

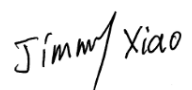
FCC PART 27
FCC PART 22H, PART 24E
TEST REPORT

For

Bolt Modus Corp

Oficina N.33 Edificio Ofidepositos Central, Calidonia - Distrito Federal, Panama

FCC ID: 2APW4LIV2L

Report Type: Original Report	Product Type: Smart phone
Report Number: RSZ200416003-00C	
Report Date: 2020-05-05	
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Reviewed By: RF Engineer	
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TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	4
MEASUREMENT UNCERTAINTY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION	5
DESCRIPTION OF TEST CONFIGURATION	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
BLOCK DIAGRAM OF TEST SETUP	5
SUMMARY OF TEST RESULTS	6
TEST EQUIPMENT LIST	7
FCC §1.1307(B) & §2.1093 - RF EXPOSURE INFORMATION.....	9
APPLICABLE STANDARD	9
TEST RESULT	9
FCC §2.1047 - MODULATION CHARACTERISTIC	10
FCC § 2.1046, § 22.913 (A) & § 24.232 (C); §27.50(C) (D) (H) - RF OUTPUT POWER.....	11
APPLICABLE STANDARD	11
TEST PROCEDURE	11
TEST DATA	11
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53 - OCCUPIED BANDWIDTH	37
APPLICABLE STANDARD	37
TEST PROCEDURE	37
TEST DATA	37
FCC §2.1051, §22.917(A) & §24.238(A); §27.53 (H) (M) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	71
APPLICABLE STANDARD	71
TEST PROCEDURE	71
TEST DATA	71
FCC § 2.1053; § 22.917 (A);§ 24.238 (A); §27.53 (H)(M) SPURIOUS RADIATED EMISSIONS.....	99
APPLICABLE STANDARD	99
TEST PROCEDURE	99
TEST DATA	99
FCC § 22.917 (A);§ 24.238 (A); §27.53 (H)(M) - BAND EDGES	103
APPLICABLE STANDARD	103
TEST PROCEDURE	103
TEST DATA	103
FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY	158
APPLICABLE STANDARD	158
TEST PROCEDURE	158
TEST DATA	159

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Smart phone
Model	LIV2LTE
Frequency Range	EGSM 850: 824-849 MHz(TX); 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 5: 824-849 MHz(TX); 869-894 MHz(RX) LTE Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) LTE Band 4: 1710-1755 MHz(TX) ; 2110-2155 MHz(RX) LTE Band 7: 2500-2570 MHz(TX); 2620-2690 MHz(RX) LTE Band 12: 699-716 MHz(TX); 729-746 MHz(RX) LTE Band 17: 704-716 MHz(TX); 734-746 MHz(RX)
Max Target Power	EGSM850: 33.00dBm(GMSK), 28dBm(8PSK) PCS1900: 31.0dBm(GMSK), 27dBm(8PSK) WCDMA Band 2: 23.0dBm WCDMA Band 5: 23.0dBm LTE Band 2: 22.5dBm LTE Band 4: 23.0dBm LTE Band 7: 23.0dBm LTE Band 12: 23.0dBm LTE Band 17: 23.0dBm
Modulation Technique	2G: GMSK, 8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antennas
Voltage Range	DC 3.8V from battery or DC 5.0V from adapter
Date of Test	2020/04/23~2020/04/27
Sample serial number	RSZ200416003-RF-S1(Assigned by BACL, Shenzhen)
Received date	2020/04/16
Sample/EUT Status	Good condition
Normal/Extreme Condition	N.V.: Nominal Voltage: 3.8V _{DC} L.V.: Low Voltage: 3.6V _{DC} H.V.: High Voltage: 4.35V _{DC}
Adapter information	Model: CLIV2LTE Input: AC 100-240V, 50/60Hz Output: DC 5.0V, 1.0A

Objective

This test report is prepared on behalf of *Bolt Modus Corp* in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Part 27 of the Federal Communication Commissions rules.

The objective is to determine the compliance of the 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 and DTS submissions with FCC ID: 2APW4LIV2L.

Test Methodology

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

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

Applicable Standards: TIA/EIA 603-D.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		±0.73dB
Unwanted Emission, conducted		±1.6dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±1°C
Humidity		±6%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. 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. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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.

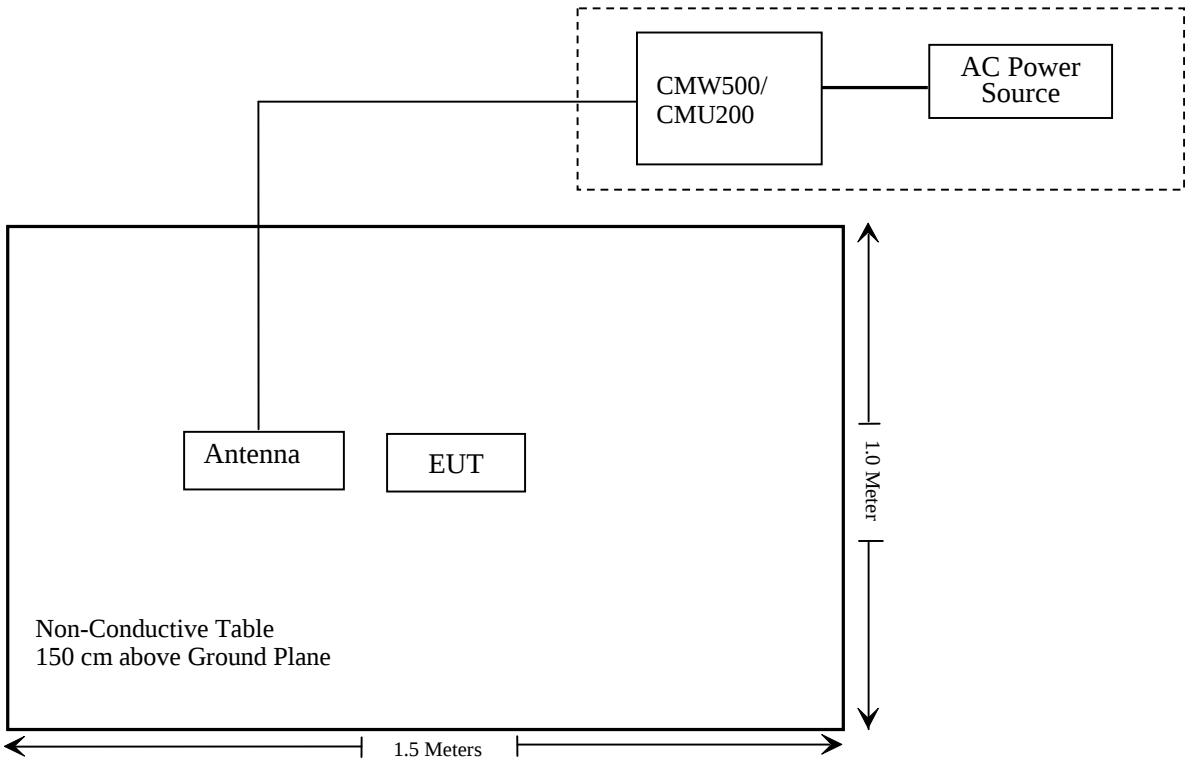
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-116218-UY
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307, §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (c) (d) (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235; §27.54	Frequency stability	Compliance

Note: * Please refer to SAR report released by BACL, report number: RSZ200416003-SA.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2019/7/9	2020/7/8
Sonoma instrument	Pre-amplifier	310 N	186238	2020/4/20	2021/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Unknow	Cable 2	RF Cable 2	F-03-EM197	2019/11/29	2020/11/28
Unknow	Cable	Chamber Cable 1	F-03-EM236	2019/11/29	2020/11/28
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2019/7/22	2020/7/21
COM-POWER	Pre-amplifier	PA-122	181919	2019/11/29	2020/11/28
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2019/11/29	2020/11/28
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017/12/22	2020/12/21
A.H.System	Horn Antenna	SAS-200/571	135	2018/9/1	2021/8/31
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2019/11/29	2020/11/28
Unknow	RF Cable	W1101-EQ1 OUT	F-19-EM005	2019/11/29	2020/11/28
MICRO-TRONICS	Passband filter	HPM50111	F-19-EM006	2020/4/20	2021/4/20
Unknown	High Pass filter	1.3GHz	101120	2020/4/20	2021/4/20
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-02 1304	2017/12/6	2020/12/5
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-01 1304	2017/12/6	2020/12/5
Agilent	Signal Generator	N5183A	MY51040755	NCR	NCR

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2020/3/2	2021/3/1
WEINSCHTEL	3dB Attenuator	Unknow	F-03-EM121	2019/11/29	2020/11/28
Unknow	RF Cable	Unknow	2301 276	2019/11/29	2020/11/28
Unknow	RF Cable	Unknow	DLO J5/W6102	2019/11/29	2020/11/28
Weinschel	Power divider	1515	MY628	2019/11/29	2020/11/28
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	115500	2019/7/22	2020/7/21
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2019/7/9	2020/7/8
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2020/01/05	2021/01/05
Fluke	Digital Multimeter	287	19000011	2020/04/12	2021/04/12

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) 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§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ200416003-SA.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50(c) (d) (h) - RF OUTPUT POWER

Applicable Standard

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

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

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

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

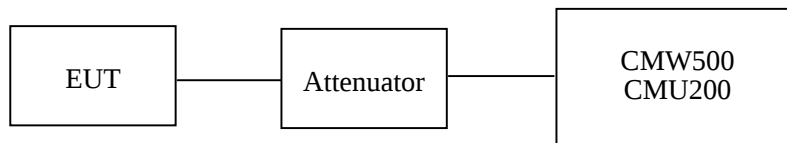
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2500-2570MHz.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMW500/CMU200 through sufficient attenuation.



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

Temperature:	24~25 °C
Relative Humidity:	50~60 %
ATM Pressure:	100.9~101.0 kPa

The testing was performed by Hams He, George Zhong, Charlie Cha from 2020-04-23 to 2020-04-27.

Conducted Power**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.27	38.45
	190	836.6	32.64	38.45
	251	848.8	32.52	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.57	30.54	28.17	27.28	38.45
	190	836.6	32.60	30.46	28.22	27.20	38.45
	251	848.8	32.41	30.63	28.08	27.29	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	27.39	25.11	23.86	21.19	38.45
	190	836.6	27.40	25.23	23.89	21.29	38.45
	251	848.8	27.57	25.15	23.91	21.15	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		22.76	22.59	22.61
		HSDPA	1	21.62	21.49	21.74
			2	21.53	21.64	21.41
			3	21.31	21.82	21.46
			4	21.49	21.77	21.46
		HSUPA	1	21.09	21.10	21.16
			2	21.21	21.26	21.12
			3	21.19	21.35	21.24
			4	21.34	21.42	21.23
			5	21.27	21.55	21.26

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.89	33
	661	1880.0	29.76	33
	810	1909.8	29.84	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	30.72	28.15	26.86	25.59	33
	661	1880.0	30.66	28.23	26.87	25.66	33
	810	1909.8	30.65	28.20	26.92	25.78	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	26.43	24.62	22.14	20.70	33
	661	1880.0	26.51	24.42	22.35	20.56	33
	810	1909.8	26.59	24.60	22.20	20.43	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		22.69	22.62	22.65
		HSDPA	1	21.65	21.47	21.74
			2	21.58	21.69	21.36
			3	21.26	21.76	21.46
			4	21.43	21.73	21.52
		HSUPA	1	21.12	2.05	21.18
			2	21.23	21.23	21.08
			3	21.23	21.32	21.26
			4	21.3	21.47	21.23
			5	21.29	21.48	21.26

Peak-to-average ratio (PAR)**Cellular Band**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.40	13
	Middle	1.52	13
	High	1.40	13

Mode	Channel	PAR (dB)	Limit (dB)
EDGE	Low	1.51	13
	Middle	1.62	13
	High	1.74	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.33	13
	Middle	3.67	13
	High	3.50	13
HSDPA (16QAM)	Low	3.08	13
	Middle	3.17	13
	High	3.19	13
HSUPA (BPSK)	Low	3.03	13
	Middle	3.13	13
	High	3.07	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.75	13
	Middle	1.54	13
	High	1.64	13

Mode	Channel	PAR (dB)	Limit (dB)
EDGE	Low	1.81	13
	Middle	1.63	13
	High	1.72	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.37	13
	Middle	3.61	13
	High	3.53	13
HSDPA (16QAM)	Low	3.12	13
	Middle	3.09	13
	High	3.19	13
HSUPA (BPSK)	Low	3.02	13
	Middle	3.08	13
	High	3.11	13

Radiated Power**GSM Mode:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	90.54	347	1.7	H	30.5	1.90	0.0	28.60	38.45	9.85
836.6	82.17	322	1.7	V	22.8	1.90	0.0	20.90	38.45	17.55
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	88.35	245	2.3	H	18.7	1.30	9.40	26.80	33.00	6.2
1880.00	86.71	107	1.7	V	16.8	1.30	9.40	24.90	33.00	8.1

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	86.69	99	1.2	H	26.7	1.35	0.0	25.35	38.45	13.10
836.6	78.93	178	1.3	V	19.6	1.35	0.0	18.25	38.45	20.20
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	88.75	63	1.3	H	18.7	1.30	8.50	25.90	33	7.10
1880.00	87.01	261	2.0	V	16.7	1.30	8.50	23.90	33	9.10

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	80.07	311	1.4	H	20.1	1.90	0.0	18.20	38.45	20.25
836.6	75.61	352	1.8	V	16.2	1.90	0.0	14.30	38.45	24.15
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	83.46	350	2.2	H	15.8	1.30	9.40	23.90	33.00	9.10
1880.00	80.79	17	2.2	V	10.9	1.30	9.40	19.00	33.00	14.00

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit - Absolute Level

dBd is for the ERP, dBi is for EIRP.

LTE Band 2:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	21.41	21.46	21.49
		RB1#3	21.33	21.17	21.37
		RB1#5	21.69	21.32	21.20
		RB3#0	21.28	21.24	21.56
		RB3#3	21.57	21.66	21.60
		RB6#0	21.18	21.37	21.37
	16QAM	RB1#0	21.47	21.60	21.30
		RB1#3	21.63	21.74	21.63
		RB1#5	21.14	21.61	21.45
		RB3#0	21.53	21.72	21.29
		RB3#3	21.14	21.66	21.32
		RB6#0	21.19	21.2	21.66
3.0	QPSK	RB1#0	21.46	21.51	21.57
		RB1#8	21.48	21.38	21.49
		RB1#14	21.52	21.36	21.35
		RB6#0	21.32	21.62	21.36
		RB6#9	21.34	21.50	21.62
		RB15#0	21.57	21.32	21.43
	16QAM	RB1#0	21.19	21.22	21.29
		RB1#8	21.57	21.34	21.5
		RB1#14	21.54	21.41	21.32
		RB6#0	21.29	21.71	21.8
		RB6#9	21.57	21.58	21.58
		RB15#0	21.71	21.66	21.36

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	21.87	21.93	21.99
		RB1#13	21.77	22.09	22
		RB1#24	22.04	22.02	21.69
		RB15#0	21.66	22	21.88
		RB15#10	21.99	22.07	22.08
		RB25#0	21.94	22.00	21.98
	16QAM	RB1#0	21.9	21.74	22.06
		RB1#13	21.78	22.02	21.82
		RB1#24	21.59	21.84	21.88
		RB15#0	21.84	22.19	22.24
		RB15#10	21.87	21.85	21.70
		RB25#0	21.8	21.73	21.84
10.0	QPSK	RB1#0	21.69	21.85	21.96
		RB1#25	21.62	21.85	21.61
		RB1#49	21.92	21.73	21.84
		RB25#0	21.89	21.92	22.01
		RB25#25	21.62	21.69	21.97
		RB50#0	21.41	21.62	21.68
	16QAM	RB1#0	21.62	22	21.93
		RB1#25	21.64	21.71	21.77
		RB1#49	21.4	21.72	21.69
		RB25#0	21.71	21.64	21.7
		RB25#25	21.76	21.57	21.7
		RB50#0	21.71	21.74	21.95

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB1#0	21.61	21.65	21.83
		RB1#38	21.46	21.63	21.49
		RB1#74	21.81	21.39	21.9
		RB36#0	21.87	21.68	21.96
		RB36#39	21.41	21.59	21.91
		RB75#0	21.37	21.66	21.6
	16QAM	RB1#0	21.88	21.68	21.7
		RB1#38	21.74	21.82	21.68
		RB1#74	21.4	21.37	21.73
		RB36#0	21.66	21.91	22.05
		RB36#39	21.47	21.44	21.78
		RB75#0	21.75	21.81	21.91
20.0	QPSK	RB1#0	22.02	22.1	22.24
		RB1#50	21.93	21.89	21.92
		RB1#99	22.1	22.17	22.34
		RB50#0	22.3	22.28	22.35
		RB50#50	21.79	22.18	22.12
		RB100#0	22.16	21.98	22.23
	16QAM	RB1#0	22.03	22.17	22.38
		RB1#50	22.01	22.35	22.19
		RB1#99	21.99	22.08	22.28
		RB50#0	22.16	22.19	22.00
		RB50#50	21.76	22.3	22.1
		RB100#0	22.21	22.08	22.15

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.74	13	Pass
QPSK (100RB Size)	5.32	13	Pass
16QAM (1RB Size)	5.67	13	Pass
16QAM (100RB Size)	6.31	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	86.82	275	1.9	H	17.1	1.30	9.40	25.20	33
1880.00	83.42	260	1.6	V	13.5	1.30	9.40	21.60	33
3 MHz Bandwidth									
1880.00	86.71	347	2.0	H	17.0	1.30	9.40	25.10	33
1880.00	83.34	257	2.5	V	13.4	1.30	9.40	21.50	33
5 MHz Bandwidth									
1880.00	86.33	184	1.2	H	16.7	1.30	9.40	24.80	33
1880.00	83.13	118	2.2	V	13.2	1.30	9.40	21.30	33
10 MHz Bandwidth									
1880.00	86.13	4	2.2	H	16.5	1.30	9.40	24.60	33
1880.00	83.06	197	2.2	V	13.2	1.30	9.40	21.30	33
15 MHz Bandwidth									
1880.00	85.89	45	2.5	H	16.2	1.30	9.40	24.30	33
1880.00	82.86	239	1.2	V	13.0	1.30	9.40	21.10	33
20 MHz Bandwidth									
1880.00	85.49	38	2.4	H	15.8	1.30	9.40	23.90	33
1880.00	82.76	276	1.8	V	12.9	1.30	9.40	21.00	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	86.96	240	1.9	H	17.3	1.30	9.40	25.40	33
1880.00	84.12	163	2.3	V	14.2	1.30	9.40	22.30	33
3 MHz Bandwidth									
1880.00	86.58	289	2.4	H	16.9	1.30	9.40	25.00	33
1880.00	84.03	116	2.4	V	14.1	1.30	9.40	22.20	33
5 MHz Bandwidth									
1880.00	86.25	102	1.9	H	16.6	1.30	9.40	24.70	33
1880.00	83.88	190	1.3	V	14.0	1.30	9.40	22.10	33
10 MHz Bandwidth									
1880.00	86.12	225	1.9	H	16.4	1.30	9.40	24.50	33
1880.00	83.74	268	1.7	V	13.8	1.30	9.40	21.90	33
15 MHz Bandwidth									
1880.00	85.91	30	1.1	H	16.2	1.30	9.40	24.30	33
1880.00	83.58	130	1.3	V	13.7	1.30	9.40	21.80	33
20 MHz Bandwidth									
1880.00	85.78	96	1.3	H	16.1	1.30	9.40	24.20	33
1880.00	83.41	286	1.0	V	13.5	1.30	9.40	21.60	33

LTE Band 4:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	21.68	21.79	21.86
		RB1#3	21.39	21.62	21.61
		RB1#5	21.85	21.65	21.88
		RB3#0	21.63	21.8	21.61
		RB3#3	21.52	21.76	21.93
		RB6#0	21.93	21.81	21.95
	16QAM	RB1#0	21.55	21.78	21.88
		RB1#3	21.86	21.86	21.87
		RB1#5	21.7	21.72	21.89
		RB3#0	21.72	21.96	21.71
		RB3#3	21.52	21.84	21.59
		RB6#0	21.46	21.81	21.86
3.0	QPSK	RB1#0	21.87	22.11	22.32
		RB1#8	21.81	21.95	22.08
		RB1#14	21.61	21.83	22.35
		RB6#0	21.61	22.22	22.05
		RB6#9	22.12	21.92	22.4
		RB15#0	21.99	21.98	22.22
	16QAM	RB1#0	22.04	22.15	22.25
		RB1#8	21.94	22.28	22.54
		RB1#14	22.15	22.11	22.26
		RB6#0	21.87	22.05	22.47
		RB6#9	22.07	21.88	22.16
		RB15#0	22.15	21.81	22.2

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	22.15	22.41	22.52
		RB1#13	21.87	22.44	22.57
		RB1#24	22.3	22.48	22.61
		RB15#0	22.34	22.13	22.35
		RB15#10	22.36	22.27	22.4
		RB25#0	22.27	22.22	22.2
	16QAM	RB1#0	21.99	22.23	22.22
		RB1#13	22.32	22.55	22.65
		RB1#24	22.45	22.53	22.27
		RB15#0	22.18	22.57	22.58
		RB15#10	21.95	22.32	22.38
		RB25#0	22.01	22.39	22.33
10.0	QPSK	RB1#0	22.14	22.32	22.39
		RB1#25	22.14	22.47	22.5
		RB1#49	21.89	22.2	22.48
		RB25#0	22.31	22.46	22.27
		RB25#25	21.94	22.21	22.09
		RB50#0	22.44	22.03	22.51
	16QAM	RB1#0	22.41	22.37	22.32
		RB1#25	22.16	22.35	22.51
		RB1#49	22.17	22.08	22.46
		RB25#0	22.27	22.17	22.51
		RB25#25	22	22.1	22.16
		RB50#0	22.08	22.44	22.61

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB1#0	21.88	22.05	22.34
		RB1#38	22.06	22.01	22.06
		RB1#74	21.83	22.11	22.21
		RB36#0	22.11	22.05	22.01
		RB36#39	22.1	22.18	22.19
		RB75#0	21.93	21.93	22.26
	16QAM	RB1#0	21.84	22.22	22.41
		RB1#38	21.63	22.03	22.07
		RB1#74	21.97	21.86	22.55
		RB36#0	22.03	22.2	22.45
		RB36#39	21.62	22.04	22.06
		RB75#0	21.78	21.9	22.47
20.0	QPSK	RB1#0	21.95	22.13	22.04
		RB1#50	22.03	21.88	22.03
		RB1#99	22.1	22.24	22.18
		RB50#0	21.94	22.27	21.76
		RB50#50	22.01	21.84	21.74
		RB100#0	22.22	22.32	22.16
	16QAM	RB1#0	22.12	21.9	22.05
		RB1#50	21.95	22.14	21.95
		RB1#99	22.03	21.89	22.29
		RB50#0	21.68	22.3	22.08
		RB50#50	22.01	22.41	22.07
		RB100#0	22.12	21.93	21.85

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.78	13	Pass
QPSK (100RB Size)	5.54	13	Pass
16QAM (1RB Size)	6.03	13	Pass
16QAM (100RB Size)	6.47	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.11	95	1.4	H	13.8	1.30	8.90	21.40	30
1732.50	85.16	56	1.0	V	12.4	1.30	8.90	20.00	30
3 MHz Bandwidth									
1732.50	87.06	345	1.8	H	13.7	1.30	8.90	21.30	30
1732.50	84.98	125	2.1	V	12.3	1.30	8.90	19.90	30
5 MHz Bandwidth									
1732.50	86.96	82	1.4	H	13.6	1.30	8.90	21.20	30
1732.50	84.78	271	2.1	V	12.1	1.30	8.90	19.70	30
10 MHz Bandwidth									
1732.50	86.76	94	1.4	H	13.4	1.30	8.90	21.00	30
1732.50	84.47	225	1.7	V	11.7	1.30	8.90	19.30	30
15 MHz Bandwidth									
1732.50	86.49	116	1.2	H	13.2	1.30	8.90	20.80	30
1732.50	84.24	13	1.5	V	11.5	1.30	8.90	19.10	30
20 MHz Bandwidth									
1732.50	86.25	13	2.0	H	12.9	1.30	8.90	20.50	30
1732.50	84.11	66	2.4	V	11.4	1.30	8.90	19.00	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.54	284	1.7	H	14.2	1.30	8.90	21.80	30
1732.50	84.89	196	2.5	V	12.2	1.30	8.90	19.80	30
3 MHz Bandwidth									
1732.50	87.24	200	2.0	H	13.9	1.30	8.90	21.50	30
1732.50	84.75	128	1.4	V	12.0	1.30	8.90	19.60	30
5 MHz Bandwidth									
1732.50	87.01	220	2.5	H	13.7	1.30	8.90	21.30	30
1732.50	84.52	214	1.8	V	11.8	1.30	8.90	19.40	30
10 MHz Bandwidth									
1732.50	86.85	141	1.3	H	13.5	1.30	8.90	21.10	30
1732.50	84.24	126	1.1	V	11.5	1.30	8.90	19.10	30
15 MHz Bandwidth									
1732.50	86.48	145	1.0	H	13.2	1.30	8.90	20.80	30
1732.50	84.12	190	1.9	V	11.4	1.30	8.90	19.00	30
20 MHz Bandwidth									
1732.50	86.28	118	1.1	H	13.0	1.30	8.90	20.60	30
1732.50	83.94	176	1.6	V	11.2	1.30	8.90	18.80	30

LTE Band 7:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB1#0	22.19	22.42	22.48
		RB1#13	21.89	22.19	22.33
		RB1#24	22.11	22.49	22.53
		RB15#0	22.15	22.5	22.53
		RB15#10	22.24	22.5	22.51
		RB25#0	22.48	22.46	22.3
	16QAM	RB1#0	22.17	22.18	22.19
		RB1#13	22.28	22.29	22.55
		RB1#24	22.23	22.14	22.55
		RB15#0	22.01	22.46	22.2
		RB15#10	22.05	22.67	22.32
		RB25#0	22.44	22.59	22.4
10	QPSK	RB1#0	22.15	22.36	22.45
		RB1#25	22	22.17	22.11
		RB1#49	21.95	22.19	22.27
		RB25#0	22.36	22.49	22.29
		RB25#25	22.13	22.42	22.59
		RB50#0	22.27	22.36	22.25
	16QAM	RB1#0	22.01	22.11	22.52
		RB1#25	22.26	22.5	22.2
		RB1#49	22.28	22.65	22.64
		RB25#0	21.95	22.32	22.37
		RB25#25	21.89	22.39	22.72
		RB50#0	22.27	22.06	22.62

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB1#0	22.15	22.31	22.39
		RB1#38	22.43	22.38	22.48
		RB1#74	22.44	22.02	22.28
		RB36#0	22.23	22.45	22.11
		RB36#39	22.03	22.47	22.2
		RB75#0	22.21	22.07	22.24
	16QAM	RB1#0	22.34	22.22	22.21
		RB1#38	21.9	22.28	22.47
		RB1#74	22.33	22.22	22.63
		RB36#0	22.38	22.05	22.39
		RB36#39	21.94	22.16	22.33
		RB75#0	22.22	22.14	22.33
20	QPSK	RB1#0	22.32	22.41	22.65
		RB1#50	22.57	22.35	22.42
		RB1#99	22.13	22.4	22.8
		RB50#0	22.13	22.47	22.63
		RB50#50	22.55	22.32	22.77
		RB100#0	22.35	22.21	22.6
	16QAM	RB1#0	22.11	22.28	22.35
		RB1#50	22.22	22.29	22.79
		RB1#99	22.45	22.4	22.84
		RB50#0	22.29	22.54	22.77
		RB50#50	22.4	22.21	22.87
		RB100#0	22.51	22.3	22.55

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.12	13	Pass
QPSK (100RB Size)	6.40	13	Pass
16QAM (1RB Size)	5.08	13	Pass
16QAM (100RB Size)	7.63	13	Pass

EIRP:**QPSK:**

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	85.81	132	1.2	H	15.6	2.60	10.20	23.20	33
2535.00	83.76	257	2.3	V	14.2	2.60	10.20	21.80	33
10 MHz Bandwidth									
2535.00	85.45	162	1.4	H	15.3	2.60	10.20	22.90	33
2535.00	83.32	297	1.5	V	13.8	2.60	10.20	21.40	33
15 MHz Bandwidth									
2535.00	85.15	148	1.1	H	15.0	2.60	10.20	22.60	33
2535.00	83.02	271	1.6	V	13.5	2.60	10.20	21.10	33
20 MHz Bandwidth									
2535.00	84.85	60	1.9	H	14.7	2.60	10.20	22.30	33
2535.00	82.72	300	2.1	V	13.2	2.60	10.20	20.80	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	85.91	163	1.6	H	15.7	2.60	10.20	23.30	33
2535.00	84.11	146	2.5	V	14.6	2.60	10.20	22.20	33
10 MHz Bandwidth									
2535.00	85.68	192	1.5	H	15.5	2.60	10.20	23.10	33
2535.00	83.81	165	1.4	V	14.3	2.60	10.20	21.90	33
15 MHz Bandwidth									
2535.00	85.13	326	1.2	H	15.0	2.60	10.20	22.60	33
2535.00	83.34	1	1.2	V	13.8	2.60	10.20	21.40	33
20 MHz Bandwidth									
2535.00	84.63	218	2.1	H	14.5	2.60	10.20	22.10	33
2535.00	83.11	220	2.3	V	13.6	2.60	10.20	21.20	33

LTE Band 12:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	22.08	22.27	22.45
		RB1#3	22.09	22.25	22.13
		RB1#5	21.79	22.07	22.29
		RB3#0	22.02	22.14	22.13
		RB3#3	22.25	22.35	22.21
		RB6#0	21.97	22.1	22.19
	16QAM	RB1#0	22.17	22.23	22.43
		RB1#3	22.35	22.21	22.24
		RB1#5	22.2	22.15	22.46
		RB3#0	22.07	22.14	22.4
		RB3#3	22.16	22.44	22.64
		RB6#0	21.86	22.51	22.16
3.0	QPSK	RB1#0	22.38	22.47	22.61
		RB1#8	22.65	22.55	22.34
		RB1#14	22.53	22.49	22.39
		RB6#0	22.41	22.47	22.58
		RB6#9	22.4	22.65	22.4
		RB15#0	22.46	22.61	22.64
	16QAM	RB1#0	22.6	22.58	22.52
		RB1#8	22.22	22.52	22.78
		RB1#14	22.3	22.31	22.69
		RB6#0	22.45	22.76	22.81
		RB6#9	22.17	22.25	22.66
		RB15#0	22.5	22.65	22.59

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	22.17	22.08	22.32
		RB1#13	21.96	22.17	22.08
		RB1#24	22.11	22.05	22.36
		RB15#0	22.08	21.8	22.03
		RB15#10	22.42	22.21	21.99
		RB25#0	22.23	22.07	22.19
	16QAM	RB1#0	22.46	21.81	22.01
		RB1#13	21.9	22.16	22.11
		RB1#24	21.93	22.09	22.54
		RB15#0	22.37	22.1	22.56
		RB15#10	22.27	22.14	22.31
		RB25#0	21.94	22.08	22.13
10.0	QPSK	RB1#0	22.31	22.42	22.49
		RB1#25	22.31	22.38	22.53
		RB1#49	22.41	22.13	22.64
		RB25#0	22.14	22.42	22.47
		RB25#25	22.18	22.36	22.55
		RB50#0	22.11	22.49	22.58
	16QAM	RB1#0	22.07	22.48	22.4
		RB1#25	22.44	22.32	22.66
		RB1#49	22.4	22.31	22.6
		RB25#0	22.43	22.33	22.74
		RB25#25	22.26	22.2	22.53
		RB50#0	22.16	22.5	22.7

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.40	13	Pass
QPSK (50RB Size)	6.56	13	Pass
16QAM (1RB Size)	6.30	13	Pass
16QAM (50RB Size)	7.46	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	91.46	230	1.7	H	25.1	1.56	0.0	23.54	34.77
707.5	80.39	294	1.3	V	12.6	1.56	0.0	11.04	34.77
3 MHz Bandwidth									
707.5	91.49	106	1.2	H	25.2	1.56	0.0	23.64	34.77
707.5	80.42	196	2.2	V	12.6	1.56	0.0	11.04	34.77
5 MHz Bandwidth									
707.5	91.54	103	2.1	H	25.2	1.56	0.0	23.64	34.77
707.5	80.63	181	2.3	V	12.8	1.56	0.0	11.24	34.77
10 MHz Bandwidth									
707.5	91.57	110	2.3	H	25.2	1.56	0.0	23.64	34.77
707.5	80.89	146	2.3	V	13.1	1.56	0.0	11.54	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	91.71	286	1.1	H	25.4	1.56	0.0	23.84	34.77
707.5	80.62	218	1.3	V	12.8	1.56	0.0	11.24	34.77
3 MHz Bandwidth									
707.5	91.68	89	1.6	H	25.3	1.56	0.0	23.74	34.77
707.5	80.73	220	2.1	V	12.9	1.56	0.0	11.34	34.77
5 MHz Bandwidth									
707.5	91.62	123	1.0	H	25.3	1.56	0.0	23.74	34.77
707.5	81.08	84	1.9	V	13.3	1.56	0.0	11.74	34.77
10 MHz Bandwidth									
707.5	91.42	172	1.5	H	25.1	1.56	0.0	23.54	34.77
707.5	81.11	20	2.0	V	13.3	1.56	0.0	11.74	34.77

LTE Band 17:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	21.73	21.65	21.47
		RB1#13	21.71	21.46	21.59
		RB1#24	21.84	21.63	21.13
		RB15#0	21.82	21.51	21.57
		RB15#10	21.77	21.69	21.4
		RB25#0	21.68	21.65	21.46
	16QAM	RB1#0	21.51	21.7	21.58
		RB1#13	21.53	21.71	21.24
		RB1#24	21.95	21.89	21.7
		RB15#0	21.91	21.74	21.38
		RB15#10	21.67	21.48	21.74
		RB25#0	21.67	21.84	21.21
10.0	QPSK	RB1#0	21.75	21.96	22.14
		RB1#25	21.45	21.99	22.17
		RB1#49	21.8	21.78	21.84
		RB25#0	21.73	22.07	22.13
		RB25#25	21.64	21.85	22.03
		RB50#0	21.53	21.88	22.23
	16QAM	RB1#0	21.66	21.67	22.08
		RB1#25	21.98	22.07	22.29
		RB1#49	21.89	21.68	22.12
		RB25#0	21.52	21.73	22.3
		RB25#25	21.97	22.13	22.1
		RB50#0	21.95	21.87	22.4

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.21	13	Pass
QPSK (50RB Size)	6.14	13	Pass
16QAM (1RB Size)	5.83	13	Pass
16QAM (50RB Size)	7.41	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
710	90.51	73	2.0	H	24.2	1.56	0.0	22.64	34.77
710	79.63	278	2.1	V	11.8	1.56	0.0	10.24	34.77
10 MHz Bandwidth									
710	90.62	304	1.1	H	24.3	1.56	0.0	22.74	34.77
710	80.16	234	1.9	V	12.4	1.56	0.0	10.84	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
710	90.42	227	1.1	H	24.1	1.56	0.0	22.54	34.77
710	80.26	151	2.0	V	12.5	1.56	0.0	10.94	34.77
10 MHz Bandwidth									
710	90.64	139	1.3	H	24.3	1.56	0.0	22.74	34.77
710	80.34	127	2.1	V	12.6	1.56	0.0	11.04	34.77

Note:

All above data were tested with no amplifier

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

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

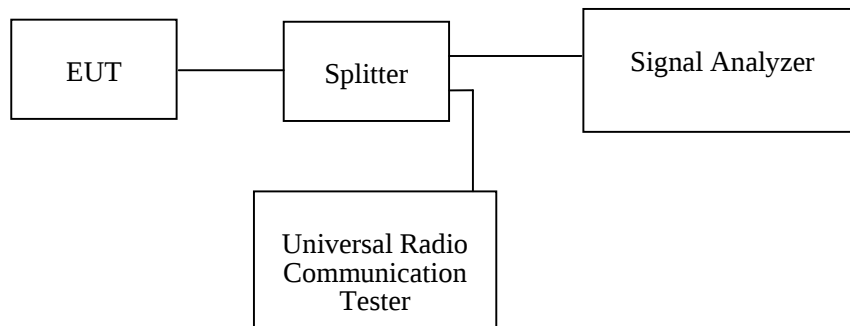
Applicable Standard

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

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	24~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by George Zhong from 2020-04-23 to 2020-05-14.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables and plots.

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	244.00	318.32
EGPRS(8PSK)	836.6	244.00	317.50

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.20	4.77
HSUPA (BPSK)	836.6	4.18	4.75
HSDPA (16QAM)	836.6	4.20	4.75

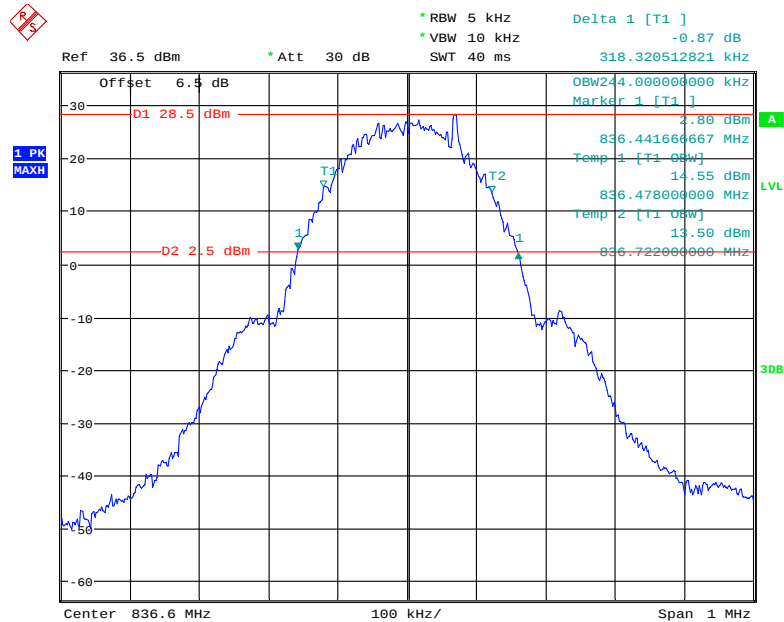
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	244.00	319.23
EGPRS(8PSK)	1880.0	244.00	314.42

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.18	4.75
HSUPA (BPSK)	1880.0	4.20	5.08
HSDPA (16QAM)	1880.0	4.22	5.15

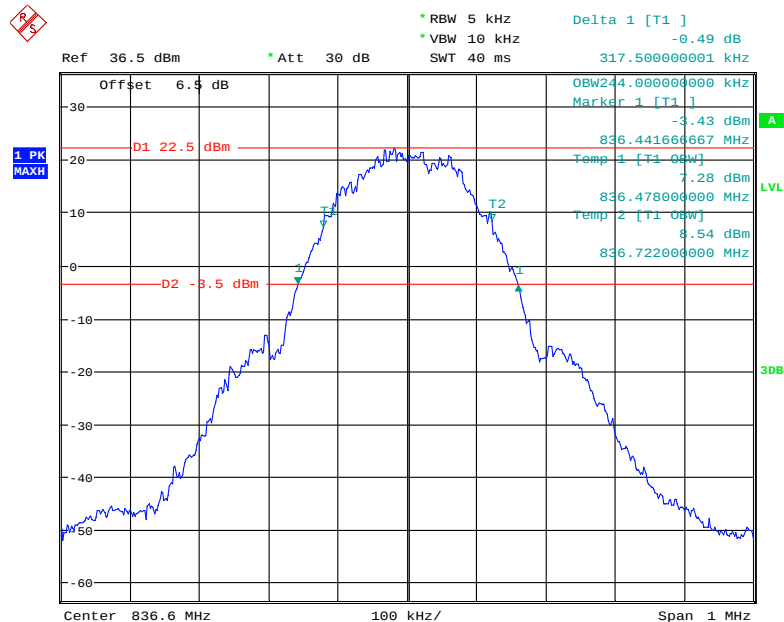
Cellular Band (Part 22H)

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



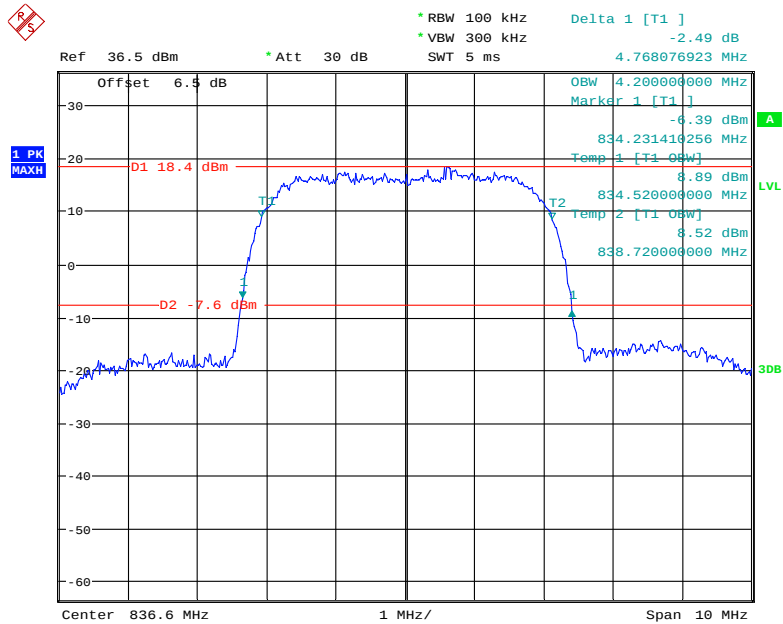
Date: 23.APR.2020 18:51:22

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



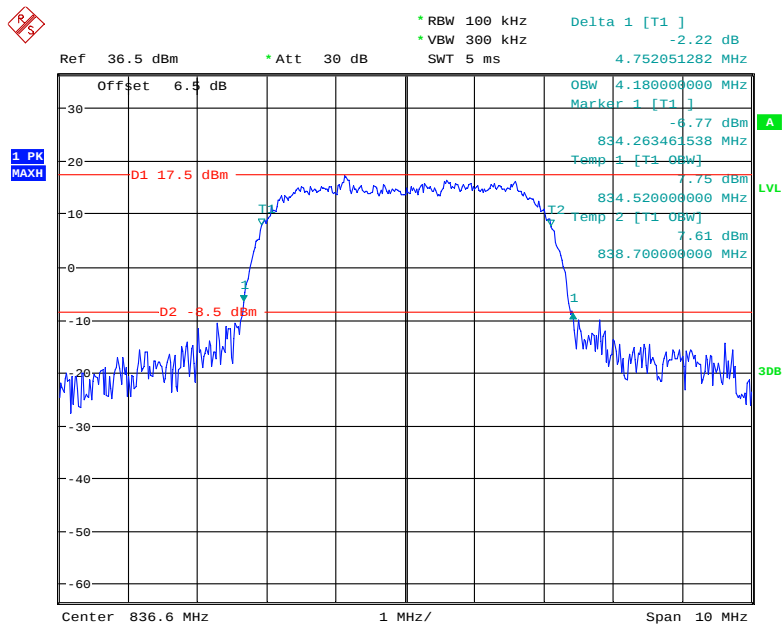
Date: 23.APR.2020 19:03:23

26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode

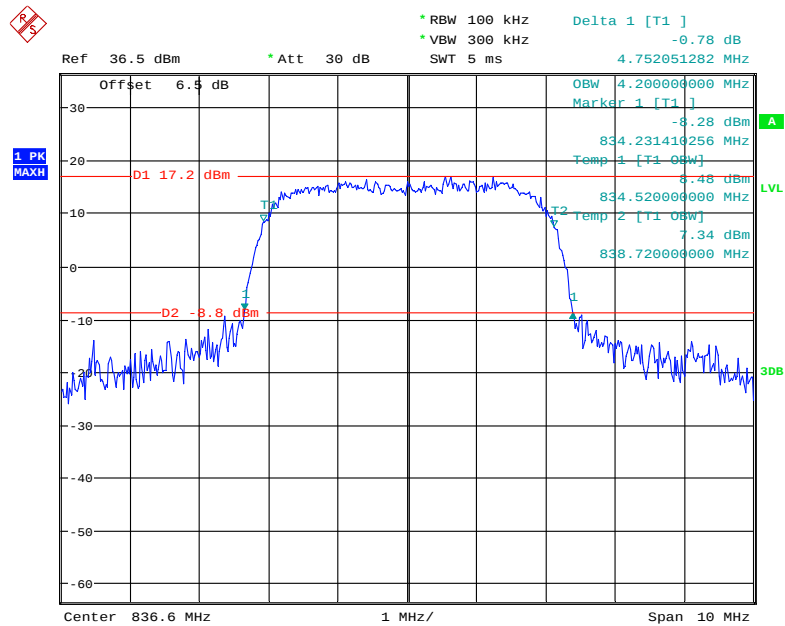


Date: 23.APR.2020 19:48:15

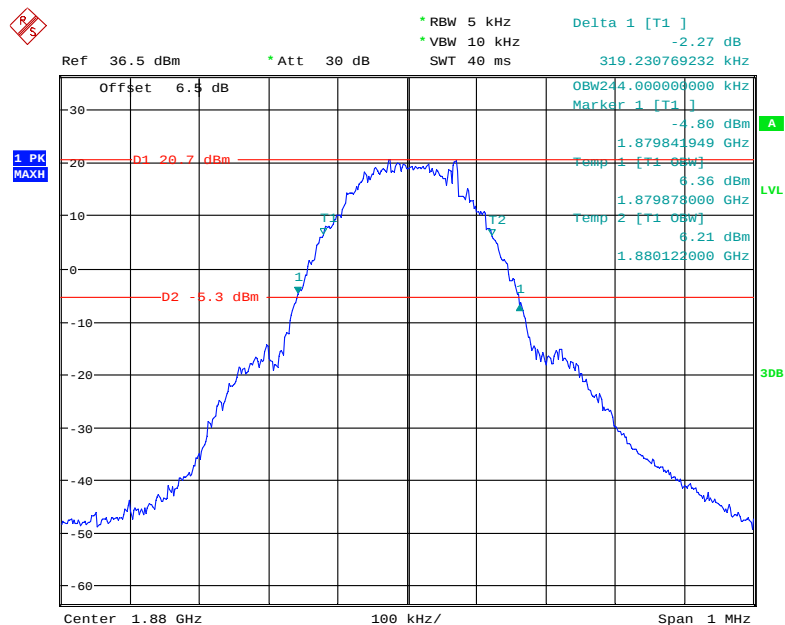
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode



Date: 23.APR.2020 19:51:31

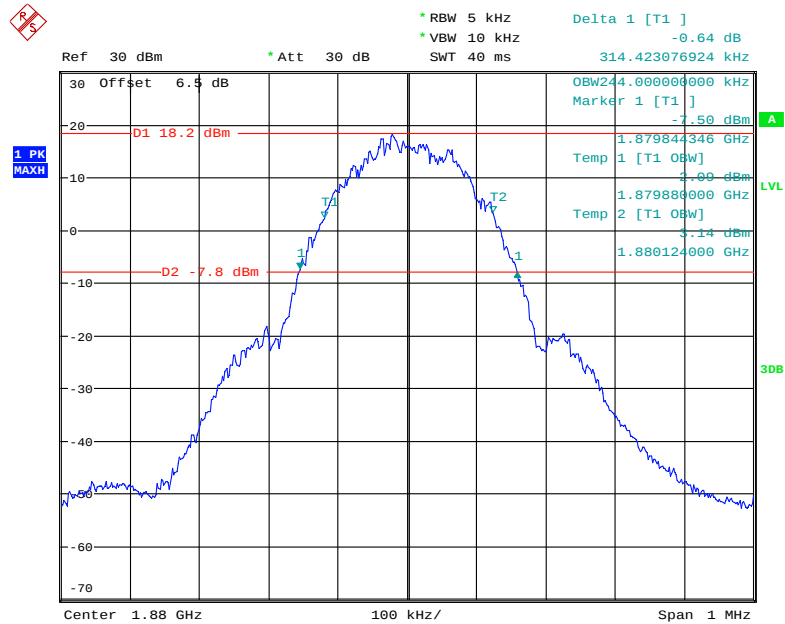
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

Date: 23.APR.2020 19:49:53

PCS Band (Part 24E)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode**

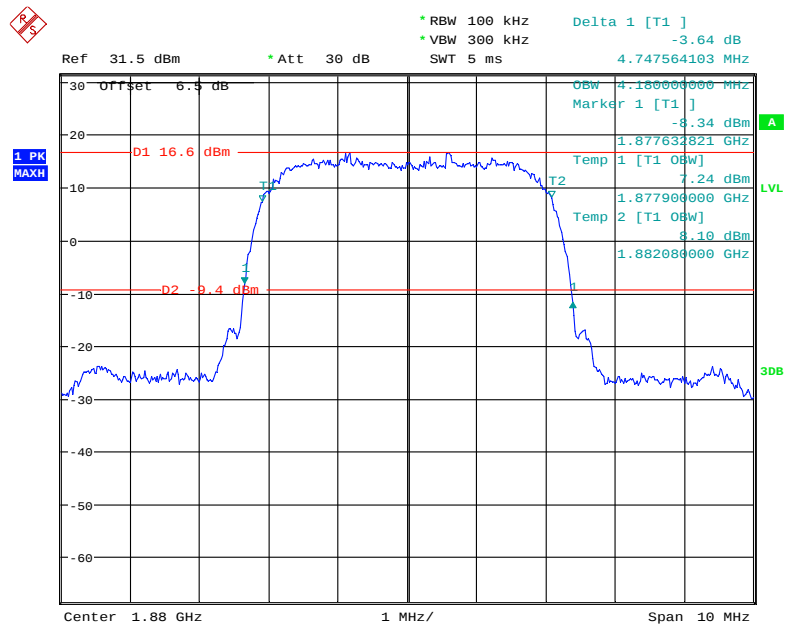
Date: 23.APR.2020 18:37:16

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



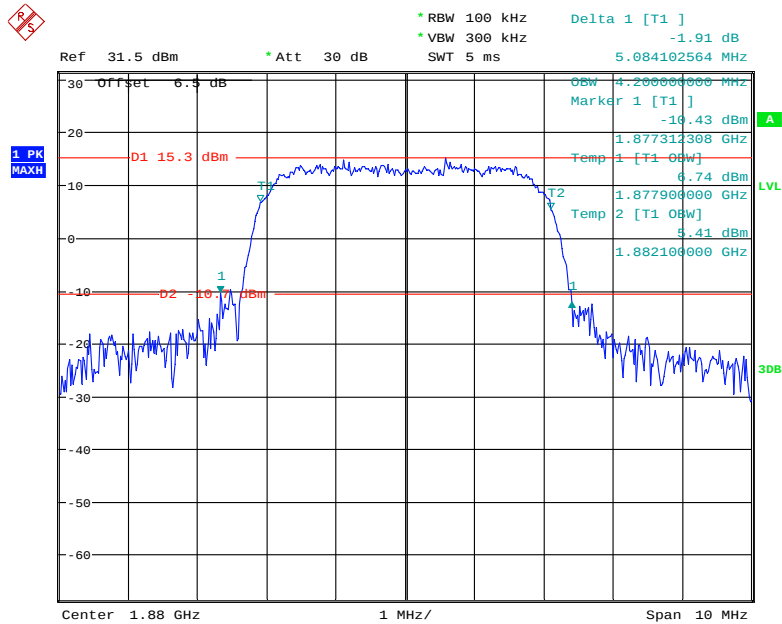
Date: 23.APR.2020 18:46:25

26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode



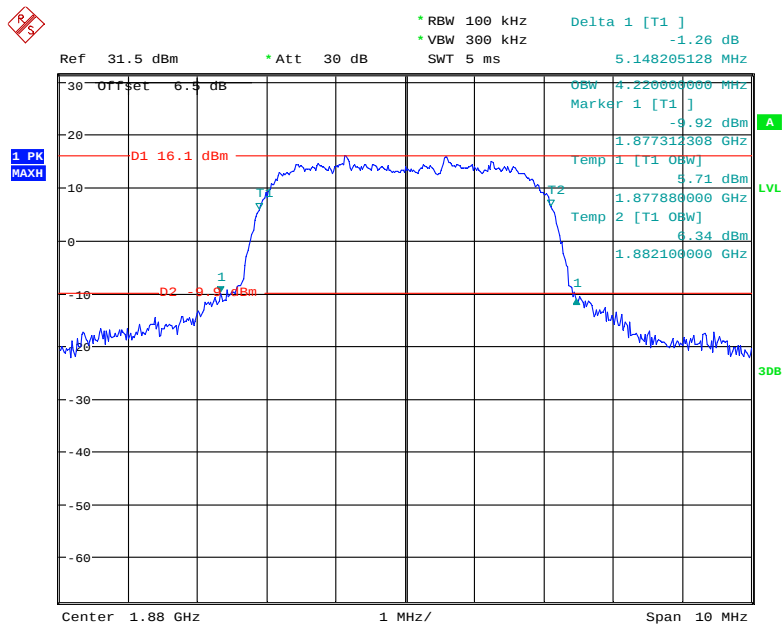
Date: 23.APR.2020 19:28:36

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



Date: 23.APR.2020 19:30:31

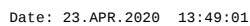
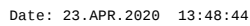
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

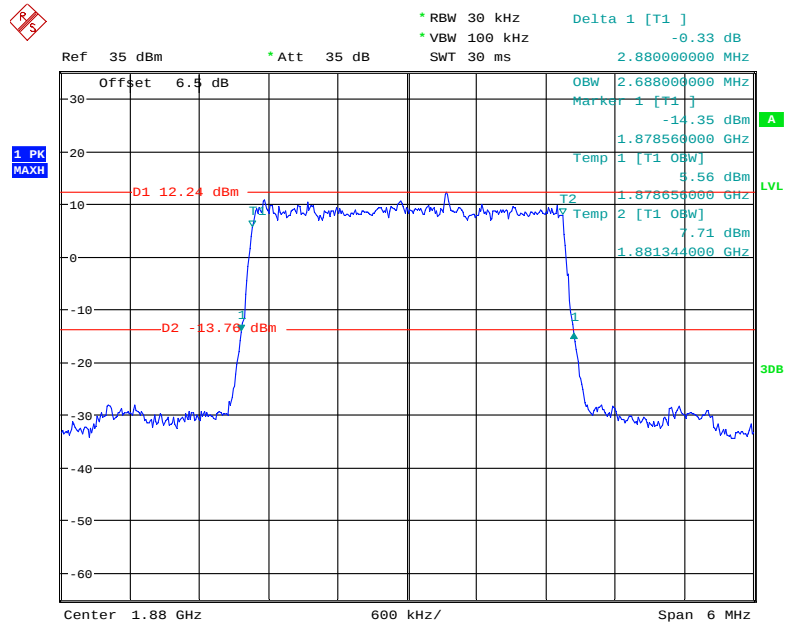


Date: 23.APR.2020 19:25:37

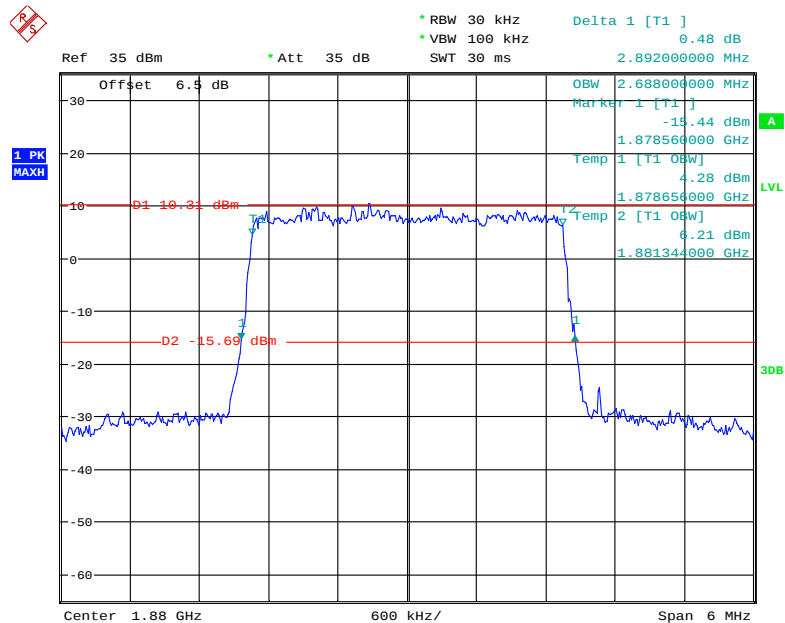
LTE Band 2: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.104	1.326
	16QAM	1.104	1.302
3.0	QPSK	2.688	2.880
	16QAM	2.688	2.892
5.0	QPSK	4.540	5.180
	16QAM	4.520	5.200
10.0	QPSK	8.960	10.000
	16QAM	8.960	9.800
15.0	QPSK	13.620	15.180
	16QAM	13.560	15.240
20.0	QPSK	18.000	19.760
	16QAM	18.000	19.760

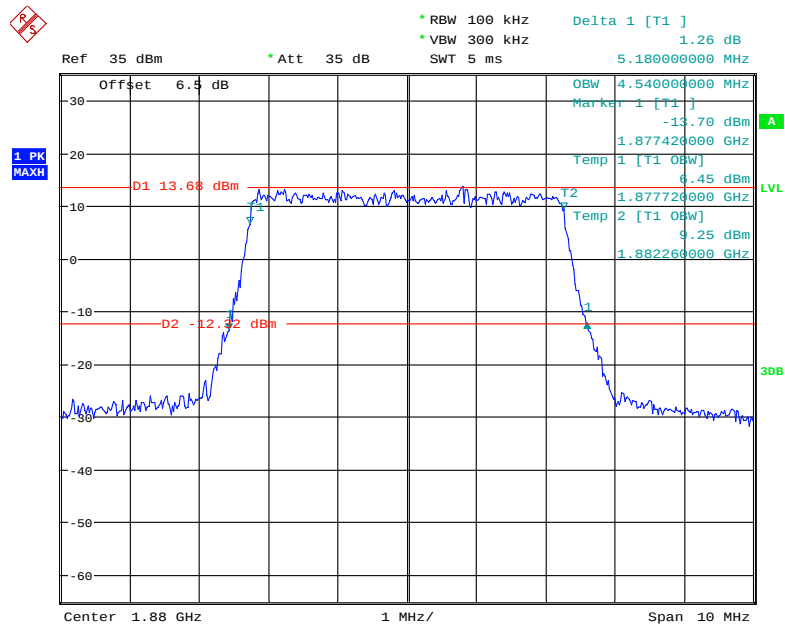


QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

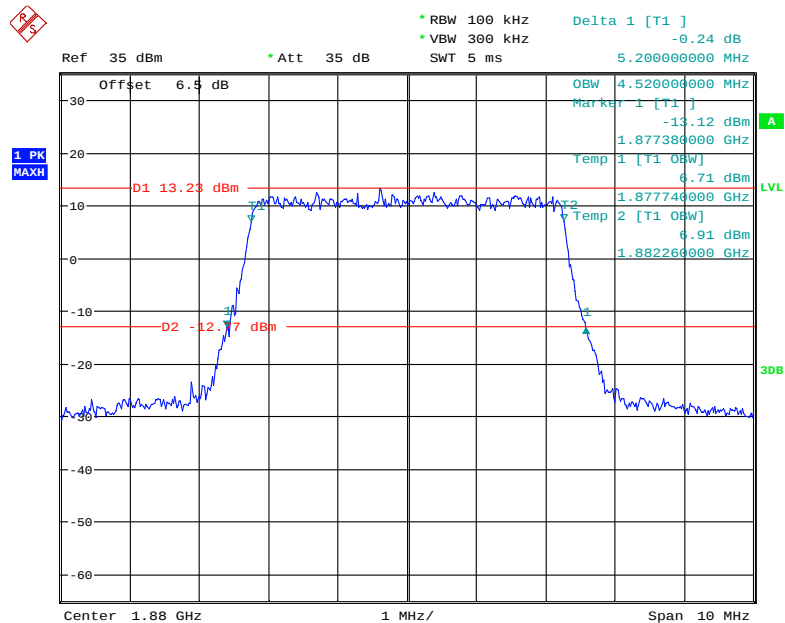
Date: 23.APR.2020 13:49:19

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

Date: 23.APR.2020 13:49:35

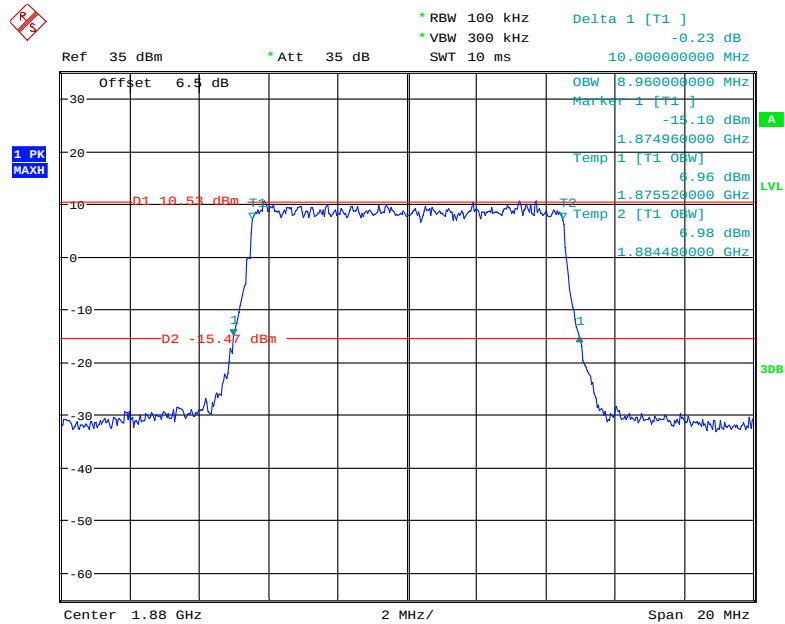
QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 23.APR.2020 13:49:54

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

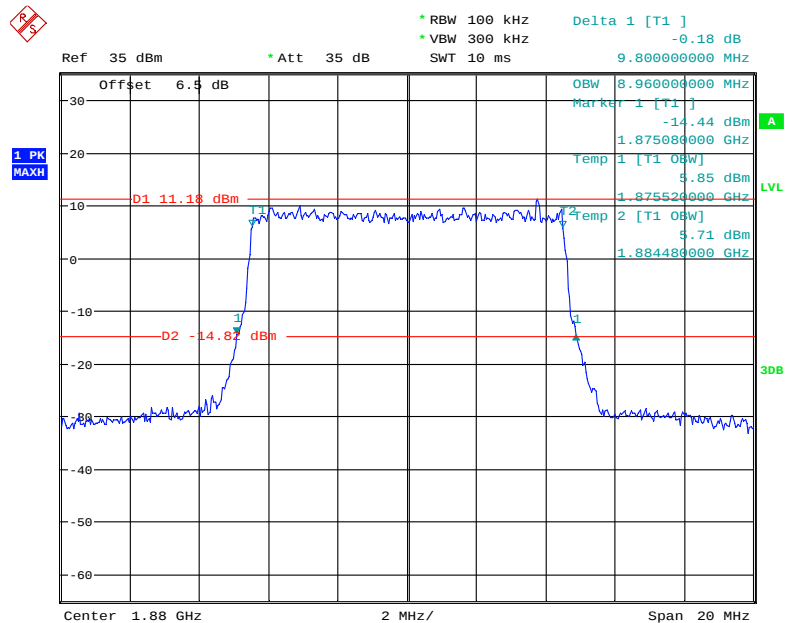
Date: 23.APR.2020 13:50:10

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

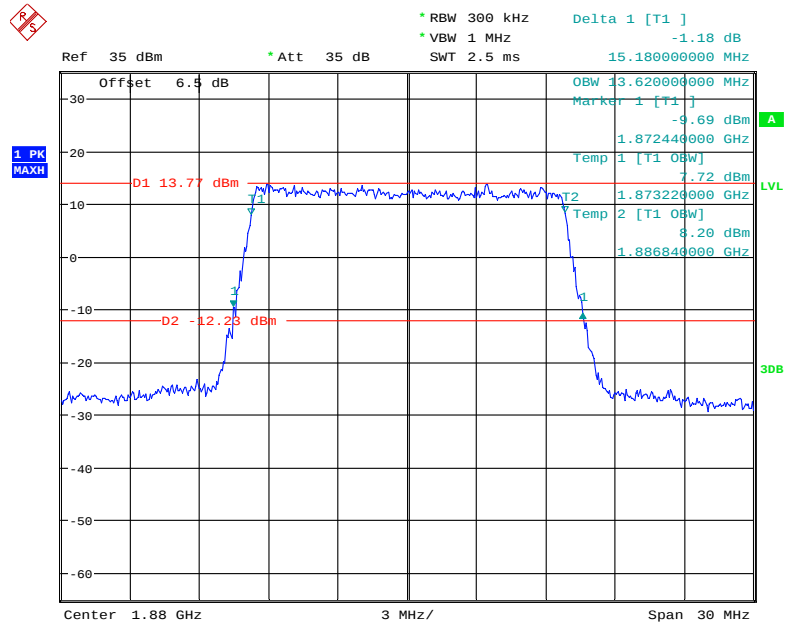


Date: 23.APR.2020 13:50:29

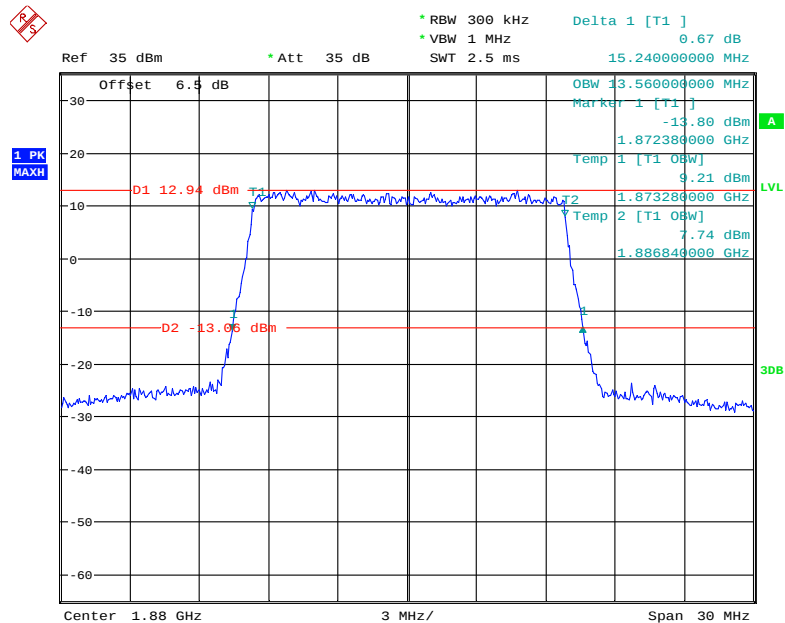
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



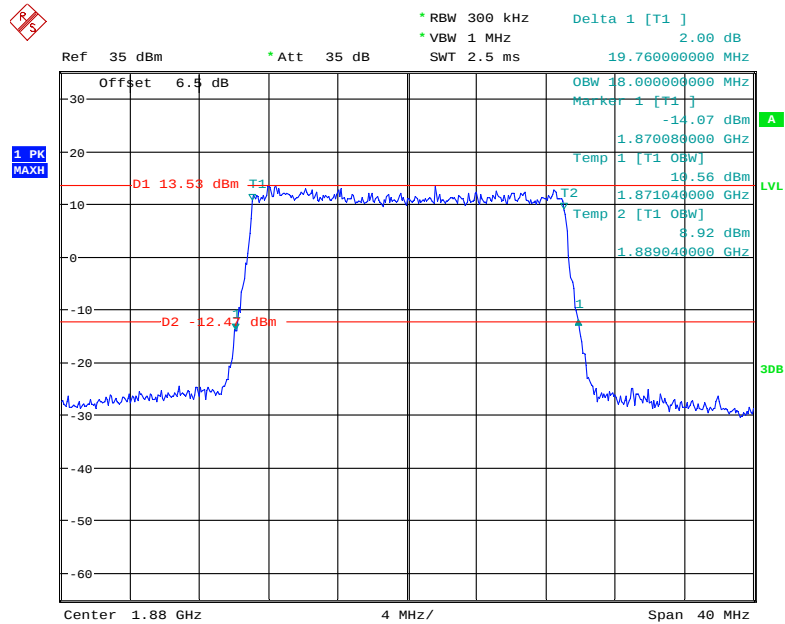
Date: 23.APR.2020 13:50:50

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

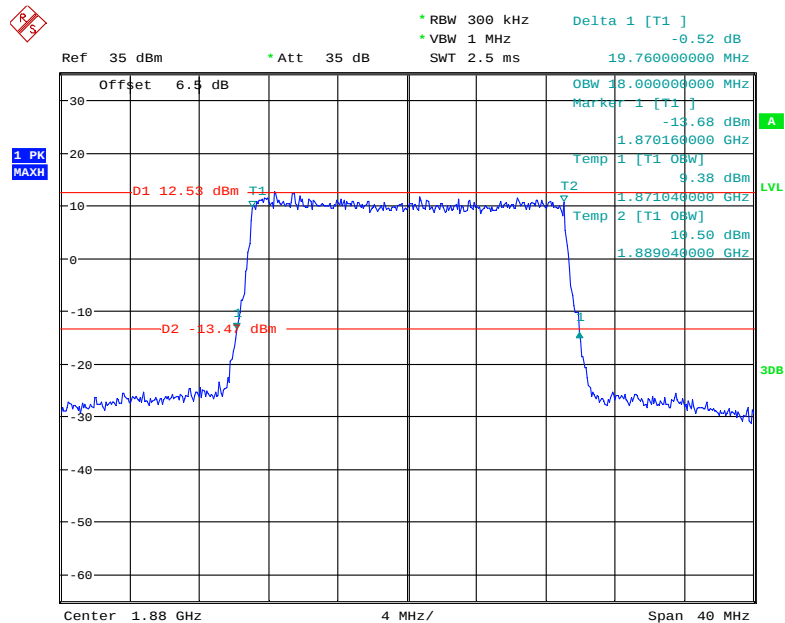
Date: 23.APR.2020 13:51:12

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

Date: 23.APR.2020 13:51:31

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

Date: 23.APR.2020 13:51:56

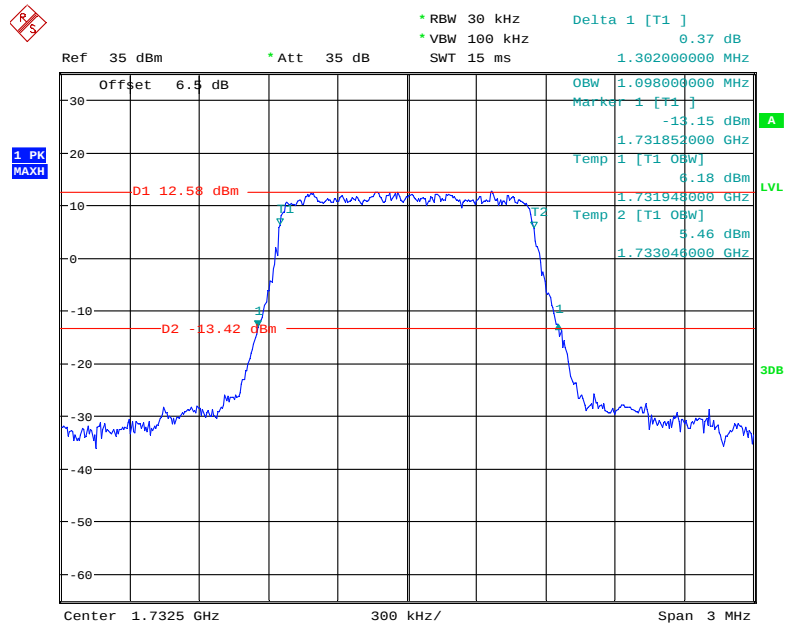
16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 23.APR.2020 13:52:16

LTE Band 4: (Middle Channel)

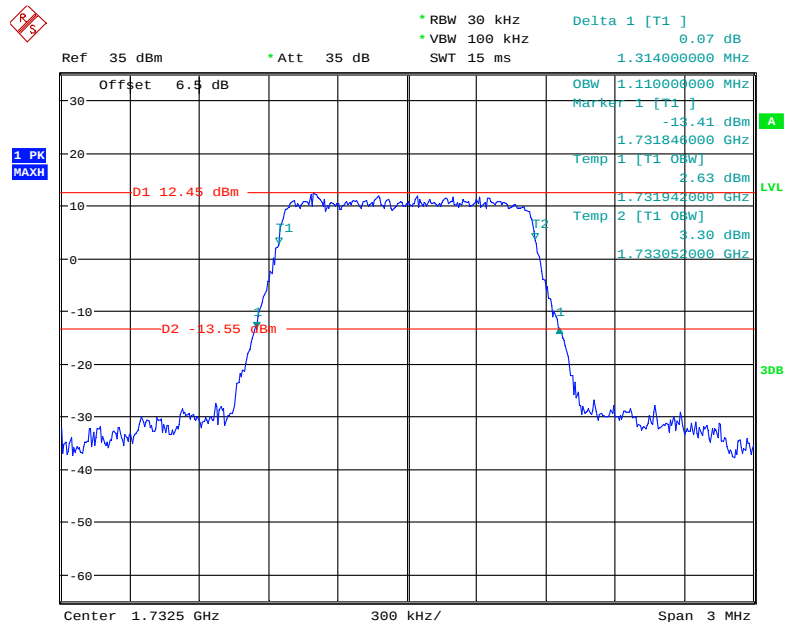
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.098	1.302
	16QAM	1.110	1.314
3.0	QPSK	2.688	2.880
	16QAM	2.688	2.868
5.0	QPSK	4.560	5.200
	16QAM	4.520	5.140
10.0	QPSK	8.960	9.960
	16QAM	8.960	9.720
15.0	QPSK	13.560	15.240
	16QAM	13.560	15.180
20.0	QPSK	18.013	19.167
	16QAM	18.000	19.680

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

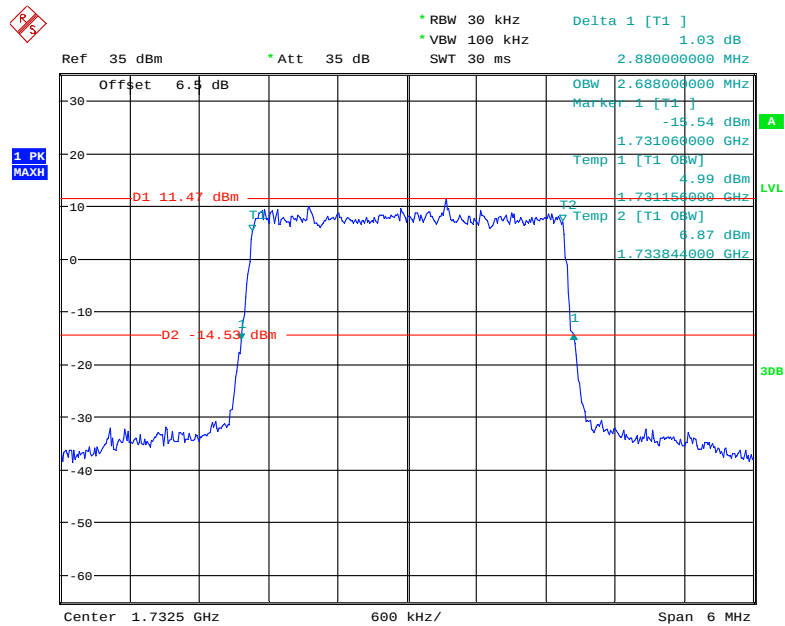


Date: 23.APR.2020 13:52:38

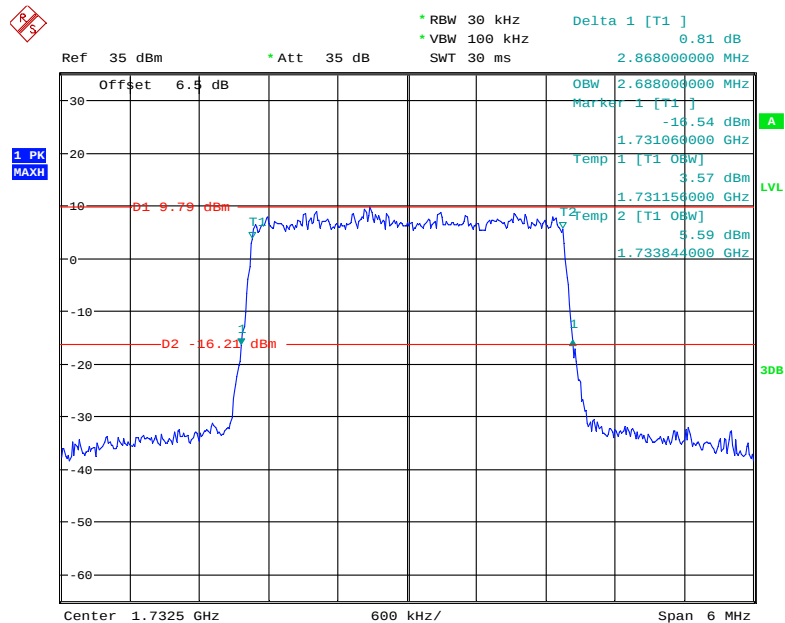
16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



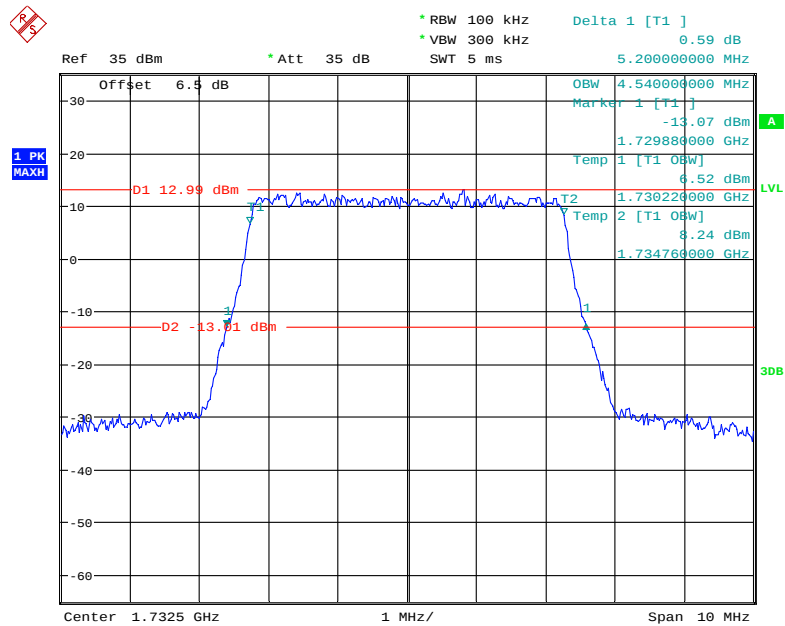
Date: 23.APR.2020 13:52:57

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

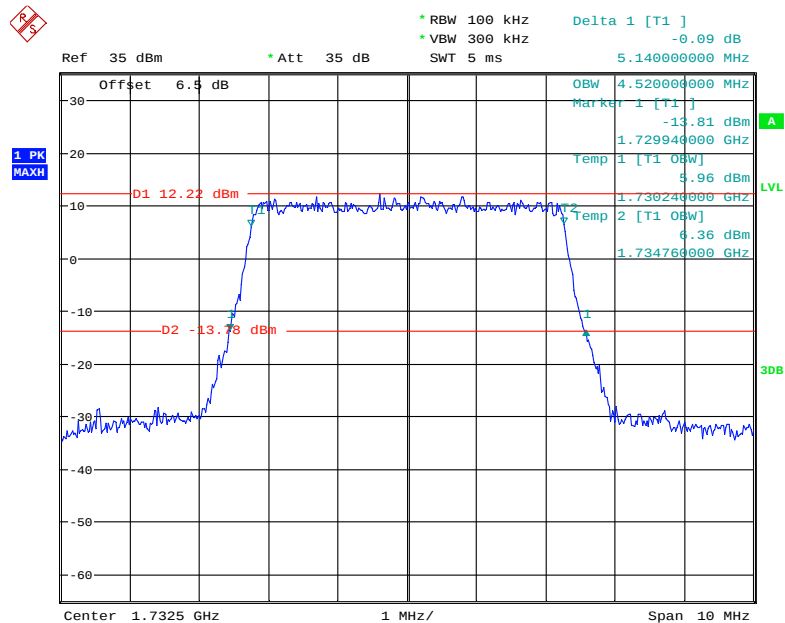
Date: 23.APR.2020 13:53:15

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

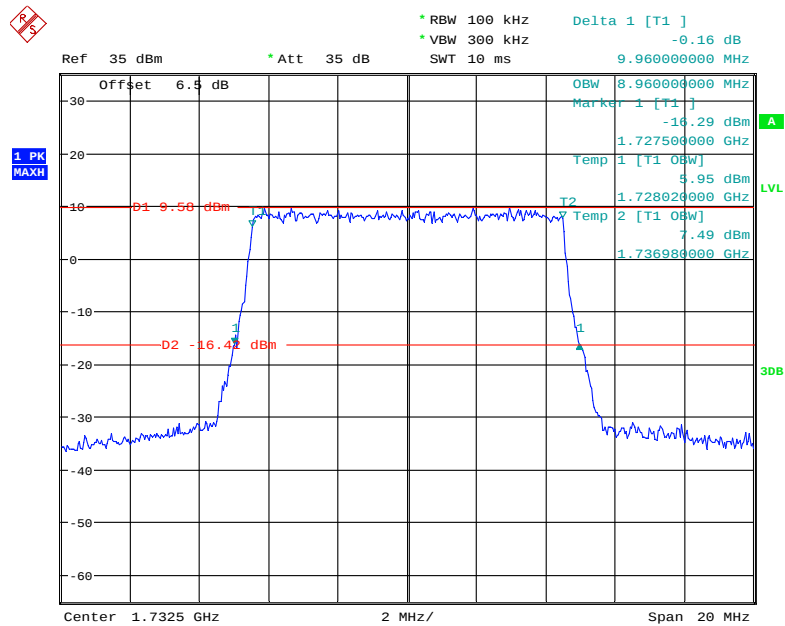
Date: 23.APR.2020 13:53:31

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

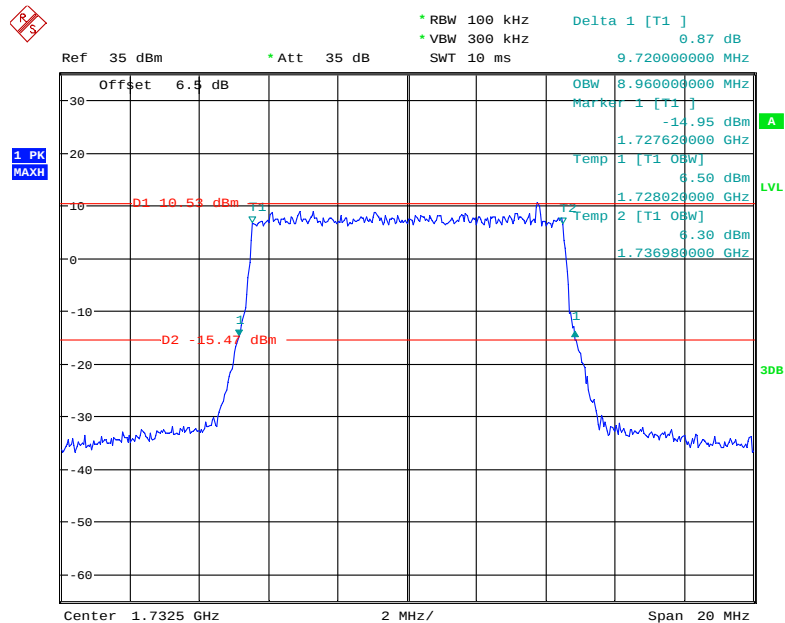
Date: 23.APR.2020 13:53:53

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

Date: 23.APR.2020 13:54:09

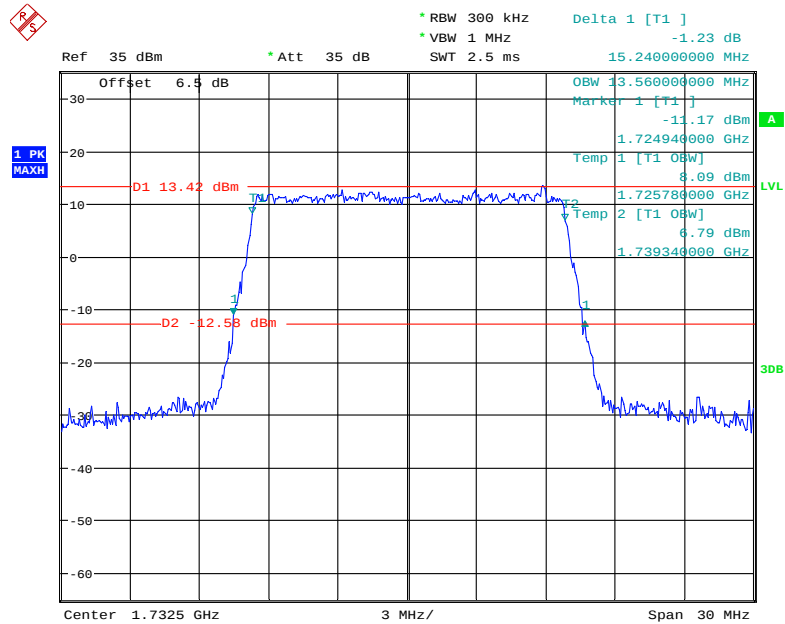
QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 23.APR.2020 13:54:32

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

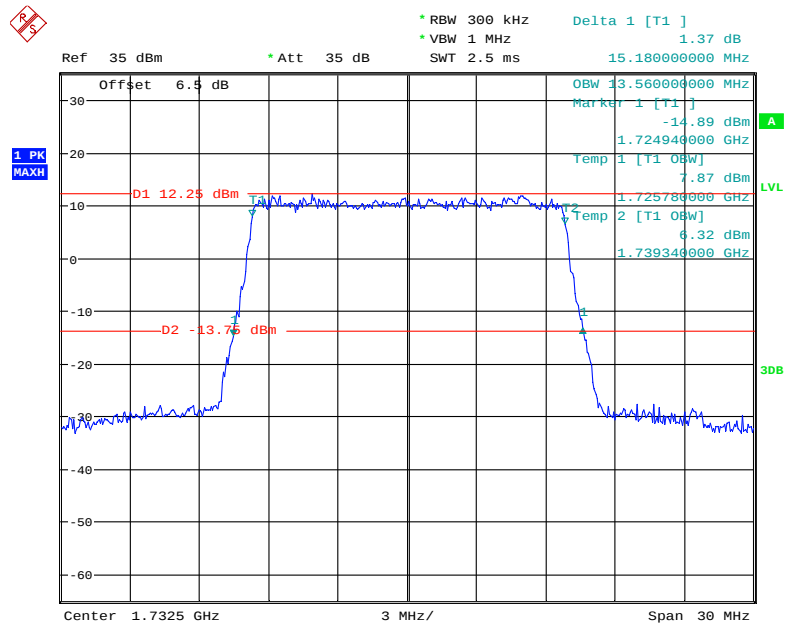
Date: 23.APR.2020 13:54:52

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

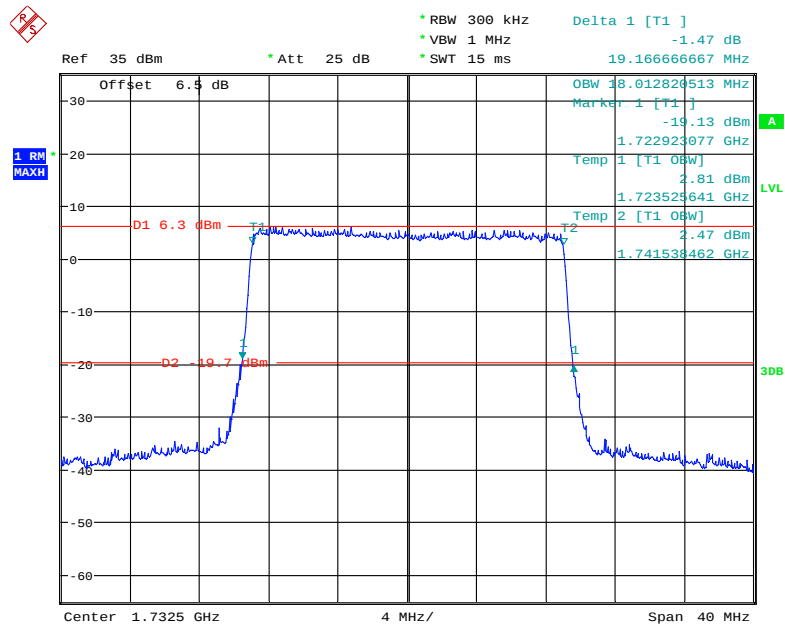


Date: 23.APR.2020 13:55:14

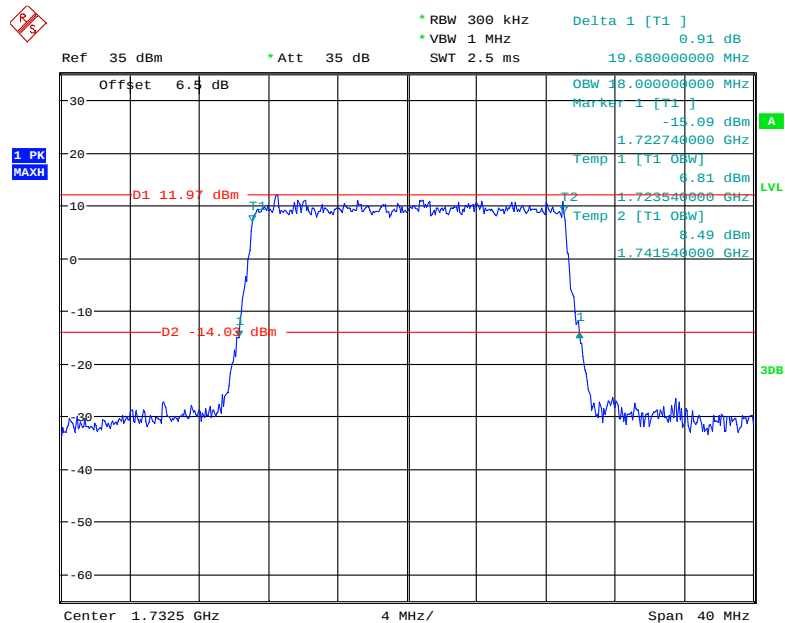
16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 23.APR.2020 13:55:34

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

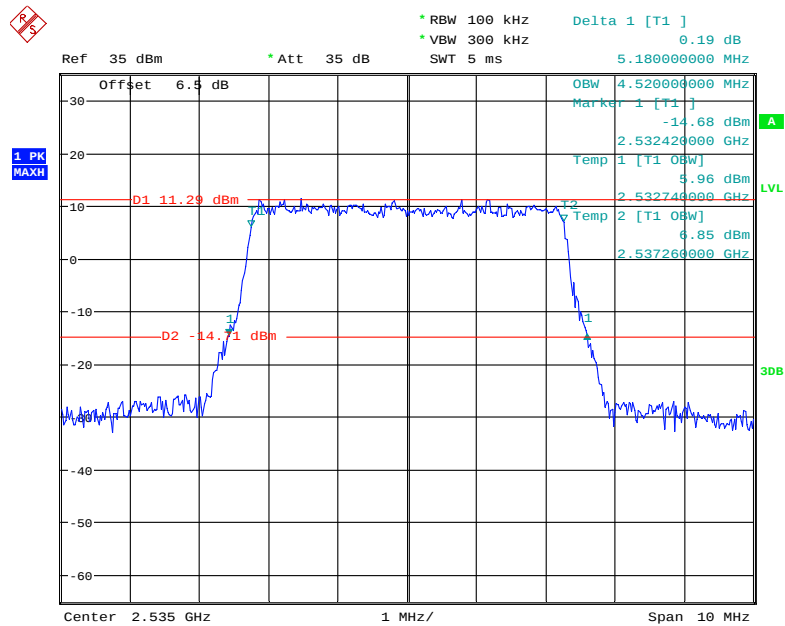
Date: 14.MAY.2020 15:19:24

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

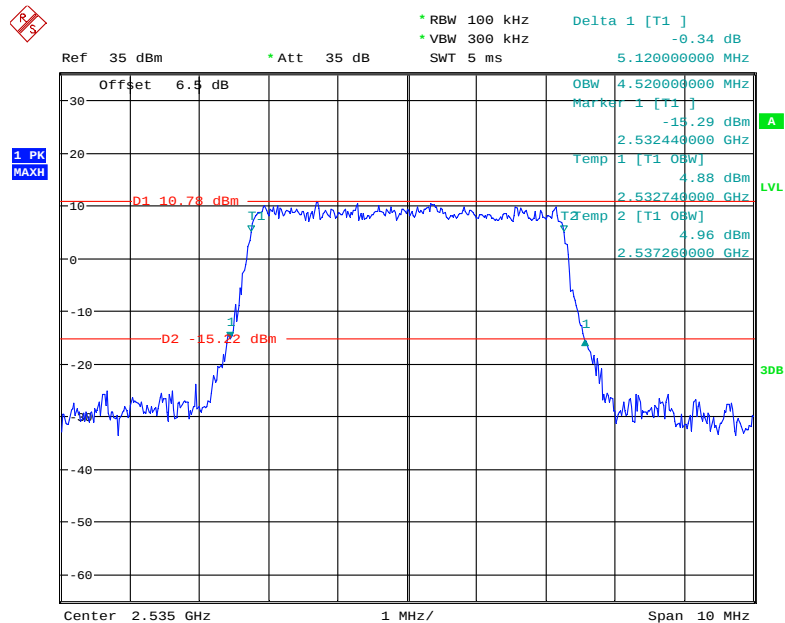
Date: 23.APR.2020 13:56:21

LTE Band 7: (Middle Channel)

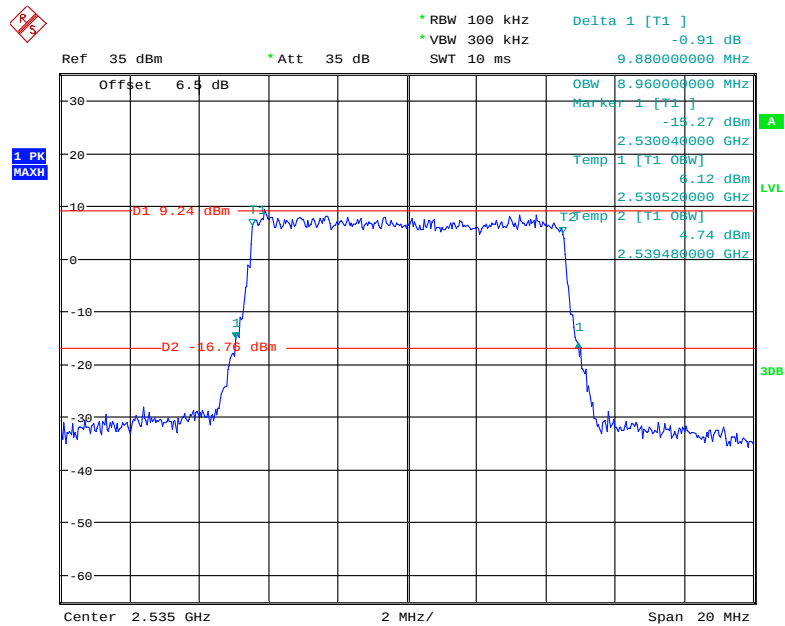
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.520	5.180
	16QAM	4.520	5.120
10.0	QPSK	8.960	9.880
	16QAM	8.960	9.760
15.0	QPSK	13.620	15.240
	16QAM	13.620	15.180
20.0	QPSK	18.000	19.600
	16QAM	18.000	19.680

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

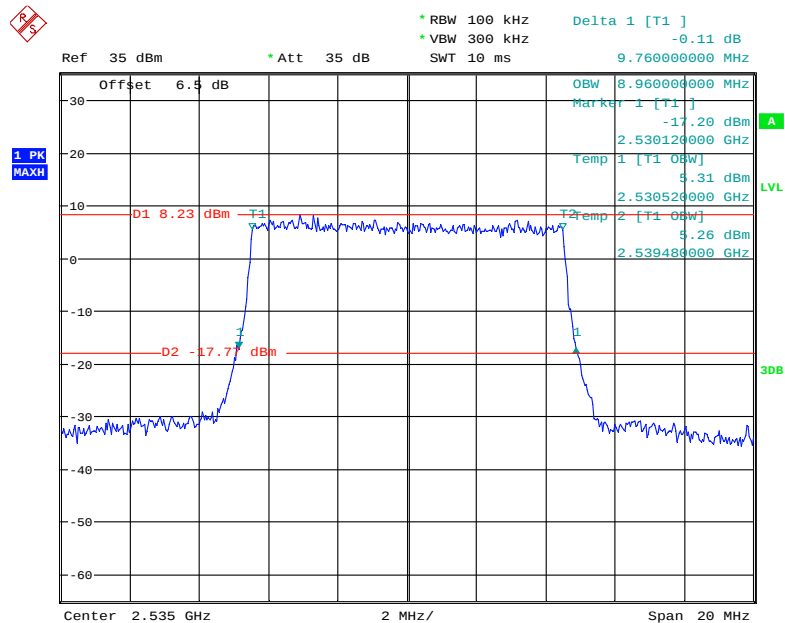
Date: 23.APR.2020 13:56:43

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

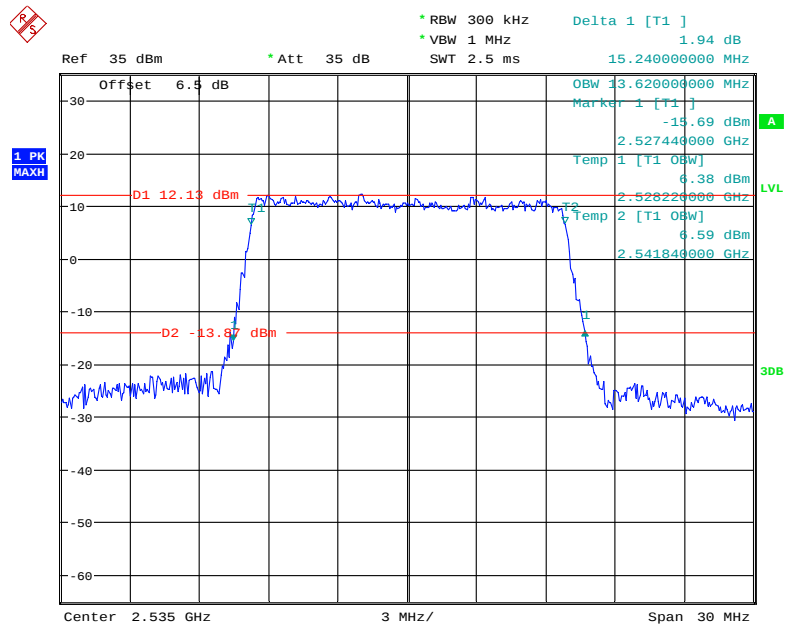
Date: 23.APR.2020 13:57:02

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

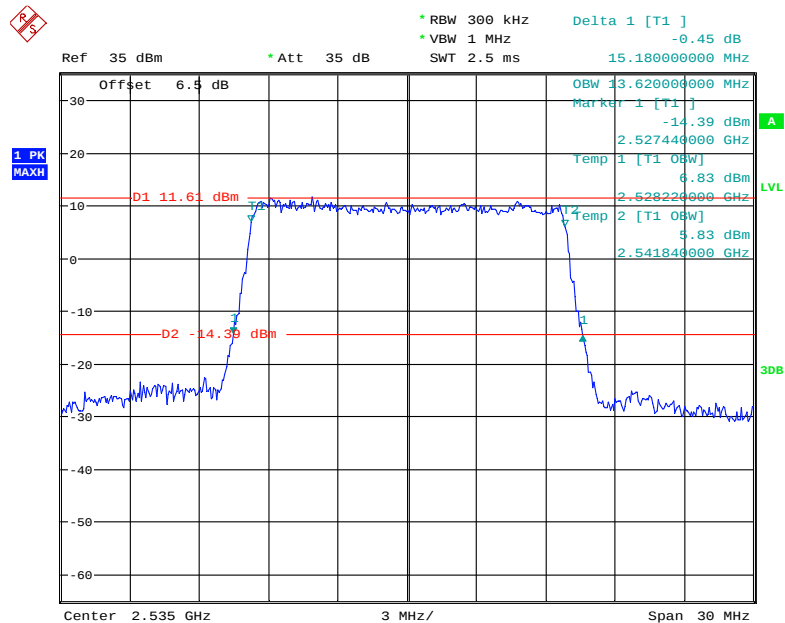
Date: 23.APR.2020 13:57:25

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

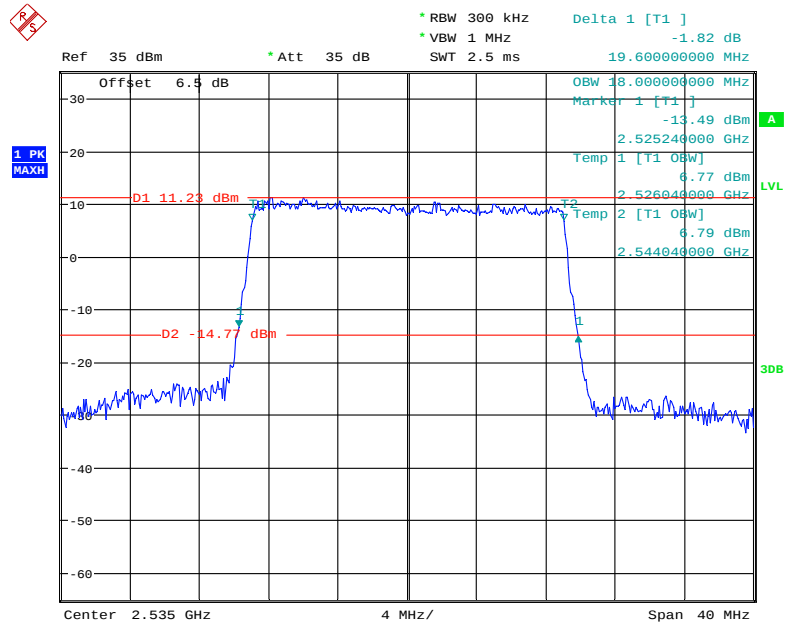
Date: 23.APR.2020 13:57:45

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

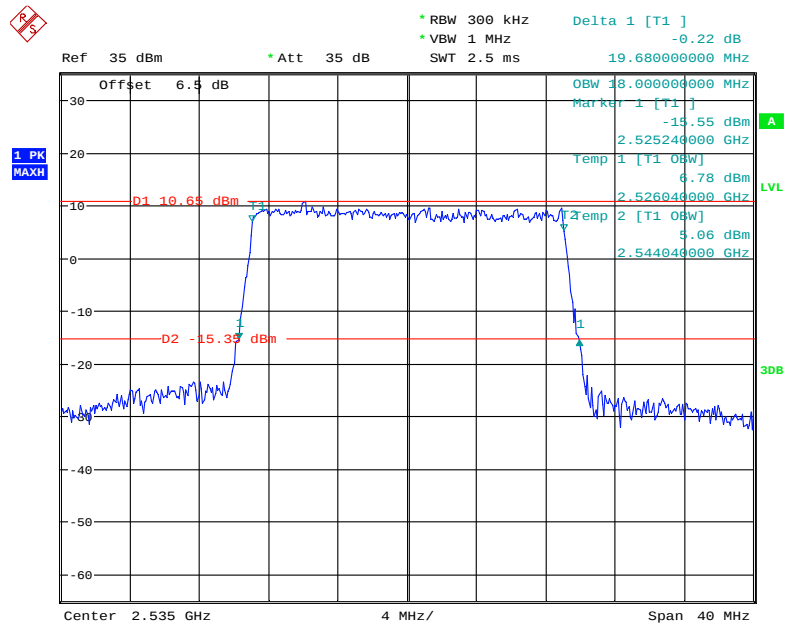
Date: 23.APR.2020 13:58:10

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

Date: 23.APR.2020 13:58:33

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

Date: 23.APR.2020 13:58:58

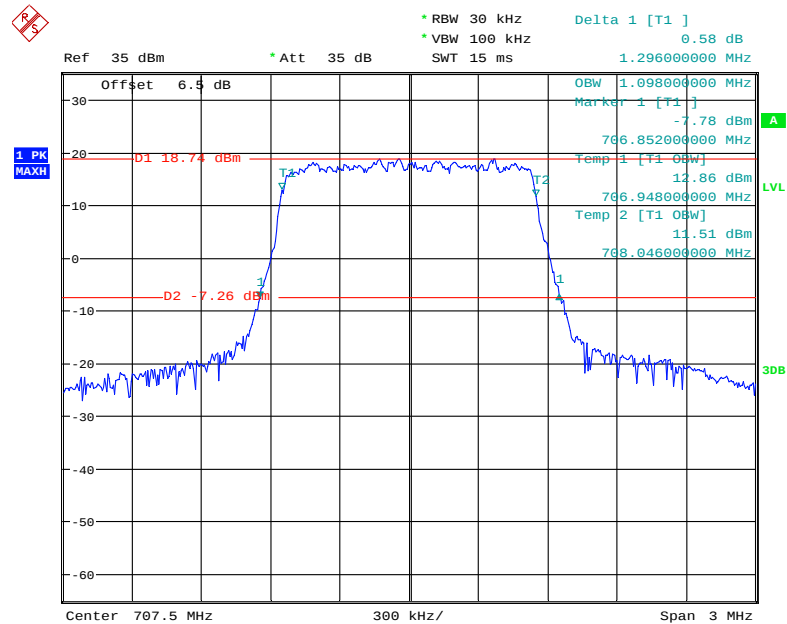
16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 23.APR.2020 13:59:21

LTE Band 12: (Middle Channel)

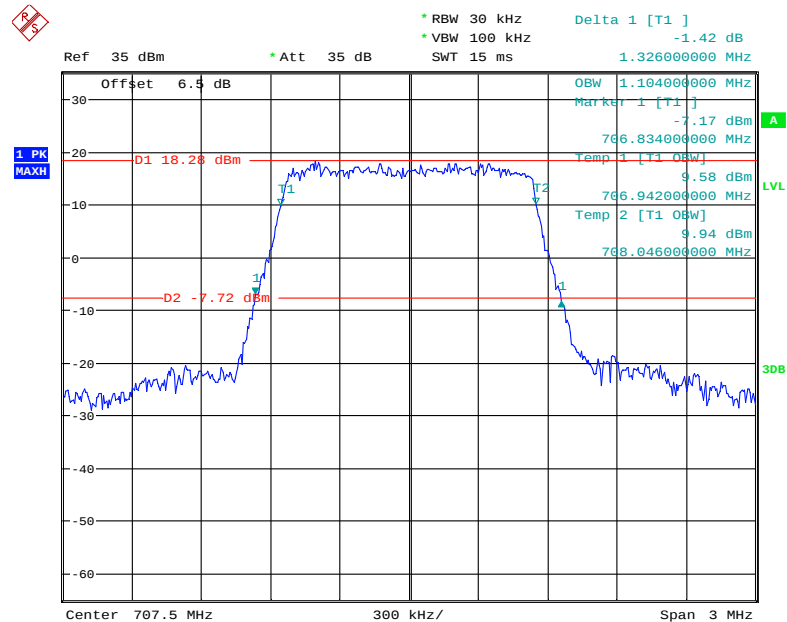
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.098	1.296
	16QAM	1.104	1.326
3.0	QPSK	2.688	2.868
	16QAM	2.688	2.904
5.0	QPSK	4.540	5.160
	16QAM	4.540	5.180
10.0	QPSK	9.000	9.880
	16QAM	8.960	9.640

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



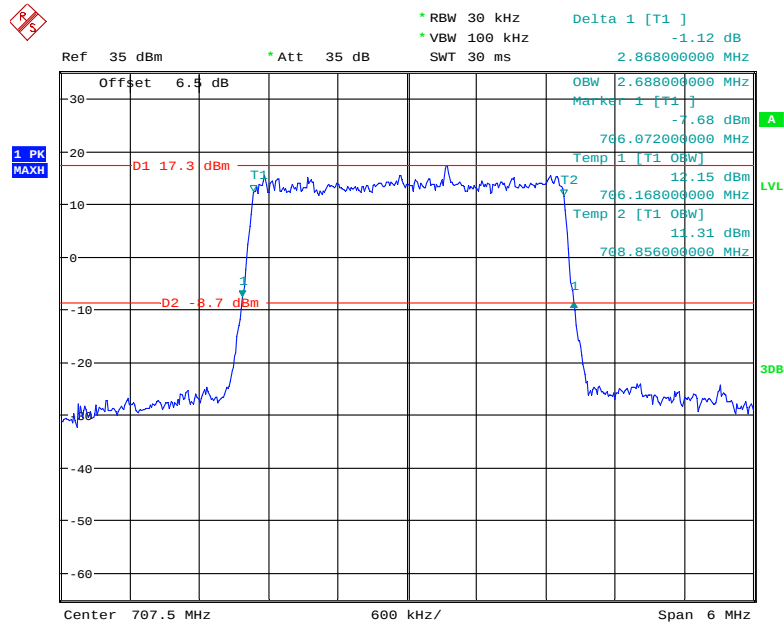
Date: 23.APR.2020 13:59:42

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



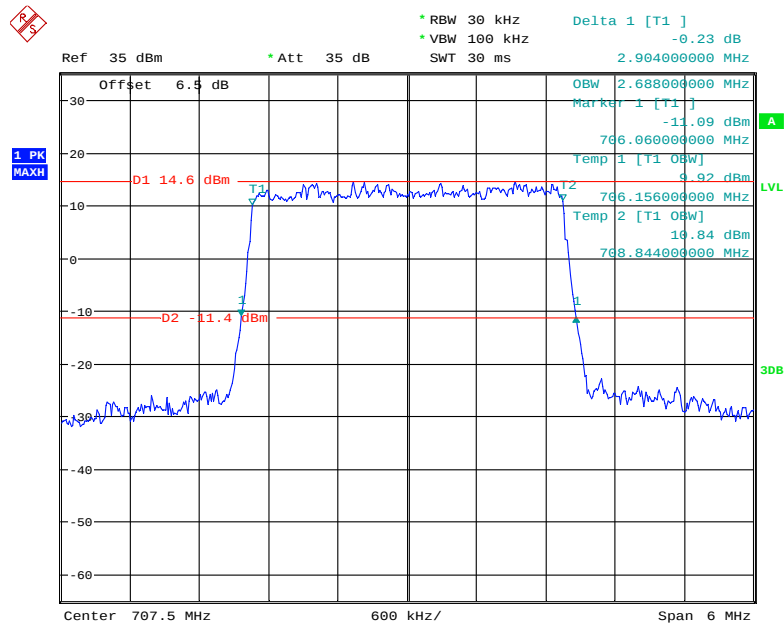
Date: 23.APR.2020 14:00:02

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

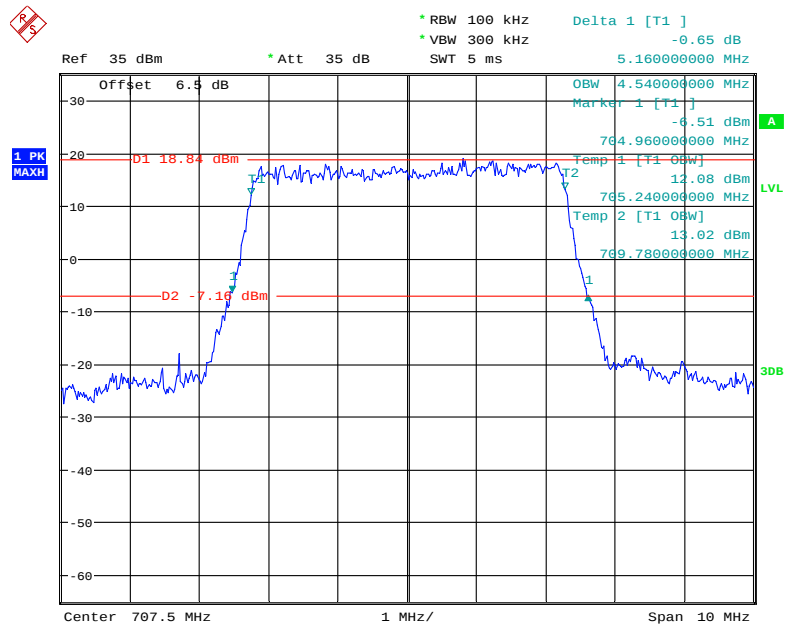


Date: 23.APR.2020 14:00:23

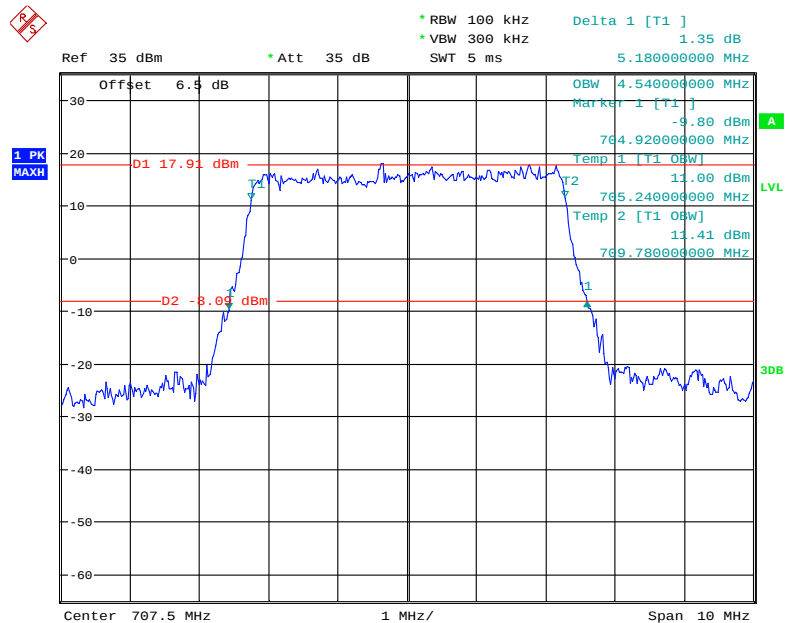
16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



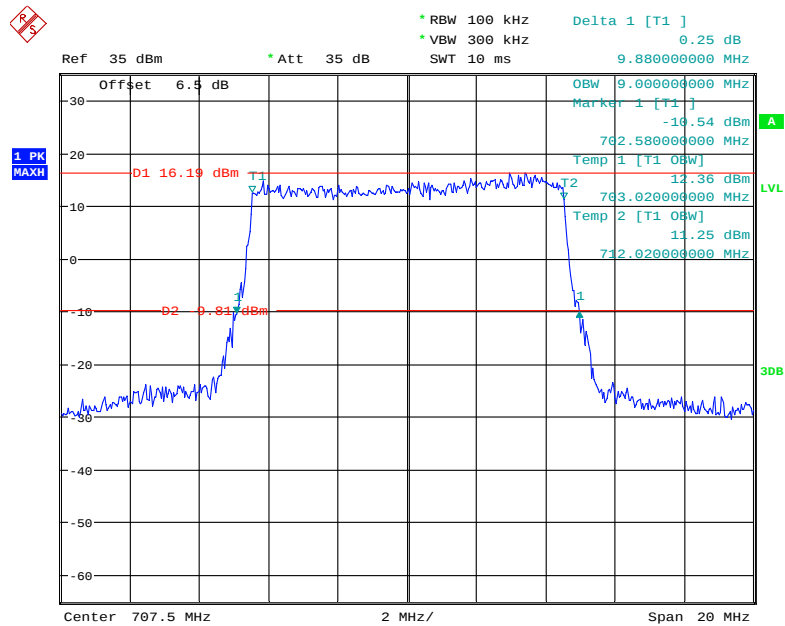
Date: 23.APR.2020 14:00:43

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

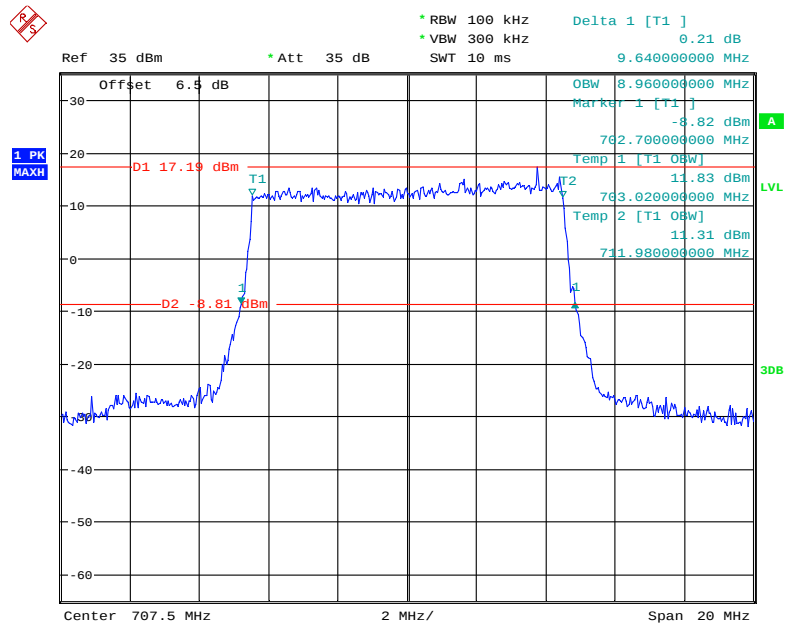
Date: 23.APR.2020 14:01:10

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

Date: 23.APR.2020 14:01:33

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

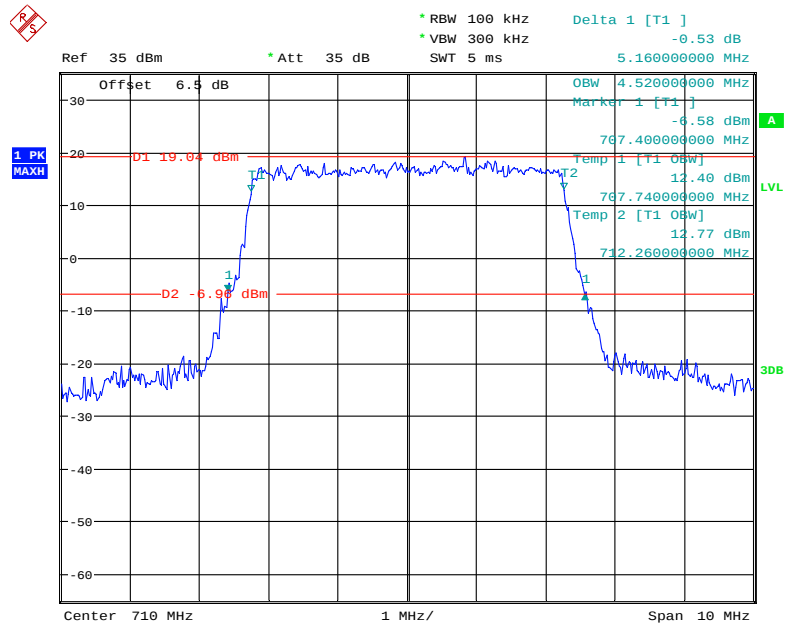
Date: 23.APR.2020 14:01:55

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

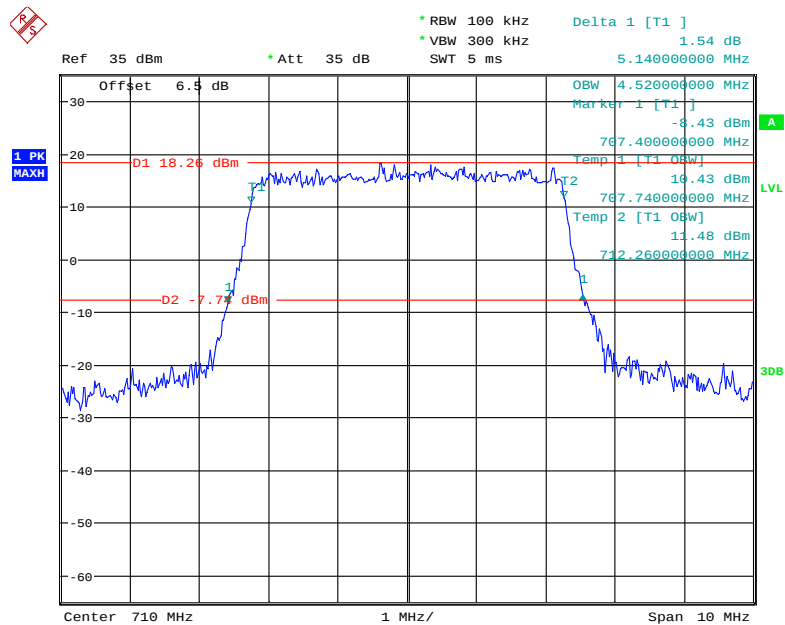
Date: 23.APR.2020 14:02:16

LTE Band 17: (Middle Channel)

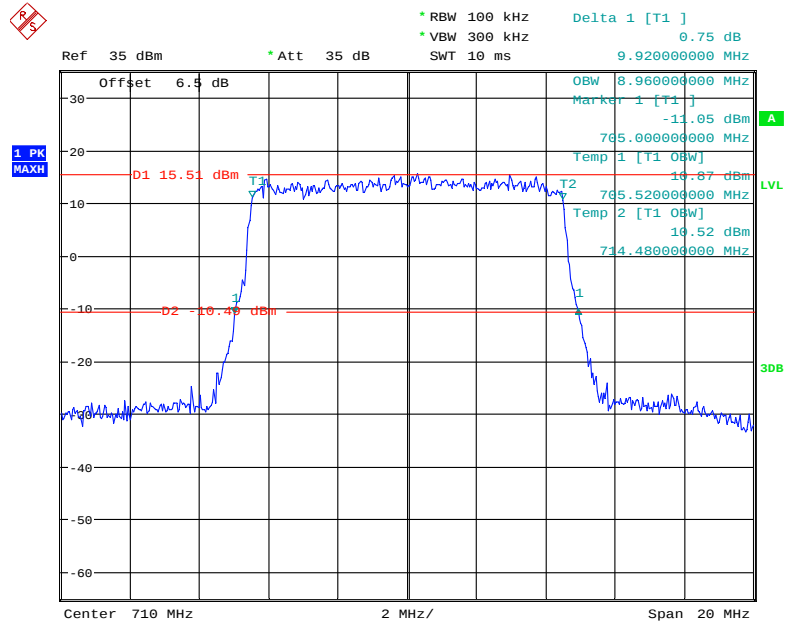
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.520	5.160
	16QAM	4.520	5.140
10.0	QPSK	8.960	9.920
	16QAM	8.960	9.720

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

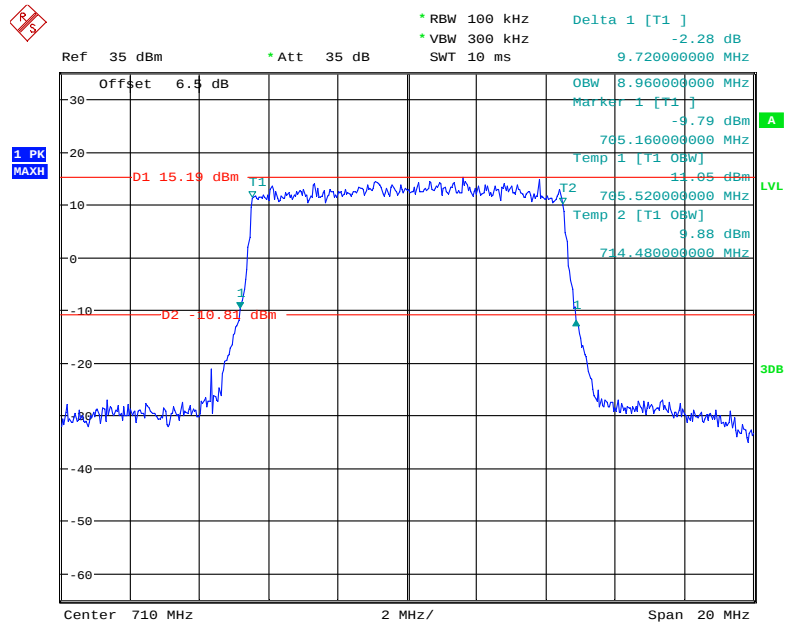
Date: 23.APR.2020 14:02:41

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

Date: 23.APR.2020 14:03:00

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

Date: 23.APR.2020 14:03:23

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

Date: 23.APR.2020 14:03:43

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

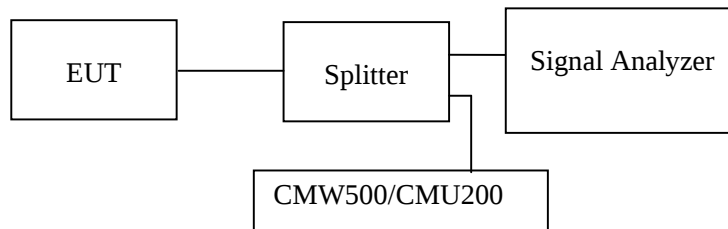
Applicable Standard

FCC §2.1051, §22.917(a) and §24.238(a) and §27.53(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 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Data

Environmental Conditions

Temperature:	24~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by George Zhong on 2020-04-23.

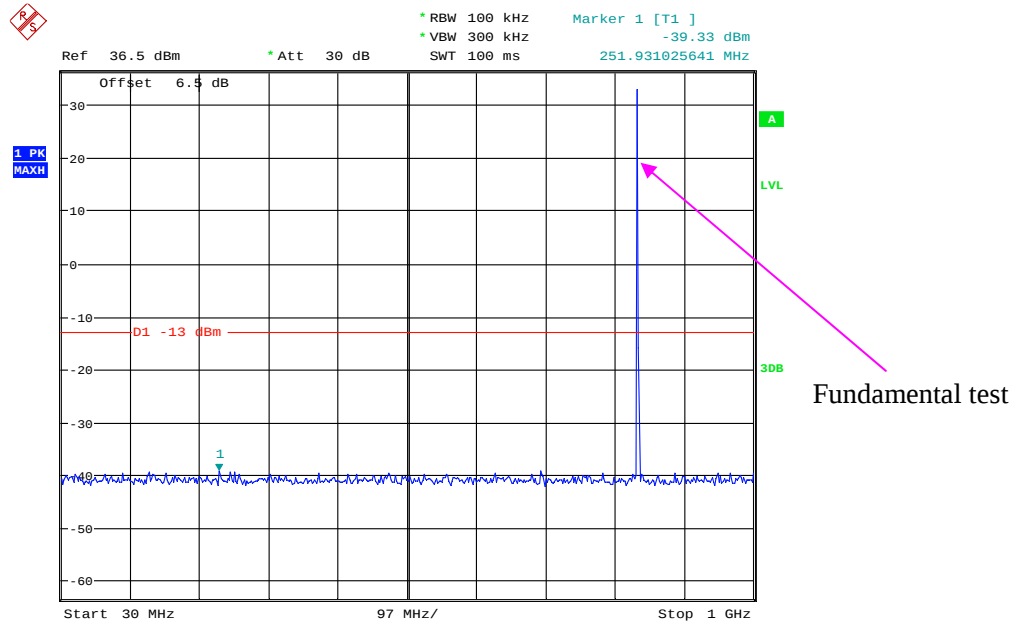
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

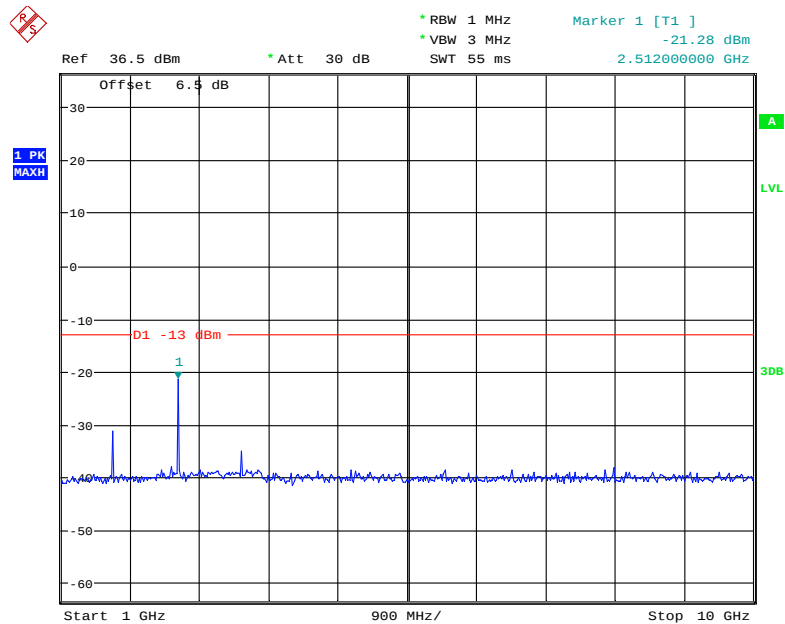
Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode)



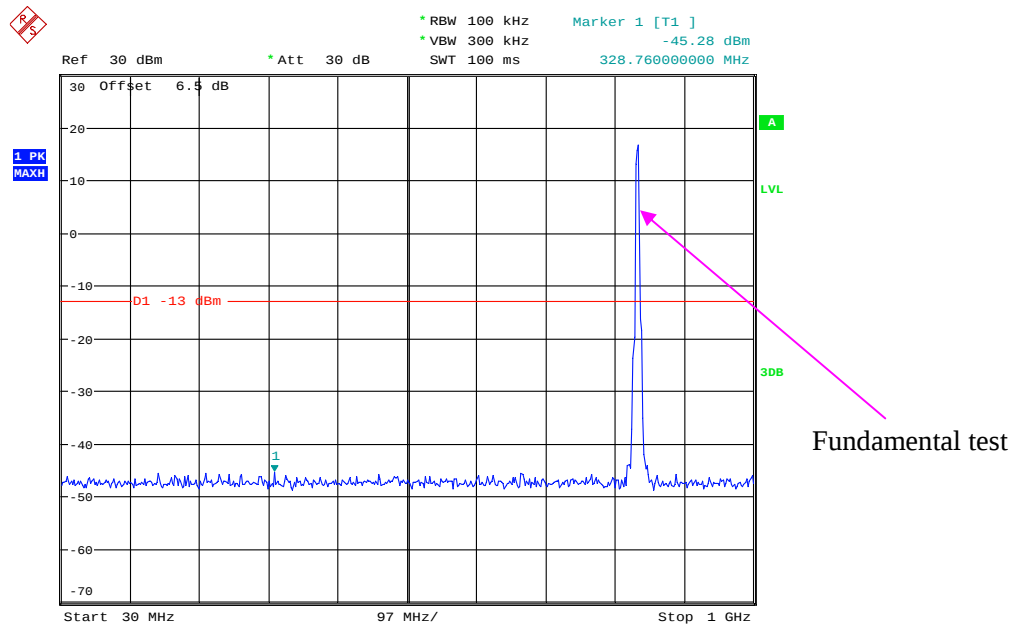
Date: 23.APR.2020 18:29:13

1 GHz – 10 GHz (GSM Mode)



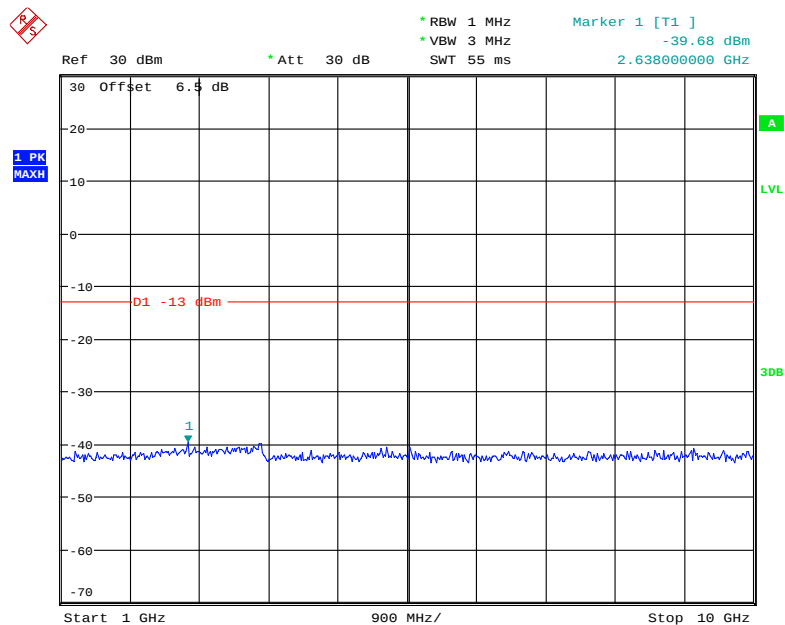
Date: 23.APR.2020 18:30:44

30 MHz – 1 GHz (WCDMA Mode)



Date: 23.APR.2020 19:44:51

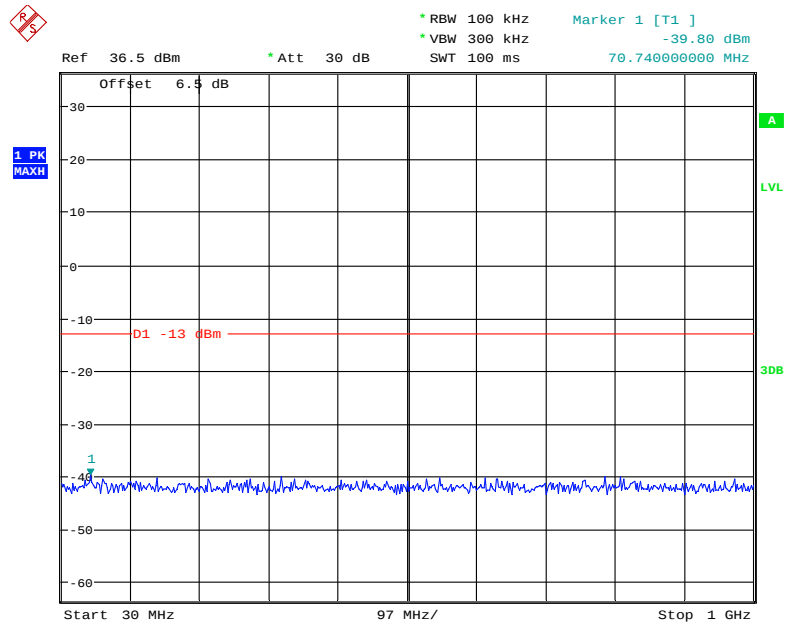
1 GHz – 10 GHz (WCDMA Mode)



Date: 23.APR.2020 19:44:15

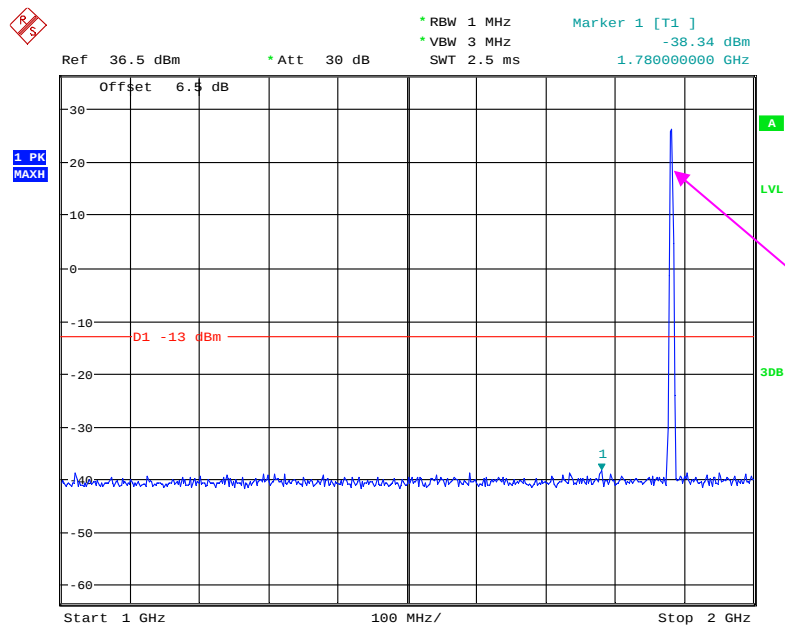
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 23.APR.2020 18:34:12

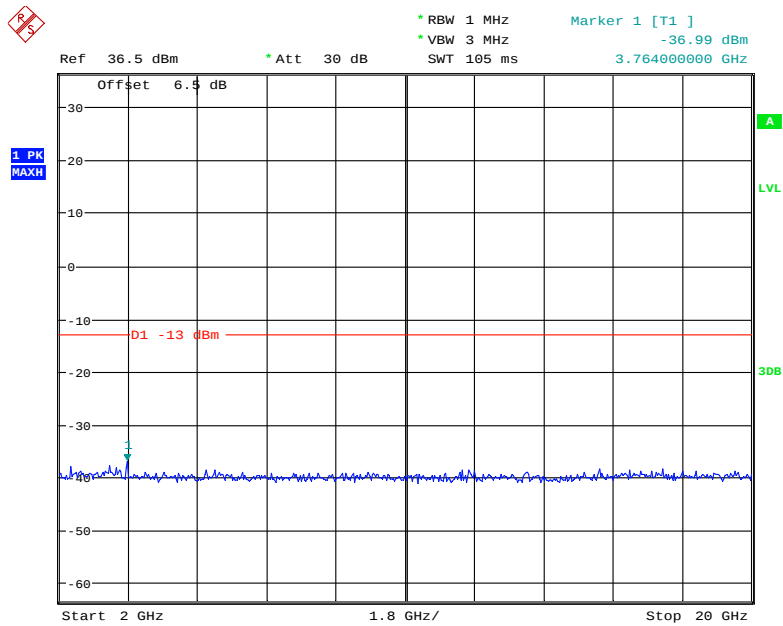
1 GHz – 2 GHz (GSM Mode)



Fundamental test

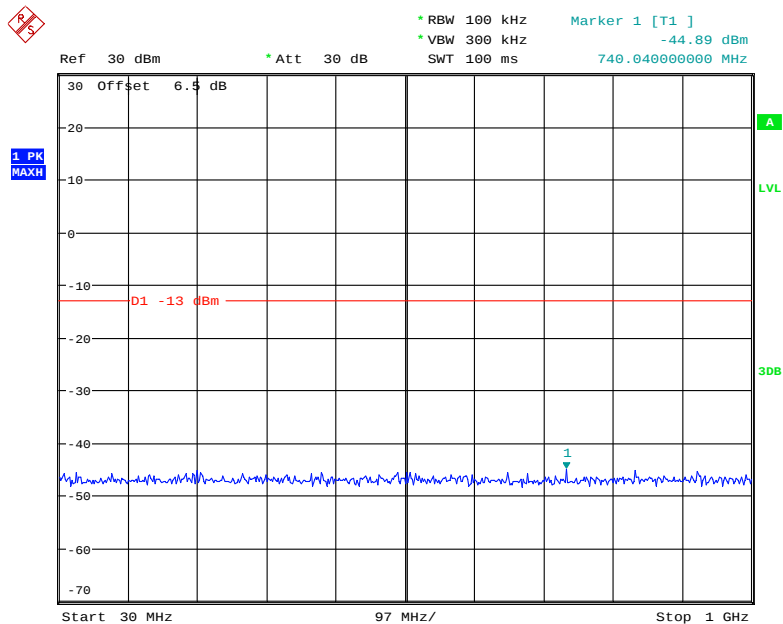
Date: 23.APR.2020 18:33:21

2 GHz – 20 GHz (GSM Mode)



Date: 23.APR.2020 18:33:53

30 MHz – 1 GHz (WCDMA Mode)



Date: 23.APR.2020 19:39:42

The spectrum plot shows a signal with a peak at 1.236 GHz. The peak is labeled '1' and has a power level of -13 dBm. The plot includes a reference line at -13 dBm and a marker at 1.236 GHz. The plot also shows the signal's bandwidth and other parameters.

Ref 30 dBm * Att 30 dB * RBW 1 MHz * VBW 3 MHz Marker 1 [T1] -40.85 dBm
SWT 2.5 ms 1.236000000 GHz

30 Offset 6.5 dB

1 PK
MAXH

D1 -13 dBm

1

Start 1 GHz 100 MHz/ Stop 2 GHz

Fundamental test

Ref 30 dBm * Att 30 dB * RBW 1 MHz * VBW 3 MHz Marker 1 [T1] -39.25 dBm
SWT 105 ms 2.93600000 GHz

30 Offset 6.5 dB

1 PK MAXH

D1 -13 dBm

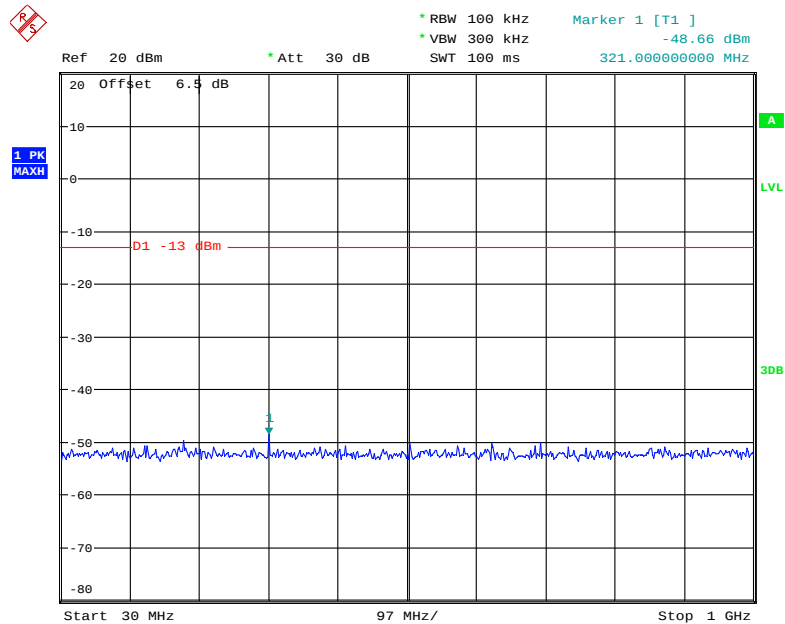
1

Start 2 GHz 1.8 GHz/ Stop 20 GHz

Page 76 of 167

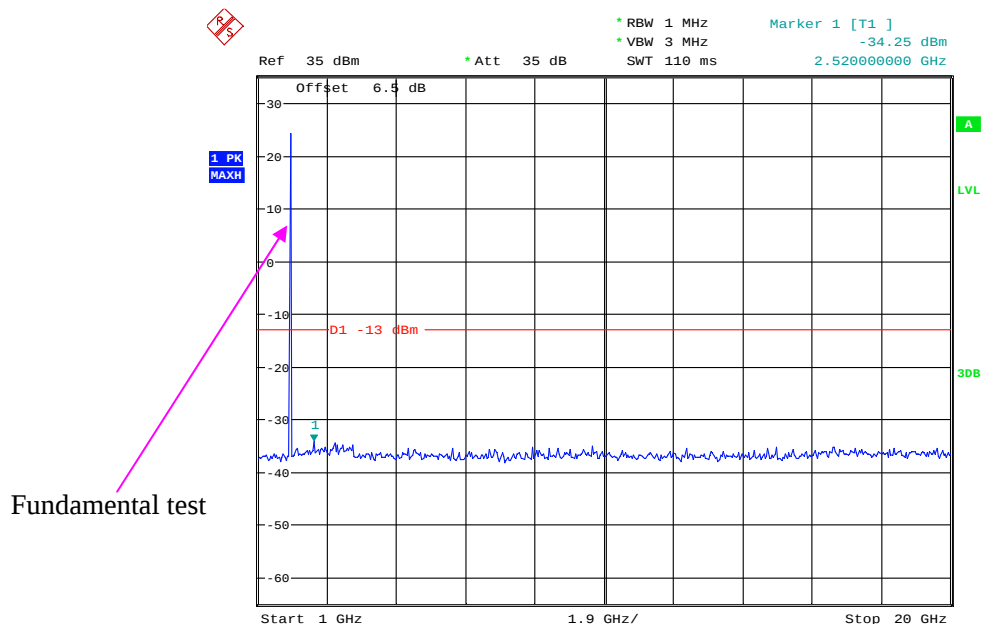
LTE Band 2:

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



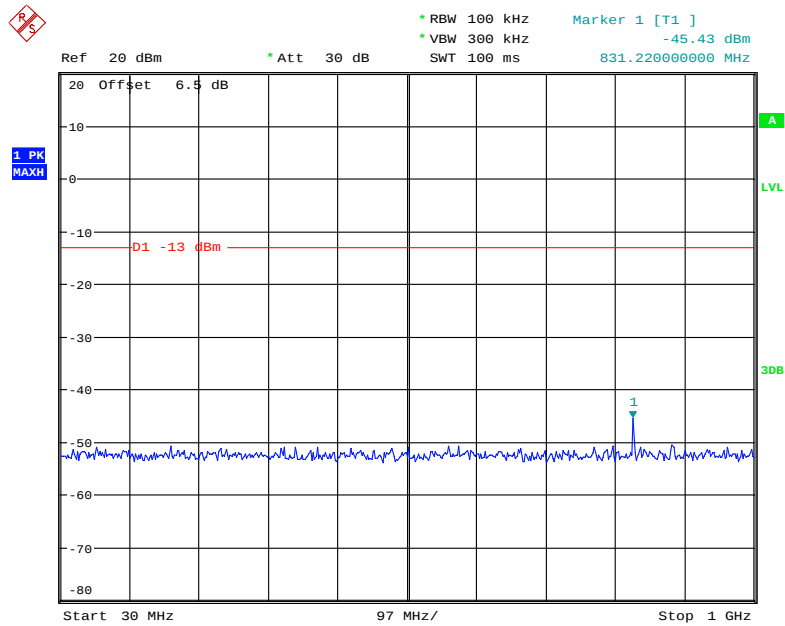
Date: 23.APR.2020 14:39:01

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



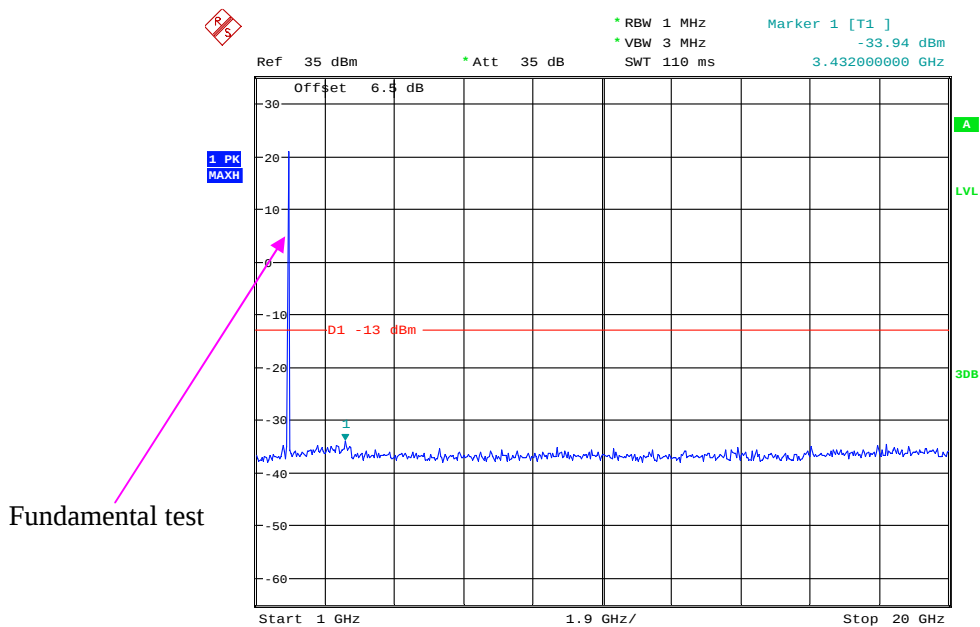
Date: 23.APR.2020 14:39:12

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



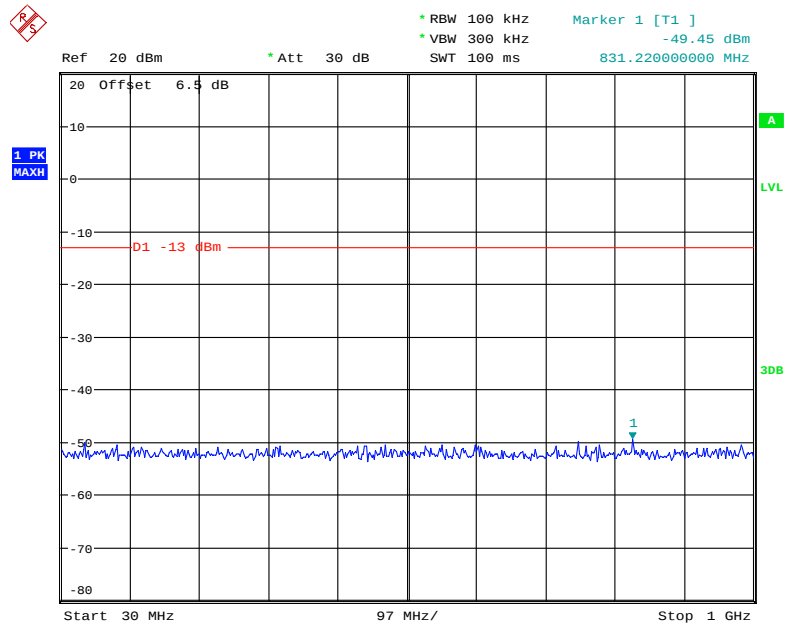
Date: 23.APR.2020 14:39:29

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



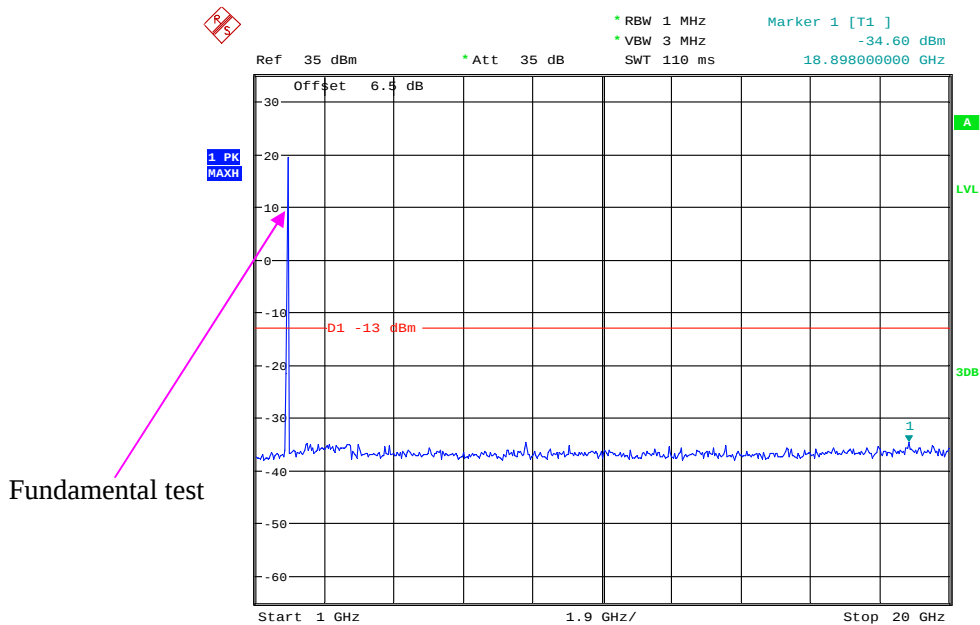
Date: 23.APR.2020 14:39:39

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



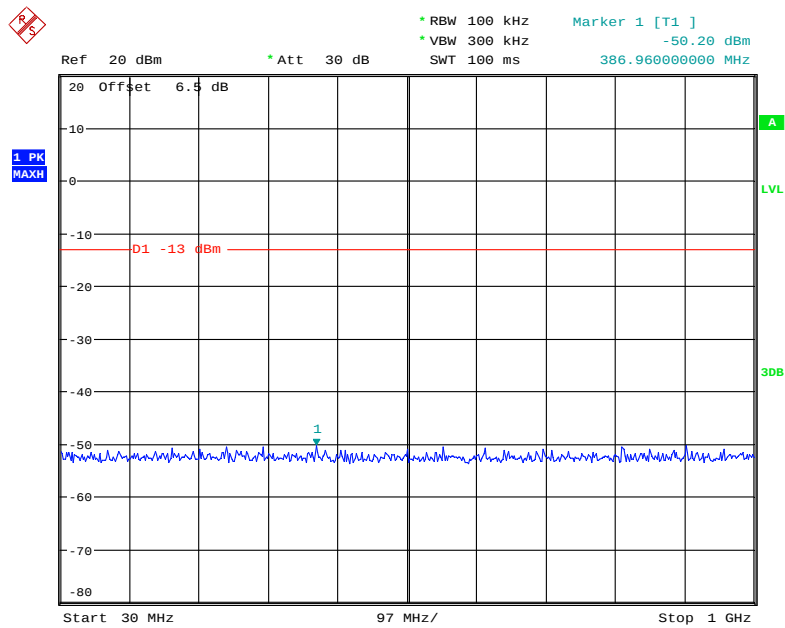
Date: 23.APR.2020 14:40:00

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



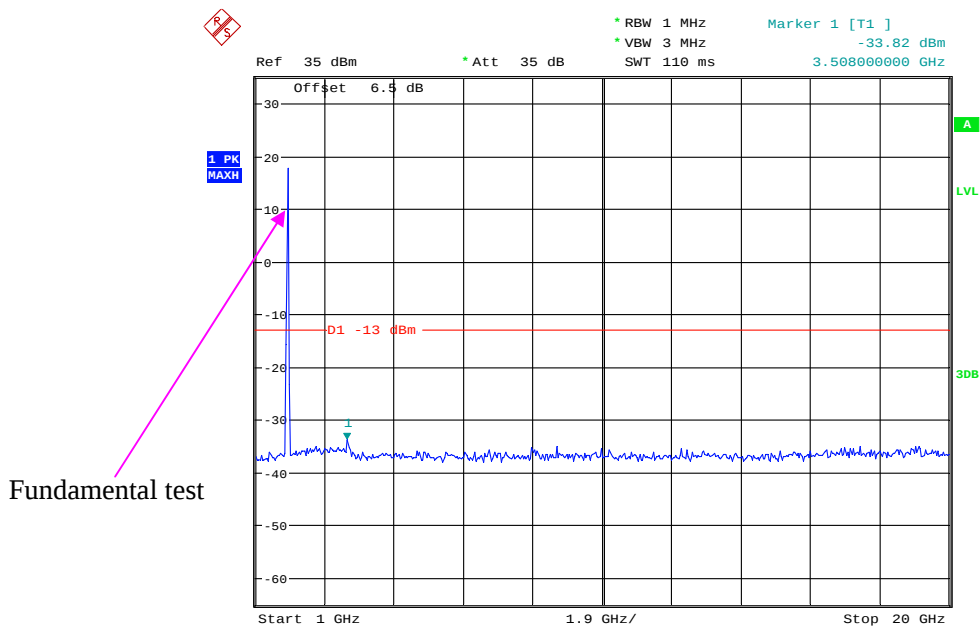
Date: 23.APR.2020 14:40:10

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



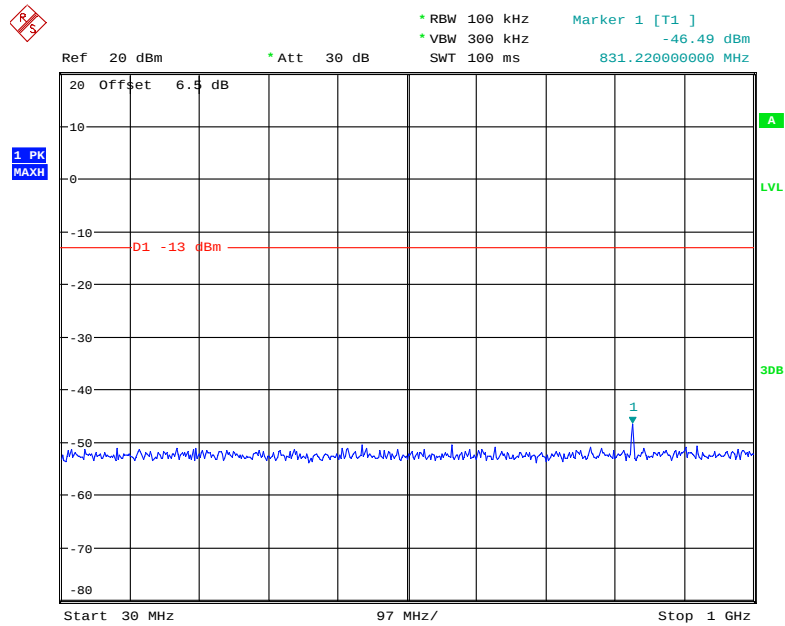
Date: 23.APR.2020 14:40:28

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



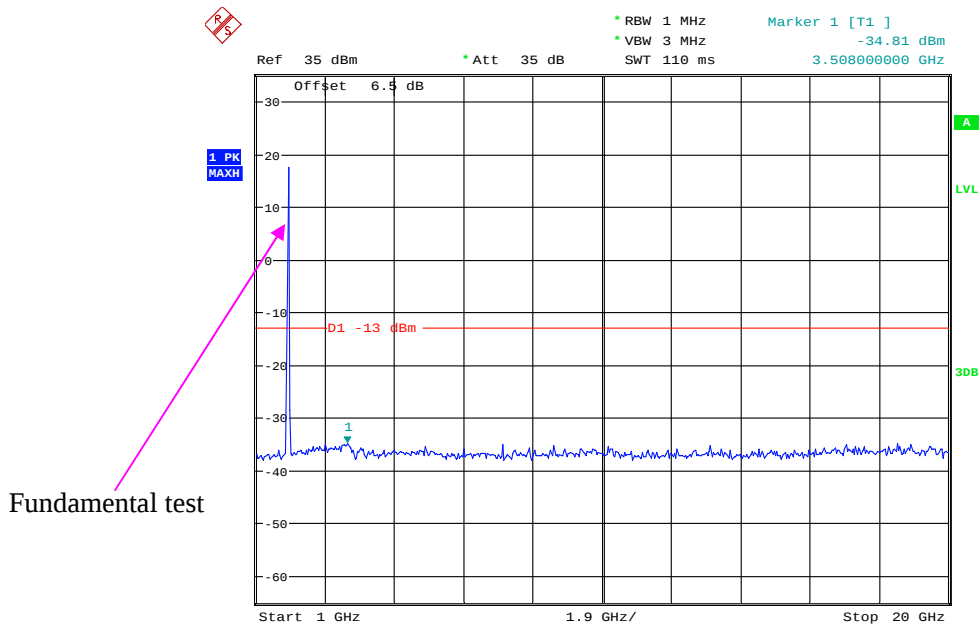
Date: 23.APR.2020 14:40:39

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



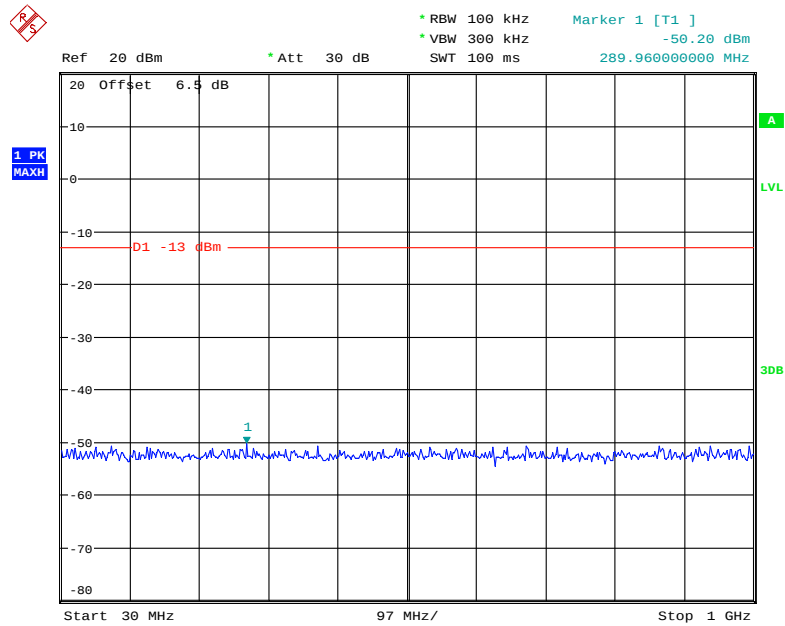
Date: 23.APR.2020 14:40:59

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



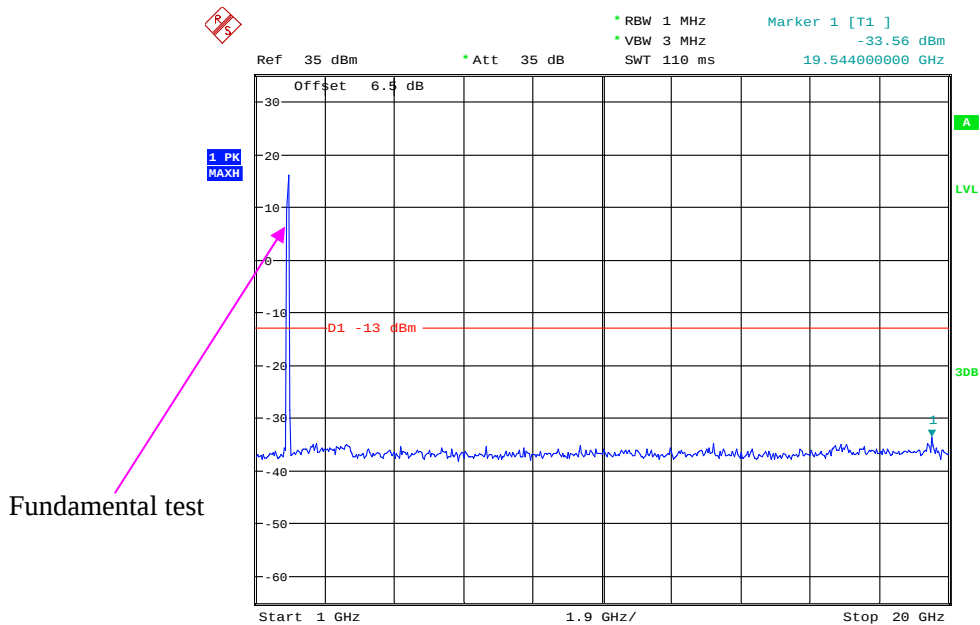
Date: 23.APR.2020 14:41:10

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



Date: 23.APR.2020 14:41:30

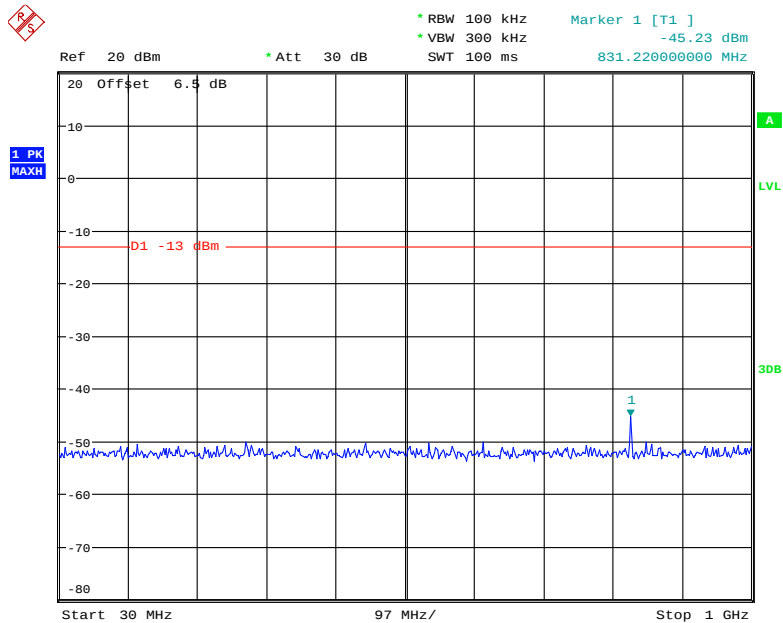
1 GHz - 20 GHz (20.0 MHz, Middle Channel)



Date: 23.APR.2020 14:41:41

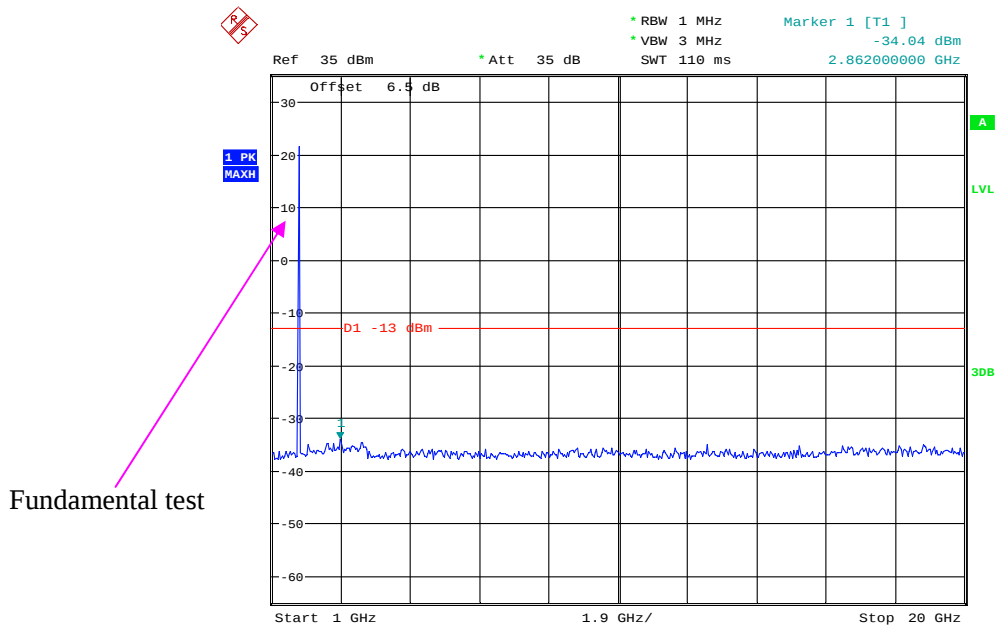
LTE Band 4:

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



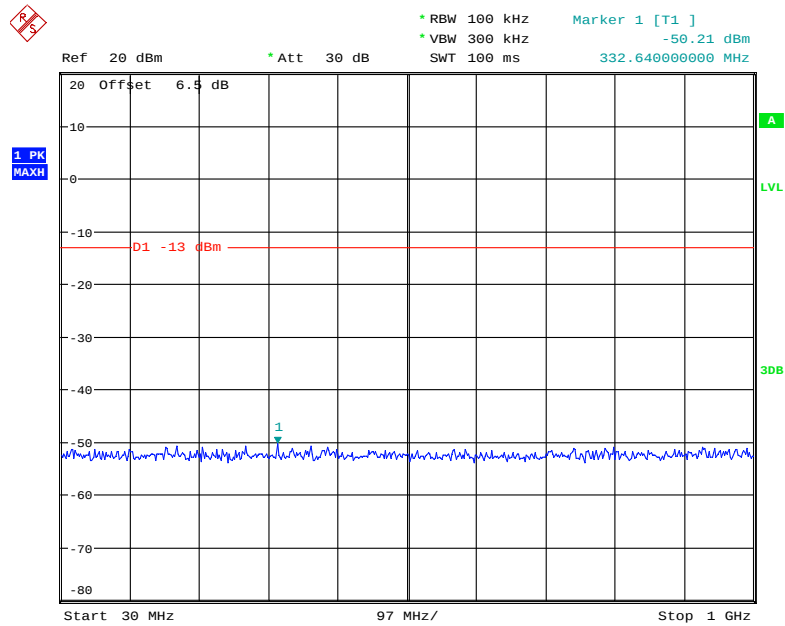
Date: 23.APR.2020 14:42:01

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



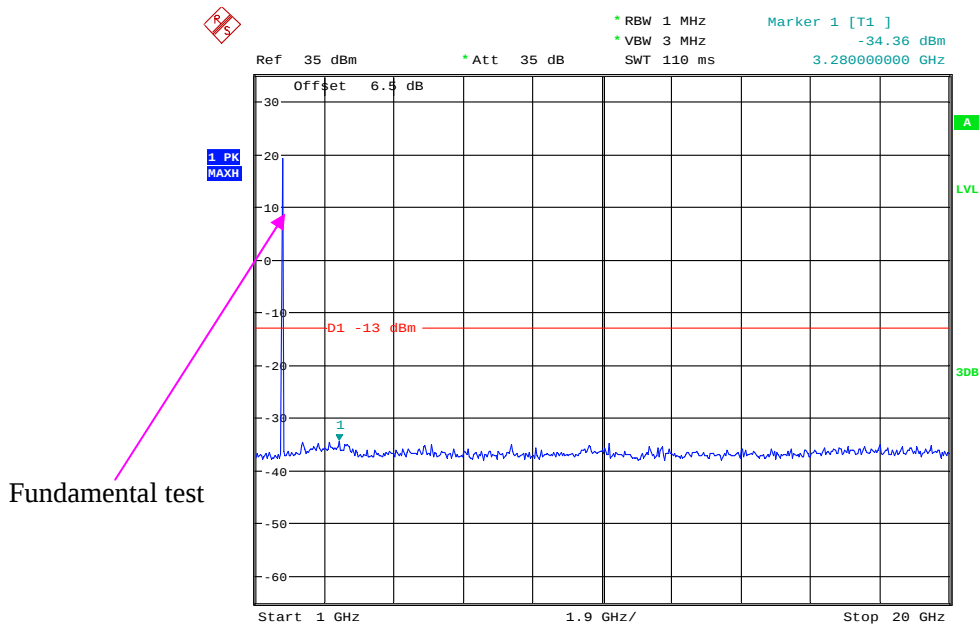
Date: 23.APR.2020 14:42:12

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



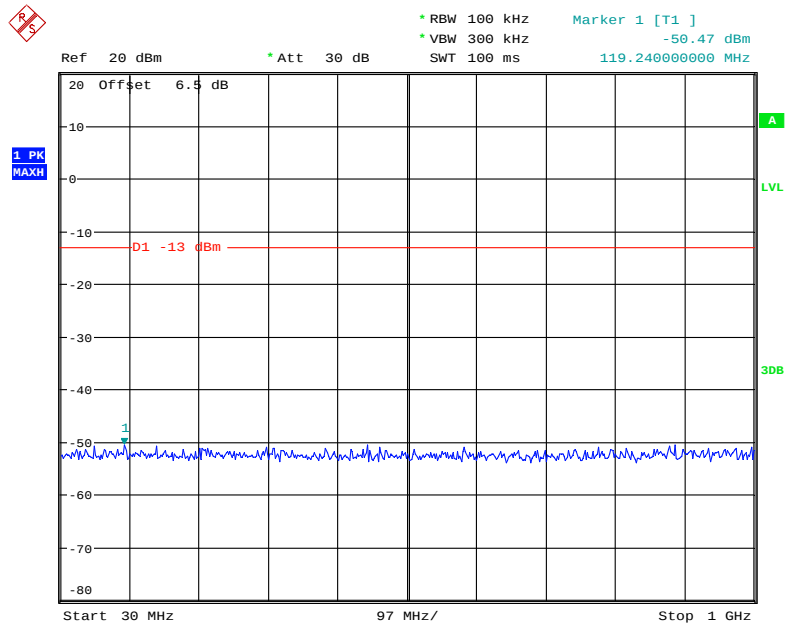
Date: 23.APR.2020 14:42:29

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



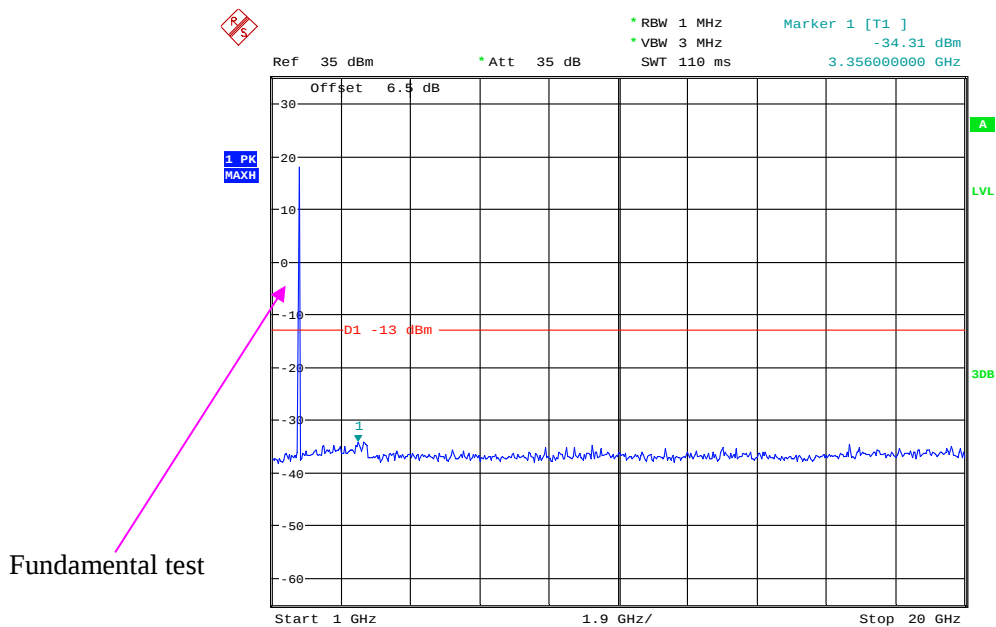
Date: 23.APR.2020 14:42:39

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



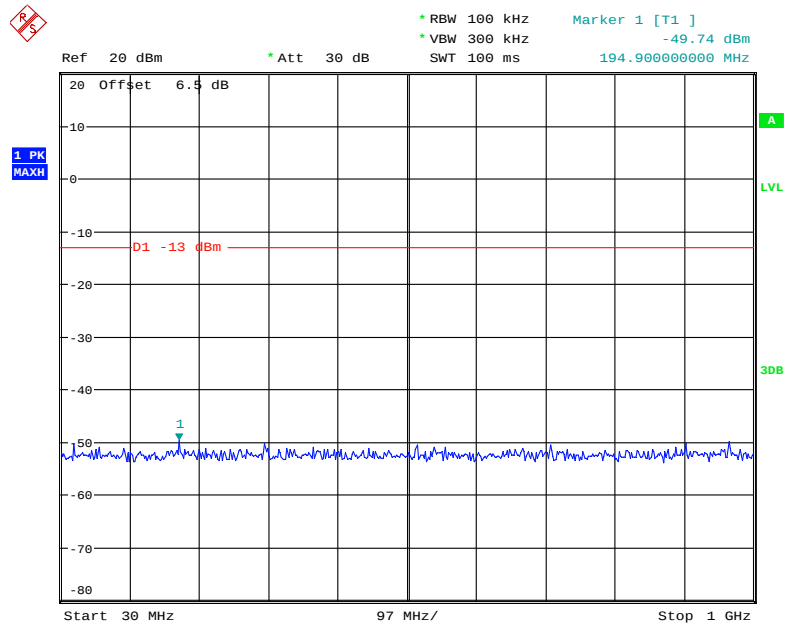
Date: 23.APR.2020 14:42:56

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



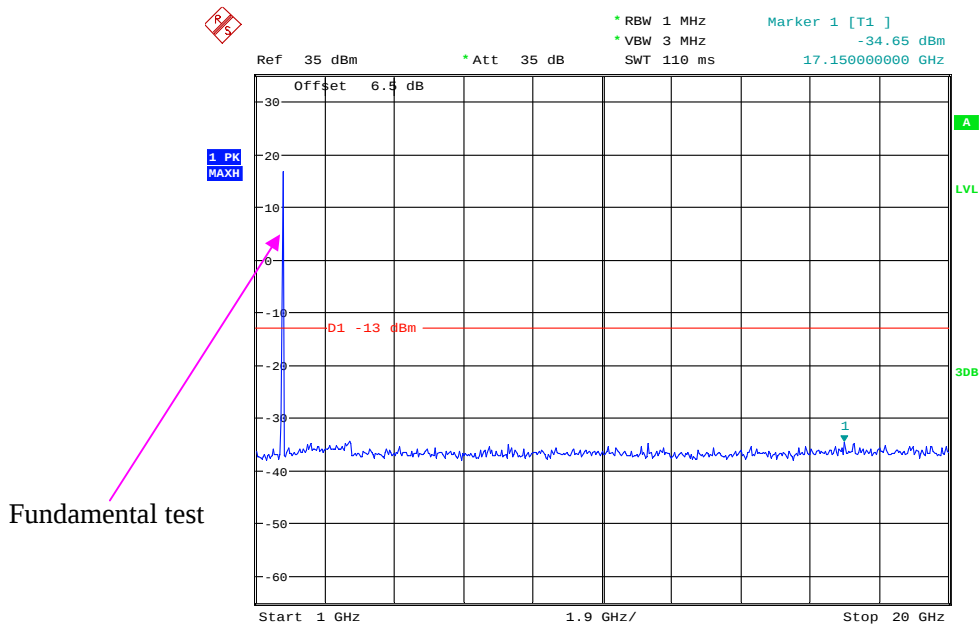
Date: 23.APR.2020 14:43:07

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



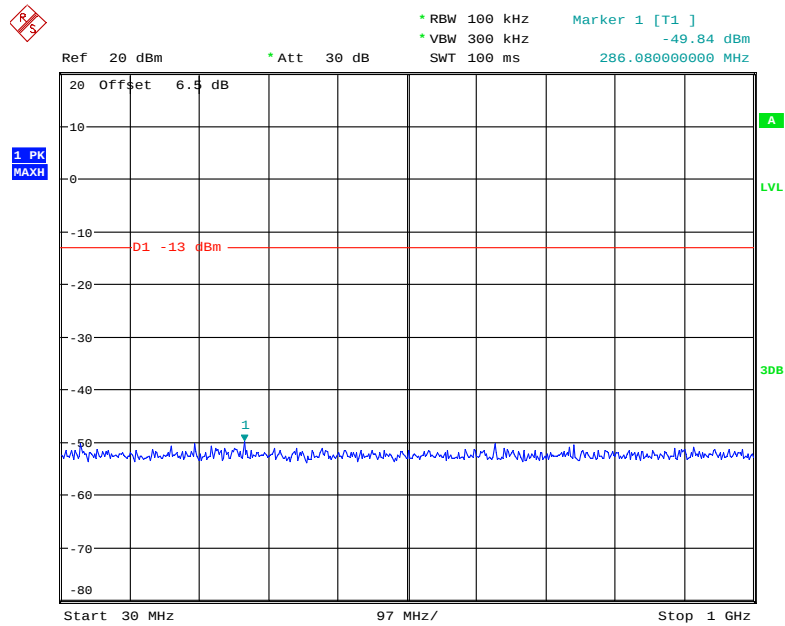
Date: 23.APR.2020 14:43:25

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



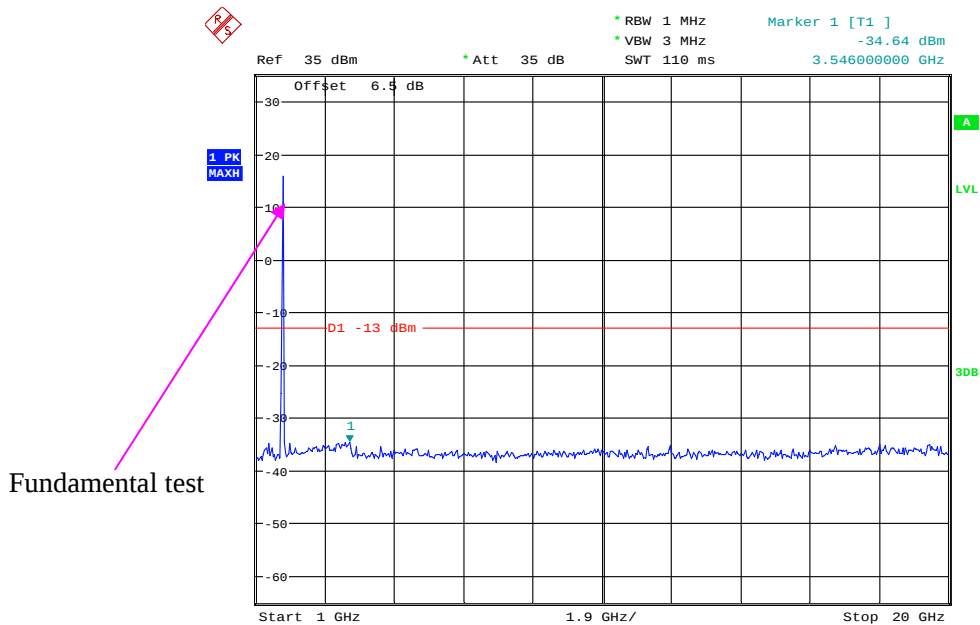
Date: 23.APR.2020 14:43:36

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



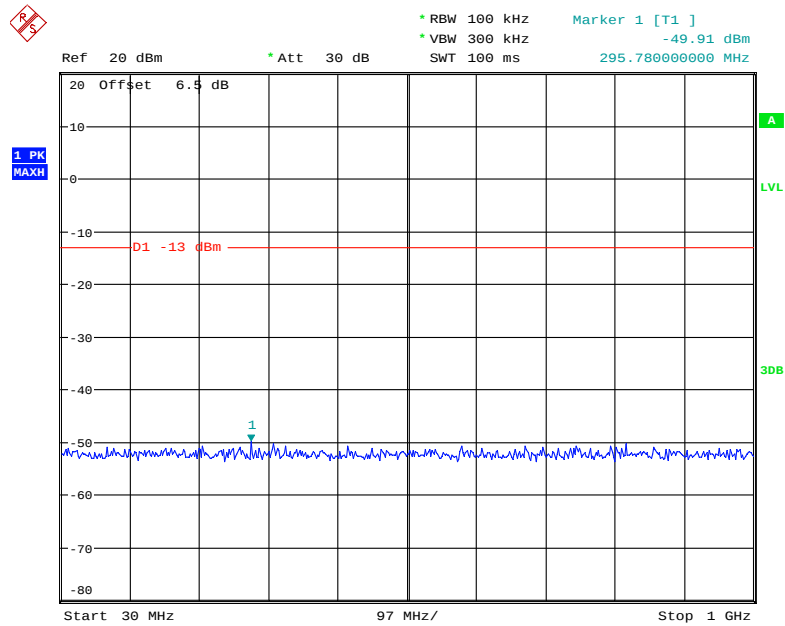
Date: 23.APR.2020 14:43:56

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



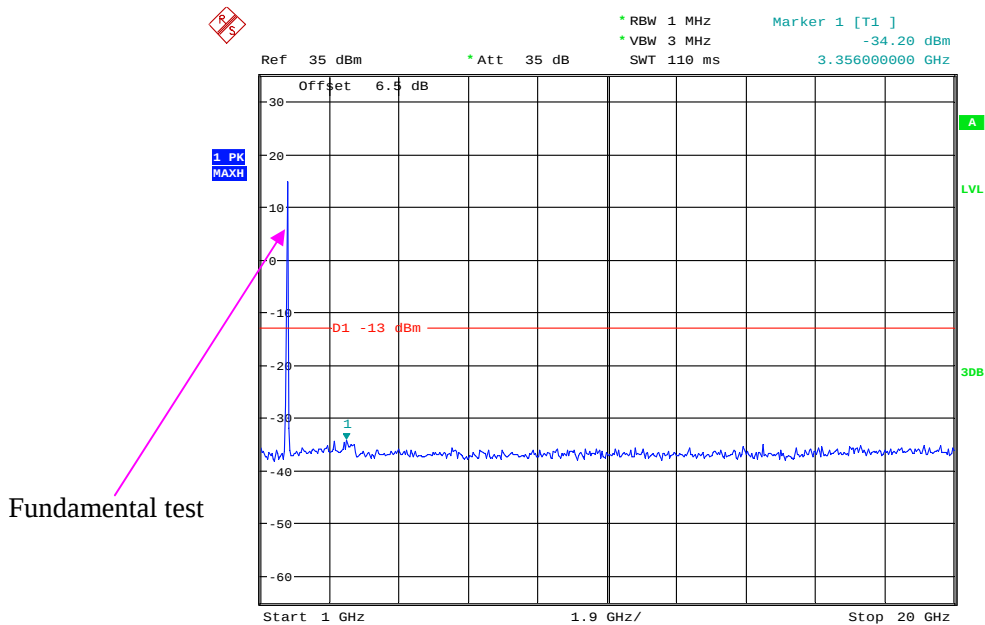
Date: 23.APR.2020 14:44:07

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



Date: 23.APR.2020 14:44:30

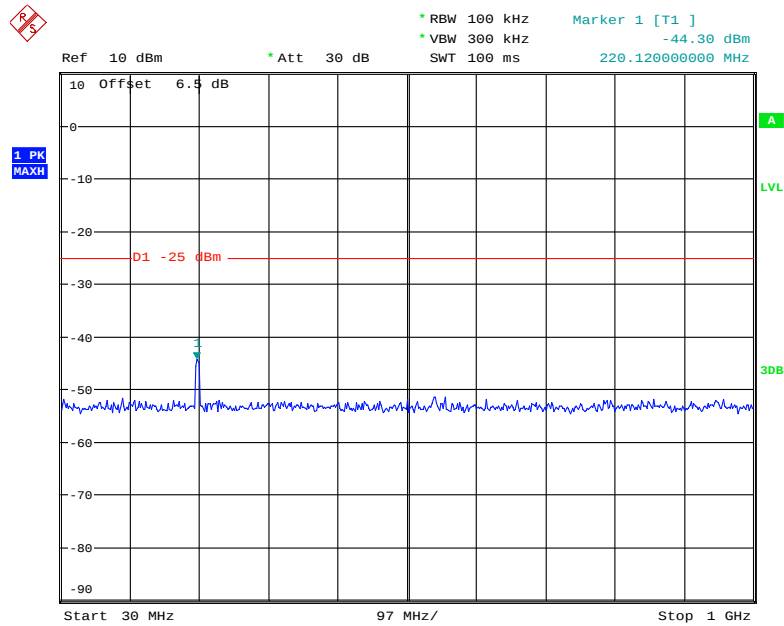
1 GHz - 20 GHz (20.0 MHz, Middle Channel)



Date: 23.APR.2020 14:44:41

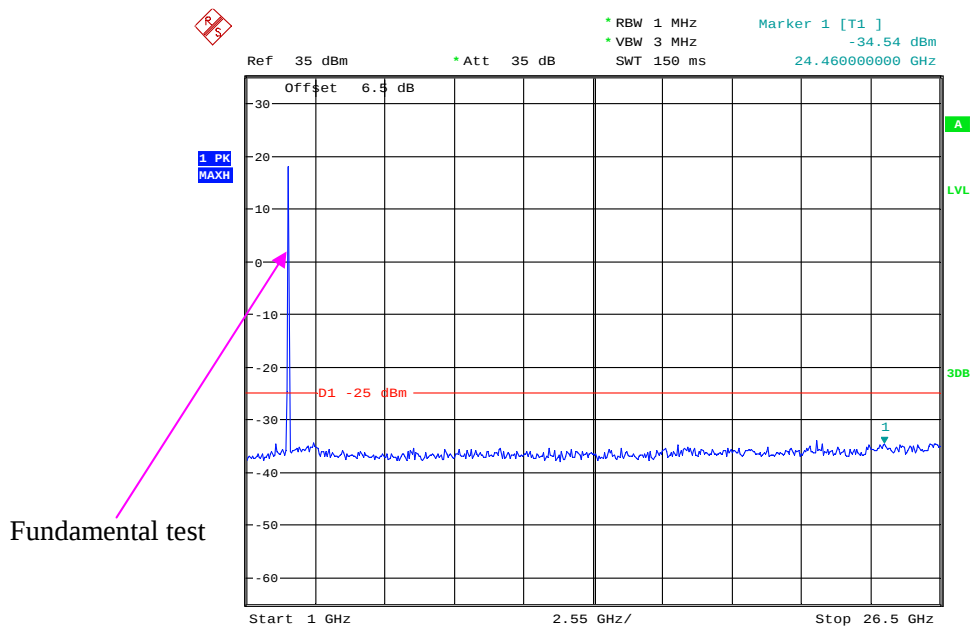
LTE Band 7:

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



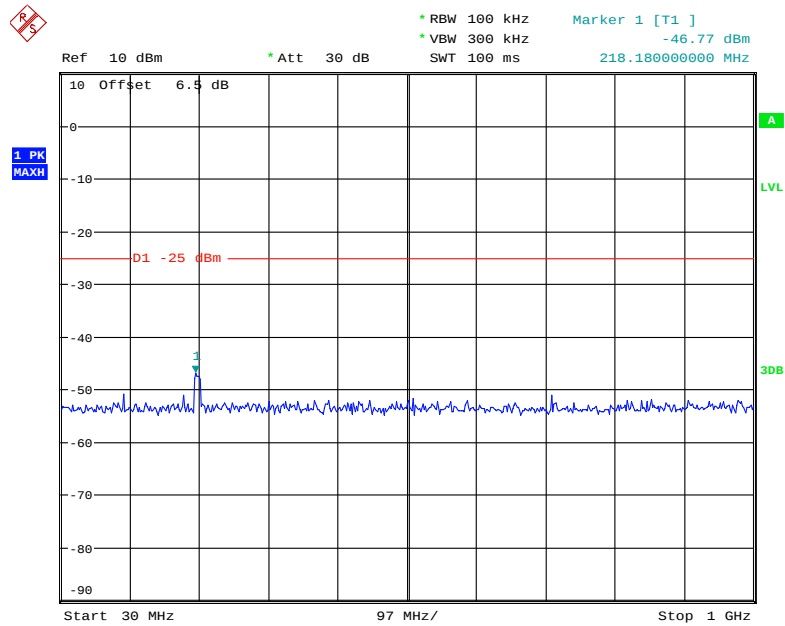
Date: 23.APR.2020 14:45:01

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



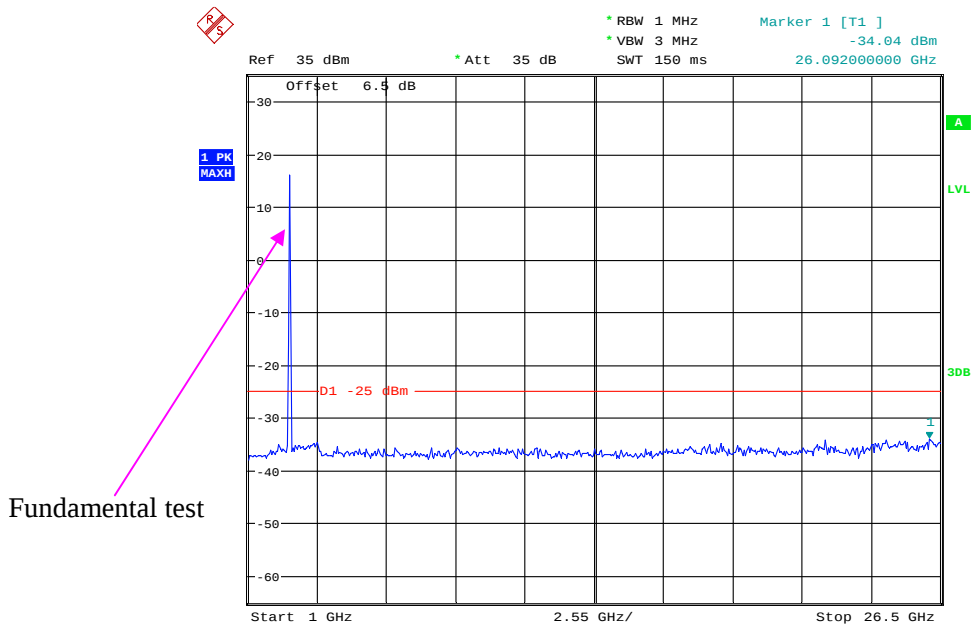
Date: 23.APR.2020 14:45:12

30 MHz – 1.0 GHz (10.0 MHz, Middle Channel)



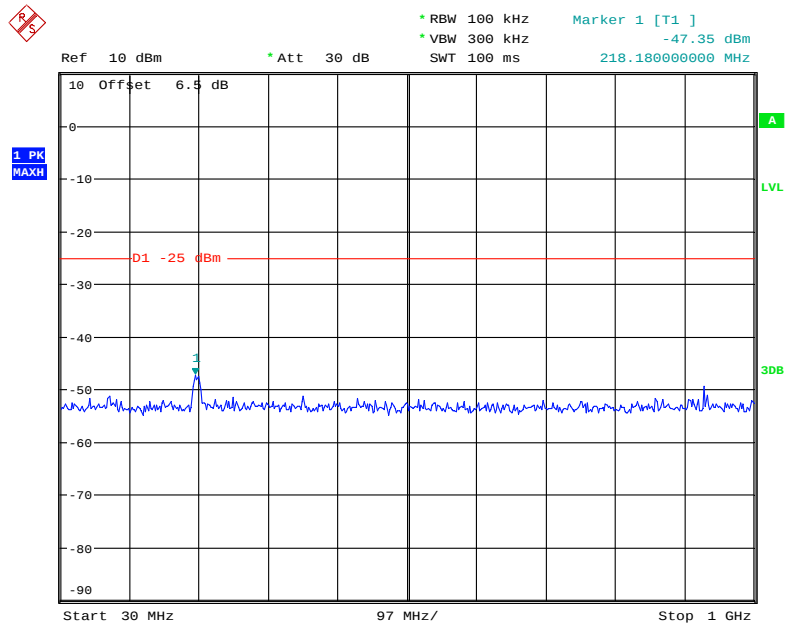
Date: 23.APR.2020 14:45:30

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



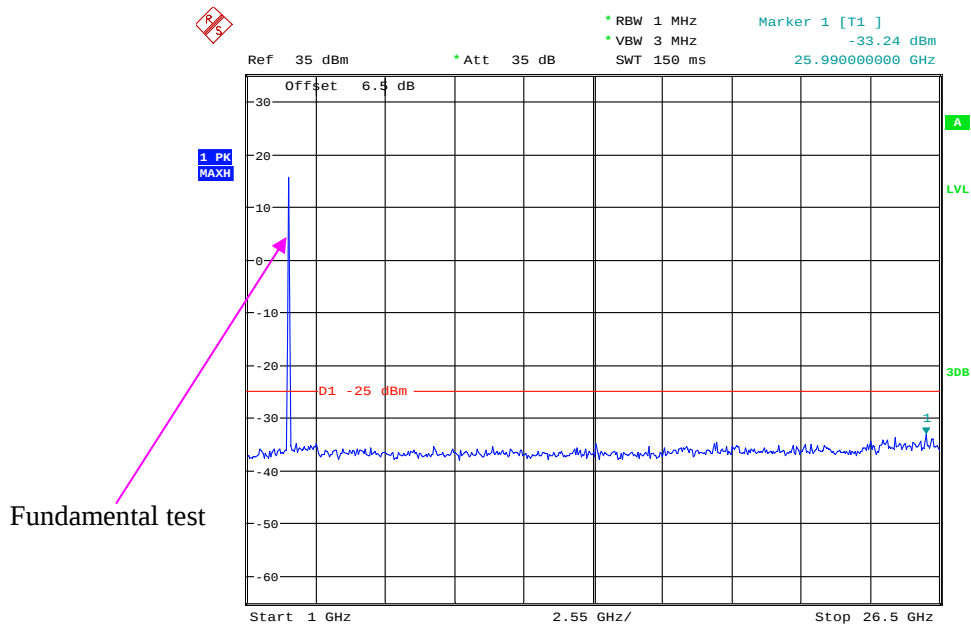
Date: 23.APR.2020 14:45:40

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



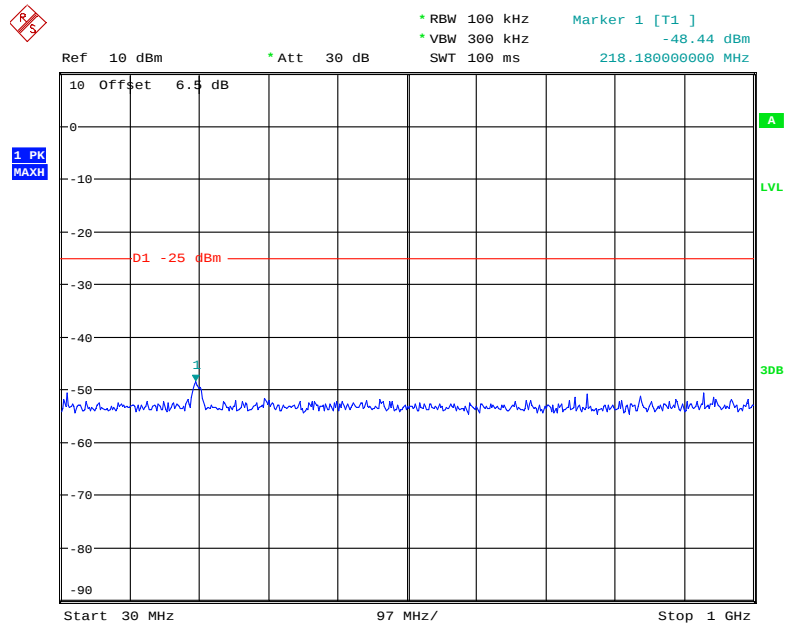
Date: 23.APR.2020 14:46:04

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



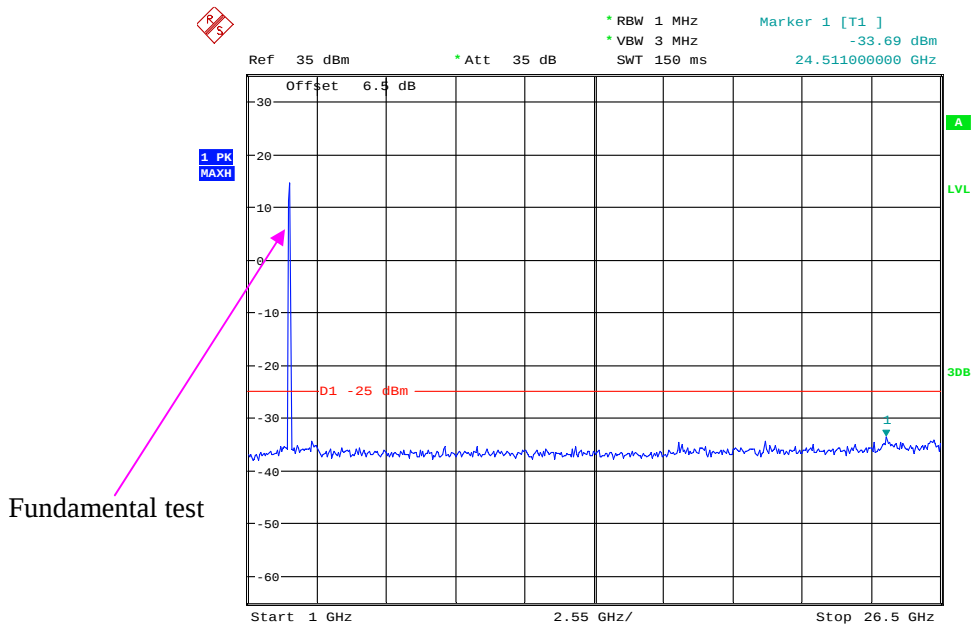
Date: 23.APR.2020 14:46:15

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



Date: 23.APR.2020 14:46:38

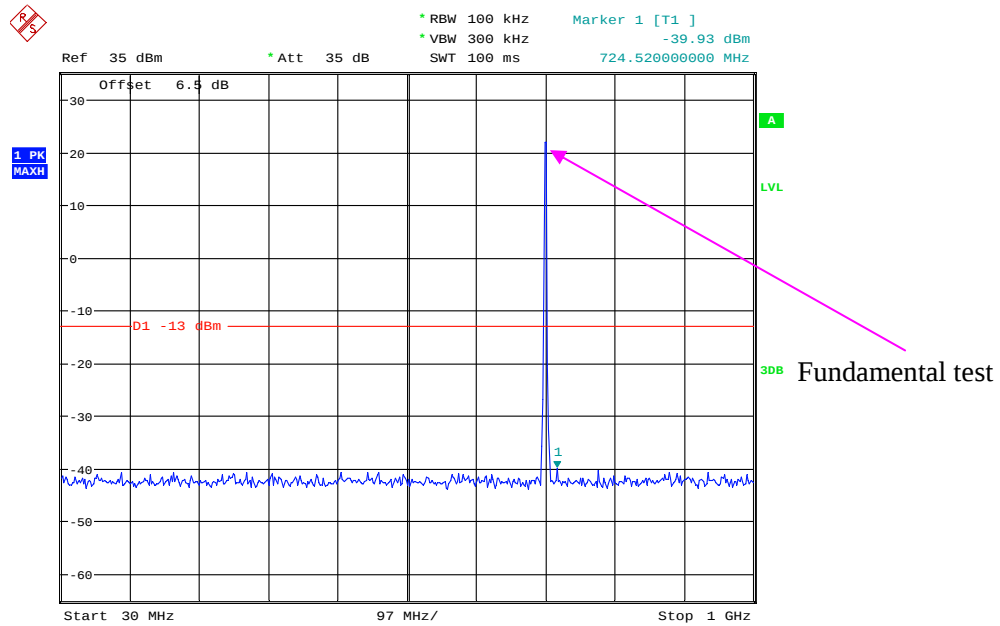
1 GHz – 26.5 GHz (20.0 MHz, Middle Channel)



Date: 23.APR.2020 14:46:48

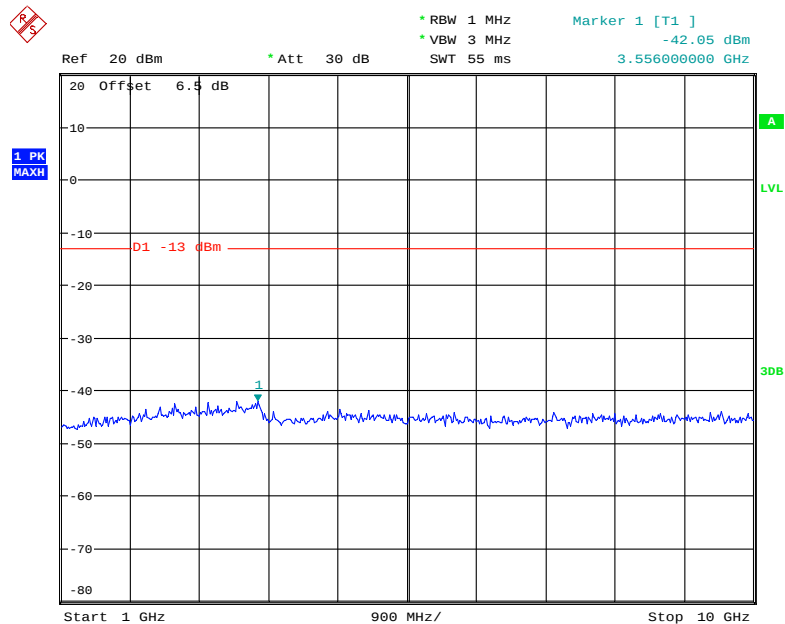
LTE Band 12:

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



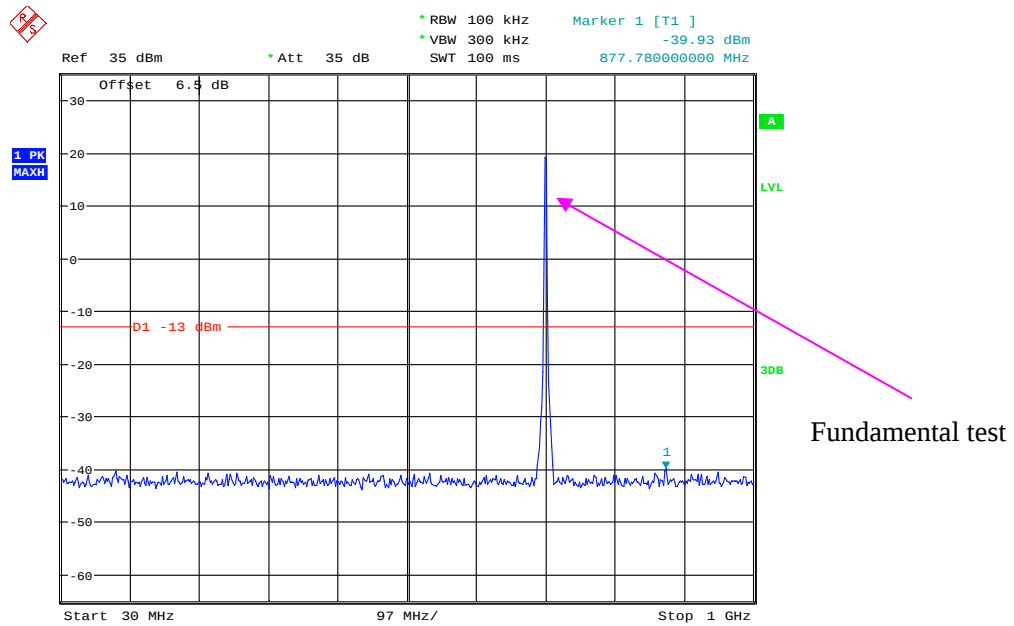
Date: 23.APR.2020 14:47:06

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



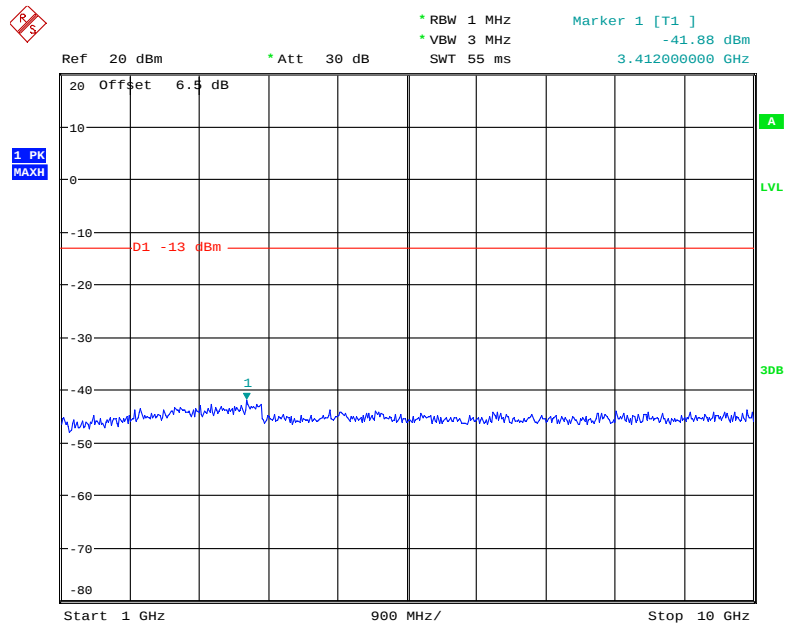
Date: 23.APR.2020 14:47:16

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



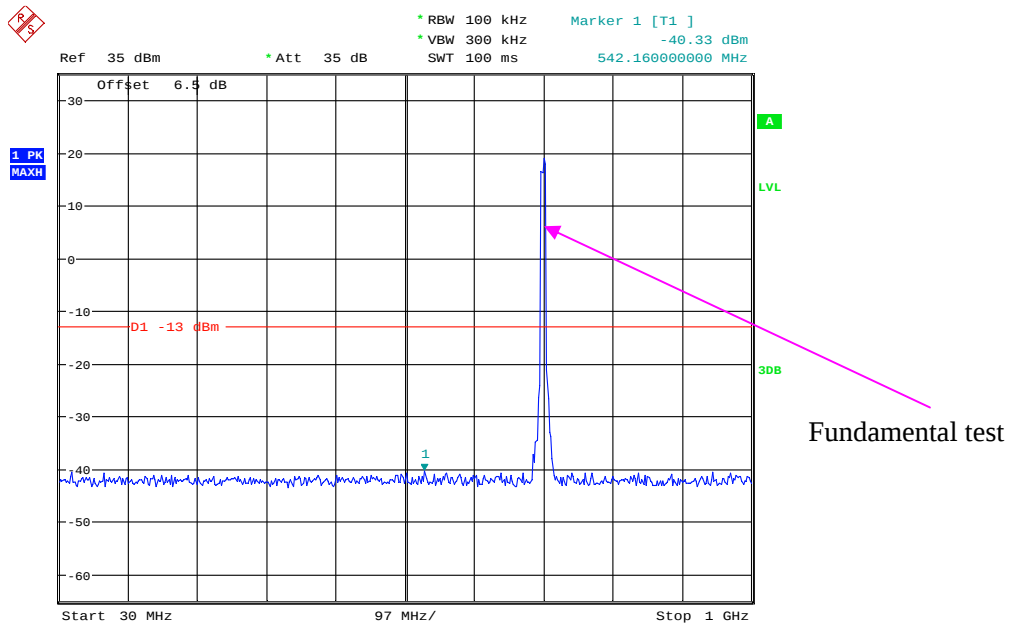
Date: 23.APR.2020 14:47:34

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



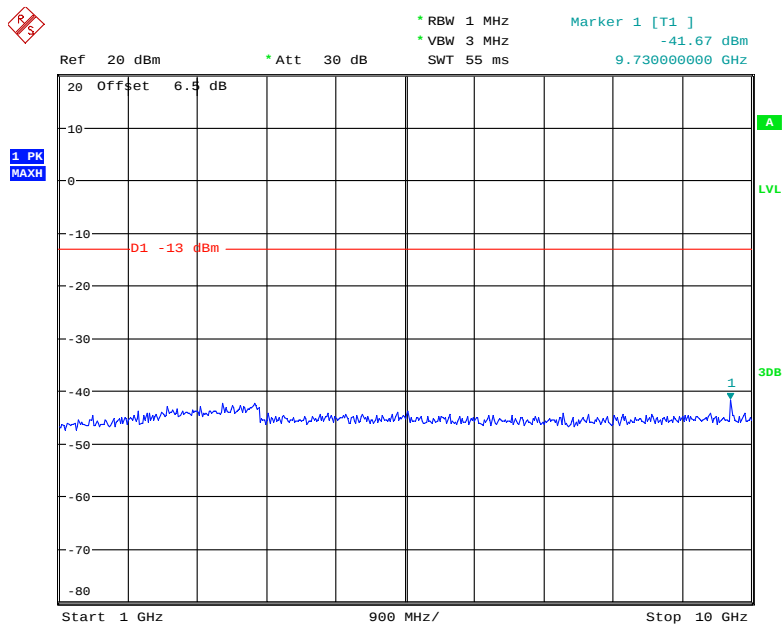
Date: 23.APR.2020 14:47:44

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



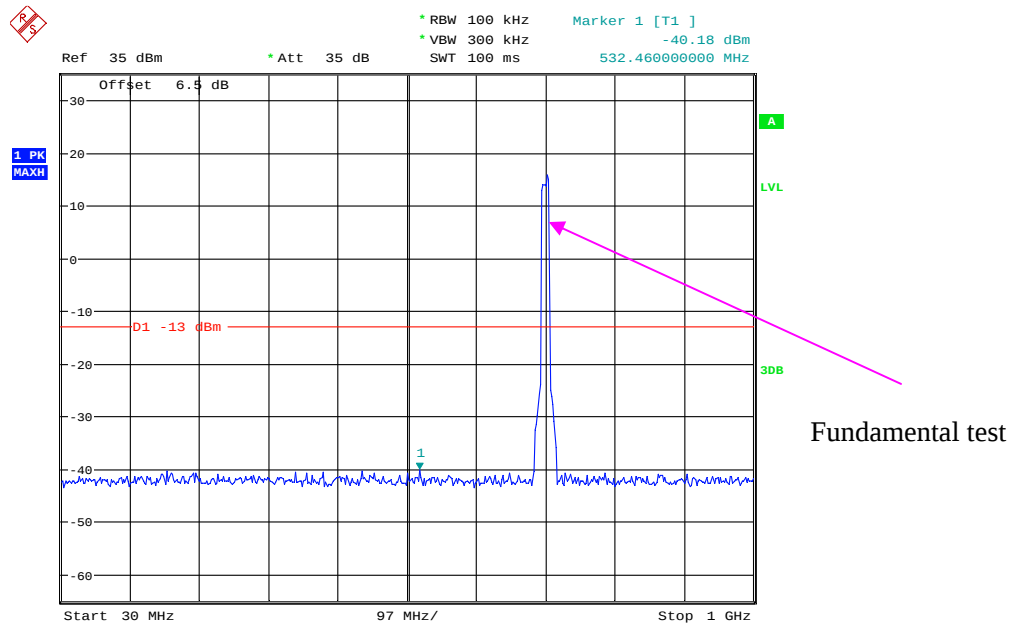
Date: 23.APR.2020 14:48:04

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



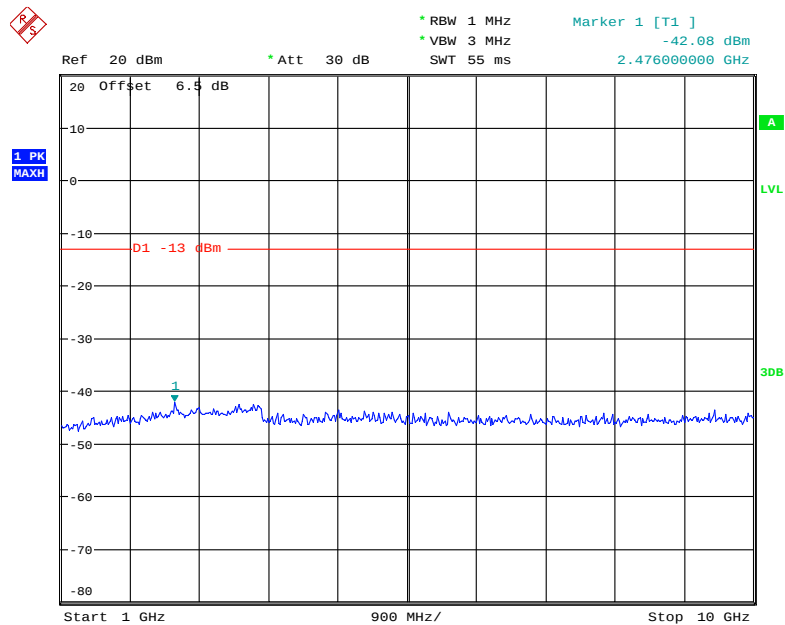
Date: 23.APR.2020 14:48:15

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



Date: 23.APR.2020 14:48:36

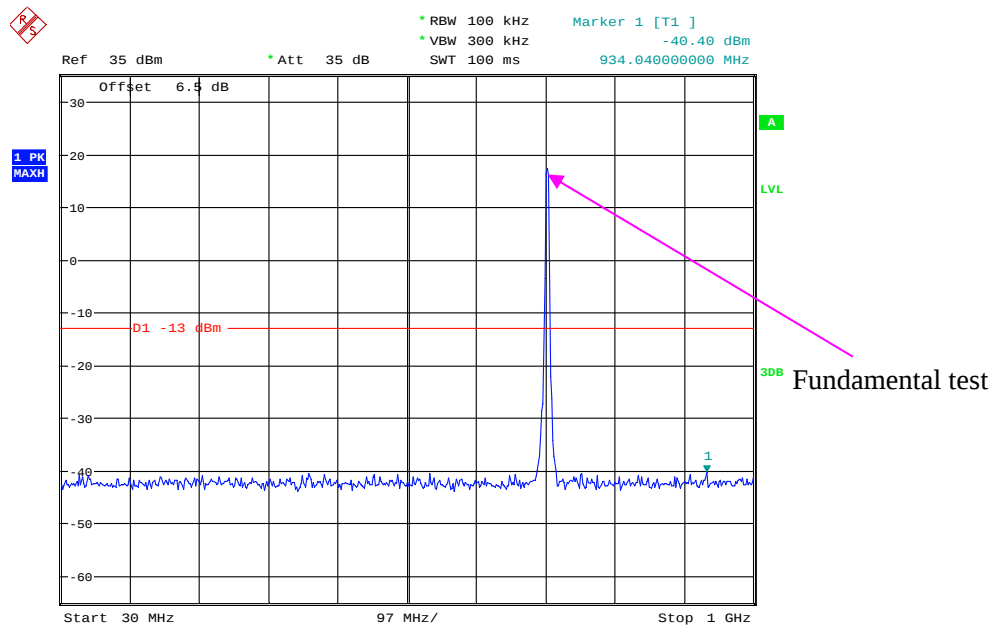
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 23.APR.2020 14:48:47

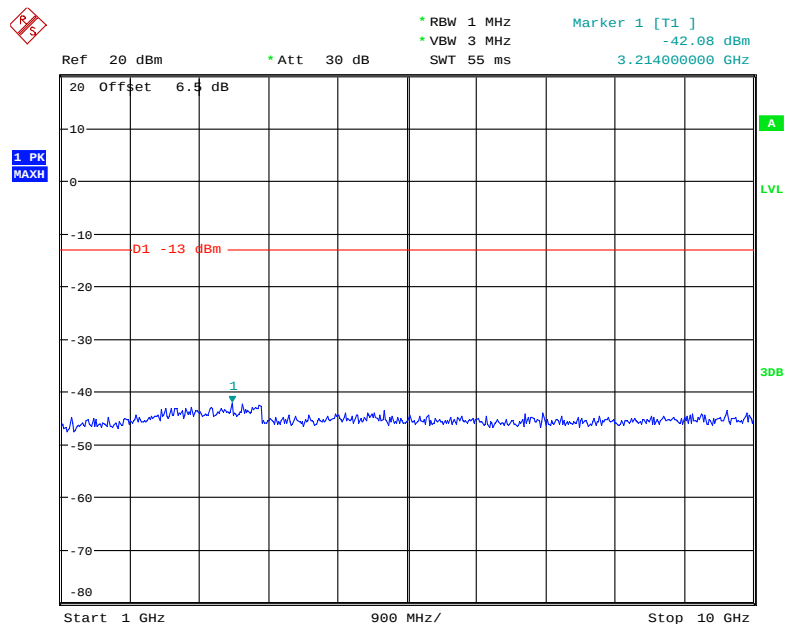
LTE Band 17:

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



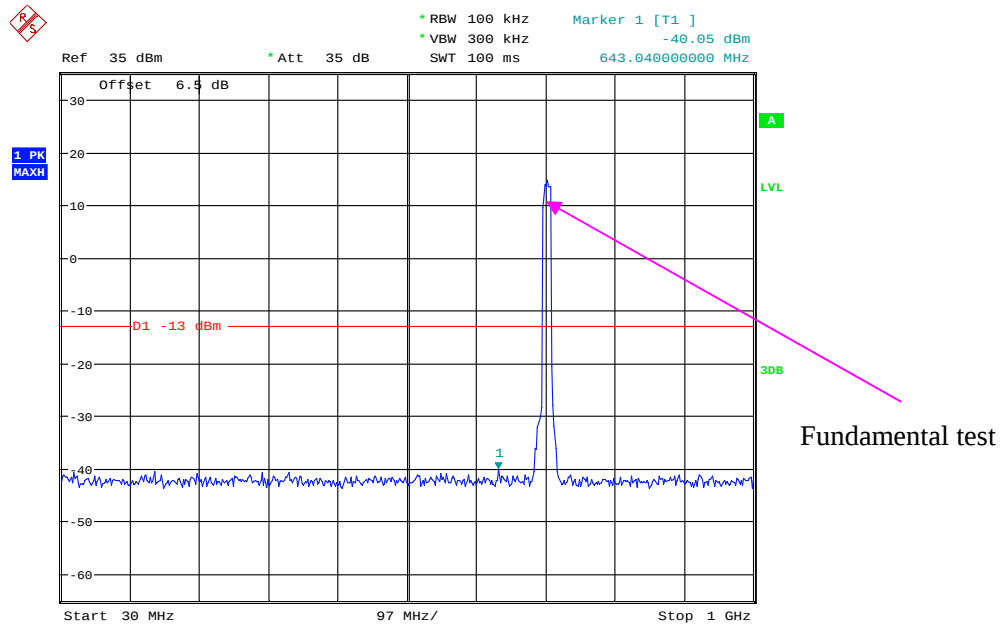
Date: 23.APR.2020 14:49:04

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



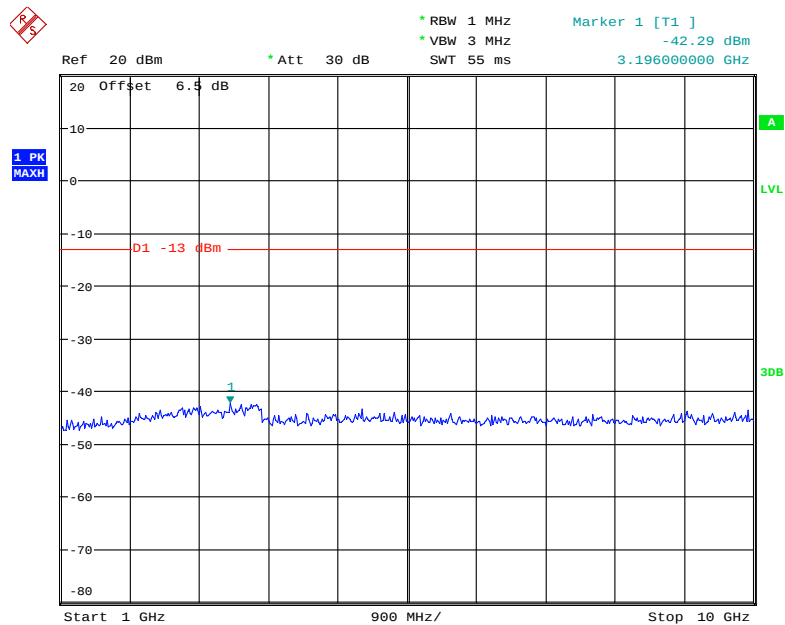
Date: 23.APR.2020 14:49:15

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



Date: 23.APR.2020 14:49:33

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



Date: 23.APR.2020 14:49:43

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

Applicable Standard

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

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 receiving 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.

Test Data**Environmental Conditions**

Temperature:	24~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	100.9~101.0kPa

The testing was performed by Hams He and Charlie Cha from 2020-04-24 to 2020-04-27.

EUT operation mode: Transmitting

Pre-scan with Low, Middle and High channel, the worst case as below:

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
958.7	37.82	311	2.3	H	-62.8	1.37	0.0	-64.17	-13	51.17
958.7	38.06	357	1.6	V	-61.3	1.37	0.0	-62.67	-13	49.67
1673.20	73.85	170	2.4	H	-32.5	1.30	8.90	-24.90	-13	11.90
1673.20	66.82	209	1.2	V	-38.9	1.30	8.90	-31.30	-13	18.30
2509.80	68.67	105	1.2	H	-34.7	2.60	10.20	-27.10	-13	14.10
2509.80	65.15	199	1.8	V	-37.6	2.60	10.20	-30.00	-13	17.00
3346.40	55.65	329	2.1	H	-45.2	1.50	11.70	-35.00	-13	22.00
3346.40	50.25	41	1.7	V	-50.7	1.50	11.70	-40.50	-13	27.50
WCDMA Mode, Middle channel										
959.8	37.08	327	1.2	H	-63.5	1.37	0.0	-64.87	-13	51.87
959.8	38.16	298	2.5	V	-61.2	1.37	0.0	-62.57	-13	49.57
1673.20	49.47	180	2.4	H	-56.9	1.30	8.90	-49.30	-13	36.30
1673.20	51.36	147	1.2	V	-54.4	1.30	8.90	-46.80	-13	33.80
2509.80	49.59	78	1.7	H	-53.8	2.60	10.20	-46.20	-13	33.20
2509.80	52.36	212	1.2	V	-50.4	2.60	10.20	-42.80	-13	29.80
3346.40	45.26	194	2.1	H	-55.6	1.50	11.70	-45.40	-13	32.40
3346.40	44.12	200	1.9	V	-56.8	1.50	11.70	-46.60	-13	33.60

30 MHz ~ 20 GHz:**PCS Band (Part 24E)**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
960.3	37.92	126	1.4	H	-62.7	1.37	0.0	-64.07	-13	51.07
960.3	38.24	24	1.9	V	-61.1	1.37	0.0	-62.47	-13	49.47
3760.00	59.11	276	1.6	H	-42.9	1.50	11.80	-32.60	-13	19.60
3760.00	56.35	159	2.0	V	-45.2	1.50	11.80	-34.90	-13	21.90
5640.00	56.77	350	1.8	H	-42.9	1.70	12.40	-32.20	-13	19.20
5640.00	53.59	313	2.2	V	-45.8	1.70	12.40	-35.10	-13	22.10
7520.00	43.65	25	1.1	H	-52.3	1.90	10.70	-43.50	-13	30.50
7520.00	44.12	209	1.6	V	-51.4	1.90	10.70	-42.60	-13	29.60
WCDMA Mode Band II, Middle channel										
962.4	37.16	228	1.2	H	-63.4	1.37	0.0	-64.77	-13	51.77
962.4	38.28	175	1.4	V	-61.1	1.37	0.0	-62.47	-13	49.47
3760.00	49.47	204	1.2	H	-52.6	1.50	11.80	-42.30	-13	29.30
3760.00	50.35	232	1.6	V	-51.2	1.50	11.80	-40.90	-13	27.90

LTE Band: (Pre-scan with all the bandwidths, and worse case is the lowest bandwidth)

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
Band 2										
959.4	37.61	143	2.1	H	-63.0	1.37	0.0	-64.37	-13	51.37
959.4	38.24	49	1.4	V	-61.1	1.37	0.0	-62.47	-13	49.47
3760.00	51.98	246	2.1	H	-50.1	1.50	11.80	-39.80	-13	26.80
3760.00	56.25	161	1.8	V	-45.3	1.50	11.80	-35.00	-13	22.00
Band 4										
960.2	37.26	224	2.2	H	-63.3	1.37	0.0	-64.67	-13	51.67
960.2	38.14	225	2.4	V	-61.2	1.37	0.0	-62.57	-13	49.57
3465.00	48.75	76	2.2	H	-52.0	1.50	12.00	-41.50	-13	28.50
3465.00	52.44	358	2.0	V	-49.1	1.50	12.00	-38.60	-13	25.60
Band 7										
958.6	37.64	288	1.3	H	-63.0	1.37	0.0	-64.37	-25	39.37
958.6	38.25	306	1.2	V	-61.1	1.37	0.0	-62.47	-25	37.47
5070.00	54.88	306	1.1	H	-45.1	1.60	12.10	-34.60	-25	9.60
5070.00	56.12	129	2.1	V	-43.9	1.60	12.10	-33.40	-25	8.40
Band 12										
956.3	37.58	52	1.7	H	-63.0	1.37	0.0	-64.37	-13	51.37
956.3	38.72	324	2.2	V	-60.6	1.37	0.0	-61.97	-13	48.97
1415.00	49.52	266	2.0	H	-58.7	1.60	7.90	-52.40	-13	39.40
1415.00	51.12	191	1.3	V	-57.3	1.60	7.90	-51.00	-13	38.00
Band 17										
961.8	37.36	79	1.2	H	-63.2	1.37	0.0	-64.57	-13	51.57
961.8	38.84	316	2.0	V	-60.5	1.37	0.0	-61.87	-13	48.87
1420.00	50.12	71	1.3	H	-58.1	1.60	7.90	-51.80	-13	38.80
1420.00	50.16	112	1.7	V	-58.3	1.60	7.90	-52.00	-13	39.00

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

dBd is for the ERP, dBi is for EIRP.

FCC § 22.917 (a);§ 24.238 (a); §27.53 (h)(m) - BAND EDGES**Applicable Standard**

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

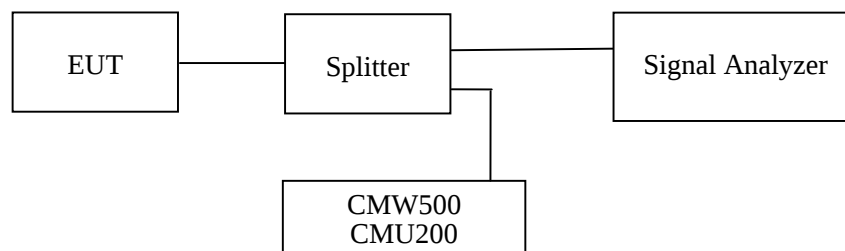
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to 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.

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**

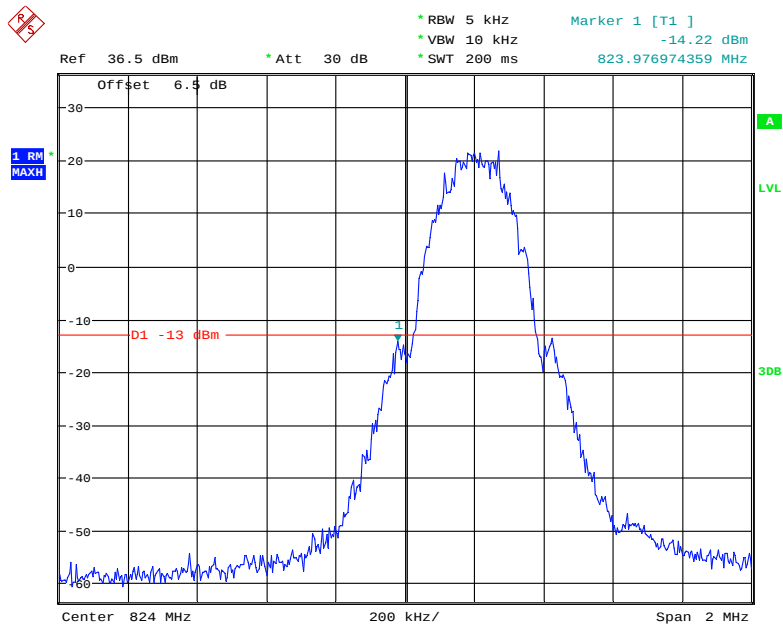
Temperature:	24~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by George Zhong from 2020-04-23 to 2020-05-14.

EUT operation mode: Transmitting

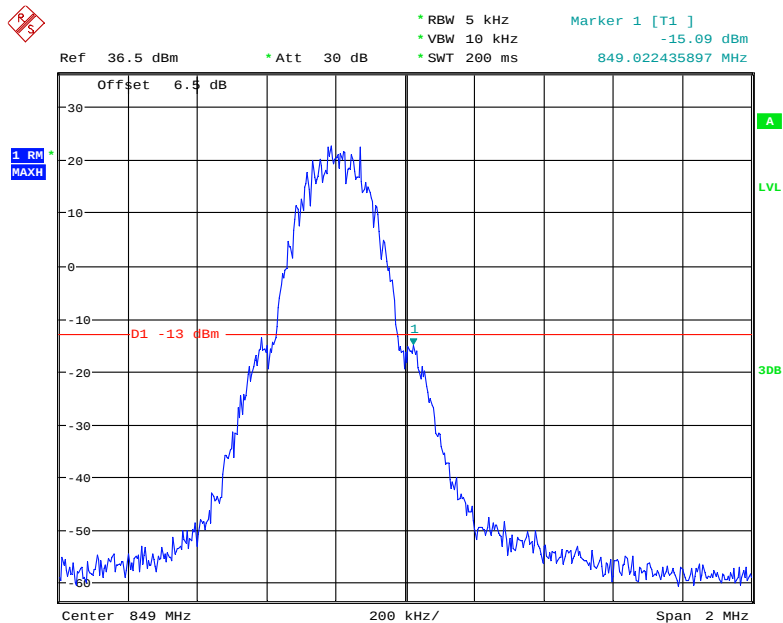
Test Result: Compliance. Please refer to the following plots.

Cellular Band, Left Band Edge for GSM (GMSK) Mode



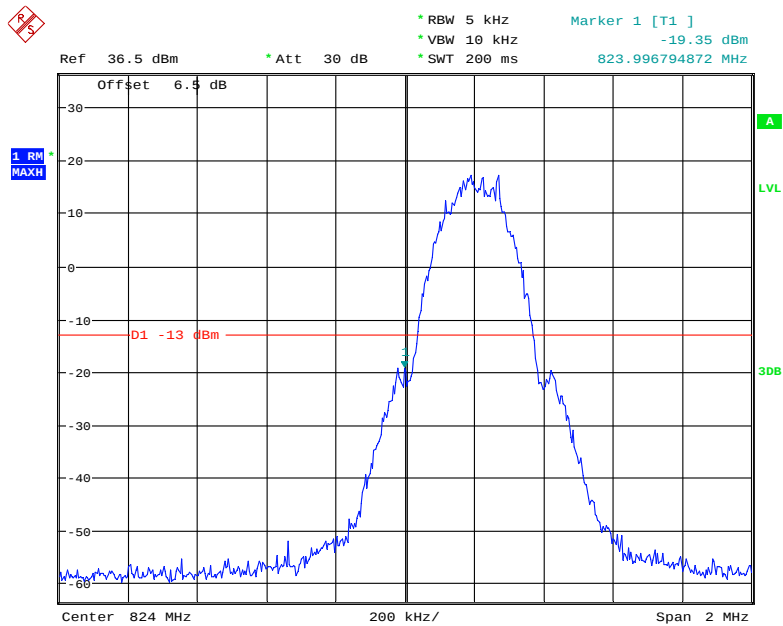
Date: 23.APR.2020 18:54:37

Cellular Band, Right Band Edge for GSM (GMSK) Mode



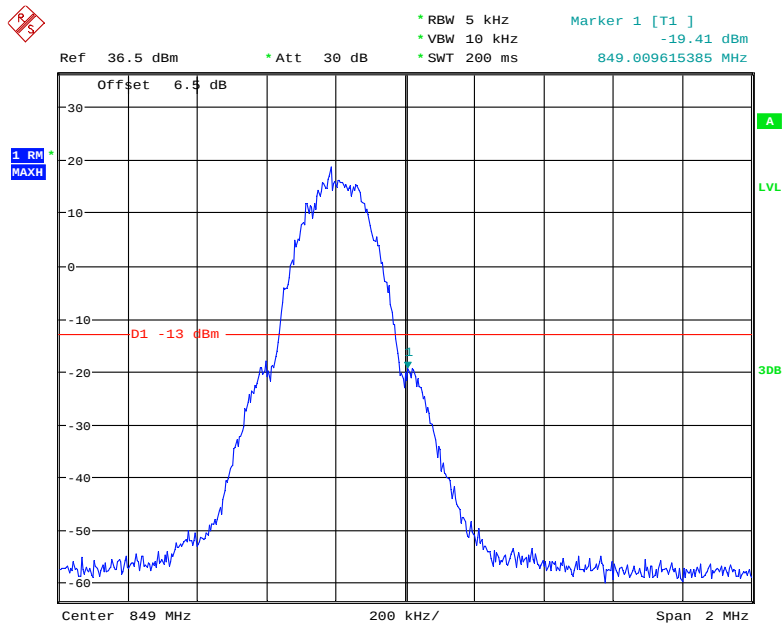
Date: 23.APR.2020 18:56:06

Cellular Band, Left Band Edge for EDGE Mode



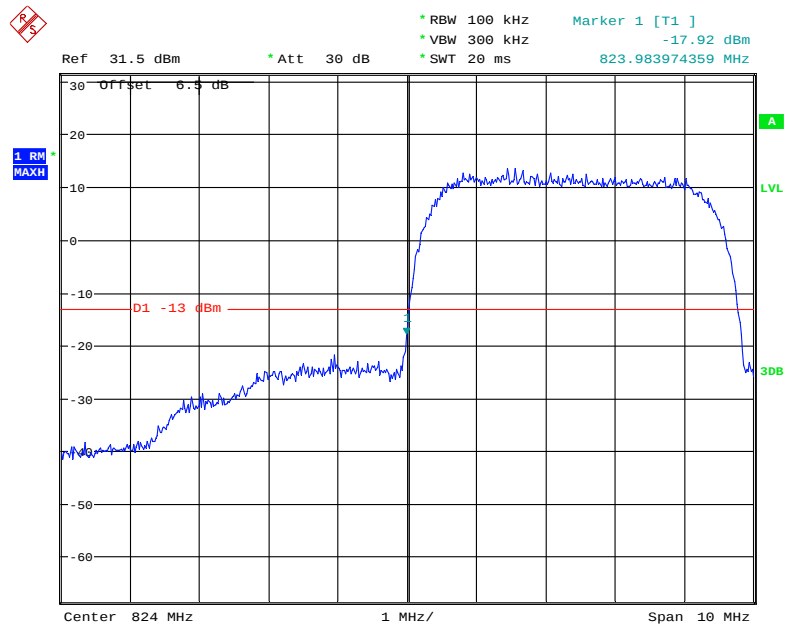
Date: 23.APR.2020 19:01:13

Cellular Band, Right Band Edge for EDGE Mode



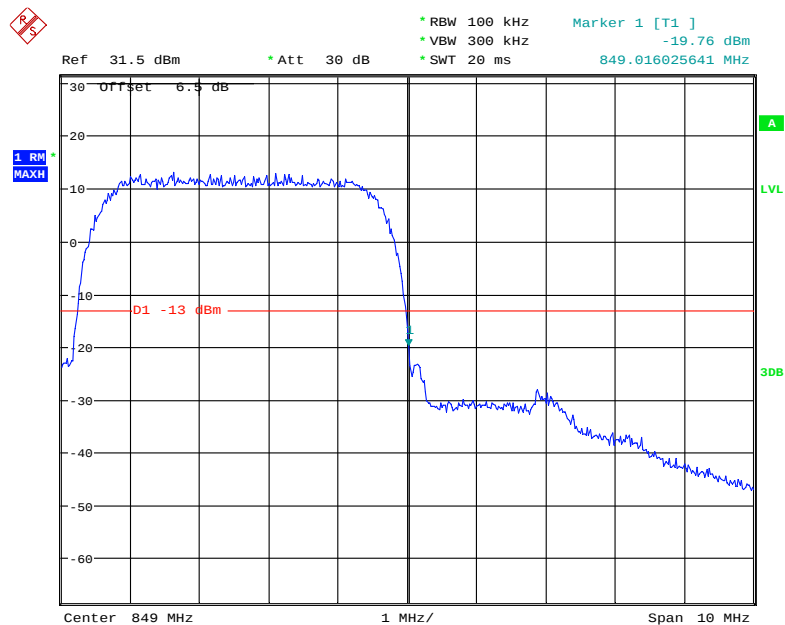
Date: 23.APR.2020 19:00:14

Cellular Band, Left Band Edge for WCDMA (BPSK) Mode



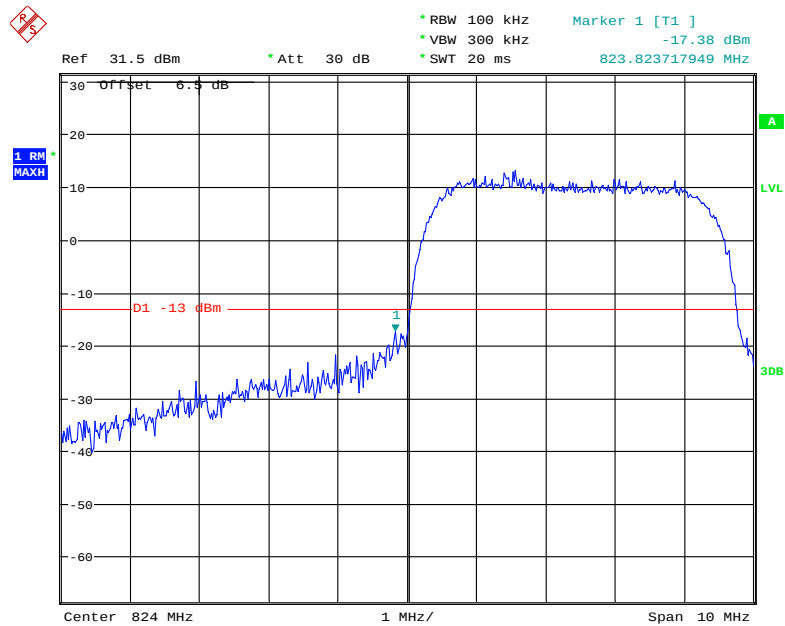
Date: 23.APR.2020 19:58:36

Cellular Band, Right Band Edge for WCDMA (BPSK) Mode



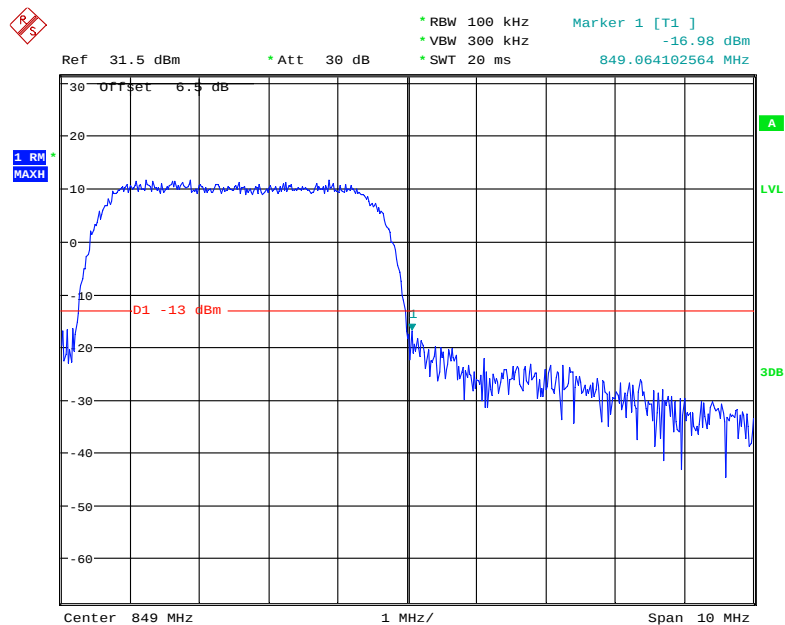
Date: 23.APR.2020 19:58:57

Cellular Band, Left Band Edge for HSDPA (16QAM) Mode



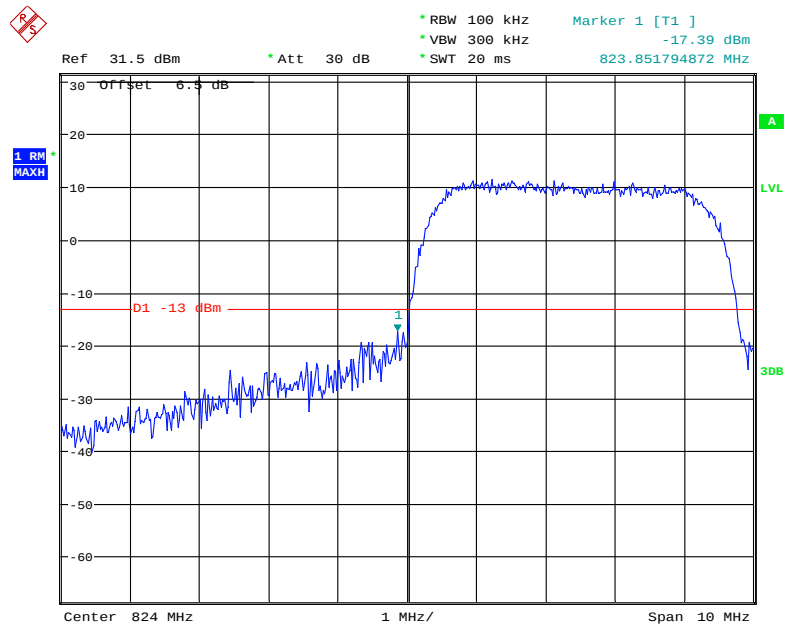
Date: 23.APR.2020 19:57:23

Cellular Band, Right Band Edge for HSDPA (16QAM) Mode



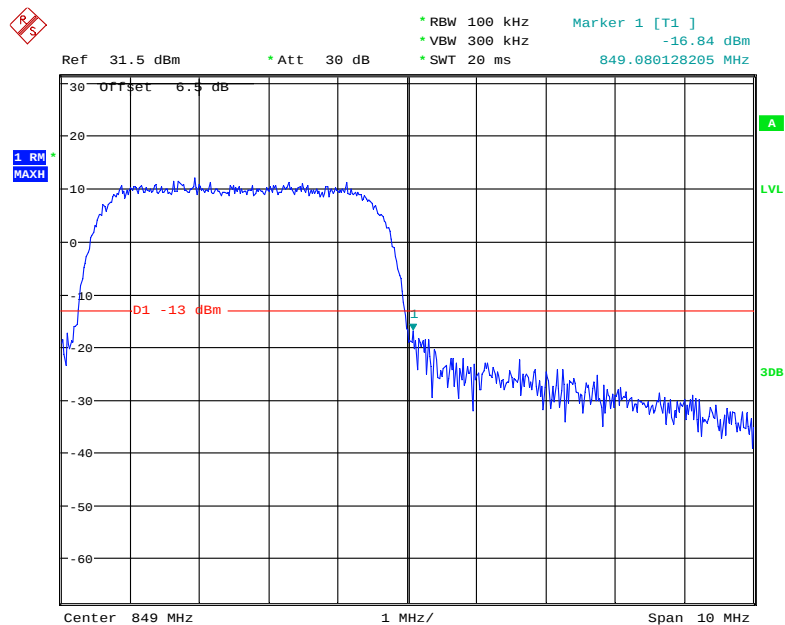
Date: 23.APR.2020 19:55:59

Cellular Band, Left Band Edge for HSUPA (BPSK) Mode



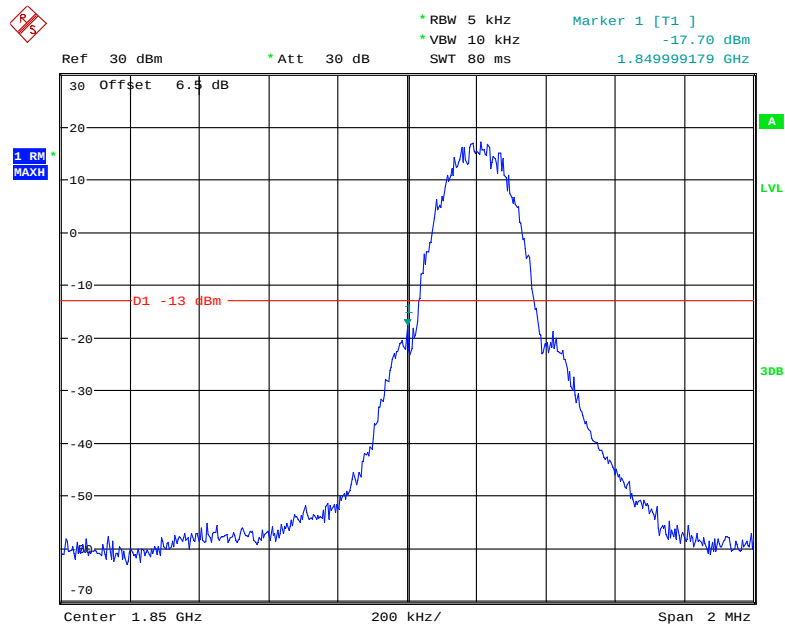
Date: 23.APR.2020 19:54:48

Cellular Band, Right Band Edge for HSUPA (BPSK) Mode



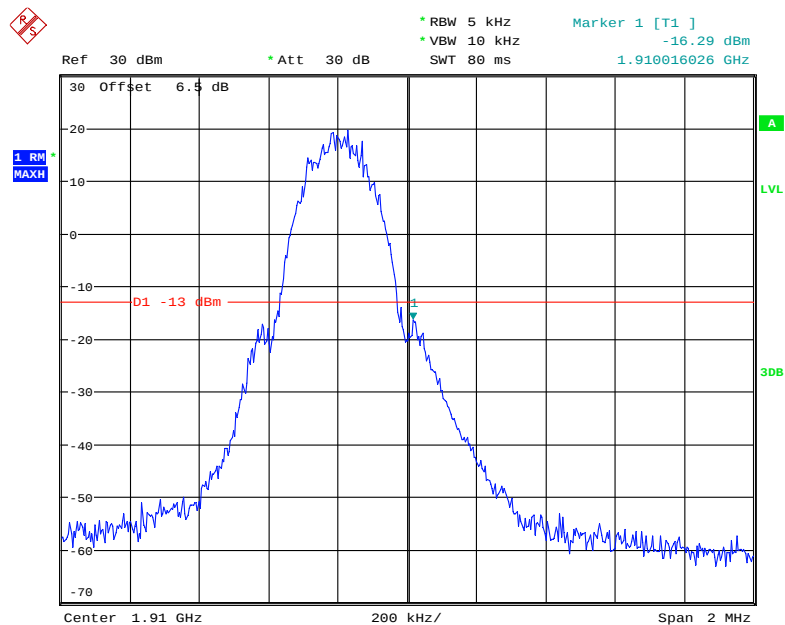
Date: 23.APR.2020 19:55:25

PCS Band, Left Band Edge for GSM (GMSK) Mode



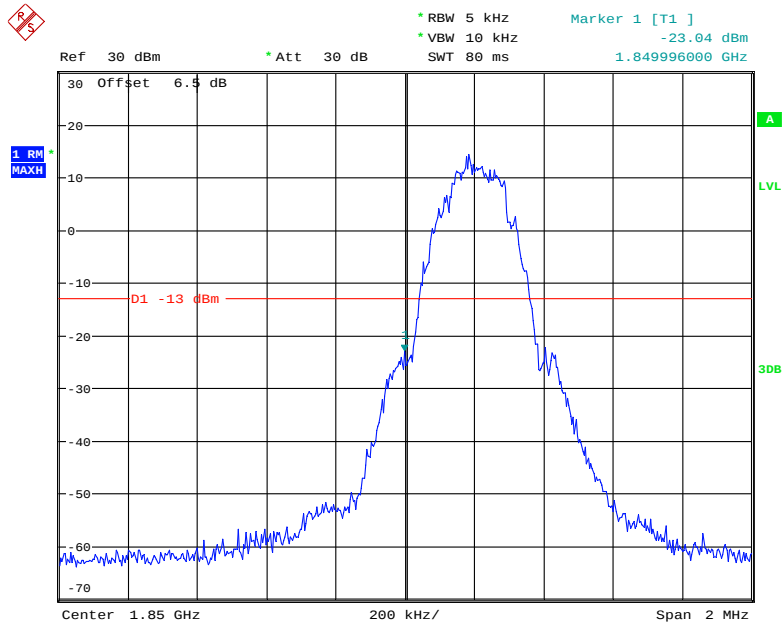
Date: 23.APR.2020 18:40:14

PCS Band, Right Band Edge for GSM (GMSK) Mode



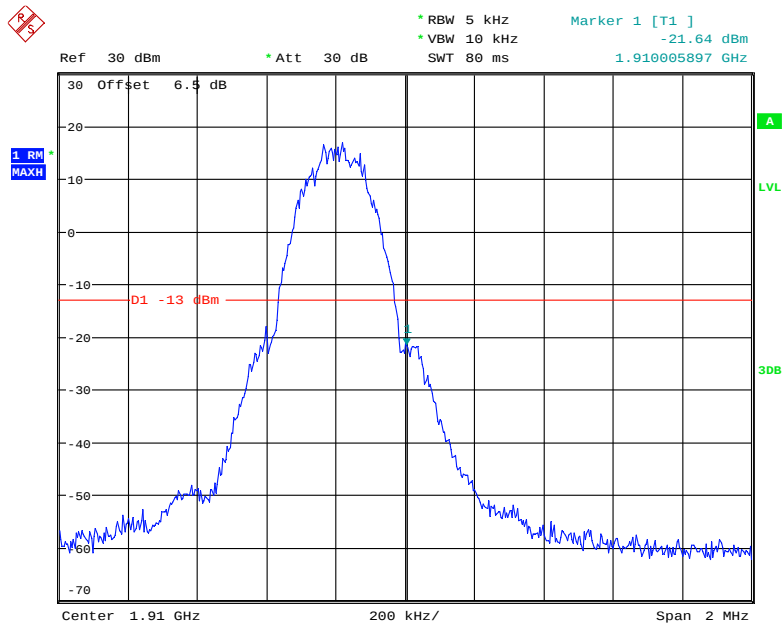
Date: 23.APR.2020 18:40:50

PCS Band, Left Band Edge for EDGE Mode



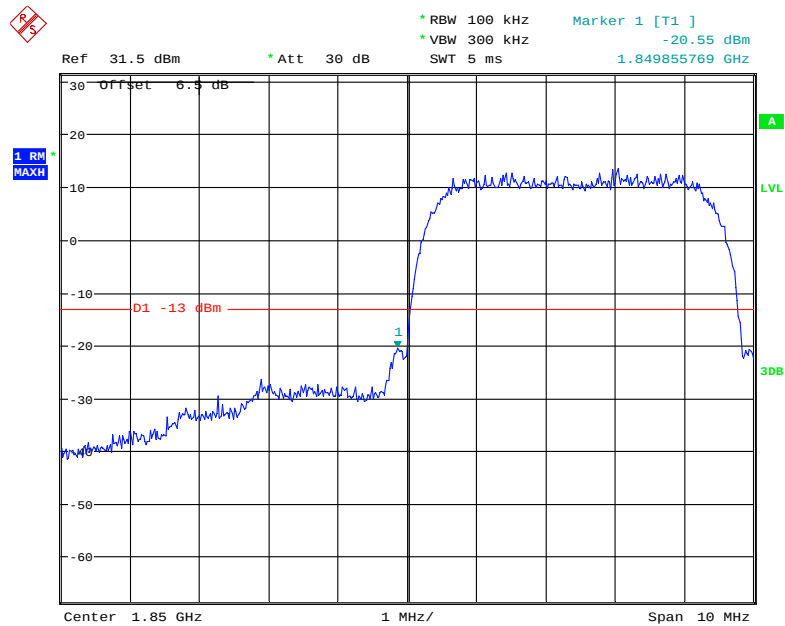
Date: 23.APR.2020 18:45:00

PCS Band, Right Band Edge for EDGE Mode



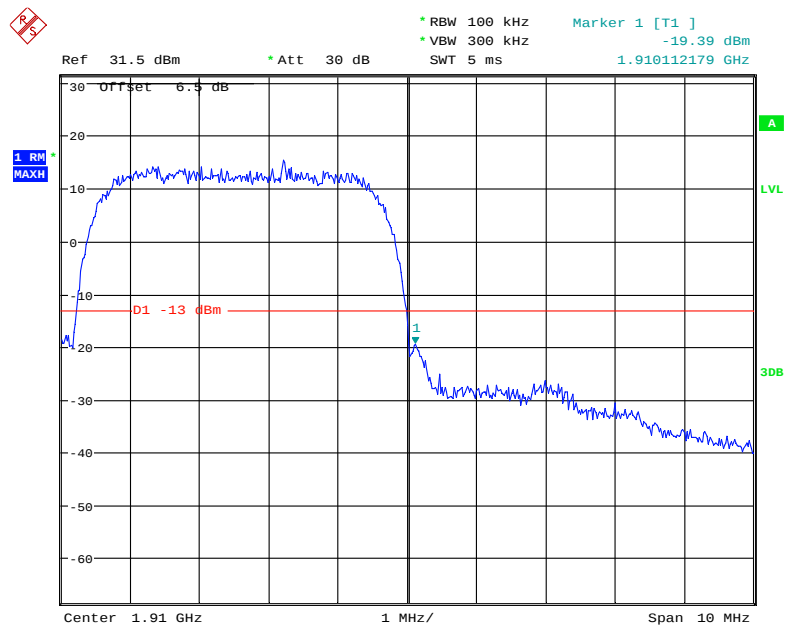
Date: 23.APR.2020 18:44:11

PCS Band, Left Band Edge for WCDMA (BPSK) Mode



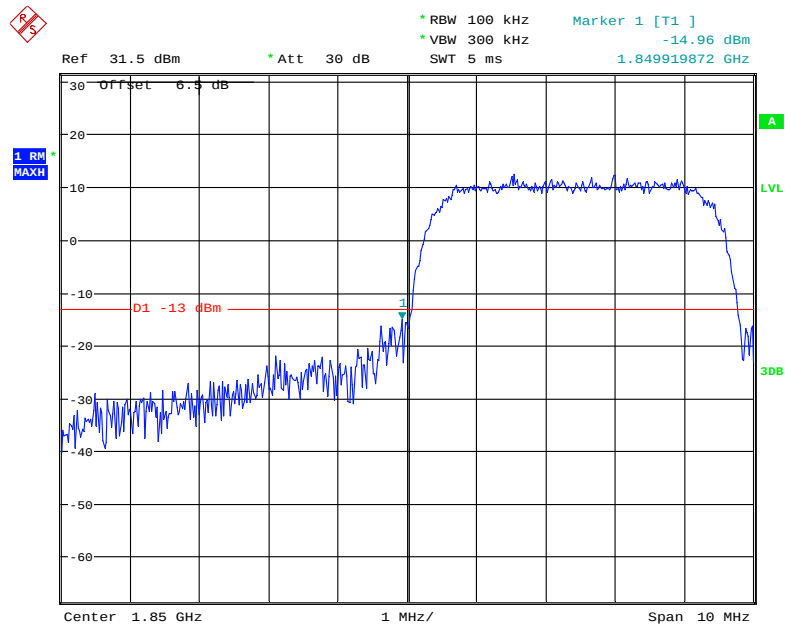
Date: 23.APR.2020 19:36:44

PCS Band, Right Band Edge for WCDMA (BPSK) Mode



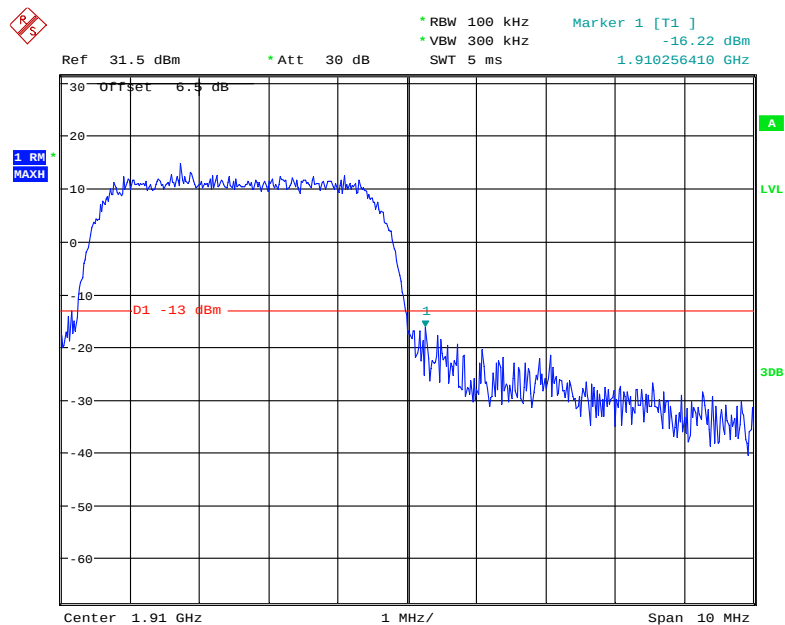
Date: 23.APR.2020 19:37:26

PCS Band, Left Band Edge for HSDPA (16QAM) Mode



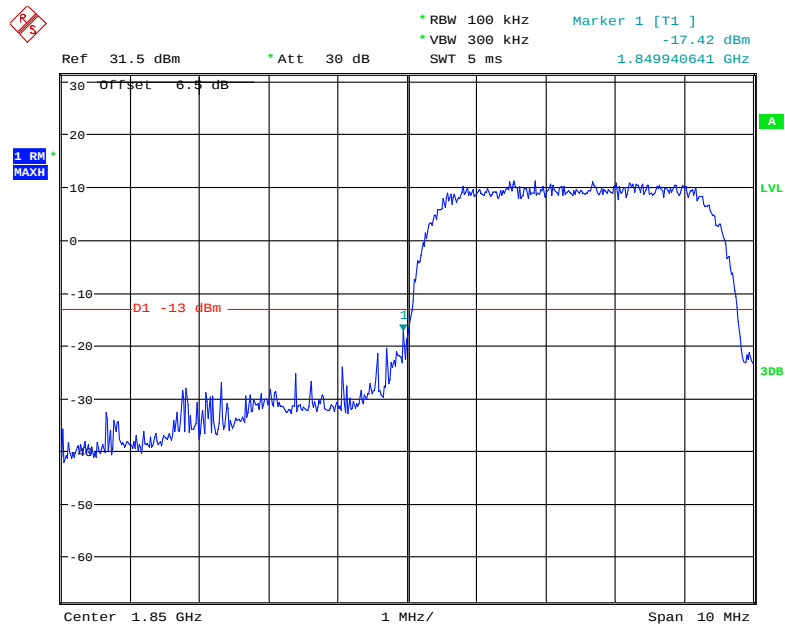
Date: 23.APR.2020 19:35:32

PCS Band, Right Band Edge for HSDPA (16QAM) Mode



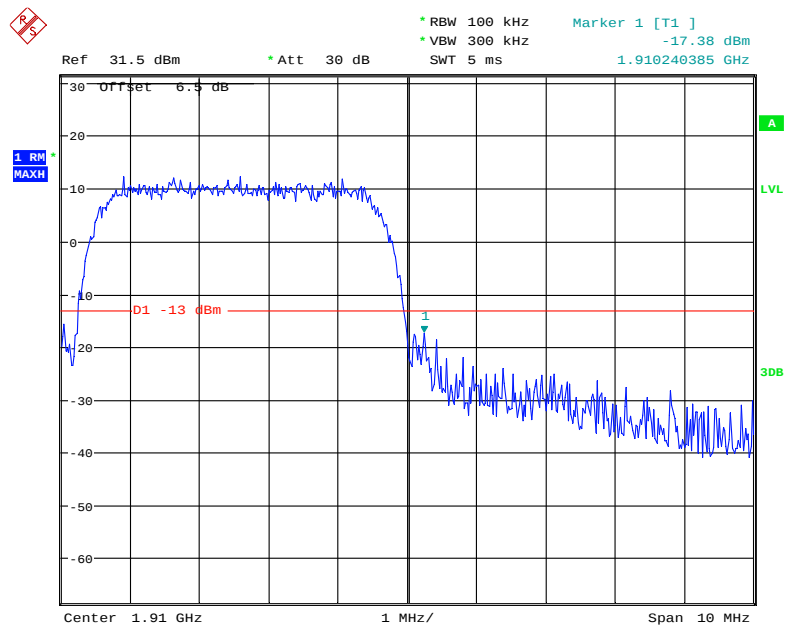
Date: 23.APR.2020 19:34:50

PCS Band, Left Band Edge for HSUPA (BPSK) Mode



Date: 23.APR.2020 19:32:37

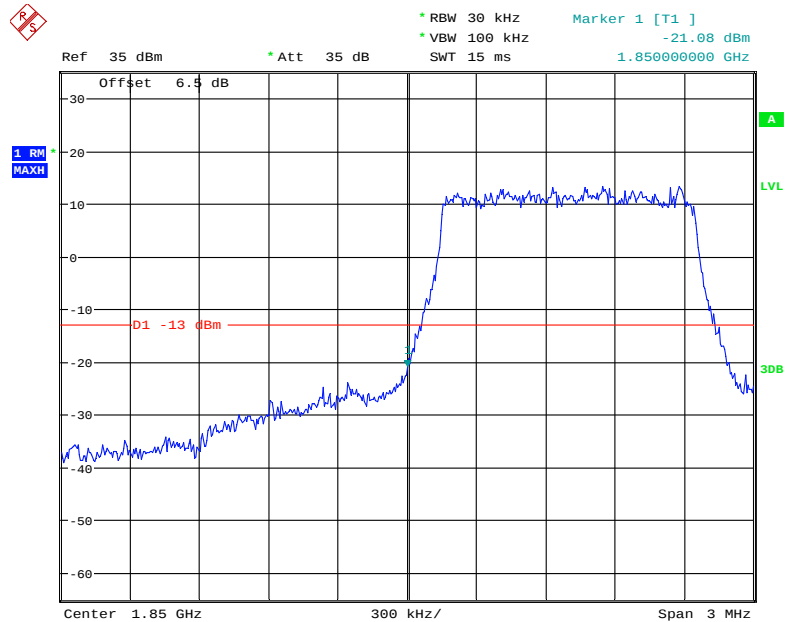
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 23.APR.2020 19:34:03

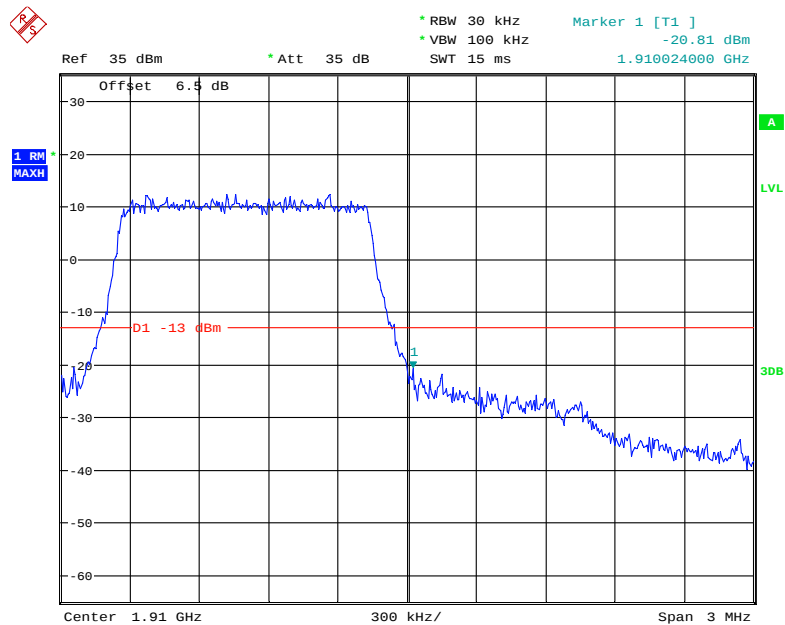
Band 2:

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



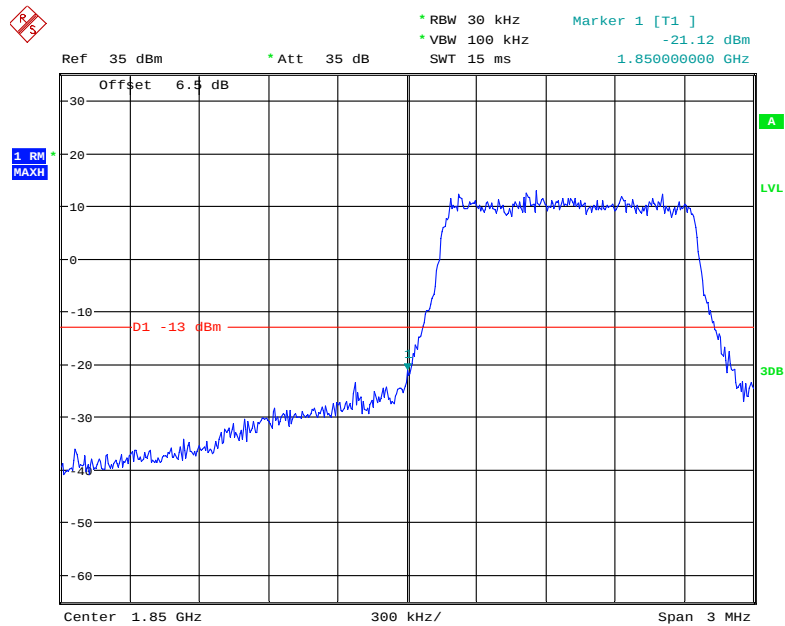
Date: 23.APR.2020 14:04:42

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



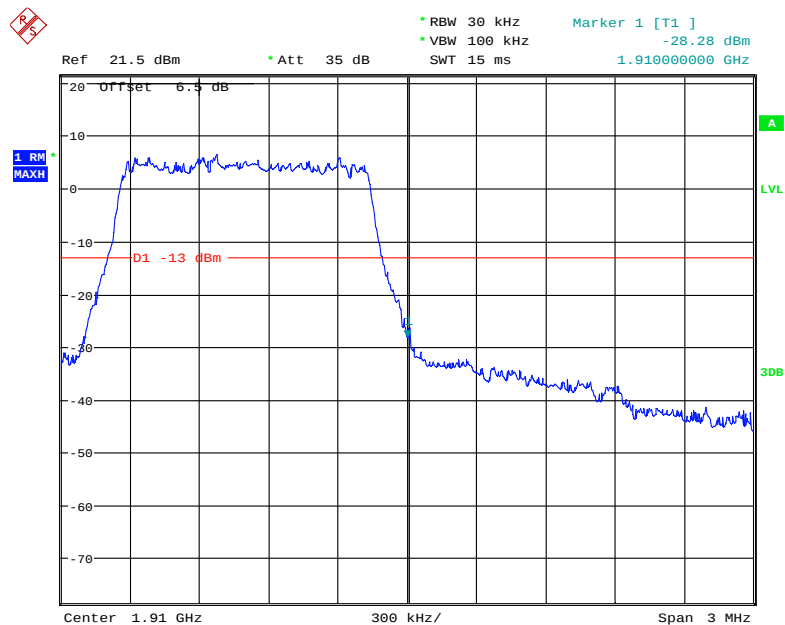
Date: 23.APR.2020 14:05:15

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



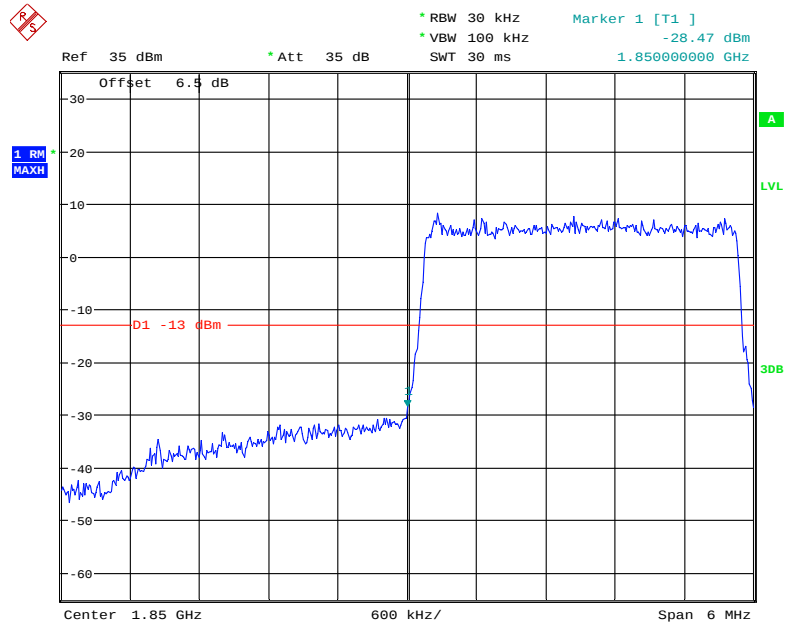
Date: 23.APR.2020 14:04:58

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



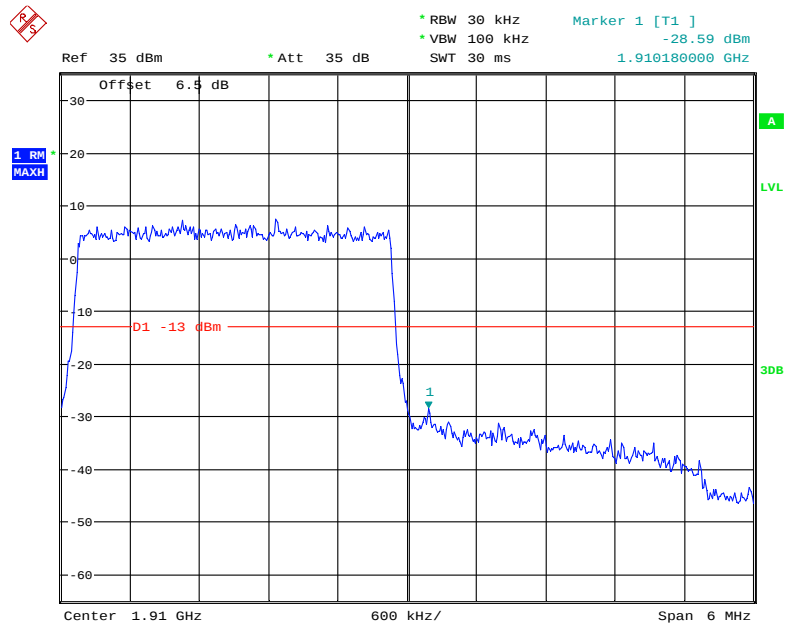
Date: 14.MAY.2020 13:26:09

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



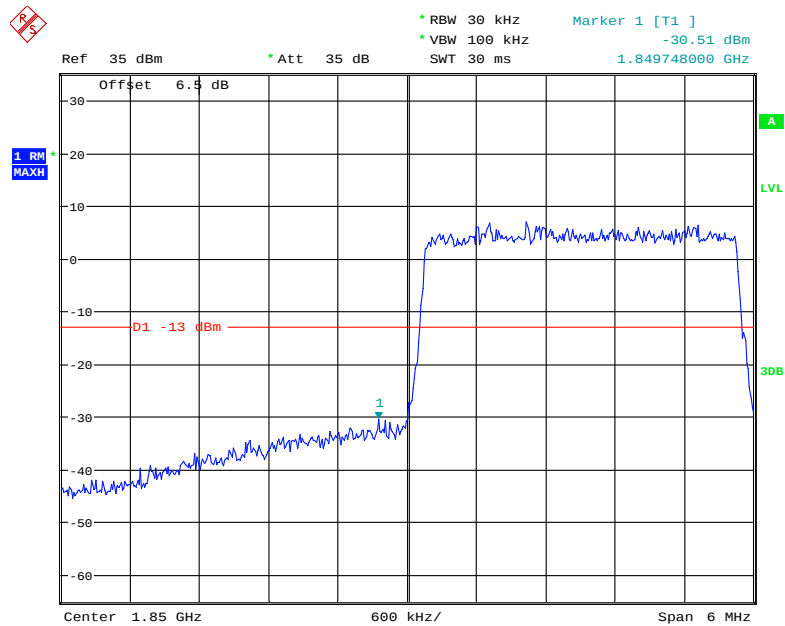
Date: 23.APR.2020 14:05:54

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



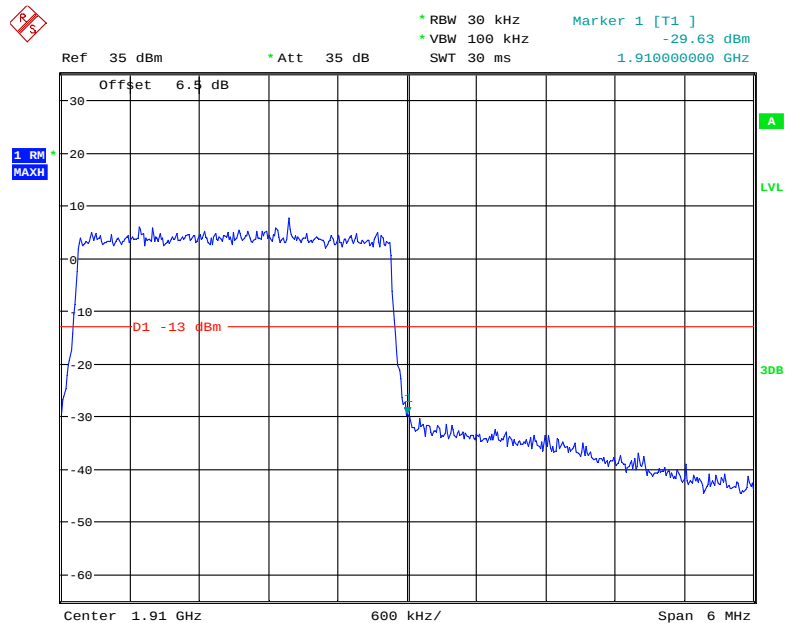
Date: 23.APR.2020 14:06:26

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



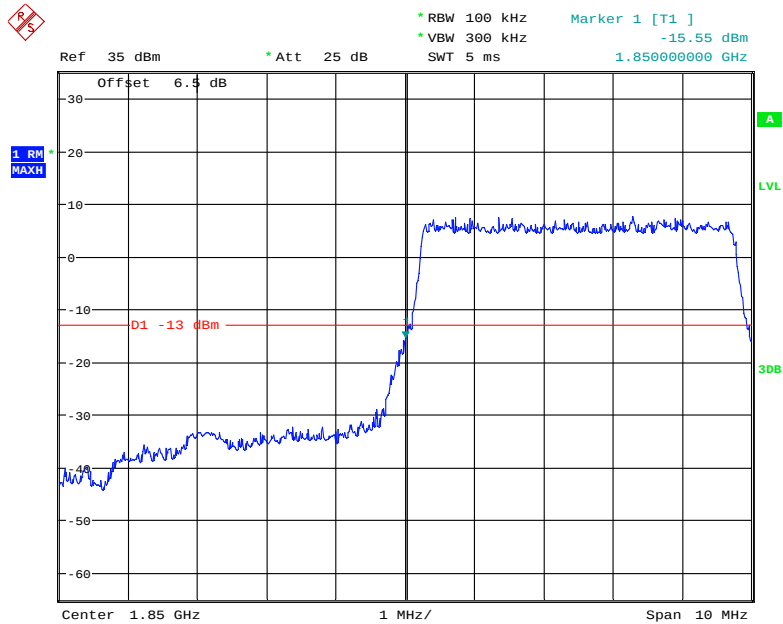
Date: 23.APR.2020 14:06:10

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



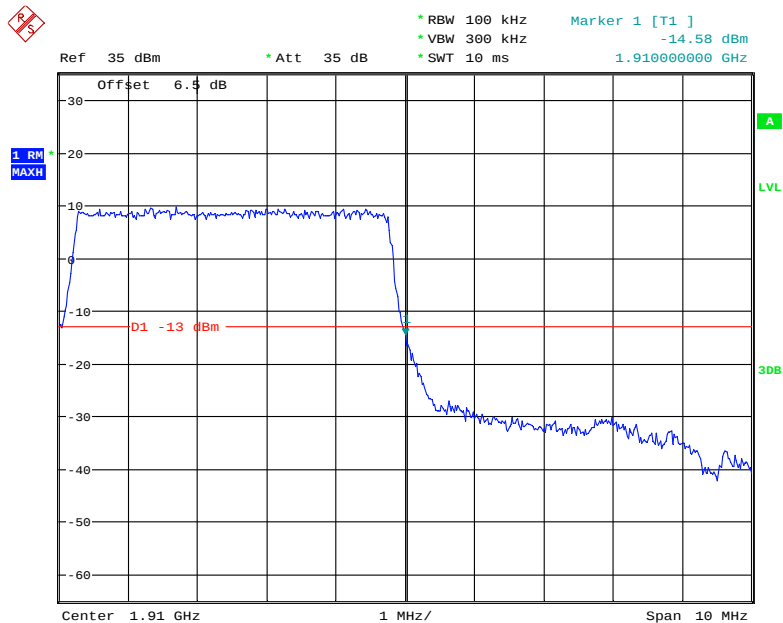
Date: 23.APR.2020 14:06:41

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



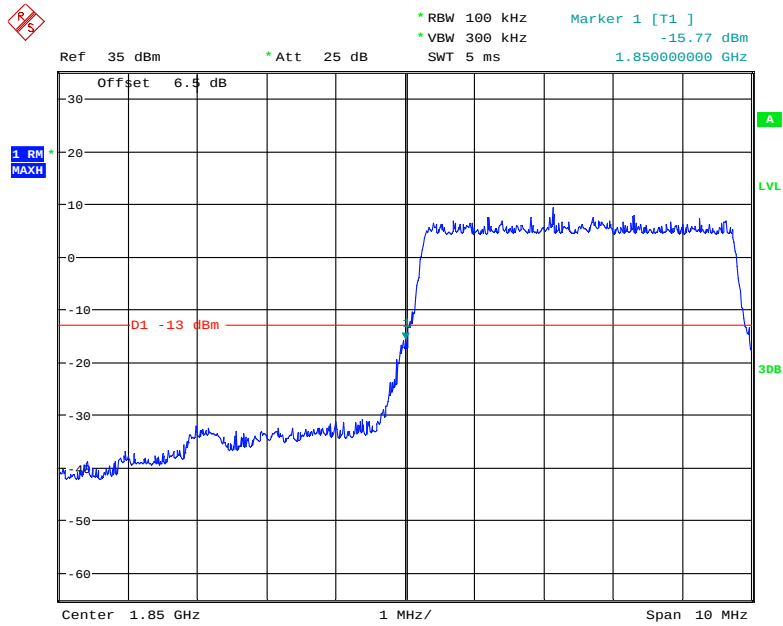
Date: 14.MAY.2020 13:32:05

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



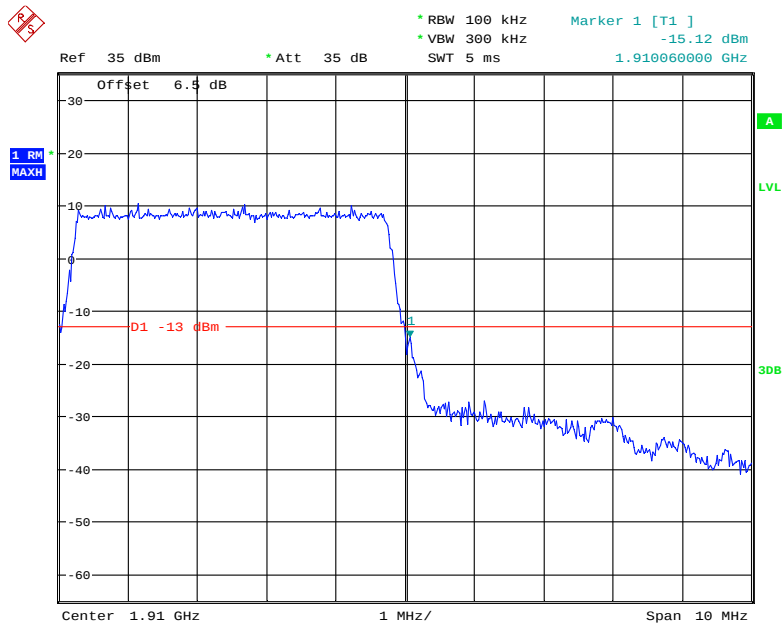
Date: 23.APR.2020 15:05:47

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



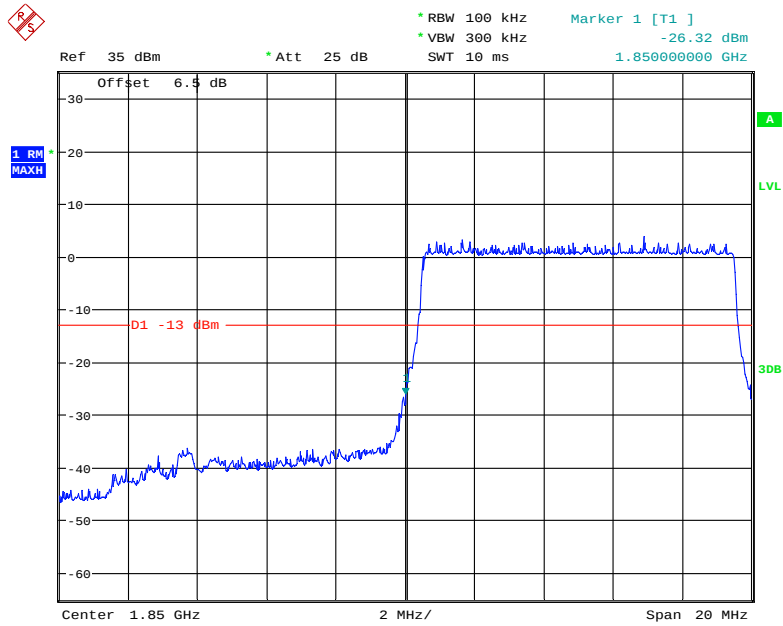
Date: 14.MAY.2020 13:30:18

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



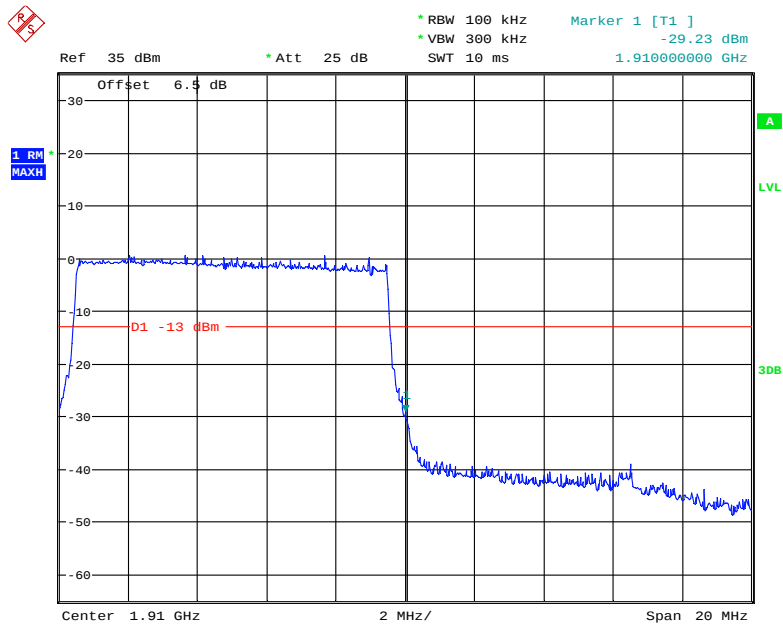
Date: 23.APR.2020 14:07:53

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



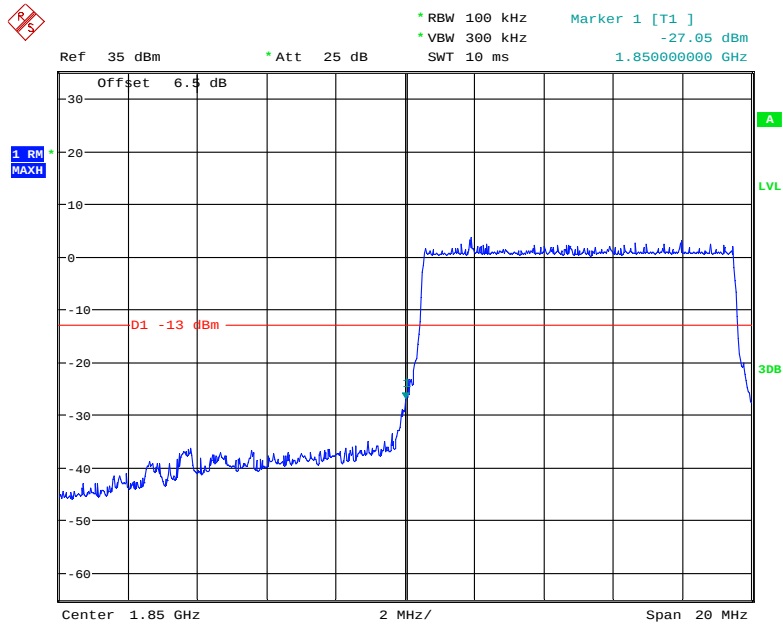
Date: 14.MAY.2020 13:38:18

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



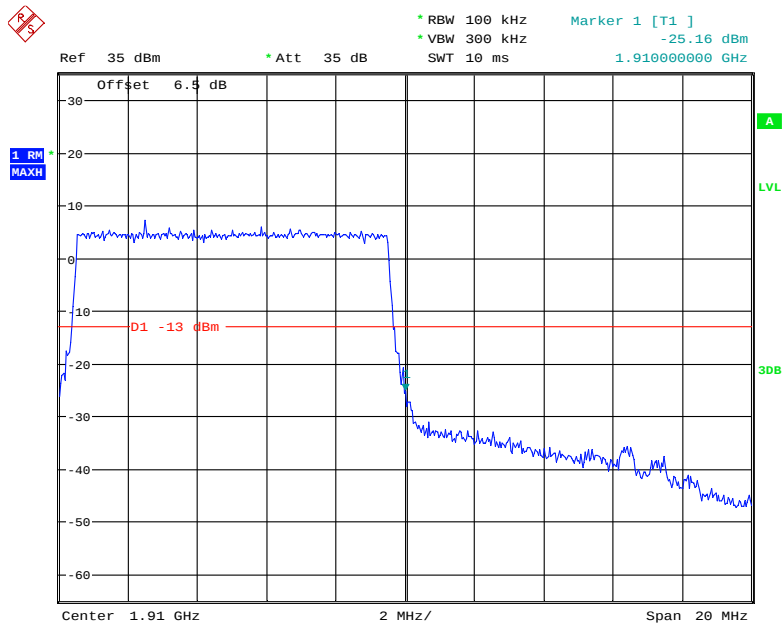
Date: 14.MAY.2020 13:44:38

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



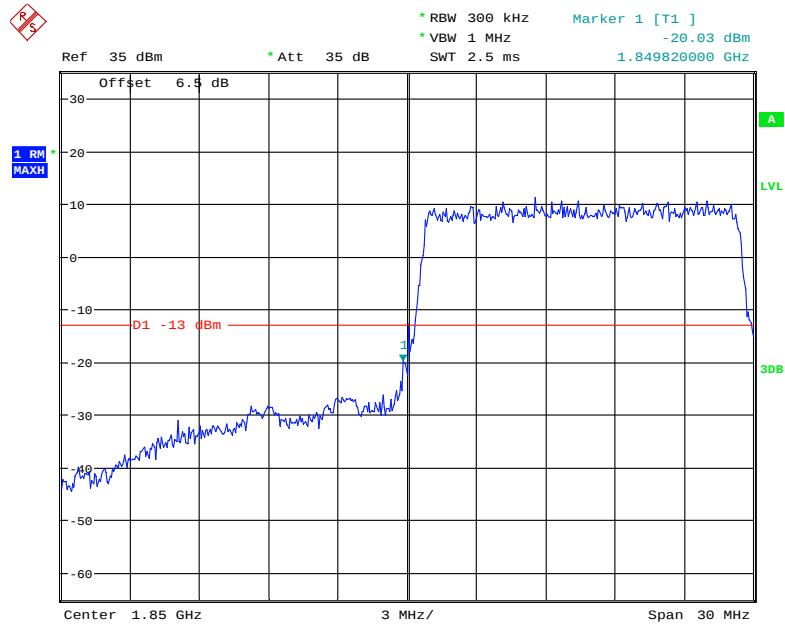
Date: 14.MAY.2020 13:42:20

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



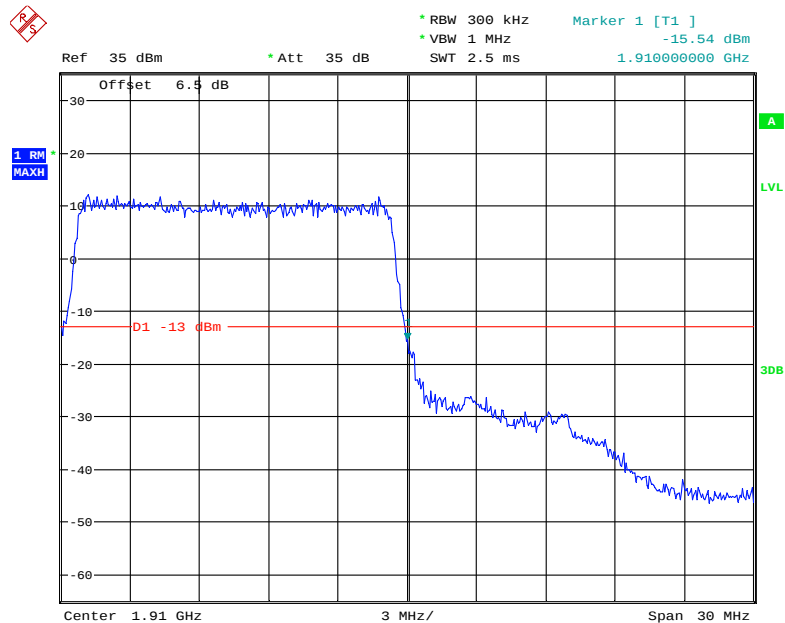
Date: 23.APR.2020 14:09:02

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



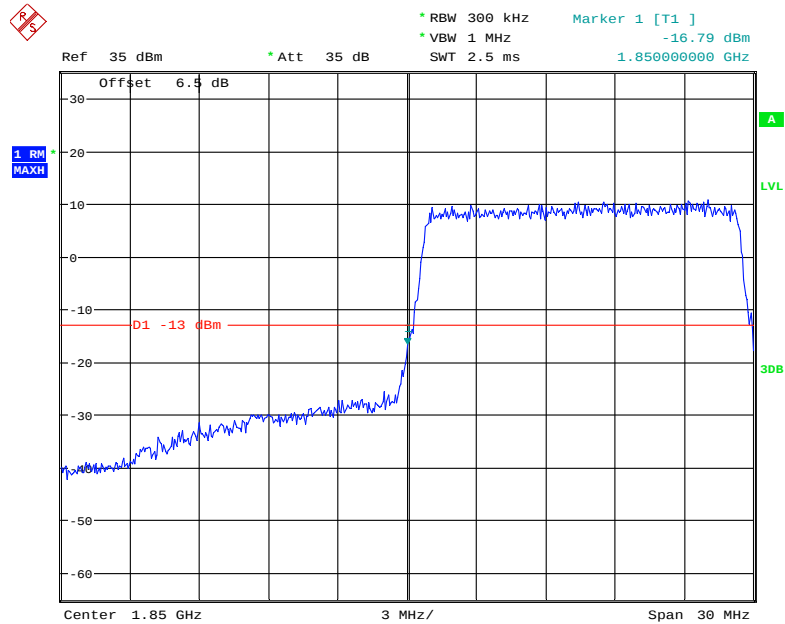
Date: 23.APR.2020 14:09:21

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



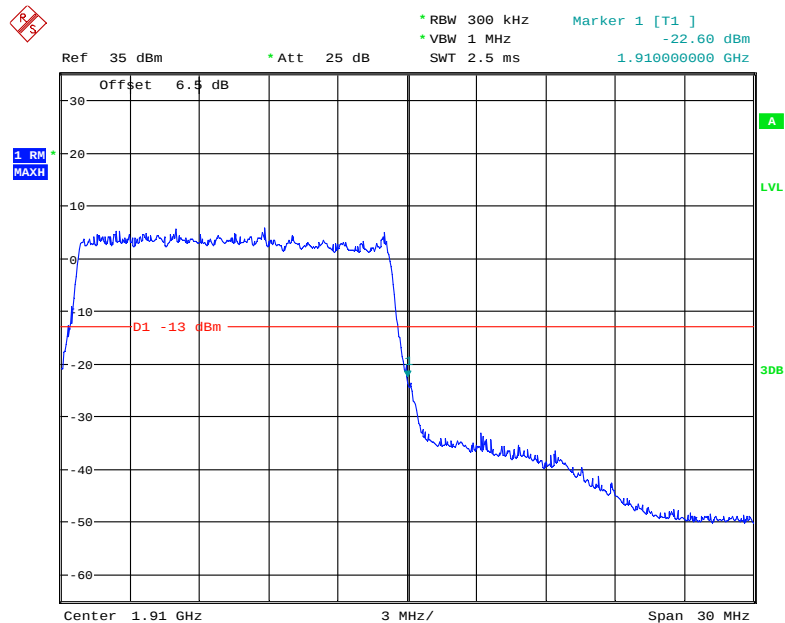
Date: 23.APR.2020 14:11:53

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



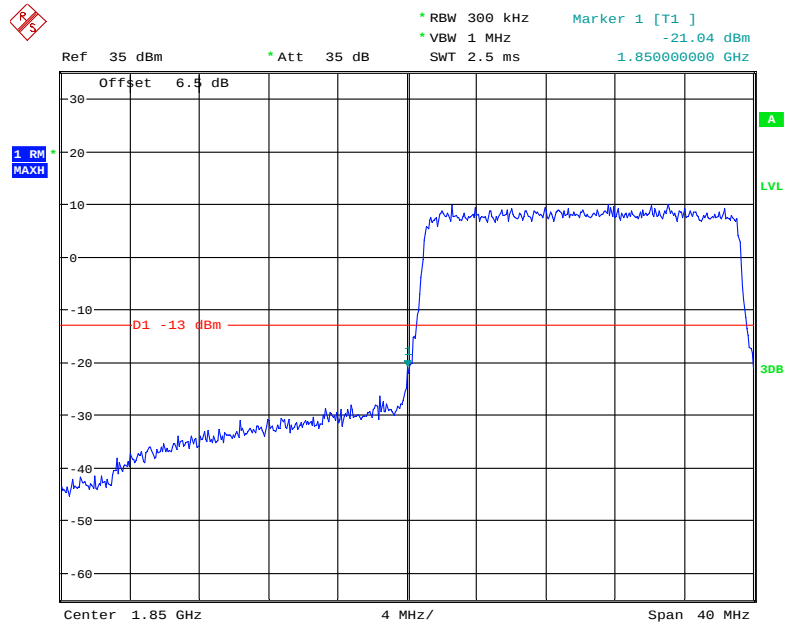
Date: 23.APR.2020 14:11:33

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



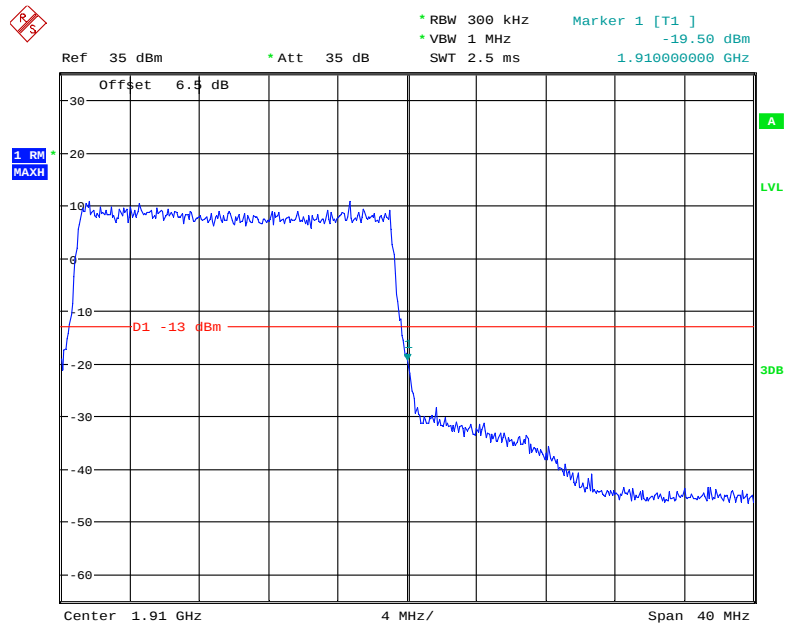
Date: 14.MAY.2020 13:46:44

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



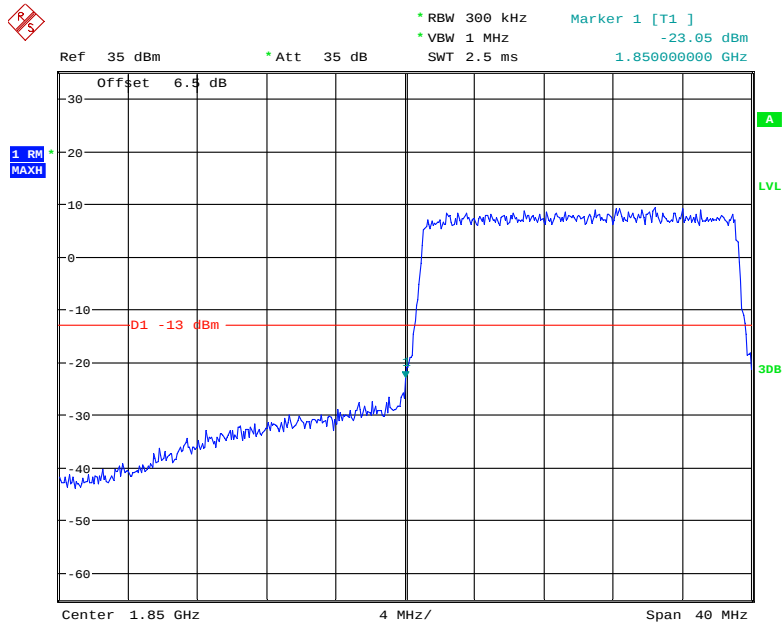
Date: 23.APR.2020 14:12:39

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



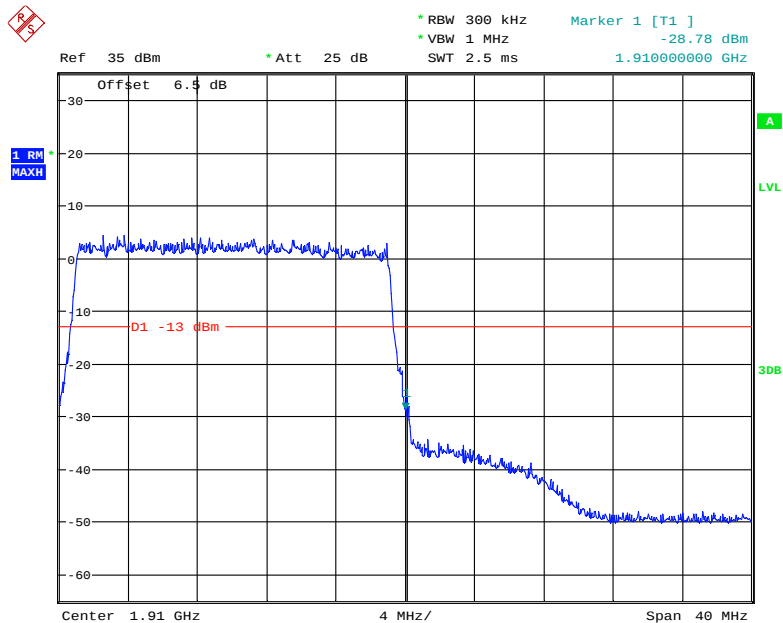
Date: 23.APR.2020 14:13:21

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



Date: 23.APR.2020 14:13:01

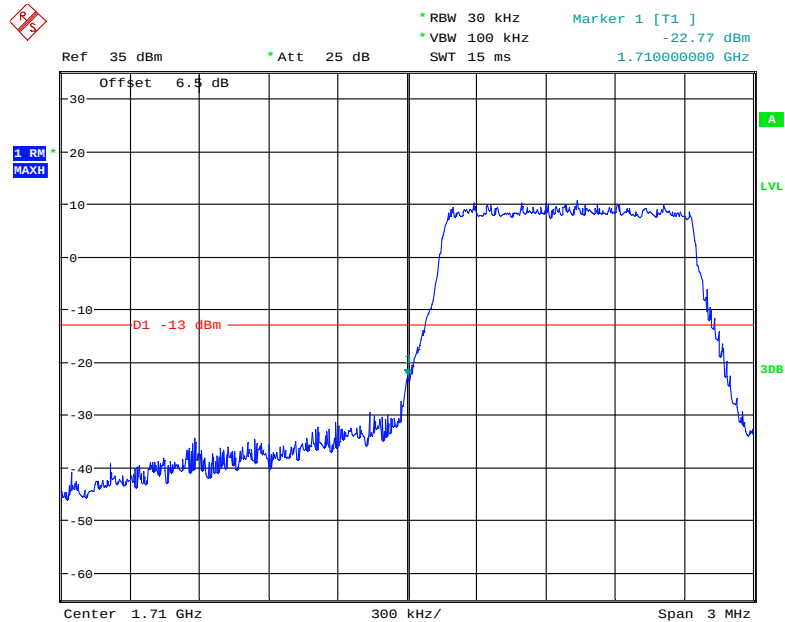
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 14.MAY.2020 13:48:32

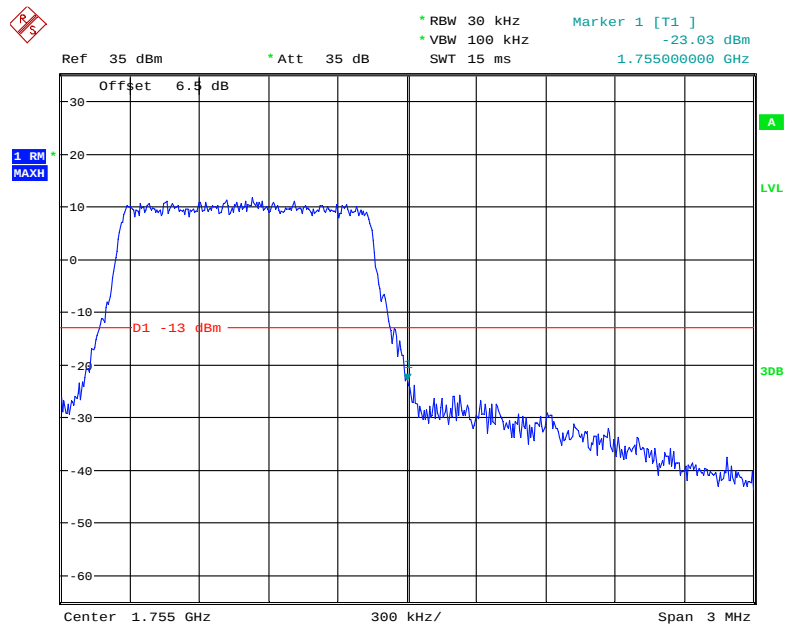
Band 4:

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



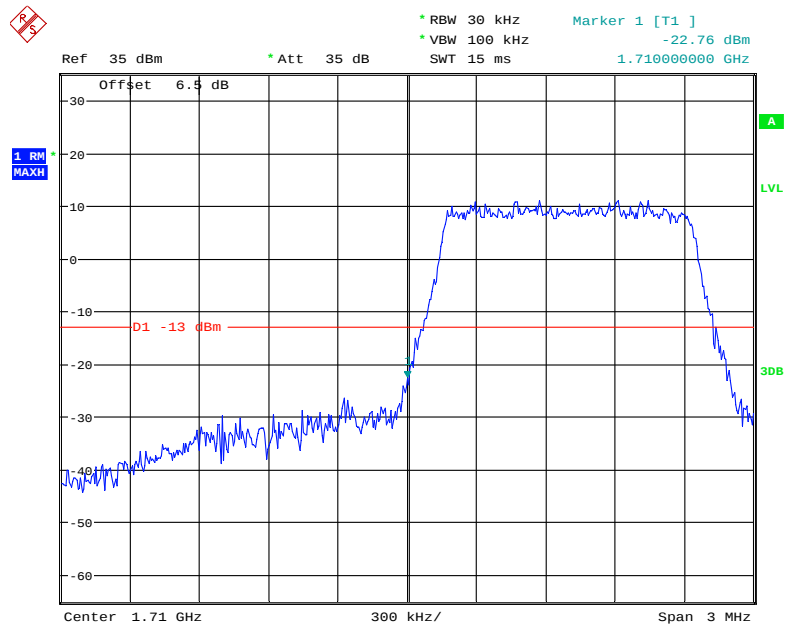
Date: 14.MAY.2020 13:50:50

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



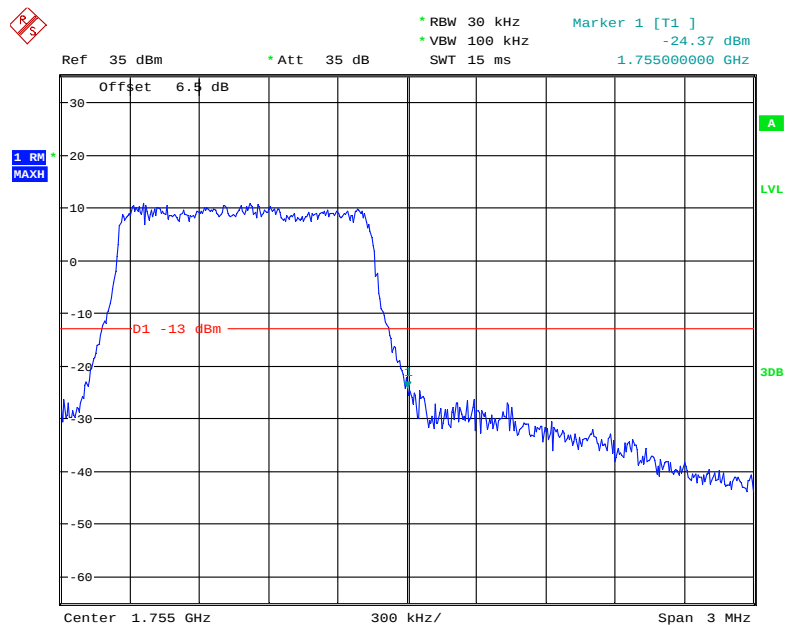
Date: 23.APR.2020 14:14:42

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



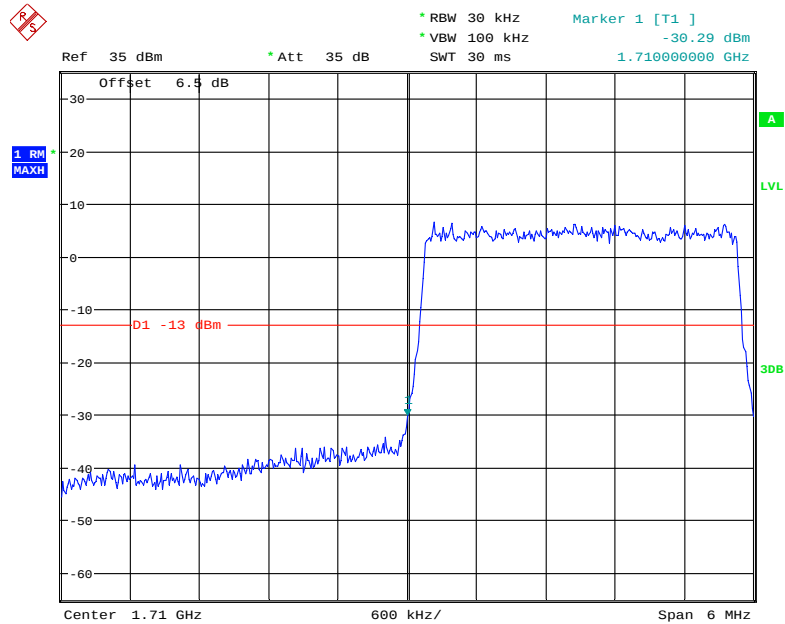
Date: 23.APR.2020 14:14:25

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



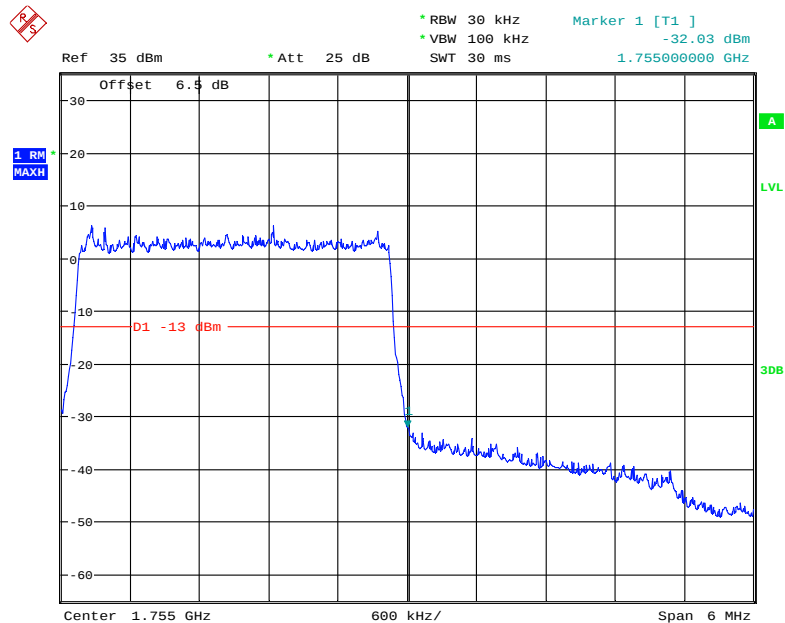
Date: 23.APR.2020 14:15:00

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



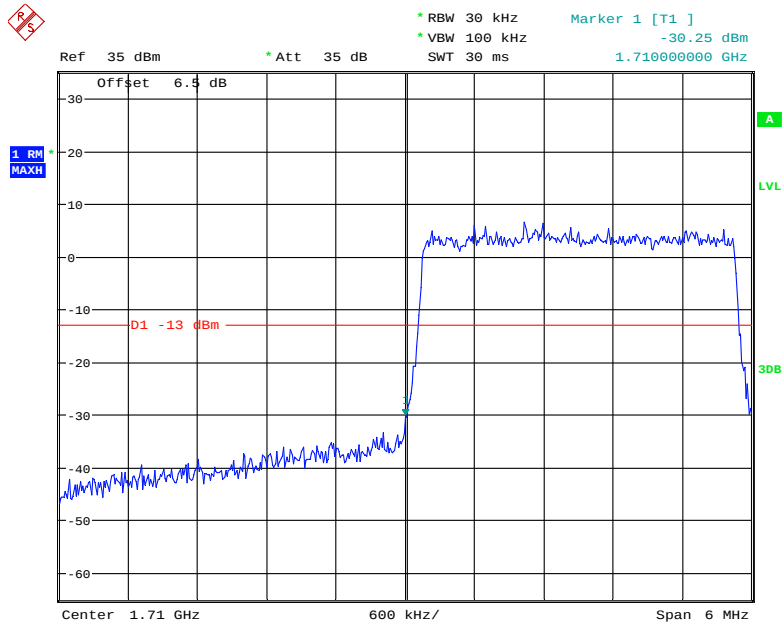
Date: 23.APR.2020 14:15:18

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



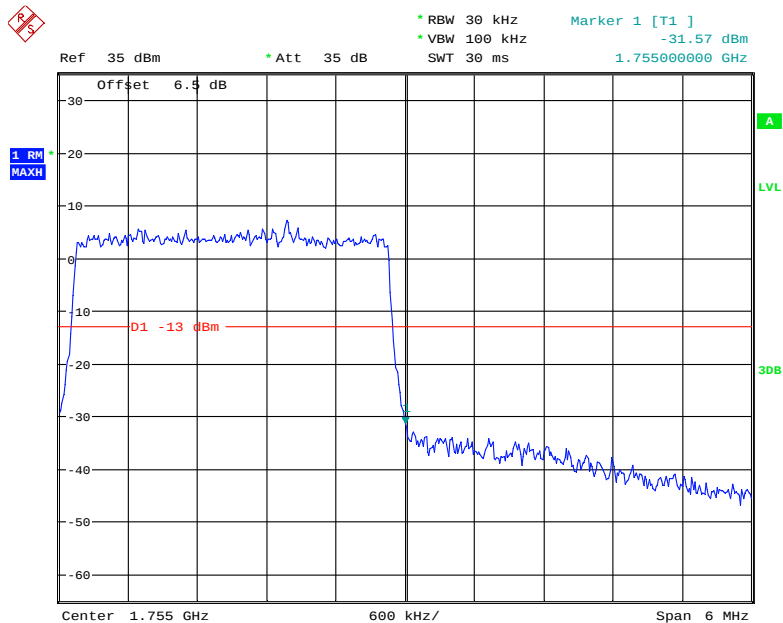
Date: 14.MAY.2020 13:53:15

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



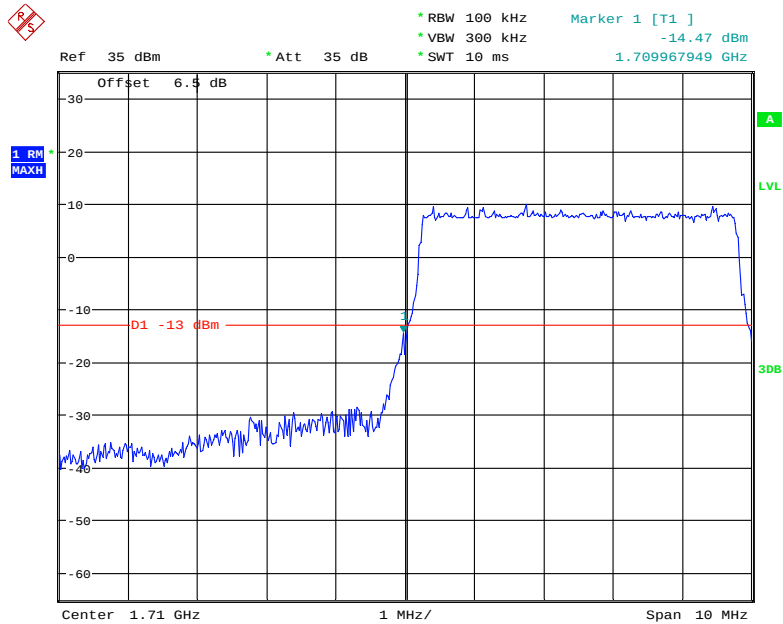
Date: 23.APR.2020 14:15:34

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



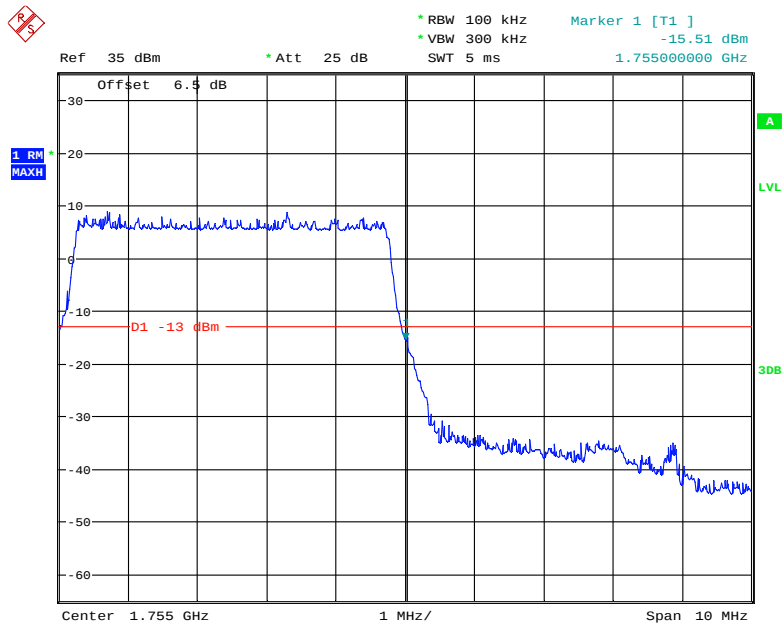
Date: 23.APR.2020 14:16:09

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



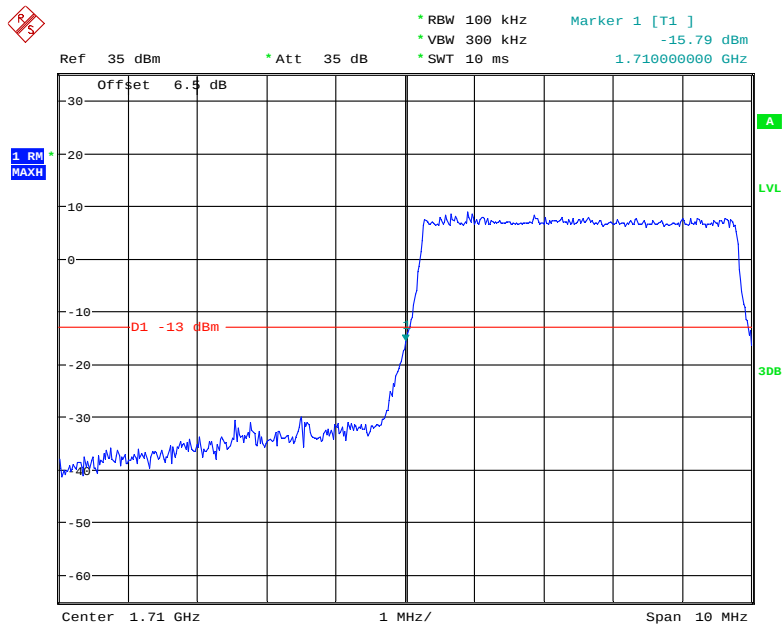
Date: 23.APR.2020 15:12:44

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



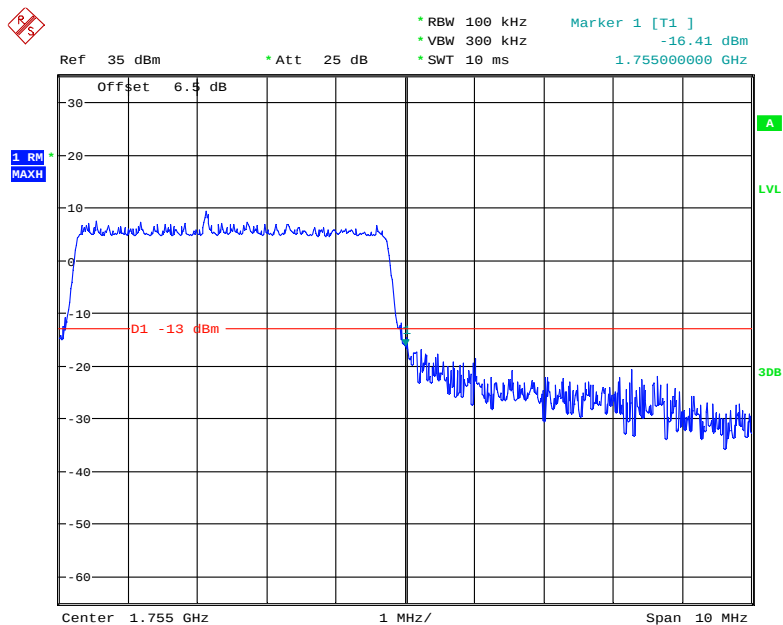
Date: 14.MAY.2020 13:58:57

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



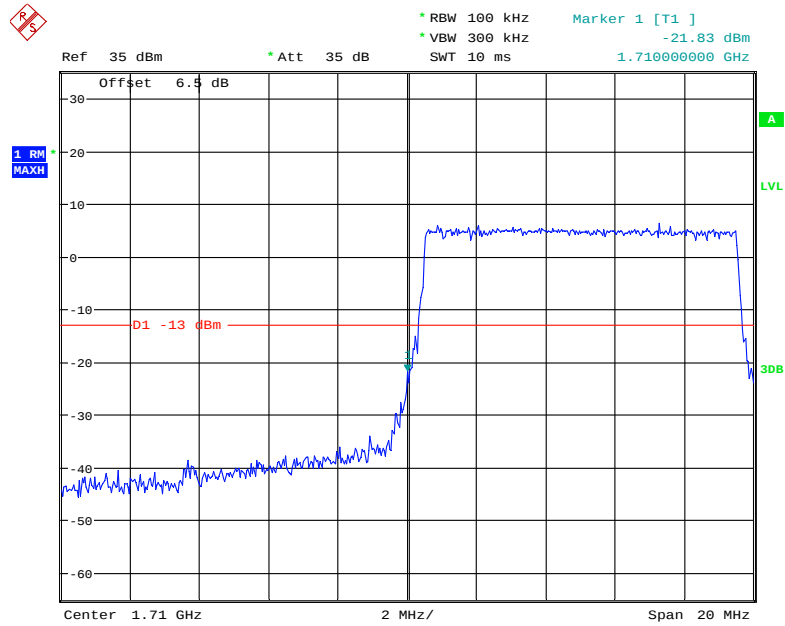
Date: 23.APR.2020 15:13:58

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



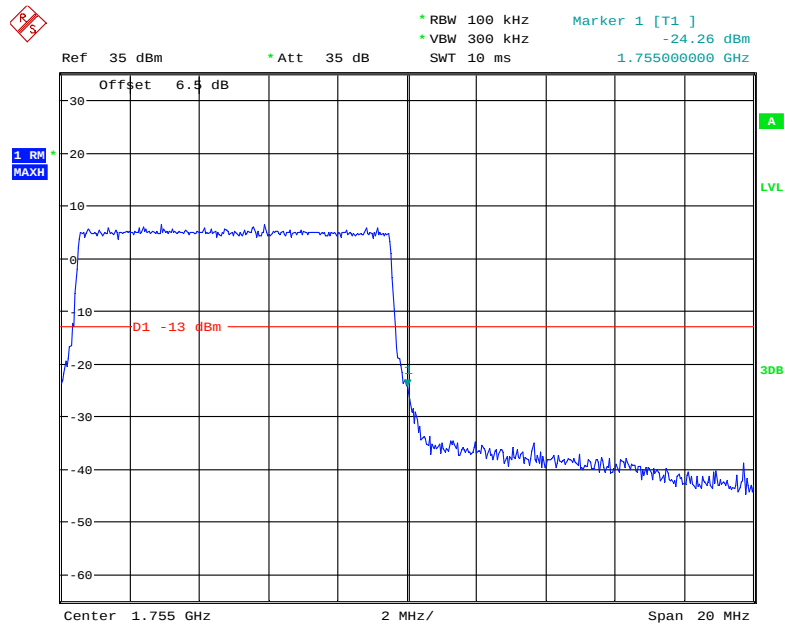
Date: 14.MAY.2020 14:03:43

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



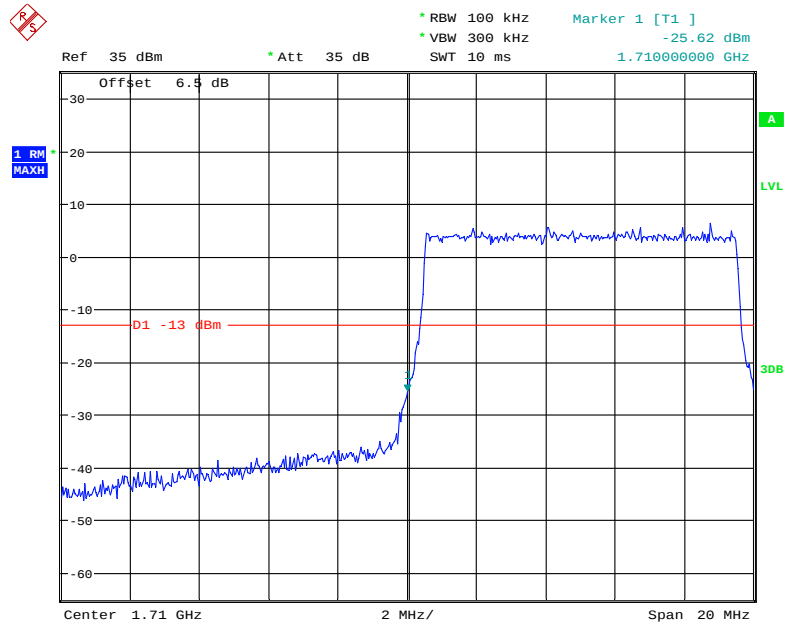
Date: 23.APR.2020 14:17:49

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



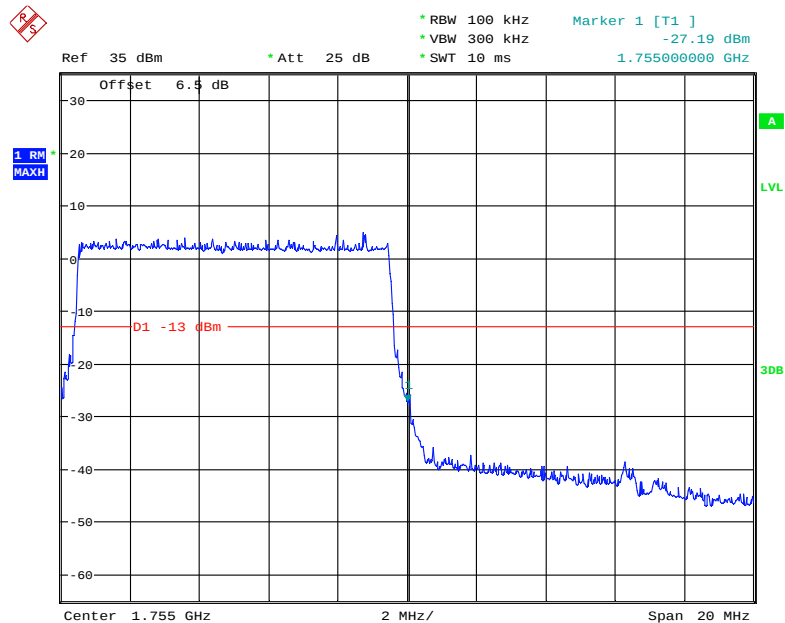
Date: 23.APR.2020 14:18:23

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



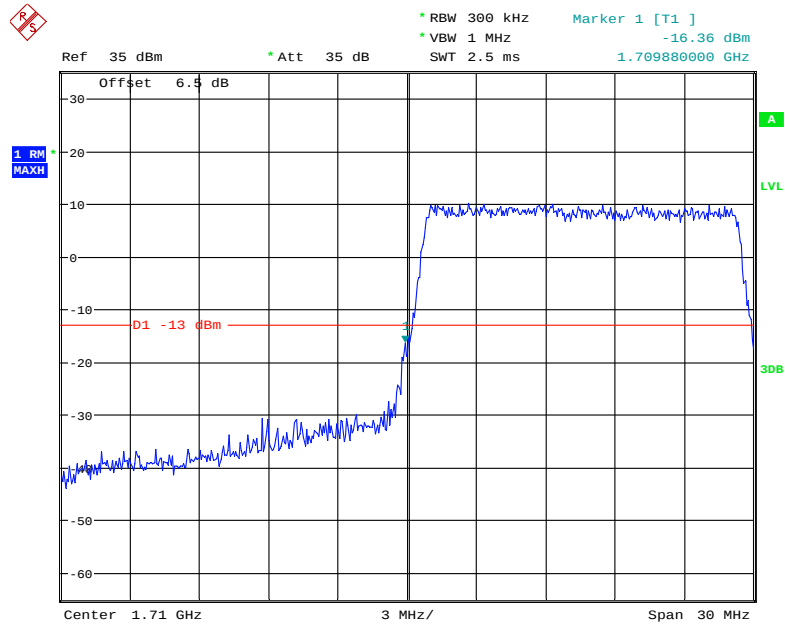
Date: 23.APR.2020 14:18:06

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



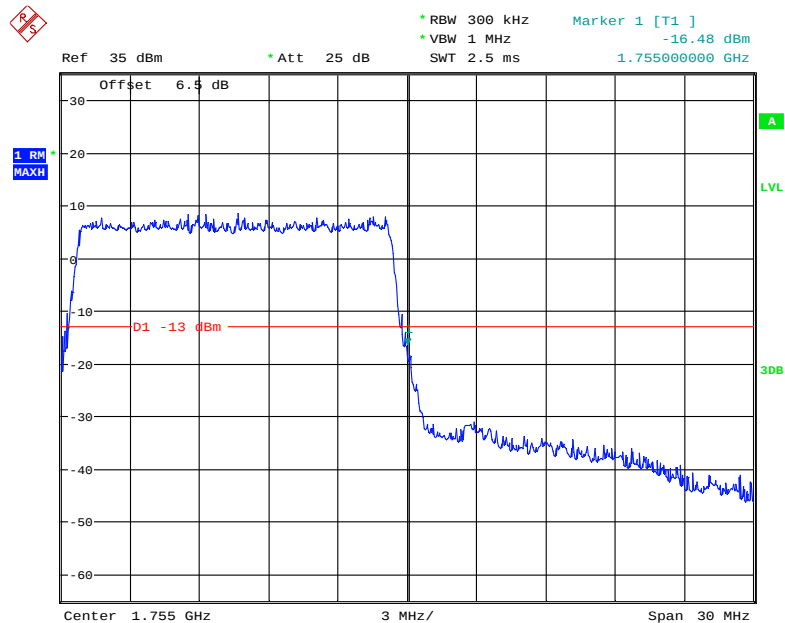
Date: 14.MAY.2020 14:09:43

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



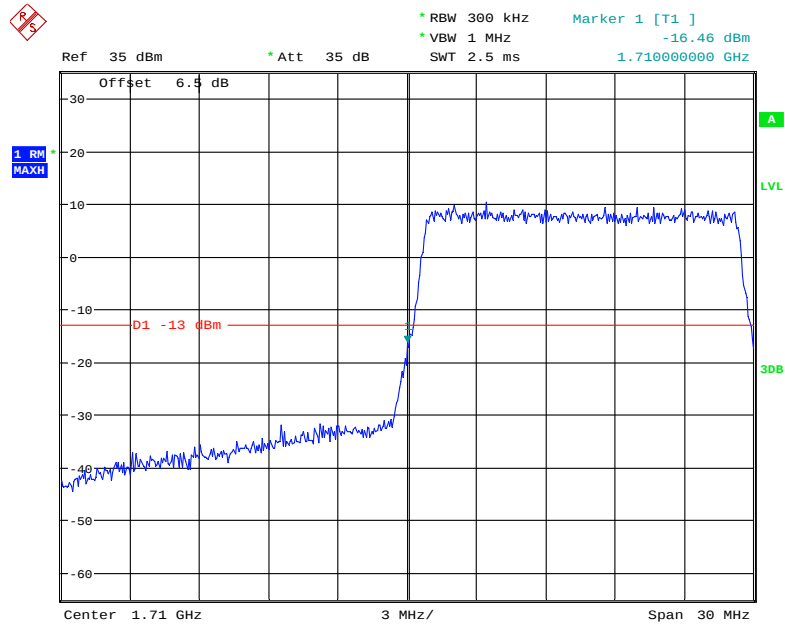
Date: 23.APR.2020 14:19:01

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



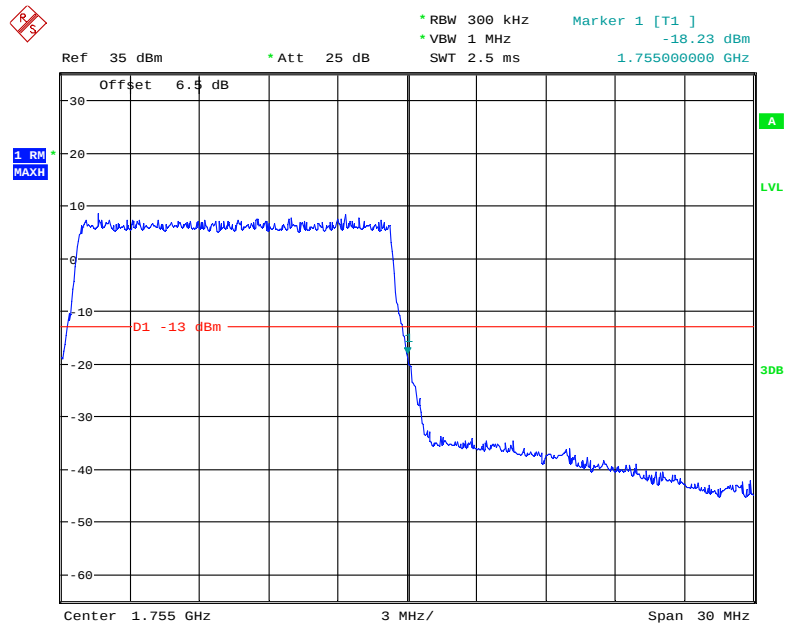
Date: 14.MAY.2020 14:12:01

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



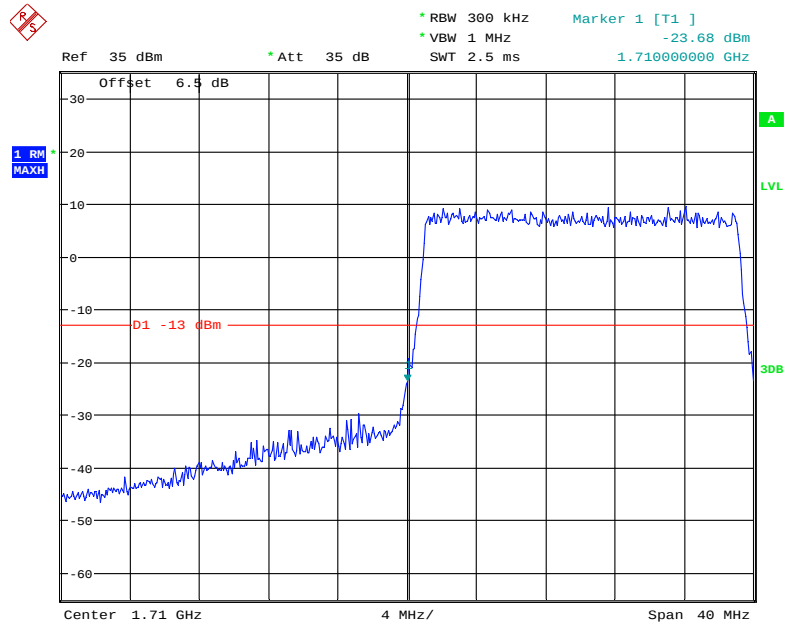
Date: 23.APR.2020 14:19:23

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



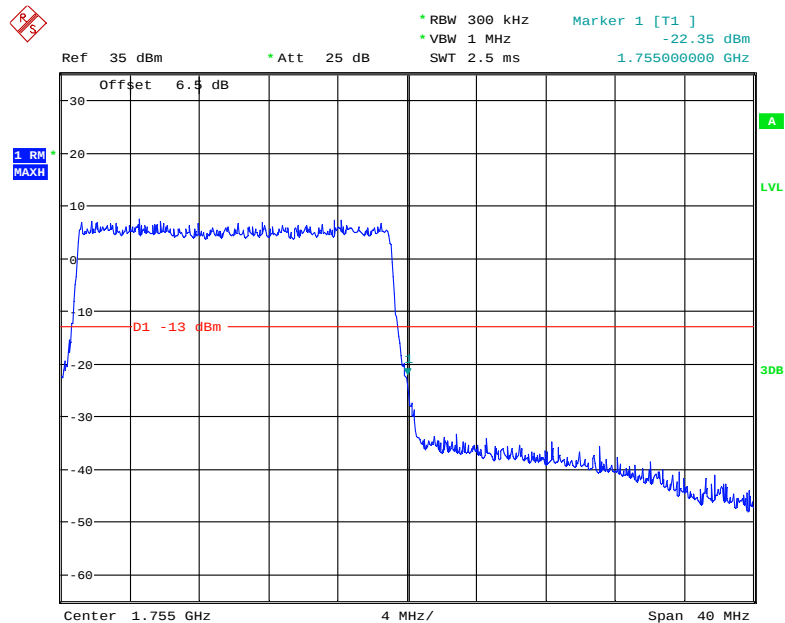
Date: 14.MAY.2020 14:12:56

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



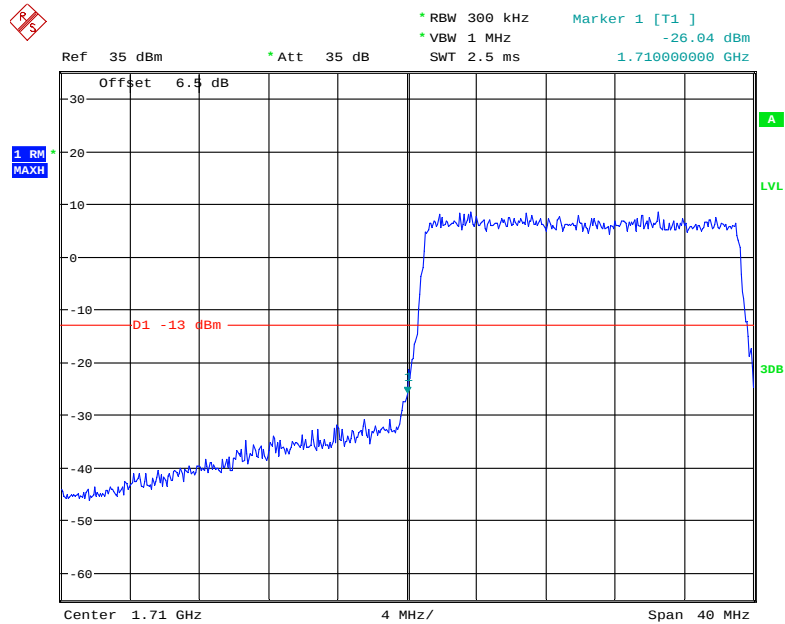
Date: 23.APR.2020 14:20:23

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



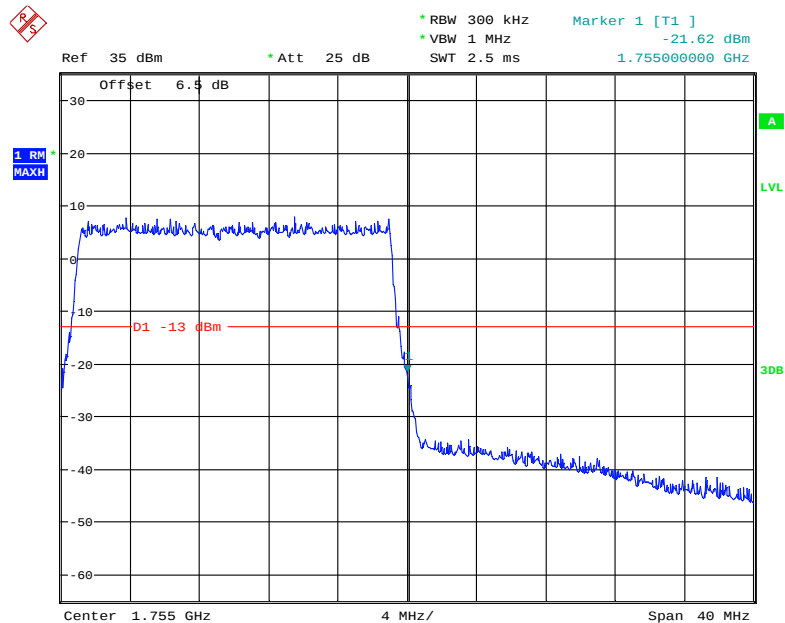
Date: 14.MAY.2020 14:14:39

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



Date: 23.APR.2020 14:20:42

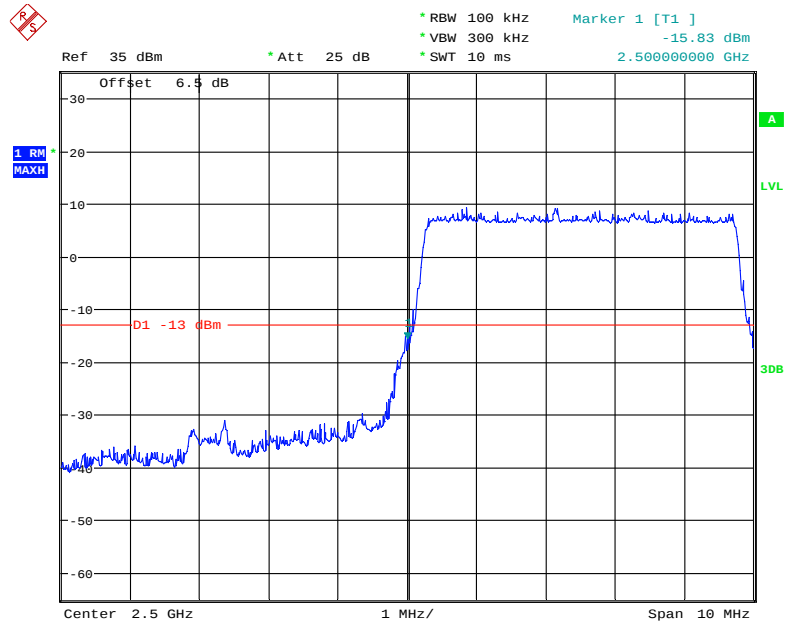
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 14.MAY.2020 14:18:13

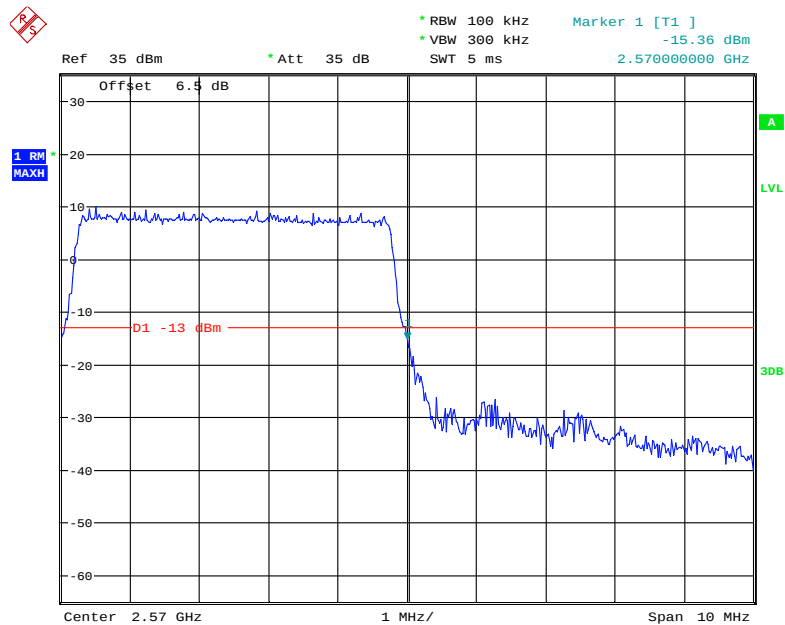
Band 7:

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



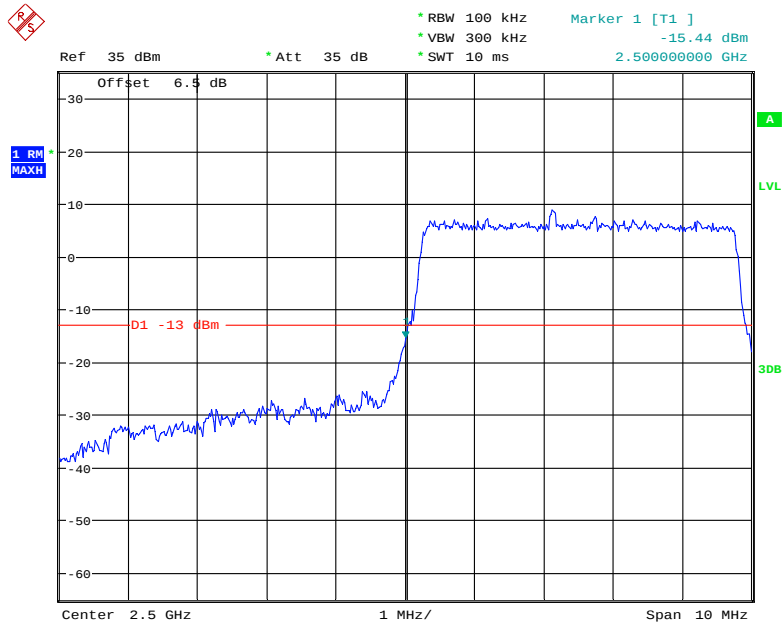
Date: 14.MAY.2020 14:20:27

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



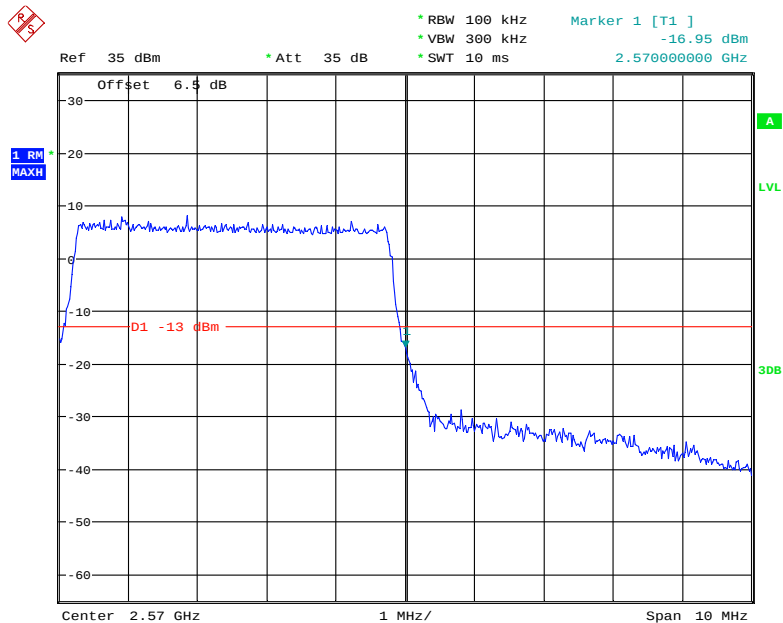
Date: 23.APR.2020 14:22:16

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



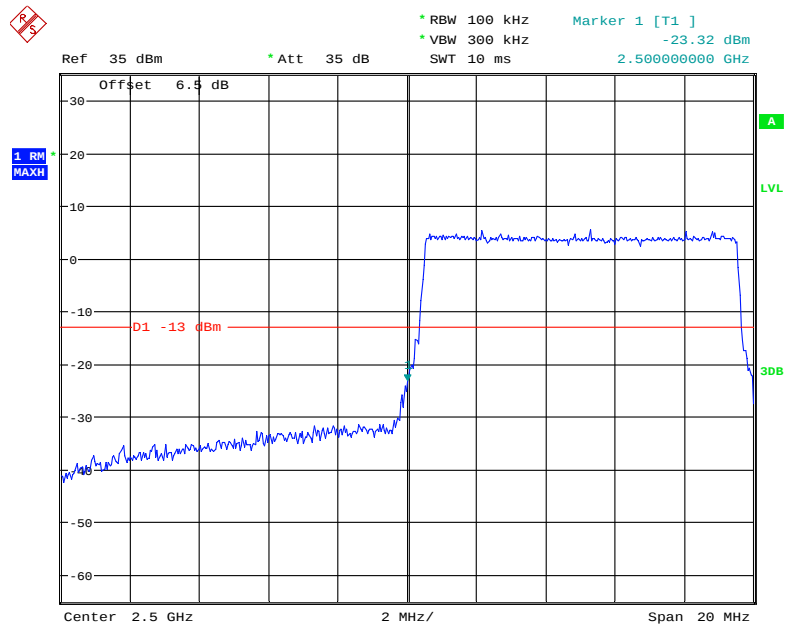
Date: 23.APR.2020 15:20:28

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



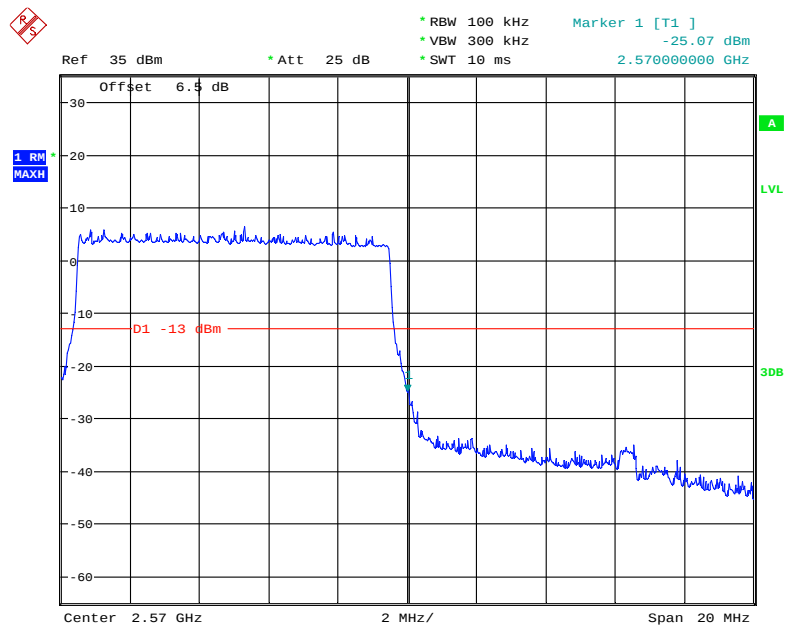
Date: 23.APR.2020 15:22:04

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



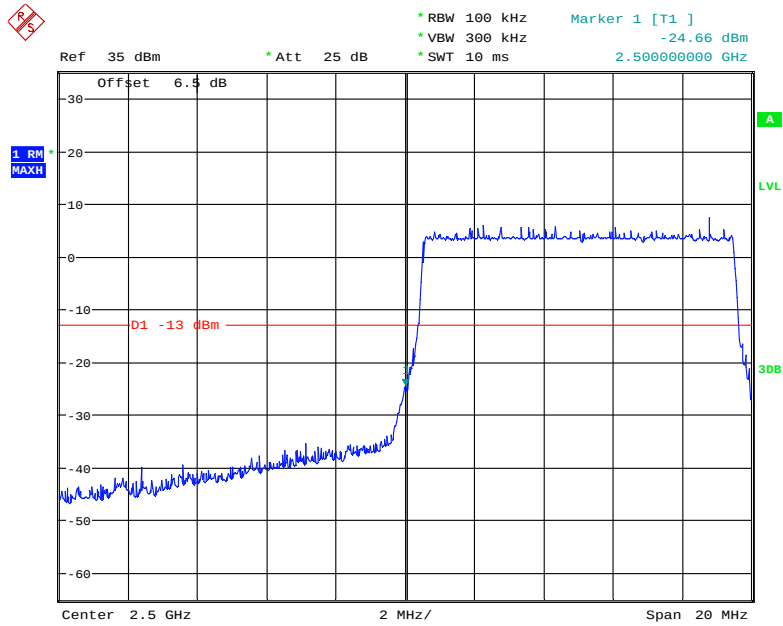
Date: 23.APR.2020 14:22:52

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



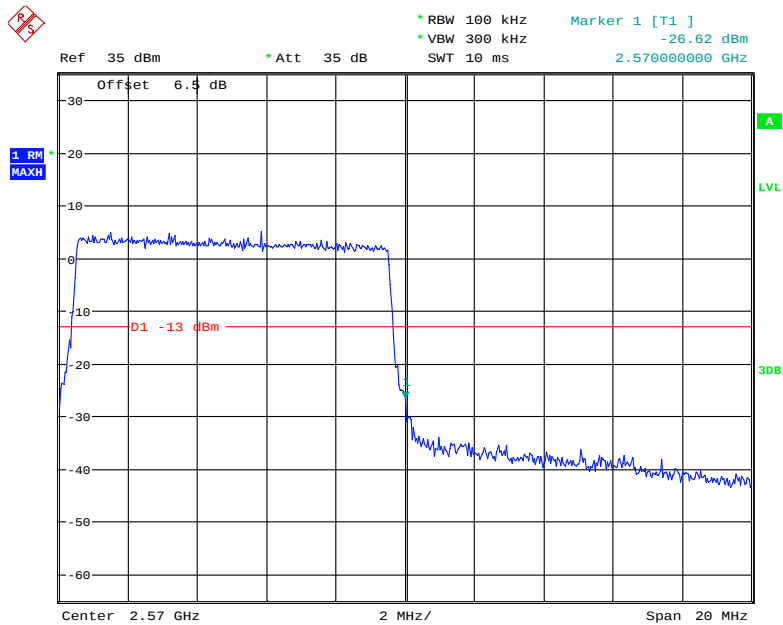
Date: 14.MAY.2020 14:25:40

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



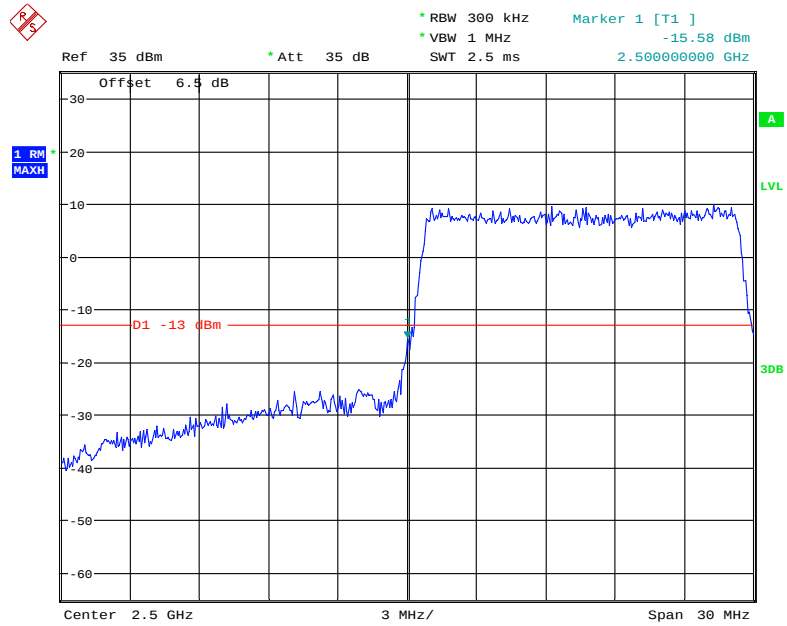
Date: 14.MAY.2020 14:22:38

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



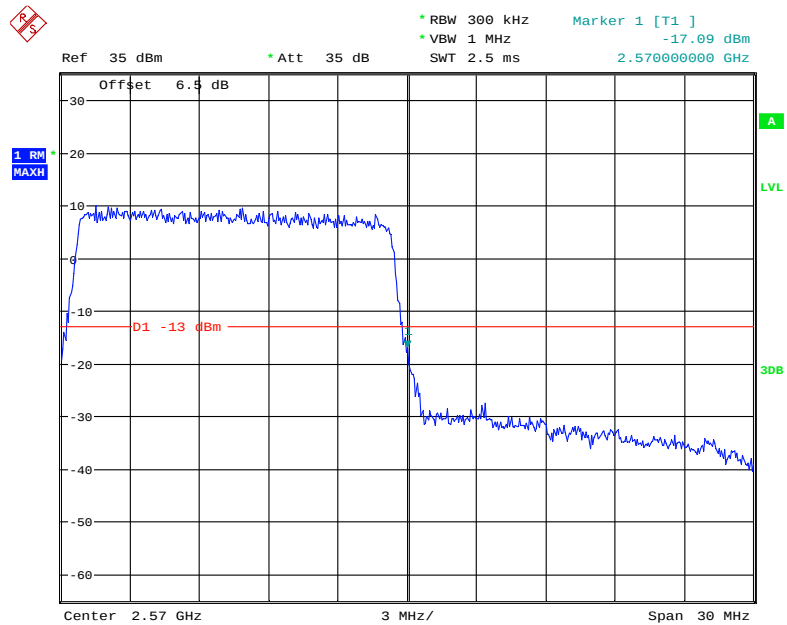
Date: 23.APR.2020 14:23:42

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



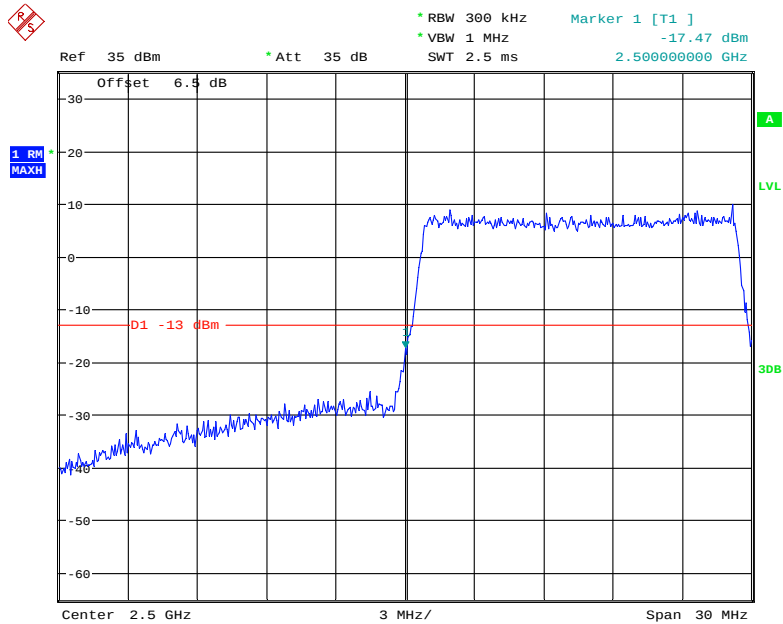
Date: 23.APR.2020 14:24:04

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



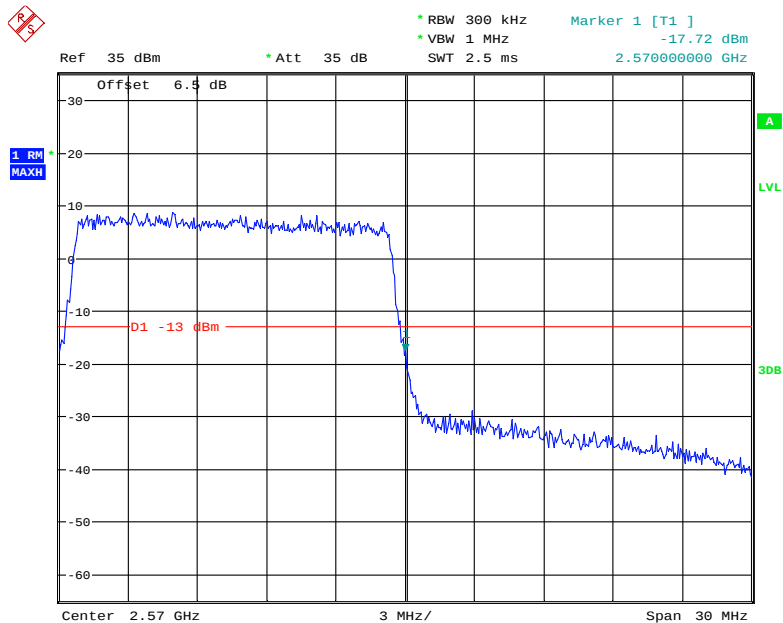
Date: 23.APR.2020 14:24:49

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



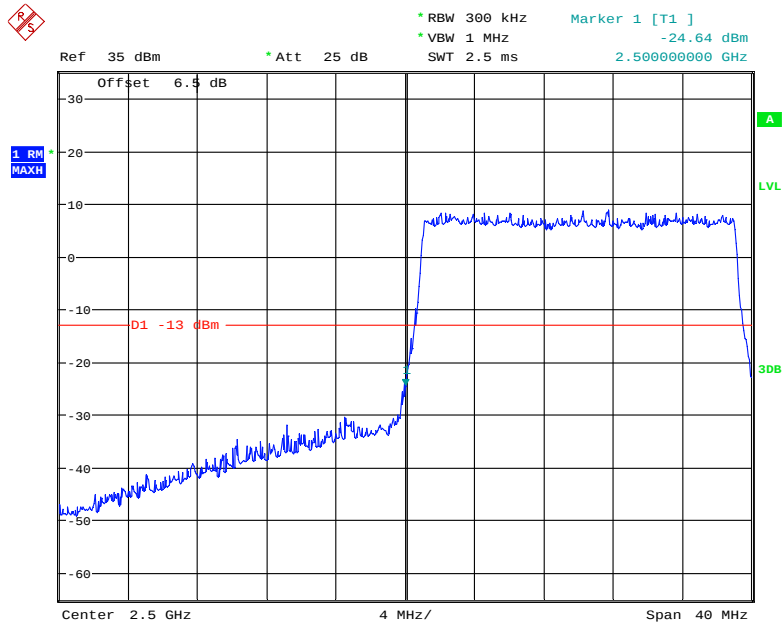
Date: 23.APR.2020 14:24:26

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



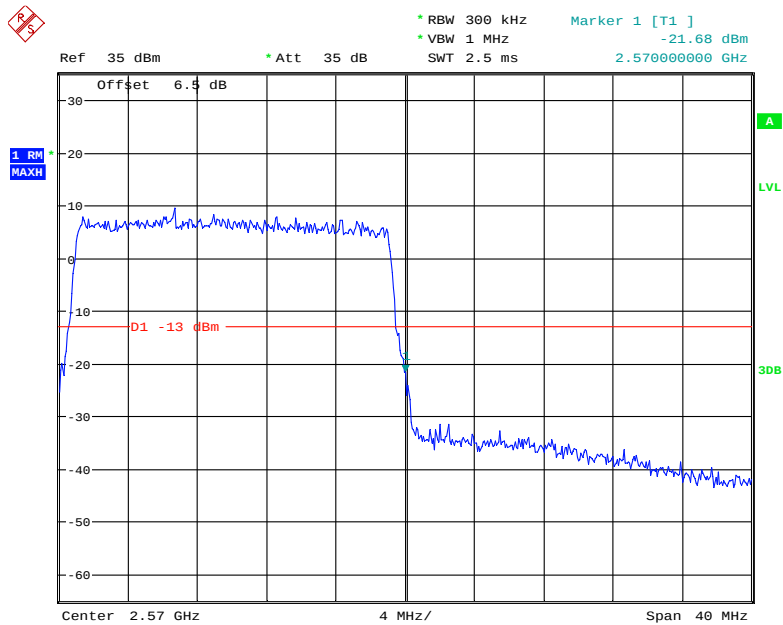
Date: 23.APR.2020 14:25:08

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



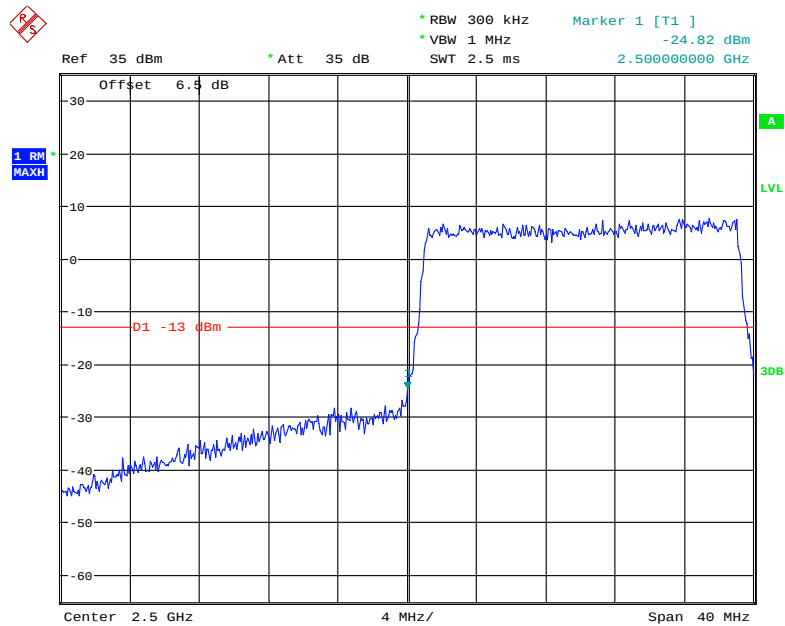
Date: 14.MAY.2020 14:27:43

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



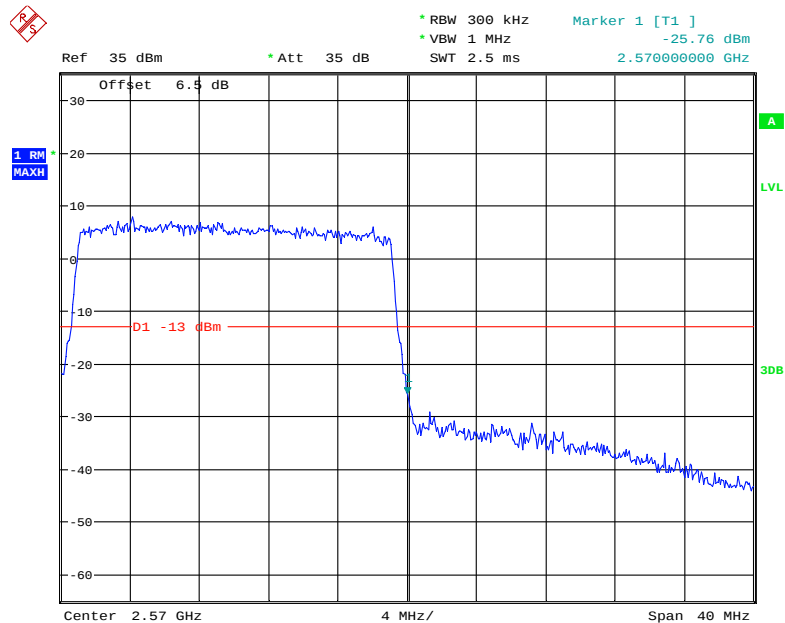
Date: 23.APR.2020 14:26:11

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



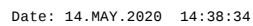
Date: 23.APR.2020 14:25:51

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



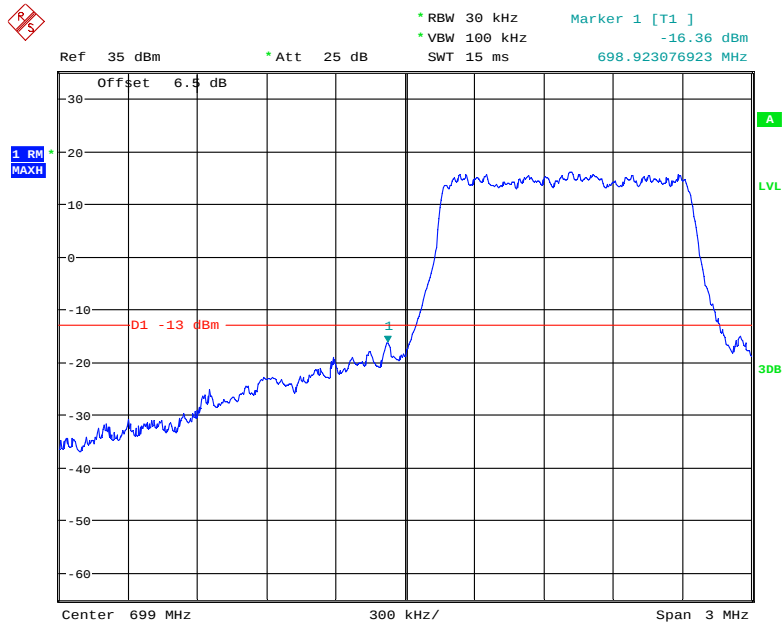
Date: 23.APR.2020 14:26:33

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



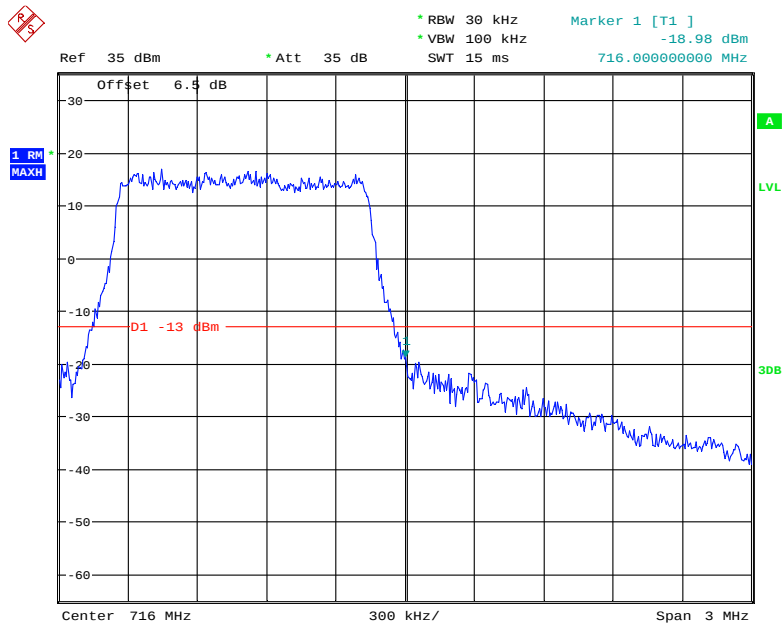
Date: 23.APR.2020 14:27:32

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



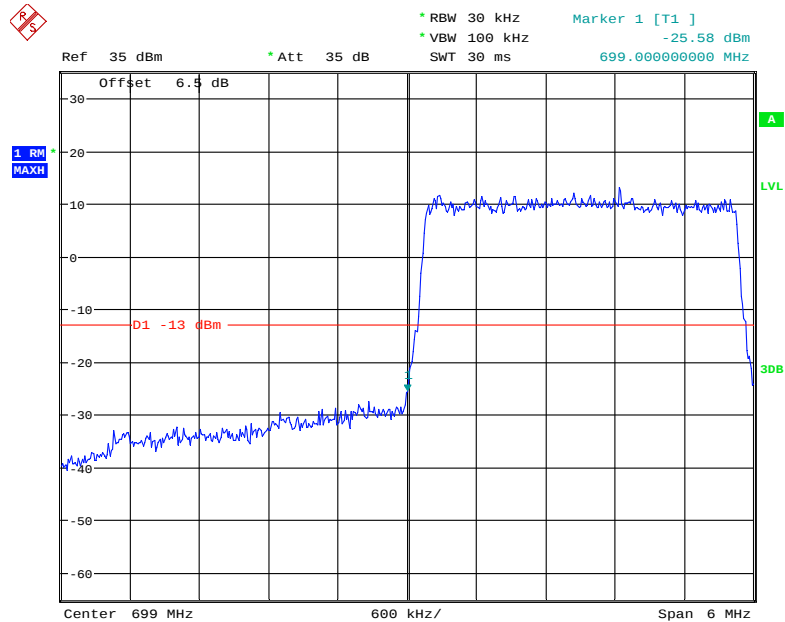
Date: 14.MAY.2020 14:42:18

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



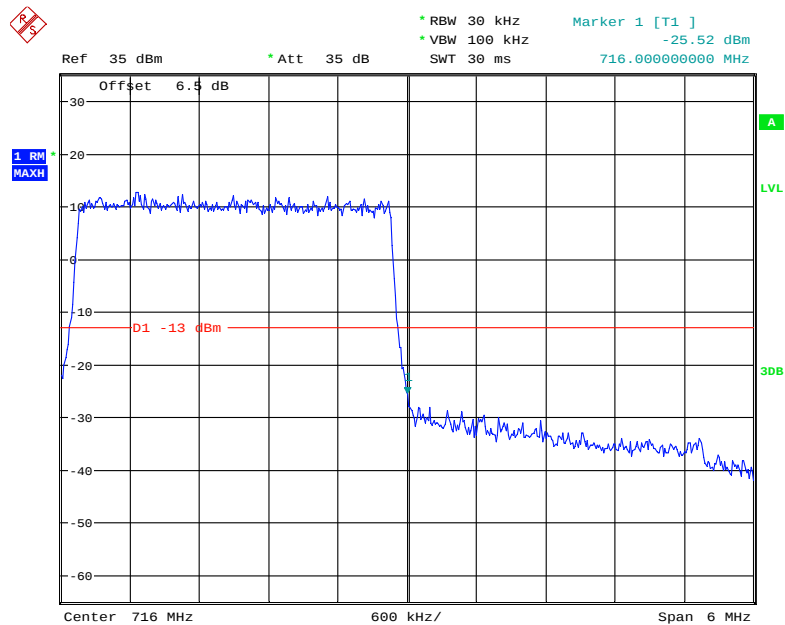
Date: 23.APR.2020 14:27:47

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



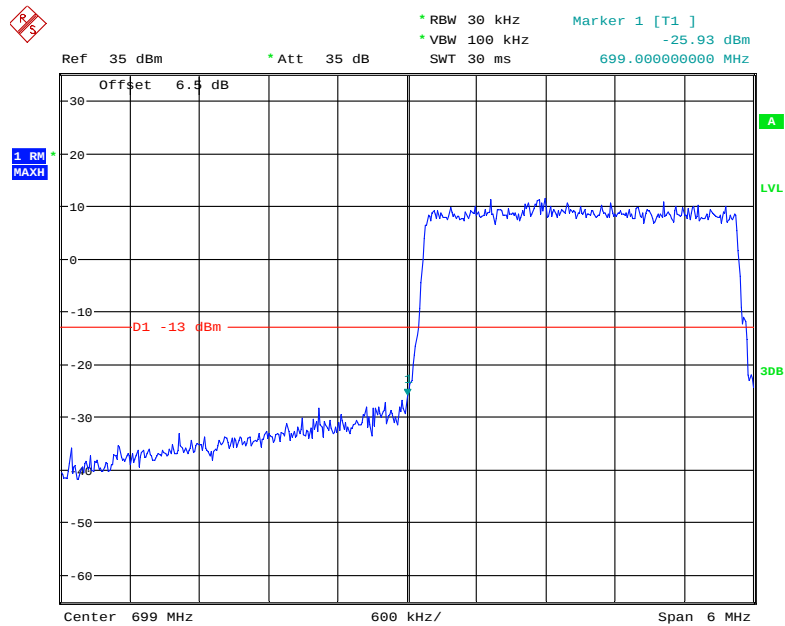
Date: 23.APR.2020 14:28:06

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



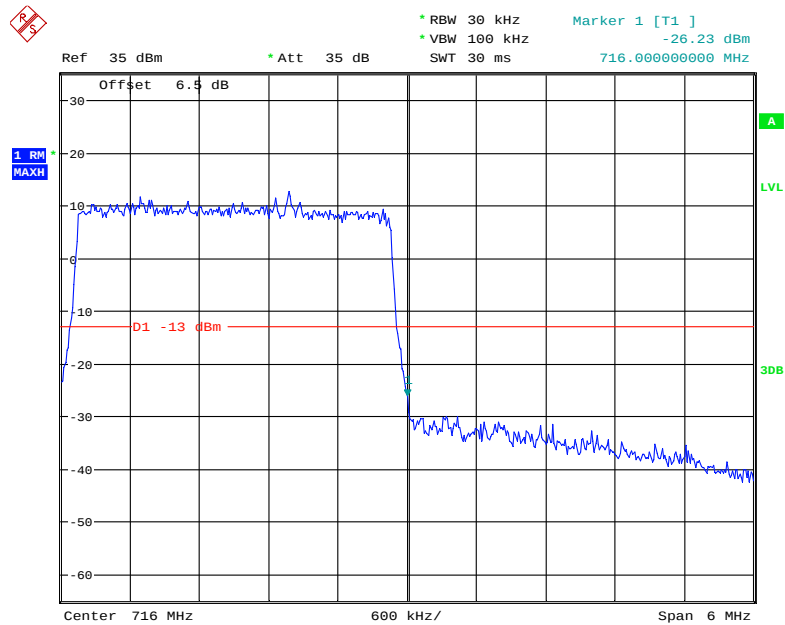
Date: 23.APR.2020 14:28:41

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



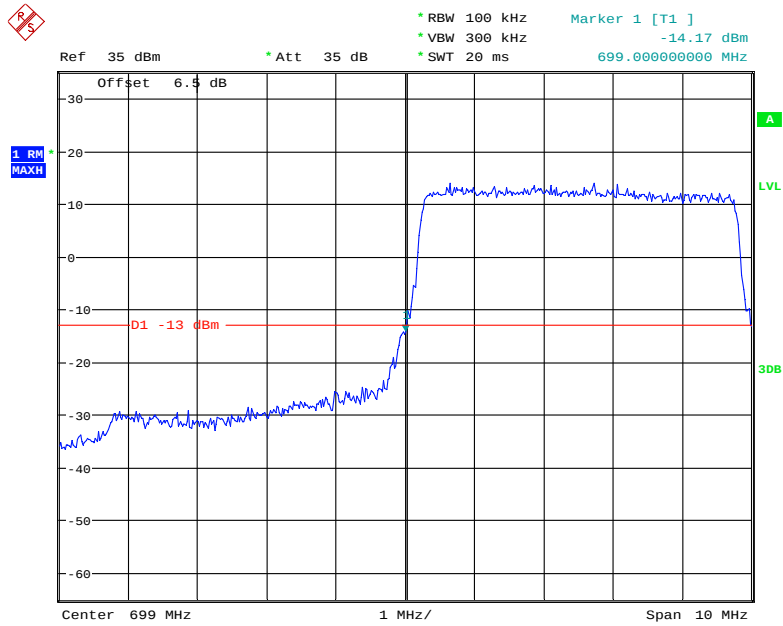
Date: 23.APR.2020 14:28:21

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



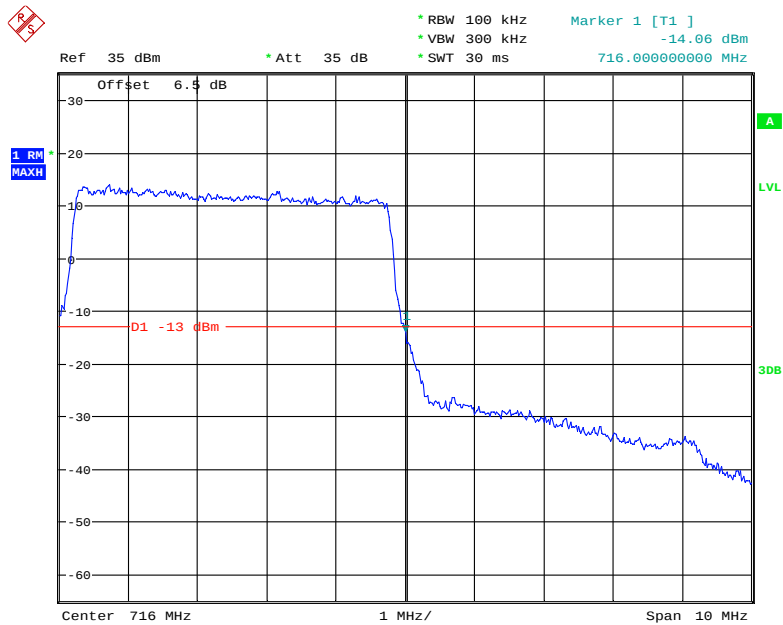
Date: 23.APR.2020 14:28:56

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



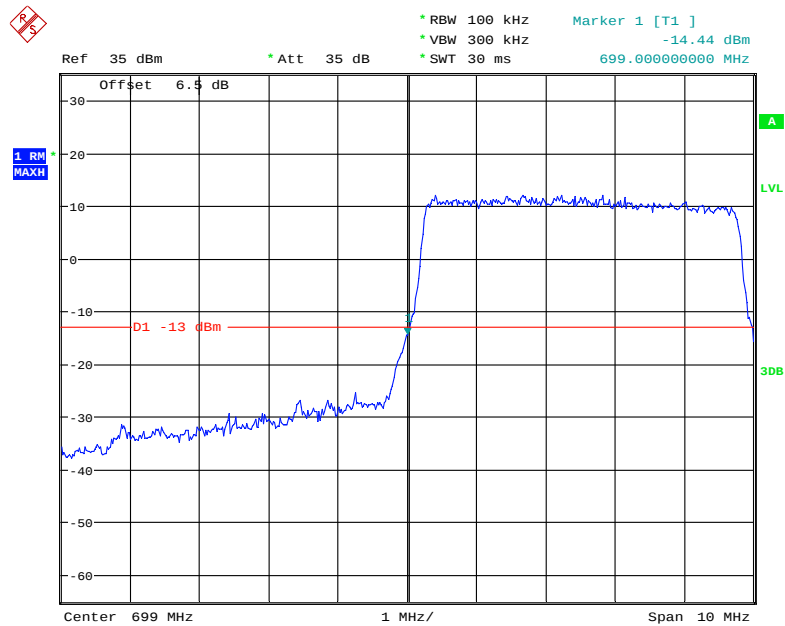
Date: 23.APR.2020 15:29:11

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



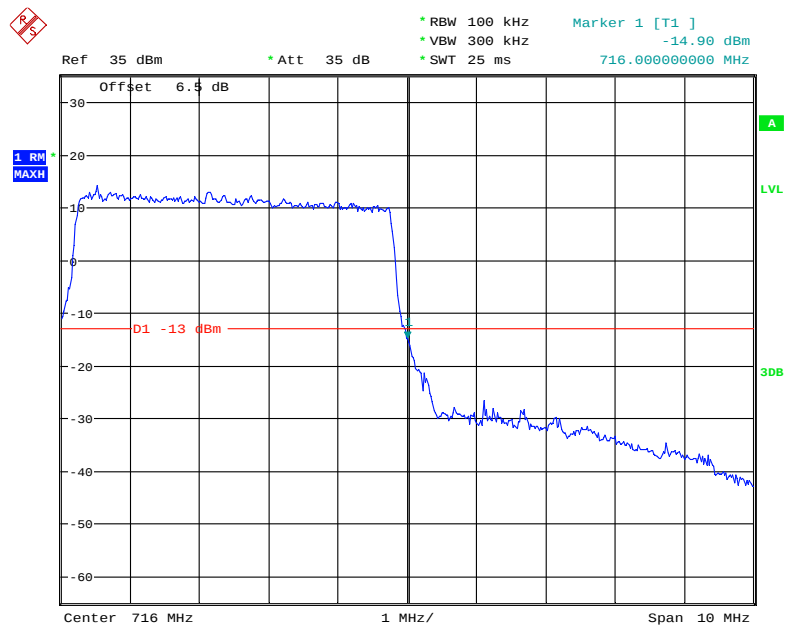
Date: 23.APR.2020 15:31:53

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



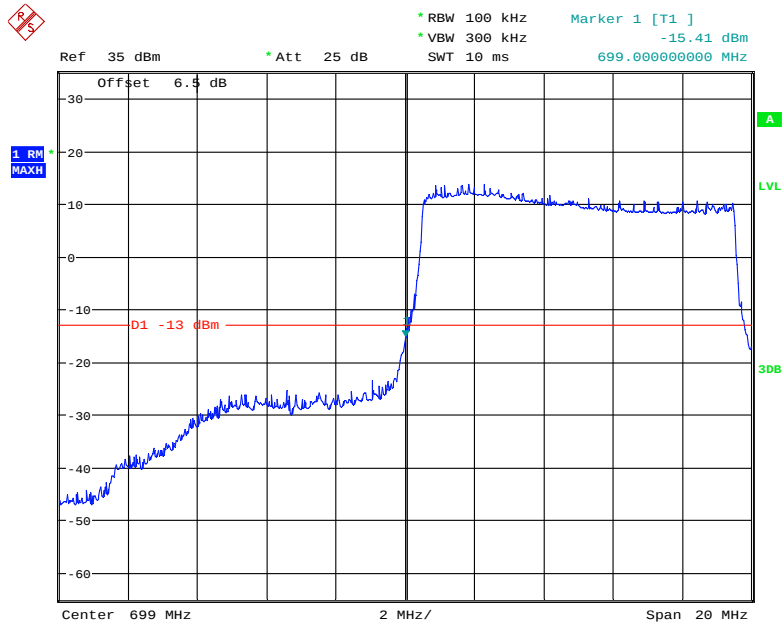
Date: 23.APR.2020 15:30:42

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



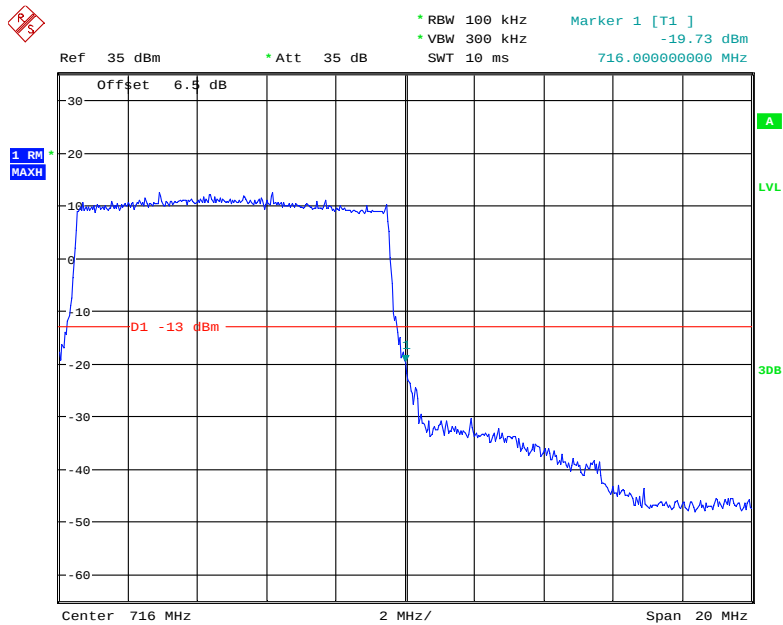
Date: 23.APR.2020 15:33:32

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



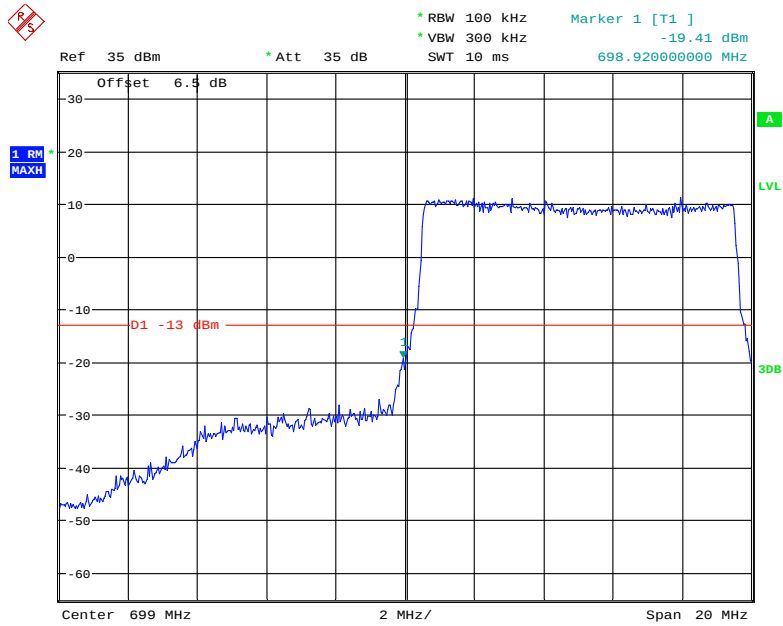
Date: 14.MAY.2020 14:46:43

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



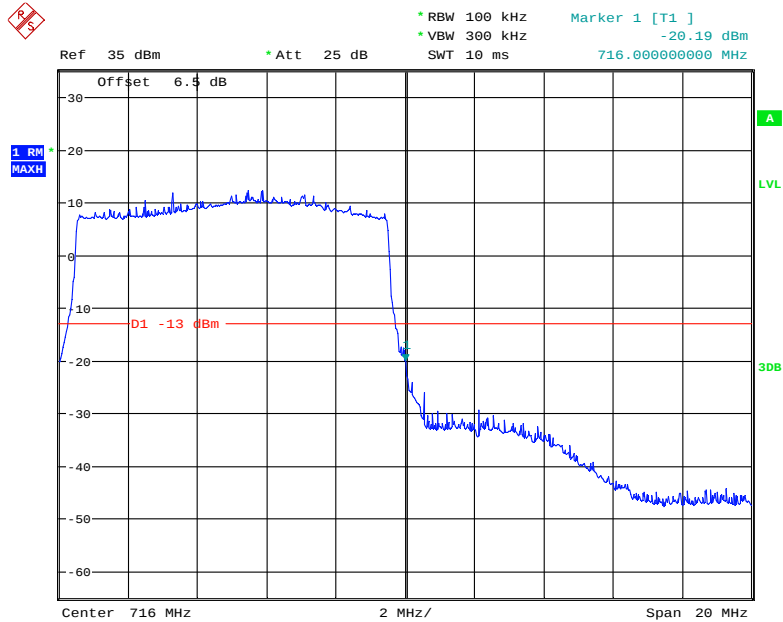
Date: 23.APR.2020 14:31:08

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



Date: 23.APR.2020 14:30:50

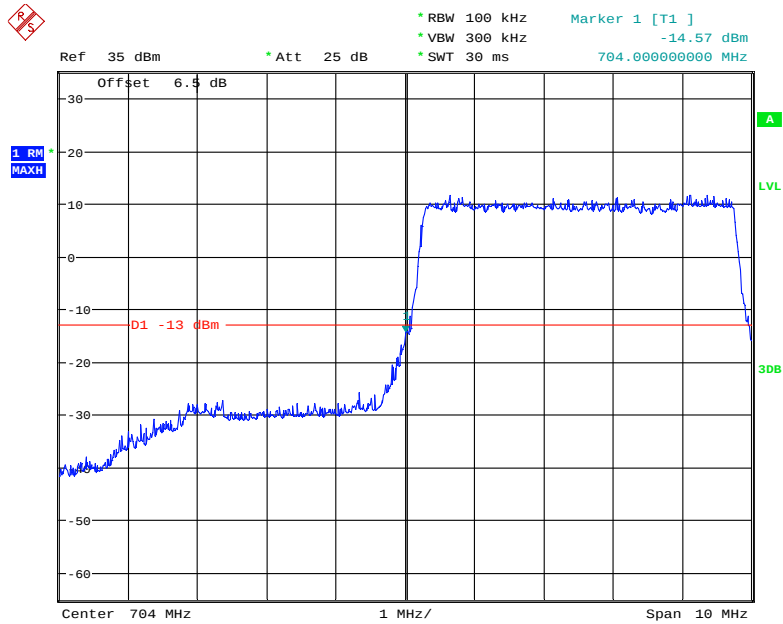
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 14.MAY.2020 14:51:58

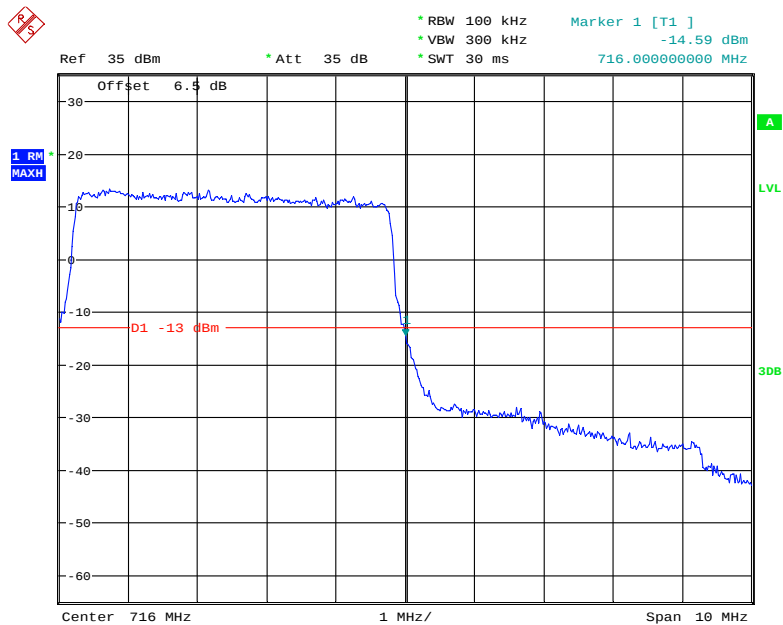
Band 17:

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



Date: 14.MAY.2020 14:55:07

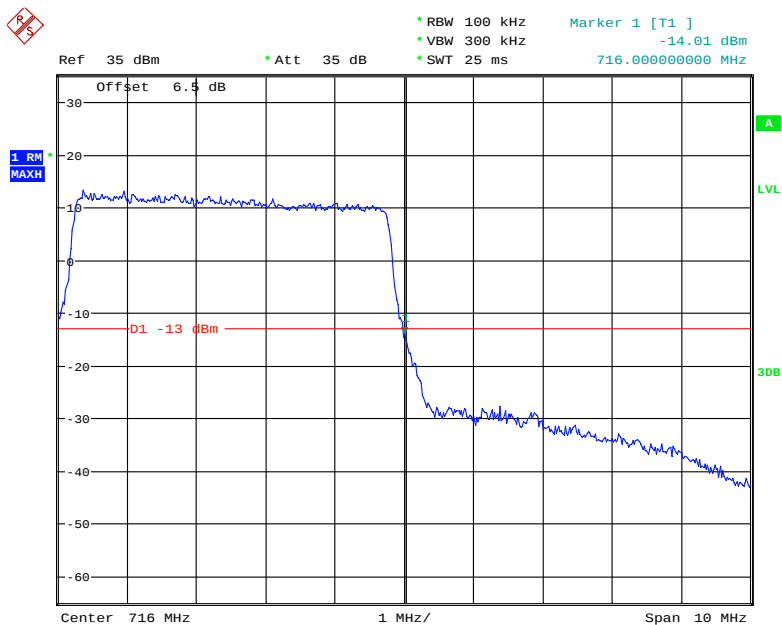
QPSK (5.0 MHz, FULL RB) - Right Band Edge



Date: 23.APR.2020 15:38:29

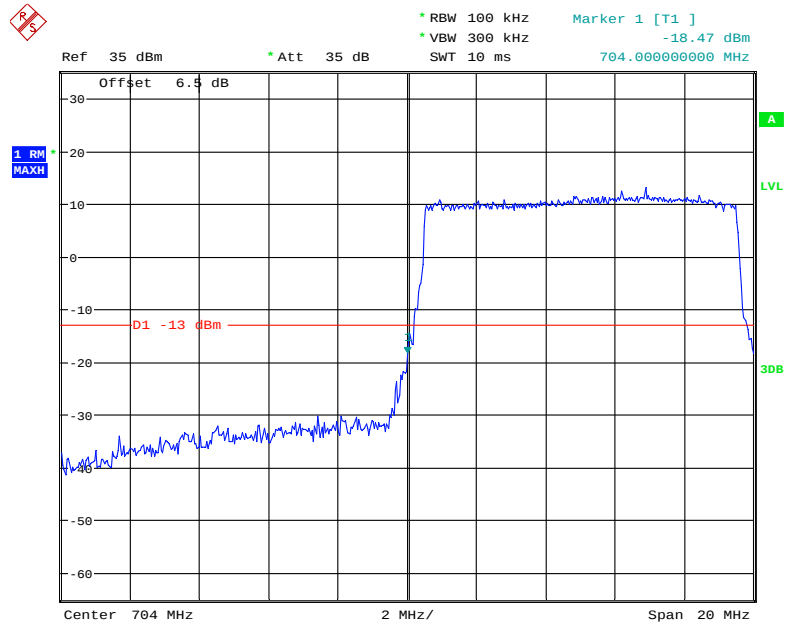
The screenshot displays a spectrum analyzer interface. At the top, a red square icon with 'F' and 'S' is visible. The main display area shows a blue trace of a signal. A red horizontal line marks the signal level at -13 dBm, labeled 'D1 -13 dBm'. The x-axis is labeled 'Center 704 MHz' and 'Span 10 MHz'. The y-axis is labeled 'Ref 35 dBm' and 'Att 25 dB'. A vertical line is positioned at 704.00000000 MHz, with a marker label 'Marker 1 [T1] -14.61 dBm'. The signal trace shows a sharp rise from approximately -35 dBm to -10 dBm at the center frequency, followed by a gradual decline. The background is a grid with major lines every 10 dB and minor lines every 1 dB.

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



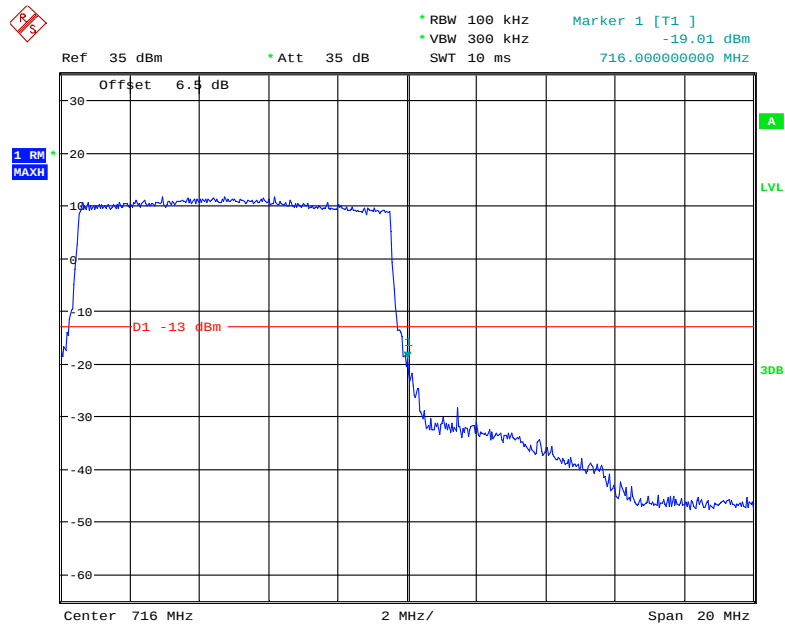
Page 155 of 167

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



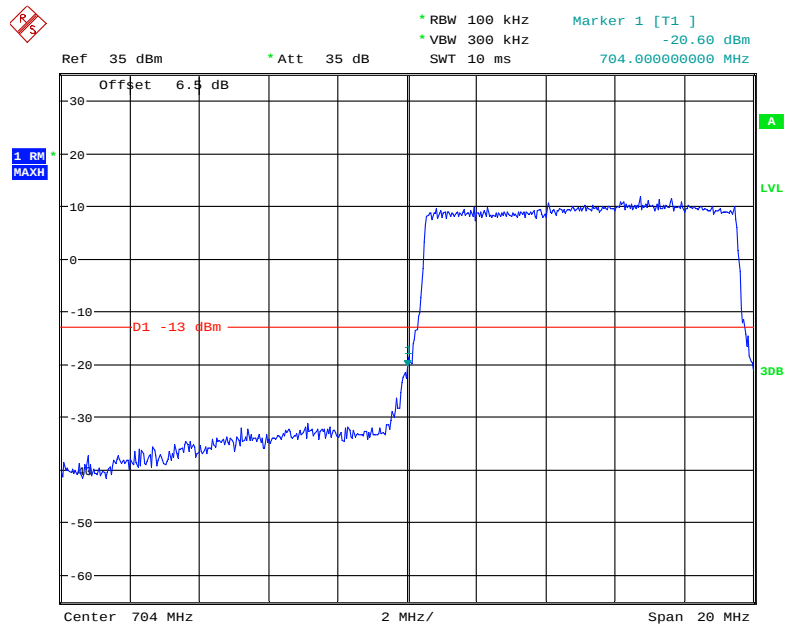
Date: 23.APR.2020 14:33:03

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



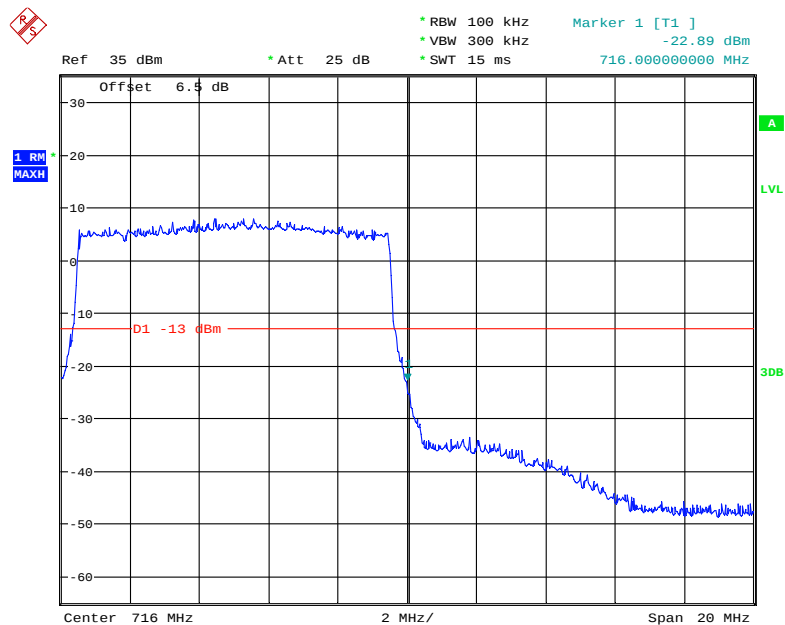
Date: 23.APR.2020 14:33:37

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



Date: 23.APR.2020 14:33:20

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



Date: 14.MAY.2020 14:59:08

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

Applicable Standard

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

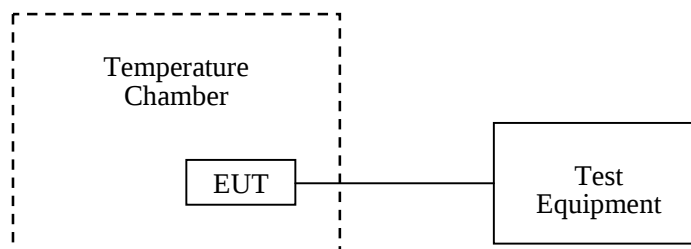
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data**Environmental Conditions**

Temperature:	20 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by George Zhong on 2020-04-23.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables.

Cellular Band (Part 22H)**GSM Mode**

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	3	0.003586	2.5
-20		5	0.005977	2.5
-10		-4	-0.004781	2.5
0		1	0.001195	2.5
10		-6	-0.007172	2.5
20		-7	-0.008367	2.5
30		8	0.009563	2.5
40		-2	-0.002391	2.5
50		1	0.001195	2.5
20	L.V.	-8	-0.009563	2.5
	H.V.	-7	-0.008367	2.5

EDGE Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	4	0.004781	2.5
-20		-5	-0.005977	2.5
-10		1	0.001195	2.5
0		-6	-0.007172	2.5
10		-8	-0.009563	2.5
20		7	0.008367	2.5
30		-4	-0.004781	2.5
40		2	0.002391	2.5
50		-3	-0.003586	2.5
20	L.V.	8	0.009563	2.5
	H.V.	-7	-0.008367	2.5

WCDMA Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	5	0.005977	2.5
-20		2	0.002391	2.5
-10		-6	-0.007172	2.5
0		4	0.004781	2.5
10		-2	-0.002391	2.5
20		3	0.003586	2.5
30		-5	-0.005977	2.5
40		1	0.001195	2.5
50		-2	-0.002391	2.5
20	L.V.	3	0.003586	2.5
	H.V.	-7	-0.008367	2.5

PCS Band (Part 24E)**GSM Mode**

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	4	0.002128	pass
-20		-2	-0.001064	pass
-10		1	0.000532	pass
0		-5	-0.002660	pass
10		3	0.001596	pass
20		-7	-0.003723	pass
30		-5	-0.002660	pass
40		4	0.002128	pass
50		-6	-0.003191	pass
20	L.V.	8	0.004255	pass
	H.V.	5	0.002660	pass

EDGE Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	6	0.003191	pass
-20		-4	-0.002128	pass
-10		8	0.004255	pass
0		-2	-0.001064	pass
10		1	0.000532	pass
20		-7	-0.003723	pass
30		6	0.003191	pass
40		-9	-0.004787	pass
50		5	0.002660	pass
20	L.V.	8	0.004255	pass
	H.V.	5	0.002660	pass

WCDMA Mode

Middle Channel, $f_0=1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	3	0.001596	pass
-20		-5	-0.002660	pass
-10		6	0.003191	pass
0		-2	-0.001064	pass
10		-1	-0.000532	pass
20		4	0.002128	pass
30		-5	-0.002660	pass
40		8	0.004255	pass
50		-7	-0.003723	pass
20	L.V.	-4	-0.002128	pass
	H.V.	5	0.002660	pass

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, $f_0=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	-12.59	-0.0067	pass
-20		-9.97	-0.0053	pass
-10		-6.13	-0.0033	pass
0		6.17	0.0033	pass
10		7.92	0.0042	pass
20		6.46	0.0034	pass
30		-6.52	-0.0035	pass
40		7.18	0.0038	pass
50		-9.69	-0.0052	pass
20	L.V.	-8.17	-0.0043	pass
	H.V.	-7.05	-0.0038	pass

Band 4:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1710.4895	1754.5040	1710	1755
-20		1710.4864	1754.4994	1710	1755
-10		1710.4907	1754.4998	1710	1755
0		1710.4904	1754.5000	1710	1755
10		1710.4872	1754.5012	1710	1755
20		1710.4849	1754.5038	1710	1755
30		1710.4881	1754.5034	1710	1755
40		1710.4872	1754.5020	1710	1755
50		1710.4877	1754.5031	1710	1755
20	L.V.	1710.4915	1754.5026	1710	1755
	H.V.	1710.4872	1754.5005	1710	1755

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2500.5106	2569.439	2500	2570
-20		2500.5126	2569.4423	2500	2570
-10		2500.5132	2569.4358	2500	2570
0		2500.5142	2569.4404	2500	2570
10		2500.5135	2569.4376	2500	2570
20		2500.5128	2569.435	2500	2570
30		2500.5122	2569.4417	2500	2570
40		2500.5135	2569.4423	2500	2570
50		2500.5129	2569.4353	2500	2570
20	L.V.	2500.5157	2569.4464	2500	2570
	H.V.	2500.5134	2569.4365	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	699.4840	715.6225	699	716
-20		699.4847	715.6252	699	716
-10		699.4863	715.6262	699	716
0		699.4877	715.6202	699	716
10		699.4865	715.6228	699	716
20		699.4847	715.6240	699	716
30		699.4839	715.6257	699	716
40		699.4911	715.6276	699	716
50		699.4828	715.6251	699	716
20	L.V.	699.4873	715.6277	699	716
	H.V.	699.4866	715.6237	699	716

Band 17:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	704.5661	715.6438	704	716
-20		704.5609	715.6439	704	716
-10		704.5598	715.6431	704	716
0		704.5632	715.6435	704	716
10		704.5619	715.6421	704	716
20		704.5594	715.6469	704	716
30		704.5611	715.6425	704	716
40		704.5599	715.6432	704	716
50		704.5586	715.6443	704	716
20	L.V.	704.5619	715.6401	704	716
	H.V.	704.5640	715.6407	704	716

16QAM:**Band 2:**

10.0 MHz Middle Channel, f ₀ =1880MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	-0.57	-0.0003	pass
-20		-6.68	-0.0036	pass
-10		9.77	0.0052	pass
0		-7.62	-0.0041	pass
10		-9.91	-0.0053	pass
20		-9.82	-0.0052	pass
30		-6.68	-0.0036	pass
40		-8.85	-0.0047	pass
50		5.67	0.003	pass
20	L.V.	6.05	0.0032	pass
	H.V.	7.52	0.0040	pass

Band 4:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1710.4811	1754.5015	1710	1755
-20		1710.4812	1754.5065	1710	1755
-10		1710.4886	1754.5008	1710	1755
0		1710.4866	1754.5062	1710	1755
10		1710.4836	1754.5028	1710	1755
20		1710.4872	1754.5063	1710	1755
30		1710.4818	1754.5075	1710	1755
40		1710.4858	1754.5055	1710	1755
50		1710.4886	1754.5104	1710	1755
20	L.V.	1710.4820	1754.5105	1710	1755
	H.V.	1710.4822	1754.5074	1710	1755

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2500.5186	2569.4402	2500	2570
-20		2500.5113	2569.4415	2500	2570
-10		2500.5128	2569.4404	2500	2570
0		2500.5111	2569.4355	2500	2570
10		2500.5141	2569.4378	2500	2570
20		2500.5176	2569.4408	2500	2570
30		2500.5147	2569.4381	2500	2570
40		2500.5112	2569.4407	2500	2570
50		2500.5214	2569.4384	2500	2570
20	L.V.	2500.5195	2569.4374	2500	2570
	H.V.	2500.5153	2569.4407	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	699.4825	715.6251	699	716
-20		699.4886	715.6232	699	716
-10		699.4899	715.6245	699	716
0		699.4898	715.6252	699	716
10		699.4852	715.6231	699	716
20		699.4871	715.6217	699	716
30		699.4871	715.6208	699	716
40		699.4880	715.623	699	716
50		699.4908	715.6223	699	716
20	L.V.	699.4849	715.6224	699	716
	H.V.	699.4842	715.6252	699	716

Band 17:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	704.5606	715.6456	704	716
-20		704.5673	715.6474	704	716
-10		704.5598	715.6423	704	716
0		704.5674	715.6429	704	716
10		704.5625	715.6433	704	716
20		704.5605	715.6464	704	716
30		704.5626	715.6437	704	716
40		704.5632	715.6455	704	716
50		704.5613	715.6502	704	716
20	L.V.	704.5676	715.6444	704	716
	H.V.	704.5641	715.6441	704	716

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