TESTING LABORATORY
CERTIFICATE#4323.01

FCC PART 27

FCC PART 90

FCC PART 22H, PART 24E

MEASUREMENT AND TEST REPORT

For

Shanghai SmartPeak Technology Co.,Ltd.

Block 2, No.20 Xuhongzhong Rd, Xuhui District, Shanghai, China

FCC ID: 2AJMSP1000

Report Type:	**Product Type:**
Original Report	POS Terminal

Test Engineer:	Hope Zhang
Report Number:	RSHA181219001-00B
Report Date:	2019-01-28
Reviewed By:	Oscar Ye RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu province, China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Shanghai SmartPeak Technology Co.,Ltd.
Tested Model	P1000
Product Type	POS Terminal
Dimension	170mm(L)*82mm(W)*56mm(H)
Power Supply	DC 5V from adapter and DC 7.4V from battery

Adapter information:
Model: ASSA65w-050200
Input: AC 100-240V, 50/60Hz 0.45A
Output: DC 5.0V, 2.0A

**All measurement and test data in this report was gathered from production sample serial number: 20181219001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2018-12-19)*

Objective

This type approval report is prepared on behalf of Shanghai SmartPeak Technology Co.,Ltd. in accordance with Part 2, Part 22-Subpart H and Part 24-Subpart E , Part 27 and Part 90 of the Federal Communication Commission's rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS, Part 15.247 DTS, Part 15.225 DXX submittals with FCC ID: 2AJMSP1000.

Test Methodology

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

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services
Part 27 – Miscellaneous wireless communications services
Part 90 – Private Land Mobile Radio Service

Applicable Standards: TIA/EIA 603-D.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	5.91dB
	1GHz~6GHz	4.68dB
	6GHz~18GHz	4.92dB
	18GHz~40GHz	5.21dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

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

The final qualification test was performed with the EUT operating at normal mode.

Channel List

Mode		Channel		Frequency (MHz)
GPRS/EGPRS 850		Low	128	824.2
		Middle	190	836.6
		High	251	848.8
GPRS/EGPRS 1900		Low	512	1850.2
		Middle	661	1880.0
		High	810	1909.8
WCDMA Band II		Low	9262	1852.4
		Middle	9400	1880.0
		High	9538	1907.6
WCDMA Band IV		Low	1312	1712.4
		Middle	1413	1732.6
		High	1513	1752.6
WCDMA Band V		Low	4132	826.4
		Middle	4183	836.6
		High	4233	846.6
LTE Band 2	1.4M	Low	18607	1850.7
		Middle	18900	1880.0
		High	19193	1909.3
	3M	Low	18615	1851.5
		Middle	18900	1880.0
		High	19185	1908.5
	5M	Low	18625	1852.5
		Middle	18900	1880.0
		High	19175	1907.5
	10M	Low	18650	1855.0
		Middle	18900	1880.0
		High	19150	1905.0
	15M	Low	18675	1857.5
		Middle	18900	1880.0
		High	19125	1902.5
	20M	Low	18700	1860.0
		Middle	18900	1880.0
		High	19100	1900.0

Mode		Channel		Frequency (MHz)
LTE Band 4	1.4M	Low	19957	1710.7
		Middle	20175	1732.5
		High	20393	1754.3
	3M	Low	19965	1711.5
		Middle	20175	1732.5
		High	20385	1753.5
	5M	Low	19975	1712.5
		Middle	20175	1732.5
		High	20375	1752.5
	10M	Low	20000	1715.0
		Middle	20175	1732.5
		High	20350	1750.0
	15M	Low	20025	1717.5
		Middle	20175	1732.5
		High	20325	1747.5
	20M	Low	20050	1720.0
		Middle	20175	1732.5
		High	20300	1745.0
LTE Band 5	1.4M	Low	20407	824.7
		Middle	20525	836.5
		High	20643	848.3
	3M	Low	20415	825.5
		Middle	20525	836.5
		High	20635	847.5
	5M	Low	20425	826.5
		Middle	20525	836.5
		High	20625	846.5
	10M	Low	20450	829.0
		Middle	20525	836.5
		High	20600	844.0
LTE Band 7	5M	Low	20775	2502.5
		Middle	21100	2535.0
		High	21425	2567.5
	10M	Low	20800	2505.0
		Middle	21100	2535.0
		High	21400	2565.0
	15M	Low	20825	2507.5
		Middle	21100	2535.0
		High	21375	2562.5
	20M	Low	20850	2510.0
		Middle	21100	2535.0
		High	21350	2560.0

Mode		Channel		Frequency (MHz)
LTE Band 12	1.4M	Low	23017	699.7
		Middle	23095	707.5
		High	23173	715.3
	3M	Low	23025	700.5
		Middle	23095	707.5
		High	23165	714.5
	5M	Low	23035	701.5
		Middle	23095	707.5
		High	23155	713.5
	10M	Low	23060	704.0
		Middle	23095	707.5
		High	23130	711.0
LTE Band 13	5M	Low	23205	779.5
		Middle	23230	782.0
		High	23255	784.5
	10M	Low	/	/
		Middle	23230	782.0
		High	/	/
LTE Band 25	1.4M	Low	26047	1850.7
		Middle	26365	1882.5
		High	26683	1914.3
	3M	Low	26055	1851.5
		Middle	26683	1882.5
		High	26675	1913.5
	5M	Low	26065	1852.5
		Middle	26683	1882.5
		High	26665	1912.5
	10M	Low	26090	1855.0
		Middle	26683	1882.5
		High	26640	1910.0
	15M	Low	26115	1857.5
		Middle	26683	1882.5
		High	26615	1907.5
	20M	Low	26140	1860.0
		Middle	26683	1882.5
		High	26590	1905.0

Mode		Channel		Frequency (MHz)
LTE Band 26	1.4M	Low	26697	814.7
		Middle	26915	836.5
		High	27033	848.3
	3M	Low	26705	815.5
		Middle	26915	836.5
		High	27025	847.5
	5M	Low	26715	816.5
		Middle	26915	836.5
		High	27015	846.5
	10M	Low	26740	819.0
		Middle	26915	836.5
		High	26990	844.0
	15M	Low	26765	821.5
		Middle	26915	836.5
		High	26965	841.5

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

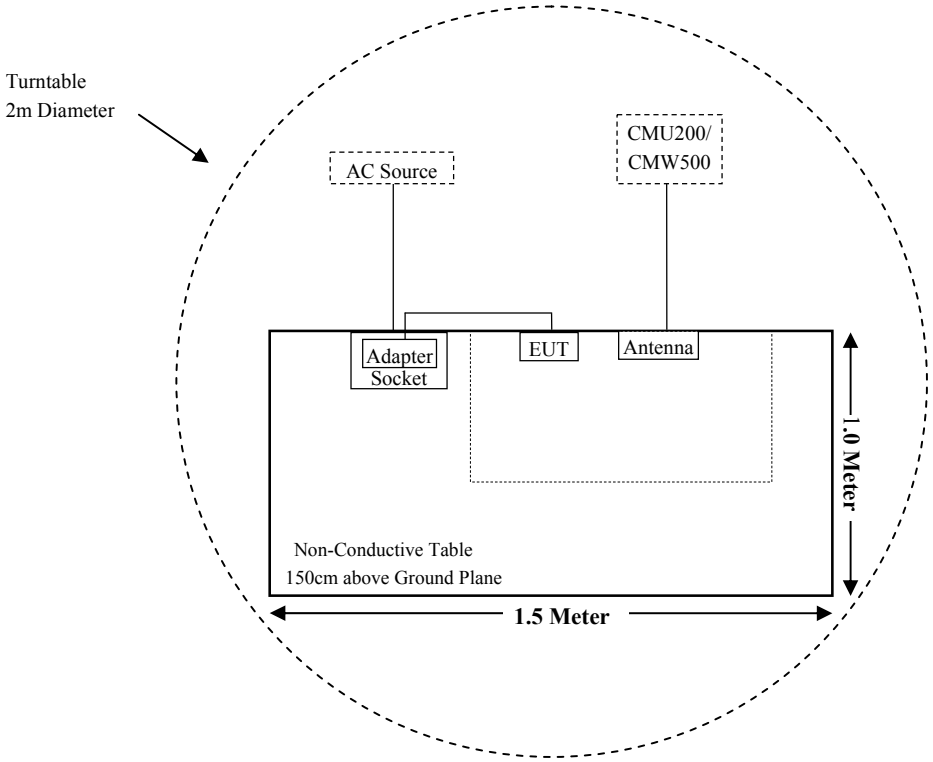
Manufacturer	Description	Model	Serial Number
Waylens Inc.	Antenna	/	/
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605
R & S	Wideband Radio Communication Tester	CMW500	104478

External I/O Cable

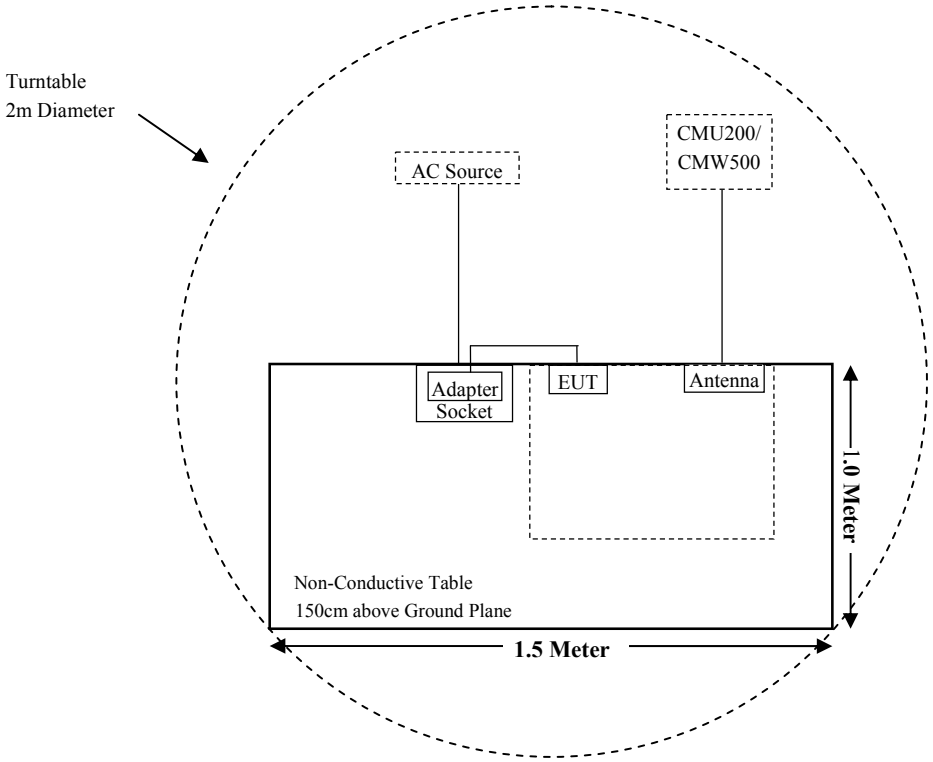
Cable Description	Length (m)	From Port	To
Power Cable	0.8	EUT	Adapter

Block Diagram of Test Setup

For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307(b)(1)& §2.1093	RF Exposure Information	Compliant
§2.1046; § 22.913 (a);§ 24.232 (c); § 27.50 (c)(d);§27.50(h) (2); § 90.635(b)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53; § 90.209	Occupied Bandwidth	Compliant
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53; § 90.691	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h) (m); § 90.691	Spurious Radiated Emissions	Compliant
§ 22.917 (a); § 24.238 (a); §27.53 (h) (m); § 90.691	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235; §27.54; § 90.213	Frequency stability	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test（Chamber 1#）					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2018-11-12	2019-11-11
HP	Signal Generator	HP 8341B	2624A00116	2018-08-29	2019-08-28
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Sonoma Instrunent	Pre-amplifier	310N	171205	2018-08-15	2019-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2018-08-15	2019-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-12	2019-11-11
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
Radiated Emission Test（Chamber 2#）					
HP	Signal Generator	HP 8341B	2624A00116	2018-08-29	2019-08-28
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2018-08-27	2019-08-26
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3115	6229	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
ETS-LINDGREN	Horn Antenna	3116	2516	2016-12-12	2019-12-12
Mini-Circuits	Amplifier	ZVA-183W-S+	220701818	2018-05-20	2019-05-19
EM Electronics Corporation	Amplifier	EM18G40G	060726	2018-03-22	2019-03-21
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2018-08-15	2019-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-12	2019-11-11
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-09-21	2019-09-20
Narda	Attenuator/6dB	10690812-2	26850-6	2018-01-10	2019-01-09
Narda	Attenuator/6dB	10690812-2	26850-6	2019-01-10	2020-01-09
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-12	2019-11-11
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
Mini-Ciruits	Power splitter	ZFRSC-14-S+	SF019411452	2018-11-10	2019-11-09
BACL	Temperature & Humidity Chamber	BTH-150	30023	2018-10-10	2019-10-09
EAST	Regulated DC Power Supply	MCH-303D-II	14070562	2018-10-10	2019-10-09
SmartPeak	RF Cable	SmartPeakC01	C01	Each Time	/

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

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1307,§2.1093.

Test Result

Compliance, please refer to the SAR report: RSH181219050-20

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E, Part 27 , Part 90 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 (c) (d); §27.50(h) (2) ; §90.635 (b) - RF OUTPUT POWER

Applicable Standards

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts (38.45dBm).

According to FCC §2.1046 and §24.232 (c), mobile and portable stations are limited to 2 watts (33dBm) EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

According to §27.50(c), the maximum EIRP must not exceed 3Watts (34.77dBm) for 699-716MHz.

According to §27.50(h) (2), Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

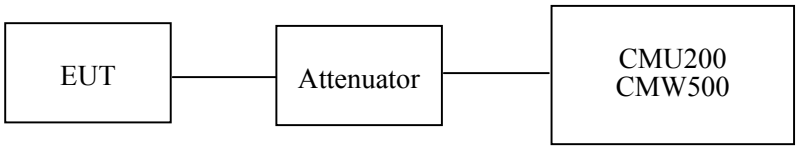
According to FCC §2.1046 and §90.635 (b),The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw)

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMU200 through sufficient attenuation.



Radiated Output Power:

The measurements procedures specified in ANSI/TIA-603-D were applied.

a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.

b) Key the transmitter, then rotate the EUT 360o azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).

c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.

d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used,raise and lower the test antenna to obtain a maximum reading.
LOSS = Generator Output Power (dBm) – Analyzer reading (dBm)

e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:
ERP (dBm) = LVL (dBm) + LOSS (dB)

f) The maximum ERP is the maximum value determined in the preceding step.
(Note: Effective Isotropic Radiated Power (EIRP) can be computed using the following:
EIRP (dBm) = ERP (dBm) + 2.15 (dB)

Test Data

Environmental Conditions

Temperature:	23.2℃
Relative Humidity:	51 %
ATM Pressure:	101.3kPa

The testing was performed by Hope Zhang on 2018-12-29.

Conducted Power:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.31	31.65	31.02	30.24	38.45
	190	836.6	32.46	31.67	31.10	30.25	38.45
	251	848.8	32.35	31.69	31.12	30.54	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	26.87	26.01	25.12	24.58	38.45
	190	836.6	26.54	25.94	25.03	24.55	38.45
	251	848.8	26.93	25.96	25.24	24.64	38.45

WCDMA Band V

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	Rel 99	1	22.76	22.16	22.38
		HSDPA	1	23.07	22.37	23.09
			2	23.33	22.51	22.91
			3	23.14	22.16	22.49
			4	23.49	22.78	22.99
		HSUPA	1	23.49	22.76	23.24
			2	23.32	22.39	23.11
			3	23.27	22.61	22.76
			4	23.18	22.76	23.48
			5	23.29	22.38	23.34
		HSPA+	1	22.59	22.19	22.81

PCS 1900 Band

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	30.31	29.21	28.61	27.94	33
	661	1880.0	30.29	29.31	28.52	27.93	33
	810	1909.8	30.42	29.28	28.54	27.83	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	26.59	25.74	24.87	24.12	33
	661	1880.0	26.67	25.61	24.98	24.13	33
	810	1909.8	26.54	25.68	24.95	24.05	33

WCDMA Band II

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	Rel 99	1	23.58	22.83	23.18
		HSDPA	1	23.28	23.15	24.02
			2	23.25	22.64	22.67
			3	22.98	22.59	23.08
			4	22.96	22.47	23.02
		HSUPA	1	22.77	22.51	23.34
			2	23.12	22.43	23.38
			3	23.02	22.69	23.38
			4	23.09	22.76	23.68
			5	22.94	22.77	23.16
		HSPA+	1	23.23	22.68	22.97

WCDMA Band IV

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band IV)	Normal	Rel 99	1	22.88	22.04	23.04
		HSDPA	1	22.66	22.32	22.57
			2	22.36	22.16	22.65
			3	22.87	22.31	22.63
			4	22.85	22.17	22.26
		HSUPA	1	22.97	22.45	23.32
			2	22.97	22.34	23.17
			3	22.87	22.59	23.43
			4	23.42	22.61	23.45
			5	22.66	22.57	23.20
		HSPA+	1	22.91	22.38	22.53

Maximum Output Power:

LTE Band 2

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	21.60	21.56	21.49
		1#3	21.85	21.51	21.82
		1#5	21.84	21.41	21.49
		3#0	21.46	21.88	21.26
		3#1	21.52	21.91	21.61
		3#3	21.38	21.50	21.33
		6#0	21.58	21.60	21.93
	16-QAM	1#0	21.76	21.46	21.33
		1#3	21.70	21.49	21.48
		1#5	21.36	21.88	21.39
		3#0	21.56	21.73	21.43
		3#1	21.30	21.59	21.33
		3#3	21.55	21.79	21.51
		6#0	21.68	21.53	21.47
3M	QPSK	1#0	21.64	21.48	21.45
		1#7	21.53	21.93	21.56
		1#14	21.60	21.51	21.63
		8#0	21.62	21.47	21.24
		8#4	21.95	21.77	21.84
		8#7	21.90	21.55	21.40
		15#0	21.80	21.50	21.56
	16-QAM	1#0	21.47	21.77	21.20
		1#7	21.23	21.46	21.22
		1#14	21.81	21.43	21.48
		8#0	21.61	21.19	21.49
		8#4	21.87	21.41	21.27
		8#7	21.84	21.33	21.57
		15#0	21.62	21.72	21.75

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.31	21.55	21.40
		1#12	21.48	21.50	21.52
		1#24	21.67	21.85	21.59
		12#0	21.57	21.81	21.35
		12#6	21.40	21.57	21.40
		12#11	21.88	21.53	21.34
		25#0	21.41	21.67	21.85
	16-QAM	1#0	21.61	21.83	21.46
		1#12	21.53	21.54	21.74
		1#24	21.79	21.78	21.37
		12#0	21.50	21.59	21.67
		12#6	21.42	21.43	21.62
		12#11	21.73	21.77	21.61
		25#0	21.68	21.38	21.81
10M	QPSK	1#0	21.45	21.68	21.20
		1#24	21.47	21.64	21.42
		1#49	21.37	21.31	21.25
		25#0	21.93	21.71	21.13
		25#12	21.33	21.32	21.66
		25#24	21.47	21.35	21.29
		50#0	21.71	21.20	21.27
	16-QAM	1#0	21.70	21.53	21.54
		1#24	21.41	21.27	21.57
		1#49	21.96	21.82	21.39
		25#0	21.32	21.68	21.73
		25#12	21.58	21.55	21.67
		25#24	21.56	21.83	21.88
		50#0	21.89	21.36	21.37

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.82	21.91	21.74
		1#37	21.51	21.70	21.29
		1#74	21.46	21.67	21.16
		36#0	21.50	21.78	21.49
		36#17	21.64	21.71	21.34
		36#35	21.58	21.46	21.46
		75#0	21.36	21.55	21.31
	16-QAM	1#0	21.63	21.59	21.11
		1#37	21.46	21.32	21.67
		1#74	21.63	21.64	21.66
		36#0	21.59	21.70	21.67
		36#17	21.75	21.56	21.43
		36#35	21.19	21.37	21.38
		75#0	21.43	21.17	21.85
20M	QPSK	1#0	21.27	21.40	21.54
		1#49	21.85	21.75	21.23
		1#99	21.89	21.52	21.63
		50#0	21.26	21.49	21.43
		50#24	21.30	21.51	21.58
		50#49	21.19	21.63	21.46
		100#0	21.75	21.79	21.78
	16-QAM	1#0	21.77	21.37	21.37
		1#49	21.60	21.37	21.58
		1#99	21.79	21.38	21.22
		50#0	21.56	21.27	21.32
		50#24	21.59	21.73	21.80
		50#49	21.55	21.93	21.40
		100#0	21.73	21.84	21.57

LTE Band 4

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	21.50	21.54	21.60
		1#3	21.79	21.74	21.16
		1#5	21.42	21.60	21.29
		3#0	21.32	21.34	21.60
		3#1	21.63	21.96	21.71
		3#3	21.78	21.55	21.55
		6#0	21.84	21.19	21.24
	16-QAM	1#0	21.45	21.65	21.59
		1#3	21.61	21.61	21.48
		1#5	21.34	21.80	21.51
		3#0	21.19	21.68	21.59
		3#1	21.94	21.19	21.39
		3#3	21.38	21.43	21.61
		6#0	21.71	21.54	21.81
3M	QPSK	1#0	21.38	21.41	21.94
		1#7	21.65	21.59	21.69
		1#14	21.45	21.13	21.41
		8#0	21.14	21.37	22.02
		8#4	21.26	21.51	21.43
		8#7	21.63	21.65	21.41
		15#0	21.40	21.50	21.77
	16-QAM	1#0	21.27	21.36	21.21
		1#7	21.37	21.50	21.39
		1#14	21.26	21.12	21.84
		8#0	21.67	21.41	21.46
		8#4	21.78	21.53	21.47
		8#7	21.42	21.52	21.66
		15#0	21.44	21.27	21.92

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.29	21.39	21.67
		1#12	21.53	21.48	21.35
		1#24	21.52	21.69	21.51
		12#0	21.05	21.76	21.50
		12#6	21.69	21.73	21.54
		12#11	21.36	21.38	21.42
		25#0	21.15	21.67	21.66
	16-QAM	1#0	21.51	21.58	21.39
		1#12	21.96	21.86	21.15
		1#24	21.54	21.78	21.29
		12#0	21.40	21.66	21.36
		12#6	21.50	21.90	21.66
		12#11	21.39	21.69	21.32
		25#0	21.42	21.43	21.71
10M	QPSK	1#0	21.11	21.47	21.60
		1#24	21.62	21.75	21.85
		1#49	21.56	21.58	21.38
		25#0	21.55	21.52	21.29
		25#12	21.37	21.59	21.93
		25#24	21.31	21.37	21.72
		50#0	21.35	21.81	21.33
	16-QAM	1#0	21.53	21.75	21.71
		1#24	21.38	21.92	21.34
		1#49	21.56	21.58	21.49
		25#0	21.46	21.48	21.28
		25#12	21.52	21.84	21.80
		25#24	21.33	21.52	21.18
		50#0	21.59	21.43	21.57

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.31	21.57	21.52
		1#37	21.89	21.59	21.59
		1#74	21.56	21.50	22.01
		36#0	21.18	21.33	21.53
		36#17	21.70	21.34	21.63
		36#35	21.17	21.62	21.84
		75#0	21.48	21.33	21.70
	16-QAM	1#0	21.52	21.33	22.00
		1#37	21.63	21.35	21.24
		1#74	21.69	21.60	21.37
		36#0	21.56	21.18	21.24
		36#17	21.96	21.28	21.54
		36#35	21.75	21.41	21.82
		75#0	21.61	21.67	21.49
20M	QPSK	1#0	21.29	21.61	21.86
		1#49	21.37	21.69	21.62
		1#99	21.55	21.80	21.66
		50#0	21.43	21.90	21.70
		50#24	21.55	21.44	21.59
		50#49	21.58	21.44	21.57
		100#0	21.51	21.15	21.68
	16-QAM	1#0	21.36	21.39	21.75
		1#49	21.60	21.49	21.94
		1#99	21.15	21.66	21.79
		50#0	21.16	21.55	21.43
		50#24	21.53	21.51	21.55
		50#49	21.49	21.31	21.77
		100#0	21.87	21.48	21.26

LTE Band 5

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	22.10	22.20	22.15
		1#3	22.31	22.04	22.42
		1#5	22.36	22.23	22.07
		3#0	22.06	22.16	22.30
		3#1	22.20	22.42	22.59
		3#3	22.07	22.38	22.20
		6#0	21.67	22.40	22.16
	16-QAM	1#0	22.18	22.09	21.99
		1#3	21.78	22.30	22.40
		1#5	21.85	22.05	21.93
		3#0	22.20	22.09	22.52
		3#1	22.00	22.25	22.15
		3#3	22.02	22.09	21.80
		6#0	21.92	21.97	22.52
3M	QPSK	1#0	22.13	22.21	22.15
		1#7	21.79	22.36	21.80
		1#14	21.76	22.32	22.12
		8#0	22.44	21.95	21.94
		8#4	22.43	22.39	21.77
		8#7	22.26	22.25	21.99
		15#0	22.10	22.38	22.24
	16-QAM	1#0	22.16	21.99	22.11
		1#7	22.11	22.26	22.16
		1#14	22.10	22.22	22.22
		8#0	21.90	22.22	22.51
		8#4	22.35	22.13	22.23
		8#7	22.11	22.31	22.34
		15#0	21.95	22.41	22.26

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.95	21.89	22.06
		1#12	22.06	22.23	22.50
		1#24	21.95	22.25	22.19
		12#0	22.28	22.29	21.86
		12#6	22.05	22.03	21.96
		12#11	22.00	21.83	22.16
		25#0	22.36	22.27	22.25
	16-QAM	1#0	21.79	22.31	22.41
		1#12	22.13	22.24	22.20
		1#24	22.06	22.55	21.96
		12#0	22.21	22.04	22.11
		12#6	22.49	22.24	22.47
		12#11	21.86	22.07	22.11
		25#0	21.77	21.86	22.05
10M	QPSK	1#0	22.01	21.83	22.22
		1#24	22.05	22.19	22.08
		1#49	21.72	22.30	21.98
		25#0	22.07	22.58	21.97
		25#12	22.23	22.19	22.01
		25#24	21.83	22.38	22.39
		50#0	22.22	22.51	22.08
	16-QAM	1#0	22.13	22.02	22.51
		1#24	22.00	22.11	22.24
		1#49	22.09	22.41	21.90
		25#0	22.06	22.00	21.81
		25#12	21.74	22.56	21.75
		25#24	22.29	22.03	22.02
		50#0	22.10	22.10	22.43

LTE Band 7

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.89	21.58	21.29
		1#12	21.71	21.69	21.63
		1#24	21.73	21.55	21.44
		12#0	21.98	21.46	21.44
		12#6	21.39	21.55	21.54
		12#11	21.49	21.35	21.50
		25#0	21.71	21.63	21.65
	16-QAM	1#0	21.56	21.86	21.52
		1#12	21.66	21.91	21.44
		1#24	21.80	21.56	21.87
		12#0	21.62	22.01	21.39
		12#6	21.37	21.82	21.48
		12#11	21.91	21.64	21.48
		25#0	21.49	21.80	21.68
10M	QPSK	1#0	21.45	21.49	21.67
		1#24	21.45	21.94	21.68
		1#49	21.95	21.60	21.13
		25#0	21.79	21.73	21.90
		25#12	21.54	21.57	21.63
		25#24	21.22	21.68	21.80
		50#0	21.60	21.47	21.45
	16-QAM	1#0	21.57	21.59	21.54
		1#24	21.61	21.50	21.71
		1#49	21.64	21.54	21.57
		25#0	21.54	21.51	21.62
		25#12	21.68	21.72	21.78
		25#24	21.74	21.78	21.62
		50#0	21.76	21.55	21.34

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.79	21.52	21.89
		1#37	21.39	21.65	21.48
		1#74	21.85	21.74	21.44
		36#0	21.54	21.54	21.63
		36#17	21.78	21.87	21.70
		36#35	21.63	21.90	21.26
		75#0	21.23	21.15	21.63
	16-QAM	1#0	21.83	21.42	21.44
		1#37	21.64	21.62	21.76
		1#74	21.38	21.38	21.56
		36#0	21.45	21.30	21.58
		36#17	21.93	21.51	21.56
		36#35	21.45	21.42	21.80
		75#0	21.56	21.34	21.54
20M	QPSK	1#0	21.48	21.45	21.62
		1#49	21.50	21.79	21.51
		1#99	21.55	21.27	21.80
		50#0	21.72	21.92	21.53
		50#24	21.72	21.50	21.29
		50#49	21.61	21.24	21.52
		100#0	21.62	21.47	21.78
	16-QAM	1#0	21.34	21.38	21.62
		1#49	21.81	21.68	21.78
		1#99	21.80	21.60	21.89
		50#0	21.82	21.54	21.57
		50#24	21.68	21.62	21.93
		50#49	21.42	21.13	21.96
		100#0	21.43	21.82	21.58

LTE Band 12

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	22.85	22.87	23.10
		1#3	22.88	23.34	22.89
		1#5	23.22	23.15	23.05
		3#0	23.16	23.14	22.84
		3#1	22.91	22.95	23.00
		3#3	23.27	23.04	23.27
		6#0	23.09	23.18	23.17
	16-QAM	1#0	23.28	22.97	23.24
		1#3	22.70	23.38	23.34
		1#5	23.08	23.03	23.17
		3#0	22.98	23.14	22.95
		3#1	22.85	22.92	23.25
		3#3	23.02	22.78	23.07
		6#0	22.90	23.08	23.04
3M	QPSK	1#0	22.81	22.97	23.57
		1#7	23.13	23.07	23.52
		1#14	23.08	23.11	22.72
		8#0	23.16	23.16	22.98
		8#4	23.13	23.45	22.80
		8#7	23.19	23.18	23.05
		15#0	23.45	23.26	23.01
	16-QAM	1#0	22.70	23.34	23.32
		1#7	23.17	23.32	23.23
		1#14	23.13	23.02	22.76
		8#0	23.09	23.16	22.95
		8#4	23.16	22.68	23.23
		8#7	23.18	23.28	23.21
		15#0	22.88	22.96	22.73

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	23.08	23.22	23.18
		1#12	23.09	22.69	22.91
		1#24	23.42	23.11	23.38
		12#0	23.03	22.73	23.21
		12#6	22.72	23.03	23.04
		12#11	22.89	23.04	23.10
		25#0	23.22	23.21	23.12
	16-QAM	1#0	23.25	22.98	23.42
		1#12	22.89	23.19	23.02
		1#24	23.12	23.14	23.27
		12#0	23.24	23.17	22.95
		12#6	23.33	22.99	23.25
		12#11	23.12	22.89	22.86
		25#0	23.14	23.44	23.12
10M	QPSK	1#0	22.84	23.12	23.46
		1#24	23.22	23.05	23.00
		1#49	22.71	23.14	22.95
		25#0	23.13	22.76	23.48
		25#12	23.26	23.36	23.30
		25#24	23.47	22.97	23.34
		50#0	22.91	23.32	23.15
	16-QAM	1#0	23.13	22.84	23.21
		1#24	23.25	23.08	23.17
		1#49	23.18	23.40	22.79
		25#0	23.35	22.99	22.92
		25#12	23.06	23.31	22.83
		25#24	23.35	23.21	23.15
		50#0	23.14	23.26	23.03

LTE Band 13

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.44	22.40	22.42
		1#12	22.68	22.48	22.33
		1#24	22.22	22.05	22.68
		12#0	22.06	22.30	22.30
		12#6	22.45	22.66	22.45
		12#11	22.39	22.54	22.64
		25#0	22.48	22.52	22.39
	16-QAM	1#0	22.31	22.27	22.48
		1#12	22.25	22.33	22.51
		1#24	22.05	22.42	22.42
		12#0	22.60	22.25	22.40
		12#6	22.84	22.25	22.71
		12#11	22.58	22.38	22.10
		25#0	22.62	22.35	22.52
10M	QPSK	1#0	/	22.48	/
		1#24	/	22.00	/
		1#49	/	22.43	/
		25#0	/	22.67	/
		25#12	/	22.60	/
		25#24	/	22.49	/
		50#0	/	22.54	/
	16-QAM	1#0	/	22.47	/
		1#24	/	22.16	/
		1#49	/	22.15	/
		25#0	/	22.15	/
		25#12	/	22.31	/
		25#24	/	22.14	/
		50#0	/	22.39	/

LTE Band 25

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	21.79	21.58	21.82
		1#3	21.89	21.58	21.85
		1#5	21.77	21.39	21.86
		3#0	21.59	21.41	21.26
		3#1	21.58	21.30	21.73
		3#3	21.57	21.55	21.57
		6#0	21.52	21.48	21.53
	16-QAM	1#0	21.54	21.57	21.80
		1#3	21.88	21.73	21.89
		1#5	21.81	21.67	21.64
		3#0	21.63	21.22	21.49
		3#1	21.92	21.95	21.99
		3#3	21.67	21.73	21.73
		6#0	21.52	21.49	21.84
3M	QPSK	1#0	21.14	21.47	21.64
		1#7	21.50	21.58	21.31
		1#14	21.93	21.59	21.91
		8#0	21.93	21.60	21.84
		8#4	21.65	21.26	21.65
		8#7	21.71	21.73	21.31
		15#0	21.49	21.63	21.74
	16-QAM	1#0	21.93	21.63	21.74
		1#7	21.98	21.65	21.54
		1#14	21.49	21.48	21.59
		8#0	21.29	21.89	21.65
		8#4	21.42	21.34	21.28
		8#7	21.51	21.57	22.06
		15#0	21.86	21.63	21.26

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.44	21.54	21.99
		1#12	21.35	21.87	21.66
		1#24	21.48	21.62	22.08
		12#0	21.73	21.40	21.70
		12#6	21.24	21.39	21.35
		12#11	21.55	21.72	21.51
		25#0	21.67	21.84	21.95
	16-QAM	1#0	21.60	21.32	21.30
		1#12	21.42	21.69	21.35
		1#24	21.76	21.51	21.40
		12#0	21.58	21.72	21.45
		12#6	21.64	21.57	21.65
		12#11	21.61	21.65	21.69
		25#0	21.95	21.80	21.57
10M	QPSK	1#0	21.52	21.60	21.91
		1#24	21.41	21.52	21.95
		1#49	21.84	21.73	21.75
		25#0	21.72	21.53	21.42
		25#12	21.64	21.48	21.68
		25#24	21.65	21.57	21.62
		50#0	21.26	21.26	21.41
	16-QAM	1#0	21.73	21.66	21.51
		1#24	21.81	21.86	21.77
		1#49	21.51	21.55	21.66
		25#0	21.86	21.93	21.72
		25#12	21.83	21.45	21.49
		25#24	21.40	21.55	21.57
		50#0	21.98	21.59	21.46

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.52	21.42	21.46
		1#37	21.65	21.44	21.54
		1#74	21.44	21.58	21.72
		36#0	21.77	21.59	21.69
		36#17	21.39	21.79	21.60
		36#35	21.17	21.77	21.62
		75#0	21.82	21.40	21.41
	16-QAM	1#0	21.14	21.77	21.75
		1#37	22.00	21.48	21.91
		1#74	22.02	21.63	21.33
		36#0	21.54	21.53	21.33
		36#17	21.33	21.43	21.81
		36#35	21.56	21.53	21.98
		75#0	21.77	21.75	21.99
20M	QPSK	1#0	21.88	21.62	21.68
		1#49	22.02	21.67	21.57
		1#99	21.46	21.48	21.29
		50#0	21.68	21.42	21.70
		50#24	21.54	21.51	21.51
		50#49	21.49	21.68	21.59
		100#0	21.64	21.92	21.27
	16-QAM	1#0	21.74	21.37	21.34
		1#49	21.31	21.65	21.84
		1#99	21.62	21.65	21.76
		50#0	21.39	21.73	21.56
		50#24	21.63	21.44	21.45
		50#49	21.87	21.83	21.38
		100#0	21.87	21.84	21.91

LTE Band 26

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	22.13	21.84	21.84
		1#3	21.85	21.53	21.61
		1#5	22.10	21.96	21.85
		3#0	22.26	22.01	22.01
		3#1	21.98	21.84	22.26
		3#3	21.64	22.20	22.10
		6#0	22.08	22.16	22.11
	16-QAM	1#0	22.16	22.08	21.77
		1#3	21.78	21.96	22.13
		1#5	21.85	21.79	21.68
		3#0	21.67	22.15	22.16
		3#1	21.83	22.28	21.71
		3#3	21.95	21.70	21.91
		6#0	22.24	22.01	22.19
3M	QPSK	1#0	21.95	21.98	21.95
		1#7	21.79	21.97	21.81
		1#14	21.77	22.16	22.02
		8#0	21.92	21.88	22.15
		8#4	21.57	22.35	21.96
		8#7	22.21	22.13	21.93
		15#0	21.97	21.98	21.89
	16-QAM	1#0	22.00	21.67	21.61
		1#7	21.73	21.81	22.24
		1#14	21.96	21.95	21.99
		8#0	22.01	22.03	21.90
		8#4	21.89	21.70	21.69
		8#7	22.12	21.67	21.96
		15#0	21.97	21.84	21.89

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.94	21.49	21.94
		1#12	21.96	22.02	21.92
		1#24	21.56	21.60	21.80
		12#0	21.66	21.99	22.14
		12#6	21.83	22.17	21.92
		12#11	21.84	21.75	21.77
		25#0	22.03	21.55	21.96
	16-QAM	1#0	21.87	21.91	21.94
		1#12	21.91	21.84	22.09
		1#24	21.96	21.99	21.88
		12#0	22.09	21.63	21.94
		12#6	22.02	21.62	21.92
		12#11	21.98	21.68	21.78
		25#0	21.85	21.61	22.01
10M	QPSK	1#0	22.21	22.16	22.29
		1#24	21.78	21.73	21.70
		1#49	21.84	22.10	21.77
		25#0	21.68	22.10	21.96
		25#12	21.78	22.18	21.70
		25#24	21.69	21.80	22.23
		50#0	21.53	21.53	21.93
	16-QAM	1#0	21.50	22.13	22.10
		1#24	21.61	21.68	21.99
		1#49	22.17	21.76	21.91
		25#0	21.53	21.95	22.14
		25#12	21.55	21.89	21.88
		25#24	21.79	21.49	21.71
		50#0	22.01	21.63	21.64

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	22.12	21.88	21.70
		1#37	21.58	22.14	22.09
		1#74	21.96	22.03	22.22
		36#0	21.57	21.92	21.84
		36#17	21.86	21.82	21.81
		36#35	22.15	21.98	21.61
		75#0	21.81	21.94	21.79
	16-QAM	1#0	21.97	21.46	22.18
		1#37	22.10	21.88	22.03
		1#74	22.36	21.55	21.89
		36#0	21.46	22.02	21.86
		36#17	21.78	22.13	21.85
		36#35	21.98	21.87	22.19
		75#0	21.77	21.96	21.94

Peak-to-average ratio (PAR):

GSM850 Band:

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.35	13
	Middle	2.37	13
	High	2.35	13

Mode	**Channel**	**PAR (dB)**	**Limit (dB)**
EGPRS	Low	2.41	13
	Middle	2.39	13
	High	2.36	13

WCDMA Band V:

Mode	**Channel**	**PAR (dB)**	**Limit (dB)**
WCDMA (Rel99)	Low	2.42	≤ 13
	Middle	2.38	≤ 13
	High	2.45	≤ 13
WCDMA (HSDPA)	Low	2.35	≤ 13
	Middle	2.41	≤ 13
	High	2.46	≤ 13
WCDMA (HSUPA)	Low	2.39	≤ 13
	Middle	2.46	≤ 13
	High	2.37	≤ 13
WCDMA (HSPA+)	Low	2.46	≤ 13
	Middle	2.51	≤ 13
	High	2.47	≤ 13

PCS 1900 Band

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.25	13
	Middle	2.31	13
	High	2.39	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.36	13
	Middle	2.39	13
	High	2.45	13

WCDMA Band II

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	2.53	≤ 13
	Middle	2.68	≤ 13
	High	2.72	≤ 13
WCDMA (HSDPA)	Low	2.31	≤ 13
	Middle	2.38	≤ 13
	High	2.21	≤ 13
WCDMA (HSUPA)	Low	2.35	≤ 13
	Middle	2.48	≤ 13
	High	2.29	≤ 13
WCDMA (HSPA+)	Low	2.45	≤ 13
	Middle	2.61	≤ 13
	High	2.53	≤ 13

WCDMA Band IV

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	2.51	≤ 13
	Middle	2.61	≤ 13
	High	2.32	≤ 13
WCDMA (HSDPA)	Low	2.34	≤ 13
	Middle	2.35	≤ 13
	High	2.21	≤ 13
WCDMA (HSUPA)	Low	2.33	≤ 13
	Middle	2.42	≤ 13
	High	2.35	≤ 13
WCDMA (HSPA+)	Low	2.29	≤ 13
	Middle	2.46	≤ 13
	High	2.53	≤ 13

LTE Band 2

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit (dB)
QPSK	1 RB	20M	3.43	3.55	3.60	13
	100 RB		5.76	5.71	5.84	13
16-QAM	1 RB	20M	4.77	4.70	7.21	13
	100 RB		6.52	6.34	6.87	13

LTE Band 4

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.67	3.51	3.34	13
	100 RB		6.14	6.62	6.87	13
16-QAM	1 RB	20M	5.43	5.61	5.75	13
	100 RB		7.62	7.28	7.49	13

LTE Band 5

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	10M	3.43	3.42	3.67	13
	50 RB		5.88	5.13	6.23	13
16-QAM	1 RB	10M	5.11	5.81	5.98	13
	50 RB		6.08	6.22	6.19	13

LTE Band 7

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.89	3.54	3.16	13
	100 RB		6.83	6.47	6.58	13
16-QAM	1 RB	20M	5.33	5.91	5.60	13
	100 RB		7.53	7.08	7.19	13

LTE Band 25

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.81	3.68	3.46	13
	100 RB		6.26	6.38	6.61	13
16-QAM	1 RB	20M	5.65	5.35	5.71	13
	100 RB		7.88	7.91	7.73	13

LTE Band 26

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	15M	3.84	3.77	3.58	13
	75 RB		6.54	6.47	6.71	13
16-QAM	1 RB	15M	5.71	5.57	5.84	13
	75 RB		7.93	7.96	7.83	13

Radiated Power:

GSM Mode

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
GPRS 850, Middle Channel (ERP)										
836.6	94.36	12	211	H	30.90	0.63	-1.14	29.13	38.45	9.32
836.6	97.64	240	190	V	30.72	0.63	-1.14	28.95	38.45	9.50
EGPRS 850, Middle Channel (ERP)										
836.6	90.03	238	211	H	26.57	0.63	-1.14	24.80	38.45	13.65
836.6	92.45	275	132	V	25.53	0.63	-1.14	23.76	38.45	14.69
GPRS 1900, Middle Channel (EIRP)										
1880.0	94.35	10	123	H	21.22	0.85	8.81	29.37	33.00	3.63
1880.0	94.65	263	208	V	21.09	0.85	8.81	29.19	33.00	3.81
EGPRS 1900, Middle Channel (EIRP)										
1880.0	90.11	214	168	H	16.98	0.85	8.81	24.94	33.00	8.06
1880.0	90.78	257	102	V	17.22	0.85	8.81	25.18	33.00	7.82

WCDMA Mode

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Band V, Middle Channel(ERP)										
836.6	85.58	40	187	H	21.91	0.63	-1.14	20.14	38.45	18.31
836.6	88.81	201	130	V	21.79	0.63	-1.14	20.02	38.45	18.43
WCDMA Band II, Middle Channel(EIRP)										
1880.0	85.64	211	214	H	12.61	0.85	8.81	20.57	33.00	12.43
1880.0	85.37	210	206	V	11.91	0.85	8.81	19.87	33.00	13.13
WCDMA Band Ⅳ, Middle Channel(EIRP)										
1732.6	84.69	211	214	H	10.76	0.84	8.57	18.49	30.00	11.51
1732.6	85.96	210	206	V	10.05	0.84	8.57	17.78	30.00	12.22

EIRP:

LTE Band 2

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4M BW Middle Channel								
1880	H	83.20	10.47	0.85	8.81	18.43	33	14.57
1880	V	82.91	9.75	0.85	8.81	17.71	33	15.29
16-QAM 1.4M BW Middle Channel								
1880	H	84.01	11.28	0.85	8.81	19.24	33	13.76
1880	V	83.25	10.09	0.85	8.81	18.05	33	14.95
QPSK 3M BW Middle Channel								
1880	H	84.06	11.33	0.85	8.81	19.29	33	13.71
1880	V	83.28	10.12	0.85	8.81	18.08	33	14.92
16-QAM 3M BW Middle Channel								
1880	H	83.67	10.94	0.85	8.81	18.90	33	14.10
1880	V	82.91	9.75	0.85	8.81	17.71	33	15.29
QPSK 5M BW Middle Channel								
1880	H	83.54	10.81	0.85	8.81	18.77	33	14.23
1880	V	82.19	9.03	0.85	8.81	16.99	33	16.01
16-QAM 5M BW Middle Channel								
1880	H	82.94	10.21	0.85	8.81	18.17	33	14.83
1880	V	83.07	9.91	0.85	8.81	17.87	33	15.13
QPSK 10M BW Middle Channel								
1880	H	82.78	10.05	0.85	8.81	18.01	33	14.99
1880	V	83.21	10.05	0.85	8.81	18.01	33	14.99
16-QAM 10M BW Middle Channel								
1880	H	83.67	10.94	0.85	8.81	18.90	33	14.10
1880	V	83.18	10.02	0.85	8.81	17.98	33	15.02
QPSK 15M BW Middle Channel								
1880	H	83.48	10.75	0.85	8.81	18.71	33	14.29
1880	V	83.49	10.33	0.85	8.81	18.29	33	14.71
16-QAM 15M BW Middle Channel								
1880	H	84.01	11.28	0.85	8.81	19.24	33	13.76
1880	V	82.92	9.76	0.85	8.81	17.72	33	15.28
QPSK 20M BW Middle Channel								
1880	H	83.55	10.82	0.85	8.81	18.78	33	14.22
1880	V	82.88	9.72	0.85	8.81	17.68	33	15.32
16-QAM 20M BW Middle Channel								
1880	H	82.99	10.26	0.85	8.81	18.22	33	14.78
1880	V	83.07	9.91	0.85	8.81	17.87	33	15.13

LTE Band 4

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4M BW Middle Channel								
1732.5	H	81.64	8.41	0.84	8.57	16.14	30	13.86
1732.5	V	82.08	8.38	0.84	8.57	16.11	30	13.89
16-QAM 1.4M BW Middle Channel								
1732.5	H	81.68	8.45	0.84	8.57	16.18	30	13.82
1732.5	V	82.14	8.44	0.84	8.57	16.17	30	13.83
QPSK 3M BW Middle Channel								
1732.5	H	82.67	9.44	0.84	8.57	17.17	30	12.83
1732.5	V	81.34	7.64	0.84	8.57	15.37	30	14.63
16-QAM 3M BW Middle Channel								
1732.5	H	81.26	8.03	0.84	8.57	15.76	30	14.24
1732.5	V	81.64	7.94	0.84	8.57	15.67	30	14.33
QPSK 5M BW Middle Channel								
1732.5	H	81.52	8.29	0.84	8.57	16.02	30	13.98
1732.5	V	81.38	7.68	0.84	8.57	15.41	30	14.59
16-QAM 5M BW Middle Channel								
1732.5	H	81.64	8.41	0.84	8.57	16.14	30	13.86
1732.5	V	81.18	7.48	0.84	8.57	15.21	30	14.79
QPSK 10M BW Middle Channel								
1732.5	H	81.69	8.46	0.84	8.57	16.19	30	13.81
1732.5	V	81.29	7.59	0.84	8.57	15.32	30	14.68
16-QAM 10M BW Middle Channel								
1732.5	H	82.08	8.85	0.84	8.57	16.58	30	13.42
1732.5	V	81.37	7.67	0.84	8.57	15.40	30	14.60
QPSK 15M BW Middle Channel								
1732.5	H	81.77	8.54	0.84	8.57	16.27	30	13.73
1732.5	V	81.69	7.99	0.84	8.57	15.72	30	14.28
16-QAM 15M BW Middle Channel								
1732.5	H	81.81	8.58	0.84	8.57	16.31	30	13.69
1732.5	V	81.29	7.59	0.84	8.57	15.32	30	14.68
QPSK 20M BW Middle Channel								
1732.5	H	82.31	9.08	0.84	8.57	16.81	30	13.19
1732.5	V	82.16	8.46	0.84	8.57	16.19	30	14.81
16-QAM 20M BW Middle Channel								
1732.5	H	81.24	8.01	0.84	8.57	15.74	30	14.26
1732.5	V	81.16	7.46	0.84	8.57	15.19	30	14.81

LTE Band 5

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4M BW Middle Channel								
836.5	H	85.37	23.04	0.63	-1.1	21.31	38.45	17.14
836.5	V	89.97	22.98	0.63	-1.1	21.25	38.45	17.20
16-QAM 1.4M BW Middle Channel								
836.5	H	85.42	23.09	0.63	-1.1	21.36	38.45	17.09
836.5	V	89.77	22.78	0.63	-1.1	21.05	38.45	17.40
QPSK 3M BW Middle Channel								
836.5	H	84.75	22.42	0.63	-1.1	20.69	38.45	17.76
836.5	V	89.80	22.81	0.63	-1.1	21.08	38.45	17.37
16-QAM 3M BW Middle Channel								
836.5	H	85.04	22.71	0.63	-1.1	20.98	38.45	17.47
836.5	V	89.78	22.79	0.63	-1.1	21.06	38.45	17.39
QPSK 5M BW Middle Channel								
836.5	H	85.45	23.12	0.63	-1.1	21.39	38.45	17.06
836.5	V	89.80	22.81	0.63	-1.1	21.08	38.45	17.37
16-QAM 5M BW Middle Channel								
836.5	H	85.10	22.77	0.63	-1.1	21.04	38.45	17.41
836.5	V	89.66	22.67	0.63	-1.1	20.94	38.45	17.51
QPSK 10M BW Middle Channel								
836.5	H	84.89	22.56	0.63	-1.1	20.83	38.45	17.62
836.5	V	90.10	23.11	0.63	-1.1	21.38	38.45	17.07
16-QAM 10M BW Middle Channel								
836.5	H	84.73	22.40	0.63	-1.1	20.67	38.45	17.78
836.5	V	89.66	22.67	0.63	-1.1	20.94	38.45	17.51

LTE Band 7

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5M BW Middle Channel								
2535	H	80.15	8.86	0.89	10.05	18.02	33	14.98
2535	V	80.05	8.74	0.89	10.05	17.90	33	15.10
16-QAM 5M BW Middle Channel								
2535	H	79.92	8.63	0.89	10.05	17.79	33	15.21
2535	V	80.16	8.85	0.89	10.05	18.01	33	14.99
QPSK 10M BW Middle Channel								
2535	H	80.12	8.83	0.89	10.05	17.99	33	15.01
2535	V	79.94	8.63	0.89	10.05	17.79	33	15.21
16-QAM 10M BW Middle Channel								
2535	H	79.67	8.38	0.89	10.05	17.54	33	15.46
2535	V	80.09	8.78	0.89	10.05	17.94	33	15.06
QPSK 15M BW Middle Channel								
2535	H	80.22	8.93	0.89	10.05	18.09	33	14.91
2535	V	80.11	8.80	0.89	10.05	17.96	33	15.04
16-QAM 15M BW Middle Channel								
2535	H	80.14	8.85	0.89	10.05	18.01	33	14.99
2535	V	79.99	8.68	0.89	10.05	17.84	33	15.16
QPSK 20M BW Middle Channel								
2535	H	79.98	8.69	0.89	10.05	17.85	33	15.15
2535	V	79.89	8.58	0.89	10.05	17.74	33	15.26
16-QAM 20M BW Middle Channel								
2535	H	80.16	8.87	0.89	10.05	18.03	33	14.97
2535	V	80.11	8.80	0.89	10.05	17.96	33	15.04

LTE Band 12

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4M BW Middle Channel								
707.5	H	91.04	22.34	0.62	-1.71	20.01	34.77	18.44
707.5	V	89.58	22.27	0.62	-1.71	19.94	34.77	18.51
16-QAM 1.4M BW Middle Channel								
707.5	H	91.08	22.38	0.62	-1.71	20.05	34.77	18.40
707.5	V	89.55	22.24	0.62	-1.71	19.91	34.77	18.54
QPSK 3 M BW Middle Channel								
707.5	H	90.99	22.29	0.62	-1.71	19.96	34.77	18.49
707.5	V	90.00	22.69	0.62	-1.71	20.36	34.77	18.09
16-QAM 3M BW Middle Channel								
707.5	H	91.51	22.81	0.62	-1.71	20.48	34.77	17.97
707.5	V	89.65	22.34	0.62	-1.71	20.01	34.77	18.44
QPSK 5M BW Middle Channel								
707.5	H	91.00	22.30	0.62	-1.71	19.97	34.77	18.48
707.5	V	89.53	22.22	0.62	-1.71	19.89	34.77	18.56
16-QAM 5M BW Middle Channel								
707.5	H	91.11	22.41	0.62	-1.71	20.08	34.77	18.37
707.5	V	89.68	22.37	0.62	-1.71	20.04	34.77	18.41
QPSK 10M BW Middle Channel								
707.5	H	91.18	22.48	0.62	-1.71	20.15	34.77	18.30
707.5	V	89.53	22.22	0.62	-1.71	19.89	34.77	18.56
16-QAM 10M BW Middle Channel								
707.5	H	91.37	22.67	0.62	-1.71	20.34	34.77	18.11
707.5	V	89.77	22.46	0.62	-1.71	20.13	34.77	18.32

LTE Band 13

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5M BW Middle Channel								
782	H	88.66	21.06	0.62	-1.34	19.10	34.77	19.35
782	V	87.46	21.24	0.62	-1.34	19.28	34.77	19.17
16-QAM 5M BW Middle Channel								
782	H	89.24	21.64	0.62	-1.34	19.68	34.77	18.77
782	V	88.12	21.90	0.62	-1.34	19.94	34.77	18.51
QPSK 10M BW Middle Channel								
782	H	89.51	21.91	0.62	-1.34	19.95	34.77	18.50
782	V	88.05	21.83	0.62	-1.34	19.87	34.77	18.58
16-QAM 10M BW Middle Channel								
782	H	89.24	21.64	0.62	-1.34	19.68	34.77	18.77
782	V	88.10	21.88	0.62	-1.34	19.92	34.77	18.53

LTE Band 25

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4M BW Middle Channel								
1882.5	H	82.59	9.87	0.85	8.81	17.83	33	15.17
1882.5	V	82.64	9.50	0.85	8.81	17.46	33	15.54
16-QAM 1.4M BW Middle Channel								
1882.5	H	82.69	9.97	0.85	8.81	17.93	33	15.07
1882.5	V	82.37	9.23	0.85	8.81	17.19	33	15.81
QPSK 3M BW Middle Channel								
1882.5	H	83.04	10.32	0.85	8.81	18.28	33	14.72
1882.5	V	82.94	9.80	0.85	8.81	17.76	33	15.24
16-QAM 3M BW Middle Channel								
1882.5	H	82.84	10.12	0.85	8.81	18.08	33	14.92
1882.5	V	82.94	9.80	0.85	8.81	17.76	33	15.24
QPSK 5M BW Middle Channel								
1882.5	H	82.28	9.56	0.85	8.81	17.52	33	15.48
1882.5	V	82.67	9.53	0.85	8.81	17.49	33	15.51
16-QAM 5M BW Middle Channel								
1882.5	H	82.79	10.07	0.85	8.81	18.03	33	14.97
1882.5	V	82.89	9.75	0.85	8.81	17.71	33	15.29
QPSK 10M BW Middle Channel								
1882.5	H	83.36	10.64	0.85	8.81	18.60	33	14.40
1882.5	V	83.01	9.87	0.85	8.81	17.83	33	15.17
16-QAM 10M BW Middle Channel								
1882.5	H	82.29	9.57	0.85	8.81	17.53	33	15.47
1882.5	V	82.37	9.23	0.85	8.81	17.19	33	15.81
QPSK 15M BW Middle Channel								
1882.5	H	82.76	10.04	0.85	8.81	18.00	33	15.00
1882.5	V	82.22	9.08	0.85	8.81	17.04	33	15.96
16-QAM 15M BW Middle Channel								
1882.5	H	82.64	9.92	0.85	8.81	17.88	33	15.12
1882.5	V	82.66	9.52	0.85	8.81	17.48	33	15.52
QPSK 20M BW Middle Channel								
1882.5	H	82.48	9.76	0.85	8.81	17.72	33	15.28
1882.5	V	82.88	9.74	0.85	8.81	17.70	33	15.30
16-QAM 20M BW Middle Channel								
1882.5	H	82.49	9.77	0.85	8.81	17.73	33	15.27
1882.5	V	82.31	9.17	0.85	8.81	17.13	33	15.87

LTE Band 26

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4M BW Middle Channel								
836.5	H	115.47	20.14	0.63	-1.16	18.35	38.45	20.10
836.5	V	118.53	20.15	0.63	-1.16	18.36	38.45	20.09
16-QAM 1.4M BW Middle Channel								
836.5	H	115.36	20.03	0.63	-1.16	18.24	38.45	20.21
836.5	V	118.36	19.98	0.63	-1.16	18.19	38.45	20.26
QPSK 3M BW Middle Channel								
836.5	H	115.53	20.20	0.63	-1.16	18.41	38.45	20.04
836.5	V	118.19	19.81	0.63	-1.16	18.02	38.45	20.43
16-QAM 3M BW Middle Channel								
836.5	H	115.30	19.97	0.63	-1.16	18.18	38.45	20.27
836.5	V	118.26	19.88	0.63	-1.16	18.09	38.45	20.36
QPSK 5M BW Middle Channel								
836.5	H	115.28	19.95	0.63	-1.16	18.16	38.45	20.29
836.5	V	118.48	20.10	0.63	-1.16	18.31	38.45	20.14
16-QAM 5M BW Middle Channel								
836.5	H	115.31	19.98	0.63	-1.16	18.19	38.45	20.26
836.5	V	118.81	20.43	0.63	-1.16	18.64	38.45	19.81
QPSK 10M BW Middle Channel								
836.5	H	115.37	20.04	0.63	-1.16	18.25	38.45	20.20
836.5	V	118.81	20.43	0.63	-1.16	18.64	38.45	19.81
16-QAM 10M BW Middle Channel								
836.5	H	115.39	20.06	0.63	-1.16	18.27	38.45	20.18
836.5	V	118.36	19.98	0.63	-1.16	18.19	38.45	20.26
QPSK 15M BW Middle Channel								
836.5	H	115.79	20.46	0.63	-1.16	18.67	38.45	19.78
836.5	V	118.42	20.04	0.63	-1.16	18.25	38.45	20.20
16-QAM 15M BW Middle Channel								
836.5	H	115.71	20.38	0.63	-1.16	18.59	38.45	19.86
836.5	V	118.44	20.06	0.63	-1.16	18.27	38.45	20.18

Note:
All above data were tested without amplifier.
Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)
Margin (dB) = Limit (dBm) - Absolute Level (dBm)

FCC §2.1049, §22.917, §22.905 & §24.238; §27.53; §90.209- OCCUPIED BANDWIDTH

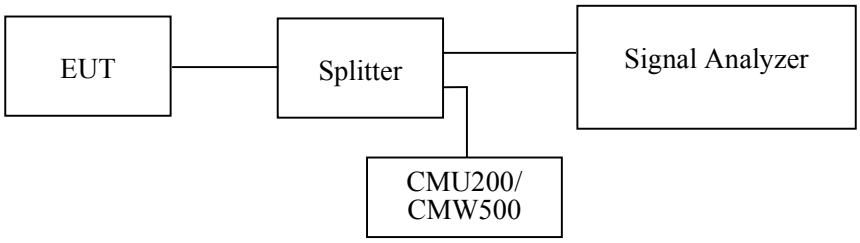
Applicable Standards

FCC 47 §2.1049, §22.917, §22.905 & §24.238, §90.209 and §27.53.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 5 kHz (Cellular /PCS) & 100 kHz (WCDMA), and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	23.2℃-23.5℃
Relative Humidity:	51 %-23%
ATM Pressure:	101.1kPa-103.3kPa

The testing was performed by Hope Zhang from 2018-12-22 to 2019-01-11.

EUT operation mode: Transmitting

Test Result: Compliance.

GSM 850 Band

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GPRS (GMSK)	836.6	0.319	0.244
EGPRS (8PSK)	836.6	0.315	0.244

WCDMA Band V

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (BPSK)	1880	4.749	4.168
WCDMA (HSDPA)	1880	4.770	4.168
WCDMA (HSUPA)	1880	4.790	4.148
WCDMA (HSPA+)	1880	4.770	4.148

PCS 1900 Band

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GPRS (GMSK)	1880	0.311	0.244
EGPRS (8PSK)	1880	0.309	0.244

WCDMA Band II

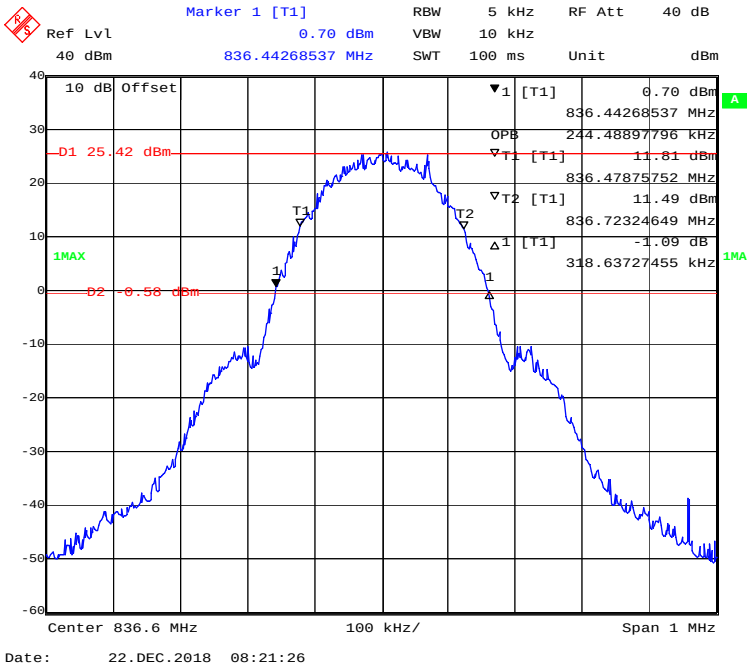
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (BPSK)	1880	4.729	4.168
WCDMA (HSDPA)	1880	4.729	4.168
WCDMA (HSUPA)	1880	4.749	4.168
WCDMA (HSPA+)	1880	4.749	4.168

WCDMA Band IV

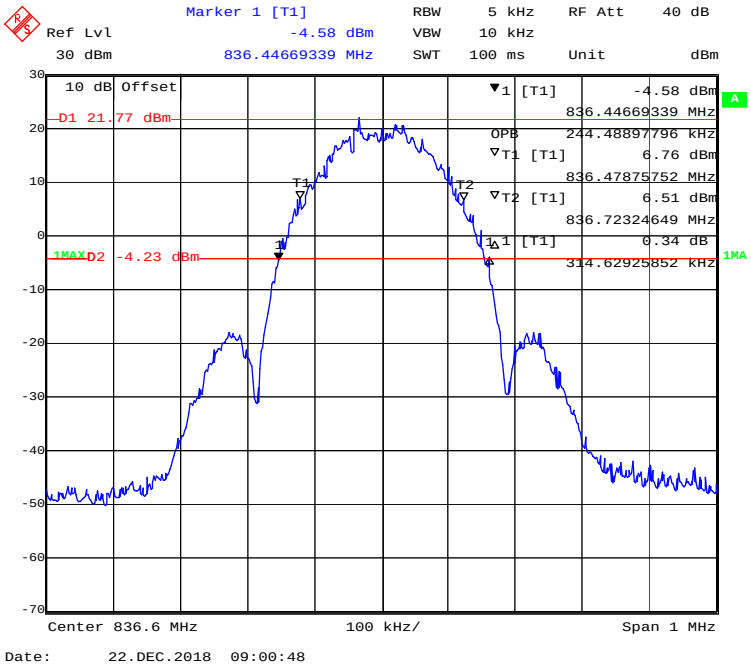
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (BPSK)	1732.6	4.770	4.168
WCDMA (HSDPA)	1732.6	4.770	4.168
WCDMA (HSUPA)	1732.6	4.749	4.168
WCDMA (HSPA+)	1732.6	4.770	4.168

GSM 850 Band

99% Occupied & 26 dB Emissions Bandwidth for GPRS (GMSK) Mode

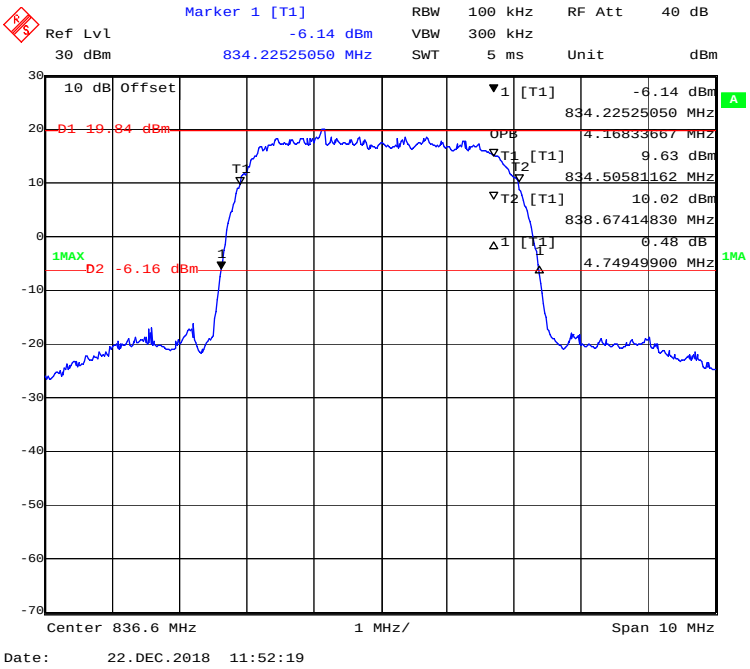


99% Occupied & 26 dB Emissions Bandwidth for EGPRS (8PSK) Mode

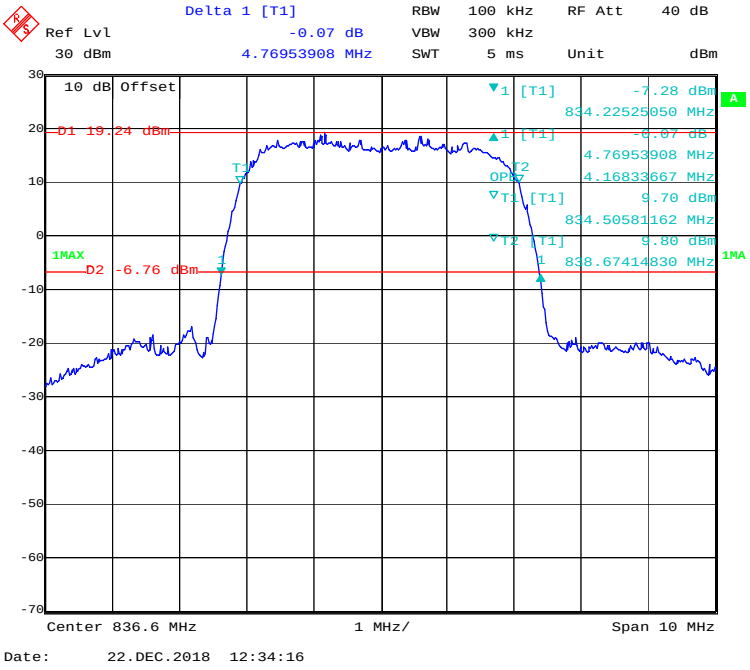


WCDMA Band V

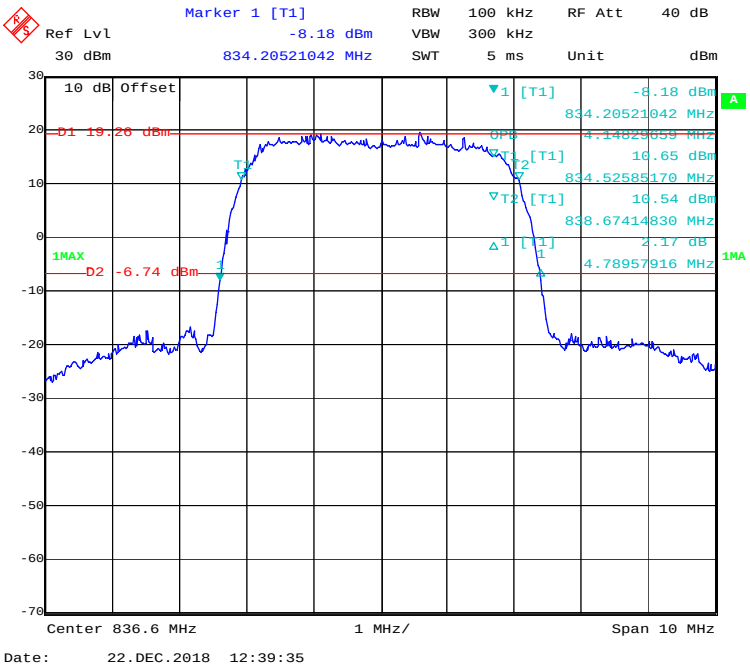
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode



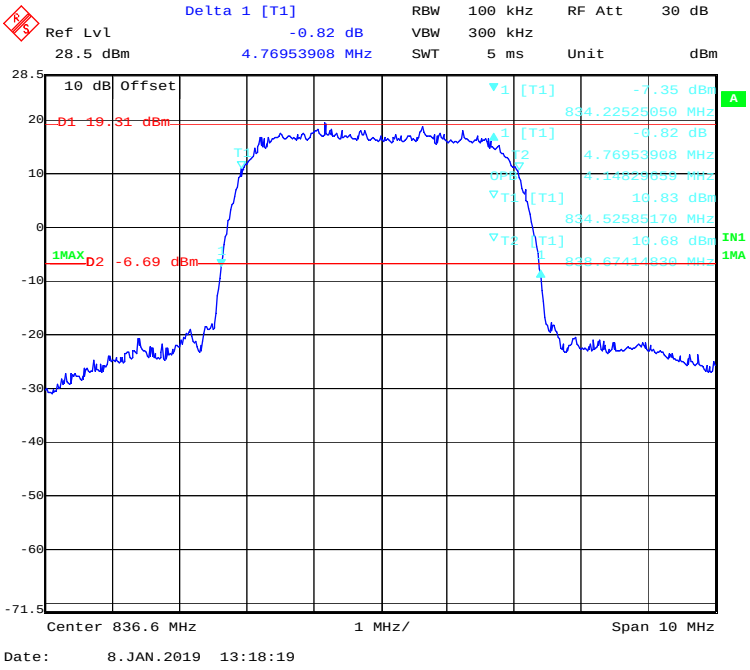
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSUPA) Mode

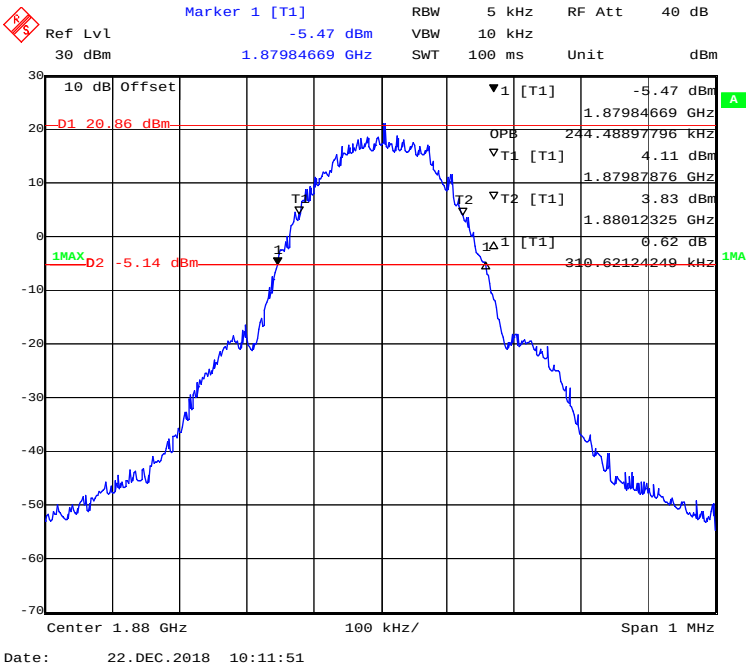


99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode

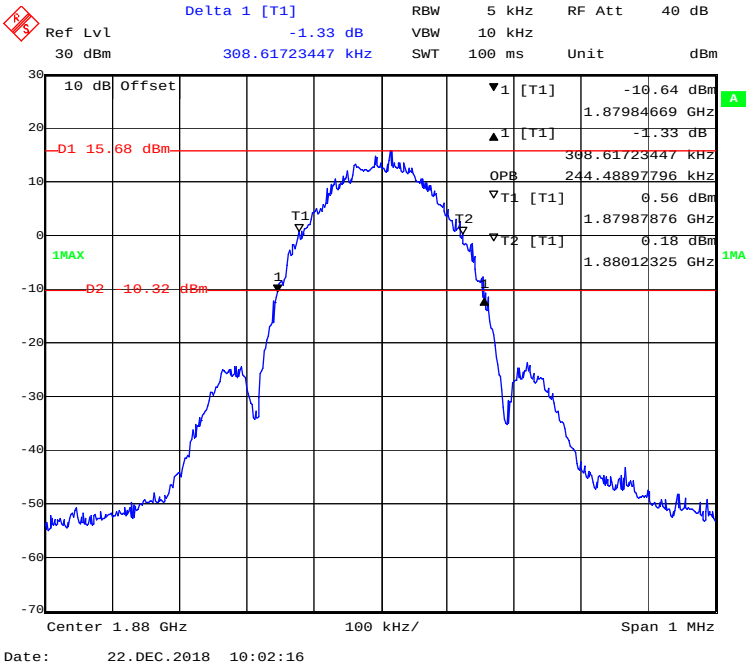


PCS 1900Band

99% Occupied & 26 dB Emissions Bandwidth for GPRS (GMSK) Mode

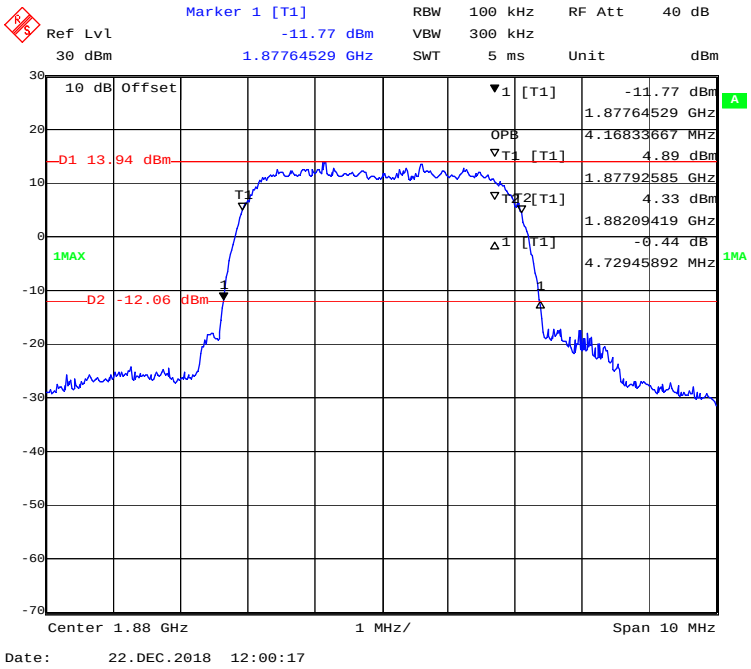


99% Occupied & 26 dB Emissions Bandwidth for EGPRS (8PSK) Mode

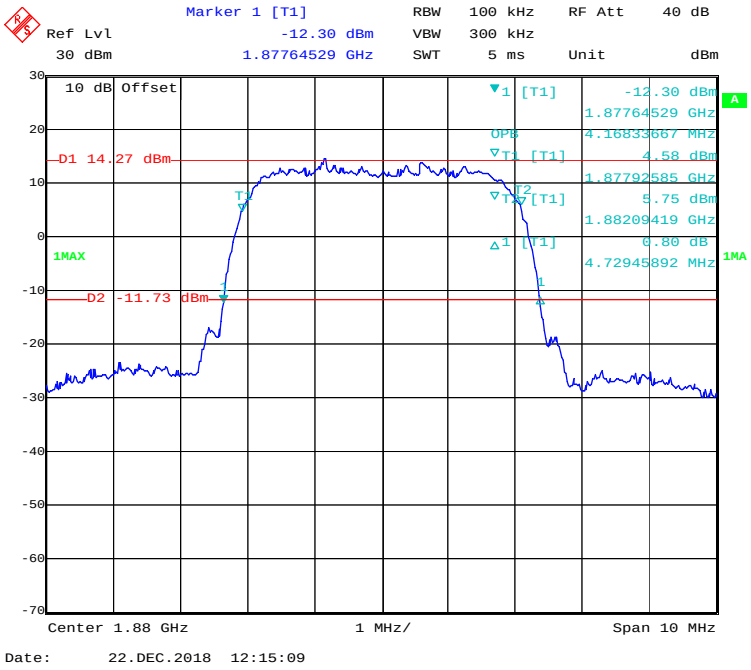


WCDMA Band II

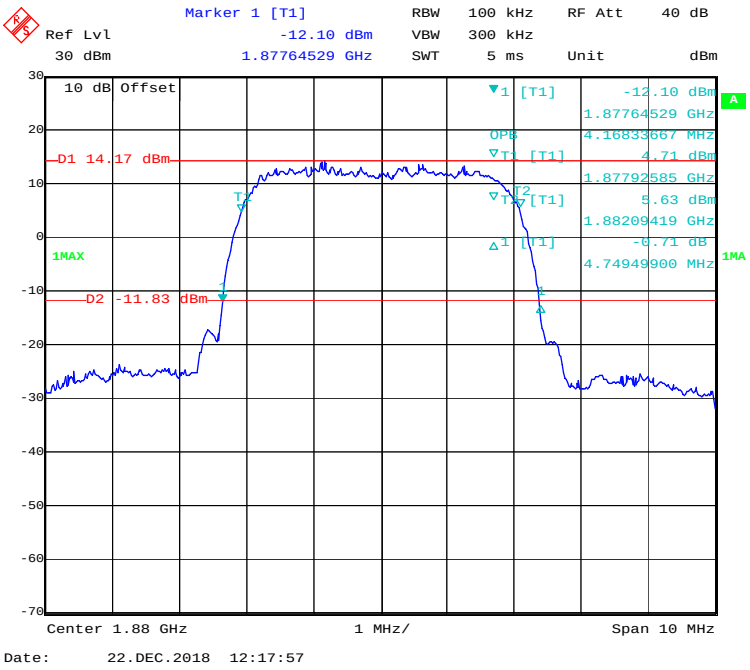
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode



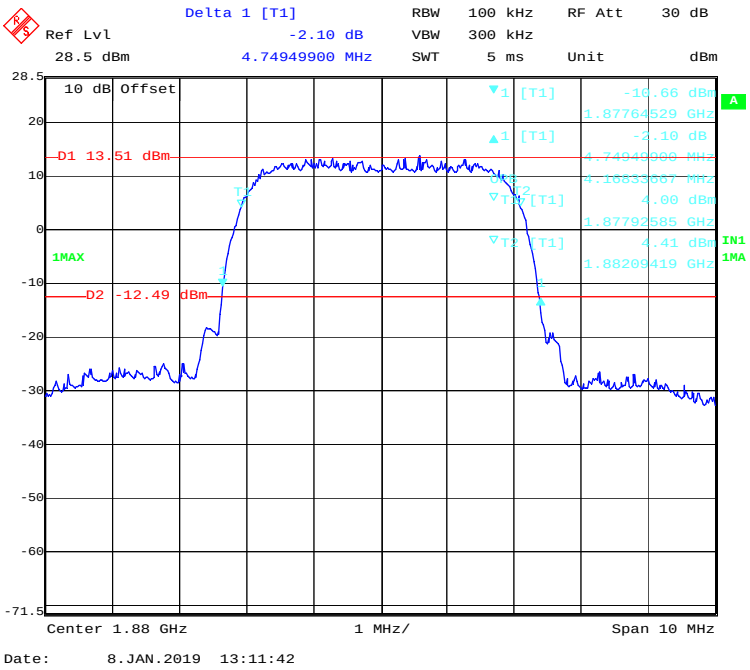
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSUPA) Mode

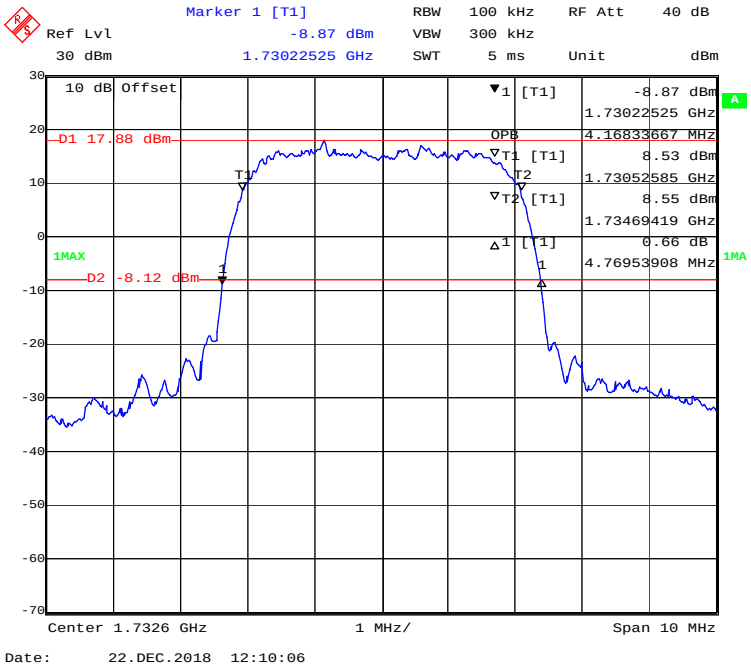


99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode

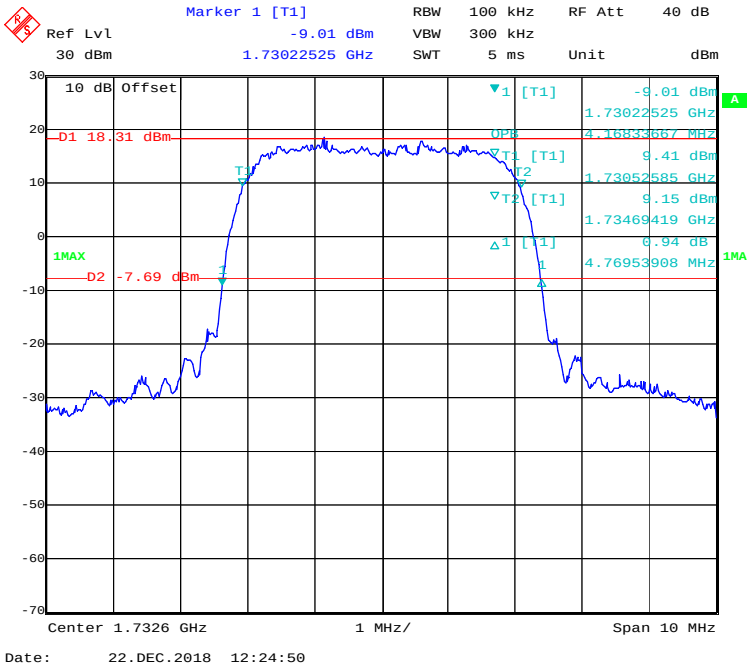


WCDMA Band IV

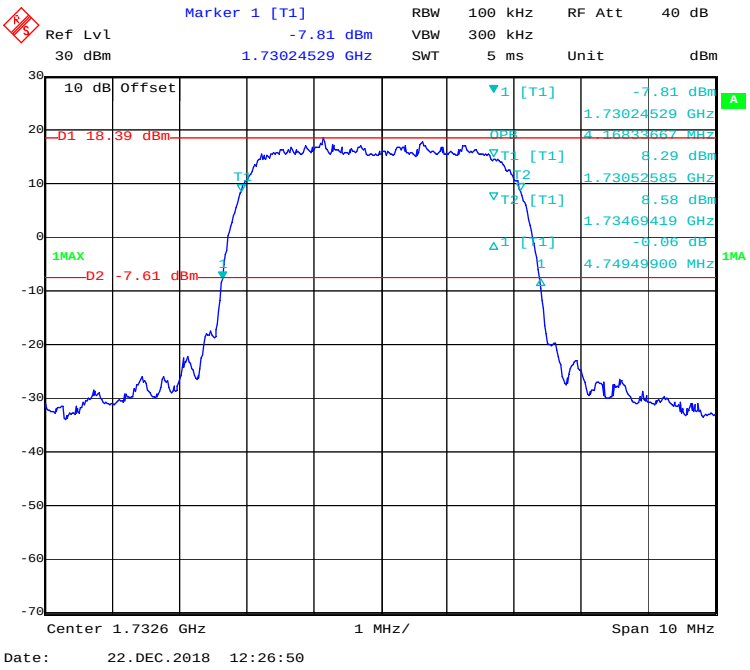
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode



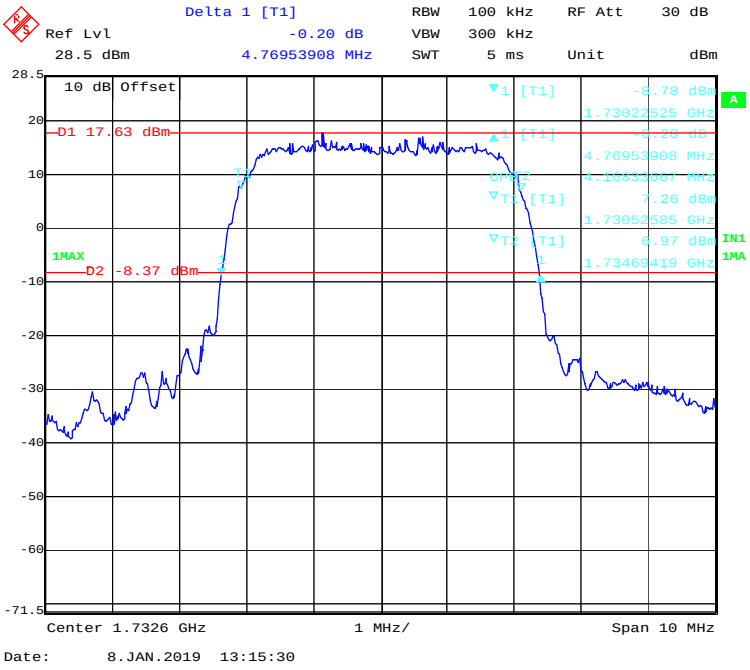
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSUPA) Mode



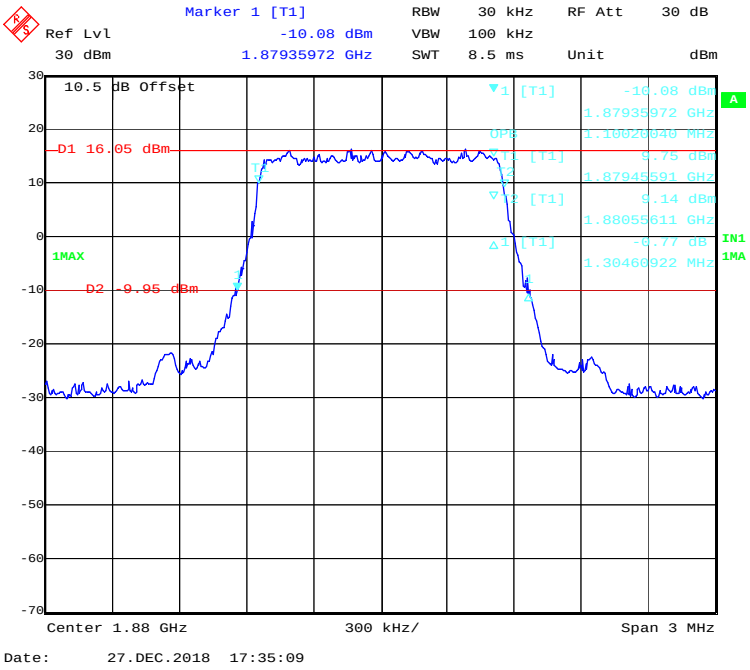
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode



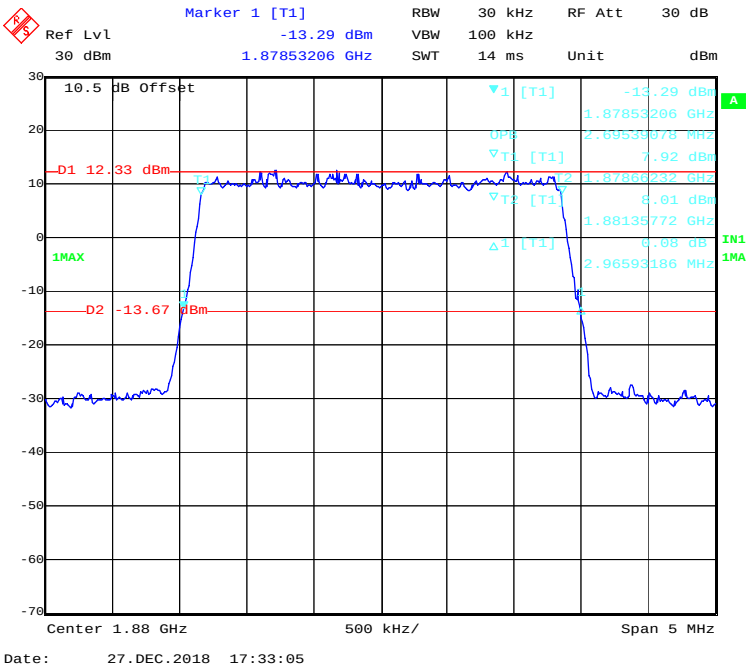
LTE Band 2:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.305	1.100
	3M		2.966	2.695
	5M		4.930	4.489
	10M		9.739	8.978
	15M		14.790	13.527
	20M		19.269	17.956
16-QAM	1.4M	Middle	1.311	1.100
	3M		2.966	2.695
	5M		4.935	4.489
	10M		9.619	8.938
	15M		14.669	13.467
	20M		19.319	17.956

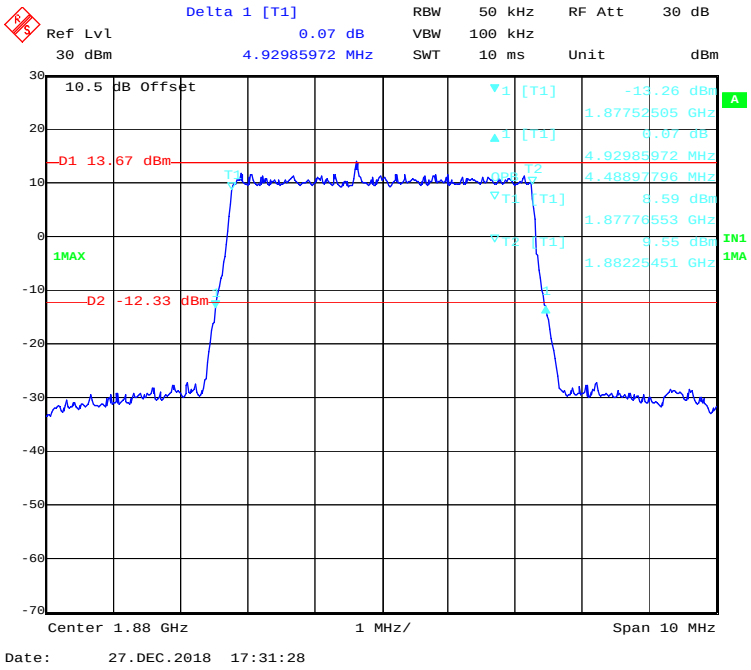
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



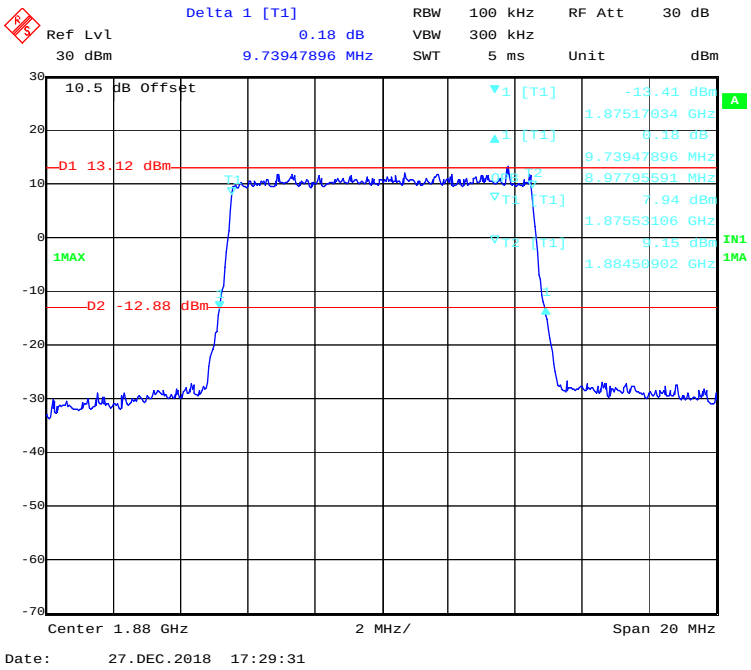
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



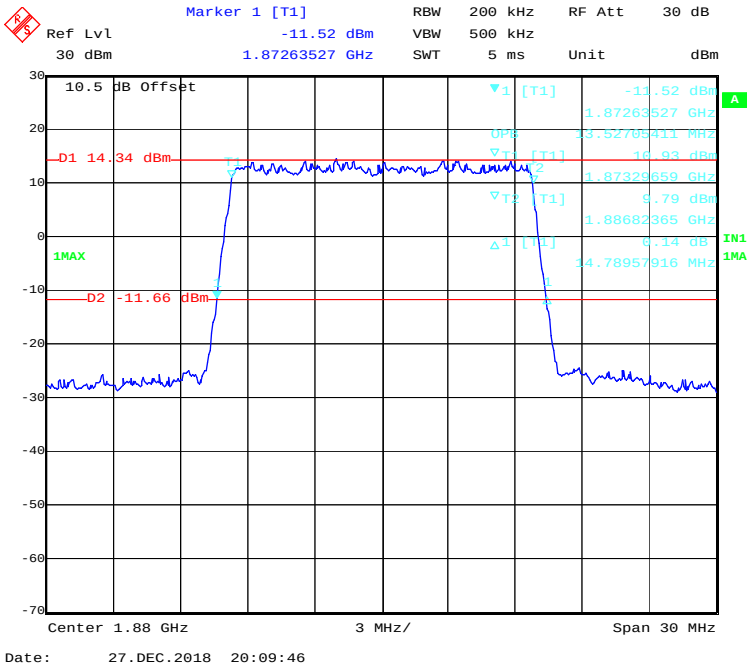
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



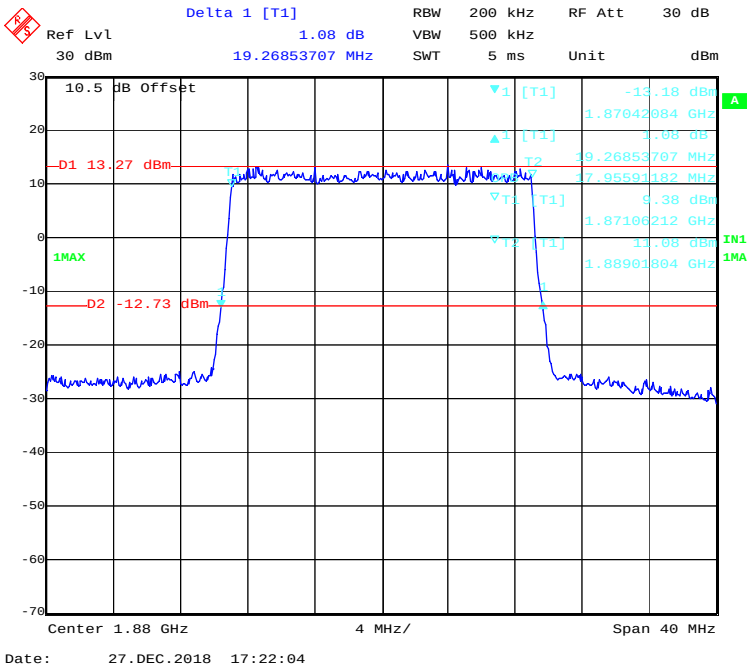
QPSK (10.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



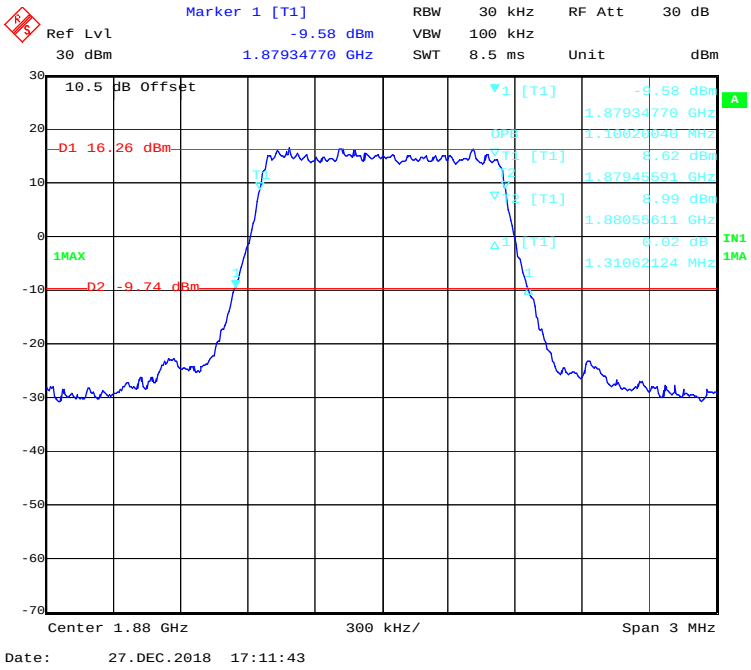
QPSK (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



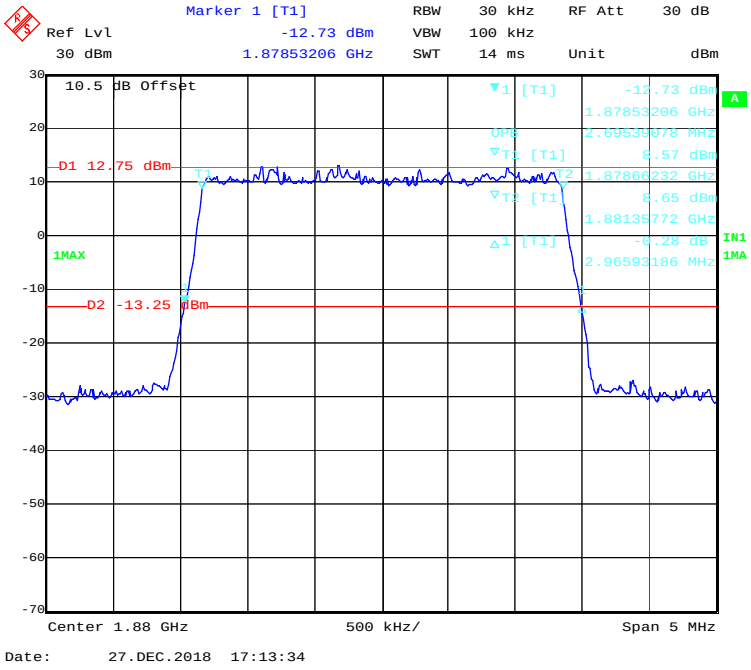
QPSK (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



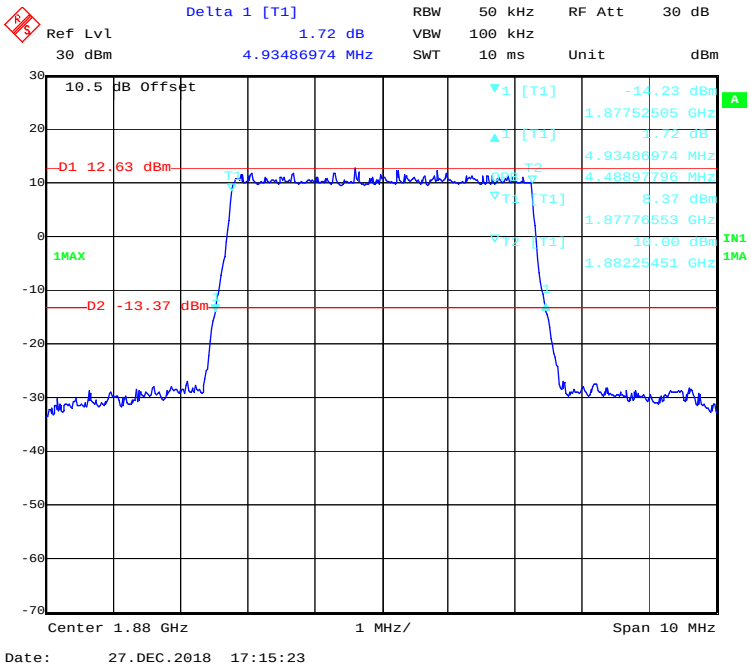
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



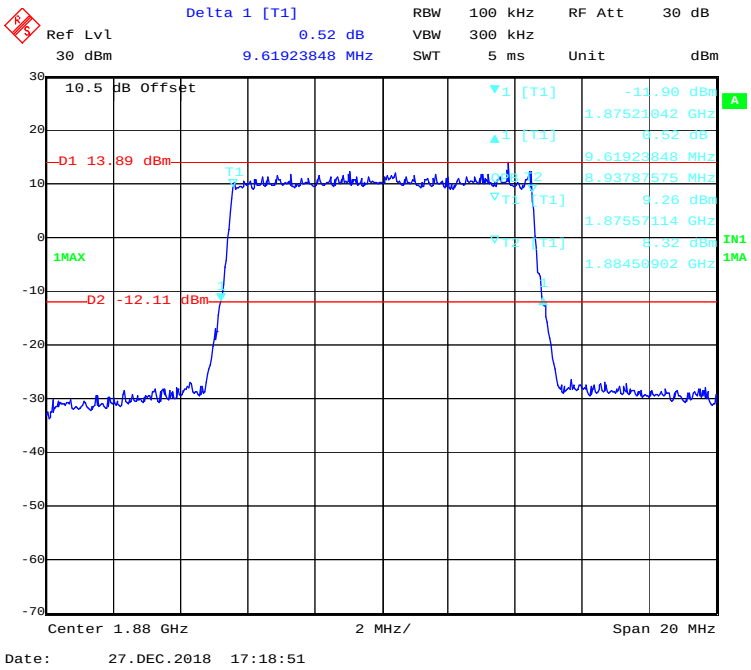
16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



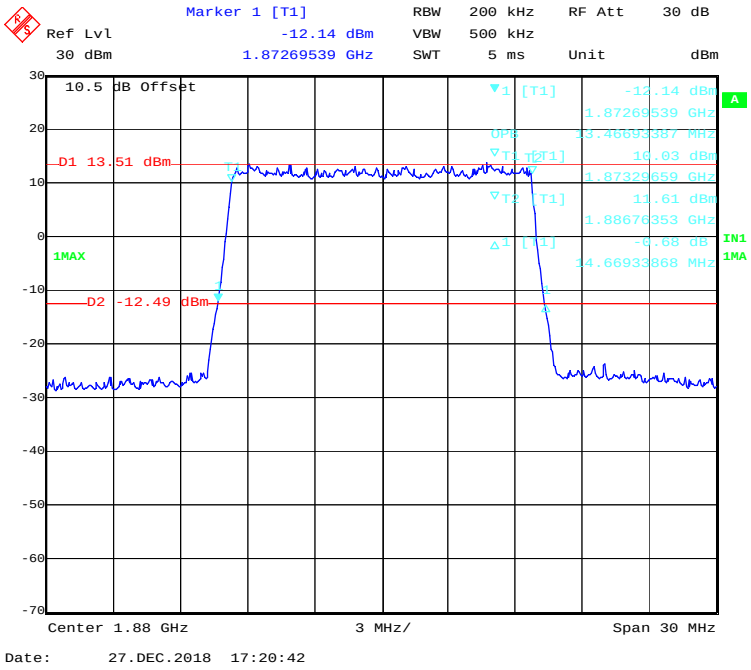
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



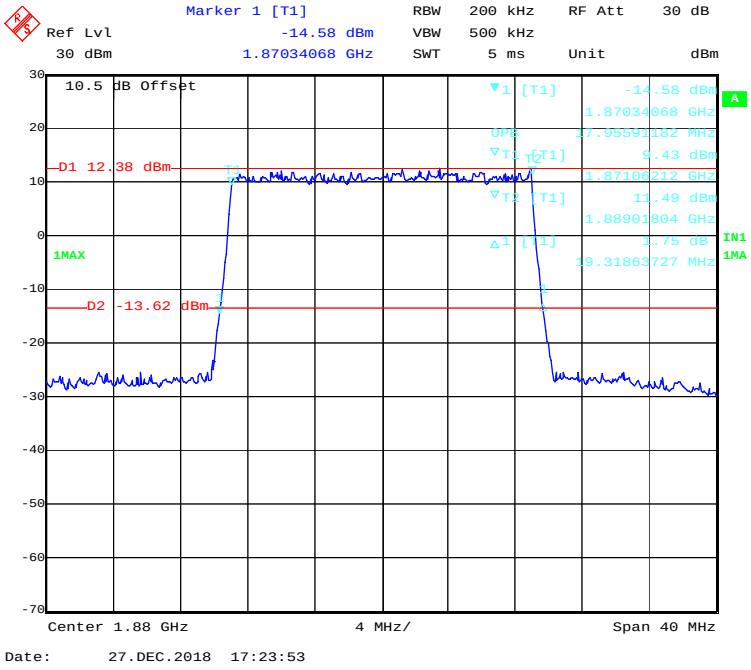
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



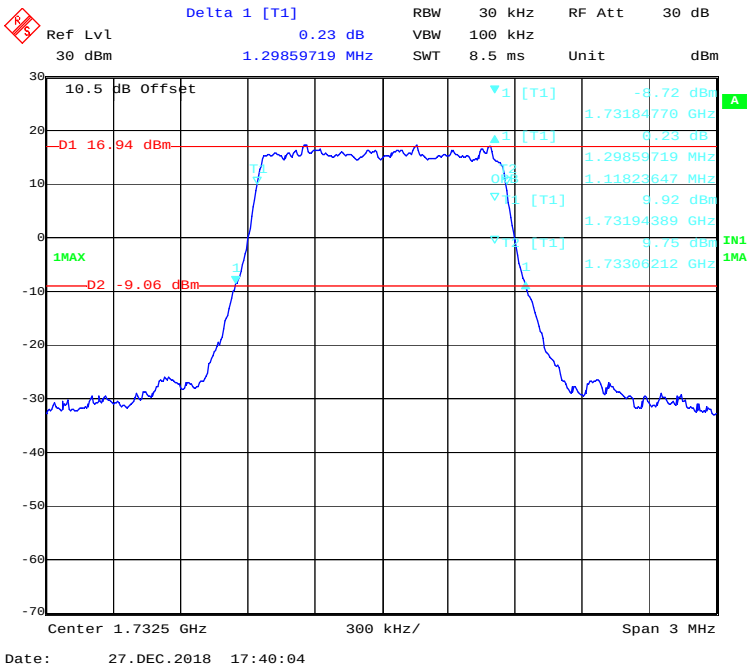
16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



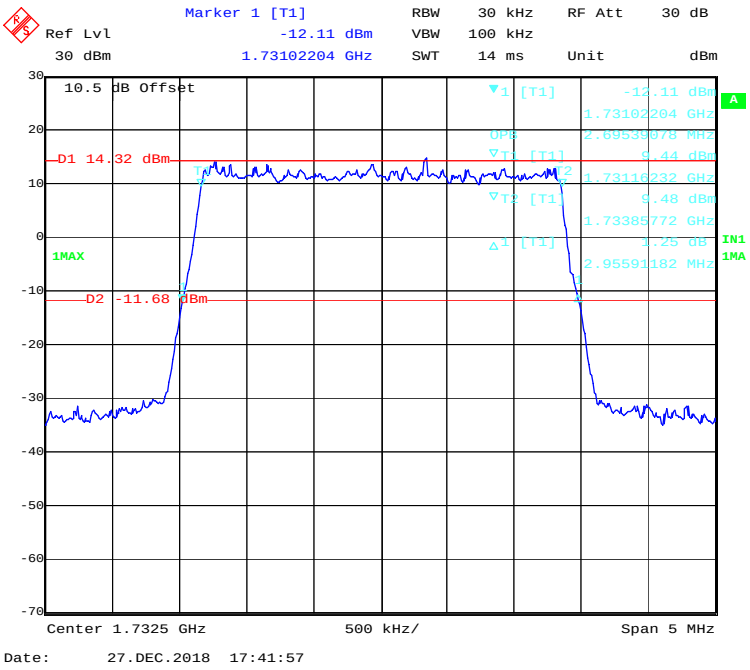
LTE Band 4:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.299	1.118
	3M		2.956	2.695
	5M		4.945	4.489
	10M		9.699	8.978
	15M		14.489	13.527
	20M		19.158	17.956
16-QAM	1.4M	Middle	1.317	1.112
	3M		2.956	2.695
	5M		4.910	4.489
	10M		9.729	8.978
	15M		14.669	13.467
	20M		19.399	17.956

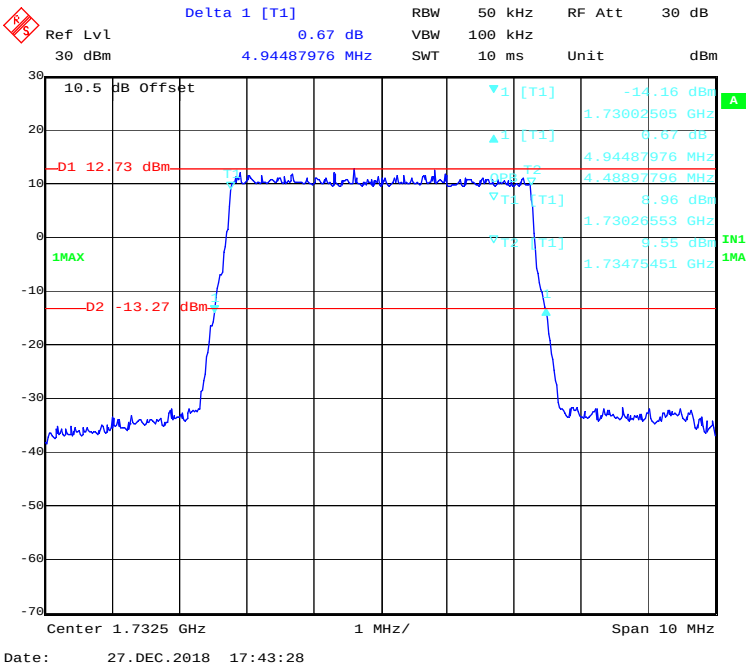
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



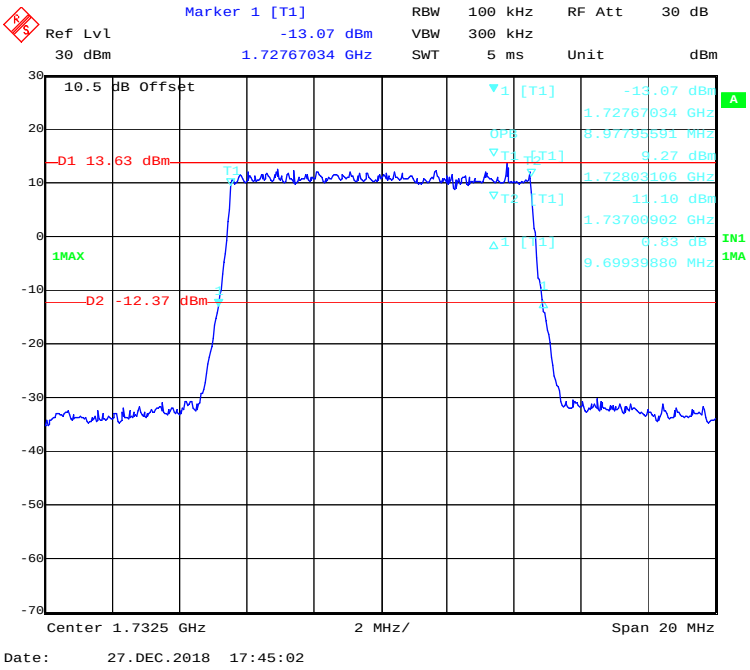
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



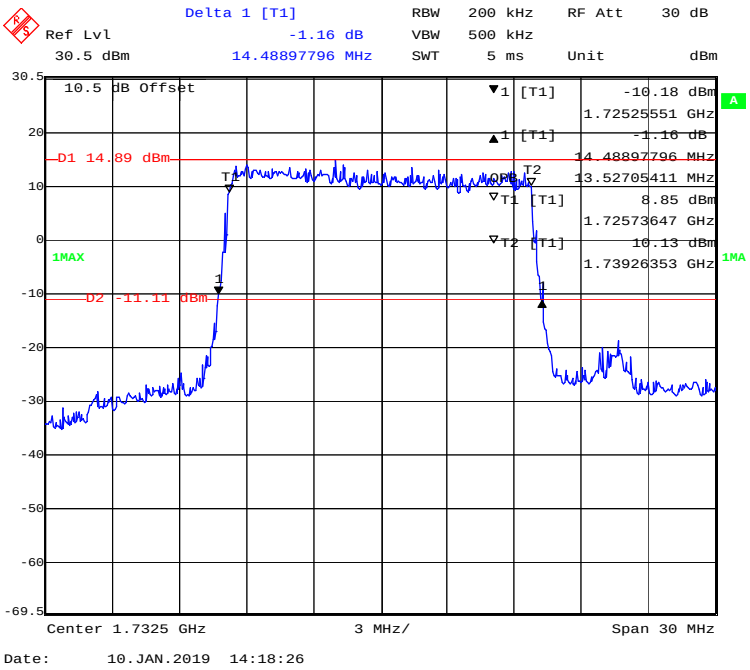
QPSK (5.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



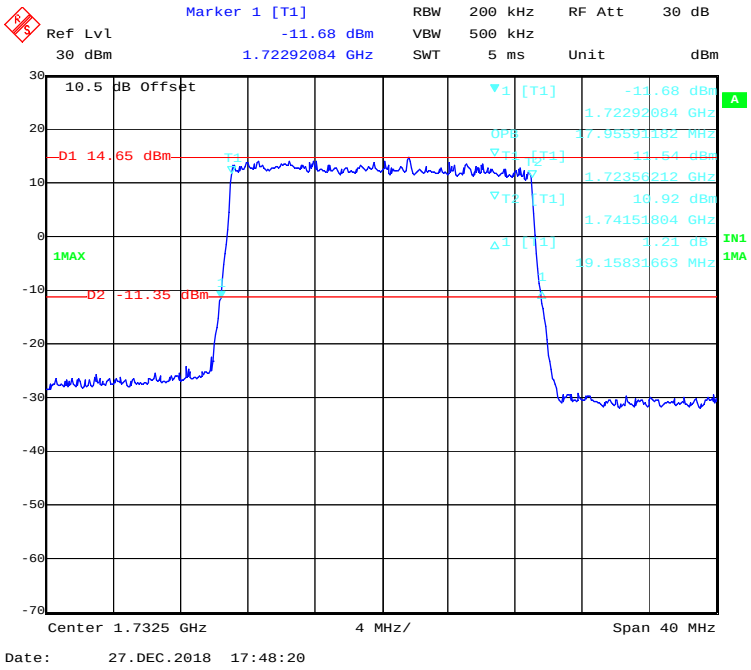
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



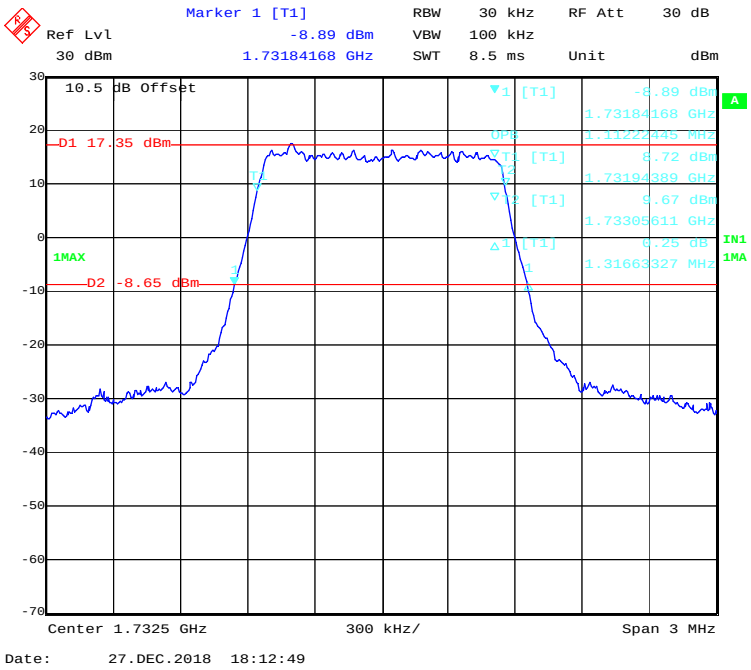
QPSK (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



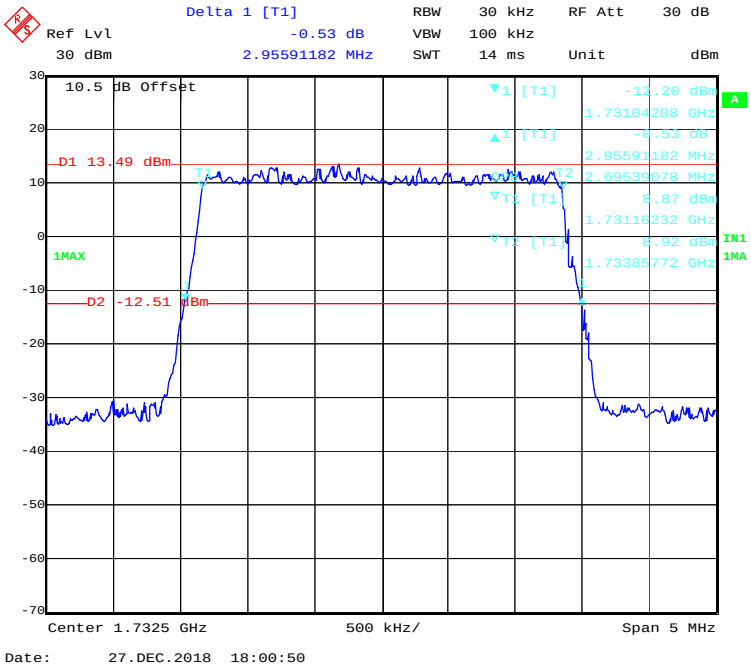
QPSK (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



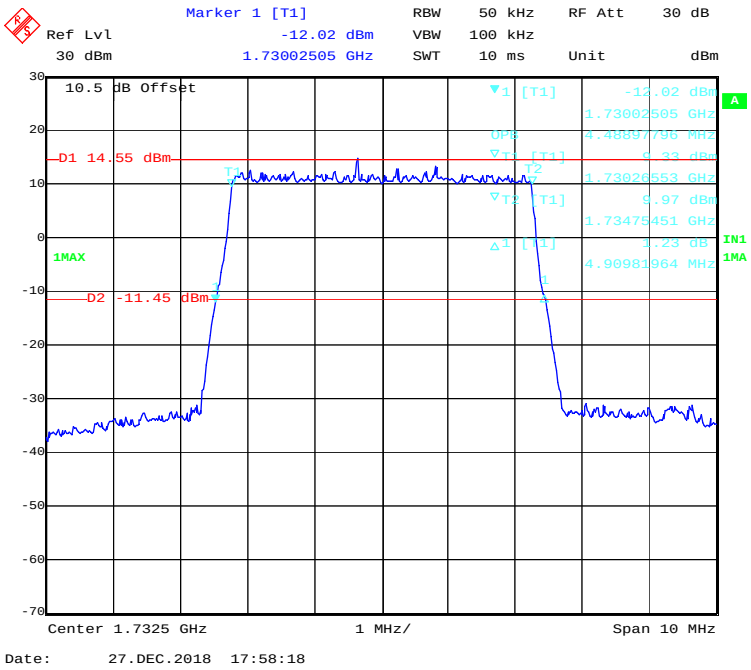
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



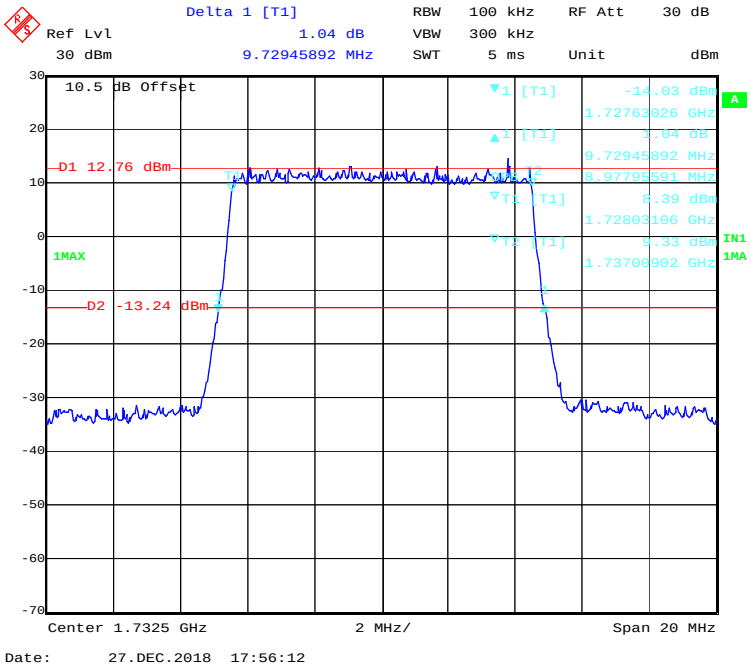
16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



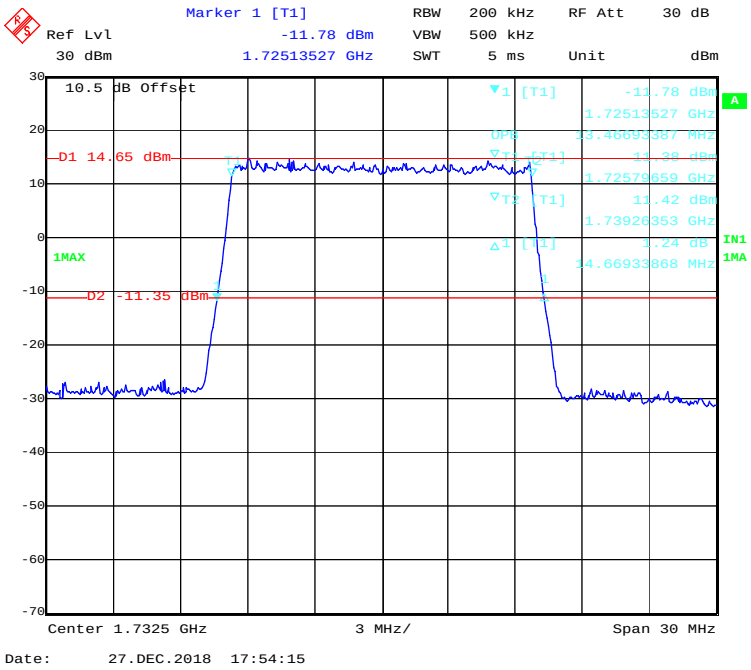
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



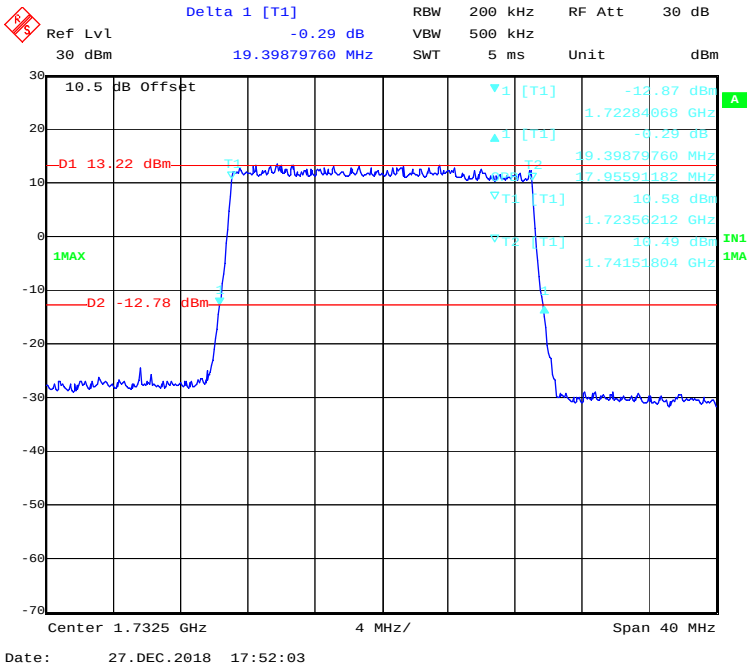
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



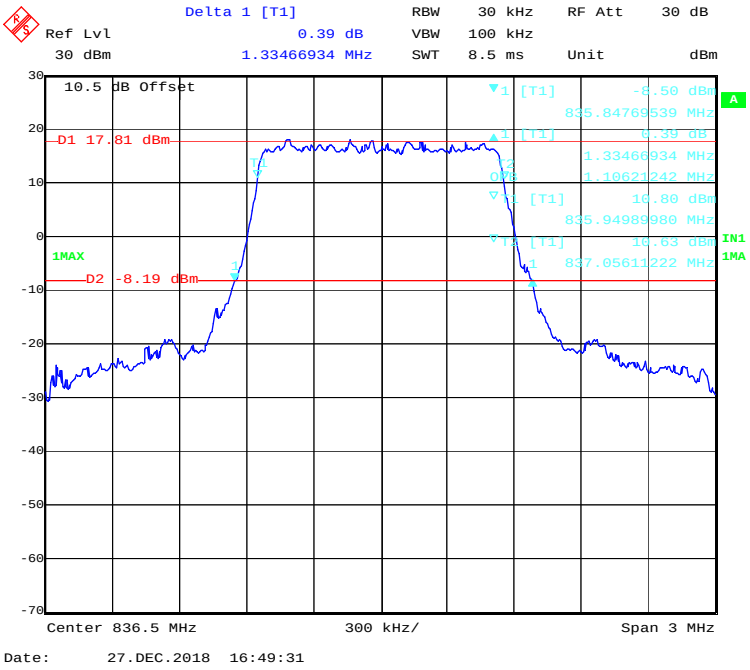
16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



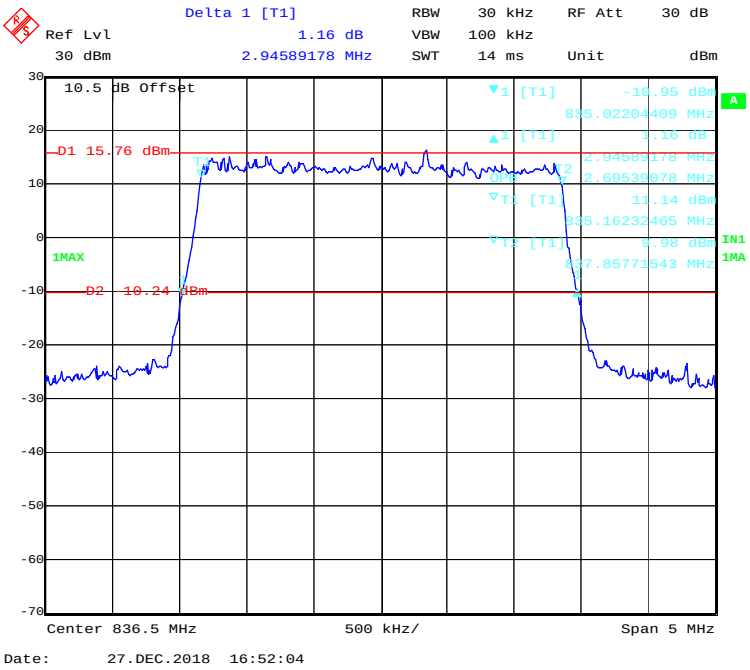
LTE Band 5:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.335	1.106
	3M		2.946	2.695
	5M		4.950	4.489
	10M		9.820	8.978
16-QAM	1.4M	Middle	1.311	1.112
	3M		2.976	2.695
	5M		4.950	4.489
	10M		9.699	8.978

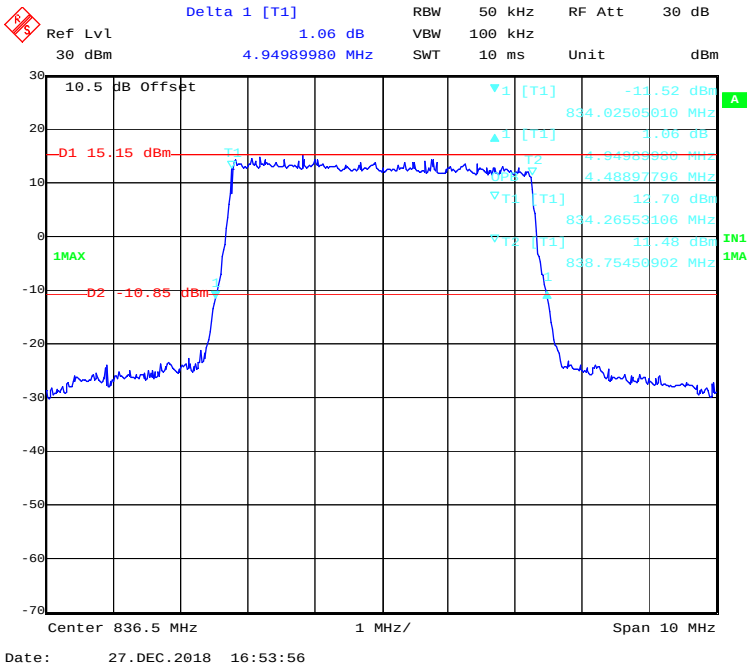
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



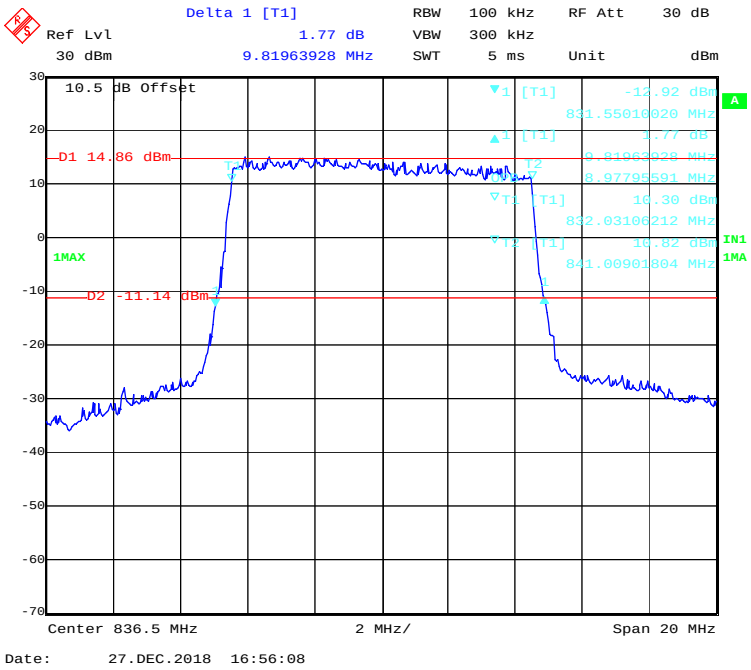
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



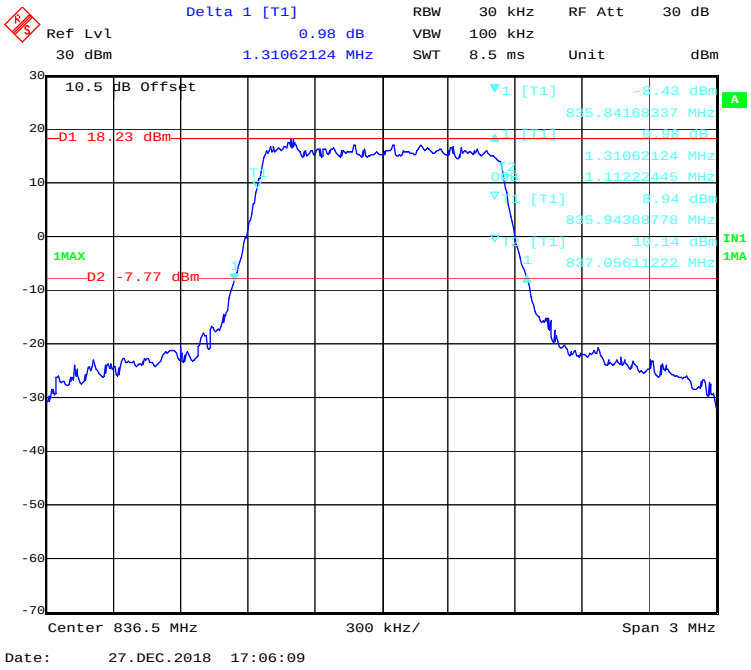
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



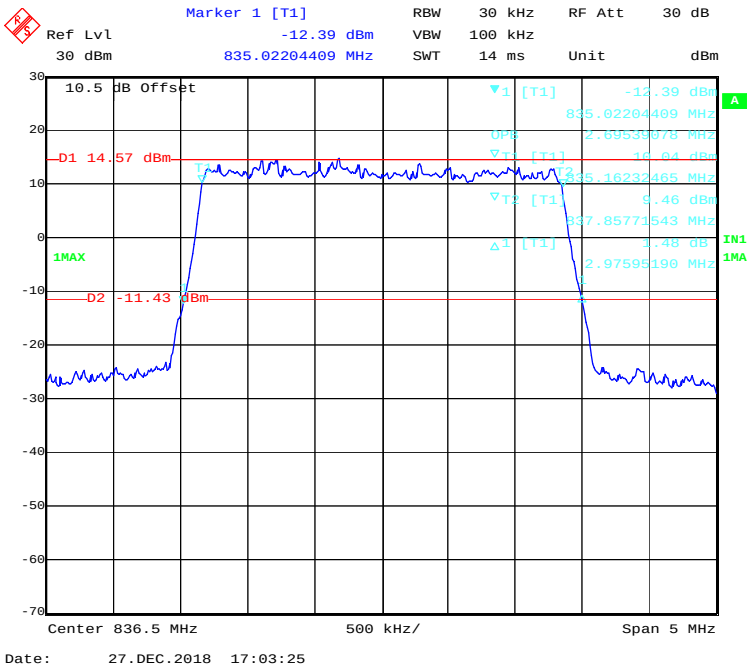
QPSK (10.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



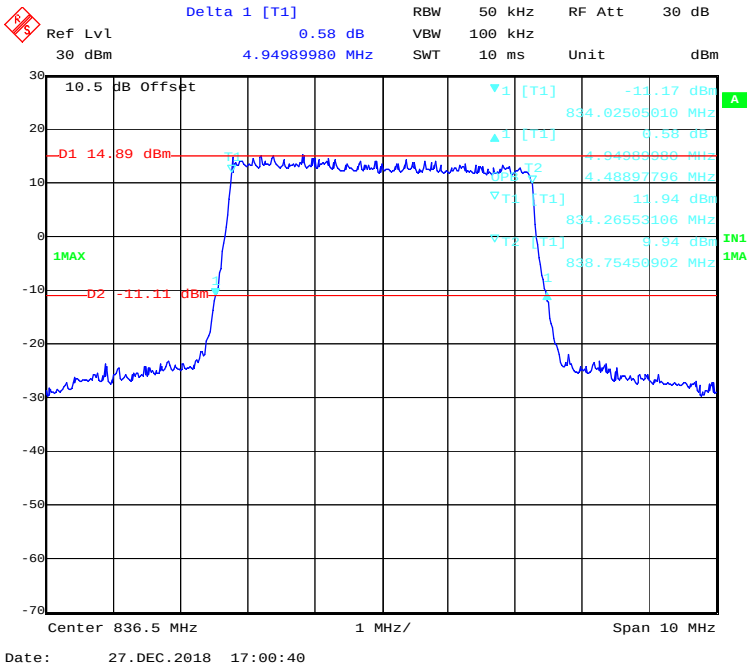
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



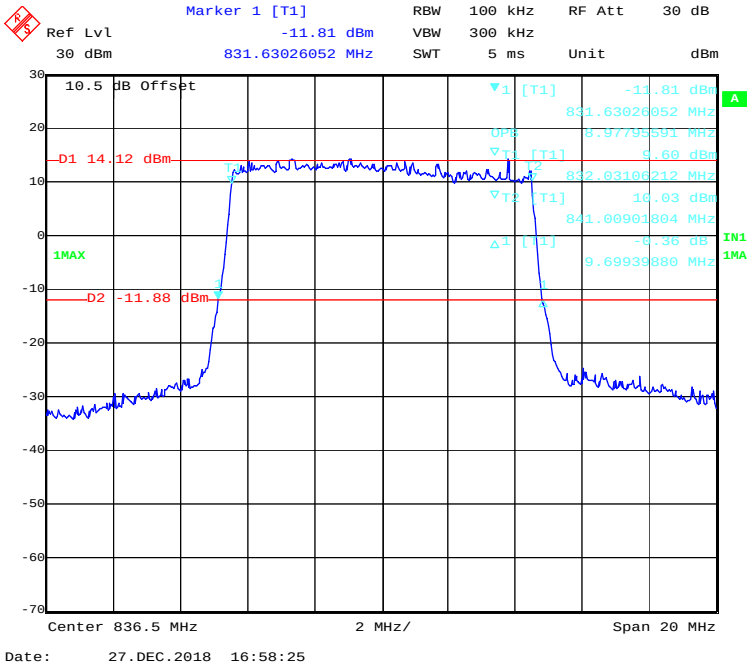
16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



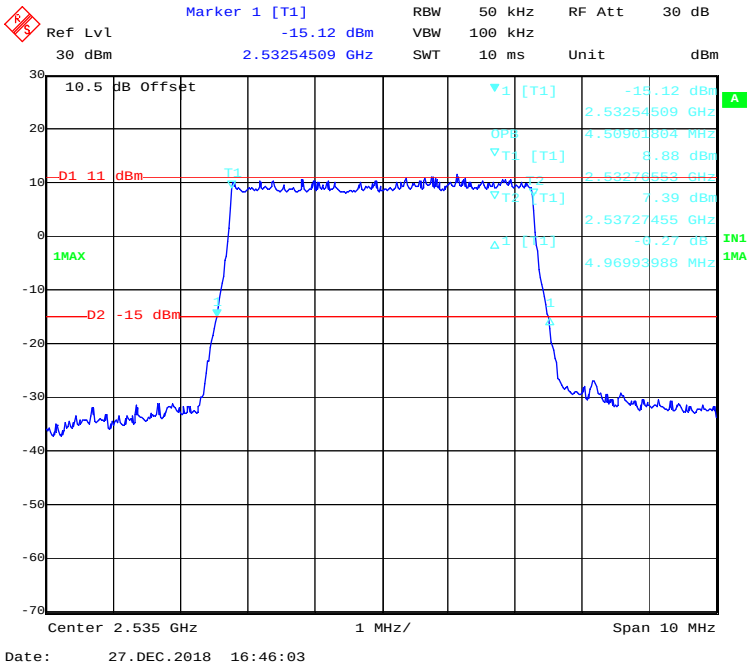
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



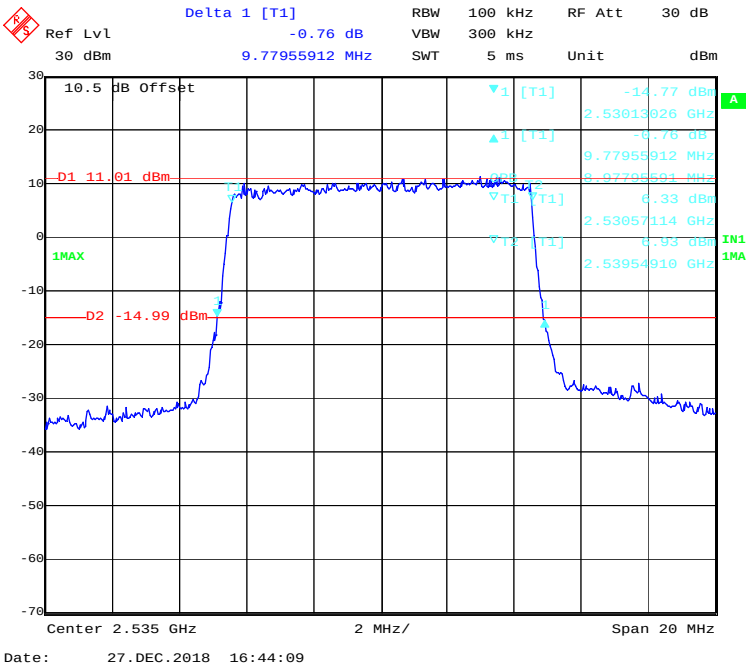
LTE Band 7:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	4.970	4.509
	10M		9.780	8.978
	15M		14.659	13.467
	20M		19.078	17.876
16-QAM	5M	Middle	4.950	4.509
	10M		9.820	8.938
	15M		14.609	13.467
	20M		19.238	17.876

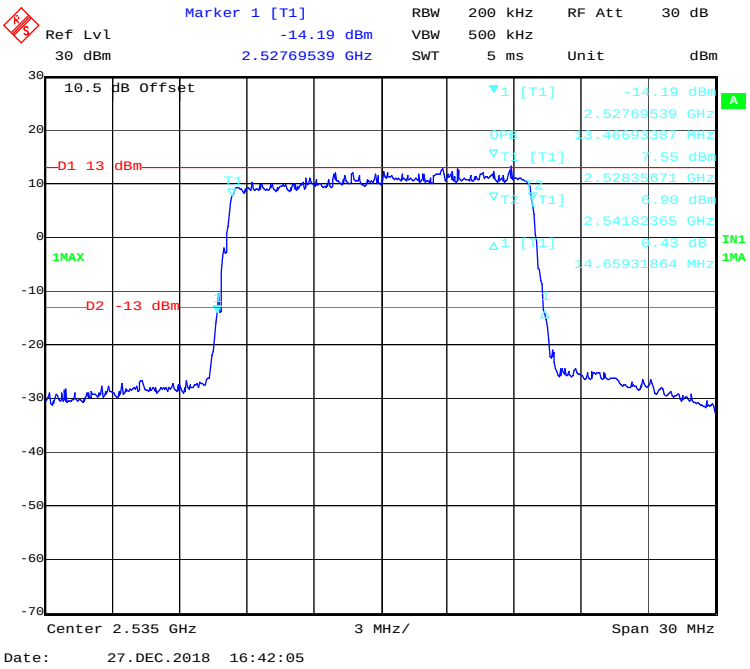
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



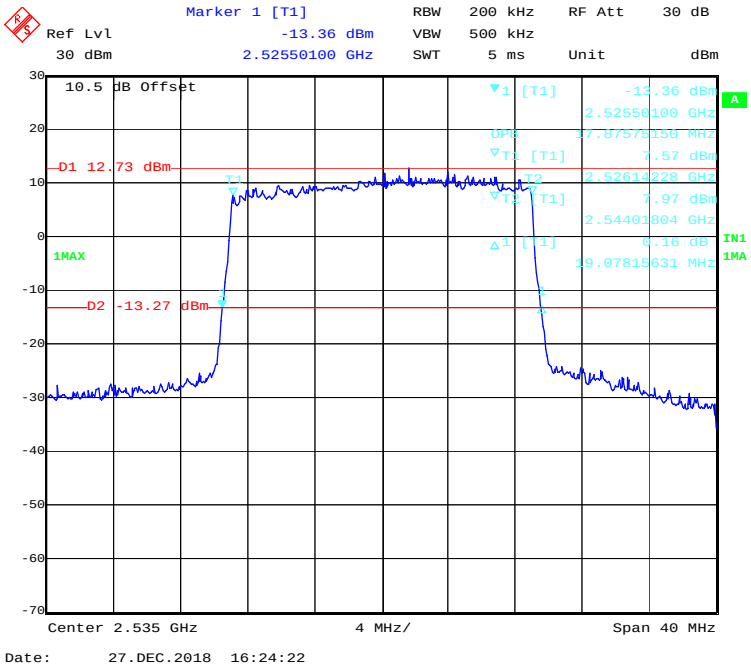
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



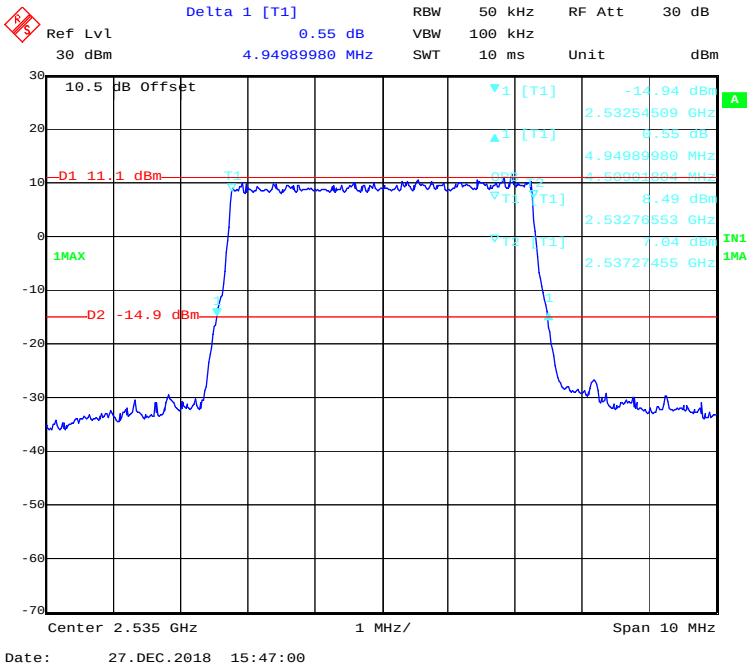
QPSK (15.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



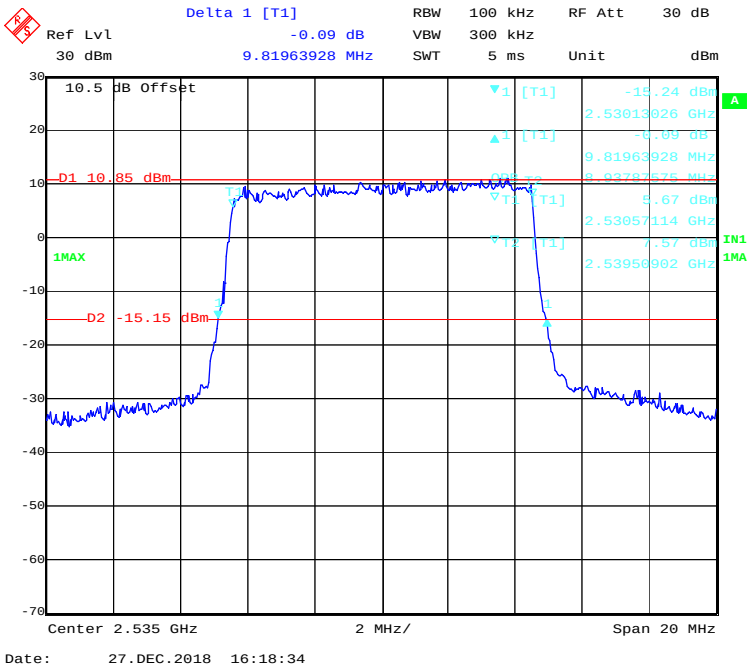
QPSK (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



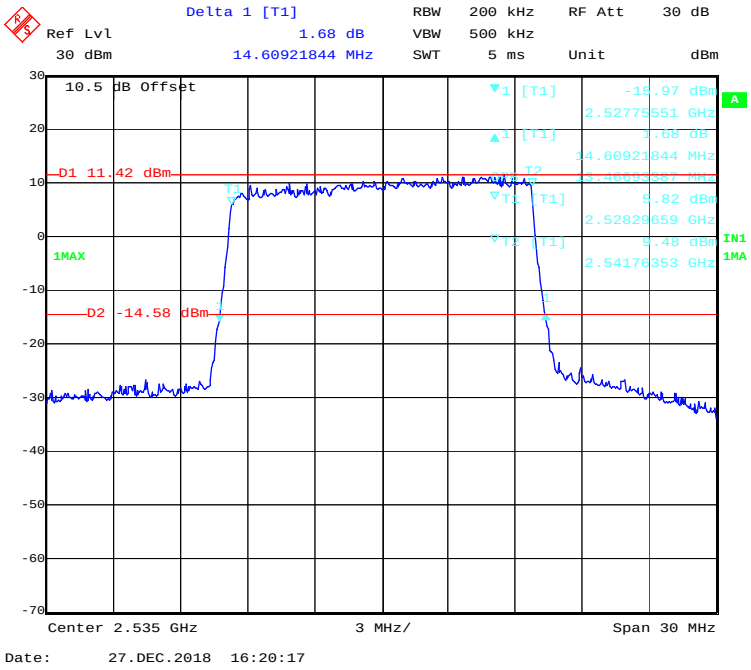
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



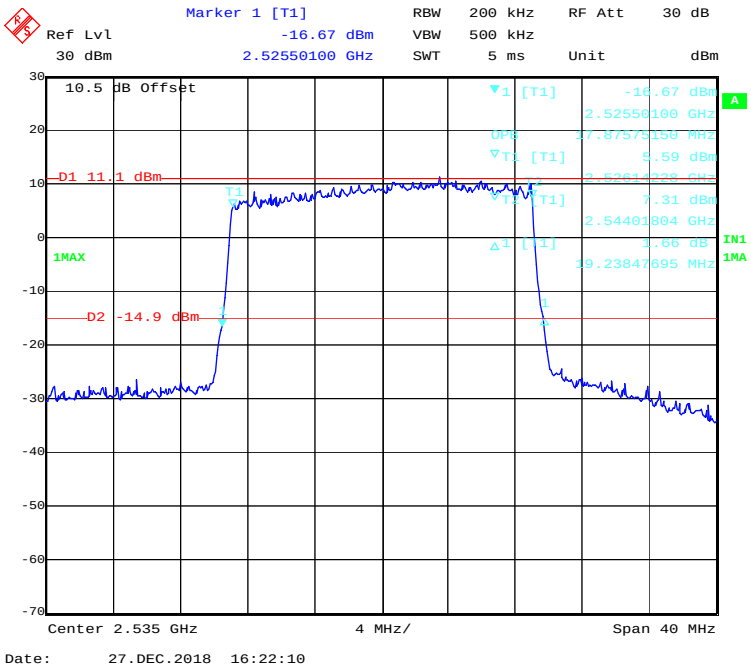
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



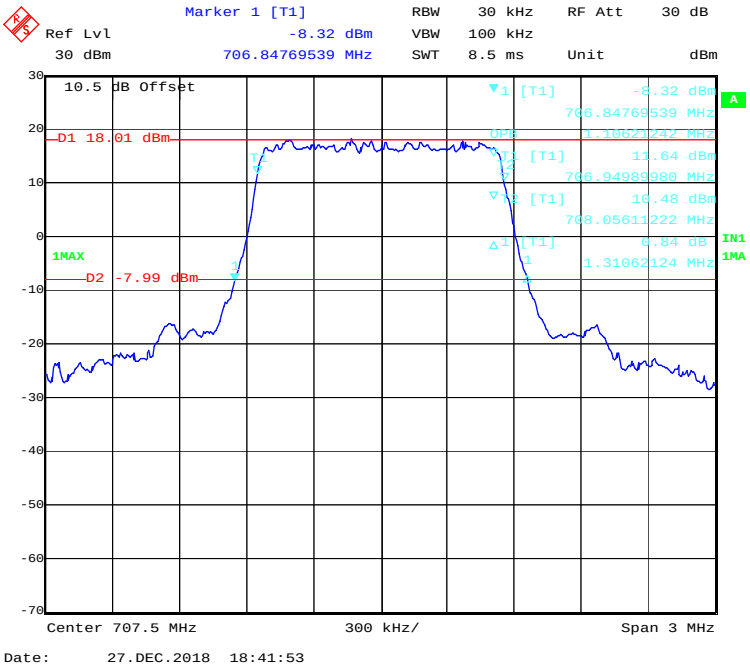
16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



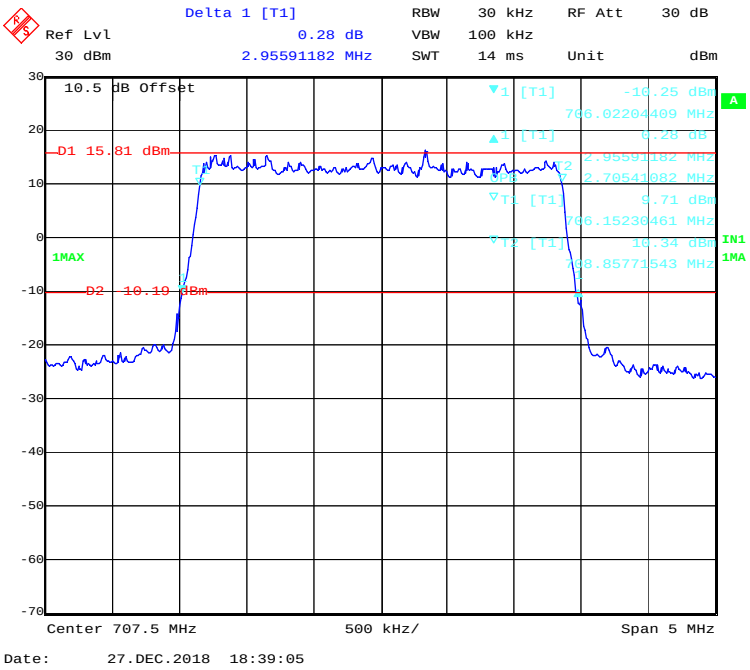
LTE Band 12:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.311	1.106
	3M		2.956	2.705
	5M		4.930	4.489
	10M		9.900	8.978
16-QAM	1.4M	Middle	1.311	1.100
	3M		2.976	2.695
	5M		4.910	4.489
	10M		9.820	9.018

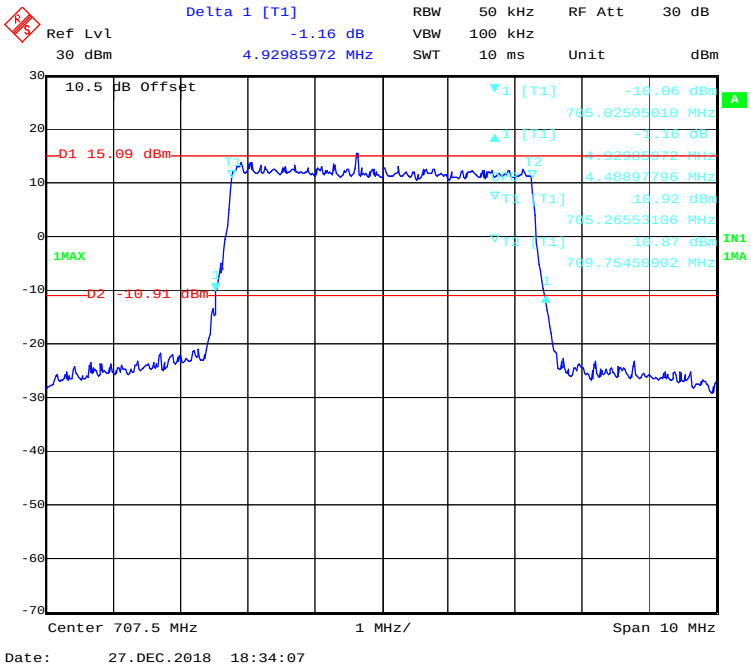
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



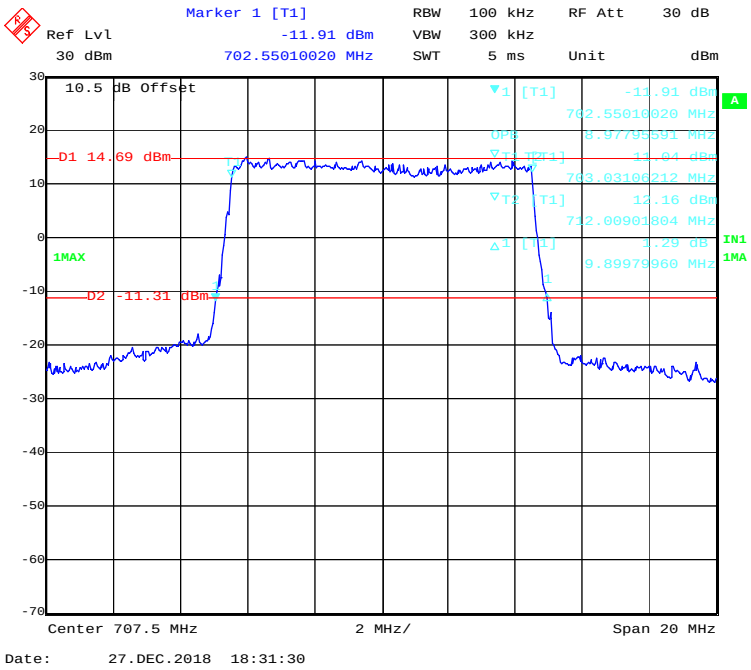
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



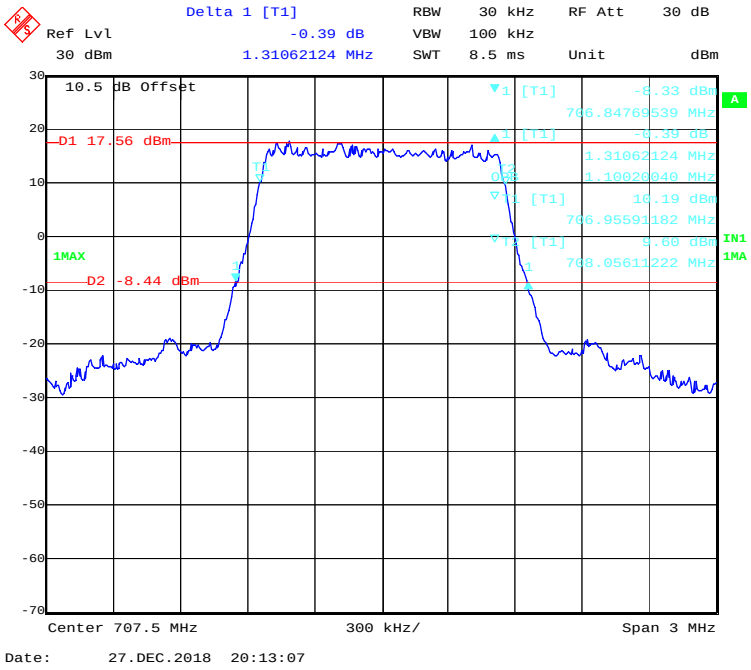
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



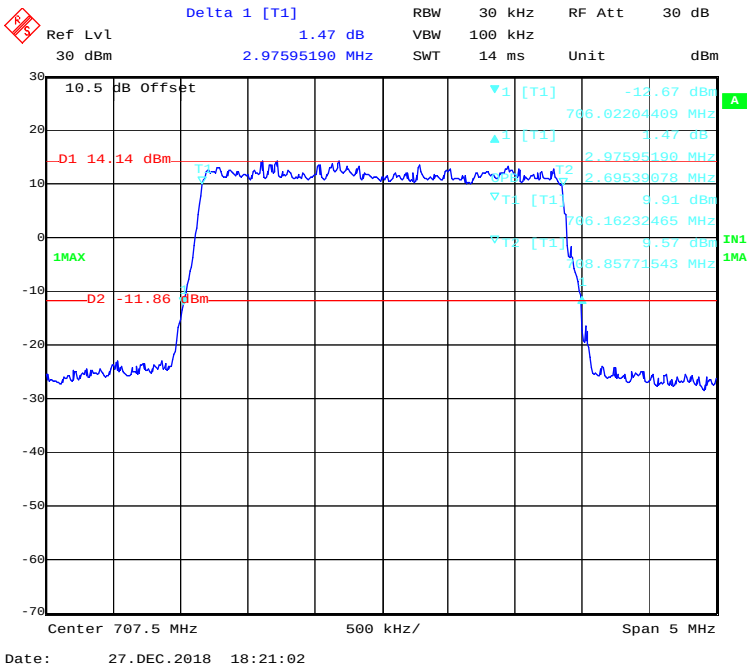
QPSK (10.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



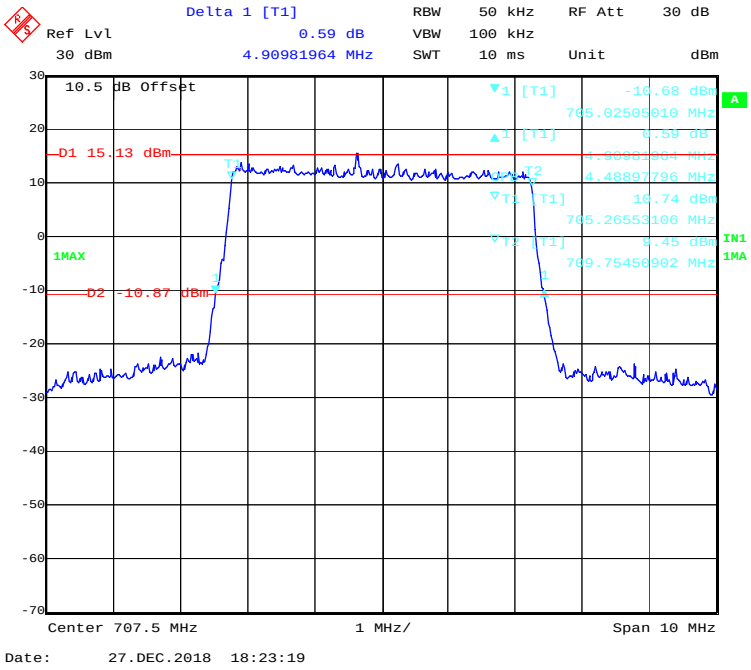
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



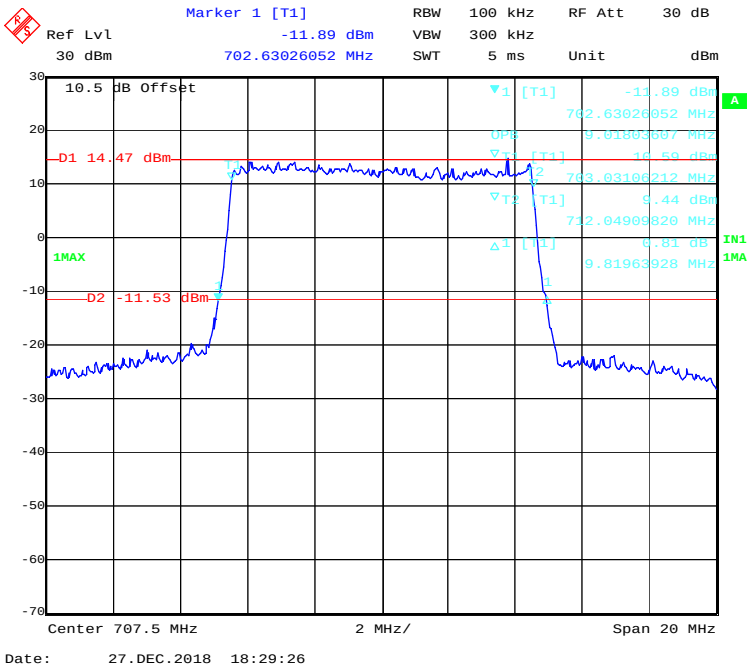
16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



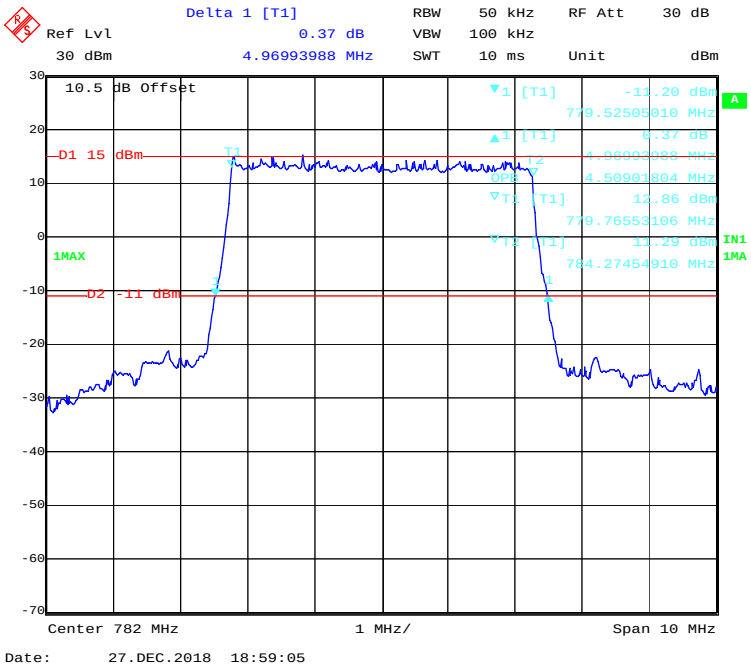
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



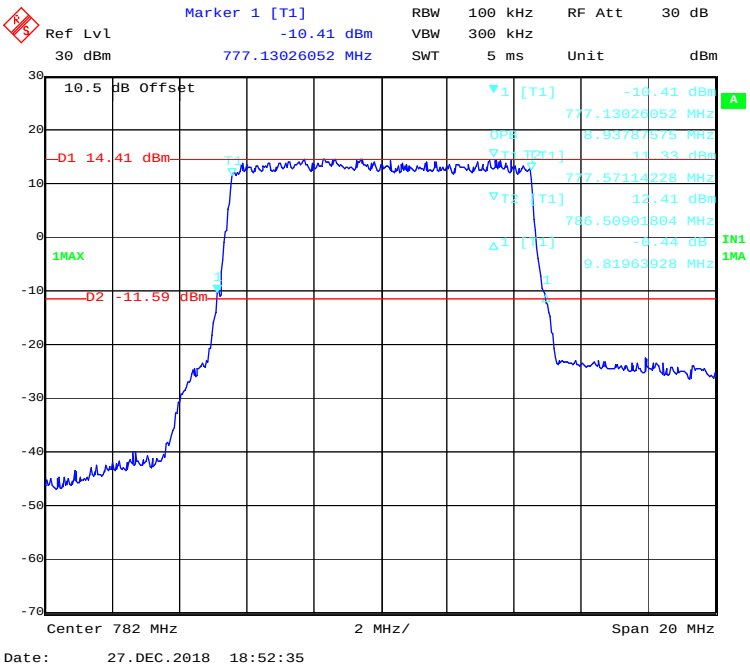
LTE Band 13:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	4.970	4.509
	10M		9.820	8.938
16-QAM	5M	Middle	4.923	4.489
	10M		9.659	8.938

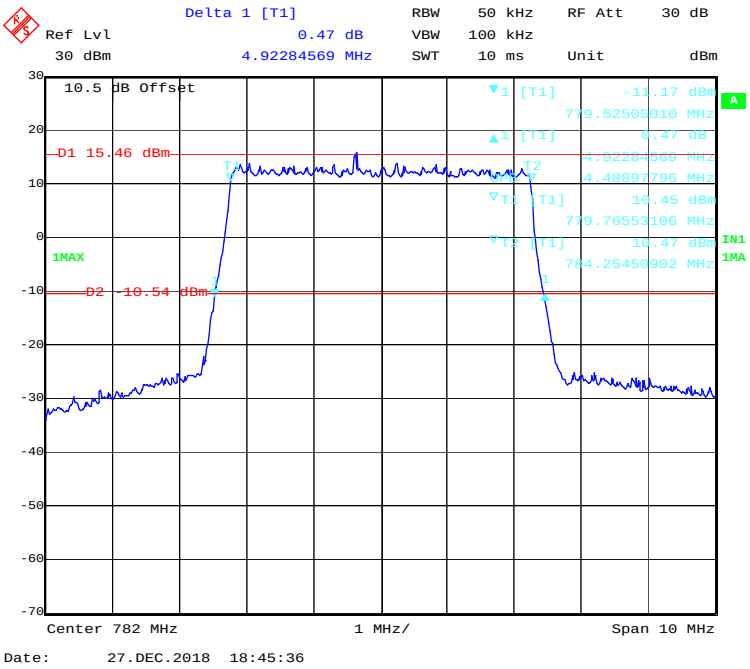
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



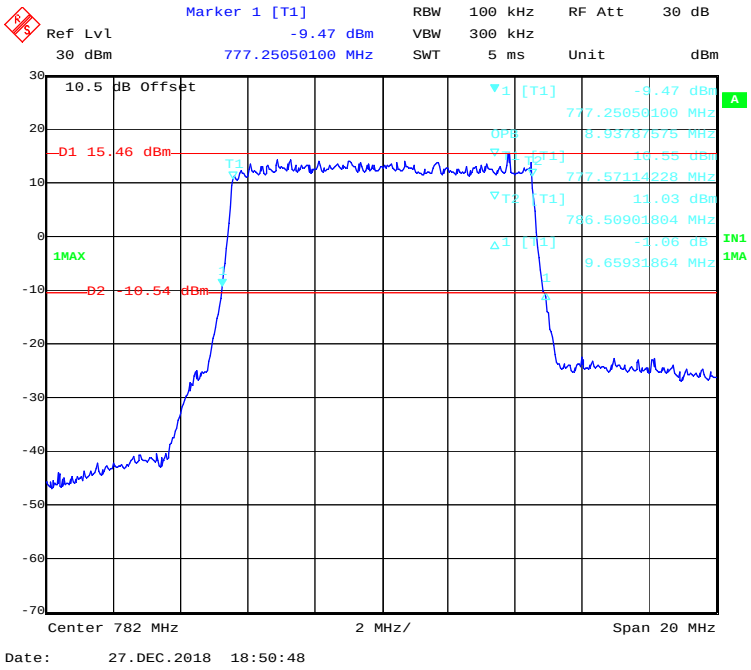
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (5.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



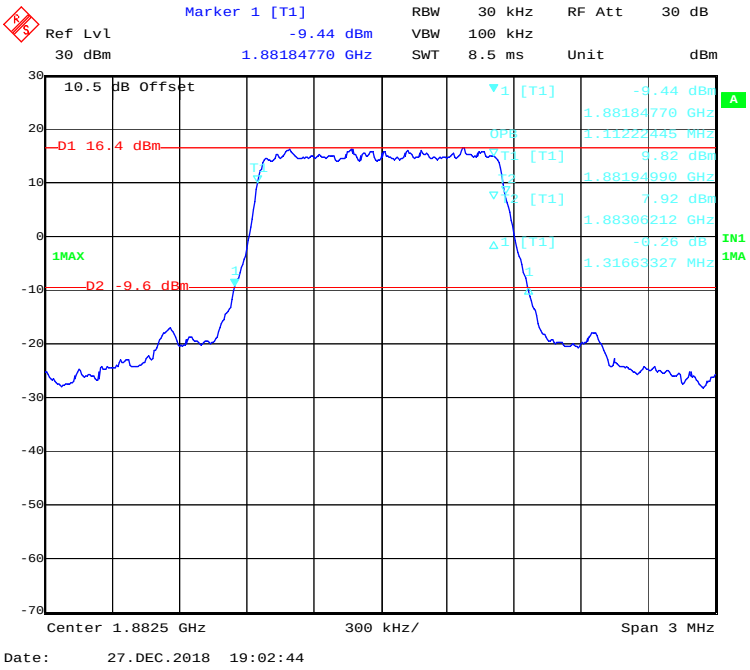
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



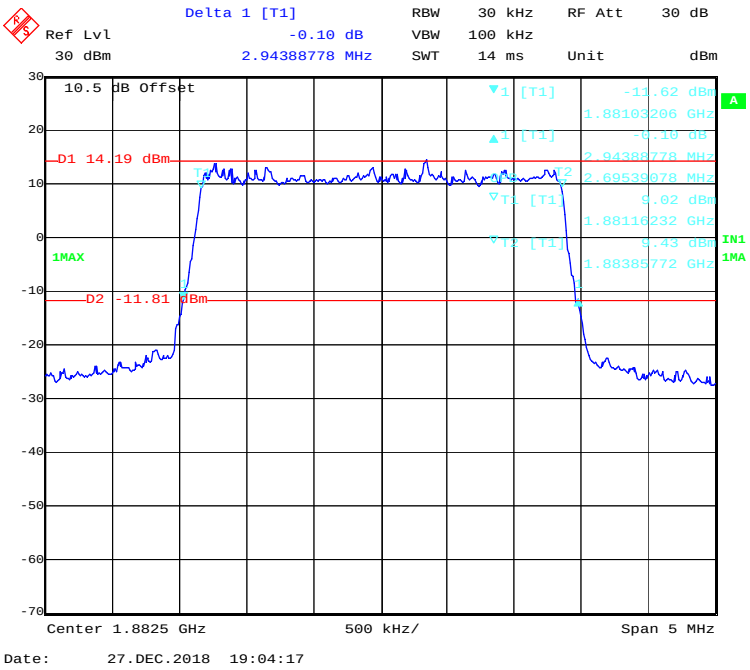
LTE Band 25:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.317	1.112
	3M		2.944	2.695
	5M		4.990	4.509
	10M		9.900	8.978
	15M		14.729	13.467
	20M		19.238	17.956
16-QAM	1.4M	Middle	1.341	1.118
	3M		2.966	2.695
	5M		4.970	4.489
	10M		9.860	8.978
	15M		14.669	13.467
	20M		19.399	18.036

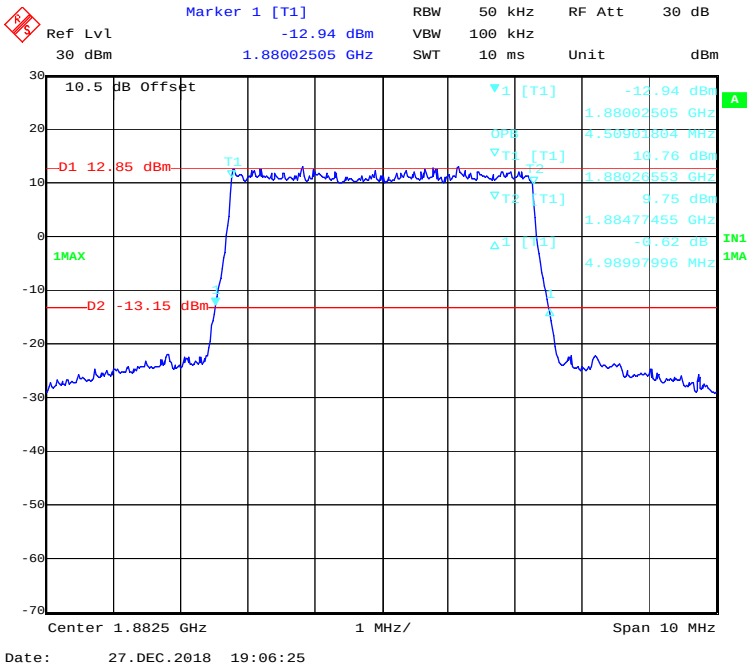
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



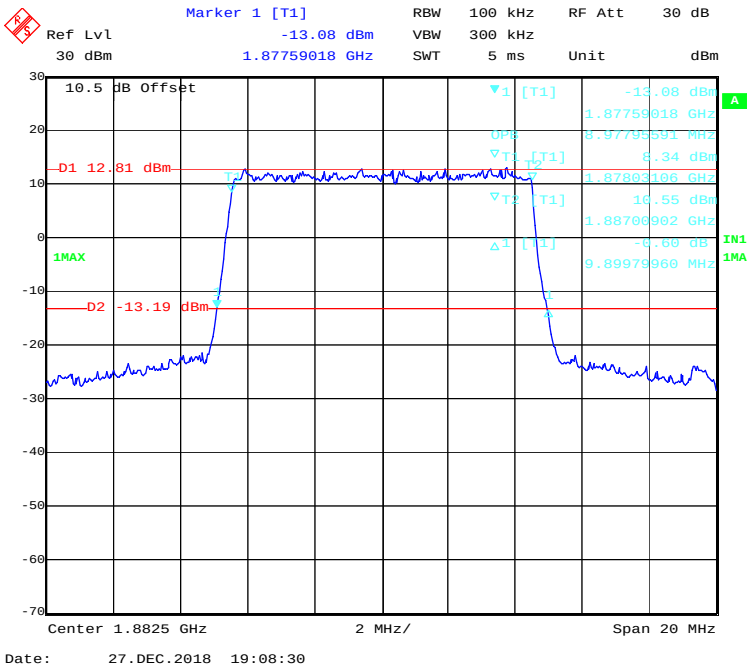
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



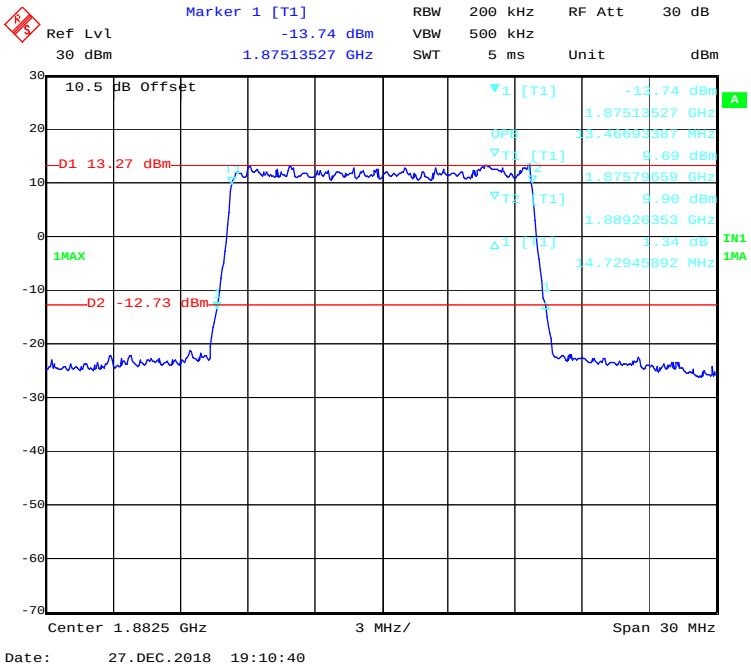
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



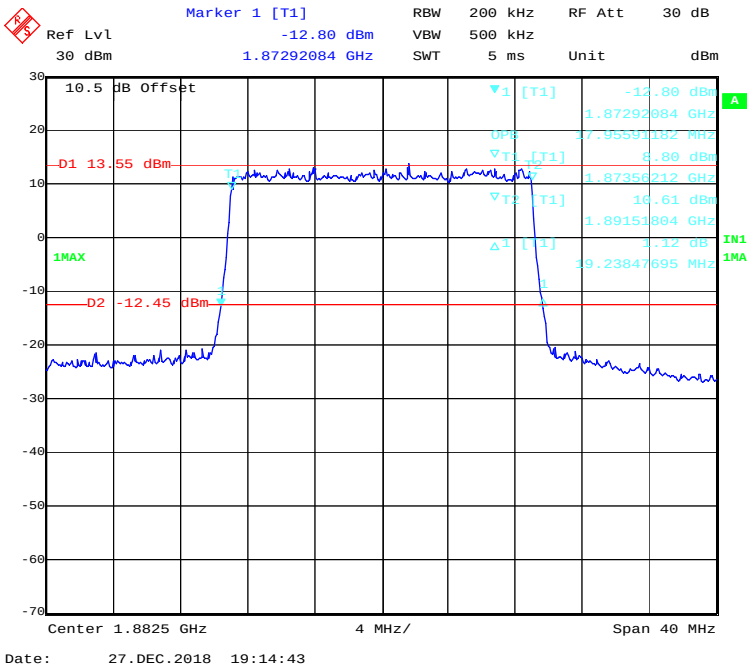
QPSK (10.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



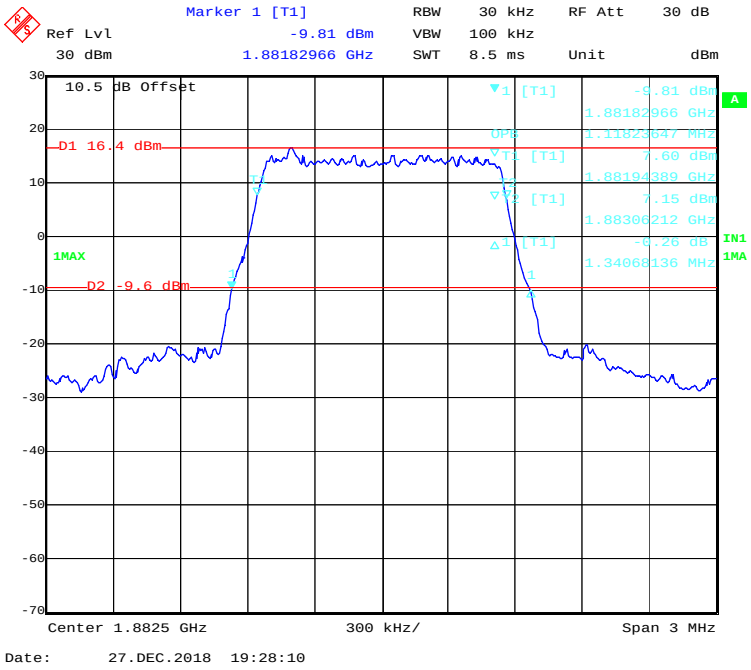
QPSK (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



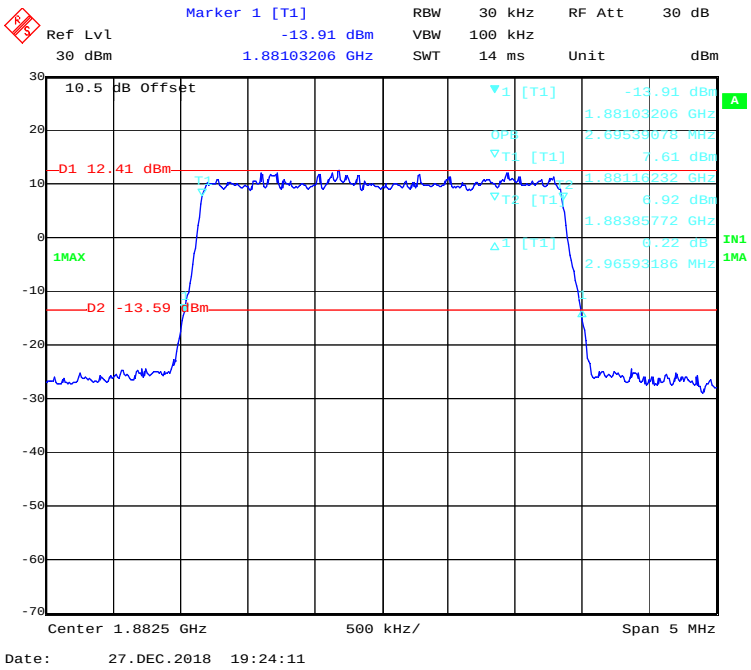
QPSK (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



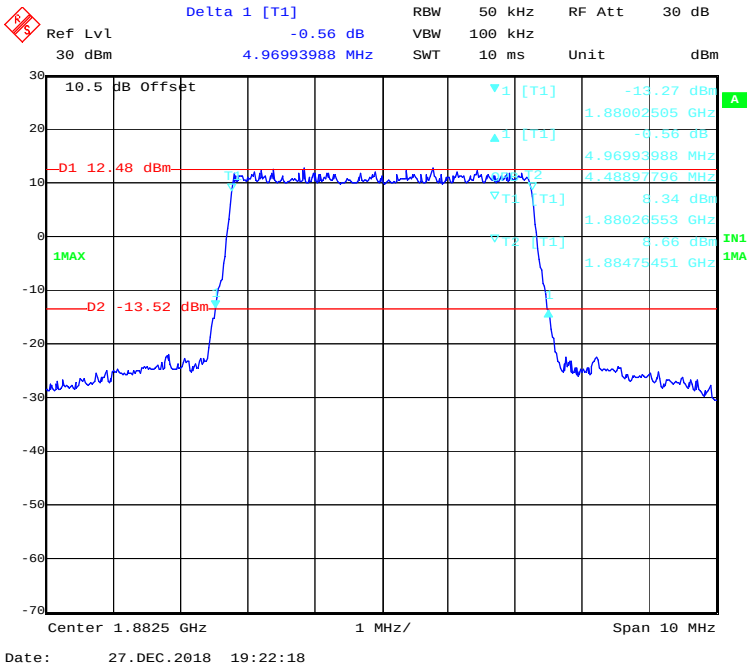
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



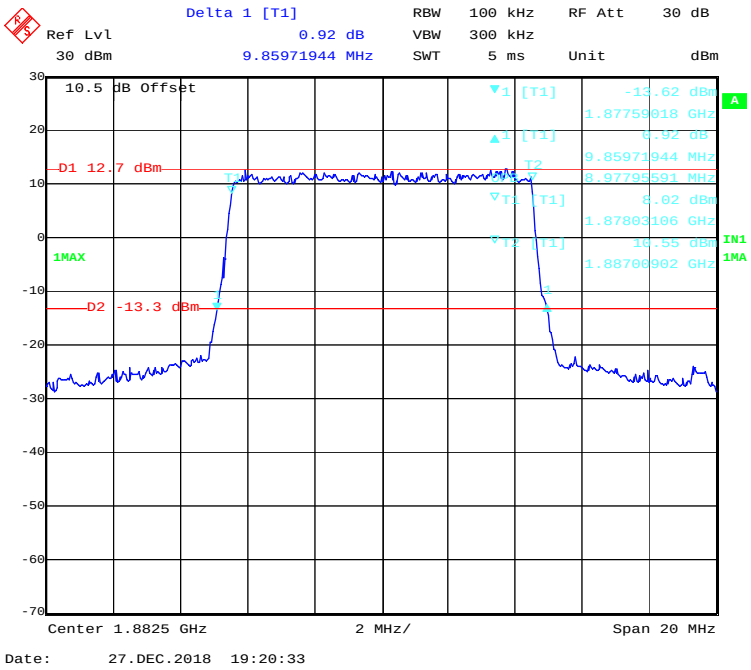
16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



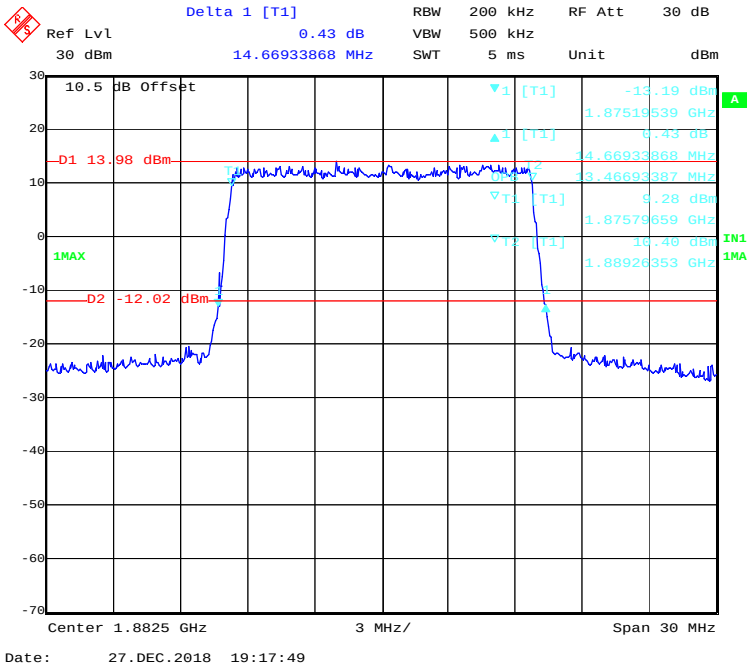
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



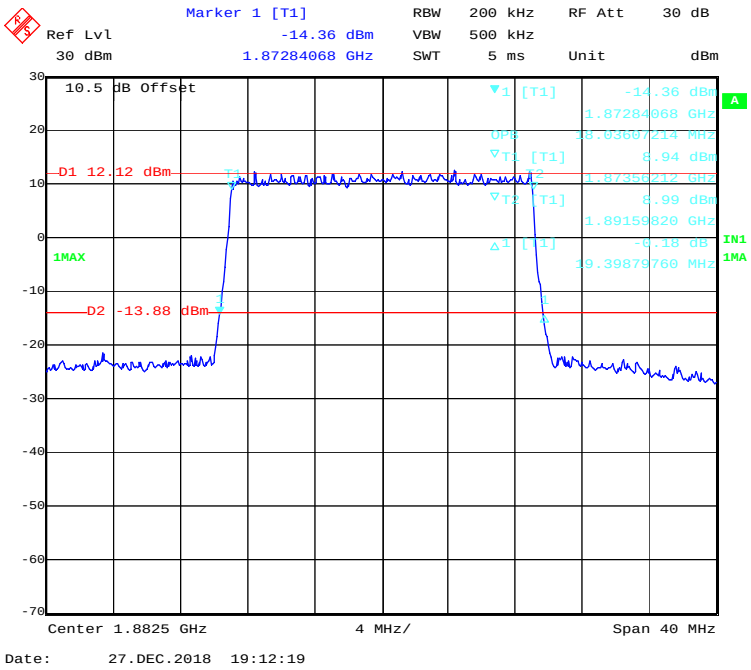
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



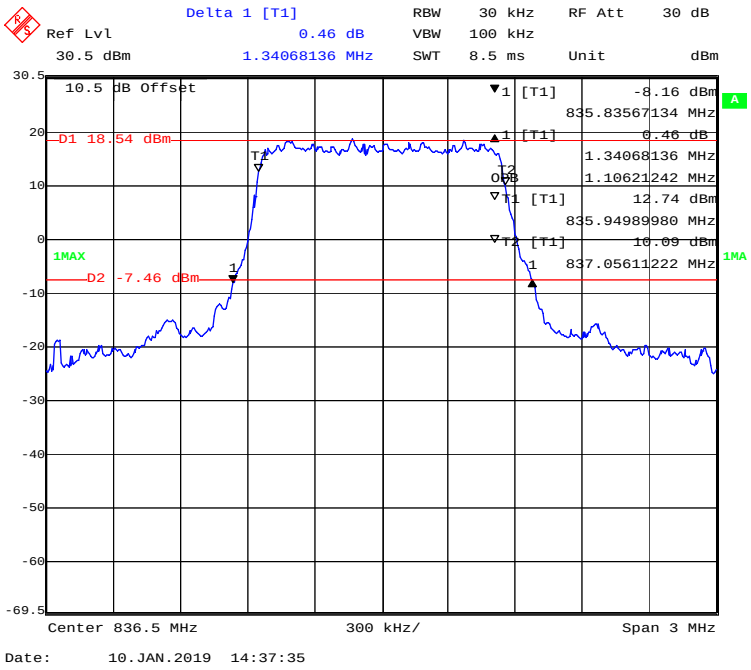
16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



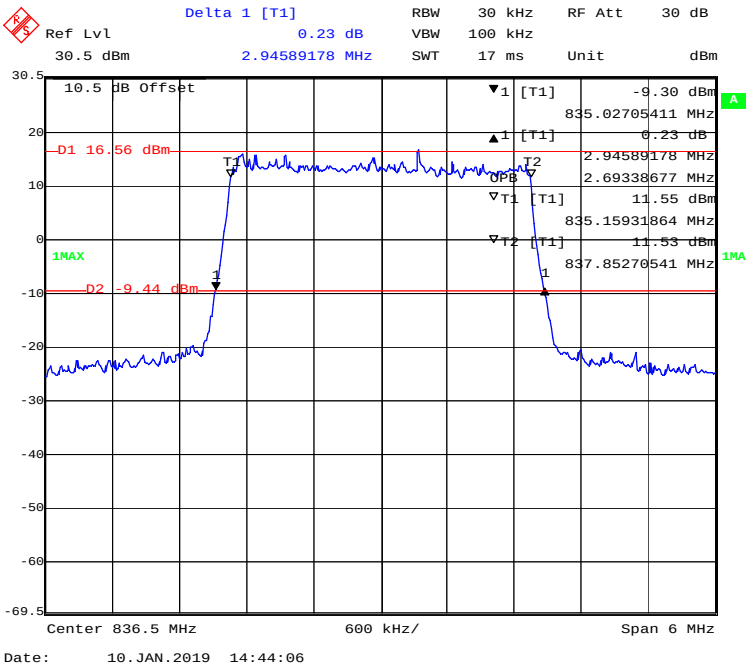
LTE Band 26:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.341	1.106
	3M		2.946	2.693
	5M		4.930	4.489
	10M		9.820	8.978
	15M		14.670	13.467
16-QAM	1.4M	Middle	1.347	1.106
	3M		2.958	2.693
	5M		4.950	4.489
	10M		9.820	8.978
	15M		14.609	13.467

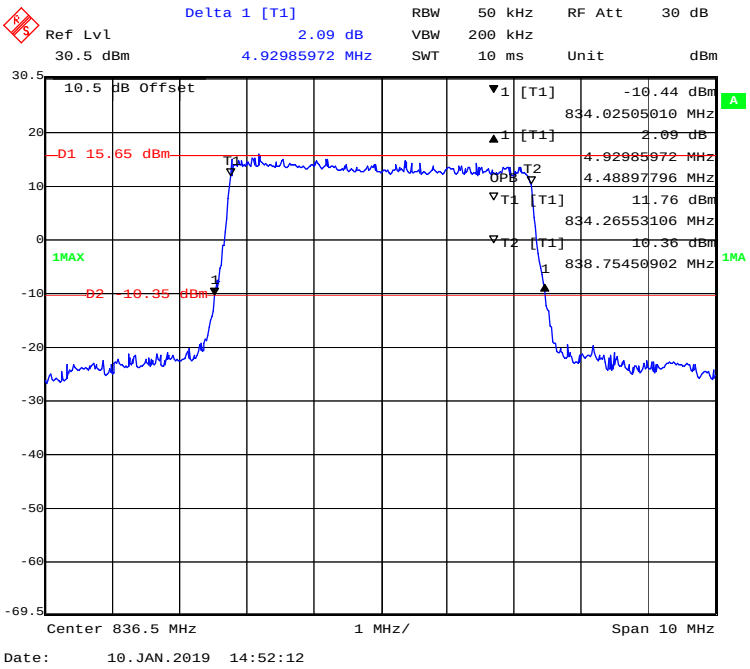
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



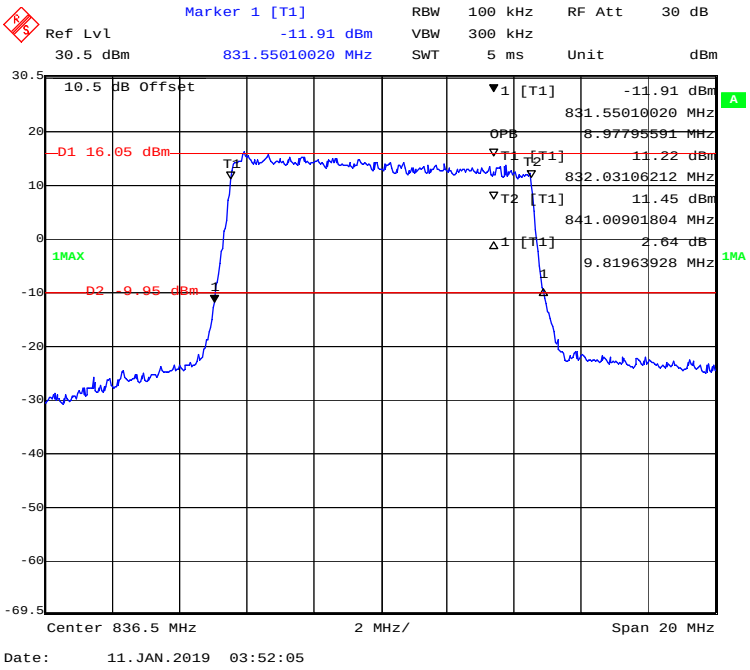
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



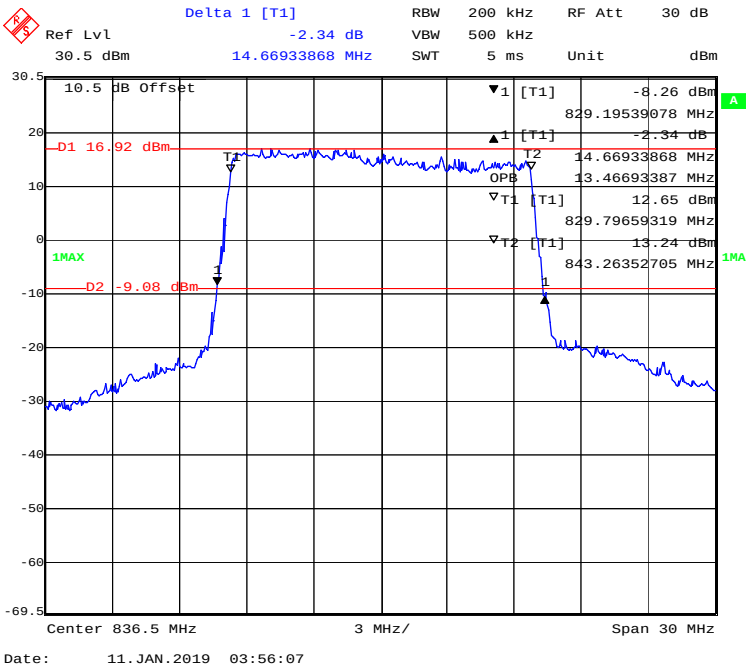
QPSK (5.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



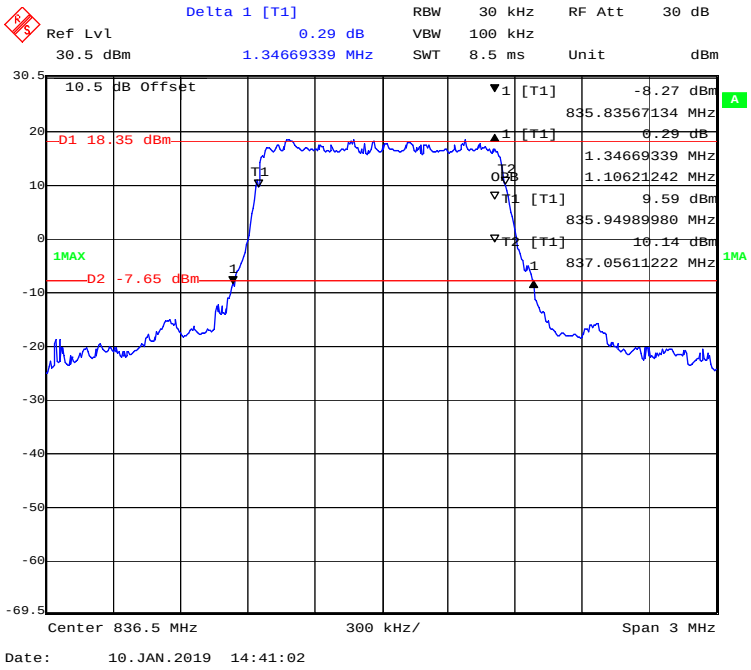
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



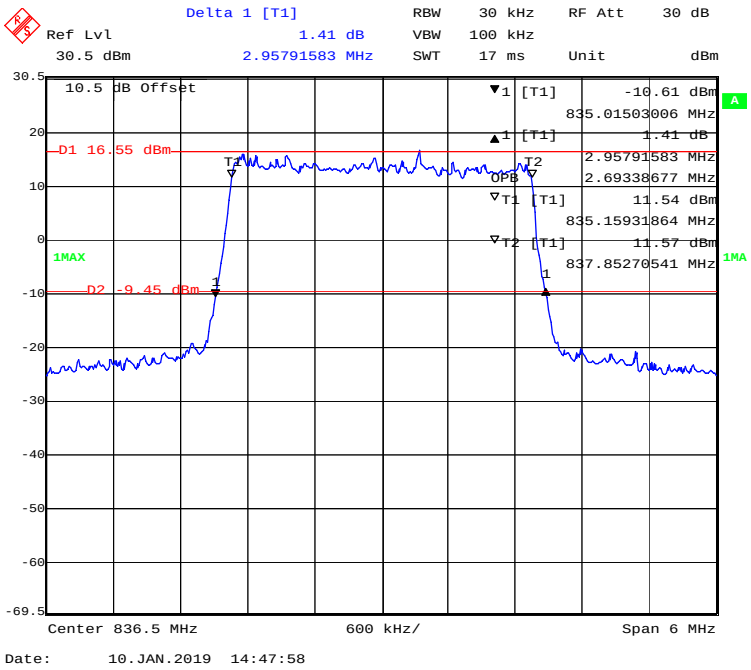
QPSK (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



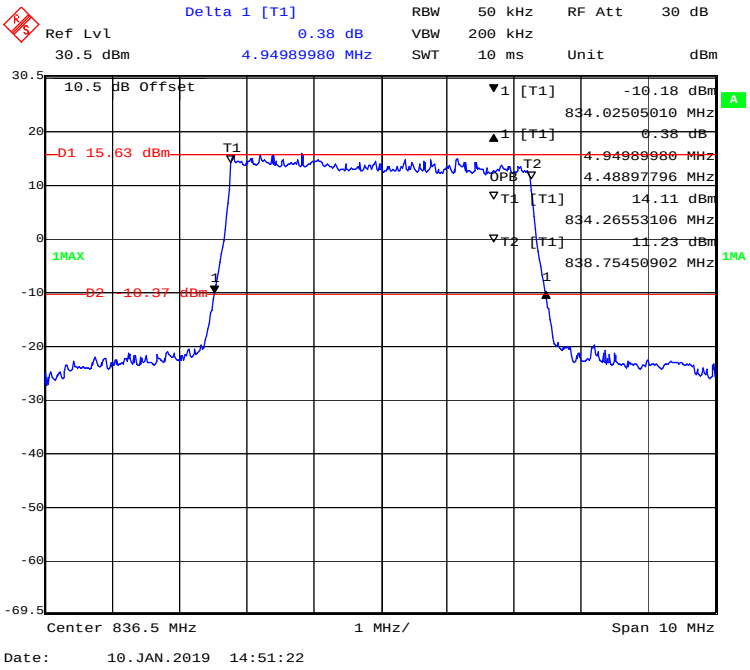
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



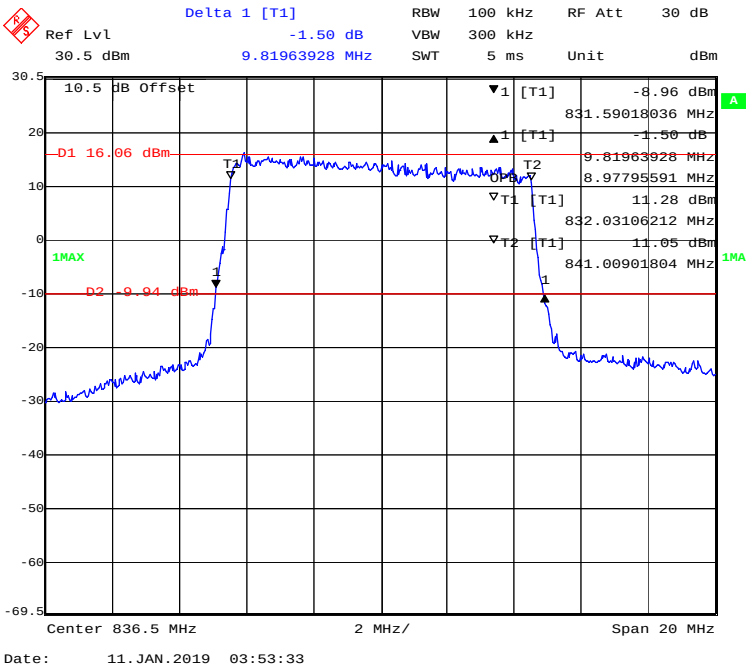
16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



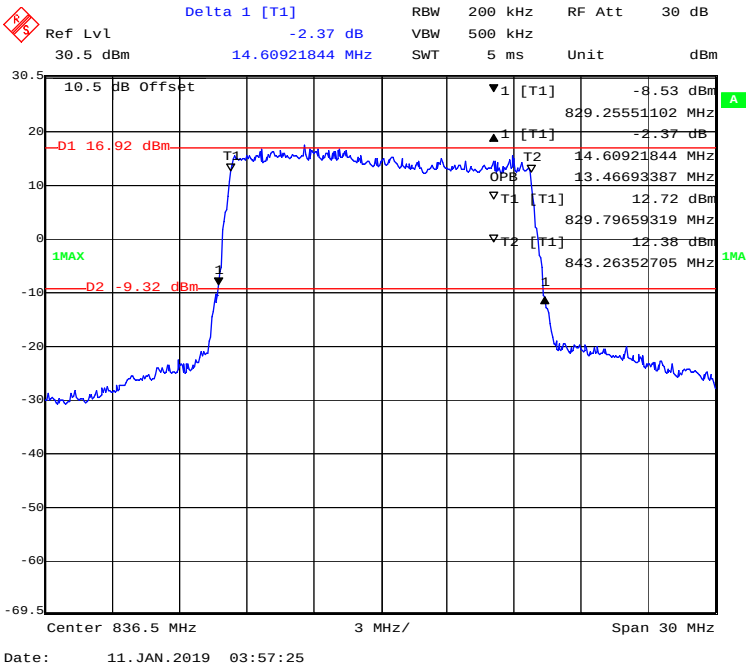
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



FCC § 2.1051; § 22.917 (a); § 24.238 (a); §27.53(c) (f) (h) (m); § 90.691 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

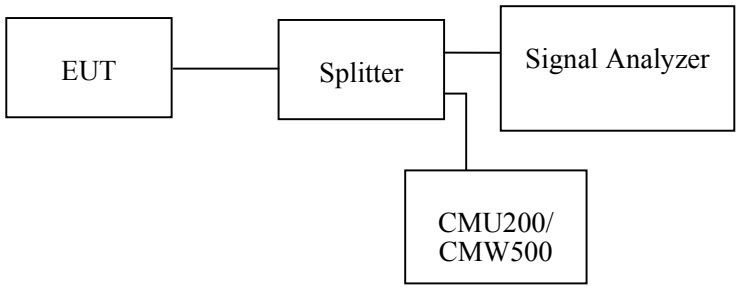
Applicable Standards

FCC §2.1051, §22.917(a) and §24.238(a) , §90.691(a) and §27.53(c) (f) (h) (m).

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. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for below 1GHz & 1MHz for above 1GHz. sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Data

Environmental Conditions

Temperature:	23.2℃-23.5℃
Relative Humidity:	51 %-23%
ATM Pressure:	101.1kPa-103.3kPa

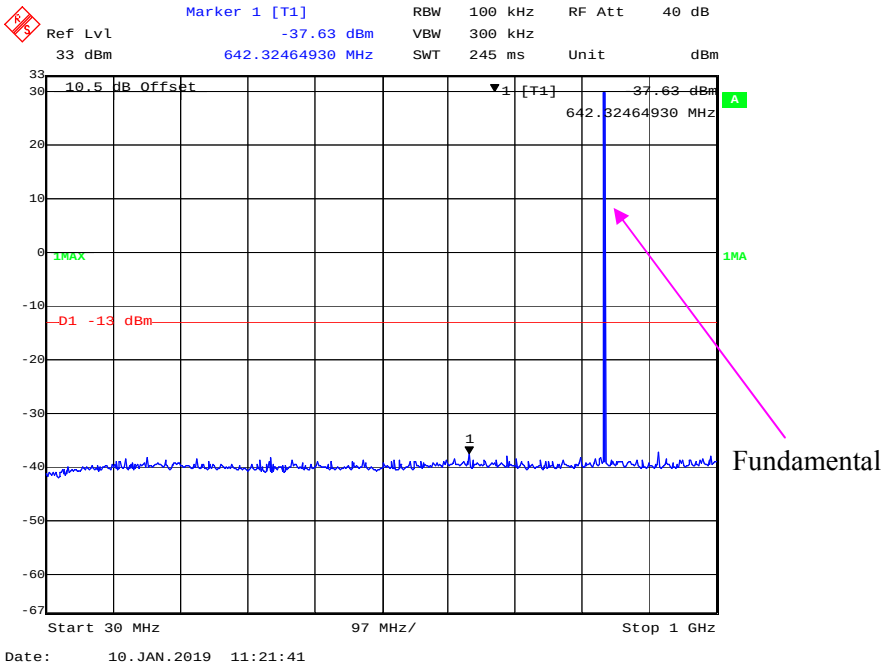
The testing was performed by Hope Zhang from 2018-12-22 to 2019-01-26.

EUT operation mode: Transmitting

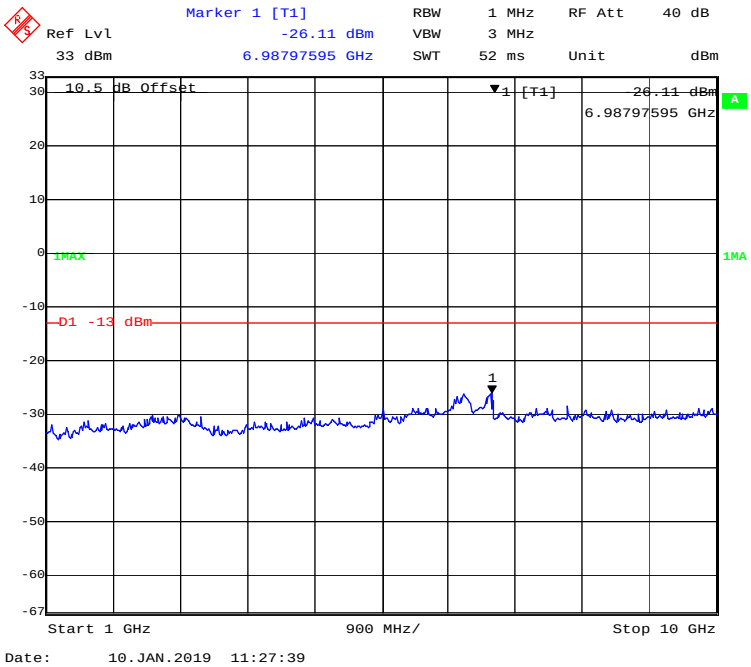
Test Result: Compliance.

GSM 850 Band:

30 MHz – 1GHz(GPRS Mode)

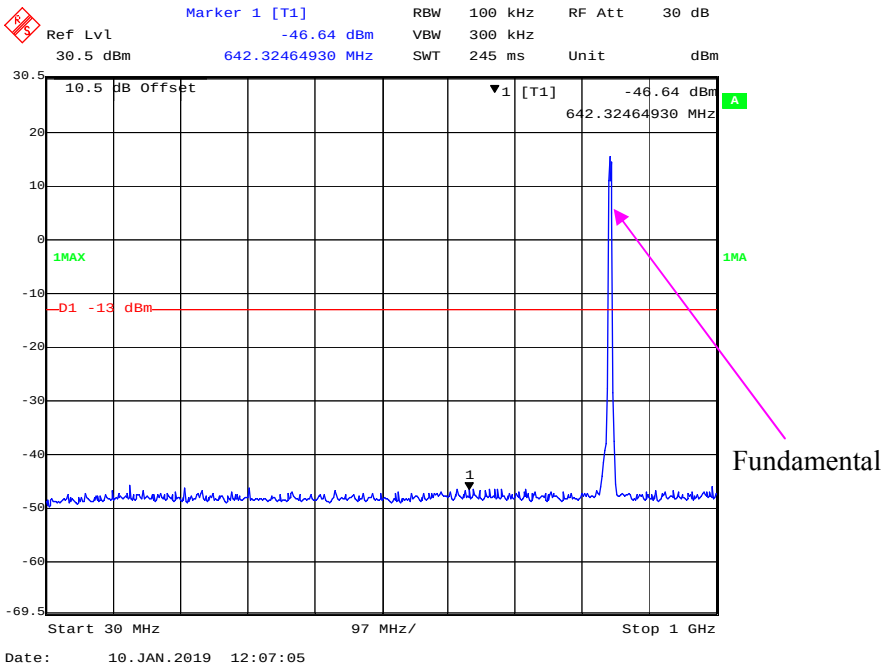


1 GHz – 10 GHz (GPRS Mode)

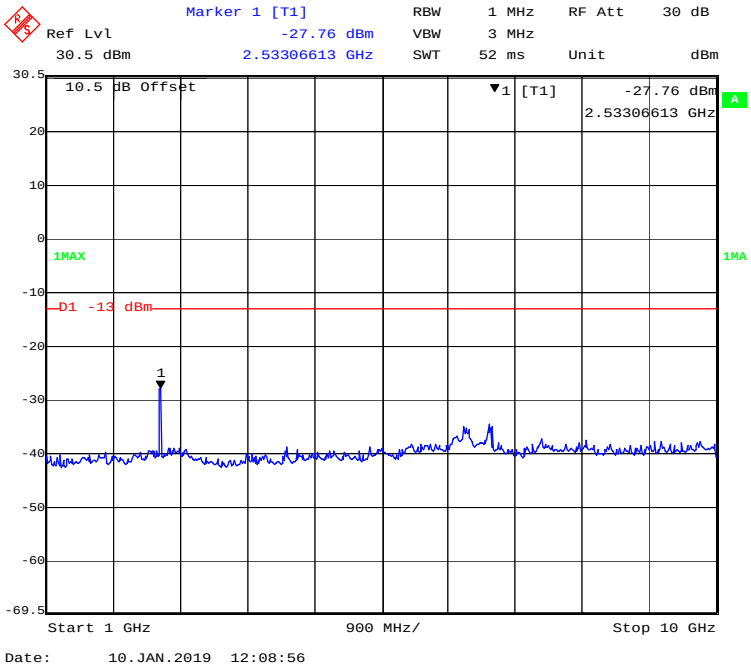


WCDMA Band V:

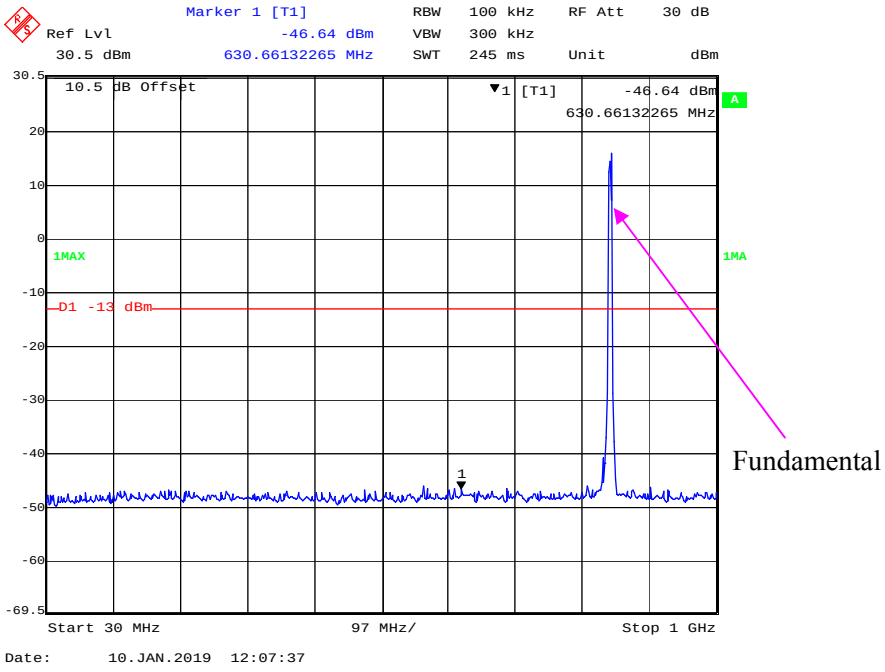
30 MHz – 1GHz WCDMA (Rel 99) Mode



1 GHz – 10 GHz WCDMA (Rel 99) Mode

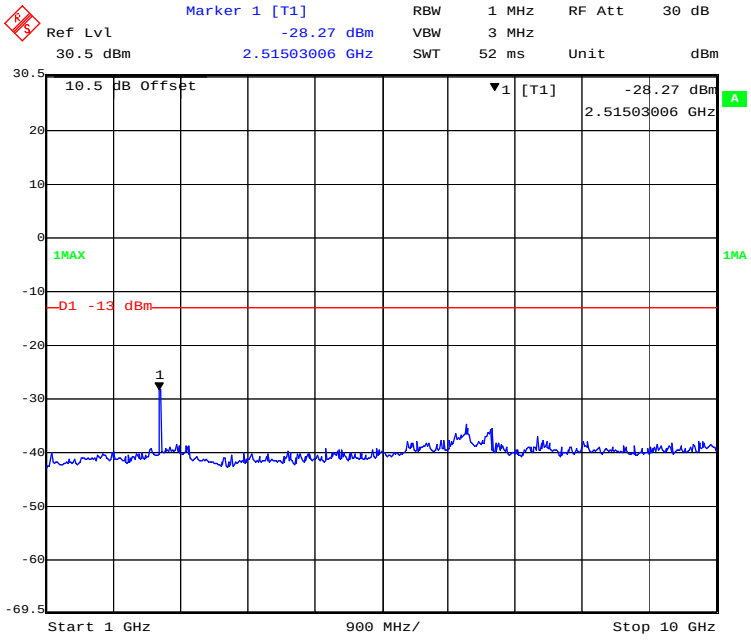


30 MHz – 1GHz WCDMA (HSDPA) Mode



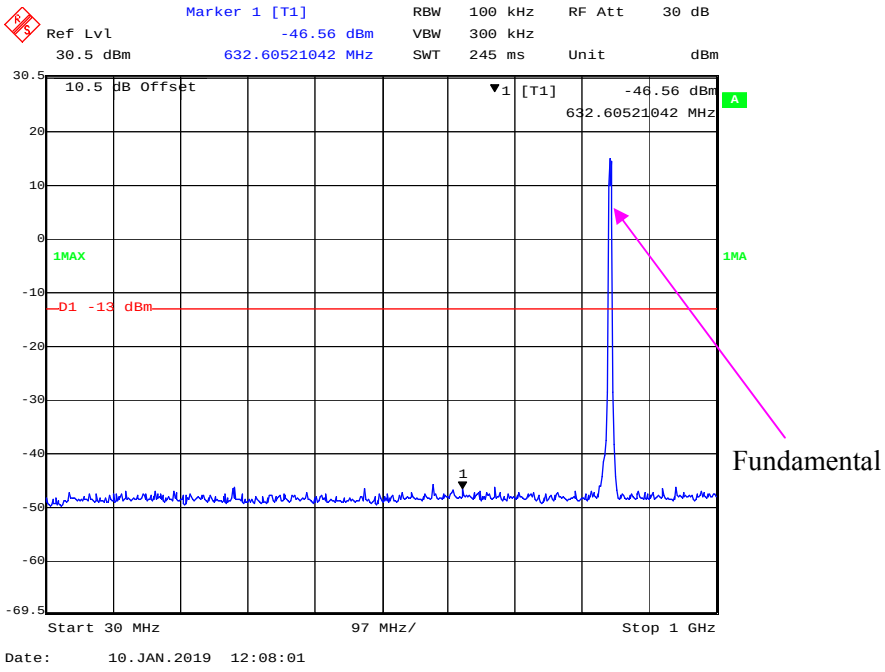
Date: 10.JAN.2019 12:07:37

1 GHz – 10 GHz WCDMA (HSDPA) Mode



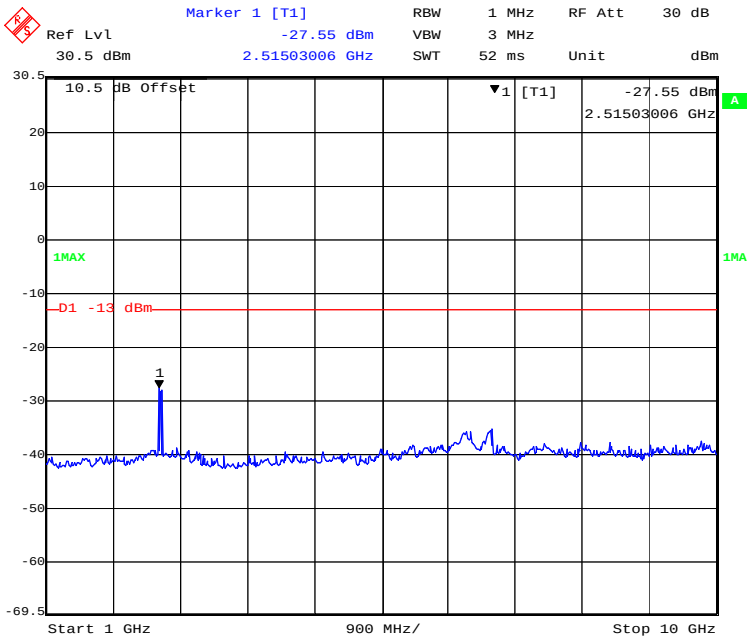
Date: 10.JAN.2019 12:09:33

30 MHz – 1GHz WCDMA (HSUPA) Mode



Date: 10.JAN.2019 12:08:01

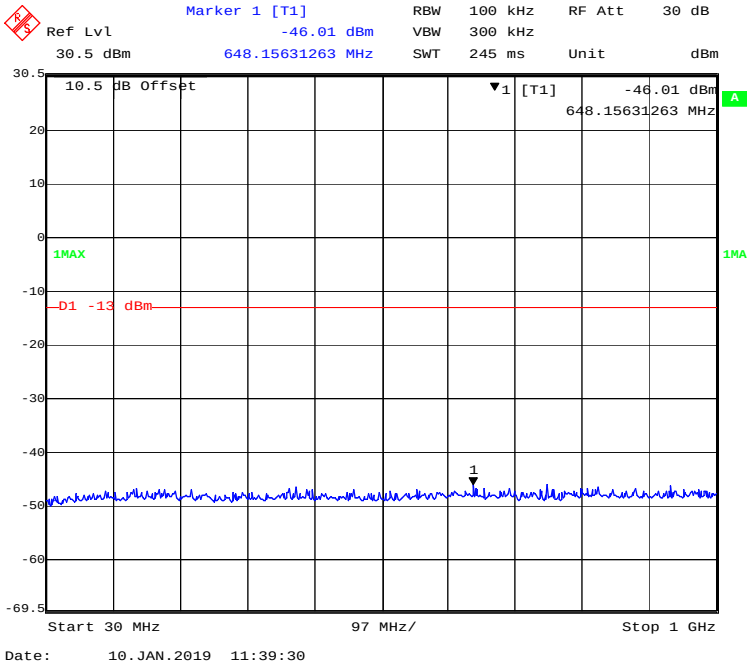
1 GHz – 10 GHz WCDMA (HSUPA) Mode



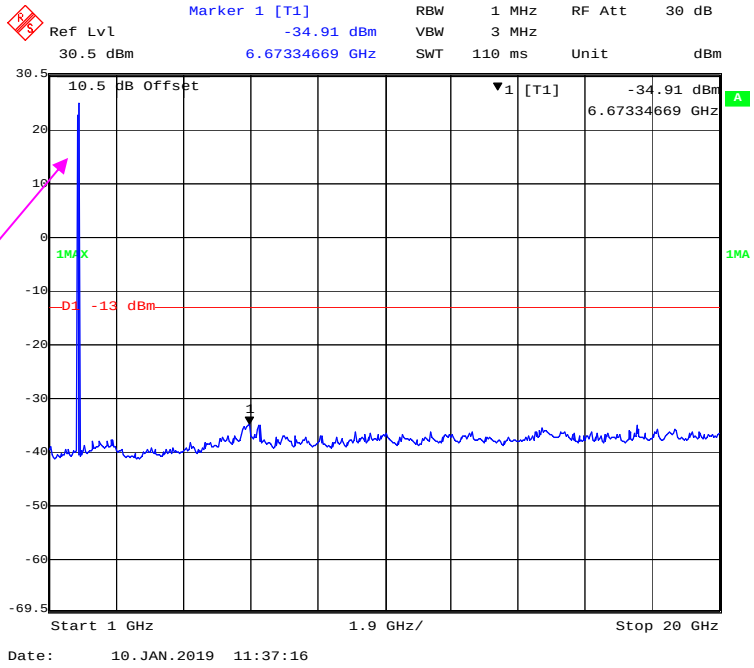
Date: 10.JAN.2019 12:09:49

PCS 1900 Band:

30 MHz – 1GHz(GPRS Mode)



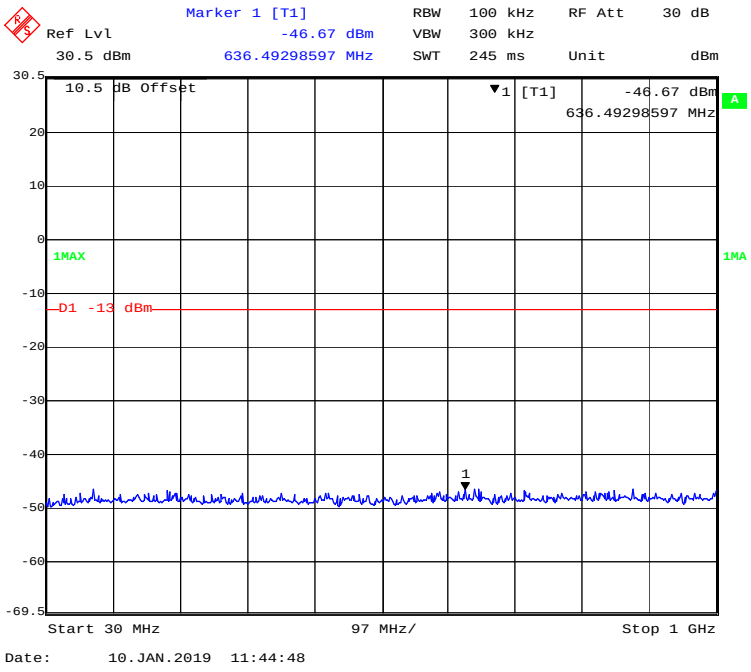
1 GHz – 20 GHz (GPRS Mode)



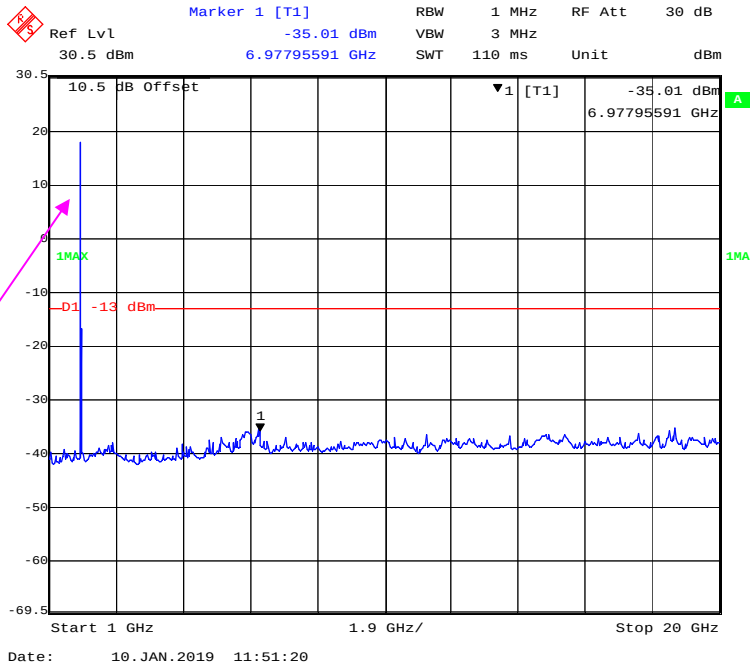
Fundamental

WCDMA Band II:

30 MHz – 1GHz WCDMA (Rel 99) Mode

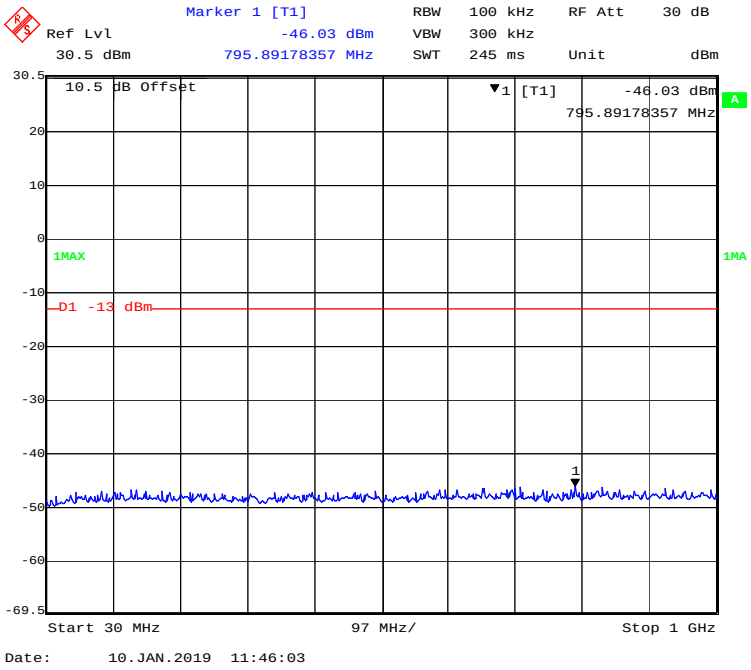


1 GHz – 20 GHz WCDMA (Rel 99) Mode

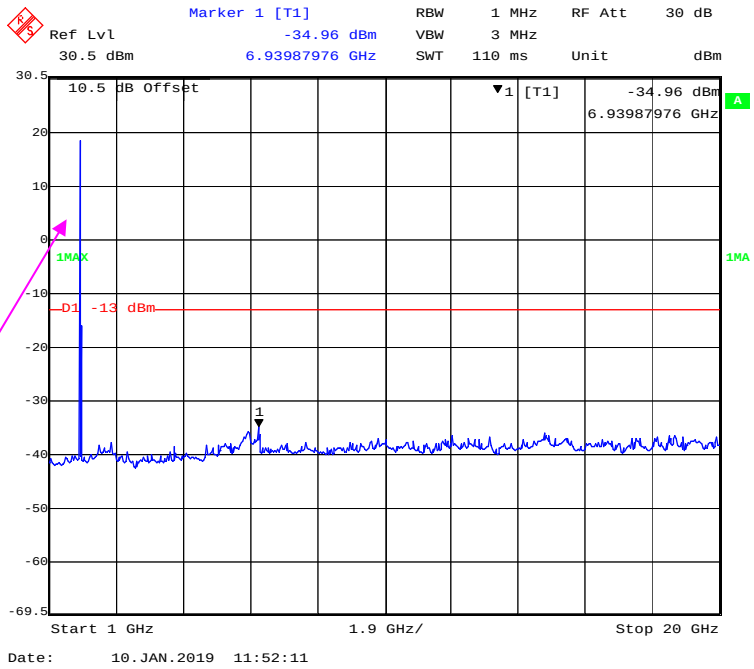


Fundamental

30 MHz – 1GHz WCDMA (HSDPA) Mode

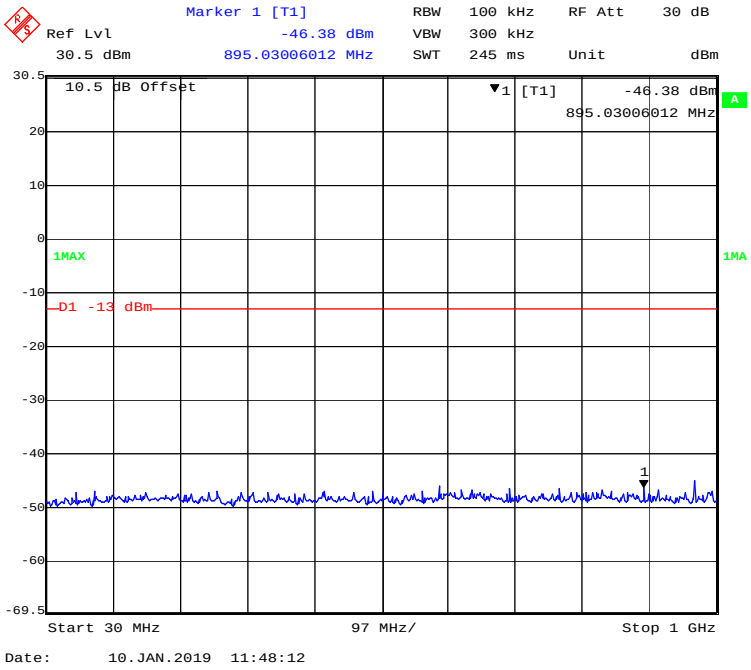


1 GHz – 20 GHz WCDMA (HSDPA) Mode

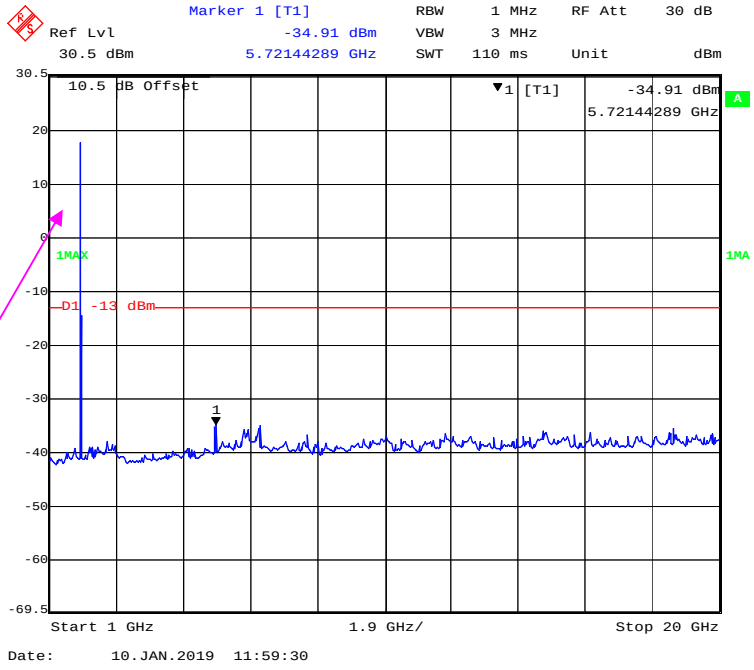


Fundamental

30 MHz – 1GHz WCDMA (HSUPA) Mode



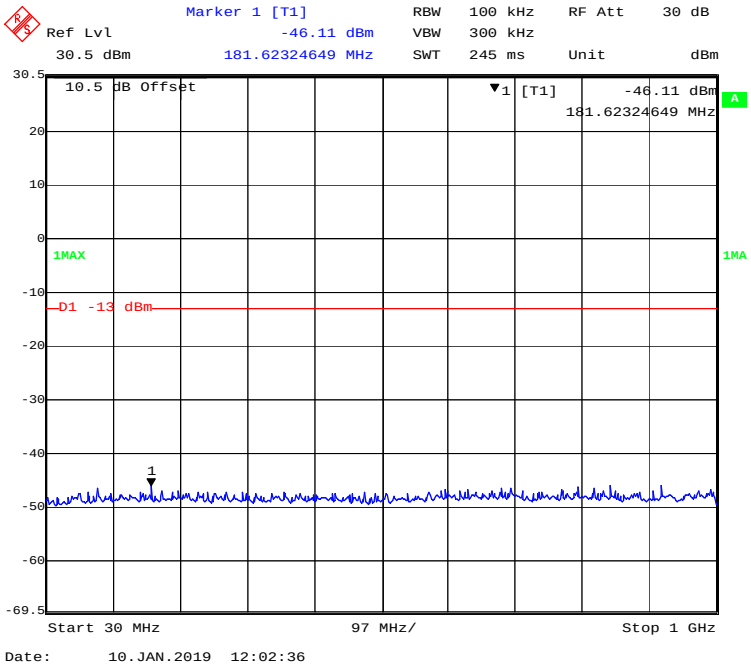
1 GHz – 20 GHz WCDMA (HSUPA) Mode



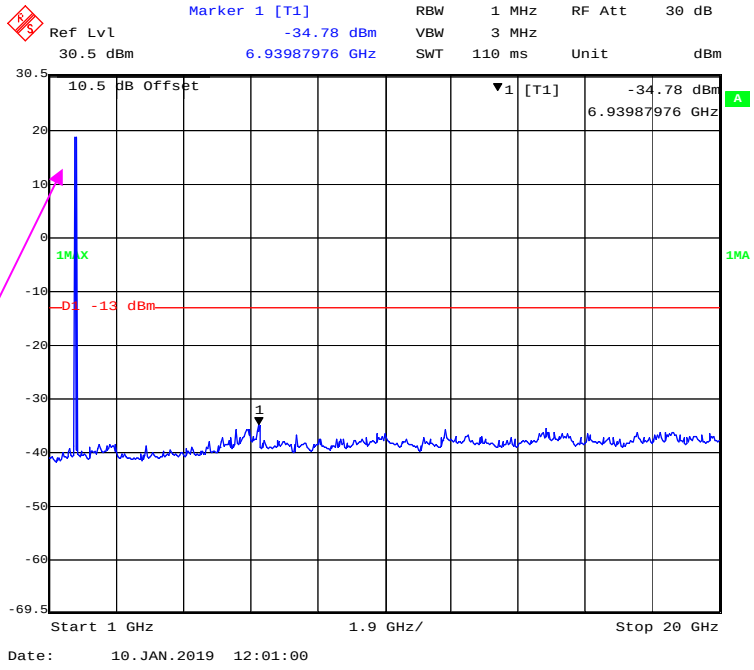
Fundamental

WCDMA Band IV:

30 MHz – 1GHz WCDMA (Rel 99) Mode

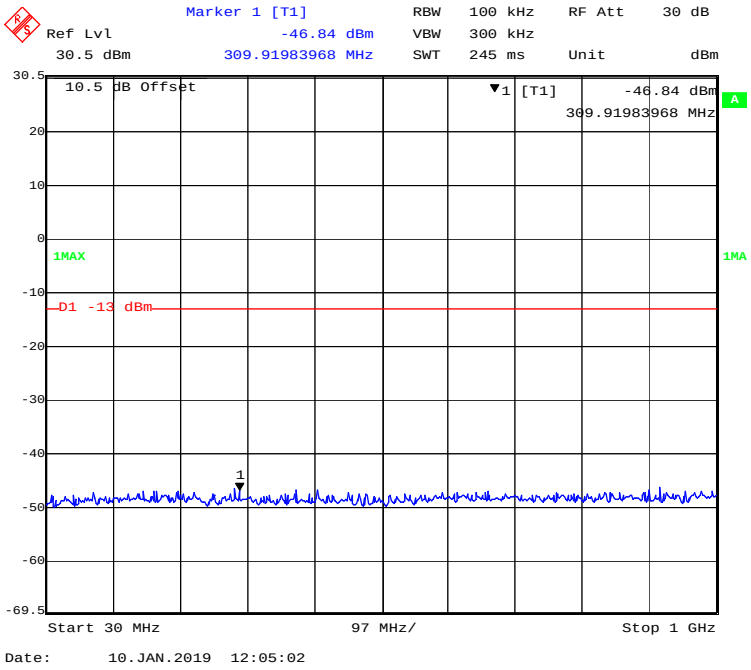


1 GHz – 20 GHz WCDMA (Rel 99) Mode

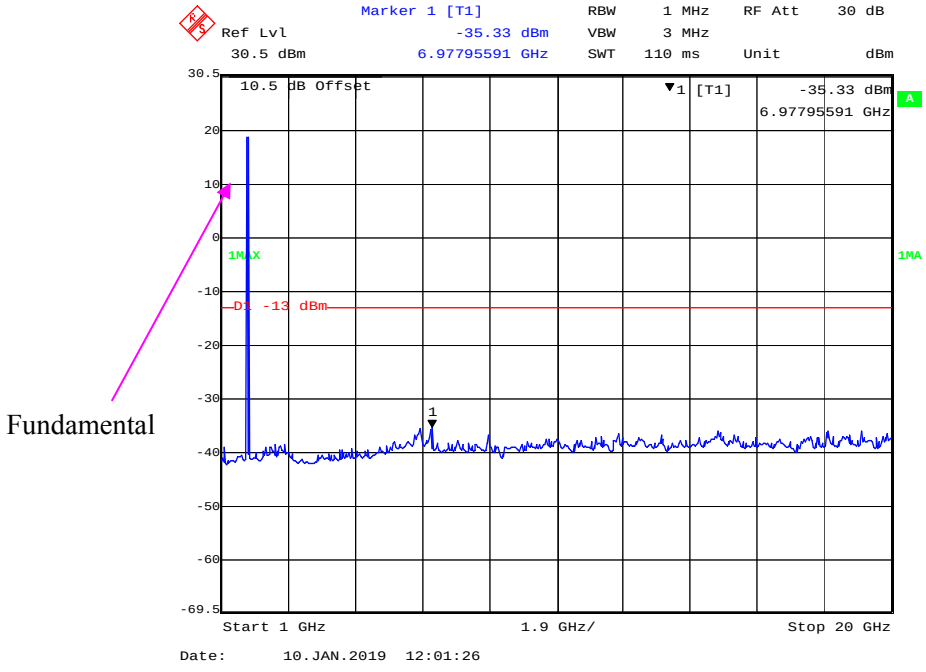


Fundamental

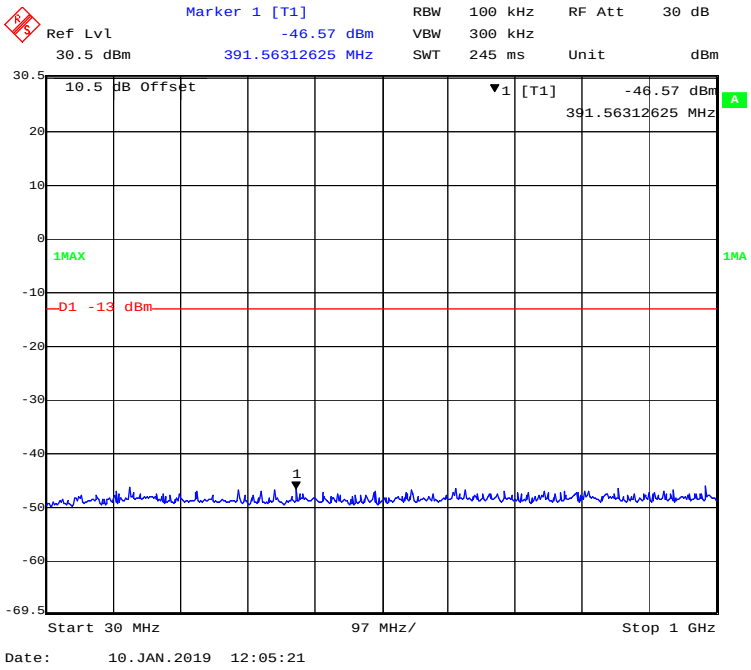
30 MHz – 1GHz WCDMA (HSDPA) Mode



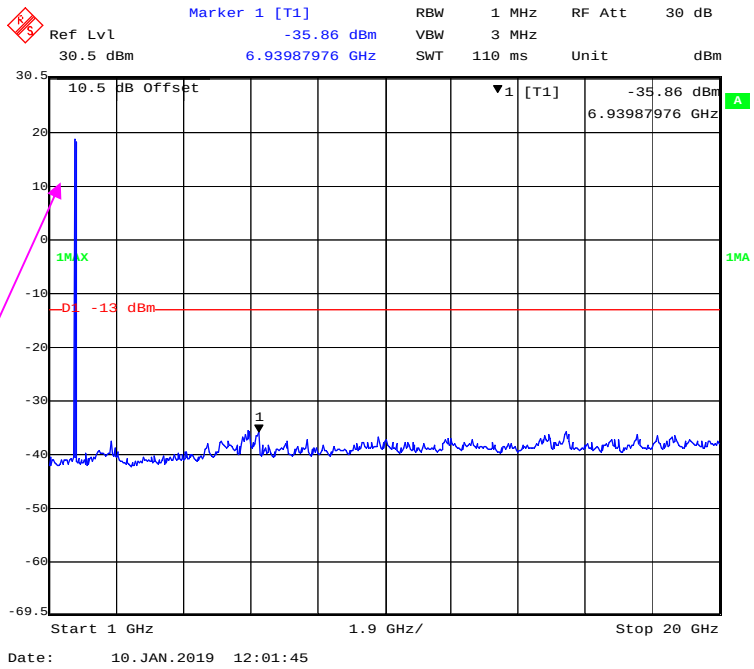
1 GHz – 10 GHz WCDMA (HSDPA) Mode



30 MHz – 1GHz WCDMA (HSUPA) Mode



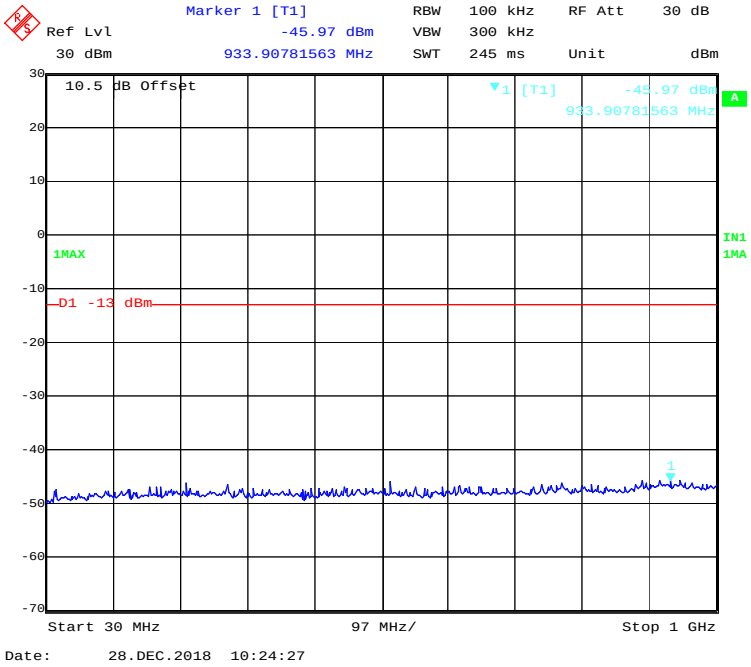
1 GHz – 20 GHz WCDMA (HSUPA) Mode



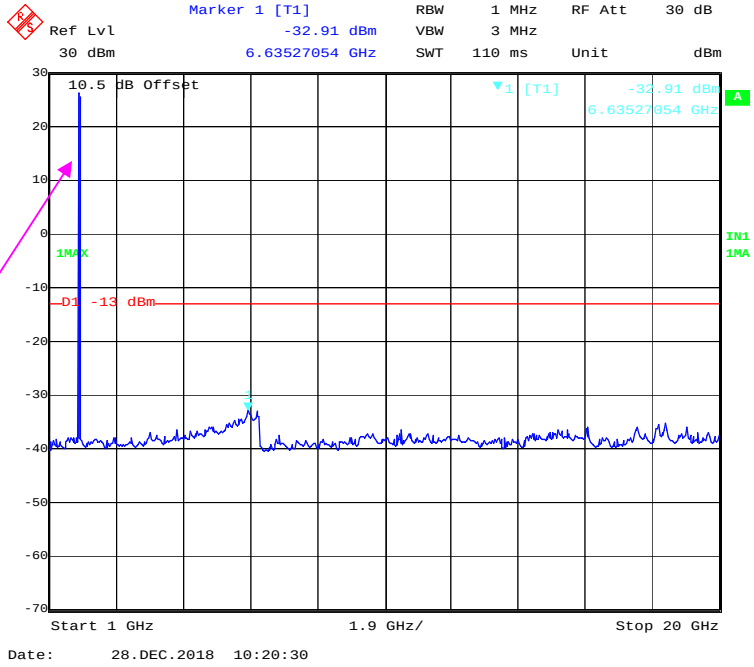
Fundamental

LTE Band 2:

30 MHz - 1 GHz (1.4 MHz, Middle Channel)

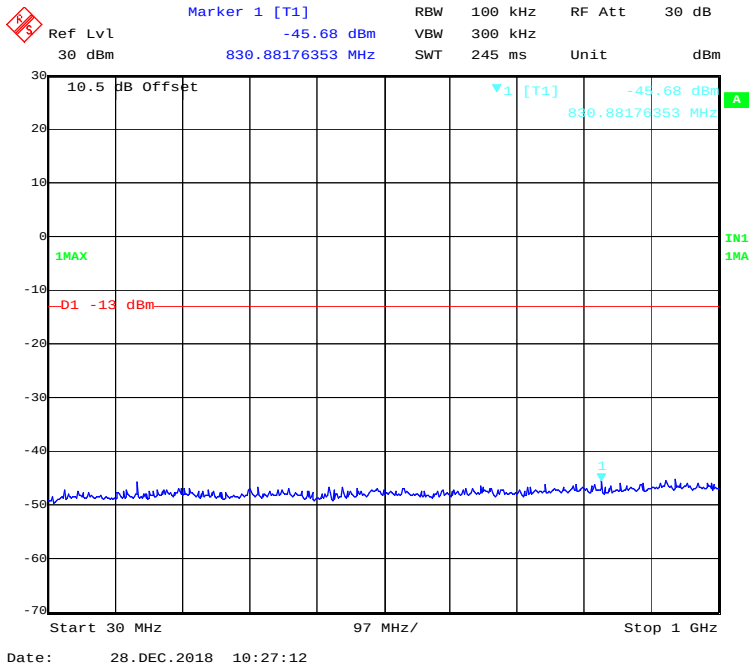


1 GHz – 20 GHz (1.4 MHz, Middle Channel)

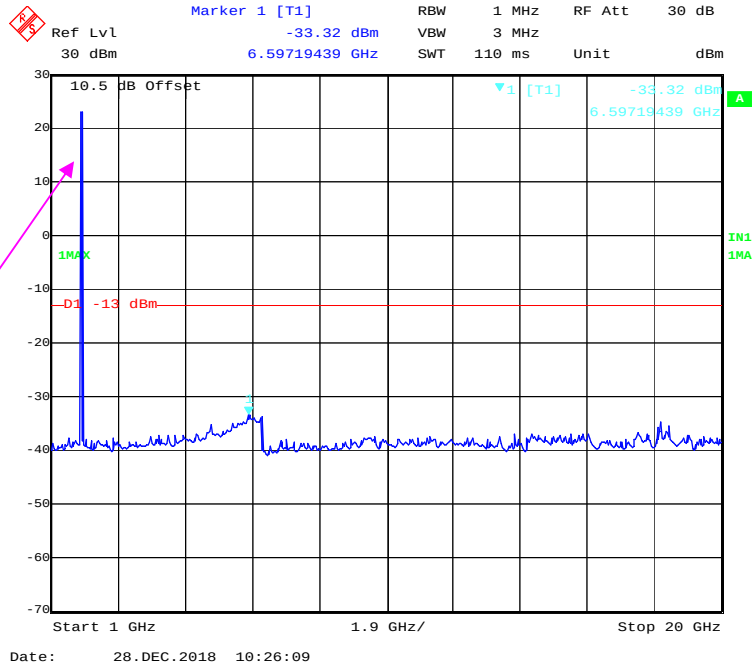


Fundamental

30 MHz - 1 GHz (3.0 MHz, Middle Channel)

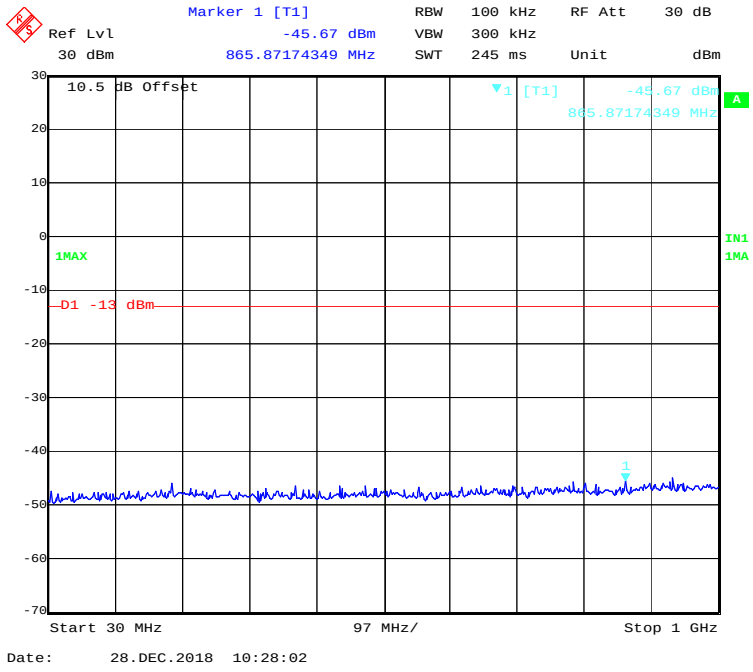


1 GHz – 20 GHz (3.0 MHz, Middle Channel)

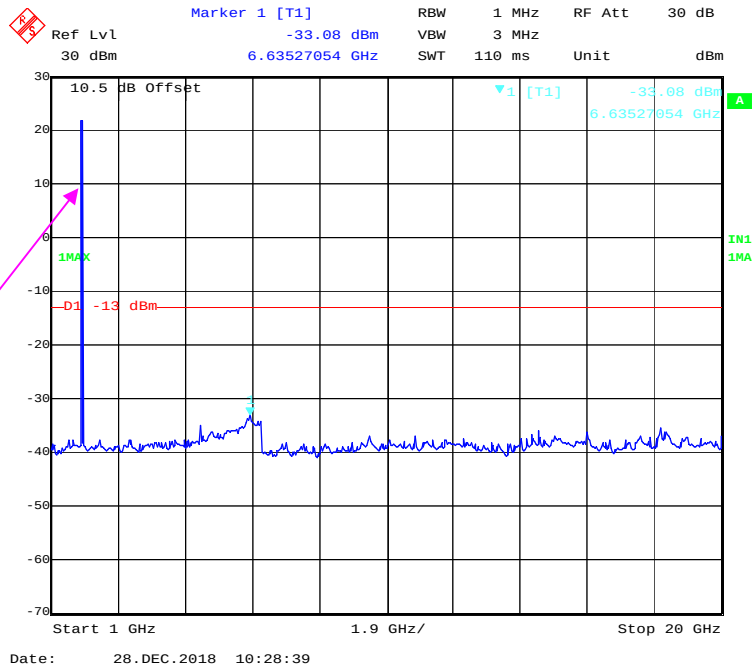


Fundamental

30 MHz - 1 GHz (5.0 MHz, Middle Channel)

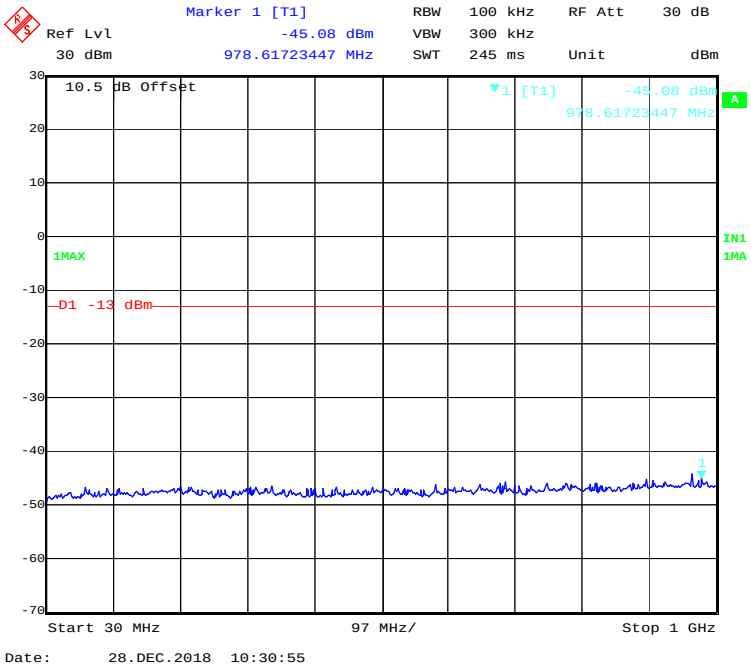


1 GHz – 20 GHz (5.0MHz, Middle Channel)

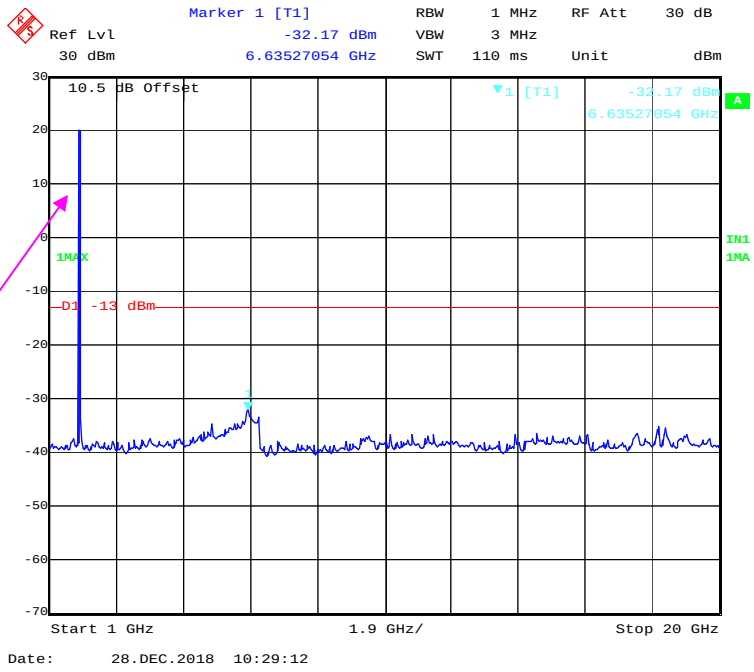


Fundamental

30 MHz - 1 GHz (10.0 MHz, Middle Channel)

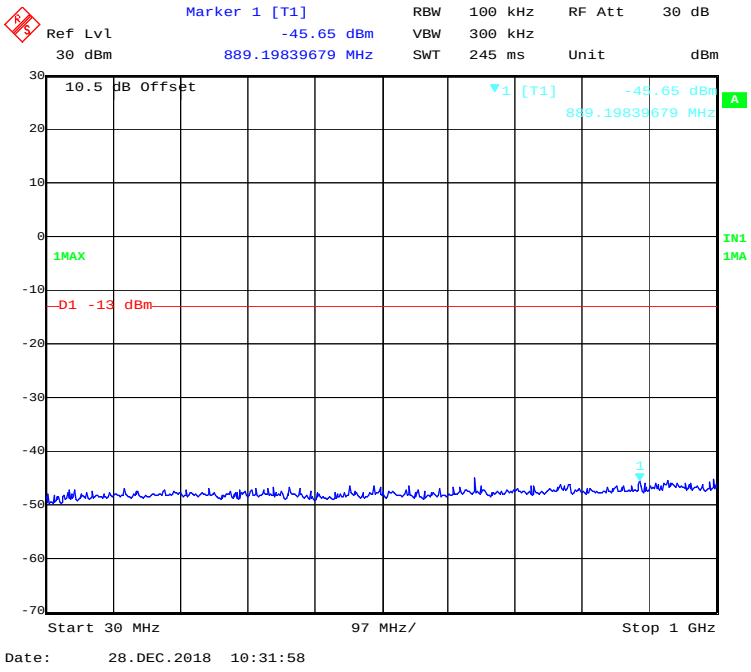


1 GHz – 20 GHz (10.0 MHz, Middle Channel)

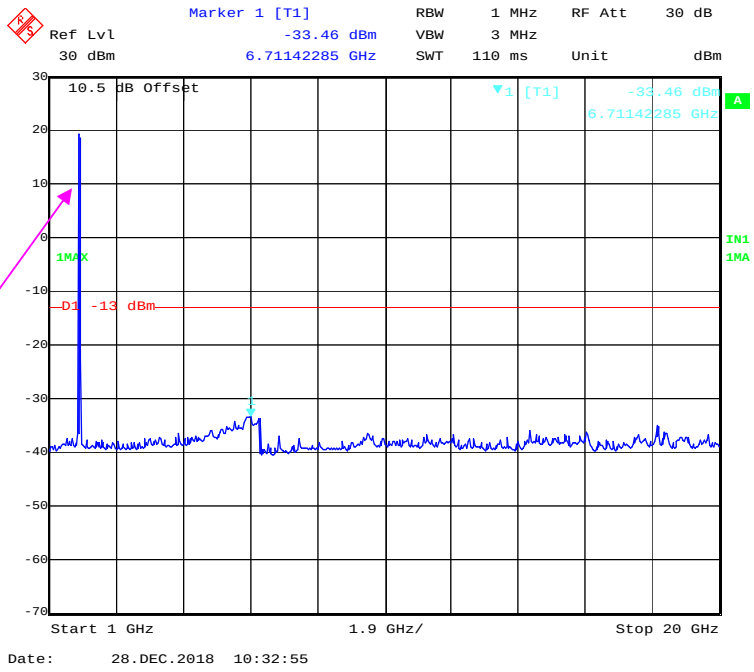


Fundamental

30 MHz - 1 GHz (15.0 MHz, Middle Channel)

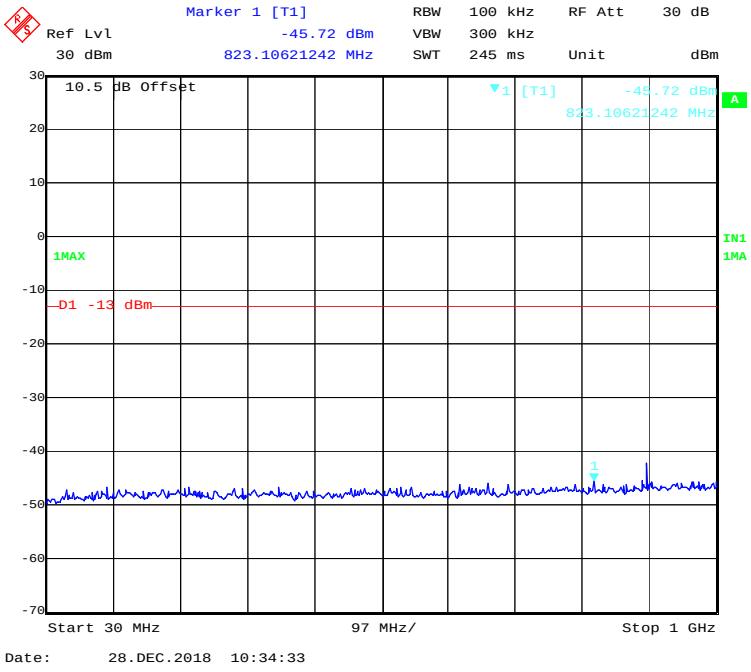


1 GHz – 20 GHz (15.0 MHz, Middle Channel)

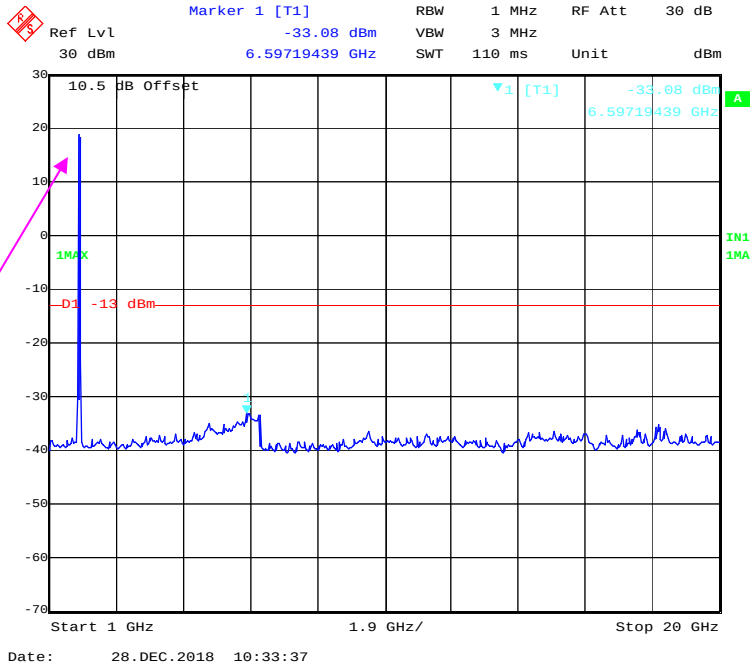


Fundamental

30 MHz - 1 GHz (20.0 MHz, Middle Channel)



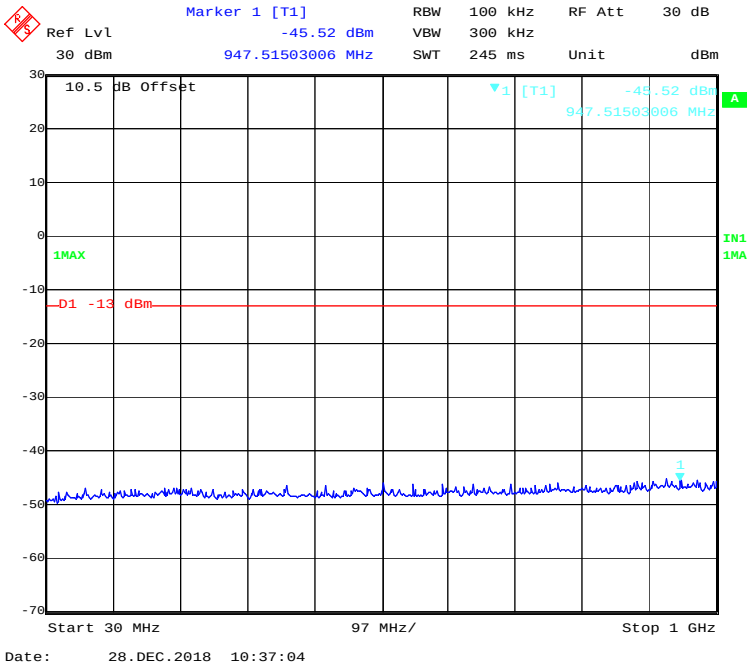
1 GHz – 20 GHz (20.0 MHz, Middle Channel)



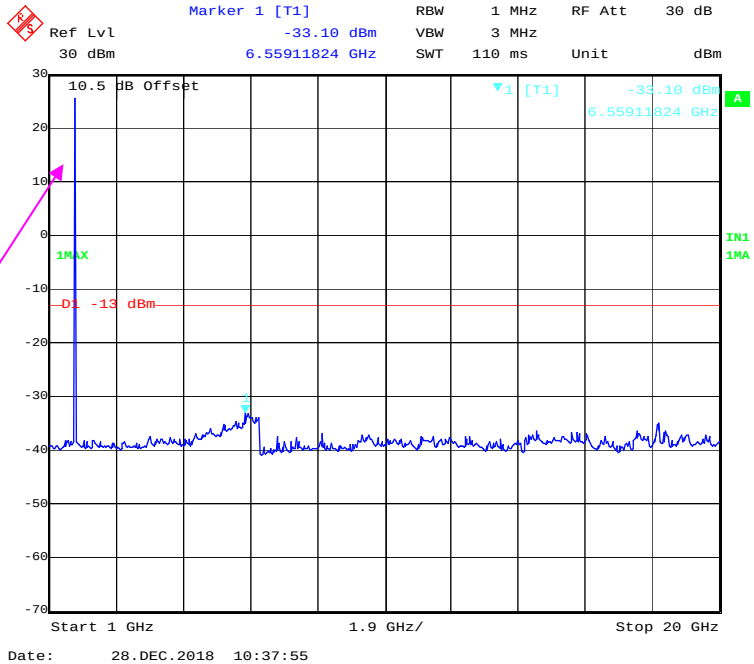
Fundamental

LTE Band 4:

30 MHz - 1 GHz (1.4 MHz, Middle Channel)

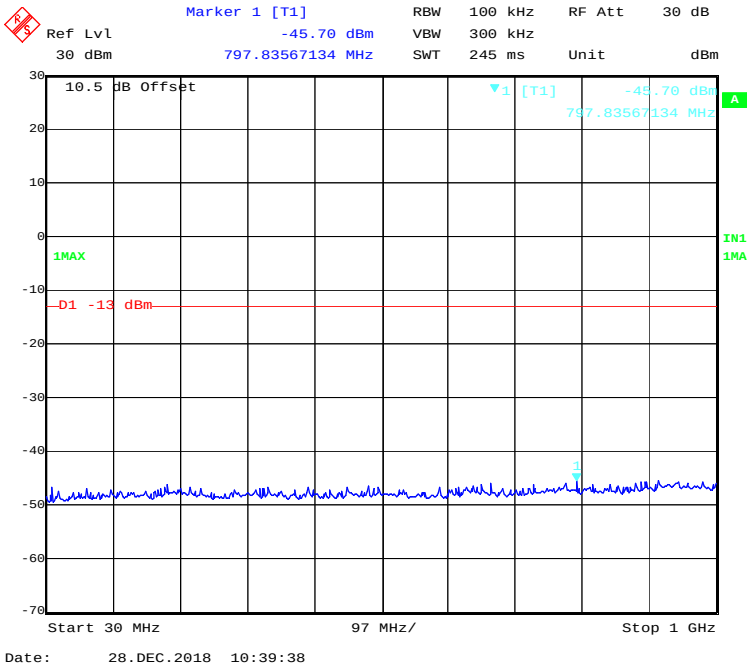


1 GHz – 20 GHz (1.4 MHz, Middle Channel)

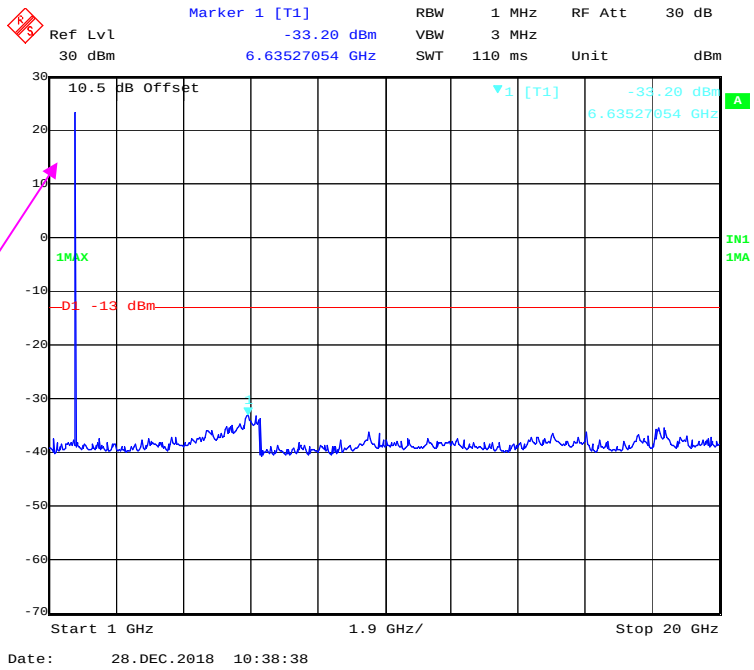


Fundamental

30 MHz - 1 GHz (3.0 MHz, Middle Channel)

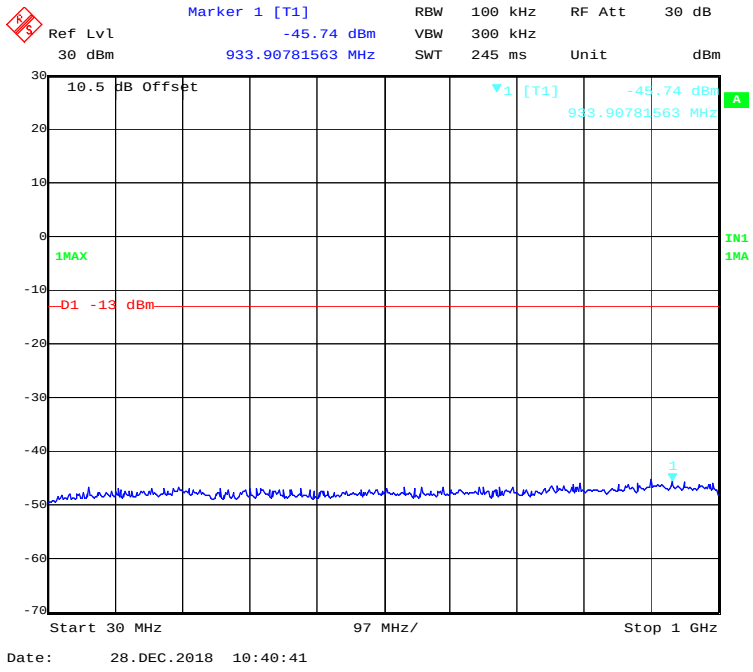


1 GHz – 20 GHz (3.0 MHz, Middle Channel)

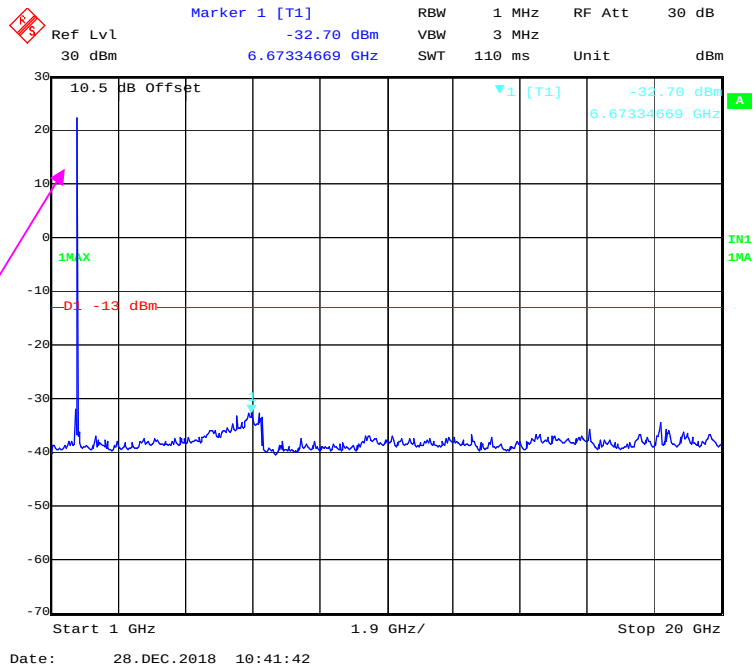


Fundamental

30 MHz - 1 GHz (5.0 MHz, Middle Channel)

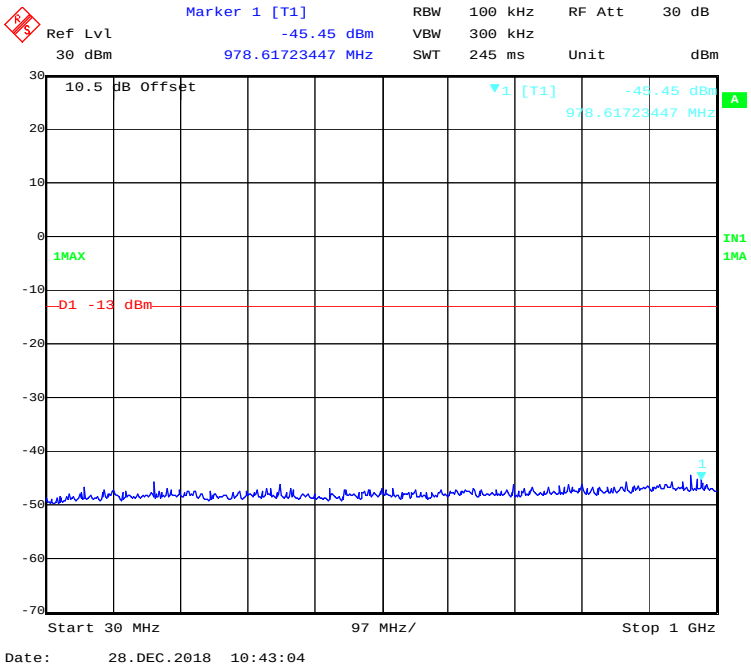


1 GHz – 20 GHz (5.0MHz, Middle Channel)

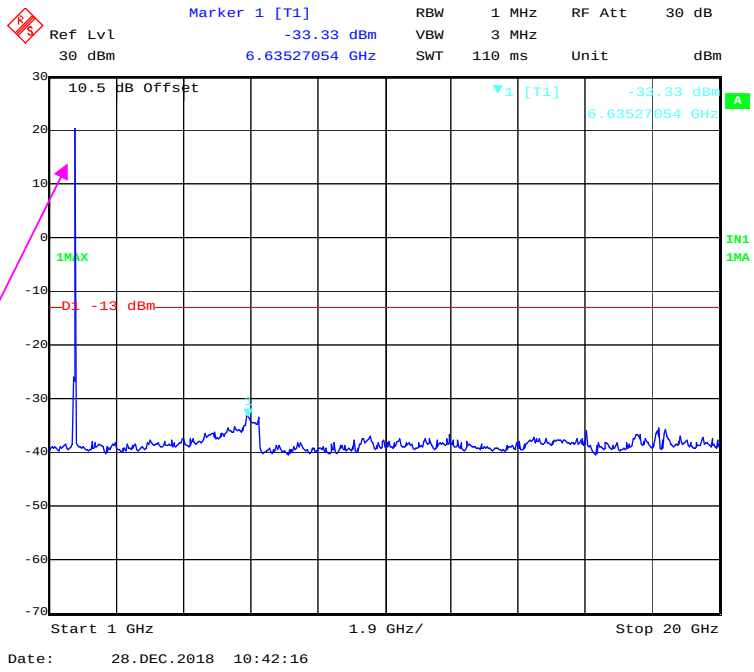


Fundamental

30 MHz - 1 GHz (10.0 MHz, Middle Channel)

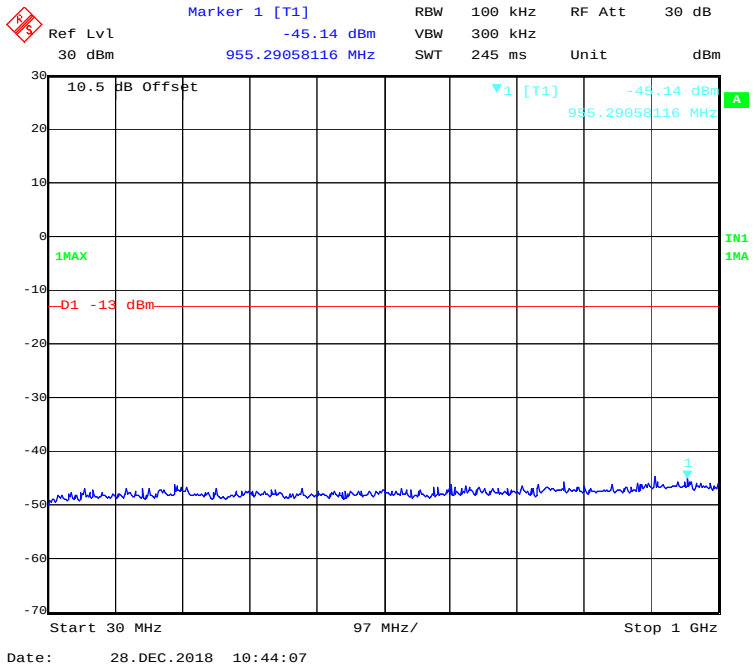


1 GHz – 20 GHz (10.0 MHz, Middle Channel)

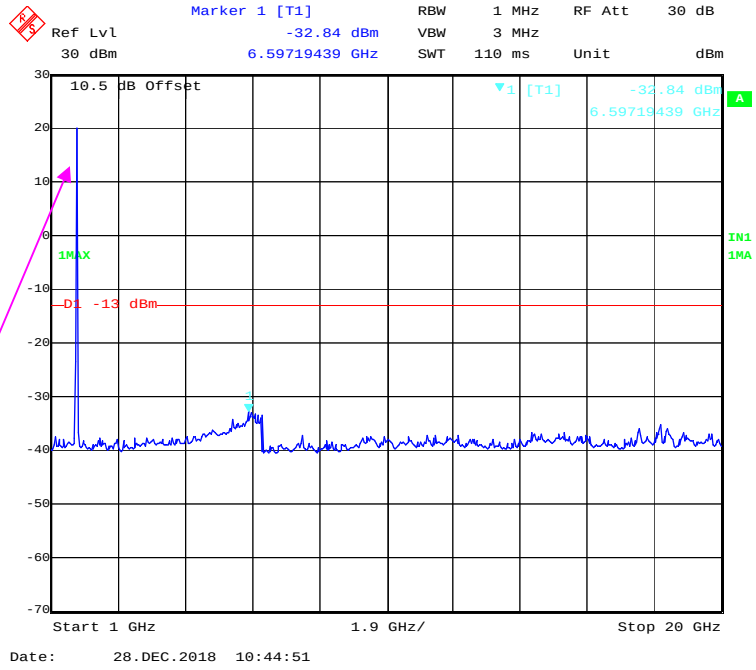


Fundamental

30 MHz - 1 GHz (15.0 MHz, Middle Channel)

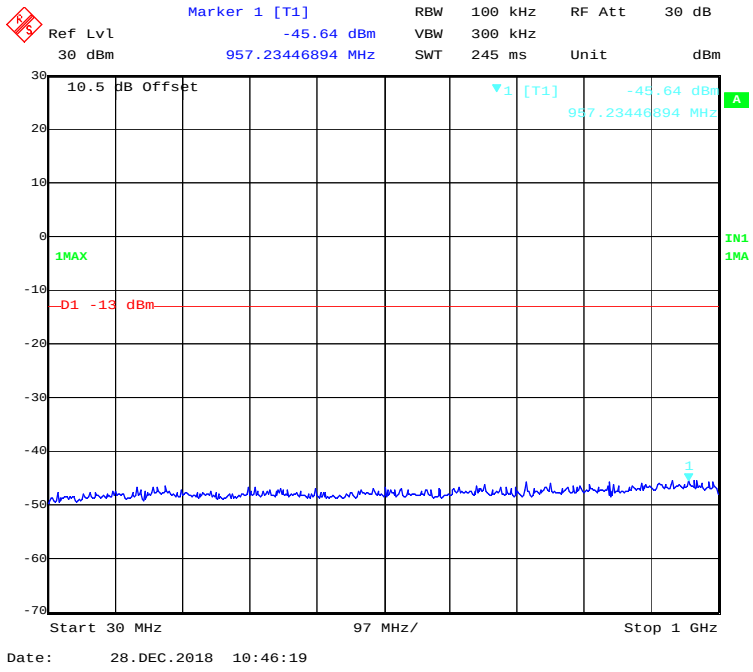


1 GHz – 20 GHz (15.0 MHz, Middle Channel)

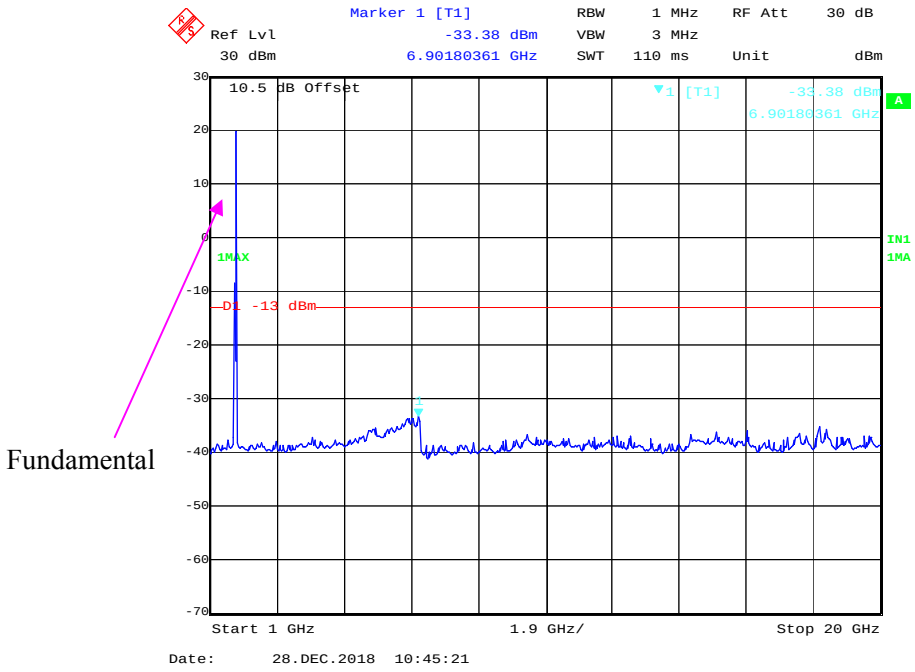


Fundamental

30 MHz - 1 GHz (20.0 MHz, Middle Channel)

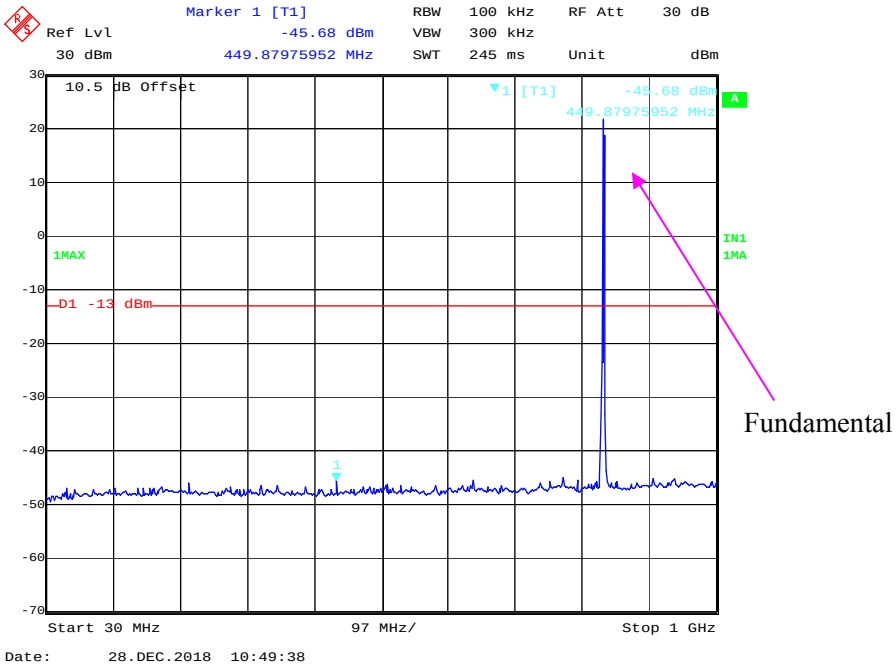


1 GHz – 20 GHz (20.0 MHz, Middle Channel)

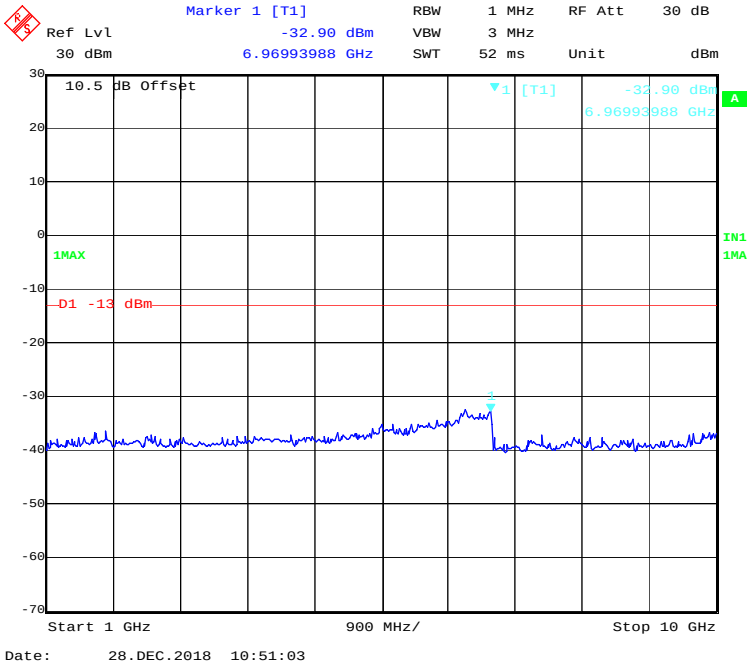


LTE Band 5:

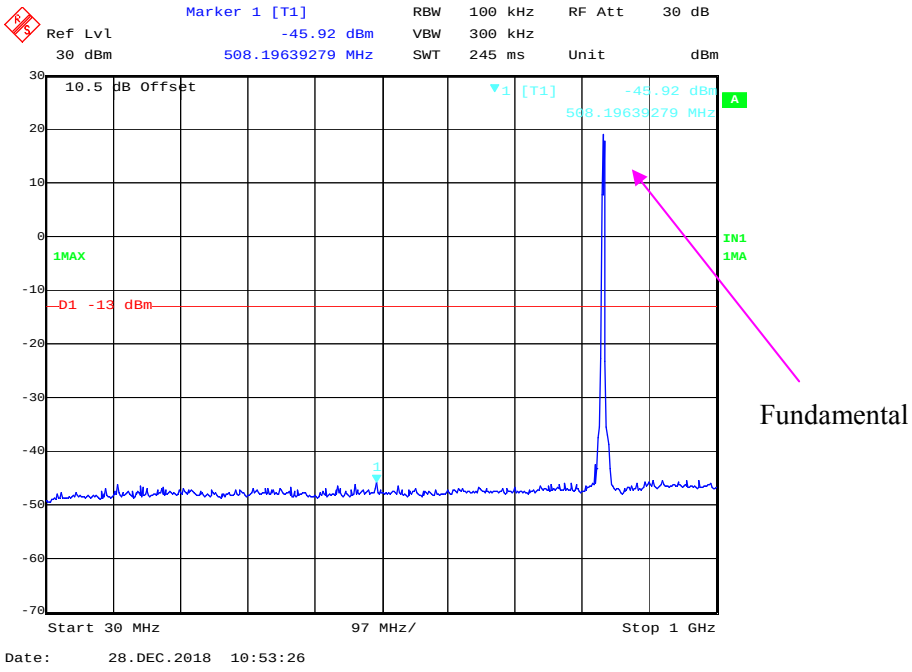
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



1 GHz – 10 GHz (1.4 MHz, Middle Channel)

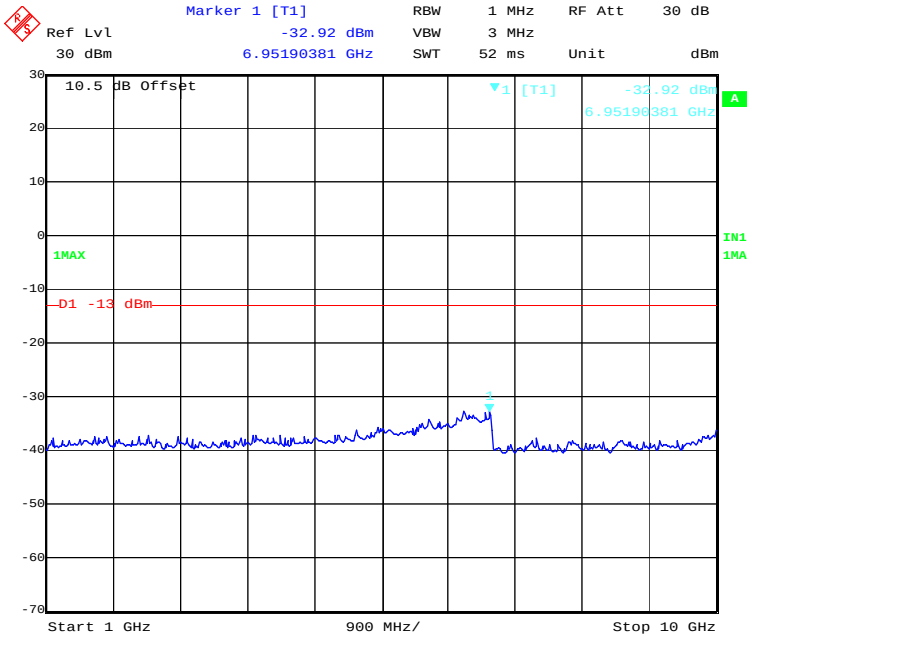


30 MHz - 1 GHz (3.0 MHz, Middle Channel)



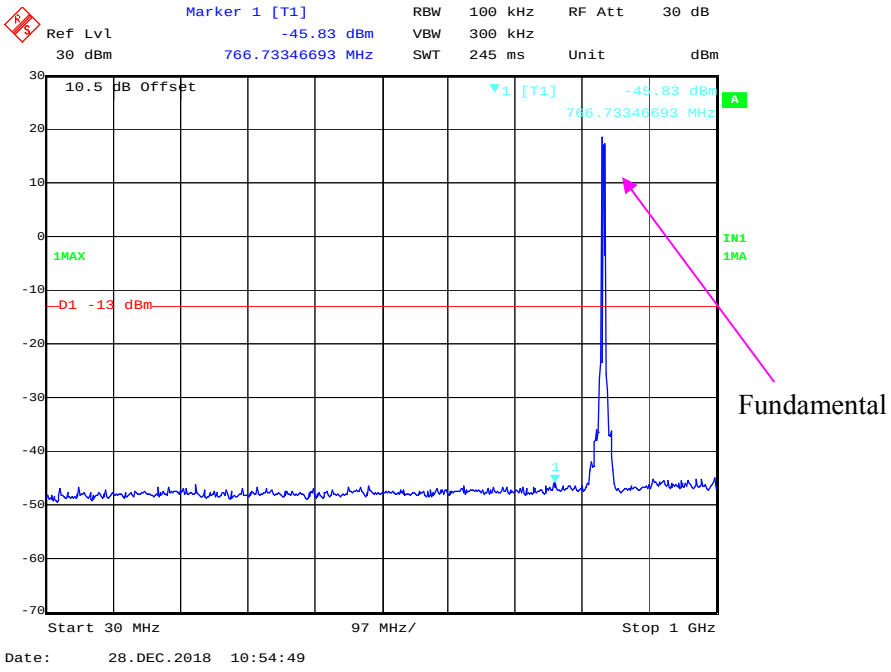
Date: 28.DEC.2018 10:53:26

1 GHz – 10 GHz (3.0 MHz, Middle Channel)



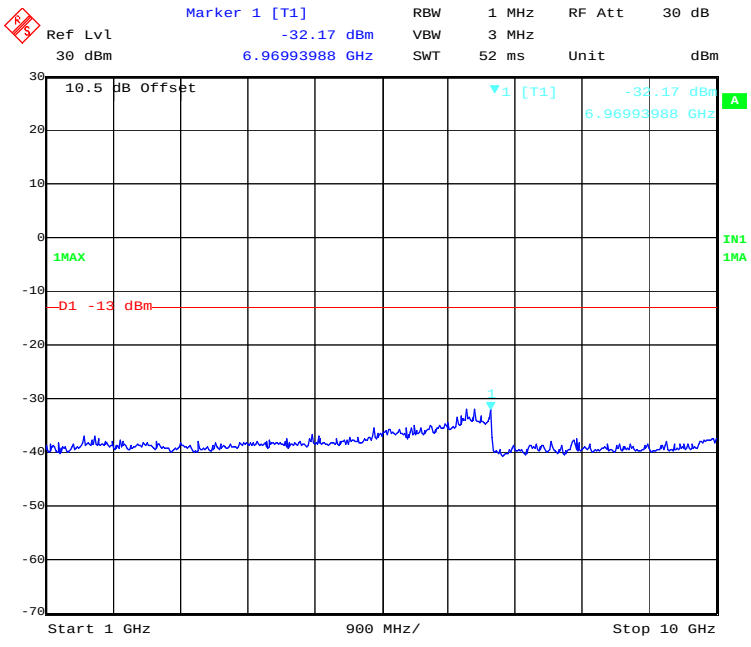
Date: 28.DEC.2018 10:51:59

30 MHz - 1 GHz (5.0 MHz, Middle Channel)



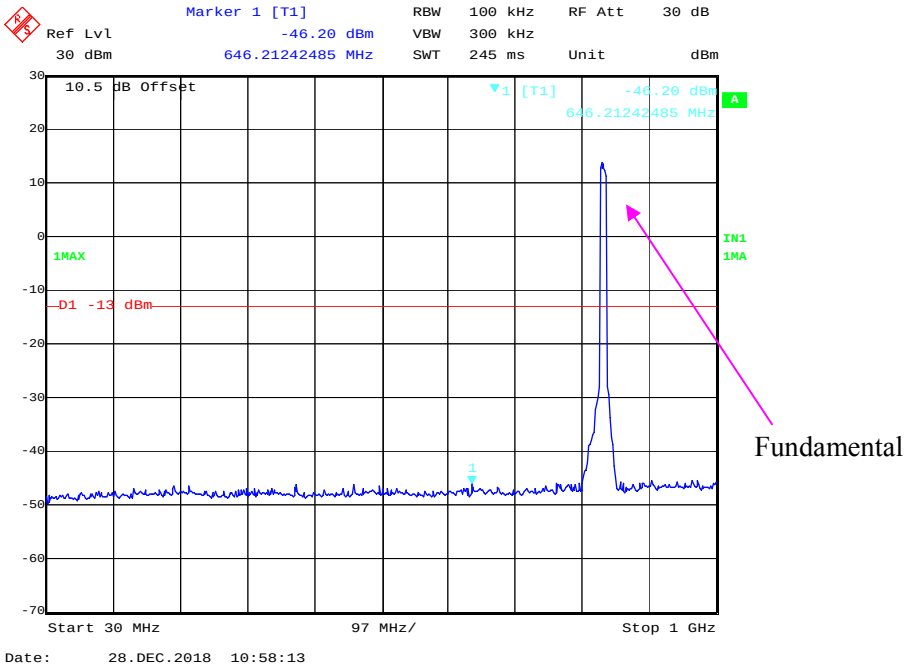
Date: 28.DEC.2018 10:54:49

1 GHz – 10 GHz (5.0MHz, Middle Channel)



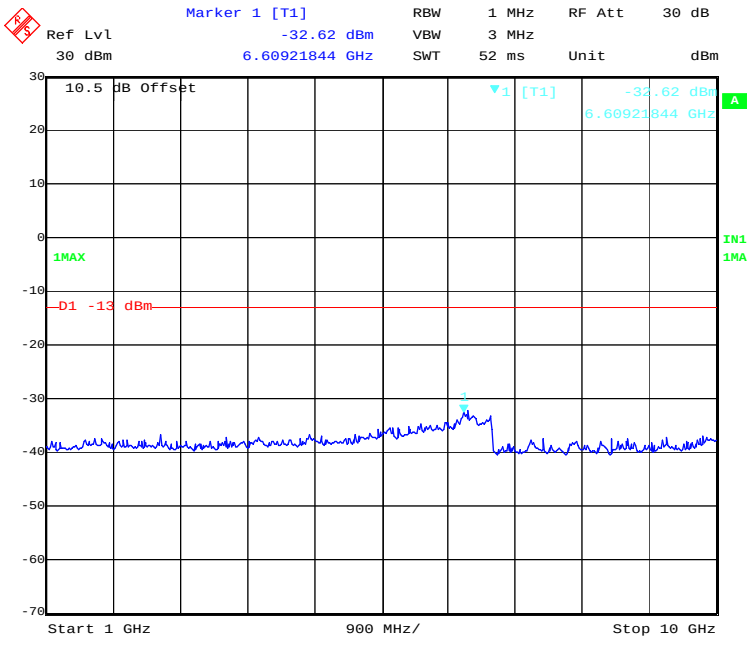
Date: 28.DEC.2018 10:55:44

30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Date: 28.DEC.2018 10:58:13

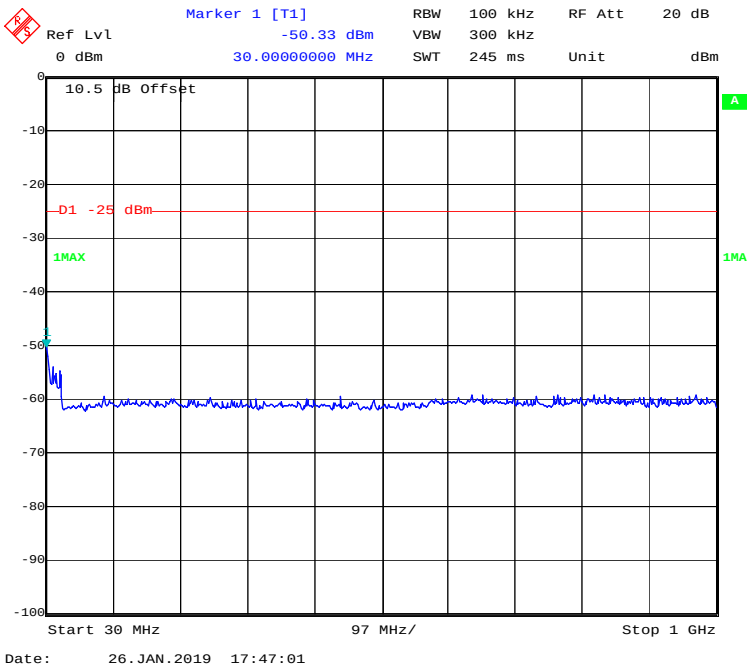
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



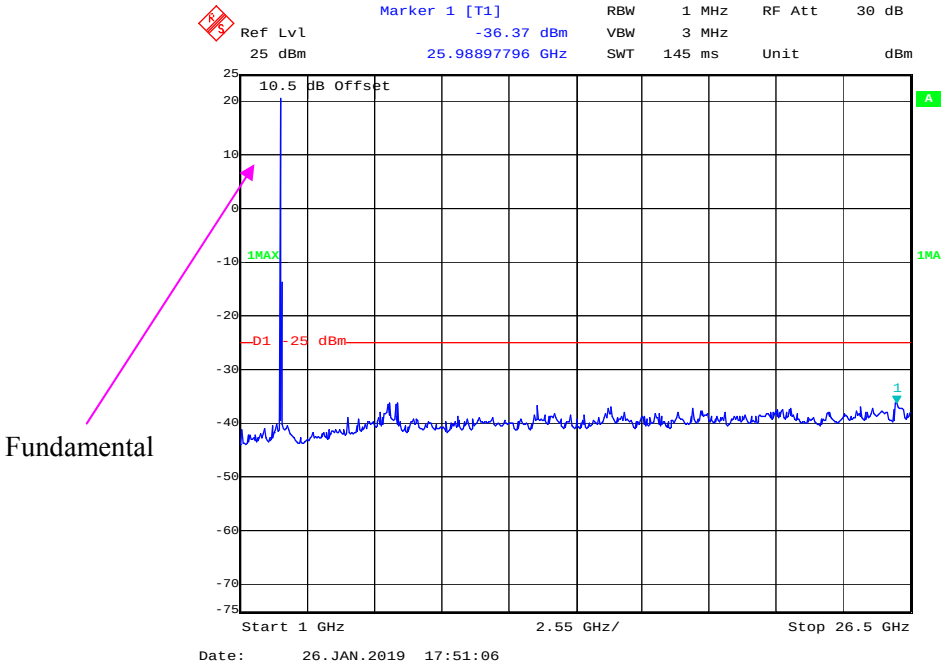
Date: 28.DEC.2018 10:56:51

LTE Band 7:

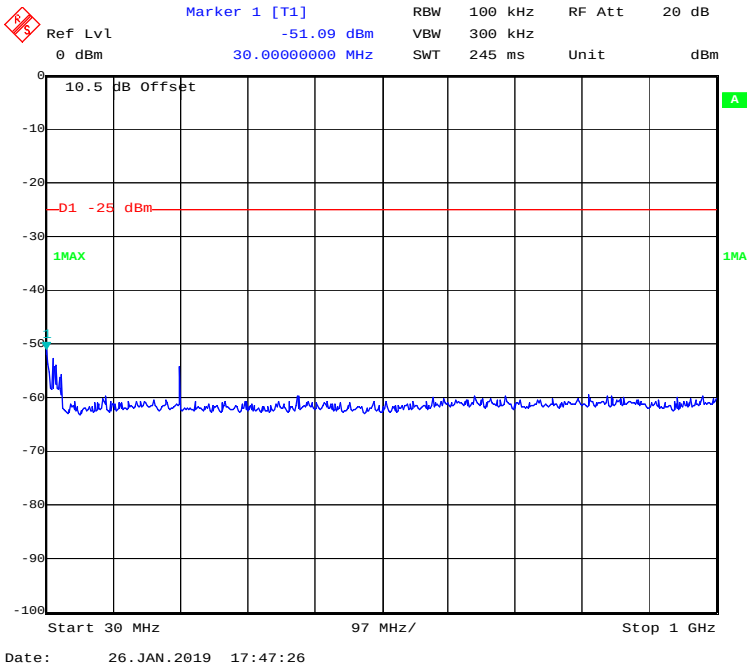
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



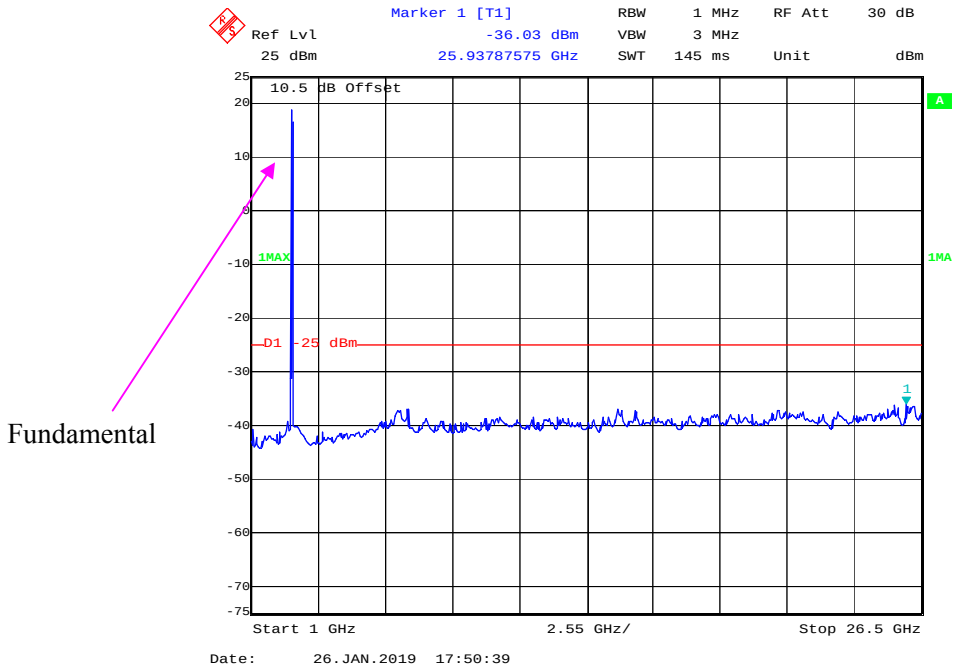
1 GHz – 26.5 GHz (5.0 MHz, Middle Channel)



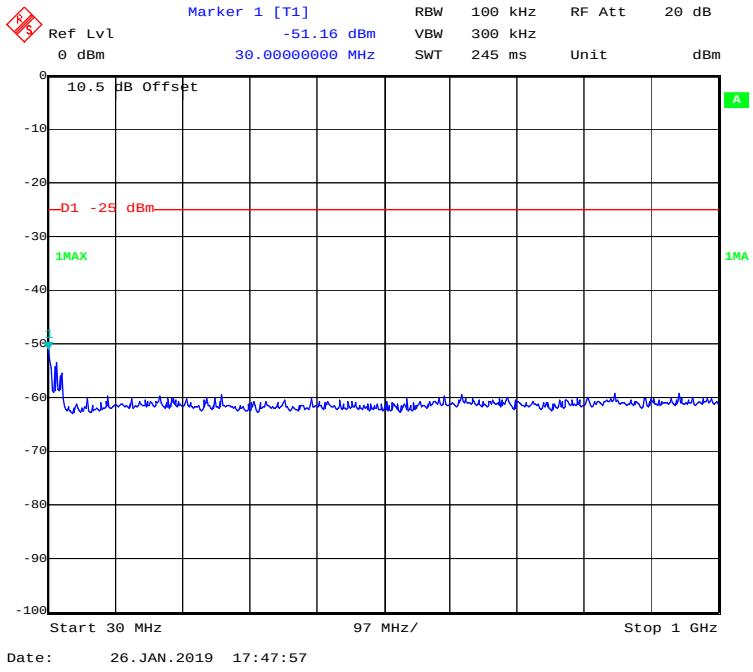
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



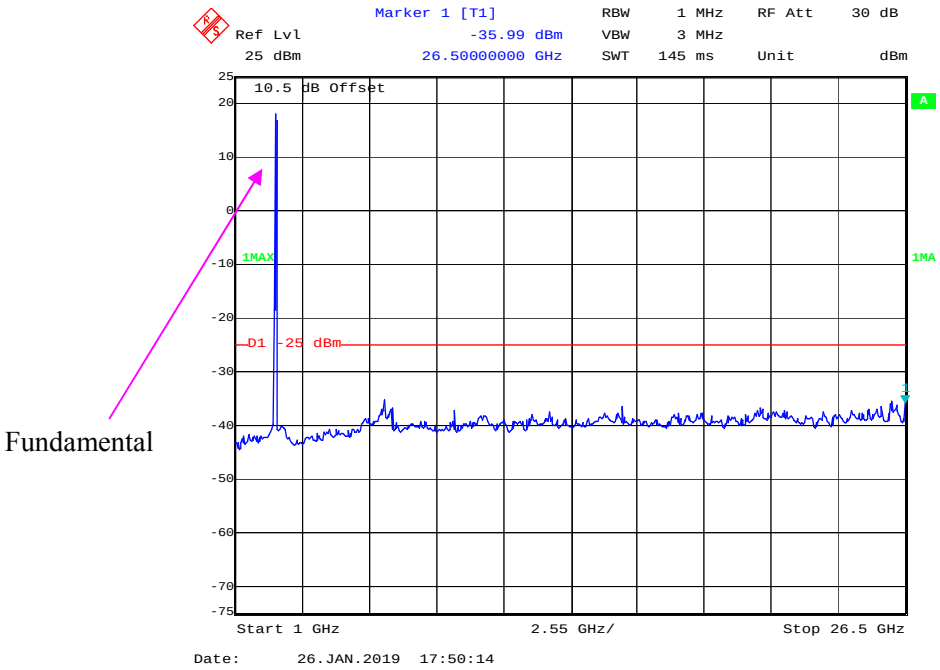
1 GHz – 26.5 GHz (10.0 MHz, Middle Channel)



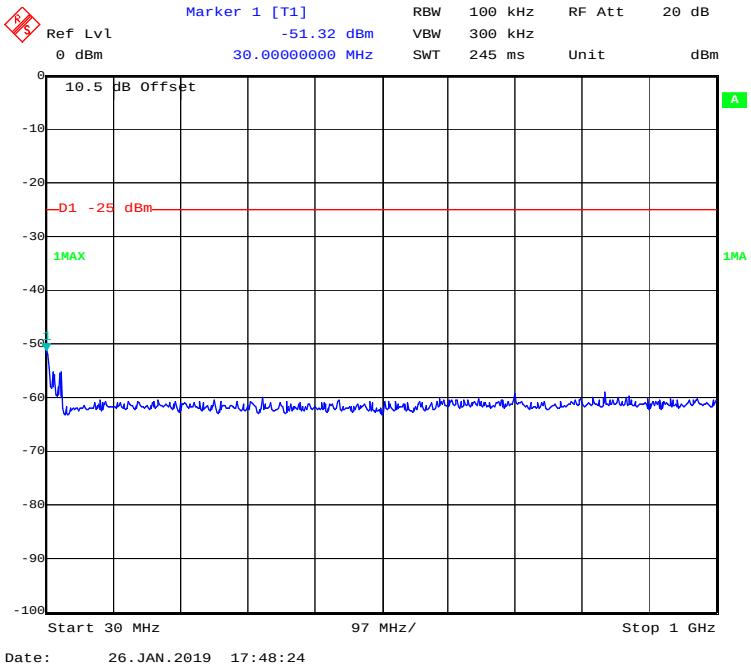
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



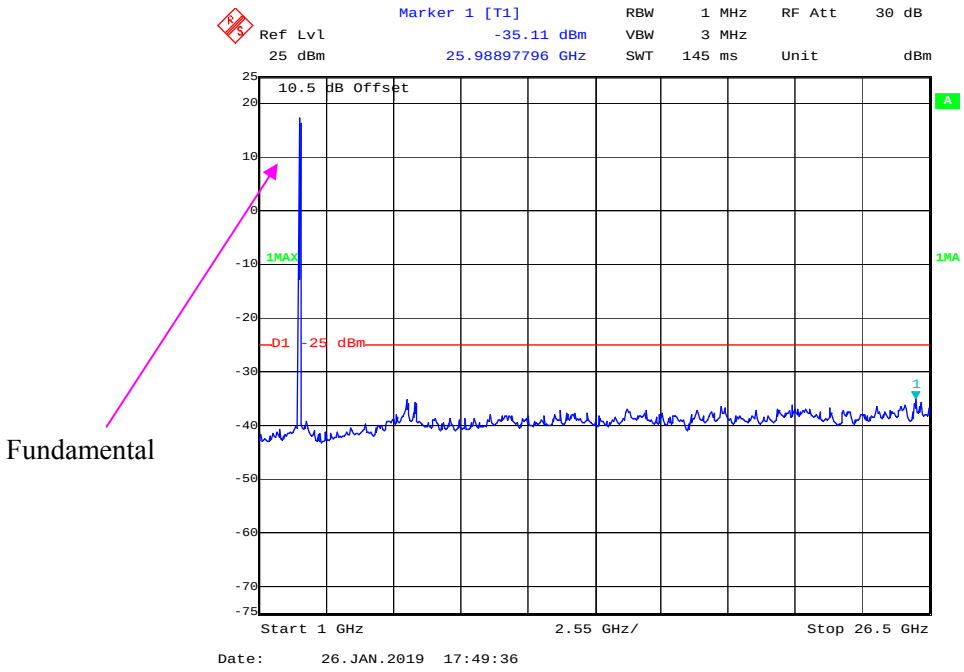
1 GHz – 26.5 GHz (15.0MHz, Middle Channel)



30 MHz - 1 GHz (20.0 MHz, Middle Channel)

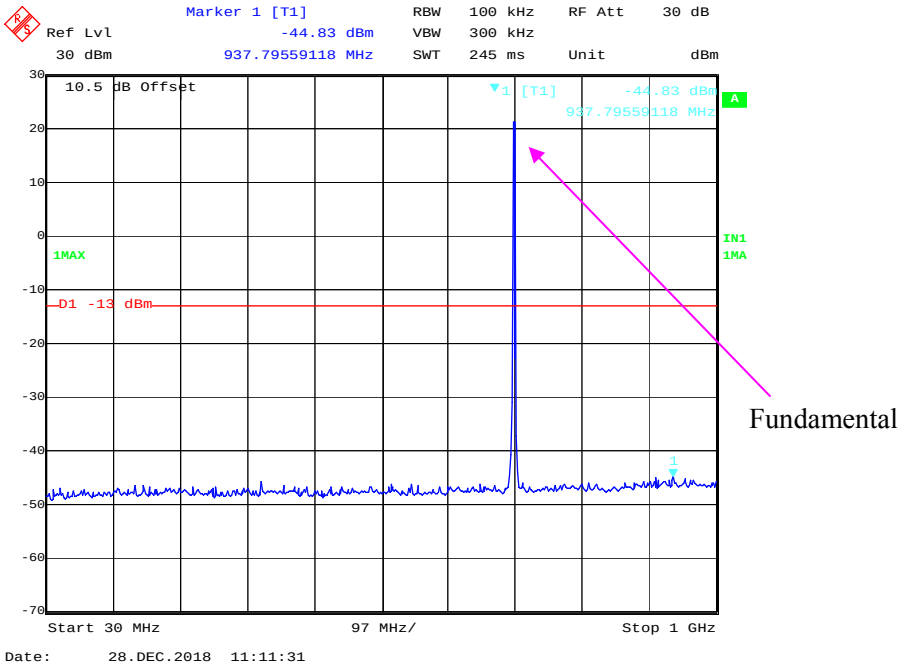


1 GHz – 26.5 GHz (20.0 MHz, Middle Channel)

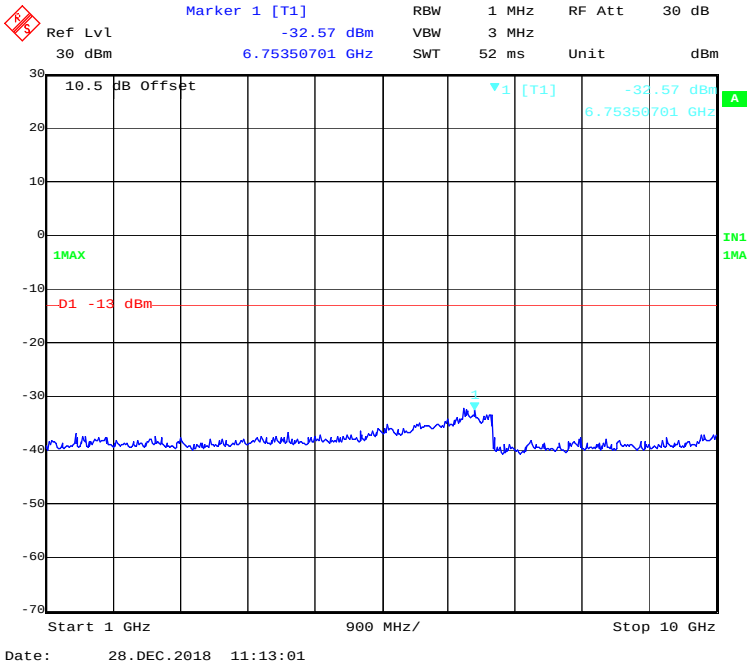


LTE Band 12:

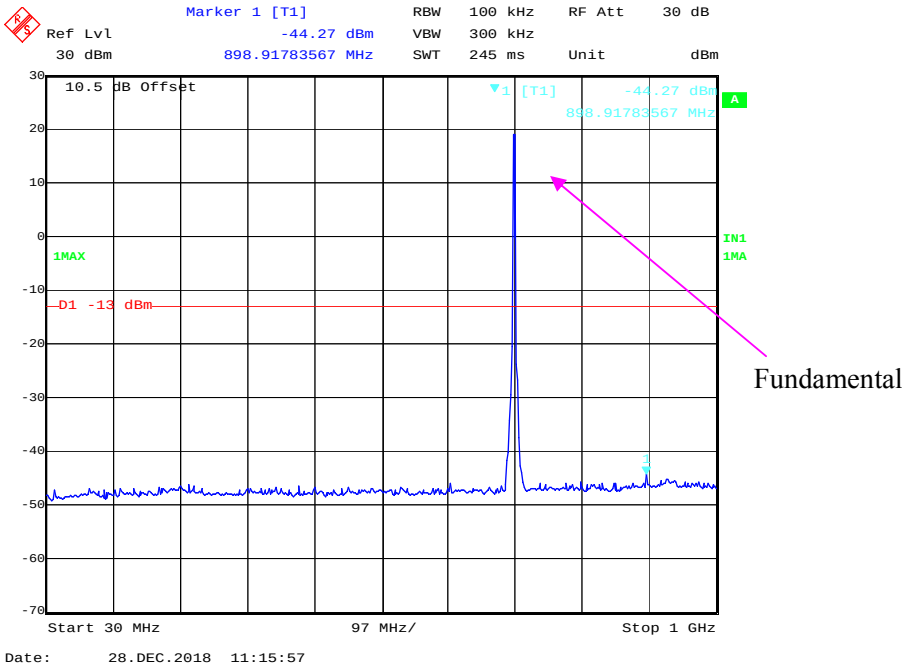
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



1 GHz – 10 GHz (1.4 MHz, Middle Channel)

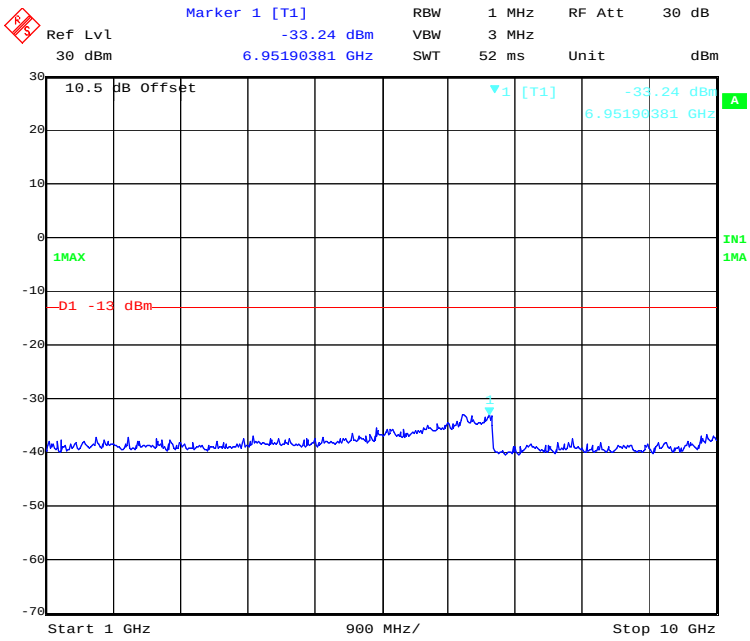


30 MHz - 1 GHz (3.0 MHz, Middle Channel)



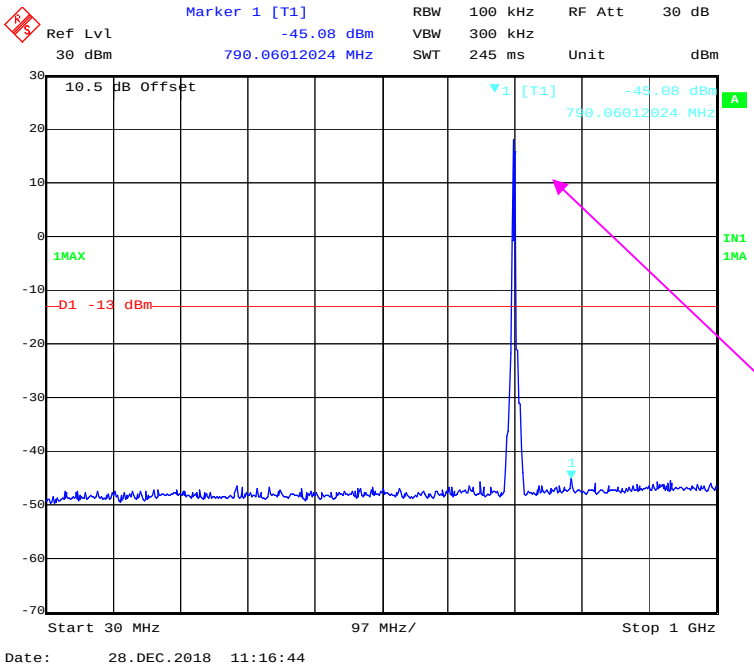
Date: 28.DEC.2018 11:15:57

1 GHz – 10 GHz (3.0 MHz, Middle Channel)



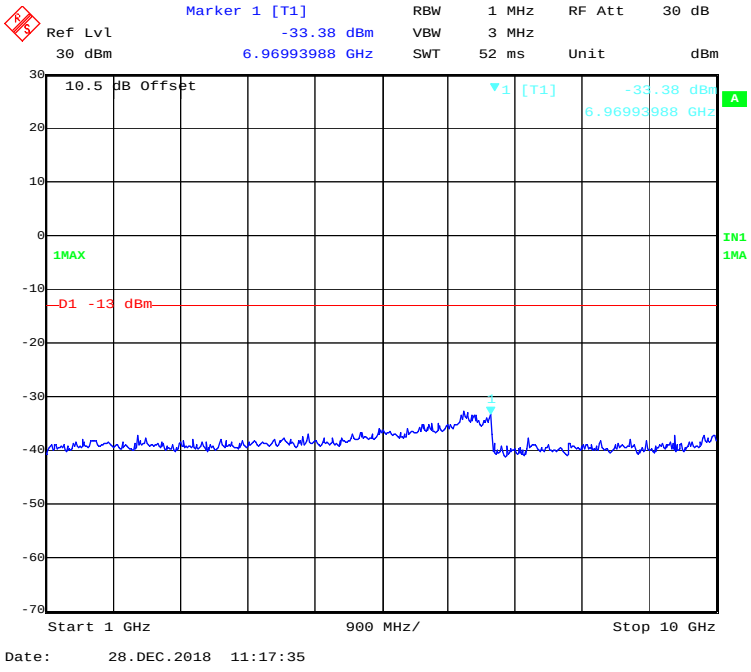
Date: 28.DEC.2018 11:14:06

30 MHz - 1 GHz (5.0 MHz, Middle Channel)

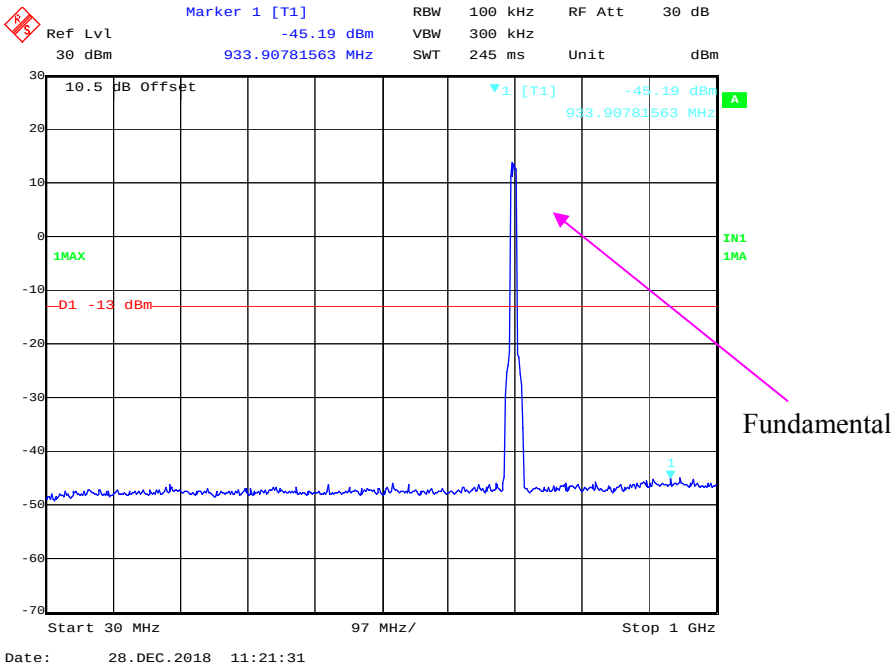


Fundamental

1 GHz – 10 GHz (5.0MHz, Middle Channel)

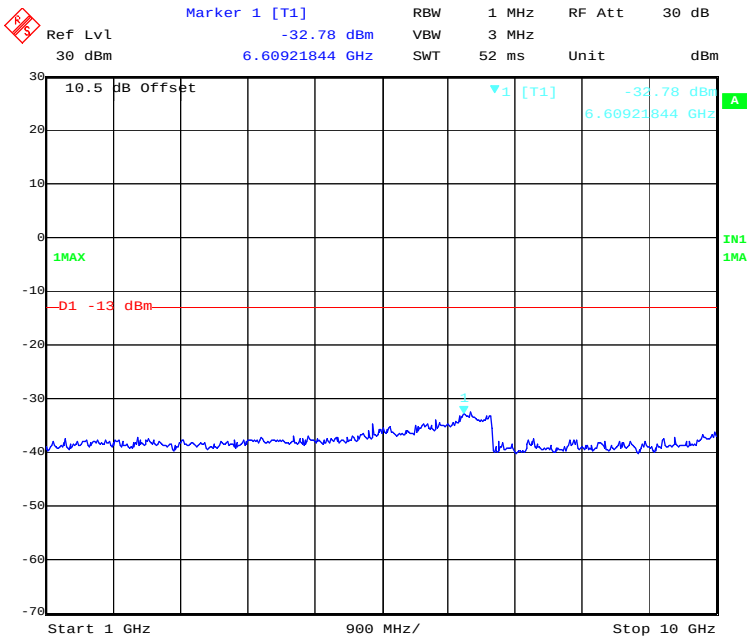


30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Date: 28.DEC.2018 11:21:31

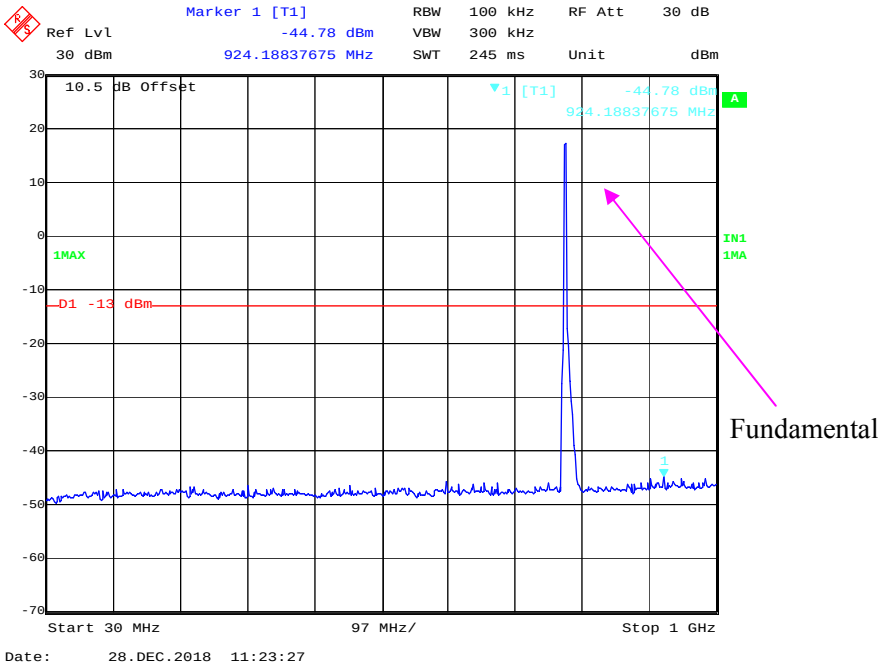
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



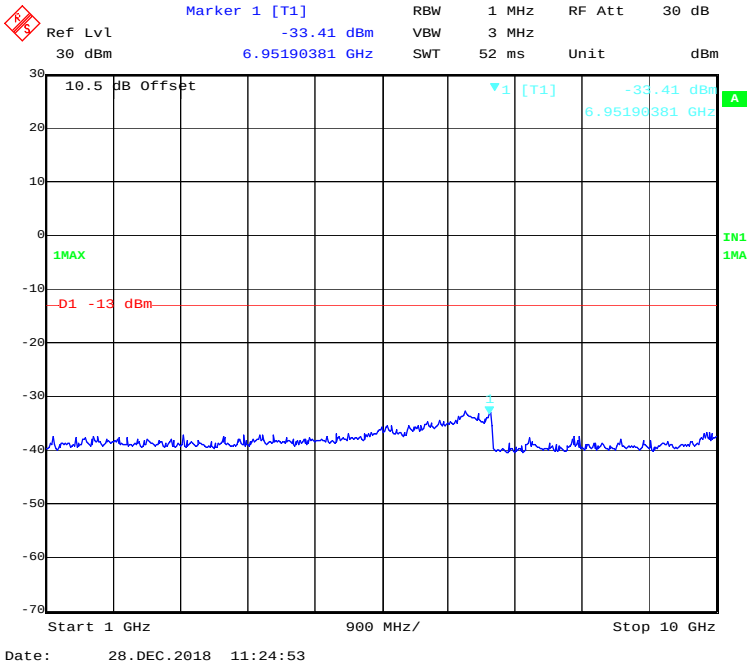
Date: 28.DEC.2018 11:19:14

LTE Band 13:

30 MHz - 1 GHz (5.0 MHz, Middle Channel)

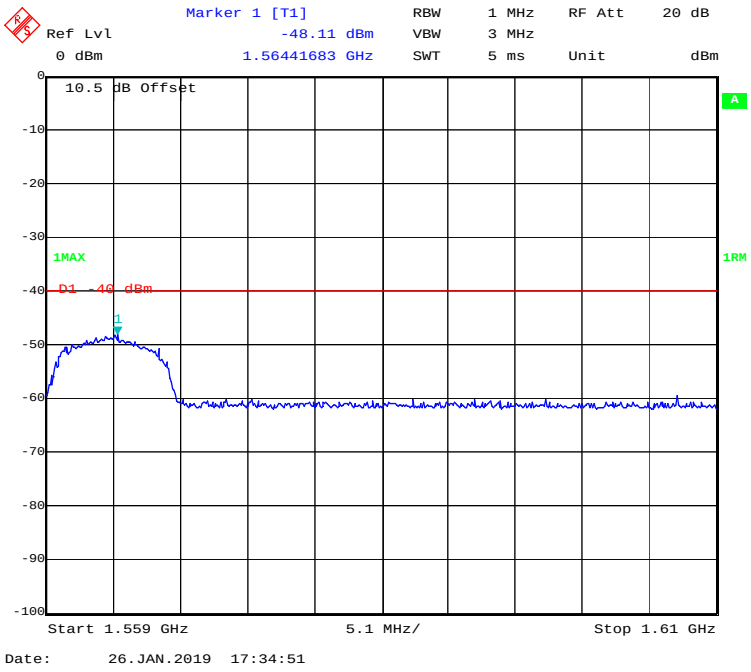


1 GHz – 10 GHz (5.0 MHz, Middle Channel)



1.559 GHz – 1.610 GHz (5.0 MHz, Middle Channel)

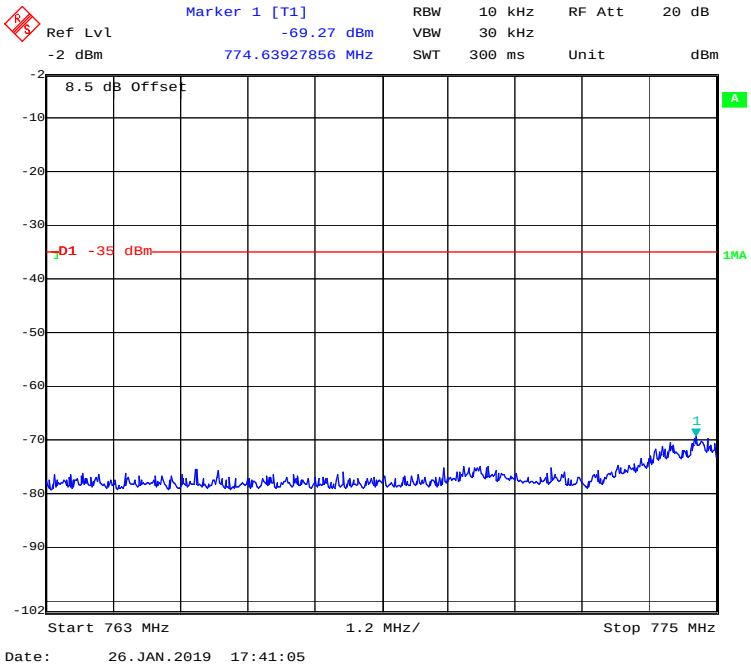
Additional Conducted Spurious Emissions Evaluations in accordance with FCC §27.53 (f)



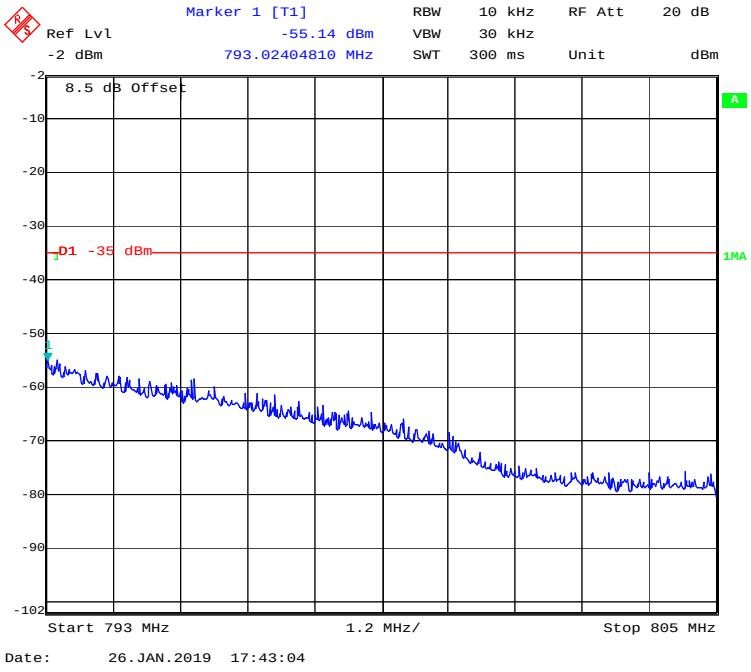
Additional Conducted Spurious Emissions Evaluations in accordance with FCC §27.53 (c)

Note: because of RBW 10kHz convert to 6.25kHz, 10lg (10/6.25) = 2, offset reduced with more 2dB.

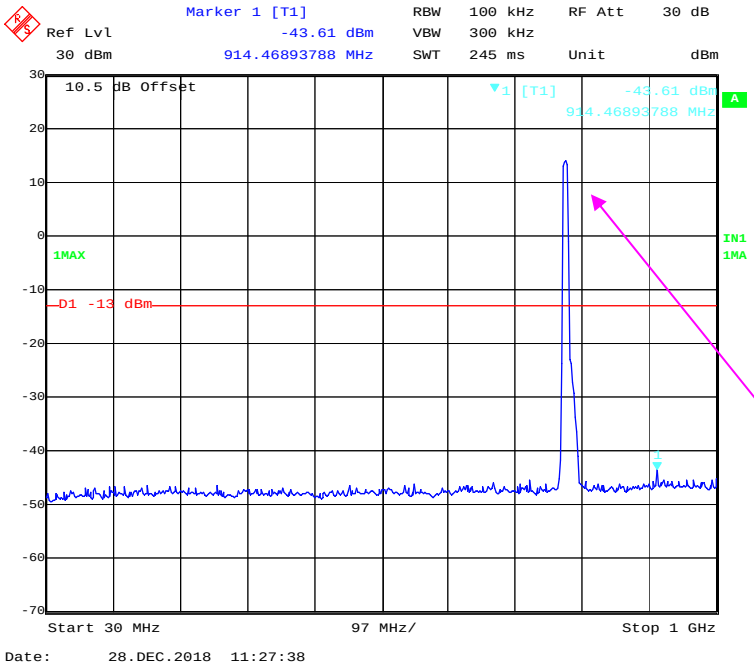
763 MHz – 775 MHz, 5MHz



793 MHz – 805 MHz, 5MHz

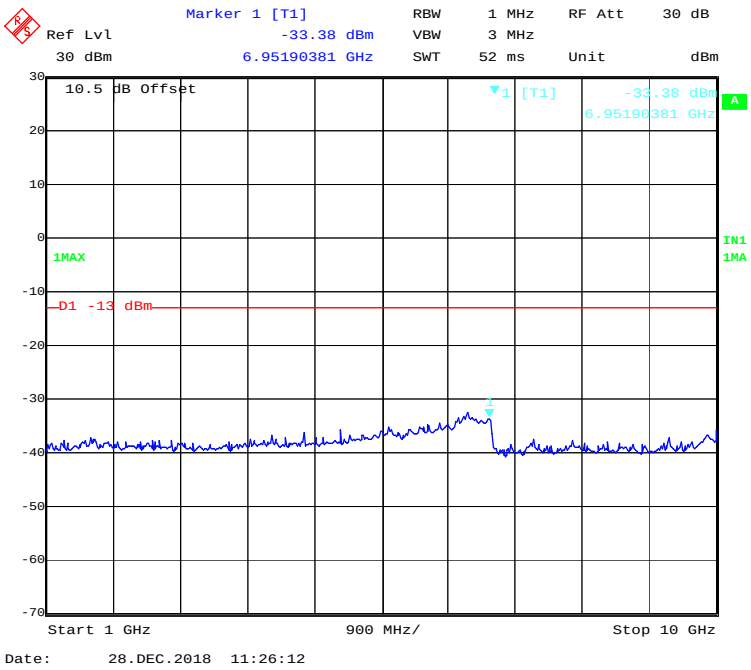


30 MHz - 1 GHz (10.0 MHz, Middle Channel)



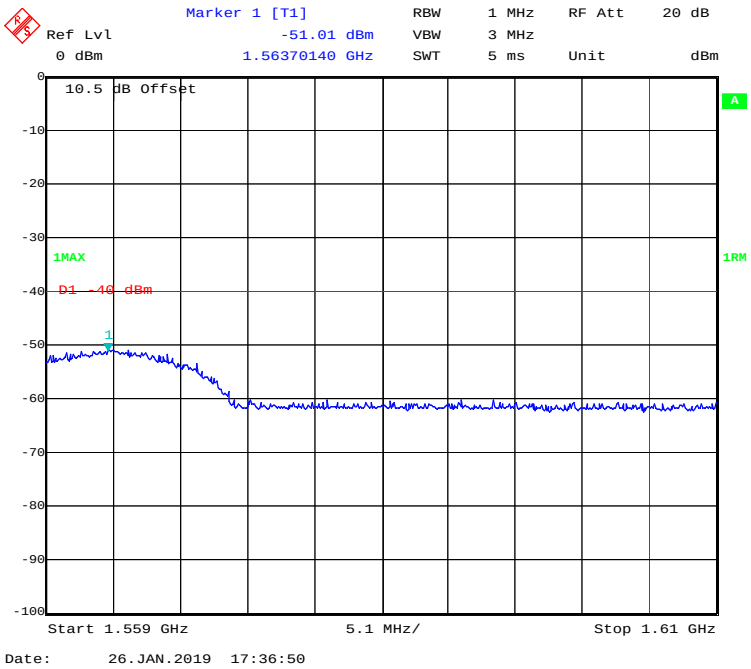
Fundamental

1 GHz – 10 GHz (10.0 MHz, Middle Channel)



1.559 GHz – 1.610 GHz (5.0 MHz, Middle Channel)

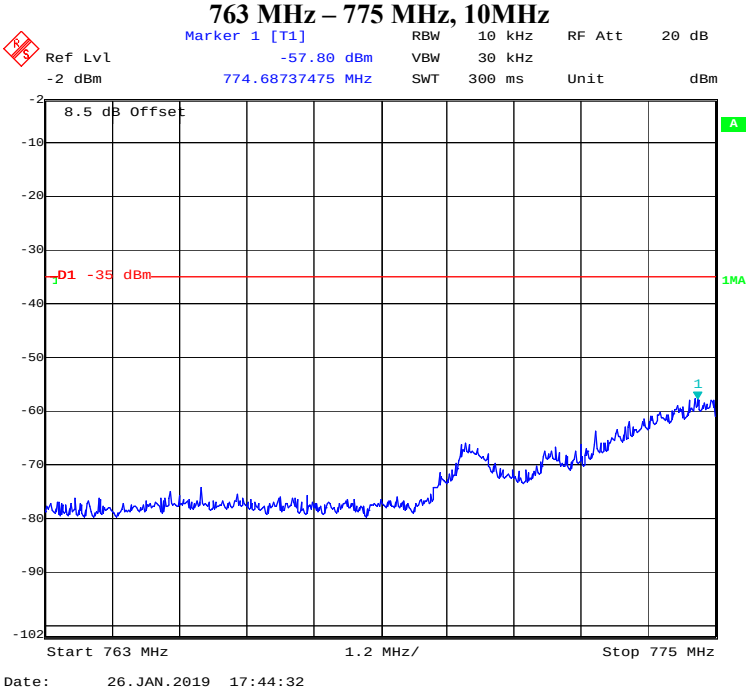
Additional Conducted Spurious Emissions Evaluations in accordance with FCC §27.53 (f)



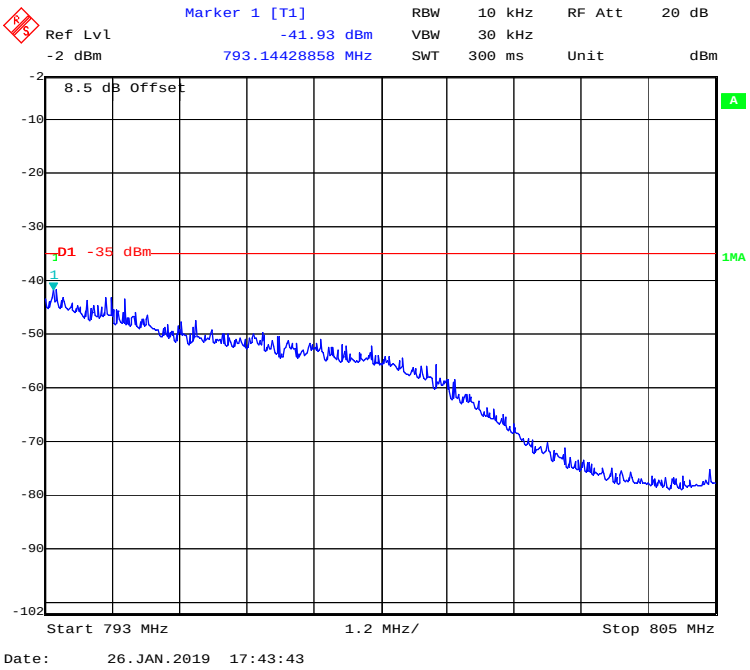
Additional Conducted Spurious Emissions Evaluations in accordance with FCC §27.53 (c)

Note: because of RBW 10kHz convert to 6.25kHz, 10lg (10/6.25) = 2, offset reduced with more 2dB.

763 MHz – 775 MHz, 10MHz

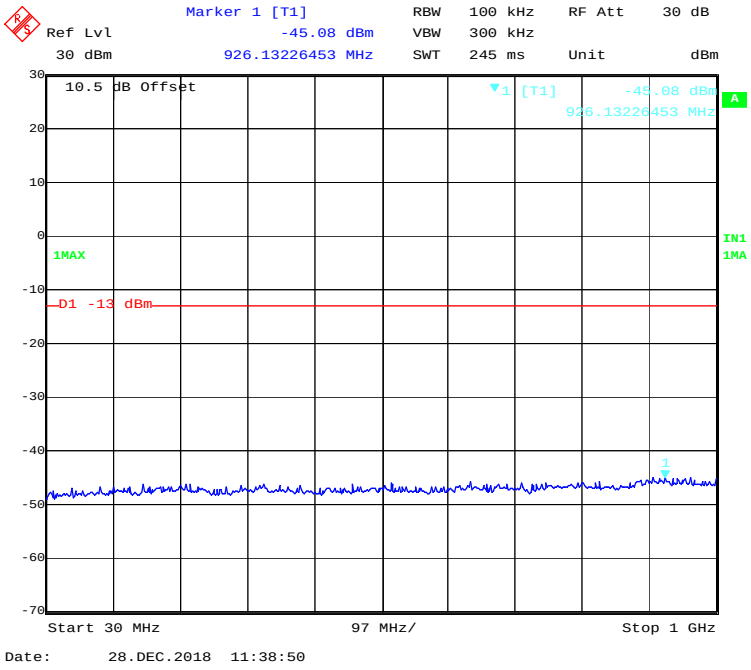


793 MHz – 805 MHz, 10MHz

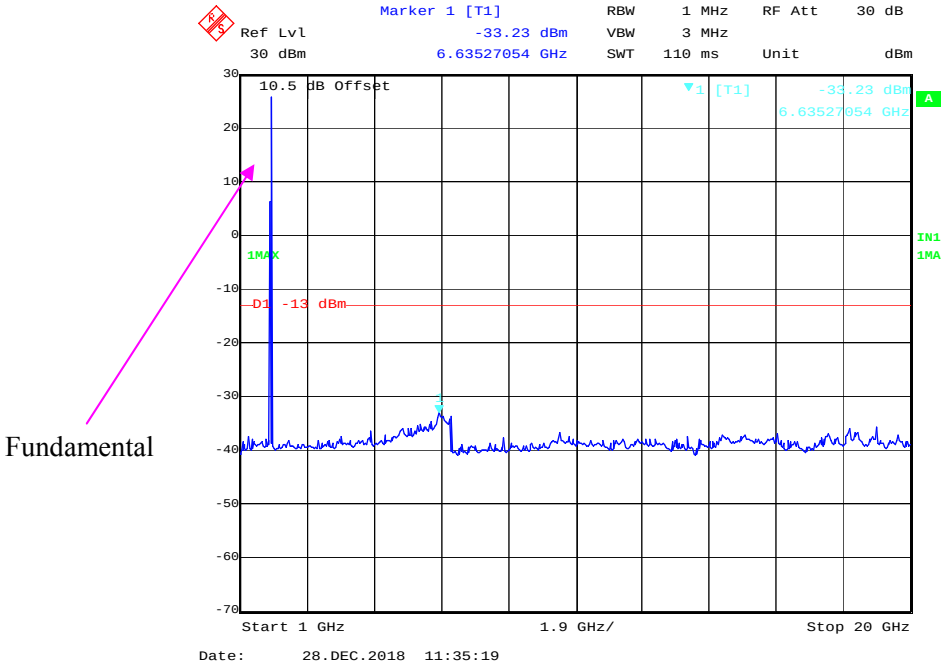


LTE Band 25:

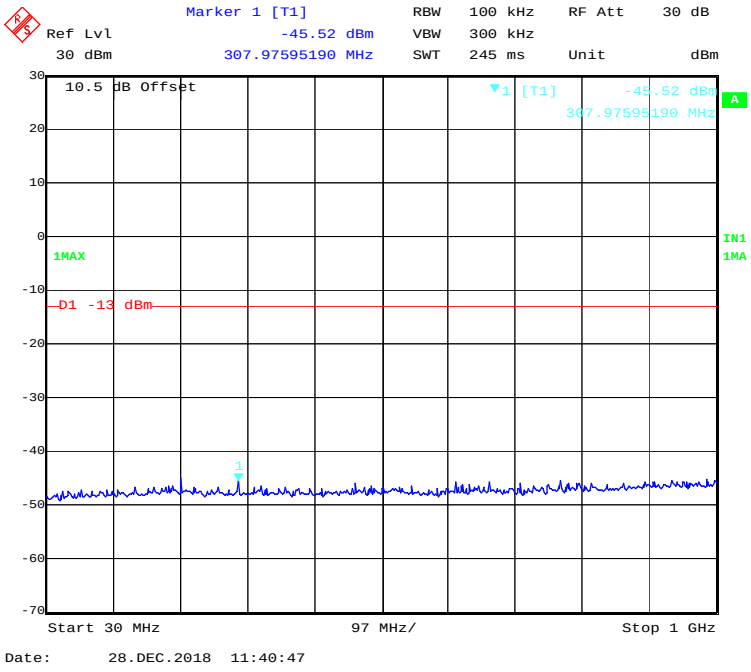
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



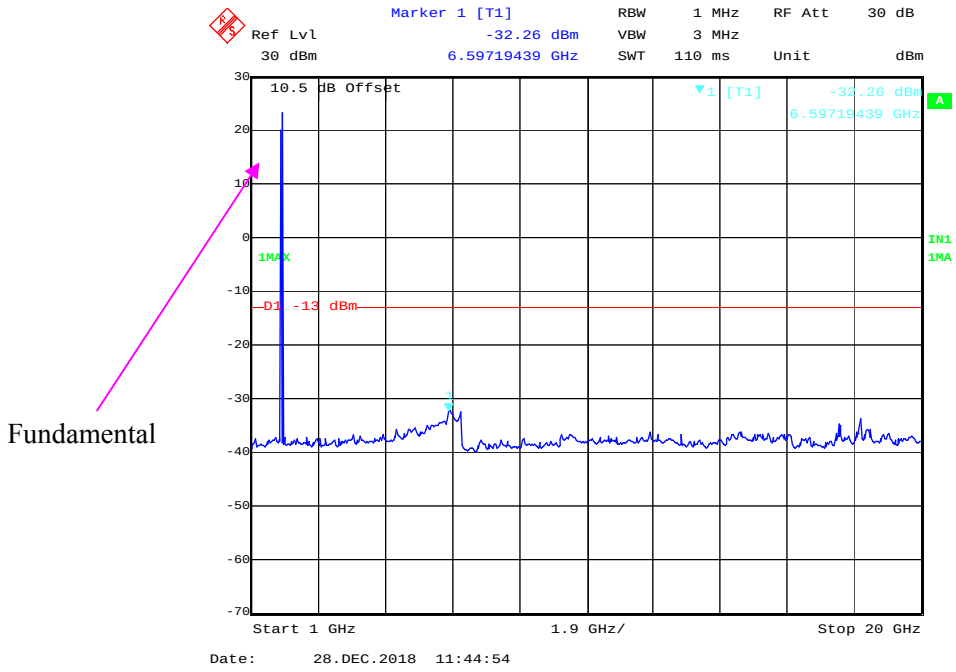
1 GHz – 20 GHz (1.4 MHz, Middle Channel)



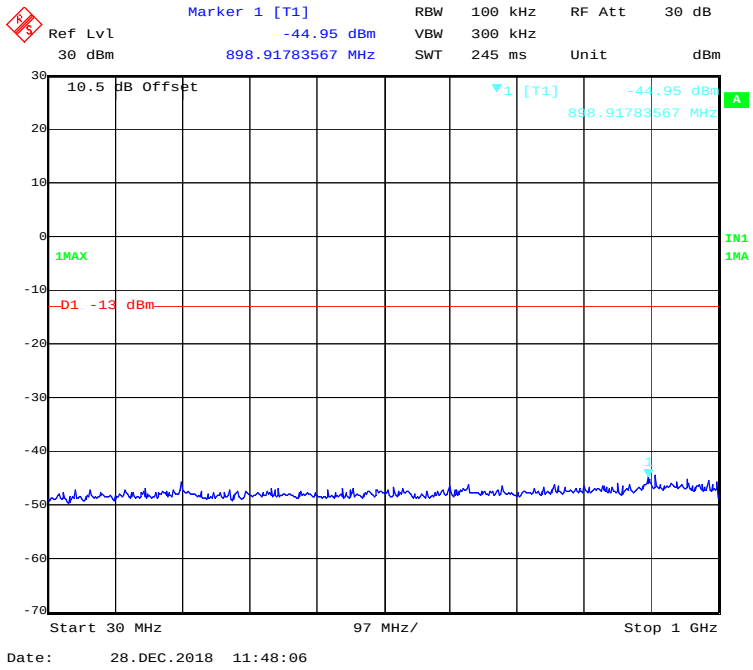
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



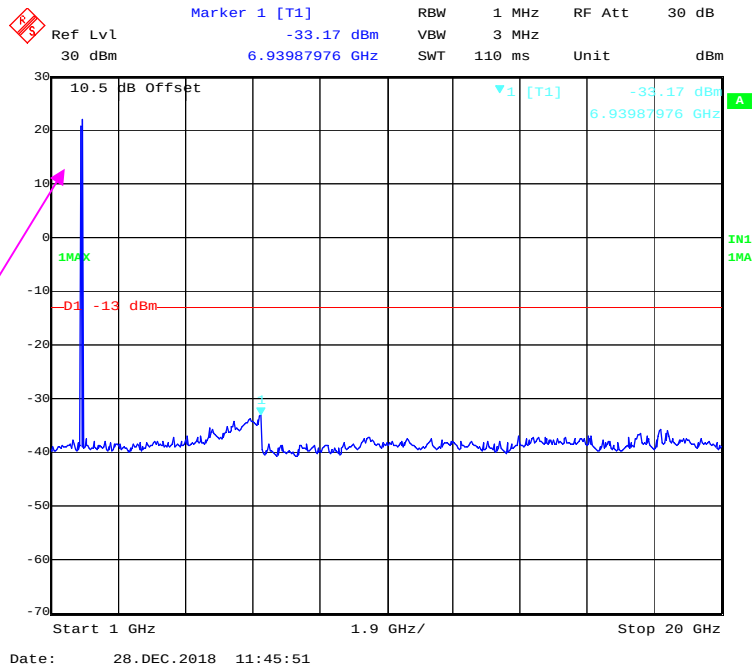
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



30 MHz - 1 GHz (5.0 MHz, Middle Channel)

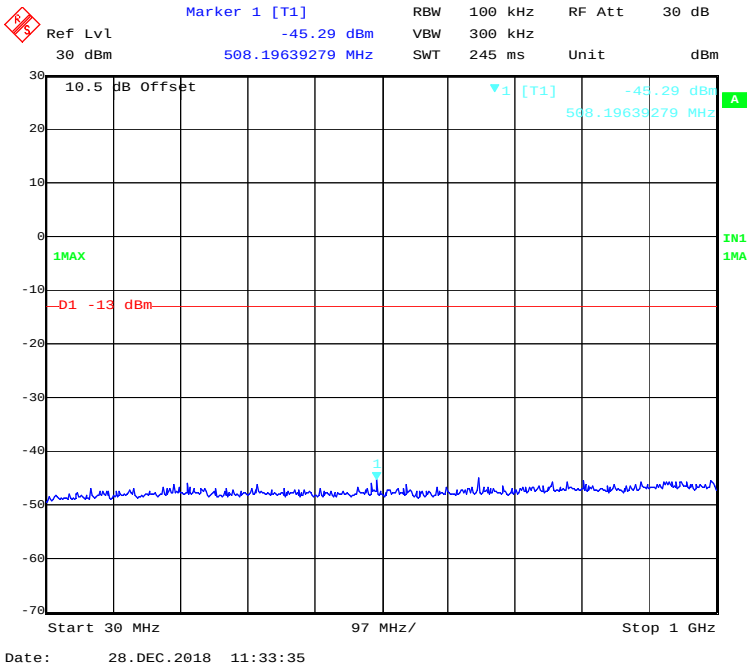


1 GHz – 20 GHz (5.0MHz, Middle Channel)

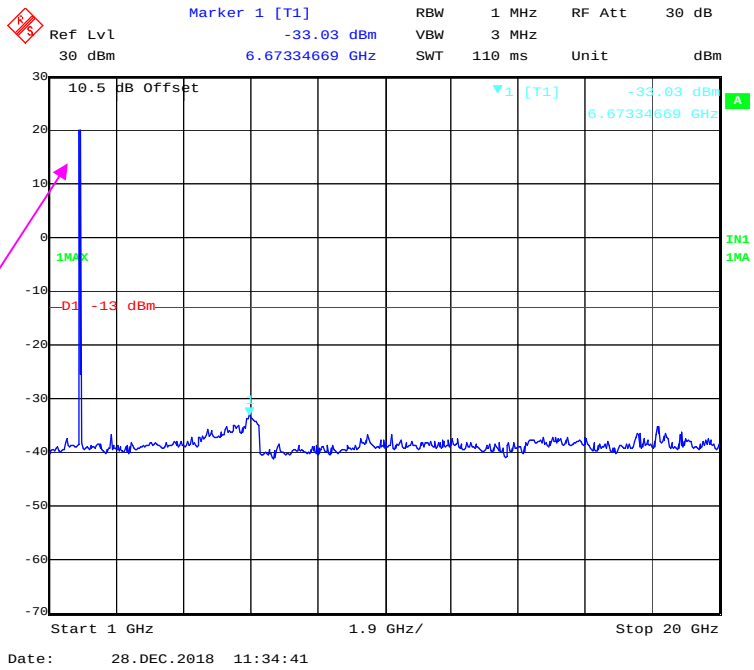


Fundamental

30 MHz - 1 GHz (10.0 MHz, Middle Channel)

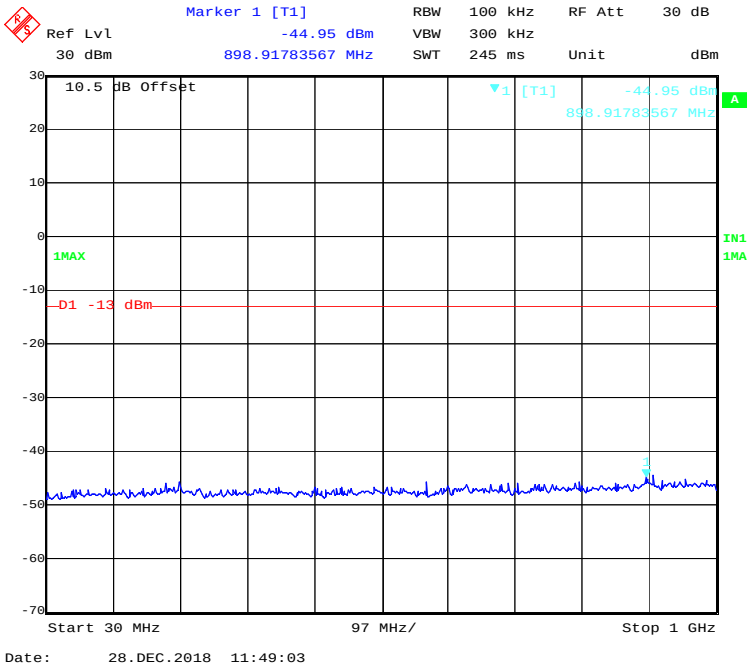


1 GHz – 20 GHz (10.0 MHz, Middle Channel)

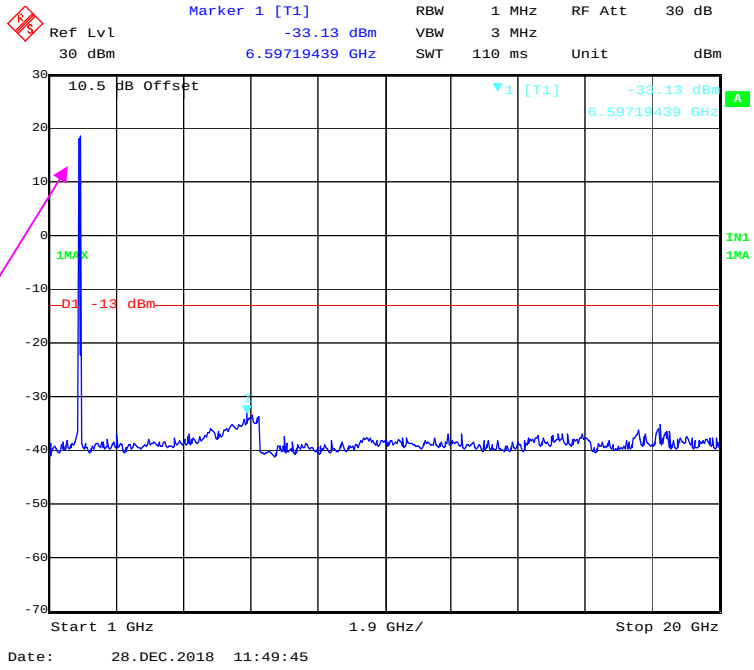


Fundamental

30 MHz - 1 GHz (15.0 MHz, Middle Channel)

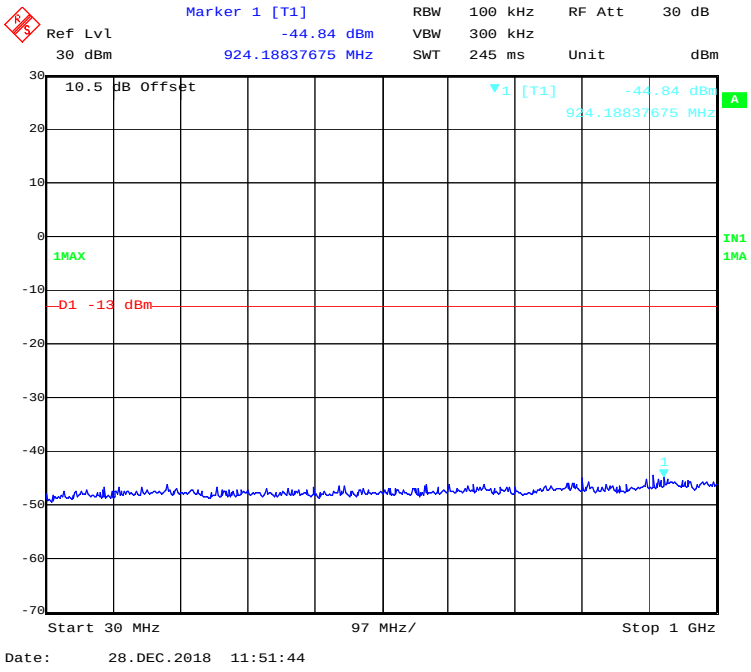


1 GHz – 20 GHz (15.0 MHz, Middle Channel)

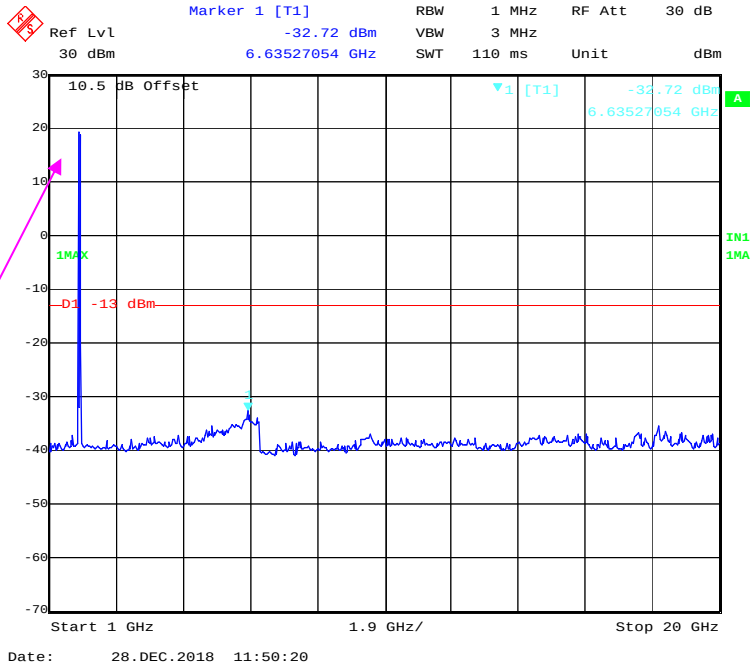


Fundamental

30 MHz - 1 GHz (20.0 MHz, Middle Channel)



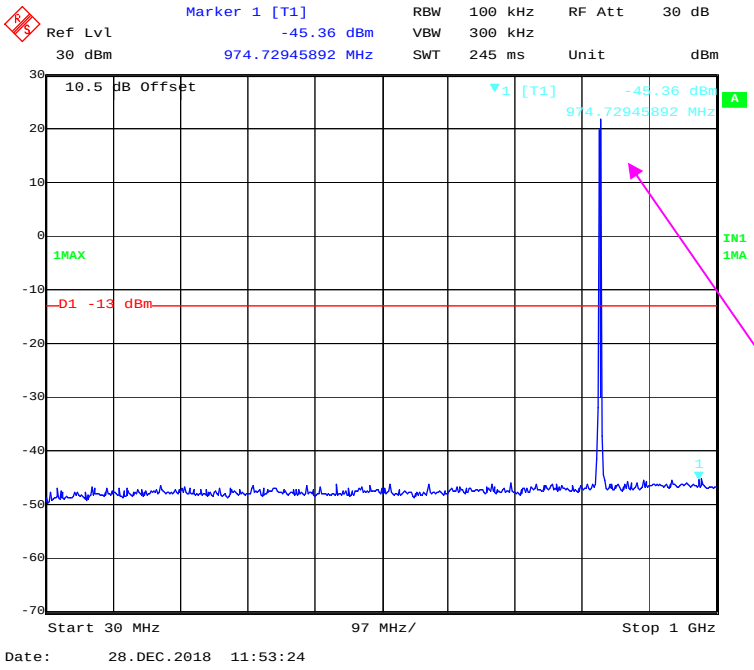
1 GHz – 20 GHz (20.0 MHz, Middle Channel)



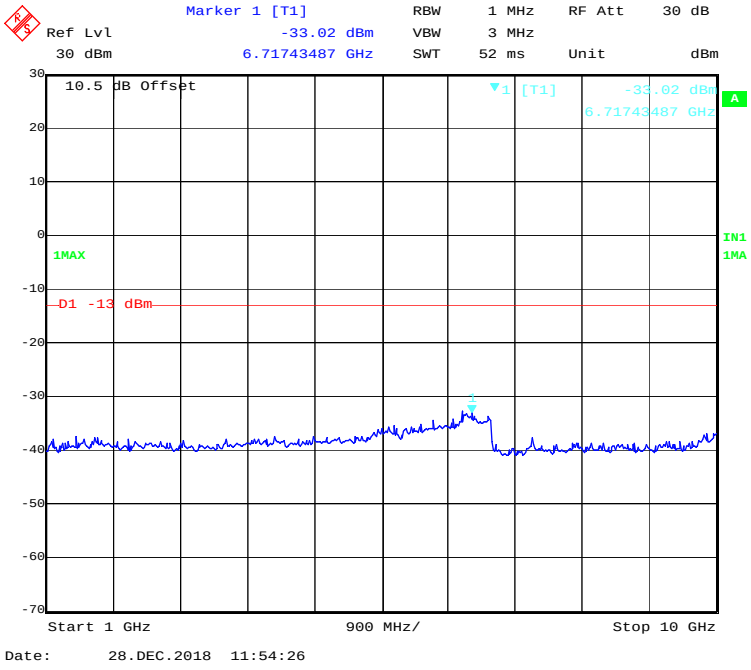
Fundamental

LTE Band 26:

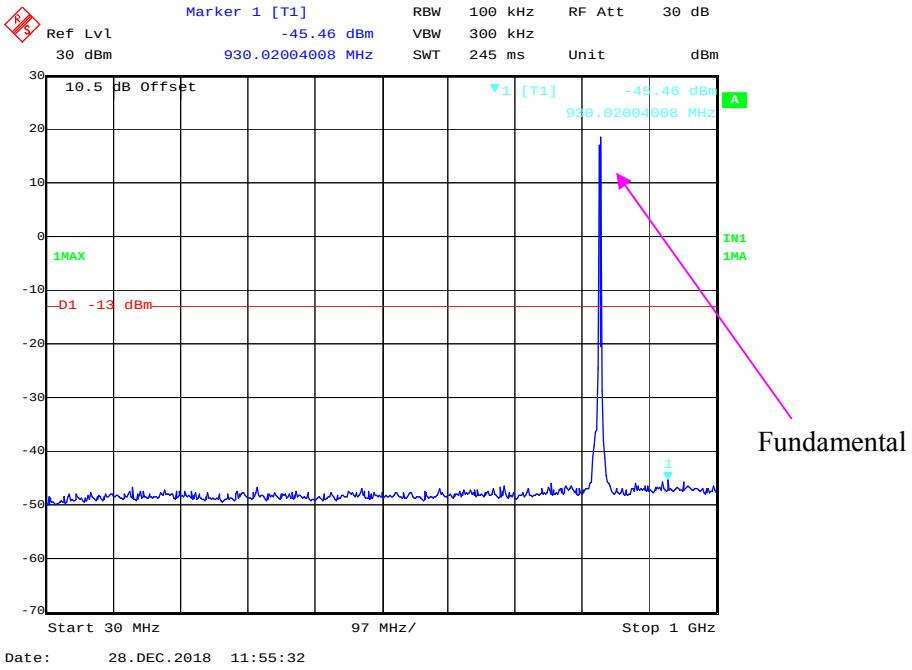
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



1 GHz – 10 GHz (1.4 MHz, Middle Channel)

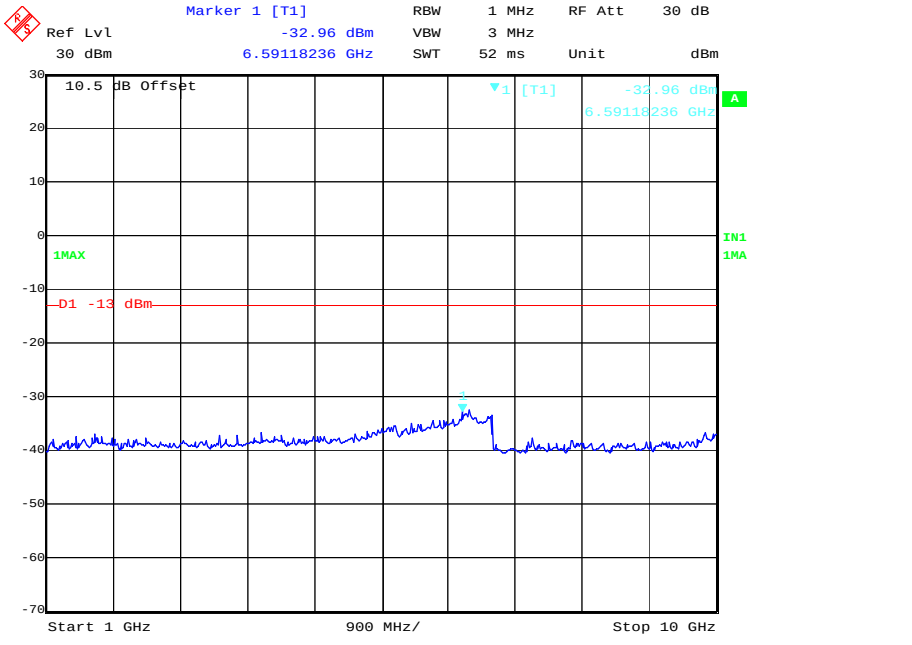


30 MHz - 1 GHz (3.0 MHz, Middle Channel)



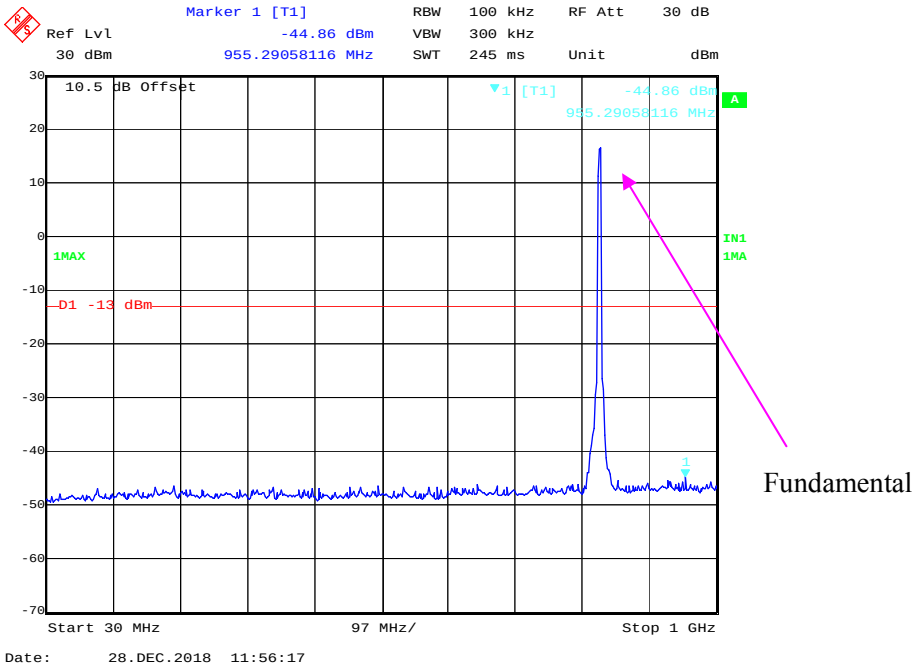
Date: 28.DEC.2018 11:55:32

1 GHz – 10 GHz (3.0 MHz, Middle Channel)



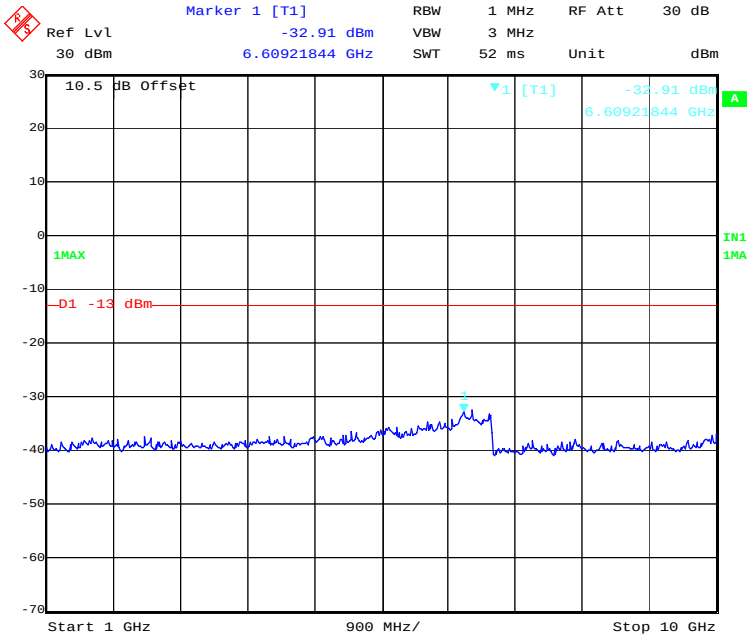
Date: 28.DEC.2018 11:54:53

30 MHz - 1 GHz (5.0 MHz, Middle Channel)



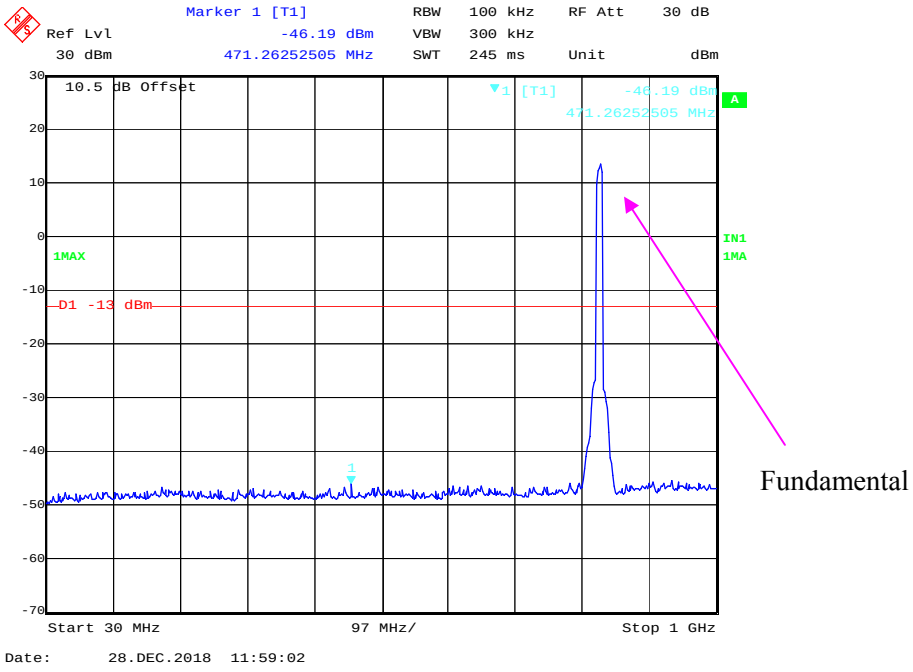
Date: 28.DEC.2018 11:56:17

1 GHz – 10 GHz (5.0MHz, Middle Channel)



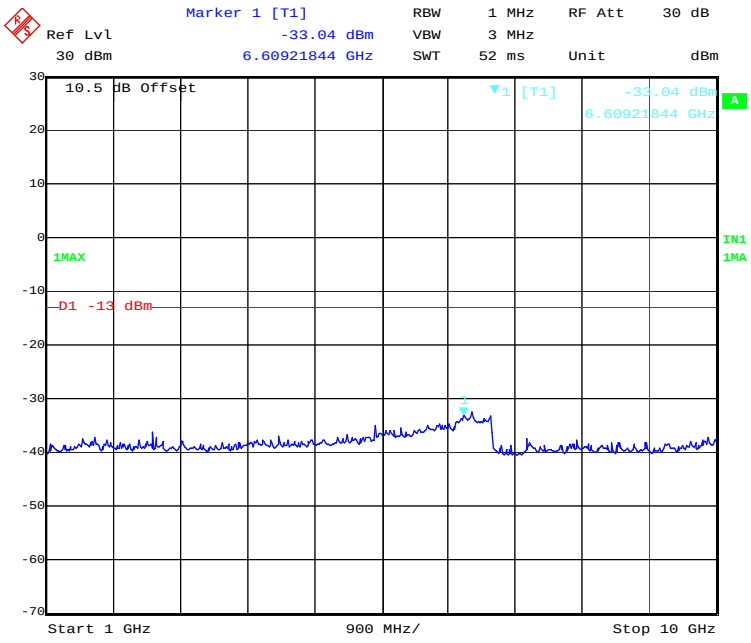
Date: 28.DEC.2018 11:57:04

30 MHz - 1 GHz (10.0 MHz, Middle Channel)



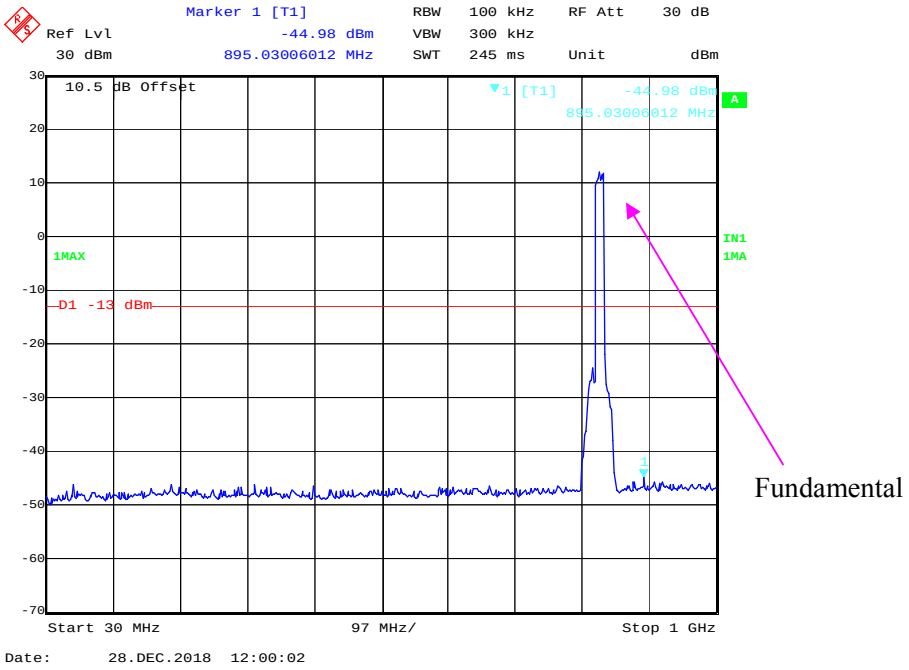
Date: 28.DEC.2018 11:59:02

1 GHz – 10 GHz (10.0 MHz, Middle Channel)



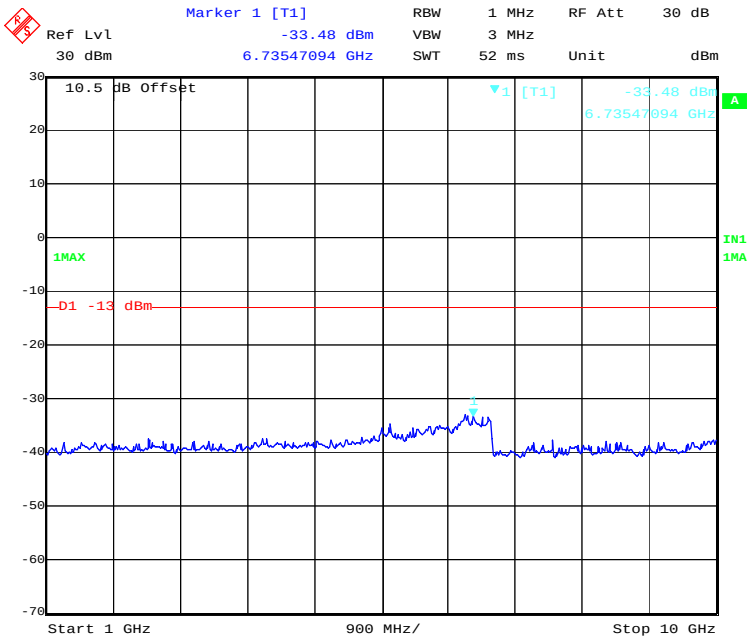
Date: 28.DEC.2018 11:58:02

30 MHz - 1 GHz (15.0 MHz, Middle Channel)



Date: 28.DEC.2018 12:00:02

1 GHz – 10 GHz (15.0 MHz, Middle Channel)



Date: 28.DEC.2018 12:00:51

FCC § 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h) (m) ; § 90.691- SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053, §22.917(a) and § 24.238(a), §90.691 and § 27.53(h) (m)

22.917 (a) Out of band emissions. The power of any emission 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.

24.238 (a) Out of band emissions. The power of any emission 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.

27.53(h) (m), 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.

Rule Part 90.691 specifies that “The power of any emission 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.

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 (TX pwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	23.2℃
Relative Humidity:	51 %
ATM Pressure:	101.3kPa

The testing was performed by Hope Zhang from 2018-12-23.

Test mode: Transmitting (Pre-scan with low, middle and high channels, and the worse case data as below)

30 MHz ~ 10 GHz:

GSM 850 Band

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
GPRS Mode, Middle channel										
130.65	42.56	98	204	H	-63.29	0.35	-6.11	-69.75	-13	56.75
130.65	41.24	66	147	V	-58.53	0.35	-6.11	-64.99	-13	51.99
1673.20	50.24	45	117	H	-53.15	0.84	8.48	-45.51	-13	32.51
1673.20	48.39	153	133	V	-55.50	0.84	8.48	-47.86	-13	34.86
2509.80	50.36	74	102	H	-50.58	0.89	10.09	-41.38	-13	28.38
2509.80	50.15	6	135	V	-50.79	0.89	10.09	-41.59	-13	28.59

WCDMA Band V

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Middle channel										
173.69	47.06	219	143	H	-57.69	0.37	-6.15	-64.21	-13	51.21
173.69	47.13	97	128	V	-53.53	0.37	-6.15	-60.05	-13	47.05
1673.20	51.23	158	131	H	-53.23	0.83	8.20	-45.86	-13	32.86
1673.20	52.67	263	199	V	-52.34	0.83	8.20	-44.97	-13	31.97
2509.80	50.32	335	176	H	-50.75	0.89	10.10	-41.54	-13	28.54
2509.80	50.89	40	185	V	-50.17	0.89	10.10	-40.96	-13	27.96

30 MHz ~ 20 GHz:

PCS 1900 Band

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
GPRS Mode, Middle channel										
130.65	43.28	275	138	H	-62.57	0.35	-6.11	-69.03	-13	56.03
130.65	41.58	169	157	V	-58.19	0.35	-6.11	-64.65	-13	51.65
3764.20	49.38	219	151	H	-47.32	0.95	9.74	-38.53	-13	25.53
3764.20	50.20	109	193	V	-46.99	0.95	9.74	-38.20	-13	25.20
5647.80	50.46	125	216	H	-43.47	1.15	10.48	-34.14	-13	21.14
5647.80	51.28	68	214	V	-42.68	1.15	10.48	-33.35	-13	20.35

WCDMA Band II

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Middle channel										
173.69	47.29	119	162	H	-57.46	0.37	-6.15	-63.98	-13	50.98
173.69	47.13	337	143	V	-53.53	0.37	-6.15	-60.05	-13	47.05
3760.00	51.93	257	210	H	-45.74	0.93	9.90	-36.77	-13	23.77
3760.00	51.81	229	163	V	-46.33	0.93	9.90	-37.36	-13	24.36
5640.00	52.37	56	215	H	-41.62	1.14	10.30	-32.46	-13	19.46
5640.00	51.23	312	170	V	-42.80	1.14	10.30	-33.64	-13	20.64

WCDMA Band IV

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Middle channel										
173.69	47.35	219	143	H	-57.40	0.37	-6.15	-63.92	-13	50.92
173.69	47.16	97	128	V	-53.50	0.37	-6.15	-60.02	-13	47.02
3465.20	52.07	158	131	H	-45.54	0.93	9.87	-36.60	-13	23.60
3465.20	51.92	263	199	V	-46.23	0.93	9.87	-37.29	-13	24.29
5197.80	50.31	335	176	H	-45.28	1.08	10.30	-36.06	-13	23.06
5197.80	50.26	40	185	V	-45.65	1.08	10.30	-36.43	-13	23.43

Note:
1) Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)
2) Margin (dB) = Limit (dBm) - Absolute Level (dBm)

Test mode: Transmitting (Pre-scan with all the bandwidth, and worse case as below)

30 MHz ~ 20 GHz:

LTE Band 2:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
130.35	37.24	185	117	H	-68.63	0.35	-6.11	-75.09	-13	62.09
130.35	36.25	64	116	V	-63.51	0.35	-6.11	-69.97	-13	56.97
3760.00	42.65	114	165	H	-55.02	0.93	9.90	-46.05	-13	33.05
3760.00	41.36	2	105	V	-56.78	0.93	9.90	-47.81	-13	34.81
5640.00	40.35	12	220	H	-53.64	1.14	10.30	-44.48	-13	31.48
5640.00	41.28	1	165	V	-52.75	1.14	10.30	-43.59	-13	30.59

30 MHz ~ 20 GHz:
LTE Band 4:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
130.35	36.87	185	117	H	-69.00	0.35	-6.11	-75.46	-13	62.46
130.35	37.12	64	116	V	-62.64	0.35	-6.11	-69.10	-13	56.10
3465.00	43.18	114	165	H	-54.43	0.93	9.87	-45.49	-13	32.49
3465.00	42.68	2	105	V	-55.47	0.93	9.87	-46.53	-13	33.53
5197.50	41.16	12	220	H	-54.43	1.08	10.30	-45.21	-13	32.21
5197.50	40.38	1	165	V	-55.53	1.08	10.30	-46.31	-13	33.31

30 MHz ~ 10 GHz:

LTE Band 5:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
256.71	35.98	185	117	H	-65.44	0.44	-2.25	-68.13	-13	55.13
256.71	36.27	64	116	V	-73.43	0.44	-2.25	-76.12	-13	63.12
1673.00	41.82	114	165	H	-62.64	0.83	8.20	-55.27	-13	42.27
1673.00	42.36	2	105	V	-62.65	0.83	8.20	-55.28	-13	42.28
2509.50	43.15	12	220	H	-57.92	0.89	10.10	-48.71	-13	35.71
2509.50	43.69	1	165	V	-57.37	0.89	10.10	-48.16	-13	35.16

30 MHz ~ 26.5 GHz:
LTE Band 7:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5.0MHz Bandwidth Middle Channel										
130.35	36.19	185	117	H	-69.68	0.35	-6.11	-76.14	-25	51.14
130.35	35.81	64	116	V	-63.95	0.35	-6.11	-70.41	-25	45.41
5070.00	43.05	114	165	H	-52.21	1.09	10.36	-42.94	-25	17.94
5070.00	42.76	2	105	V	-52.93	1.09	10.36	-43.66	-25	18.66
7605.00	40.21	12	220	H	-50.44	1.78	10.08	-42.14	-25	17.14
7605.00	41.36	1	165	V	-49.46	1.78	10.08	-41.16	-25	16.16

30 MHz ~ 10 GHz:
LTE Band 12:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
130.35	36.12	185	117	H	-69.75	0.35	-6.11	-76.21	-13	63.21
130.35	35.61	64	116	V	-64.15	0.35	-6.11	-70.61	-13	57.61
1415.00	41.55	114	165	H	-63.20	0.82	7.96	-56.06	-13	43.06
1415.00	42.37	2	105	V	-62.78	0.82	7.96	-55.64	-13	42.64
2122.50	40.59	12	220	H	-60.67	0.85	9.00	-52.52	-13	39.52
2122.50	40.13	1	165	V	-61.41	0.85	9.00	-53.26	-13	40.26

30 MHz ~ 10 GHz:
LTE Band 13:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5.0MHz Bandwidth Middle Channel										
130.35	36.47	185	117	H	-69.40	0.35	-6.11	-75.86	-13	62.86
130.35	36.13	64	116	V	-63.63	0.35	-6.11	-70.09	-13	57.09
1564.00	42.55	114	165	H	-61.66	0.84	8.38	-54.12	-13	41.12
1564.00	42.07	2	105	V	-62.71	0.84	8.38	-55.17	-13	42.17
2346.00	41.72	12	220	H	-59.38	0.88	9.76	-50.50	-13	37.50
2346.00	40.68	1	165	V	-60.54	0.88	9.76	-51.66	-13	38.66

30 MHz ~ 20 GHz:
LTE Band 25:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
130.35	36.23	185	117	H	-69.64	0.35	-6.11	-76.10	-13	63.10
130.35	35.91	64	116	V	-63.85	0.35	-6.11	-70.31	-13	57.31
3765.00	42.68	114	165	H	-54.99	0.93	9.90	-46.02	-13	33.02
3765.00	42.17	2	105	V	-55.97	0.93	9.90	-47.00	-13	34.00
5647.50	41.05	12	220	H	-52.94	1.14	10.30	-43.78	-13	30.78
5647.50	41.64	1	165	V	-52.39	1.14	10.30	-43.23	-13	30.23

30 MHz ~ 10 GHz:
LTE Band 26:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
130.35	36.15	185	117	H	-69.72	0.35	-6.11	-76.18	-13	63.18
130.35	36.77	64	116	V	-62.99	0.35	-6.11	-69.45	-13	56.45
1673.00	42.96	114	165	H	-61.50	0.83	8.20	-54.13	-13	41.13
1673.00	42.13	2	105	V	-62.88	0.83	8.20	-55.51	-13	42.51
2509.50	41.37	12	220	H	-59.63	0.89	10.09	-50.43	-13	37.43
2509.50	40.52	1	165	V	-60.54	0.89	10.09	-51.34	-13	38.34

Note:
1) Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)
2) Margin (dB) = Limit (dBm) - Absolute Level (dBm)

FCC § 22.917 (a); § 24.238 (a); §27.53 (h) (m); § 90.691 - BAND EDGES

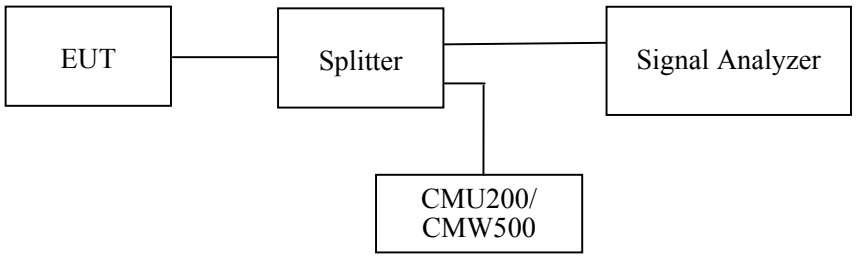
Applicable Standards

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 FCC §27.53 (h) (m), the power of any emission 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.
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.
FCC §2.1051 and §90.691(a).The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

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 Data

Environmental Conditions

Temperature:	23.2℃-23.5℃
Relative Humidity:	51 %-23%
ATM Pressure:	101.1kPa-103.3kPa

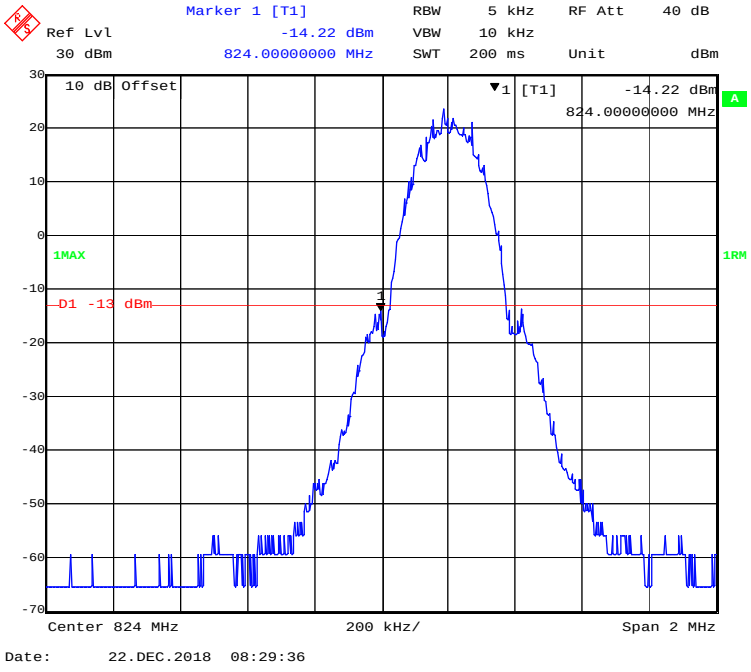
The testing was performed by Hope Zhang from 2018-12-22 to 2019-01-26

EUT operation mode: Transmitting

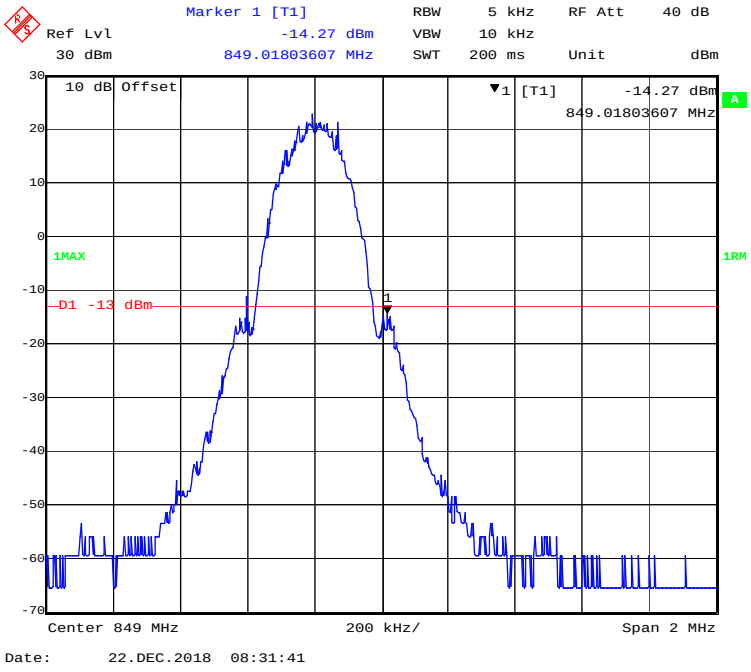
Test Result: Compliance.

GSM 850 Band:

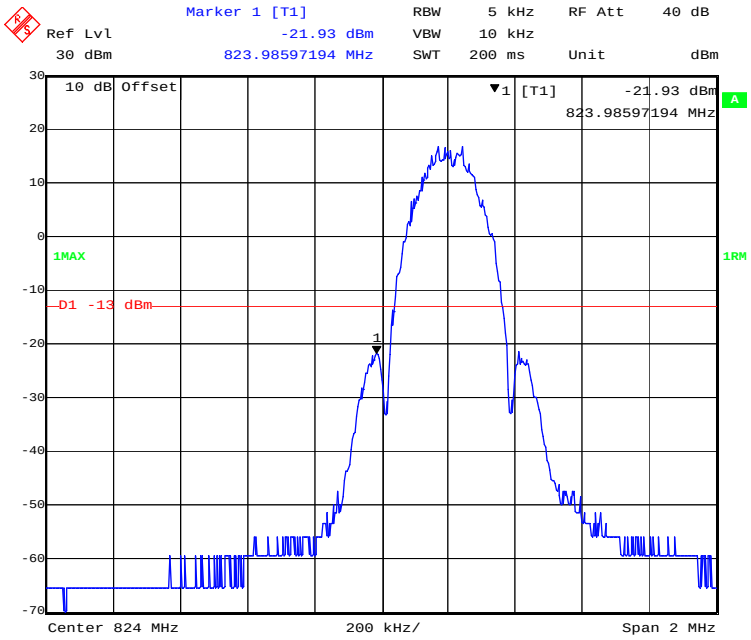
GPRS Mode, Left Band Edge



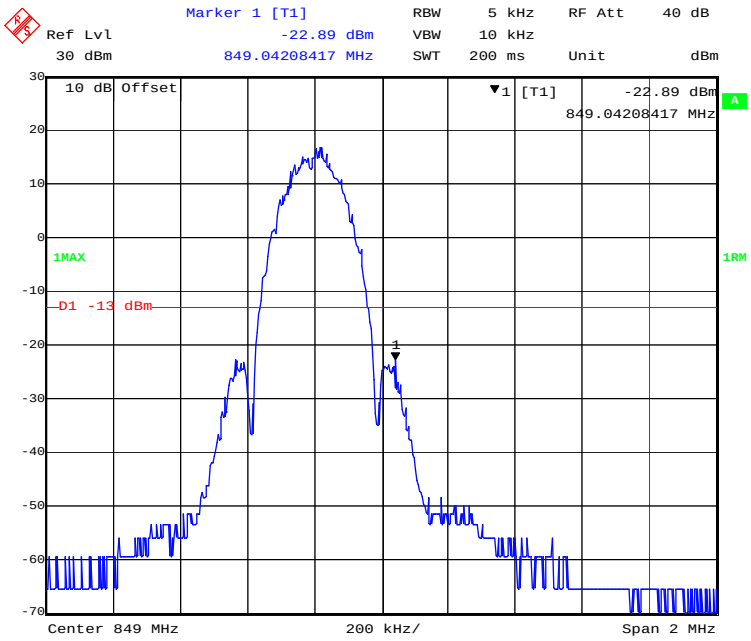
GPRS Mode, Right Band Edge



EGPRS Mode, Left Band Edge

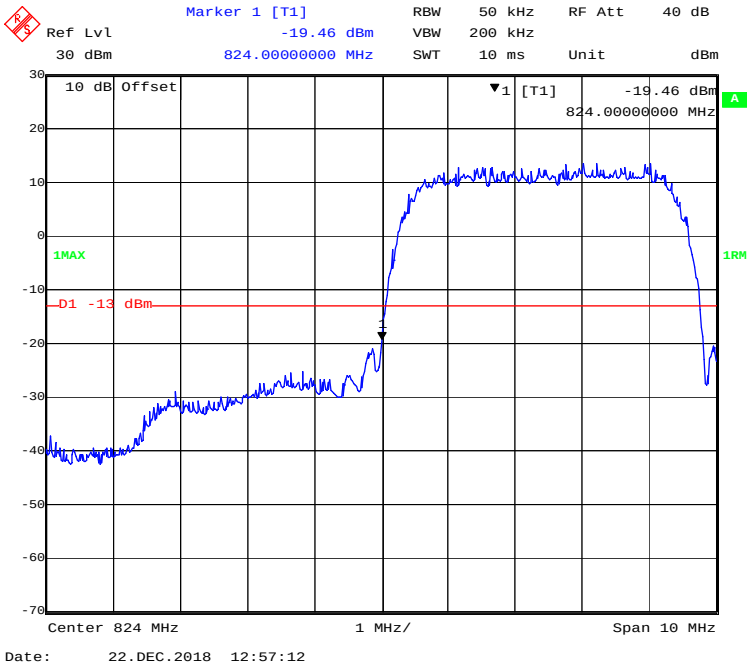


EGPRS Mode, Right Band Edge

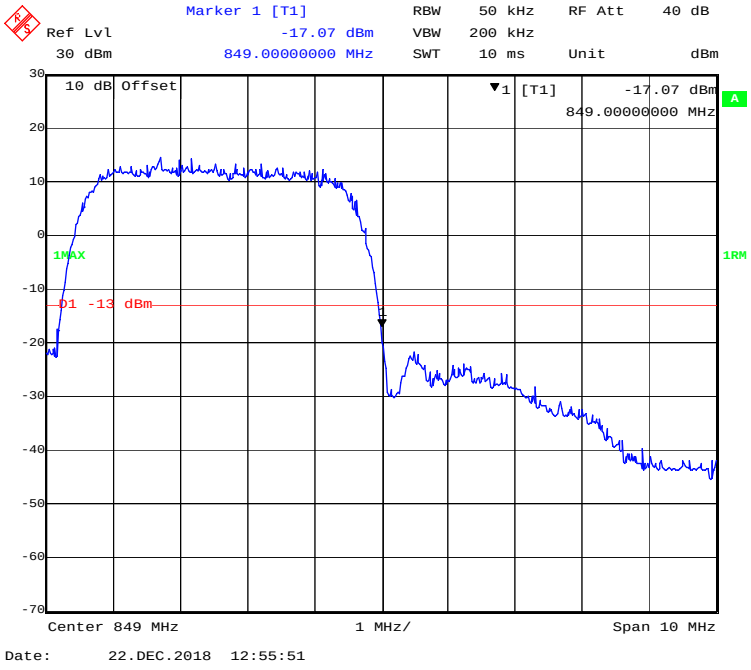


WCDMA Band V

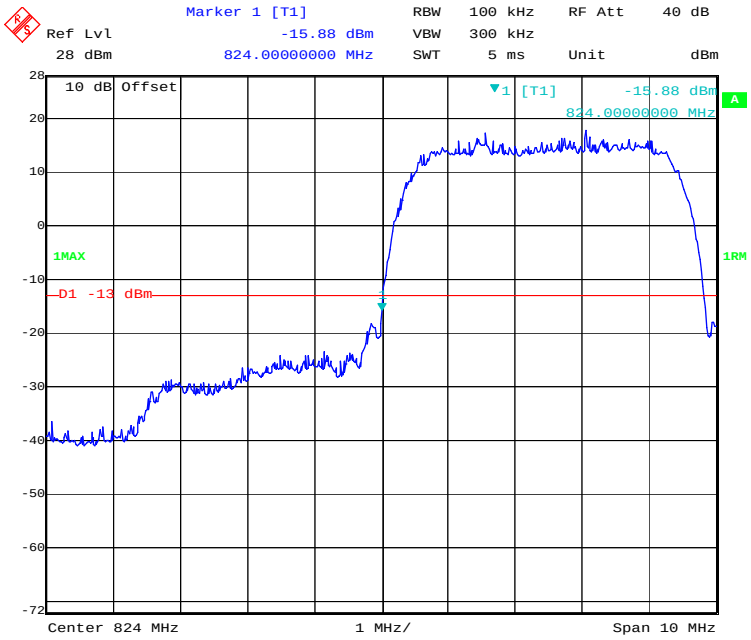
WCDMA (Rel 99) Mode, Left Band Edge



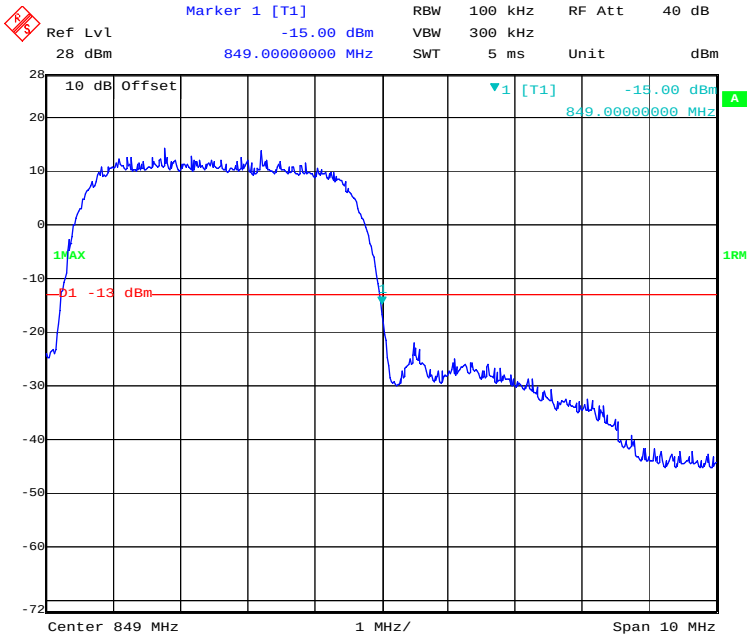
WCDMA (Rel 99) Mode, Right Band Edge



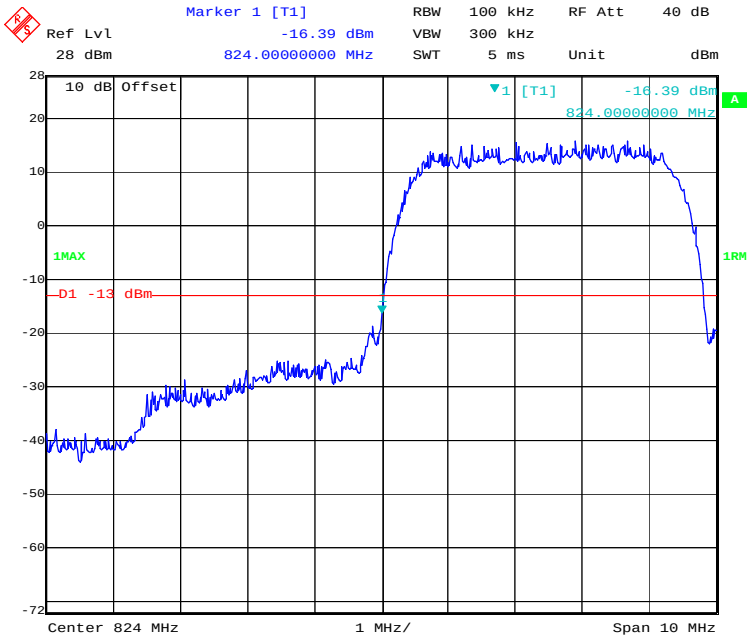
WCDMA (HSDPA) Mode, Left Band Edge



WCDMA (HSDPA) Mode, Right Band Edge



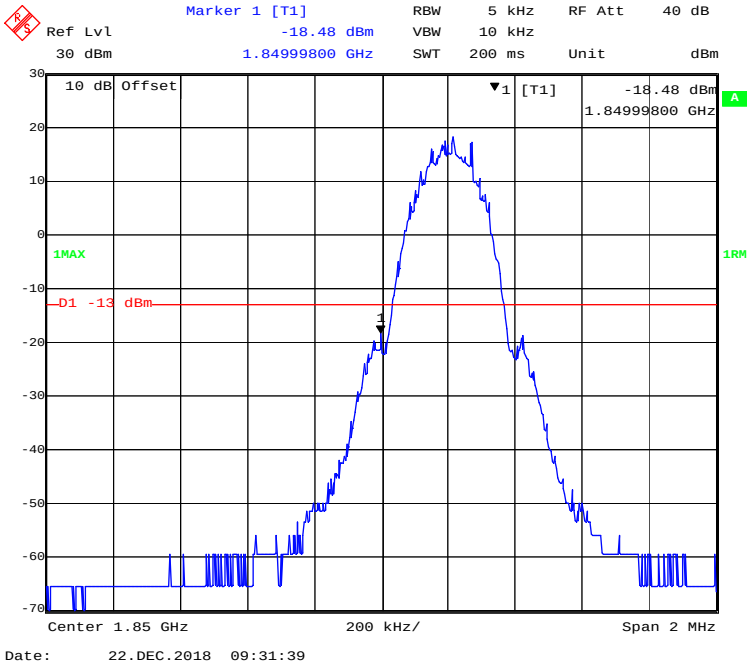
WCDMA (HSUPA) Mode, Left Band Edge



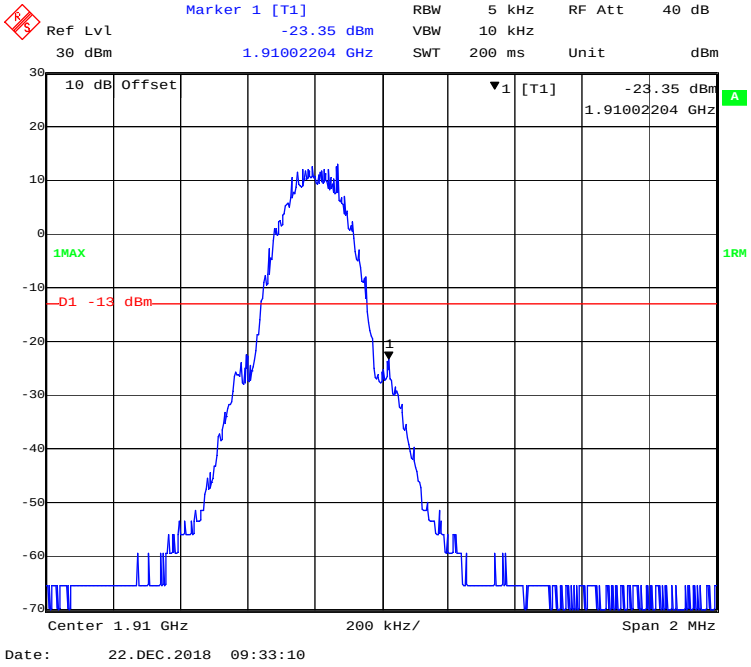
WCDMA (HSUPA) Mode, Right Band Edge

PCS 1900 Band:

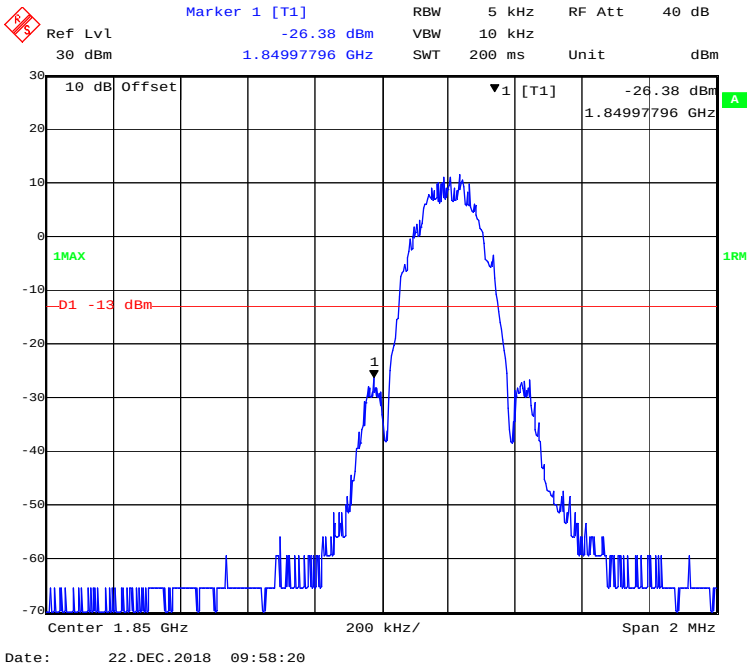
GPRS Mode, Left Band Edge



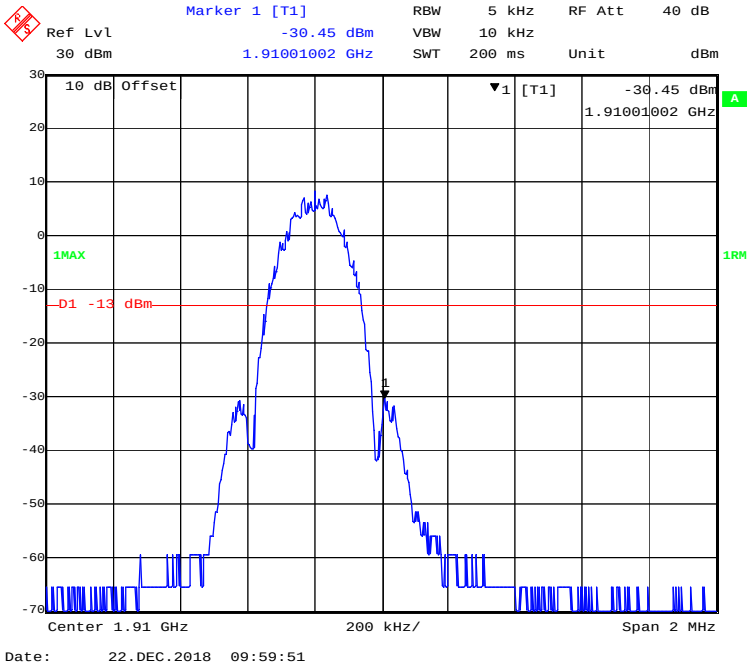
GPRS Mode, Right Band Edge



EGPRS Mode, Left Band Edge

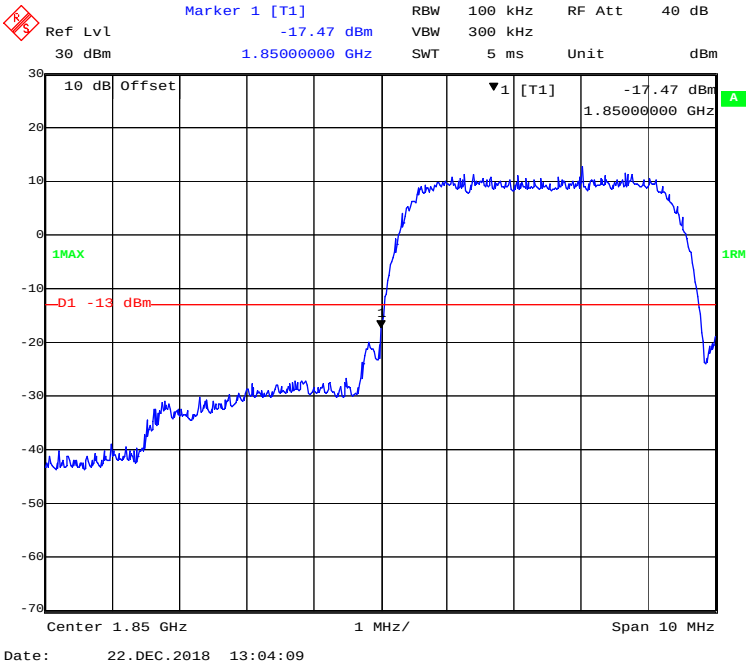


EGPRS Mode, Right Band Edge

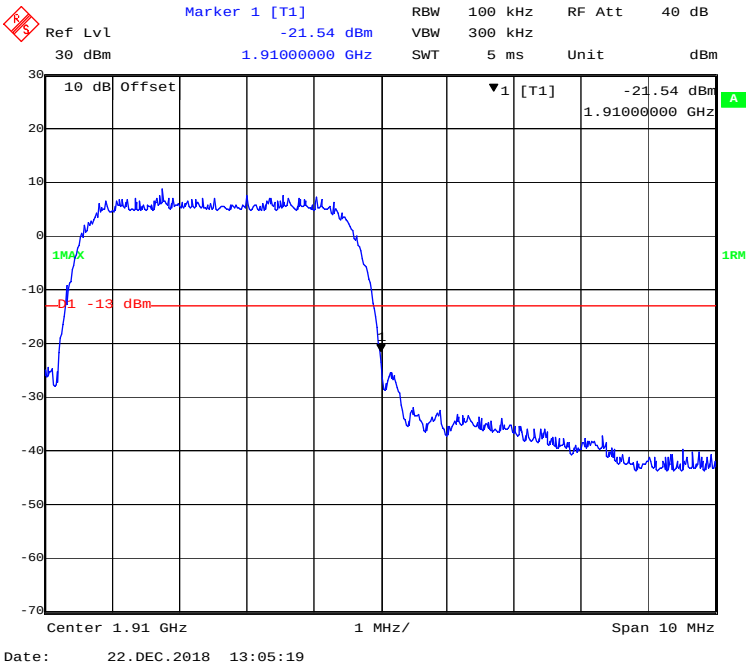


WCDMA Band II

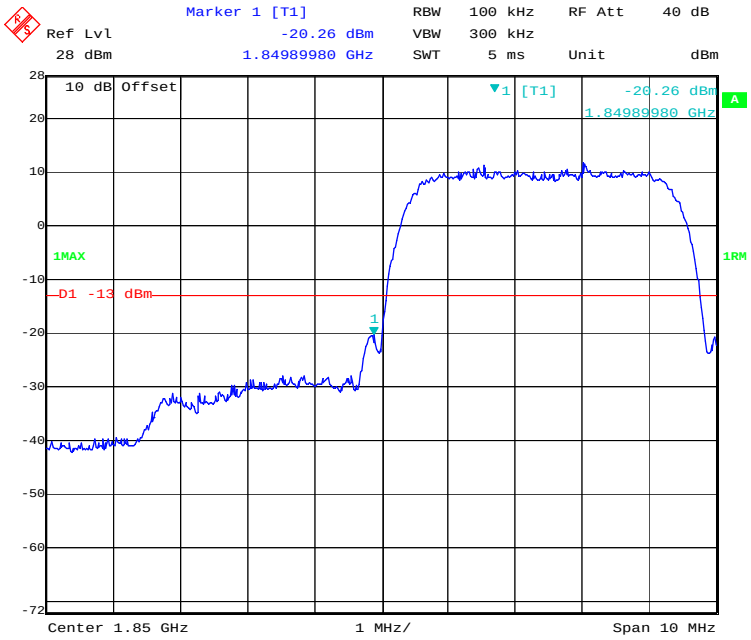
WCDMA (Rel99) Mode, Left Band Edge



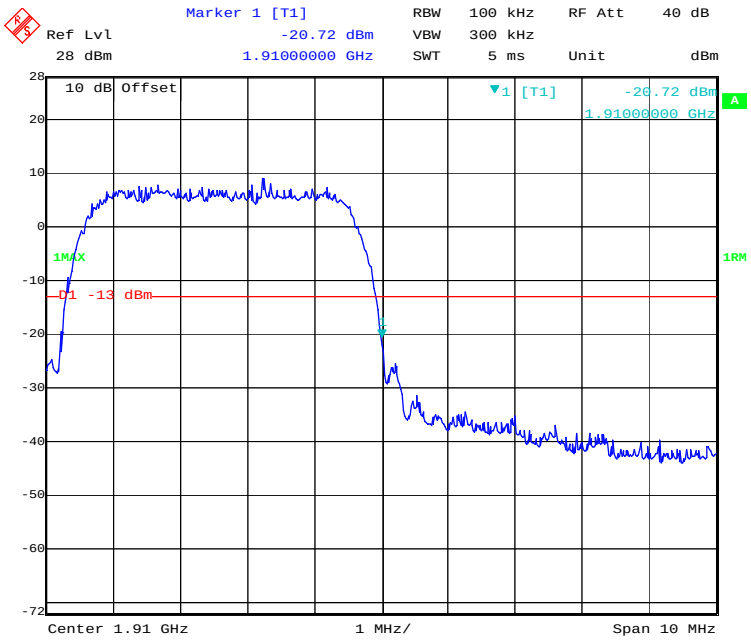
WCDMA (Rel99) Mode, Right Band Edge



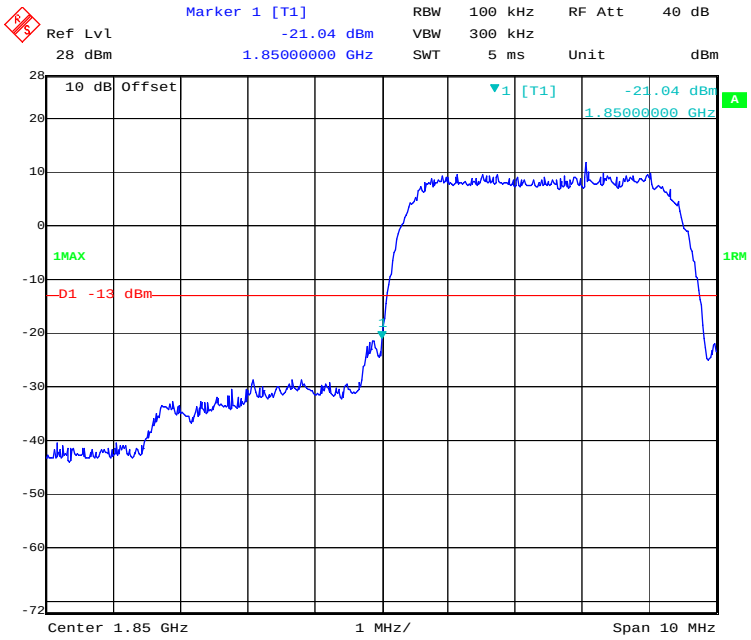
WCDMA (HSDPA) Mode, Left Band Edge



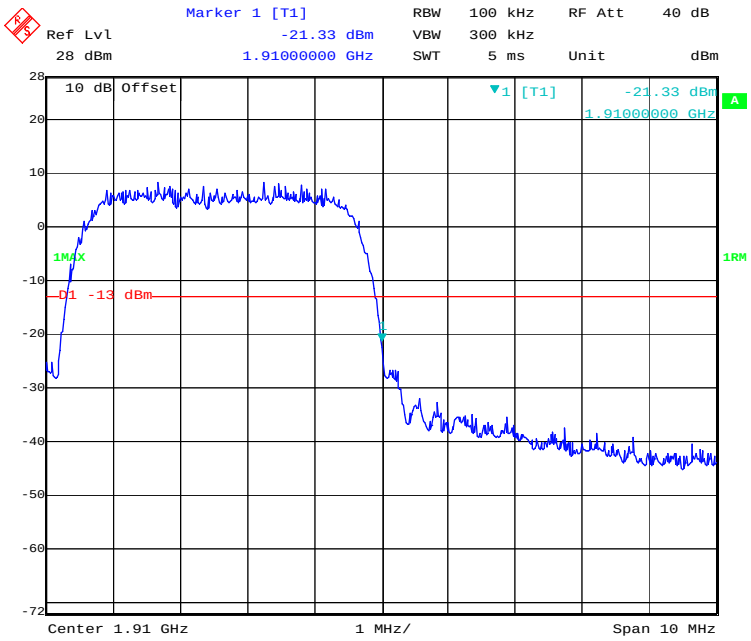
WCDMA (HSDPA) Mode, Right Band Edge



WCDMA (HSUPA) Mode, Left Band Edge

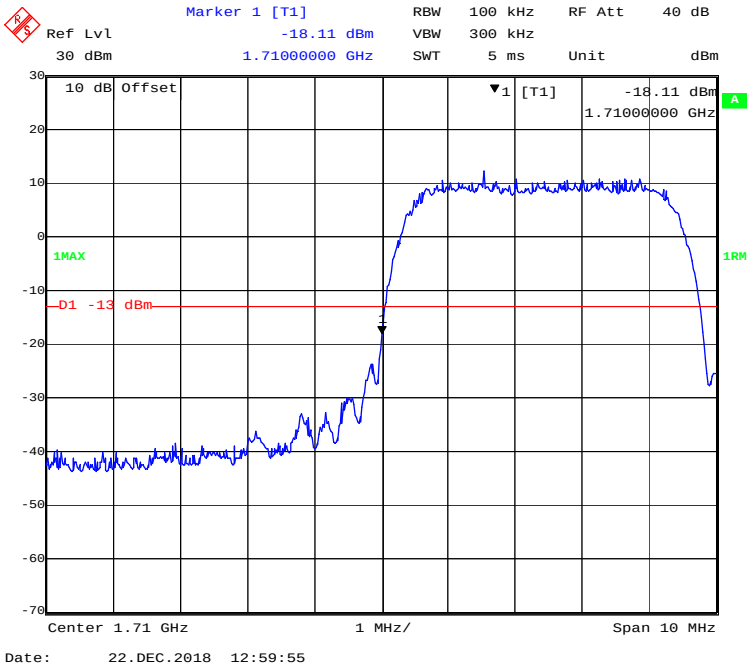


WCDMA (HSUPA) Mode, Right Band Edge

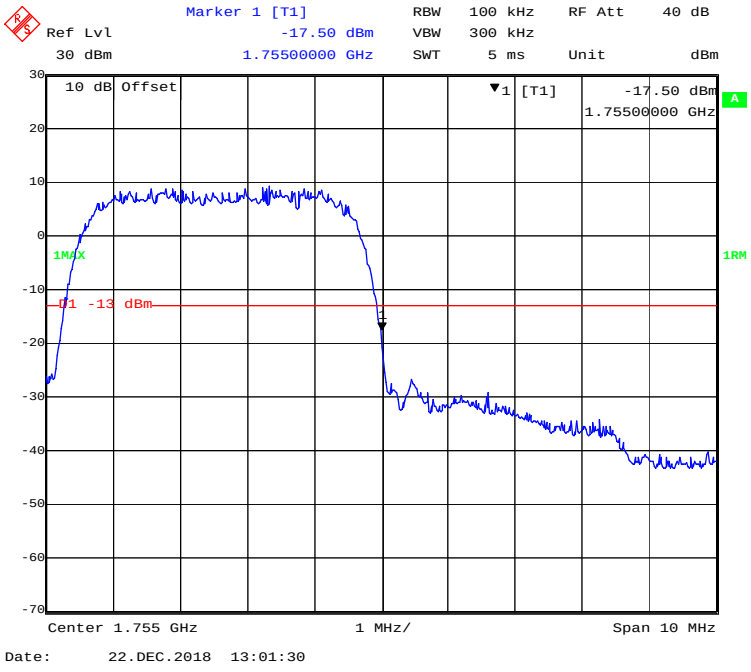


WCDMA Band IV

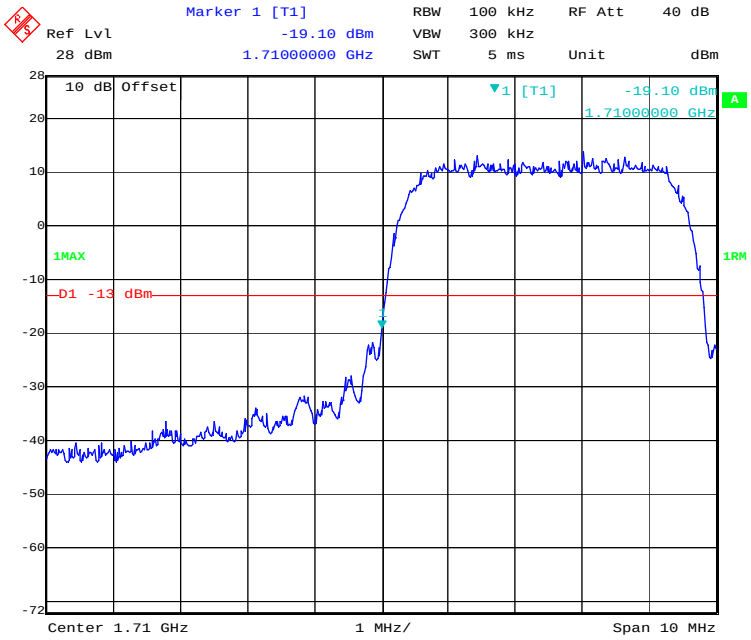
WCDMA (Rel99) Mode, Left Band Edge



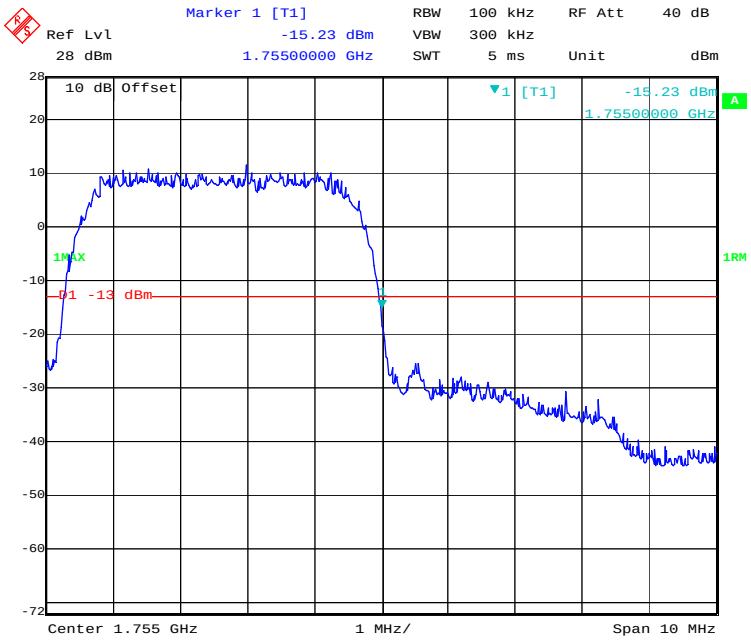
WCDMA (Rel99) Mode, Right Band Edge



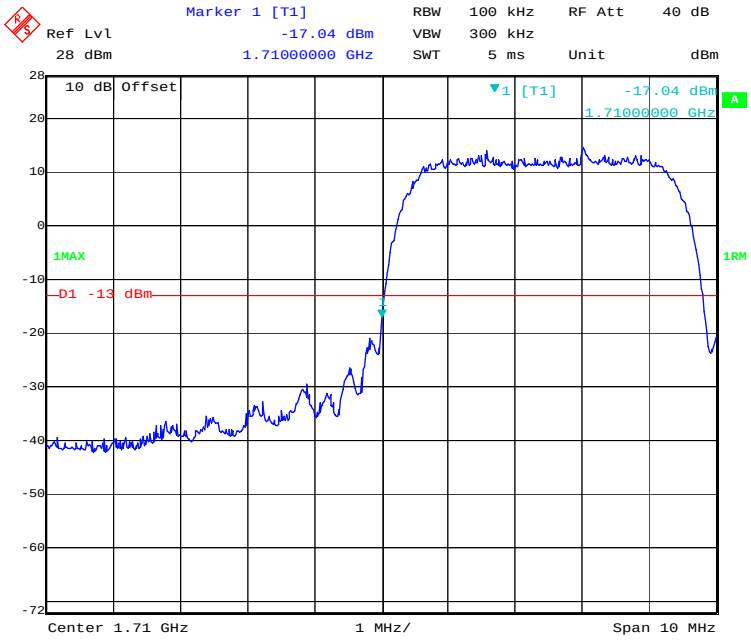
WCDMA (HSDPA) Mode, Left Band Edge



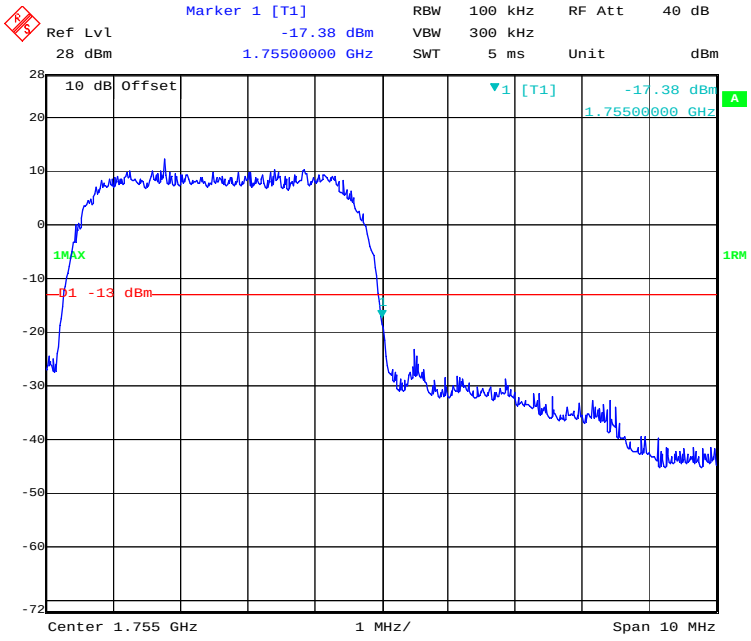
WCDMA (HSDPA) Mode, Right Band Edge



WCDMA (HSUPA) Mode, Left Band Edge

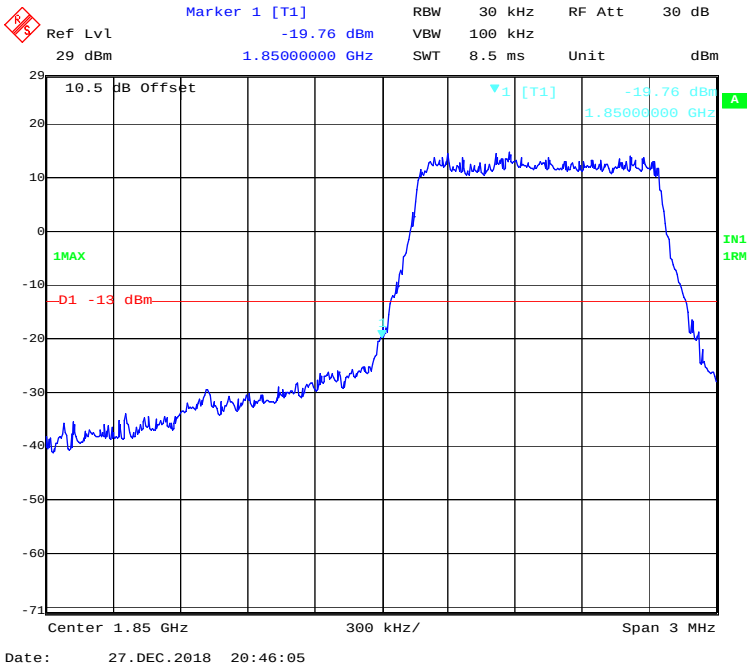


WCDMA (HSUPA) Mode, Right Band Edge

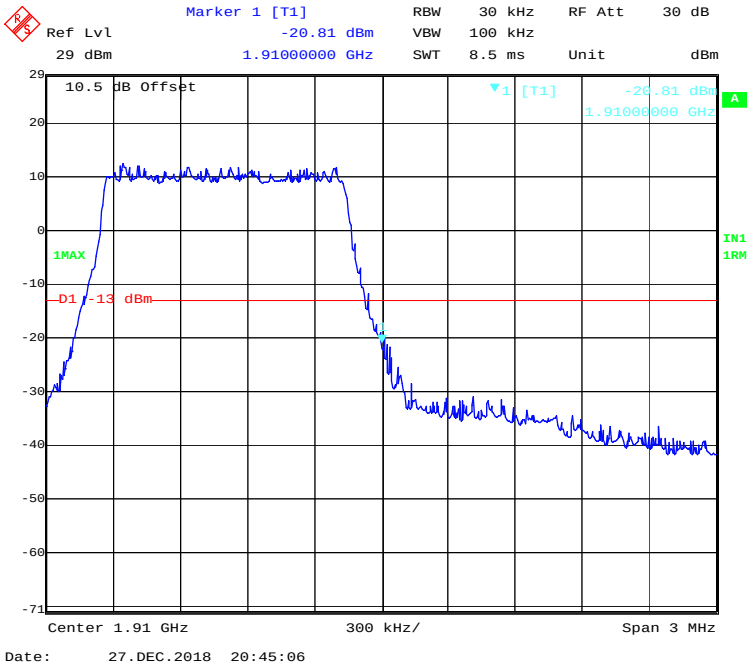


LTE Band 2:

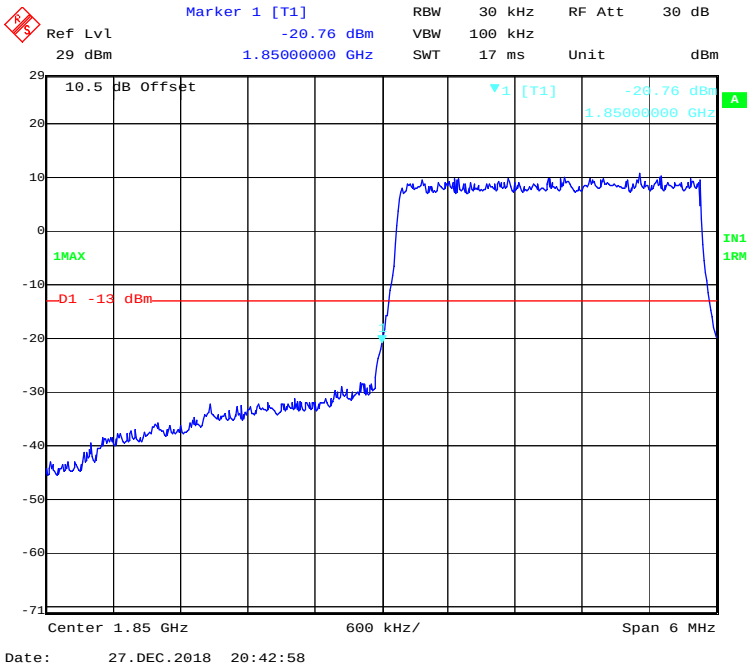
QPSK (1.4 MHz, FULL RB) - Left Band Edge



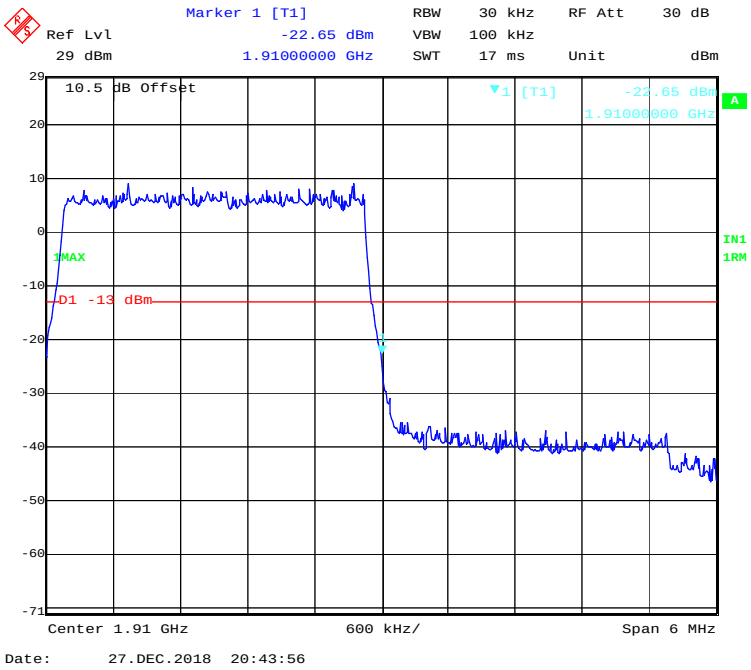
QPSK (1.4 MHz, FULL RB) - Right Band Edge



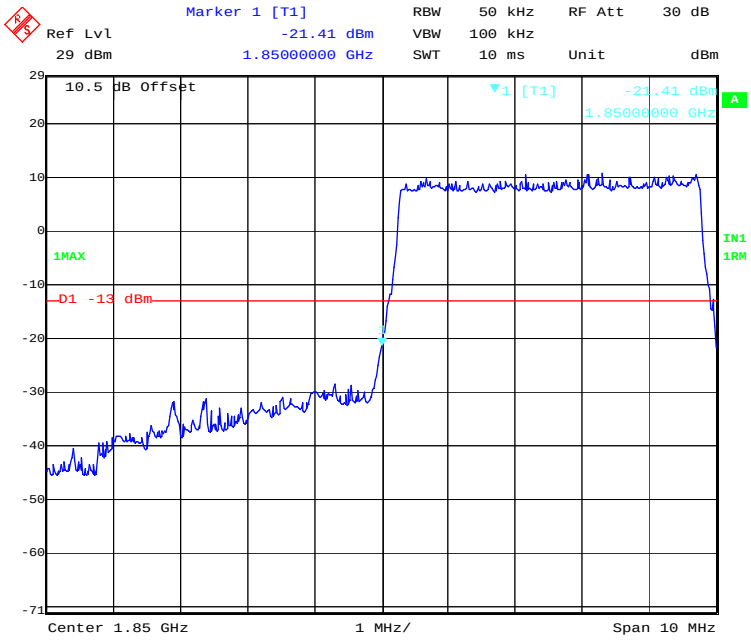
QPSK (3.0 MHz, FULL RB) - Left Band Edge



QPSK (3.0 MHz, FULL RB) - Right Band Edge

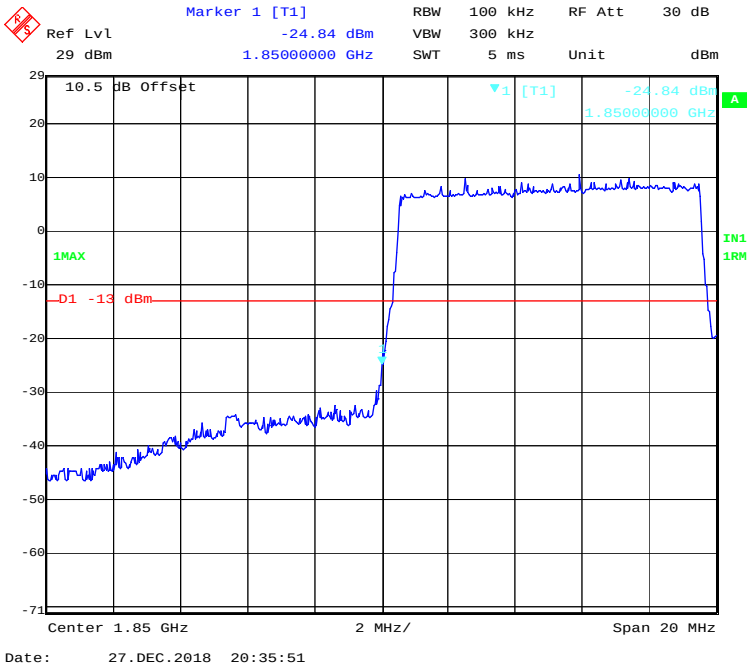


QPSK (5.0 MHz, FULL RB) - Left Band Edge



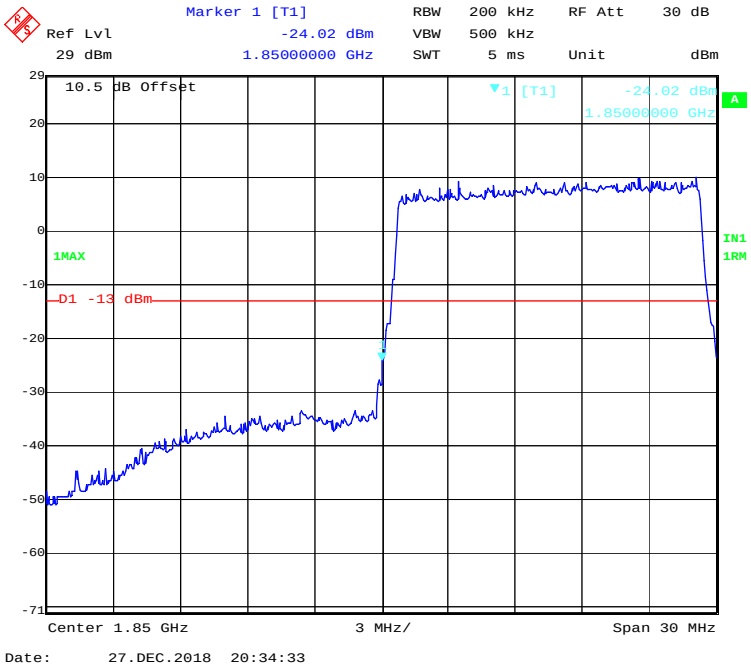
QPSK (5.0 MHz, FULL RB) - Right Band Edge

QPSK (10.0 MHz, FULL RB) - Left Band Edge

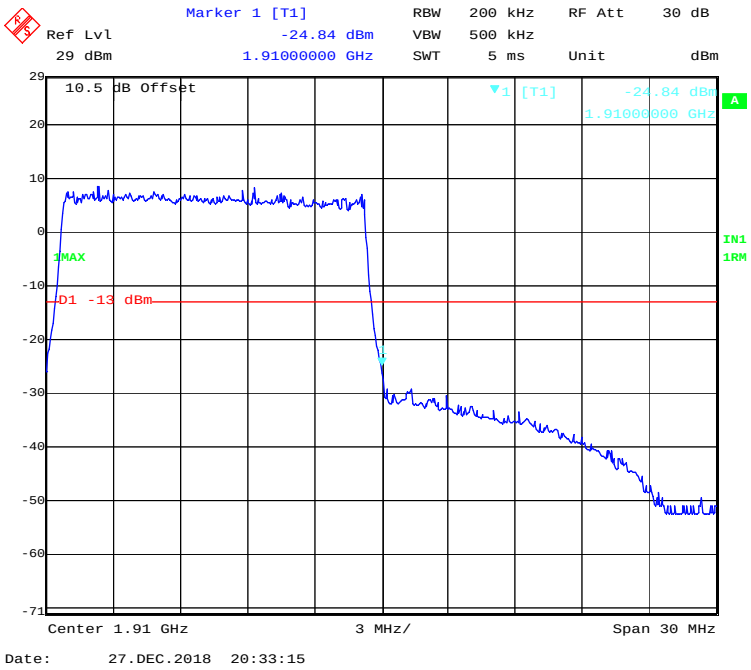


QPSK (10.0 MHz, FULL RB) - Right Band Edge

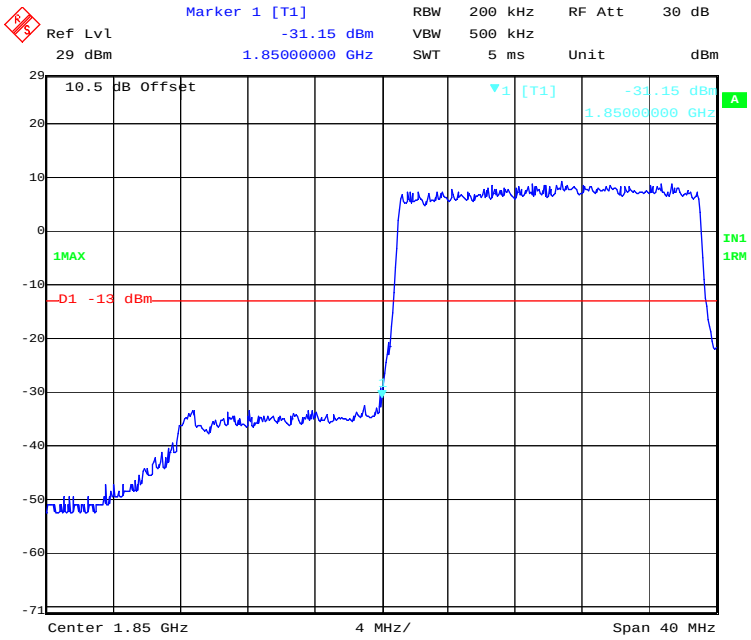
QPSK (15.0 MHz, FULL RB) - Left Band Edge



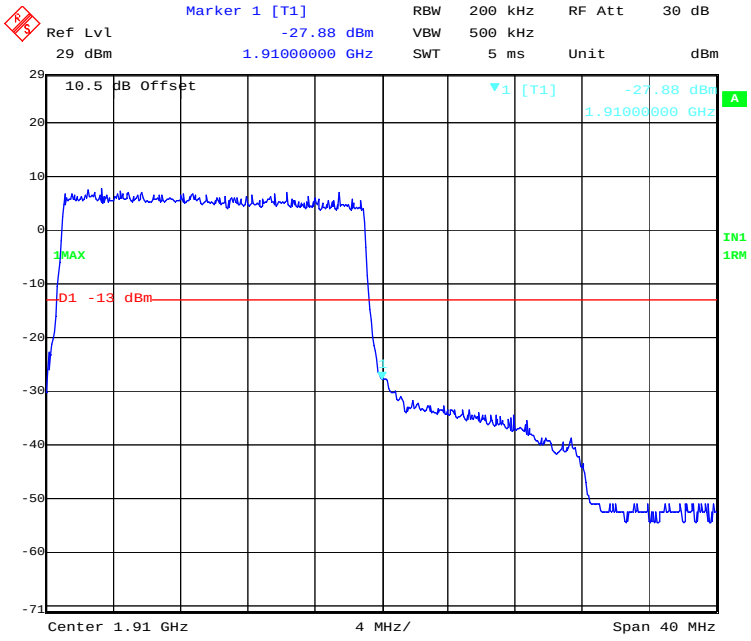
QPSK (15.0 MHz, FULL RB) - Right Band Edge



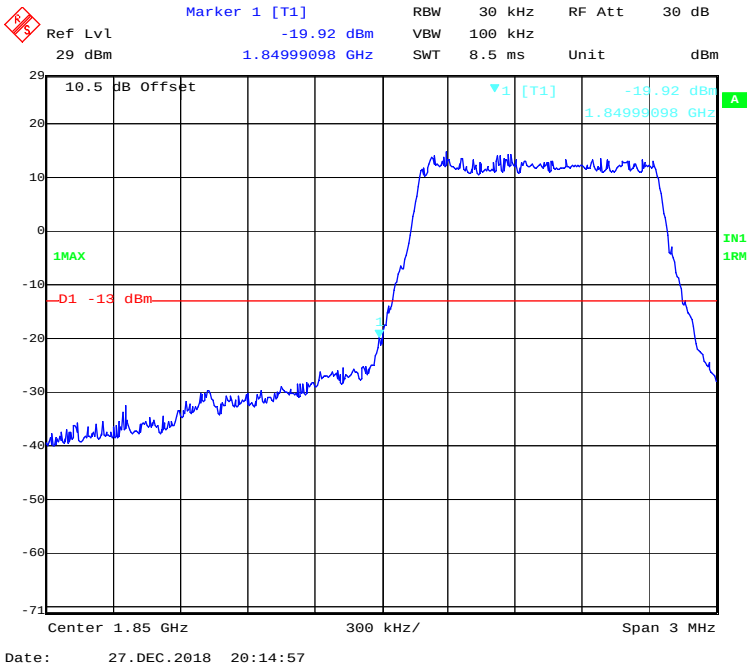
QPSK (20.0 MHz, FULL RB) - Left Band Edge



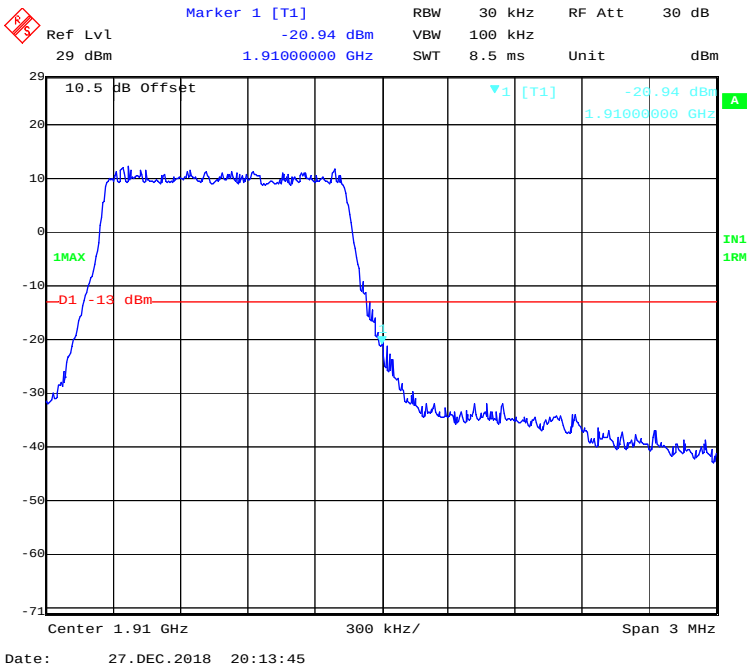
QPSK (20.0 MHz, FULL RB) - Right Band Edge



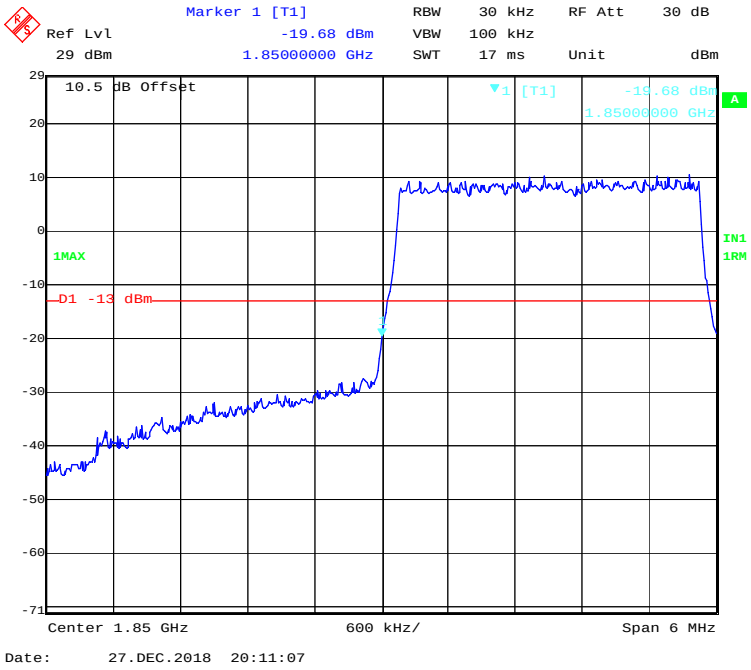
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



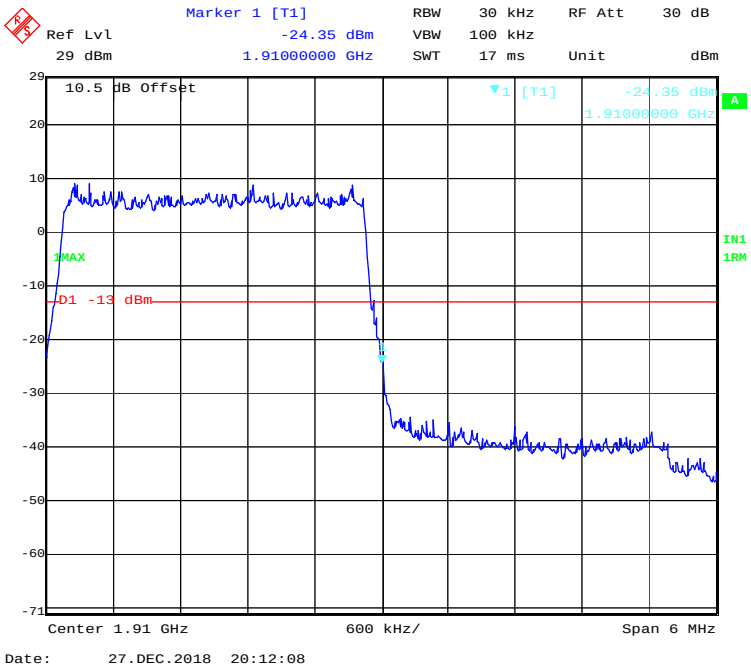
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



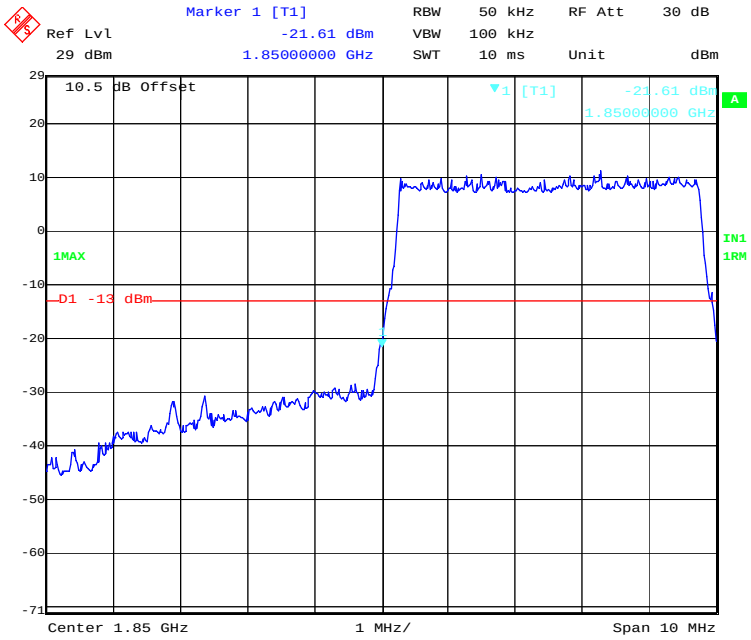
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



16-QAM (3.0 MHz, FULL RB) - Right Band Edge

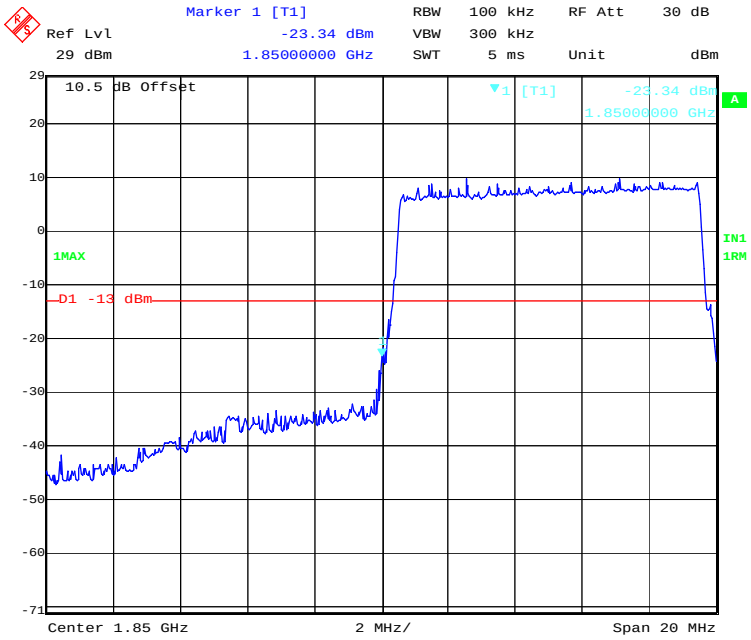


16-QAM (5.0 MHz, FULL RB) - Left Band Edge

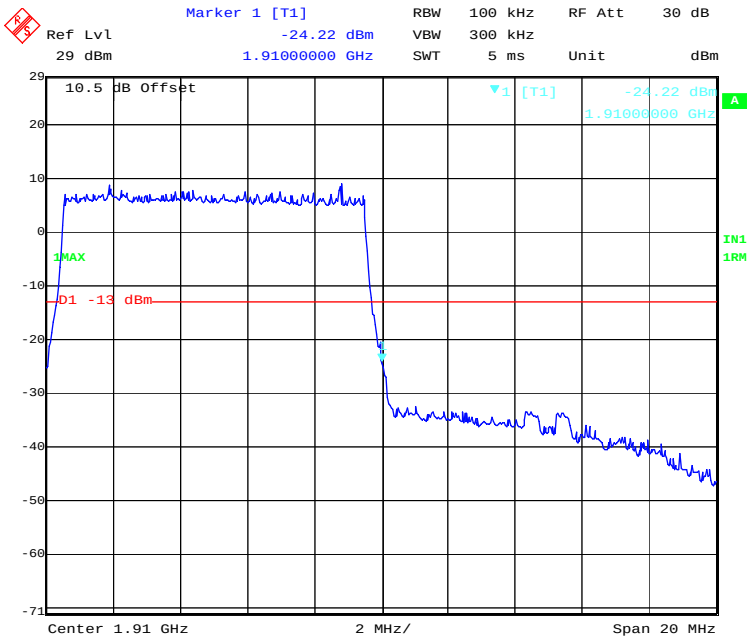


16-QAM (5.0 MHz, FULL RB) - Right Band Edge

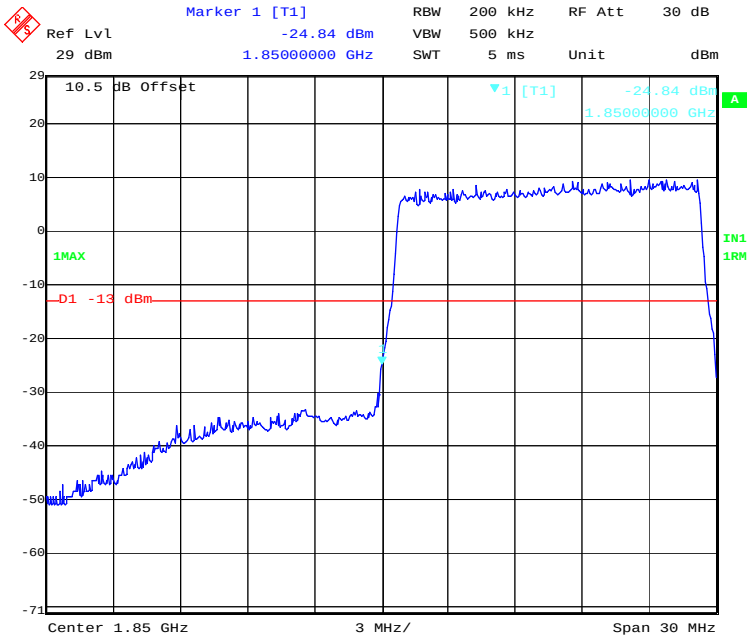
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



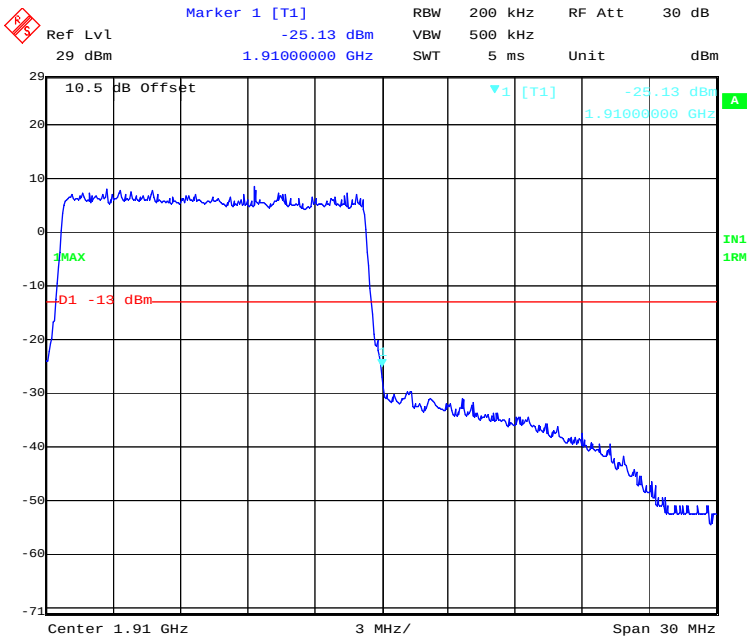
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



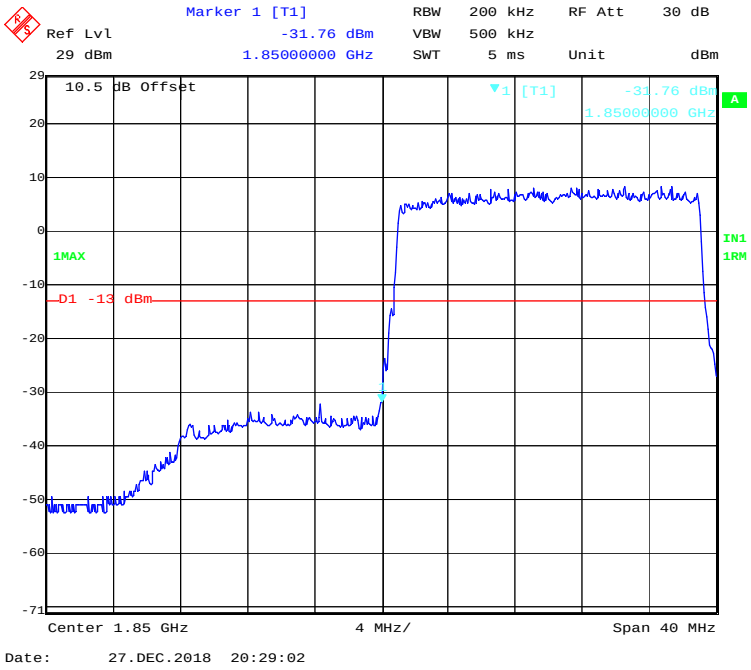
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



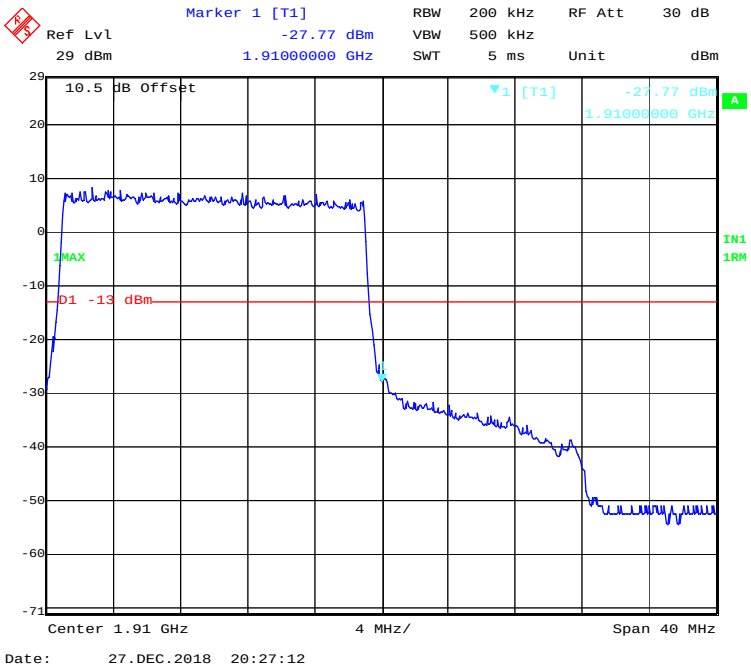
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



16-QAM (20.0 MHz, FULL RB) - Left Band Edge

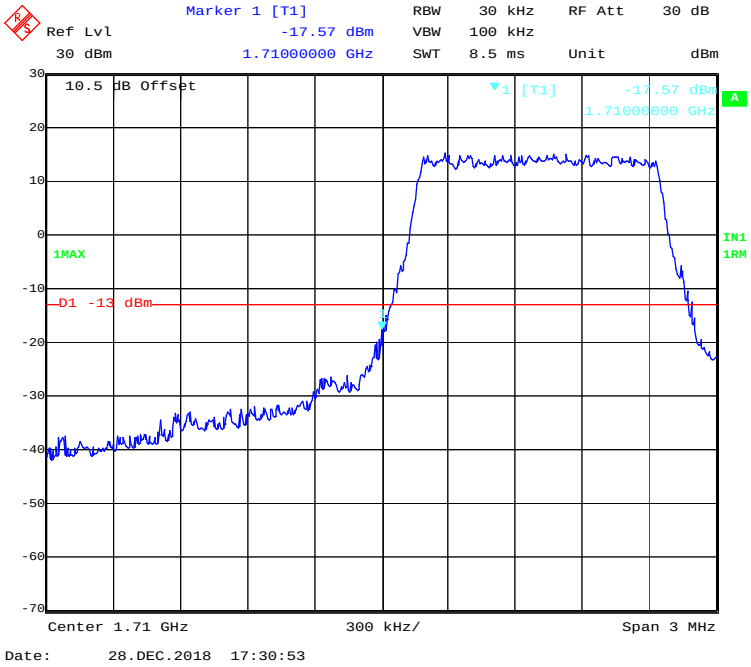


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

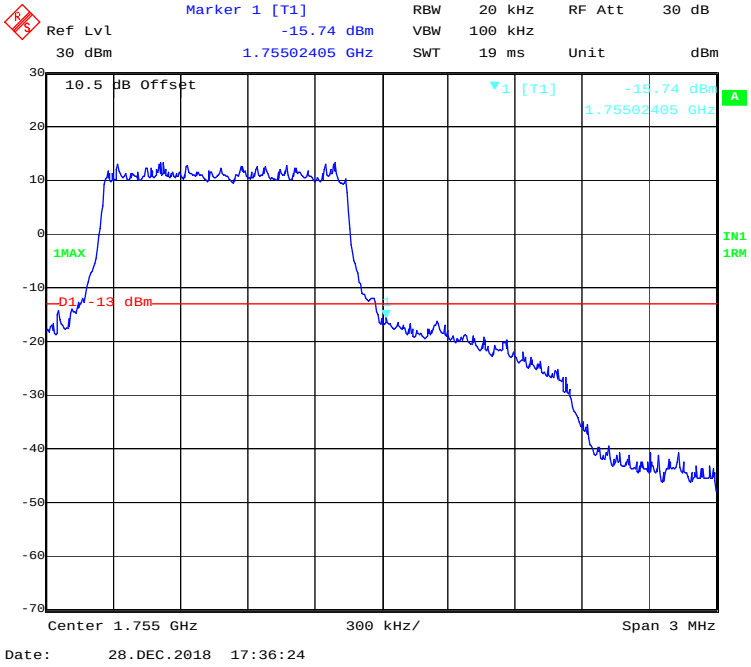


LTE Band 4:

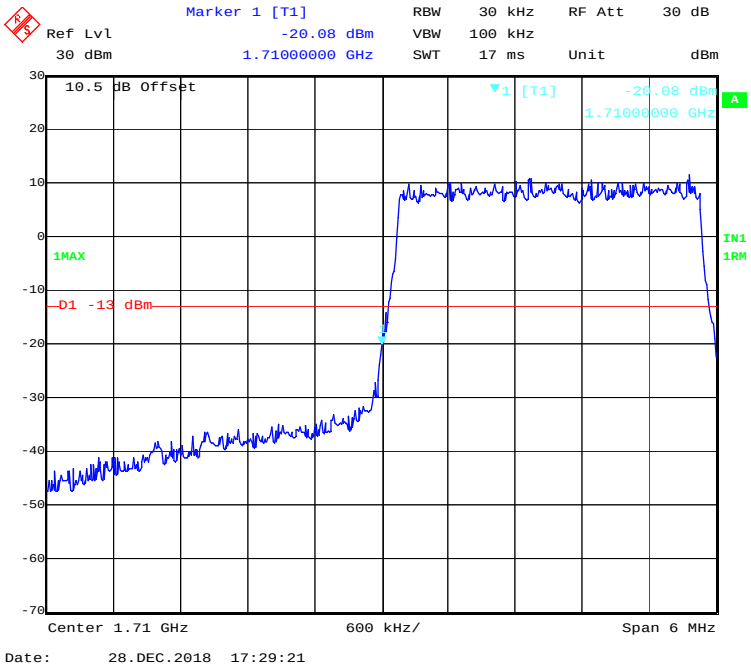
QPSK (1.4 MHz, FULL RB) - Left Band Edge



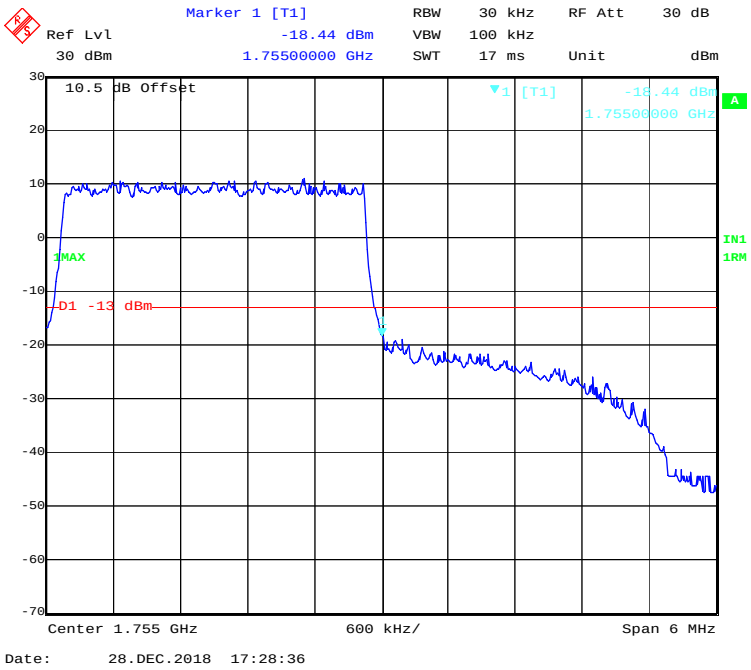
QPSK (1.4 MHz, FULL RB) - Right Band Edge



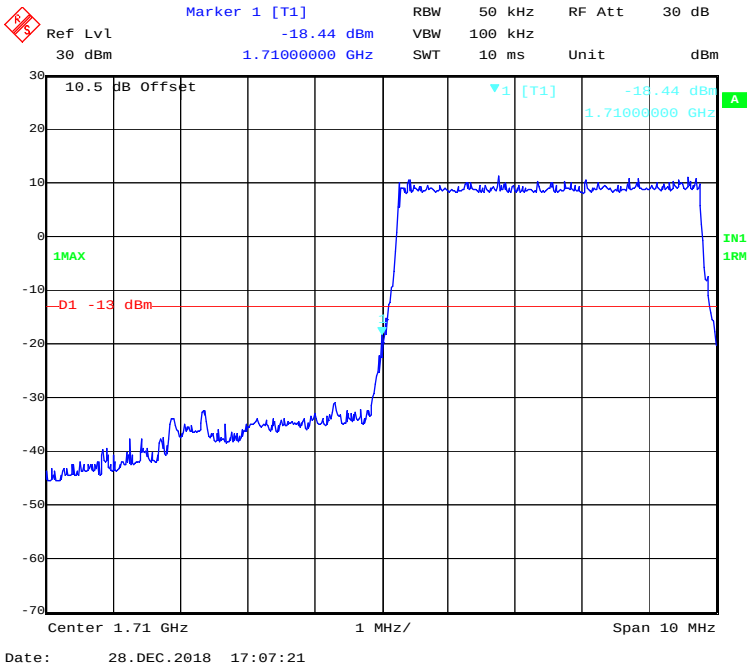
QPSK (3.0 MHz, FULL RB) - Left Band Edge



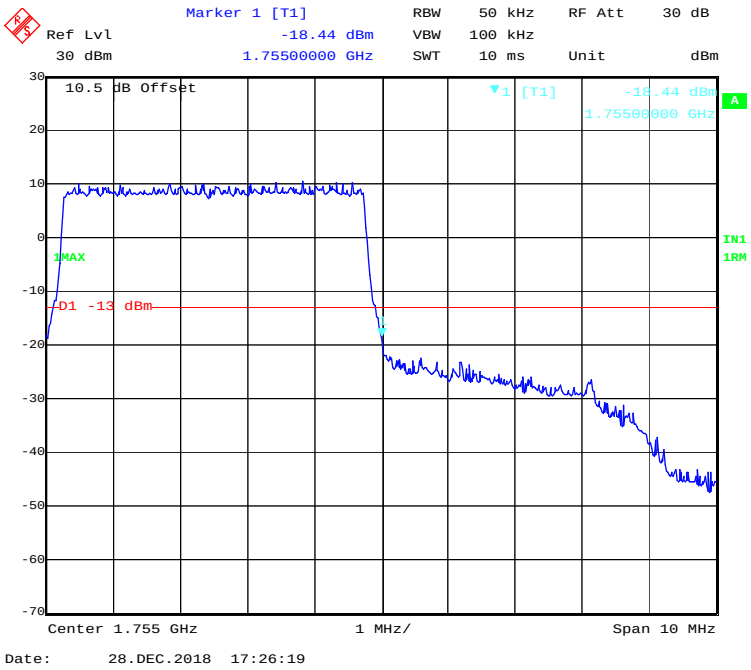
QPSK (3.0 MHz, FULL RB) - Right Band Edge



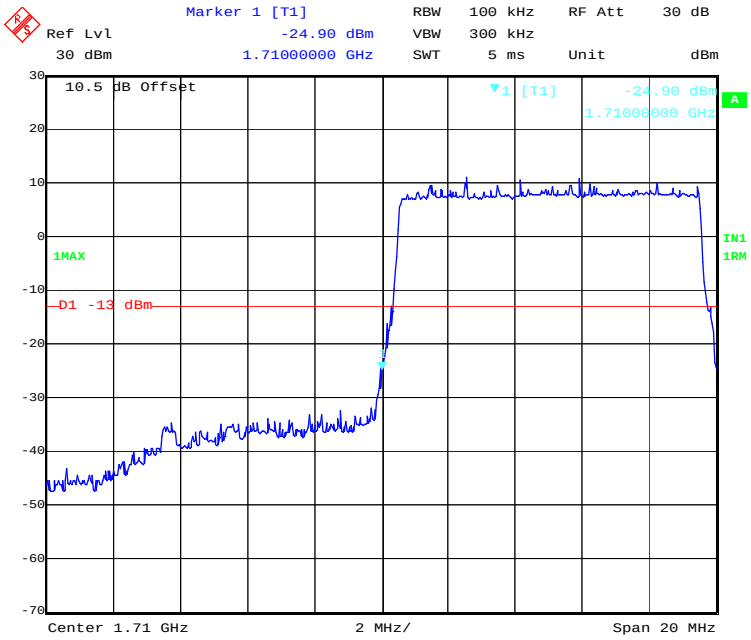
QPSK (5.0 MHz, FULL RB) - Left Band Edge



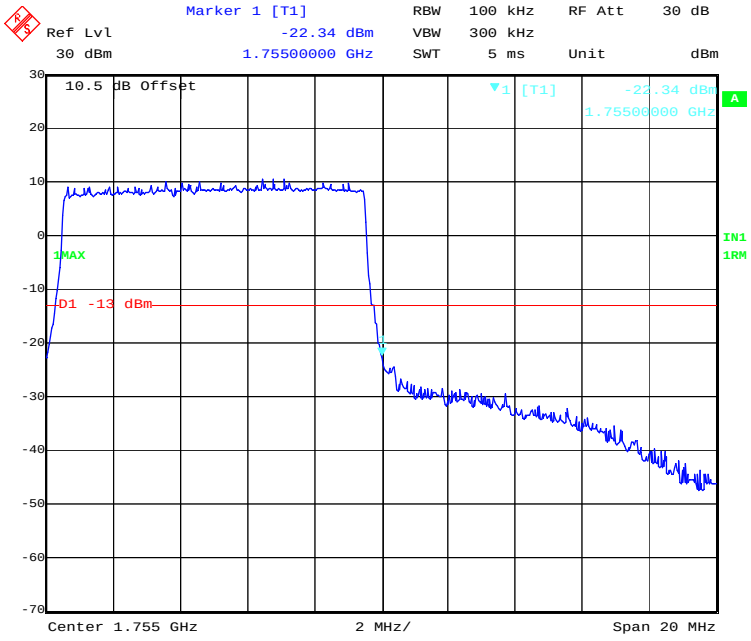
QPSK (5.0 MHz, FULL RB) - Right Band Edge



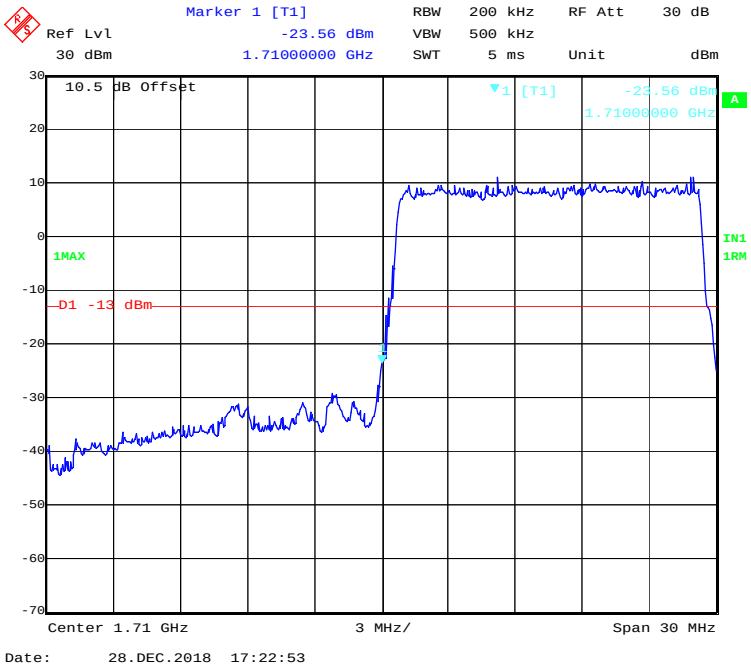
QPSK (10.0 MHz, FULL RB) - Left Band Edge



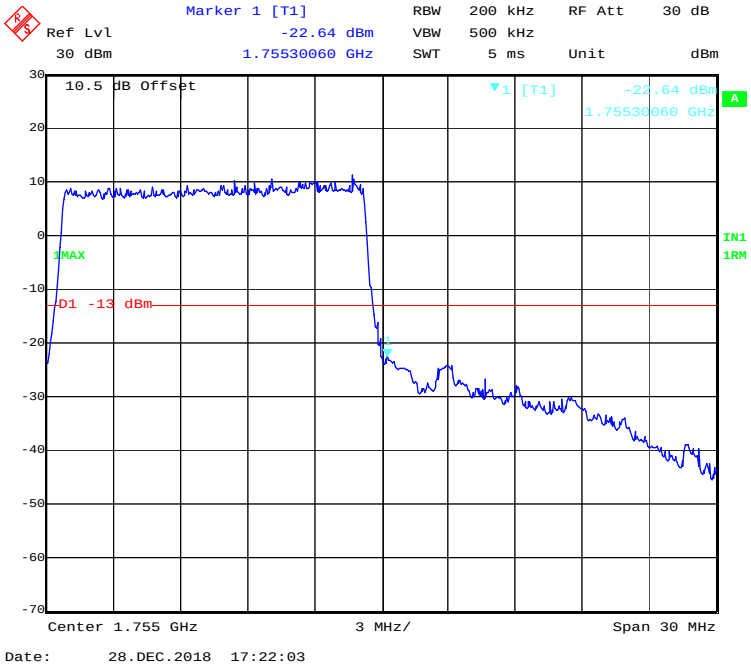
QPSK (10.0 MHz, FULL RB) - Right Band Edge



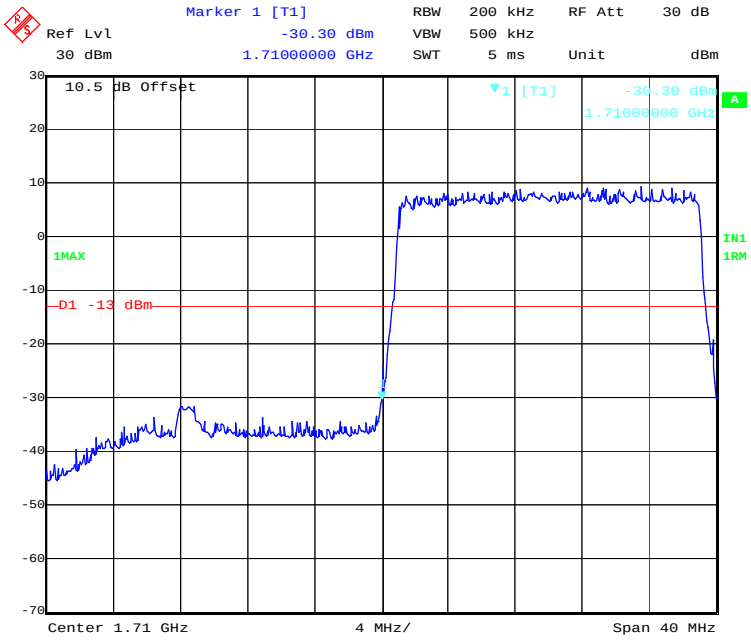
QPSK (15.0 MHz, FULL RB) - Left Band Edge



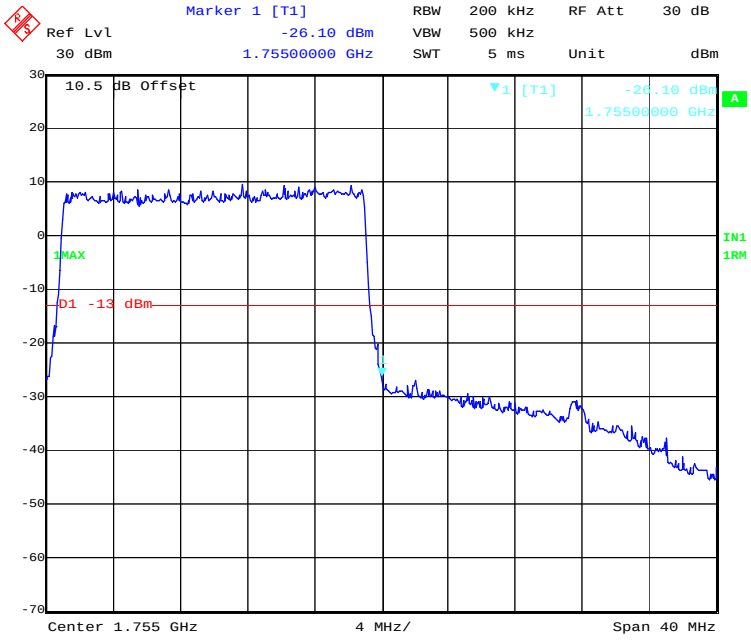
QPSK (15.0 MHz, FULL RB) - Right Band Edge



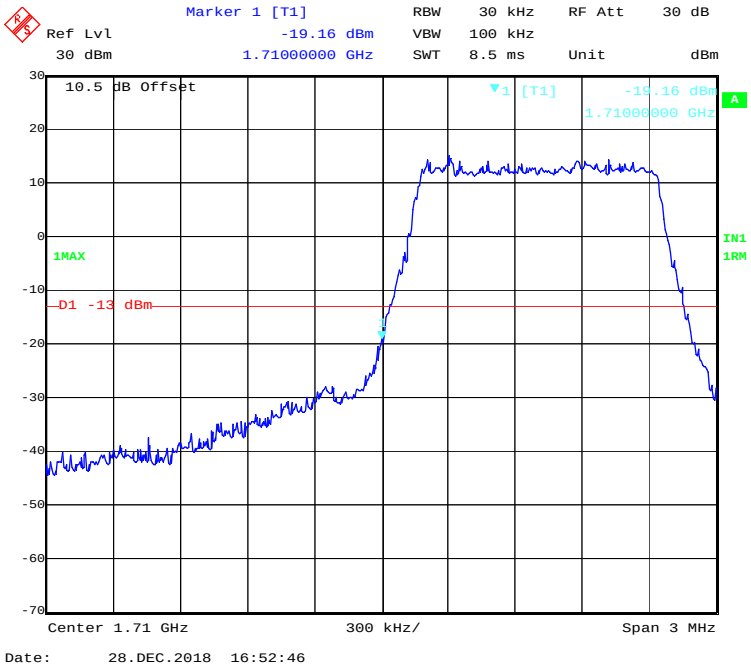
QPSK (20.0 MHz, FULL RB) - Left Band Edge



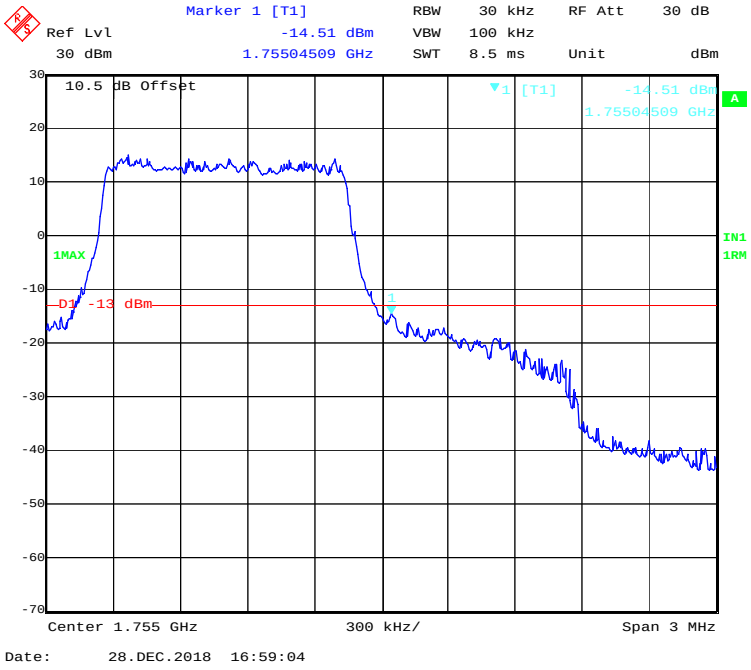
QPSK (20.0 MHz, FULL RB) - Right Band Edge



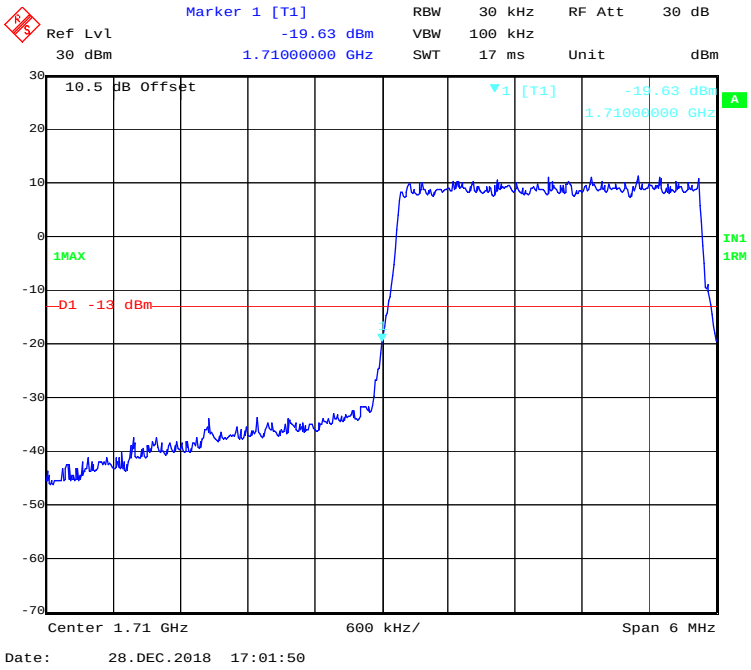
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



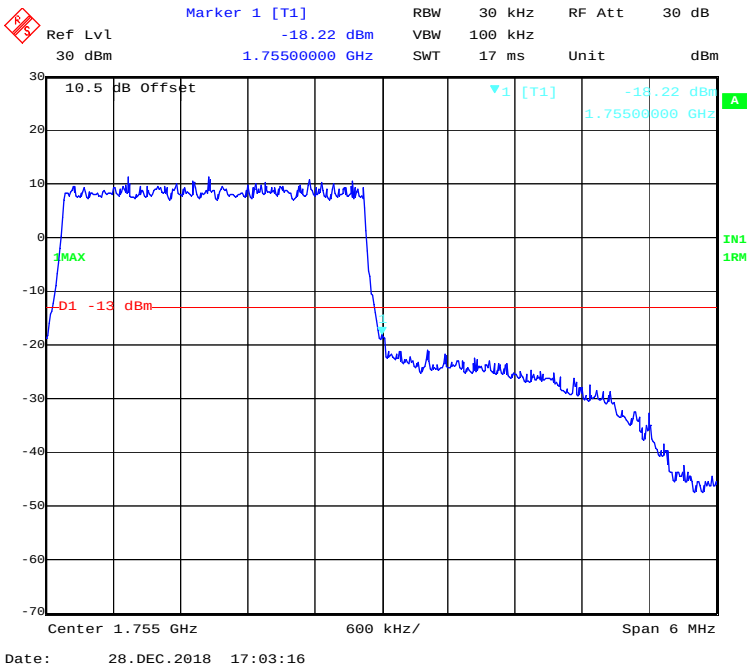
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



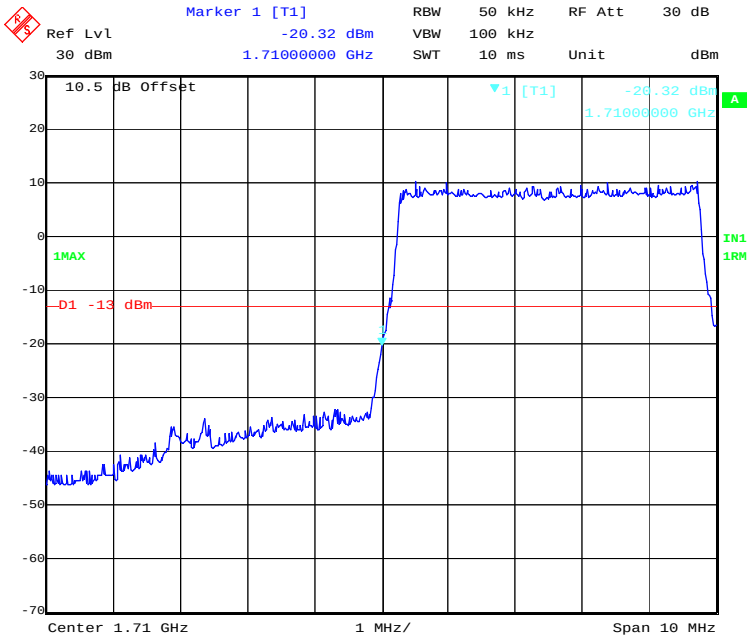
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



16-QAM (3.0 MHz, FULL RB) - Right Band Edge

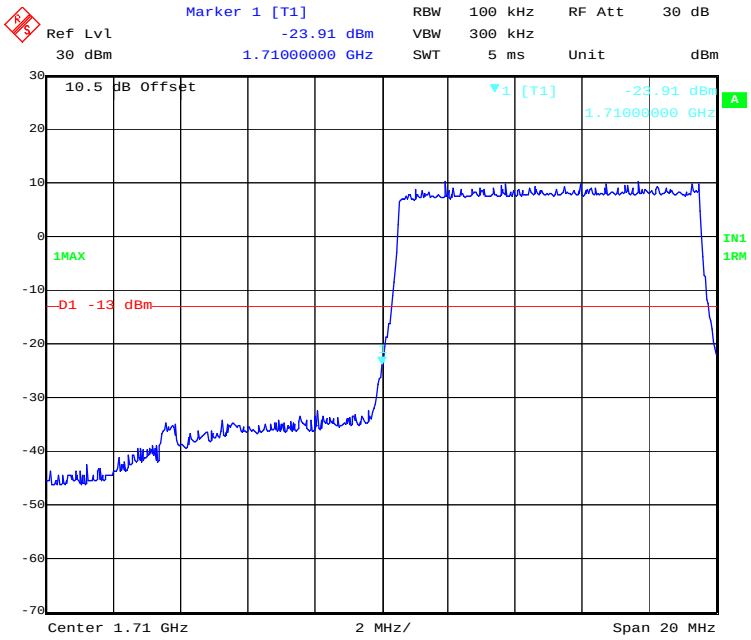


16-QAM (5.0 MHz, FULL RB) - Left Band Edge

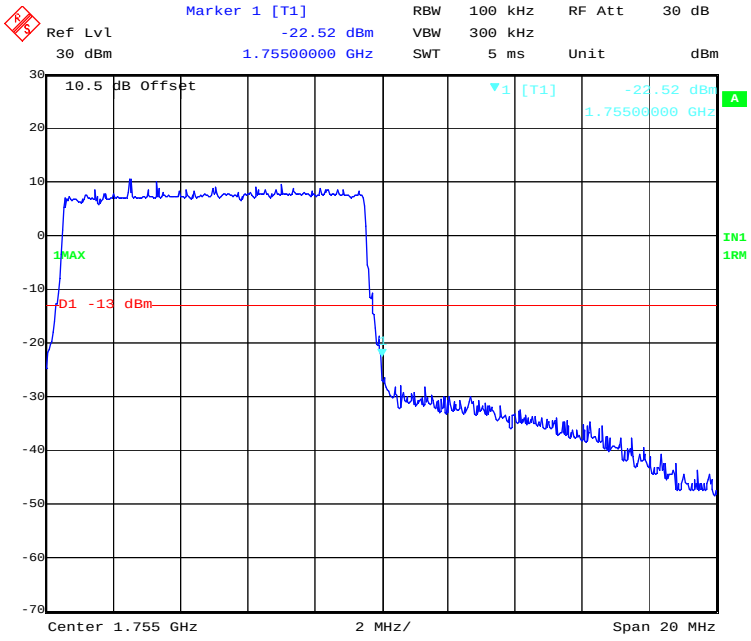


16-QAM (5.0 MHz, FULL RB) - Right Band Edge

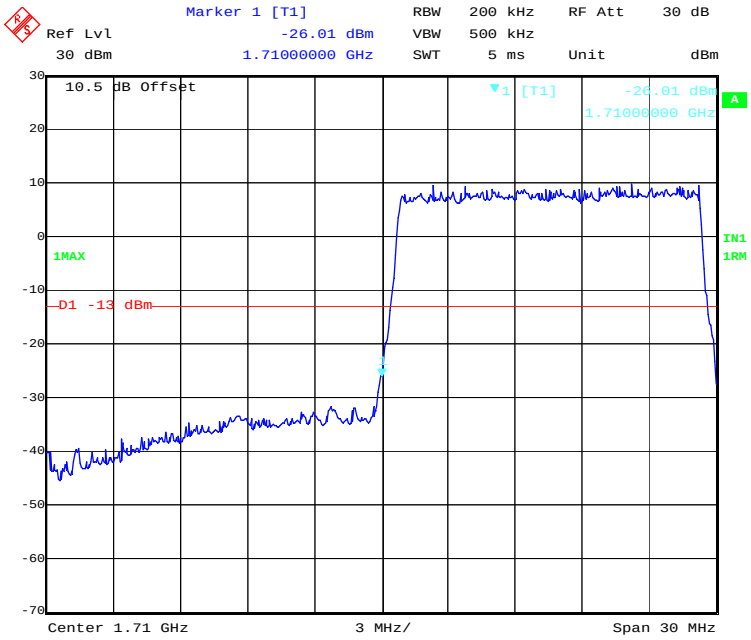
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



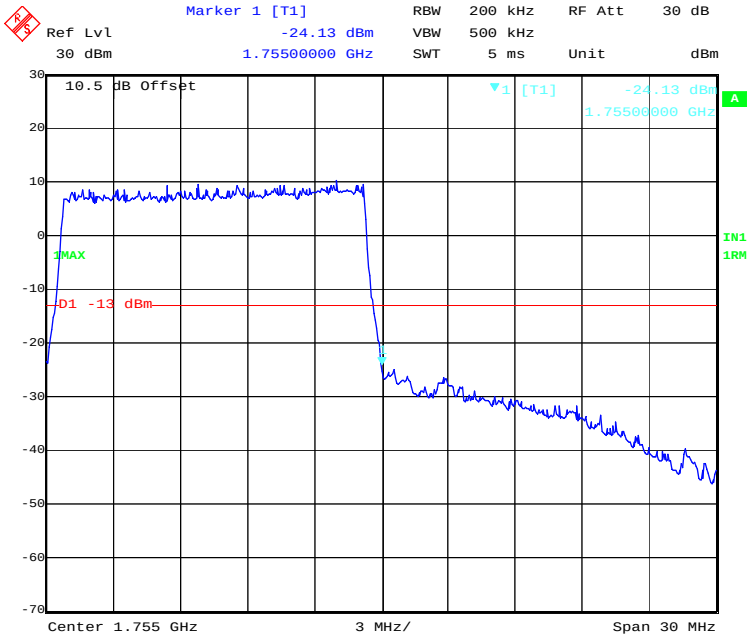
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



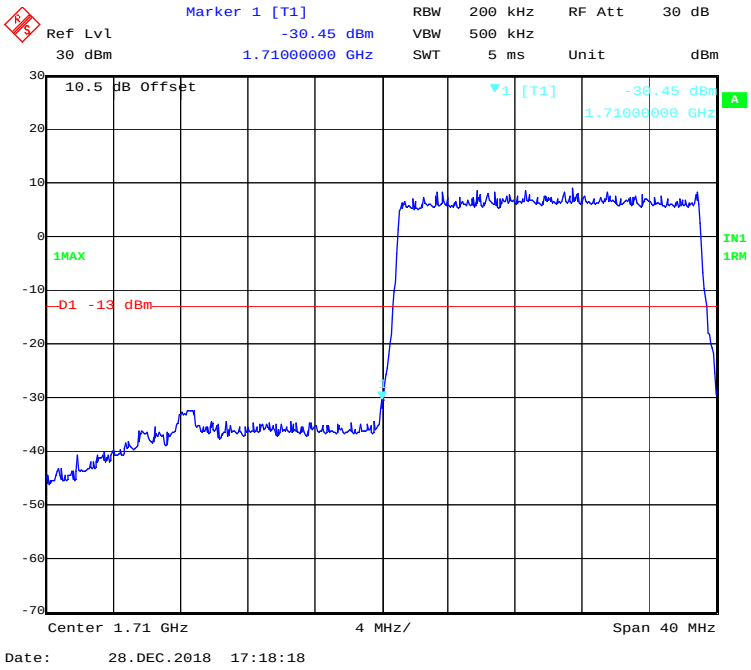
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



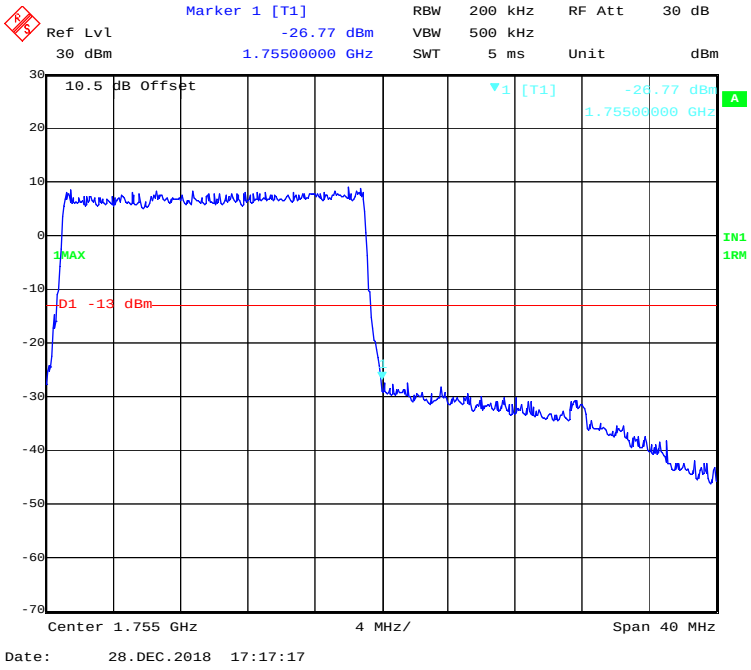
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



16-QAM (20.0 MHz, FULL RB) - Left Band Edge

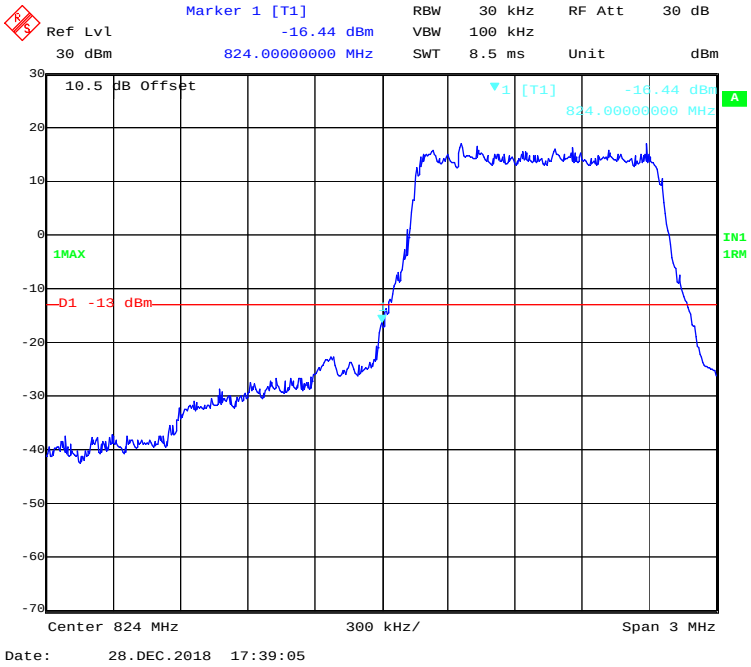


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

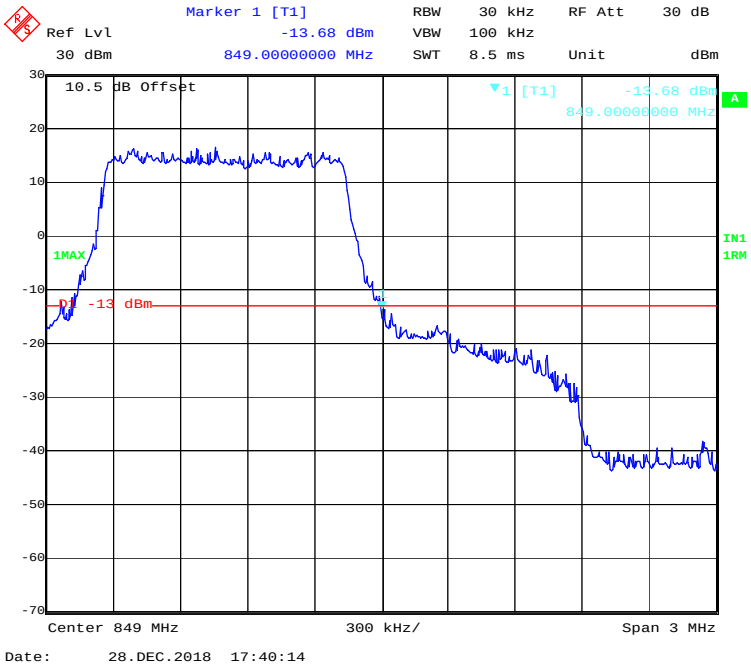


LTE Band 5:

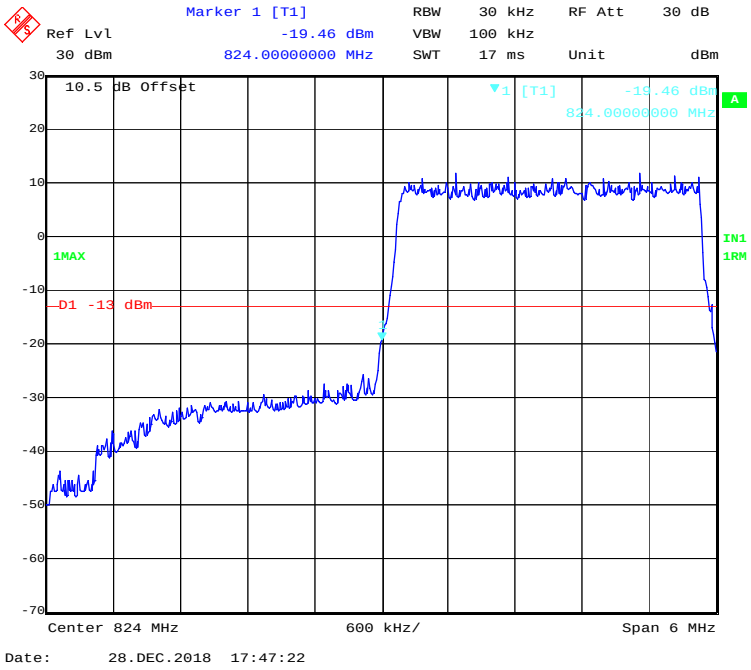
QPSK (1.4 MHz, FULL RB) - Left Band Edge



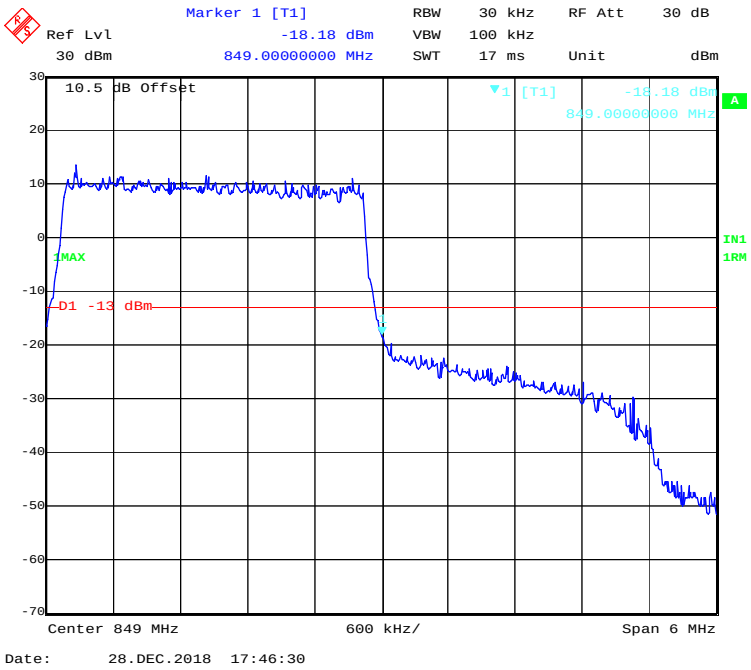
QPSK (1.4 MHz, FULL RB) - Right Band Edge



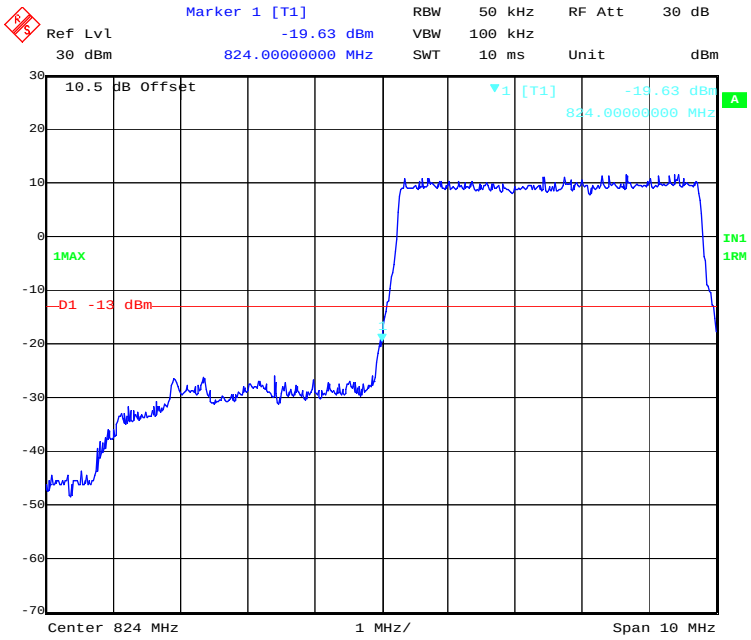
QPSK (3.0 MHz, FULL RB) - Left Band Edge



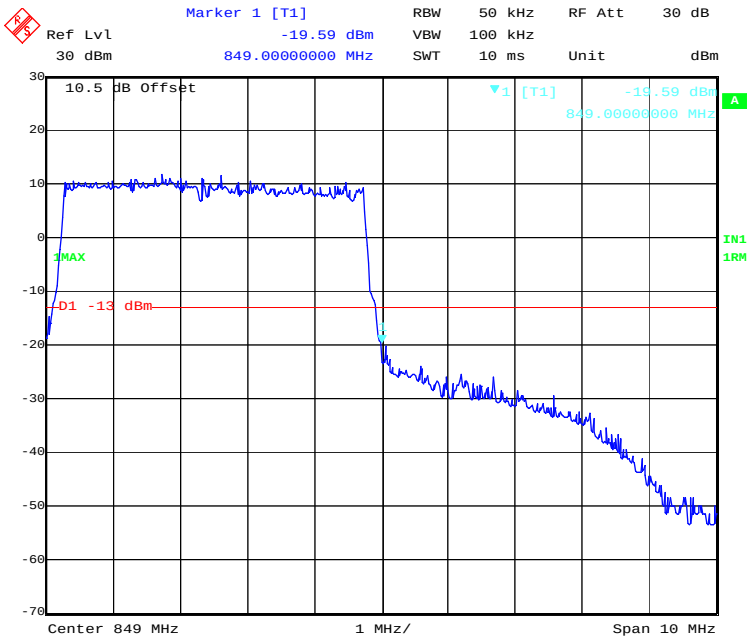
QPSK (3.0 MHz, FULL RB) - Right Band Edge



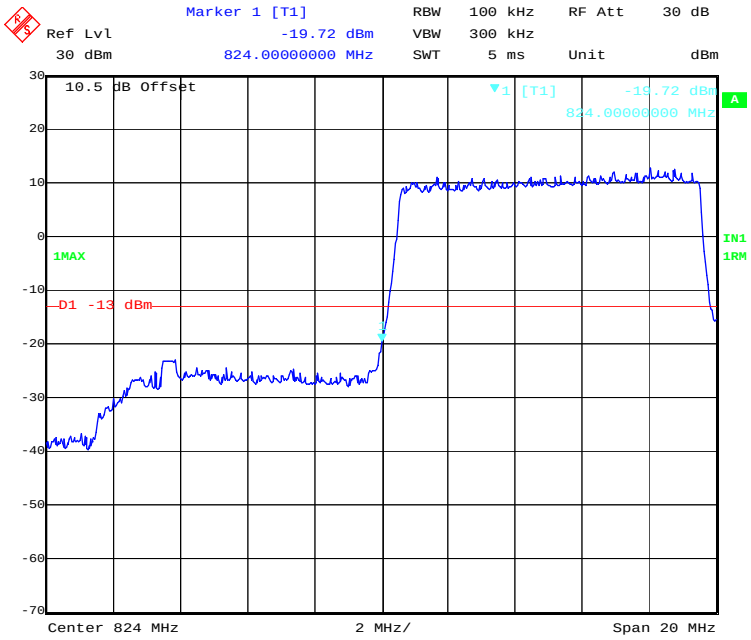
QPSK (5.0 MHz, FULL RB) - Left Band Edge



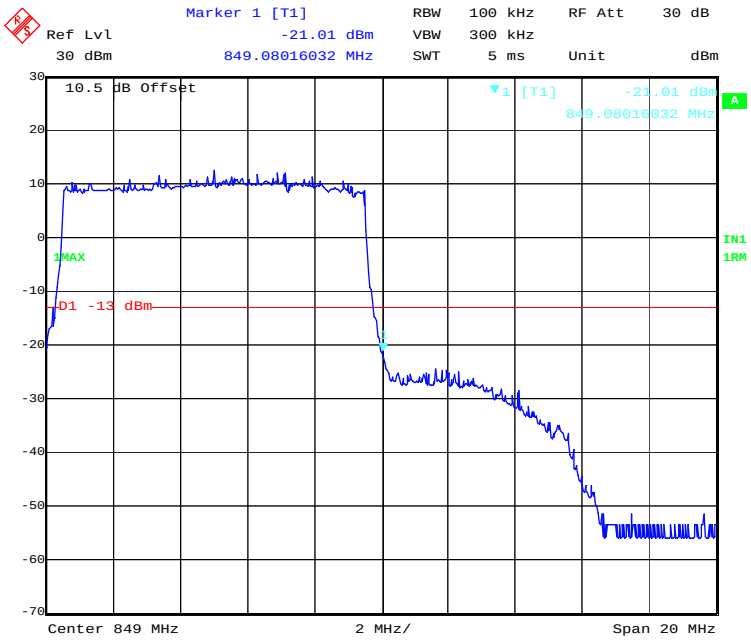
QPSK (5.0 MHz, FULL RB) - Right Band Edge



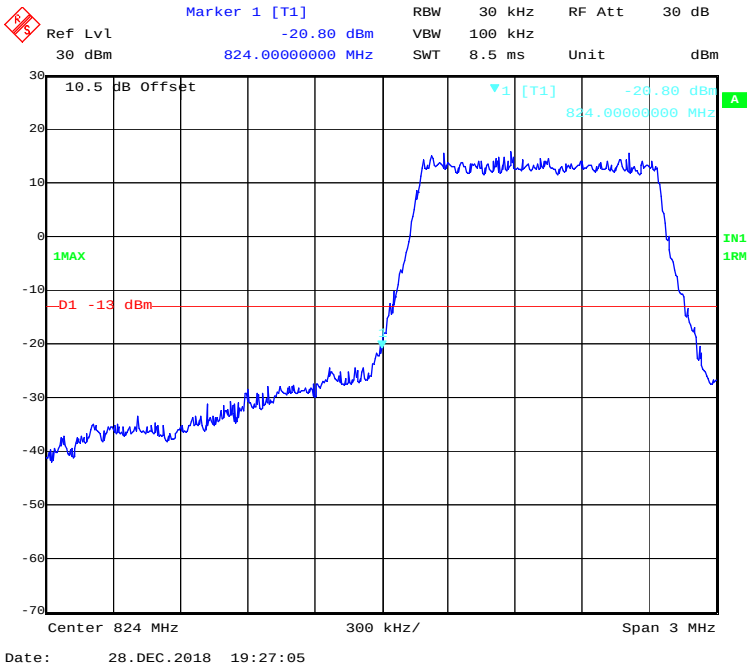
QPSK (10.0 MHz, FULL RB) - Left Band Edge



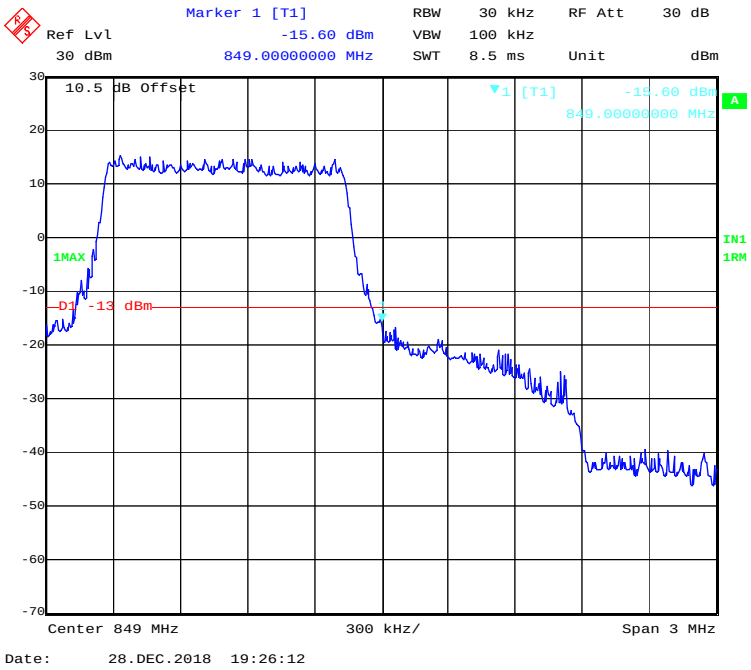
QPSK (10.0 MHz, FULL RB) - Right Band Edge



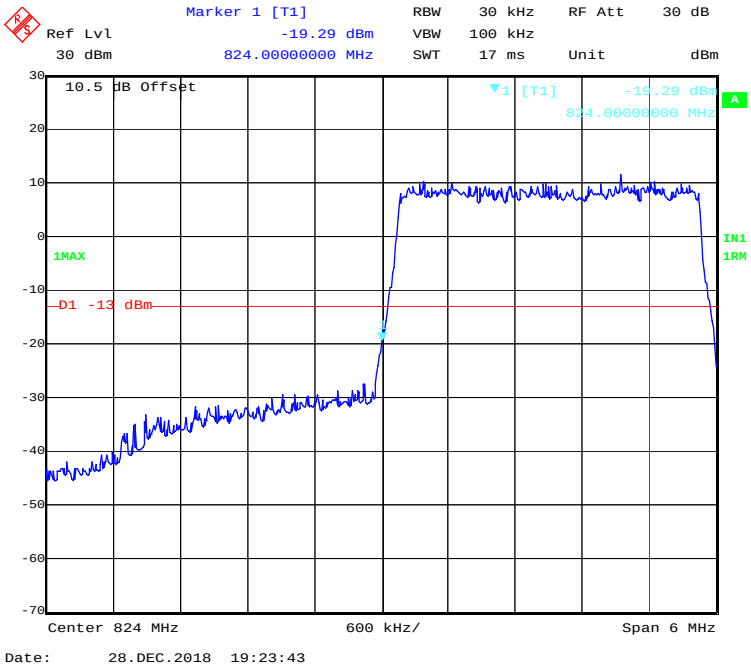
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



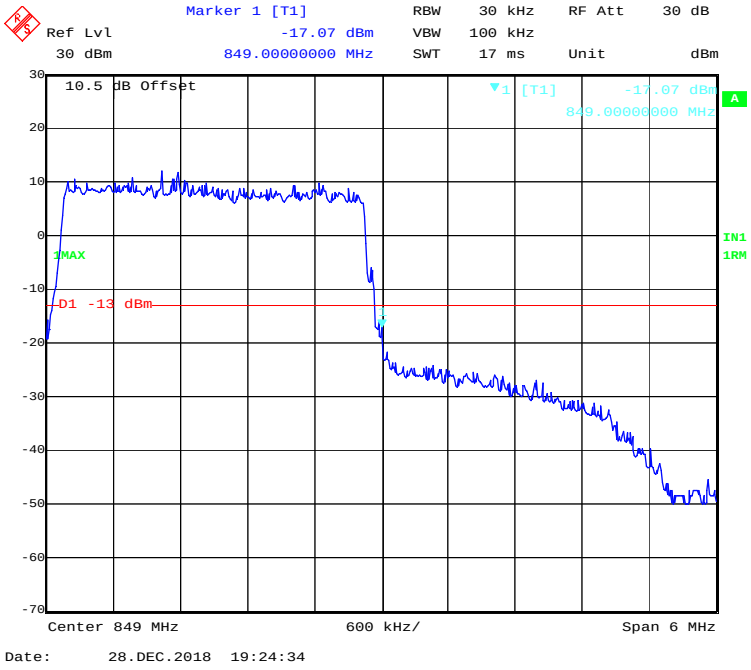
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



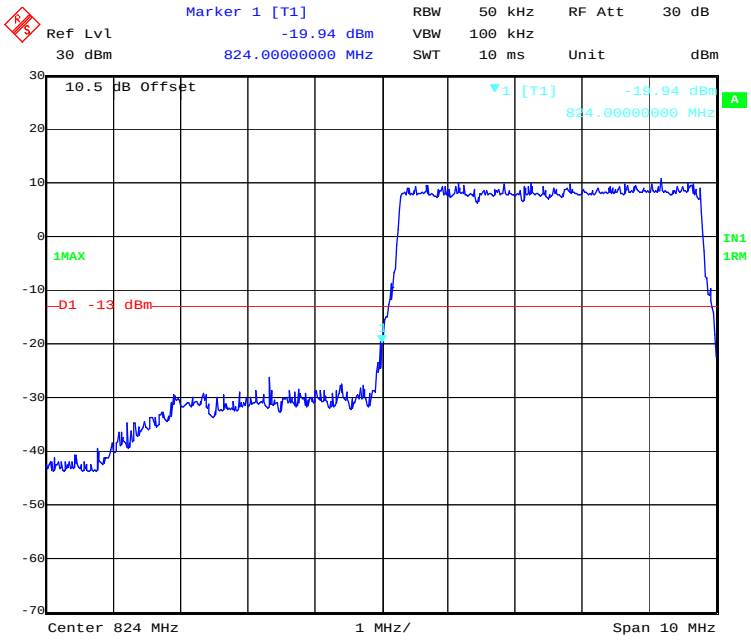
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



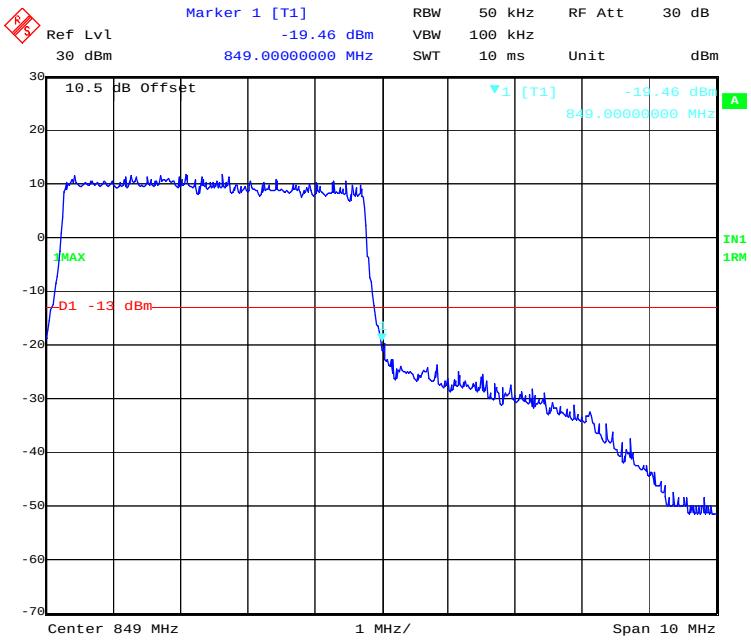
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



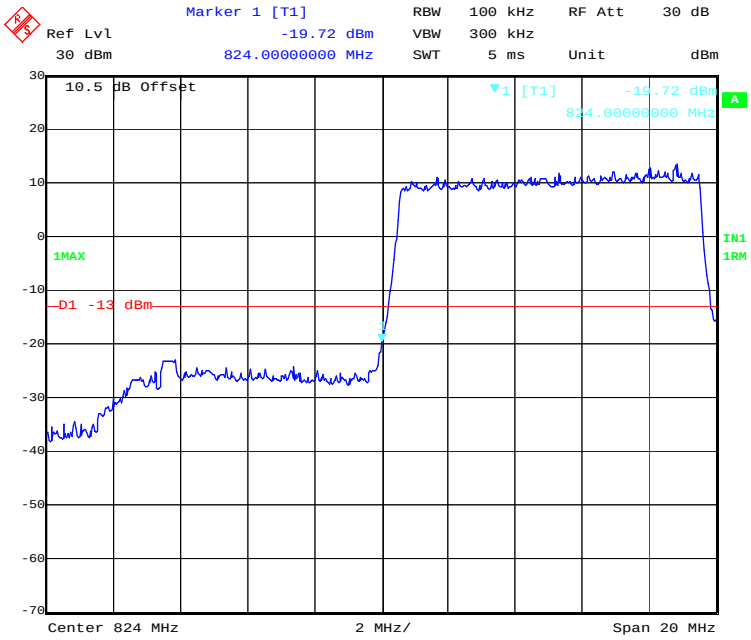
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



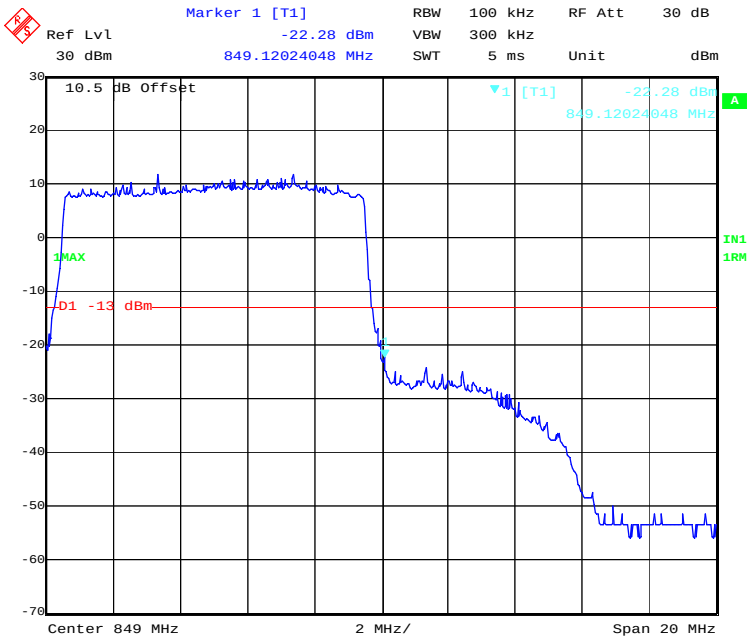
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



16-QAM (10.0 MHz, FULL RB) - Left Band Edge

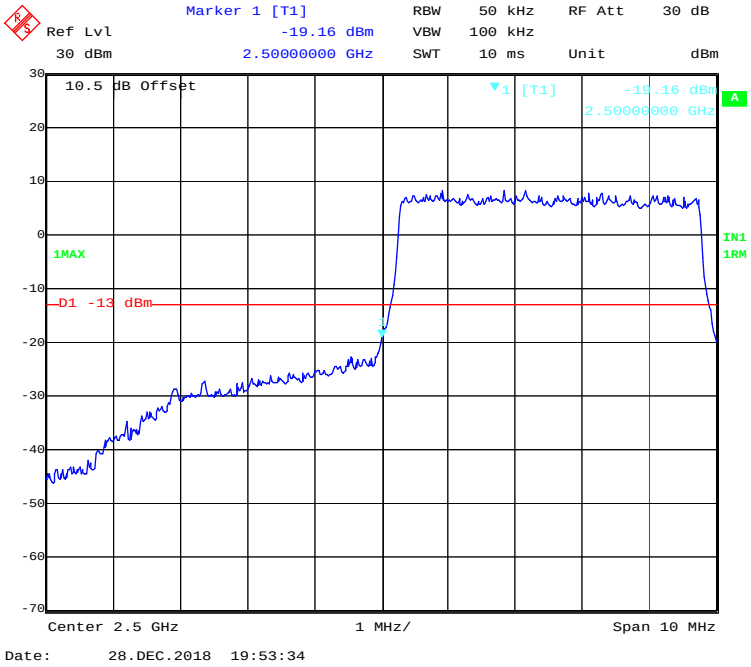


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

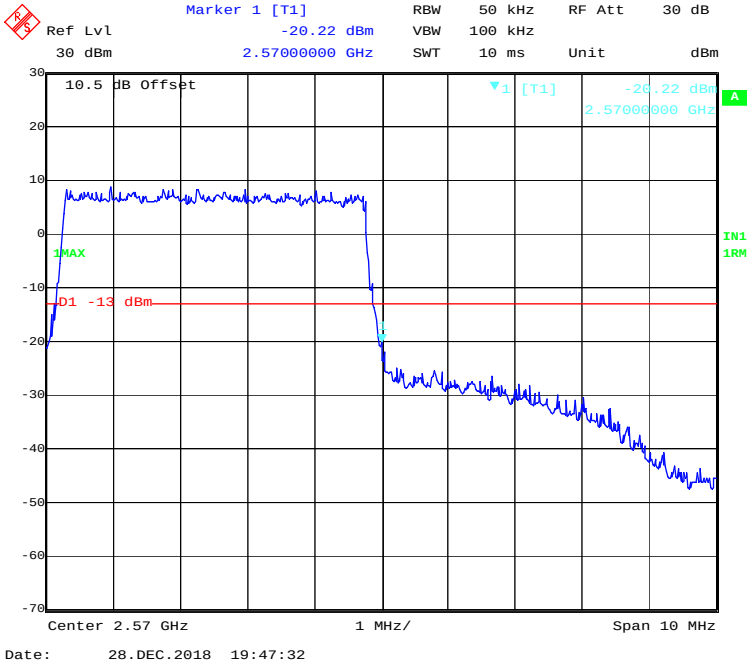


LTE Band 7:

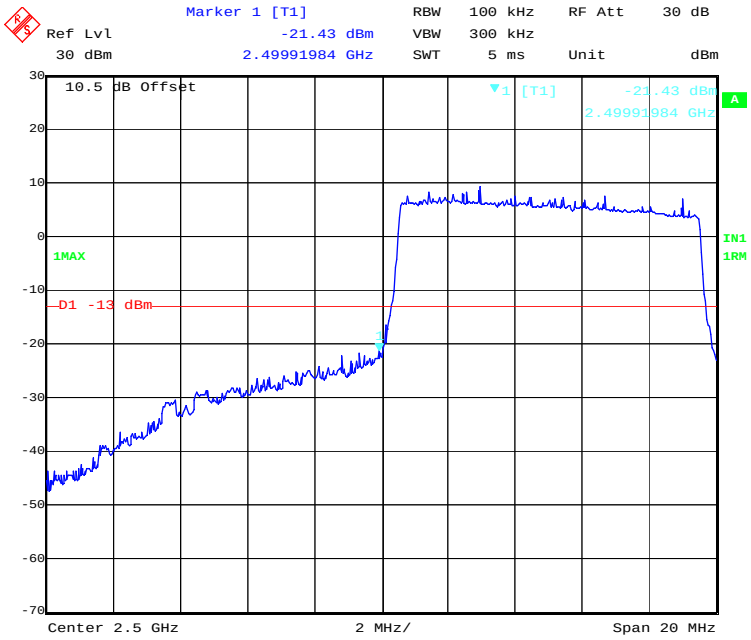
QPSK (5.0 MHz, FULL RB) - Left Band Edge



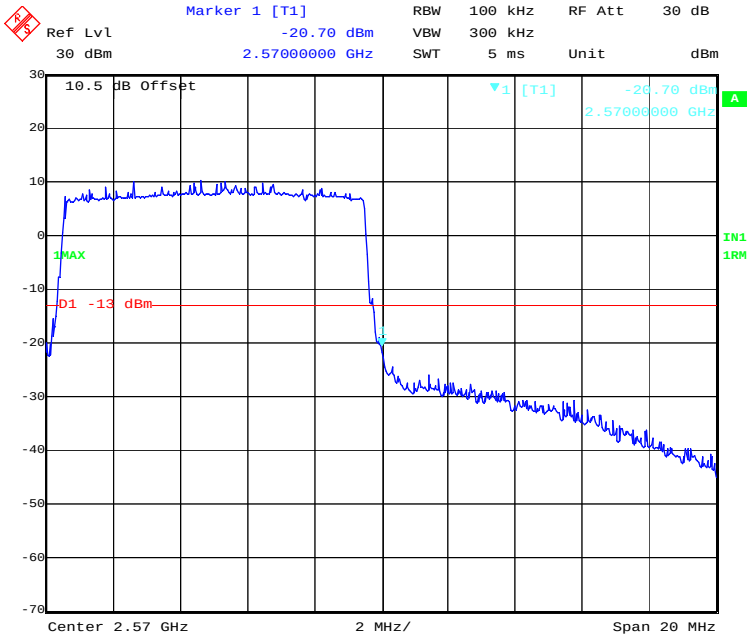
QPSK (5.0 MHz, FULL RB) - Right Band Edge



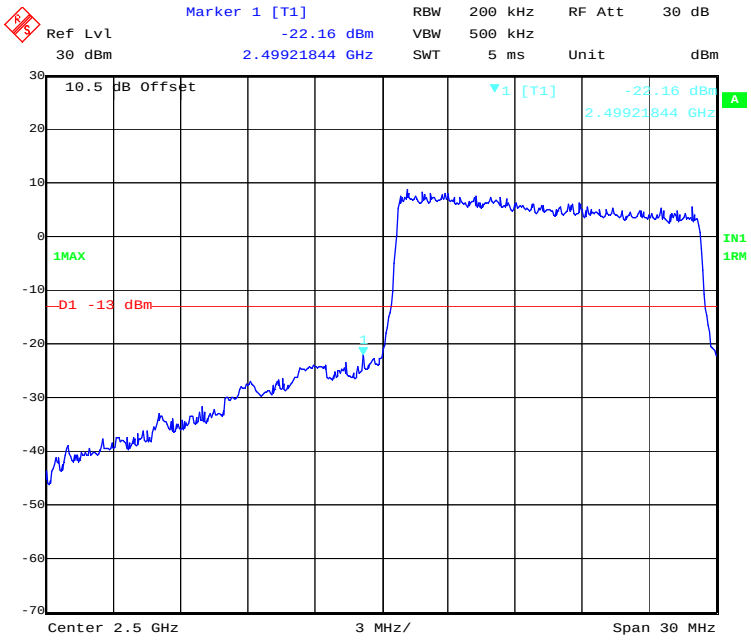
QPSK (10.0 MHz, FULL RB) - Left Band Edge



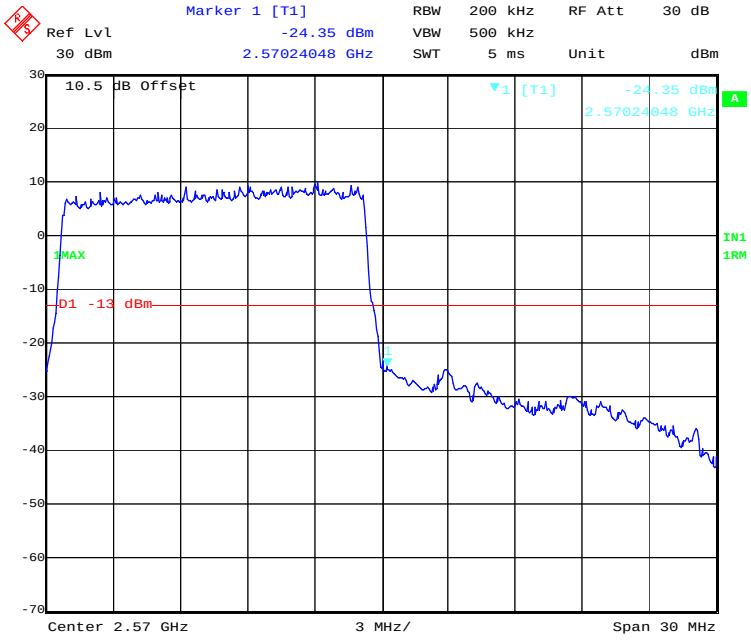
QPSK (10.0 MHz, FULL RB) - Right Band Edge



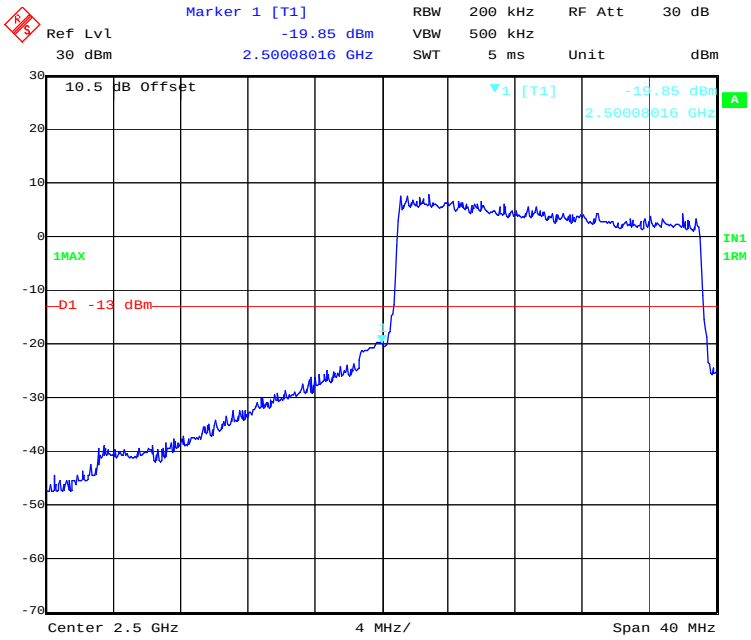
QPSK (15.0 MHz, FULL RB) - Left Band Edge



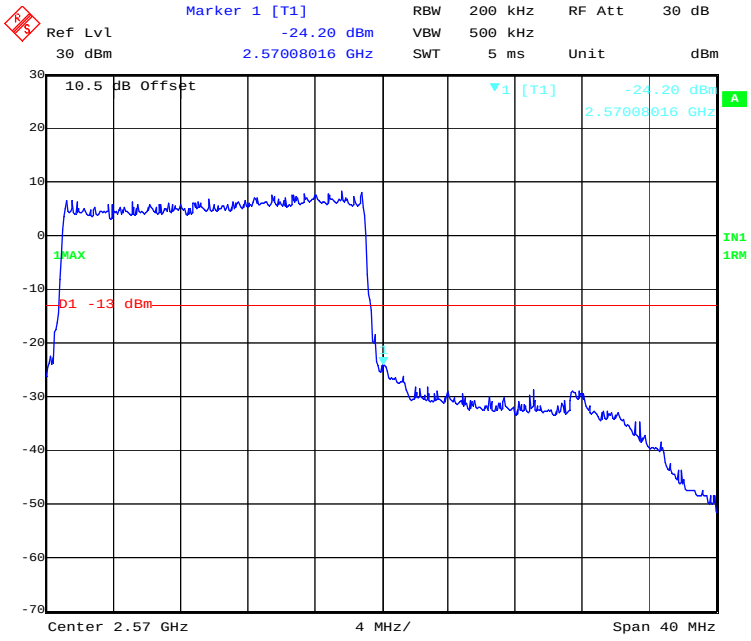
QPSK (15.0 MHz, FULL RB) - Right Band Edge



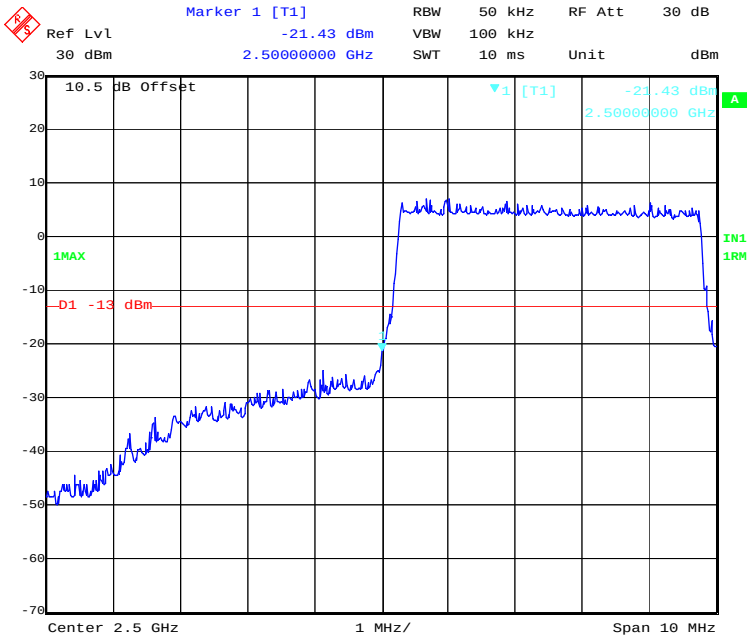
QPSK (20.0 MHz, FULL RB) - Left Band Edge



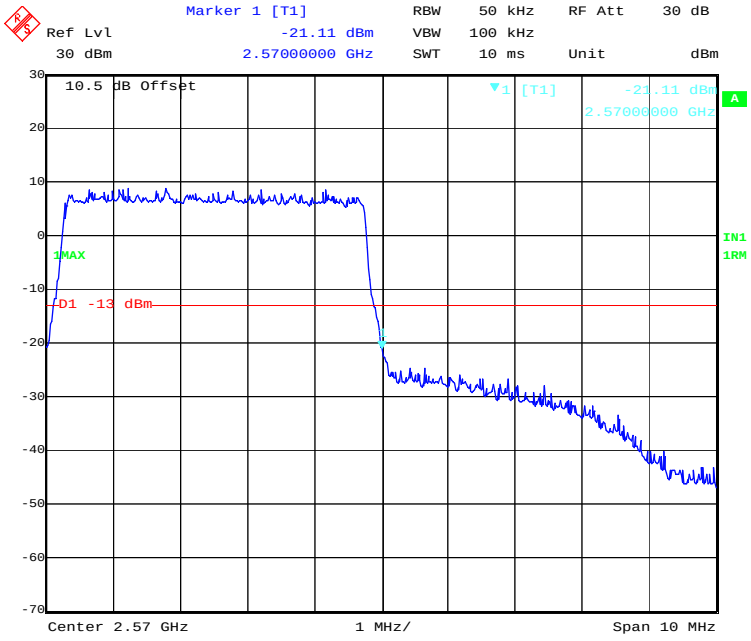
QPSK (20.0 MHz, FULL RB) - Right Band Edge



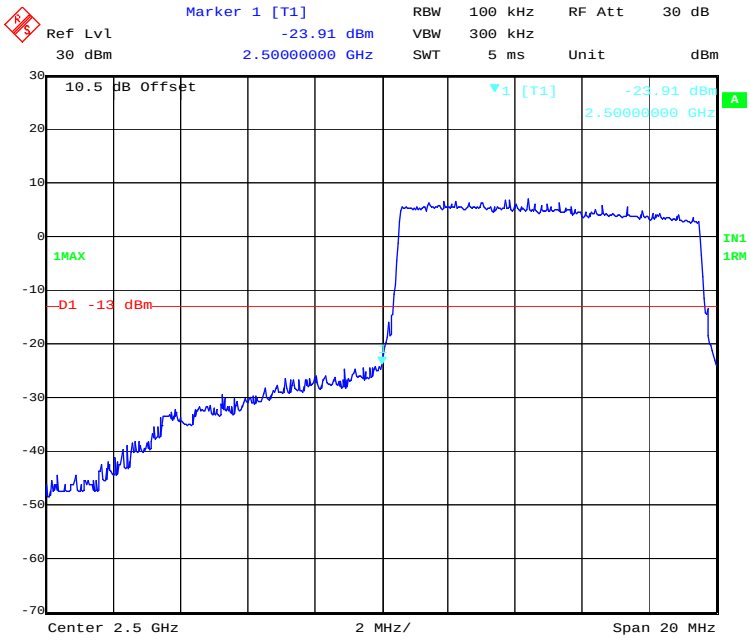
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



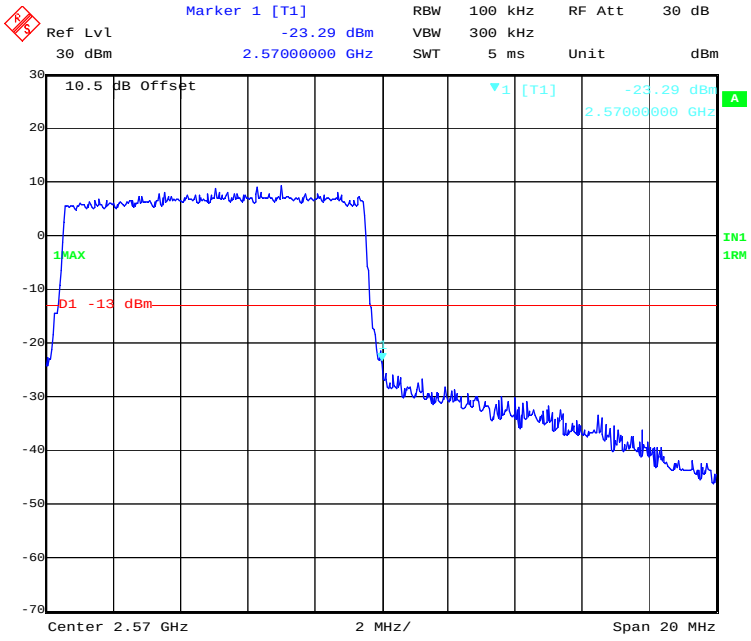
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



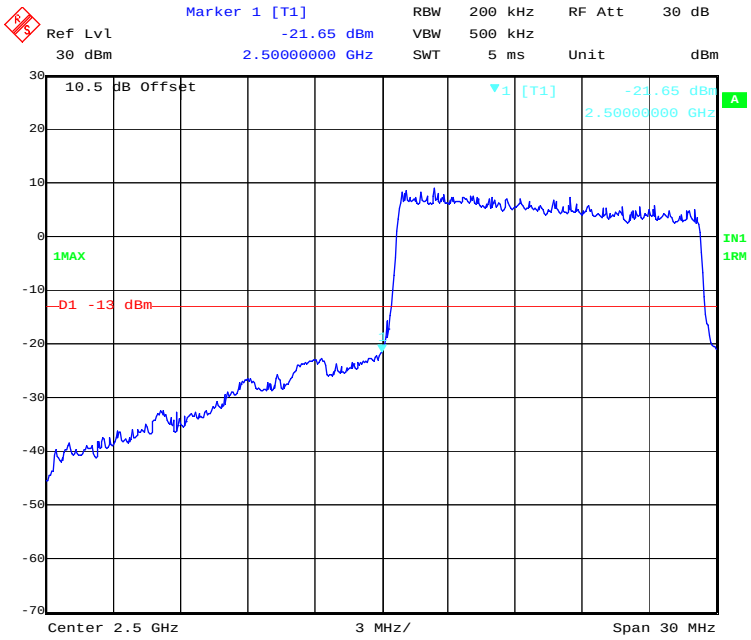
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



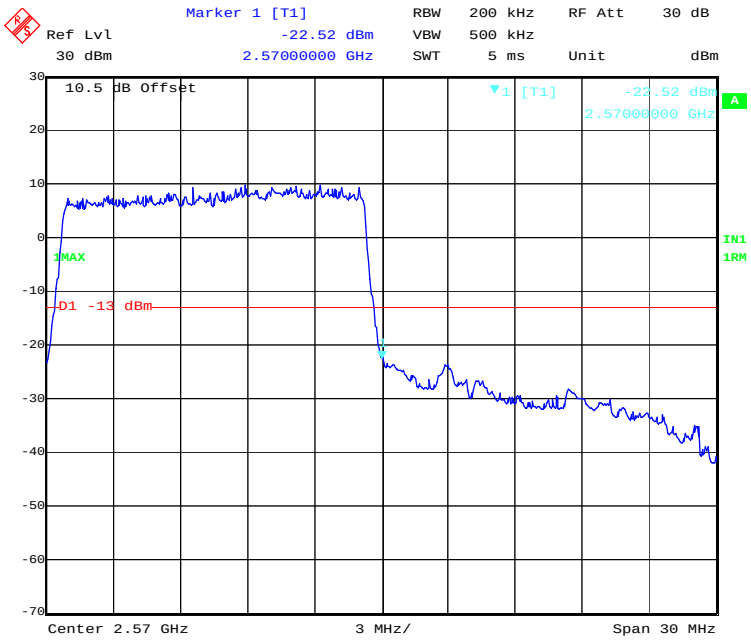
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



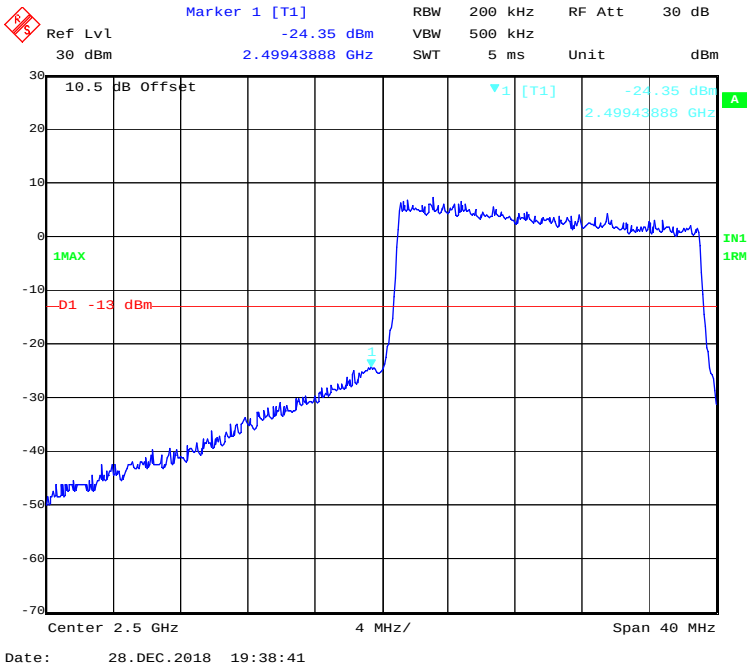
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



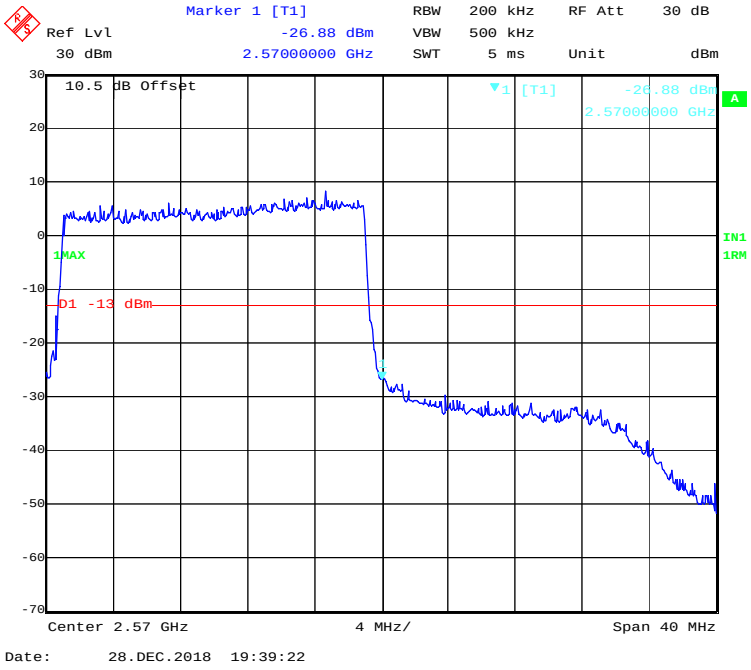
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



16-QAM (20.0 MHz, FULL RB) - Left Band Edge

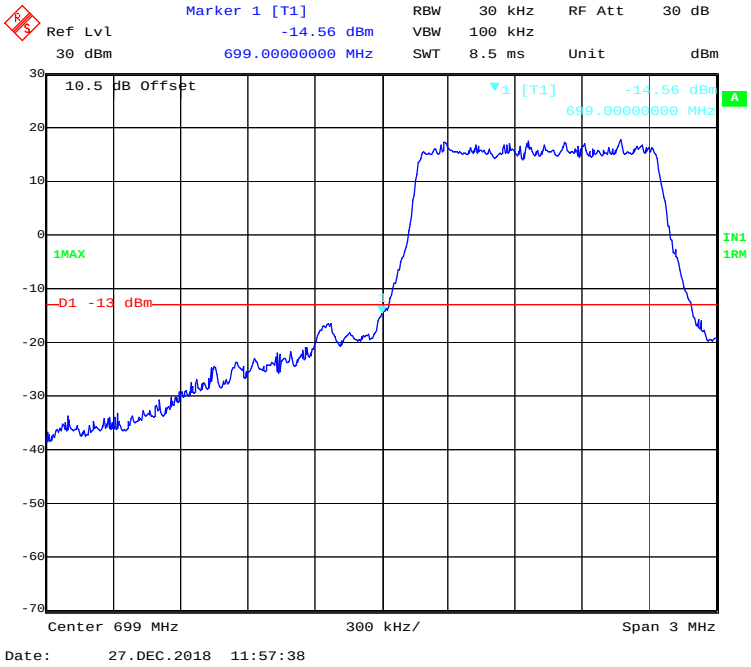


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

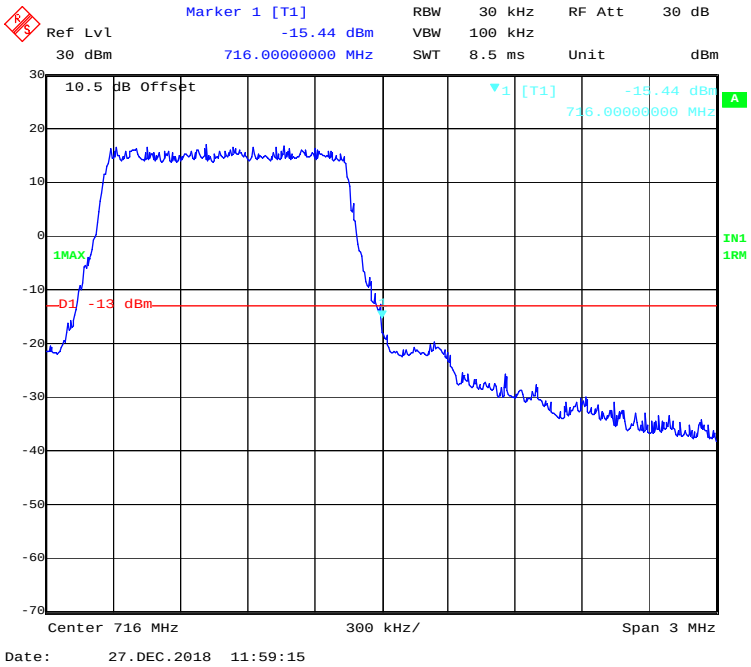


LTE Band 12:

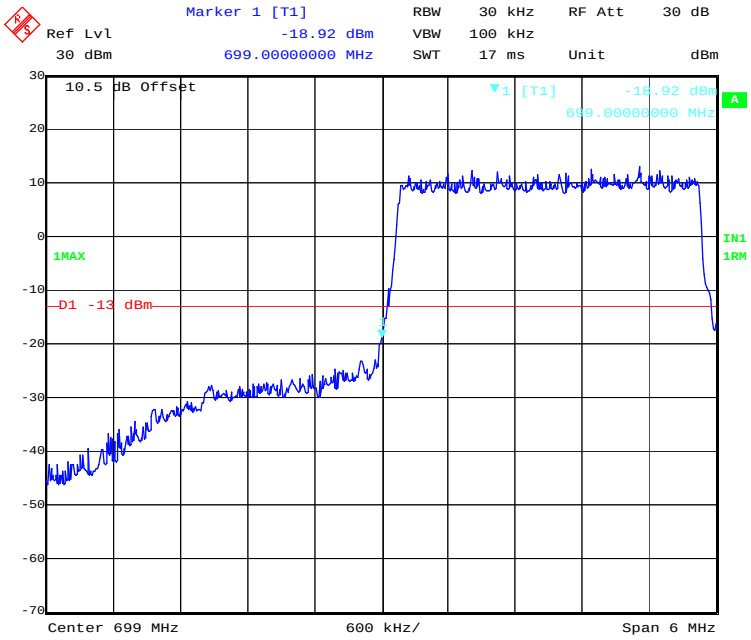
QPSK (1.4 MHz, FULL RB) - Left Band Edge



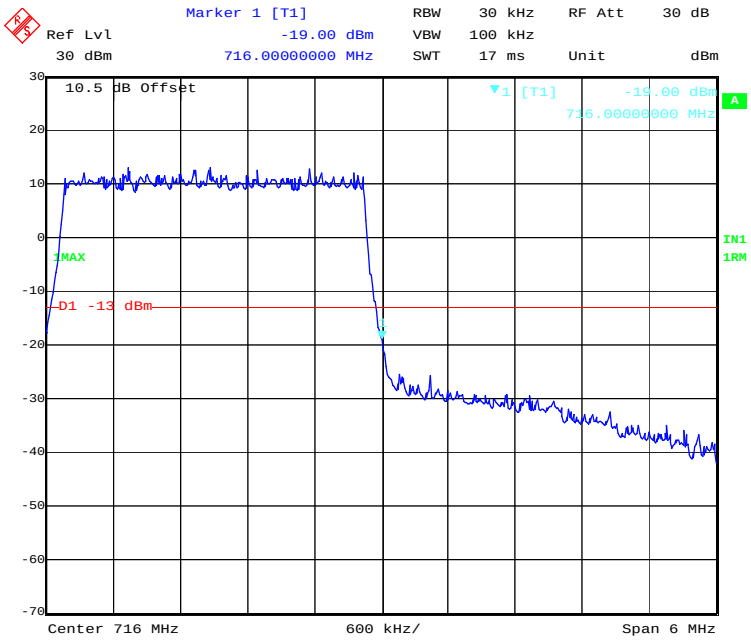
QPSK (1.4 MHz, FULL RB) - Right Band Edge



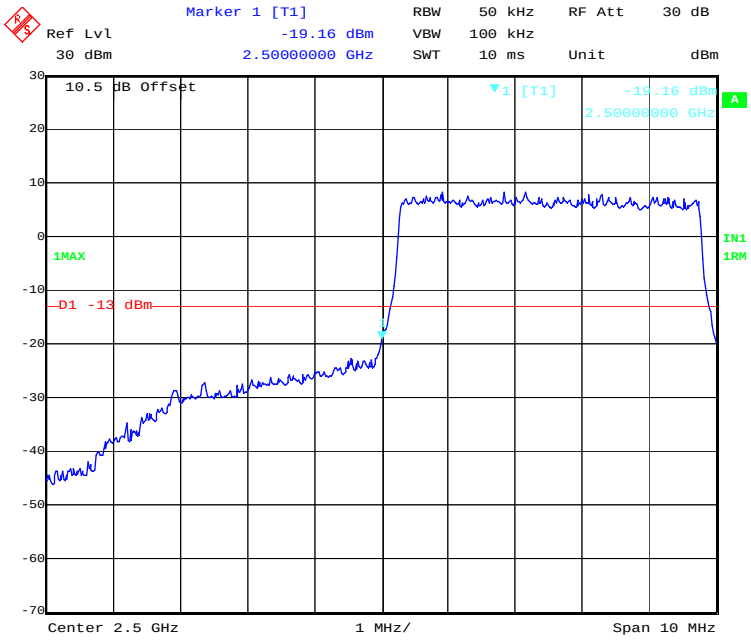
QPSK (3.0 MHz, FULL RB) - Left Band Edge



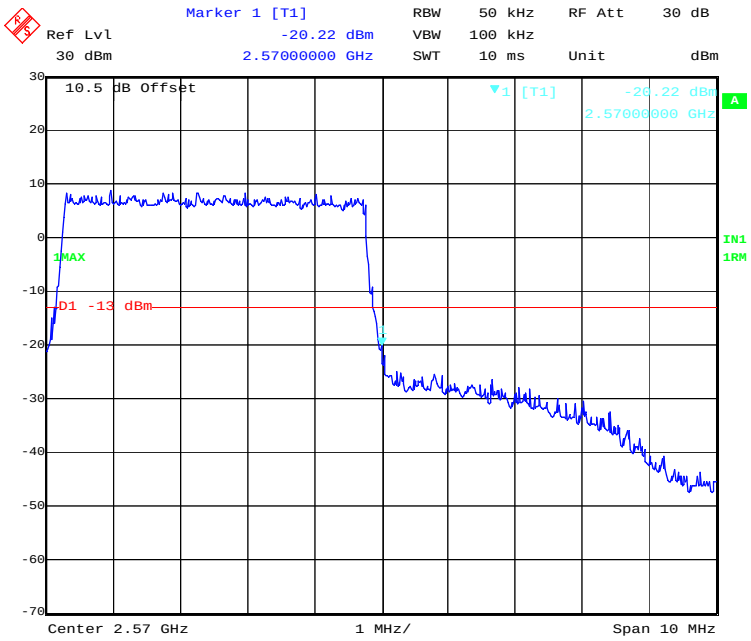
QPSK (3.0 MHz, FULL RB) - Right Band Edge



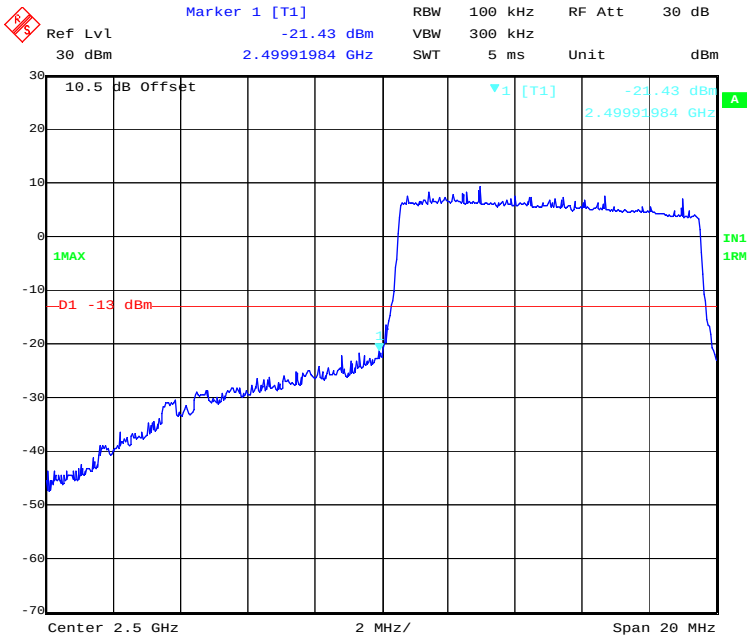
QPSK (5.0 MHz, FULL RB) - Left Band Edge



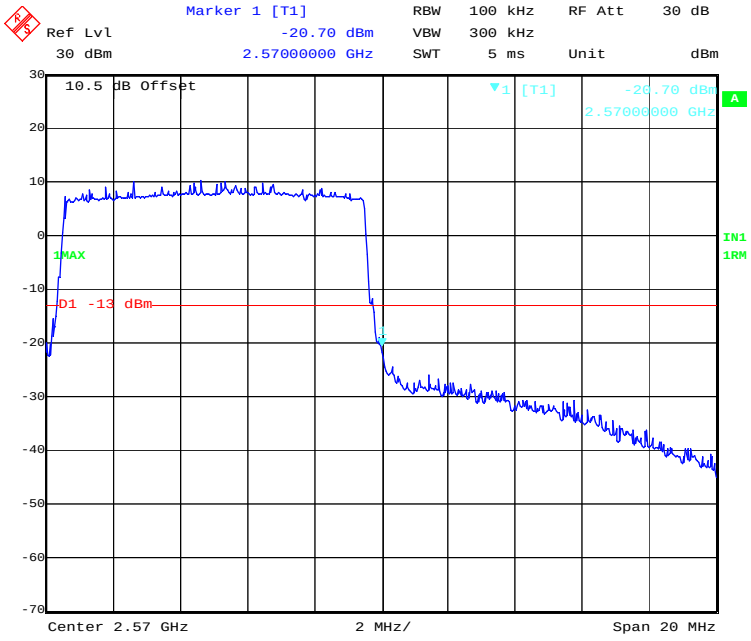
QPSK (5.0 MHz, FULL RB) - Right Band Edge



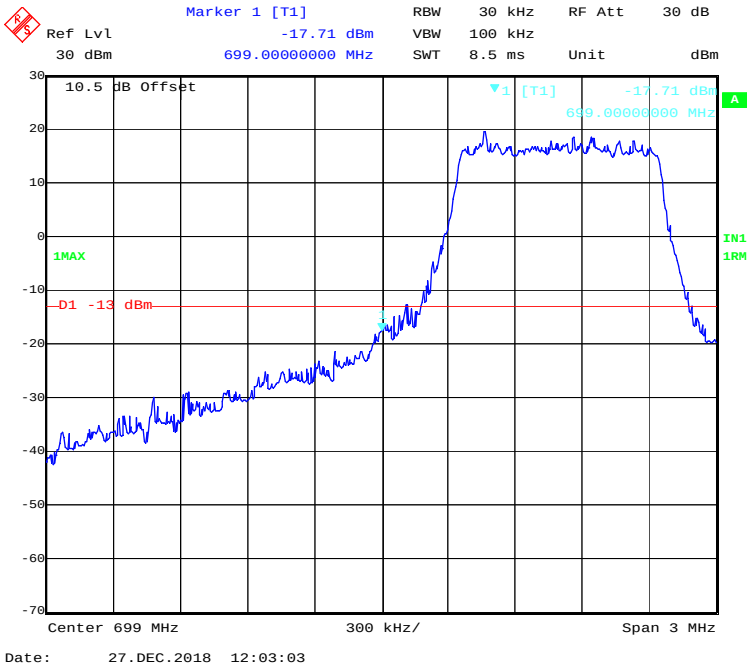
QPSK (10.0 MHz, FULL RB) - Left Band Edge



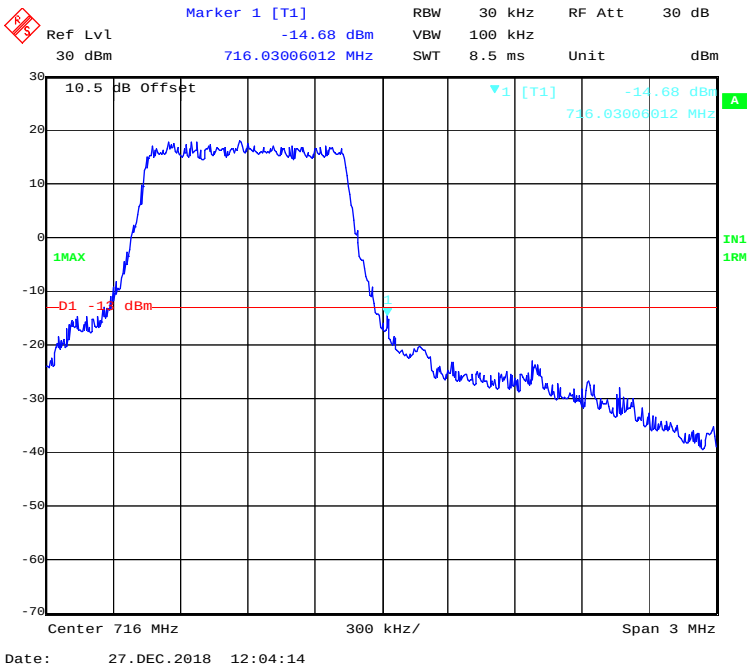
QPSK (10.0 MHz, FULL RB) - Right Band Edge



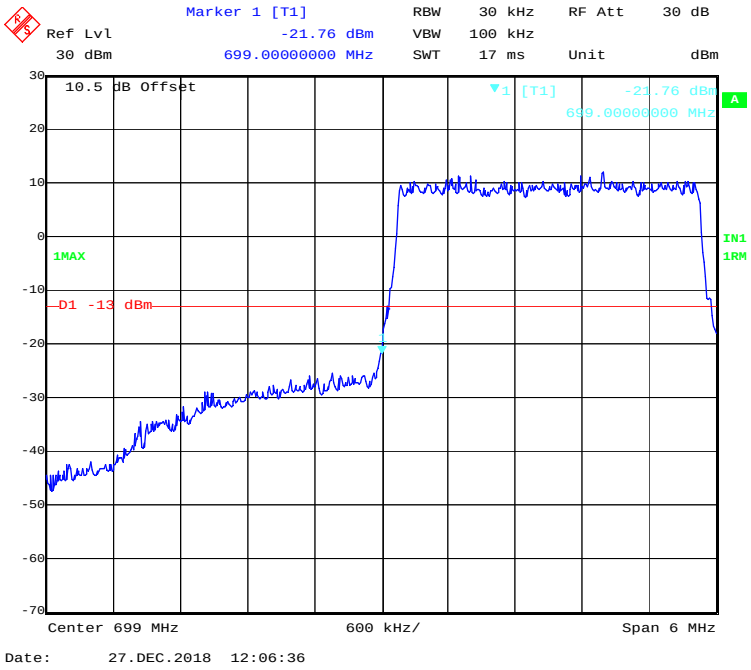
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



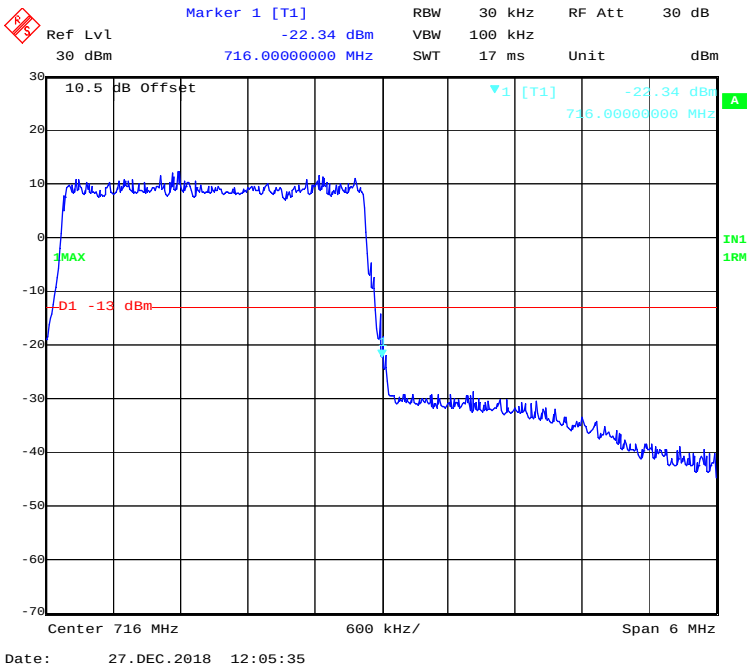
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



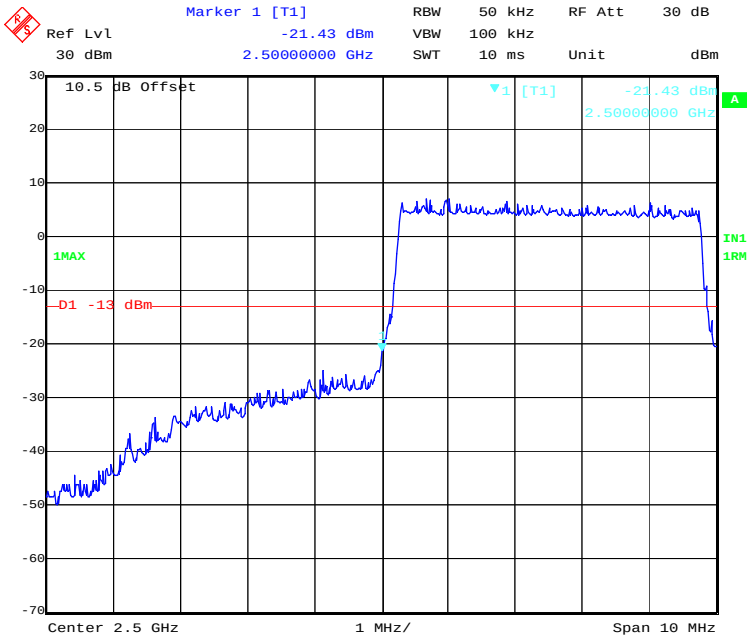
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



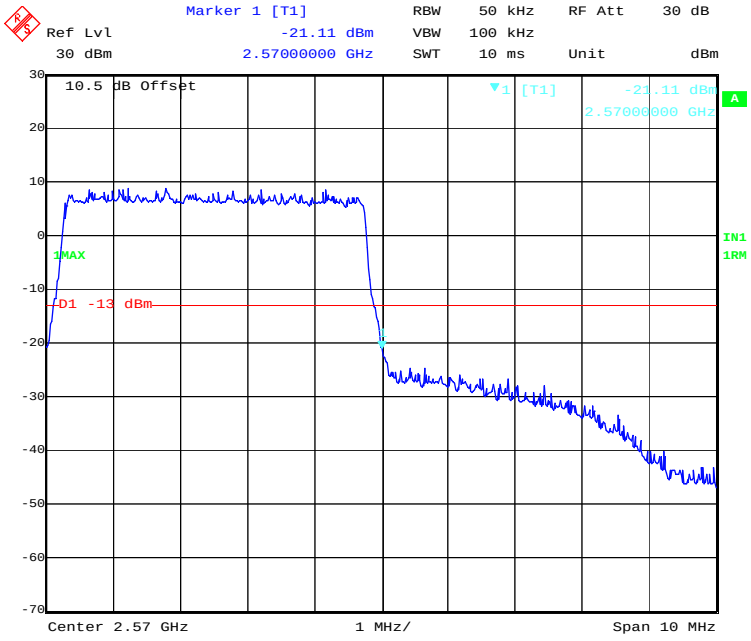
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



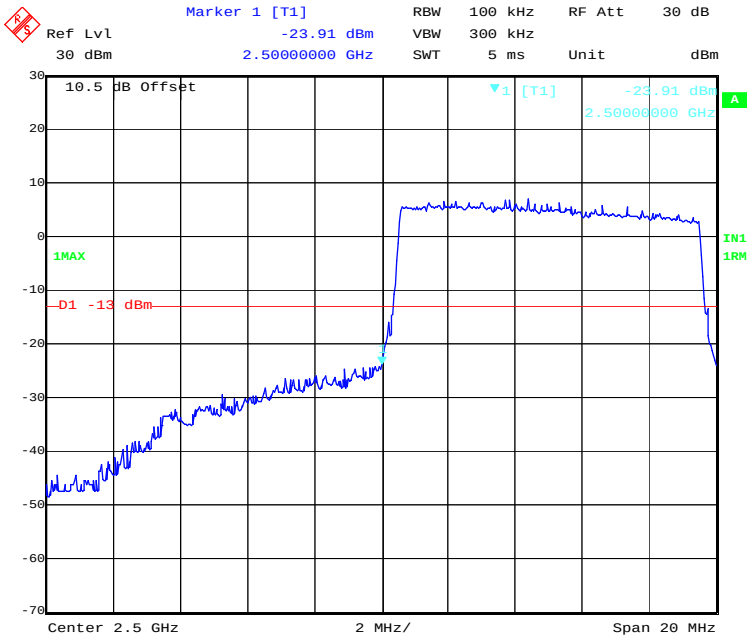
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



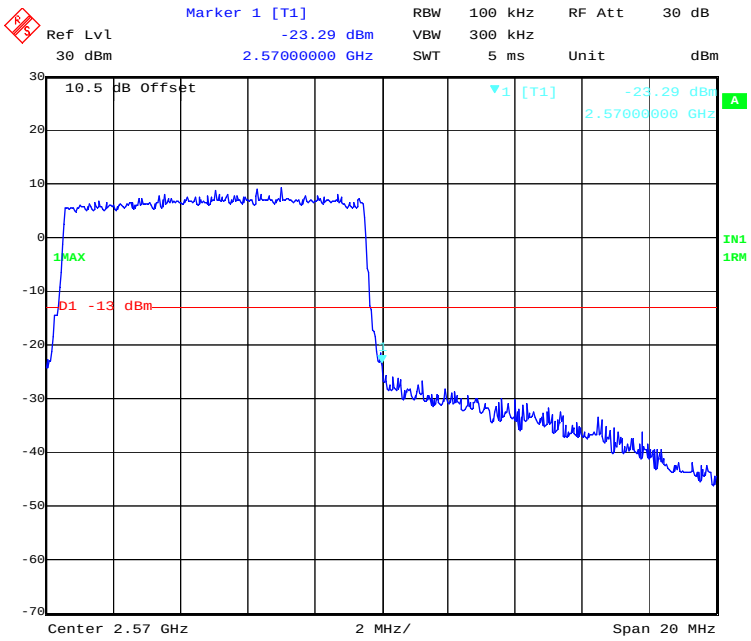
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



16-QAM (10.0 MHz, FULL RB) - Left Band Edge

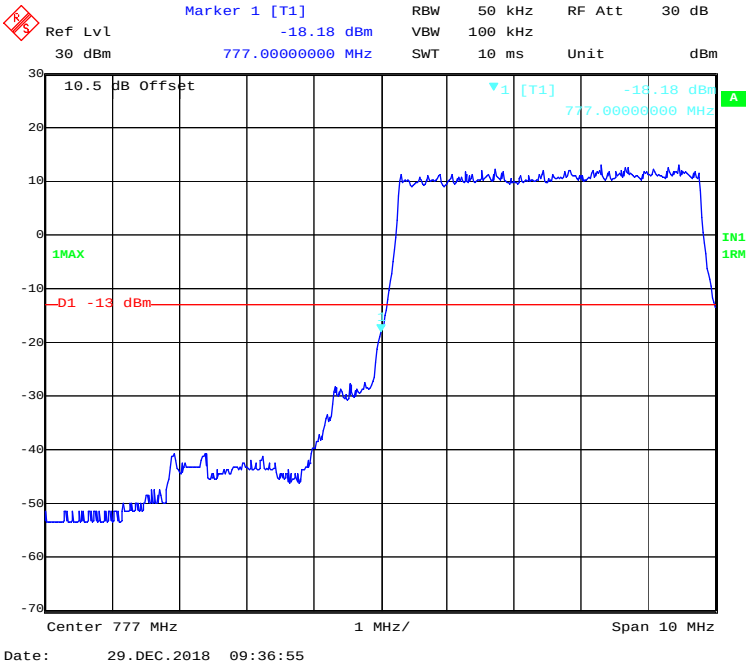


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

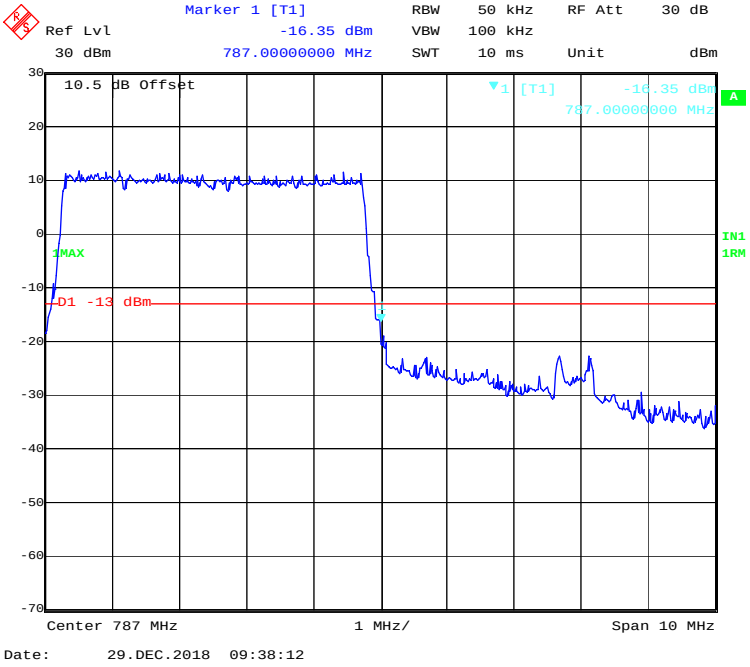


LTE Band 13:

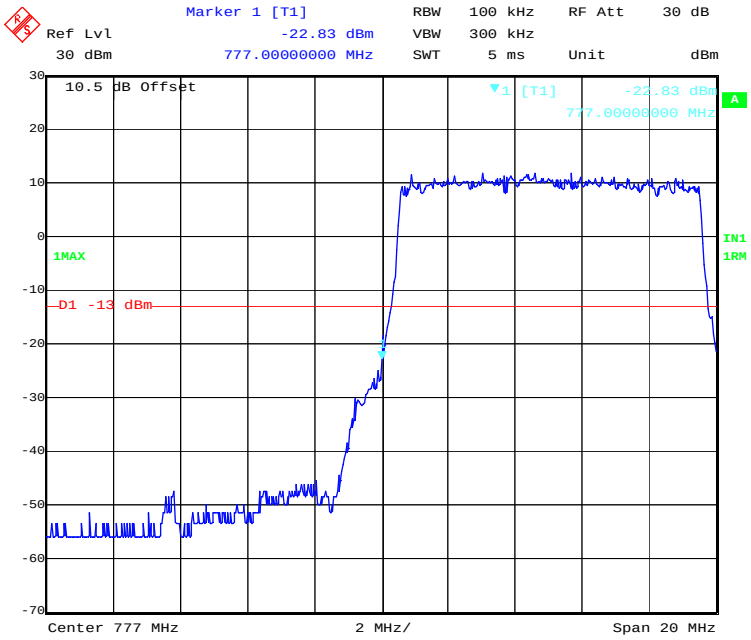
QPSK (5.0 MHz, FULL RB) - Left Band Edge



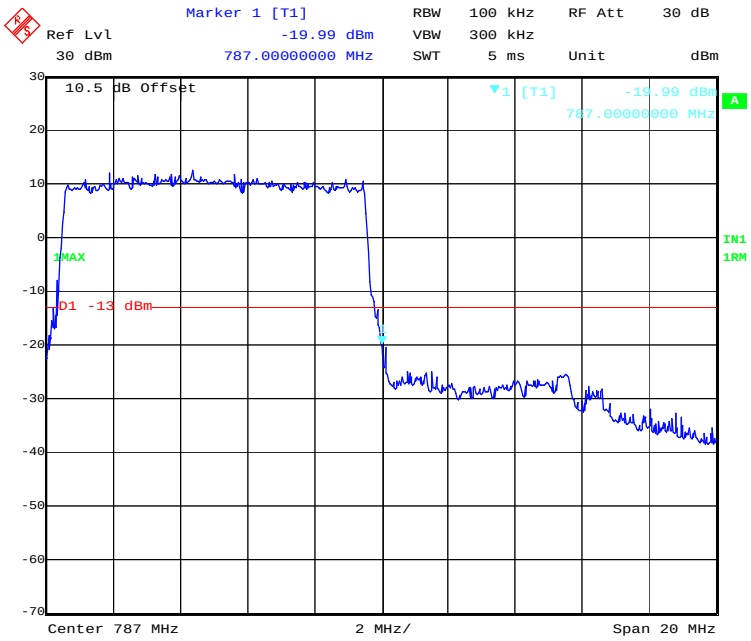
QPSK (5.0 MHz, FULL RB) - Right Band Edge



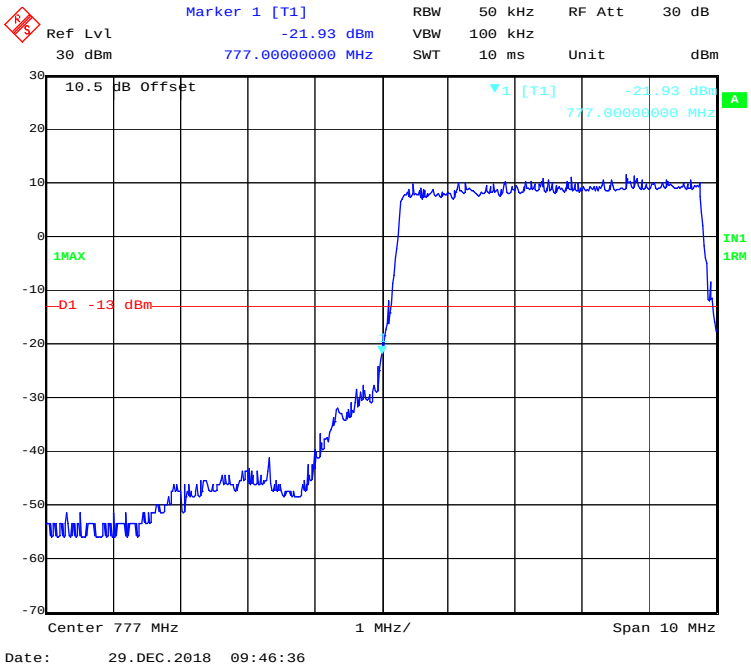
QPSK (10.0 MHz, FULL RB) - Left Band Edge



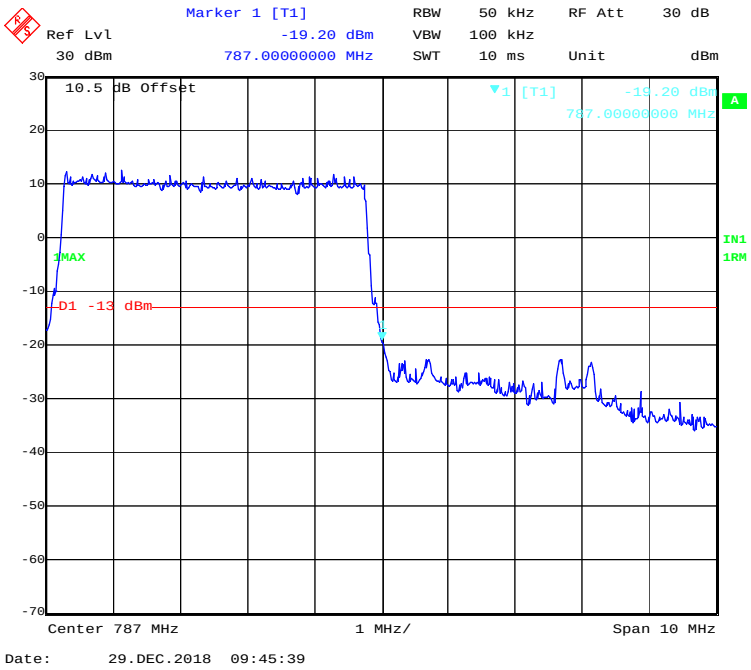
QPSK (10.0 MHz, FULL RB) - Right Band Edge



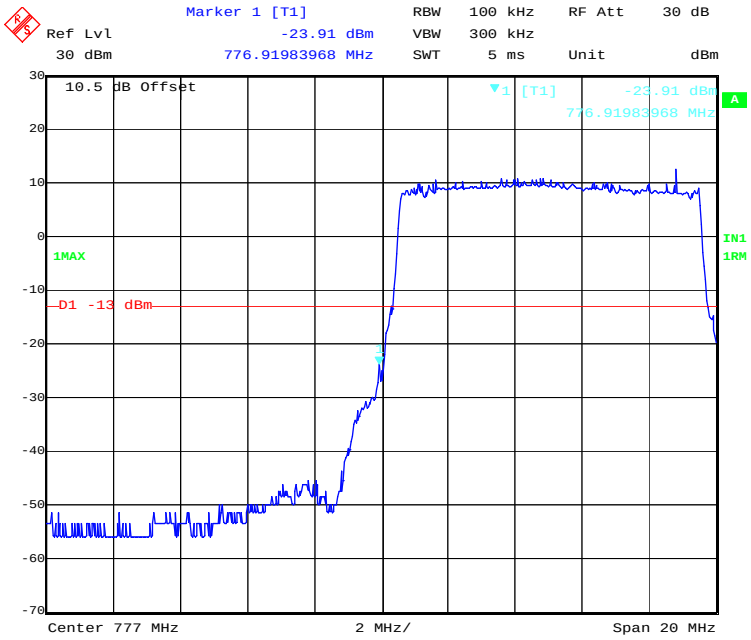
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



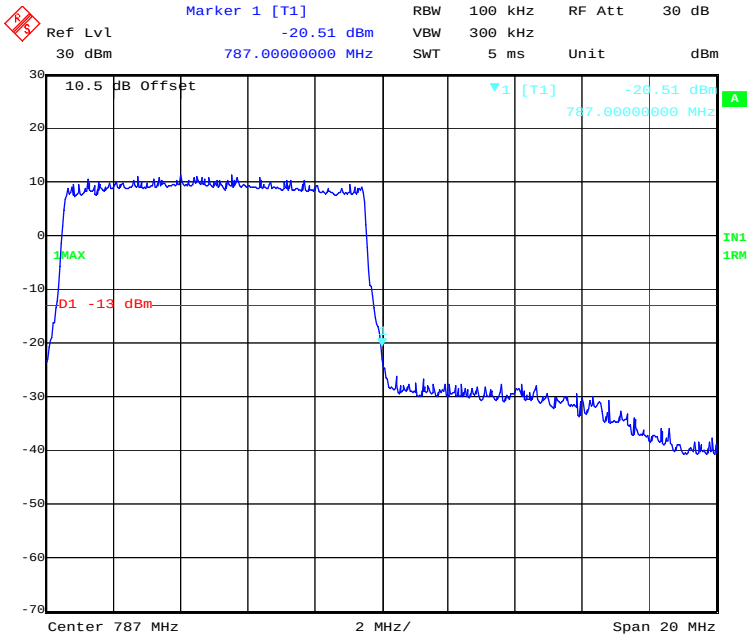
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



16-QAM (10.0 MHz, FULL RB) - Left Band Edge

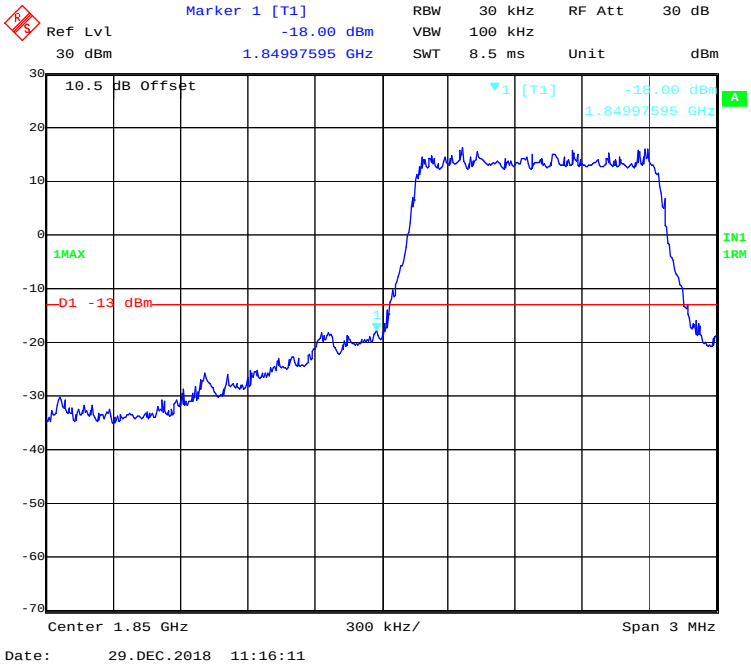


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

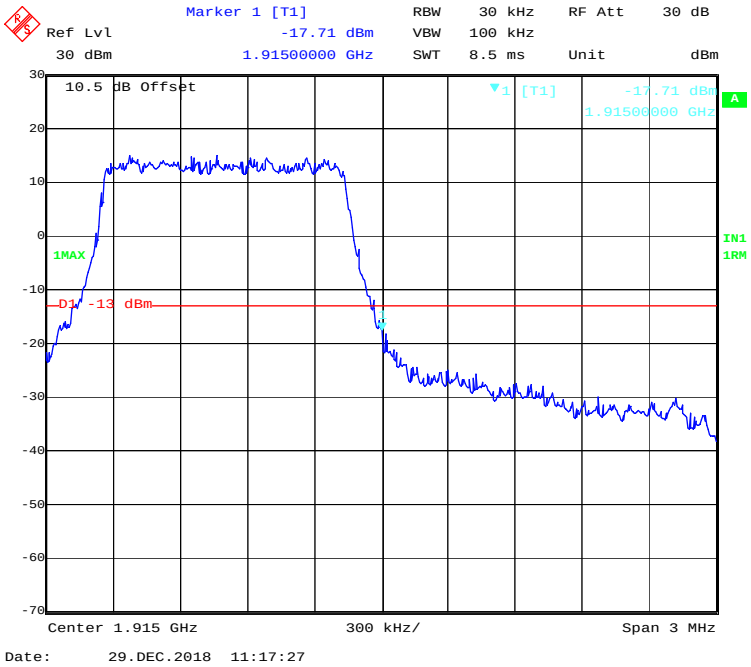


LTE Band 25:

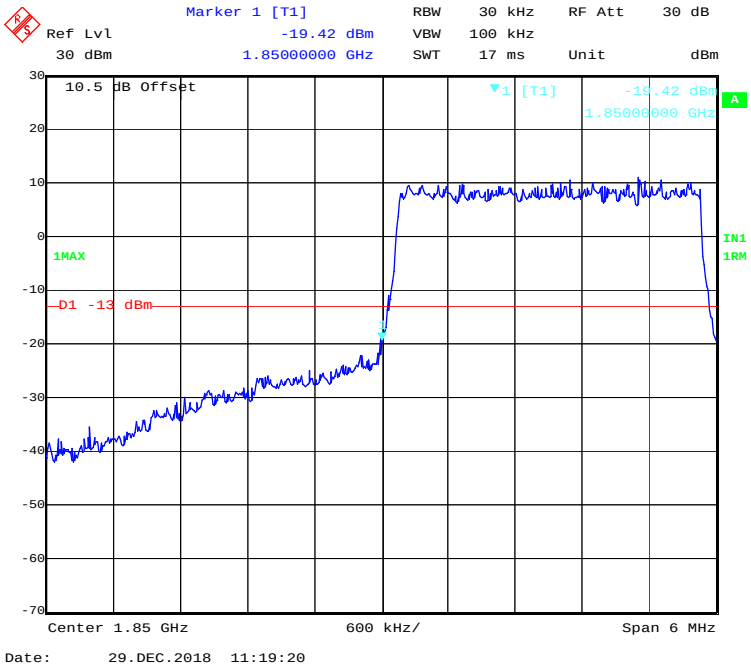
QPSK (1.4 MHz, FULL RB) - Left Band Edge



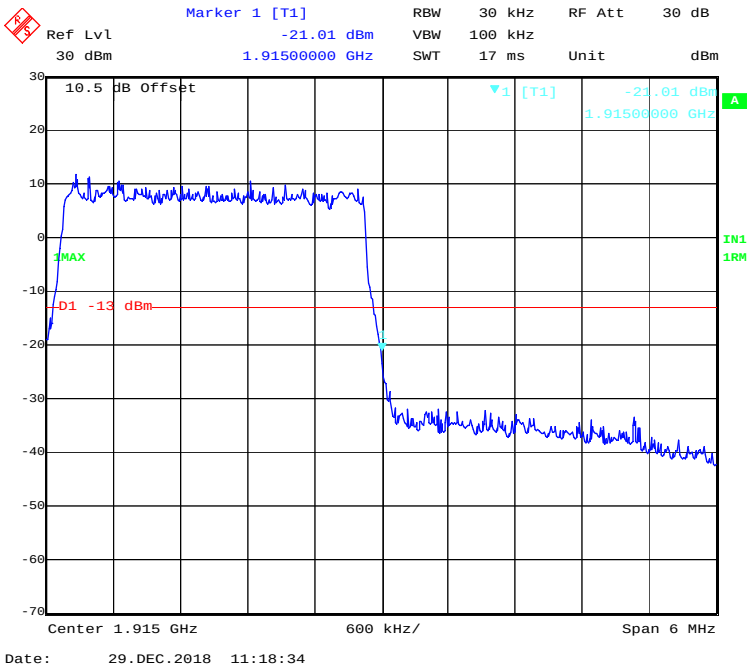
QPSK (1.4 MHz, FULL RB) - Right Band Edge



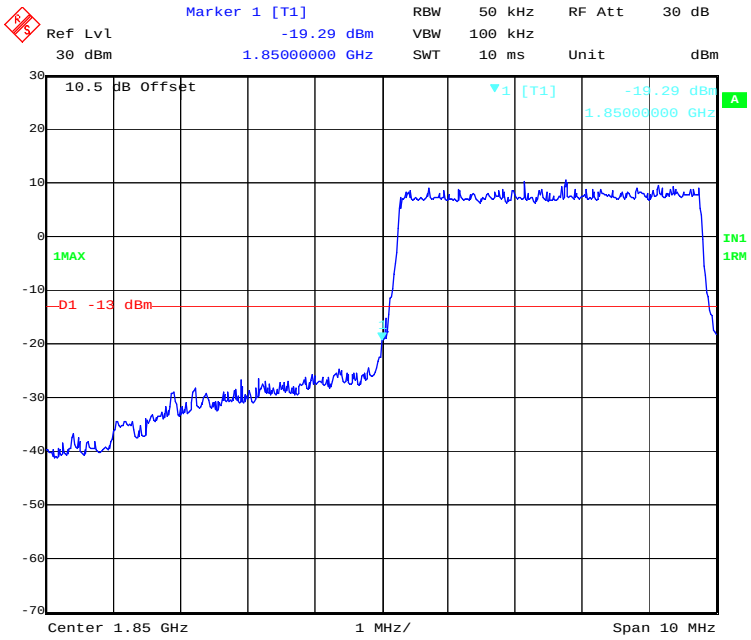
QPSK (3.0 MHz, FULL RB) - Left Band Edge



QPSK (3.0 MHz, FULL RB) - Right Band Edge

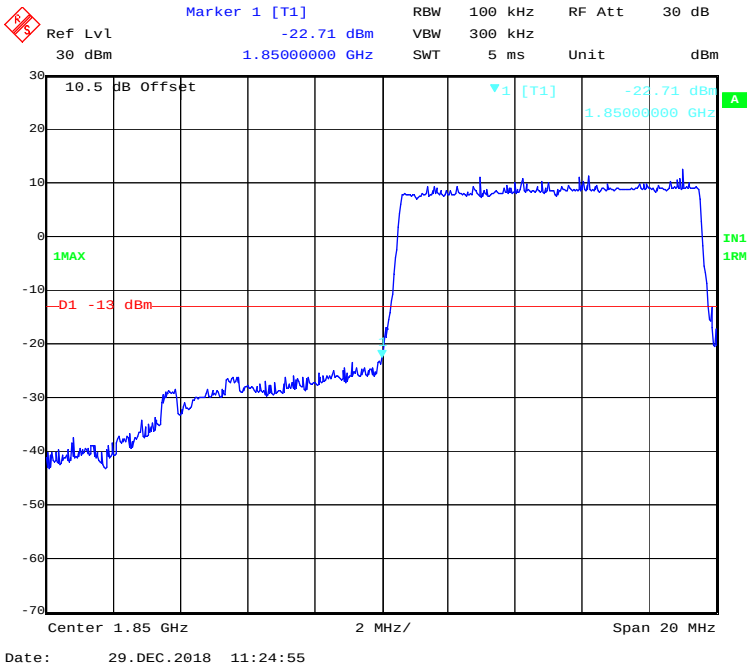


QPSK (5.0 MHz, FULL RB) - Left Band Edge

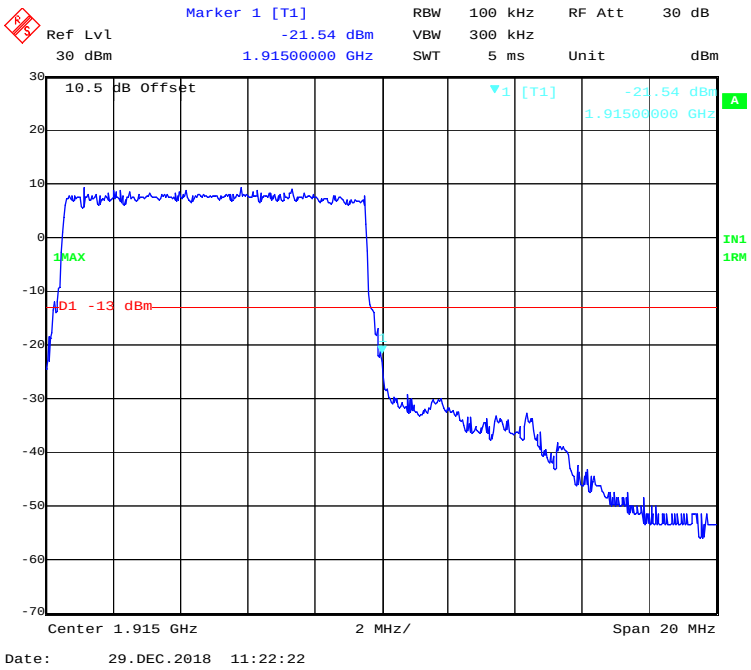


QPSK (5.0 MHz, FULL RB) - Right Band Edge

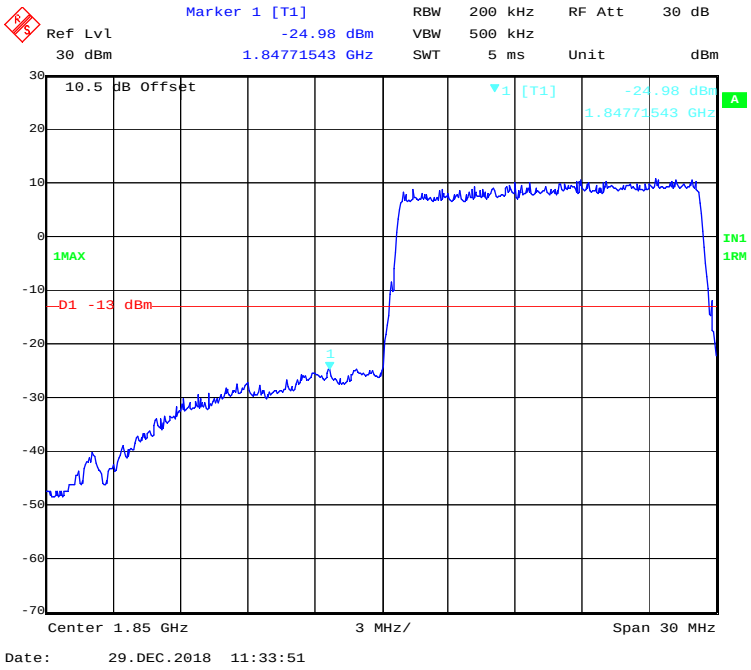
QPSK (10.0 MHz, FULL RB) - Left Band Edge



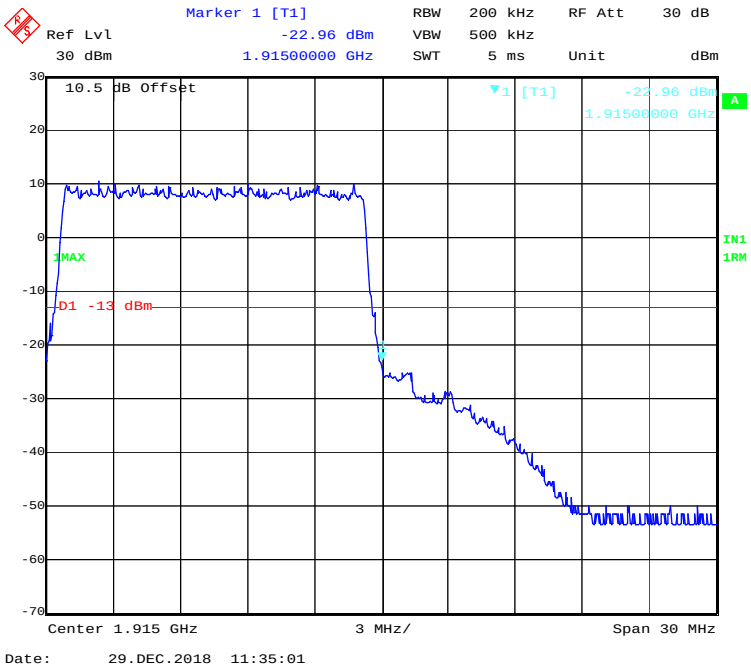
QPSK (10.0 MHz, FULL RB) - Right Band Edge



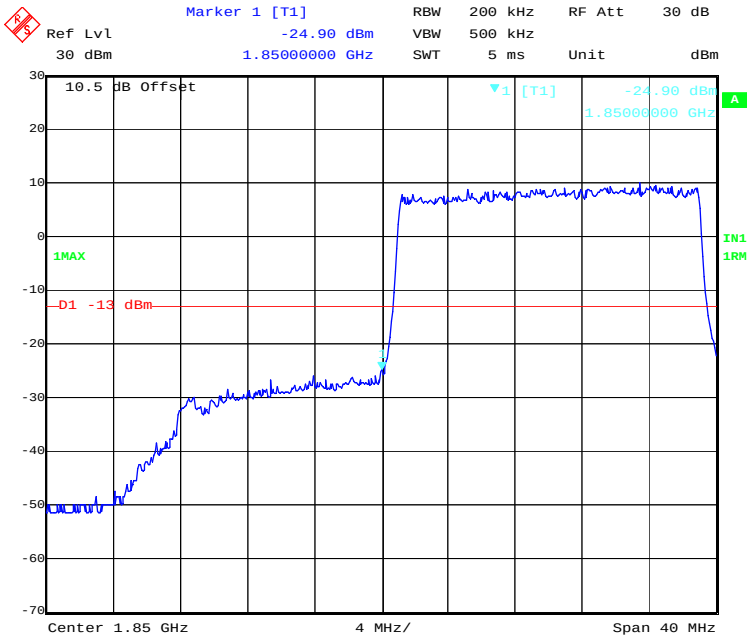
QPSK (15.0 MHz, FULL RB) - Left Band Edge



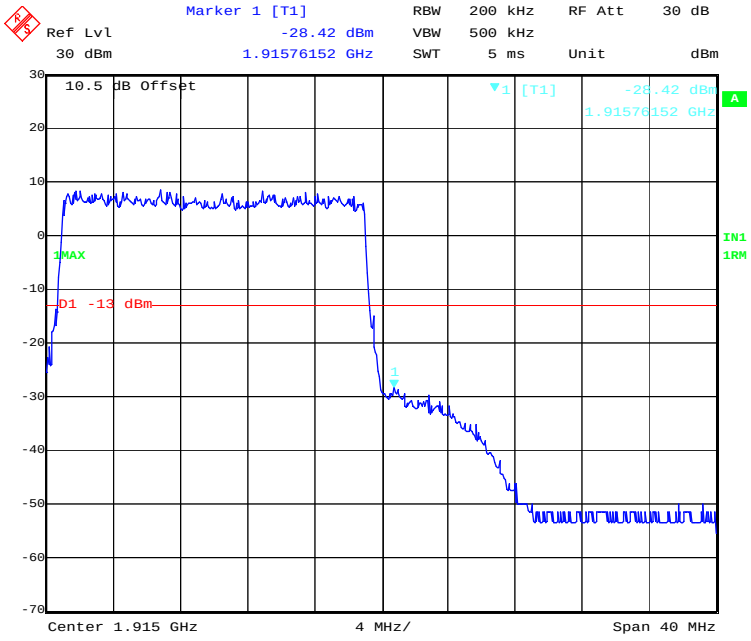
QPSK (15.0 MHz, FULL RB) - Right Band Edge



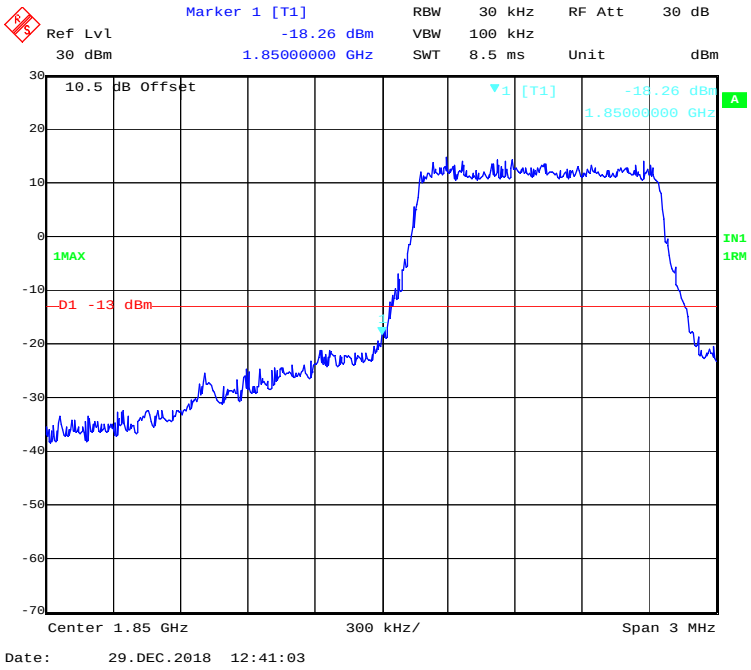
QPSK (20.0 MHz, FULL RB) - Left Band Edge



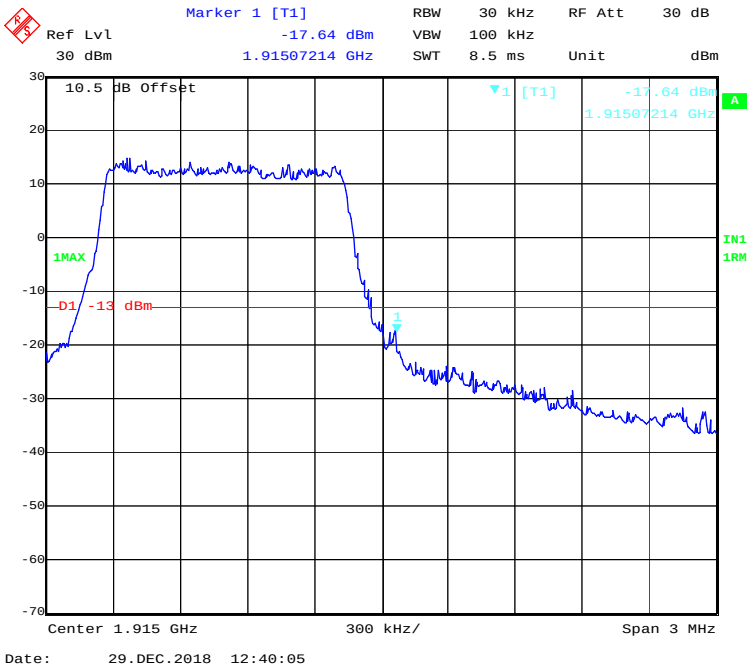
QPSK (20.0 MHz, FULL RB) - Right Band Edge



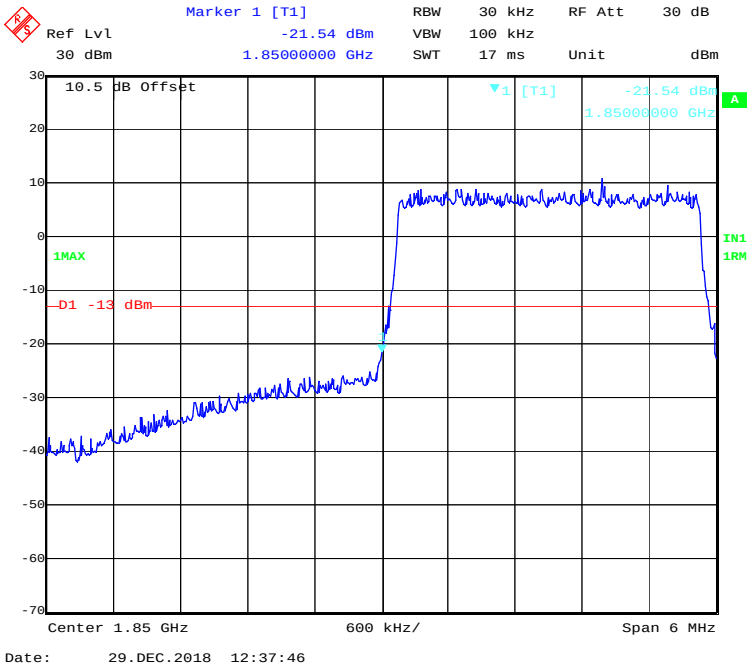
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



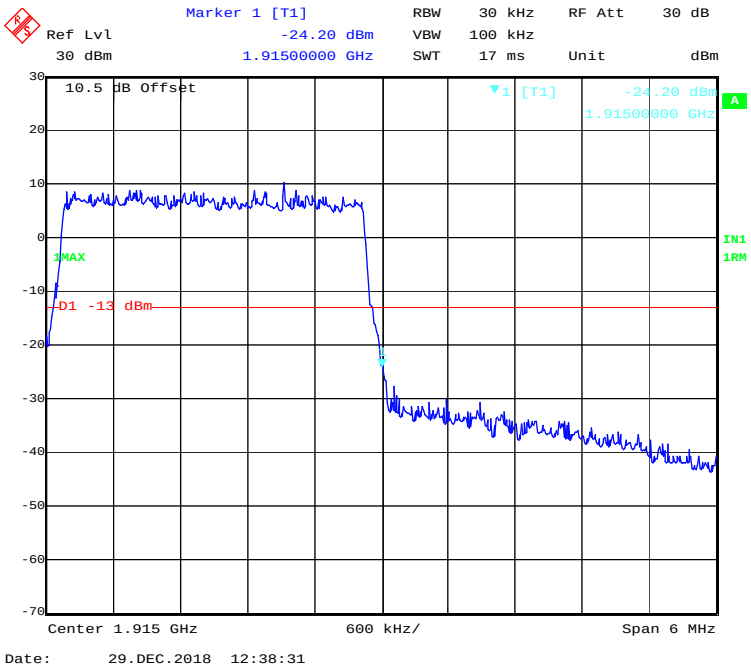
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



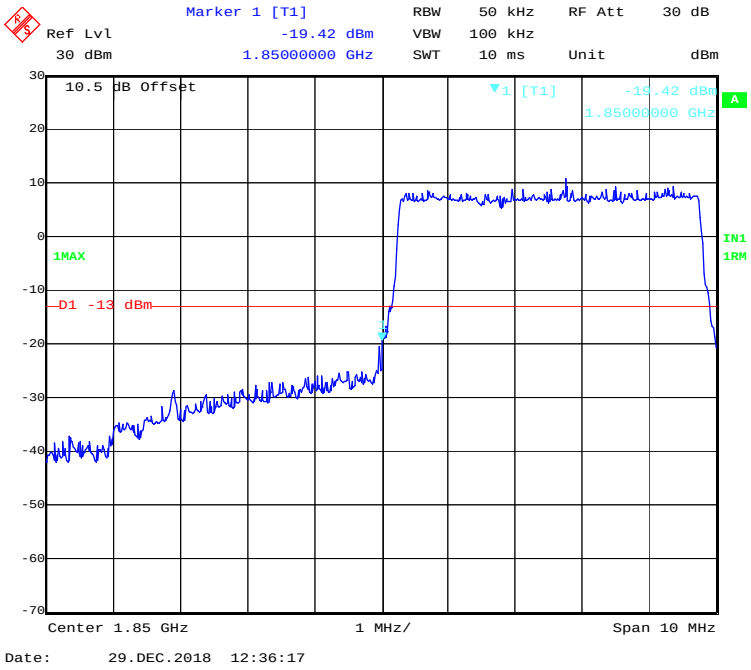
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



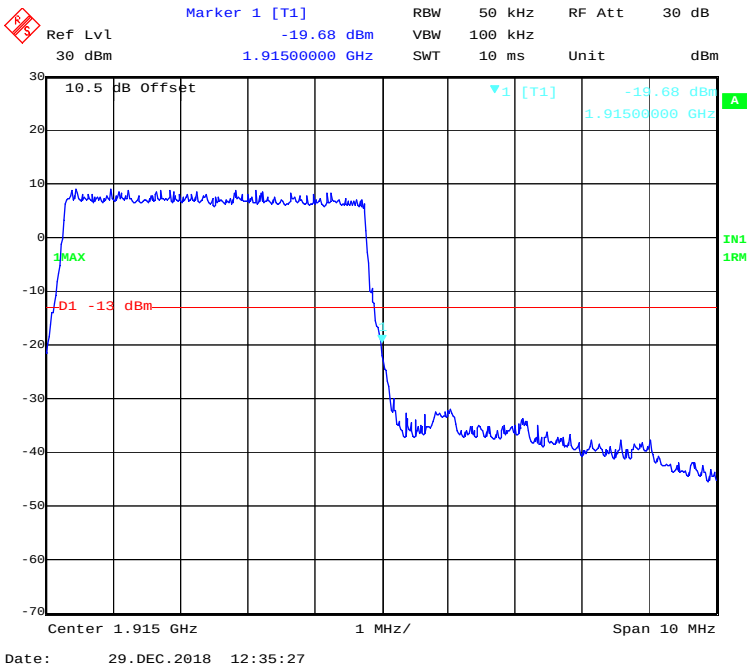
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



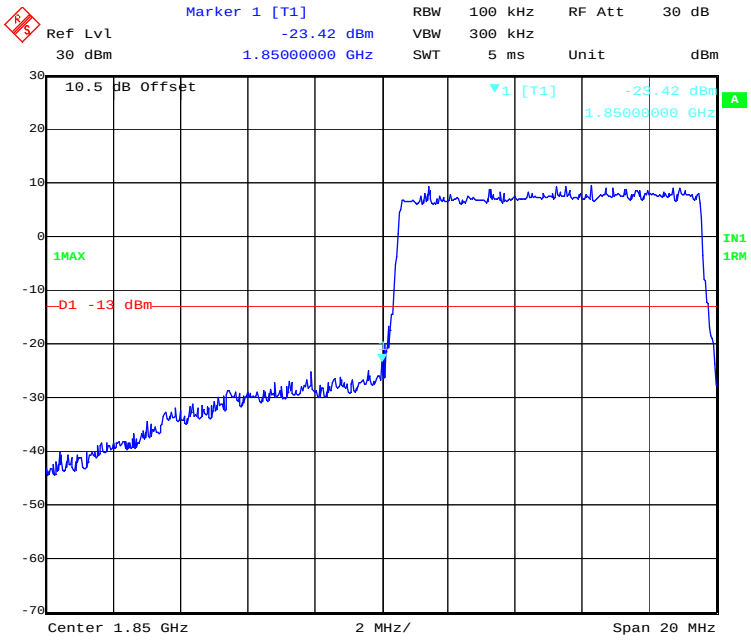
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



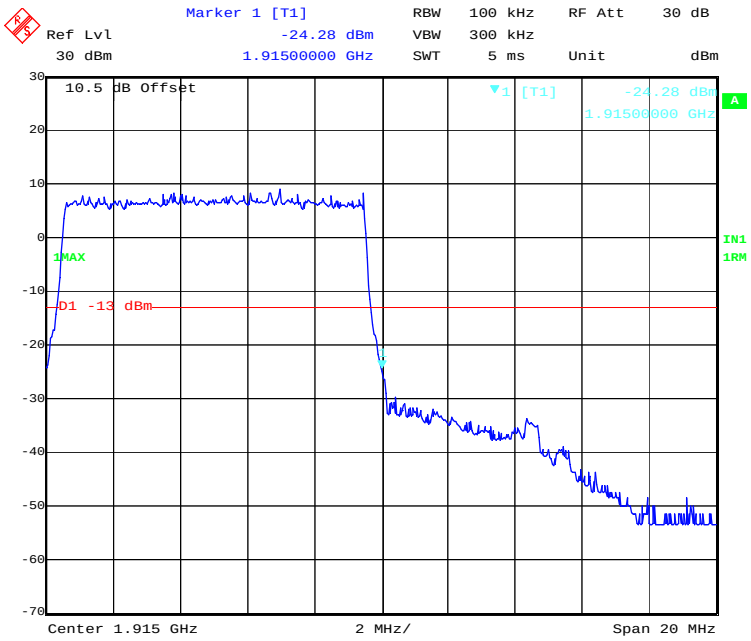
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



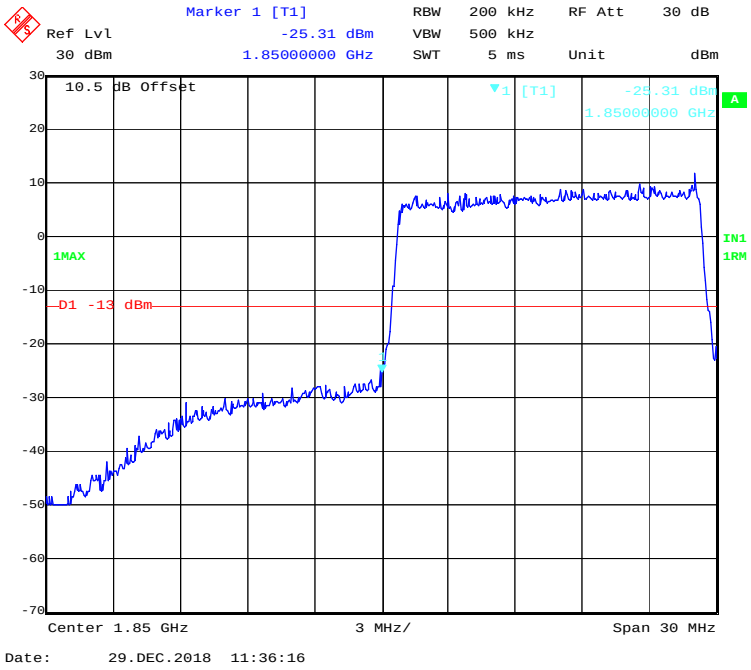
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



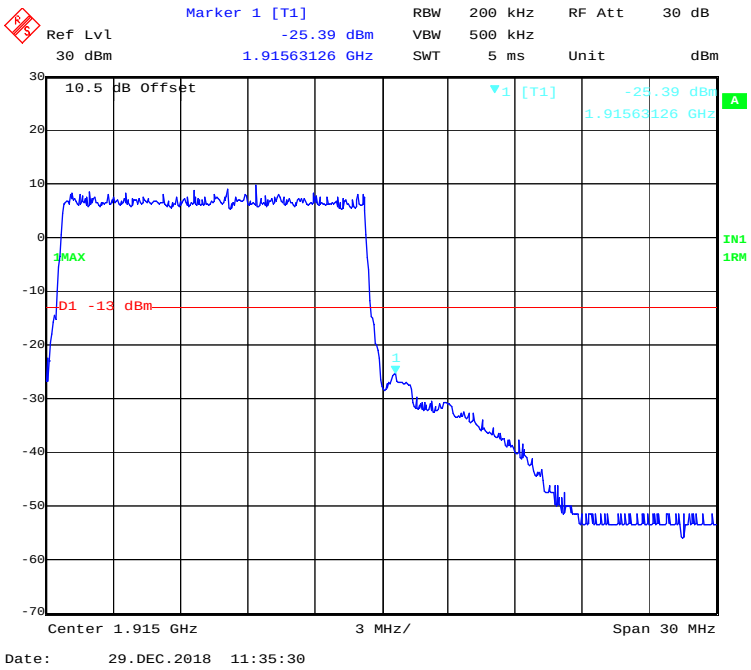
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



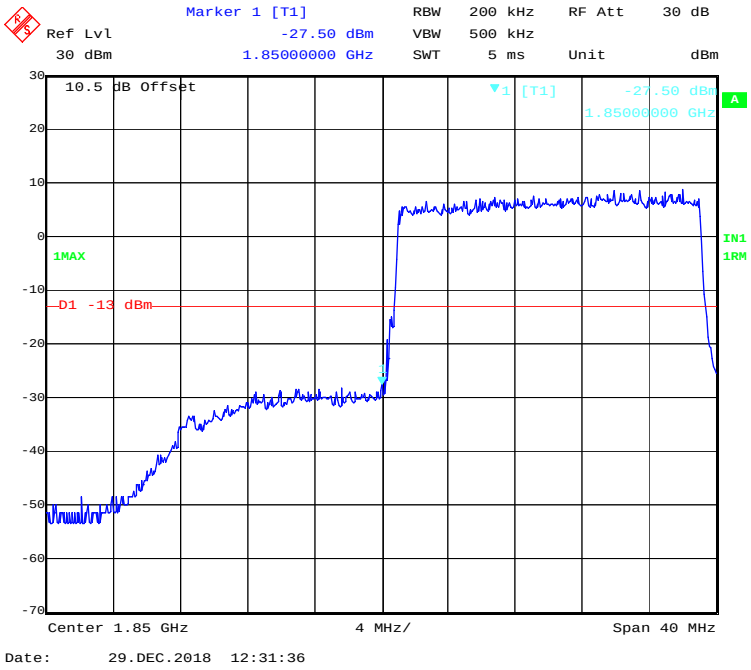
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



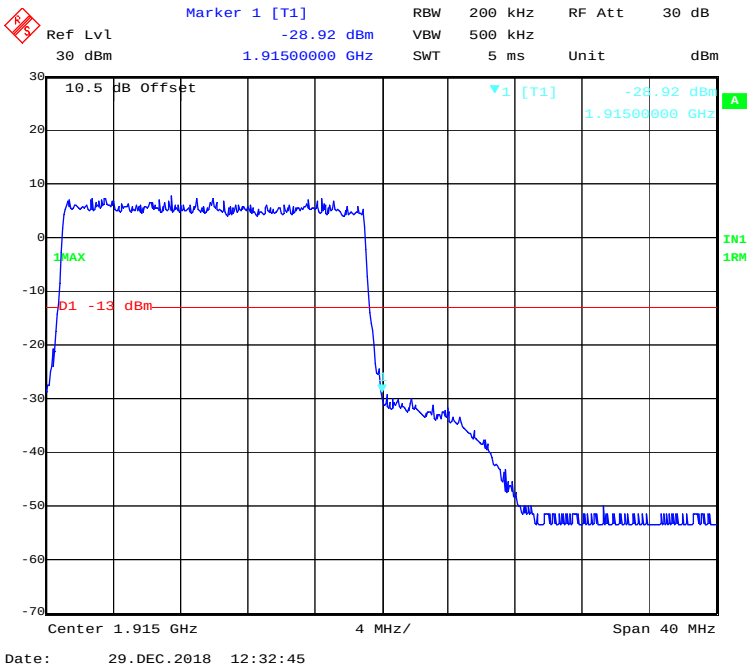
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



16-QAM (20.0 MHz, FULL RB) - Left Band Edge

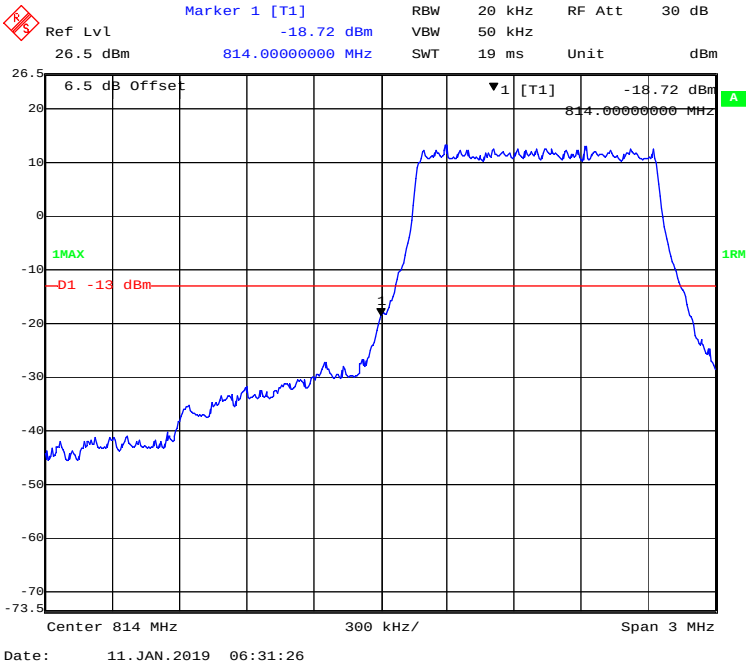


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

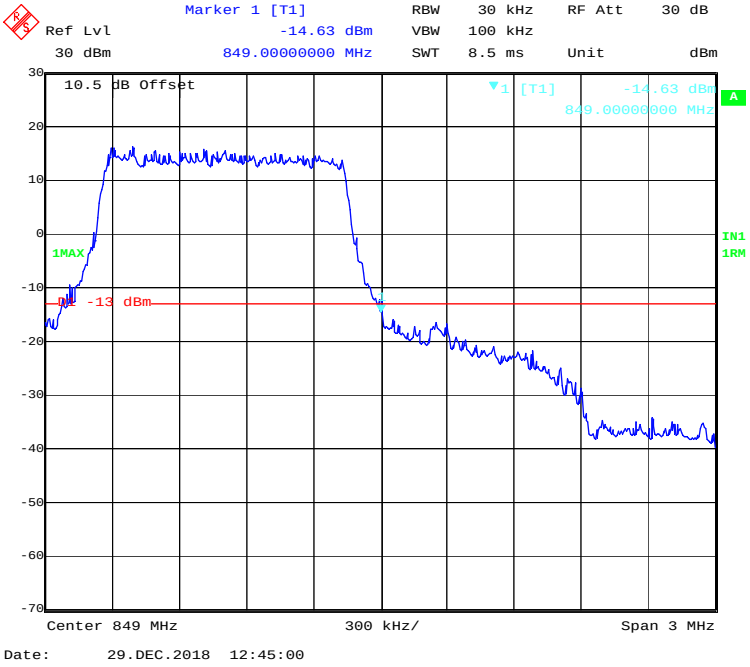


LTE Band 26:

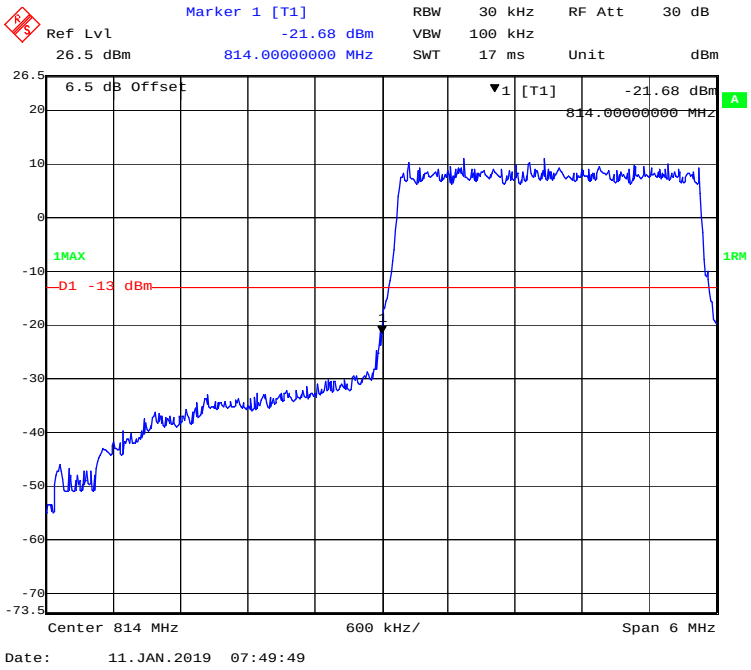
QPSK (1.4 MHz, FULL RB) - Left Band Edge



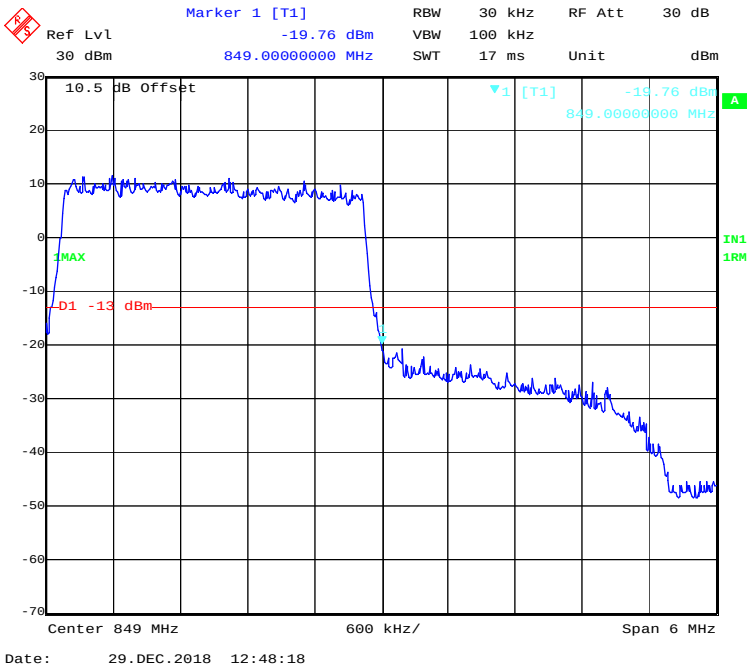
QPSK (1.4 MHz, FULL RB) - Right Band Edge



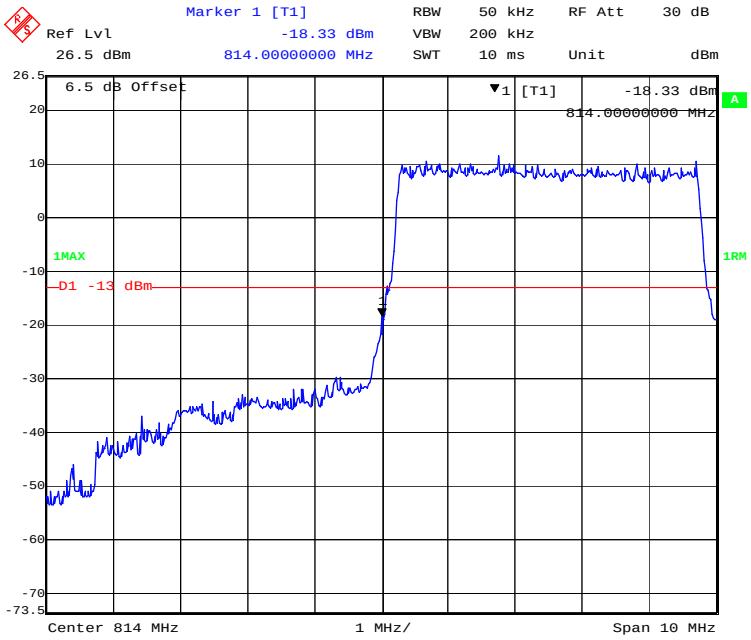
QPSK (3.0 MHz, FULL RB) - Left Band Edge



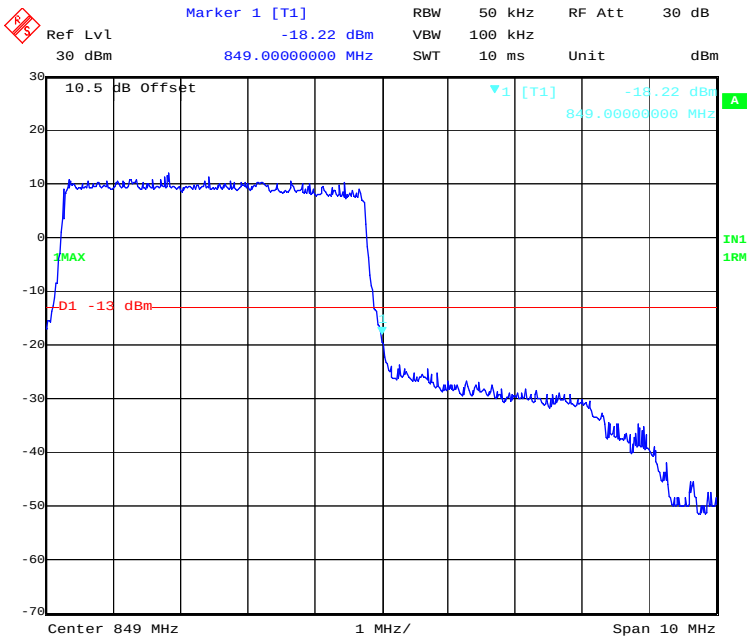
QPSK (3.0 MHz, FULL RB) - Right Band Edge



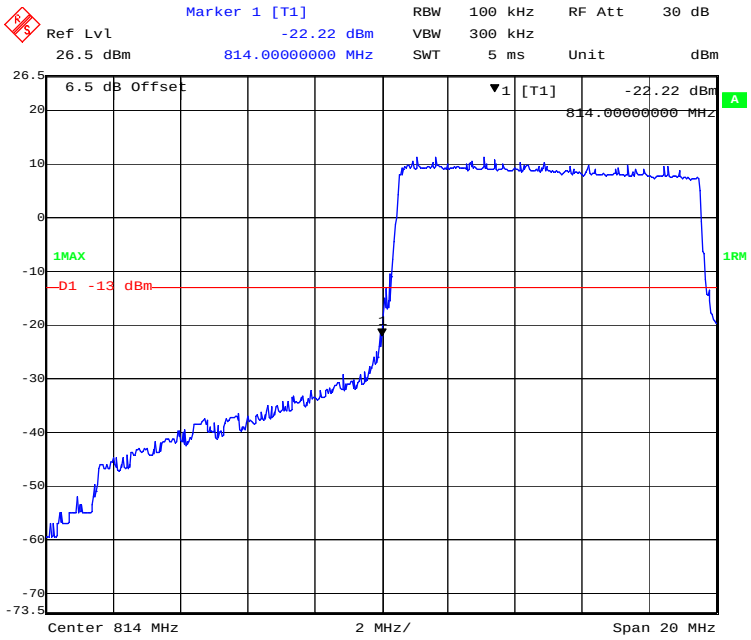
QPSK (5.0 MHz, FULL RB) - Left Band Edge



QPSK (5.0 MHz, FULL RB) - Right Band Edge

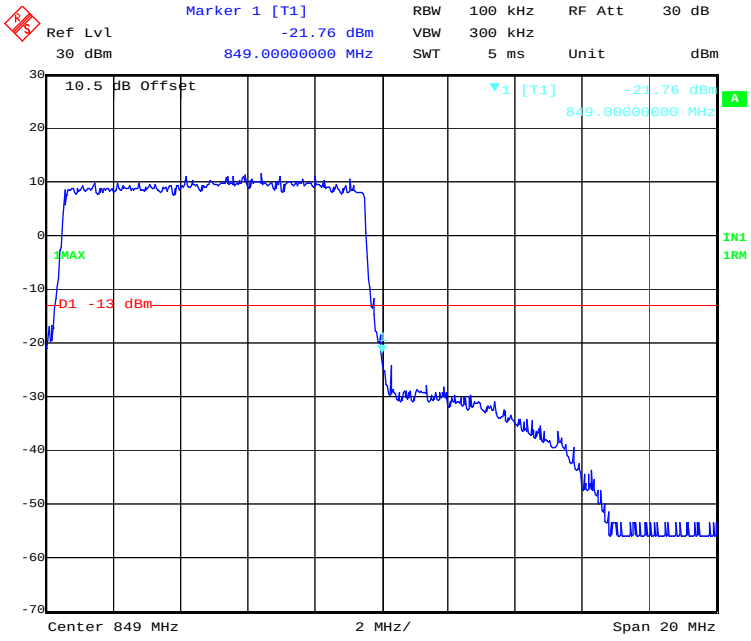


QPSK (10.0 MHz, FULL RB) - Left Band Edge



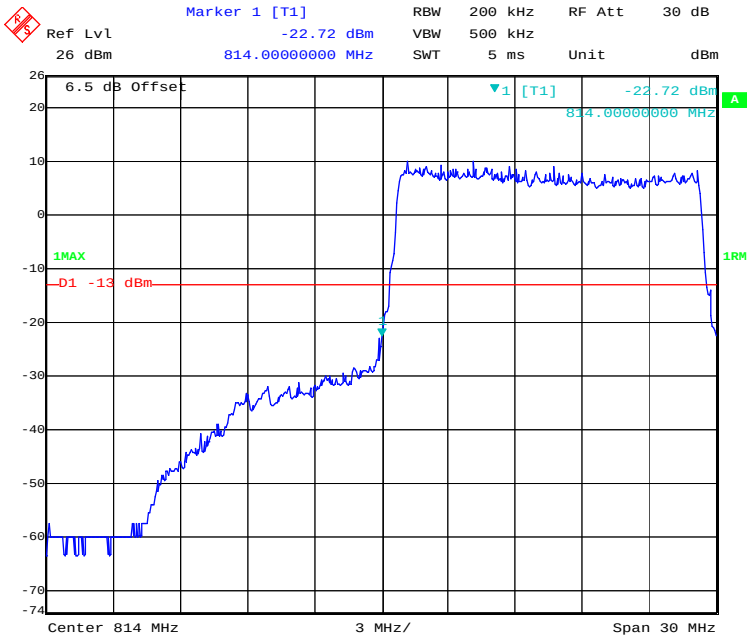
Date: 11.JAN.2019 07:56:14

QPSK (10.0 MHz, FULL RB) - Right Band Edge

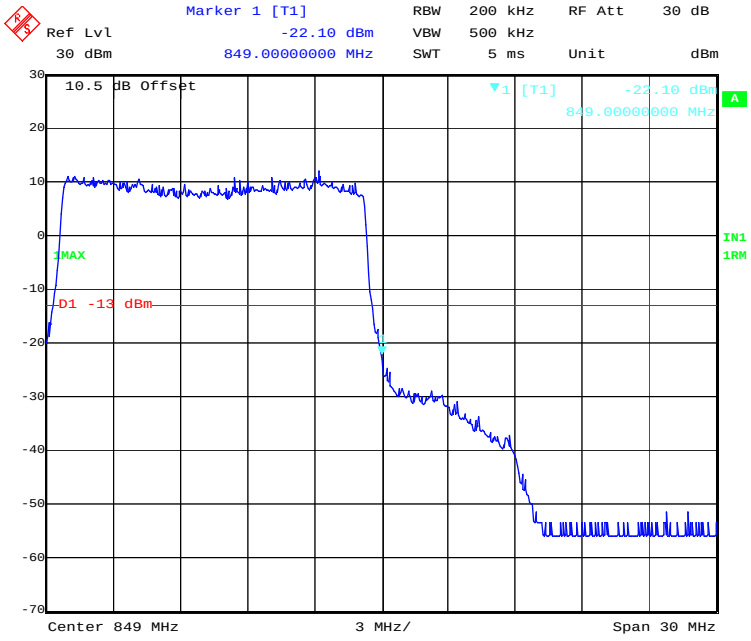


Date: 29.DEC.2018 12:56:10

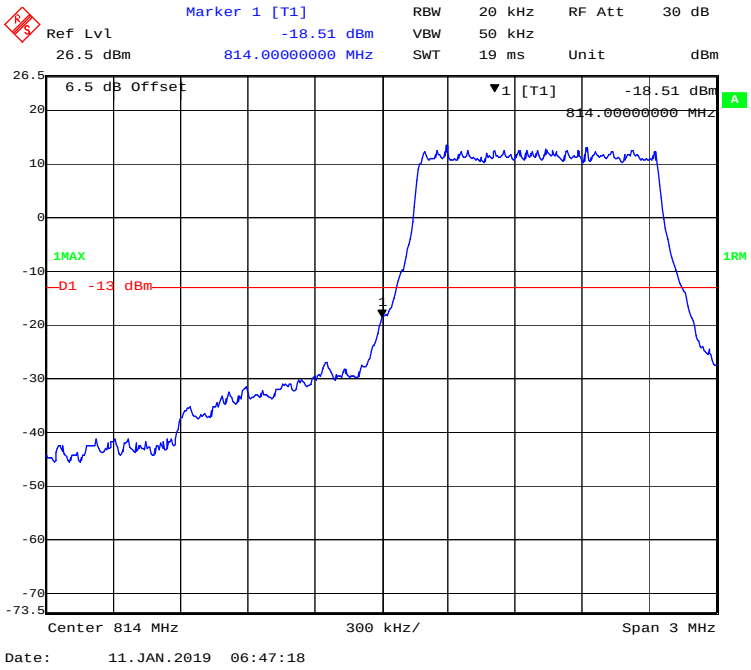
QPSK (15.0 MHz, FULL RB) - Left Band Edge



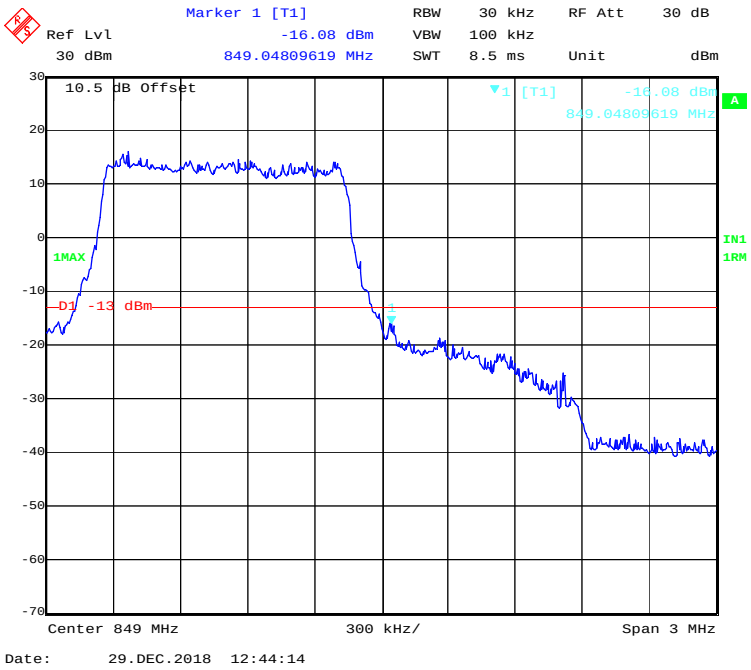
QPSK (15.0 MHz, FULL RB) - Right Band Edge



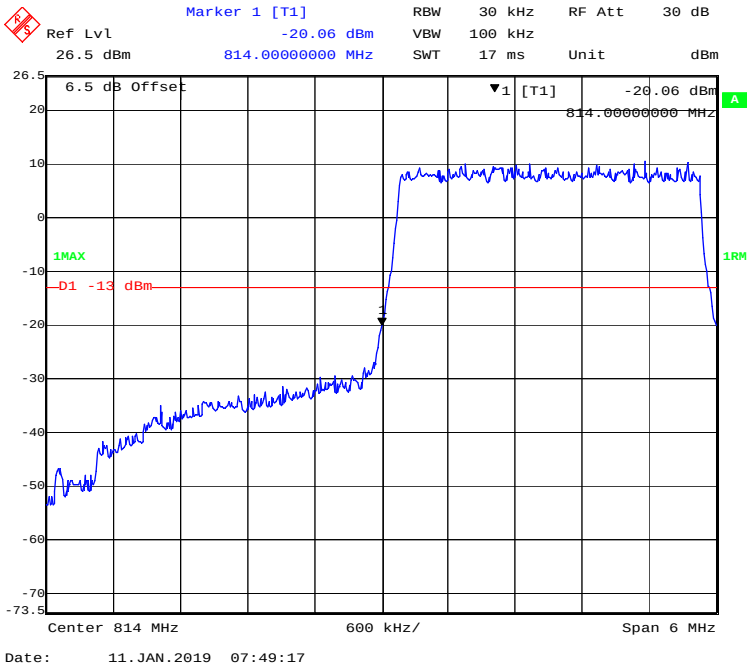
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



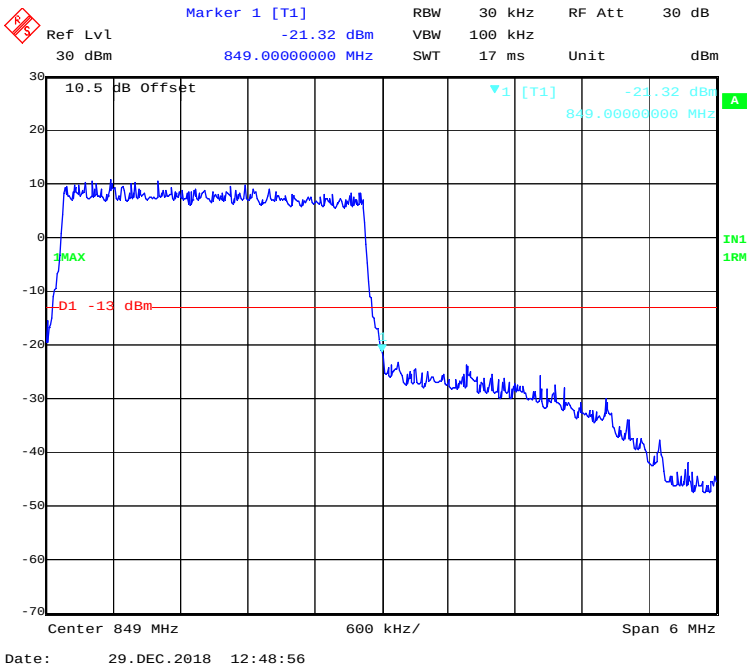
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



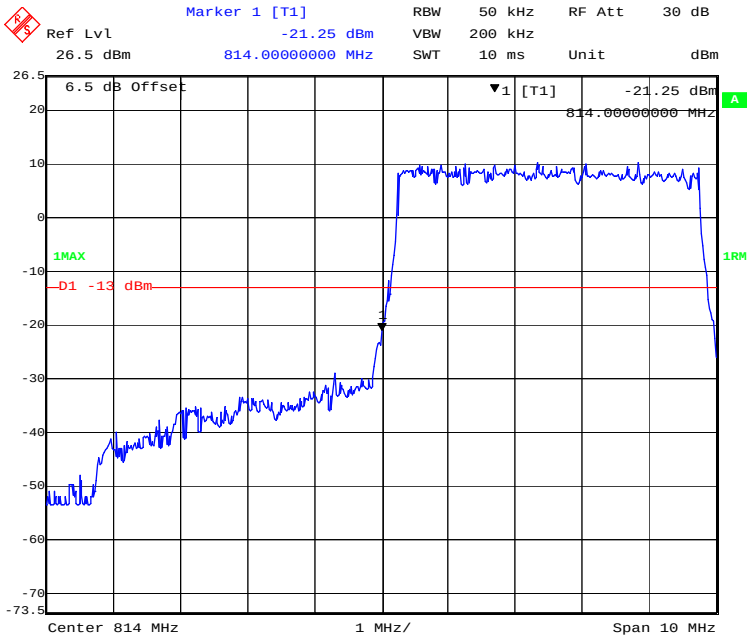
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



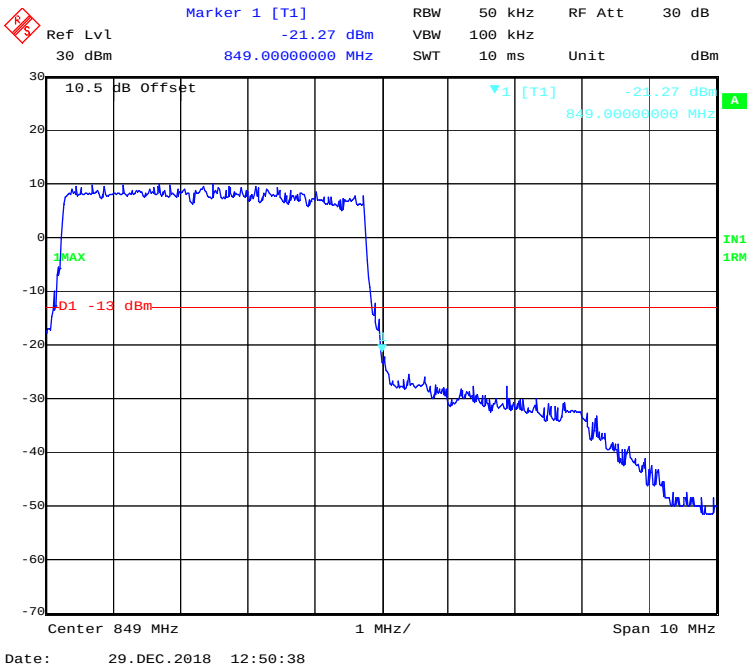
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



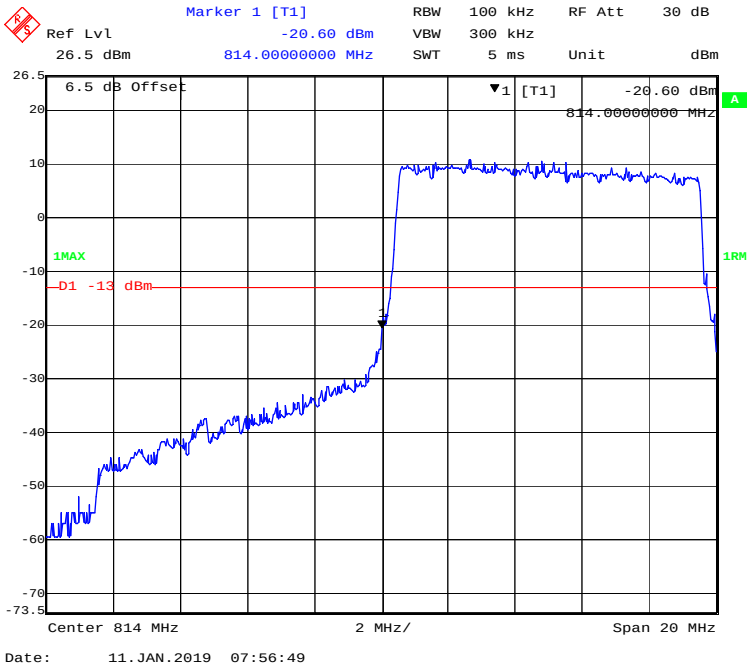
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



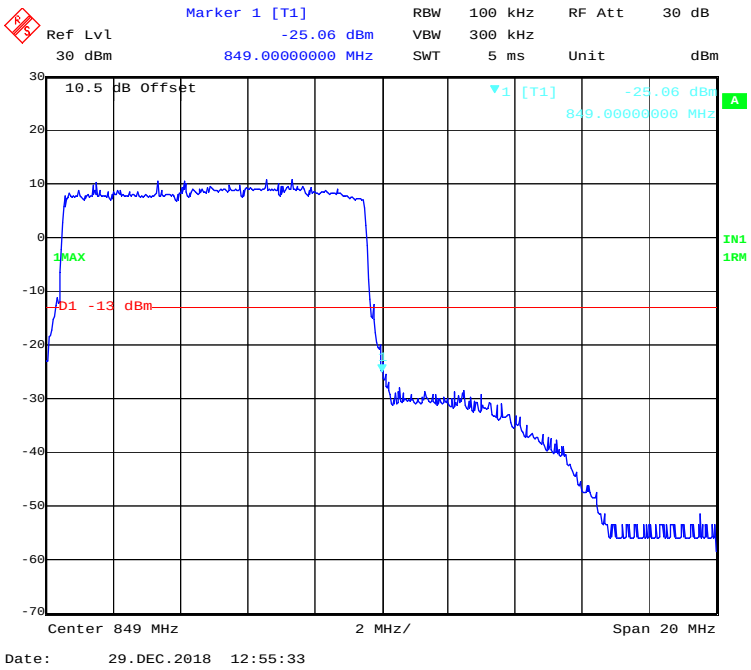
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



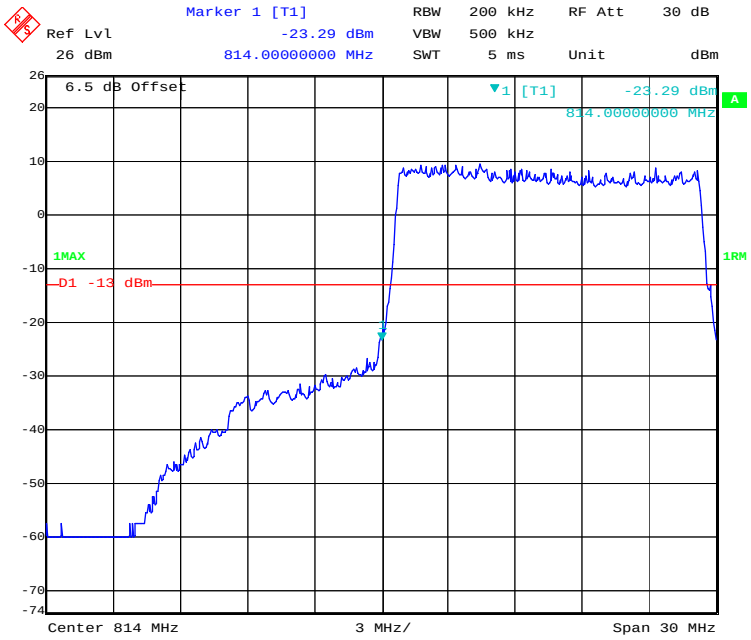
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



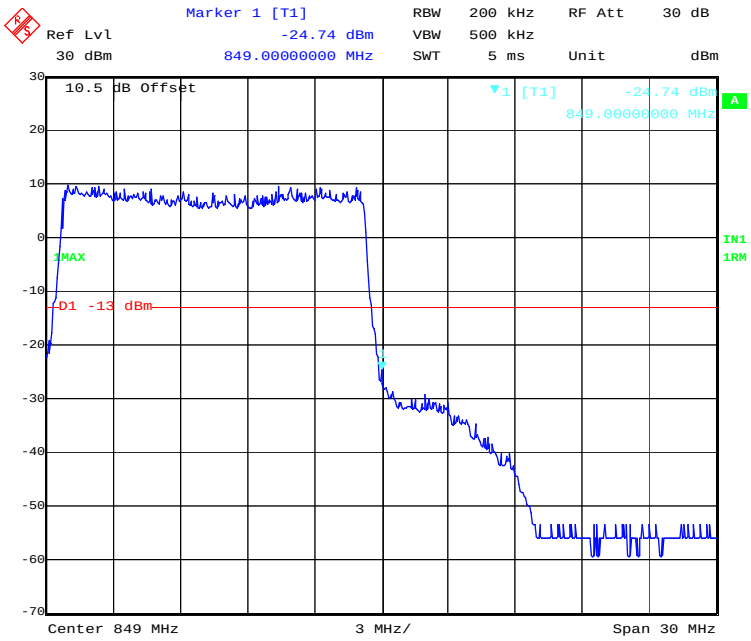
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



16-QAM (15.0 MHz, FULL RB) - Left Band Edge



16-QAM (15.0 MHz, FULL RB) - Right Band Edge



FCC § 2.1055; § 22.355; § 24.235; §27.54, § 90.213- FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055, §22.355, §24.235 , § 90.213 and §27.54.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

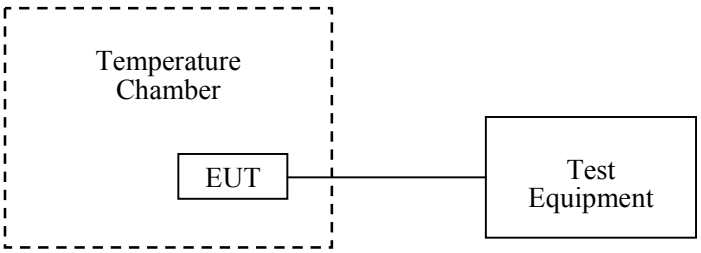
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external 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: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data

Environmental Conditions

Temperature:	23.2℃
Relative Humidity:	51 %
ATM Pressure:	101.3kPa

The testing was performed by Hope Zhang on 2018-12-23.

EUT operation mode: Transmitting

Test Result: Compliance.

GSM 850 Band:

GPRS Mode, Middle Channel, f_o=836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	7.4	11	0.0131	2.5
-20		14	0.0167	2.5
-10		2	0.0024	2.5
0		12	0.0143	2.5
10		4	0.0048	2.5
20		2	0.0024	2.5
30		5	0.0060	2.5
40		10	0.0120	2.5
50		3	0.0036	2.5
20	V min.= 7.0	13	0.0155	2.5
20	V max.=8.4	8	0.0096	2.5

EGPRS Mode, Middle Channel, f_o=836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	7.4	13	0.0155	2.5
-20		6	0.0072	2.5
-10		2	0.0024	2.5
0		9	0.0108	2.5
10		10	0.0120	2.5
20		8	0.0096	2.5
30		11	0.0131	2.5
40		2	0.0024	2.5
50		1	0.0012	2.5
20	V min.= 7.0	5	0.0060	2.5
20	V max.=8.4	2	0.0024	2.5

WCDMA Band V:

Middle Channel, f_o = 836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	7.4	14	0.01673	2.5
-20		5	0.00598	2.5
-10		13	0.01554	2.5
0		11	0.01315	2.5
10		9	0.01076	2.5
20		7	0.00837	2.5
30		10	0.01195	2.5
40		4	0.00478	2.5
50		10	0.01195	2.5
20	V min.= 7.0	13	0.01554	2.5
20	V max.= 8.4	8	0.00956	2.5

PCS 1900 Band:

GPRS Mode, Middle Channel, f_o=1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.4	-12	-0.0143	pass
-20		-7	-0.0084	pass
-10		-6	-0.0072	pass
0		-5	-0.0060	pass
10		-3	-0.0036	pass
20		0	0.0000	pass
30		-5	-0.0060	pass
40		-8	-0.0096	pass
50		-6	-0.0072	pass
20	V min.= 7.0	-10	-0.0120	pass
20	V max.=8.4	-5	-0.0060	pass

EGPRS Mode, Middle Channel, f_o=1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.4	-9	-0.0108	pass
-20		-4	-0.0048	pass
-10		0	0.0000	pass
0		-6	-0.0072	pass
10		3	0.0036	pass
20		-2	-0.0024	pass
30		-7	-0.0084	pass
40		-2	-0.0024	pass
50		-11	-0.0131	pass
20	V min.= 7.0	-9	-0.0108	pass
20	V max.= 8.4	-8	-0.0096	pass

WCDMA Band II:

WCDMA Mode, Middle Channel, f_o=1880.0 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.4	15	0.01793	pass
-20		3	0.00359	pass
-10		12	0.01434	pass
0		11	0.01315	pass
10		9	0.01076	pass
20		7	0.00837	pass
30		8	0.00956	pass
40		4	0.00478	pass
50		10	0.01195	pass
20	V min.= 7.0	13	0.01554	pass
20	V max.=8.4	7	0.00837	pass

WCDMA Band IV:

Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	1710.3283	1754.6786	1710	1755
-20		1710.3259	1754.6739	1710	1755
-10		1710.3268	1754.6764	1710	1755
0		1710.3225	1754.6735	1710	1755
10		1710.3273	1754.6709	1710	1755
20		1710.3231	1754.6767	1710	1755
30		1710.3212	1754.6785	1710	1755
40		1710.3276	1754.6749	1710	1755
50		1710.3246	1754.6785	1710	1755
20	V min.= 7.0	1710.3279	1754.6734	1710	1755
20	V max.= 8.4	1710.3205	1754.6758	1710	1755

LTE Band 2:

Middle Channel, f_o=1880.0 MHz (QPSK)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.4	10	0.0053	pass
-20		8	0.0043	pass
-10		11	0.0059	pass
0		9	0.0048	pass
10		6	0.0032	pass
20		5	0.0027	pass
30		3	0.0016	pass
40		2	0.0011	pass
50		7	0.0037	pass
20	V min.= 7.0	10	0.0053	pass
20	V max.=8.4	8	0.0043	pass

Middle Channel, f_o=1880.0 MHz (16-QAM)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.4	11	0.0059	pass
-20		8	0.0043	pass
-10		10	0.0053	pass
0		7	0.0037	pass
10		12	0.0064	pass
20		6	0.0032	pass
30		3	0.0016	pass
40		2	0.0011	pass
50		8	0.0043	pass
20	V min.= 7.0	11	0.0059	pass
20	V max.=8.4	9	0.0048	pass

LTE Band 4:

Low Channel & High Channel (QPSK)					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	1710.0496	1754.9497	1710	1755
-20		1710.0507	1754.9493	1710	1755
-10		1710.0502	1754.9502	1710	1755
0		1710.0496	1754.9487	1710	1755
10		1710.0509	1754.9486	1710	1755
20		1710.0489	1754.9499	1710	1755
30		1710.0495	1754.9497	1710	1755
40		1710.049	1754.9496	1710	1755
50		1710.0503	1754.9502	1710	1755
20	V min.= 7.0	1710.0496	1754.9499	1710	1755
20	V max.= 8.4	1710.05	1754.9517	1710	1755

Low Channel & High Channel (16-QAM)					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	1710.05	1754.9496	1710	1755
-20		1710.0496	1754.9505	1710	1755
-10		1710.05	1754.9497	1710	1755
0		1710.0503	1754.9496	1710	1755
10		1710.0501	1754.9495	1710	1755
20		1710.051	1754.9497	1710	1755
30		1710.0501	1754.9496	1710	1755
40		1710.0495	1754.9489	1710	1755
50		1710.0509	1754.9511	1710	1755
20	V min.= 7.0	1710.0494	1754.9481	1710	1755
20	V max.= 8.4	1710.0492	1754.9485	1710	1755

LTE Band 5:

Middle Channel, f_o =836.6 MHz (QPSK)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	7.4	11	0.0131	2.5
-20		10	0.0120	2.5
-10		5	0.0060	2.5
0		8	0.0096	2.5
10		7	0.0084	2.5
20		6	0.0072	2.5
30		2	0.0024	2.5
40		9	0.0108	2.5
50		5	0.0060	2.5
20	V min.= 7.0	8	0.0096	2.5
20	V max.= 8.4	15	0.0179	2.5

Middle Channel, f_o =836.6 MHz(16-QAM)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	7.4	12	0.0143	2.5
-20		9	0.0108	2.5
-10		4	0.0048	2.5
0		9	0.0108	2.5
10		7	0.0084	2.5
20		5	0.0060	2.5
30		3	0.0036	2.5
40		10	0.0120	2.5
50		6	0.0072	2.5
20	V min.= 7.0	7	0.0084	2.5
20	V max.= 8.4	14	0.0167	2.5

LTE Band 7:

Low Channel & High Channel (QPSK)					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	2500.0497	2569.9496	2500	2570
-20		2500.0498	2569.9496	2500	2570
-10		2500.0489	2569.95	2500	2570
0		2500.048	2569.9501	2500	2570
10		2500.0506	2569.9492	2500	2570
20		2500.0514	2569.9518	2500	2570
30		2500.0506	2569.9505	2500	2570
40		2500.0493	2569.9516	2500	2570
50		2500.0508	2569.9505	2500	2570
20	V min.= 7.0	2500.0513	2569.9484	2500	2570
20	V max.= 8.4	2500.0508	2569.9505	2500	2570

Low Channel & High Channel (16-QAM)					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	2500.0501	2569.949	2500	2570
-20		2500.0509	2569.9511	2500	2570
-10		2500.0506	2569.9495	2500	2570
0		2500.0499	2569.9499	2500	2570
10		2500.0512	2569.9487	2500	2570
20		2500.0503	2569.9498	2500	2570
30		2500.0485	2569.9497	2500	2570
40		2500.0516	2569.9486	2500	2570
50		2500.0506	2569.9492	2500	2570
20	V min.= 7.0	2500.049	2569.9506	2500	2570
20	V max.= 8.4	2500.0501	2569.9503	2500	2570

LTE Band 12:

Low Channel & High Channel (QPSK)					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	699.0193	715.9795	699	716
-20		699.0198	715.9803	699	716
-10		699.0206	715.9792	699	716
0		699.0192	715.979	699	716
10		699.0208	715.9787	699	716
20		699.0206	715.9802	699	716
30		699.0197	715.9799	699	716
40		699.0213	715.9816	699	716
50		699.0204	715.9816	699	716
20	V min.= 7.0	699.0215	715.98	699	716
20	V max.= 8.4	699.0211	715.9804	699	716

Low Channel & High Channel (16-QAM)					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	699.0199	715.9802	699	716
-20		699.02	715.9795	699	716
-10		699.0197	715.9789	699	716
0		699.019	715.9792	699	716
10		699.0212	715.9801	699	716
20		699.0196	715.9803	699	716
30		699.0209	715.9796	699	716
40		699.0216	715.9812	699	716
50		699.019	715.9796	699	716
20	V min.= 7.0	699.0193	715.9818	699	716
20	V max.= 8.4	699.0196	715.9804	699	716

LTE Band 13:

Low Channel & High Channel (QPSK)					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	777.0215	786.9809	777	787
-20		777.0202	786.9798	777	787
-10		777.0206	786.9797	777	787
0		777.0194	786.9801	777	787
10		777.0206	786.9797	777	787
20		777.0212	786.9794	777	787
30		777.0207	786.9798	777	787
40		777.0211	786.9803	777	787
50		777.0198	786.9805	777	787
20	V min.= 7.0	777.0195	786.9796	777	787
20	V max.= 8.4	777.0198	786.9782	777	787

Low Channel & High Channel (16-QAM)					
Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	7.4	777.0201	786.98	777	787
-20		777.0208	786.979	777	787
-10		777.0197	786.9799	777	787
0		777.0196	786.9787	777	787
10		777.0218	786.9801	777	787
20		777.0214	786.9786	777	787
30		777.0202	786.9807	777	787
40		777.0201	786.9792	777	787
50		777.0204	786.981	777	787
20	V min.= 7.0	777.021	786.9804	777	787
20	V max.= 8.4	777.0185	786.9802	777	787

LTE Band 25:

Middle Channel, f_o =1882.6 MHz (QPSK)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.4	13	0.0069	pass
-20		9	0.0048	pass
-10		11	0.0058	pass
0		8	0.0042	pass
10		7	0.0037	pass
20		5	0.0027	pass
30		3	0.0016	pass
40		9	0.0048	pass
50		5	0.0027	pass
20	V min.= 7.0	15	0.0080	pass
20	V max.= 8.4	9	0.0048	pass

Middle Channel, f_o =1882.6 MHz(16-QAM)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	7.4	15	0.0080	pass
-20		10	0.0053	pass
-10		9	0.0048	pass
0		7	0.0037	pass
10		4	0.0021	pass
20		6	0.0032	pass
30		3	0.0016	pass
40		10	0.0053	pass
50		6	0.0032	pass
20	V min.= 7.0	14	0.0074	pass
20	V max.= 8.4	8	0.0042	pass

LTE Band 26:

Middle Channel, f_o =836.5 MHz (QPSK)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	7.4	17	0.0203	2.5
-20		10	0.0120	2.5
-10		9	0.0108	2.5
0		6	0.0072	2.5
10		13	0.0155	2.5
20		6	0.0072	2.5
30		3	0.0036	2.5
40		5	0.0060	2.5
50		8	0.0096	2.5
20	V min.= 7.0	8	0.0096	2.5
20	V max.= 8.4	11	0.0132	2.5

Middle Channel, f_o =836.5 MHz(16-QAM)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	7.4	16	0.0191	2.5
-20		9	0.0108	2.5
-10		7	0.0084	2.5
0		6	0.0072	2.5
10		14	0.0167	2.5
20		6	0.0072	2.5
30		5	0.0060	2.5
40		7	0.0084	2.5
50		8	0.0096	2.5
20	V min.= 7.0	10	0.0120	2.5
20	V max.= 8.4	11	0.0132	2.5

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