FCC PART 22H, PART 24E

FCC PART 27

MEASUREMENT AND TEST REPORT

For

MAXWEST INTERNATIONAL LIMITED.

No.1,Longgang Road,Buji,Longgang,ShenzhenCity,Guangdong Province, P.R. China

FCC ID: 2AEN3ASTROX55LTE

Report Type:	**Product Name:**
Original Report	Mobile Phone

Test Engineer:	*Tom Tang*
Report Number:	RDG161114001D
Report Date:	2016-12-27
Reviewed By:	Henry Ding EMC Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China Tel: 028-65523123, Fax: 028-65525125 www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***MAXWEST INTERNATIONAL LIMITED.*** 's product, model number: ***Astro X55 LTE (FCC ID: 2AEN3ASTROX55LTE)*** (the "EUT") in this report was a ***Mobile Phone***, which was measured approximately: 15.05 cm (L) × 7.63 cm (W) × 0.81 cm (H), rated input voltage: DC3.8V battery or DC5V from adapter.

Adapter Information:
MODEL: SCJ-05100
Input: AC100-240V 50/60Hz 0.2A
Output: DC5V 1A

**All measurement and test data in this report was gathered from final production sample, serial number: 161114001 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2016-11-17, and EUT conformed to test requirement.*

Objective

This report is prepared on behalf of ***MAXWEST INTERNATIONAL LIMITED.*** 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: 2AEN3ASTROX55LTE.
FCC Part 15C DTS submissions with FCC ID: 2AEN3ASTROX55LTE.
FCC Part 15C DSS submissions with FCC ID: 2AEN3ASTROX55LTE.

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.

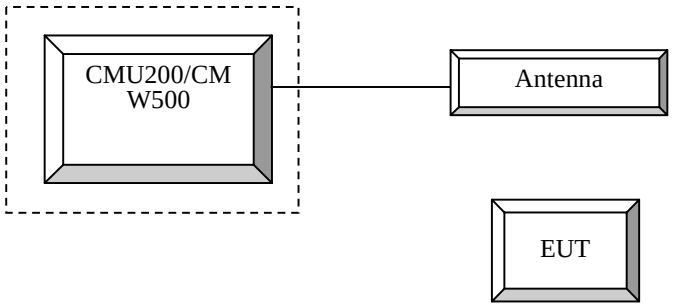
Equipment Modifications

No modification was made to the EUT.

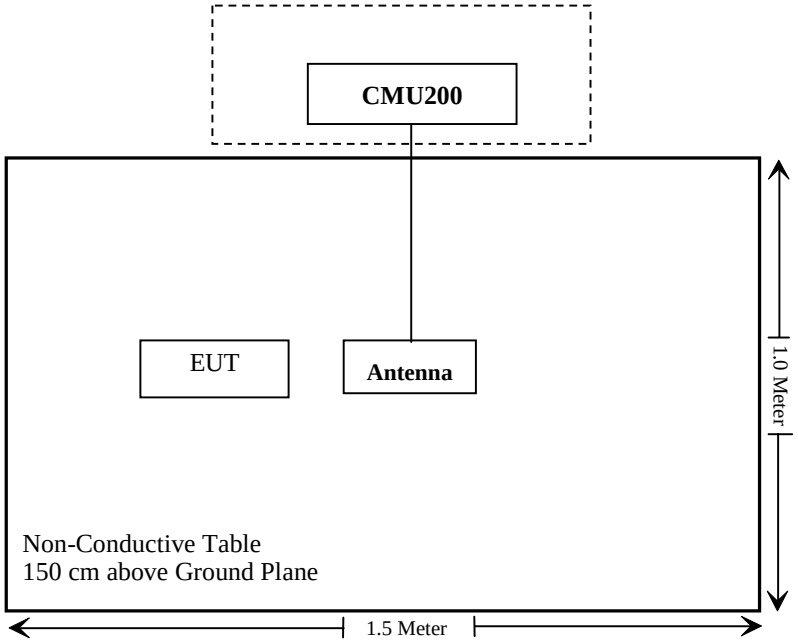
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universial 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: RDG161114001-20.

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
	βc / βd	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			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/ βd	2/15	12/15	15/8	15/4
	βhs	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			
	Ahs=βhs/ βc	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				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/ βd	11/15	6/15	15/9	2/15	-
	βhs	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				
	Ahs=βhs/ βc	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_FCIs	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 (Note3)	β_d	β_{HS} (Note1)	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_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_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 β_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
16 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 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
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	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
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	2016-11-10	2017-11-09
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	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	2016-11-23	2017-11-23

*** 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:	26.3 °C
Relative Humidity:	41 %
ATM Pressure:	100.8 kPa

The testing was performed by Tom Tang on 2016-12-12.

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	32.50	32.37	31.01	29.82	28.36	26.12	25.05	23.95	23.69
	190	32.43	32.39	31.03	29.79	28.58	26.46	25.23	24.22	22.92
	251	32.55	32.34	31.23	29.86	28.68	26.01	24.72	23.67	22.54
PCS	512	30.13	29.84	29.57	28.36	27.15	25.14	24.41	22.48	21.42
	661	29.20	29.00	28.84	27.55	26.57	25.25	24.40	22.87	21.70
	810	29.11	28.69	28.55	27.47	26.20	25.33	24.64	22.80	21.71

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	22.88	3.25	22.66	4.17	22.41	3.89
HSDPA (QPSK)	1	21.34	3.32	21.57	4.33	21.80	3.96
	2	21.83	3.36	21.34	3.87	21.63	3.73
	3	21.55	3.42	21.35	4.11	21.72	3.68
	4	21.53	3.06	21.60	4.21	21.48	3.80
HSUPA (QPSK)	1	21.61	3.35	21.55	3.89	21.64	3.70
	2	21.45	2.98	21.24	3.95	21.41	3.97
	3	21.64	3.02	21.21	4.29	21.33	3.59
	4	21.56	3.10	21.47	4.40	21.25	4.09
	5	21.53	3.15	21.54	4.08	21.26	4.12
DC-HSDPA (QPSK)	1	21.54	3.07	21.27	4.25	21.18	4.06
	2	21.63	3.24	21.10	4.32	21.35	3.60
	3	21.65	3.47	21.42	3.92	21.12	3.85
	4	21.37	3.46	21.55	3.92	21.46	3.71
HSPA+ (16QAM)	1	21.35	3.08	21.34	4.20	20.90	3.76

WCDMA Band IV

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	23.57	3.85	23.15	3.25	23.51	3.65
HSDPA (QPSK)	1	22.49	3.97	22.22	3.51	22.49	3.43
	2	22.52	3.74	22.38	3.33	22.32	3.82
	3	22.26	3.80	22.46	3.09	22.36	3.66
	4	22.30	3.65	21.97	3.37	22.55	3.88
HSUPA (QPSK)	1	22.65	4.15	21.94	2.99	22.68	3.50
	2	22.47	3.68	22.46	3.40	22.31	3.42
	3	22.22	3.60	22.36	3.14	22.26	3.59
	4	22.44	3.58	21.85	3.05	22.08	3.91
	5	22.31	3.70	22.12	3.43	22.24	3.48
DC-HSDPA (QPSK)	1	22.38	3.70	22.15	3.10	22.42	3.42
	2	22.38	3.99	22.27	3.08	22.42	3.71
	3	22.12	3.68	22.26	3.10	22.21	3.91
	4	22.04	4.14	21.97	3.05	21.93	3.56
HSPA+ (16QAM)	1	22.26	4.08	22.24	3.48	22.42	3.42

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	22.11	3.85	22.37	3.13	22.48	3.53
HSDPA (QPSK)	1	21.30	3.85	21.55	3.00	21.44	3.45
	2	21.02	3.74	21.38	3.28	21.23	3.62
	3	21.28	3.77	21.47	2.99	21.45	3.73
	4	21.20	3.81	21.38	3.27	21.31	3.57
HSUPA (QPSK)	1	21.19	3.68	21.31	3.19	21.49	3.73
	2	21.27	3.90	21.16	3.19	21.11	3.63
	3	21.27	3.72	21.19	3.04	21.37	3.54
	4	21.20	3.93	21.21	3.28	21.11	3.64
	5	20.98	4.03	21.39	3.31	21.31	3.51
DC-HSDPA (QPSK)	1	20.84	3.98	21.20	3.07	21.22	3.61
	2	21.06	3.98	21.18	2.98	21.36	3.69
	3	20.89	3.99	21.07	2.98	21.11	3.59
	4	21.13	3.65	21.34	3.23	21.11	3.50
HSPA+ (16QAM)	1	20.75	3.66	21.23	3.14	20.97	3.53

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	22.22	22.08	22.03
		1#3	22.38	22.15	22.32
		1#5	22.12	22.18	22.29
		3#0	22.10	21.85	21.62
		3#1	22.16	21.96	21.59
		3#3	22.00	21.97	21.63
		6#0	21.19	20.90	20.87
	16QAM	1#0	22.34	21.83	21.84
		1#3	22.36	21.89	21.70
		1#5	22.19	21.81	21.82
		3#0	21.48	21.32	21.21
		3#1	21.47	21.32	21.51
		3#3	21.47	21.32	21.38
		6#0	20.85	20.28	20.71
3 MHz	QPSK	1#0	22.40	22.11	22.17
		1#7	22.31	22.03	21.92
		1#14	22.32	22.21	21.80
		8#0	21.71	21.82	21.74
		8#4	21.67	21.93	21.51
		8#7	21.71	21.64	21.57
		15#0	21.27	21.04	20.93
	16QAM	1#0	22.12	21.73	21.56
		1#7	22.24	21.64	21.40
		1#14	22.13	21.57	21.45
		8#0	21.58	21.24	20.96
		8#4	21.52	21.19	20.94
		8#7	21.50	21.26	21.25
		15#0	20.62	20.55	20.60
5 MHz	QPSK	1#0	22.45	22.11	21.91
		1#12	22.34	21.89	21.93
		1#24	22.19	19.99	21.80
		12#0	21.54	21.42	21.28
		12#6	21.66	21.29	21.37
		12#11	21.37	21.14	21.41
		25#0	21.20	20.92	20.49
	16QAM	1#0	21.60	21.36	21.50
		1#12	21.59	21.41	21.63
		1#24	21.53	21.43	21.52
		12#0	21.36	21.25	20.95
		12#6	21.23	21.26	20.91
		12#11	21.27	21.15	20.74
		25#0	20.61	20.44	20.33

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10 MHz	QPSK	1#0	22.32	21.96	21.95
		1#24	22.45	21.92	21.96
		1#49	22.30	22.05	22.00
		25#0	21.59	21.25	21.47
		25#12	21.45	21.30	21.42
		25#24	21.44	21.29	21.25
		50#0	20.95	20.52	20.63
	16QAM	1#0	21.81	21.48	21.41
		1#24	21.99	21.39	21.48
		1#49	20.84	21.54	21.32
		25#0	21.16	21.08	20.68
		25#12	21.13	21.13	20.85
		25#24	21.11	21.10	20.84
		50#0	20.75	20.28	20.05
15 MHz	QPSK	1#0	22.24	22.09	22.03
		1#37	22.03	22.17	22.05
		1#74	22.13	22.14	22.19
		36#0	21.31	21.67	21.47
		36#17	21.47	21.51	21.57
		36#35	21.49	21.67	21.67
		75#0	20.92	20.70	20.38
	16QAM	1#0	21.76	21.46	21.45
		1#37	21.80	21.61	21.27
		1#74	21.71	21.39	21.30
		36#0	21.28	21.05	20.55
		36#17	21.35	20.86	20.64
		36#35	21.20	21.02	20.54
		75#0	20.58	20.22	19.74
20 MHz	QPSK	1#0	22.18	21.77	21.81
		1#49	22.26	21.88	21.79
		1#99	22.14	21.85	22.08
		50#0	21.56	21.62	21.08
		50#24	21.36	21.12	21.65
		50#49	21.50	21.35	21.63
		100#0	20.57	20.62	20.60
	16QAM	1#0	21.48	21.54	21.54
		1#49	21.46	21.38	21.48
		1#99	21.42	21.52	21.41
		50#0	20.91	21.00	20.86
		50#24	20.97	20.91	20.66
		50#49	20.88	20.83	20.80
		100#0	20.50	20.36	20.11

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	22.24	21.98	22.33
		1#3	21.99	21.76	22.24
		1#5	22.31	21.87	22.14
		3#0	21.65	21.21	21.73
		3#1	21.57	21.13	21.45
		3#3	21.54	21.15	21.52
		6#0	21.03	20.44	20.97
	16QAM	1#0	21.79	21.28	21.76
		1#3	21.67	21.45	21.76
		1#5	21.82	21.48	21.86
		3#0	21.16	20.89	21.04
		3#1	21.16	20.76	21.17
		3#3	21.25	20.71	21.18
		6#0	20.45	20.26	20.38
3 MHz	QPSK	1#0	22.04	21.65	22.12
		1#7	22.19	21.62	21.93
		1#14	22.10	21.54	22.15
		8#0	21.54	21.14	21.43
		8#4	21.65	21.12	21.25
		8#7	21.60	21.22	21.26
		15#0	20.84	20.42	20.88
	16QAM	1#0	21.56	21.17	21.52
		1#7	21.73	21.15	21.77
		1#14	21.60	21.24	21.83
		8#0	20.87	20.49	21.07
		8#4	20.96	20.56	21.06
		8#7	20.88	20.65	21.11
		15#0	19.33	20.11	20.35
5 MHz	QPSK	1#0	21.93	21.49	22.18
		1#12	21.92	21.50	22.07
		1#24	21.92	21.50	22.12
		12#0	21.19	21.13	21.49
		12#6	22.23	21.07	21.48
		12#11	21.13	21.14	21.30
		25#0	20.36	20.31	20.77
	16QAM	1#0	21.55	21.09	21.57
		1#12	21.54	21.15	21.43
		1#24	21.57	21.27	21.45
		12#0	20.95	20.50	20.83
		12#6	21.11	20.55	20.88
		12#11	21.04	20.44	20.91
		25#0	20.30	20.18	20.32

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10 MHz	QPSK	1#0	21.68	21.29	21.81
		1#24	21.68	21.50	21.86
		1#49	21.67	21.27	21.86
		25#0	21.31	20.96	21.09
		25#12	21.25	20.92	21.01
		25#24	21.26	20.65	21.02
		50#0	20.43	20.24	20.65
	16QAM	1#0	21.53	21.01	21.34
		1#24	21.57	21.31	21.35
		1#49	21.52	21.16	21.34
		25#0	20.81	20.48	20.88
		25#12	20.73	20.62	20.90
		25#24	20.99	20.71	21.00
		50#0	20.10	20.02	20.30
15 MHz	QPSK	1#0	22.06	21.49	21.82
		1#37	21.81	21.22	21.63
		1#74	21.82	21.36	21.67
		36#0	21.22	20.97	21.09
		36#17	21.16	20.75	21.01
		36#35	21.36	20.78	21.17
		75#0	20.47	20.21	20.47
	16QAM	1#0	21.31	21.15	21.40
		1#37	21.23	21.14	21.39
		1#74	21.42	21.13	21.27
		36#0	20.75	20.74	20.74
		36#17	20.69	20.68	20.77
		36#35	20.53	20.79	20.84
		75#0	20.17	19.90	20.26
20 MHz	QPSK	1#0	21.96	21.89	21.87
		1#49	22.08	21.83	21.72
		1#99	21.84	22.03	21.86
		50#0	21.43	21.42	21.27
		50#24	21.49	21.41	21.15
		50#49	21.54	21.30	21.13
		100#0	21.00	20.43	20.75
	16QAM	1#0	21.39	21.15	21.33
		1#49	21.29	21.09	21.28
		1#99	21.24	21.15	21.30
		50#0	20.50	20.69	20.75
		50#24	20.42	20.48	20.69
		50#49	20.52	20.52	20.60
		100#0	20.03	20.04	20.15

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	22.37	22.28	21.98
		1#12	22.37	22.36	21.90
		1#24	22.28	22.30	21.89
		12#0	21.59	21.59	21.26
		12#6	21.52	21.65	21.19
		12#11	19.51	21.59	21.36
		25#0	20.72	21.21	21.05
	16QAM	1#0	21.44	21.68	21.74
		1#12	21.36	21.69	21.56
		1#24	21.52	21.81	21.56
		12#0	21.00	21.25	20.81
		12#6	20.85	21.20	20.70
		12#11	21.00	21.12	20.79
		25#0	20.42	20.66	20.15
10 MHz	QPSK	1#0	22.37	22.32	22.05
		1#24	22.47	22.35	21.99
		1#49	2.40	22.39	22.00
		25#0	21.35	21.66	21.28
		25#12	21.34	21.48	21.33
		25#24	21.54	21.53	21.25
		50#0	20.88	21.28	20.91
	16QAM	1#0	21.37	21.68	21.69
		1#24	21.30	21.85	21.62
		1#49	21.32	21.88	21.72
		25#0	20.86	20.99	20.57
		25#12	20.68	21.06	20.70
		25#24	20.80	21.12	20.66
		50#0	20.32	20.29	20.17

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15 MHz	QPSK	1#0	22.26	22.33	21.76
		1#37	22.40	22.44	21.88
		1#74	22.33	22.32	21.95
		36#0	21.57	21.54	21.30
		36#17	21.68	21.53	21.49
		36#35	21.83	21.67	21.35
		75#0	20.85	20.96	20.86
	16QAM	1#0	21.50	21.72	21.42
		1#37	21.62	21.73	21.37
		1#74	21.61	21.79	21.39
		36#0	20.92	20.95	20.51
		36#17	20.86	21.02	20.65
		36#35	20.74	21.19	20.53
		75#0	20.40	20.26	19.99
20 MHz	QPSK	1#0	22.37	22.20	21.99
		1#49	22.35	22.54	21.88
		1#99	22.20	22.26	22.13
		50#0	21.64	21.78	21.44
		50#24	21.60	21.80	21.33
		50#49	21.63	21.71	21.37
		100#0	20.97	21.02	20.89
	16QAM	1#0	21.75	21.62	21.36
		1#49	21.68	21.79	21.32
		1#99	21.49	21.67	21.39
		50#0	20.69	21.10	20.82
		50#24	20.55	20.99	20.78
		50#49	20.66	20.98	20.73
		100#0	20.24	20.23	20.11

LTE Band 12 (PART 27)

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4 MHz	QPSK	1#0	22.49	22.25	22.29
		1#3	22.26	22.08	22.45
		1#5	22.38	22.15	22.20
		3#0	22.07	21.98	22.06
		3#1	22.08	21.86	22.12
		3#3	22.05	21.94	21.83
		6#0	21.65	21.70	21.21
	16QAM	1#0	21.89	21.71	21.65
		1#3	21.63	21.85	21.50
		1#5	21.60	21.60	21.77
		3#0	21.27	21.31	21.31
		3#1	21.35	21.38	21.21
		3#3	21.53	21.59	21.31
		6#0	20.54	20.97	20.69
3 MHz	QPSK	1#0	22.46	22.64	22.30
		1#7	22.62	22.84	22.39
		1#14	22.70	22.60	22.52
		8#0	22.18	22.27	22.00
		8#4	22.13	22.08	22.06
		8#7	22.15	22.40	21.94
		15#0	21.77	21.84	21.62
	16QAM	1#0	21.78	22.05	21.62
		1#7	21.75	21.95	21.74
		1#14	21.73	21.85	21.59
		8#0	21.50	21.46	21.10
		8#4	21.27	21.63	21.13
		8#7	21.34	21.61	21.06
		15#0	20.82	21.01	20.83

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5 MHz	QPSK	1#0	22.70	22.67	22.58
		1#12	22.82	22.45	22.49
		1#24	22.59	22.66	22.64
		12#0	22.19	22.42	22.33
		12#6	22.09	22.39	22.08
		12#11	22.17	22.53	22.18
		25#0	21.57	21.45	21.30
	16QAM	1#0	21.96	22.00	21.65
		1#12	21.67	21.93	21.58
		1#24	21.83	21.93	21.53
		12#0	21.32	21.74	21.27
		12#6	21.33	21.60	21.15
		12#11	21.29	21.60	21.14
		25#0	20.82	20.90	20.65
10 MHz	QPSK	1#0	22.41	22.73	22.50
		1#24	22.48	22.68	22.43
		1#49	22.52	22.68	22.48
		25#0	22.14	22.32	21.95
		25#12	22.23	22.38	21.79
		25#24	21.98	22.35	21.74
		50#0	21.36	21.74	21.23
	16QAM	1#0	22.03	22.14	21.56
		1#24	22.07	22.17	21.62
		1#49	22.01	22.11	21.60
		25#0	21.46	21.78	21.22
		25#12	21.40	21.78	21.39
		25#24	21.58	21.68	21.09
		50#0	20.54	20.87	20.55

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	22.29	22.27	22.40
		1#12	22.41	22.38	22.42
		1#24	22.37	22.32	22.27
		12#0	21.82	21.66	21.71
		12#6	21.76	21.61	21.79
		12#11	21.83	21.66	21.70
		25#0	21.48	21.25	21.37
	16QAM	1#0	21.52	21.43	21.78
		1#12	21.42	21.40	21.70
		1#24	21.62	21.44	21.61
		12#0	20.74	20.99	21.19
		12#6	20.85	21.16	21.06
		12#11	20.99	20.93	21.07
		25#0	20.15	20.34	20.56
10 MHz	QPSK	1#0	22.19	22.18	22.09
		1#24	22.16	22.20	22.14
		1#49	22.31	22.16	22.09
		25#0	21.63	21.64	21.64
		25#12	21.64	21.62	21.80
		25#24	21.69	21.63	21.73
		50#0	20.35	21.03	21.15
	16QAM	1#0	21.62	21.37	21.69
		1#24	21.36	21.50	21.72
		1#49	21.26	21.52	21.68
		25#0	20.97	20.91	21.17
		25#12	20.98	20.79	21.23
		25#24	20.81	20.83	21.04
		50#0	20.26	20.41	20.49

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	3.69	4.61	4.37	13
	100 RB		7..82	3.73	3.69	13
16QAM	1 RB	20 MHz	3.97	4.77	4.73	13
	100 RB		8.30	5.57	5.37	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	4.69	4.45	3.17	13
	100 RB		3.45	3.97	3.89	13
16QAM	1 RB	20 MHz	5.49	3.93	3.69	13
	100 RB		5.57	5.65	5.09	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	3.85	4.05	4.45	13
	100 RB		3.61	3.89	3.49	13
16QAM	1 RB	20 MHz	4.37	4.69	4.57	13
	100 RB		5.49	5.41	5.33	13

PAR, Band 12

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	3.21	4.73	4.01	13
	50 RB		3.41	3.65	3.53	13
16QAM	1 RB	10 MHz	3.93	5.57	4.81	13
	50 RB		4.93	6.05	5.37	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	4.89	4.65	4.13	13
	50 RB		3.49	3.45	3.49	13
16QAM	1 RB	10 MHz	4.25	5.37	4.93	13
	50 RB		5.49	5.25	5.09	13

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

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								
836.6	H	108.36	31.3	0.0	0.6	30.7	38.5	7.8
836.6	V	98.58	23.6	0.0	0.6	23.0	38.5	15.5
EDGE 850_Middle Channel								
836.6	H	102.25	25.2	0.0	0.6	24.6	38.5	13.9
836.6	V	95.71	20.7	0.0	0.6	20.1	38.5	18.4
WCDMA Band V Middle Channel								
836.6	H	98.36	21.3	0.0	0.6	20.7	38.5	17.8
836.6	V	94.55	19.5	0.0	0.6	18.9	38.5	19.6

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	H	93.57	20	8.0	0.9	27.1	33.0	5.9
1880	V	85.33	12.9	8.0	0.9	20.0	33.0	13.0
EDGE 1900_Middle Channel								
1880	H	90.13	16.5	8.0	0.9	23.6	33.0	9.4
1880	V	82.27	9.9	8.0	0.9	17.0	33.0	16.0
WCDMA Band II Middle Channel								
1880	H	89.86	16.2	8.0	0.9	23.3	33.0	9.7
1880	V	83.33	10.9	8.0	0.9	18.0	33.0	15.0

Part 27

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)			
WCDMA Band IV Middle Channel								
1732.5	H	91.65	16.2	7.9	0.9	23.2	30.0	6.8
1732.5	V	86.76	12.4	7.9	0.9	19.4	30.0	10.6

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								
1880.000	H	88.68	15.1	8.0	0.9	22.2	33.0	10.8
1880.000	V	83.80	11.4	8.0	0.9	18.5	33.0	14.5
QPSK 3 MHz Middle Channel								
1880.000	H	88.26	14.6	8.0	0.9	21.7	33.0	11.3
1880.000	V	82.84	10.4	8.0	0.9	17.5	33.0	15.5
QPSK 5 MHz Middle Channel								
1880.000	H	86.45	12.8	8.0	0.9	19.9	33.0	13.1
1880.000	V	79.52	7.1	8.0	0.9	14.2	33.0	18.8
QPSK 10 MHz Middle Channel								
1880.000	H	85.73	12.1	8.0	0.9	19.2	33.0	13.8
1880.000	V	81.13	8.7	8.0	0.9	15.8	33.0	17.2
QPSK 15 MHz Middle Channel								
1880.000	H	86.05	12.4	8.0	0.9	19.5	33.0	13.5
1880.000	V	81.56	9.2	8.0	0.9	16.3	33.0	16.7
QPSK 20 MHz Middle Channel								
1880.000	H	85.79	12.2	8.0	0.9	19.3	33.0	13.7
1880.000	V	81.01	8.6	8.0	0.9	15.7	33.0	17.3
16QAM 1.4 MHz Middle Channel								
1880.000	H	88.05	14.4	8.0	0.9	21.5	33.0	11.5
1880.000	V	84.38	12	8.0	0.9	19.1	33.0	13.9
16QAM 3 MHz Middle Channel								
1880.000	H	87.25	13.6	8.0	0.9	20.7	33.0	12.3
1880.000	V	80.79	8.4	8.0	0.9	15.5	33.0	17.5
16QAM 5 MHz Middle Channel								
1880.000	H	85.45	11.8	8.0	0.9	18.9	33.0	14.1
1880.000	V	78.52	6.1	8.0	0.9	13.2	33.0	19.8
16QAM 10 MHz Middle Channel								
1880.000	H	84.58	11	8.0	0.9	18.1	33.0	14.9
1880.000	V	80.73	8.3	8.0	0.9	15.4	33.0	17.6
16QAM 15 MHz Middle Channel								
1880.000	H	85.02	11.4	8.0	0.9	18.5	33.0	14.5
1880.000	V	81.84	9.4	8.0	0.9	16.5	33.0	16.5
16QAM 20 MHz Middle Channel								
1880.000	H	85.41	11.8	8.0	0.9	18.9	33.0	14.1
1880.000	V	80.76	8.4	8.0	0.9	15.5	33.0	17.5

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								
1732.500	H	91.26	15.8	7.9	0.9	22.8	30.0	7.2
1732.500	V	88.71	14.4	7.9	0.9	21.4	30.0	8.6
QPSK 3 MHz Middle Channel								
1732.500	H	89.57	14.1	7.9	0.9	21.1	30.0	8.9
1732.500	V	87.80	13.5	7.9	0.9	20.5	30.0	9.5
QPSK 5 MHz Middle Channel								
1732.500	H	88.04	12.6	7.9	0.9	19.6	30.0	10.4
1732.500	V	86.13	11.8	7.9	0.9	18.8	30.0	11.2
QPSK 10 MHz Middle Channel								
1732.500	H	87.77	12.3	7.9	0.9	19.3	30.0	10.7
1732.500	V	85.62	11.3	7.9	0.9	18.3	30.0	11.7
QPSK 15 MHz Middle Channel								
1732.500	H	86.57	11.1	7.9	0.9	18.1	30.0	11.9
1732.500	V	84.33	10	7.9	0.9	17.0	30.0	13.0
QPSK 20 MHz Middle Channel								
1732.500	H	85.93	10.5	7.9	0.9	17.5	30.0	12.5
1732.500	V	83.91	9.6	7.9	0.9	16.6	30.0	13.4
16QAM 1.4 MHz Middle Channel								
1732.500	H	90.89	15.4	7.9	0.9	22.4	30.0	7.6
1732.500	V	87.42	13.1	7.9	0.9	20.1	30.0	9.9
16QAM 3 MHz Middle Channel								
1732.500	H	89.21	13.8	7.9	0.9	20.8	30.0	9.2
1732.500	V	87.34	13	7.9	0.9	20.0	30.0	10.0
16QAM 5 MHz Middle Channel								
1732.500	H	87.57	12.1	7.9	0.9	19.1	30.0	10.9
1732.500	V	86.64	12.3	7.9	0.9	19.3	30.0	10.7
16QAM 10 MHz Middle Channel								
1732.500	H	86.68	11.2	7.9	0.9	18.2	30.0	11.8
1732.500	V	84.94	10.6	7.9	0.9	17.6	30.0	12.4
16QAM 15 MHz Middle Channel								
1732.500	H	86.22	10.8	7.9	0.9	17.8	30.0	12.2
1732.500	V	84.14	9.8	7.9	0.9	16.8	30.0	13.2
16QAM 20 MHz Middle Channel								
1732.500	H	85.71	10.3	7.9	0.9	17.3	30.0	12.7
1732.500	V	82.68	8.4	7.9	0.9	15.4	30.0	14.6

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								
2535.000	H	86.77	13.9	8.9	1.2	21.6	33.0	11.4
2535.000	V	84.26	11.7	8.9	1.2	19.4	33.0	13.6
QPSK 10 MHz Middle Channel								
2535.000	H	85.89	13	8.9	1.2	20.7	33.0	12.3
2535.000	V	82.46	9.9	8.9	1.2	17.6	33.0	15.4
QPSK 15 MHz Middle Channel								
2535.000	H	83.25	10.4	8.9	1.2	18.1	33.0	14.9
2535.000	V	82.01	9.5	8.9	1.2	17.2	33.0	15.8
QPSK 20MHz Middle Channel								
2535.000	H	82.48	9.6	8.9	1.2	17.3	33.0	15.7
2535.000	V	81.32	8.8	8.9	1.2	16.5	33.0	16.5
16QAM 5 MHz Middle Channel								
2535.000	H	86.69	13.8	8.9	1.2	21.5	33.0	11.5
2535.000	V	84.52	12	8.9	1.2	19.7	33.0	13.3
16QAM 10 MHz Middle Channel								
2535.000	H	84.83	12	8.9	1.2	19.7	33.0	13.3
2535.000	V	83.99	11.5	8.9	1.2	19.2	33.0	13.8
16QAM 15 MHz Middle Channel								
2535.000	H	84.26	11.4	8.9	1.2	19.1	33.0	13.9
2535.000	V	83.34	10.8	8.9	1.2	18.5	33.0	14.5
16QAM 20 MHz Middle Channel								
2535.000	H	83.25	10.4	8.9	1.2	18.1	33.0	14.9
2535.000	V	82.62	10.1	8.9	1.2	17.8	33.0	15.2

LTE Band 12

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								
707.5	H	100.26	23.6	0.0	0.6	23.0	34.8	11.8
707.5	V	96.69	18.6	0.0	0.6	18.0	34.8	16.8
QPSK 3 MHz Middle Channel								
707.5	H	99.29	22.6	0.0	0.6	22.0	34.8	12.8
707.5	V	95.53	17.4	0.0	0.6	16.8	34.8	18.0
QPSK 5 MHz Middle Channel								
707.5	H	98.51	21.9	0.0	0.6	21.3	34.8	13.5
707.5	V	95.11	17	0.0	0.6	16.4	34.8	18.4
QPSK 10MHz Middle Channel								
707.5	H	96.48	19.8	0.0	0.6	19.2	34.8	15.6
707.5	V	94.33	16.2	0.0	0.6	15.6	34.8	19.2
16QAM 1.4 MHz Middle Channel								
707.5	H	99.7	23	0.0	0.6	22.4	34.8	12.4
707.5	V	96.15	18.1	0.0	0.6	17.5	34.8	17.3
16QAM 3 MHz Middle Channel								
707.5	H	99.15	22.5	0.0	0.6	21.9	34.8	12.9
707.5	V	95.36	17.3	0.0	0.6	16.7	34.8	18.1
16QAM 5 MHz Middle Channel								
707.5	H	97.91	21.3	0.0	0.6	20.7	34.8	14.1
707.5	V	94.68	16.6	0.0	0.6	16.0	34.8	18.8
16QAM 10 MHz Middle Channel								
707.5	H	95.94	19.3	0.0	0.6	18.7	34.8	16.1
707.5	V	93.74	15.6	0.0	0.6	15.0	34.8	19.8

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	98	21.3	0.0	0.6	20.7	34.8	14.1
710	V	94.42	16.4	0.0	0.6	15.8	34.8	19.0
QPSK 10 MHz Middle Channel								
710	H	97.03	20.4	0.0	0.6	19.8	34.8	15.0
710	V	93.48	15.4	0.0	0.6	14.8	34.8	20.0
16QAM 5 MHz Middle Channel								
710	H	97.6	20.9	0.0	0.6	20.3	34.8	14.5
710	V	94.1	16.1	0.0	0.6	15.5	34.8	19.3
16QAM 10MHz Middle Channel								
710	H	96.6	19.9	0.0	0.6	19.3	34.8	15.5
710	V	92.93	14.9	0.0	0.6	14.3	34.8	20.5

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

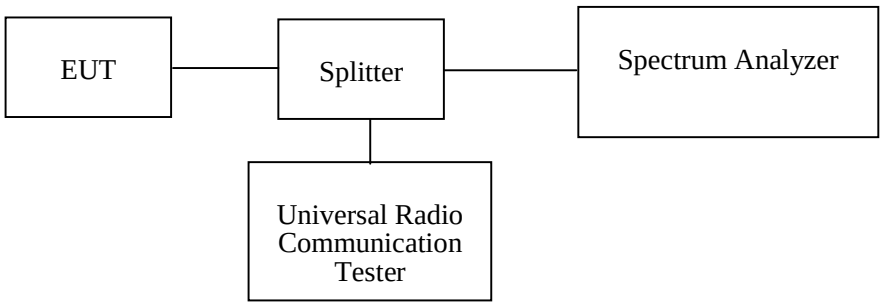
Applicable Standard

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
N/A	RF Cable	N/A	N/A	Each Time	/
N/A	Two-way Spliter	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:	26.3~27.5 °C
Relative Humidity:	41 %
ATM Pressure:	100.8~101.2 kPa

The testing was performed by Tom Tang from 2016-12-12 to 2016-12-21.

Test Mode: Transmitting

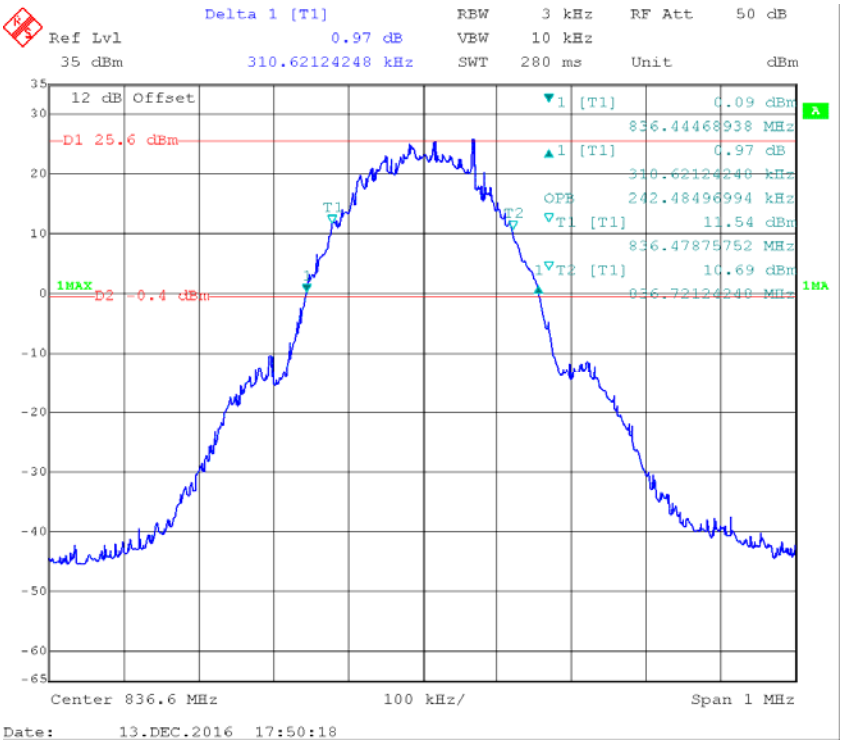
Test Result: Compliant. Please refer to the following table and plots.

Band	Test Channel	Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Cellular	M	GSM	0.242	0.311
		EDGE	0.253	0.323
PCS		PCS	0.246	0.319
		EDGE	0.255	0.323
WCDMA Band II		Rel 99	4.208	4.91
		HSDPA	4.228	4.93
		HSUPA	4.208	4.91
WCDMA Band IV		Rel 99	4.228	4.89
		HSDPA	4.228	4.89
		HSUPA	4.208	4.91
WCDMA Band V		Rel 99	4.248	4.89
		HSDPA	4.248	4.85
		HSUPA	4.228	4.89

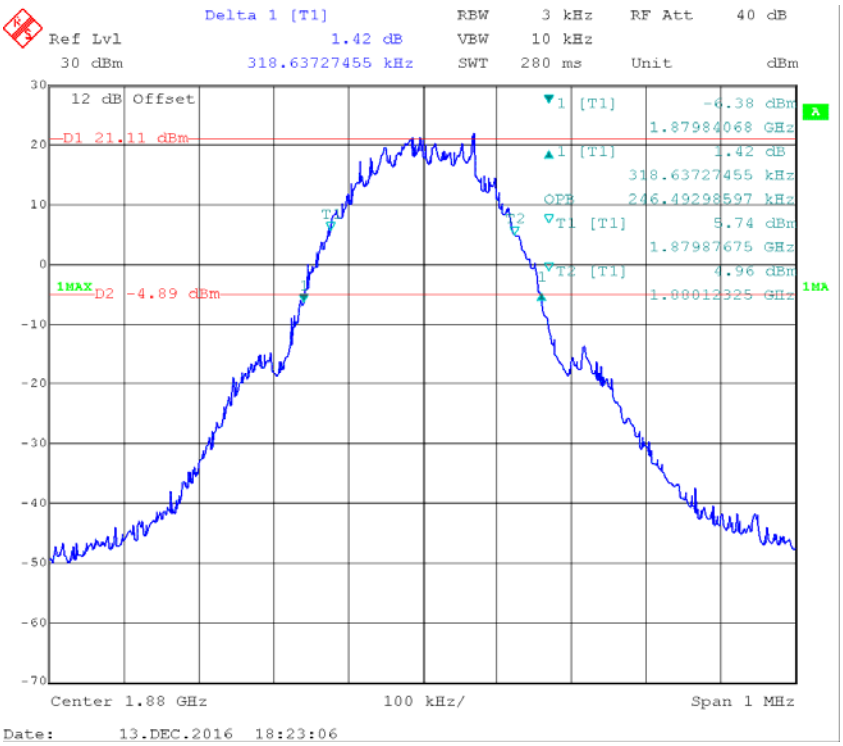
Band	Test Modulation	Test Bandwidth (MHz)	Test Channel	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
LTE Band II	QPSK	1.4	M	1.106	1.287
		3		2.705	2.958
		5		4.549	5.070
		10		9.138	10.341
		15		13.587	15.210
		20		17.956	19.559
	16QAM	1.4	M	1.106	1.287
		3		2.717	2.970
		5		4.549	5.110
		10		9.138	10.381
		15		13.587	15.030
		20		17.956	19.639
LTE Band IV	QPSK	1.4	M	1.112	1.287
		3		2.729	2.970
		5		4.549	5.050
		10		9.098	10.301
		15		13.587	15.150
		20		18.036	19.559
	16QAM	1.4	M	1.106	1.281
		3		2.717	2.958
		5		4.569	5.130
		10		9.138	10.341
		15		13.587	15.150
		20		18.036	19.559

Band	Test Modulation	Test Bandwidth (MHz)	Test Channel	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
LTE Band VII	QPSK	5	M	4.589	5.150
		10		9.178	10.421
		15		13.647	15.150
		20		17.956	19.800
	16QAM	5	M	4.589	5.170
		10		9.138	10.461
		15		13.587	15.721
		20		18.036	19.800
LTE Band 12	QPSK	1.4	M	1.100	1.263
		3		2.717	2.970
		5		4.549	5.010
		10		9.138	10.421
	16QAM	1.4	M	1.106	1.275
		3		2.705	2.958
		5		4.549	5.070
		10		9.138	10.421
LTE Band 17	QPSK	5	M	4.549	5.090
		10		9.098	10.381
	16QAM	5	M	4.529	5.070
		10		9.058	10.301

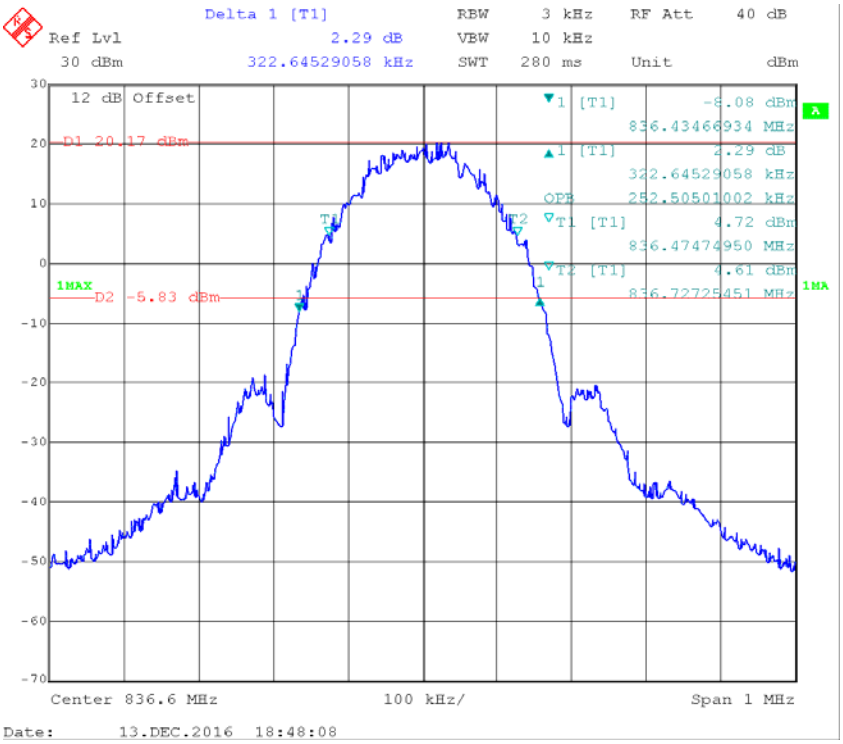
GMSK 850 Cellular Band



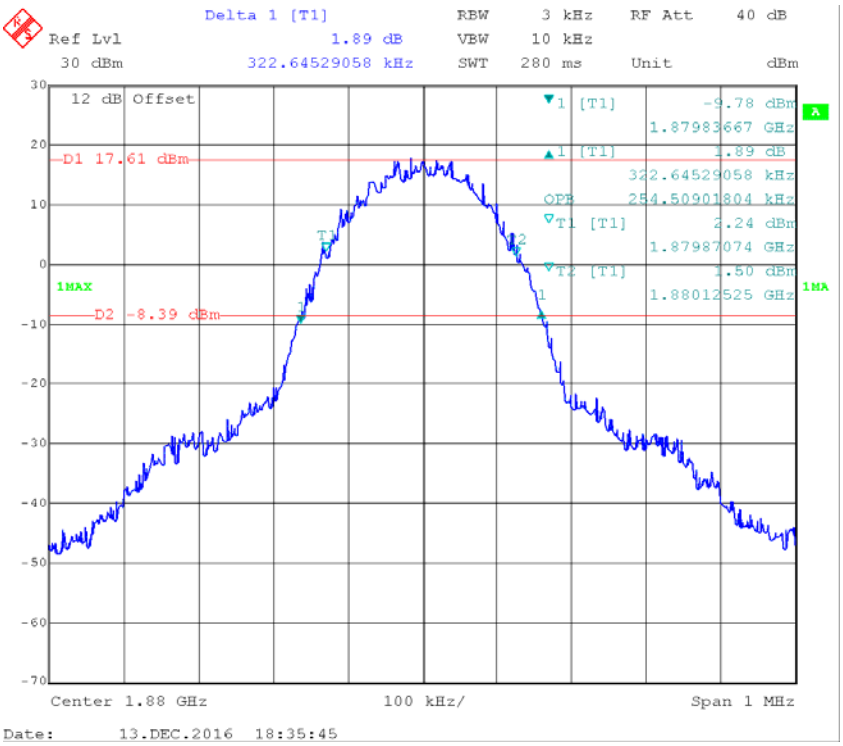
GMSK PCS Band



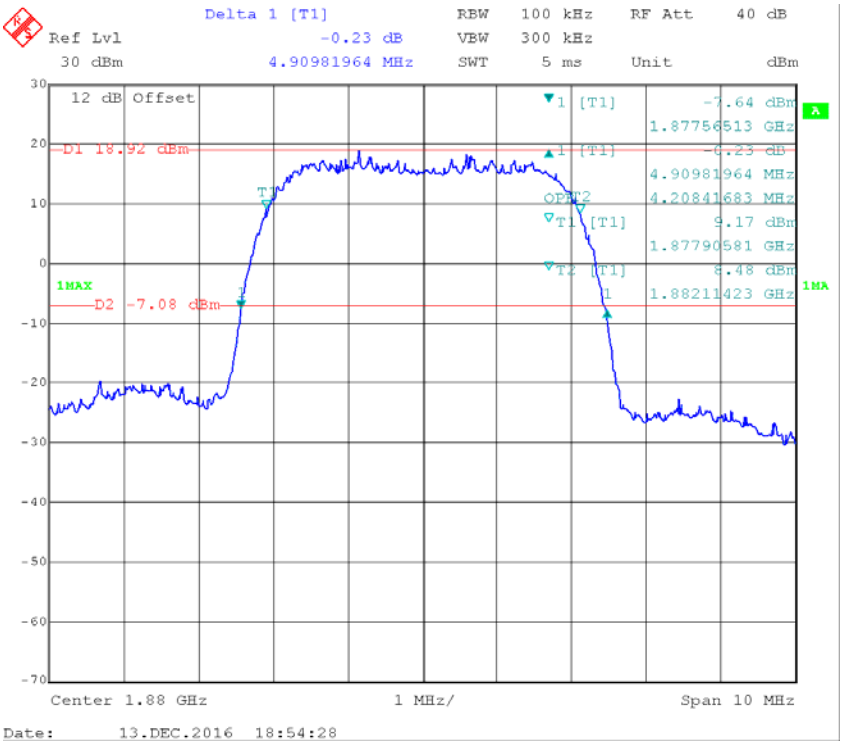
EDGE 850 Cellular Band



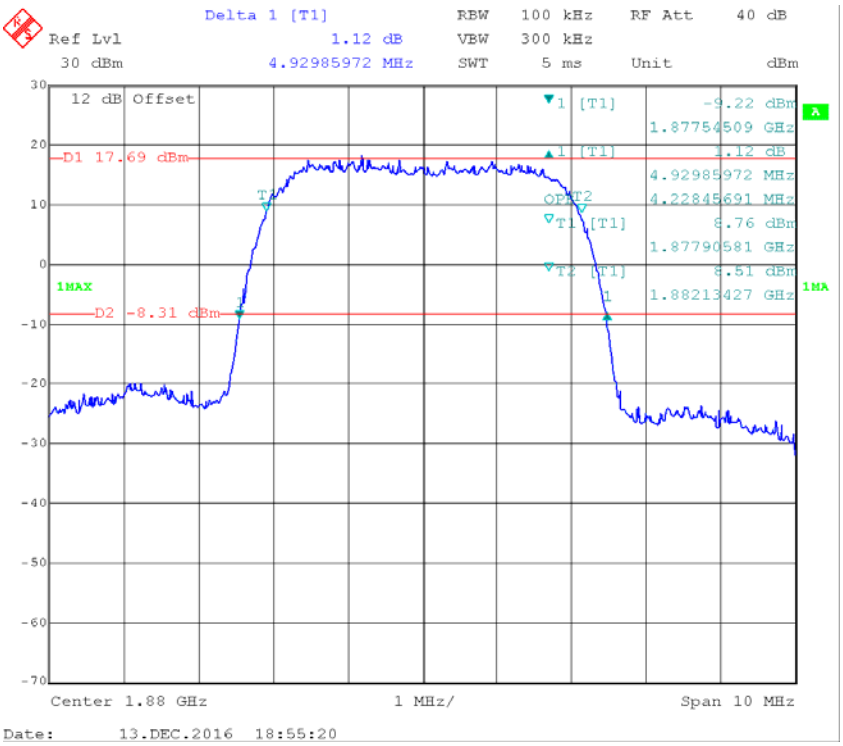
EDGE PCS Band



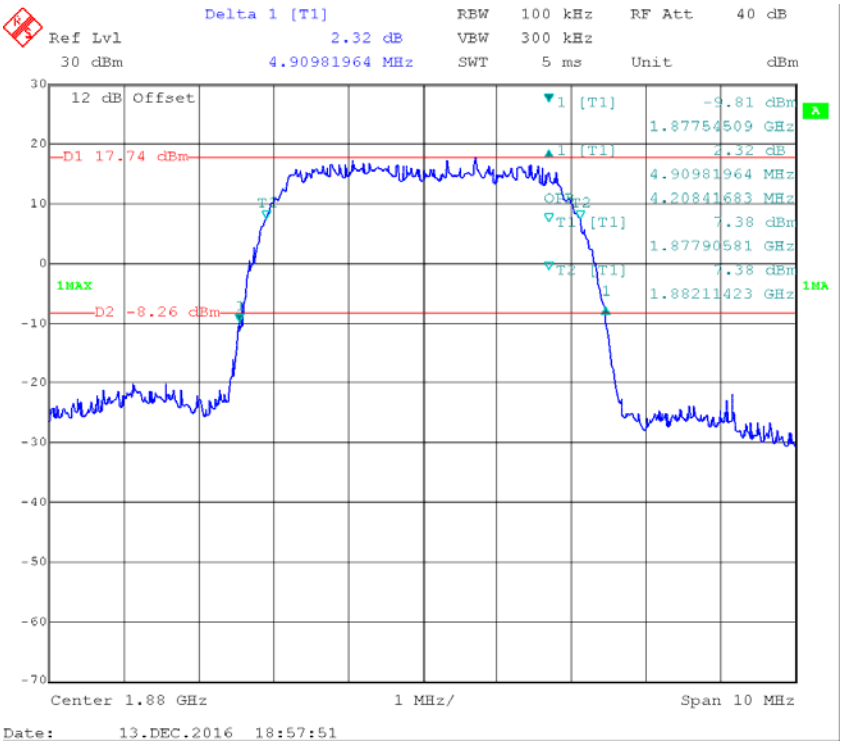
REL99 Band II



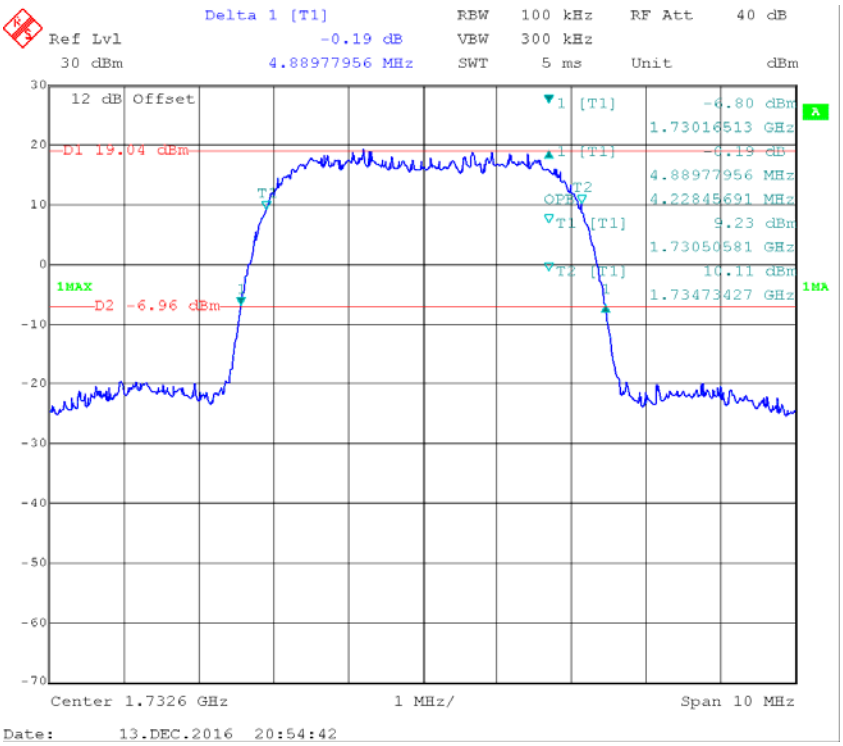
HSDPA Band II



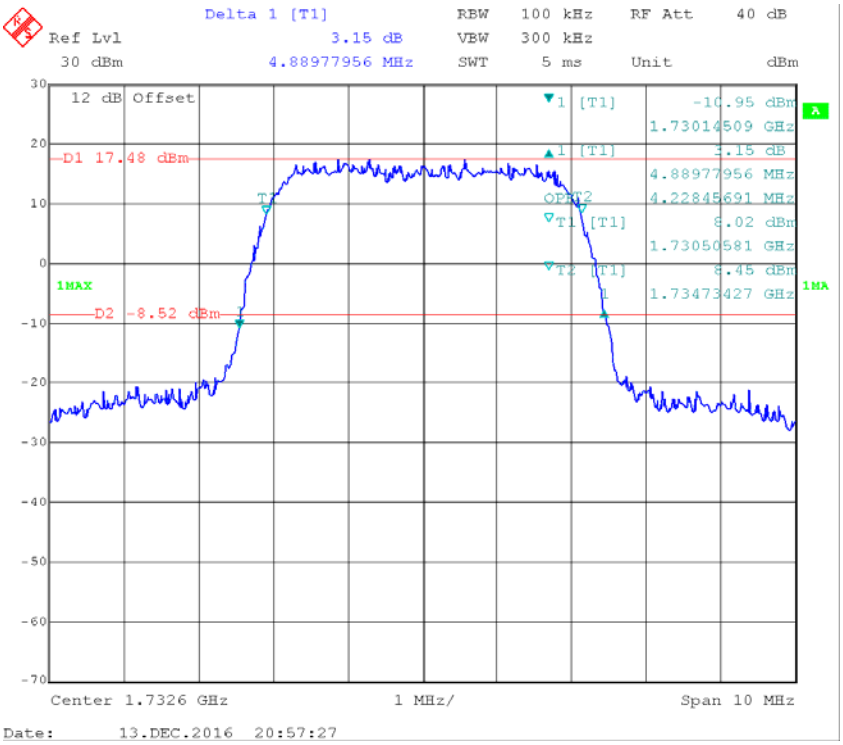
HSUPA Band II



REL99 Band IV



HSDPA Band IV



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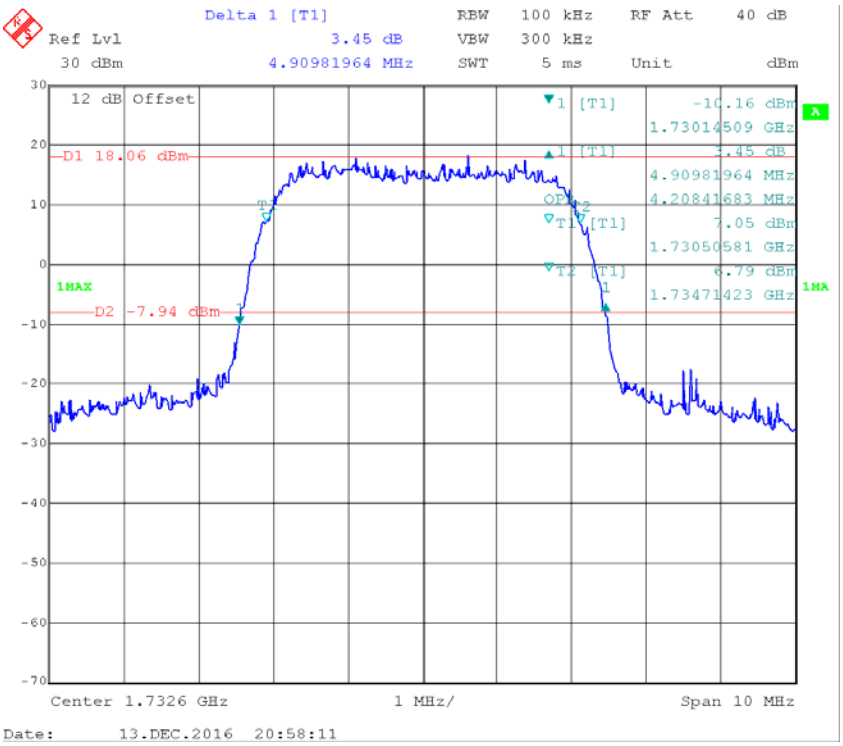
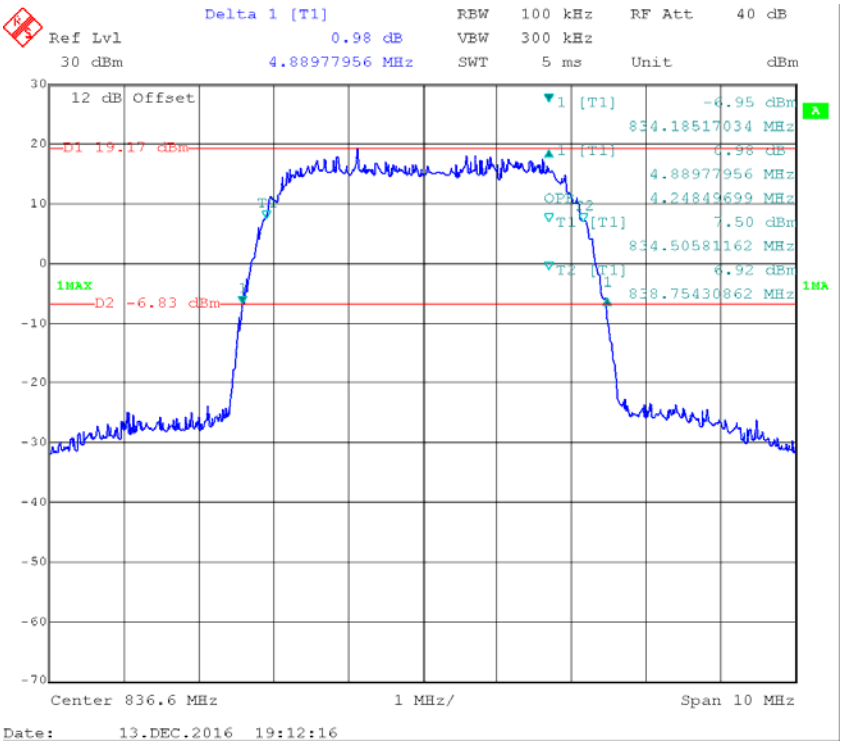


REL99 Band V



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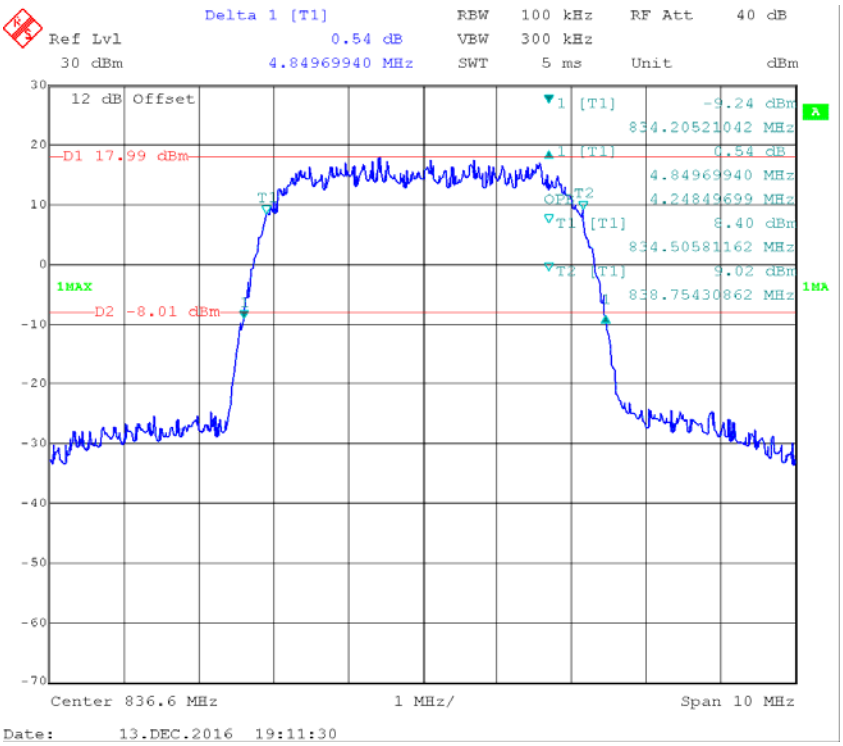
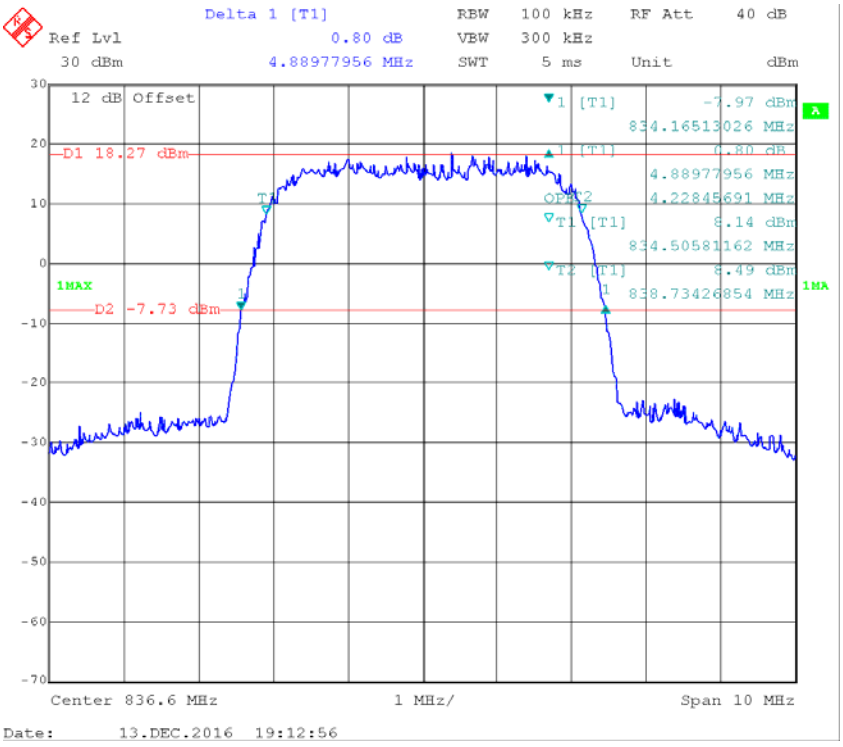


HSUPA Band V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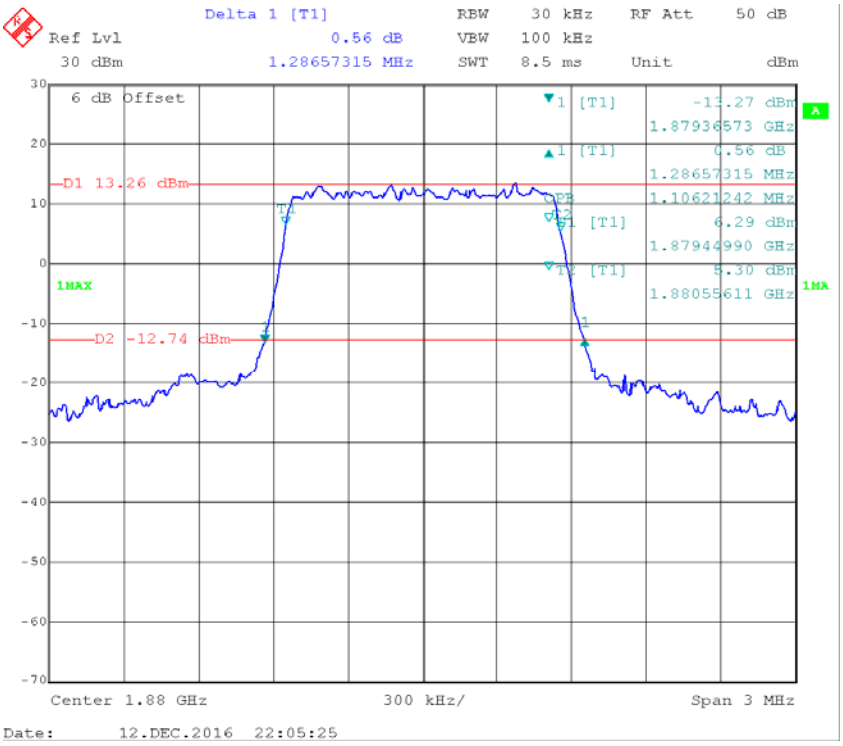
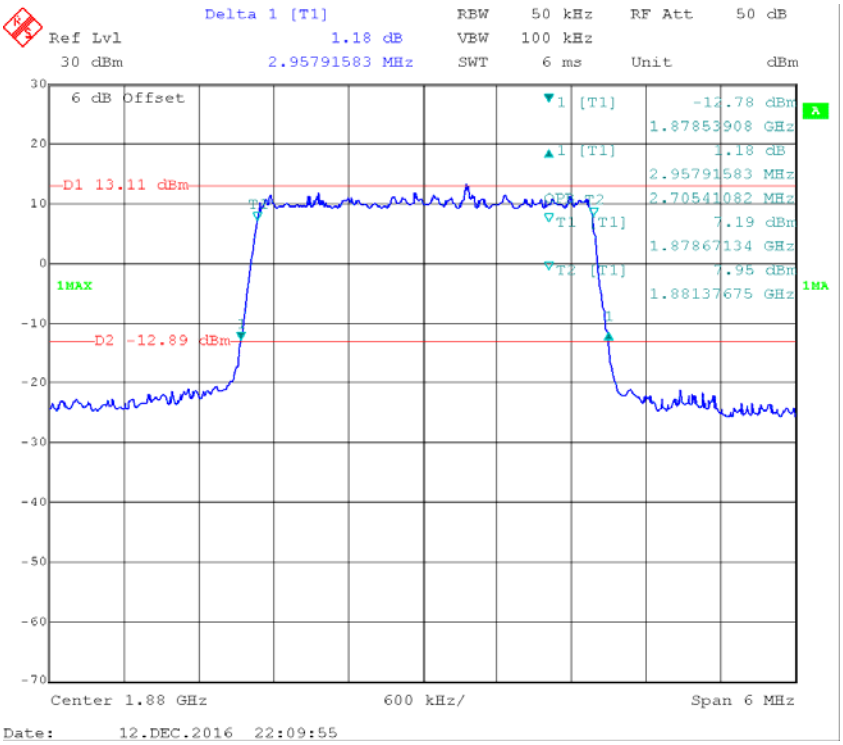
0.80 dB
4.88977956 MHz
RBW 100 kHz
VBW 300 kHz
SWT 5 ms
RF Att 40 dB
Unit dBm
Ref Lvl
30 dBm
12 dB Offset
D1 18.27 dBm
D2 -7.73 dBm
1MAX
1 [T1] -7.97 dBm
834.16513026 MHz
1 [T1] 0.80 dB
4.88977956 MHz
OBW 4.22845691 MHz
T1 [T1] 8.14 dBm
834.50581162 MHz
T2 [T1] 8.49 dBm
838.73426854 MHz
Center 836.6 MHz
1 MHz/
Span 10 MHz
Date: 13.DEC.2016 19:12:56

LTE Band II

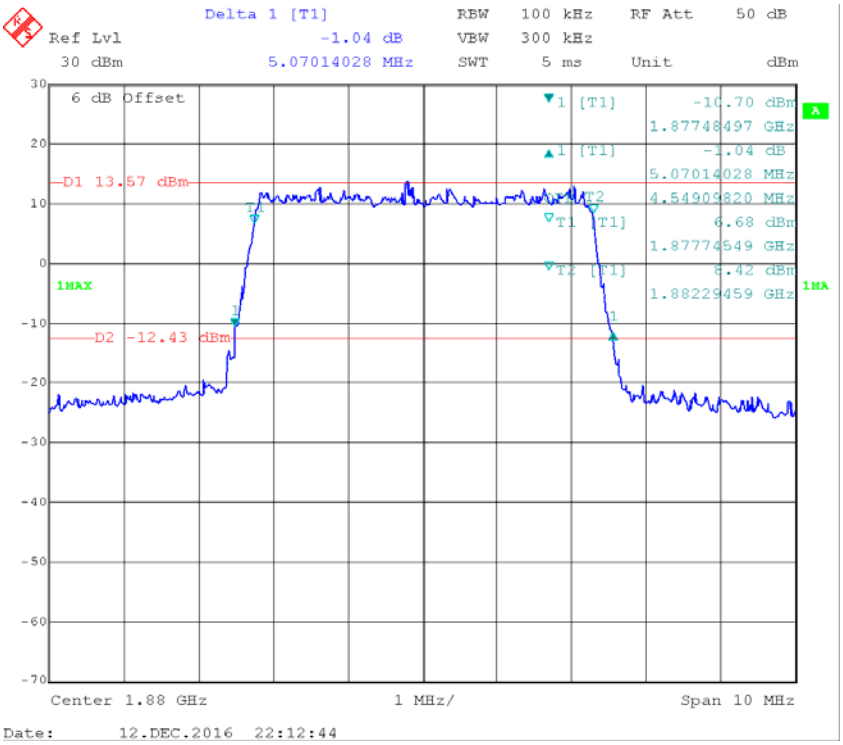
QPSK_1.4 MHz



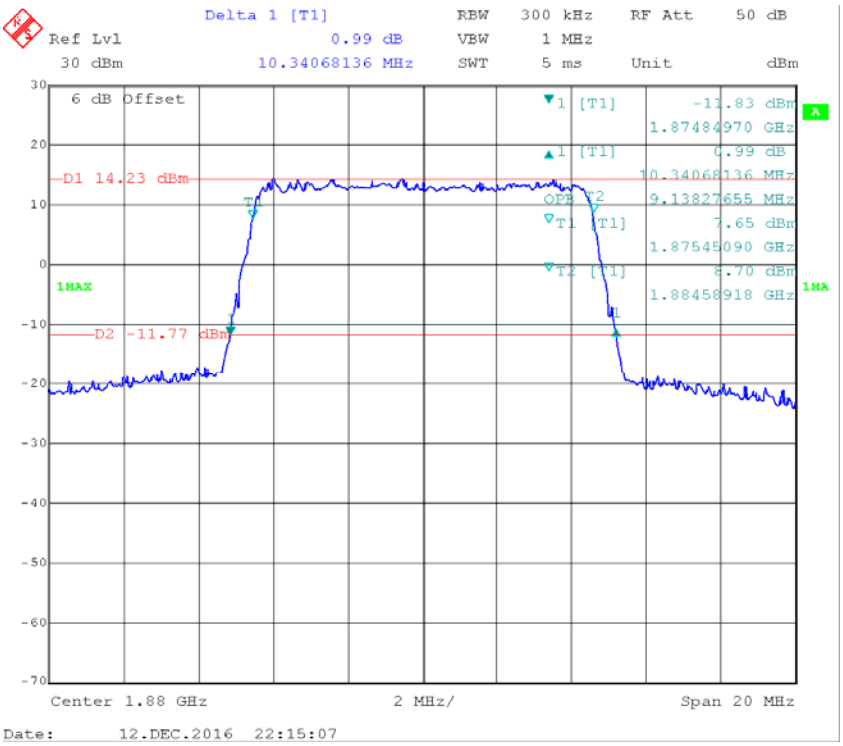
QPSK_3 MHz



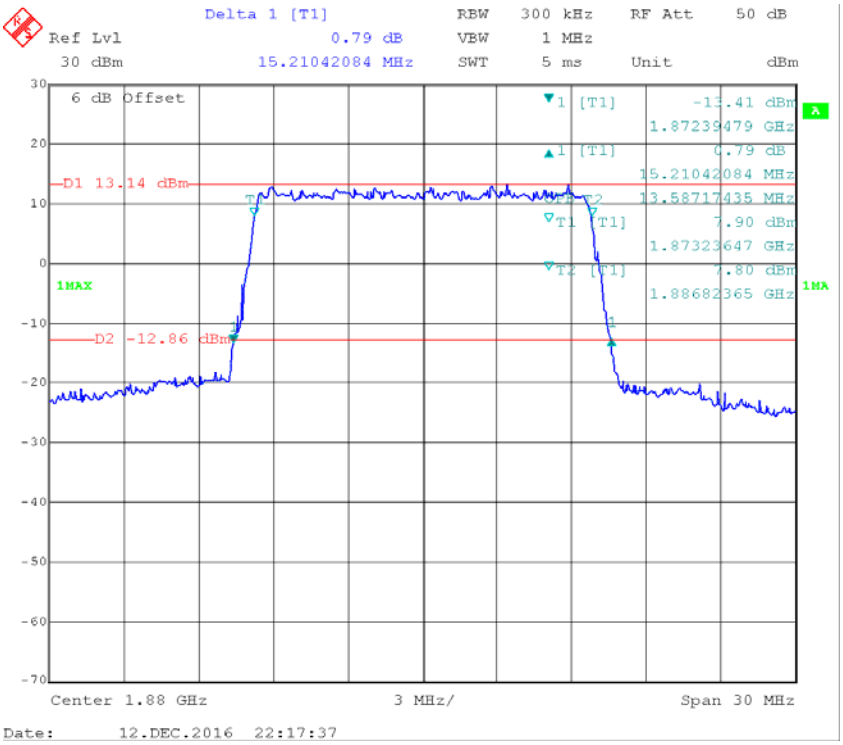
QPSK_5 MHz



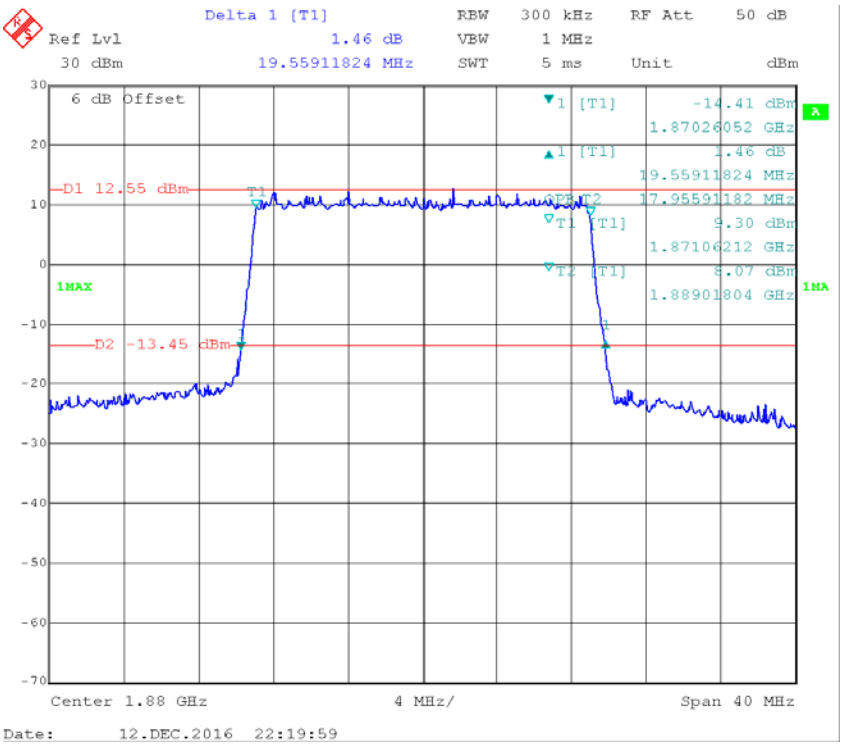
QPSK_10 MHz



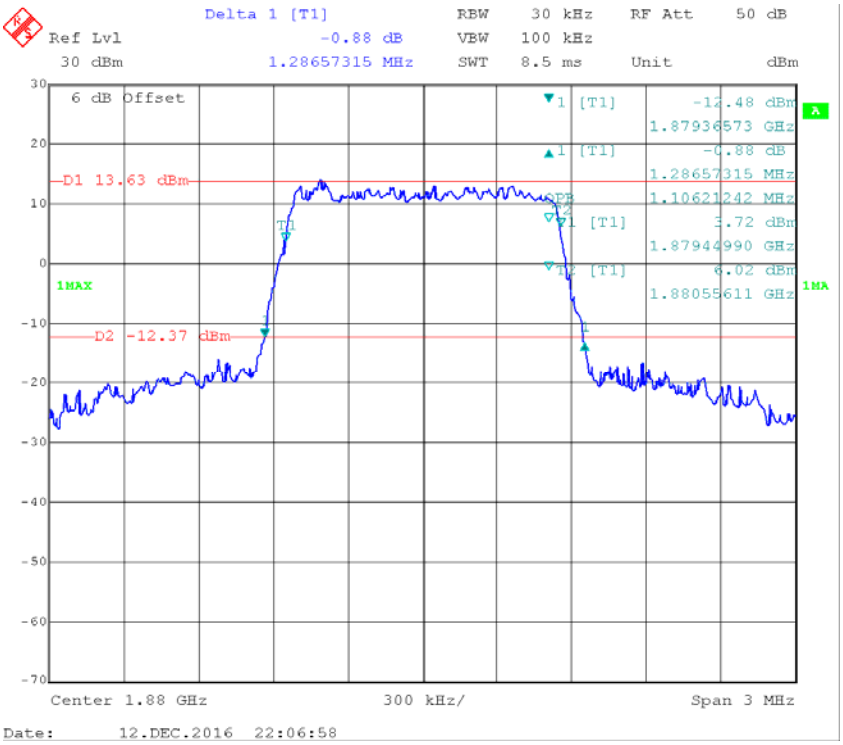
QPSK_15 MHz



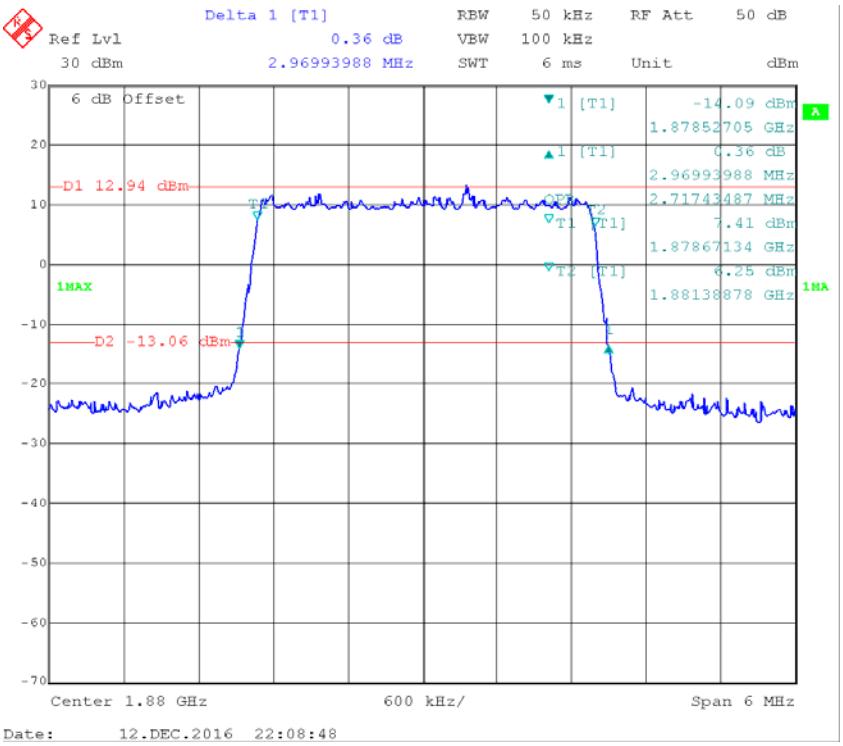
QPSK_20 MHz



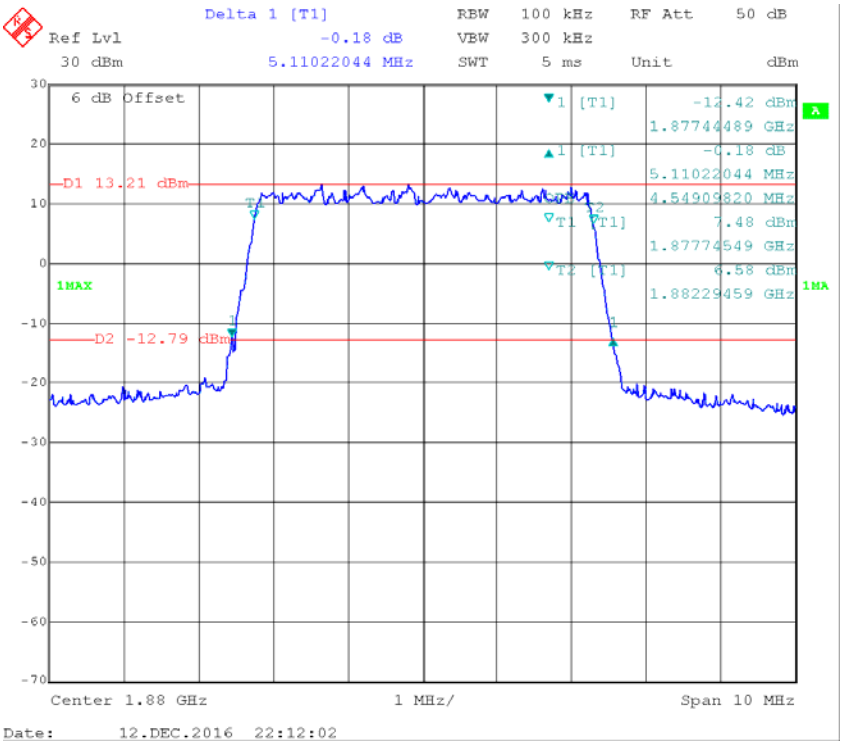
16QAM_1.4 MHz



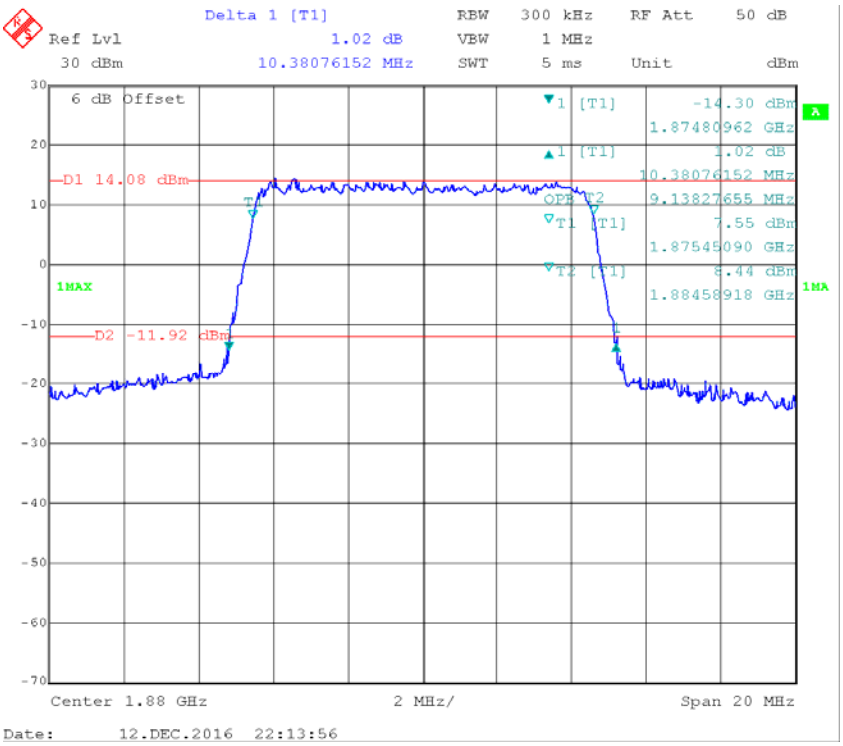
16QAM_3 MHz



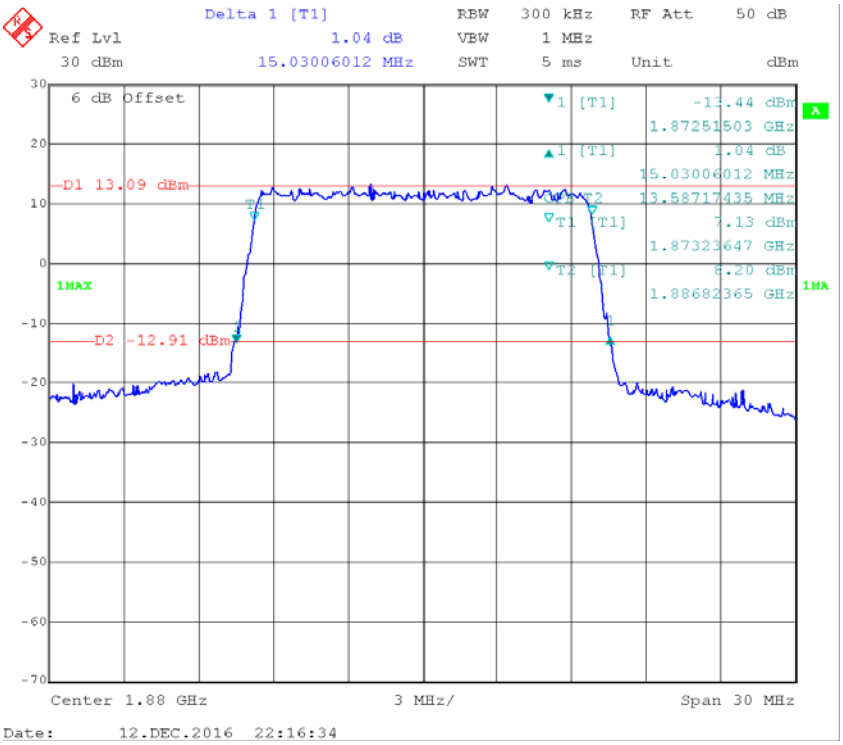
16QAM_5 MHz



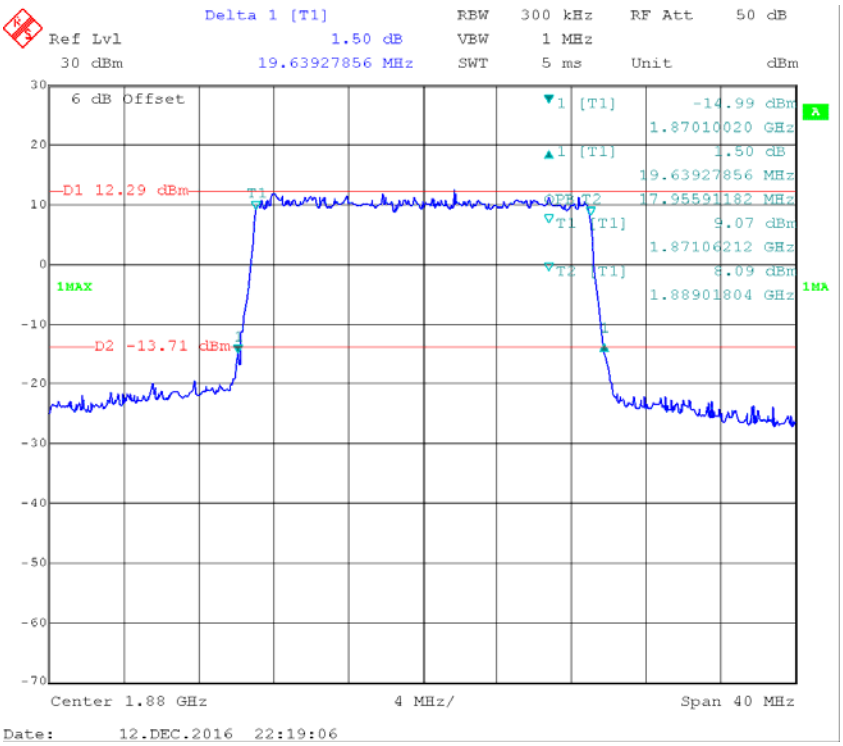
16QAM_10 MHz



16QAM_15 MHz

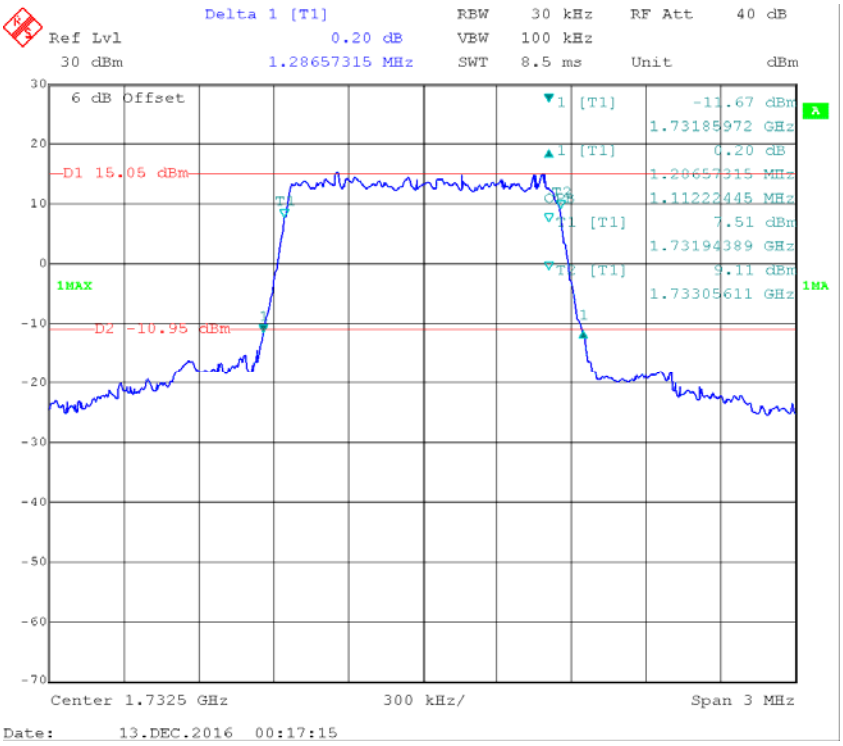


16QAM_20 MHz

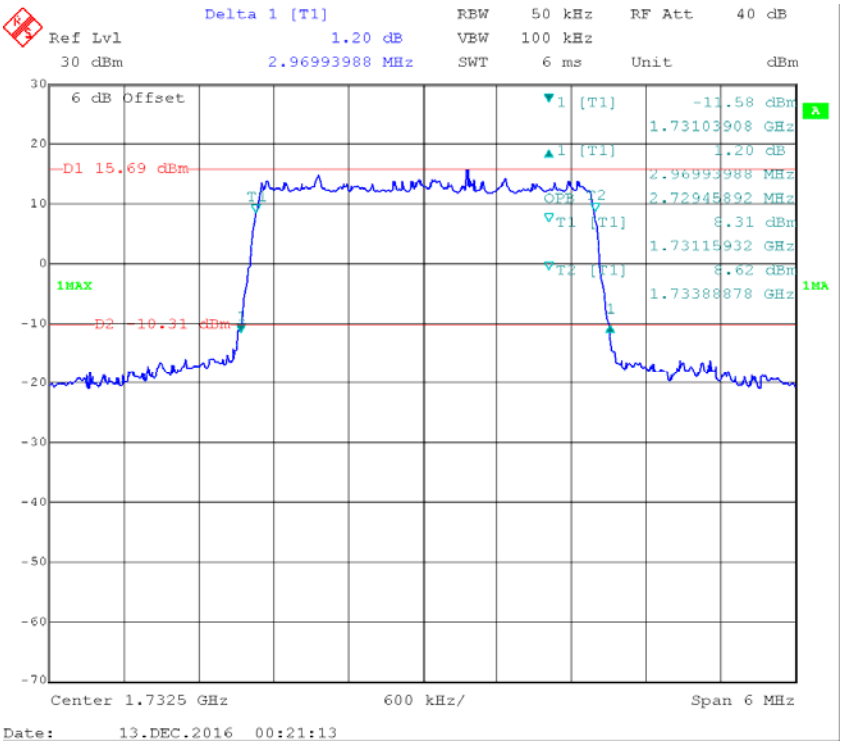


LTE Band IV:

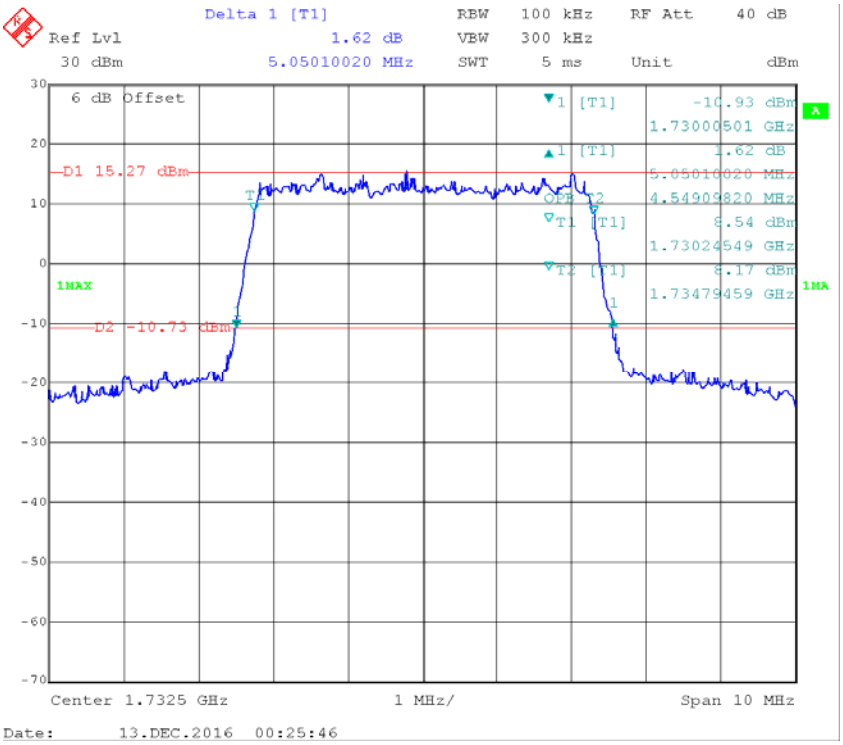
QPSK_1.4 MHz



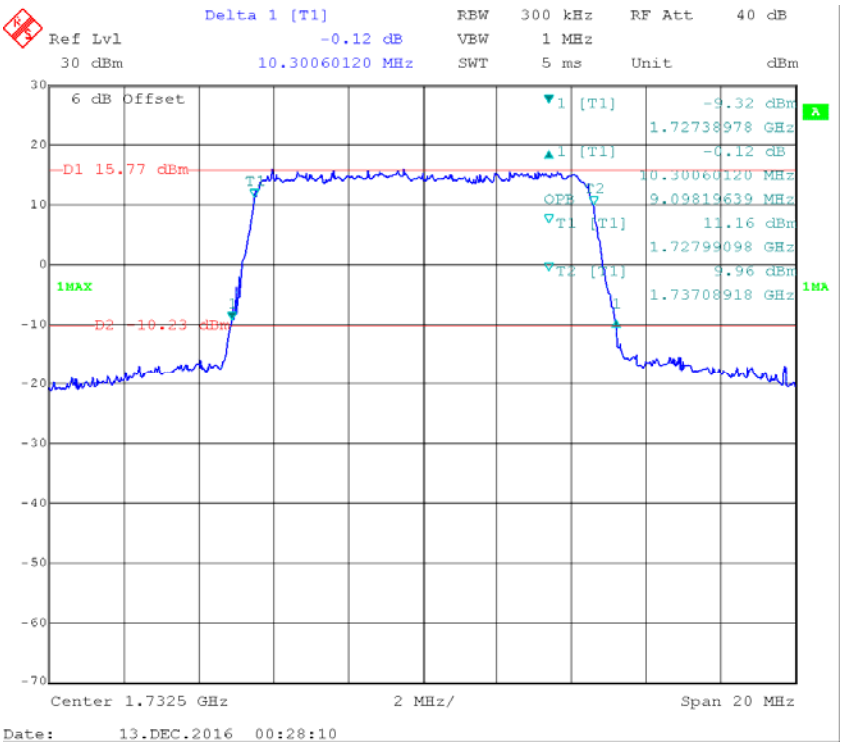
QPSK_3 MHz



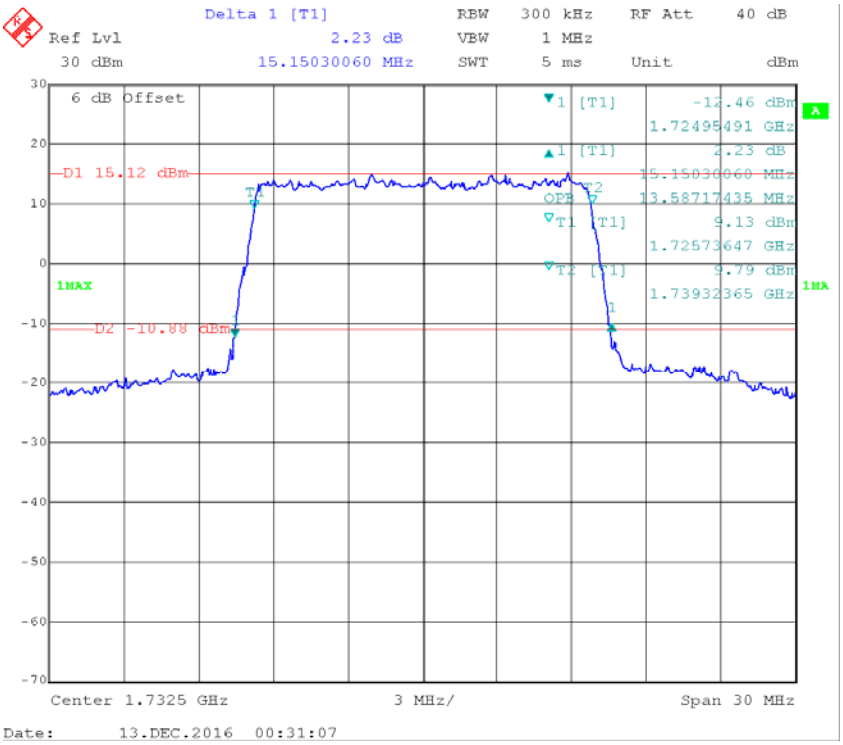
QPSK_5 MHz



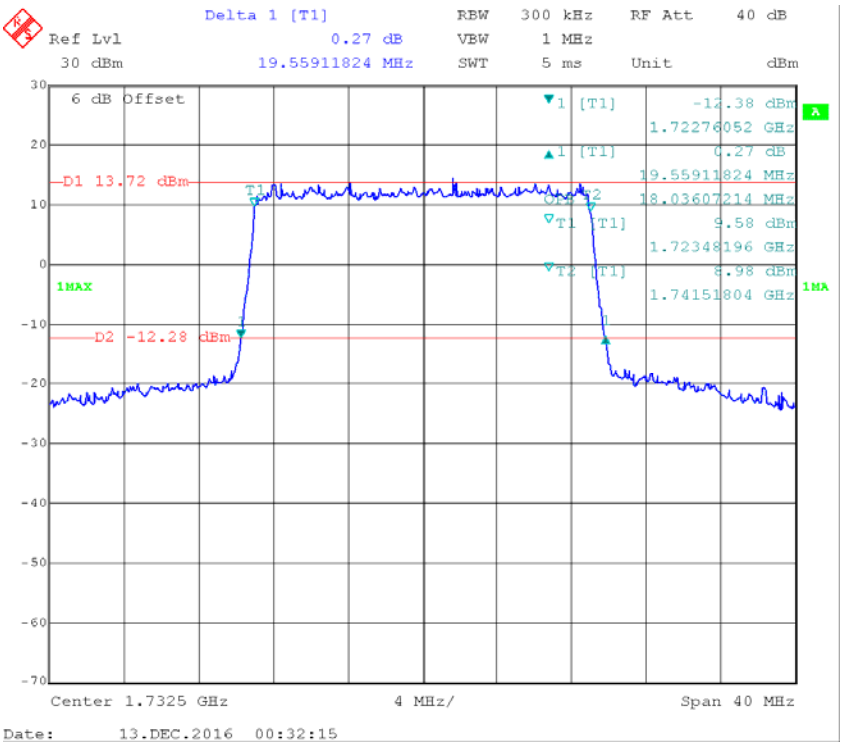
QPSK_10 MHz



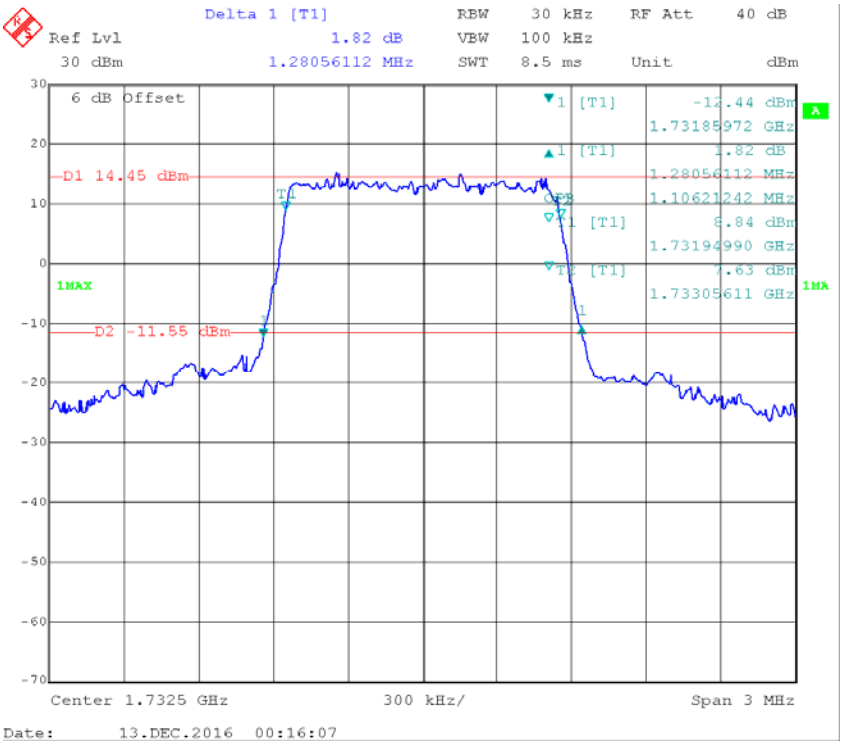
QPSK_15 MHz



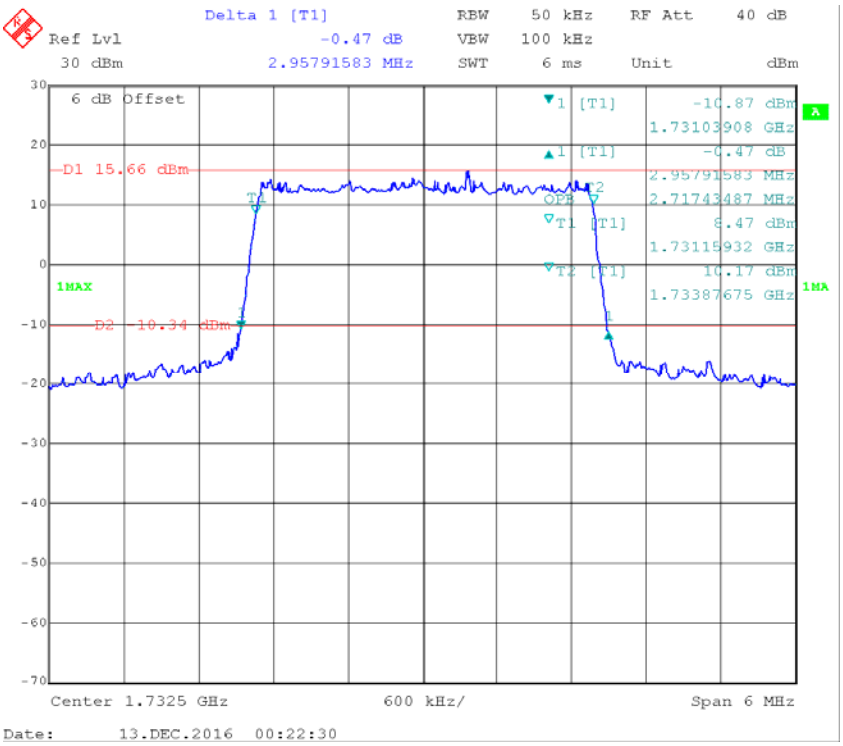
QPSK_20 MHz



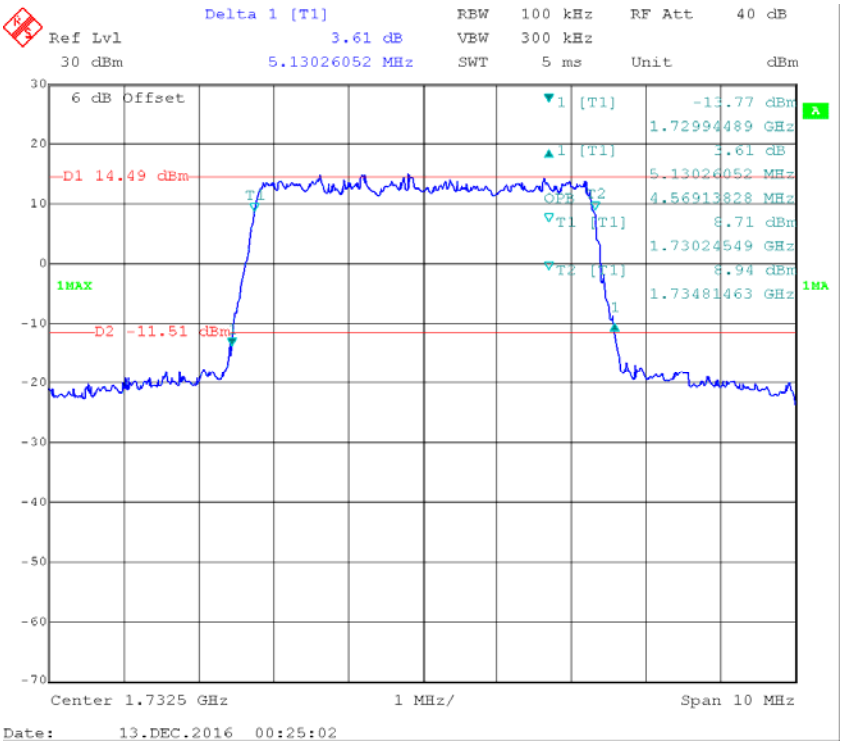
16QAM_1.4 MHz



16QAM_3 MHz



16QAM_5 MHz



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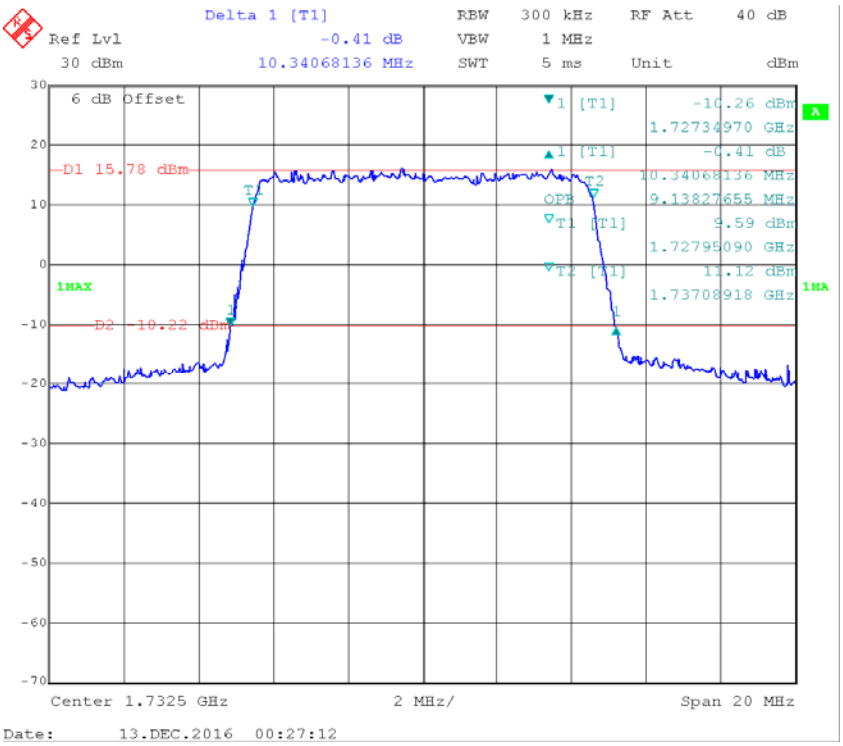
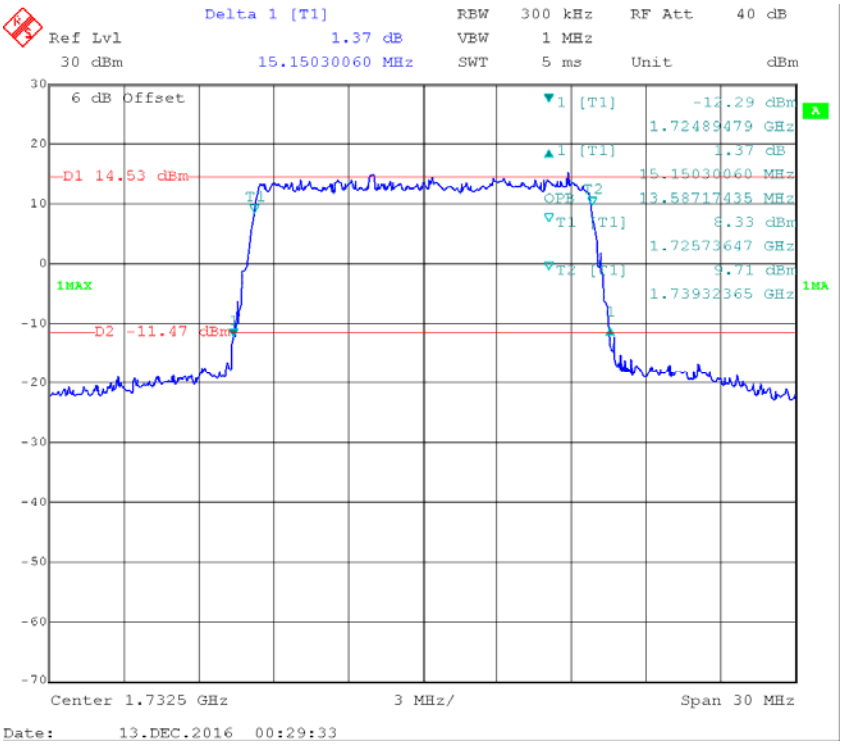
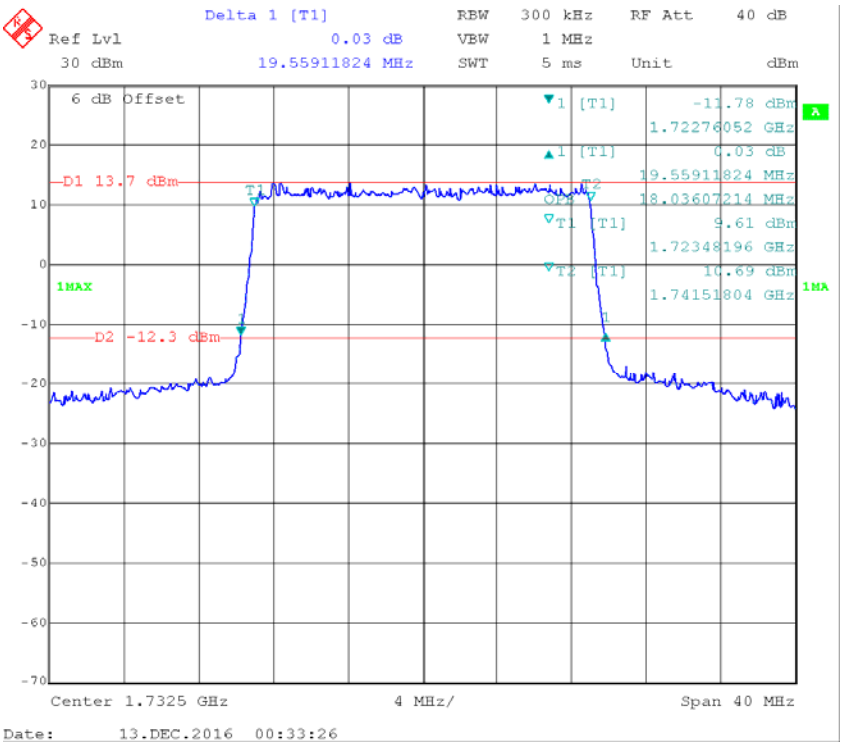


16QAM_15 MHz

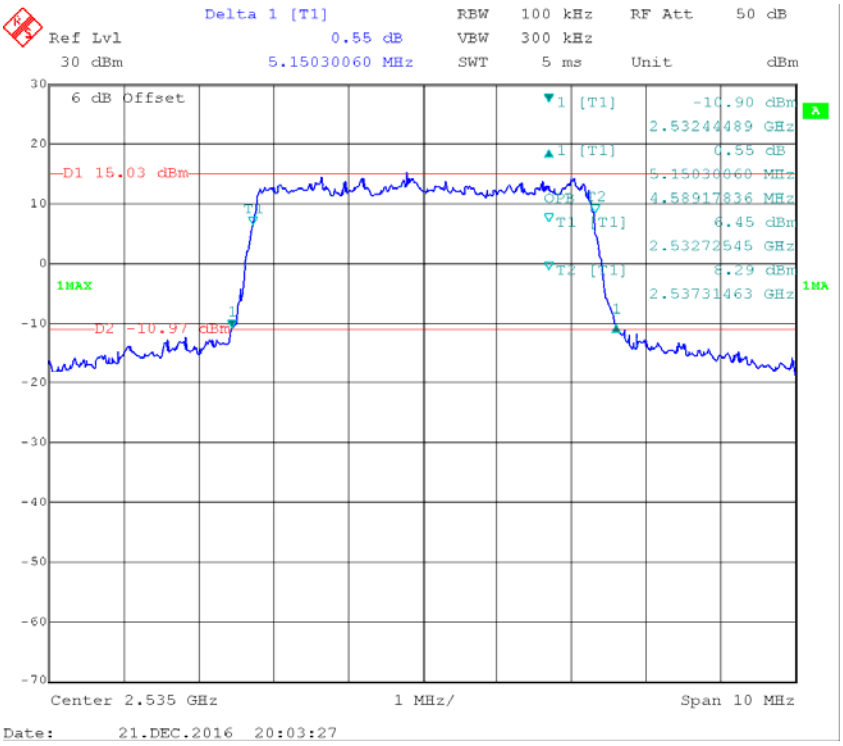


16QAM_20 MHz

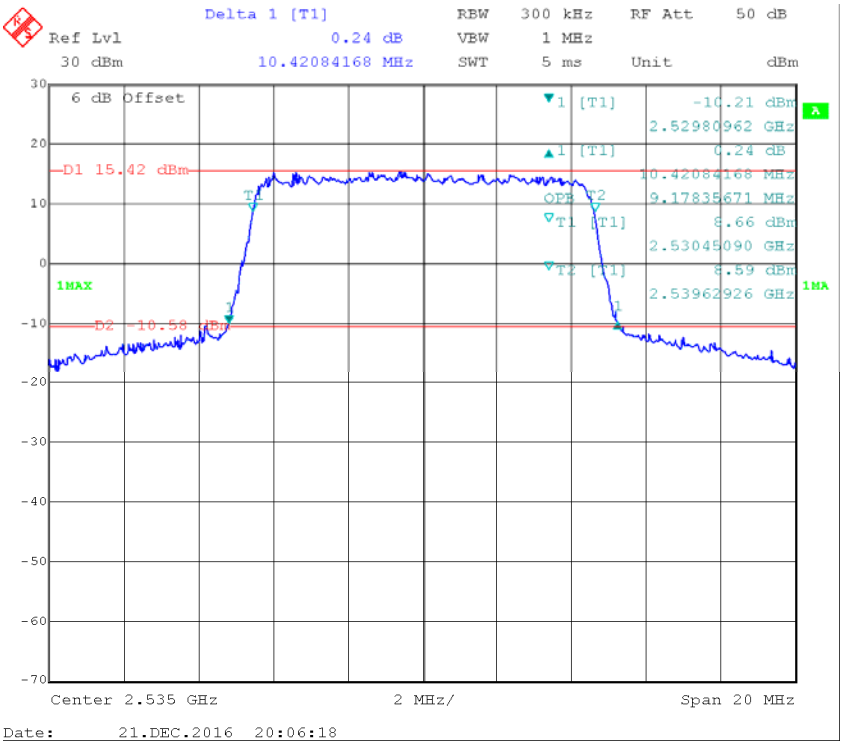


LTE Band VII:

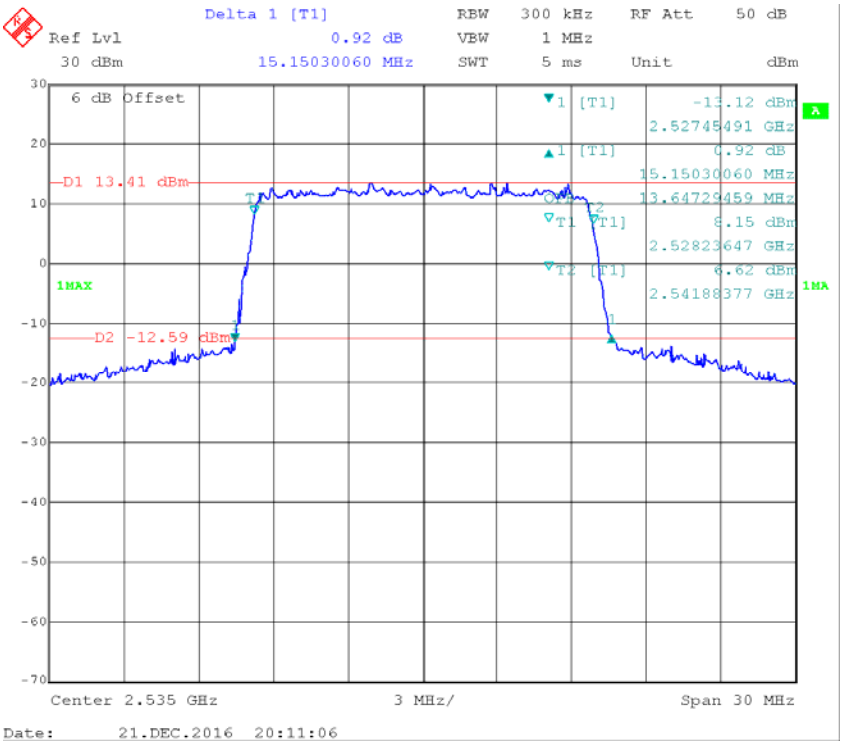
QPSK_5 MHz



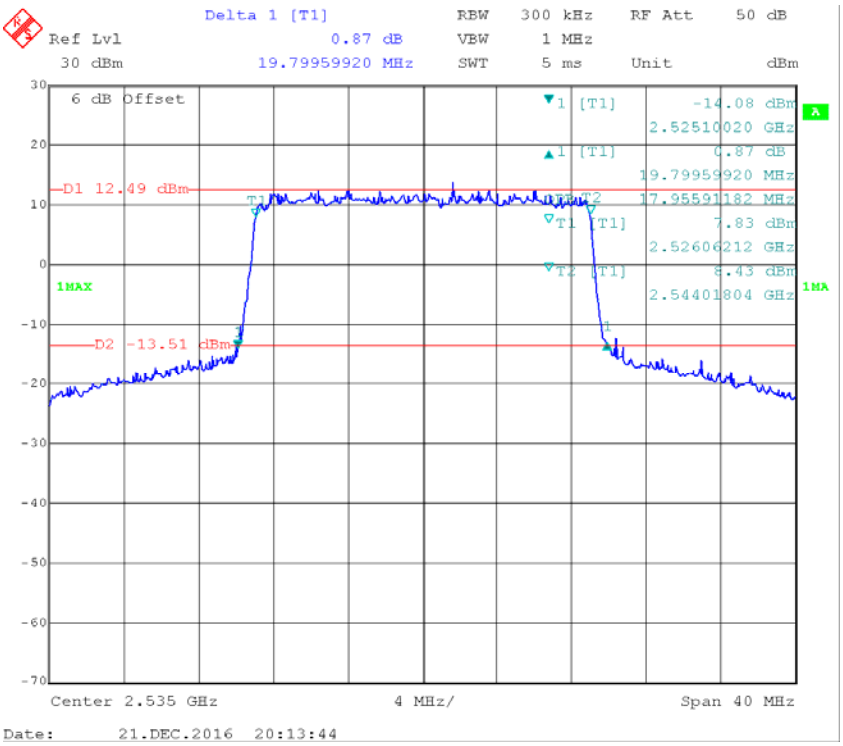
QPSK_10 MHz



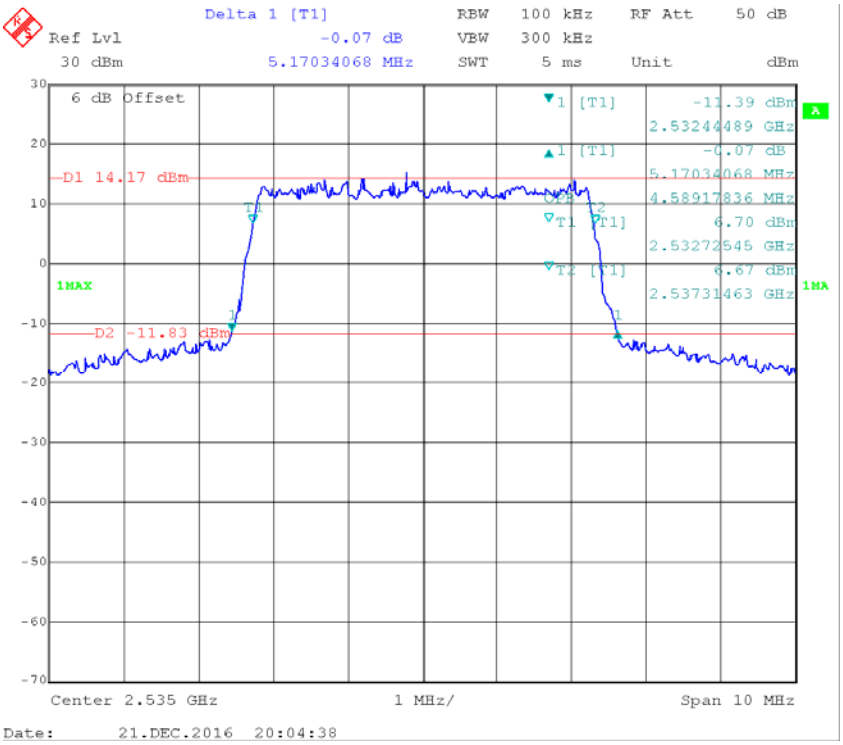
QPSK_15 MHz



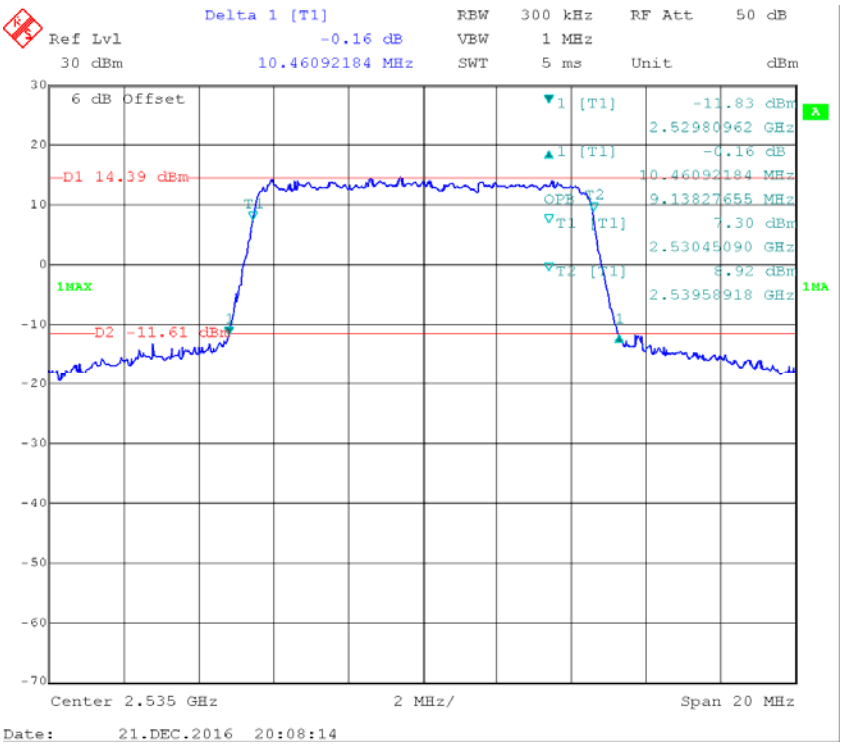
QPSK_20 MHz



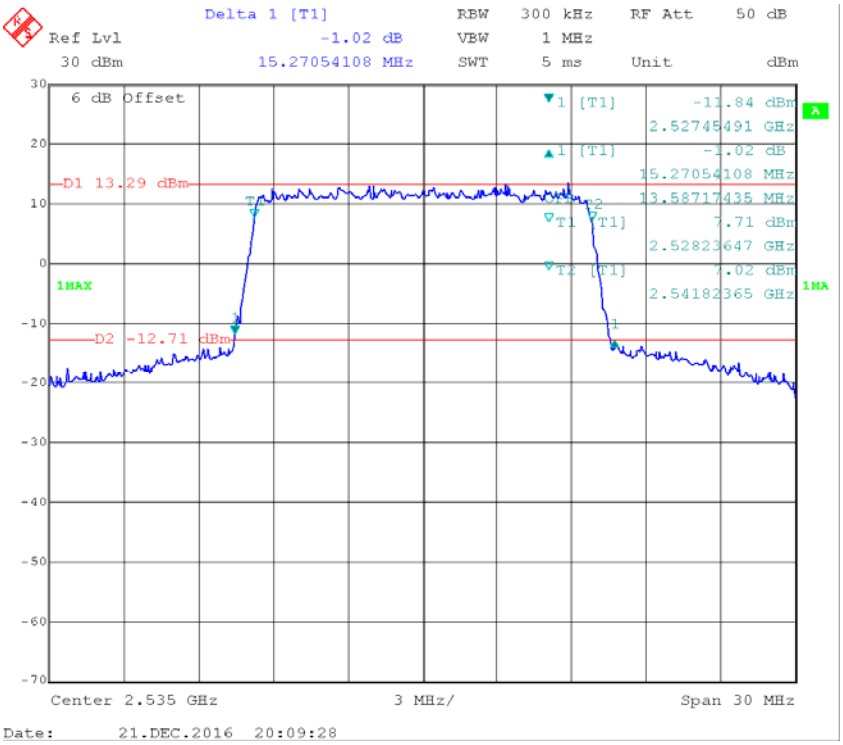
16QAM_5 MHz



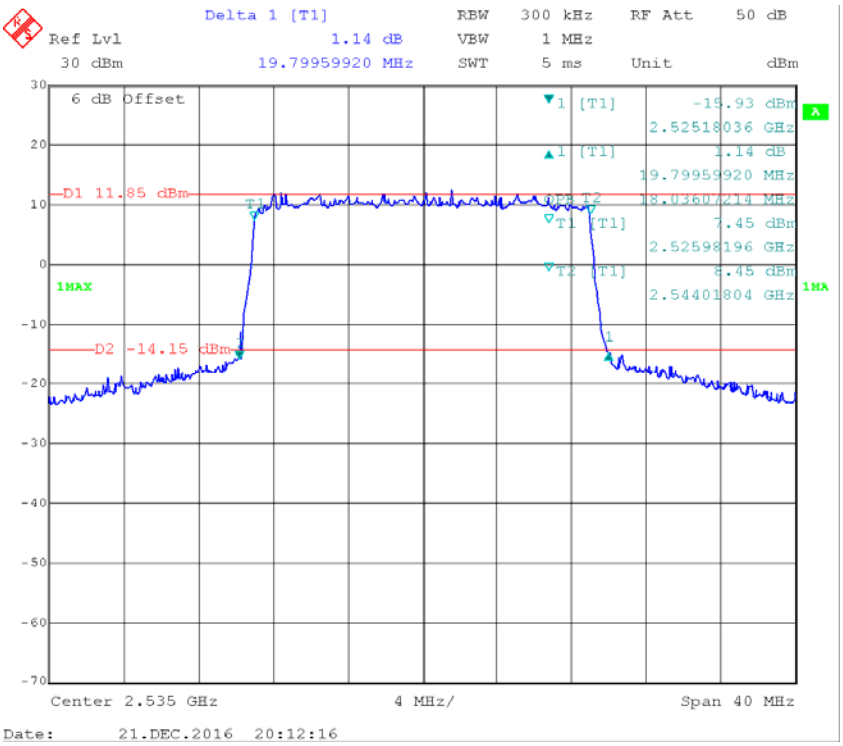
16QAM_10 MHz



16QAM_15 MHz

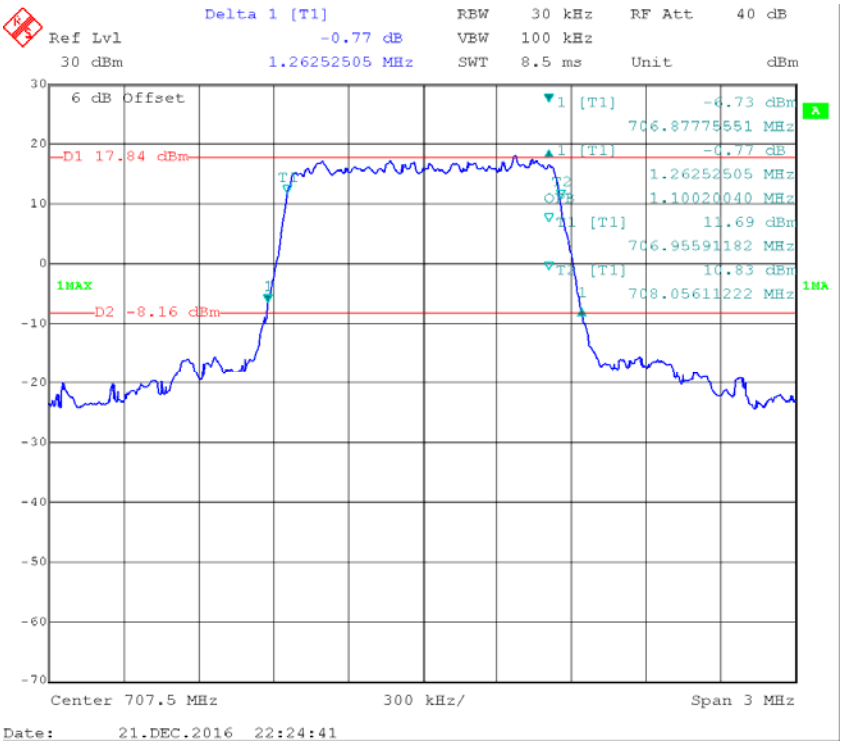


16QAM_20 MHz

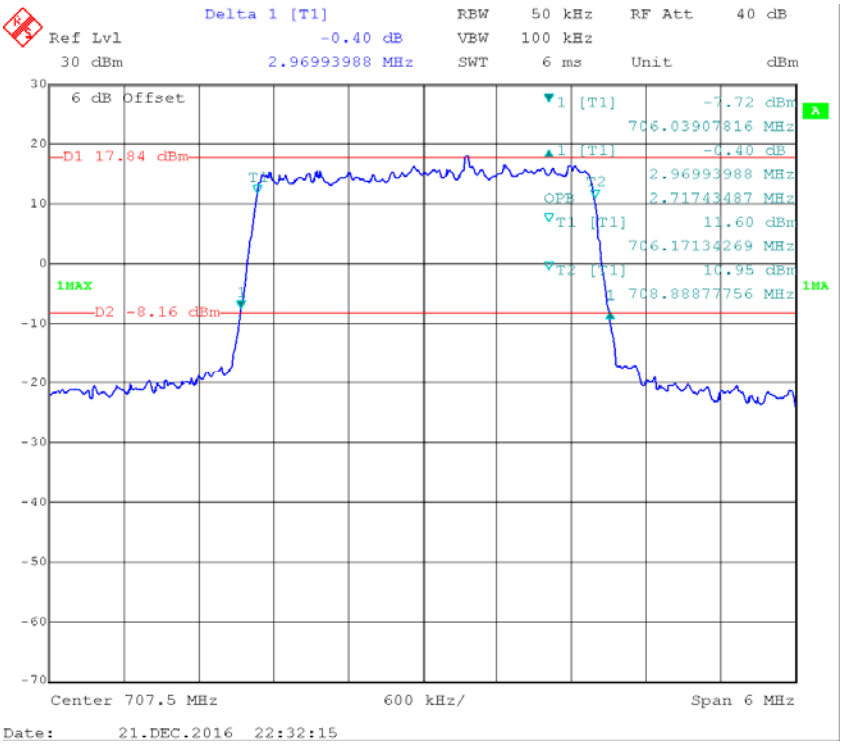


LTE Band 12:

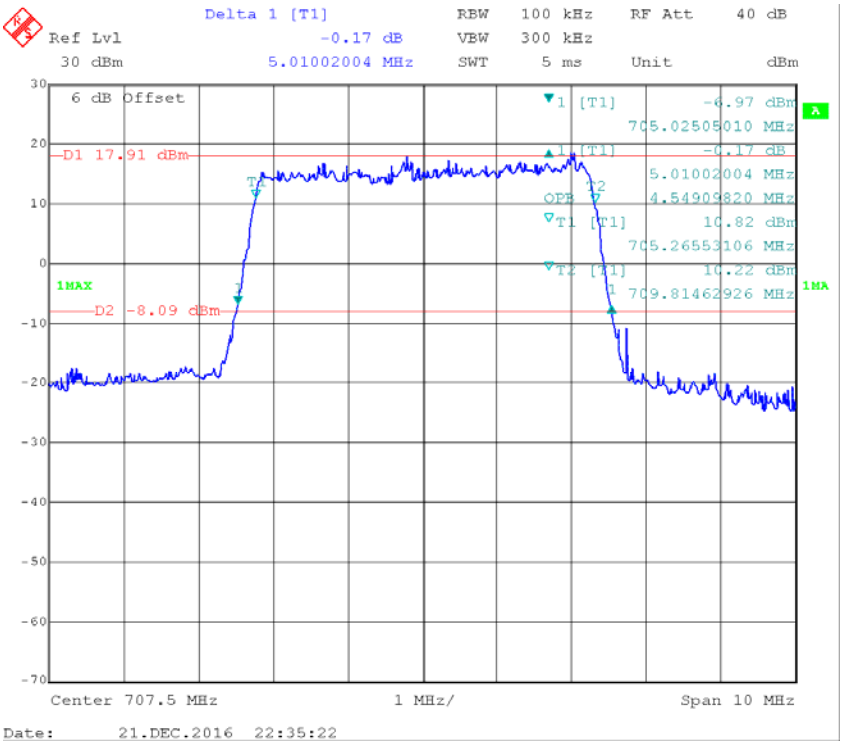
QPSK_1.4 MHz



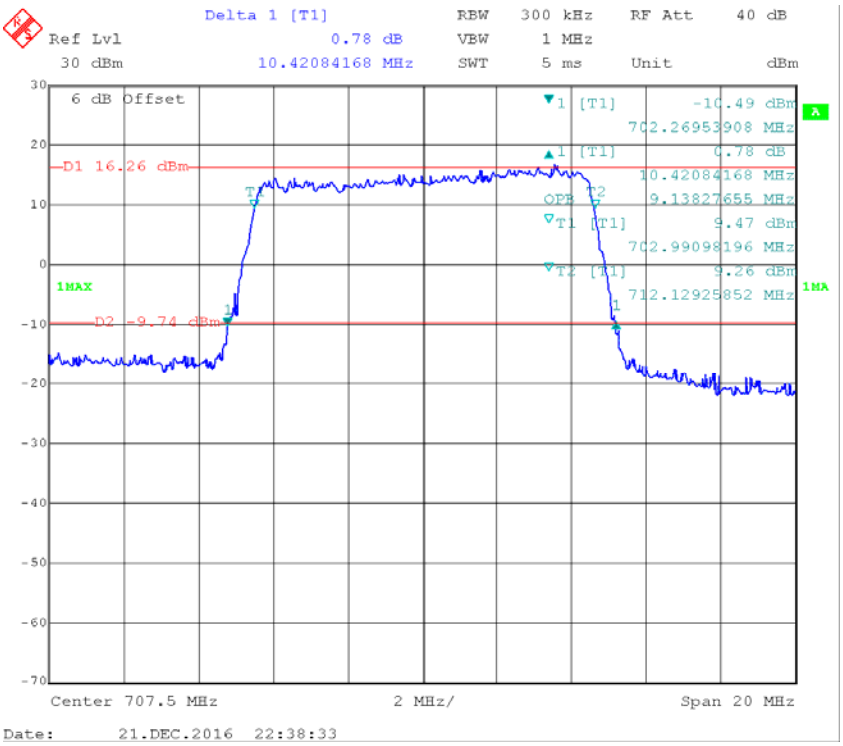
QPSK_3 MHz



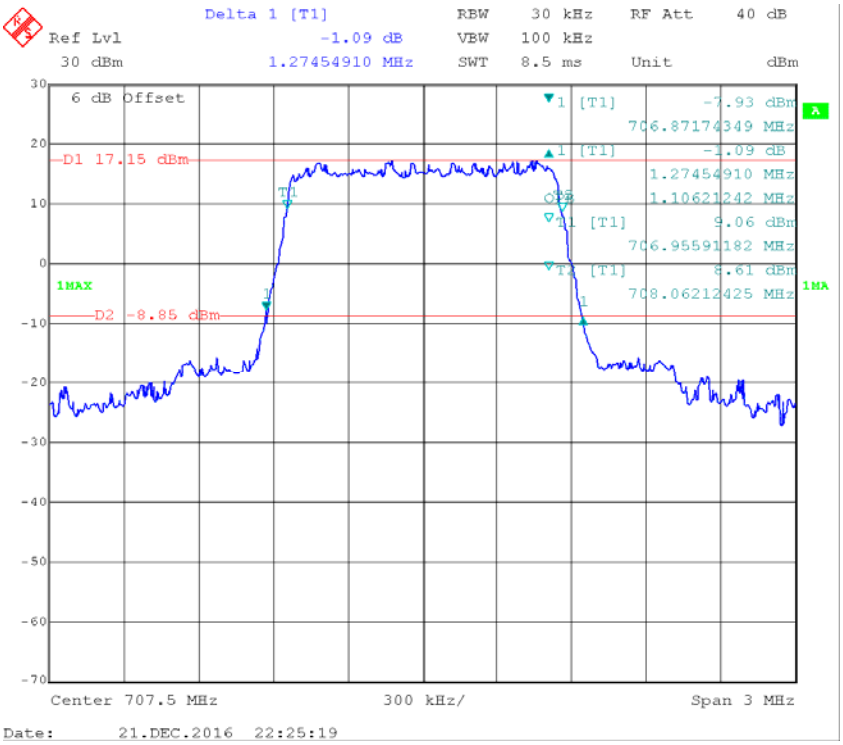
QPSK_5 MHz



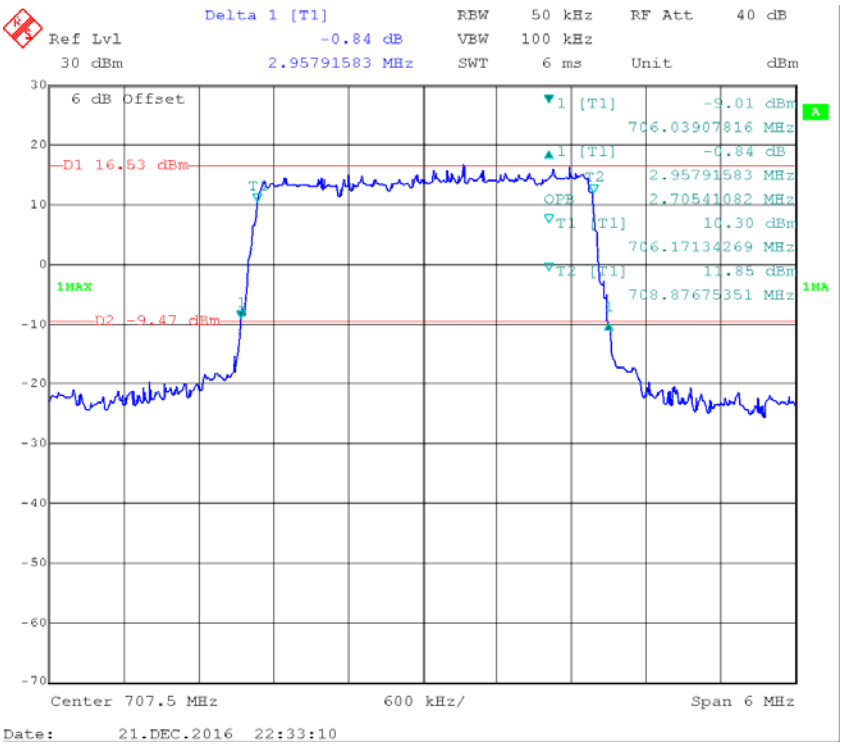
QPSK_10 MHz



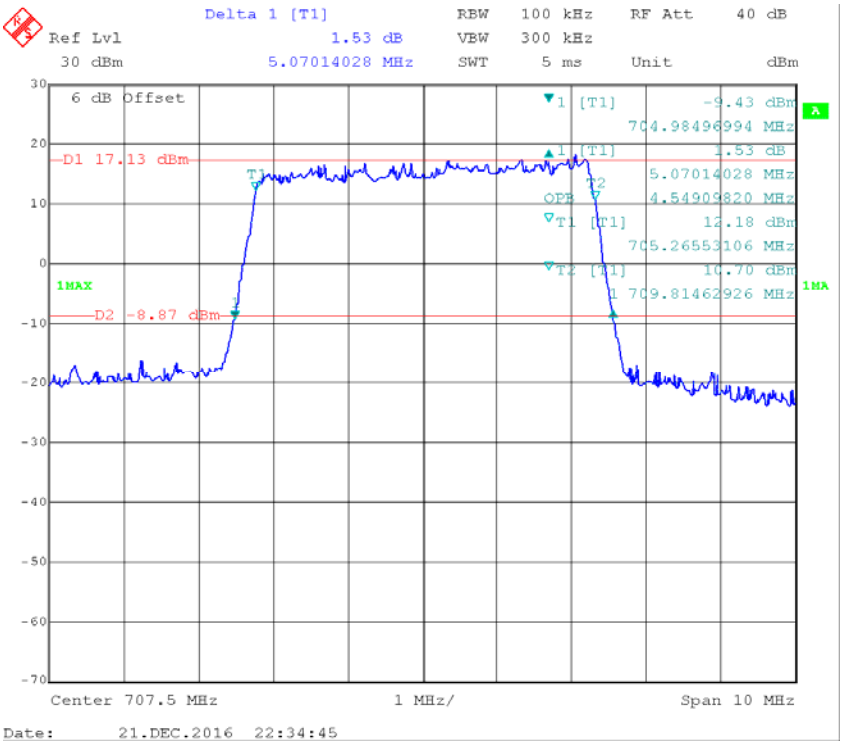
16QAM_1.4 MHz



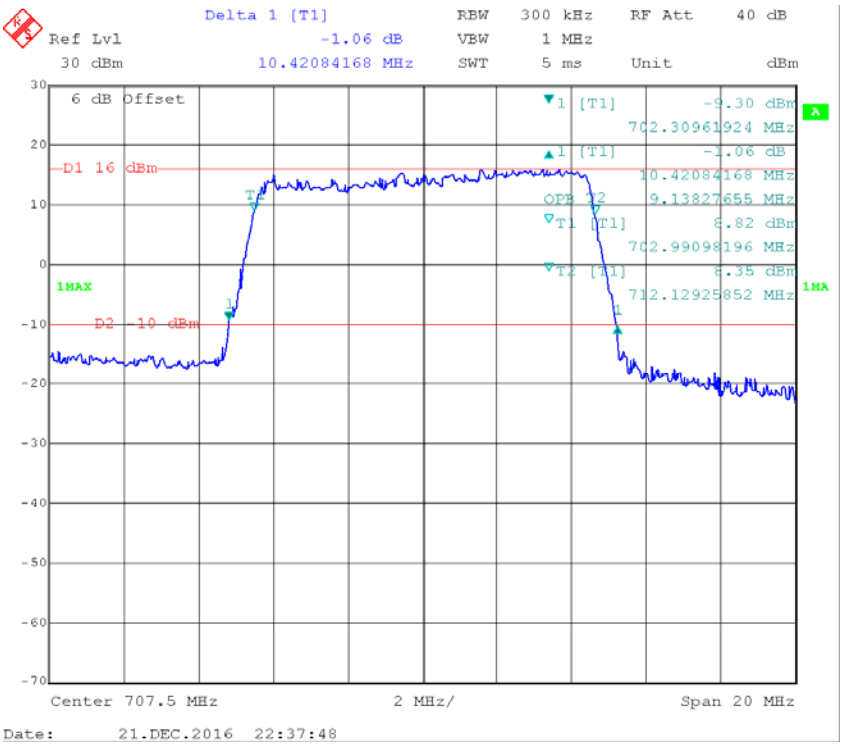
16QAM_3 MHz



16QAM_5 MHz

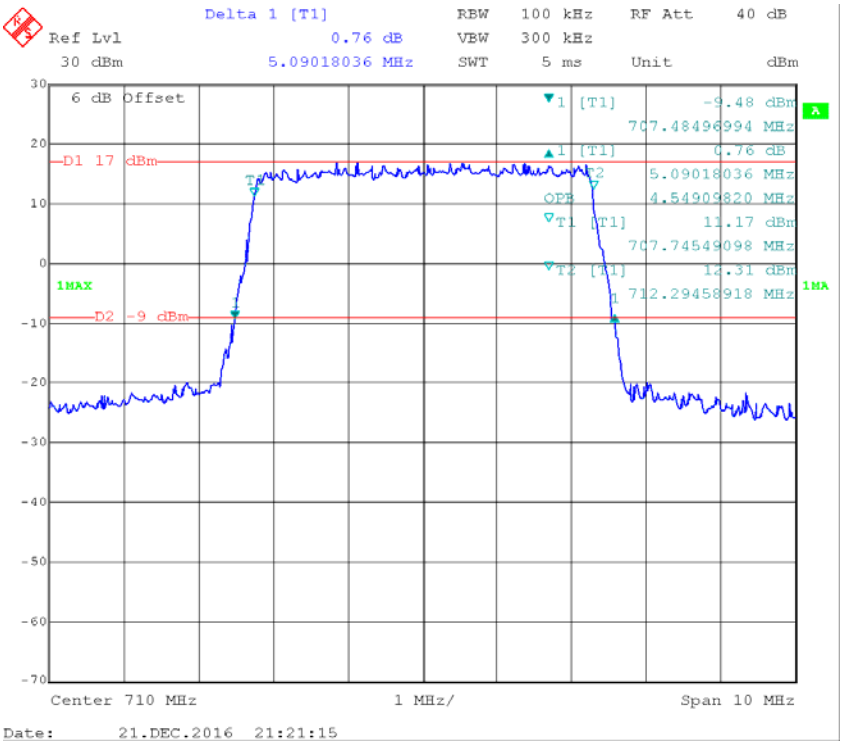


16QAM_10 MHz

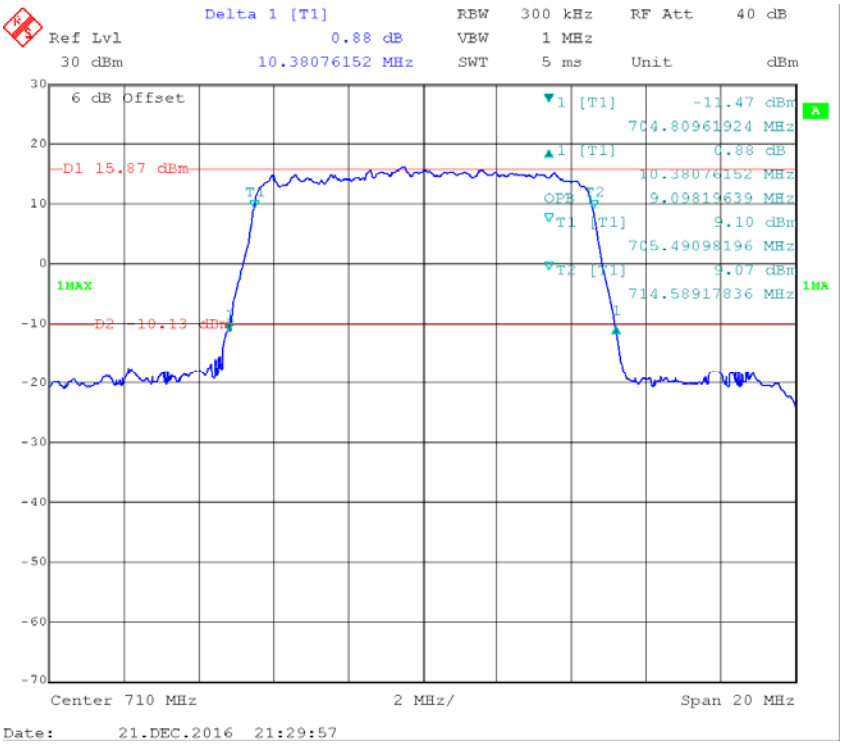


LTE Band 17:

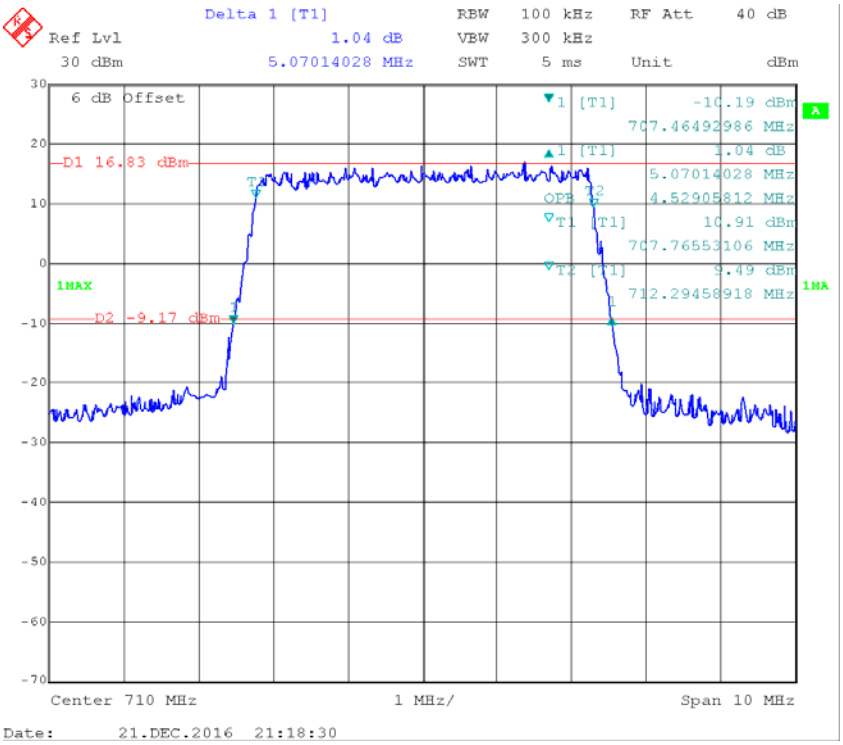
QPSK_5 MHz



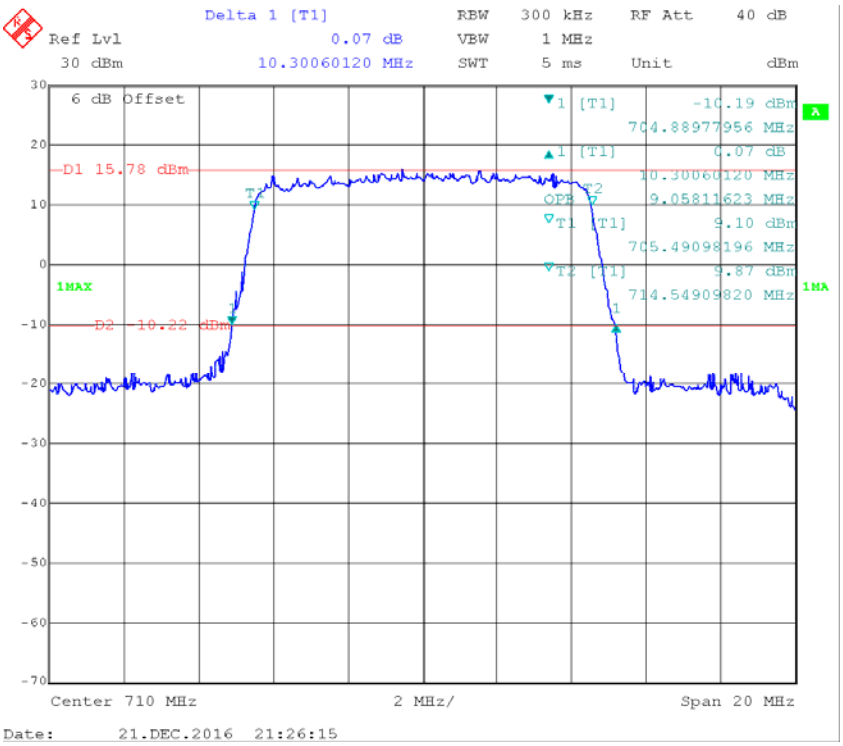
QPSK_10 MHz



16QAM_5 MHz



16QAM_10 MHz



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

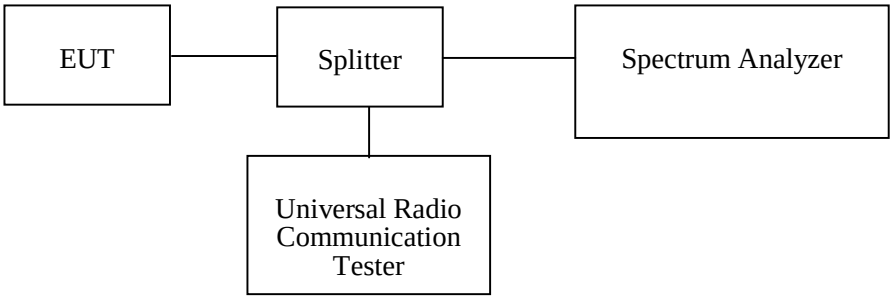
Applicable Standard

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

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/
N/A	Two-way Spliter	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

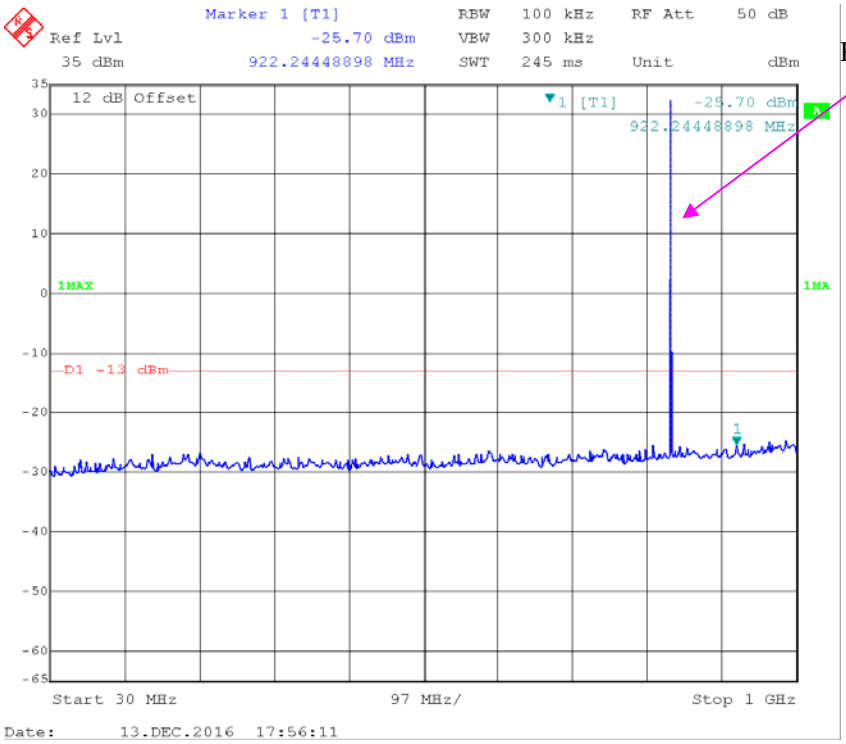
Environmental Conditions

Temperature:	26.3~27.5 °C
Relative Humidity:	41 %
ATM Pressure:	100.8~101.2 kPa

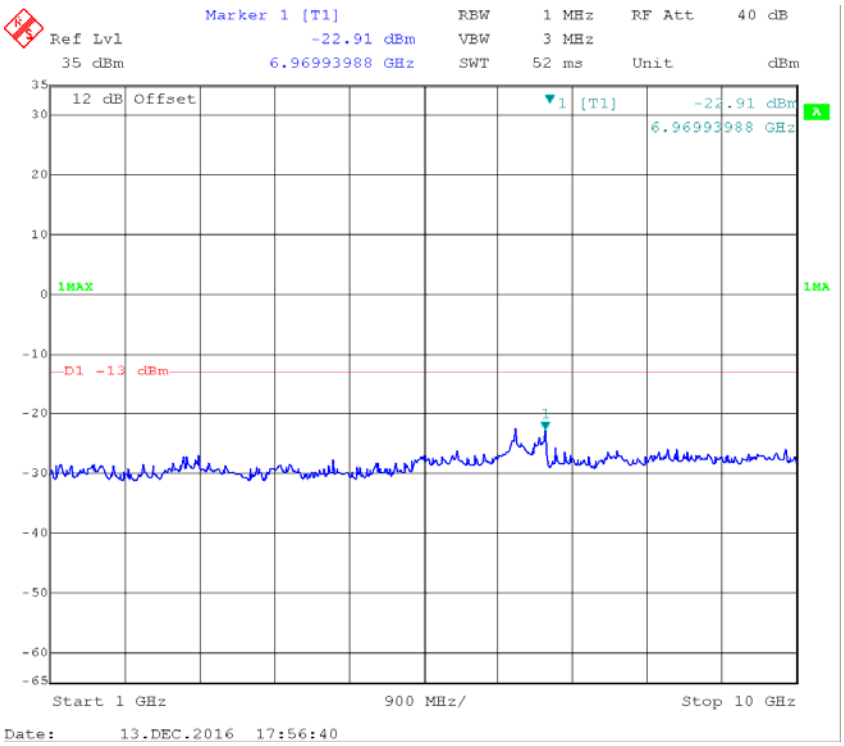
The testing was performed by Tom Tang from 2016-12-12 to 2016-12-21.

Please refer to the following plots.

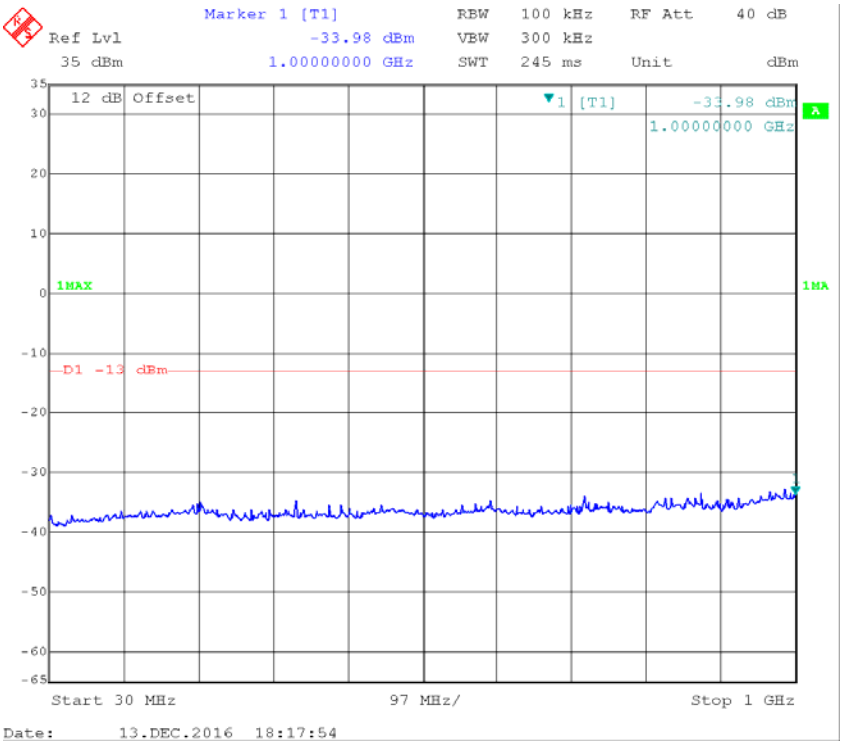
GSM850_Middle Channel



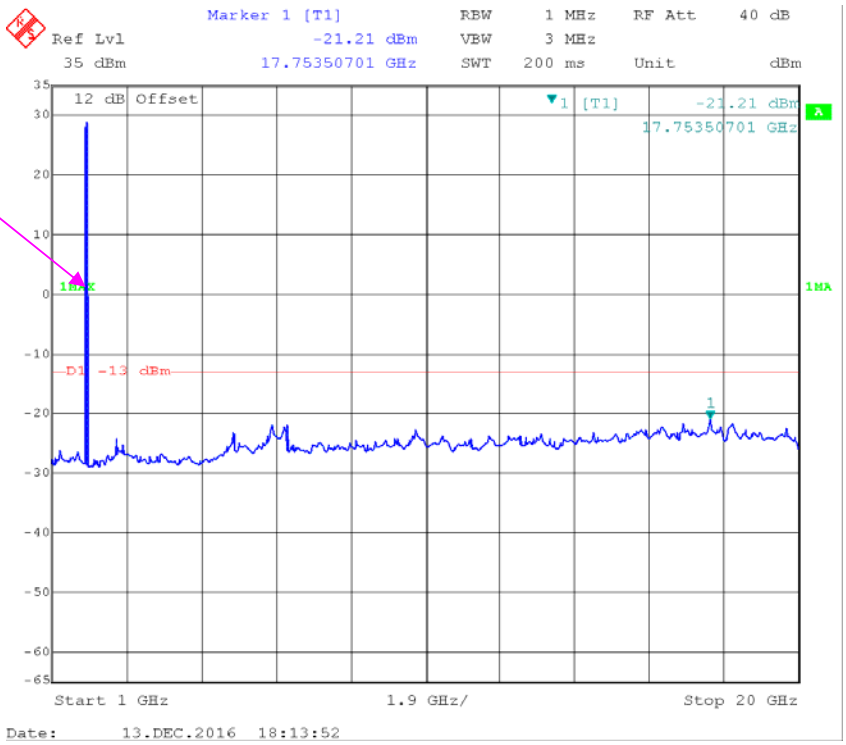
Fundamental



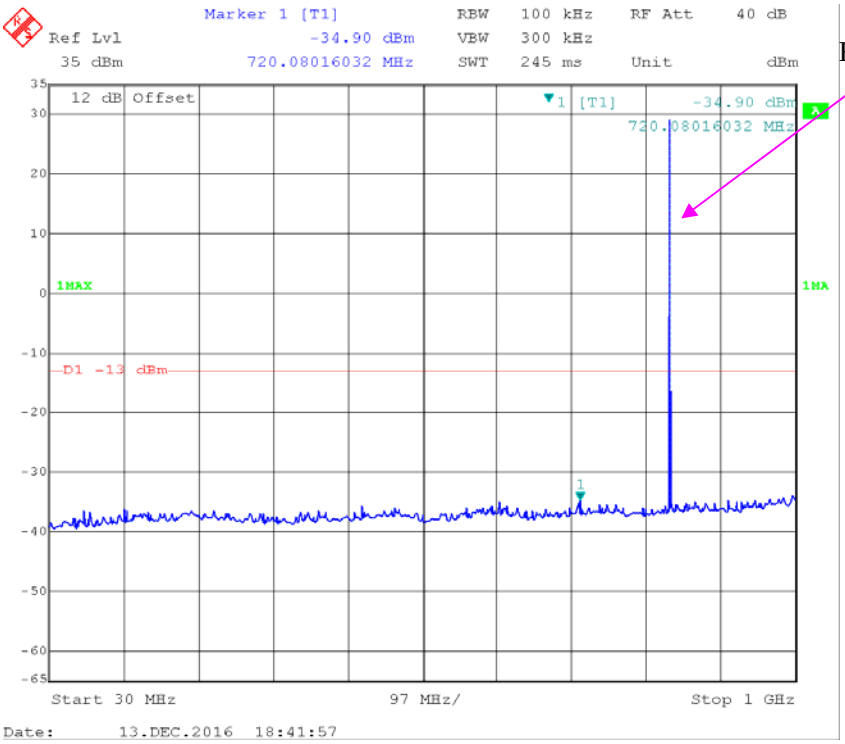
PCS 1900_ High Channel

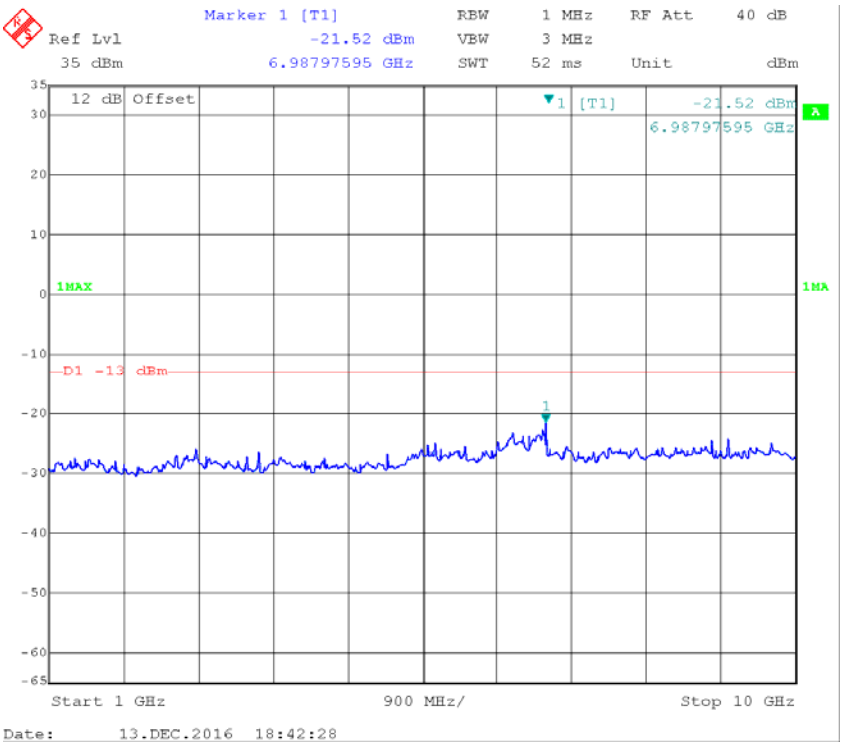


Fundamental

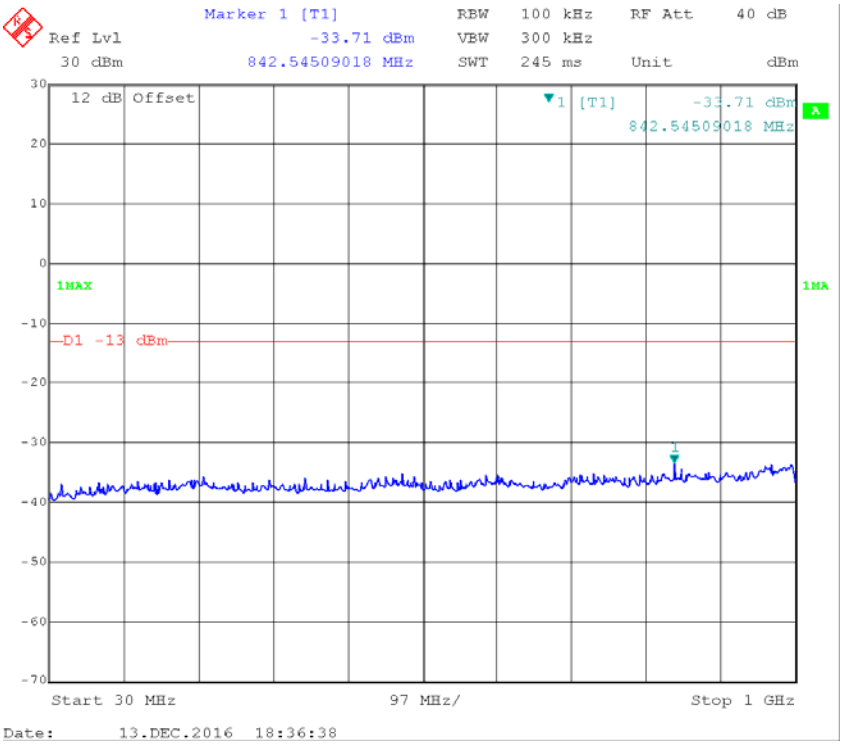


EDGE 850_Middle Channel

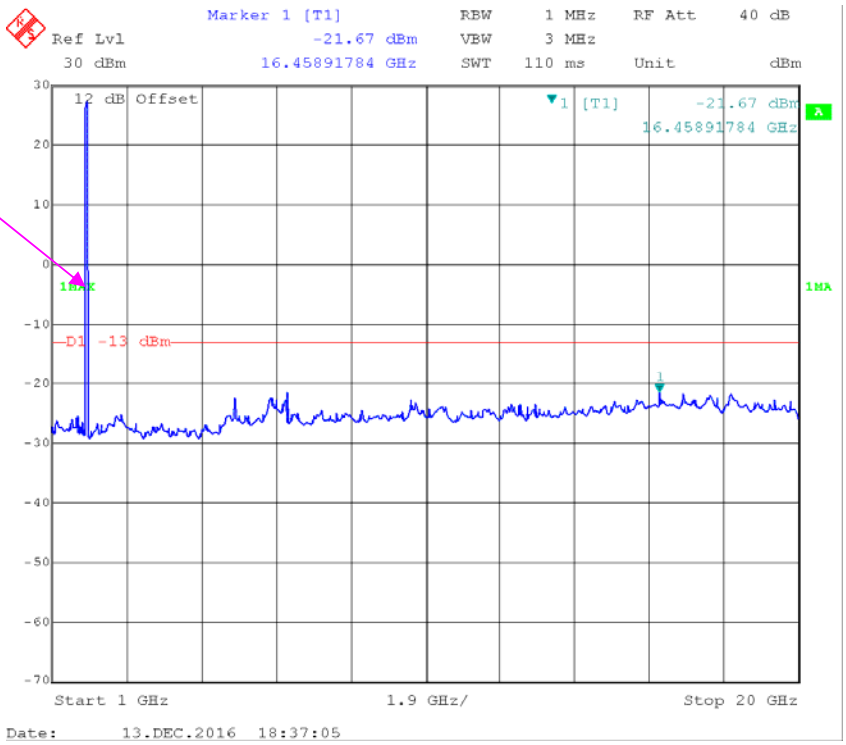




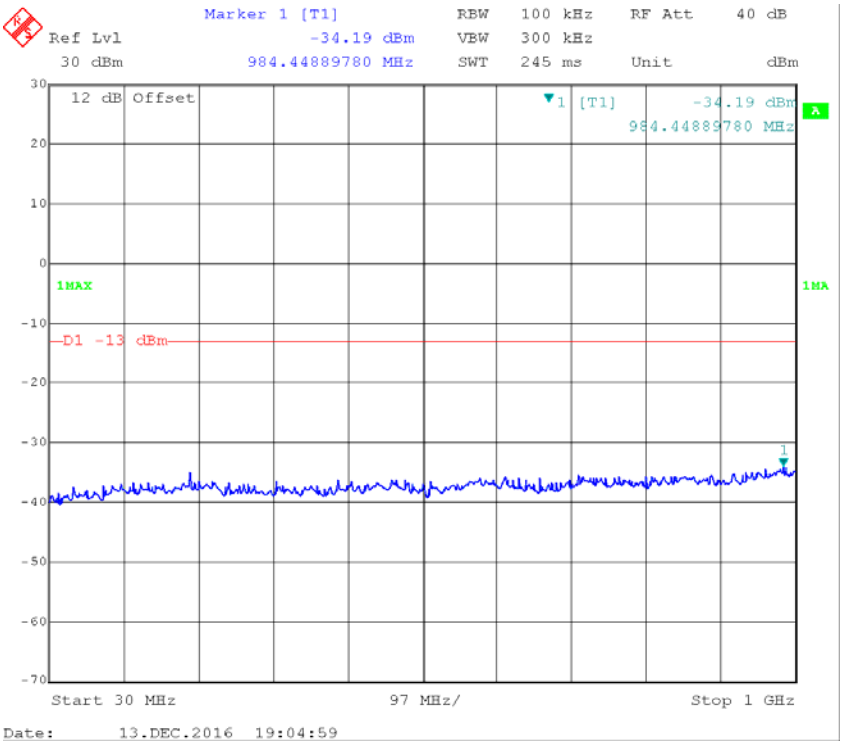
EDGE 1900_ High Channel

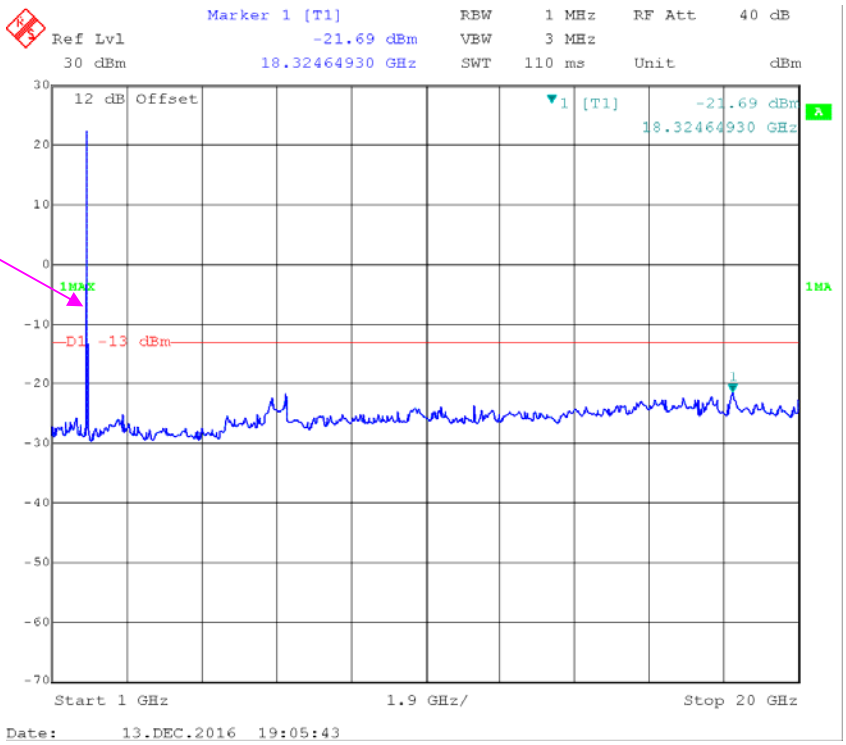


Fundamental



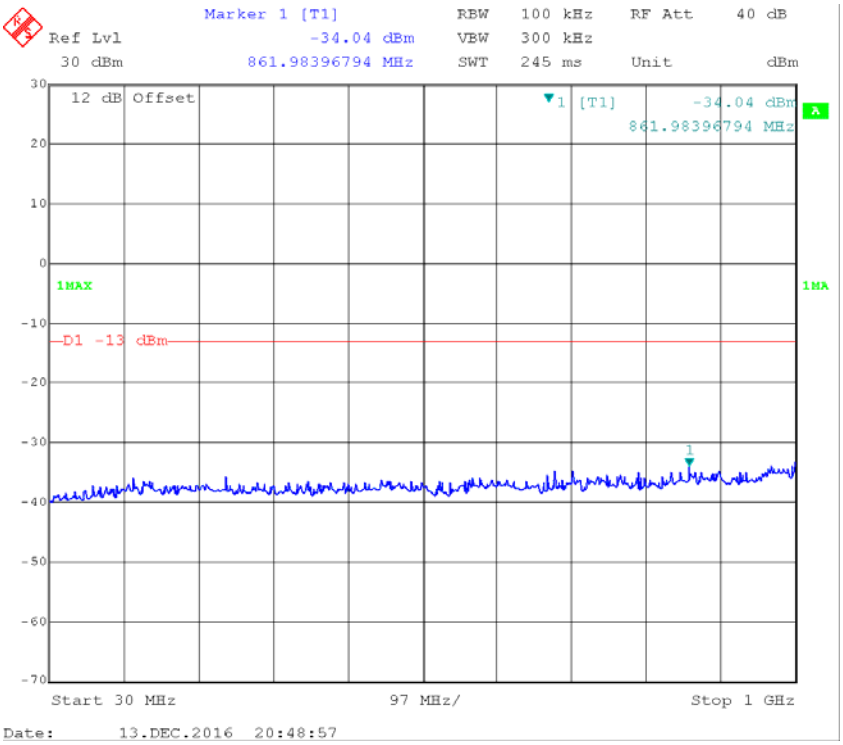
REL99 Band II_ Middle Channel

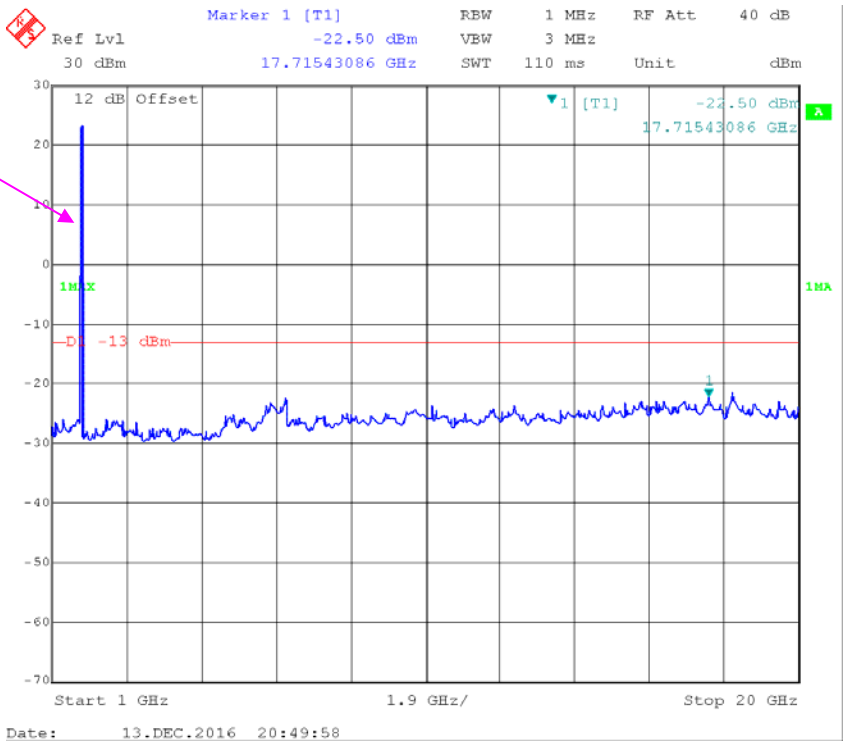




Fundamental

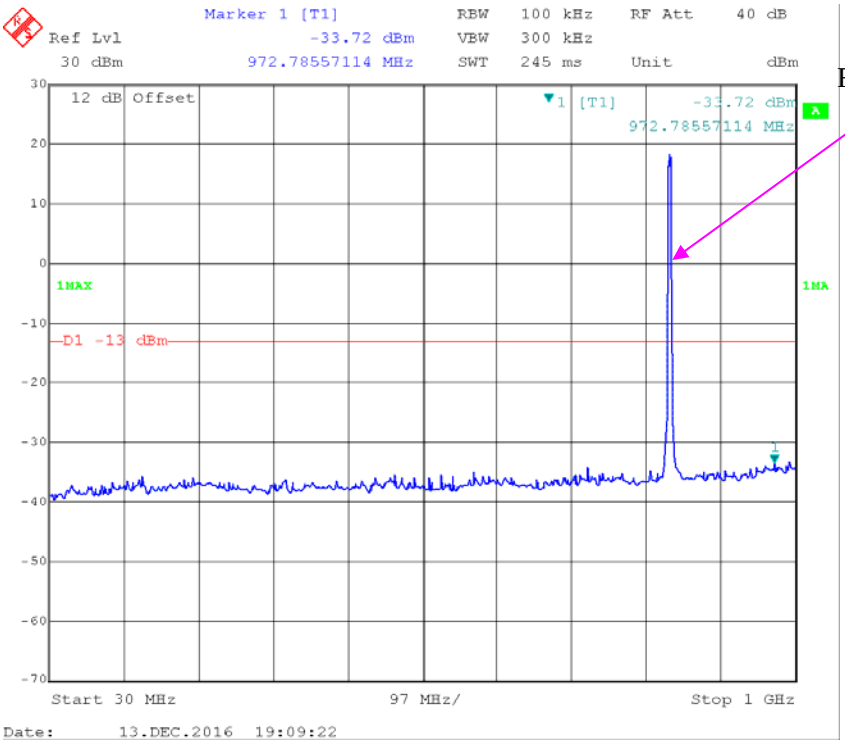
REL99 Band IV_ Middle Channel

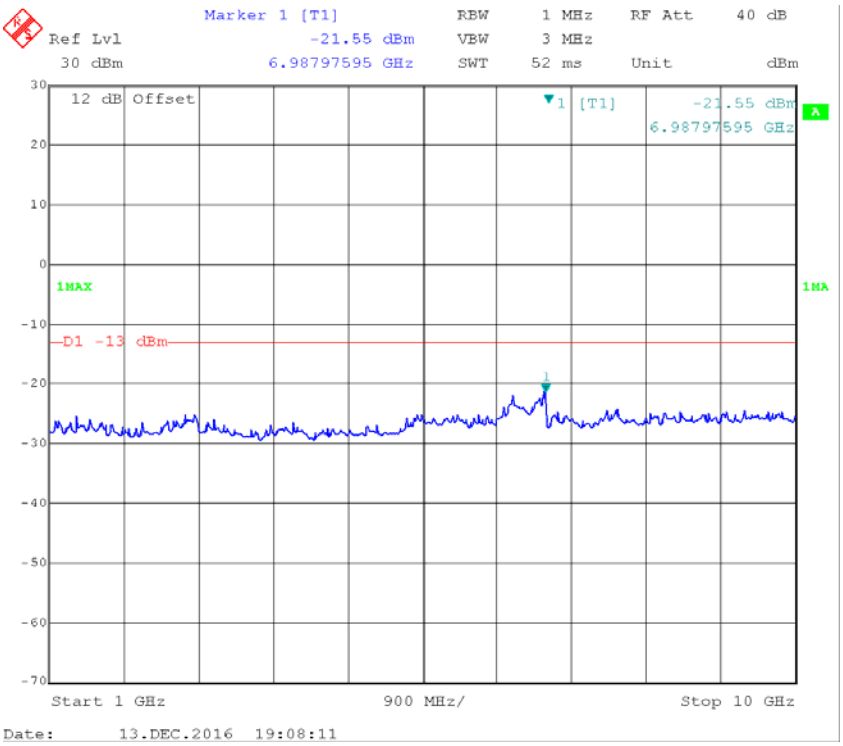




Fundamental

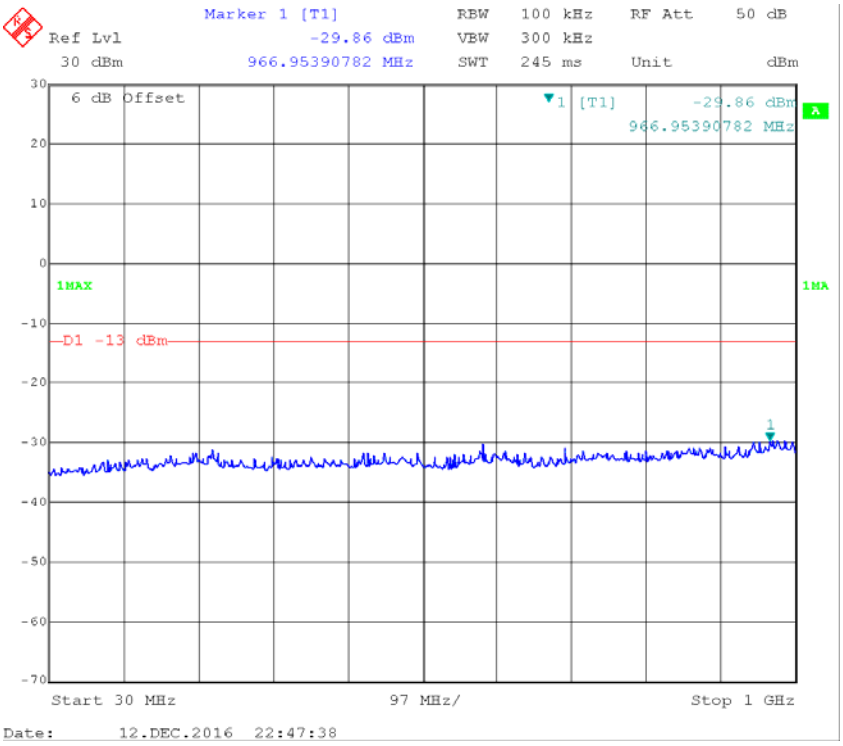
REL99 Band V_ Middle Channel



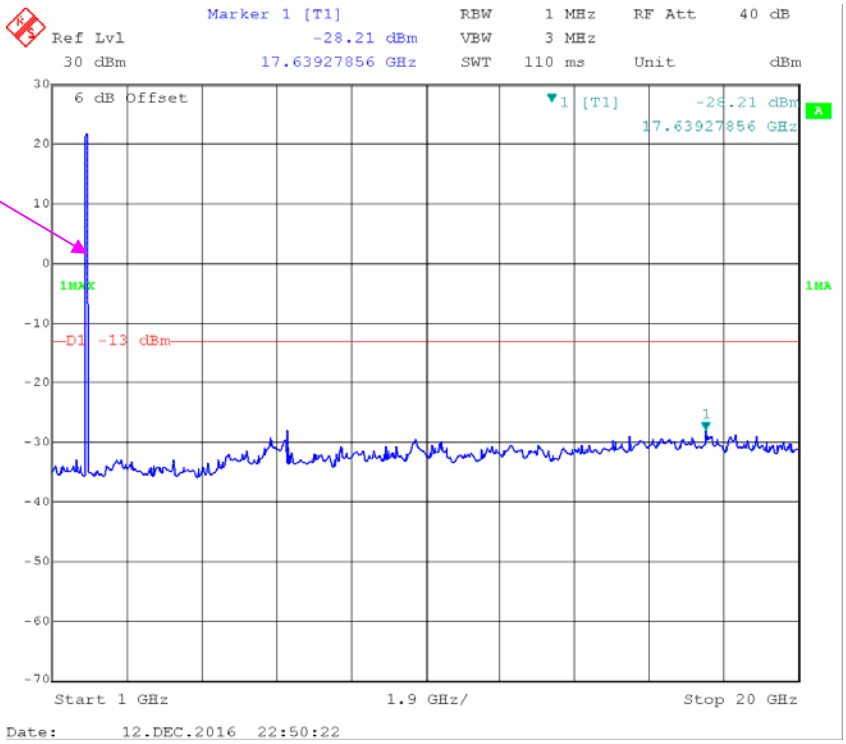


LTE Band II (Middle Channel)

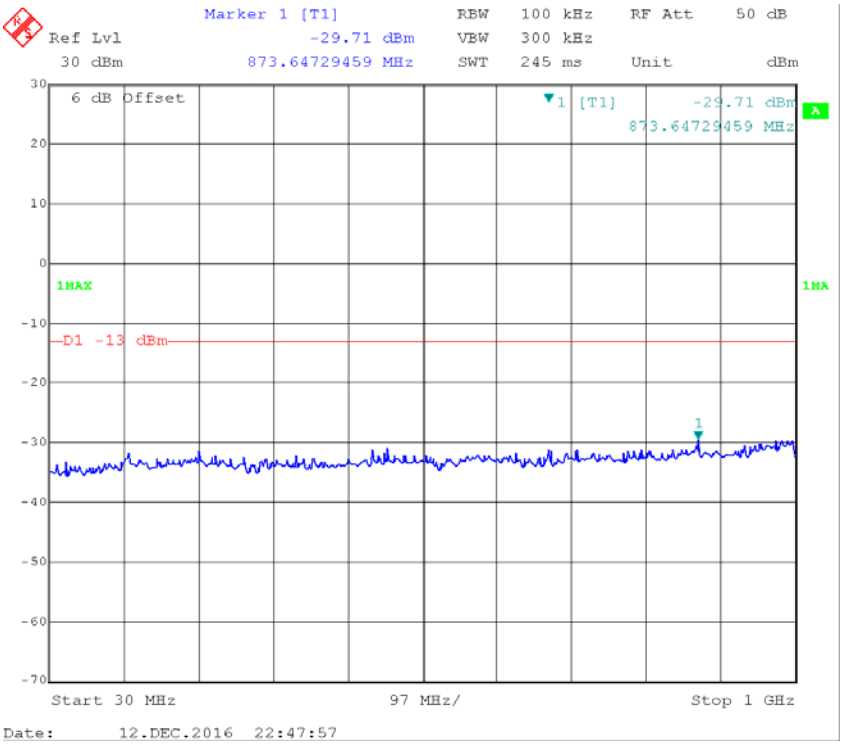
QPSK_1.4 MHz



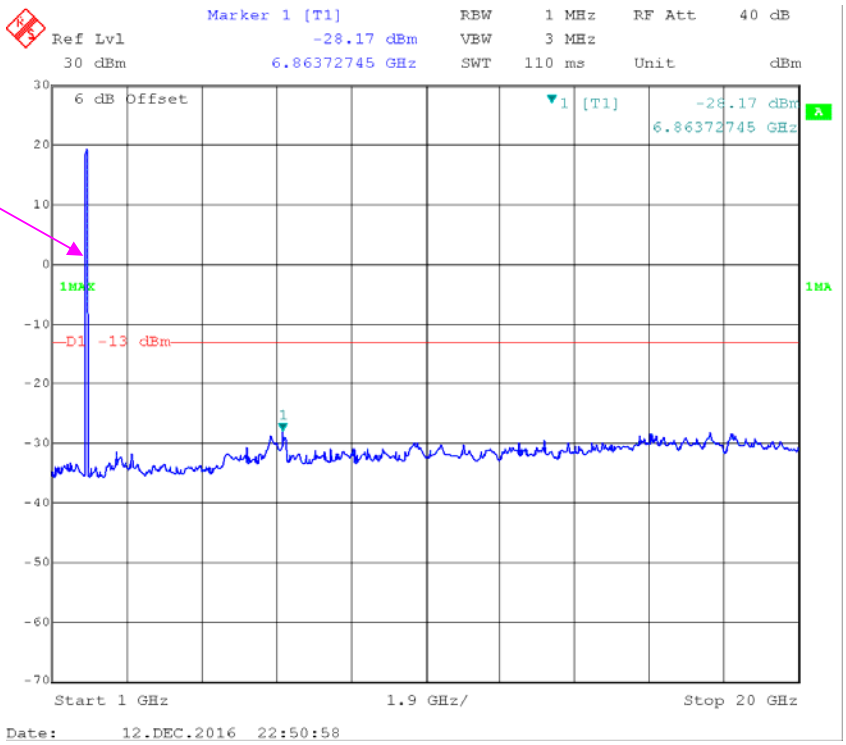
Fundamental



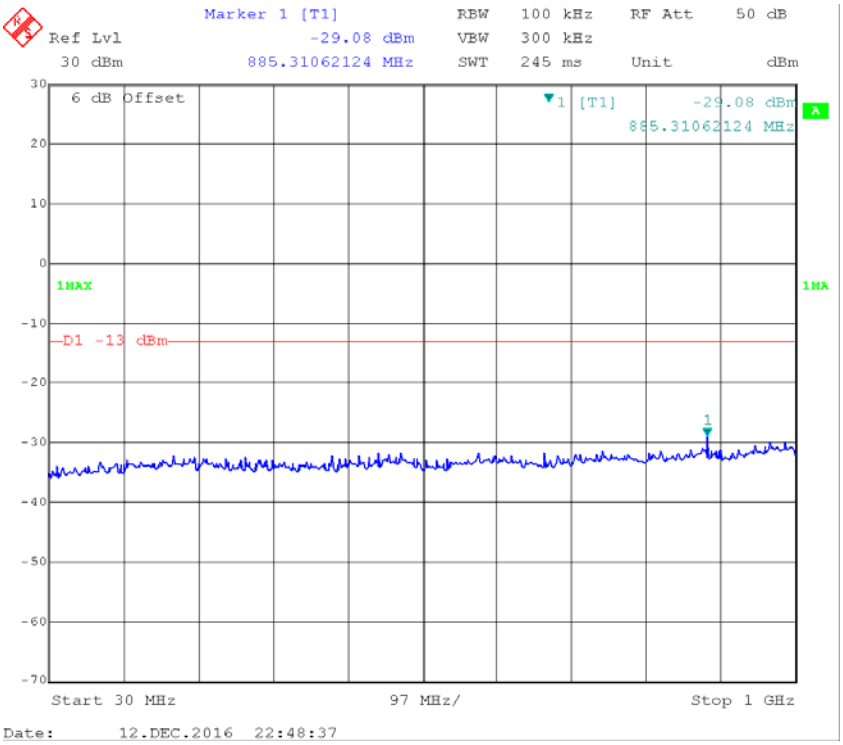
QPSK_3 MHz

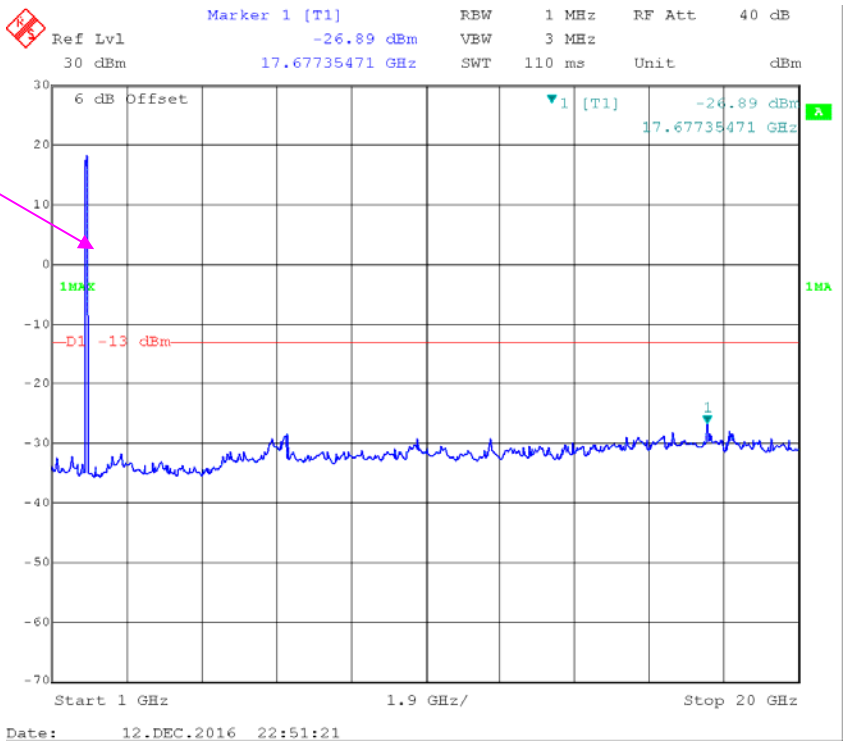


Fundamental



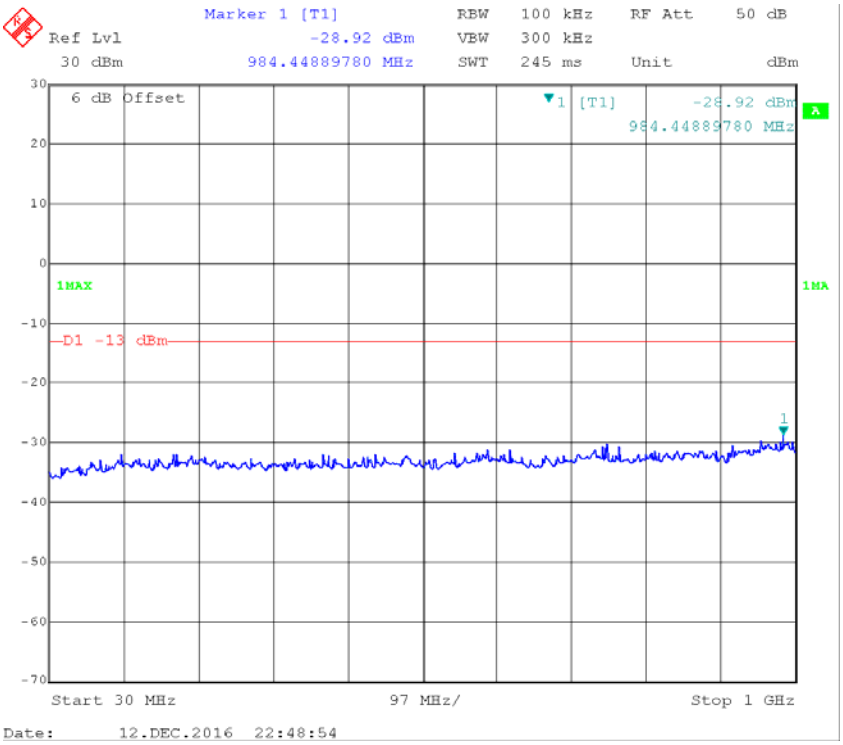
QPSK_5 MHz



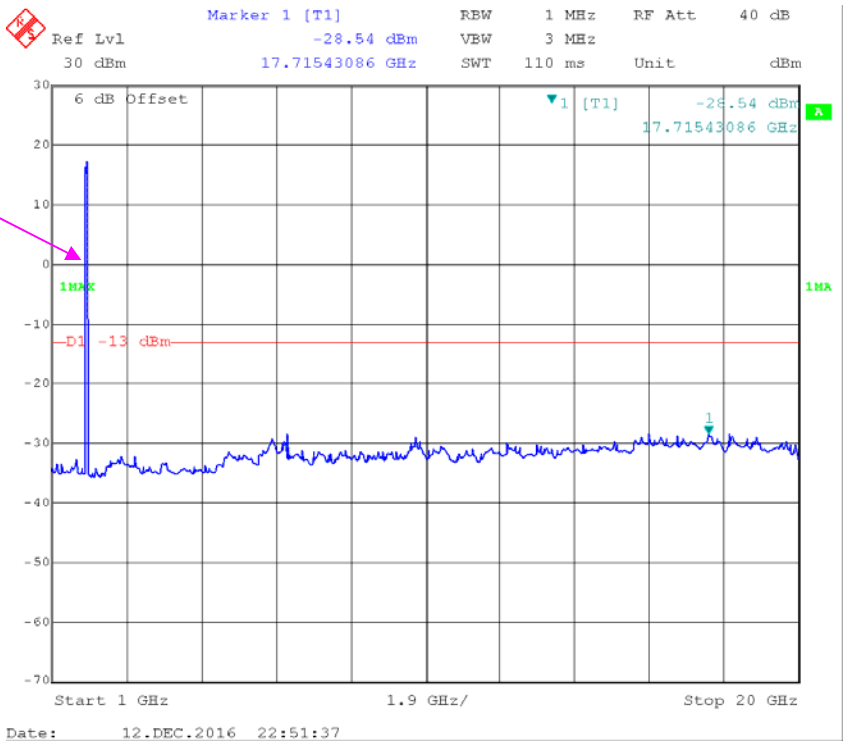


Fundamental

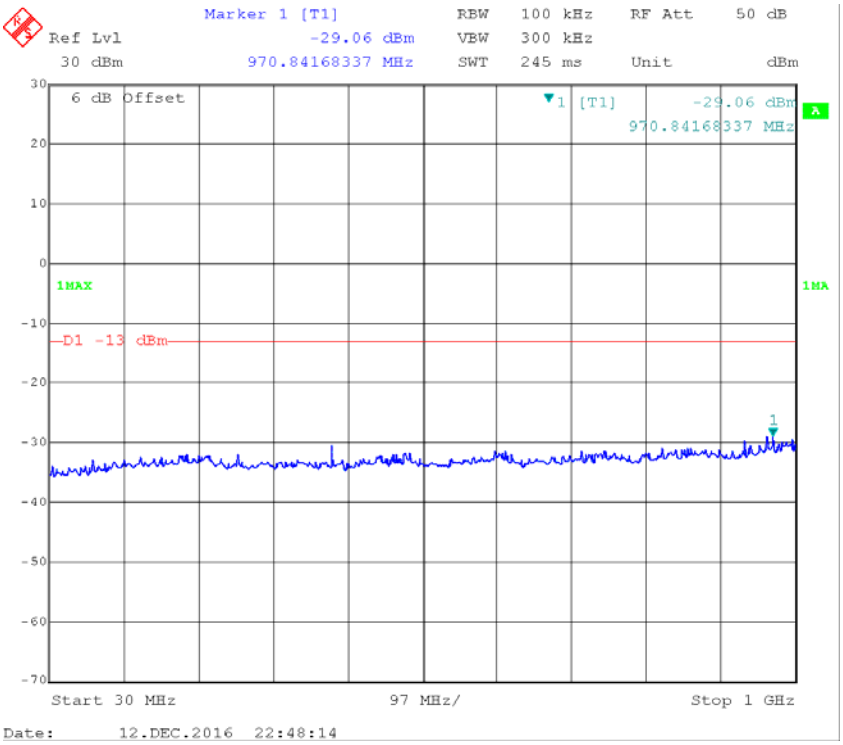
QPSK_10 MHz



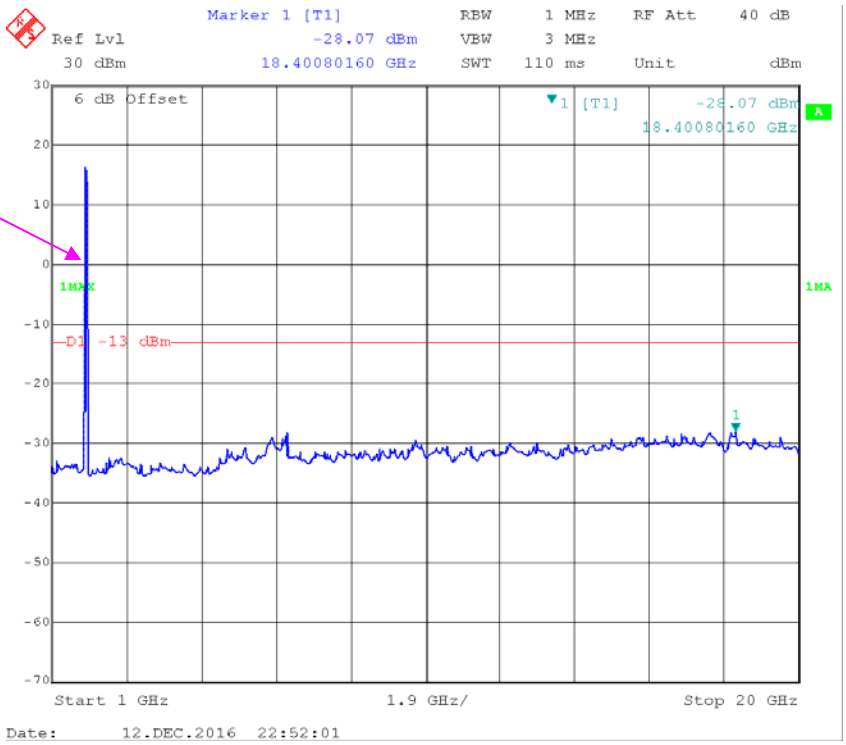
Fundamental



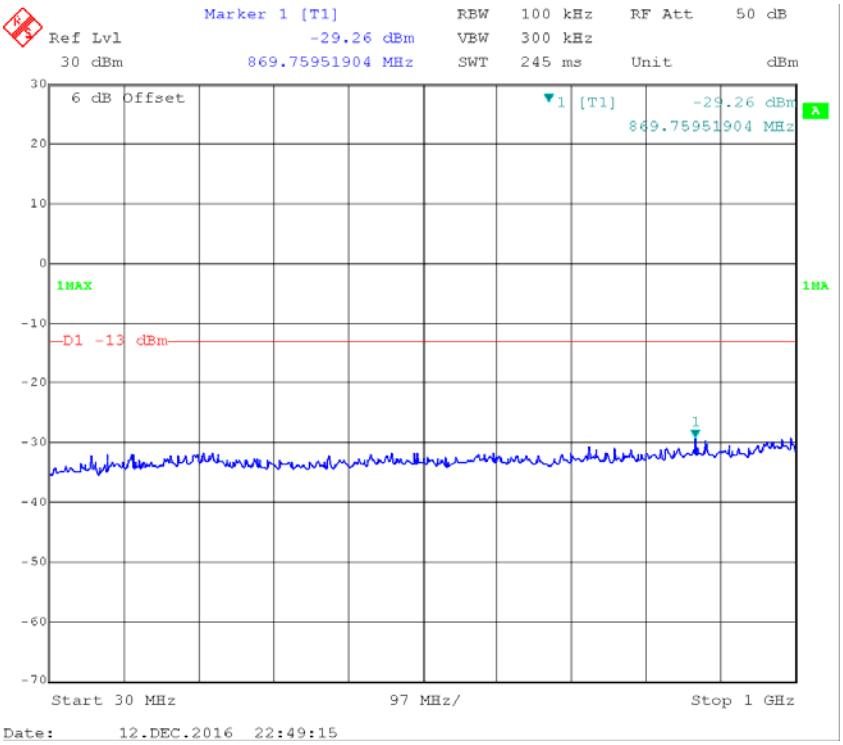
QPSK_15 MHz



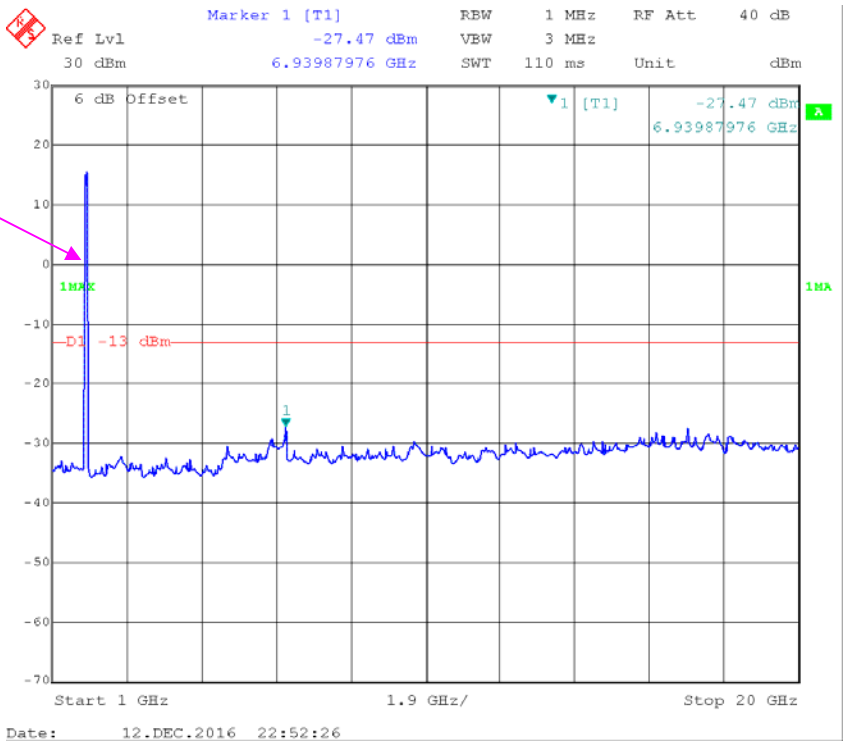
Fundamental



QPSK_20 MHz

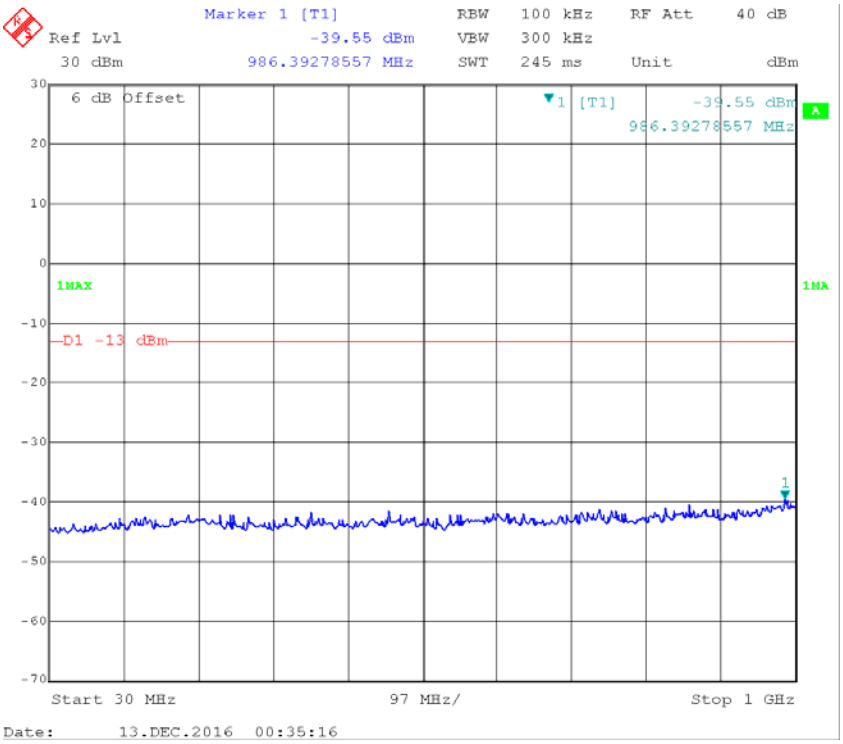


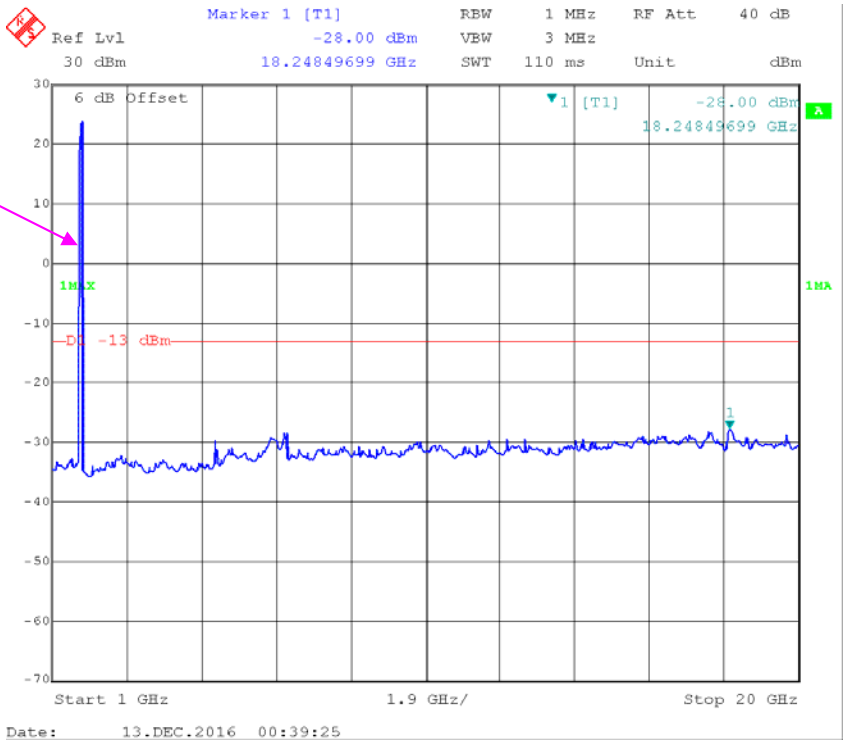
Fundamental



LTE Band IV (Middle Channel)

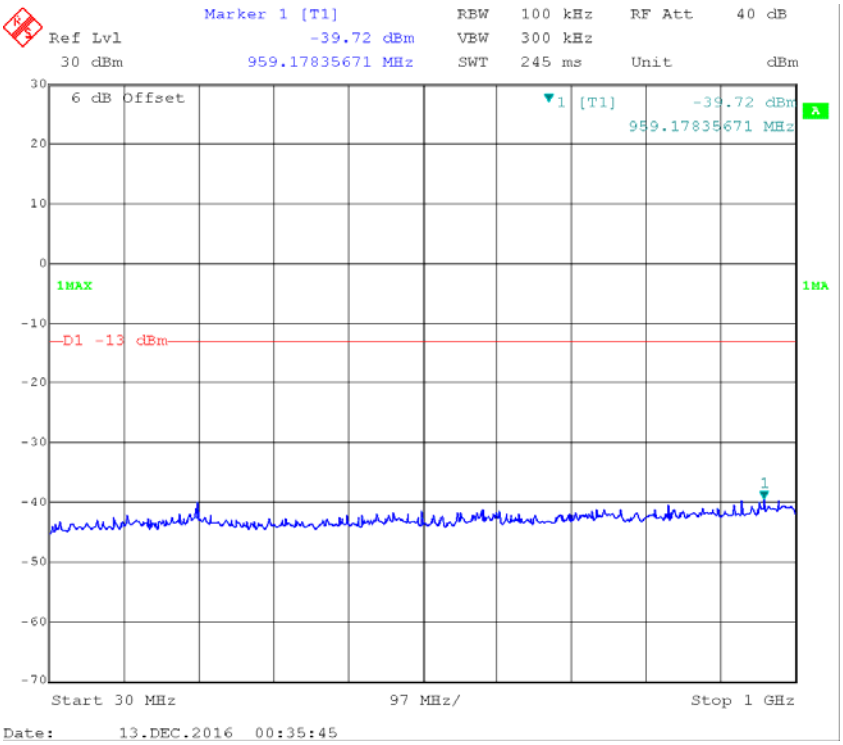
QPSK_1.4 MHz

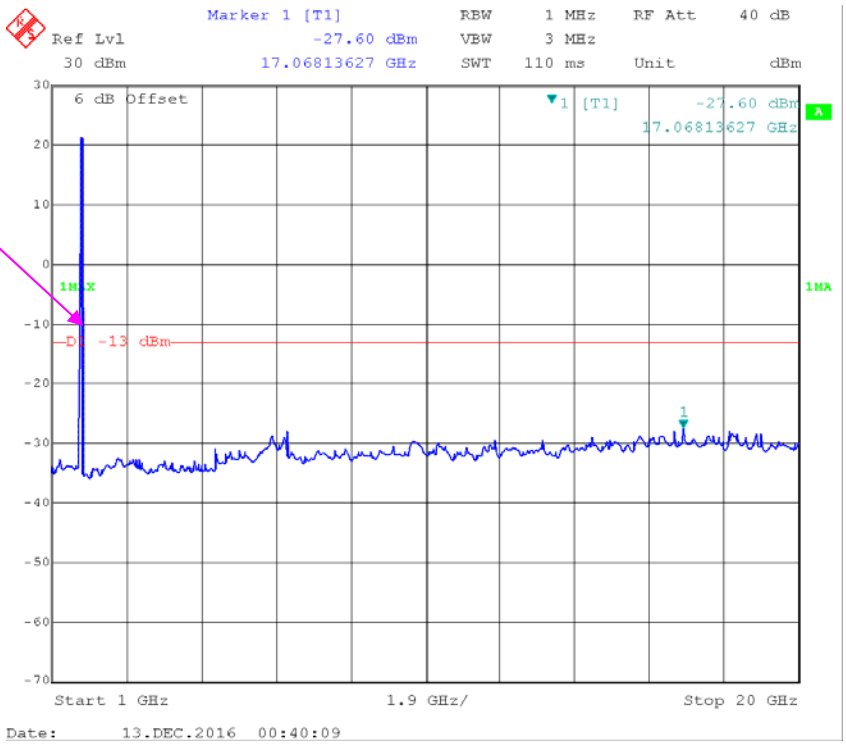




Fundamental

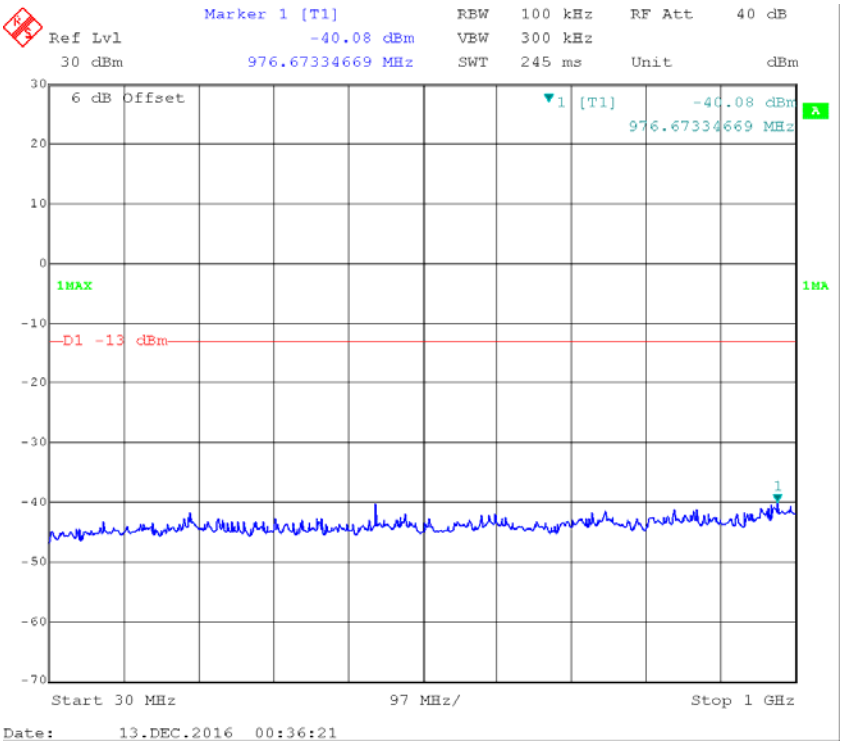
QPSK_3 MHz

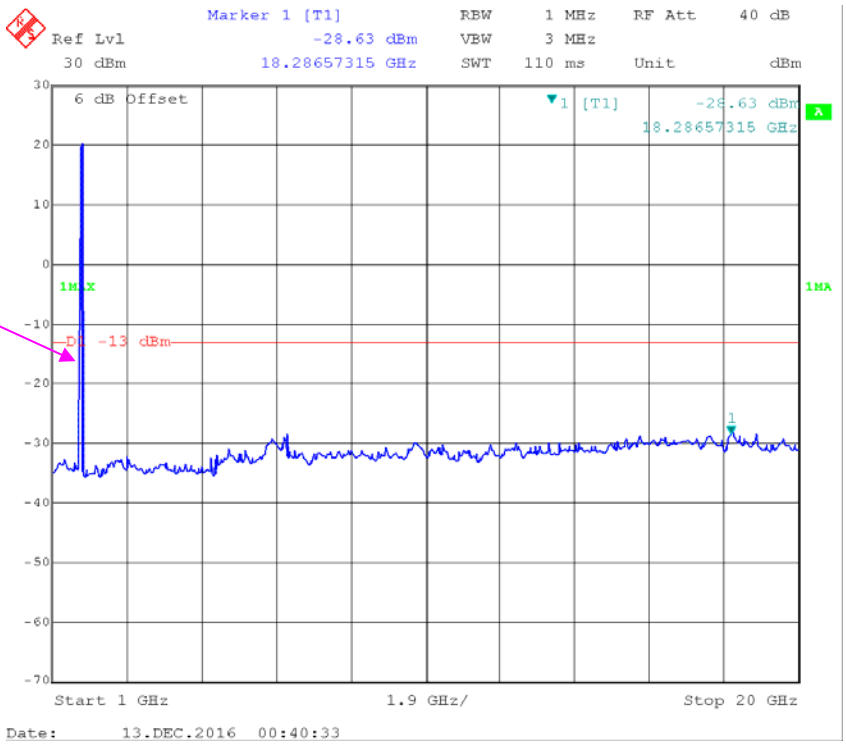




Fundamental

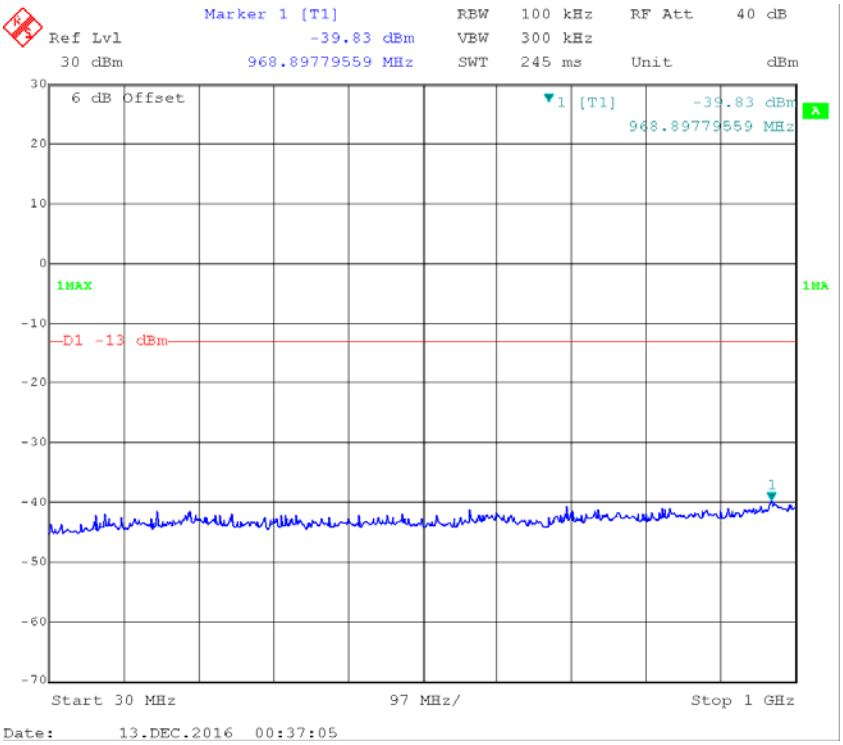
QPSK_5 MHz

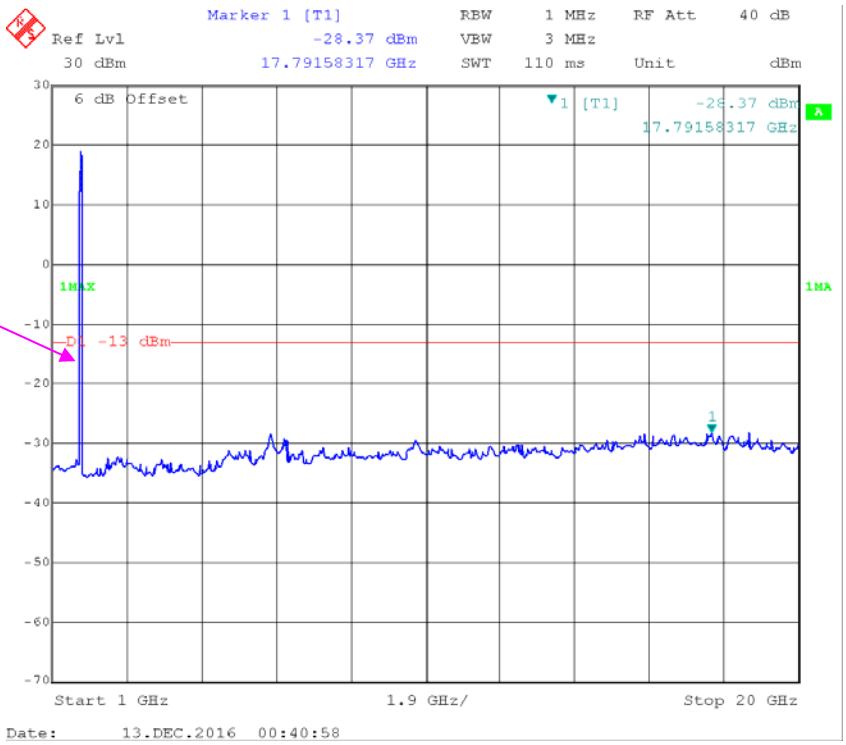




Fundamental

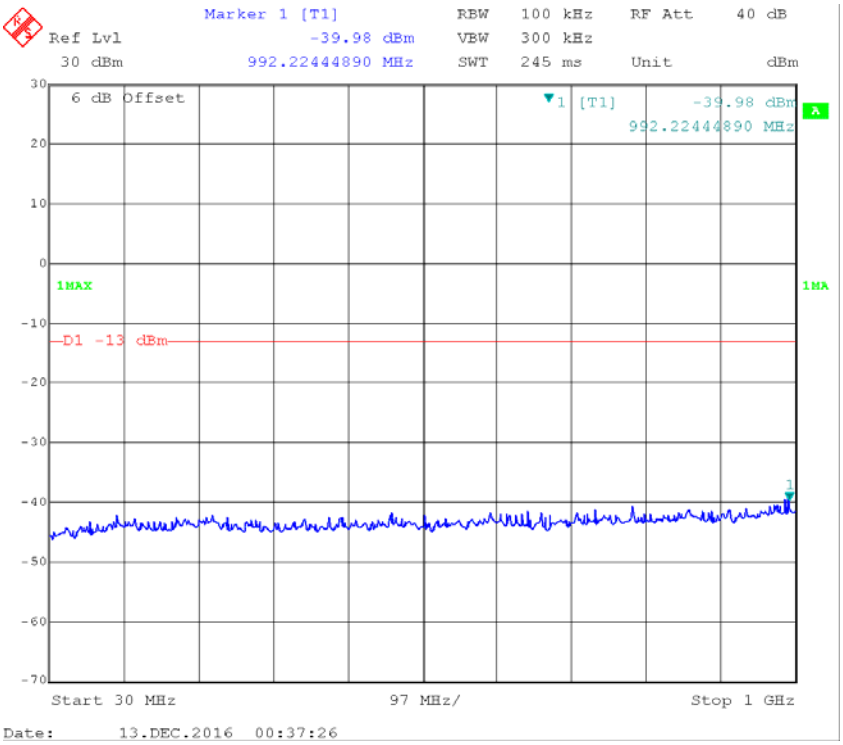
QPSK_10 MHz

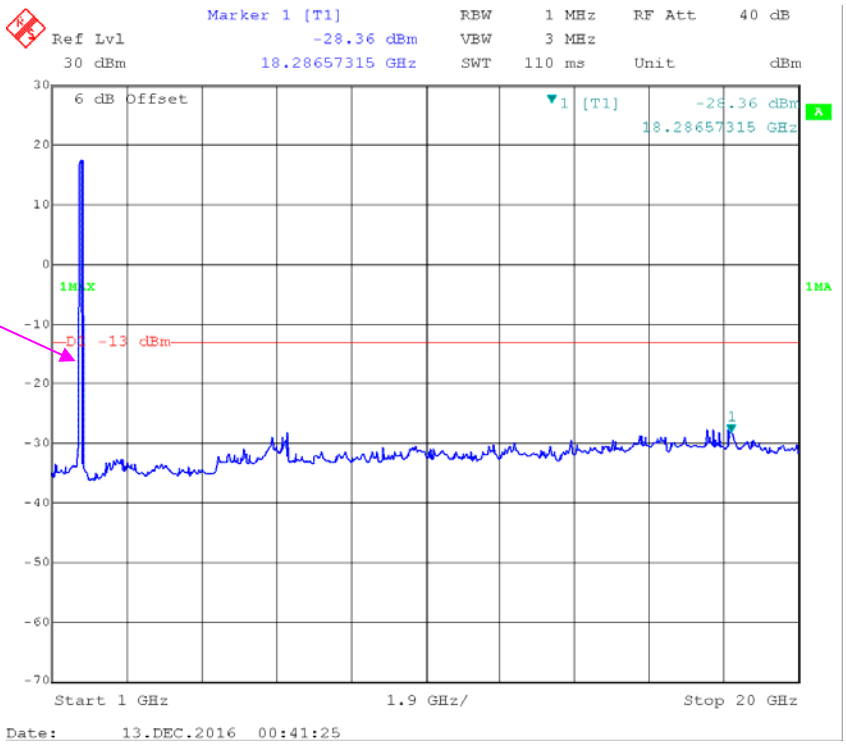




Fundamental

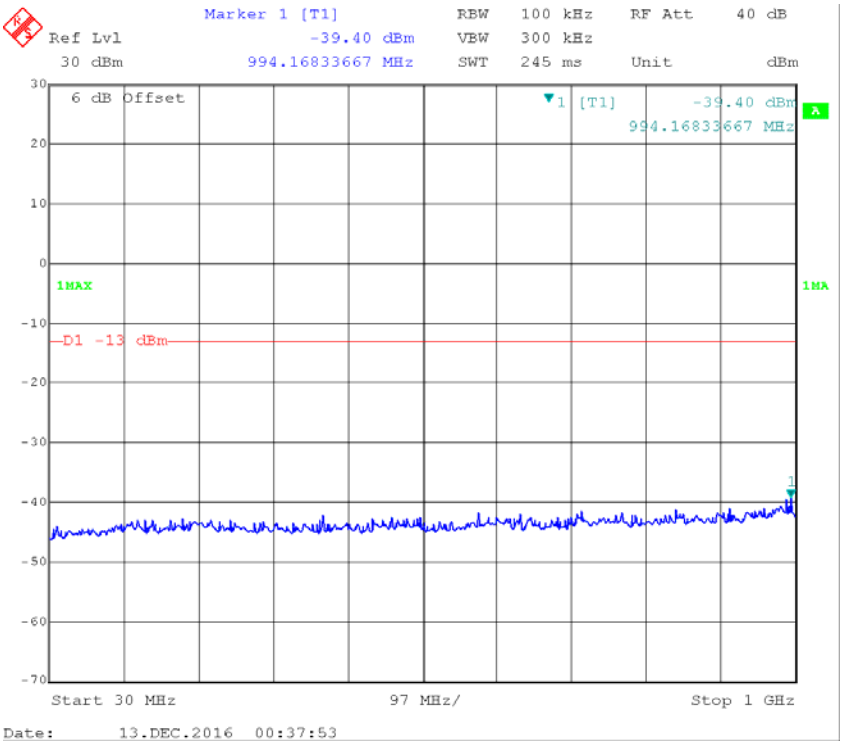
QPSK_15 MHz

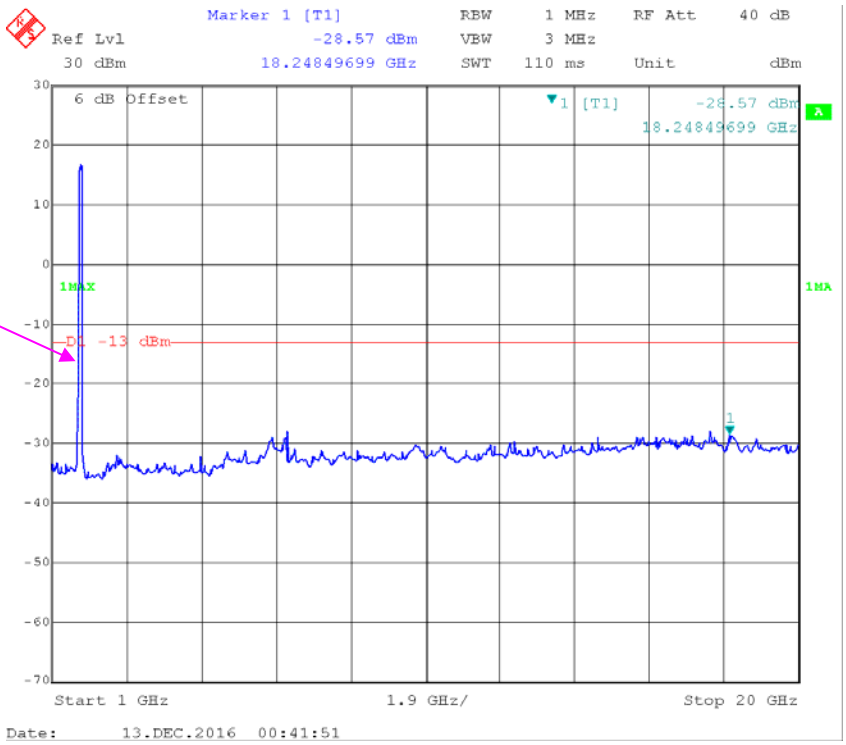




Fundamental

QPSK_20 MHz

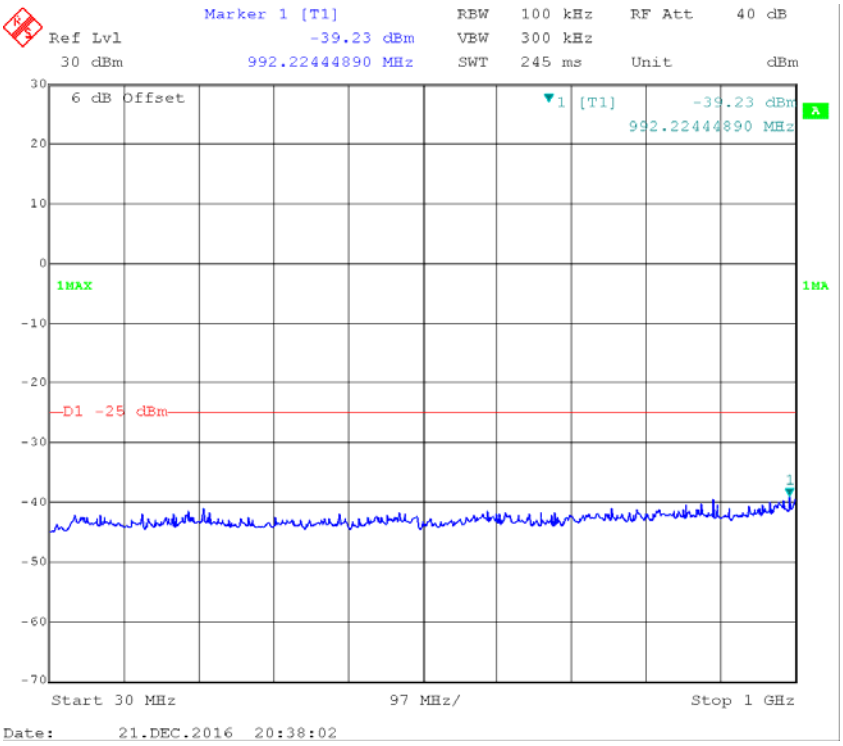




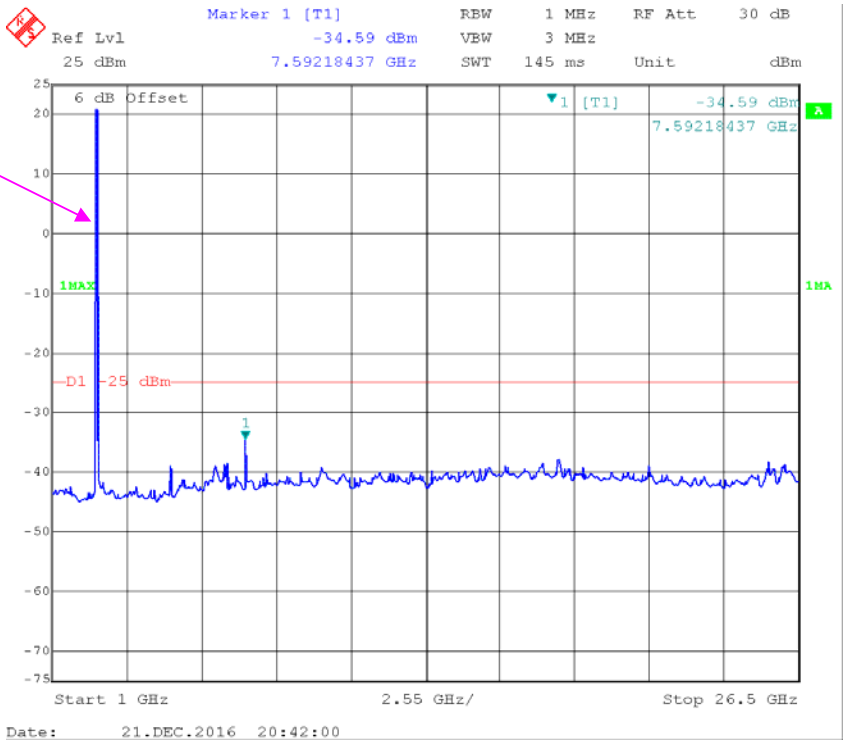
Fundamental

LTE Band VII (Middle Channel)

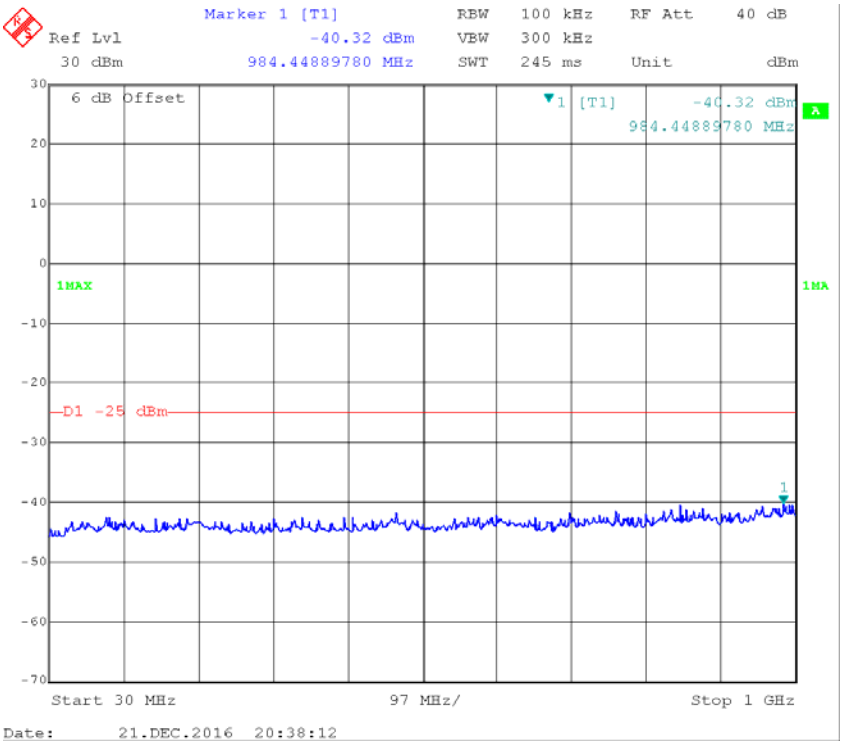
QPSK_5 MHz

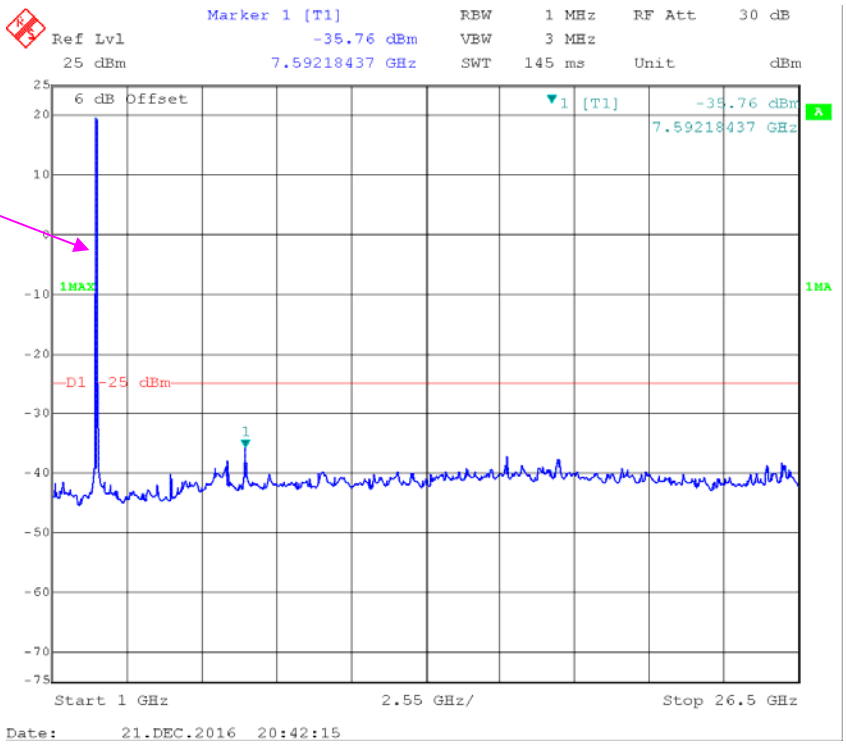


Fundamental



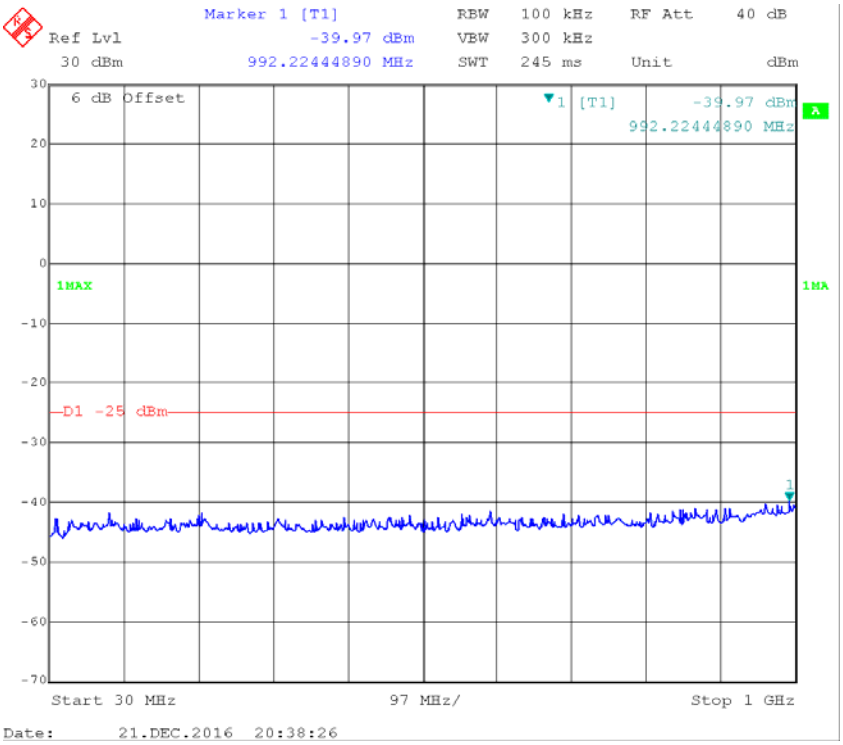
QPSK_10 MHz

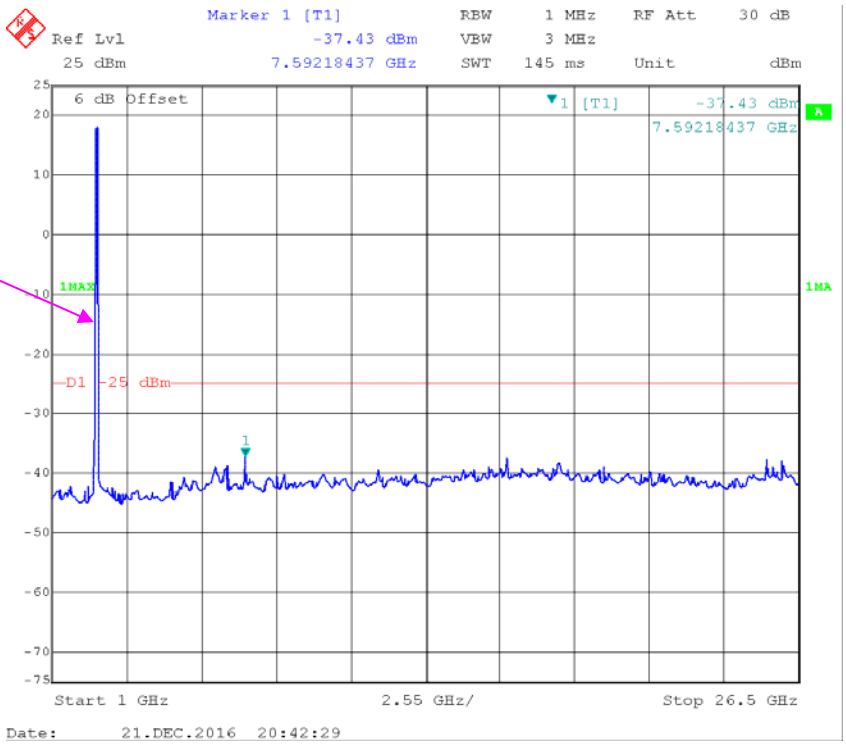




Fundamental

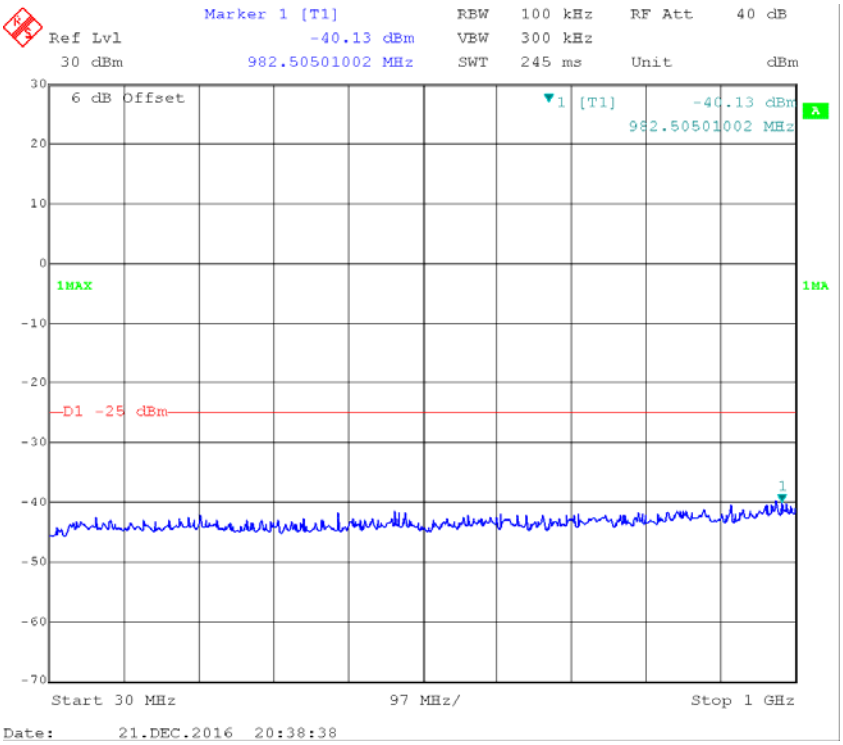
QPSK_15 MHz



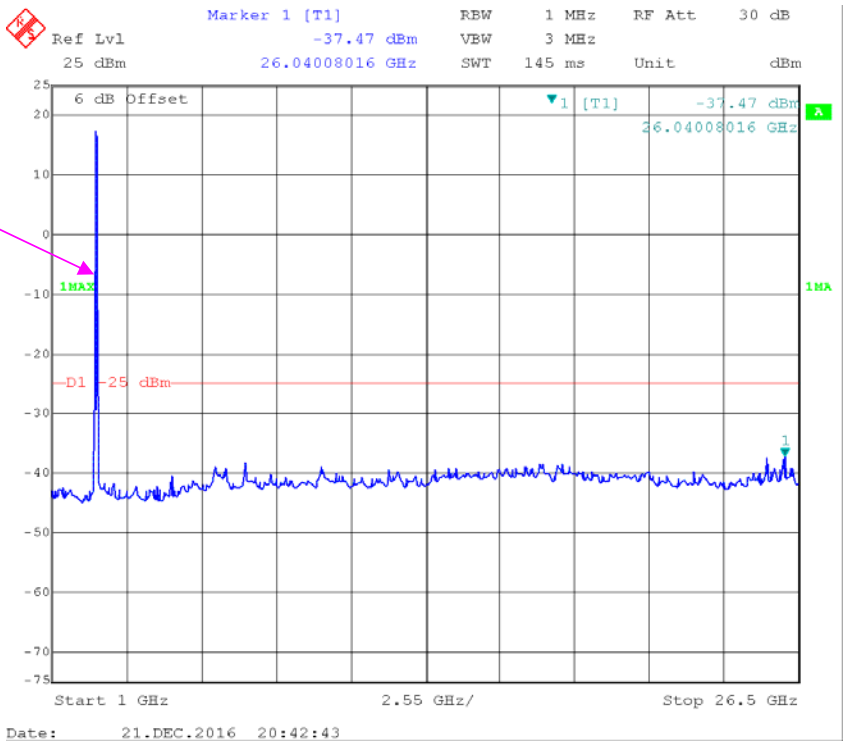


Fundamental

QPSK_20 MHz

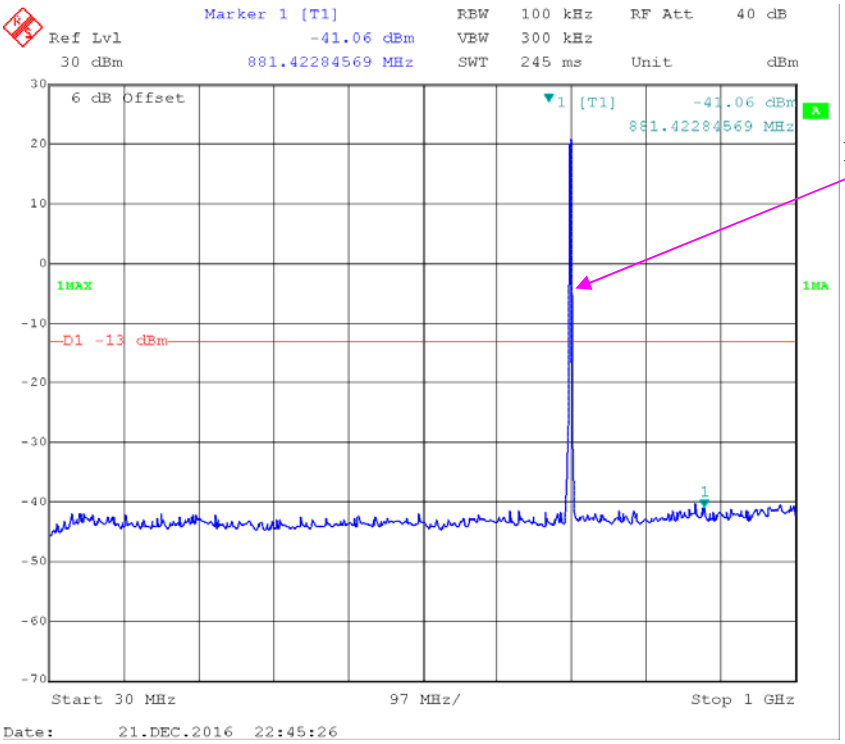


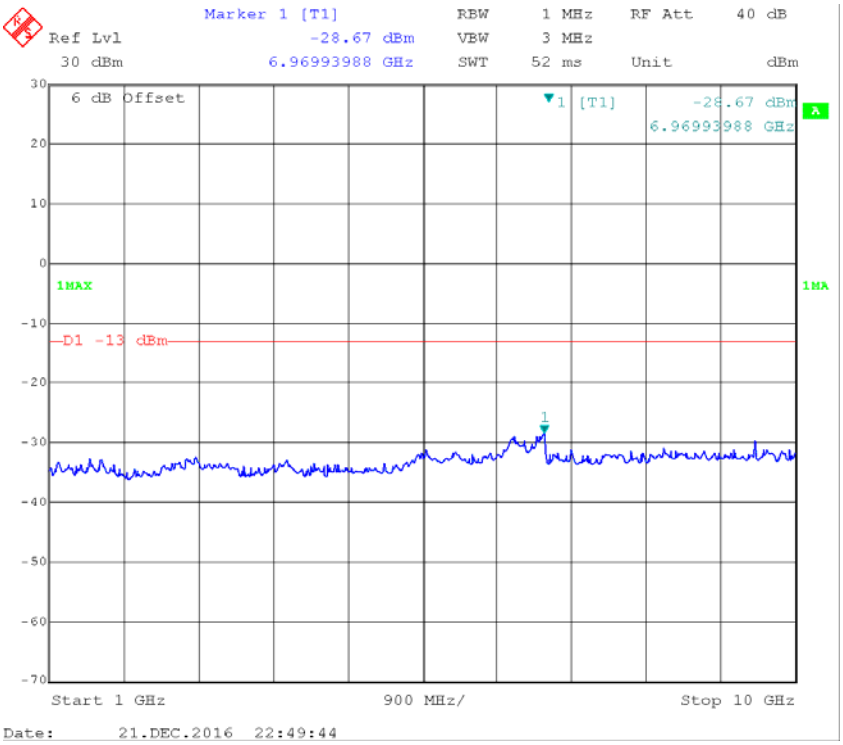
Fundamental



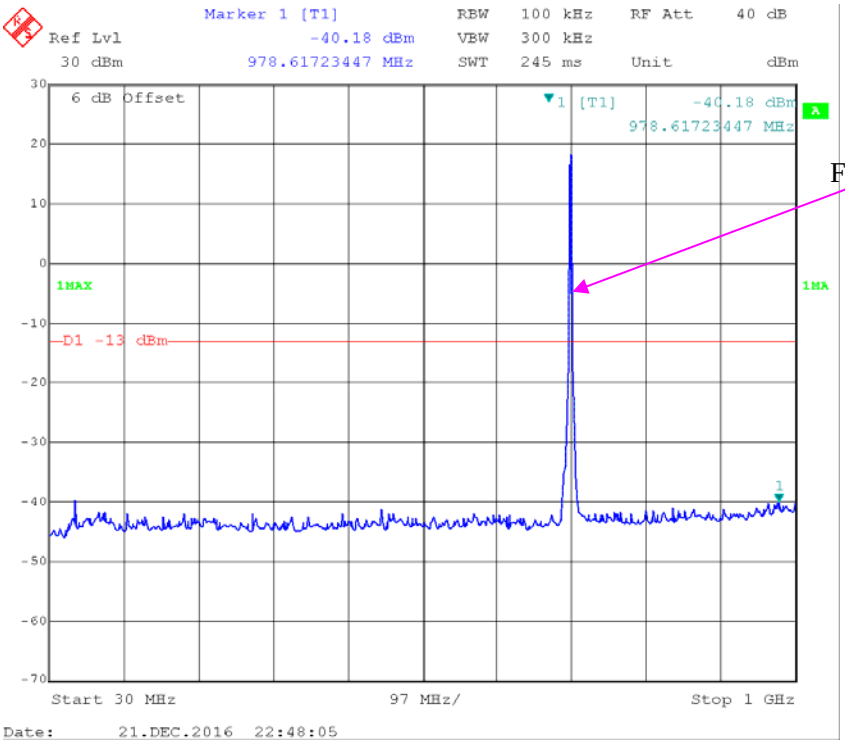
LTE Band 12

QPSK_1.4 MHz

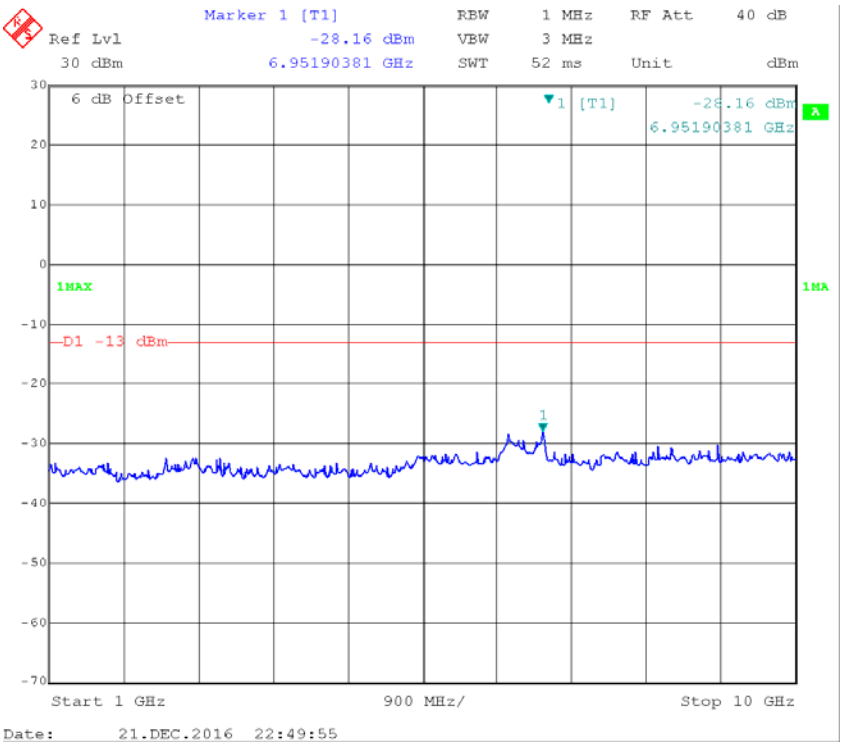




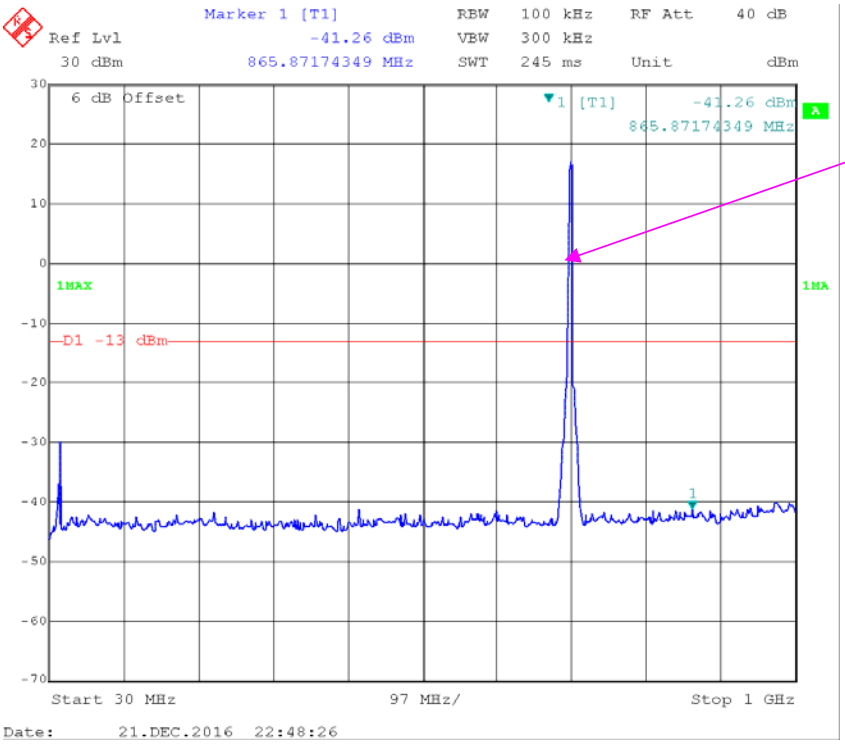
QPSK_3 MHz



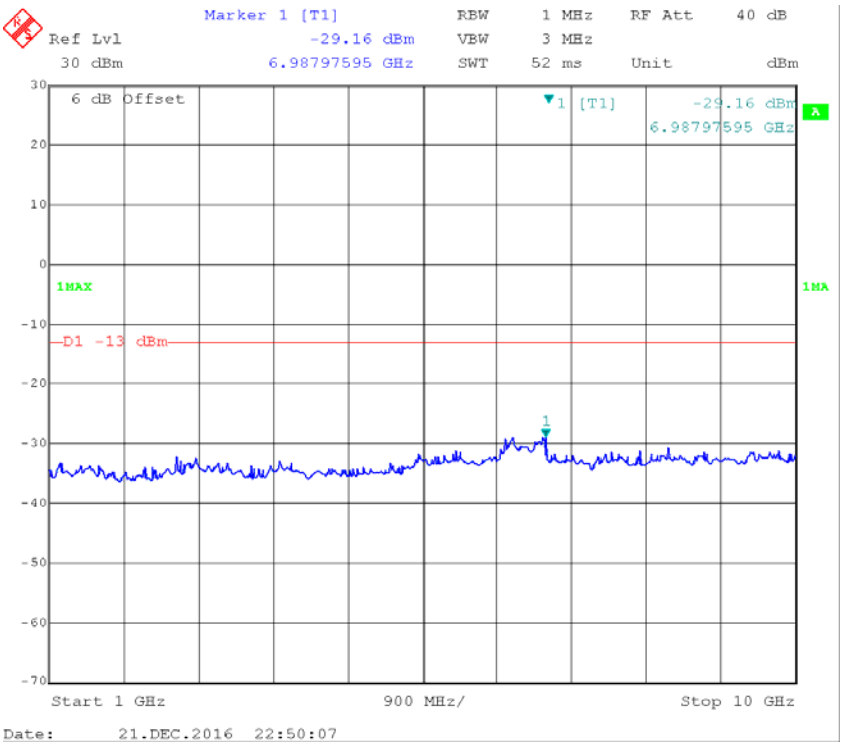
Fundamental



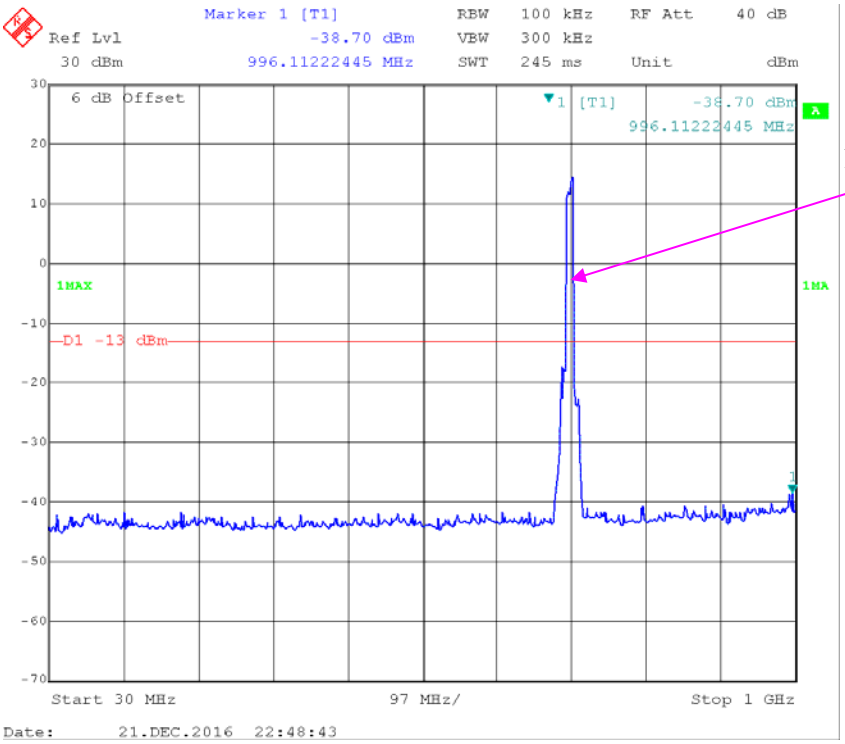
QPSK_5 MHz



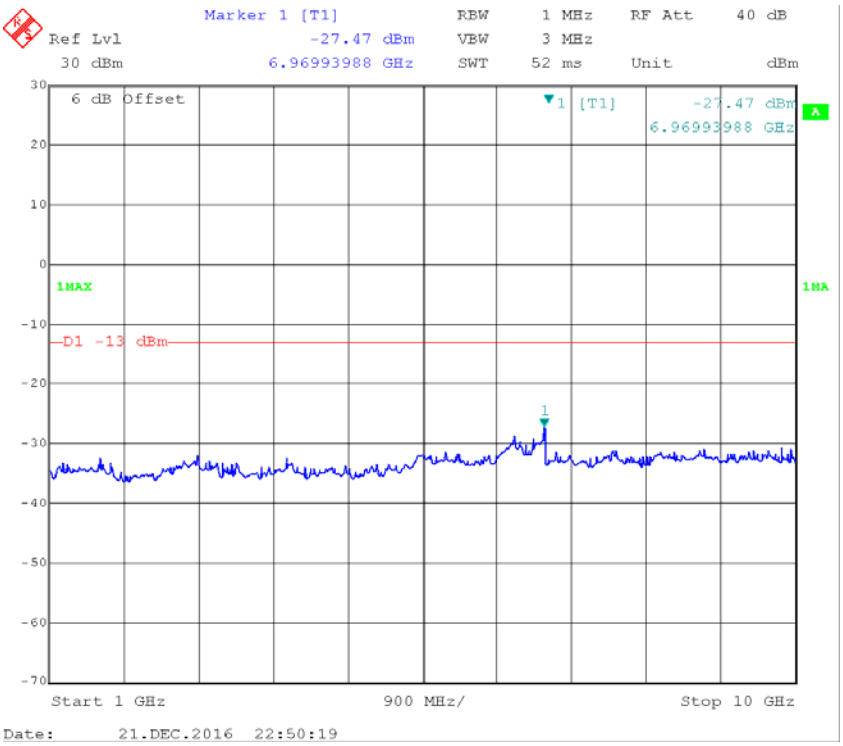
Fundamental



QPSK_10 MHz

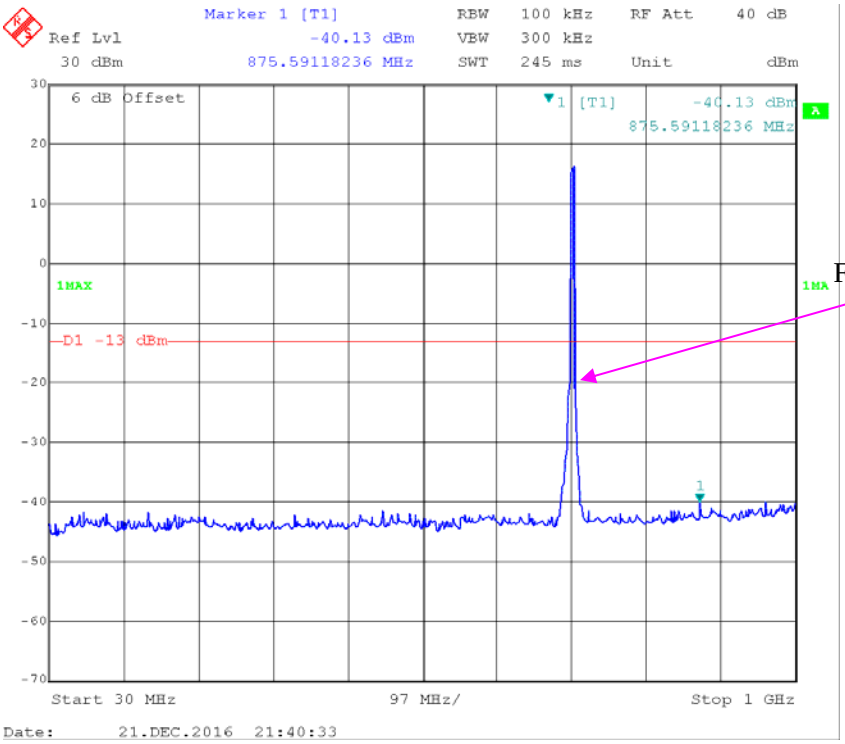


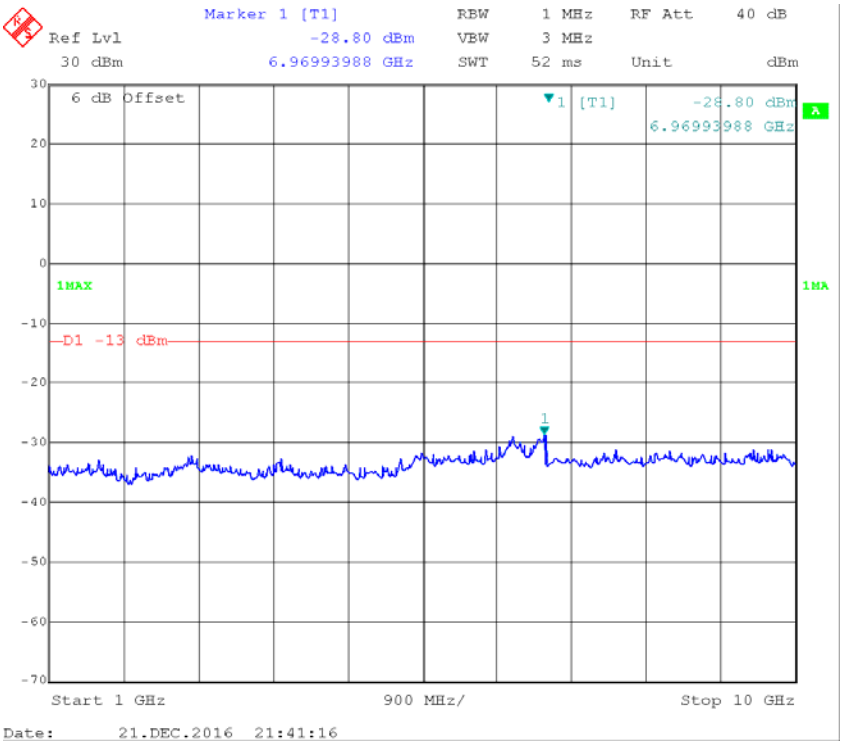
Fundamental



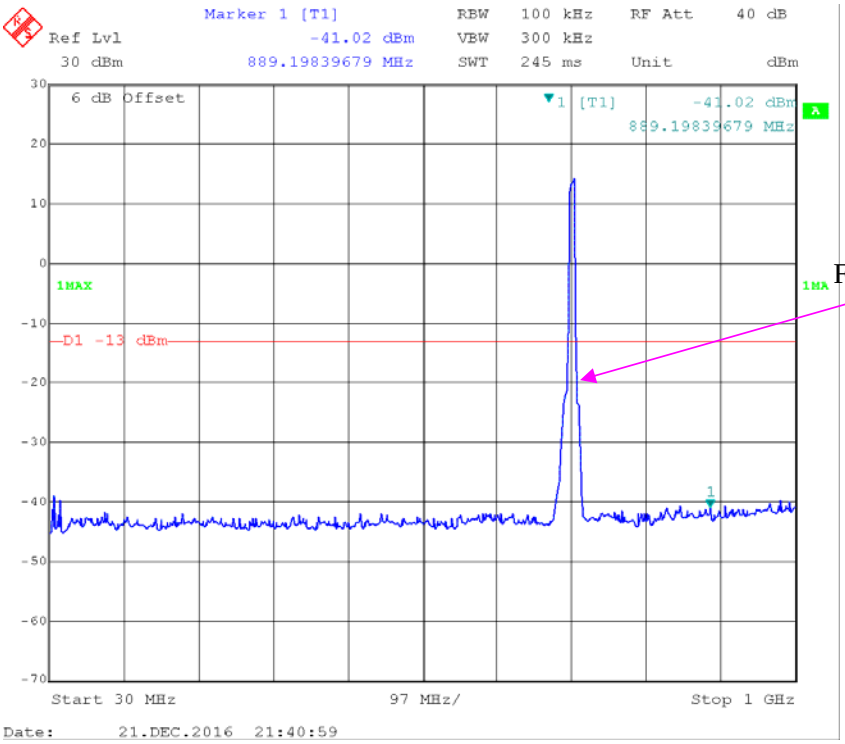
LTE Band 17 (Middle Channel)

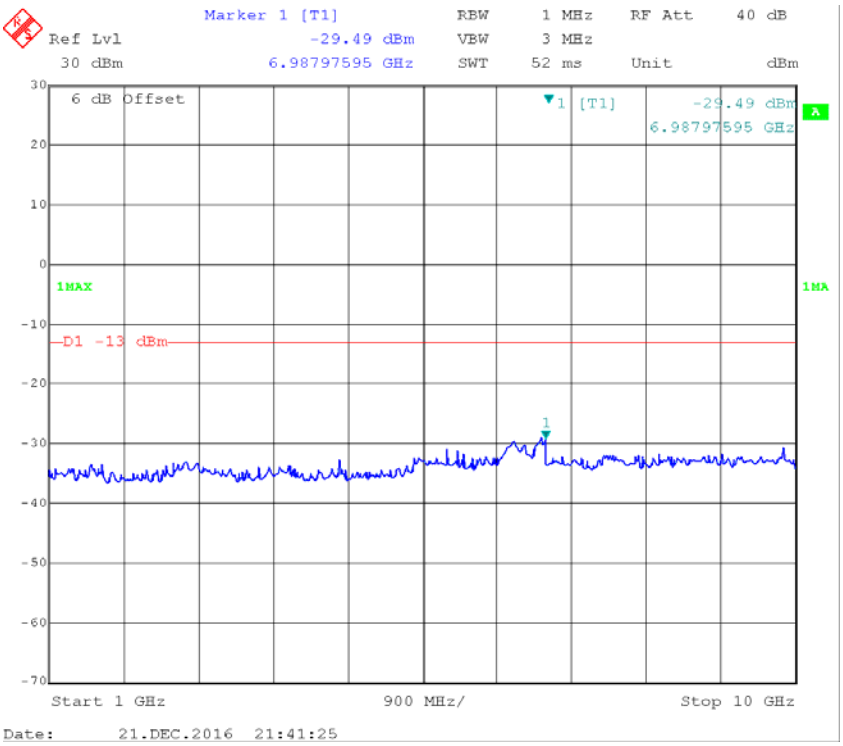
QPSK_5 MHz





QPSK_10 MHz


Marker 1 [T1]
RBW 100 kHz
RF Att 40 dB
Ref Lvl
-41.02 dBm
VBW 300 kHz
30 dBm
889.19839679 MHz
SWT 245 ms
Unit dBm
6 dB Offset
1 [T1]
-41.02 dBm
889.19839679 MHz
1MAX
1MA
D1 -13 dBm
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 21.DEC.2016 21:40:59
Fundamental


Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-29.49 dBm
VBW 3 MHz
30 dBm
6.98797595 GHz
SWT 52 ms
Unit dBm
6 dB Offset
1 [T1]
-29.49 dBm
6.98797595 GHz
1MAX
1MA
D1 -13 dBm
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 21.DEC.2016 21:41:25

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 (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (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	2016-11-10	2017-11-09
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	2016-11-10	2017-11-09
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1315	2016-08-18	2017-08-18
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1312	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:	27.5 °C
Relative Humidity:	31 %
ATM Pressure:	100.4 kPa

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

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								
1673.2	H	43.99	-59.1	7.9	0.8	-52.0	-13.0	39.0
1673.2	V	39.74	-61.6	7.9	0.8	-54.5	-13.0	41.5
2509.8	H	37.03	-62.7	8.9	1.3	-55.1	-13.0	42.1
2509.8	V	36.52	-61	8.9	1.3	-53.4	-13.0	40.4
54.25	H	31.58	-73.1	-12.9	0.1	-86.1	-13.0	73.1
176.47	V	30.06	-81.4	0.0	0.2	-81.6	-13.0	68.6
WCDMA Band V R99,Frequency:836.600 MHz								
1673.2	H	37.49	-65.6	7.9	0.8	-58.5	-13.0	45.5
1673.2	V	36.58	-64.8	7.9	0.8	-57.7	-13.0	44.7
2509.8	H	44.56	-55.2	8.9	1.3	-47.6	-13.0	34.6
2509.8	V	41.97	-55.6	8.9	1.3	-48.0	-13.0	35.0
54.25	H	31.58	-73.1	-12.9	0.1	-86.1	-13.0	73.1
176.47	V	30.06	-81.4	0.0	0.2	-81.6	-13.0	68.6

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	H	35.58	-59.3	8.8	1.4	-51.9	-13.0	38.9
3760	V	33.05	-61.8	8.8	1.4	-54.4	-13.0	41.4
5640	H	41.62	-51.5	10.3	1.8	-43.0	-13.0	30.0
5640	V	40.24	-52.9	10.3	1.8	-44.4	-13.0	31.4
54.25	H	31.67	-73	-12.9	0.1	-86.0	-13.0	73.0
176.47	V	29.16	-82.3	0.0	0.2	-82.5	-13.0	69.5
WCDMA Band II, R99, Frequency:1880.000 MHz								
3760	H	33.5	-61.4	8.8	1.4	-54.0	-13.0	41.0
3760	V	32.18	-62.7	8.8	1.4	-55.3	-13.0	42.3
5640	H	44.46	-48.6	10.3	1.8	-40.1	-13.0	27.1
5640	V	43.89	-49.3	10.3	1.8	-40.8	-13.0	27.8
54.25	H	31.61	-73.1	-12.9	0.1	-86.1	-13.0	73.1
176.47	V	30.22	-81.2	0.0	0.2	-81.4	-13.0	68.4

WCDMA 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)			
WCDMA Band IV, R99, Frequency:1732.500 MHz								
3465	H	35.38	-61.2	8.8	1.3	-53.7	-13.0	40.7
3465	V	34.35	-62.3	8.8	1.3	-54.8	-13.0	41.8
5197.5	H	39.8	-53.5	10.0	1.7	-45.2	-13.0	32.2
5197.5	V	38.56	-54.6	10.0	1.7	-46.3	-13.0	33.3
54.25	H	31.75	-72.9	-12.9	0.1	-85.9	-13.0	72.9
176.47	V	28.89	-82.6	0.0	0.2	-82.8	-13.0	69.8

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	34.52	-60.4	8.8	1.4	-53.0	-13.0	40.0
3760	V	33.75	-61.1	8.8	1.4	-53.7	-13.0	40.7
5640	H	33.05	-60.1	10.3	1.8	-51.6	-13.0	38.6
5640	V	32.43	-60.7	10.3	1.8	-52.2	-13.0	39.2
480.2	H	33.58	-77.2	0.0	0.4	-77.6	-13.0	64.6
398.6	V	31.47	-78.8	0.0	0.4	-79.2	-13.0	66.2
16-QAM,Frequency:1880.00 MHz								
3760	H	35.01	-59.9	8.8	1.4	-52.5	-13.0	39.5
3760	V	34.24	-60.6	8.8	1.4	-53.2	-13.0	40.2
5640	H	33.52	-59.6	10.3	1.8	-51.1	-13.0	38.1
5640	V	32.13	-61	10.3	1.8	-52.5	-13.0	39.5
480.2	H	33.78	-77	0.0	0.4	-77.4	-13.0	64.4
398.6	V	31.28	-79	0.0	0.4	-79.4	-13.0	66.4

LTE Band IV (30MHz-18GHz):

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	32.98	-63.6	8.8	1.3	-56.1	-13.0	43.1
3465	V	32.15	-64.5	8.8	1.3	-57.0	-13.0	44.0
5197.5	H	36.23	-57	10.0	1.7	-48.7	-13.0	35.7
5197.5	V	35.01	-58.1	10.0	1.7	-49.8	-13.0	36.8
480.2	H	33.65	-77.2	0.0	0.4	-77.6	-13.0	64.6
398.6	V	31.58	-78.7	0.0	0.4	-79.1	-13.0	66.1
16-QAM,Frequency: 1732.500 MHz								
3465	H	34.08	-62.5	8.8	1.3	-55.0	-13.0	42.0
3465	V	33.42	-63.3	8.8	1.3	-55.8	-13.0	42.8
5197.5	H	35.86	-57.4	10.0	1.7	-49.1	-13.0	36.1
5197.5	V	36.24	-56.9	10.0	1.7	-48.6	-13.0	35.6
480.2	H	33.57	-77.2	0.0	0.4	-77.6	-13.0	64.6
398.6	V	31.53	-78.8	0.0	0.4	-79.2	-13.0	66.2

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	33.65	-60	9.9	1.7	-51.8	-25.0	26.8
5070	V	32.11	-61.4	9.9	1.7	-53.2	-25.0	28.2
7605	H	36.25	-53.4	10.4	2.3	-45.3	-25.0	20.3
7605	V	36.78	-54	10.4	2.3	-45.9	-25.0	20.9
480.2	H	33.38	-77.4	0.0	0.4	-77.8	-25.0	52.8
398.6	V	31.23	-79.1	0.0	0.4	-79.5	-25.0	54.5
16-QAM,Frequency: 535.000 MHz								
5070	H	33.62	-60	9.9	1.7	-51.8	-25.0	26.8
5070	V	33.46	-60	9.9	1.7	-51.8	-25.0	26.8
7605	H	38.33	-51.3	10.4	2.3	-43.2	-25.0	18.2
7605	V	37.25	-53.6	10.4	2.3	-45.5	-25.0	20.5
480.2	H	33.45	-77.4	0.0	0.4	-77.8	-25.0	52.8
398.6	V	31.37	-78.9	0.0	0.4	-79.3	-25.0	54.3

LTE Band 12 (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:707.500 MHz								
1415	H	33.32	-69.7	7.4	0.8	-63.1	-13.0	50.1
1415	V	32.45	-69.9	7.4	0.8	-63.3	-13.0	50.3
2122.5	H	35.73	-63.3	8.3	1.3	-56.3	-13.0	43.3
2122.5	V	35.29	-61.6	8.3	1.3	-54.6	-13.0	41.6
480.2	H	33.35	-77.5	0.0	0.4	-77.9	-13.0	64.9
398.6	V	31.35	-79	0.0	0.4	-79.4	-13.0	66.4
16-QAM,Frequency:707.500 MHz								
1415	H	33.85	-69.2	7.4	0.8	-62.6	-13.0	49.6
1415	V	33.07	-69.3	7.4	0.8	-62.7	-13.0	49.7
2122.5	H	35.92	-63.1	8.3	1.3	-56.1	-13.0	43.1
2122.5	V	36.13	-60.7	8.3	1.3	-53.7	-13.0	40.7
480.2	H	33.25	-77.6	0.0	0.4	-78.0	-13.0	65.0
398.6	V	31.36	-78.9	0.0	0.4	-79.3	-13.0	66.3

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	33.58	-69.5	7.4	0.8	-62.9	-13.0	49.9
1420	V	32.48	-69.9	7.4	0.8	-63.3	-13.0	50.3
2130	H	37.22	-61.9	8.3	1.3	-54.9	-13.0	41.9
2130	V	36.81	-60	8.3	1.3	-53.0	-13.0	40.0
480.2	H	33.24	-77.6	0.0	0.4	-78.0	-13.0	65.0
398.6	V	31.51	-78.8	0.0	0.4	-79.2	-13.0	66.2
16-QAM,Frequency: 710.000 MHz								
1420	H	34.05	-69	7.4	0.8	-62.4	-13.0	49.4
1420	V	33.41	-68.9	7.4	0.8	-62.3	-13.0	49.3
2130	H	37.84	-61.3	8.3	1.3	-54.3	-13.0	41.3
2130	V	37.22	-59.6	8.3	1.3	-52.6	-13.0	39.6
480.2	H	33.59	-77.2	0.0	0.4	-77.6	-13.0	64.6
398.6	V	31.18	-79.1	0.0	0.4	-79.5	-13.0	66.5

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.

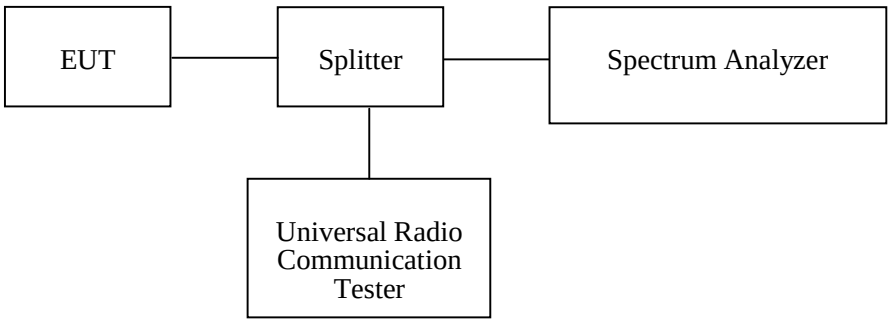
According to §27.53 (h), AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (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 that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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
N/A	RF Cable	N/A	N/A	Each Time	/
N/A	Two-way Spliter	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

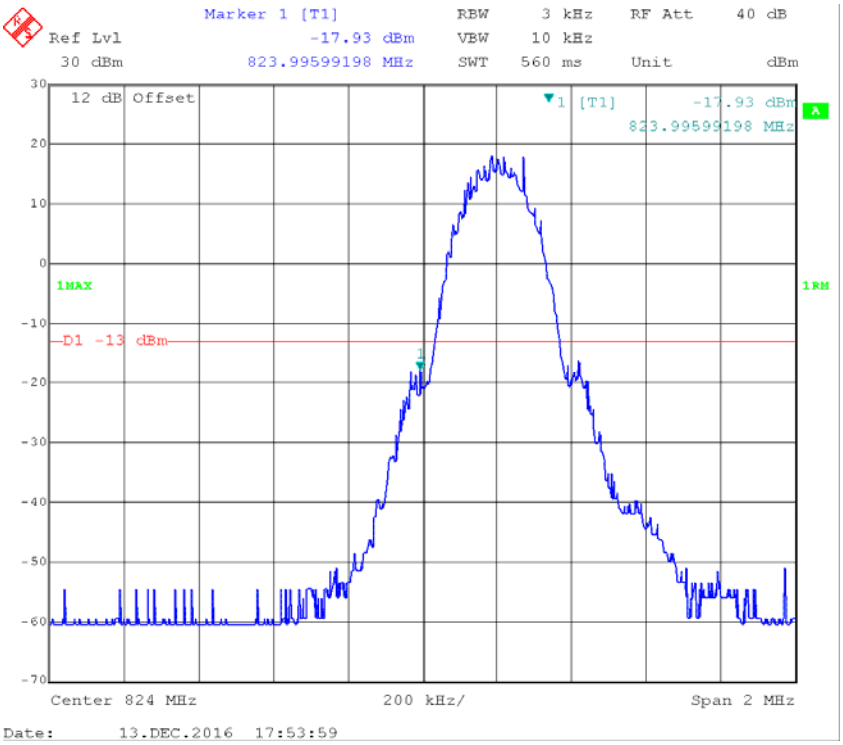
Temperature:	26.3~27.5 °C
Relative Humidity:	41 %
ATM Pressure:	100.8~101.2 kPa

The testing was performed by Tom Tang from 2016-12-12 to 2016-12-21.

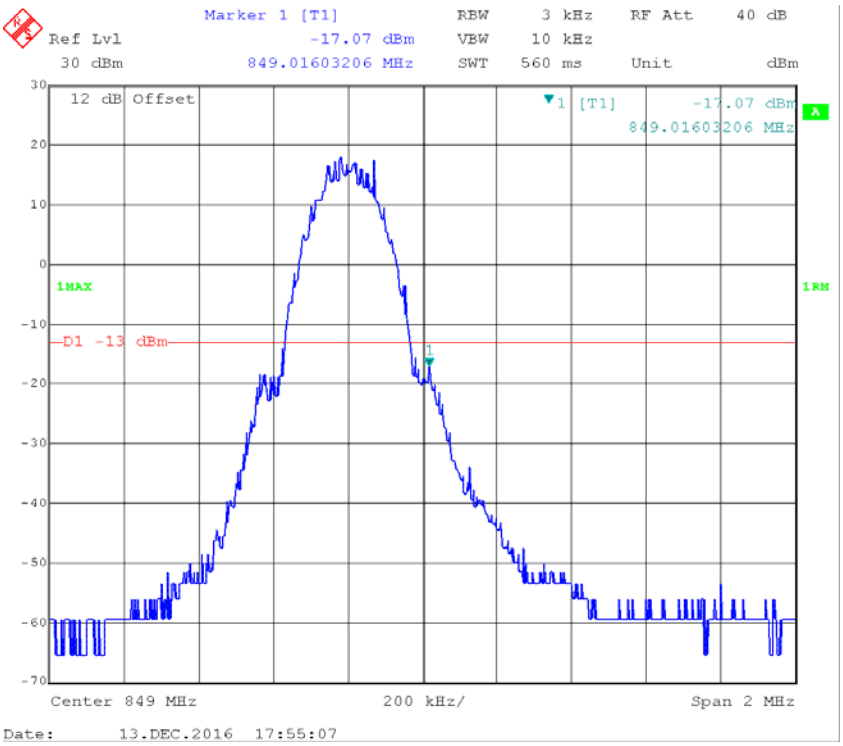
Test Mode: Transmitting

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

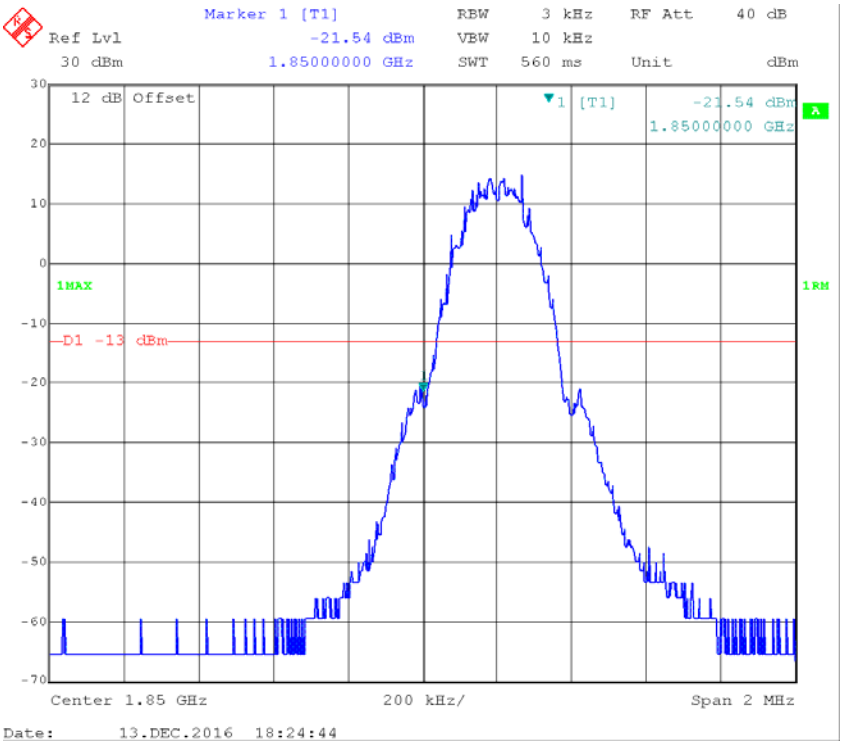
GSM 850, Left Band Edge



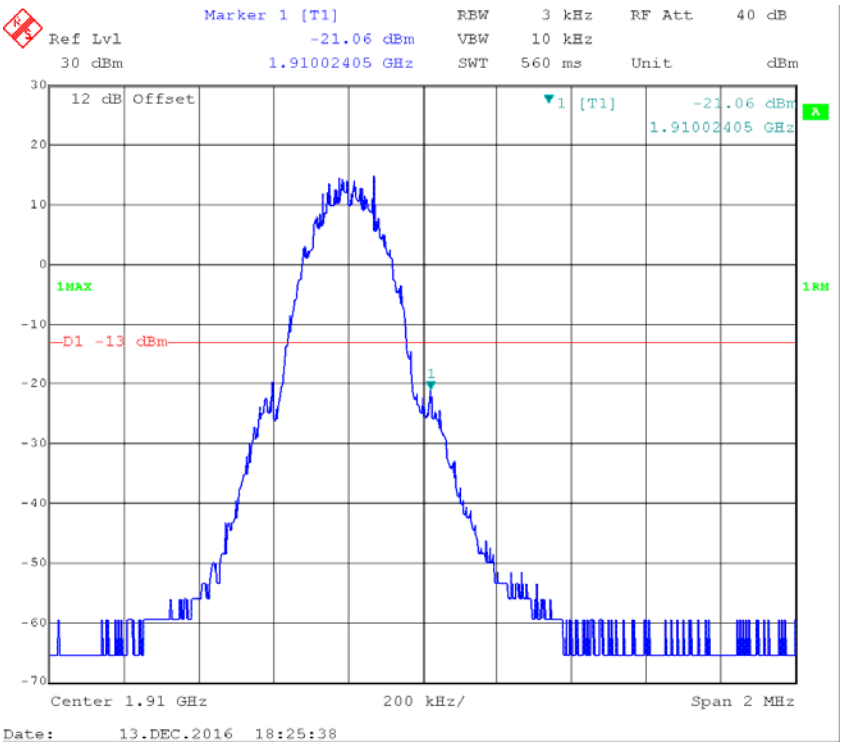
GSM 850, Right Band Edge



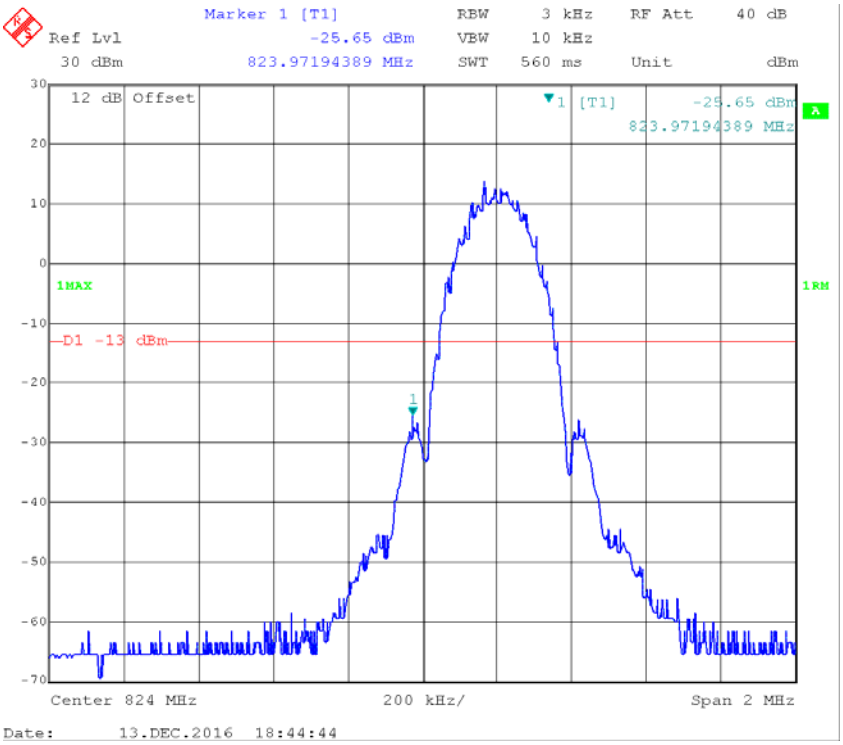
GSM 1900, Left Band Edge



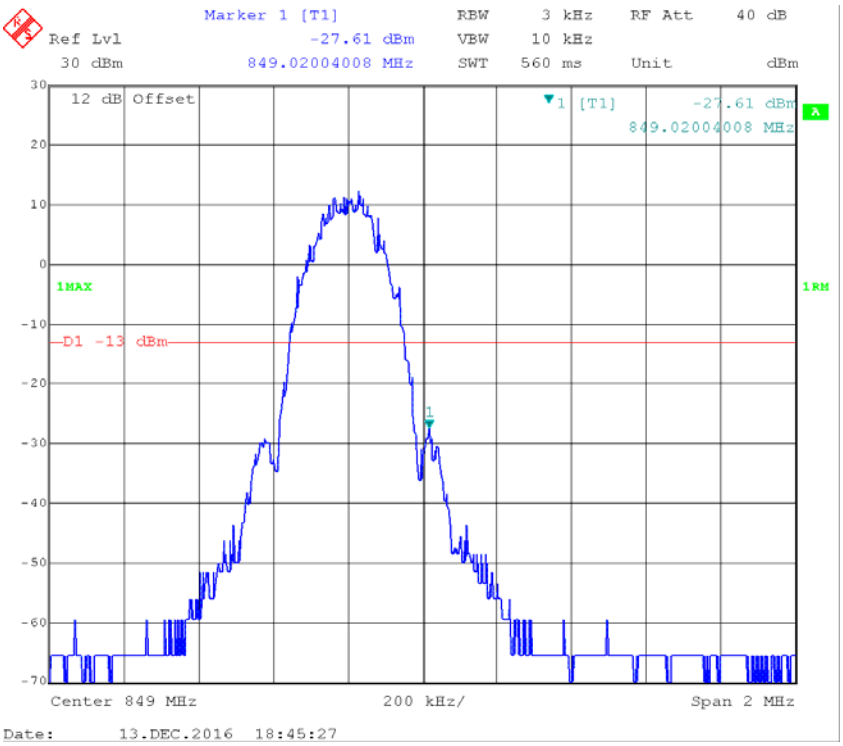
GSM 1900, Right Band Edge



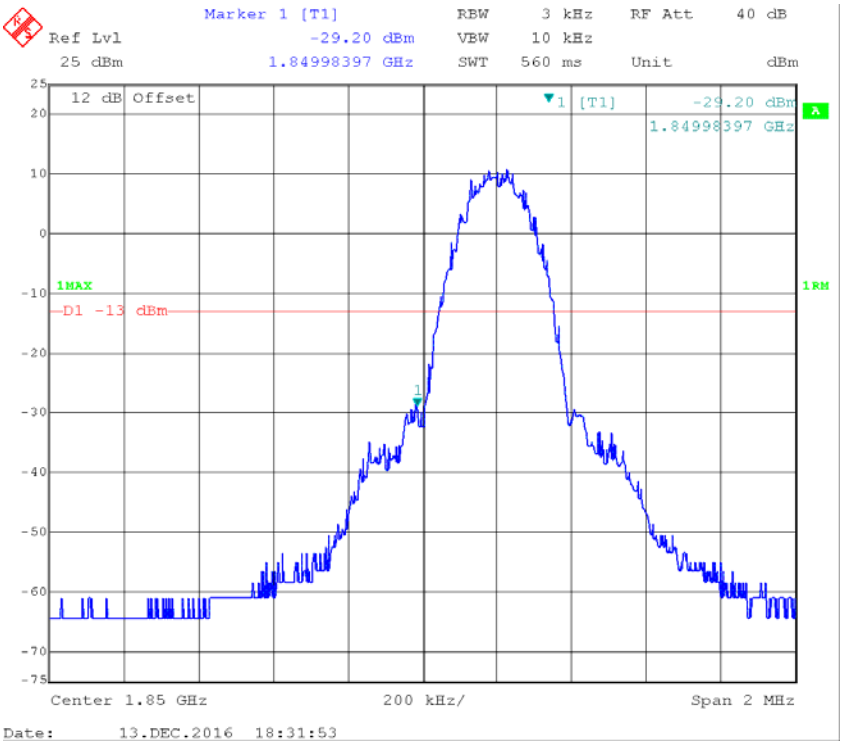
EDGE 850, Left Band Edge



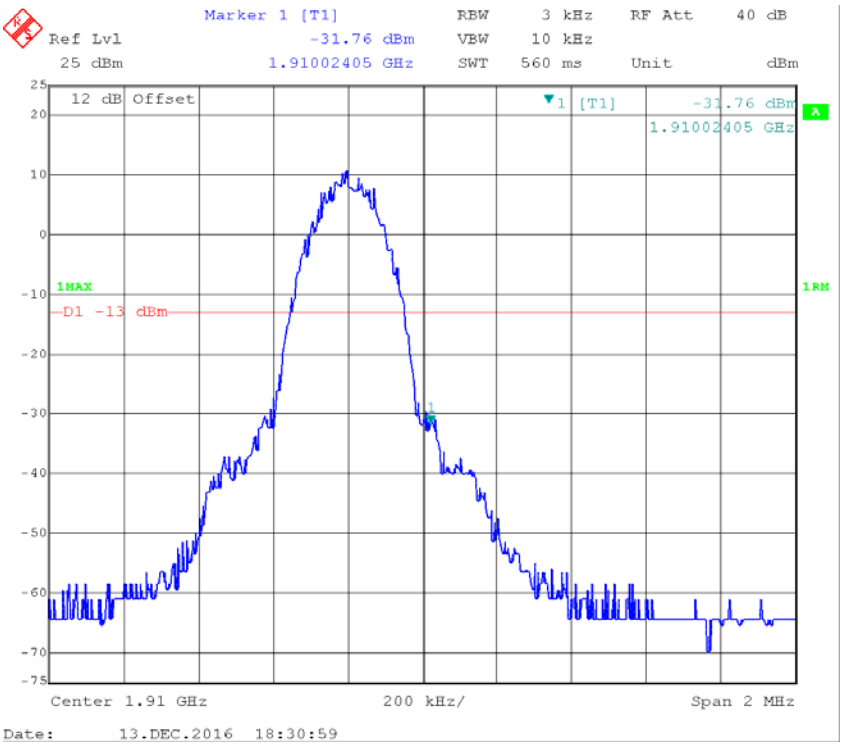
EDGE 850, Right Band Edge



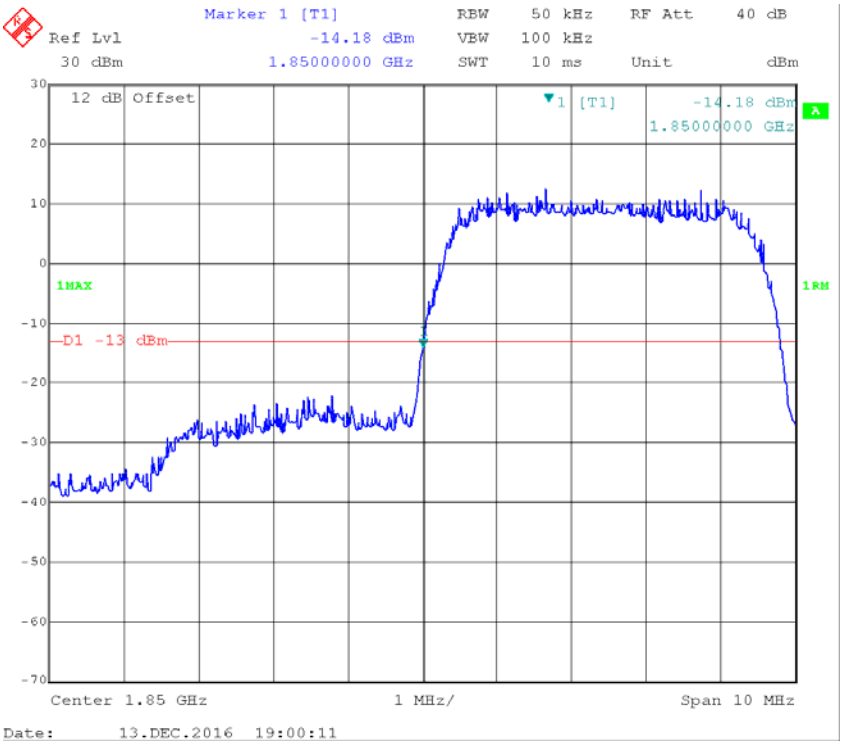
EDGE 1900, Left Band Edge



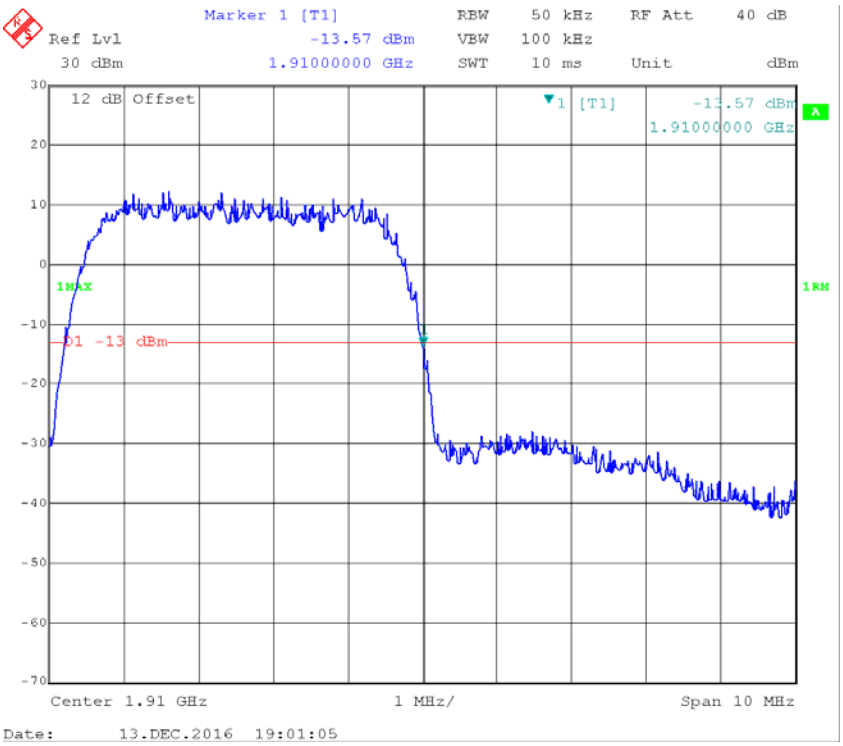
EDGE 1900, Right Band Edge



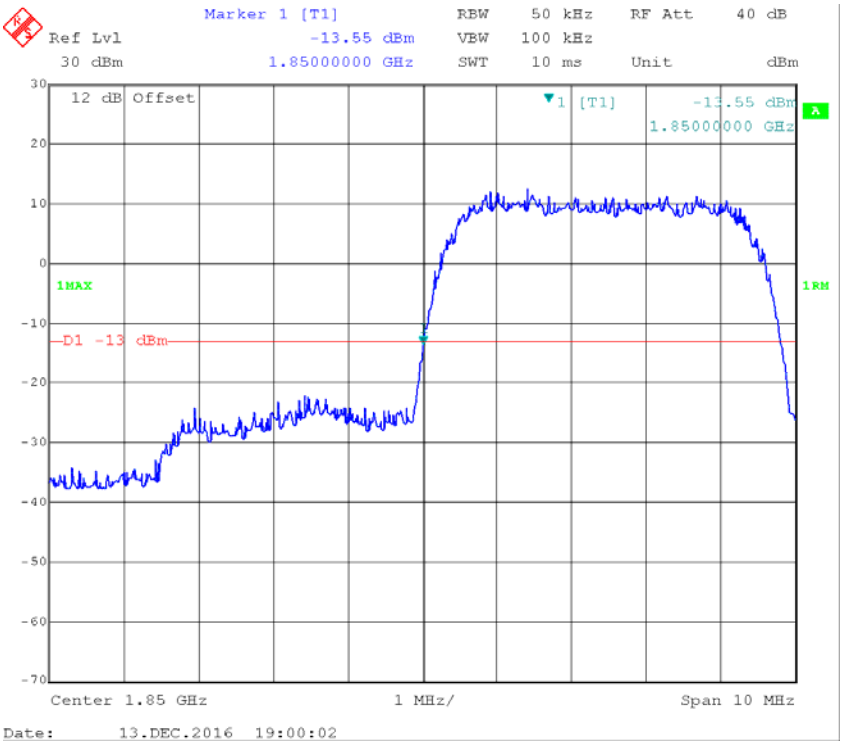
REL99 Band II, Left Band Edge



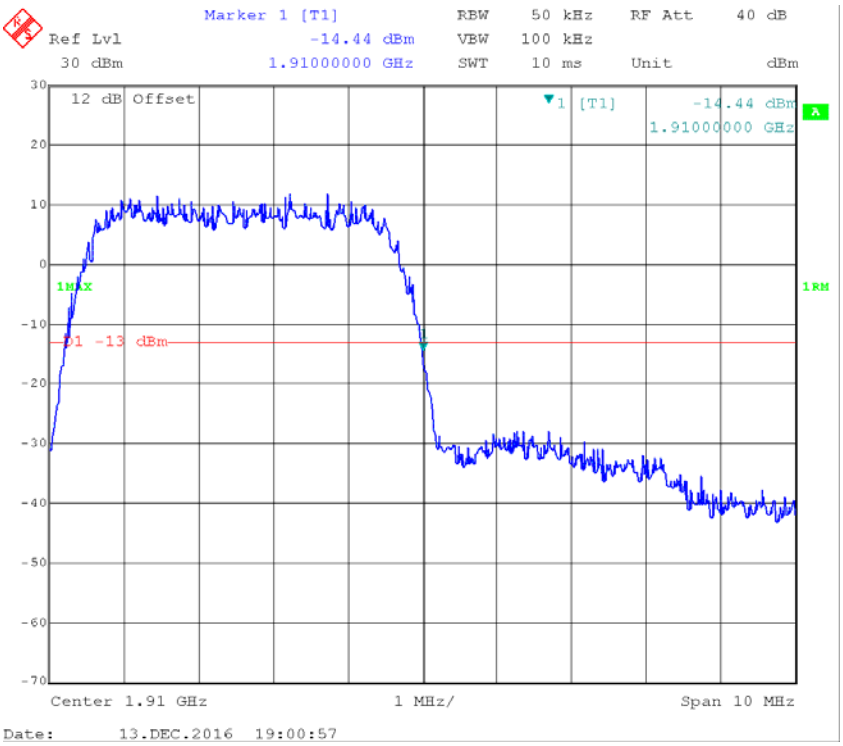
REL99 Band II, Right Band Edge



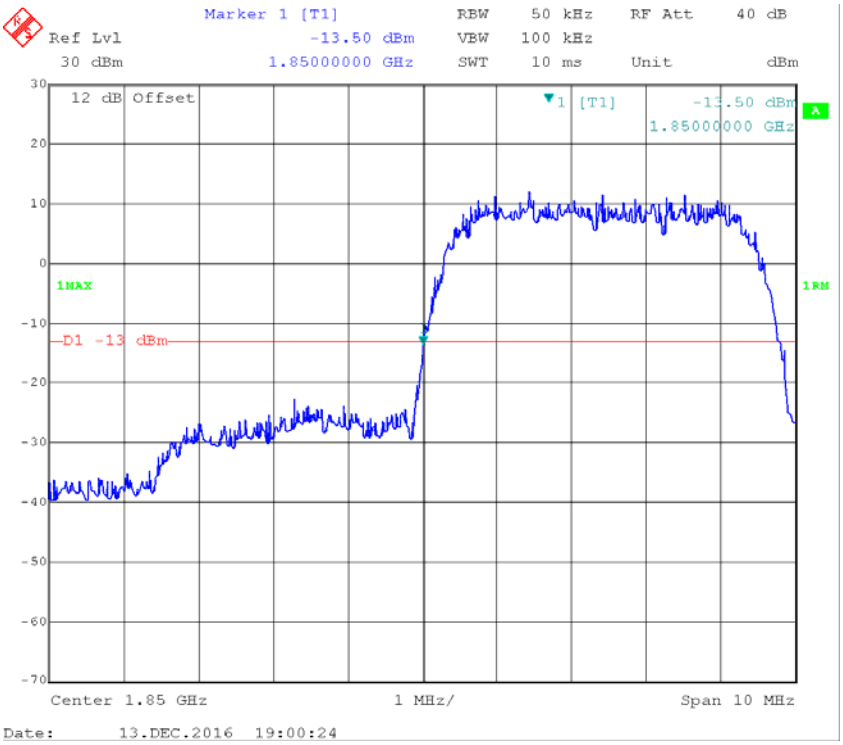
HSDPA Band II, Left Band Edge



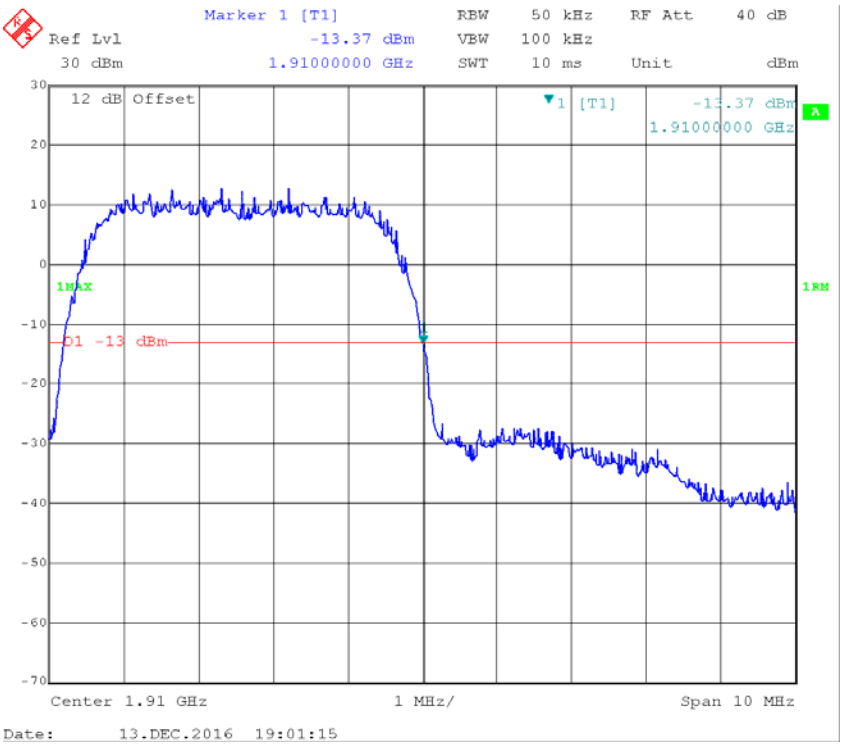
HSDPA Band II, Right Band Edge



HSUPA Band II, Left Band Edge

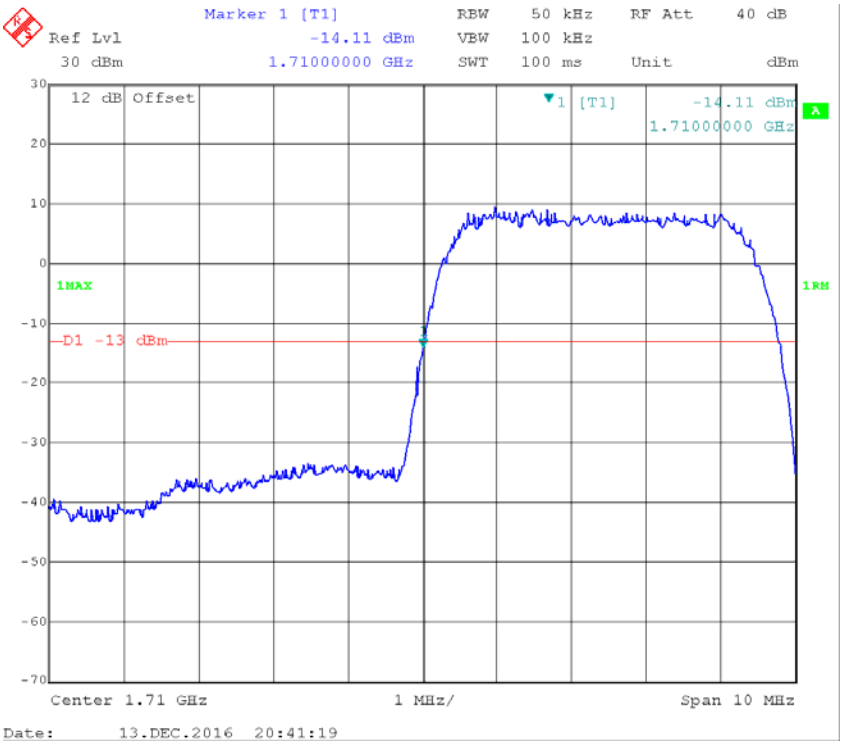


HSUPA Band II, Right Band Edge

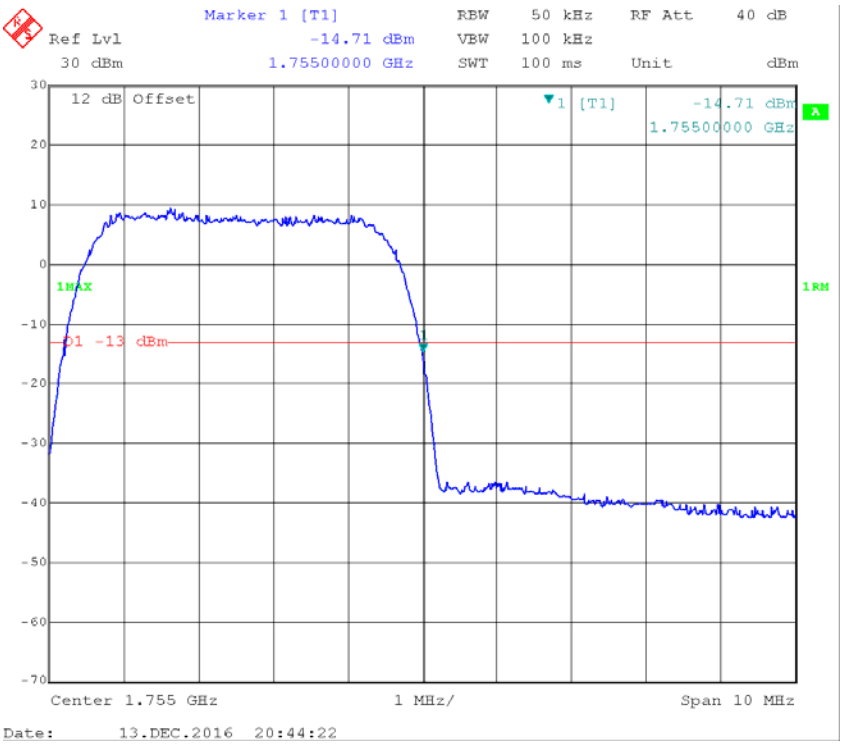


WCDMA Band IV

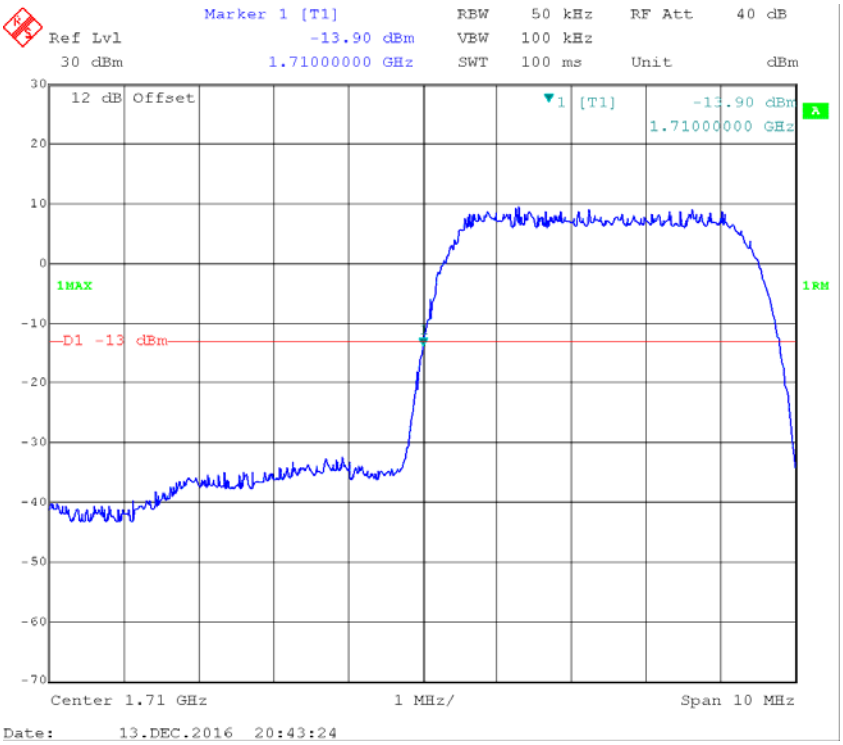
REL99 Band IV, Left Band Edge



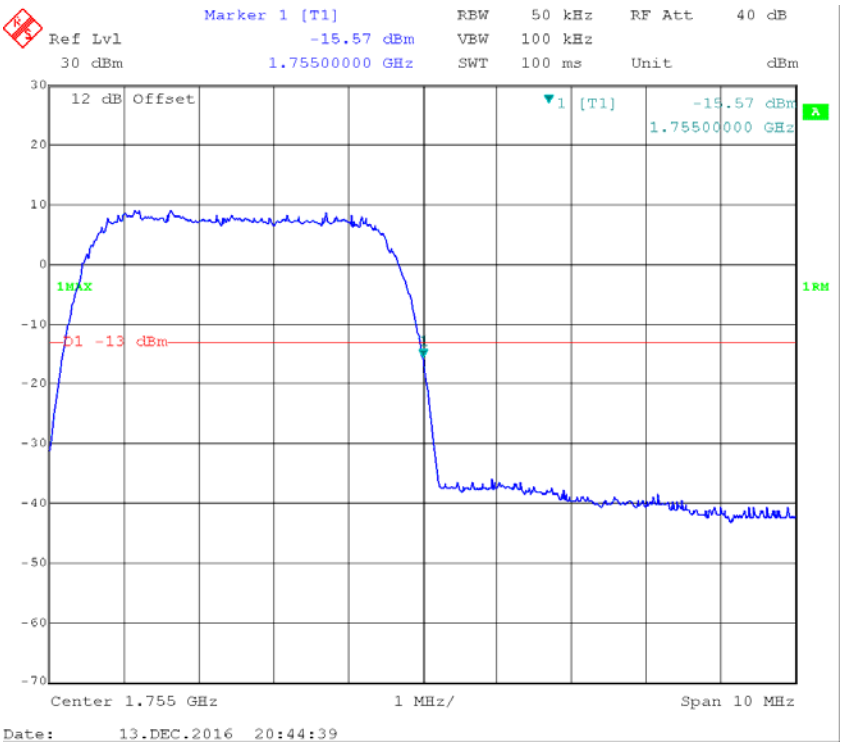
REL99 Band IV Right Band Edge



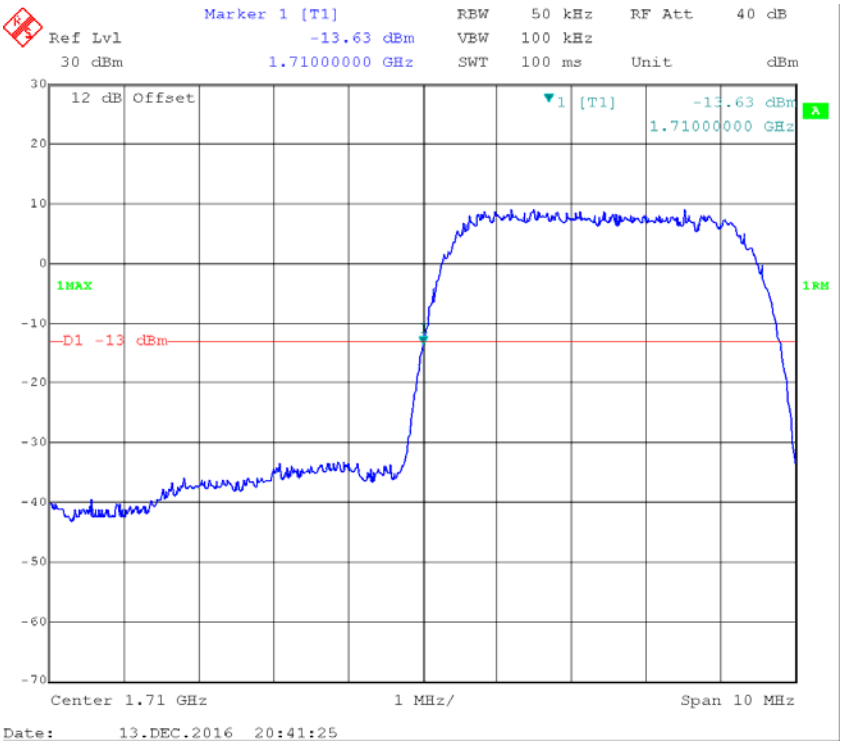
HSDPA Band IV, Left Band Edge



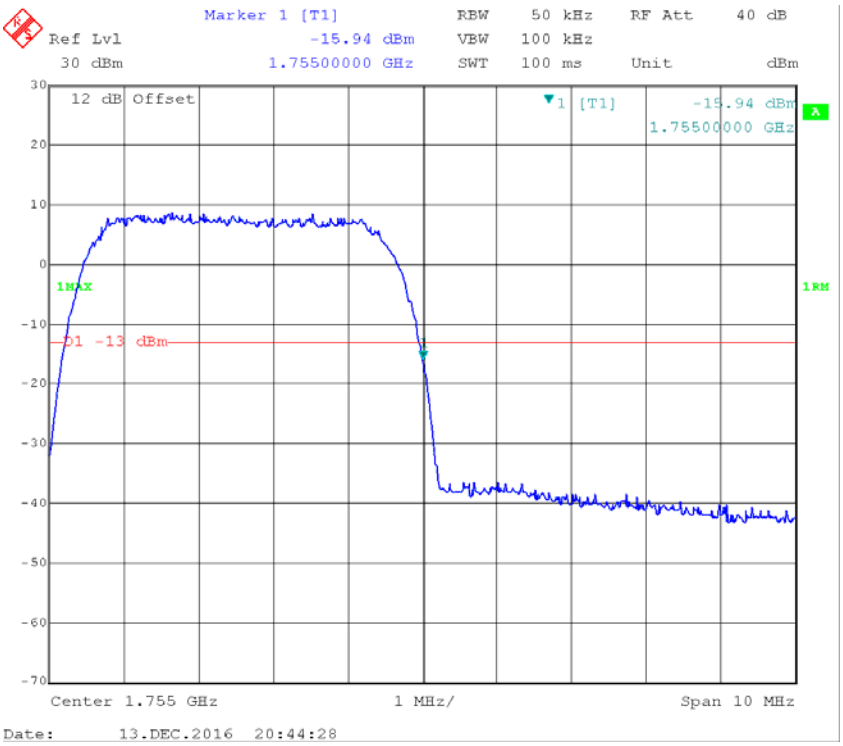
HSDPA Band IV, Right Band Edge



HSUPA Band IV, Left Band Edge

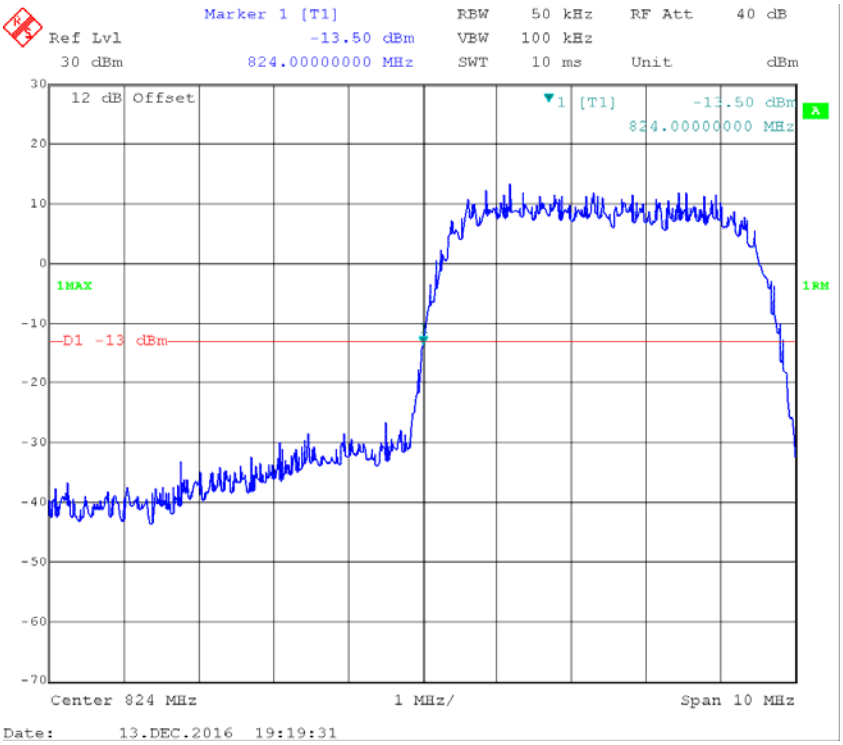


HSUPA Band IV, Right Band Edge

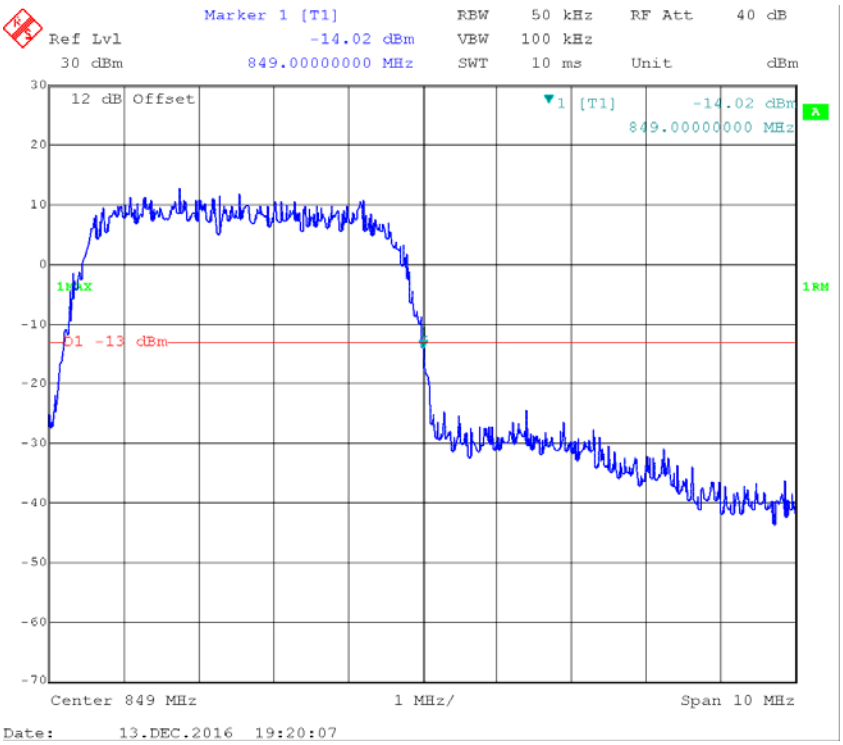


WCDMA Band V

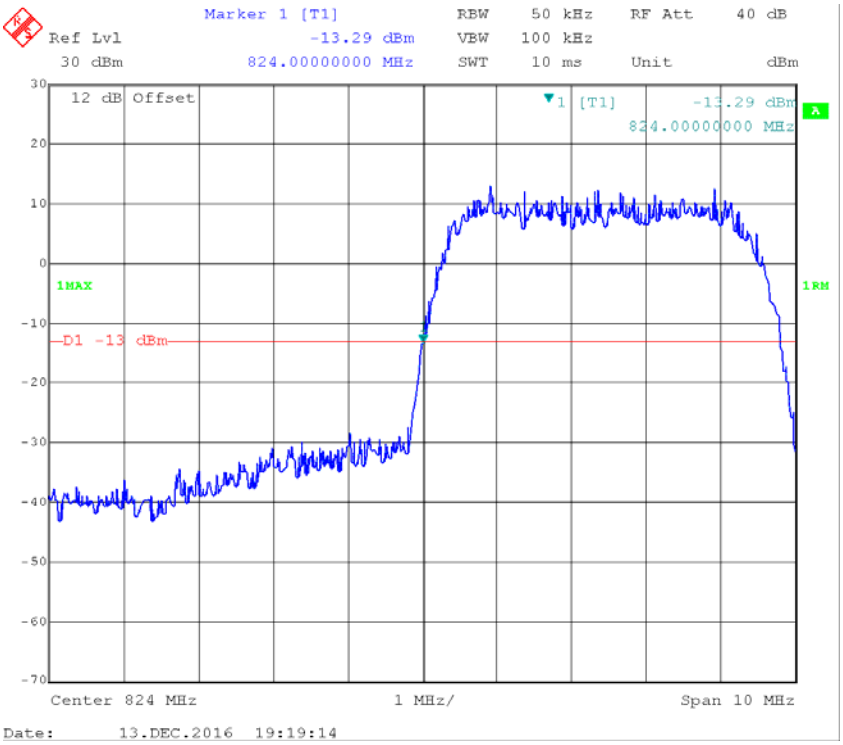
REL99 Band V, Left Band Edge



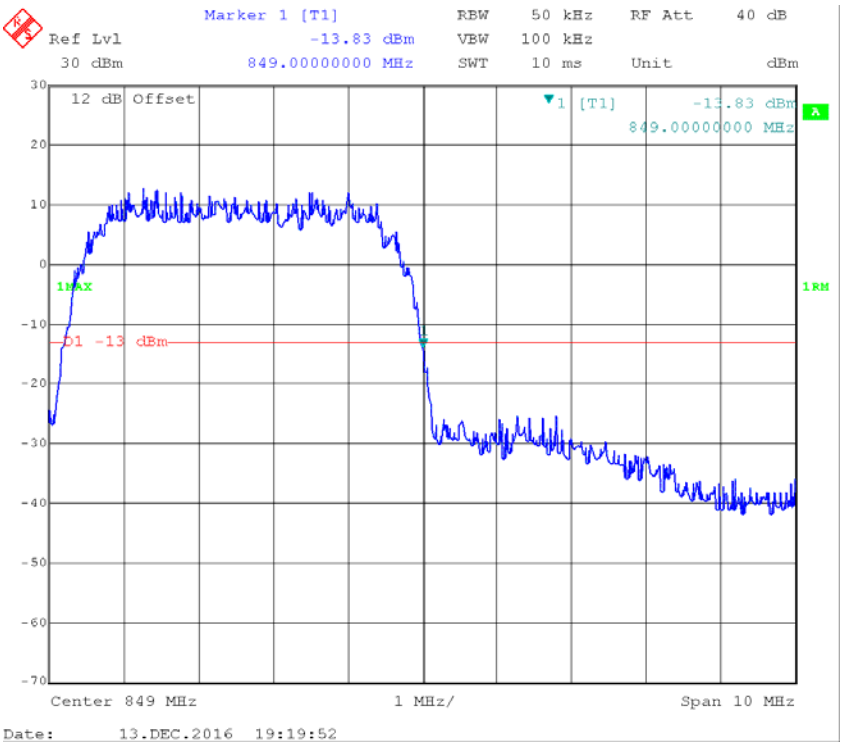
REL99 Band V Right Band Edge



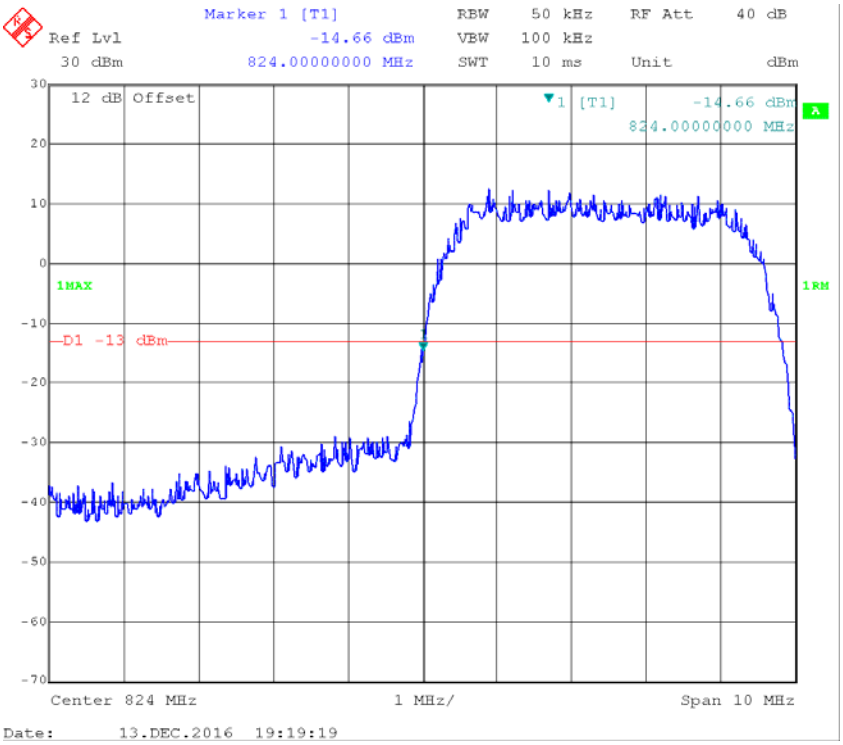
HSDPA Band V, Left Band Edge



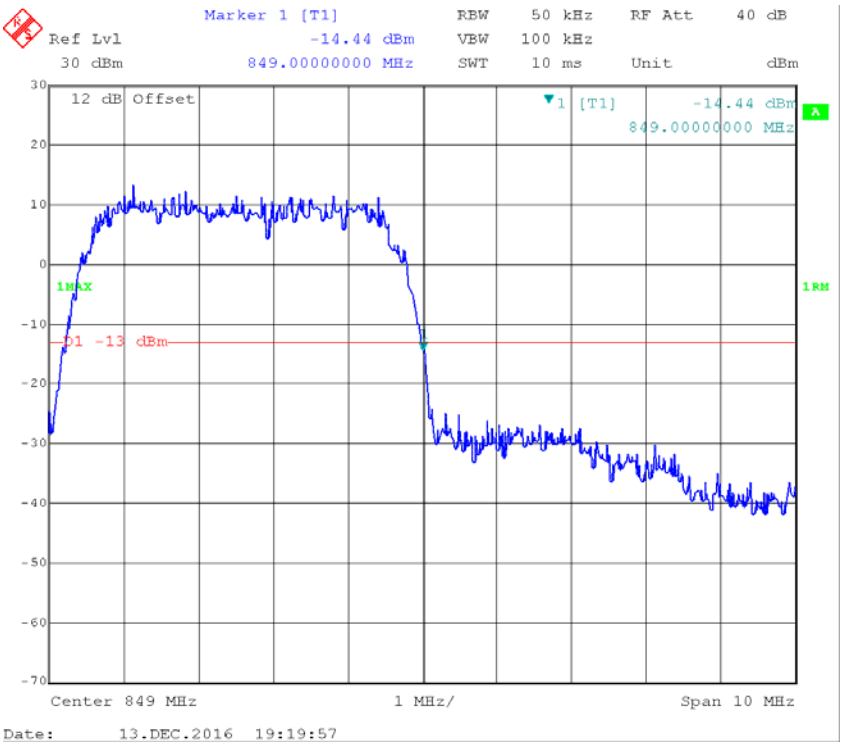
HSDPA Band V, Right Band Edge



HSUPA Band V, Left Band Edge

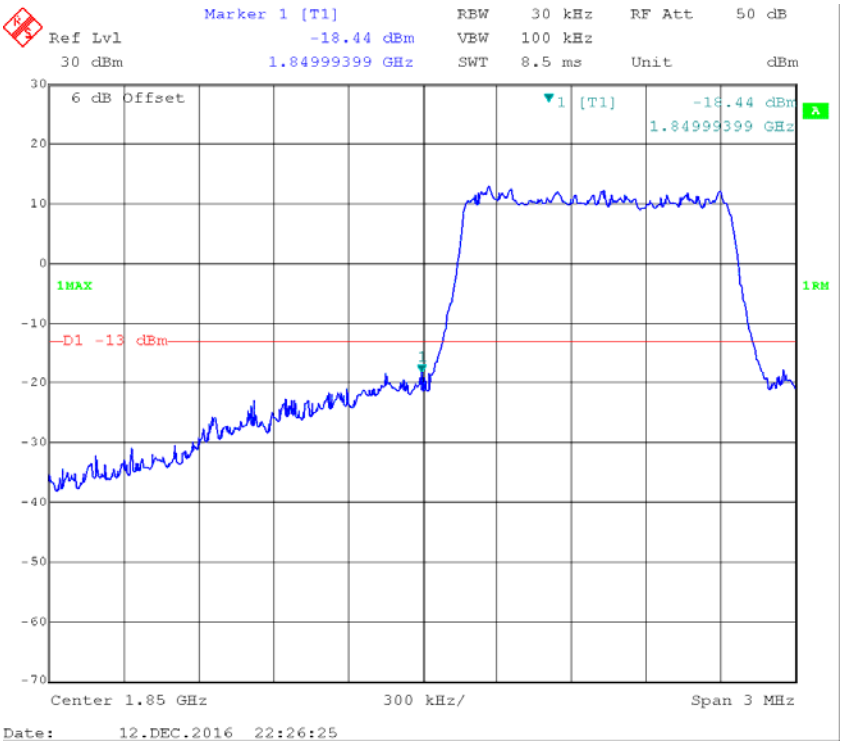


HSUPA Band V, Right Band Edge

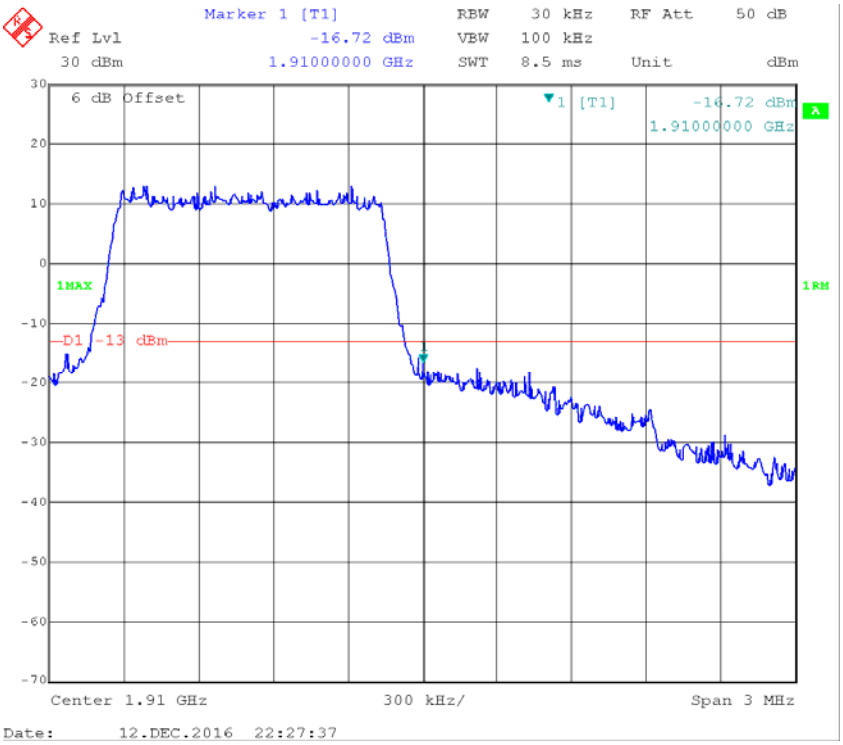


LTE Band II

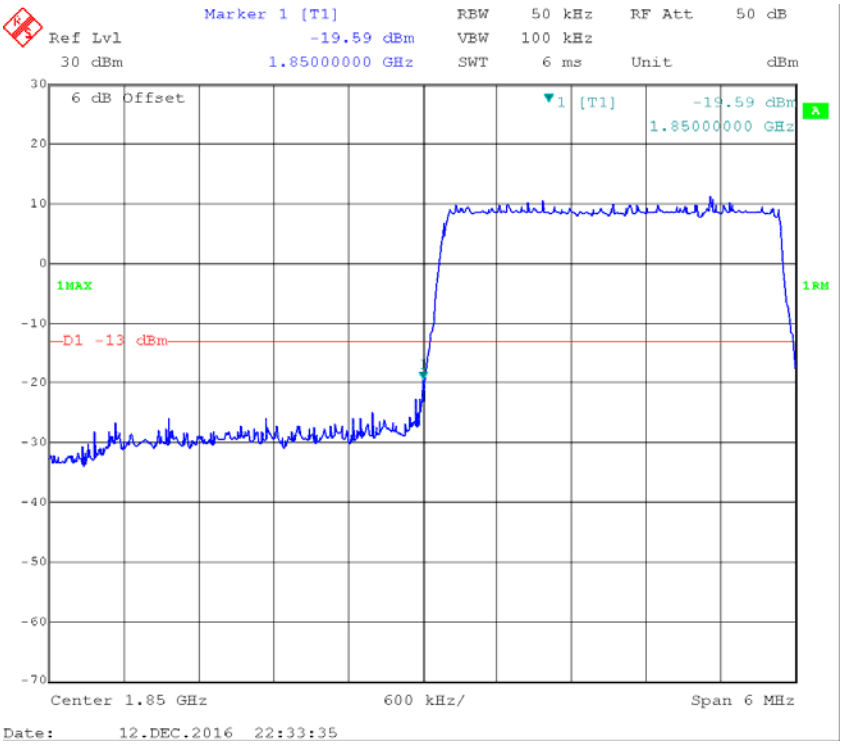
QPSK_1.4MHz_ 6 RB_ Left



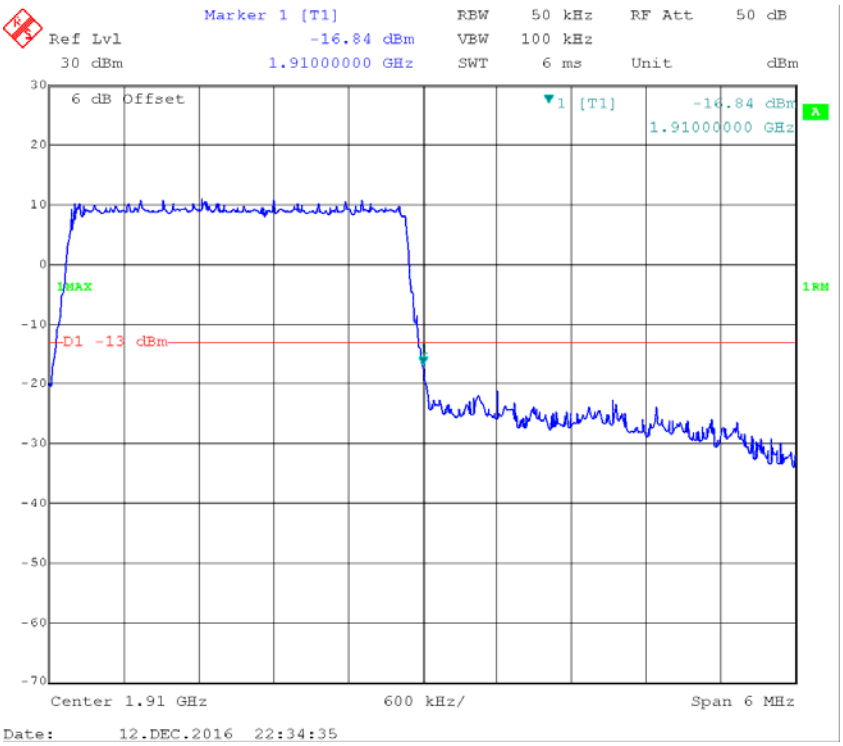
QPSK_1.4MHz_ 6 RB_ Right



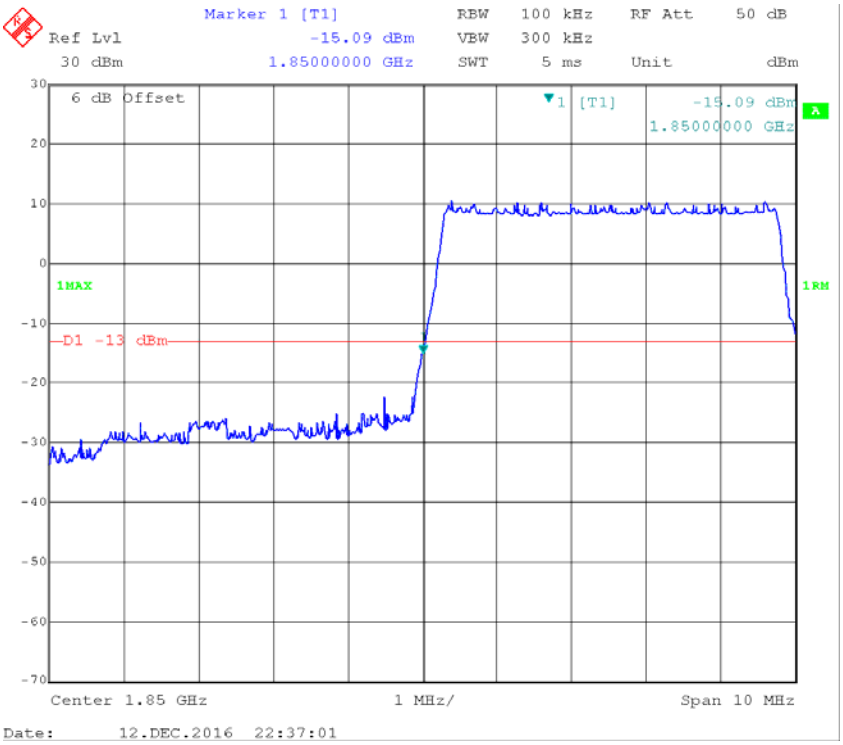
QPSK_3MHz_ 15 RB_ Left



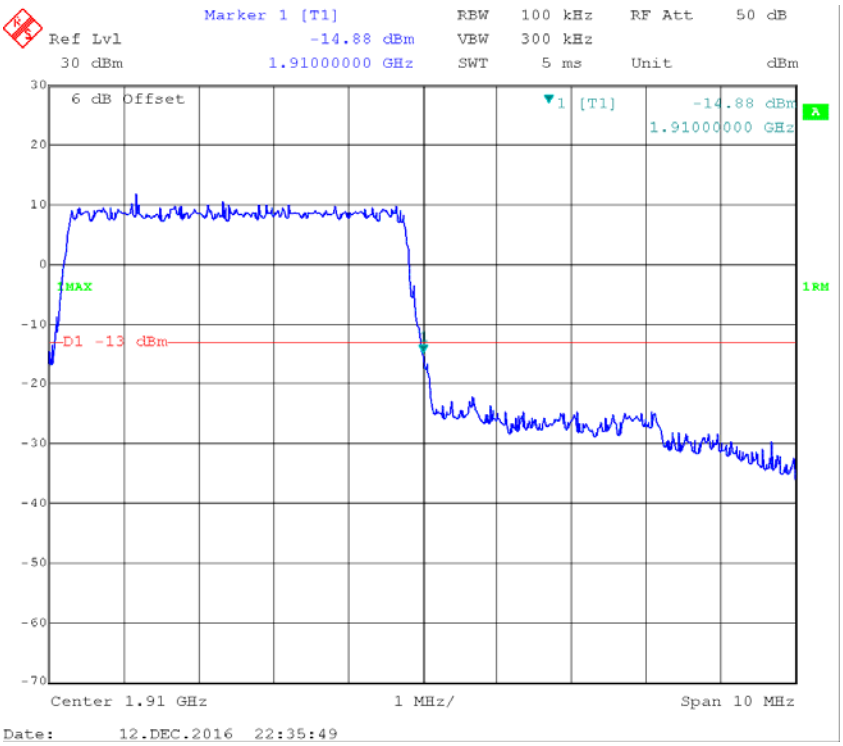
QPSK_3MHz_ 15 RB_ Right



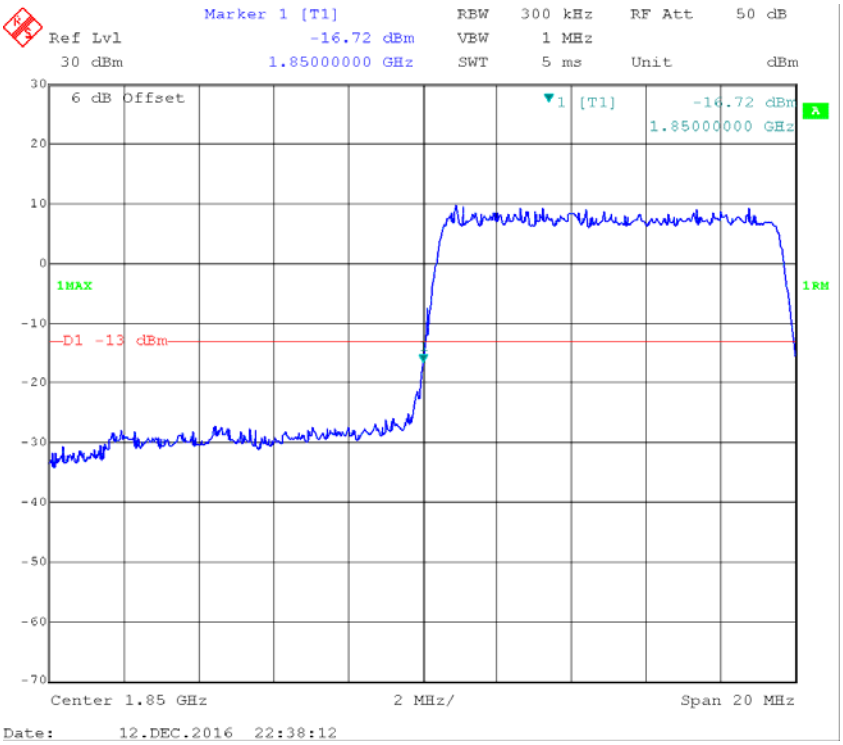
QPSK_5MHz_ 25 RB_ Left



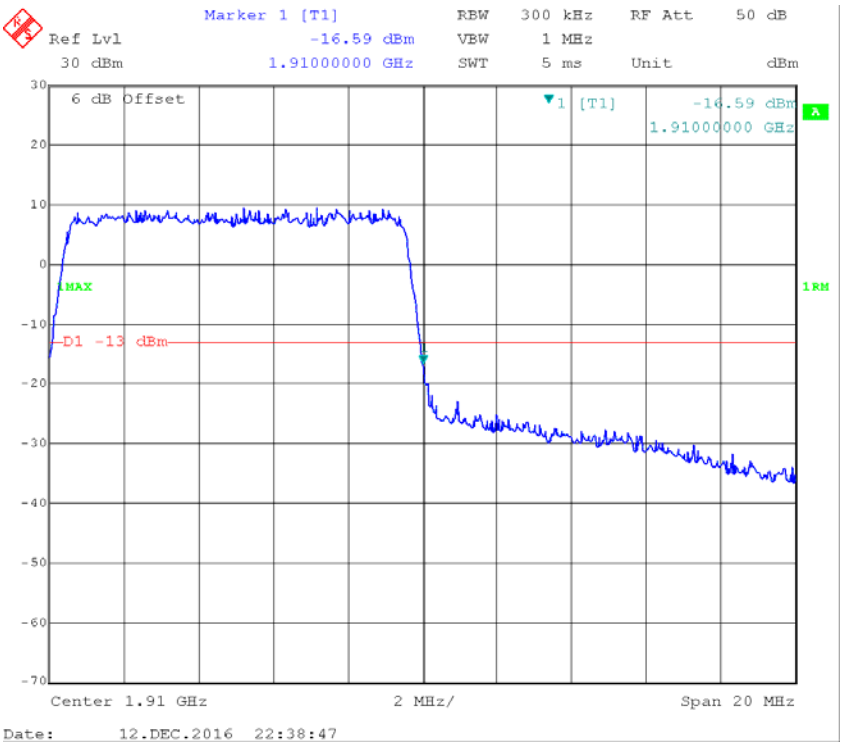
QPSK_5MHz_ 25 RB_ Right



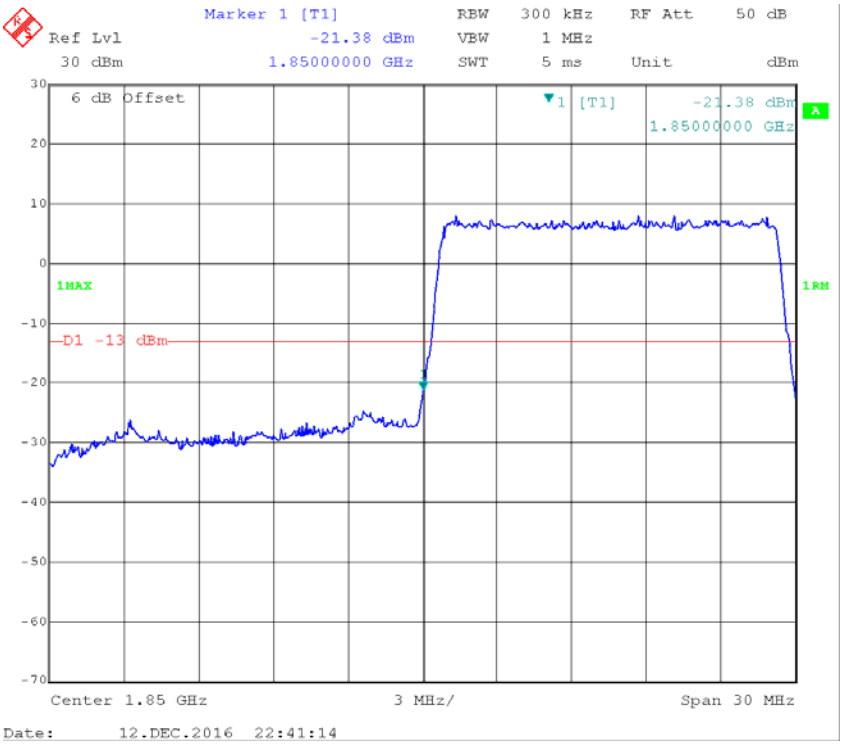
QPSK_10MHz_ 50 RB_ Left



QPSK_10MHz_ 50 RB_ Right

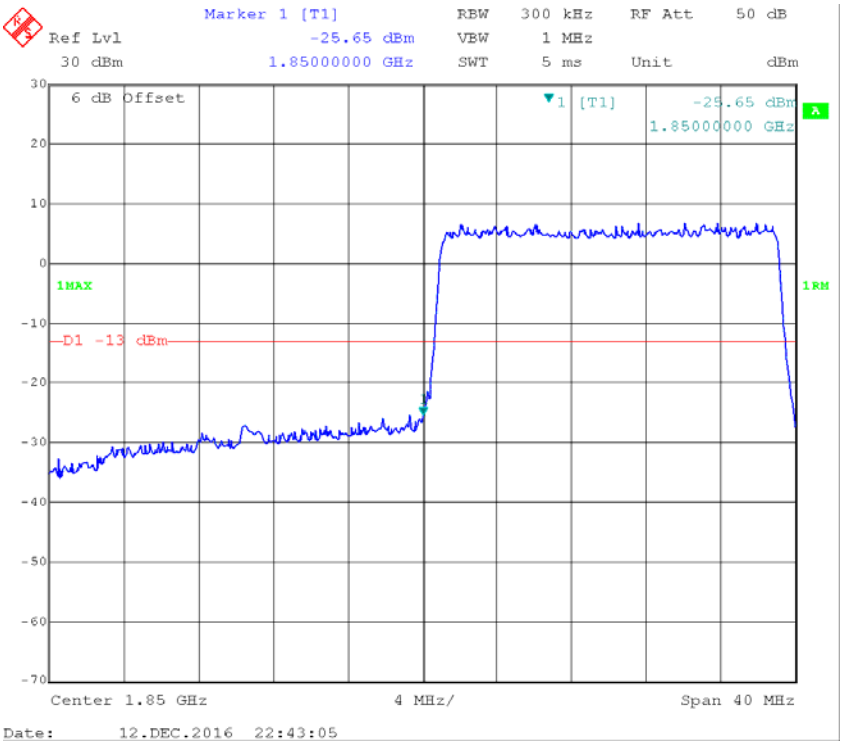


QPSK_15MHz_ 75 RB_ Left

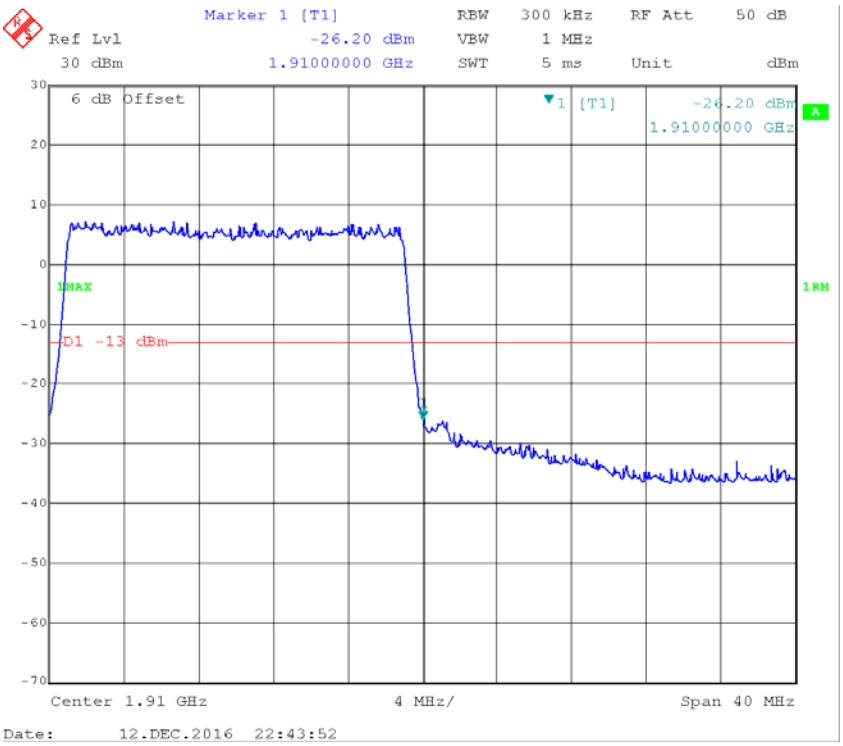


QPSK_15MHz_ 75 RB_ Right

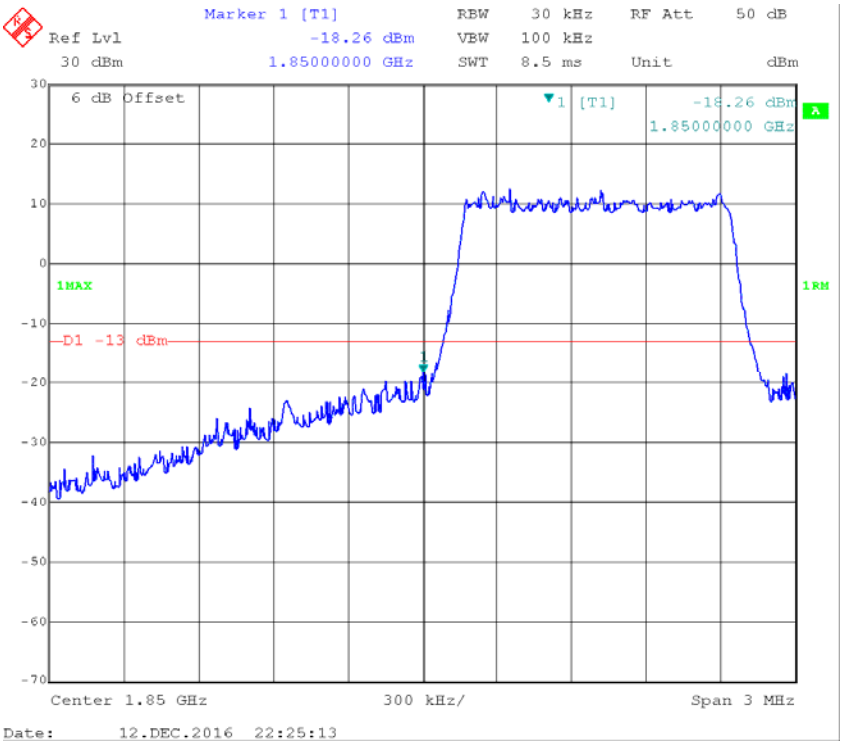
QPSK_20MHz_ FULL RB_ Left



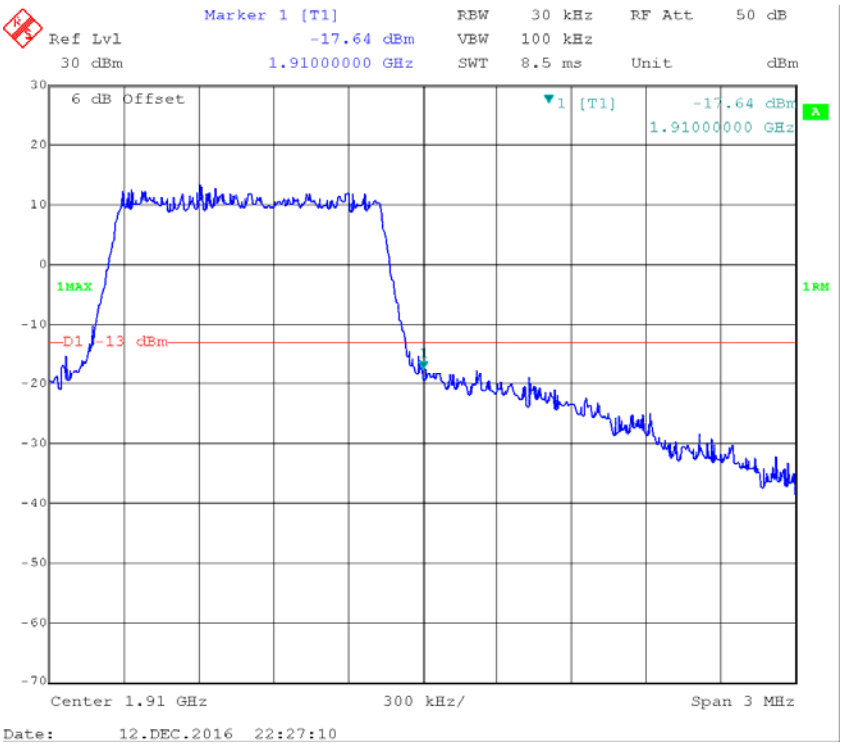
QPSK_20MHz_ FULL RB_ Right



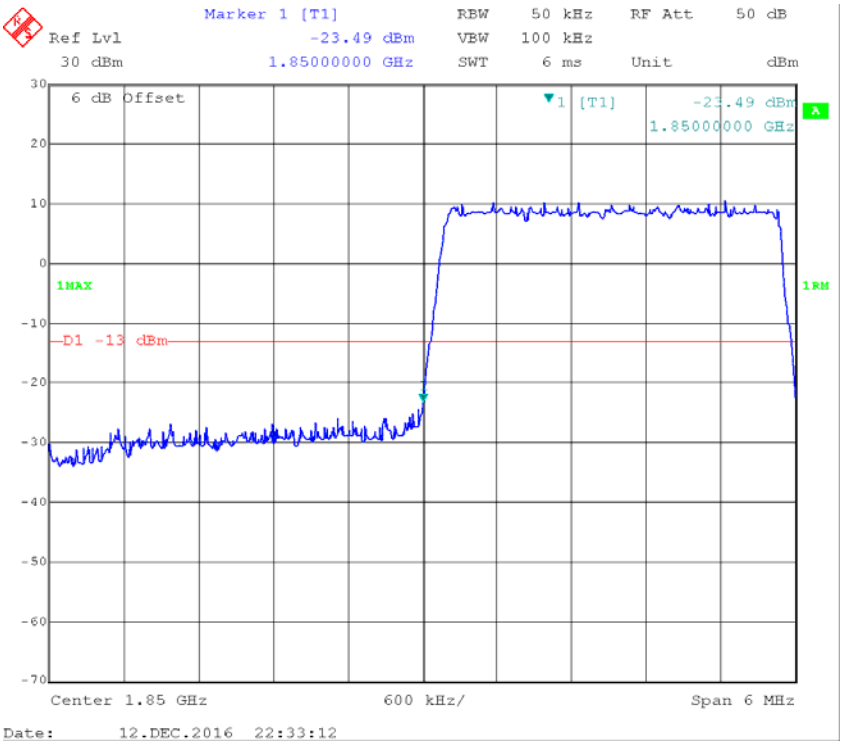
16QAM_1.4MHz_ 6 RB_ Left



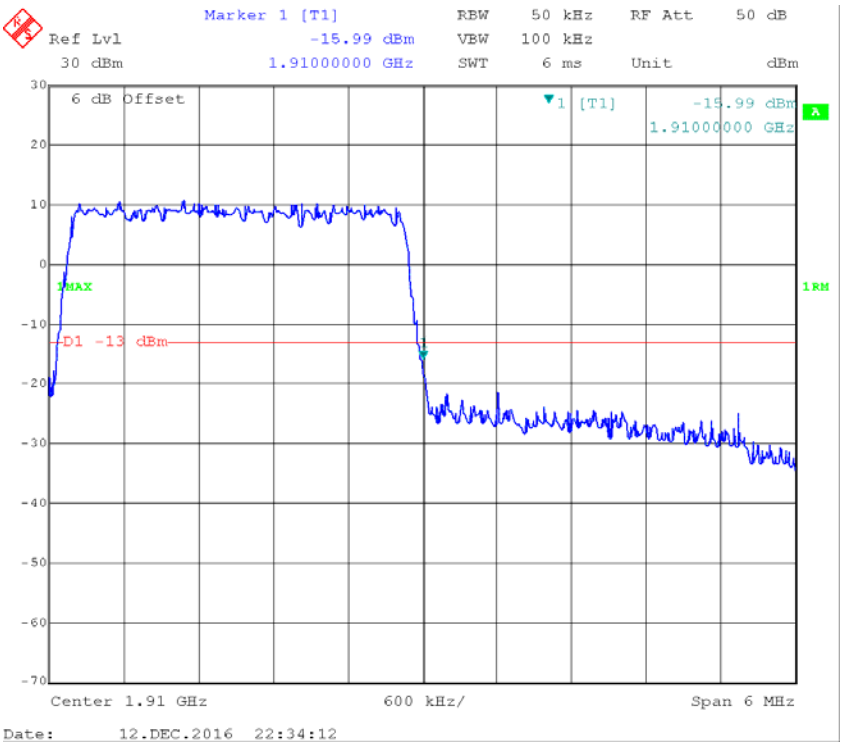
16QAM_1.4MHz_ 6 RB_ Right



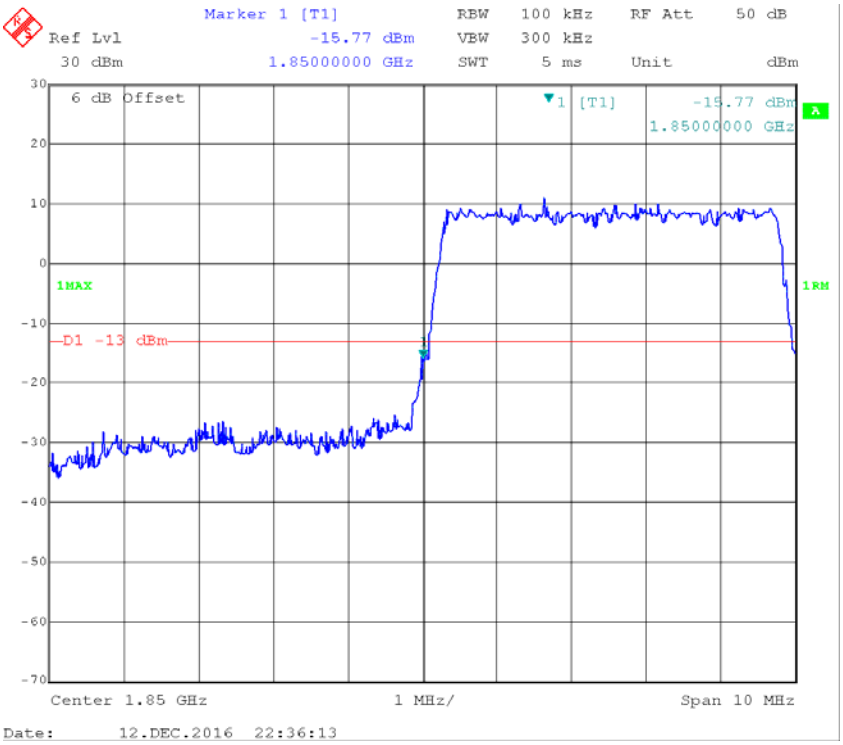
16QAM_3MHz_ 15 RB_ Left



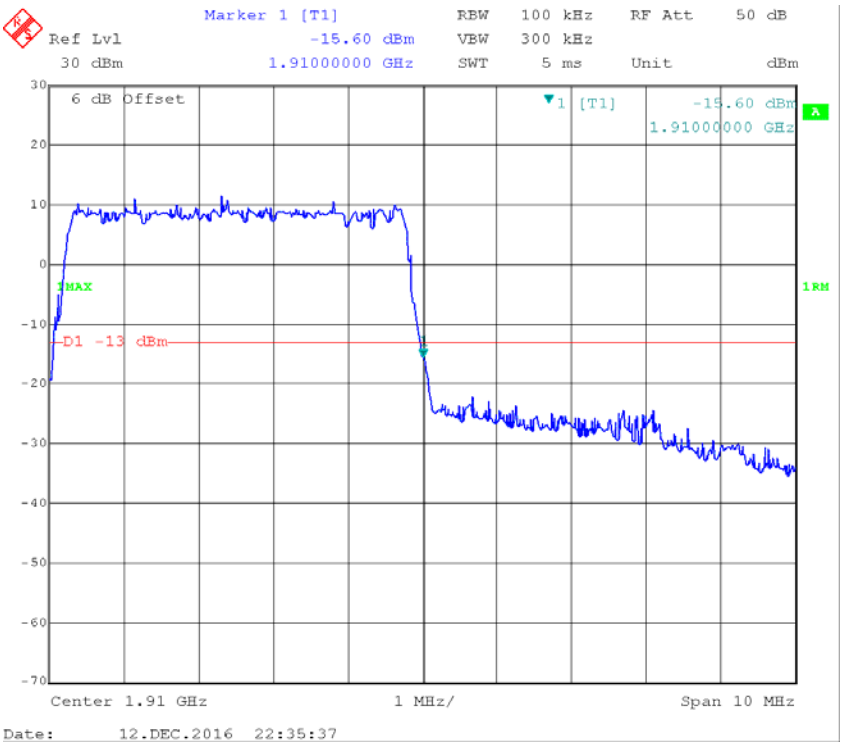
16QAM_3MHz_ 15 RB_ Right



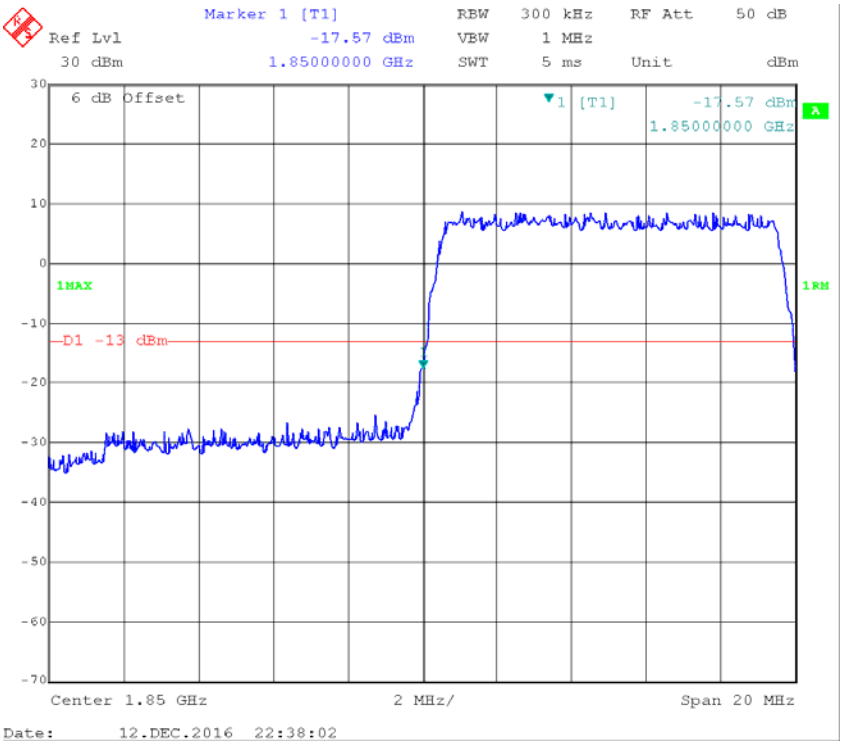
16QAM_5MHz_ 25 RB_ Left



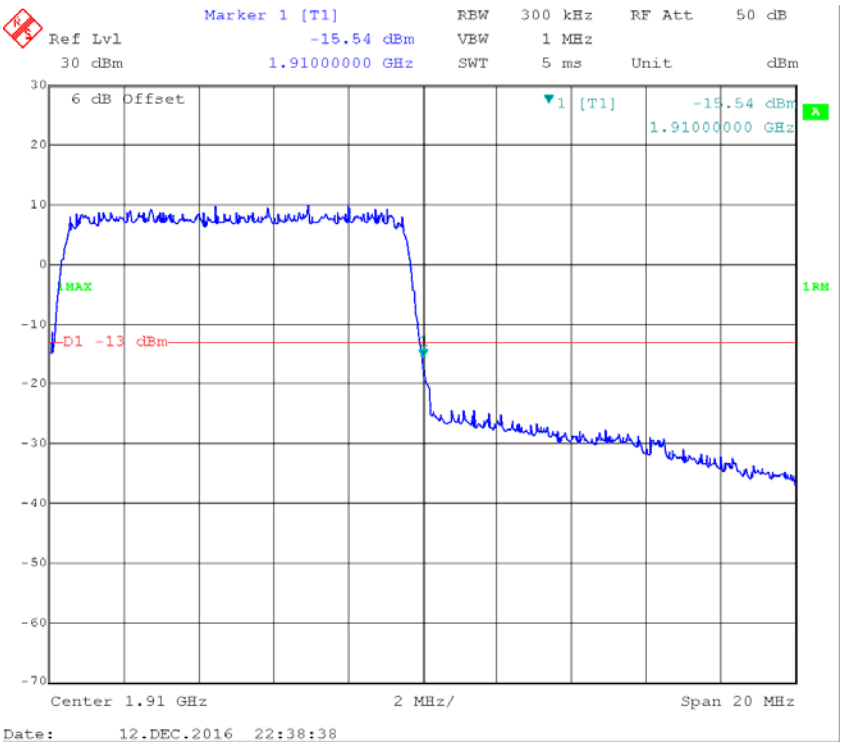
16QAM_5MHz_ 25 RB_ Right



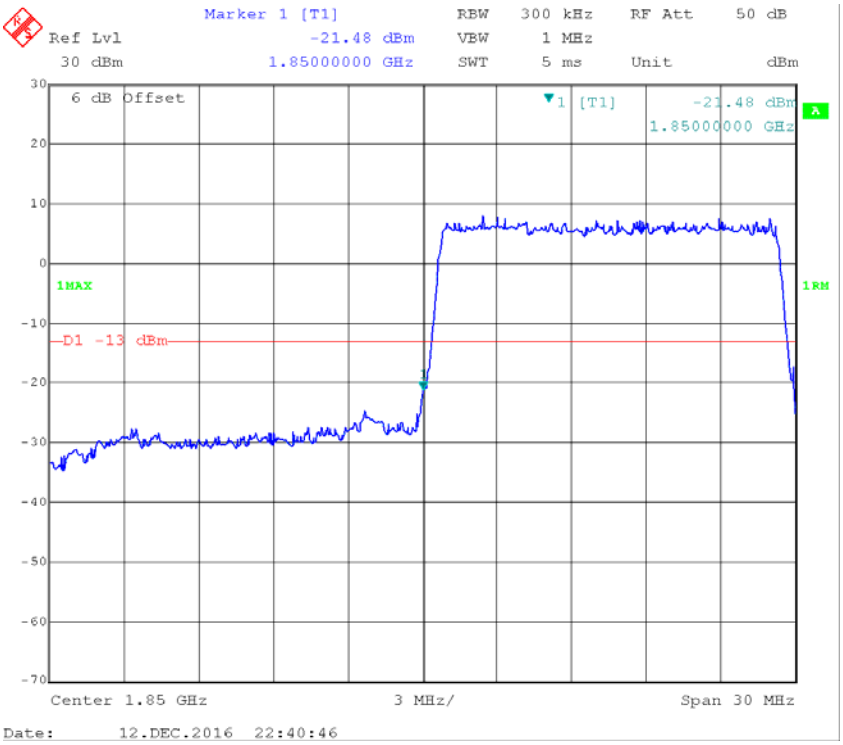
16QAM_10MHz_ 50 RB_ Left



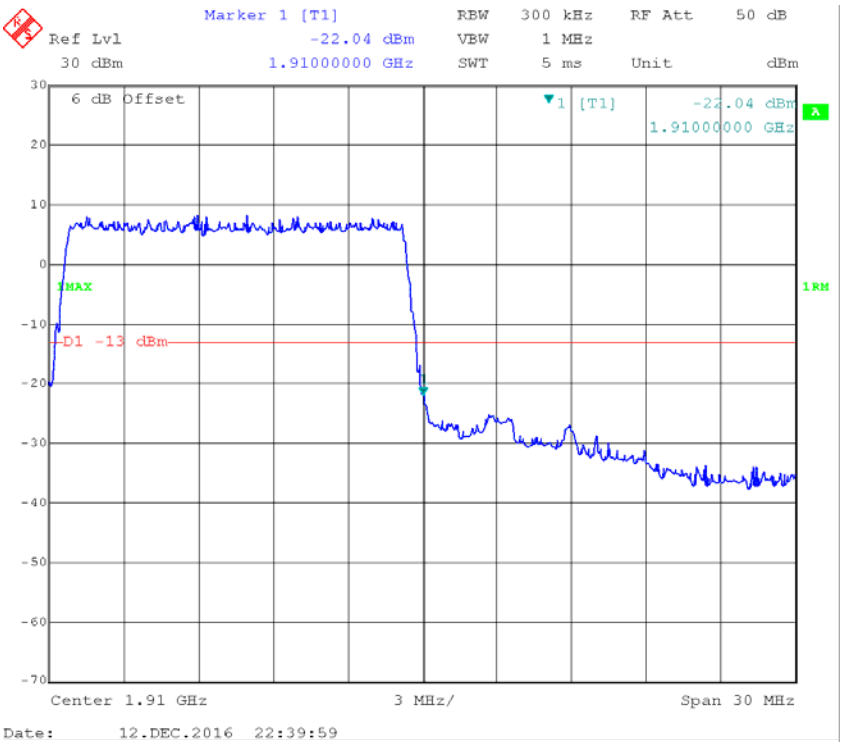
16QAM_10MHz_ 50 RB_ Right



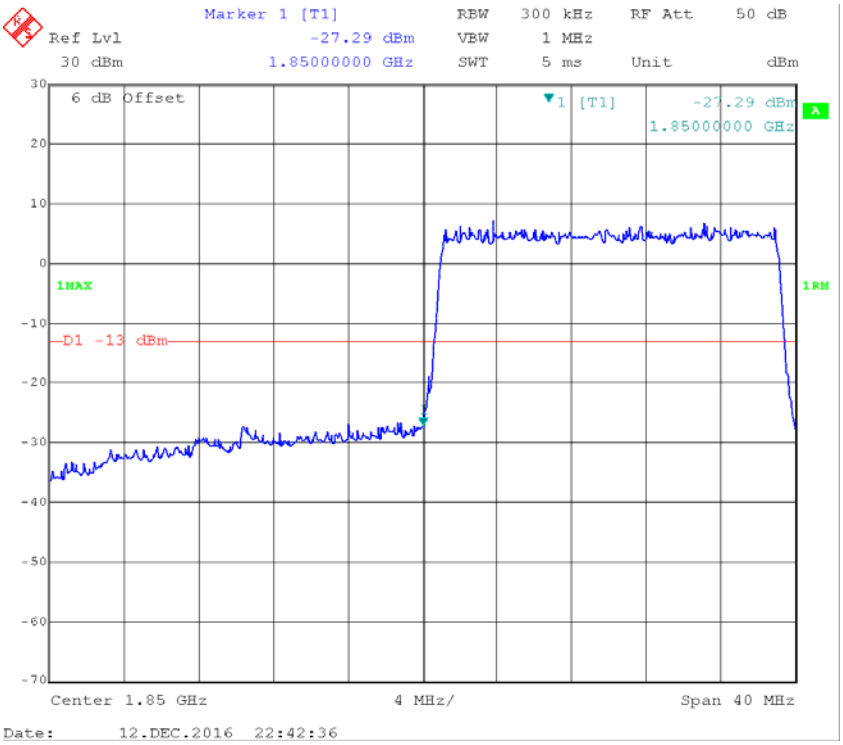
16QAM_15MHz_ 75 RB_ Left



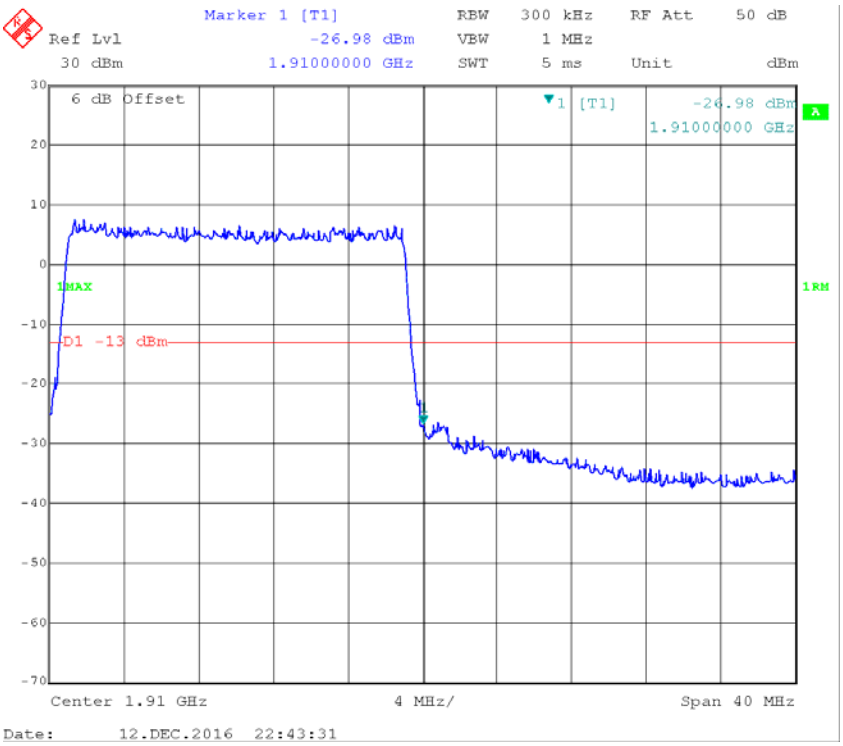
16QAM_15MHz_ 75 RB_ Right



16QAM_20MHz_ FULL RB_ Left

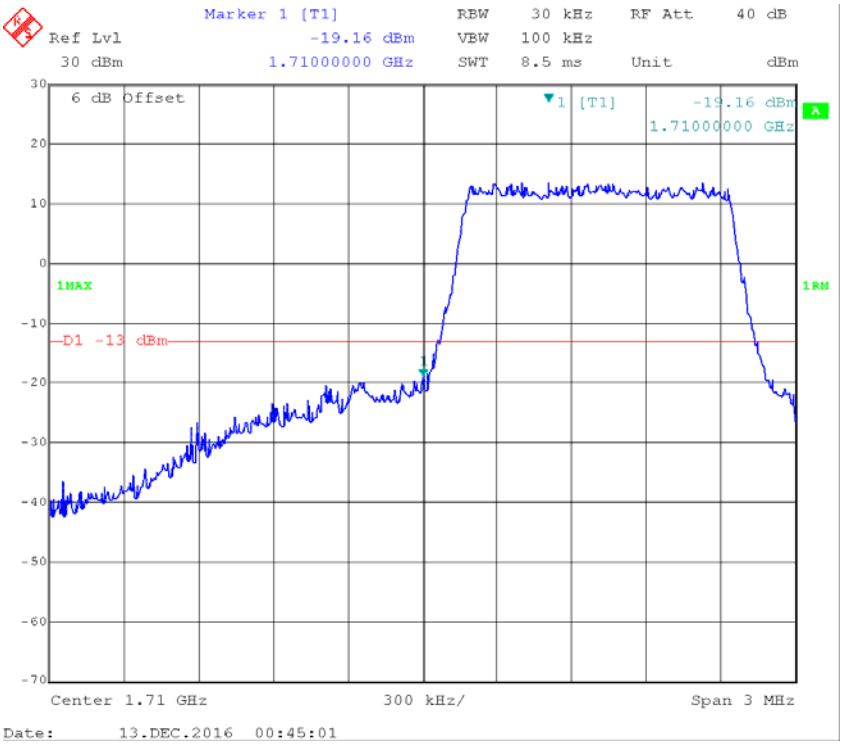


16QAM_20MHz_ FULL RB_ Right

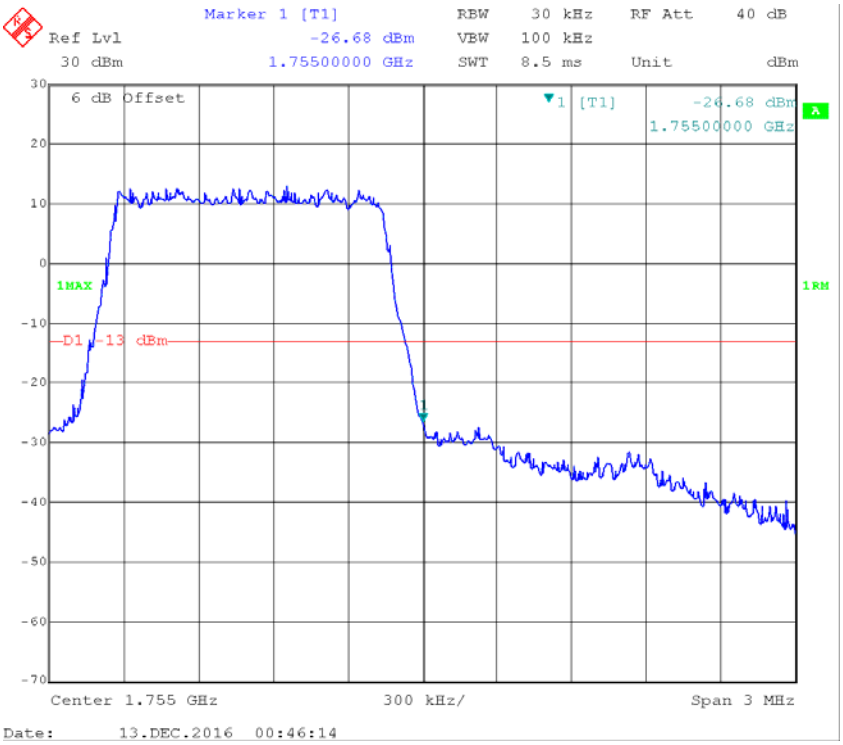


LTE Band IV

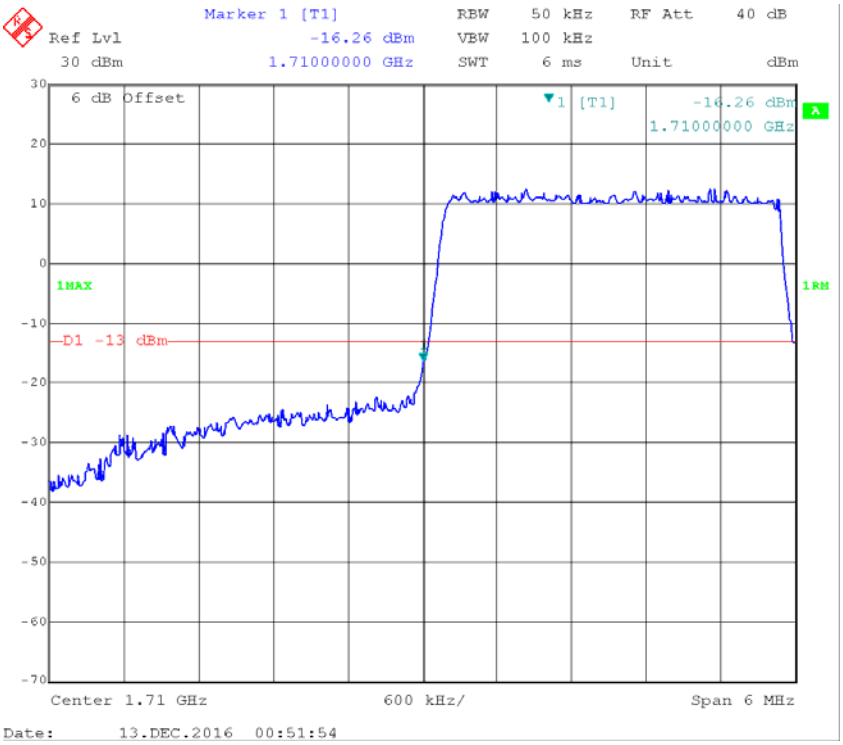
QPSK_1.4MHz_ 6 RB_ Left



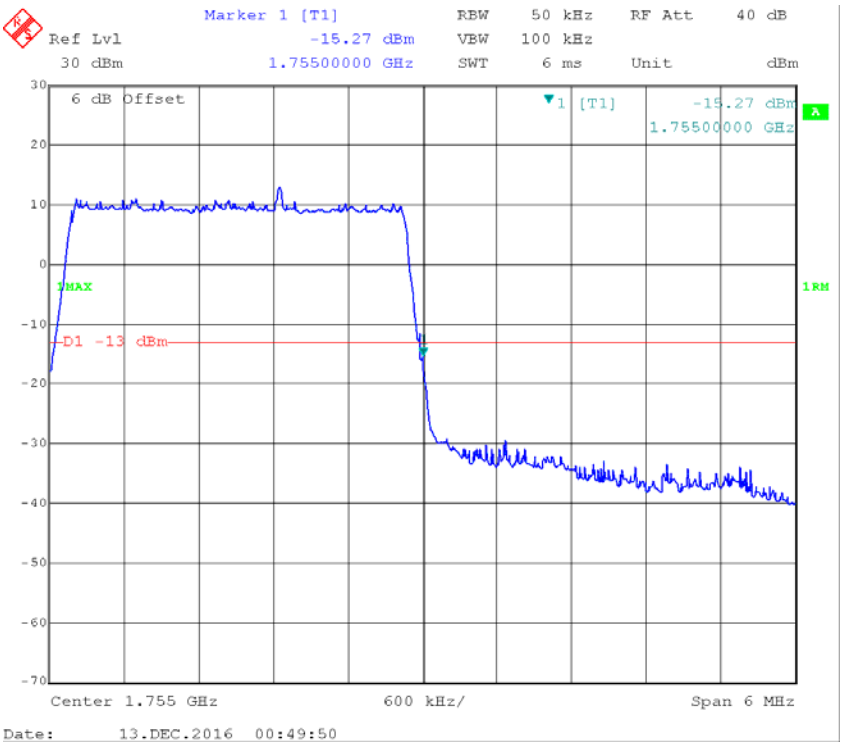
QPSK_1.4MHz_ 6 RB_ Right



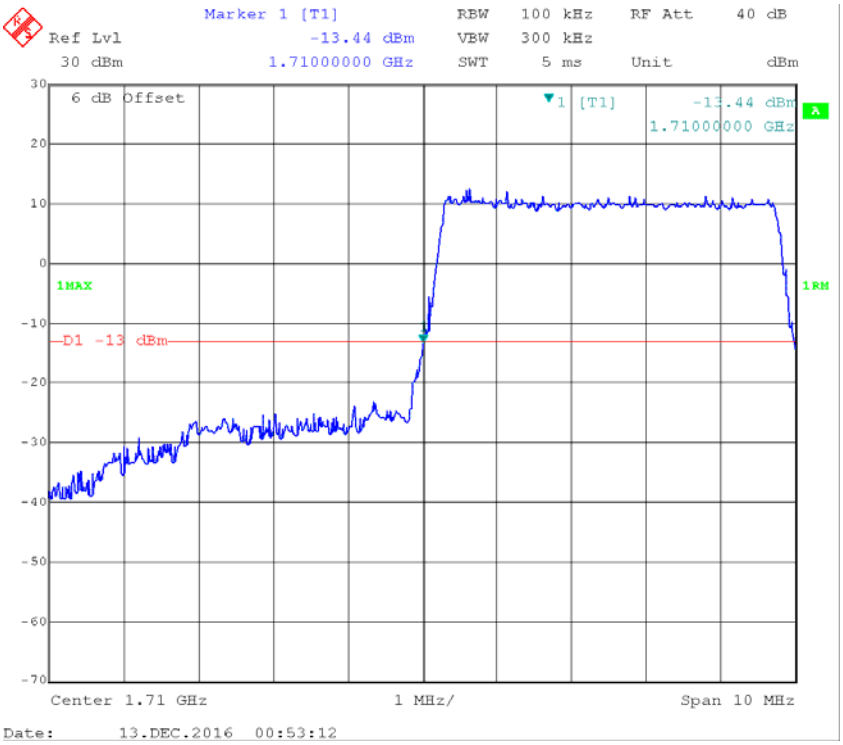
QPSK_3MHz_ 15 RB_ Left



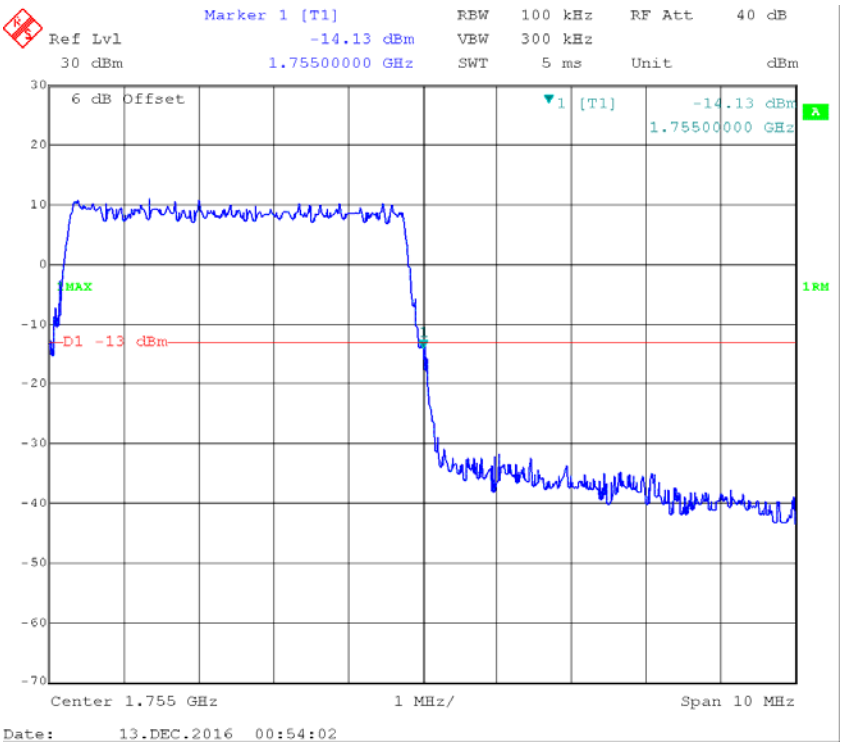
QPSK_3MHz_ 15 RB_ Right



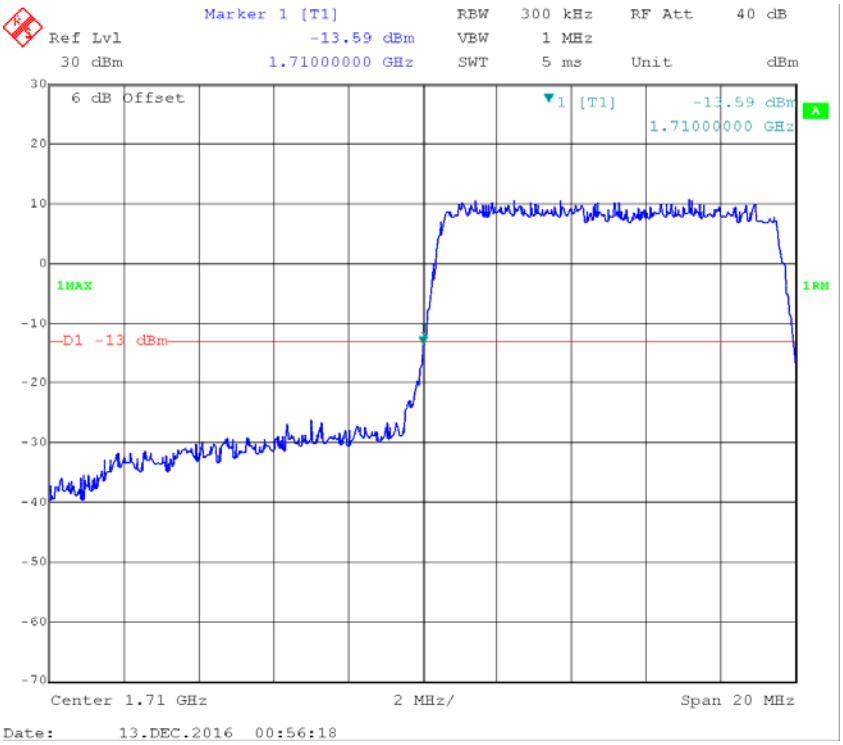
QPSK_5MHz_ 25 RB_ Left



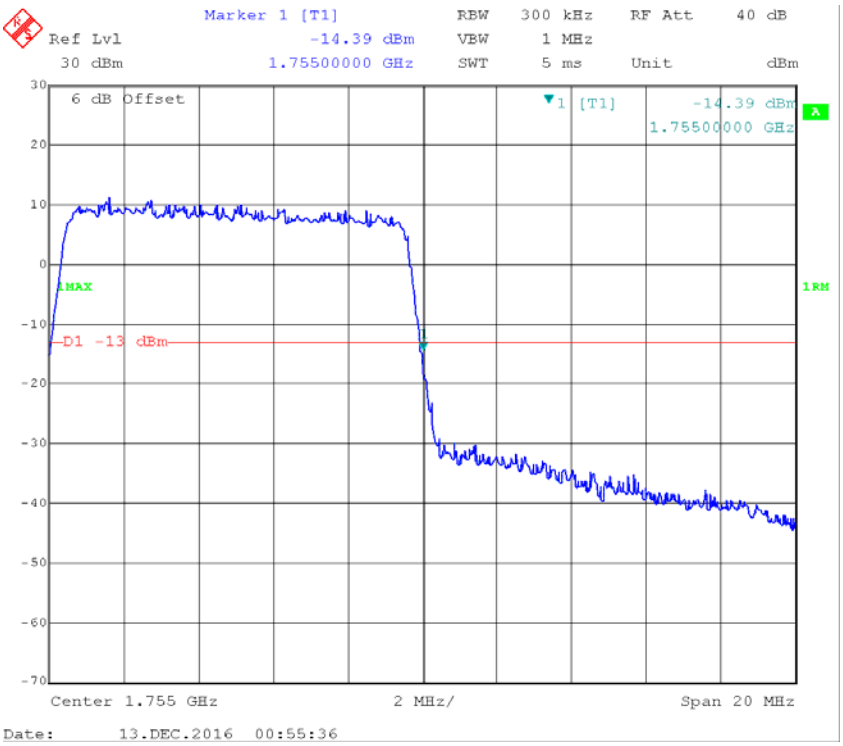
QPSK_5MHz_ 25 RB_ Right



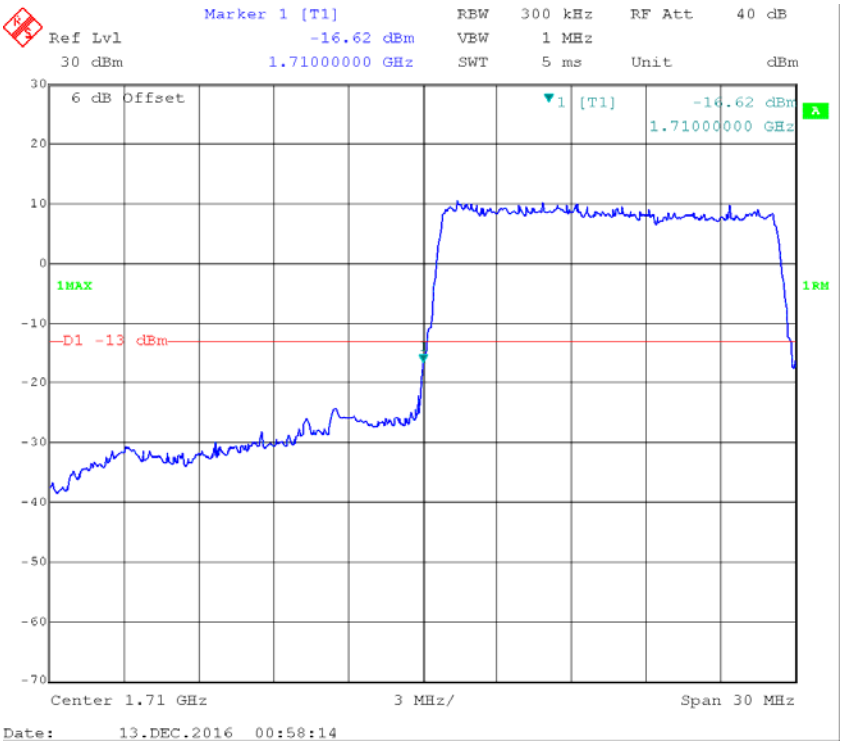
QPSK_10MHz_ 50 RB_ Left



QPSK_10MHz_ 50 RB_ Right

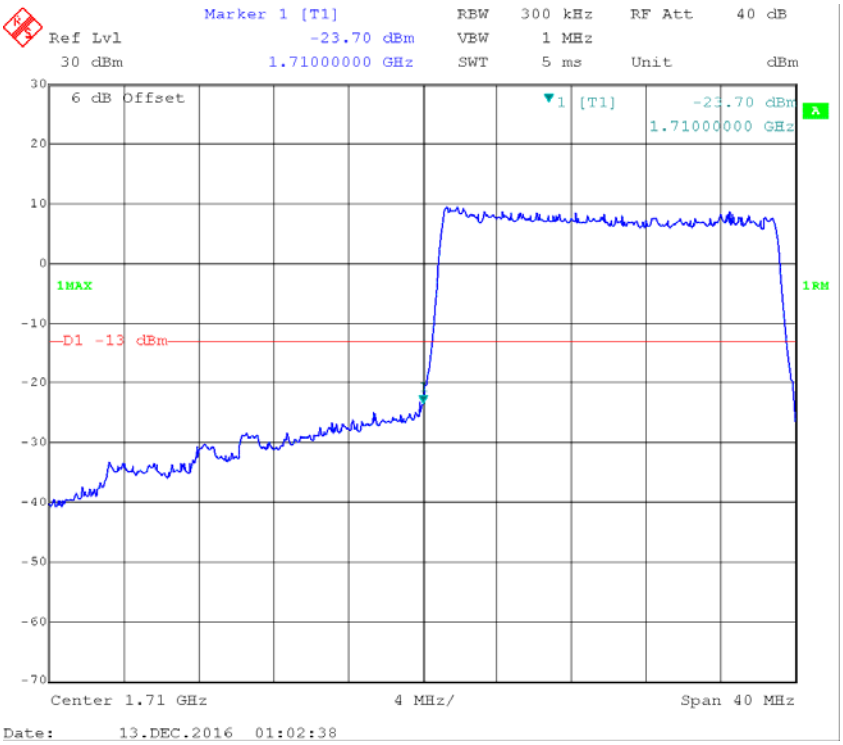


QPSK_15MHz_ 75 RB_ Left

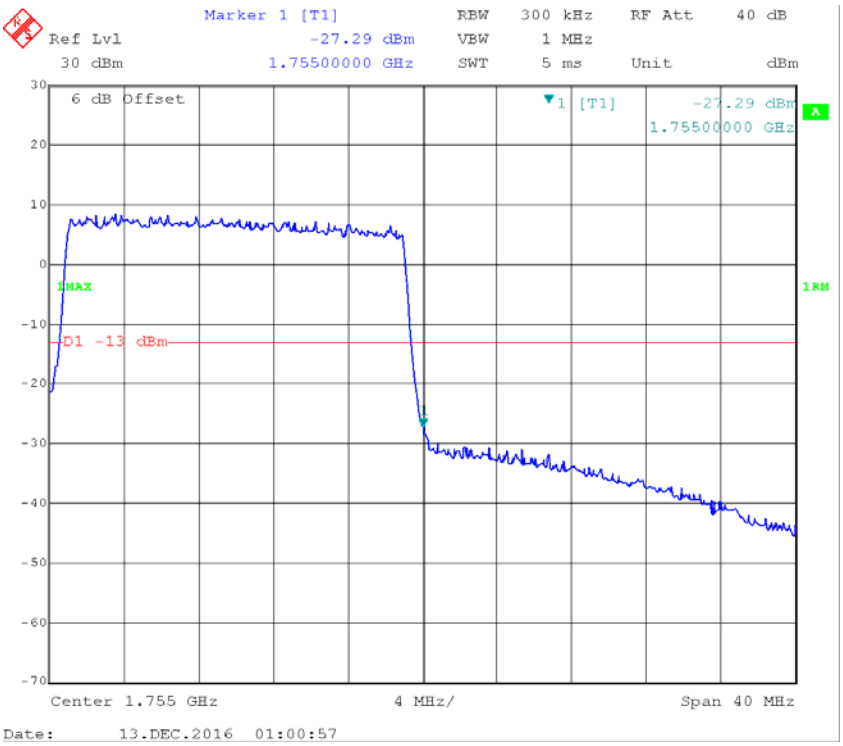


QPSK_15MHz_ 75 RB_ Right

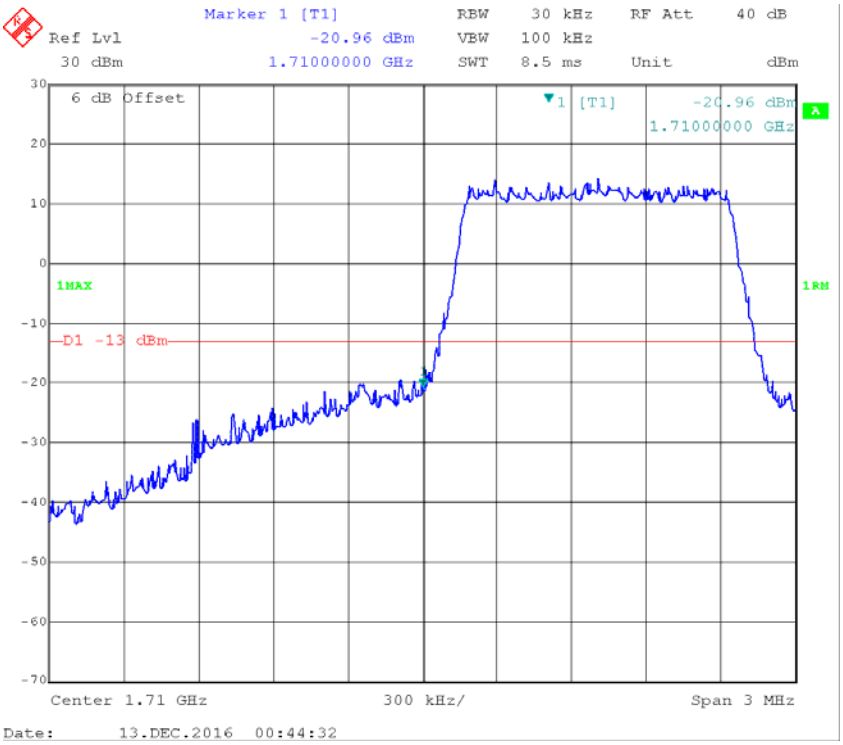
QPSK_20MHz_ FULL RB_ Left



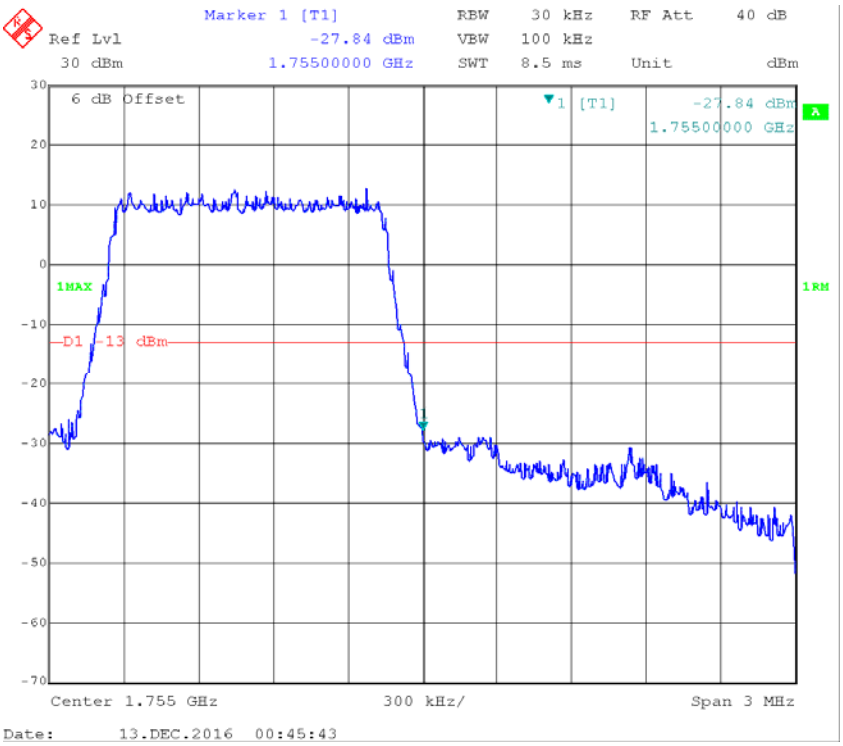
QPSK_20MHz_ FULL RB_ Right



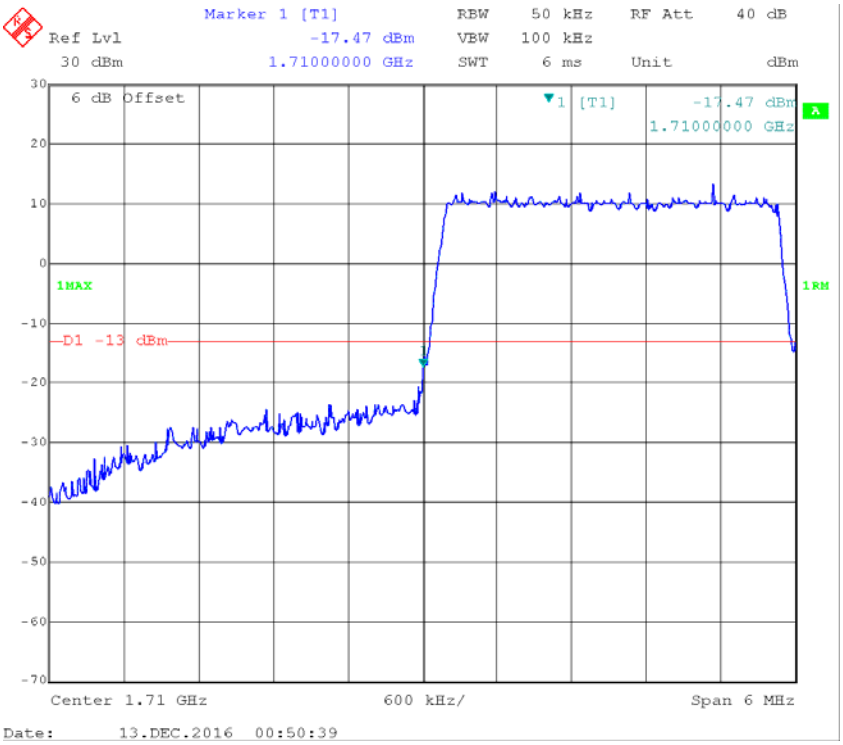
16QAM_1.4MHz_ 6 RB_ Left



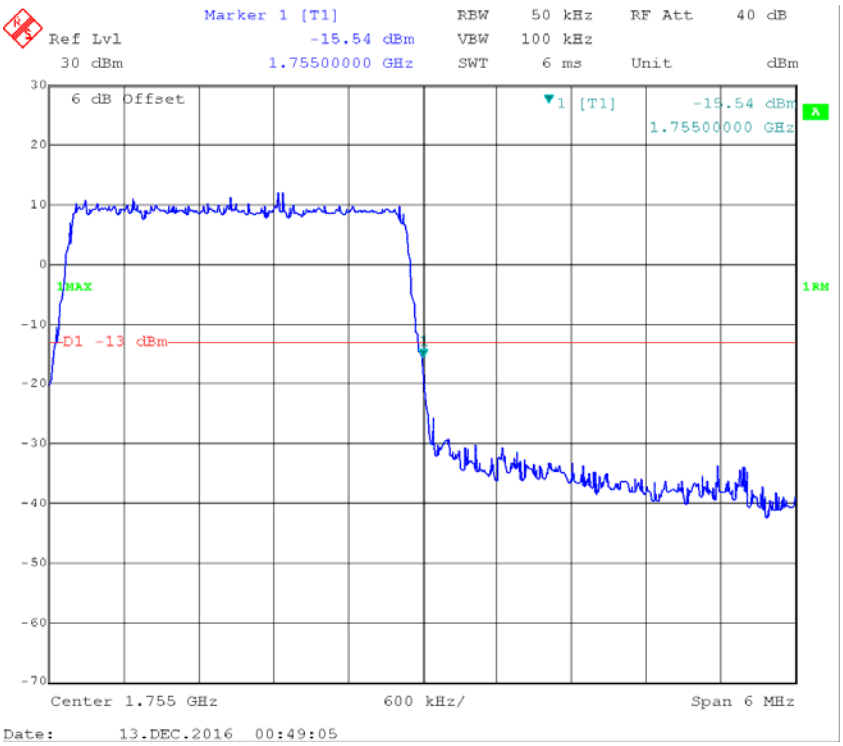
16QAM_1.4MHz_ 6 RB_ Right



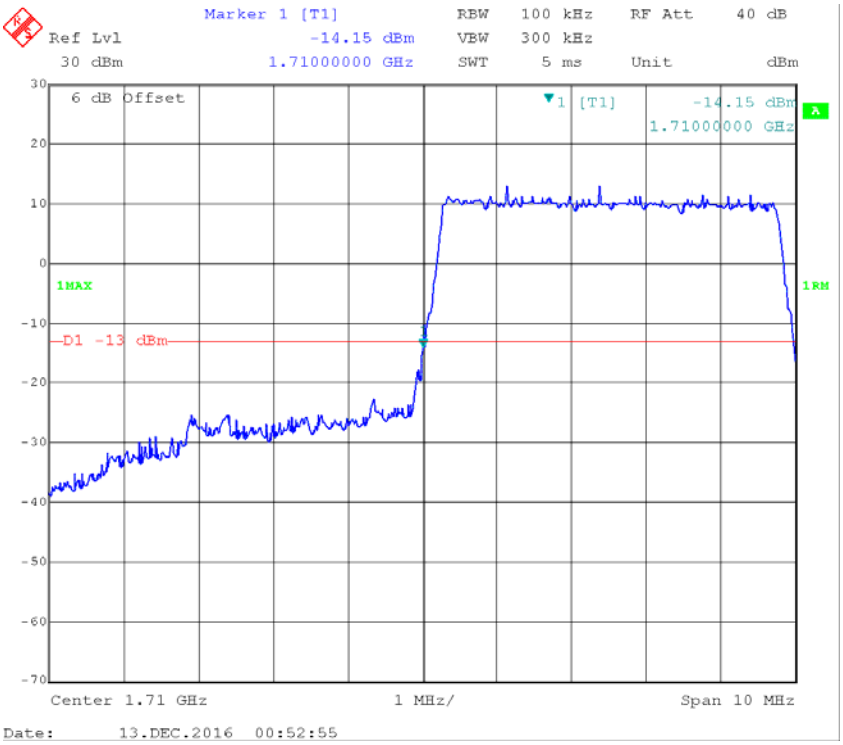
16QAM_3MHz_ 15 RB_ Left



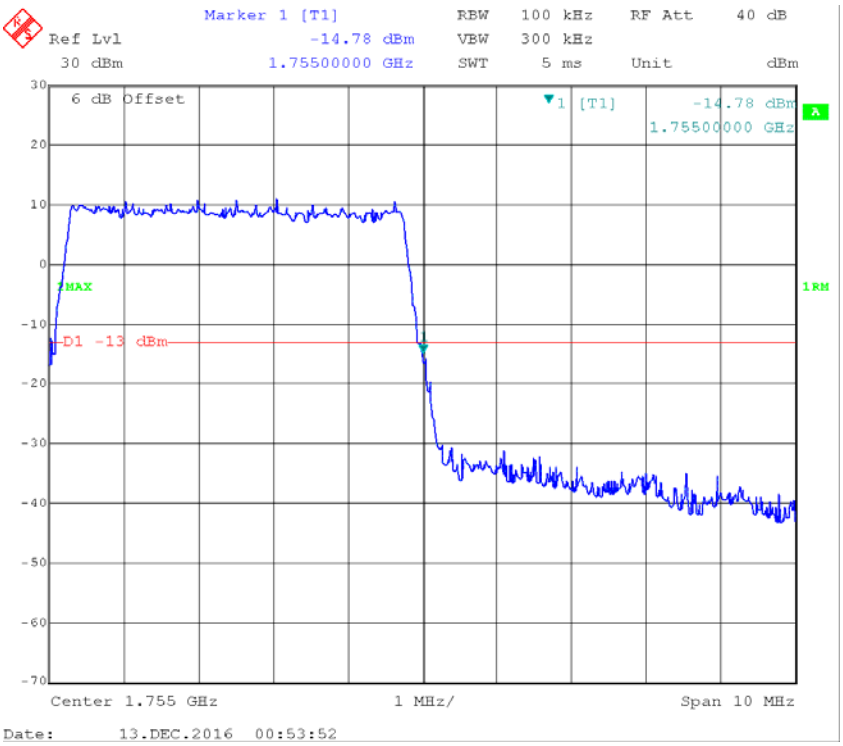
16QAM_3MHz_ 15 RB_ Right



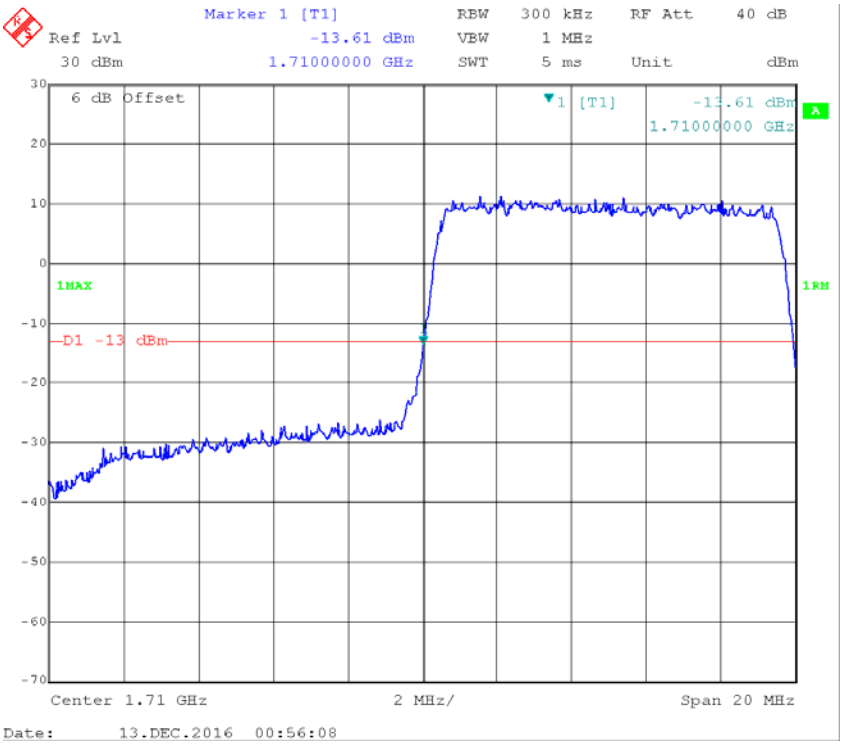
16QAM_5MHz_ 25 RB_ Left



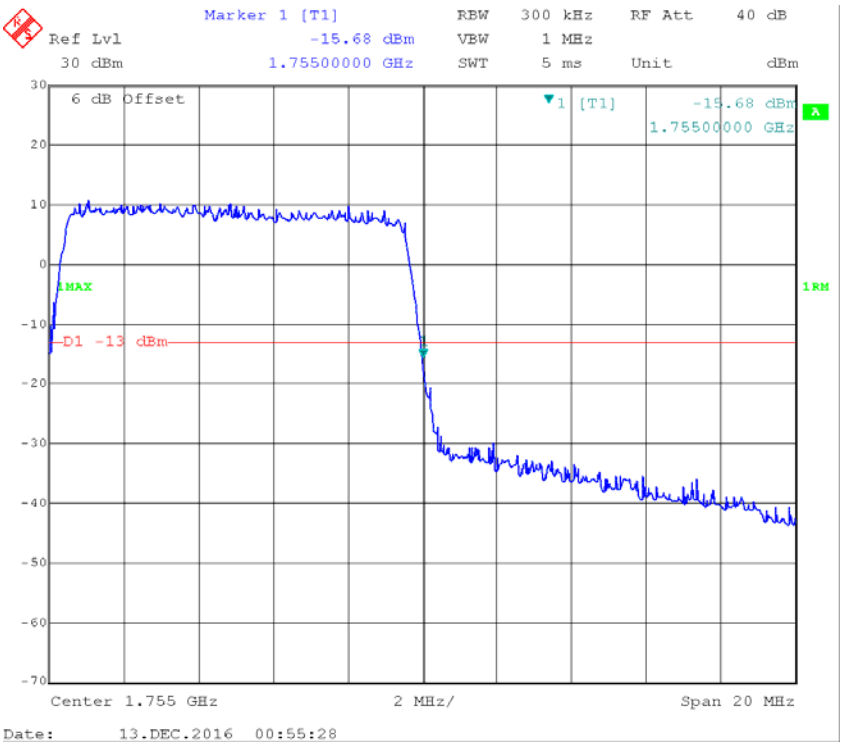
16QAM_5MHz_ 25 RB_ Right



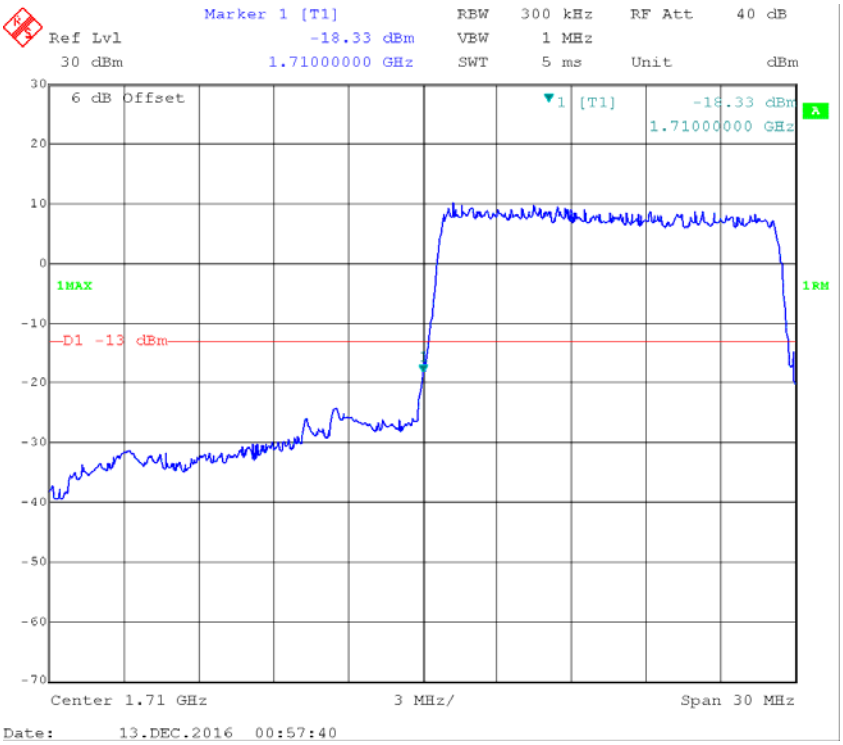
16QAM_10MHz_ 50 RB_ Left



16QAM_10MHz_ 50 RB_ Right

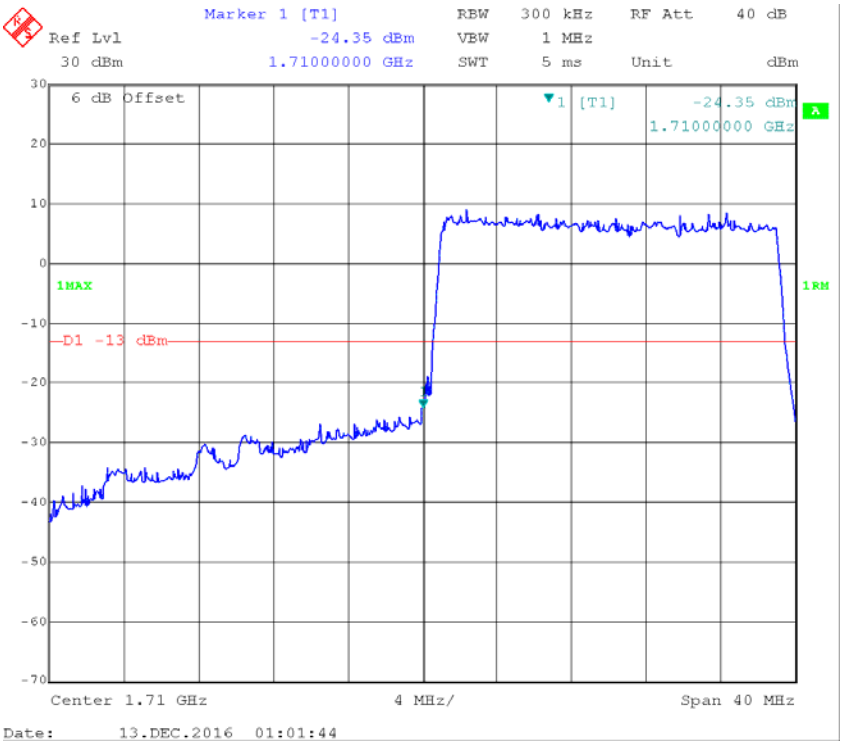


16QAM_15MHz_ 75 RB_ Left

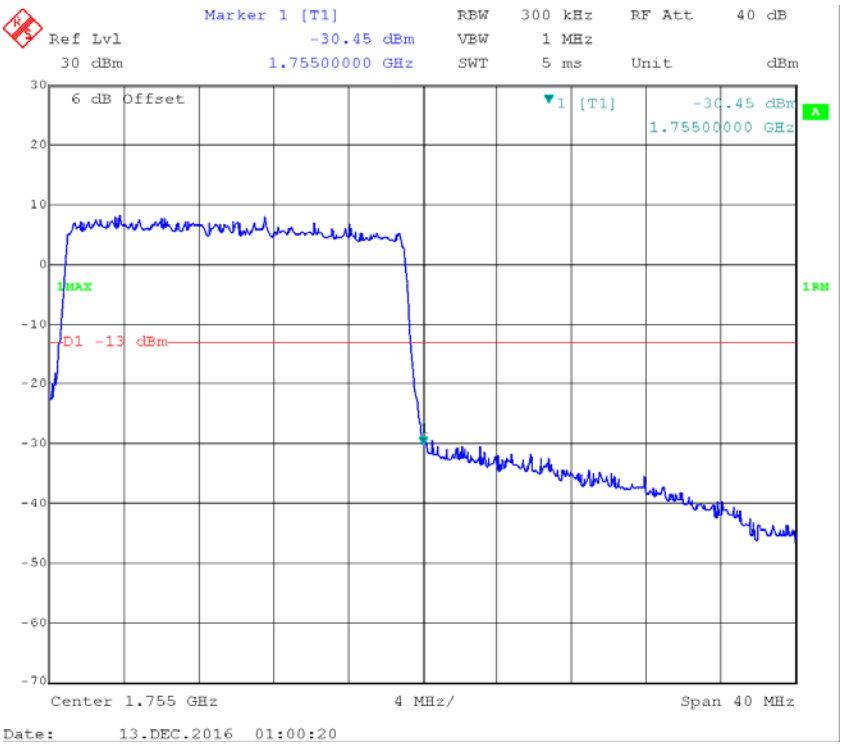


16QAM_15MHz_ 75 RB_ Right

16QAM_20MHz_ FULL RB_ Left

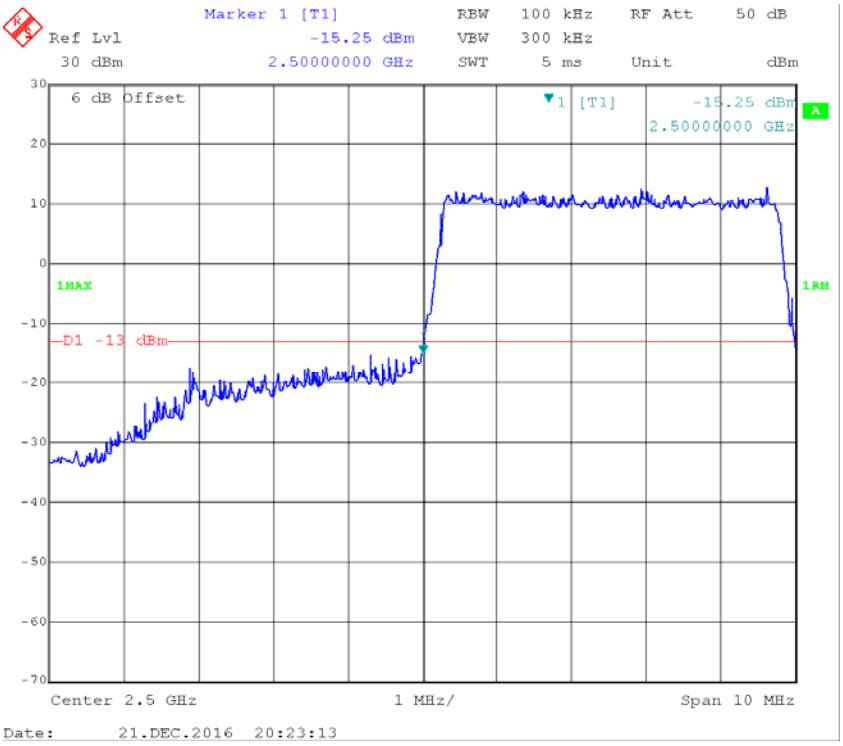


16QAM_20MHz_ FULL RB_ Right

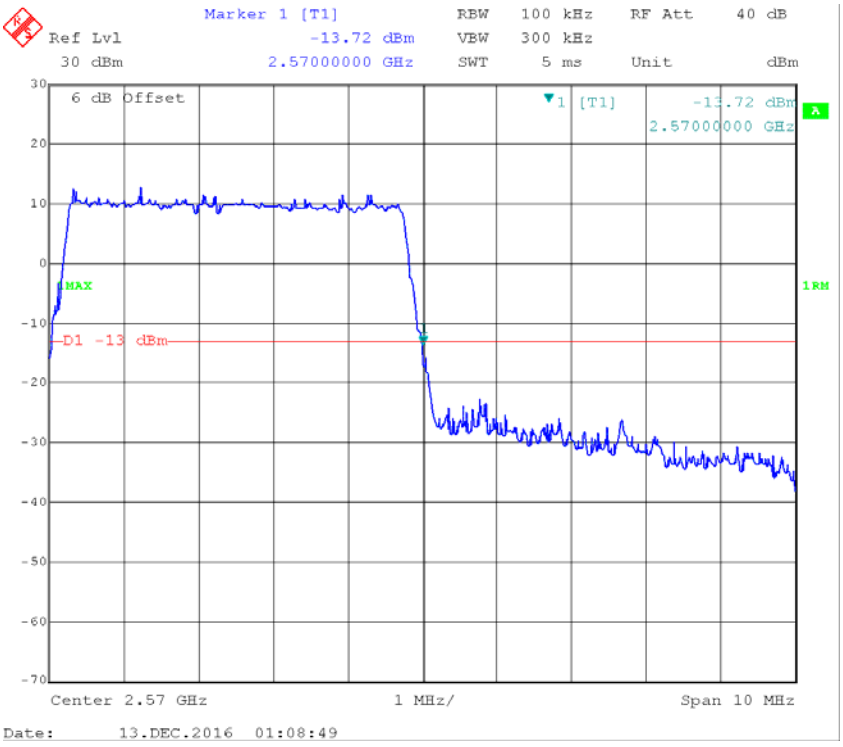


LTE Band VII

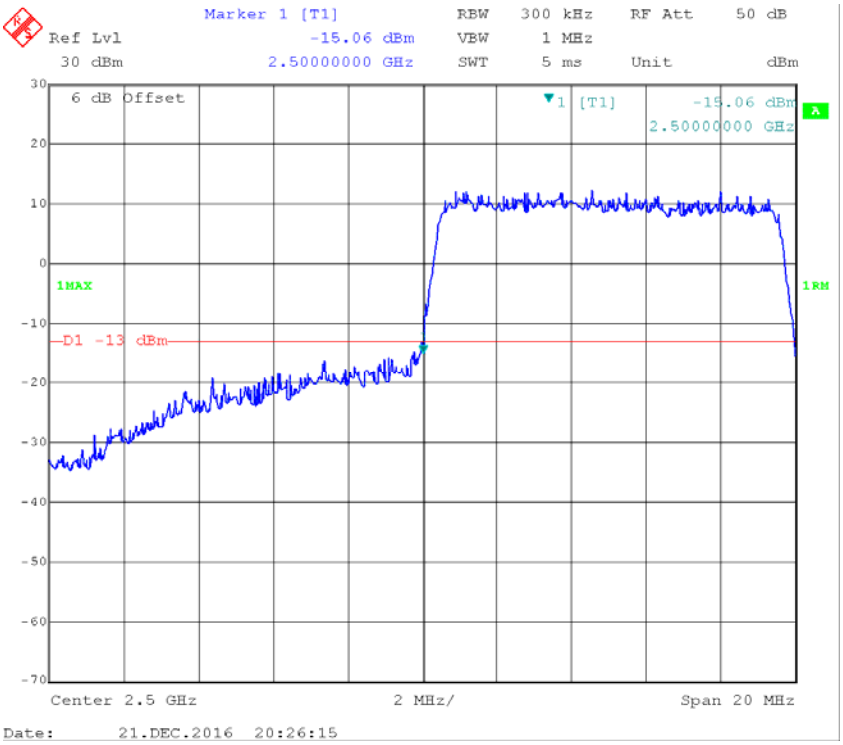
QPSK_5MHz_ 25 RB_ Left



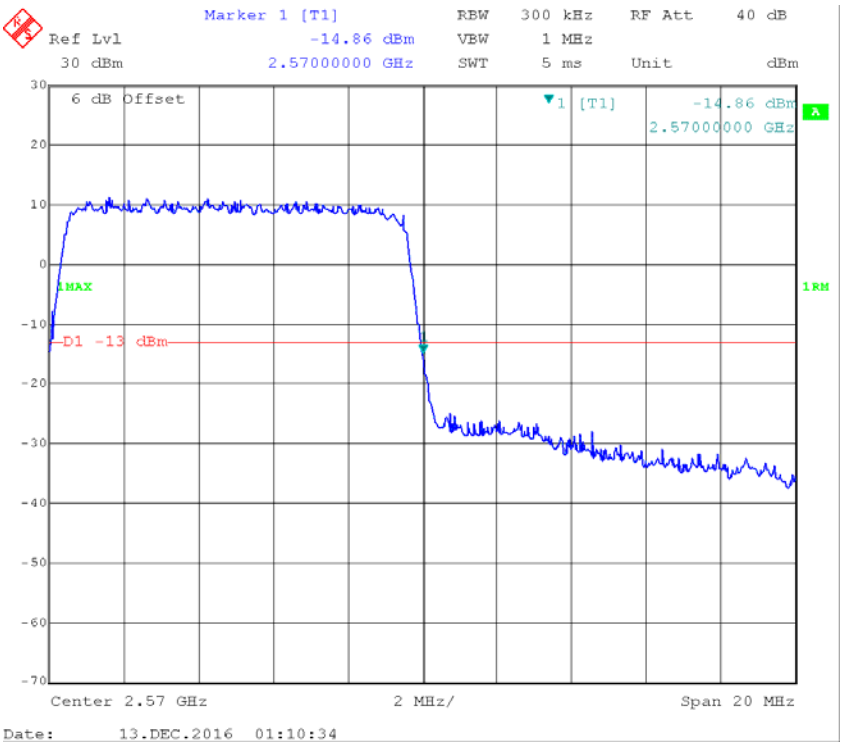
QPSK_5MHz_ 25 RB_ Right



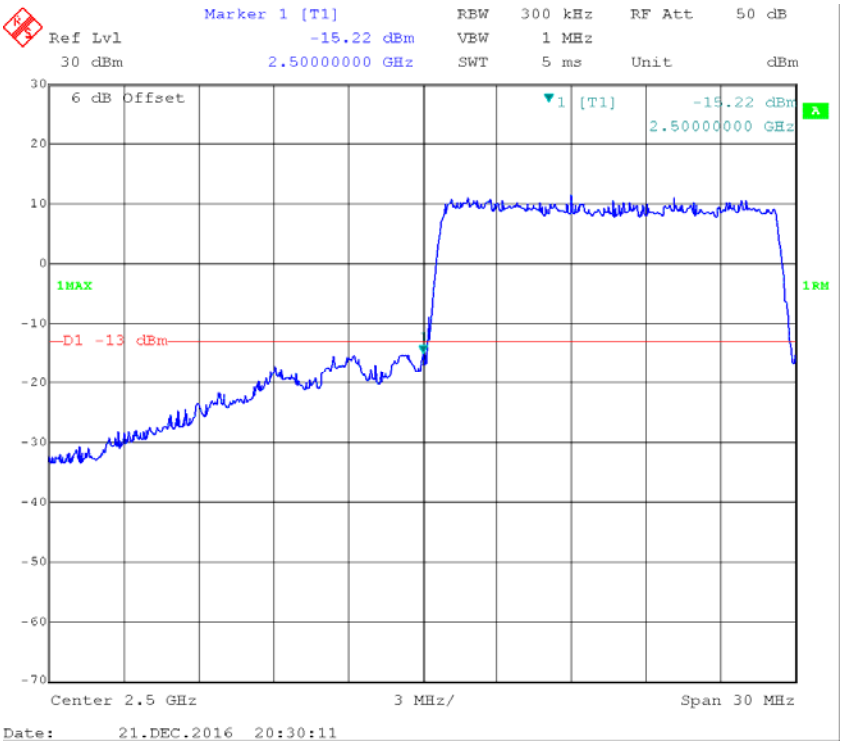
QPSK_10MHz_ 50 RB_ Left



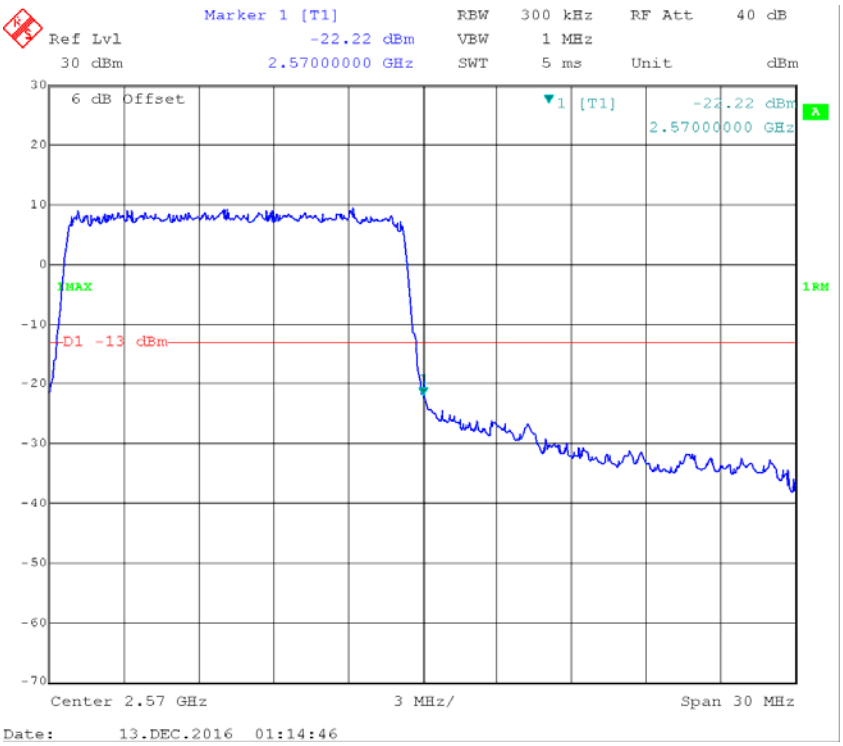
QPSK_10MHz_ 50 RB_ Right



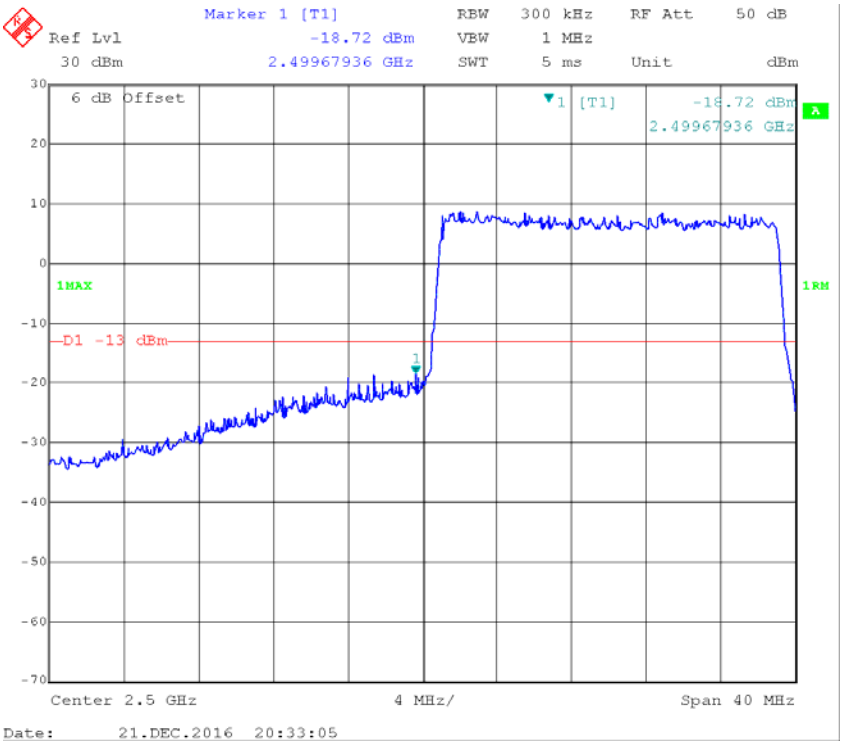
QPSK_15MHz_ 75 RB_ Left



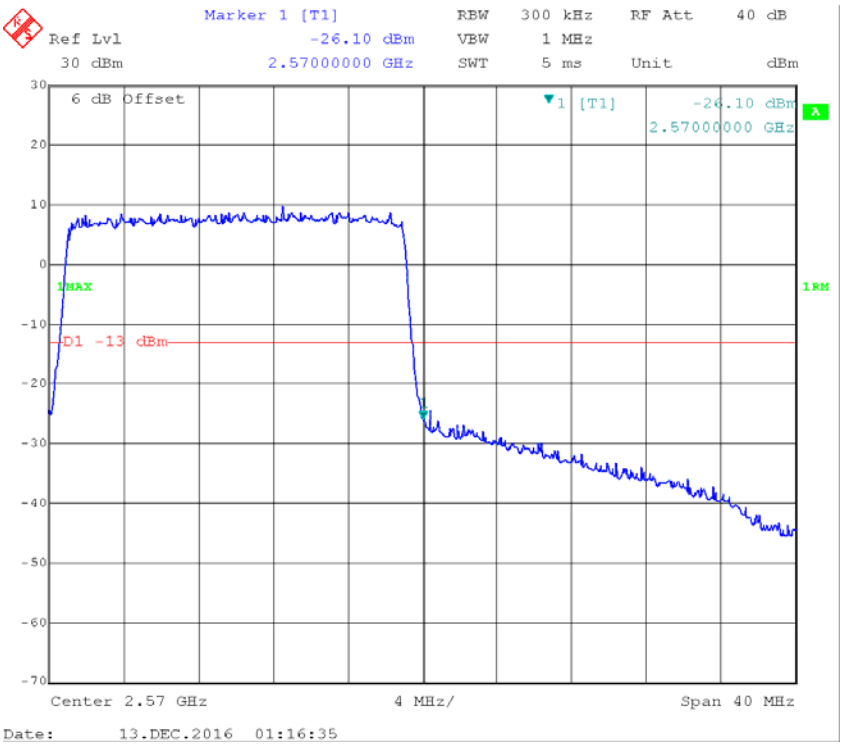
QPSK_15MHz_ 75 RB_ Right



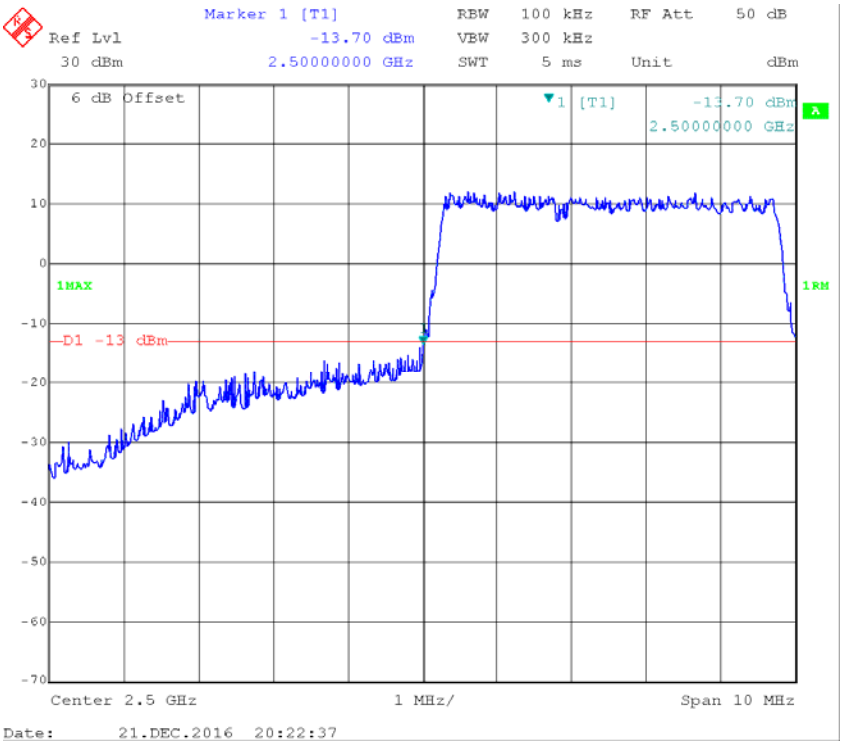
QPSK_20MHz_ FULL RB_ Left



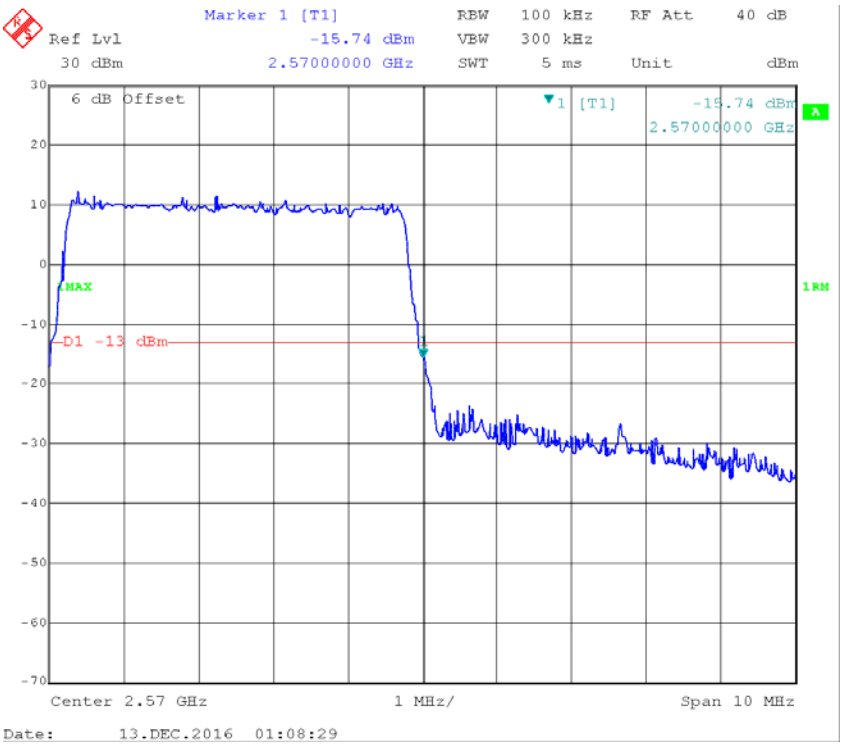
QPSK_20MHz_ FULL RB_ Right



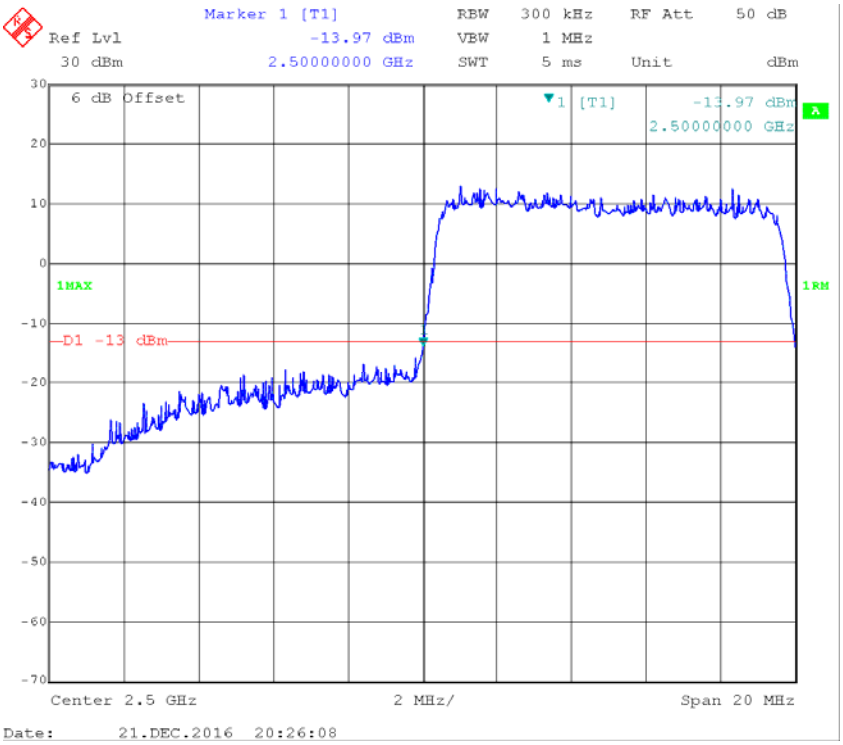
16QAM_5MHz_ 25 RB_ Left



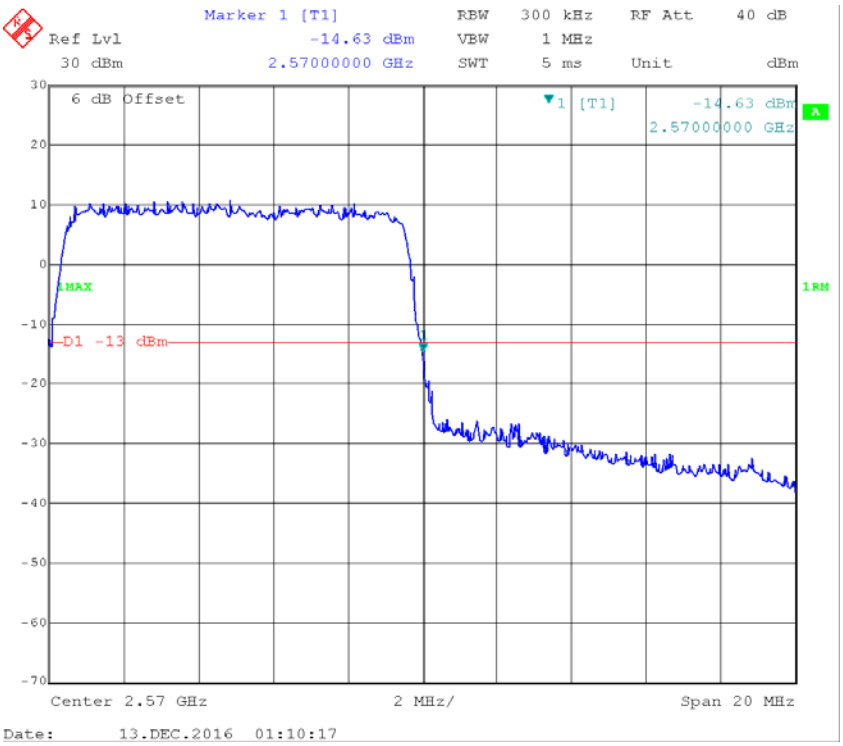
16QAM_5MHz_ 25 RB_ Right



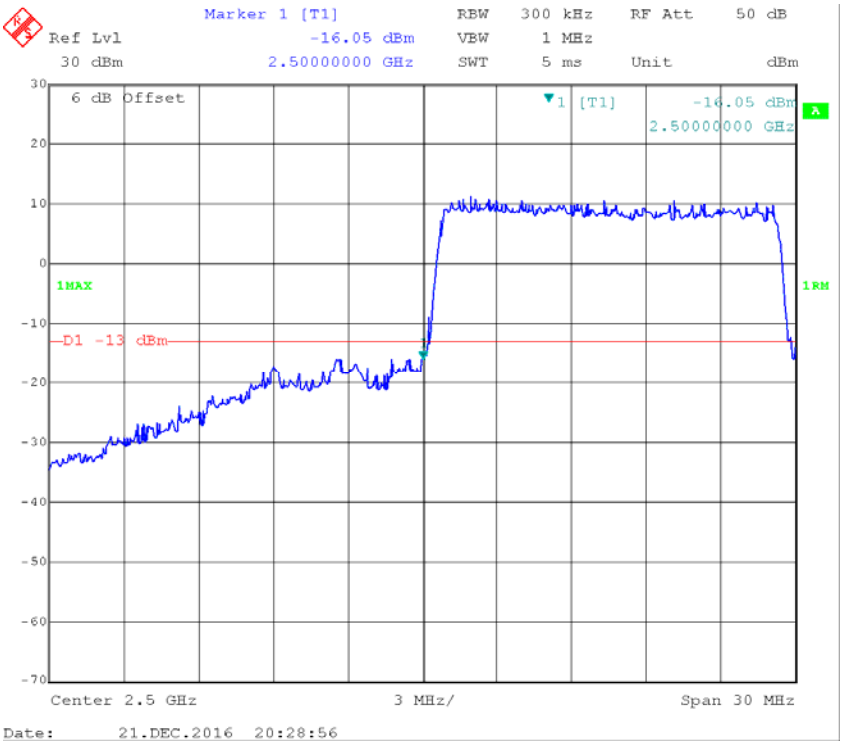
16QAM_10MHz_ 50 RB_ Left



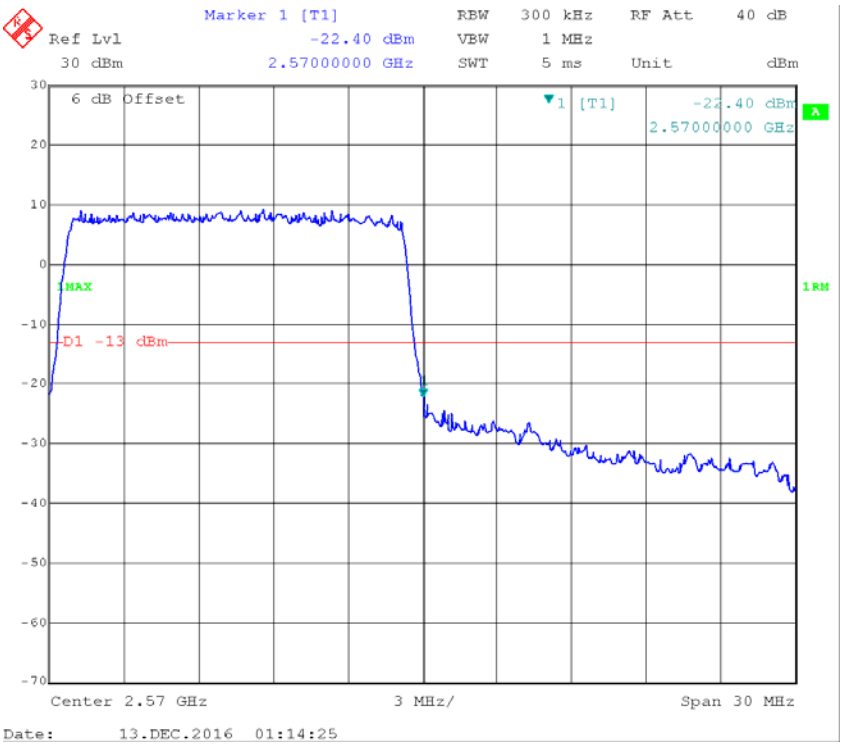
16QAM_10MHz_ 50 RB_ Right



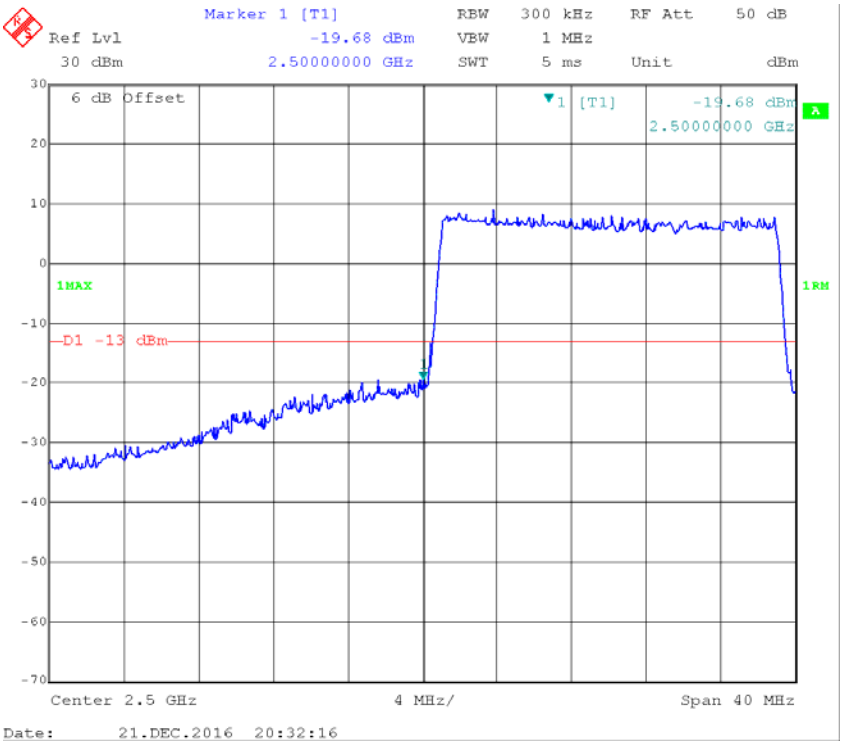
16QAM_15MHz_ 75 RB_ Left



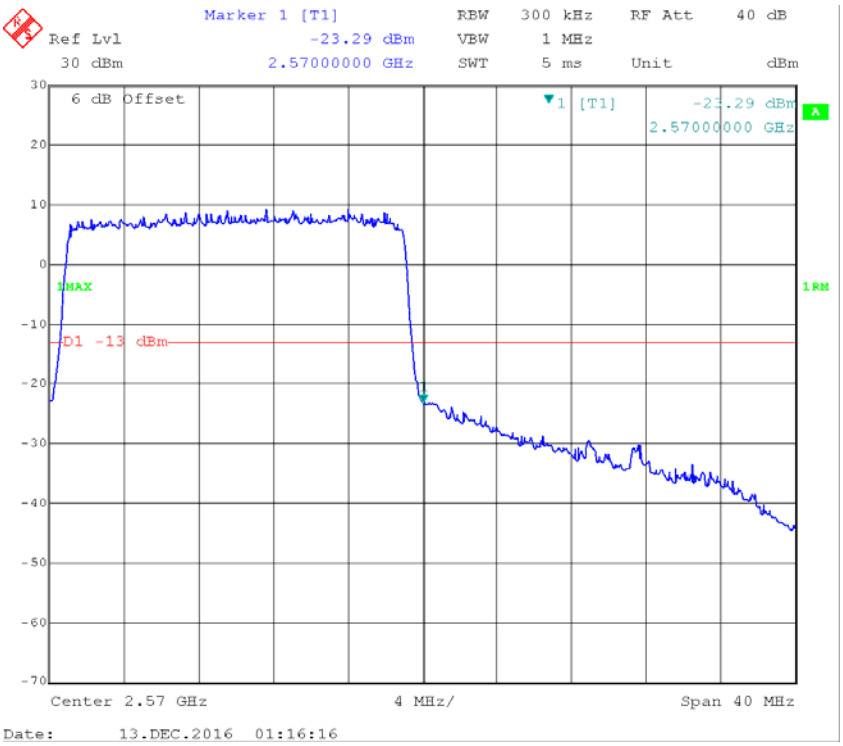
16QAM_15MHz_ 75 RB_ Right



16QAM_20MHz_ FULL RB_ Left

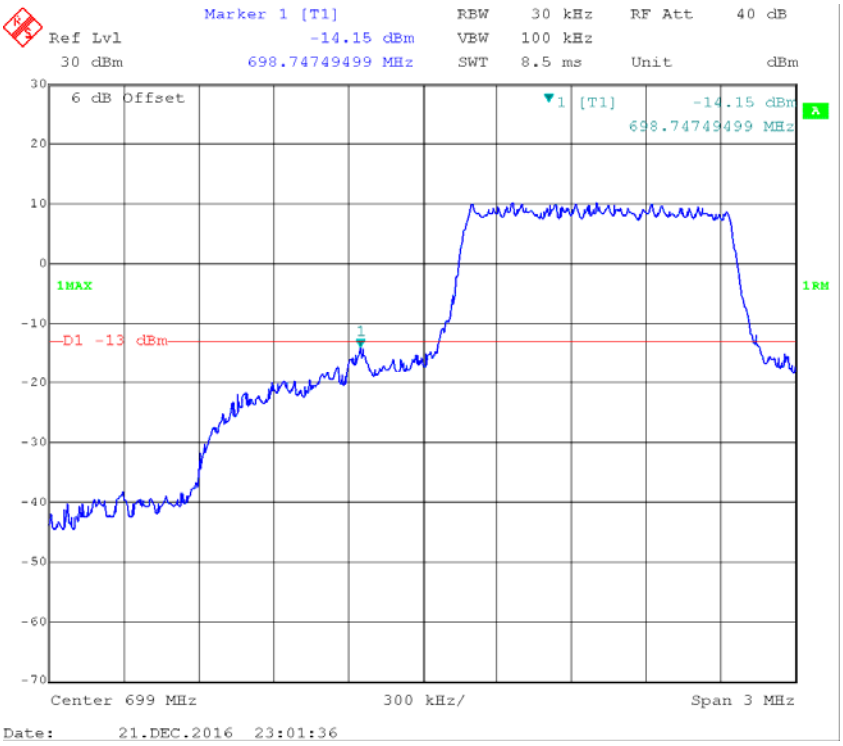


16QAM_20MHz_ FULL RB_ Right



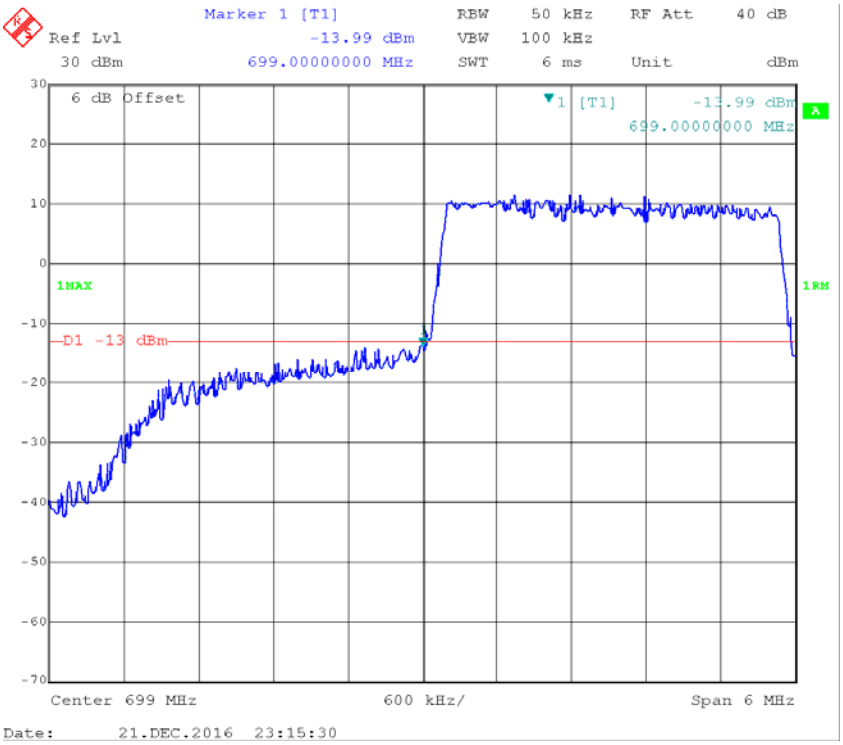
LTE Band 12

QPSK_1.4MHz_ 6 RB_ Left

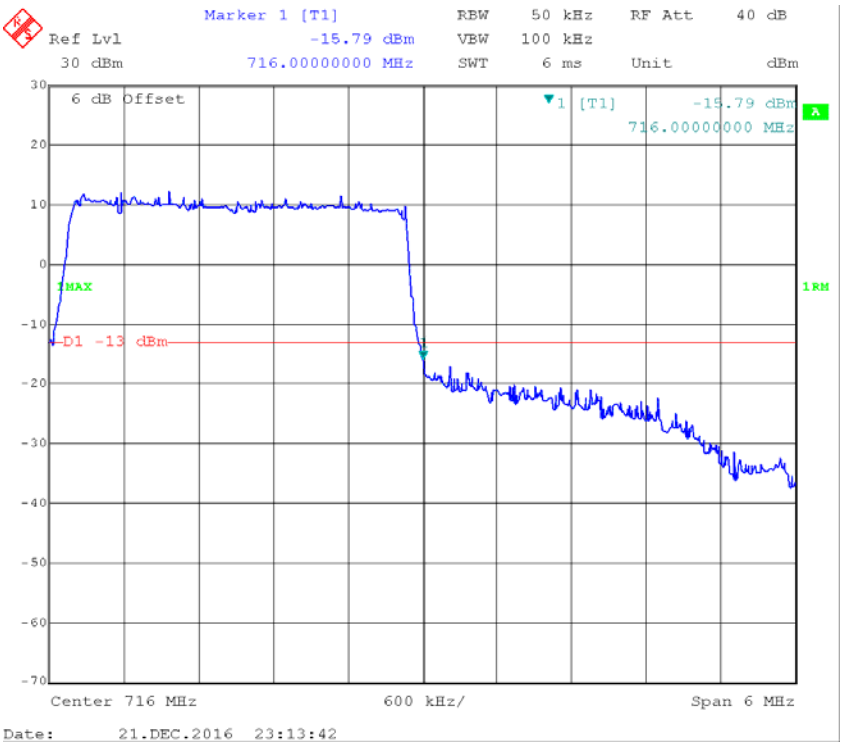


QPSK_1.4MHz_ 6 RB_ Right

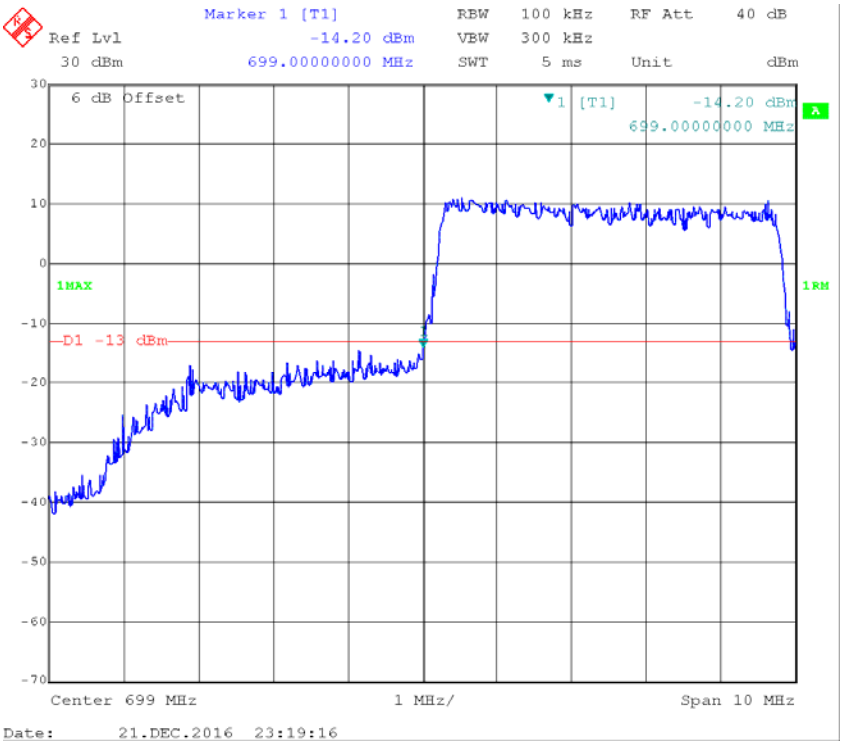
QPSK_3MHz_ 15 RB_ Left



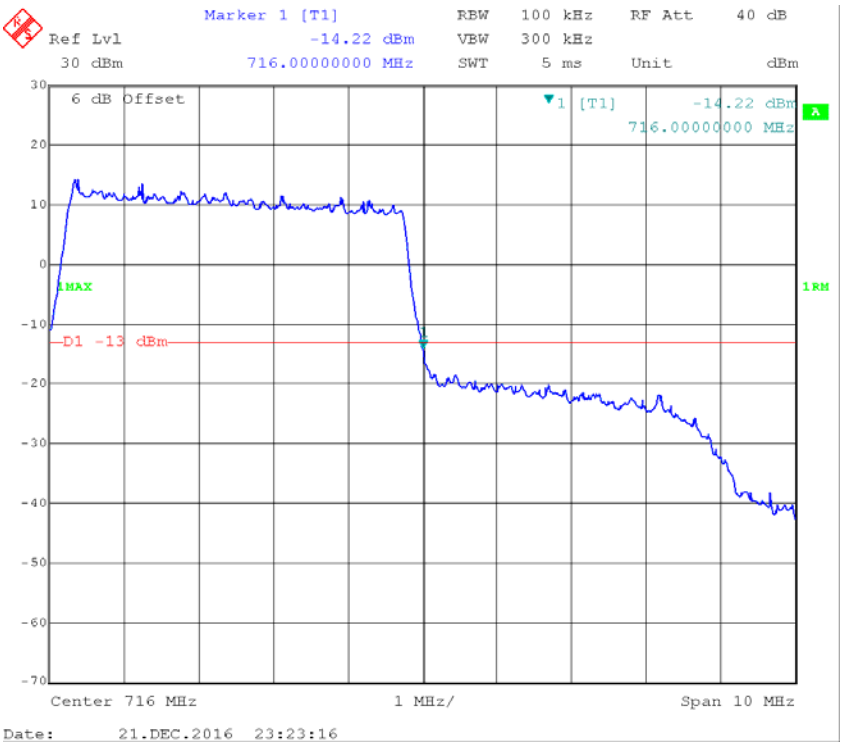
QPSK_3MHz_ 15 RB_ Right



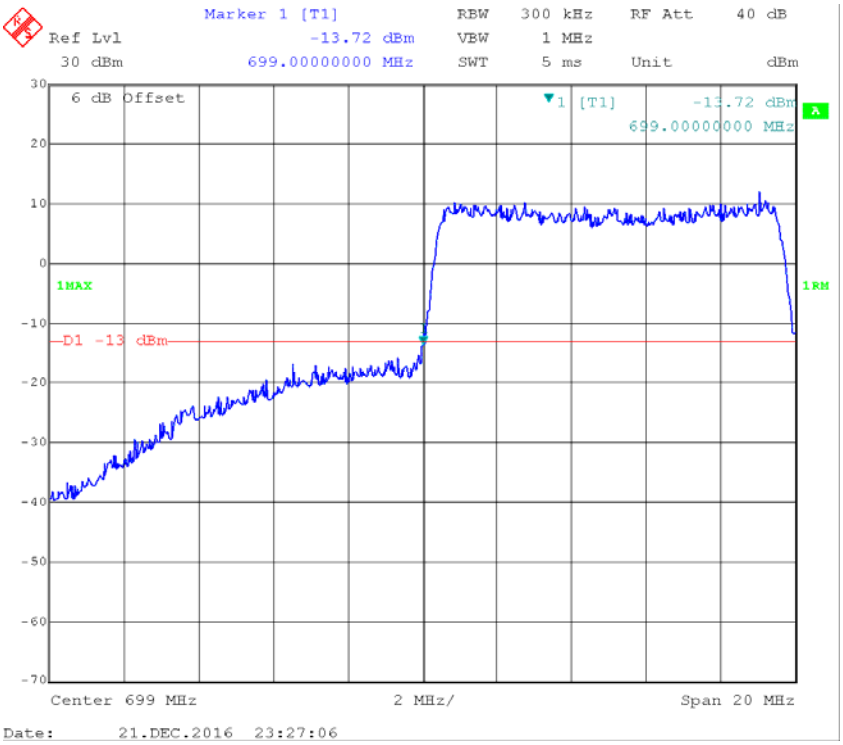
QPSK_5MHz_ 25 RB_ Left



QPSK_5MHz_ 25 RB_ Right

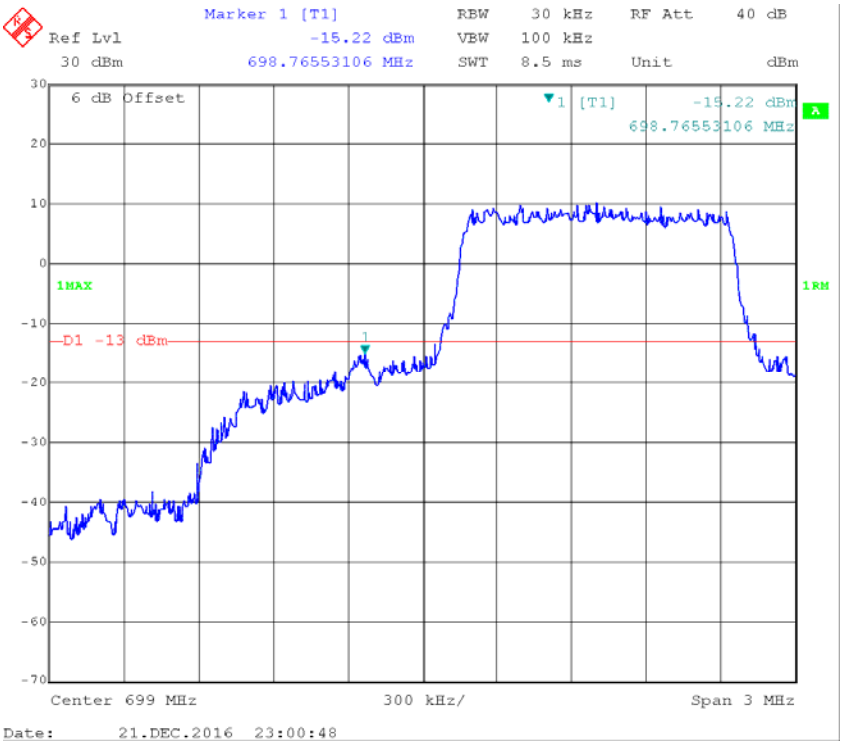


QPSK_10MHz_ 50 RB_ Left

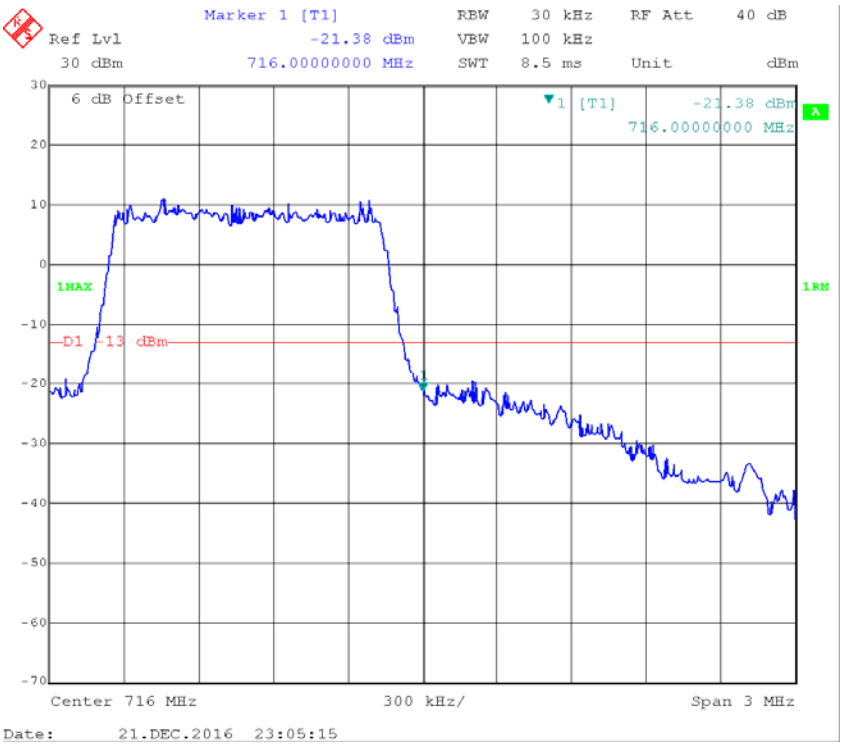


QPSK_10MHz_ 50 RB_ Right

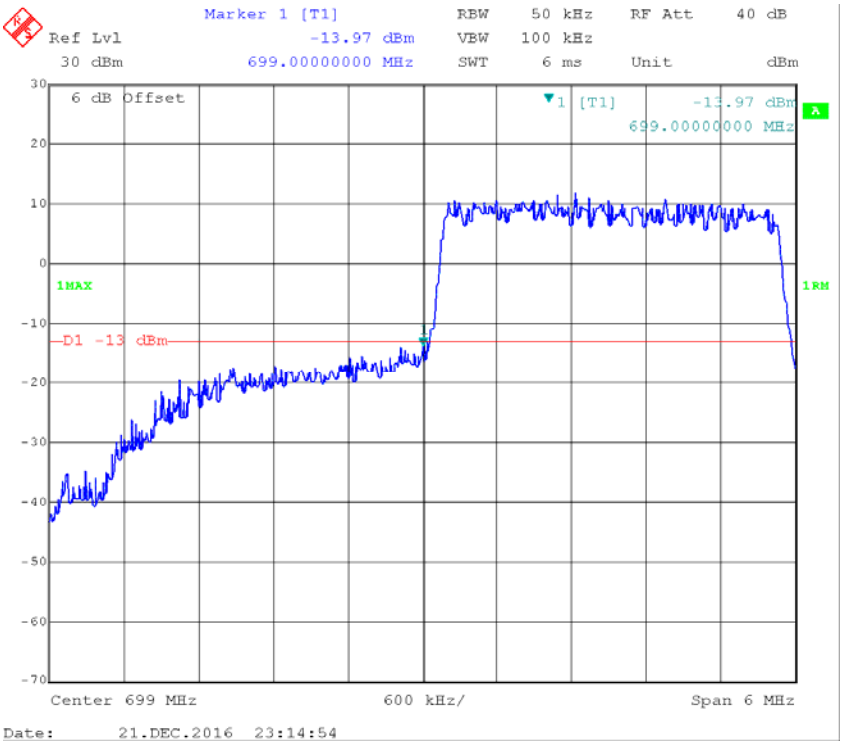
16QAM_1.4MHz_ 6 RB_ Left



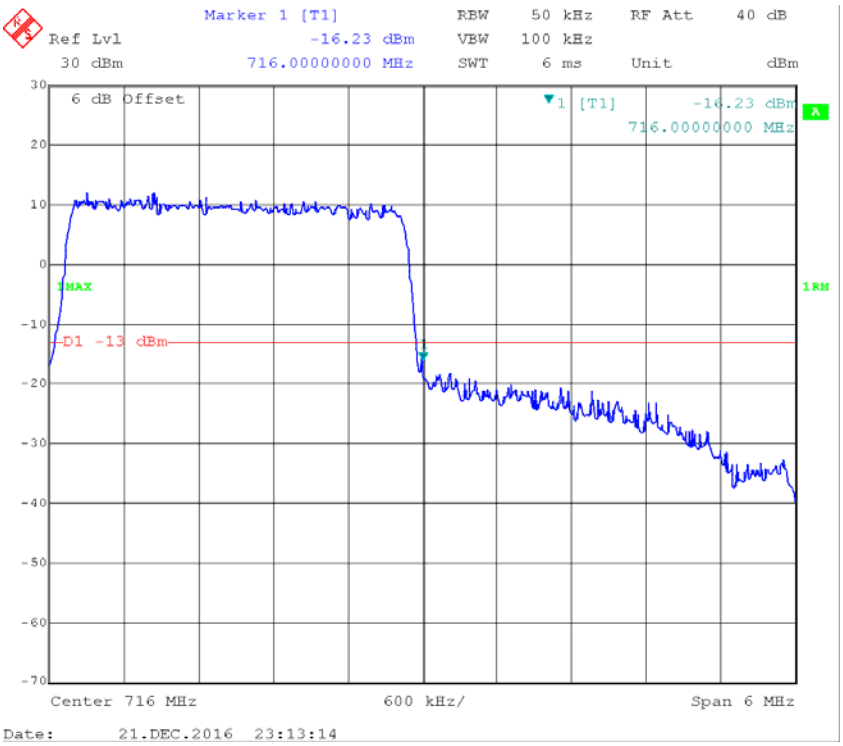
16QAM_1.4MHz_ 6 RB_ Right



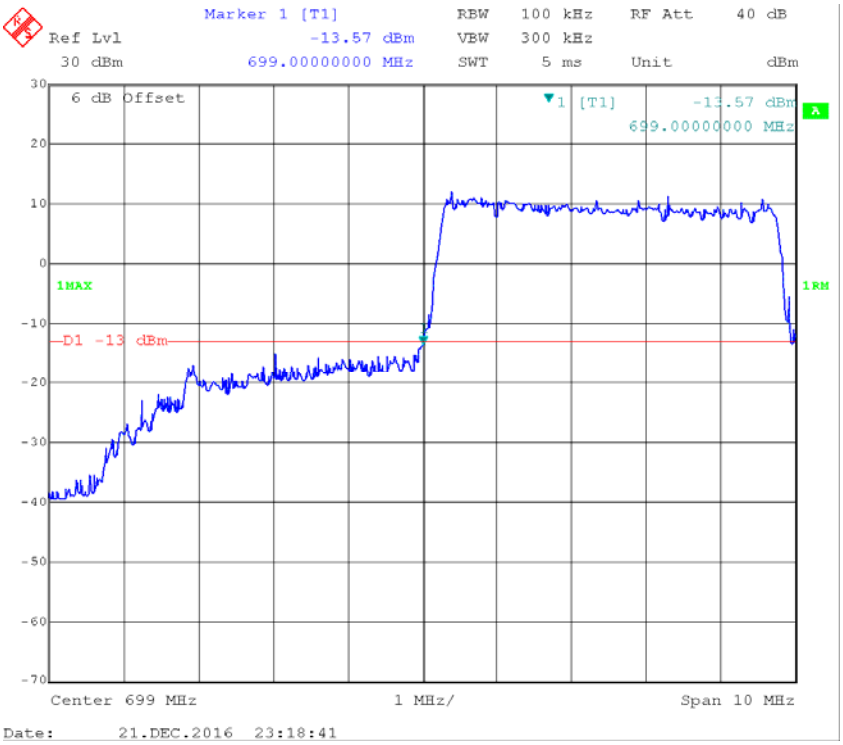
16QAM_3MHz_ 15 RB_ Left



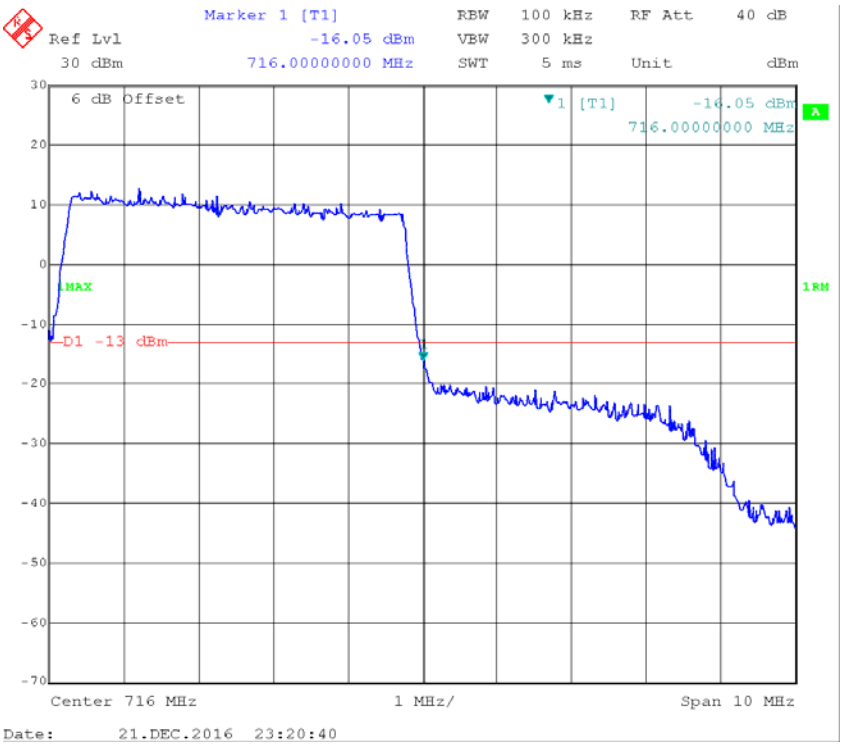
16QAM_3MHz_ 15 RB_ Right



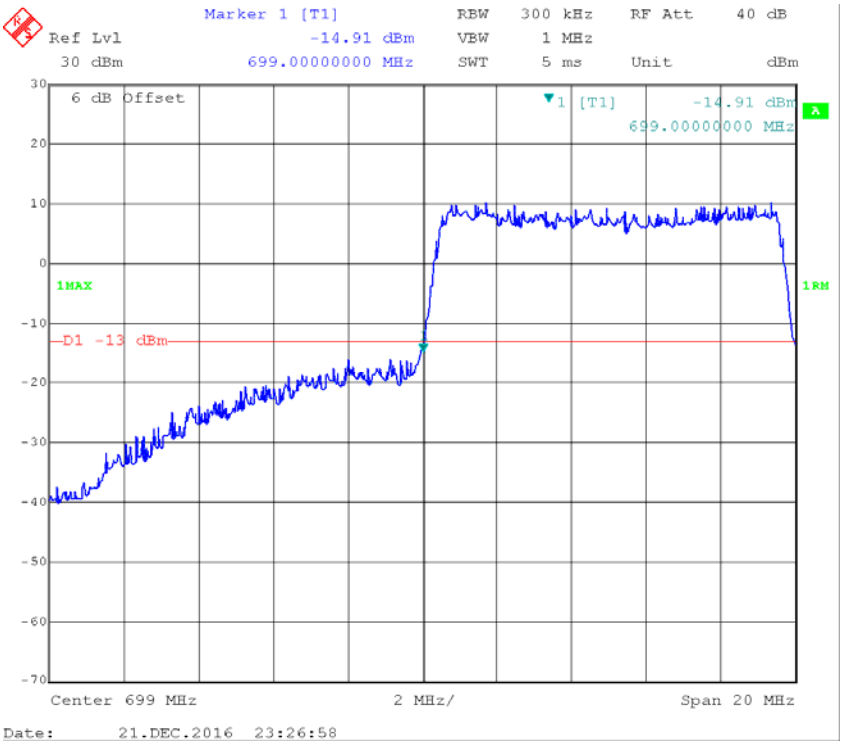
16QAM_5MHz_ 25 RB_ Left



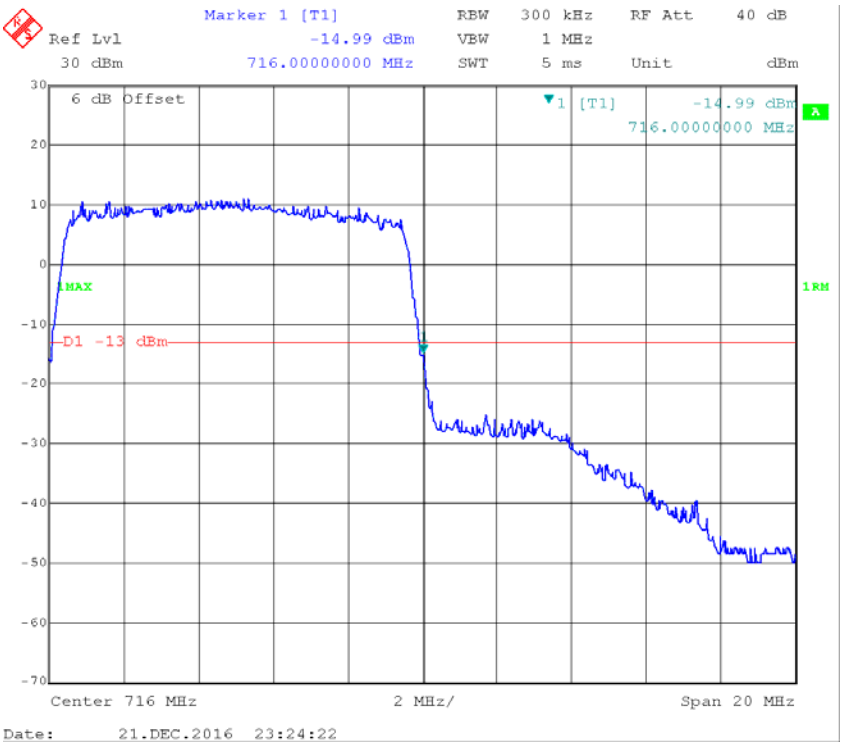
16QAM_5MHz_ 25 RB_ Right



16QAM_10MHz_ 50 RB_ Left

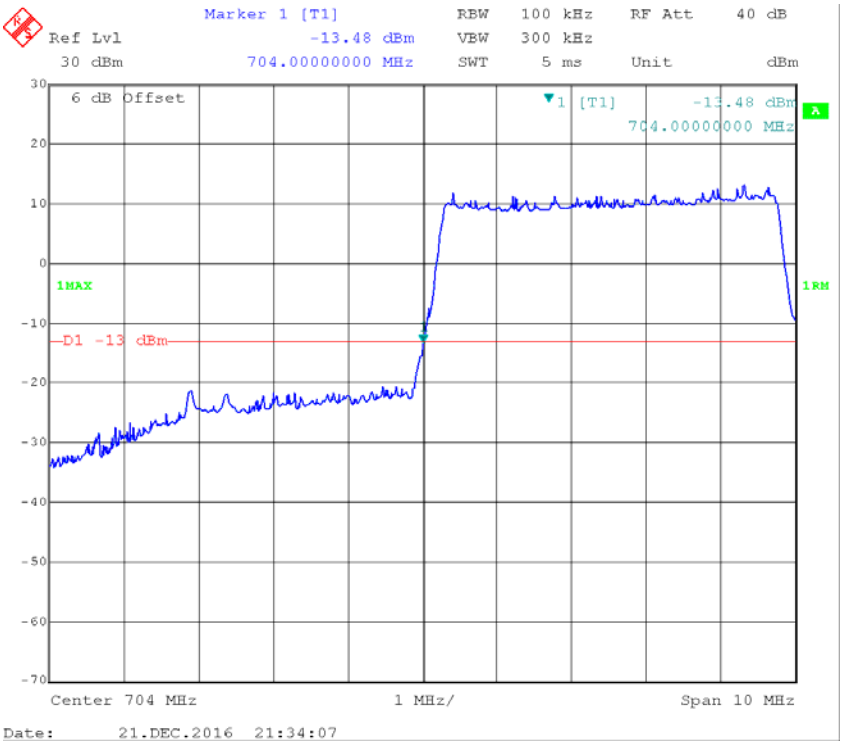


16QAM_10MHz_ 50 RB_ Right

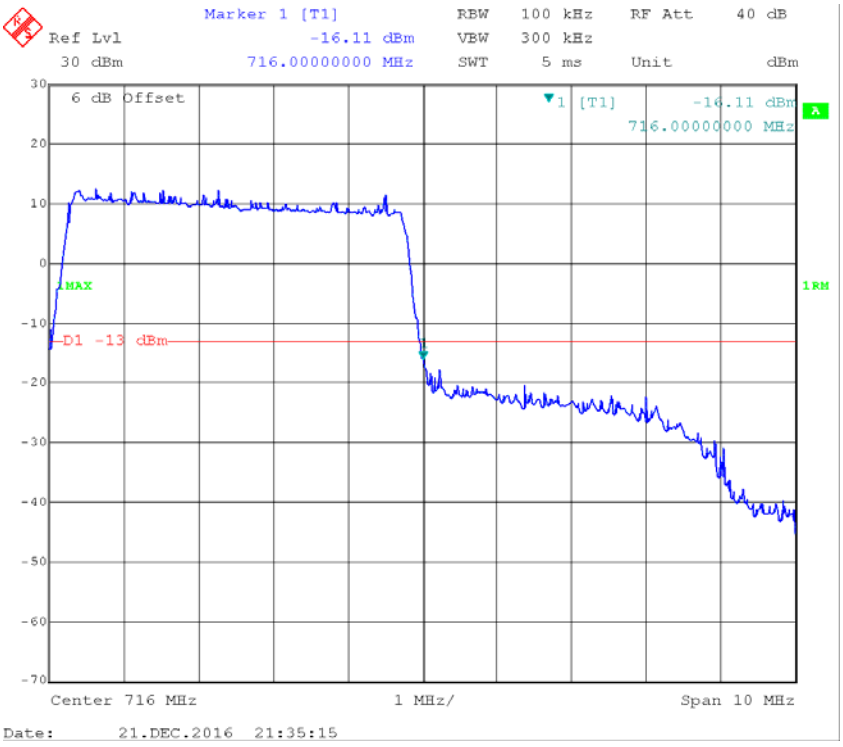


LTE Band 17:

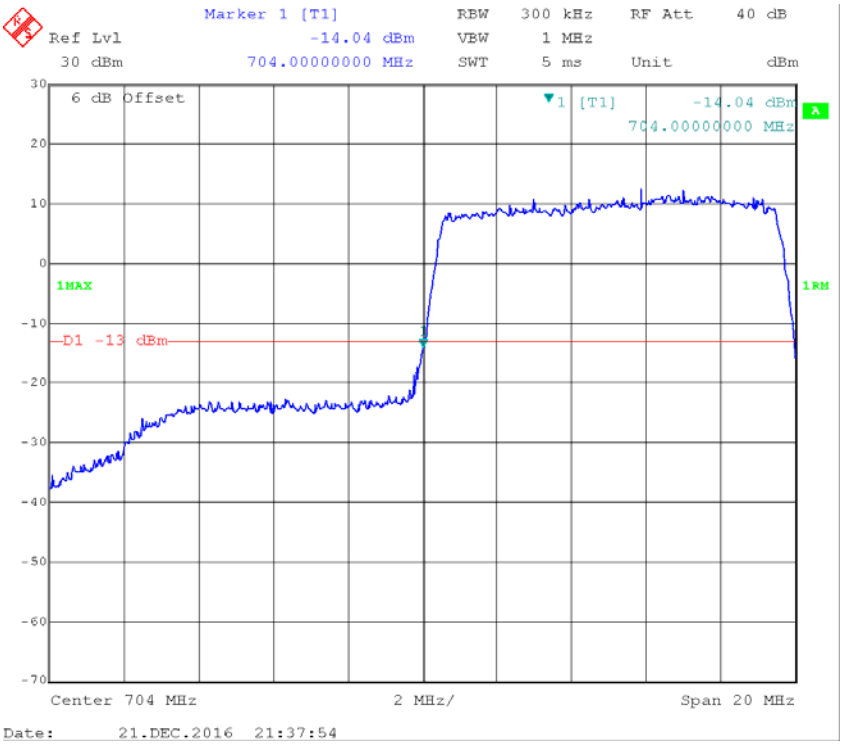
QPSK_5MHz_ 25 RB_ Left



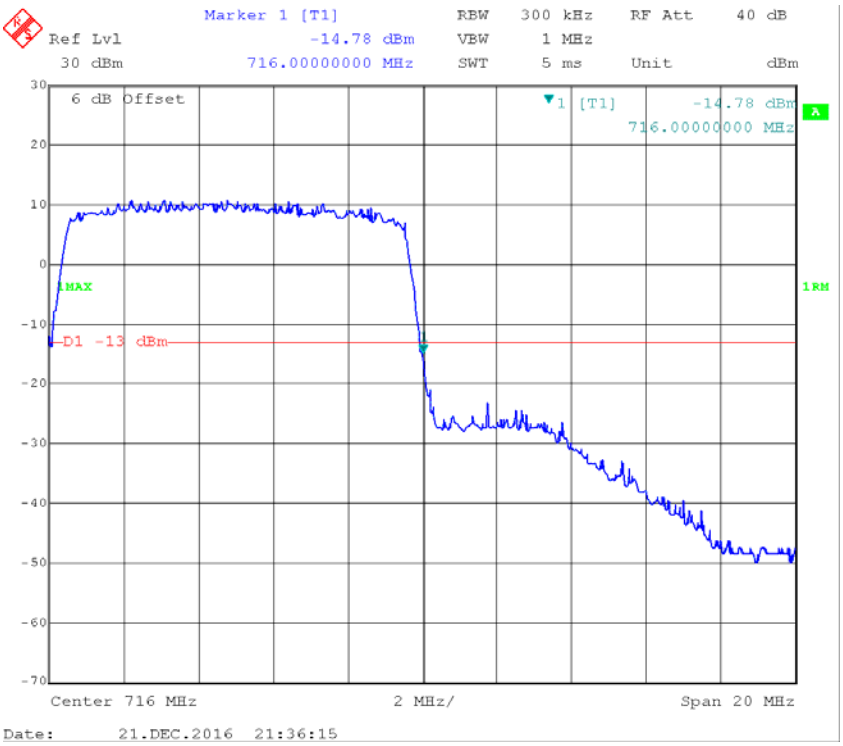
QPSK_5MHz_ 25 RB_ Right



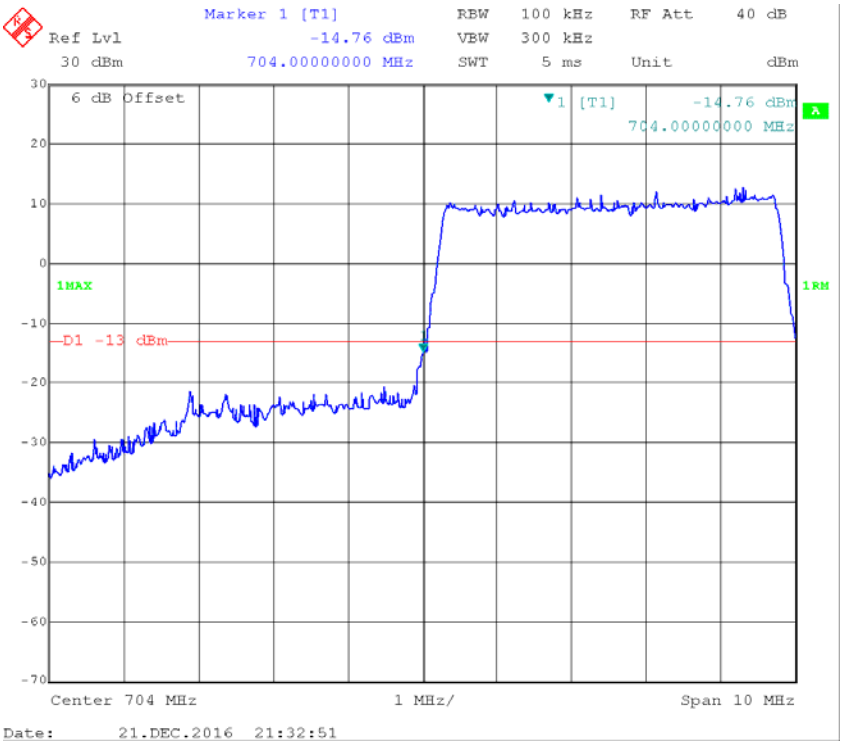
QPSK_10MHz_ 50 RB_ Left



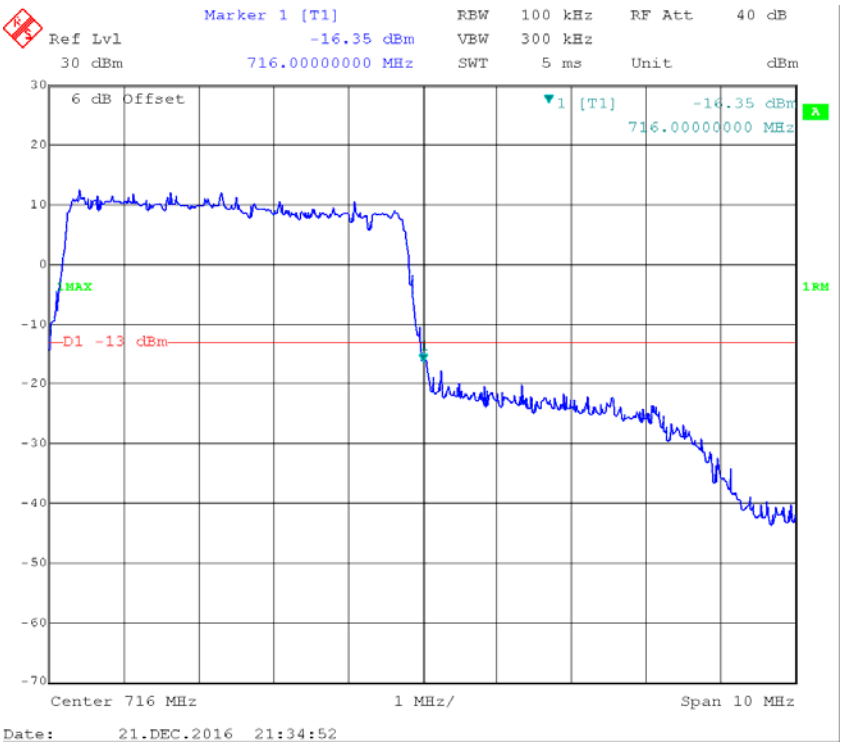
QPSK_10MHz_ 50 RB_ Right



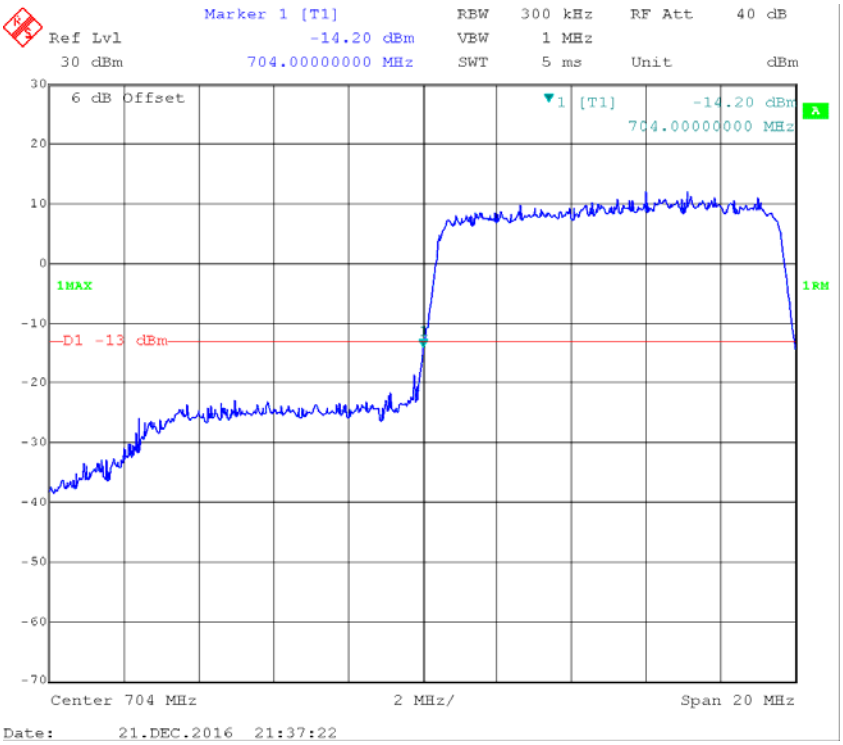
16QAM_5MHz_ 25 RB_ Left



16QAM_5MHz_ 25 RB_ Right



16QAM_10MHz_ 50 RB_ Left



16QAM_10MHz_ 50 RB_ Right

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

Applicable Standard

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

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

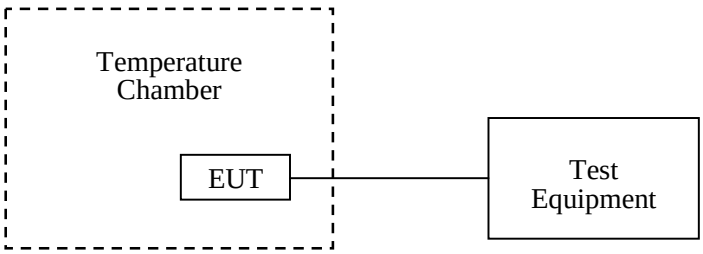
According to §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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	2016-12-02	2017-12-01
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	2016-11-23	2017-11-23
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:	26.3 °C
Relative Humidity:	41 %
ATM Pressure:	100.8kPa

The testing was performed by Tom Tang on 2016-12-12.

Cellular Band (Part 22H)

GMSK, Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	25	0.030	2.5
-20	3.8	26	0.031	2.5
-10	3.8	22	0.026	2.5
0	3.8	26	0.031	2.5
10	3.8	24	0.029	2.5
20	3.8	33	0.039	2.5
30	3.8	28	0.033	2.5
40	3.8	25	0.030	2.5
50	3.8	33	0.039	2.5
25	3.6	33	0.039	2.5
25	4.35	30	0.036	2.5

Cellular Band (Part 22H)

EDGE, Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	-7	-0.008	2.5
-20	3.8	-5	-0.006	2.5
-10	3.8	25	0.030	2.5
0	3.8	26	0.031	2.5
10	3.8	1	0.001	2.5
20	3.8	-9	-0.011	2.5
30	3.8	-4	-0.005	2.5
40	3.8	25	0.030	2.5
50	3.8	33	0.039	2.5
20	3.5	-5	-0.006	2.5
20	4.2	25	0.030	2.5

PCS Band (Part 24E)

GMSK, Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	30	0.016	Pass
-20	3.8	35	0.019	Pass
-10	3.8	33	0.018	Pass
0	3.8	38	0.020	Pass
10	3.8	33	0.018	Pass
20	3.8	32	0.017	Pass
30	3.8	27	0.014	Pass
40	3.8	30	0.016	Pass
50	3.8	24	0.013	Pass
25	3.6	28	0.015	Pass
25	4.35	27	0.014	Pass

PCS Band (Part 24E)

EDGE, Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	38	0.020	Pass
-20	3.8	33	0.018	Pass
-10	3.8	5	-0.003	Pass
0	3.8	28	0.015	Pass
10	3.8	27	0.014	Pass
20	3.8	6	-0.001	Pass
30	3.8	4	0.001	Pass
40	3.8	4	0.001	Pass
50	3.8	2	-0.002	Pass
20	3.5	28	0.015	Pass
20	4.2	27	0.014	Pass

WCDMA Band V :

Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	23	0.027	2.5
-20	3.8	11	0.013	2.5
-10	3.8	12	0.014	2.5
0	3.8	14	0.017	2.5
10	3.8	8	0.010	2.5
20	3.8	16	0.019	2.5
30	3.8	9	0.011	2.5
40	3.8	16	0.019	2.5
50	3.8	12	0.014	2.5
25	3.6	14	0.017	2.5
25	4.35	13	0.016	2.5

WCDMA Band II :

Middle Channel, f_c = 1880.0 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	20	0.011	Pass
-20	3.8	18	0.010	Pass
-10	3.8	16	0.009	Pass
0	3.8	13	0.007	Pass
10	3.8	18	0.010	Pass
20	3.8	13	0.007	Pass
30	3.8	14	0.007	Pass
40	3.8	16	0.009	Pass
50	3.8	16	0.009	Pass
25	3.6	12	0.006	Pass
25	4.35	15	0.008	Pass

WCDMA Band IV :

Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	15	0.009	Pass
-20	3.8	9	0.005	Pass
-10	3.8	11	0.006	Pass
0	3.8	15	0.009	Pass
10	3.8	9	0.005	Pass
20	3.8	10	0.006	Pass
30	3.8	13	0.008	Pass
40	3.8	8	0.005	Pass
50	3.8	12	0.007	Pass
25	3.6	15	0.009	Pass
25	4.35	13	0.008	Pass

LTE Band II:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 1880 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	15.43	0.0082	Pass
-20	3.8	14.85	0.0079	Pass
-10	3.8	14.33	0.0076	Pass
0	3.8	15.30	0.0081	Pass
10	3.8	15.01	0.0080	Pass
20	3.8	14.62	0.0078	Pass
30	3.8	14.32	0.0076	Pass
40	3.8	15.00	0.0080	Pass
50	3.8	14.89	0.0079	Pass
25	3.6	14.98	0.0080	Pass
25	4.35	14.59	0.0078	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c =1880 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	15.90	0.0085	Pass
-20	3.8	16.18	0.0086	Pass
-10	3.8	15.72	0.0084	Pass
0	3.8	14.97	0.0080	Pass
10	3.8	15.35	0.0082	Pass
20	3.8	14.64	0.0078	Pass
30	3.8	16.36	0.0087	Pass
40	3.8	15.82	0.0084	Pass
50	3.8	14.83	0.0079	Pass
25	3.6	16.47	0.0088	Pass
25	4.35	15.14	0.0081	Pass

LTE Band IV:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 1732.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
℃	V_{DC}	Hz	ppm	ppm
-30	3.8	19.93	0.0115	2.5
-20	3.8	18.67	0.0108	2.5
-10	3.8	19.13	0.0110	2.5
0	3.8	19.85	0.0115	2.5
10	3.8	19.98	0.0115	2.5
20	3.8	19.47	0.0112	2.5
30	3.8	20.17	0.0116	2.5
40	3.8	20.25	0.0117	2.5
50	3.8	19.10	0.0110	2.5
25	3.6	18.62	0.0107	2.5
25	4.35	19.47	0.0112	2.5

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c = 1732.5 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	17.68	0.0102	2.5
-20	3.8	18.57	0.0107	2.5
-10	3.8	18.29	0.0106	2.5
0	3.8	17.87	0.0103	2.5
10	3.8	17.67	0.0102	2.5
20	3.8	17.78	0.0103	2.5
30	3.8	18.85	0.0109	2.5
40	3.8	18.69	0.0108	2.5
50	3.8	17.19	0.0099	2.5
25	3.6	19.42	0.0112	2.5
25	4.35	18.33	0.0106	2.5

LTE Band VII:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 2535 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	25.29	0.0100	Pass
-20	3.8	25.30	0.0100	Pass
-10	3.8	26.19	0.0103	Pass
0	3.8	25.29	0.0100	Pass
10	3.8	24.73	0.0098	Pass
20	3.8	26.58	0.0105	Pass
30	3.8	24.80	0.0098	Pass
40	3.8	25.93	0.0102	Pass
50	3.8	24.26	0.0096	Pass
25	3.6	25.77	0.0102	Pass
25	4.35	26.68	0.0105	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c =836.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	23.00	0.0091	Pass
-20	3.8	22.83	0.0090	Pass
-10	3.8	22.67	0.0089	Pass
0	3.8	22.56	0.0089	Pass
10	3.8	23.98	0.0095	Pass
20	3.8	24.68	0.0097	Pass
30	3.8	23.96	0.0095	Pass
40	3.8	23.65	0.0093	Pass
50	3.8	24.00	0.0095	Pass
25	3.6	22.73	0.0090	Pass
25	4.35	23.24	0.0092	Pass

LTE Band 12:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 707.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	20.42	0.0289	Pass
-20	3.8	20.36	0.0288	Pass
-10	3.8	20.12	0.0284	Pass
0	3.8	19.70	0.0278	Pass
10	3.8	20.28	0.0287	Pass
20	3.8	20.47	0.0289	Pass
30	3.8	19.71	0.0279	Pass
40	3.8	20.03	0.0283	Pass
50	3.8	19.23	0.0272	Pass
25	3.6	18.94	0.0268	Pass
25	4.35	20.17	0.0285	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c =707.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	17.08	0.0241	Pass
-20	3.8	18.06	0.0255	Pass
-10	3.8	17.78	0.0251	Pass
0	3.8	18.65	0.0264	Pass
10	3.8	17.15	0.0242	Pass
20	3.8	17.47	0.0247	Pass
30	3.8	17.41	0.0246	Pass
40	3.8	17.83	0.0252	Pass
50	3.8	17.98	0.0254	Pass
25	3.6	17.07	0.0241	Pass
25	4.35	17.47	0.0247	Pass

LTE Band 17:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 710 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	16.87	0.0238	Pass
-20	3.8	16.21	0.0228	Pass
-10	3.8	15.87	0.0224	Pass
0	3.8	16.12	0.0227	Pass
10	3.8	16.01	0.0225	Pass
20	3.8	16.58	0.0234	Pass
30	3.8	15.96	0.0225	Pass
40	3.8	16.32	0.0230	Pass
50	3.8	16.20	0.0228	Pass
25	3.6	16.06	0.0226	Pass
25	4.35	16.00	0.0225	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c =710 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	18.03	0.0254	Pass
-20	3.8	18.42	0.0259	Pass
-10	3.8	19.27	0.0271	Pass
0	3.8	18.44	0.0260	Pass
10	3.8	18.22	0.0257	Pass
20	3.8	18.77	0.0264	Pass
30	3.8	18.85	0.0265	Pass
40	3.8	18.37	0.0259	Pass
50	3.8	18.73	0.0264	Pass
25	3.6	18.74	0.0264	Pass
25	4.35	17.97	0.0253	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* *****