

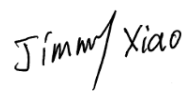
FCC PART 27
FCC PART 22H, PART 24E
TEST REPORT

For

Bolt Modus Corp

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

FCC ID: 2APW4ART1

Report Type: Original Report	Product Type: Smart phone
Report Number: RSZ200110005-00D	
Report Date: 2020-03-14	
Jimmy Xiao 	
Reviewed By: RF Engineer	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Smart phone
Model	ART1
Frequency Range	Cellular: 824-849 MHz PCS: 1850-1910 MHz WCDMA B2/LTE B2: 1850-1910 MHz WCDMA B5: 824-849 MHz LTE B4: 1710-1755 MHz LTE B7: 2500-2570 MHz LTE B12: 699-716 MHz LTE B17: 704-716 MHz
Transmit Power	GSM850: 32.40dBm PCS1900: 28.51dBm WCDMA Band 2: 22.45dBm WCDMA Band 5: 22.62dBm LTE Band 2: 22.76dBm LTE Band 4: 22.64dBm LTE Band 7: 22.64dBm LTE Band 12: 22.78dBm LTE Band 17: 22.04dBm
Modulation Technique	2G: GMSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antennas
Voltage Range	DC 3.8 V from battery or DC 5.0V from adapter
Date of Test	2020/01/16~2020/03/13
Sample serial number	RSZ200110005-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2020/01/10
Sample/EUT Status	Good condition
Normal/Extreme Condition	N.V.: Nominal Voltage: 3.8V _{DC} L.V.: Low Voltage: 3.5V _{DC} H.V.: High Voltage: 4.35V _{DC}
Adapter information	Model: CART1 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&DTS submissions with FCC ID: 2APW4ART1.

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.

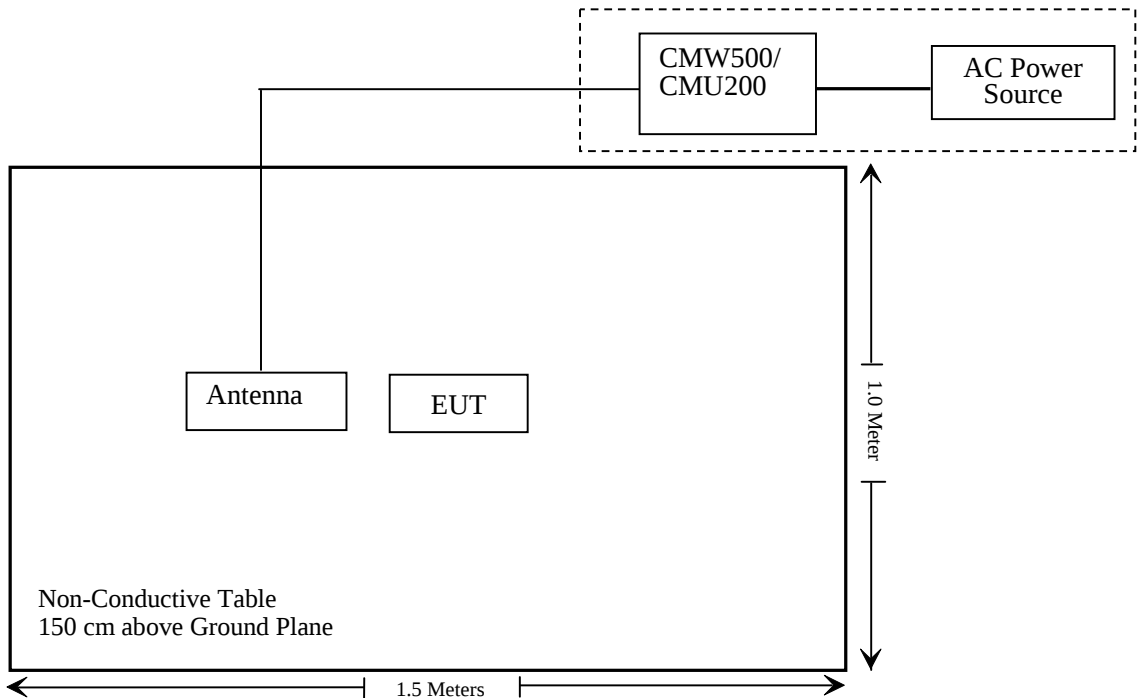
Equipment Modifications

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: RSZ200110005-SAA

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	2019/4/20	2020/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Unknown	Cable 2	RF Cable 2	F-03-EM197	2019/11/29	2020/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2019/11/29	2020/11/28
Unknown	Cable	Chamber Cable 4	EC-007	2019/11/29	2020/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
Yijia	Temperature & Humidity Meter	TA218B	E0938	2019/10/14	2020/10/13
Agilent	Signal Generator	N5183A	MY51040755	2019/12/04	2020/12/04
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2019/7/22	2020/07/21
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	2018/09/01	2021/08/31
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2019/11/29	2020/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2019/11/29	2020/11/28
Unknown	High Pass filter	2.8GHz	15989	2019/4/20	2020/4/20
Unknown	High Pass filter	1.3GHz	15963	2019/4/20	2020/4/20
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-02 1304	2017/12/6	2020/12/5
Ducommun Technologies	Horn antenna	ARH-2823-02	1007726-02 1302	2017/12/6	2020/12/5

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2019/3/2	2020/3/1
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2020/3/2	2021/3/1
WEINSCHEL	3dB Attenuator	Unknown	F-03-EM121	2019/11/29	2020/11/28
Unknown	RF Cable	Unknown	2301 276	2019/11/29	2020/11/28
Unknown	RF Cable	Unknown	0501 067	2019/11/29	2020/11/28
Weinschel	Power divider	1515	RH386	2019/4/20	2020/4/20
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
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2020/01/05	2021/01/05
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR

* 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: RSZ200110005-SAA.

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.

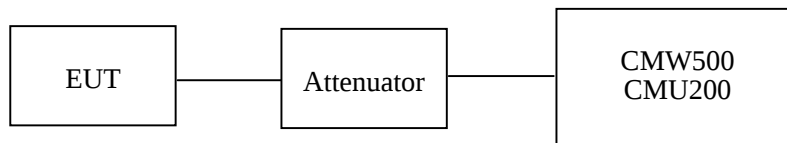
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo from 2020-01-16 to 2020-02-25 and by Zero Yan on 2020-02-10.

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

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	31.2	38.45
	190	836.6	31.3	38.45
	251	848.8	32.4	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.29	30.56	28.70	27.70	38.45
	190	836.6	31.43	30.69	28.80	27.57	38.45
	251	848.8	31.53	30.81	28.88	27.67	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		22.62	22.43	22.51
		HSDPA	1	21.48	21.53	21.57
			2	21.37	21.52	21.53
			3	21.29	21.59	21.49
			4	21.37	21.67	21.62
		HSUPA	1	21.42	21.24	21.41
			2	21.51	21.38	21.28
			3	21.49	21.23	21.51
			4	21.61	21.30	21.43
			5	21.47	21.37	21.52
		HSPA+	/	21.50	21.37	21.47

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.2	33
	661	1880.0	28.5	33
	810	1909.8	28.4	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.21	27.48	25.62	24.58	33
	661	1880.0	28.50	27.88	26.30	25.12	33
	810	1909.8	28.51	27.92	26.37	25.21	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		22.34	22.45	22.39
		HSDPA	1	21.54	21.62	21.58
			2	21.52	21.52	21.62
			3	21.48	21.34	21.74
			4	21.62	21.59	21.84
		HSUPA	1	21.48	21.62	21.53
			2	21.52	21.62	21.49
			3	21.53	21.46	21.52
			4	21.42	21.52	21.49
			5	21.39	21.51	21.46
		HSPA+	/	21.40	21.56	21.41

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

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.22	13
	Middle	1.20	13
	High	1.23	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.62	13
	Middle	3.43	13
	High	3.34	13
HSDPA (16QAM)	Low	3.62	13
	Middle	3.24	13
	High	3.63	13
HSUPA (BPSK)	Low	3.52	13
	Middle	3.62	13
	High	3.19	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.45	13
	Middle	1.47	13
	High	1.44	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.96	13
	Middle	3.03	13
	High	3.16	13
HSDPA (16QAM)	Low	3.16	13
	Middle	3.28	13
	High	3.46	13
HSUPA (BPSK)	Low	2.76	13
	Middle	3.20	13
	High	2.86	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	90.81	120	1.4	H	31.4	1.90	0.0	29.50	38.45	8.95
836.6	83.64	6	2.2	V	23.6	1.90	0.0	21.70	38.45	16.75
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	86.32	75	2.3	V	16.6	1.30	9.40	24.70	33.00	8.30
1880.00	87.29	102	1.9	H	17.4	1.30	9.40	25.50	33.00	7.50

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	75.86	211	2.1	V	16.5	1.90	0.0	14.60	38.45	23.85
836.6	81.53	297	1.8	H	21.5	1.90	0.0	19.60	38.45	18.85
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	84.18	163	1.7	H	14.5	1.30	9.40	22.60	33	10.4
1880.00	79.63	82	2.4	V	9.7	1.30	9.40	17.80	33	15.2

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	RB Size=1, RB Offset=0	22.34	22.15	22.11
		RB Size=1, RB Offset=2	21.56	21.58	21.48
		RB Size=1, RB Offset=5	22.29	22.26	22.13
		RB Size=3, RB Offset=0	22.55	22.53	22.42
		RB Size=3, RB Offset=1	22.62	22.64	22.56
		RB Size=3, RB Offset=2	22.05	22.06	21.95
		RB Size=6, RB Offset=0	22.43	22.44	22.41
	16QAM	RB Size=1, RB Offset=0	22.06	21.96	21.93
		RB Size=1, RB Offset=2	21.36	21.24	21.21
		RB Size=1, RB Offset=5	22.07	22.01	21.94
		RB Size=3, RB Offset=0	22.29	22.17	22.08
		RB Size=3, RB Offset=1	22.53	22.40	22.34
		RB Size=3, RB Offset=2	21.91	21.87	21.76
		RB Size=6, RB Offset=0	22.38	22.34	22.28
3.0	QPSK	RB Size=1, RB Offset=0	22.34	22.37	22.30
		RB Size=1, RB Offset=7	21.64	21.65	21.59
		RB Size=1, RB Offset=14	22.59	22.56	22.45
		RB Size=8, RB Offset=0	22.34	22.29	22.20
		RB Size=8, RB Offset=4	22.20	22.16	22.12
		RB Size=8, RB Offset=7	22.35	22.30	22.26
		RB Size=15, RB Offset=0	21.96	21.95	21.85
	16QAM	RB Size=1, RB Offset=0	22.25	22.15	22.07
		RB Size=1, RB Offset=7	21.50	21.40	21.29
		RB Size=1, RB Offset=14	22.33	22.24	22.19
		RB Size=8, RB Offset=0	22.15	22.04	21.97
		RB Size=8, RB Offset=4	22.04	22.00	21.93
		RB Size=8, RB Offset=7	22.18	22.14	22.03
		RB Size=15, RB Offset=0	21.82	21.69	21.61

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.28	22.36	22.29
		RB Size=1, RB Offset=12	21.94	21.96	21.85
		RB Size=1, RB Offset=24	21.79	21.74	21.66
		RB Size=12, RB Offset=0	22.41	22.40	22.34
		RB Size=12, RB Offset=6	22.51	22.50	22.44
		RB Size=12, RB Offset=11	21.95	21.97	21.92
		RB Size=25, RB Offset=0	22.47	22.49	22.41
	16QAM	RB Size=1, RB Offset=0	22.25	22.13	22.09
		RB Size=1, RB Offset=12	21.76	21.72	21.62
		RB Size=1, RB Offset=24	21.57	21.53	21.49
		RB Size=12, RB Offset=0	22.29	22.21	22.16
		RB Size=12, RB Offset=6	22.35	22.24	22.15
		RB Size=12, RB Offset=11	21.86	21.78	21.66
		RB Size=25, RB Offset=0	22.38	22.29	22.21
10.0	QPSK	RB Size=1, RB Offset=0	22.19	22.13	22.10
		RB Size=1, RB Offset=24	22.21	22.18	22.08
		RB Size=1, RB Offset=49	22.64	22.65	22.55
		RB Size=25, RB Offset=0	22.33	22.34	22.27
		RB Size=25, RB Offset=12	21.93	21.91	21.82
		RB Size=25, RB Offset=24	22.27	22.24	22.15
		RB Size=50, RB Offset=0	21.06	21.00	20.89
	16QAM	RB Size=1, RB Offset=0	22.05	22.00	21.87
		RB Size=1, RB Offset=24	21.96	21.84	21.78
		RB Size=1, RB Offset=49	22.45	22.35	22.23
		RB Size=25, RB Offset=0	22.20	22.10	22.04
		RB Size=25, RB Offset=12	21.77	21.65	21.59
		RB Size=25, RB Offset=24	22.04	21.97	21.91
		RB Size=50, RB Offset=0	20.85	20.81	20.77

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.31	22.25	22.19
		RB Size=1, RB Offset=37	22.28	22.23	22.15
		RB Size=1, RB Offset=74	21.90	21.93	21.83
		RB Size=36, RB Offset=0	22.74	22.74	22.67
		RB Size=36, RB Offset=18	22.48	22.48	22.45
		RB Size=36, RB Offset=37	22.29	22.27	22.18
		RB Size=75, RB Offset=0	22.49	22.50	22.46
	16QAM	RB Size=1, RB Offset=0	22.07	22.00	21.95
		RB Size=1, RB Offset=37	22.10	22.03	21.96
		RB Size=1, RB Offset=74	21.79	21.68	21.63
		RB Size=36, RB Offset=0	22.59	22.50	22.40
		RB Size=36, RB Offset=18	22.39	22.27	22.16
		RB Size=36, RB Offset=37	22.12	22.00	21.93
		RB Size=75, RB Offset=0	22.38	22.29	22.26
20.0	QPSK	RB Size=1, RB Offset=0	22.38	22.41	22.38
		RB Size=1, RB Offset=49	22.24	22.21	22.09
		RB Size=1, RB Offset=99	22.76	22.70	22.66
		RB Size=50, RB Offset=0	22.10	22.04	21.97
		RB Size=50, RB Offset=24	22.42	22.41	22.34
		RB Size=50, RB Offset=49	22.11	22.09	22.05
		RB Size=100, RB Offset=0	21.94	21.91	21.86
	16QAM	RB Size=1, RB Offset=0	22.35	22.22	22.16
		RB Size=1, RB Offset=49	22.04	21.92	21.87
		RB Size=1, RB Offset=99	22.53	22.48	22.39
		RB Size=50, RB Offset=0	21.94	21.87	21.82
		RB Size=50, RB Offset=24	22.29	22.22	22.16
		RB Size=50, RB Offset=49	21.96	21.92	21.83
		RB Size=100, RB Offset=0	21.79	21.68	21.65

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.44	13	Pass
QPSK (100RB Size)	5.49	13	Pass
16QAM (1RB Size)	6.88	13	Pass
16QAM (100RB Size)	6.57	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	82.02	237	1.8	H	12.3	1.30	9.40	20.40	33
1880.00	77.11	28	1.4	V	7.2	1.30	9.40	15.30	33
3 MHz Bandwidth									
1880.00	81.59	189	1.5	H	11.9	1.30	9.40	20.00	33
1880.00	76.60	342	1.4	V	6.7	1.30	9.40	14.80	33
5 MHz Bandwidth									
1880.00	81.46	336	1.6	H	11.8	1.30	9.40	19.90	33
1880.00	77.67	56	1.8	V	7.8	1.30	9.40	15.90	33
10 MHz Bandwidth									
1880.00	81.06	93	1.0	H	11.4	1.30	9.40	19.50	33
1880.00	76.36	351	2.1	V	6.5	1.30	9.40	14.60	33
15 MHz Bandwidth									
1880.00	80.19	324	2.3	H	10.5	1.30	9.40	18.60	33
1880.00	76.59	99	1.7	V	6.7	1.30	9.40	14.80	33
20 MHz Bandwidth									
1880.00	81.40	325	2.2	H	11.7	1.30	9.40	19.80	33
1880.00	76.14	214	1.4	V	6.2	1.30	9.40	14.30	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	82.54	17	2.4	H	12.9	1.30	9.40	21.00	33
1880.00	77.50	175	2.0	V	7.6	1.30	9.40	15.70	33
3 MHz Bandwidth									
1880.00	82.29	121	2.5	H	12.6	1.30	9.40	20.70	33
1880.00	76.72	230	1.3	V	6.8	1.30	9.40	14.90	33
5 MHz Bandwidth									
1880.00	82.16	68	1.7	H	12.5	1.30	9.40	20.60	33
1880.00	76.45	137	1.3	V	6.6	1.30	9.40	14.70	33
10 MHz Bandwidth									
1880.00	81.67	60	1.2	H	12.0	1.30	9.40	20.10	33
1880.00	77.69	216	1.2	V	7.8	1.30	9.40	15.90	33
15 MHz Bandwidth									
1880.00	81.92	360	1.1	H	12.2	1.30	9.40	20.30	33
1880.00	75.88	154	1.9	V	6.0	1.30	9.40	14.10	33
20 MHz Bandwidth									
1880.00	81.48	280	1.7	H	11.8	1.30	9.40	19.90	33
1880.00	75.77	101	2.4	V	5.9	1.30	9.40	14.00	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	RB Size=1, RB Offset=0	22.18	22.33	22.21
		RB Size=1, RB Offset=2	21.47	21.41	21.37
		RB Size=1, RB Offset=5	21.64	21.61	21.50
		RB Size=3, RB Offset=0	22.33	22.32	22.19
		RB Size=3, RB Offset=1	22.27	22.28	22.21
		RB Size=3, RB Offset=2	21.61	21.57	21.46
		RB Size=6, RB Offset=0	22.37	22.35	22.32
	16QAM	RB Size=1, RB Offset=0	22.13	22.07	22.01
		RB Size=1, RB Offset=2	21.31	21.23	21.19
		RB Size=1, RB Offset=5	21.44	21.36	21.24
		RB Size=3, RB Offset=0	22.13	22.00	21.90
		RB Size=3, RB Offset=1	22.13	22.09	21.97
		RB Size=3, RB Offset=2	21.39	21.29	21.21
		RB Size=6, RB Offset=0	22.22	22.14	22.10
3.0	QPSK	RB Size=1, RB Offset=0	22.32	22.31	22.21
		RB Size=1, RB Offset=7	21.92	21.93	21.85
		RB Size=1, RB Offset=14	22.64	22.61	22.49
		RB Size=8, RB Offset=0	22.22	22.22	22.10
		RB Size=8, RB Offset=4	21.68	21.67	21.59
		RB Size=8, RB Offset=7	21.63	21.57	21.54
		RB Size=15, RB Offset=0	21.43	21.37	21.25
	16QAM	RB Size=1, RB Offset=0	22.13	22.03	21.93
		RB Size=1, RB Offset=7	21.77	21.65	21.61
		RB Size=1, RB Offset=14	22.46	22.39	22.33
		RB Size=8, RB Offset=0	22.03	22.00	21.89
		RB Size=8, RB Offset=4	21.50	21.37	21.34
		RB Size=8, RB Offset=7	21.49	21.40	21.28
		RB Size=15, RB Offset=0	21.15	21.11	20.99

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.96	22.08	21.99
		RB Size=1, RB Offset=12	21.49	21.47	21.36
		RB Size=1, RB Offset=24	20.97	20.90	20.82
		RB Size=12, RB Offset=0	22.11	22.09	22.03
		RB Size=12, RB Offset=6	21.99	21.98	21.89
		RB Size=12, RB Offset=11	21.70	21.68	21.65
		RB Size=25, RB Offset=0	22.37	22.31	22.22
	16QAM	RB Size=1, RB Offset=0	21.86	21.75	21.66
		RB Size=1, RB Offset=12	21.30	21.25	21.14
		RB Size=1, RB Offset=24	20.70	20.66	20.59
		RB Size=12, RB Offset=0	21.91	21.87	21.78
		RB Size=12, RB Offset=6	21.81	21.76	21.71
		RB Size=12, RB Offset=11	21.58	21.51	21.39
		RB Size=25, RB Offset=0	22.11	22.03	21.91
10.0	QPSK	RB Size=1, RB Offset=0	22.17	22.18	22.08
		RB Size=1, RB Offset=24	21.78	21.78	21.70
		RB Size=1, RB Offset=49	22.47	22.45	22.34
		RB Size=25, RB Offset=0	22.27	22.28	22.22
		RB Size=25, RB Offset=12	22.11	22.13	22.00
		RB Size=25, RB Offset=24	21.59	21.58	21.46
		RB Size=50, RB Offset=0	20.91	20.84	20.73
	16QAM	RB Size=1, RB Offset=0	22.02	21.90	21.77
		RB Size=1, RB Offset=24	21.64	21.52	21.42
		RB Size=1, RB Offset=49	22.22	22.13	22.02
		RB Size=25, RB Offset=0	22.12	22.02	21.91
		RB Size=25, RB Offset=12	21.92	21.83	21.77
		RB Size=25, RB Offset=24	21.35	21.24	21.15
		RB Size=50, RB Offset=0	20.69	20.62	20.59

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.04	21.89	21.81
		RB Size=1, RB Offset=37	21.52	21.46	21.42
		RB Size=1, RB Offset=74	21.57	21.52	21.41
		RB Size=36, RB Offset=0	22.28	22.30	22.25
		RB Size=36, RB Offset=18	22.18	22.17	22.12
		RB Size=36, RB Offset=37	21.90	21.88	21.85
		RB Size=75, RB Offset=0	22.33	22.28	22.23
	16QAM	RB Size=1, RB Offset=0	21.72	21.66	21.61
		RB Size=1, RB Offset=37	21.33	21.24	21.17
		RB Size=1, RB Offset=74	21.32	21.26	21.17
		RB Size=36, RB Offset=0	22.18	22.14	22.08
		RB Size=36, RB Offset=18	22.07	21.97	21.92
		RB Size=36, RB Offset=37	21.72	21.59	21.51
		RB Size=75, RB Offset=0	22.16	22.13	22.09
20.0	QPSK	RB Size=1, RB Offset=0	21.98	21.96	21.89
		RB Size=1, RB Offset=49	22.22	22.18	22.09
		RB Size=1, RB Offset=99	22.62	22.61	22.50
		RB Size=50, RB Offset=0	22.19	22.19	22.14
		RB Size=50, RB Offset=24	21.97	21.93	21.83
		RB Size=50, RB Offset=49	21.48	21.47	21.37
		RB Size=100, RB Offset=0	21.38	21.36	21.31
	16QAM	RB Size=1, RB Offset=0	21.79	21.72	21.68
		RB Size=1, RB Offset=49	21.98	21.91	21.80
		RB Size=1, RB Offset=99	22.40	22.28	22.16
		RB Size=50, RB Offset=0	22.01	21.94	21.89
		RB Size=50, RB Offset=24	21.79	21.75	21.69
		RB Size=50, RB Offset=49	21.29	21.24	21.16
		RB Size=100, RB Offset=0	21.26	21.16	21.10

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.37	13	Pass
QPSK (100RB Size)	6.44	13	Pass
16QAM (1RB Size)	7.44	13	Pass
16QAM (100RB Size)	7.43	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	85.49	252	2.3	H	12.2	1.30	8.90	19.80	30
1732.50	79.77	109	1.7	V	7.0	1.30	8.90	14.60	30
3 MHz Bandwidth									
1732.50	84.82	171	1.3	H	11.5	1.30	8.90	19.10	30
1732.50	80.47	310	1.5	V	7.7	1.30	8.90	15.30	30
5 MHz Bandwidth									
1732.50	84.68	191	2.1	H	11.4	1.30	8.90	19.00	30
1732.50	80.19	245	1.5	V	7.5	1.30	8.90	15.10	30
10 MHz Bandwidth									
1732.50	84.39	189	1.7	H	11.1	1.30	8.90	18.70	30
1732.50	79.77	269	1.1	V	7.0	1.30	8.90	14.60	30
15 MHz Bandwidth									
1732.50	84.57	262	1.4	H	11.2	1.30	8.90	18.80	30
1732.50	80.02	338	1.4	V	7.3	1.30	8.90	14.90	30
20 MHz Bandwidth									
1732.50	84.66	94	1.7	H	11.3	1.30	8.90	18.90	30
1732.50	80.33	98	1.5	V	7.6	1.30	8.90	15.20	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	85.22	265	1.5	H	11.9	1.30	8.90	19.50	30
1732.50	79.79	250	1.3	V	7.1	1.30	8.90	14.70	30
3 MHz Bandwidth									
1732.50	85.19	146	2.2	H	11.9	1.30	8.90	19.50	30
1732.50	79.30	223	1.4	V	6.6	1.30	8.90	14.20	30
5 MHz Bandwidth									
1732.50	84.97	315	1.2	H	11.6	1.30	8.90	19.20	30
1732.50	79.34	335	1.8	V	6.6	1.30	8.90	14.20	30
10 MHz Bandwidth									
1732.50	84.99	107	1.8	H	11.7	1.30	8.90	19.30	30
1732.50	80.68	28	1.6	V	8.0	1.30	8.90	15.60	30
15 MHz Bandwidth									
1732.50	84.83	105	1.1	H	11.5	1.30	8.90	19.10	30
1732.50	79.99	85	1.2	V	7.3	1.30	8.90	14.90	30
20 MHz Bandwidth									
1732.50	84.65	331	1.8	H	11.3	1.30	8.90	18.90	30
1732.50	80.02	319	1.3	V	7.3	1.30	8.90	14.90	30

LTE Band 7:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	22.15	22.36	22.32
		RB Size=1, RB Offset=12	22.03	22.03	21.97
		RB Size=1, RB Offset=24	21.49	21.50	21.38
		RB Size=12, RB Offset=0	22.48	22.50	22.45
		RB Size=12, RB Offset=6	22.68	22.62	22.53
		RB Size=12, RB Offset=11	21.95	21.91	21.79
		RB Size=25, RB Offset=0	22.41	22.35	22.28
	16QAM	RB Size=1, RB Offset=0	22.20	22.07	21.98
		RB Size=1, RB Offset=12	21.92	21.84	21.75
		RB Size=1, RB Offset=24	21.25	21.17	21.12
		RB Size=12, RB Offset=0	22.38	22.29	22.23
		RB Size=12, RB Offset=6	22.42	22.32	22.19
		RB Size=12, RB Offset=11	21.73	21.63	21.56
		RB Size=25, RB Offset=0	22.22	22.13	22.01
10	QPSK	RB Size=1, RB Offset=0	22.07	22.07	21.95
		RB Size=1, RB Offset=24	22.25	22.21	22.16
		RB Size=1, RB Offset=49	22.51	22.48	22.42
		RB Size=25, RB Offset=0	22.02	22.03	21.95
		RB Size=25, RB Offset=12	21.67	21.69	21.66
		RB Size=25, RB Offset=24	22.13	22.09	21.97
		RB Size=50, RB Offset=0	21.36	21.32	21.29
	16QAM	RB Size=1, RB Offset=0	21.88	21.82	21.70
		RB Size=1, RB Offset=24	22.05	22.02	21.92
		RB Size=1, RB Offset=49	22.38	22.27	22.19
		RB Size=25, RB Offset=0	21.84	21.72	21.64
		RB Size=25, RB Offset=12	21.58	21.52	21.46
		RB Size=25, RB Offset=24	21.89	21.84	21.78
		RB Size=50, RB Offset=0	21.24	21.17	21.05

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	22.09	22.16	22.07
		RB Size=1, RB Offset=37	21.70	21.70	21.59
		RB Size=1, RB Offset=74	21.62	21.63	21.53
		RB Size=36, RB Offset=0	22.53	22.56	22.49
		RB Size=36, RB Offset=18	22.44	22.37	22.33
		RB Size=36, RB Offset=37	21.96	21.98	21.86
		RB Size=75, RB Offset=0	22.21	22.18	22.11
	16QAM	RB Size=1, RB Offset=0	21.94	21.88	21.79
		RB Size=1, RB Offset=37	21.49	21.39	21.30
		RB Size=1, RB Offset=74	21.41	21.34	21.27
		RB Size=36, RB Offset=0	22.41	22.30	22.22
		RB Size=36, RB Offset=18	22.24	22.13	22.00
		RB Size=36, RB Offset=37	21.77	21.70	21.59
		RB Size=75, RB Offset=0	22.03	21.91	21.87
20	QPSK	RB Size=1, RB Offset=0	21.93	21.86	21.76
		RB Size=1, RB Offset=49	22.20	22.13	22.07
		RB Size=1, RB Offset=99	22.21	22.21	22.15
		RB Size=50, RB Offset=0	21.61	21.59	21.55
		RB Size=50, RB Offset=24	21.93	21.89	21.77
		RB Size=50, RB Offset=49	21.90	21.88	21.83
		RB Size=100, RB Offset=0	21.12	21.13	21.08
	16QAM	RB Size=1, RB Offset=0	21.71	21.59	21.56
		RB Size=1, RB Offset=49	22.01	21.89	21.79
		RB Size=1, RB Offset=99	22.09	21.99	21.93
		RB Size=50, RB Offset=0	21.44	21.40	21.33
		RB Size=50, RB Offset=24	21.71	21.65	21.54
		RB Size=50, RB Offset=49	21.75	21.65	21.52
		RB Size=100, RB Offset=0	20.95	20.83	20.73

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.76	13	Pass
QPSK (100RB Size)	5.87	13	Pass
16QAM (1RB Size)	7.57	13	Pass
16QAM (100RB Size)	7.40	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	82.13	350	1.4	H	12.0	2.60	10.20	19.60	33
2535.00	76.40	44	1.1	V	6.8	2.60	10.20	14.40	33
10 MHz Bandwidth									
2535.00	81.76	226	1.7	H	11.6	2.60	10.20	19.20	33
2535.00	76.88	149	1.9	V	7.3	2.60	10.20	14.90	33
15 MHz Bandwidth									
2535.00	81.53	261	1.2	H	11.4	2.60	10.20	19.00	33
2535.00	77.41	77	1.1	V	7.8	2.60	10.20	15.40	33
20 MHz Bandwidth									
2535.00	81.58	90	1.2	H	11.4	2.60	10.20	19.00	33
2535.00	77.83	293	1.7	V	8.3	2.60	10.20	15.90	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	82.94	104	1.6	H	12.8	2.60	10.20	20.40	33
2535.00	75.75	200	1.4	V	6.2	2.60	10.20	13.80	33
10 MHz Bandwidth									
2535.00	82.68	281	2.1	H	12.5	2.60	10.20	20.10	33
2535.00	75.79	103	1.7	V	6.2	2.60	10.20	13.80	33
15 MHz Bandwidth									
2535.00	82.57	0	1.3	H	12.4	2.60	10.20	20.00	33
2535.00	75.55	308	1.6	V	6.0	2.60	10.20	13.60	33
20 MHz Bandwidth									
2535.00	81.83	71	1.5	H	11.7	2.60	10.20	19.30	33
2535.00	76.07	229	1.3	V	6.5	2.60	10.20	14.10	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	RB Size=1, RB Offset=0	22.2	22.07	22.21
		RB Size=1, RB Offset=2	22.43	22.43	22.77
		RB Size=1, RB Offset=5	22.45	22.48	22.42
		RB Size=3, RB Offset=0	21.36	21.1	21.78
		RB Size=3, RB Offset=1	21.3	21.22	21.48
		RB Size=3, RB Offset=2	21.07	21.34	21.69
		RB Size=6, RB Offset=0	21.34	21.33	21.7
	16QAM	RB Size=1, RB Offset=0	22.41	22.78	22.66
		RB Size=1, RB Offset=2	22.57	22.44	22.6
		RB Size=1, RB Offset=5	22.1	22.79	22.58
		RB Size=3, RB Offset=0	21.48	21.65	21.29
		RB Size=3, RB Offset=1	21.38	21.53	21.4
		RB Size=3, RB Offset=2	21.54	21.31	21.27
		RB Size=6, RB Offset=0	21.75	21.06	21.22
3.0	QPSK	RB Size=1, RB Offset=0	22.61	22.27	22.25
		RB Size=1, RB Offset=7	22.53	22.77	22.22
		RB Size=1, RB Offset=14	22.46	22.07	22.56
		RB Size=8, RB Offset=0	21.1	21.49	21.36
		RB Size=8, RB Offset=4	21.59	21.25	21.52
		RB Size=8, RB Offset=7	21.49	21.32	21.06
		RB Size=15, RB Offset=0	21.03	21.45	21.08
	16QAM	RB Size=1, RB Offset=0	22.24	22.78	22.52
		RB Size=1, RB Offset=7	22.31	22.76	22.54
		RB Size=1, RB Offset=14	22.06	22.12	22.18
		RB Size=8, RB Offset=0	21.62	21.48	21.55
		RB Size=8, RB Offset=4	21.56	21.17	21.7
		RB Size=8, RB Offset=7	21.33	21.29	21.24
		RB Size=15, RB Offset=0	21.67	21.55	21.77

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.14	22.01	22.41
		RB Size=1, RB Offset=12	22.24	22.66	22.23
		RB Size=1, RB Offset=24	22.26	22.64	22.21
		RB Size=12, RB Offset=0	21.63	21.47	21.61
		RB Size=12, RB Offset=6	21.69	21.64	21.77
		RB Size=12, RB Offset=11	21.59	21.57	21.68
		RB Size=25, RB Offset=0	21.63	21	21.24
	16QAM	RB Size=1, RB Offset=0	22.56	22.31	22.03
		RB Size=1, RB Offset=12	22.44	22.55	22.26
		RB Size=1, RB Offset=24	22.56	22.34	22.21
		RB Size=12, RB Offset=0	21.41	21.43	21.06
		RB Size=12, RB Offset=6	21.69	21.7	21.41
		RB Size=12, RB Offset=11	21.65	21.28	21.19
		RB Size=25, RB Offset=0	21.67	21.04	21.21
10.0	QPSK	RB Size=1, RB Offset=0	22.71	22.24	22.57
		RB Size=1, RB Offset=24	22.42	22.32	22.11
		RB Size=1, RB Offset=49	22.25	22.14	22.75
		RB Size=25, RB Offset=0	21.64	21.12	21.12
		RB Size=25, RB Offset=12	21.16	21.12	21.76
		RB Size=25, RB Offset=24	21.59	21.36	21.2
		RB Size=50, RB Offset=0	21.7	21.51	21.67
	16QAM	RB Size=1, RB Offset=0	22.27	22.46	22.7
		RB Size=1, RB Offset=24	22.77	22.44	22.39
		RB Size=1, RB Offset=49	22.19	22.18	22.72
		RB Size=25, RB Offset=0	21.76	21.18	21.41
		RB Size=25, RB Offset=12	21.68	21.46	21.47
		RB Size=25, RB Offset=24	21.64	21.76	21.7
		RB Size=50, RB Offset=0	21.7	21.3	21.69

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.48	13	Pass
QPSK (50RB Size)	6.42	13	Pass
16QAM (1RB Size)	7.16	13	Pass
16QAM (50RB Size)	7.26	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	86.92	277	1.9	H	19.1	1.2	0.0	17.90	34.77
707.5	82.27	35	2.1	V	15.9	1.2	0.0	14.70	34.77
3 MHz Bandwidth									
707.5	86.66	252	1.3	H	18.9	1.2	0	17.70	34.77
707.5	82.24	105	1.8	V	15.9	1.2	0	14.70	34.77
5 MHz Bandwidth									
707.5	86.47	146	1.5	H	18.7	1.2	0	17.50	34.77
707.5	82.16	240	2.1	V	15.8	1.2	0	14.60	34.77
10 MHz Bandwidth									
707.5	86.25	110	1.2	H	18.5	1.2	0	17.30	34.77
707.5	81.45	17	1.7	V	15.1	1.2	0	13.90	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	86.38	296	2.3	H	18.6	1.2	0	17.40	34.77
707.5	81.47	6	1.7	V	15.1	1.2	0	13.90	34.77
3 MHz Bandwidth									
707.5	85.60	225	1.3	H	17.8	1.2	0	16.60	34.77
707.5	81.97	257	1.9	V	15.6	1.2	0	14.40	34.77
5 MHz Bandwidth									
707.5	85.02	319	2.3	H	17.2	1.2	0	16.00	34.77
707.5	81.67	164	1.1	V	15.3	1.2	0	14.10	34.77
10 MHz Bandwidth									
707.5	85.84	190	2.4	H	18.1	1.2	0	16.90	34.77
707.5	81.98	169	2.2	V	15.6	1.2	0	14.40	34.77

LTE Band 17:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.94	21.88	21.80
		RB Size=1, RB Offset=12	21.85	21.82	21.71
		RB Size=1, RB Offset=24	21.18	21.19	21.15
		RB Size=12, RB Offset=0	21.94	21.88	21.83
		RB Size=12, RB Offset=6	21.99	21.97	21.92
		RB Size=12, RB Offset=11	21.88	21.84	21.75
		RB Size=25, RB Offset=0	21.94	21.88	21.80
	16QAM	RB Size=1, RB Offset=0	21.76	21.66	21.57
		RB Size=1, RB Offset=12	21.59	21.47	21.40
		RB Size=1, RB Offset=24	21.03	21.00	20.89
		RB Size=12, RB Offset=0	21.71	21.63	21.52
		RB Size=12, RB Offset=6	21.83	21.78	21.71
		RB Size=12, RB Offset=11	21.71	21.62	21.50
		RB Size=25, RB Offset=0	21.76	21.66	21.57
10.0	QPSK	RB Size=1, RB Offset=0	21.87	21.88	21.80
		RB Size=1, RB Offset=24	22.04	22.03	21.96
		RB Size=1, RB Offset=49	22.17	22.10	21.99
		RB Size=25, RB Offset=0	21.74	21.72	21.68
		RB Size=25, RB Offset=12	21.98	21.92	21.81
		RB Size=25, RB Offset=24	21.05	21.06	20.94
		RB Size=50, RB Offset=0	21.58	21.56	21.52
	16QAM	RB Size=1, RB Offset=0	21.68	21.56	21.52
		RB Size=1, RB Offset=24	21.92	21.87	21.81
		RB Size=1, RB Offset=49	21.89	21.83	21.73
		RB Size=25, RB Offset=0	21.61	21.52	21.42
		RB Size=25, RB Offset=12	21.72	21.68	21.65
		RB Size=25, RB Offset=24	20.87	20.81	20.74
		RB Size=50, RB Offset=0	21.40	21.32	21.20

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.65	13	Pass
QPSK (50RB Size)	6.29	13	Pass
16QAM (1RB Size)	7.31	13	Pass
16QAM (50RB Size)	7.29	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									
710.0	87.23	144	1.2	H	19.4	1.2	0	18.20	34.77
710.0	82.74	306	2.4	V	16.4	1.2	0	15.20	34.77
10 MHz Bandwidth									
710.0	86.35	303	1.4	H	18.6	1.2	0	17.40	34.77
710.0	82.82	39	2.2	V	16.5	1.2	0	15.30	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									
710.0	86.82	194	2.1	H	19.0	1.2	0	17.80	34.77
710.0	81.27	244	1.9	V	14.9	1.2	0	13.70	34.77
10 MHz Bandwidth									
710.0	86.12	90	2.5	H	18.3	1.2	0	17.10	34.77
710.0	82.35	186	1.4	V	16.0	1.2	0	14.80	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

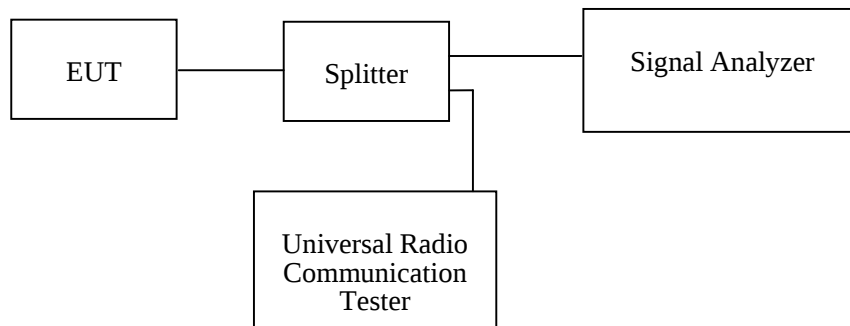
Applicable Standard

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 Kieron Luo from 2020-01-16 to 2020-03-13.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

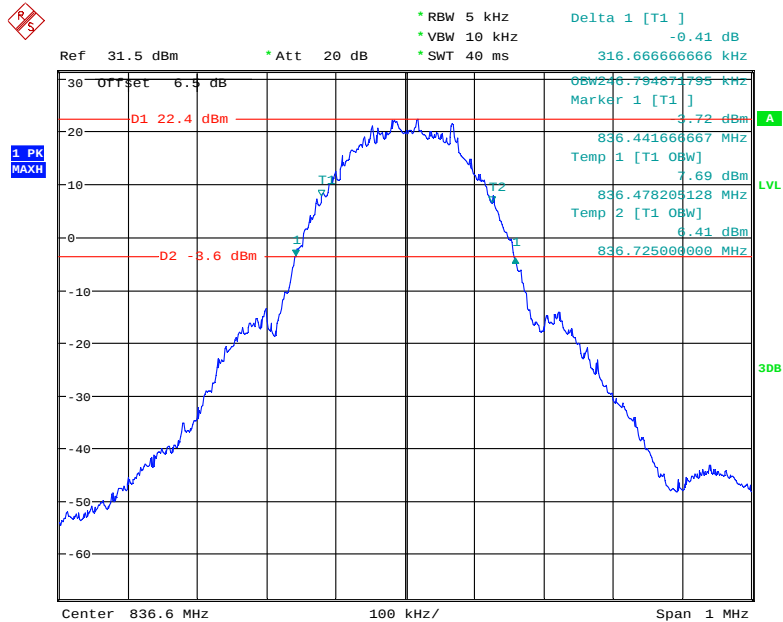
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	246.79	316.67

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.167	4.724
HSUPA (BPSK)	836.6	4.231	4.961
HSDPA (16QAM)	836.6	4.215	5.304

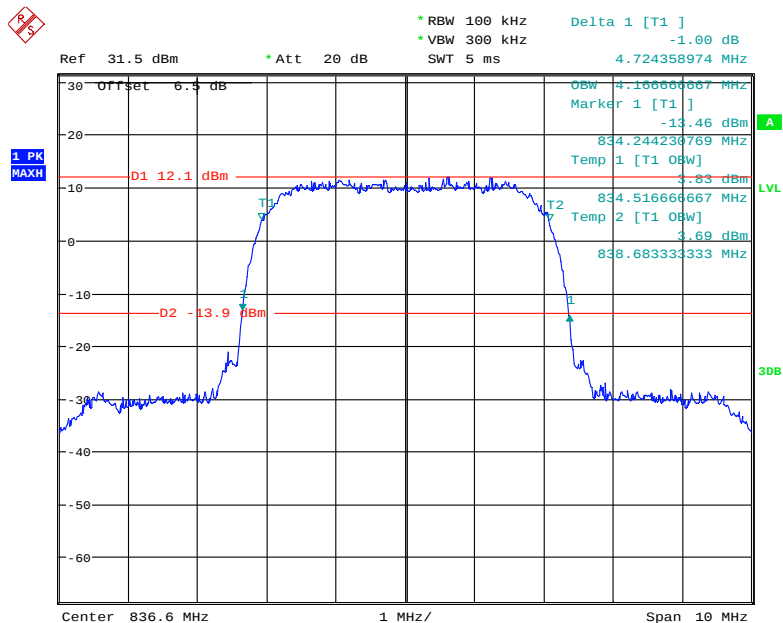
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	246.79	320.19

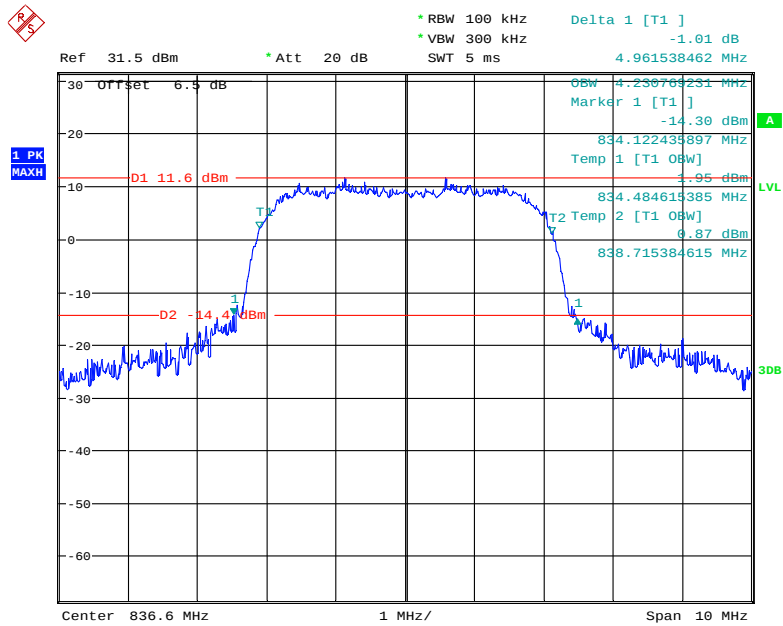
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.183	4.728
HSUPA (BPSK)	1880.0	4.183	4.728
HSDPA (16QAM)	1880.0	4.183	4.712

Cellular Band (Part 22H)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode**

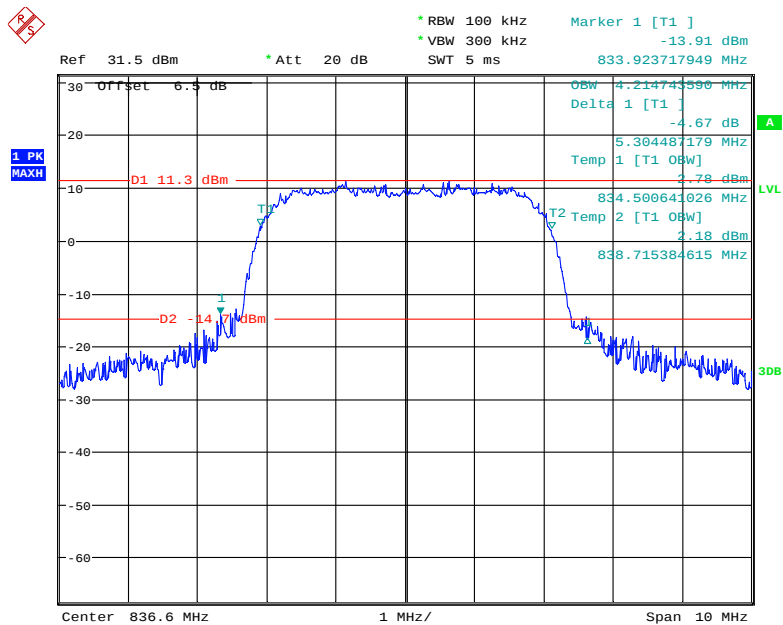
Date: 25.FEB.2020 09:05:33

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

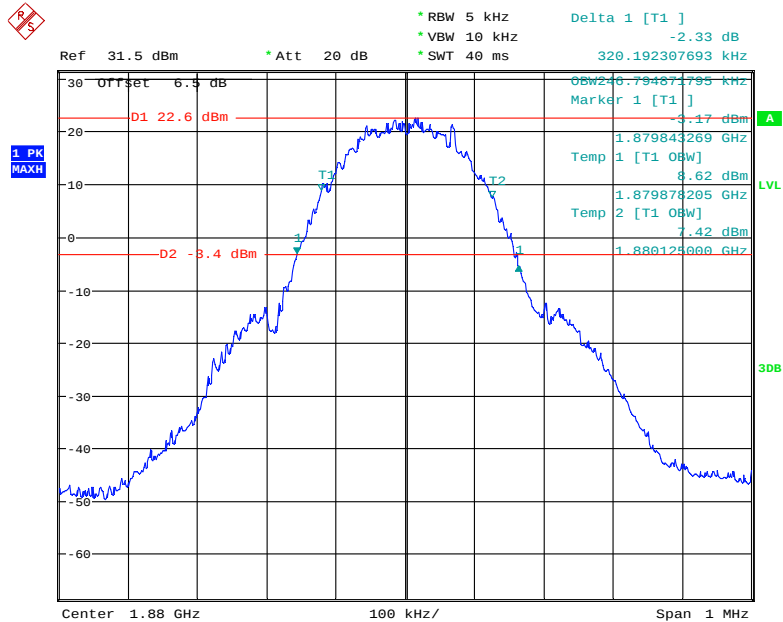
Date: 25.FEB.2020 11:51:34

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

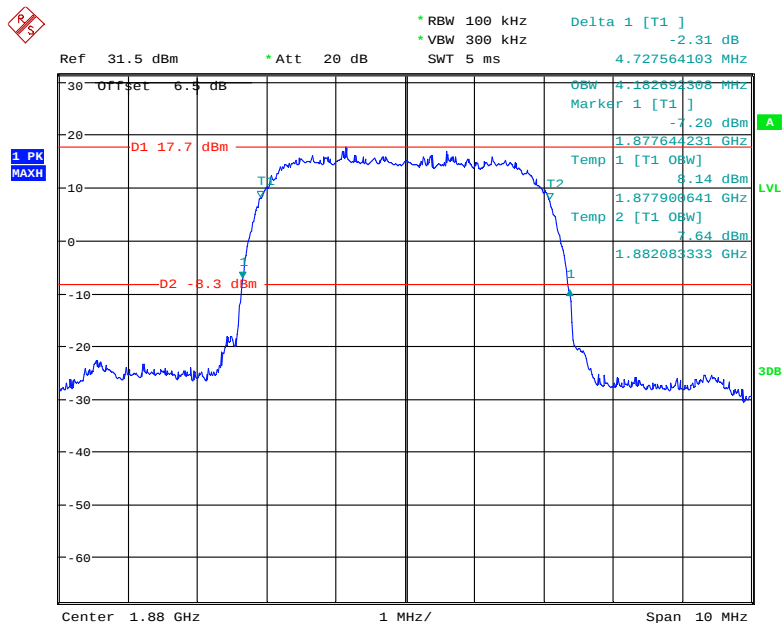
Date: 25.FEB.2020 13:44:34

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

Date: 25.FEB.2020 13:36:33

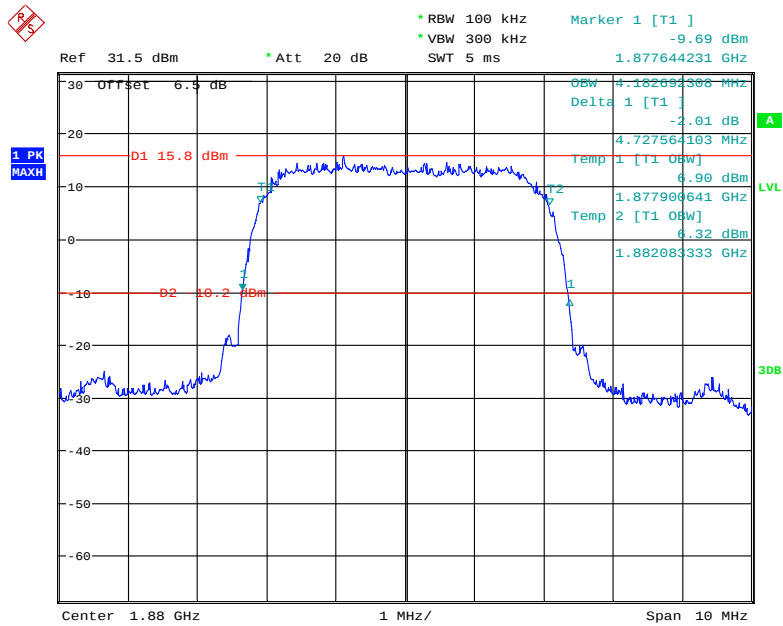
PCS Band (Part 24E)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode**

Date: 25.FEB.2020 09:23:53

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

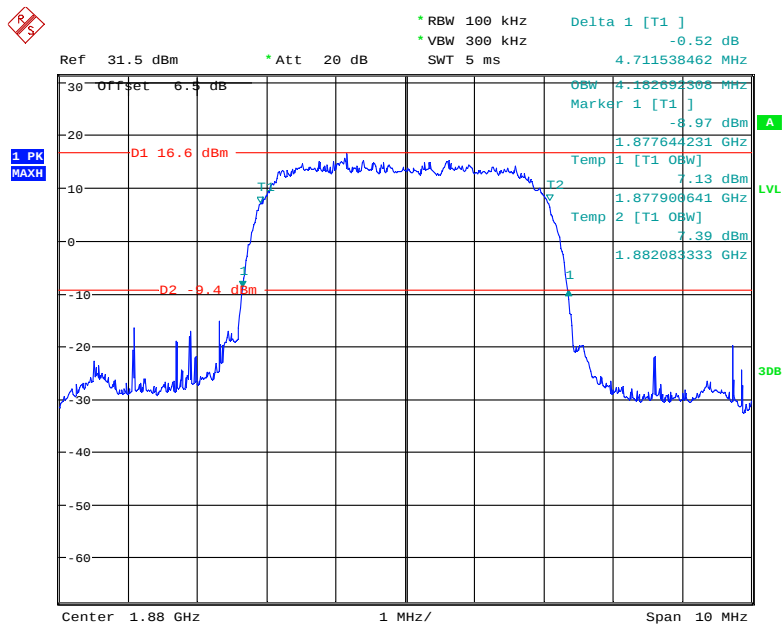
Date: 25.FEB.2020 14:04:59

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



Date: 25.FEB.2020 14:16:47

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

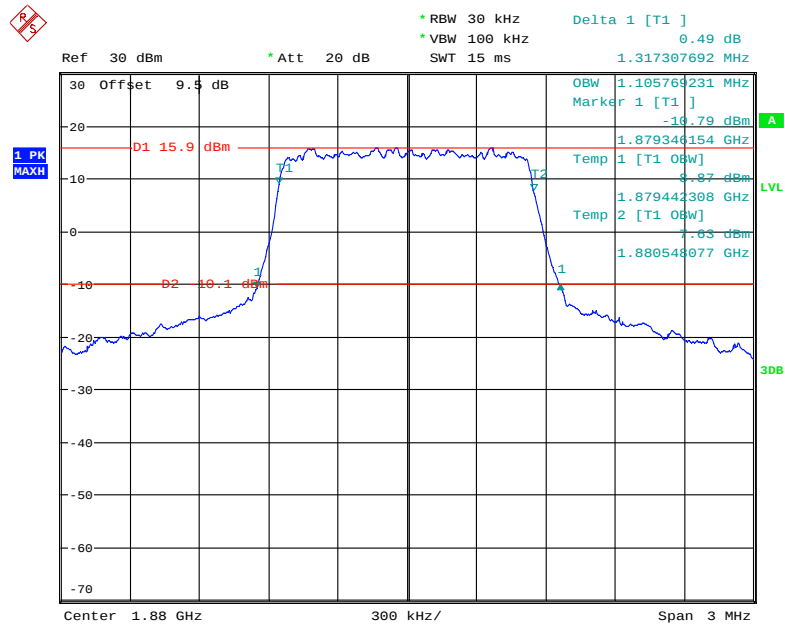


Date: 25.FEB.2020 14:15:02

LTE Band 2: (Middle Channel)

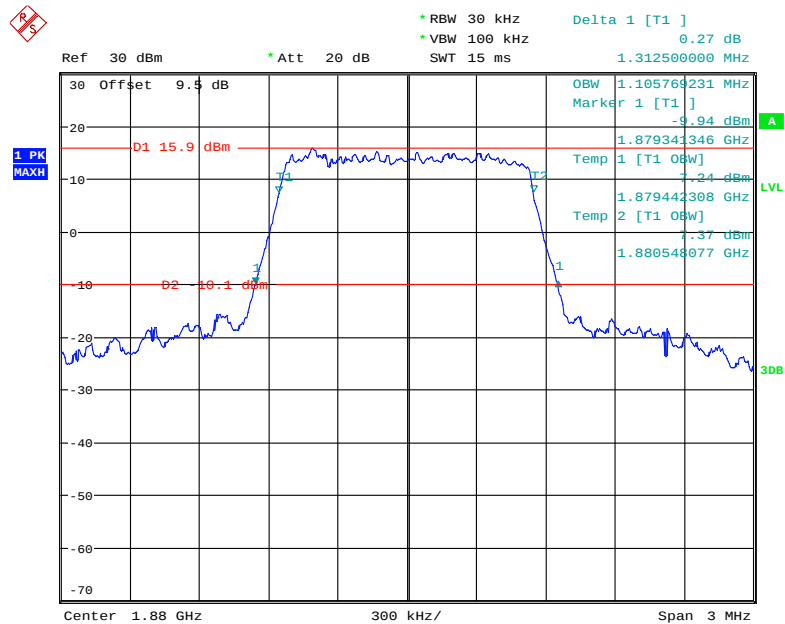
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.32
	16QAM	1.11	1.31
3.0	QPSK	2.69	2.88
	16QAM	2.69	2.89
5.0	QPSK	4.55	5.22
	16QAM	4.54	5.21
10.0	QPSK	9.01	9.95
	16QAM	8.97	9.89
15.0	QPSK	13.56	15.00
	16QAM	13.46	14.86
20.0	QPSK	18.00	19.33
	16QAM	17.95	19.38

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



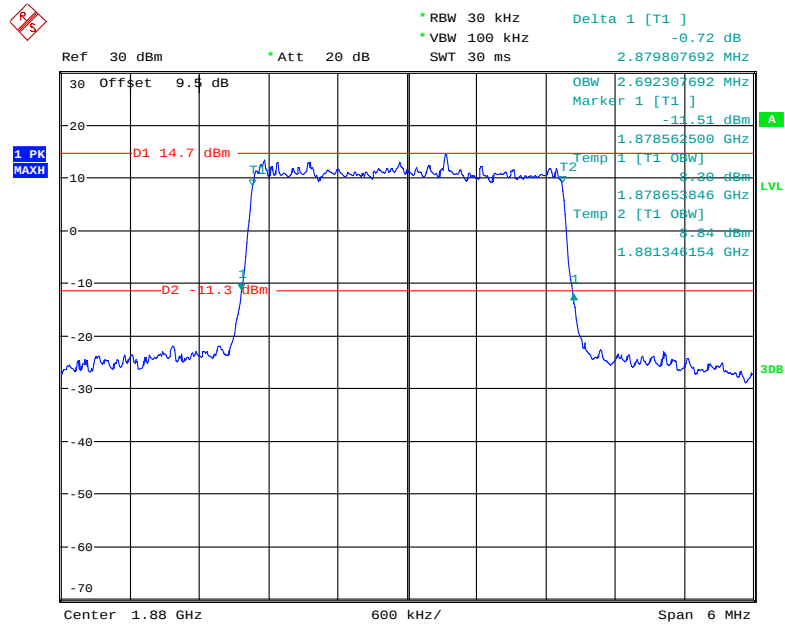
Date: 16.JAN.2020 10:57:28

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



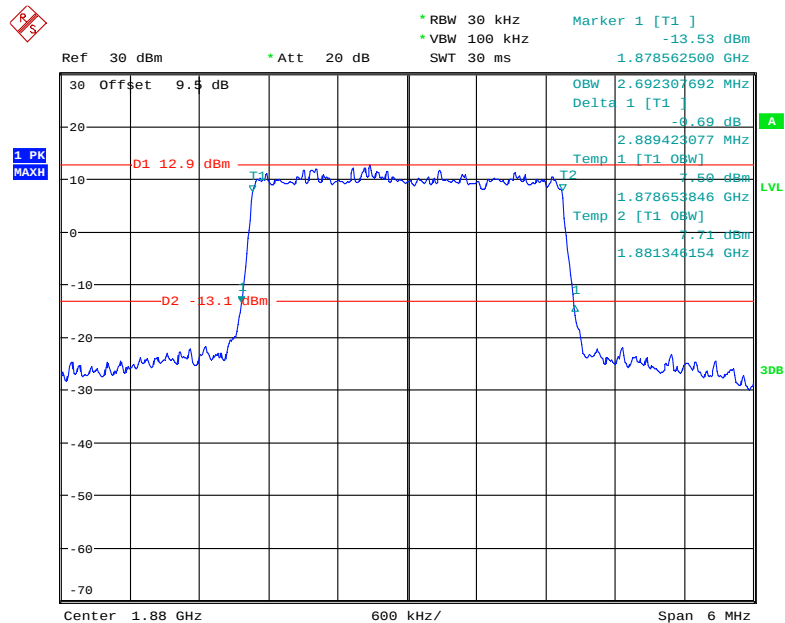
Date: 16.JAN.2020 10:58:48

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

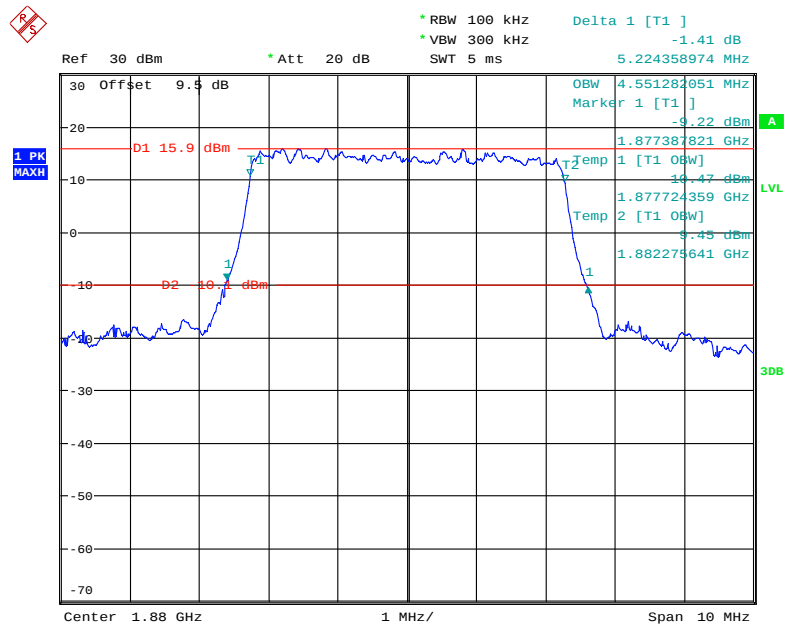


Date: 16.JAN.2020 11:01:06

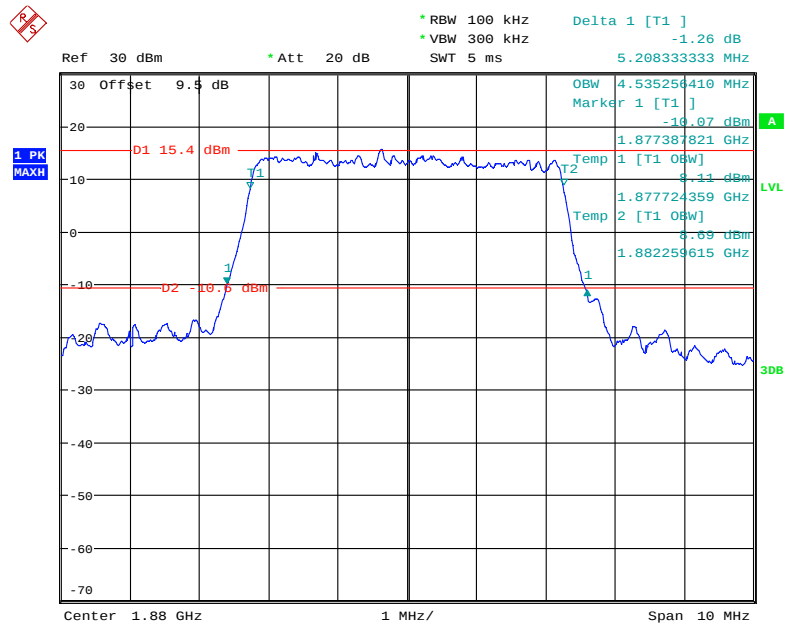
16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 16.JAN.2020 11:03:20

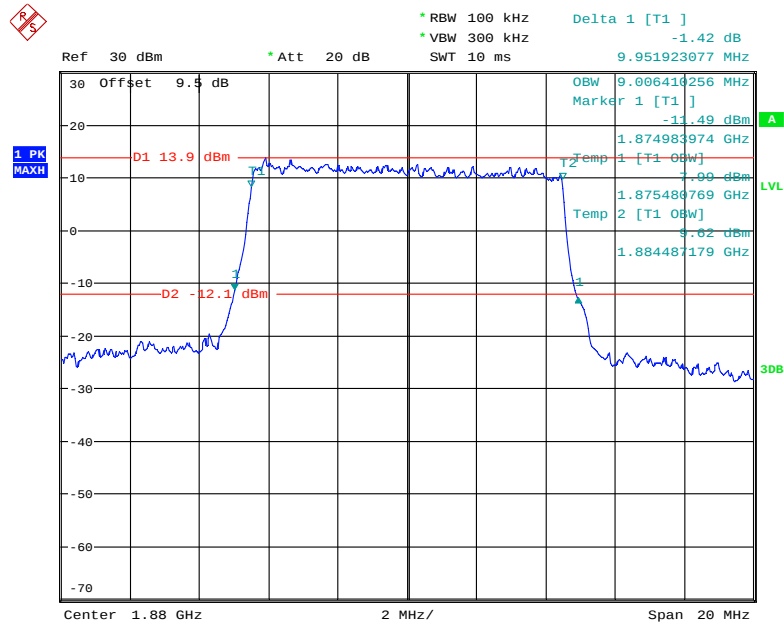
QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.JAN.2020 11:21:47

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

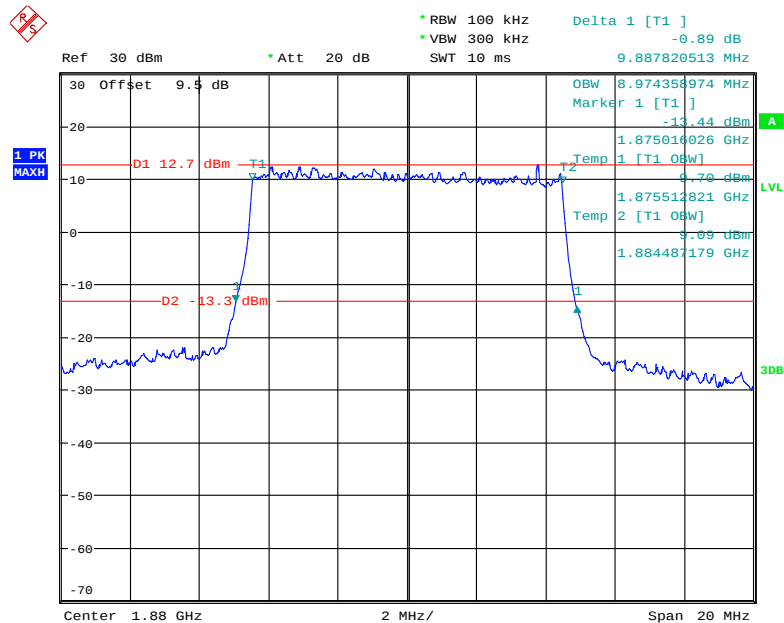
Date: 16.JAN.2020 11:23:53

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

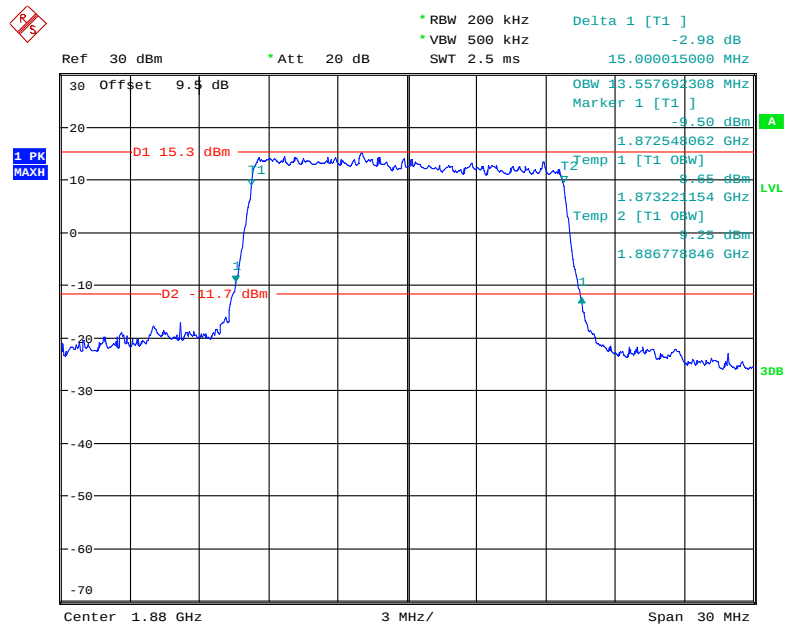


Date: 16.JAN.2020 11:27:57

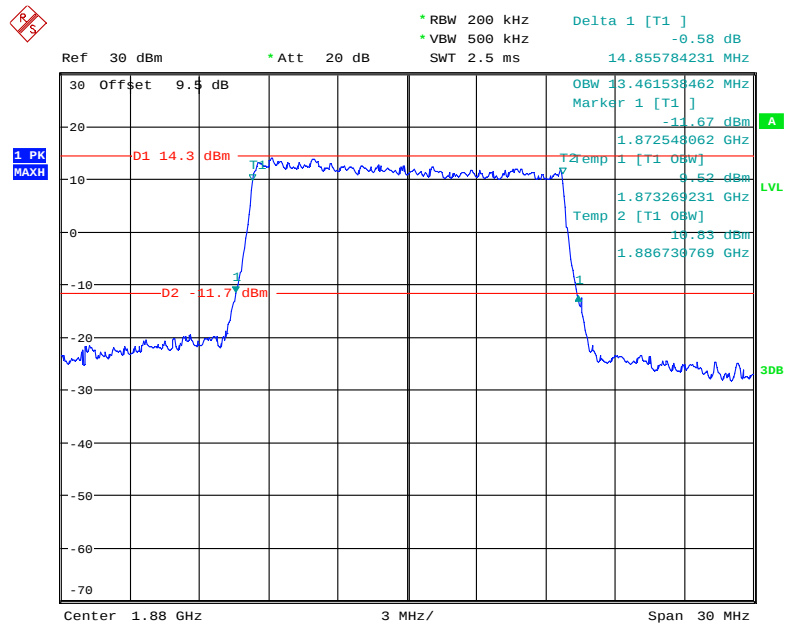
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 16.JAN.2020 11:31:29

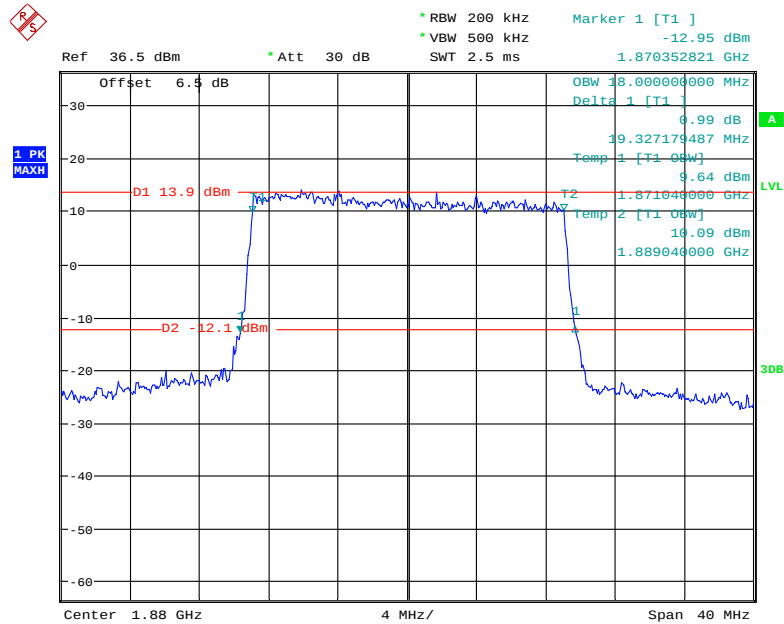
QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.JAN.2020 11:39:00

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

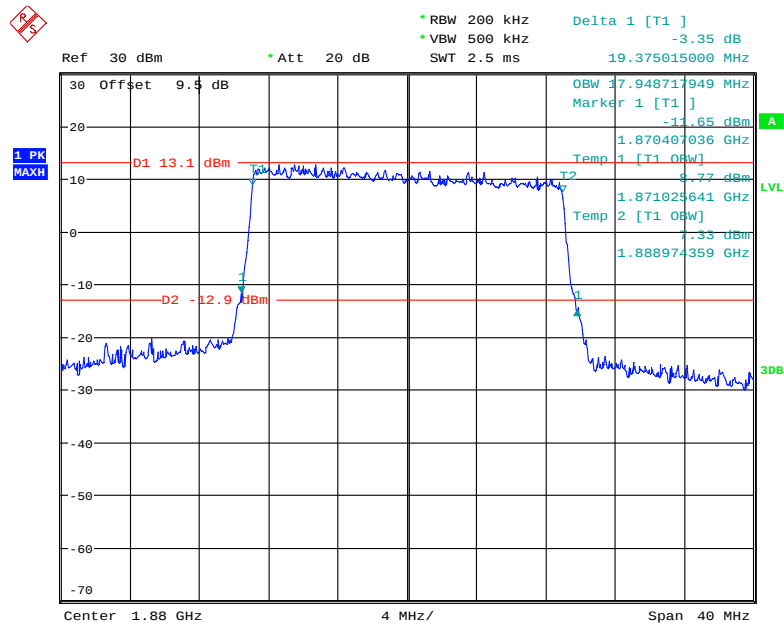
Date: 16.JAN.2020 11:40:55

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



Date: 13.MAR.2020 15:16:06

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

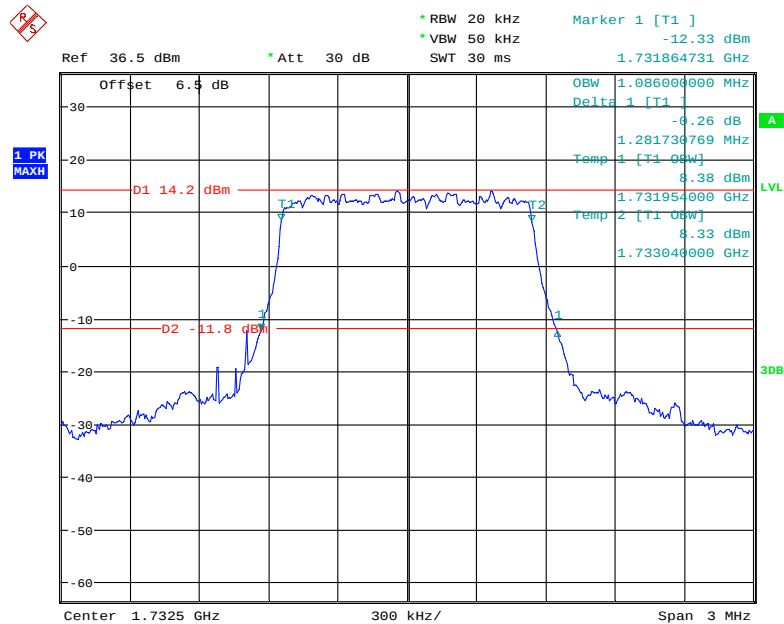


Date: 16.JAN.2020 11:46:24

LTE Band 4: (Middle Channel)

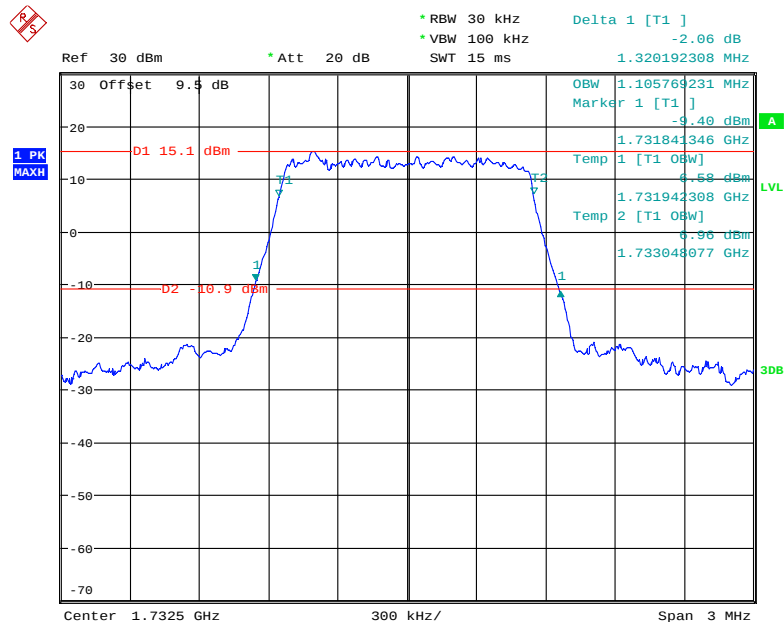
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.09	1.28
	16QAM	1.11	1.32
3.0	QPSK	2.68	2.88
	16QAM	2.69	2.89
5.0	QPSK	4.55	5.20
	16QAM	4.53	5.17
10.0	QPSK	8.97	9.94
	16QAM	8.97	9.84
15.0	QPSK	13.51	14.84
	16QAM	13.51	14.98
20.0	QPSK	17.88	19.31
	16QAM	18.00	19.62

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



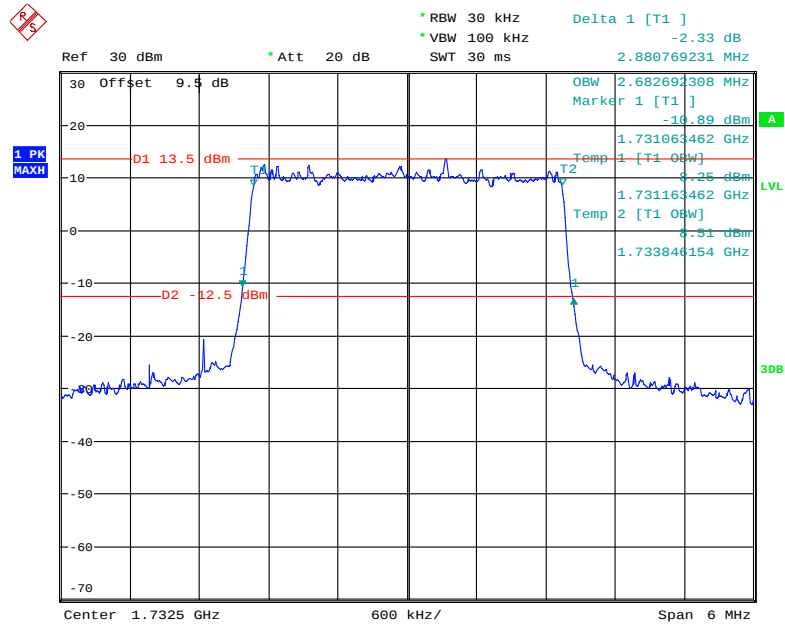
Date: 13.MAR.2020 15:18:42

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



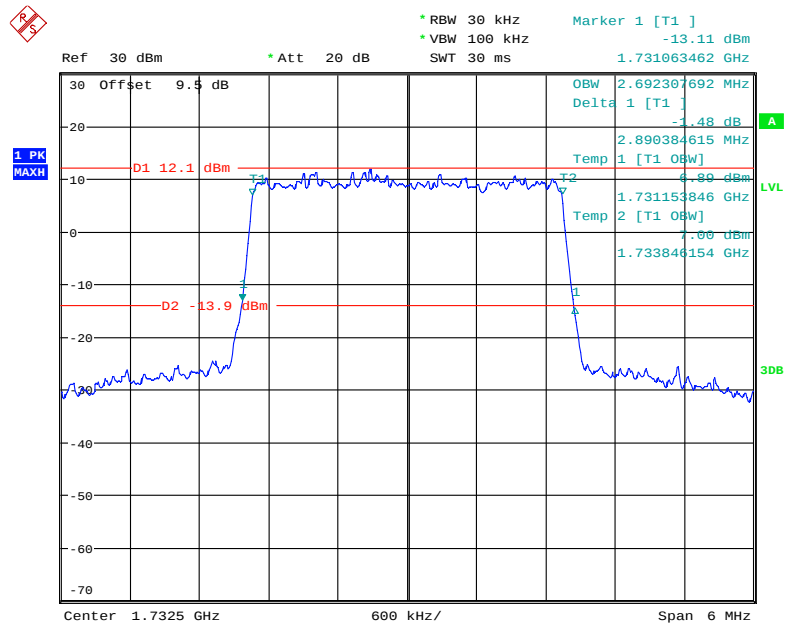
Date: 16.JAN.2020 11:55:20

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



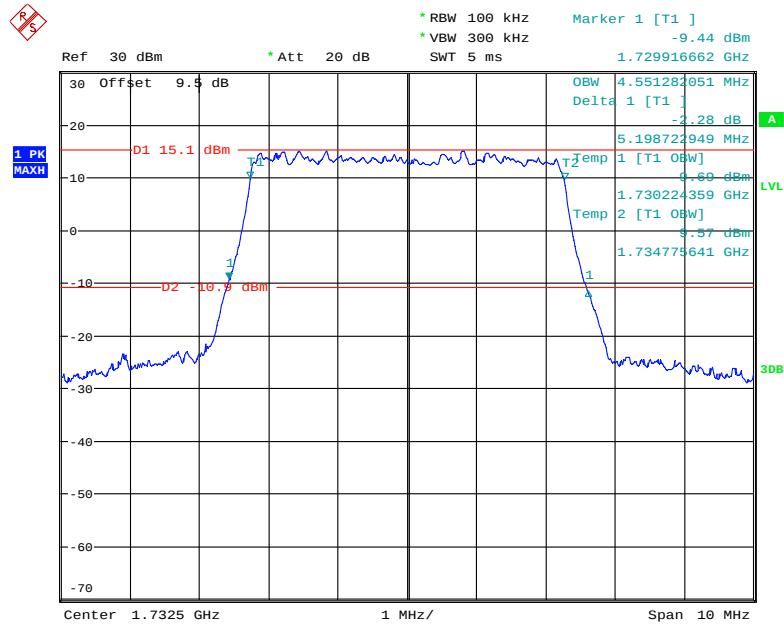
Date: 16.JAN.2020 13:16:13

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



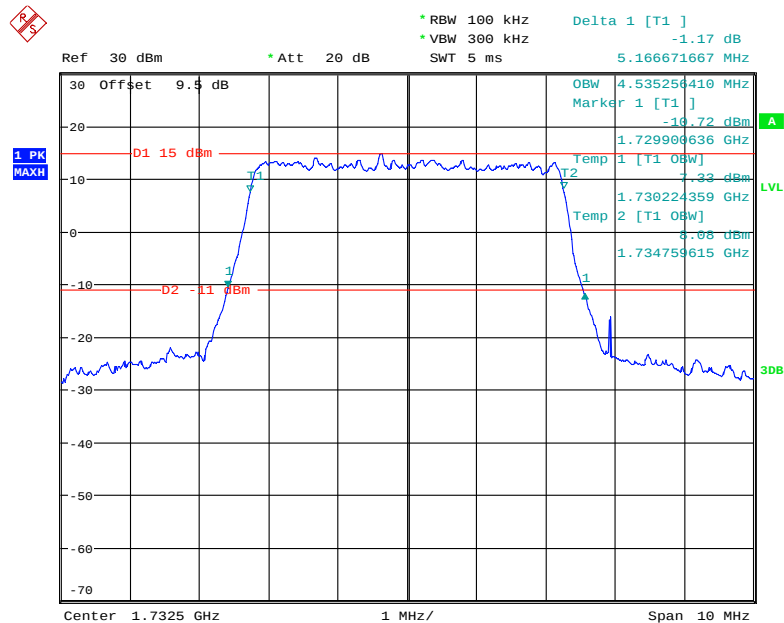
Date: 16.JAN.2020 13:14:36

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



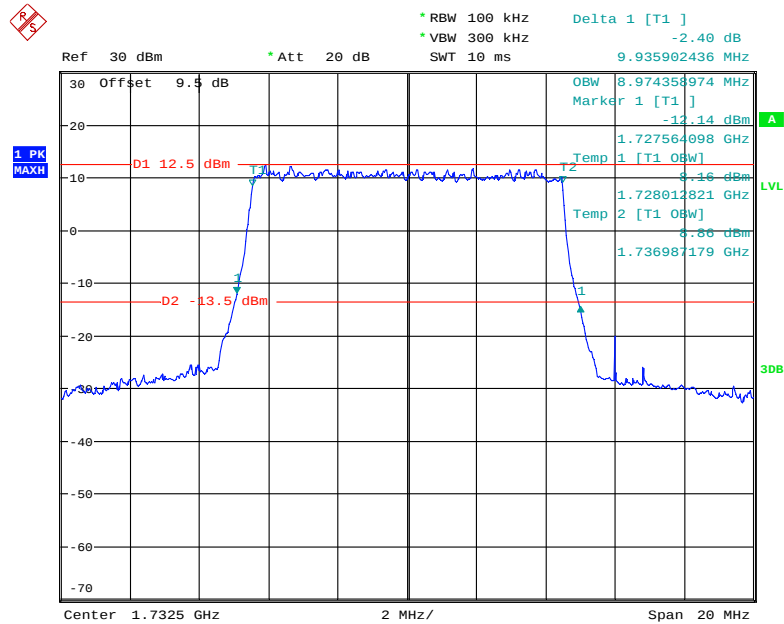
Date: 16.JAN.2020 13:21:23

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



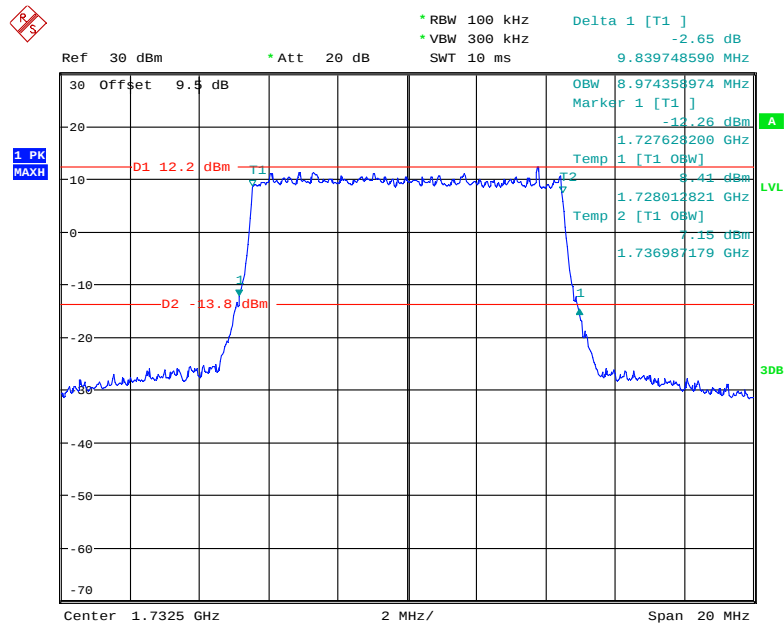
Date: 16.JAN.2020 13:19:39

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



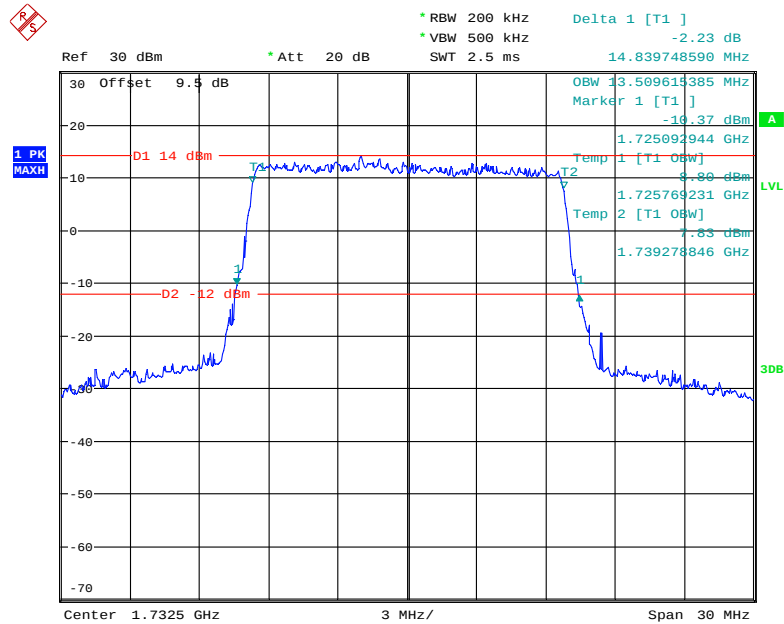
Date: 16.JAN.2020 13:25:15

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



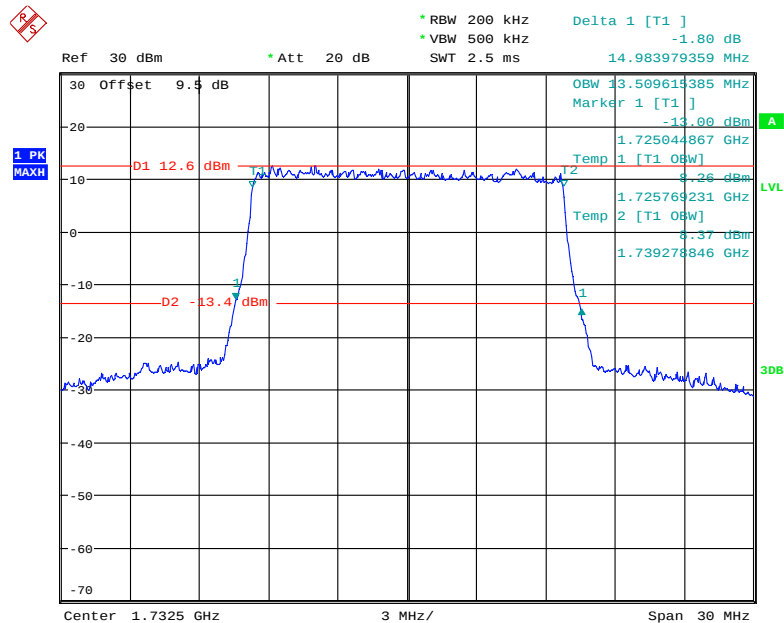
Date: 16.JAN.2020 13:23:26

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

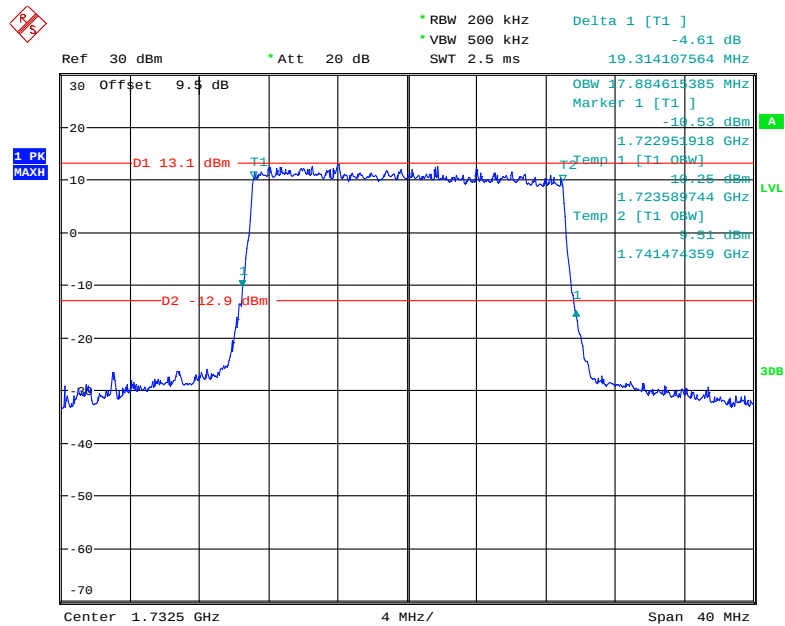


Date: 16.JAN.2020 13:28:25

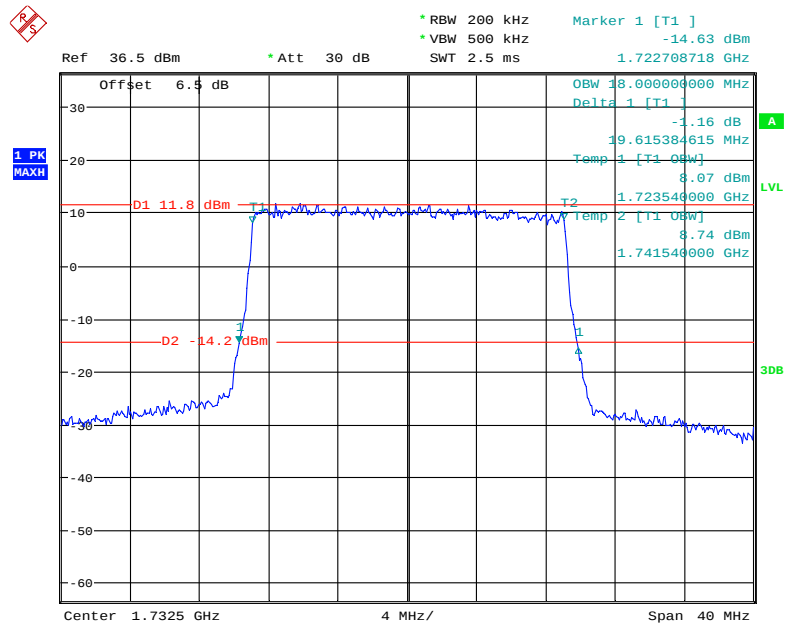
16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 16.JAN.2020 13:27:11

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

Date: 16.JAN.2020 13:34:00

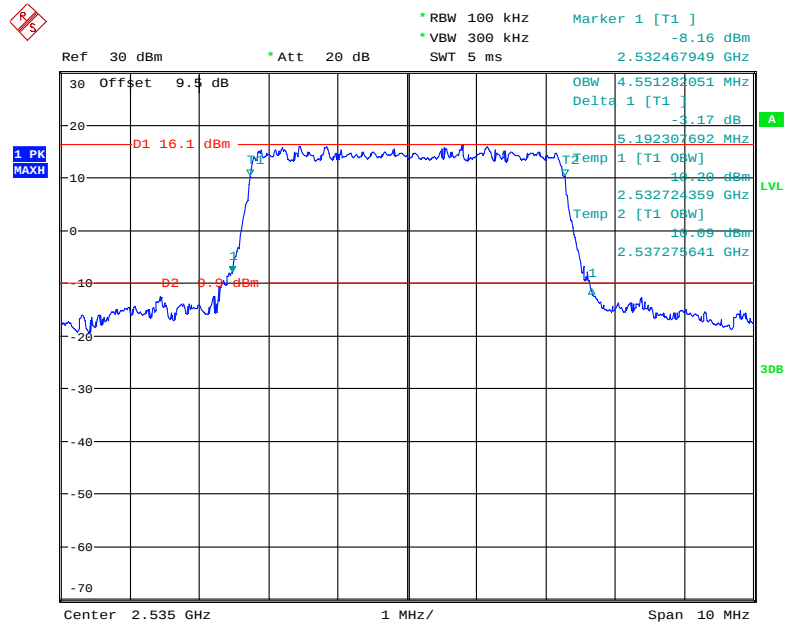
16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 13.MAR.2020 15:21:01

LTE Band 7: (Middle Channel)

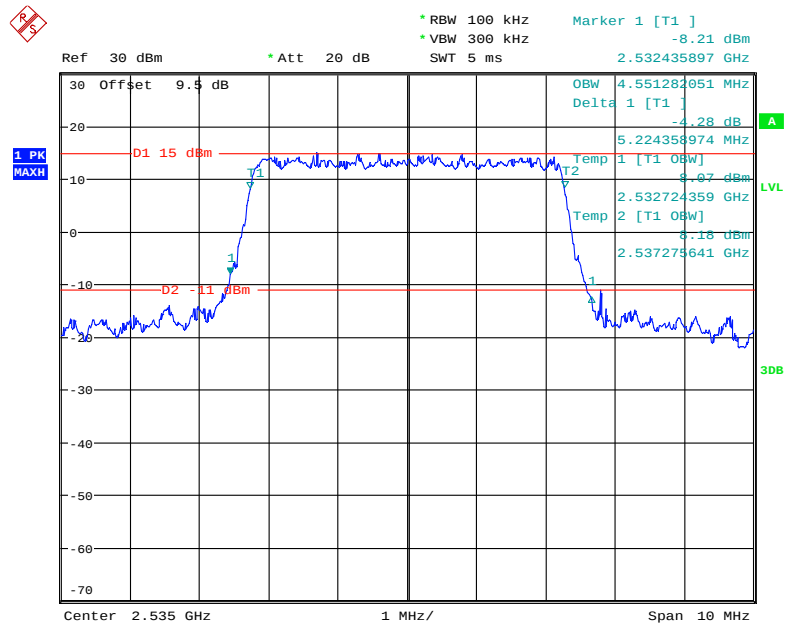
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.55	5.19
	16QAM	4.55	5.22
10.0	QPSK	9.03	10.20
	16QAM	8.97	9.91
15.0	QPSK	13.58	15.09
	16QAM	13.51	15.04
20.0	QPSK	18.01	22.79
	16QAM	18.08	23.37

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

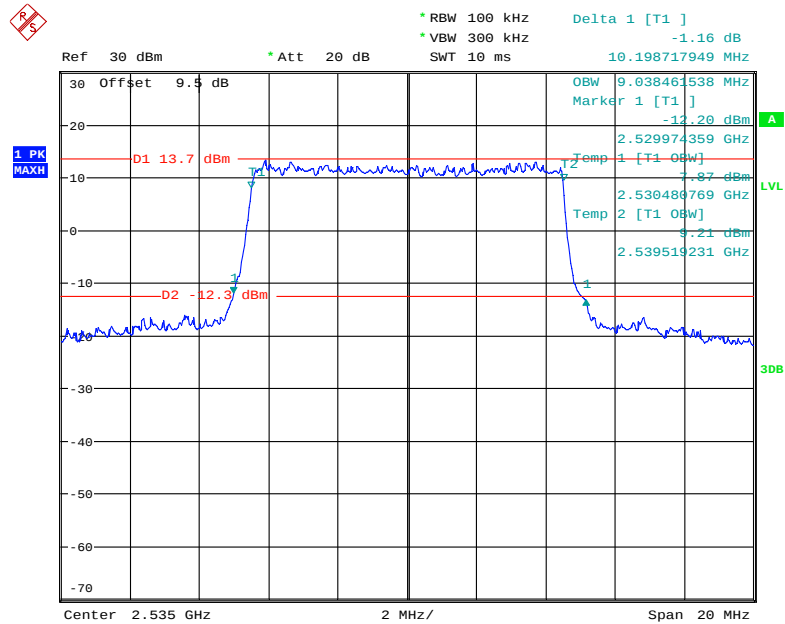


Date: 16.JAN.2020 13:42:26

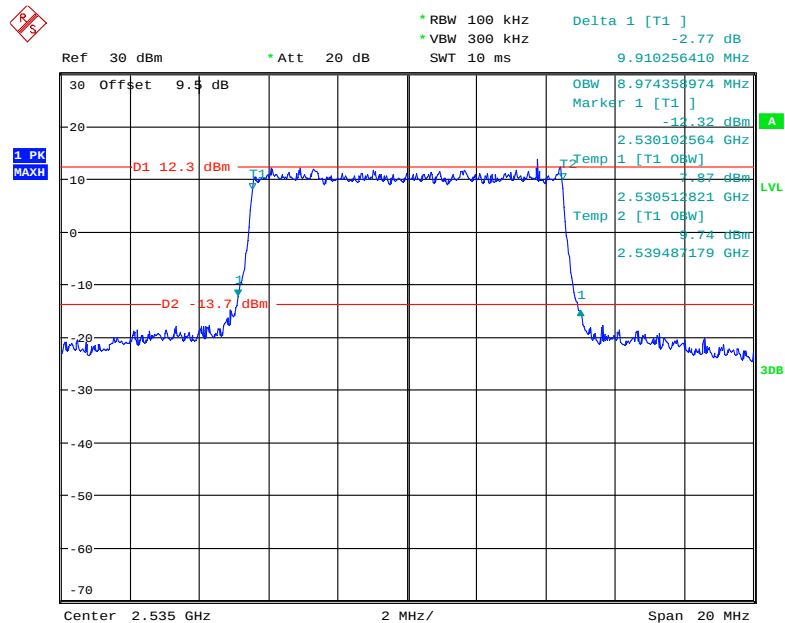
16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 16.JAN.2020 13:43:36

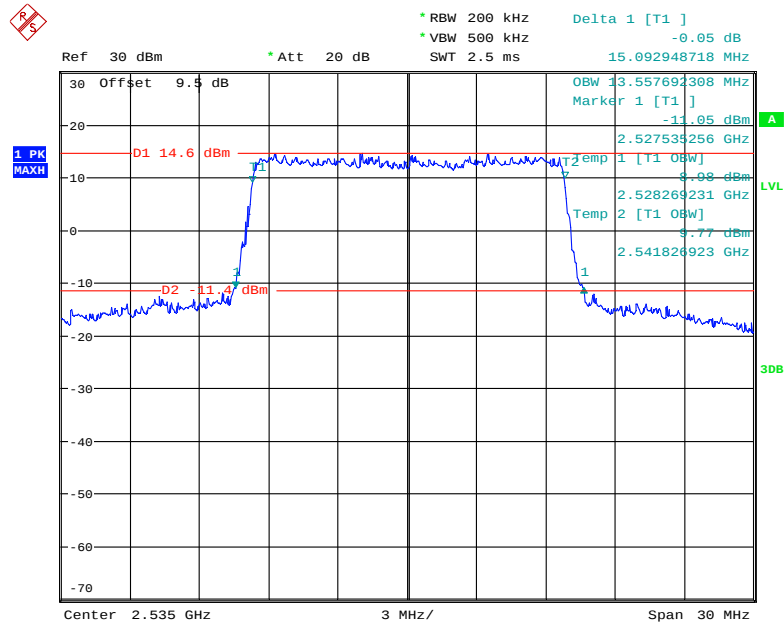
QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.JAN.2020 13:46:04

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

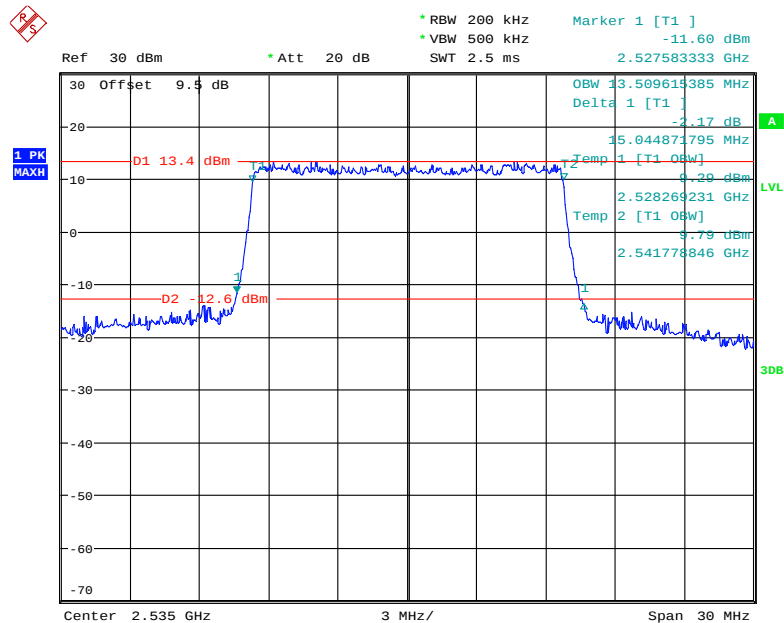
Date: 16.JAN.2020 13:47:13

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



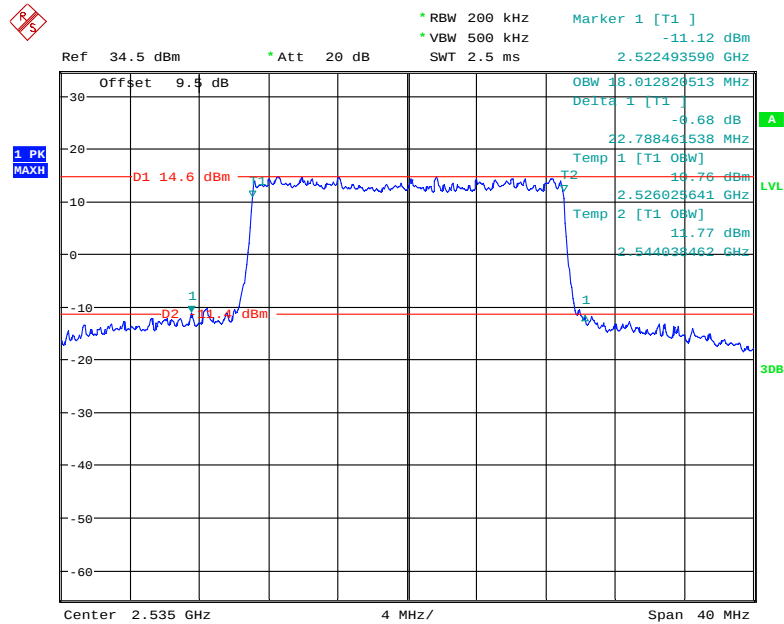
Date: 16.JAN.2020 13:49:29

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



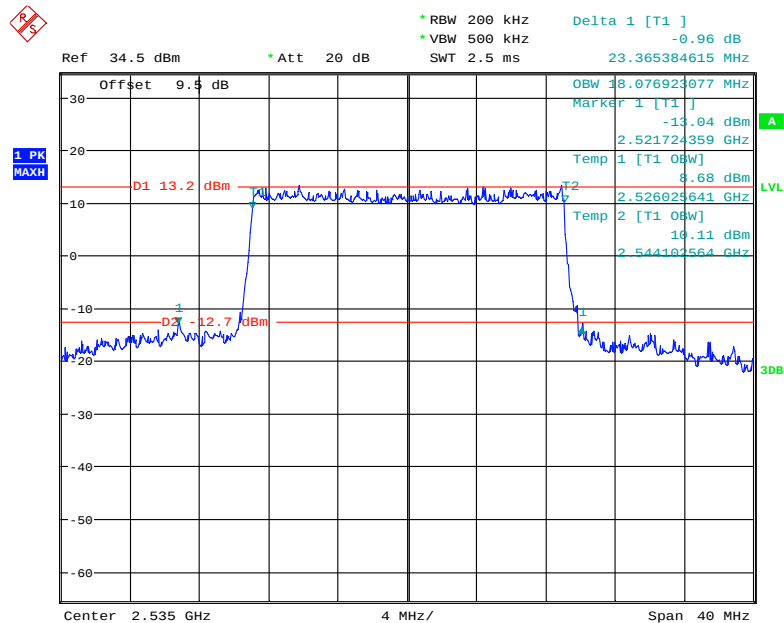
Date: 16.JAN.2020 13:50:50

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



Date: 16.JAN.2020 16:44:05

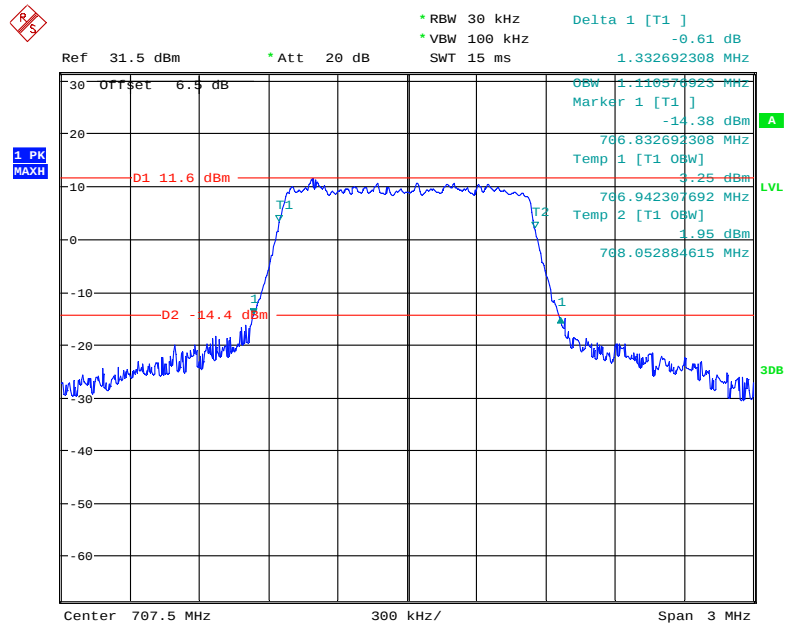
16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



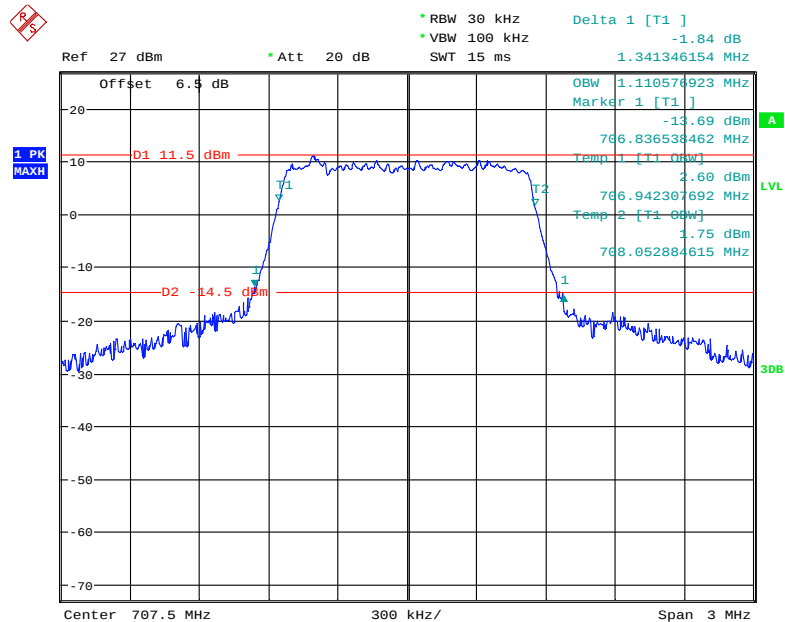
Date: 16.JAN.2020 16:47:21

LTE Band 12: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.33
	16QAM	1.11	1.34
3.0	QPSK	2.69	2.89
	16QAM	2.69	2.96
5.0	QPSK	4.50	5.06
	16QAM	4.49	5.03
10.0	QPSK	8.96	9.99
	16QAM	8.96	10.07

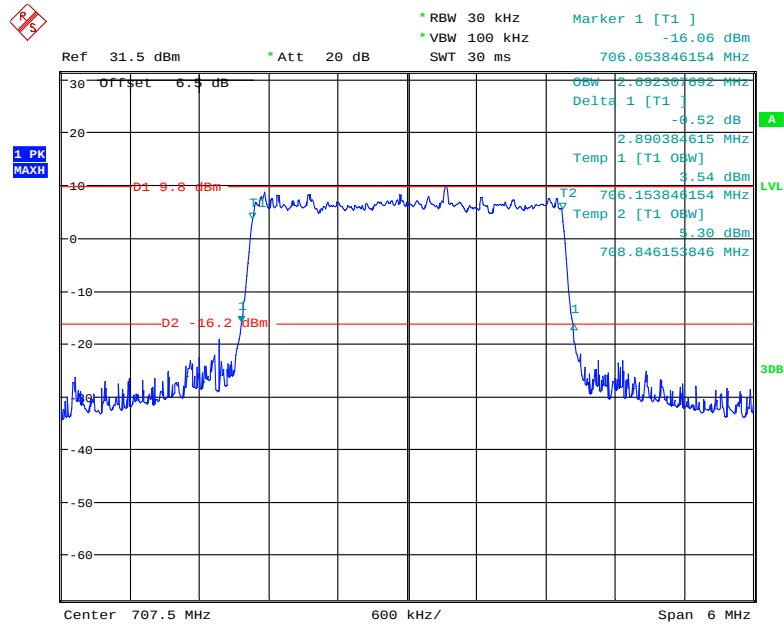
QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 25.FEB.2020 16:21:59

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

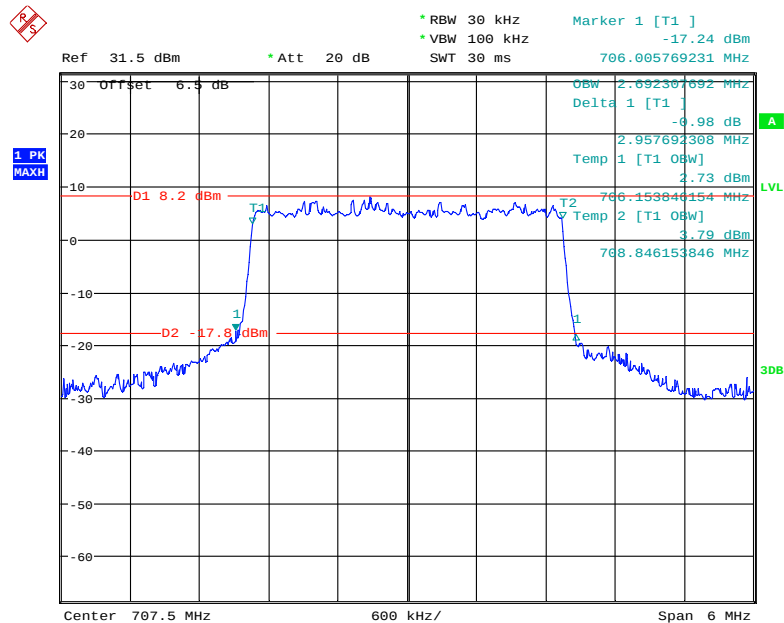
Date: 25.FEB.2020 16:39:26

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



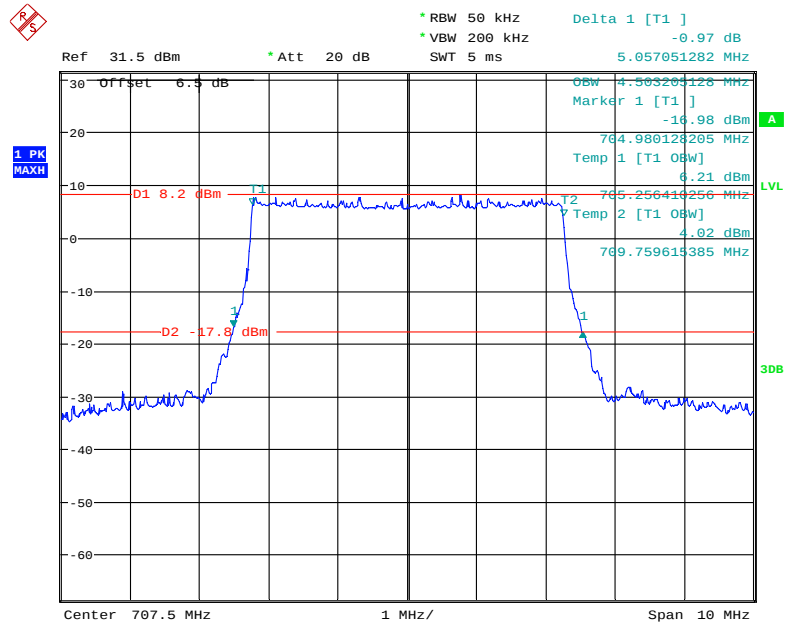
Date: 25.FEB.2020 16:24:36

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



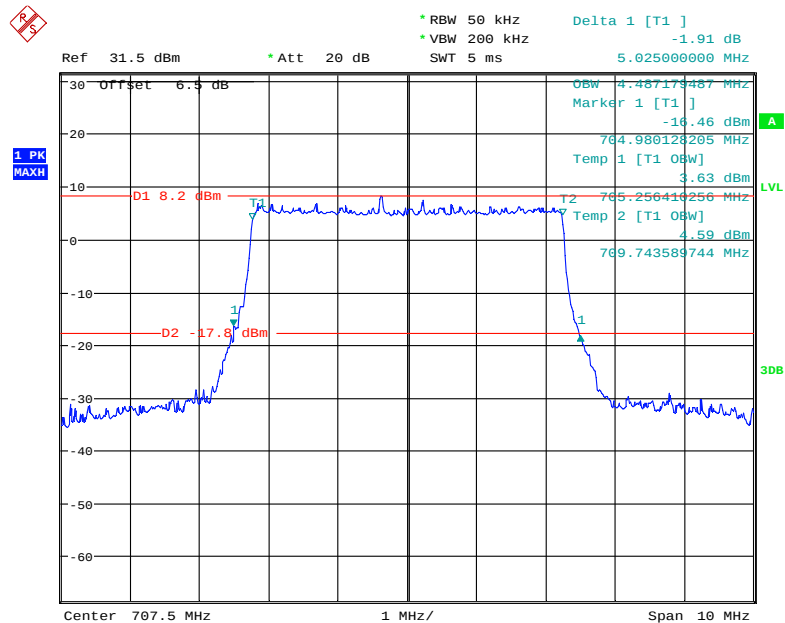
Date: 25.FEB.2020 16:26:49

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

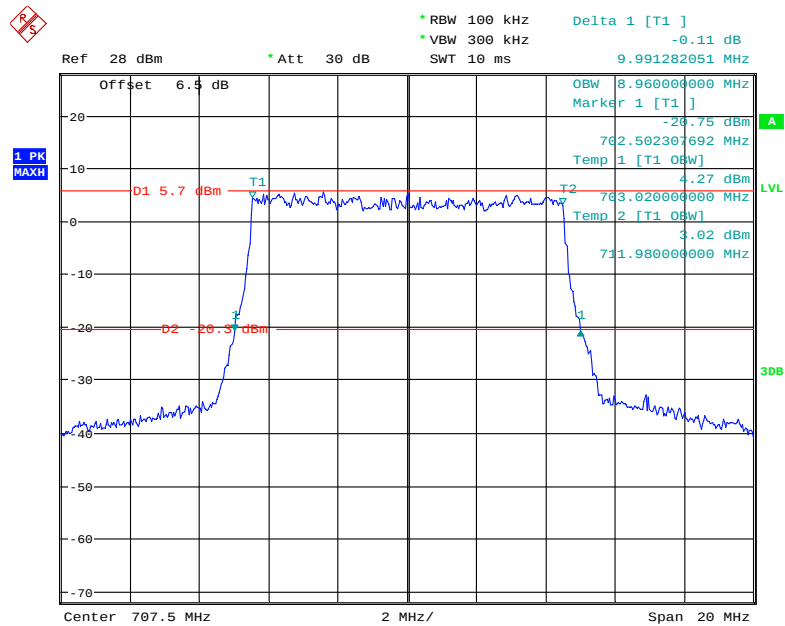


Date: 25.FEB.2020 16:30:35

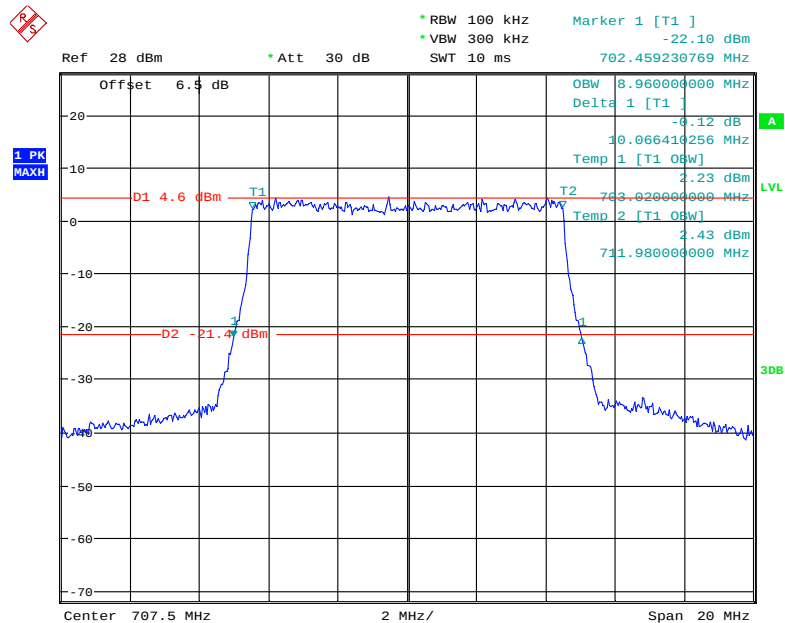
16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 25.FEB.2020 16:29:34

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

Date: 13.MAR.2020 15:24:12

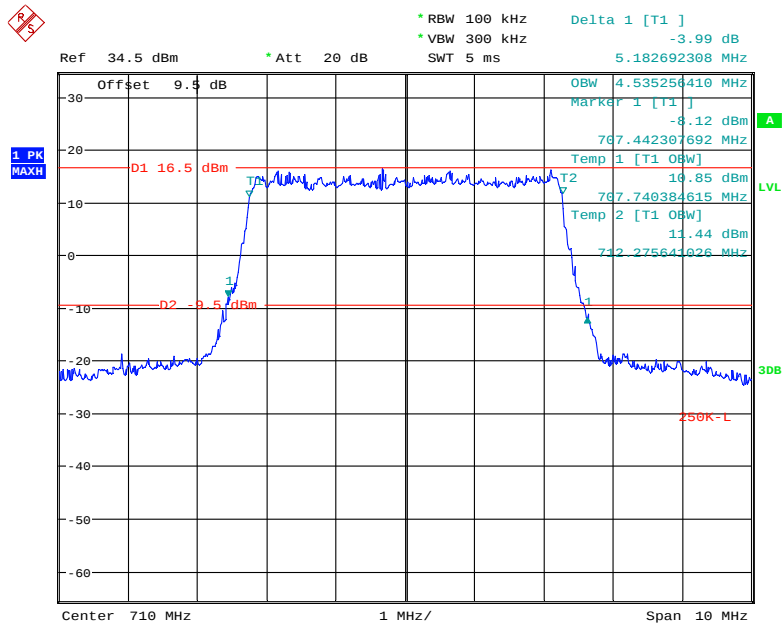
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 13.MAR.2020 15:23:10

LTE Band 17: (Middle Channel)

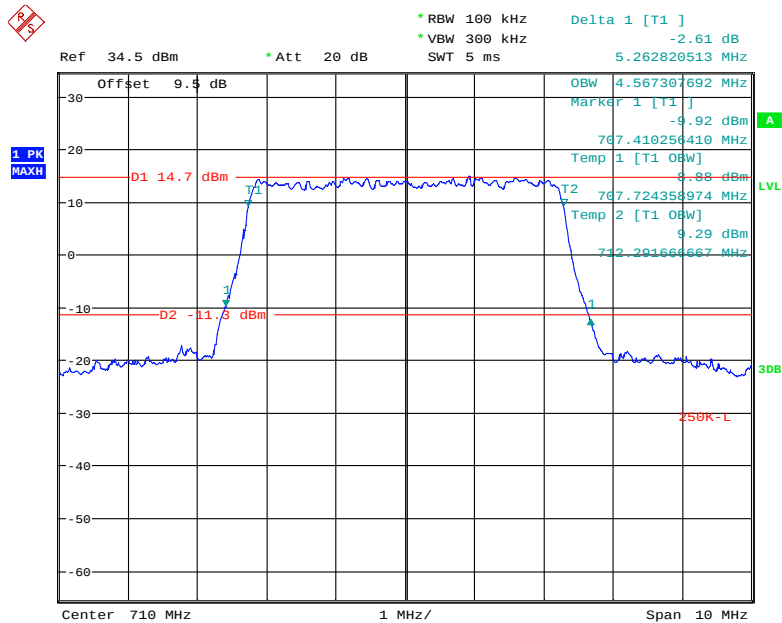
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.54	5.18
	16QAM	4.57	5.26
10.0	QPSK	9.01	10.03
	16QAM	9.00	10.07

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



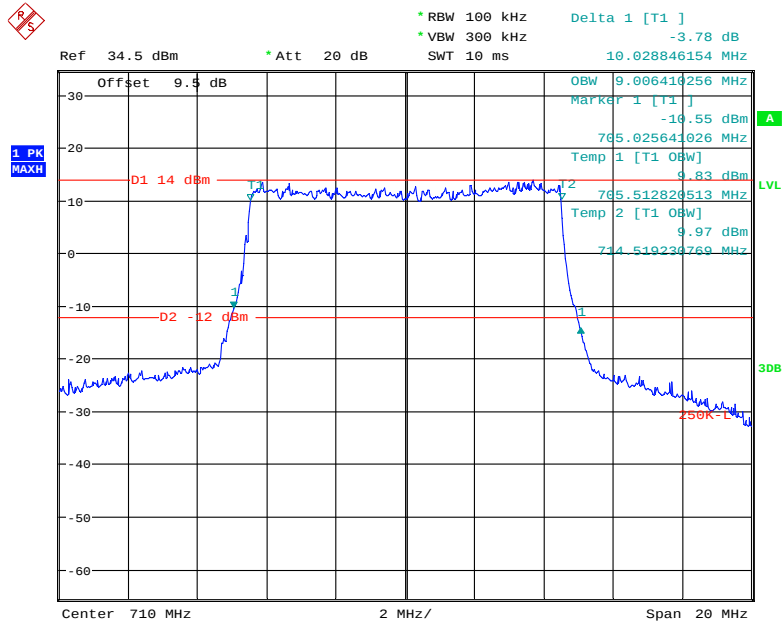
Date: 17.JAN.2020 09:15:21

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



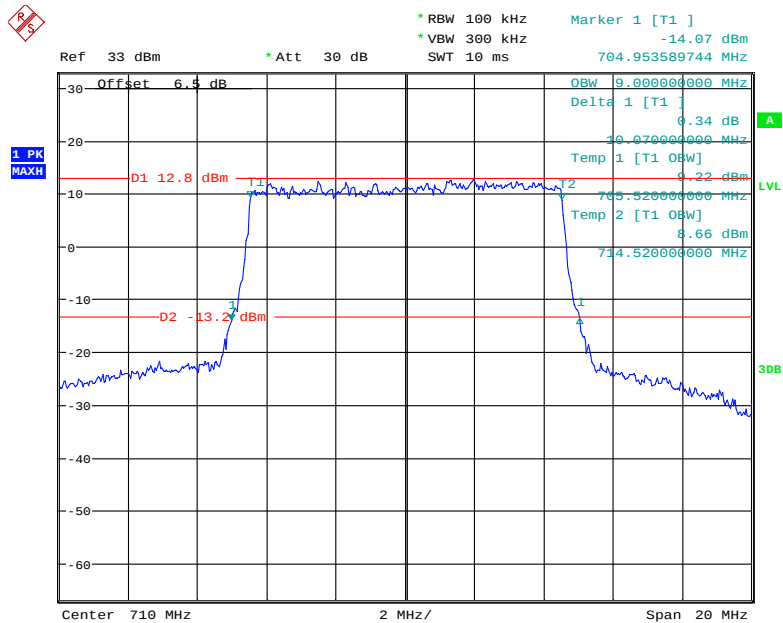
Date: 17.JAN.2020 09:12:36

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



Date: 17.JAN.2020 09:17:35

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



Date: 13.MAR.2020 15:26:23

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

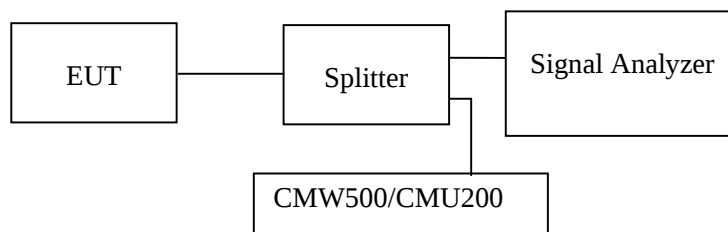
Applicable Standard

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 Kieron Luo from 2020-01-17 to 2020-03-13

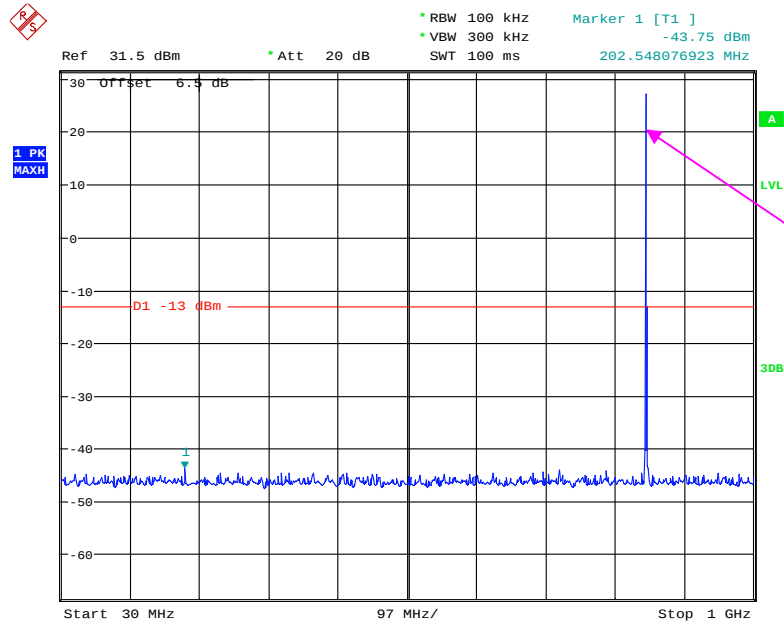
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

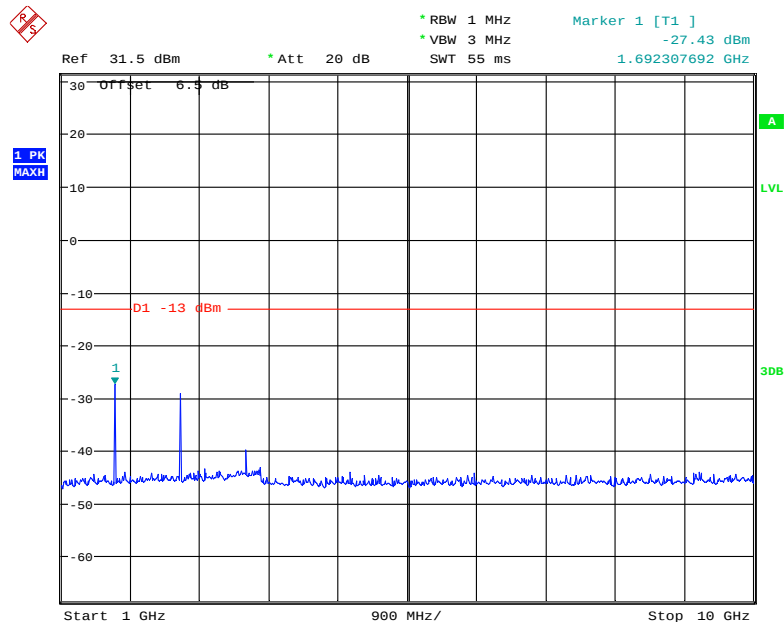
30 MHz – 1 GHz (GSM Mode)



Fundamental test

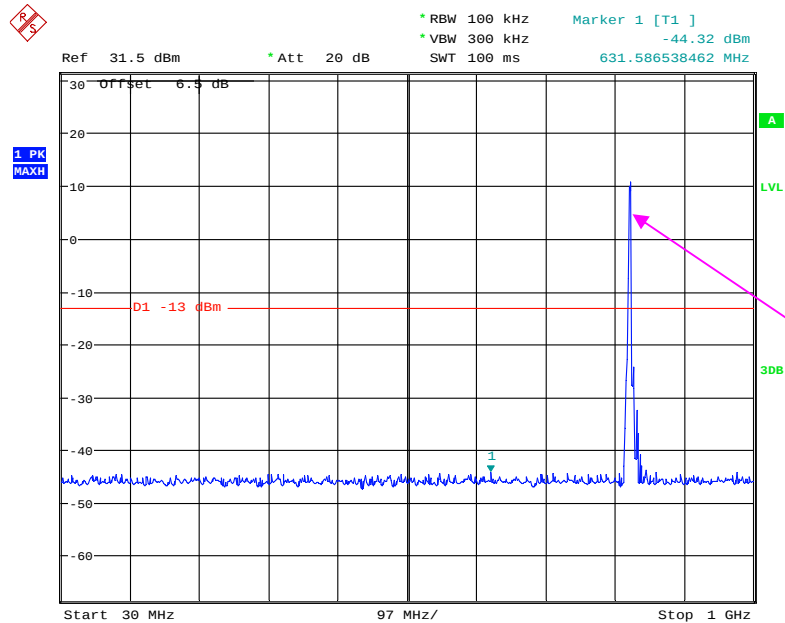
Date: 25.FEB.2020 09:19:14

1 GHz – 10 GHz (GSM Mode)



Date: 25.FEB.2020 09:20:11

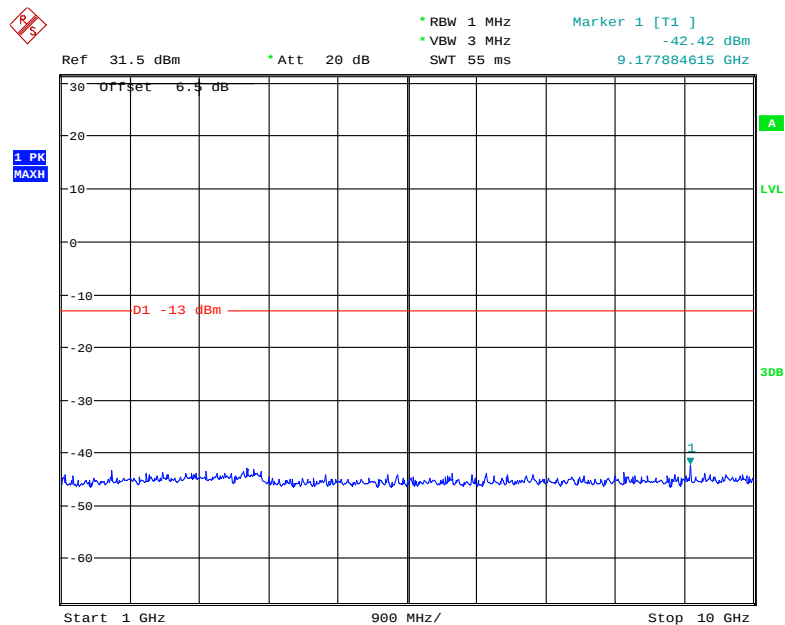
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 25.FEB.2020 13:57:19

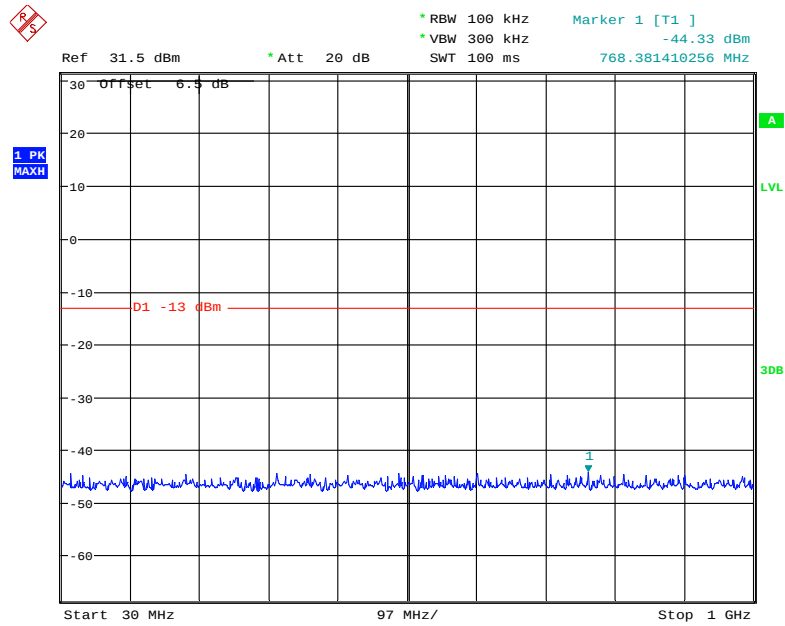
1 GHz – 10 GHz (WCDMA Mode)



Date: 25.FEB.2020 13:58:44

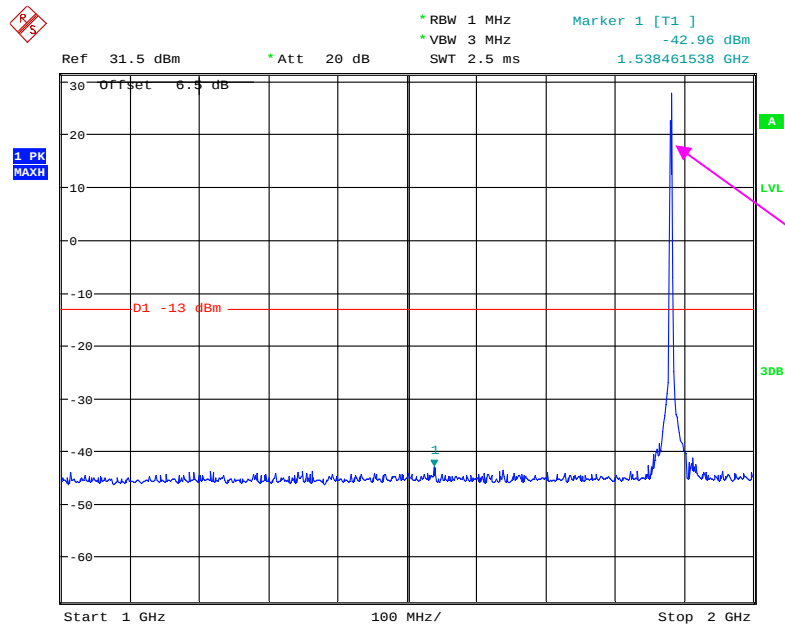
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 25.FEB.2020 09:28:46

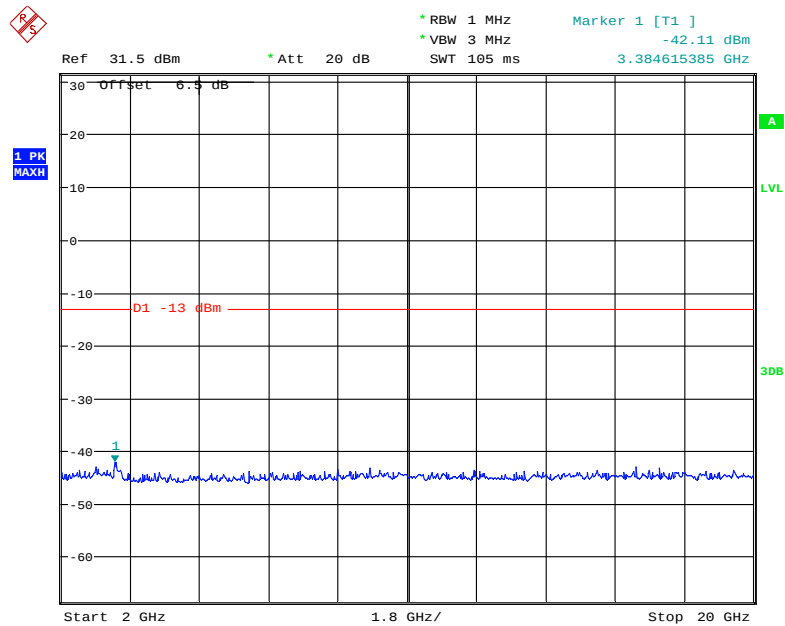
1 GHz – 2 GHz (GSM Mode)



Fundamental test

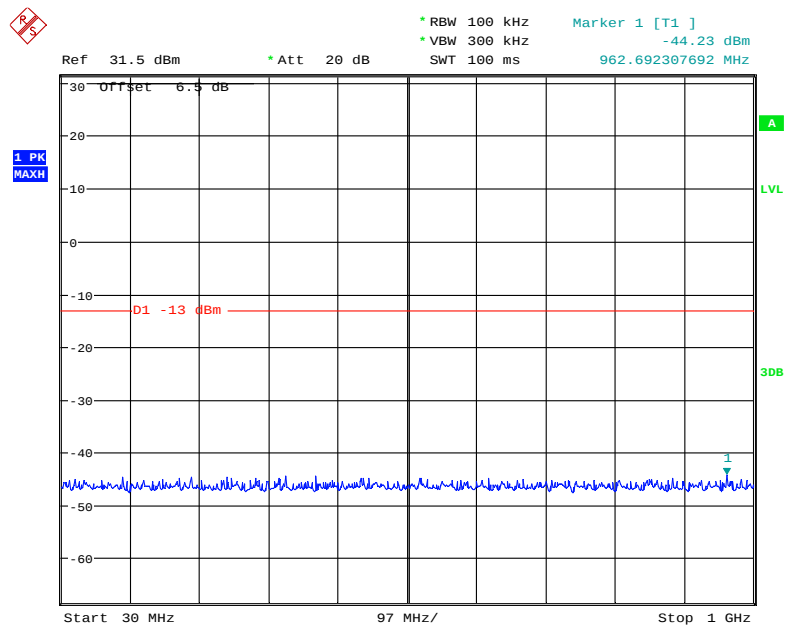
Date: 25.FEB.2020 09:34:12

2 GHz – 20 GHz (GSM Mode)



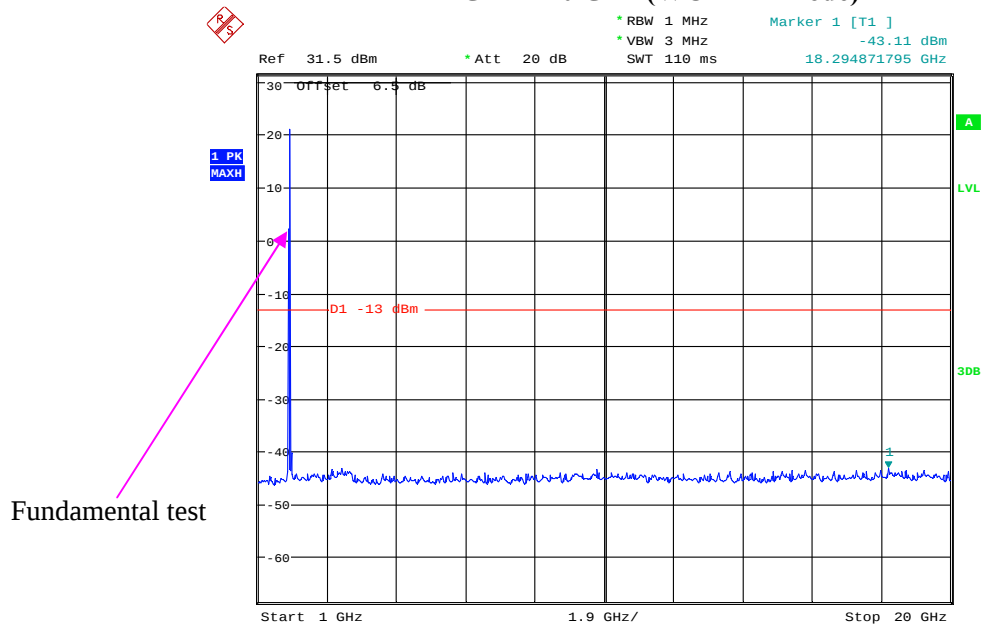
Date: 25.FEB.2020 09:35:16

30 MHz – 1 GHz (WCDMA Mode)

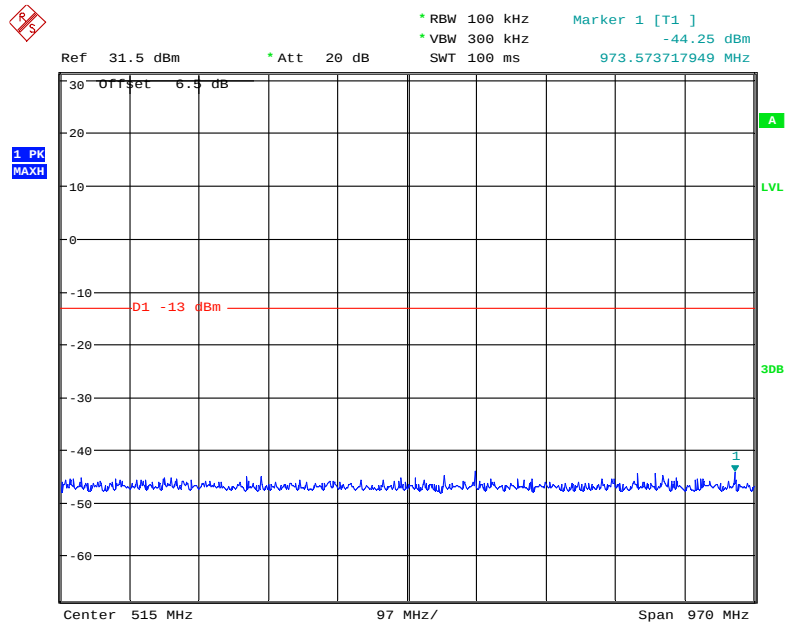


Date: 25.FEB.2020 14:02:54

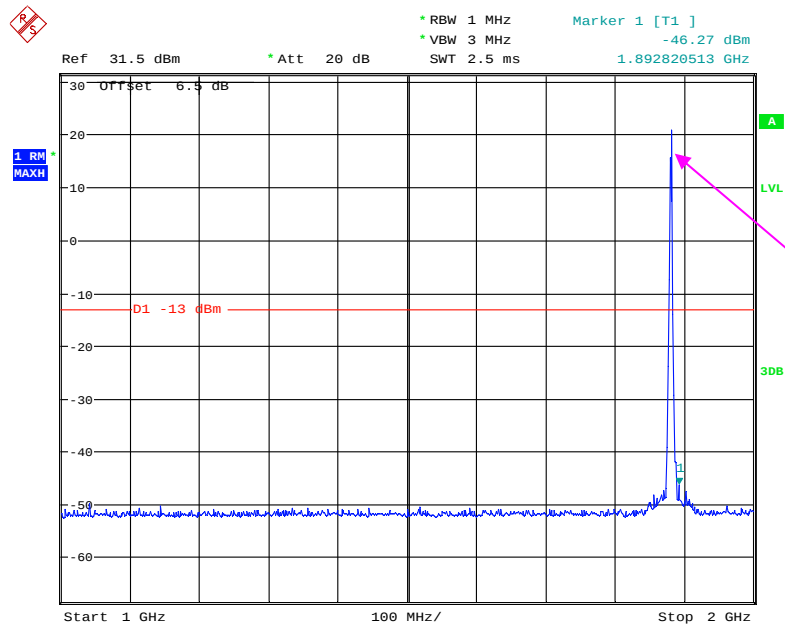
1 GHz – 20 GHz (WCDMA Mode)



Date: 25.FEB.2020 14:01:50

LTE Band 2:**30 MHz - 1 GHz (1.4 MHz, Middle Channel)**

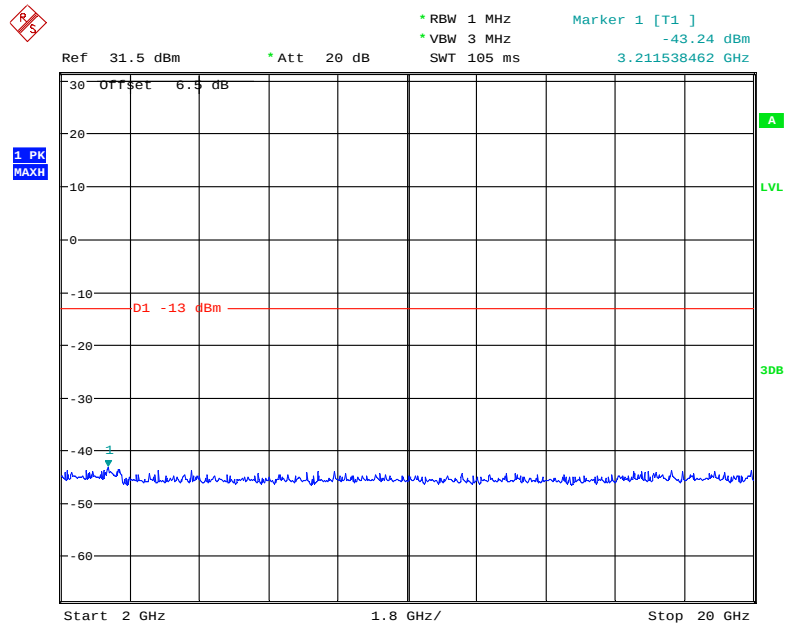
Date: 17.JAN.2020 16:31:40

1 GHz - 2 GHz (1.4 MHz, Middle Channel)

Fundamental test

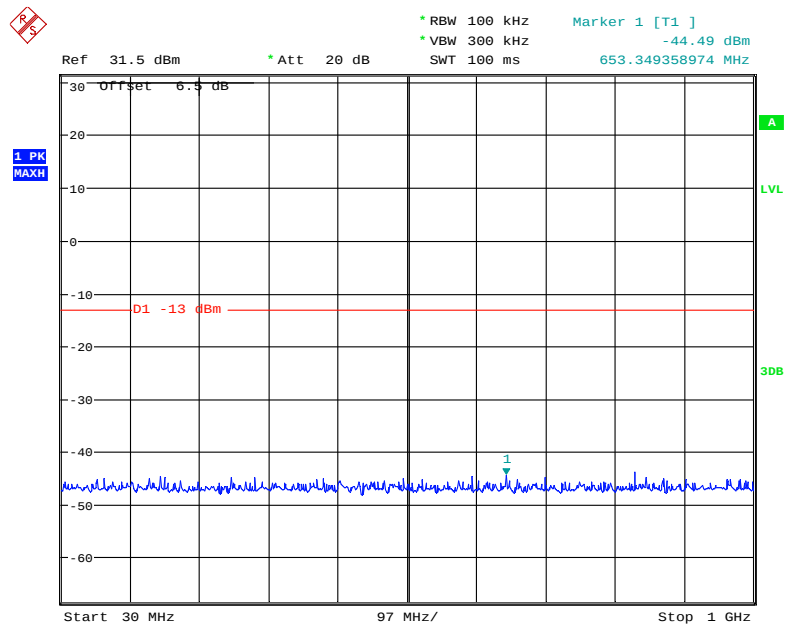
Date: 17.JAN.2020 16:26:08

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



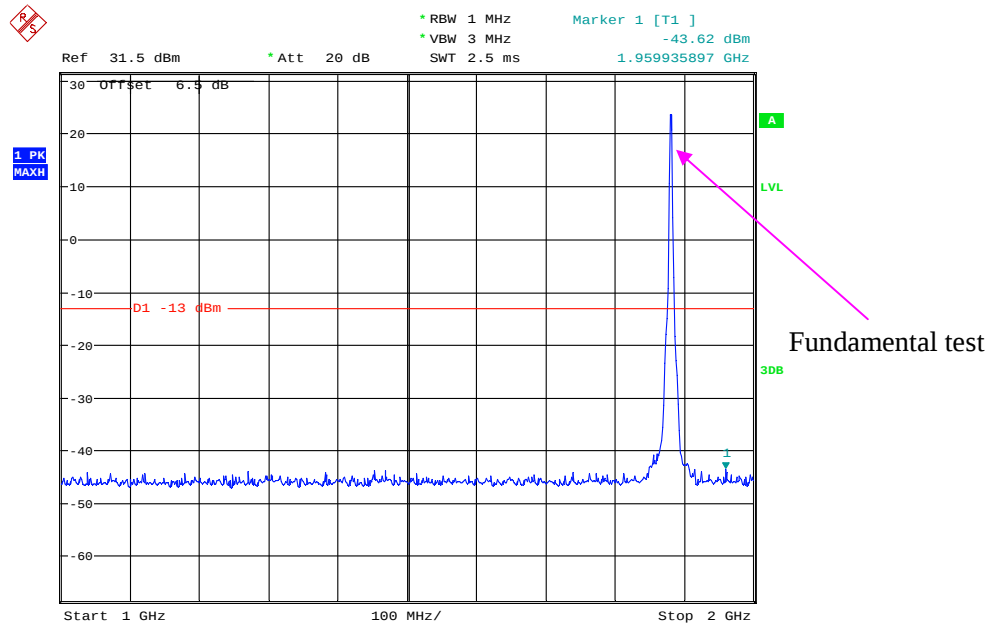
Date: 17.JAN.2020 16:29:16

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



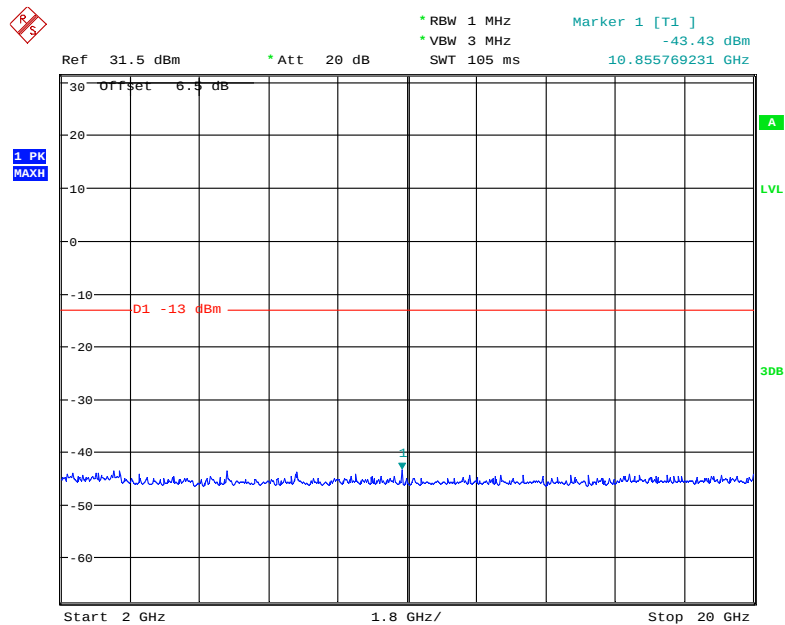
Date: 17.JAN.2020 16:40:25

1 GHz – 2 GHz (3.0 MHz, Middle Channel)



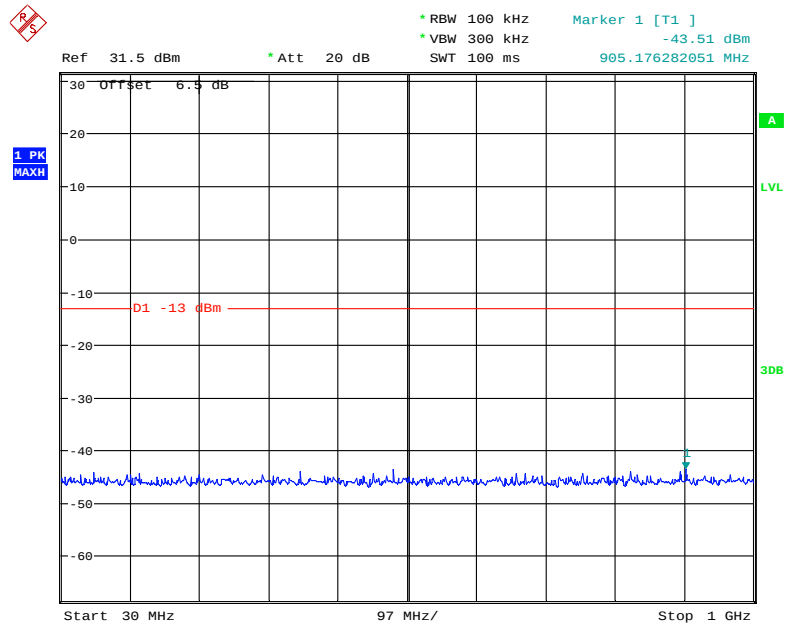
Date: 17.JAN.2020 16:37:05

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



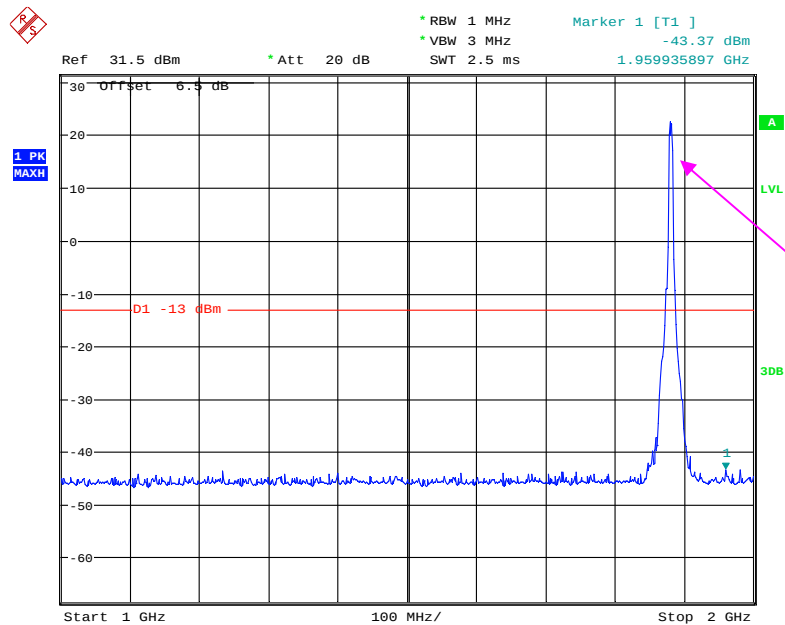
Date: 17.JAN.2020 16:38:32

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



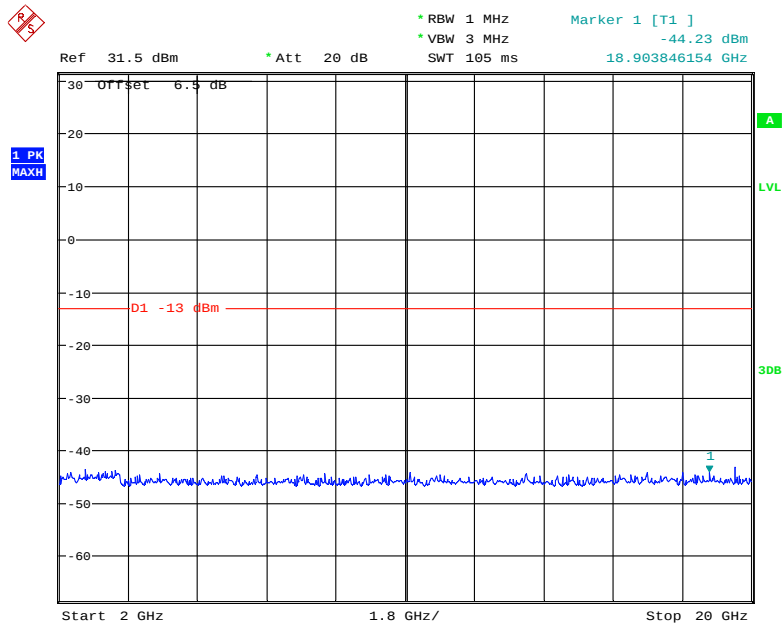
Date: 17.JAN.2020 16:42:24

1 GHz - 2 GHz (5.0 MHz, Middle Channel)



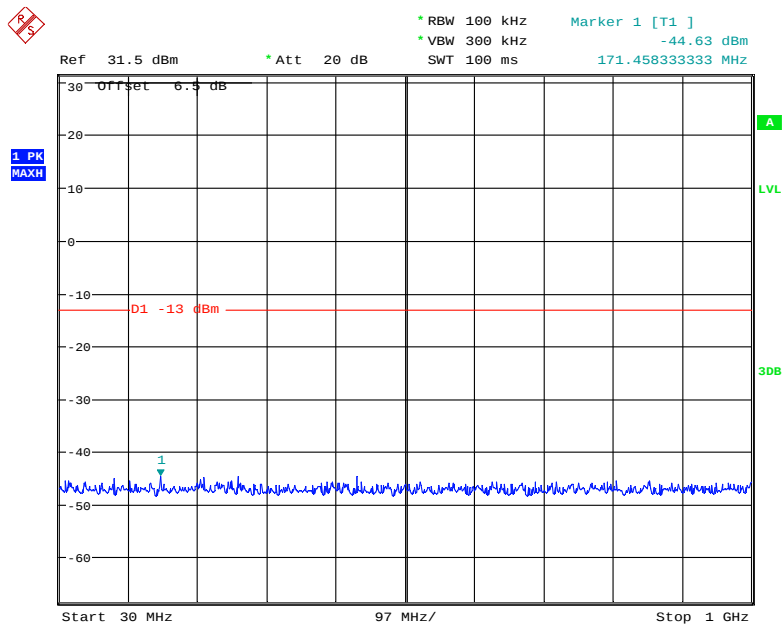
Date: 17.JAN.2020 16:44:51

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



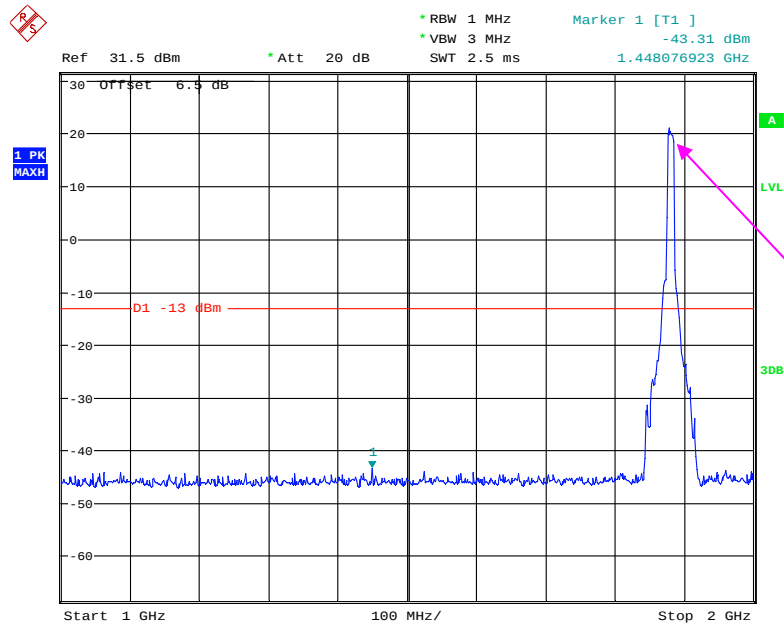
Date: 17.JAN.2020 16:43:20

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



Date: 17.JAN.2020 16:52:51

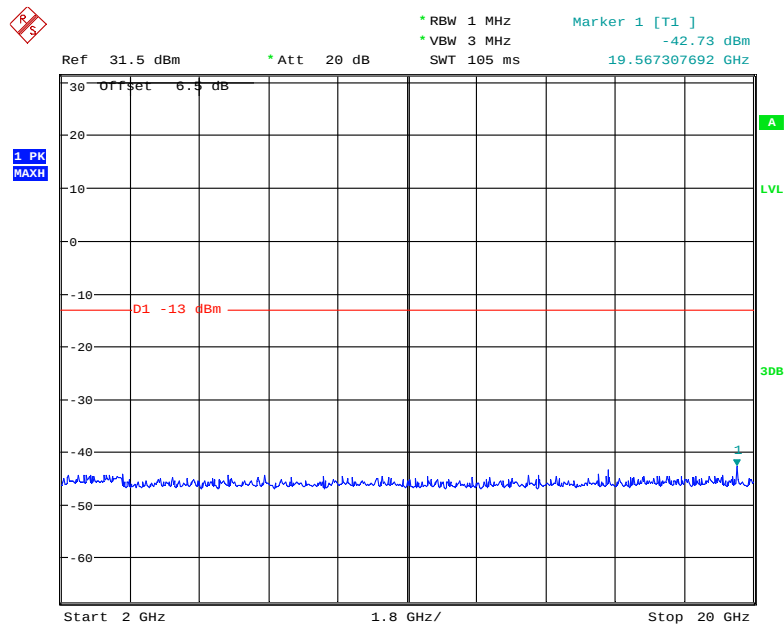
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



Fundamental test

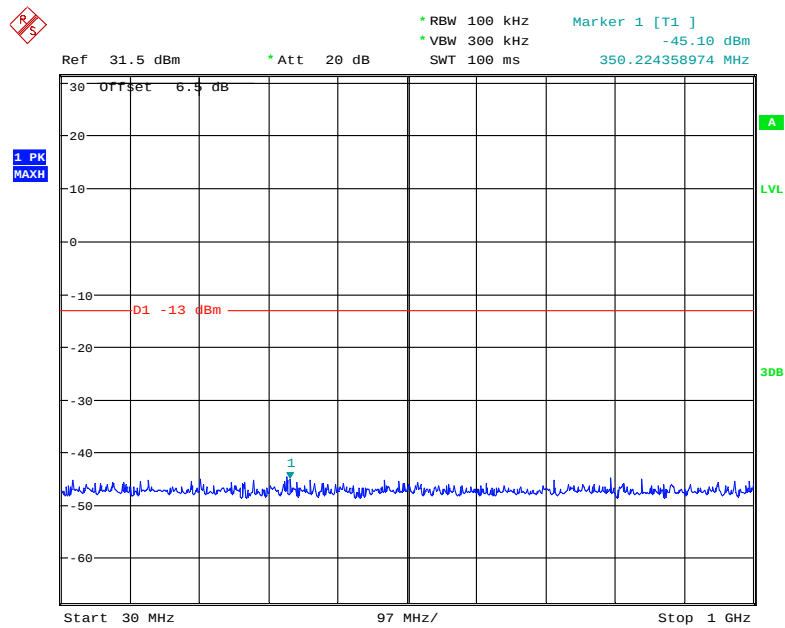
Date: 17.JAN.2020 16:46:10

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



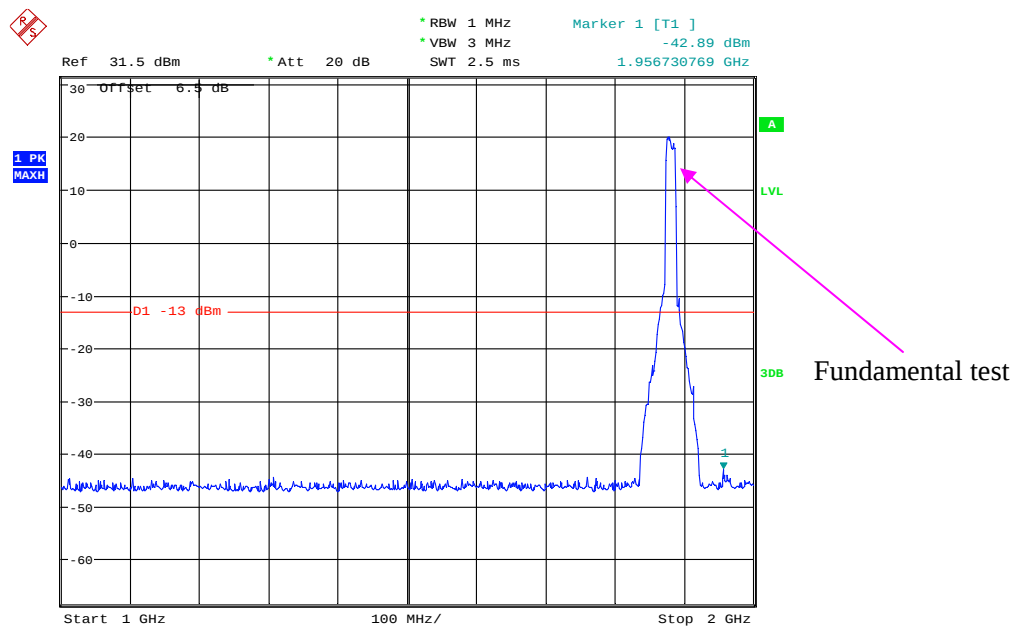
Date: 17.JAN.2020 16:52:15

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



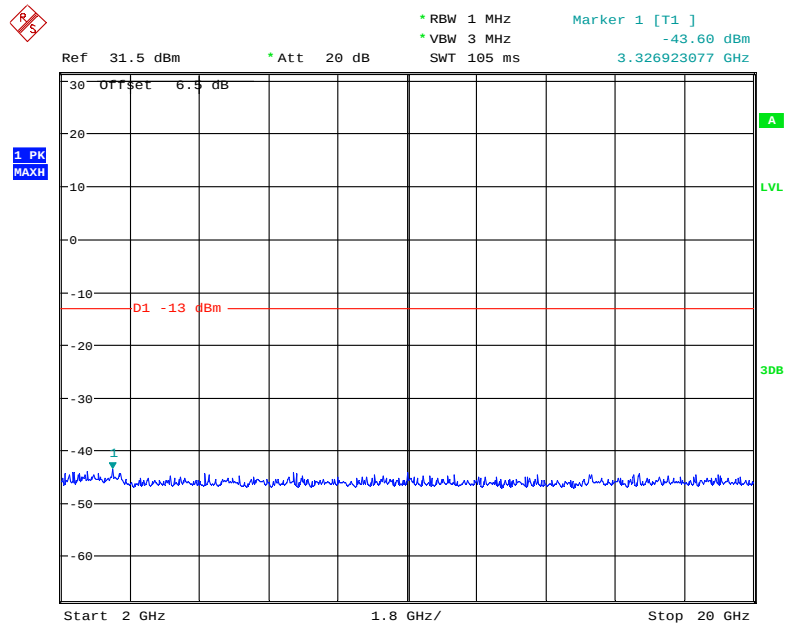
Date: 17.JAN.2020 16:54:41

1 GHz - 2 GHz (15.0 MHz, Middle Channel)



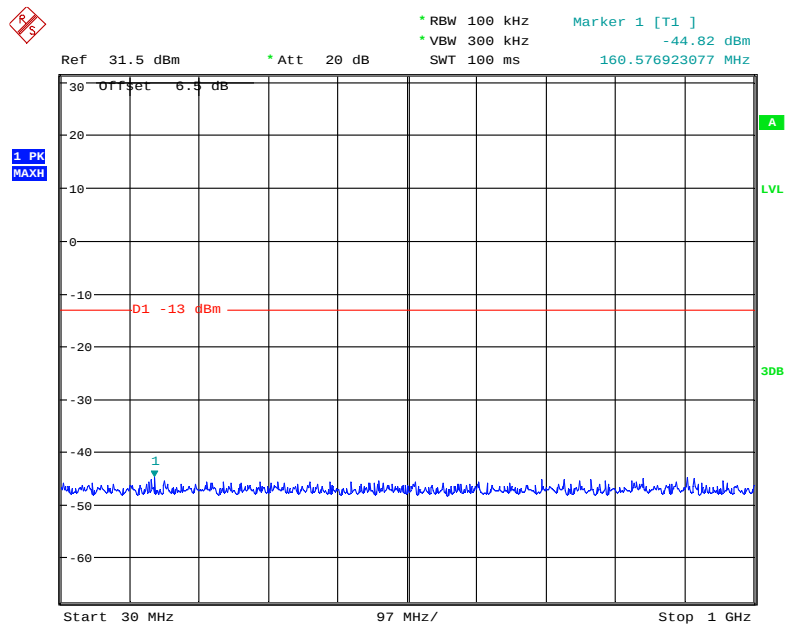
Date: 17.JAN.2020 16:56:13

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



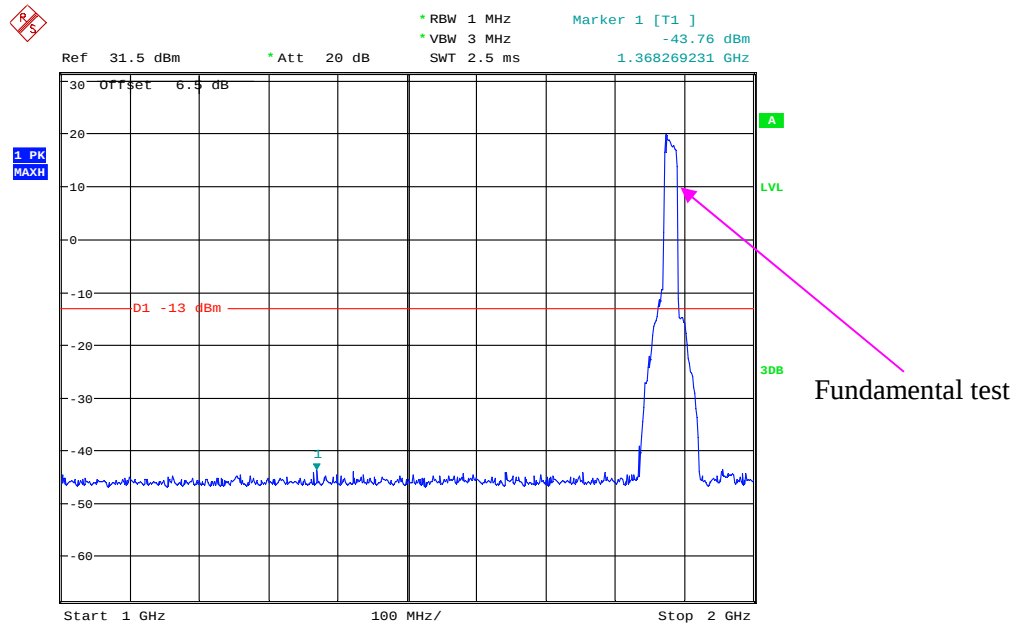
Date: 17.JAN.2020 16:55:47

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



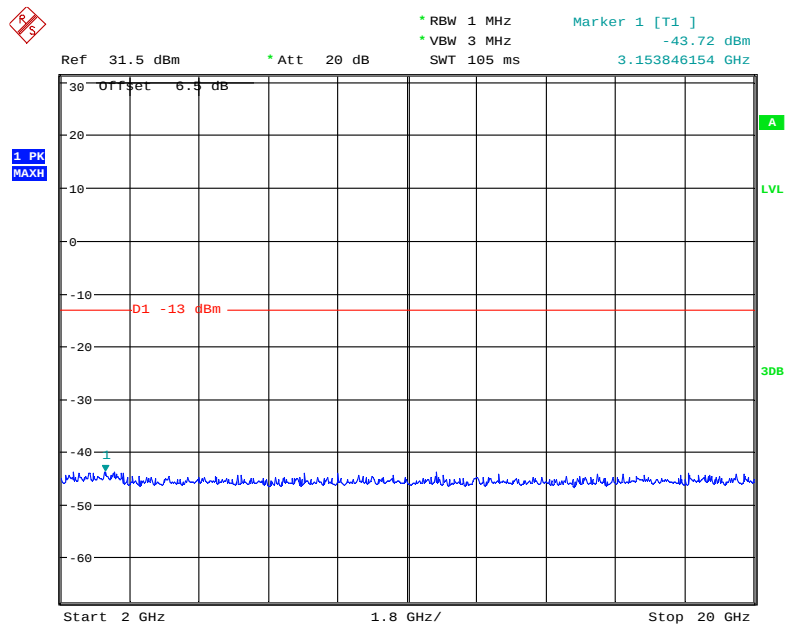
Date: 17.JAN.2020 16:58:28

1 GHz – 2 GHz (20.0 MHz, Middle Channel)

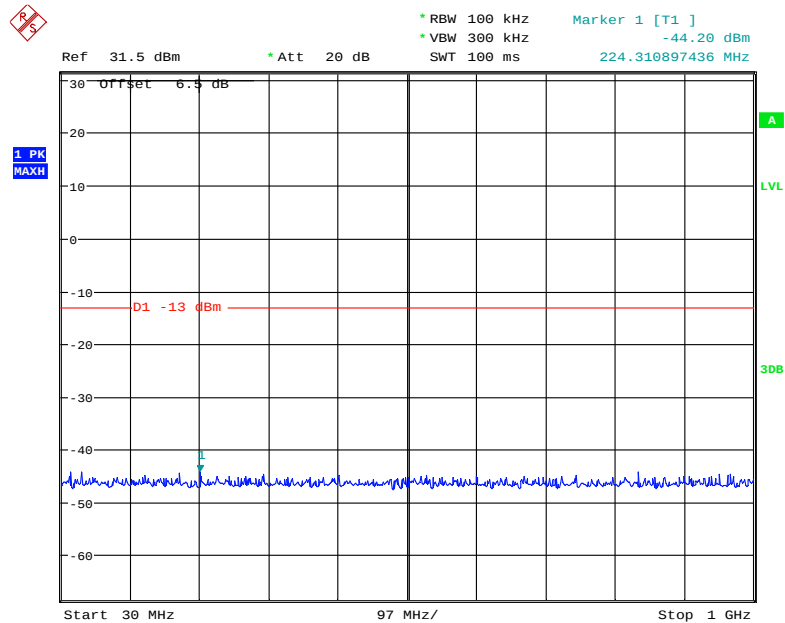


Date: 17.JAN.2020 16:57:24

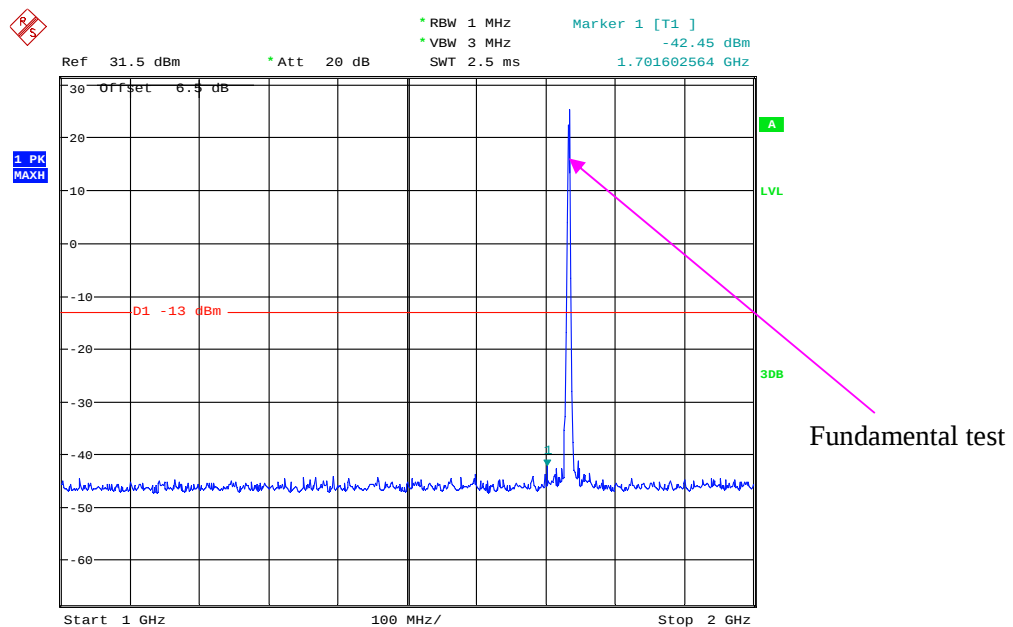
2 GHz –20 GHz (20.0 MHz, Middle Channel)



Date: 17.JAN.2020 16:57:54

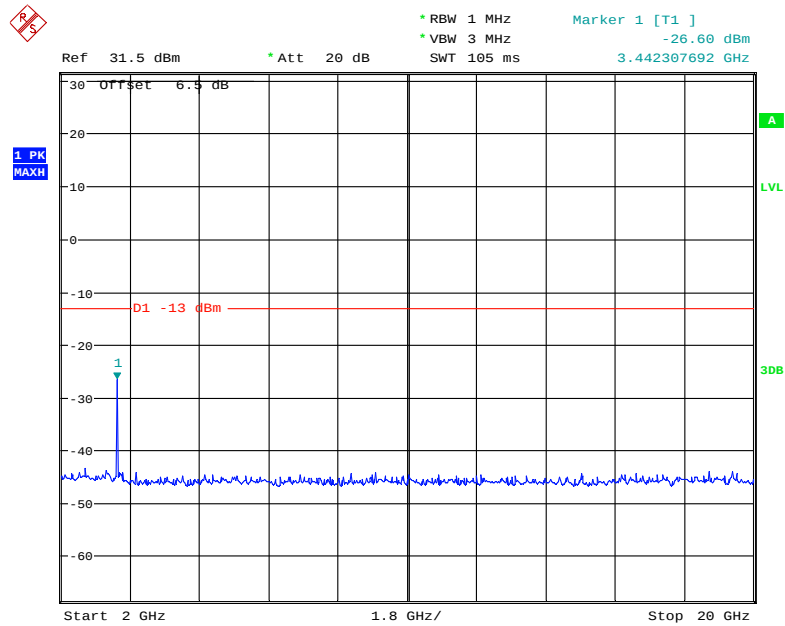
LTE Band 4:**30 MHz - 1 GHz (1.4 MHz, Middle Channel)**

Date: 17.JAN.2020 17:01:23

1 GHz - 2 GHz (1.4 MHz, Middle Channel)

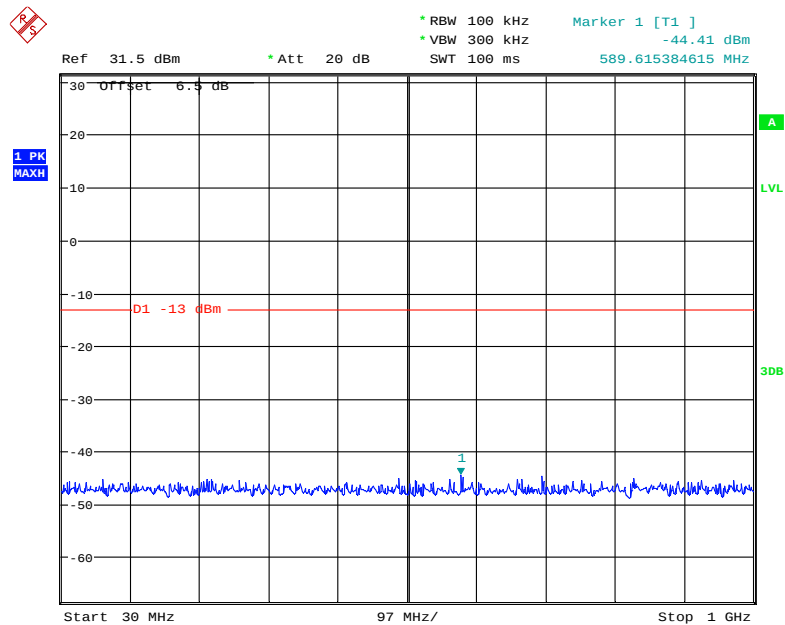
Date: 17.JAN.2020 17:02:36

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



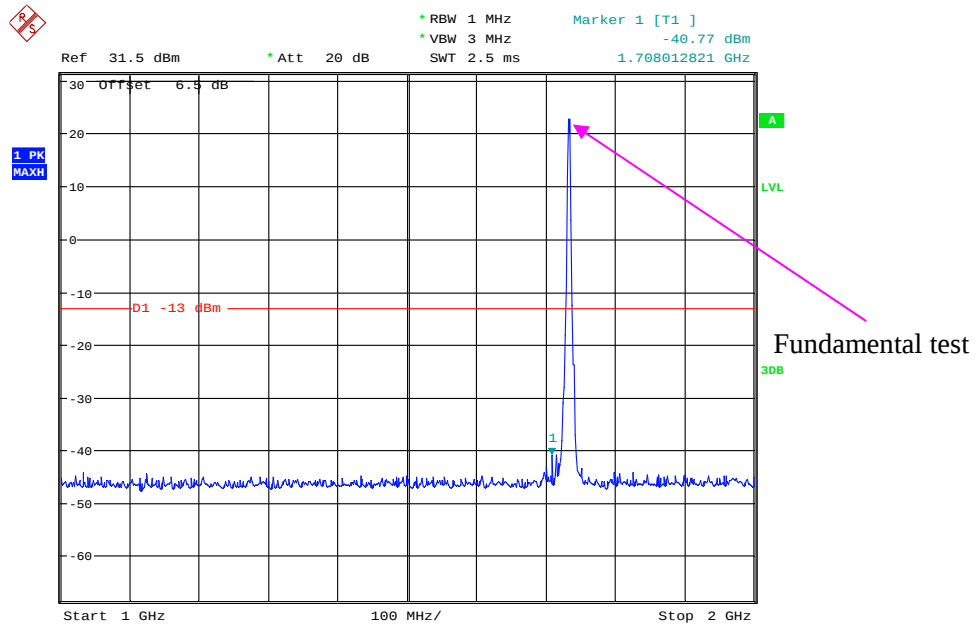
Date: 17.JAN.2020 17:02:05

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



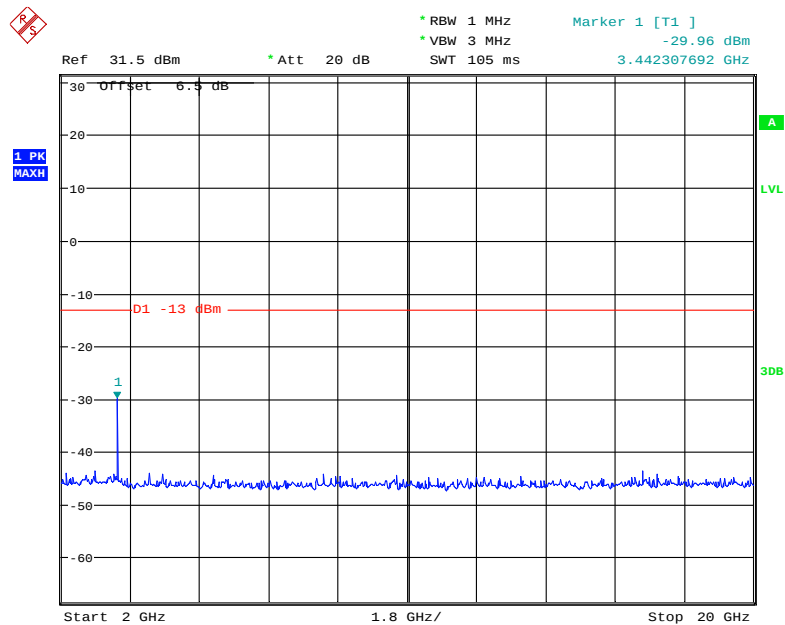
Date: 17.JAN.2020 17:04:05

1 GHz – 2 GHz (3.0 MHz, Middle Channel)



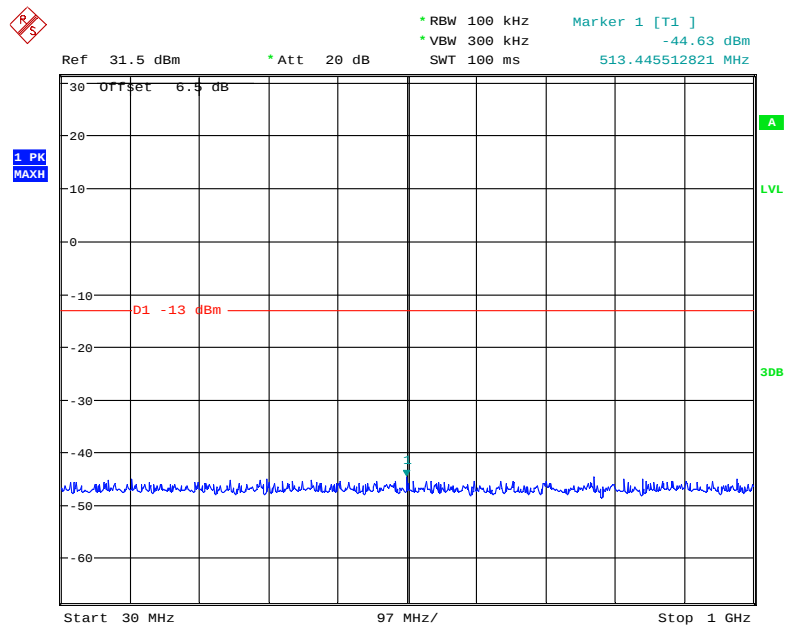
Date: 17.JAN.2020 17:03:10

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



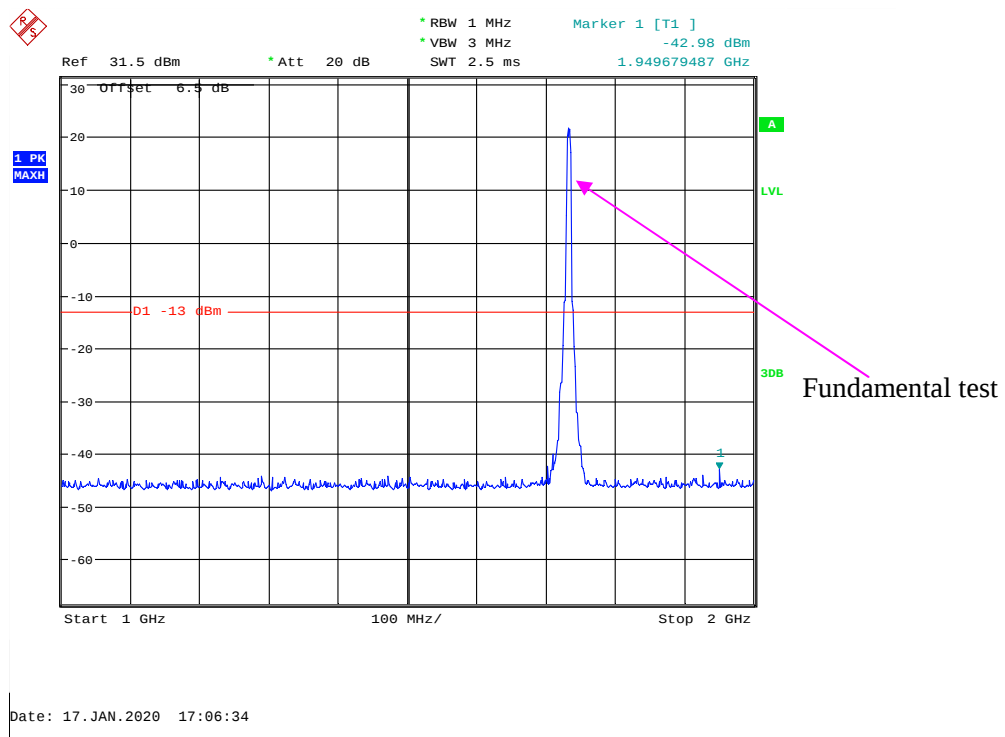
Date: 17.JAN.2020 17:03:32

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



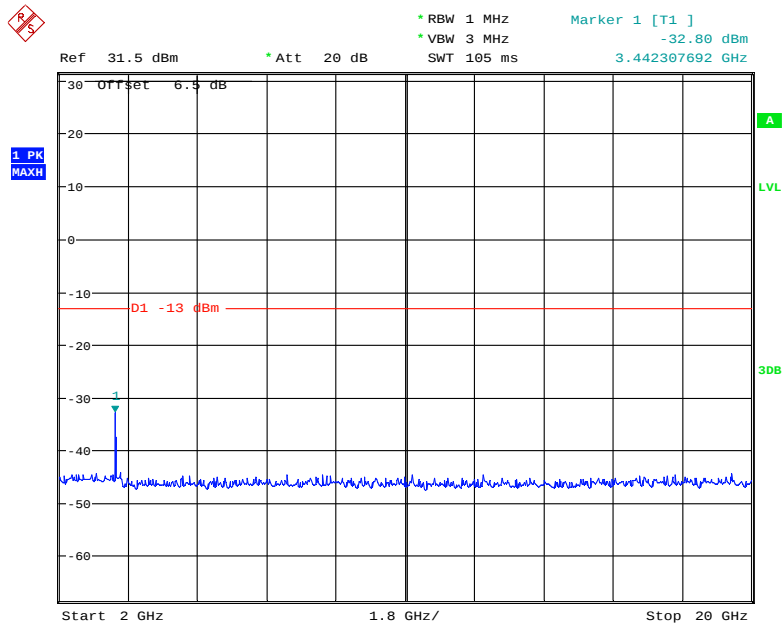
Date: 17.JAN.2020 17:04:39

1 GHz - 2 GHz (5.0 MHz, Middle Channel)



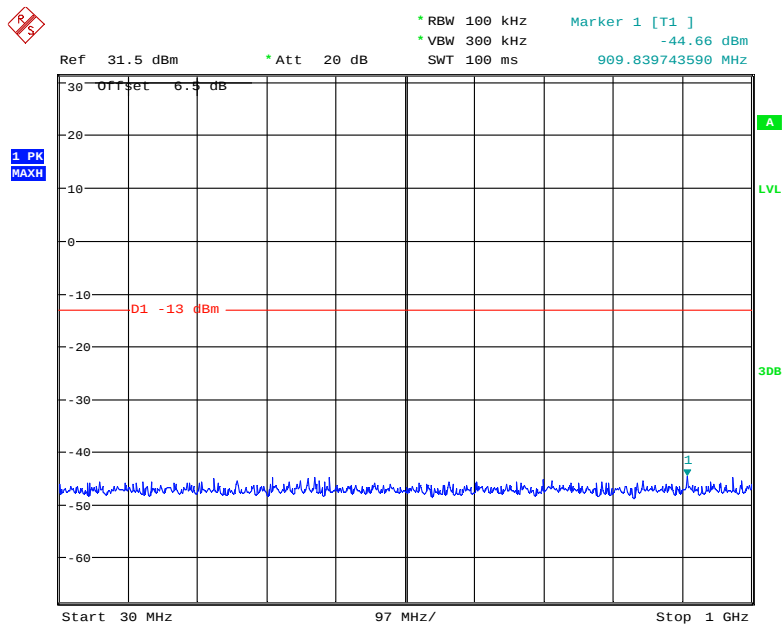
Date: 17.JAN.2020 17:06:34

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



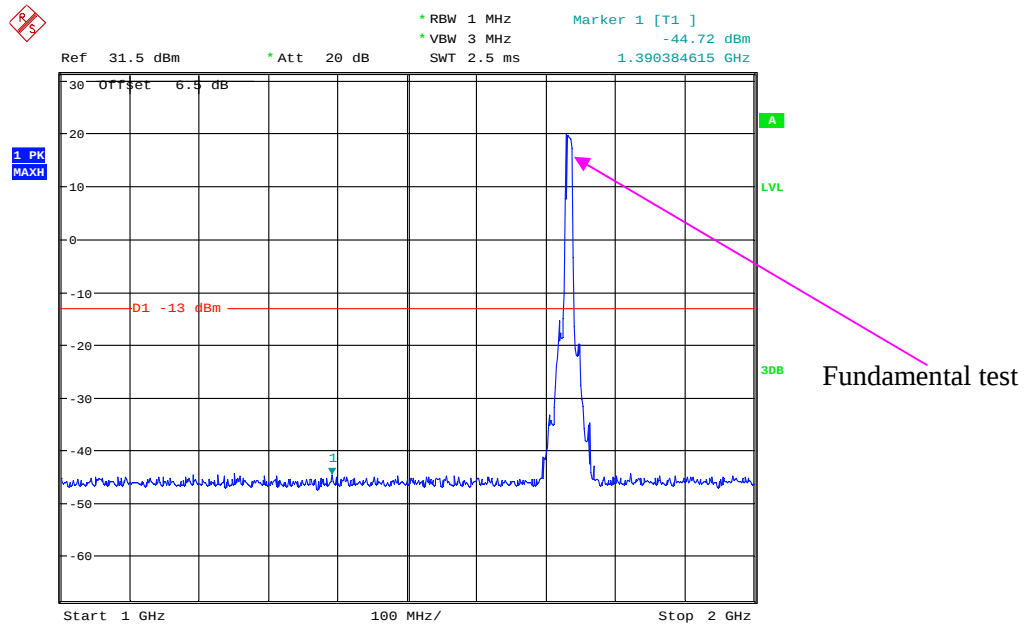
Date: 17.JAN.2020 17:05:16

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



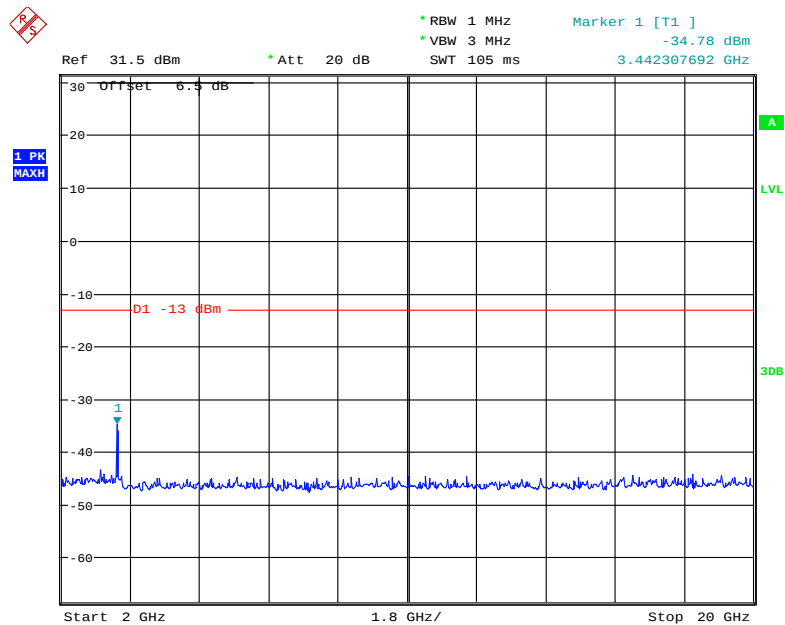
Date: 17.JAN.2020 17:08:22

1 GHz – 2 GHz (10.0 MHz, Middle Channel)



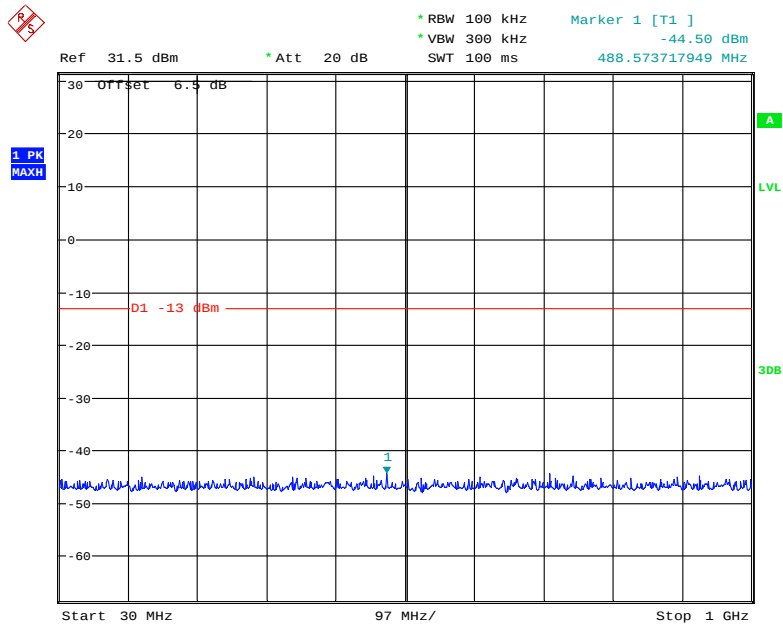
Date: 17.JAN.2020 17:07:09

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



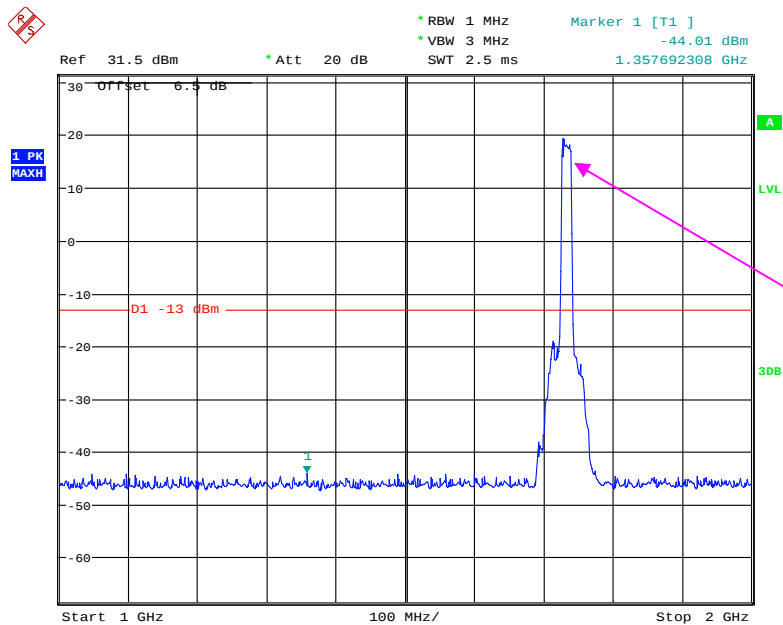
Date: 17.JAN.2020 17:07:33

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



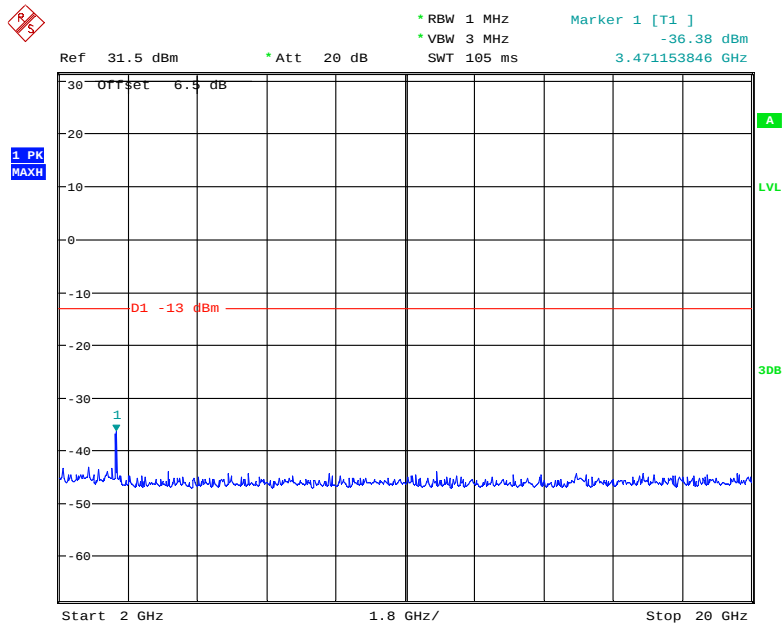
Date: 17.JAN.2020 17:09:12

1 GHz - 2 GHz (15.0 MHz, Middle Channel)



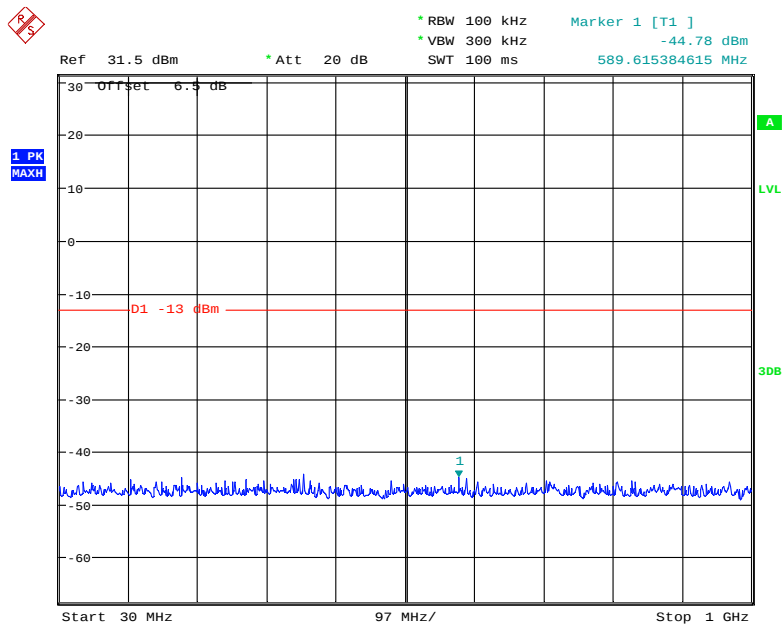
Date: 17.JAN.2020 17:10:18

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



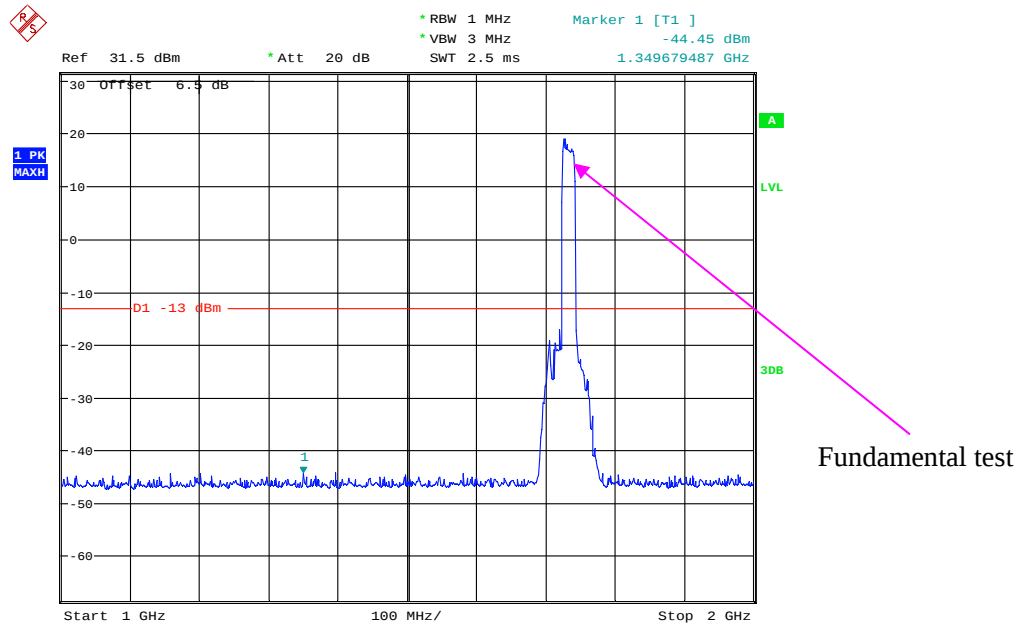
Date: 17.JAN.2020 17:09:49

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



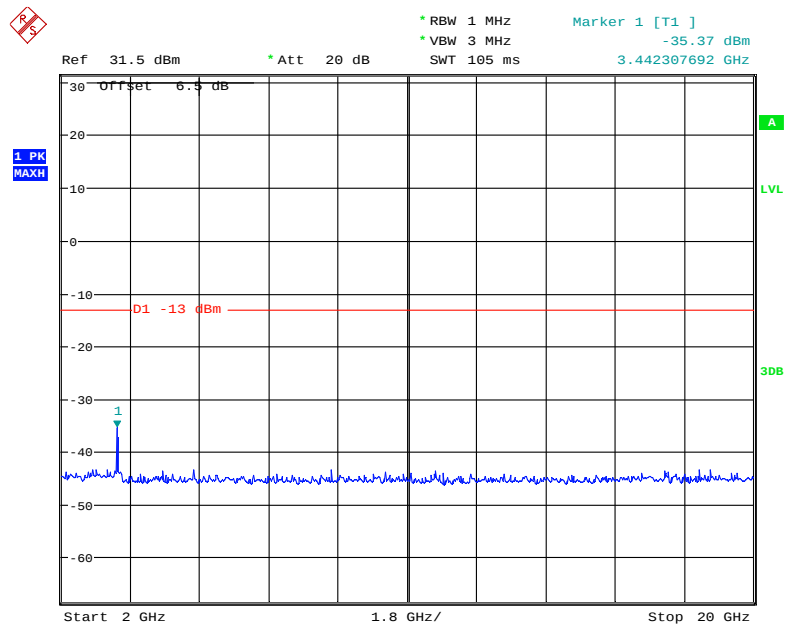
Date: 17.JAN.2020 17:14:41

1 GHz – 2 GHz (20.0 MHz, Middle Channel)



Date: 17.JAN.2020 17:12:47

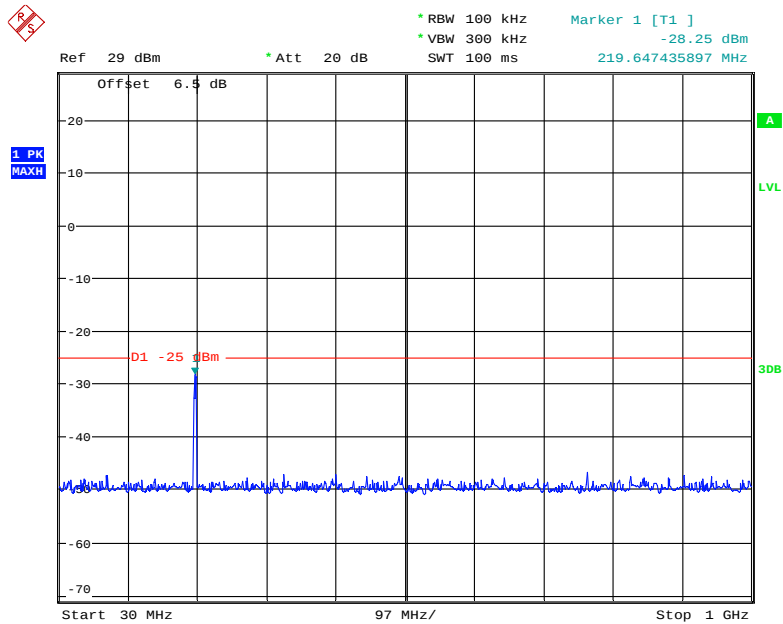
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 17.JAN.2020 17:13:52

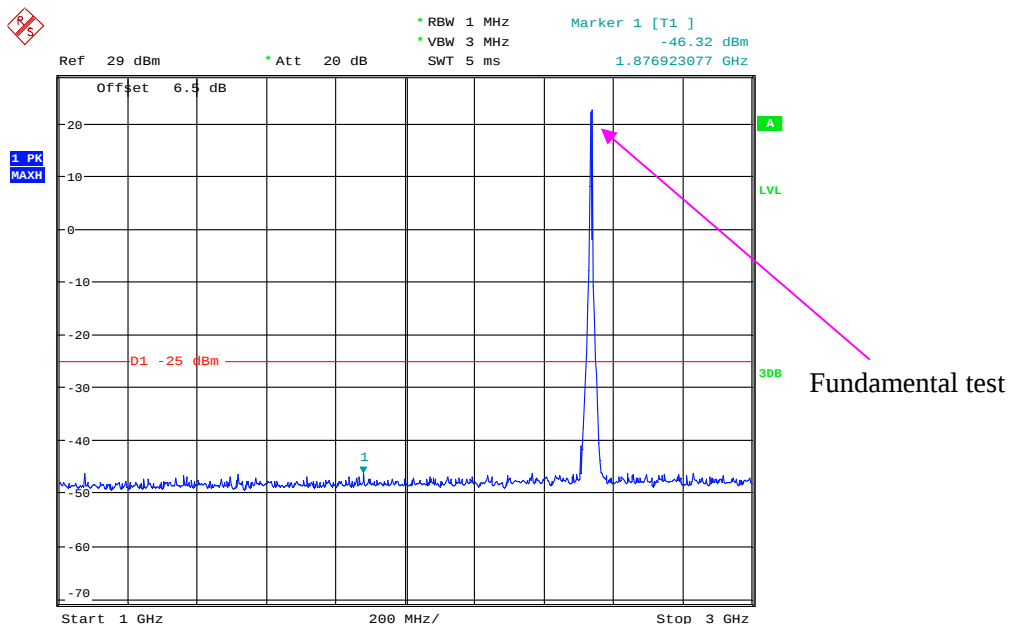
LTE Band 7:

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



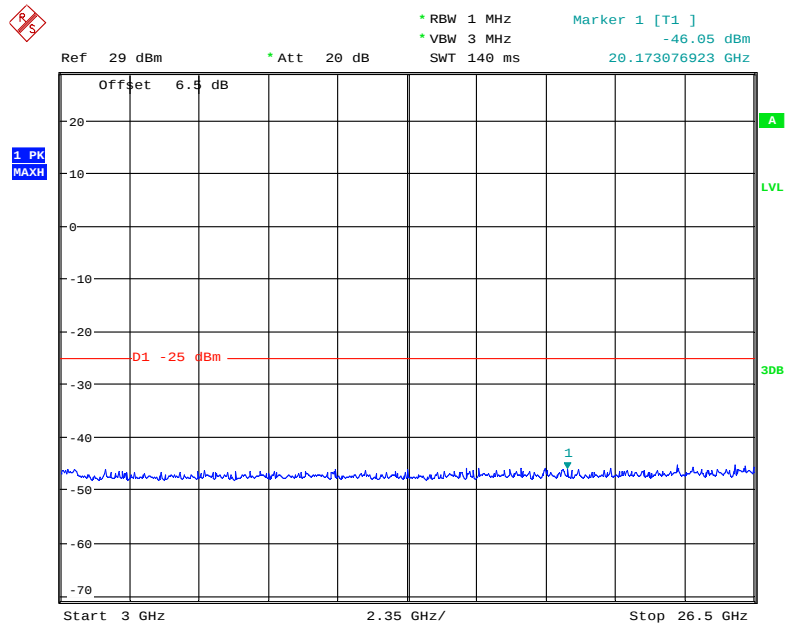
Date: 17.JAN.2020 17:29:53

1 GHz – 3.0 GHz (5.0 MHz, Middle Channel)



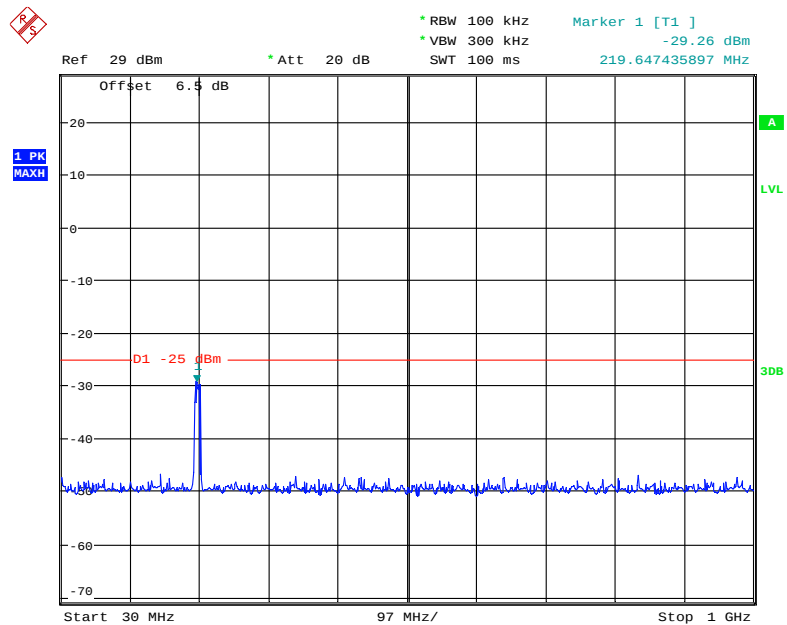
Date: 17.JAN.2020 17:27:00

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



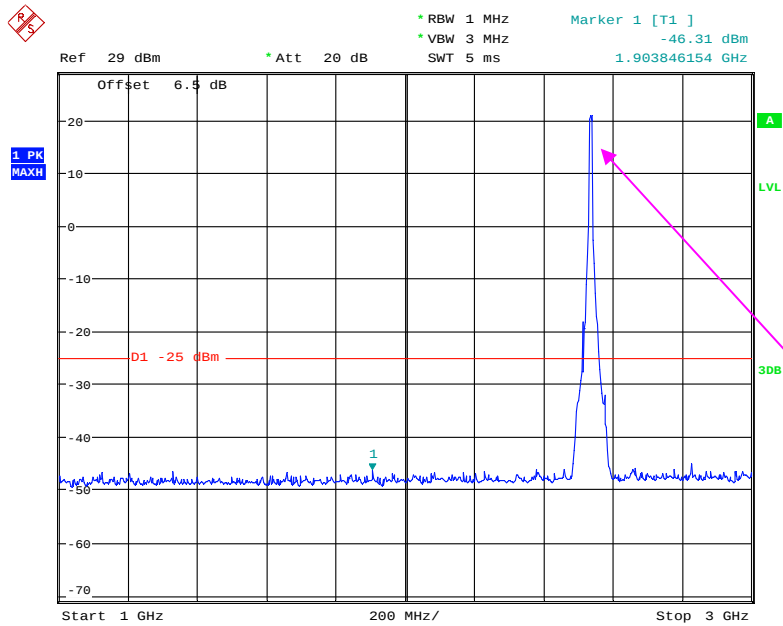
Date: 17.JAN.2020 17:26:04

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



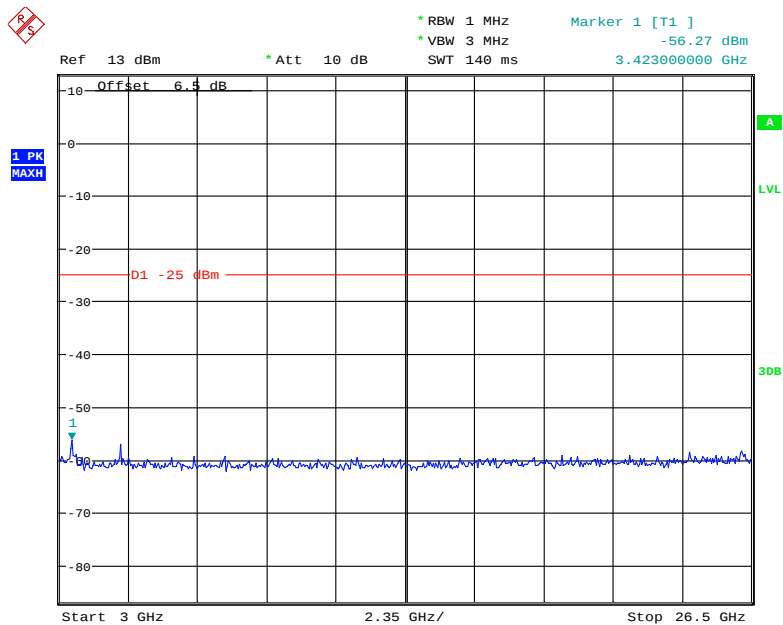
Date: 17.JAN.2020 17:30:14

1 GHz – 3 GHz (10.0 MHz, Middle Channel)



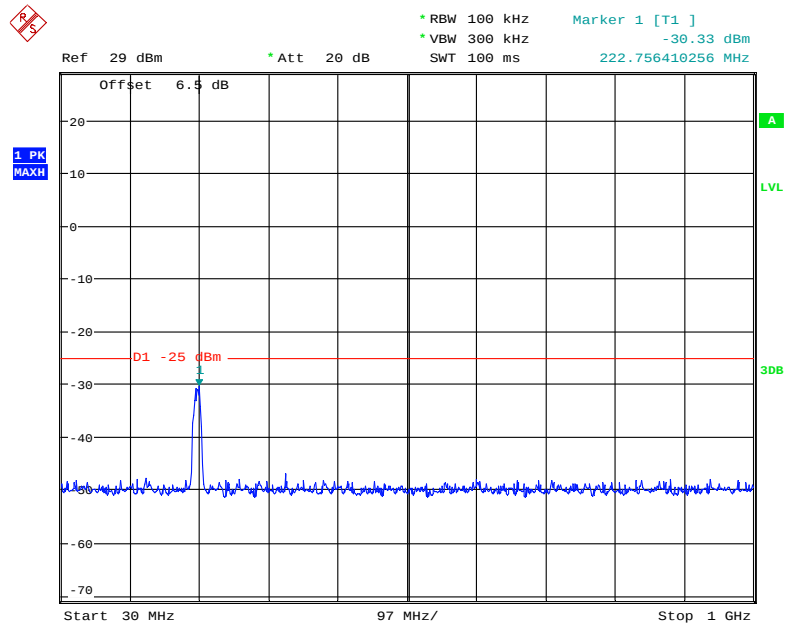
Date: 17.JAN.2020 17:31:40

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



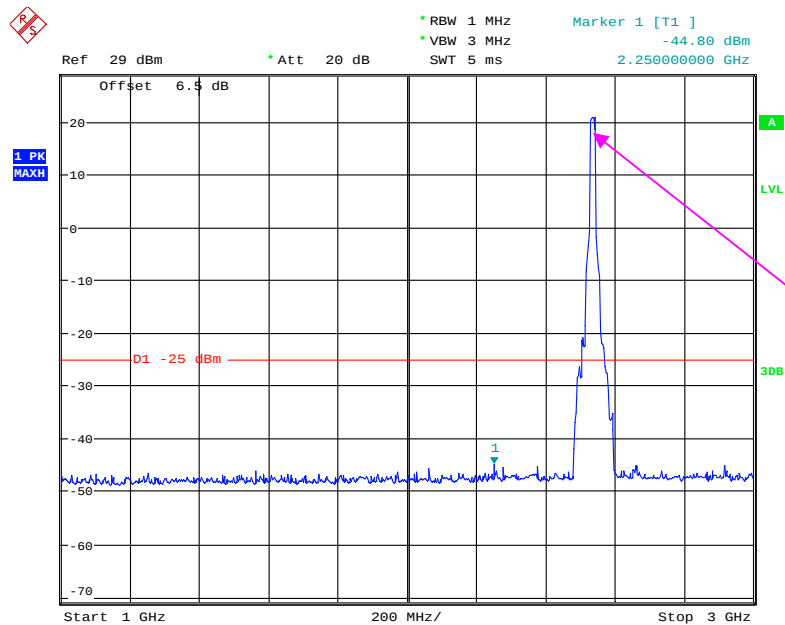
Date: 13.MAR.2020 15:28:39

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



Date: 17.JAN.2020 18:16:42

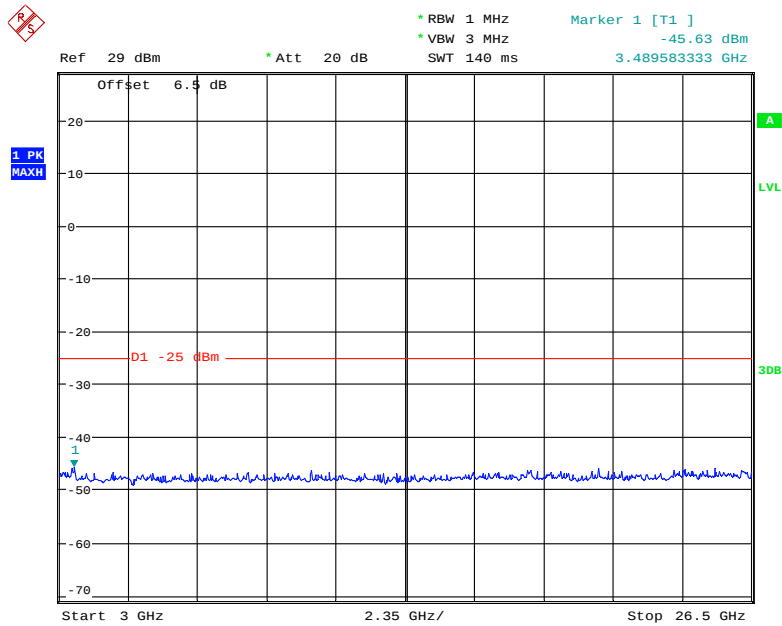
1 GHz – 3 GHz (15.0 MHz, Middle Channel)



Fundamental test

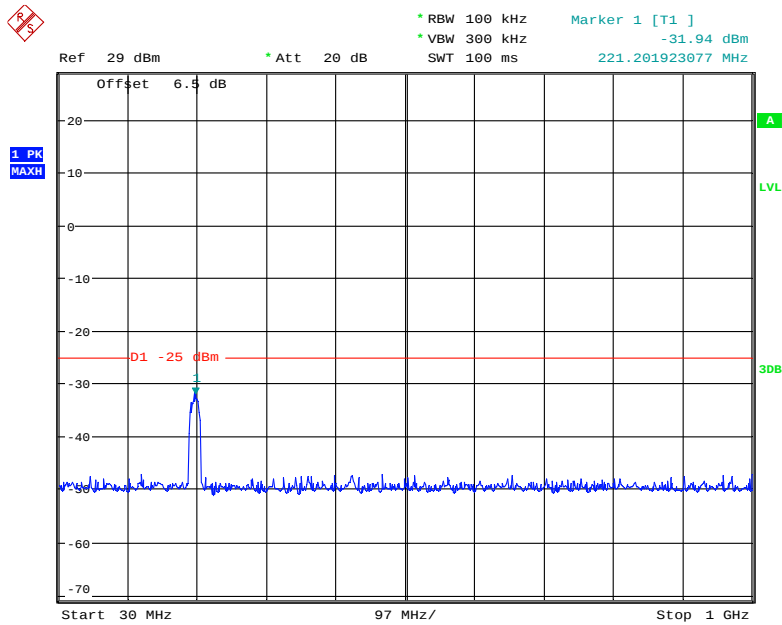
Date: 17.JAN.2020 18:15:32

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



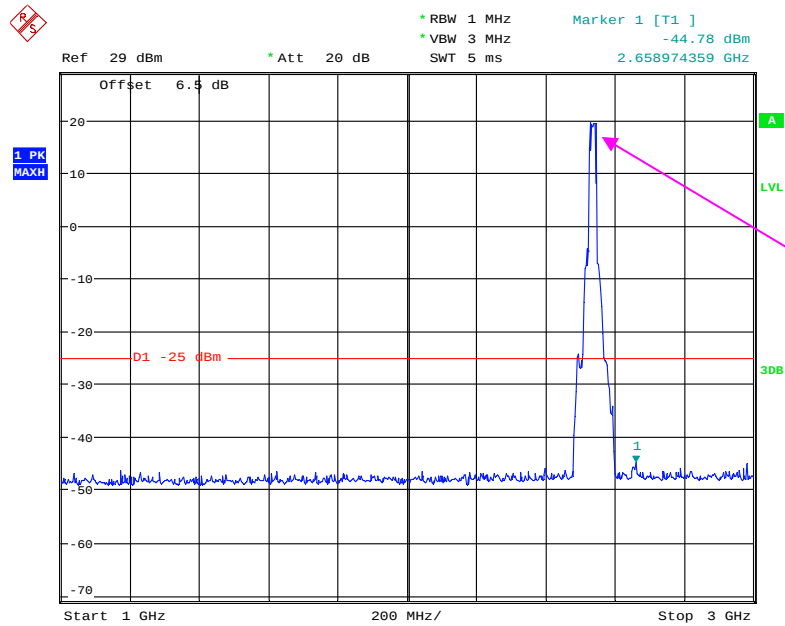
Date: 17.JAN.2020 18:16:10

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



Date: 17.JAN.2020 18:17:16

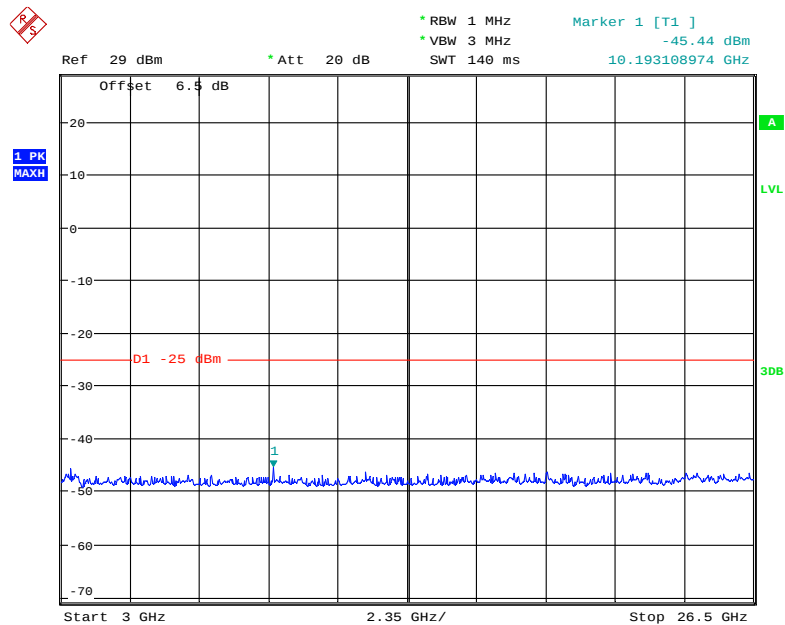
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



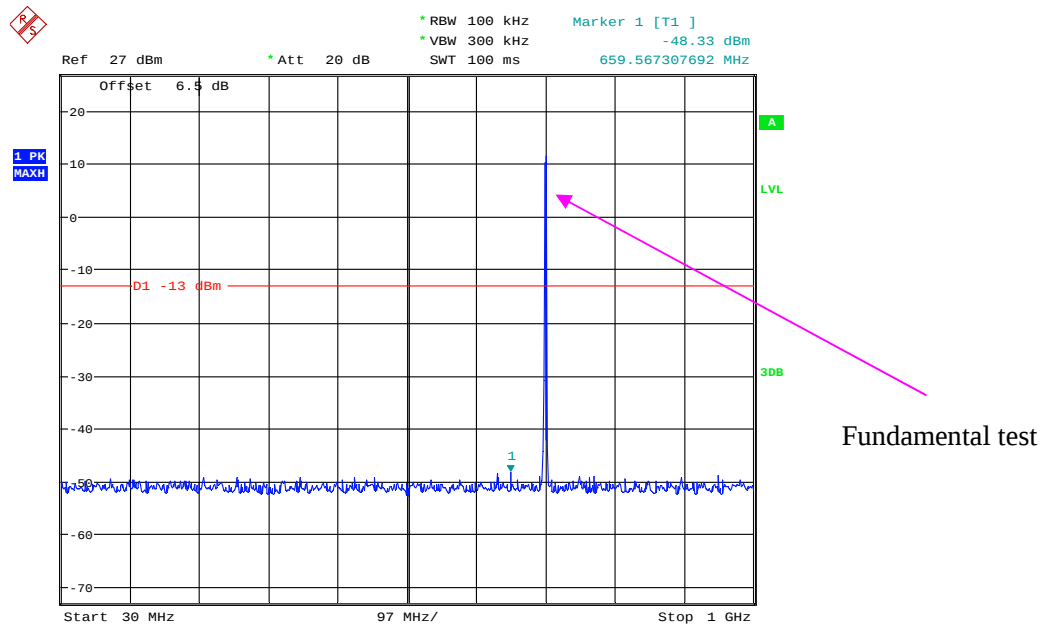
Fundamental test

Date: 17.JAN.2020 18:18:53

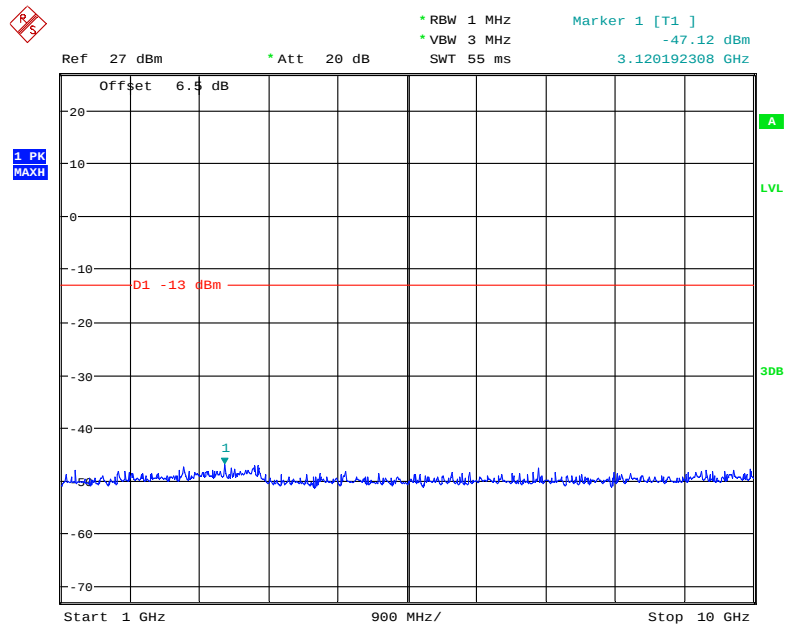
3 GHz – 26.5 GHz (20.0 MHz, Middle Channel)



Date: 17.JAN.2020 18:17:48

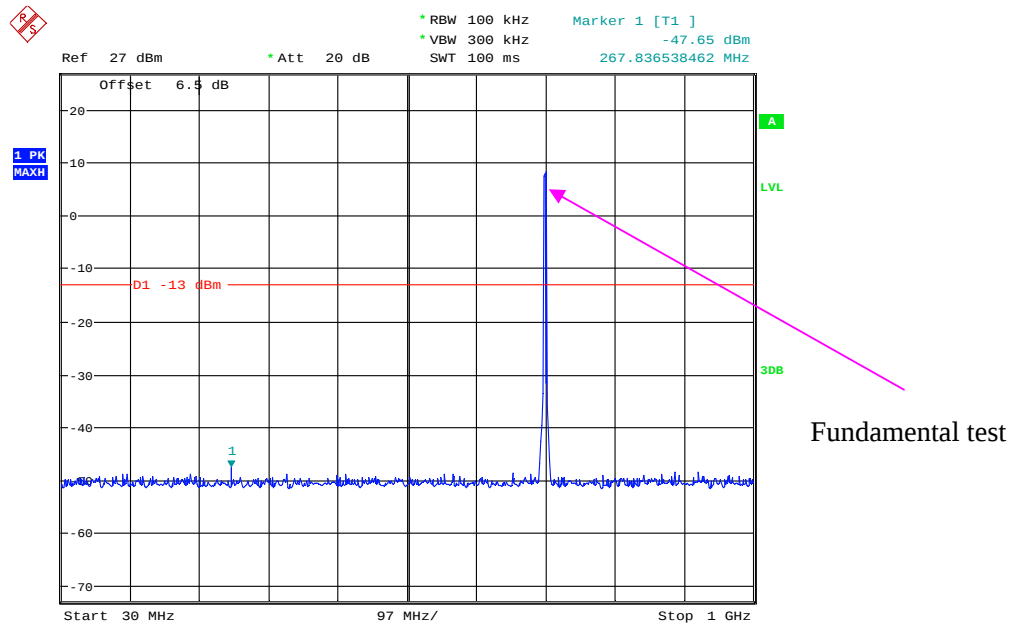
LTE Band 12:**30 MHz - 1 GHz (1.4 MHz, Middle Channel)**

Date: 25.FEB.2020 17:21:06

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

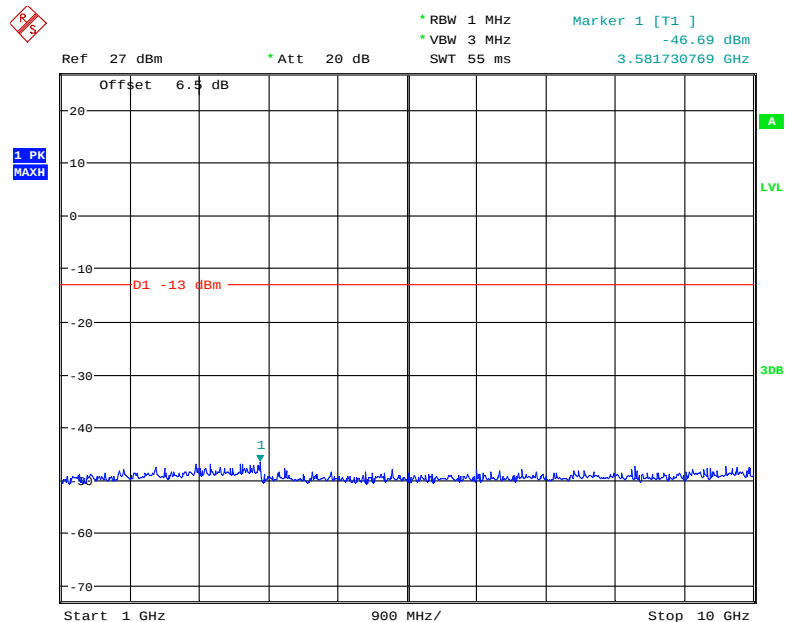
Date: 25.FEB.2020 17:20:42

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



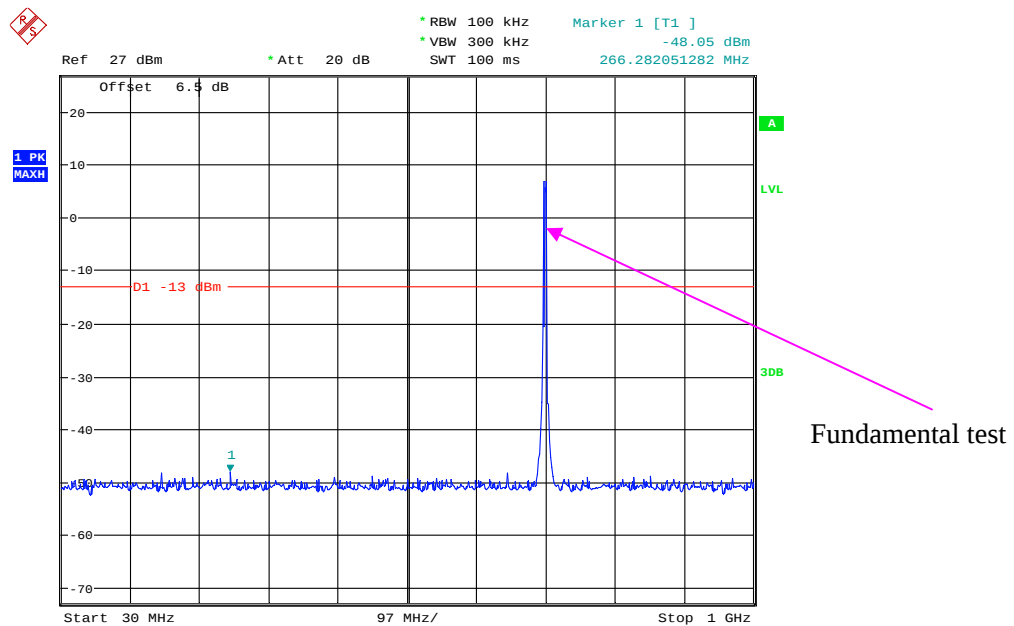
Date: 25.FEB.2020 17:19:21

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



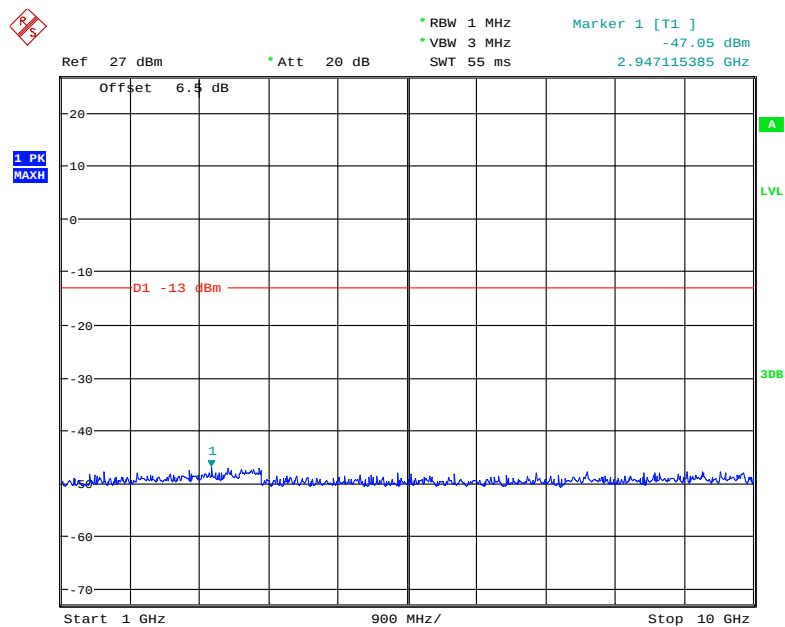
Date: 25.FEB.2020 17:19:47

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



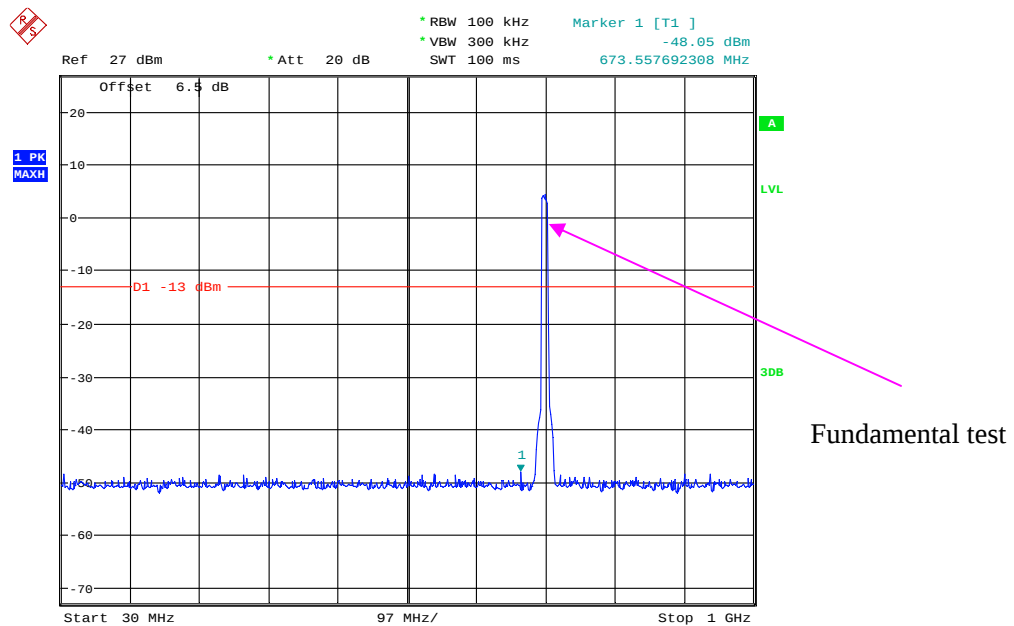
Date: 25.FEB.2020 17:18:33

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



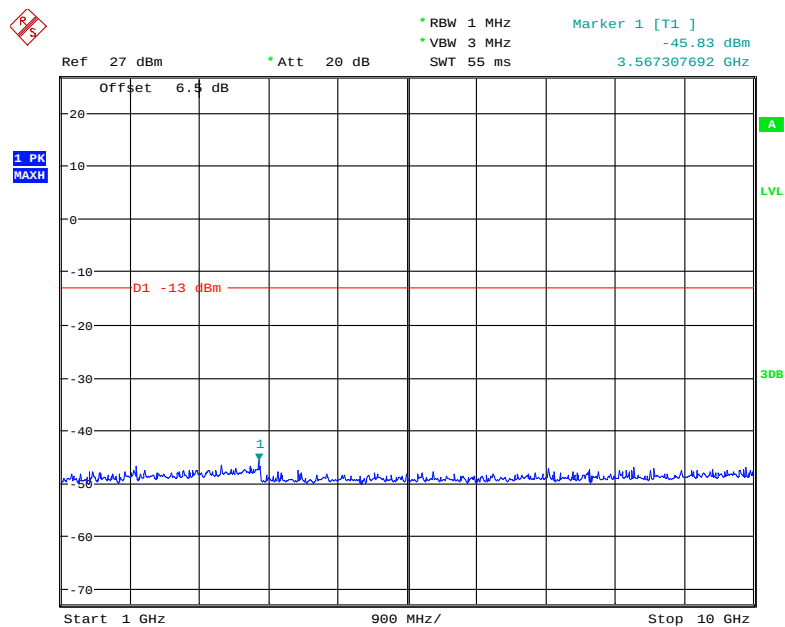
Date: 25.FEB.2020 17:17:42

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

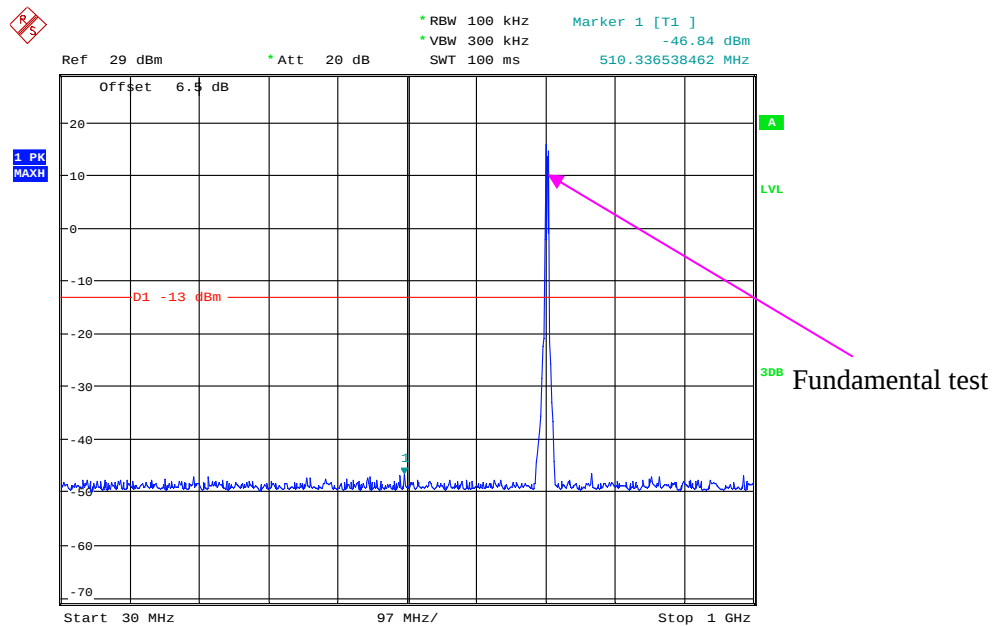


Date: 25.FEB.2020 17:15:48

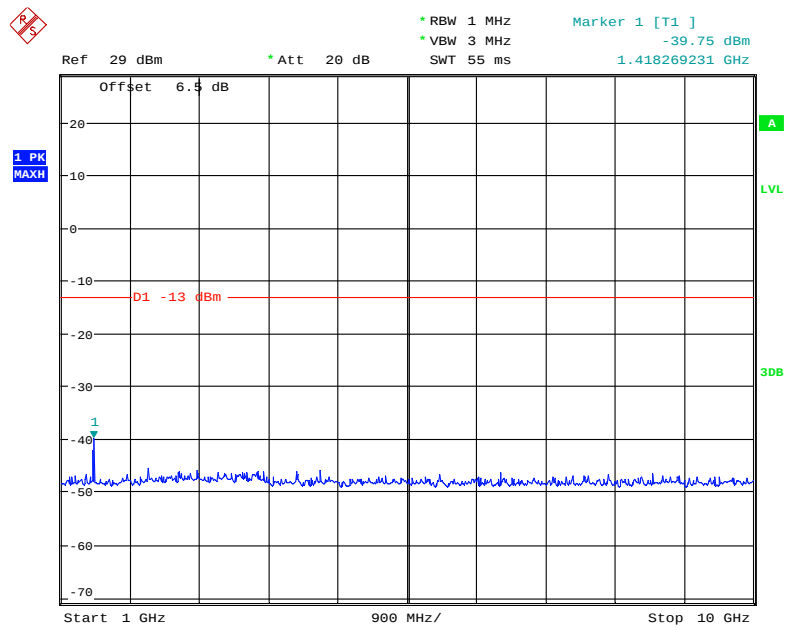
1 GHz - 10 GHz (10.0 MHz, Middle Channel)



Date: 25.FEB.2020 17:16:58

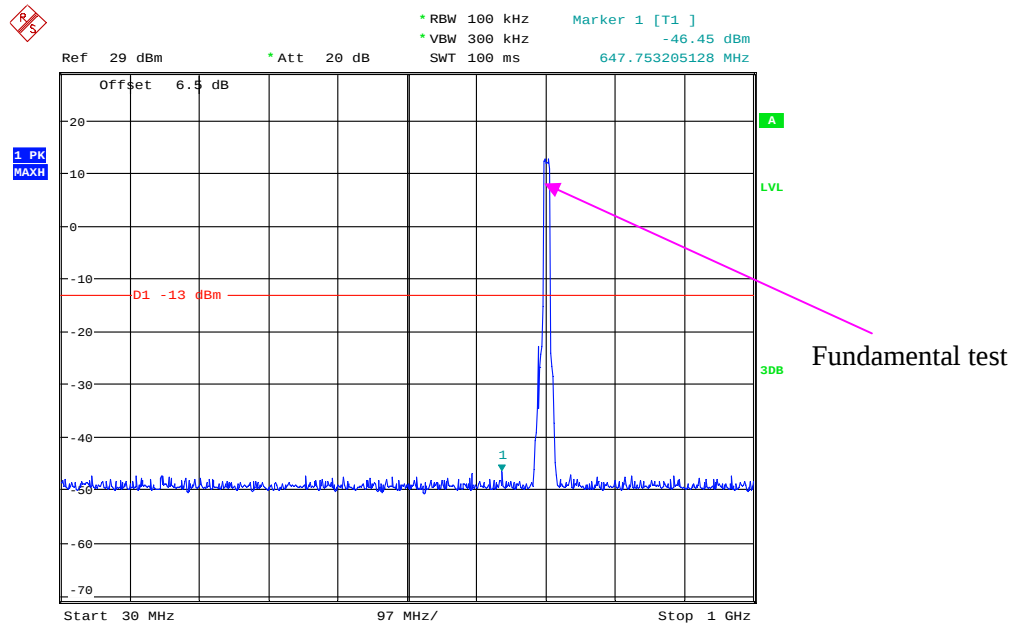
LTE Band 17:**30 MHz - 1 GHz (5.0 MHz, Middle Channel)**

Date: 17.JAN.2020 18:24:50

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

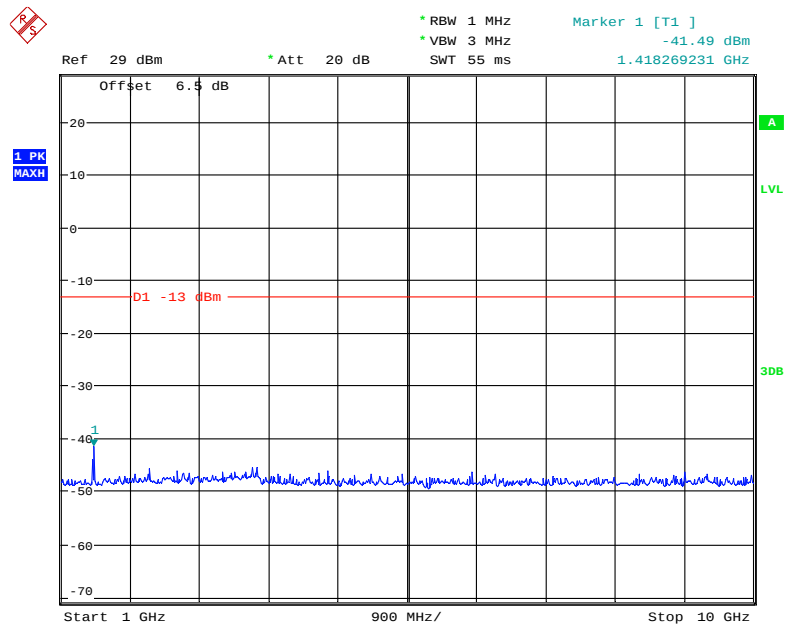
Date: 17.JAN.2020 18:23:52

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



Date: 17.JAN.2020 18:25:24

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



Date: 17.JAN.2020 18:25:56

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:	101.0 kPa

The testing was performed by Alan He on 2020-01-21 and by Zero Yan on 2020-02-10.

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										
947.8	37.19	226	1.4	H	-63.4	1.37	0.0	-64.77	-13	51.77
947.8	37.73	351	1.5	V	-61.6	1.37	0.0	-62.97	-13	49.97
1673.20	55.30	172	2.0	H	-51.0	1.30	8.90	-43.40	-13	30.40
1673.20	55.13	211	2.2	V	-50.6	1.30	8.90	-43.00	-13	30.00
2509.80	49.98	121	1.3	H	-53.4	2.60	10.20	-45.80	-13	32.80
2509.80	47.72	101	2.2	V	-55.0	2.60	10.20	-47.40	-13	34.40
WCDMA Mode, Middle channel										
957.5	37.39	240	1.8	H	-63.2	1.37	0.0	-64.57	-13	51.57
957.5	38.12	237	1.1	V	-61.2	1.37	0.0	-62.57	-13	49.57
1673.20	42.86	62	2.2	H	-63.5	1.30	8.90	-55.90	-13	42.90
1673.20	42.22	12	2.4	V	-63.5	1.30	8.90	-55.90	-13	42.90
2509.80	46.90	161	2.5	H	-56.5	2.60	10.20	-48.90	-13	35.90
2509.80	46.07	98	2.2	V	-56.7	2.60	10.20	-49.10	-13	36.10
3346.40	43.54	178	2.1	H	-57.4	1.50	11.70	-47.20	-13	34.20
3346.40	43.34	21	2.0	V	-57.6	1.50	11.70	-47.40	-13	34.40

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										
950.1	37.35	231	1.7	H	-63.3	1.37	0.0	-64.67	-13	51.67
950.1	37.98	292	1.6	V	-61.4	1.37	0.0	-62.77	-13	49.77
3760.00	54.45	52	1.8	H	-47.6	1.50	11.80	-37.30	-13	24.30
3760.00	54.69	165	1.1	V	-46.9	1.50	11.80	-36.60	-13	23.60
5640.00	54.89	22	1.6	H	-44.8	1.70	12.40	-34.10	-13	21.10
5640.00	55.12	173	2.2	V	-44.2	1.70	12.40	-33.50	-13	20.50
WCDMA Mode Band II, Middle channel										
952.1	37.40	325	2.3	H	-63.2	1.37	0.0	-64.57	-13	51.57
952.1	38.16	151	1.9	V	-61.2	1.37	0.0	-62.57	-13	49.57
3760.00	48.43	351	1.7	H	-53.6	1.50	11.80	-43.30	-13	30.30
3760.00	49.10	192	1.4	V	-52.5	1.50	11.80	-42.20	-13	29.20

LTE Band: (Pre-scan with all the bandwidth, and worse case as below)

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										
Middle Channel(1880MHz)										
948.6	37.50	151	1.9	H	-63.1	1.37	0.0	-64.47	-13	51.47
948.6	38.16	334	1.0	V	-61.2	1.37	0.0	-62.57	-13	49.57
3760.00	44.88	291	1.8	H	-57.2	1.50	11.80	-46.90	-13	33.90
3760.00	44.57	116	2.3	V	-57.0	1.50	11.80	-46.70	-13	33.70
Band 4										
Middle Channel(1732.5MHz)										
949.8	37.47	195	2.2	H	-63.1	1.37	0.0	-64.47	-13	51.47
949.8	38.22	142	1.1	V	-61.1	1.37	0.0	-62.47	-13	49.47
3465.00	44.10	318	1.8	H	-56.6	1.50	12.00	-46.10	-13	33.10
3465.00	45.17	203	1.3	V	-56.3	1.50	12.00	-45.80	-13	32.80
Band 7										
Middle Channel(2535MHz)										
953.2	37.49	194	1.6	H	-63.1	1.37	0.0	-64.47	-25	39.47
953.2	38.28	42	1.9	V	-61.1	1.37	0.0	-62.47	-25	37.47
5070.00	43.86	324	2.1	H	-56.1	1.60	12.10	-45.60	-25	20.60
5070.00	44.02	0	1.2	V	-56.0	1.60	12.10	-45.50	-25	20.50
Band 12										
Middle Channel(707.5MHz)										
952.5	37.55	180	1.5	H	-63.0	1.37	0.0	-64.37	-13	51.37
952.5	38.23	94	2.0	V	-61.1	1.37	0.0	-62.47	-13	49.47
1415.00	43.80	231	1.4	H	-64.4	1.60	7.90	-58.10	-13	45.10
1415.00	43.44	43	2.3	V	-65.0	1.60	7.90	-58.70	-13	45.70
Band 17										
Middle Channel(710MHz)										
953.3	37.42	192	1.2	H	-63.2	1.37	0.0	-64.57	-13	51.57
953.3	38.36	300	1.8	V	-61.0	1.37	0.0	-62.37	-13	49.37
1420.00	47.12	18	1.9	H	-61.1	1.60	7.90	-54.80	-13	41.80
1420.00	46.50	160	2.1	V	-61.9	1.60	7.90	-55.60	-13	42.60

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.

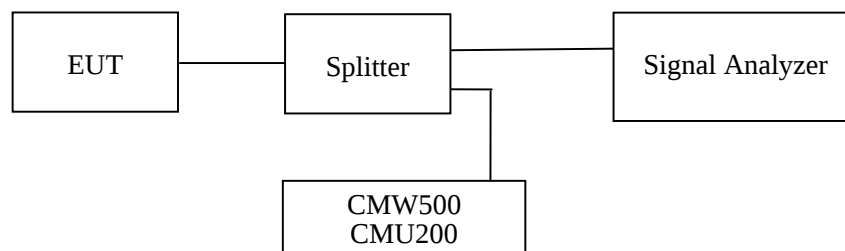
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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**

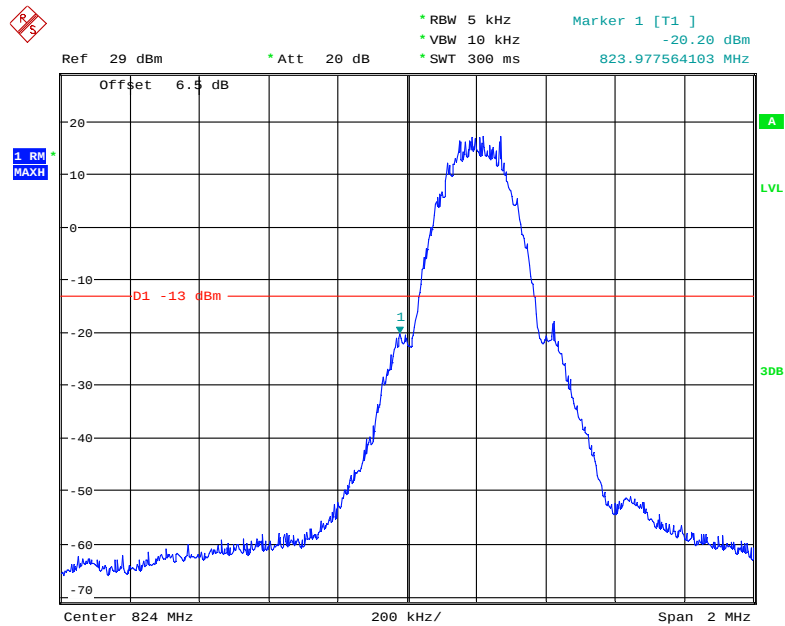
Temperature:	24~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo from 2020-01-17 to 2020-03-13

EUT operation mode: Transmitting

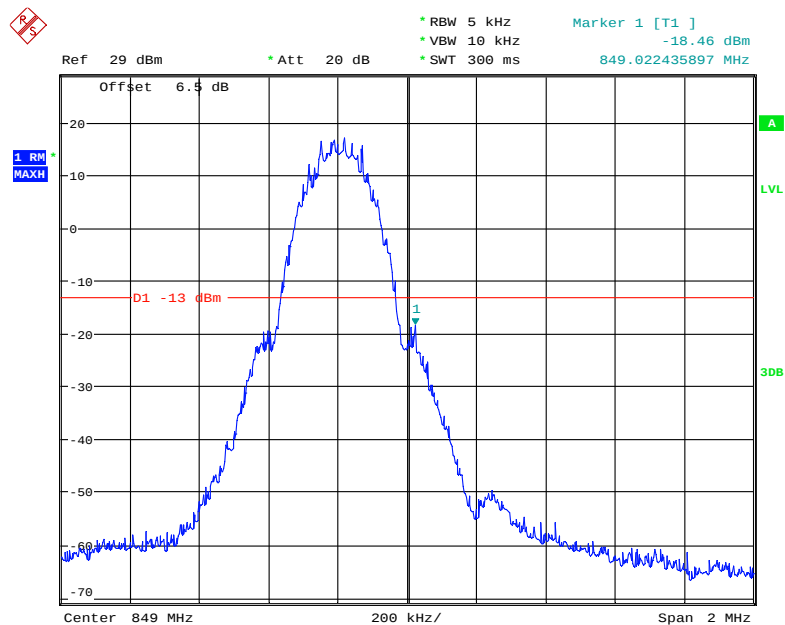
Test Result: Compliance. Please refer to the following plots.

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



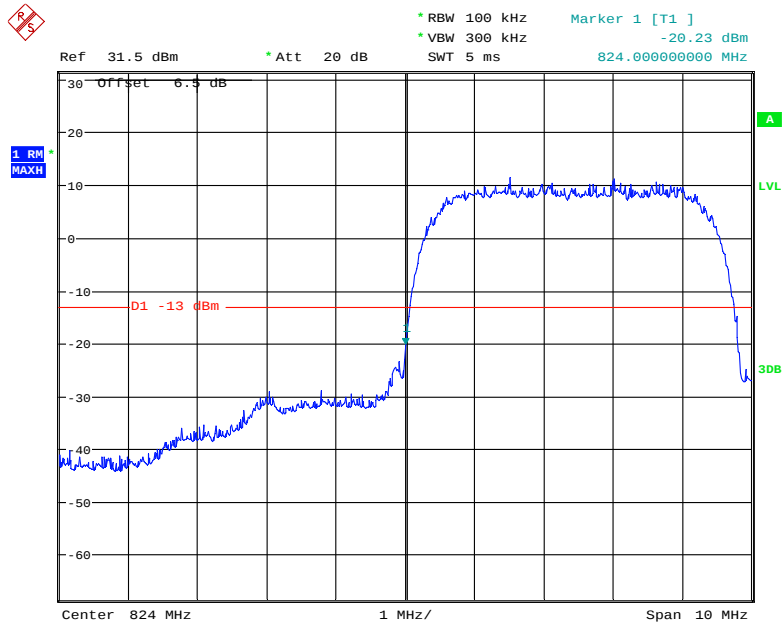
Date: 25.FEB.2020 09:15:46

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



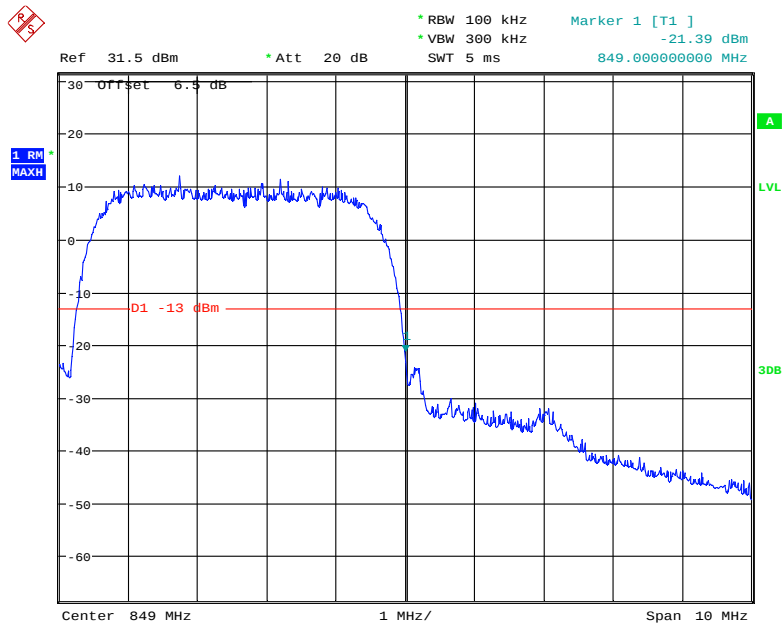
Date: 25.FEB.2020 09:17:41

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



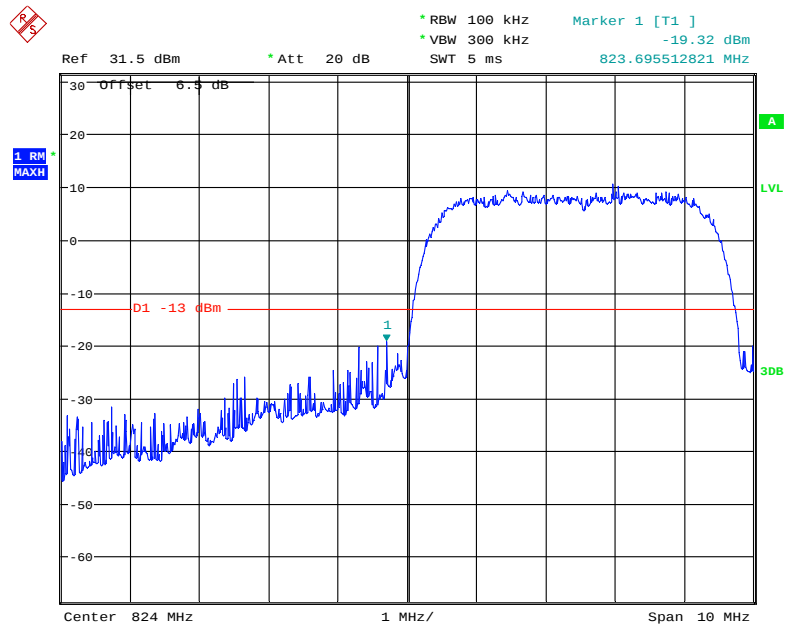
Date: 25.FEB.2020 11:54:46

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



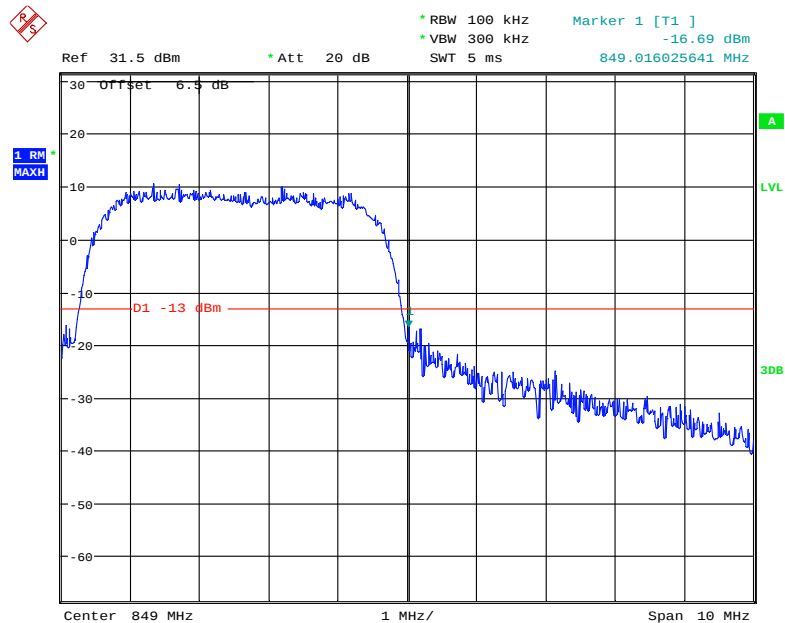
Date: 25.FEB.2020 11:55:54

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



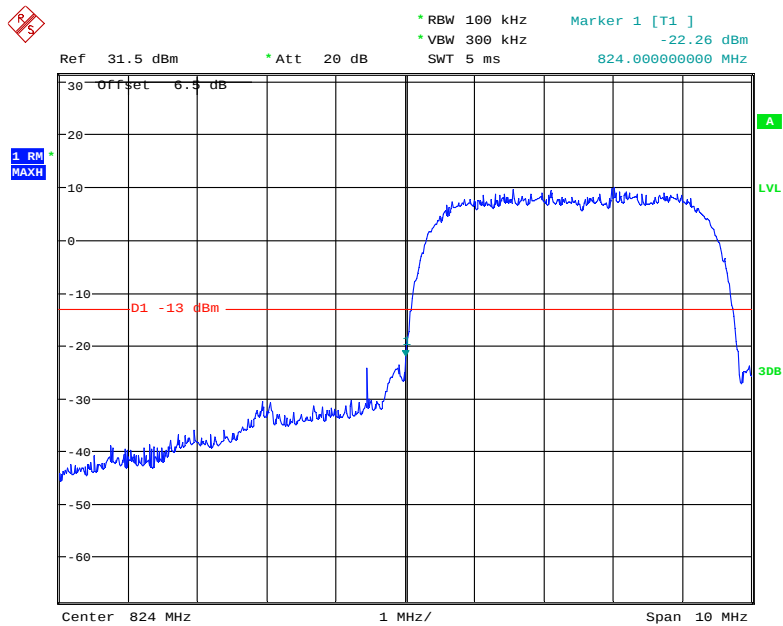
Date: 25.FEB.2020 13:55:30

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



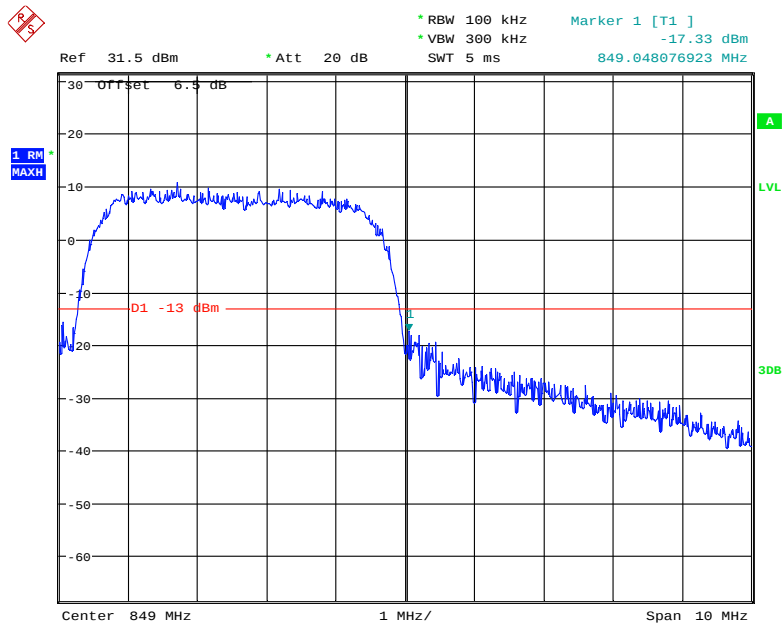
Date: 25.FEB.2020 13:53:31

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



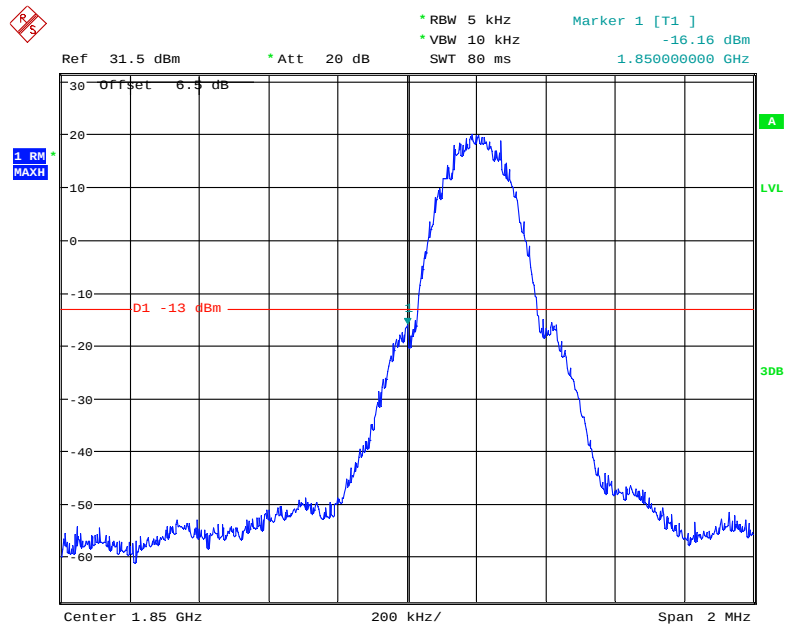
Date: 25.FEB.2020 13:48:40

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



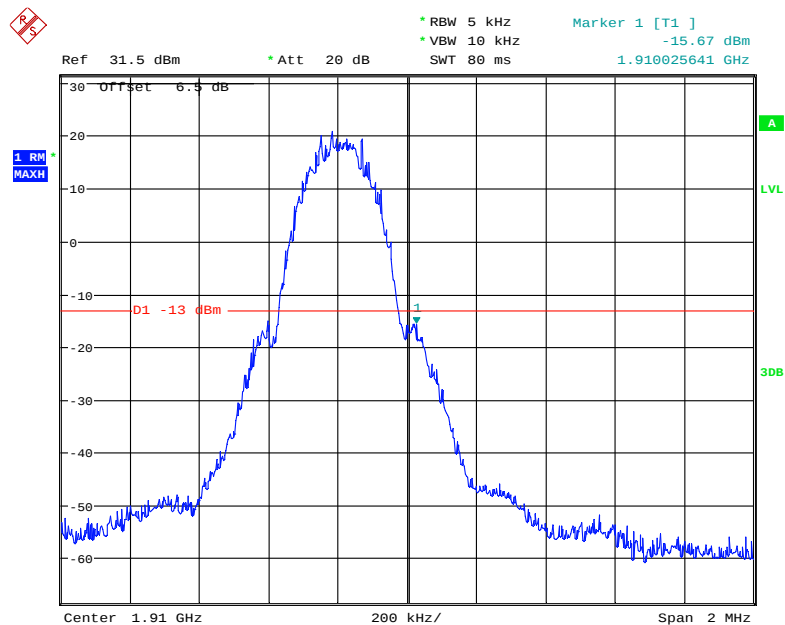
Date: 25.FEB.2020 13:50:12

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



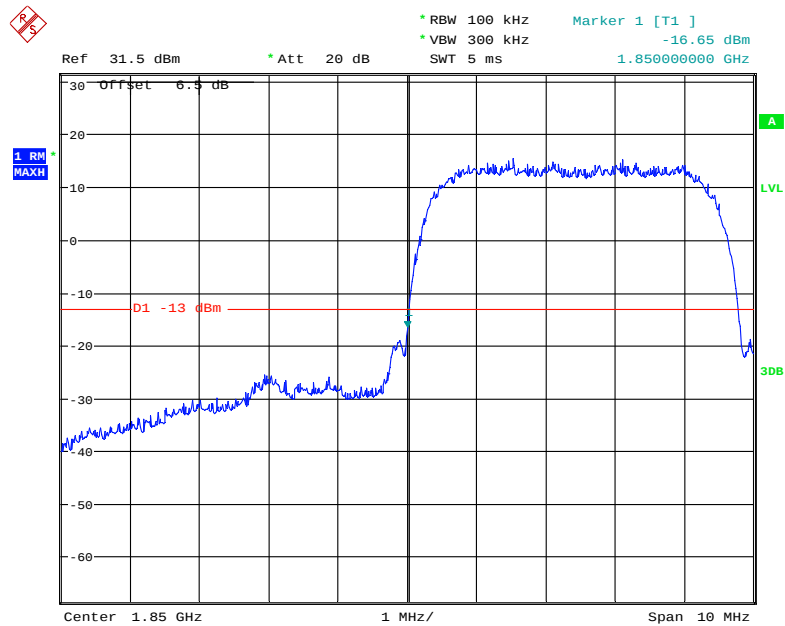
Date: 25.FEB.2020 09:26:11

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



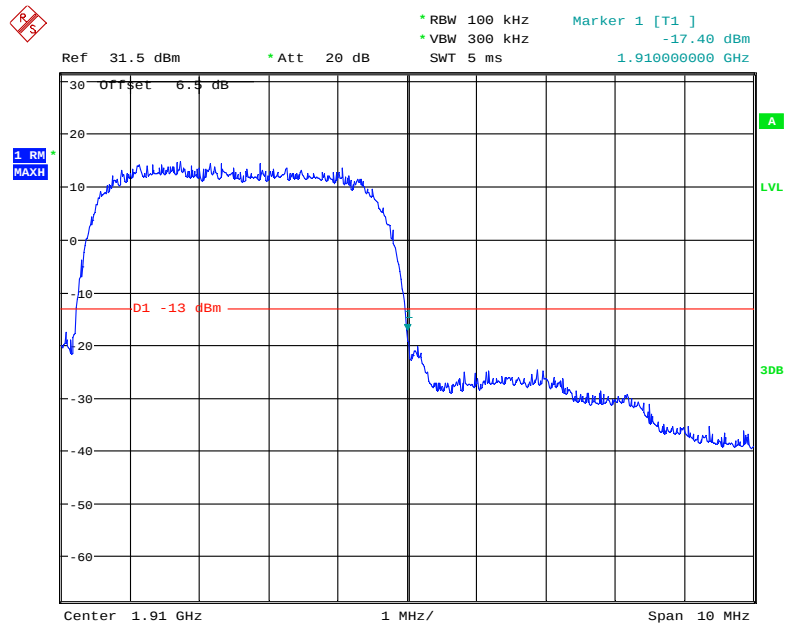
Date: 25.FEB.2020 09:27:46

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



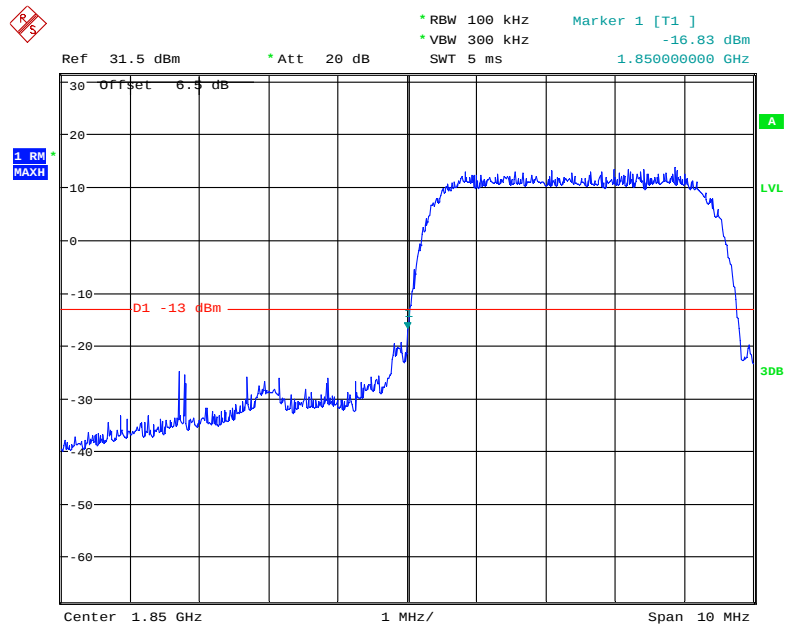
Date: 25.FEB.2020 14:07:28

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



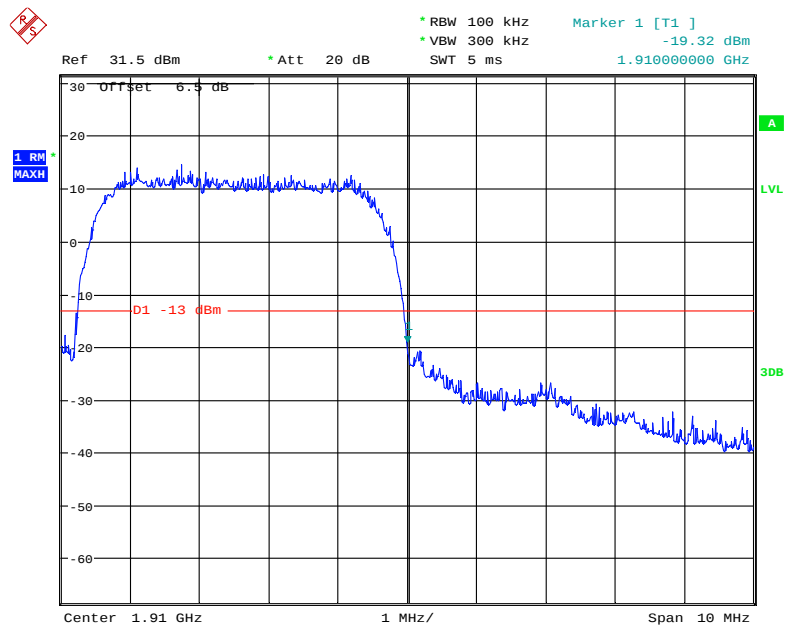
Date: 25.FEB.2020 14:08:35

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



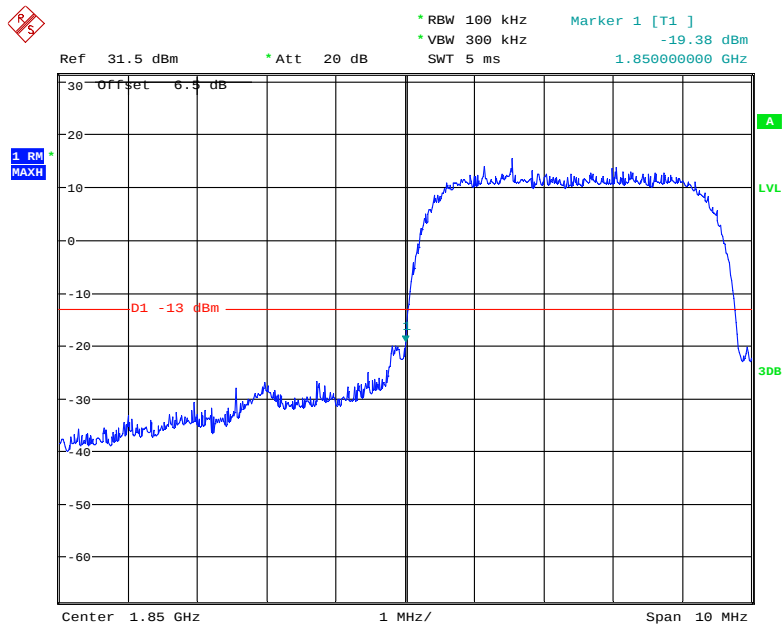
Date: 25.FEB.2020 14:24:19

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



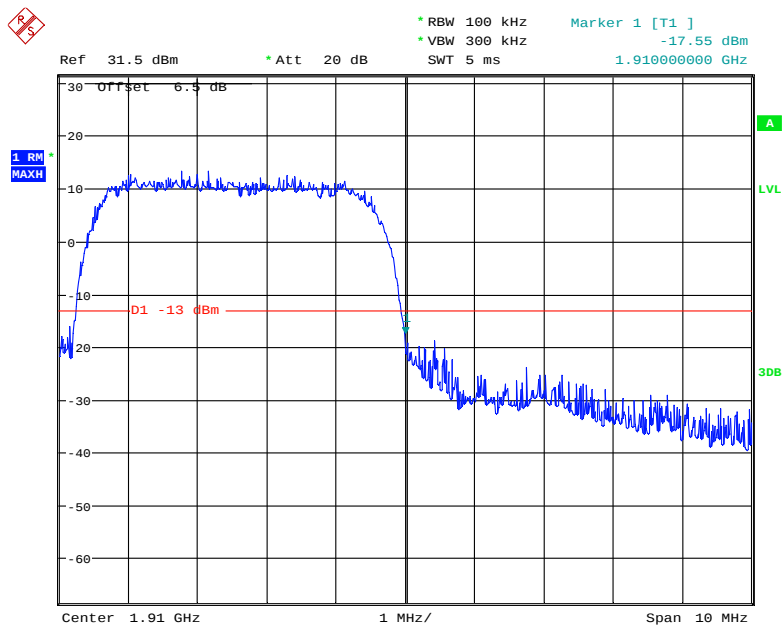
Date: 25.FEB.2020 14:23:29

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

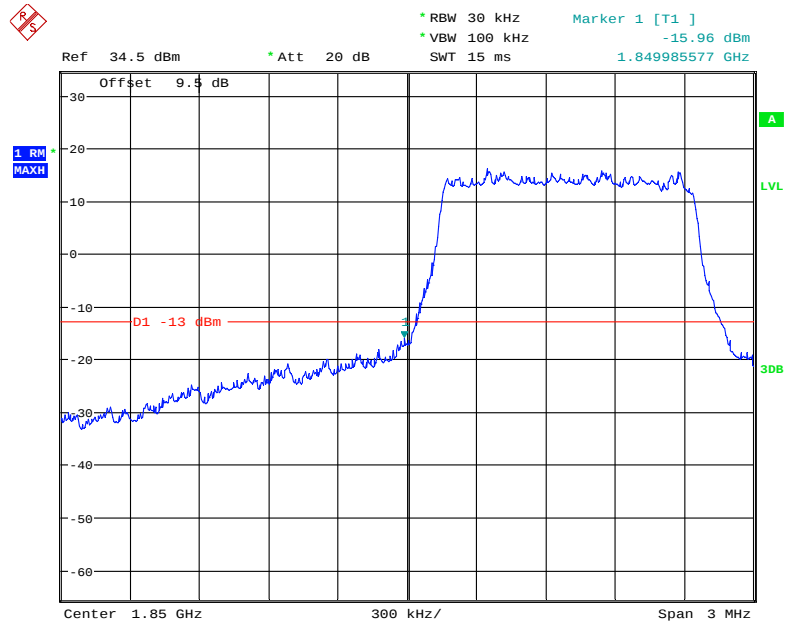


Date: 25.FEB.2020 14:21:00

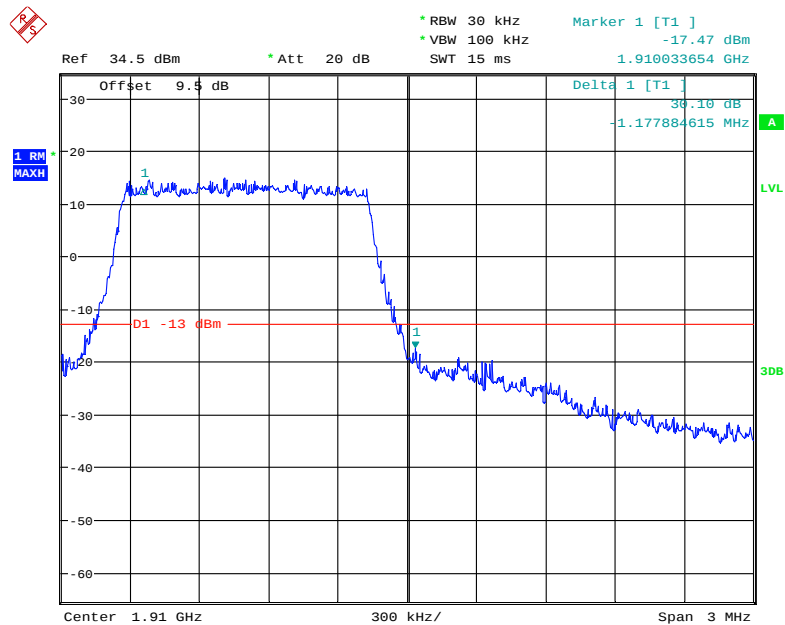
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 25.FEB.2020 14:22:10

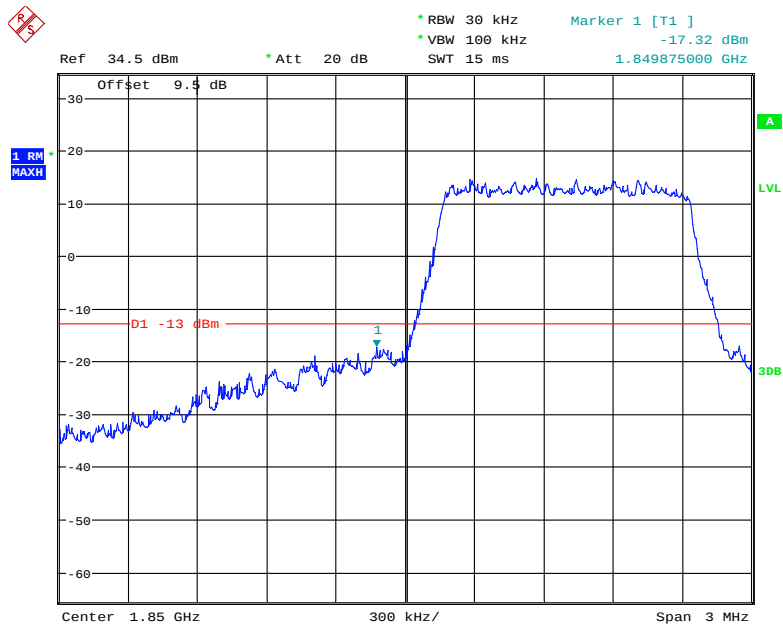
Band 2:**QPSK (1.4 MHz, FULL RB) - Left Band Edge**

Date: 17.JAN.2020 09:50:20

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

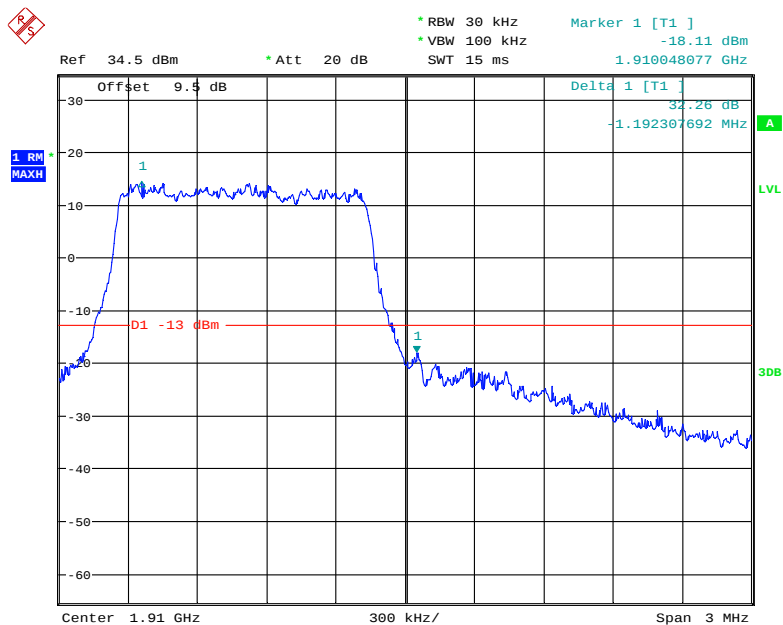
Date: 17.JAN.2020 10:07:01

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



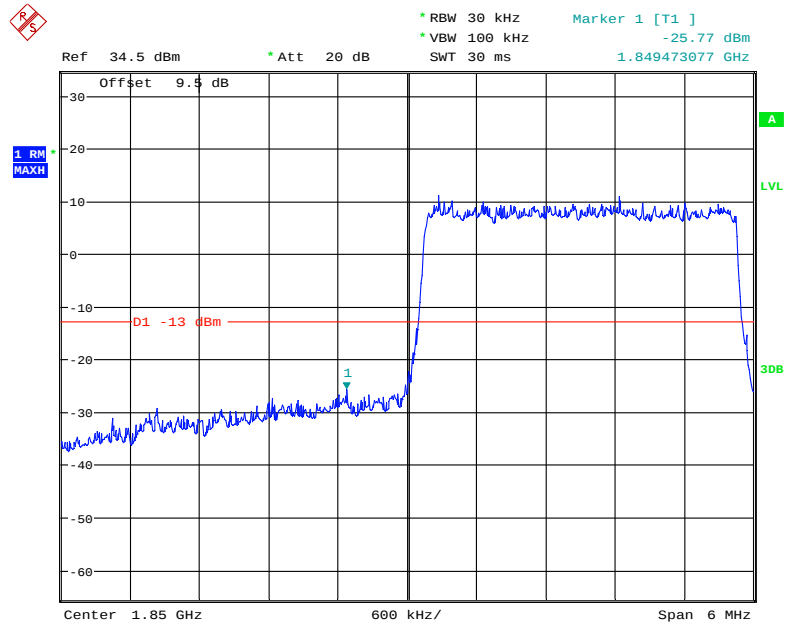
Date: 17.JAN.2020 10:03:34

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



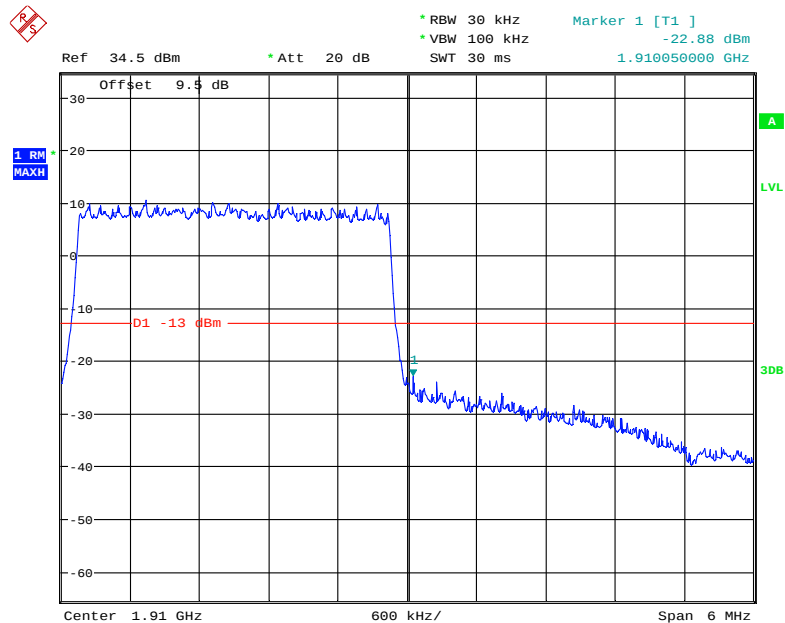
Date: 17.JAN.2020 10:06:00

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



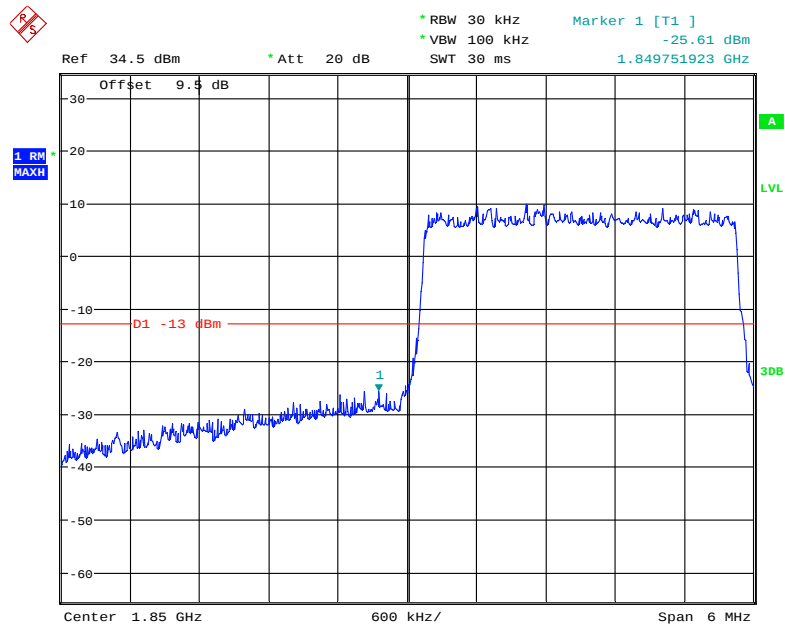
Date: 17.JAN.2020 10:14:49

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



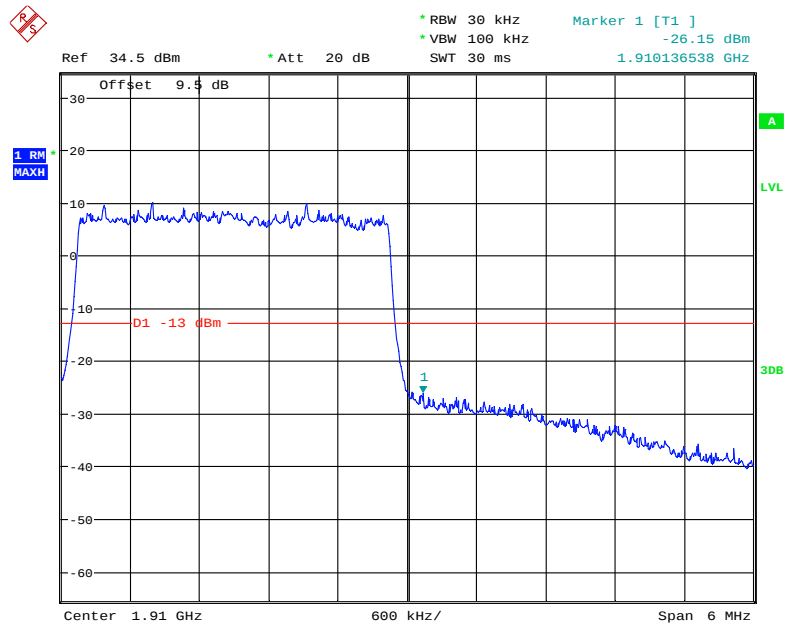
Date: 17.JAN.2020 10:09:53

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



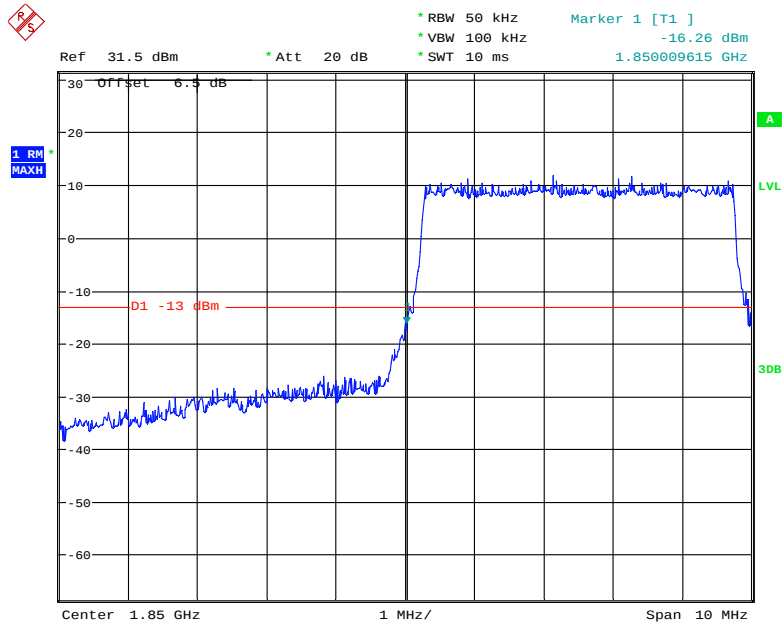
Date: 17.JAN.2020 10:13:40

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



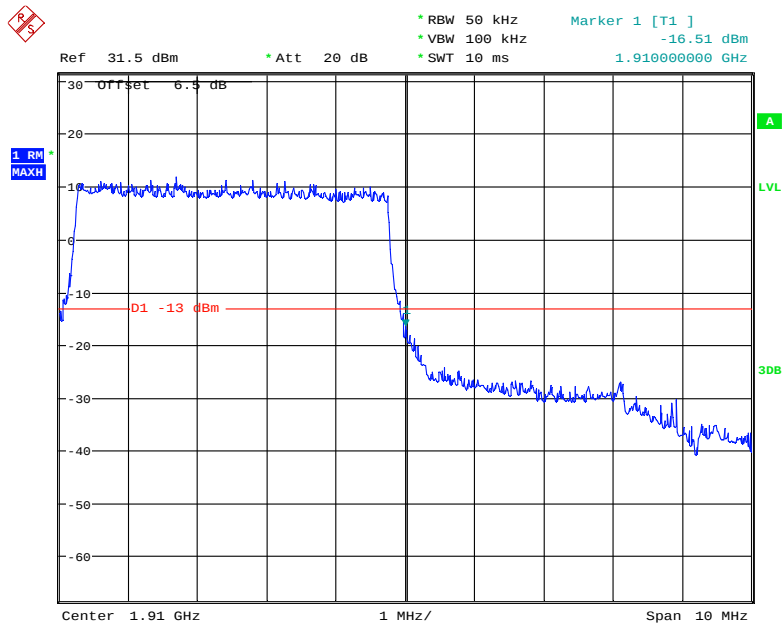
Date: 17.JAN.2020 10:12:30

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



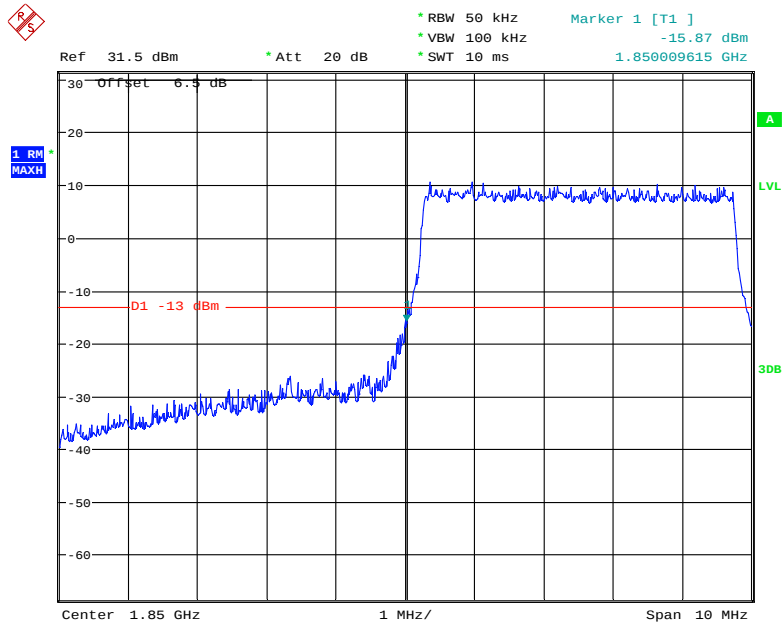
Date: 17.JAN.2020 15:56:19

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



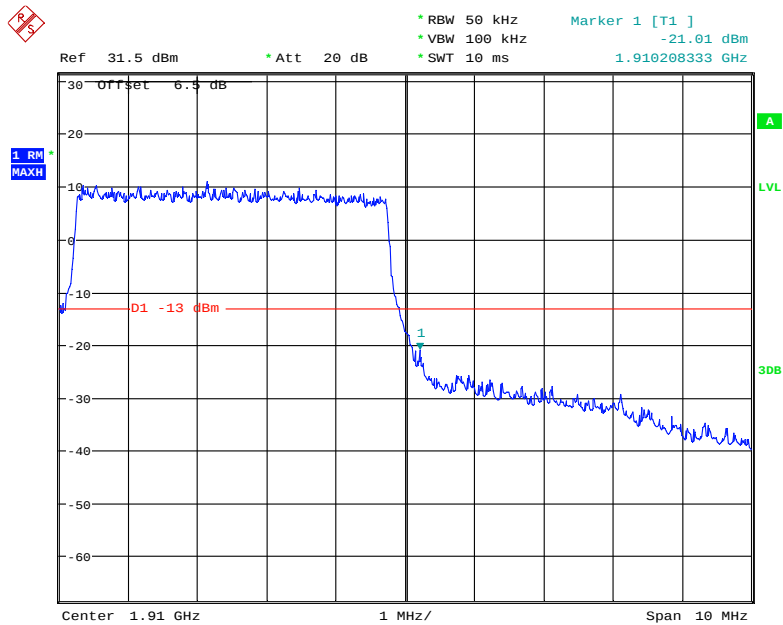
Date: 17.JAN.2020 15:57:32

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



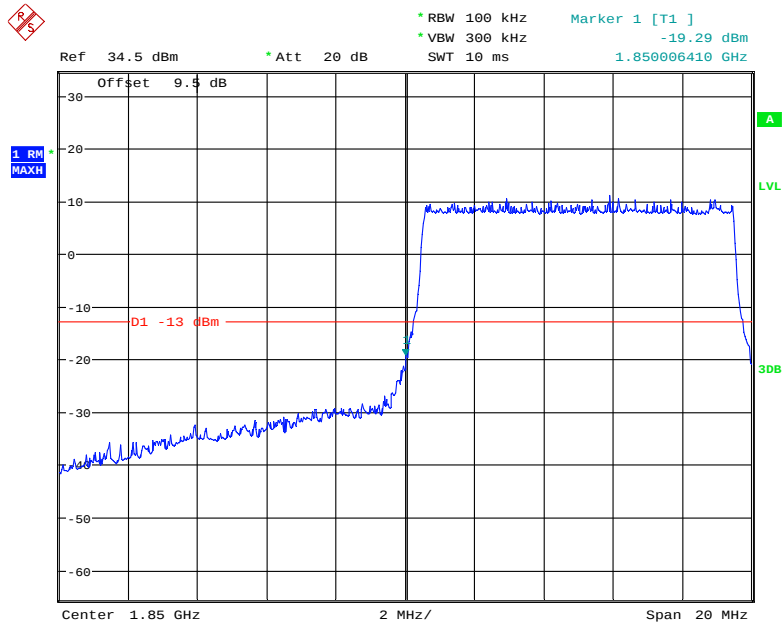
Date: 17.JAN.2020 15:55:40

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



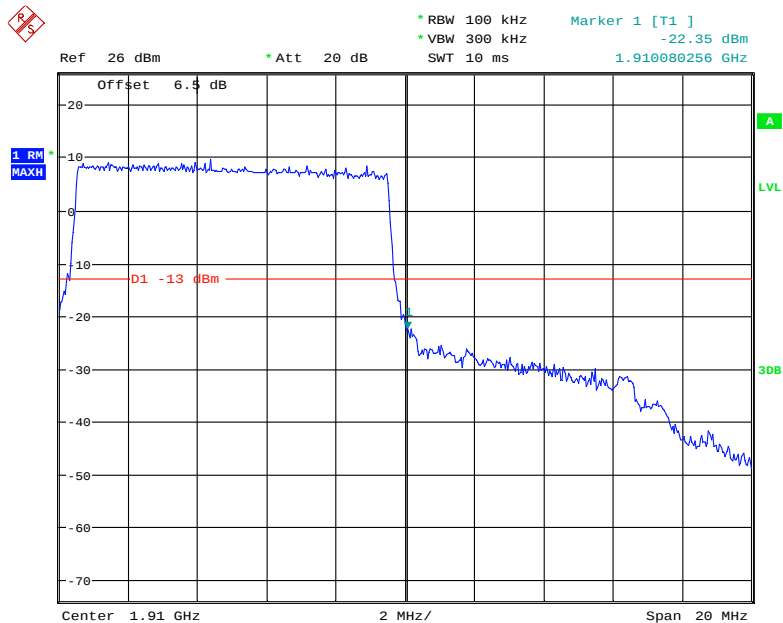
Date: 17.JAN.2020 15:59:01

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



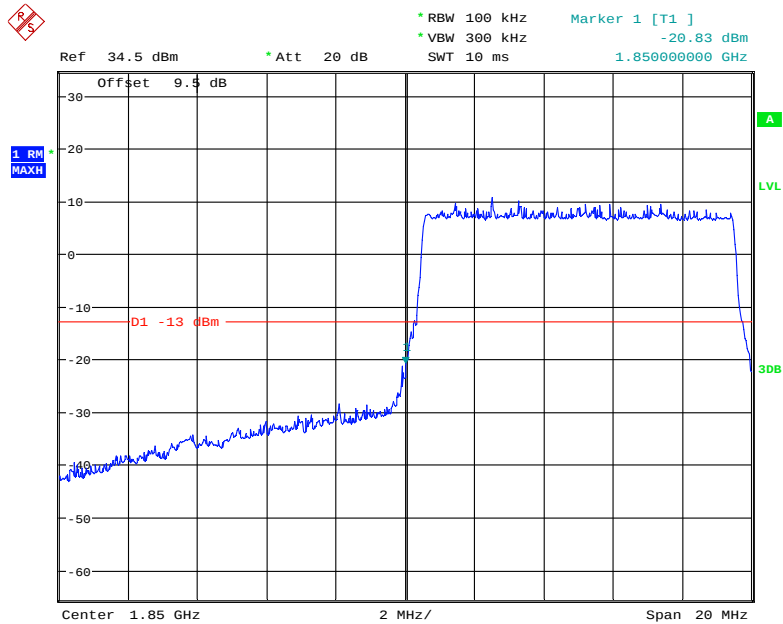
Date: 17.JAN.2020 10:26:31

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



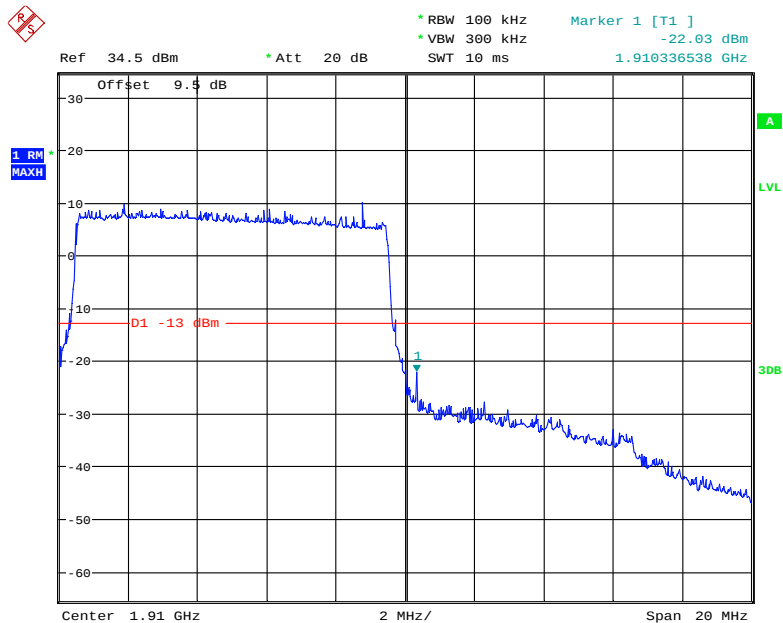
Date: 13.MAR.2020 15:44:54

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



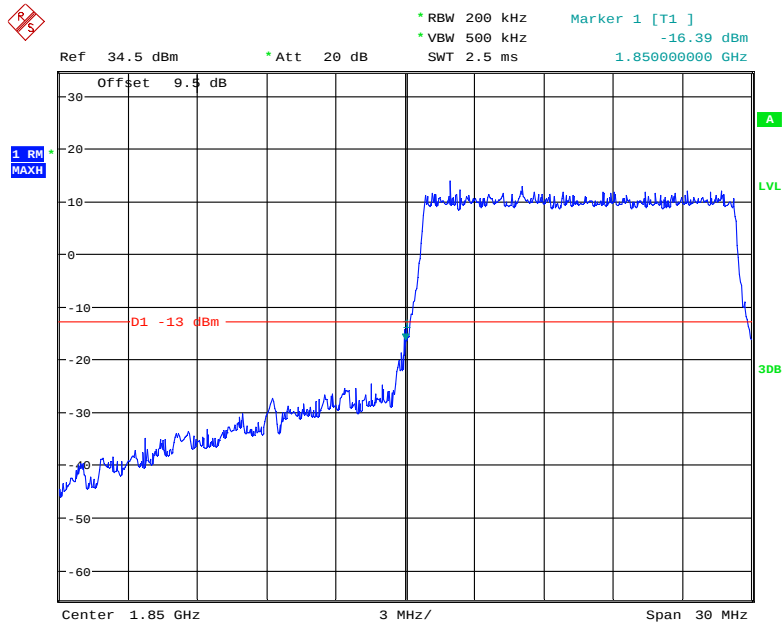
Date: 17.JAN.2020 10:28:01

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



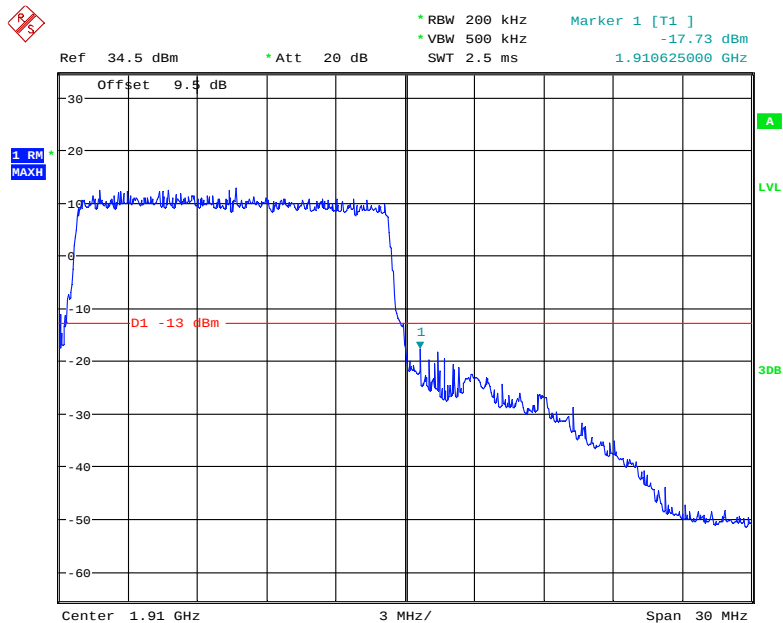
Date: 17.JAN.2020 10:21:02

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



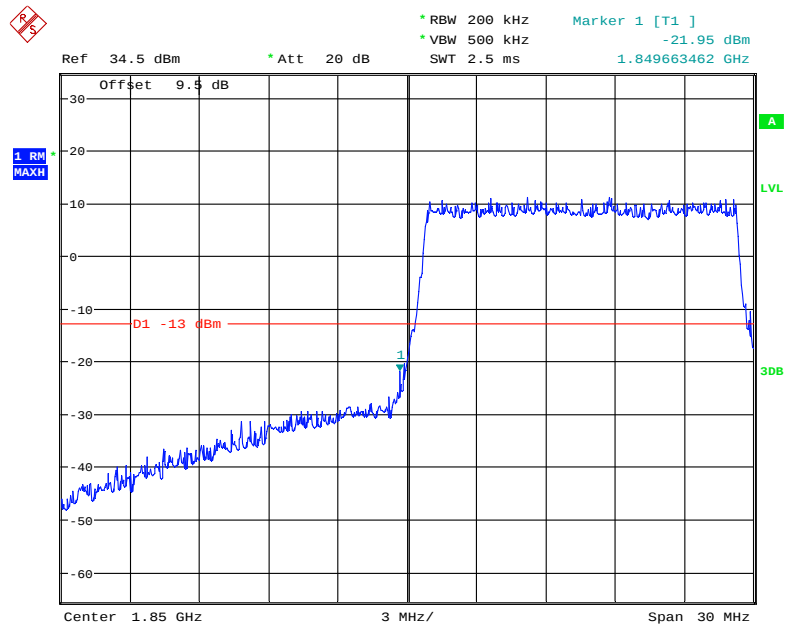
Date: 17.JAN.2020 10:31:04

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



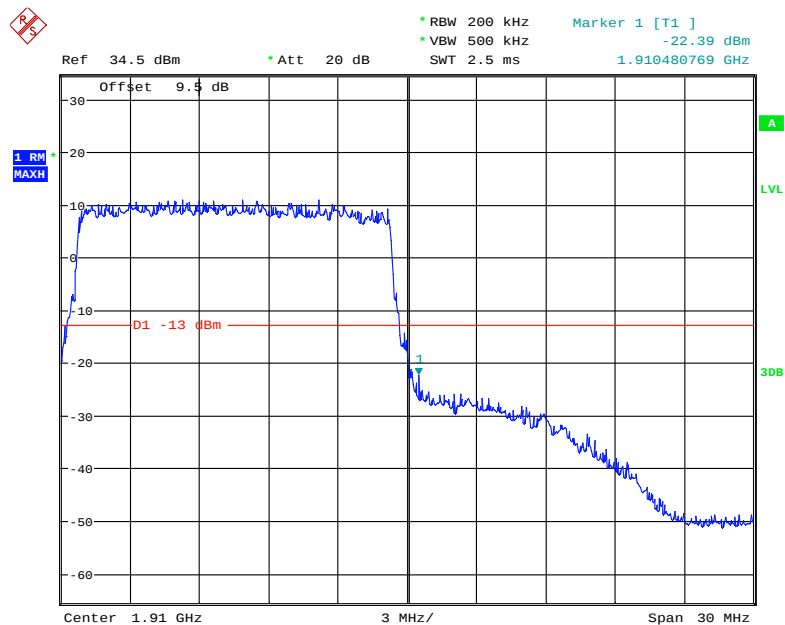
Date: 17.JAN.2020 10:33:42

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



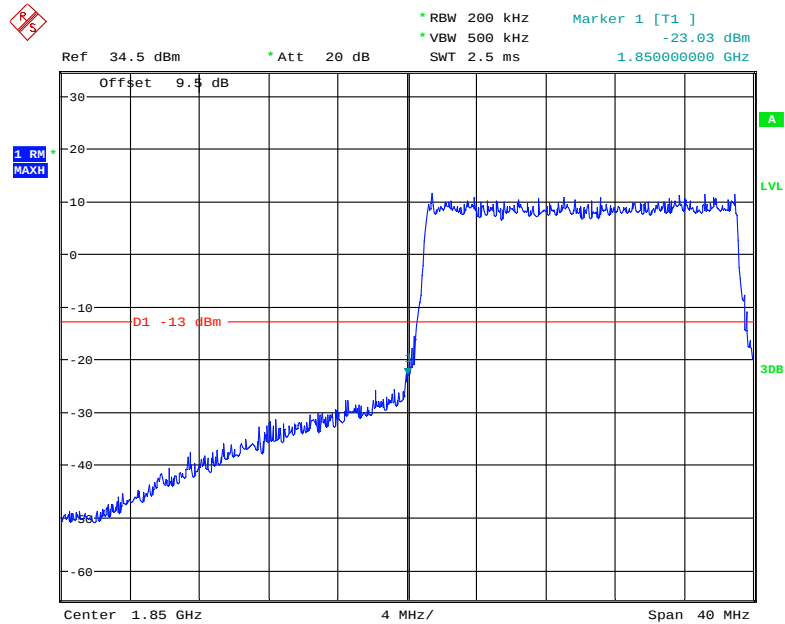
Date: 17.JAN.2020 10:31:49

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



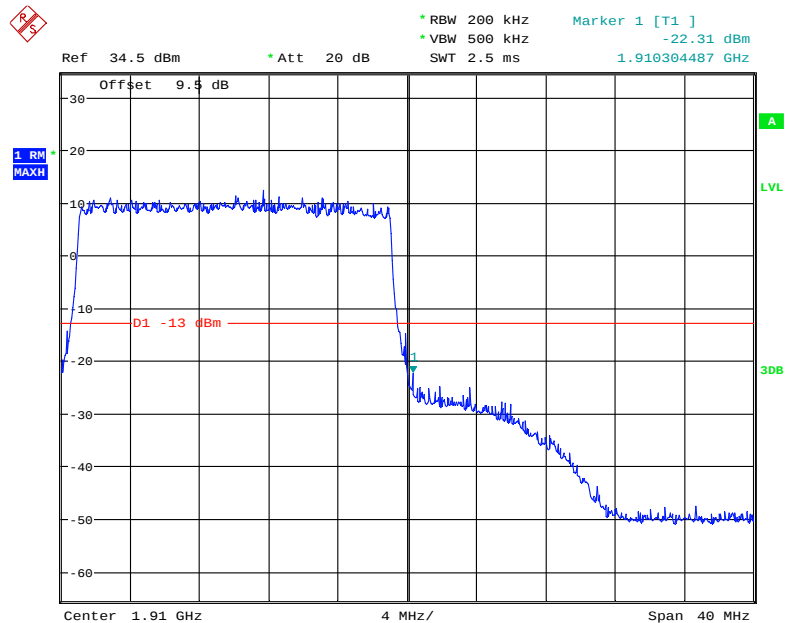
Date: 17.JAN.2020 10:32:52

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



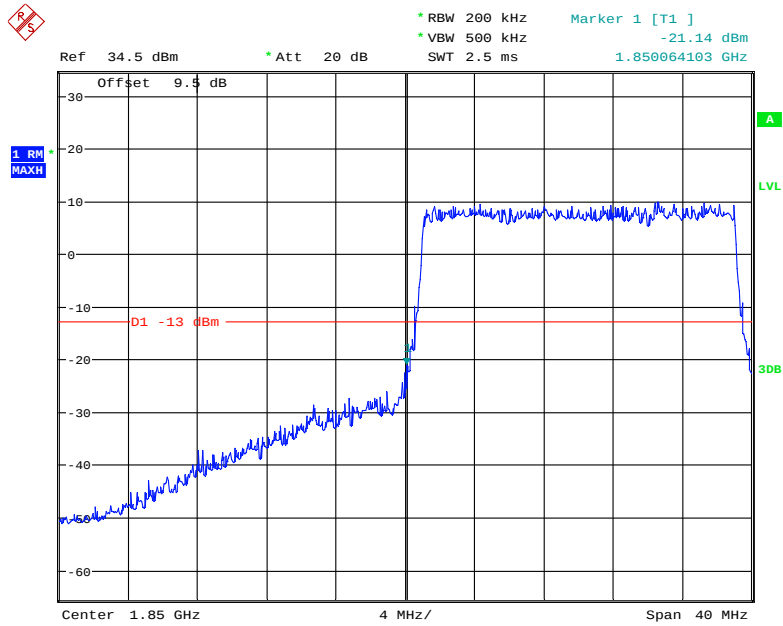
Date: 17.JAN.2020 10:38:55

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



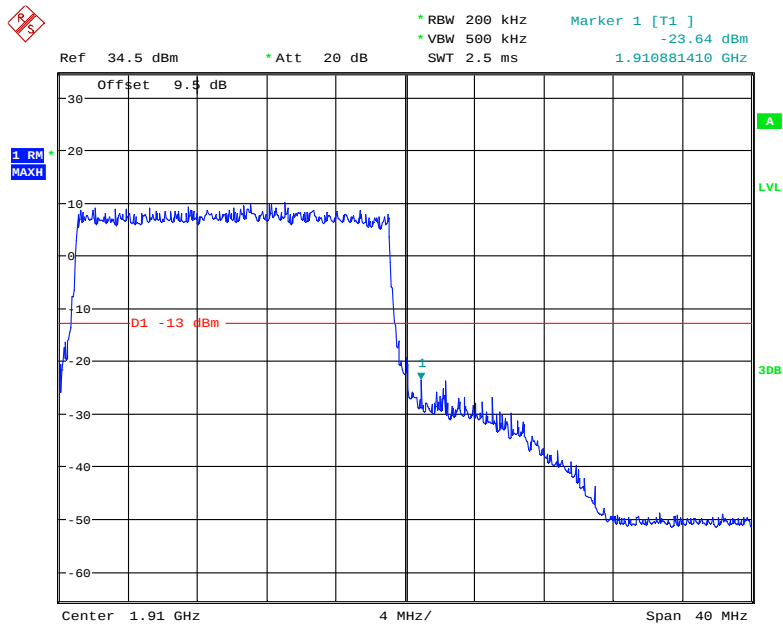
Date: 17.JAN.2020 10:35:18

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



Date: 17.JAN.2020 10:38:14

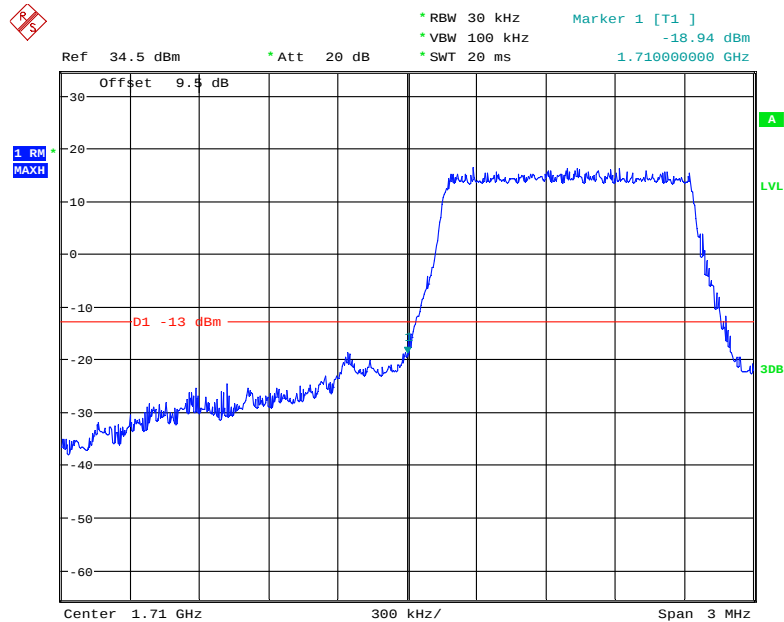
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 17.JAN.2020 10:36:30

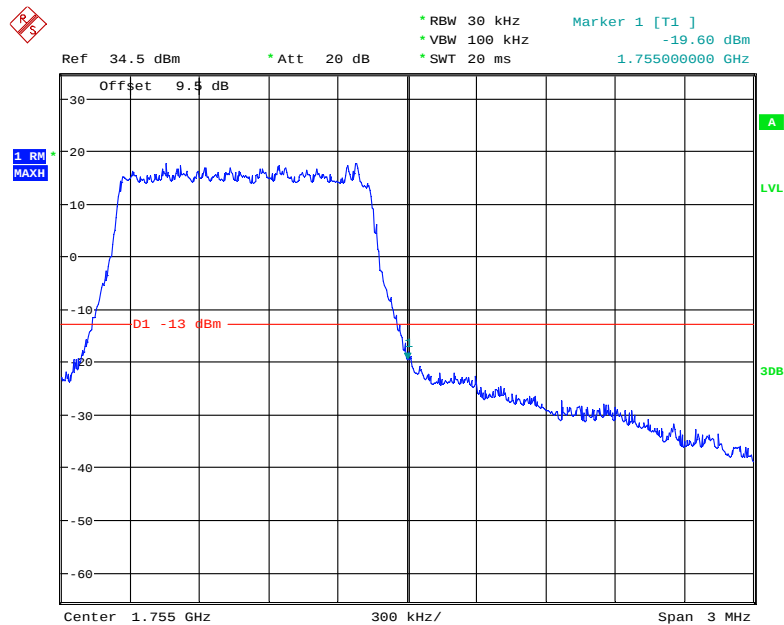
Band 4:

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



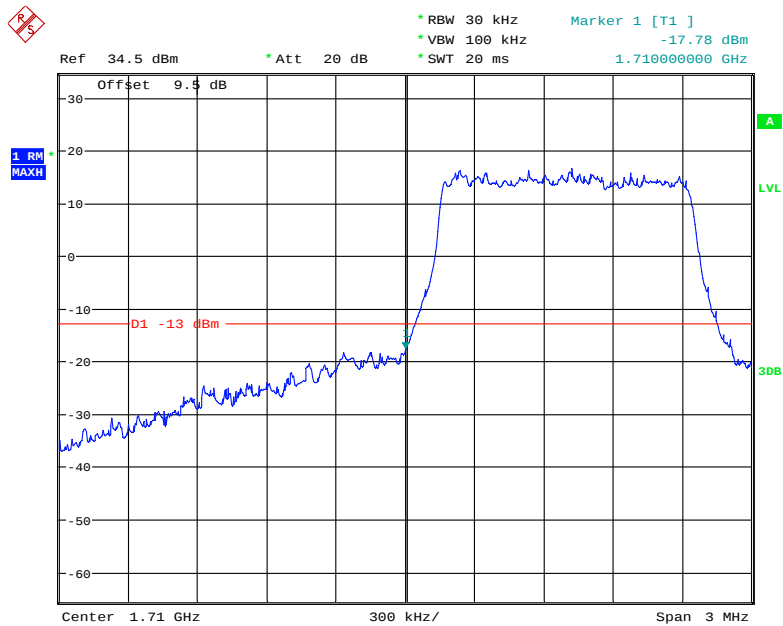
Date: 17.JAN.2020 13:28:44

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



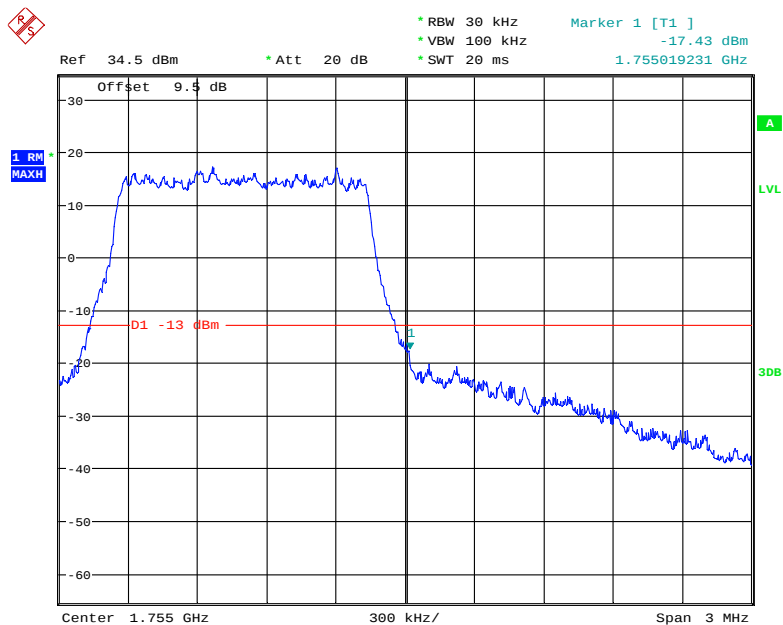
Date: 17.JAN.2020 13:33:29

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



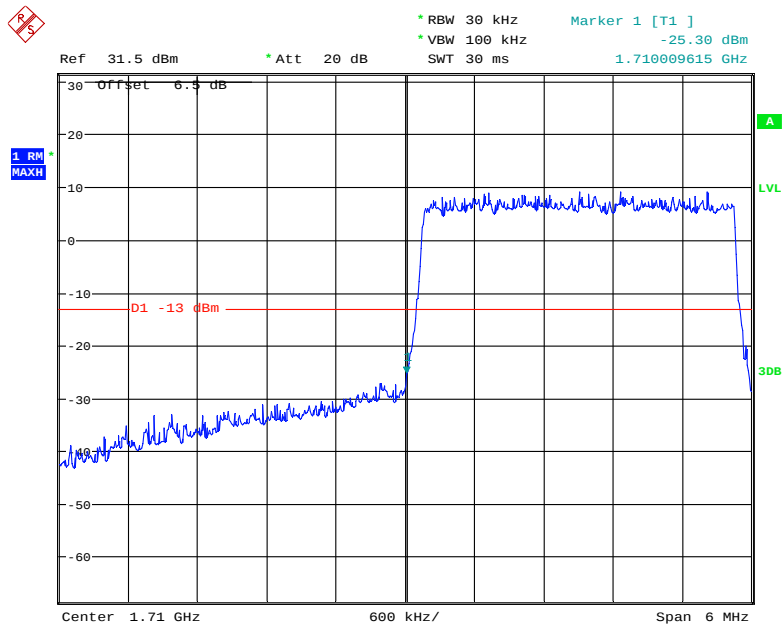
Date: 17.JAN.2020 13:30:54

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



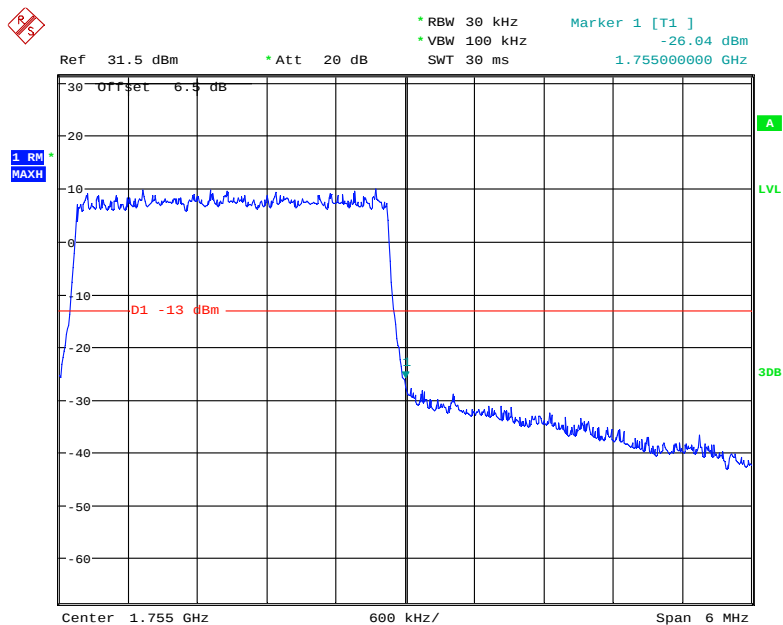
Date: 17.JAN.2020 13:32:26

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



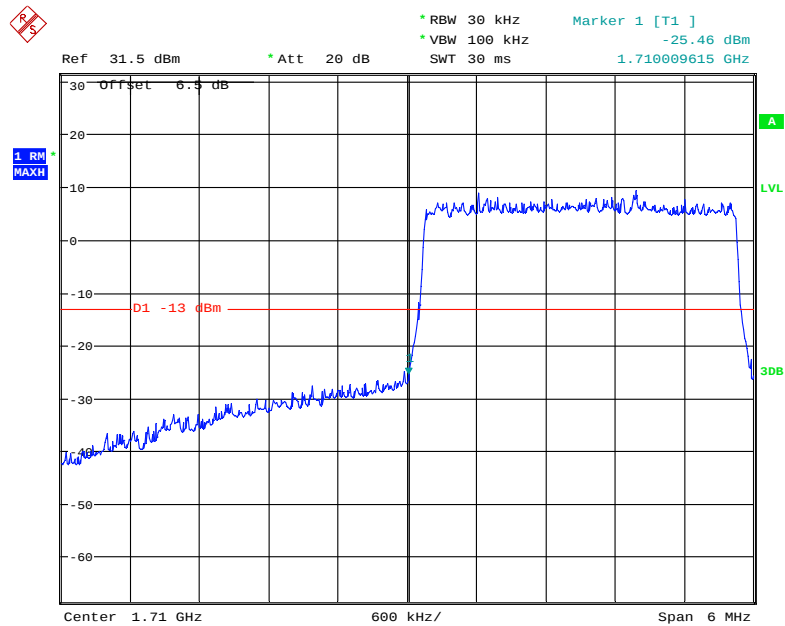
Date: 17.JAN.2020 16:05:27

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



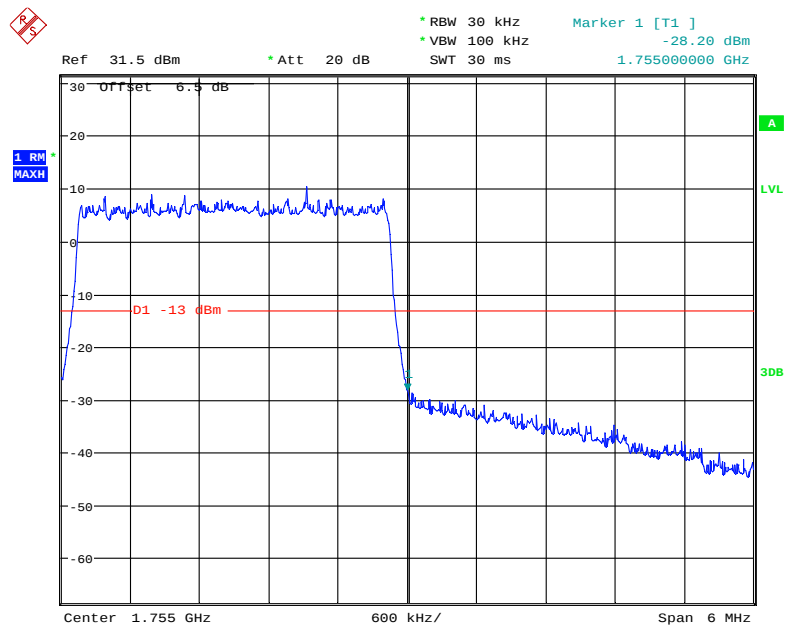
Date: 17.JAN.2020 16:07:44

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



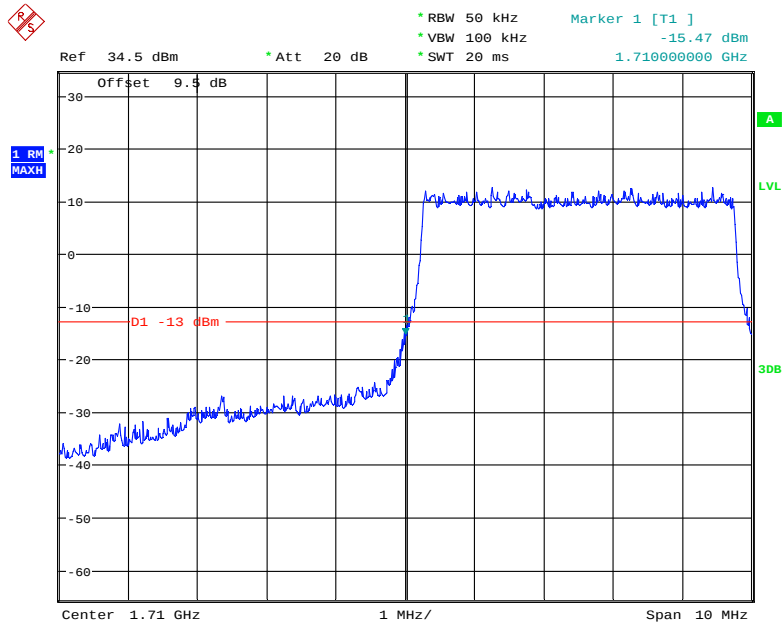
Date: 17.JAN.2020 16:05:03

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



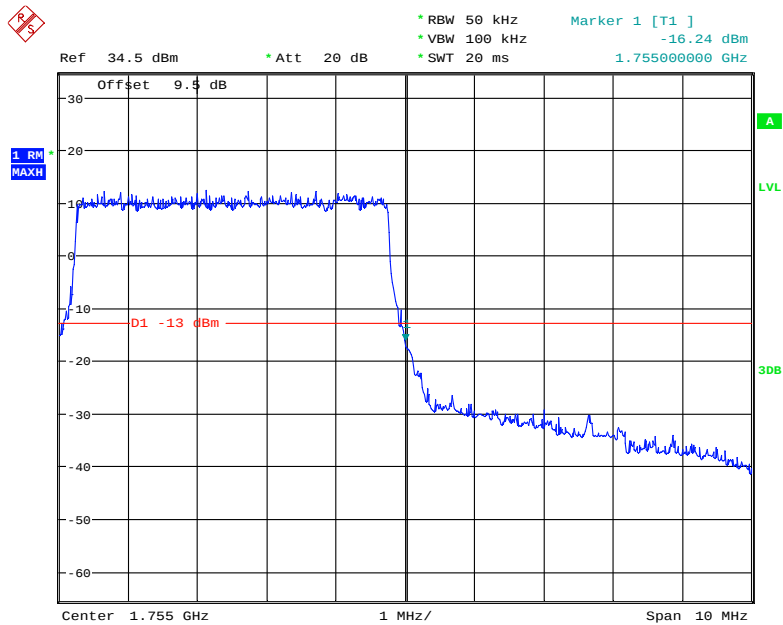
Date: 17.JAN.2020 16:08:18

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



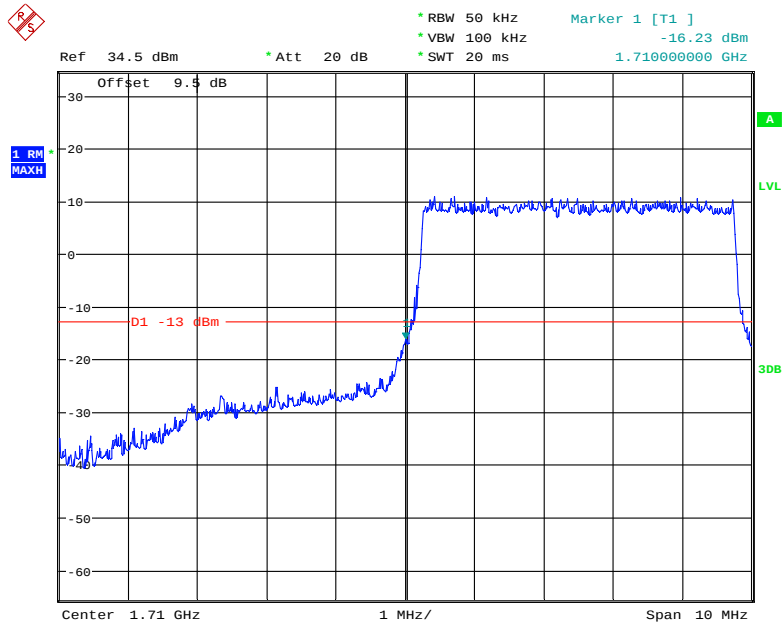
Date: 17.JAN.2020 13:46:46

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



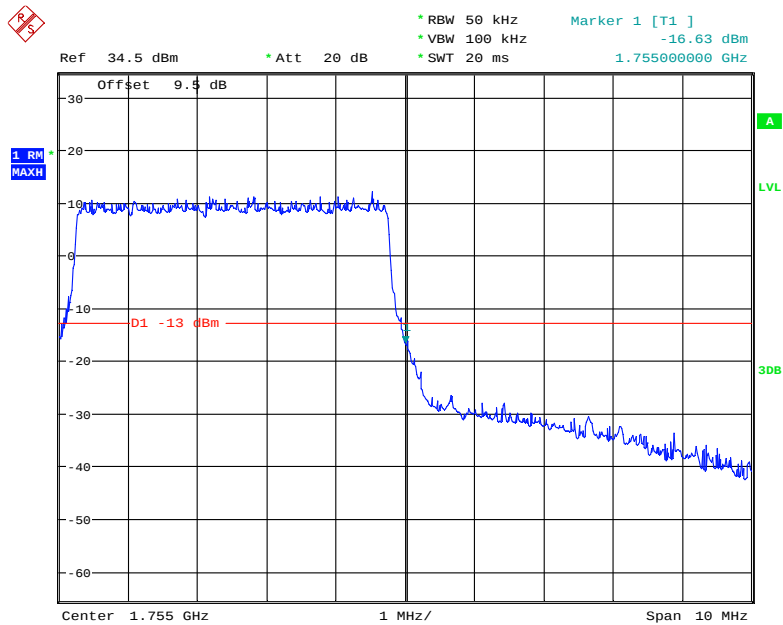
Date: 17.JAN.2020 13:41:42

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



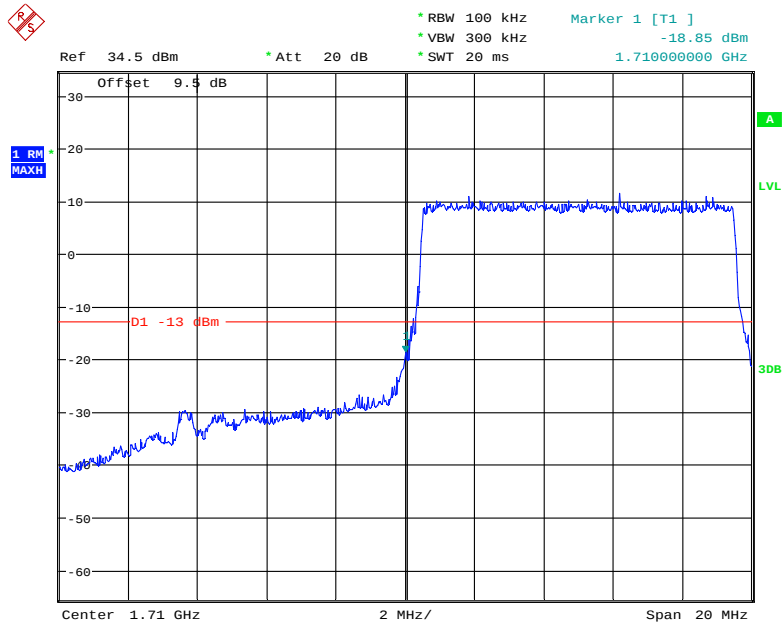
Date: 17.JAN.2020 13:45:19

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



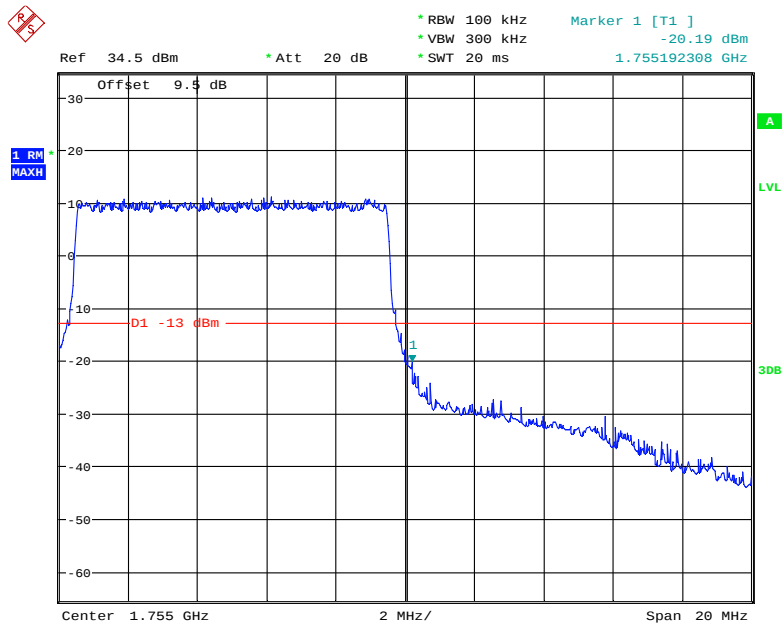
Date: 17.JAN.2020 13:42:22

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



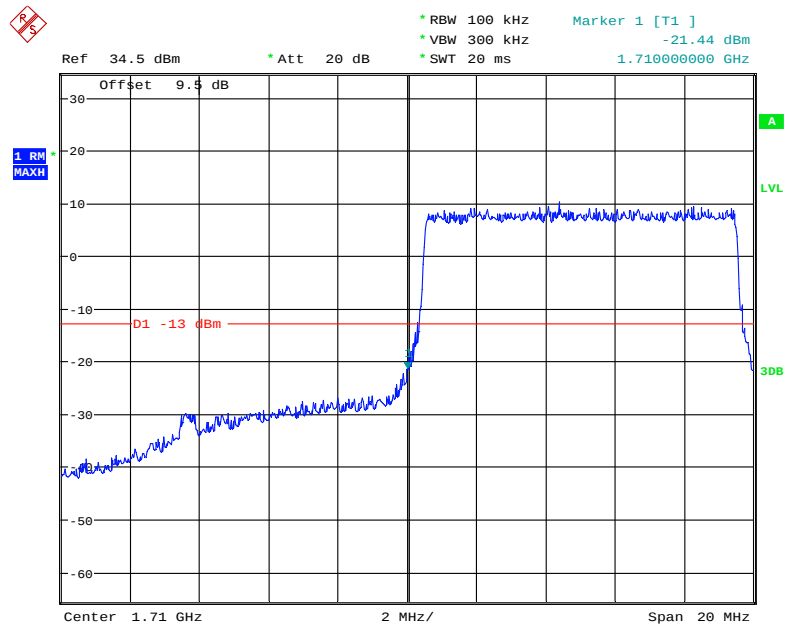
Date: 17.JAN.2020 13:49:17

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



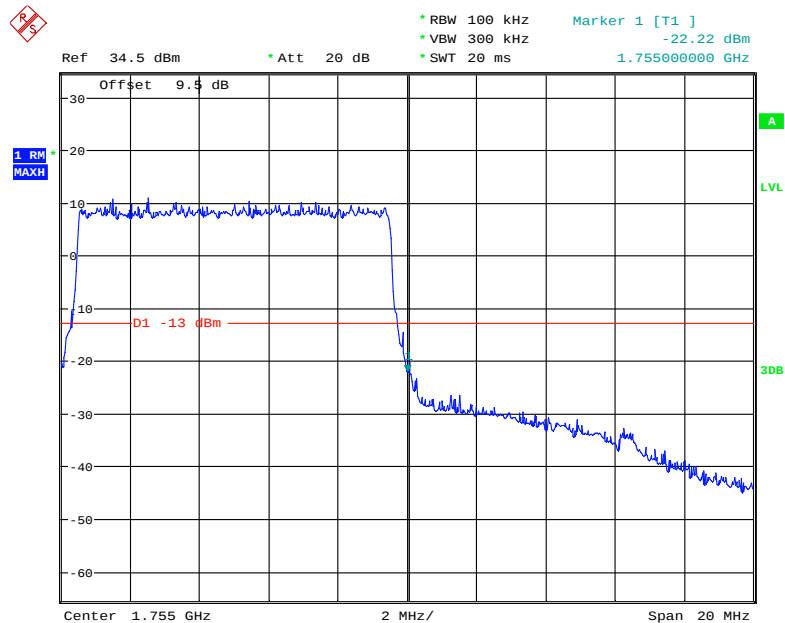
Date: 17.JAN.2020 13:52:43

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



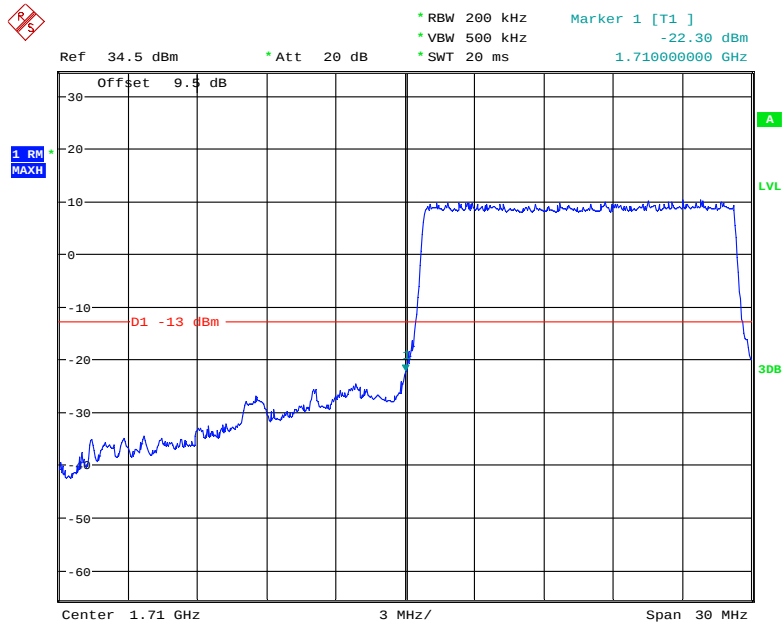
Date: 17.JAN.2020 13:49:47

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



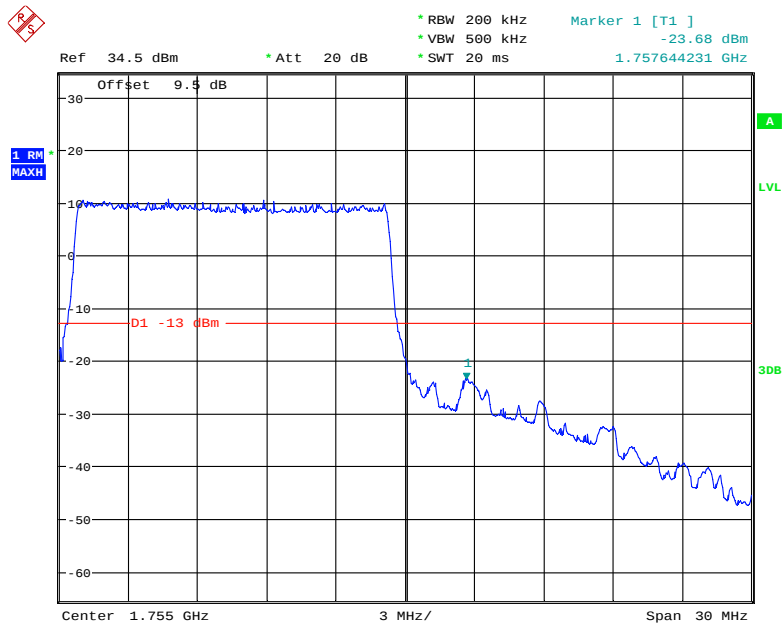
Date: 17.JAN.2020 13:51:18

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



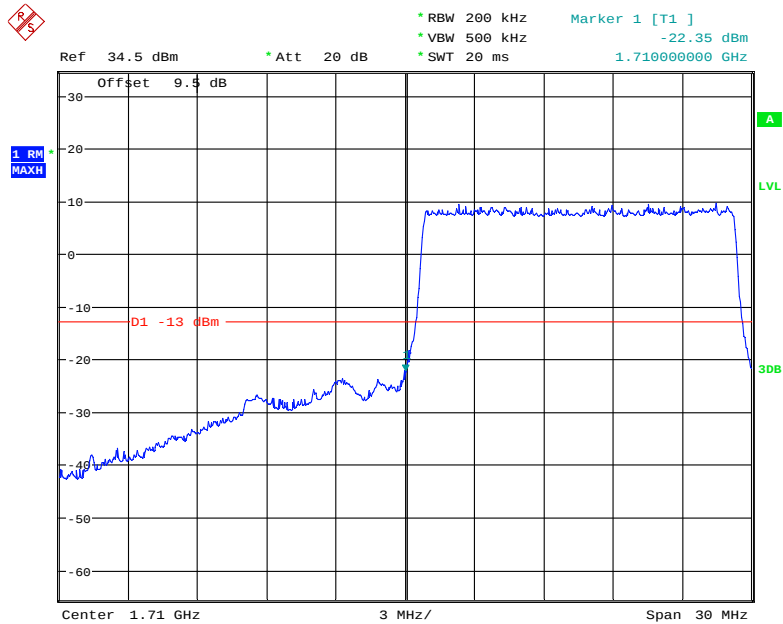
Date: 17.JAN.2020 13:59:56

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



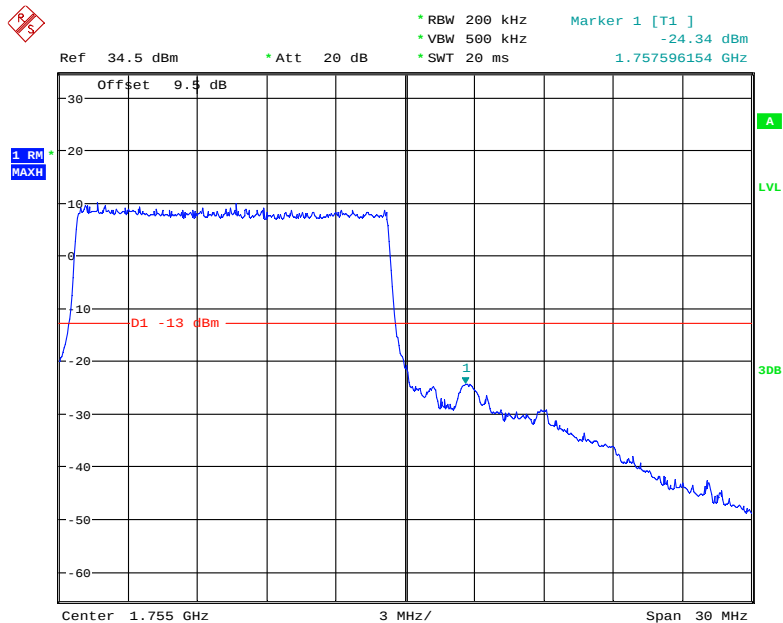
Date: 17.JAN.2020 13:57:29

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



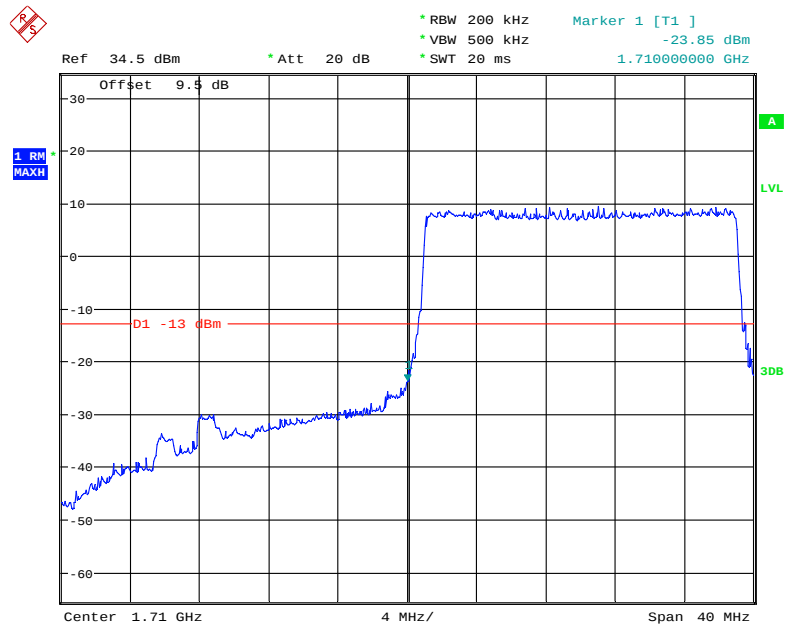
Date: 17.JAN.2020 13:59:11

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



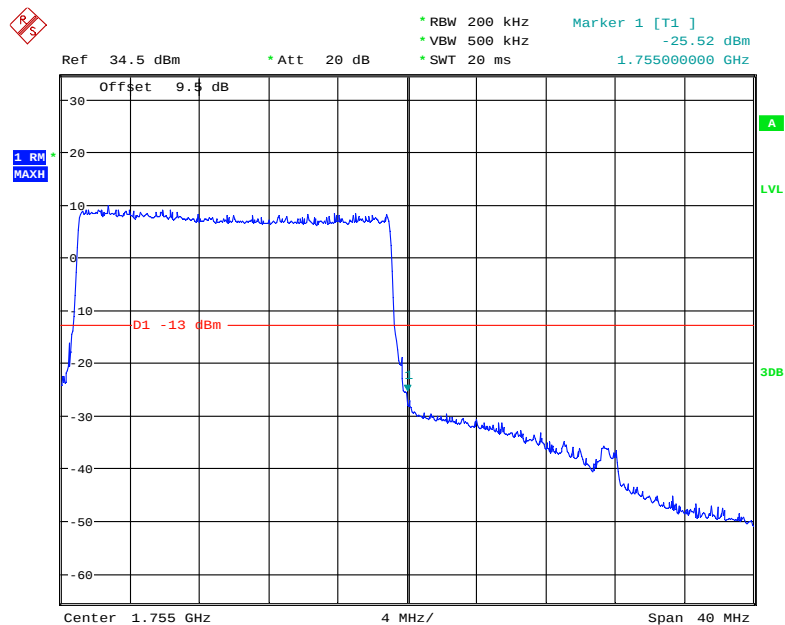
Date: 17.JAN.2020 13:58:09

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

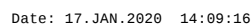
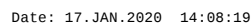


Date: 17.JAN.2020 14:07:26

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

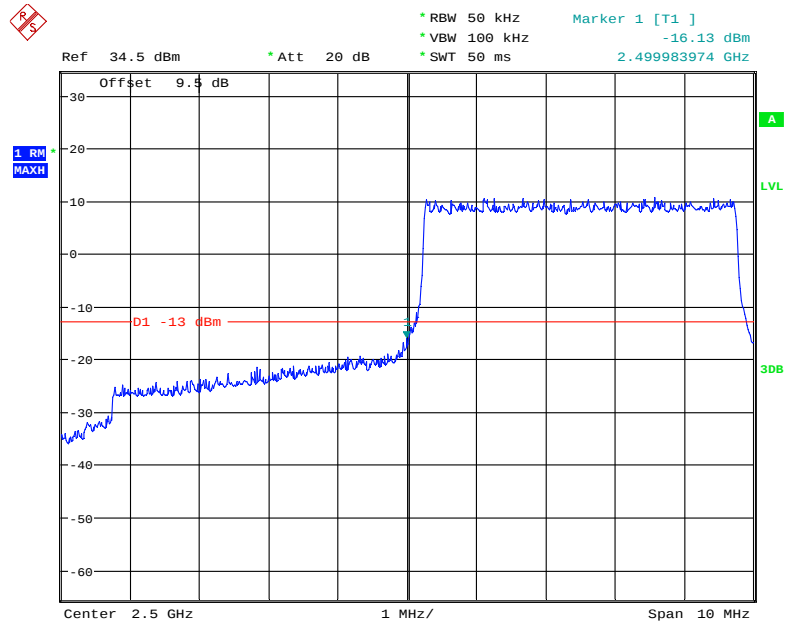


Date: 17.JAN.2020 14:09:49



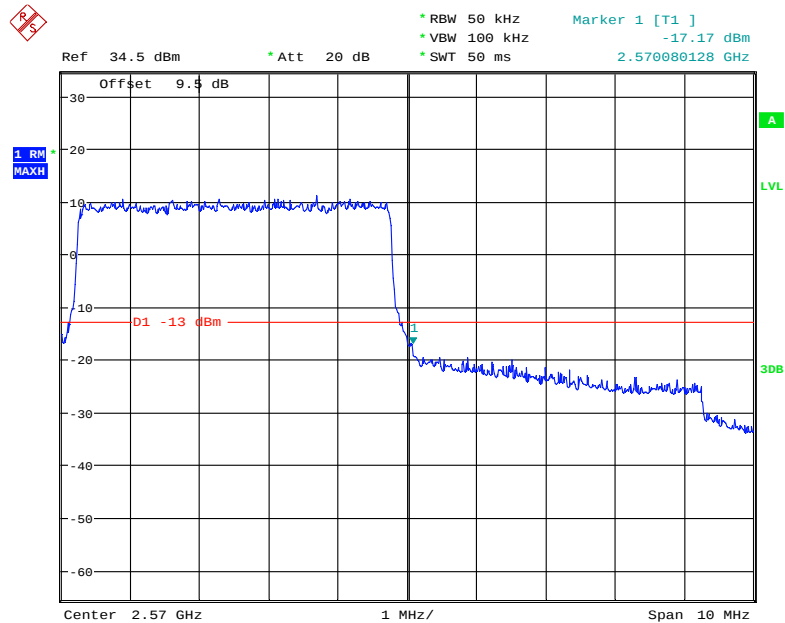
Band 7:

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



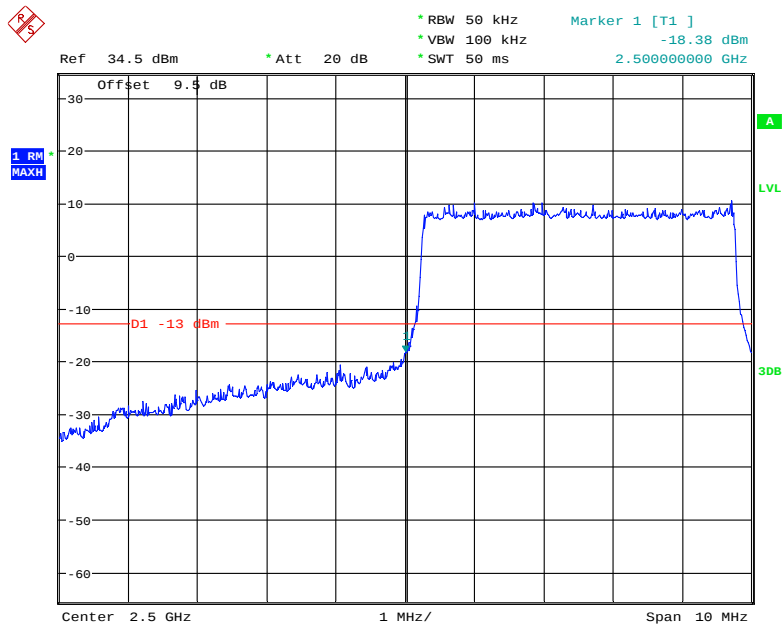
Date: 17.JAN.2020 14:22:44

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



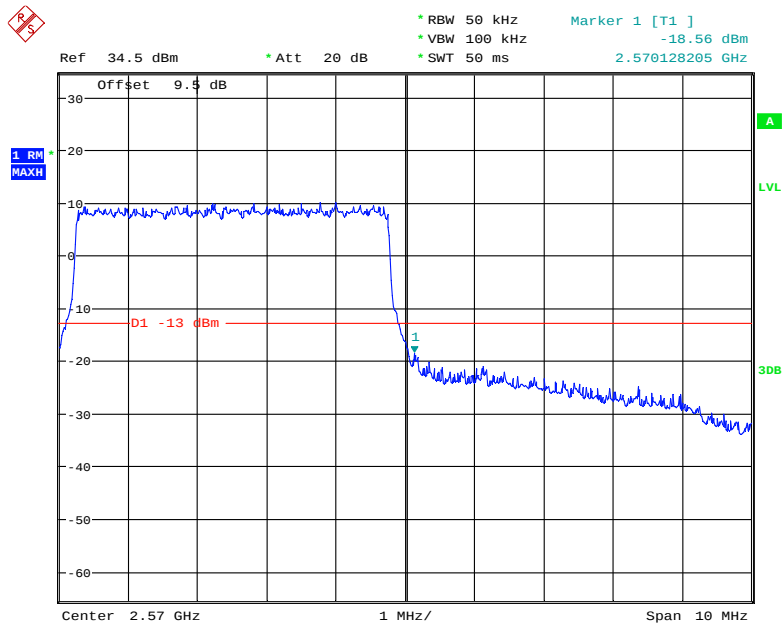
Date: 17.JAN.2020 14:25:36

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



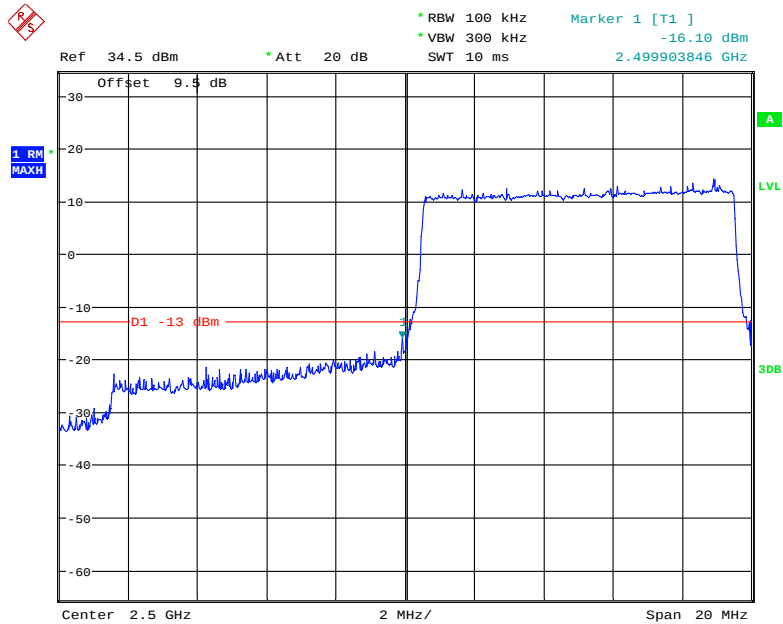
Date: 17.JAN.2020 14:23:22

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



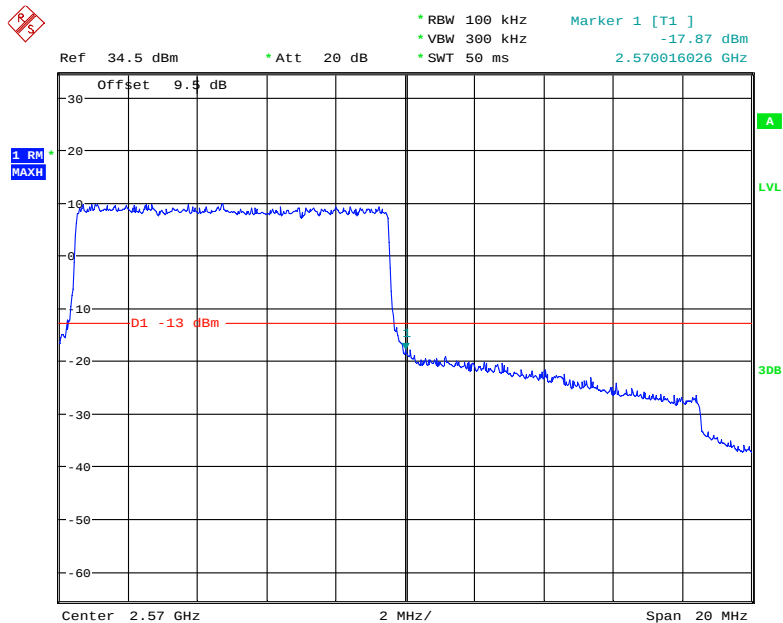
Date: 17.JAN.2020 14:24:43

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



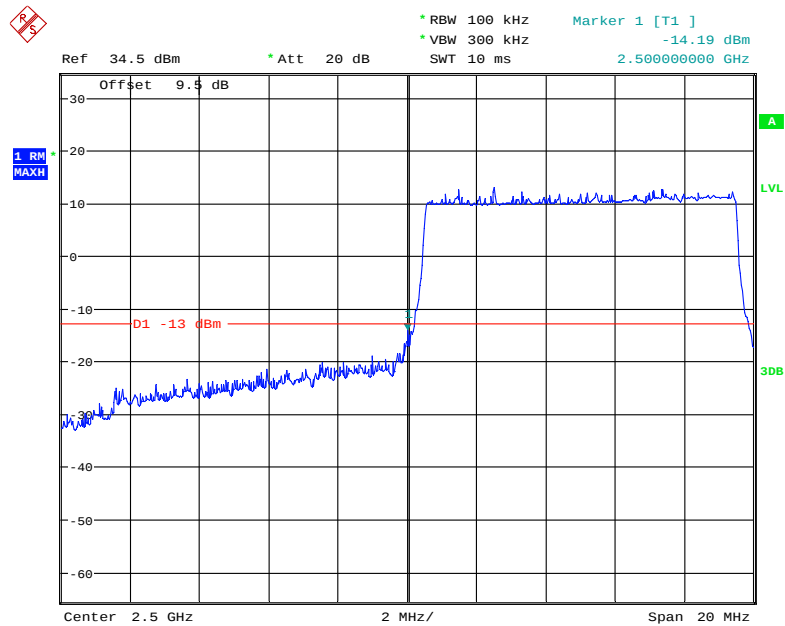
Date: 17.JAN.2020 14:30:08

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



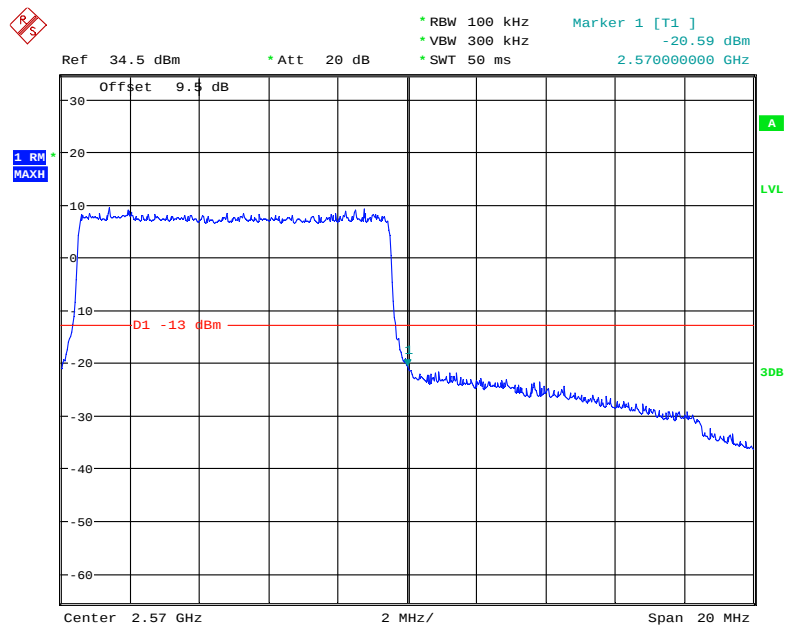
Date: 17.JAN.2020 14:27:11

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



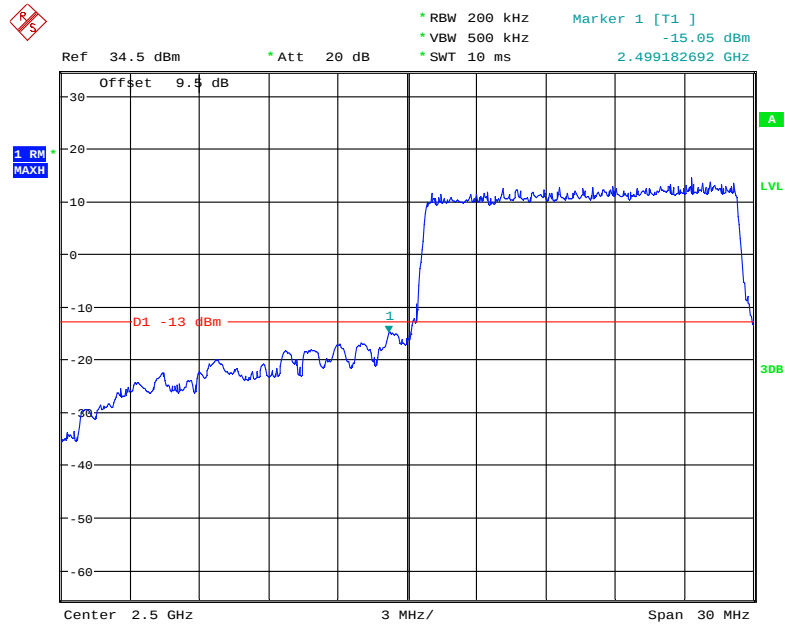
Date: 17.JAN.2020 14:29:24

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



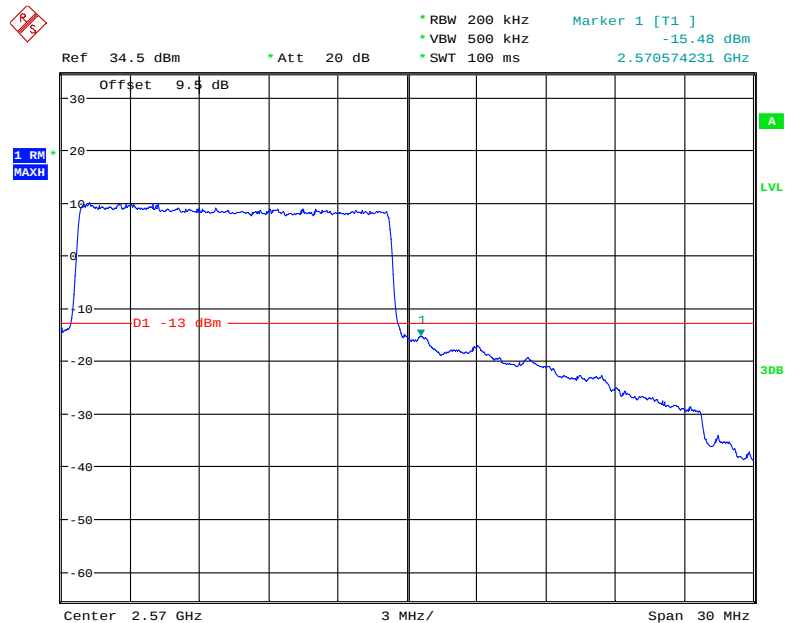
Date: 17.JAN.2020 14:27:51

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



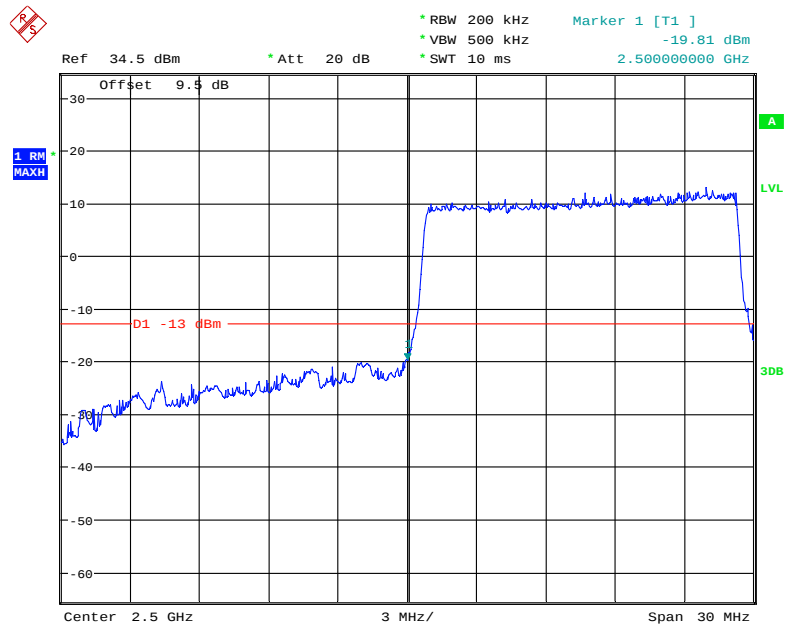
Date: 17.JAN.2020 14:32:00

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



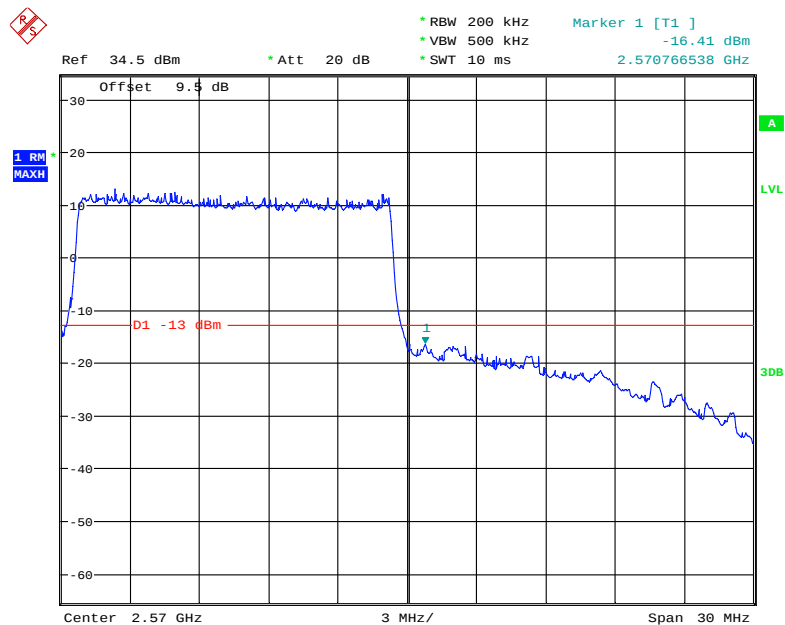
Date: 17.JAN.2020 14:39:33

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



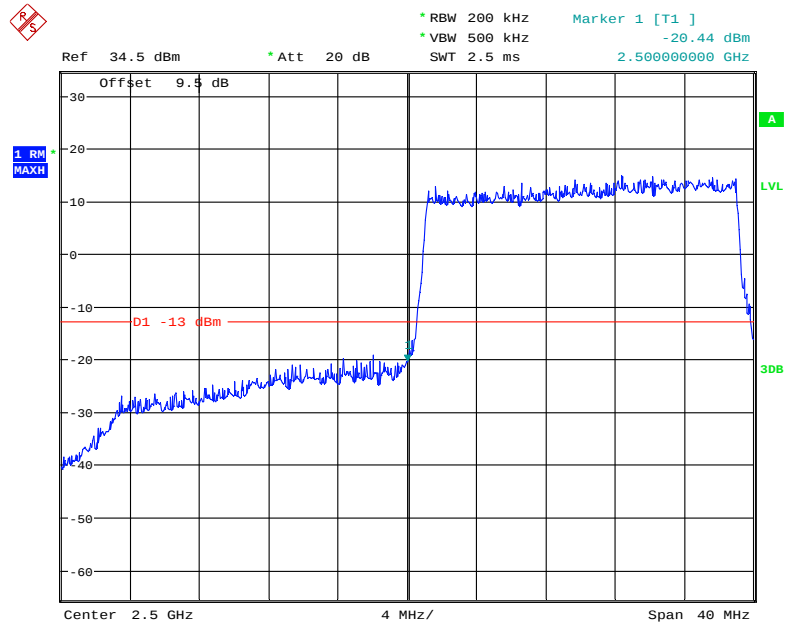
Date: 17.JAN.2020 14:33:04

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



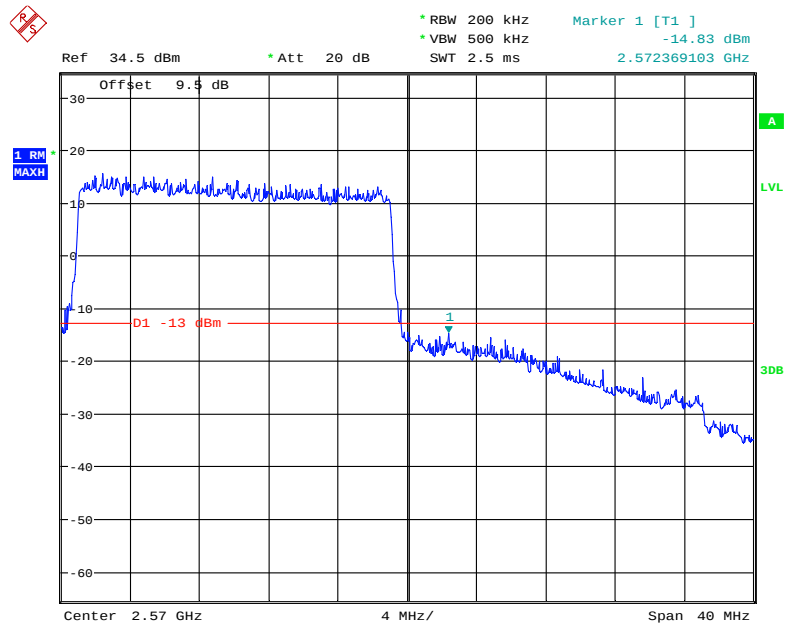
Date: 17.JAN.2020 14:38:25

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

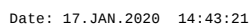
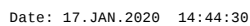


Date: 17.JAN.2020 14:45:10

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

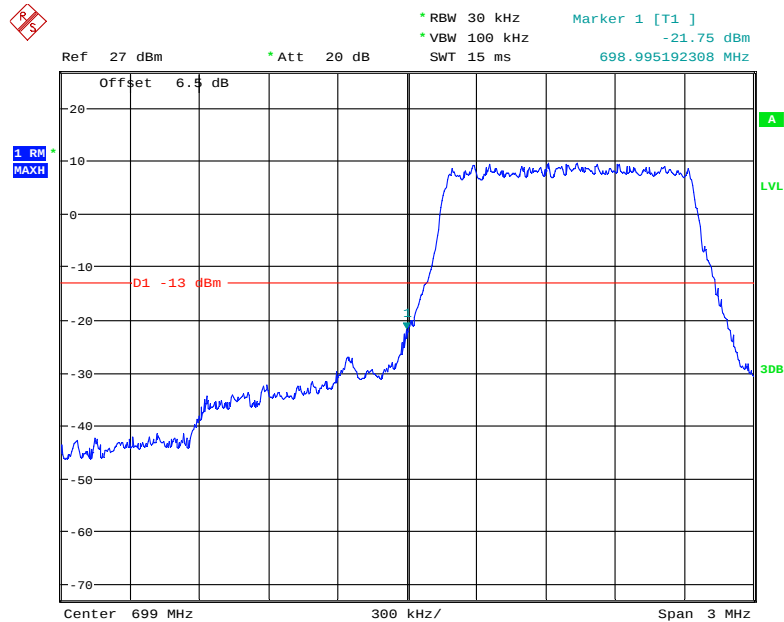


Date: 17.JAN.2020 14:42:36



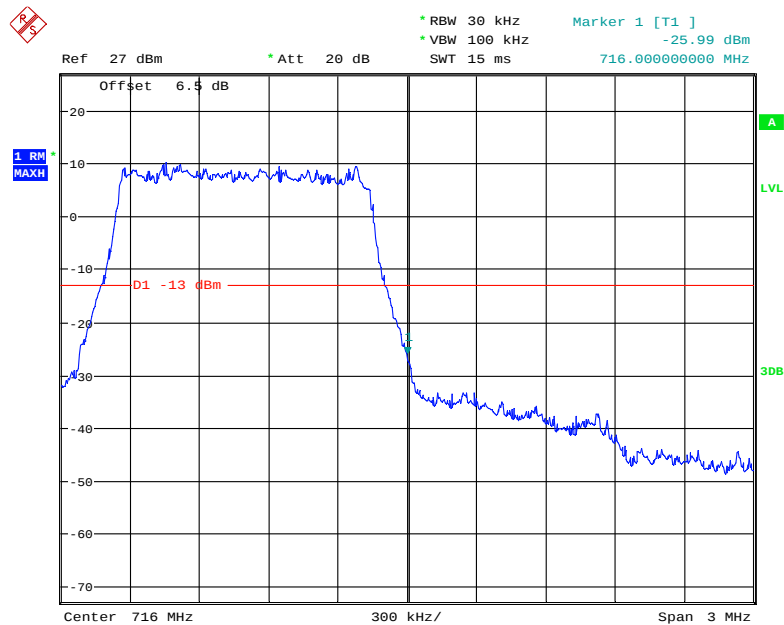
Band 12:

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



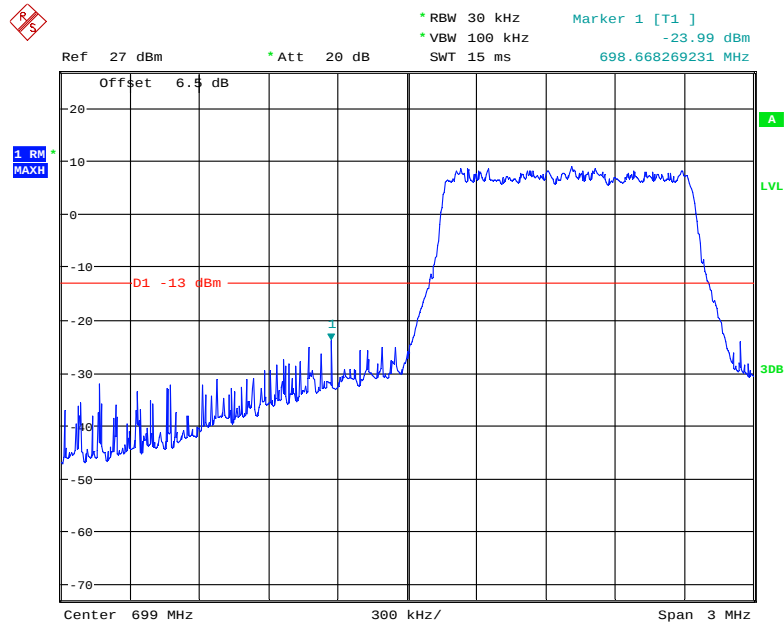
Date: 25.FEB.2020 16:48:18

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



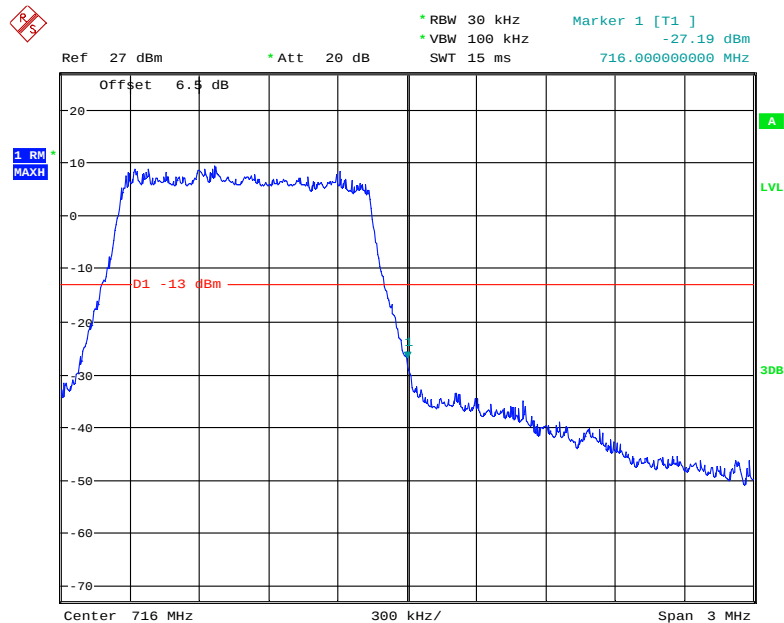
Date: 25.FEB.2020 16:49:53

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



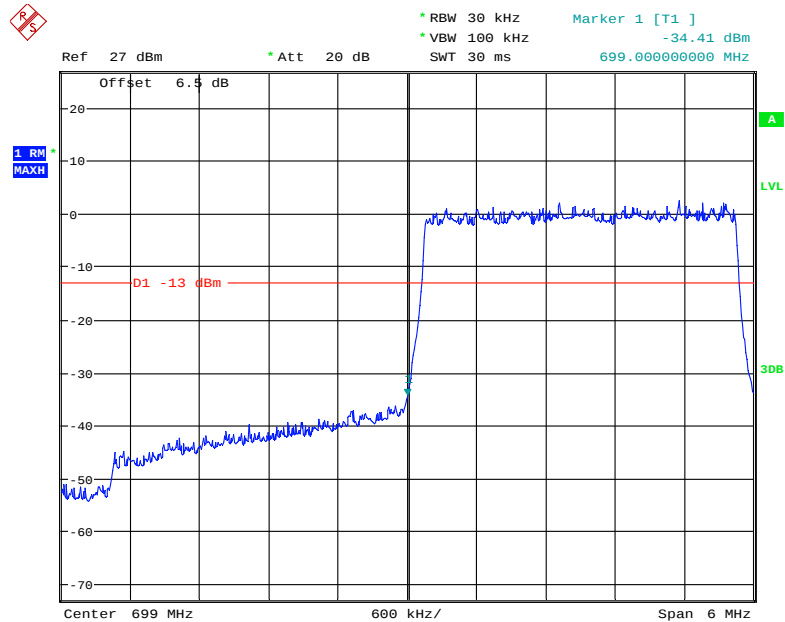
Date: 25.FEB.2020 16:45:37

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



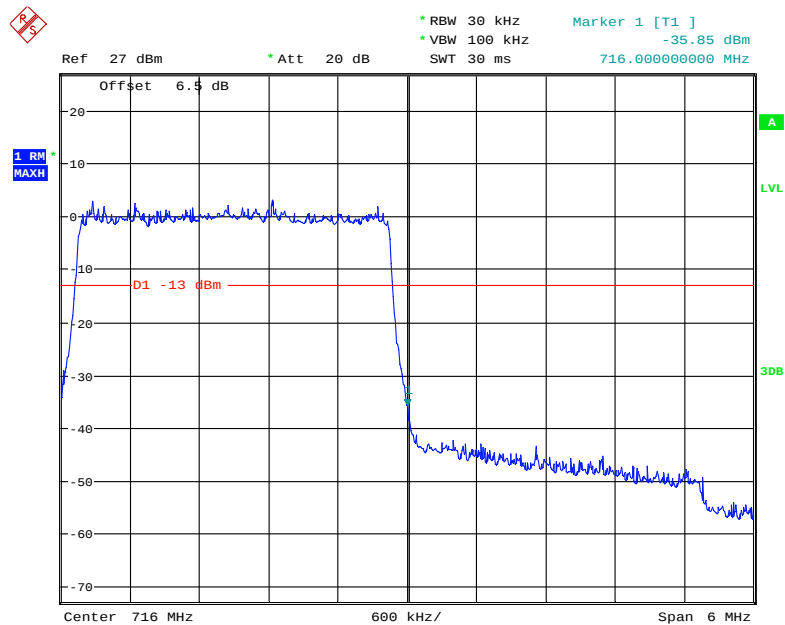
Date: 25.FEB.2020 16:50:38

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



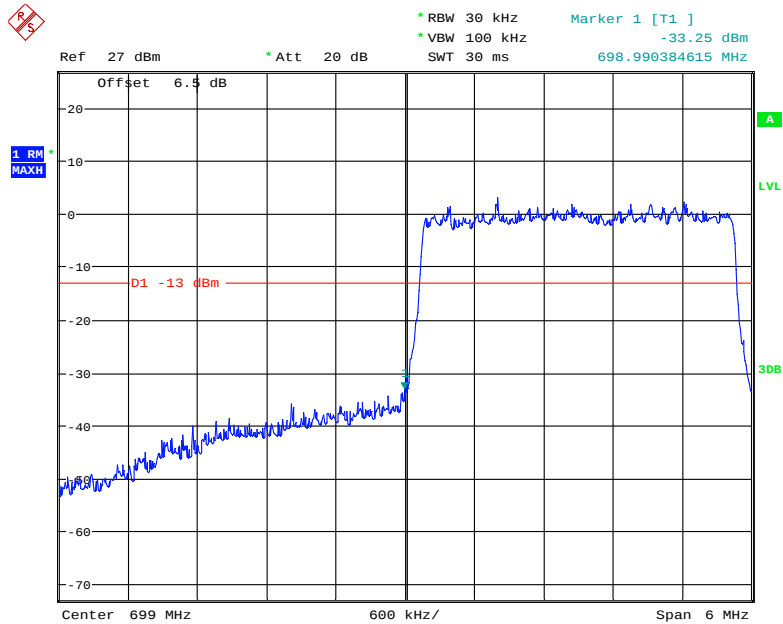
Date: 25.FEB.2020 16:53:45

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



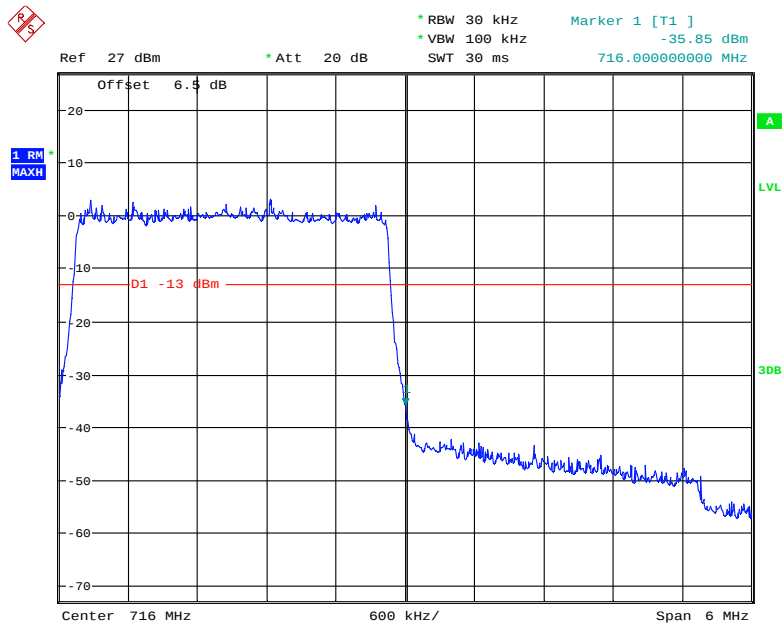
Date: 25.FEB.2020 16:54:32

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



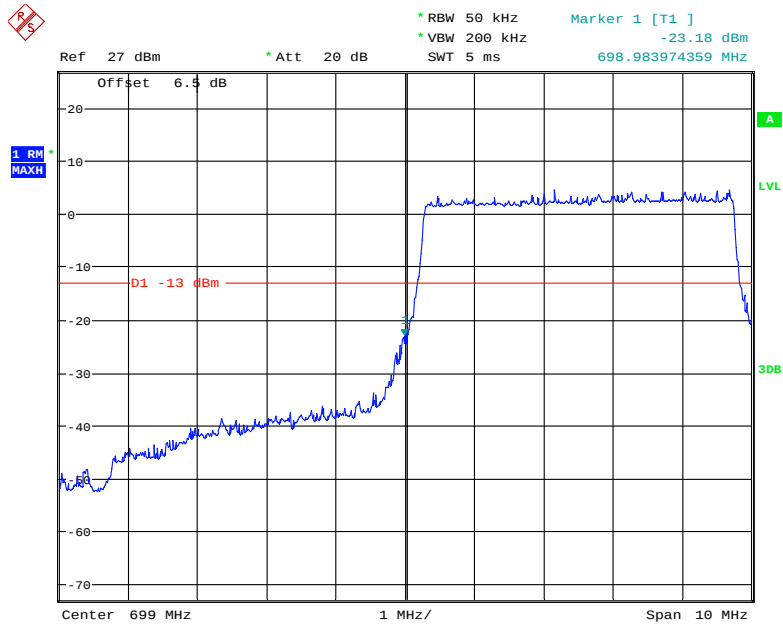
Date: 25.FEB.2020 16:52:38

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



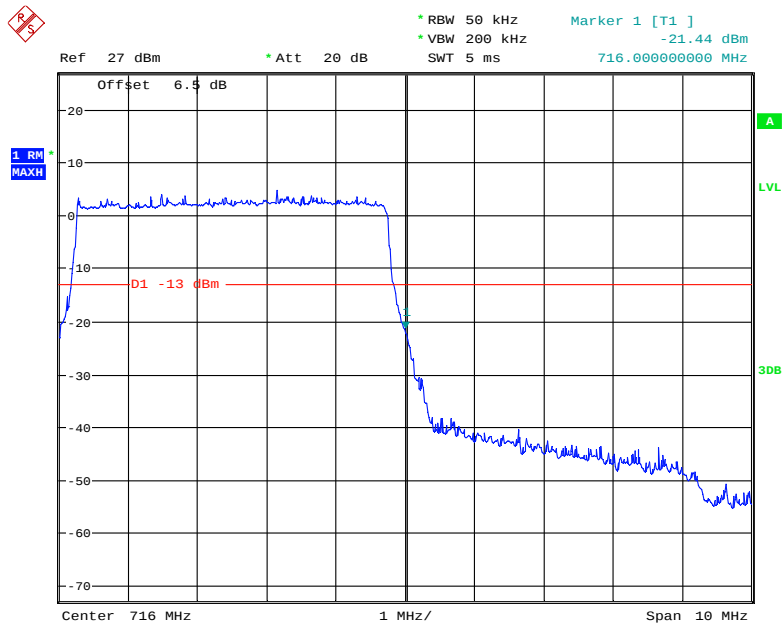
Date: 25.FEB.2020 16:54:32

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



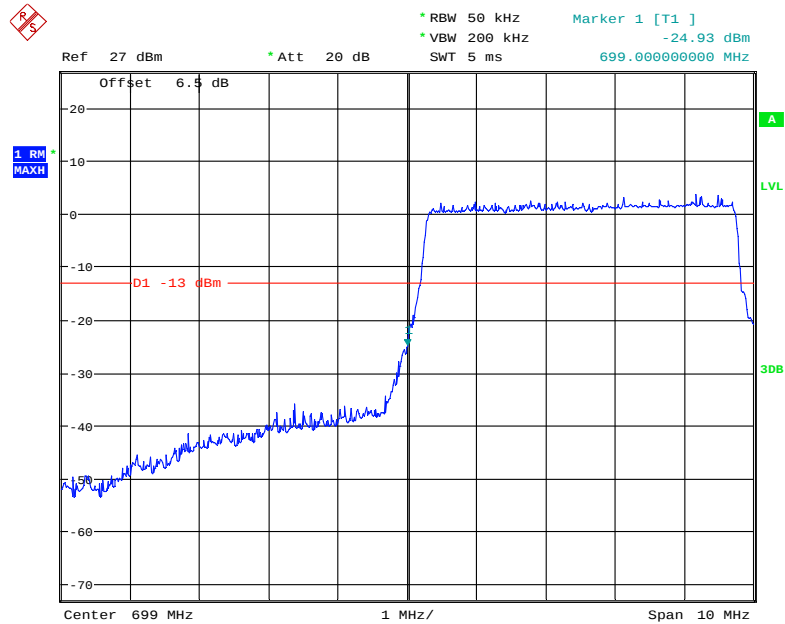
Date: 25.FEB.2020 16:58:38

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



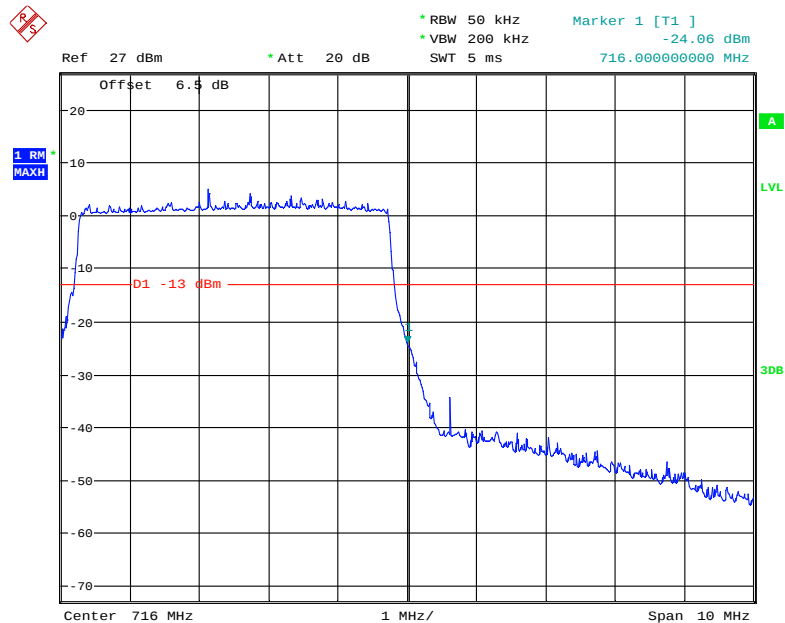
Date: 25.FEB.2020 17:02:19

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



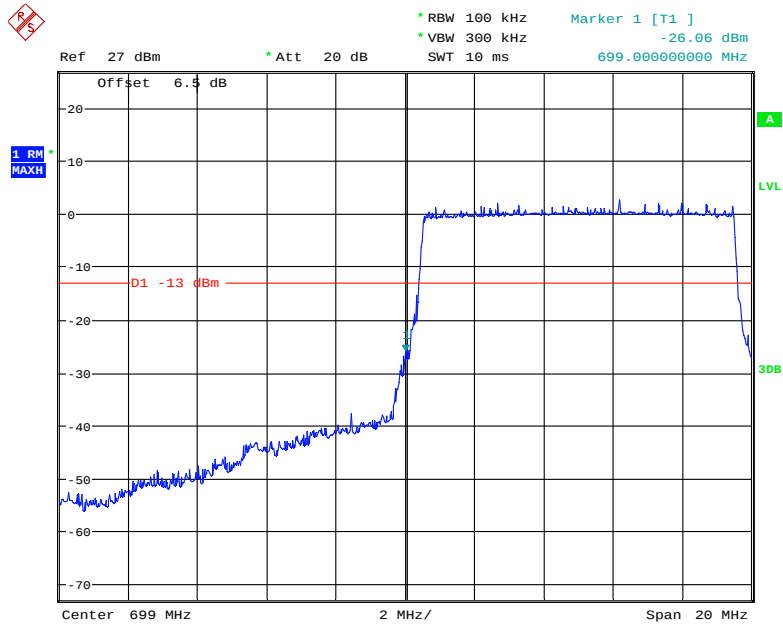
Date: 25.FEB.2020 16:59:53

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



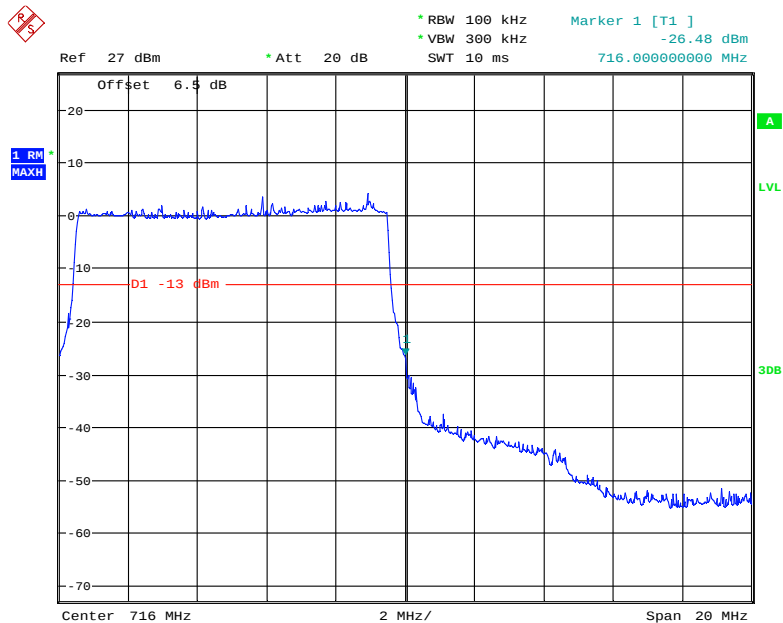
Date: 25.FEB.2020 17:01:32

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



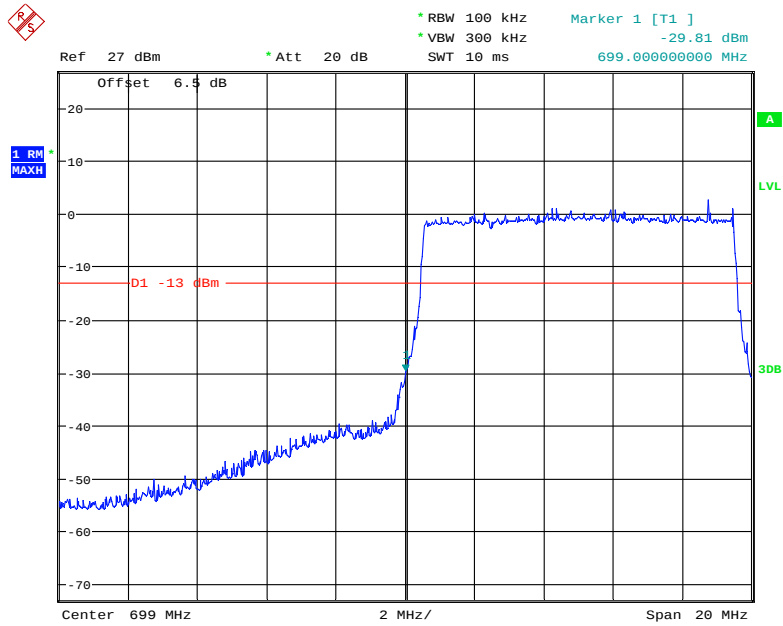
Date: 25.FEB.2020 17:03:57

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



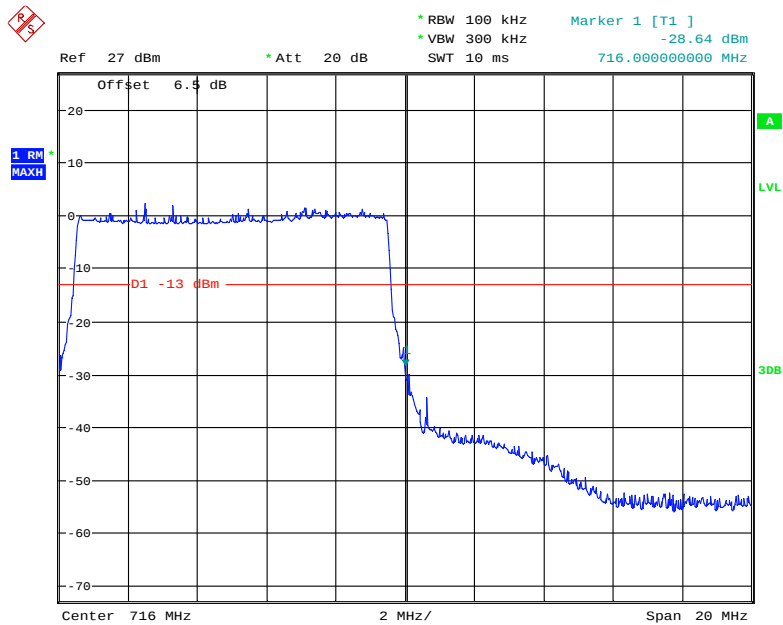
Date: 25.FEB.2020 17:07:02

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



Date: 25.FEB.2020 17:04:49

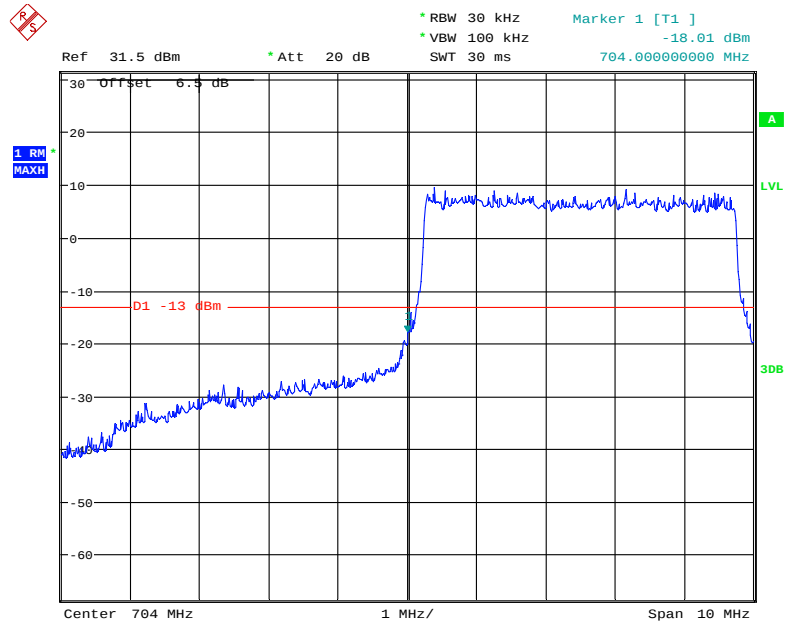
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 25.FEB.2020 17:05:52

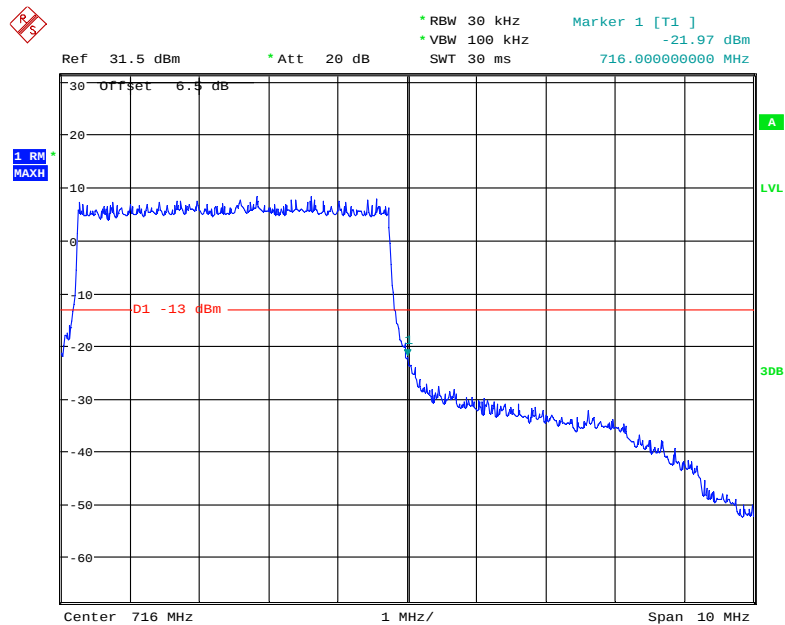
Band 17:

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



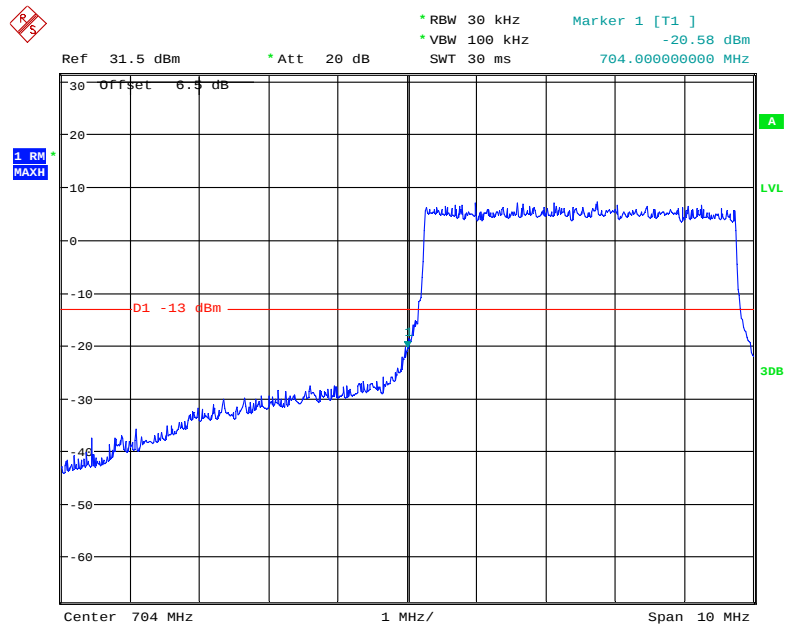
Date: 17.JAN.2020 15:36:39

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



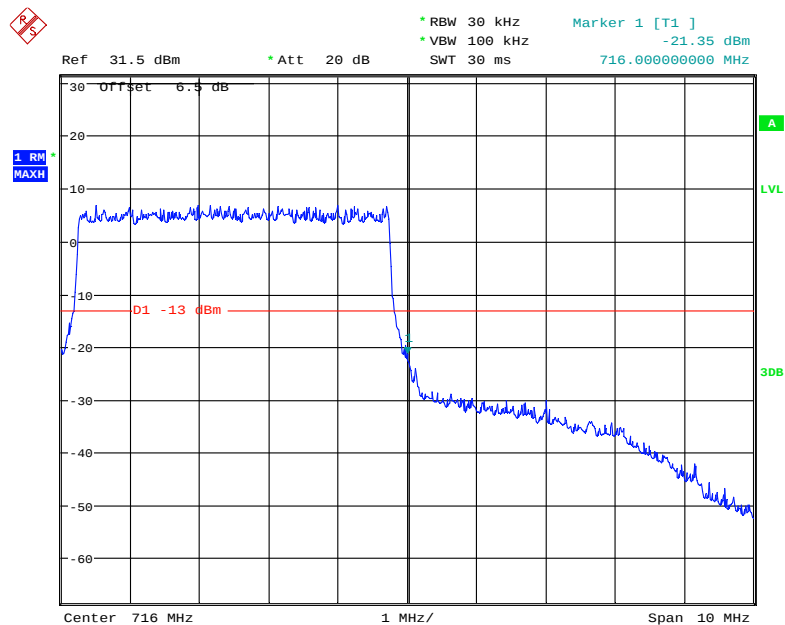
Date: 17.JAN.2020 15:40:40

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



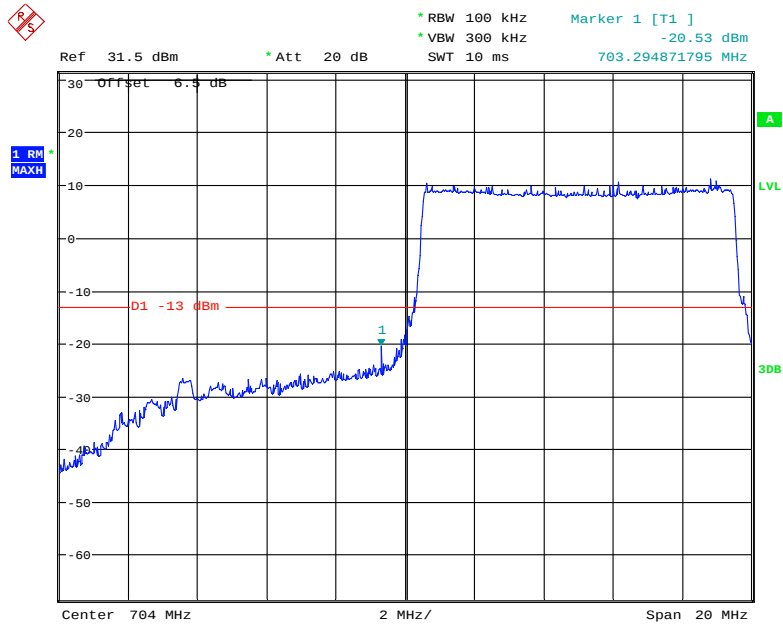
Date: 17.JAN.2020 15:39:06

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



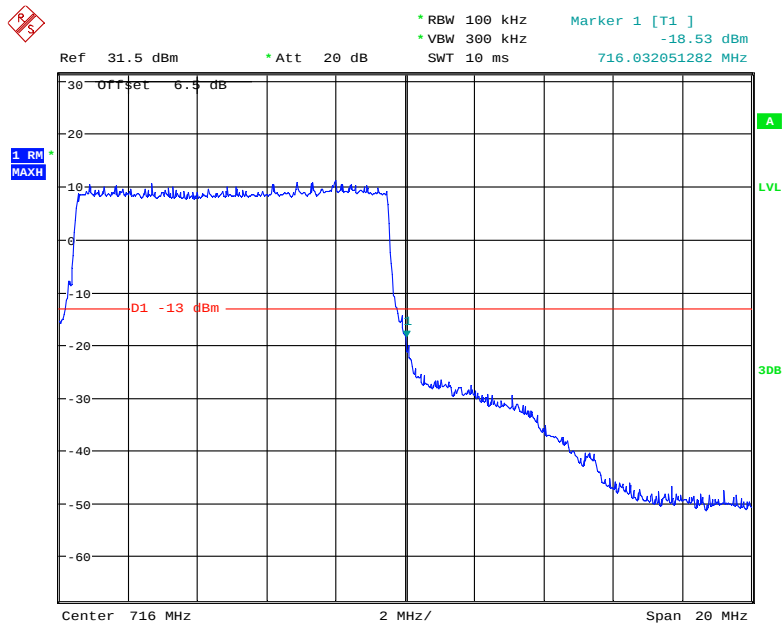
Date: 17.JAN.2020 15:40:05

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



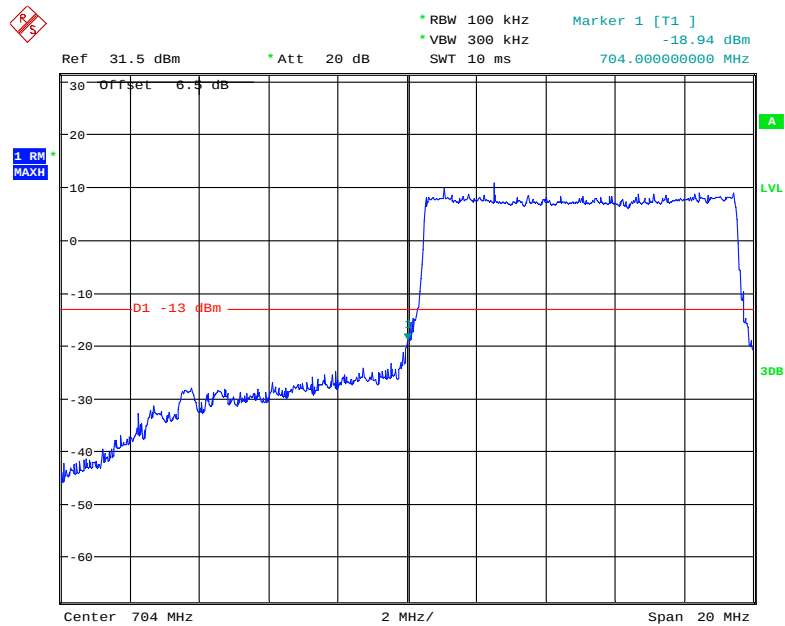
Date: 17.JAN.2020 15:45:28

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



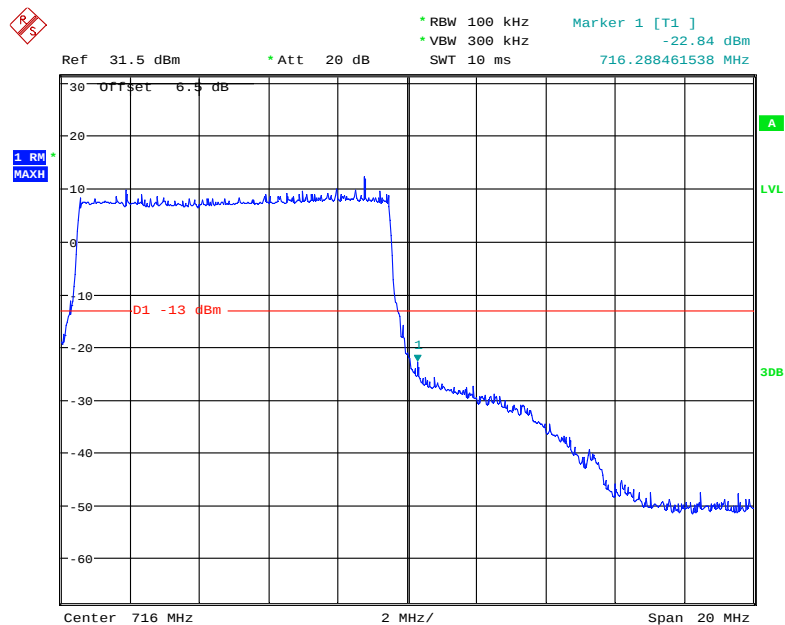
Date: 17.JAN.2020 15:42:49

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



Date: 17.JAN.2020 15:44:34

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



Date: 17.JAN.2020 15:43:48

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

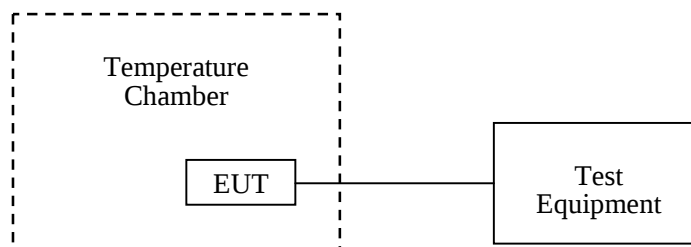
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2020-02-25.

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.	4	0.0048	2.5
-20		2	0.0024	2.5
-10		3	0.0036	2.5
0		5	0.0060	2.5
10		-3	-0.0036	2.5
20		4	0.0048	2.5
30		3	0.0036	2.5
40		-5	-0.0060	2.5
50		-3	-0.0036	2.5
20	L.V.	5	0.0060	2.5
	H.V.	4	0.0048	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.	4	0.0048	2.5
-20		5	0.0060	2.5
-10		-3	-0.0036	2.5
0		4	0.0048	2.5
10		3	0.0036	2.5
20		-5	-0.0060	2.5
30		3	0.0036	2.5
40		2	0.0024	2.5
50		-4	-0.0048	2.5
20	L.V.	4	0.0048	2.5
	H.V.	-3	-0.0036	2.5

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

Middle Channel, $f_0=1880.0\text{ MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	4	0.0021	pass
-20		3	0.0016	pass
-10		5	0.0027	pass
0		-3	-0.0016	pass
10		5	0.0027	pass
20		3	0.0016	pass
30		4	0.0021	pass
40		2	0.0011	pass
50		4	0.0021	pass
20	L.V.	-4	-0.0021	pass
	H.V.	3	0.0016	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.	5	0.0027	pass
-20		2	0.0011	pass
-10		4	0.0021	pass
0		-4	-0.0021	pass
10		-3	-0.0016	pass
20		4	0.0021	pass
30		2	0.0011	pass
40		5	0.0027	pass
50		3	0.0016	pass
20	L.V.	-3	-0.0016	pass
	H.V.	-5	-0.0027	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.	-3	-0.0016	pass
-20		-6	-0.0032	pass
-10		-4	-0.0021	pass
0		-5	-0.0027	pass
10		-3	-0.0016	pass
20		-3	-0.0016	pass
30		-3	-0.0016	pass
40		-3	-0.0016	pass
50		-4	-0.0021	pass
20	L.V.	-5	-0.0027	pass
	H.V.	-4	-0.0021	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.	1710.4596	1754.6243	1710	1755
-20		1710.4625	1754.6236	1710	1755
-10		1710.4629	1754.6268	1710	1755
0		1710.4653	1754.6225	1710	1755
10		1710.4628	1754.6246	1710	1755
20		1710.4648	1754.6253	1710	1755
30		1710.4648	1754.6259	1710	1755
40		1710.4631	1754.6221	1710	1755
50		1710.4661	1754.6226	1710	1755
20	L.V.	1710.4586	1754.6234	1710	1755
	H.V.	1710.4639	1754.6246	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.	2500.4732	2569.6954	2500	2570
-20		2500.4753	2569.6982	2500	2570
-10		2500.4729	2569.6959	2500	2570
0		2500.4763	2569.6984	2500	2570
10		2500.4734	2569.6952	2500	2570
20		2500.4739	2569.6943	2500	2570
30		2500.4743	2569.6953	2500	2570
40		2500.4732	2569.6942	2500	2570
50		2500.4732	2569.6982	2500	2570
20	L.V.	2500.4734	2569.6946	2500	2570
	H.V.	2500.4766	2569.6980	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.	699.5231	715.5859	699	716
-20		699.5222	715.5863	699	716
-10		699.5241	715.5874	699	716
0		699.5228	715.5863	699	716
10		699.5228	715.5864	699	716
20		699.5232	715.5868	699	716
30		699.5217	715.5853	699	716
40		699.5246	715.5889	699	716
50		699.5237	715.5863	699	716
20	L.V.	699.5235	715.5884	699	716
	H.V.	699.5216	715.5876	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.	704.3859	715.6894	704	716
-20		704.3858	715.6909	704	716
-10		704.3871	715.6916	704	716
0		704.3873	715.6906	704	716
10		704.3872	715.6902	704	716
20		704.3868	715.6896	704	716
30		704.3872	715.6912	704	716
40		704.3882	715.6913	704	716
50		704.3881	715.6911	704	716
20	L.V.	704.3862	715.7252	704	716
	H.V.	704.3887	715.7260	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.	-6	-0.0032	pass
-20		-7	-0.0037	pass
-10		-2	-0.0011	pass
0		-5	-0.0027	pass
10		-4	-0.0021	pass
20		-4	-0.0021	pass
30		-4	-0.0021	pass
40		-4	-0.0021	pass
50		-6	-0.0032	pass
20	L.V.	-4	-0.0021	pass
	H.V.	-3	-0.0016	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.	1710.4378	1754.7869	1710	1755
-20		1710.439	1754.7877	1710	1755
-10		1710.4377	1754.7866	1710	1755
0		1710.4399	1754.7880	1710	1755
10		1710.4387	1754.7889	1710	1755
20		1710.4386	1754.7884	1710	1755
30		1710.4386	1754.7868	1710	1755
40		1710.4392	1754.7887	1710	1755
50		1710.4383	1754.7891	1710	1755
20	L.V.	1710.4379	1754.7867	1710	1755
	H.V.	1710.4383	1754.7879	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.	2500.5947	2569.7488	2500	2570
-20		2500.5968	2569.7508	2500	2570
-10		2500.5964	2569.7502	2500	2570
0		2500.5953	2569.7495	2500	2570
10		2500.5955	2569.7494	2500	2570
20		2500.5943	2569.7491	2500	2570
30		2500.5969	2569.7574	2500	2570
40		2500.5966	2569.7497	2500	2570
50		2500.5979	2569.7568	2500	2570
20	L.V.	2500.5961	2569.7486	2500	2570
	H.V.	2500.5954	2569.7494	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.	699.5562	715.7834	699	716
-20		699.5566	715.7837	699	716
-10		699.5581	715.7843	699	716
0		699.5582	715.7841	699	716
10		699.5575	715.7841	699	716
20		699.5582	715.7858	699	716
30		699.5573	715.7836	699	716
40		699.5584	715.7846	699	716
50		699.5561	715.7835	699	716
20	L.V.	699.5577	715.7848	699	716
	H.V.	699.5580	715.7851	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.	704.4577	715.7194	704	716
-20		704.4222	715.7451	704	716
-10		704.4359	715.7131	704	716
0		704.3561	715.7117	704	716
10		704.5247	715.7726	704	716
20		704.4538	715.7951	704	716
30		704.4894	715.7742	704	716
40		704.4954	715.6794	704	716
50		704.4290	715.8014	704	716
20	L.V.	704.5479	715.8735	704	716
	H.V.	704.3855	715.8454	704	716

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