



FCC PART 27
FCC PART 90
FCC PART 22H, PART 24E
MEASUREMENT AND TEST REPORT

For

CloudMinds Technology Inc.

4500 Great America Parkway, Suite 230 Santa Clara, California, 95054 United States

FCC ID: 2ASQT-MR-5S

Report Type: Original Report	Product Type: Raman Spectrometer
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Report Number: RKSA190116001-00B	
Report Date: 2019-08-29	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	CloudMinds Technology Inc.
Tested Model	MR-5S
Product Type	Raman Spectrometer
Dimension	159 mm(L)*78.9 mm(W)*27 mm(H)
Power Supply	DC 3.6V-6.5V or 6.5V-9V or 9V-12V from adapter and DC 3.8V from battery

Adapter information:

Model: NKA02U

Input: AC 100-240V, 50/60Hz 0.6A

Output: DC 3.6V-6.5V, 3A or 6.5V-9V, 2A or 9V-12V, 1.5A

**All measurement and test data in this report was gathered from production sample serial number: 20190116001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-01-16)*

Objective

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

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS, Part 15.247 DTS, Part 15.225 DXX and Part 15.407 NII submittals with FCC ID: 2ASQT-MR-5S

Test Methodology

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

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Part 27 – Miscellaneous wireless communications services

Part 90 – Private Land Mobile Radio Service

Applicable Standards: TIA/EIA 603-D.

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

Measurement Uncertainty

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

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)
GSM/GPRS/EGPRS 850		Low	128	824.2
		Middle	190	836.6
		High	251	848.8
GSM/GPRS/EGPRS 1900		Low	512	1850.2
		Middle	661	1880.0
		High	810	1909.8
WCDMA Band II		Low	9262	1852.4
		Middle	9400	1880.0
		High	9538	1907.6
WCDMA Band 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
LTE Band 5	1.4M	Low	20050	1720.0
		Middle	20175	1732.5
		High	20300	1745.0
	3M	Low	20407	824.7
		Middle	20525	836.5
		High	20643	848.3
	5M	Low	20415	825.5
		Middle	20525	836.5
		High	20635	847.5
	10M	Low	20425	826.5
		Middle	20525	836.5
		High	20625	846.5
	15M	Low	20450	829.0
		Middle	20525	836.5
		High	20600	844.0

Mode		Channel		Frequency (MHz)
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
LTE Band 25	1.4M	Low	26047	1850.7
		Middle	26365	1882.5
		High	26683	1914.3
	3M	Low	26055	1851.5
		Middle	26683	1882.5
		High	26675	1913.5
	5M	Low	26065	1852.5
		Middle	26683	1882.5
		High	26665	1912.5
	10M	Low	26090	1855.0
		Middle	26683	1882.5
		High	26640	1910.0
	15M	Low	26115	1857.5
		Middle	26683	1882.5
		High	26615	1907.5
	20M	Low	26140	1860.0
		Middle	26683	1882.5
		High	26590	1905.0

Mode		Channel		Frequency (MHz)
LTE Band 26	1.4M	Low	26697	814.7
		Middle	26915	831.5
		High	27033	848.3
	3M	Low	26705	815.5
		Middle	26915	831.5
		High	27025	847.5
	5M	Low	26715	816.5
		Middle	26915	831.5
		High	27015	846.5
	10M	Low	26740	819.0
		Middle	26915	831.5
		High	26990	844.0
	15M	Low	26765	821.5
		Middle	26915	831.5
		High	26965	841.5
LTE Band 38	5M	Low	37775	2572.5
		Middle	38000	2595.0
		High	38225	2617.5
	10M	Low	37800	2575.0
		Middle	38000	2595.0
		High	38200	2615.0
	15M	Low	37825	2577.5
		Middle	38000	2595.0
		High	38175	2612.5
	20M	Low	37850	2580.0
		Middle	38000	2595.0
		High	38150	2610.0
LTE Band 41	5M	Low	40265	2547.5
		Middle	40740	2600.0
		High	41215	2652.5
	10M	Low	40290	2550.0
		Middle	40740	2600.0
		High	41190	2650.0
	15M	Low	40315	2552.5
		Middle	40740	2600.0
		High	41165	2647.5
	20M	Low	40340	2555.0
		Middle	40740	2600.0
		High	41140	2645.0

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

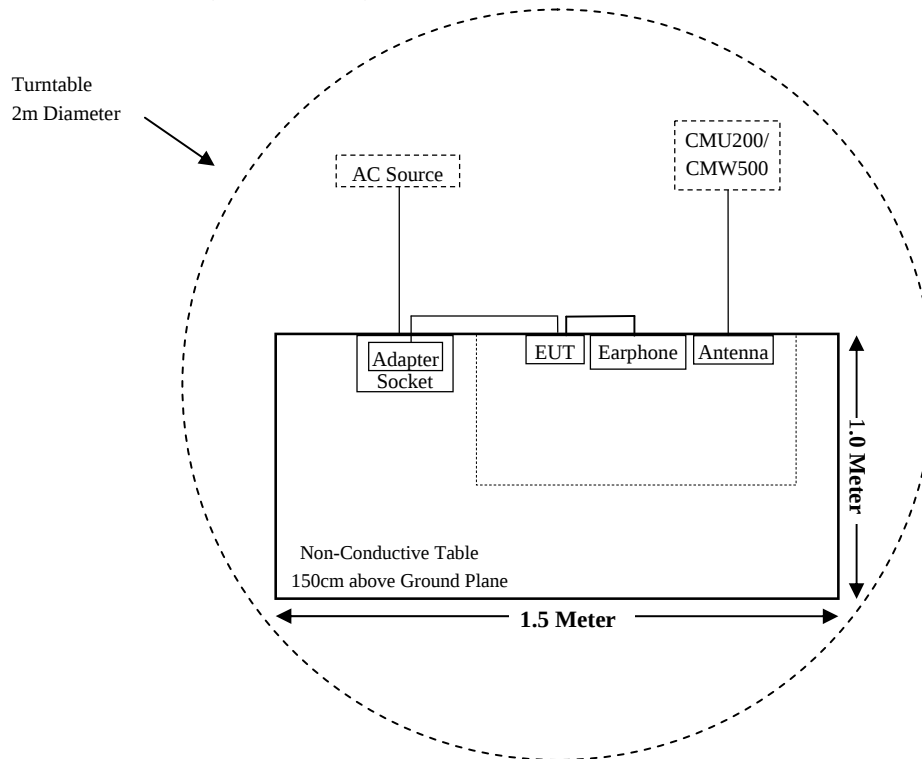
Manufacturer	Description	Model	Serial Number
Waylens Inc.	Antenna	/	/
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605
R & S	Wideband Radio Communication Tester	CMW500	104478
/	Earphone	/	/

External I/O Cable

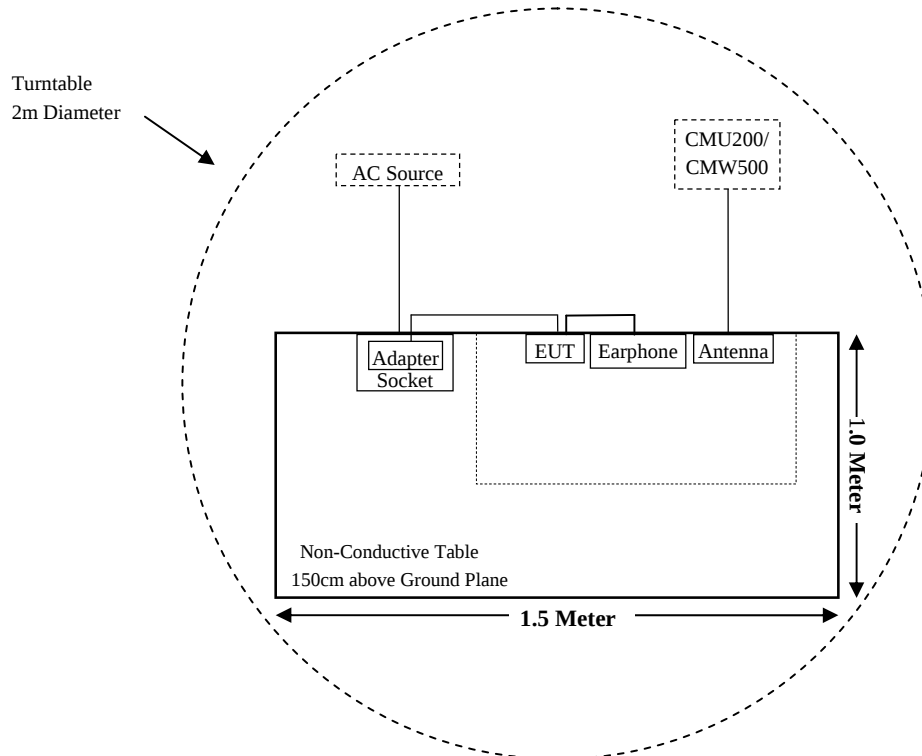
Cable Description	Length (m)	From Port	To
Power Cable	0.8	EUT	Adapter

Block Diagram of Test Setup

For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307(b)(1)& §2.1093	RF Exposure Information	Compliant
§2.1046; § 22.913 (a);§ 24.232 (c); § 27.50 (a) (3) (d);§27.50(h) (2); § 90.635(b)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53; § 90.209	Occupied Bandwidth	Compliant
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53; § 90.691	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h) (m); § 90.691	Spurious Radiated Emissions	Compliant
§ 22.917 (a); § 24.238 (a); §27.53 (h) (m); § 90.691	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235; §27.54; § 90.213	Frequency stability	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber 1#)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2018-11-12	2019-11-11
HP	Signal Generator	HP 8341B	2624A00116	2018-08-29	2019-08-28
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sunol Sciences	Bilog antenna	JB3	A060217	2017-08-04	2020-08-03
Sonoma Instrunent	Pre-amplifier	310N	171205	2018-08-15	2019-08-14
Sonoma Instrunent	Pre-amplifier	310N	171205	2019-08-15	2020-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2018-08-15	2019-08-14
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
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-12	2019-11-11
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
R & S	Wideband Radio Communication Tester	CMW500	104478	2019-07-21	2020-07-20
Radiated Emission Test (Chamber 2#)					
HP	Signal Generator	HP 8341B	2624A00116	2018-08-29	2019-08-28
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2018-08-27	2019-08-26
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2019-08-27	2020-08-26
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	2019-12-12
A.H.Systems, inc	Amplifier	2641-1	491	2019-02-20	2020-02-19
EM Electronics Corporation	Amplifier	EM18G40G	060726	2018-03-22	2019-03-21
EM Electronics Corporation	Amplifier	EM18G40G	060726	2019-03-22	2020-03-21
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
MICRO-COAX	Coaxial Cable	Cable-11	011	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2018-08-15	2019-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2019-08-15	2020-08-14
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-12	2019-11-11
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
R & S	Wideband Radio Communication Tester	CMW500	104478	2019-07-21	2020-07-20
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-09-21	2019-09-20
Rohde & Schwarz	Signal Analyzer	FSV40	101116	2018-07-23	2019-07-22
Rohde & Schwarz	Signal Analyzer	FSV40	101116	2019-07-23	2020-07-22
Narda	Attenuator	6dB	006	2019-01-10	2020-01-09
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2018-11-12	2019-11-11
R & S	Wideband Radio Communication Tester	CMW500	104478	2018-07-21	2019-07-20
R & S	Wideband Radio Communication Tester	CMW500	104478	2019-07-21	2020-07-20
Mini-Circuits	Power splitter	ZFRSC-14-S+	SF019411452	2018-11-10	2019-11-09
BACL	Temperature & Humidity Chamber	BTH-150	30023	2018-10-10	2019-10-09
EAST	Regulated DC Power Supply	MCH-303D-II	14070562	2018-10-10	2019-10-09
CloudMinds	RF Cable	CloudMinds 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 §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1307,§2.1093.

According to KDB447498 D01 General RF Exposure Guidance v06:

For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Measurement Result

For BLE&BT3.0 mode:

Mode	Frequency Range (MHz)	Tune-up Conducted Power		Calculated Distance (mm)	Calculated Value	Threshold (1-g)	SAR Test Exclusion
		(dBm)	(mW)				
BT3.0	2402-2480	8.20	6.61	5.00	2.10	3.00	Yes
BLE	2402-2480	0.50	1.12	5.00	0.35	3.00	Yes

Note: 1.The tune-up output power was declared by the manufacturer.

So the stand-alone SAR evaluation is not necessary

For Wi-Fi&GSM&WCDMA<E mode:

Please refer to the SAR report: RKSA190116001-20

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E, Part 27 , Part 90 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC §2.1046; § 22.913 (a); § 24.232 (c); §27.50 (a) (3) (d); §27.50(h) (2) ; §90.635 (b) - RF OUTPUT POWER**Applicable Standards**

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

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

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

According to §27.50(a) (3) , the maximum EIRP must not exceed 0.25Watts (23.98mW) for 2350-2360MHz.

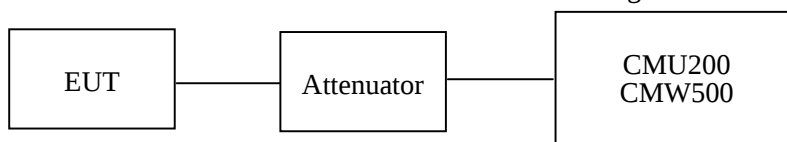
According to §27.50(h) (2), Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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

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

Test Procedure**Conducted method:**

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

**Radiated Output Power:**

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

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

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

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

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

e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:

$$\text{ERP (dBm)} = \text{LVL (dBm)} + \text{LOSS (dB)}$$

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:

$$\text{EIRP (dBm)} = \text{ERP (dBm)} + 2.15 \text{ (dB)}$$

Test Data

Environmental Conditions

Temperature:	23.2 °C
Relative Humidity:	51 %
ATM Pressure:	101.3 kPa

The testing was performed by Max Min on 2019-08-23.

Conducted Power:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.98	38.45
	190	836.6	32.72	38.45
	251	848.8	32.55	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.87	32.33	31.07	30.85	38.45
	190	836.6	32.65	32.14	30.94	30.69	38.45
	251	848.8	32.41	32.05	30.79	30.37	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	27.03	25.92	25.56	25.27	38.45
	190	836.6	26.95	25.75	25.49	25.13	38.45
	251	848.8	26.74	25.62	25.21	24.96	38.45

WCDMA Band V

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	Rel 99	1	22.64	22.57	22.54
		HSDPA	1	21.42	21.28	21.28
			2	21.29	21.26	21.30
			3	21.37	21.32	21.21
			4	21.33	21.33	21.28
		HSUPA	1	21.43	21.33	21.19
			2	21.40	21.25	21.22
			3	21.32	21.26	21.16
			4	21.25	21.29	21.33
			5	21.28	21.21	21.21
		HSPA+	1	21.34	21.35	21.26

PCS 1900 Band

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.03	33
	661	1880.0	29.17	33
	810	1909.8	29.31	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.97	28.67	27.44	27.16	33
	661	1880.0	29.02	28.86	27.59	27.18	33
	810	1909.8	29.24	29.05	27.78	27.43	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.46	24.01	23.77	23.51	33
	661	1880.0	25.31	23.97	23.64	23.36	33
	810	1909.8	25.13	23.76	23.50	23.24	33

WCDMA Band II

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	Rel 99	1	21.96	21.77	21.58
		HSDPA	1	20.51	20.38	20.26
			2	20.58	20.40	20.27
			3	20.58	20.37	20.19
			4	20.51	20.39	20.31
		HSUPA	1	20.49	20.45	20.20
			2	20.46	20.41	20.20
			3	20.59	20.44	20.33
			4	20.51	20.39	20.30
			5	20.64	20.55	20.38
		HSPA+	1	20.52	20.54	20.24

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	21.29	21.46	21.49
		1#3	21.63	21.52	21.09
		1#5	21.45	21.32	21.72
		3#0	21.55	21.32	21.28
		3#1	21.51	21.47	21.36
		3#3	21.27	21.40	21.67
		6#0	21.36	21.56	21.40
	16-QAM	1#0	21.61	21.63	21.32
		1#3	21.74	21.41	21.86
		1#5	21.63	21.85	21.28
		3#0	21.12	21.40	21.47
		3#1	21.64	21.45	21.34
		3#3	21.34	21.33	21.58
		6#0	21.20	21.32	21.29
3M	QPSK	1#0	21.38	21.59	21.25
		1#7	21.67	21.56	21.65
		1#14	21.38	21.48	21.51
		8#0	21.78	21.07	21.47
		8#4	21.22	21.50	21.28
		8#7	21.79	21.46	21.32
		15#0	21.42	21.25	21.57
	16-QAM	1#0	21.20	21.33	21.39
		1#7	21.56	21.55	21.85
		1#14	21.50	21.72	21.54
		8#0	21.43	21.87	21.42
		8#4	21.94	21.18	21.77
		8#7	21.38	21.74	21.77
		15#0	21.55	21.77	21.39

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.28	21.92	21.41
		1#12	21.80	21.57	21.46
		1#24	21.59	21.61	21.22
		12#0	21.59	21.67	21.48
		12#6	21.48	21.21	21.93
		12#11	21.38	21.27	21.77
		25#0	21.26	21.47	21.41
	16-QAM	1#0	21.62	21.53	21.27
		1#12	21.83	21.52	21.50
		1#24	21.12	21.38	21.41
		12#0	21.35	21.26	21.61
		12#6	21.55	21.61	21.40
		12#11	21.58	21.14	21.25
		25#0	21.45	21.34	21.83
10M	QPSK	1#0	21.19	21.66	21.45
		1#24	21.44	21.40	21.47
		1#49	21.38	21.68	21.70
		25#0	21.13	21.46	21.56
		25#12	21.42	21.63	21.37
		25#24	21.48	21.26	21.43
		50#0	21.21	21.63	21.70
	16-QAM	1#0	21.67	21.65	21.48
		1#24	21.48	21.52	21.25
		1#49	21.66	21.44	21.75
		25#0	21.72	21.35	21.67
		25#12	21.32	21.59	21.42
		25#24	21.17	21.28	21.68
		50#0	21.31	21.41	21.63

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.68	21.43	21.50
		1#37	21.76	21.19	21.20
		1#74	21.39	21.52	21.39
		36#0	21.91	21.55	21.51
		36#17	21.31	21.56	21.96
		36#35	21.47	21.28	21.31
		75#0	21.64	21.13	21.28
	16-QAM	1#0	21.23	21.63	21.41
		1#37	21.57	21.80	21.55
		1#74	21.31	21.39	21.55
		36#0	21.32	21.38	21.45
		36#17	21.77	21.51	21.30
		36#35	21.53	21.48	21.58
		75#0	21.79	21.64	21.62
20M	QPSK	1#0	21.04	21.55	21.48
		1#49	21.50	21.54	21.48
		1#99	21.75	21.57	21.21
		50#0	21.35	21.51	21.63
		50#24	21.53	21.63	21.84
		50#49	21.36	21.71	21.25
		100#0	21.24	21.76	21.91
	16-QAM	1#0	21.87	21.49	21.39
		1#49	21.28	21.44	21.47
		1#99	21.82	21.50	21.64
		50#0	21.45	21.35	21.52
		50#24	21.53	21.65	21.26
		50#49	21.86	21.31	21.54
		100#0	21.64	21.37	21.85

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	20.92	21.12	21.39
		1#3	20.75	20.95	21.25
		1#5	21.04	20.73	21.02
		3#0	20.67	21.14	20.82
		3#1	21.25	20.74	21.00
		3#3	20.75	20.96	21.01
		6#0	21.28	21.00	20.72
	16-QAM	1#0	21.03	21.05	20.55
		1#3	21.00	21.11	20.76
		1#5	20.56	21.19	21.08
		3#0	21.25	20.90	21.01
		3#1	20.72	20.71	21.32
		3#3	21.17	20.62	21.31
		6#0	20.96	21.16	20.99
3M	QPSK	1#0	21.01	20.81	20.98
		1#7	21.06	20.83	21.11
		1#14	21.11	21.35	21.04
		8#0	21.13	20.60	20.97
		8#4	21.19	21.10	21.24
		8#7	20.75	21.24	21.28
		15#0	21.02	21.05	20.68
	16-QAM	1#0	20.91	21.34	20.97
		1#7	21.42	21.16	20.85
		1#14	20.93	21.10	21.03
		8#0	20.99	21.06	21.10
		8#4	20.95	21.11	21.17
		8#7	20.97	21.03	20.96
		15#0	20.81	20.88	20.78

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	20.83	21.04	20.99
		1#12	20.98	21.40	21.20
		1#24	21.16	20.91	21.05
		12#0	21.10	20.69	21.14
		12#6	21.31	21.08	20.78
		12#11	20.73	20.94	21.19
		25#0	20.87	21.13	21.33
	16-QAM	1#0	20.75	20.88	20.95
		1#12	21.20	20.97	21.25
		1#24	21.20	21.19	21.00
		12#0	20.95	21.11	20.64
		12#6	21.09	20.64	20.98
		12#11	20.98	20.99	20.73
		25#0	20.99	21.15	21.08
10M	QPSK	1#0	20.90	20.96	20.97
		1#24	20.81	20.86	21.04
		1#49	20.83	21.21	20.99
		25#0	20.90	21.01	21.22
		25#12	20.77	21.00	20.57
		25#24	20.98	20.95	21.09
		50#0	20.60	20.73	21.03
	16-QAM	1#0	21.04	20.98	21.09
		1#24	20.91	20.95	21.09
		1#49	21.12	21.09	20.94
		25#0	20.99	20.52	20.77
		25#12	20.62	21.08	21.29
		25#24	20.98	21.28	20.76
		50#0	20.70	21.22	20.96

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	20.67	21.16	21.44
		1#37	20.83	20.92	21.01
		1#74	20.79	21.21	21.29
		36#0	20.59	20.52	21.08
		36#17	20.93	21.24	21.02
		36#35	21.31	20.57	20.56
		75#0	20.73	20.72	21.00
	16-QAM	1#0	21.17	20.88	20.92
		1#37	20.81	20.97	21.16
		1#74	21.15	21.28	21.05
		36#0	20.82	20.90	20.99
		36#17	20.62	21.07	21.18
		36#35	21.14	20.81	21.35
		75#0	20.71	20.68	20.97
20M	QPSK	1#0	20.65	20.64	20.95
		1#49	21.12	21.17	21.19
		1#99	21.10	21.23	20.82
		50#0	20.61	21.12	20.90
		50#24	20.99	21.19	20.88
		50#49	20.82	21.03	21.05
		100#0	20.87	21.00	21.28
	16-QAM	1#0	20.81	20.68	21.20
		1#49	21.16	21.37	20.93
		1#99	20.54	21.00	20.84
		50#0	20.95	21.25	21.31
		50#24	21.13	20.69	21.17
		50#49	21.44	20.91	20.56
		100#0	20.60	20.95	21.15

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	21.78	21.53	21.94
		1#3	22.00	21.41	21.68
		1#5	21.59	21.69	22.06
		3#0	21.41	21.88	21.89
		3#1	21.47	21.54	21.96
		3#3	21.76	21.67	21.90
		6#0	21.69	21.39	21.48
	16-QAM	1#0	21.66	21.72	21.85
		1#3	21.50	21.46	22.02
		1#5	21.84	21.58	21.88
		3#0	21.93	21.53	21.70
		3#1	21.43	22.06	21.54
		3#3	21.73	21.62	21.47
		6#0	21.84	21.64	21.83
3M	QPSK	1#0	21.74	21.32	21.59
		1#7	21.91	21.48	21.96
		1#14	21.44	21.45	21.76
		8#0	22.08	21.50	21.61
		8#4	21.68	21.41	21.53
		8#7	21.54	21.87	21.87
		15#0	22.08	21.88	21.74
	16-QAM	1#0	21.66	21.62	21.79
		1#7	21.44	21.67	21.69
		1#14	21.35	22.02	21.49
		8#0	21.93	21.77	21.69
		8#4	21.82	21.76	21.66
		8#7	21.72	21.69	21.68
		15#0	22.08	21.67	22.02

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.12	21.86	22.13
		1#12	21.91	21.47	21.56
		1#24	21.72	21.72	21.98
		12#0	21.65	21.81	21.73
		12#6	21.70	21.86	21.79
		12#11	21.47	21.76	21.65
		25#0	21.81	21.62	21.63
	16-QAM	1#0	21.70	21.65	21.73
		1#12	21.90	21.39	21.76
		1#24	21.72	22.04	21.67
		12#0	21.81	21.71	21.56
		12#6	21.72	21.56	21.85
		12#11	21.40	21.47	22.05
		25#0	21.54	21.52	21.37
10M	QPSK	1#0	21.56	21.47	21.37
		1#24	21.84	21.85	21.61
		1#49	21.64	21.43	21.57
		25#0	21.73	21.71	21.63
		25#12	22.13	21.80	21.62
		25#24	21.62	21.57	21.94
		50#0	21.91	21.75	21.78
	16-QAM	1#0	21.89	21.42	21.51
		1#24	21.79	21.93	21.48
		1#49	21.47	21.42	21.69
		25#0	21.54	21.45	21.35
		25#12	21.59	21.85	21.84
		25#24	21.93	21.61	21.75
		50#0	21.76	21.98	21.31

LTE Band 7

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.94	22.01	22.19
		1#12	21.93	22.06	22.21
		1#24	21.81	21.89	21.97
		12#0	21.86	21.92	22.25
		12#6	22.08	21.81	22.38
		12#11	22.15	21.64	21.97
		25#0	22.25	22.31	22.00
	16-QAM	1#0	21.73	21.88	21.76
		1#12	21.77	22.31	21.64
		1#24	22.31	21.98	22.03
		12#0	21.98	21.98	22.26
		12#6	21.80	22.26	21.72
		12#11	21.83	22.05	21.93
		25#0	22.22	21.92	21.69
10M	QPSK	1#0	21.94	21.95	21.95
		1#24	21.85	22.22	22.36
		1#49	21.81	21.75	21.66
		25#0	21.61	21.98	21.88
		25#12	21.94	22.32	22.06
		25#24	21.59	22.21	21.53
		50#0	21.95	22.30	22.12
	16-QAM	1#0	21.86	21.90	22.11
		1#24	21.82	21.95	22.22
		1#49	22.17	21.91	22.07
		25#0	21.97	21.88	22.24
		25#12	21.99	22.22	22.25
		25#24	22.27	21.82	22.08
		50#0	21.92	21.92	22.17

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.93	21.87	21.74
		1#37	21.93	22.14	21.71
		1#74	21.88	21.71	22.03
		36#0	21.85	21.94	22.01
		36#17	22.08	22.40	22.03
		36#35	21.73	21.60	21.82
		75#0	22.23	21.88	21.80
	16-QAM	1#0	21.91	21.66	21.85
		1#37	22.05	21.65	22.22
		1#74	22.35	21.92	21.88
		36#0	21.59	22.00	21.84
		36#17	21.94	21.97	22.24
		36#35	21.80	22.02	21.99
		75#0	21.82	22.43	21.84
20M	QPSK	1#0	21.66	21.81	21.60
		1#49	22.14	22.05	22.22
		1#99	21.94	22.22	22.09
		50#0	21.93	21.95	21.78
		50#24	22.03	21.73	22.26
		50#49	22.16	21.69	21.82
		100#0	21.96	22.17	22.05
	16-QAM	1#0	21.88	22.13	22.32
		1#49	22.16	21.97	22.11
		1#99	21.62	21.79	21.81
		50#0	22.22	21.95	22.32
		50#24	21.89	22.02	22.18
		50#49	21.88	22.00	21.62
		100#0	22.47	22.02	21.73

LTE Band 25

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	22.18	22.27	21.92
		1#3	21.60	22.01	21.90
		1#5	22.05	21.89	22.20
		3#0	21.70	22.07	21.73
		3#1	22.21	21.89	21.92
		3#3	22.06	21.79	21.57
		6#0	21.96	22.18	22.00
	16-QAM	1#0	22.41	22.12	21.92
		1#3	22.36	21.87	21.67
		1#5	21.66	21.66	21.69
		3#0	21.59	21.93	21.99
		3#1	22.13	22.12	22.13
		3#3	22.08	22.26	21.92
		6#0	21.84	22.12	21.95
3M	QPSK	1#0	21.60	22.01	21.80
		1#7	21.75	22.00	21.90
		1#14	22.18	22.20	22.01
		8#0	22.02	21.88	21.78
		8#4	22.01	21.94	21.85
		8#7	22.11	21.85	22.14
		15#0	22.20	22.07	21.92
	16-QAM	1#0	21.87	22.06	21.95
		1#7	21.92	21.88	22.21
		1#14	22.23	22.17	22.29
		8#0	22.26	22.25	21.93
		8#4	22.20	22.06	21.75
		8#7	21.57	22.09	21.92
		15#0	21.79	22.04	21.85

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.31	22.21	22.19
		1#12	22.05	21.81	21.71
		1#24	21.99	22.03	21.96
		12#0	21.61	21.97	22.19
		12#6	22.12	22.19	22.17
		12#11	21.81	21.61	22.01
		25#0	22.06	21.80	22.42
	16-QAM	1#0	21.78	22.05	22.05
		1#12	21.73	22.06	21.94
		1#24	22.02	22.12	21.83
		12#0	22.27	21.67	21.99
		12#6	21.84	22.42	21.74
		12#11	21.98	21.85	22.00
		25#0	21.72	21.90	21.74
10M	QPSK	1#0	22.31	21.84	22.12
		1#24	21.73	21.61	21.92
		1#49	22.28	22.13	21.84
		25#0	21.92	22.07	22.24
		25#12	22.00	21.99	21.96
		25#24	21.98	22.19	22.27
		50#0	22.34	22.01	21.97
	16-QAM	1#0	21.97	21.87	21.89
		1#24	22.03	22.06	22.28
		1#49	21.94	22.02	21.94
		25#0	22.25	22.32	22.01
		25#12	22.17	21.83	22.14
		25#24	21.96	21.99	21.97
		50#0	21.90	21.84	21.97

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.78	22.14	21.78
		1#37	22.09	21.86	21.67
		1#74	22.21	21.83	22.17
		36#0	21.97	22.00	22.06
		36#17	22.00	21.99	22.23
		36#35	22.06	21.77	21.79
		75#0	21.80	22.14	21.72
	16-QAM	1#0	22.04	22.32	22.06
		1#37	22.27	22.14	22.00
		1#74	21.81	22.27	21.81
		36#0	21.73	21.75	22.04
		36#17	22.38	21.76	22.01
		36#35	22.01	22.09	22.16
		75#0	22.02	21.70	22.03
20M	QPSK	1#0	22.16	22.12	22.20
		1#49	21.92	22.38	22.11
		1#99	21.95	22.02	21.77
		50#0	22.14	22.39	22.14
		50#24	22.21	21.87	22.43
		50#49	22.34	22.08	22.12
		100#0	22.05	22.02	22.11
	16-QAM	1#0	22.18	21.85	21.82
		1#49	21.85	21.77	21.80
		1#99	22.06	22.15	21.88
		50#0	22.43	22.06	22.04
		50#24	21.68	22.02	22.03
		50#49	22.32	21.88	22.03
		100#0	22.03	22.26	21.98

LTE Band 26

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	21.76	21.56	21.49
		1#3	21.39	21.33	21.48
		1#5	21.28	21.55	21.85
		3#0	21.51	21.66	21.41
		3#1	21.47	21.55	21.82
		3#3	21.04	21.10	21.69
		6#0	21.51	21.89	21.86
	16-QAM	1#0	21.13	21.24	21.23
		1#3	21.34	21.71	21.22
		1#5	21.51	21.45	21.40
		3#0	21.58	21.50	21.22
		3#1	21.36	21.75	21.58
		3#3	21.74	21.45	21.48
		6#0	21.62	21.31	21.19
3M	QPSK	1#0	21.60	21.02	21.65
		1#7	21.68	21.85	21.61
		1#14	21.32	21.72	21.39
		8#0	21.81	21.92	21.46
		8#4	21.57	21.17	21.16
		8#7	21.41	21.54	21.50
		15#0	21.40	21.58	21.81
	16-QAM	1#0	21.43	21.51	21.14
		1#7	21.89	21.09	21.24
		1#14	21.43	21.46	21.47
		8#0	21.57	21.75	21.42
		8#4	21.65	21.31	21.28
		8#7	21.45	21.64	21.21
		15#0	21.39	21.79	21.55

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.74	21.23	21.28
		1#12	21.43	21.63	21.26
		1#24	21.24	21.53	21.88
		12#0	21.79	21.53	21.41
		12#6	21.33	21.43	21.69
		12#11	21.50	21.71	21.13
		25#0	21.53	21.50	21.44
	16-QAM	1#0	21.53	21.54	21.10
		1#12	21.85	21.82	21.53
		1#24	21.90	21.47	21.84
		12#0	21.92	21.71	21.34
		12#6	21.37	21.49	21.47
		12#11	21.91	21.63	21.53
		25#0	21.50	21.39	21.47
10M	QPSK	1#0	21.46	21.69	21.87
		1#24	21.60	21.84	21.36
		1#49	21.23	21.29	21.43
		25#0	21.74	21.46	21.19
		25#12	21.68	21.68	21.65
		25#24	21.35	21.29	21.52
		50#0	21.45	21.47	21.24
	16-QAM	1#0	21.22	21.39	21.18
		1#24	21.19	21.44	21.43
		1#49	21.11	21.27	21.79
		25#0	21.49	21.73	21.41
		25#12	21.28	21.51	21.60
		25#24	21.49	21.66	21.47
		50#0	21.28	21.38	21.29

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.59	21.16	21.55
		1#37	21.52	21.32	21.90
		1#74	21.83	21.55	21.83
		36#0	21.87	21.40	21.49
		36#17	21.14	21.28	21.84
		36#35	21.55	21.88	21.94
		75#0	21.42	21.31	21.35
	16-QAM	1#0	21.35	21.73	21.69
		1#37	21.64	21.75	21.47
		1#74	21.48	21.88	21.35
		36#0	21.26	21.54	21.14
		36#17	21.53	21.47	21.61
		36#35	21.48	21.13	21.35
		75#0	21.04	21.27	21.44

LTE Band 38

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.66	21.93	21.58
		1#12	21.26	21.31	21.60
		1#24	21.44	21.74	21.67
		12#0	21.39	21.20	21.34
		12#6	21.35	21.37	21.42
		12#11	21.38	21.54	21.79
		25#0	21.63	21.91	21.51
	16-QAM	1#0	21.63	21.06	21.56
		1#12	21.47	21.67	21.28
		1#24	21.55	21.16	21.32
		12#0	21.40	21.48	21.36
		12#6	21.90	21.38	21.80
		12#11	21.40	21.53	21.61
		25#0	21.13	21.41	21.32
10M	QPSK	1#0	21.58	21.54	21.58
		1#24	21.38	21.43	21.39
		1#49	21.58	21.28	21.48
		25#0	21.23	21.32	21.09
		25#12	21.41	21.57	21.38
		25#24	21.86	21.59	21.48
		50#0	21.27	21.28	21.74
	16-QAM	1#0	21.56	21.52	21.46
		1#24	21.48	21.59	21.27
		1#49	21.74	21.78	21.35
		25#0	21.75	21.37	21.39
		25#12	21.48	21.38	21.59
		25#24	21.53	21.72	21.26
		50#0	21.57	21.83	21.46

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.58	21.27	21.68
		1#37	21.17	21.52	21.65
		1#74	21.20	21.25	21.49
		36#0	21.38	21.64	21.57
		36#17	21.20	21.51	21.64
		36#35	21.79	21.60	21.48
		75#0	21.47	21.31	21.42
	16-QAM	1#0	21.49	21.18	21.55
		1#37	21.71	21.77	21.69
		1#74	21.34	21.61	21.84
		36#0	21.86	21.43	21.10
		36#17	21.72	21.37	21.44
		36#35	21.73	21.51	21.27
		75#0	21.59	21.19	21.38
20M	QPSK	1#0	21.41	21.36	21.82
		1#49	21.91	21.62	21.52
		1#99	21.95	21.28	21.59
		50#0	21.40	21.30	21.79
		50#24	21.70	21.48	21.51
		50#49	21.62	21.62	21.69
		100#0	21.25	21.51	21.36
	16-QAM	1#0	21.33	21.50	21.28
		1#49	21.49	21.70	21.70
		1#99	21.64	21.22	21.45
		50#0	21.28	21.67	21.40
		50#24	21.40	21.56	21.59
		50#49	21.97	21.54	21.50
		100#0	21.31	21.42	21.32

LTE Band 41

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.40	21.41	21.44
		1#12	21.28	21.45	21.70
		1#24	21.45	21.37	21.62
		12#0	21.63	21.74	21.27
		12#6	21.59	21.57	21.84
		12#11	21.94	21.24	21.94
		25#0	21.26	21.56	21.45
	16-QAM	1#0	21.46	21.28	21.64
		1#12	21.72	21.42	21.66
		1#24	21.44	21.46	21.38
		12#0	21.37	21.54	21.35
		12#6	21.53	21.61	21.67
		12#11	21.50	21.46	21.51
		25#0	21.31	21.36	21.34
10M	QPSK	1#0	21.05	21.44	21.53
		1#24	21.54	21.31	21.39
		1#49	21.46	21.52	21.24
		25#0	21.06	21.22	21.43
		25#12	21.29	21.48	21.23
		25#24	21.31	21.32	21.52
		50#0	21.25	21.53	21.93
	16-QAM	1#0	21.30	21.46	21.78
		1#24	21.44	21.69	21.44
		1#49	21.54	21.57	21.75
		25#0	21.32	21.62	21.53
		25#12	21.14	21.45	21.47
		25#24	21.56	21.53	21.84
		50#0	21.23	21.72	21.49

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.47	21.87	21.39
		1#37	21.50	21.77	21.39
		1#74	21.73	21.80	21.27
		36#0	21.39	21.37	21.41
		36#17	21.57	21.31	21.52
		36#35	21.30	21.61	21.61
		75#0	21.27	21.32	21.27
	16-QAM	1#0	21.30	21.22	21.82
		1#37	21.44	21.44	21.56
		1#74	21.29	21.32	21.52
		36#0	21.46	21.31	21.53
		36#17	21.63	21.55	21.36
		36#35	21.62	21.50	21.34
		75#0	21.41	21.50	21.74
20M	QPSK	1#0	21.58	21.63	21.12
		1#49	21.09	21.39	21.33
		1#99	21.59	21.22	21.44
		50#0	21.40	21.78	21.42
		50#24	21.67	21.46	21.70
		50#49	21.12	21.43	21.28
		100#0	21.41	21.73	21.39
	16-QAM	1#0	21.33	21.34	21.52
		1#49	21.25	21.58	21.53
		1#99	21.41	21.40	21.35
		50#0	21.60	21.61	21.19
		50#24	21.55	21.63	21.67
		50#49	21.39	21.48	21.56
		100#0	21.09	21.30	21.81

Peak-to-average ratio (PAR):**GSM 850**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.31	13
	Middle	3.25	13
	High	3.18	13

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	3.44	13
	Middle	3.52	13
	High	3.56	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	4.16	13
	Middle	4.12	13
	High	4.21	13

WCDMA Band V

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	3.33	≤ 13
	Middle	3.27	≤ 13
	High	3.23	≤ 13
WCDMA (HSDPA)	Low	2.75	≤ 13
	Middle	2.66	≤ 13
	High	2.57	≤ 13
WCDMA (HSUPA)	Low	2.86	≤ 13
	Middle	2.86	≤ 13
	High	2.89	≤ 13
WCDMA (HSPA+)	Low	2.61	≤ 13
	Middle	2.55	≤ 13
	High	2.64	≤ 13

PCS 1900

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	2.33	13
	Middle	2.27	13
	High	2.20	13

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.45	13
	Middle	2.54	13
	High	2.56	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.39	13
	Middle	2.30	13
	High	2.37	13

WCDMA Band II

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	2.74	≤ 13
	Middle	2.77	≤ 13
	High	2.85	≤ 13
WCDMA (HSDPA)	Low	2.59	≤ 13
	Middle	2.49	≤ 13
	High	2.46	≤ 13
WCDMA (HSUPA)	Low	2.62	≤ 13
	Middle	2.54	≤ 13
	High	2.45	≤ 13
WCDMA (HSPA+)	Low	2.53	≤ 13
	Middle	2.50	≤ 13
	High	2.52	≤ 13

LTE Band 2

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit (dB)
QPSK	1 RB	20M	3.59	3.76	3.64	13
	100 RB		5.61	5.71	5.55	13
16-QAM	1 RB	20M	4.46	4.63	4.55	13
	100 RB		6.50	6.56	6.51	13

LTE Band 4

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.51	3.64	3.43	13
	100 RB		5.55	5.67	5.35	13
16-QAM	1 RB	20M	4.29	4.56	4.39	13
	100 RB		6.24	6.60	6.34	13

LTE Band 5

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	10M	3.39	3.68	3.61	13
	50 RB		5.37	5.64	5.56	13
16-QAM	1 RB	10M	4.63	4.75	4.65	13
	50 RB		6.65	6.83	6.57	13

LTE Band 7

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.36	3.69	3.61	13
	100 RB		5.37	5.74	5.64	13
16-QAM	1 RB	20M	4.43	4.76	4.64	13
	100 RB		6.34	6.66	6.65	13

LTE Band 25

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.34	3.65	2.54	13
	100 RB		5.40	5.62	4.53	13
16-QAM	1 RB	20M	4.28	4.76	4.63	13
	100 RB		6.27	6.84	6.70	13

LTE Band 26

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	15M	3.66	3.66	3.56	13
	75 RB		5.57	5.72	5.63	13
16-QAM	1 RB	15M	4.71	4.71	4.61	13
	75 RB		6.67	6.67	6.70	13

LTE Band 38

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.56	3.60	3.51	13
	100 RB		5.61	5.65	5.48	13
16-QAM	1 RB	20M	4.22	4.61	4.53	13
	100 RB		6.13	6.54	6.59	13

LTE Band 41

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.56	3.60	3.54	13
	100 RB		5.65	5.65	5.55	13
16-QAM	1 RB	20M	4.22	4.61	4.53	13
	100 RB		6.30	6.58	6.52	13

Radiated Power:**GSM Mode**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
GSM 850, Middle Channel (ERP)										
836.6	92.15	57	150	H	28.46	0.63	-1.14	26.69	38.45	11.76
836.6	99.89	245	150	V	32.74	0.63	-1.14	30.97	38.45	7.48
GPRS 850, Middle Channel (ERP)										
836.6	91.56	57	150	H	27.87	0.63	-1.14	26.10	38.45	12.35
836.6	99.67	245	150	V	32.52	0.63	-1.14	30.75	38.45	7.70
EGPRS 850, Middle Channel (ERP)										
836.6	87.89	57	200	H	24.2	0.63	-1.14	22.43	38.45	16.02
836.6	95.34	245	200	V	28.19	0.63	-1.14	26.42	38.45	12.03
GSM 1900, Middle Channel (EIRP)										
1880.0	92.37	228	150	H	21.58	0.85	8.81	29.54	33.00	3.46
1880.0	91.63	134	150	V	20.53	0.85	8.81	28.49	33.00	4.51
GPRS 1900, Middle Channel (EIRP)										
1880.0	92.14	228	150	H	21.35	0.85	8.81	29.31	33.00	3.69
1880.0	91.38	134	150	V	20.28	0.85	8.81	28.24	33.00	4.76
EGPRS 1900, Middle Channel (EIRP)										
1880.0	88.51	228	150	H	17.72	0.85	8.81	25.68	33.00	7.32
1880.0	87.81	134	150	V	16.71	0.85	8.81	24.67	33.00	8.33

WCDMA Mode

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Band V, Middle Channel(ERP)										
836.6	80.89	38	196	H	17.2	0.63	-1.14	15.43	38.45	23.02
836.6	88.94	328	134	V	21.79	0.63	-1.14	20.02	38.45	18.43
WCDMA Band II, Middle Channel(EIRP)										
1880.0	85.11	253	241	H	14.32	0.85	8.81	22.28	33.00	10.72
1880.0	86.69	269	189	V	15.59	0.85	8.81	23.55	33.00	9.45

EIRP:**LTE Band 2**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4M BW Middle Channel								
1880	H	84.81	14.02	0.85	8.81	21.98	33	11.02
1880	V	80.08	8.98	0.85	8.81	16.94	33	16.06
16-QAM 1.4M BW Middle Channel								
1880	H	84.62	13.83	0.85	8.81	21.79	33	11.21
1880	V	79.89	8.79	0.85	8.81	16.75	33	16.25
QPSK 3M BW Middle Channel								
1880	H	84.54	13.75	0.85	8.81	21.71	33	11.29
1880	V	79.64	8.54	0.85	8.81	16.50	33	16.50
16-QAM 3M BW Middle Channel								
1880	H	84.31	13.52	0.85	8.81	21.48	33	11.52
1880	V	79.44	8.34	0.85	8.81	16.30	33	16.70
QPSK 5M BW Middle Channel								
1880	H	83.59	12.80	0.85	8.81	20.76	33	12.24
1880	V	79.16	8.06	0.85	8.81	16.02	33	16.98
16-QAM 5M BW Middle Channel								
1880	H	83.31	12.52	0.85	8.81	20.48	33	12.52
1880	V	79.21	8.11	0.85	8.81	16.07	33	16.93
QPSK 10M BW Middle Channel								
1880	H	82.91	12.12	0.85	8.81	20.08	33	12.92
1880	V	78.82	7.72	0.85	8.81	15.68	33	17.32
16-QAM 10M BW Middle Channel								
1880	H	82.64	11.85	0.85	8.81	19.81	33	13.19
1880	V	78.51	7.41	0.85	8.81	15.37	33	17.63
QPSK 15M BW Middle Channel								
1880	H	82.79	12.00	0.85	8.81	19.96	33	13.04
1880	V	78.61	7.51	0.85	8.81	15.47	33	17.53
16-QAM 15M BW Middle Channel								
1880	H	81.41	10.62	0.85	8.81	18.58	33	14.42
1880	V	77.61	6.51	0.85	8.81	14.47	33	18.53
QPSK 20M BW Middle Channel								
1880	H	81.89	11.10	0.85	8.81	19.06	33	13.94
1880	V	77.54	6.44	0.85	8.81	14.40	33	18.60
16-QAM 20M BW Middle Channel								
1880	H	81.49	10.70	0.85	8.81	18.66	33	14.34
1880	V	77.22	6.12	0.85	8.81	14.08	33	18.92

LTE Band 4

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4M BW Middle Channel								
1732.5	H	84.51	12.68	0.84	8.57	20.41	30	9.59
1732.5	V	79.33	7.23	0.84	8.57	14.96	30	15.04
16-QAM 1.4M BW Middle Channel								
1732.5	H	84.11	12.28	0.84	8.57	20.01	30	9.99
1732.5	V	79.09	6.99	0.84	8.57	14.72	30	15.28
QPSK 3M BW Middle Channel								
1732.5	H	84.24	12.41	0.84	8.57	20.14	30	9.86
1732.5	V	78.99	6.89	0.84	8.57	14.62	30	15.38
16-QAM 3M BW Middle Channel								
1732.5	H	84.07	12.24	0.84	8.57	19.97	30	10.03
1732.5	V	78.86	6.76	0.84	8.57	14.49	30	15.51
QPSK 5M BW Middle Channel								
1732.5	H	84.19	12.36	0.84	8.57	20.09	30	9.91
1732.5	V	78.94	6.84	0.84	8.57	14.57	30	15.43
16-QAM 5M BW Middle Channel								
1732.5	H	84.01	12.18	0.84	8.57	19.91	30	10.09
1732.5	V	78.64	6.54	0.84	8.57	14.27	30	15.73
QPSK 10M BW Middle Channel								
1732.5	H	84.11	12.28	0.84	8.57	20.01	30	9.99
1732.5	V	78.71	6.61	0.84	8.57	14.34	30	15.66
16-QAM 10M BW Middle Channel								
1732.5	H	83.86	12.03	0.84	8.57	19.76	30	10.24
1732.5	V	78.37	6.27	0.84	8.57	14.00	30	16.00
QPSK 15M BW Middle Channel								
1732.5	H	83.88	12.05	0.84	8.57	19.78	30	10.22
1732.5	V	78.64	6.54	0.84	8.57	14.27	30	15.73
16-QAM 15M BW Middle Channel								
1732.5	H	83.44	11.61	0.84	8.57	19.34	30	10.66
1732.5	V	78.27	6.17	0.84	8.57	13.90	30	16.10
QPSK 20M BW Middle Channel								
1732.5	H	83.41	11.58	0.84	8.57	19.31	30	10.69
1732.5	V	78.21	6.11	0.84	8.57	13.84	30	16.16
16-QAM 20M BW Middle Channel								
1732.5	H	83.11	11.28	0.84	8.57	19.01	30	10.99
1732.5	V	78.02	5.92	0.84	8.57	13.65	30	16.35

LTE Band 5

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 1.4M BW Middle Channel								
836.5	H	88.06	24.37	0.63	-1.14	22.60	33	10.40
836.5	V	83.42	16.27	0.63	-1.14	14.50	33	18.50
16-QAM 1.4M BW Middle Channel								
836.5	H	87.87	24.18	0.63	-1.14	22.41	33	10.59
836.5	V	83.11	15.96	0.63	-1.14	14.19	33	18.81
QPSK 3M BW Middle Channel								
836.5	H	87.94	24.25	0.63	-1.14	22.48	33	10.52
836.5	V	83.34	16.19	0.63	-1.14	14.42	33	18.58
16-QAM 3M BW Middle Channel								
836.5	H	87.66	23.97	0.63	-1.14	22.20	33	10.80
836.5	V	83.02	15.87	0.63	-1.14	14.10	33	18.90
QPSK 5M BW Middle Channel								
836.5	H	87.71	24.02	0.63	-1.14	22.25	33	10.75
836.5	V	83.12	15.97	0.63	-1.14	14.20	33	18.80
16-QAM 5M BW Middle Channel								
836.5	H	87.51	23.82	0.63	-1.14	22.05	33	10.95
836.5	V	82.97	15.82	0.63	-1.14	14.05	33	18.95
QPSK 10M BW Middle Channel								
836.5	H	87.43	23.74	0.63	-1.14	21.97	33	11.03
836.5	V	82.51	15.36	0.63	-1.14	13.59	33	19.41
16-QAM 10M BW Middle Channel								
836.5	H	87.11	23.42	0.63	-1.14	21.65	33	11.35
836.5	V	82.31	15.16	0.63	-1.14	13.39	33	19.61

LTE Band 7

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5M BW Middle Channel								
2535	H	82.03	12.20	0.89	10.05	21.36	33	11.64
2535	V	78.44	8.54	0.89	10.05	17.70	33	15.30
16-QAM 5M BW Middle Channel								
2535	H	81.76	11.93	0.89	10.05	21.09	33	11.91
2535	V	78.16	8.26	0.89	10.05	17.42	33	15.58
QPSK 10M BW Middle Channel								
2535	H	81.86	12.03	0.89	10.05	21.19	33	11.81
2535	V	78.11	8.21	0.89	10.05	17.37	33	15.63
16-QAM 10M BW Middle Channel								
2535	H	81.43	11.6	0.89	10.05	20.76	33	12.24
2535	V	77.89	7.99	0.89	10.05	17.15	33	15.85
QPSK 15M BW Middle Channel								
2535	H	81.51	11.68	0.89	10.05	20.84	33	12.16
2535	V	77.84	7.94	0.89	10.05	17.10	33	15.90
16-QAM 15M BW Middle Channel								
2535	H	81.24	11.41	0.89	10.05	20.57	33	12.43
2535	V	77.46	7.56	0.89	10.05	16.72	33	16.28
QPSK 20M BW Middle Channel								
2535	H	81.13	11.30	0.89	10.05	20.46	33	12.54
2535	V	77.37	7.47	0.89	10.05	16.63	33	16.37
16-QAM 20M BW Middle Channel								
2535	H	80.97	11.14	0.89	10.05	20.30	33	12.70
2535	V	77.06	7.16	0.89	10.05	16.32	33	16.68

LTE Band 25

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4M BW Middle Channel								
1882.5	H	85.19	14.42	0.85	8.81	22.38	33	10.62
1882.5	V	79.18	8.10	0.85	8.81	16.06	33	16.94
16-QAM 1.4M BW Middle Channel								
1882.5	H	85.01	14.24	0.85	8.81	22.20	33	10.80
1882.5	V	78.86	7.78	0.85	8.81	15.74	33	17.26
QPSK 3M BW Middle Channel								
1882.5	H	84.91	14.14	0.85	8.81	22.10	33	10.90
1882.5	V	78.86	7.78	0.85	8.81	15.74	33	17.26
16-QAM 3M BW Middle Channel								
1882.5	H	84.61	13.84	0.85	8.81	21.8	33	11.2
1882.5	V	78.57	7.49	0.85	8.81	15.45	33	17.55
QPSK 5M BW Middle Channel								
1882.5	H	84.59	13.82	0.85	8.81	21.78	33	11.22
1882.5	V	78.42	7.34	0.85	8.81	15.30	33	17.70
16-QAM 5M BW Middle Channel								
1882.5	H	84.21	13.44	0.85	8.81	21.4	33	11.6
1882.5	V	78.06	6.98	0.85	8.81	14.94	33	18.06
QPSK 10M BW Middle Channel								
1882.5	H	84.05	13.28	0.85	8.81	21.24	33	11.76
1882.5	V	78.11	7.03	0.85	8.81	14.99	33	18.01
16-QAM 10M BW Middle Channel								
1882.5	H	83.87	13.1	0.85	8.81	21.06	33	11.94
1882.5	V	77.86	6.78	0.85	8.81	14.74	33	18.26
QPSK 15M BW Middle Channel								
1882.5	H	83.67	12.90	0.85	8.81	20.86	33	12.14
1882.5	V	77.69	6.61	0.85	8.81	14.57	33	18.43
16-QAM 15M BW Middle Channel								
1882.5	H	83.51	12.74	0.85	8.81	20.70	33	12.30
1882.5	V	77.43	6.35	0.85	8.81	14.31	33	18.69
QPSK 20M BW Middle Channel								
1882.5	H	83.41	12.64	0.85	8.81	20.60	33	12.40
1882.5	V	77.29	6.21	0.85	8.81	14.17	33	18.83
16-QAM 20M BW Middle Channel								
1882.5	H	83.24	12.47	0.85	8.81	20.43	33	12.57
1882.5	V	77.01	5.93	0.85	8.81	13.89	33	19.11

LTE Band 26

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4M BW Middle Channel								
831.5	H	86.19	22.75	0.63	-1.16	20.96	38.45	17.49
831.5	V	80.42	13.97	0.63	-1.16	12.18	38.45	26.27
16-QAM 1.4M BW Middle Channel								
831.5	H	86.01	22.57	0.63	-1.16	20.78	38.45	17.67
831.5	V	80.22	13.77	0.63	-1.16	11.98	38.45	26.47
QPSK 3M BW Middle Channel								
831.5	H	86.01	22.57	0.63	-1.16	20.78	38.45	17.67
831.5	V	80.21	13.76	0.63	-1.16	11.97	38.45	26.48
16-QAM 3M BW Middle Channel								
831.5	H	85.64	22.2	0.63	-1.16	20.41	38.45	18.04
831.5	V	79.91	13.46	0.63	-1.16	11.67	38.45	26.78
QPSK 5M BW Middle Channel								
831.5	H	85.86	22.42	0.63	-1.16	20.63	38.45	17.82
831.5	V	80.01	13.56	0.63	-1.16	11.77	38.45	26.68
16-QAM 5M BW Middle Channel								
831.5	H	85.67	22.23	0.63	-1.16	20.44	38.45	18.01
831.5	V	79.67	13.22	0.63	-1.16	11.43	38.45	27.02
QPSK 10M BW Middle Channel								
831.5	H	85.37	21.93	0.63	-1.16	20.14	38.45	18.31
831.5	V	79.86	13.41	0.63	-1.16	11.62	38.45	26.83
16-QAM 10M BW Middle Channel								
831.5	H	85.11	21.67	0.63	-1.16	19.88	38.45	18.57
831.5	V	79.61	13.16	0.63	-1.16	11.37	38.45	27.08
QPSK 15M BW Middle Channel								
831.5	H	85.11	21.67	0.63	-1.16	19.88	38.45	18.57
831.5	V	79.67	13.22	0.63	-1.16	11.43	38.45	27.02
16-QAM 15M BW Middle Channel								
831.5	H	84.97	21.53	0.63	-1.16	19.74	38.45	18.71
831.5	V	79.16	12.71	0.63	-1.16	10.92	38.45	27.53

LTE Band 38

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5M BW Middle Channel								
2595	H	78.43	8.79	0.9	9.97	17.86	33	15.14
2595	V	80.21	10.50	0.9	9.97	19.57	33	13.43
16-QAM 5M BW Middle Channel								
2595	H	78.11	8.47	0.89	10.05	17.63	33	15.37
2595	V	80.05	10.34	0.89	10.05	19.50	33	13.50
QPSK 10M BW Middle Channel								
2595	H	78.11	8.47	0.89	10.05	17.63	33	15.37
2595	V	79.98	10.27	0.89	10.05	19.43	33	13.57
16-QAM 10M BW Middle Channel								
2595	H	77.96	8.32	0.89	10.05	17.48	33	15.52
2595	V	79.57	9.86	0.89	10.05	19.02	33	13.98
QPSK 15M BW Middle Channel								
2595	H	77.94	8.30	0.89	10.05	17.46	33	15.54
2595	V	79.76	10.05	0.89	10.05	19.21	33	13.79
16-QAM 15M BW Middle Channel								
2595	H	77.61	7.97	0.89	10.05	17.13	33	15.87
2595	V	79.34	9.63	0.89	10.05	18.79	33	14.21
QPSK 20M BW Middle Channel								
2595	H	77.64	8.00	0.89	10.05	17.16	33	15.84
2595	V	79.51	9.80	0.89	10.05	18.96	33	14.04
16-QAM 20M BW Middle Channel								
2595	H	77.33	7.69	0.89	10.05	16.85	33	16.15
2595	V	79.15	9.44	0.89	10.05	18.60	33	14.40

LTE Band 41

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5M BW Middle Channel								
2600	H	78.19	8.57	0.9	9.96	17.63	33	15.37
2600	V	80.39	10.70	0.9	9.96	19.76	33	13.24
16-QAM 5M BW Middle Channel								
2600	H	78.05	8.43	0.89	10.05	17.59	33	15.41
2600	V	80.04	10.35	0.89	10.05	19.51	33	13.49
QPSK 10M BW Middle Channel								
2600	H	78.02	8.40	0.89	10.05	17.56	33	15.44
2600	V	80.12	10.43	0.89	10.05	19.59	33	13.41
16-QAM 10M BW Middle Channel								
2600	H	77.86	8.24	0.89	10.05	17.4	33	15.6
2600	V	79.94	10.25	0.89	10.05	19.41	33	13.59
QPSK 15M BW Middle Channel								
2600	H	77.56	7.94	0.89	10.05	17.10	33	15.90
2600	V	79.68	9.99	0.89	10.05	19.15	33	13.85
16-QAM 15M BW Middle Channel								
2600	H	77.42	7.80	0.89	10.05	16.96	33	16.04
2600	V	79.91	10.22	0.89	10.05	19.38	33	13.62
QPSK 20M BW Middle Channel								
2600	H	77.24	7.62	0.89	10.05	16.78	33	16.22
2600	V	79.37	9.68	0.89	10.05	18.84	33	14.16
16-QAM 20M BW Middle Channel								
2600	H	77.11	7.49	0.89	10.05	16.65	33	16.35
2600	V	79.38	9.69	0.89	10.05	18.85	33	14.15

Note:

All above data were tested without amplifier.

Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)

Margin (dB) = Limit (dBm) - Absolute Level (dBm)

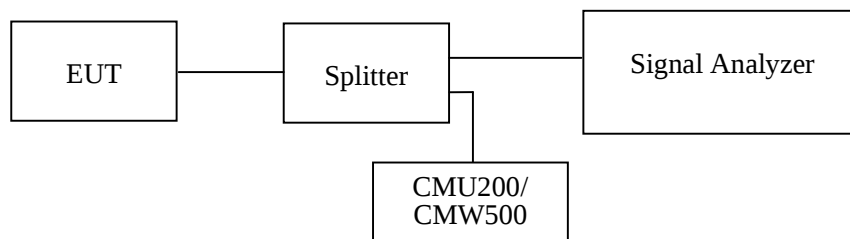
FCC §2.1049, §22.917, §22.905 & §24.238; §27.53; §90.209- OCCUPIED BANDWIDTH**Applicable Standards**

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

Test Procedure

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

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

**Test Data****Environmental Conditions**

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

The testing was performed by Max Min from 2019-03-01 to 2019-08-29.

EUT operation mode: Transmitting

Test Result: Compliant.

GSM 850

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GSM (GMSK)	836.6	0.317	0.246
GPRS (GMSK)	836.6	0.321	0.244
EGPRS (8PSK)	836.6	0.323	0.253

WCDMA Band V

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

PCS 1900

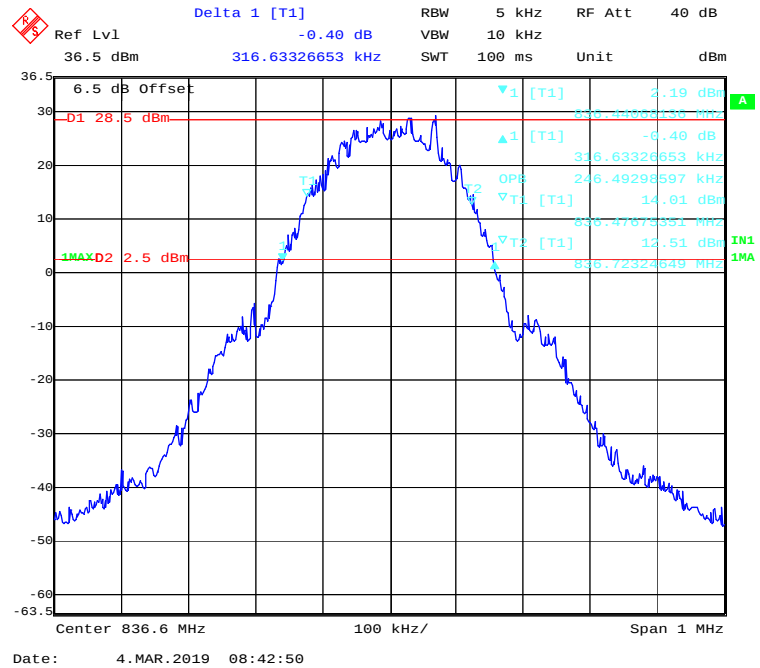
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GSM (GMSK)	1880	0.313	0.242
GPRS (GMSK)	1880	0.321	0.244
EGPRS (8PSK)	1880	0.313	0.248

WCDMA Band II

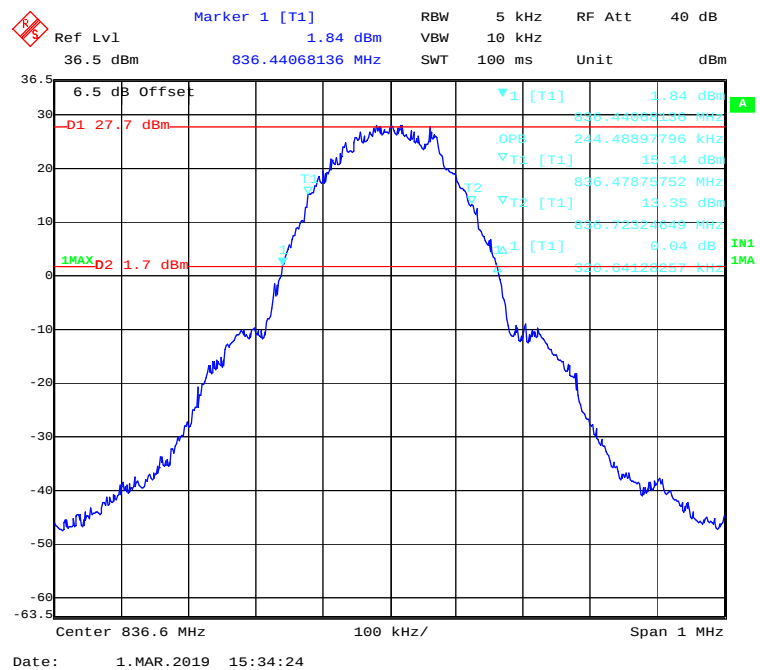
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (BPSK)	1880	4.770	4.188
WCDMA (HSDPA)	1880	4.770	4.148
WCDMA (HSUPA)	1880	4.770	4.168
WCDMA (HSPA+)	1880	4.790	4.148

GSM 850

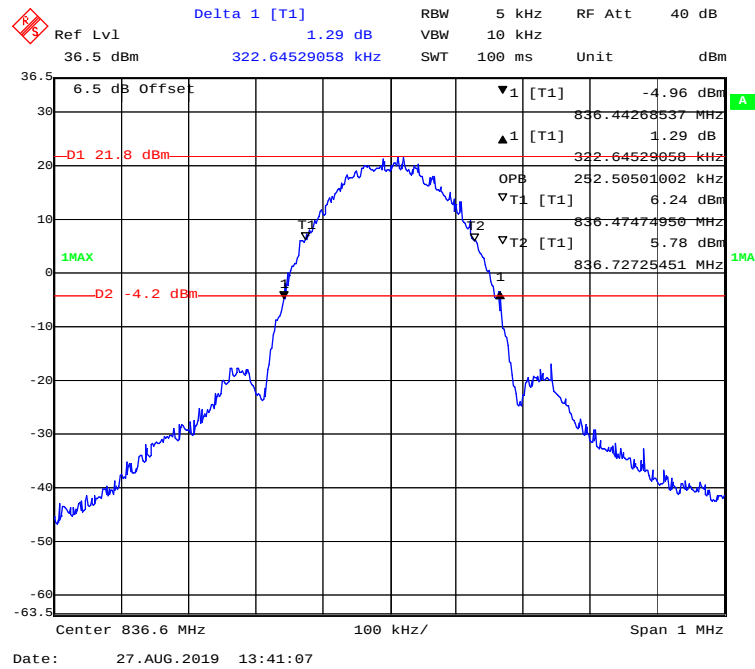
99% Occupied & 26 dB Emissions Bandwidth for GSM (GMSK) Mode



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

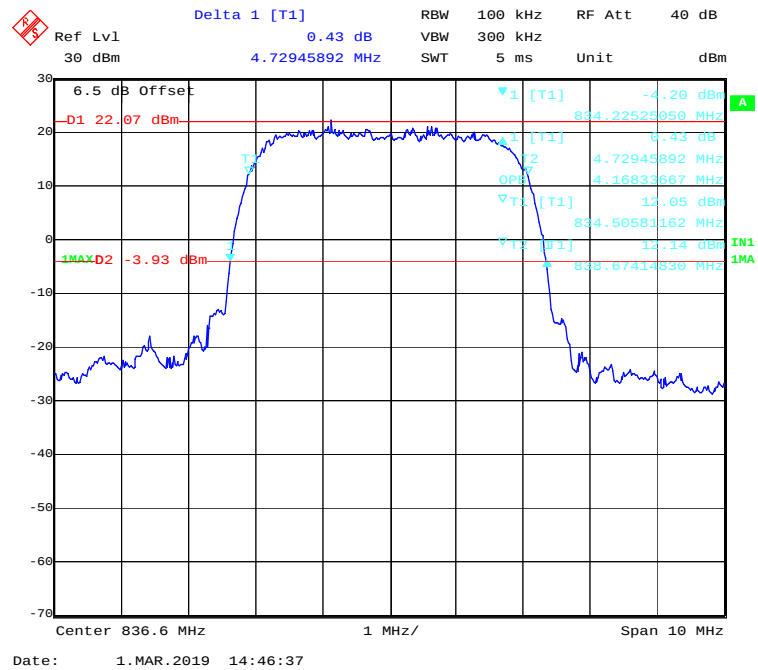


99% Occupied & 26 dB Emissions Bandwidth for EGPRS (8PSK) Mode

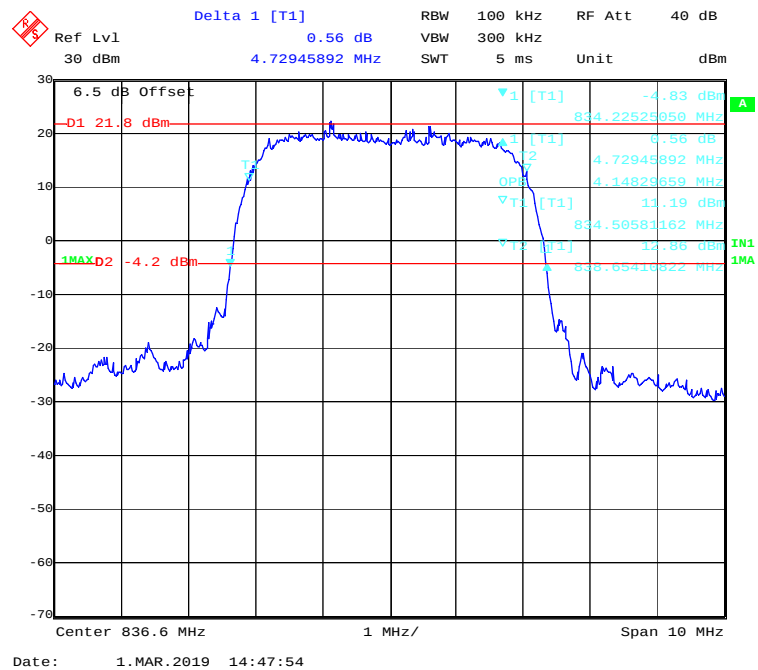


WCDMA Band V

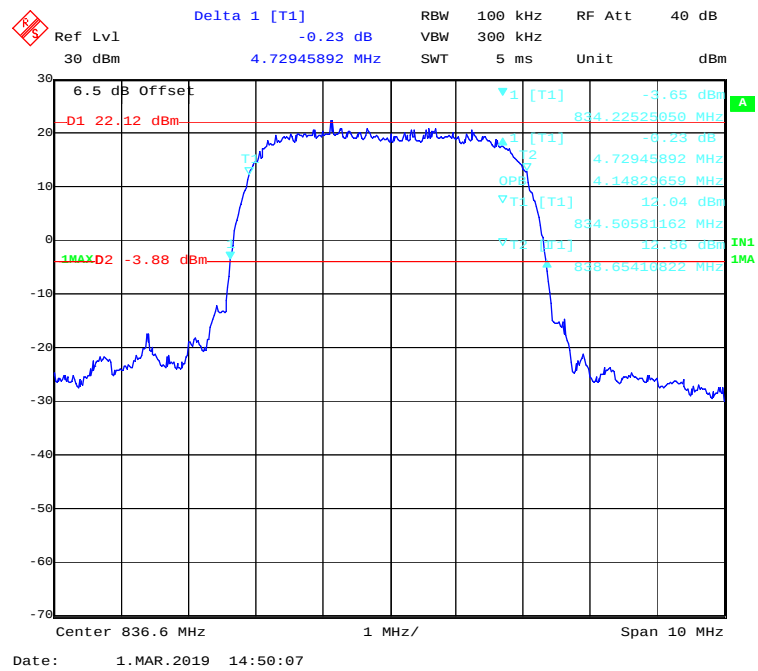
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode



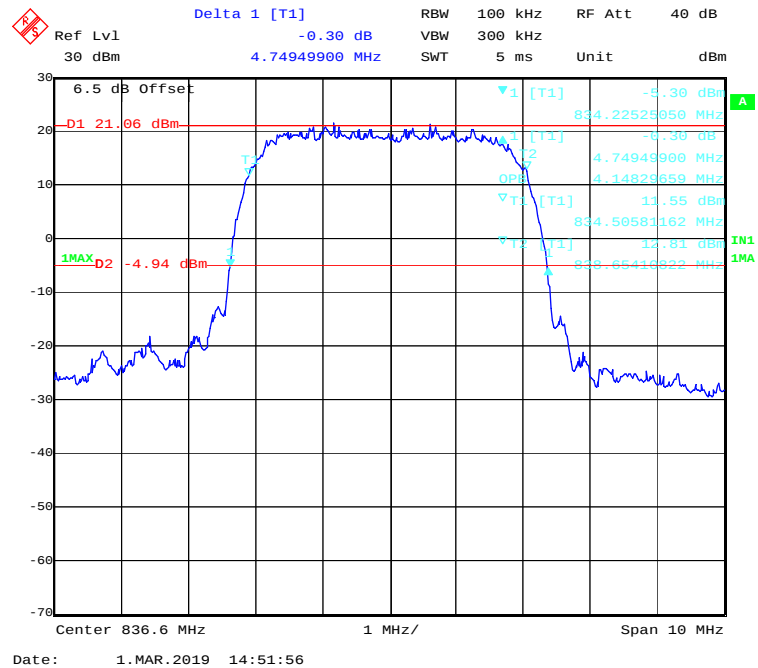
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



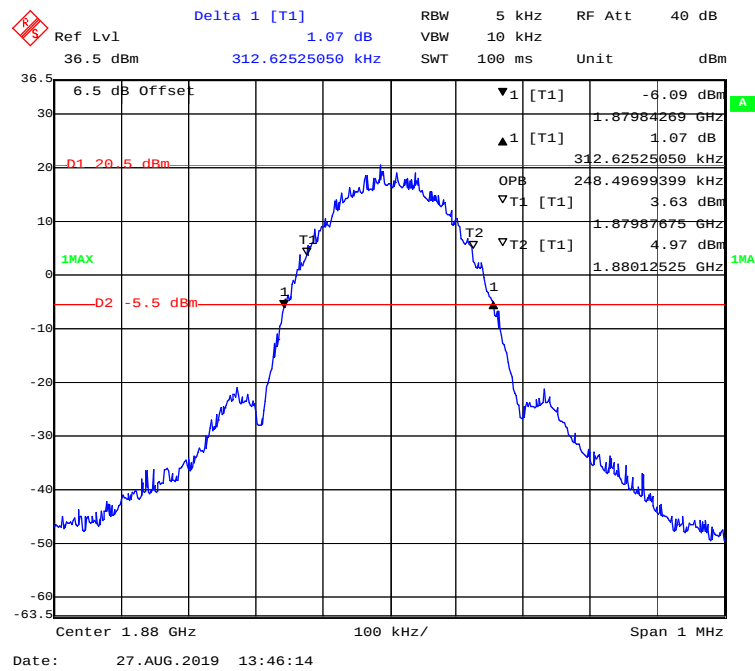
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSUPA) Mode



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

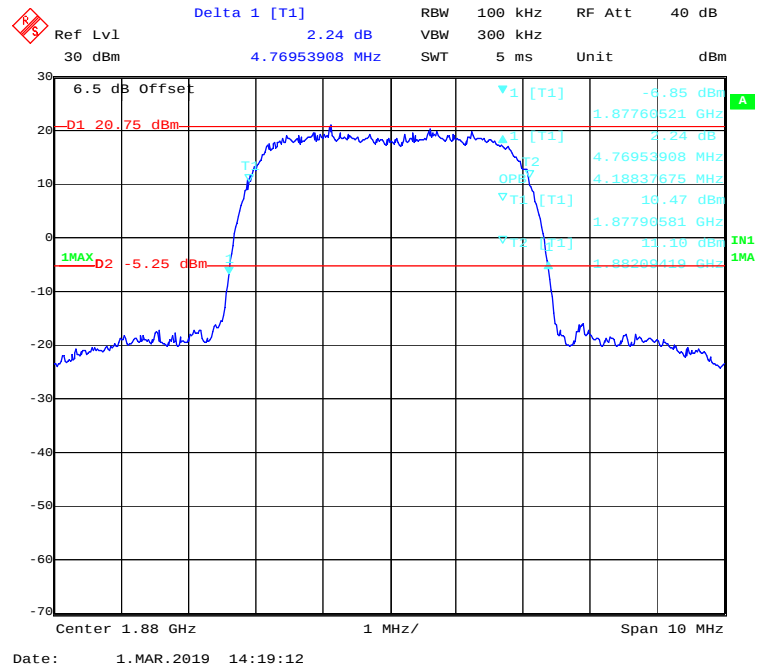


99% Occupied & 26 dB Emissions Bandwidth for EGPRS (8PSK) Mode

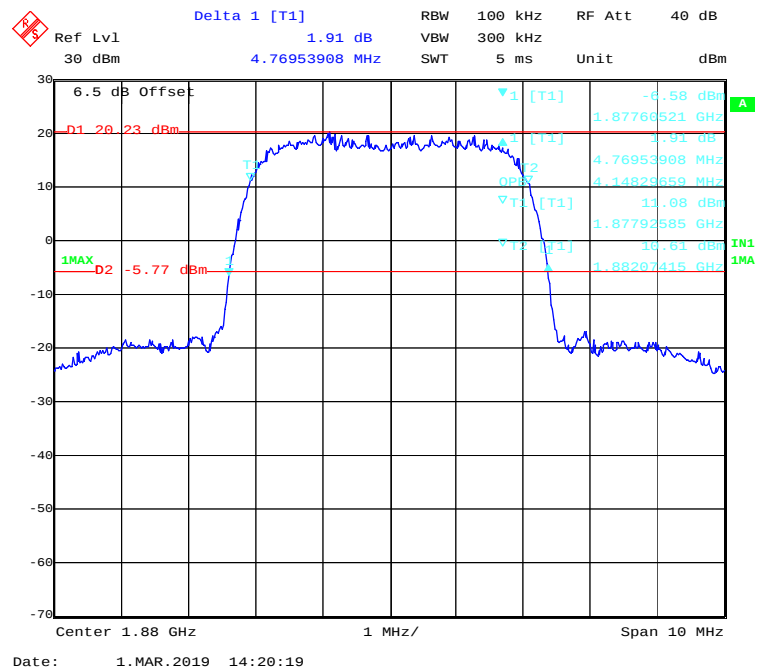


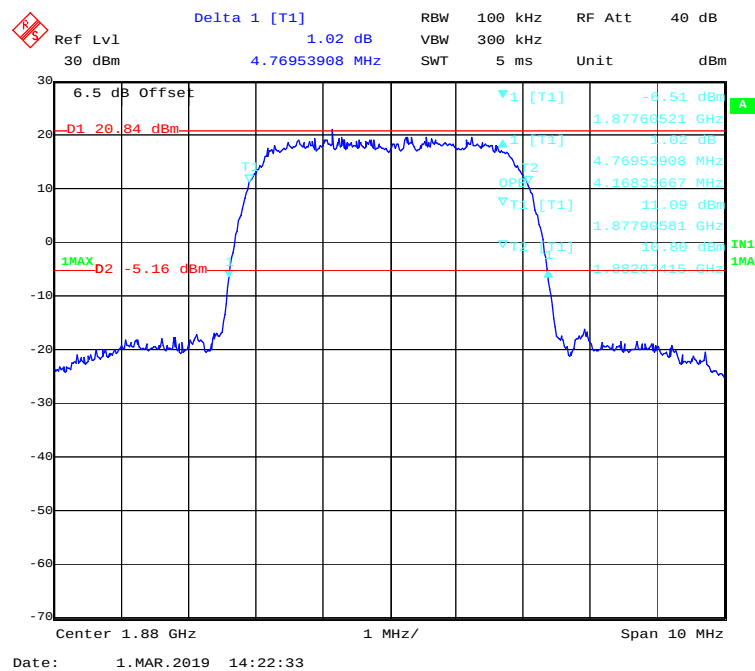
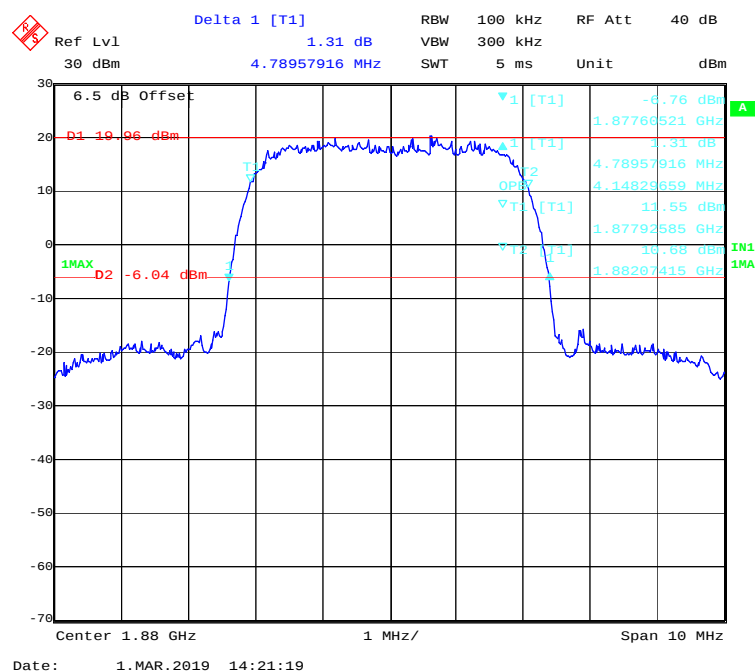
WCDMA Band II

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



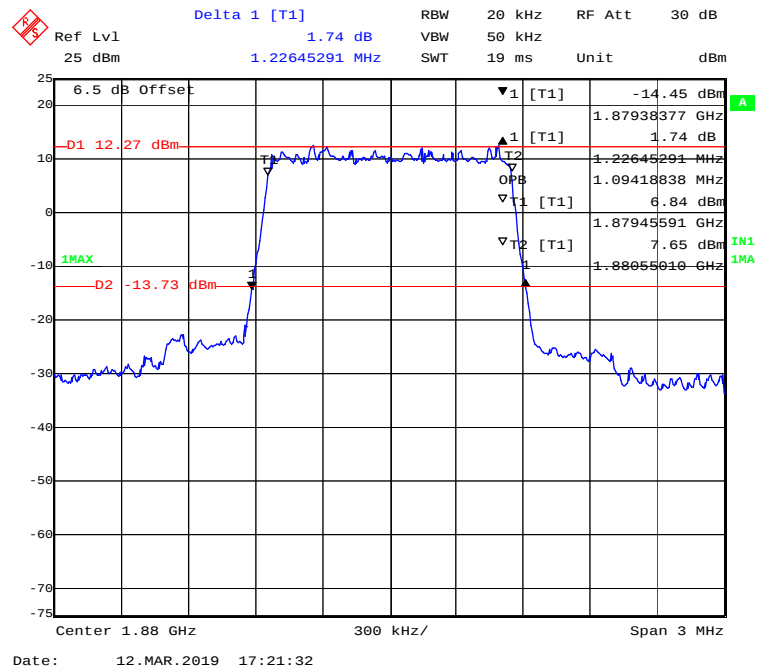
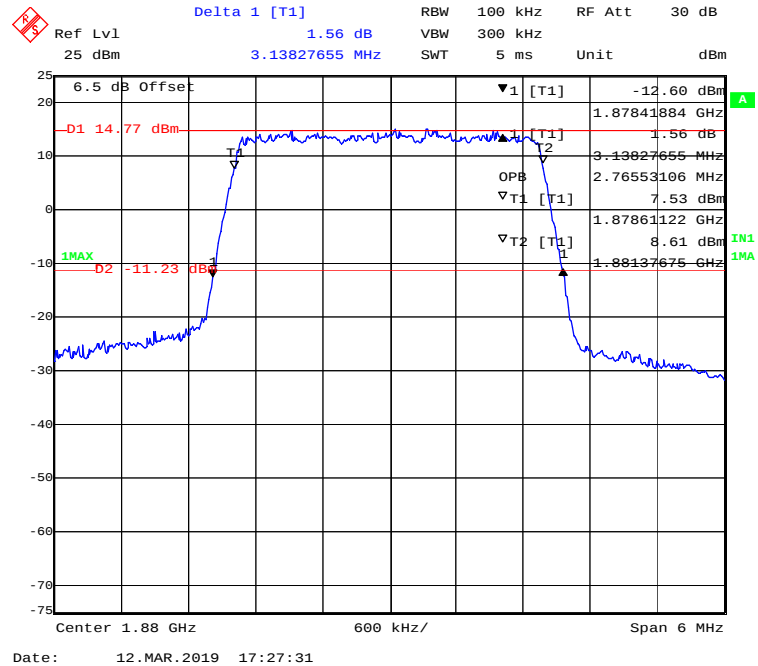
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



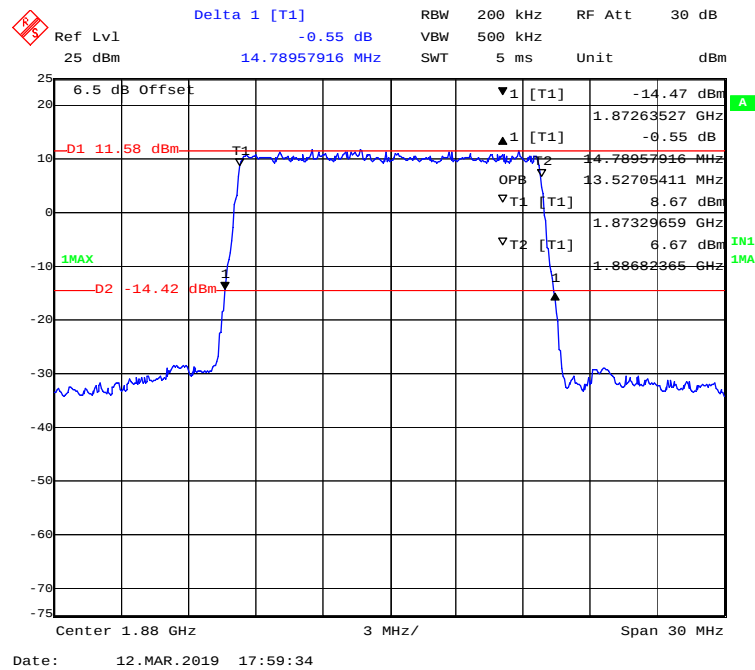
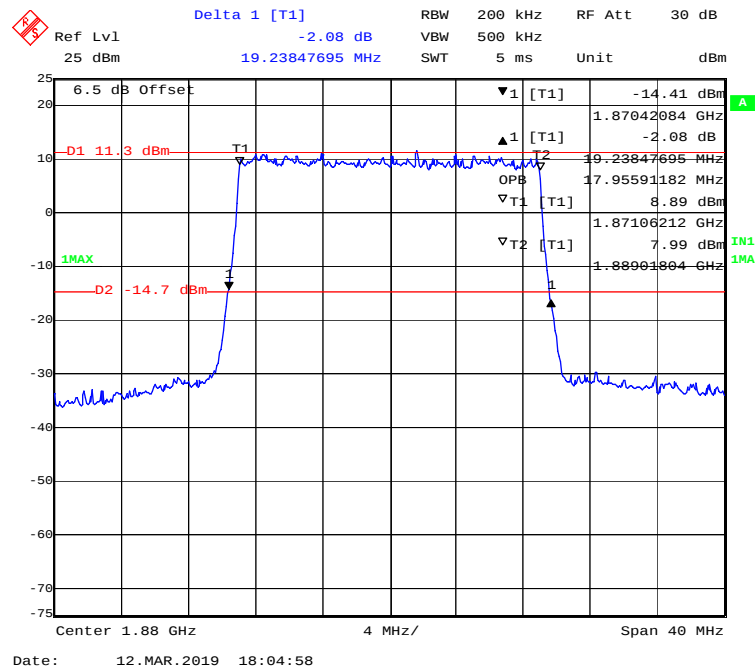
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSUPA) Mode**99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode**

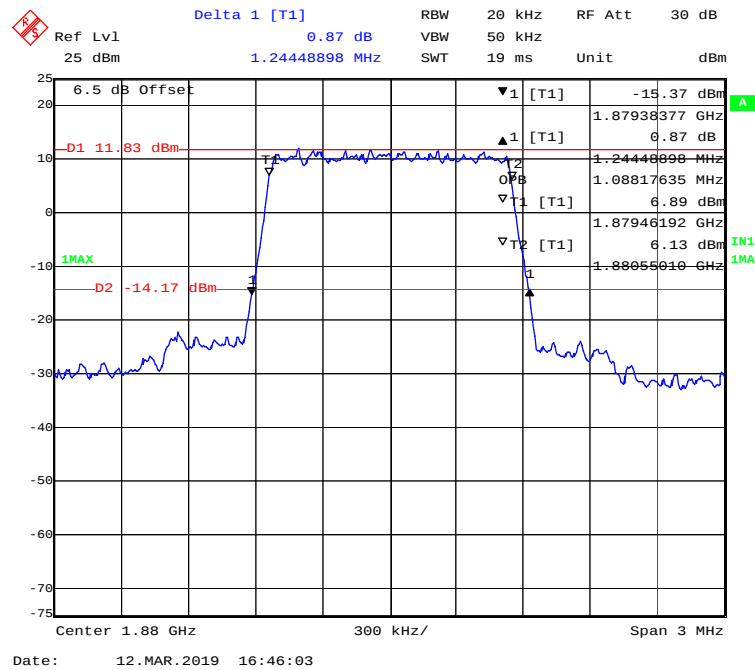
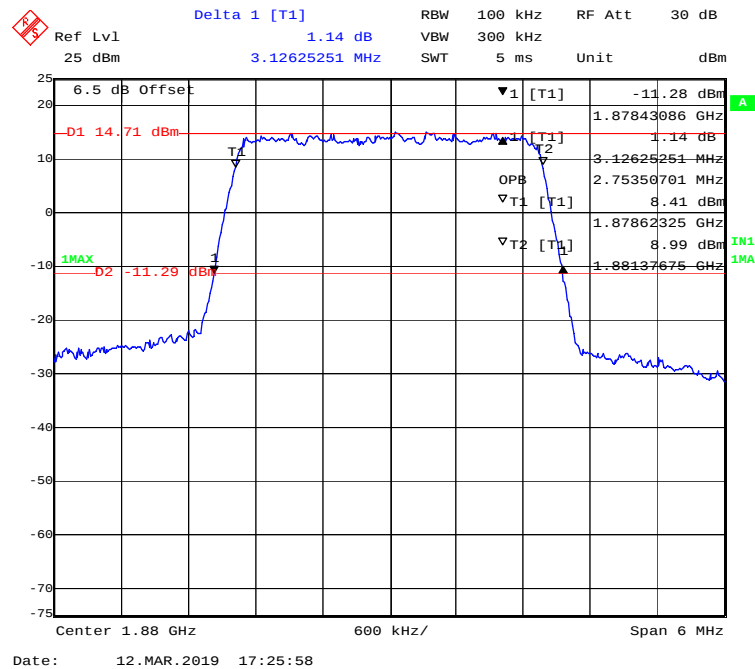
LTE Band 2:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.226	1.094
	3M		3.138	2.766
	5M		5.010	4.529
	10M		9.699	8.978
	15M		14.790	13.527
	20M		19.238	17.956
16-QAM	1.4M	Middle	1.244	1.088
	3M		3.126	2.754
	5M		5.010	4.529
	10M		9.739	8.978
	15M		14.609	13.467
	20M		19.158	17.956

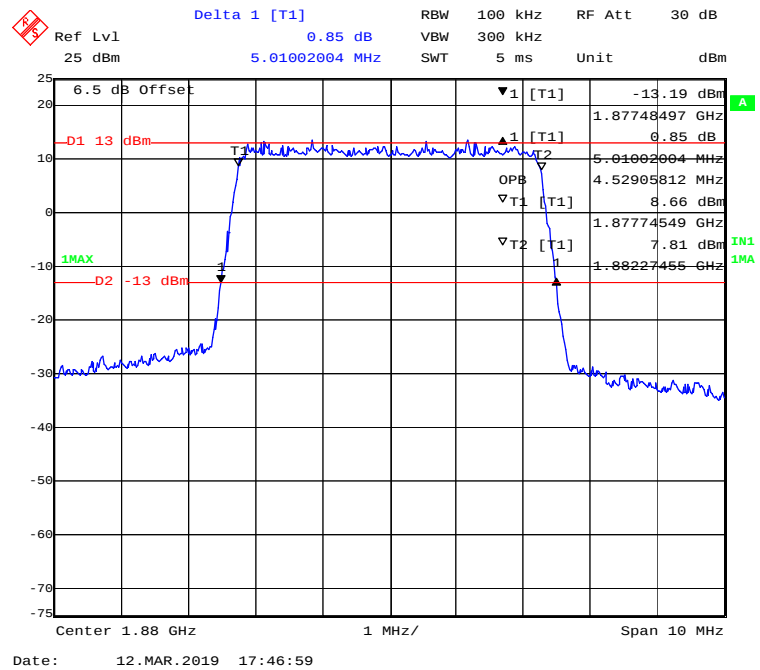
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

[illegible][illegible]

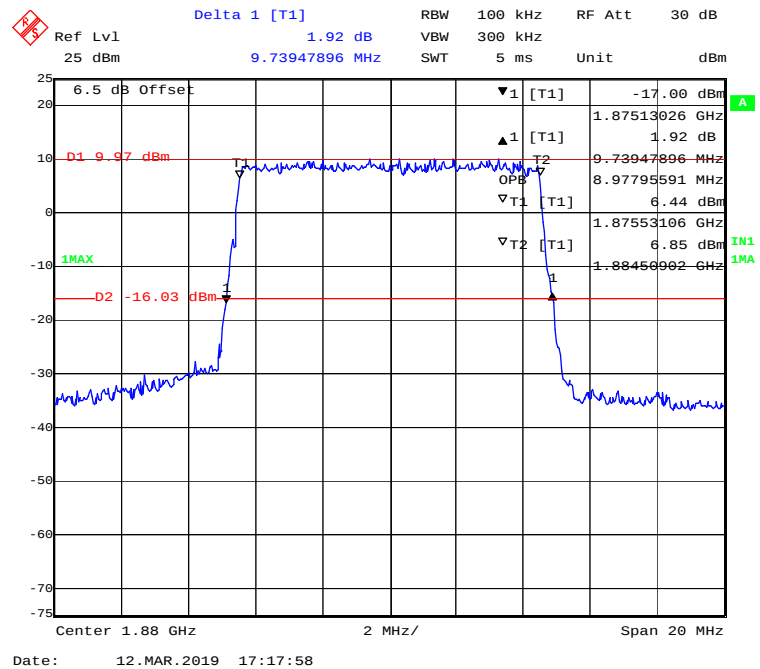
QPSK (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

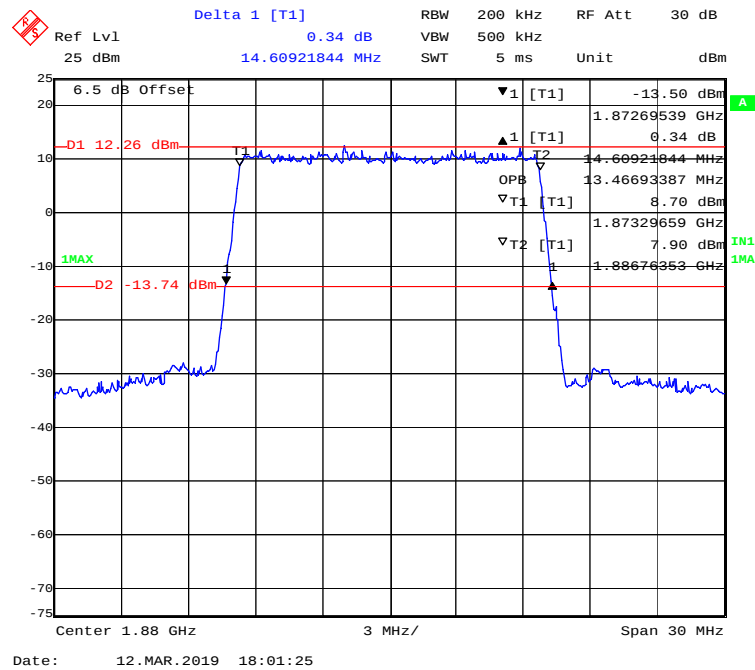
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



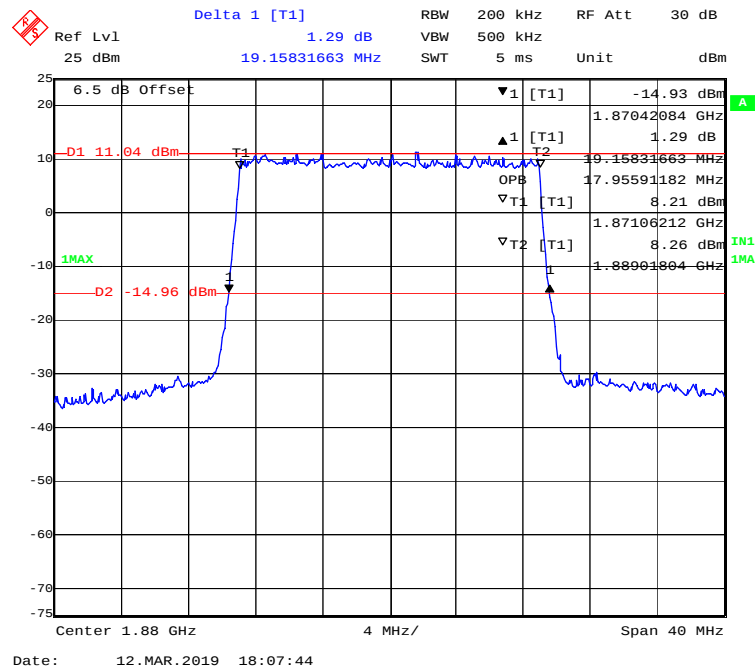
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



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

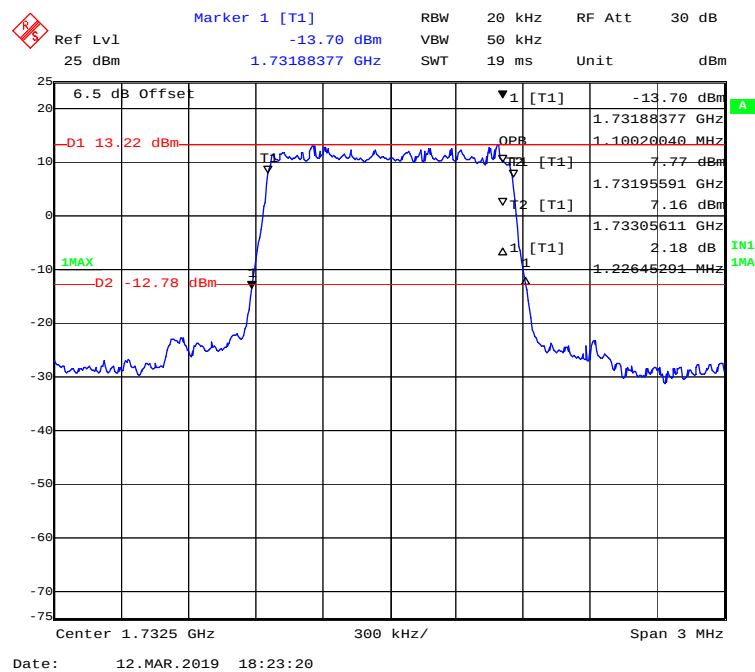


16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

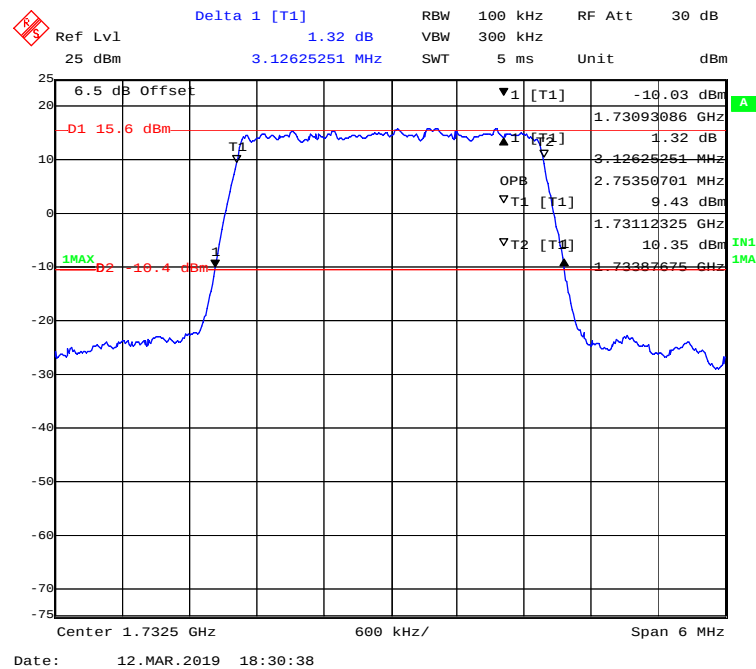


LTE Band 4:

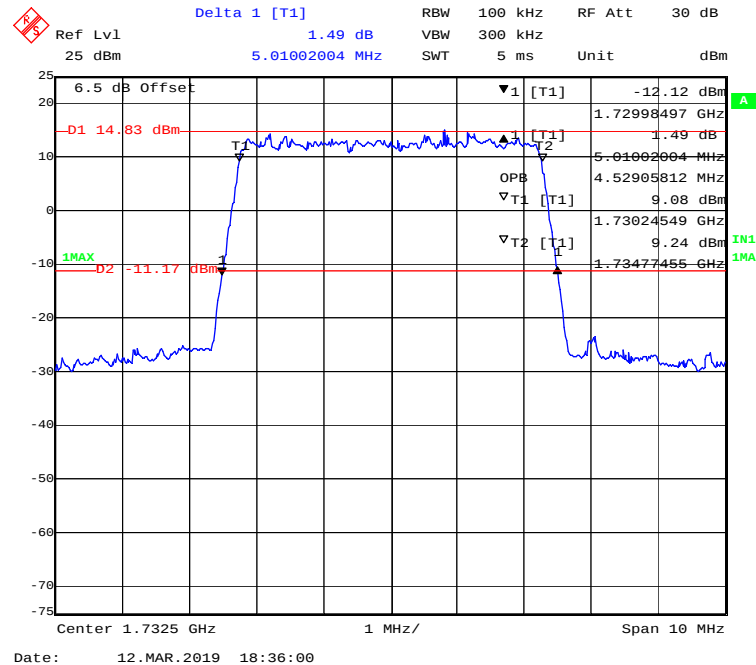
Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.226	1.100
	3M		3.126	2.754
	5M		5.010	4.529
	10M		9.739	8.978
	15M		14.669	13.527
	20M		19.238	17.956
16-QAM	1.4M	Middle	1.768	1.365
	3M		3.114	2.754
	5M		5.010	4.529
	10M		9.739	8.978
	15M		14.549	13.527
	20M		19.238	17.956

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

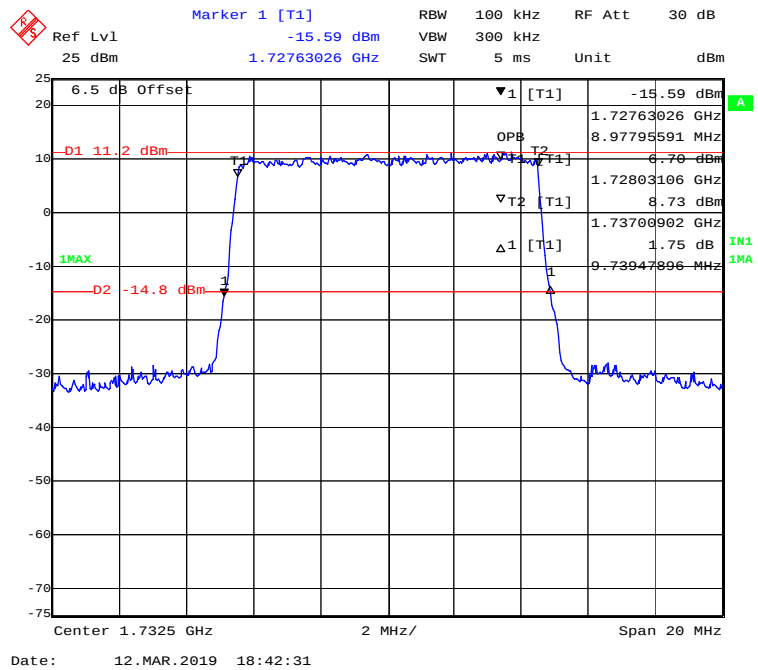
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



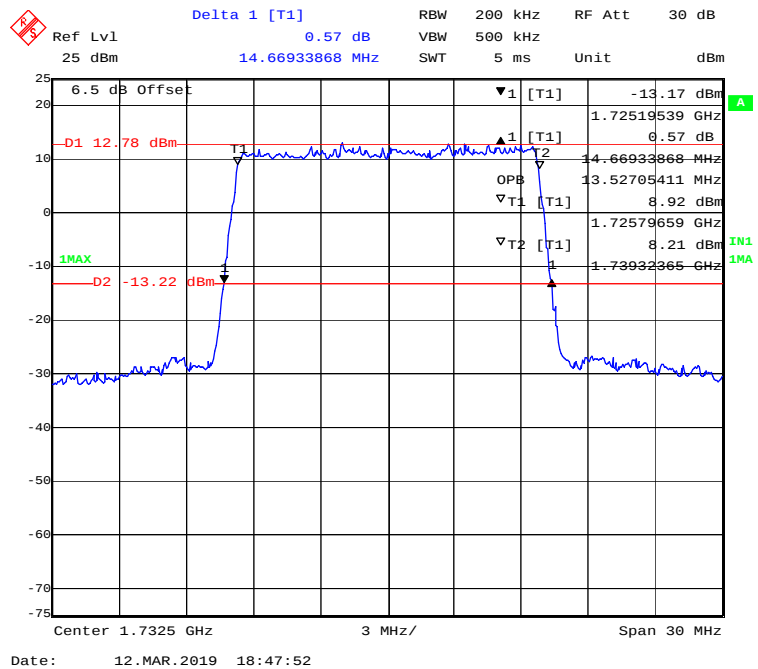
QPSK (5.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



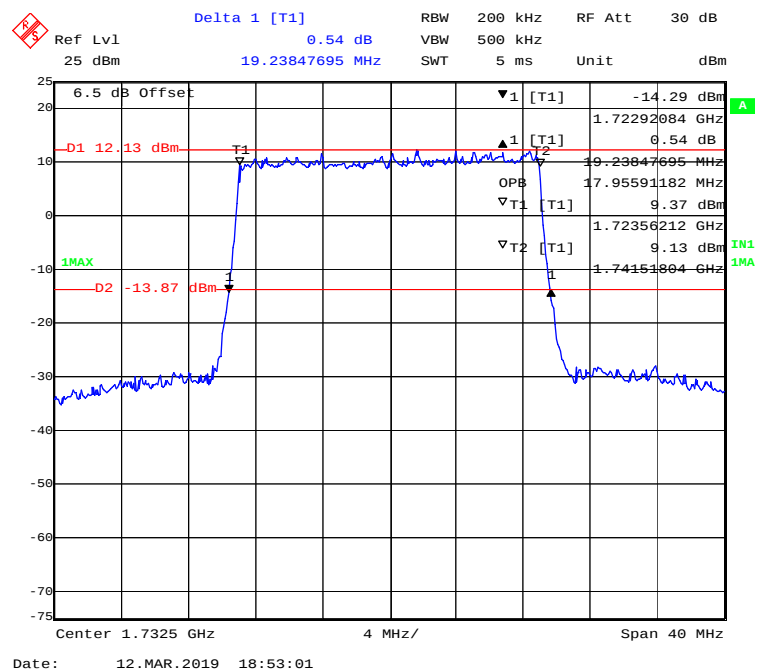
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



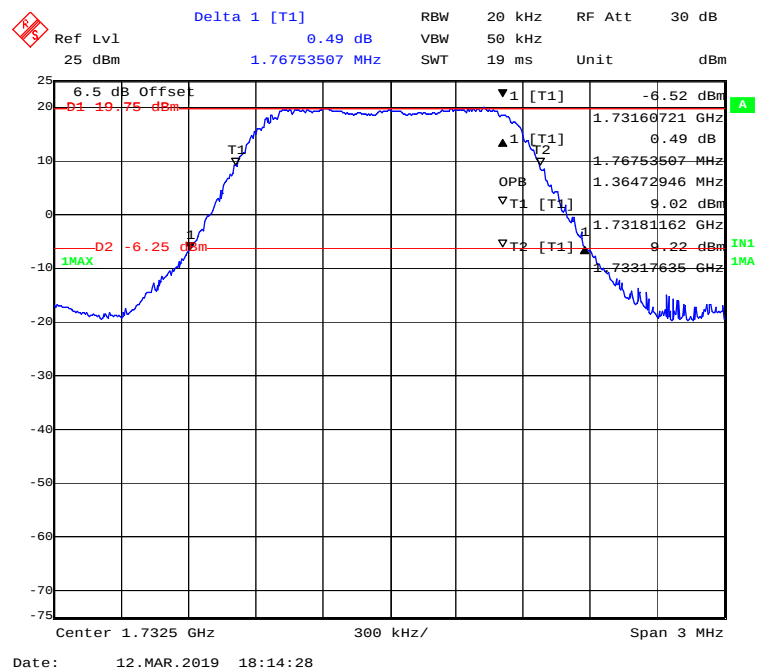
QPSK (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



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



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



Delta 1 [T1] 1.73 dB
 Ref Lvl 25 dBm
 RBW 100 kHz
 RF Att 30 dB
 3.11422846 MHz
 VBW 300 kHz
 SWT 5 ms
 Unit dBm

6.5 dB Offset
 D1 15.48 dBm
 1 15.48 dBm
 1MAX
 D2 -10.52 dBm
 1MA
 T1 [T1] 1.73 dB
 T2 [T1] 1.73 dB
 OPB
 T1 [T1] 9.38 dBm
 T2 [T1] 9.28 dBm
 -10.22 dBm
 1.73093086 GHz
 1.731422846 MHz
 2.75350701 MHz
 1.73112325 GHz
 1.73387675 GHz

Center 1.7325 GHz
 600 kHz/
 Span 6 MHz

Date: 12.MAR.2019 18:26:18

Ref Lvl 25 dBm

Delta 1 [T1] 0.51 dB

RBW 100 kHz

RF Att 30 dB

SWT 5 ms

Unit dBm

6.5 dB Offset

D1 14.29 dBm

T1

1

1MAX

D2 -11.71 dBm

1

1MA

▼1 [T1]

1 [T1]

OPB

▽T1 [T1]

▽T2 [T1]

1

1

1.72998497 GHz

0.51 dB

5.01002004 MHz

4.52905812 MHz

9.33 dBm

1.73024549 GHz

9.25 dBm

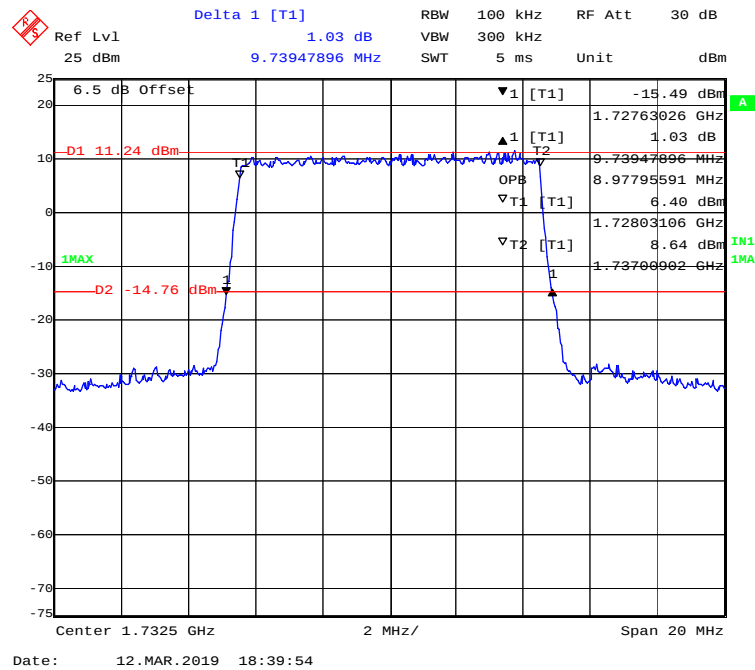
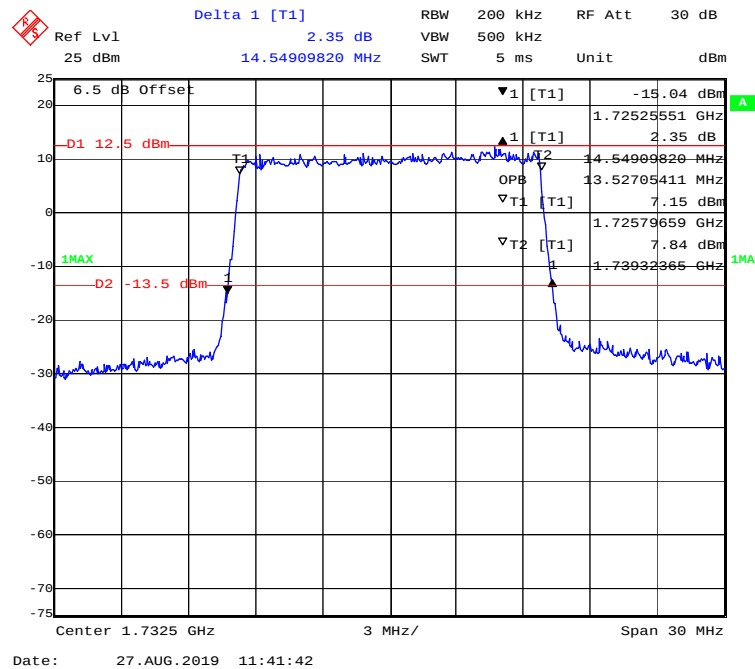
1.73477455 GHz

Center 1.7325 GHz

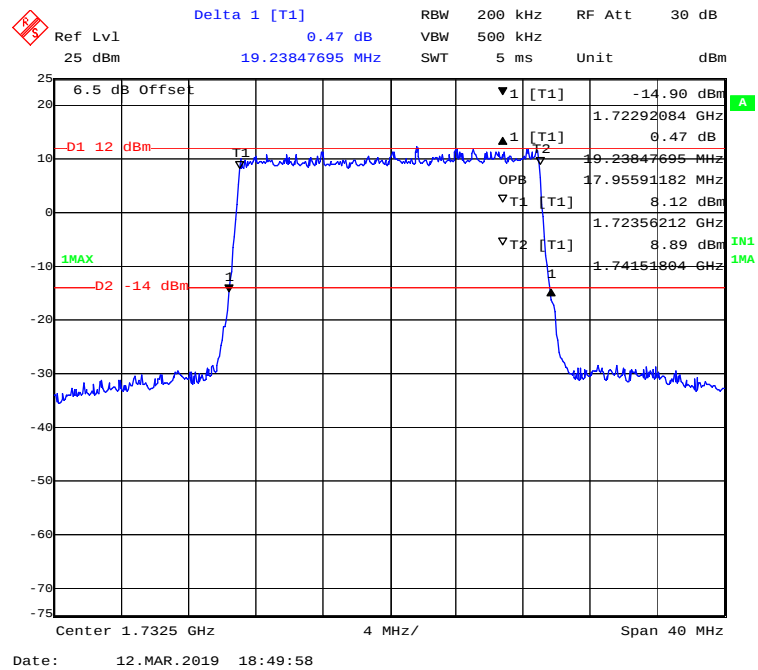
1 MHz/

Span 10 MHz

Date: 12.MAR.2019 18:33:31

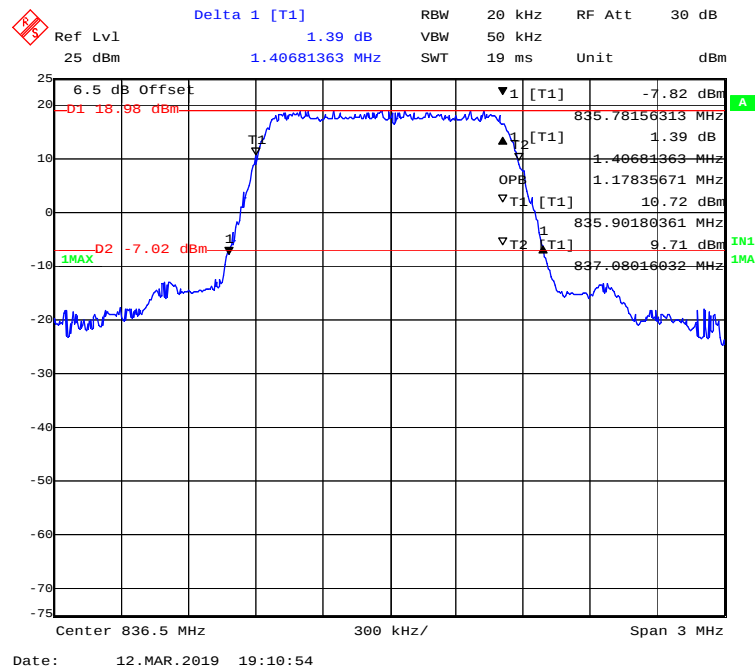
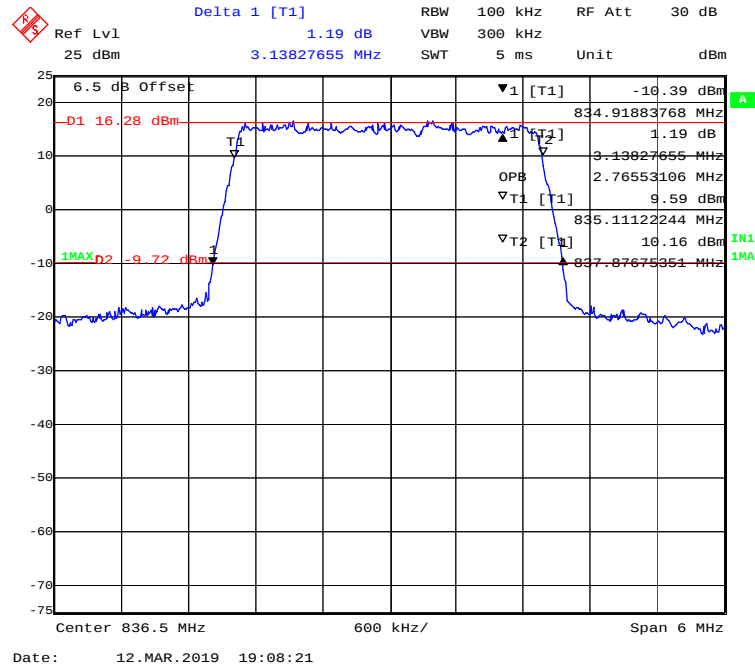
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

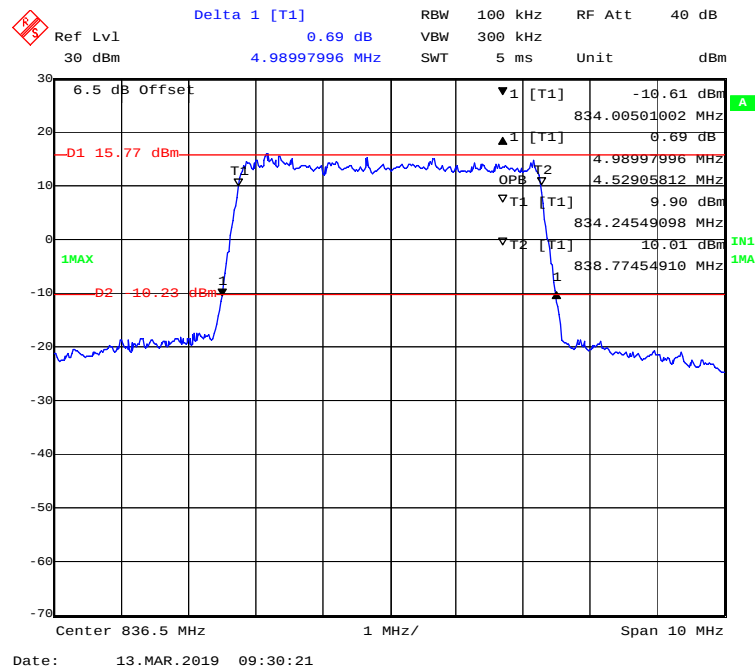
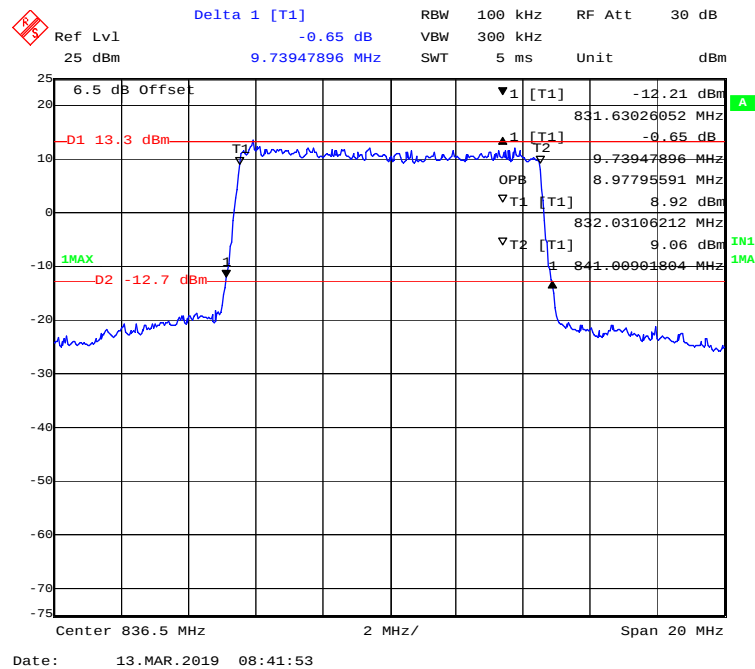
16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

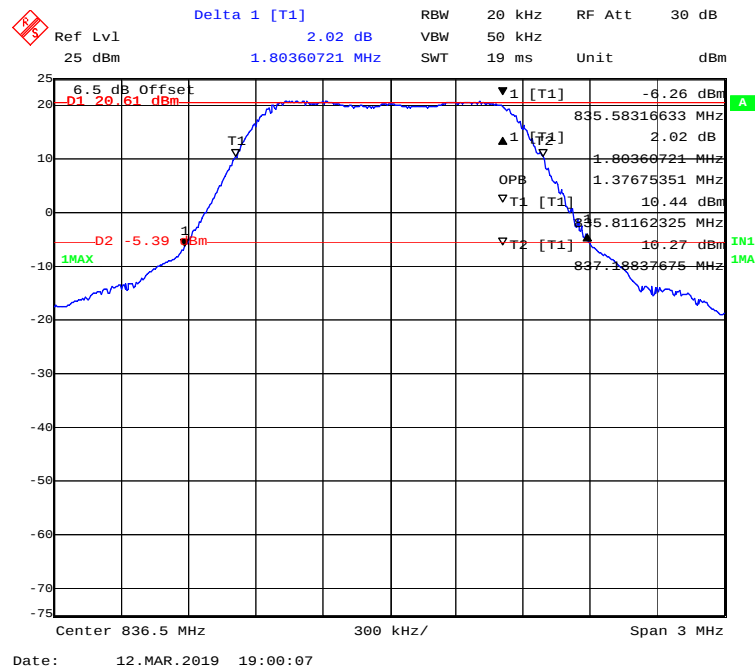
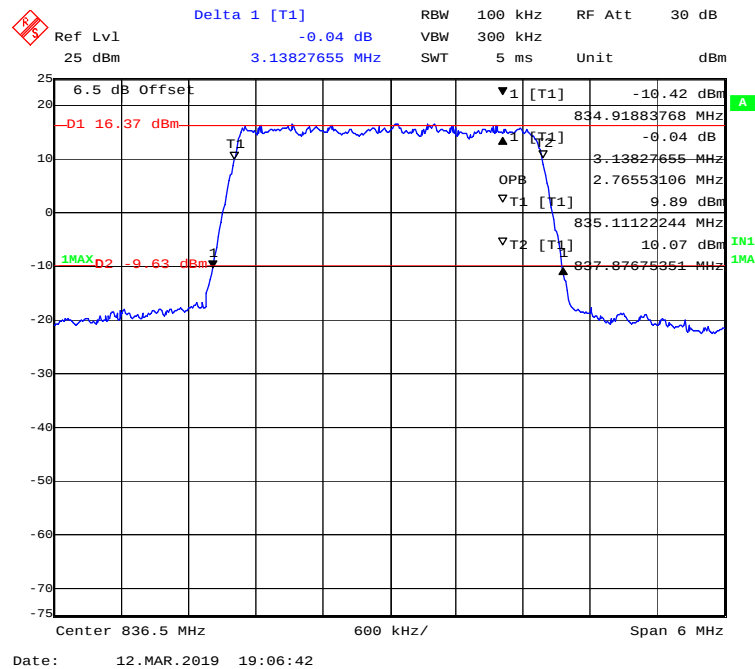


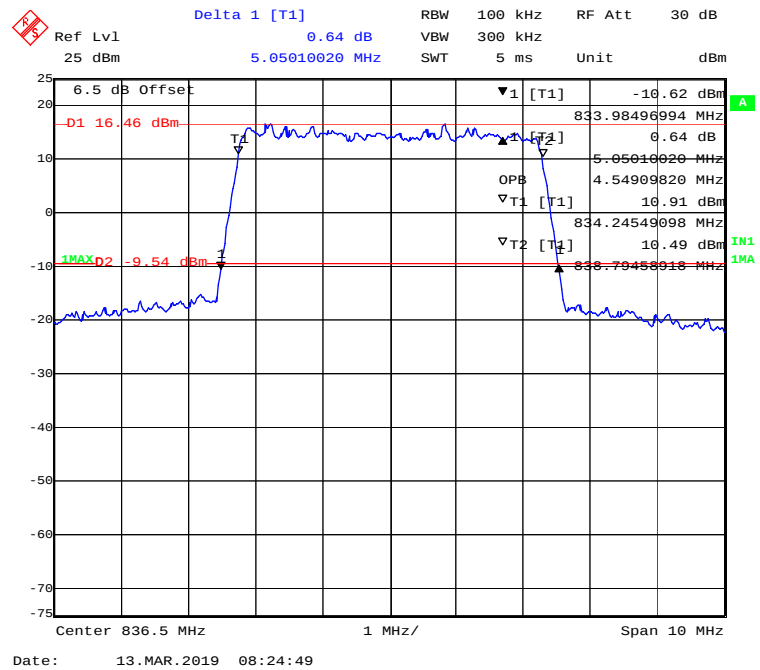
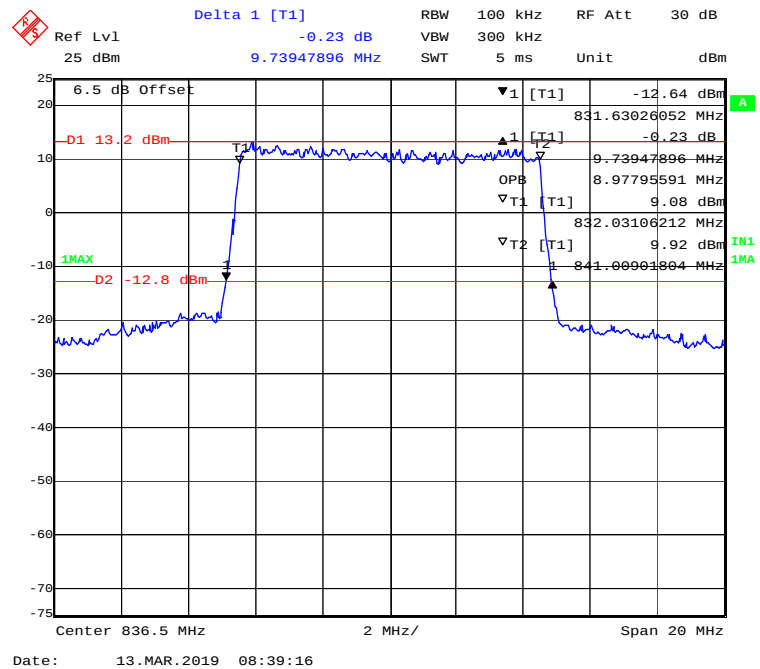
LTE Band 5:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.407	1.178
	3M		3.138	2.766
	5M		4.990	4.529
	10M		9.739	8.978
16-QAM	1.4M	Middle	1.804	1.377
	3M		3.138	2.766
	5M		5.050	4.549
	10M		9.739	8.978

QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

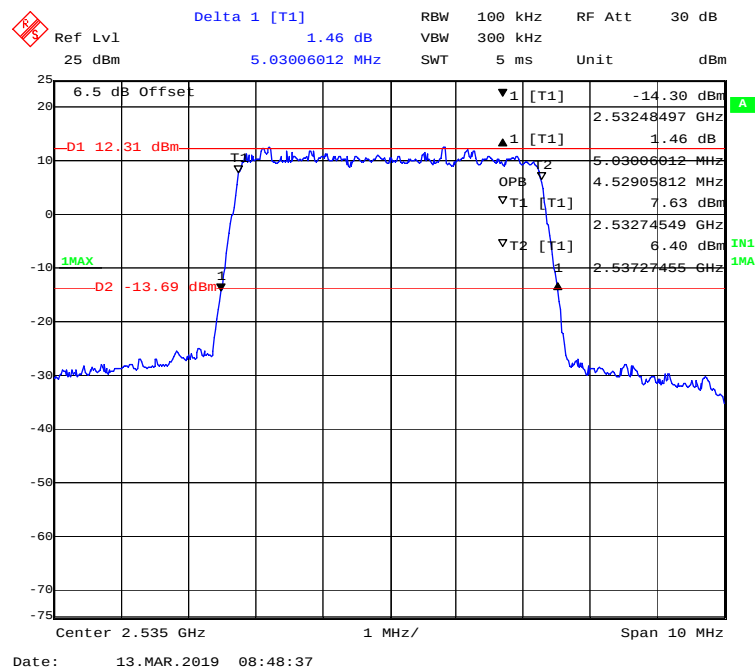
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (10.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

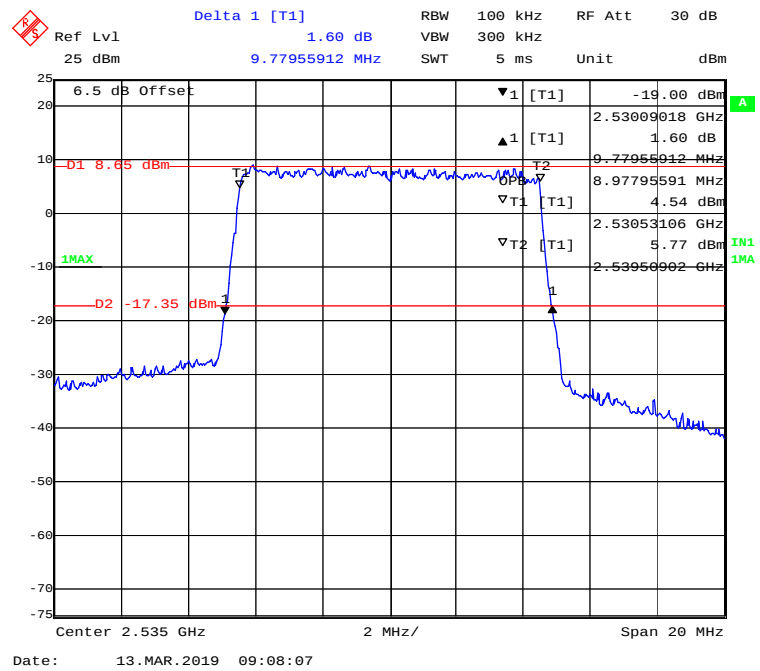
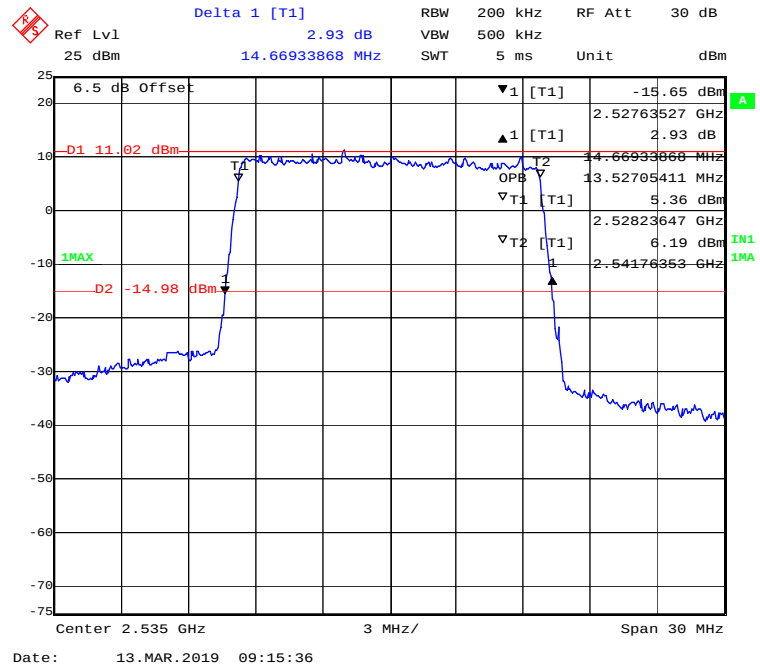
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

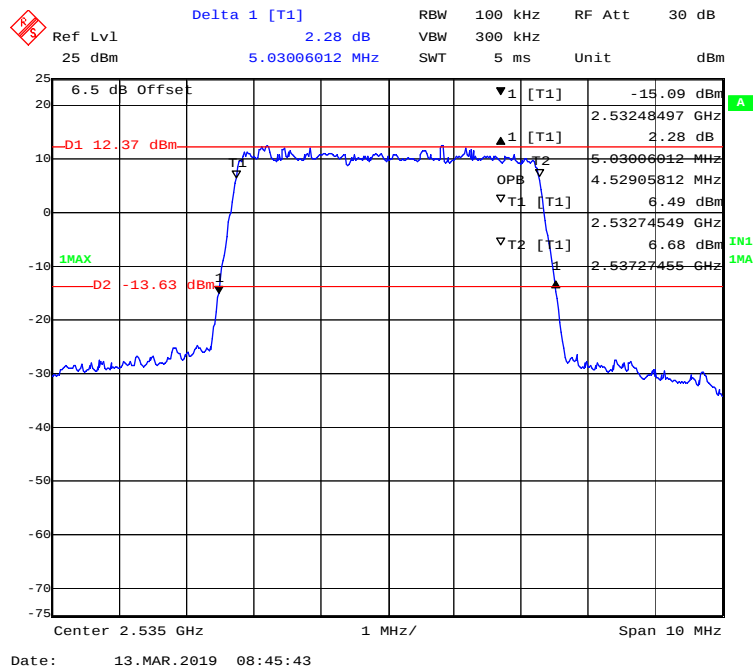
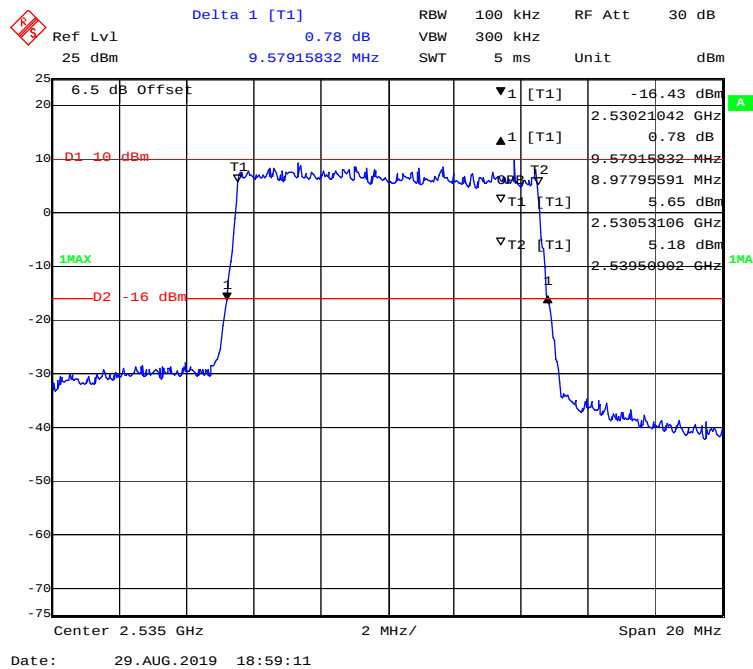
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

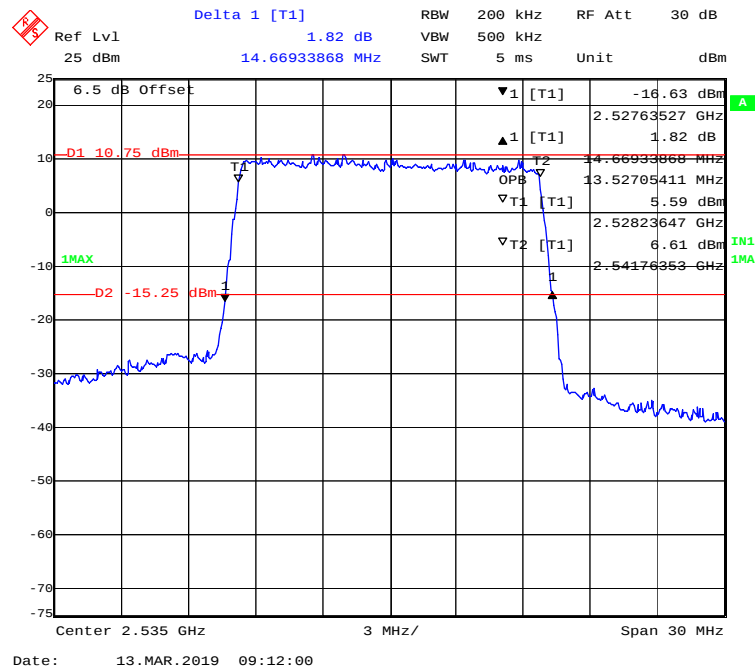
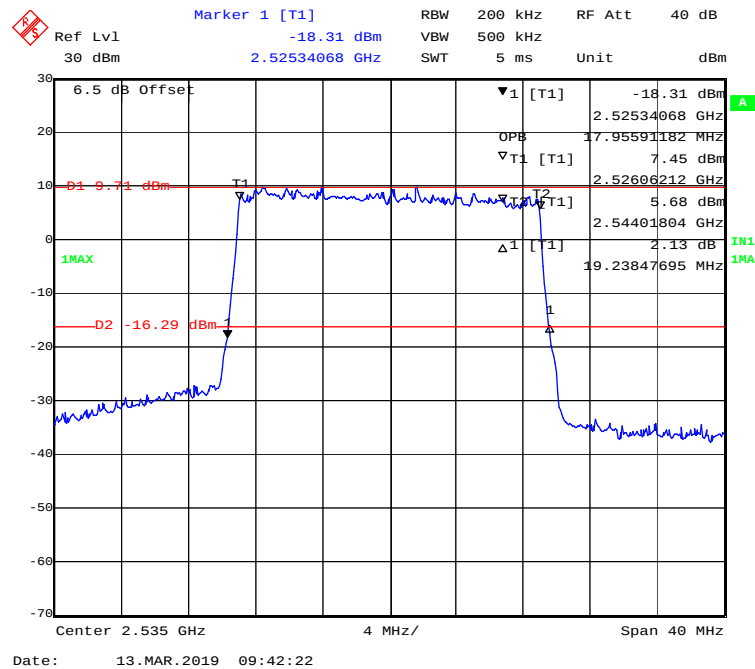
LTE Band 7:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	5.030	4.529
	10M		9.780	8.978
	15M		14.669	13.527
	20M		19.479	17.956
16-QAM	5M	Middle	5.030	4.529
	10M		9.579	8.978
	15M		14.669	13.527
	20M		19.238	17.956

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

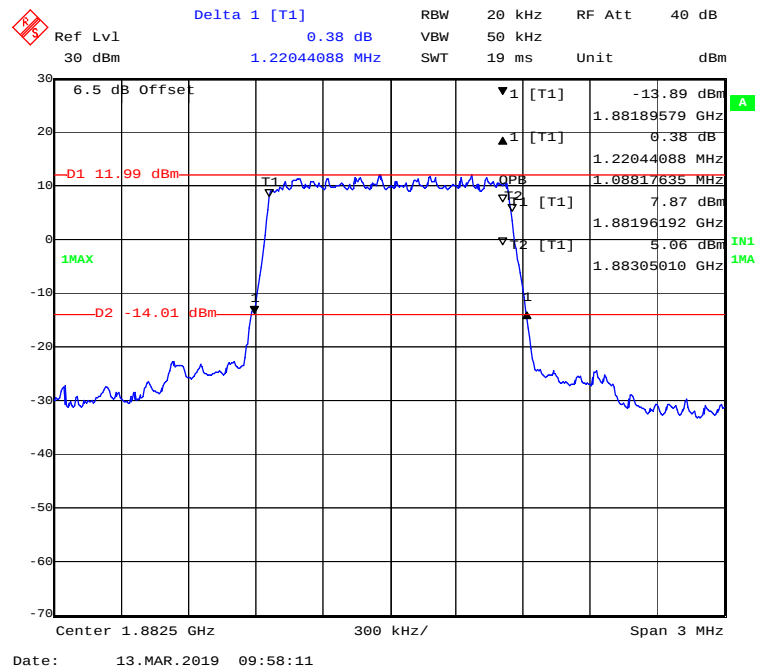
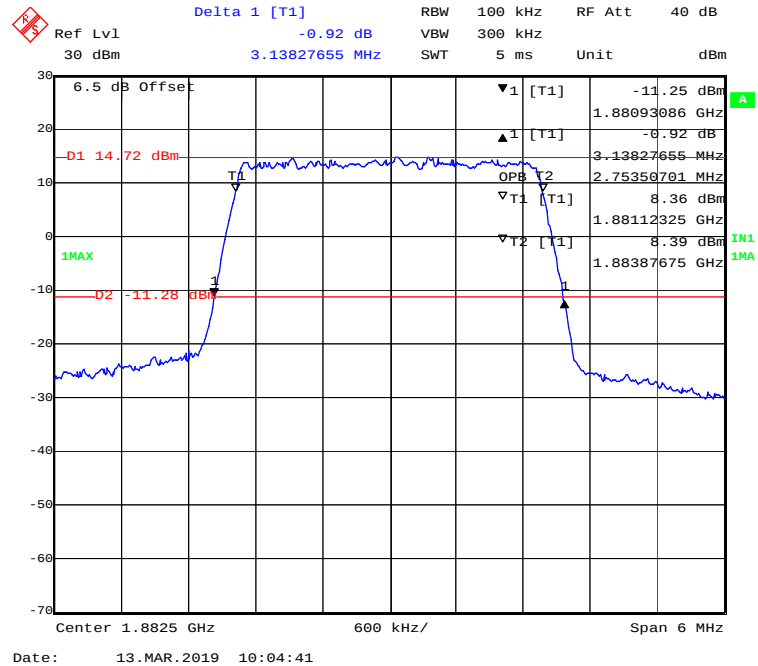
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (15.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

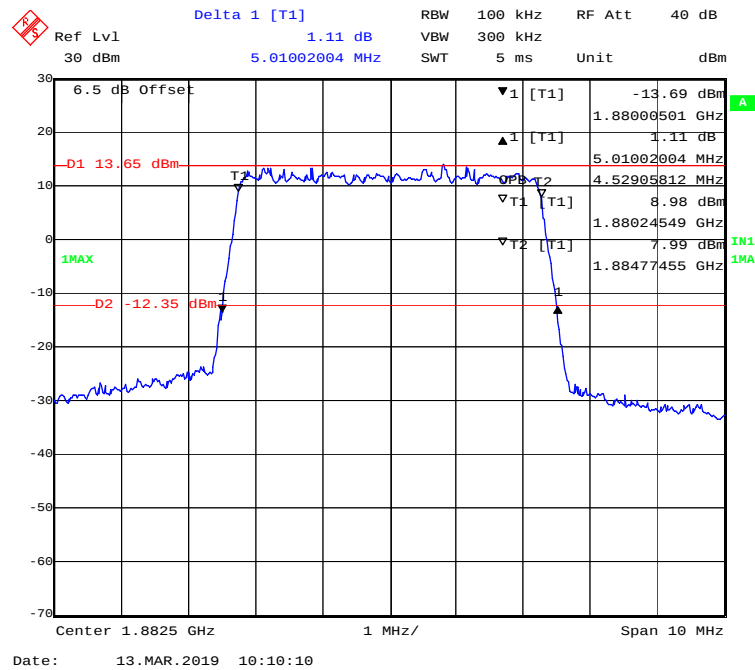
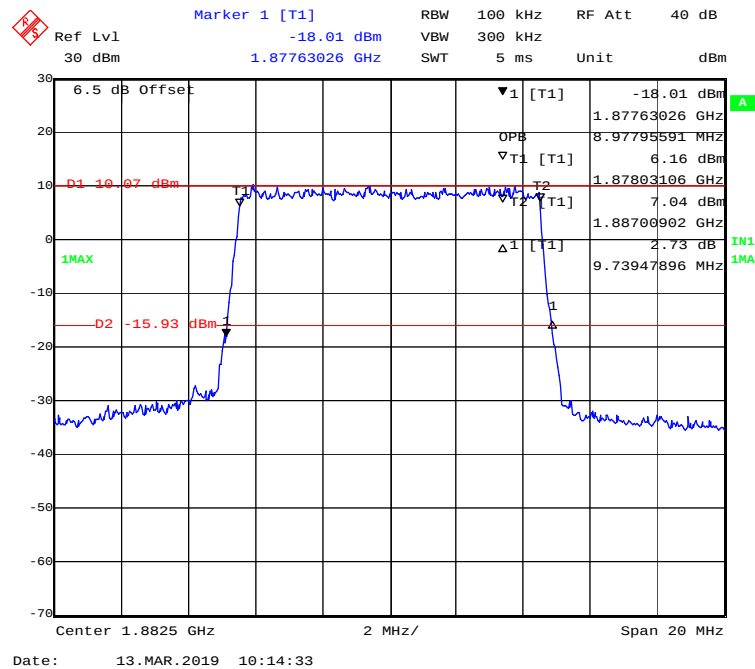
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

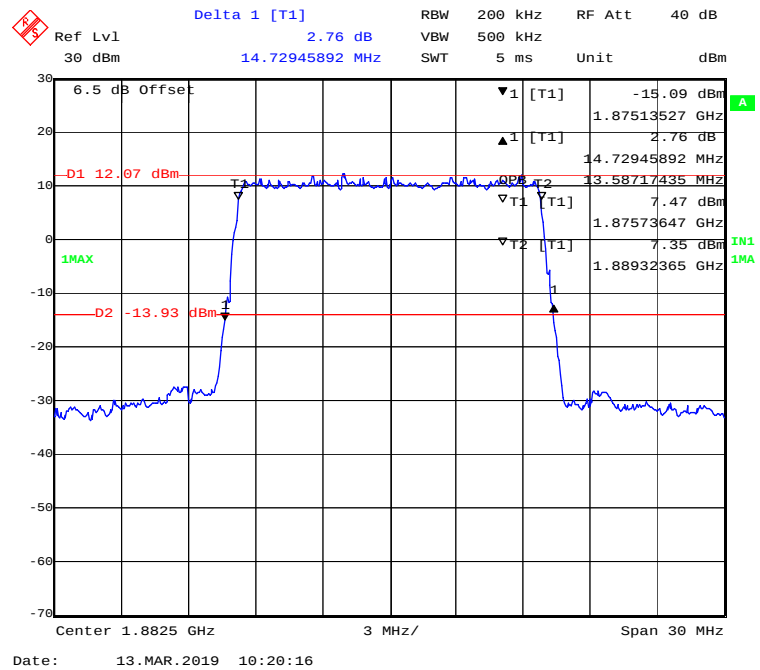
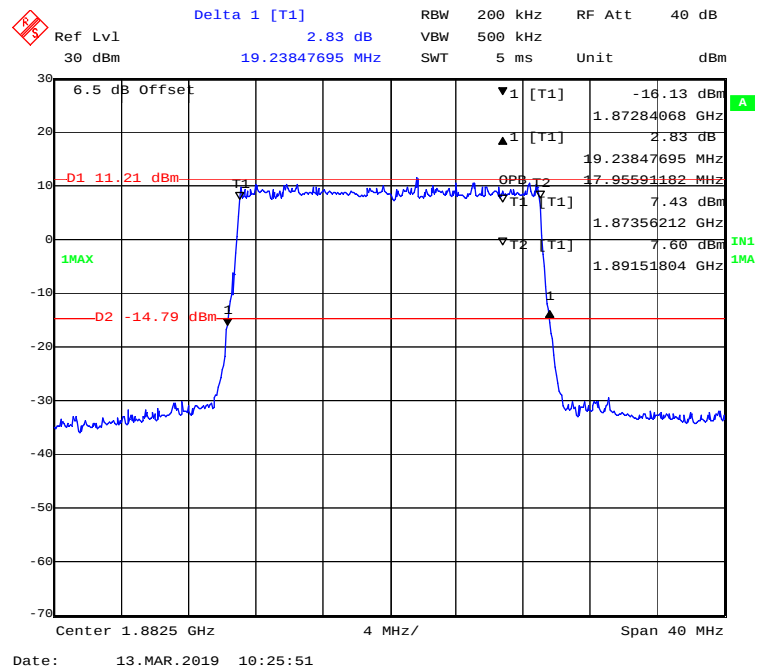
16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

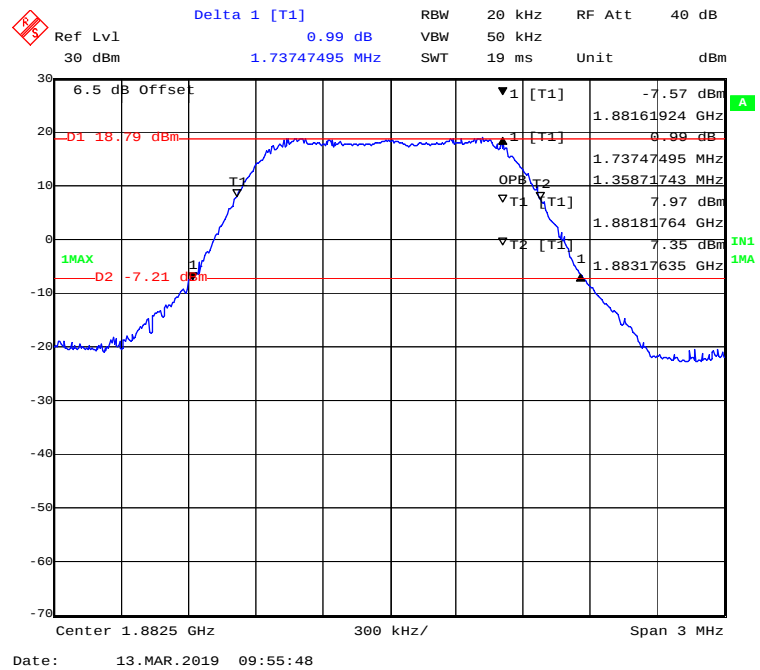
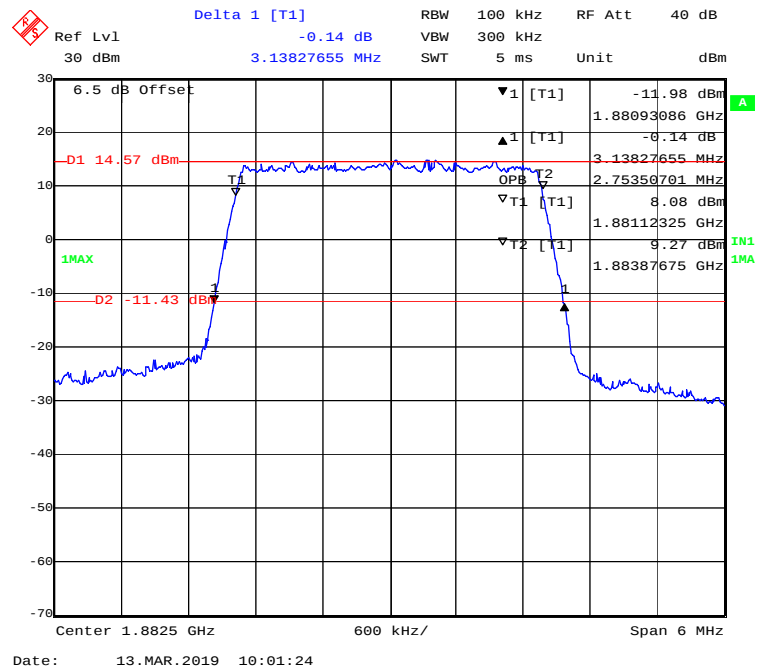
LTE Band 25:

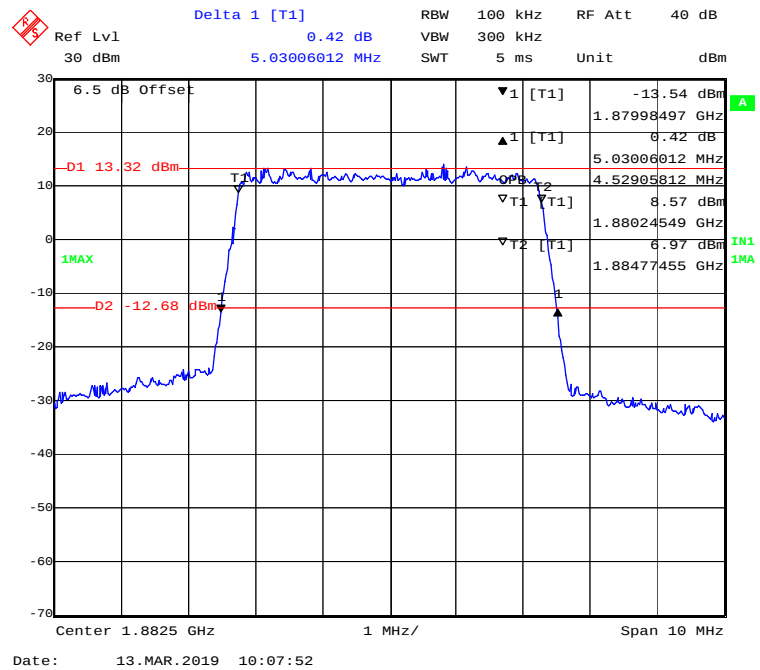
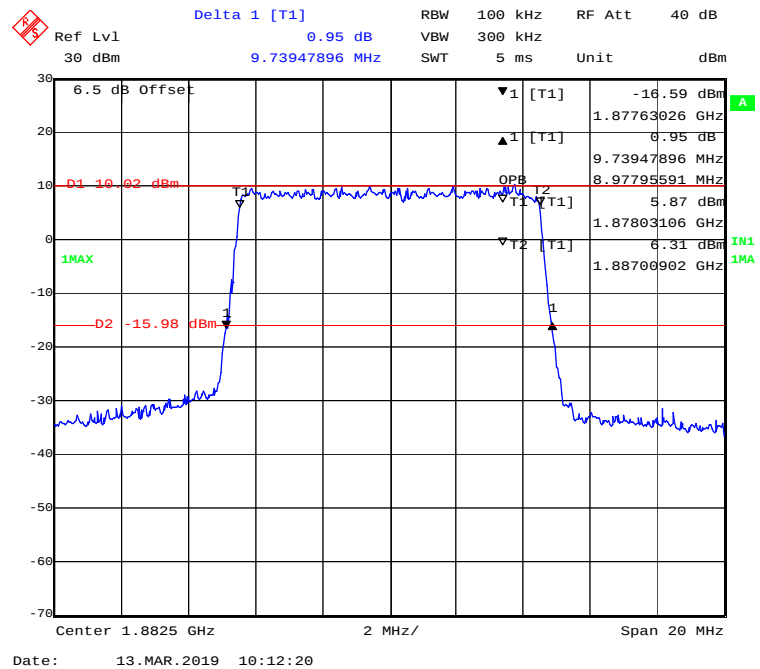
Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.220	1.088
	3M		3.138	2.754
	5M		5.010	4.529
	10M		9.939	8.978
	15M		14.729	13.587
	20M		19.238	17.956
16-QAM	1.4M	Middle	1.737	1.358
	3M		3.138	2.754
	5M		5.030	4.529
	10M		9.739	8.978
	15M		14.729	13.467
	20M		19.259	17.956

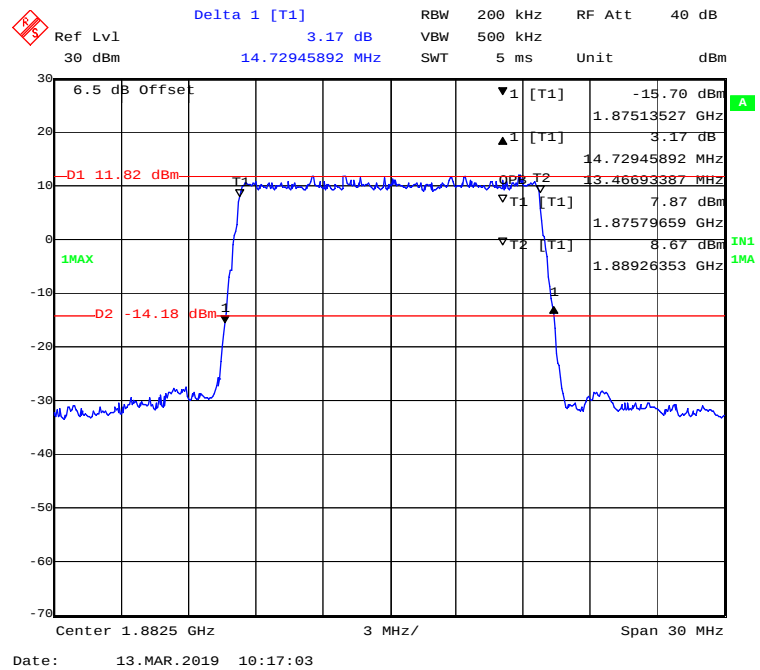
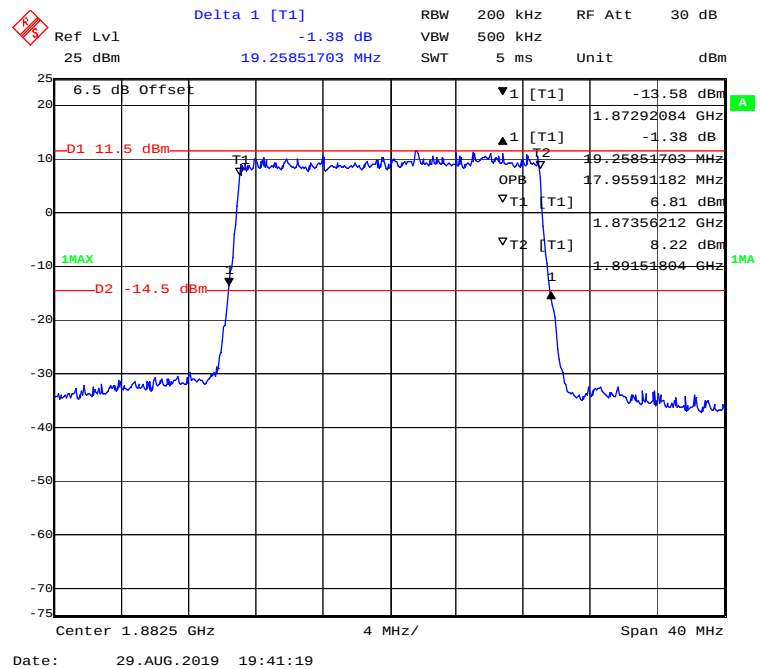
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (10.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

QPSK (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

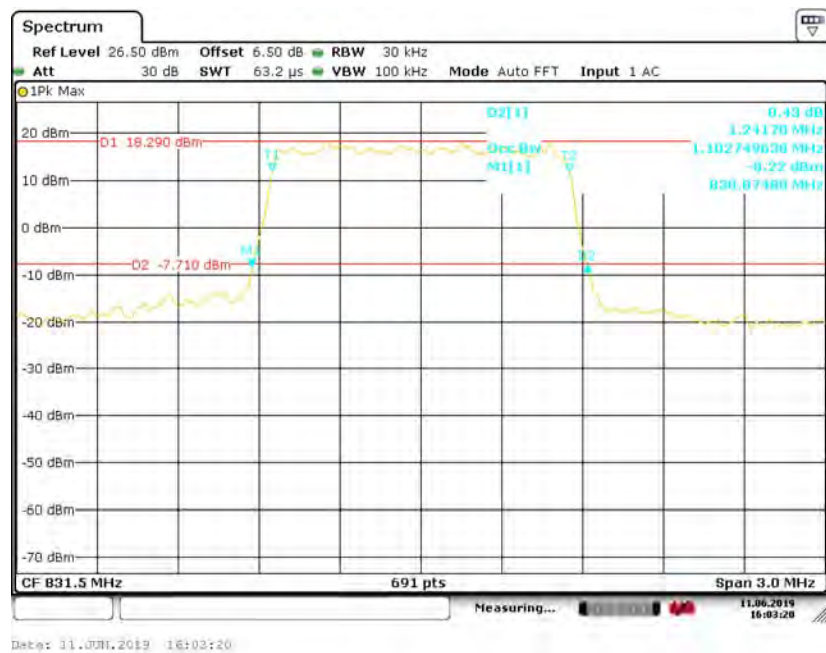
16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

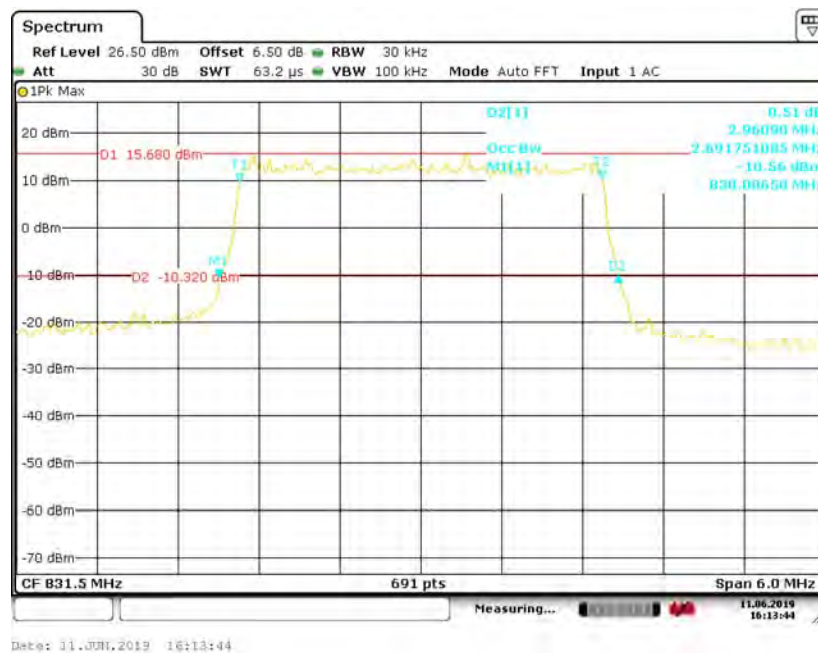
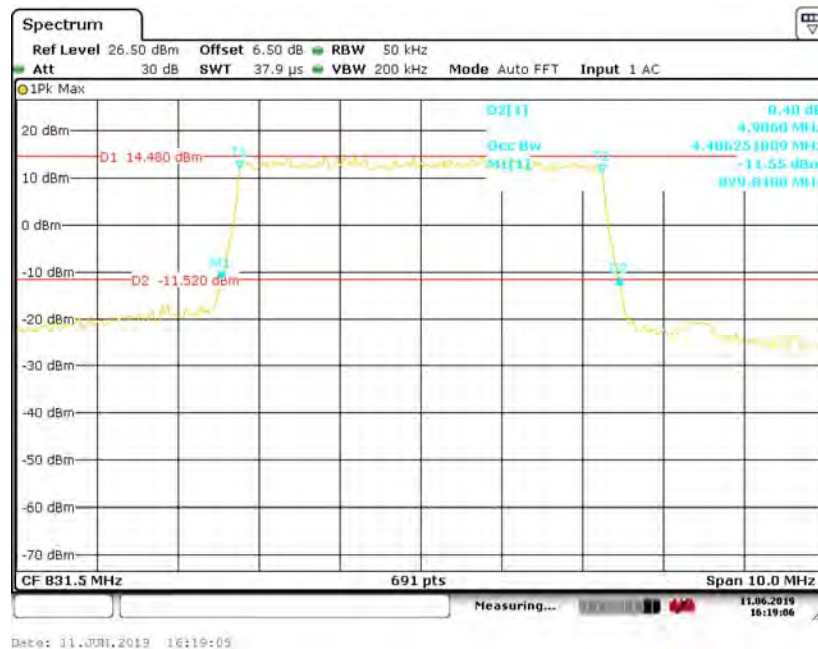
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

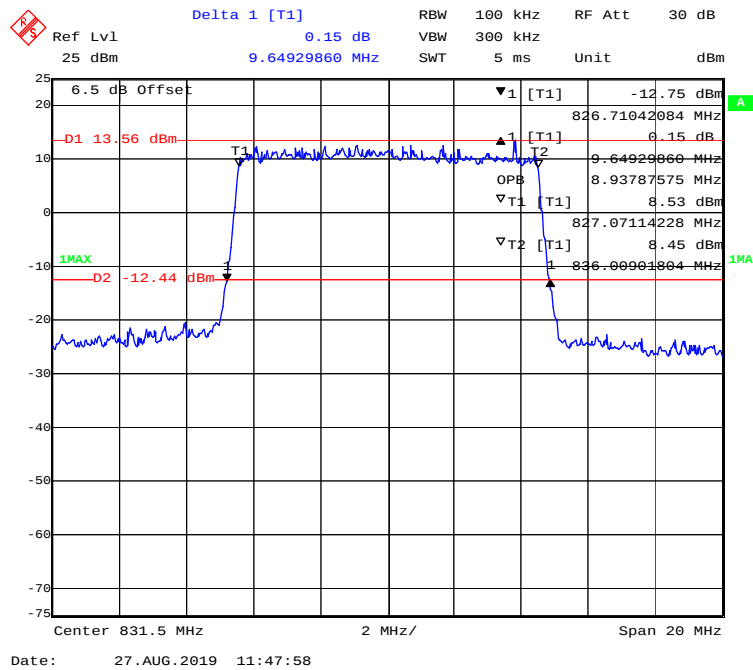
LTE Band 26:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.241	1.103
	3M		2.961	2.692
	5M		4.906	4.486
	10M		9.649	8.938
	15M		14.674	13.459
16-QAM	1.4M	Middle	1.242	1.103
	3M		2.961	2.692
	5M		4.906	4.486
	10M		9.725	8.944
	15M		14.631	13.459

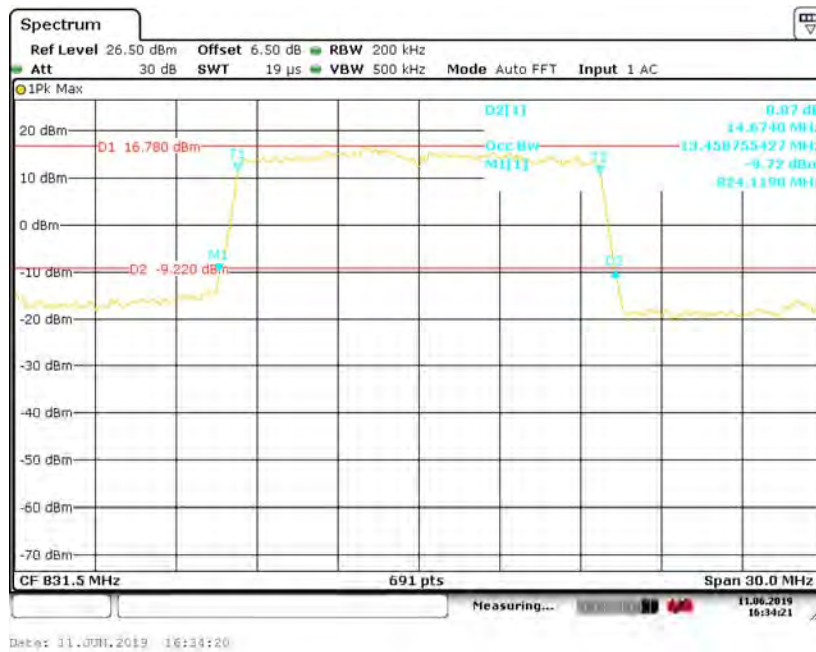
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

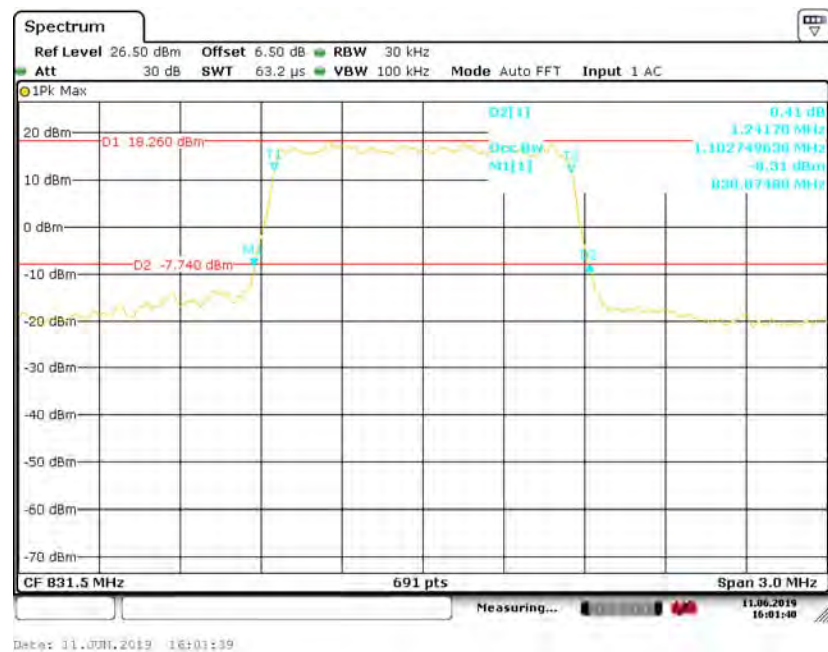
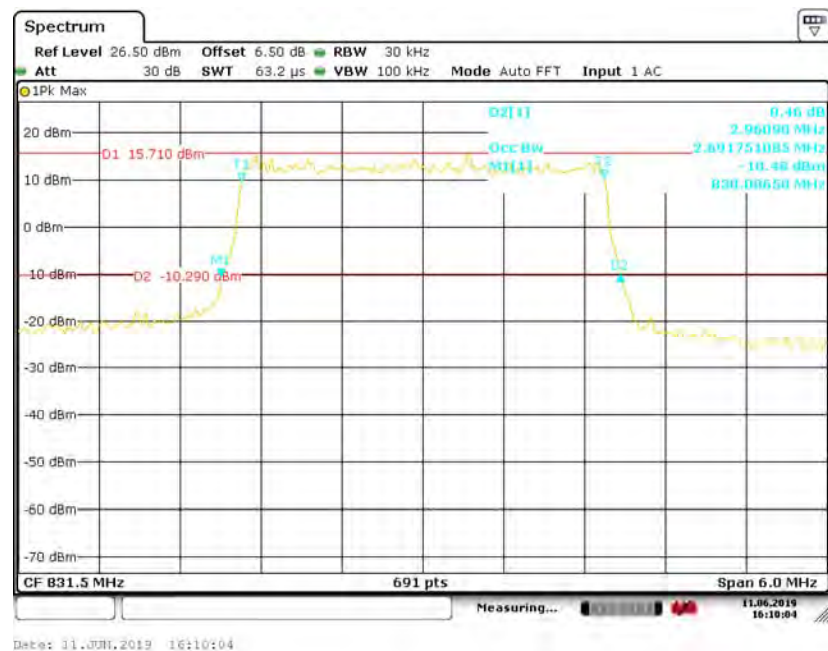
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (5.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

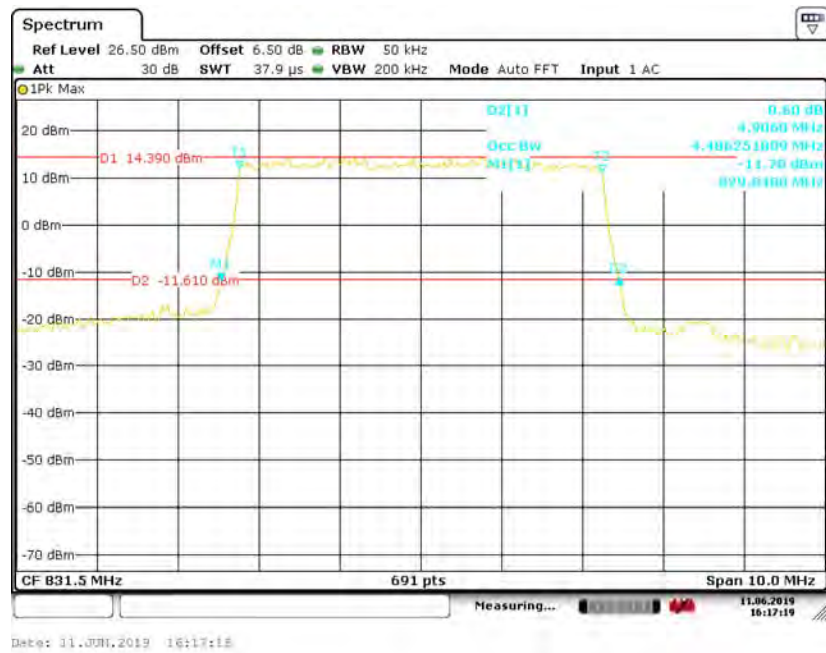
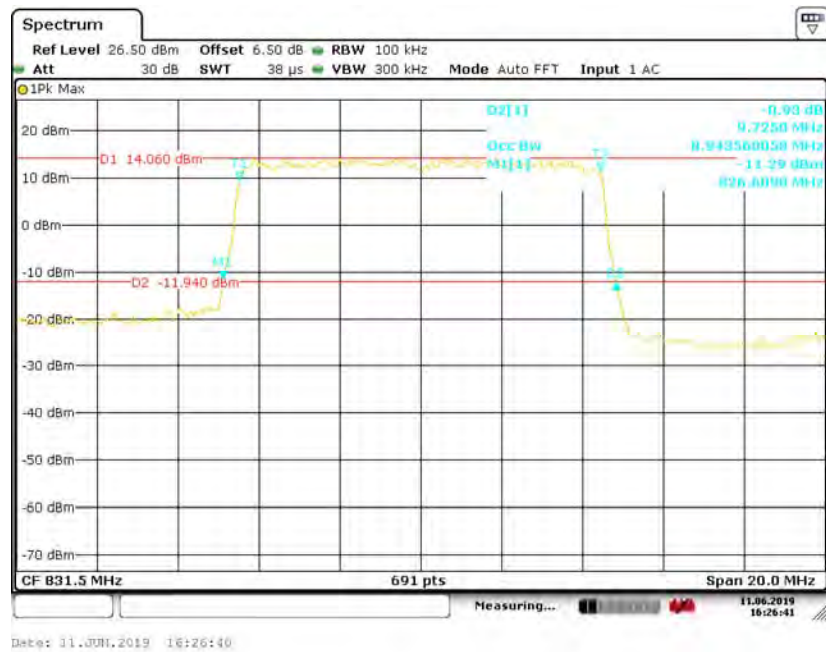
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



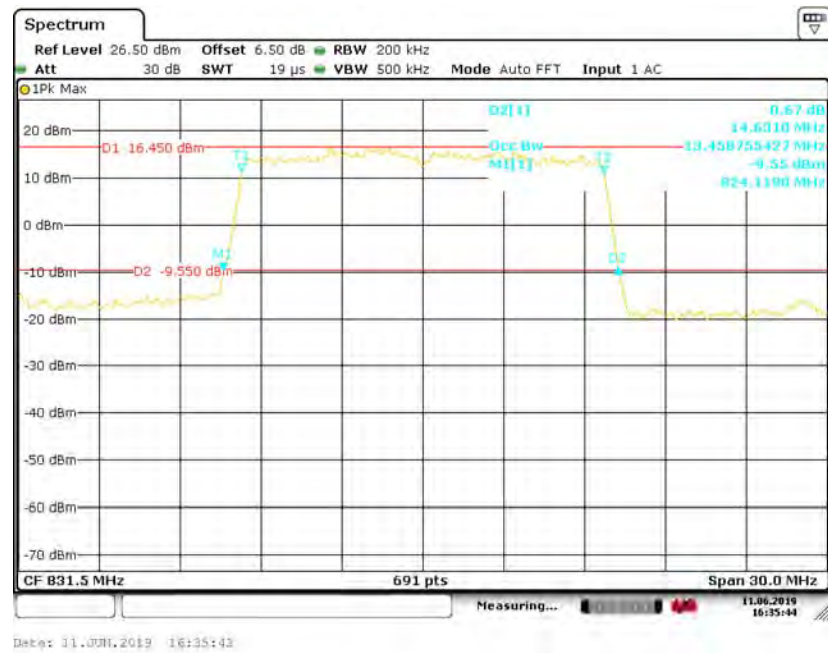
QPSK (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

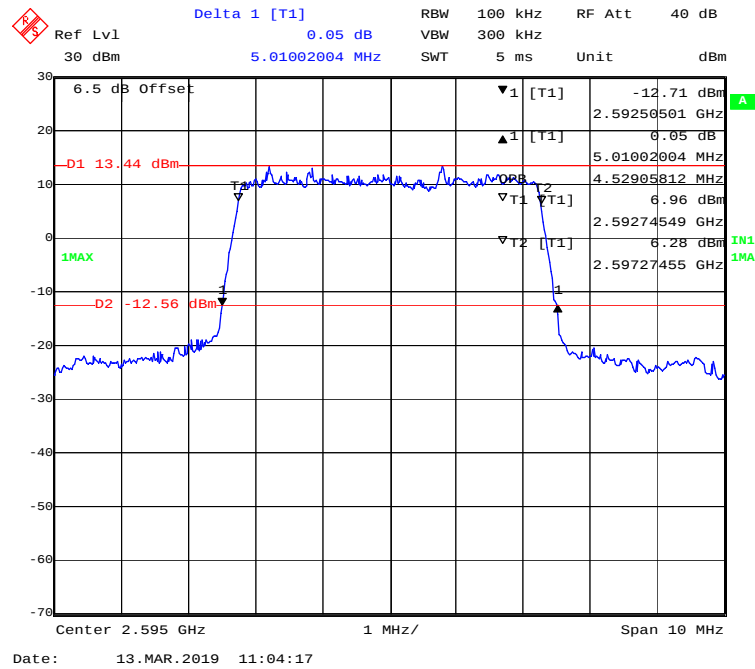
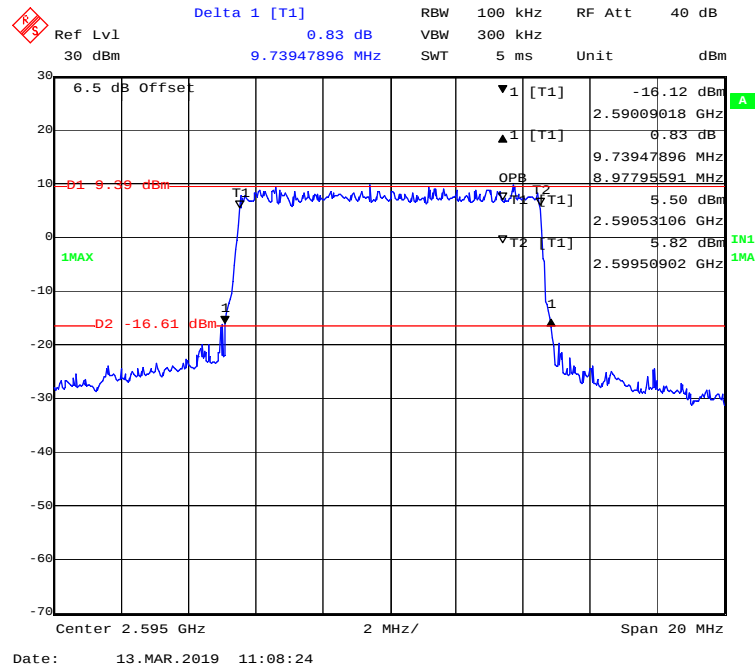
16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

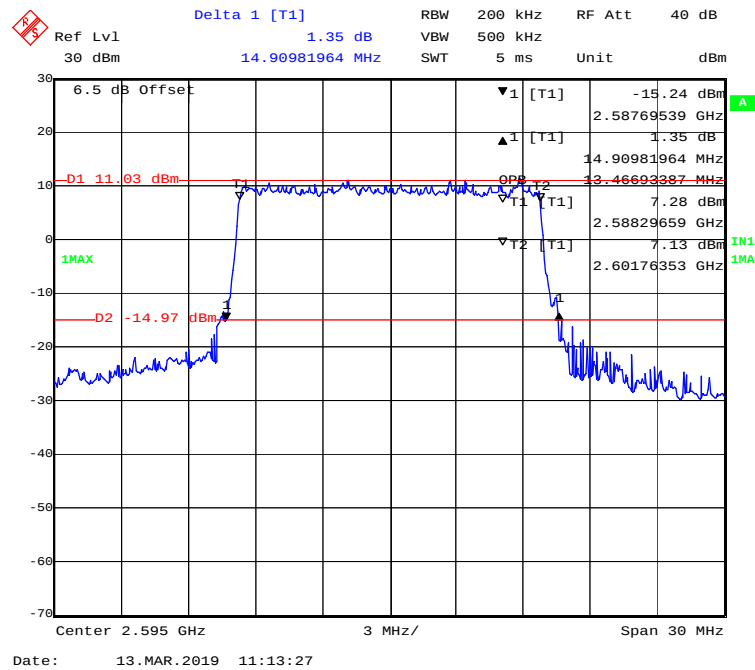
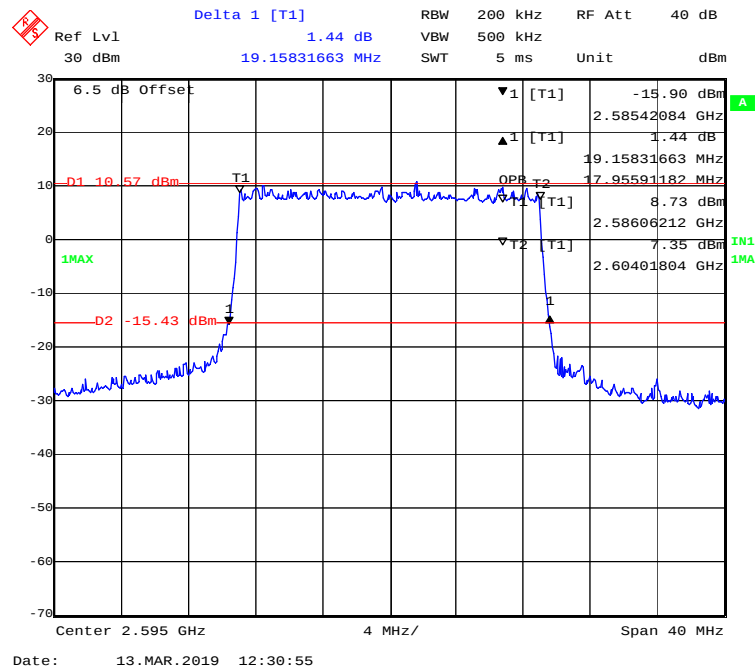
16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

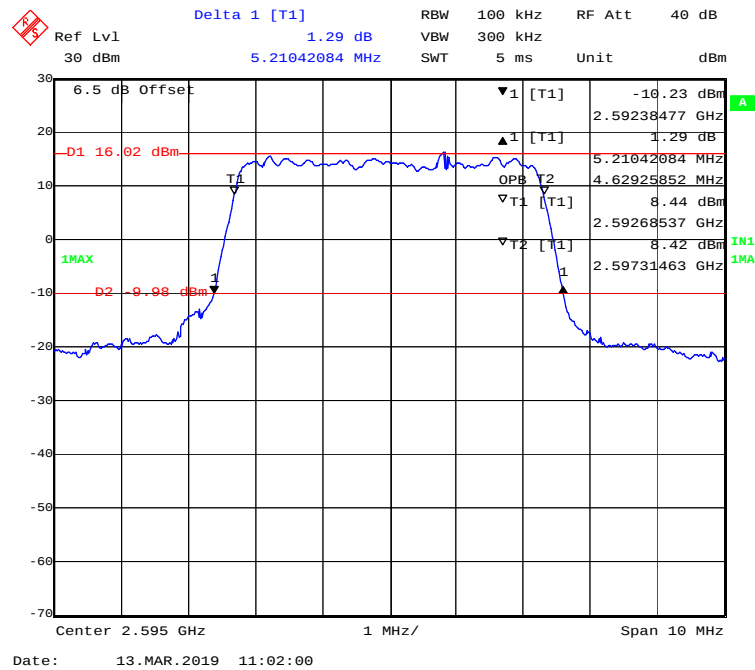
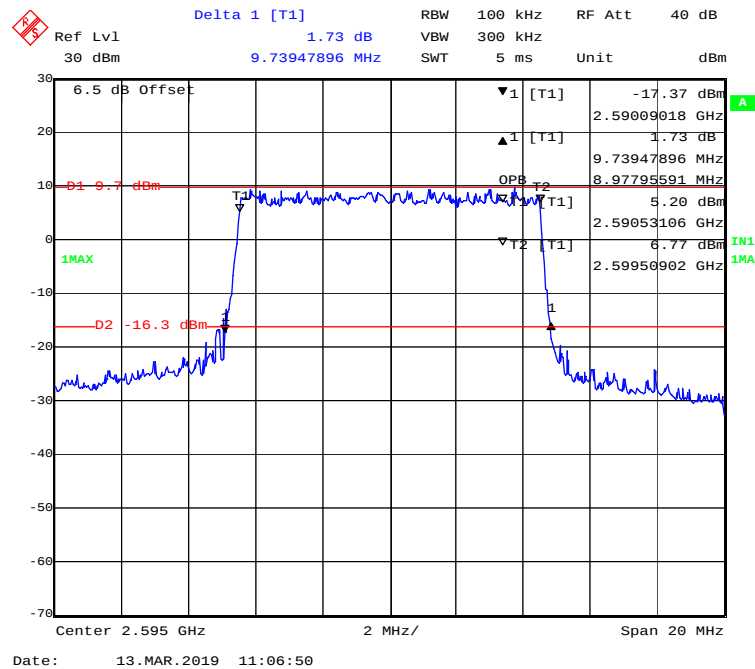


LTE Band 38:

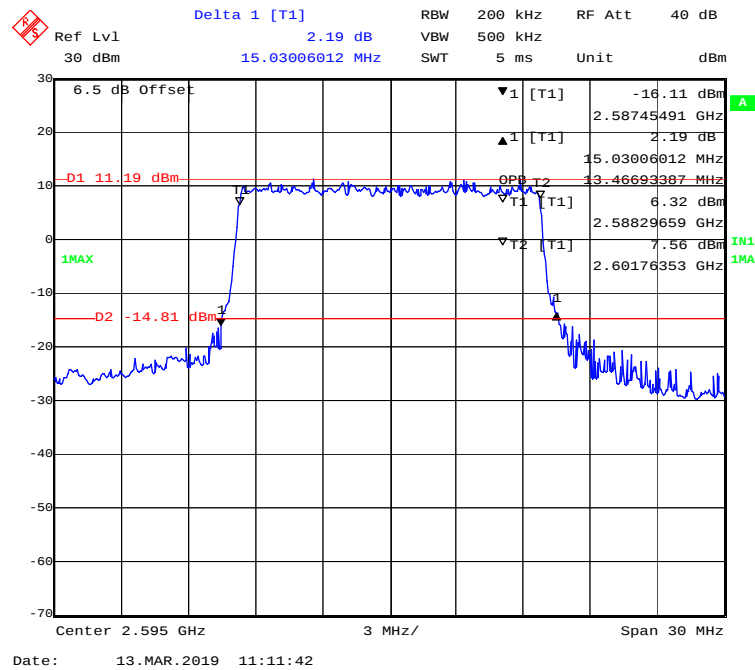
Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
QPSK	5M	Middle	5.010	4.529
	10M		9.739	8.978
	15M		14.910	13.467
	20M		19.158	17.956
16-QAM	5M	Middle	5.210	4.629
	10M		9.739	8.978
	15M		15.030	13.467
	20M		19.238	17.956

LTE Band 38:**QPSK (5 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel****QPSK (10 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

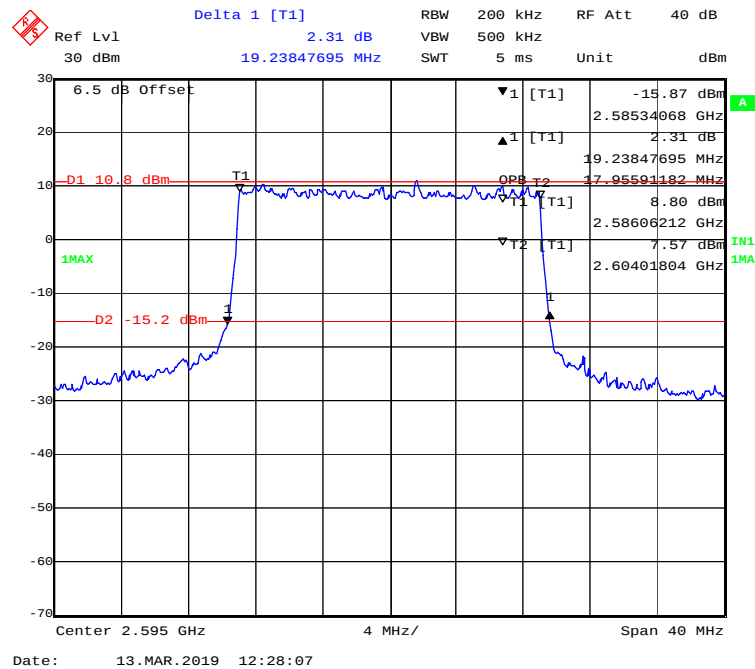
QPSK (15MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (20 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

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

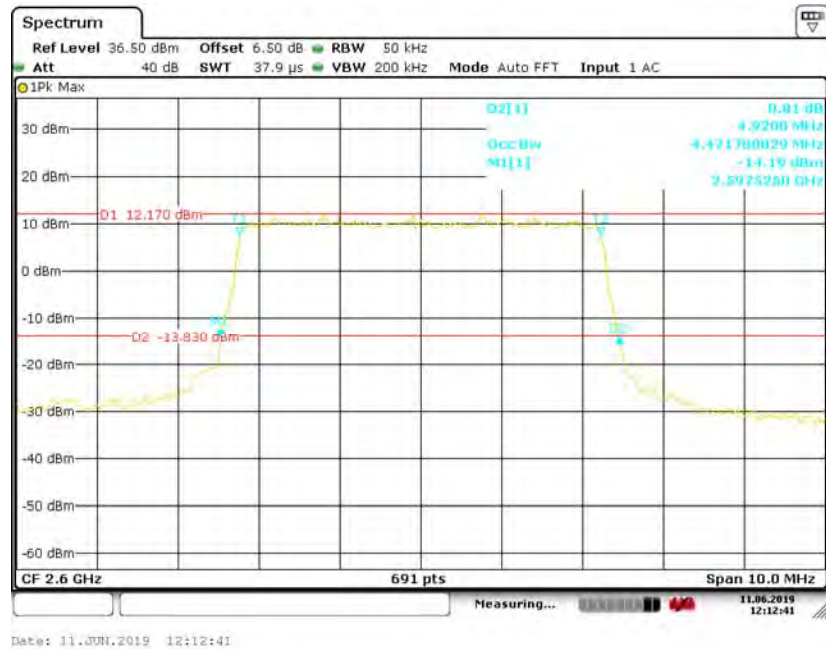
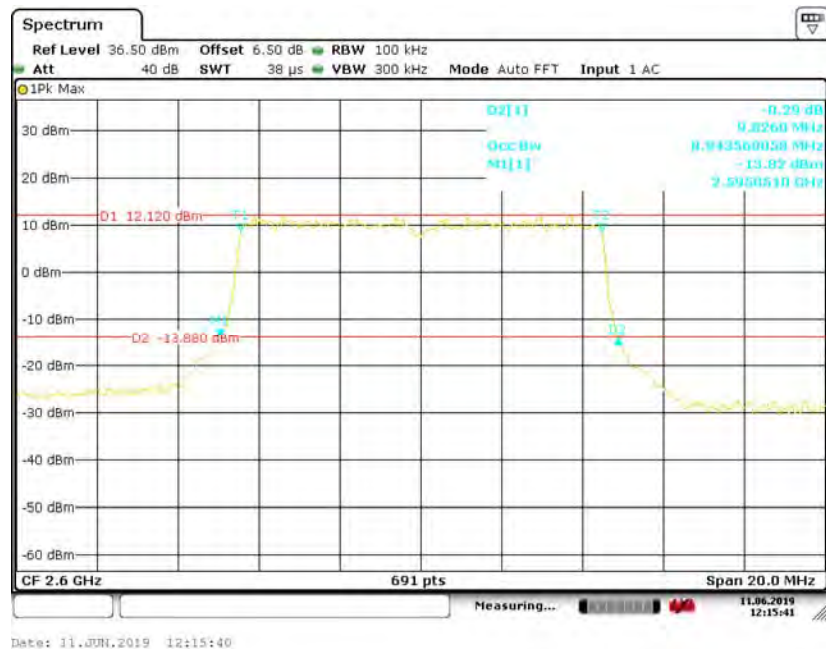


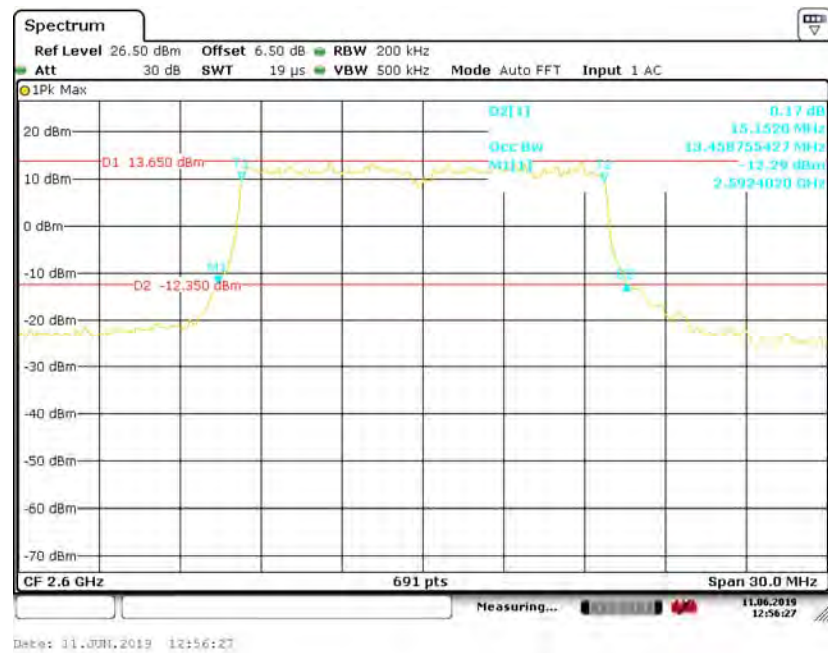
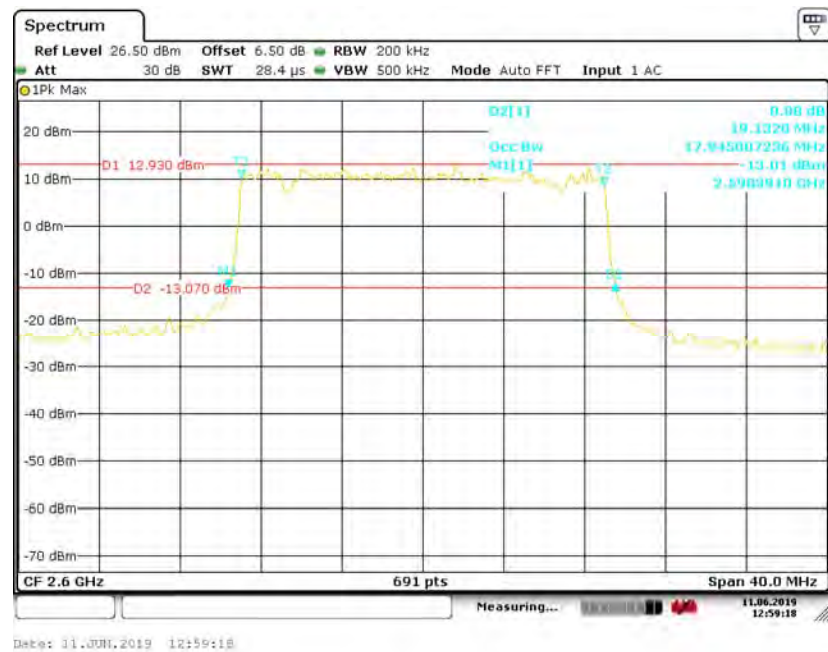
16-QAM (20 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

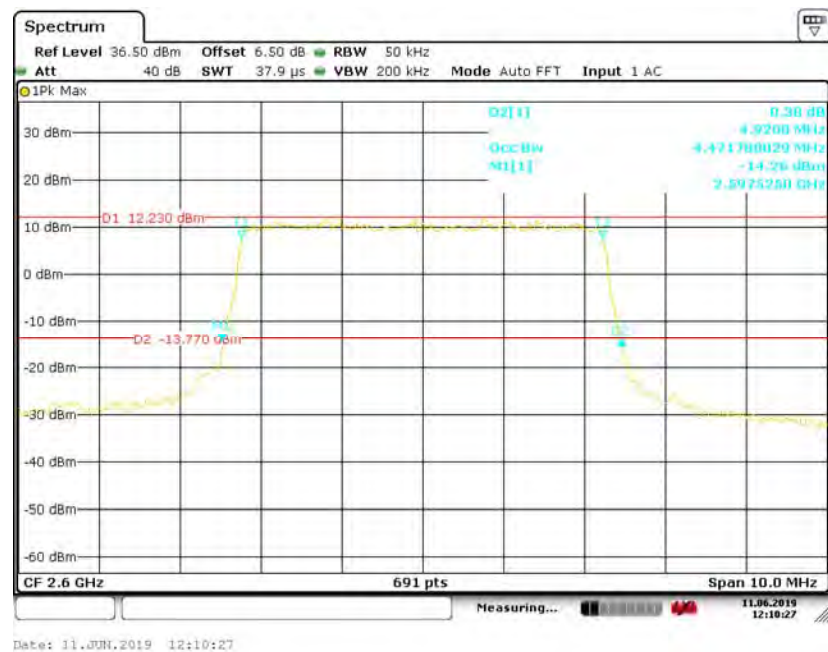
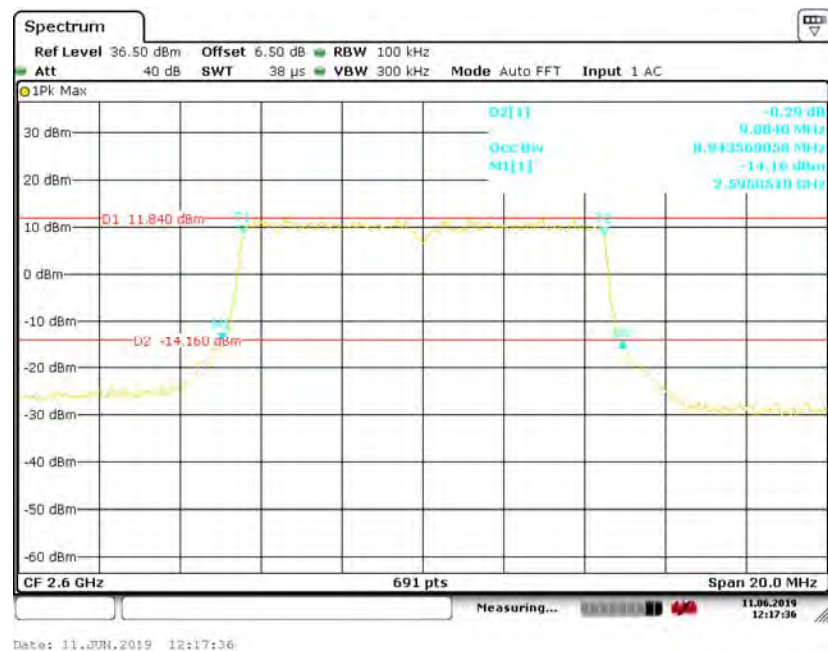


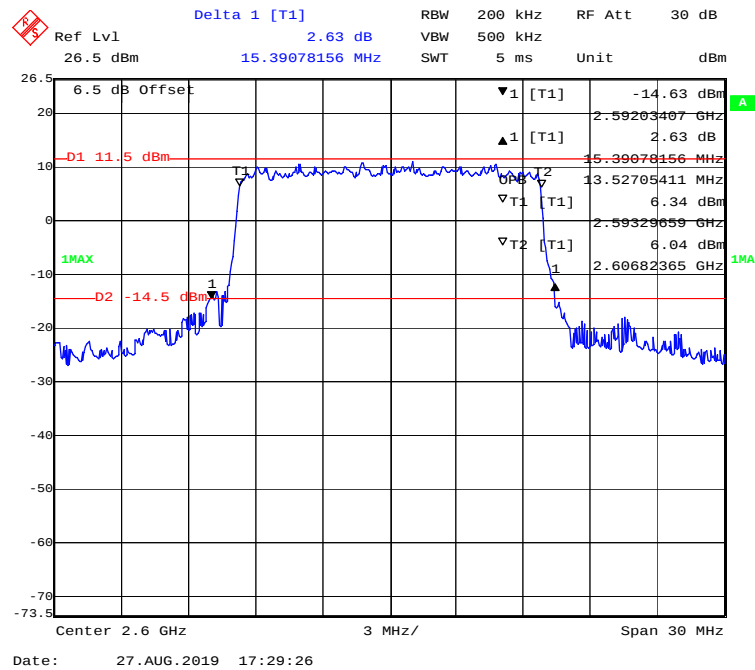
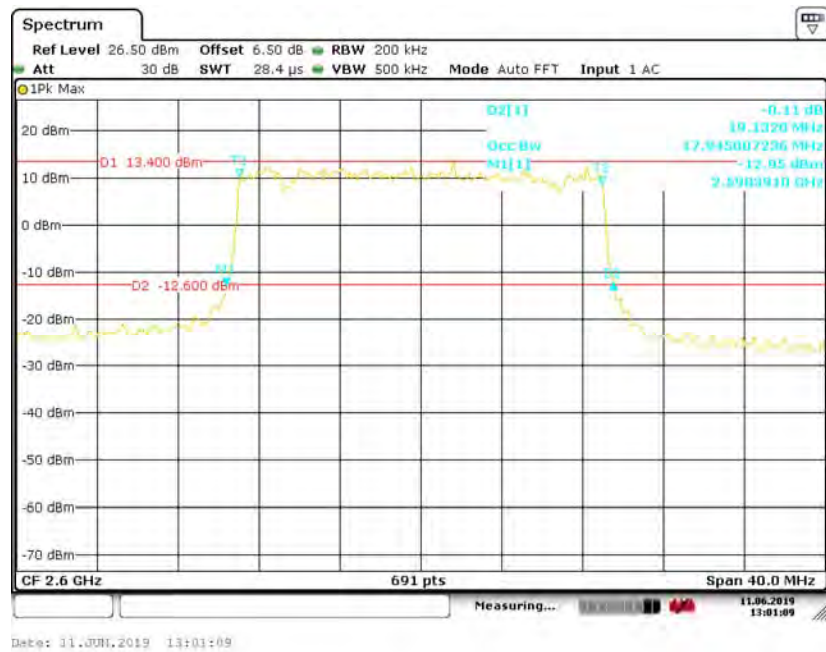
LTE Band 41:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
QPSK	5M	Middle	4.920	4.470
	10M		9.826	8.944
	15M		15.152	13.459
	20M		19.132	17.945
16-QAM	5M	Middle	4.920	4.472
	10M		9.884	8.944
	15M		15.391	13.527
	20M		19.132	17.945

LTE Band 41:**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 (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**

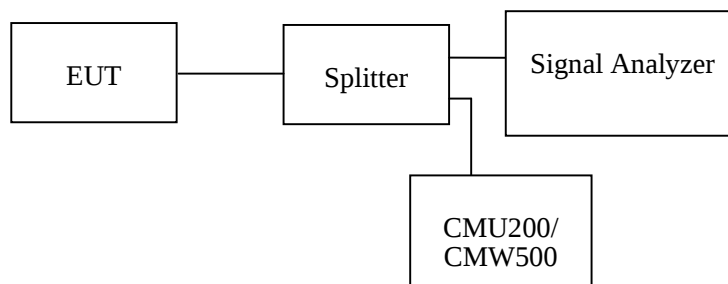
**FCC § 2.1051; § 22.917 (a); § 24.238 (a); §27.53(c) (f) (h) (m); § 90.691 -
SPURIOUS EMISSIONS AT ANTENNA TERMINALS****Applicable Standards**

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

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

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for below 1GHz & 1MHz for above 1GHz. sufficient scans were taken to show any out of band emissions up to 10th harmonic.

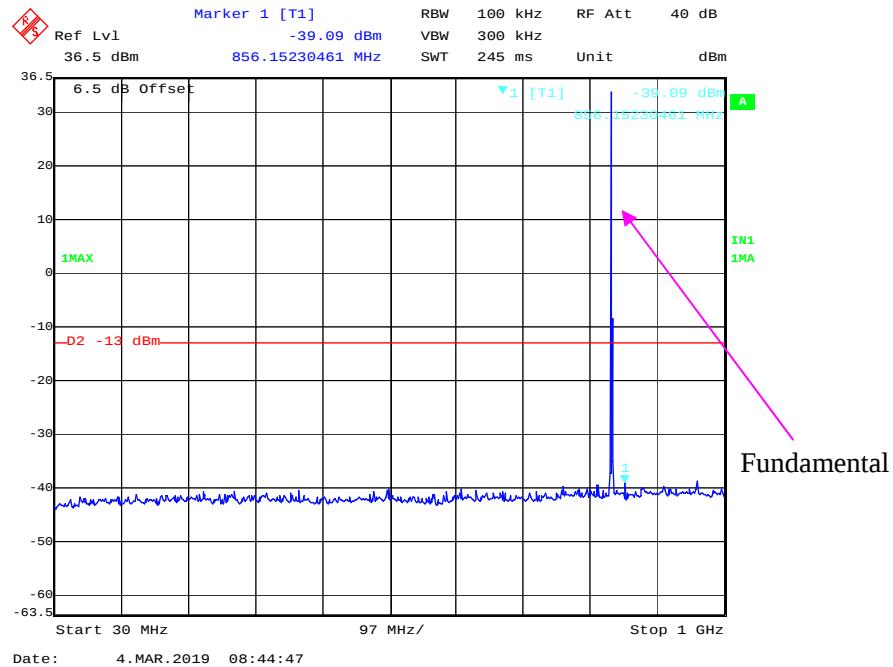
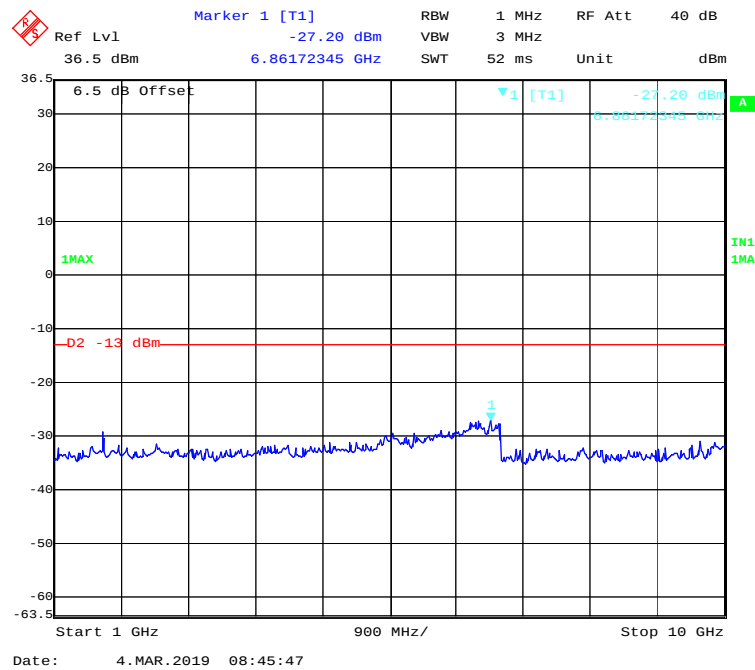
**Test Data****Environmental Conditions**

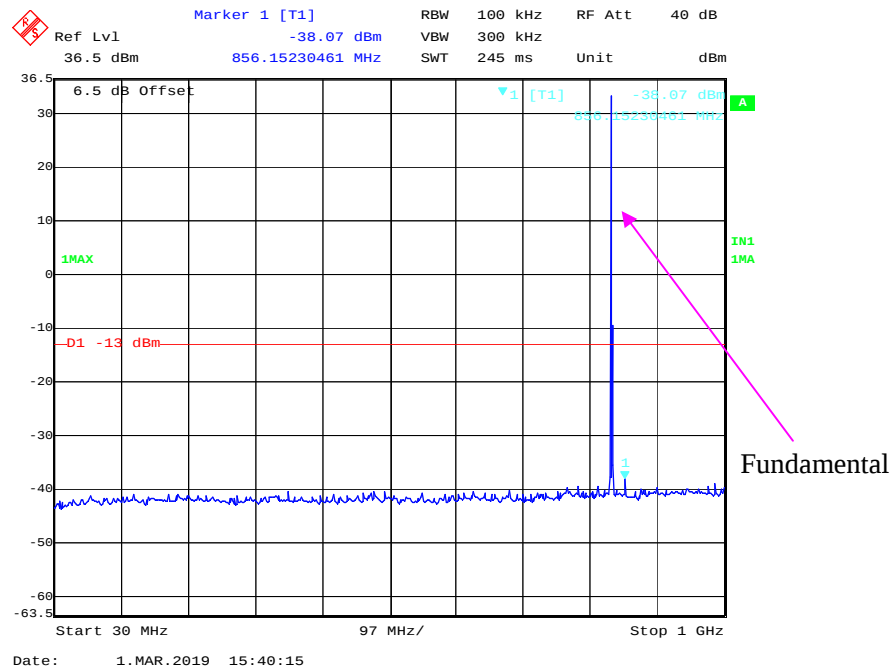
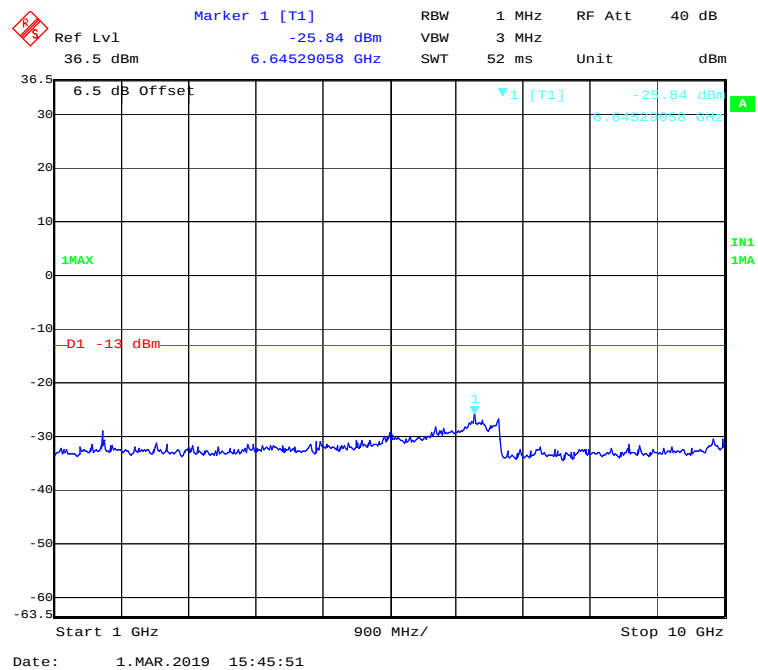
Temperature:	23.2°C-23.5°C
Relative Humidity:	51 %-23%
ATM Pressure:	101.1kPa-103.3kPa

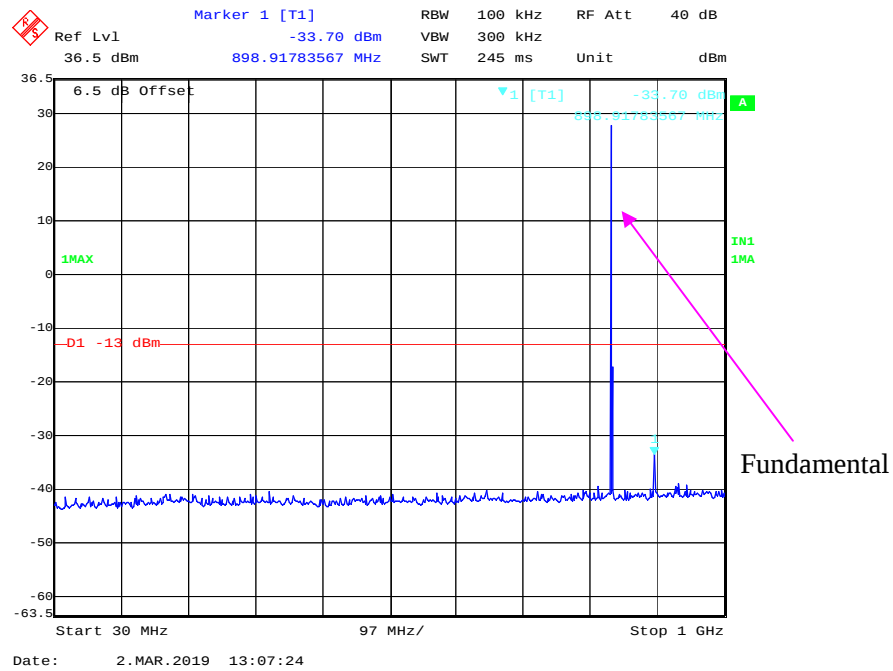
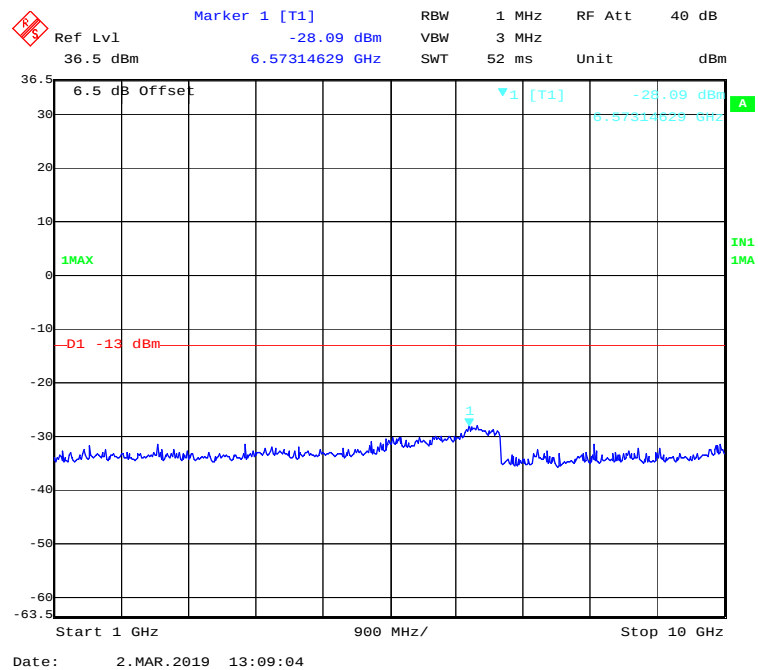
The testing was performed by Max Min from 2019-03-01 to 2019-06-13.

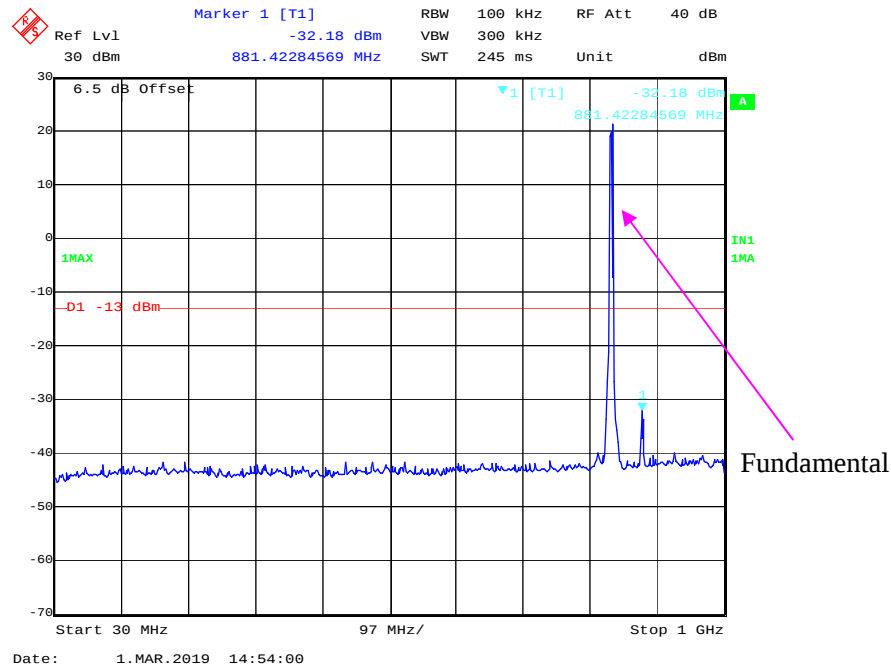
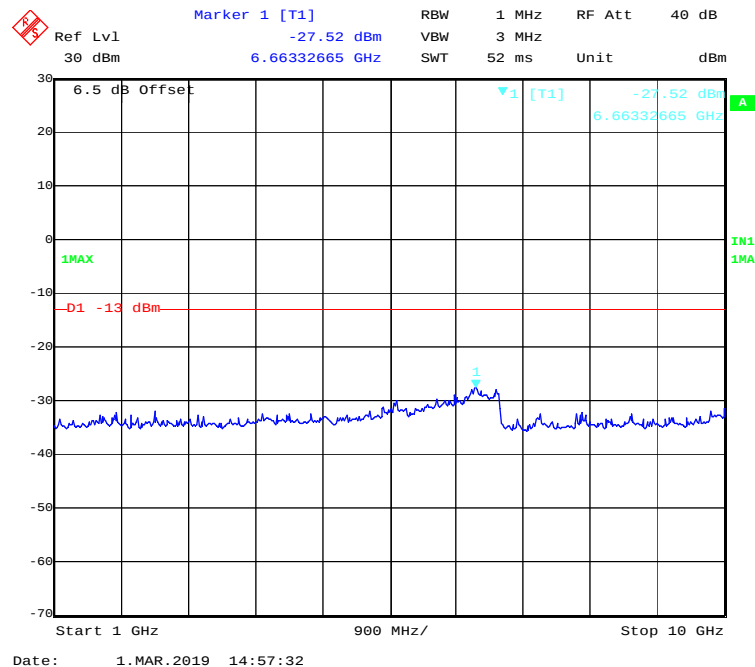
EUT operation mode: Transmitting

Test Result: Compliance.

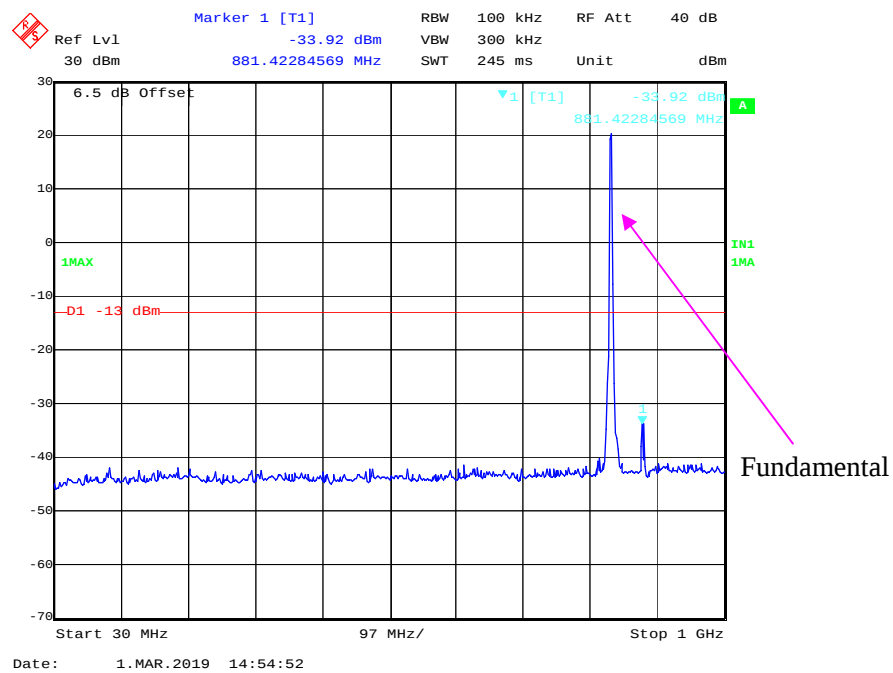
GSM 850 Band:**30 MHz – 1GHz(GSM Mode)****1 GHz – 10 GHz (GSM Mode)**

30 MHz – 1GHz(GPRS Mode)**1 GHz – 10 GHz (GPRS Mode)**

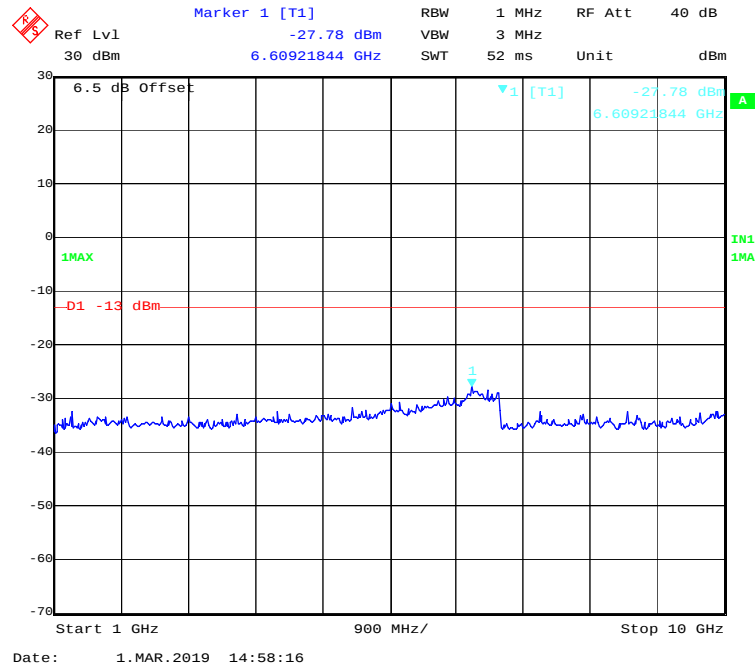
30 MHz – 1GHz(EGPRS Mode)**1 GHz – 10 GHz (EGPRS Mode)**

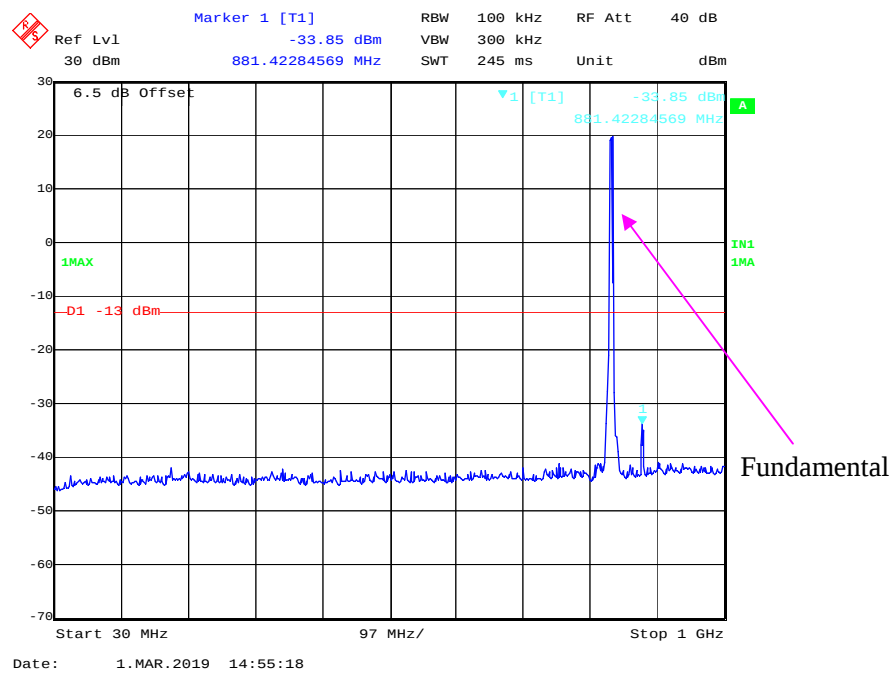
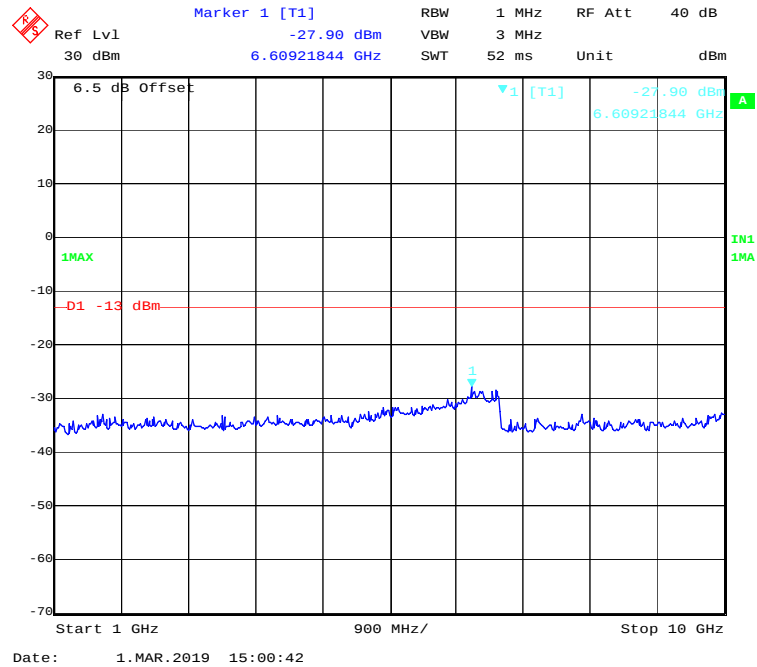
WCDMA Band V:**30 MHz – 1GHz WCDMA (Rel 99) Mode****1 GHz – 10 GHz WCDMA (Rel 99) Mode**

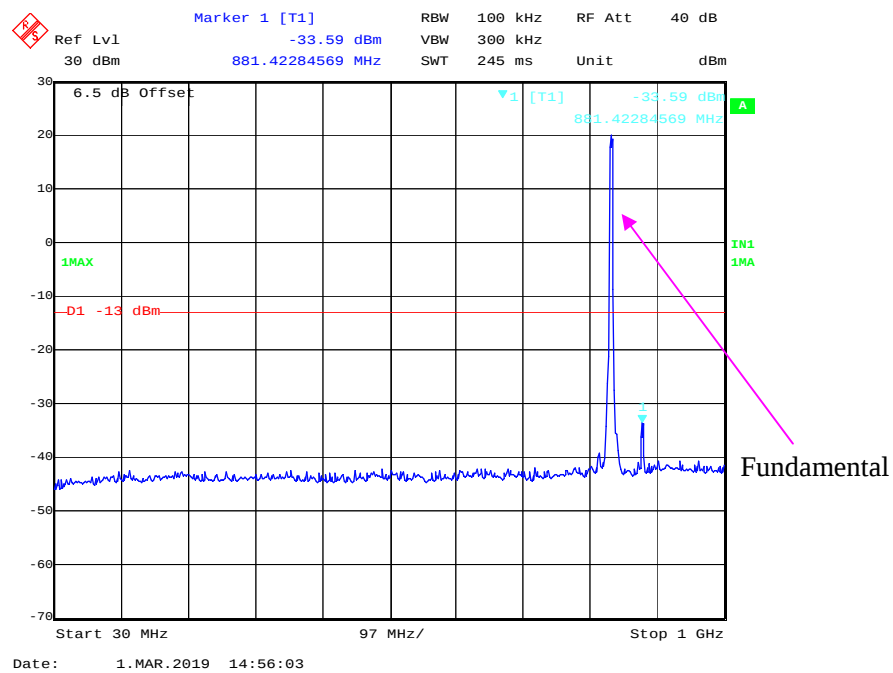
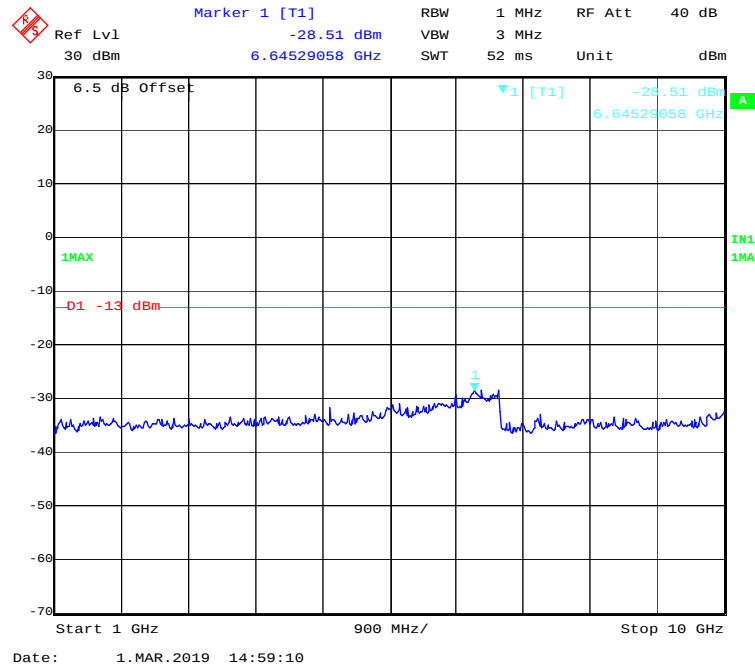
30 MHz – 1GHz WCDMA (HSDPA) Mode

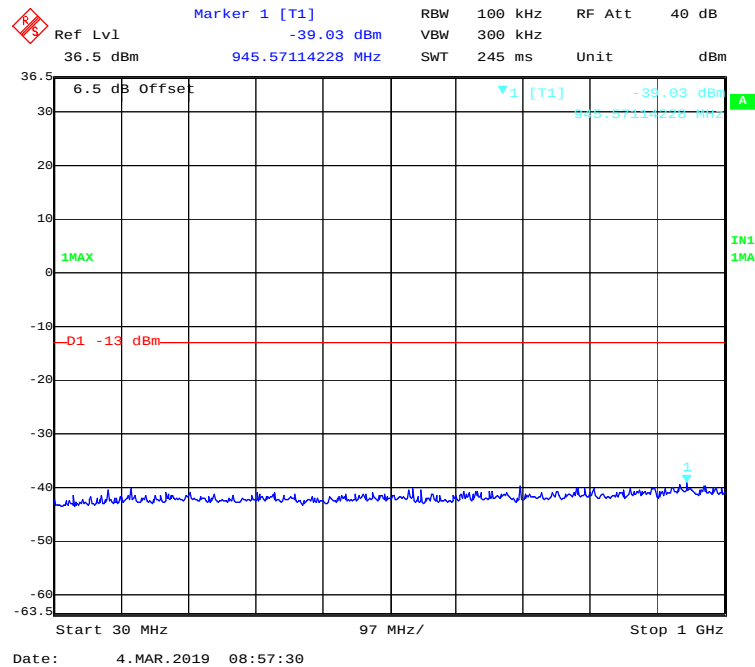
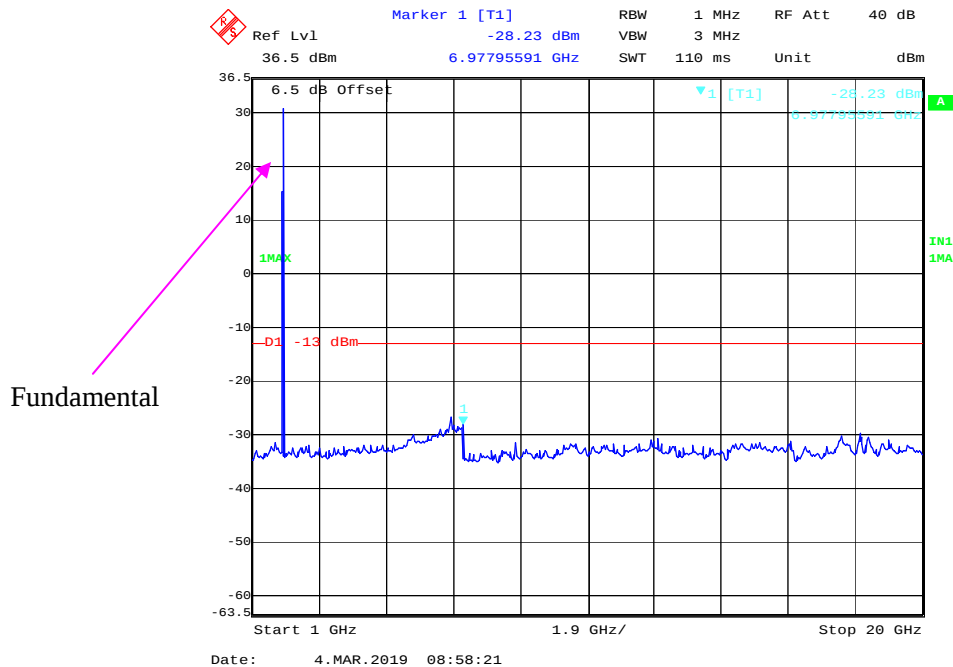


1 GHz – 10 GHz WCDMA (HSDPA) Mode

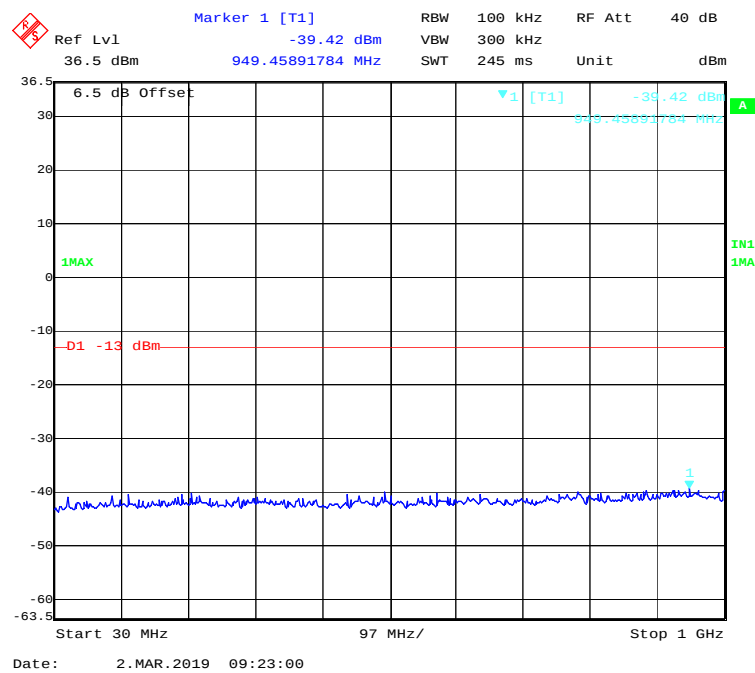


30 MHz – 1GHz WCDMA (HSUPA) Mode**1 GHz – 10 GHz WCDMA (HSUPA) Mode**

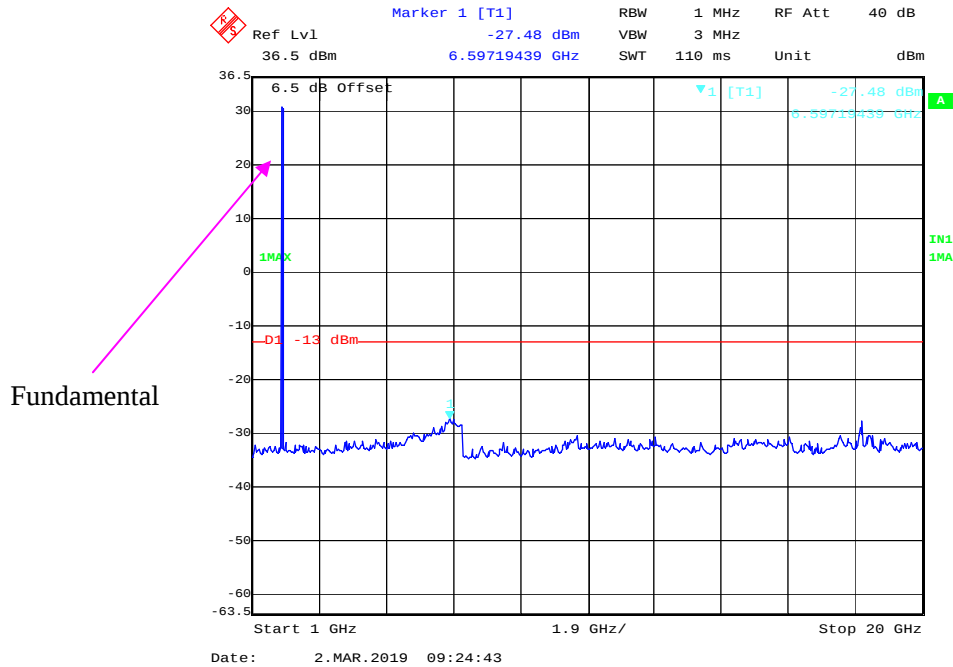
30 MHz – 1GHz WCDMA (HSPA+) Mode**1 GHz – 10 GHz WCDMA (HSPA+) Mode**

PCS 1900 Band:**30 MHz – 1GHz(GSM Mode)****1 GHz – 20 GHz (GSM Mode)**

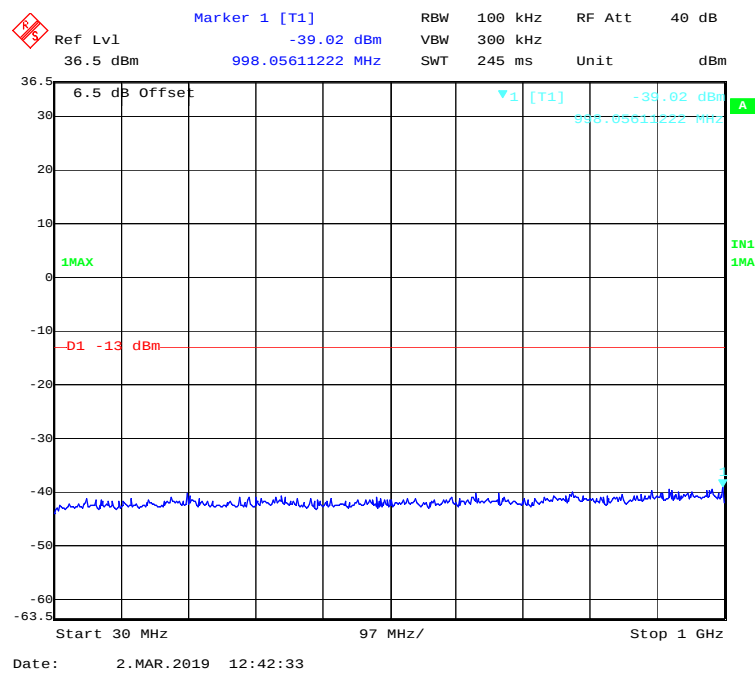
30 MHz – 1GHz(GPRS Mode)



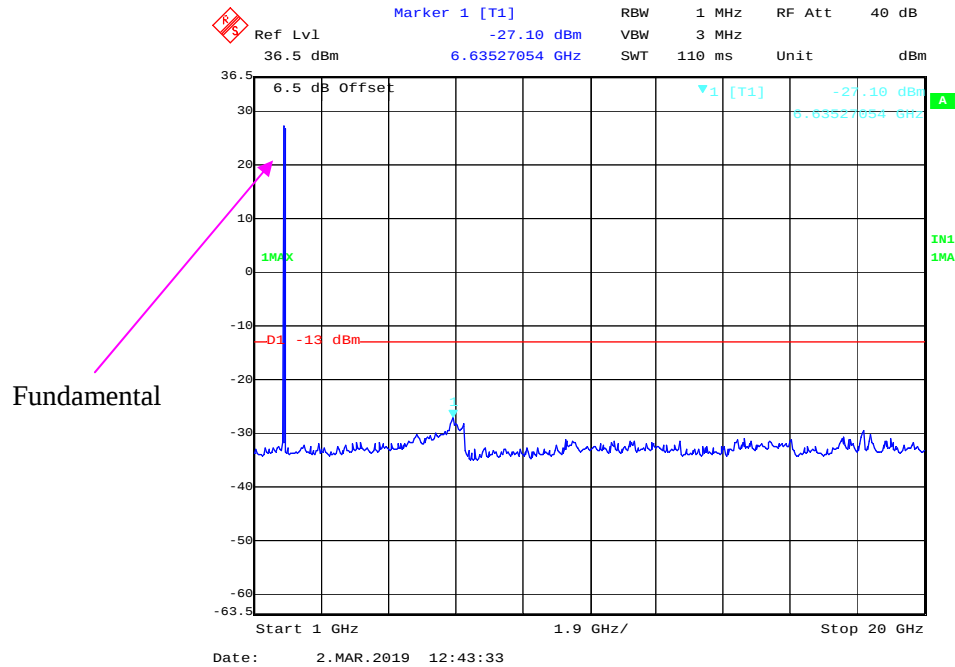
1 GHz – 20 GHz (GPRS Mode)

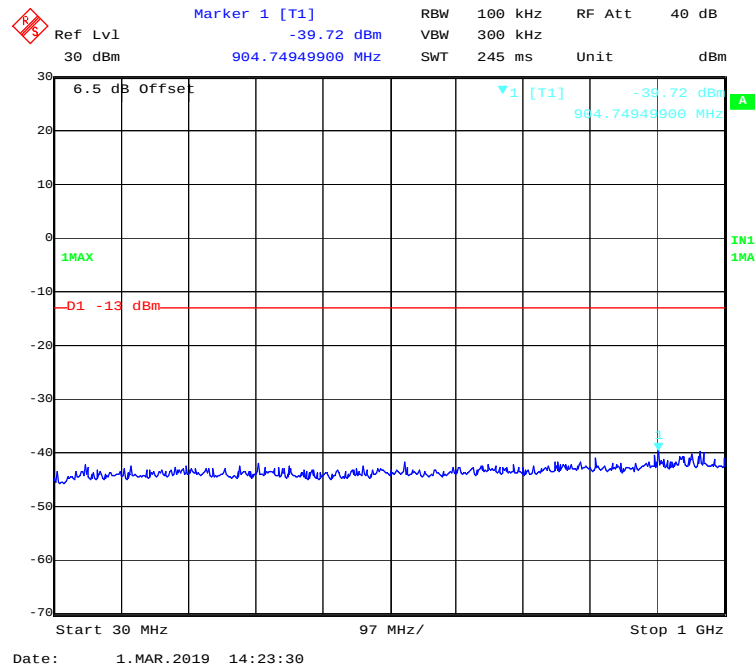
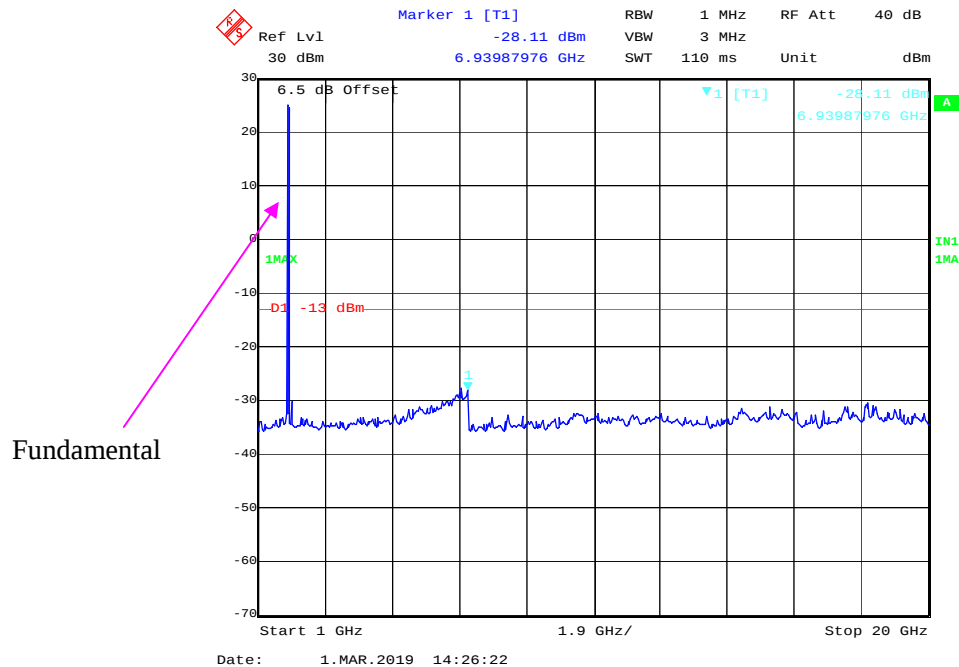


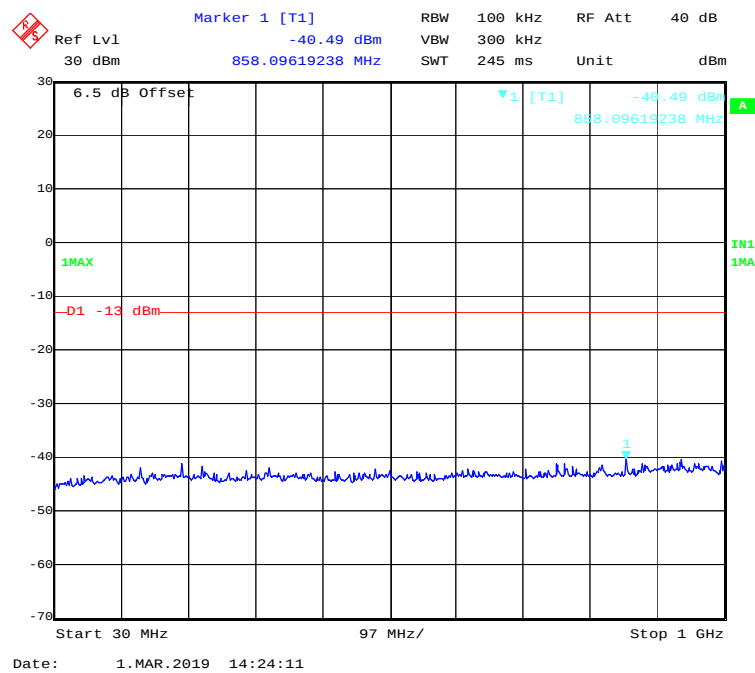
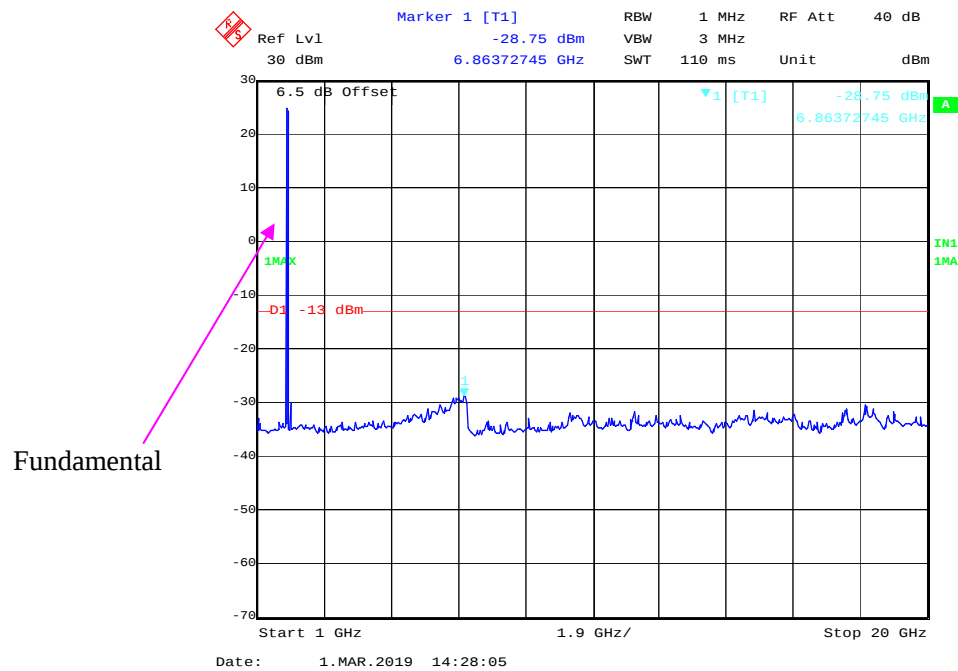
30 MHz – 1GHz(EGPRS Mode)



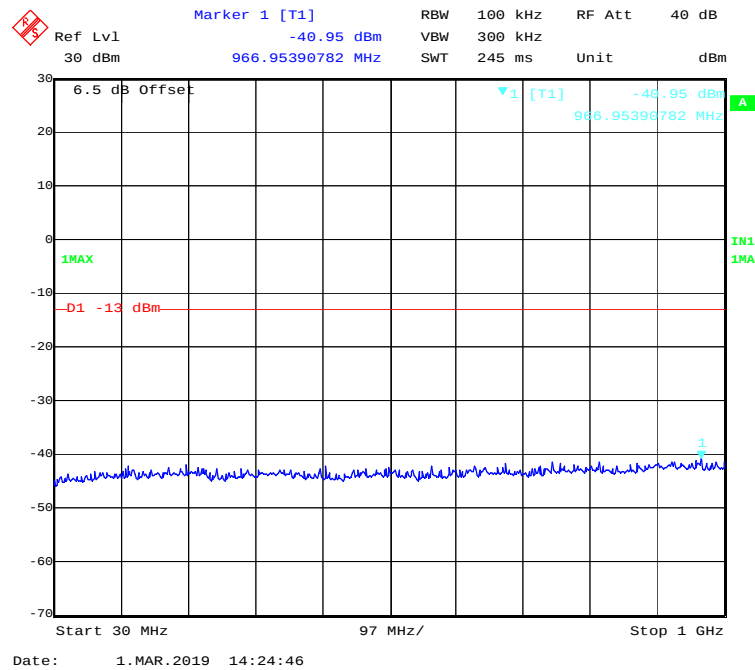
1 GHz – 20 GHz (EGPRS Mode)



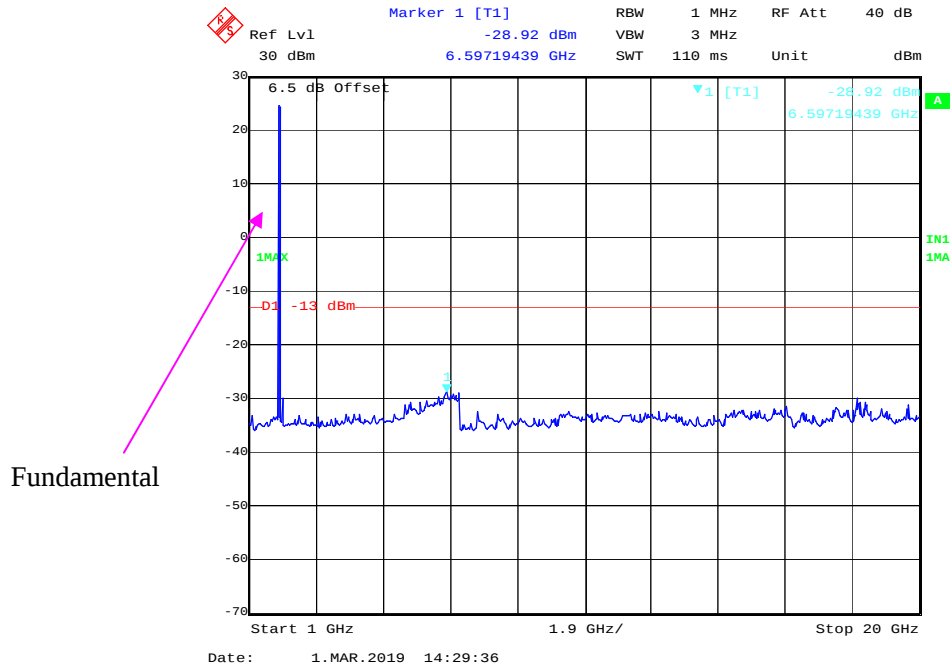
WCDMA Band II:**30 MHz – 1GHz WCDMA (Rel 99) Mode****1 GHz – 20 GHz WCDMA (Rel 99) Mode**

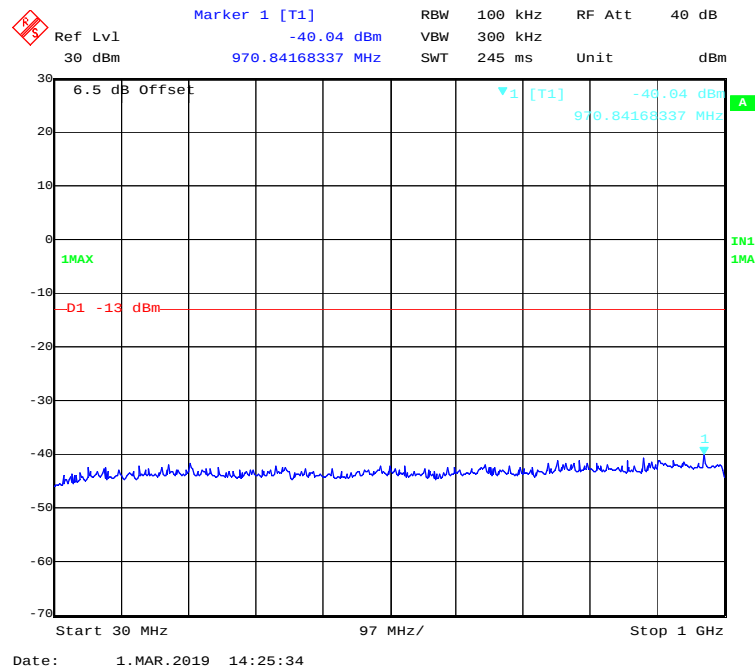
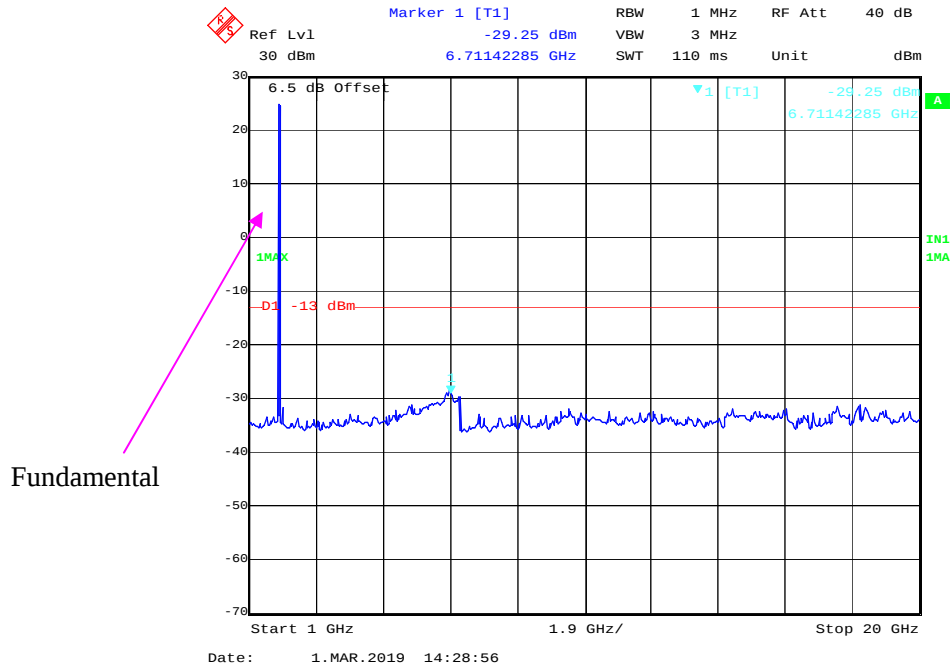
30 MHz – 1GHz WCDMA (HSDPA) Mode**1 GHz – 20 GHz WCDMA (HSDPA) Mode**

30 MHz – 1GHz WCDMA (HSUPA) Mode



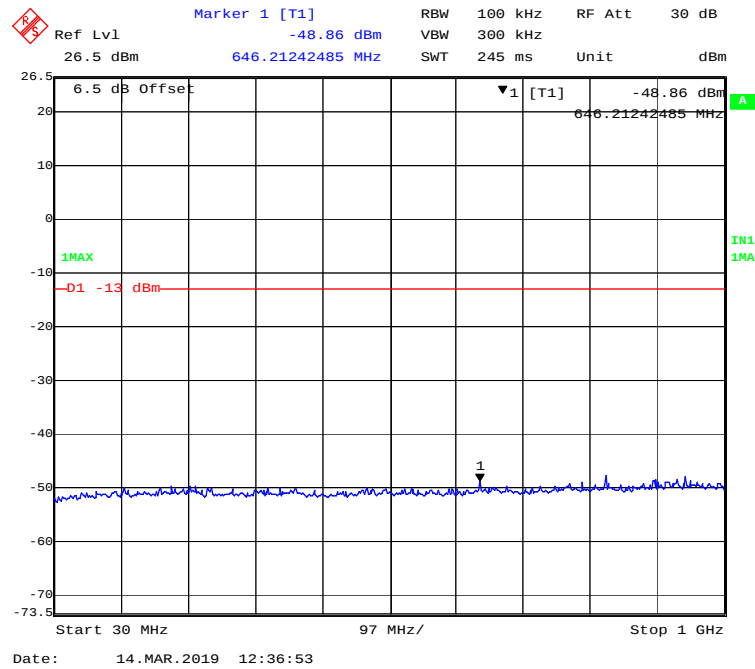
1 GHz – 20 GHz WCDMA (HSUPA) Mode



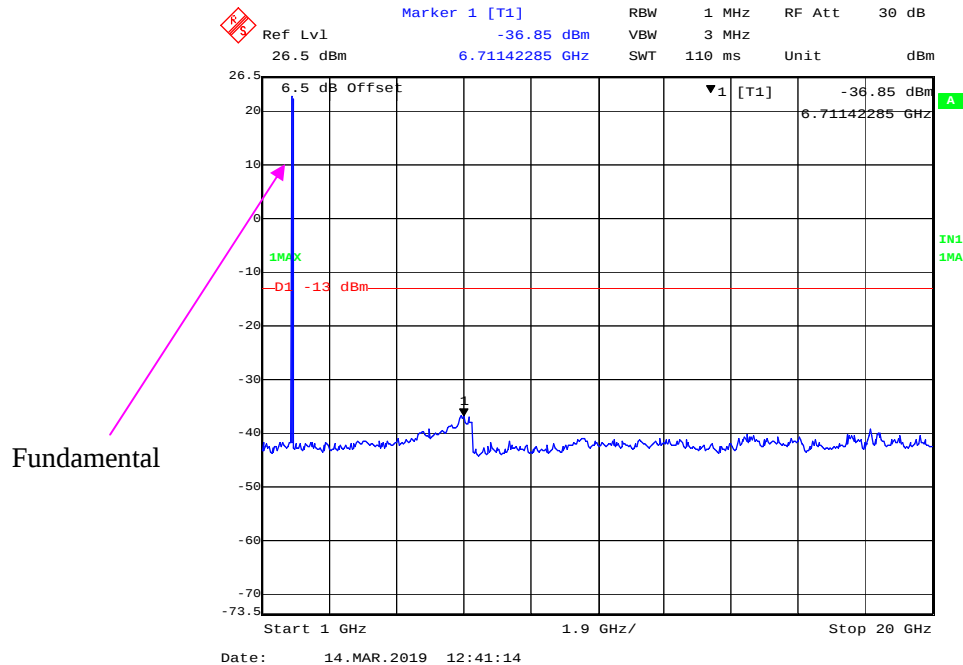
30 MHz – 1GHz WCDMA (HSPA+) Mode**1 GHz – 20 GHz WCDMA (HSPA+) Mode**

LTE Band 2:

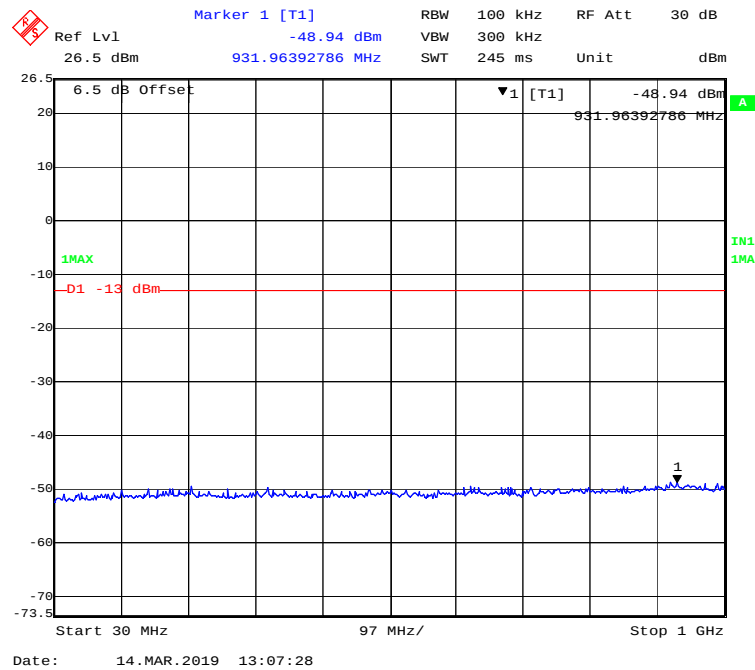
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



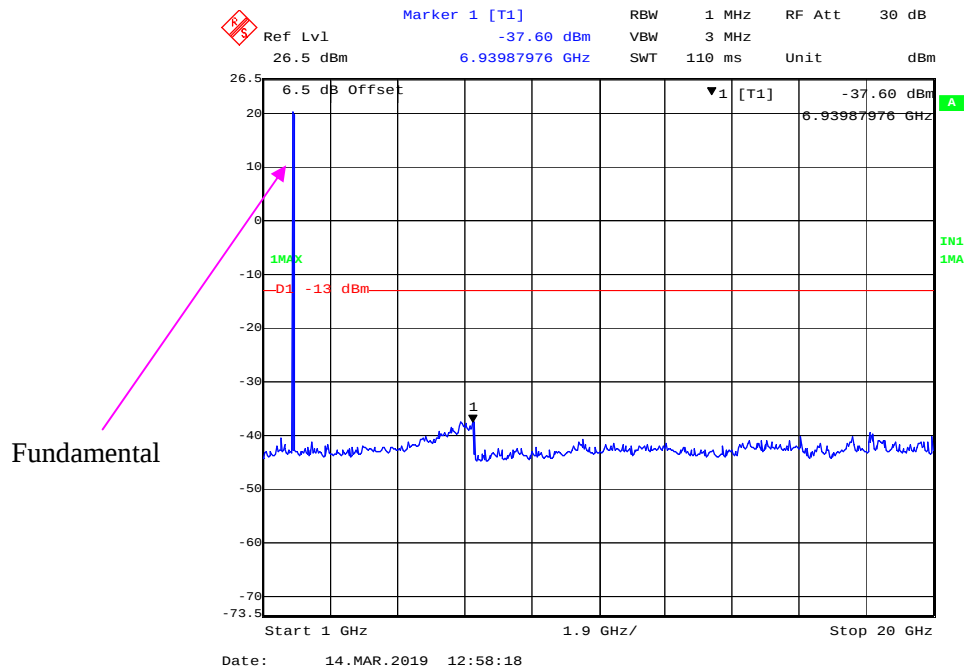
1 GHz - 20 GHz (1.4 MHz, Middle Channel)



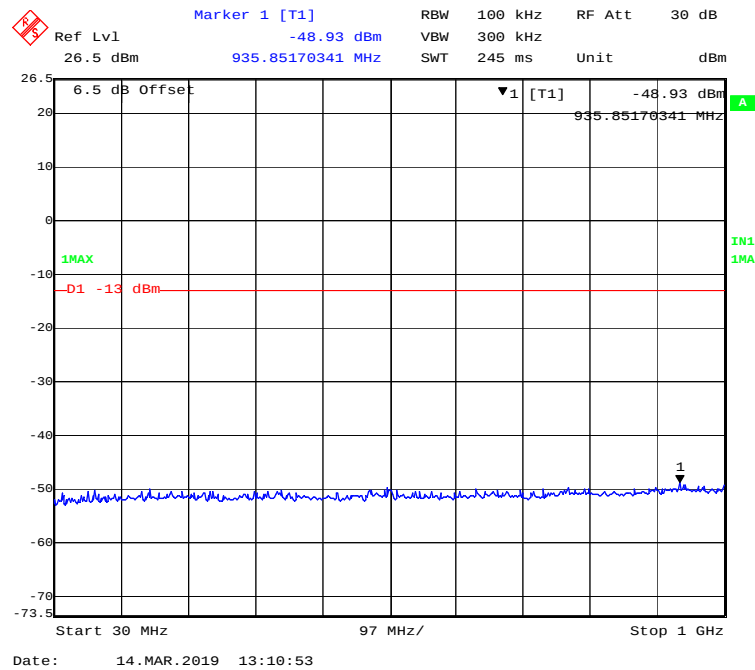
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



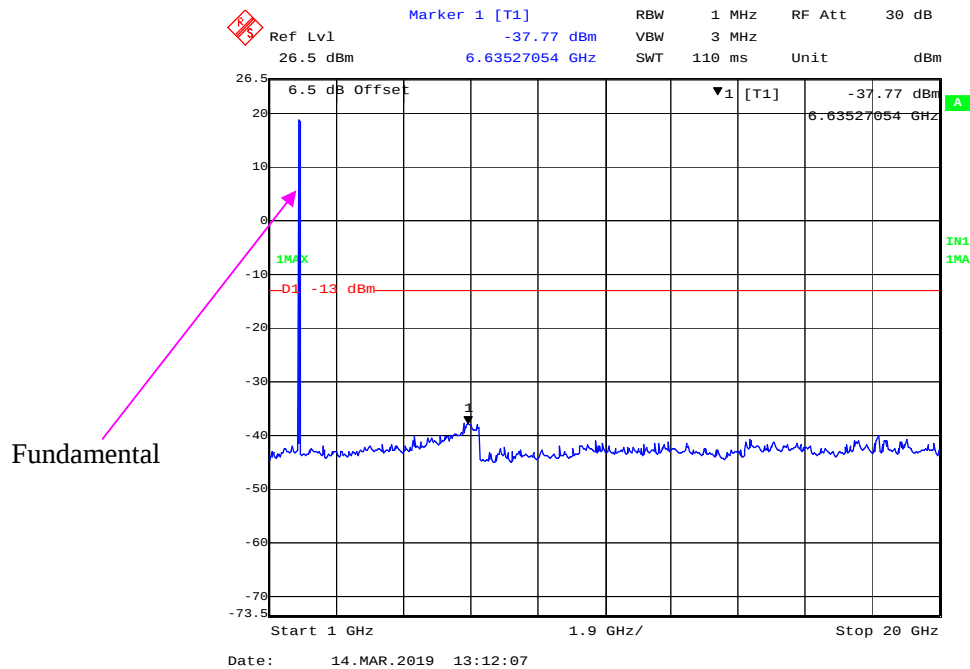
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



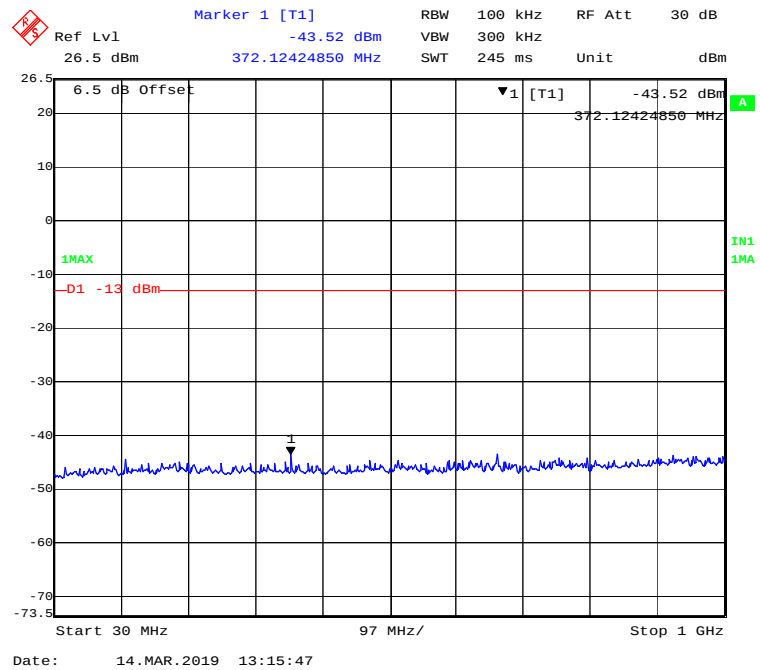
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



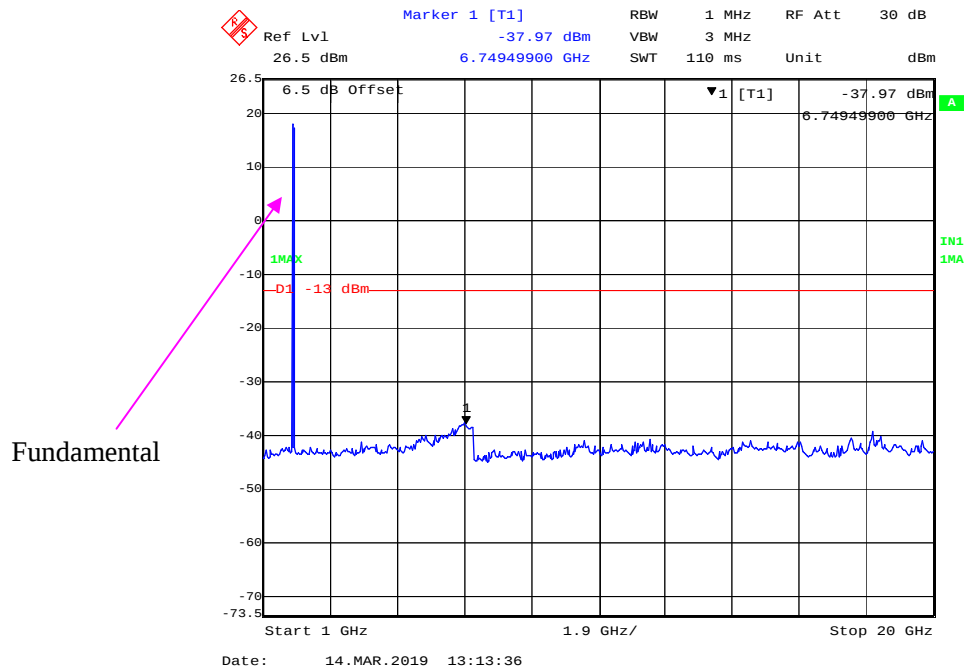
1 GHz – 20 GHz (5.0MHz, Middle Channel)



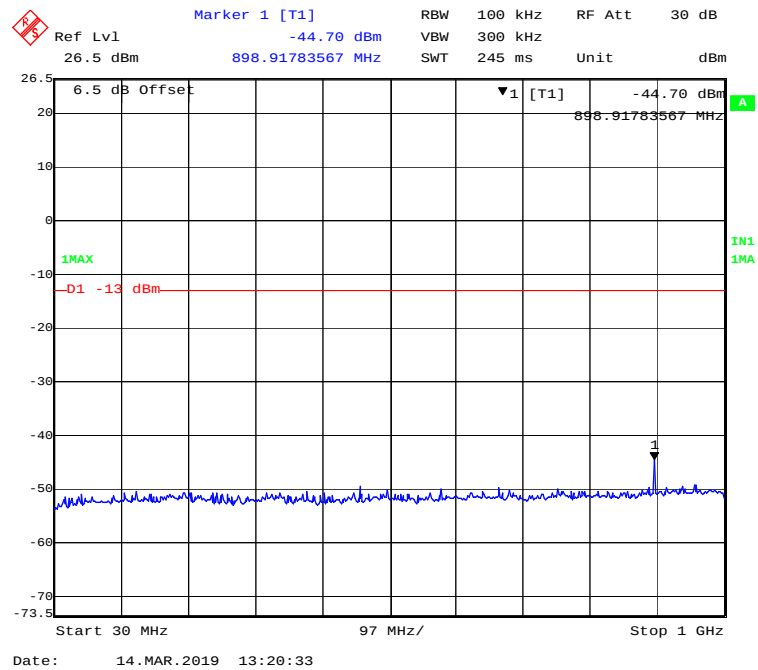
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



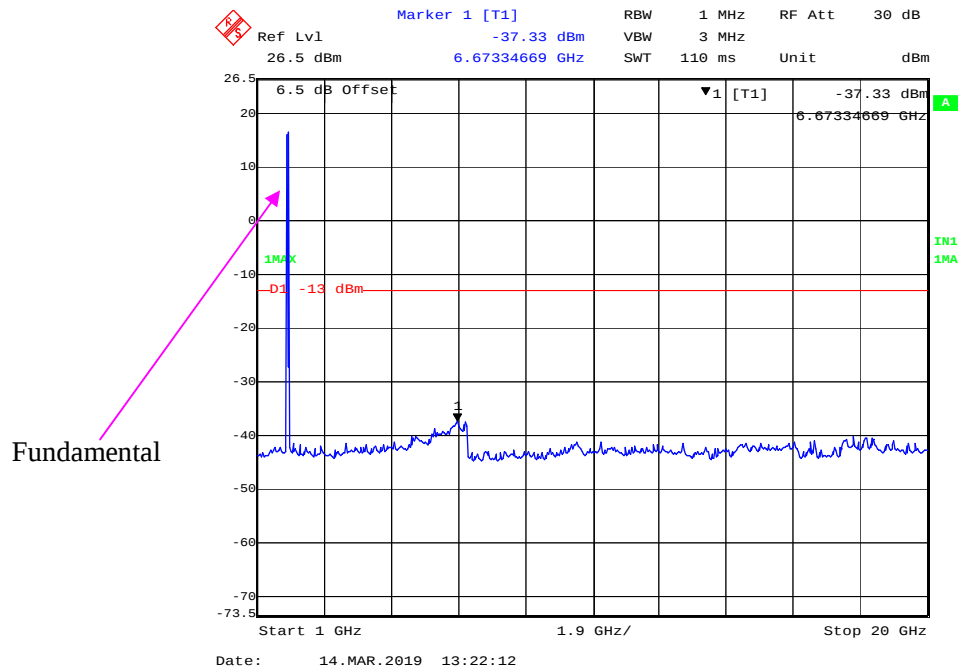
1 GHz – 20 GHz (10.0 MHz, Middle Channel)



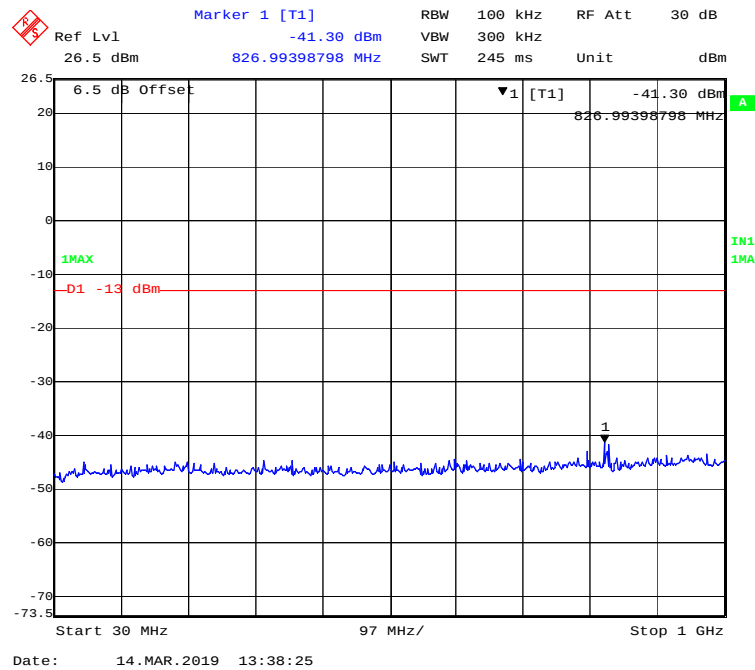
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



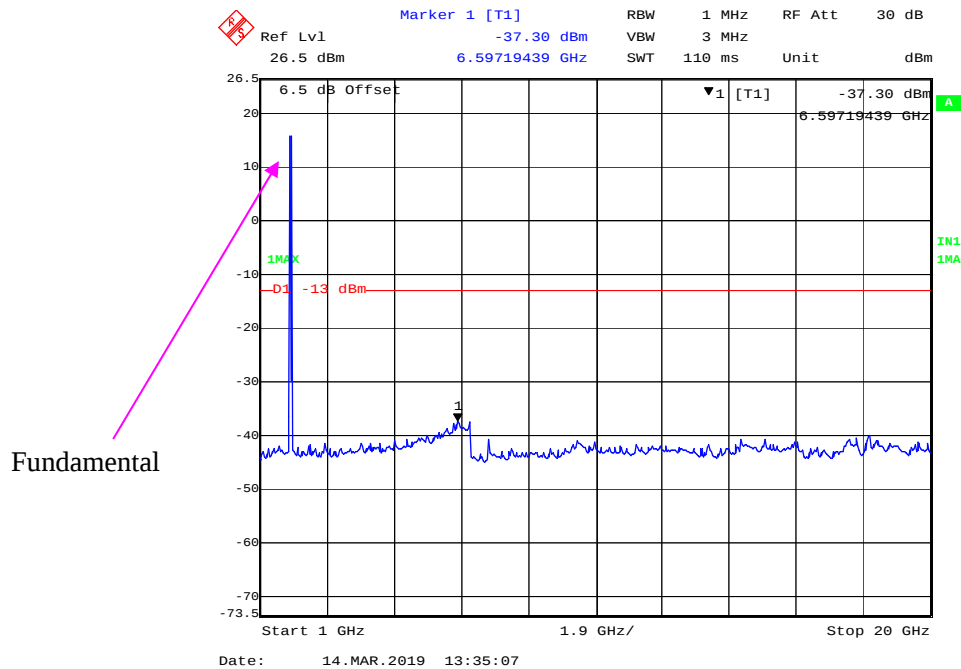
1 GHz – 20 GHz (15.0 MHz, Middle Channel)

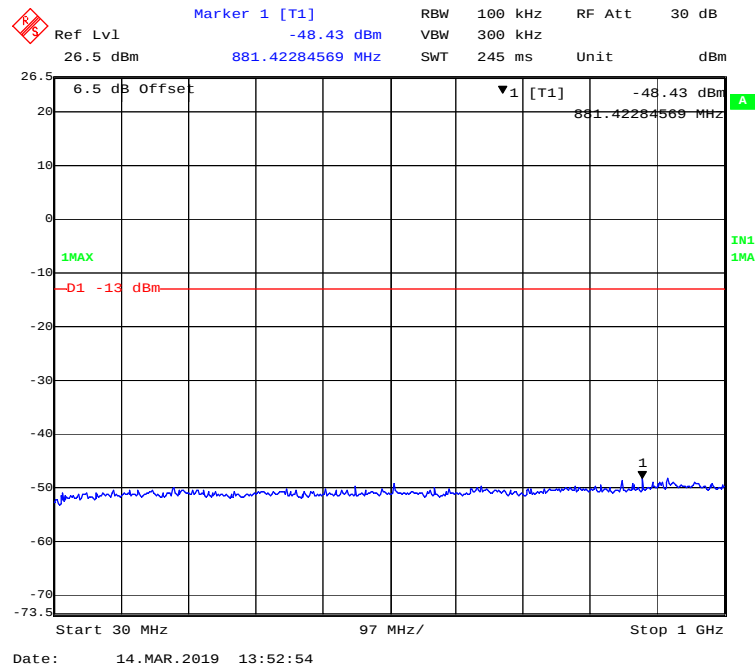
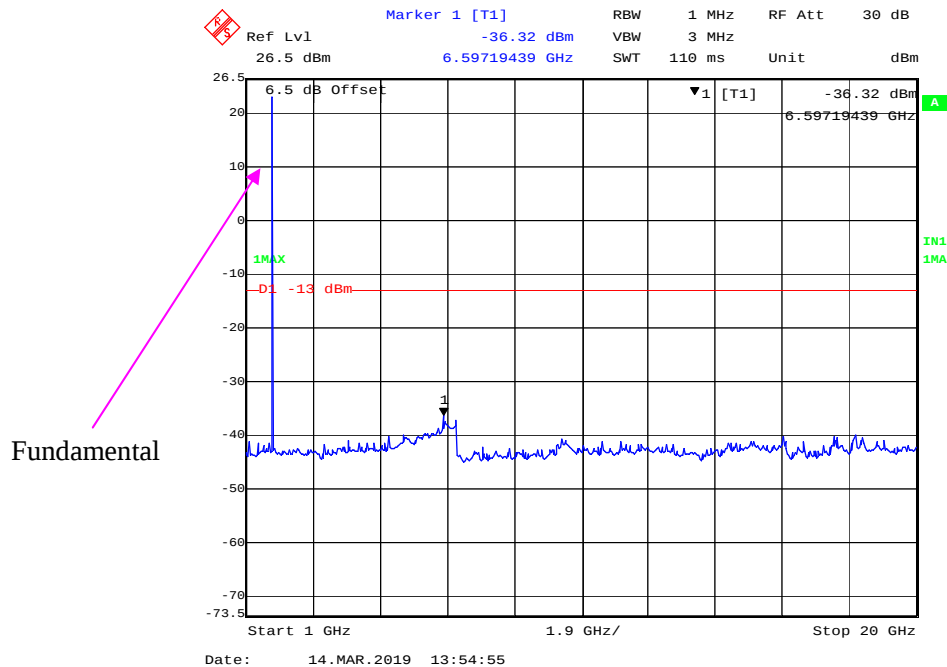


30 MHz - 1 GHz (20.0 MHz, Middle Channel)

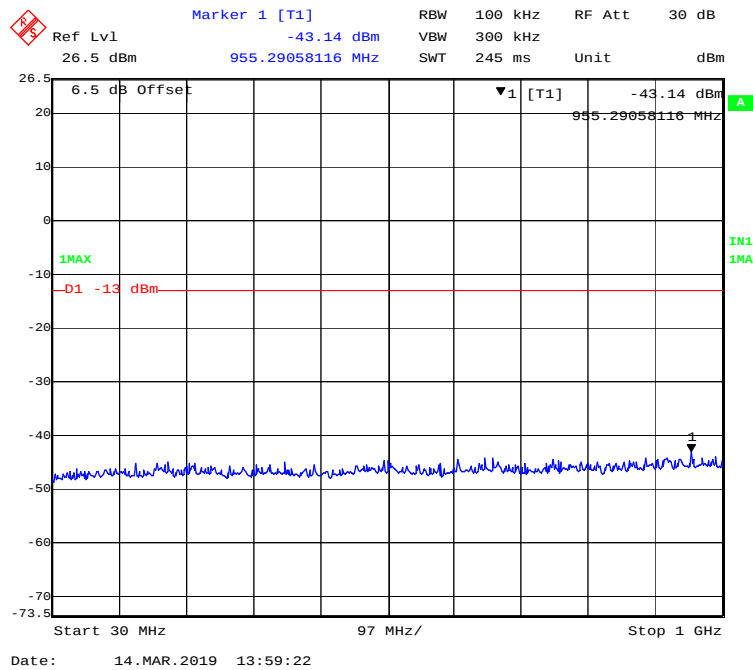


1 GHz – 20 GHz (20.0 MHz, Middle Channel)

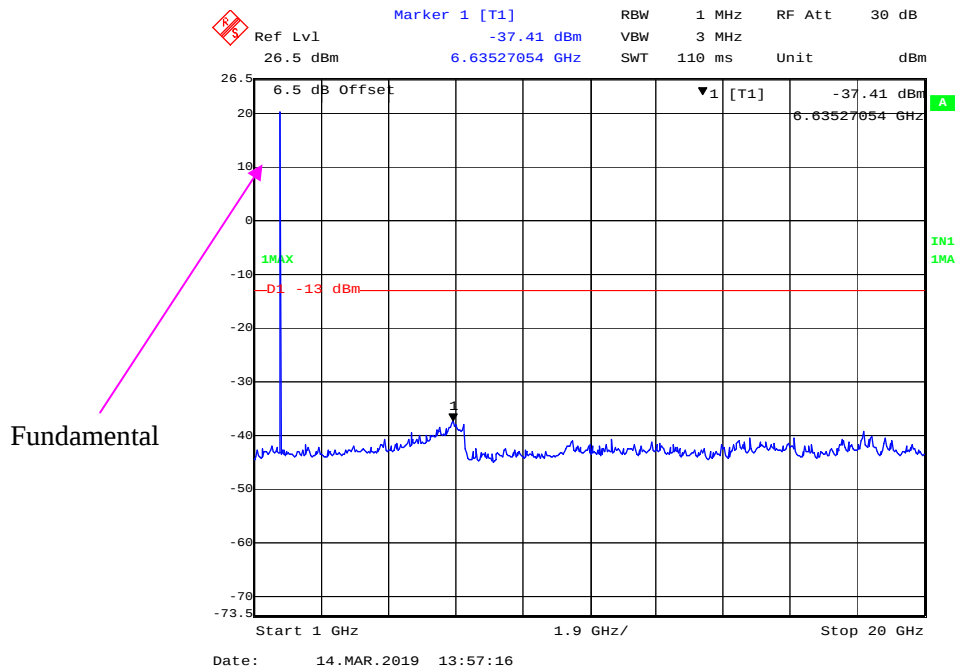


LTE Band 4:**30 MHz - 1 GHz (1.4 MHz, Middle Channel)****1 GHz - 20 GHz (1.4 MHz, Middle Channel)**

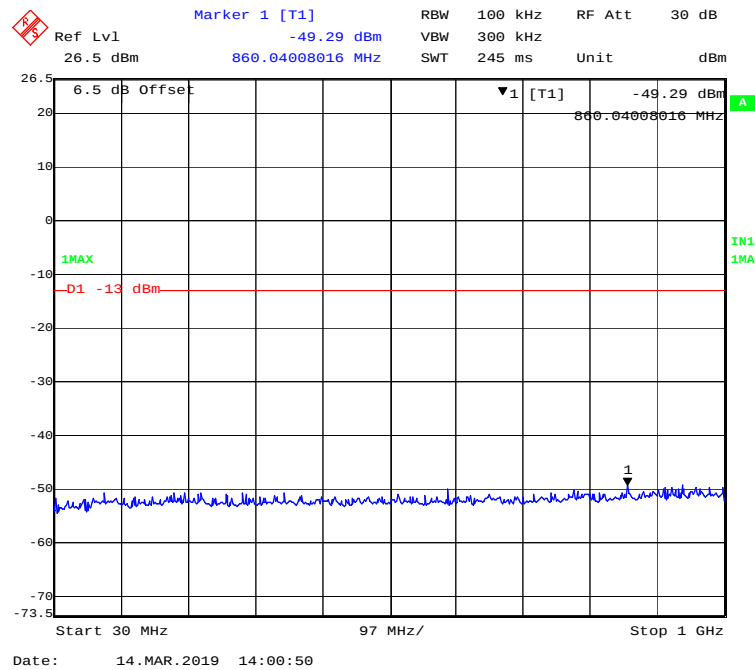
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



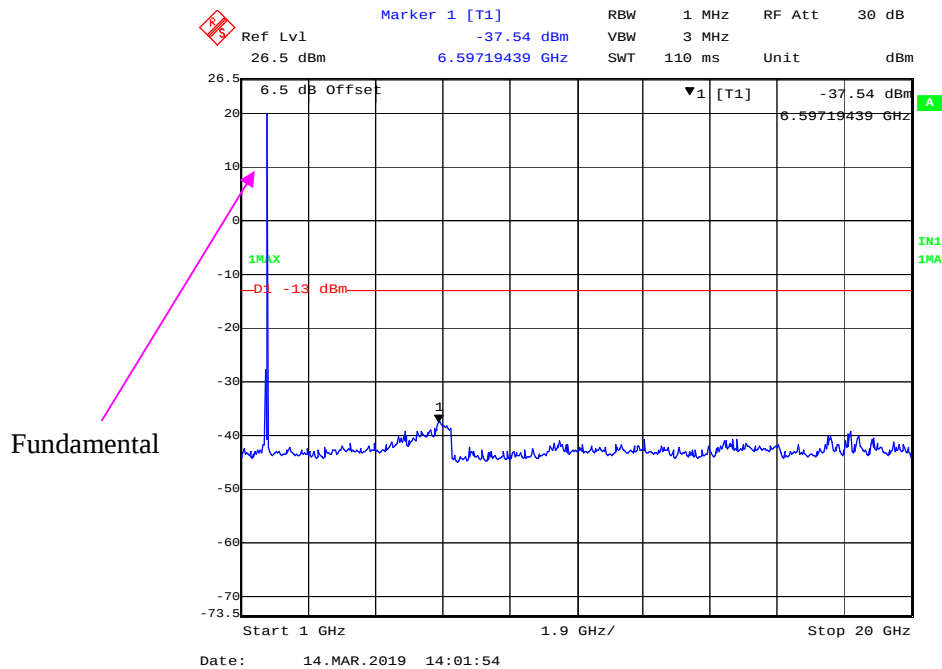
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



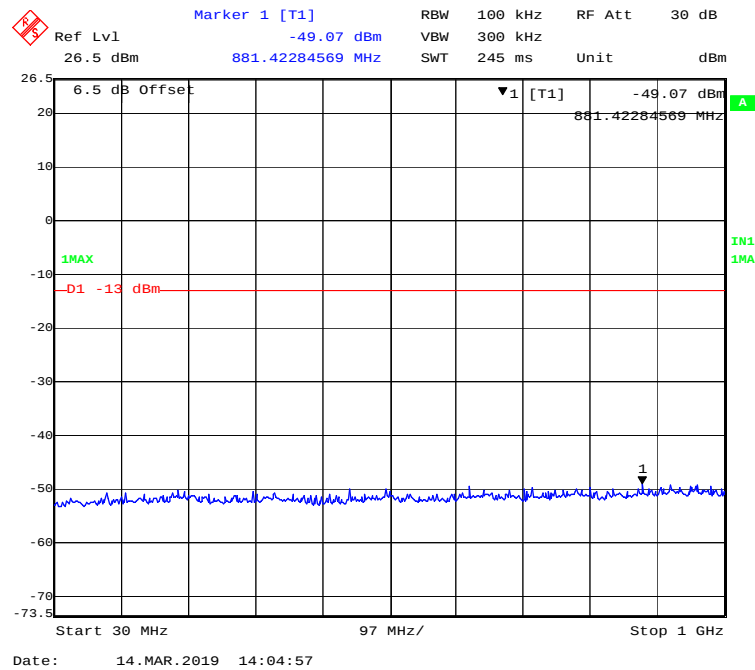
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



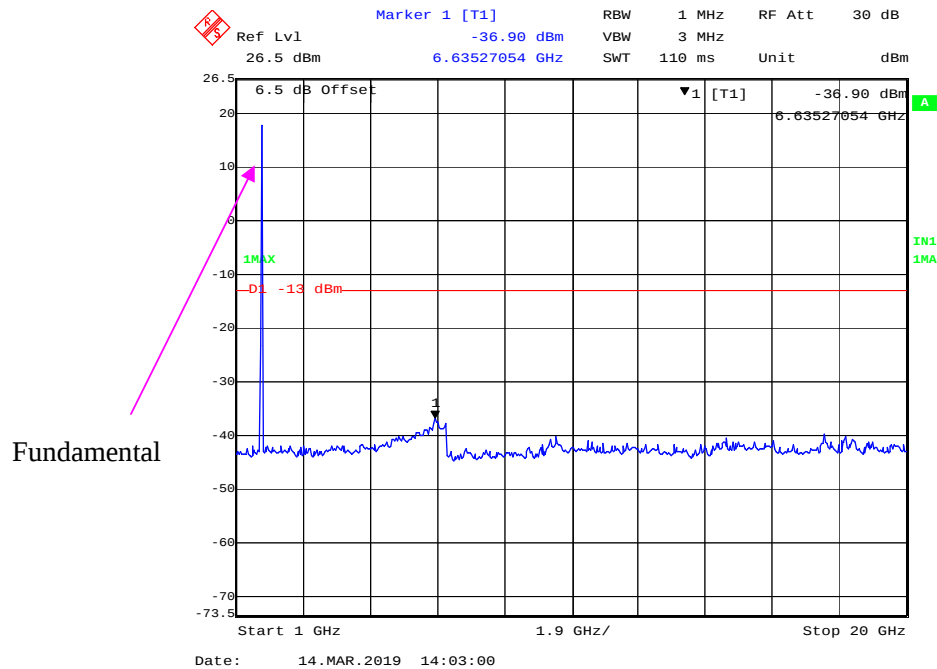
1 GHz – 20 GHz (5.0MHz, Middle Channel)



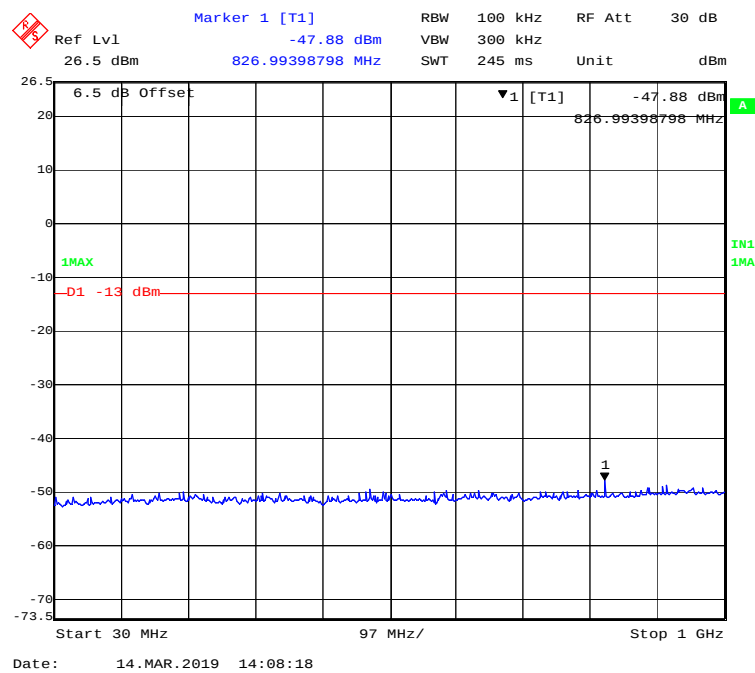
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



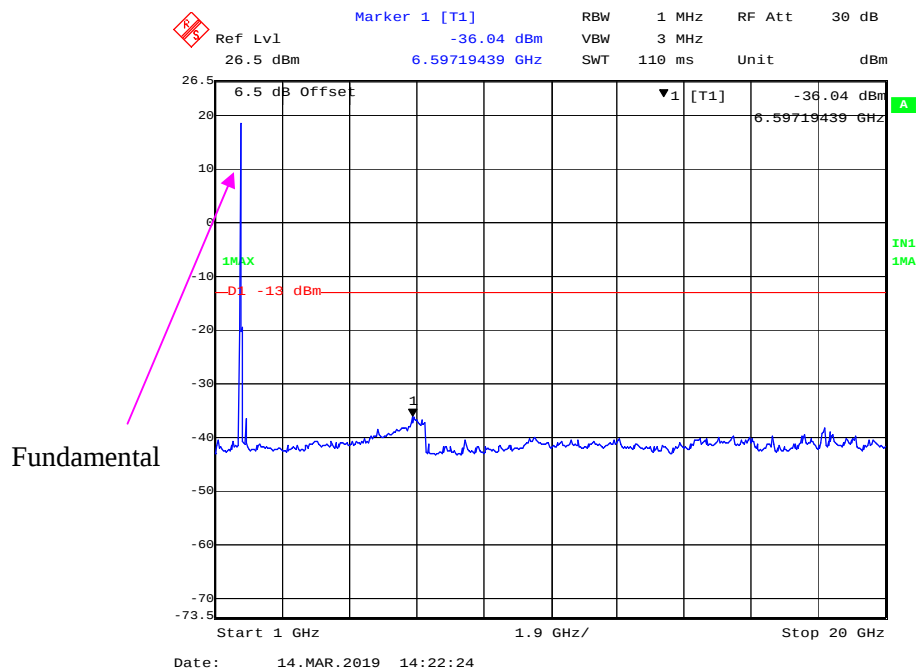
1 GHz – 20 GHz (10.0 MHz, Middle Channel)



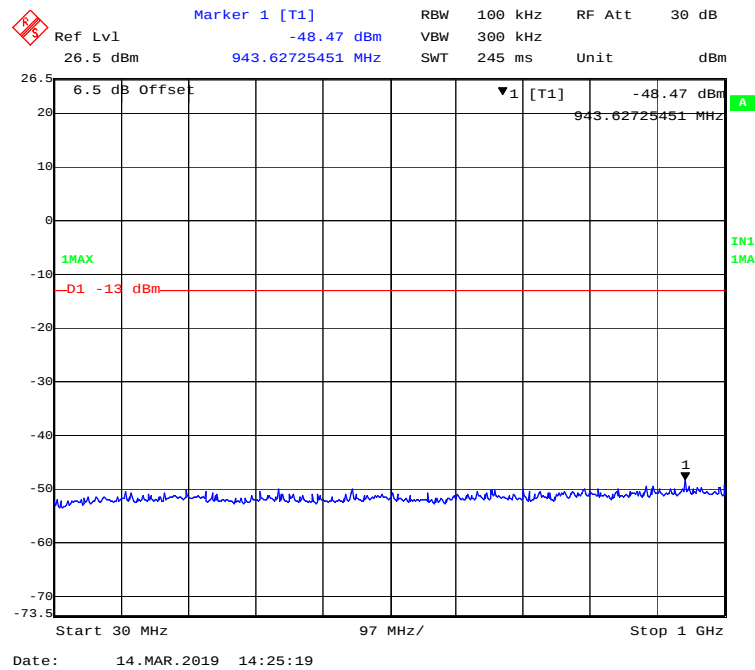
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



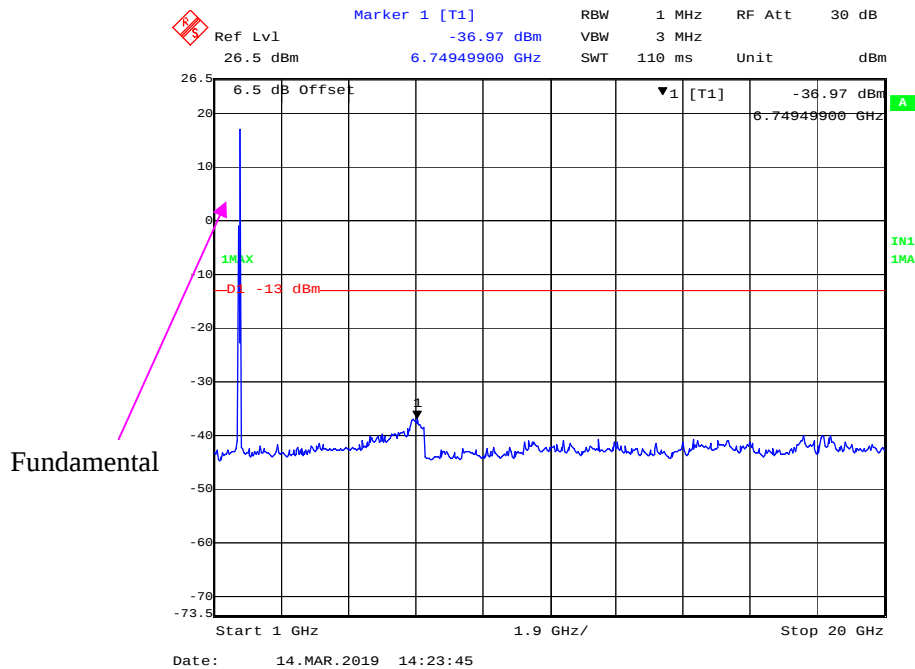
1 GHz – 20 GHz (15.0 MHz, Middle Channel)

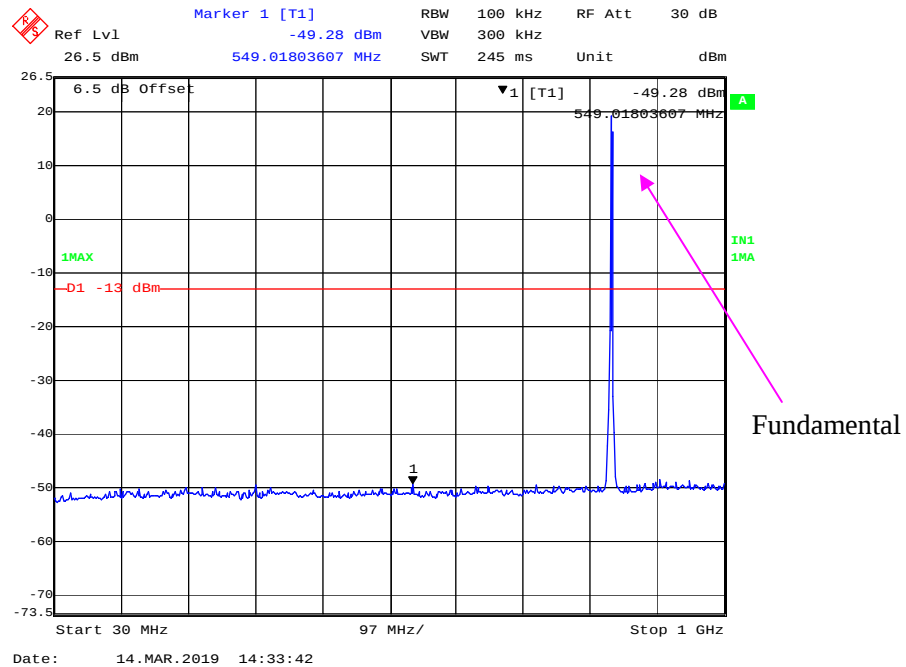
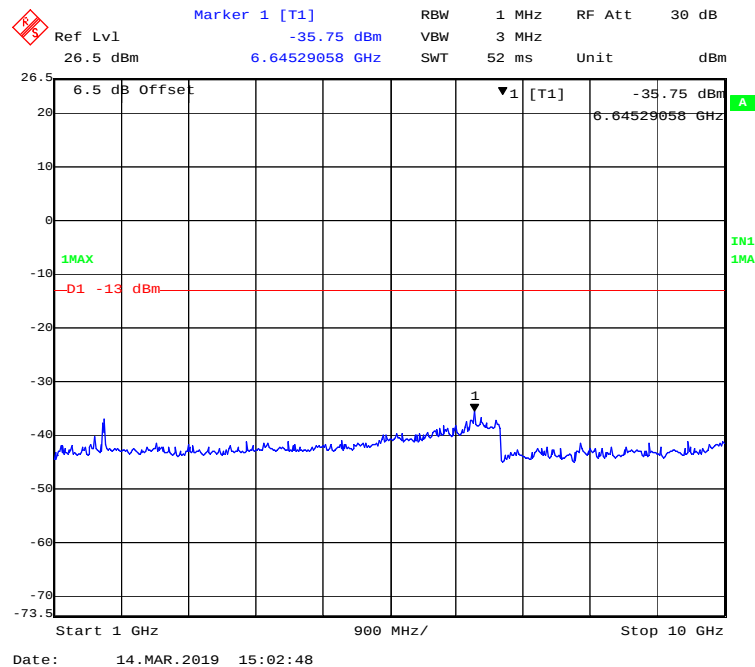


30 MHz - 1 GHz (20.0 MHz, Middle Channel)

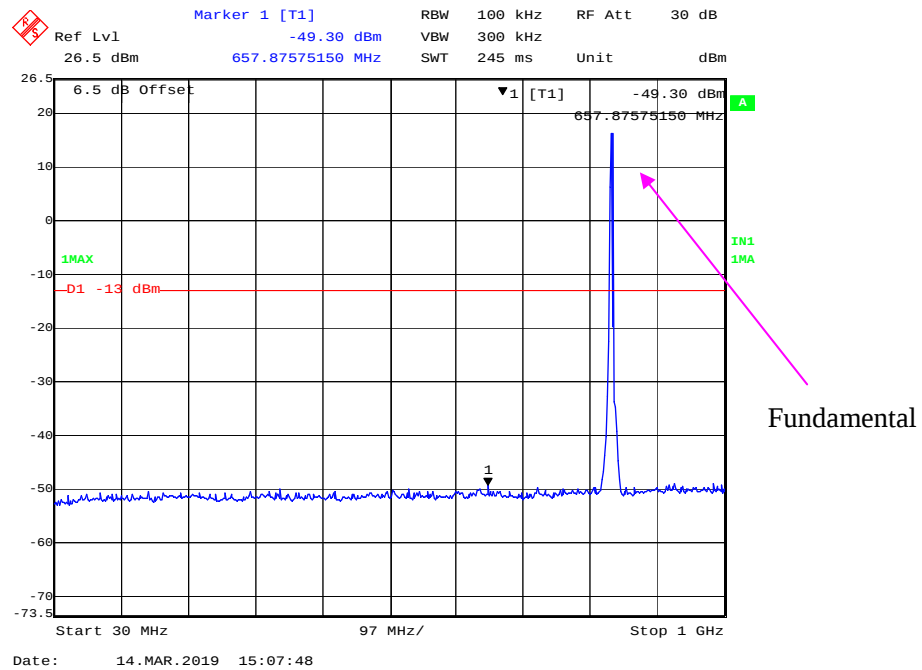


1 GHz – 20 GHz (20.0 MHz, Middle Channel)

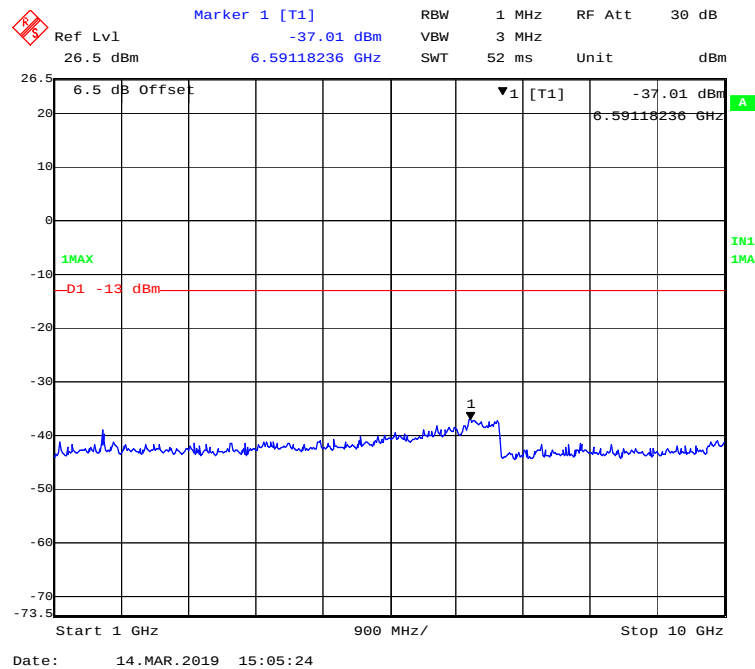


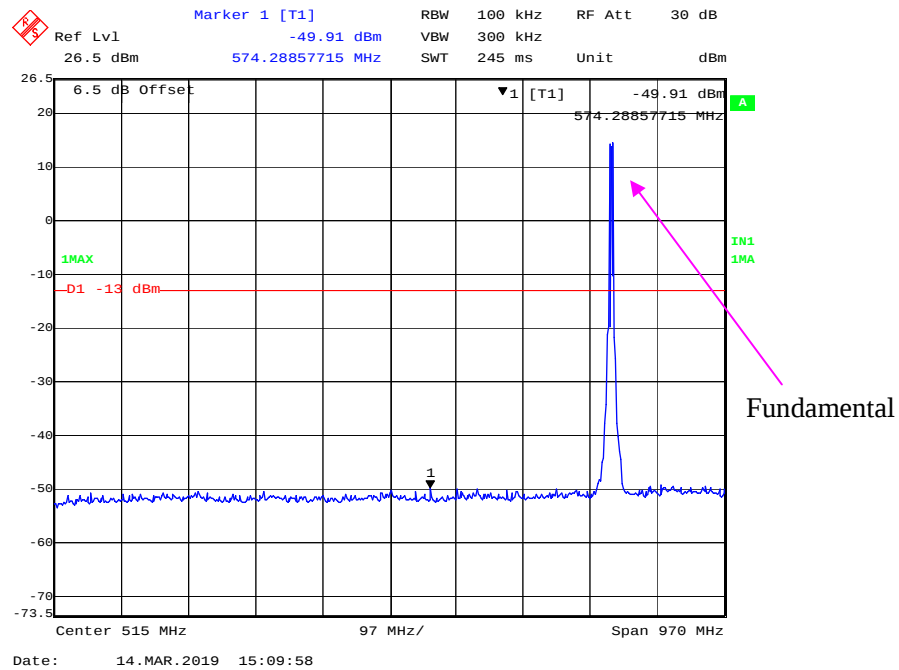
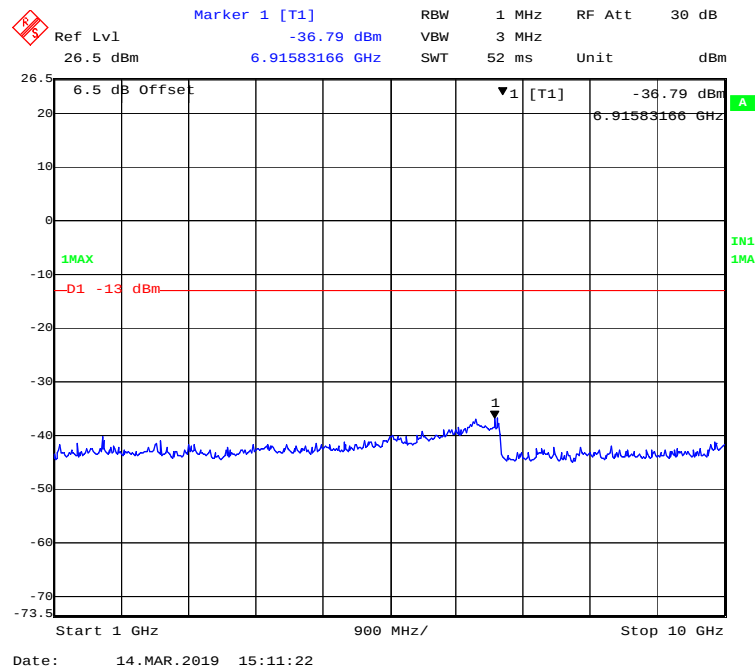
LTE Band 5:**30 MHz - 1 GHz (1.4 MHz, Middle Channel)****1 GHz - 10 GHz (1.4 MHz, Middle Channel)**

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

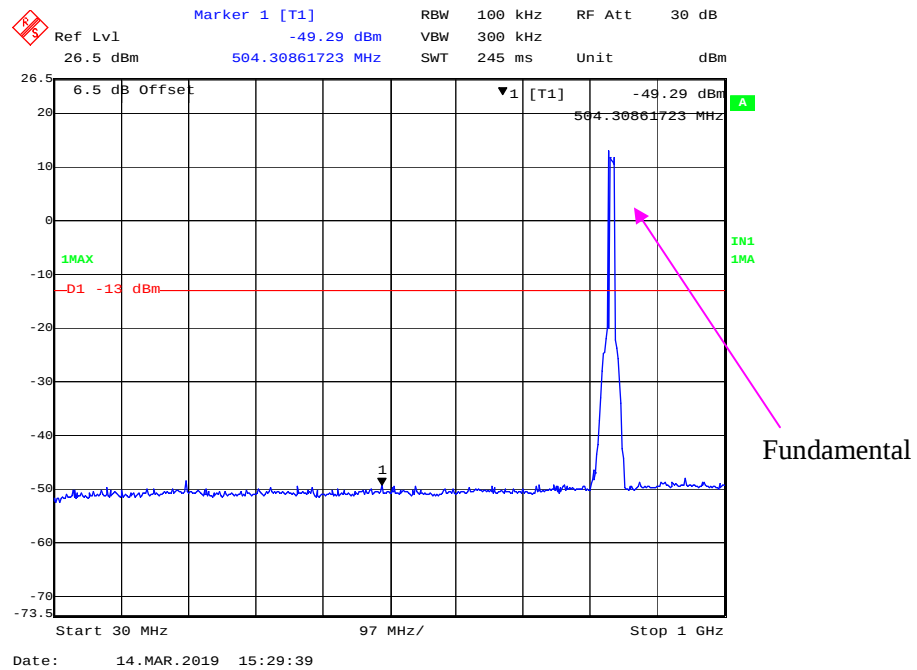


1 GHz – 10 GHz (3.0 MHz, Middle Channel)

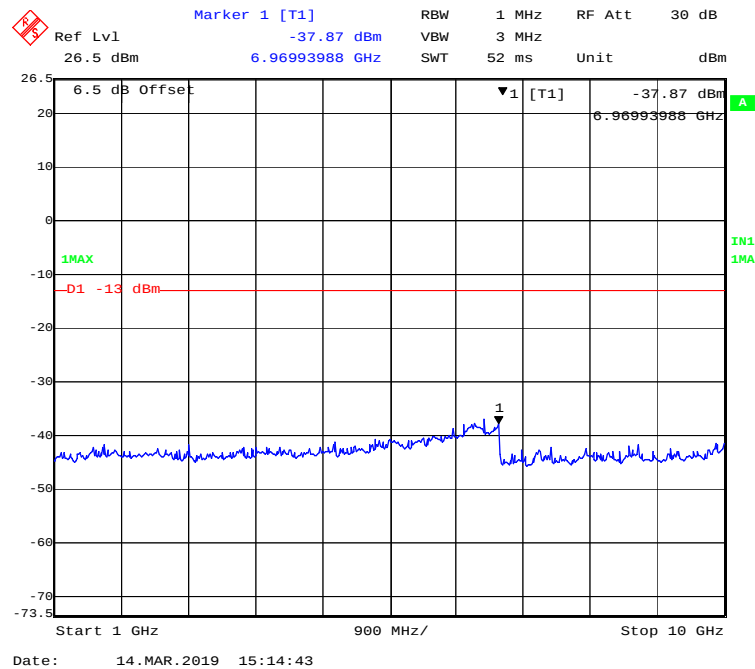


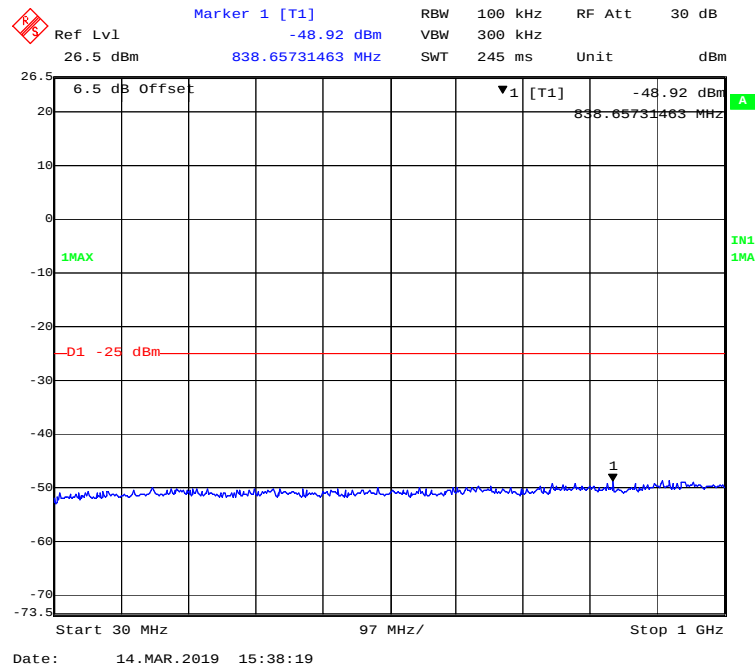
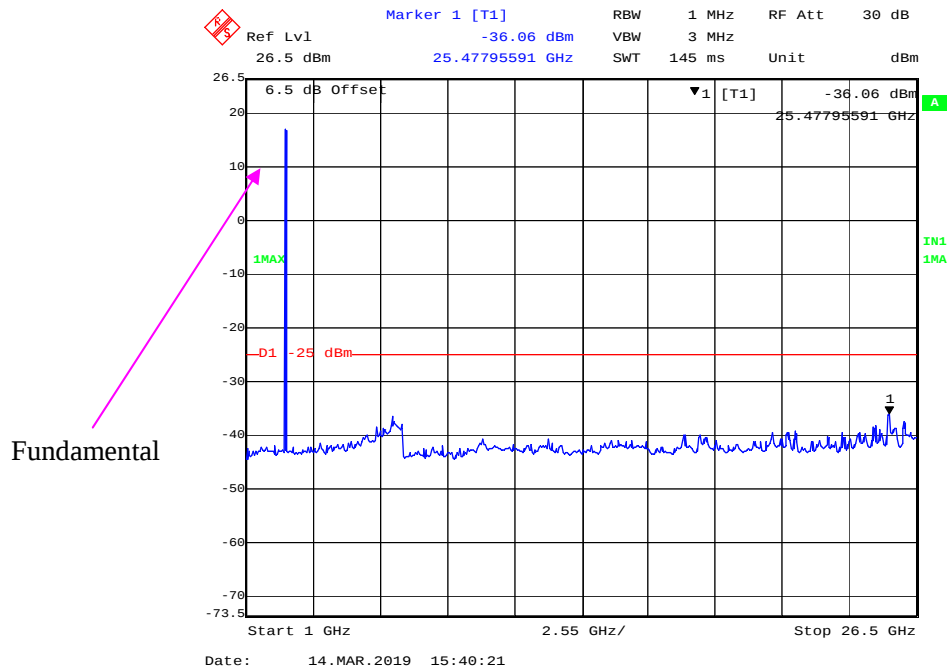
30 MHz - 1 GHz (5.0 MHz, Middle Channel)**1 GHz – 10 GHz (5.0MHz, Middle Channel)**

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

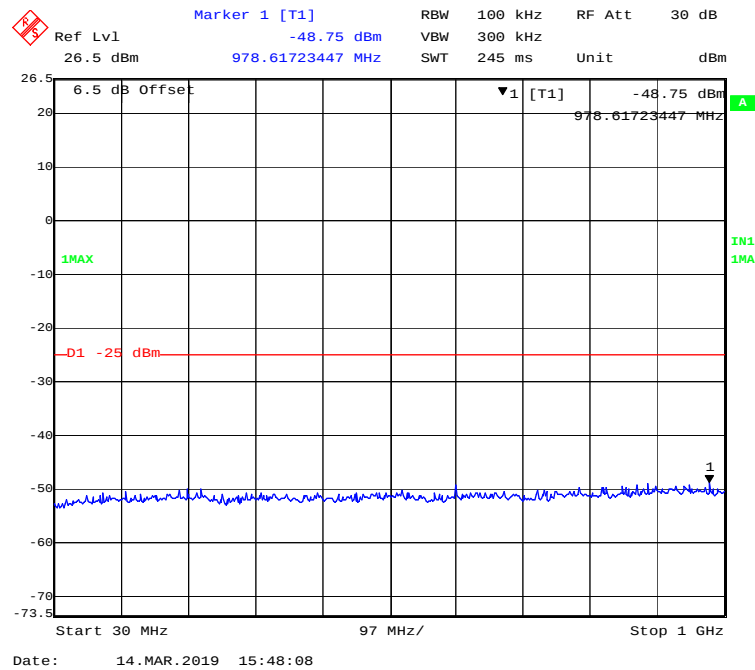


1 GHz – 10 GHz (10.0 MHz, Middle Channel)

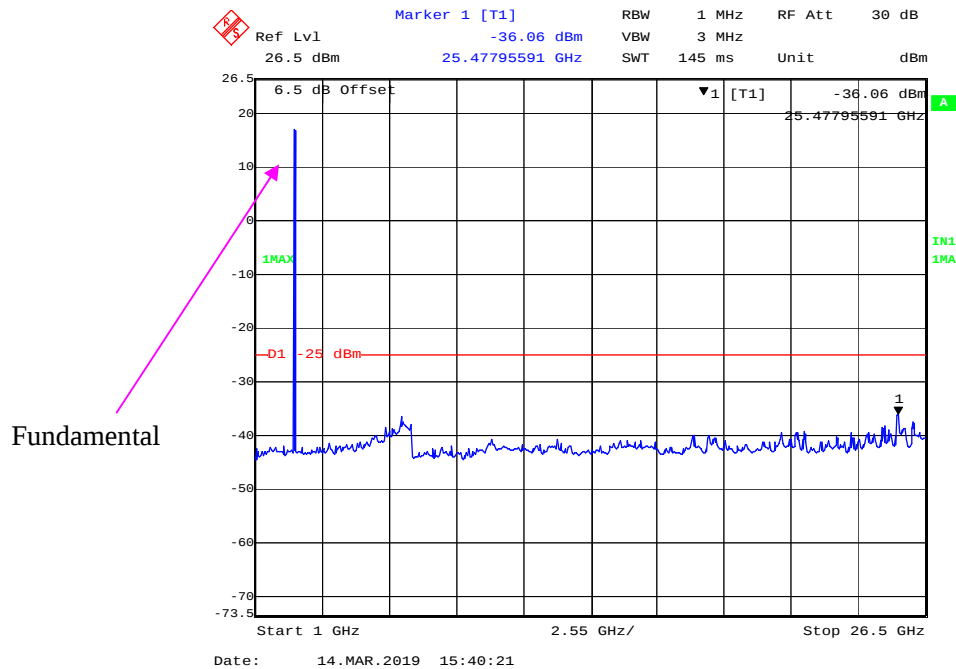


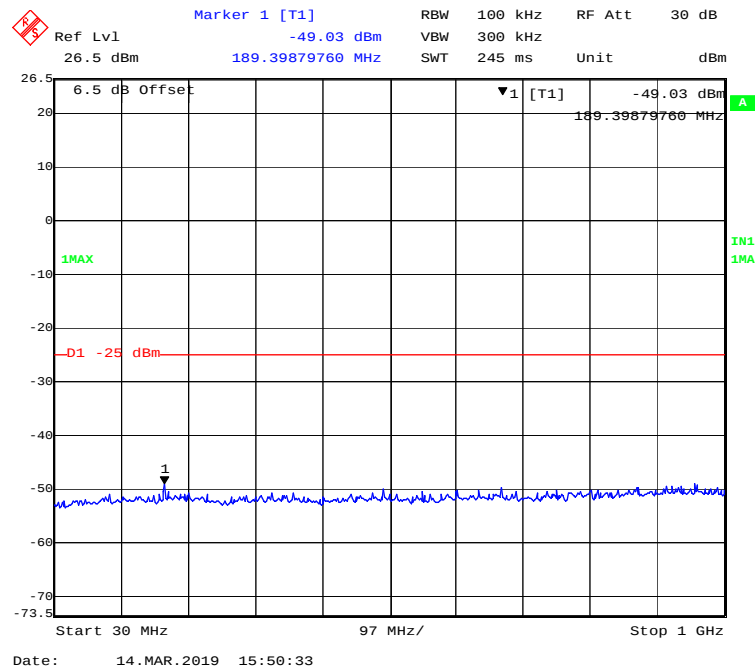
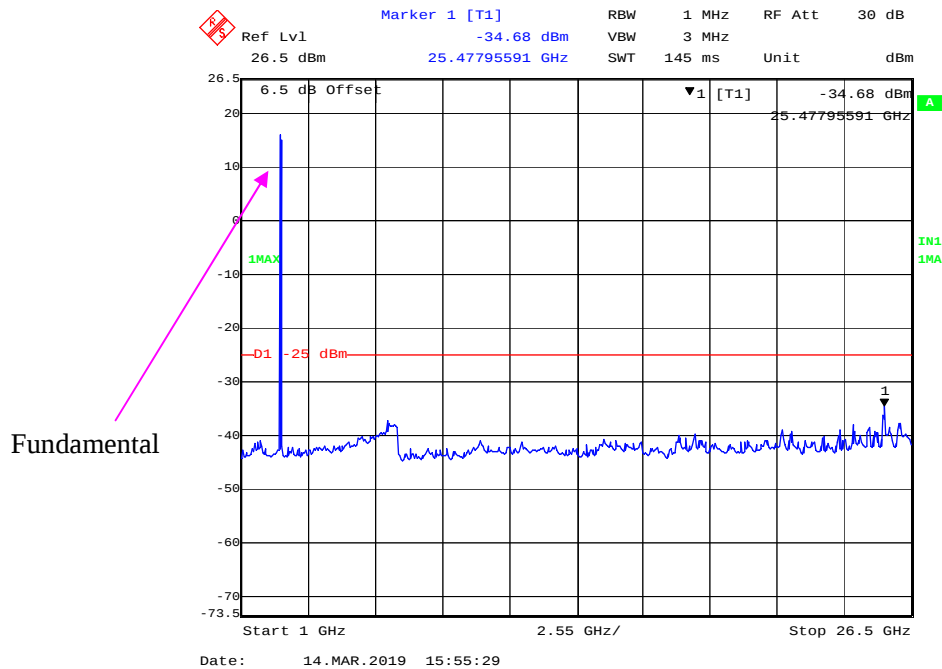
LTE Band 7:**30 MHz - 1 GHz (5.0 MHz, Middle Channel)****1 GHz - 26.5 GHz (5.0 MHz, Middle Channel)**

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

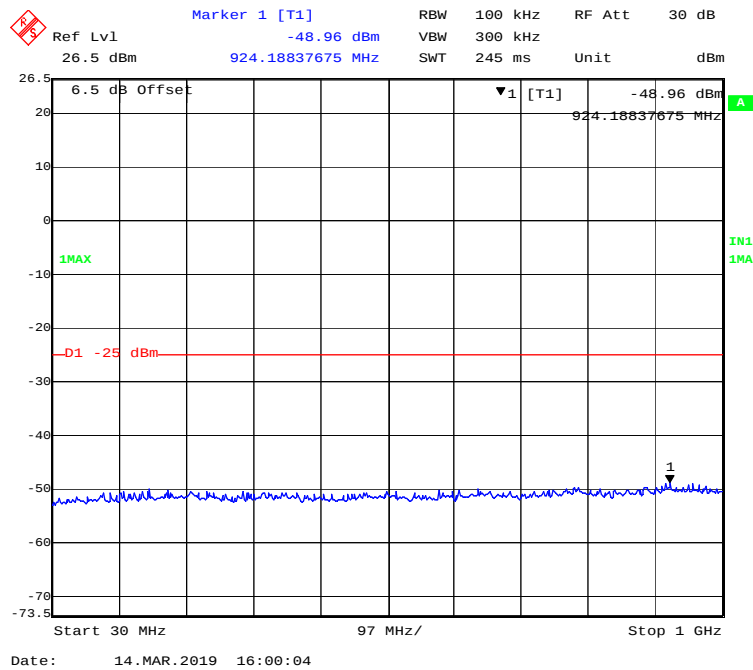


1 GHz – 26.5 GHz (10.0 MHz, Middle Channel)

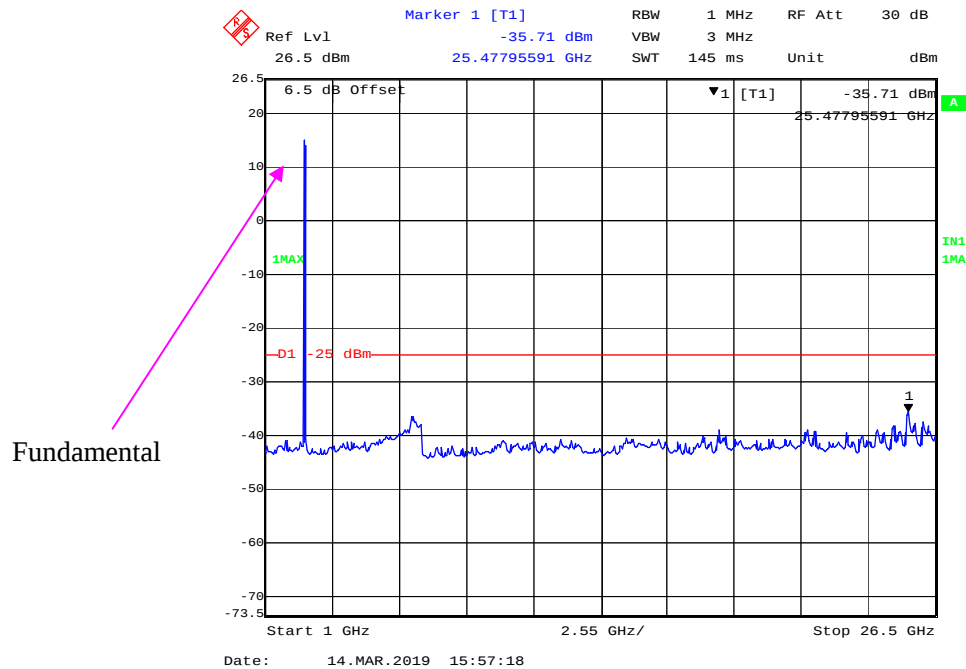


30 MHz - 1 GHz (15.0 MHz, Middle Channel)**1 GHz – 26.5 GHz (15.0MHz, Middle Channel)**

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

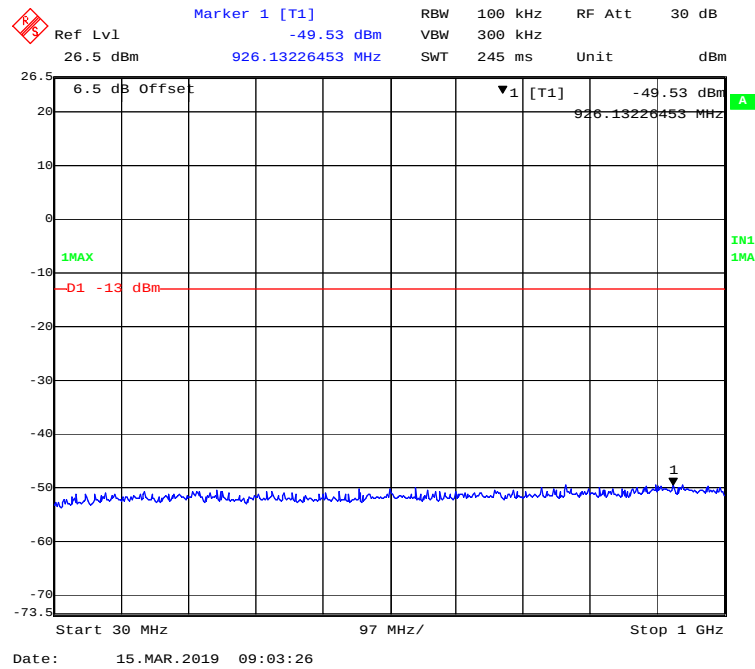


1 GHz – 26.5 GHz (20.0 MHz, Middle Channel)

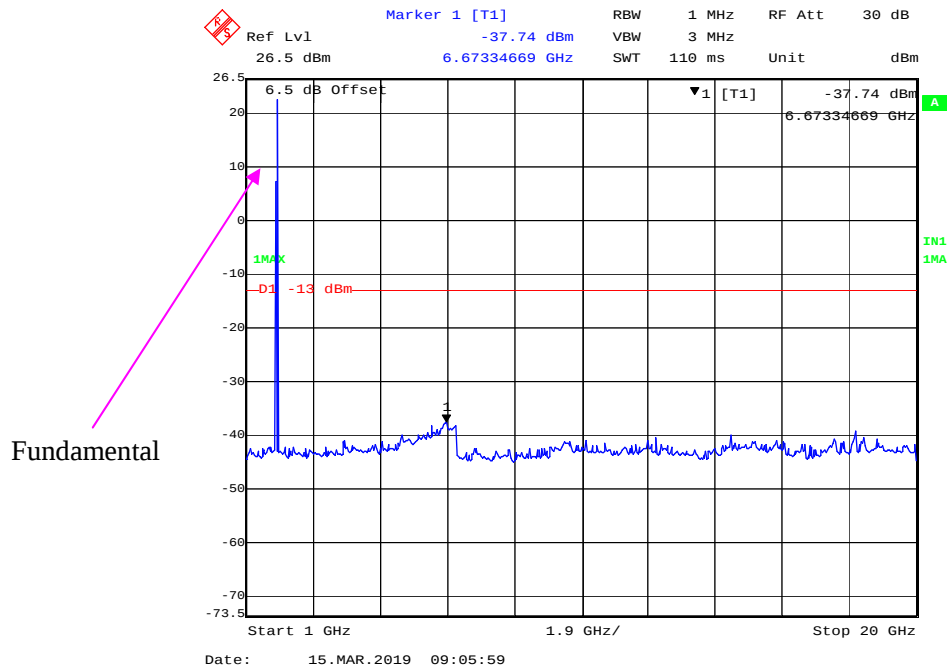


LTE Band 25:

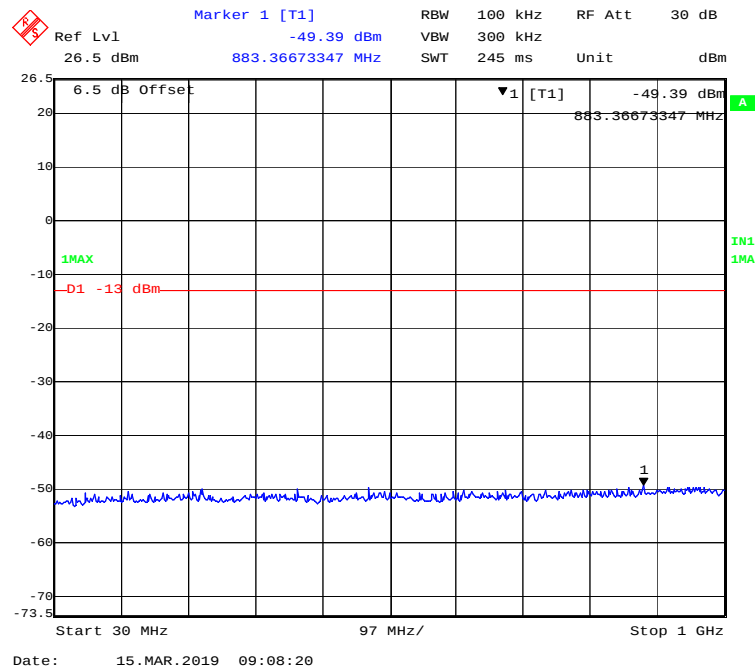
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



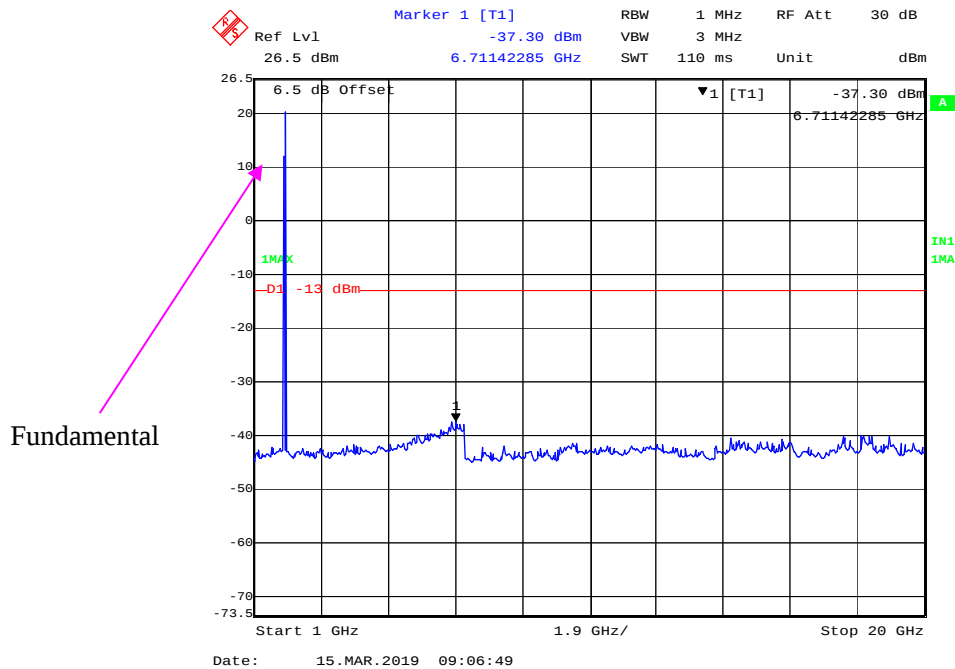
1 GHz - 20 GHz (1.4 MHz, Middle Channel)



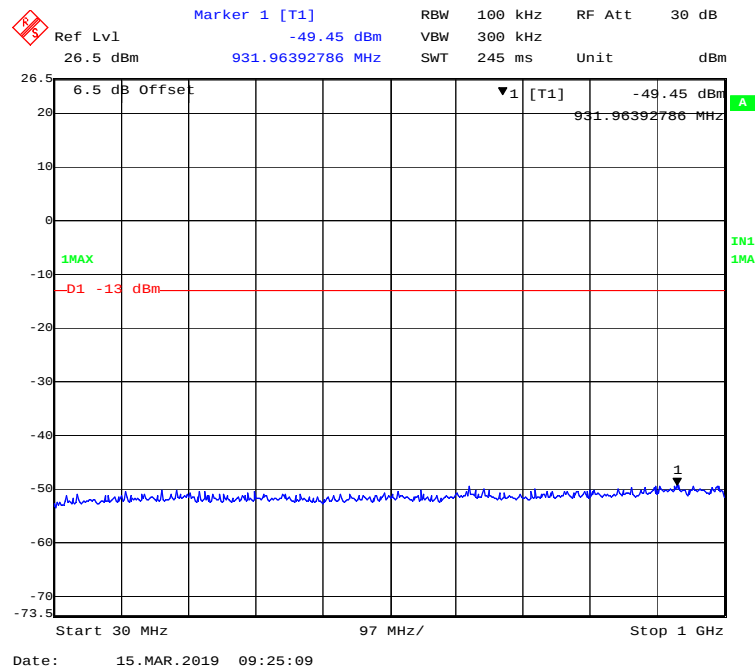
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



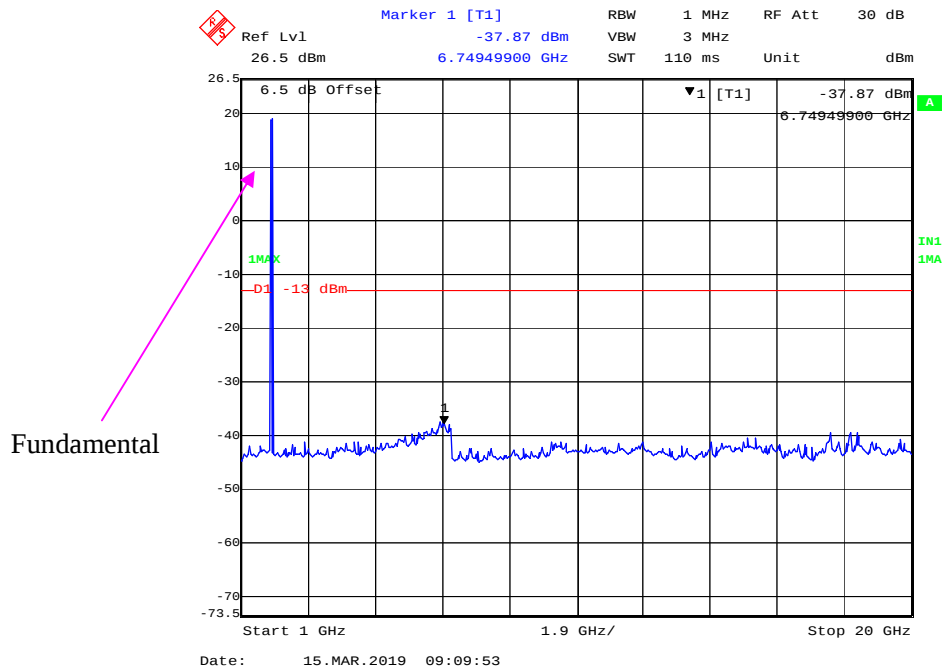
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



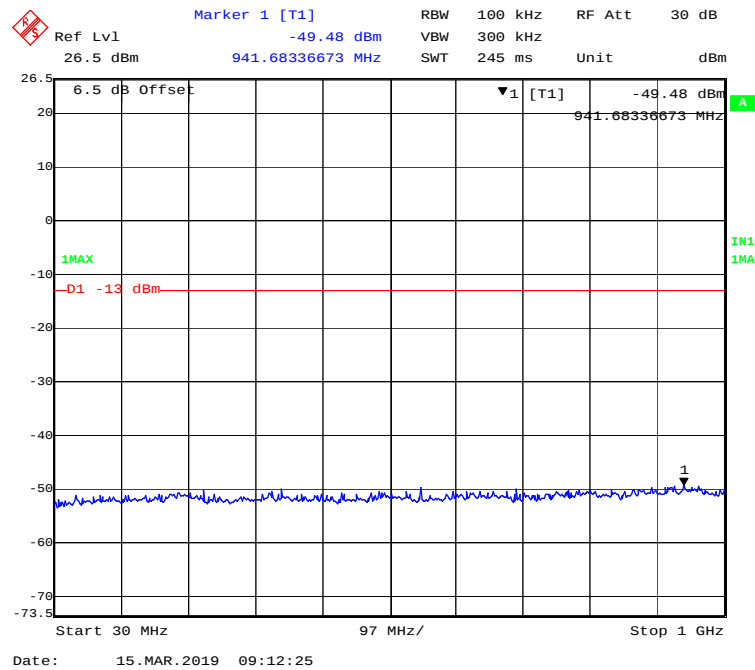
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



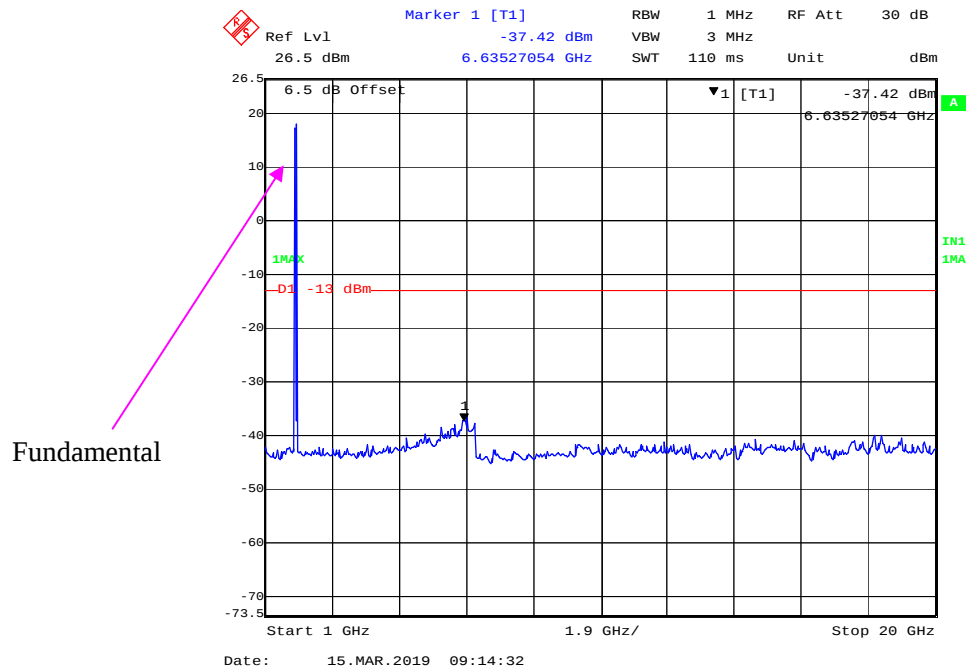
1 GHz – 20 GHz (5.0MHz, Middle Channel)



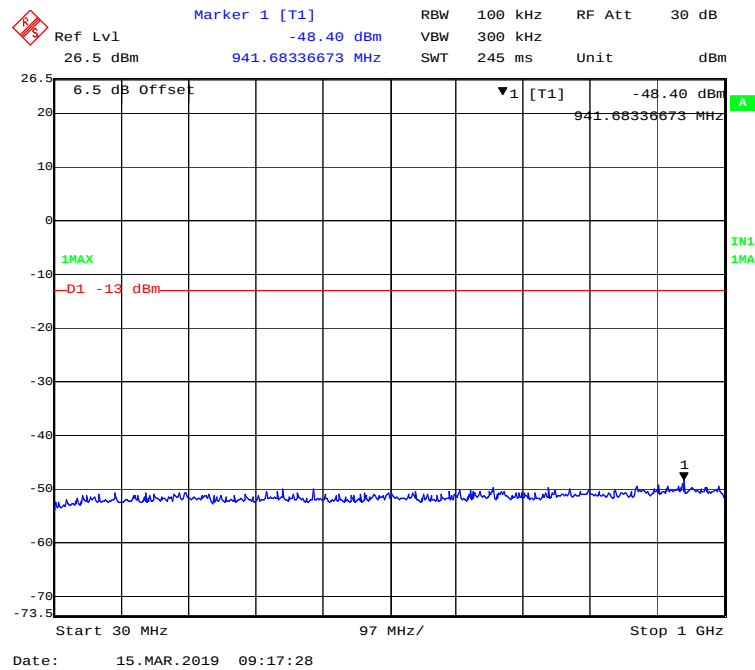
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



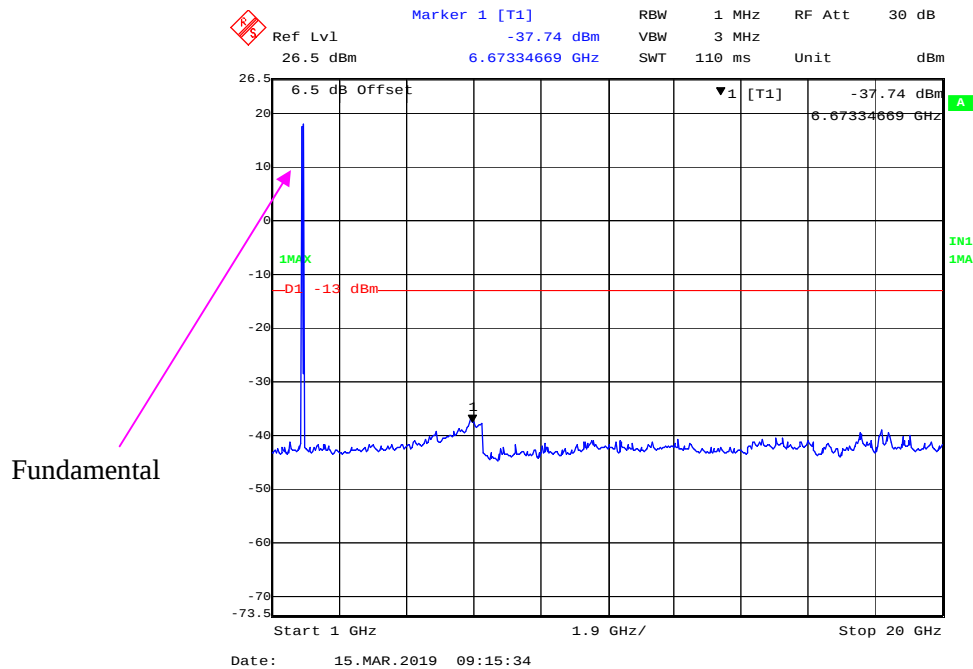
1 GHz – 20 GHz (10.0 MHz, Middle Channel)



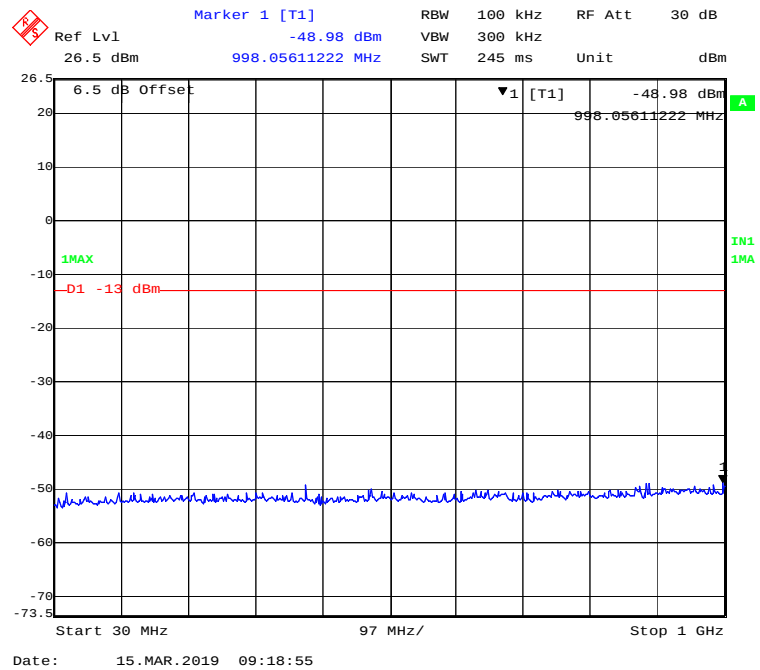
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



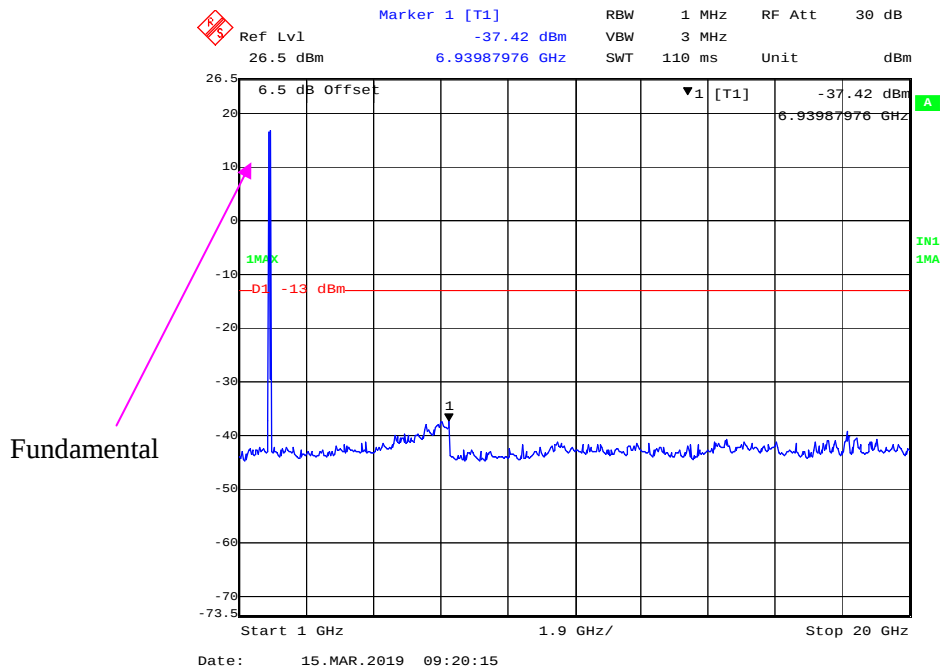
1 GHz – 20 GHz (15.0 MHz, Middle Channel)



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

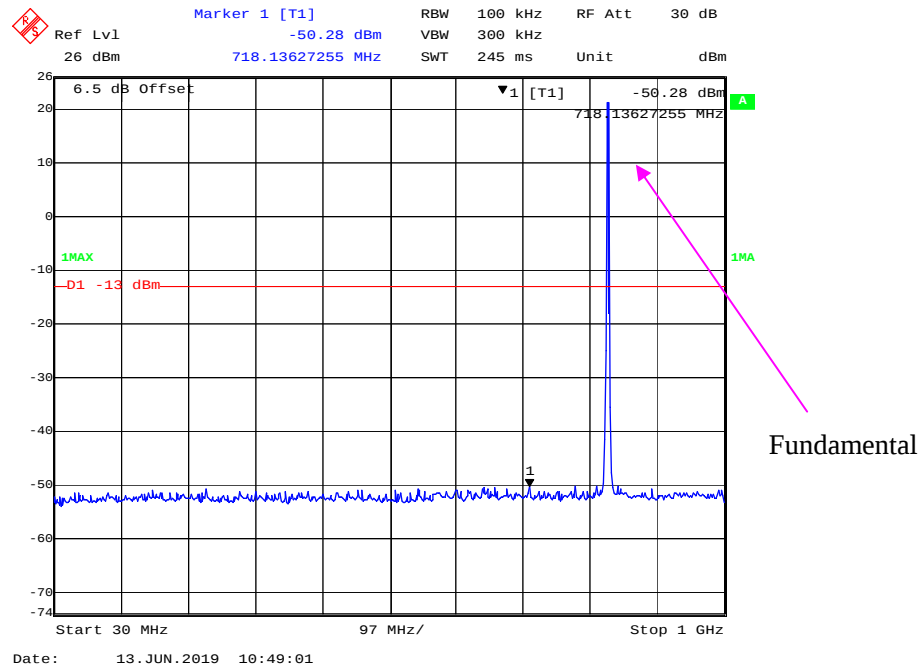


1 GHz – 20 GHz (20.0 MHz, Middle Channel)

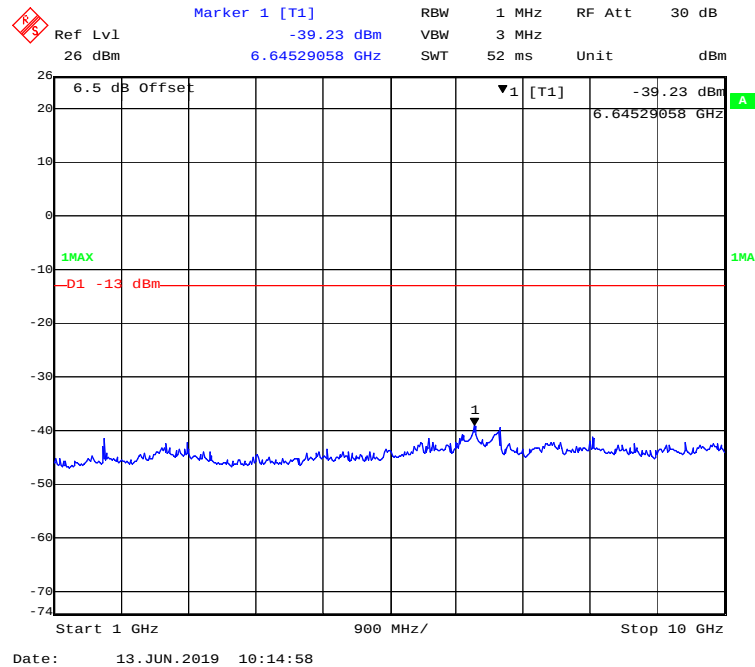


LTE Band 26:

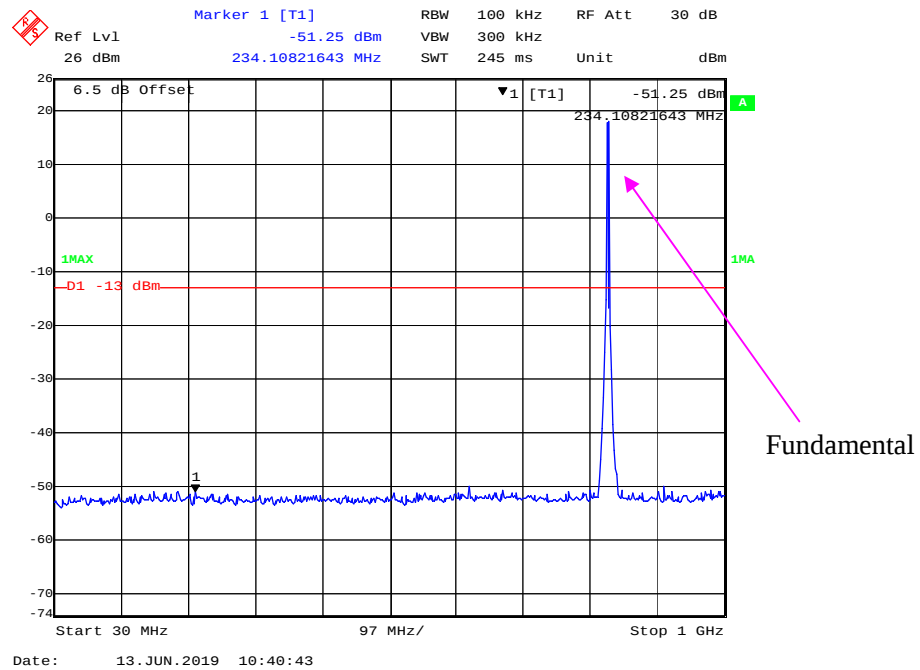
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



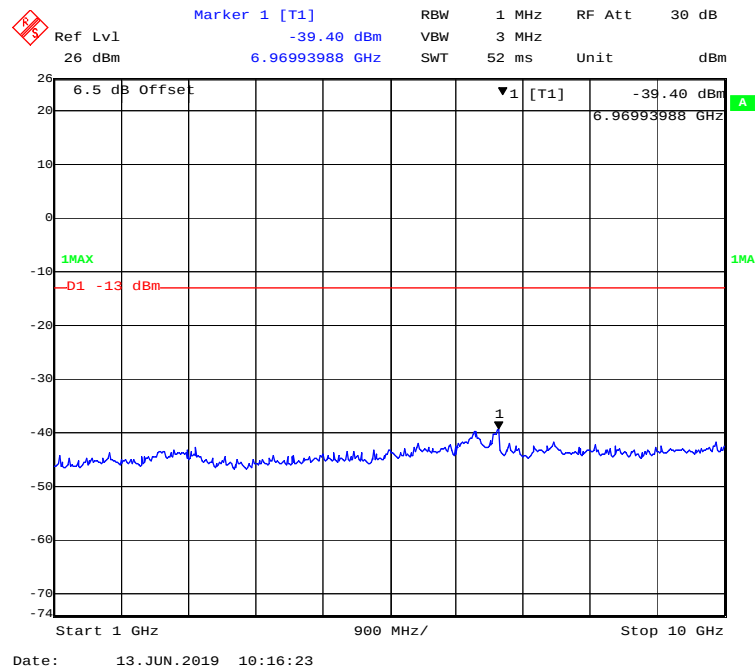
1 GHz - 10 GHz (1.4 MHz, Middle Channel)



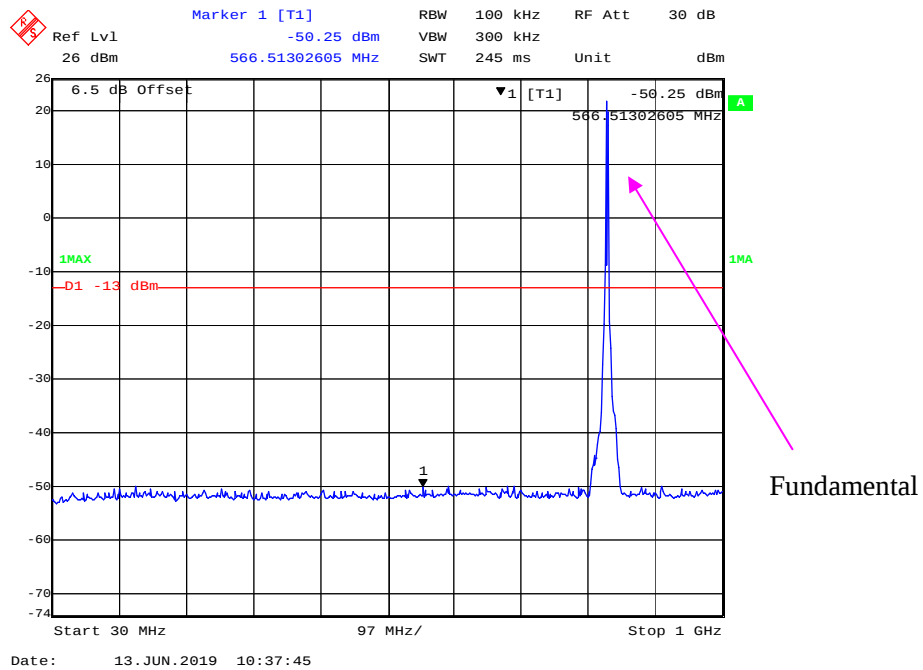
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



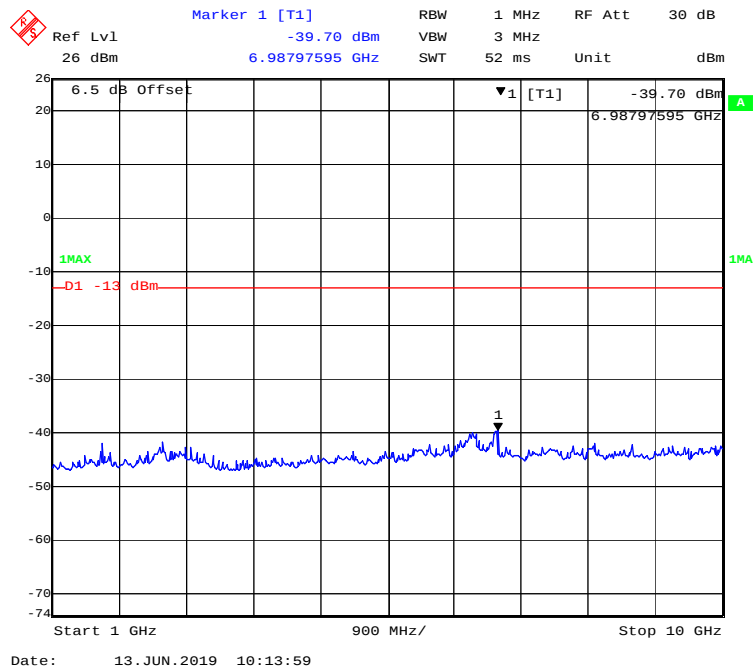
1 GHz – 10 GHz (3.0 MHz, Middle Channel)



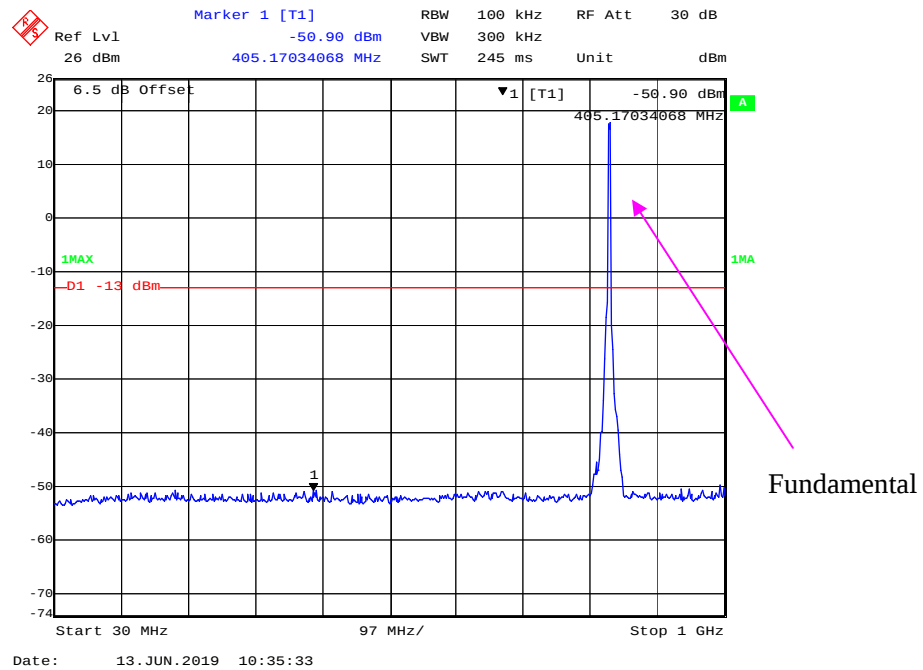
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



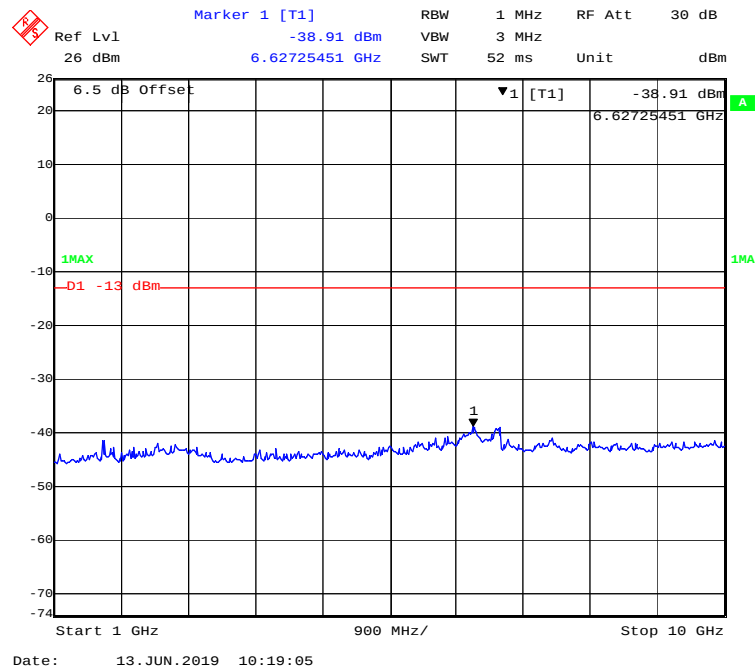
1 GHz – 10 GHz (5.0MHz, Middle Channel)



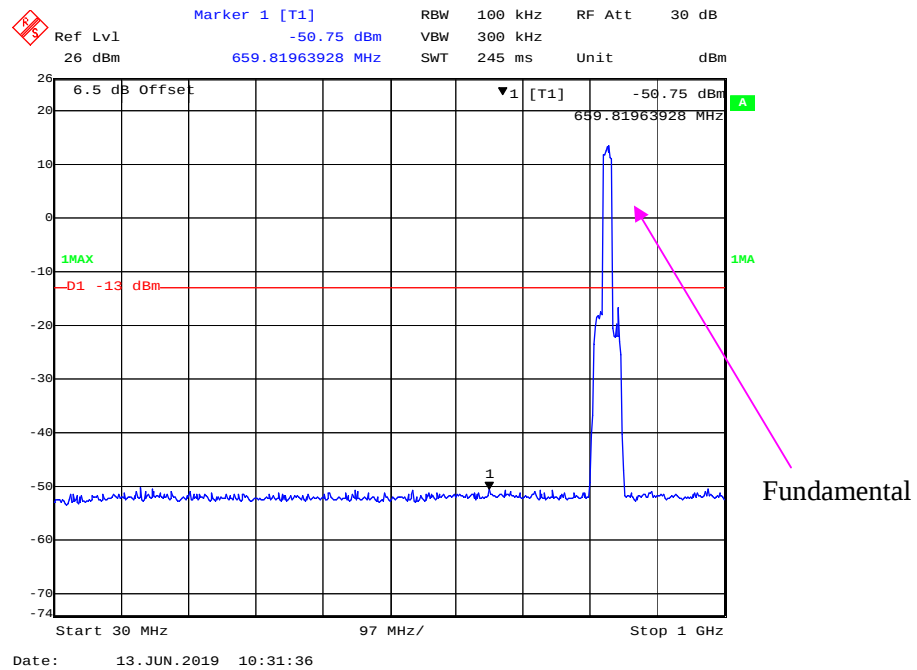
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



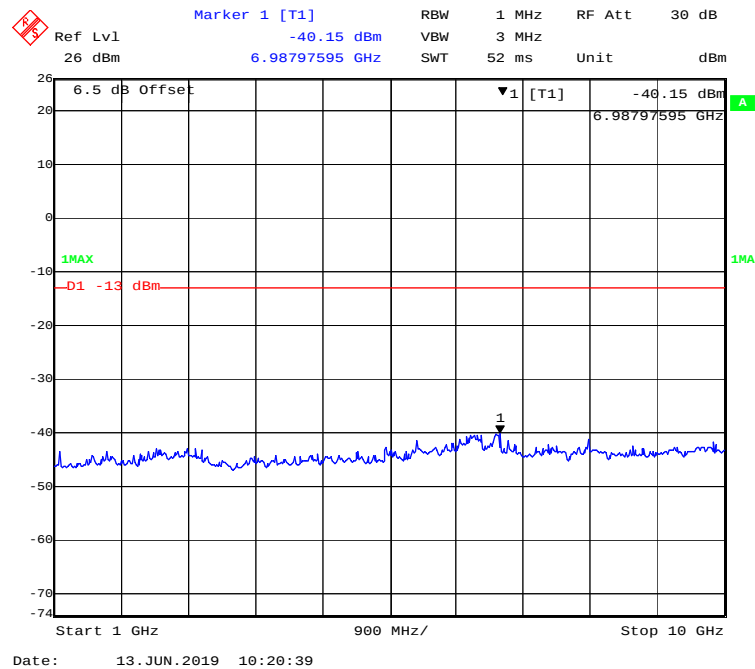
1 GHz – 10 GHz (10.0 MHz, Middle Channel)

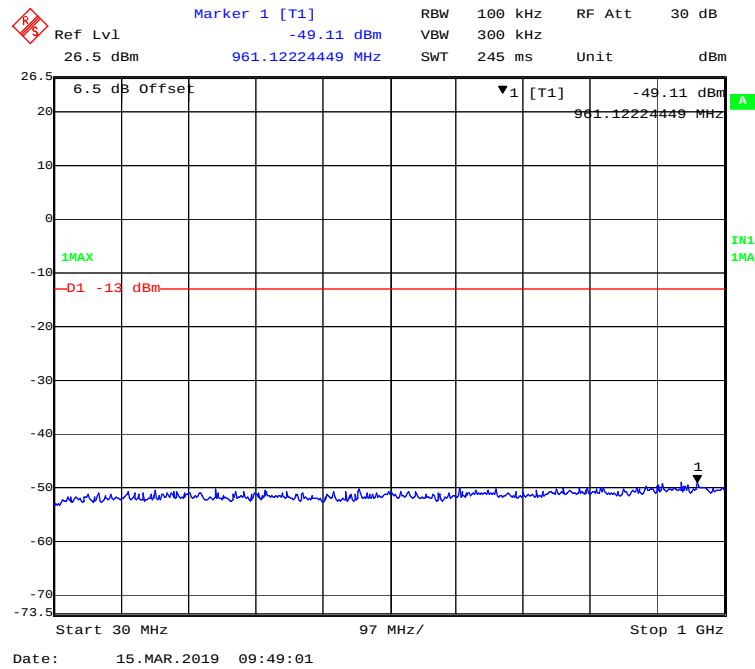
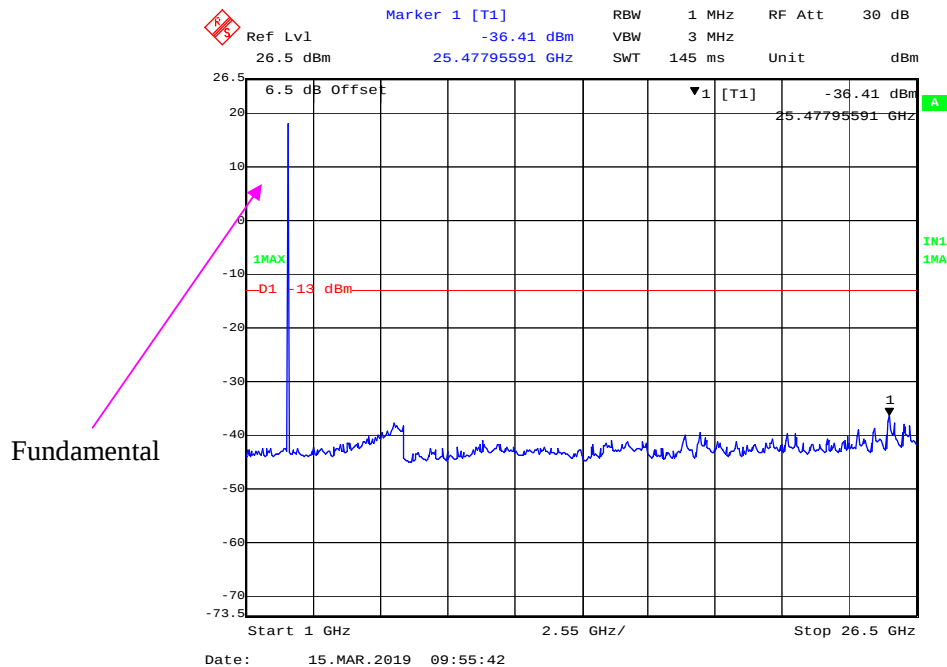


30 MHz - 1 GHz (15.0 MHz, Middle Channel)

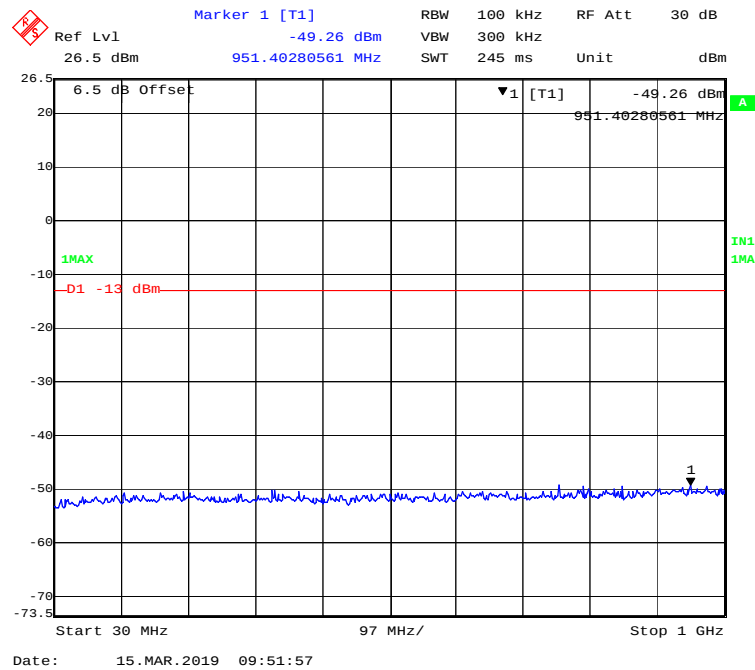


1 GHz – 10 GHz (15.0 MHz, Middle Channel)

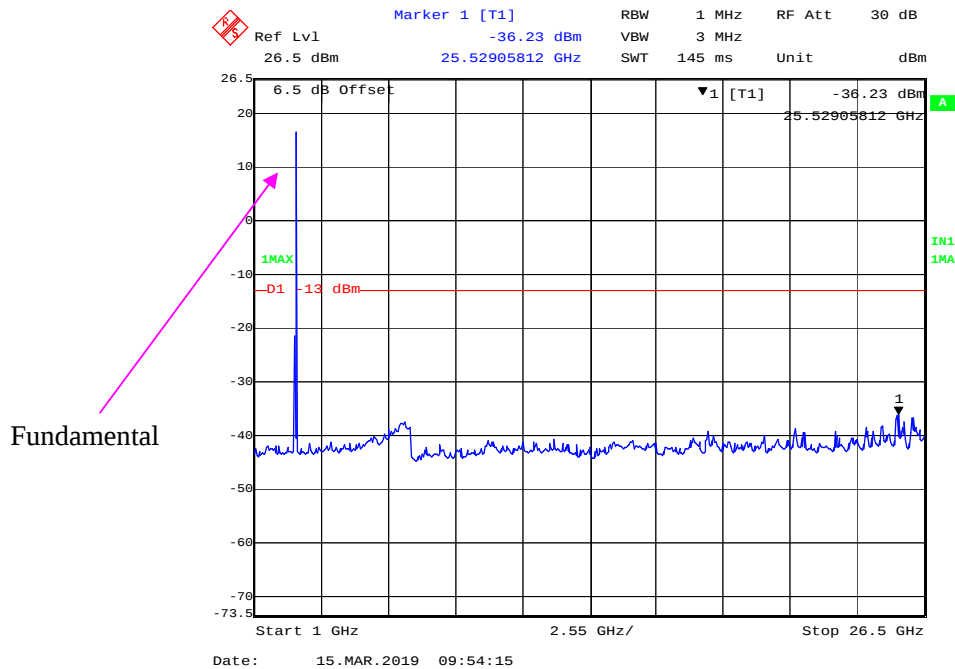


LTE Band 38:**30 MHz - 1 GHz (5 MHz, Middle Channel)****1 GHz – 26.5 GHz (5 MHz, Middle Channel)**

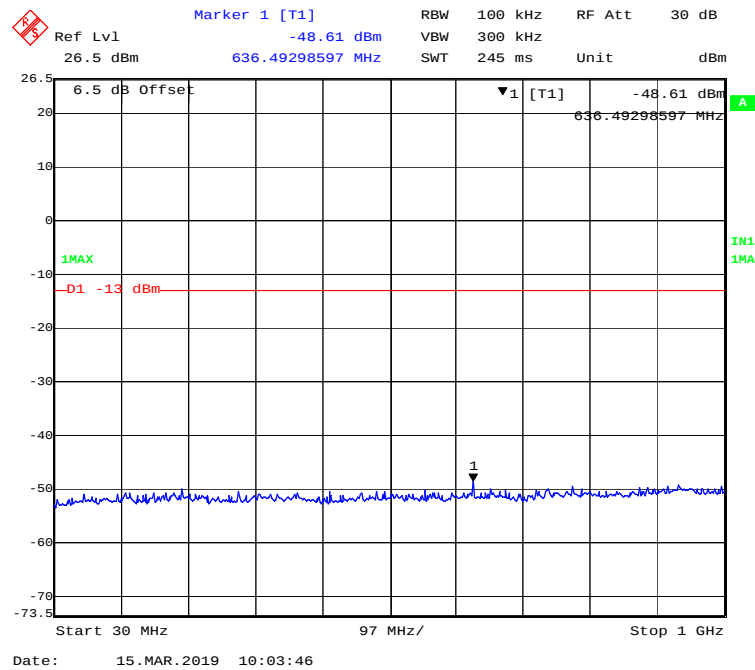
30 MHz - 1 GHz (10MHz, Middle Channel)



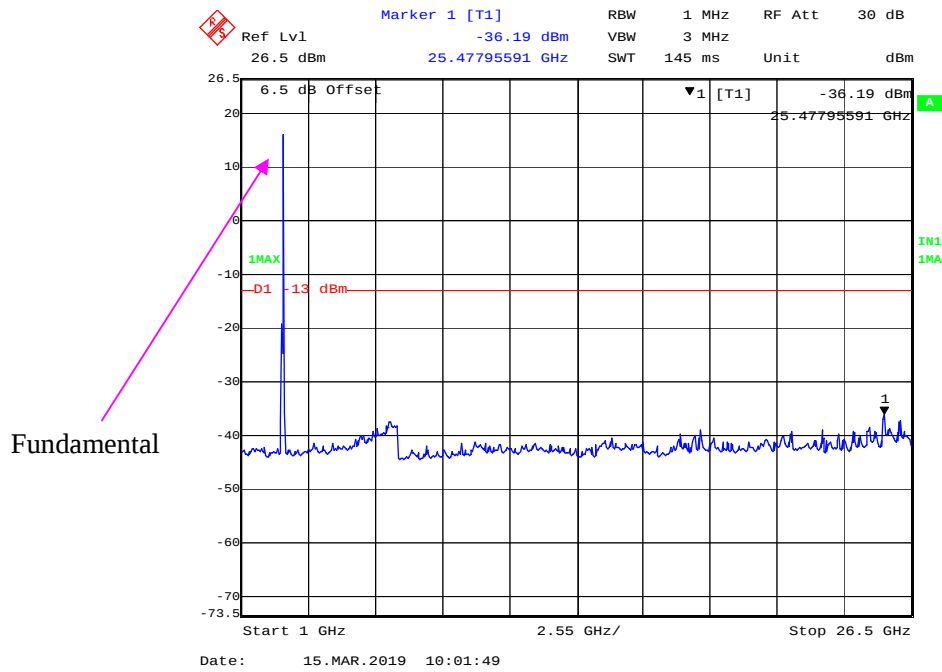
1 GHz – 26.5 GHz (10 MHz, Middle Channel)



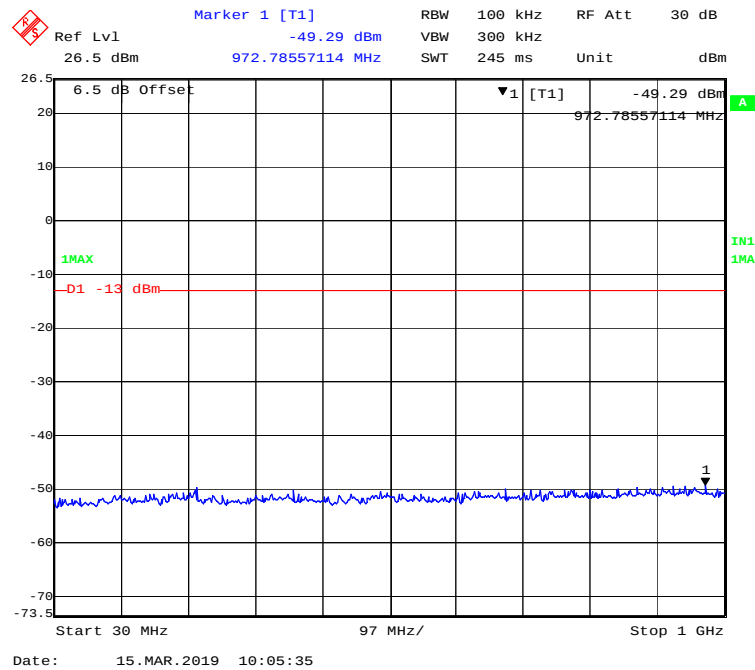
30 MHz - 1 GHz (15 MHz, Middle Channel)



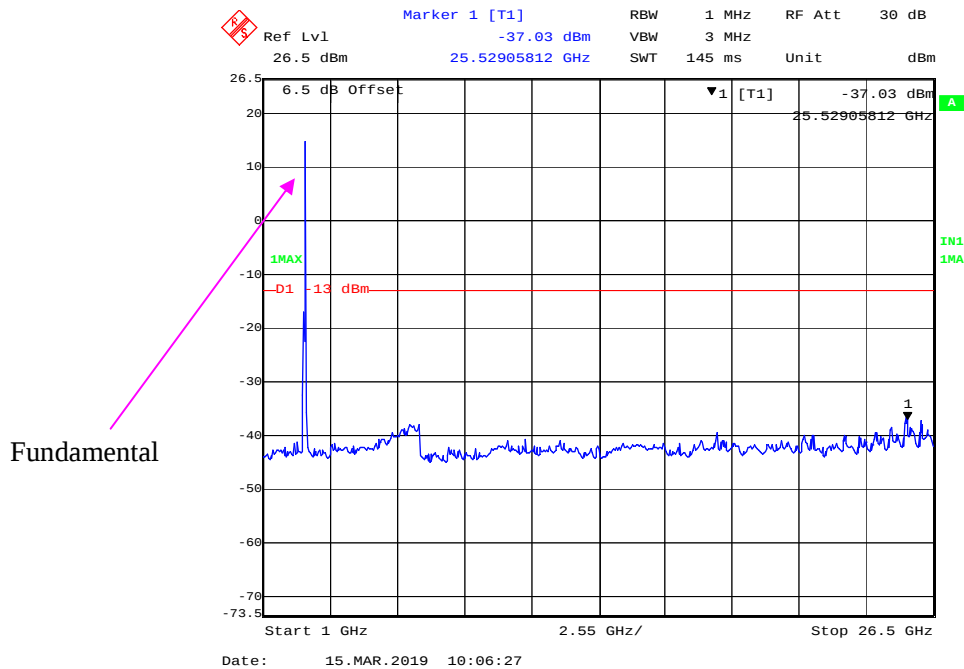
1 GHz – 26.5 GHz (15MHz, Middle Channel)



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

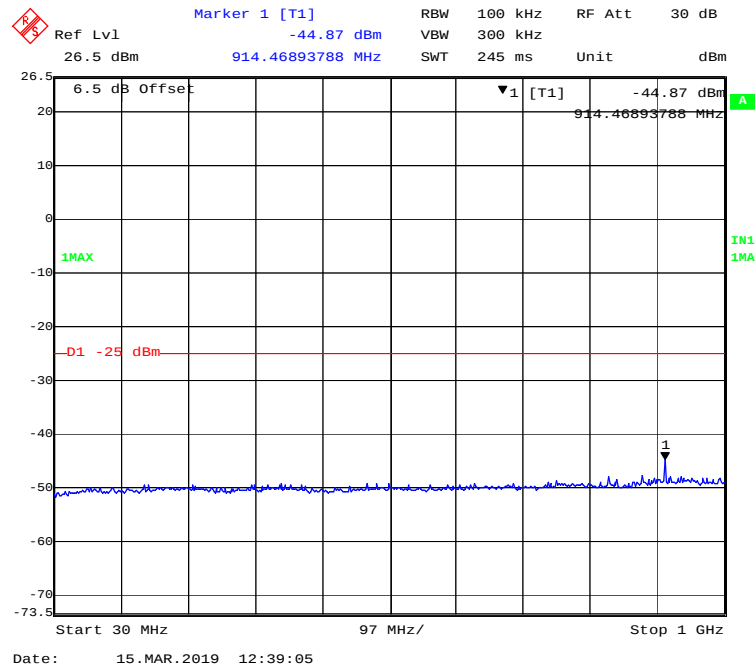


1 GHz – 26.5 GHz (20 MHz, Middle Channel)

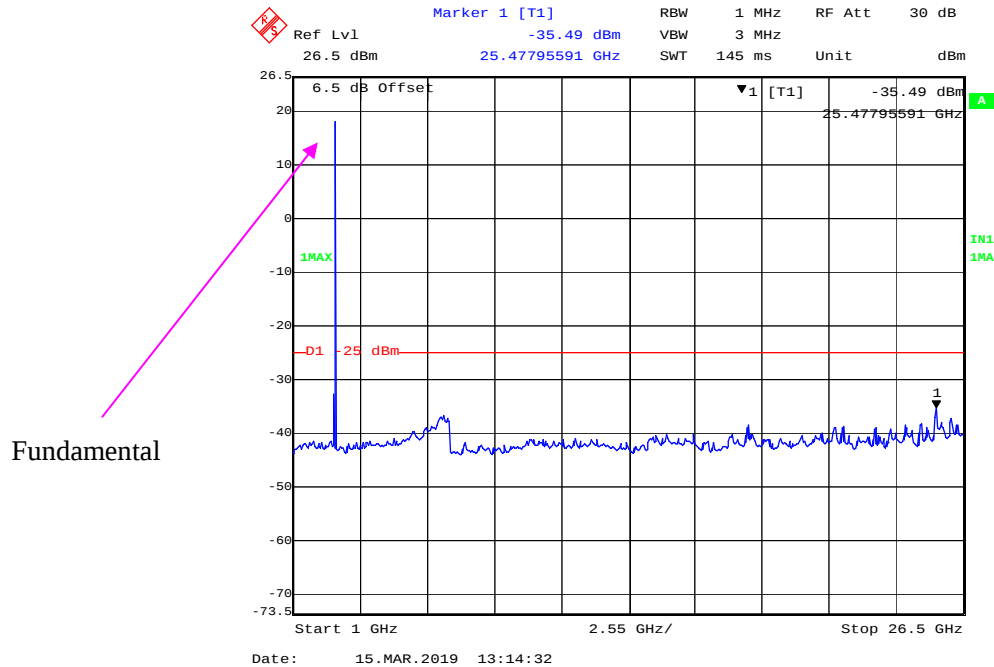


LTE Band 41:

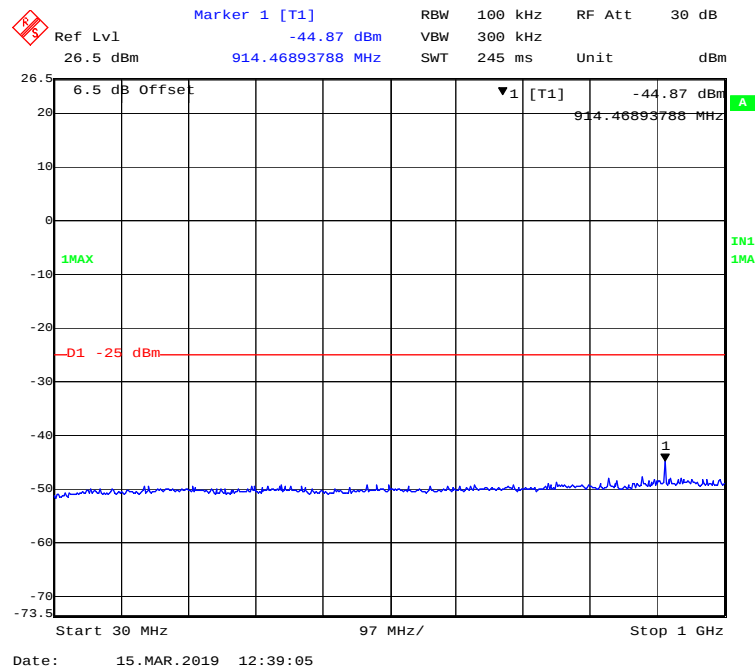
30 MHz - 1 GHz (5 MHz, Middle Channel)



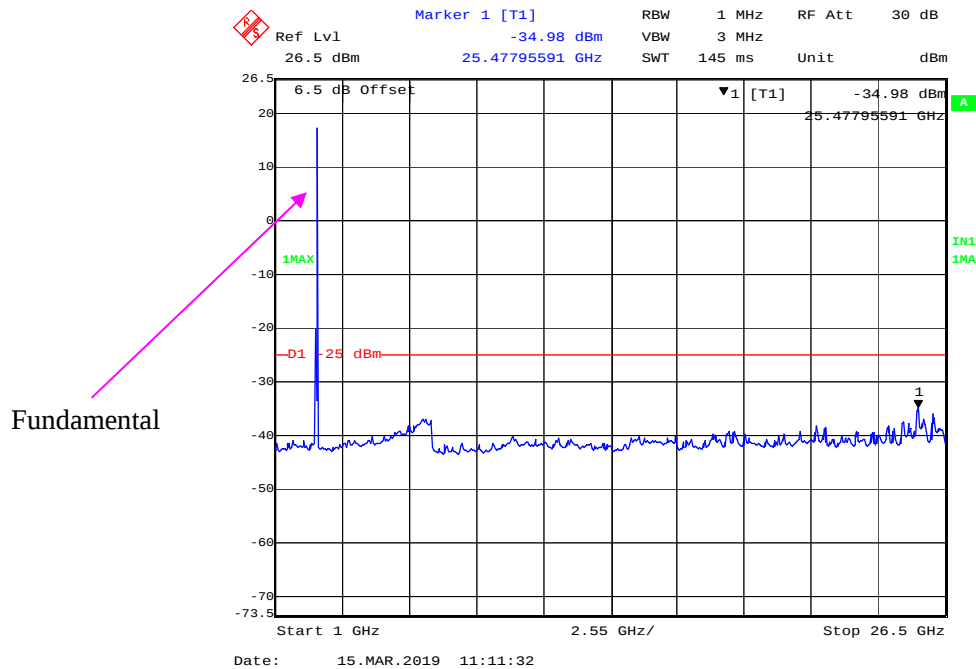
1 GHz – 26.5 GHz (5 MHz, Middle Channel)



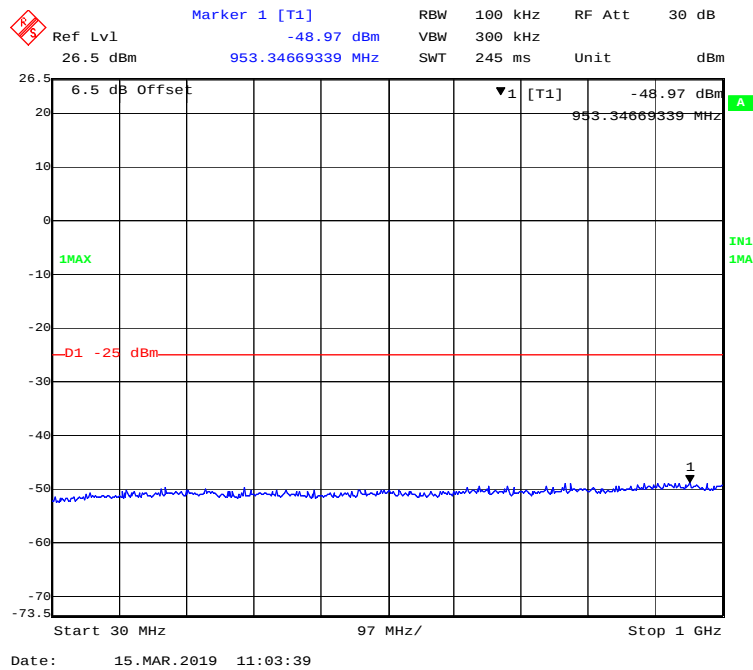
30 MHz - 1 GHz (10 MHz, Middle Channel)



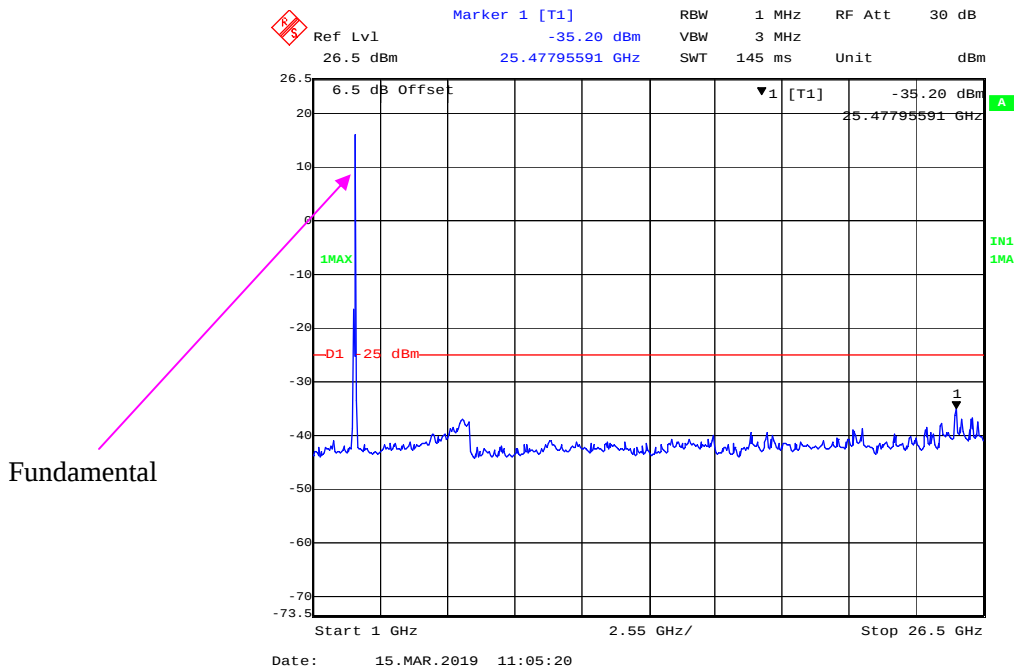
1 GHz -26.5 GHz (10 MHz, Middle Channel)



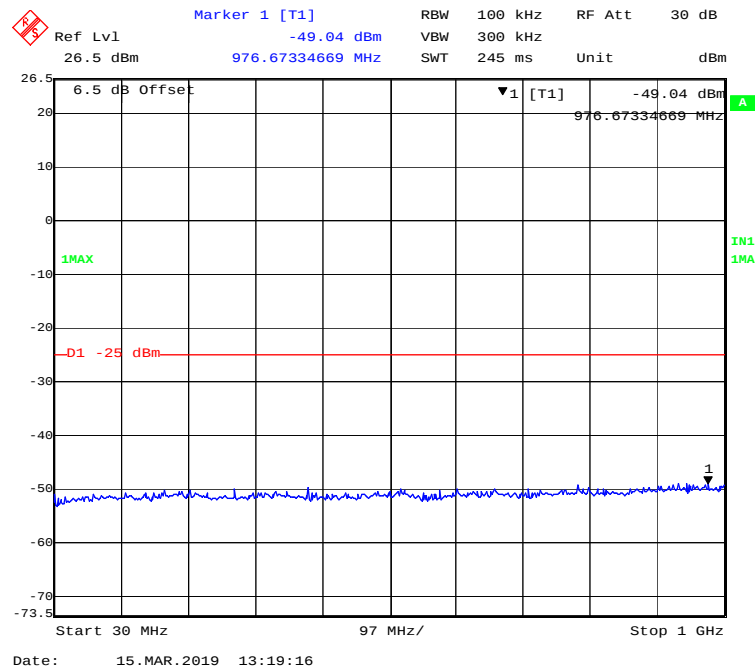
30 MHz - 1 GHz (15 MHz, Middle Channel)



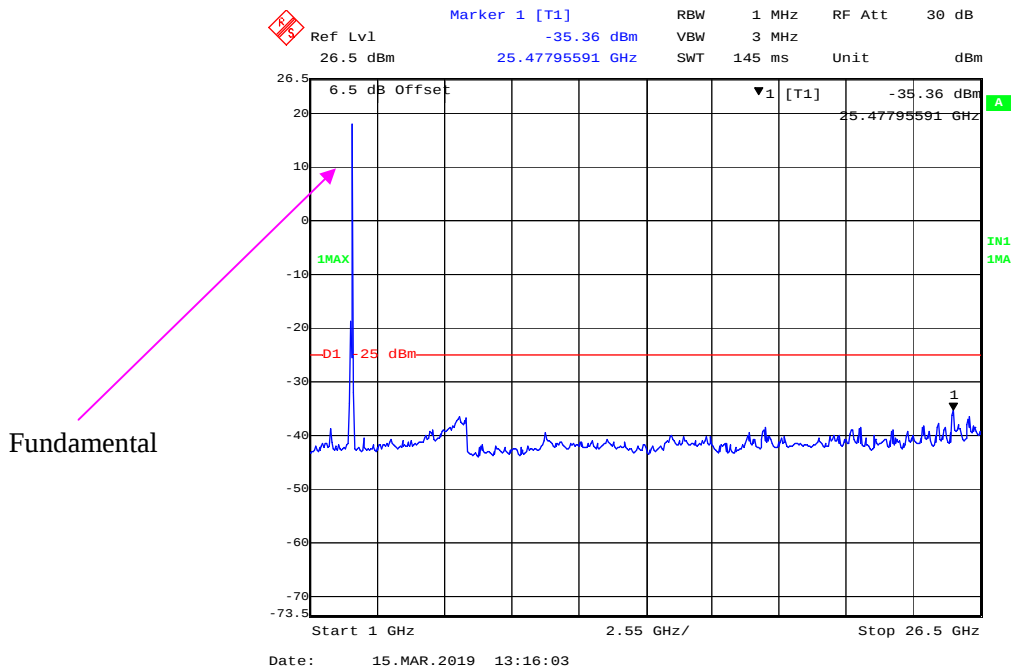
1 GHz – 26.5 GHz (15MHz, Middle Channel)



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



1 GHz – 26.5 GHz (20 MHz, Middle Channel)



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

Applicable Standards

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

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

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

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

Rule Part 90.691 specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg (\text{TX pwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{Log}_{10} (\text{power out in Watts})$

Test Data**Environmental Conditions**

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

The testing was performed by Max Min on 2019-08-23.

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

30 MHz ~ 10 GHz:

GSM 850 Band

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
GSM Mode, Middle channel										
160.21	46.67	31	167	H	-57.50	0.38	-6.17	-64.05	-13	51.05
160.21	51.94	48	152	V	-49.19	0.38	-6.17	-55.74	-13	42.74
1673.20	63.65	41	172	H	-47.30	0.84	8.48	-39.66	-13	26.66
1673.20	70.12	328	136	V	-41.08	0.84	8.48	-33.44	-13	20.44
2509.80	48.14	149	142	H	-60.48	0.89	10.09	-51.28	-13	38.28
2509.80	54.97	252	174	V	-53.72	0.89	10.09	-44.52	-13	31.52

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										
160.21	45.90	220	142	H	-58.27	0.38	-6.17	-64.82	-13	51.82
160.21	52.31	326	145	V	-48.82	0.38	-6.17	-55.37	-13	42.37
1673.20	54.21	75	183	H	-56.74	0.84	8.48	-49.10	-13	36.10
1673.20	55.18	41	151	V	-56.02	0.84	8.48	-48.38	-13	35.38
2509.80	45.59	95	109	H	-63.03	0.89	10.09	-53.83	-13	40.83
2509.80	47.35	171	136	V	-61.34	0.89	10.09	-52.14	-13	39.14

30 MHz ~ 20 GHz:

PCS 1900 Band

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
GPRS Mode, Middle channel										
160.21	46.48	340	192	H	-57.69	0.38	-6.17	-64.24	-13	51.24
160.21	52.31	239	117	V	-48.82	0.38	-6.17	-55.37	-13	42.37
3760.00	45.02	108	134	H	-58.67	0.95	9.74	-49.88	-13	36.88
3760.00	46.58	279	106	V	-57.43	0.95	9.74	-48.64	-13	35.64
5640.00	40.55	177	111	H	-59.96	1.15	10.47	-50.64	-13	37.64
5640.00	42.28	62	182	V	-58.53	1.15	10.47	-49.21	-13	36.21

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										
160.21	47.14	298	187	H	-57.03	0.38	-6.17	-63.58	-13	50.58
160.21	52.19	317	115	V	-48.94	0.38	-6.17	-55.49	-13	42.49
3760.00	38.60	215	184	H	-65.09	0.95	9.74	-56.30	-13	43.30
3760.00	40.47	48	139	V	-63.54	0.95	9.74	-54.75	-13	41.75
5640.00	42.72	183	194	H	-57.79	1.15	10.47	-48.47	-13	35.47
5640.00	44.17	292	128	V	-56.64	1.15	10.47	-47.32	-13	34.32

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)

LTE Band 2 (30 MHz ~ 20 GHz)

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										
160.21	45.61	191	167	H	-58.56	0.38	-6.17	-65.11	-13	52.11
160.21	51.64	142	150	V	-49.49	0.38	-6.17	-56.04	-13	43.04
3760.00	39.47	163	200	H	-64.22	0.95	9.74	-55.43	-13	42.43
3760.00	39.12	238	190	V	-64.89	0.95	9.74	-56.10	-13	43.10
5640.00	42.92	282	127	H	-57.59	1.15	10.47	-48.27	-13	35.27
5640.00	42.13	98	118	V	-58.68	1.15	10.47	-49.36	-13	36.36
16-QAM 1.4MHz Bandwidth Middle Channel										
160.21	45.31	39	154	H	-58.86	0.38	-6.17	-65.41	-13	52.41
160.21	52.01	79	180	V	-49.12	0.38	-6.17	-55.67	-13	42.67
3760.00	38.77	288	163	H	-64.92	0.95	9.74	-56.13	-13	43.13
3760.00	38.57	220	118	V	-65.44	0.95	9.74	-56.65	-13	43.65
5640.00	42.30	114	164	H	-58.21	1.15	10.47	-48.89	-13	35.89
5640.00	42.73	307	184	V	-58.08	1.15	10.47	-48.76	-13	35.76

LTE Band 4 (30 MHz ~ 20 GHz)

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										
160.21	46.14	359	129	H	-58.03	0.38	-6.17	-64.58	-13	51.58
160.21	51.72	56	194	V	-49.41	0.38	-6.17	-55.96	-13	42.96
3465.00	39.60	113	156	H	-65.19	0.93	9.87	-56.25	-13	43.25
3465.00	40.01	119	131	V	-65.21	0.93	9.87	-56.27	-13	43.27
5197.50	41.99	105	166	H	-60.09	1.10	10.30	-50.89	-13	37.89
5197.50	41.31	358	159	V	-60.98	1.10	10.30	-51.78	-13	38.78
16-QAM 1.4MHz Bandwidth Middle Channel										
160.21	46.85	328	128	H	-57.32	0.38	-6.17	-63.87	-13	50.87
160.21	51.93	44	147	V	-49.20	0.38	-6.17	-55.75	-13	42.75
3465.00	38.57	132	176	H	-66.22	0.93	9.87	-57.28	-13	44.28
3465.00	39.15	299	122	V	-66.07	0.93	9.87	-57.13	-13	44.13
5197.50	41.53	290	132	H	-60.55	1.10	10.30	-51.35	-13	38.35
5197.50	41.00	32	149	V	-61.29	1.10	10.30	-52.09	-13	39.09

LTE Band 5 (30 MHz ~ 10 GHz)

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										
160.21	45.68	252	154	H	-58.49	0.38	-6.17	-65.04	-13	52.04
160.21	52.70	209	157	V	-48.43	0.38	-6.17	-54.98	-13	41.98
1673.00	54.12	162	118	H	-56.83	0.84	8.48	-49.19	-13	36.19
1673.00	55.19	96	182	V	-56.01	0.84	8.48	-48.37	-13	35.37
2509.50	46.85	286	130	H	-61.77	0.89	10.09	-52.57	-13	39.57
2509.50	47.53	107	118	V	-61.16	0.89	10.09	-51.96	-13	38.96
16-QAM 1.4MHz Bandwidth Middle Channel										
160.21	45.41	358	142	H	-58.76	0.38	-6.17	-65.31	-13	52.31
160.21	52.04	68	188	V	-49.09	0.38	-6.17	-55.64	-13	42.64
1673.00	53.72	305	172	H	-57.23	0.84	8.48	-49.59	-13	36.59
1673.00	54.88	243	151	V	-56.32	0.84	8.48	-48.68	-13	35.68
2509.50	46.15	60	159	H	-62.47	0.89	10.09	-53.27	-13	40.27
2509.50	47.14	278	105	V	-61.55	0.89	10.09	-52.35	-13	39.35

LTE Band 7 (30 MHz ~ 26.5 GHz)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5.0MHz Bandwidth Middle Channel										
160.21	46.85	130	115	H	-57.32	0.38	-6.17	-63.87	-25	38.87
160.21	52.31	124	128	V	-48.82	0.38	-6.17	-55.37	-25	30.37
5070.00	42.12	256	149	H	-60.50	1.09	10.30	-51.29	-25	26.29
5070.00	41.33	249	136	V	-61.46	1.09	10.30	-52.25	-25	27.25
7605.00	41.92	110	200	H	-54.14	1.78	10.08	-45.84	-25	20.84
7605.00	41.05	122	121	V	-55.15	1.78	10.08	-46.85	-25	21.85
16-QAM 5MHz Bandwidth Middle Channel										
160.21	45.26	355	196	H	-58.91	0.38	-6.17	-65.46	-25	40.46
160.21	51.64	91	176	V	-49.49	0.38	-6.17	-56.04	-25	31.04
5070.00	41.55	83	161	H	-61.07	1.09	10.30	-51.86	-25	26.86
5070.00	41.15	54	180	V	-61.64	1.09	10.30	-52.43	-25	27.43
7605.00	41.29	72	199	H	-54.77	1.78	10.08	-46.47	-25	21.47
7605.00	40.55	61	166	V	-55.65	1.78	10.08	-47.35	-25	22.35

LTE Band 25 (30 MHz ~ 20 GHz)

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										
160.21	47.17	129	180	H	-57.00	0.38	-6.17	-63.55	-13	50.55
160.21	52.37	65	147	V	-48.76	0.38	-6.17	-55.31	-13	42.31
3765.00	43.59	354	181	H	-60.08	0.95	9.74	-51.29	-13	38.29
3765.00	42.95	294	135	V	-61.04	0.95	9.74	-52.25	-13	39.25
5647.50	53.31	73	125	H	-47.19	1.15	10.48	-37.86	-13	24.86
5647.50	52.61	308	186	V	-48.18	1.15	10.48	-38.85	-13	25.85
16-QAM 1.4MHz Bandwidth Middle Channel										
160.21	46.98	43	145	H	-57.19	0.38	-6.17	-63.74	-13	50.74
160.21	52.07	243	124	V	-49.06	0.38	-6.17	-55.61	-13	42.61
3765.00	43.02	97	139	H	-60.65	0.95	9.74	-51.86	-13	38.86
3765.00	42.77	189	138	V	-61.22	0.95	9.74	-52.43	-13	39.43
5647.50	52.77	201	200	H	-47.73	1.15	10.48	-38.40	-13	25.40
5647.50	52.23	313	167	V	-48.56	1.15	10.48	-39.23	-13	26.23

LTE Band 26 (30 MHz ~ 10 GHz)

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										
160.21	47.05	240	114	H	-57.12	0.38	-6.17	-63.67	-13	50.67
160.21	52.31	188	167	V	-48.82	0.38	-6.17	-55.37	-13	42.37
1663.00	55.67	322	134	H	-55.35	0.84	8.46	-47.73	-13	34.73
1663.00	55.30	44	171	V	-55.97	0.84	8.46	-48.35	-13	35.35
2494.50	46.28	83	154	H	-62.37	0.89	10.09	-53.17	-13	40.17
2494.50	47.10	105	100	V	-61.62	0.89	10.09	-52.42	-13	39.42
16-QAM 1.4MHz Bandwidth Middle Channel										
160.21	46.35	71	108	H	-57.82	0.38	-6.17	-64.37	-13	51.37
160.21	51.77	257	170	V	-49.36	0.38	-6.17	-55.91	-13	42.91
1663.00	54.95	248	110	H	-56.07	0.84	8.46	-48.45	-13	35.45
1663.00	54.70	338	146	V	-56.57	0.84	8.46	-48.95	-13	35.95
2494.50	45.75	24	190	H	-62.90	0.89	10.09	-53.70	-13	40.70
2494.50	46.24	196	116	V	-62.48	0.89	10.09	-53.28	-13	40.28

LTE Band 38 (30 MHz ~ 26.5 GHz)

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										
160.21	46.98	18	119	H	-57.19	0.38	-6.17	-63.74	-13	50.74
160.21	52.22	257	138	V	-48.91	0.38	-6.17	-55.46	-13	42.46
5190.00	45.05	250	113	H	-57.06	1.10	10.30	-47.86	-13	34.86
5190.00	44.22	86	187	V	-58.10	1.10	10.30	-48.90	-13	35.90
7785.00	45.86	86	115	H	-49.62	1.81	10.04	-41.39	-13	28.39
7785.00	44.86	221	147	V	-50.73	1.81	10.04	-42.50	-13	29.50
16-QAM 5MHz Bandwidth Middle Channel										
160.21	45.48	23	147	H	-58.69	0.38	-6.17	-65.24	-13	52.24
160.21	51.56	108	104	V	-49.57	0.38	-6.17	-56.12	-13	43.12
5190.00	44.45	133	175	H	-57.66	1.10	10.30	-48.46	-13	35.46
5190.00	43.64	296	152	V	-58.68	1.10	10.30	-49.48	-13	36.48
7785.00	45.56	96	148	H	-49.92	1.81	10.04	-41.69	-13	28.69
7785.00	44.33	346	123	V	-51.26	1.81	10.04	-43.03	-13	30.03

LTE Band 41 (30 MHz ~ 26.5 GHz)

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										
160.21	45.31	203	102	H	-58.86	0.38	-6.17	-65.41	-25	40.41
160.21	51.47	250	147	V	-49.66	0.38	-6.17	-56.21	-25	31.21
5200.00	44.09	162	167	H	-57.98	1.10	10.30	-48.78	-25	23.78
5200.00	43.43	185	165	V	-58.85	1.10	10.30	-49.65	-25	24.65
7800.00	45.52	128	192	H	-49.92	1.82	10.04	-41.70	-25	16.7
7800.00	46.22	322	192	V	-49.32	1.82	10.04	-41.10	-25	16.10
16-QAM 5MHz Bandwidth Middle Channel										
160.21	45.08	340	138	H	-59.09	0.38	-6.17	-65.64	-25	40.64
160.21	51.22	320	107	V	-49.91	0.38	-6.17	-56.46	-25	31.46
5200.00	43.32	110	133	H	-58.75	1.10	10.30	-49.55	-25	24.55
5200.00	42.81	116	122	V	-59.47	1.10	10.30	-50.27	-25	25.27
7800.00	45.08	55	133	H	-50.36	1.82	10.04	-42.14	-25	17.14
7800.00	45.69	351	148	V	-49.85	1.82	10.04	-41.63	-25	16.63

Note:

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

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

Applicable Standards

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

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

According to FCC §27.53 (h) (m), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

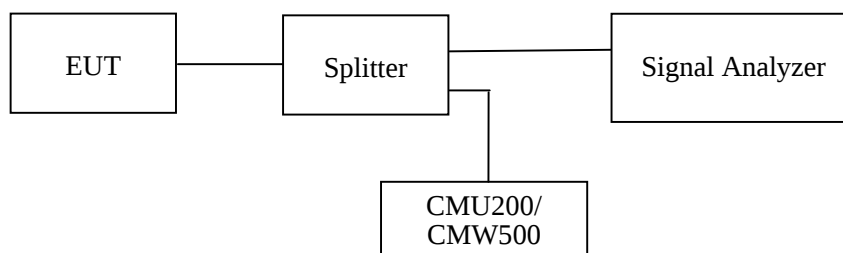
For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB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

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

Test Procedure

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

The center of the spectrum analyzer was set to block edge frequency.



Test Data

Environmental Conditions

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

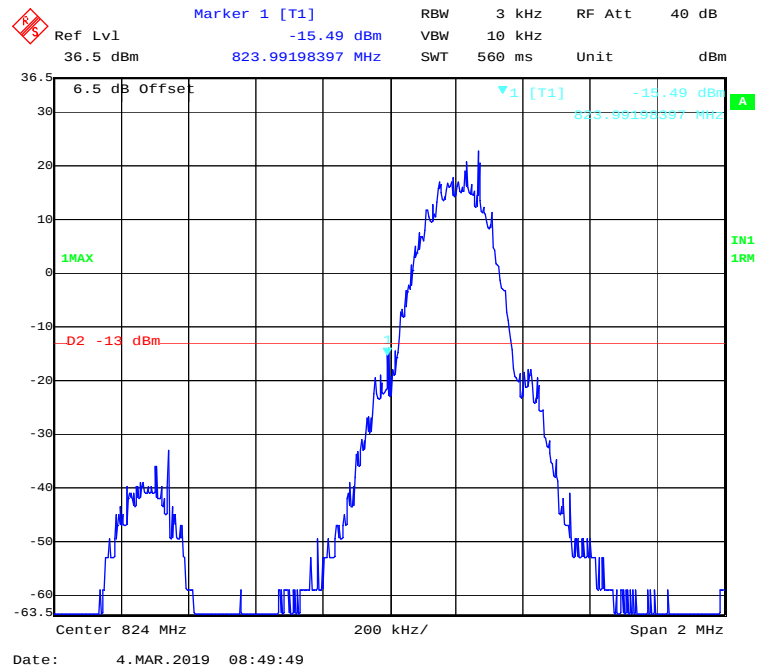
The testing was performed by Max Min from 2019-03-01 to 2019-08-28.

EUT operation mode: Transmitting

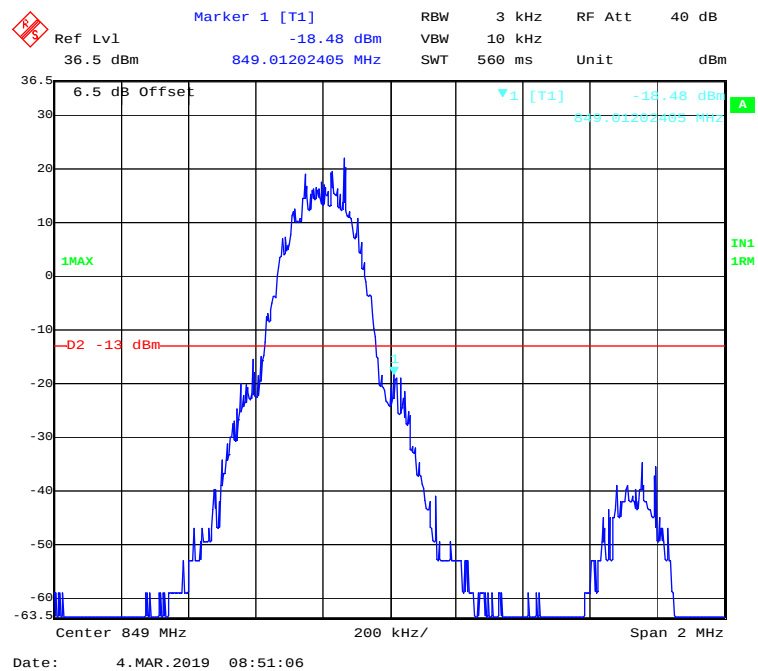
Test Result: Compliance.

GSM 850 Band:

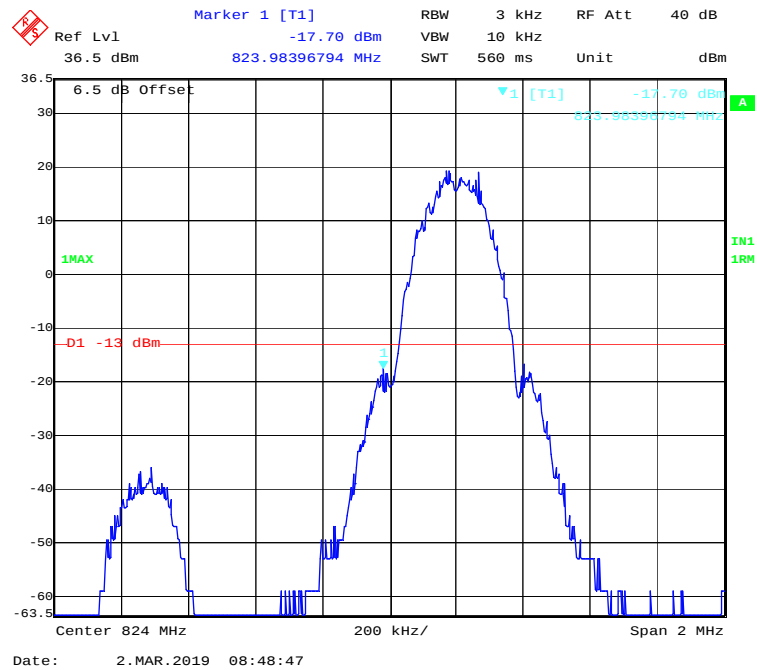
GSM Mode, Left Band Edge



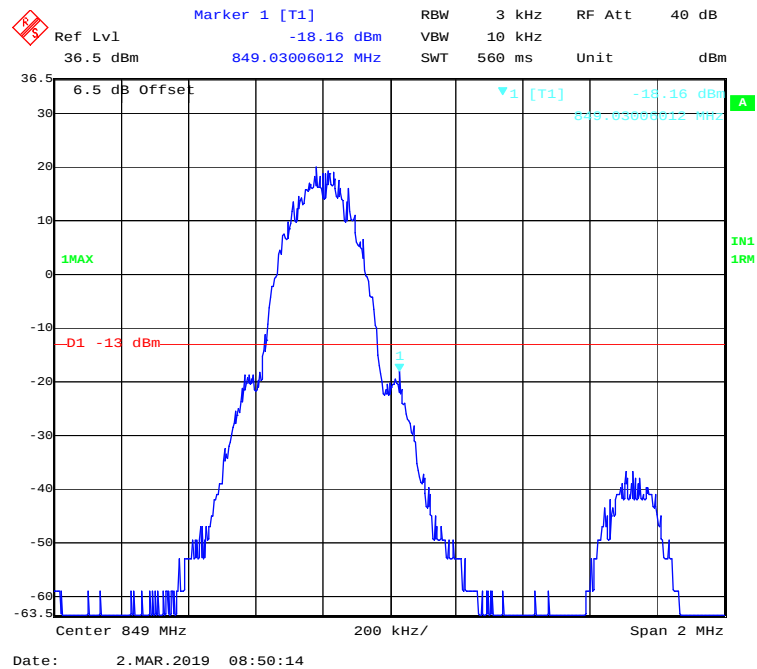
GSM Mode, Right Band Edge

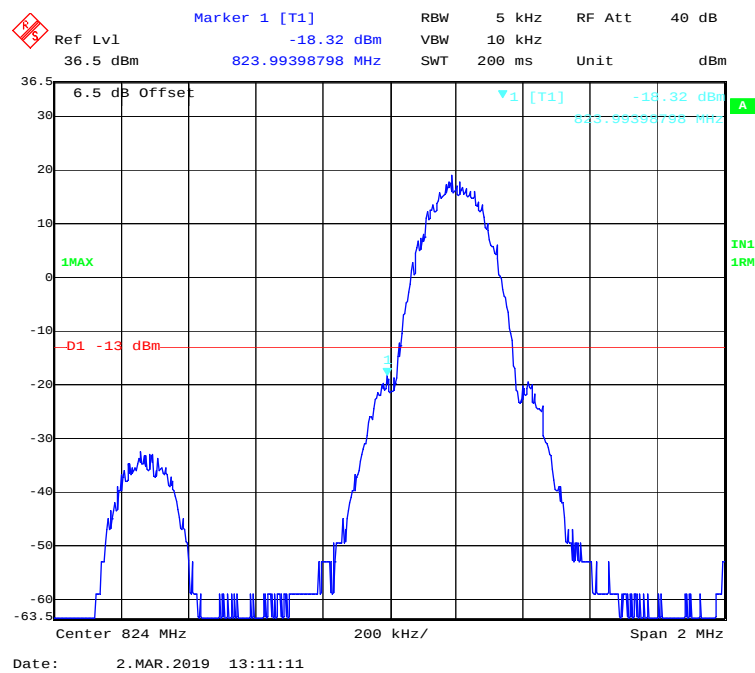
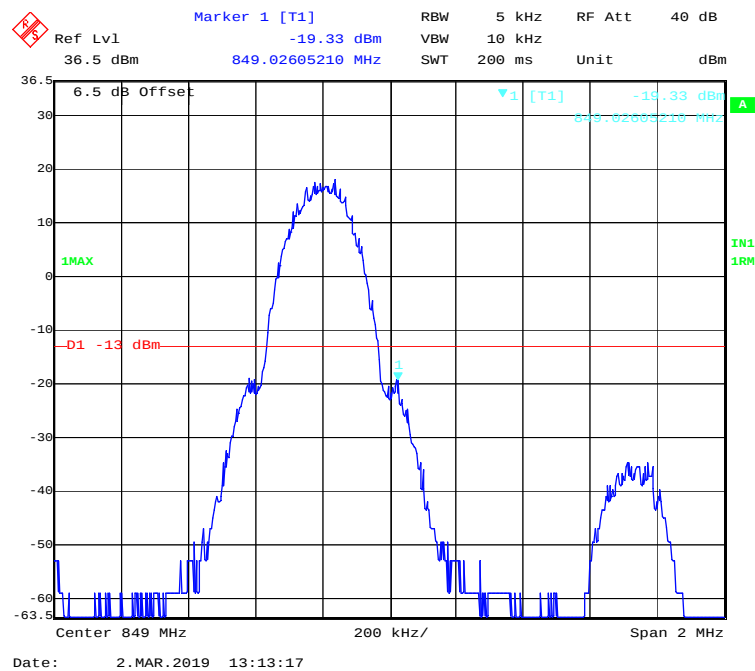


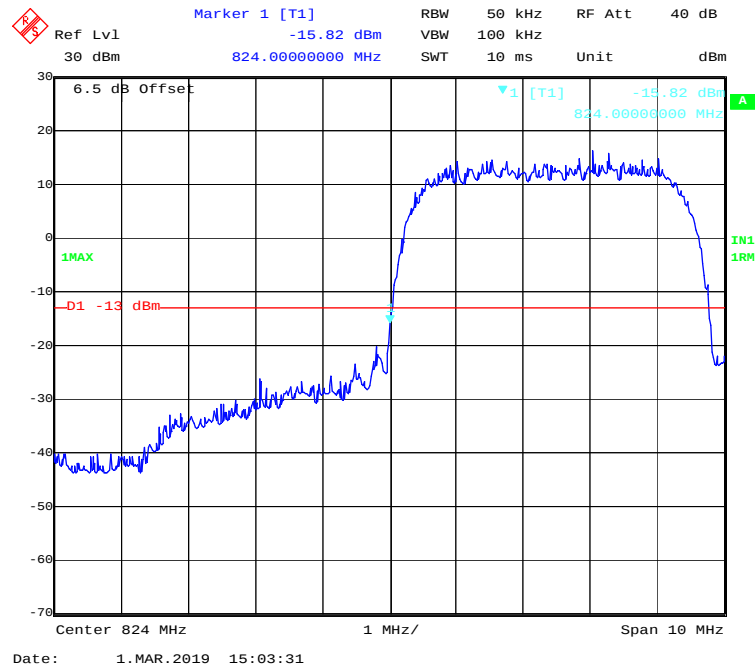
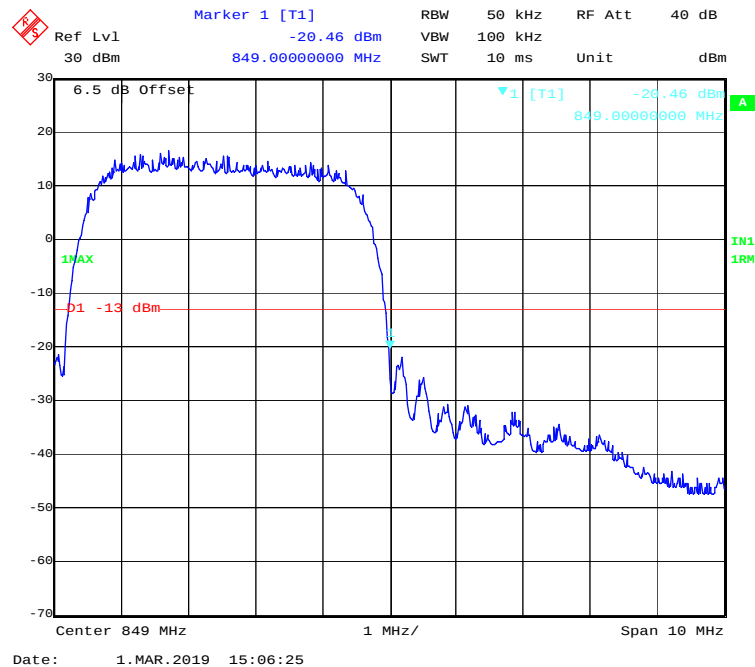
GPRS Mode, Left Band Edge

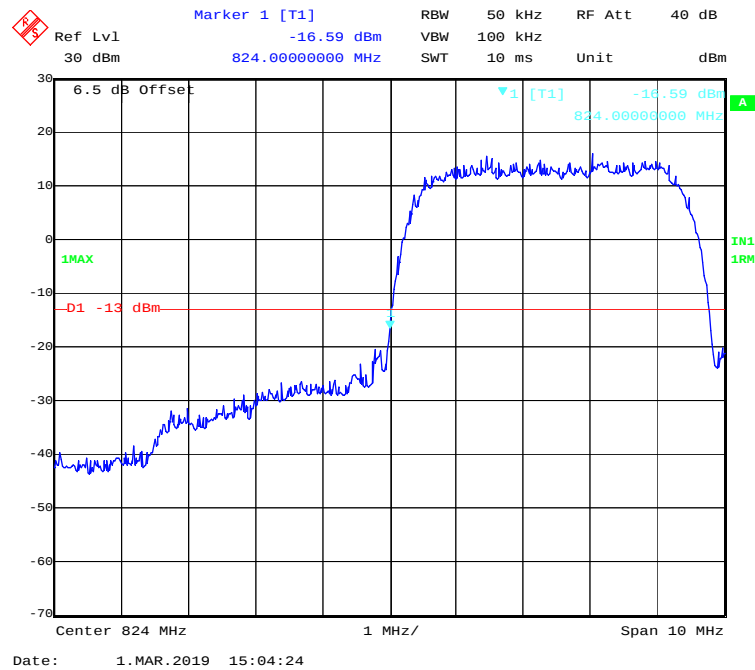
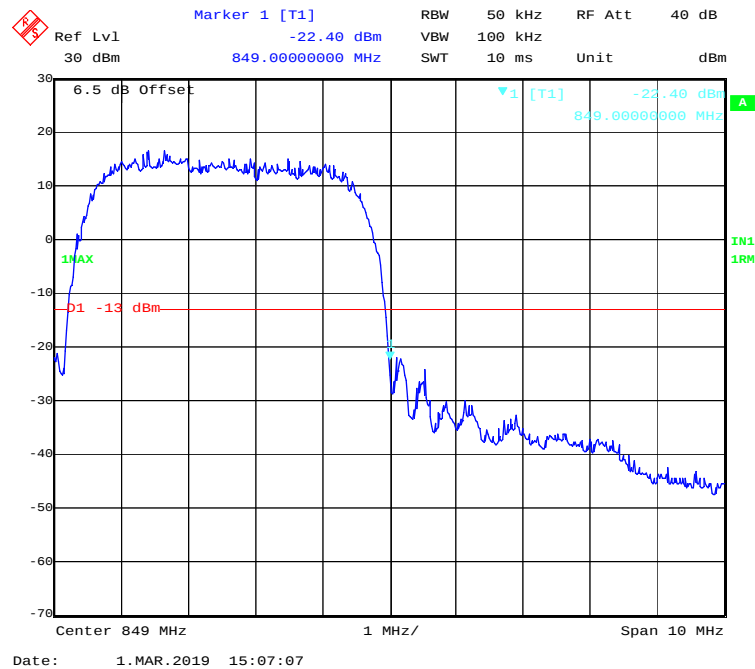


GPRS Mode, Right Band Edge

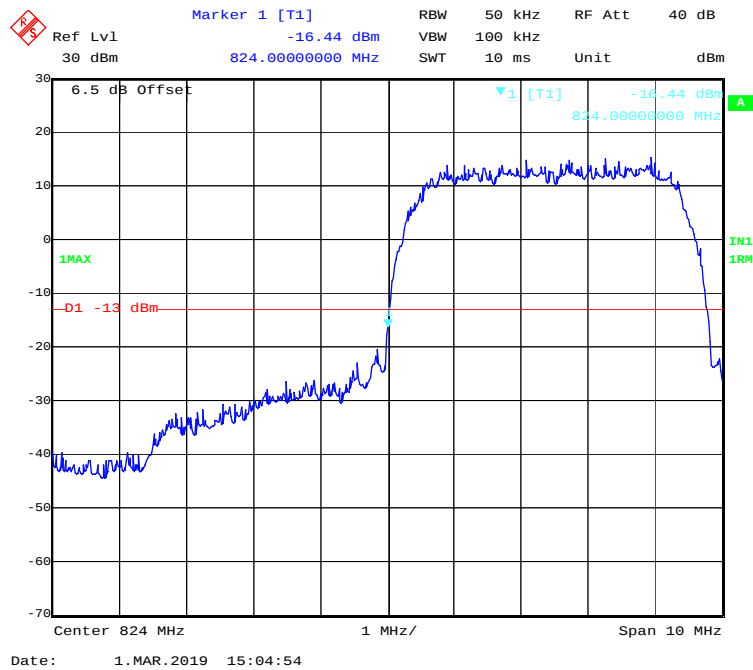


EGPRS Mode, Left Band Edge**EGPRS Mode, Right Band Edge**

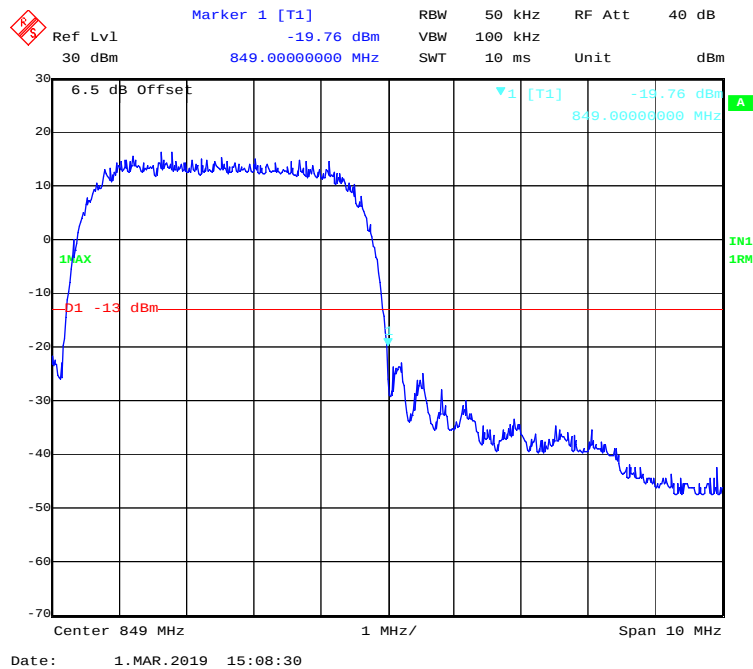
WCDMA Band V**WCDMA (Rel 99) Mode, Left Band Edge****WCDMA (Rel 99) Mode, Right Band Edge**

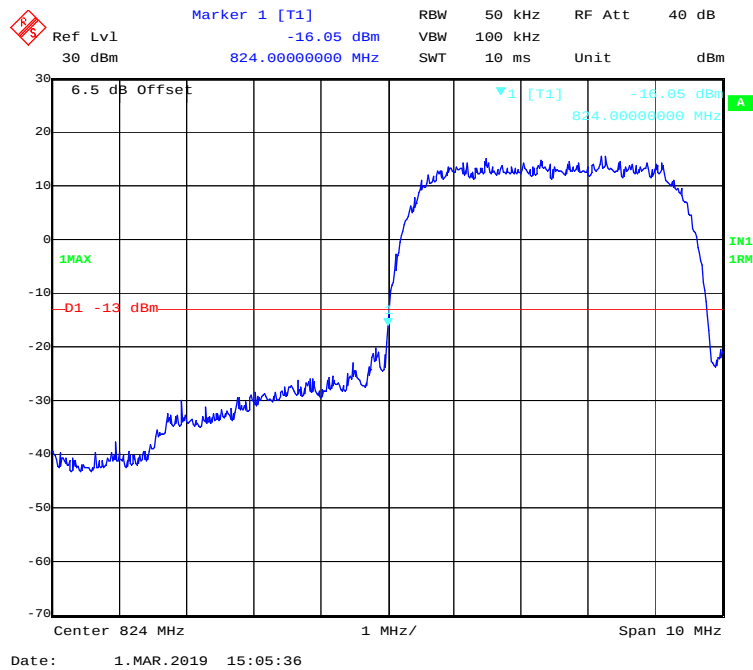
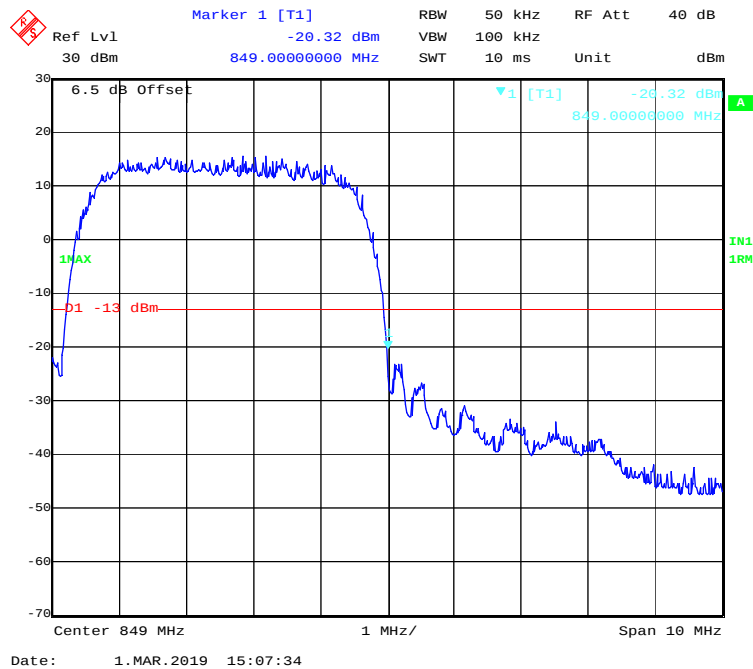
WCDMA (HSDPA) Mode, Left Band Edge**WCDMA (HSDPA) Mode, Right Band Edge**

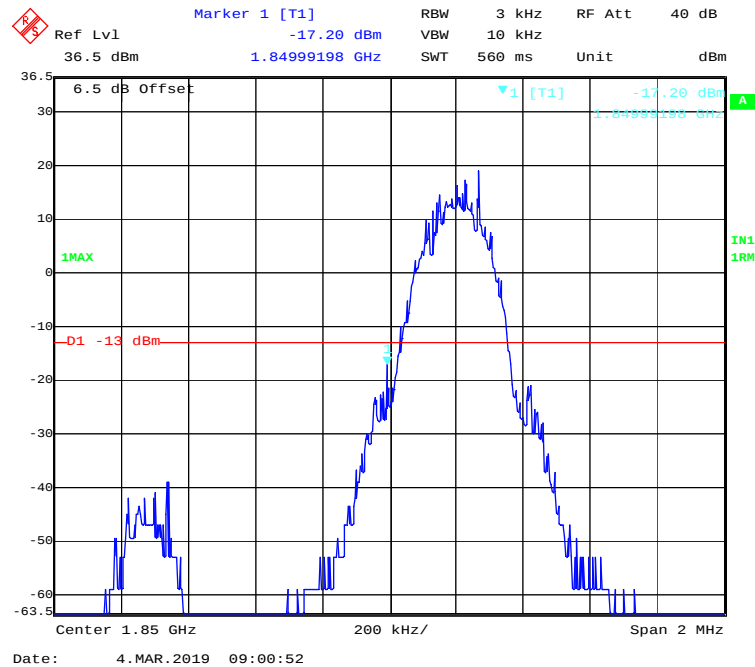
WCDMA (HSUPA) Mode, Left Band Edge



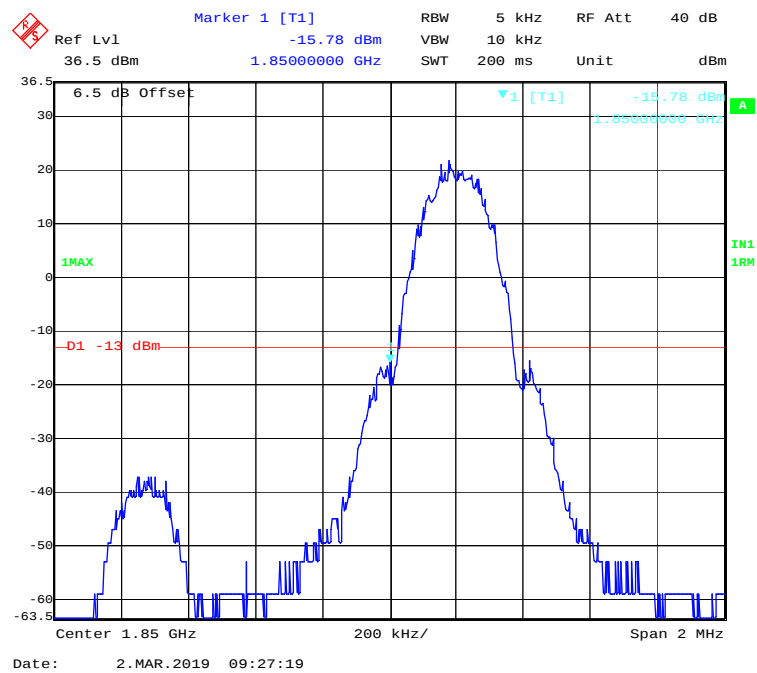
WCDMA (HSUPA) Mode, Right Band Edge



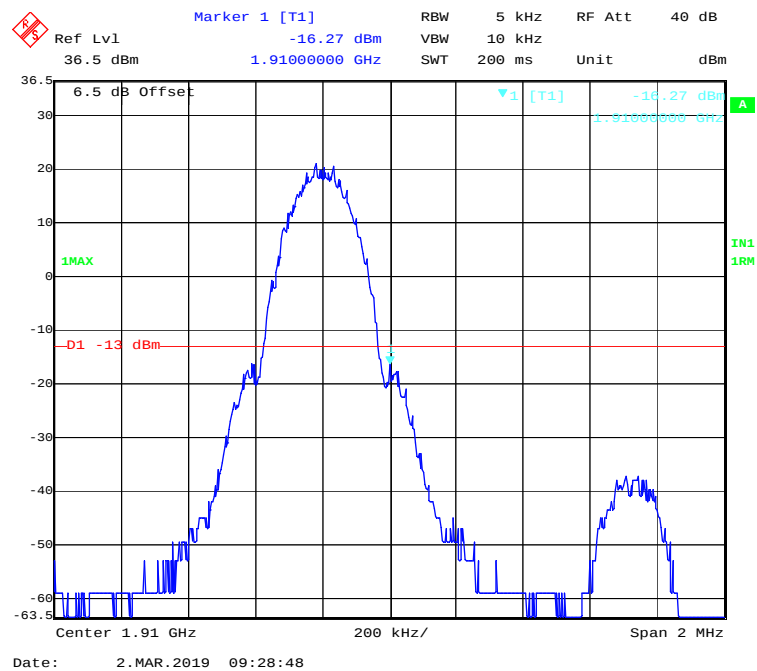
WCDMA (HSPA+) Mode, Left Band Edge**WCDMA (HSPA+) Mode, Right Band Edge**

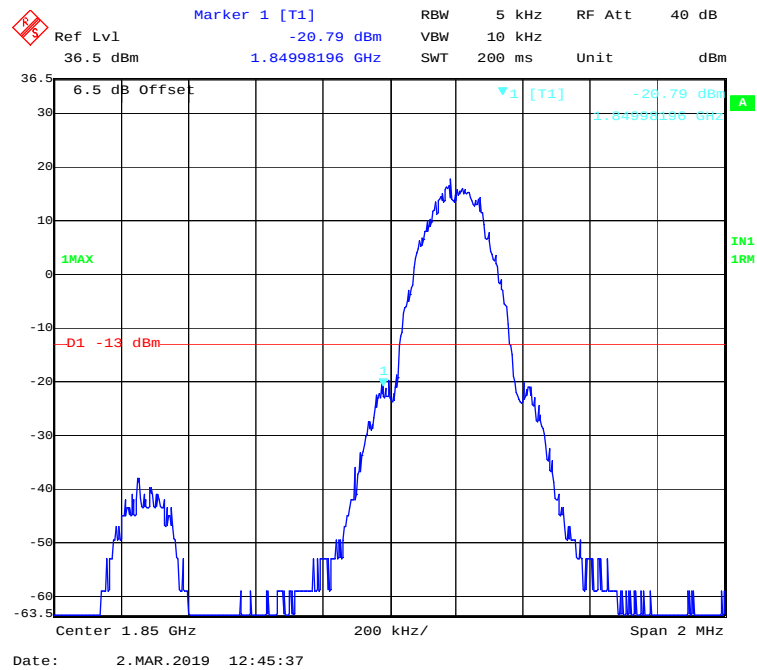
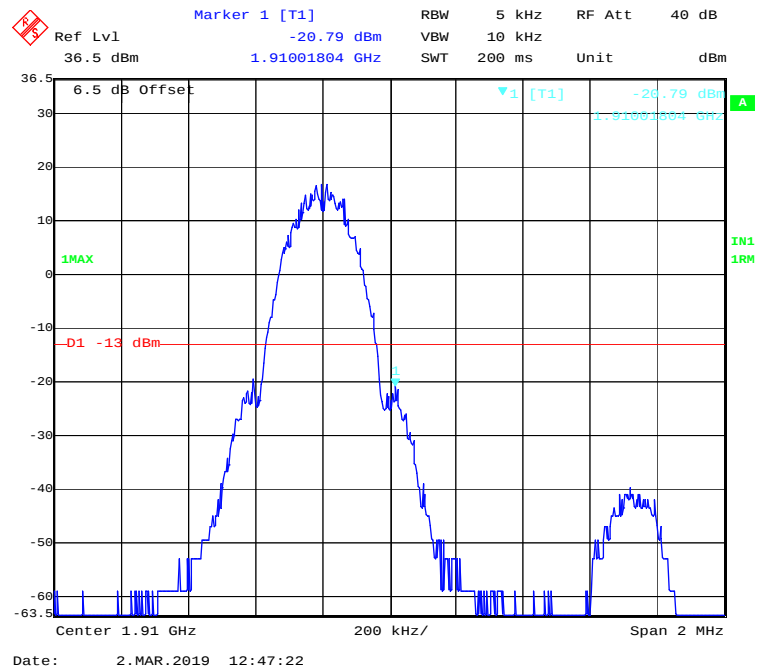
PCS 1900 Band:**GSM Mode, Left Band Edge****GSM Mode, Right Band Edge**

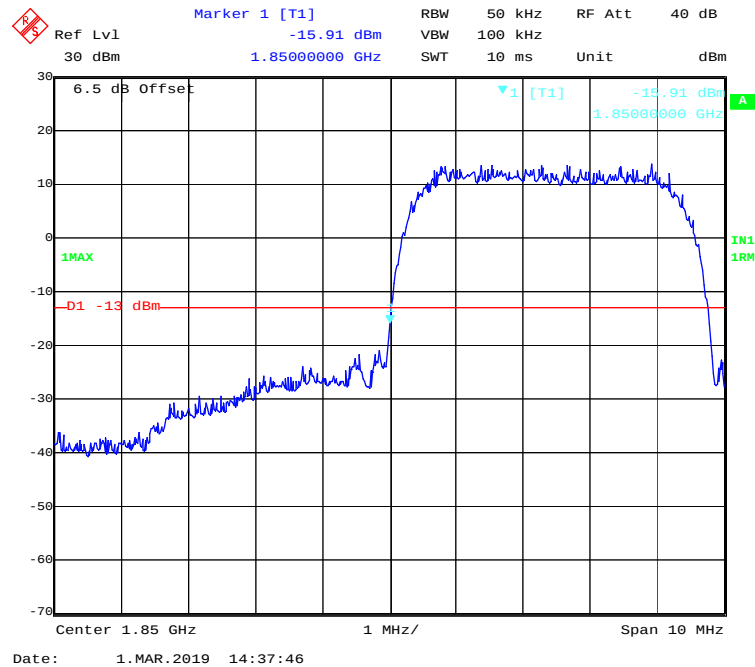
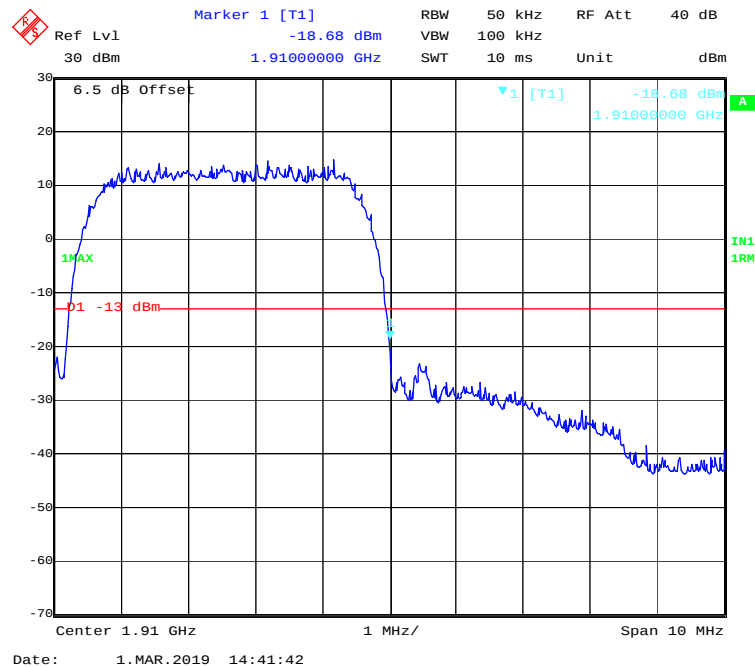
GPRS Mode, Left Band Edge

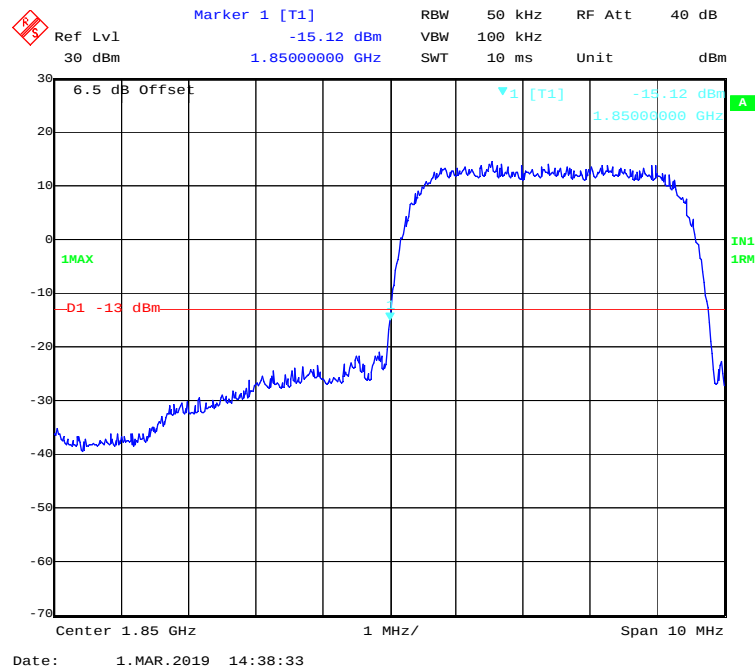
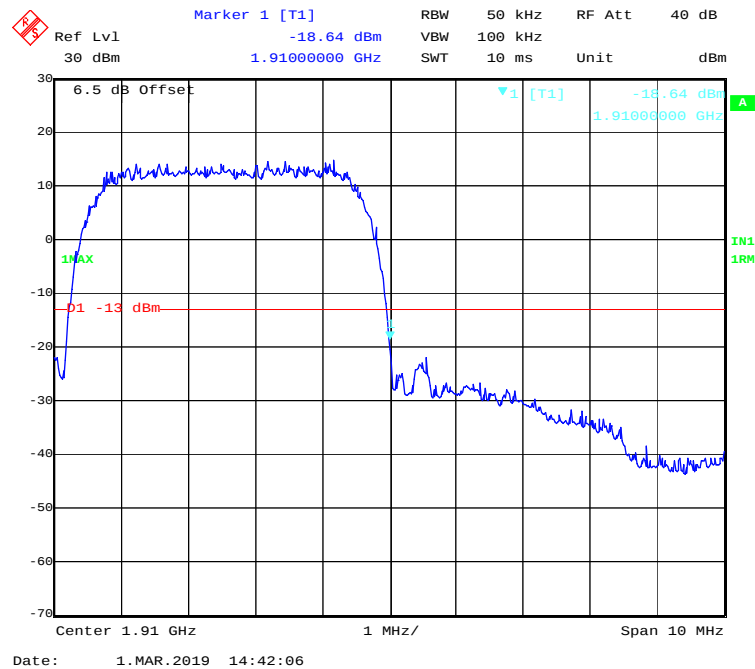


GPRS Mode, Right Band Edge

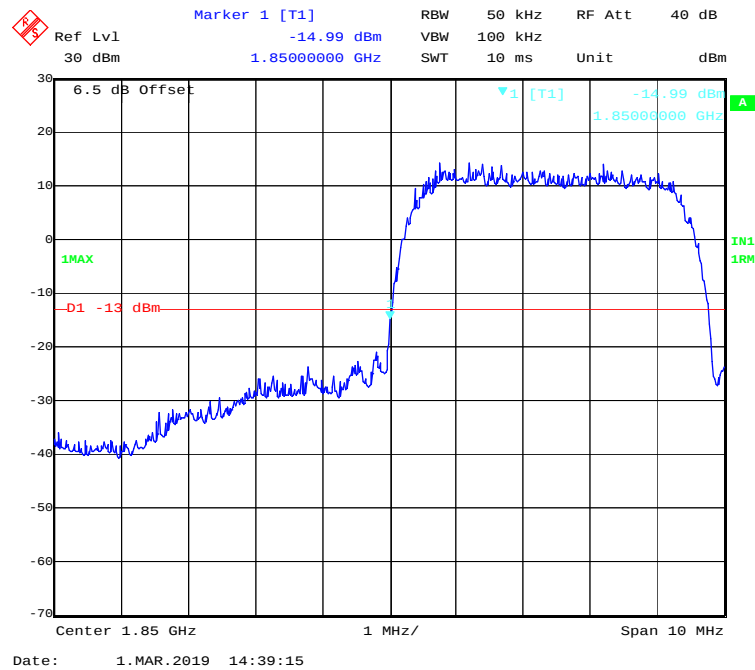


EGPRS Mode, Left Band Edge**EGPRS Mode, Right Band Edge**

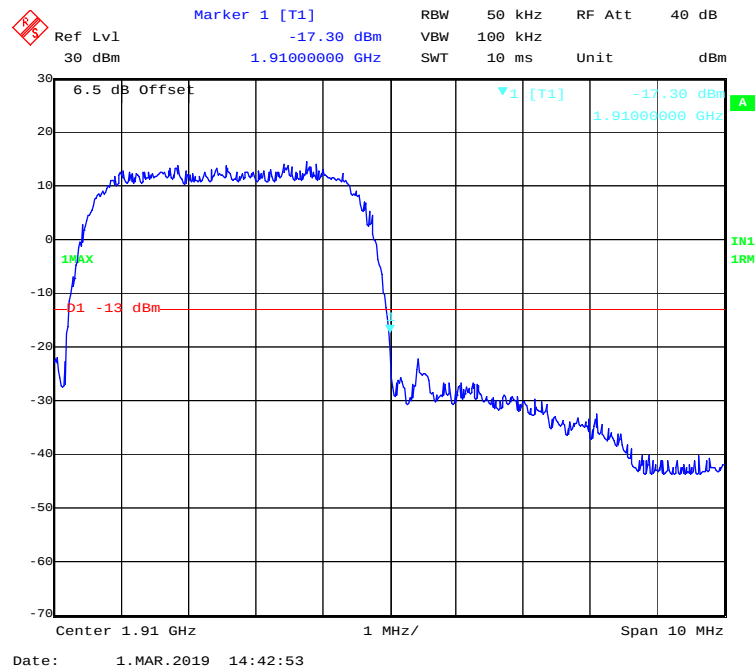
WCDMA Band II**WCDMA (Rel99) Mode, Left Band Edge****WCDMA (Rel99) Mode, Right Band Edge**

WCDMA (HSDPA) Mode, Left Band Edge**WCDMA (HSDPA) Mode, Right Band Edge**

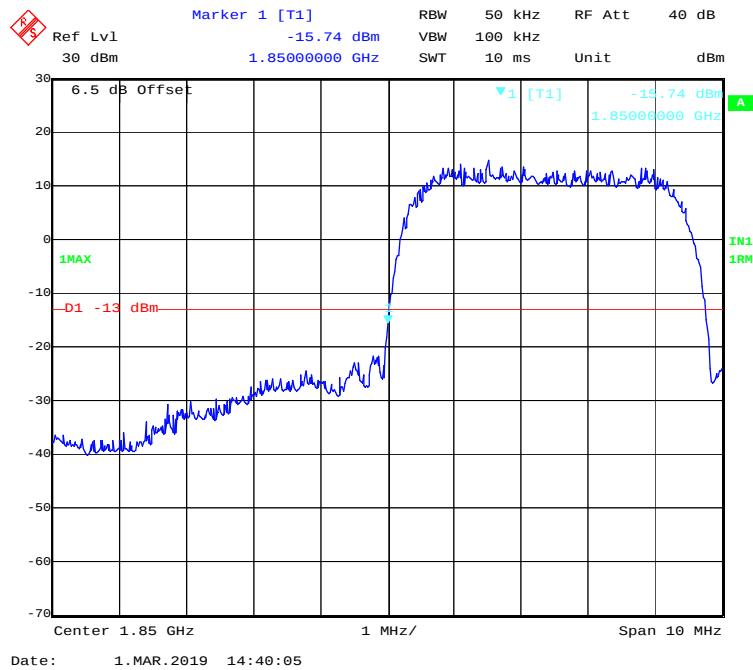
WCDMA (HSUPA) Mode, Left Band Edge



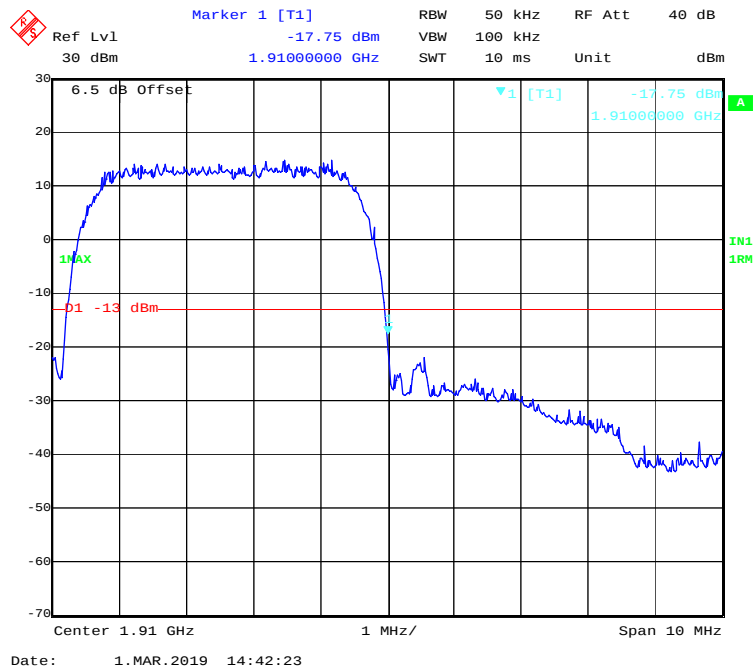
WCDMA (HSUPA) Mode, Right Band Edge

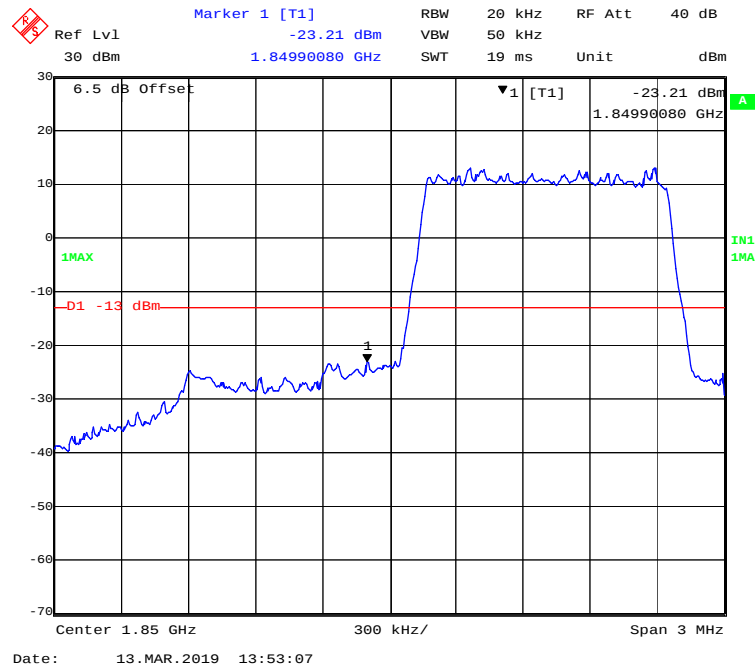
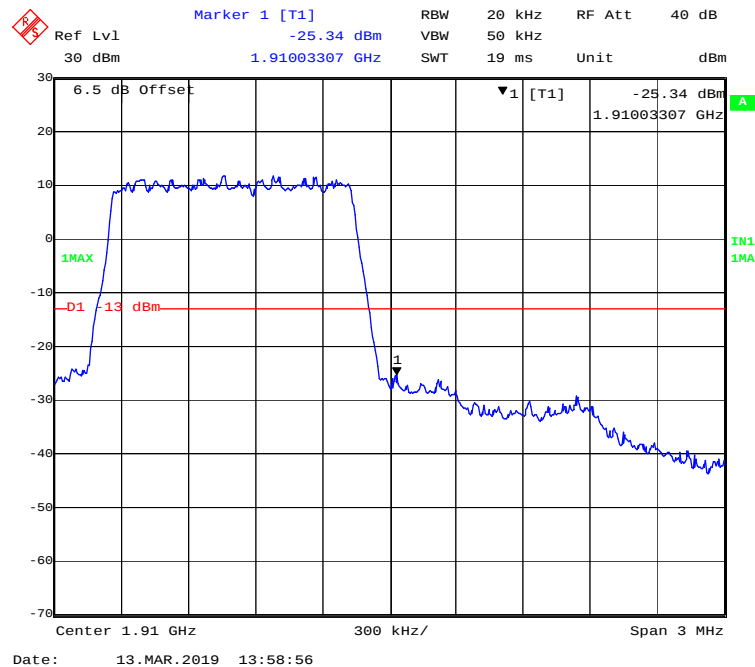


WCDMA (HSPA+) Mode, Left Band Edge

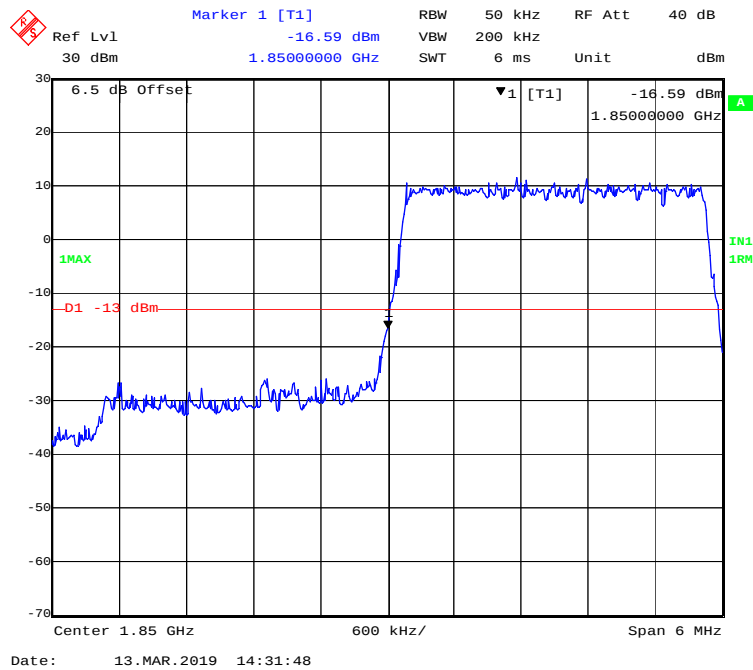


WCDMA (HSPA+) Mode, Right Band Edge

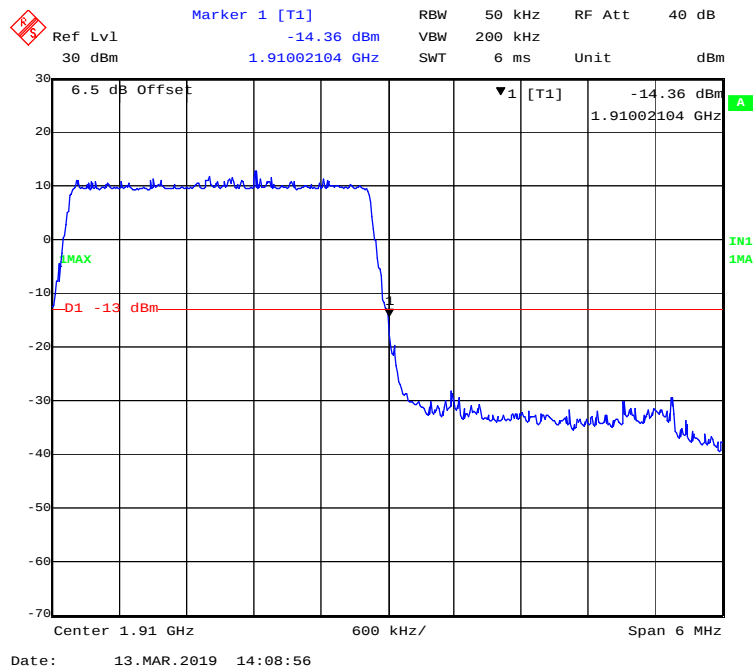


LTE Band 2:**QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

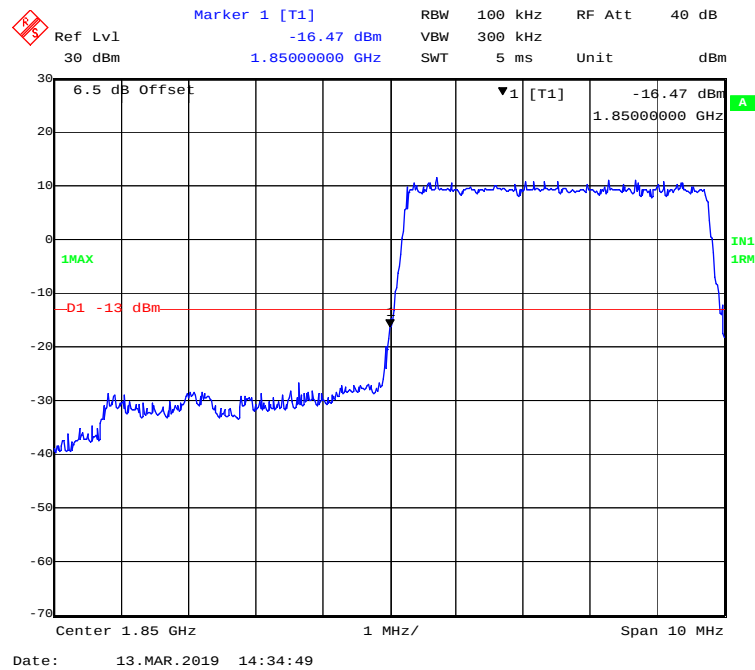
QPSK (3.0 MHz, FULL RB) - Left Band Edge



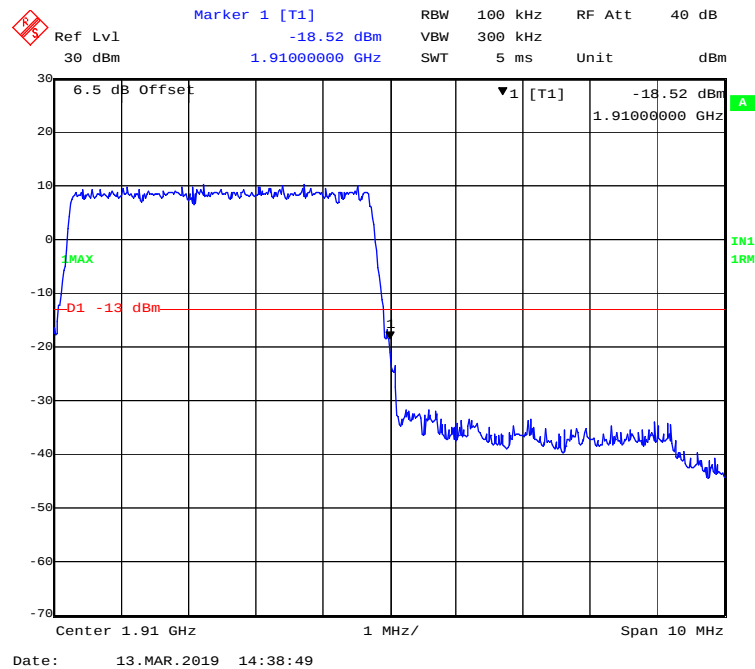
QPSK (3.0 MHz, FULL RB) - Right Band Edge



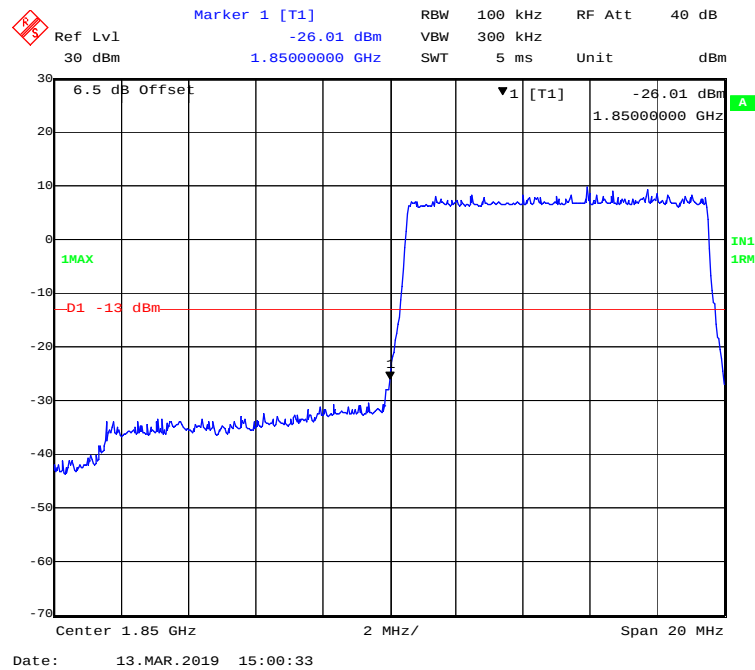
QPSK (5.0 MHz, FULL RB) - Left Band Edge



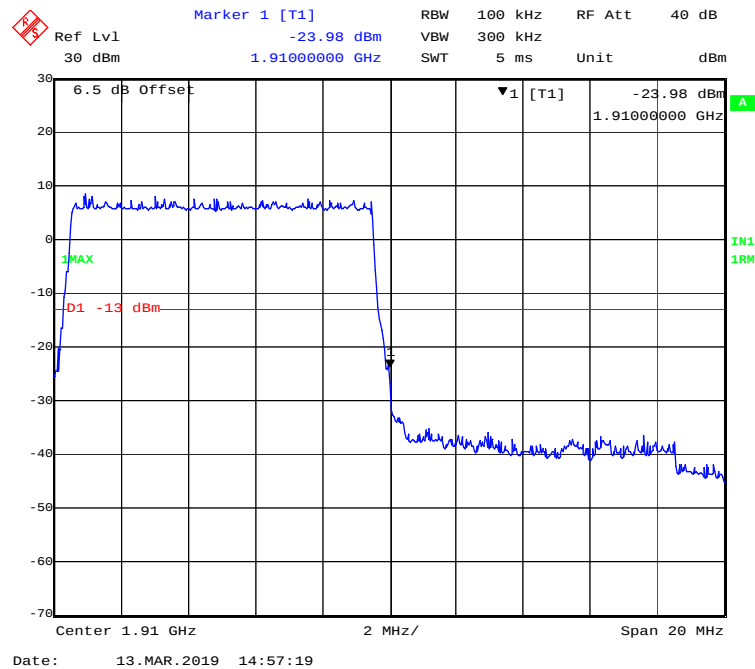
QPSK (5.0 MHz, FULL RB) - Right Band Edge



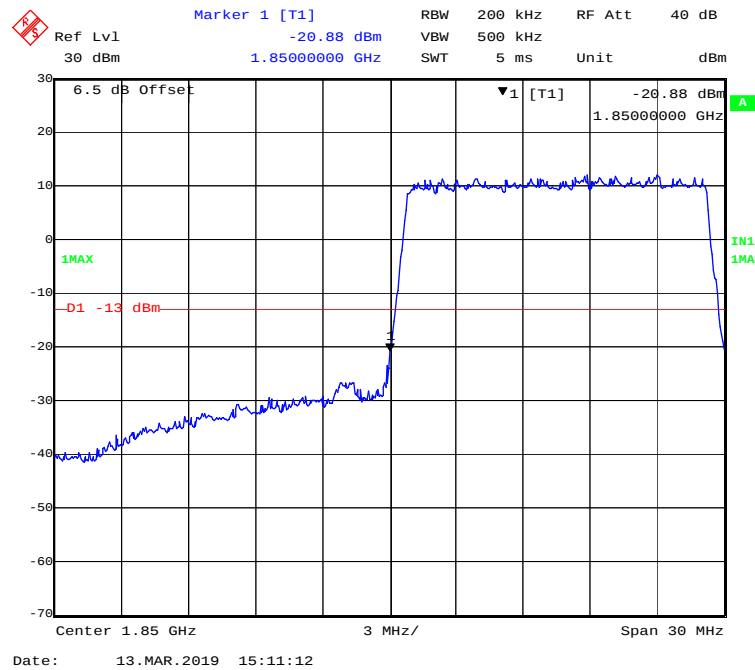
QPSK (10.0 MHz, FULL RB) - Left Band Edge



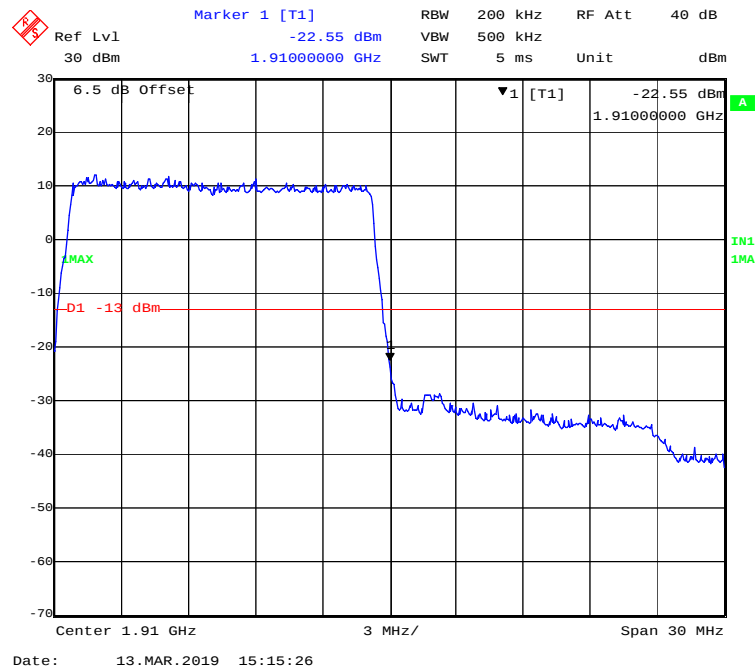
QPSK (10.0 MHz, FULL RB) - Right Band Edge

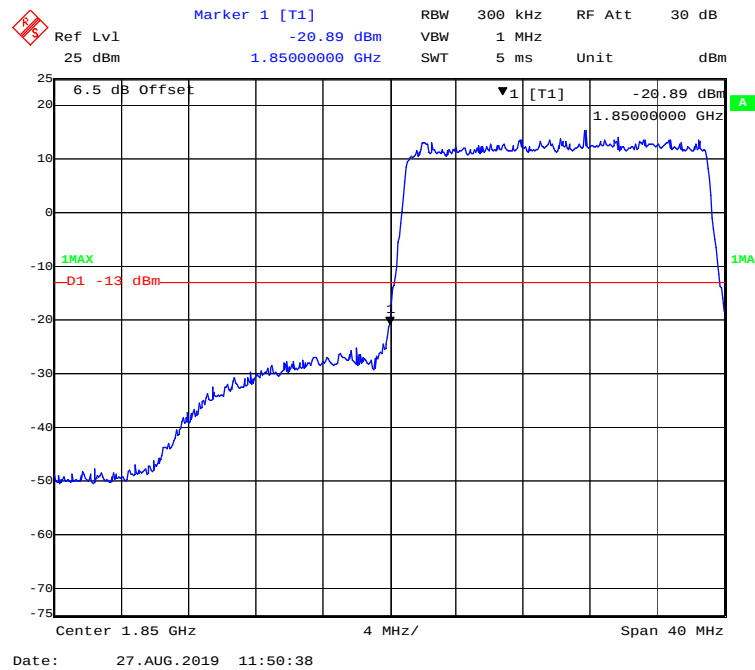
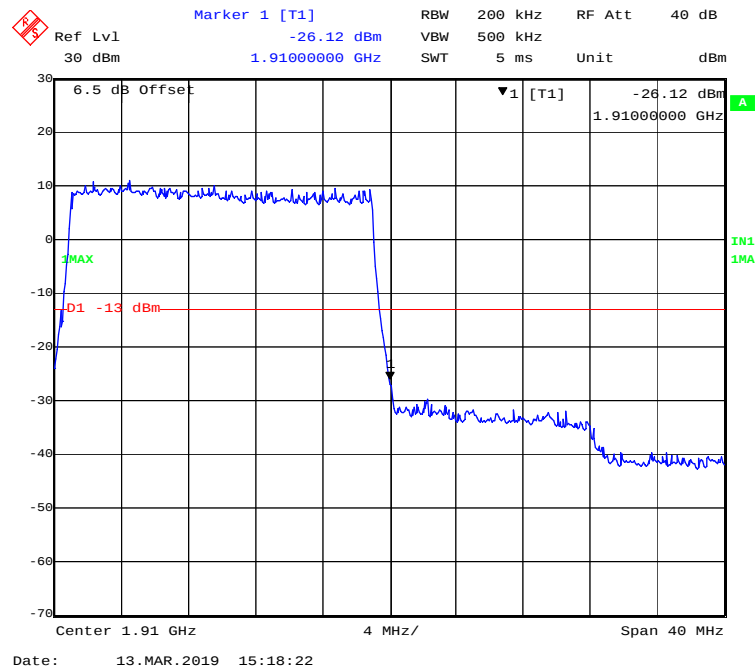


QPSK (15.0 MHz, FULL RB) - Left Band Edge

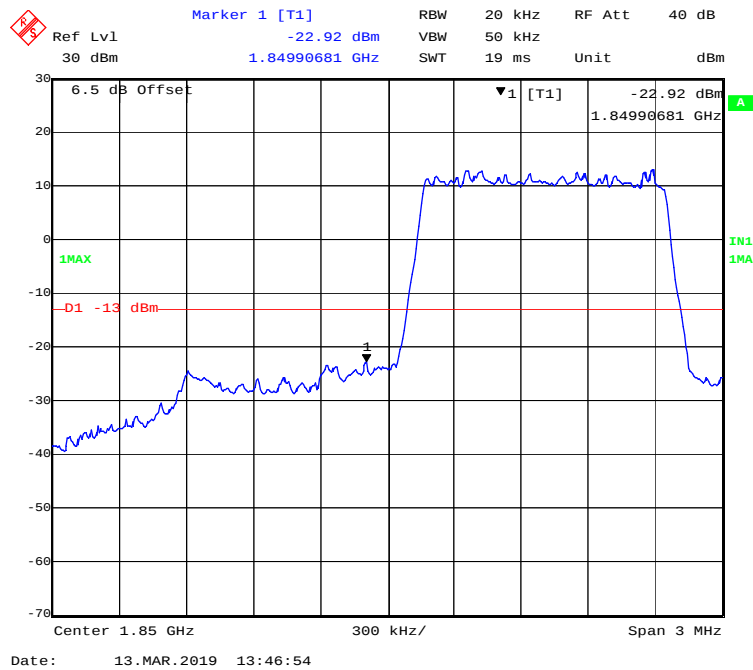


QPSK (15.0 MHz, FULL RB) - Right Band Edge

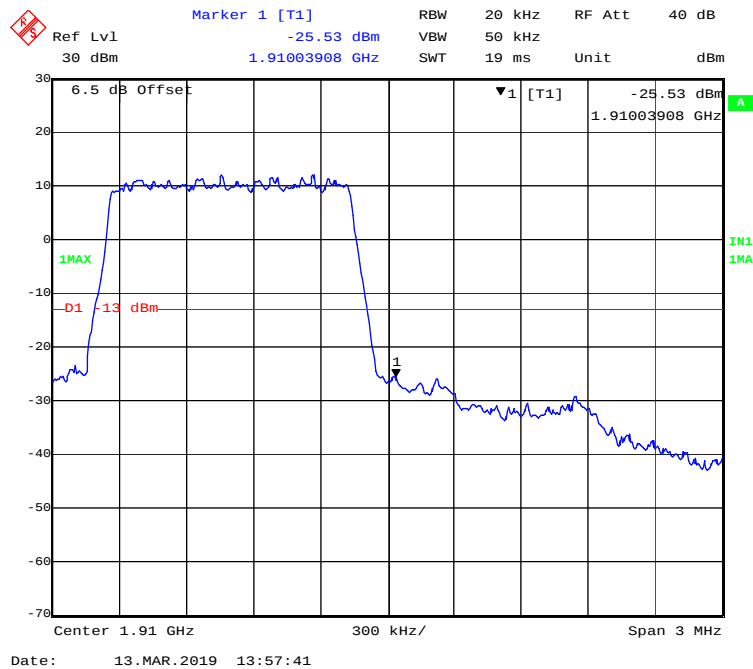


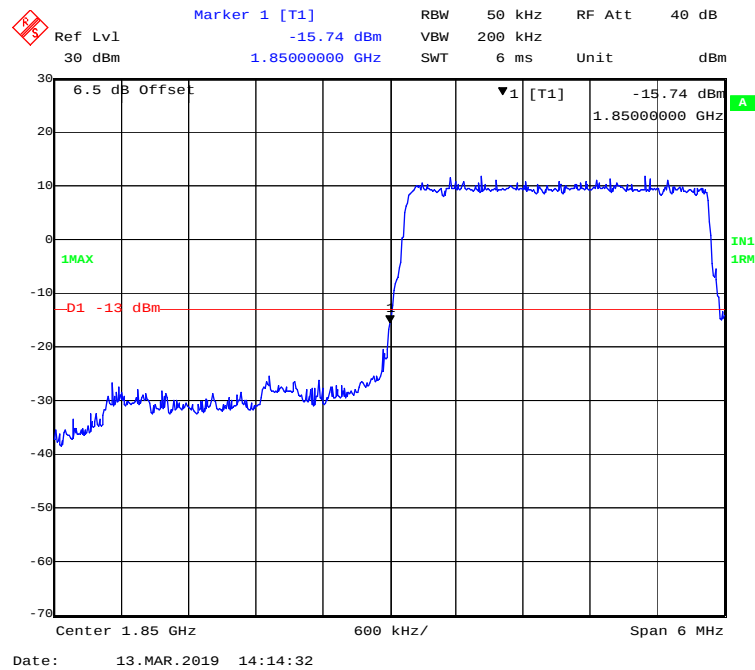
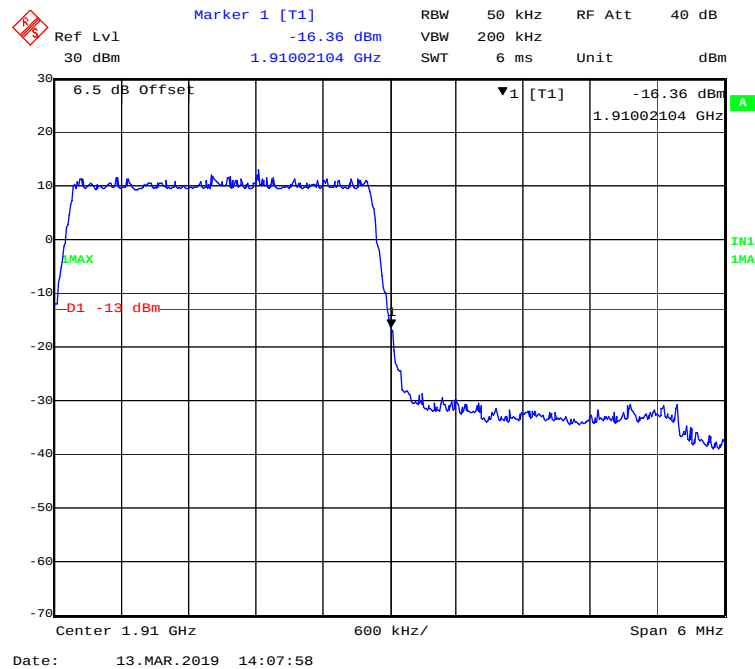
QPSK (20.0 MHz, FULL RB) - Left Band Edge**QPSK (20.0 MHz, FULL RB) - Right Band Edge**

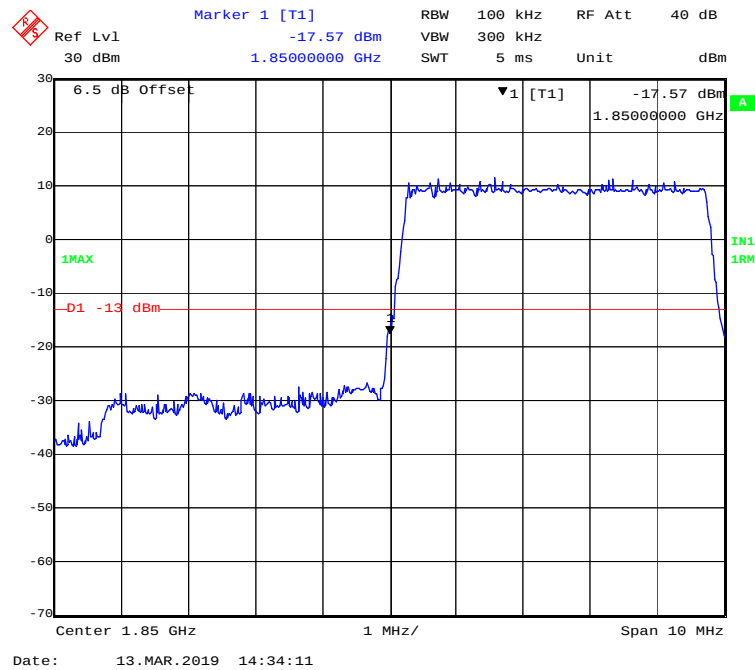
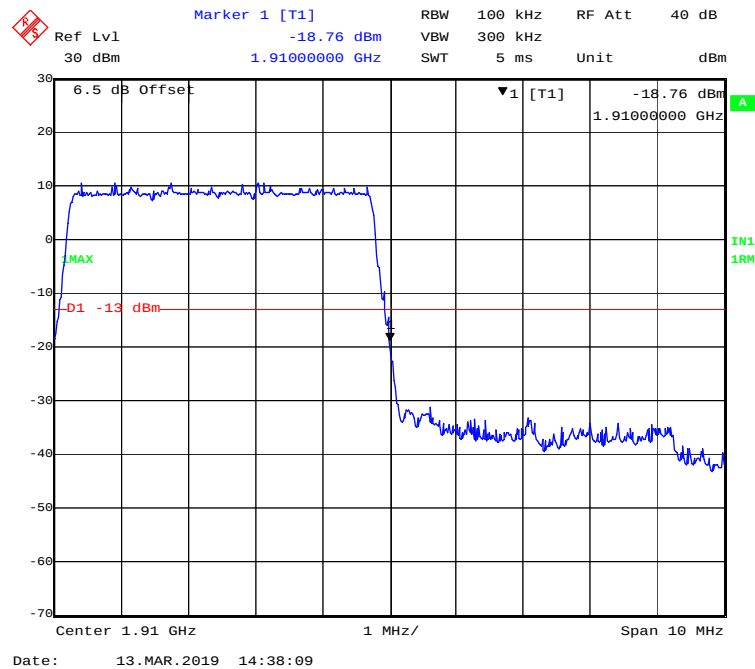
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



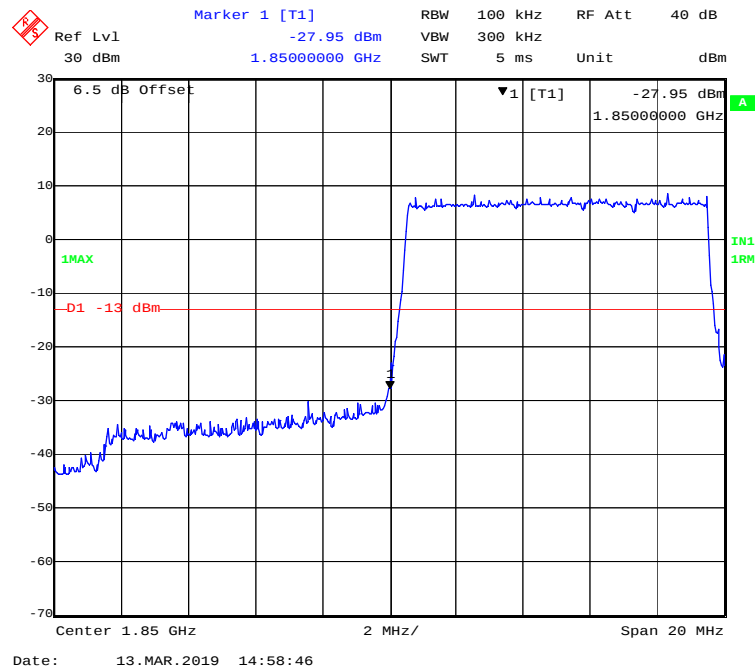
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



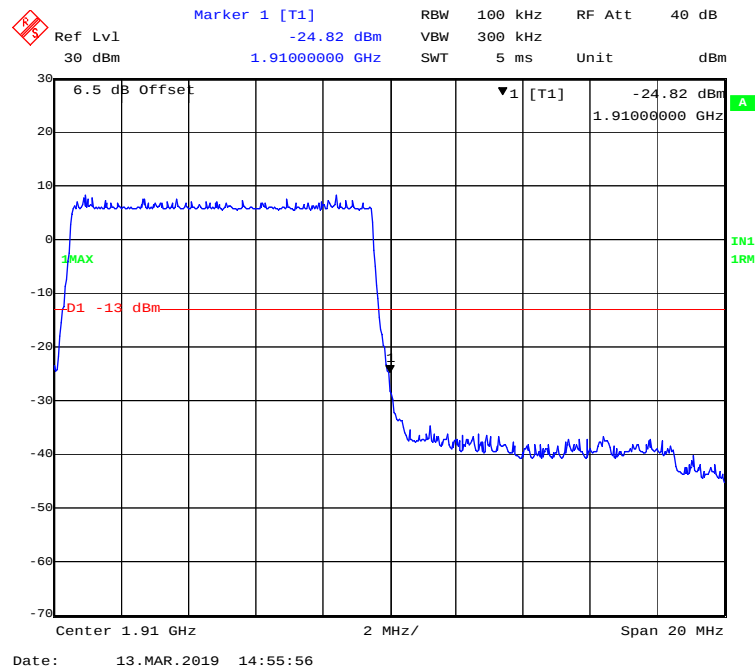
16-QAM (3.0 MHz, FULL RB) - Left Band Edge**16-QAM (3.0 MHz, FULL RB) - Right Band Edge**

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

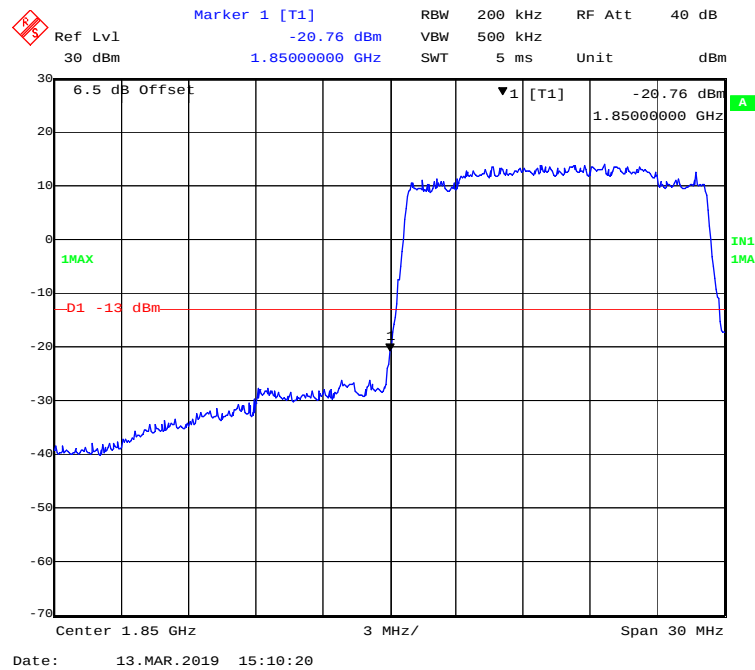
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



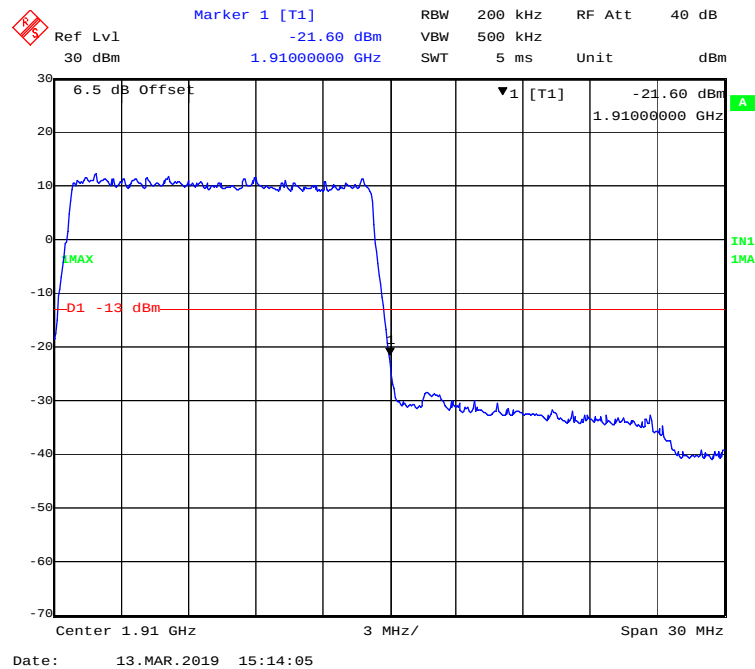
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



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



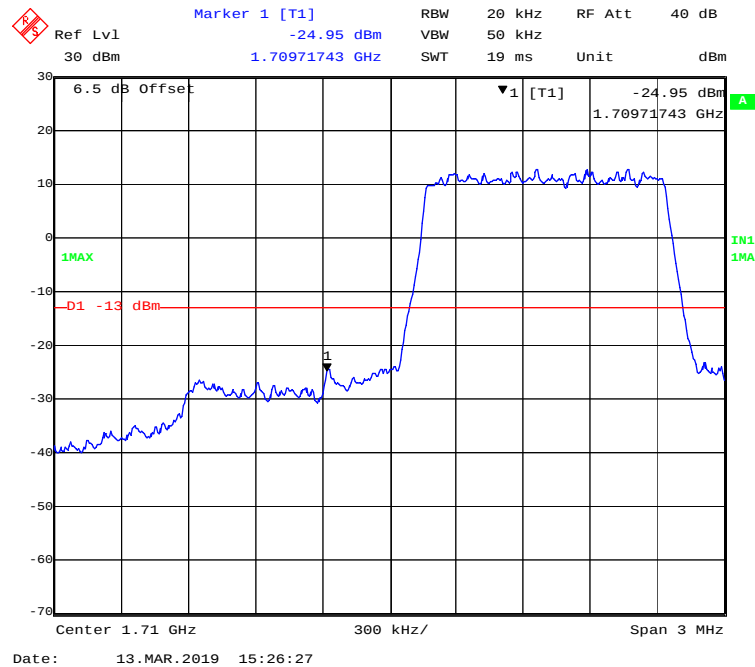
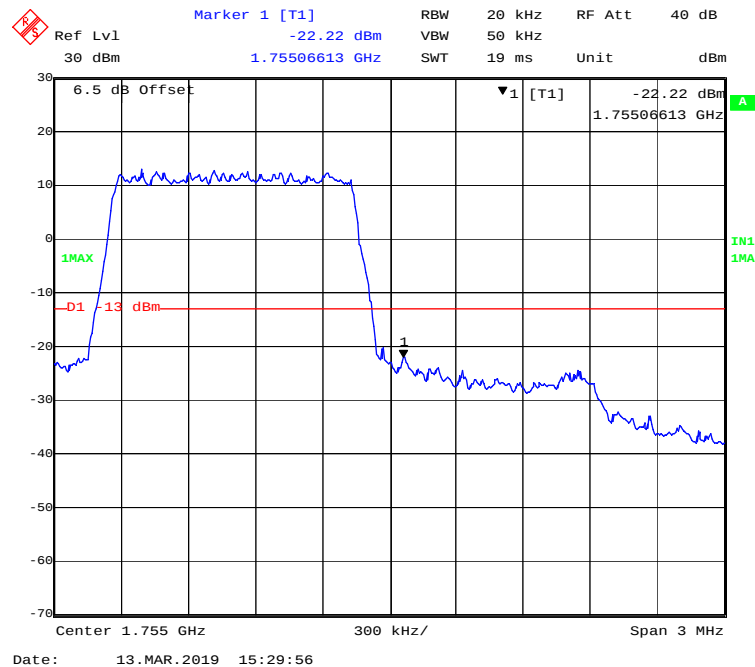
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



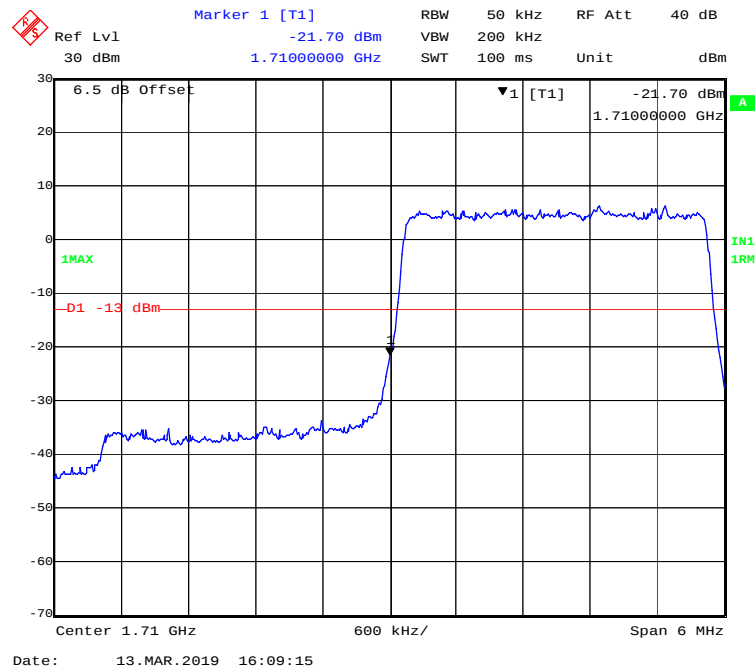
Ref Lvl 25 dBm
 25 dBm
 1.85000000 GHz
 Marker 1 [T1]
 -20.74 dBm
 RBW 300 kHz
 VBW 1 MHz
 SWT 5 ms
 RF Att 30 dB
 Unit dBm
 6.5 dB Offset
 ▼1 [T1]
 -20.74 dBm
 1.85000000 GHz
 1MAX
 -D1 -13 dBm
 Center 1.85 GHz
 4 MHz/
 Span 40 MHz
 Date: 27.AUG.2019 11:50:02

The screenshot displays a spectrum analyzer interface. The main plot shows a signal at 1.91 GHz with a power level of -25.88 dBm. A red horizontal line is drawn at -13 dBm, labeled 'D1 -13 dBm'. The signal is labeled '1MAX' in green. The plot has a center frequency of 1.91 GHz, a span of 40 MHz, and a resolution bandwidth (RBW) of 200 kHz. The reference level (Ref Lvl) is 30 dBm. The marker is labeled 'Marker 1 [T1]'.

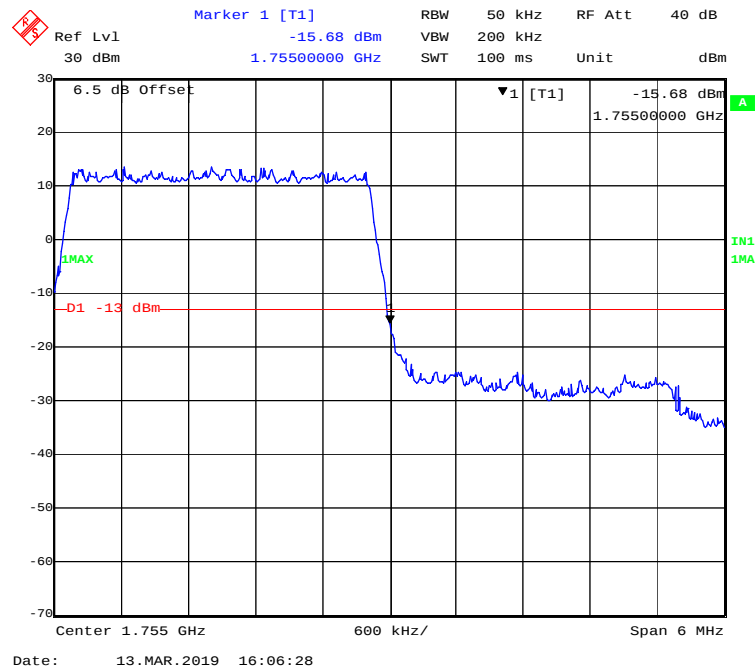
Parameter	Value
Ref Lvl	30 dBm
Marker 1 [T1]	-25.88 dBm
RBW	200 kHz
RF Att	40 dB
SWT	5 ms
Unit	dBm
Center	1.91 GHz
Span	40 MHz
Resolution	4 MHz

LTE Band 4:**QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

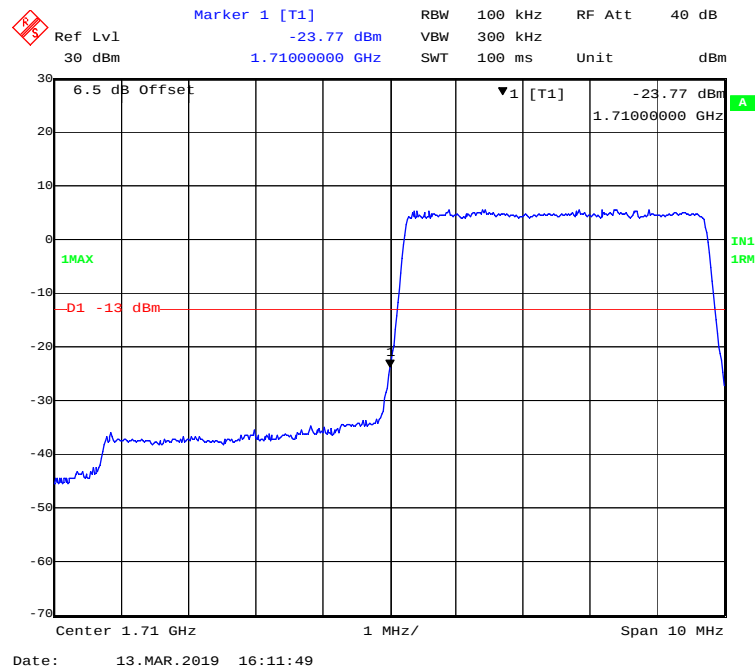
QPSK (3.0 MHz, FULL RB) - Left Band Edge



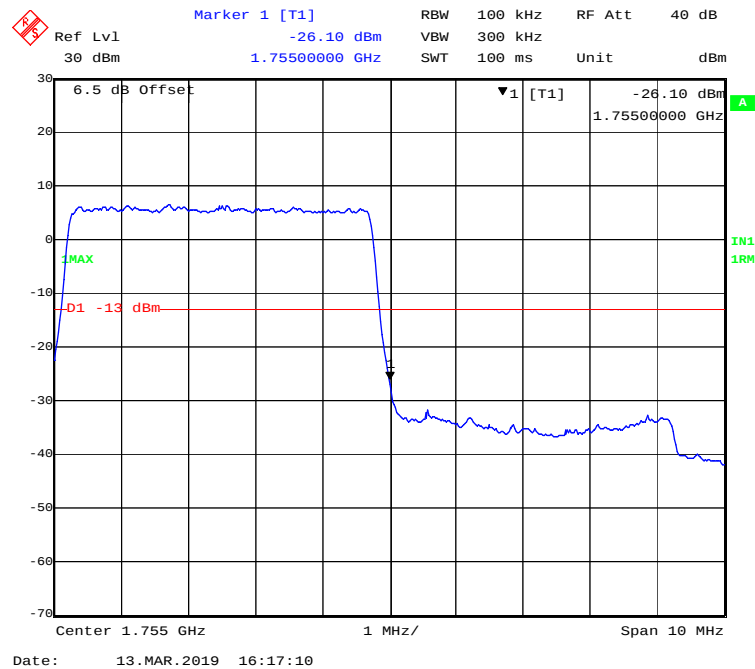
QPSK (3.0 MHz, FULL RB) - Right Band Edge



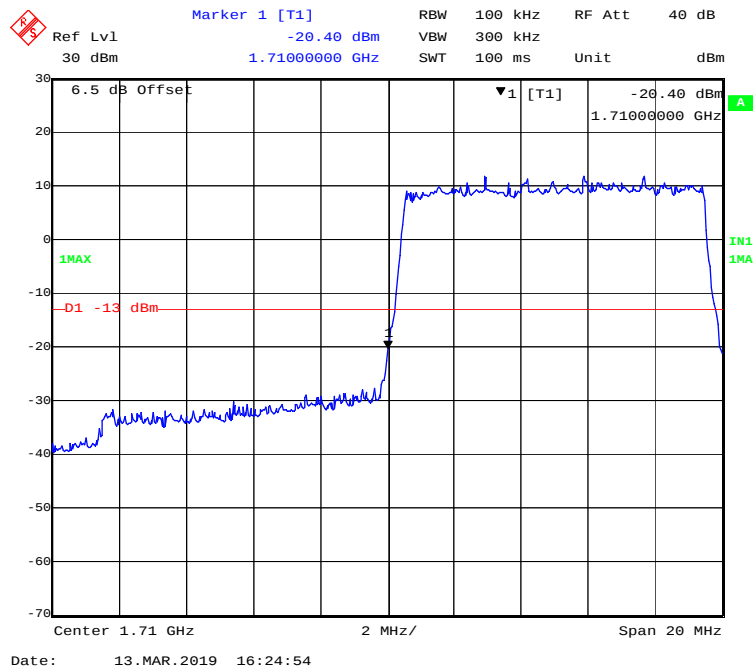
QPSK (5.0 MHz, FULL RB) - Left Band Edge



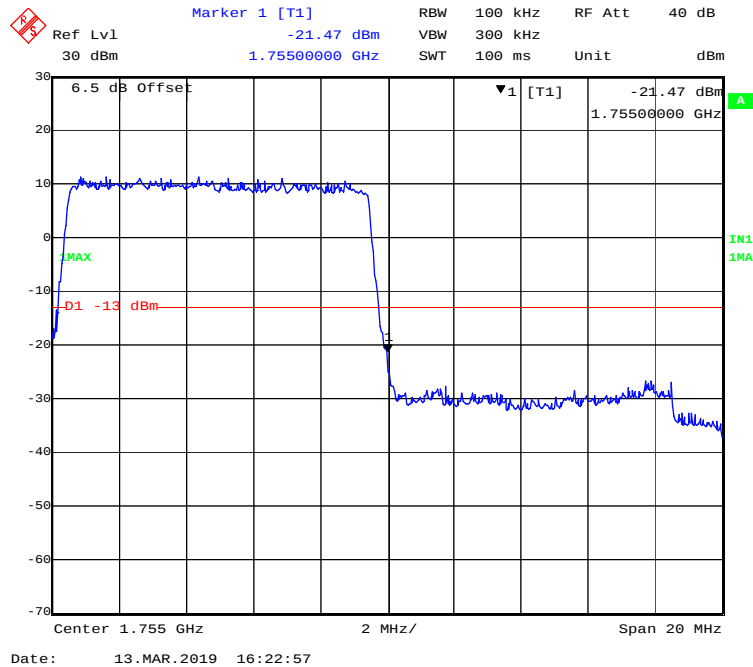
QPSK (5.0 MHz, FULL RB) - Right Band Edge



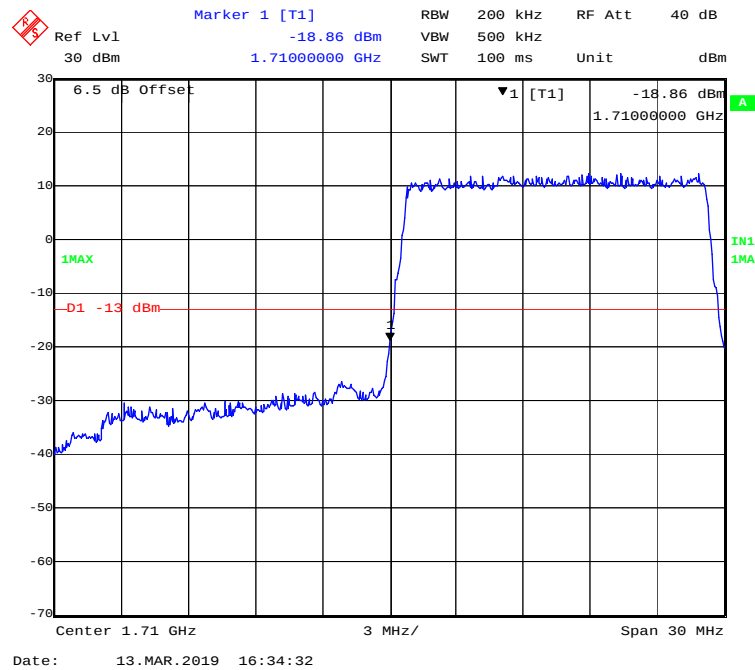
QPSK (10.0 MHz, FULL RB) - Left Band Edge



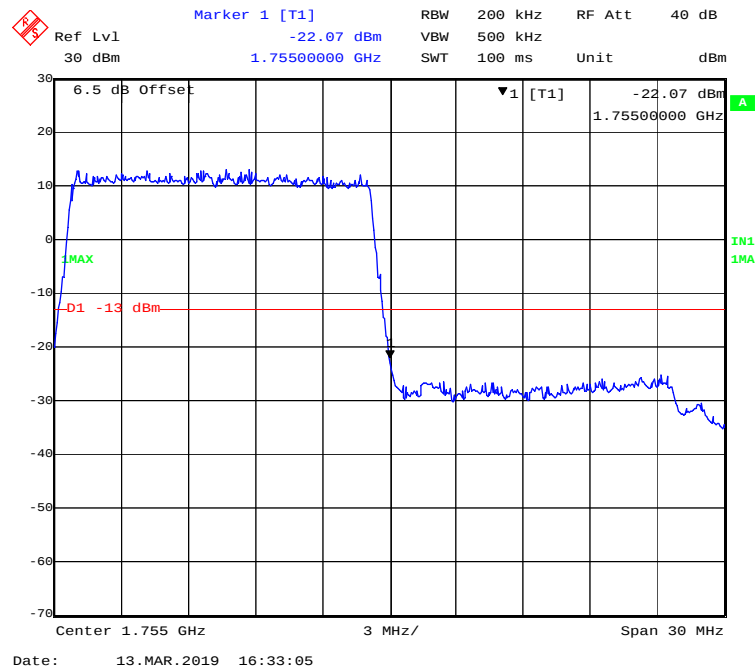
QPSK (10.0 MHz, FULL RB) - Right Band Edge



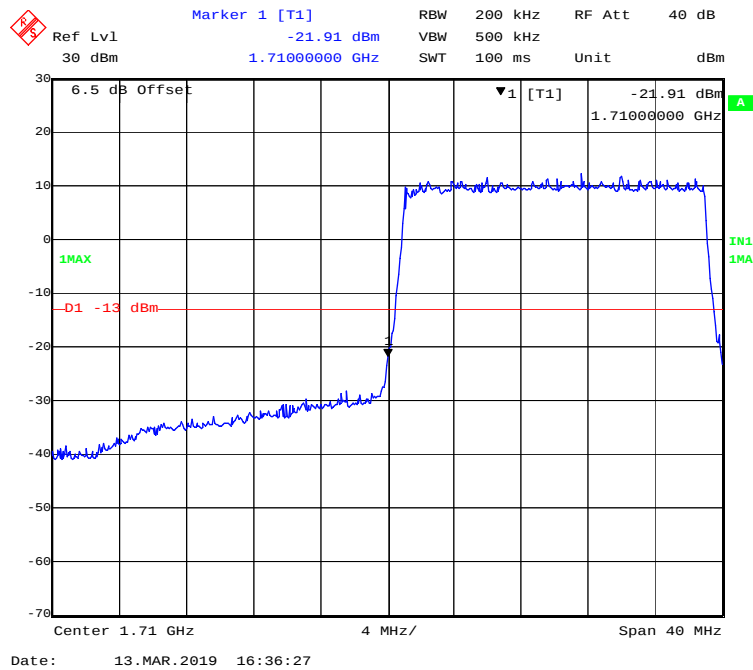
QPSK (15.0 MHz, FULL RB) - Left Band Edge



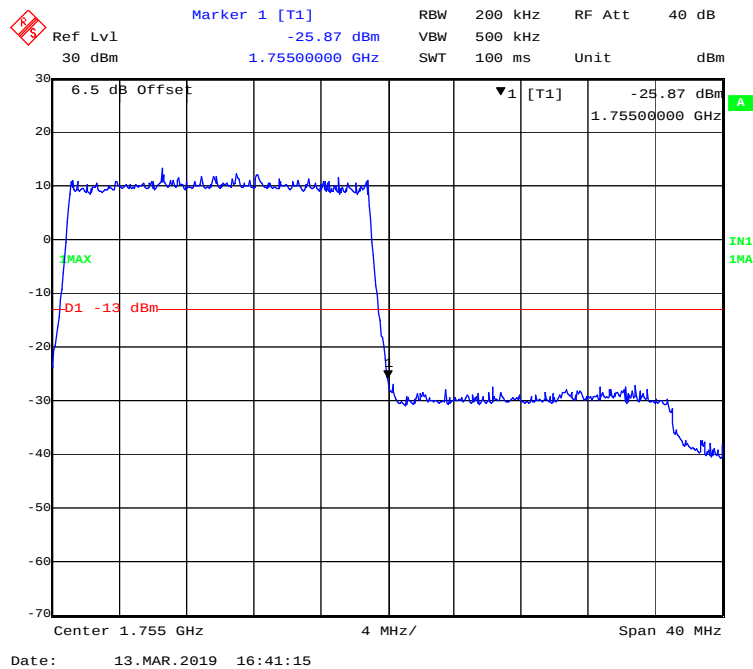
QPSK (15.0 MHz, FULL RB) - Right Band Edge

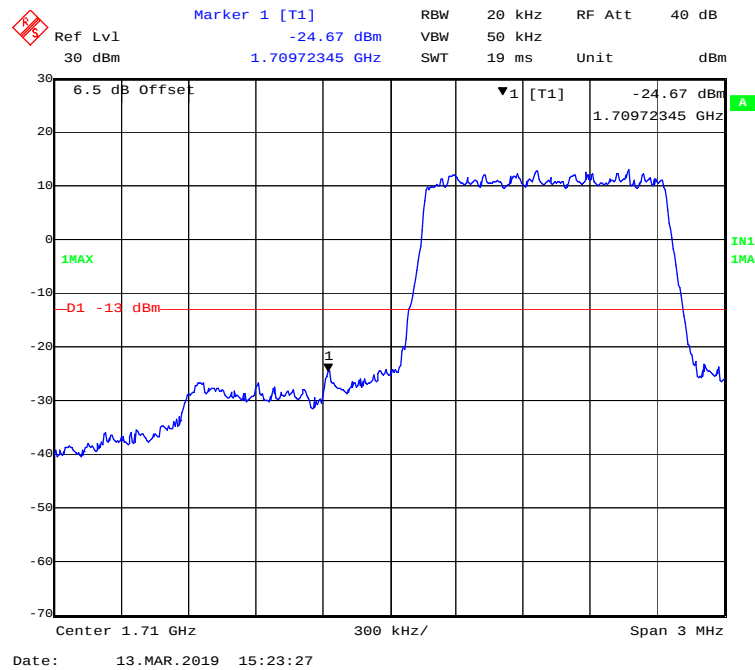
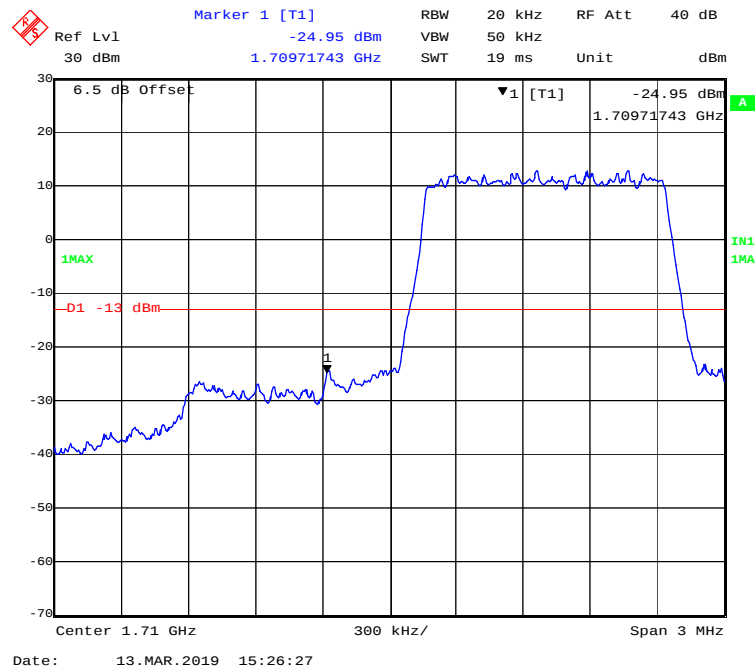


QPSK (20.0 MHz, FULL RB) - Left Band Edge

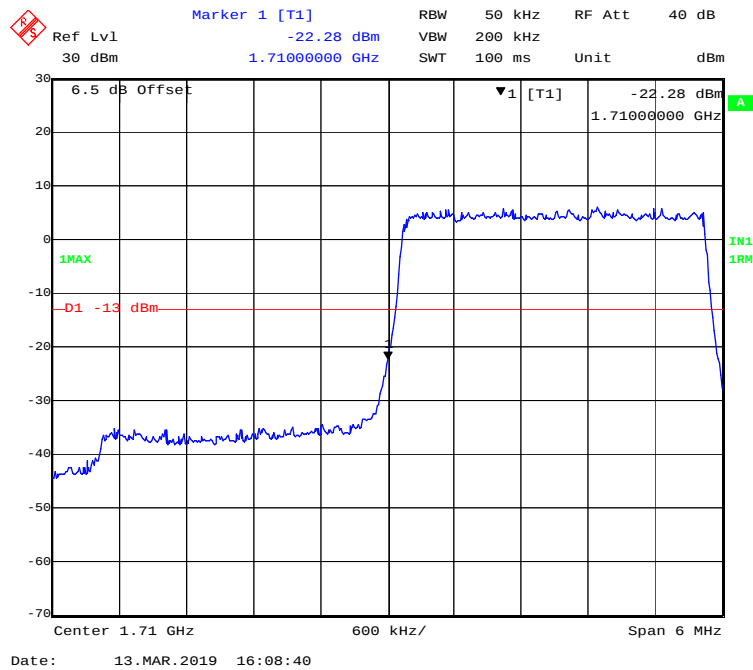


QPSK (20.0 MHz, FULL RB) - Right Band Edge

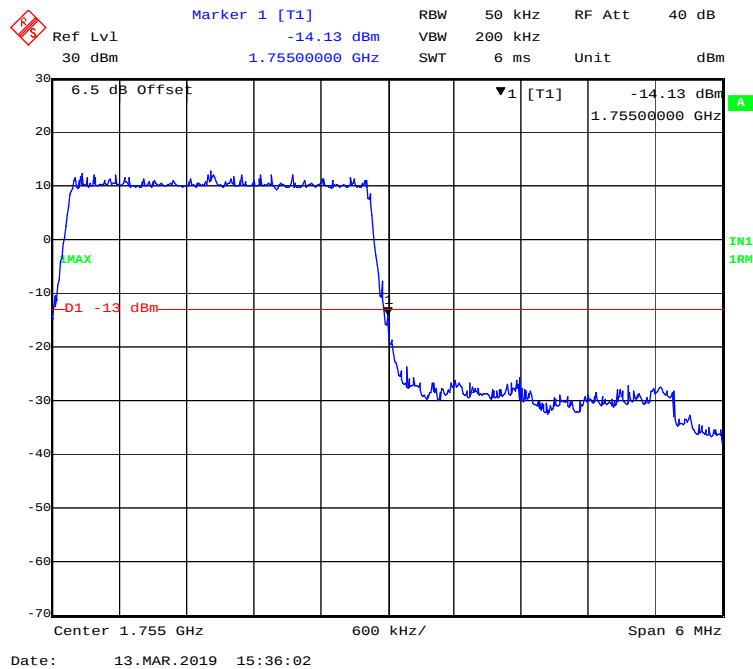


16-QAM (1.4 MHz, FULL RB) - Left Band Edge**16-QAM (1.4 MHz, FULL RB) - Right Band Edge**

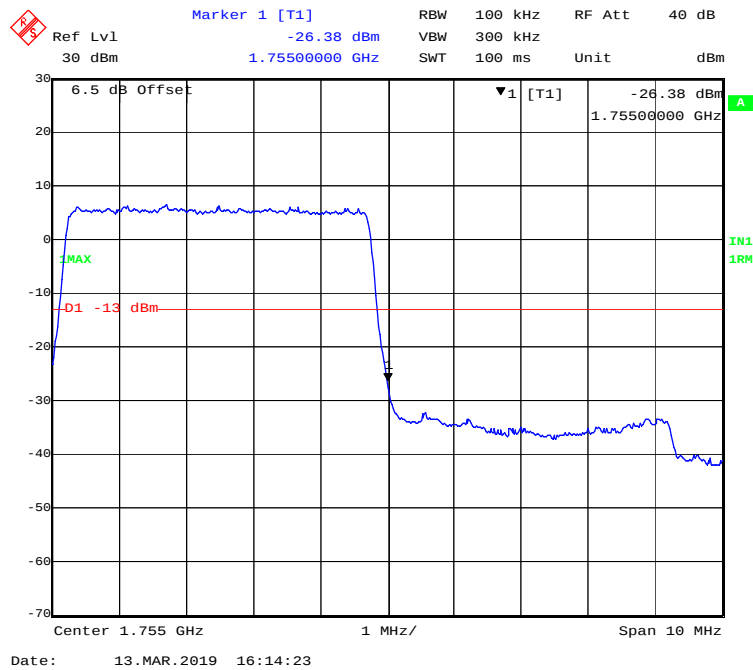
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



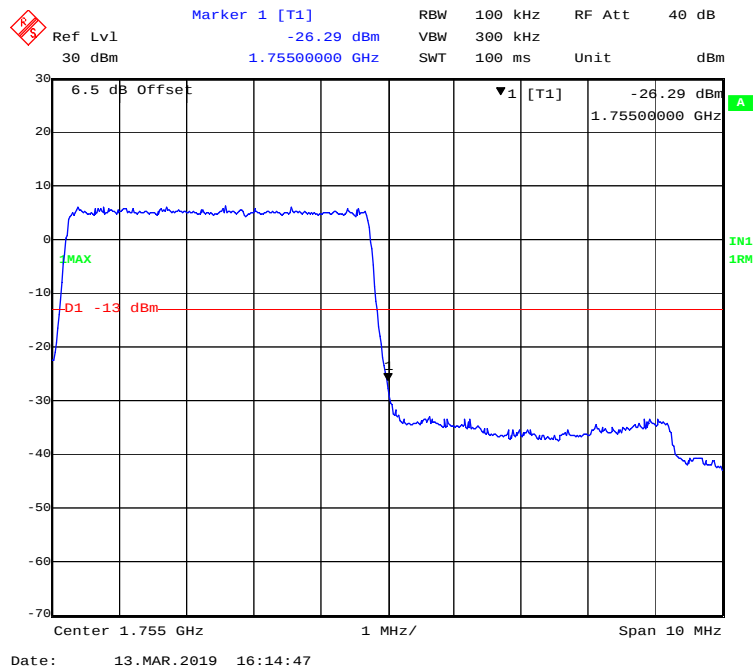
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



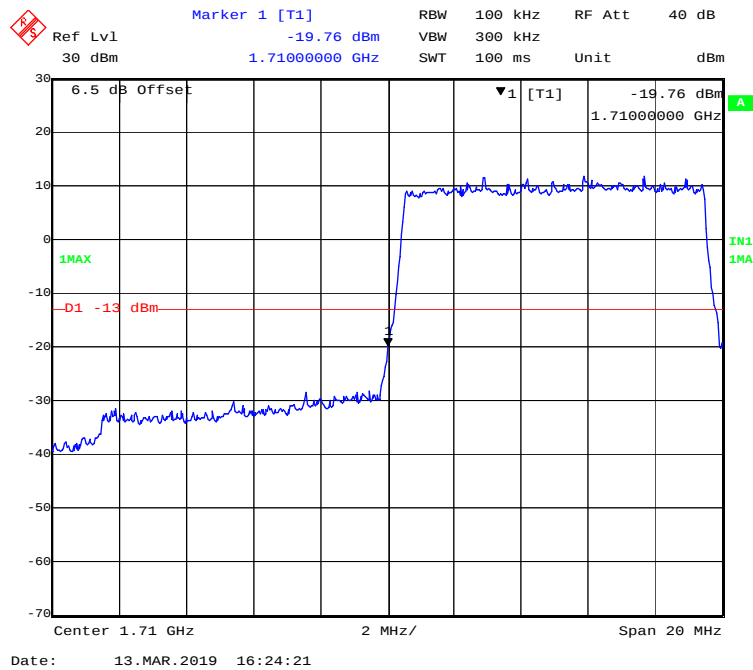
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



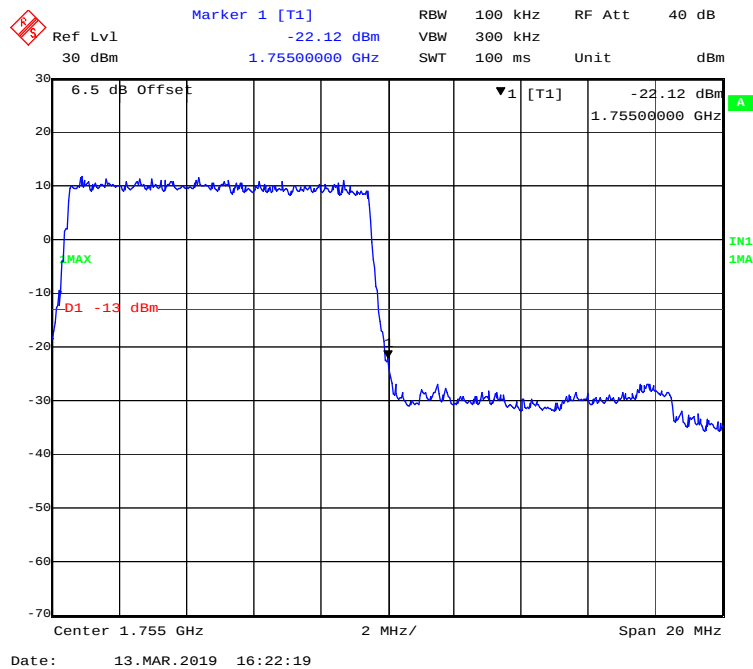
16-QAM (5.0 MHz, FULL RB) - Right Band Edge

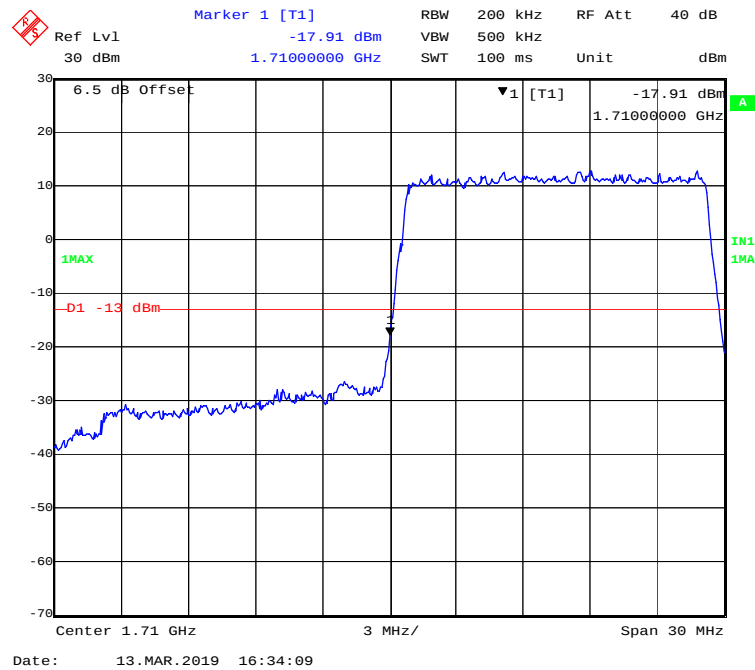
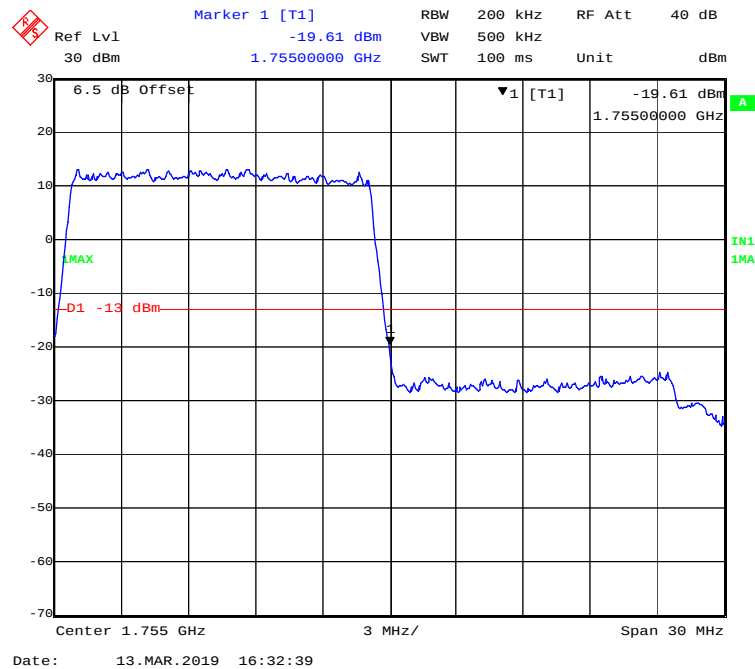


16-QAM (10.0 MHz, FULL RB) - Left Band Edge

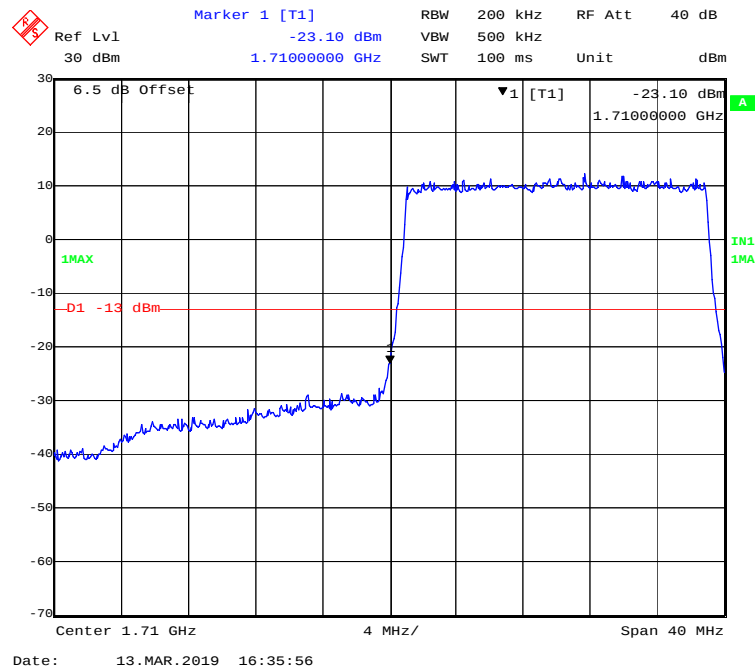


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

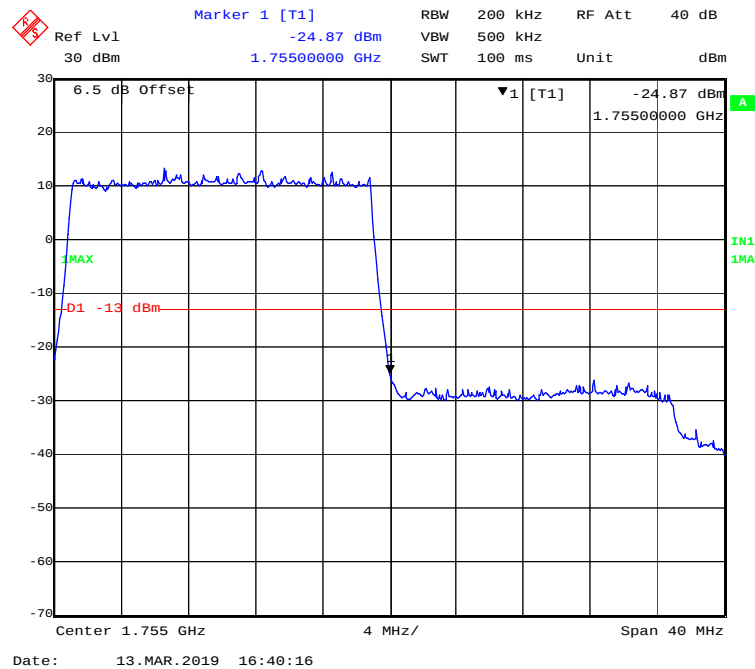


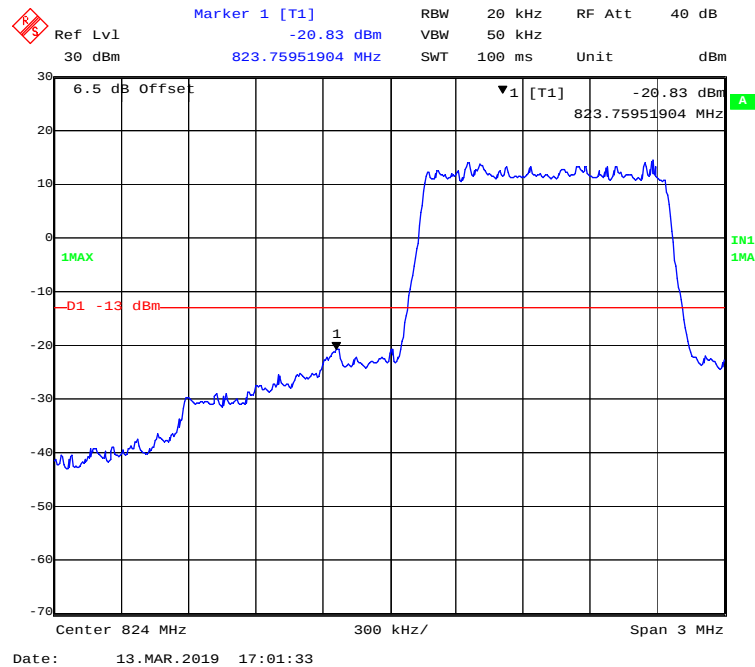
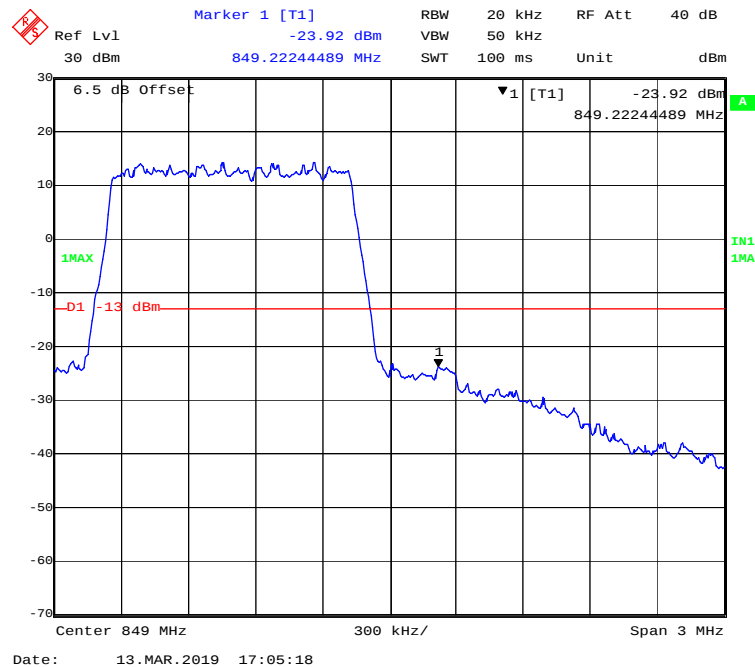
16-QAM (15.0 MHz, FULL RB) - Left Band Edge**16-QAM (15.0 MHz, FULL RB) - Right Band Edge**

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

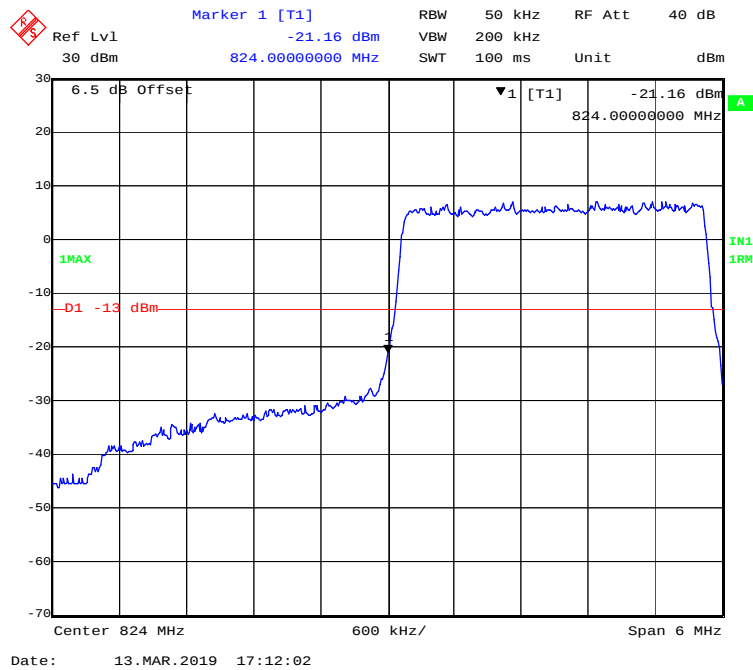


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

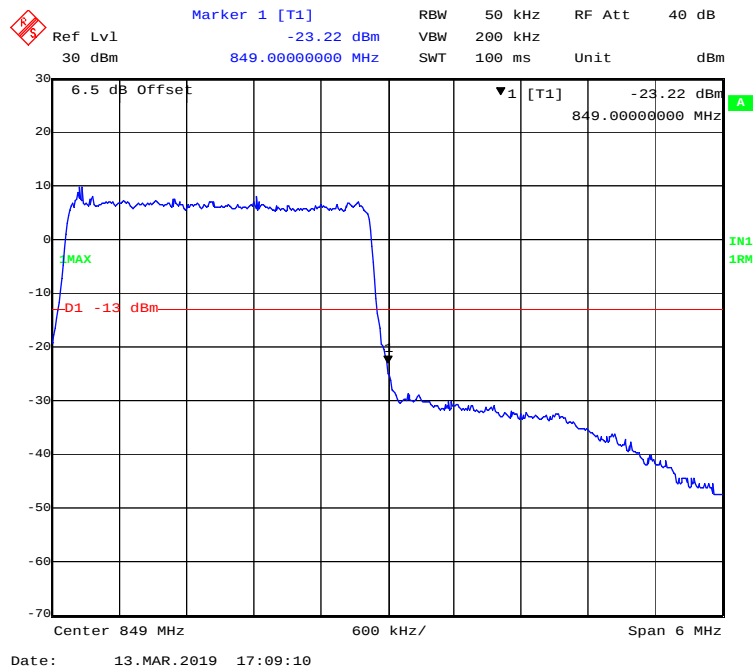


LTE Band 5:**QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

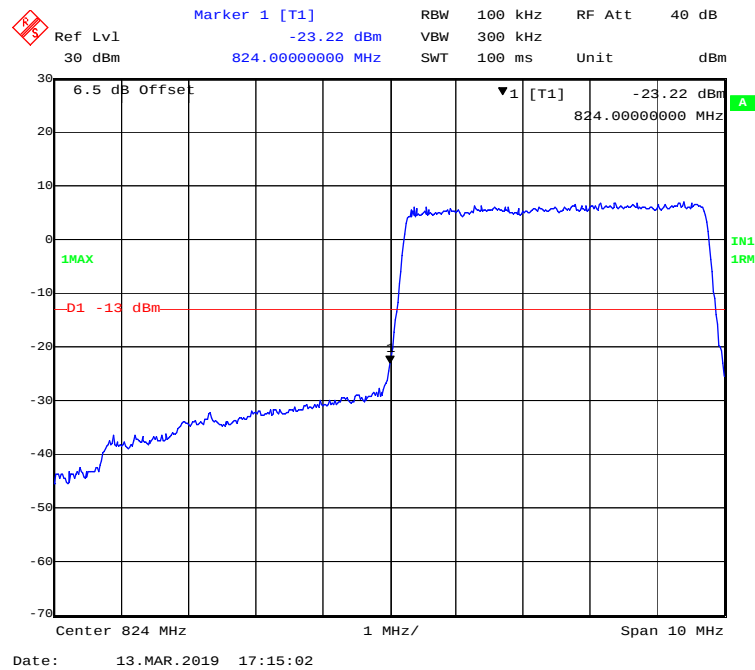
QPSK (3.0 MHz, FULL RB) - Left Band Edge



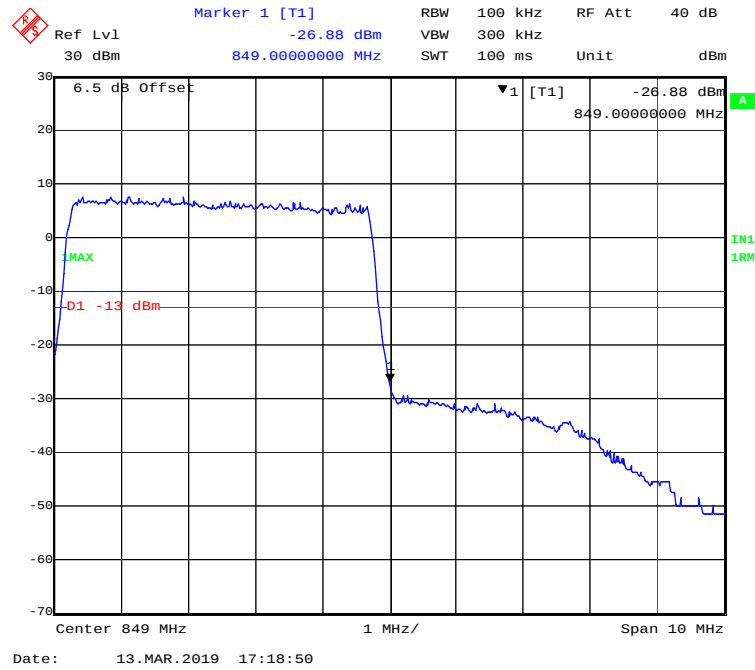
QPSK (3.0 MHz, FULL RB) - Right Band Edge



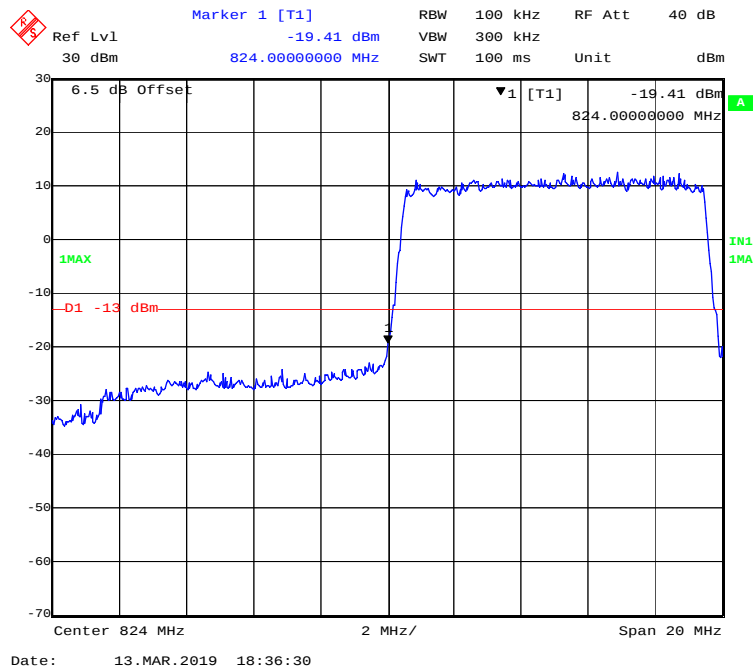
QPSK (5.0 MHz, FULL RB) - Left Band Edge



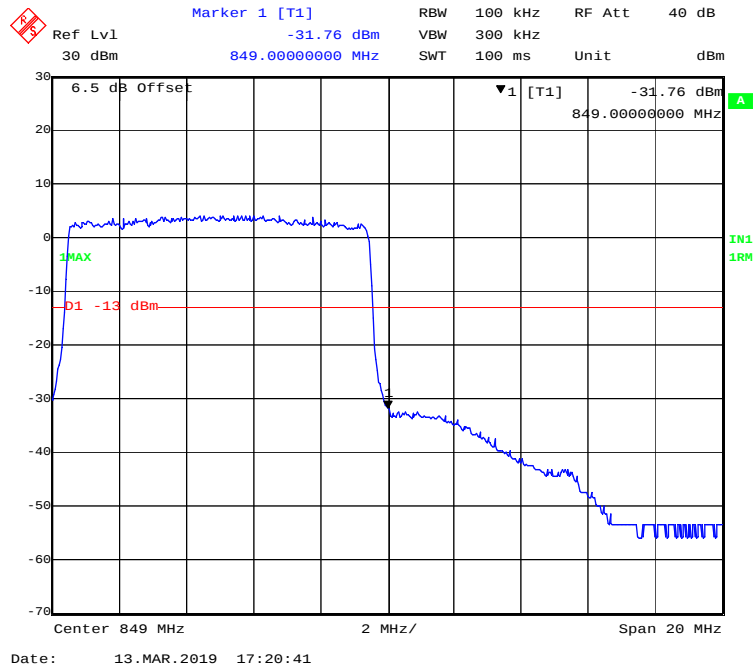
QPSK (5.0 MHz, FULL RB) - Right Band Edge



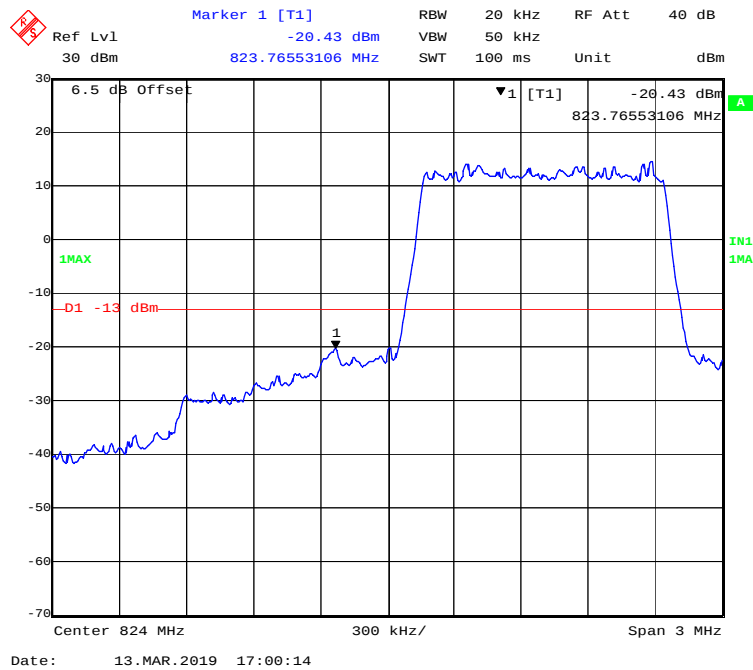
QPSK (10.0 MHz, FULL RB) - Left Band Edge



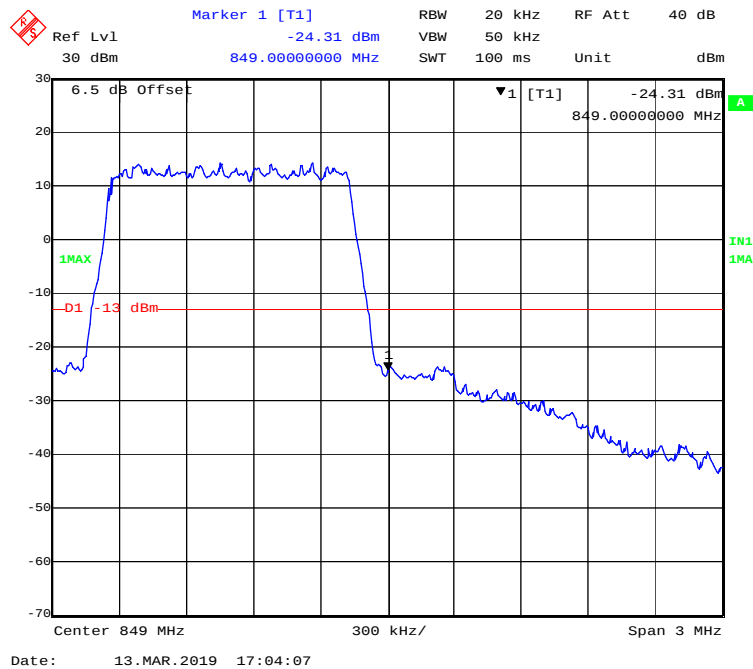
QPSK (10.0 MHz, FULL RB) - Right Band Edge

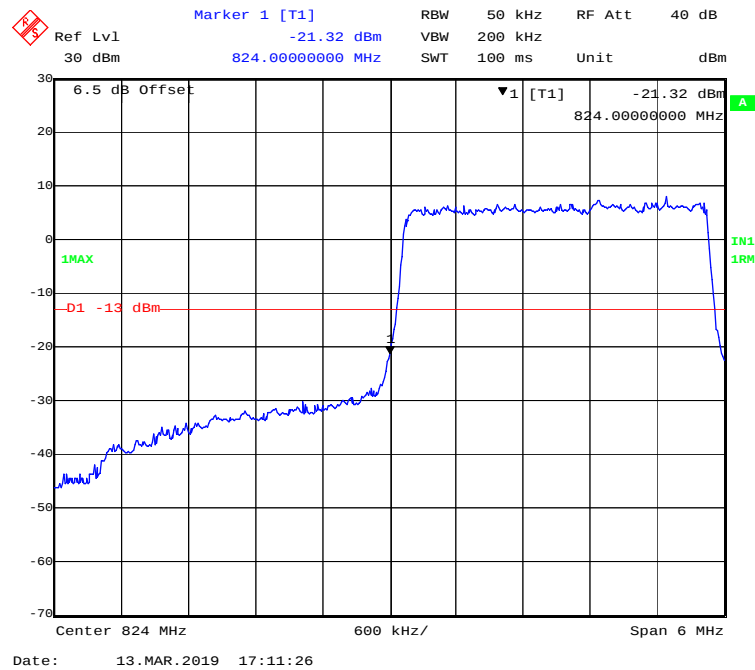
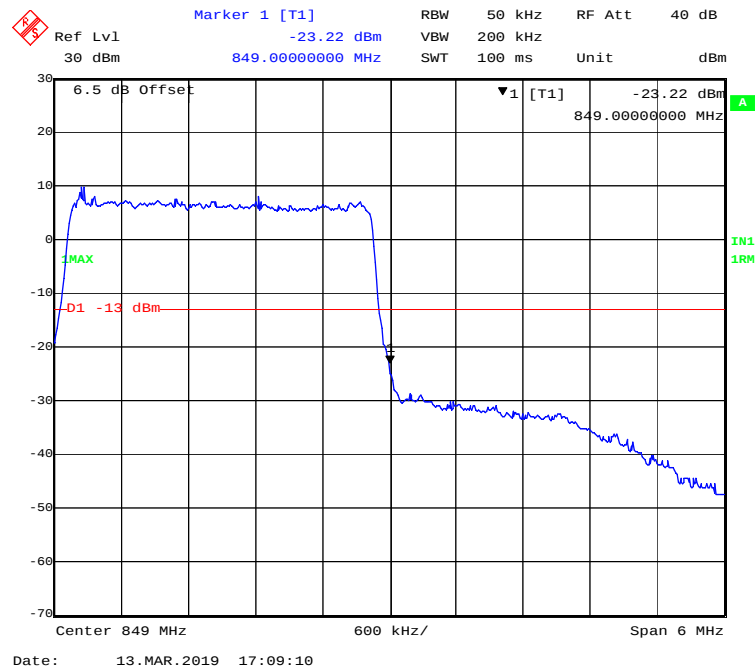


16-QAM (1.4 MHz, FULL RB) - Left Band Edge

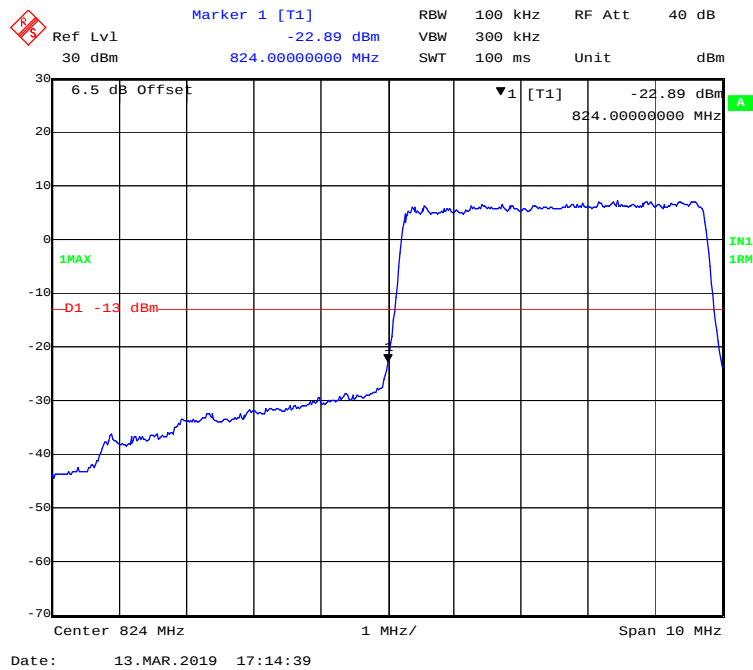


16-QAM (1.4 MHz, FULL RB) - Right Band Edge

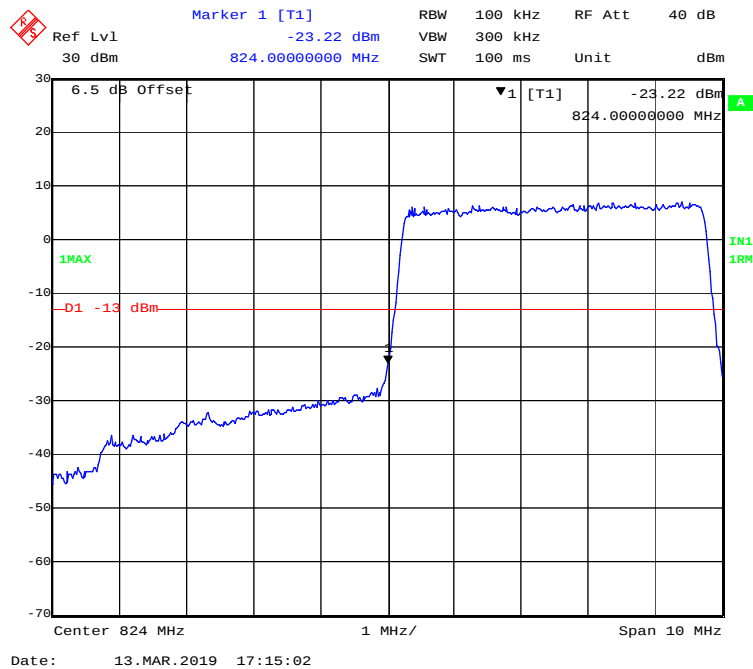


16-QAM (3.0 MHz, FULL RB) - Left Band Edge**16-QAM (3.0 MHz, FULL RB) - Right Band Edge**

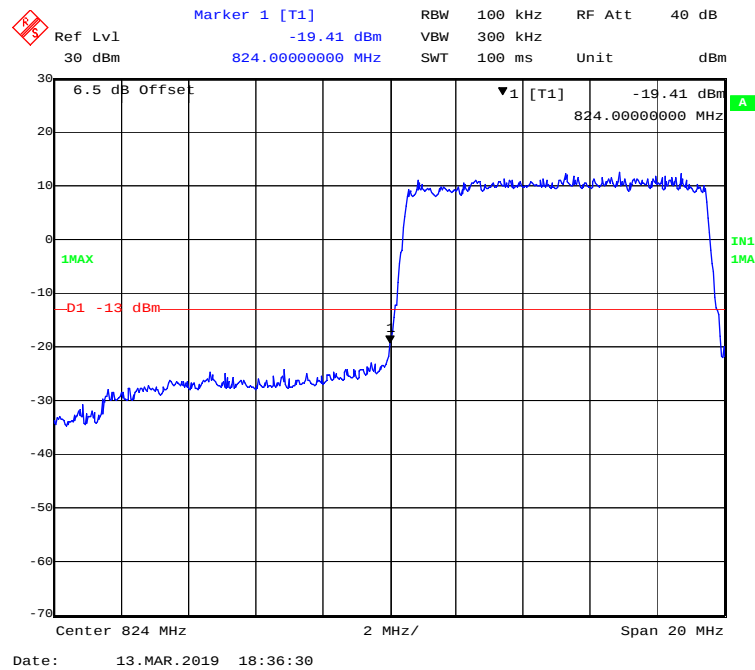
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



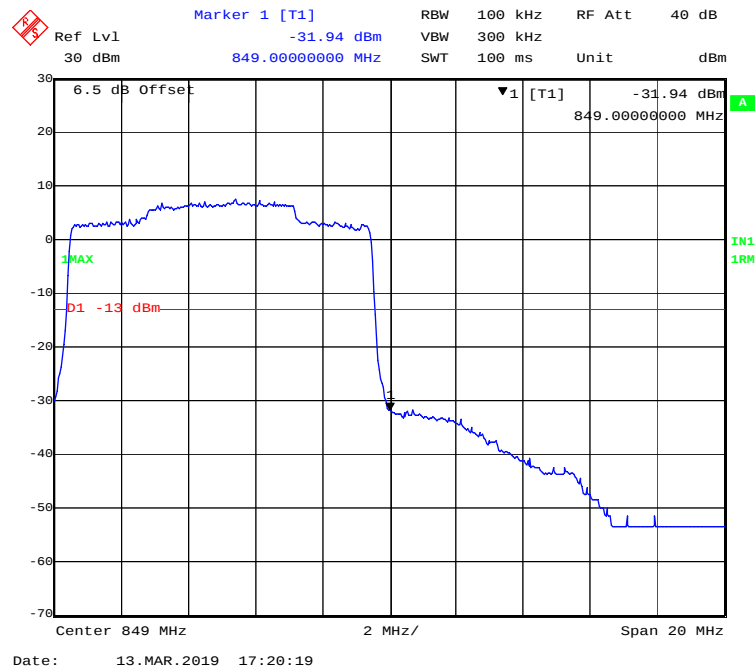
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



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

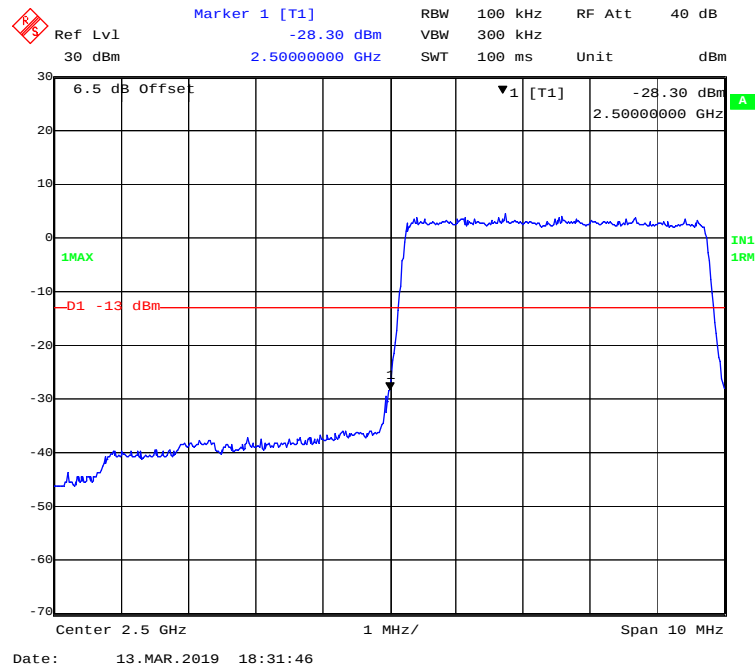


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

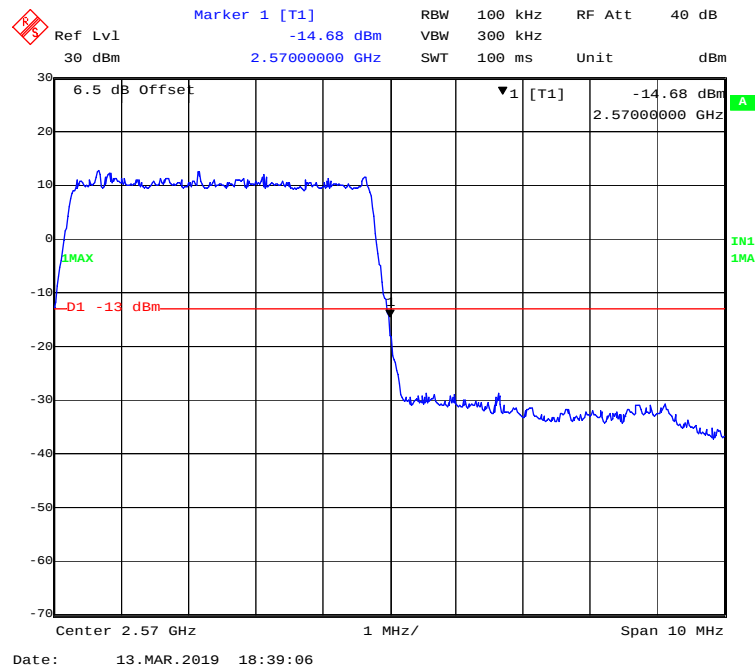


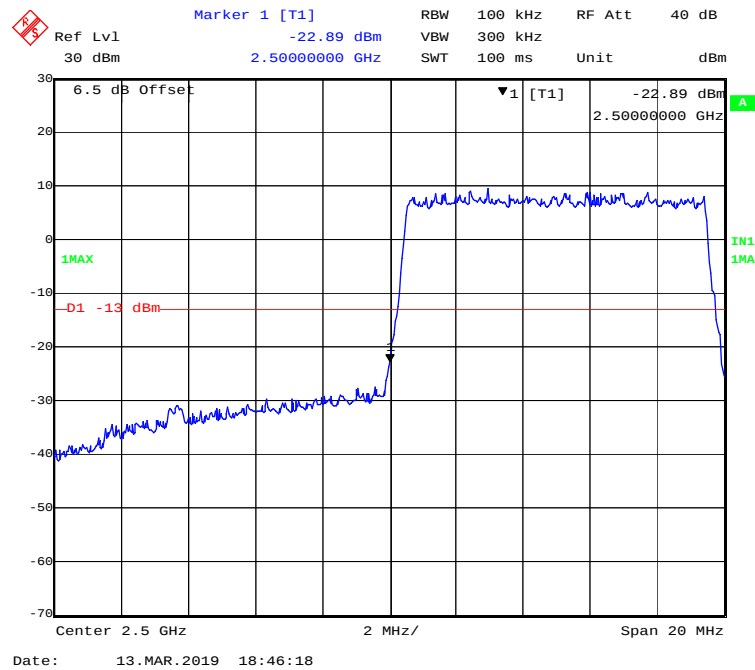
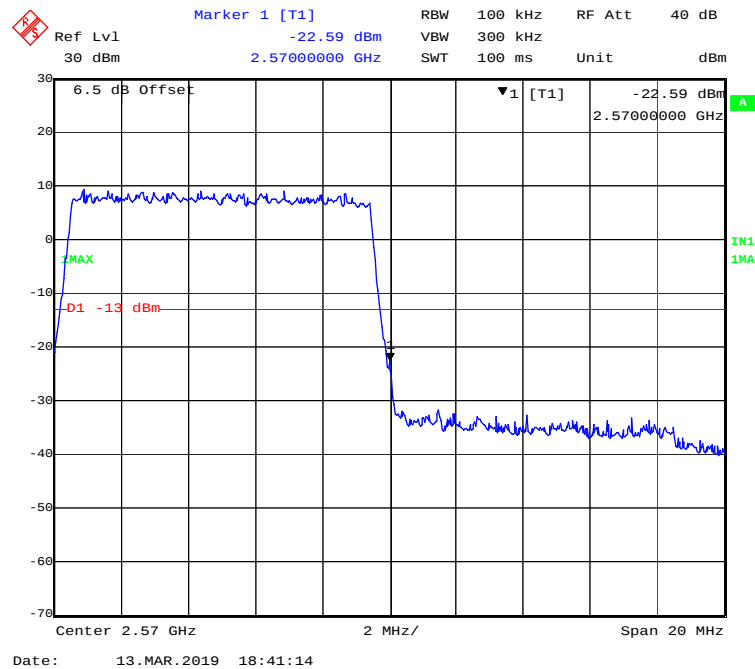
LTE Band 7:

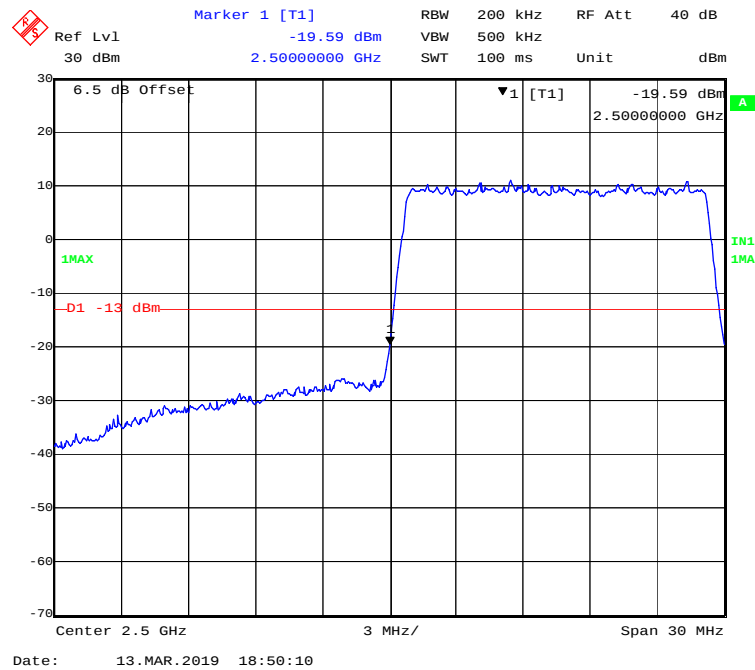
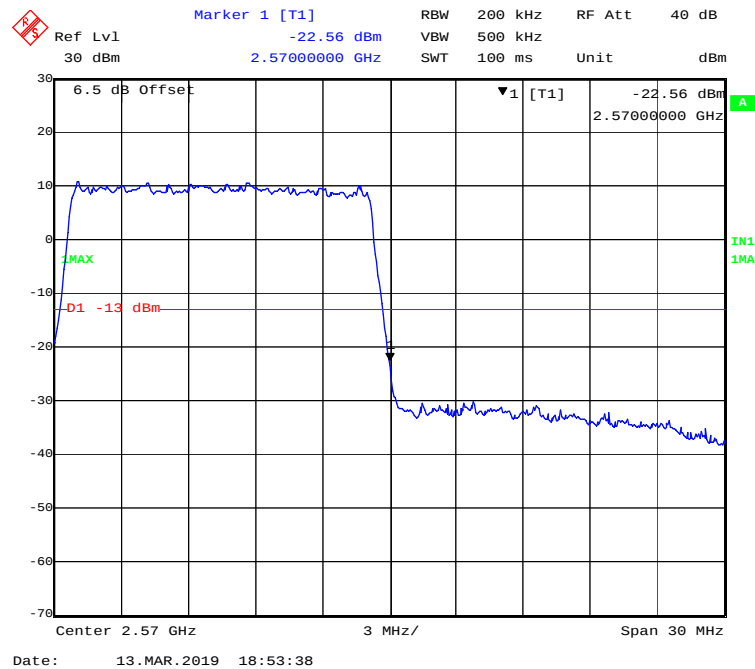
QPSK (5.0 MHz, FULL RB) - Left Band Edge



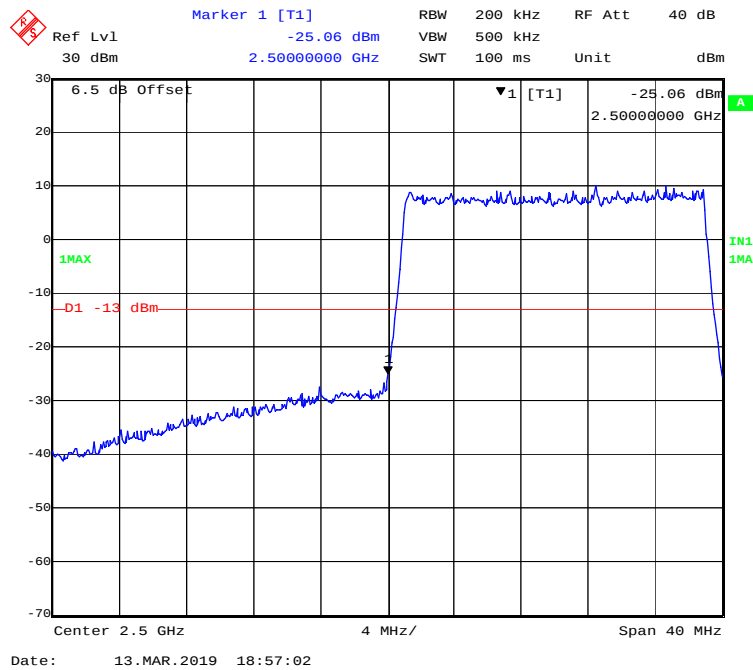
QPSK (5.0 MHz, FULL RB) - Right Band Edge



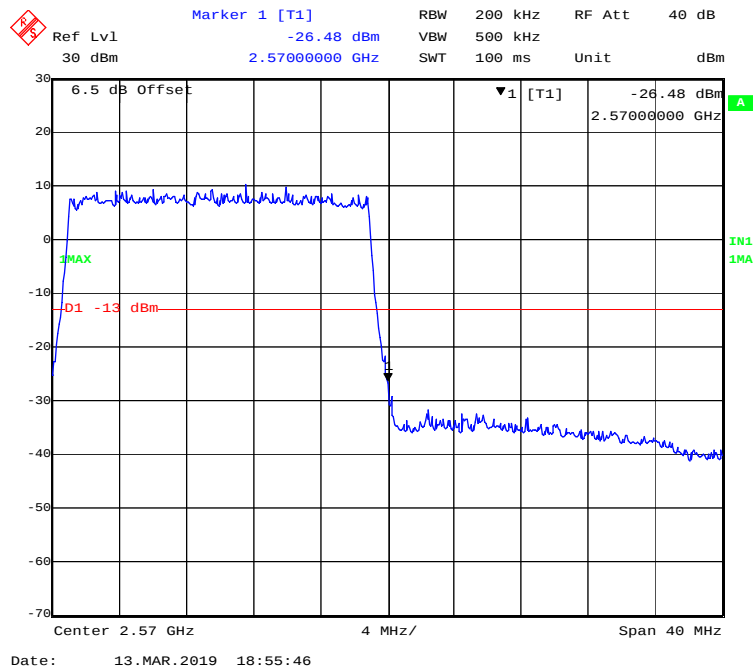
QPSK (10.0 MHz, FULL RB) - Left Band Edge**QPSK (10.0 MHz, FULL RB) - Right Band Edge**

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

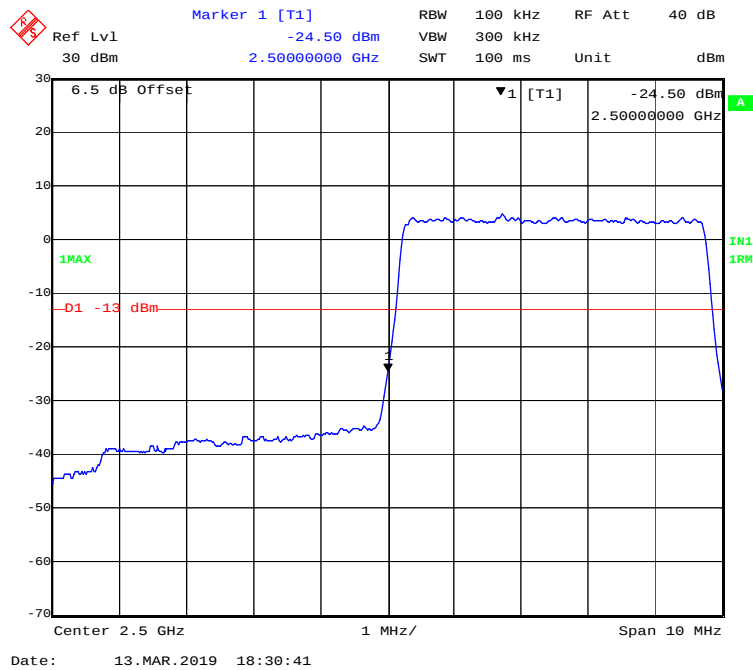
QPSK (20.0 MHz, FULL RB) - Left Band Edge



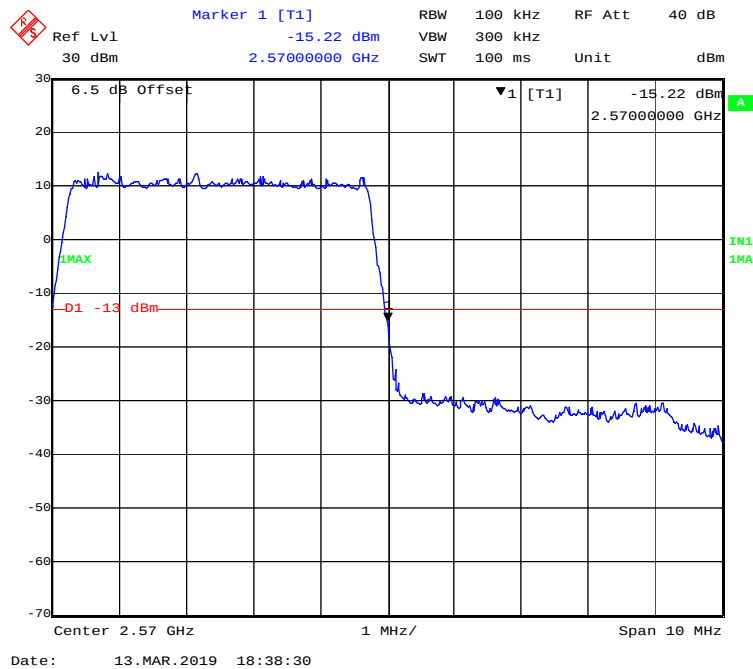
QPSK (20.0 MHz, FULL RB) - Right Band Edge



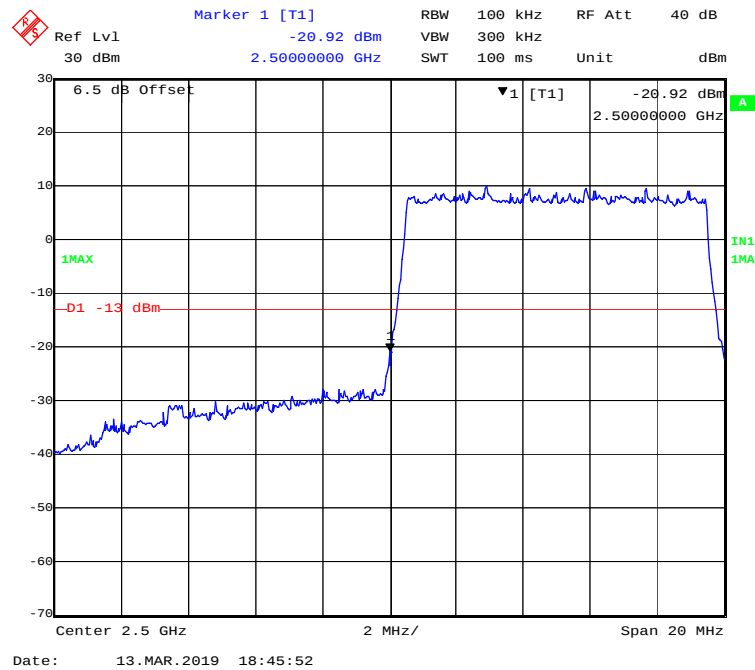
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



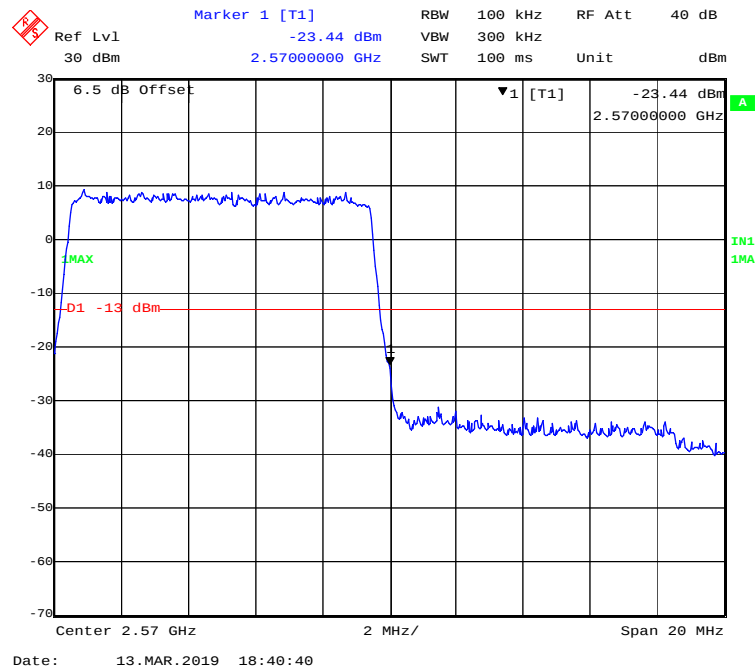
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



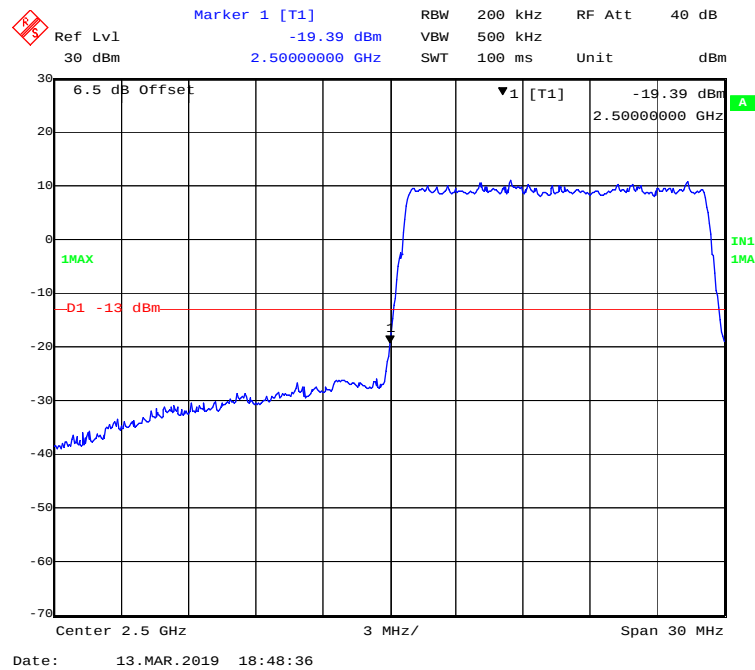
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



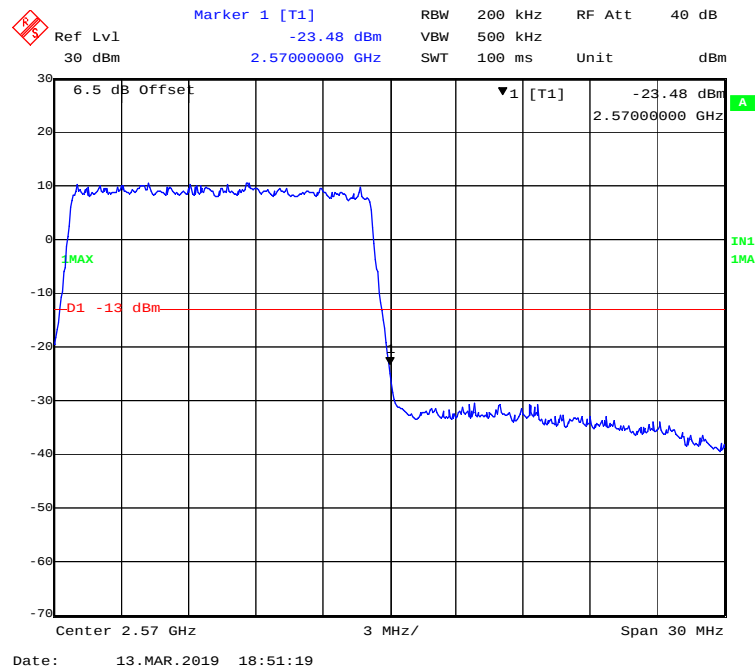
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



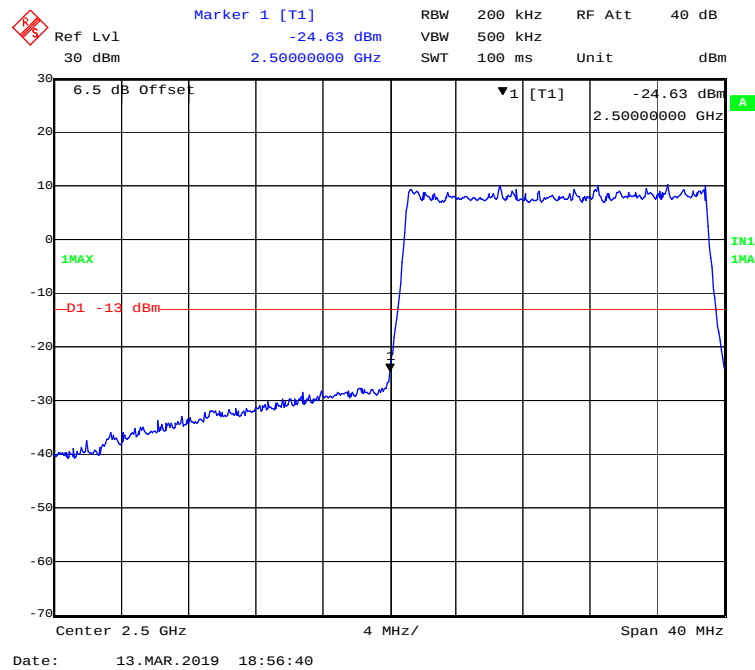
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



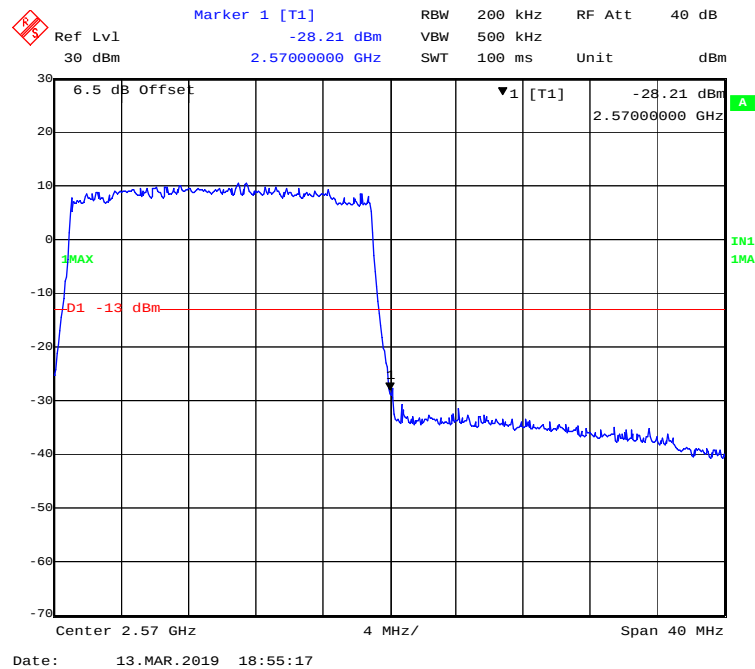
16-QAM (15.0 MHz, FULL RB) - Right Band Edge

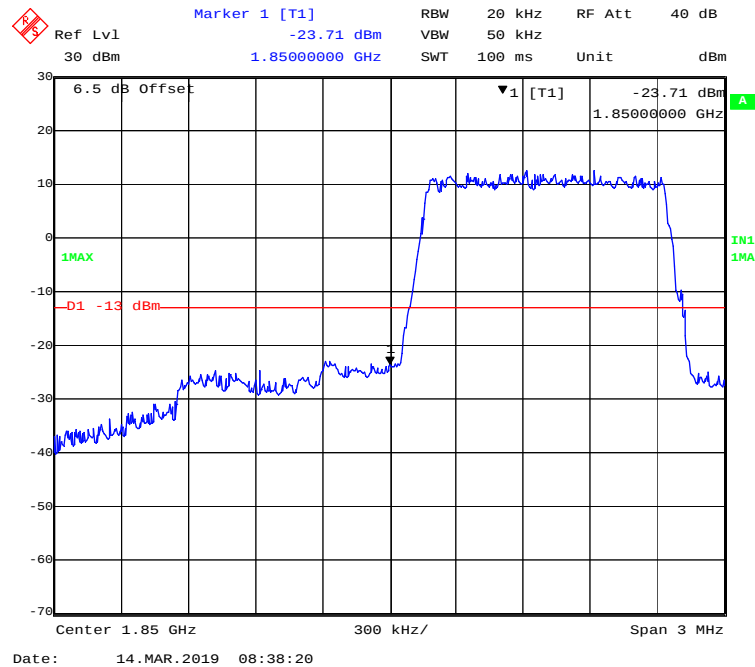
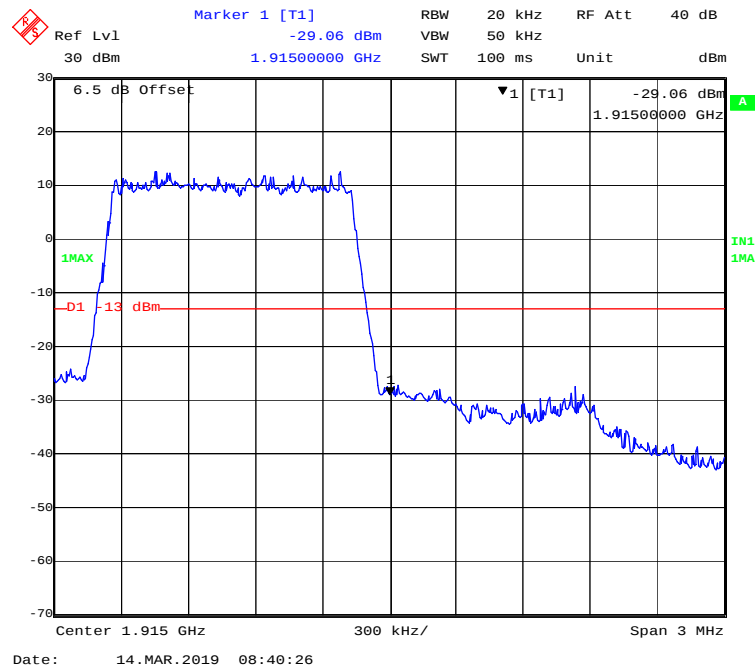


16-QAM (20.0 MHz, FULL RB) - Left Band Edge

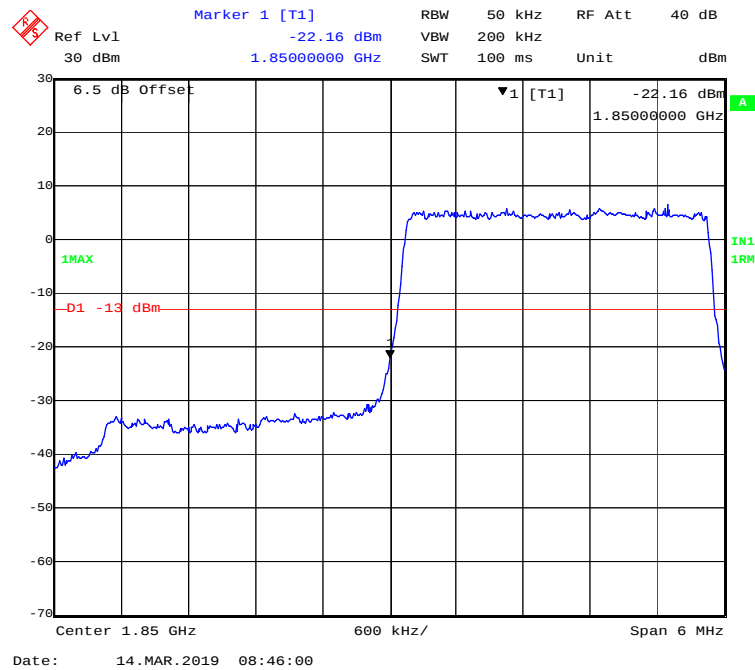


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

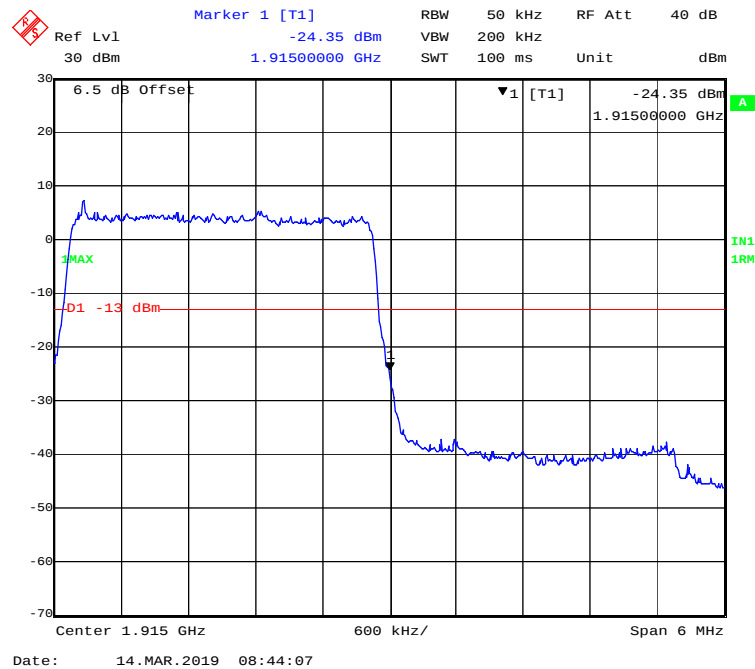


LTE Band 25:**QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

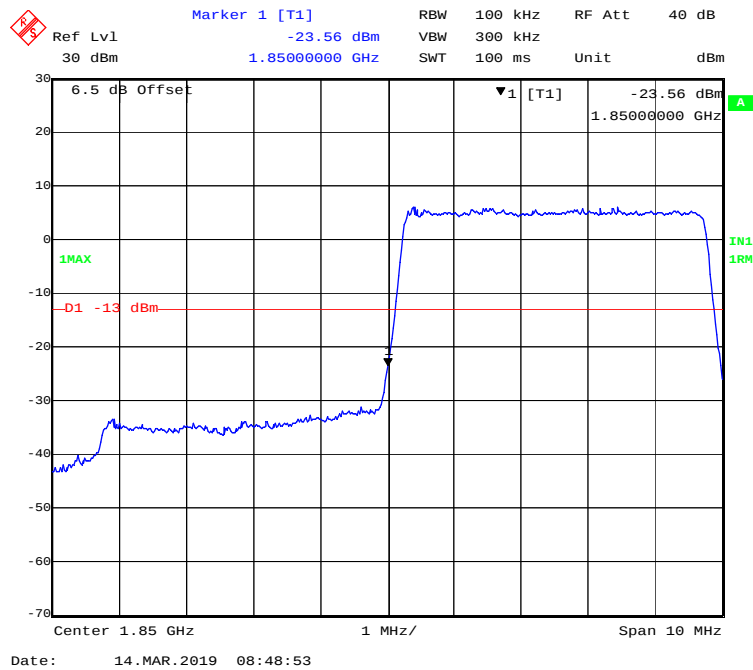
QPSK (3.0 MHz, FULL RB) - Left Band Edge



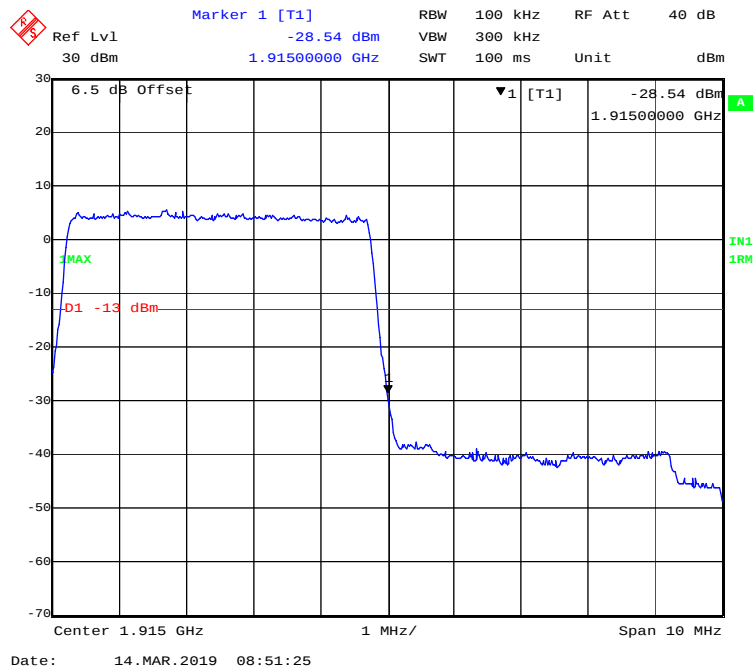
QPSK (3.0 MHz, FULL RB) - Right Band Edge



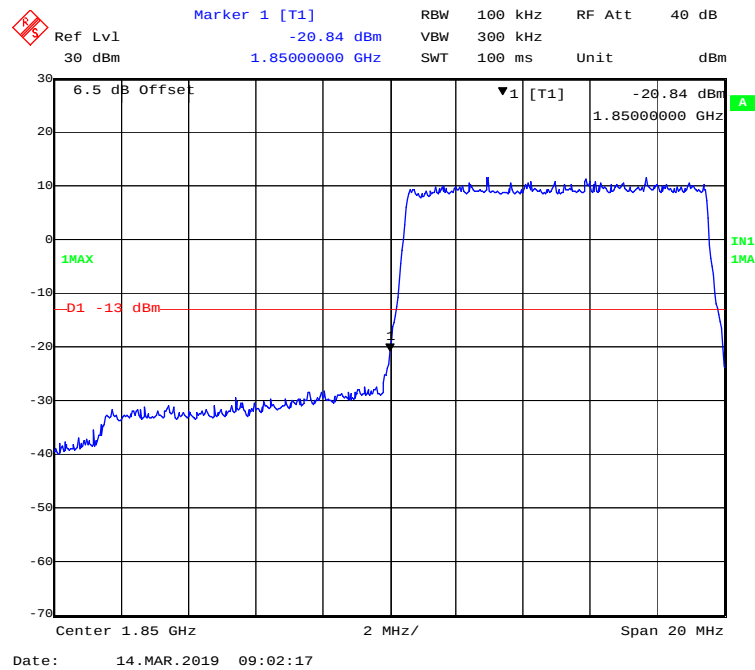
QPSK (5.0 MHz, FULL RB) - Left Band Edge



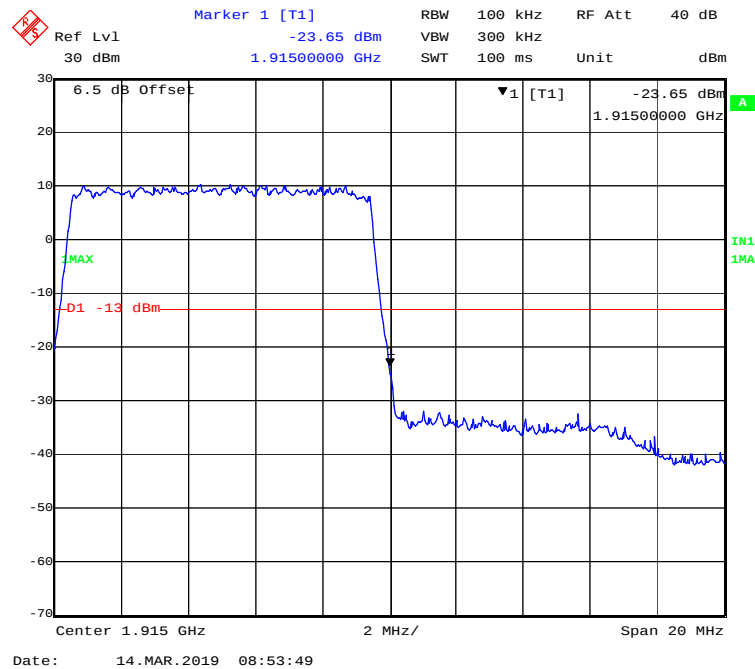
QPSK (5.0 MHz, FULL RB) - Right Band Edge



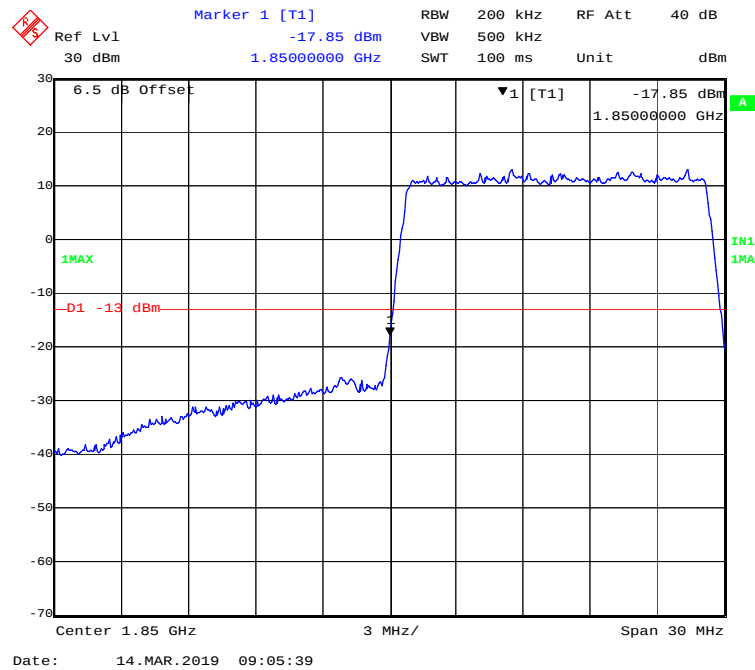
QPSK (10.0 MHz, FULL RB) - Left Band Edge



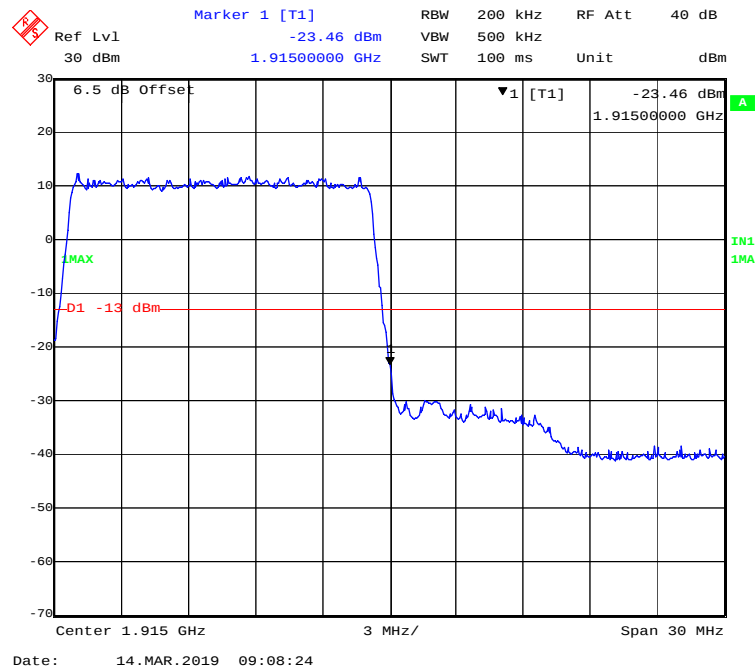
QPSK (10.0 MHz, FULL RB) - Right Band Edge



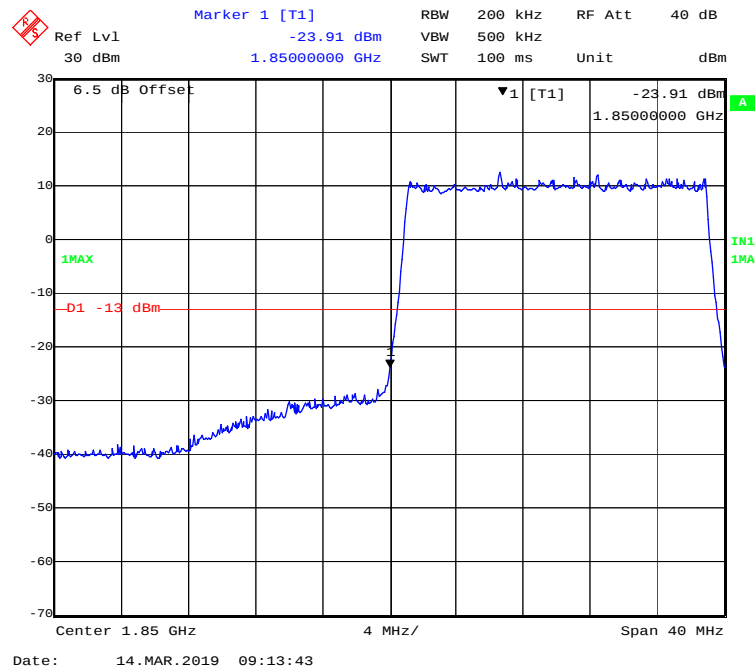
QPSK (15.0 MHz, FULL RB) - Left Band Edge



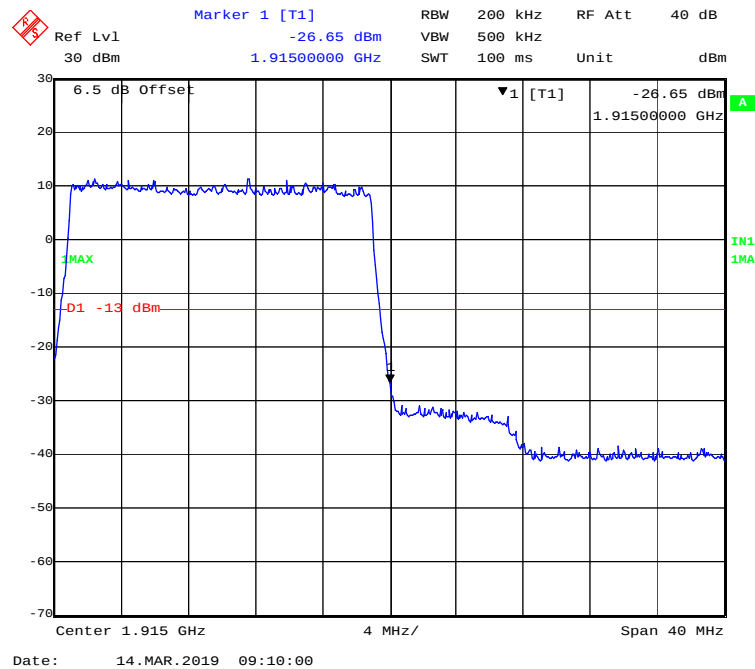
QPSK (15.0 MHz, FULL RB) - Right Band Edge



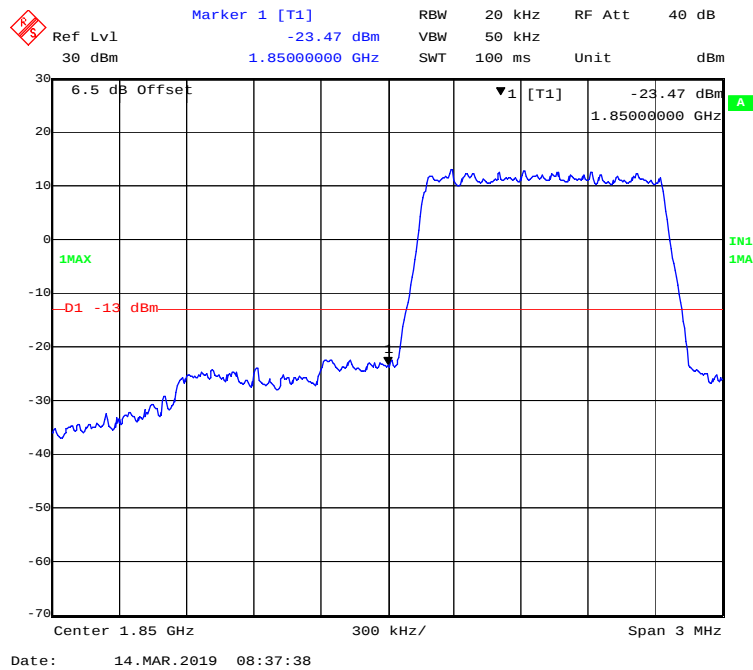
QPSK (20.0 MHz, FULL RB) - Left Band Edge



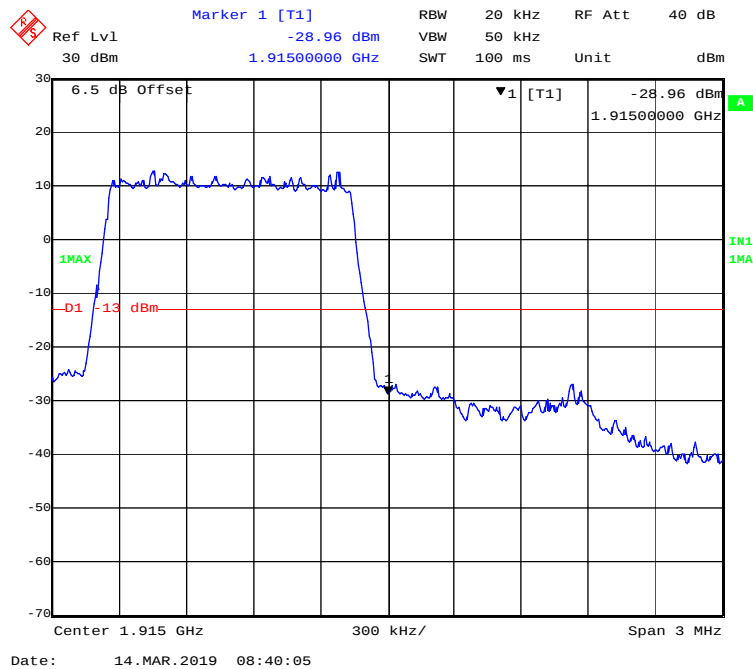
QPSK (20.0 MHz, FULL RB) - Right Band Edge



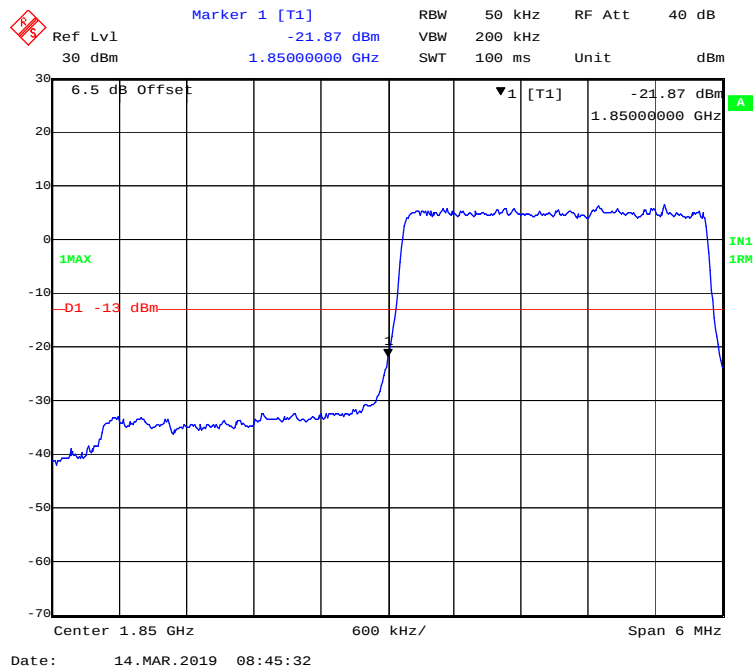
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



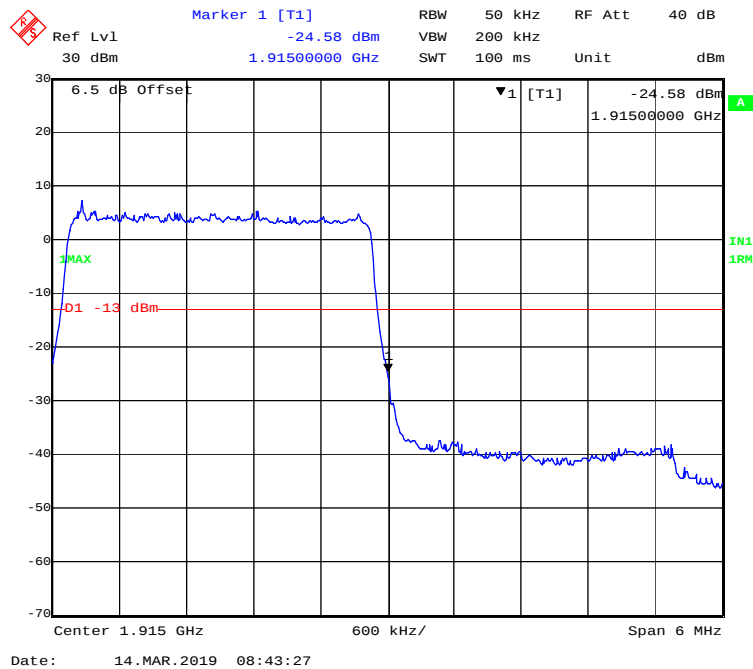
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



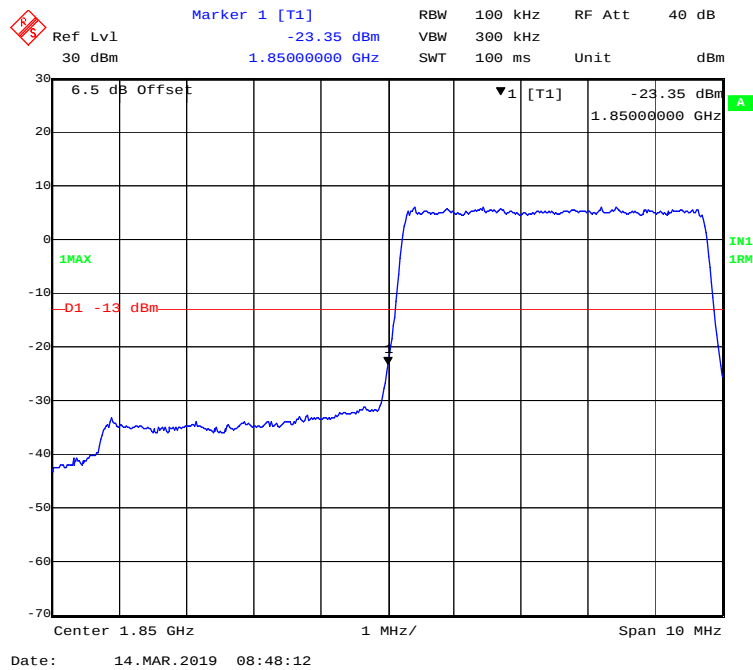
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



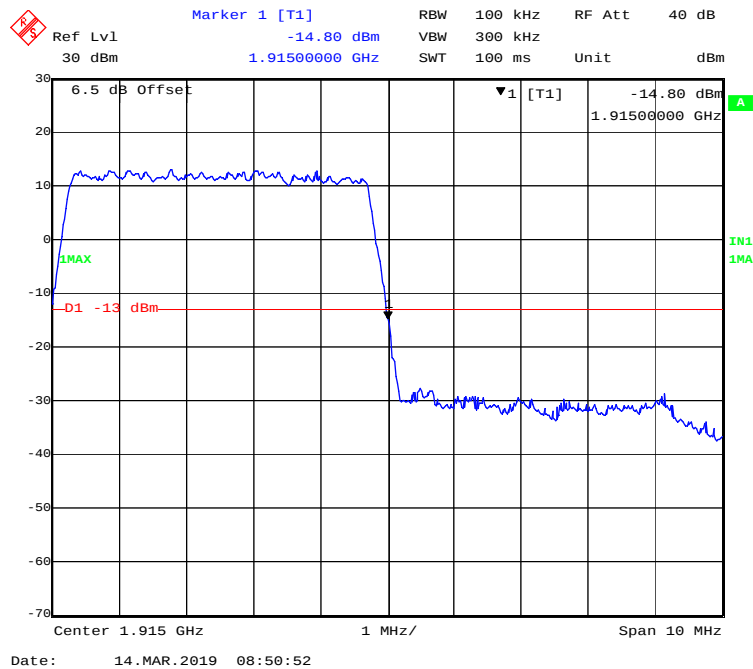
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



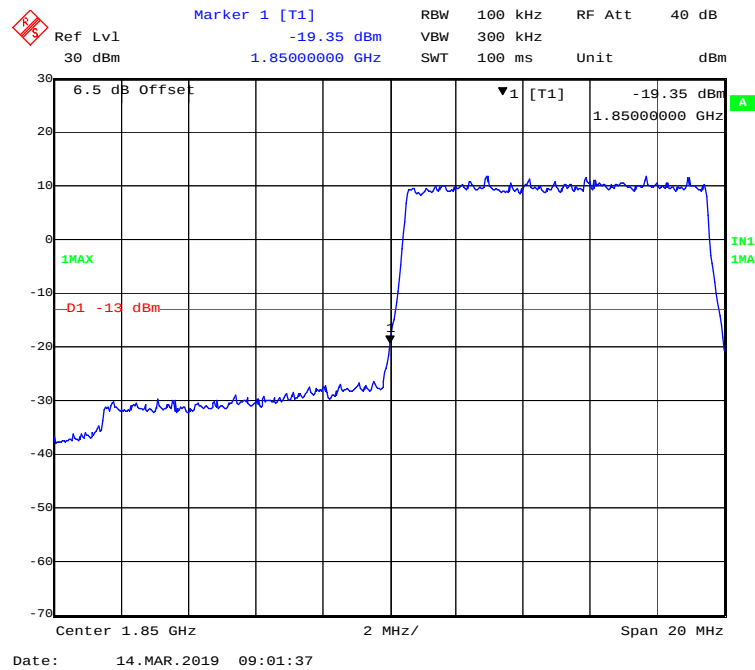
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



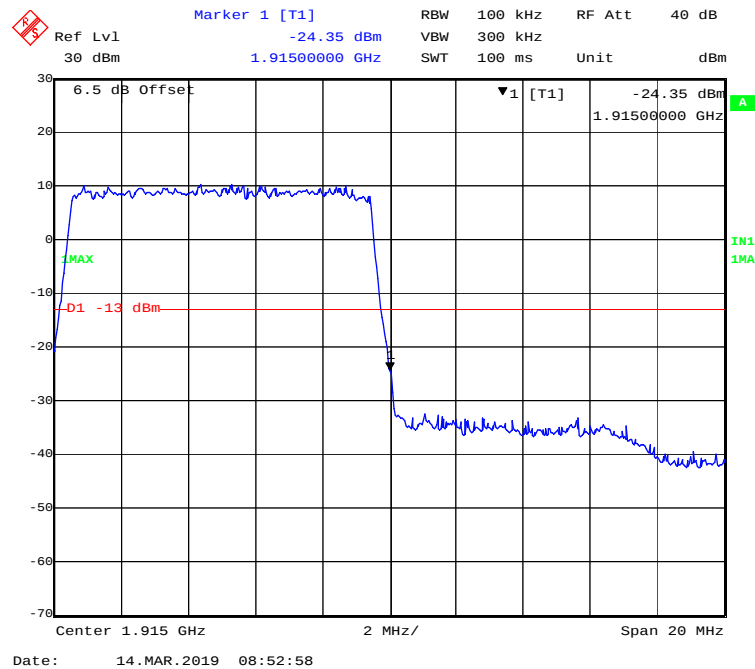
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



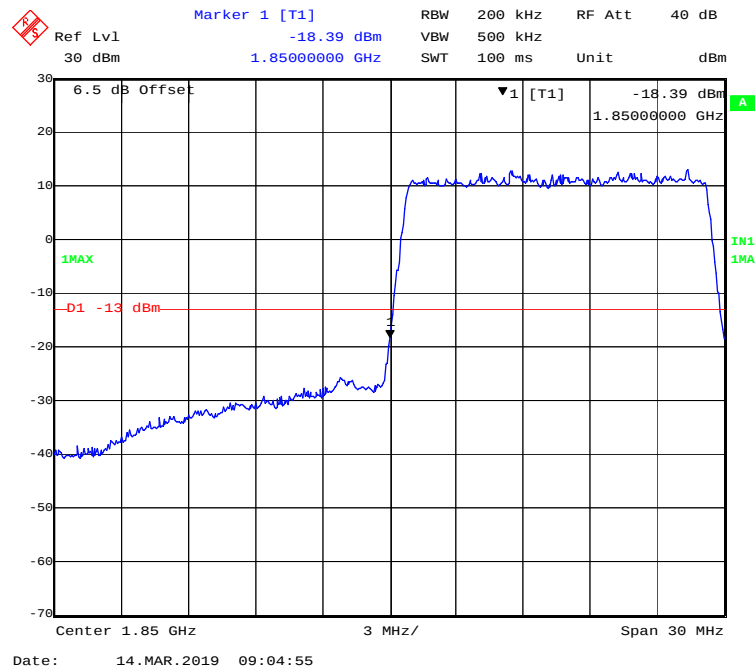
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



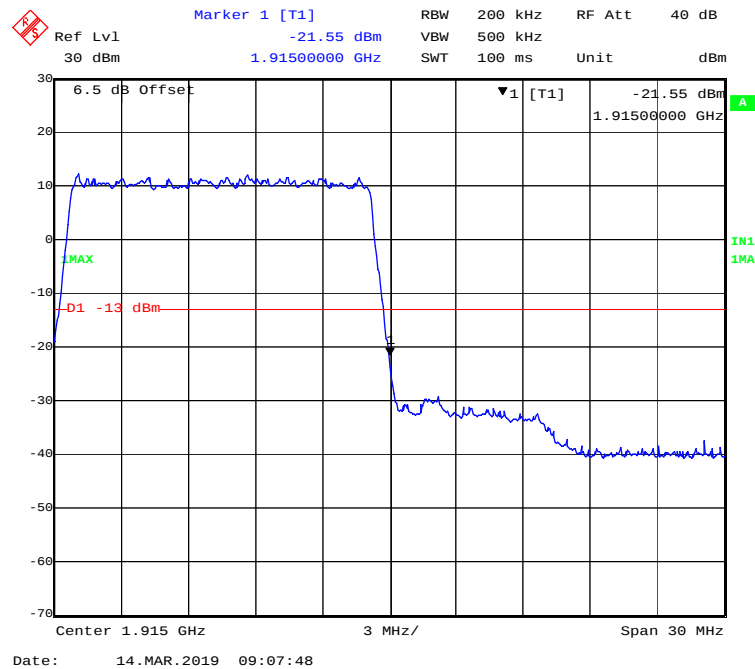
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



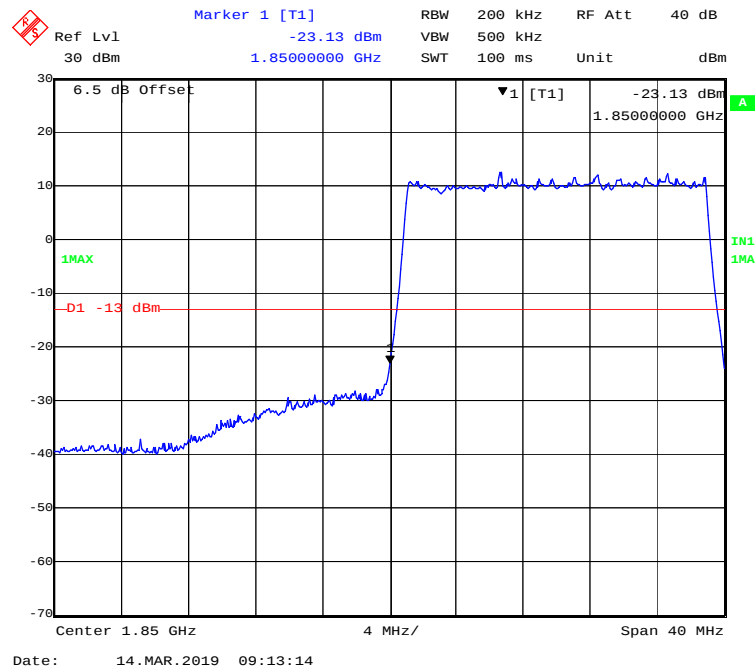
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



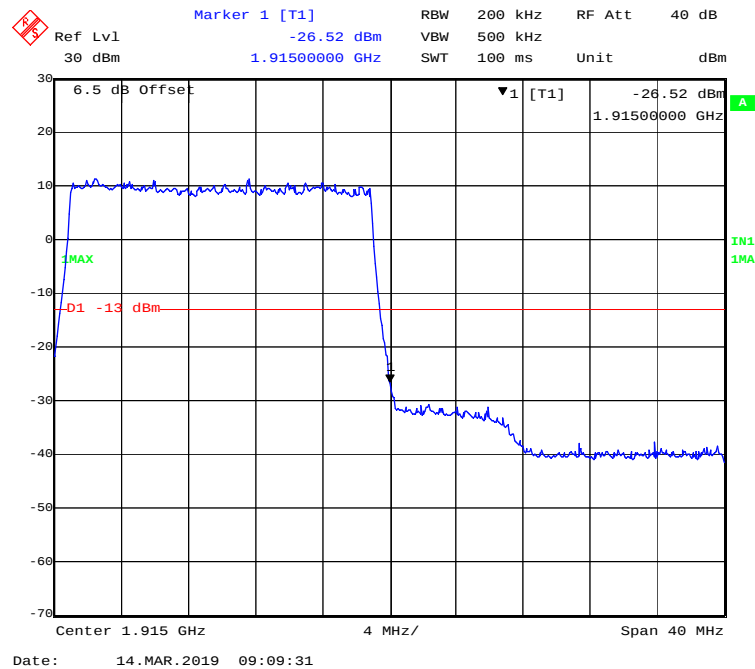
16-QAM (15.0 MHz, FULL RB) - Right Band Edge

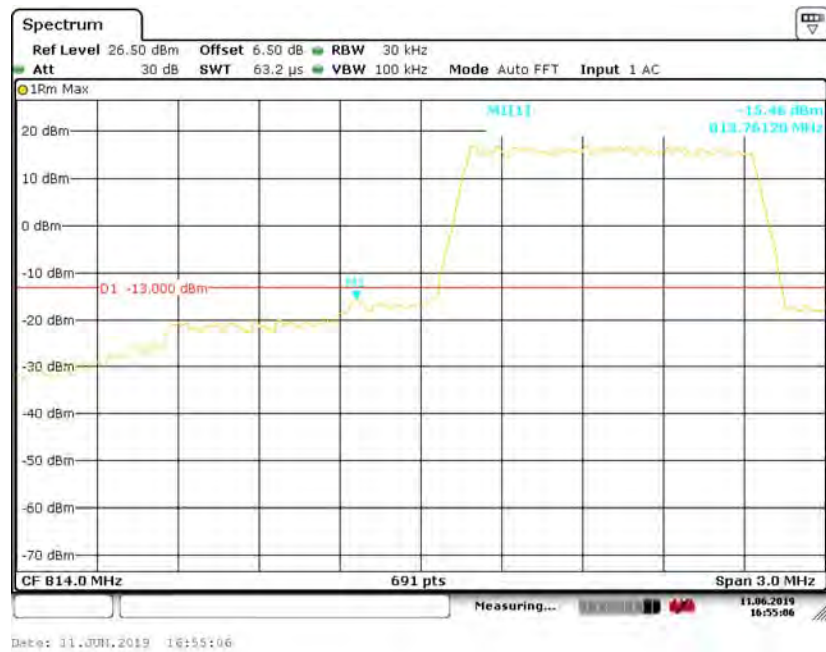
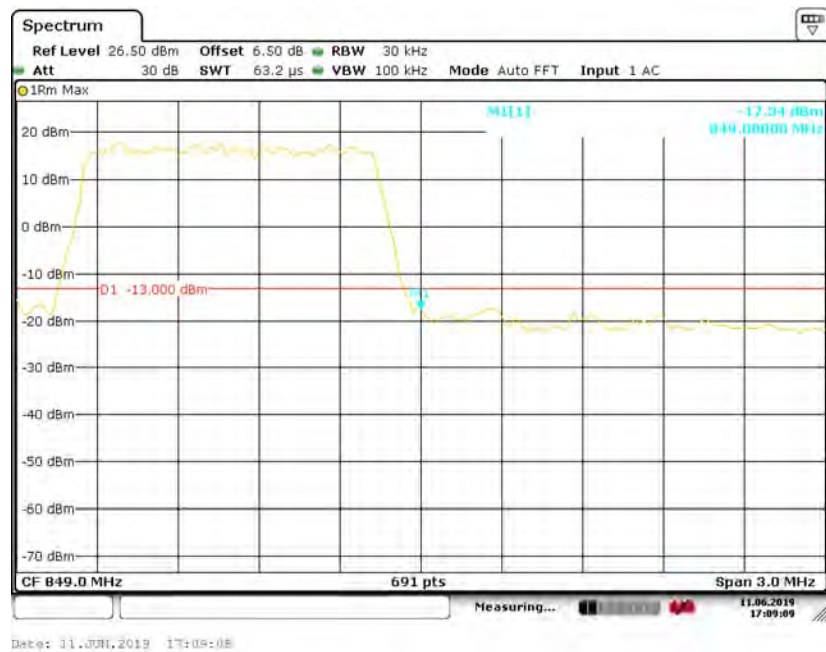


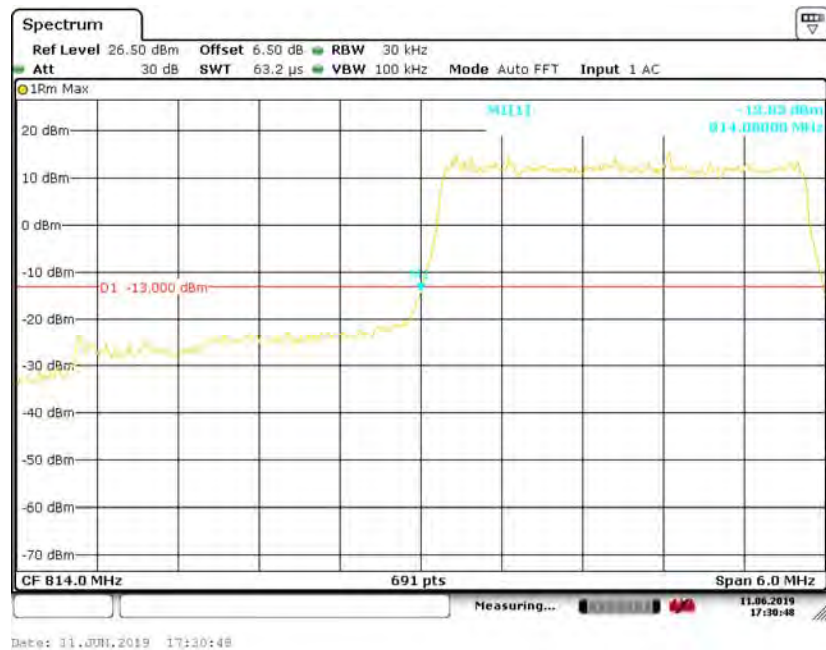
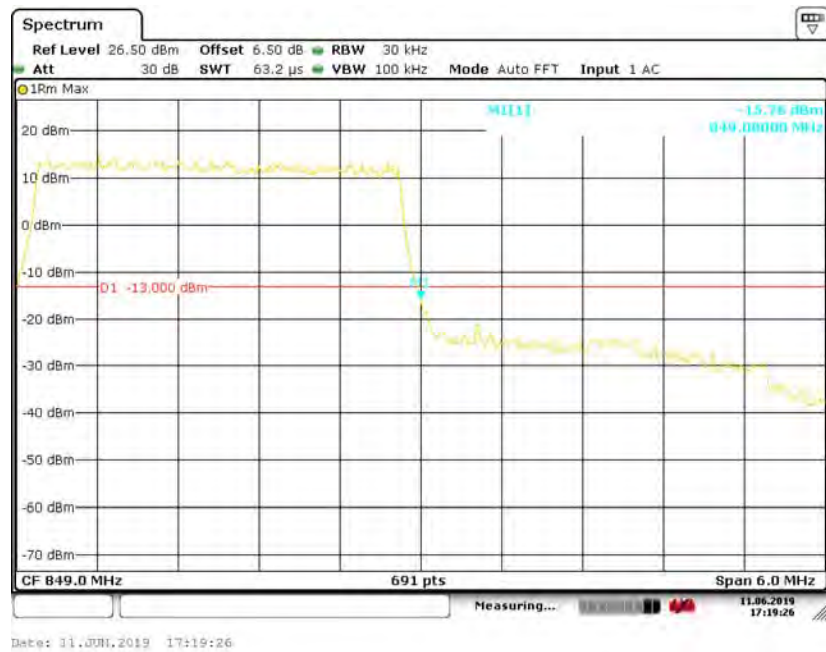
16-QAM (20.0 MHz, FULL RB) - Left Band Edge

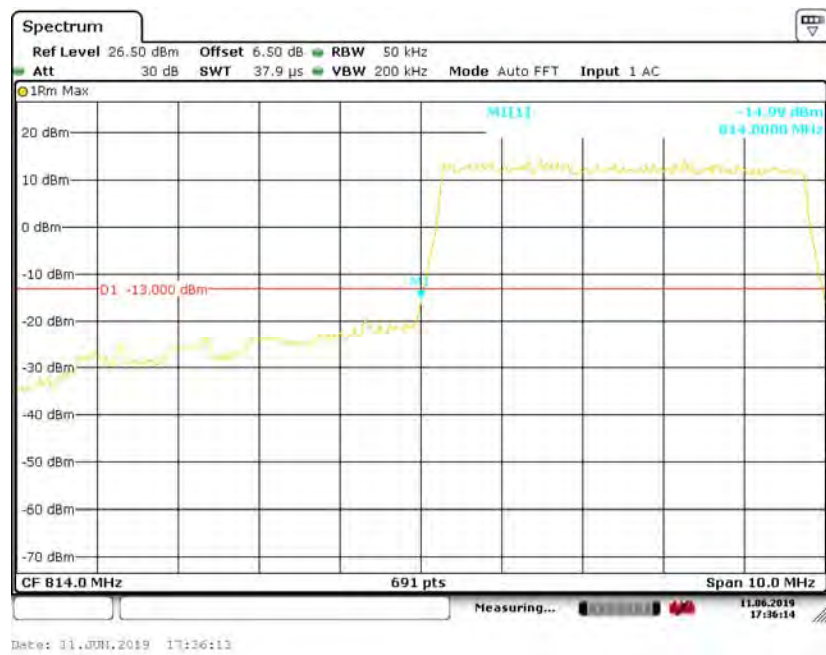
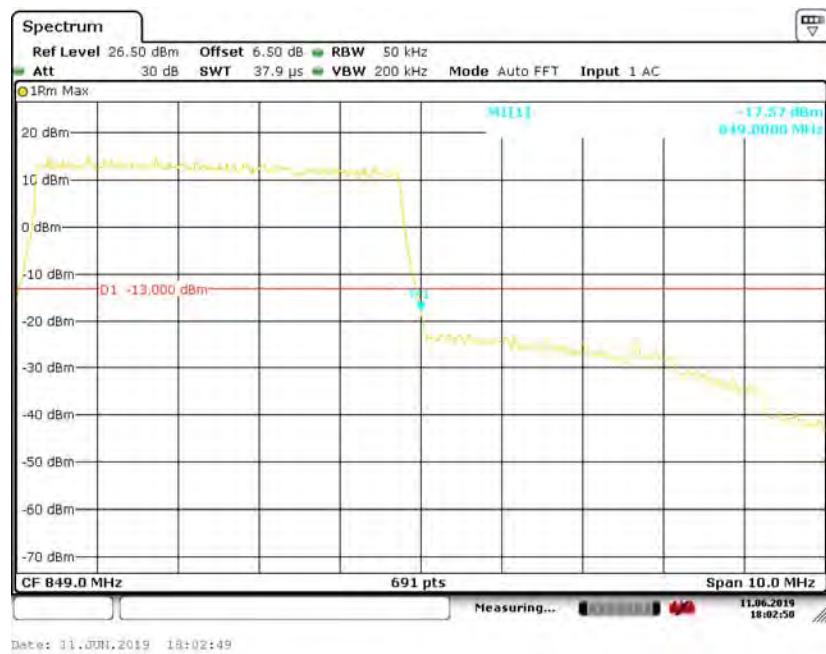


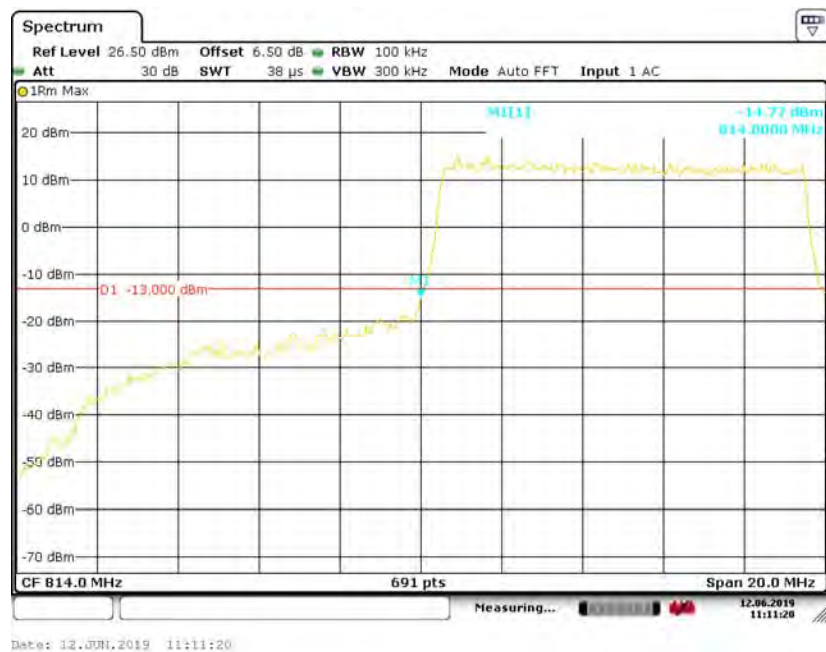
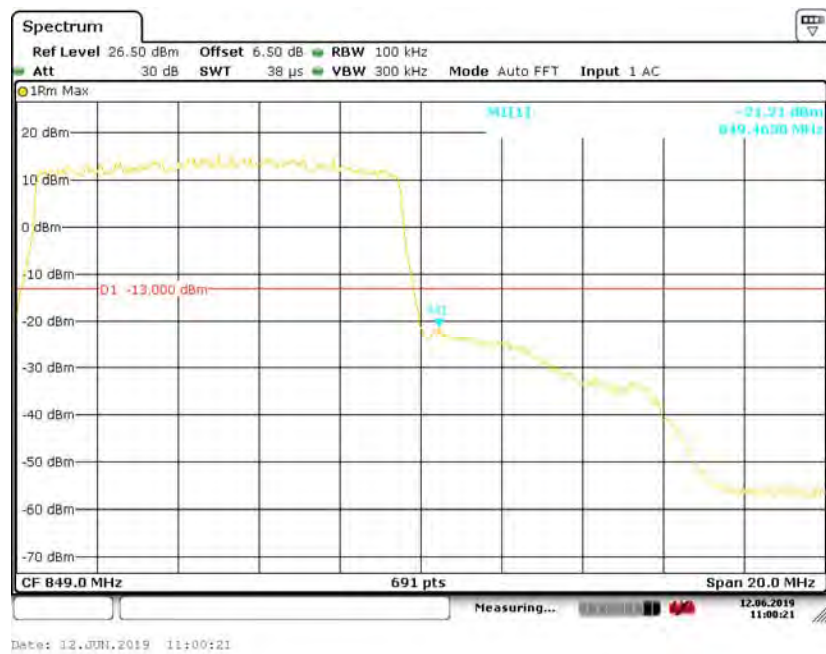
16-QAM (20.0 MHz, FULL RB) - Right Band Edge

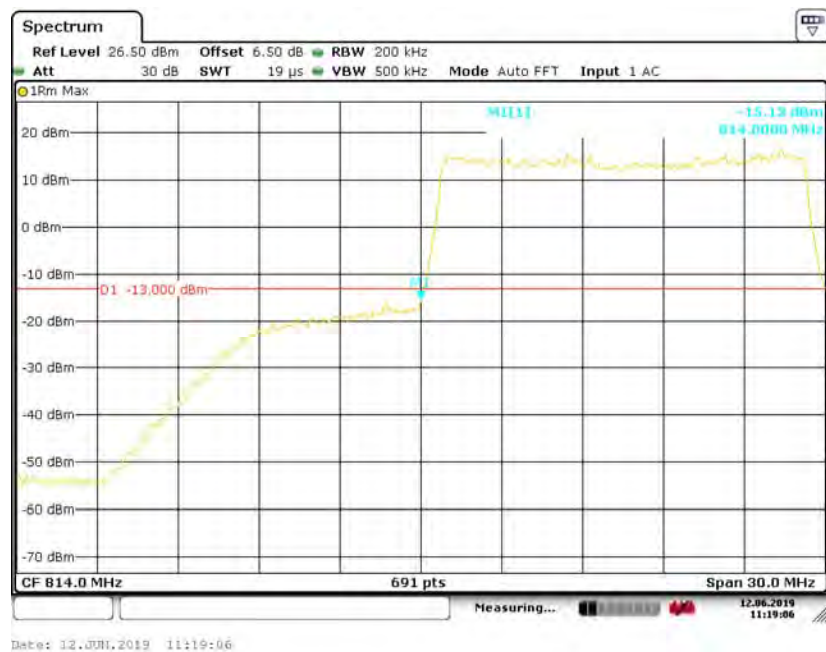
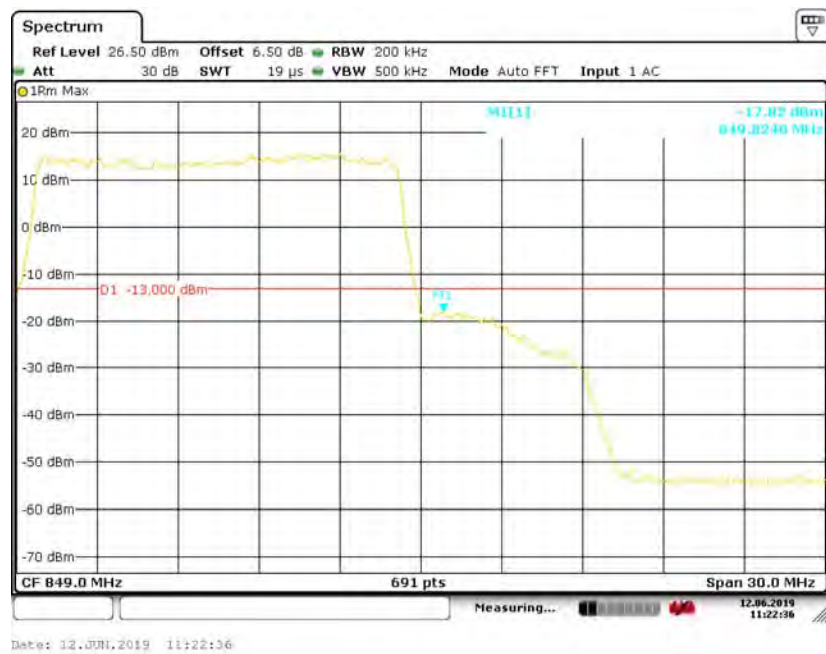


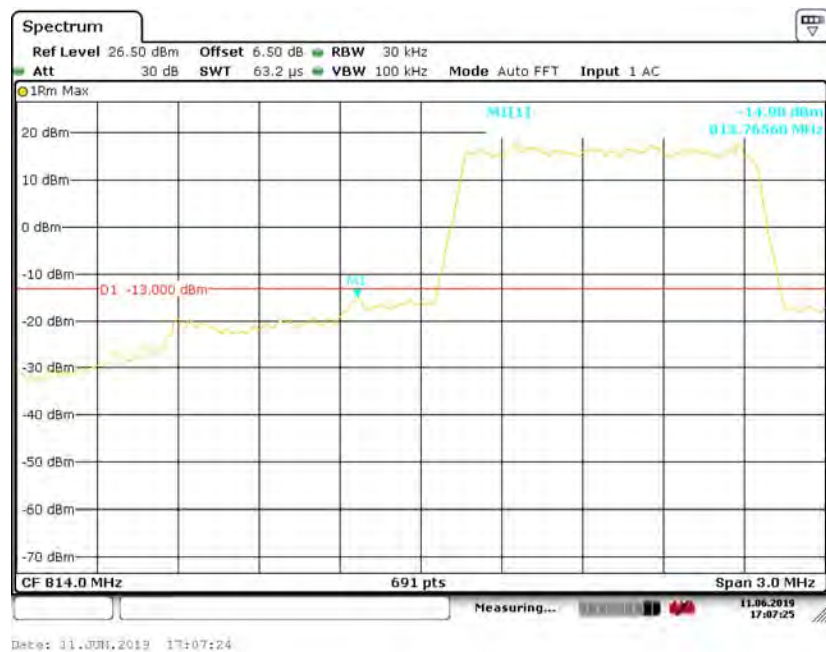
LTE Band 26:**QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

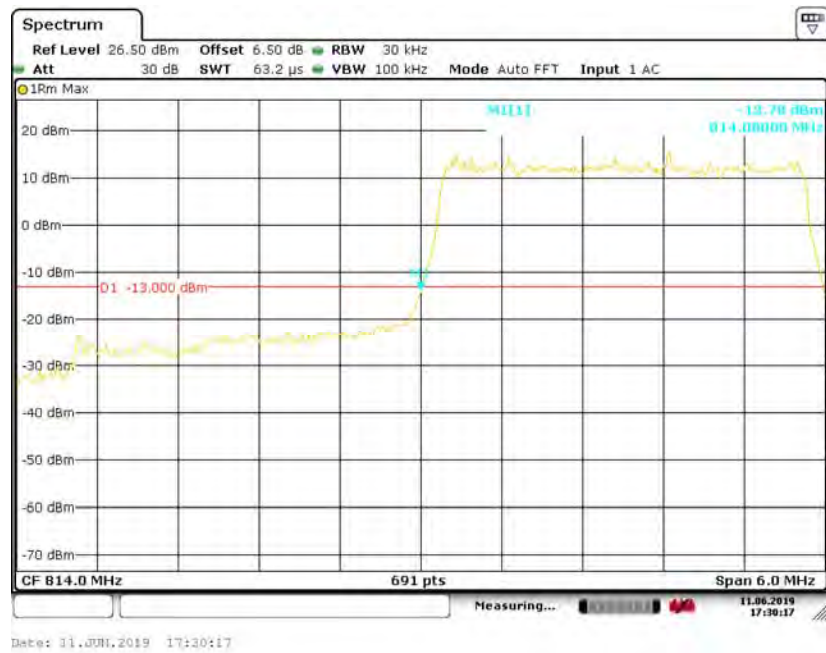
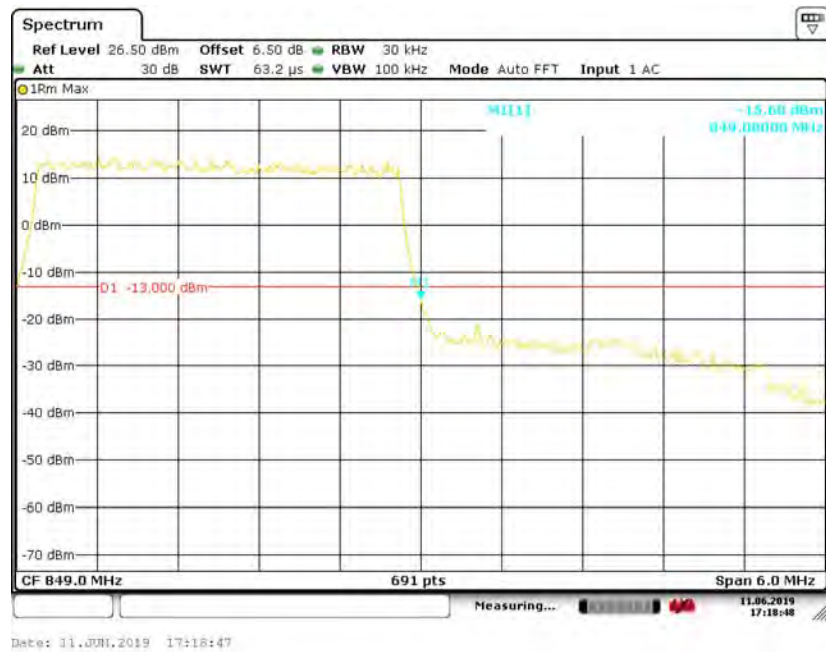
QPSK (3.0 MHz, FULL RB) - Left Band Edge**QPSK (3.0 MHz, FULL RB) - Right Band Edge**

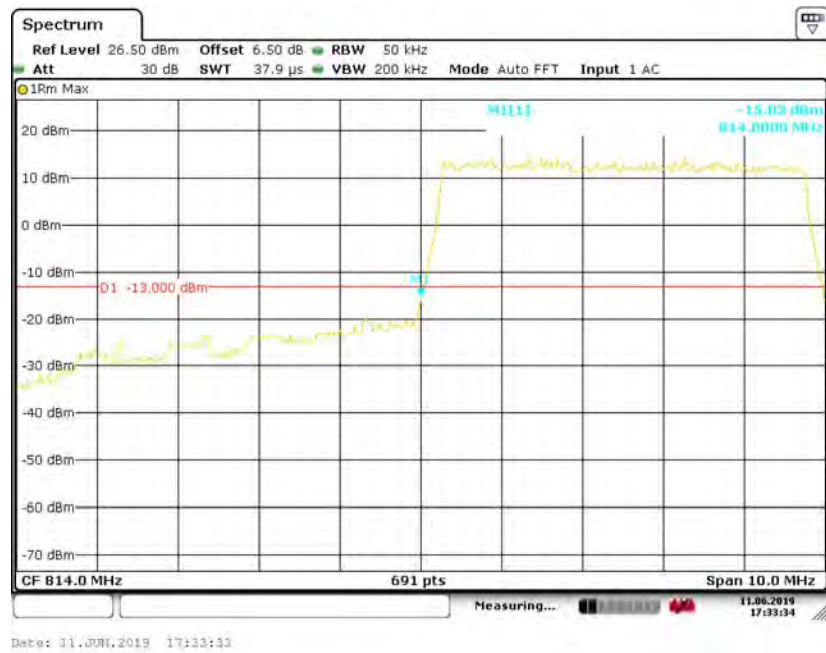
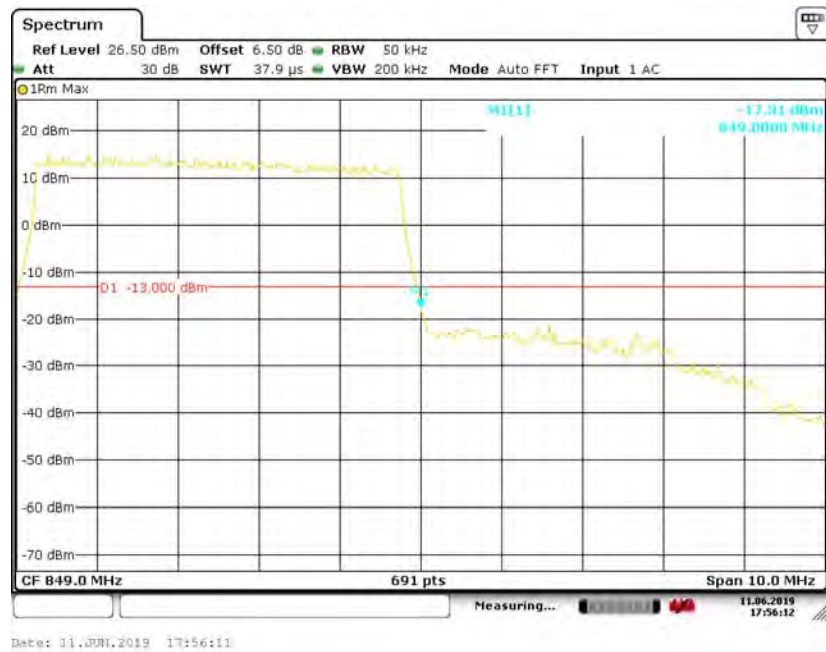
QPSK (5.0 MHz, FULL RB) - Left Band Edge**QPSK (5.0 MHz, FULL RB) - Right Band Edge**

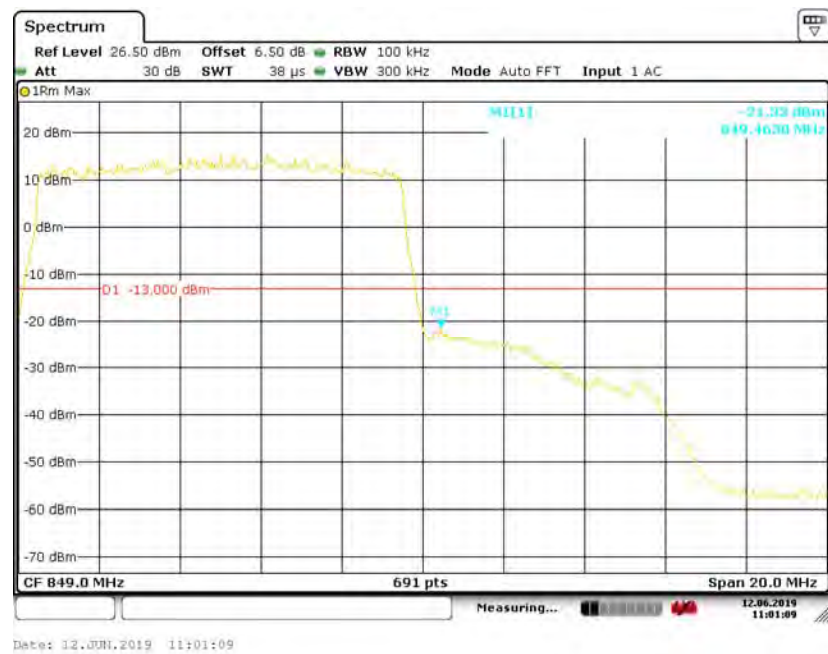
QPSK (10.0 MHz, FULL RB) - Left Band Edge**QPSK (10.0 MHz, FULL RB) - Right Band Edge**

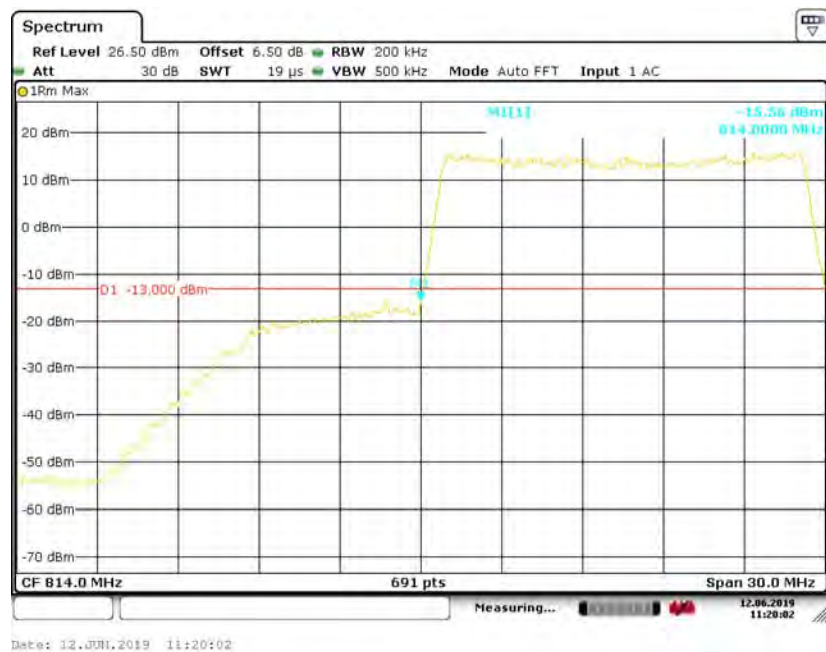
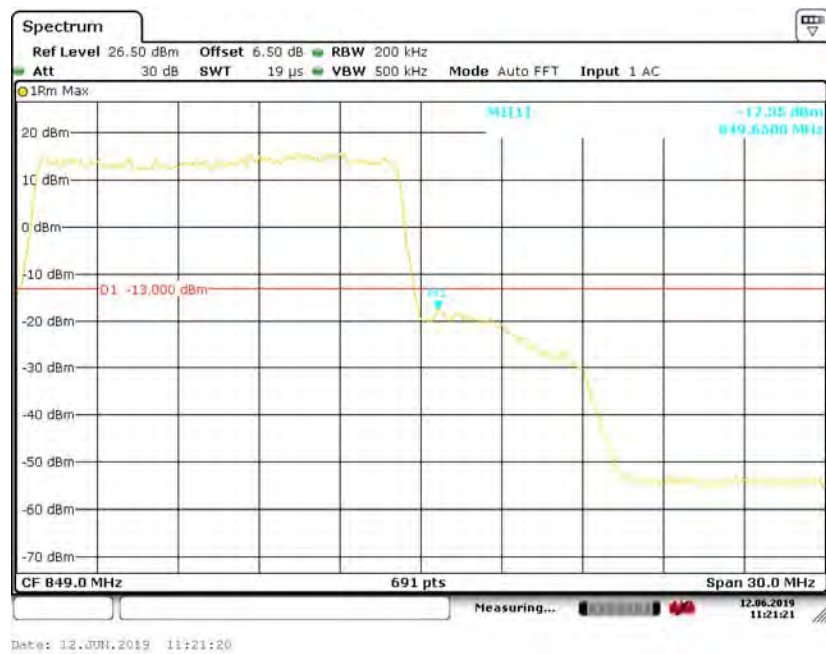
QPSK (15.0 MHz, FULL RB) - Left Band Edge**QPSK (15.0 MHz, FULL RB) - Right Band Edge**

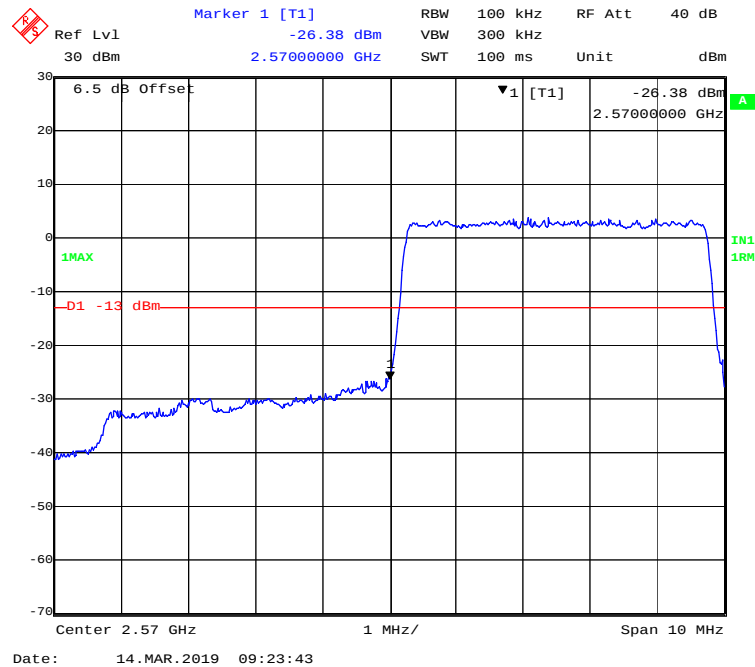
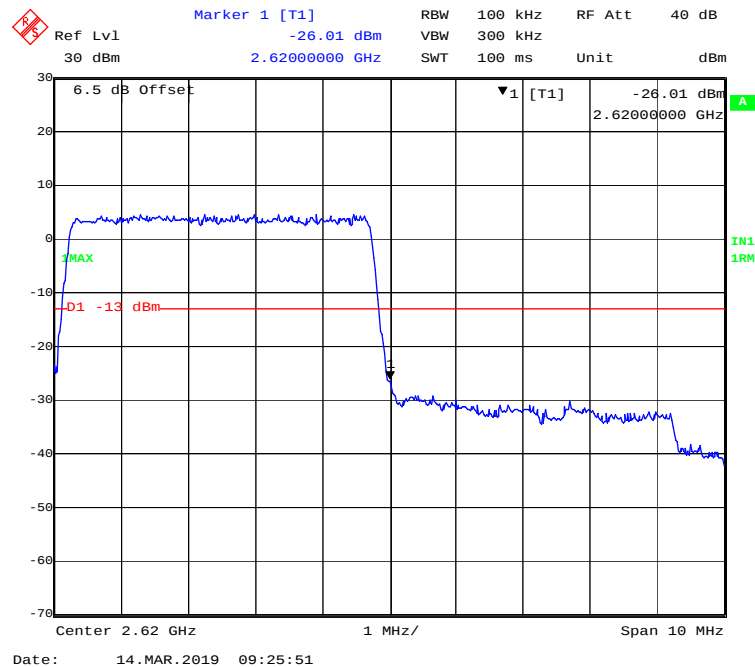
16-QAM (1.4 MHz, FULL RB) - Left Band Edge**16-QAM (1.4 MHz, FULL RB) - Right Band Edge**

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

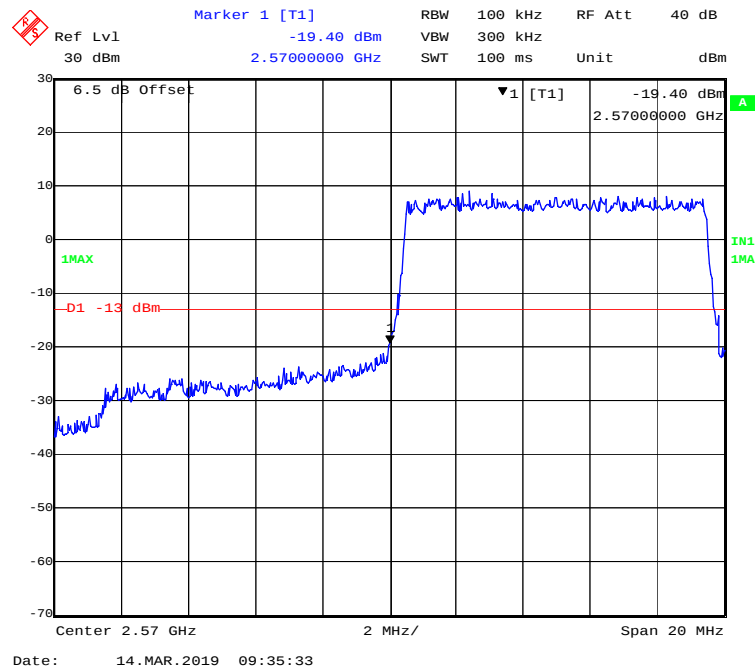
16-QAM (5.0 MHz, FULL RB) - Left Band Edge**16-QAM (5.0 MHz, FULL RB) - Right Band Edge**

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

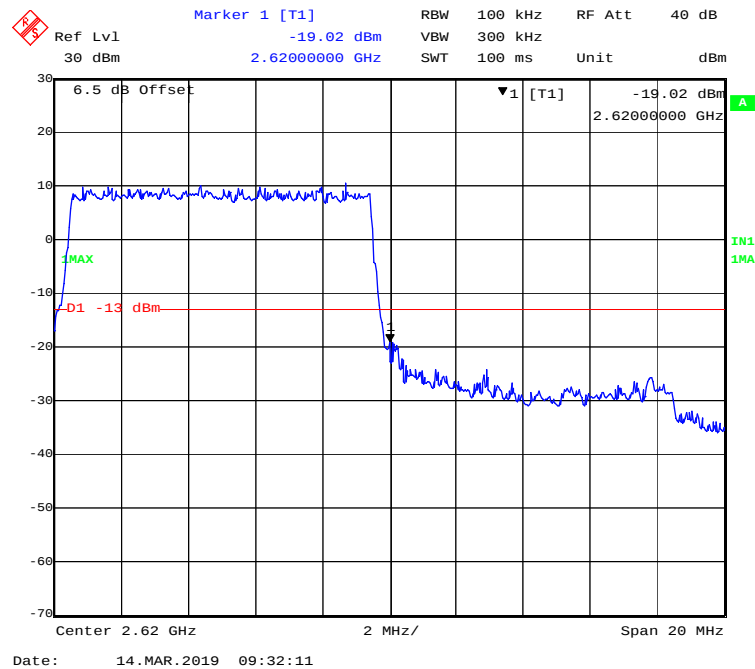
16-QAM (15.0 MHz, FULL RB) - Left Band Edge**16-QAM (15.0 MHz, FULL RB) - Right Band Edge**

LTE Band 38:**QPSK (5 MHz, FULL RB) - Left Band Edge****QPSK (5 MHz, FULL RB) - Right Band Edge**

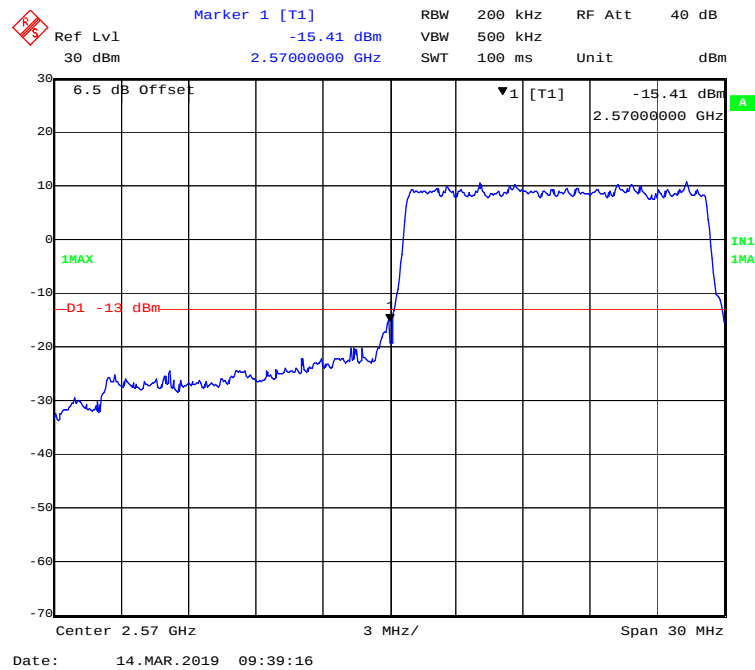
QPSK (10 MHz, FULL RB) - Left Band Edge



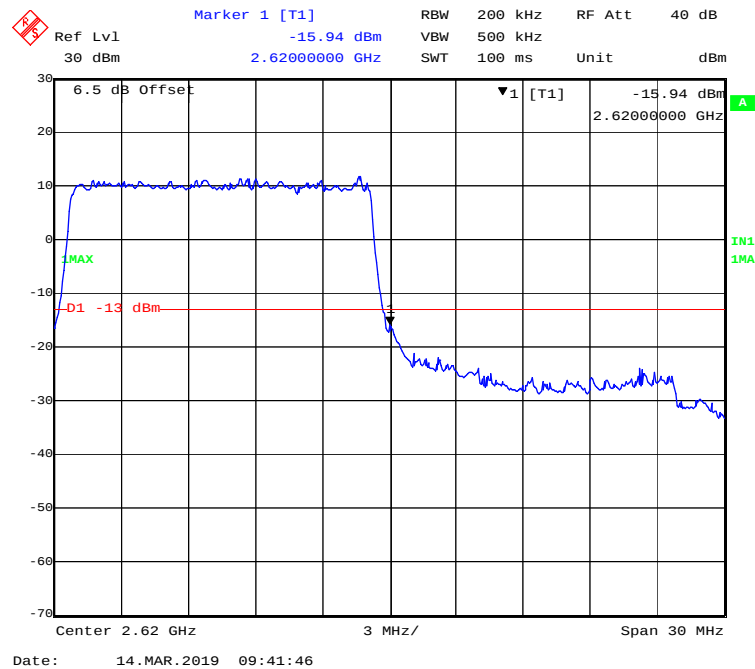
QPSK (10 MHz, FULL RB) - Right Band Edge



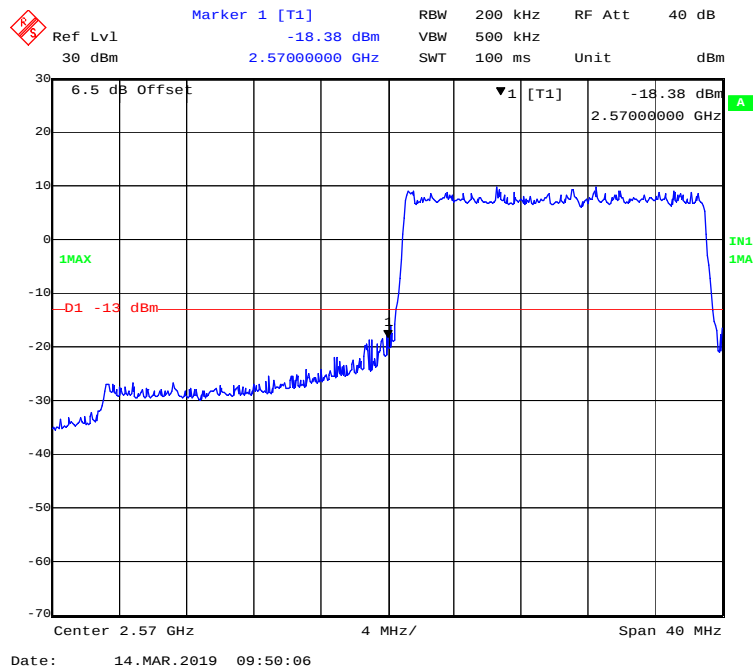
QPSK (15 MHz, FULL RB) - Left Band Edge



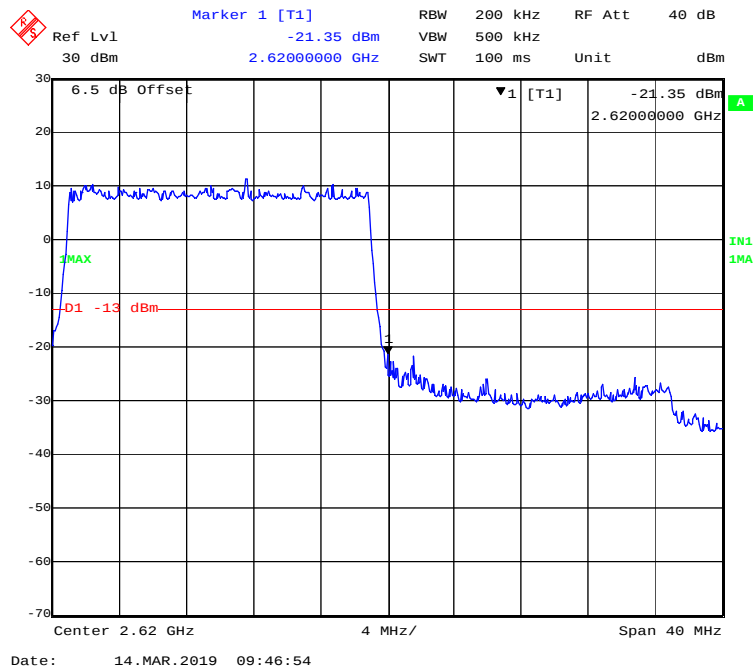
QPSK (15 MHz, FULL RB) - Right Band Edge



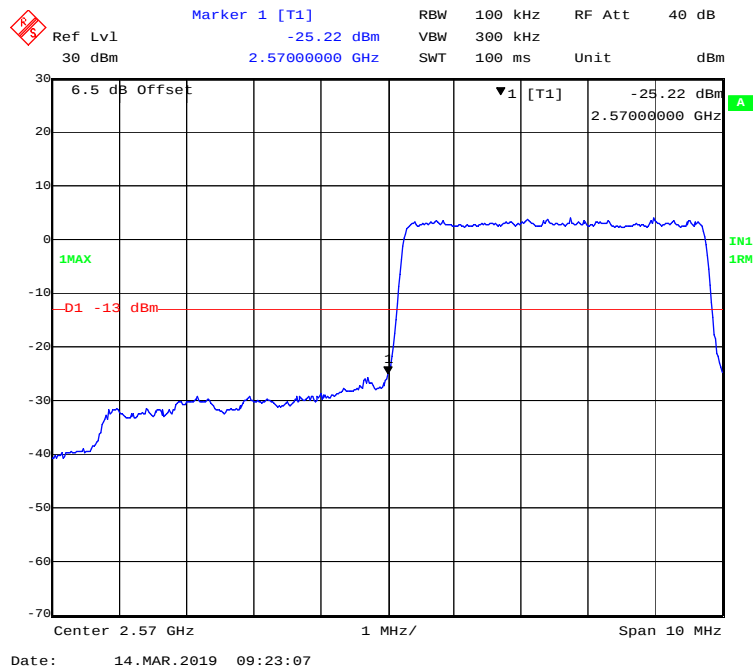
QPSK (20 MHz, FULL RB) - Left Band Edge



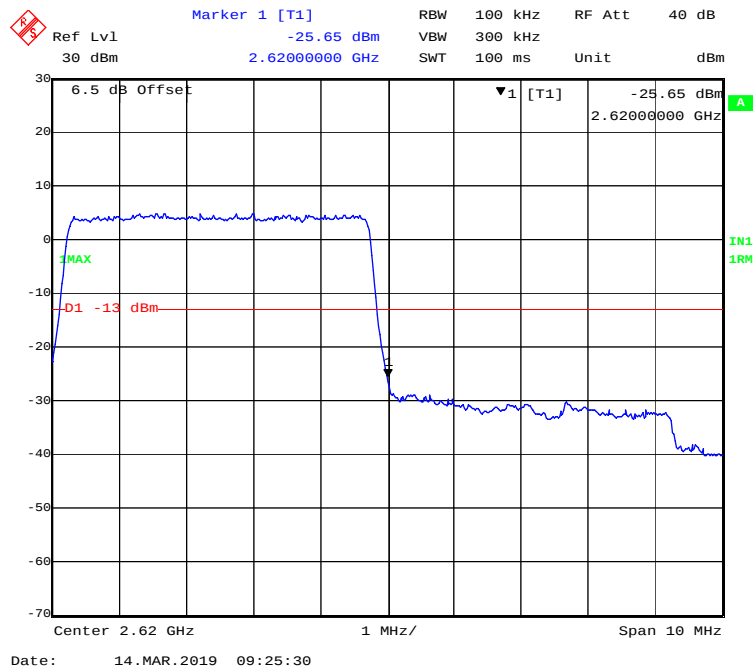
QPSK (20 MHz, FULL RB) - Right Band Edge



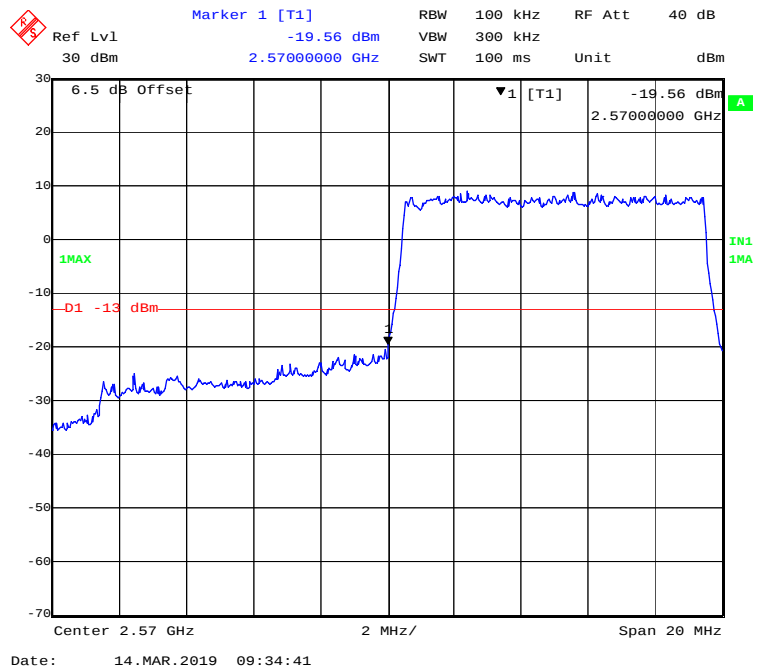
16QAM (5 MHz, FULL RB) - Left Band Edge



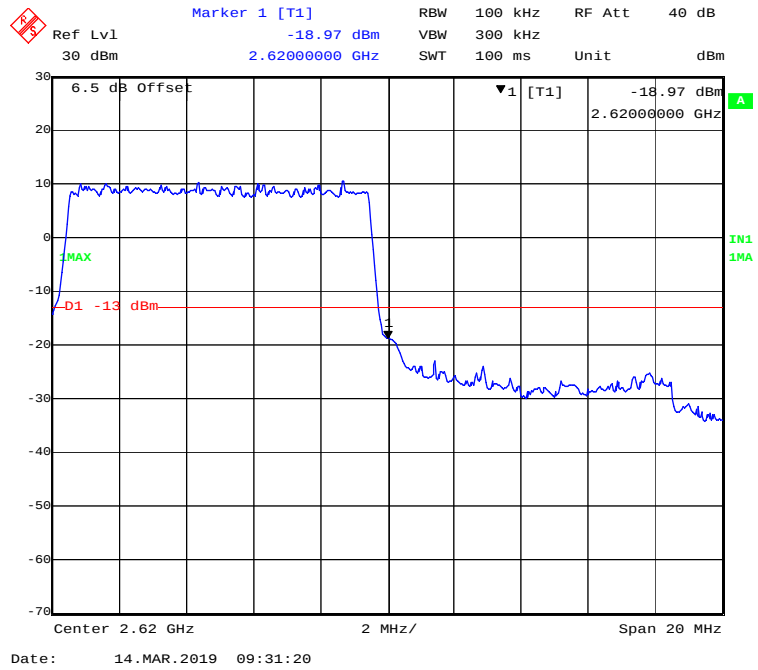
16QAM (5 MHz, FULL RB) - Right Band Edge



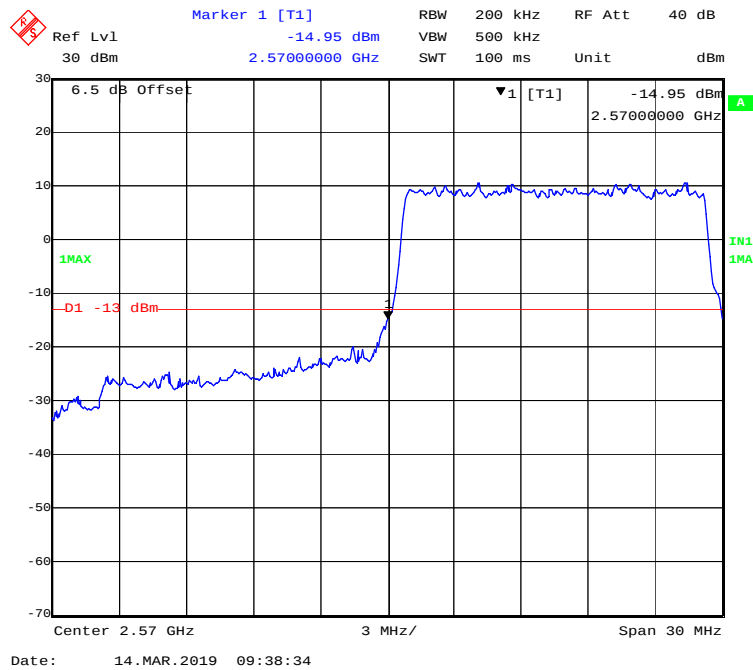
16QAM (10 MHz, FULL RB) - Left Band Edge



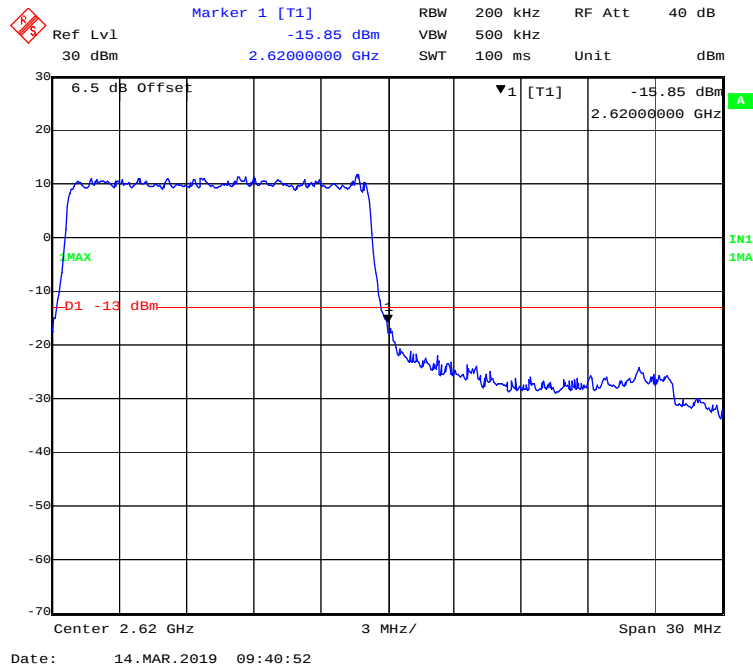
16QAM (10 MHz, FULL RB) - Right Band Edge



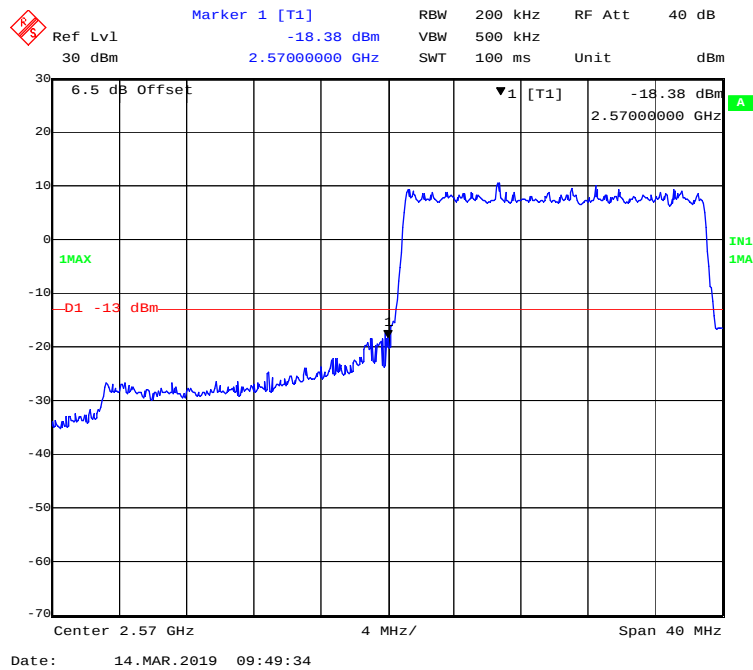
16QAM (15 MHz, FULL RB) - Left Band Edge



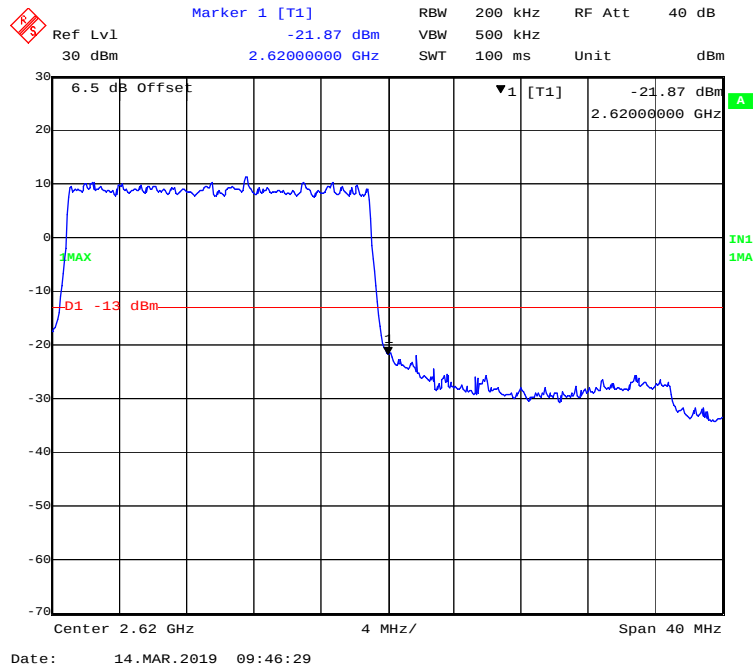
16QAM (15 MHz, FULL RB) - Right Band Edge

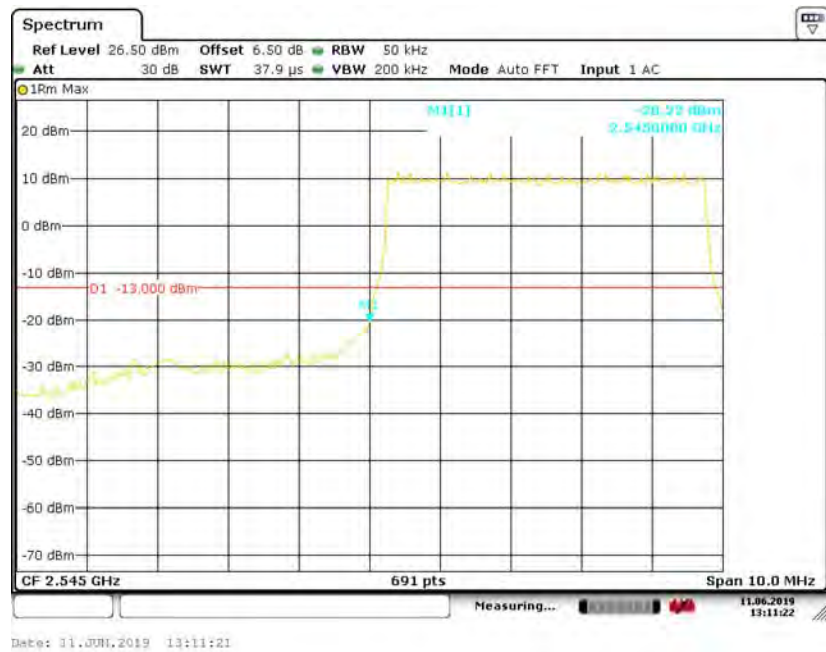
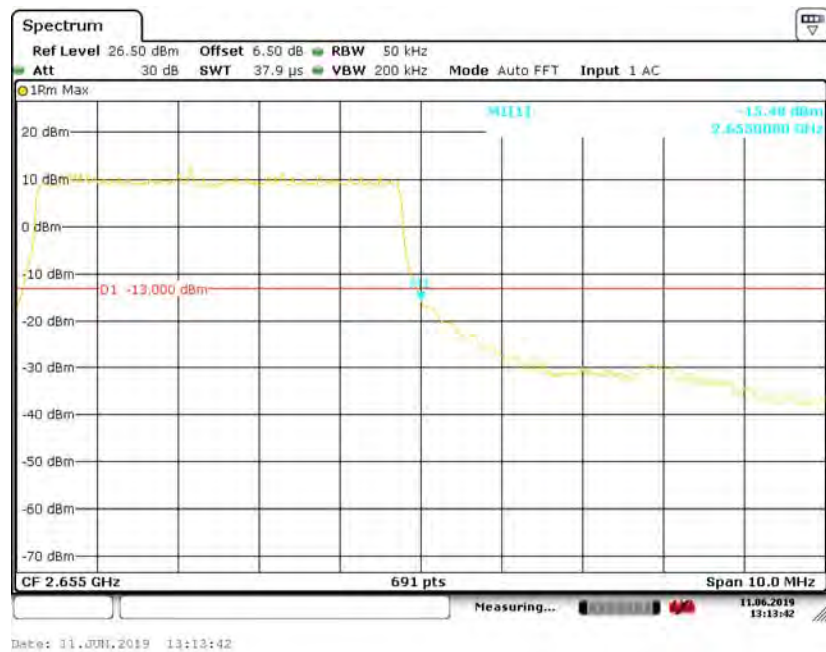


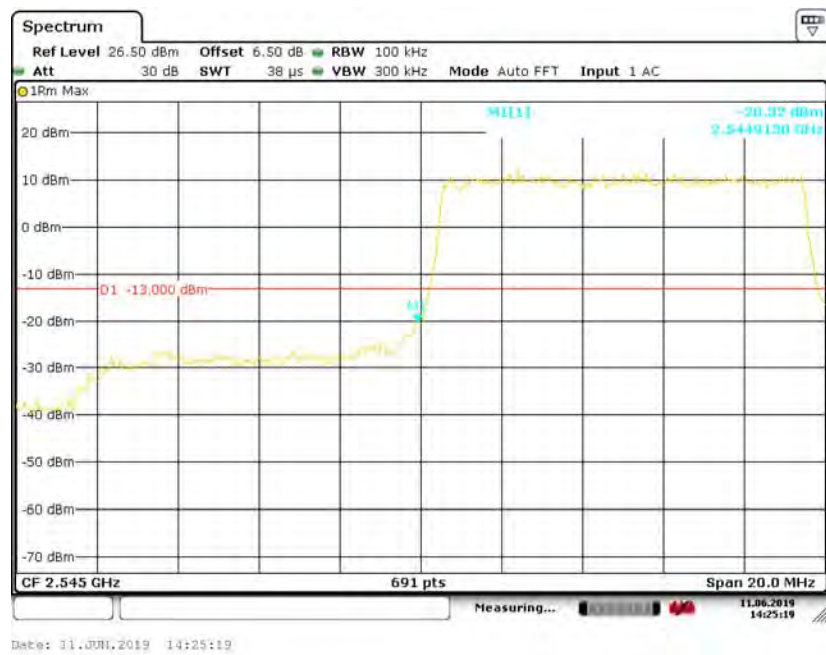
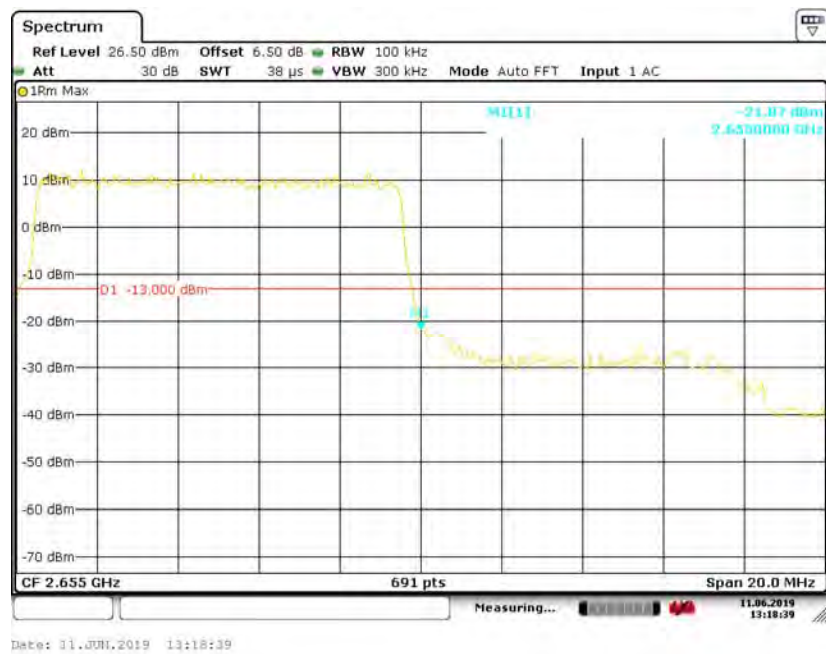
16QAM (20 MHz, FULL RB) - Left Band Edge

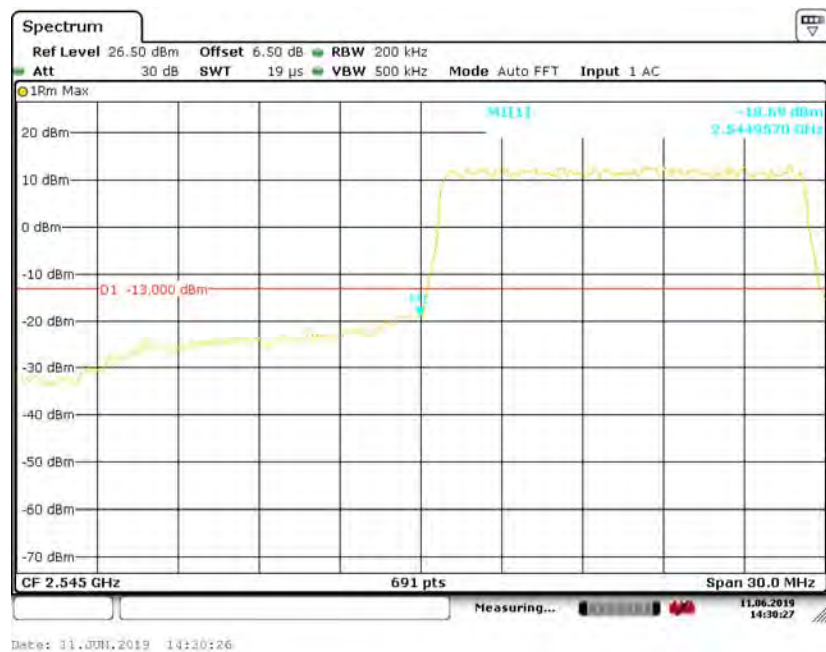


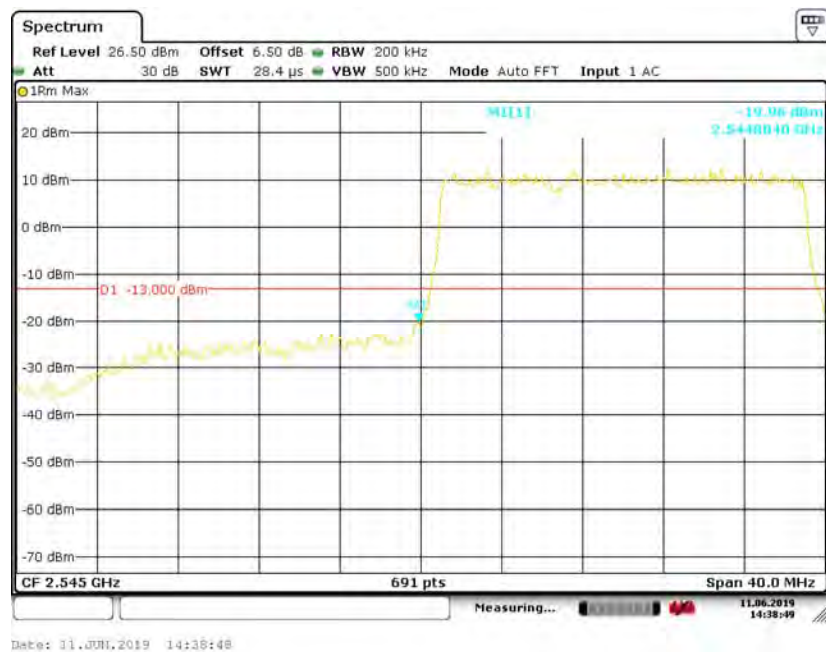
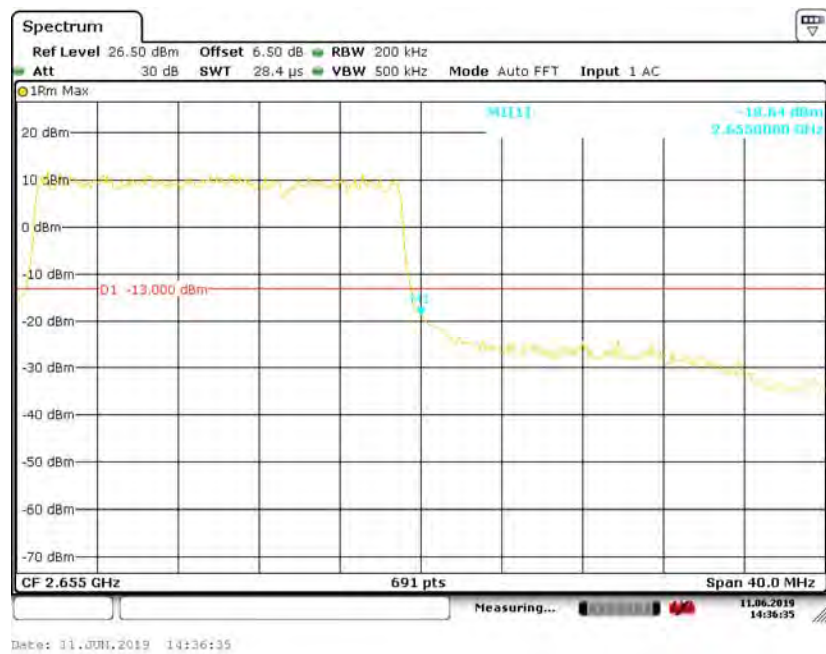
16QAM (20 MHz, FULLRB) - Right Band Edge

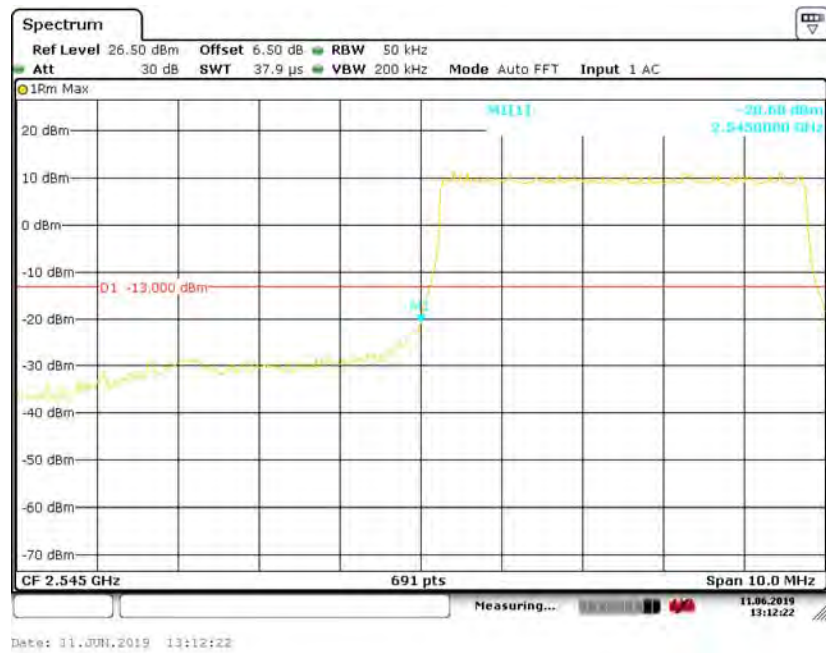
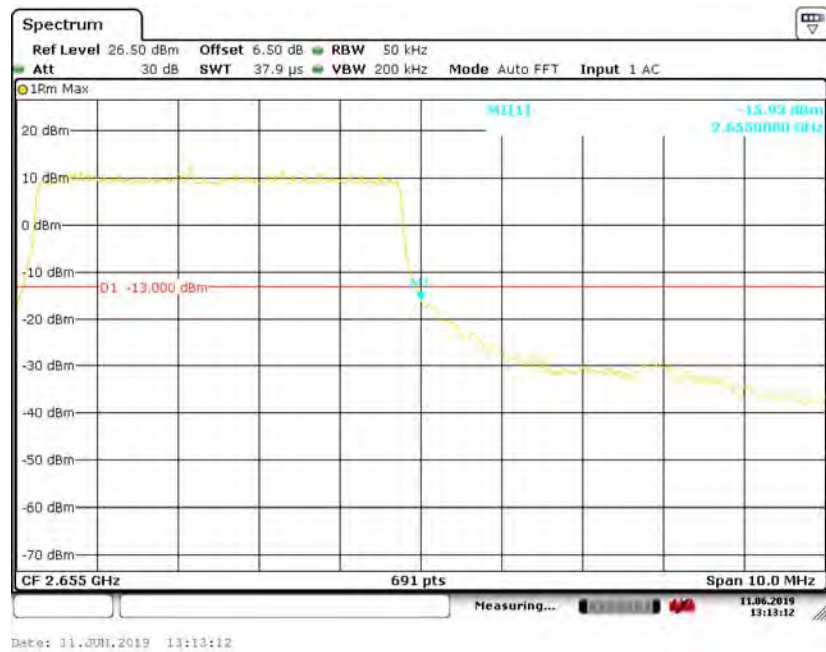


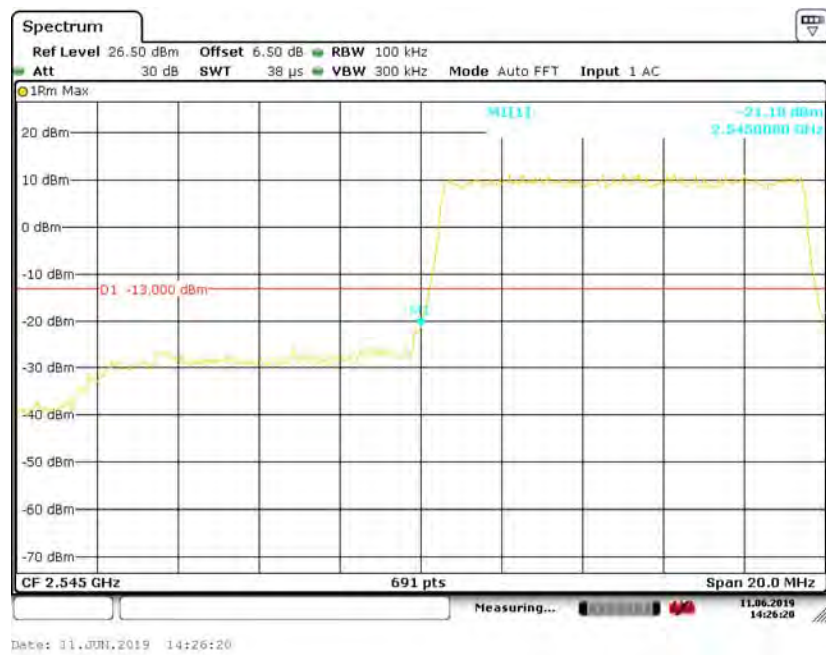
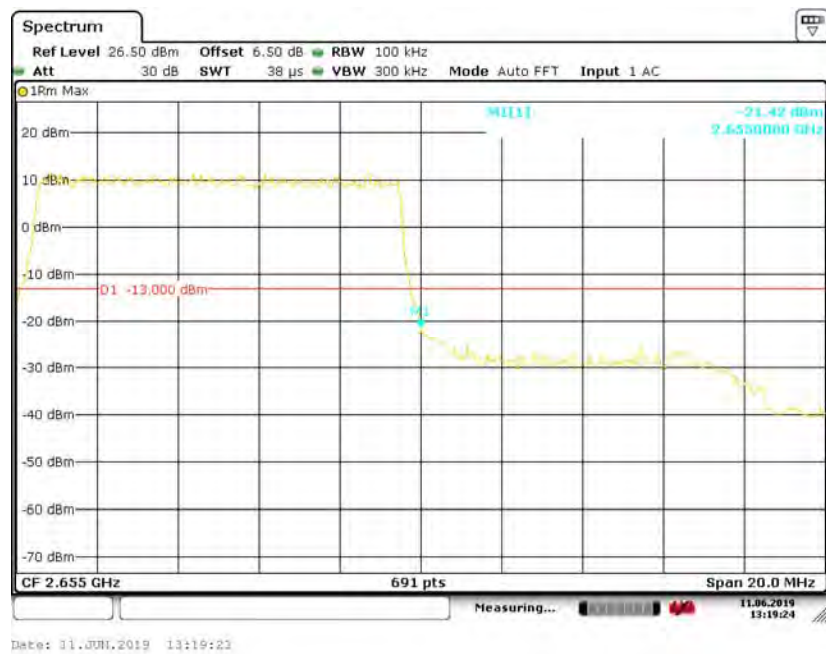
LTE Band 41:**QPSK (5 MHz, FULL RB) - Left Band Edge****QPSK (5 MHz, FULL RB) - Right Band Edge**

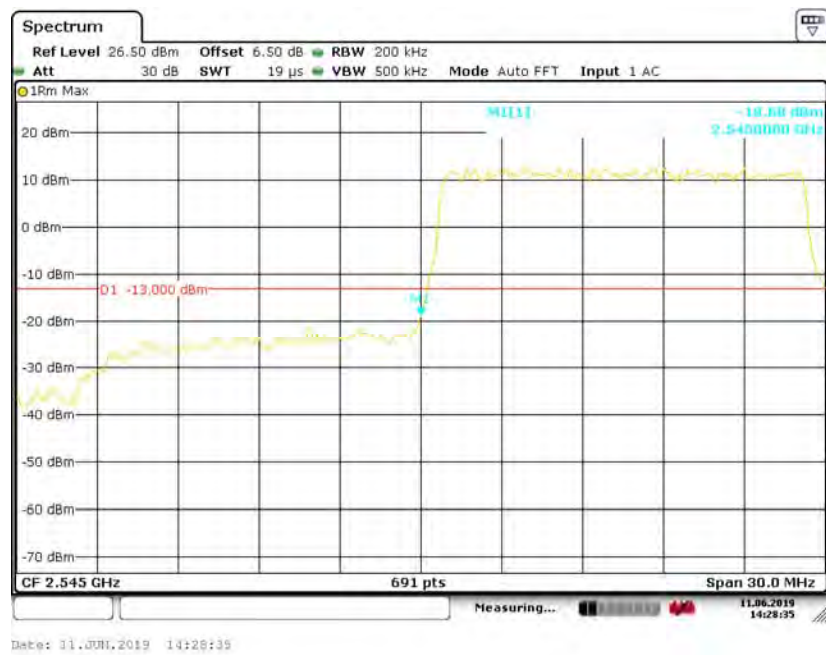
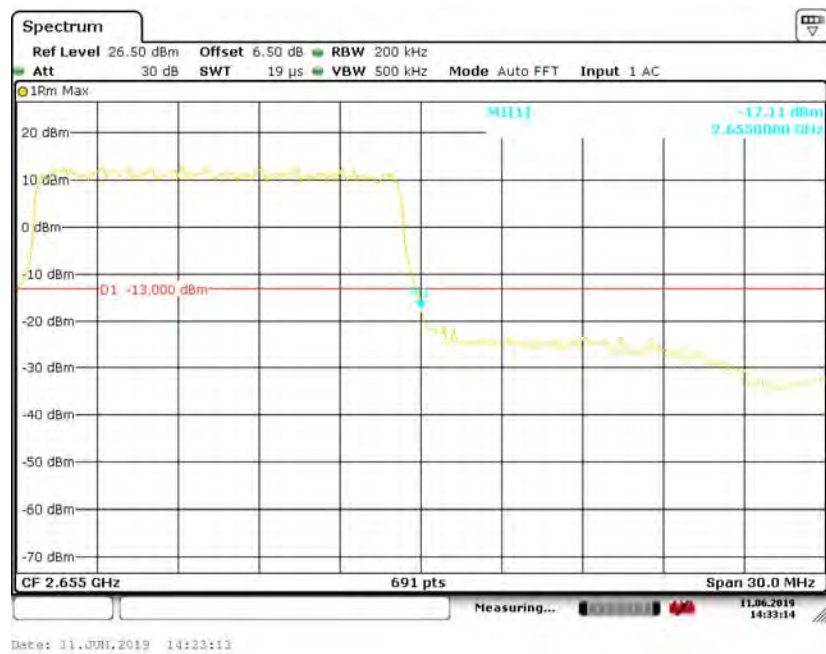
QPSK (10 MHz, FULL RB) - Left Band Edge**QPSK (10 MHz, FULL RB) - Right Band Edge**

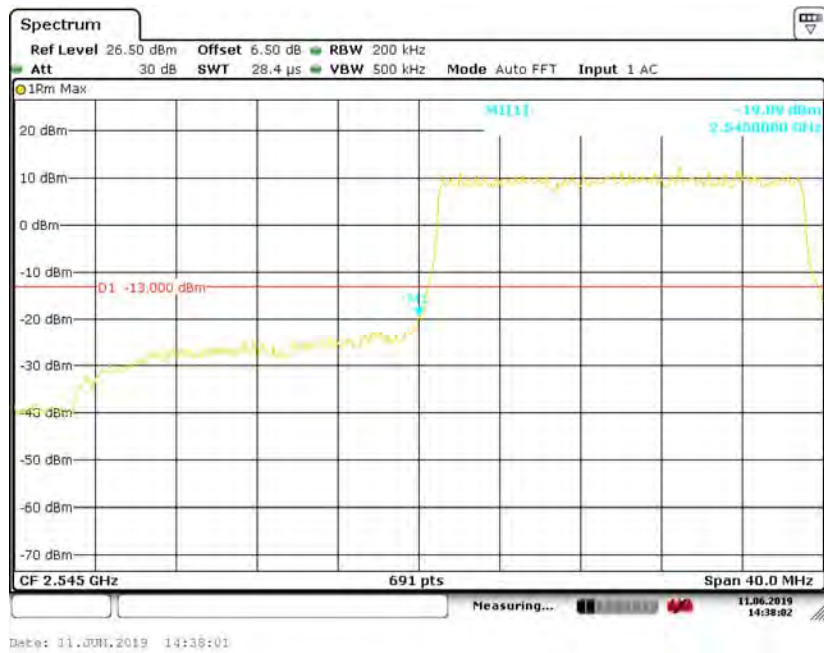
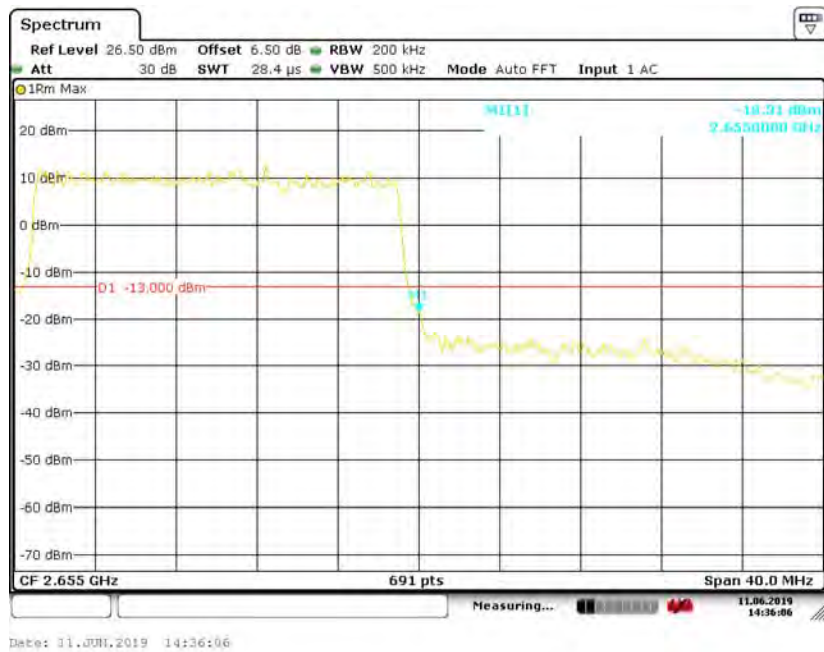
QPSK (15MHz, FULL RB) - Left Band Edge**QPSK (15 MHz, FULL RB) - Right Band Edge**

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

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

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

Applicable Standards

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

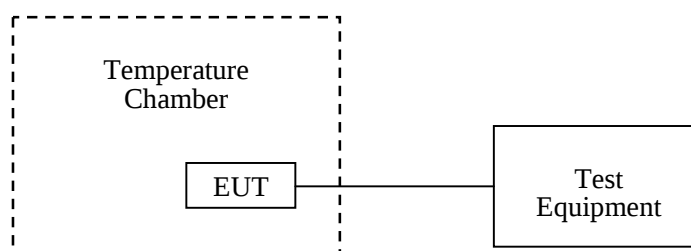
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data**Environmental Conditions**

Temperature:	23.2°C
Relative Humidity:	51 %
ATM Pressure:	101.3kPa

The testing was performed by Max Min on 2019-08-23.

EUT operation mode: Transmitting

Test Result: Compliant.

GSM 850 Band

GSM Mode, Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	12	0.0143	2.5
-20		15	0.0179	2.5
-10		3	0.0036	2.5
0		13	0.0155	2.5
10		5	0.0060	2.5
20		3	0.0036	2.5
30		6	0.0072	2.5
40		11	0.0131	2.5
50		4	0.0048	2.5
20	V min.= 3.5	14	0.0167	2.5
20	V max.=4.35	9	0.0108	2.5

GPRS Mode, Middle Channel, $f_o = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	10	0.0120	2.5
-20		13	0.0155	2.5
-10		1	0.0012	2.5
0		11	0.0131	2.5
10		3	0.0036	2.5
20		1	0.0012	2.5
30		4	0.0048	2.5
40		9	0.0108	2.5
50		2	0.0024	2.5
20	V min.= 3.5	12	0.0143	2.5
20	V max.=4.35	7	0.0084	2.5

EGPRS Mode, Middle Channel, $f_o = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	14	0.0167	2.5
-20		7	0.0084	2.5
-10		3	0.0036	2.5
0		10	0.0120	2.5
10		11	0.0131	2.5
20		9	0.0108	2.5
30		12	0.0143	2.5
40		3	0.0036	2.5
50		2	0.0024	2.5
20	V min.= 3.5	6	0.0072	2.5
20	V max.=4.35	3	0.0036	2.5

WCDMA Band V

Middle Channel, $f_o = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	15	0.0179	2.5
-20		6	0.0072	2.5
-10		14	0.0167	2.5
0		12	0.0143	2.5
10		10	0.0120	2.5
20		8	0.0096	2.5
30		11	0.0131	2.5
40		5	0.0060	2.5
50		11	0.0131	2.5
20	V min.= 3.5	14	0.0167	2.5
20	V max.=4.35	9	0.0108	2.5

PCS 1900 Band

GSM Mode, Middle Channel, $f_o = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	-11	-0.0059	pass
-20		-6	-0.0032	pass
-10		-5	-0.0027	pass
0		-4	-0.0021	pass
10		-2	-0.0011	pass
20		0	0.0000	pass
30		-4	-0.0021	pass
40		-7	-0.0037	pass
50		-5	-0.0027	pass
20	V min.= 3.5	-9	-0.0048	pass
20	V max.=4.35	-4	-0.0021	pass

GPRS Mode, Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	-13	-0.0069	pass
-20		-8	-0.0043	pass
-10		-7	-0.0037	pass
0		-6	-0.0032	pass
10		-4	-0.0021	pass
20		-2	-0.0011	pass
30		-6	-0.0032	pass
40		-9	-0.0048	pass
50		-7	-0.0037	pass
20	V min.= 3.5	-11	-0.0059	pass
20	V max.=4.35	-6	-0.0032	pass

EGPRS Mode, Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	-8	-0.0043	pass
-20		-3	-0.0016	pass
-10		1	0.0005	pass
0		-5	-0.0027	pass
10		4	0.0021	pass
20		-1	-0.0005	pass
30		-6	-0.0032	pass
40		-1	-0.0005	pass
50		-10	-0.0053	pass
20	V min.= 3.5	-8	-0.0043	pass
20	V max.=4.35	-7	-0.0037	pass

WCDMA Band II

WCDMA Mode, Middle Channel, f_o =1880.0 MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	16	0.0085	pass
-20		4	0.0021	pass
-10		13	0.0069	pass
0		12	0.0064	pass
10		10	0.0053	pass
20		8	0.0043	pass
30		9	0.0048	pass
40		5	0.0027	pass
50		11	0.0059	pass
20	V min.= 3.5	14	0.0074	pass
20	V max.=4.35	8	0.0043	pass

LTE Band 2

Middle Channel, $f_o = 1880.0$ MHz (QPSK)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	11	0.0059	pass
-20		9	0.0048	pass
-10		12	0.0064	pass
0		10	0.0053	pass
10		7	0.0037	pass
20		6	0.0032	pass
30		4	0.0021	pass
40		3	0.0016	pass
50		8	0.0043	pass
20	V min.= 3.5	11	0.0059	pass
20	V max.=4.35	9	0.0048	pass

Middle Channel, $f_o = 1880.0$ MHz (16-QAM)				
Temperature (°C)	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		8	0.0043	pass
10		13	0.0069	pass
20		7	0.0037	pass
30		4	0.0021	pass
40		3	0.0016	pass
50		9	0.0048	pass
20	V min.= 3.5	12	0.0064	pass
20	V max.=4.35	10	0.0053	pass

LTE Band 4

Low Channel & High Channel (QPSK)					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(°C)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	1710.0488	1754.9485	1710	1755
-20		1710.0511	1754.9425	1710	1755
-10		1710.0572	1754.9587	1710	1755
0		1710.0452	1754.9467	1710	1755
10		1710.0518	1754.9476	1710	1755
20		1710.0484	1754.9449	1710	1755
30		1710.0493	1754.9437	1710	1755
40		1710.0410	1754.9476	1710	1755
50		1710.0596	1754.9582	1710	1755
20	V min.= 3.5	1710.0485	1754.9488	1710	1755
20	V max.=4.35	1710.0522	1754.9525	1710	1755

Low Channel & High Channel (16-QAM)					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(°C)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	1710.0577	1754.9486	1710	1755
-20		1710.0458	1754.9595	1710	1755
-10		1710.0572	1754.9457	1710	1755
0		1710.0583	1754.9476	1710	1755
10		1710.0531	1754.9496	1710	1755
20		1710.0523	1754.9487	1710	1755
30		1710.0503	1754.9476	1710	1755
40		1710.0497	1754.9499	1710	1755
50		1710.0514	1754.9521	1710	1755
20	V min.= 3.5	1710.0496	1754.9481	1710	1755
20	V max.=4.35	1710.0472	1754.9465	1710	1755

LTE Band 5

Middle Channel, f_0 =836.5 MHz (QPSK)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	12	0.0143	2.5
-20		11	0.0132	2.5
-10		6	0.0072	2.5
0		9	0.0108	2.5
10		8	0.0096	2.5
20		7	0.0084	2.5
30		3	0.0036	2.5
40		10	0.0120	2.5
50		6	0.0072	2.5
20	V min.= 3.5	9	0.0108	2.5
20	V max.=4.35	16	0.0191	2.5

Middle Channel, f_0 =836.5 MHz(16-QAM)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	13	0.0155	2.5
-20		10	0.0120	2.5
-10		5	0.0060	2.5
0		10	0.0120	2.5
10		8	0.0096	2.5
20		6	0.0072	2.5
30		4	0.0048	2.5
40		11	0.0132	2.5
50		7	0.0084	2.5
20	V min.= 3.5	8	0.0096	2.5
20	V max.=4.35	15	0.0179	2.5

LTE Band 7

Low Channel & High Channel (QPSK)					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(°C)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	2500.0495	2569.9486	2500	2570
-20		2500.0468	2569.9476	2500	2570
-10		2500.0487	2569.9571	2500	2570
0		2500.068	2569.9531	2500	2570
10		2500.0516	2569.9462	2500	2570
20		2500.0517	2569.9578	2500	2570
30		2500.0566	2569.9565	2500	2570
40		2500.0492	2569.9513	2500	2570
50		2500.0568	2569.9502	2500	2570
20	V min.= 3.5	2500.0573	2569.9424	2500	2570
20	V max.=4.35	2500.0568	2569.9565	2500	2570

Low Channel & High Channel (16-QAM)					
Temperature	Power Supplied	F_L	F_H	F_L Limit	F_H Limit
(°C)	(V_{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.8	2500.0507	2569.9462	2500	2570
-20		2500.0559	2569.9581	2500	2570
-10		2500.0566	2569.9435	2500	2570
0		2500.0496	2569.9489	2500	2570
10		2500.0572	2569.9471	2500	2570
20		2500.0533	2569.9482	2500	2570
30		2500.0482	2569.9494	2500	2570
40		2500.0556	2569.9496	2500	2570
50		2500.0586	2569.9452	2500	2570
20	V min.= 3.5	2500.0465	2569.9536	2500	2570
20	V max.=4.35	2500.0521	2569.9505	2500	2570

LTE Band 25

Middle Channel, f_o =1882.5 MHz (QPSK)				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	14	0.0074	pass
-20		10	0.0053	pass
-10		12	0.0064	pass
0		9	0.0048	pass
10		8	0.0042	pass
20		6	0.0032	pass
30		4	0.0021	pass
40		10	0.0053	pass
50		6	0.0032	pass
20	V min.= 3.5	16	0.0085	pass
20	V max.=4.35	10	0.0053	pass

Middle Channel, f_o =1882.5 MHz(16-QAM)				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	16	0.0085	pass
-20		11	0.0058	pass
-10		10	0.0053	pass
0		8	0.0042	pass
10		5	0.0027	pass
20		7	0.0037	pass
30		4	0.0021	pass
40		11	0.0058	pass
50		7	0.0037	pass
20	V min.= 3.5	15	0.0080	pass
20	V max.=4.35	9	0.0048	pass

LTE Band 26

Middle Channel, f_0 =831.5 MHz (QPSK)				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	18	0.0215	2.5
-20		11	0.0132	2.5
-10		10	0.0120	2.5
0		7	0.0084	2.5
10		14	0.0167	2.5
20		7	0.0084	2.5
30		4	0.0048	2.5
40		6	0.0072	2.5
50		9	0.0108	2.5
20	V min.= 3.5	9	0.0108	2.5
20	V max.=4.35	12	0.0143	2.5

Middle Channel, f_0 =831.5 MHz(16-QAM)				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	17	0.0203	2.5
-20		10	0.0120	2.5
-10		8	0.0096	2.5
0		7	0.0084	2.5
10		15	0.0179	2.5
20		7	0.0084	2.5
30		6	0.0072	2.5
40		8	0.0096	2.5
50		9	0.0108	2.5
20	V min.= 3.5	11	0.0132	2.5
20	V max.=4.35	12	0.0143	2.5

LTE Band 38

5 MHz Middle Channel, $f_0 = 2595\text{MHz}$ (QPSK)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	11	0.0042	pass
-20		9	0.0035	pass
-10		12	0.0046	pass
0		10	0.0039	pass
10		8	0.0031	pass
20		-2	-0.0008	pass
30		1	0.0004	pass
40		11	0.0042	pass
50		7	0.0027	pass
25	V min.= 3.5	10	0.0039	pass
25	V max.=4.35	5	0.0019	pass

5 MHz Middle Channel, $f_0 = 2595\text{ MHz}$ (16QAM)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	14	0.0054	pass
-20		12	0.0046	pass
-10		14	0.0054	pass
0		13	0.0050	pass
10		15	0.0058	pass
20		2	0.0008	pass
30		11	0.0042	pass
40		14	0.0054	pass
50		13	0.0050	pass
25	V min.= 3.5	11	0.0042	pass
25	V max.=4.35	8	0.0031	pass

LTE Band 41

5 MHz Middle Channel, $f_o = 2600$ MHz (QPSK)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	17	0.0065	pass
-20		12	0.0046	pass
-10		15	0.0058	pass
0		14	0.0054	pass
10		17	0.0065	pass
20		4	0.0015	pass
30		10	0.0038	pass
40		12	0.0046	pass
50		12	0.0046	pass
25	V min.= 3.5	9	0.0035	pass
25	V max.=4.35	12	0.0046	pass

5 MHz Middle Channel, $f_o = 2600$ MHz (16QAM)				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	19	0.0073	pass
-20		17	0.0065	pass
-10		18	0.0069	pass
0		16	0.0061	pass
10		18	0.0069	pass
20		6	0.0023	pass
30		10	0.0038	pass
40		15	0.0058	pass
50		11	0.0042	pass
25	V min.= 3.5	10	0.0038	pass
25	V max.=4.35	11	0.0042	pass

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