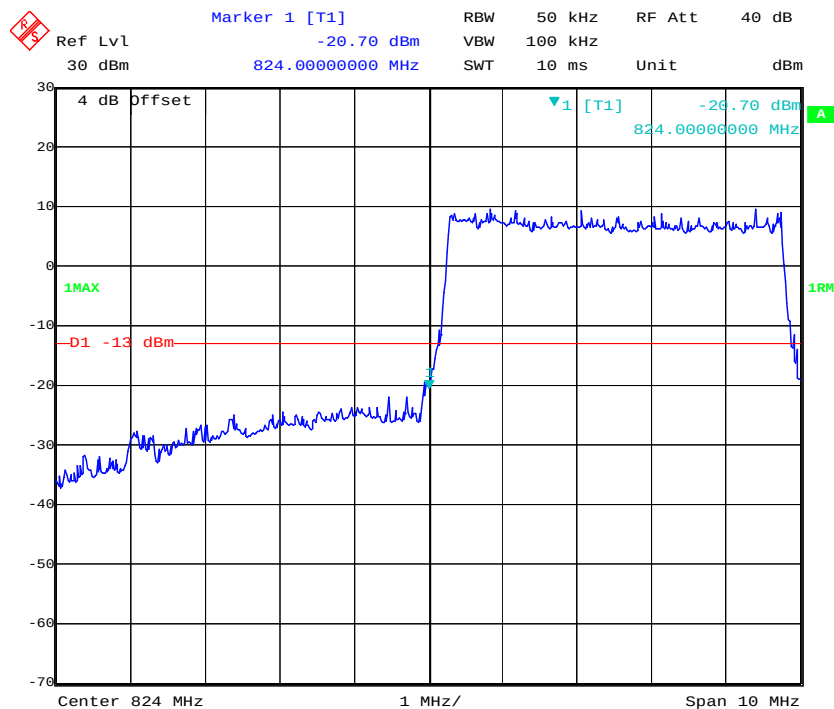
16QAM_3MHz_ FULL RB_ Left



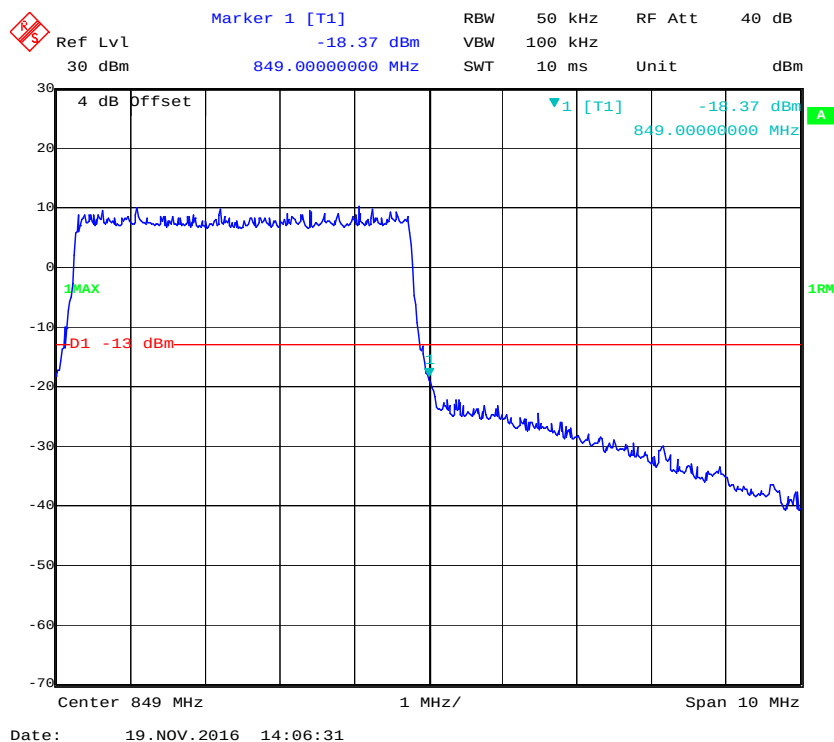
16QAM_3MHz_ FULL RB_ Right



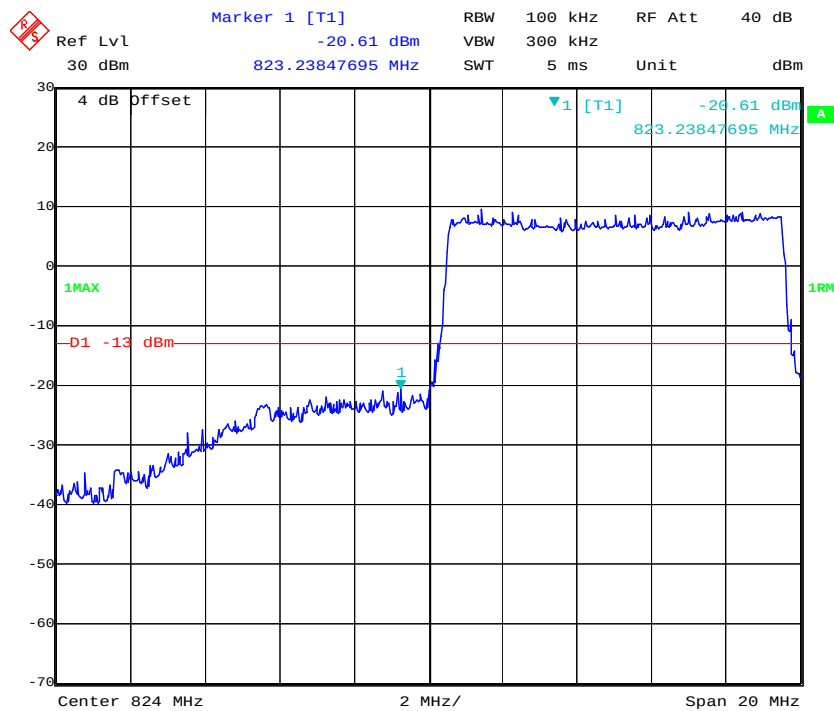
16QAM_5MHz_ FULL RB_ Left



16QAM_5MHz_ FULL RB_ Right



16QAM_10MHz_FULL RB_Left

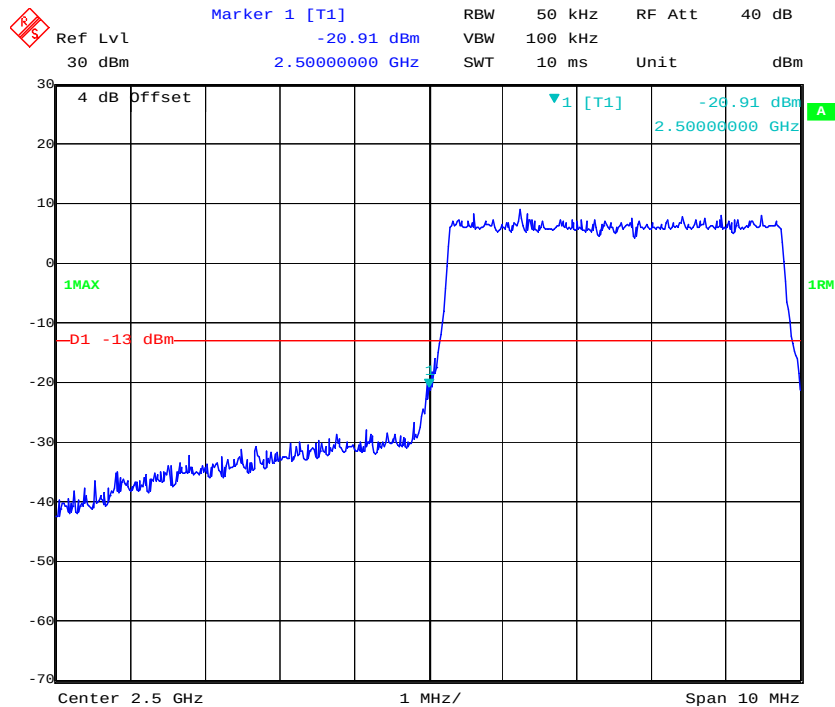


16QAM_10MHz_FULL RB_Right



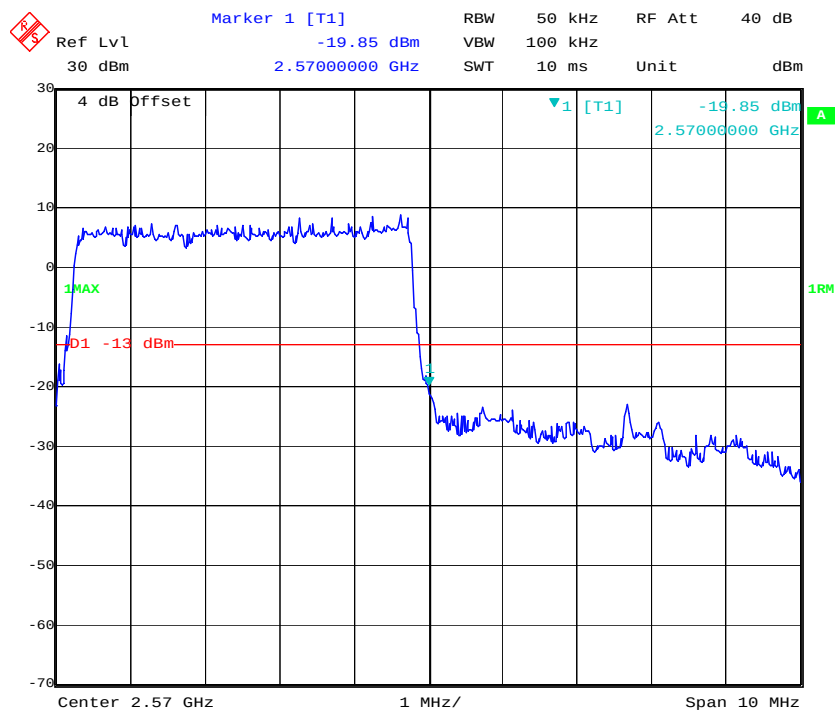
LTE Band VII

QPSK_5MHz_FULL RB_Left



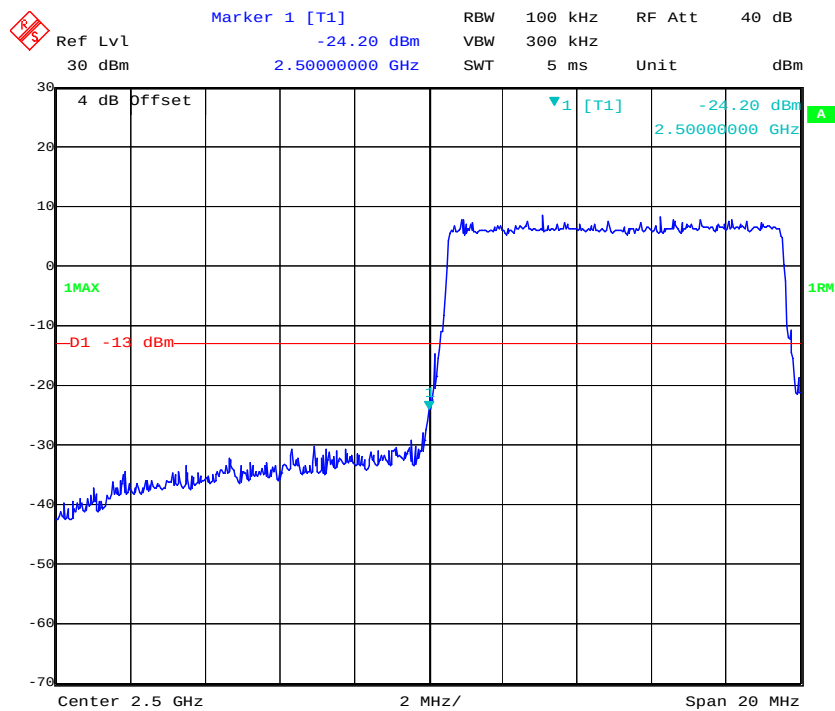
Date: 19.NOV.2016 13:32:04

QPSK_5MHz_FULL RB_Right

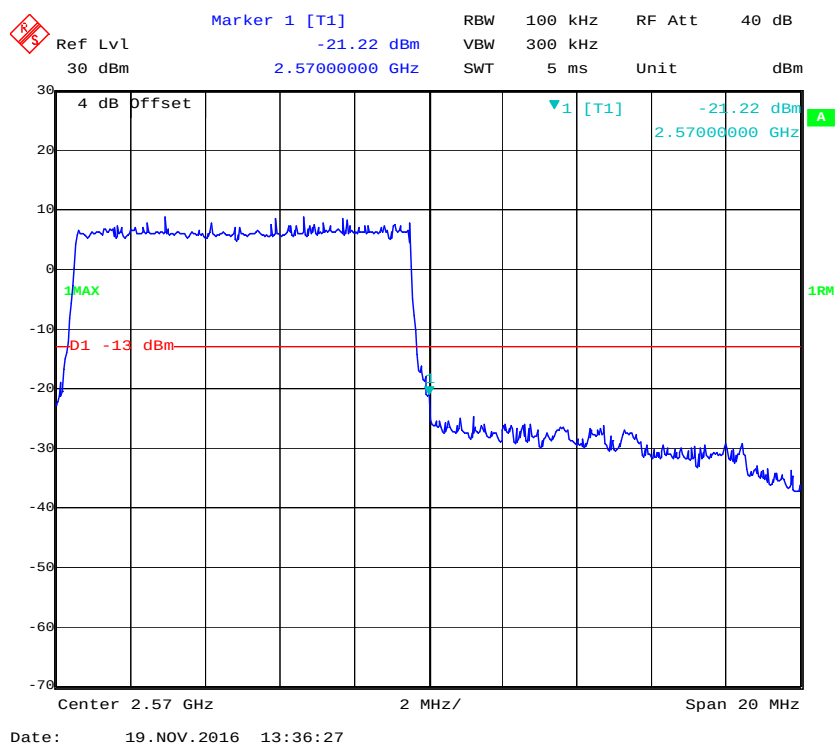


Date: 19.NOV.2016 13:29:29

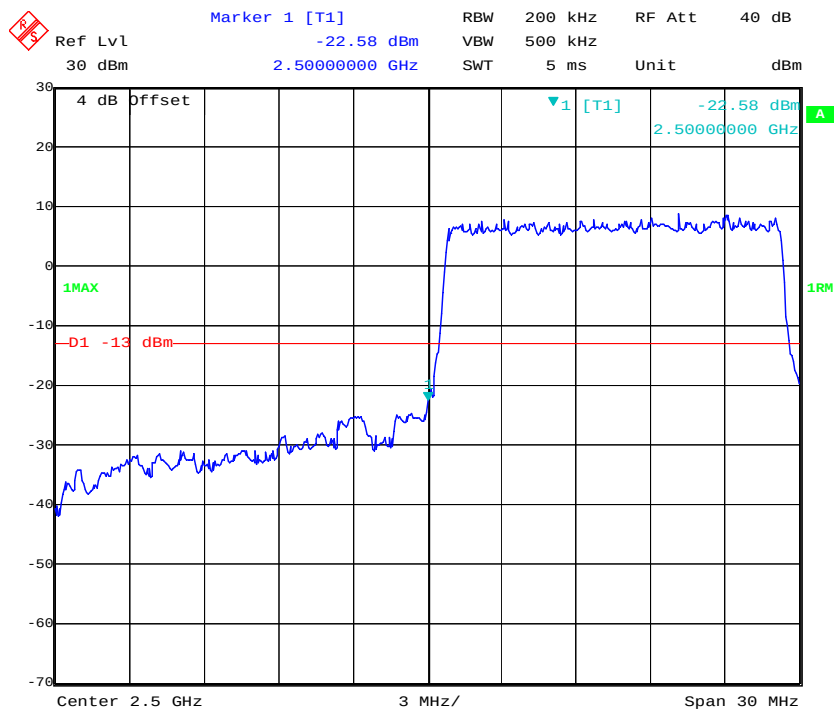
QPSK_10MHz_ FULL RB_ Left



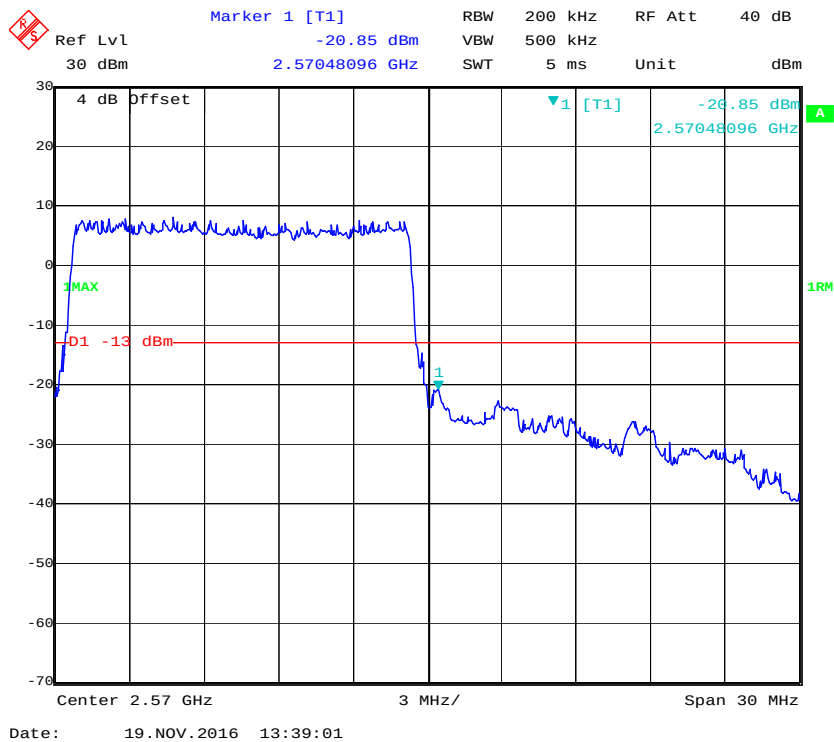
QPSK_10MHz_ FULL RB_ Right



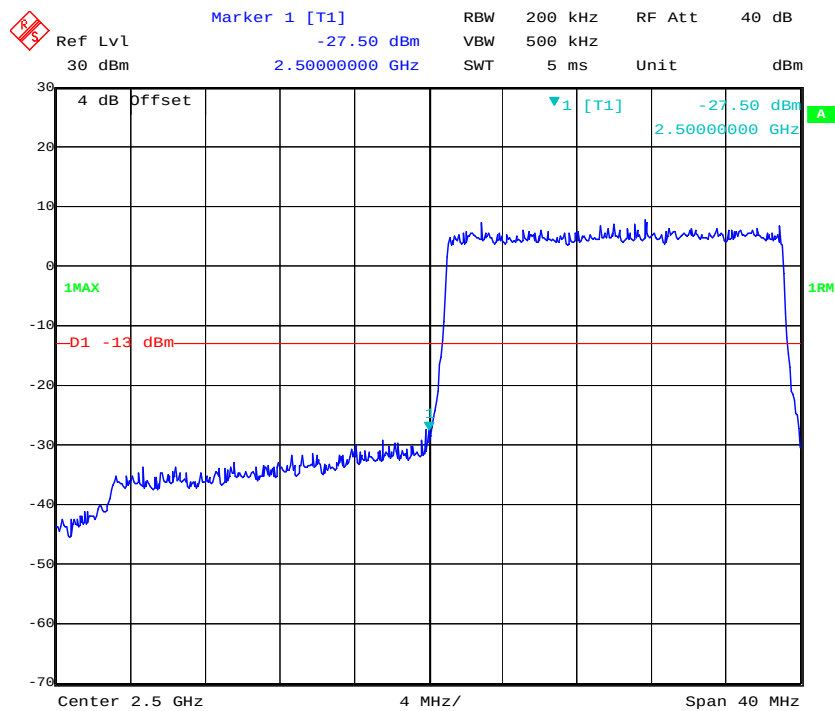
QPSK_15MHz_FULL RB_ Left



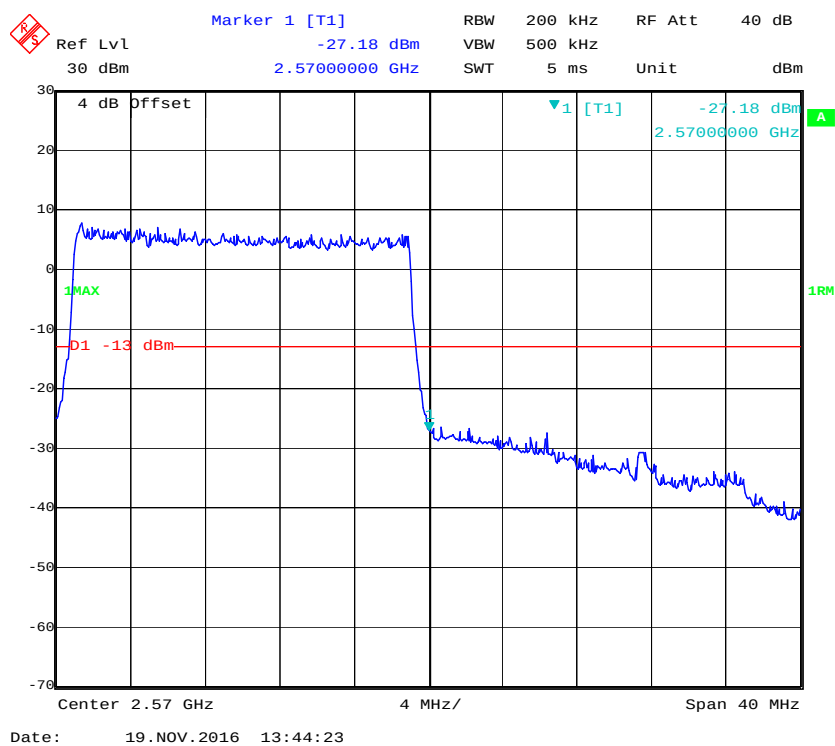
QPSK_15MHz_FULL RB_ Right



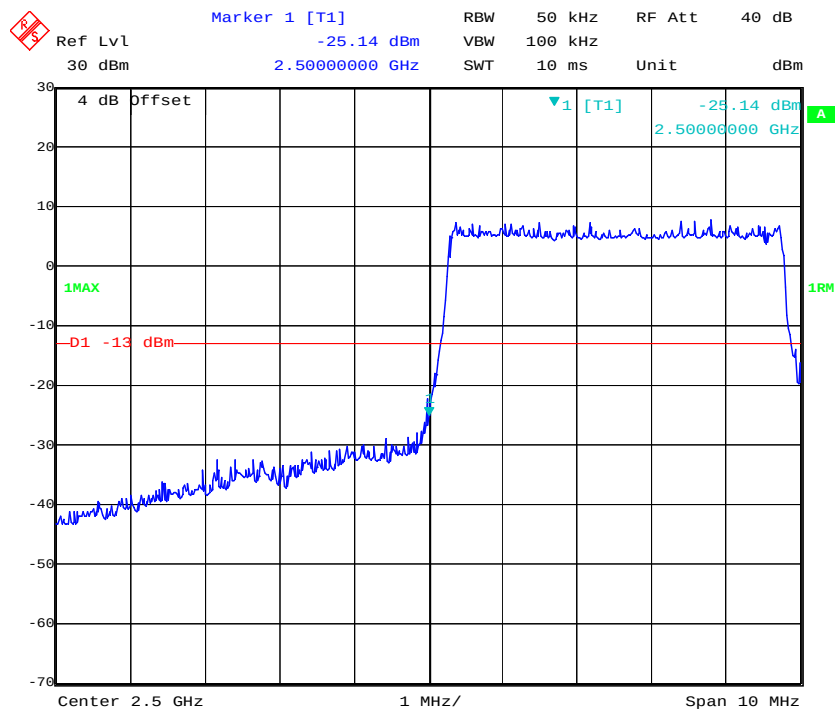
QPSK_20MHz_ FULL RB_ Left



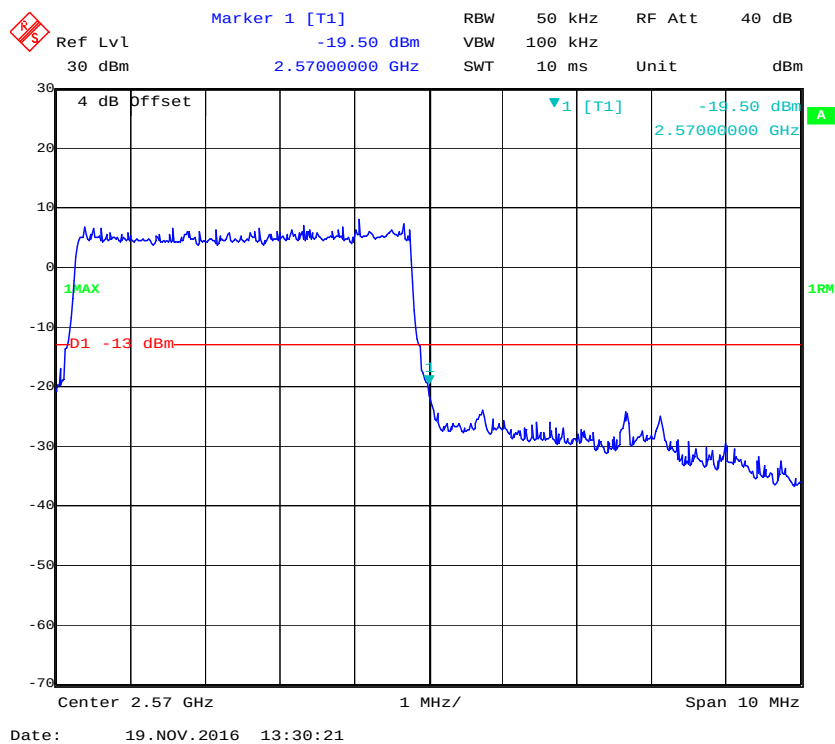
QPSK_20MHz_ FULL RB_ Right



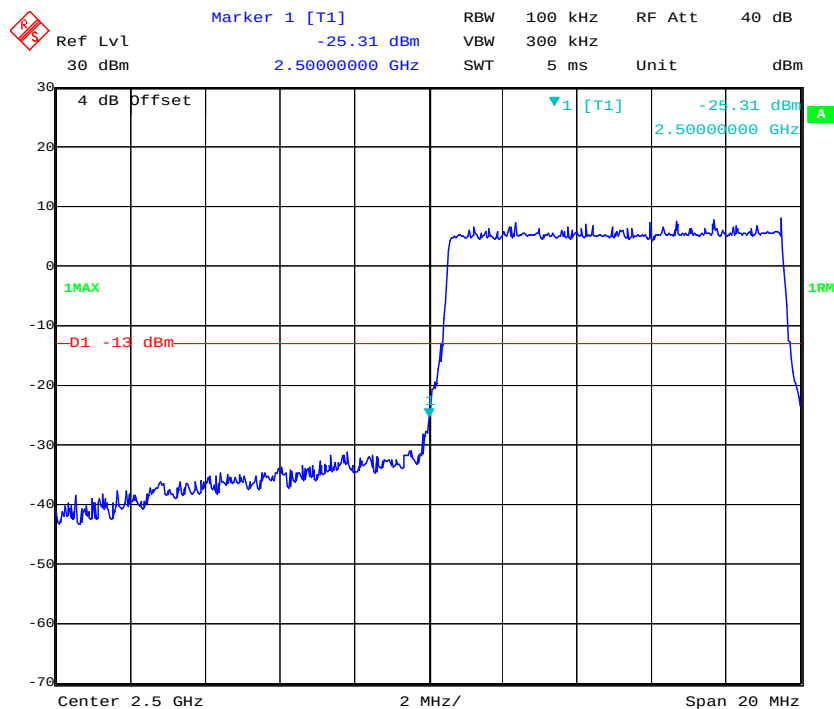
16QAM_5MHz_ FULL RB_ Left



16QAM_5MHz_ FULL RB_ Right

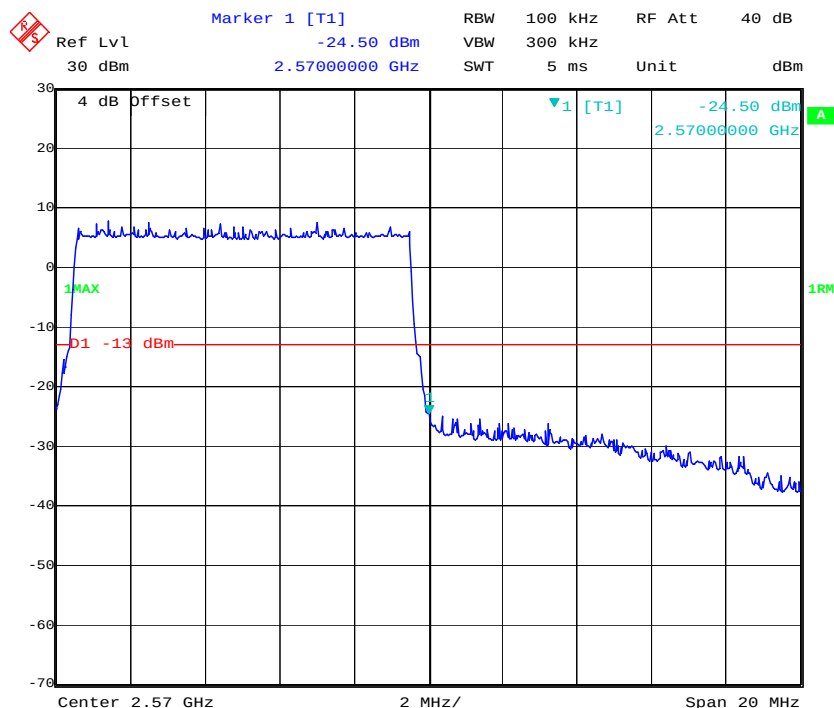


16QAM_10MHz_FULL RB_Left



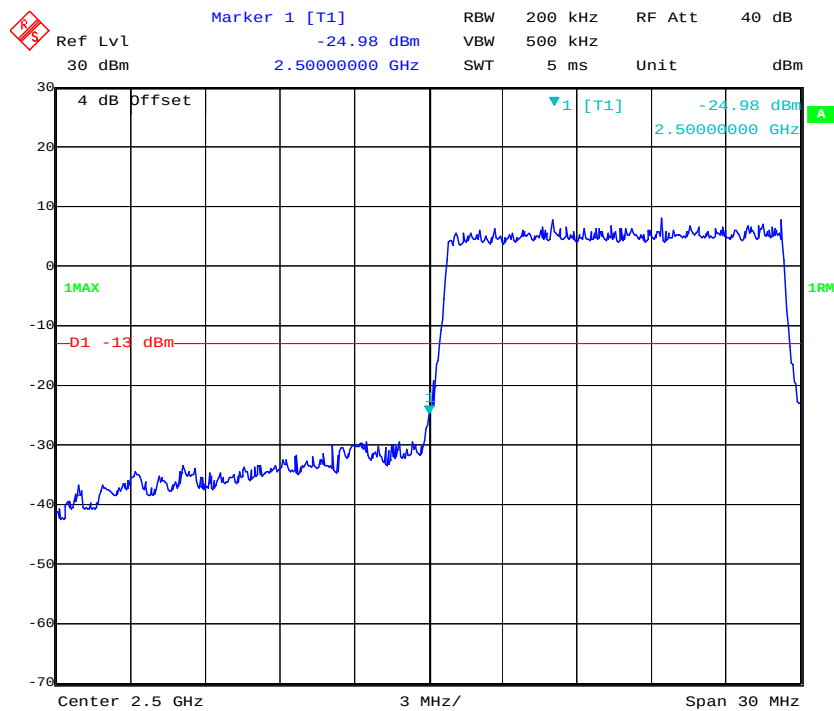
Date: 19.NOV.2016 13:34:44

16QAM_10MHz_FULL RB_Right



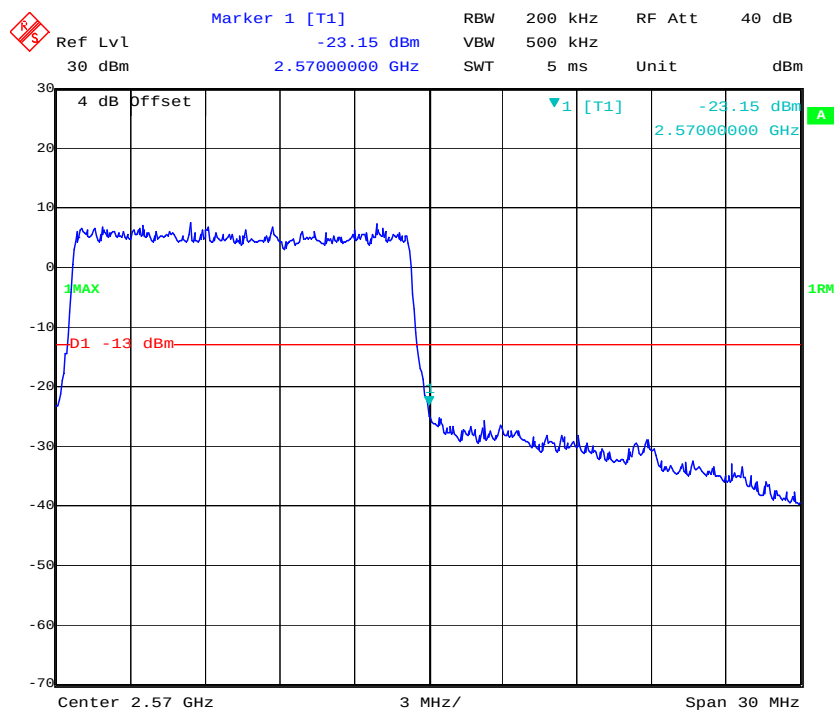
Date: 19.NOV.2016 13:36:00

16QAM_15MHz_FULL RB_Left



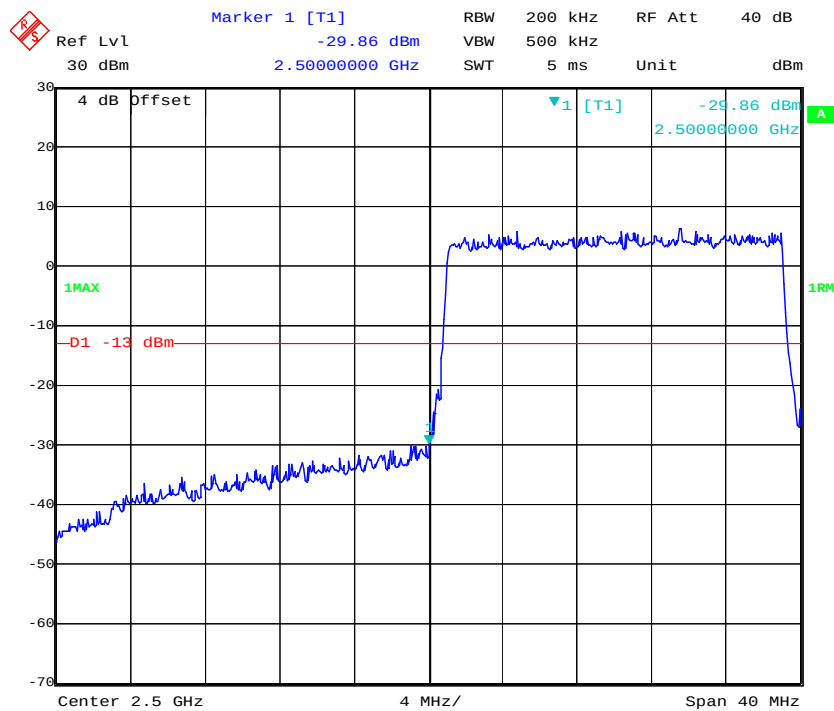
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16QAM_15MHz_FULL RB_Right

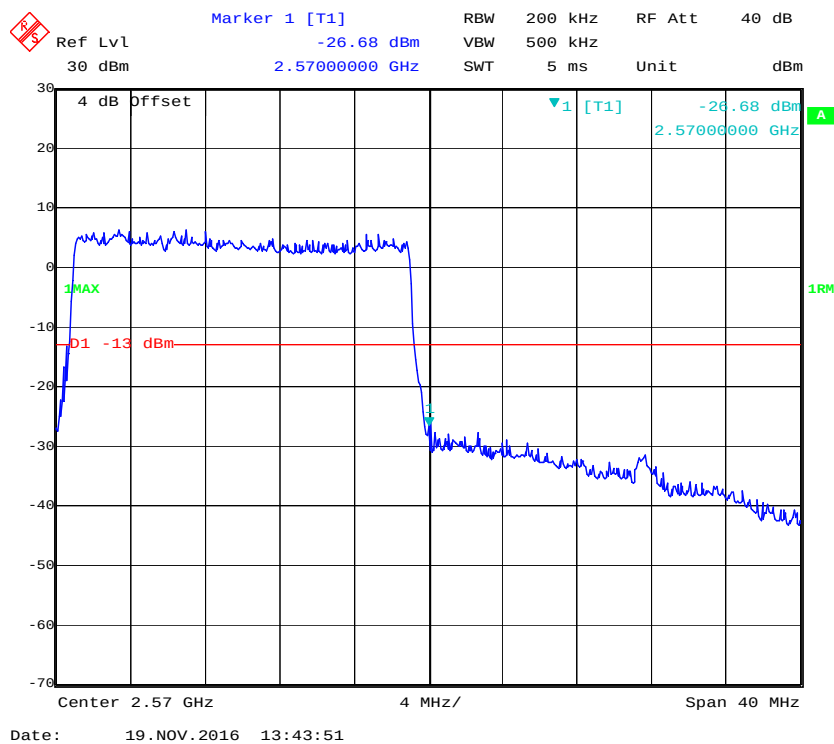


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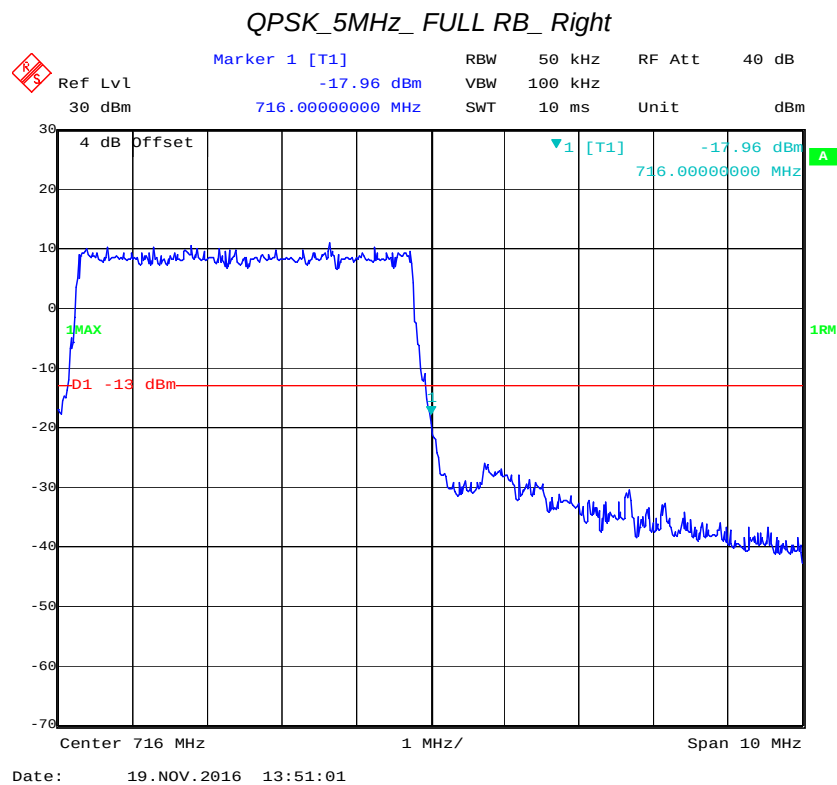
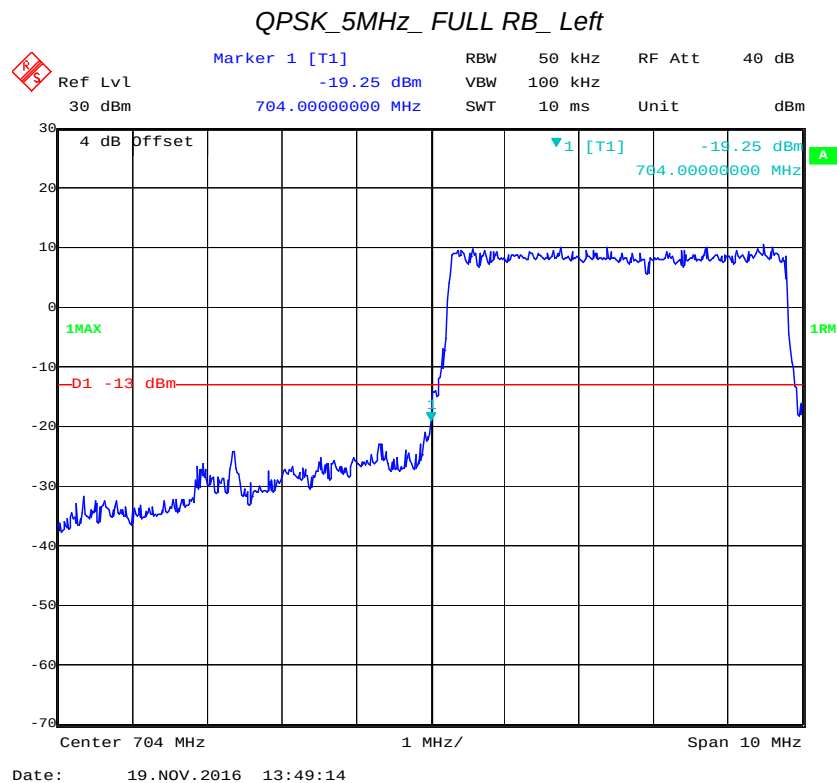
16QAM_20MHz_FULL RB_Left



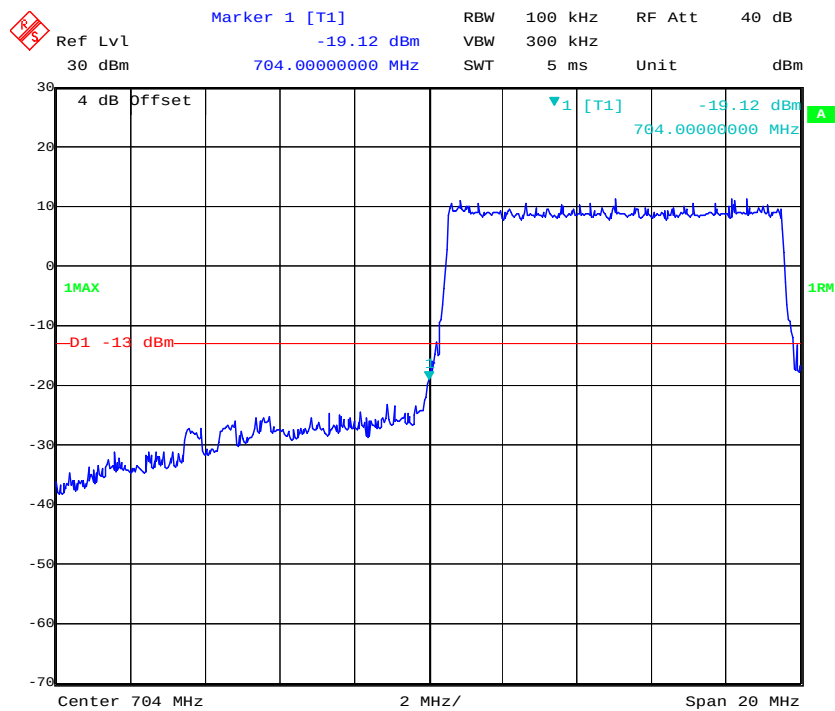
16QAM_20MHz_FULL RB_Right



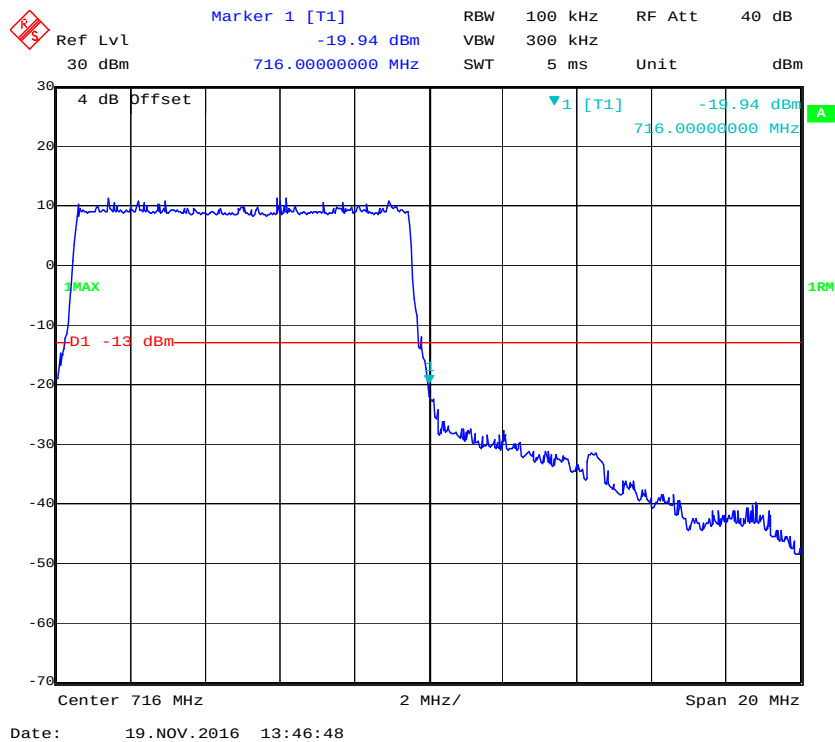
LTE Band 17:



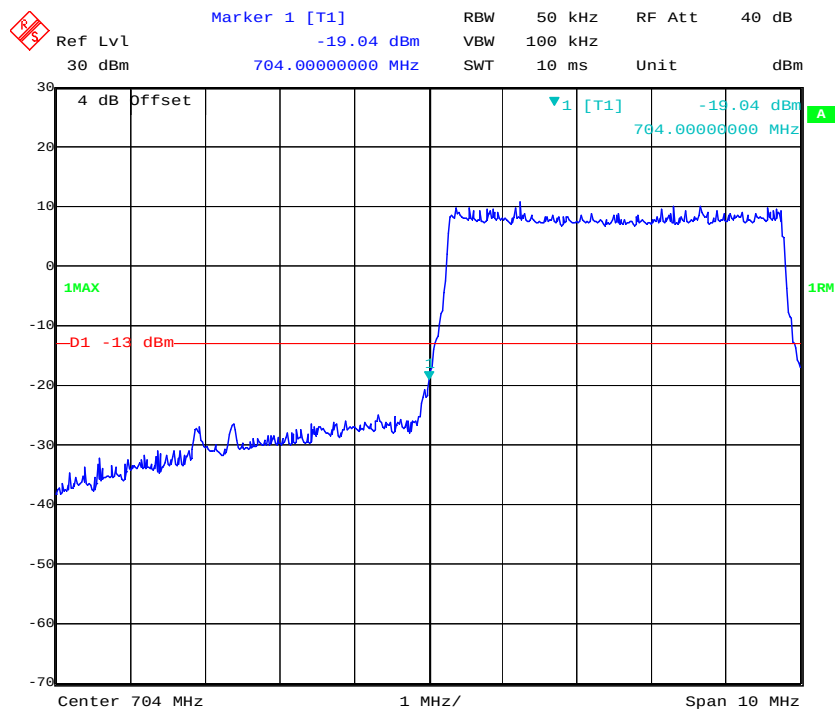
QPSK_10MHz_FULL RB_ Left



QPSK_10MHz_FULL RB_ Right



16QAM_5MHz_ FULL RB_ Left



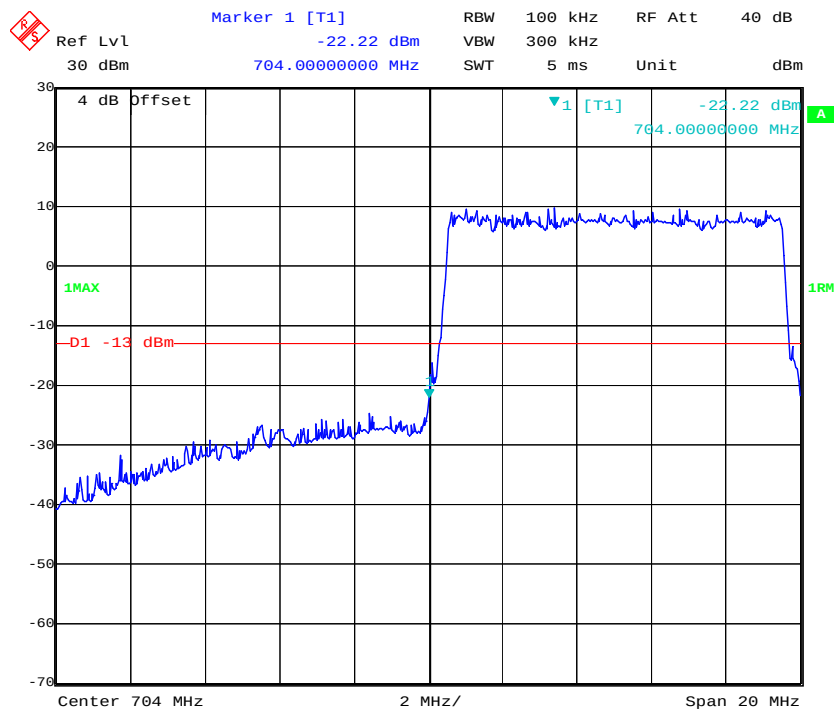
Date: 19.NOV.2016 13:49:53

16QAM_5MHz_ FULL RB_ Right



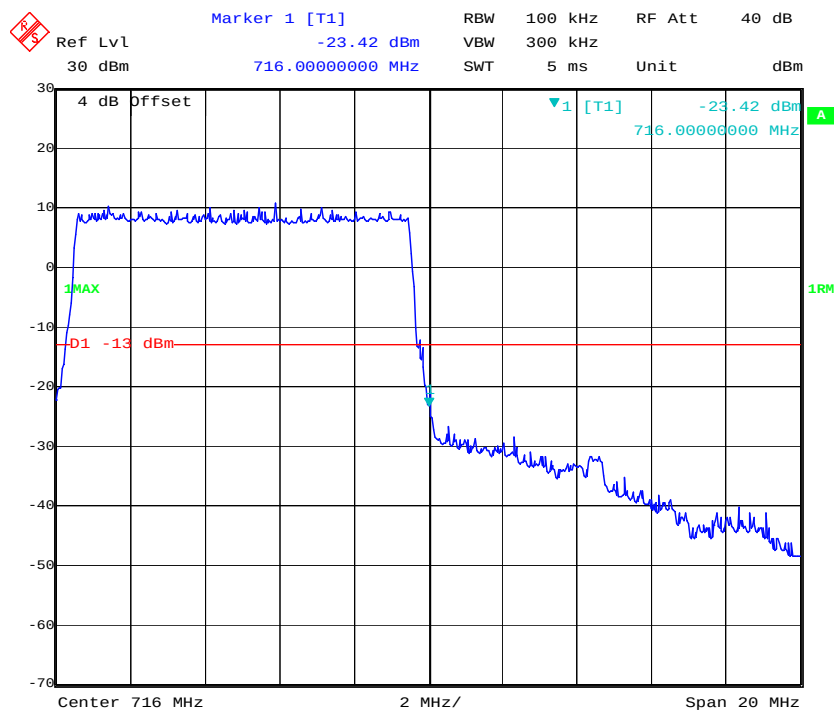
Date: 19.NOV.2016 13:50:34

16QAM_10MHz_FULL RB_Left



Date: 19.NOV.2016 13:47:54

16QAM_10MHz_FULL RB_Right



Date: 19.NOV.2016 13:47:21

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.

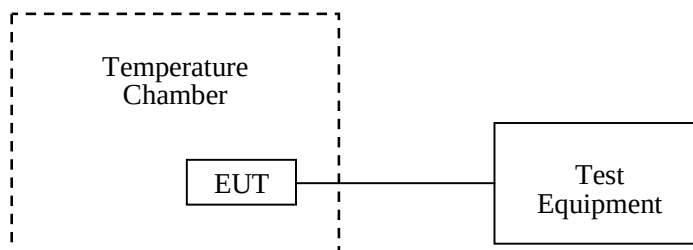
According to §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC 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 DC 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 DC 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
BACL	High Temperature Test Chamber	BTH-150	30024	2015-12-02	2016-12-01
FLUKE	Multimeter	1587	27870099	2015-12-30	2016-12-29
R&S	Universal Radio Communication Tester	CMU200	11-9435686-111	2016-07-28	2017-07-27
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-11-23	2016-11-23
N/A	RF Cable	N/A	N/A	Each Time	/

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	27.5 °C
Relative Humidity:	31 %
ATM Pressure:	100.4 kPa

The testing was performed by Tom Tang on 2016-11-21.

Cellular Band (Part 22H)

GMSK, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
$^{\circ}\text{C}$	V_{DC}	Hz	ppm	ppm
-30	3.8	-2	-0.002	2.5
-20	3.8	-6	-0.007	2.5
-10	3.8	2	0.002	2.5
0	3.8	-5	-0.006	2.5
10	3.8	-8	-0.010	2.5
20	3.8	-4	-0.005	2.5
30	3.8	1	0.001	2.5
40	3.8	-1	-0.001	2.5
50	3.8	-9	-0.011	2.5
20	3.5	-6	-0.007	2.5
20	4.2	-9	-0.011	2.5

Cellular Band (Part 22H)

EDGE, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
$^{\circ}\text{C}$	V_{DC}	Hz	ppm	ppm
-30	3.8	-7	-0.008	2.5
-20	3.8	-5	-0.006	2.5
-10	3.8	-2	-0.002	2.5
0	3.8	-9	-0.011	2.5
10	3.8	-1	-0.001	2.5
20	3.8	-6	-0.007	2.5
30	3.8	-4	-0.005	2.5
40	3.8	-7	-0.008	2.5
50	3.8	-4	-0.005	2.5
20	3.5	1	0.001	2.5
20	4.2	-9	-0.011	2.5

PCS Band (Part 24E)

GMSK, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	-1	-0.001	Pass
-20	3.8	7	0.004	Pass
-10	3.8	5	0.003	Pass
0	3.8	7	0.004	Pass
10	3.8	1	0.001	Pass
20	3.8	5	0.003	Pass
30	3.8	3	0.002	Pass
40	3.8	-1	-0.001	Pass
50	3.8	6	0.003	Pass
20	3.5	-2	-0.001	Pass
20	4.2	4	0.002	Pass

PCS Band (Part 24E)

EDGE, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	5	-0.001	Pass
-20	3.8	6	0.001	Pass
-10	3.8	5	-0.003	Pass
0	3.8	7	-0.001	Pass
10	3.8	8	-0.003	Pass
20	3.8	7	-0.001	Pass
30	3.8	6	-0.001	Pass
40	3.8	4	0.001	Pass
50	3.8	2	-0.002	Pass
20	3.5	-2	-0.003	Pass
20	4.2	5	-0.001	Pass

WCDMA Band V :

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.8	-6	-0.007	2.5
-20	3.8	1	0.001	2.5
-10	3.8	2	0.002	2.5
0	3.8	-8	-0.010	2.5
10	3.8	-1	-0.001	2.5
20	3.8	-2	-0.002	2.5
30	3.8	-7	-0.008	2.5
40	3.8	2	0.002	2.5
50	3.8	-3	-0.004	2.5
20	3.5	-7	-0.008	2.5
20	4.2	1	0.001	2.5

WCDMA Band II :

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	-2	-0.001	Pass
-20	3.8	1	0.001	Pass
-10	3.8	-5	-0.003	Pass
0	3.8	-1	-0.001	Pass
10	3.8	-5	-0.003	Pass
20	3.8	-2	-0.001	Pass
30	3.8	-1	-0.001	Pass
40	3.8	1	0.001	Pass
50	3.8	-4	-0.002	Pass
20	3.5	-6	-0.003	Pass
20	4.2	-2	-0.001	Pass

LTE Band II:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	-3.11	-0.0017	Pass
-20	3.8	-3.04	-0.0016	Pass
-10	3.8	-3.06	-0.0016	Pass
0	3.8	-3.10	-0.0016	Pass
10	3.8	-3.09	-0.0016	Pass
20	3.8	-3.09	-0.0016	Pass
30	3.8	-3.08	-0.0016	Pass
40	3.8	-3.01	-0.0016	Pass
50	3.8	-3.12	-0.0017	Pass
20	3.5	-3.09	-0.0016	Pass
20	4.2	-3.01	-0.0016	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	-3.01	-0.0016	Pass
-20	3.8	-2.99	-0.0016	Pass
-10	3.8	-3.02	-0.0016	Pass
0	3.8	-3.00	-0.0016	Pass
10	3.8	-2.97	-0.0016	Pass
20	3.8	-2.98	-0.0016	Pass
30	3.8	-2.99	-0.0016	Pass
40	3.8	-3.00	-0.0016	Pass
50	3.8	-3.02	-0.0016	Pass
20	3.5	-3.04	-0.0016	Pass
20	4.2	-3.09	-0.0016	Pass

LTE Band IV:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1732.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.8	1.49	0.0009	2.5
-20	3.8	1.50	0.0009	2.5
-10	3.8	1.48	0.0009	2.5
0	3.8	1.47	0.0008	2.5
10	3.8	1.50	0.0009	2.5
20	3.8	1.52	0.0009	2.5
30	3.8	1.52	0.0009	2.5
40	3.8	1.51	0.0009	2.5
50	3.8	1.50	0.0009	2.5
20	3.5	1.50	0.0009	2.5
20	4.2	1.49	0.0009	2.5

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1732.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.8	0.22	0.0001	2.5
-20	3.8	0.21	0.0001	2.5
-10	3.8	0.23	0.0001	2.5
0	3.8	0.22	0.0001	2.5
10	3.8	0.22	0.0001	2.5
20	3.8	0.24	0.0001	2.5
30	3.8	0.21	0.0001	2.5
40	3.8	0.20	0.0001	2.5
50	3.8	0.22	0.0001	2.5
20	3.5	0.22	0.0001	2.5
20	4.2	0.22	0.0001	2.5

LTE Band V:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 836.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	-0.23	-0.0001	Pass
-20	3.8	-0.24	-0.0001	Pass
-10	3.8	-0.20	-0.0001	Pass
0	3.8	-0.21	-0.0001	Pass
10	3.8	-0.20	-0.0001	Pass
20	3.8	-0.21	-0.0001	Pass
30	3.8	-0.23	-0.0001	Pass
40	3.8	-0.21	-0.0001	Pass
50	3.8	-0.22	-0.0001	Pass
20	3.5	-0.24	-0.0001	Pass
20	4.2	-0.24	-0.0001	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 836.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	-0.30	-0.0002	Pass
-20	3.8	-0.29	-0.0002	Pass
-10	3.8	-0.31	-0.0002	Pass
0	3.8	-0.33	-0.0002	Pass
10	3.8	-0.32	-0.0002	Pass
20	3.8	-0.31	-0.0002	Pass
30	3.8	-0.29	-0.0002	Pass
40	3.8	-0.30	-0.0002	Pass
50	3.8	-0.29	-0.0002	Pass
20	3.5	-0.32	-0.0002	Pass
20	4.2	-0.30	-0.0002	Pass

LTE Band VII:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 2535$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	2.91	0.0011	Pass
-20	3.8	2.90	0.0011	Pass
-10	3.8	2.89	0.0011	Pass
0	3.8	2.93	0.0012	Pass
10	3.8	2.98	0.0012	Pass
20	3.8	2.98	0.0012	Pass
30	3.8	3.00	0.0012	Pass
40	3.8	2.97	0.0012	Pass
50	3.8	2.96	0.0012	Pass
20	3.5	2.89	0.0011	Pass
20	4.2	2.96	0.0012	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 2535$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	3.09	0.0012	Pass
-20	3.8	3.11	0.0012	Pass
-10	3.8	3.09	0.0012	Pass
0	3.8	3.10	0.0012	Pass
10	3.8	3.08	0.0012	Pass
20	3.8	3.12	0.0012	Pass
30	3.8	3.09	0.0012	Pass
40	3.8	3.10	0.0012	Pass
50	3.8	3.09	0.0012	Pass
20	3.5	3.11	0.0012	Pass
20	4.2	3.08	0.0012	Pass

LTE Band 17:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 710$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	1.02	0.0014	Pass
-20	3.8	1.10	0.0015	Pass
-10	3.8	1.14	0.0016	Pass
0	3.8	1.09	0.0015	Pass
10	3.8	1.10	0.0015	Pass
20	3.8	1.12	0.0016	Pass
30	3.8	1.11	0.0016	Pass
40	3.8	1.08	0.0015	Pass
50	3.8	1.14	0.0016	Pass
20	3.5	1.11	0.0016	Pass
20	4.2	1.09	0.0015	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 710$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.8	0.54	0.0008	Pass
-20	3.8	0.56	0.0008	Pass
-10	3.8	0.61	0.0009	Pass
0	3.8	0.65	0.0009	Pass
10	3.8	0.66	0.0009	Pass
20	3.8	0.69	0.0010	Pass
30	3.8	0.63	0.0009	Pass
40	3.8	0.59	0.0008	Pass
50	3.8	0.60	0.0008	Pass
20	3.5	0.61	0.0009	Pass
20	4.2	0.58	0.0008	Pass

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 *******