TESTING LABORATORY
CERTIFICATE#4323.01

FCC PART 27

FCC PART 22H, PART 24E

MEASUREMENT AND TEST REPORT

For

MeiG Smart Technology Co., Ltd

3/F,No.88,Qinjiang Road,Xuhui District,Shanghai,China.

FCC ID: 2APJ4-SLM756P

Report Type:	**Product Type:**
Original Report	Smart Module

Test Engineer:	Max Min
Report Number:	RSHA190708001-00D
Report Date:	2019-08-30
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	MeiG Smart Technology Co., Ltd
Tested Model	SLM756P
Product Type	Smart Module
Dimension	44mm(L)*39mm(W)*3mm(H)
Power Supply	DC 3.8V

**All measurement and test data in this report was gathered from production sample serial number: 20190708001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-07-08)*

Objective

This type approval report is prepared on behalf of *MeiG Smart Technology Co., LTD* in accordance with Part 2, Part 22-Subpart H, Part 24-Subpart E and Part 27 of the Federal Communication Commissions' 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 DTS, Part 15.247 DSS, and Part 15.407 NII submissions with FCC ID: 2APJ4-SLM756P.

Test Methodology

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

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

Applicable Standards: TIA/EIA 603-D.

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%

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

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 and CAB identifier CN0004 under the ISED requirement. 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)
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 17	5M	Low	23755	706.5
		Middle	23790	710.0
		High	23825	713.5
	10M	Low	23780	709.0
		Middle	23790	710.0
		High	23800	711.0

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

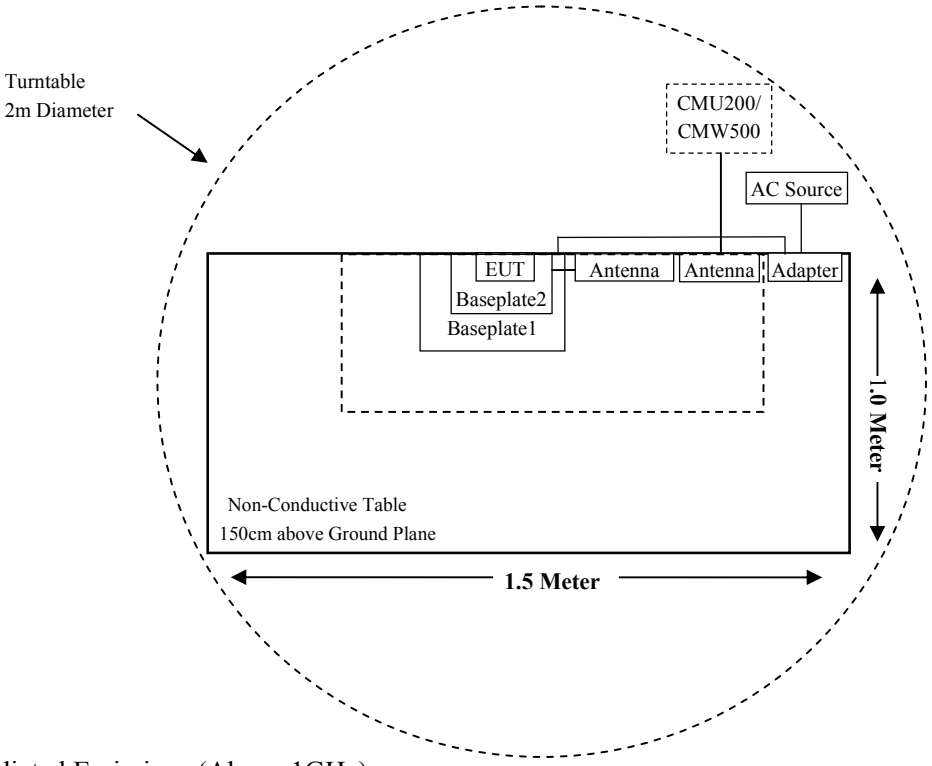
Manufacturer	Description	Model	Serial Number
Waylens Inc.	Antenna	/	/
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605
R & S	Wideband Radio Communication Tester	CMW500	104478
Dian Yuan Technology	Adapter	DYS-0502000C	/
MEIG	Baseplate1	MEIG_EVB_V1.03	/
MEIG	Baseplate2	SLM756_ZB_ V1.03_PCB	/
MeiG Smart	Antenna	/	/

External I/O Cable

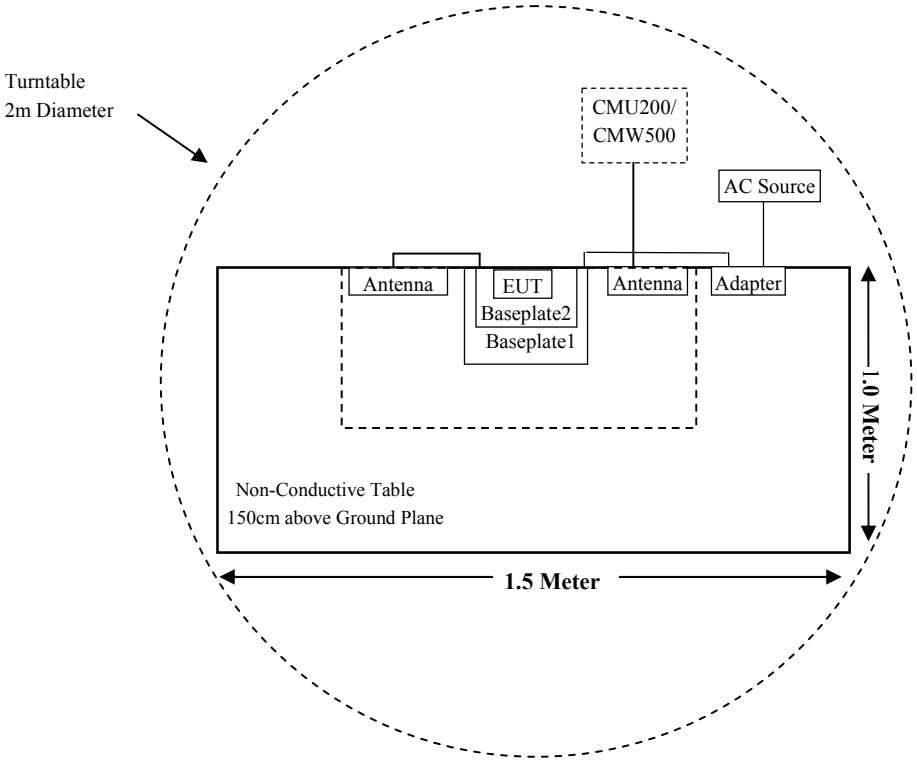
Cable Description	Length (m)	From Port	To
Power Cable	1.0	Baseplate1	Adapter
Antenna Cable	0.3	Baseplate2	MeiG Smart Antenna

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 & §2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
§2.1046; § 22.913 (a);§ 24.232 (c); § 27.50 (b)(c)(d);§27.50(h) (2);	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53;	Occupied Bandwidth	Compliant
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53;	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h) (m);	Spurious Radiated Emissions	Compliant
§ 22.917 (a); § 24.238 (a); §27.53 (h) (m);	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235; §27.54;	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	2018-11-30	2019-11-29
HP	Signal Generator	HP 8341B	2624A00116	2018-11-30	2019-11-29
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2019-01-09	2022-01-08
Sonoma Instrunent	Pre-amplifier	310N	171205	2019-08-14	2020-08-13
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2018-08-15	2019-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-30	2019-11-29
R & S	Wideband Radio Communication Tester	CMW500	104478	2019-08-05	2020-08-04
Radiated Emission Test（Chamber 2#）					
HP	Signal Generator	HP 8341B	2624A00116	2018-11-30	2019-11-29
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2019-05-30	2020-05-29
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2017-07-15	2020-07-14
ETS-LINDGREN	Horn Antenna	3115	6229	2016-12-12	2019-12-11
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-12-12	2019-12-11
ETS-LINDGREN	Horn Antenna	3116	2516	2016-12-12	2019-12-11
A.H.Systems, inc	Amplifier	2641-1	491	2019-02-20	2020-02-19
SELECTOR	Amplifier	EM18G40G	060726	2019-03-22	2020-03-21
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2019-08-15	2020-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-30	2019-11-29
R & S	Wideband Radio Communication Tester	CMW500	104478	2019-08-05	2020-08-04

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-11-30	2019-11-29
Narda	Attenuator	2dB	002	2019-08-15	2020-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-30	2019-11-29
R & S	Wideband Radio Communication Tester	CMW500	104478	2019-08-05	2020-08-04
Mini-Ciruits	Power splitter	ZFRSC-14-S+	SF019411452	2018-11-10	2019-11-09
BACL	Temperature & Humidity Chamber	BTH-150	30023	2018-12-20	2019-12-19
MeiG Smart	RF Cable	MeiG Smart C01	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 §15.247 (I) & §1.1310 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/		f/1500	30
1500-100,000	/		1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculated Data (worst case):

Mode	Frequency Range (MHz)	Maximum Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)	MPE ratio
		(dBi)	(numeric)	(dBm)	(mW)				
802.11b	2412-2462	0.00	1.00	19.00	79.43	20	0.0158	1.00	0.0158
802.11g		0.00	1.00	20.00	100.00	20	0.0199	1.00	**0.0199**
802.11n-HT20		0.00	1.00	18.50	70.79	20	0.0141	1.00	0.0141
802.11n-HT40	2422-2452	0.00	1.00	17.50	56.23	20	0.0112	1.00	0.0112
802.11a	5150~5250	0.00	1.00	12.00	15.85	20	0.0032	1.00	0.0032
	5250~5350	0.00	1.00	12.00	15.85	20	0.0032	1.00	0.0032
	5470~5725	0.00	1.00	12.50	17.78	20	0.0035	1.00	0.0035
	5725~5850	0.00	1.00	12.50	17.78	20	0.0035	1.00	0.0035
802.11n-HT20	5150~5250	0.00	1.00	12.50	17.78	20	0.0035	1.00	0.0035
	5250~5350	0.00	1.00	11.50	14.13	20	0.0028	1.00	0.0028
	5470~5725	0.00	1.00	12.50	17.78	20	0.0035	1.00	0.0035
	5725~5850	0.00	1.00	12.50	17.78	20	0.0035	1.00	0.0035
802.11n-HT40	5150~5250	0.00	1.00	9.50	8.91	20	0.0018	1.00	0.0018
	5250~5350	0.00	1.00	9.00	7.94	20	0.0016	1.00	0.0016
	5470~5725	0.00	1.00	11.50	14.13	20	0.0028	1.00	0.0028
	5725~5850	0.00	1.00	11.50	14.13	20	0.0028	1.00	0.0028
BLE	2402-2480	0.00	1.00	1.50	1.41	20	0.0003	1.00	0.0003
BT 3.0	2402-2480	0.00	1.00	11.50	14.13	20	0.0028	1.00	0.0032

Calculation of maximum antenna gain based on ERP/EIRP

Mode	Max Tune-up Power (dBm)	ERP/EIRP Limit (dBm)	Max Antenna Gain (dBd)	Max Antenna Gain (dBi)
WCDMA Band II	23.00	33.00	/	10.00
WCDMA Band IV	23.00	30.00	/	7.00
WCDMA Band V	24.00	38.45	14.45	16.60
FDD (Band 2)	22.00	33.00	/	11.00
FDD (Band 4)	22.50	30.00	/	7.00
FDD (Band 5)	22.50	38.45	15.95	18.10
FDD (Band 7)	22.50	33.00	/	10.00
FDD (Band 12)	23.00	34.77	11.77	13.92
FDD (Band 13)	23.00	34.77	11.77	13.92
FDD (Band 17)	23.00	34.77	11.77	13.92

Note:0dBd=2.15dBi

Calculation of maximum antenna gain based on MPE Ratio

Mode	Frequency Range	Tune-up Conducted Power		Power Density Limit	Maximum Power Density	Evaluation Distance	Maximun Antenna Gain Allowed based on MPE		MPE ratio
	(MHz)	(dBm)	(mW)	(mW/cm^2)	(mW/cm^2)	(cm)	(numeric)	(dBi)	
WCDMA Band II	1850.0-1910.0	23.00	199.53	1.00	0.9788	20	24.66	13.92	0.9788
WCDMA Band IV	1710.0-1755.0	23.00	199.53	1.00	0.9788	20	24.66	13.92	0.9788
WCDMA Band V	824.0-849.0	24.00	251.19	0.55	0.5619	20	19.59	12.92	0.9788
FDD (Band 2)	1850.0-1910.0	22.00	158.49	1.00	0.9789	20	31.05	14.92	**0.9789**
FDD (Band 4)	1710.0-1755.0	22.50	177.83	1.00	0.9788	20	22.67	14.42	0.9788
FDD (Band 5)	824.0-849.0	22.50	177.83	0.55	0.5619	20	22.67	14.42	0.9788
FDD (Band 7)	2500.0-2570.0	22.50	177.83	1.00	0.9788	20	22.67	14.42	0.9788
FDD (Band 12)	699.0-716.0	23.00	199.53	0.47	0.4802	20	24.66	13.92	0.9788
FDD (Band 13)	777.0-787.0	23.00	199.53	0.52	0.5313	20	24.66	13.92	0.9788
FDD (Band 17)	704.0-716.0	23.00	199.53	0.47	0.4802	20	24.66	13.92	0.9788

Note: Wi-Fi/ BLE/ BT 3.0& WCDMA/FDD can transmit simultaneously; the worst condition is 802.11b of Wi-Fi & FDD (Band13), as below:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.0199+0.9789=0.9988 < 1.0$$

Mode	Max Allow Antenna Gain (dBi)
WCDMA Band II/LTE Band 2	10.0
WCDMABand IV/ LTE Band 4	7.00
WCDMABand V/ LTE Band 5	12.92
LTE Band 7	10.00
LTE Band 12/ LTE Band 17	13.92
LTE Band 13	13.92

Result: To meet RF exposure & ERP/ERIP, the maximum net gains of antennas allowed are 10dBi@ WCDMA Band II/LTE Band 2 , 7dBi@ WCDMABand IV/ LTE Band 4 , 12.92dBi@ WCDMABand V/ LTE Band 5 ,10.00dBi @LTE Band 7, 13.92dBi @ LTE Band 12/LTE Band 17,13.92dBi @ LTE Band 13. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cmtransmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

FCC §2.1046; § 22.913 (a); § 24.232 (c); §27.50 (b) (c) (d); §27.50(h) (2); - 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(b), Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

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

According to §27.50(c), Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP..

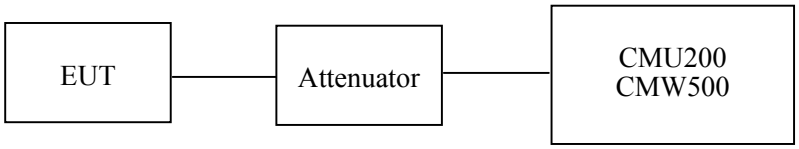
According to §27.50(h) (2), Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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 Max Min on 2019-08-27.

Conducted Power:

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	23.22	23.37	23.36
		HSDPA	1	22.55	22.80	22.75
			2	22.50	22.60	22.61
			3	22.07	22.32	22.28
			4	21.73	21.87	21.73
		HSUPA	1	21.96	22.30	22.33
			2	22.15	22.39	22.18
			3	21.86	21.83	21.98
			4	21.26	21.45	21.44
			5	20.81	21.14	21.07
		HSPA+	1	22.81	22.87	22.67

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	22.63	22.74	22.71
		HSDPA	1	22.20	22.09	22.15
			2	22.08	21.99	21.92
			3	21.66	21.72	21.60
			4	21.27	21.33	21.10
		HSUPA	1	21.86	21.76	21.55
			2	21.57	21.40	21.74
			3	21.41	21.46	21.36
			4	21.21	20.95	21.32
			5	21.01	20.87	21.26
		HSPA+	1	21.98	22.09	22.23

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	22.46	22.58	22.54
		HSDPA	1	21.87	21.92	22.04
			2	21.86	21.99	21.82
			3	21.41	21.58	21.68
			4	20.94	20.99	21.38
		HSUPA	1	21.34	21.55	21.52
			2	21.40	21.48	21.61
			3	21.30	21.21	21.30
			4	21.49	21.50	21.66
			5	21.11	21.18	21.23
		HSPA+	1	21.86	22.13	22.13

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	21.45	21.64	21.58
		1#3	21.15	21.37	21.38
		1#5	21.06	21.36	21.35
		3#0	21.16	21.43	21.20
		3#1	21.31	21.34	21.35
		3#3	21.22	21.27	21.21
		6#0	20.99	20.98	20.90
	16-QAM	1#0	20.89	21.05	20.96
		1#3	20.65	20.83	20.75
		1#5	20.45	20.68	20.71
		3#0	20.64	20.87	20.80
		3#1	20.64	20.81	20.67
		3#3	20.60	20.89	20.70
		6#0	20.32	20.66	20.38
3M	QPSK	1#0	21.47	21.66	21.56
		1#7	21.24	21.30	21.30
		1#14	21.08	21.30	21.25
		8#0	21.10	21.39	21.08
		8#4	21.25	21.31	21.40
		8#7	21.24	21.55	21.23
		15#0	20.93	21.30	21.03
	16-QAM	1#0	20.67	21.11	20.99
		1#7	20.38	20.90	20.66
		1#14	20.34	20.90	20.62
		8#0	20.17	20.66	20.54
		8#4	20.32	20.96	20.86
		8#7	20.41	20.92	20.72
		15#0	20.18	20.60	20.32

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.46	21.56	21.43
		1#12	21.13	21.34	21.12
		1#24	21.26	21.22	21.19
		12#0	21.13	21.07	21.19
		12#6	21.08	21.29	21.29
		12#11	21.17	21.17	21.28
		25#0	20.85	20.89	21.02
	16-QAM	1#0	20.82	20.97	20.94
		1#12	20.55	20.67	20.57
		1#24	20.58	20.65	20.66
		12#0	20.36	20.62	20.44
		12#6	20.56	20.62	20.76
		12#11	20.55	20.68	20.59
		25#0	20.20	20.35	20.37
10M	QPSK	1#0	21.42	21.55	21.51
		1#24	21.13	21.33	21.28
		1#49	21.20	21.32	21.17
		25#0	21.12	21.16	21.07
		25#12	21.20	21.22	21.17
		25#24	21.07	21.27	21.24
		50#0	20.70	20.96	21.00
	16-QAM	1#0	20.83	20.94	20.87
		1#24	20.54	20.73	20.60
		1#49	20.55	20.64	20.59
		25#0	20.54	20.53	20.58
		25#12	20.45	20.72	20.57
		25#24	20.45	20.70	20.52
		50#0	20.20	20.44	20.12

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.55	21.67	21.61
		1#37	21.21	21.29	21.27
		1#74	21.34	21.28	21.35
		36#0	21.25	21.24	21.39
		36#17	21.27	21.38	21.33
		36#35	21.35	21.39	21.43
		75#0	21.04	21.01	21.15
	16-QAM	1#0	21.09	21.21	21.15
		1#37	20.89	20.91	20.82
		1#74	20.85	20.86	20.91
		36#0	20.64	20.86	20.86
		36#17	20.87	20.98	21.04
		36#35	20.77	21.01	21.04
		75#0	20.56	20.64	20.73
20M	QPSK	1#0	21.42	21.57	21.51
		1#49	21.22	21.33	21.28
		1#99	21.05	21.36	21.14
		50#0	21.03	21.36	21.21
		50#24	21.18	21.19	21.26
		50#49	21.18	21.18	21.32
		100#0	20.82	20.81	21.08
	16-QAM	1#0	20.67	20.98	20.86
		1#49	20.41	20.64	20.60
		1#99	20.46	20.62	20.58
		50#0	20.25	20.74	20.53
		50#24	20.41	20.73	20.58
		50#49	20.53	20.86	20.60
		100#0	20.18	20.48	20.29

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	22.03	22.21	22.13
		1#3	21.76	22.00	21.87
		1#5	21.67	21.83	21.92
		3#0	21.82	21.82	21.72
		3#1	21.87	21.95	22.00
		3#3	21.73	22.06	21.79
		6#0	21.45	21.71	21.43
	16-QAM	1#0	21.44	21.67	21.53
		1#3	21.18	21.38	21.25
		1#5	21.07	21.43	21.14
		3#0	21.23	21.41	21.12
		3#1	21.24	21.34	21.42
		3#3	21.32	21.28	21.35
		6#0	21.08	20.94	21.10
3M	QPSK	1#0	21.91	22.13	22.06
		1#7	21.69	21.76	21.75
		1#14	21.58	21.79	21.80
		8#0	21.66	21.75	21.63
		8#4	21.72	22.01	21.69
		8#7	21.70	21.93	21.82
		15#0	21.41	21.70	21.50
	16-QAM	1#0	21.54	21.83	21.73
		1#7	21.26	21.63	21.42
		1#14	21.16	21.51	21.50
		8#0	21.09	21.47	21.44
		8#4	21.43	21.73	21.50
		8#7	21.15	21.45	21.48
		15#0	20.76	21.09	21.22

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.42	21.67	21.53
		1#12	21.18	21.33	21.23
		1#24	21.02	21.37	21.28
		12#0	21.22	21.31	21.20
		12#6	21.21	21.56	21.33
		12#11	21.09	21.40	21.41
		25#0	20.74	21.06	21.09
	16-QAM	1#0	21.02	21.13	21.16
		1#12	20.67	20.89	20.81
		1#24	20.72	20.83	20.83
		12#0	20.76	20.91	20.95
		12#6	20.71	20.94	20.82
		12#11	20.70	20.98	21.00
		25#0	20.48	20.65	20.69
10M	QPSK	1#0	21.55	21.86	21.67
		1#24	21.25	21.59	21.36
		1#49	21.30	21.50	21.40
		25#0	21.35	21.44	21.44
		25#12	21.42	21.69	21.43
		25#24	21.30	21.70	21.42
		50#0	20.92	21.40	21.09
	16-QAM	1#0	21.21	21.34	21.43
		1#24	21.00	21.04	21.15
		1#49	21.00	20.95	21.05
		25#0	20.82	21.03	21.16
		25#12	21.10	21.00	21.11
		25#24	20.91	21.15	21.19
		50#0	20.64	20.80	20.89

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.86	22.13	22.01
		1#37	21.50	21.76	21.77
		1#74	21.64	21.76	21.78
		36#0	21.44	21.69	21.79
		36#17	21.55	21.75	21.79
		36#35	21.65	21.91	21.62
		75#0	21.26	21.67	21.40
	16-QAM	1#0	21.37	21.53	21.42
		1#37	21.06	21.26	21.05
		1#74	20.98	21.27	21.18
		36#0	20.97	21.15	21.20
		36#17	21.23	21.28	21.19
		36#35	21.22	21.13	21.05
		75#0	20.87	20.76	20.65
20M	QPSK	1#0	22.01	22.34	22.1
		1#49	21.62	22.10	21.71
		1#99	21.63	22.05	21.80
		50#0	21.67	21.96	21.87
		50#24	21.73	22.12	21.93
		50#49	21.76	22.21	21.74
		100#0	21.42	21.87	21.52
	16-QAM	1#0	21.19	21.37	21.42
		1#49	20.90	21.08	21.11
		1#99	20.95	21.15	21.11
		50#0	20.96	20.96	20.98
		50#24	21.05	21.15	21.13
		50#49	20.83	21.07	21.21
		100#0	20.52	20.75	20.86

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	22.35	22.42	22.37
		1#3	22.05	22.20	22.14
		1#5	22.04	22.14	22.05
		3#0	22.14	21.95	21.95
		3#1	22.22	22.26	22.15
		3#3	22.07	22.03	22.22
		6#0	21.67	21.77	21.92
	16-QAM	1#0	21.83	21.89	21.81
		1#3	21.55	21.53	21.44
		1#5	21.52	21.57	21.48
		3#0	21.56	21.44	21.48
		3#1	21.50	21.68	21.64
		3#3	21.55	21.67	21.67
		6#0	21.34	21.27	21.38
3M	QPSK	1#0	22.25	22.37	22.21
		1#7	22.01	22.11	21.88
		1#14	21.98	22.02	21.87
		8#0	21.90	22.12	21.81
		8#4	22.15	22.14	21.84
		8#7	22.05	22.25	21.88
		15#0	21.76	21.93	21.52
	16-QAM	1#0	21.57	21.67	21.59
		1#7	21.21	21.28	21.27
		1#14	21.22	21.30	21.24
		8#0	21.34	21.42	21.36
		8#4	21.45	21.35	21.42
		8#7	21.42	21.32	21.28
		15#0	21.09	21.09	20.90

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.24	22.34	22.29
		1#12	22.02	21.97	21.90
		1#24	21.87	21.95	22.05
		12#0	21.83	21.99	21.83
		12#6	22.00	22.12	21.96
		12#11	22.06	22.06	21.99
		25#0	21.86	21.86	21.75
	16-QAM	1#0	21.64	21.71	21.58
		1#12	21.28	21.45	21.27
		1#24	21.40	21.48	21.18
		12#0	21.39	21.40	21.37
		12#6	21.53	21.60	21.34
		12#11	21.54	21.37	21.20
		25#0	21.31	21.01	21.00
10M	QPSK	1#0	22.11	22.21	22.15
		1#24	21.89	21.92	21.86
		1#49	21.80	21.90	21.86
		25#0	21.69	21.94	21.82
		25#12	21.78	21.88	22.04
		25#24	21.95	22.03	21.99
		50#0	21.72	21.75	21.72
	16-QAM	1#0	21.71	21.85	21.67
		1#24	21.40	21.54	21.33
		1#49	21.49	21.64	21.44
		25#0	21.41	21.46	21.21
		25#12	21.52	21.49	21.40
		25#24	21.54	21.59	21.29
		50#0	21.26	21.20	20.93

LTE Band 7

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.05	22.12	22.03
		1#12	21.82	21.76	21.73
		1#24	21.72	21.74	21.77
		12#0	21.63	21.62	21.64
		12#6	21.79	21.94	21.92
		12#11	21.89	21.89	21.90
		25#0	21.66	21.61	21.50
	16-QAM	1#0	21.44	21.56	21.41
		1#12	21.04	21.25	21.11
		1#24	21.23	21.35	21.06
		12#0	21.10	21.21	20.92
		12#6	21.13	21.45	21.20
		12#11	21.24	21.35	21.04
		25#0	20.95	20.99	20.69
10M	QPSK	1#0	21.87	22.03	21.86
		1#24	21.67	21.66	21.62
		1#49	21.64	21.73	21.48
		25#0	21.52	21.74	21.65
		25#12	21.73	21.92	21.50
		25#24	21.76	21.88	21.69
		50#0	21.49	21.58	21.46
	16-QAM	1#0	21.33	21.46	21.37
		1#24	21.04	21.19	21.08
		1#49	20.99	21.20	21.07
		25#0	21.13	21.00	21.15
		25#12	21.05	21.33	20.99
		25#24	21.15	21.31	21.08
		50#0	20.83	20.92	20.80

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	22.07	22.34	22.11
		1#37	21.71	21.94	21.81
		1#74	21.84	22.03	21.78
		36#0	21.63	22.04	21.84
		36#17	21.95	22.09	21.82
		36#35	21.95	22.19	21.74
		75#0	21.58	21.88	21.39
	16-QAM	1#0	21.73	21.89	21.76
		1#37	21.43	21.56	21.38
		1#74	21.35	21.64	21.43
		36#0	21.47	21.63	21.49
		36#17	21.36	21.56	21.37
		36#35	21.53	21.53	21.54
		75#0	21.18	21.33	21.23
20M	QPSK	1#0	21.93	22.11	21.89
		1#49	21.58	21.78	21.66
		1#99	21.62	21.79	21.59
		50#0	21.50	21.86	21.42
		50#24	21.57	21.74	21.51
		50#49	21.75	21.96	21.62
		100#0	21.37	21.72	21.25
	16-QAM	1#0	21.45	21.56	21.41
		1#49	21.12	21.19	21.18
		1#99	21.14	21.19	21.05
		50#0	21.10	21.24	20.93
		50#24	21.10	21.24	21.29
		50#49	21.11	21.43	21.30
		100#0	20.86	21.21	20.90

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	22.71	22.56	22.64
		1#3	22.38	22.35	22.31
		1#5	22.47	22.25	22.38
		3#0	22.38	22.15	22.22
		3#1	22.51	22.19	22.28
		3#3	22.43	22.45	22.35
		6#0	22.03	22.21	22.05
	16-QAM	1#0	21.97	21.89	21.91
		1#3	21.58	21.61	21.58
		1#5	21.70	21.50	21.69
		3#0	21.52	21.57	21.42
		3#1	21.67	21.70	21.54
		3#3	21.81	21.58	21.77
		6#0	21.43	21.22	21.48
3M	QPSK	1#0	22.71	22.43	22.46
		1#7	22.34	22.18	22.17
		1#14	22.43	22.04	22.11
		8#0	22.35	21.97	21.99
		8#4	22.43	22.25	22.33
		8#7	22.35	22.16	22.30
		15#0	21.99	21.87	21.98
	16-QAM	1#0	21.61	21.5	21.43
		1#7	21.34	21.21	21.19
		1#14	21.40	21.10	21.16
		8#0	21.38	21.13	21.22
		8#4	21.29	21.21	21.16
		8#7	21.49	21.25	21.17
		15#0	21.27	20.92	20.92

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.43	22.31	22.11
		1#12	22.10	22.09	21.75
		1#24	22.18	21.96	21.78
		12#0	22.12	21.92	21.64
		12#6	22.28	21.98	21.95
		12#11	22.25	22.05	21.95
		25#0	22.04	21.72	21.56
	16-QAM	1#0	21.81	21.65	21.68
		1#12	21.54	21.31	21.35
		1#24	21.58	21.25	21.44
		12#0	21.54	21.26	21.46
		12#6	21.59	21.44	21.42
		12#11	21.65	21.33	21.39
		25#0	21.27	21.12	21.19
10M	QPSK	1#0	22.31	22.54	22.24
		1#24	21.98	22.30	21.94
		1#49	21.94	22.18	21.91
		25#0	21.90	22.14	21.88
		25#12	22.13	22.25	22.12
		25#24	22.11	22.34	22.12
		50#0	21.86	22.05	21.85
	16-QAM	1#0	21.72	21.83	21.64
		1#24	21.41	21.63	21.28
		1#49	21.33	21.55	21.34
		25#0	21.28	21.43	21.19
		25#12	21.44	21.66	21.34
		25#24	21.36	21.56	21.46
		50#0	21.07	21.35	21.08

LTE Band 13

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.41	22.43	22.52
		1#12	22.14	22.19	22.14
		1#24	22.05	22.20	22.17
		12#0	22.05	22.05	22.31
		12#6	22.03	22.13	22.31
		12#11	22.21	22.06	22.33
		25#0	21.89	21.70	21.99
	16-QAM	1#0	21.76	21.83	21.86
		1#12	21.54	21.51	21.66
		1#24	21.54	21.50	21.53
		12#0	21.44	21.56	21.66
		12#6	21.46	21.66	21.48
		12#11	21.45	21.60	21.70
		25#0	21.16	21.29	21.50
10M	QPSK	1#0	/	22.16	/
		1#24	/	21.81	/
		1#49	/	21.78	/
		25#0	/	21.95	/
		25#12	/	21.83	/
		25#24	/	21.87	/
		50#0	/	21.55	/
	16-QAM	1#0	/	21.54	/
		1#24	/	21.27	/
		1#49	/	21.29	/
		25#0	/	21.23	/
		25#12	/	21.41	/
		25#24	/	21.20	/
		50#0	/	20.98	/

LTE Band 17

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.43	22.57	22.36
		1#12	22.15	22.31	22.14
		1#24	22.06	22.32	22.09
		12#0	22.17	22.10	22.15
		12#6	22.07	22.37	22.12
		12#11	22.07	22.23	21.98
		25#0	21.81	21.90	21.76
	16-QAM	1#0	21.55	21.81	21.64
		1#12	21.31	21.50	21.40
		1#24	21.28	21.49	21.42
		12#0	21.09	21.47	21.42
		12#6	21.21	21.57	21.44
		12#11	21.42	21.42	21.38
		25#0	21.06	21.02	21.17
10M	QPSK	1#0	22.34	22.41	22.54
		1#24	22.00	22.06	22.33
		1#49	22.03	22.18	22.25
		25#0	21.95	21.94	22.21
		25#12	21.99	22.11	22.39
		25#24	22.12	22.12	22.26
		50#0	21.79	21.86	21.87
	16-QAM	1#0	21.71	21.67	21.59
		1#24	21.48	21.37	21.25
		1#49	21.39	21.35	21.35
		25#0	21.40	21.34	21.34
		25#12	21.48	21.44	21.48
		25#24	21.35	21.52	21.34
		50#0	21.13	21.18	21.11

Peak-to-average ratio (PAR):

WCDMA Band V:

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	3.21	≤ 13
	Middle	3.14	≤ 13
	High	3.14	≤ 13
WCDMA (HSDPA)	Low	2.74	≤ 13
	Middle	2.71	≤ 13
	High	2.78	≤ 13
WCDMA (HSUPA)	Low	2.67	≤ 13
	Middle	2.71	≤ 13
	High	2.76	≤ 13
WCDMA (HSPA+)	Low	2.55	≤ 13
	Middle	2.53	≤ 13
	High	2.62	≤ 13

WCDMA Band II

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	2.69	≤ 13
	Middle	2.76	≤ 13
	High	2.80	≤ 13
WCDMA (HSDPA)	Low	2.61	≤ 13
	Middle	2.63	≤ 13
	High	2.71	≤ 13
WCDMA (HSUPA)	Low	2.62	≤ 13
	Middle	2.69	≤ 13
	High	2.71	≤ 13
WCDMA (HSPA+)	Low	2.53	≤ 13
	Middle	2.61	≤ 13
	High	2.7	≤ 13

WCDMA Band IV

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	2.77	≤ 13
	Middle	2.85	≤ 13
	High	2.89	≤ 13
WCDMA (HSDPA)	Low	2.61	≤ 13
	Middle	2.64	≤ 13
	High	2.72	≤ 13
WCDMA (HSUPA)	Low	2.51	≤ 13
	Middle	2.45	≤ 13
	High	2.47	≤ 13
WCDMA (HSPA+)	Low	2.42	≤ 13
	Middle	2.36	≤ 13
	High	2.34	≤ 13

LTE Band 2

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit (dB)
QPSK	1 RB	20M	3.53	3.72	3.66	13
	100 RB		5.58	5.75	5.63	13
16-QAM	1 RB	20M	4.42	4.6	4.56	13
	100 RB		6.39	6.64	6.53	13

LTE Band 4

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.46	3.6	3.66	13
	100 RB		5.54	5.58	5.66	13
16-QAM	1 RB	20M	4.31	4.61	4.56	13
	100 RB		6.41	6.53	6.65	13

LTE Band 5

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	10M	3.36	3.66	3.66	13
	50 RB		5.35	5.62	5.57	13
16-QAM	1 RB	10M	4.6	4.71	4.56	13
	50 RB		6.65	6.81	6.62	13

LTE Band 7

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.25	3.71	3.66	13
	100 RB		5.17	5.64	5.64	13
16-QAM	1 RB	20M	4.41	4.8	4.56	13
	100 RB		6.44	6.73	6.56	13

LTE Band 12

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	10M	3.45	2.6	3.66	13
	50 RB		5.47	4.55	5.66	13
16-QAM	1 RB	10M	4.35	4.82	4.56	13
	50 RB		6.31	6.88	6.53	13

LTE Band 13

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	10M	/	3.66	/	13
	50 RB		/	5.73	/	13
16-QAM	1 RB	10M	/	4.71	/	13
	50 RB		/	6.66	/	13

LTE Band 17

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	10M	3.56	3.60	3.66	13
	50 RB		5.55	5.65	5.72	13
16-QAM	1 RB	10M	4.22	4.61	4.56	13
	50 RB		6.26	6.69	6.53	13

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

Applicable Standards

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

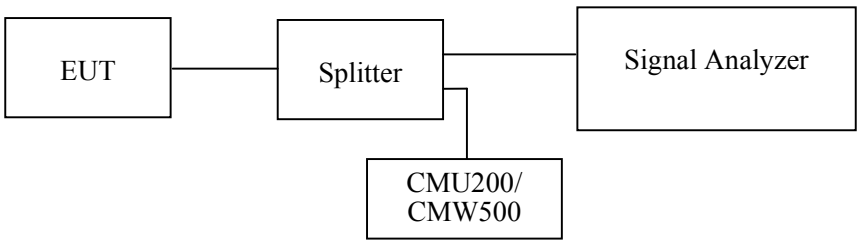
Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set as follow:

RBW=5 kHz For Cellular/PCS
RBW=100 kHz For WCDMA
RBW=20kHz For 1.4M LTE
RBW=30kHz For 3.0M LTE
RBW=50kHz For 5.0M LTE
RBW=100kHz For 10M LTE
RBW=200kHz For 15M LTE & 20M LTE

and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	23.2℃-23.5℃
Relative Humidity:	51 %-53%
ATM Pressure:	101.1kPa-103.3kPa

The testing was performed by Max Min from 2019-07-15 to 2019-08-30.

EUT operation mode: Transmitting

Test Result: Compliant.

WCDMA Band V

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (Rel 99)	836.6	4.729	4.148
WCDMA (HSDPA)	836.6	4.749	4.168
WCDMA (HSUPA)	836.6	4.749	4.168
WCDMA (HSPA+)	836.6	4.749	4.188

WCDMA Band II

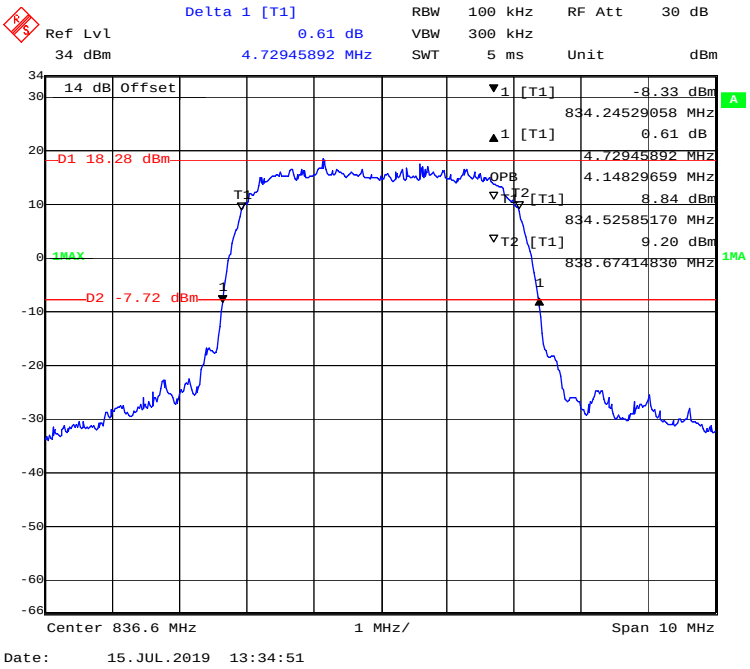
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (Rel 99)	1880	4.770	4.168
WCDMA (HSDPA)	1880	4.770	4.188
WCDMA (HSUPA)	1880	4.770	4.168
WCDMA (HSPA+)	1880	4.770	4.168

WCDMA Band IV

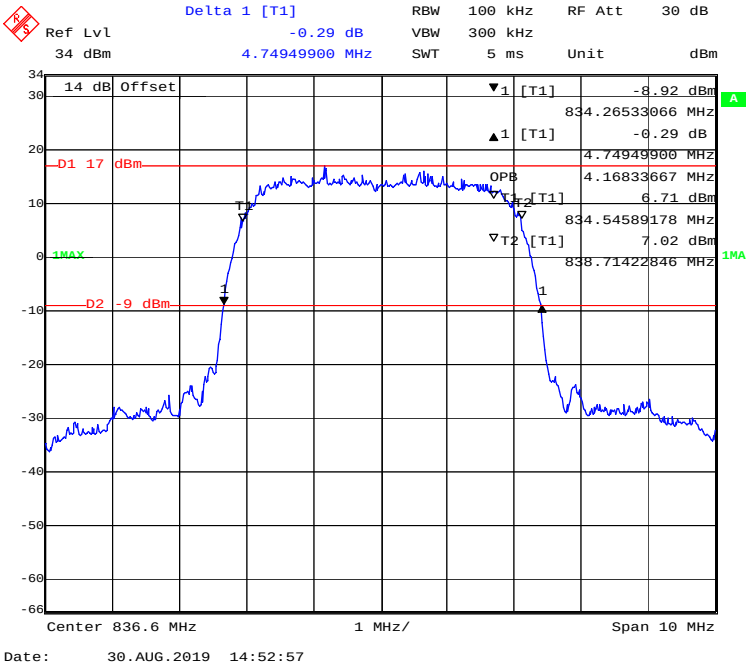
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (Rel 99)	1732.6	4.770	4.168
WCDMA (HSDPA)	1732.6	4.770	4.188
WCDMA (HSUPA)	1732.6	4.770	4.188
WCDMA (HSPA+)	1732.6	4.749	4.188

WCDMA Band V

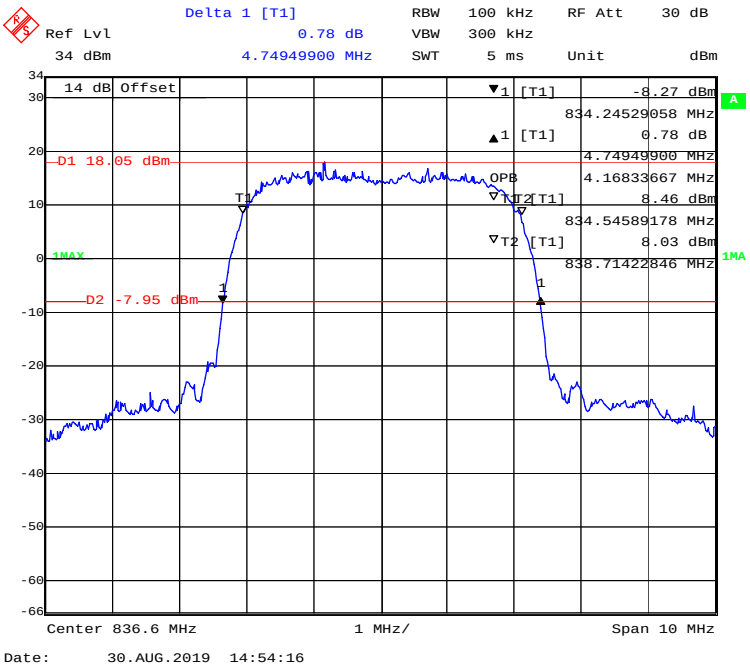
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode



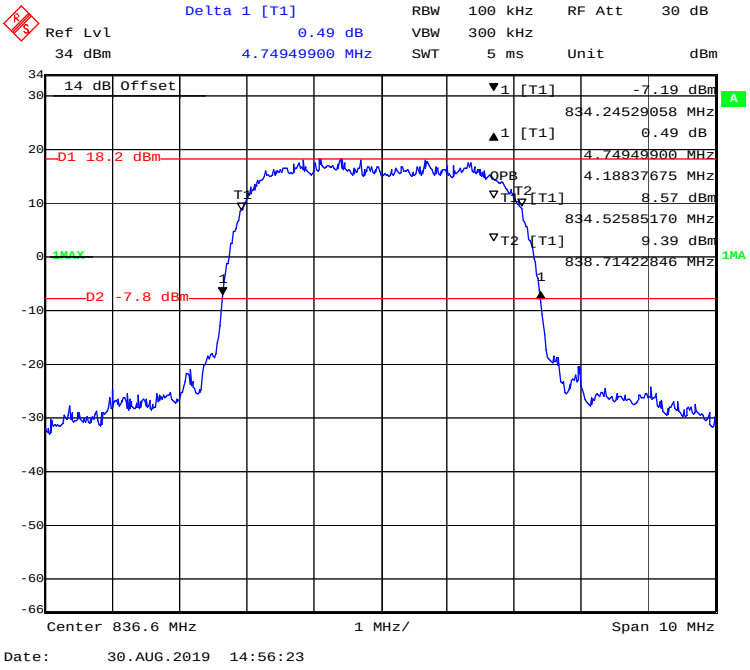
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



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

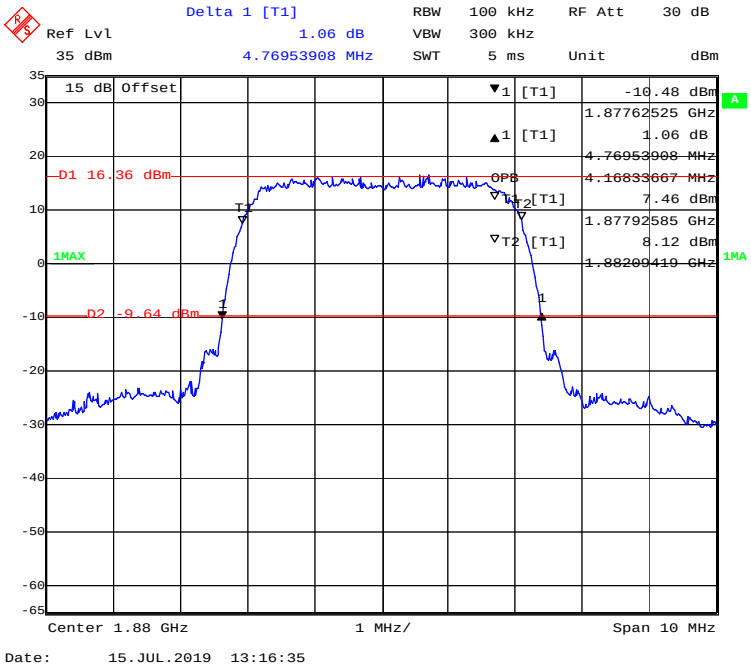


99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode

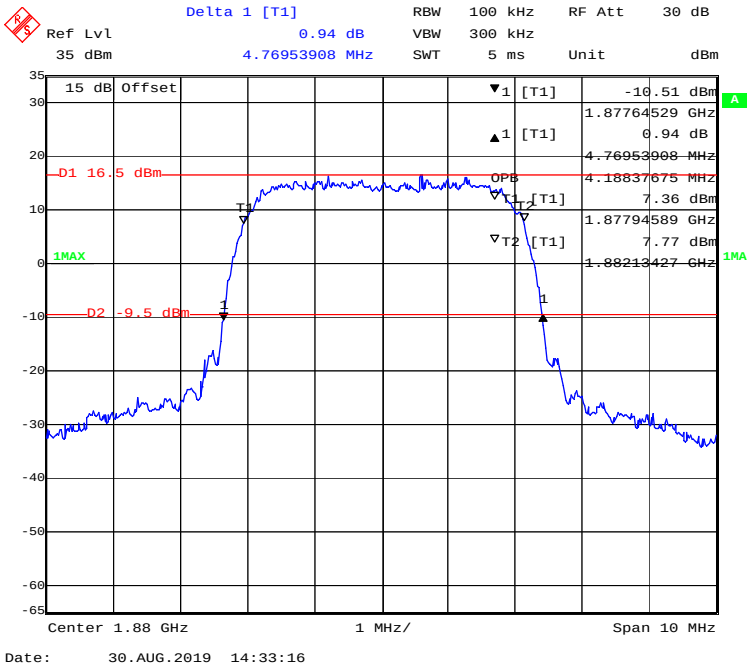


WCDMA Band II

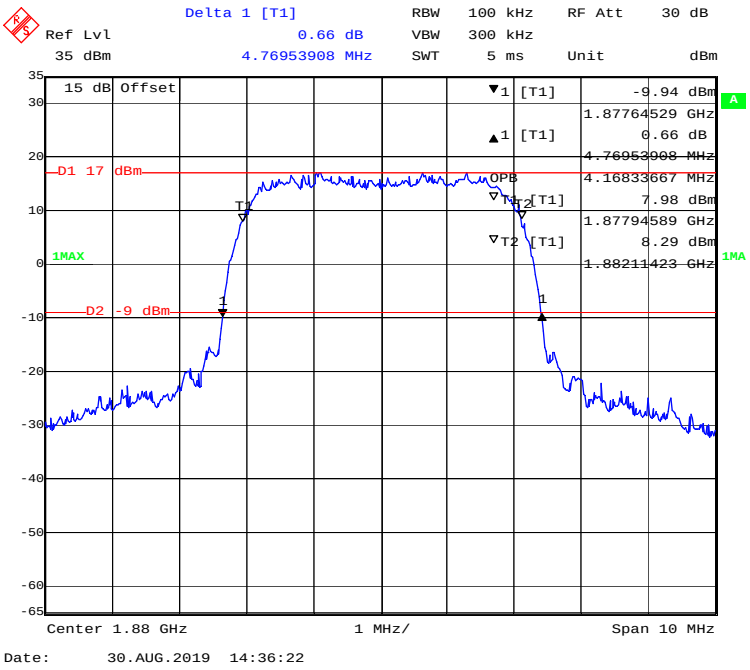
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode



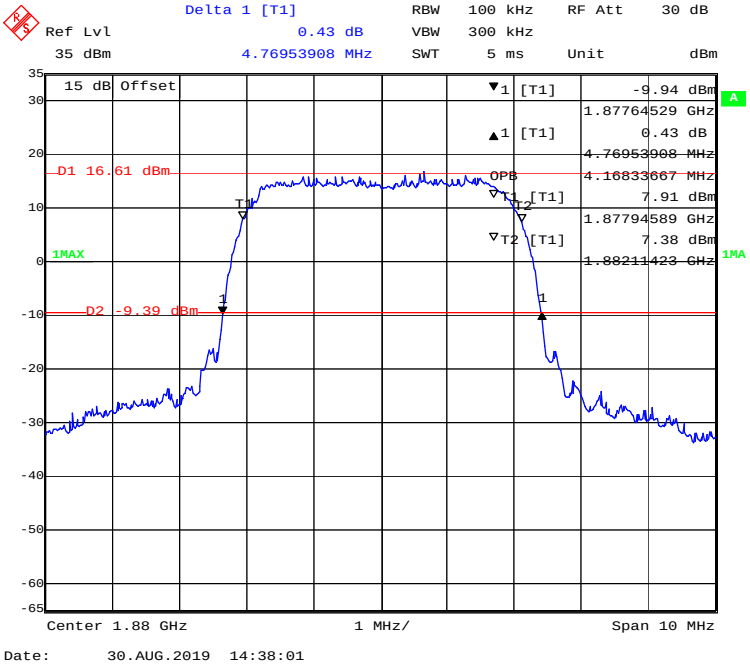
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



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

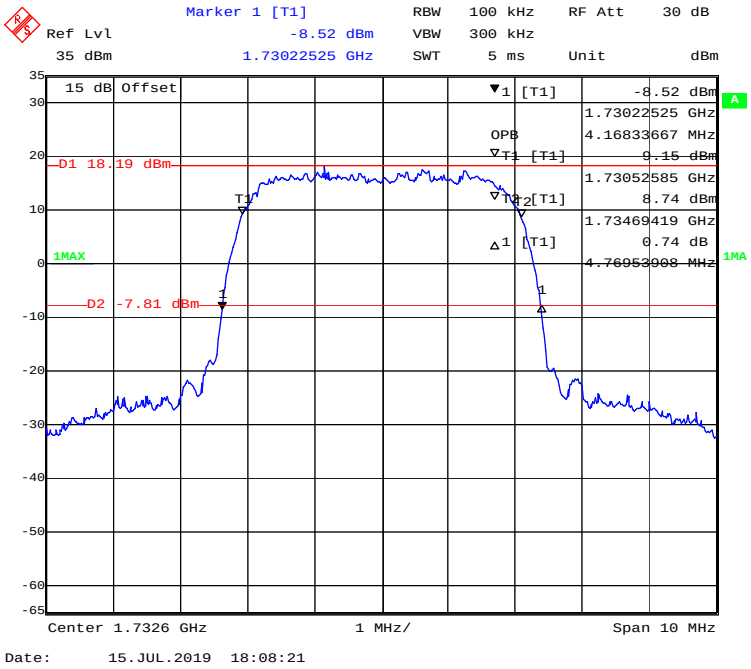


99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode

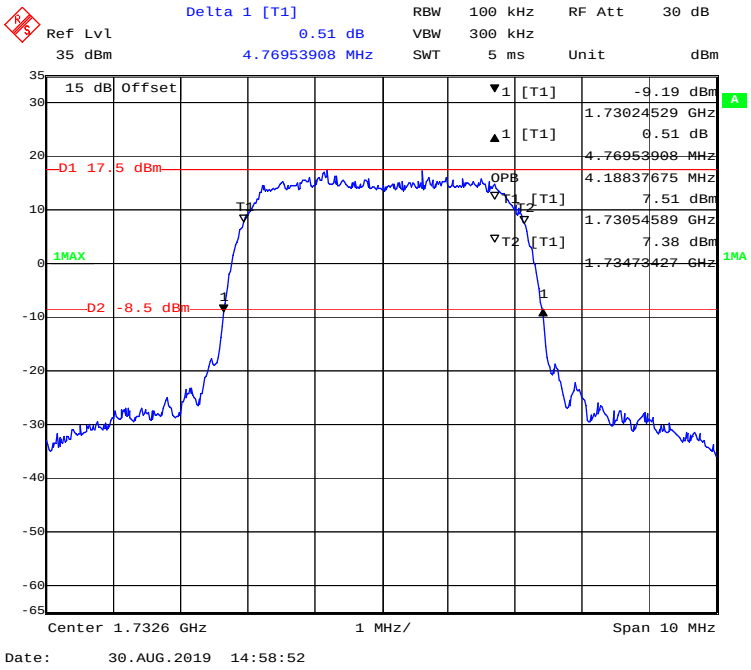


WCDMA Band IV

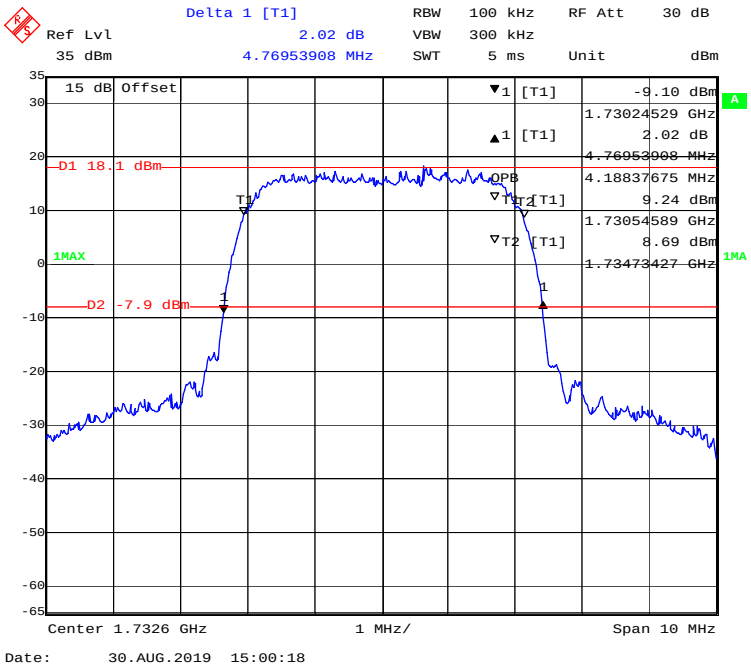
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode



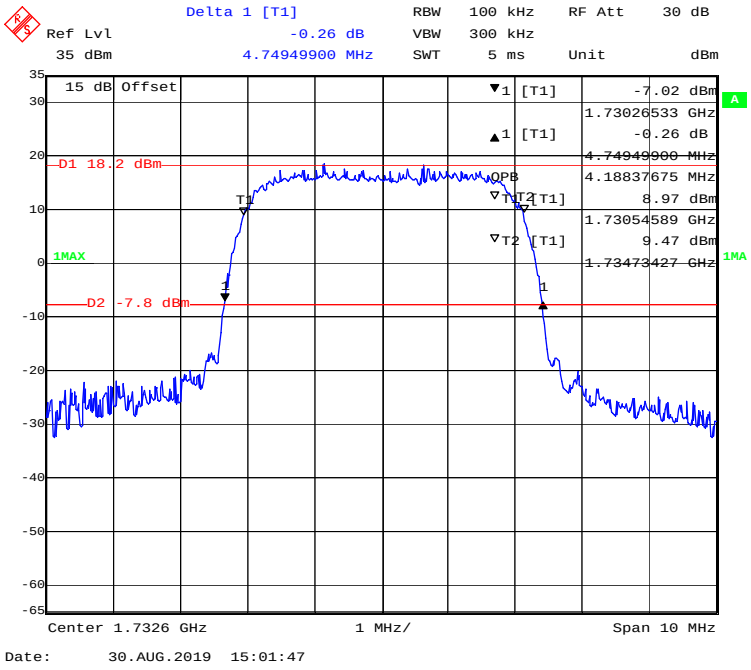
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



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



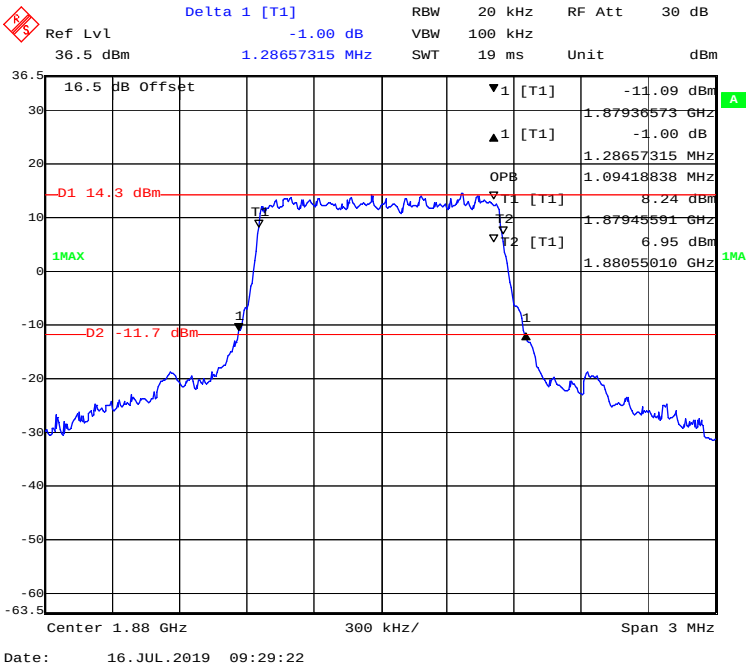
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode



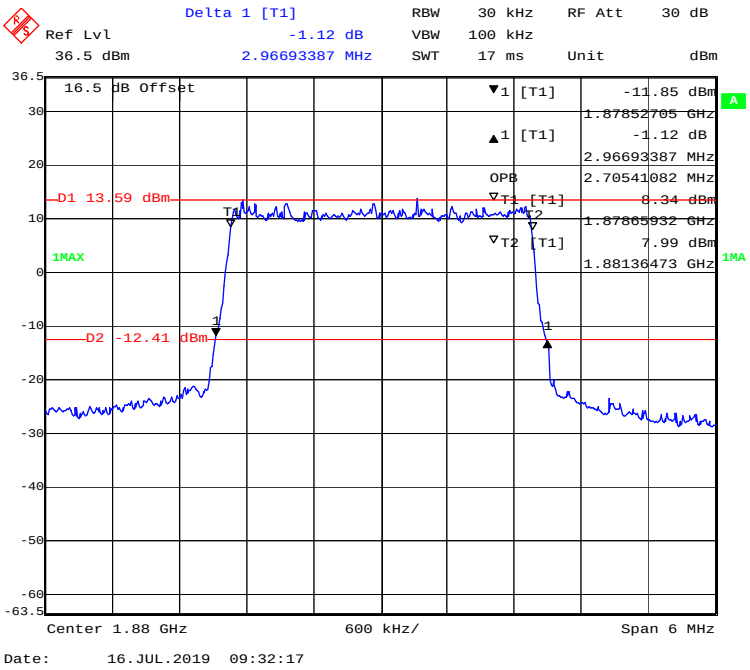
LTE Band 2:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.287	1.094
	3M		2.967	2.705
	5M		4.991	4.509
	10M		9.860	8.978
	15M		14.790	13.527
	20M		19.238	17.956
16-QAM	1.4M	Middle	1.293	1.094
	3M		2.970	2.693
	5M		4.890	4.489
	10M		9.780	8.938
	15M		14.929	13.467
	20M		19.319	17.956

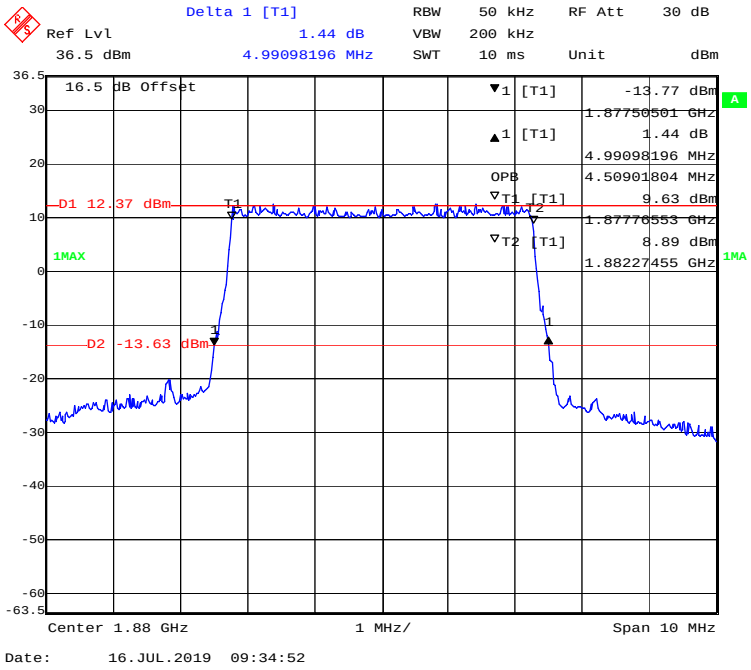
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



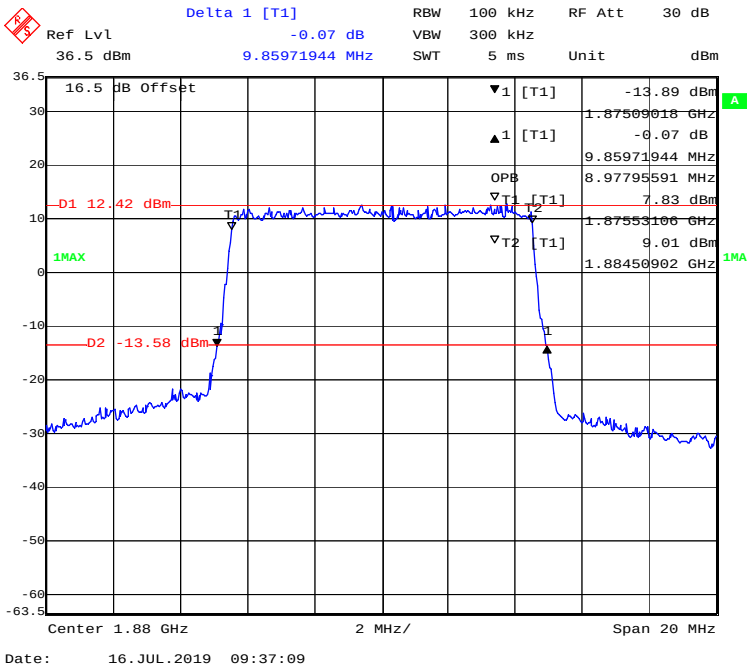
QPSK (3 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



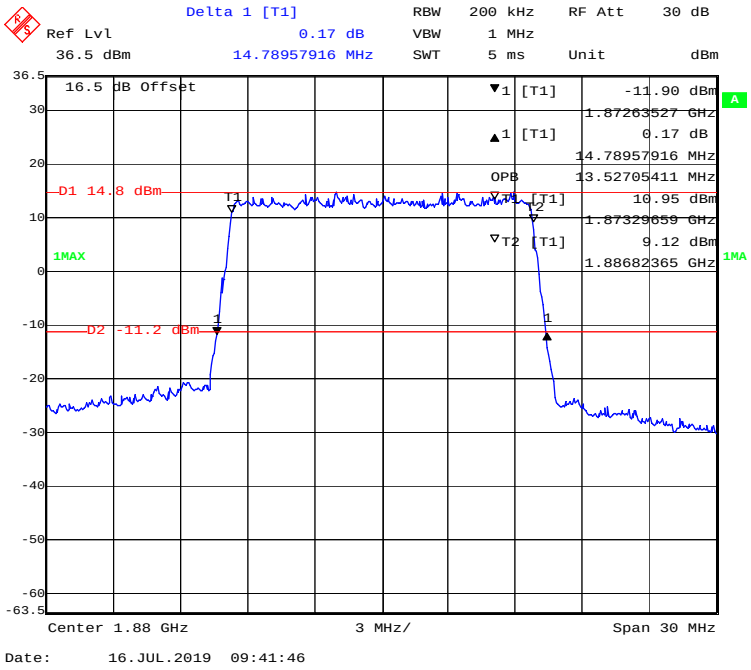
QPSK (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



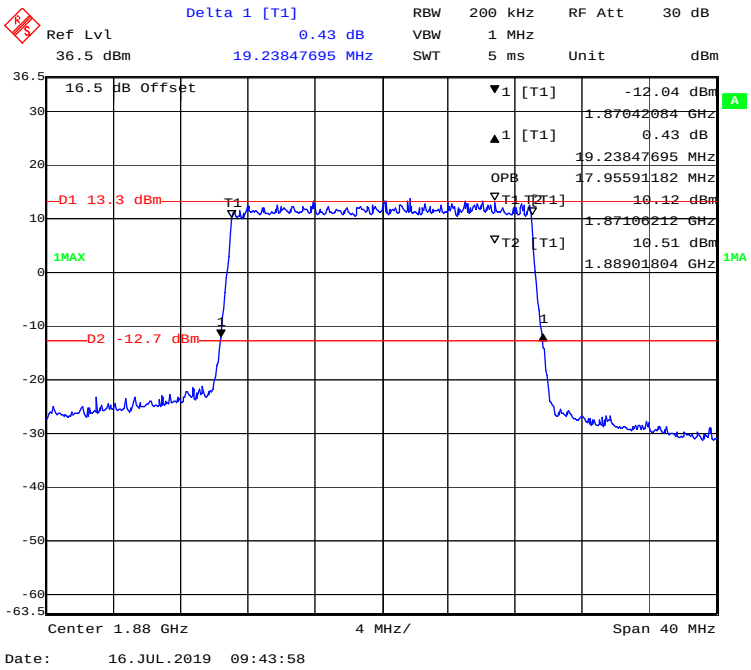
QPSK (10MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



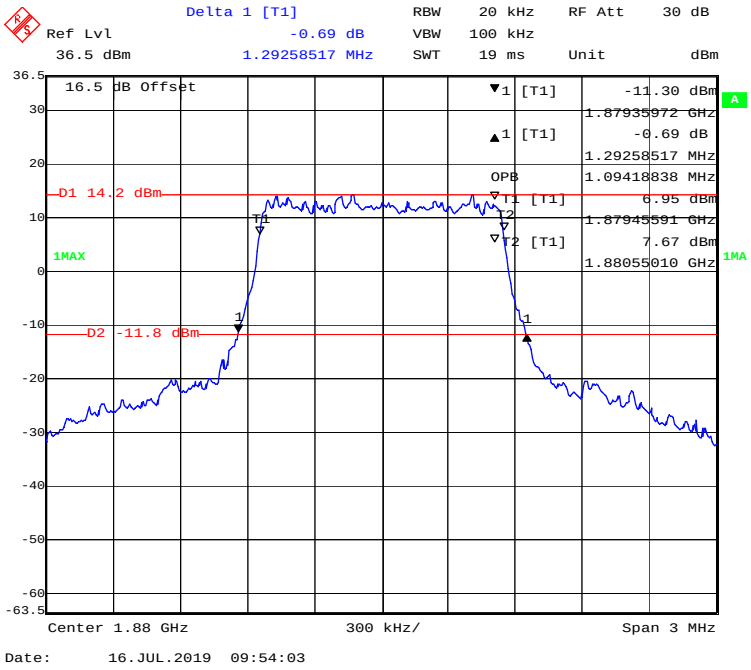
QPSK (15 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



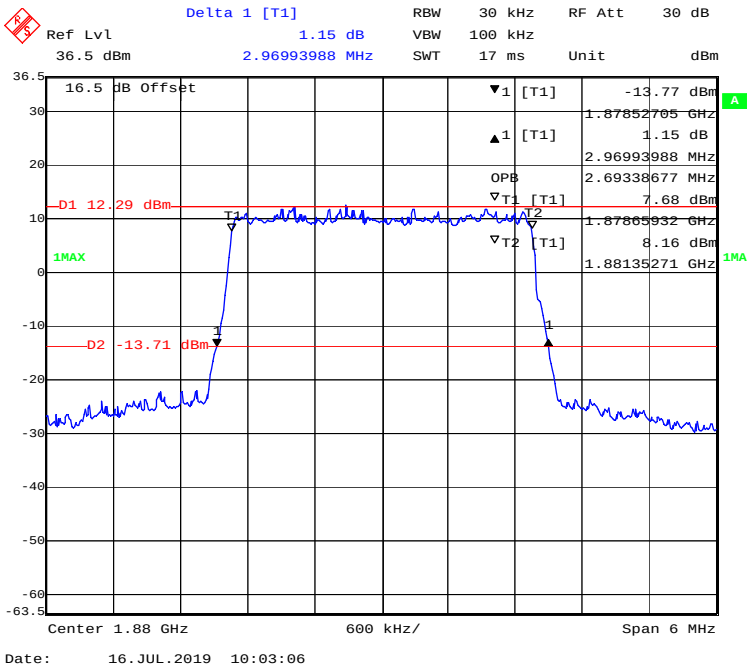
QPSK (20 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



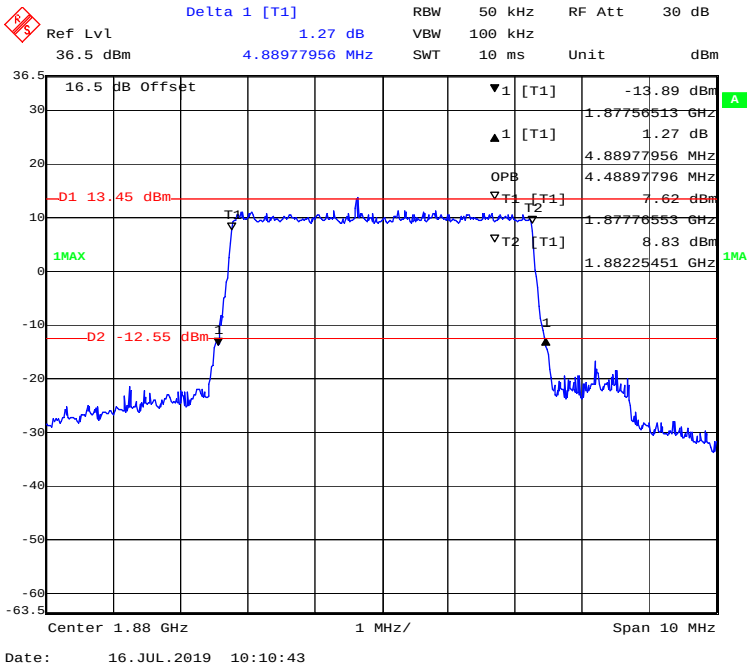
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



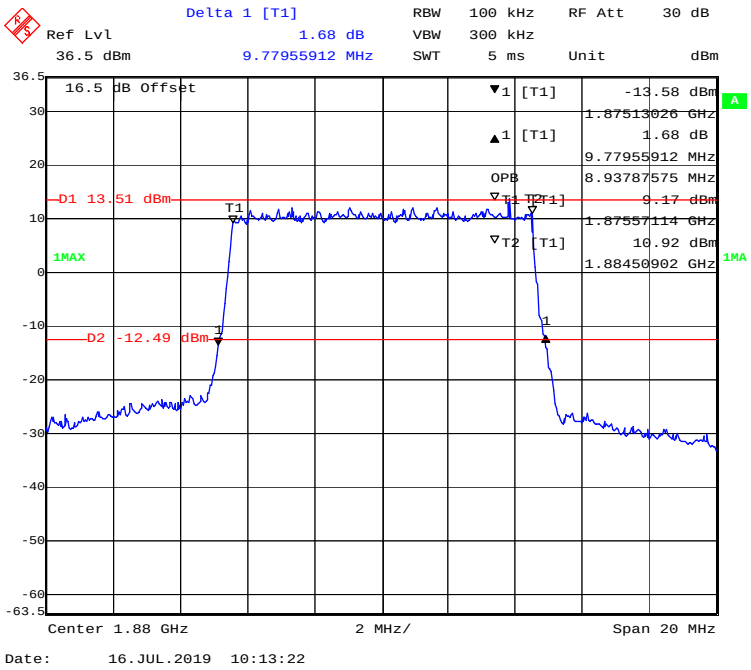
16-QAM (3 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



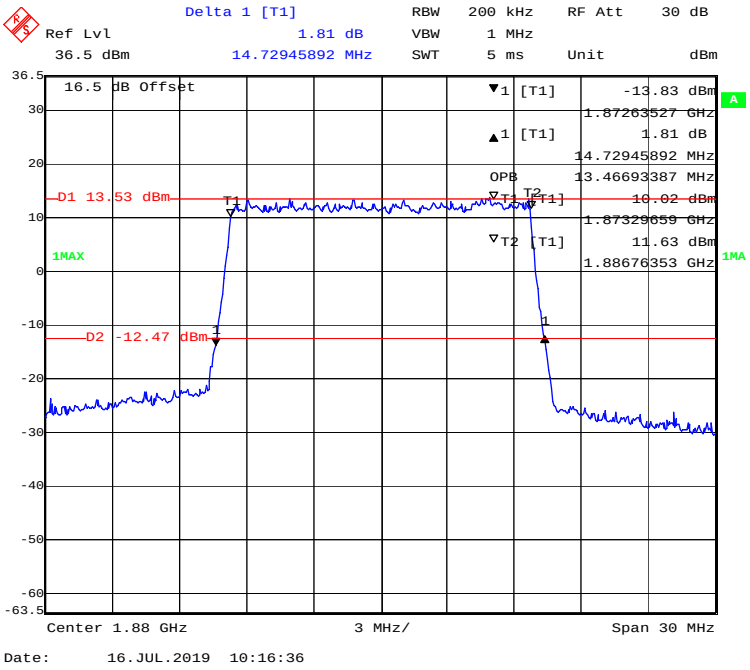
16-QAM (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



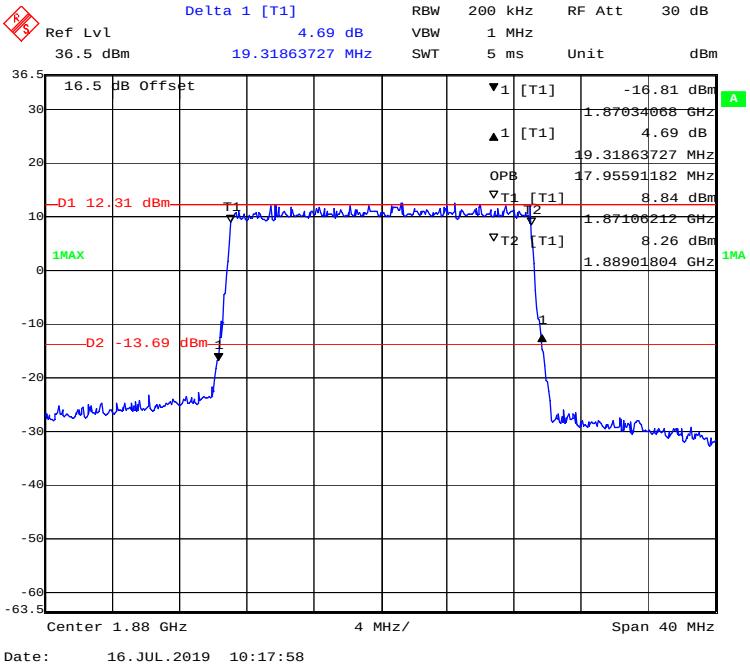
16-QAM (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (15 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



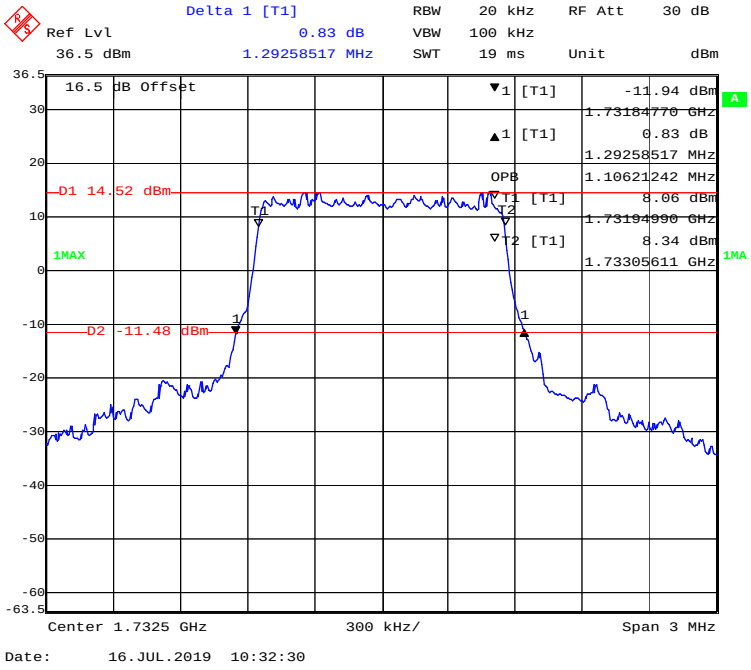
16-QAM (20 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



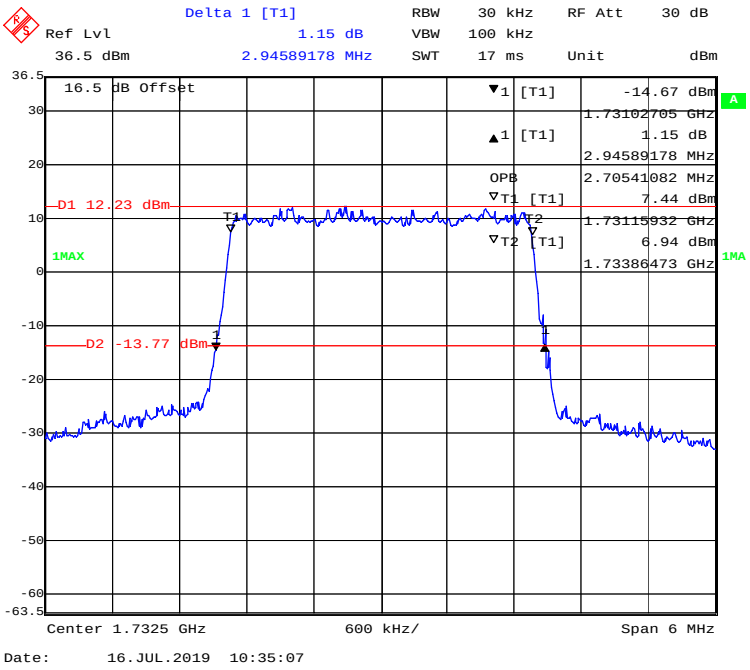
LTE Band 4:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.293	1.106
	3M		2.946	2.705
	5M		5.010	4.509
	10M		9.780	8.978
	15M		14.790	13.467
	20M		19.319	17.956
16-QAM	1.4M	Middle	1.293	1.094
	3M		2.982	2.705
	5M		4.950	4.489
	10M		9.739	8.938
	15M		14.729	13.467
	20M		19.319	17.956

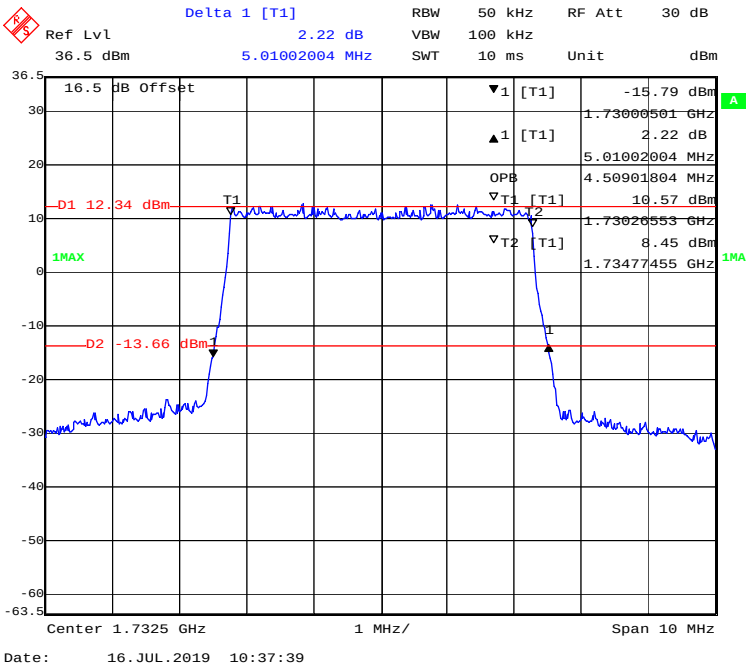
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



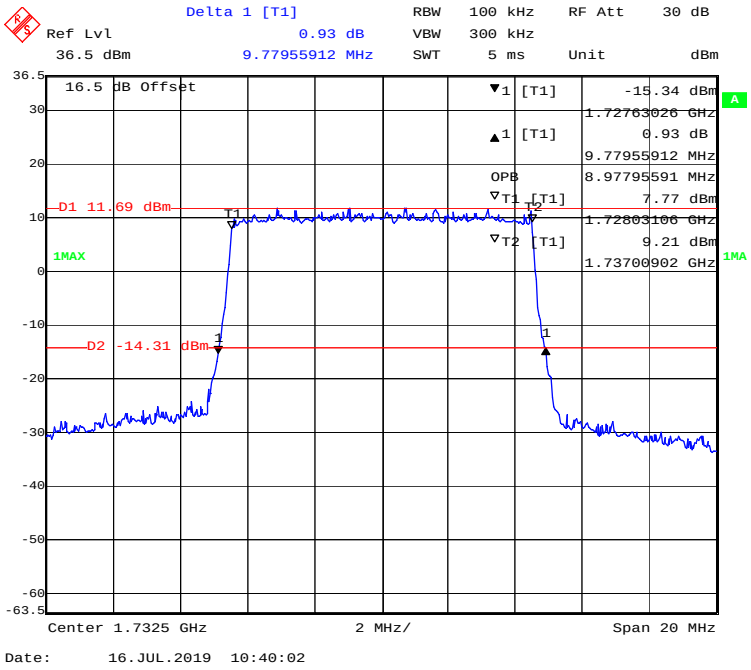
QPSK (3 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



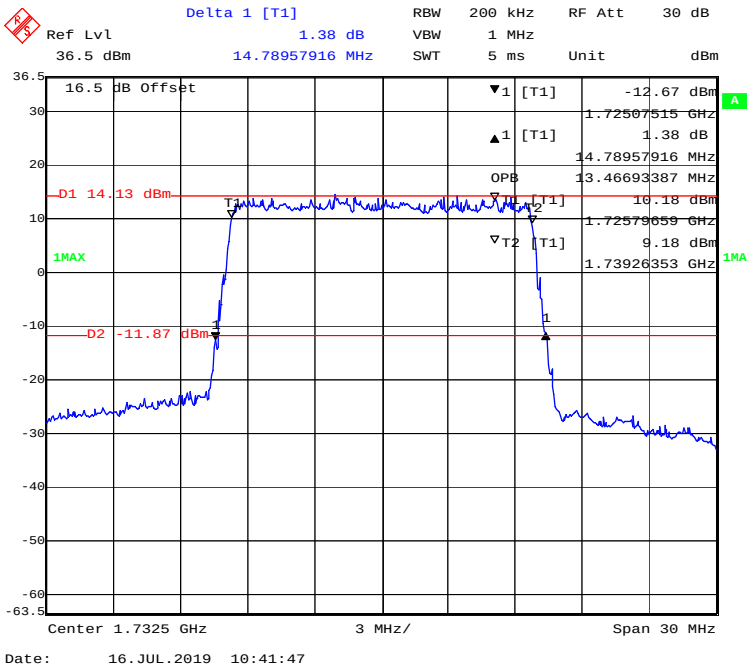
QPSK (5MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



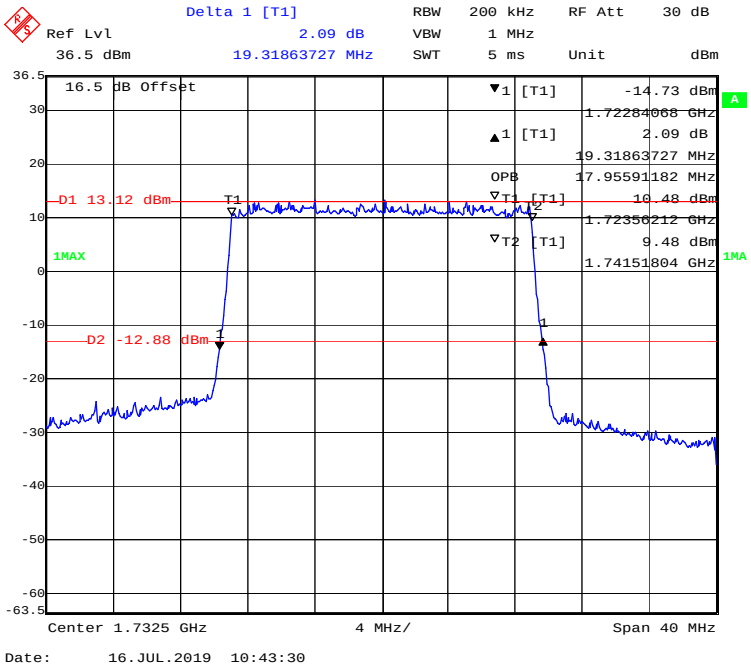
QPSK (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



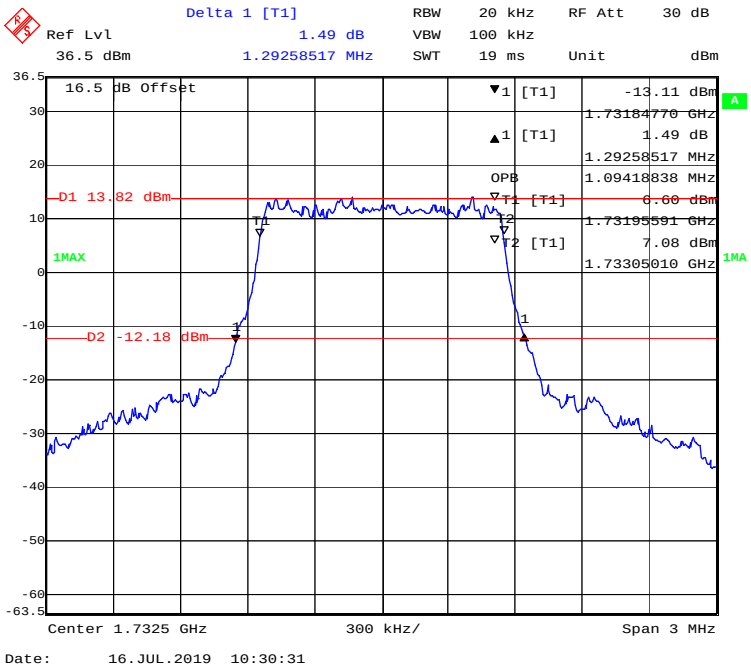
QPSK (15 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



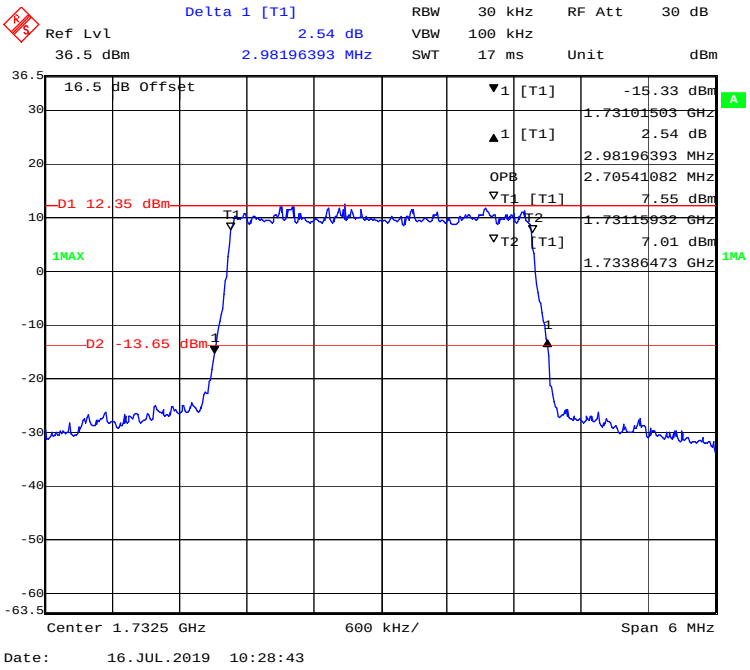
QPSK (20 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



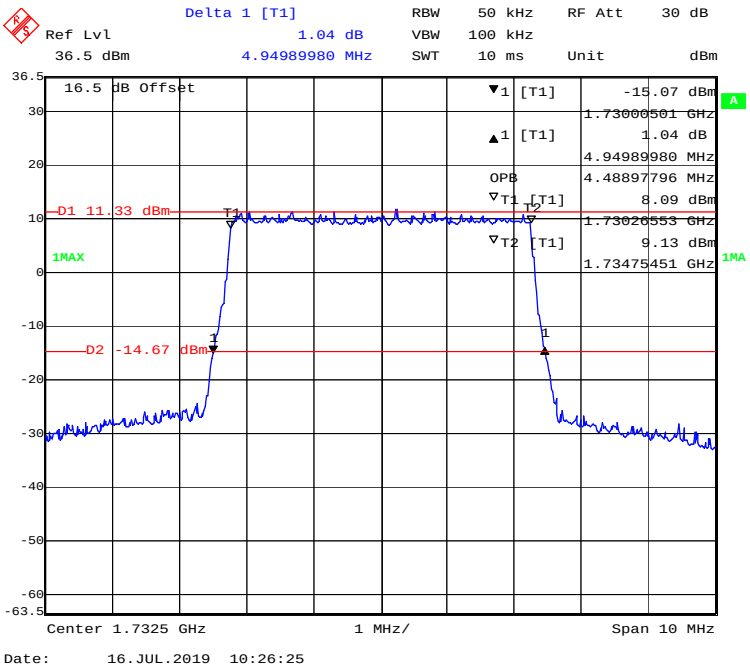
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



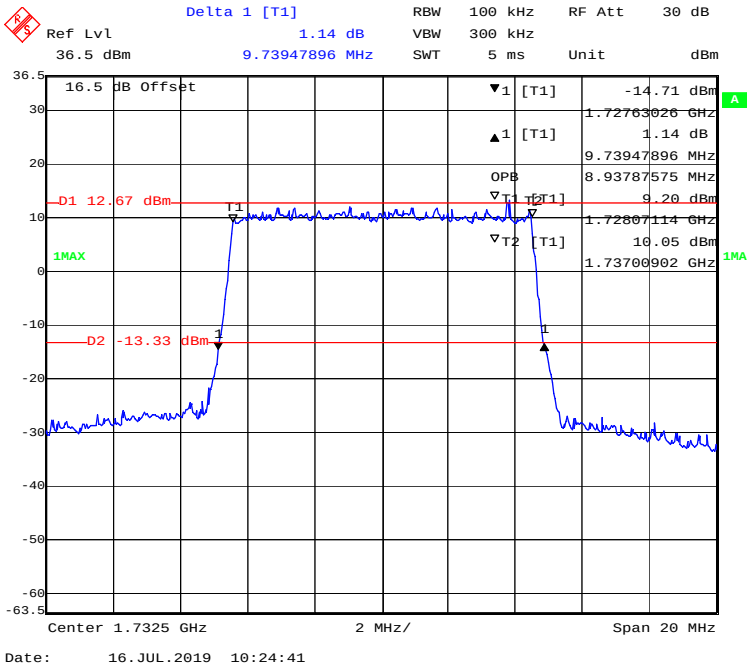
16-QAM (3 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



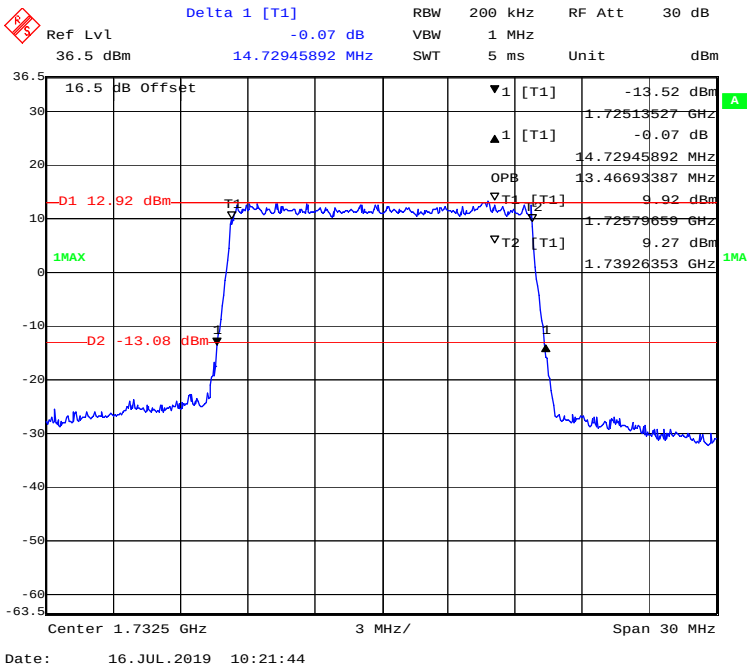
16-QAM (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



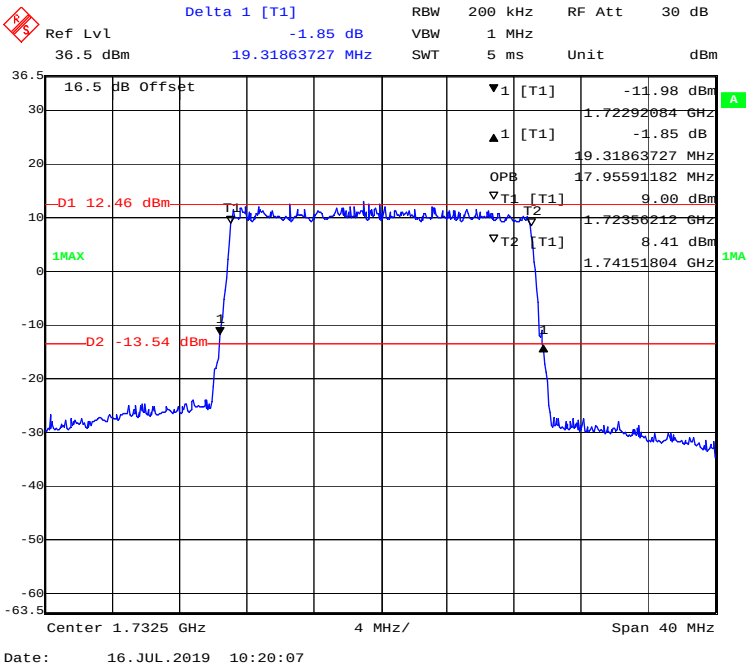
16-QAM (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (15 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



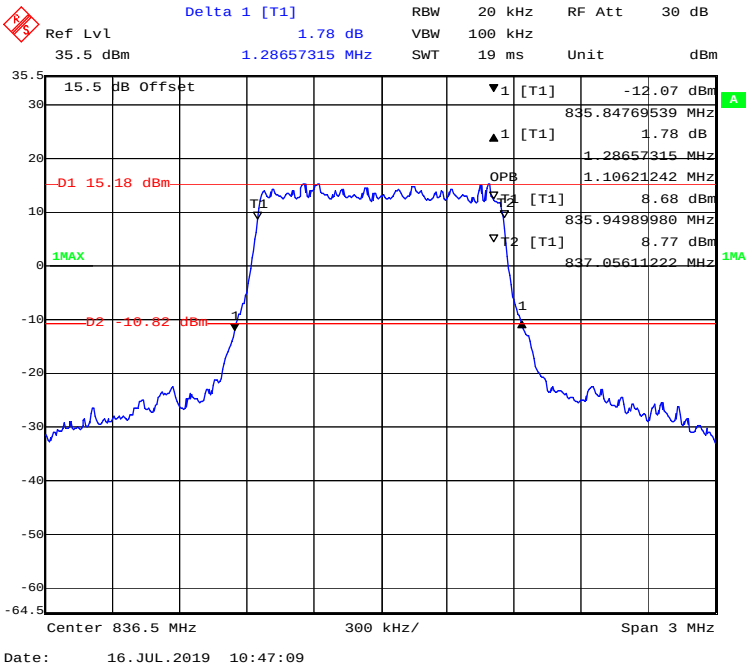
16-QAM (20 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



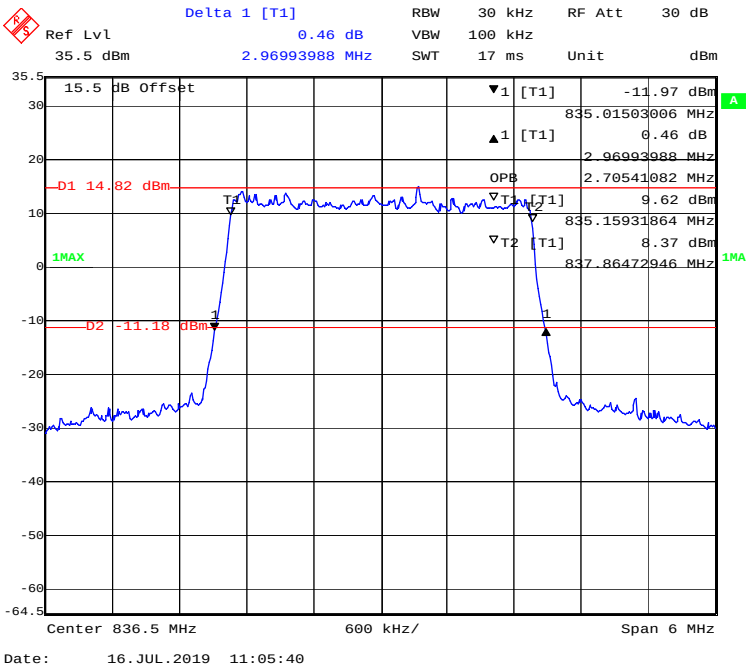
LTE Band 5:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.287	1.106
	3M		2.970	2.705
	5M		4.950	4.489
	10M		9.860	8.978
16-QAM	1.4M	Middle	1.281	1.094
	3M		2.982	2.705
	5M		4.930	4.489
	10M		9.739	8.978

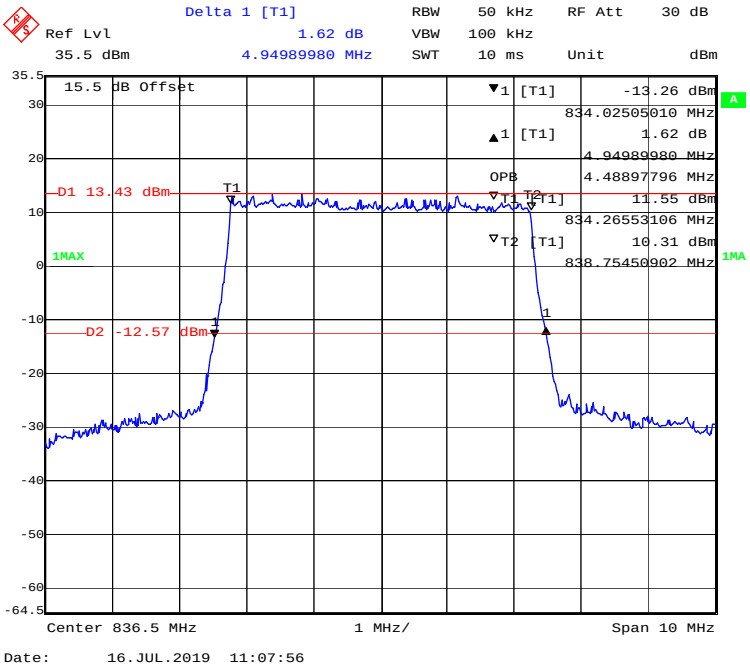
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



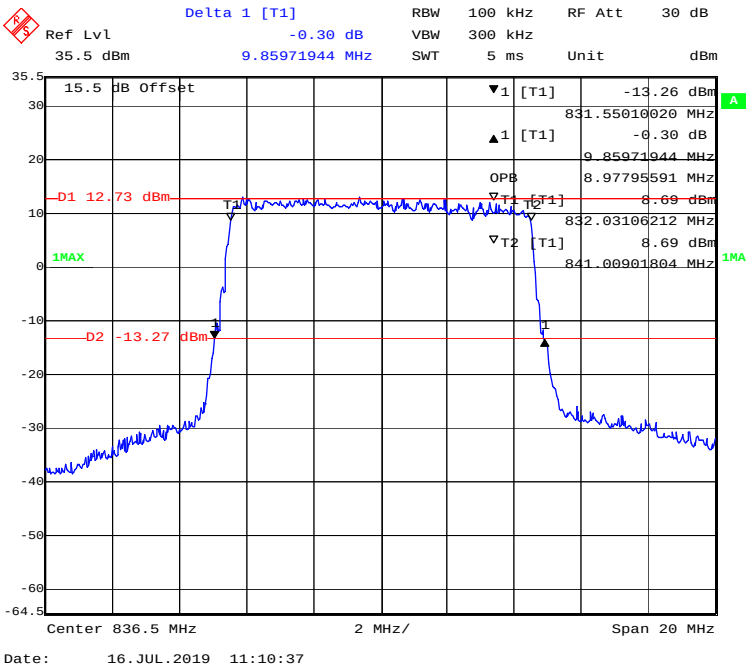
QPSK (3 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



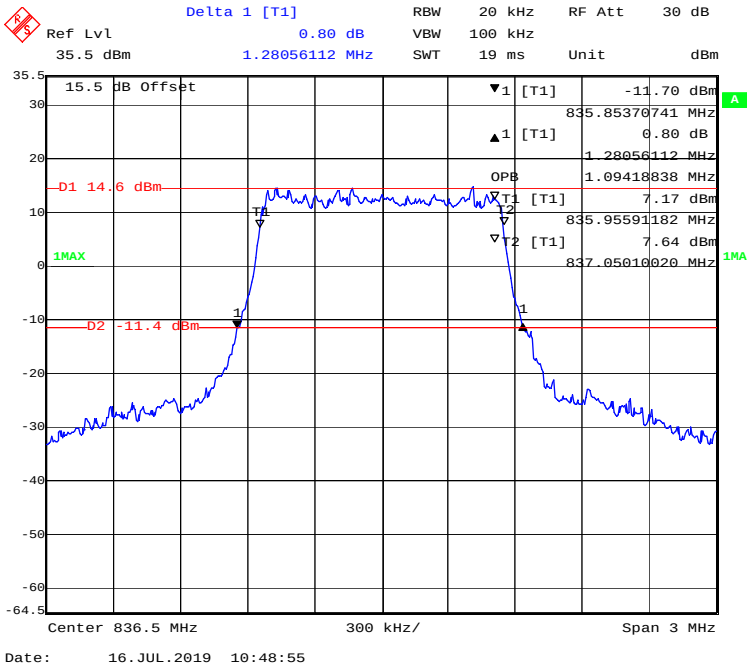
QPSK (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



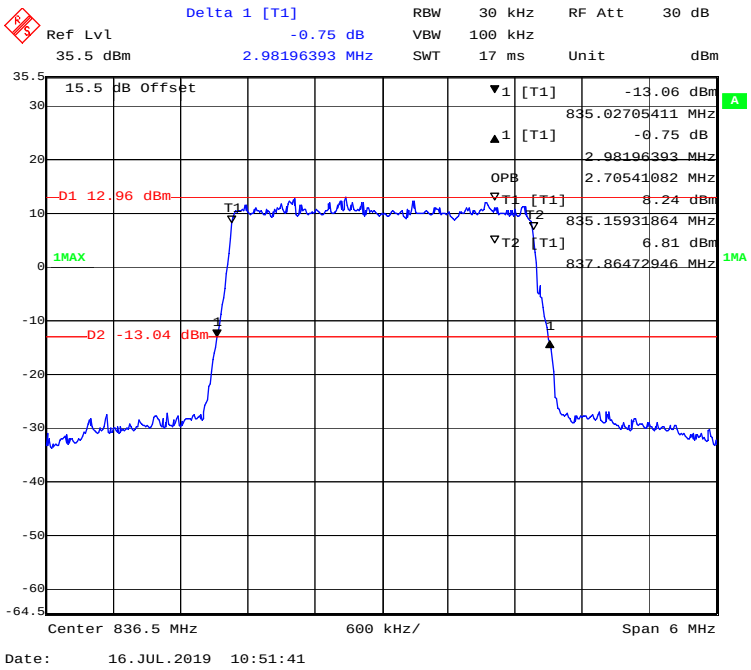
QPSK (10MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



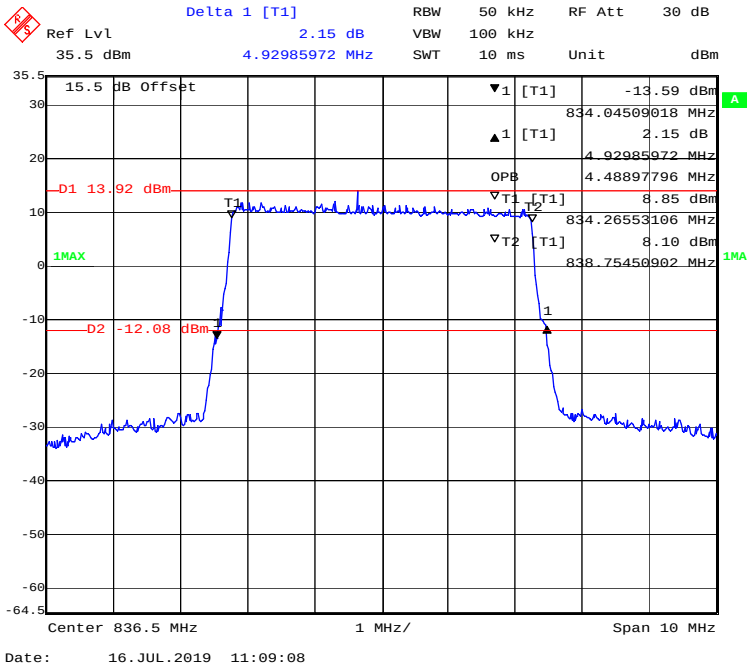
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



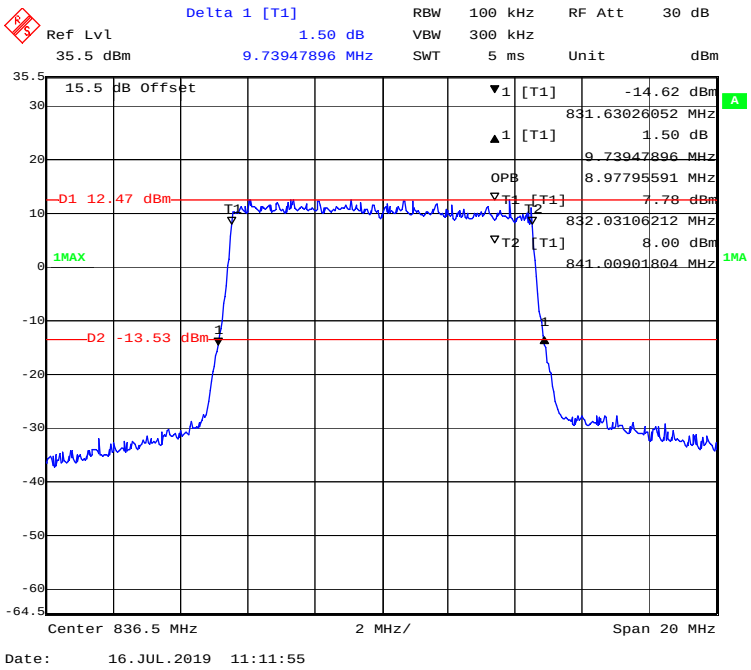
16-QAM (3 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



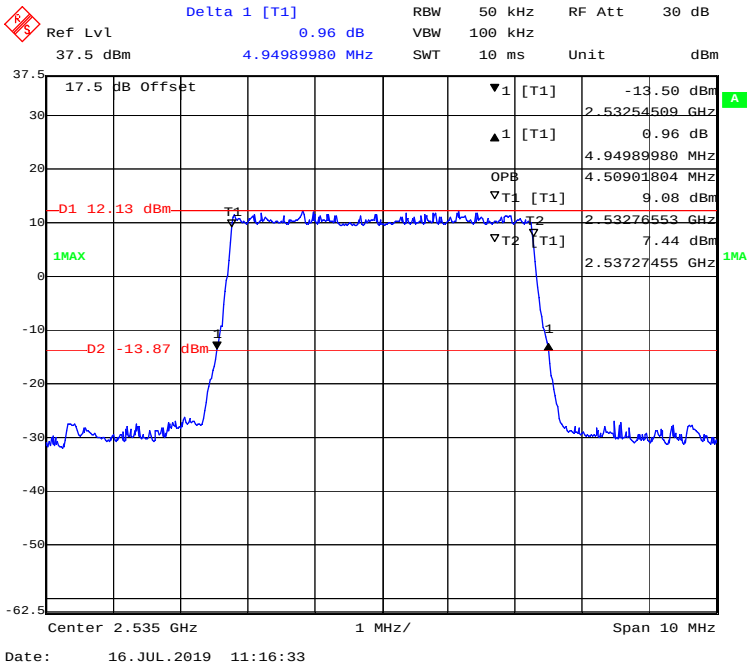
16-QAM (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



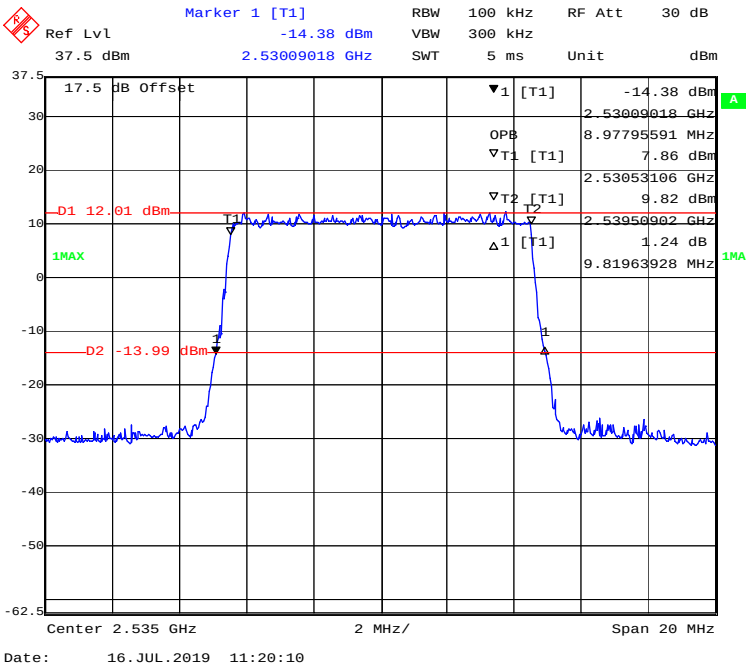
LTE Band 7:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	4.950	4.509
	10M		9.820	8.978
	15M		14.669	13.467
	20M		19.319	17.956
16-QAM	5M	Middle	4.930	4.509
	10M		9.780	9.018
	15M		14.729	13.467
	20M		19.319	17.956

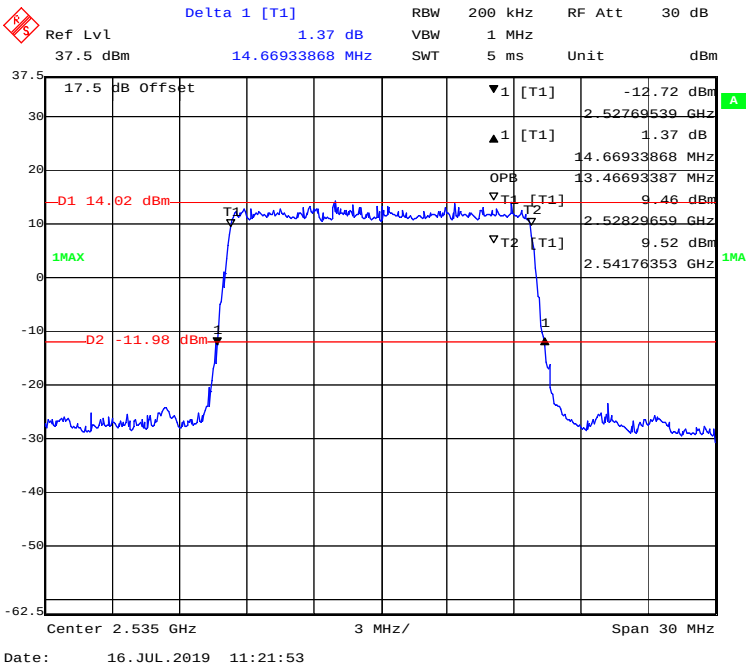
QPSK (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



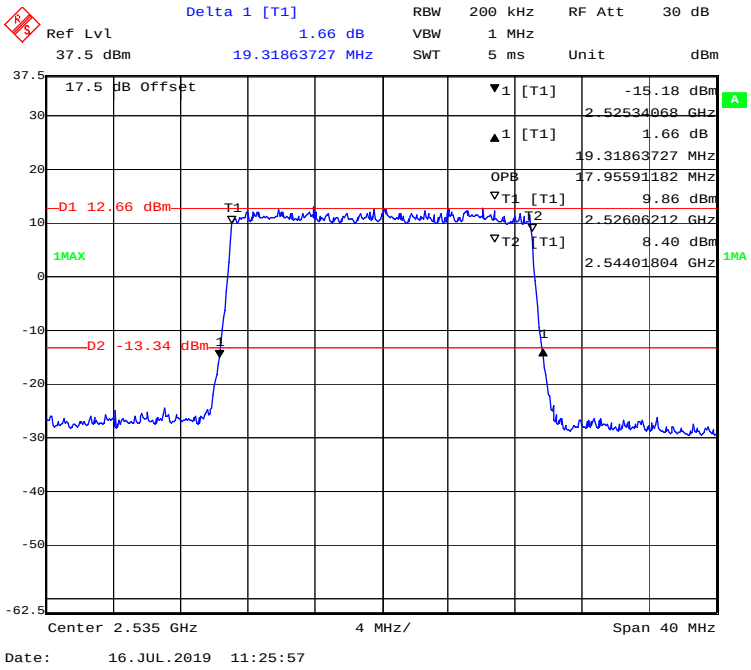
QPSK (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



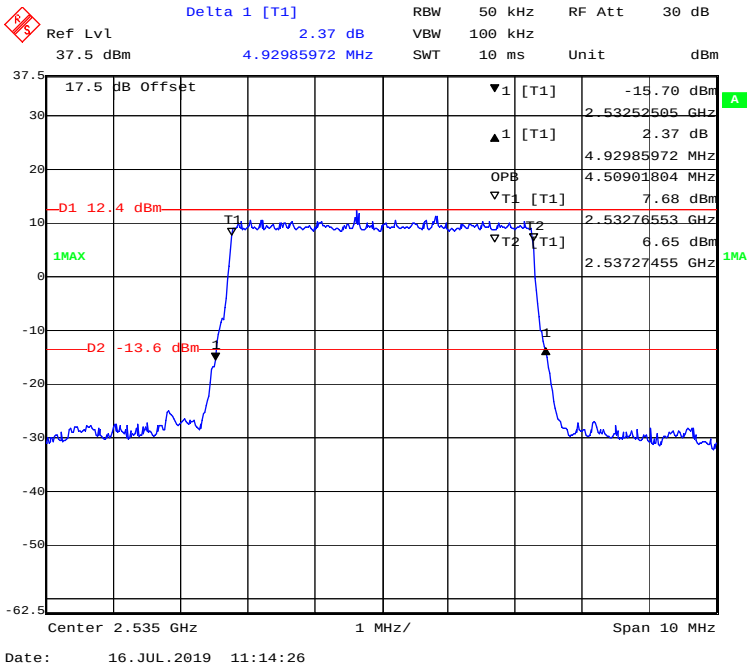
QPSK (15MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



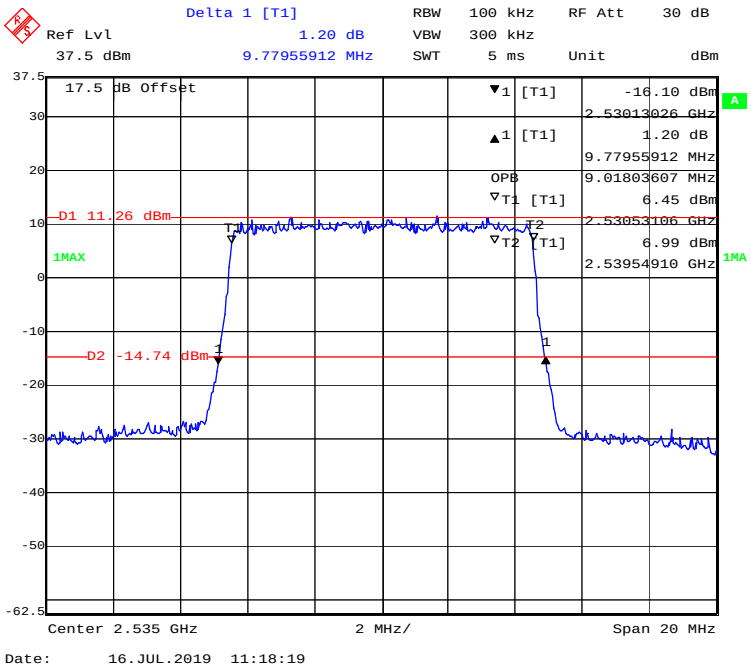
QPSK (20 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



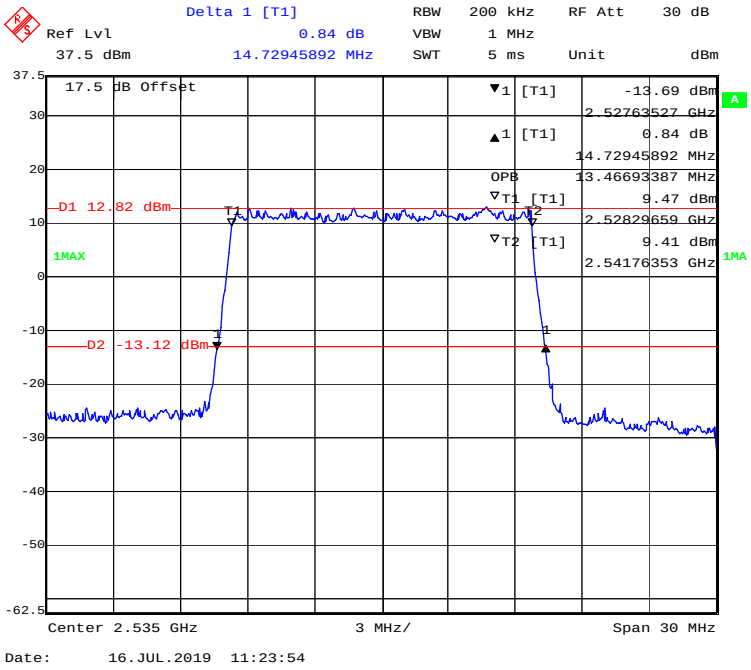
16-QAM (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



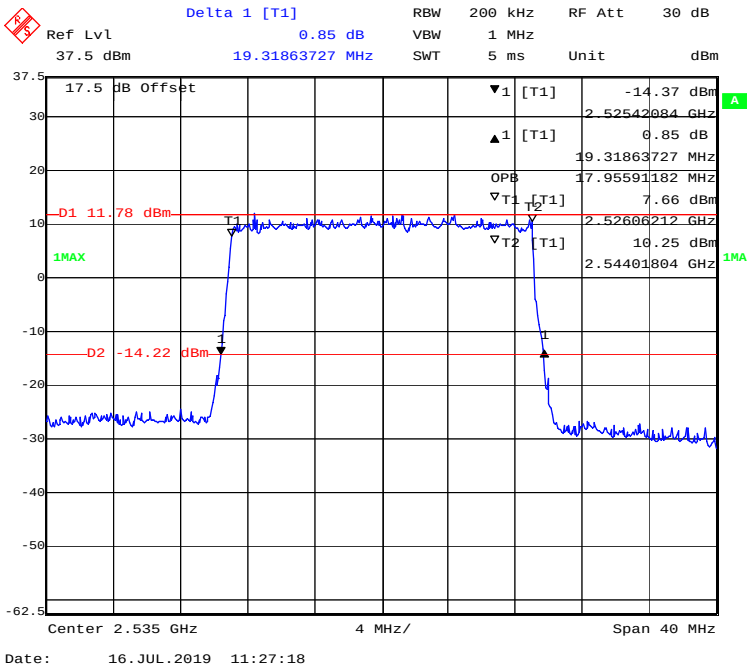
16-QAM (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (15 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



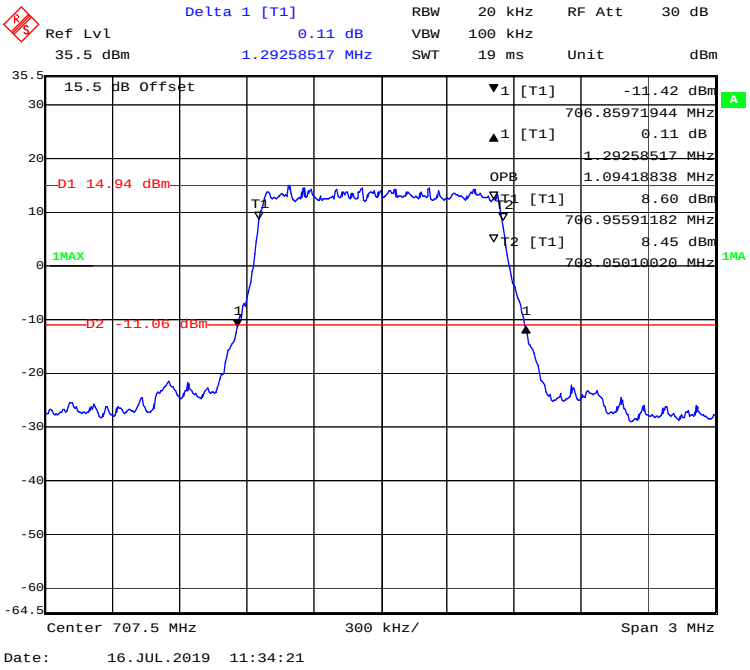
16-QAM (20 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



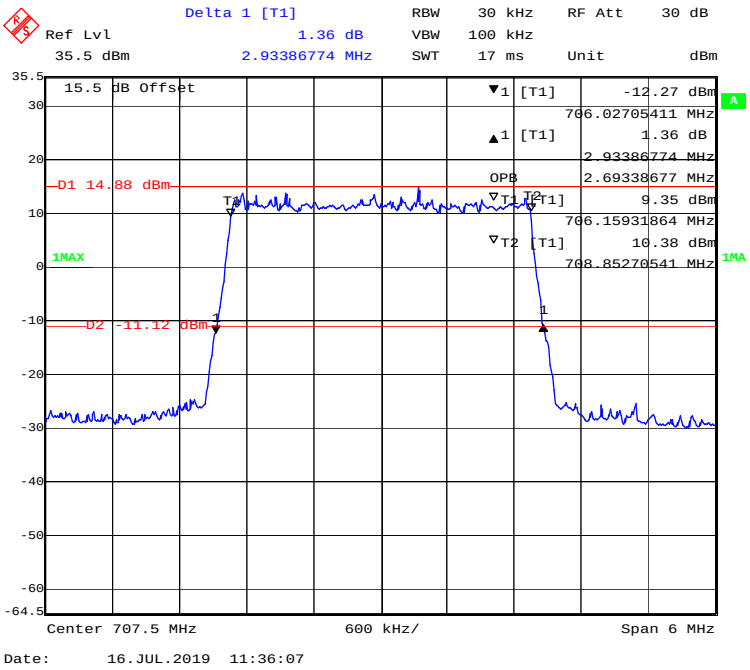
LTE Band 12:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.293	1.094
	3M		2.934	2.693
	5M		4.970	4.509
	10M		9.860	8.978
16-QAM	1.4M	Middle	1.275	1.088
	3M		2.982	2.705
	5M		4.910	4.489
	10M		9.699	8.938

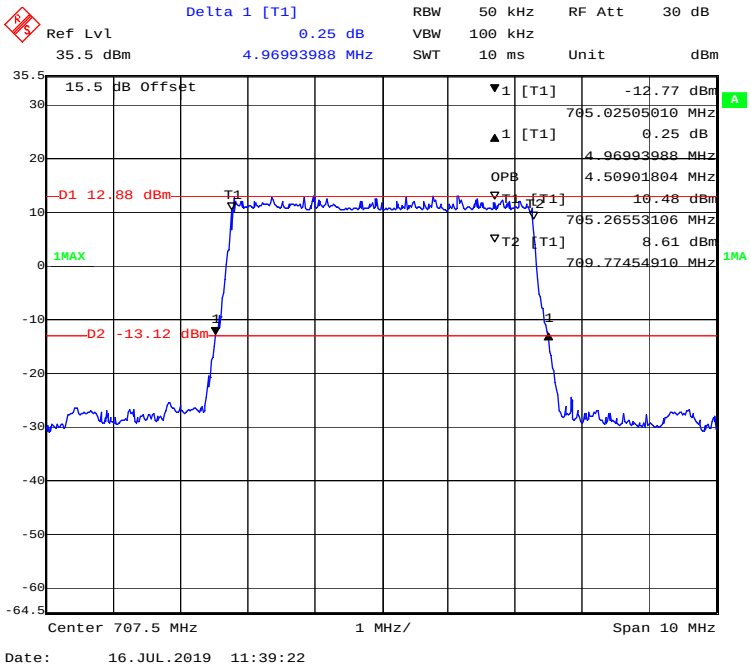
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



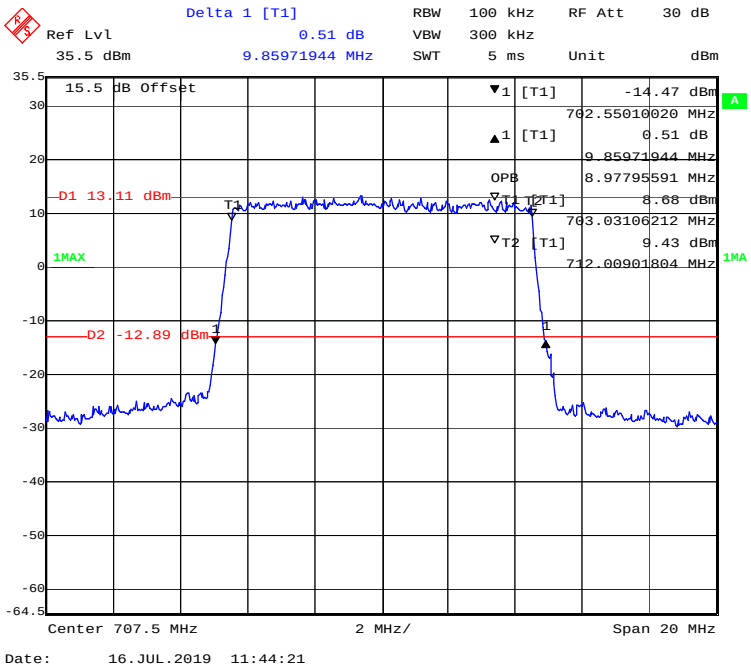
QPSK (3 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



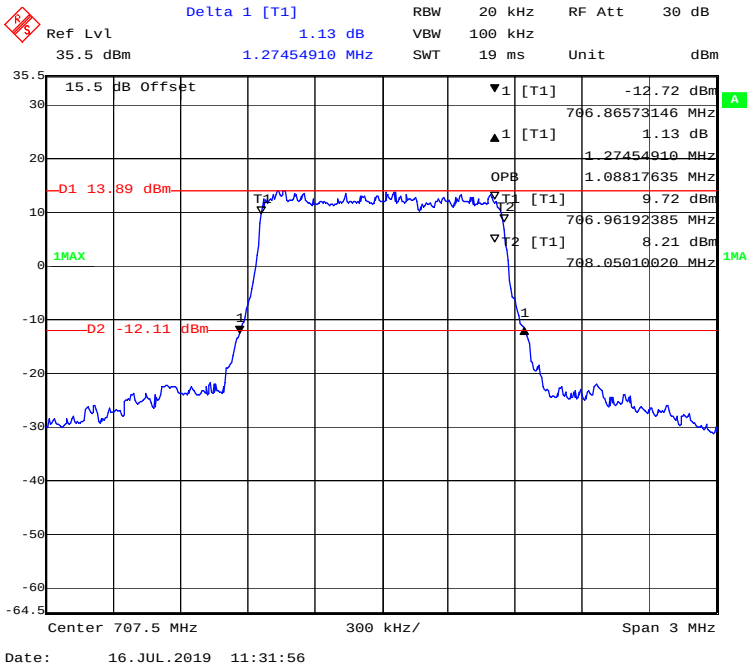
QPSK (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



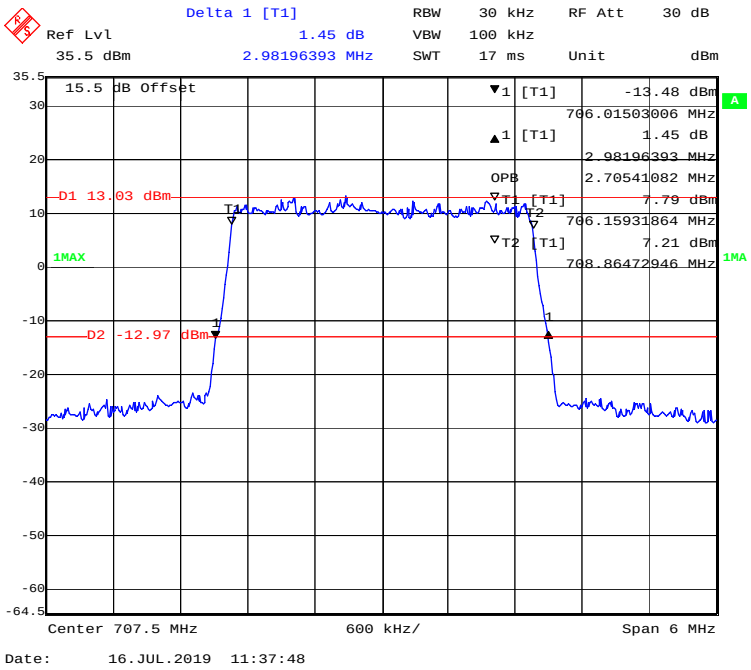
QPSK (10MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



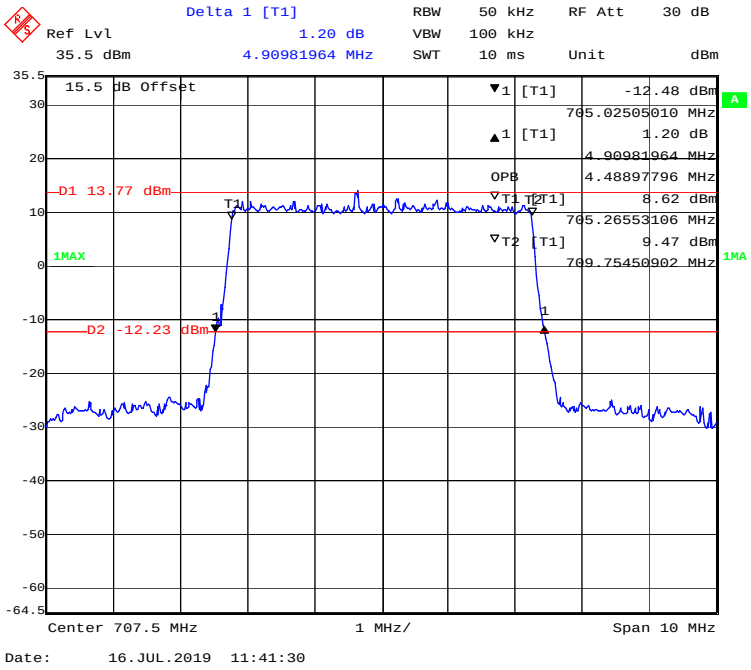
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



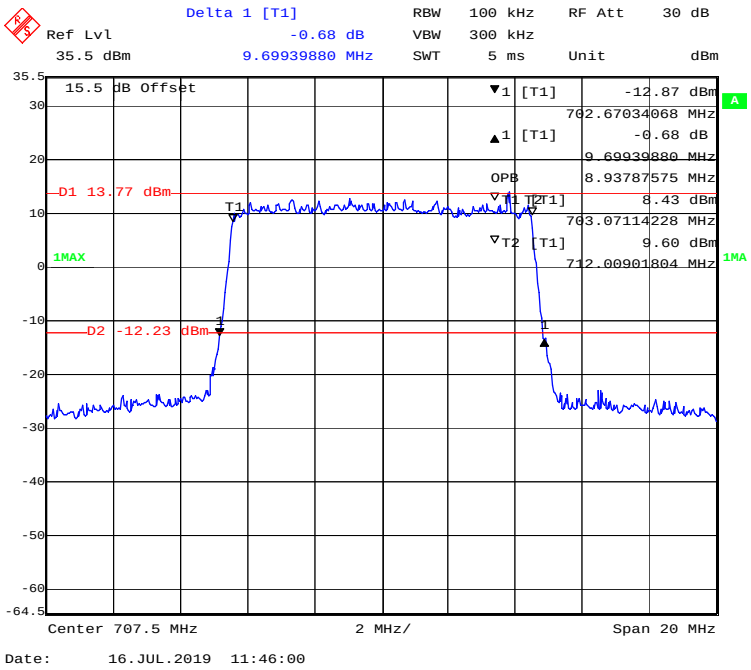
16-QAM (3 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



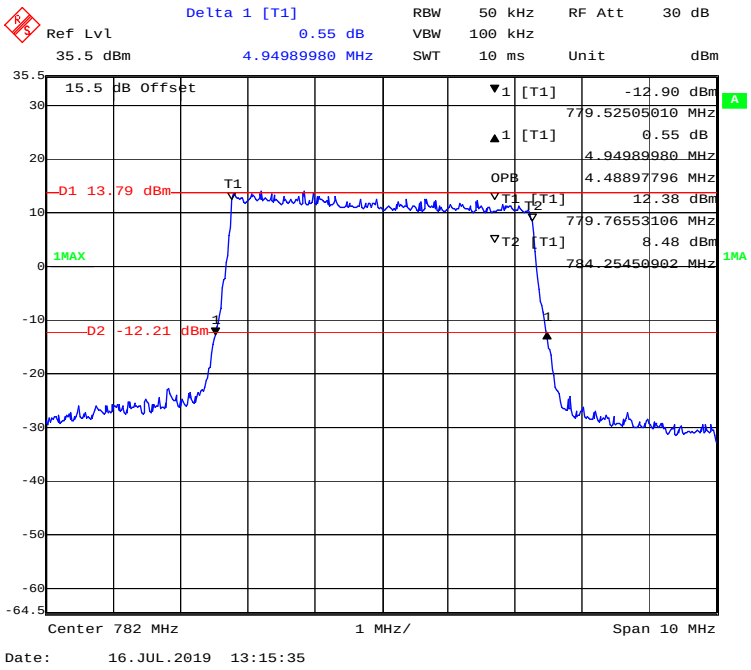
16-QAM (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



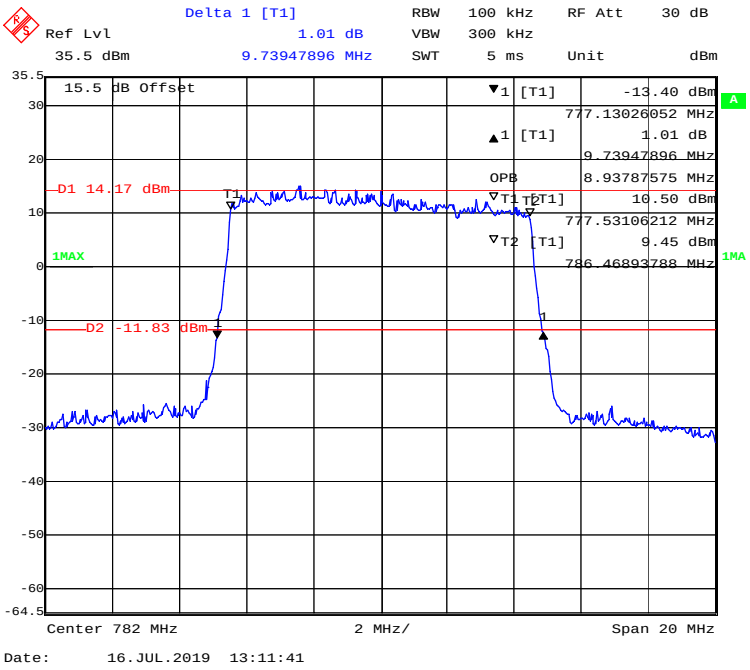
LTE Band 13:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	4.950	4.489
	10M		9.739	8.938
16-QAM	5M	Middle	4.930	4.489
	10M		9.739	8.978

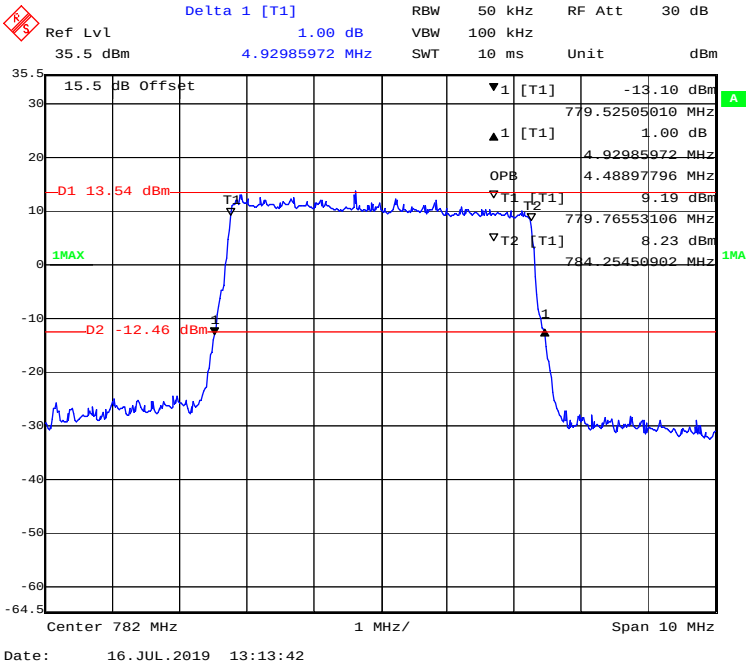
QPSK (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



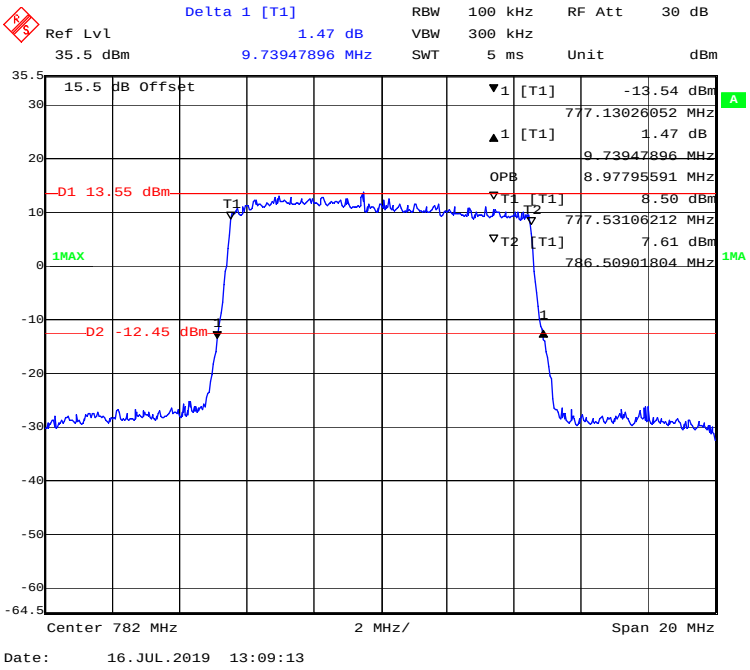
QPSK (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (5MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



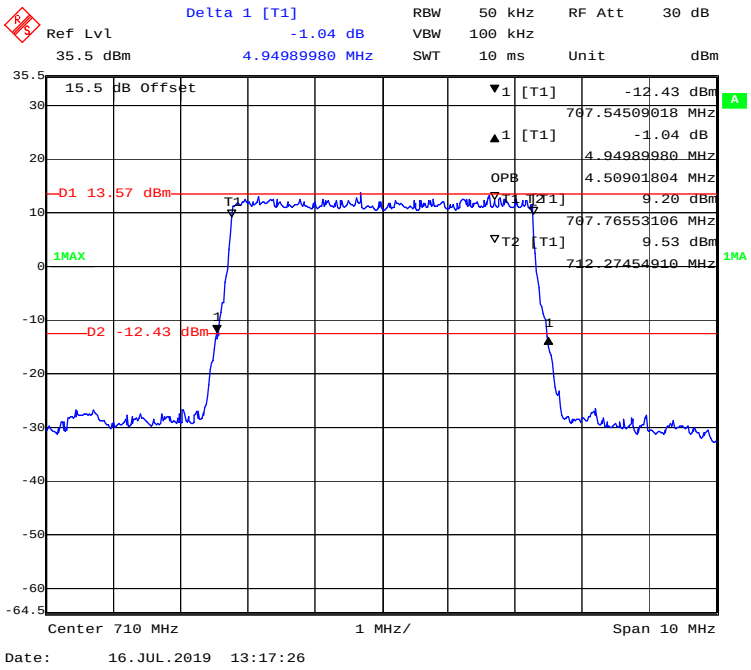
16-QAM (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



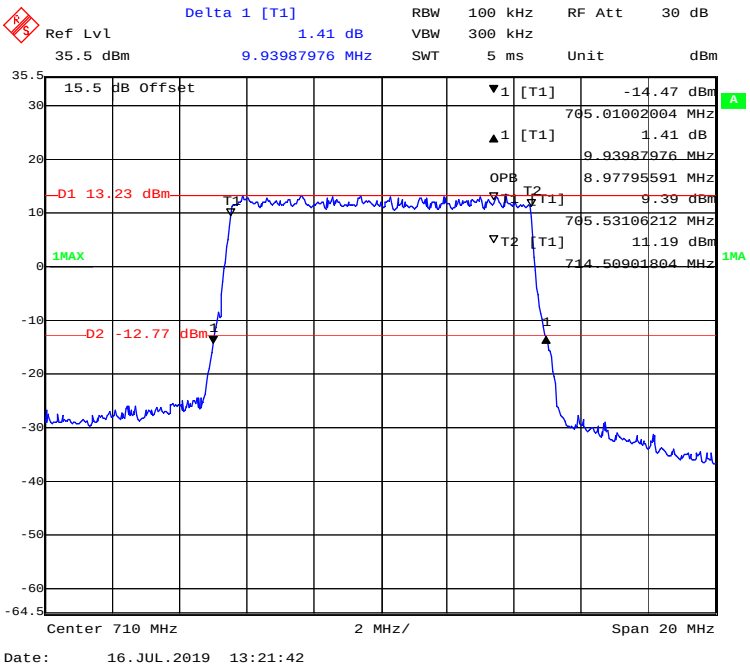
LTE Band 17:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	4.950	4.509
	10M		9.940	8.978
16-QAM	5M	Middle	4.950	4.509
	10M		9.739	8.978

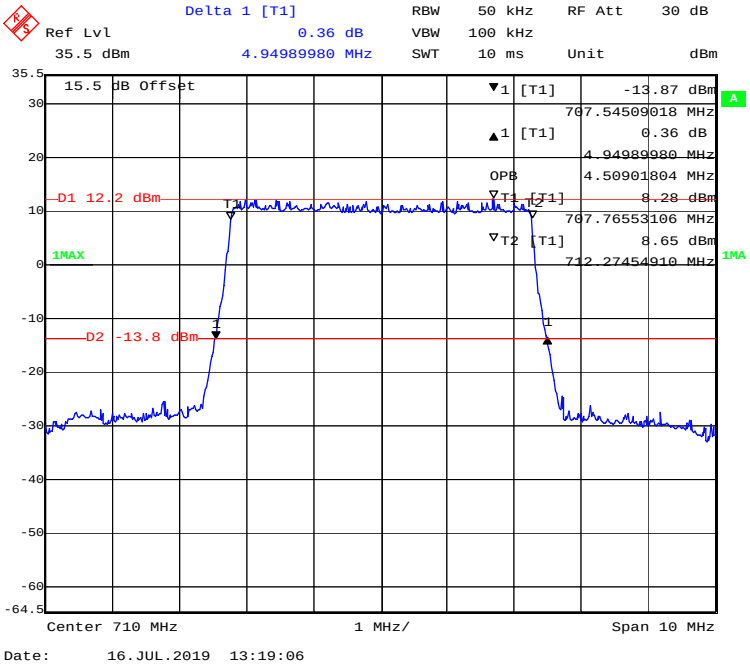
QPSK (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



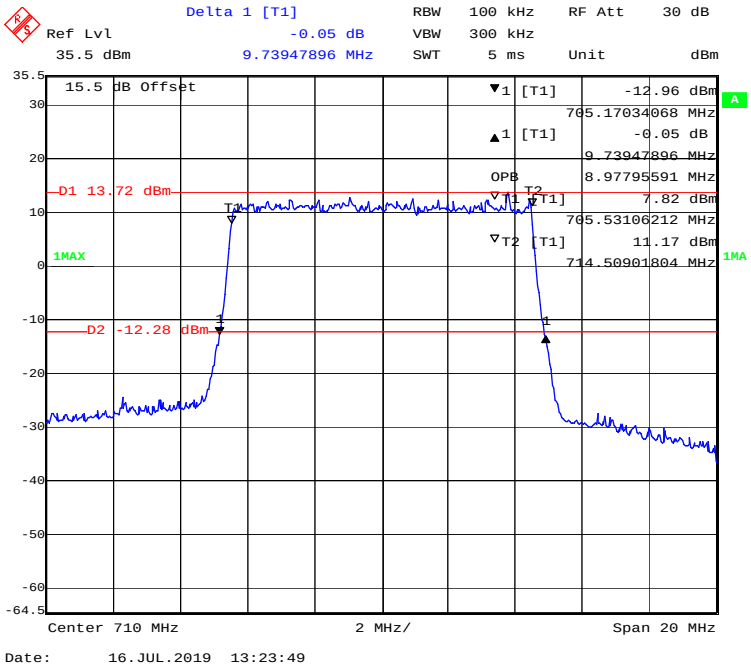
QPSK (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (5MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



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

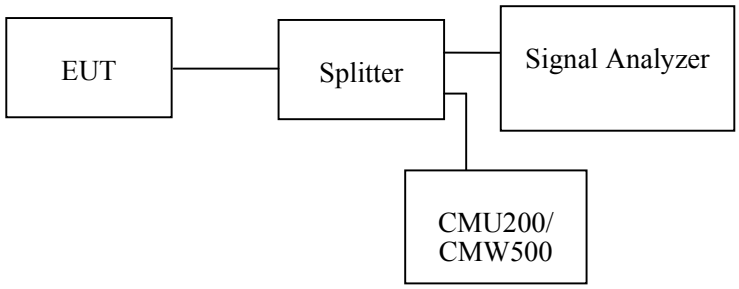
Applicable Standards

FCC §2.1051, §22.917(a) and §24.238(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 %-53%
ATM Pressure:	101.1kPa-103.3kPa

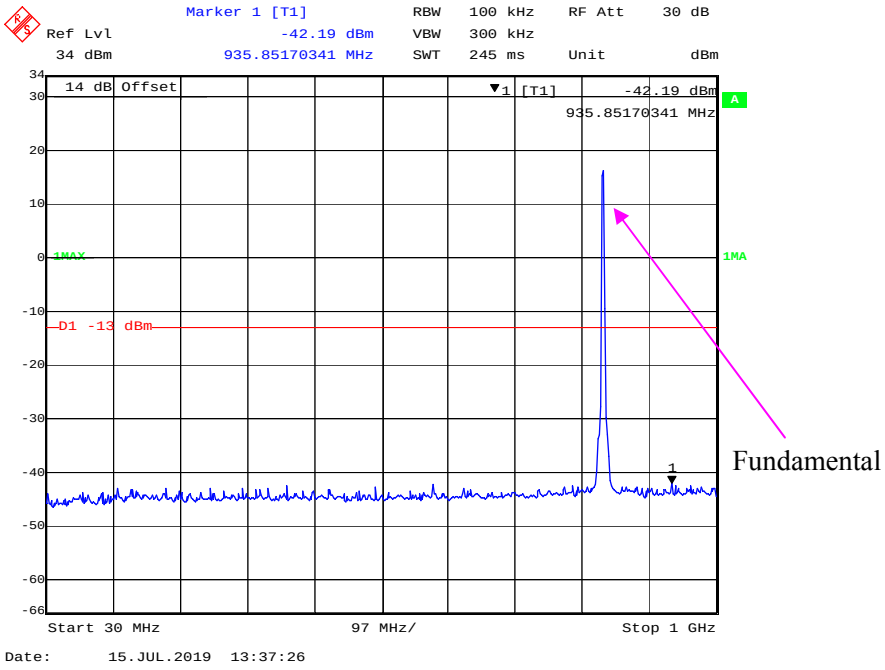
The testing was performed by Max Min from 2019-07-15 to 2019-08-01.

EUT operation mode: Transmitting

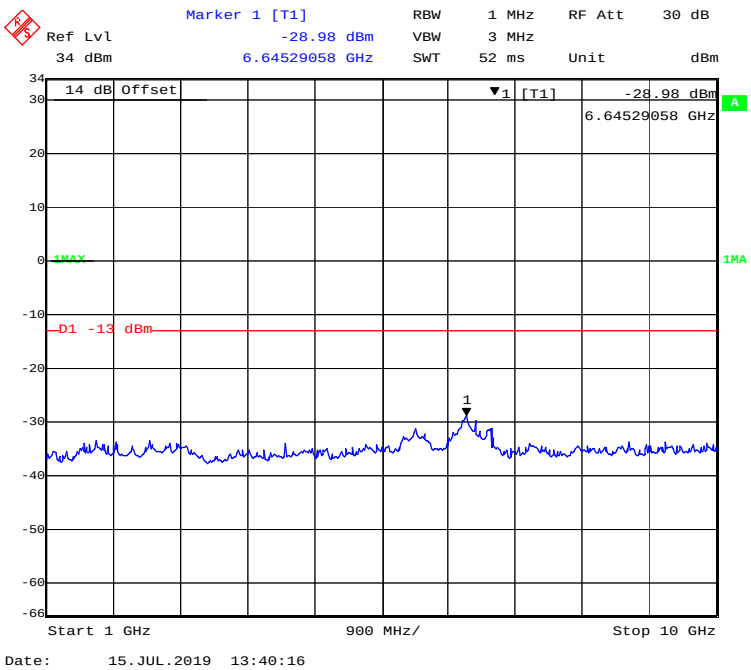
Test Result: Compliant.

WCDMA Band V:

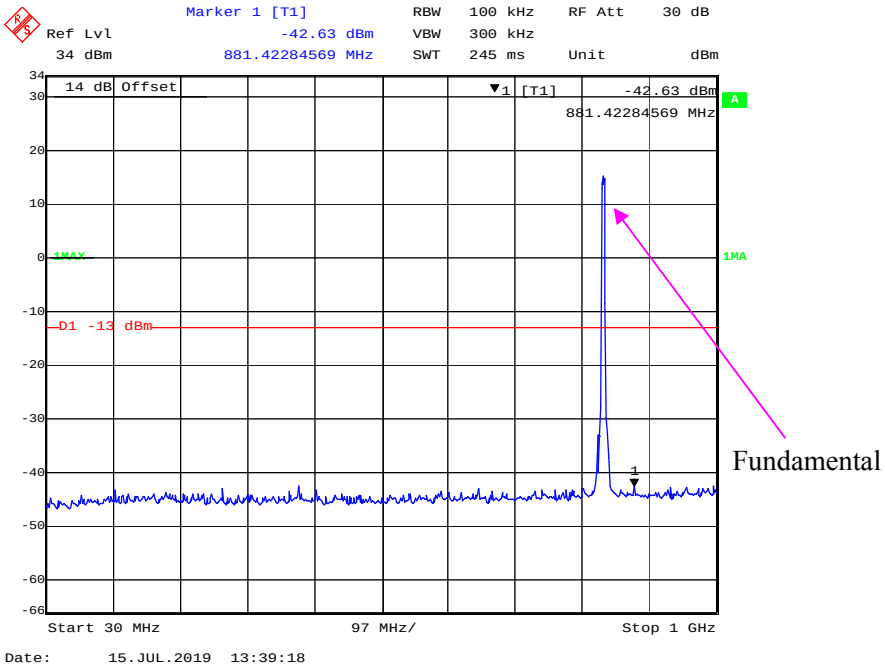
30 MHz – 1GHz WCDMA (Rel 99) Mode, Middle channel



1 GHz – 10 GHz WCDMA (Rel 99) Mode, Middle channel

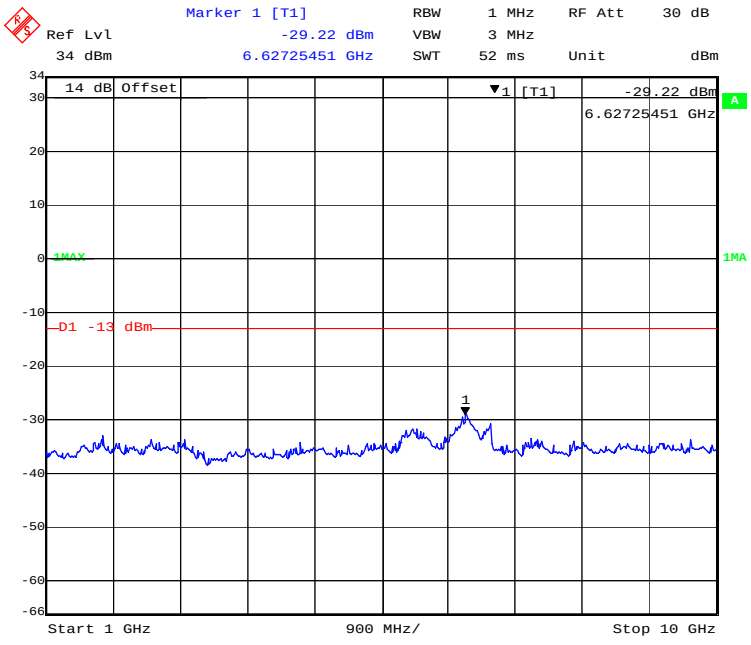


30 MHz – 1GHz WCDMA (HSDPA) Mode, Middle channel



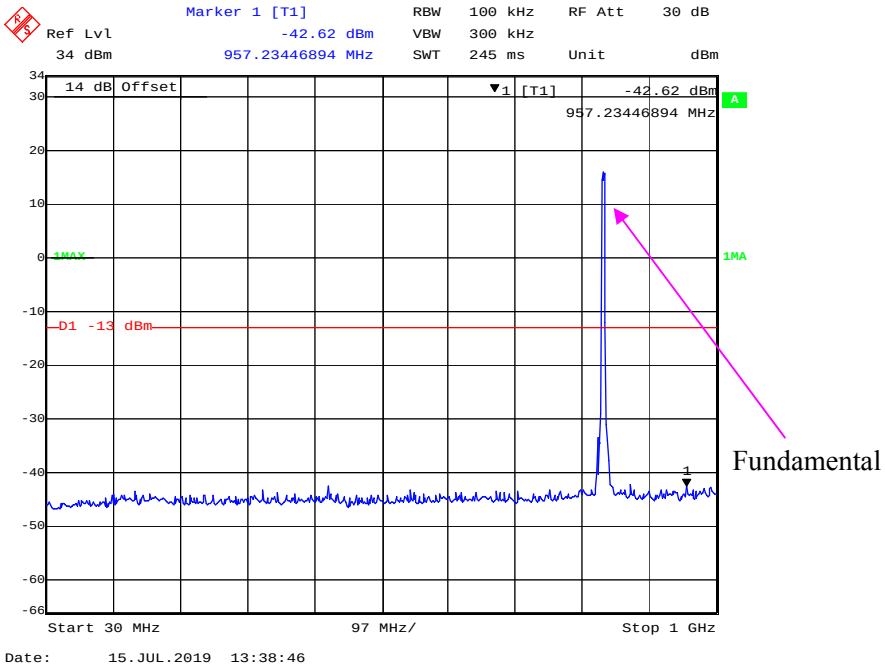
Date: 15.JUL.2019 13:39:18

1 GHz – 10 GHz WCDMA (HSDPA) Mode, Middle channel



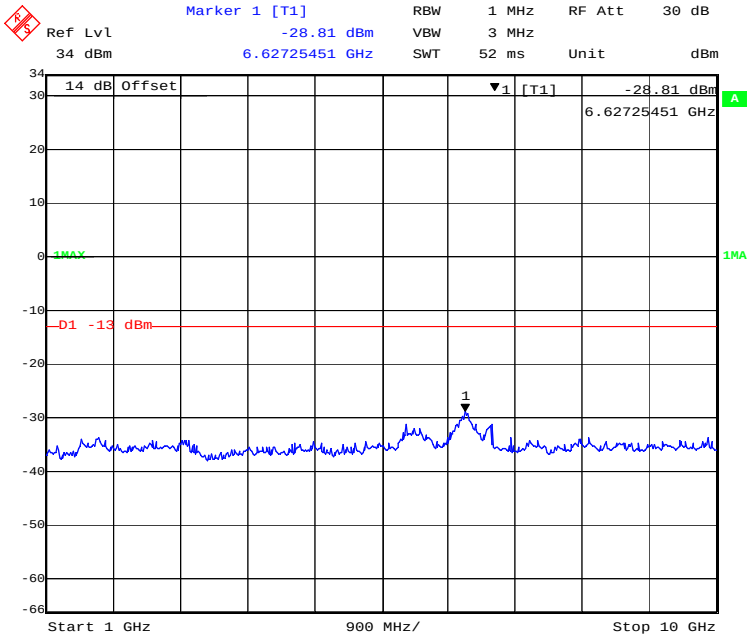
Date: 15.JUL.2019 13:41:17

30 MHz – 1GHz WCDMA (HSUPA) Mode, Middle channel



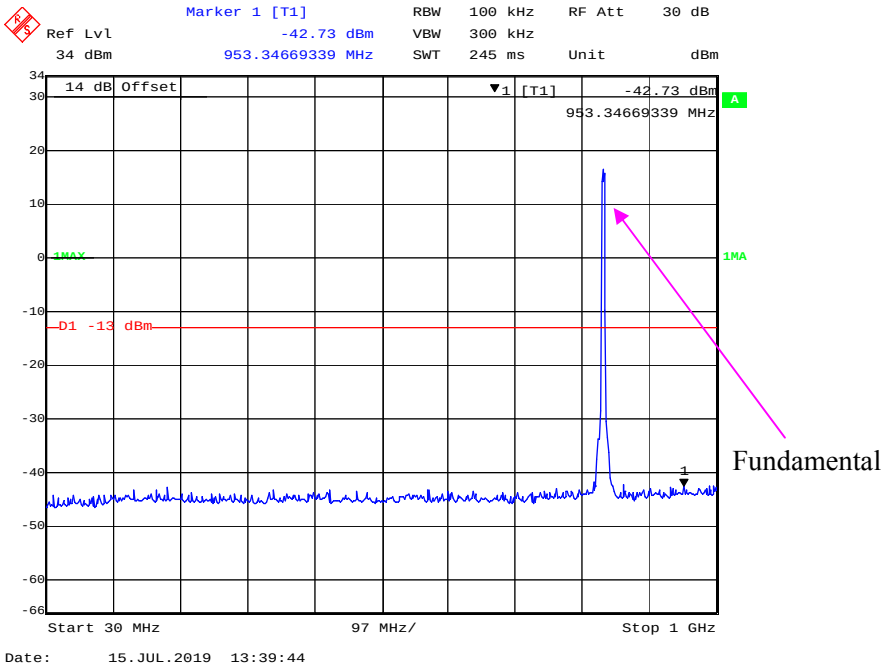
Date: 15.JUL.2019 13:38:46

1 GHz – 10 GHz WCDMA (HSUPA) Mode, Middle channel



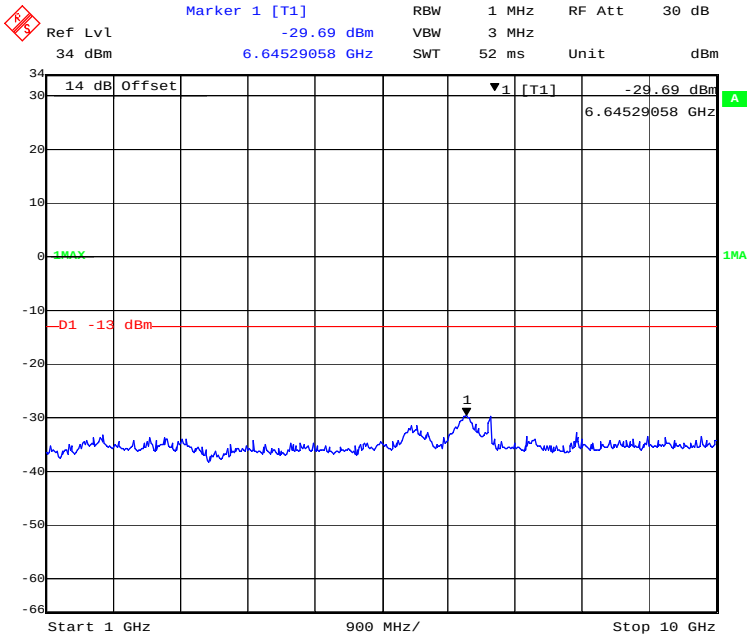
Date: 15.JUL.2019 13:40:46

30 MHz – 1GHz WCDMA (HSPA+) Mode, Middle channel



Date: 15.JUL.2019 13:39:44

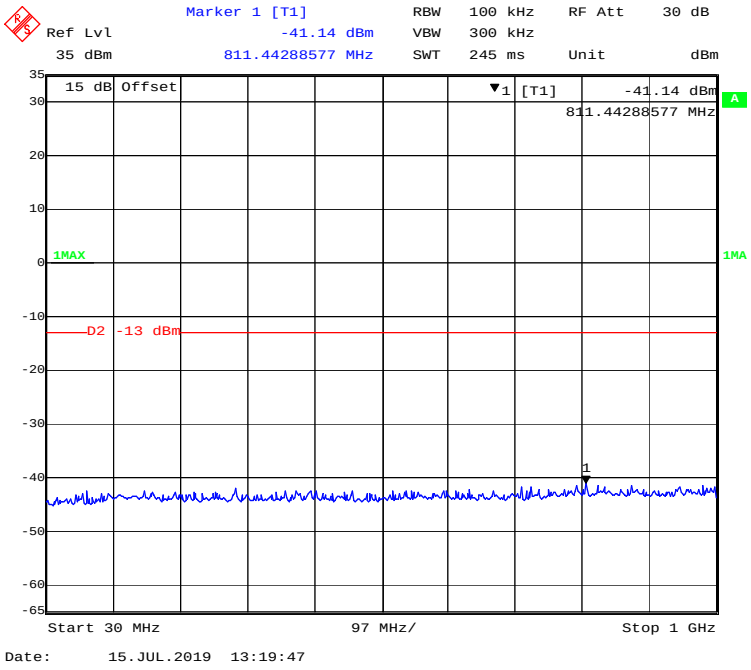
1 GHz – 10 GHz WCDMA (HSPA+) Mode, Middle channel



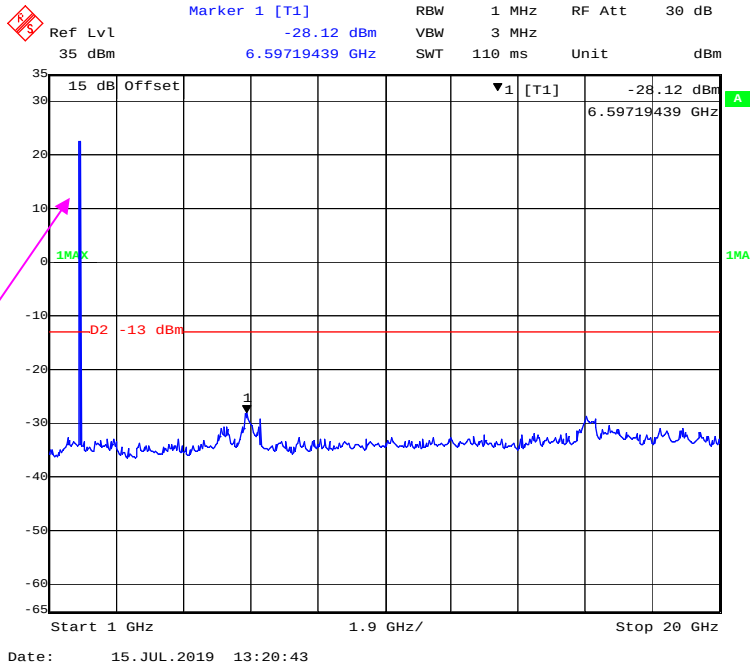
Date: 15.JUL.2019 13:41:45

WCDMA Band II:

30 MHz – 1GHz WCDMA (Rel 99) Mode, Middle channel

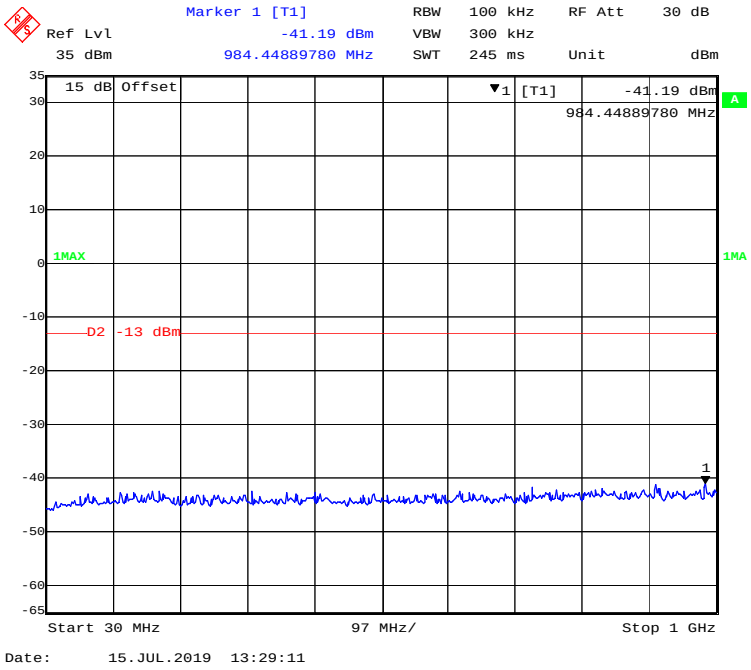


1 GHz – 20 GHz WCDMA (Rel 99) Mode, Middle channel

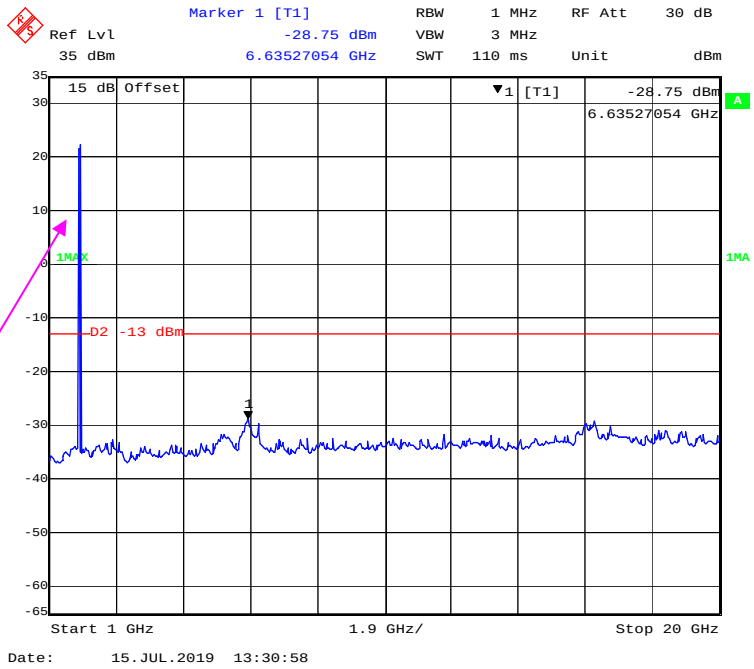


Fundamental

30 MHz – 1GHz WCDMA (HSDPA) Mode, Middle channel

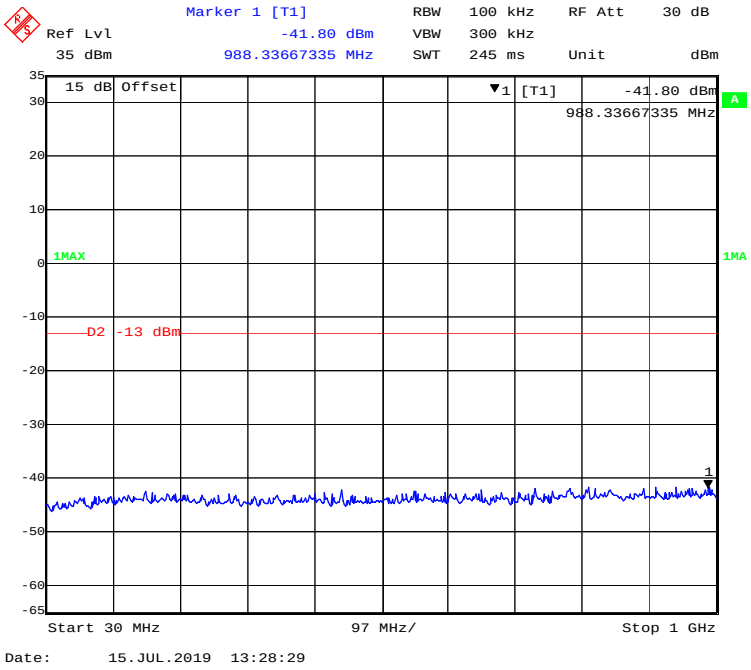


1 GHz – 20 GHz WCDMA (HSDPA) Mode, Middle channel

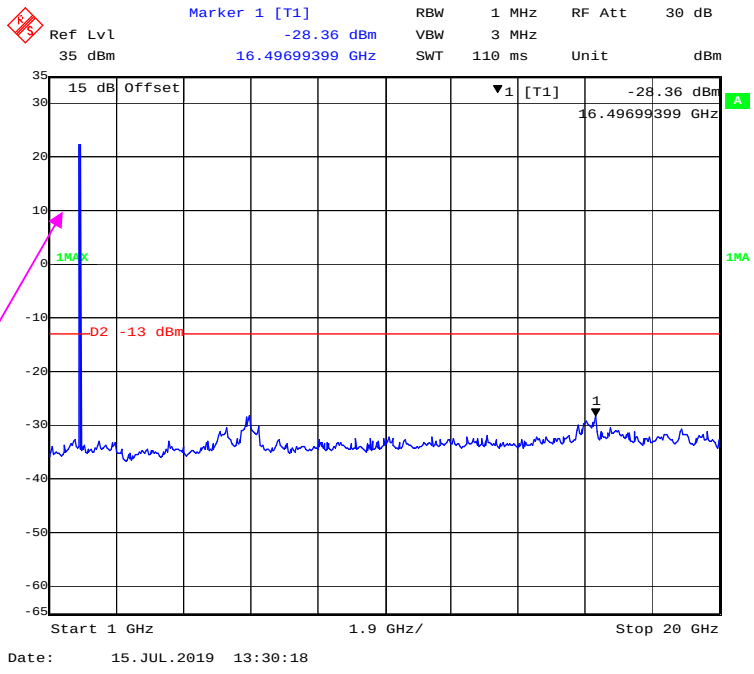


Fundamental

30 MHz – 1GHz WCDMA (HSUPA) Mode, Middle channel

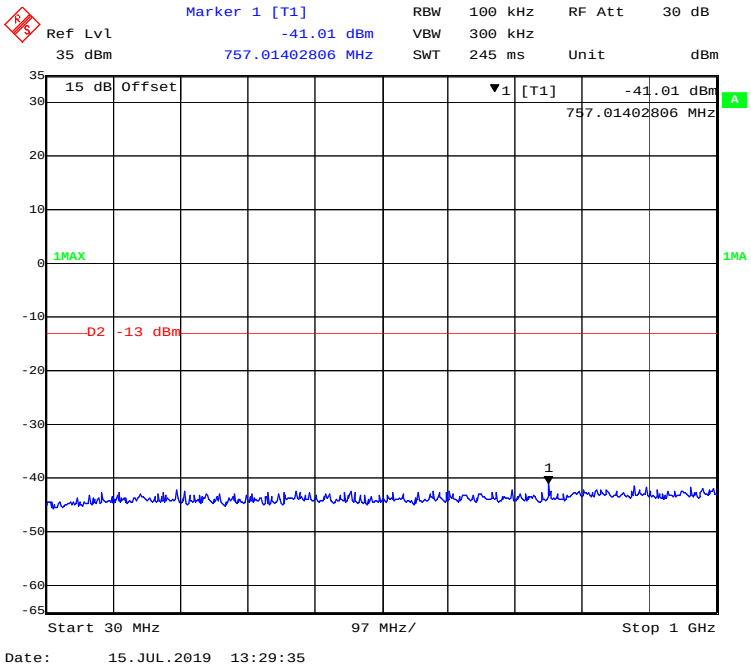


1 GHz – 20 GHz WCDMA (HSUPA) Mode, Middle channel

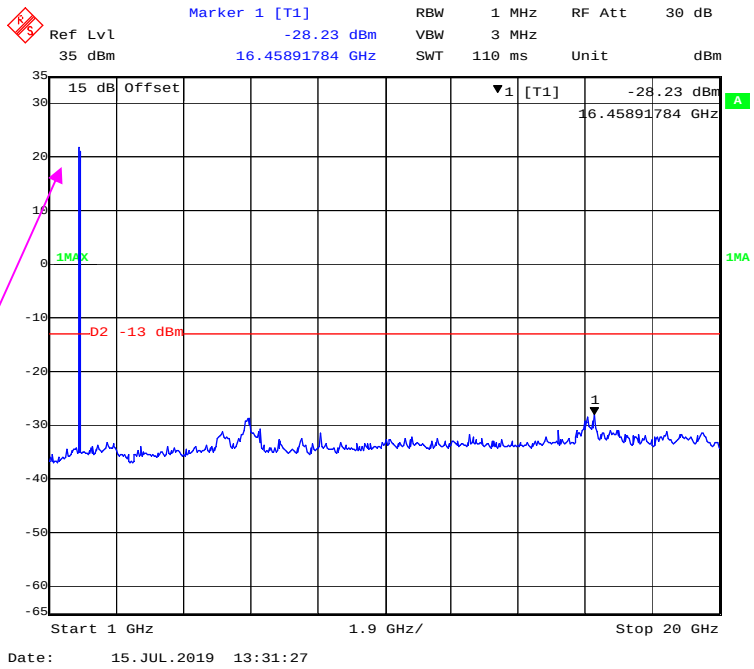


Fundamental

30 MHz – 1GHz WCDMA (HSPA+) Mode, Middle channel



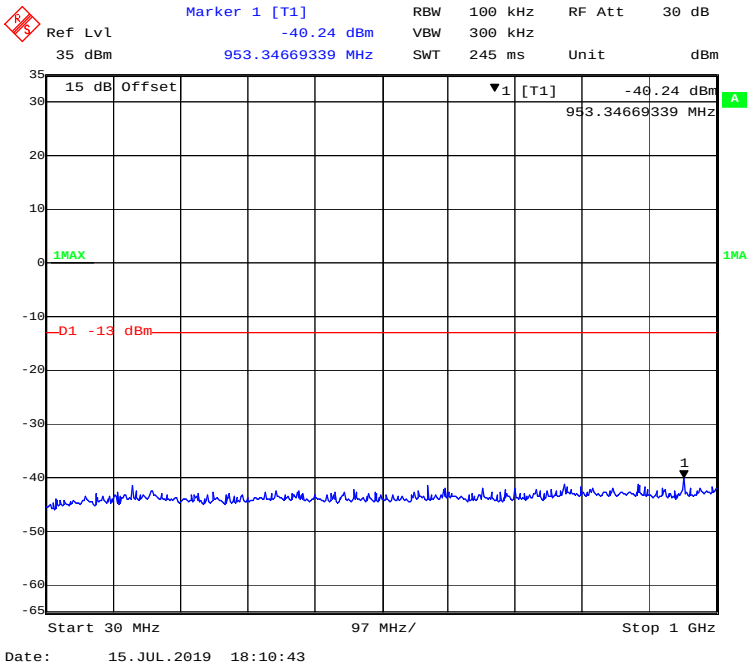
1 GHz – 20 GHz WCDMA (HSPA+) Mode, Middle channel



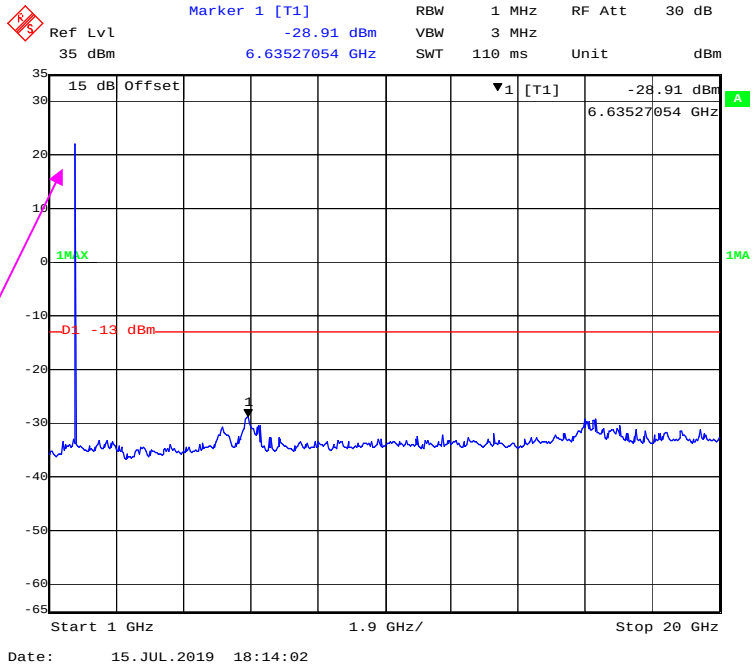
Fundamental

WCDMA Band IV:

30 MHz – 1GHz WCDMA (Rel 99) Mode, Middle channel

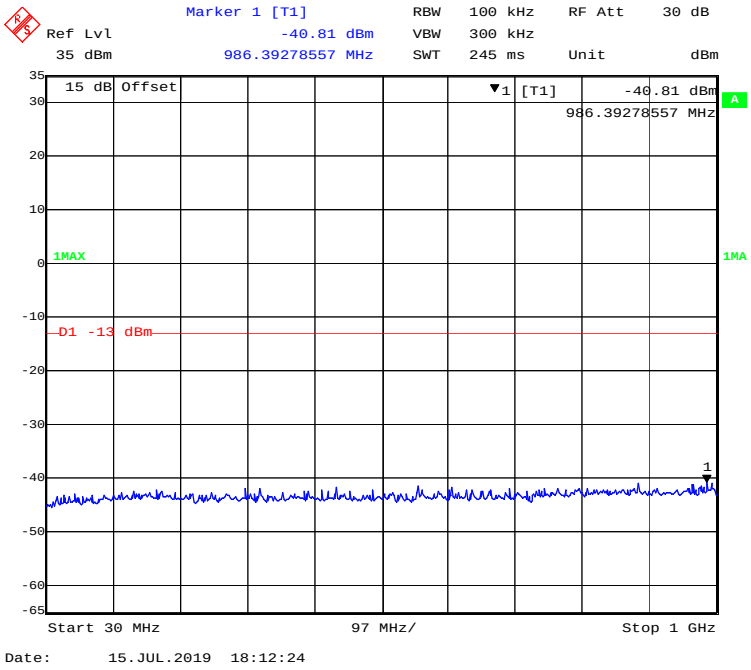


1 GHz – 20 GHz WCDMA (Rel 99) Mode, Middle channel

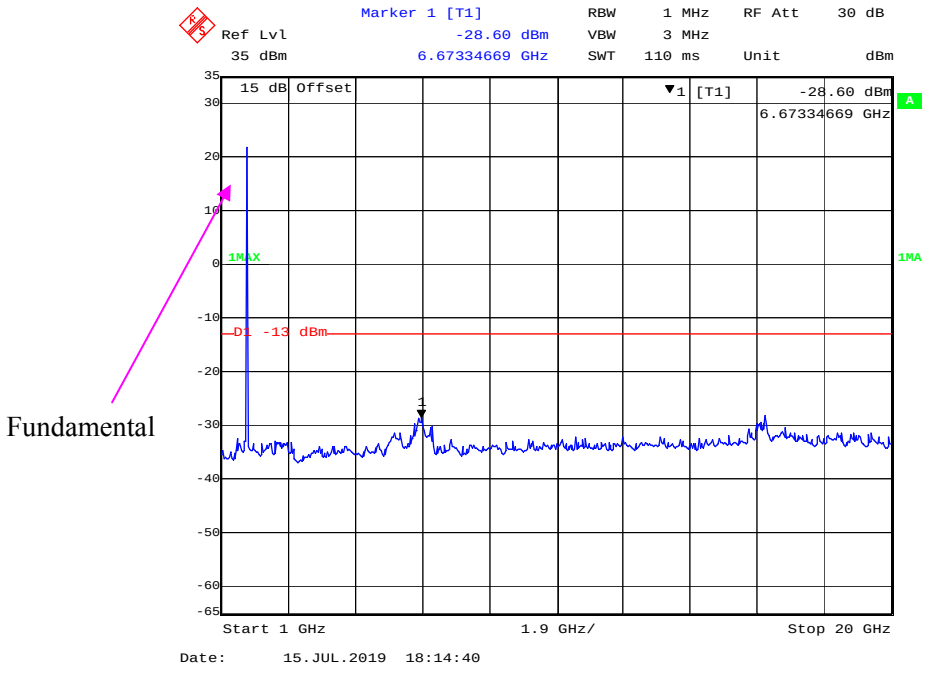


Fundamental

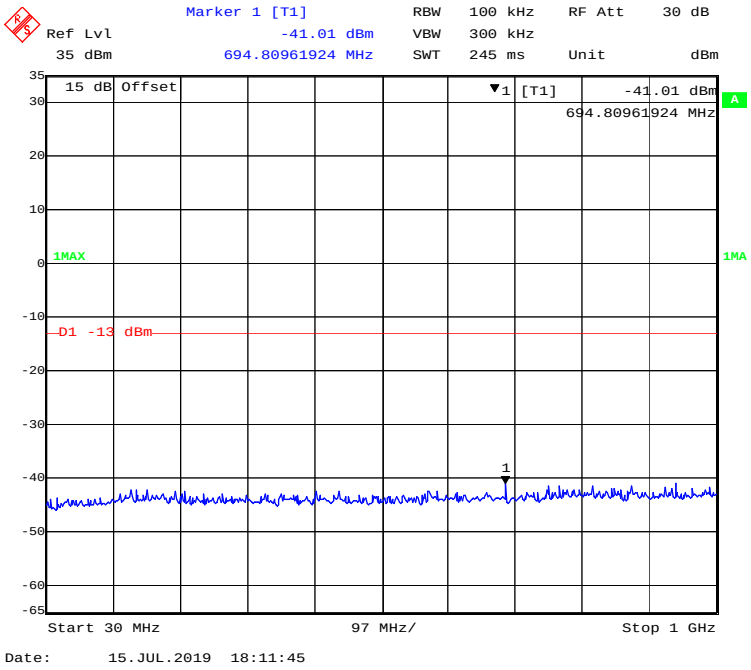
30 MHz – 1GHz WCDMA (HSDPA) Mode, Middle channel



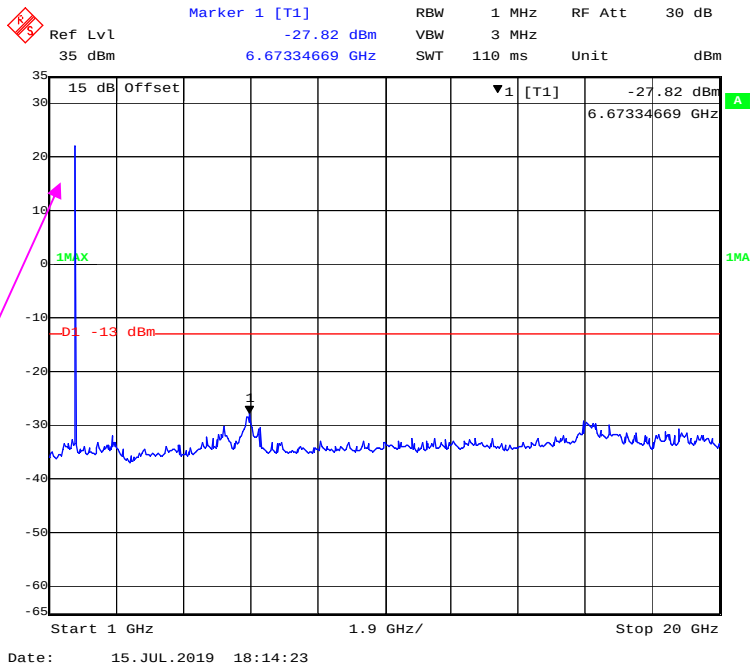
1 GHz – 20 GHz WCDMA (HSDPA) Mode, Middle channel



30 MHz – 1GHz WCDMA (HSUPA) Mode, Middle channel

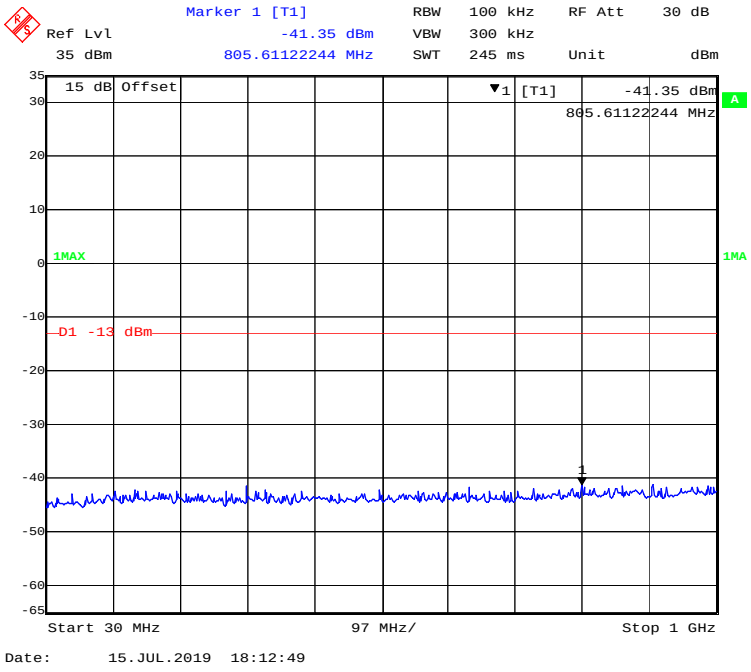


1 GHz – 20 GHz WCDMA (HSUPA) Mode, Middle channel

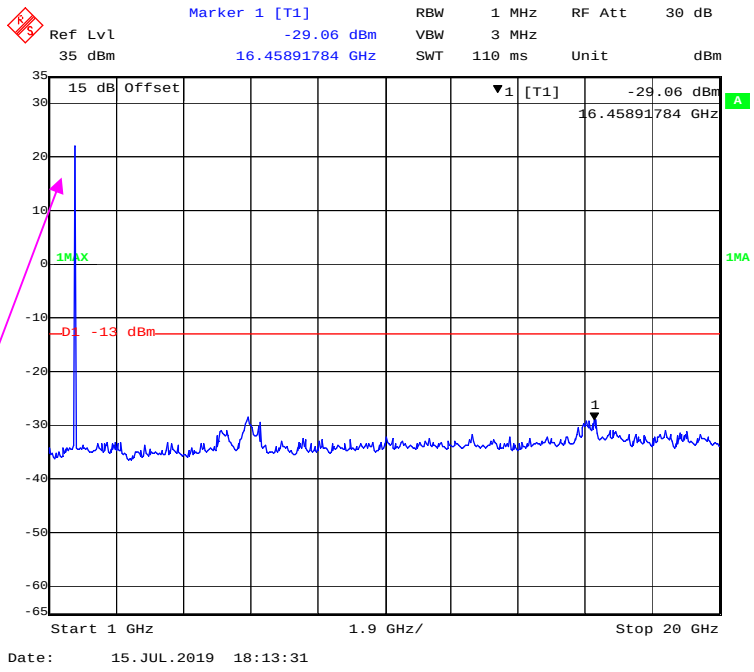


Fundamental

30 MHz – 1GHz WCDMA (HSPA+) Mode, Middle channel



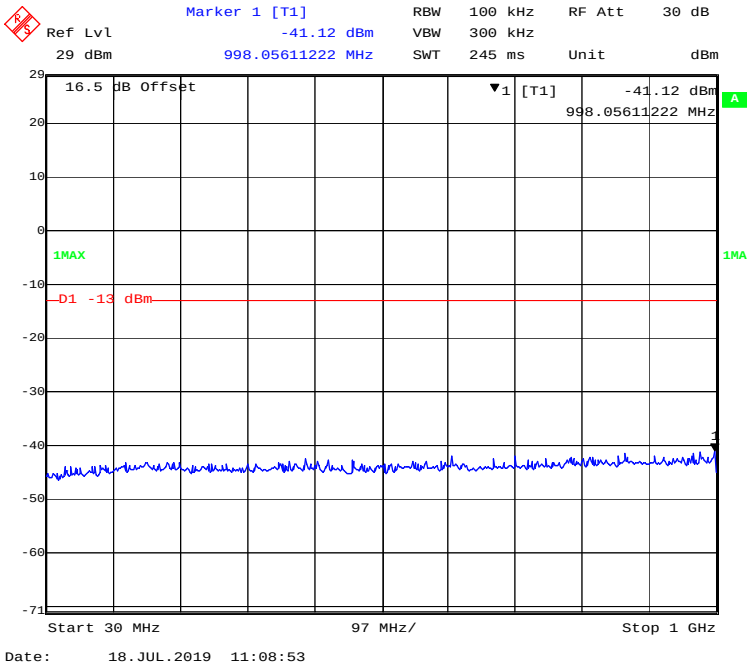
1 GHz – 20 GHz WCDMA (HSPA+) Mode, Middle channel



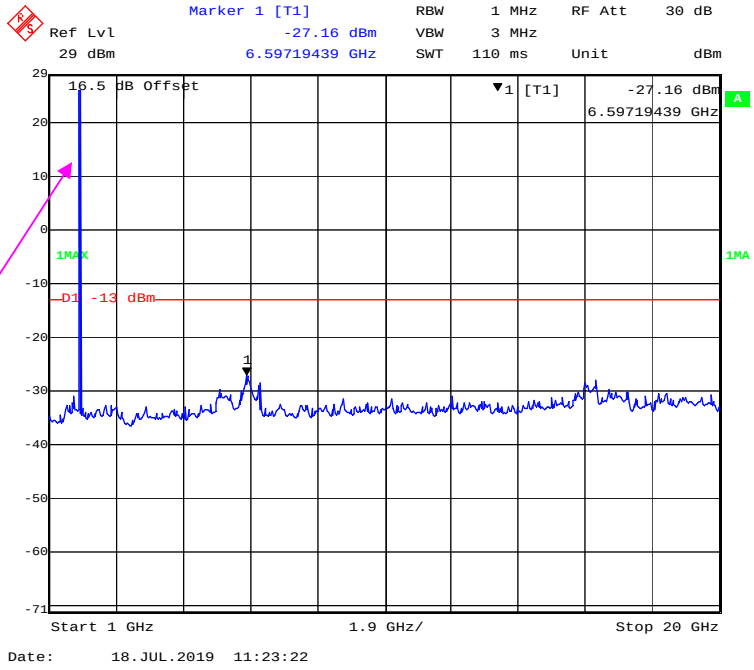
Fundamental

LTE Band 2:

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

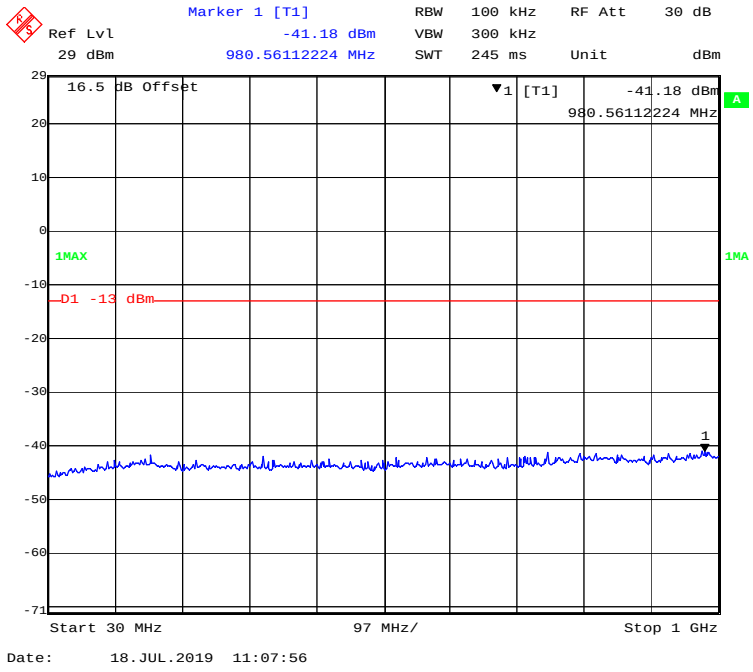


1 GHz – 20 GHz (1.4 MHz, QPSK, Middle Channel)

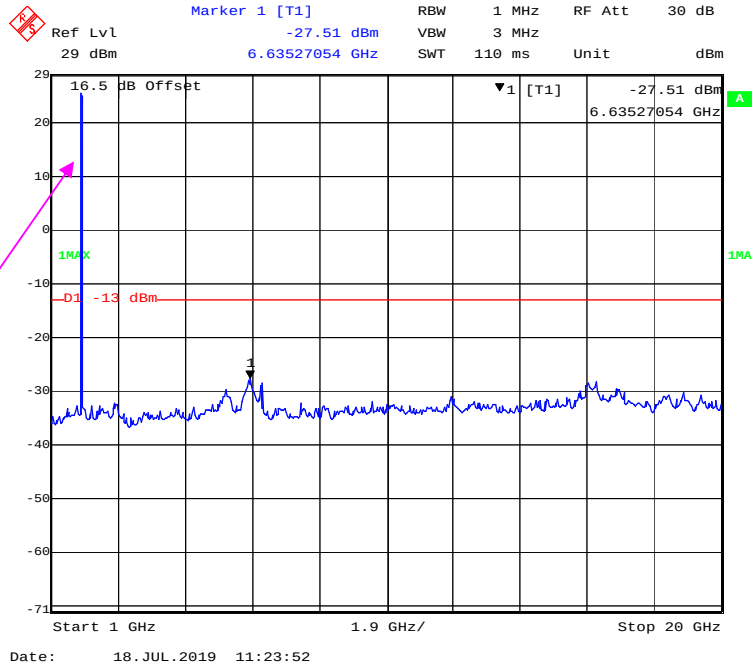


Fundamental

30 MHz - 1 GHz (1.4 MHz, 16-QAM, Middle Channel)

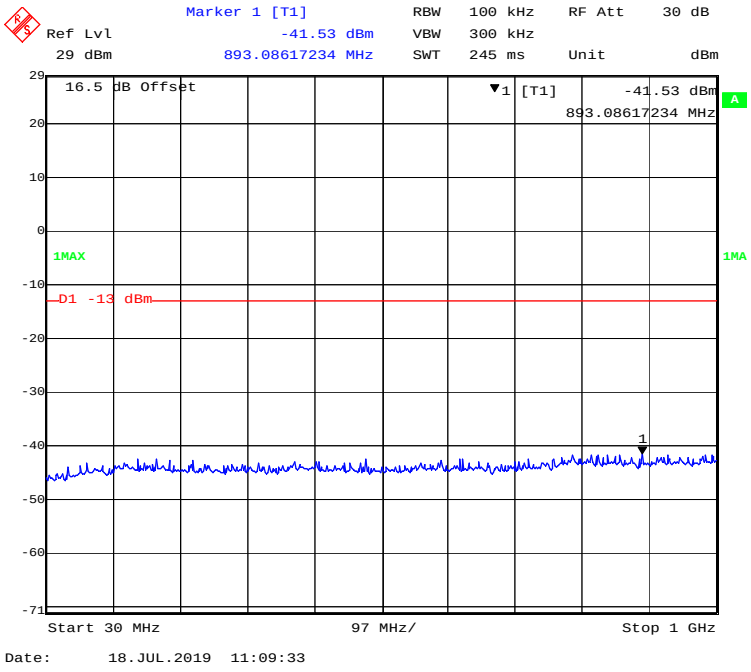


1 GHz – 20 GHz (1.4 MHz, 16-QAM, Middle Channel)

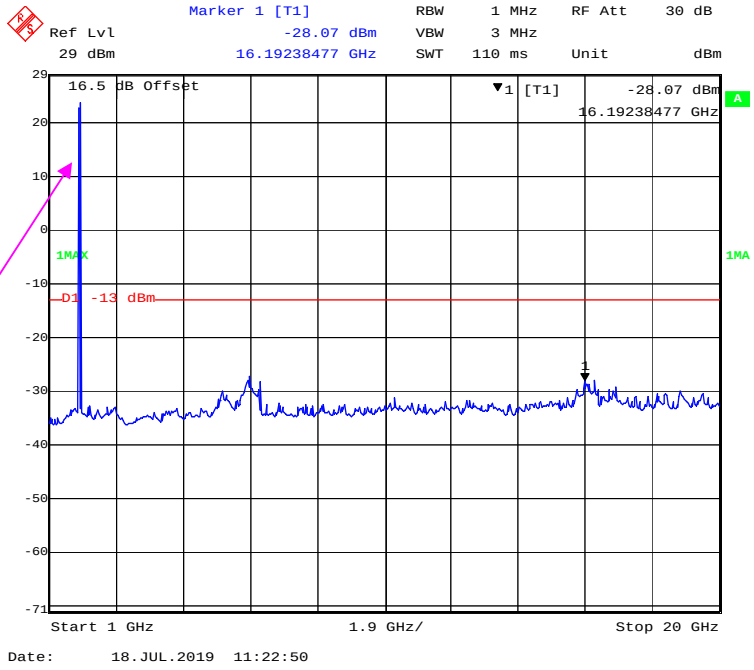


Fundamental

30 MHz - 1 GHz (3 MHz, QPSK, Middle Channel)

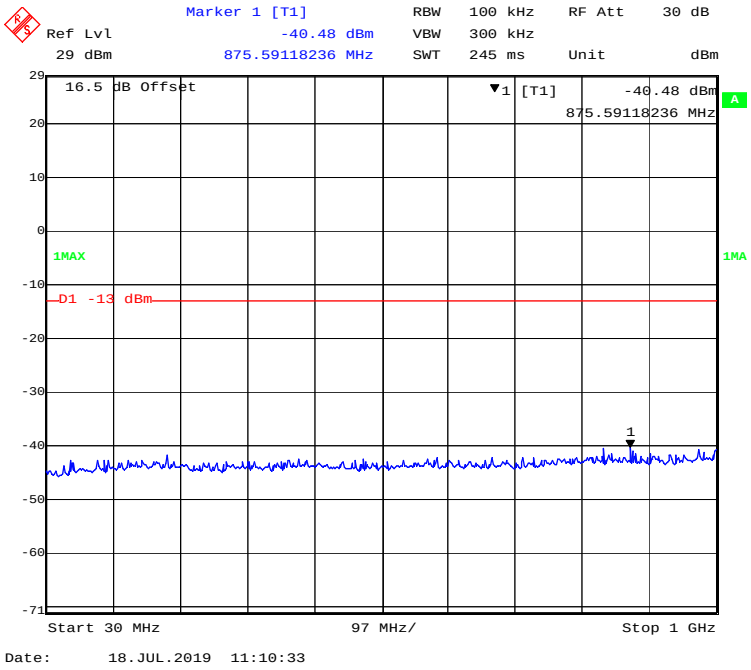


1 GHz – 20 GHz (3 MHz, QPSK, Middle Channel)

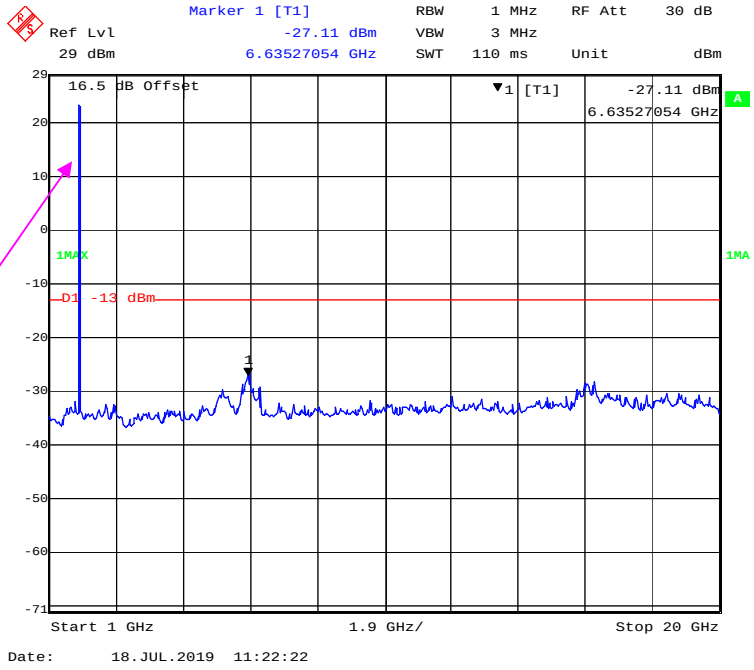


Fundamental

30 MHz - 1 GHz (3 MHz, 16-QAM, Middle Channel)

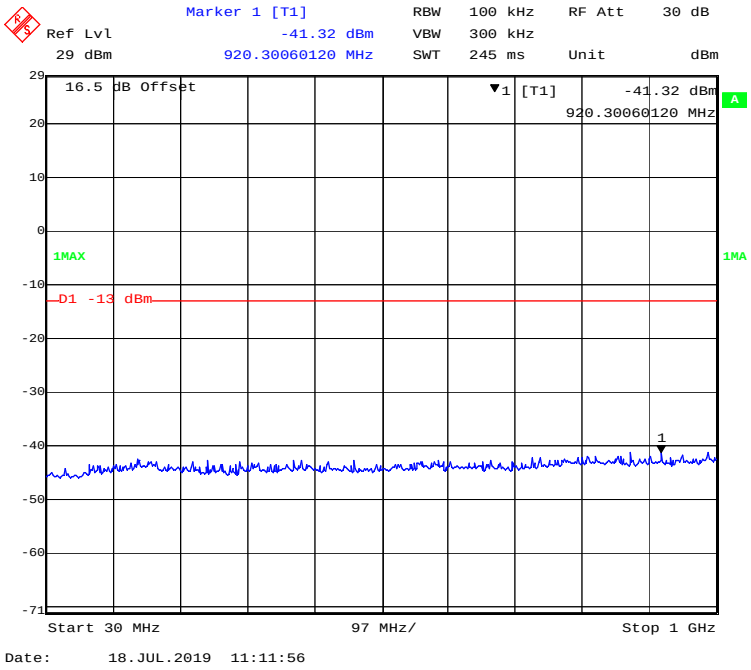


1 GHz – 20 GHz (3 MHz, 16-QAM, Middle Channel)

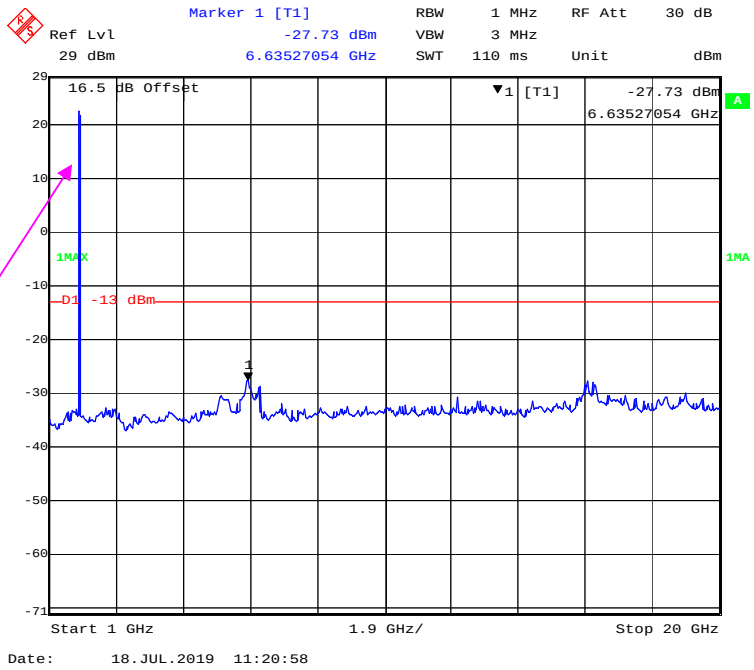


Fundamental

30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)

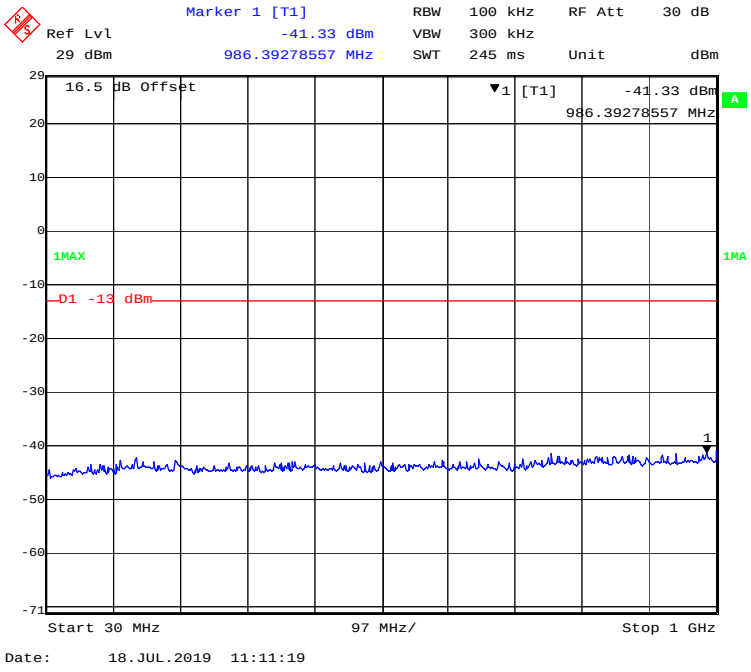


1 GHz – 20 GHz (5 MHz, QPSK, Middle Channel)

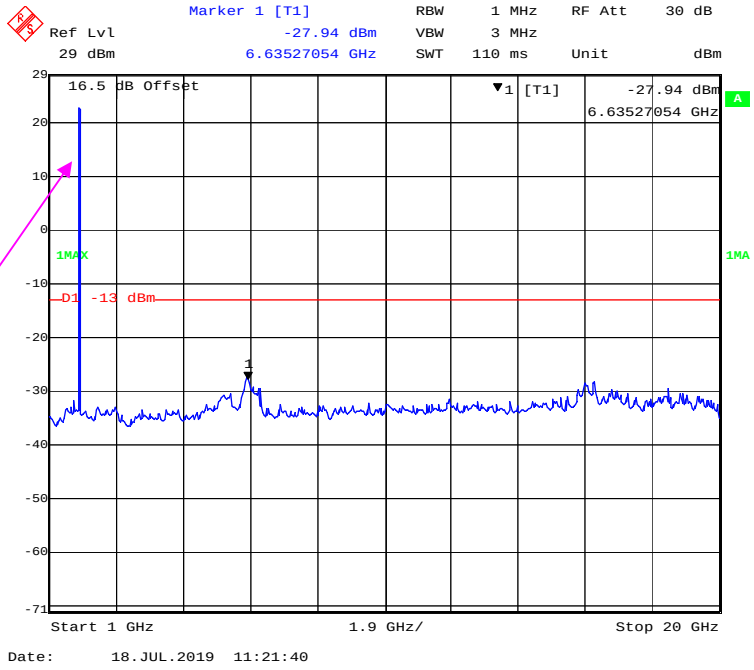


Fundamental

30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)

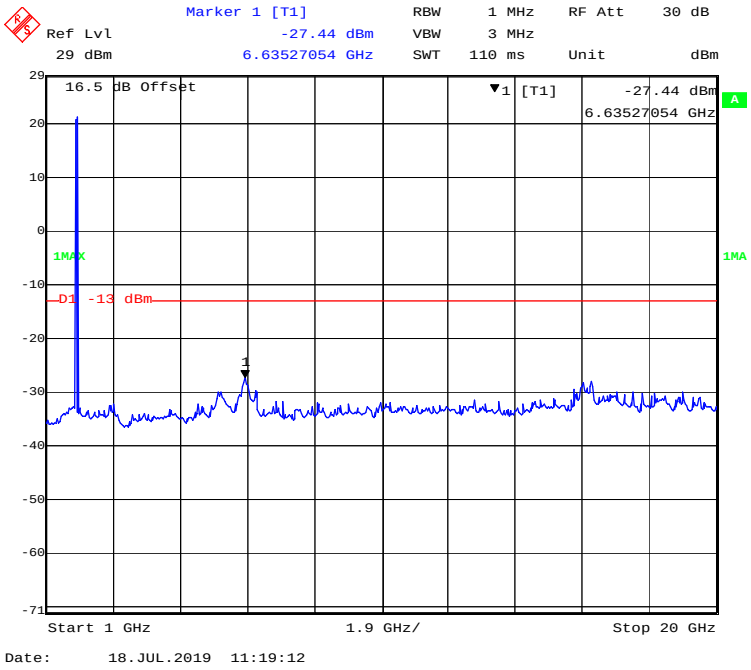


1 GHz – 20 GHz (5 MHz, 16-QAM, Middle Channel)

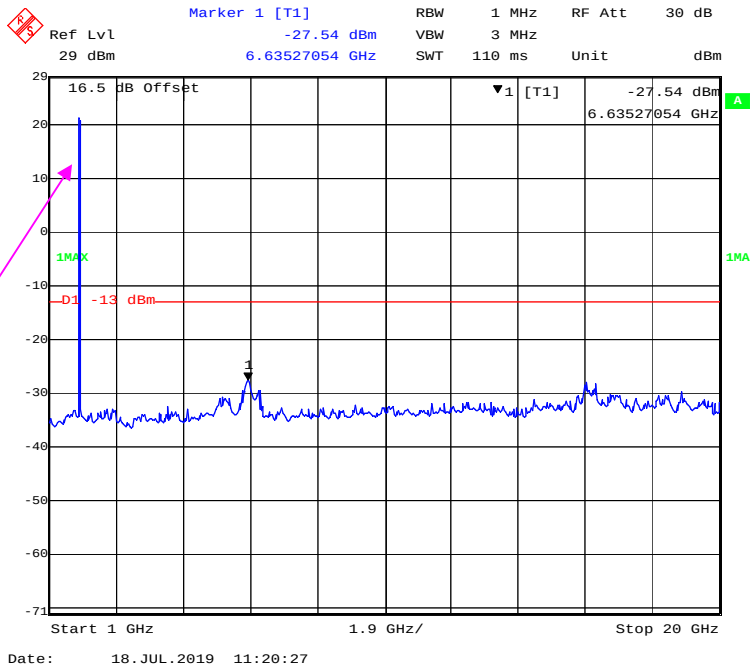


Fundamental

30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)

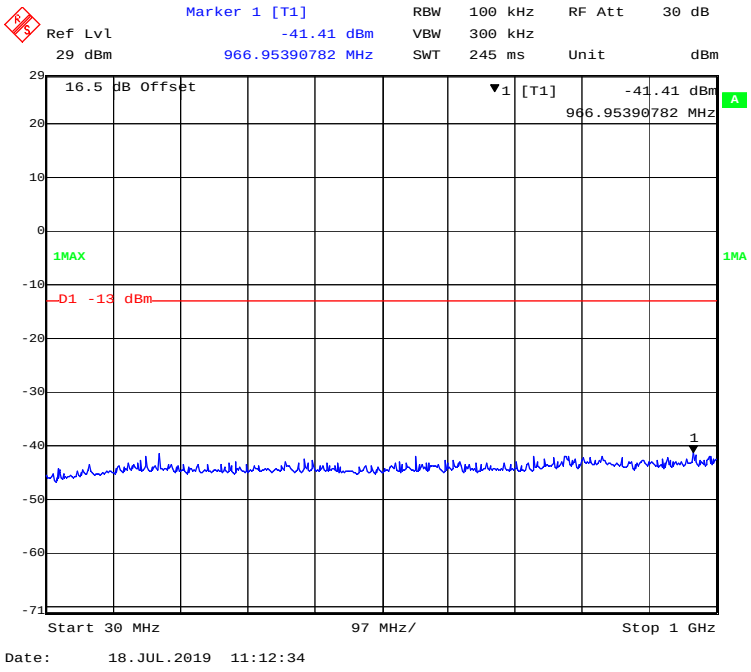


1 GHz – 20 GHz (10 MHz, QPSK, Middle Channel)

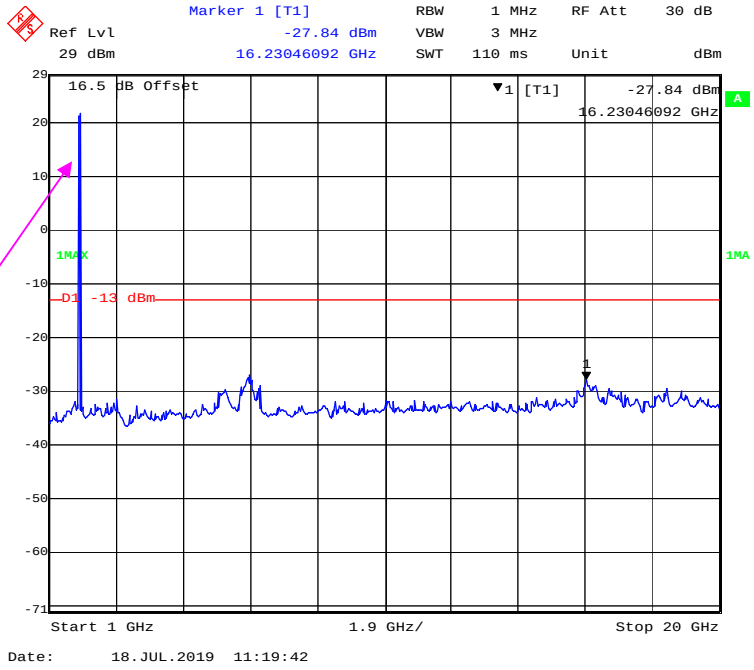


Fundamental

30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)

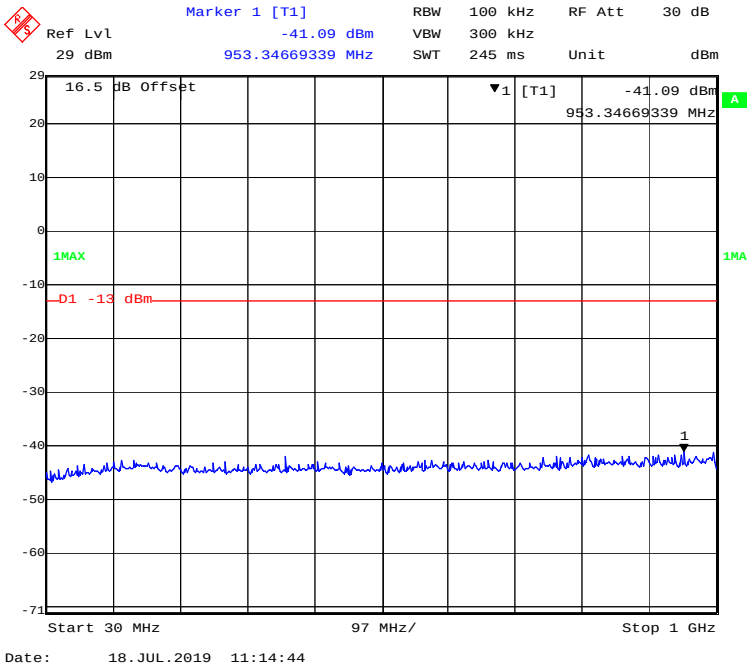


1 GHz – 20 GHz (10 MHz, 16-QAM, Middle Channel)

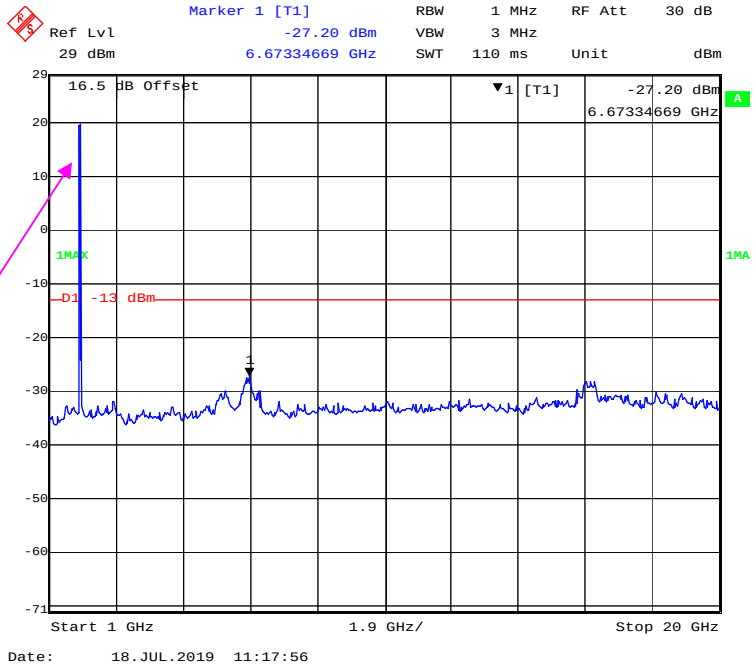


Fundamental

30 MHz - 1 GHz (15 MHz, QPSK, Middle Channel)

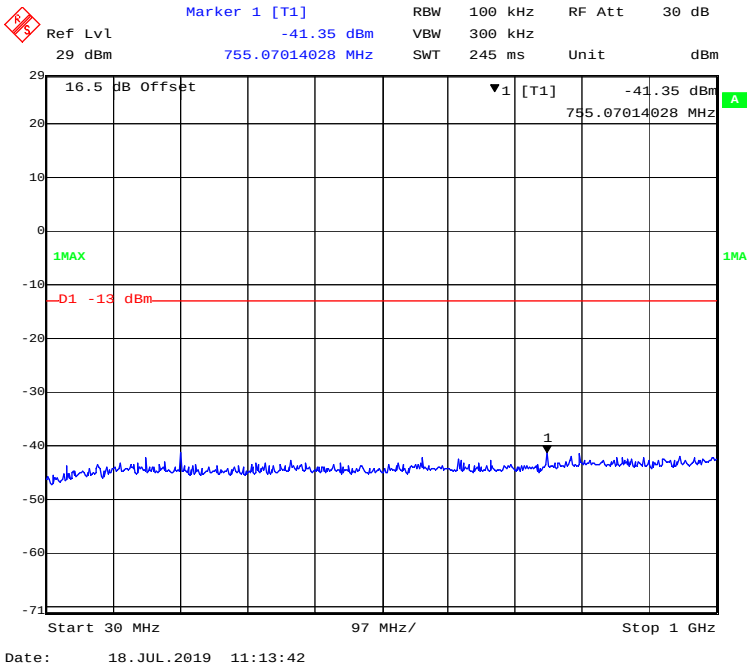


1 GHz – 20 GHz (15 MHz, QPSK, Middle Channel)

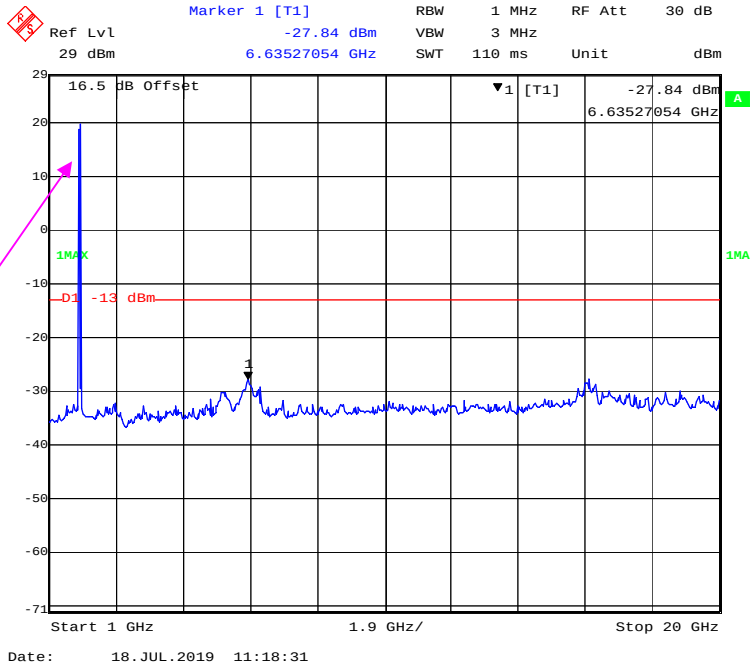


Fundamental

30 MHz - 1 GHz (15 MHz, 16-QAM, Middle Channel)

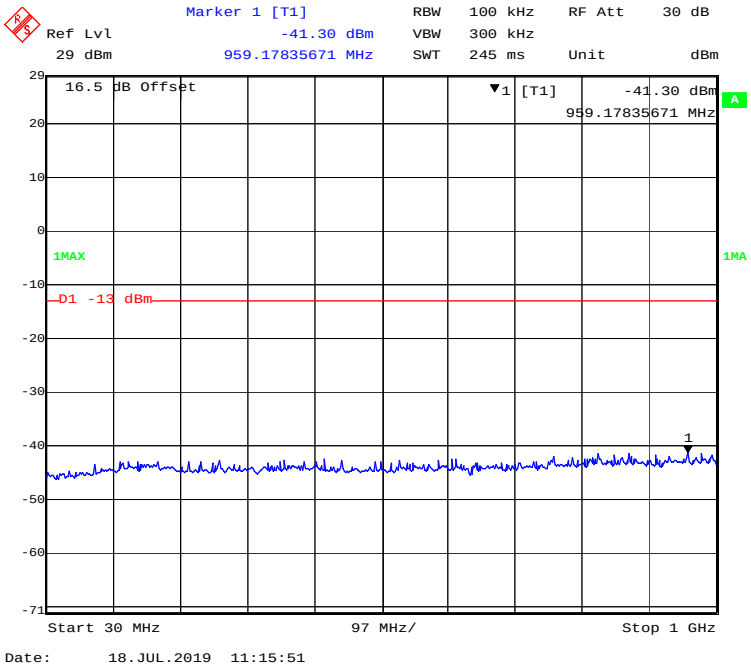


1 GHz – 20 GHz (15 MHz, 16-QAM, Middle Channel)

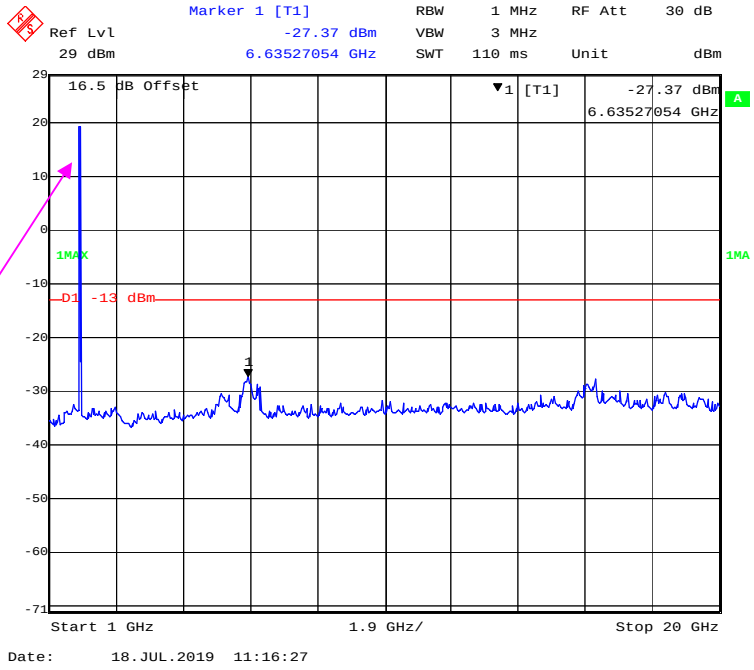


Fundamental

30 MHz - 1 GHz (20 MHz, QPSK, Middle Channel)

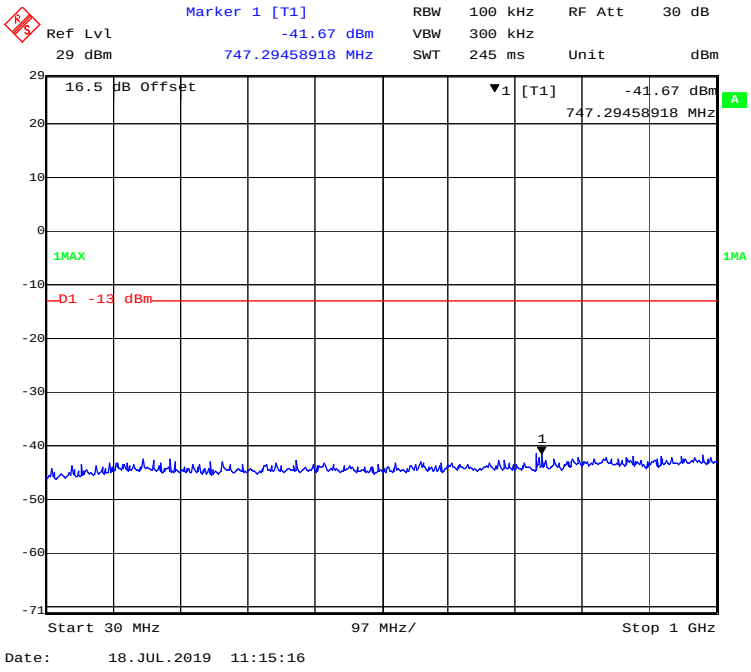


1 GHz – 20 GHz (20 MHz, QPSK, Middle Channel)

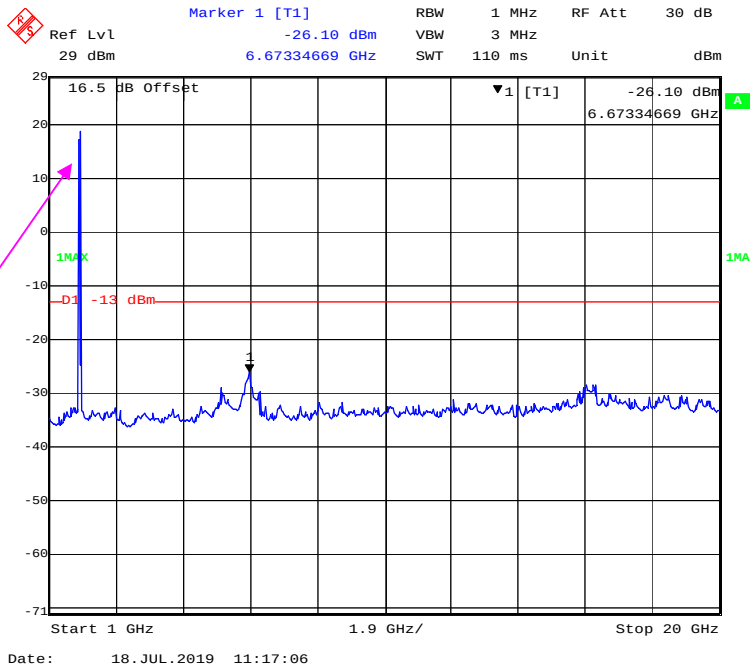


Fundamental

30 MHz - 1 GHz (20 MHz, 16-QAM, Middle Channel)



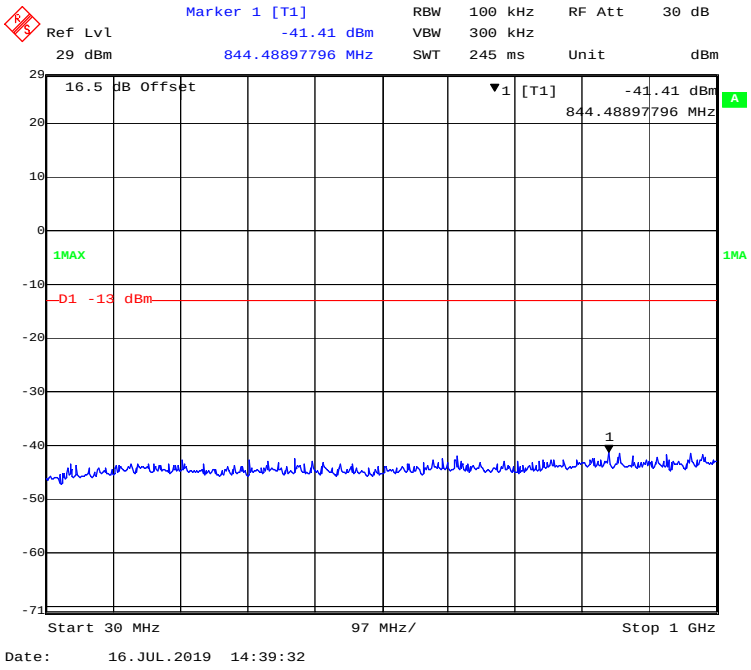
1 GHz – 20 GHz (20 MHz, 16-QAM, Middle Channel)



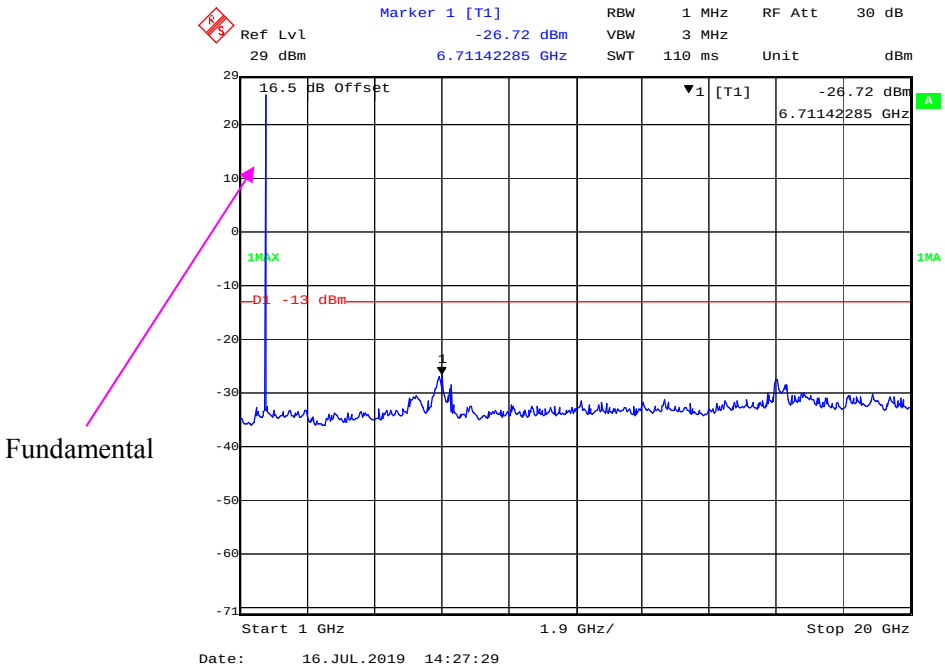
Fundamental

LTE Band 4:

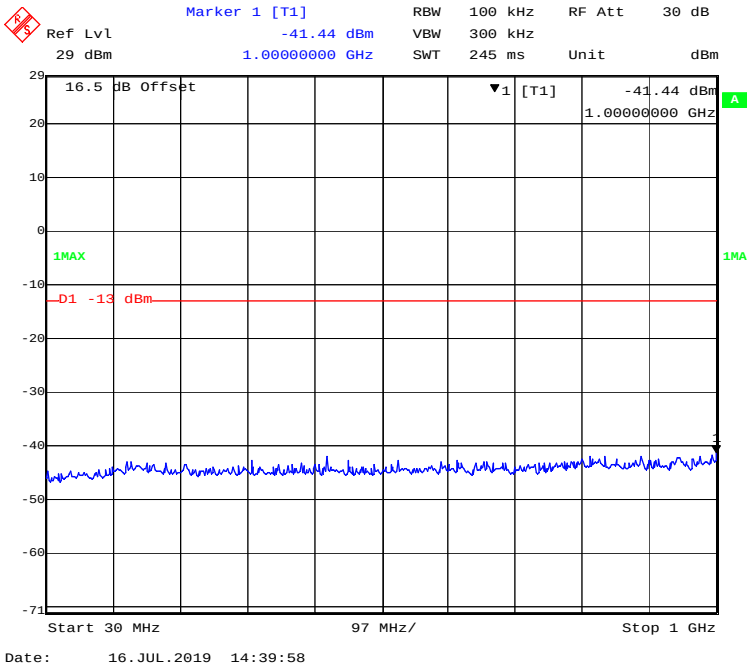
30 MHz - 1 GHz (1.4 MHz, QPSK, Middle Channel)



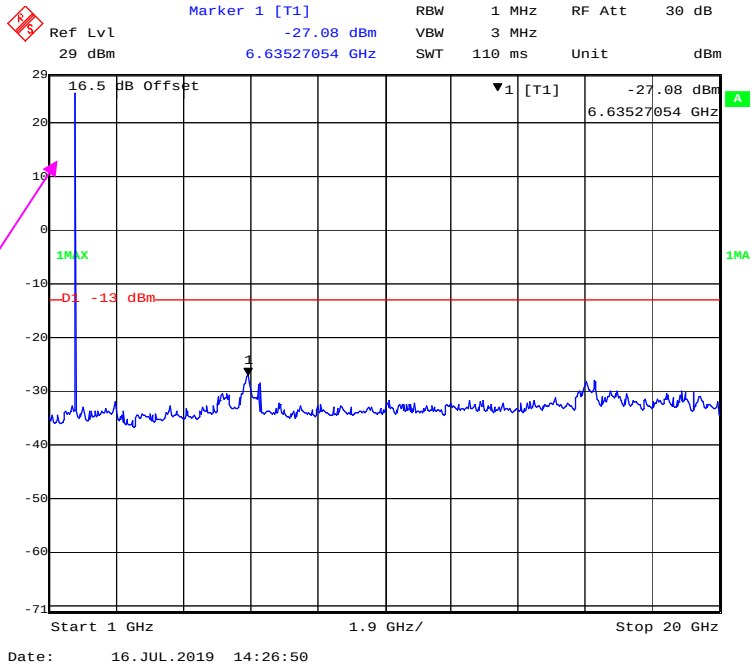
1 GHz – 20 GHz (1.4 MHz, QPSK, Middle Channel)



30 MHz - 1 GHz (1.4 MHz, 16-QAM, Middle Channel)

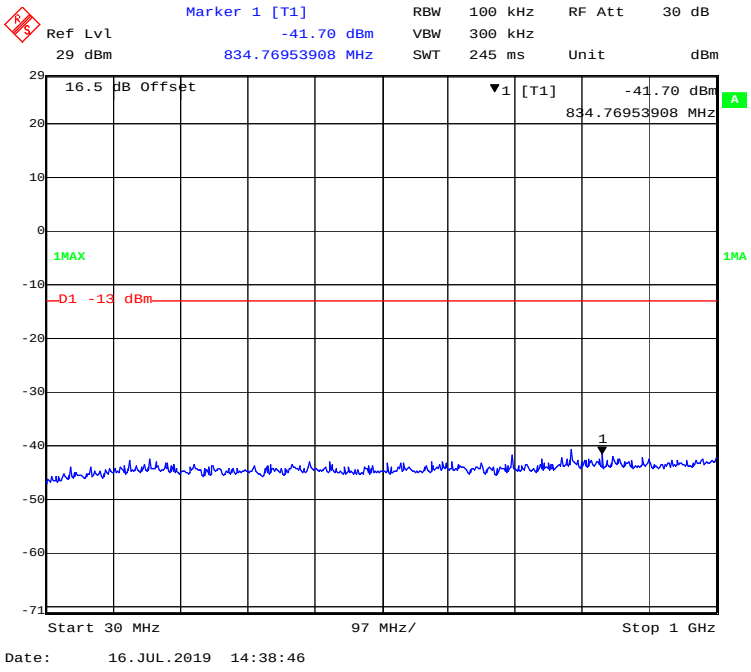


1 GHz – 20 GHz (1.4 MHz, 16-QAM, Middle Channel)

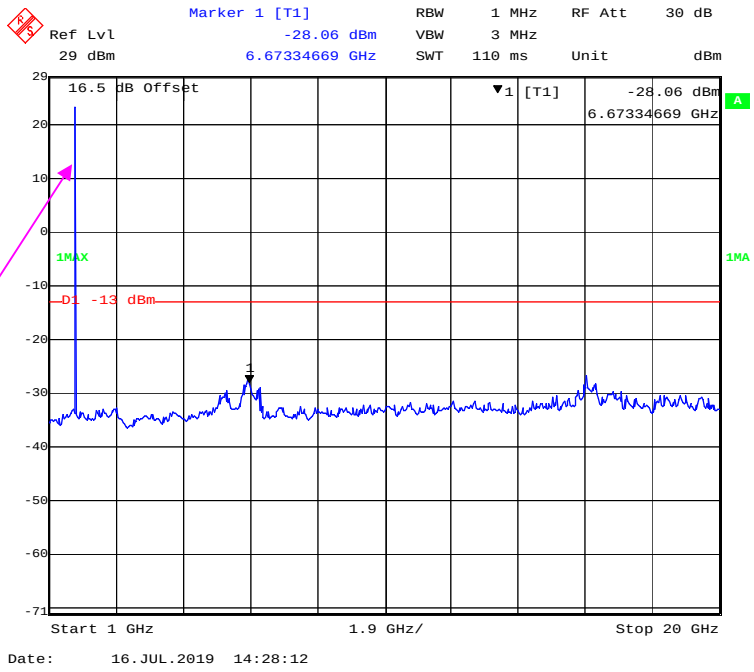


Fundamental

30 MHz - 1 GHz (3 MHz, QPSK, Middle Channel)

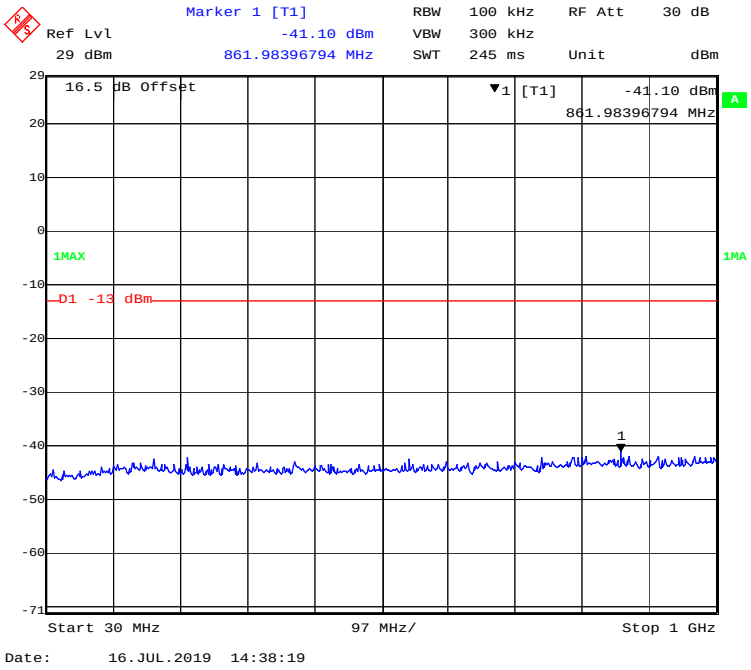


1 GHz – 20 GHz (3 MHz, QPSK, Middle Channel)

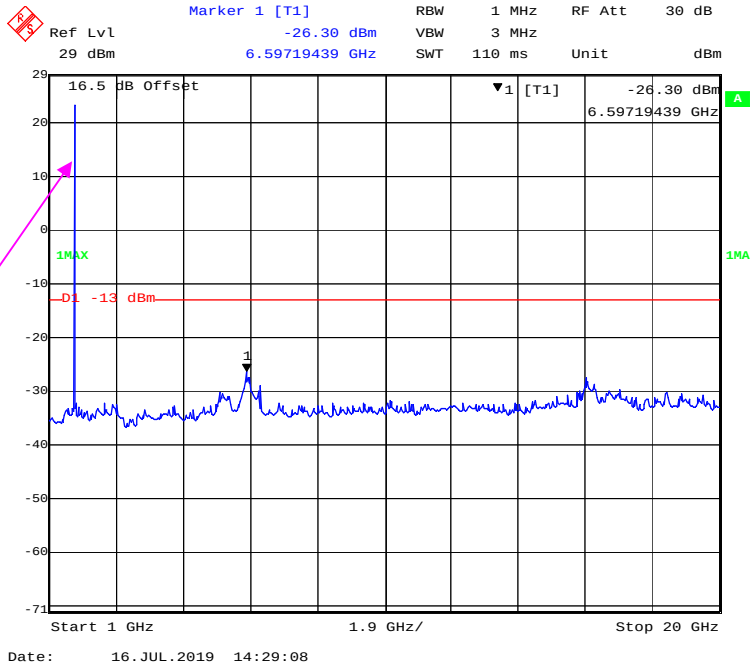


Fundamental

30 MHz - 1 GHz (3 MHz, 16-QAM, Middle Channel)

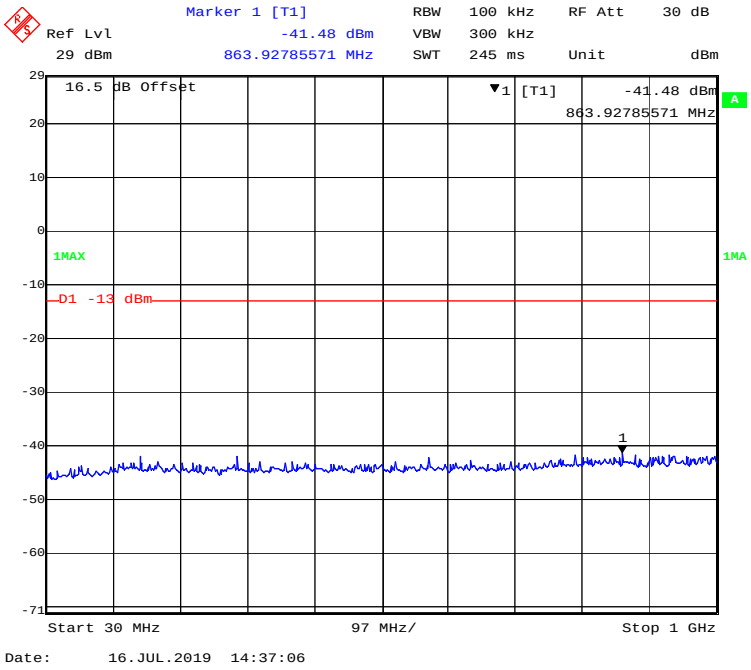


1 GHz – 20 GHz (3 MHz, 16-QAM, Middle Channel)

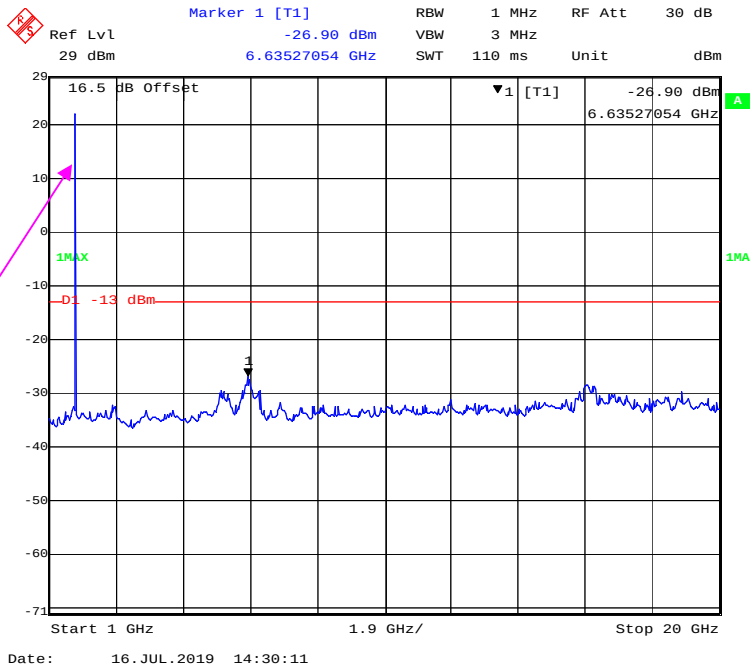


Fundamental

30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)

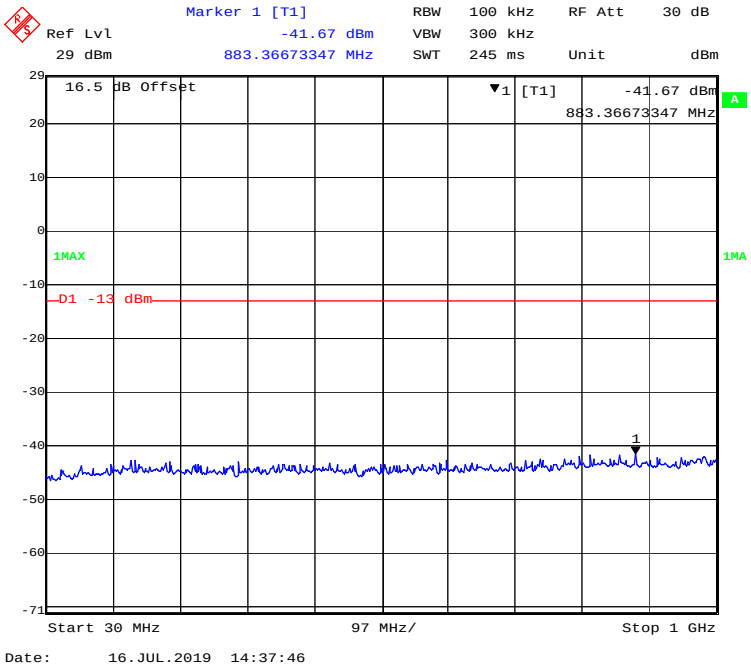


1 GHz – 20 GHz (5 MHz, QPSK, Middle Channel)

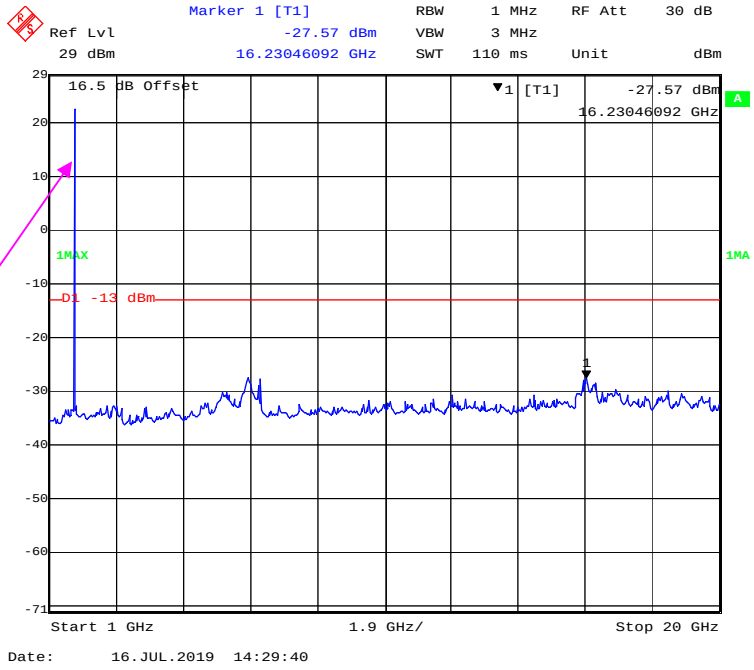


Fundamental

30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)

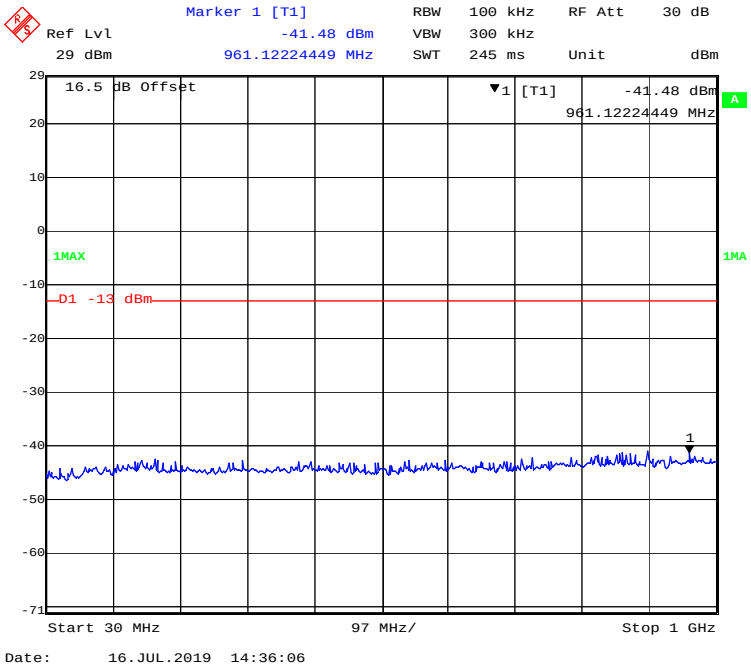


1 GHz – 20 GHz (5 MHz, 16-QAM, Middle Channel)

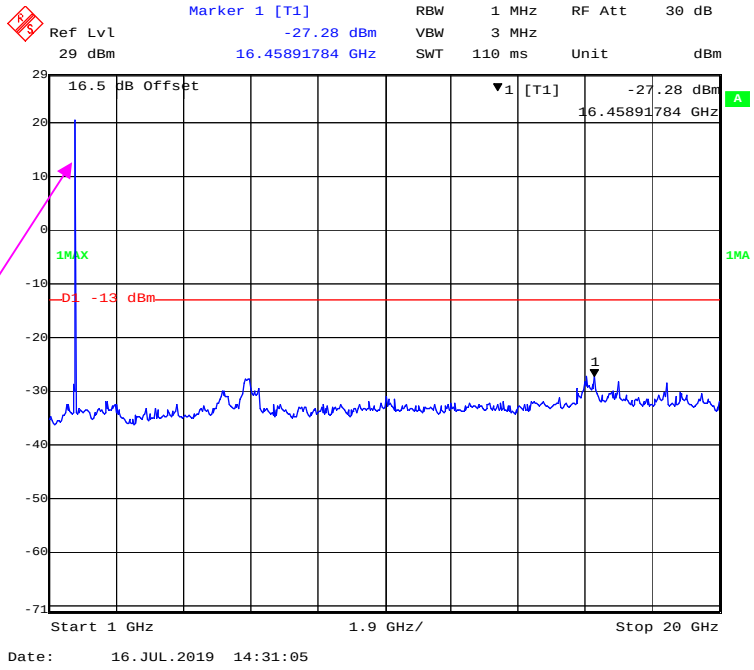


Fundamental

30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)

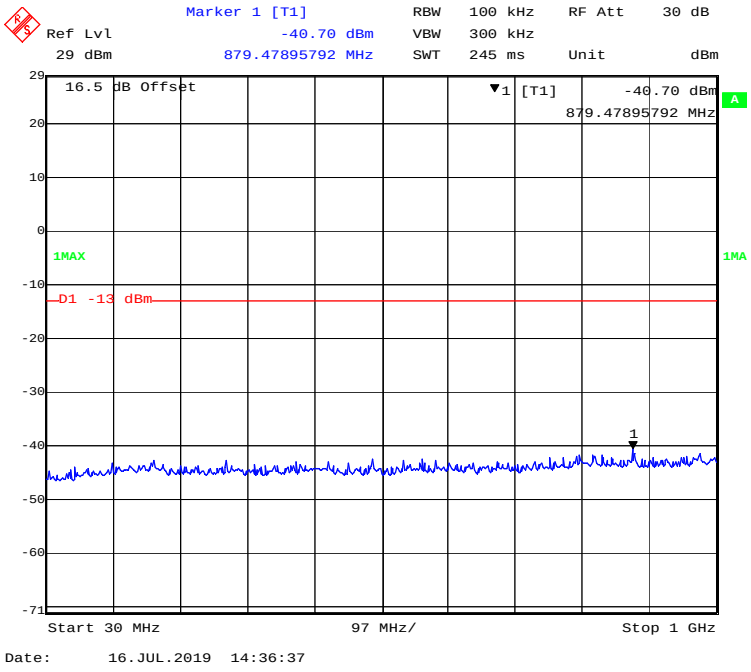


1 GHz – 20 GHz (10 MHz, QPSK, Middle Channel)

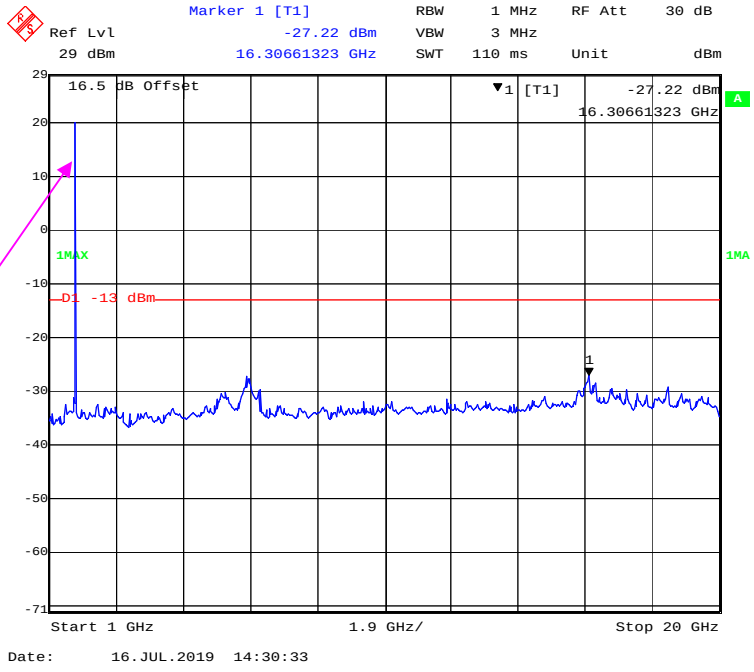


Fundamental

30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)

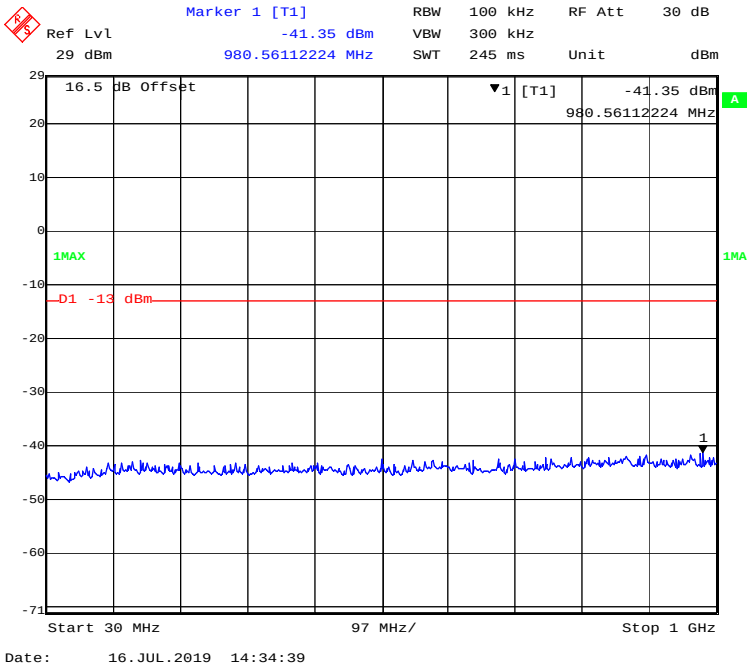


1 GHz – 20 GHz (10 MHz, 16-QAM, Middle Channel)

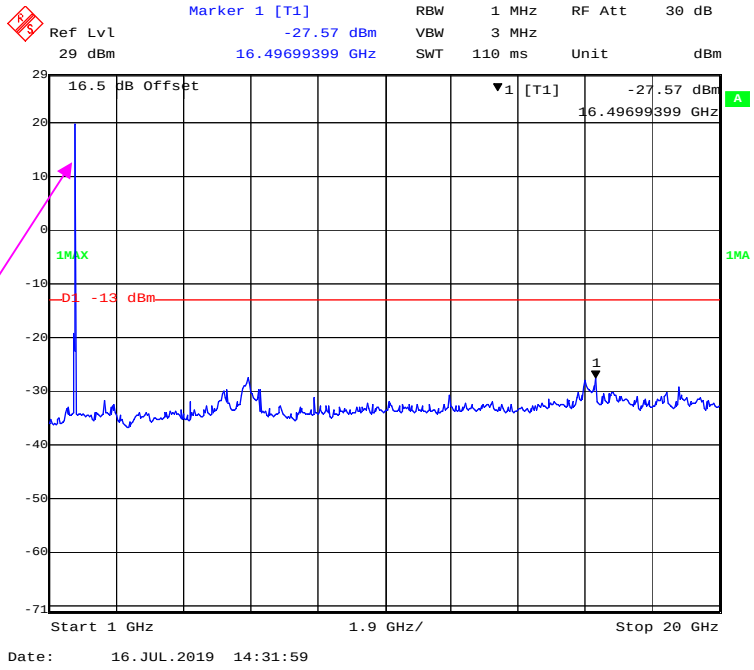


Fundamental

30 MHz - 1 GHz (15 MHz, QPSK, Middle Channel)

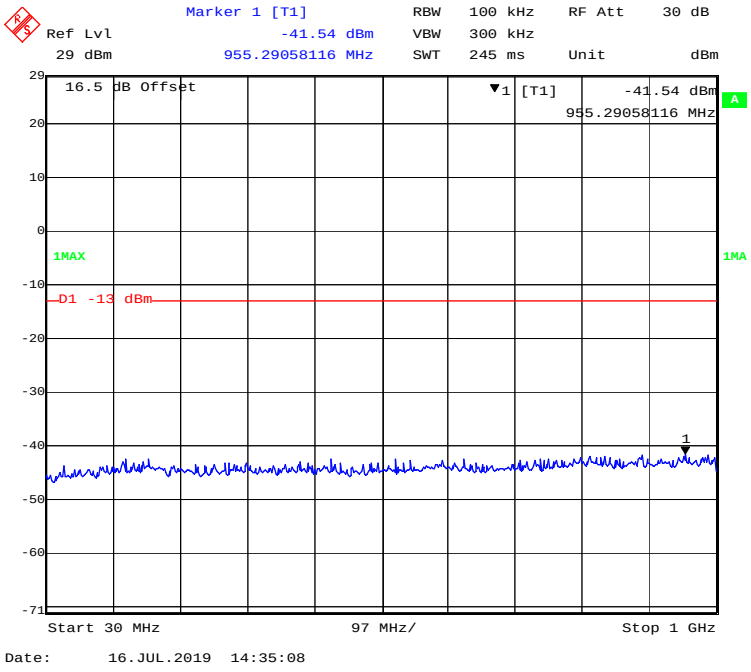


1 GHz – 20 GHz (15 MHz, QPSK, Middle Channel)

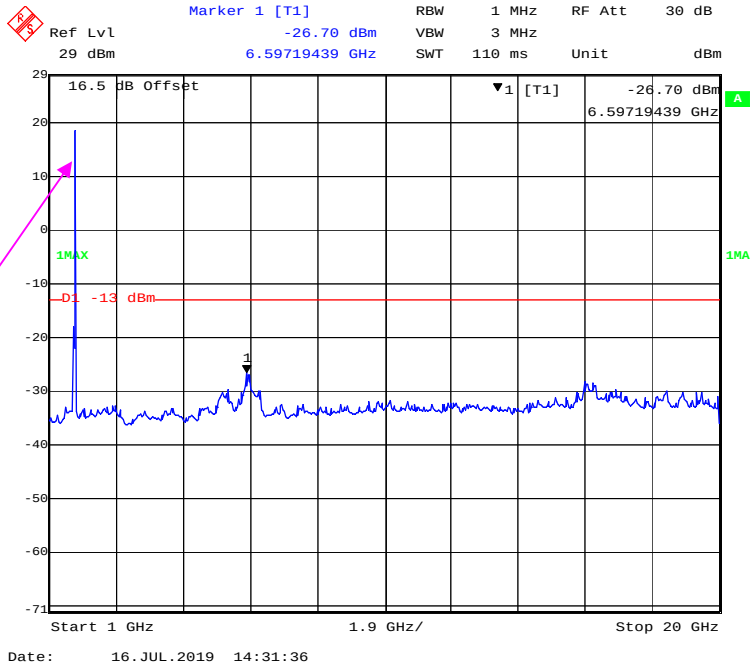


Fundamental

30 MHz - 1 GHz (15 MHz, 16-QAM, Middle Channel)

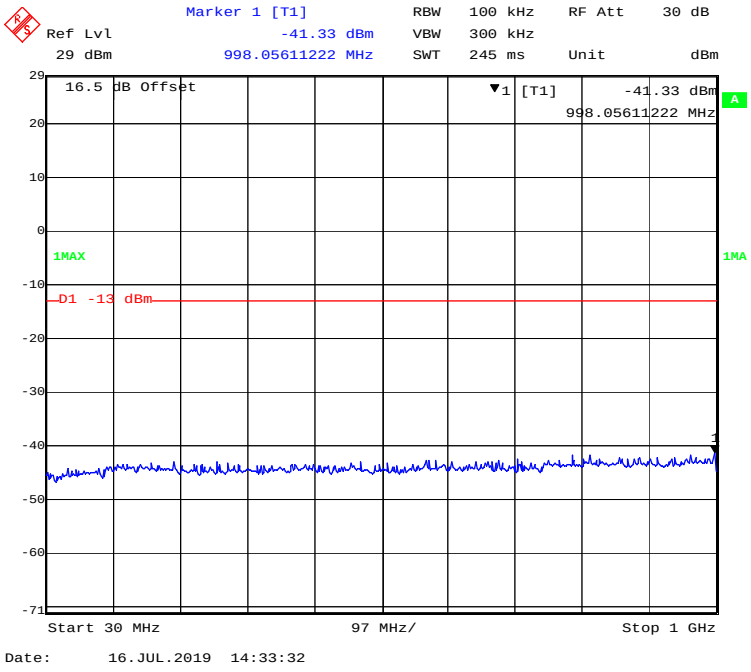


1 GHz – 20 GHz (15 MHz, 16-QAM, Middle Channel)

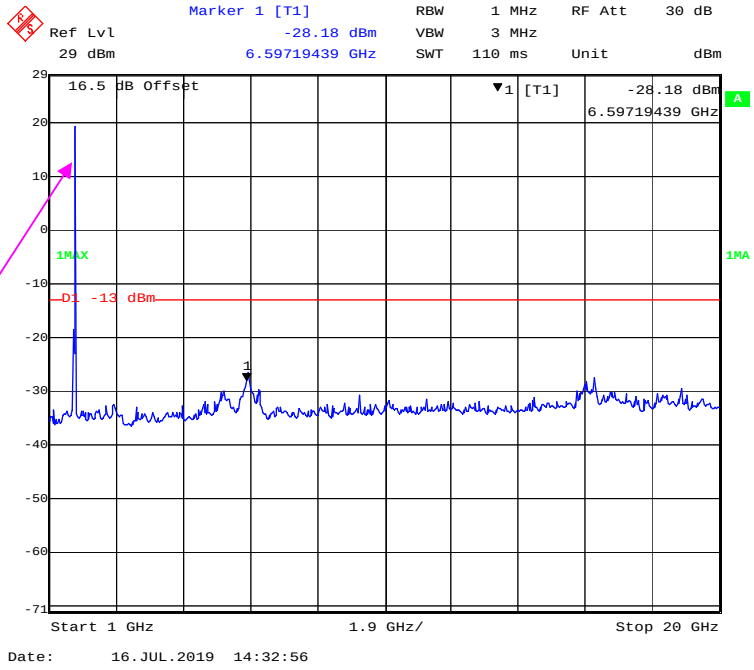


Fundamental

30 MHz - 1 GHz (20 MHz, QPSK, Middle Channel)

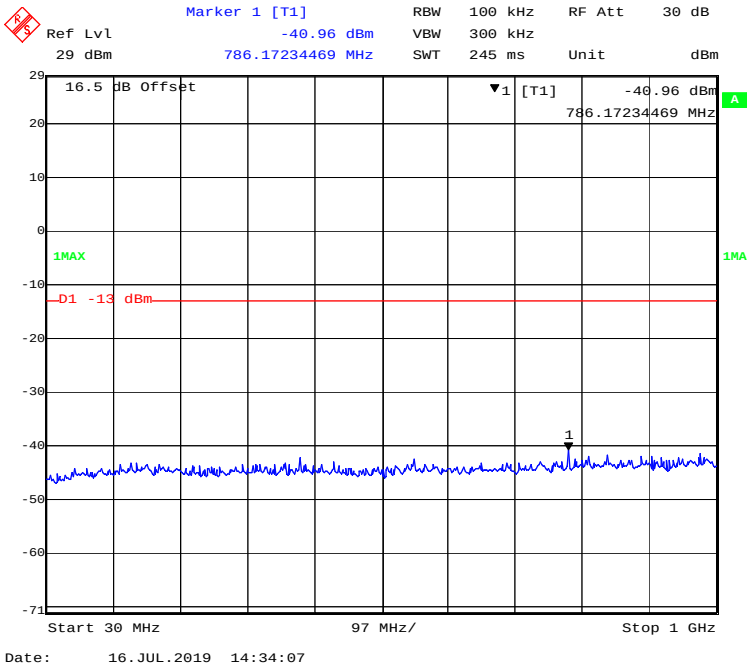


1 GHz – 20 GHz (20 MHz, QPSK, Middle Channel)

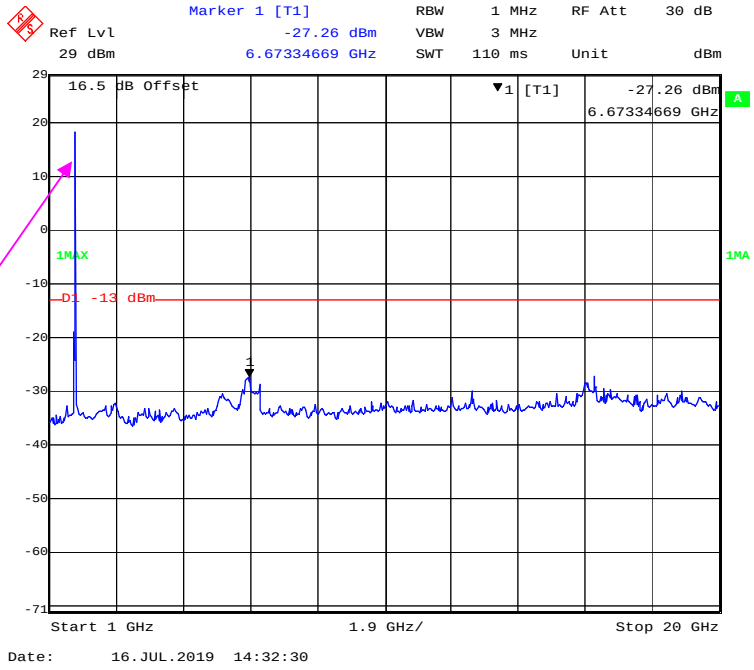


Fundamental

30 MHz - 1 GHz (20 MHz, 16-QAM, Middle Channel)



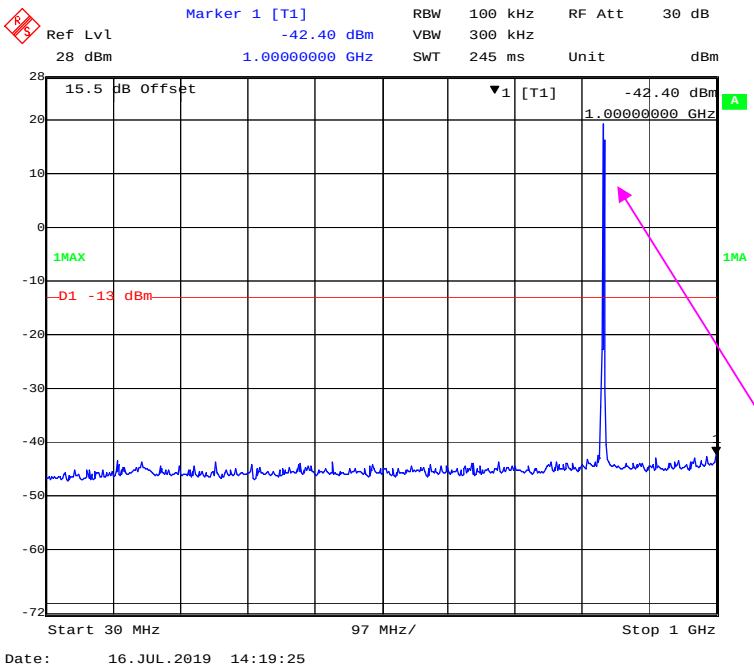
1 GHz – 20 GHz (20 MHz, 16-QAM, Middle Channel)



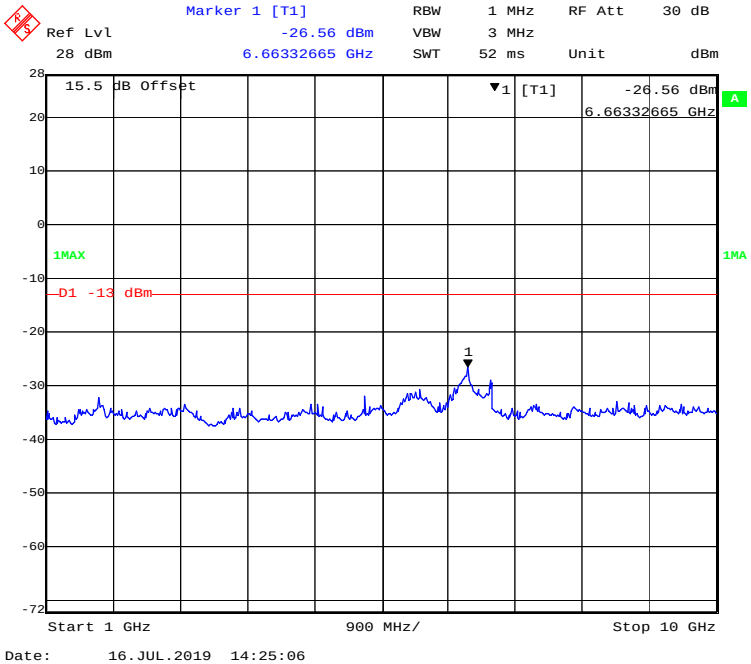
Fundamental

LTE Band 5:

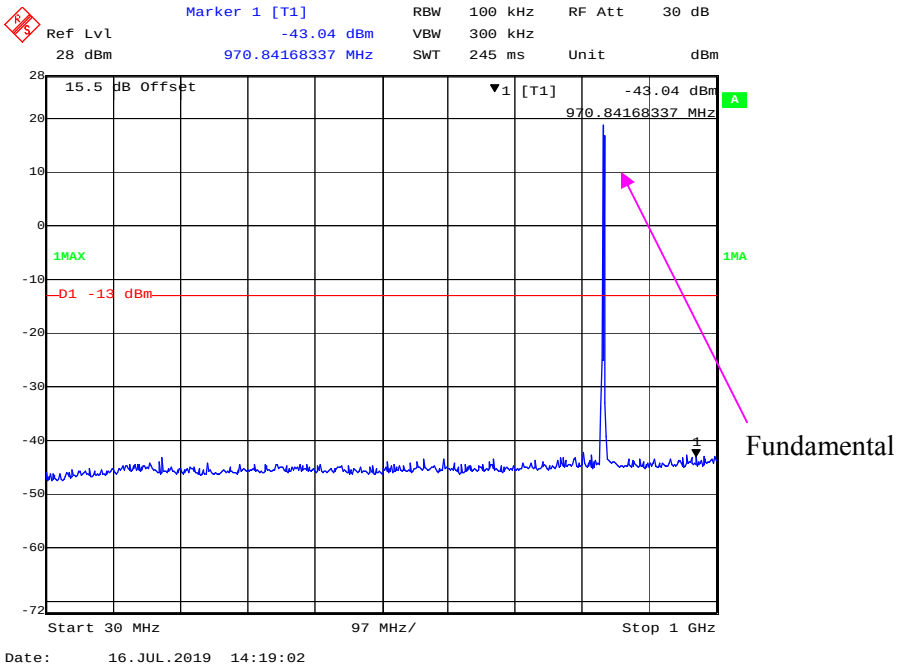
30 MHz - 1 GHz (1.4 MHz, QPSK, Middle Channel)



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

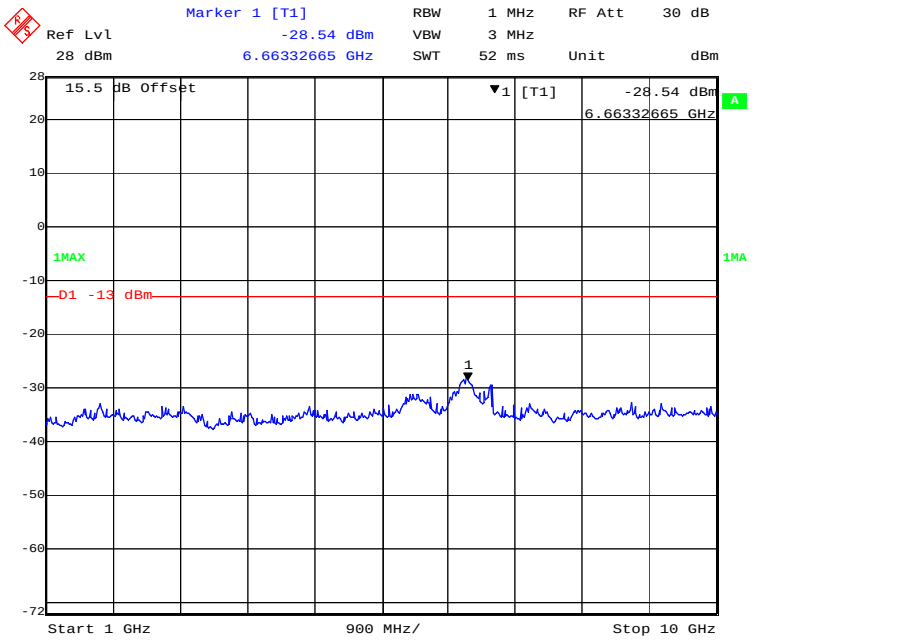


30 MHz - 1 GHz (1.4 MHz, 16-QAM, Middle Channel)



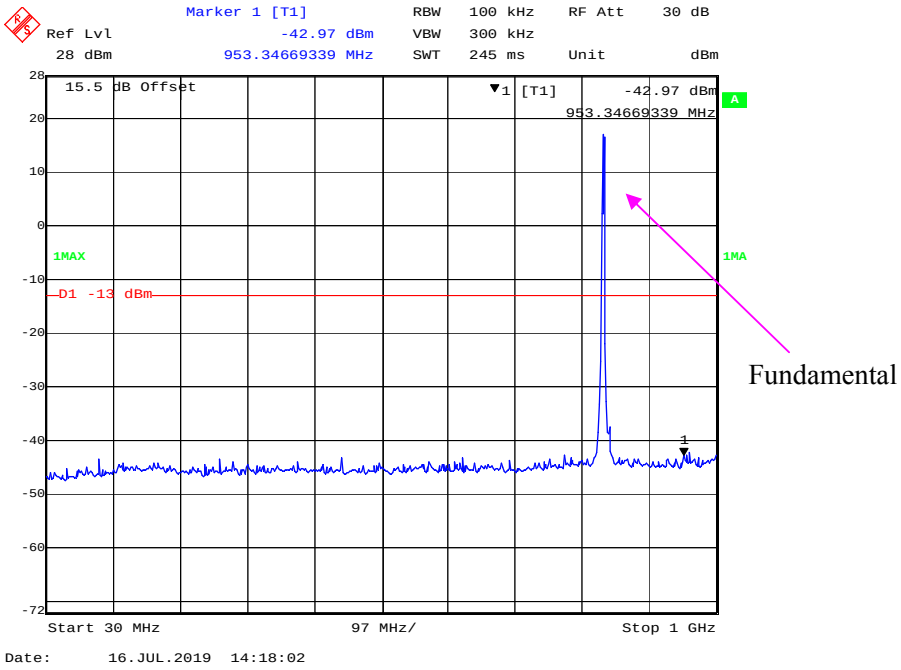
Date: 16.JUL.2019 14:19:02

1 GHz – 10 GHz (1.4 MHz, 16-QAM, Middle Channel)



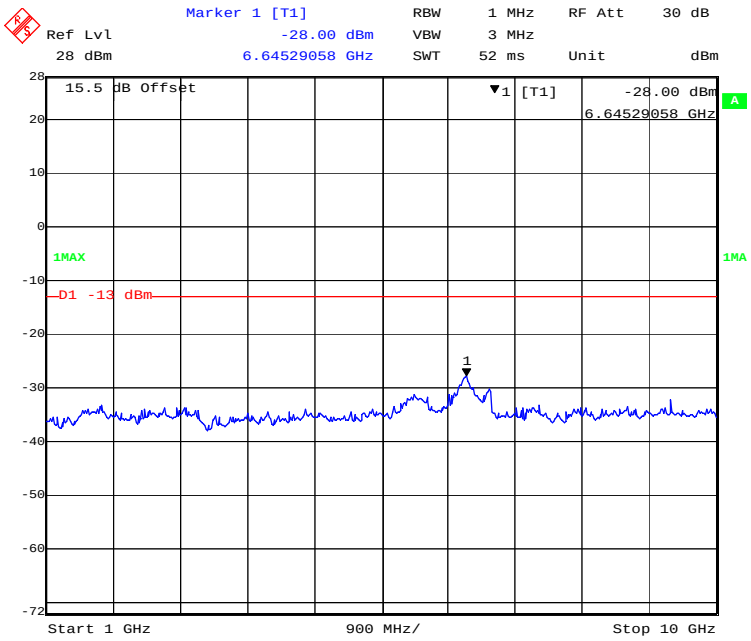
Date: 16.JUL.2019 14:25:45

30 MHz - 1 GHz (3 MHz, QPSK, Middle Channel)



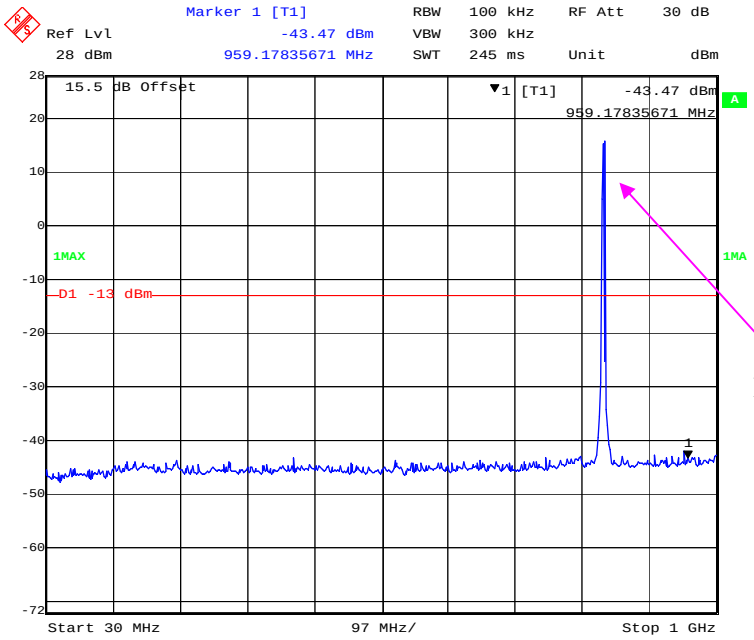
Date: 16.JUL.2019 14:18:02

1 GHz – 10 GHz (3 MHz, QPSK, Middle Channel)



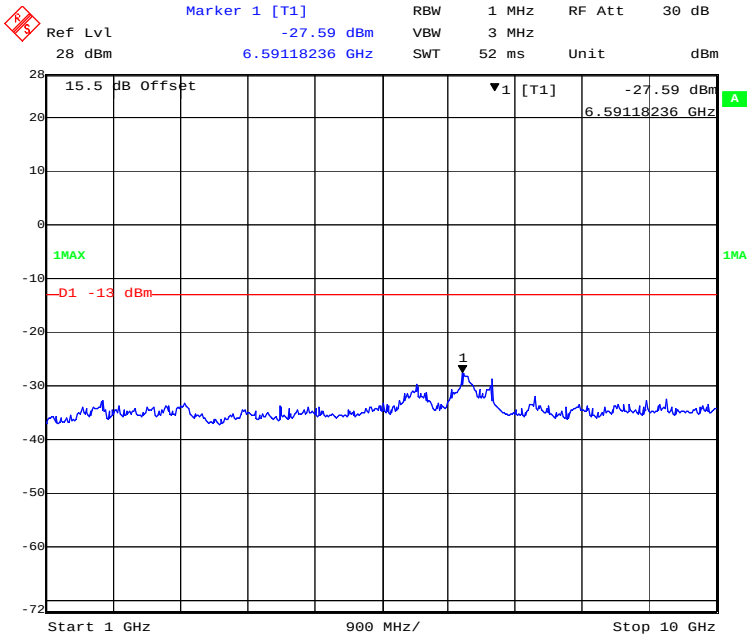
Date: 16.JUL.2019 14:24:36

30 MHz - 1 GHz (3 MHz, 16-QAM, Middle Channel)



Date: 16.JUL.2019 14:18:37

1 GHz – 10 GHz (3 MHz, 16-QAM, Middle Channel)



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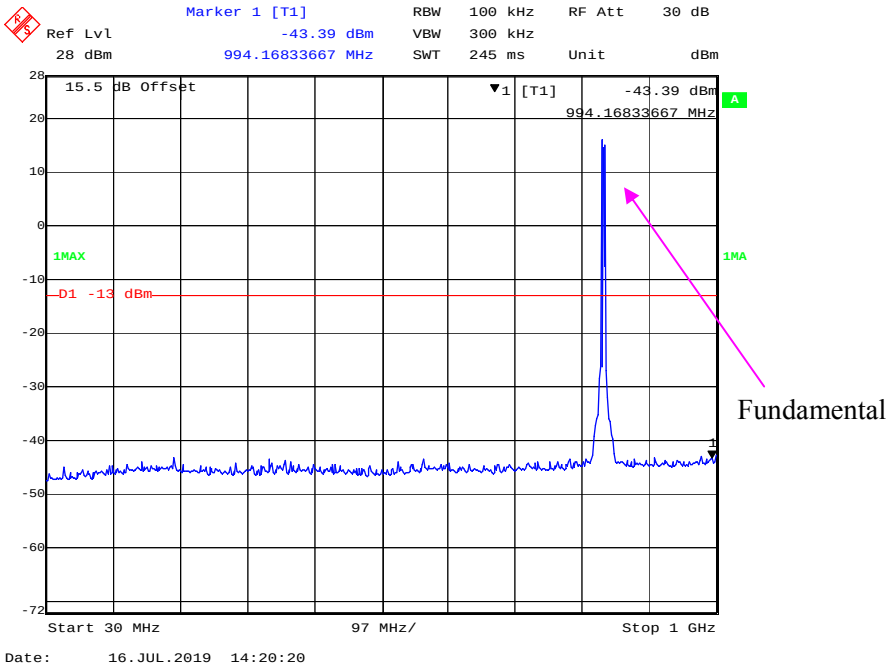
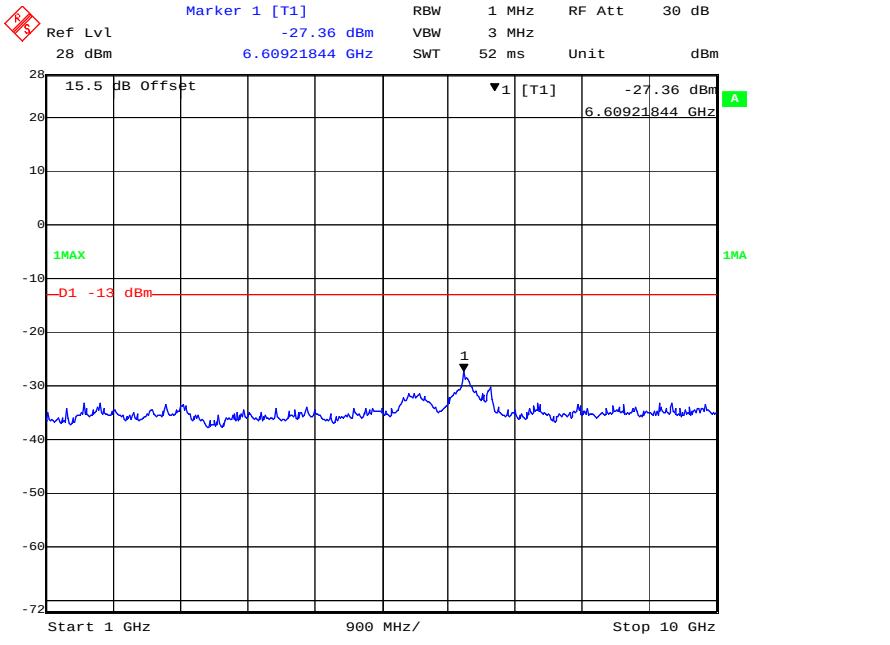
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



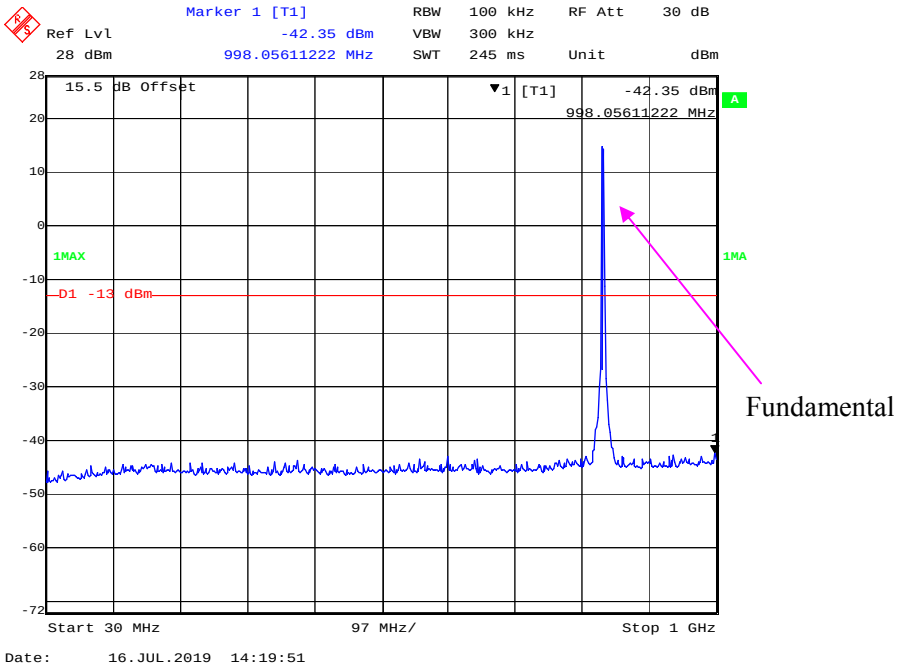
Date: 16.JUL.2019 14:20:20

1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



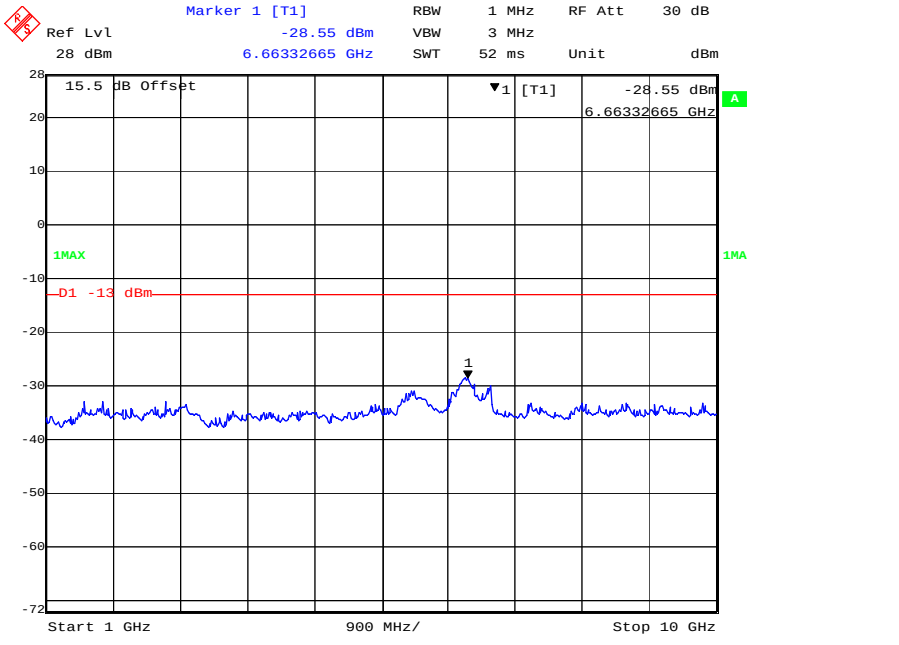
Date: 16.JUL.2019 14:23:03

30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



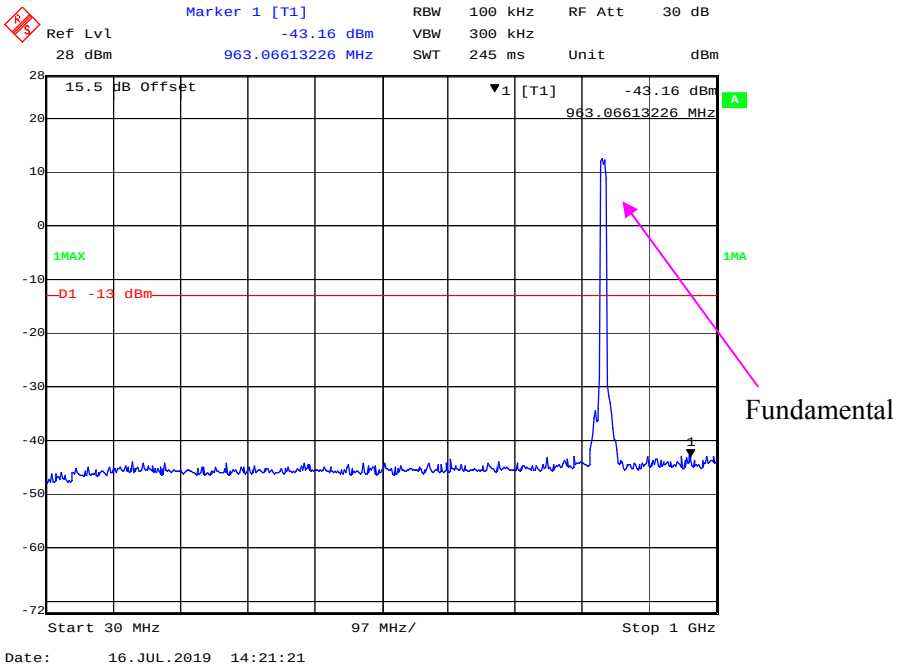
Date: 16.JUL.2019 14:19:51

1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)



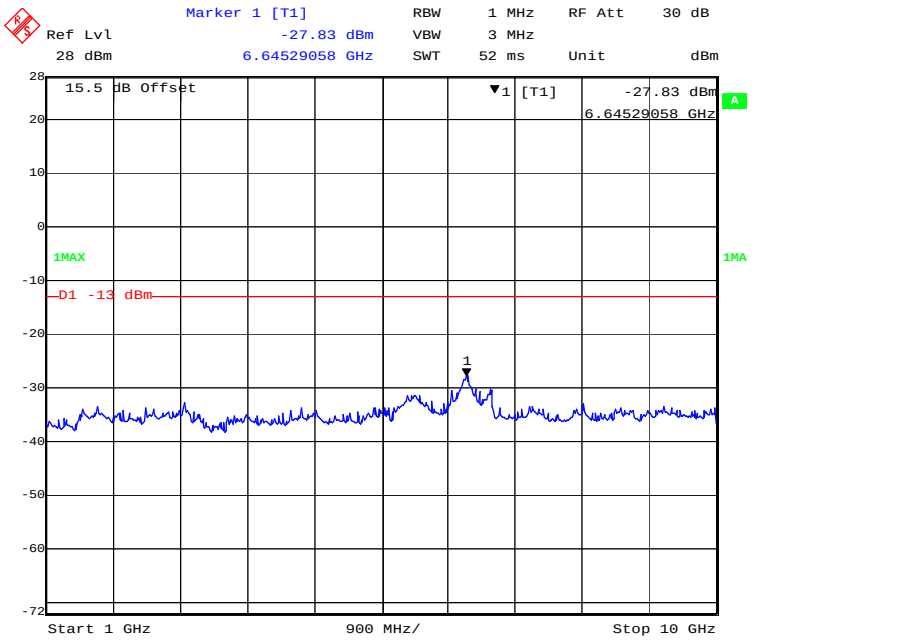
Date: 16.JUL.2019 14:23:28

30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



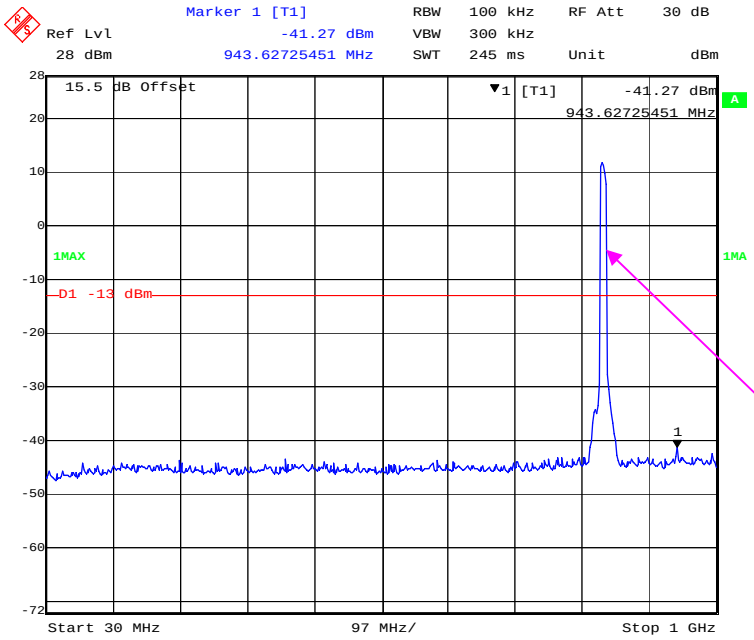
Date: 16.JUL.2019 14:21:21

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



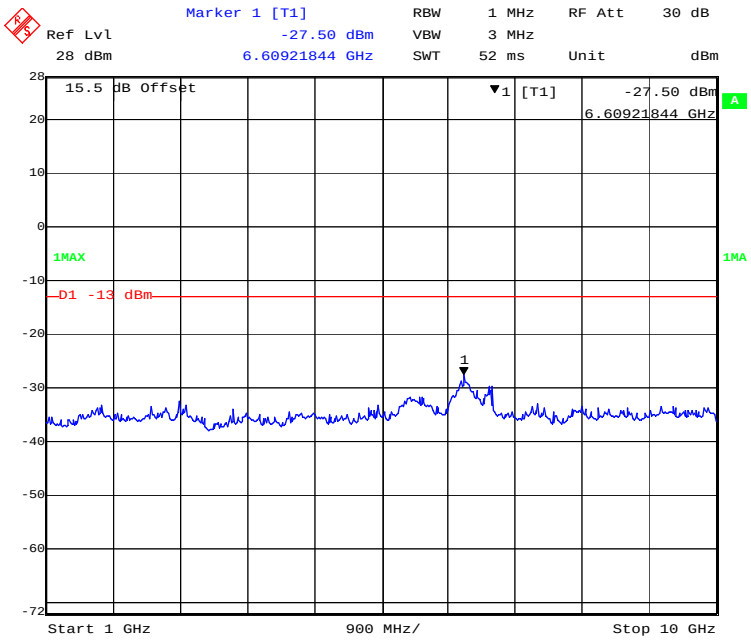
Date: 16.JUL.2019 14:22:05

30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)



Date: 16.JUL.2019 14:20:54

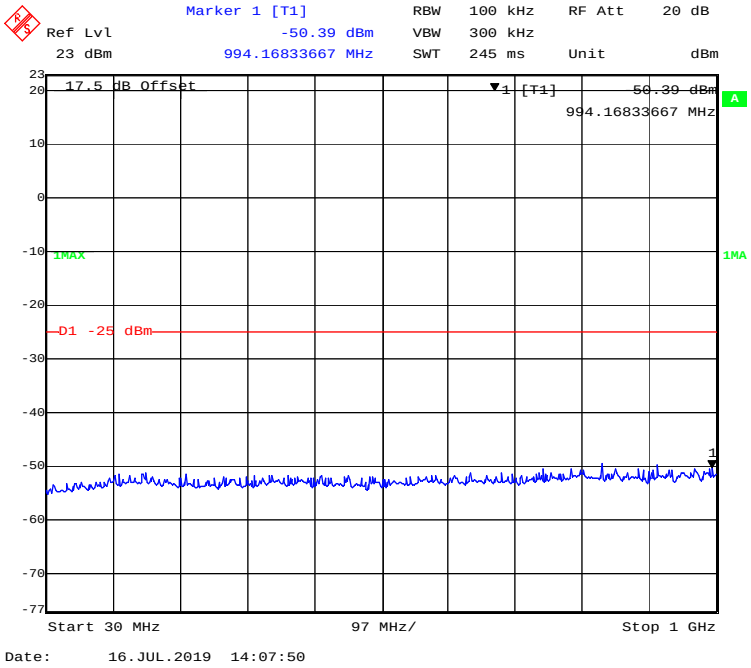
1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)



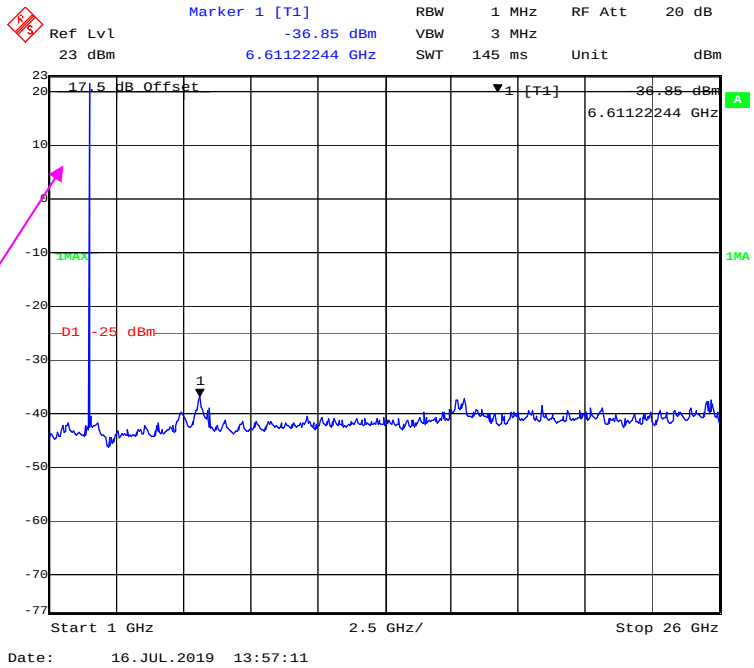
Date: 16.JUL.2019 14:22:34

LTE Band 7:

30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)

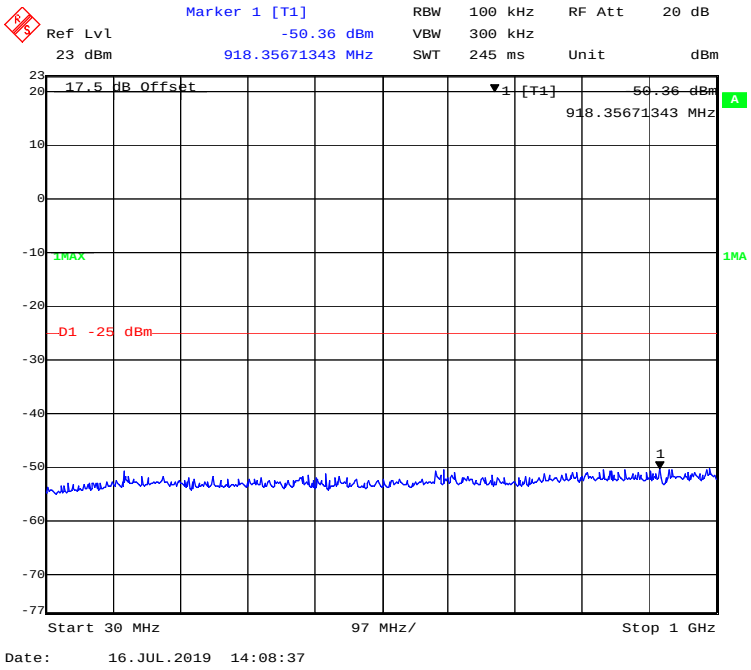


1 GHz – 26 GHz (5 MHz, QPSK, Middle Channel)

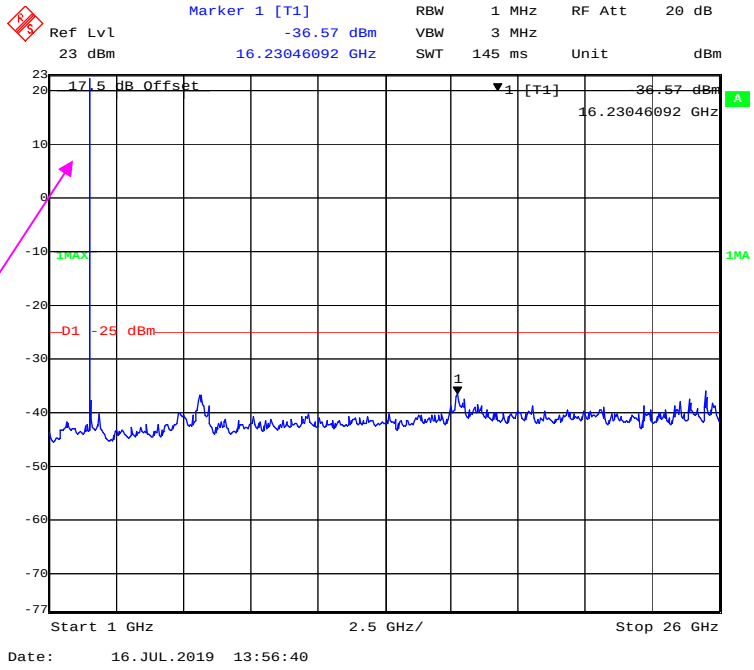


Fundamental

30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)

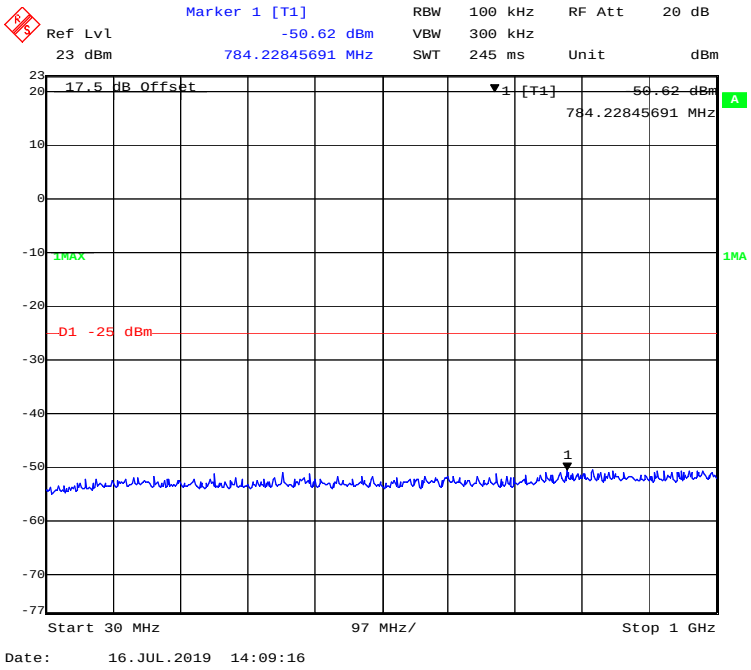


1 GHz – 26 GHz (5 MHz, 16-QAM, Middle Channel)

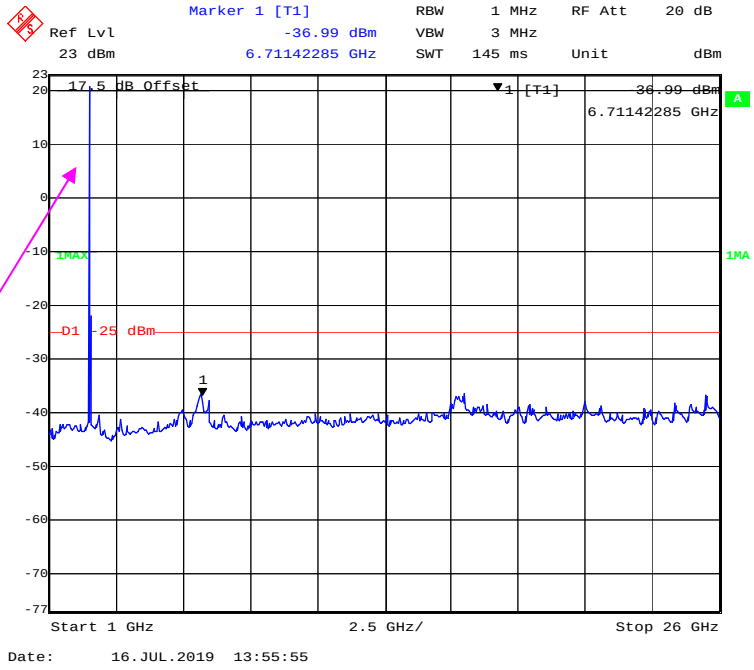


Fundamental

30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)

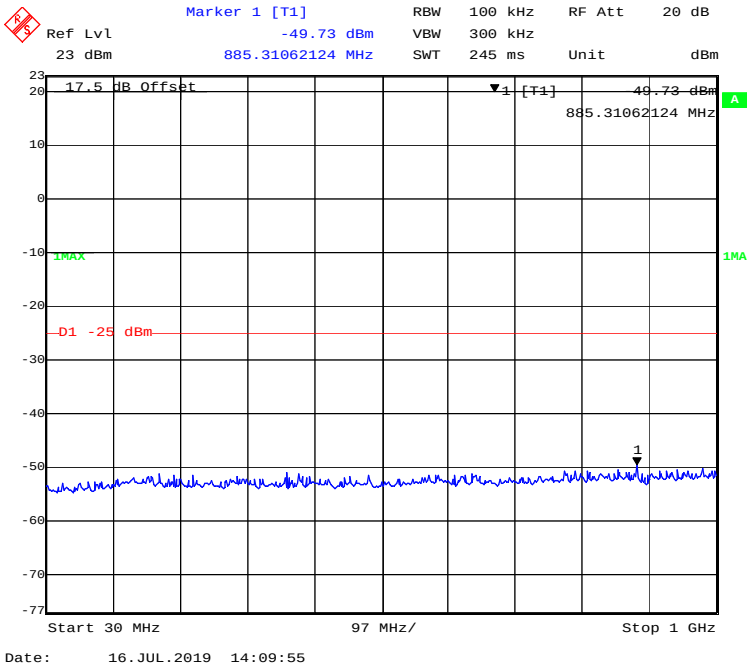


1 GHz – 26GHz (10MHz, QPSK, Middle Channel)

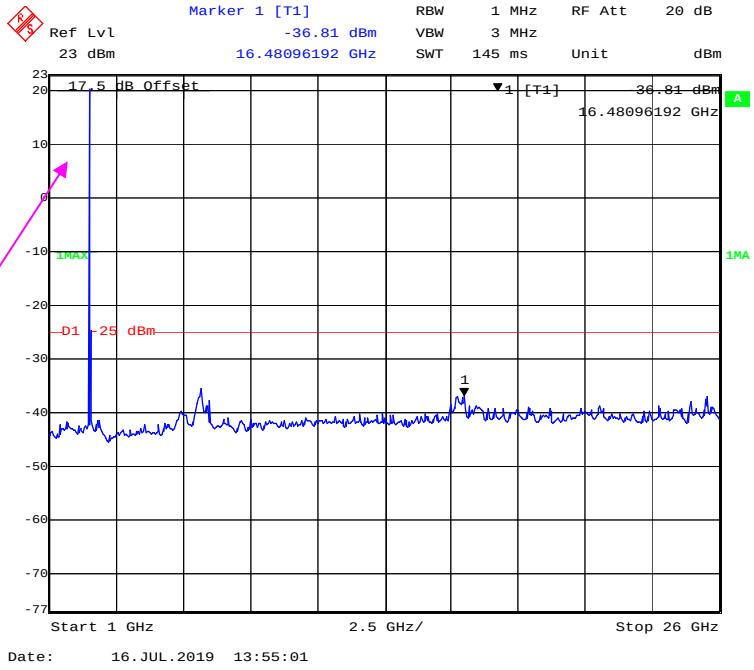


Fundamental

30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)

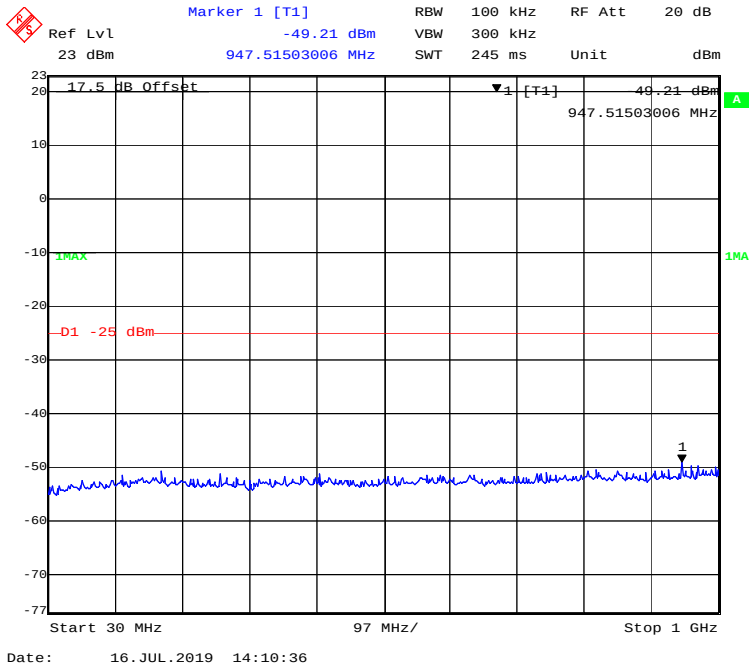


1 GHz – 26 GHz (10 MHz, 16-QAM, Middle Channel)

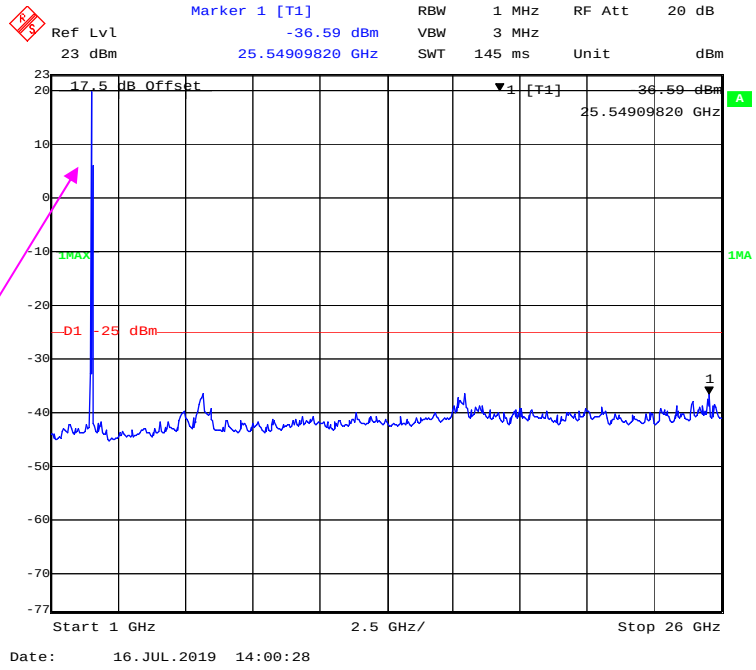


Fundamental

30 MHz - 1 GHz (15 MHz, QPSK, Middle Channel)

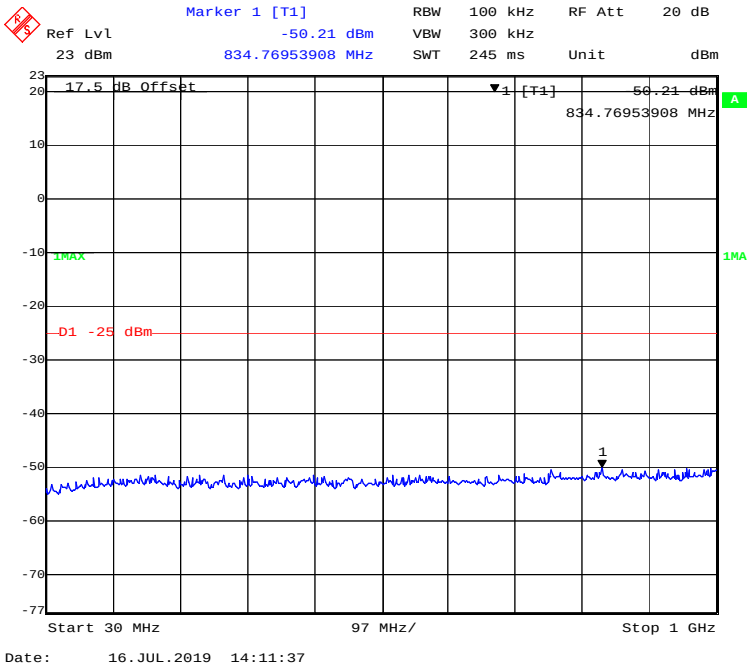


1 GHz – 26 GHz (15MHz, QPSK, Middle Channel)

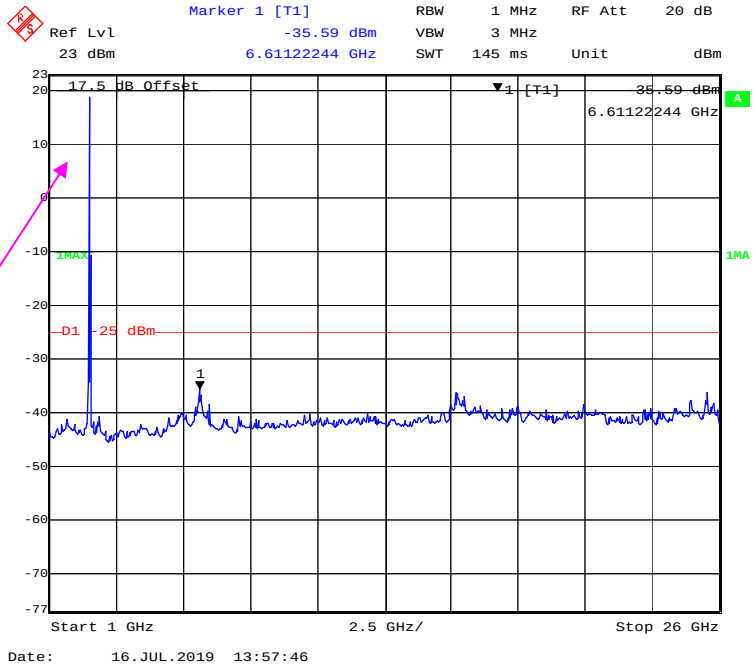


Fundamental

30 MHz - 1 GHz (15 MHz, 16-QAM, Middle Channel)

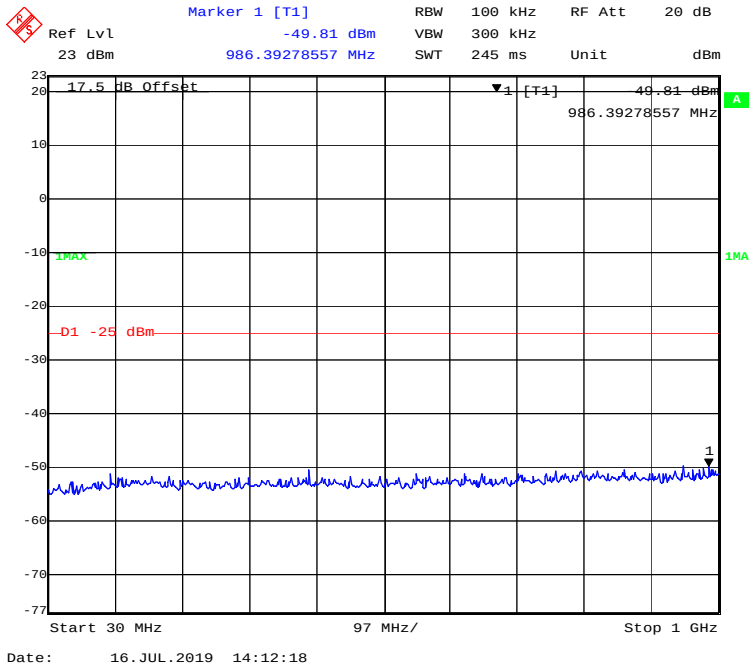


1 GHz – 26 GHz (15 MHz, 16-QAM, Middle Channel)

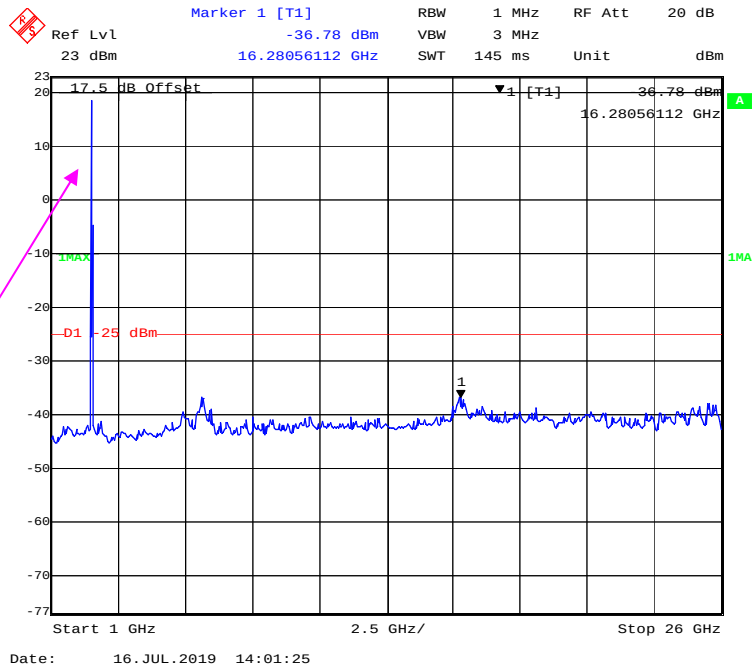


Fundamental

30 MHz - 1 GHz (20 MHz, QPSK, Middle Channel)

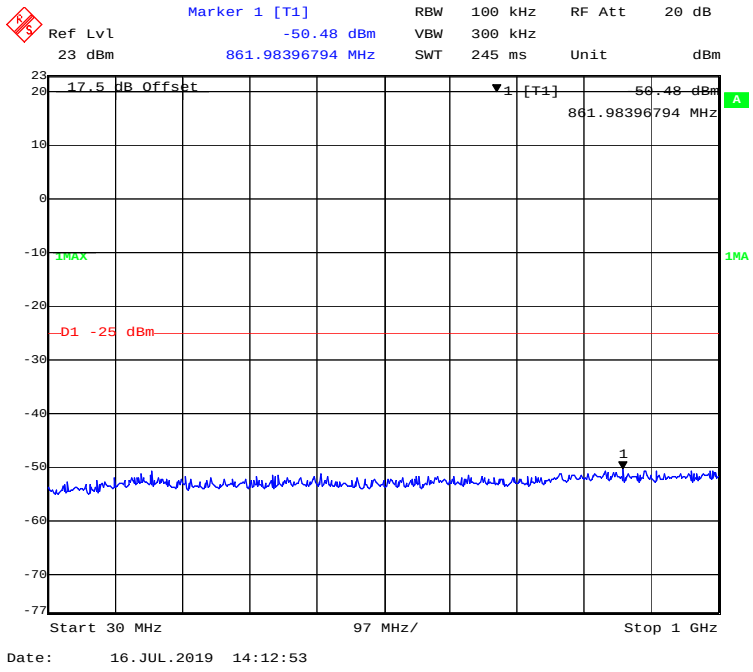


1 GHz – 26 GHz (20MHz, QPSK, Middle Channel)

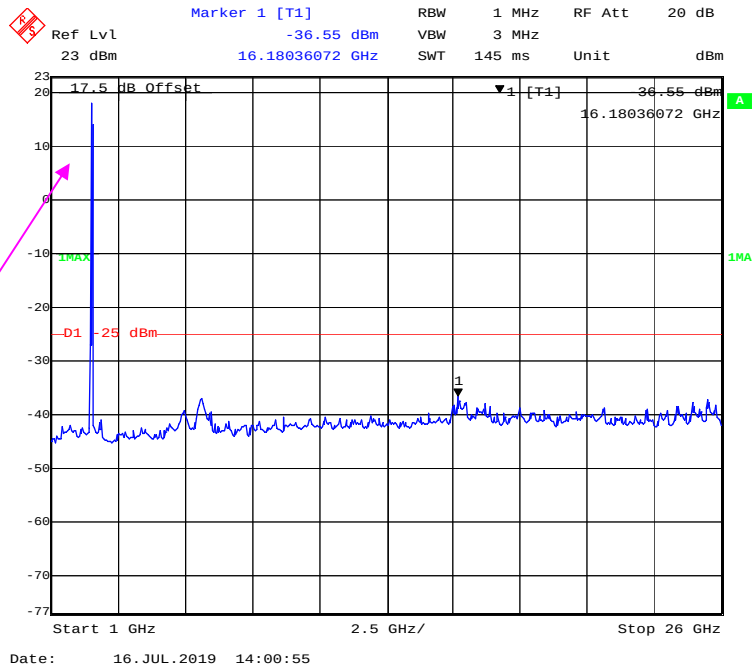


Fundamental

30 MHz - 1 GHz (20 MHz, 16-QAM, Middle Channel)



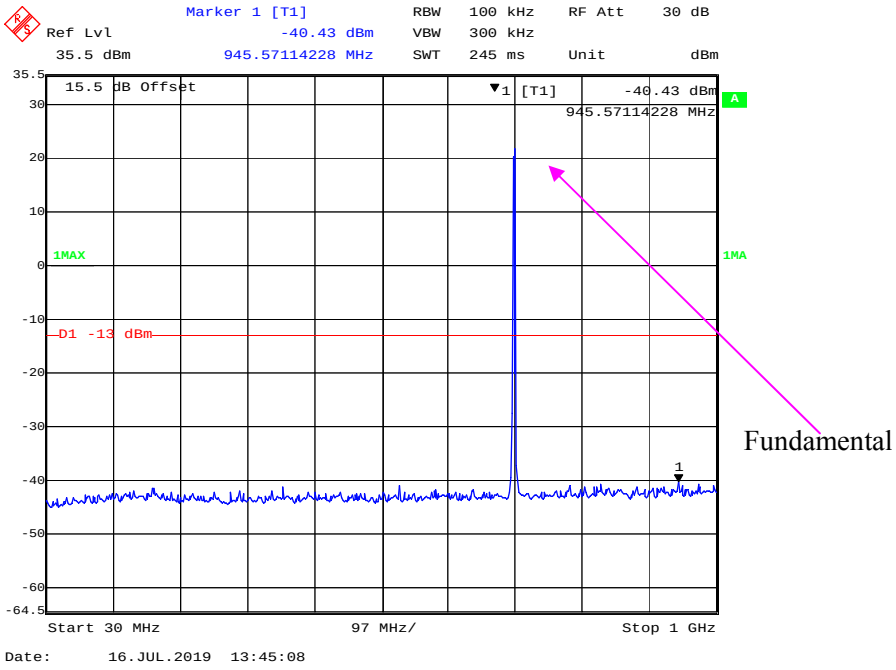
1 GHz – 26 GHz (20 MHz, 16-QAM, Middle Channel)



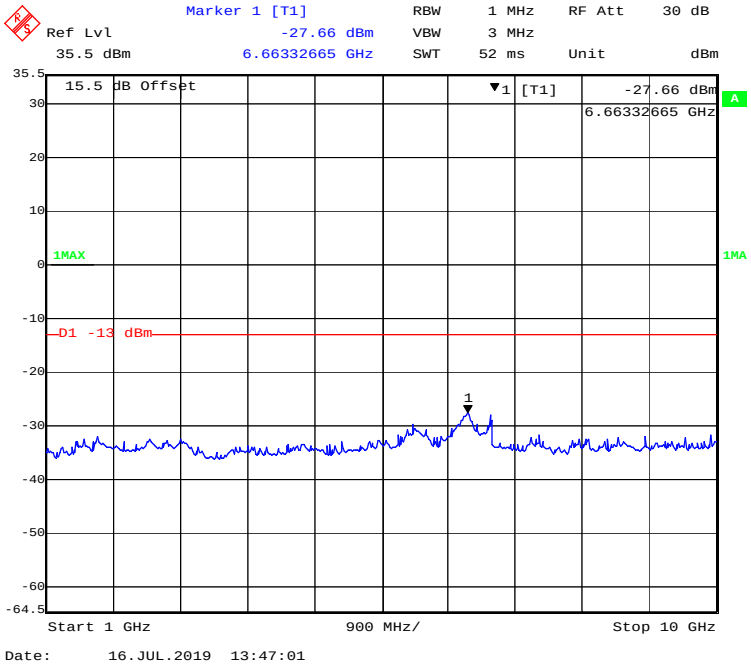
Fundamental

LTE Band 12:

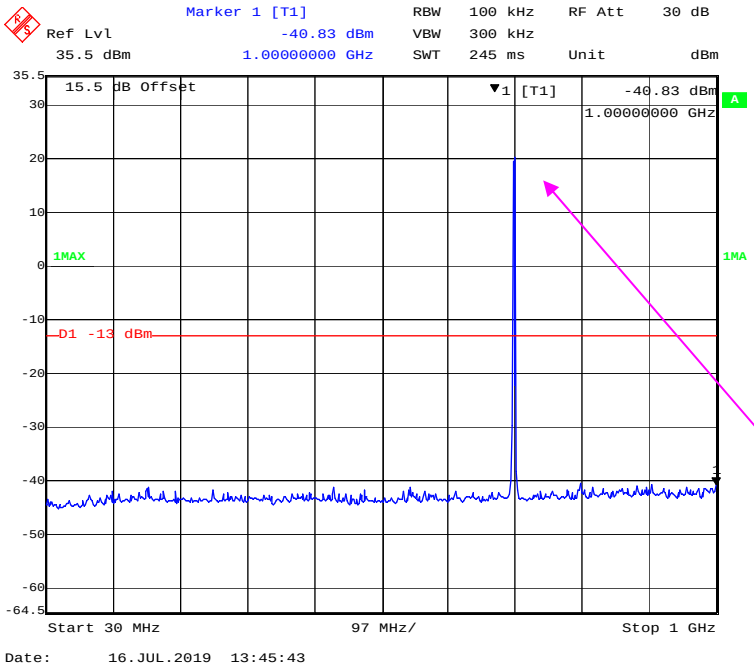
30 MHz - 1 GHz (1.4 MHz, QPSK, Middle Channel)



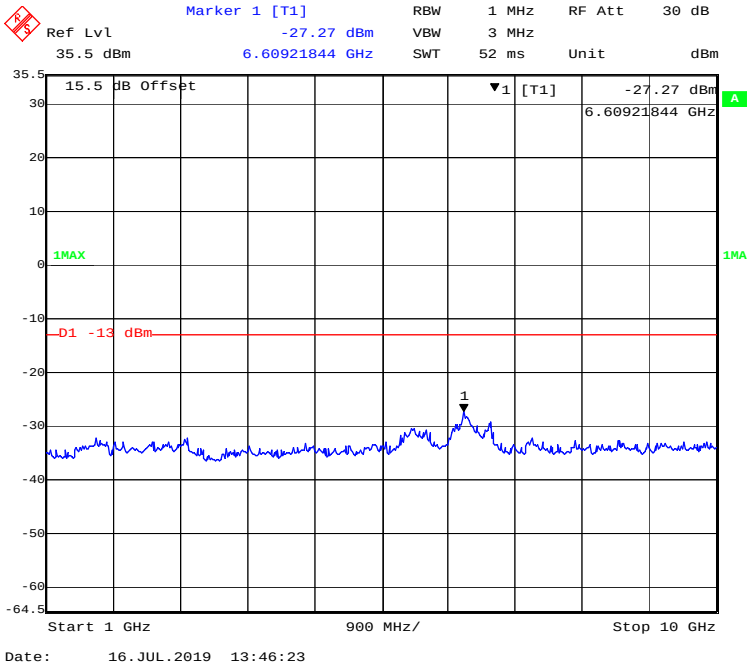
1 GHz – 10 GHz (1.4 MHz, QPSK, Middle Channel)



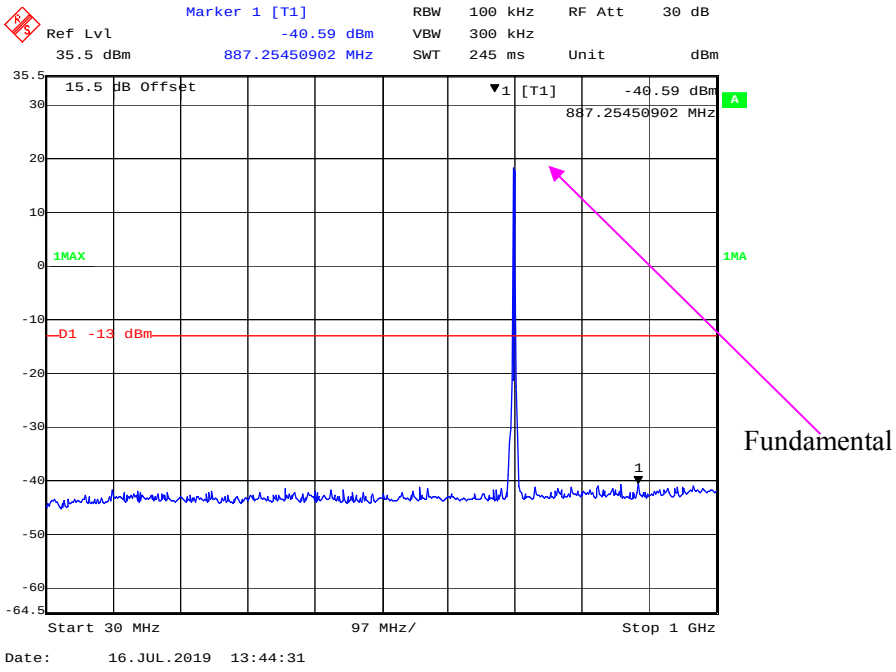
30 MHz - 1 GHz (1.4 MHz, 16-QAM, Middle Channel)



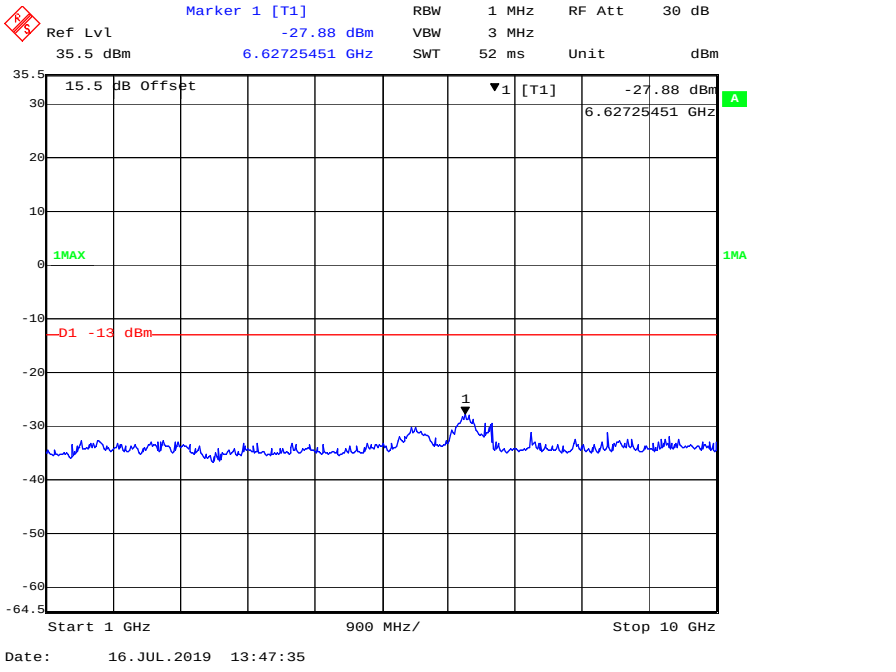
1 GHz – 10 GHz (1.4 MHz, 16-QAM, Middle Channel)



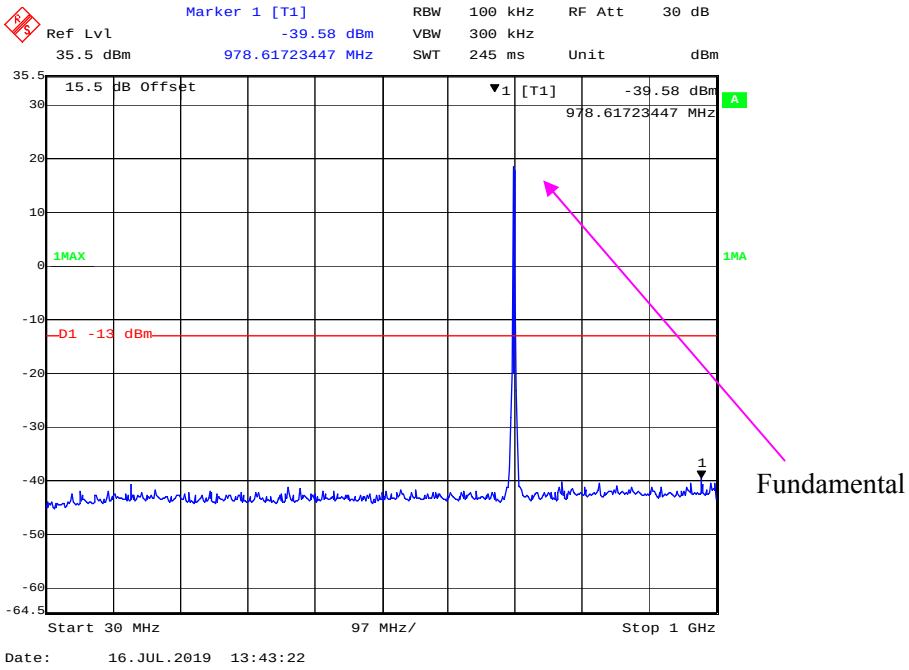
30 MHz - 1 GHz (3 MHz, QPSK, Middle Channel)



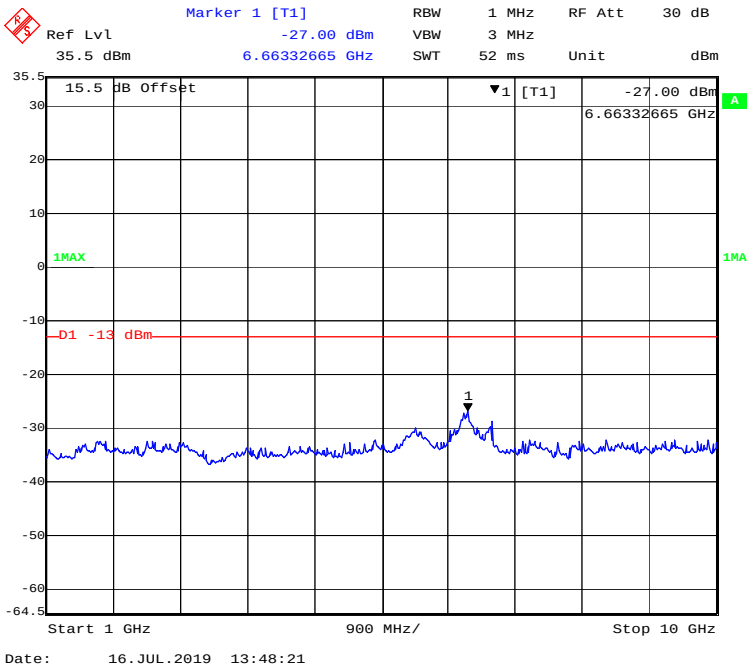
1 GHz – 10 GHz (3 MHz, QPSK, Middle Channel)



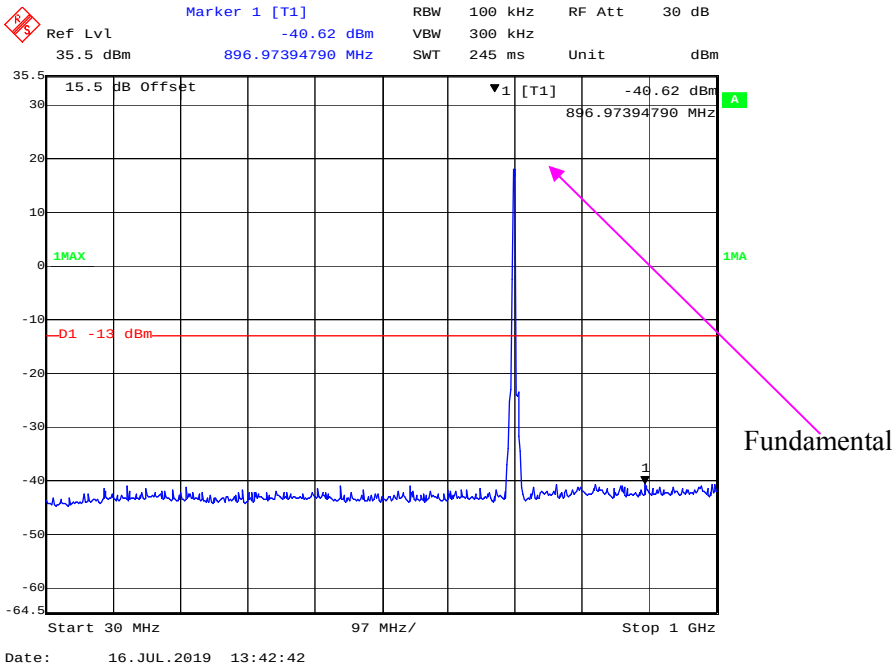
30 MHz - 1 GHz (3 MHz, 16-QAM, Middle Channel)



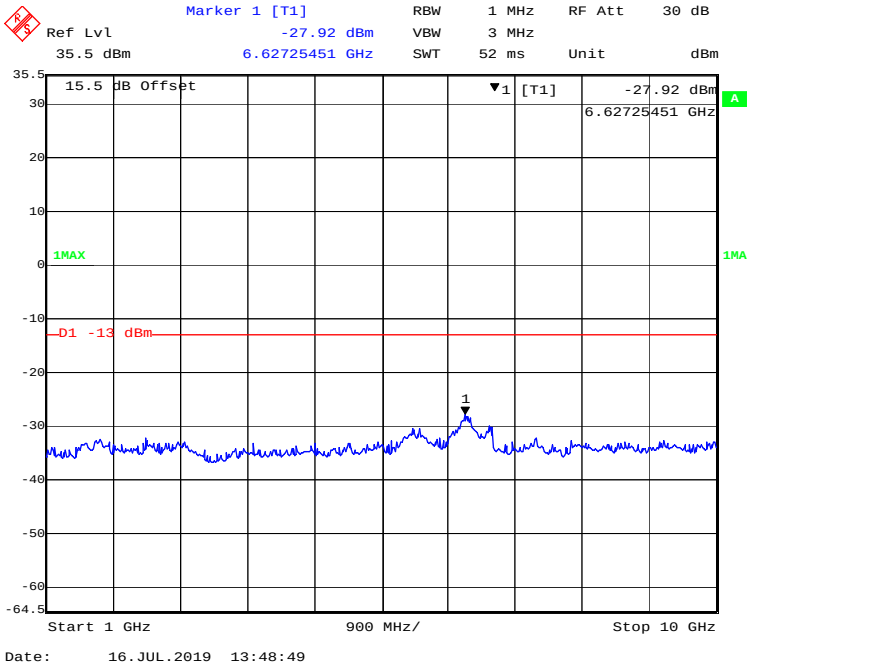
1 GHz – 10 GHz (3 MHz, 16-QAM, Middle Channel)



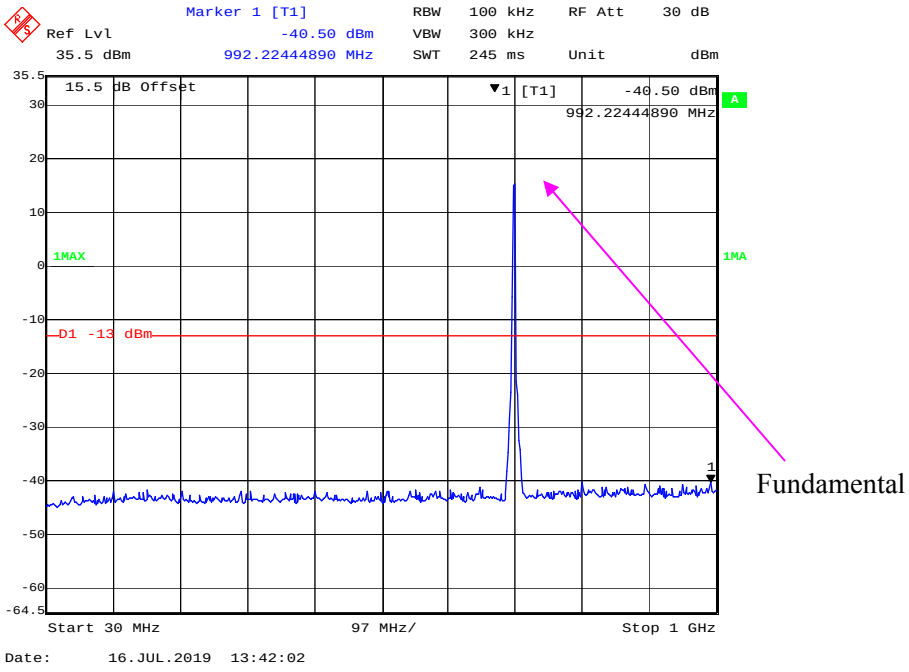
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)

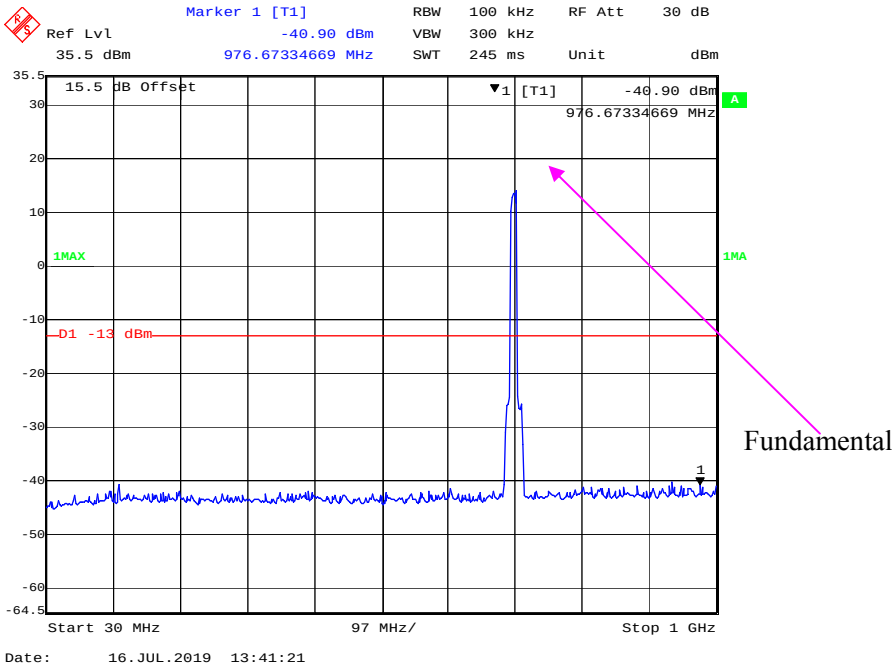


Date: 16.JUL.2019 13:42:02

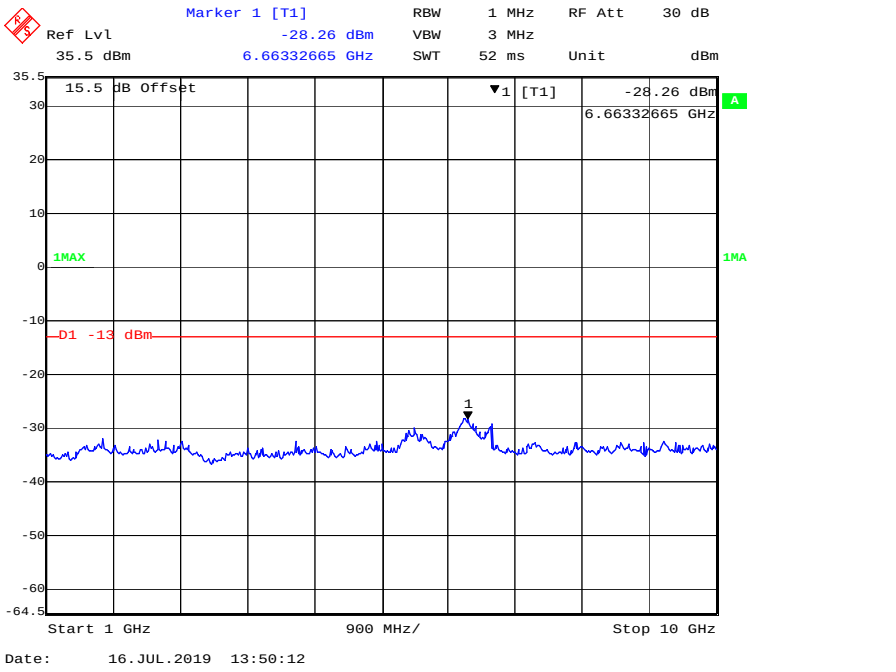
1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)

Date: 16.JUL.2019 13:49:29

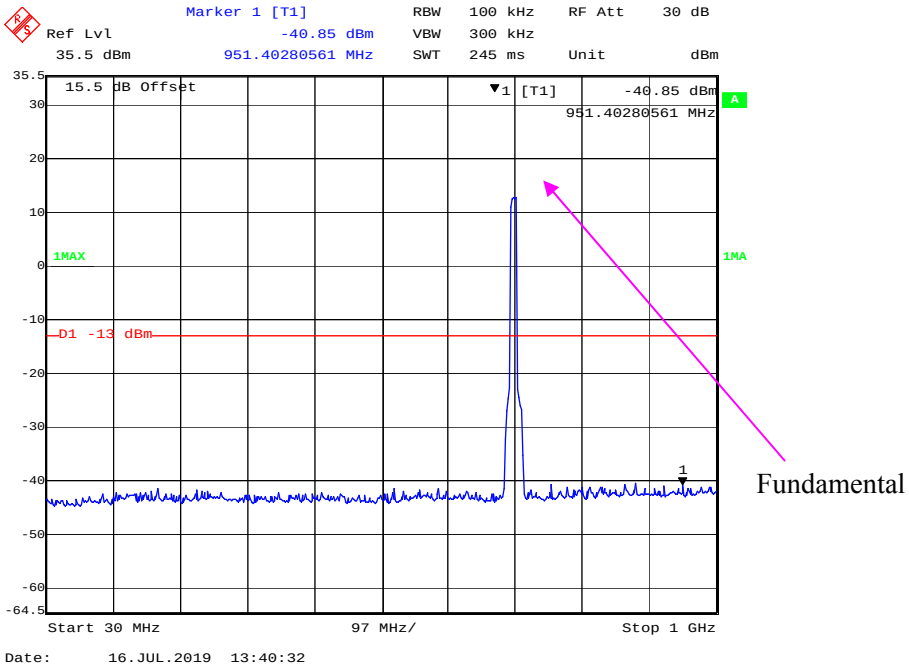
30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



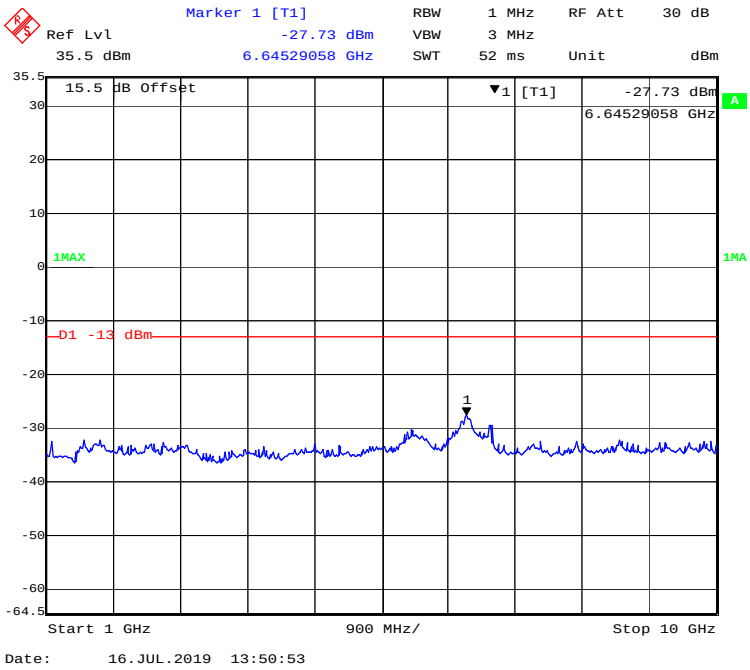
1 GHz – 10 GHz (10 MHz, QPSK, Middle Channel)



30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)

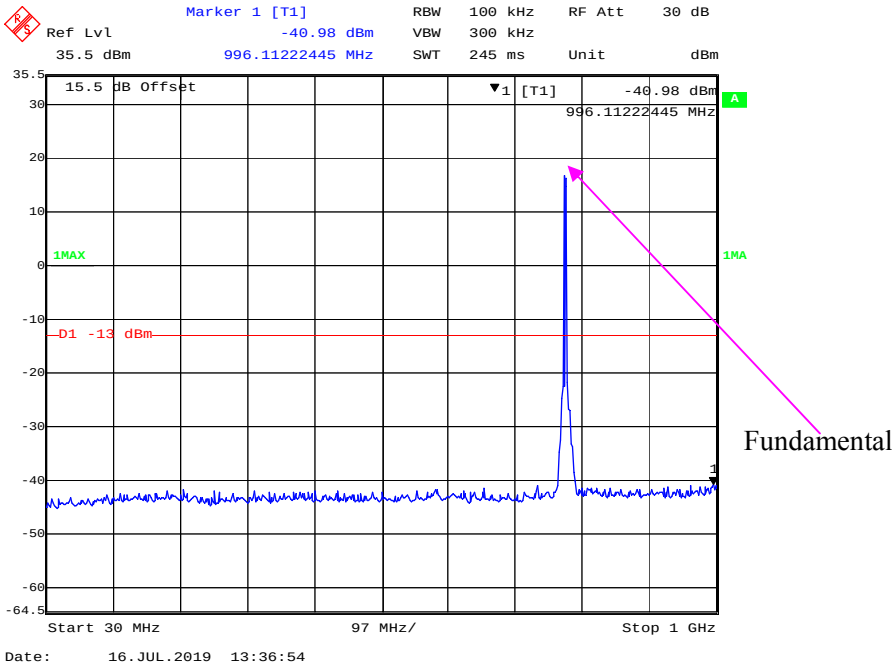


1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)

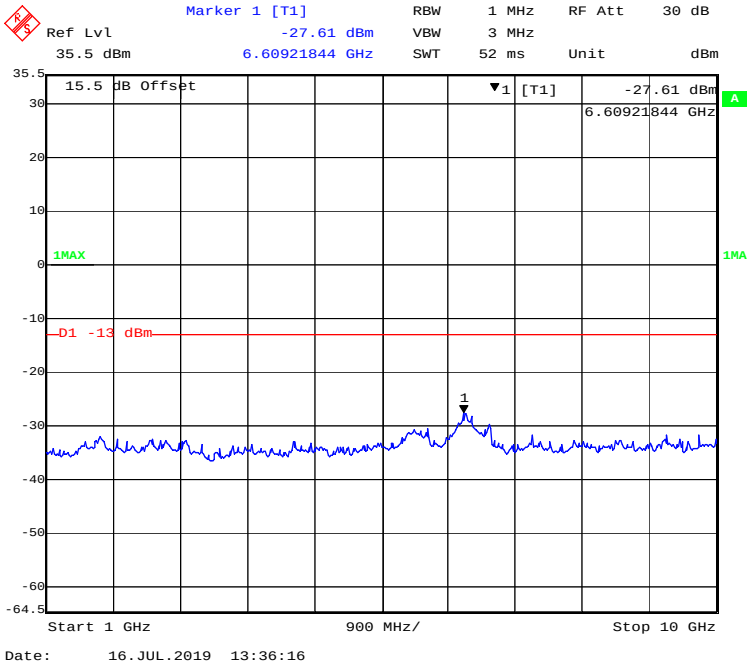


LTE Band 13:

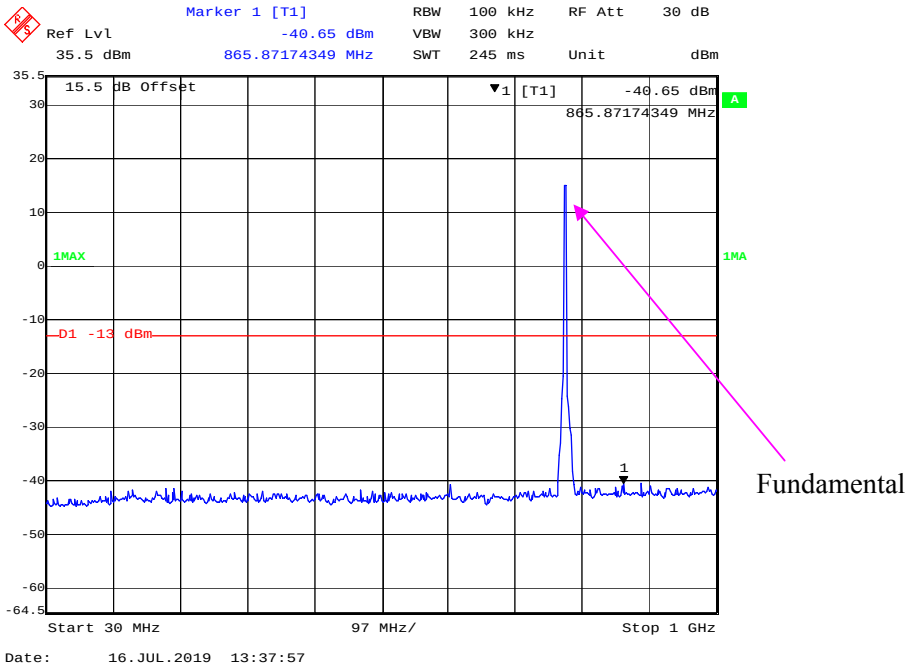
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



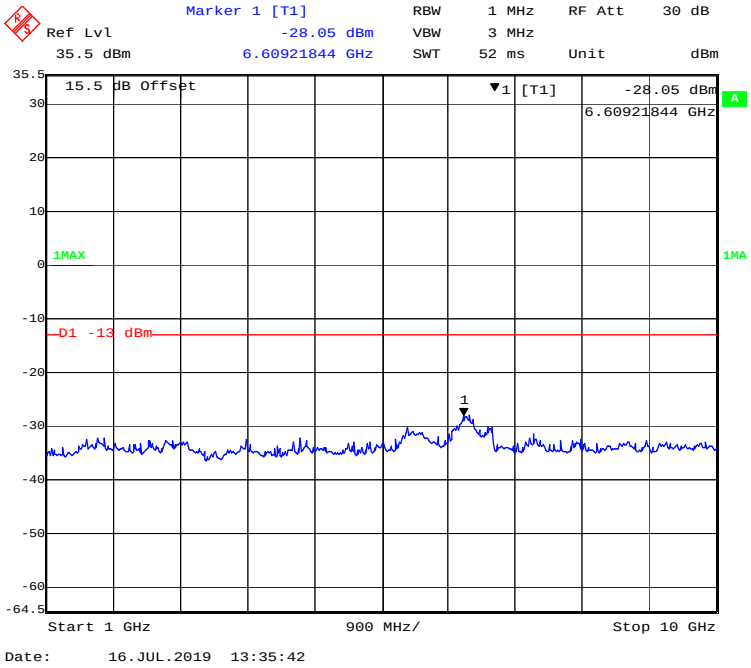
1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



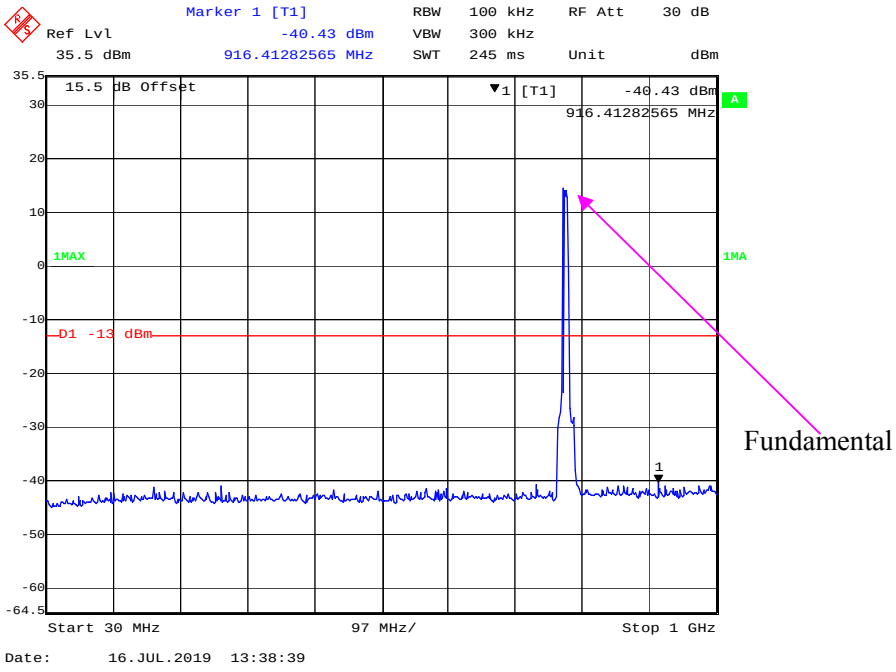
30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



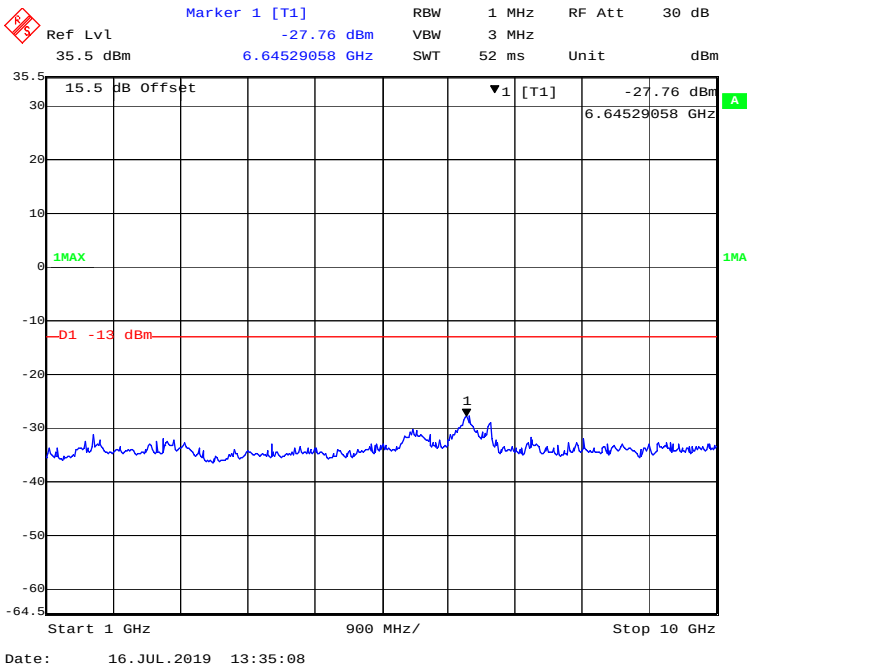
1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)



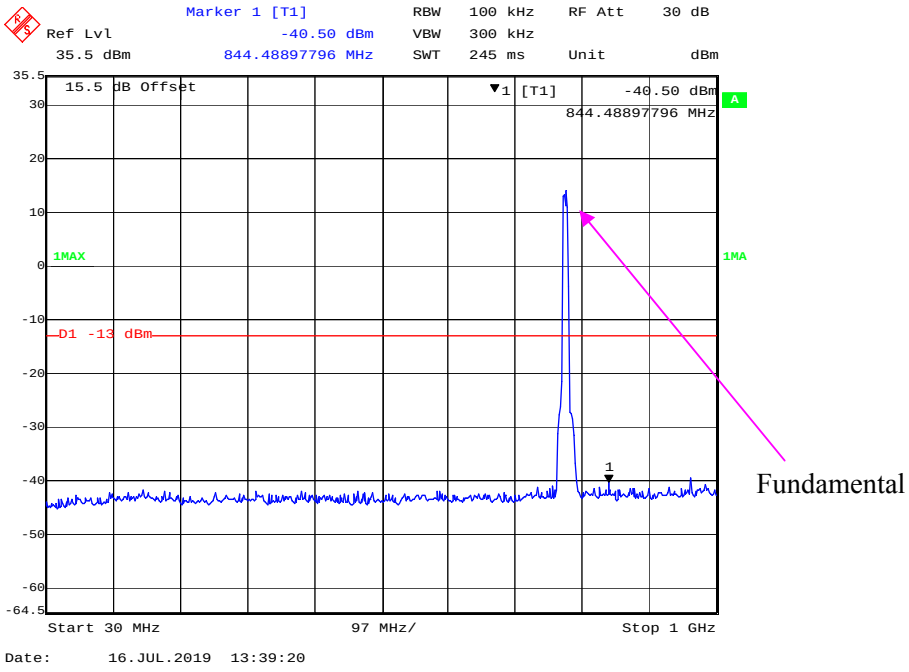
30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



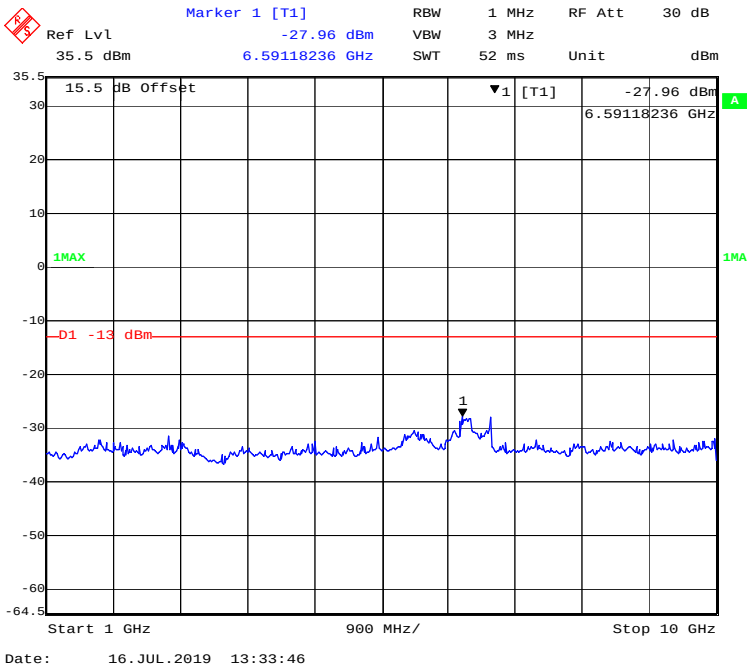
1 GHz – 10 GHz (10 MHz, QPSK, Middle Channel)



30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)

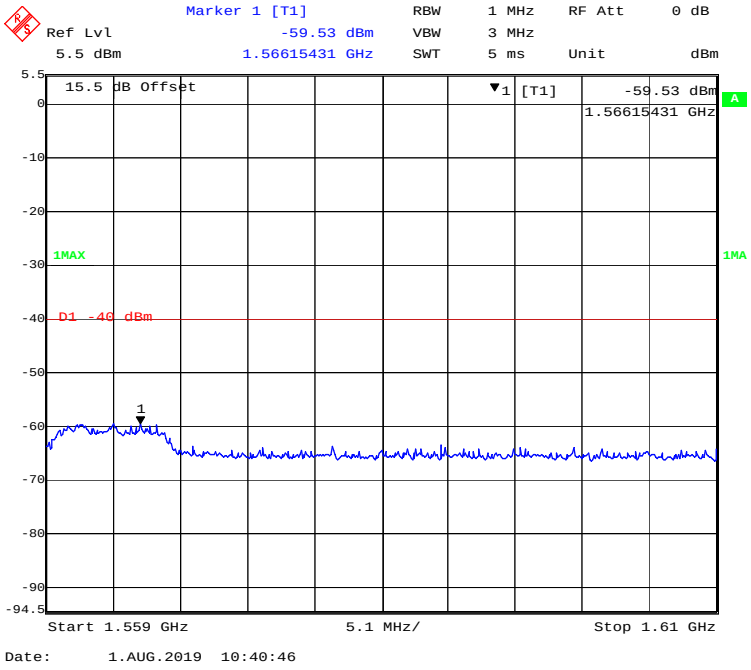


1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)

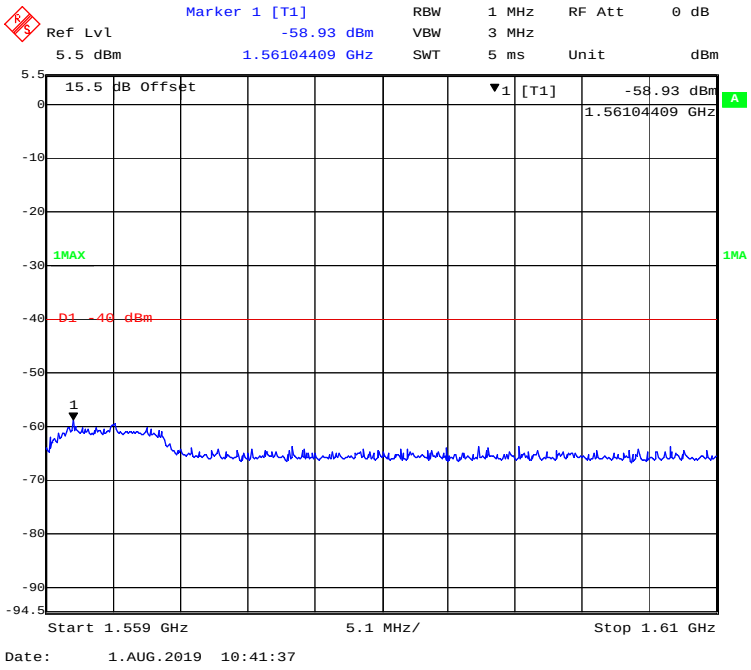


Additional Conducted Spurious Emissions Evaluations in accordance with FCC §27.53 (f)

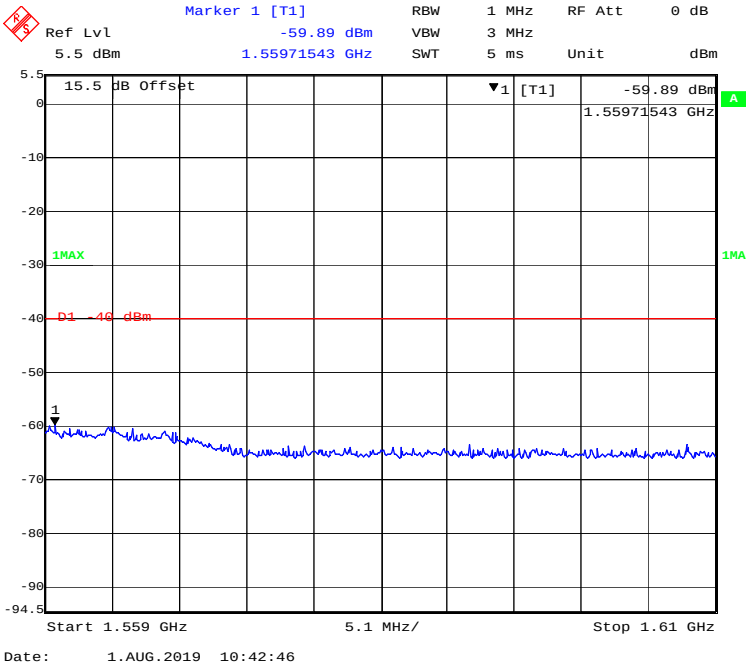
1.559 GHz – 1.610 GHz (5 MHz, QPSK, Middle Channel)



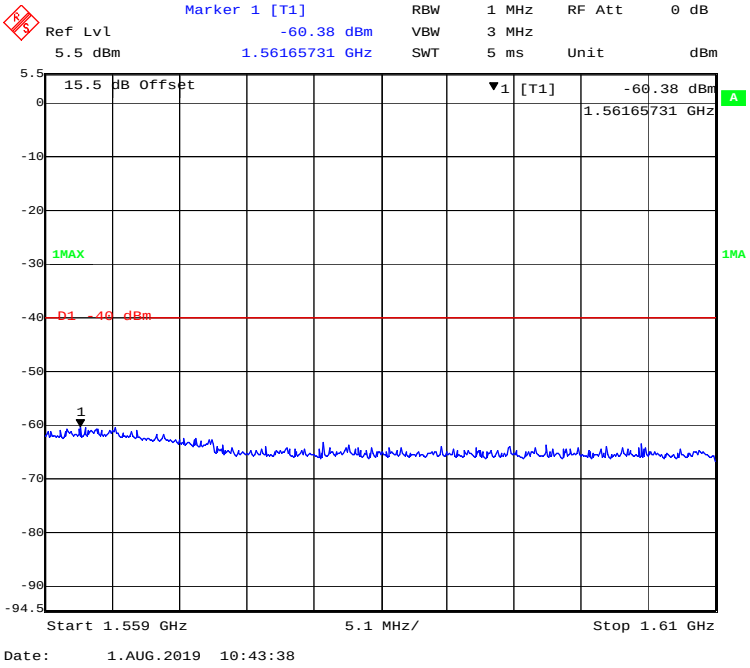
1.559 GHz – 1.610 GHz (5 MHz, 16-QAM, Middle Channel)



1.559 GHz – 1.610 GHz (10 MHz, QPSK, Middle Channel)



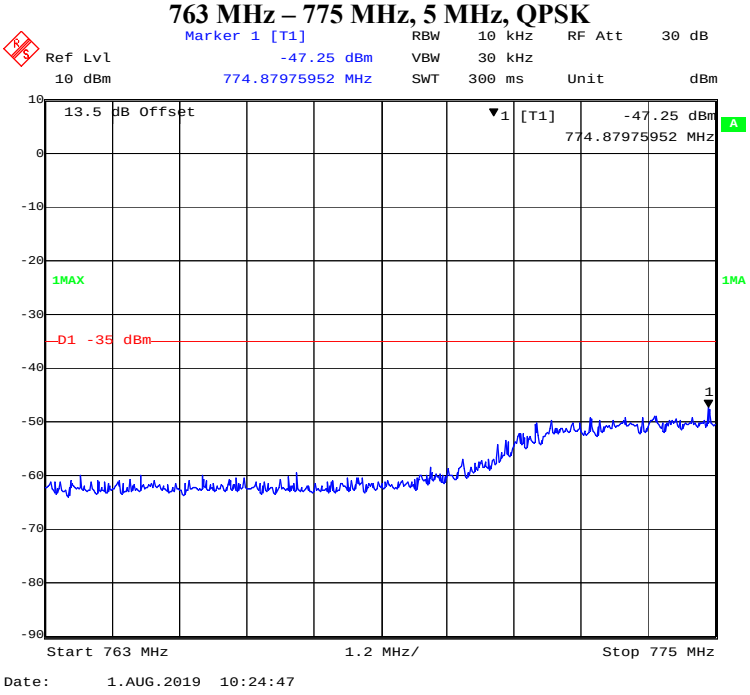
1.559 GHz – 1.610 GHz (10 MHz, 16-QAM, Middle Channel)



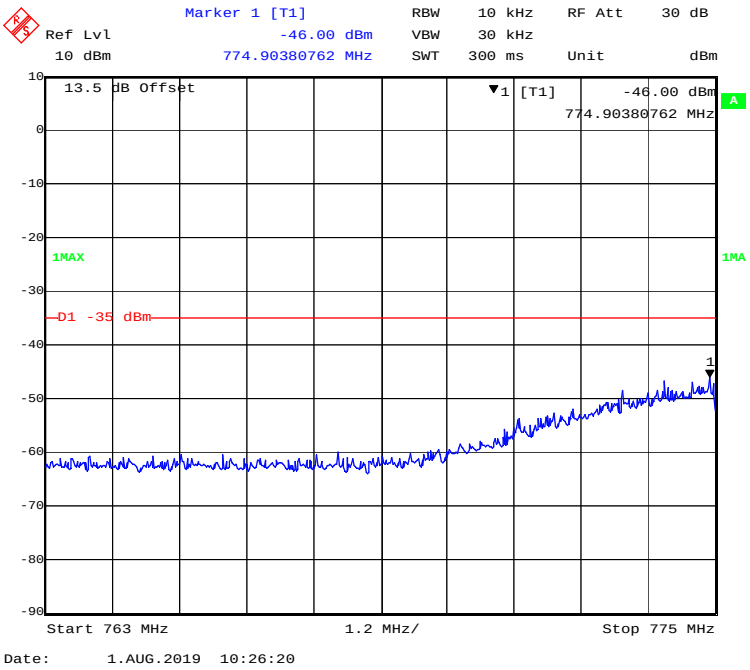
Additional Conducted Spurious Emissions Evaluations in accordance with FCC §27.53 (c)

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

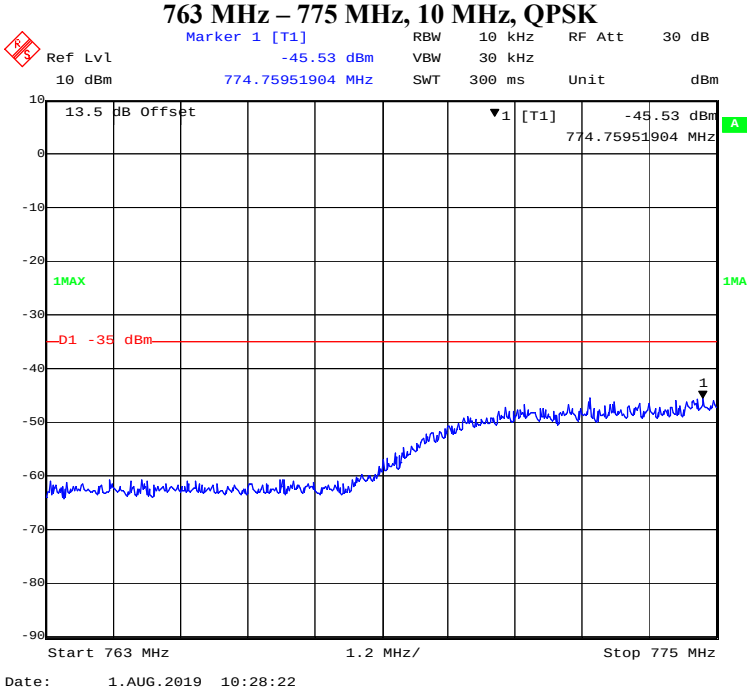
763 MHz – 775 MHz, 5 MHz, QPSK



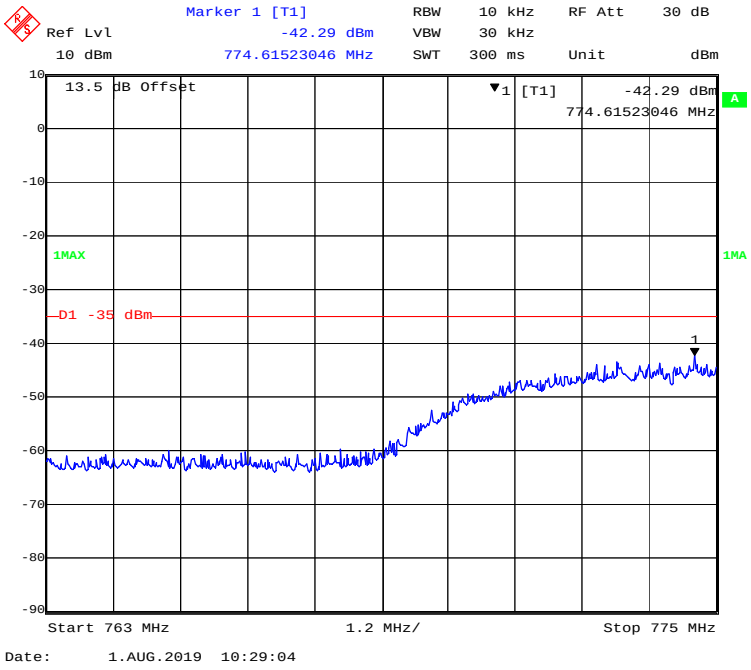
763 MHz – 775 MHz, 5 MHz, 16-QAM



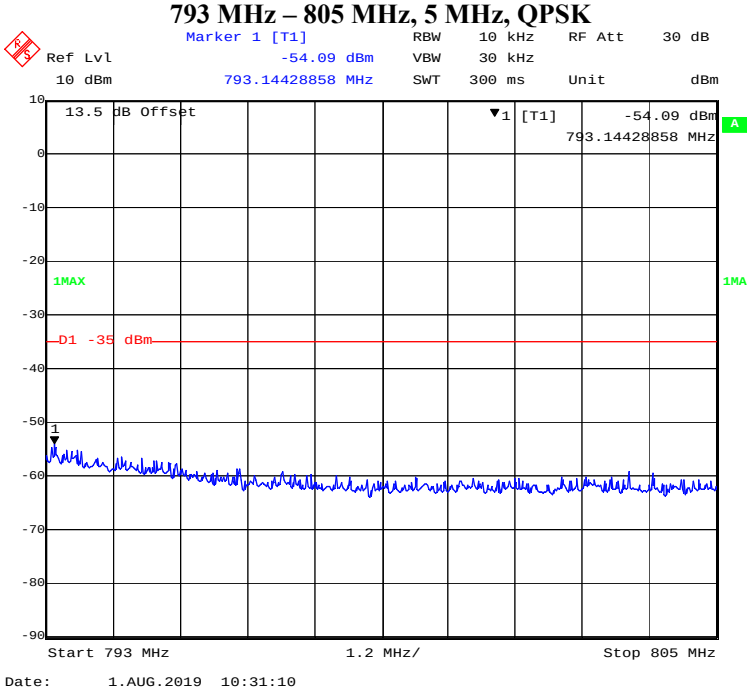
763 MHz – 775 MHz, 10 MHz, QPSK



763 MHz – 775 MHz, 10 MHz, 16-QAM

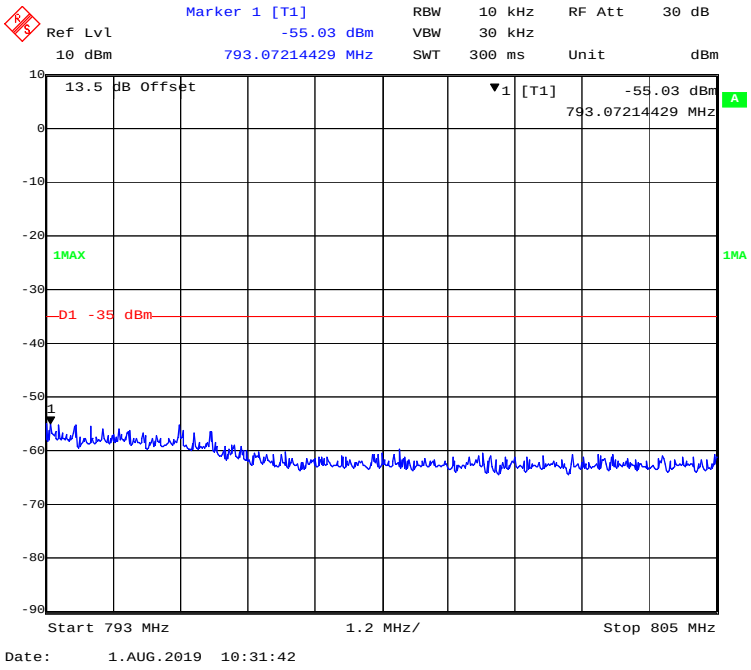


793 MHz – 805 MHz, 5 MHz, QPSK



Date: 1.AUG.2019 10:31:10

793 MHz – 805 MHz, 5 MHz, 16-QAM



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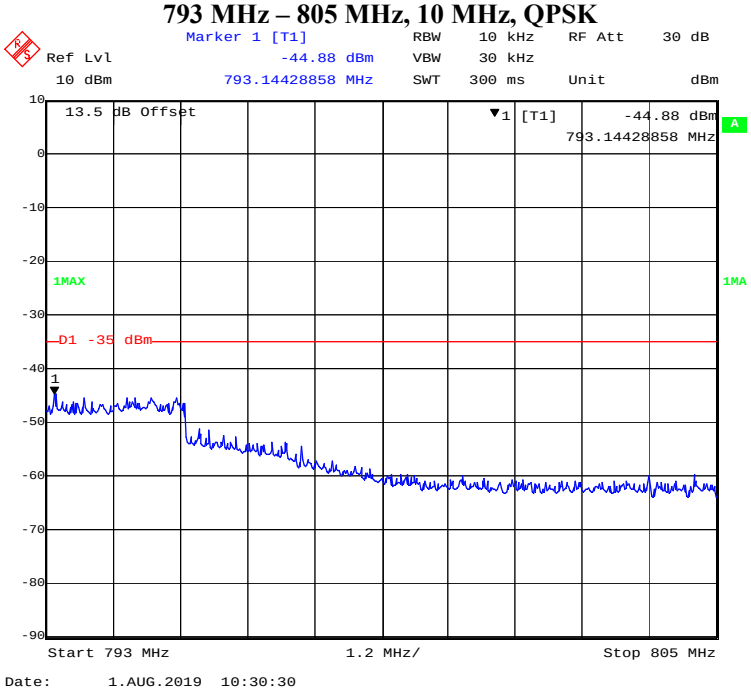
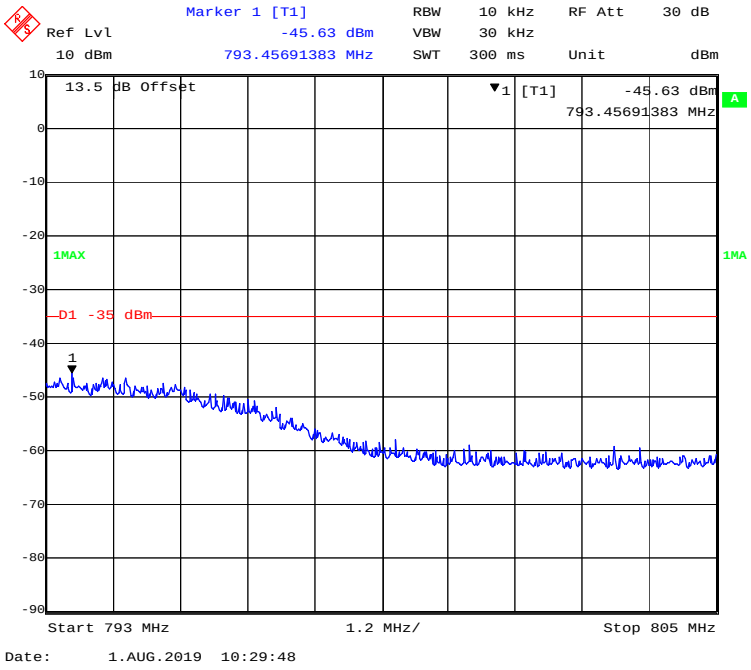
793 MHz – 805 MHz, 10 MHz, QPSK

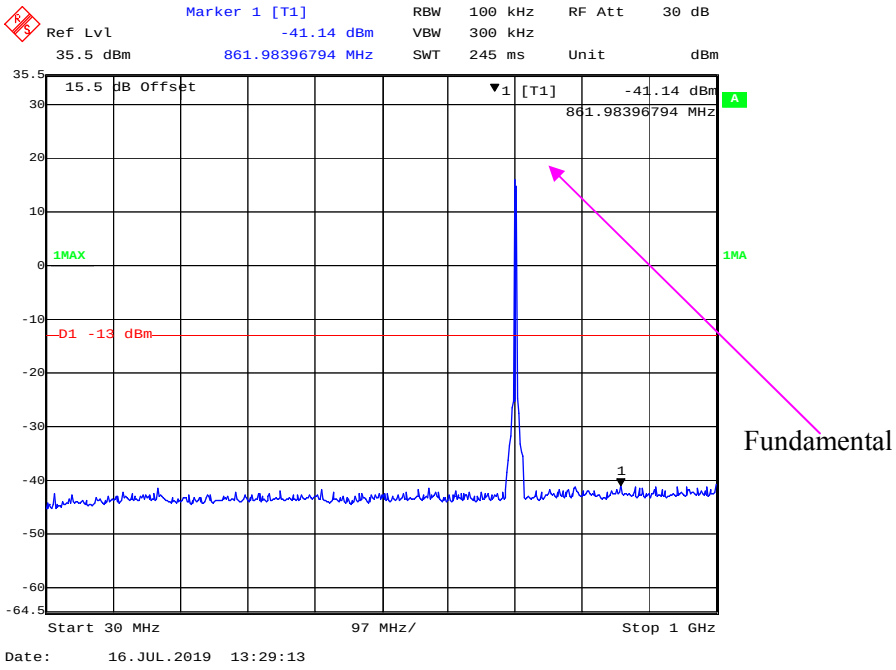


793 MHz – 805 MHz, 10 MHz, 16-QAM

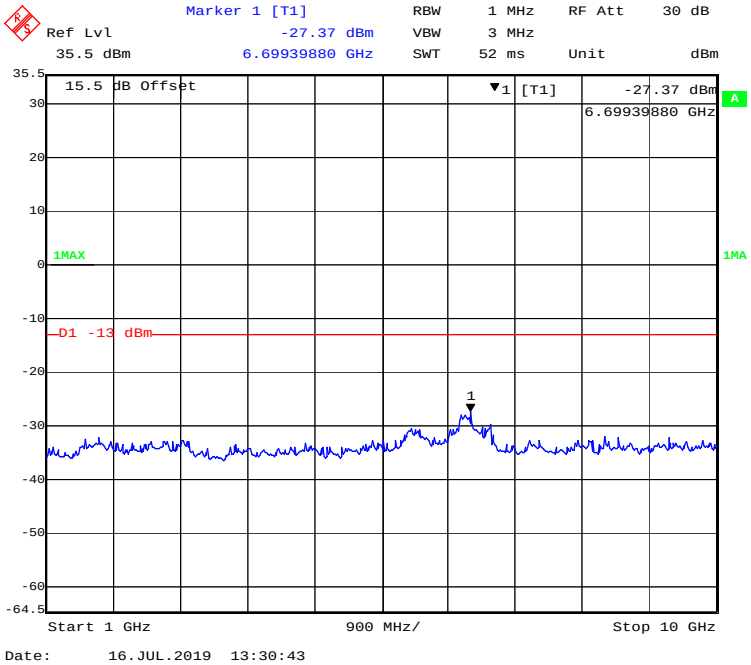


LTE Band 17:

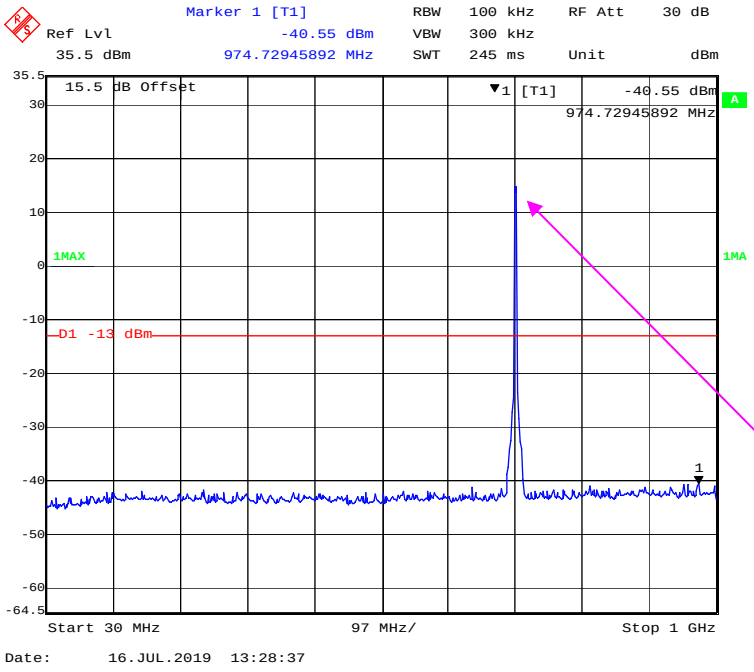
30 MHz - 1 GHz (5 MHz, QPSK, Middle Channel)



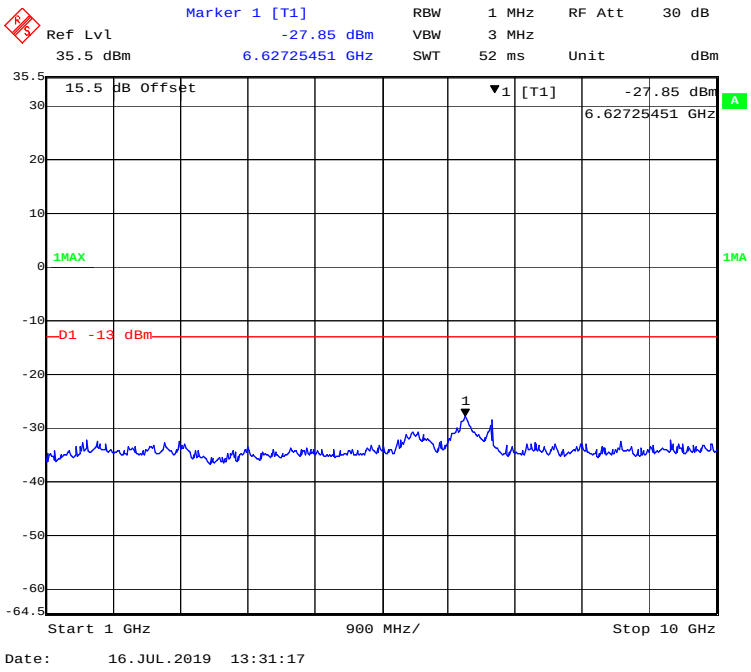
1 GHz – 10 GHz (5 MHz, QPSK, Middle Channel)



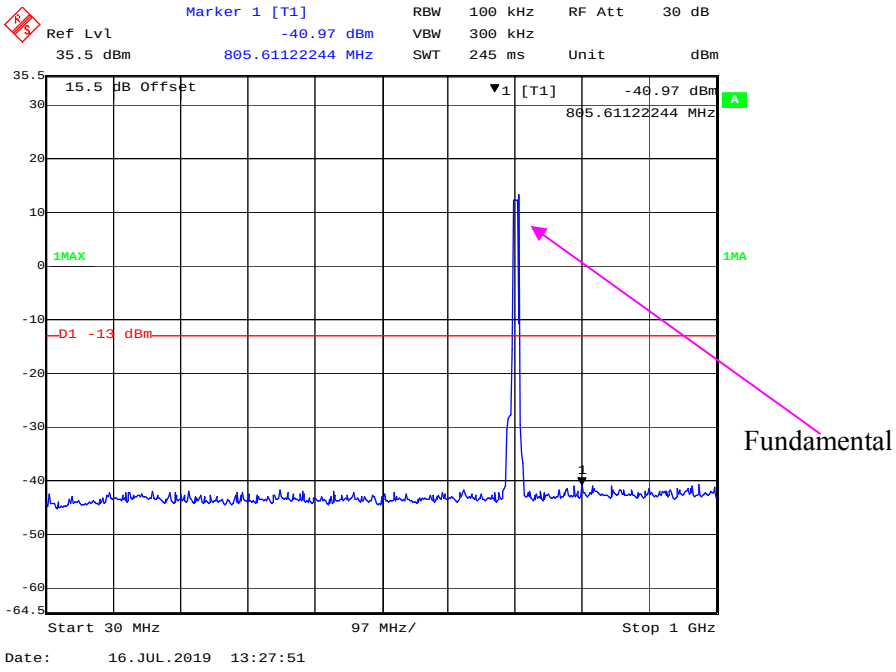
30 MHz - 1 GHz (5 MHz, 16-QAM, Middle Channel)



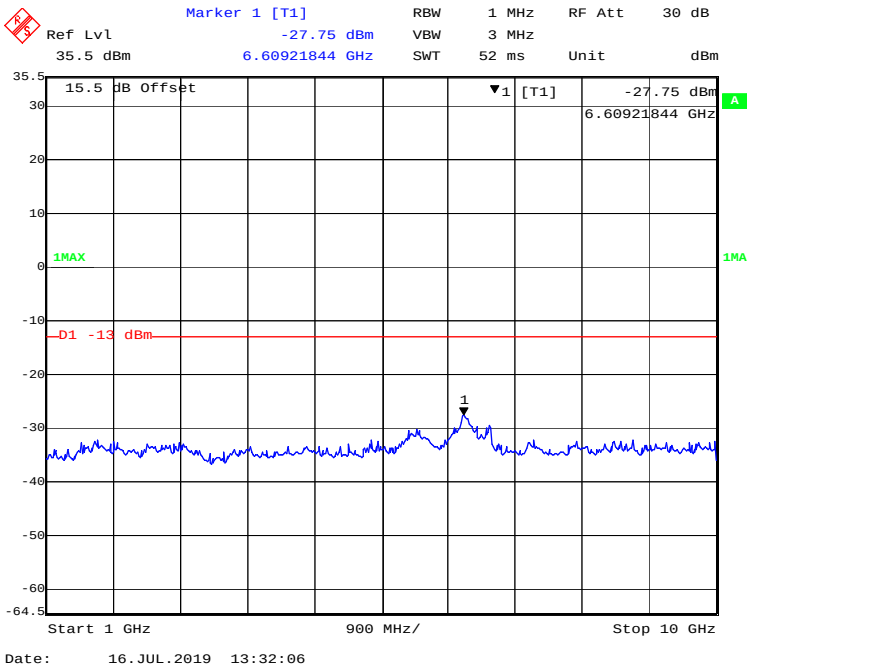
1 GHz – 10 GHz (5 MHz, 16-QAM, Middle Channel)



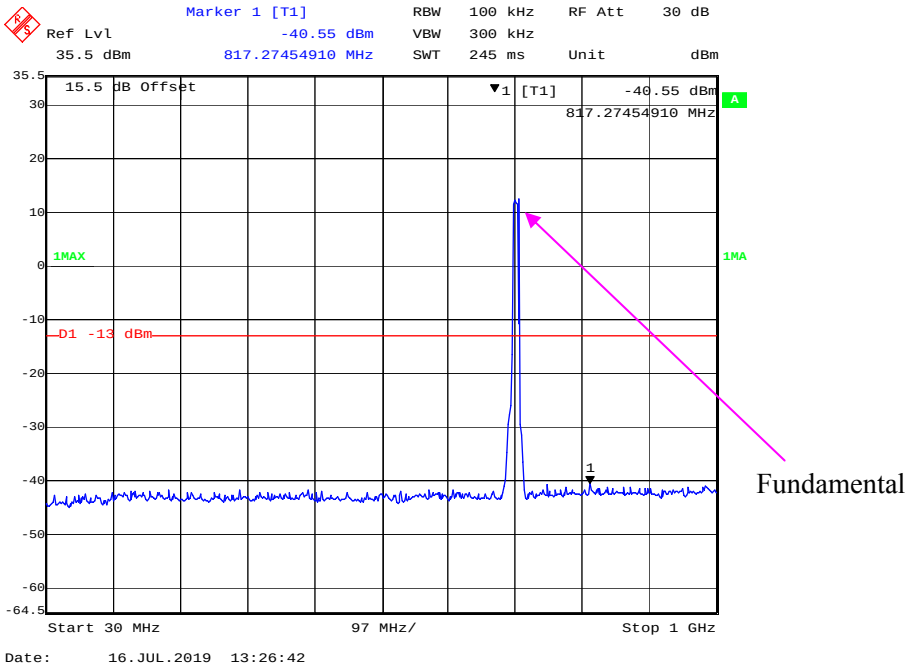
30 MHz - 1 GHz (10 MHz, QPSK, Middle Channel)



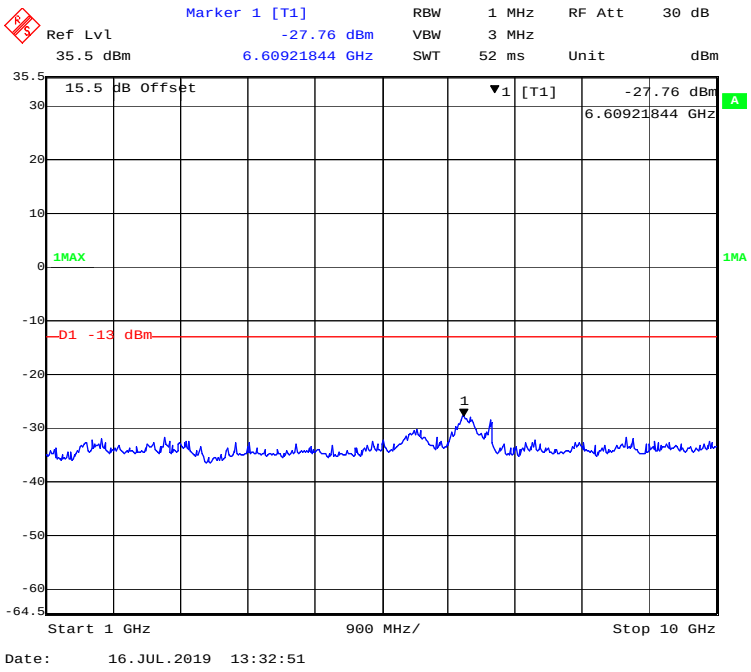
1 GHz – 10 GHz (10 MHz, QPSK, Middle Channel)



30 MHz - 1 GHz (10 MHz, 16-QAM, Middle Channel)



1 GHz – 10 GHz (10 MHz, 16-QAM, Middle Channel)



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

Applicable Standards

FCC § 2.1053, §22.917(a) and § 24.238(a) 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.

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 Max Min on 2019-08-27.

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

30 MHz ~ 10 GHz:

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										
134.52	52	275	250	H	-53.63	0.36	-6.12	-60.11	-13	47.11
134.52	49.06	94	100	V	-50.89	0.36	-6.12	-57.37	-13	44.37
1673.2	50.2	114	150	H	-60.75	0.84	8.48	-53.11	-13	40.11
1673.2	49.8	246	200	V	-60.4	0.84	8.48	-52.76	-13	39.76
2509.8	54.45	142	100	H	-54.17	0.89	10.09	-44.97	-13	31.97
2509.8	54.93	228	250	V	-53.76	0.89	10.09	-44.56	-13	31.56

30 MHz ~ 20 GHz:

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										
134.58	52.47	89	150	H	-53.16	0.36	-6.12	-59.64	-13	46.64
134.58	48.97	2	200	V	-50.98	0.35	-6.12	-57.45	-13	44.45
3760.00	44.89	221	100	H	-58.8	0.95	9.74	-50.01	-13	37.01
3760.00	45.67	169	100	V	-58.34	0.95	9.74	-49.55	-13	36.55
5640.00	41.52	209	200	H	-58.99	1.15	10.47	-49.67	-13	36.67
5640.00	42.38	166	200	V	-58.43	1.15	10.47	-49.11	-13	36.11

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										
133.95	52.03	89	150	H	-53.63	0.36	-6.12	-60.11	-13	47.11
133.95	48.26	2	100	V	-51.66	0.35	-6.12	-58.13	-13	45.13
3465.20	43.18	56	100	H	-61.61	0.93	9.87	-52.67	-13	39.67
3465.20	44.24	193	150	V	-60.98	0.93	9.87	-52.04	-13	39.04
5197.80	44.02	298	200	H	-58.06	1.1	10.3	-48.86	-13	35.86
5197.80	44.74	93	150	V	-57.54	1.1	10.3	-48.34	-13	35.34

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										
136.87	52.34	89	150	H	-53.16	0.36	-6.12	-59.64	-13	46.64
136.87	48.69	2	250	V	-51.37	0.35	-6.12	-57.84	-13	44.84
3760.00	42.69	144	250	H	-61	0.95	9.74	-52.21	-13	39.21
3760.00	42.25	235	250	V	-61.76	0.95	9.74	-52.97	-13	39.97
5640.00	42.88	94	250	H	-57.63	1.15	10.47	-48.31	-13	35.31
5640.00	42.57	253	250	V	-58.24	1.15	10.47	-48.92	-13	35.92
16-QAM 1.4MHz Bandwidth Middle Channel										
136.87	52.34	89	200	H	-53.16	0.36	-6.12	-59.64	-13	46.64
136.87	49.48	2	200	V	-50.58	0.35	-6.12	-57.05	-13	44.05
3760.00	40.79	194	150	H	-62.9	0.95	9.74	-54.11	-13	41.11
3760.00	41.53	214	100	V	-62.48	0.95	9.74	-53.69	-13	40.69
5640.00	42.85	276	150	H	-57.66	1.15	10.47	-48.34	-13	35.34
5640.00	43.63	11	100	V	-57.18	1.15	10.47	-47.86	-13	34.86

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										
135.95	52.69	89	250	H	-52.86	0.36	-6.12	-59.34	-13	46.34
135.95	49.22	2	150	V	-50.79	0.35	-6.12	-57.26	-13	44.26
3465.00	42.16	173	150	H	-62.63	0.93	9.87	-53.69	-13	40.69
3465.00	43.27	108	250	V	-61.95	0.93	9.87	-53.01	-13	40.01
5197.50	44.21	17	250	H	-57.87	1.1	10.3	-48.67	-13	35.67
5197.50	45.08	124	250	V	-57.21	1.1	10.3	-48.01	-13	35.01
16-QAM 1.4MHz Bandwidth Middle Channel										
135.95	53.36	89	250	H	-52.19	0.36	-6.12	-58.67	-13	45.67
135.95	49.37	2	200	V	-50.64	0.35	-6.12	-57.11	-13	44.11
3465.00	41.99	183	150	H	-62.8	0.93	9.87	-53.86	-13	40.86
3465.00	43.04	209	100	V	-62.18	0.93	9.87	-53.24	-13	40.24
5197.50	44.2	23	100	H	-57.88	1.1	10.3	-48.68	-13	35.68
5197.50	44.93	215	100	V	-57.36	1.1	10.3	-48.16	-13	35.16

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										
134.58	51.86	89	250	H	-53.77	0.36	-6.12	-60.25	-13	47.25
134.58	49.44	2	150	V	-50.51	0.35	-6.12	-56.98	-13	43.98
1673.00	47.68	304	150	H	-63.27	0.84	8.48	-55.63	-13	42.63
1673.00	47.52	87	100	V	-62.68	0.84	8.48	-55.04	-13	42.04
2509.50	53.53	335	150	H	-55.09	0.89	10.09	-45.89	-13	32.89
2509.50	54.14	147	250	V	-54.55	0.89	10.09	-45.35	-13	32.35
16-QAM 1.4MHz Bandwidth Middle Channel										
134.58	52.44	89	100	H	-53.19	0.36	-6.12	-59.67	-13	46.67
134.58	49.26	2	100	V	-50.69	0.35	-6.12	-57.16	-13	44.16
1673.00	47.53	343	150	H	-63.42	0.84	8.48	-55.78	-13	42.78
1673.00	47.22	43	100	V	-62.98	0.84	8.48	-55.34	-13	42.34
2509.50	53.61	17	150	H	-55.01	0.89	10.09	-45.81	-13	32.81
2509.50	53.82	360	150	V	-54.87	0.89	10.09	-45.67	-13	32.67

30 MHz ~ 26 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 5MHz Bandwidth Middle Channel										
133.89	51.61	89	150	H	-54.06	0.36	-6.12	-60.54	-25	47.54
133.89	48.72	2	150	V	-51.2	0.35	-6.12	-57.67	-25	44.67
5070.00	41.55	141	100	H	-61.07	1.09	10.3	-51.86	-25	26.86
5070.00	41.39	146	250	V	-61.4	1.09	10.3	-52.19	-25	27.19
7605.00	42.88	187	100	H	-53.18	1.78	10.08	-44.88	-25	19.88
7605.00	43.52	159	200	V	-52.68	1.78	10.08	-44.38	-25	19.38
16-QAM 5MHz Bandwidth Middle Channel										
133.89	52.04	89	150	H	-53.63	0.36	-6.12	-60.11	-25	47.11
133.89	49.05	2	250	V	-50.87	0.35	-6.12	-57.34	-25	44.34
5070.00	41.48	306	150	H	-61.14	1.09	10.3	-51.93	-25	26.93
5070.00	41.21	145	150	V	-61.58	1.09	10.3	-52.37	-25	27.37
7605.00	42.8	9	250	H	-53.26	1.78	10.08	-44.96	-25	19.96
7605.00	43.23	112	100	V	-52.97	1.78	10.08	-44.67	-25	19.67

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										
136.55	53.02	89	150	H	-52.49	0.36	-6.12	-58.97	-13	45.97
136.55	50.17	2	100	V	-49.87	0.35	-6.12	-56.34	-13	43.34
1415.00	55.28	82	200	H	-56.77	0.82	7.96	-49.63	-13	36.63
1415.00	56.1	320	250	V	-56.25	0.82	7.96	-49.11	-13	36.11
2122.50	45.36	64	150	H	-63.28	0.86	9.27	-54.87	-13	41.87
2122.50	45.83	223	200	V	-63.09	0.86	9.27	-54.68	-13	41.68
16-QAM 1.4MHz Bandwidth Middle Channel										
136.55	52.32	89	250	H	-53.19	0.36	-6.12	-59.67	-13	46.67
136.55	50.09	2	100	V	-49.95	0.35	-6.12	-56.42	-13	43.42
1415.00	54.97	90	250	H	-57.08	0.82	7.96	-49.94	-13	36.94
1415.00	56.7	197	150	V	-55.65	0.82	7.96	-48.51	-13	35.51
2122.50	45.02	8	250	H	-63.62	0.86	9.27	-55.21	-13	42.21
2122.50	45.09	89	300	V	-63.83	0.86	9.27	-55.42	-13	42.42

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 5MHz Bandwidth Middle Channel										
137.54	52.26	89	150	H	-53.2	0.36	-6.13	-59.69	-13	46.69
137.54	49.42	2	250	V	-50.67	0.35	-6.13	-57.15	-13	44.15
1564.00	45.61	194	200	H	-66.11	0.83	8.3	-58.64	-13	45.64
1564.00	46.36	224	250	V	-65.58	0.83	8.3	-58.11	-13	45.11
2346.00	42.81	78	200	H	-65.84	0.88	9.76	-56.96	-13	43.96
2346.00	43.31	203	250	V	-65.49	0.88	9.76	-56.61	-13	43.61
16-QAM 5MHz Bandwidth Middle Channel										
137.54	52.31	89	200	H	-53.15	0.36	-6.13	-59.64	-13	46.64
137.54	49.54	2	200	V	-50.55	0.35	-6.13	-57.03	-13	44.03
1564.00	45.41	210	250	H	-66.31	0.83	8.3	-58.84	-13	45.84
1564.00	45.94	35	150	V	-66	0.83	8.3	-58.53	-13	45.53
2346.00	42.73	20	250	H	-65.92	0.88	9.76	-57.04	-13	44.04
2346.00	43.11	161	150	V	-65.69	0.88	9.76	-56.81	-13	43.81

30 MHz ~ 10 GHz:
LTE Band 17:

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 5MHz Bandwidth Middle Channel										
135.25	52.61	89	250	H	-52.98	0.36	-6.12	-59.46	-13	46.46
135.25	49.49	2	200	V	-50.49	0.35	-6.12	-56.96	-13	43.96
1420.00	50.05	72	100	H	-62.01	0.82	7.98	-54.85	-13	41.85
1420.00	50.73	292	250	V	-61.63	0.82	7.98	-54.47	-13	41.47
2130.00	44.34	339	100	H	-64.3	0.86	9.29	-55.87	-13	42.87
2130.00	44.81	282	250	V	-64.1	0.86	9.29	-55.67	-13	42.67
16-QAM 5MHz Bandwidth Middle Channel										
135.25	52.76	89	250	H	-52.83	0.36	-6.12	-59.31	-13	46.31
135.25	49.78	2	100	V	-50.2	0.35	-6.12	-56.67	-13	43.67
1420.00	49.63	84	250	H	-62.43	0.83	8.30	-54.96	-13	41.96
1420.00	50.2	332	150	V	-62.16	0.83	8.30	-54.69	-13	41.69
2130.00	43.65	39	100	H	-64.99	0.88	9.76	-56.11	-13	43.11
2130.00	44.12	263	150	V	-64.79	0.88	9.76	-55.91	-13	42.91

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) - BAND EDGES

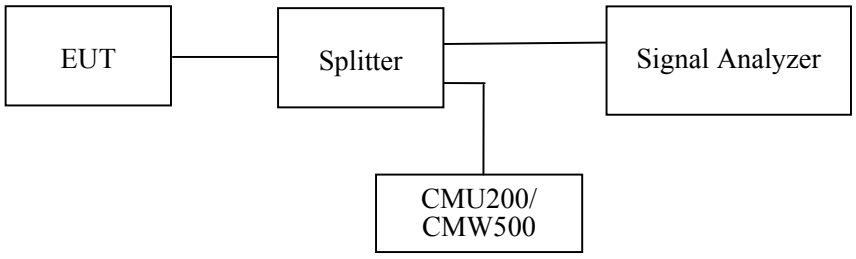
Applicable Standards

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.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 %-53%
ATM Pressure:	101.1kPa-103.3kPa

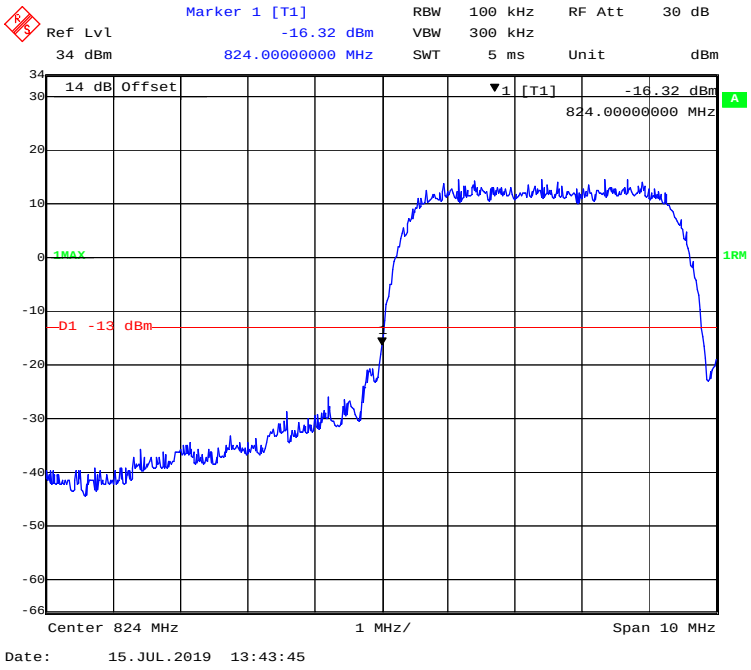
The testing was performed by Max Min from 2019-07-15 to 2019-07-23.

EUT operation mode: Transmitting

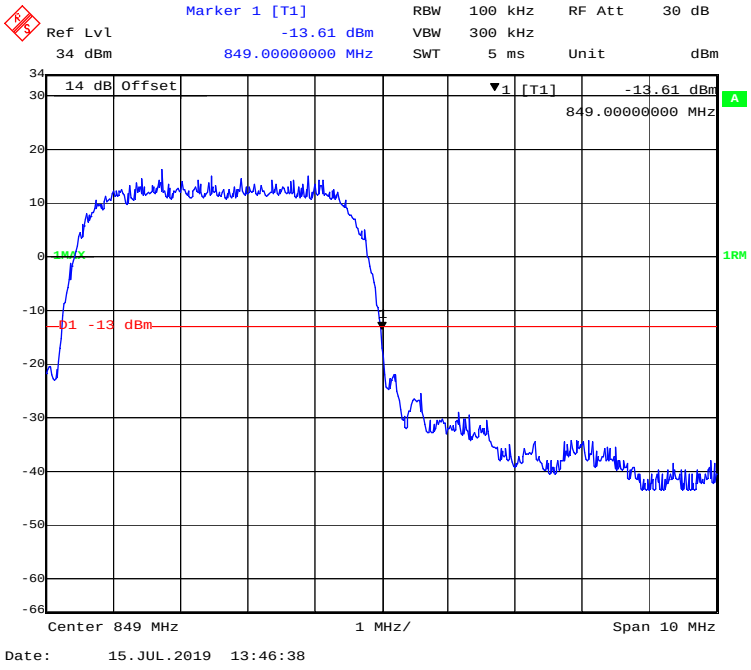
Test Result: Compliant.

WCDMA Band V

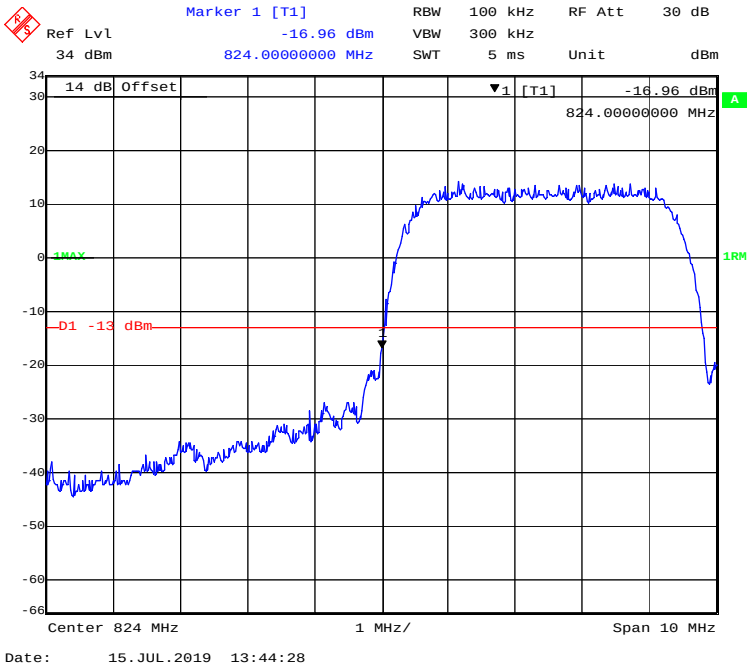
WCDMA (Rel 99) Mode, Left Band Edge



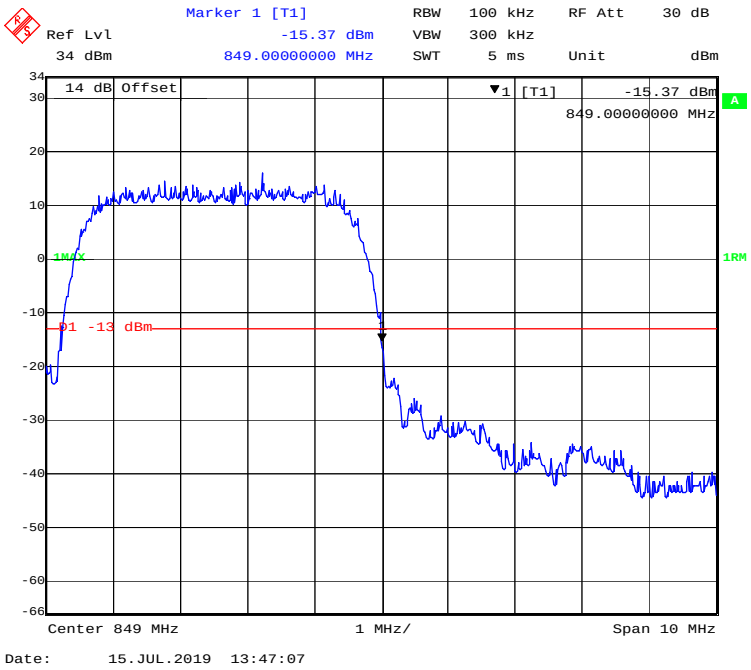
WCDMA (Rel 99) Mode, Right Band Edge



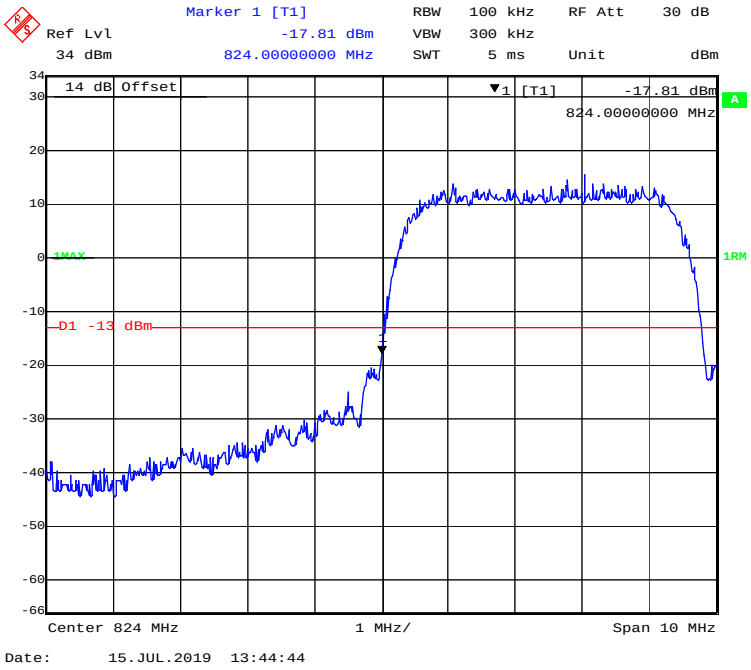
WCDMA (HSDPA) Mode, Left Band Edge



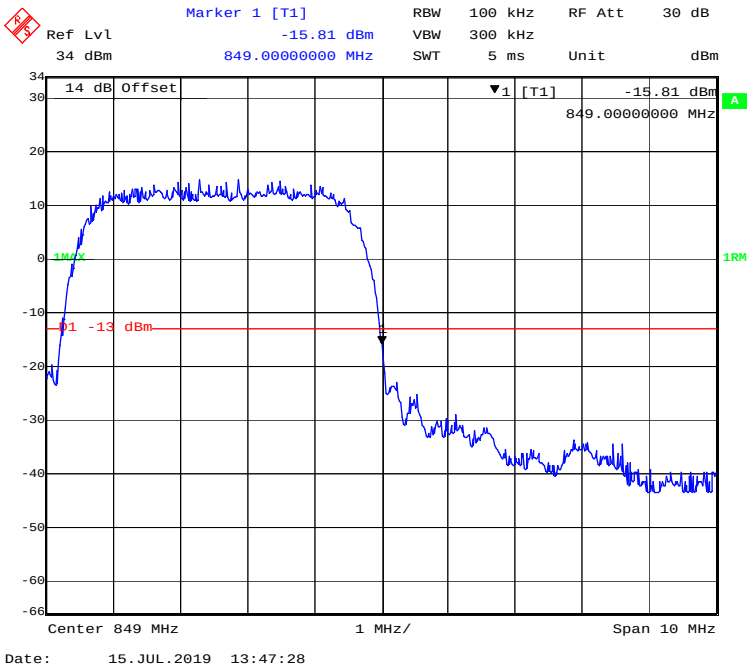
WCDMA (HSDPA) Mode, Right Band Edge



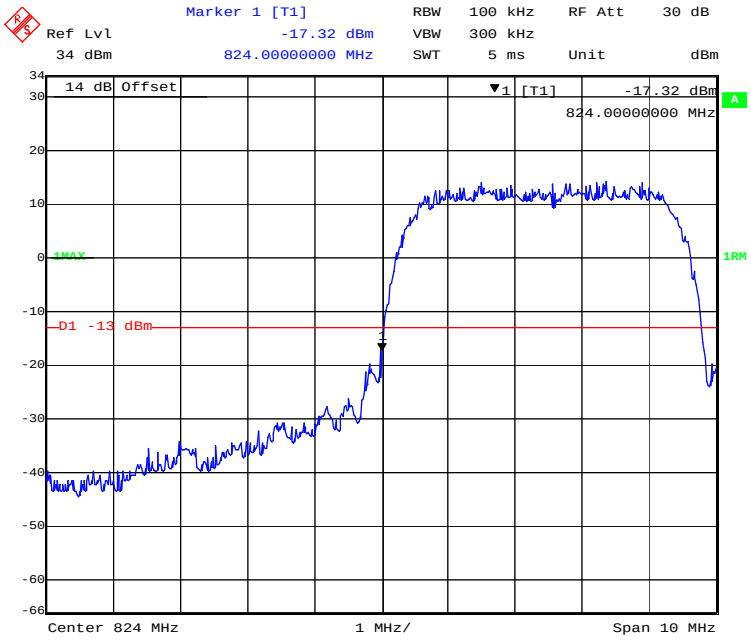
WCDMA (HSUPA) Mode, Left Band Edge



WCDMA (HSUPA) Mode, Right Band Edge



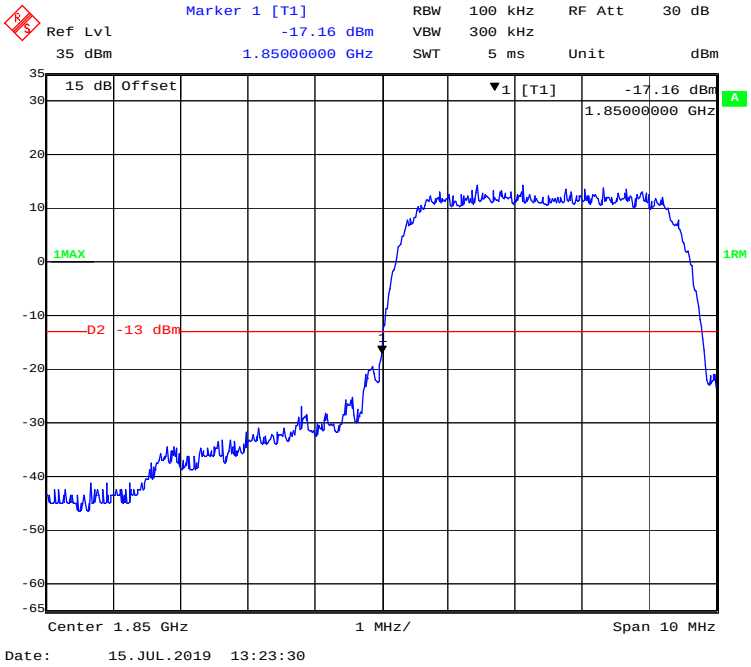
WCDMA (HSPA+) Mode, Left Band Edge



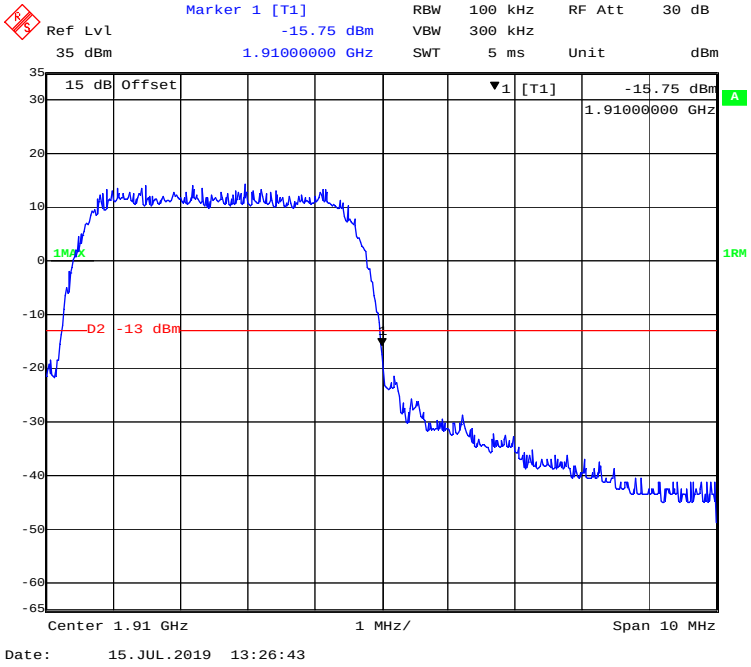
WCDMA (HSPA+) Mode, Right Band Edge

WCDMA Band II

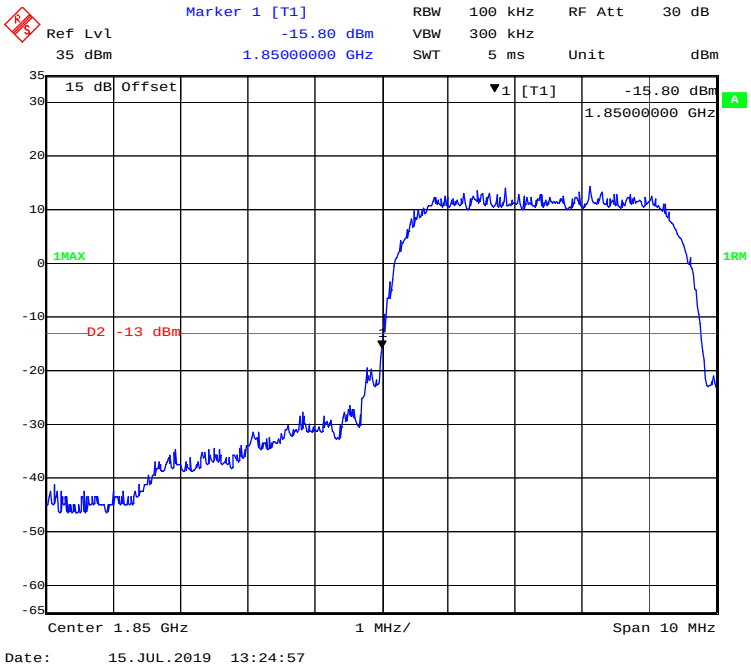
WCDMA (Rel99) Mode, Left Band Edge



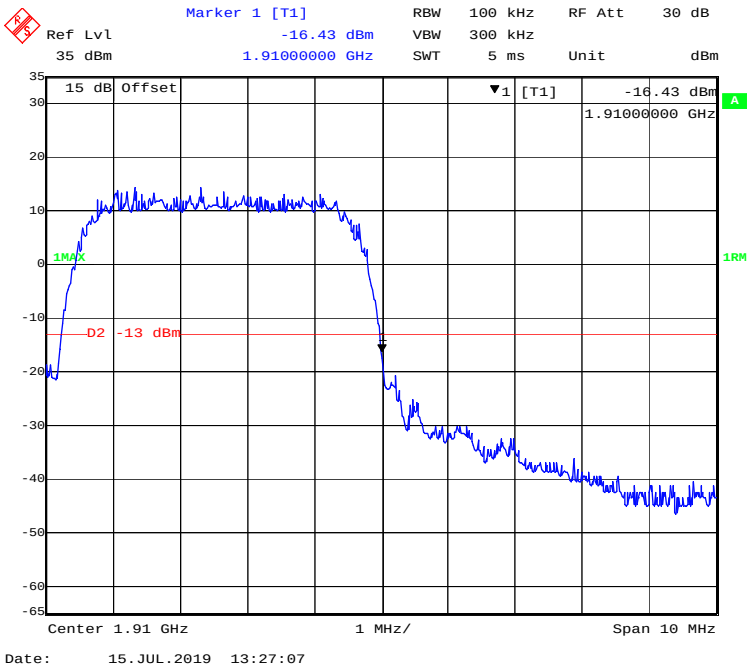
WCDMA (Rel99) Mode, Right Band Edge



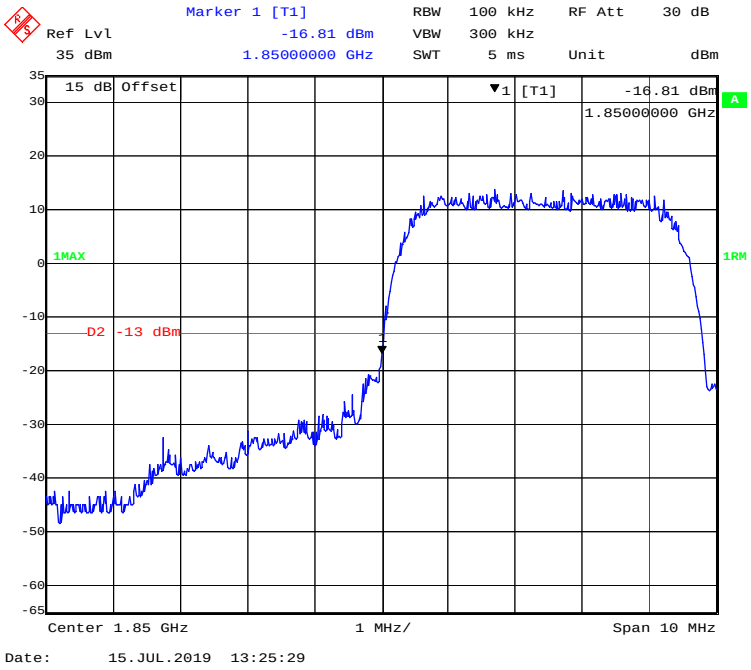
WCDMA (HSDPA) Mode, Left Band Edge



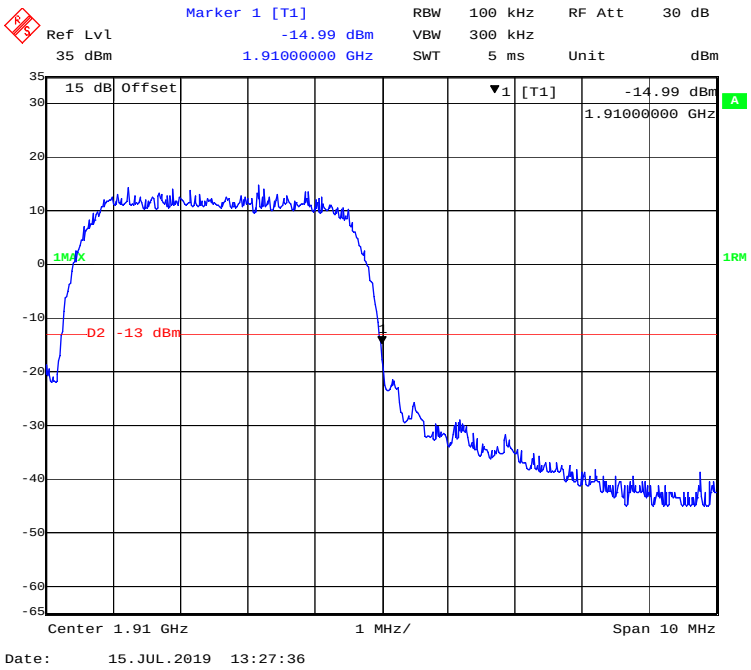
WCDMA (HSDPA) Mode, Right Band Edge



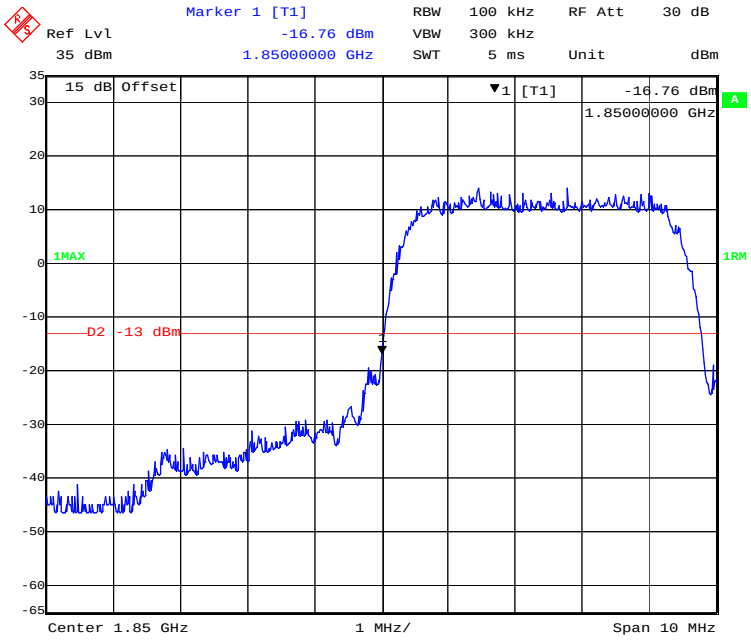
WCDMA (HSUPA) Mode, Left Band Edge



WCDMA (HSUPA) Mode, Right Band Edge



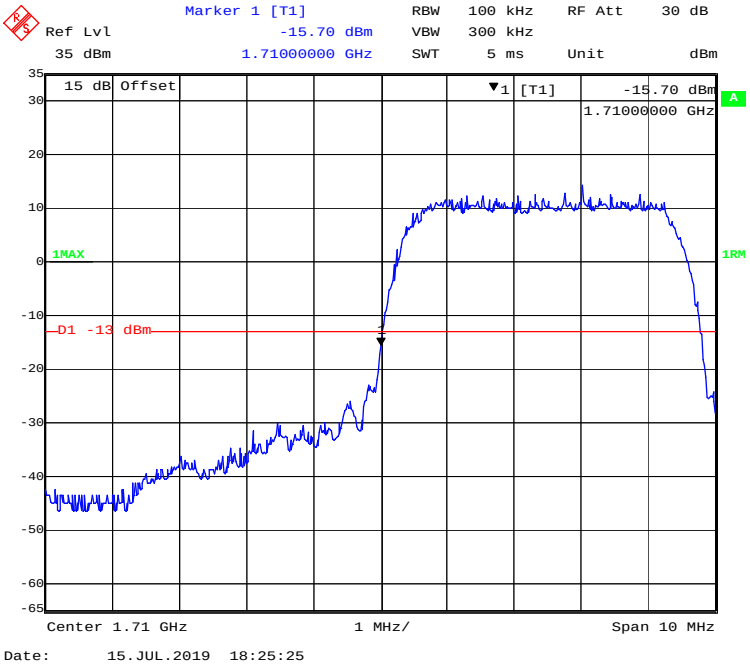
WCDMA (HSPA+) Mode, Left Band Edge



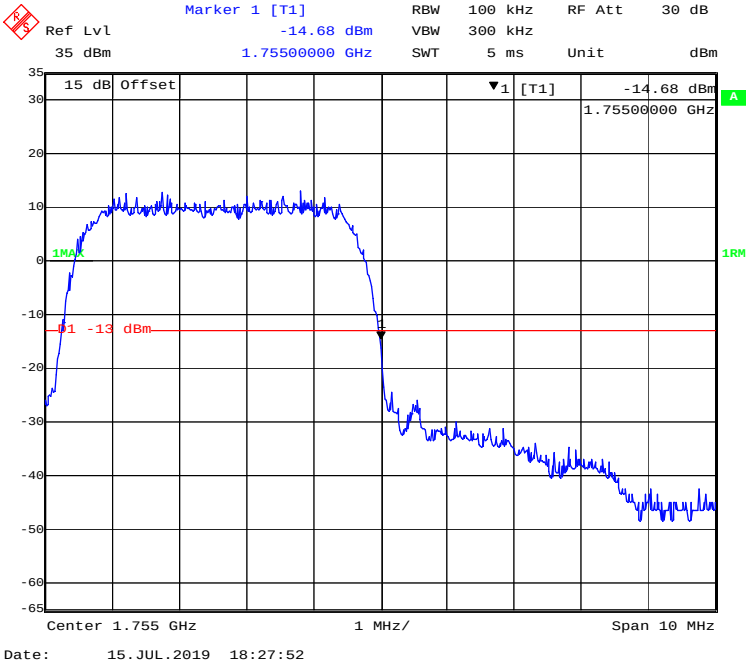
WCDMA (HSPA+) Mode, Right Band Edge

WCDMA Band IV

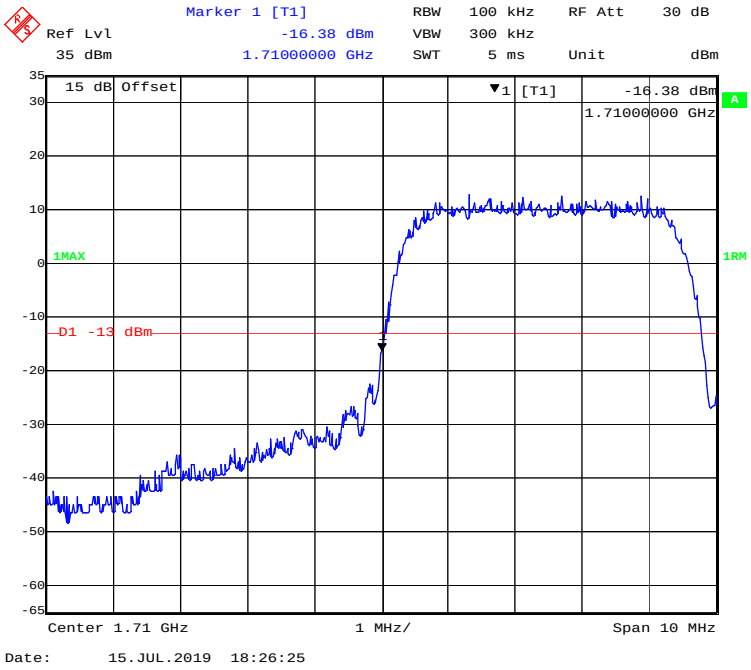
WCDMA (Rel99) Mode, Left Band Edge



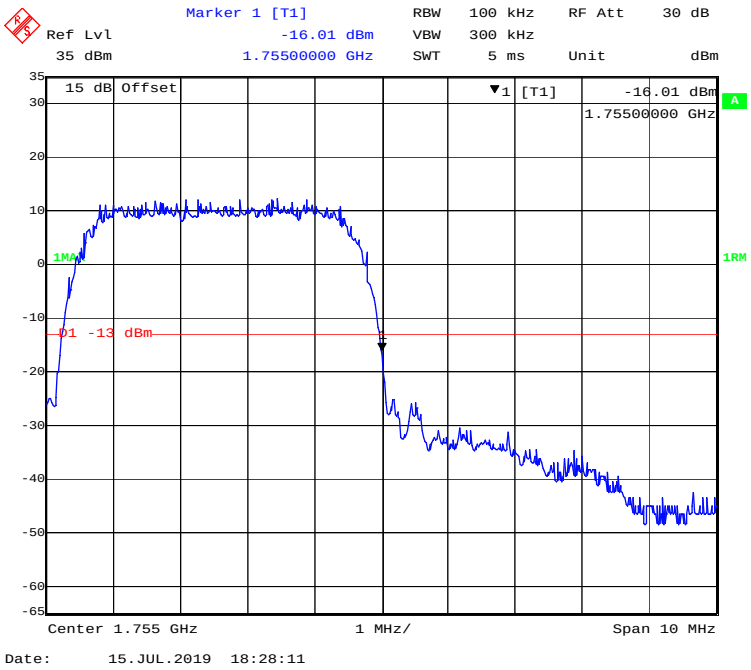
WCDMA (Rel99) Mode, Right Band Edge



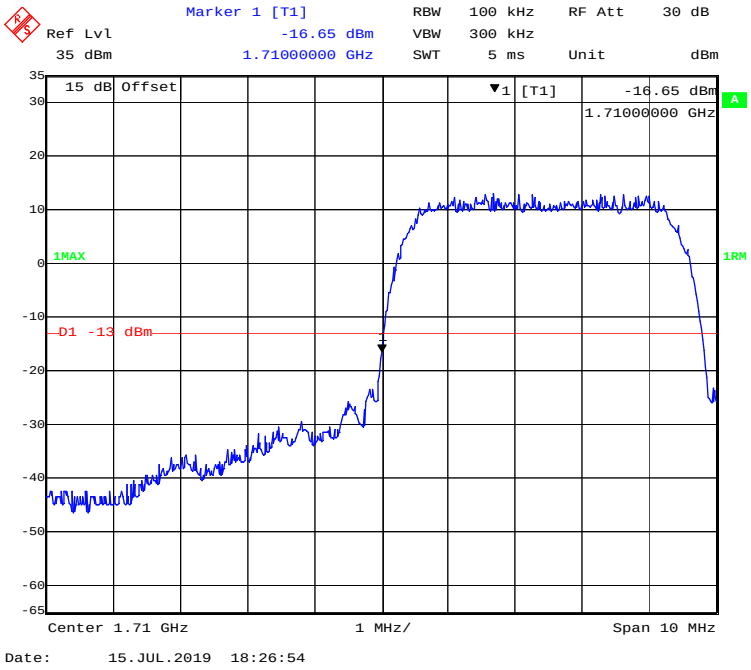
WCDMA (HSDPA) Mode, Left Band Edge



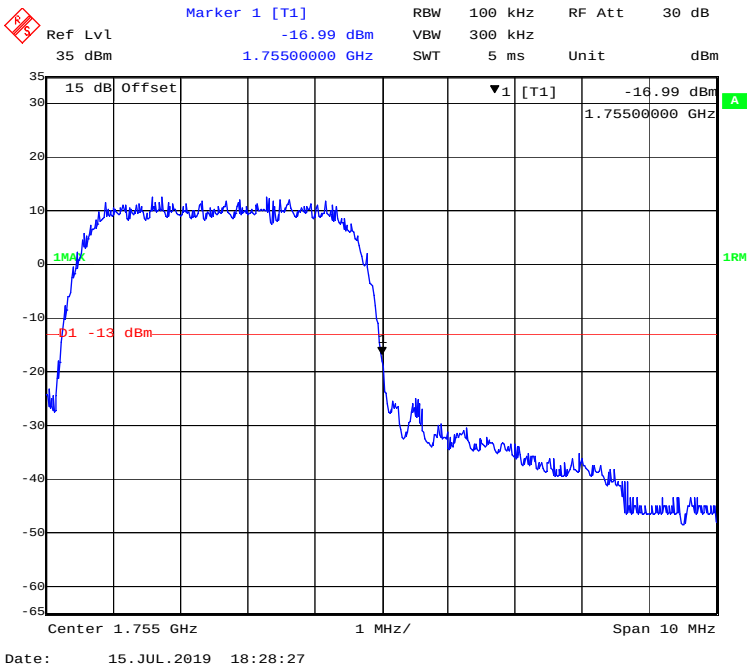
WCDMA (HSDPA) Mode, Right Band Edge



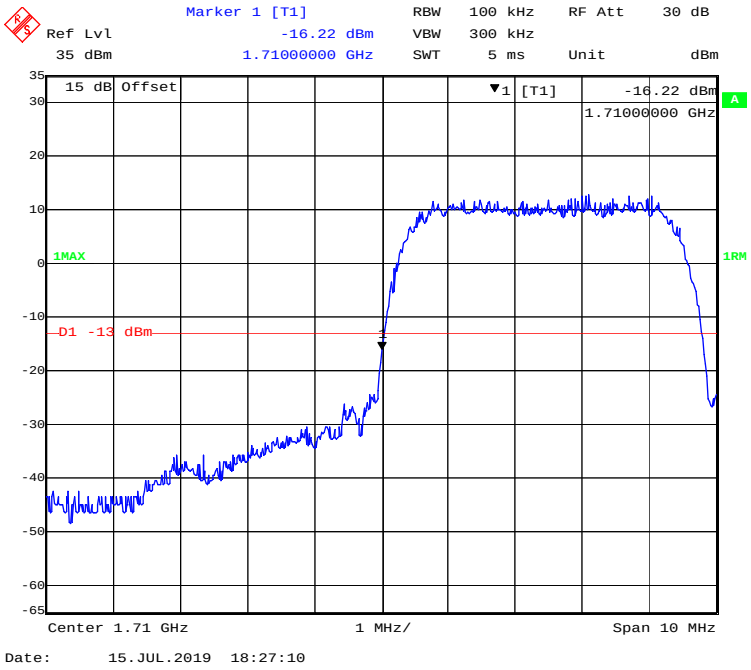
WCDMA (HSUPA) Mode, Left Band Edge



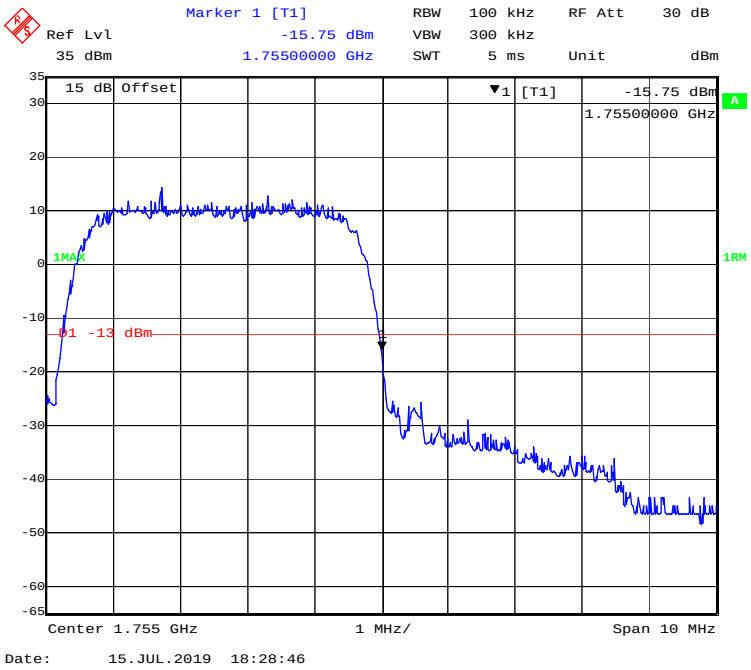
WCDMA (HSUPA) Mode, Right Band Edge



WCDMA (HSPA+) Mode, Left Band Edge

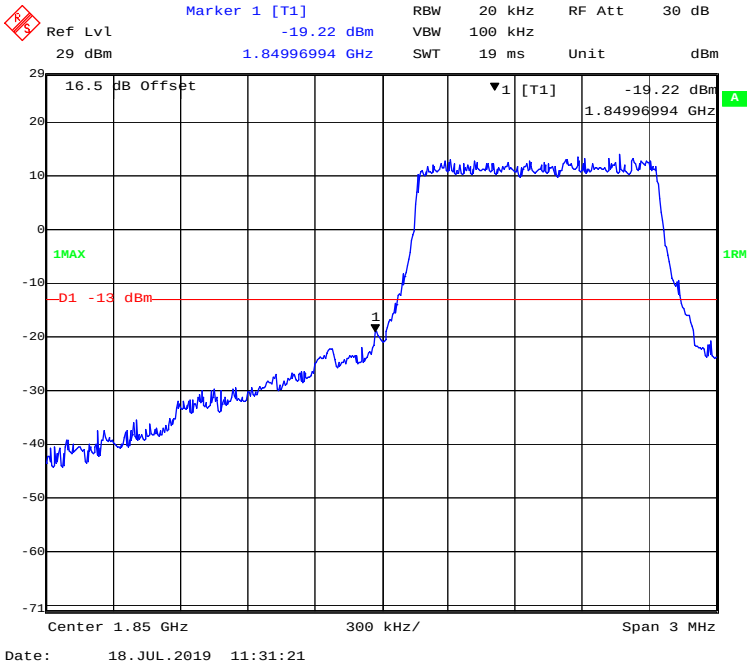


WCDMA (HSPA+) Mode, Right Band Edge

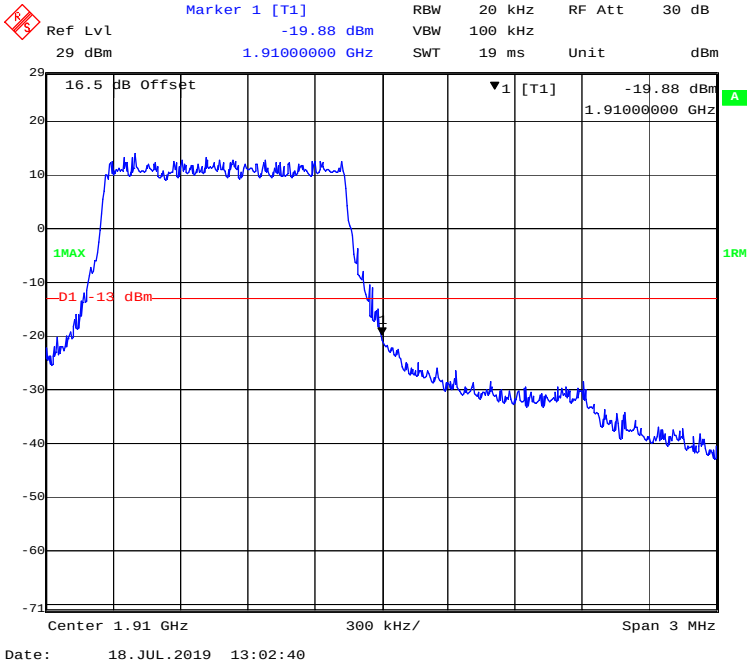


LTE Band 2:

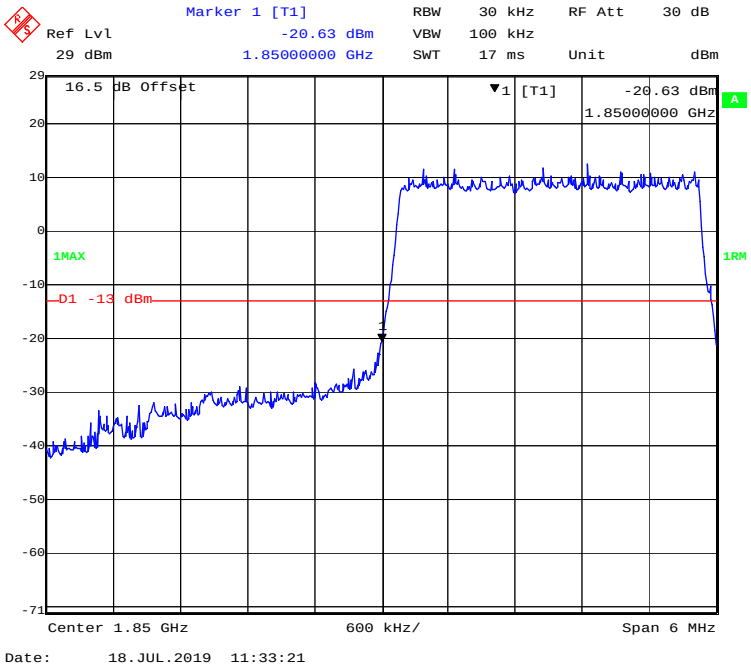
QPSK (1.4 MHz, FULL RB) - Left Band Edge



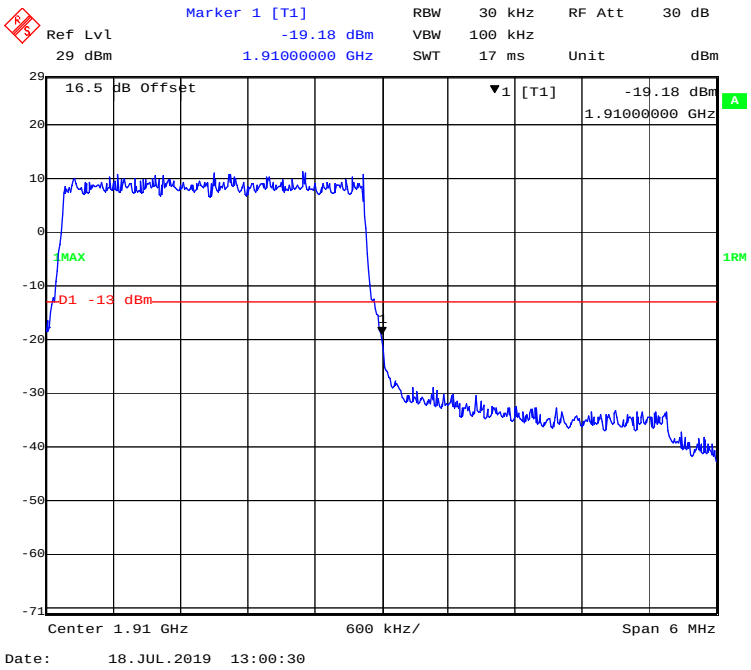
QPSK (1.4 MHz, FULL RB) - Right Band Edge



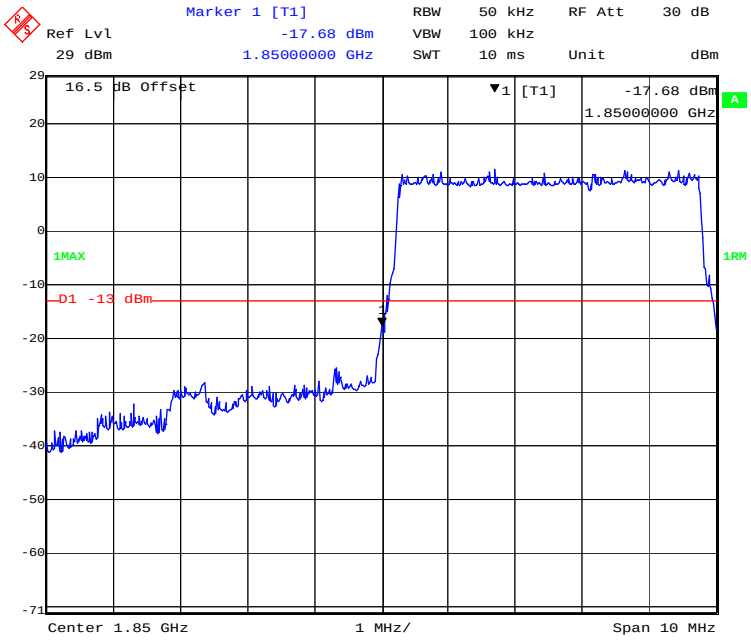
QPSK (3 MHz, FULL RB) - Left Band Edge



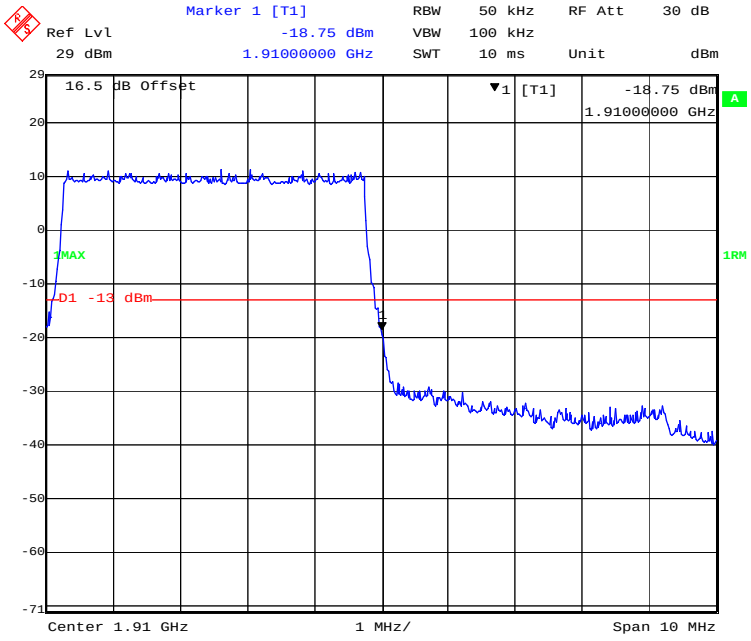
QPSK (3 MHz, FULL RB) - Right Band Edge



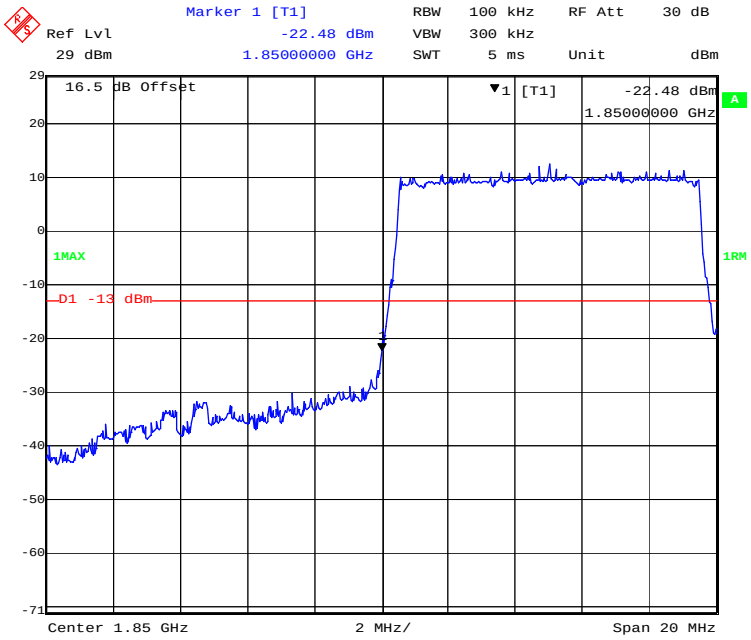
QPSK (5 MHz, FULL RB) - Left Band Edge



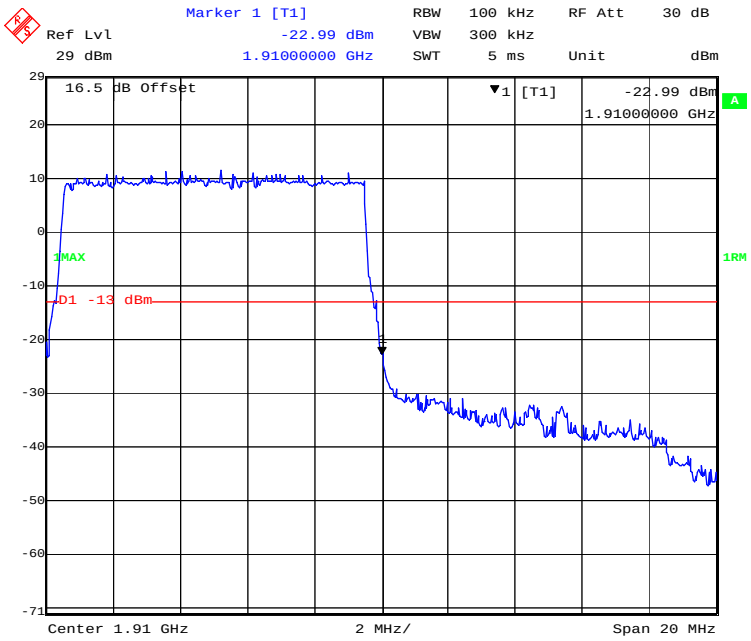
QPSK (5 MHz, FULL RB) - Right Band Edge



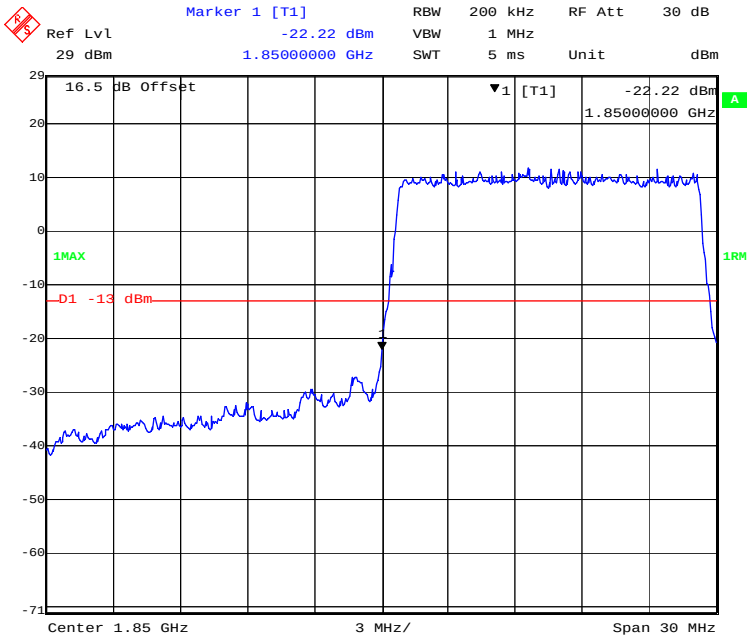
QPSK (10 MHz, FULL RB) - Left Band Edge



QPSK (10 MHz, FULL RB) - Right Band Edge

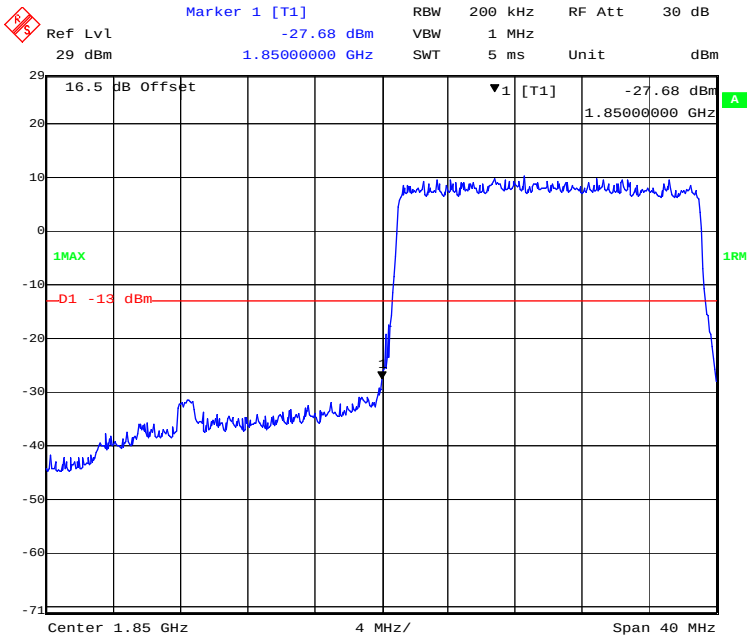


QPSK (15 MHz, FULL RB) - Left Band Edge



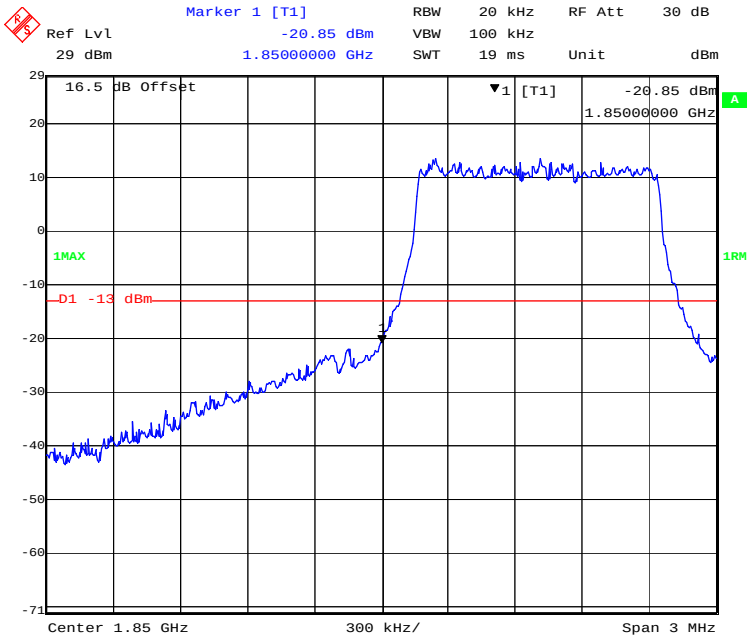
QPSK (15 MHz, FULL RB) - Right Band Edge

QPSK (20 MHz, FULL RB) - Left Band Edge

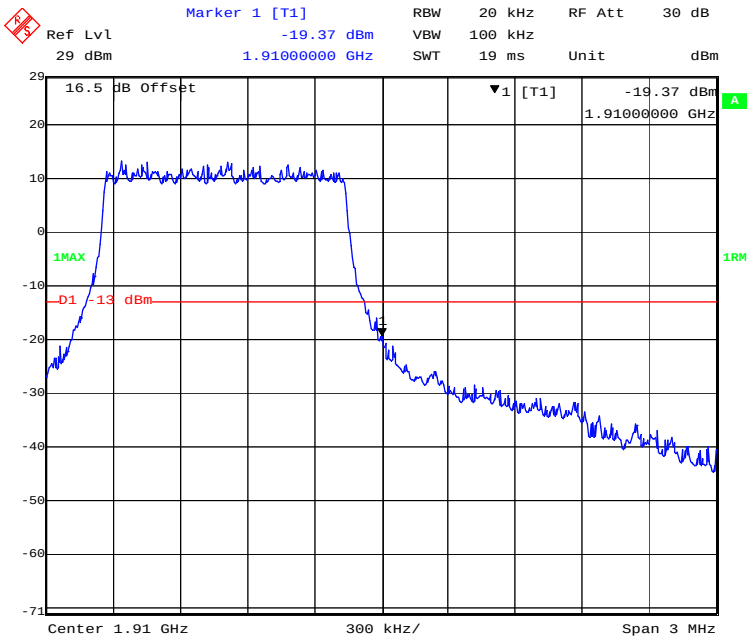


QPSK (20 MHz, FULL RB) - Right Band Edge

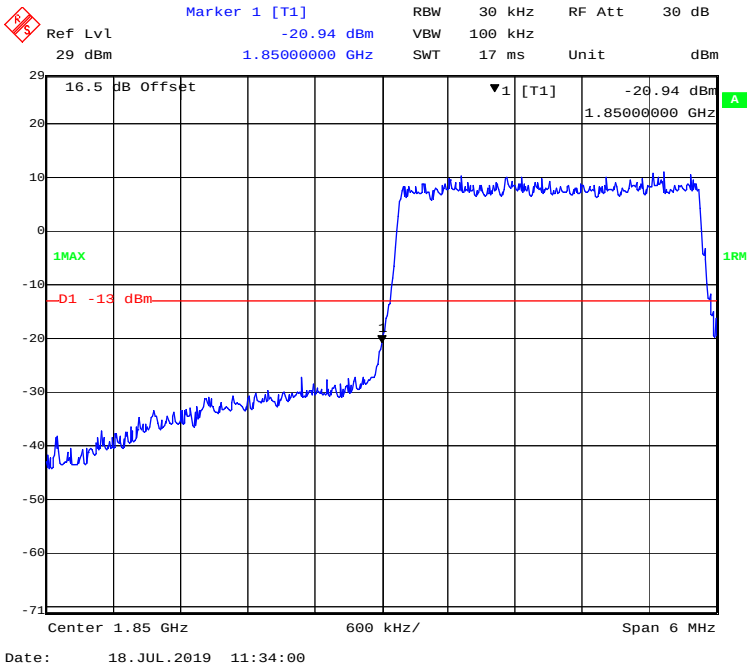
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



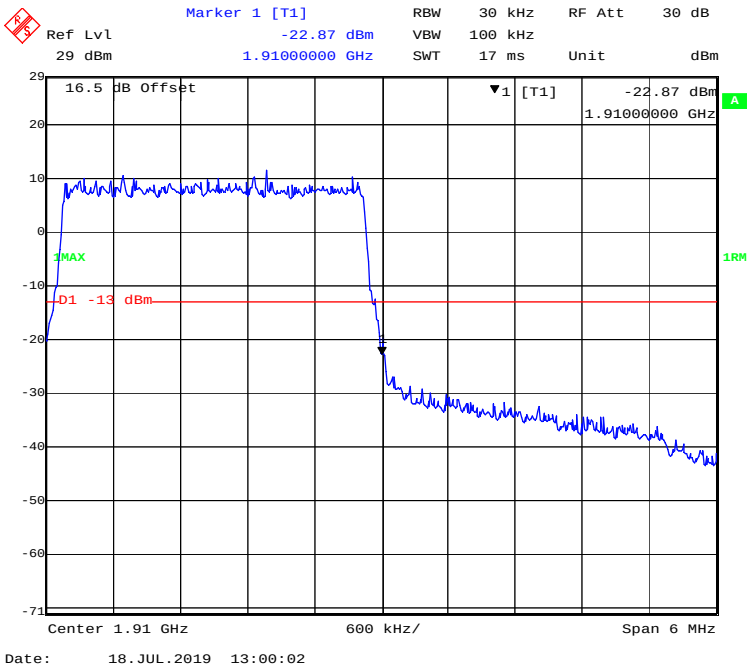
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



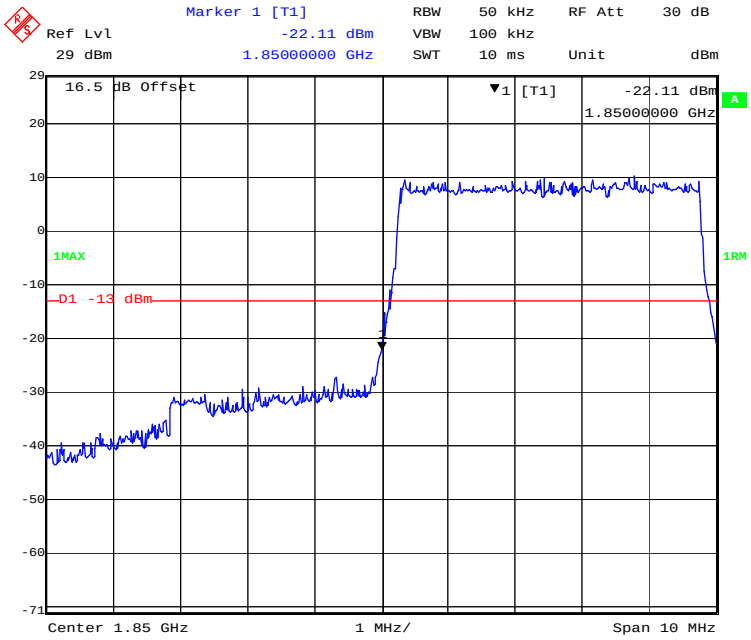
16-QAM (3 MHz, FULL RB) - Left Band Edge



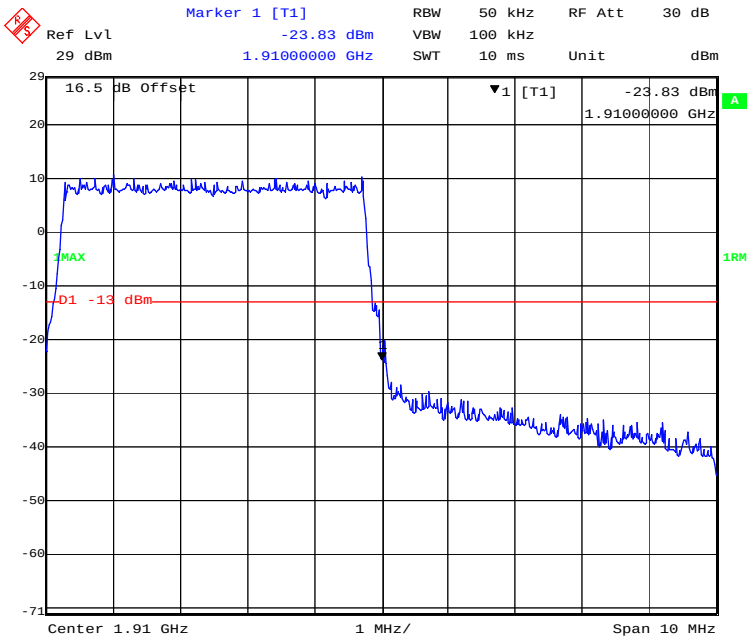
16-QAM (3 MHz, FULL RB) - Right Band Edge



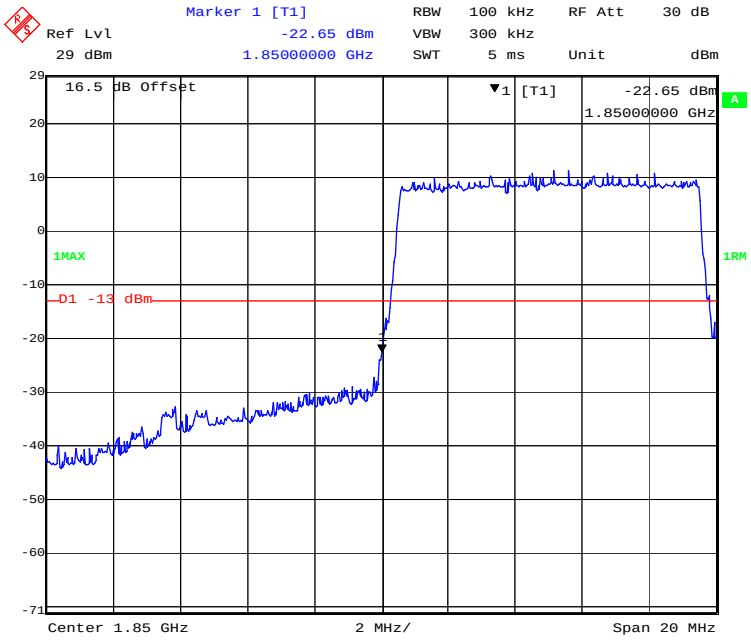
16-QAM (5 MHz, FULL RB) - Left Band Edge



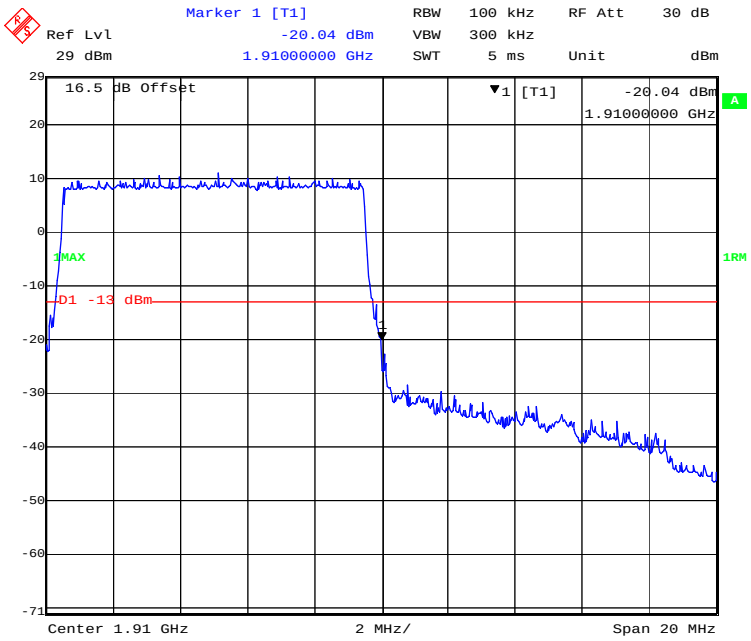
16-QAM (5 MHz, FULL RB) - Right Band Edge



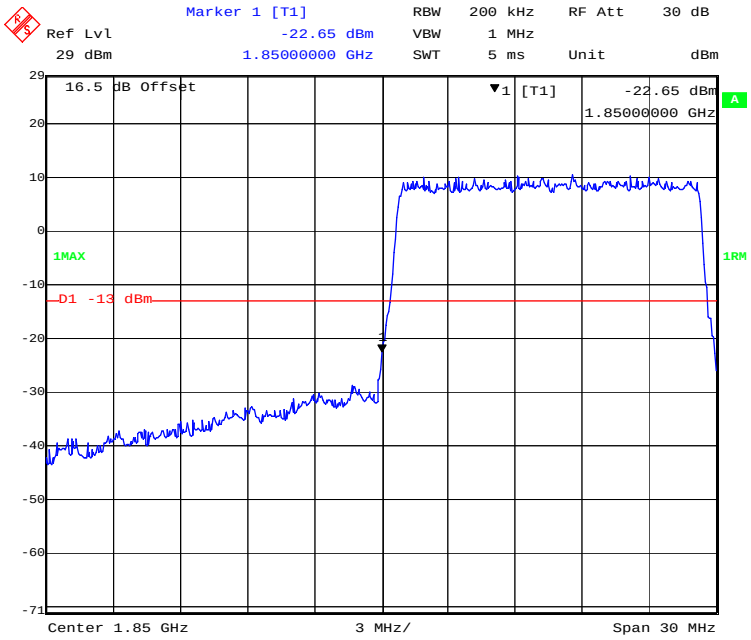
16-QAM (10 MHz, FULL RB) - Left Band Edge



16-QAM (10 MHz, FULL RB) - Right Band Edge

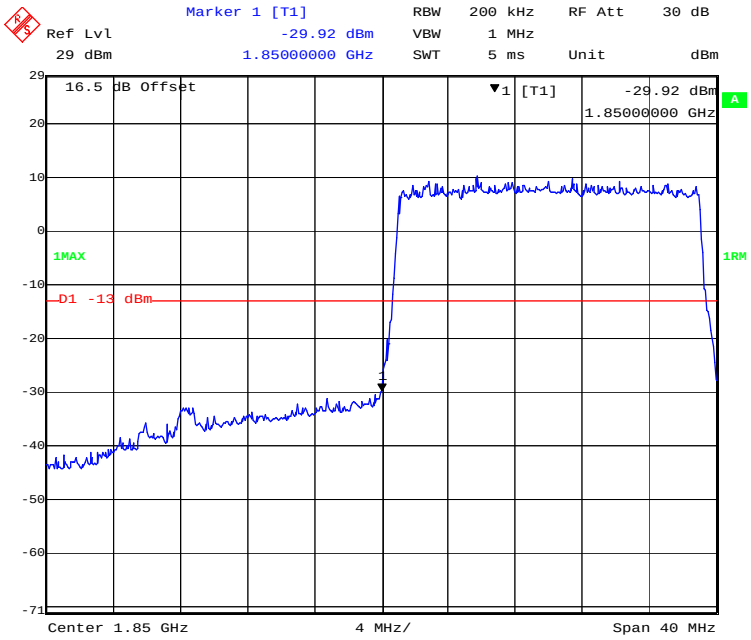


16-QAM (15 MHz, FULL RB) - Left Band Edge

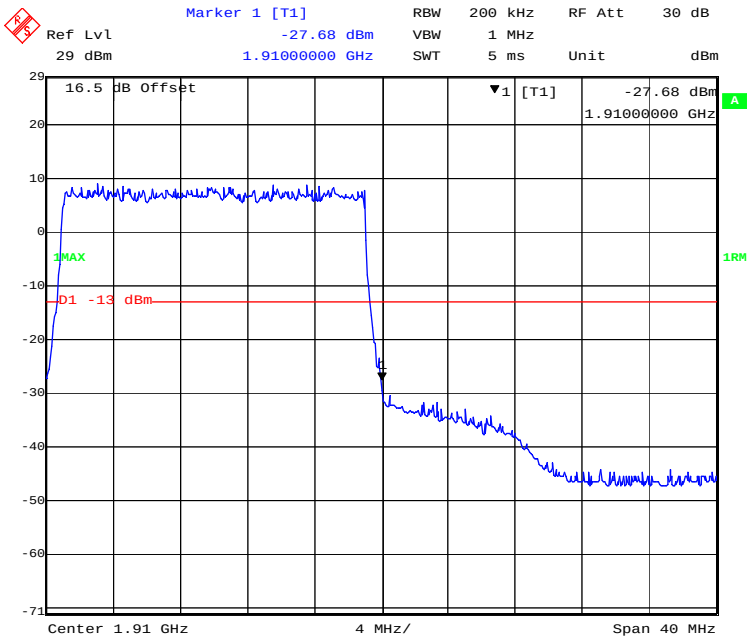


16-QAM (15 MHz, FULL RB) - Right Band Edge

16-QAM (20 MHz, FULL RB) - Left Band Edge

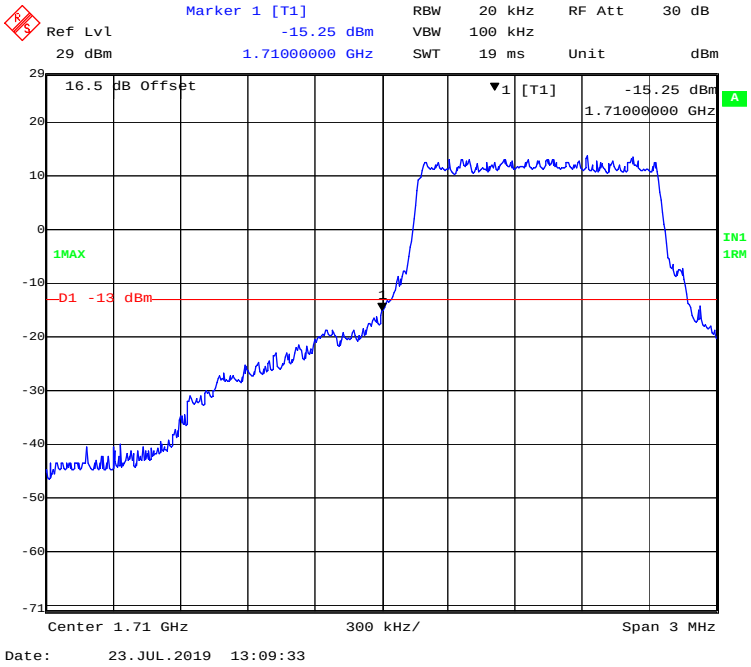


16-QAM (20 MHz, FULL RB) - Right Band Edge

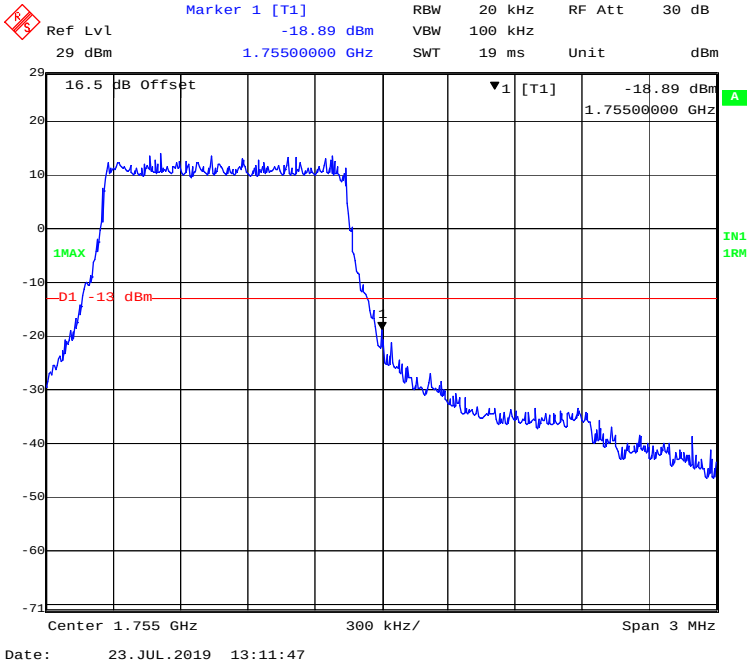


LTE Band 4:

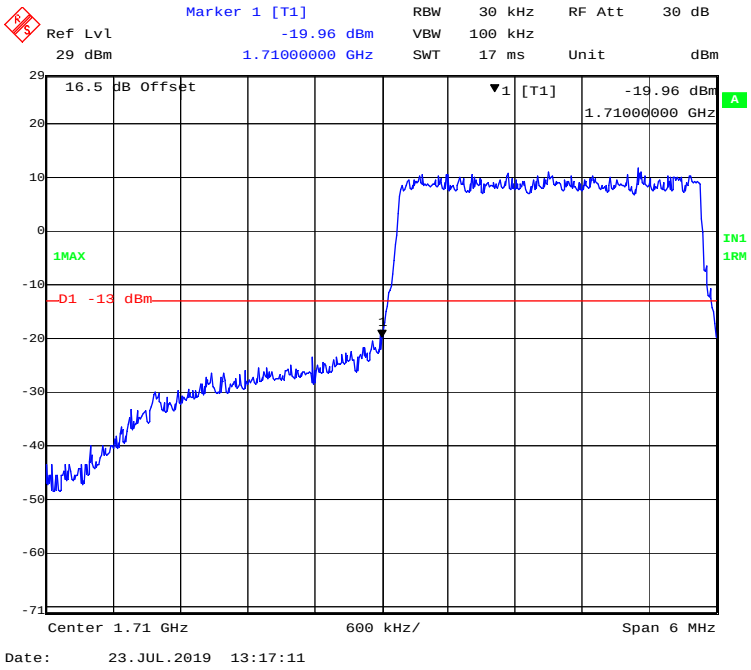
QPSK (1.4 MHz, FULL RB) - Left Band Edge



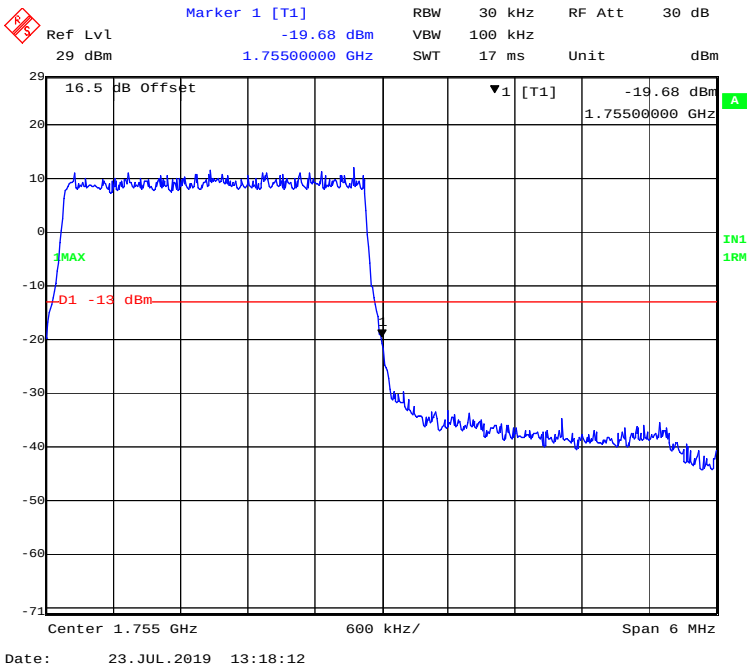
QPSK (1.4 MHz, FULL RB) - Right Band Edge



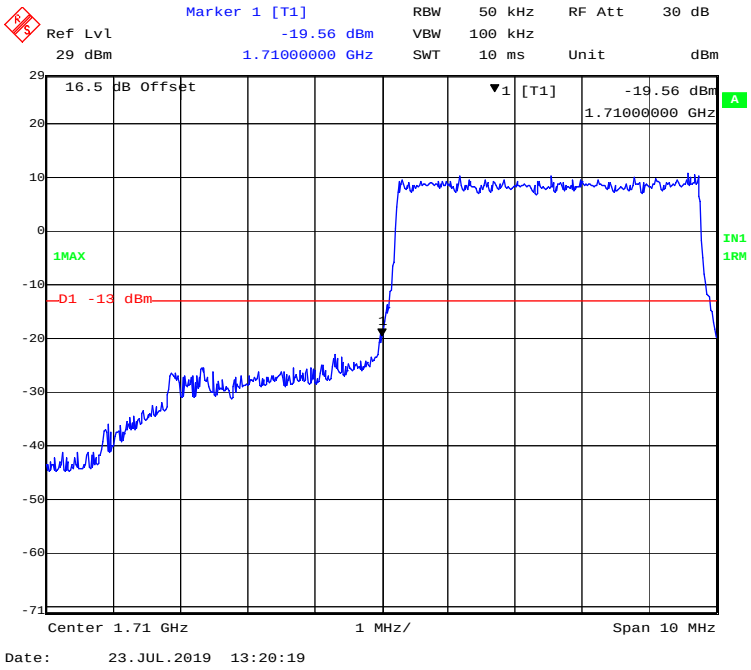
QPSK (3 MHz, FULL RB) - Left Band Edge



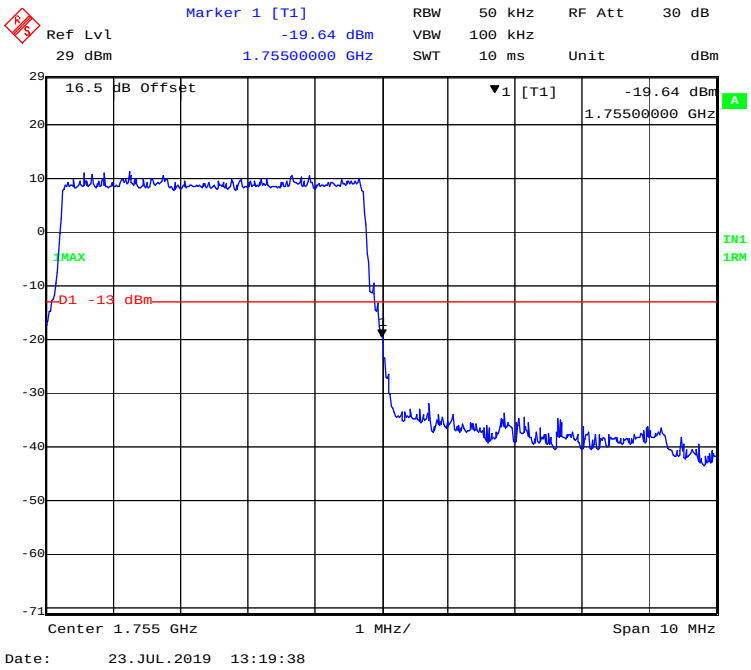
QPSK (3 MHz, FULL RB) - Right Band Edge



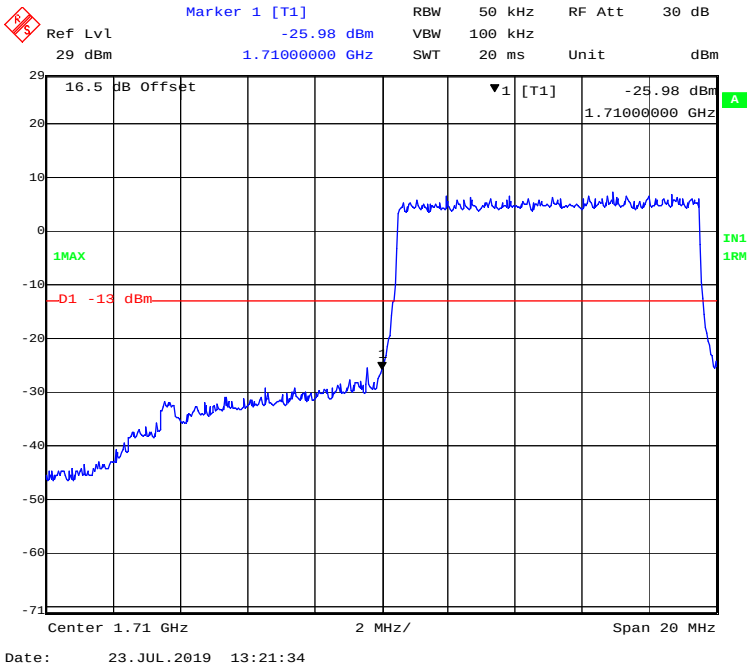
QPSK (5 MHz, FULL RB) - Left Band Edge



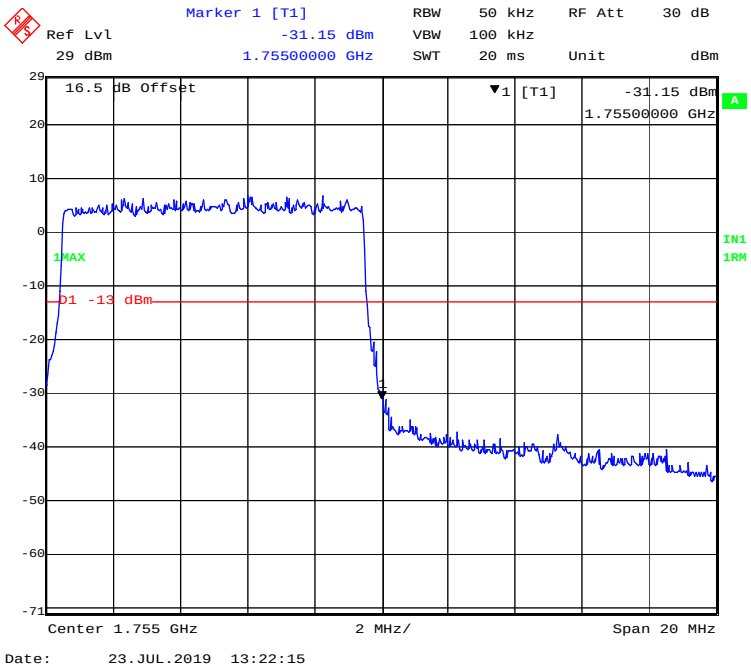
QPSK (5 MHz, FULL RB) - Right Band Edge



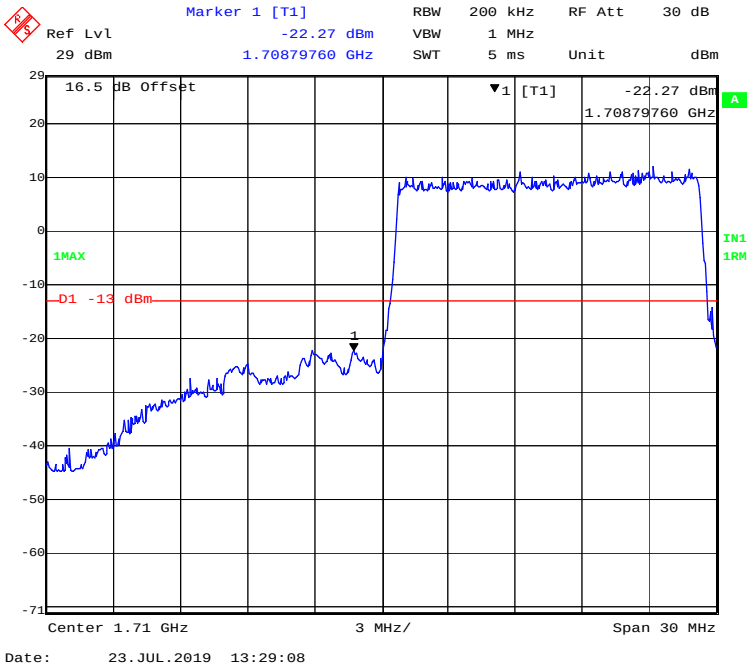
QPSK (10 MHz, FULL RB) - Left Band Edge



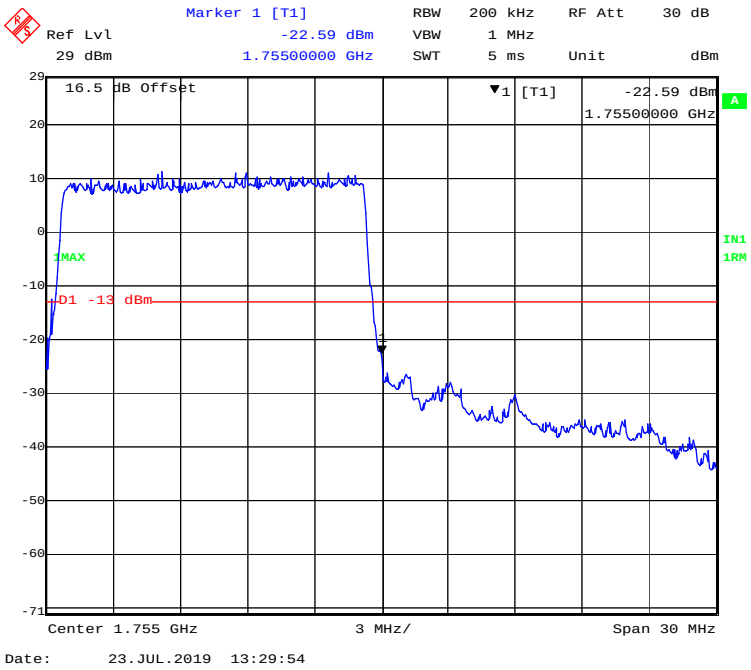
QPSK (10 MHz, FULL RB) - Right Band Edge



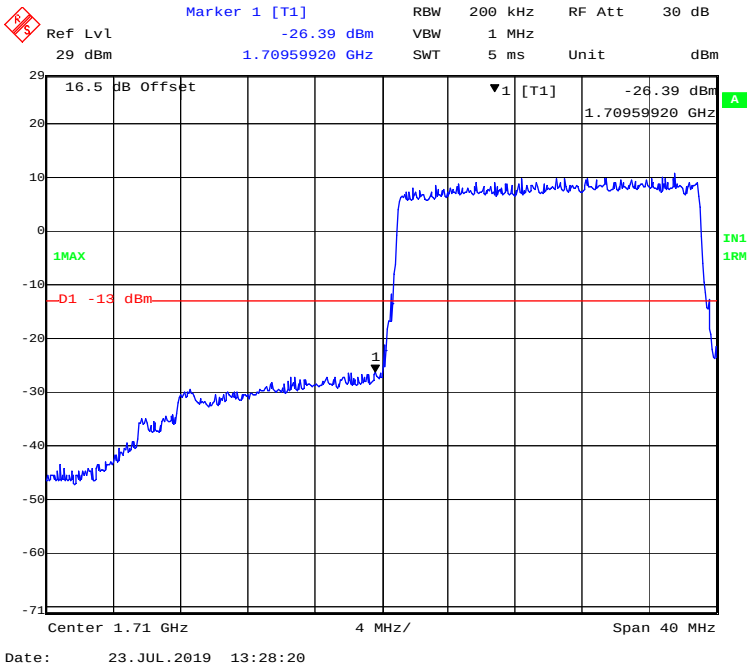
QPSK (15 MHz, FULL RB) - Left Band Edge



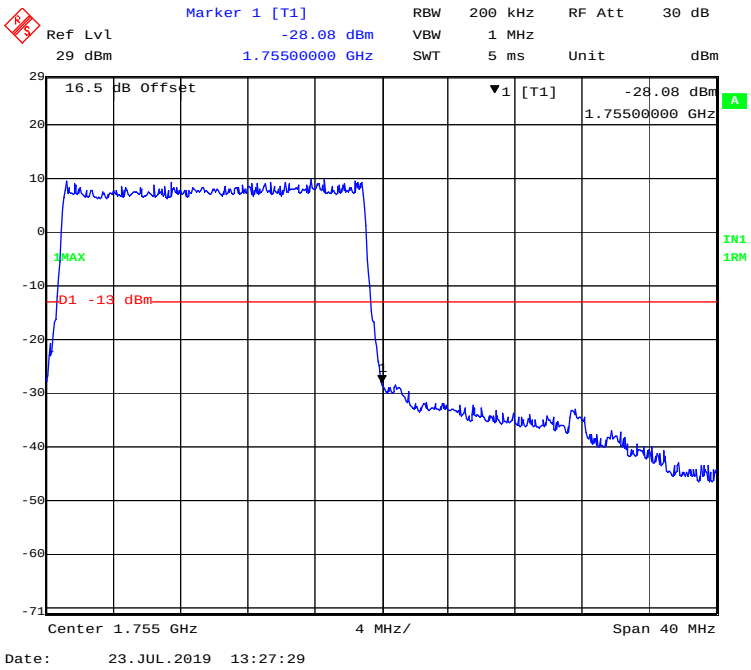
QPSK (15 MHz, FULL RB) - Right Band Edge



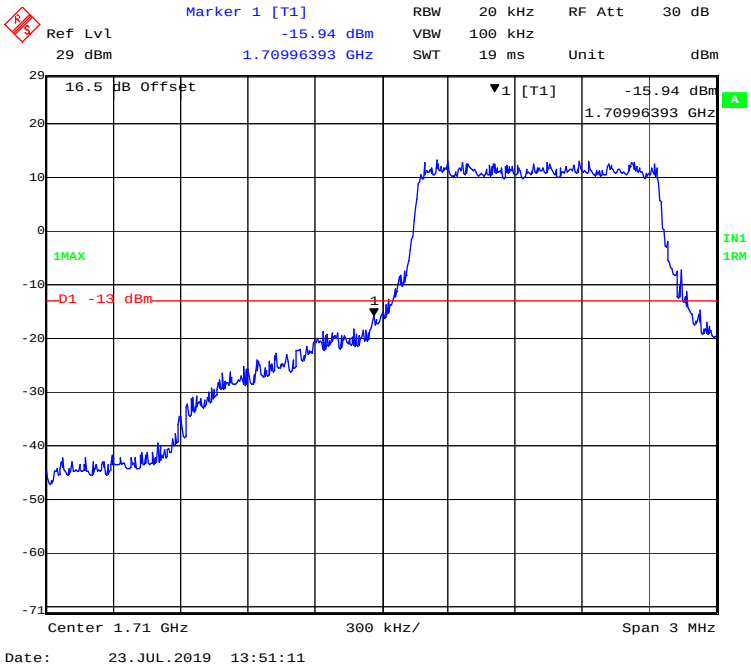
QPSK (20 MHz, FULL RB) - Left Band Edge



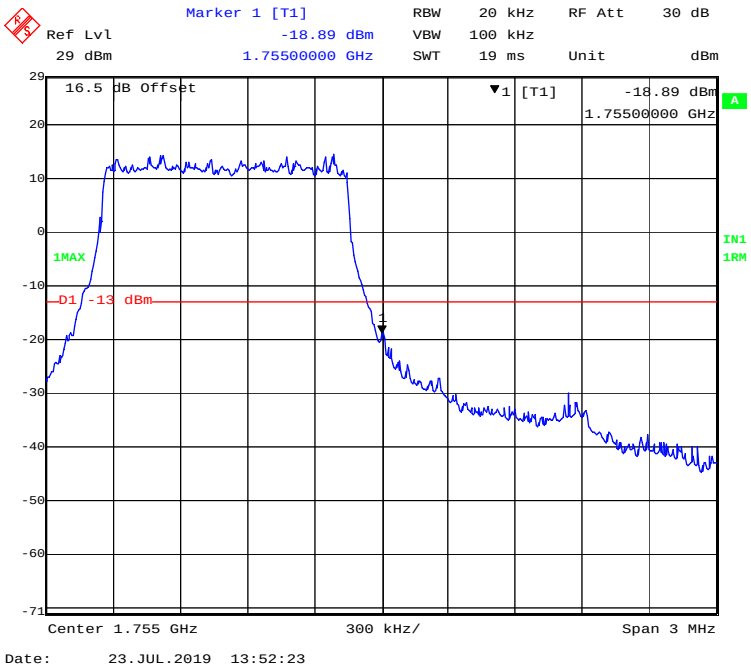
QPSK (20 MHz, FULL RB) - Right Band Edge



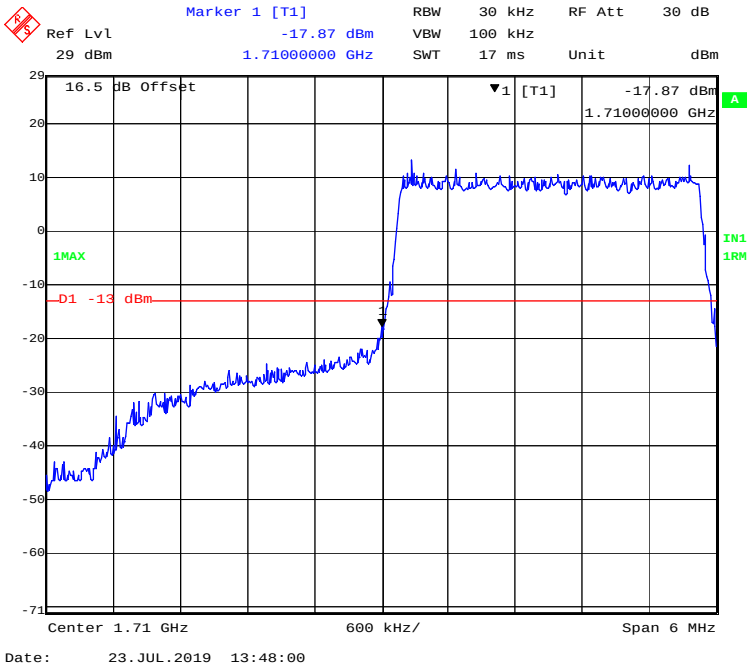
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



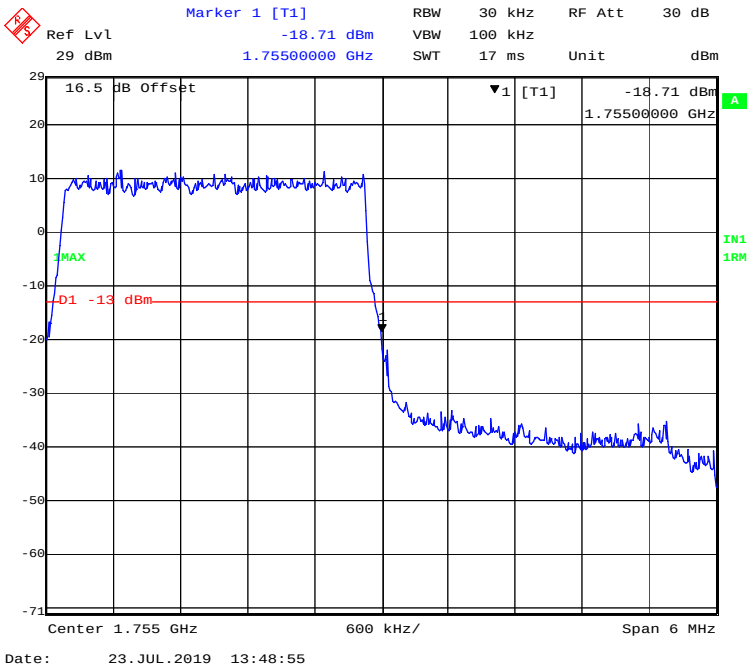
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



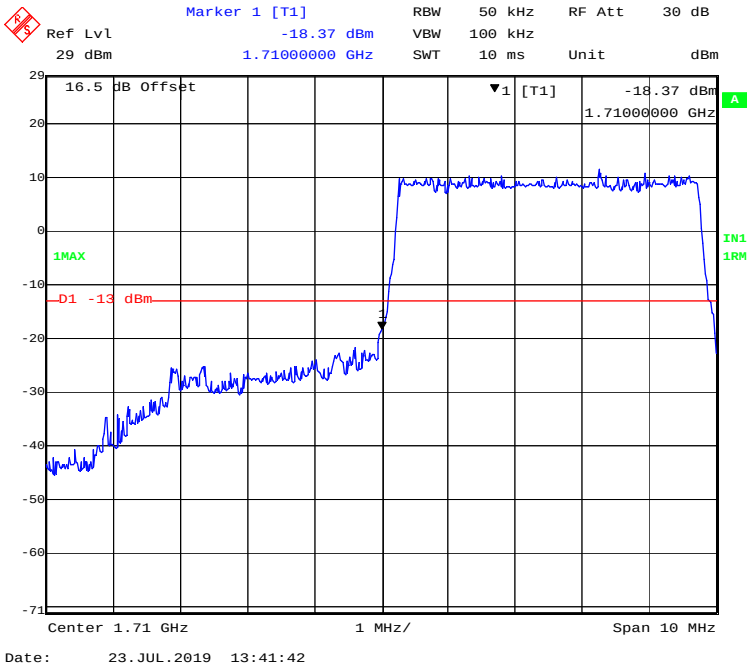
16-QAM (3 MHz, FULL RB) - Left Band Edge



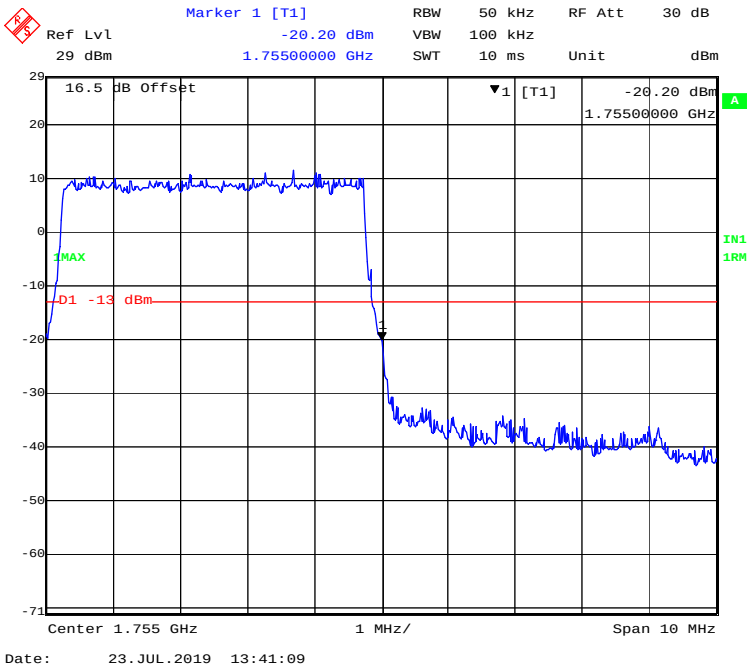
16-QAM (3 MHz, FULL RB) - Right Band Edge



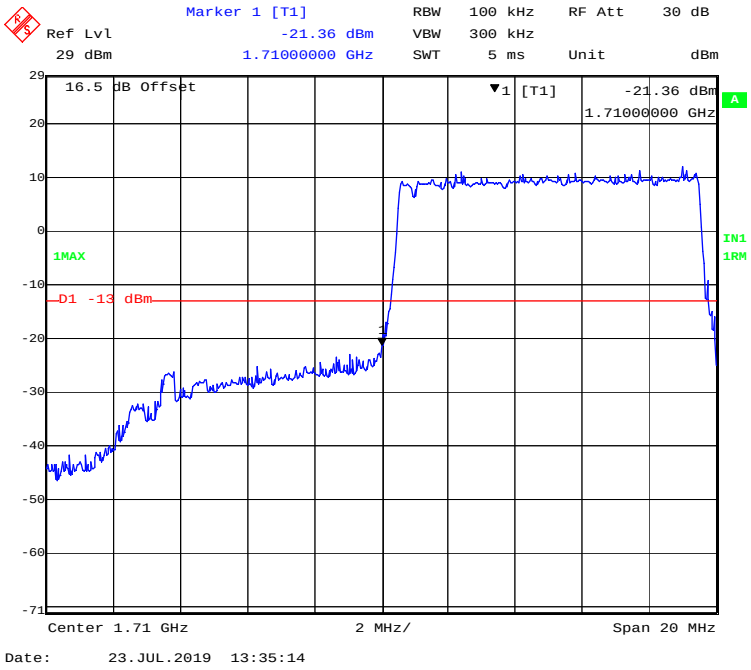
16-QAM (5 MHz, FULL RB) - Left Band Edge



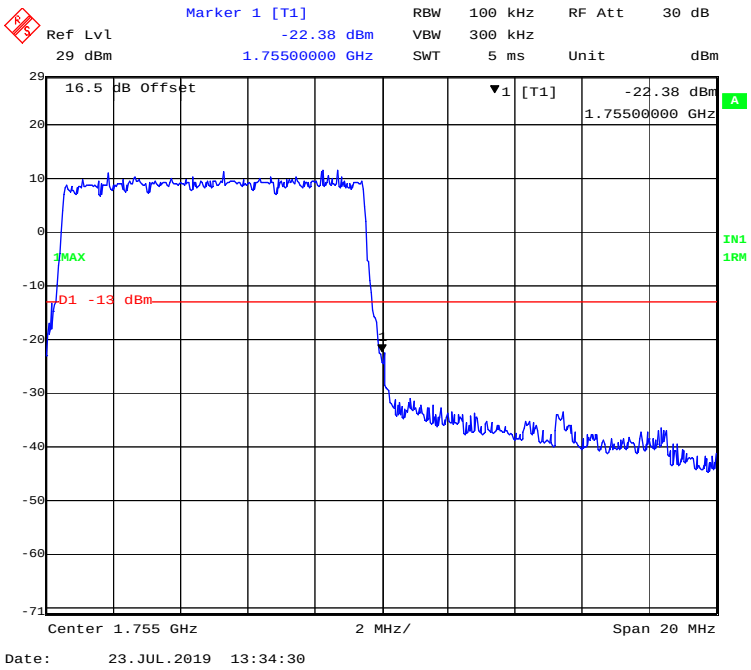
16-QAM (5 MHz, FULL RB) - Right Band Edge



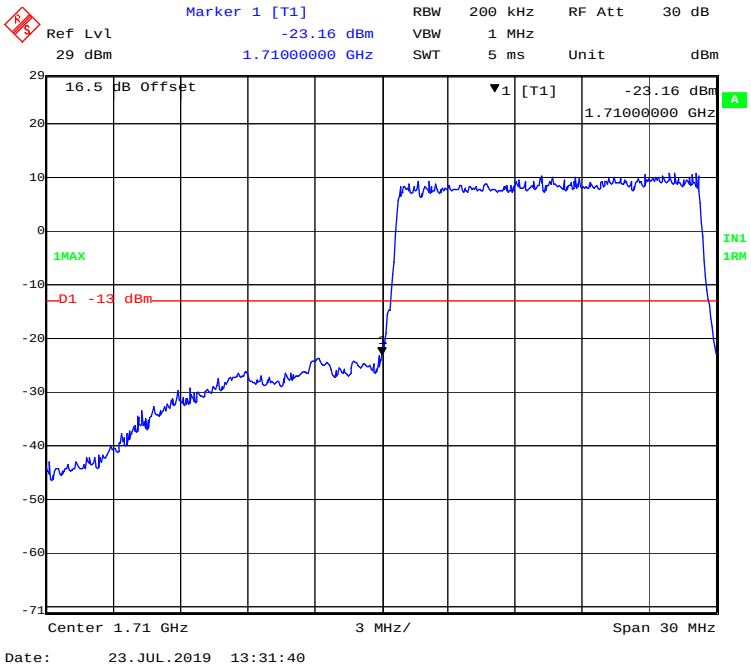
16-QAM (10 MHz, FULL RB) - Left Band Edge



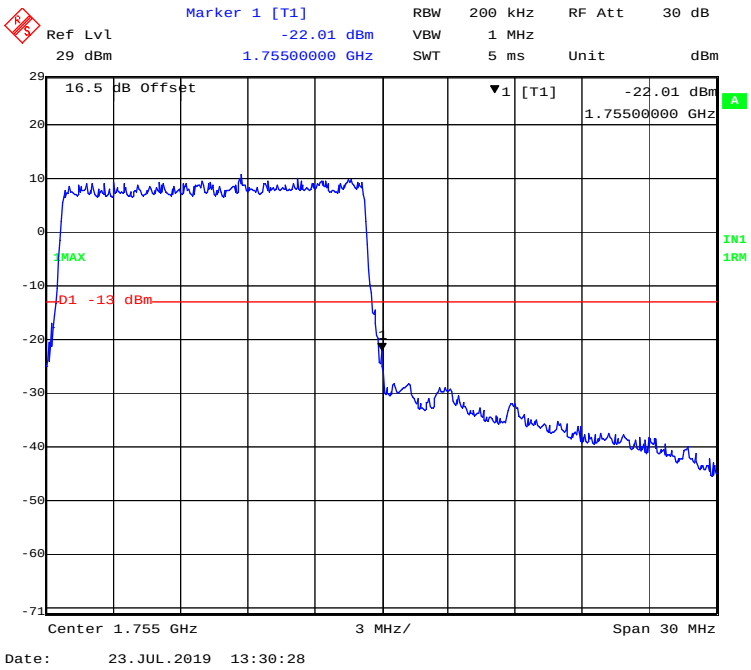
16-QAM (10 MHz, FULL RB) - Right Band Edge



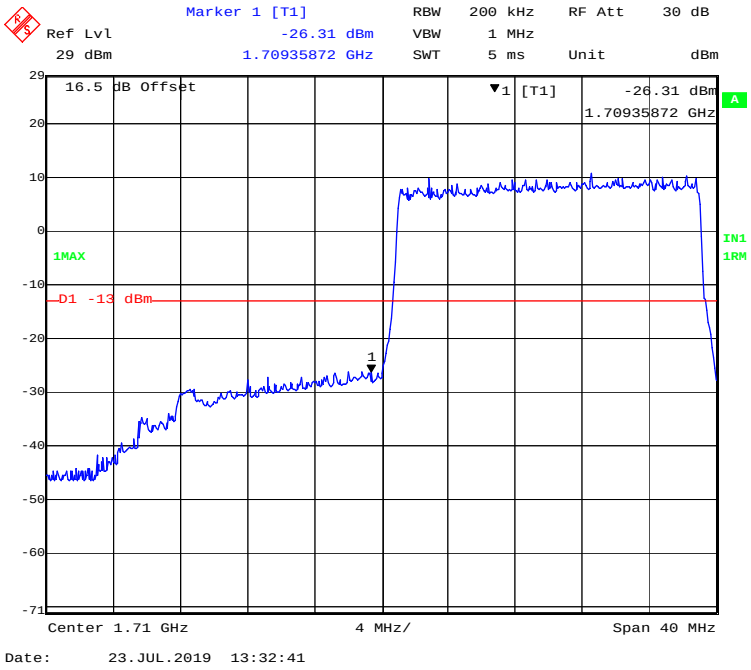
16-QAM (15 MHz, FULL RB) - Left Band Edge



16-QAM (15 MHz, FULL RB) - Right Band Edge

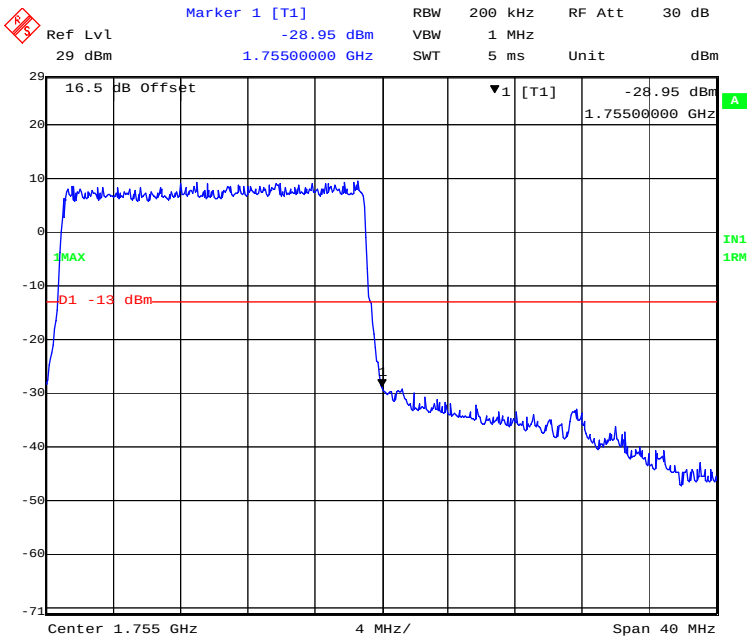


16-QAM (20 MHz, FULL RB) - Left Band Edge



Date: 23.JUL.2019 13:32:41

16-QAM (20 MHz, FULL RB) - Right Band Edge



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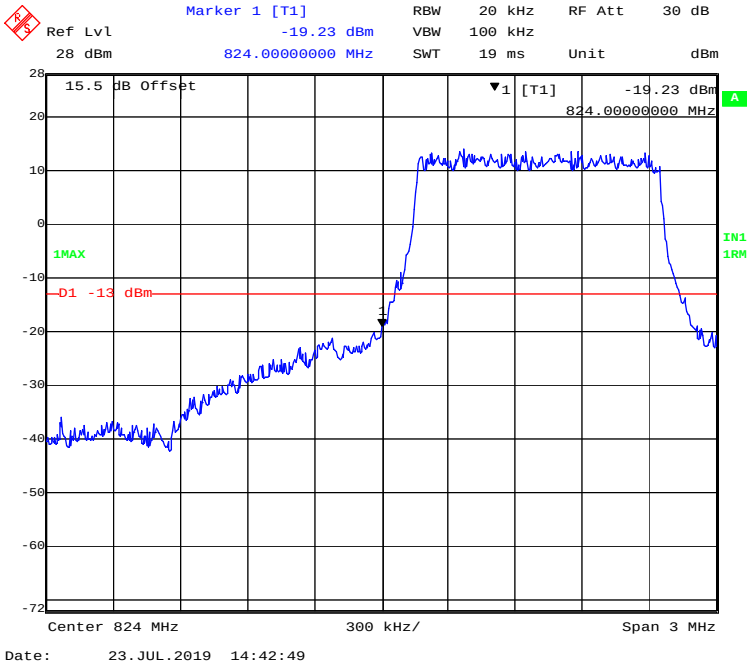
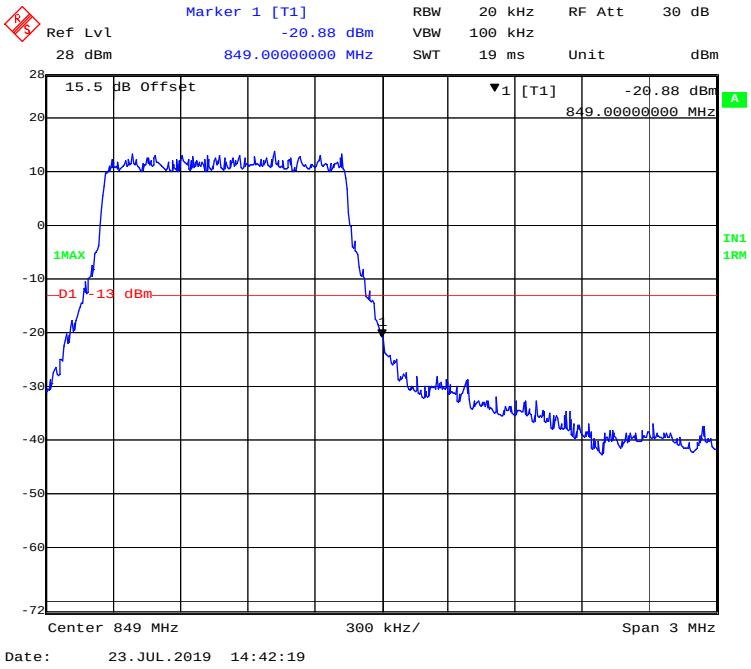
LTE Band 5:

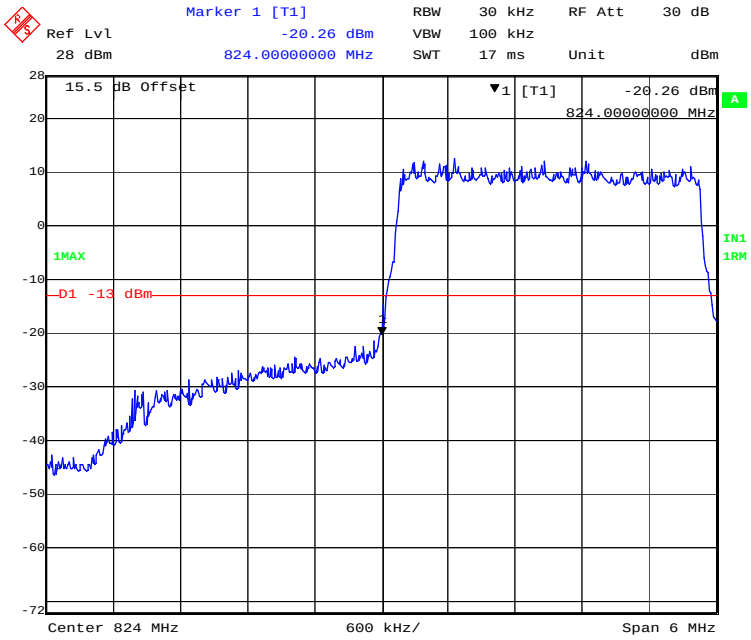
QPSK (1.4 MHz, FULL RB) - Left Band Edge



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

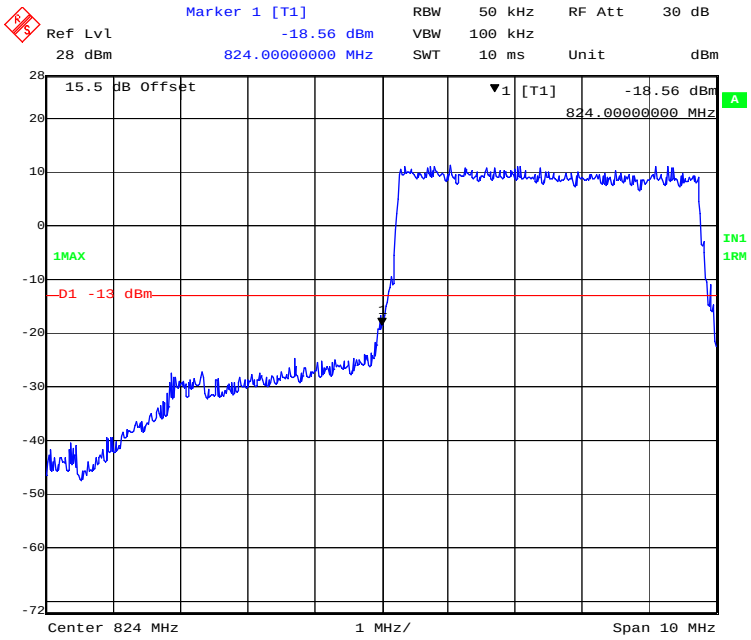


QPSK (3 MHz, FULL RB) - Left Band Edge

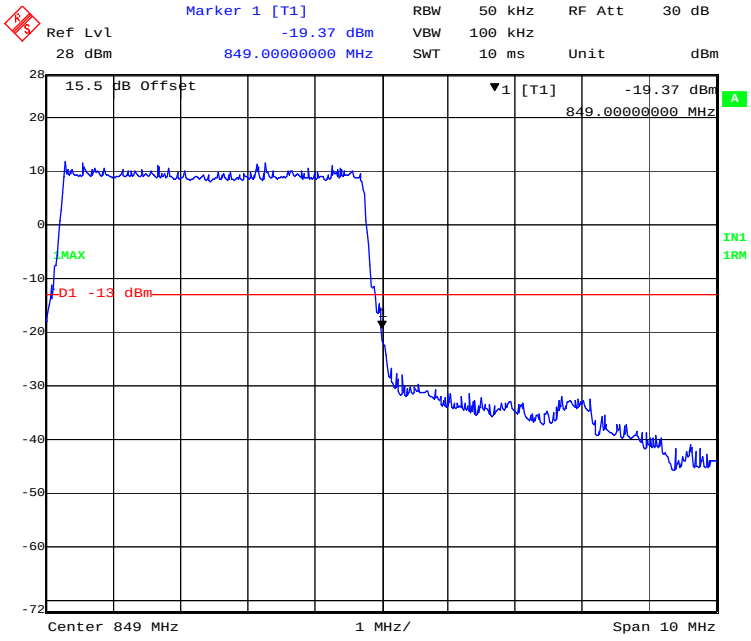


QPSK (3 MHz, FULL RB) - Right Band Edge

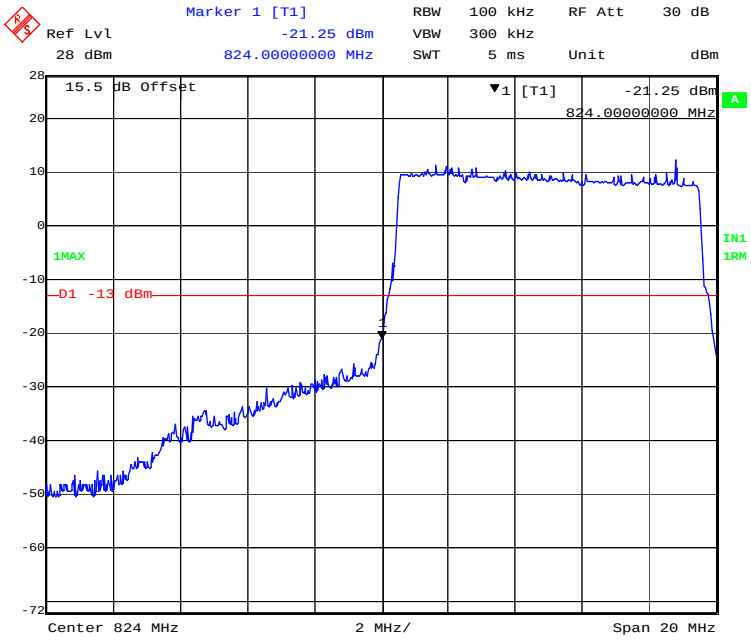
QPSK (5 MHz, FULL RB) - Left Band Edge



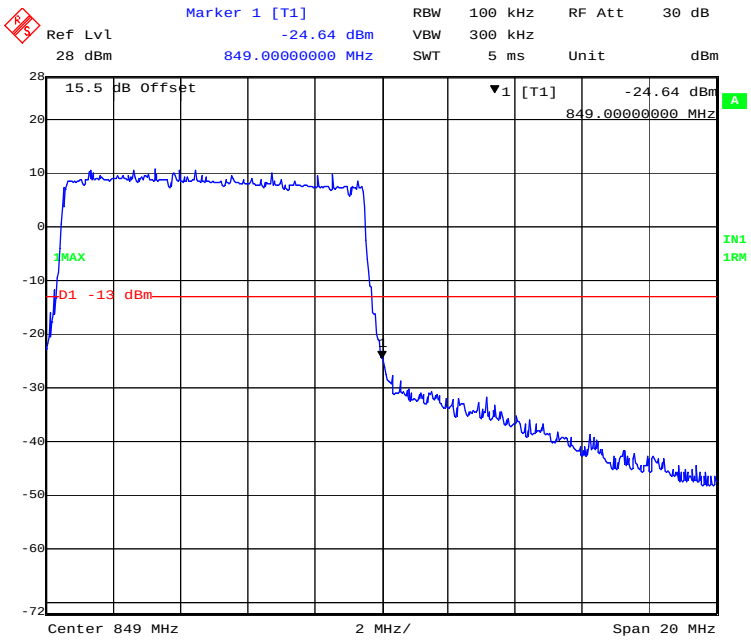
QPSK (5 MHz, FULL RB) - Right Band Edge



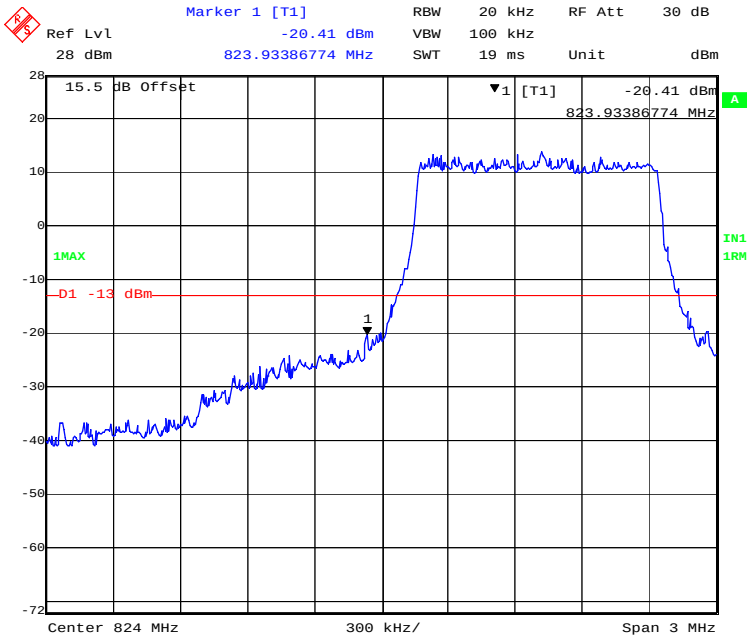
QPSK (10 MHz, FULL RB) - Left Band Edge



QPSK (10 MHz, FULL RB) - Right Band Edge

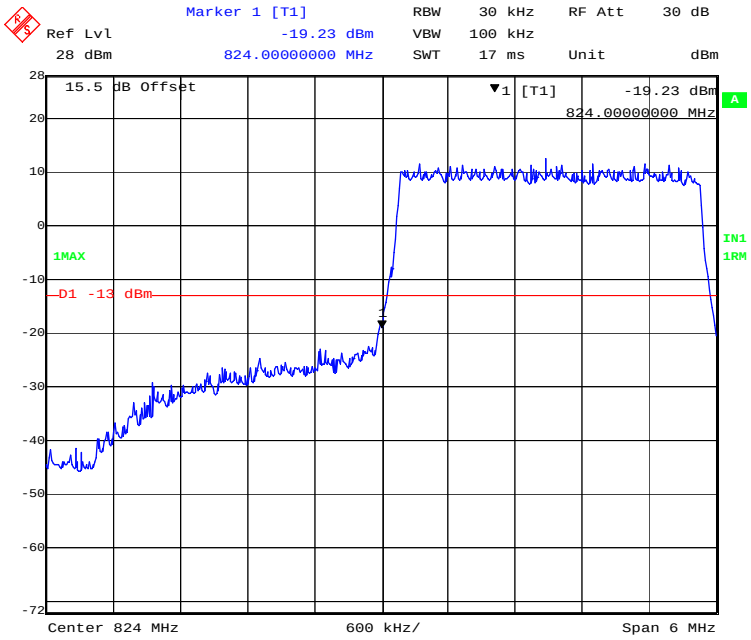


16-QAM (1.4 MHz, FULL RB) - Left Band Edge

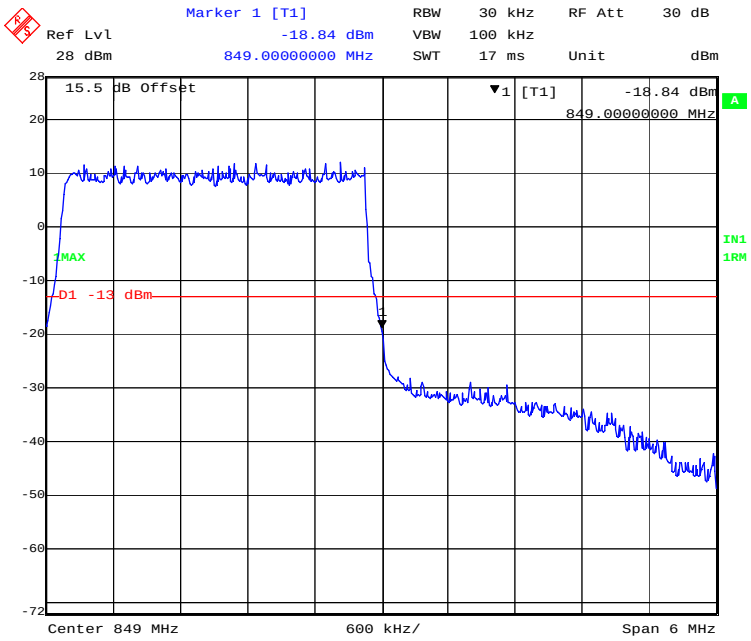


16-QAM (1.4 MHz, FULL RB) - Right Band Edge

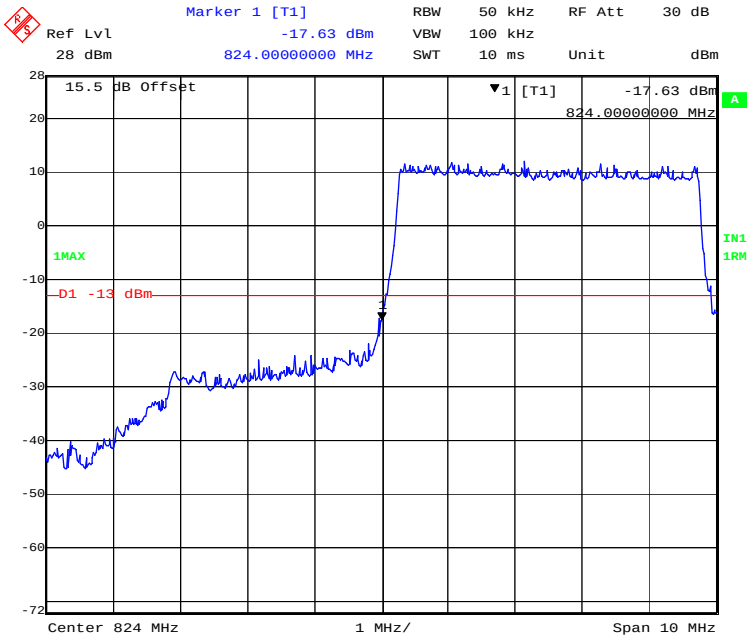
16-QAM (3 MHz, FULL RB) - Left Band Edge



16-QAM (3 MHz, FULL RB) - Right Band Edge

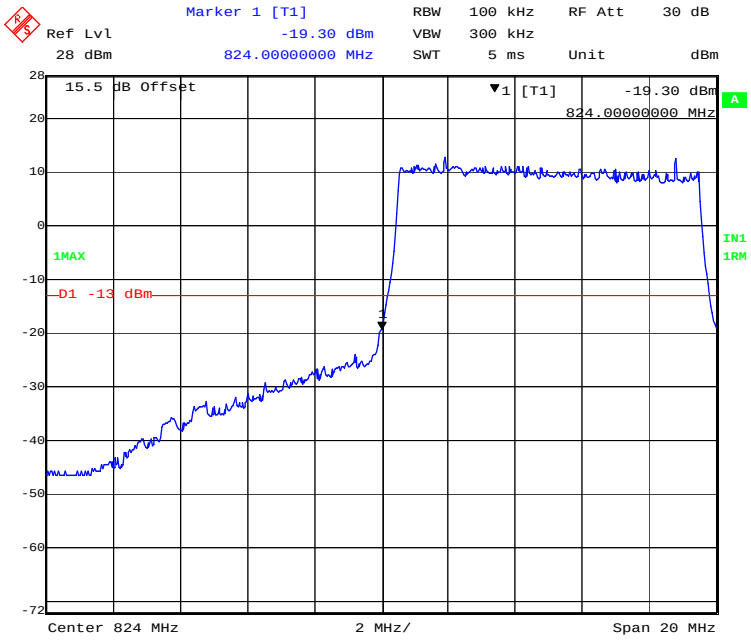


16-QAM (5 MHz, FULL RB) - Left Band Edge

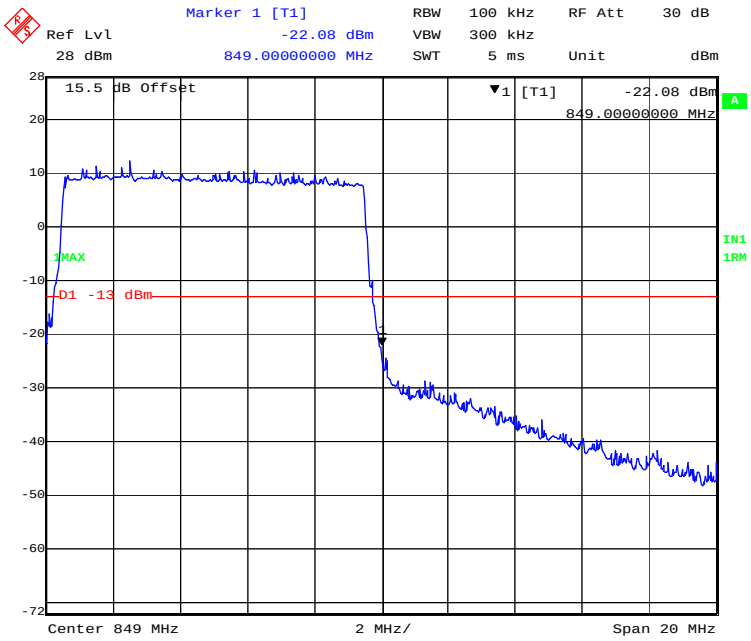


16-QAM (5 MHz, FULL RB) - Right Band Edge

16-QAM (10 MHz, FULL RB) - Left Band Edge

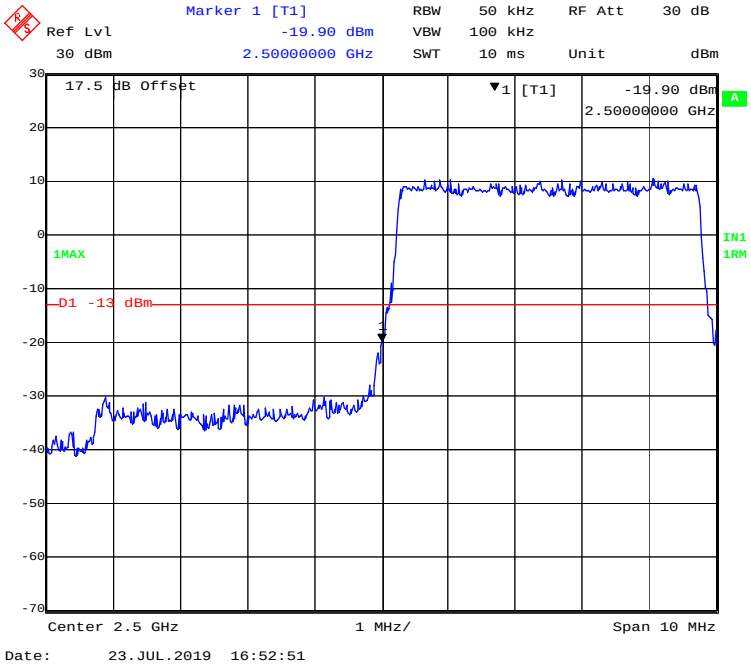


16-QAM (10 MHz, FULL RB) - Right Band Edge

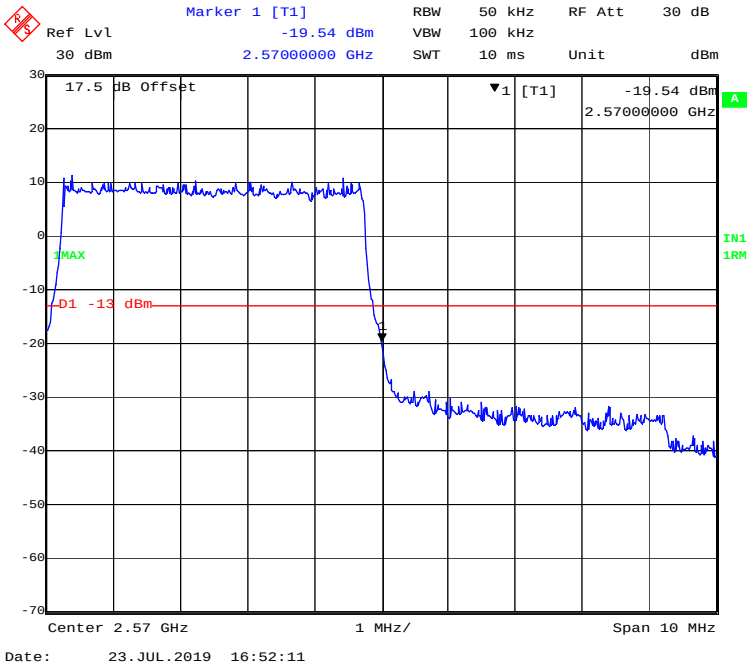


LTE Band 7:

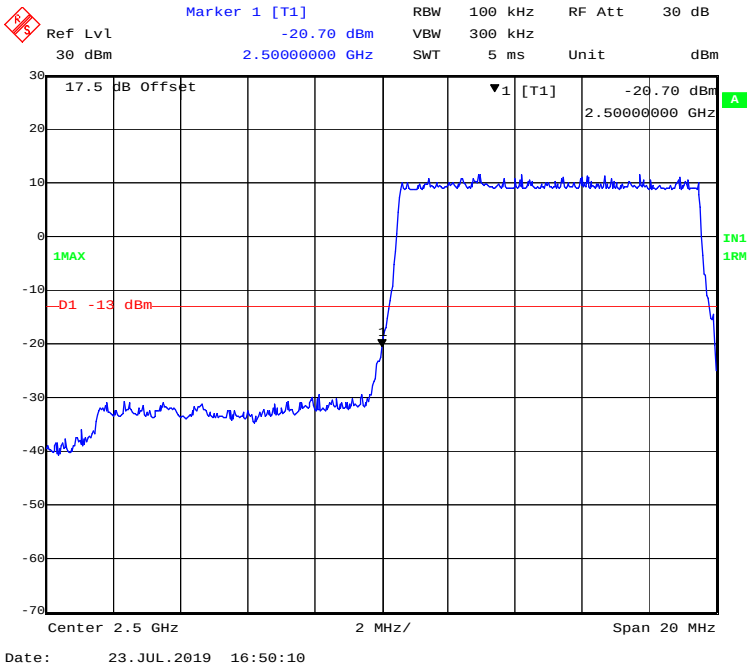
QPSK (5 MHz, FULL RB) - Left Band Edge



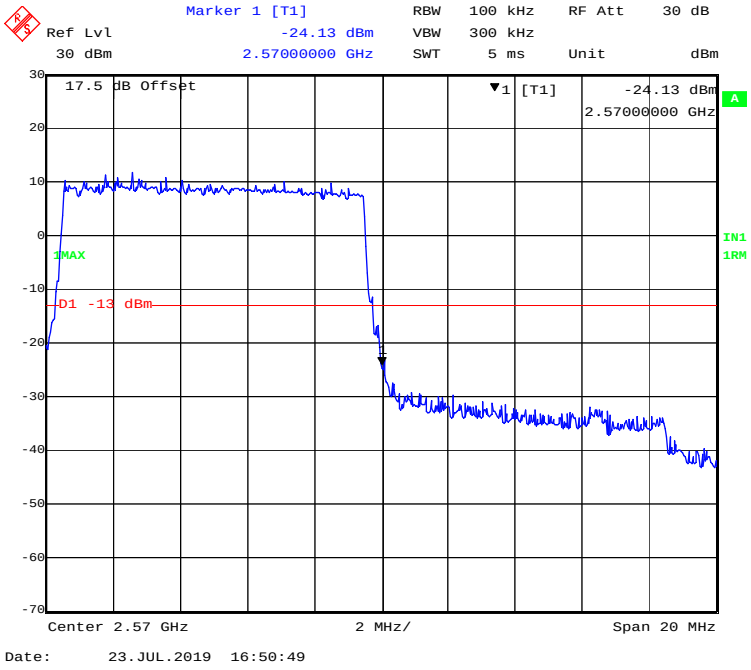
QPSK (5 MHz, FULL RB) - Right Band Edge



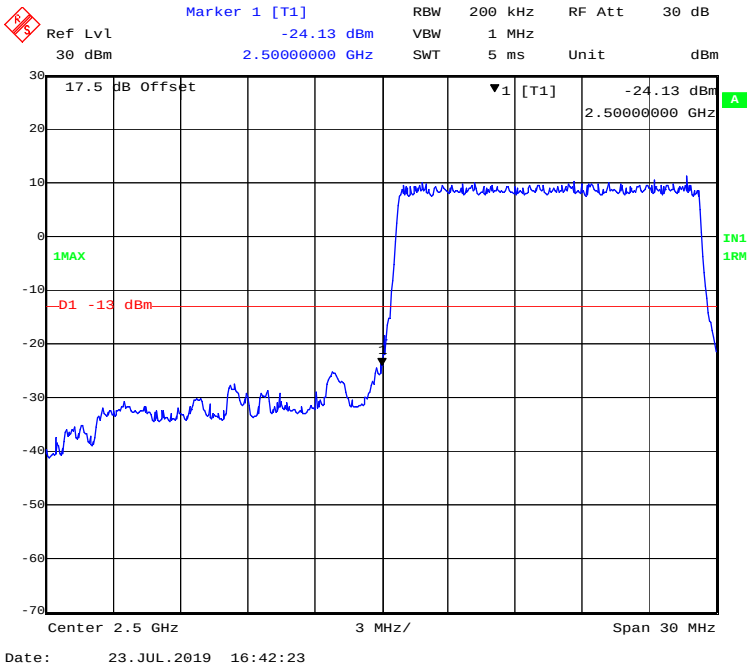
QPSK (10 MHz, FULL RB) - Left Band Edge



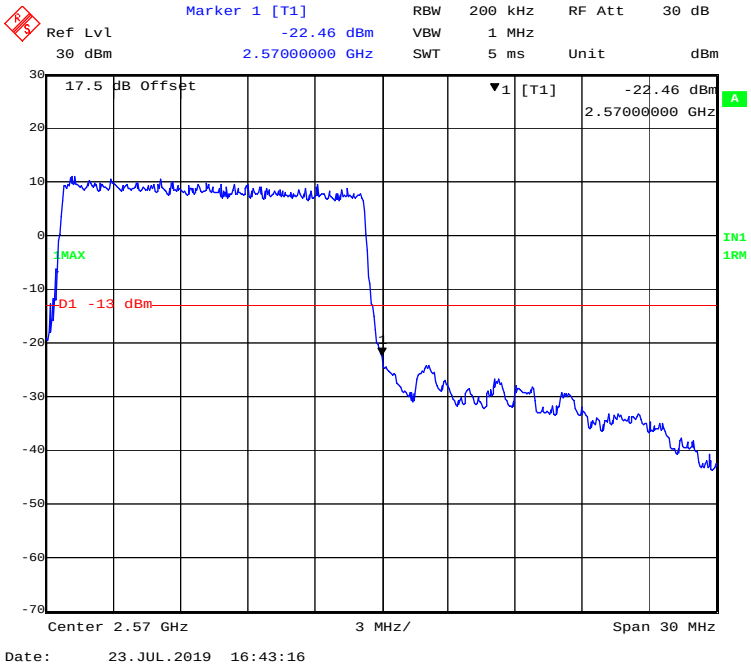
QPSK (10 MHz, FULL RB) - Right Band Edge



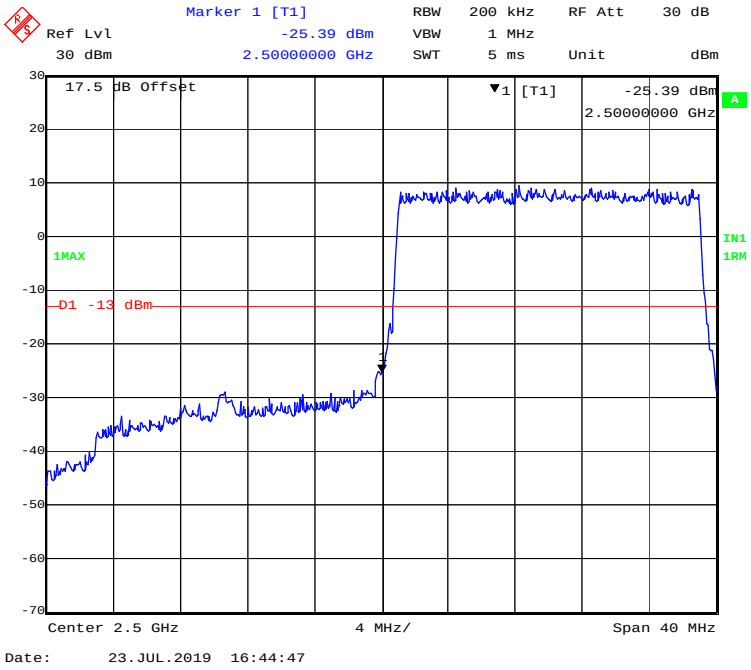
QPSK (15 MHz, FULL RB) - Left Band Edge



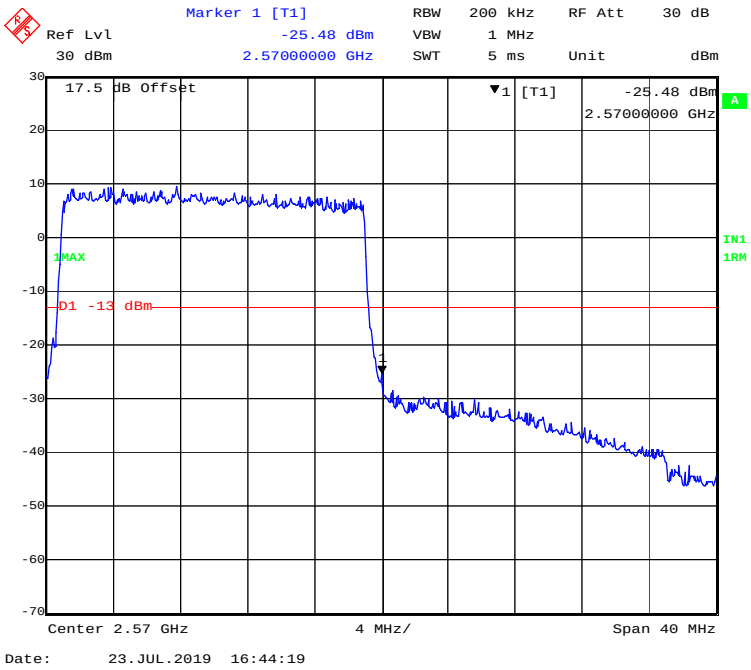
QPSK (15 MHz, FULL RB) - Right Band Edge



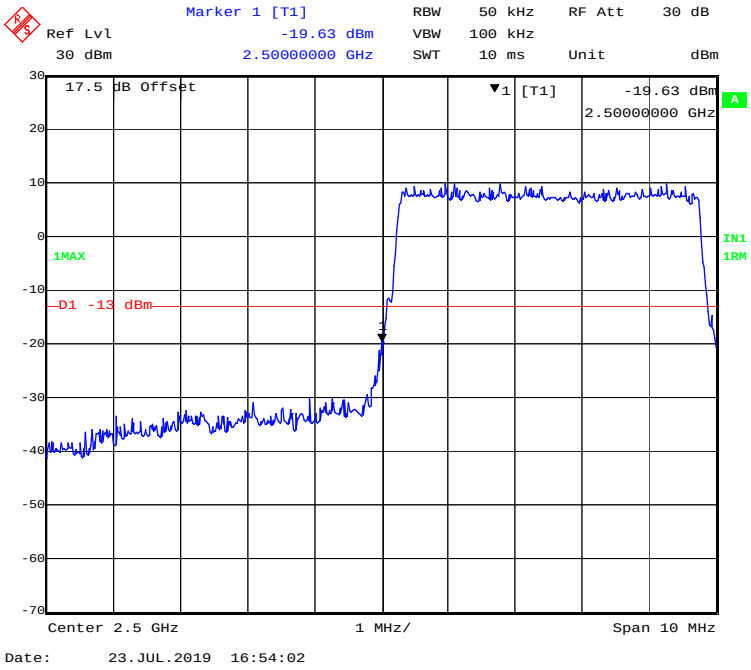
QPSK (20 MHz, FULL RB) - Left Band Edge



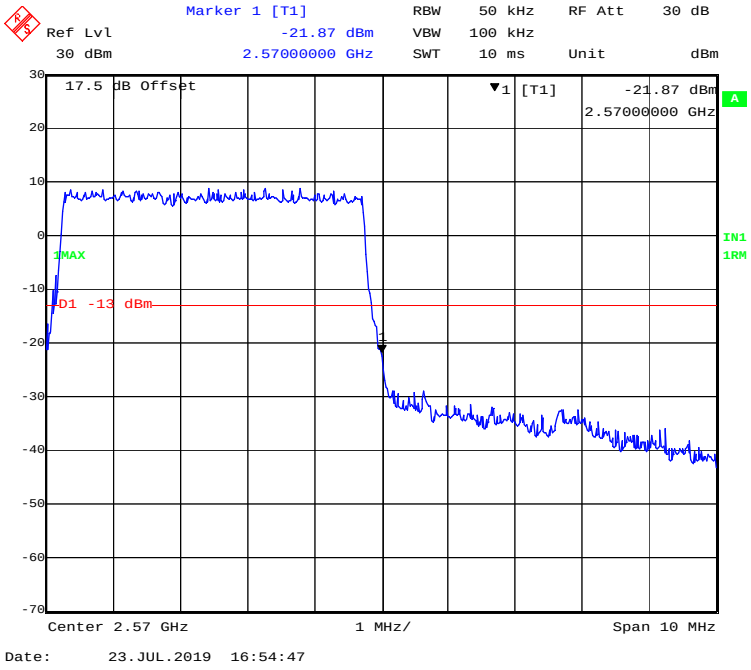
QPSK (20 MHz, FULL RB) - Right Band Edge



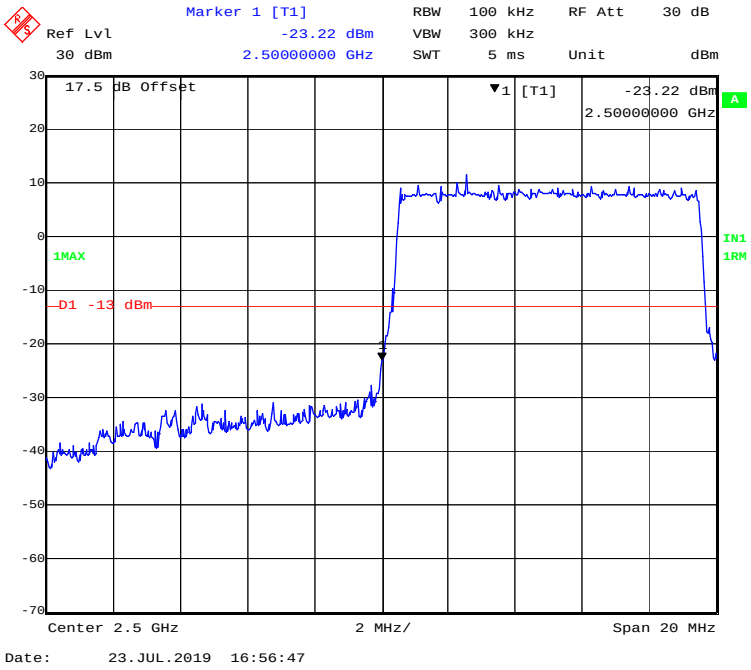
16-QAM (5 MHz, FULL RB) - Left Band Edge



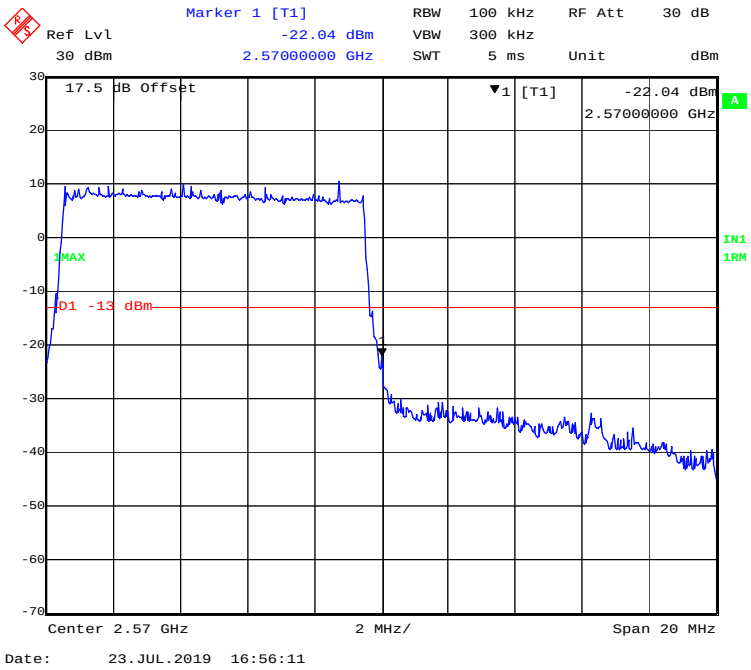
16-QAM (5 MHz, FULL RB) - Right Band Edge



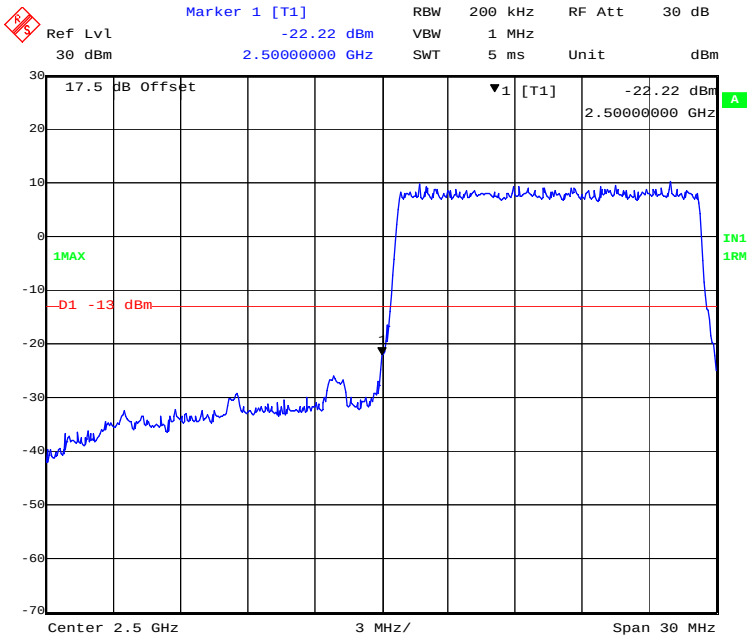
16-QAM (10 MHz, FULL RB) - Left Band Edge



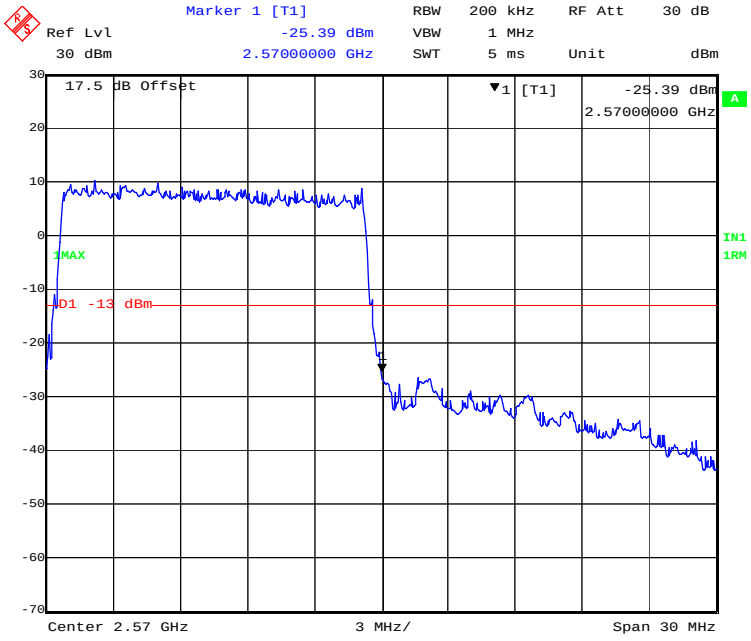
16-QAM (10 MHz, FULL RB) - Right Band Edge



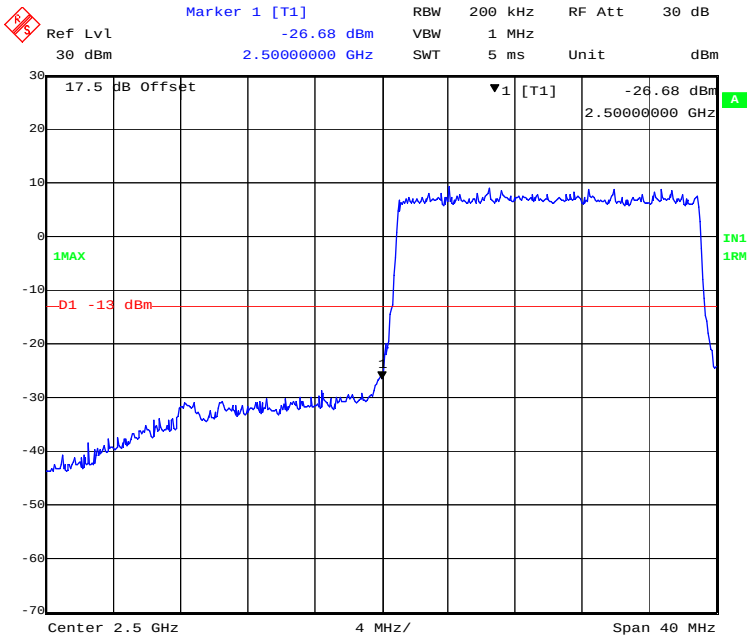
16-QAM (15 MHz, FULL RB) - Left Band Edge



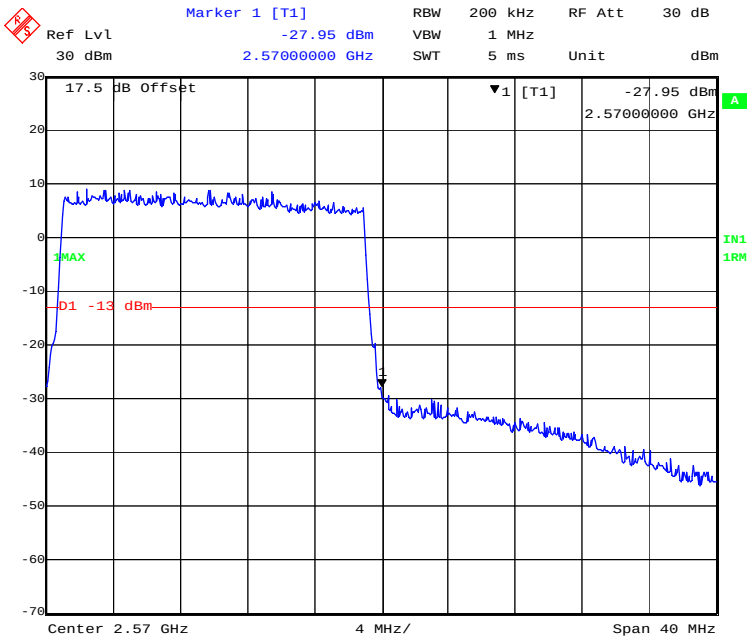
16-QAM (15 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge

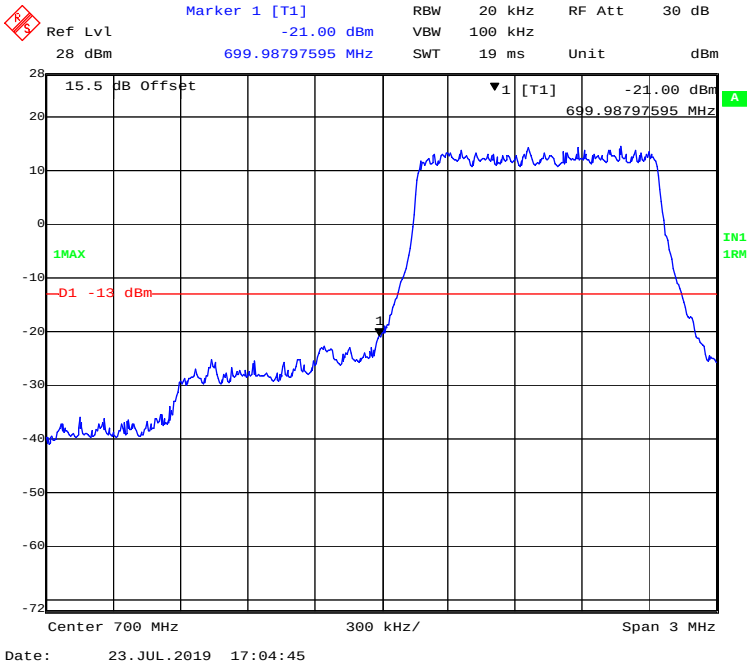


16-QAM (20 MHz, FULL RB) - Right Band Edge

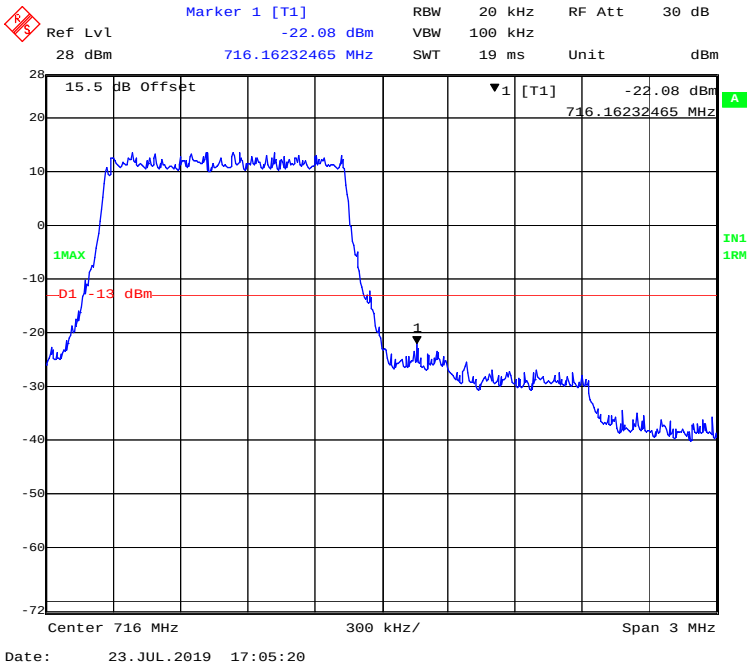


LTE Band 12:

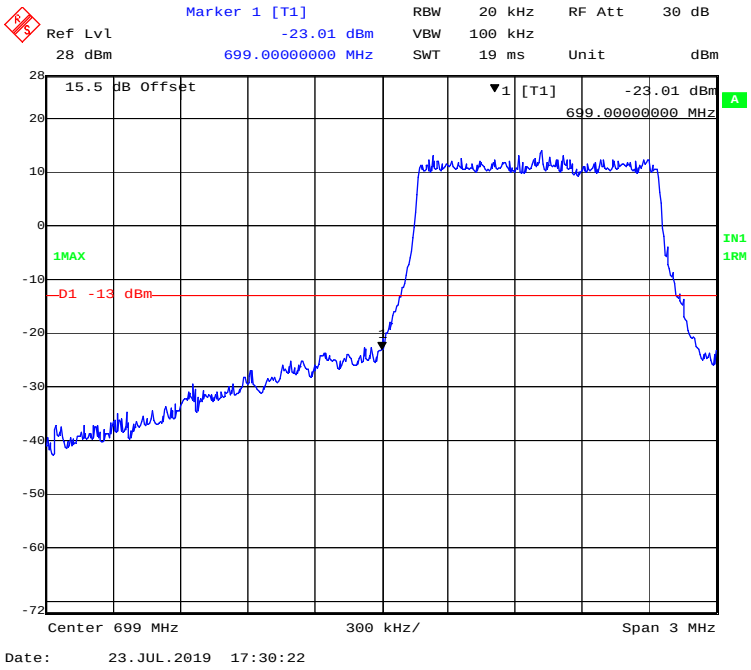
QPSK (1.4 MHz, FULL RB) - Left Band Edge



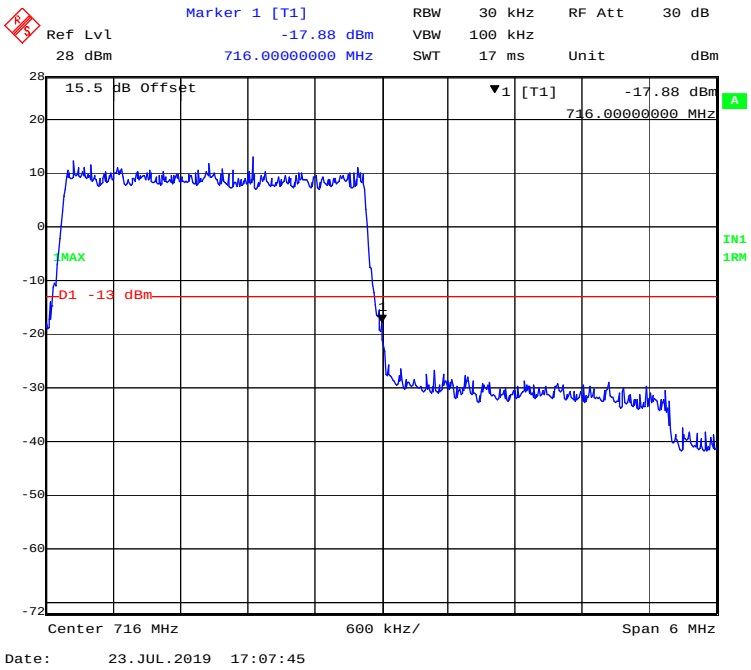
QPSK (1.4 MHz, FULL RB) - Right Band Edge



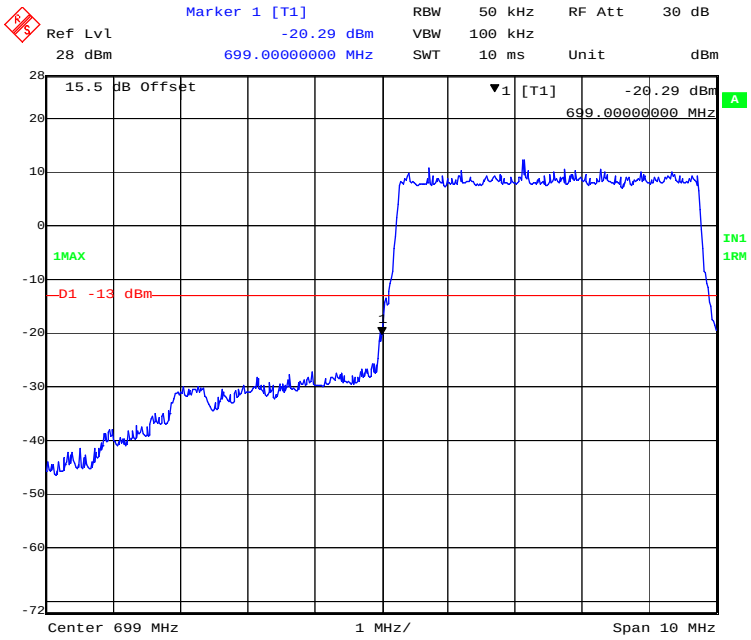
QPSK (3 MHz, FULL RB) - Left Band Edge



QPSK (3 MHz, FULL RB) - Right Band Edge



QPSK (5 MHz, FULL RB) - Left Band Edge

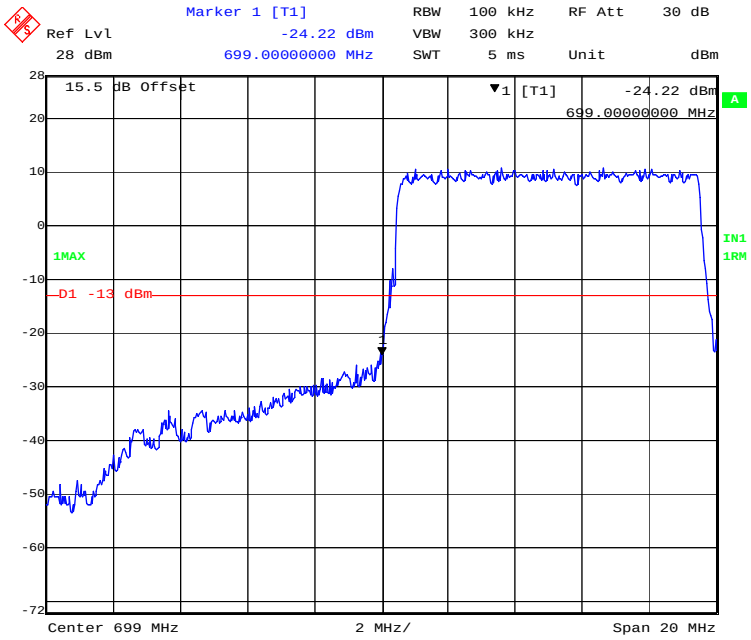


Date: 23.JUL.2019 17:31:34

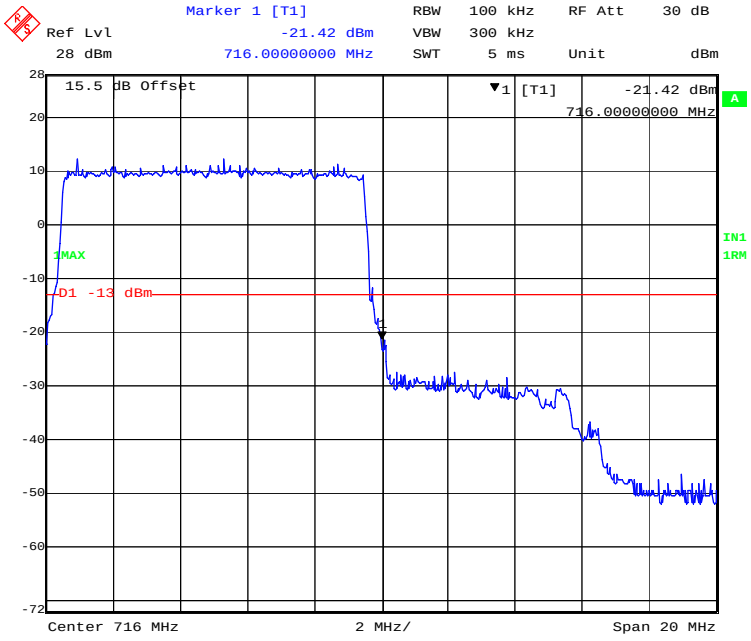
QPSK (5 MHz, FULL RB) - Right Band Edge

Date: 23.JUL.2019 17:10:09

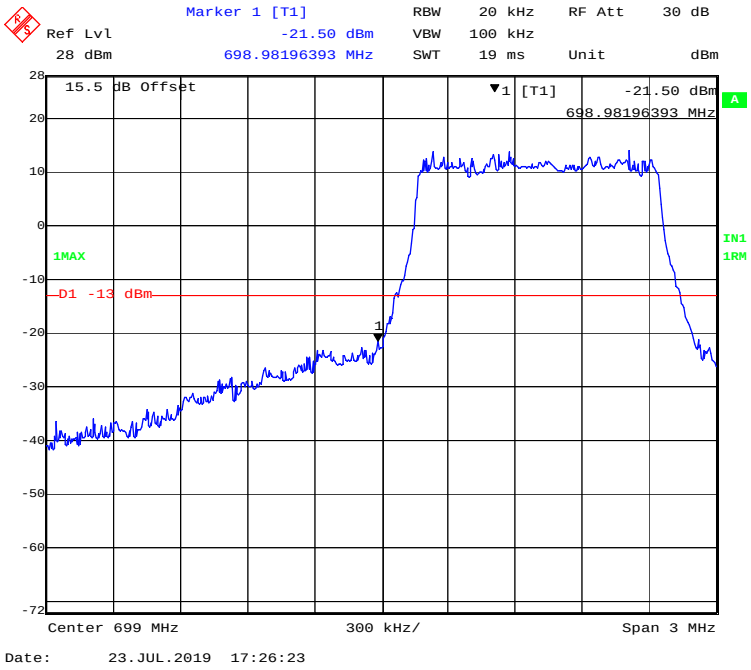
QPSK (10 MHz, FULL RB) - Left Band Edge



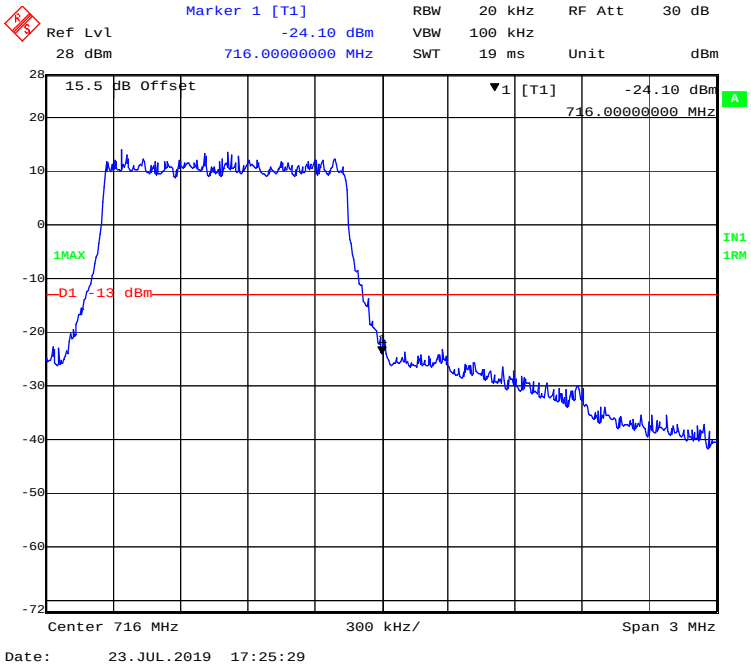
QPSK (10 MHz, FULL RB) - Right Band Edge



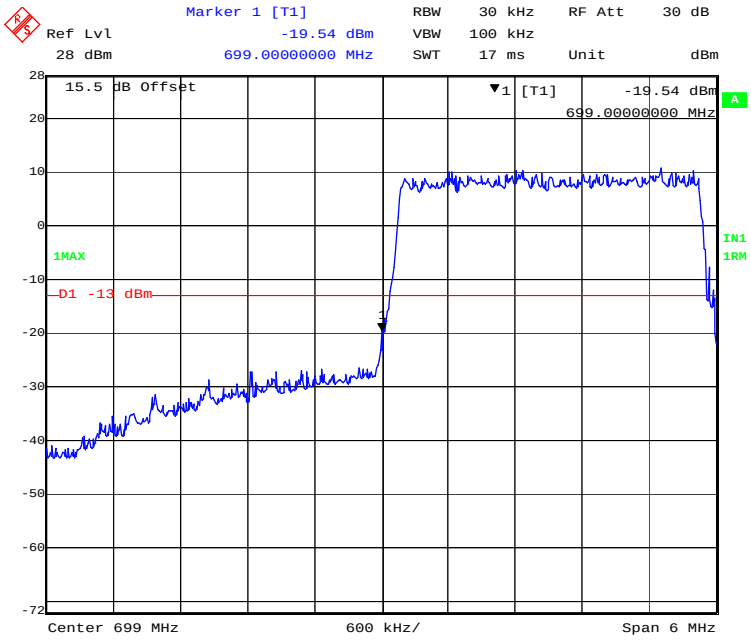
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



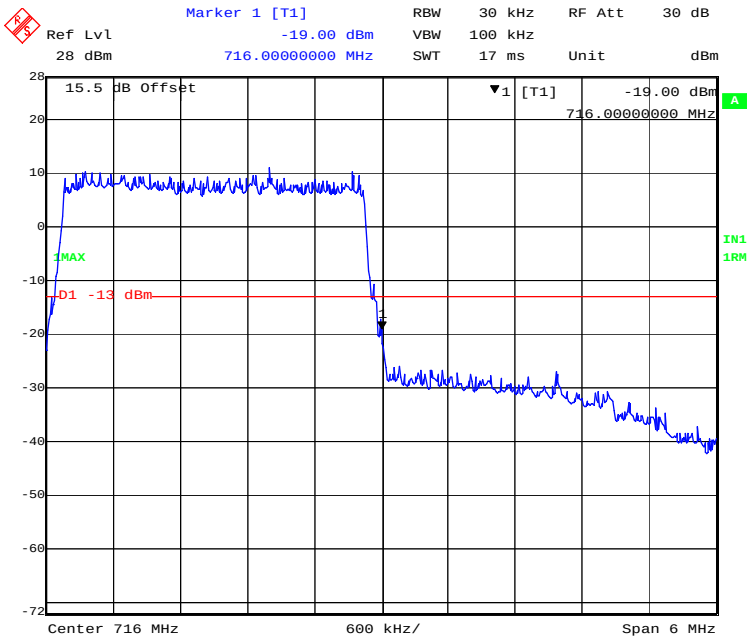
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



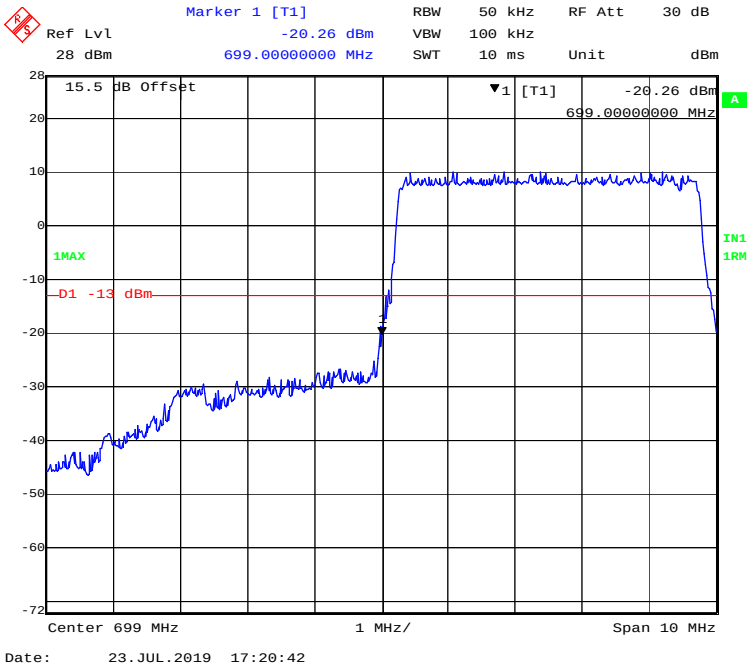
16-QAM (3 MHz, FULL RB) - Left Band Edge



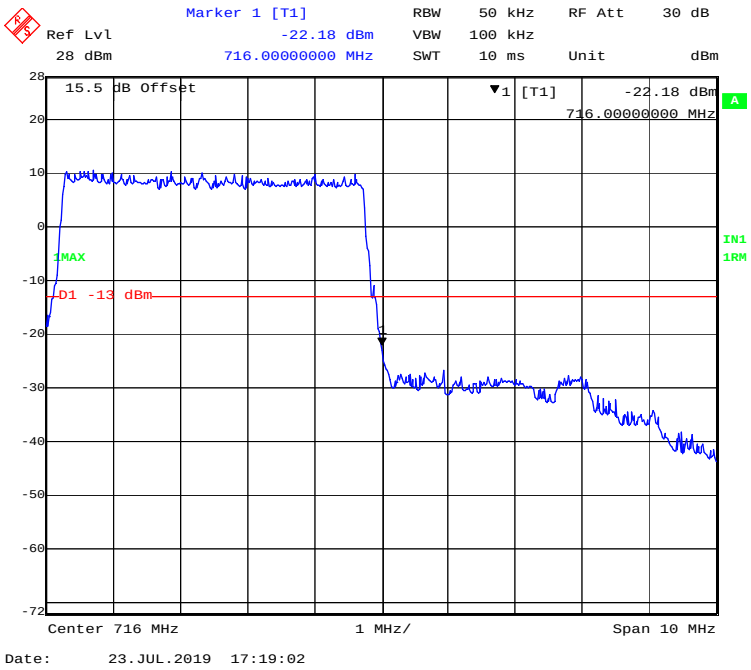
16-QAM (3 MHz, FULL RB) - Right Band Edge



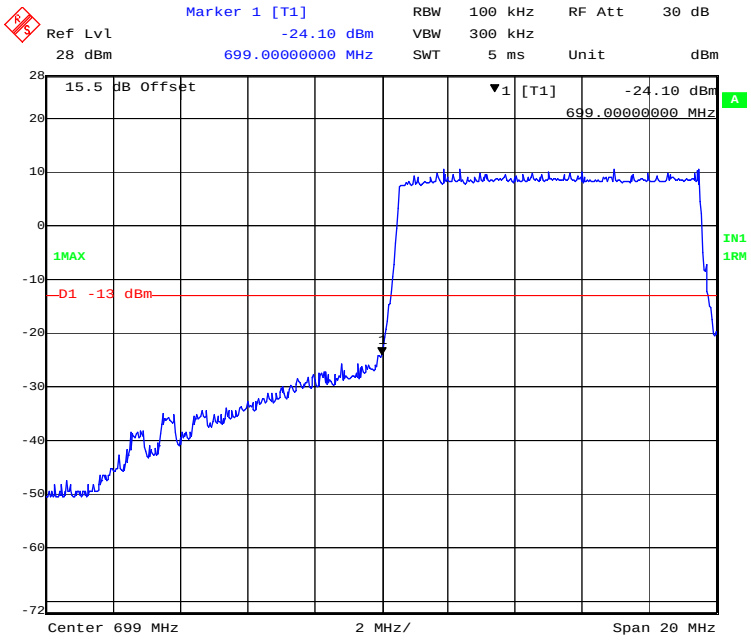
16-QAM (5 MHz, FULL RB) - Left Band Edge



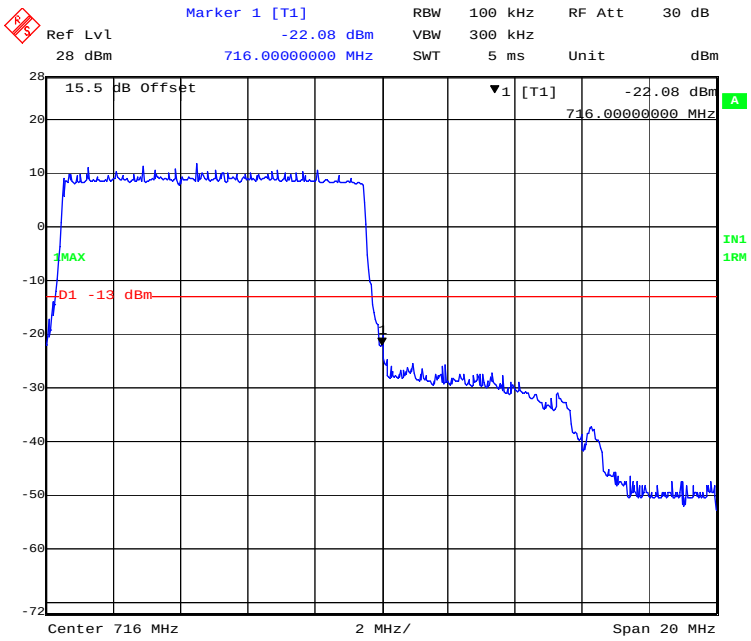
16-QAM (5 MHz, FULL RB) - Right Band Edge



16-QAM (10 MHz, FULL RB) - Left Band Edge

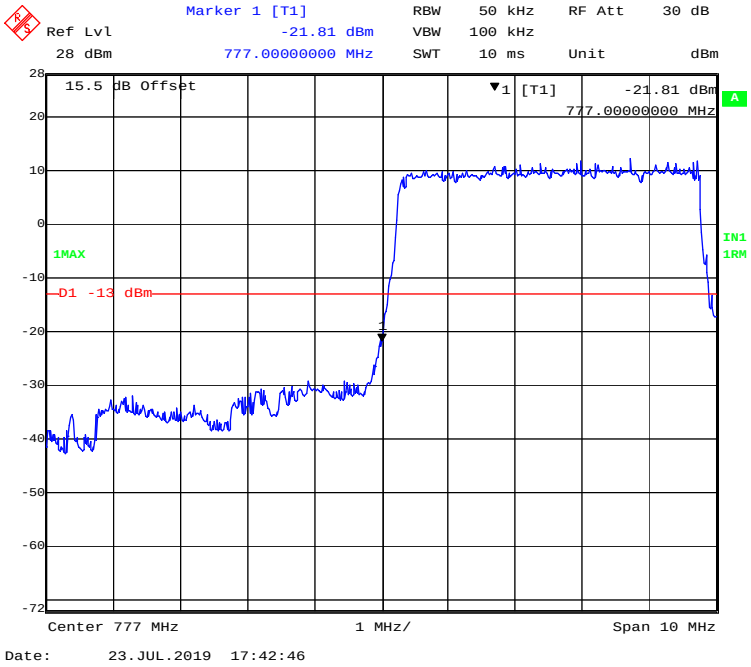


16-QAM (10 MHz, FULL RB) - Right Band Edge

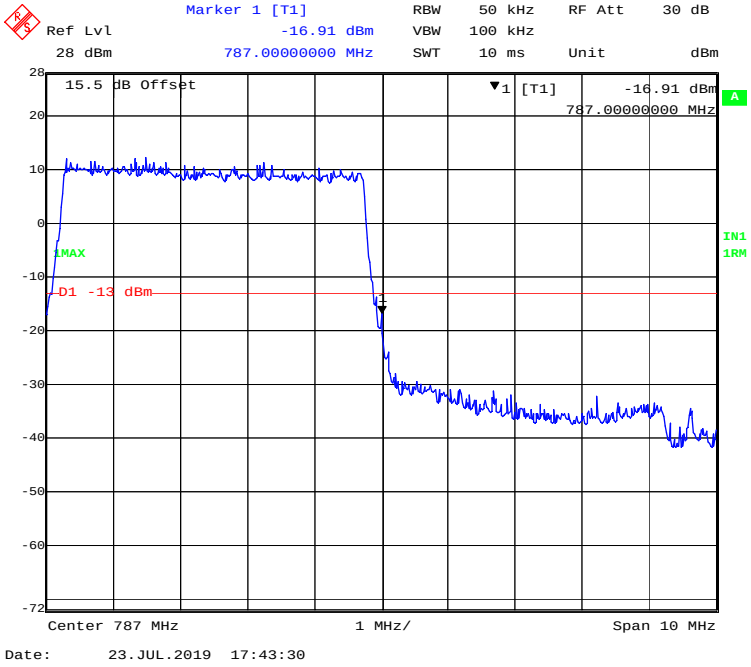


LTE Band 13:

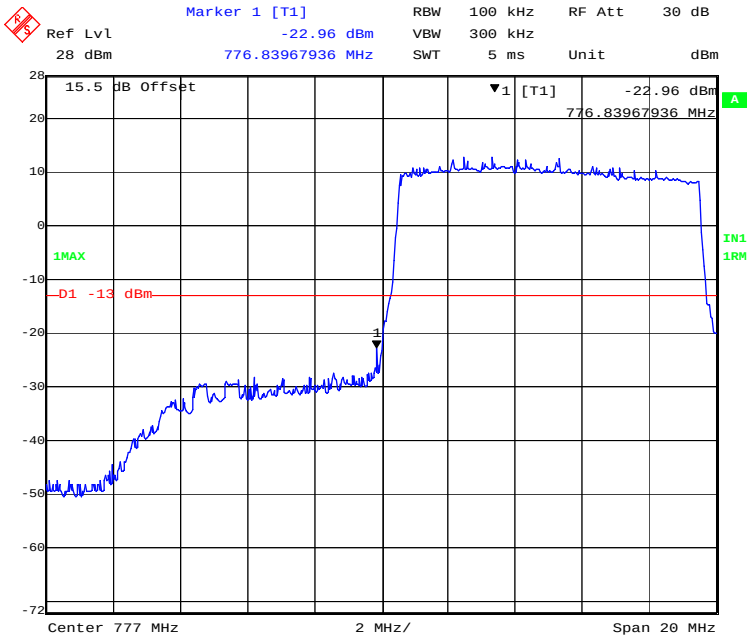
QPSK (5 MHz, FULL RB) - Left Band Edge



QPSK (5 MHz, FULL RB) - Right Band Edge

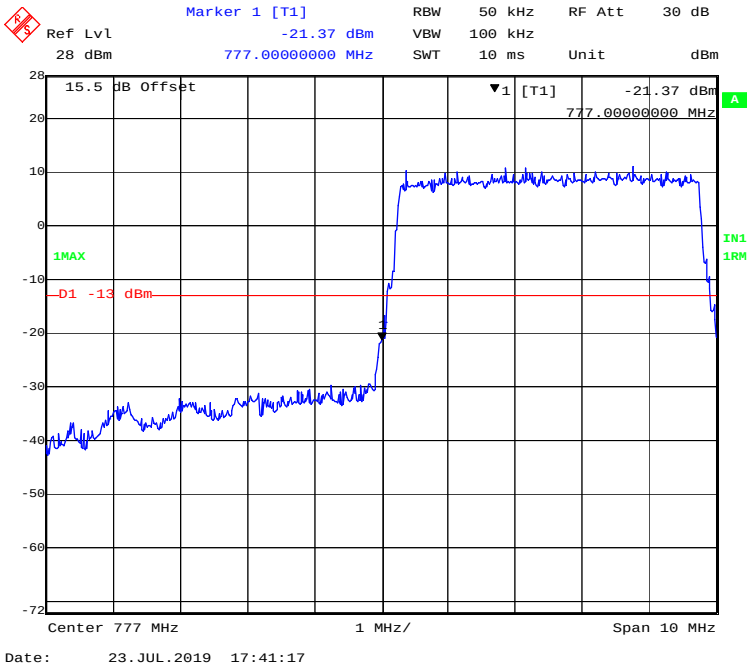


QPSK (10 MHz, FULL RB) - Left Band Edge

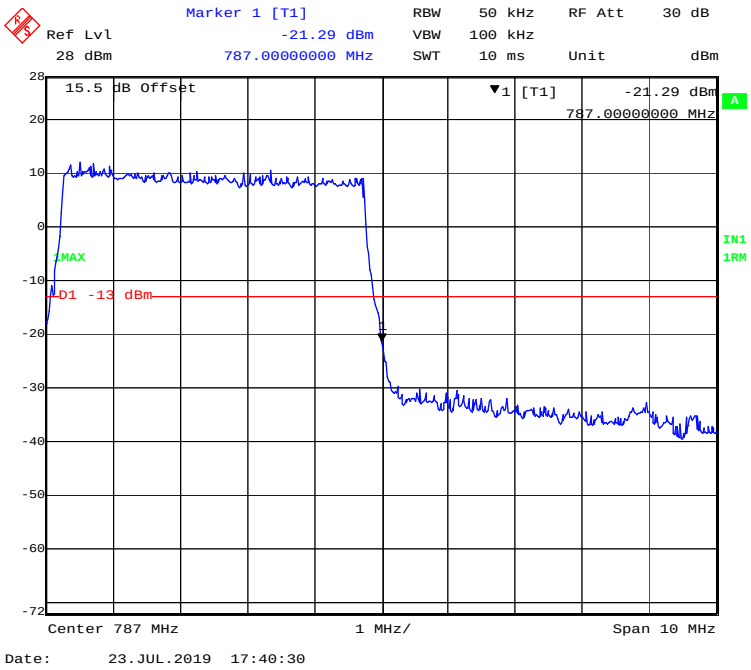


QPSK (10 MHz, FULL RB) - Right Band Edge

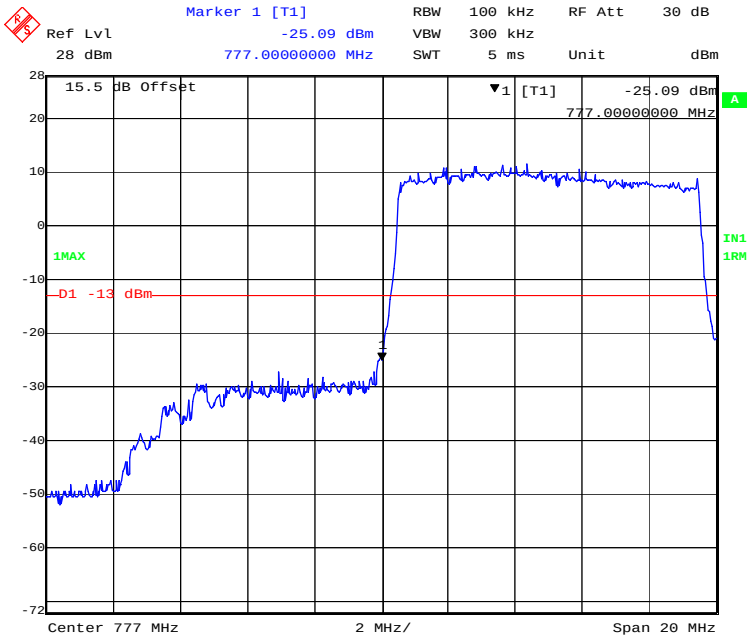
16-QAM (5 MHz, FULL RB) - Left Band Edge



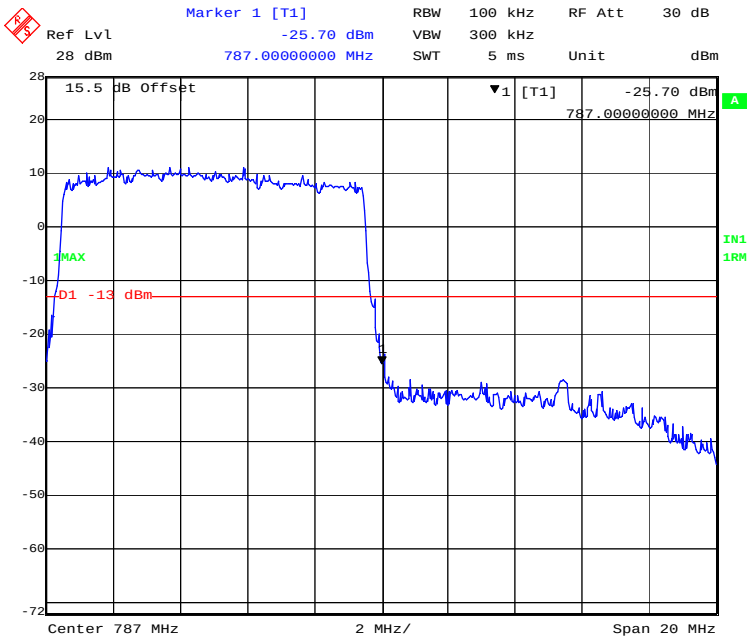
16-QAM (5 MHz, FULL RB) - Right Band Edge



16-QAM (10 MHz, FULL RB) - Left Band Edge

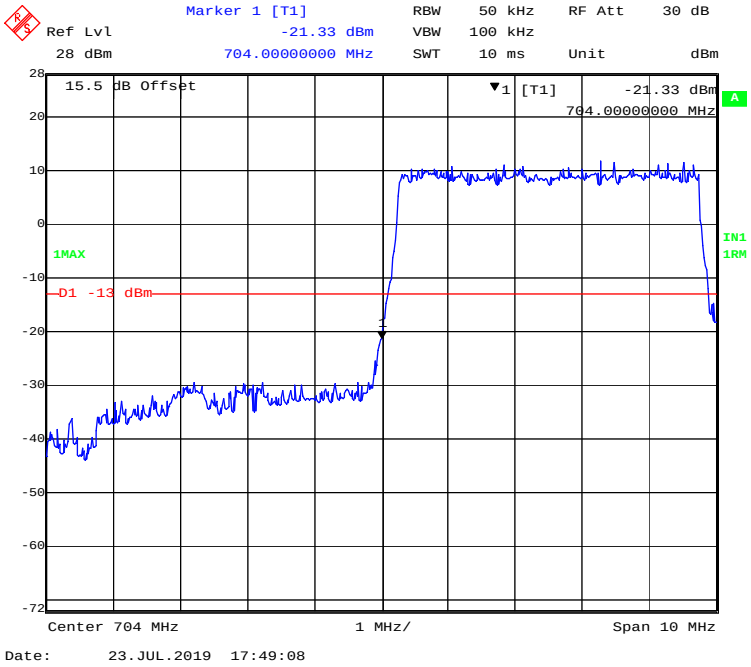


16-QAM (10 MHz, FULL RB) - Right Band Edge

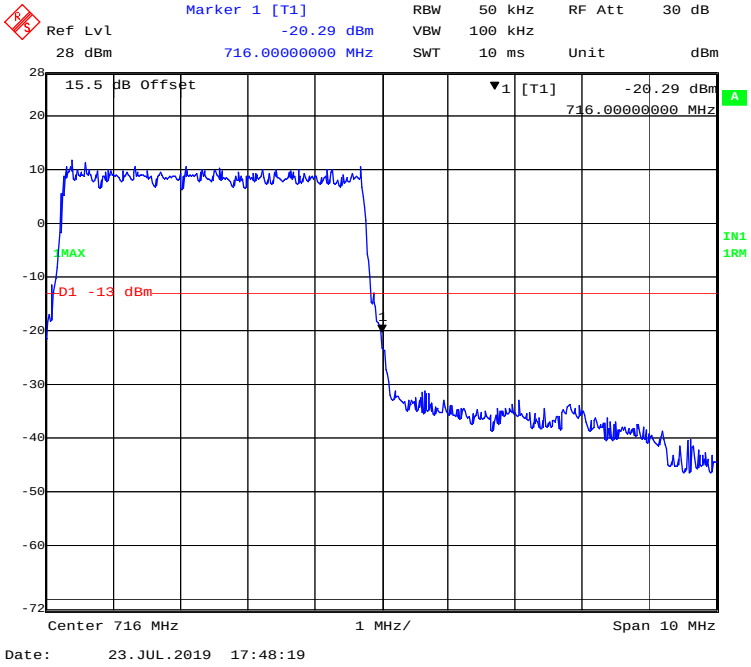


LTE Band 17:

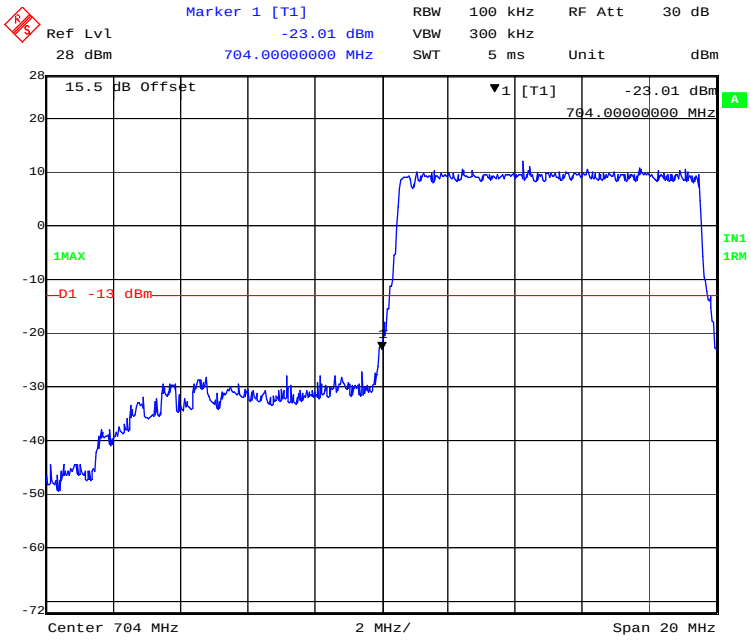
QPSK (5 MHz, FULL RB) - Left Band Edge



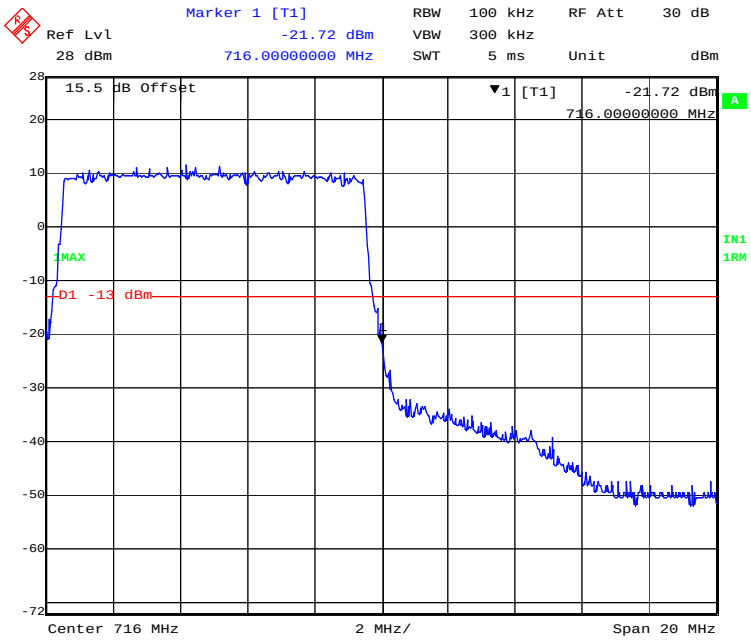
QPSK (5 MHz, FULL RB) - Right Band Edge



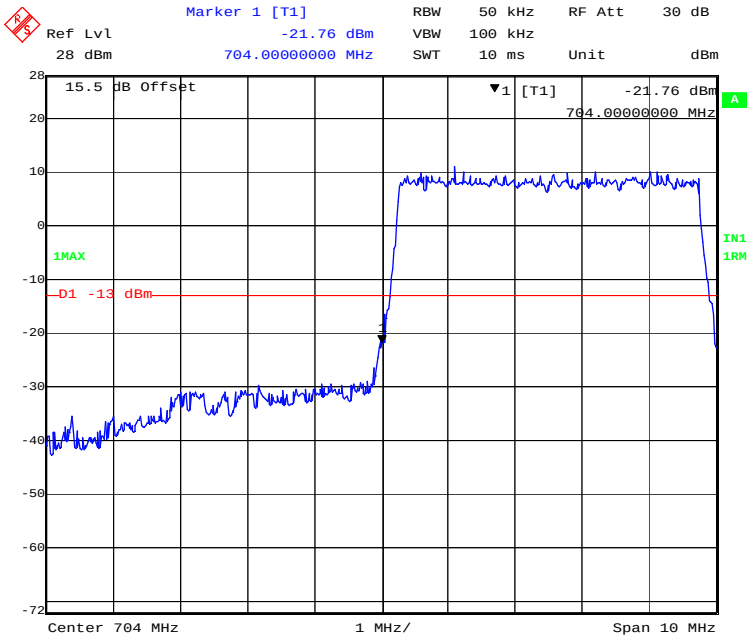
QPSK (10 MHz, FULL RB) - Left Band Edge



QPSK (10 MHz, FULL RB) - Right Band Edge

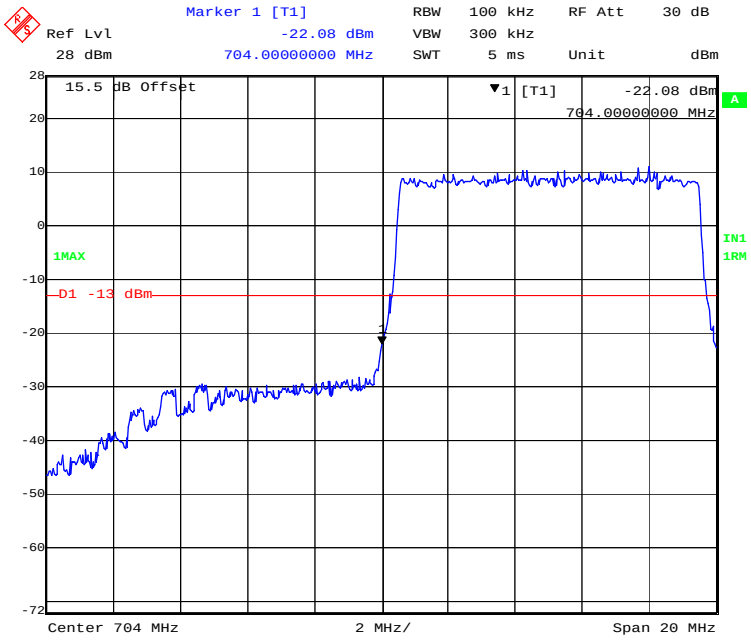


16-QAM (5 MHz, FULL RB) - Left Band Edge

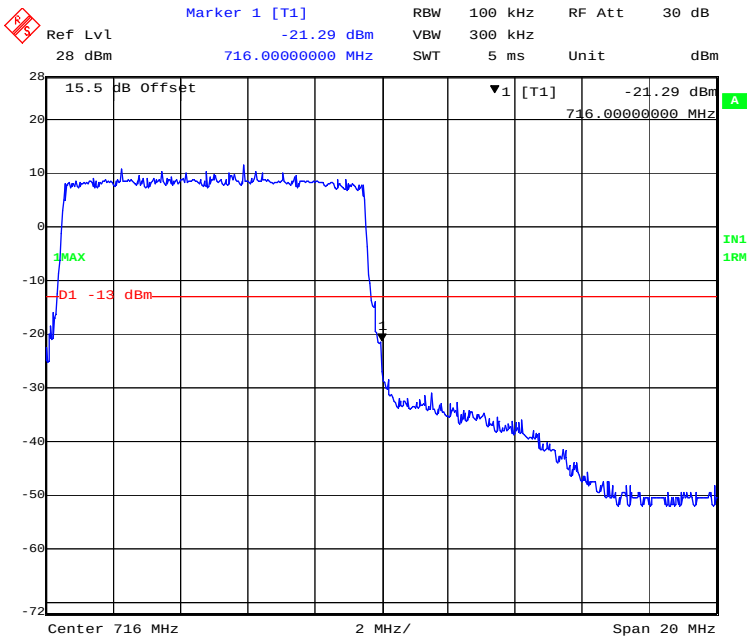


16-QAM (5 MHz, FULL RB) - Right Band Edge

16-QAM (10 MHz, FULL RB) - Left Band Edge



16-QAM (10 MHz, FULL RB) - Right Band Edge



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

Applicable Standards

FCC § 2.1055, §22.355, §24.235 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

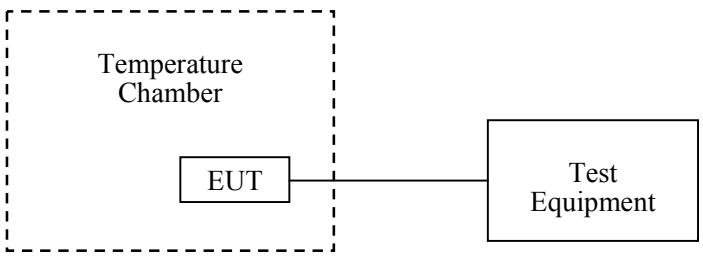
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 Max Min on 2019-08-27.

EUT operation mode: Transmitting

Test Result: Compliant.

WCDMA Band V:

Middle Channel, f_o = 836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	12	0.0143	2.5
-20		11	0.0131	2.5
-10		15	0.0179	2.5
0		9	0.0108	2.5
10		7	0.0084	2.5
20		7	0.0084	2.5
30		5	0.0060	2.5
40		4	0.0048	2.5
50		6	0.0072	2.5
25	V min.= 3.5	8	0.0096	2.5
25	V max.= 4.2	7	0.0084	2.5

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	3.8	13	0.0069	Pass
-20		9	0.0048	Pass
-10		14	0.0074	Pass
0		9	0.0048	Pass
10		6	0.0032	Pass
20		7	0.0037	Pass
30		7	0.0037	Pass
40		8	0.0043	Pass
50		5	0.0027	Pass
25	V min.= 3.5	8	0.0043	Pass
25	V max.= 4.2	7	0.0037	Pass

WCDMA Band IV:

Temperature	**Power Supplied**	**F_L**	**F_H**	**F_L Limit**	**F_H Limit**
(℃)	**(V_{DC})**	**(MHz)**	**(MHz)**	**(MHz)**	**(MHz)**
-30	3.8	1710.3263	1754.6744	1710	1755
-20		1710.3282	1754.6747	1710	1755
-10		1710.3253	1754.6783	1710	1755
0		1710.3297	1754.6785	1710	1755
10		1710.3203	1754.6752	1710	1755
20		1710.3227	1754.6741	1710	1755
30		1710.3235	1754.6780	1710	1755
40		1710.3272	1754.6702	1710	1755
50		1710.3210	1754.6796	1710	1755
25	V min.= 3.5	1710.3228	1754.6761	1710	1755
25	V max.= 4.2	1710.3267	1754.6734	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	3.8	16	0.0085	Pass
-20		11	0.0059	Pass
-10		15	0.0080	Pass
0		10	0.0053	Pass
10		12	0.0064	Pass
20		6	0.0032	Pass
30		5	0.0027	Pass
40		13	0.0069	Pass
50		8	0.0043	Pass
25	V min.= 3.5	9	0.0048	Pass
25	V max.= 4.2	11	0.0059	Pass

Middle Channel, f_o=1880.0 MHz (16-QAM)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	12	0.0064	Pass
-20		9	0.0048	Pass
-10		11	0.0059	Pass
0		10	0.0053	Pass
10		12	0.0064	Pass
20		5	0.0027	Pass
30		6	0.0032	Pass
40		3	0.0016	Pass
50		6	0.0032	Pass
25	V min.= 3.5	7	0.0037	Pass
25	V max.= 4.2	8	0.0043	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	3.8	1710.0403	1754.9473	1710	1755
-20		1710.0420	1754.9410	1710	1755
-10		1710.0438	1754.9481	1710	1755
0		1710.0499	1754.9430	1710	1755
10		1710.0439	1754.9497	1710	1755
20		1710.0402	1754.9472	1710	1755
30		1710.0401	1754.9403	1710	1755
40		1710.0474	1754.9483	1710	1755
50		1710.0418	1754.9460	1710	1755
25	V min.= 3.5	1710.0485	1754.9455	1710	1755
25	V max.= 4.2	1710.0451	1754.9461	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	3.8	1710.0418	1754.9457	1710	1755
-20		1710.0444	1754.9489	1710	1755
-10		1710.0476	1754.9493	1710	1755
0		1710.0436	1754.9446	1710	1755
10		1710.0403	1754.9461	1710	1755
20		1710.0423	1754.9493	1710	1755
30		1710.0454	1754.9466	1710	1755
40		1710.0462	1754.9422	1710	1755
50		1710.0424	1754.9488	1710	1755
25	V min.= 3.5	1710.0434	1754.9428	1710	1755
25	V max.= 4.2	1710.0499	1754.9410	1710	1755

LTE Band 5:

Middle Channel, f_o =836.5 MHz (QPSK)				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	13	0.0155	2.5
-20		11	0.0132	2.5
-10		9	0.0108	2.5
0		12	0.0143	2.5
10		11	0.0132	2.5
20		6	0.0072	2.5
30		5	0.0060	2.5
40		9	0.0108	2.5
50		8	0.0096	2.5
25	V min.= 3.5	10	0.0120	2.5
25	V max.= 4.2	9	0.0108	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	3.8	9	0.0108	2.5
-20		12	0.0143	2.5
-10		11	0.0132	2.5
0		9	0.0108	2.5
10		8	0.0096	2.5
20		13	0.0155	2.5
30		11	0.0132	2.5
40		7	0.0084	2.5
50		6	0.0072	2.5
25	V min.= 3.5	10	0.0120	2.5
25	V max.= 4.2	12	0.0143	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	3.8	2500.0463	2569.9493	2500	2570
-20		2500.0492	2569.9481	2500	2570
-10		2500.0423	2569.9424	2500	2570
0		2500.0406	2569.9410	2500	2570
10		2500.0497	2569.9483	2500	2570
20		2500.0448	2569.9407	2500	2570
30		2500.0439	2569.9409	2500	2570
40		2500.0405	2569.9486	2500	2570
50		2500.0473	2569.9439	2500	2570
25	V min.= 3.5	2500.0455	2569.9427	2500	2570
25	V max.= 4.2	2500.0489	2569.9416	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	3.8	2500.0437	2569.9413	2500	2570
-20		2500.0472	2569.9409	2500	2570
-10		2500.0409	2569.9439	2500	2570
0		2500.0432	2569.9419	2500	2570
10		2500.0430	2569.9403	2500	2570
20		2500.0458	2569.9454	2500	2570
30		2500.0452	2569.9450	2500	2570
40		2500.0473	2569.9465	2500	2570
50		2500.0428	2569.9441	2500	2570
25	V min.= 3.5	2500.0463	2569.9487	2500	2570
25	V max.= 4.2	2500.0434	2569.9441	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	3.8	699.0158	715.9752	699	716
-20		699.0157	715.9816	699	716
-10		699.0113	715.9743	699	716
0		699.0277	715.9714	699	716
10		699.0101	715.9768	699	716
20		699.0110	715.9782	699	716
30		699.0276	715.9786	699	716
40		699.0140	715.9776	699	716
50		699.0175	715.9734	699	716
25	V min.= 3.5	699.0117	715.9871	699	716
25	V max.= 4.2	699.0160	715.9777	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	3.8	699.0180	715.9748	699	716
-20		699.0167	715.9882	699	716
-10		699.0210	715.9779	699	716
0		699.0102	715.9883	699	716
10		699.0109	715.9800	699	716
20		699.0161	715.9743	699	716
30		699.0140	715.9811	699	716
40		699.0258	715.9712	699	716
50		699.0255	715.9782	699	716
25	V min.= 3.5	699.0117	715.9718	699	716
25	V max.= 4.2	699.0118	715.9735	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	3.8	777.0204	786.9755	777	787
-20		777.0204	786.9768	777	787
-10		777.0213	786.9828	777	787
0		777.0218	786.9746	777	787
10		777.0162	786.9798	777	787
20		777.0221	786.9758	777	787
30		777.0293	786.9753	777	787
40		777.0164	786.9701	777	787
50		777.0270	786.9786	777	787
25	V min.= 3.5	777.0231	786.9892	777	787
25	V max.= 4.2	777.0251	786.9703	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	3.8	777.0272	786.9755	777	787
-20		777.0291	786.9800	777	787
-10		777.0123	786.9731	777	787
0		777.0281	786.9752	777	787
10		777.0206	786.9778	777	787
20		777.0298	786.9724	777	787
30		777.0242	786.9702	777	787
40		777.0195	786.9782	777	787
50		777.0217	786.9713	777	787
25	V min.= 3.5	777.0292	786.9720	777	787
25	V max.= 4.2	777.0264	786.9766	777	787

LTE Band 17:

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	3.8	704.0188	715.9885	704	716
-20		704.0154	715.9710	704	716
-10		704.0297	715.9706	704	716
0		704.0175	715.9705	704	716
10		704.0148	715.9799	704	716
20		704.0183	715.9880	704	716
30		704.0119	715.9782	704	716
40		704.0175	715.9776	704	716
50		704.0245	715.9732	704	716
25	V min.= 3.5	704.0110	715.9705	704	716
25	V max.= 4.2	704.0119	715.9768	704	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	3.8	704.0121	715.9798	704	716
-20		704.0317	715.9895	704	716
-10		704.0180	715.9801	704	716
0		704.0160	715.9890	704	716
10		704.0115	715.9882	704	716
20		704.0256	715.9803	704	716
30		704.0162	715.9737	704	716
40		704.0160	715.9884	704	716
50		704.0114	715.9804	704	716
25	V min.= 3.5	704.0259	715.9832	704	716
25	V max.= 4.2	704.0121	715.9885	704	716

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