FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

BLU Products, Inc.

10814 NW 33rd St # 100 Doral, FL 33172, United States

FCC ID: YHLBLUG50MEGA

Report Type:	Product Type:
Original Report	Mobile Phone

Report Number:	RSZ200603001-00D
Report Date:	2020-07-17
Reviewed By:	Jimmy Xiao RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Mobile Phone
Tested Model	G50 MEGA
Frequency Range	EGSM 850: 824-849 MHz(TX); 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 4: 1710-1755 MHz(TX); 2110-2155 MHz(RX) WCDMA Band 5: 824-849 MHz(TX); 869-894 MHz(RX) LTE Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) LTE Band 4: 1710-1755 MHz(TX); 2110-2155 MHz(RX) LTE Band 5: 824-849 MHz(TX); 869-894 MHz(RX) LTE Band 12: 699-716 MHz(TX); 729-746 MHz(RX) LTE Band 17: 704-716 MHz(TX); 734-746 MHz(RX)
Maximum Target Output Power	EGSM850: 33.5dBm(GMSK) PCS1900: 30.2dBm(GMSK) WCDMA Band 2: 22.5dBm WCDMA Band 4: 22.5dBm WCDMA Band 5: 23.0dBm LTE Band 2: 23.0dBm LTE Band 4: 23.0dBm LTE Band 5: 23.2dBm LTE Band 12: 23.0dBm LTE Band 17: 23.0dBm
Modulation Technique	2G: GMSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antennas
Voltage Range	DC 3.85V from battery or DC 5.0V from adapter
Date of Test	2020-06-09 to 2020-07-17
Sample serial number	RSZ200603001-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2020-06-03
Sample/EUT Status	Good condition
Normal/Extreme Condition	N.V.: Normal Voltage: 3.85V_{DC} L.V.: Low Voltage: 3.5V_{DC} H.V.: High Voltage: 4.4V_{DC}
Adapter information	Model: US-WW-2000 Input: AC 100-240V, 50/60Hz, 0.4A Output: DC 5.0V, 2000mA

Objective

This test report is prepared on behalf of *BLU Products, Inc.* in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Subpart 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 and Part 15B JBP submissions with FCC ID: YHLBLUG50MEGA.

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-603-E.

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℃
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-603-E.

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

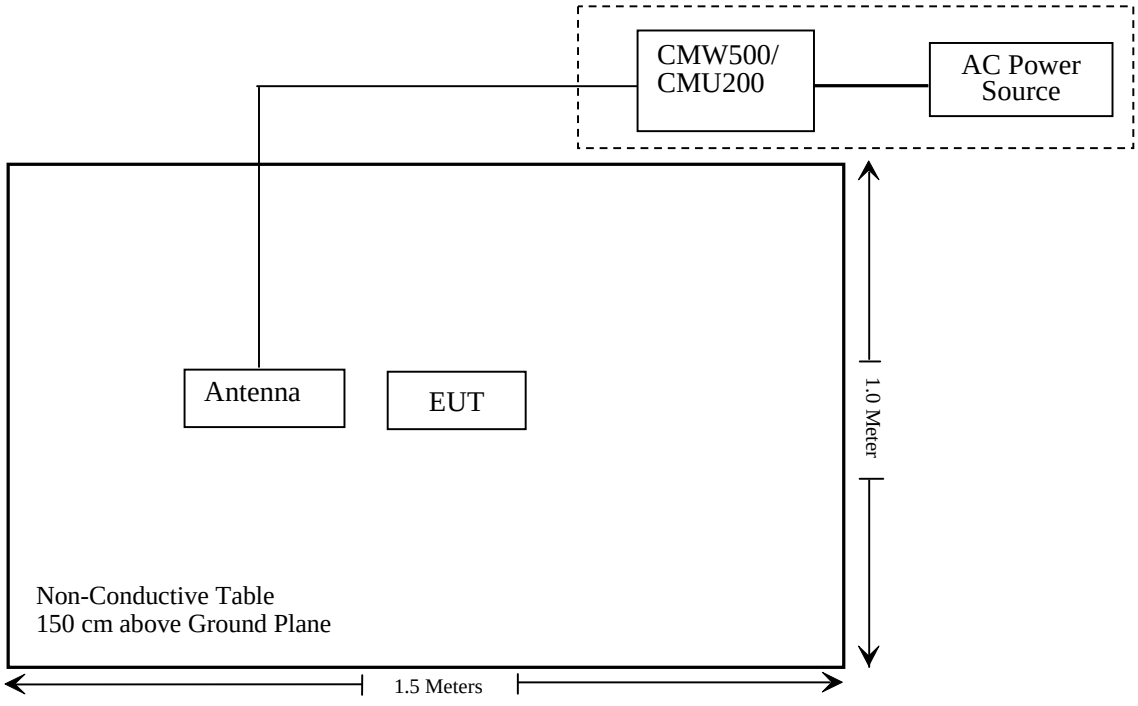
Equipment Modifications

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 (b (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	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53	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: RSZ200603001-SA.

TEST EQUIPMENT LIST

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

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2020/3/2	2021/3/1
WEINSCHEL	3dB Attenuator	Unknow	F-03-EM121	2019/11/29	2020/11/28
Unknow	RF Cable	Unknow	2301 276	2019/11/29	2020/11/28
Unknow	RF Cable	Unknow	DLO J5/W6102	2019/11/29	2020/11/28
Weinschel	Power divider	1515	MY628	2019/11/29	2020/11/28
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	115500	2019/7/22	2020/7/21
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2019/7/9	2020/7/8
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2020/7/9	2021/7/8
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2020/1/5	2021/1/5
Fluke	Digital Multimeter	287	19000011	2020/4/12	2021/4/12

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

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

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ200603001-SA.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50 (b) (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.

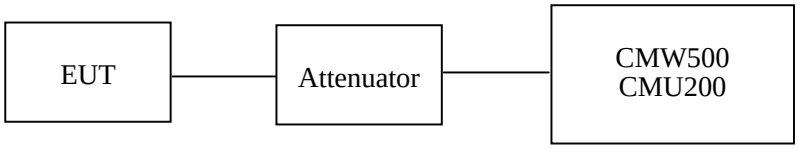
According to §27.50(c), Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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

Test Procedure

Conducted method:

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



Radiated method:

TIA-603-E section 2.2.17

Test Data

Environmental Conditions

Temperature:	23~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Gavin Guo from 2020-06-10 to 2020-06-11.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	33.26	38.45
	190	836.6	33.25	38.45
	251	848.8	33.20	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	33.21	30.82	28.59	26.47	38.45
	190	836.6	33.12	30.72	28.47	26.38	38.45
	251	848.8	33.06	30.61	28.40	26.38	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		22.50	22.59	22.50
		HSDPA	1	22.17	22.21	22.11
			2	20.92	21.41	20.99
			3	21.32	21.20	21.06
			4	21.37	21.04	21.09
		HSUPA	1	22.15	22.51	22.13
			2	21.39	21.39	20.71
			3	21.15	21.16	21.12
			4	21.53	21.27	21.24
			5	21.25	21.53	21.04

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.96	33
	661	1880.0	29.90	33
	810	1909.8	29.49	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.99	27.14	25.07	22.64	33
	661	1880.0	29.92	27.03	24.92	22.64	33
	810	1909.8	29.54	26.89	24.83	22.47	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		22.40	22.21	22.30
		HSDPA	1	21.83	21.23	20.96
			2	21.53	21.75	21.41
			3	21.36	21.83	21.45
			4	21.63	21.85	21.52
		HSUPA	1	21.85	21.17	20.92
			2	21.21	21.36	21.19
			3	21.24	21.41	21.22
			4	21.34	21.44	21.30
			5	21.37	21.50	21.34

AWS Band (Part 27)

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band IV)	Normal	RMC12.2k		22.15	22.16	22.08
		HSDPA	1	21.57	21.20	21.40
			2	21.38	21.13	21.08
			3	21.06	20.83	21.08
			4	21.90	21.59	21.45
		HSUPA	1	21.68	21.18	21.40
			2	21.56	21.31	20.85
			3	21.87	21.26	21.19
			4	21.69	21.30	21.30
			5	21.60	21.65	21.44

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.29	13
	Middle	1.33	13
	High	1.25	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.96	13
	Middle	3.13	13
	High	3.46	13
HSDPA (16QAM)	Low	3.22	13
	Middle	3.16	13
	High	3.15	13
HSUPA (BPSK)	Low	3.08	13
	Middle	2.86	13
	High	2.93	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.46	13
	Middle	1.42	13
	High	1.40	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.93	13
	Middle	3.33	13
	High	3.13	13
HSDPA (16QAM)	Low	3.85	13
	Middle	3.24	13
	High	3.42	13
HSUPA (BPSK)	Low	3.54	13
	Middle	3.88	13
	High	3.68	13

AWS Band

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.90	13
	Middle	3.38	13
	High	2.81	13
HSDPA (16QAM)	Low	3.30	13
	Middle	3.19	13
	High	3.50	13
HSUPA (BPSK)	Low	2.82	13
	Middle	3.03	13
	High	3.26	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	83.76	58	1.4	H	24.4	1.90	0.0	22.50	38.45	15.95
836.6	92.23	266	1.2	V	32.2	1.90	0.0	30.30	38.45	8.15
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	90.77	175	1.0	H	21.1	1.30	9.40	29.20	33	3.80
1880.00	83.13	254	1.9	V	13.2	1.30	9.40	21.30	33	11.70

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	76.97	89	2.5	H	17.6	1.90	0.0	15.70	38.45	22.75
836.6	82.85	291	1.6	V	22.9	1.90	0.0	21.00	38.45	17.45
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	82.66	154	2.3	H	13.0	1.30	9.40	21.10	33	11.90
1880.00	76.58	342	2.0	V	6.7	1.30	9.40	14.80	33	18.20
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	87.43	36	1.5	H	14.1	1.30	8.90	21.70	30	8.30
1732.60	82.97	45	2.3	V	10.2	1.30	8.90	17.80	30	12.20

Note:
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level
dBd is for the ERP, dBi is for EIRP.

LTE Band 2:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	22.41	22.53	22.63
		RB1#3	22.45	22.57	22.64
		RB1#5	22.39	22.60	22.61
		RB3#0	22.53	22.69	22.70
		RB3#3	22.56	22.70	22.70
		RB6#0	21.52	21.59	21.55
	16QAM	RB1#0	22.32	21.42	22.31
		RB1#3	22.27	21.46	22.35
		RB1#5	22.30	21.51	22.32
		RB3#0	21.48	21.91	21.74
		RB3#3	21.39	21.92	21.79
		RB6#0	20.65	20.81	20.89
3.0	QPSK	RB1#0	22.47	22.49	22.60
		RB1#8	22.42	22.58	22.57
		RB1#14	22.34	22.57	22.60
		RB6#0	21.50	21.67	21.65
		RB6#9	21.45	21.69	21.73
		RB15#0	21.57	21.60	21.72
	16QAM	RB1#0	21.98	22.16	21.46
		RB1#8	21.94	22.22	21.44
		RB1#14	21.92	22.21	21.46
		RB6#0	20.58	20.88	21.06
		RB6#9	20.59	20.92	20.95
		RB15#0	20.74	20.66	20.80

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	22.41	22.64	22.70
		RB1#13	22.35	22.77	22.56
		RB1#24	22.40	22.83	22.51
		RB15#0	21.48	21.64	21.71
		RB15#10	21.54	21.66	21.67
		RB25#0	21.37	21.61	21.65
	16QAM	RB1#0	20.73	21.89	21.39
		RB1#13	20.67	21.83	21.40
		RB1#24	20.70	21.90	21.37
		RB15#0	20.64	20.58	20.86
		RB15#10	20.67	20.63	20.83
		RB25#0	20.74	20.70	20.70
10.0	QPSK	RB1#0	22.48	22.67	22.67
		RB1#25	22.44	22.64	22.69
		RB1#49	22.47	22.73	22.58
		RB25#0	21.55	21.55	21.73
		RB25#25	21.51	21.72	21.73
		RB50#0	21.59	21.58	21.63
	16QAM	RB1#0	22.01	21.81	21.22
		RB1#25	21.87	21.74	21.22
		RB1#49	21.97	21.85	21.17
		RB25#0	20.71	20.86	20.92
		RB25#25	20.74	20.89	20.93
		RB50#0	20.67	20.74	20.85

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB1#0	22.47	22.53	22.65
		RB1#38	22.47	22.61	22.66
		RB1#74	22.53	22.62	22.59
		RB36#0	21.62	21.69	21.75
		RB36#39	21.51	21.60	21.76
		RB75#0	21.58	21.60	21.69
	16QAM	RB1#0	21.94	21.93	22.17
		RB1#38	22.00	21.99	22.16
		RB1#74	22.01	22.04	22.17
		RB36#0	20.71	20.79	20.93
		RB36#39	20.67	20.88	20.83
		RB75#0	20.68	20.72	20.91
20.0	QPSK	RB1#0	22.55	22.62	22.76
		RB1#50	22.58	22.62	22.74
		RB1#99	22.78	22.72	22.81
		RB50#0	21.54	21.60	21.74
		RB50#50	21.62	21.71	21.71
		RB100#0	21.53	21.63	21.71
	16QAM	RB1#0	21.78	21.63	22.47
		RB1#50	21.70	21.66	22.48
		RB1#99	21.87	21.73	22.44
		RB50#0	20.71	20.83	20.89
		RB50#50	20.76	20.85	20.77
		RB100#0	20.67	20.73	20.96

Peak-to-average ratio (PAR)

20MHz bandwidth

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.49	13	Pass
QPSK (100RB Size)	5.51	13	Pass
16QAM (1RB Size)	5.61	13	Pass
16QAM (100RB Size)	6.31	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	82.16	42	2.1	H	12.5	1.30	9.40	20.60	33
1880.00	75.57	219	1.3	V	5.7	1.30	9.40	13.80	33
3 MHz Bandwidth									
1880.00	82.07	114	1.7	H	12.4	1.30	9.40	20.50	33
1880.00	75.01	56	1.1	V	5.1	1.30	9.40	13.20	33
5 MHz Bandwidth									
1880.00	81.67	80	2.1	H	12.0	1.30	9.40	20.10	33
1880.00	74.27	164	2.4	V	4.4	1.30	9.40	12.50	33
10 MHz Bandwidth									
1880.00	81.45	146	2.4	H	11.8	1.30	9.40	19.90	33
1880.00	74.25	312	1.3	V	4.3	1.30	9.40	12.40	33
15 MHz Bandwidth									
1880.00	80.65	0	2.2	H	11.0	1.30	9.40	19.10	33
1880.00	74.19	211	1.7	V	4.3	1.30	9.40	12.40	33
20 MHz Bandwidth									
1880.00	80.60	47	2.3	H	10.9	1.30	9.40	19.00	33
1880.00	74.14	250	1.1	V	4.2	1.30	9.40	12.30	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	81.94	290	1.6	H	12.3	1.30	9.40	20.40	33
1880.00	75.53	287	2.1	V	5.6	1.30	9.40	13.70	33
3 MHz Bandwidth									
1880.00	81.88	93	2.2	H	12.2	1.30	9.40	20.30	33
1880.00	75.41	357	2.4	V	5.5	1.30	9.40	13.60	33
5 MHz Bandwidth									
1880.00	81.41	129	2.5	H	11.7	1.30	9.40	19.80	33
1880.00	75.30	218	1.6	V	5.4	1.30	9.40	13.50	33
10 MHz Bandwidth									
1880.00	80.75	23	1.3	H	11.1	1.30	9.40	19.20	33
1880.00	75.25	162	1.4	V	5.3	1.30	9.40	13.40	33
15 MHz Bandwidth									
1880.00	80.74	37	2.2	H	11.1	1.30	9.40	19.20	33
1880.00	75.17	278	1.8	V	5.3	1.30	9.40	13.40	33
20 MHz Bandwidth									
1880.00	80.69	60	2.2	H	11.0	1.30	9.40	19.10	33
1880.00	75.12	31	2.0	V	5.2	1.30	9.40	13.30	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	22.31	22.32	22.39
		RB1#3	22.34	22.29	22.37
		RB1#5	22.31	22.37	22.46
		RB3#0	22.37	22.44	22.28
		RB3#3	22.40	22.39	22.37
		RB6#0	21.25	21.48	21.30
	16QAM	RB1#0	22.07	22.20	21.39
		RB1#3	22.07	22.21	21.39
		RB1#5	22.08	22.20	21.40
		RB3#0	21.47	21.30	21.34
		RB3#3	21.52	21.38	21.31
		RB6#0	20.69	20.61	20.71
3.0	QPSK	RB1#0	22.25	22.41	22.53
		RB1#8	22.21	22.36	22.47
		RB1#14	22.21	22.41	22.44
		RB6#0	21.32	21.48	21.33
		RB6#9	21.23	21.51	21.29
		RB15#0	21.42	21.40	21.33
	16QAM	RB1#0	21.83	22.23	21.40
		RB1#8	21.78	22.21	21.41
		RB1#14	21.77	22.23	21.48
		RB6#0	20.40	20.68	20.71
		RB6#9	20.39	20.61	20.70
		RB15#0	20.60	20.51	20.54

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	22.28	22.49	22.17
		RB1#13	22.30	22.53	22.10
		RB1#24	22.28	22.58	22.08
		RB15#0	21.41	21.37	21.43
		RB15#10	21.30	21.23	21.40
		RB25#0	21.40	21.36	21.37
	16QAM	RB1#0	20.53	21.66	20.95
		RB1#13	20.61	21.60	20.91
		RB1#24	20.61	21.54	20.97
		RB15#0	20.66	20.47	20.51
		RB15#10	20.58	20.40	20.48
		RB25#0	20.56	20.55	20.33
10.0	QPSK	RB1#0	22.22	22.35	22.45
		RB1#25	22.26	22.45	22.57
		RB1#49	22.25	22.43	22.48
		RB25#0	21.27	21.35	21.25
		RB25#25	21.29	21.40	21.35
		RB50#0	21.38	21.38	21.37
	16QAM	RB1#0	21.56	21.55	20.88
		RB1#25	21.57	21.54	20.93
		RB1#49	21.56	21.57	20.87
		RB25#0	20.53	20.63	20.57
		RB25#25	20.49	20.60	20.55
		RB50#0	20.51	20.57	20.49

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB1#0	22.23	22.35	22.52
		RB1#38	22.15	22.42	22.51
		RB1#74	22.31	22.47	22.41
		RB36#0	21.24	21.31	21.44
		RB36#39	21.34	21.42	21.30
		RB75#0	21.28	21.46	21.34
	16QAM	RB1#0	21.52	21.60	21.74
		RB1#38	21.51	21.53	21.75
		RB1#74	21.62	21.65	21.72
		RB36#0	20.54	20.59	20.51
		RB36#39	20.60	20.60	20.56
		RB75#0	20.45	20.57	20.43
20.0	QPSK	RB1#0	22.53	22.31	22.53
		RB1#50	22.47	22.34	22.41
		RB1#99	22.60	22.41	22.50
		RB50#0	21.24	21.32	21.33
		RB50#50	21.33	21.46	21.45
		RB100#0	21.28	21.45	21.32
	16QAM	RB1#0	21.36	22.01	22.07
		RB1#50	21.25	21.90	22.06
		RB1#99	21.40	21.85	22.03
		RB50#0	20.50	20.63	20.42
		RB50#50	20.58	20.60	20.47
		RB100#0	20.45	20.60	20.61

Peak-to-average ratio (PAR)

20MHz bandwidth

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.23	13	Pass
QPSK (100RB Size)	5.48	13	Pass
16QAM (1RB Size)	5.29	13	Pass
16QAM (100RB Size)	6.31	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	85.37	208	1.0	H	13.0	1.30	8.90	20.60	30
1732.50	84.79	257	1.1	V	12.1	1.30	8.90	19.70	30
3 MHz Bandwidth									
1732.50	85.37	208	1.0	H	13.0	1.30	8.90	20.60	30
1732.50	84.79	257	1.1	V	12.1	1.30	8.90	19.70	30
5 MHz Bandwidth									
1732.50	86.25	55	1.2	H	12.9	1.30	8.90	20.50	30
1732.50	84.37	149	1.8	V	11.6	1.30	8.90	19.20	30
10 MHz Bandwidth									
1732.50	86.15	236	1.8	H	12.8	1.30	8.90	20.40	30
1732.50	84.15	333	1.2	V	11.4	1.30	8.90	19.00	30
15 MHz Bandwidth									
1732.50	85.94	94	1.3	H	12.6	1.30	8.90	20.20	30
1732.50	84.14	116	1.8	V	11.4	1.30	8.90	19.00	30
20 MHz Bandwidth									
1732.50	86.11	46	1.1	H	12.8	1.30	8.90	20.40	30
1732.50	85.73	1	1.5	V	12.0	1.30	8.90	19.60	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	86.74	9	1.6	H	14.0	1.30	8.90	21.60	30
1732.50	86.63	82	1.2	V	13.3	1.30	8.90	20.90	30
3 MHz Bandwidth									
1732.50	86.63	305	2.0	H	13.9	1.30	8.90	21.50	30
1732.50	86.24	155	1.8	V	12.9	1.30	8.90	20.50	30
5 MHz Bandwidth									
1732.50	86.07	327	1.2	H	13.3	1.30	8.90	20.90	30
1732.50	85.60	204	1.4	V	12.3	1.30	8.90	19.90	30
10 MHz Bandwidth									
1732.50	86.02	29	1.3	H	13.3	1.30	8.90	20.90	30
1732.50	85.30	327	2.5	V	12.0	1.30	8.90	19.60	30
15 MHz Bandwidth									
1732.50	86.00	214	1.4	H	13.3	1.30	8.90	20.90	30
1732.50	85.25	225	2.1	V	11.9	1.30	8.90	19.50	30
20 MHz Bandwidth									
1732.50	85.98	139	1.9	H	13.3	1.30	8.90	20.90	30
1732.50	85.18	333	2.3	V	11.9	1.30	8.90	19.50	30

LTE Band 5:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	22.56	22.63	22.69
		RB1#3	22.55	22.62	22.57
		RB1#5	22.50	22.70	22.69
		RB3#0	22.57	22.85	22.77
		RB3#3	22.56	22.77	22.64
		RB6#0	21.54	21.85	21.60
	16QAM	RB1#0	22.04	22.31	21.46
		RB1#3	22.05	22.42	21.49
		RB1#5	22.07	22.43	21.45
		RB3#0	21.71	21.68	21.81
		RB3#3	21.72	21.70	21.75
		RB6#0	21.02	20.87	20.89
3.0	QPSK	RB1#0	22.50	22.69	22.68
		RB1#8	22.48	22.64	22.65
		RB1#14	22.50	22.65	22.68
		RB6#0	21.59	21.69	21.67
		RB6#9	21.69	21.78	21.54
		RB15#0	21.50	21.71	21.52
	16QAM	RB1#0	21.93	22.28	21.34
		RB1#8	21.86	22.40	21.30
		RB1#14	21.95	22.46	21.30
		RB6#0	20.77	20.80	20.82
		RB6#9	20.68	20.89	20.88
		RB15#0	20.75	20.86	20.55

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	22.58	22.82	22.62
		RB1#13	22.63	22.81	22.66
		RB1#24	22.59	22.75	22.62
		RB15#0	21.70	21.75	21.71
		RB15#10	21.67	21.70	21.76
		RB25#0	21.66	21.84	21.70
	16QAM	RB1#0	20.74	21.84	21.31
		RB1#13	20.83	21.95	21.33
		RB1#24	20.75	21.82	21.32
		RB15#0	20.90	20.75	20.72
		RB15#10	20.76	20.75	20.68
		RB25#0	20.77	20.89	20.58
10.0	QPSK	RB1#0	22.53	22.83	22.68
		RB1#25	22.58	22.88	22.66
		RB1#49	22.63	22.80	22.65
		RB25#0	21.67	21.75	21.66
		RB25#25	21.76	21.77	21.57
		RB50#0	21.69	21.90	21.63
	16QAM	RB1#0	21.81	21.89	21.13
		RB1#25	21.76	21.92	21.18
		RB1#49	21.76	21.83	21.15
		RB25#0	20.76	20.89	20.84
		RB25#25	20.83	20.82	20.75
		RB50#0	20.75	20.98	20.88

Peak-to-average ratio (PAR)

10MHz bandwidth

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.94	13	Pass
QPSK (50RB Size)	5.42	13	Pass
16QAM (1RB Size)	6.31	13	Pass
16QAM (50RB Size)	6.15	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									
836.5	83.33	315	1.7	H	23.3	1.90	0.0	21.40	38.45
836.5	83.35	61	1.7	V	24.0	1.90	0.0	22.10	38.45
3 MHz Bandwidth									
836.5	83.05	29	1.5	H	23.1	1.90	0.0	21.20	38.45
836.5	83.15	94	1.8	V	23.8	1.90	0.0	21.90	38.45
5 MHz Bandwidth									
836.5	82.83	254	1.8	H	22.8	1.90	0.0	20.90	38.45
836.5	82.86	111	2.1	V	23.5	1.90	0.0	21.60	38.45
10 MHz Bandwidth									
836.5	82.54	44	1.3	H	22.5	1.90	0.0	20.60	38.45
836.5	82.41	275	1.5	V	23.0	1.90	0.0	21.10	38.45

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									
836.5	82.27	144	2.2	H	22.3	1.90	0.0	20.40	38.45
836.5	83.29	168	1.9	V	23.9	1.90	0.0	22.00	38.45
3 MHz Bandwidth									
836.5	83.08	19	1.3	H	23.7	1.90	0.0	21.80	38.45
836.5	83.96	253	1.2	V	24.0	1.90	0.0	22.10	38.45
5 MHz Bandwidth									
836.5	82.48	53	2.3	H	23.1	1.90	0.0	21.20	38.45
836.5	84.62	169	1.5	V	24.6	1.90	0.0	22.70	38.45
10 MHz Bandwidth									
836.5	82.38	113	1.5	H	23.0	1.90	0.0	21.10	38.45
836.5	84.5	228	2.0	V	24.5	1.90	0.0	22.60	38.45

LTE Band 12:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	22.36	22.28	22.36
		RB1#3	22.42	22.25	22.33
		RB1#5	22.44	22.27	22.32
		RB3#0	22.37	22.43	22.35
		RB3#3	22.31	22.41	22.40
		RB6#0	21.51	21.35	21.34
	16QAM	RB1#0	21.96	22.15	20.98
		RB1#3	21.94	21.95	20.96
		RB1#5	22.03	22.02	21.01
		RB3#0	21.64	21.22	21.36
		RB3#3	21.72	21.23	21.39
		RB6#0	20.79	20.37	20.89
3.0	QPSK	RB1#0	22.36	22.30	22.36
		RB1#8	22.38	22.33	22.36
		RB1#14	22.35	22.31	22.37
		RB6#0	21.68	21.43	21.34
		RB6#9	21.31	21.28	21.28
		RB15#0	21.67	21.33	21.45
	16QAM	RB1#0	21.93	22.11	21.09
		RB1#8	21.84	22.03	21.06
		RB1#14	21.68	21.92	21.00
		RB6#0	20.63	20.59	20.90
		RB6#9	20.67	20.30	20.46
		RB15#0	20.67	20.43	20.53

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	22.50	22.59	22.59
		RB1#13	22.42	22.36	22.62
		RB1#24	22.41	22.58	22.66
		RB15#0	21.77	21.70	21.78
		RB15#10	21.43	21.80	21.92
		RB25#0	21.53	21.68	21.98
	16QAM	RB1#0	22.08	22.26	21.37
		RB1#13	21.77	22.29	21.66
		RB1#24	22.03	22.17	21.59
		RB15#0	20.47	21.16	21.13
		RB15#10	20.64	21.06	20.70
		RB25#0	20.96	20.84	21.15
10.0	QPSK	RB1#0	22.24	22.50	22.50
		RB1#25	21.31	21.81	21.69
		RB1#49	21.45	21.82	21.91
		RB25#0	21.77	21.46	21.81
		RB25#25	22.36	22.82	22.60
		RB50#0	21.69	21.69	21.77
	16QAM	RB1#0	21.39	21.58	21.62
		RB1#25	21.49	21.45	21.52
		RB1#49	22.00	22.11	21.20
		RB25#0	21.79	21.49	21.86
		RB25#25	22.07	22.33	21.57
		RB50#0	22.07	22.64	21.39

Peak-to-average ratio (PAR)

10MHz bandwidth

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.03	13	Pass
QPSK (50RB Size)	5.71	13	Pass
16QAM (1RB Size)	6.15	13	Pass
16QAM (50RB Size)	6.54	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	79.66	151	1.1	H	11.9	1.56	0.0	10.34	34.77
707.5	88.54	345	1.1	V	22.2	1.56	0.0	20.64	34.77
3 MHz Bandwidth									
707.5	79.45	245	1.6	H	11.7	1.56	0.0	10.14	34.77
707.5	88.34	228	1.4	V	22.0	1.56	0.0	20.44	34.77
5 MHz Bandwidth									
707.5	79.22	286	1.6	H	11.4	1.56	0.0	9.84	34.77
707.5	88.19	226	1.3	V	21.9	1.56	0.0	20.34	34.77
10 MHz Bandwidth									
707.5	79.06	245	2.3	H	11.3	1.56	0.0	9.74	34.77
707.5	88.14	147	1.5	V	21.8	1.56	0.0	20.24	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	79.57	93	1.9	H	11.8	1.56	0.0	10.24	34.77
707.5	88.94	160	2.3	V	22.6	1.56	0.0	21.04	34.77
3 MHz Bandwidth									
707.5	79.12	29	1.8	H	11.3	1.56	0.0	9.74	34.77
707.5	88.76	312	1.2	V	22.4	1.56	0.0	20.84	34.77
5 MHz Bandwidth									
707.5	78.83	275	2.2	H	11.0	1.56	0.0	9.44	34.77
707.5	88.71	54	1.7	V	22.4	1.56	0.0	20.84	34.77
10 MHz Bandwidth									
707.5	78.55	46	1.7	H	10.8	1.56	0.0	9.24	34.77
707.5	88.63	100	2.2	V	22.3	1.56	0.0	20.74	34.77

LTE Band 17:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB1#0	22.31	22.67	22.65
		RB1#13	21.36	21.74	21.51
		RB1#24	21.37	21.58	21.63
		RB15#0	21.37	21.37	21.87
		RB15#10	21.86	22.39	21.62
		RB25#0	21.59	21.78	21.94
	16QAM	RB1#0	21.61	21.60	21.67
		RB1#13	21.71	22.27	21.34
		RB1#24	21.61	21.64	21.78
		RB15#0	22.20	22.24	21.22
		RB15#10	21.45	21.50	21.66
		RB25#0	22.02	22.19	21.37
10	QPSK	RB1#0	22.12	22.60	22.72
		RB1#25	21.49	21.77	21.84
		RB1#49	21.33	21.74	21.82
		RB25#0	21.61	21.52	21.76
		RB25#25	21.86	22.29	21.50
		RB50#0	21.49	21.75	21.67
	16QAM	RB1#0	21.49	21.72	21.70
		RB1#25	21.88	22.18	21.35
		RB1#49	21.43	21.78	21.76
		RB25#0	22.05	22.12	21.38
		RB25#25	21.63	21.32	21.86
		RB50#0	22.06	22.33	21.77

Peak-to-average ratio (PAR)

10MHz bandwidth

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.83	13	Pass
QPSK (50RB Size)	5.48	13	Pass
16QAM (1RB Size)	6.99	13	Pass
16QAM (50RB Size)	6.38	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	78.64	258	1.8	H	10.9	1.56	0.0	9.34	34.77
710	88.01	332	2.4	V	21.7	1.56	0.0	20.14	34.77
10 MHz Bandwidth									
710	77.31	87	1.6	H	9.5	1.56	0.0	7.94	34.77
710	85.76	216	2.0	V	19.4	1.56	0.0	17.84	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
710	77.48	226	1.0	H	9.7	1.56	0.0	8.14	34.77
710	87.56	340	1.8	V	21.2	1.56	0.0	19.64	34.77
10 MHz Bandwidth									
710	76.91	64	2.3	H	9.1	1.56	0.0	7.54	34.77
710	85.57	176	1.4	V	19.2	1.56	0.0	17.64	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

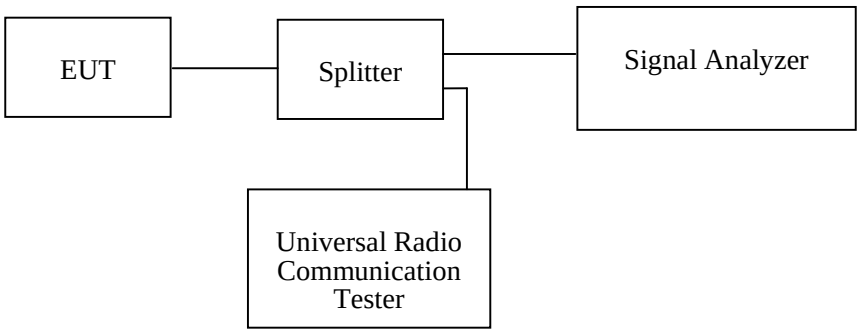
Applicable Standard

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:	23~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Gavin Guo from 2020-06-10 to 2020-07-06.

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	242.00	311.03

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.17	4.68
HSUPA (BPSK)	836.6	4.15	4.68
HSDPA (16QAM)	836.6	4.17	4.68

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	242.00	312.87

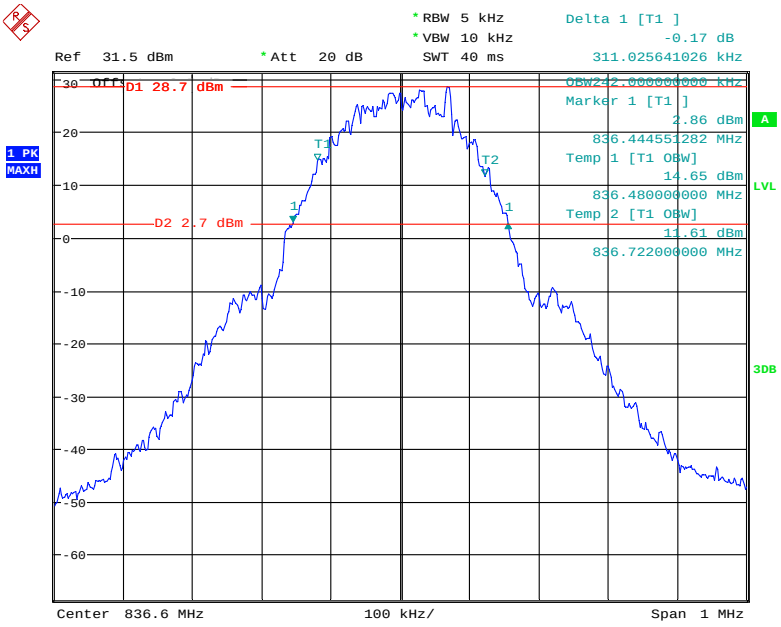
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.17	4.70
HSUPA (BPSK)	1880.0	4.17	4.68
HSDPA (16QAM)	1880.0	4.15	4.68

AWS Band (Part 27)

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1732.6	4.17	4.69
HSUPA (BPSK)	1732.6	4.15	4.67
HSDPA (16QAM)	1732.6	4.17	4.67

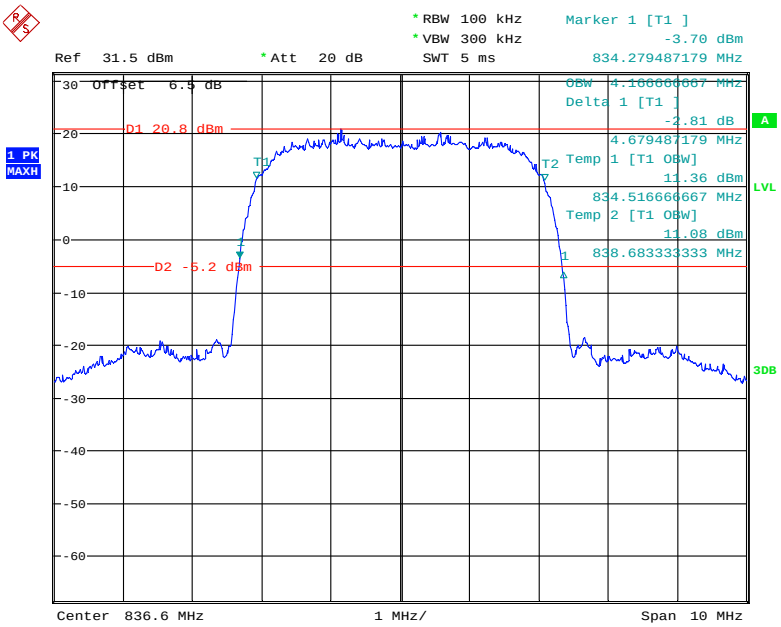
Cellular Band (Part 22H)

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



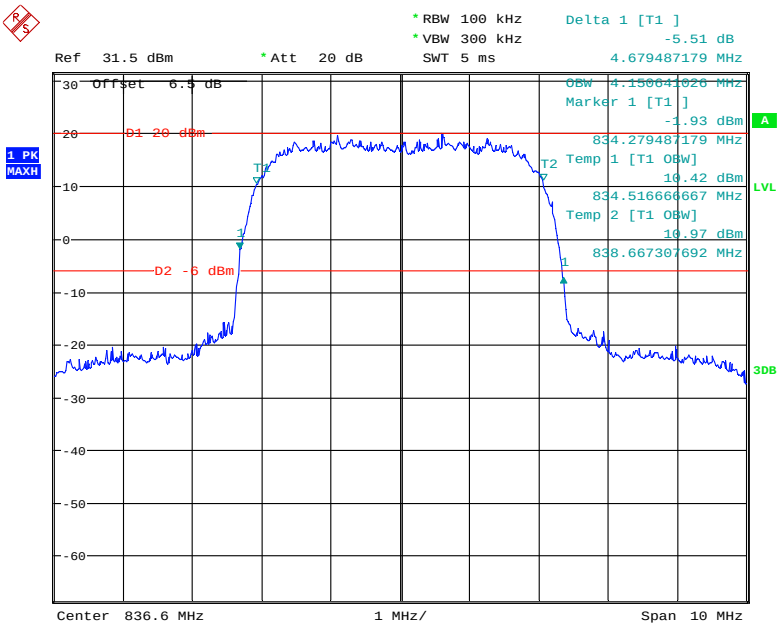
Date: 10.JUN.2020 15:13:39

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



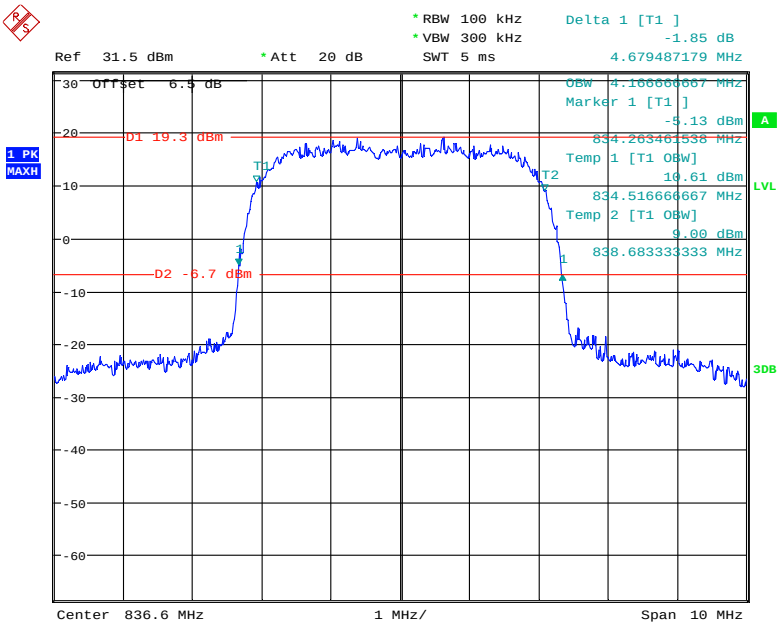
Date: 11.JUN.2020 15:59:04

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



Date: 11.JUN.2020 16:01:15

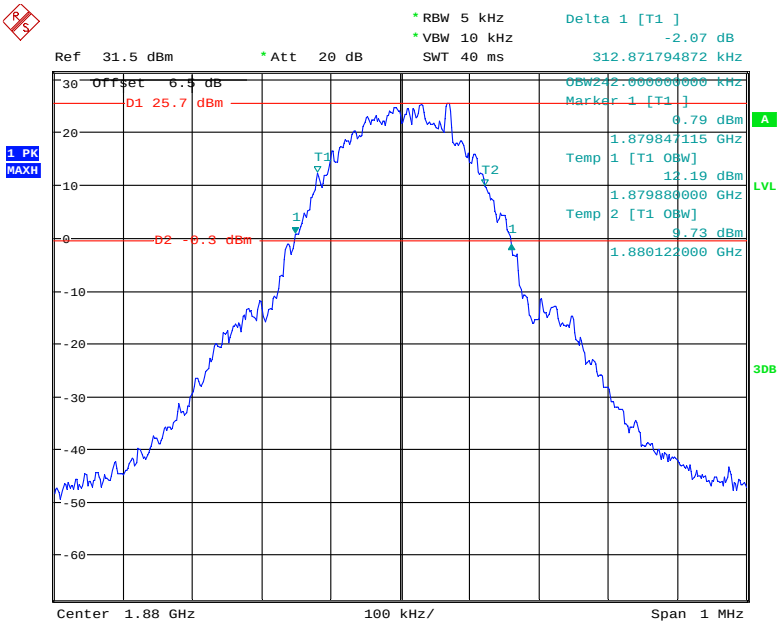
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 11.JUN.2020 16:02:13

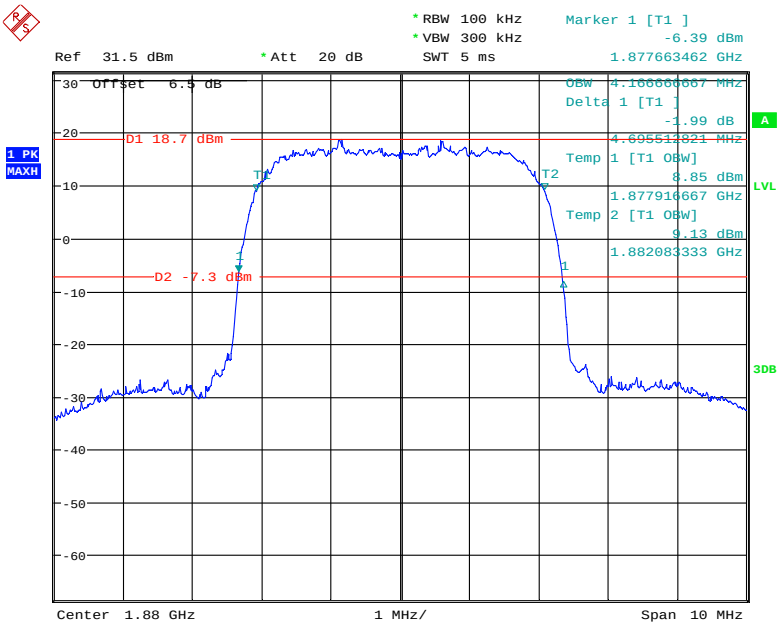
PCS Band (Part 24E)

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



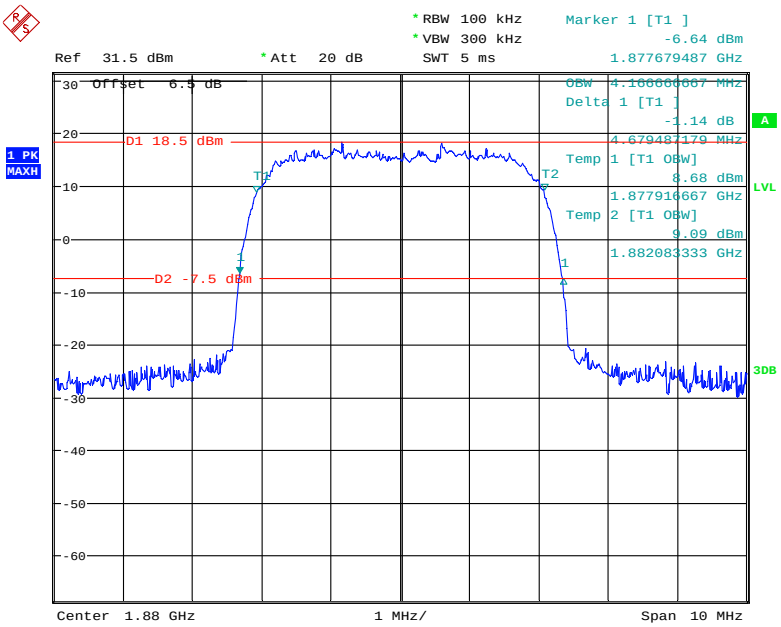
Date: 10.JUN.2020 15:48:05

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



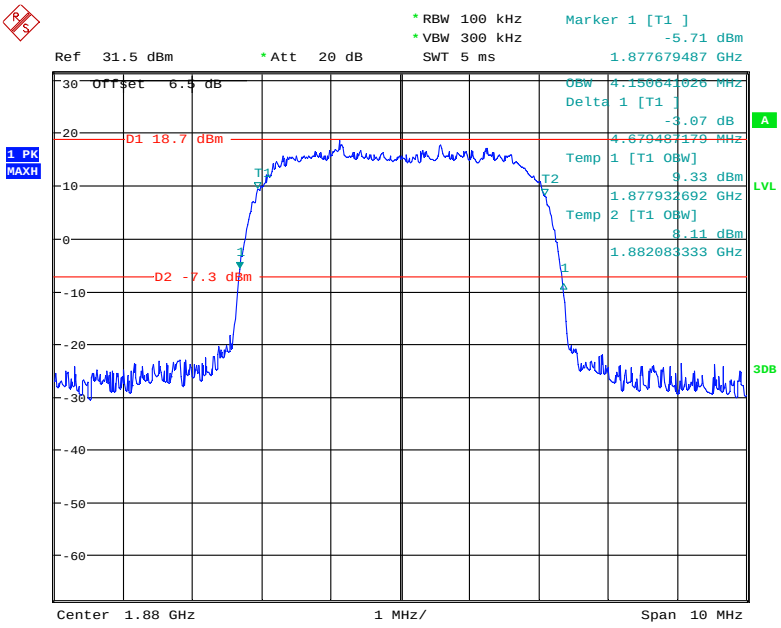
Date: 11.JUN.2020 15:08:41

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



Date: 11.JUN.2020 15:13:30

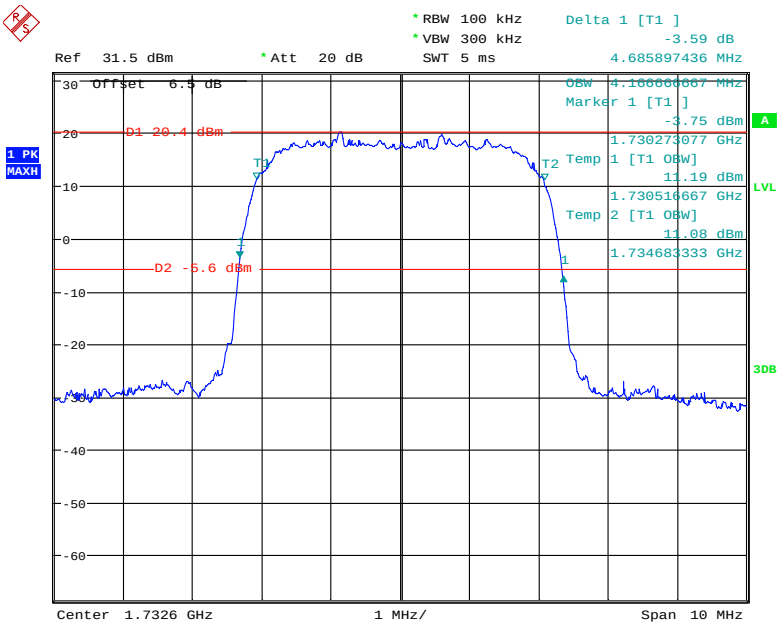
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 11.JUN.2020 15:11:08

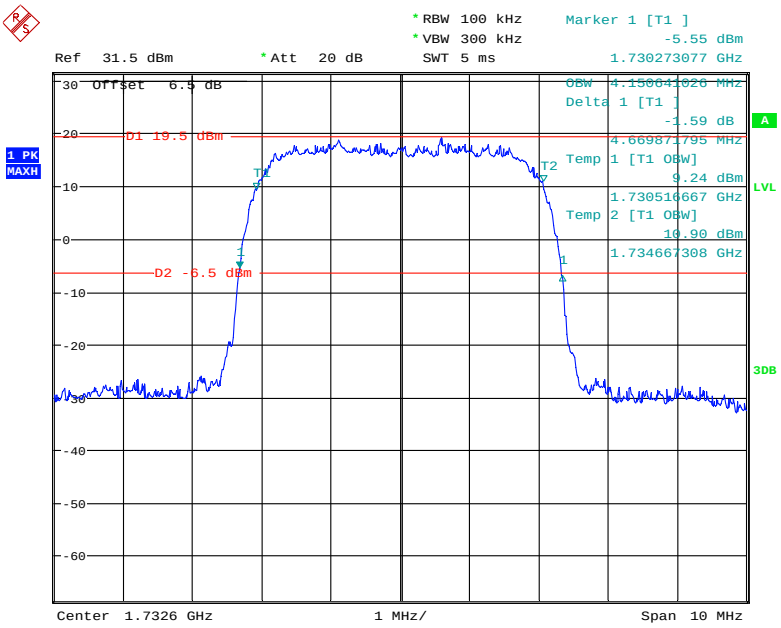
AWS Band (Part 27)

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



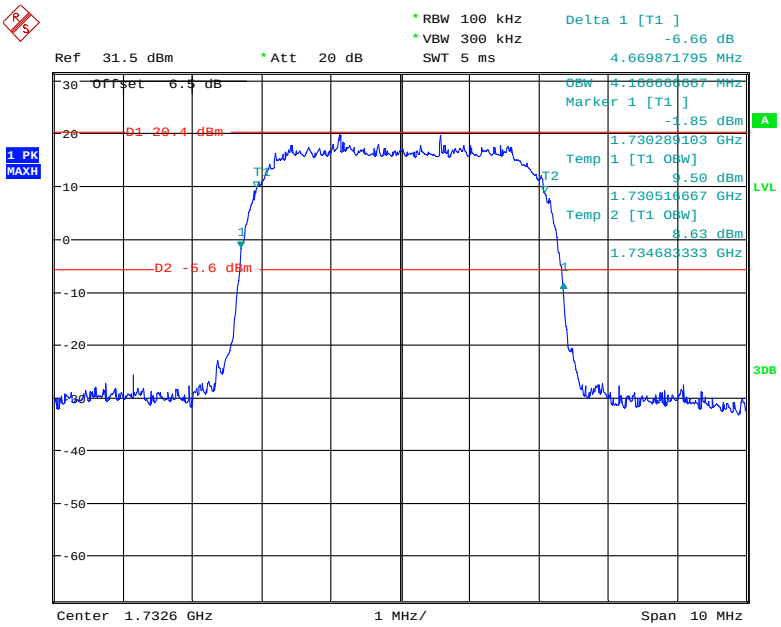
Date: 11.JUN.2020 15:34:19

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



Date: 11.JUN.2020 15:36:37

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

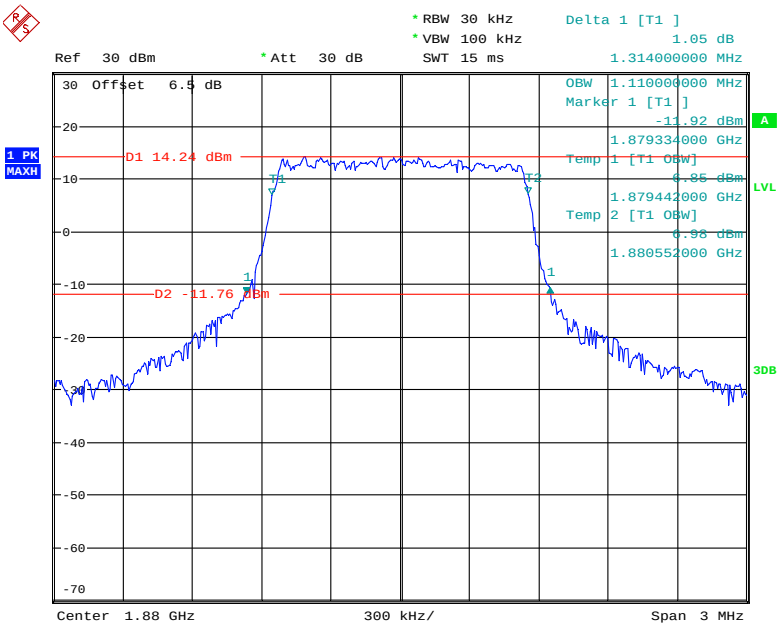


Date: 11.JUN.2020 15:35:12

LTE Band 2: (Middle Channel)

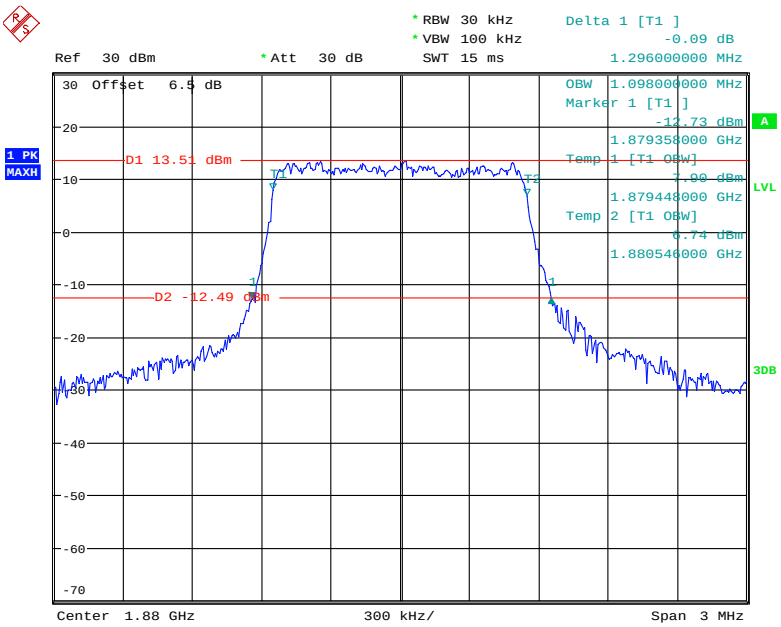
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.110	1.314
	16QAM	1.098	1.296
3.0	QPSK	2.700	3.012
	16QAM	2.700	3.024
5.0	QPSK	4.540	5.417
	16QAM	4.520	5.465
10.0	QPSK	8.960	9.840
	16QAM	8.960	9.960
15.0	QPSK	13.620	15.420
	16QAM	13.560	15.060
20.0	QPSK	18.000	20.000
	16QAM	18.080	19.840

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



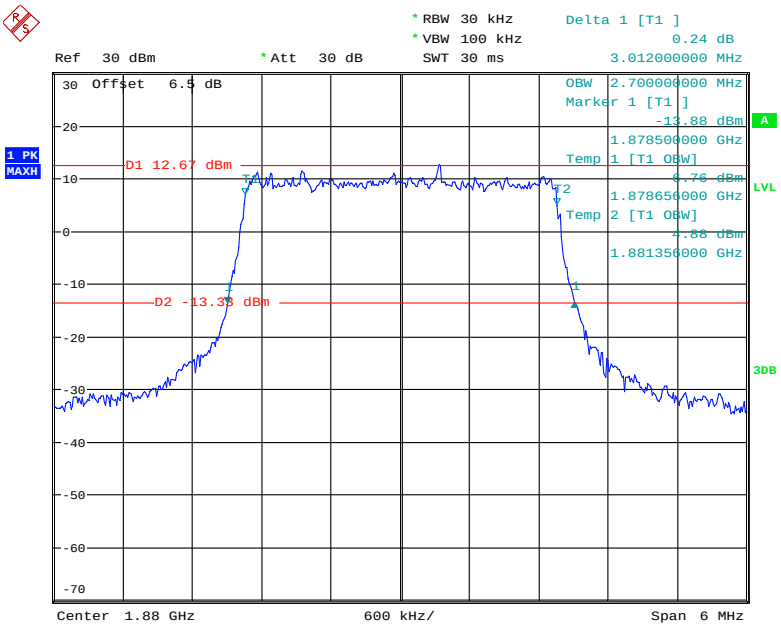
Date: 10.JUN.2020 09:40:55

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



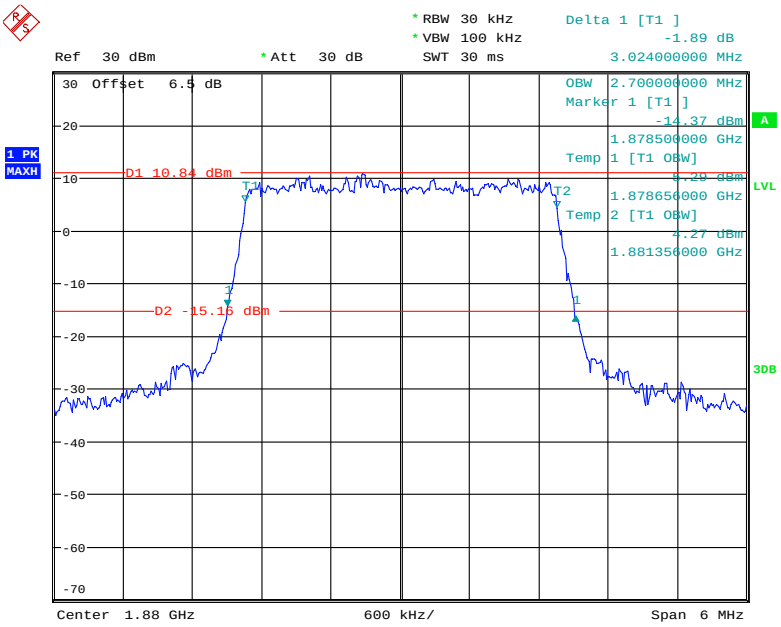
Date: 10.JUN.2020 09:41:16

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



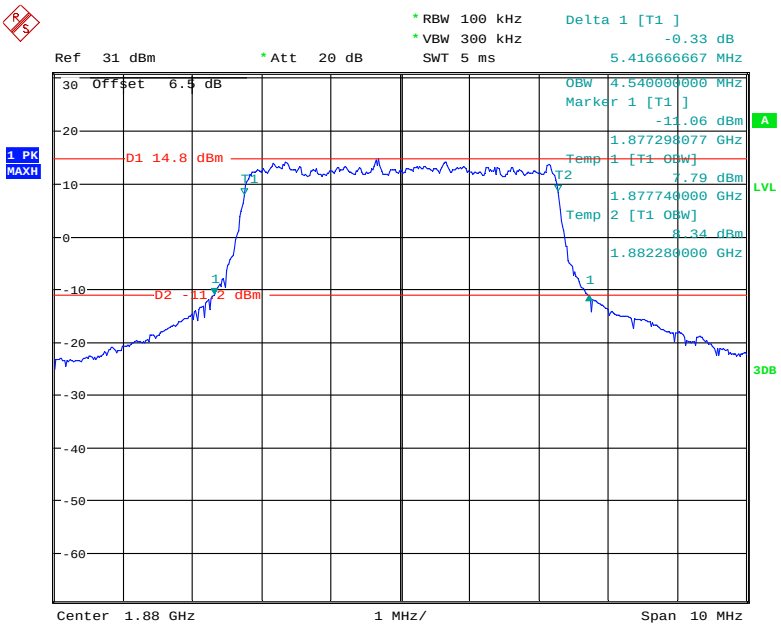
Date: 10.JUN.2020 09:41:39

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



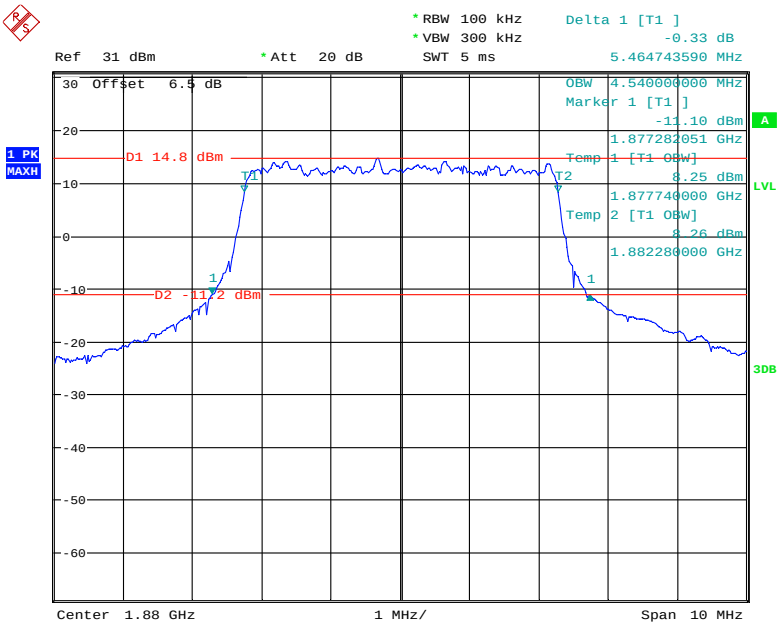
Date: 10.JUN.2020 09:41:59

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



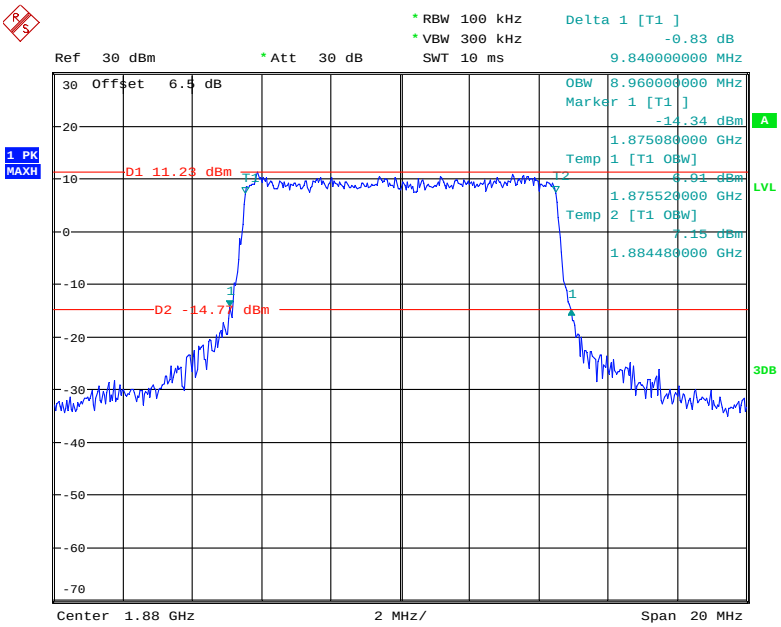
Date: 10.JUN.2020 13:52:52

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



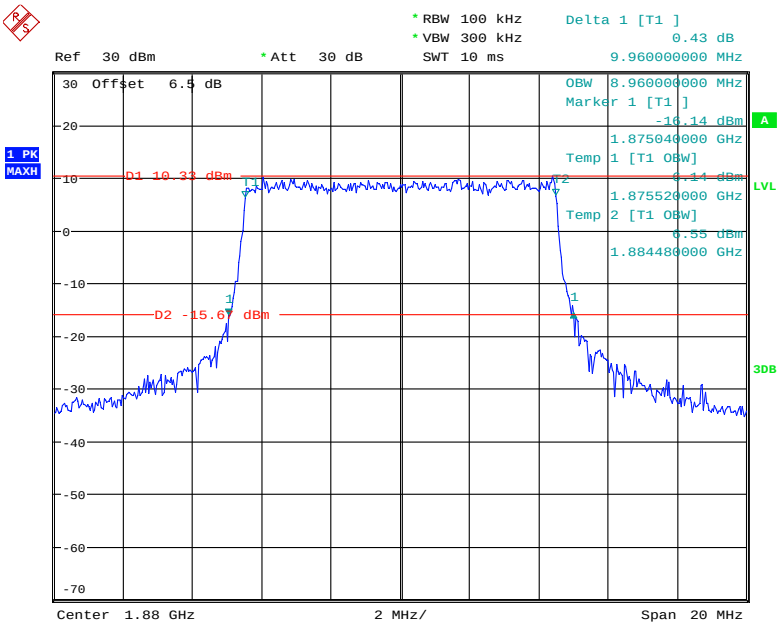
Date: 10.JUN.2020 13:54:45

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



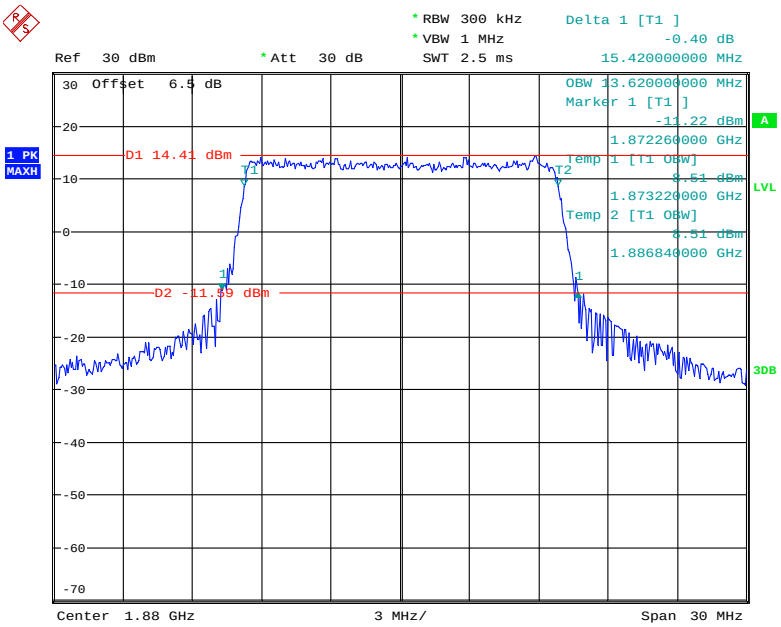
Date: 10.JUN.2020 09:43:21

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



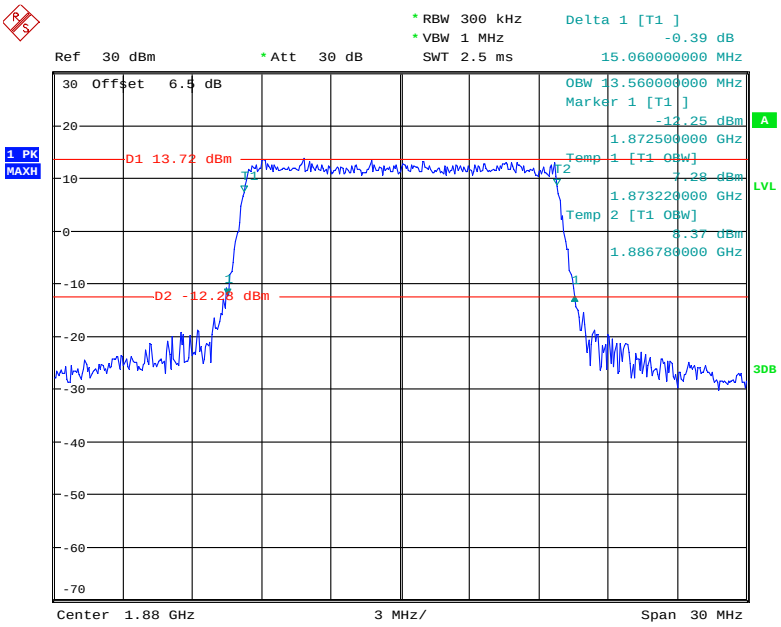
Date: 10.JUN.2020 09:43:43

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



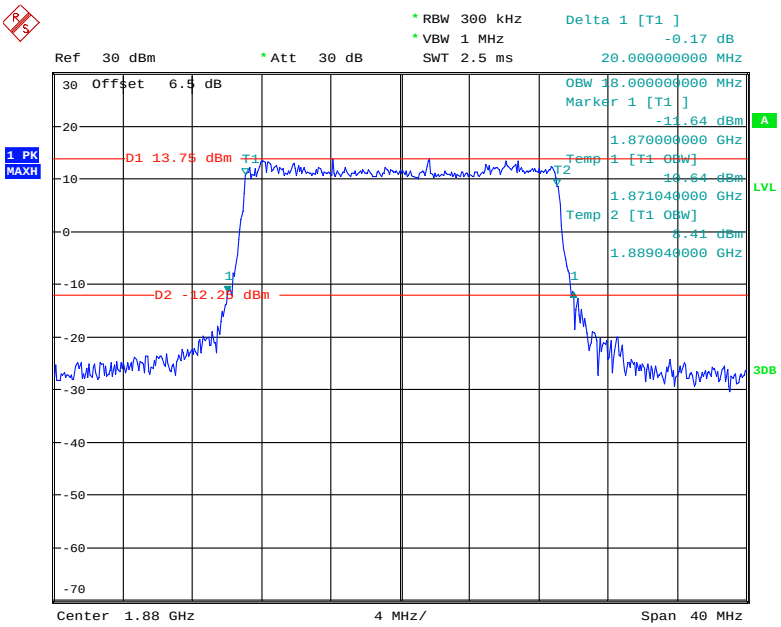
Date: 10.JUN.2020 09:44:14

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



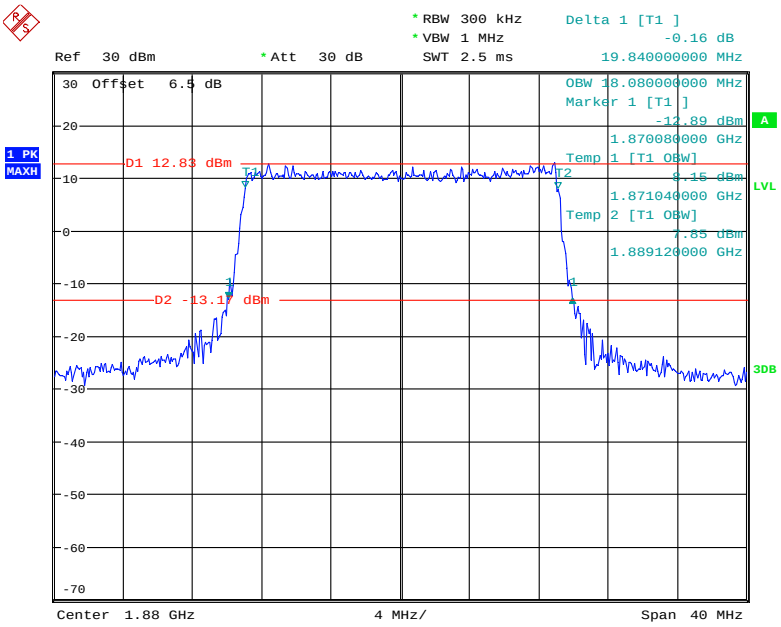
Date: 10.JUN.2020 09:44:39

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



Date: 10.JUN.2020 09:45:09

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

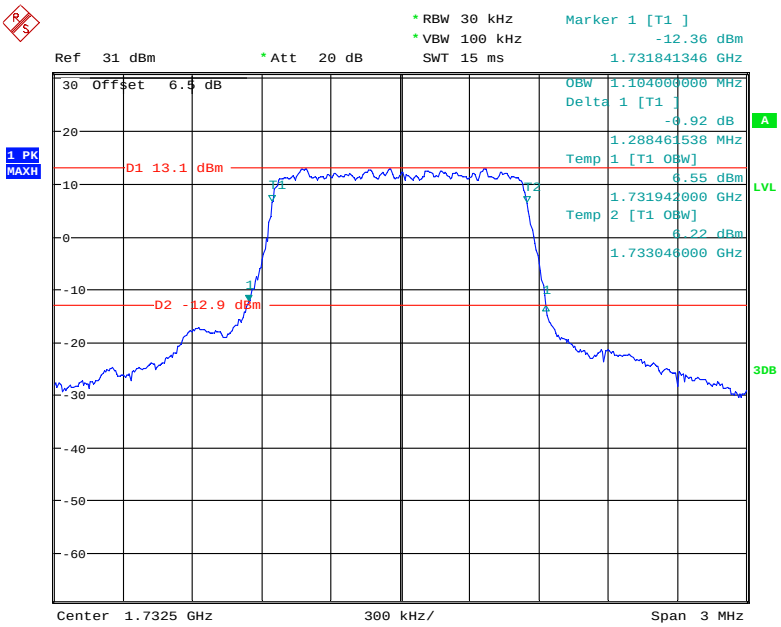


Date: 10.JUN.2020 09:45:38

LTE Band 4: (Middle Channel)

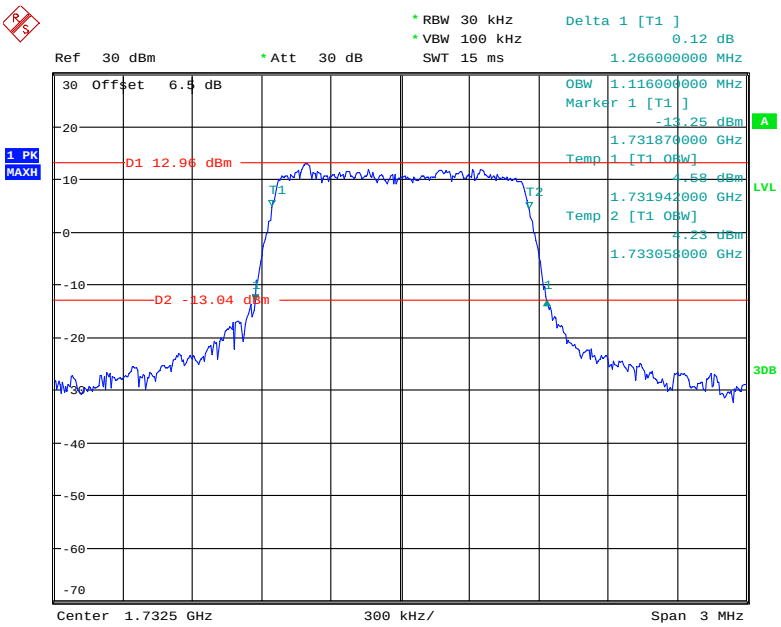
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.104	1.288
	16QAM	1.116	1.266
3.0	QPSK	2.702	3.023
	16QAM	2.700	3.024
5.0	QPSK	4.560	5.353
	16QAM	4.540	5.353
10.0	QPSK	8.960	9.840
	16QAM	8.960	9.840
15.0	QPSK	13.620	16.048
	16QAM	13.560	15.060
20.0	QPSK	18.000	19.760
	16QAM	18.000	19.760

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



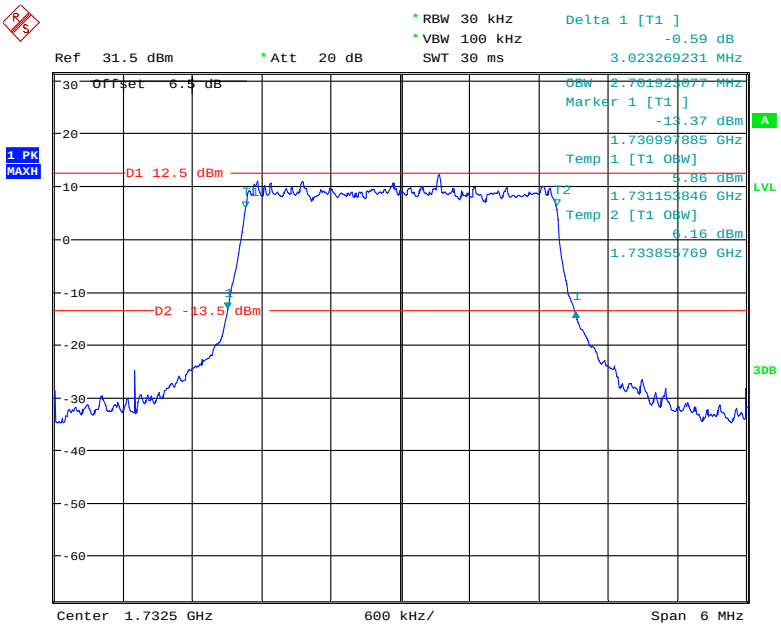
Date: 10.JUN.2020 13:50:45

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



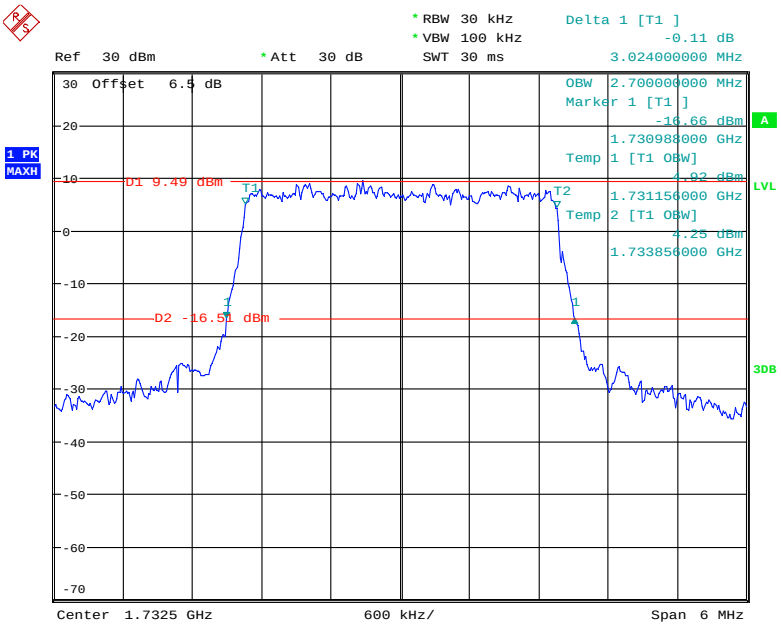
Date: 10.JUN.2020 09:46:22

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



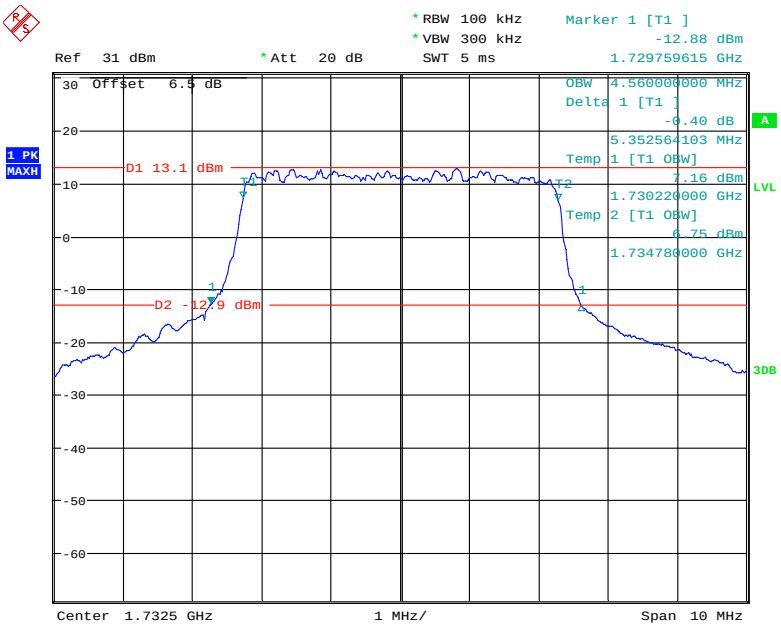
Date: 6.JUL.2020 10:14:19

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



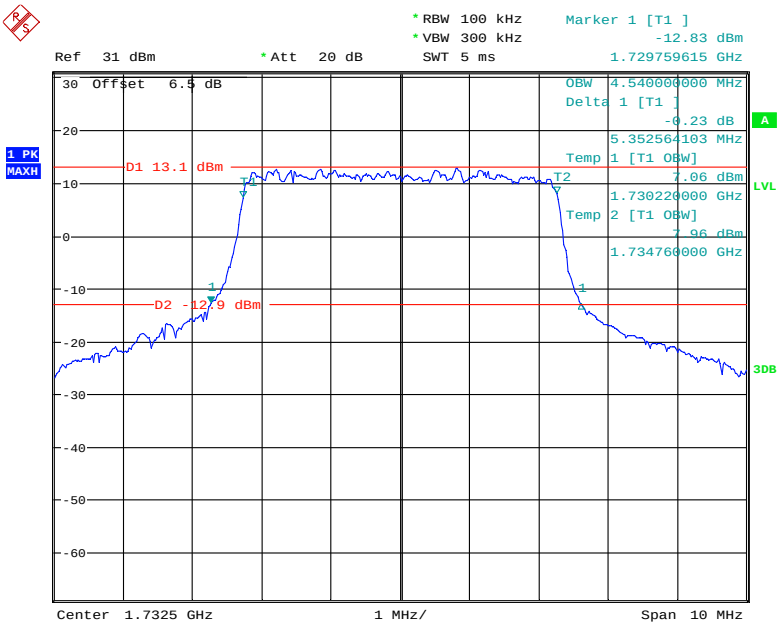
Date: 10.JUN.2020 09:47:05

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



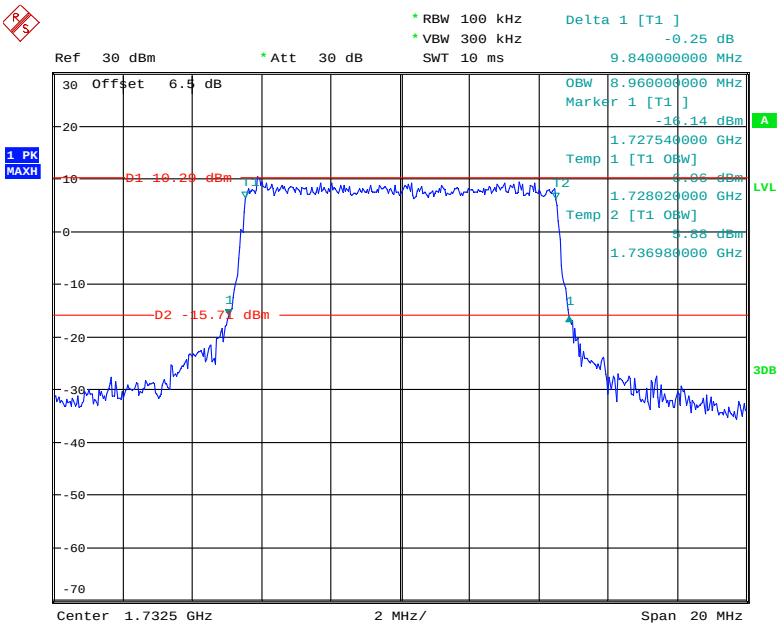
Date: 10.JUN.2020 13:47:02

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



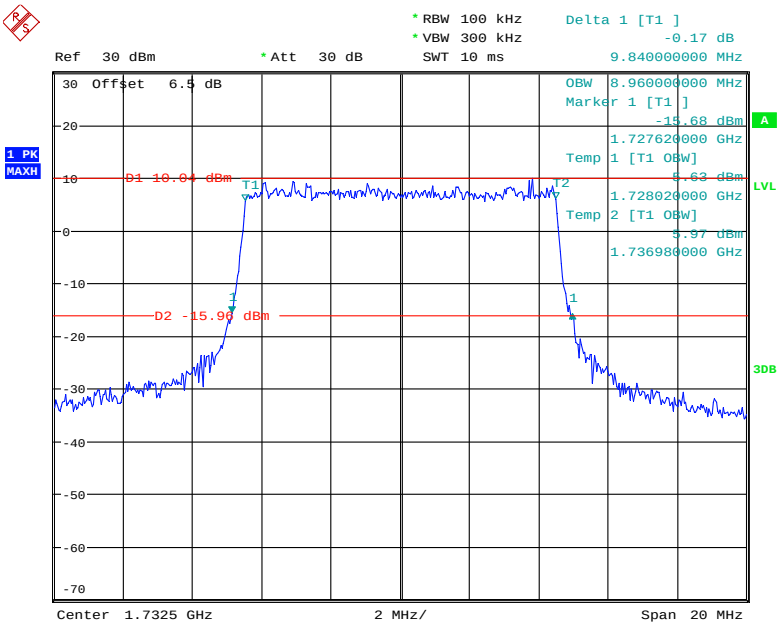
Date: 10.JUN.2020 13:44:32

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



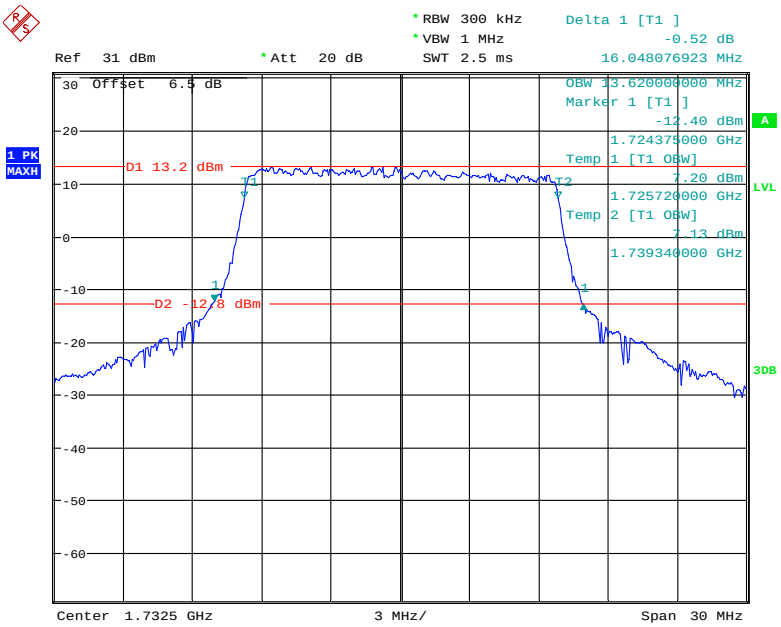
Date: 10.JUN.2020 09:48:24

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



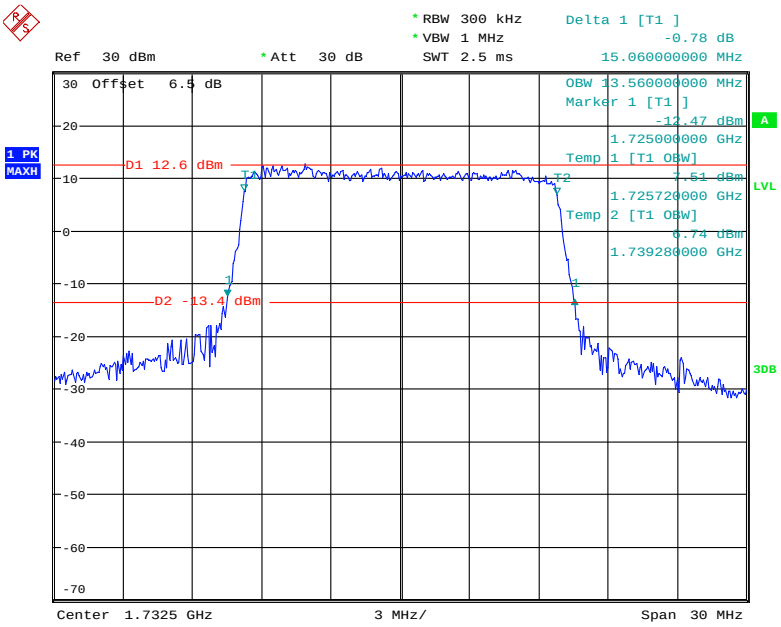
Date: 10.JUN.2020 09:48:46

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



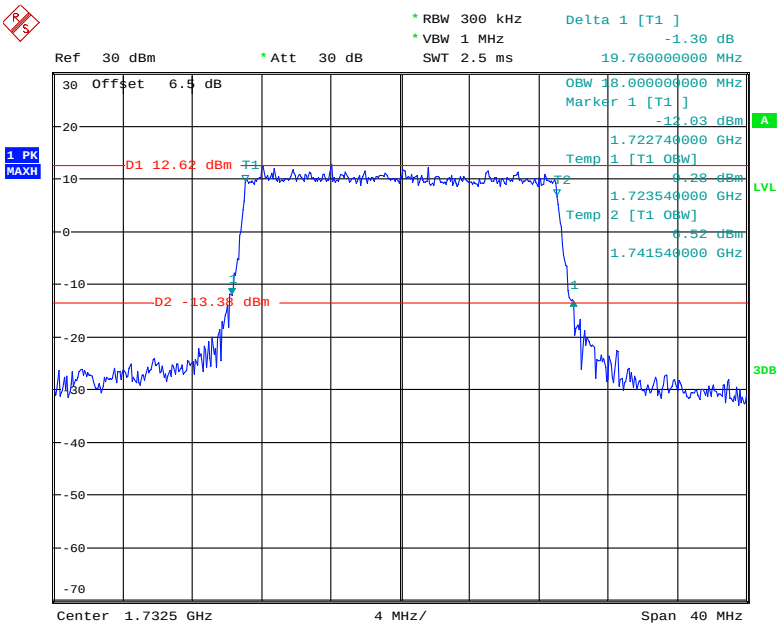
Date: 10.JUN.2020 13:42:50

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



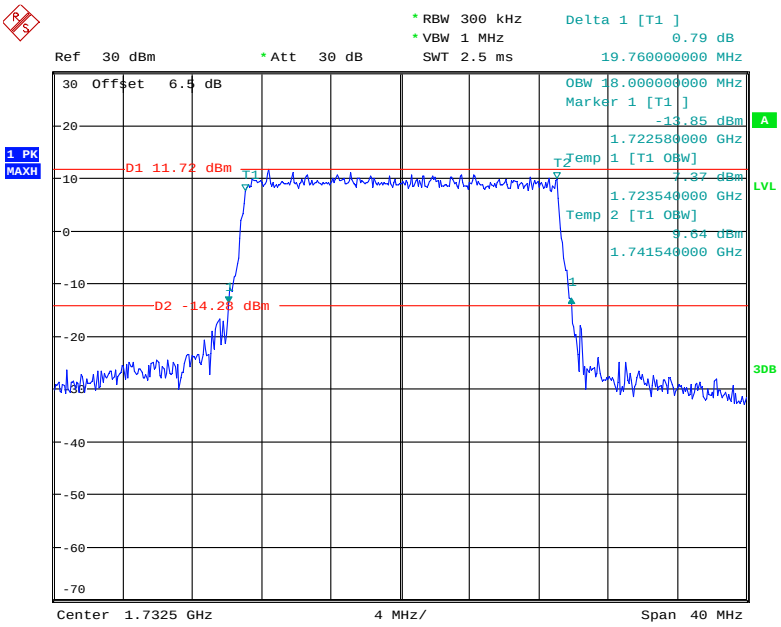
Date: 10.JUN.2020 09:49:44

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



Date: 10.JUN.2020 09:50:11

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

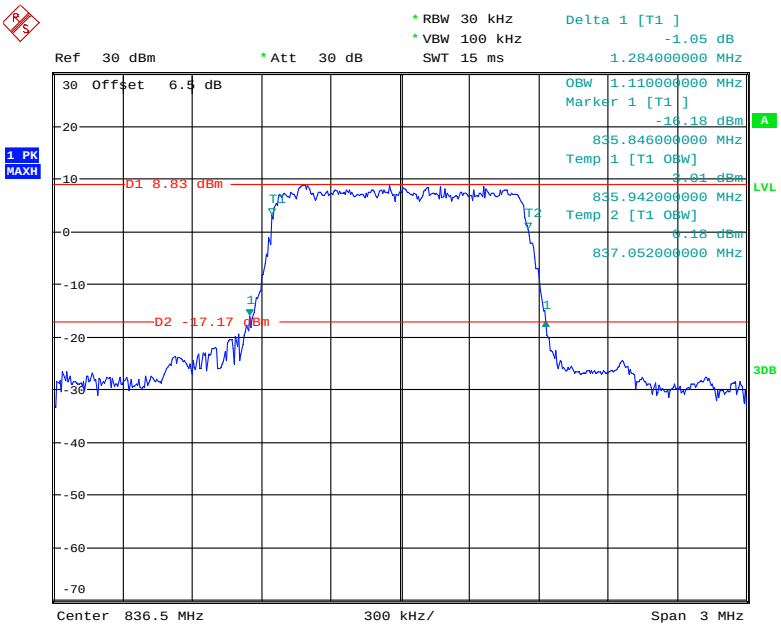


Date: 10.JUN.2020 09:50:36

LTE Band 5: (Middle Channel)

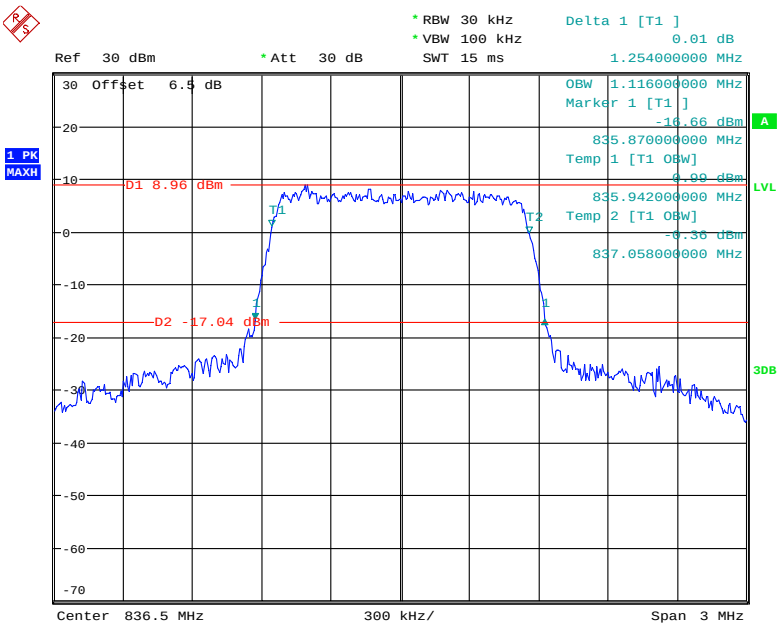
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.110	1.284
	16QAM	1.116	1.254
3.0	QPSK	2.712	3.036
	16QAM	2.772	3.245
5.0	QPSK	4.540	5.401
	16QAM	4.540	5.369
10.0	QPSK	8.960	9.878
	16QAM	8.960	9.800

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



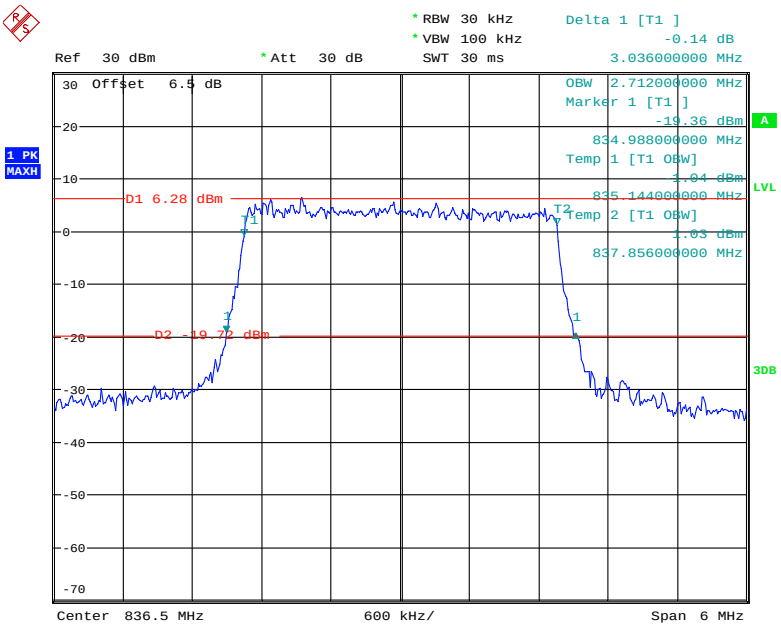
Date: 10.JUN.2020 09:51:03

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



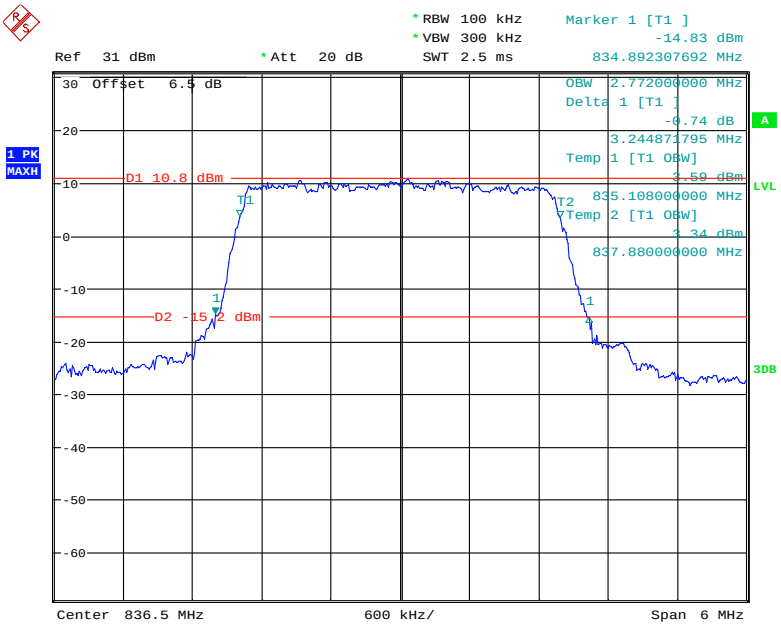
Date: 10.JUN.2020 09:51:24

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



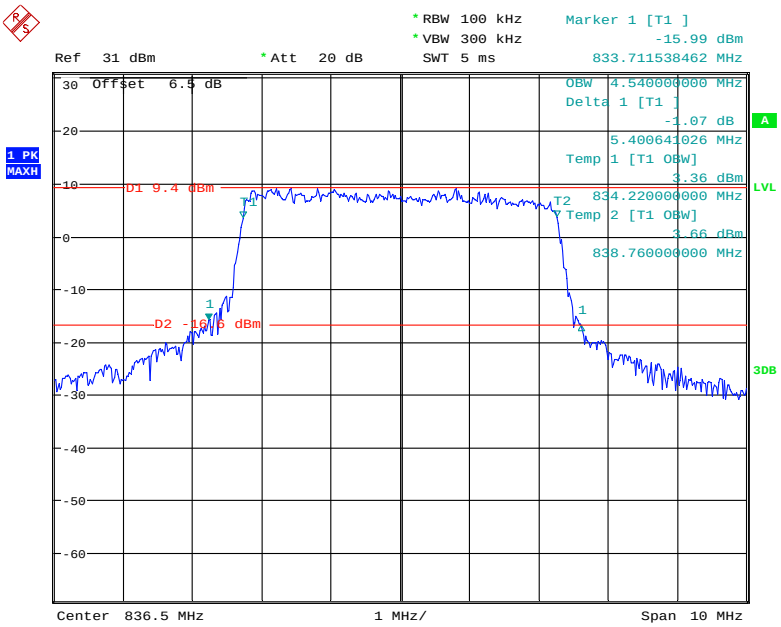
Date: 10.JUN.2020 09:51:46

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



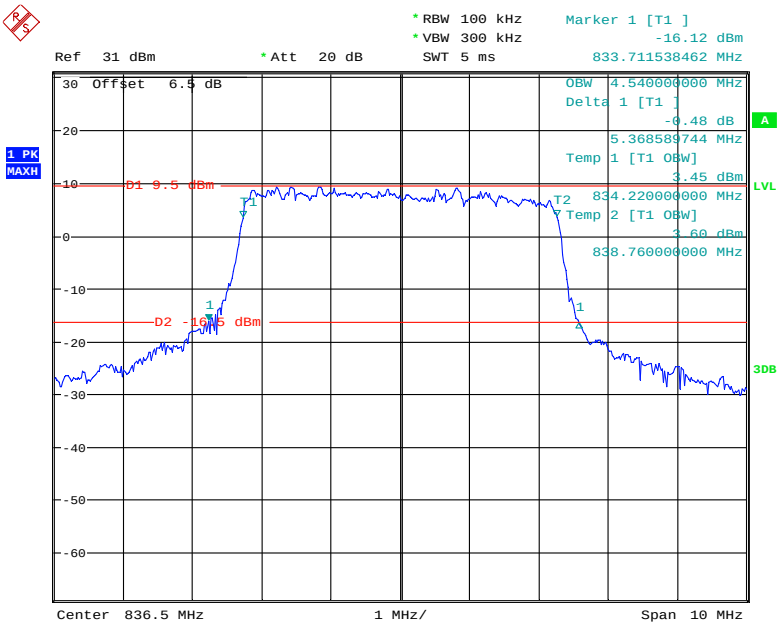
Date: 10.JUN.2020 13:39:35

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



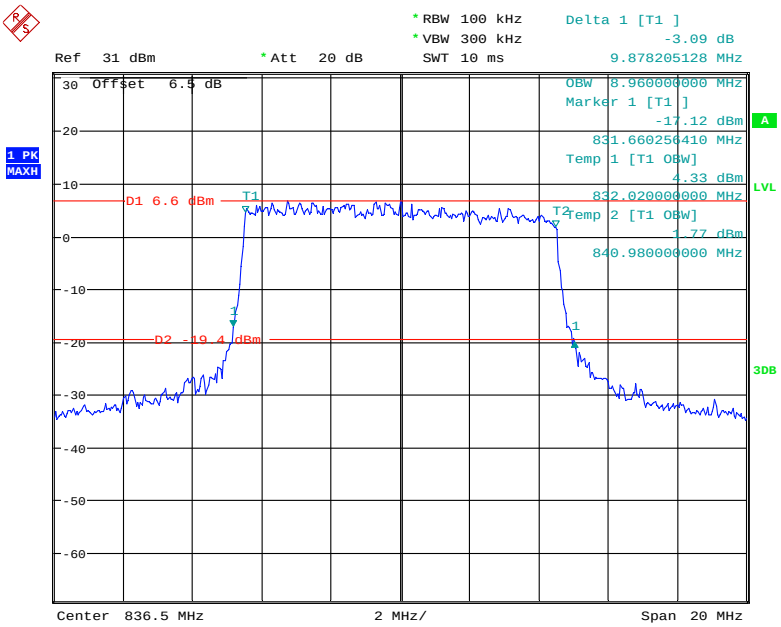
Date: 10.JUN.2020 13:37:11

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



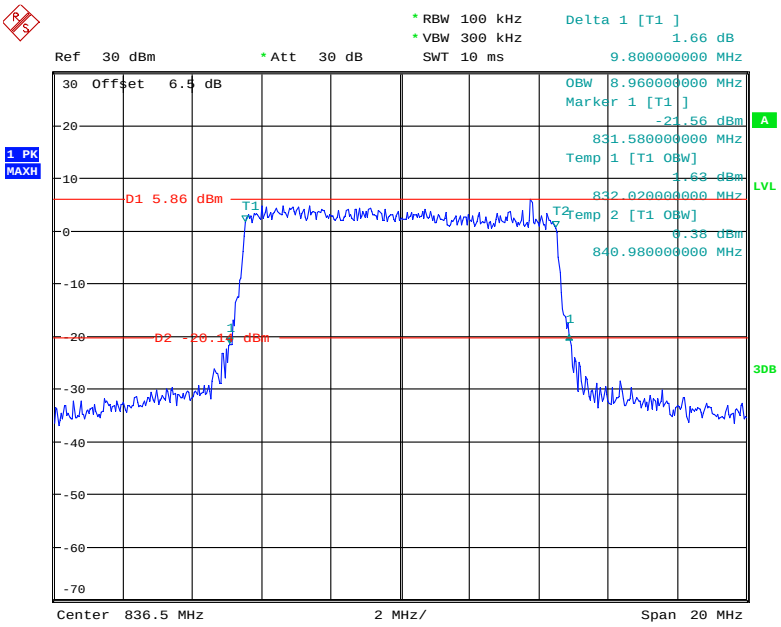
Date: 10.JUN.2020 13:35:50

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



Date: 10.JUN.2020 13:31:05

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

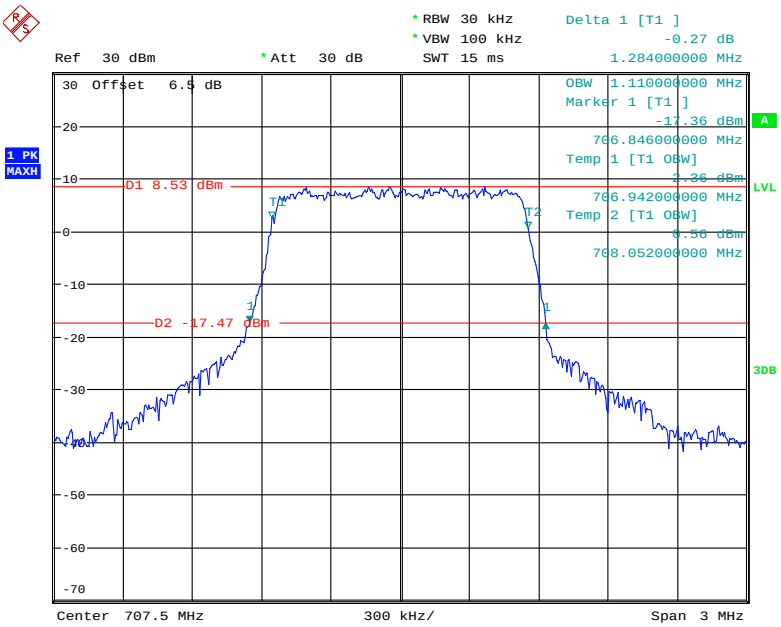


Date: 10.JUN.2020 09:53:47

LTE Band 12: (Middle Channel)

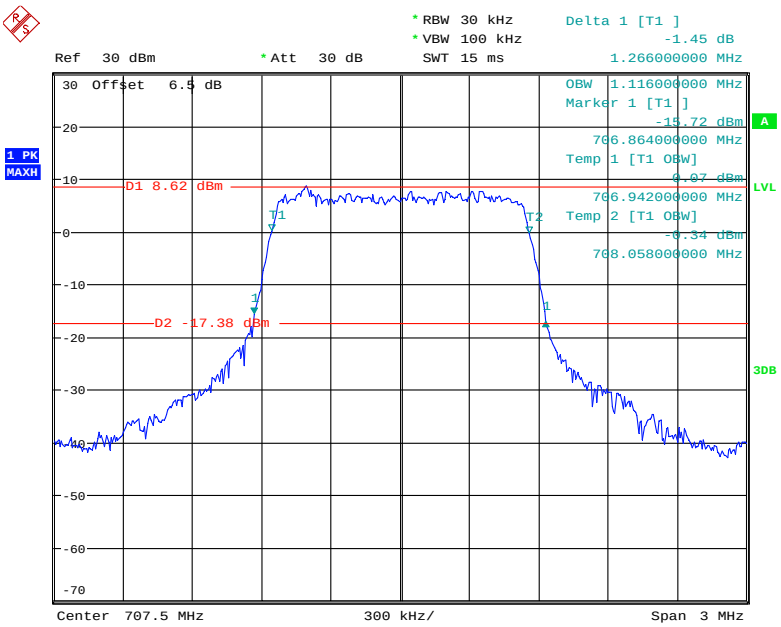
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.110	1.284
	16QAM	1.116	1.266
3.0	QPSK	2.700	3.017
	16QAM	2.688	3.012
5.0	QPSK	4.540	5.501
	16QAM	4.540	5.501
10.0	QPSK	9.000	9.760
	16QAM	8.960	9.880

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



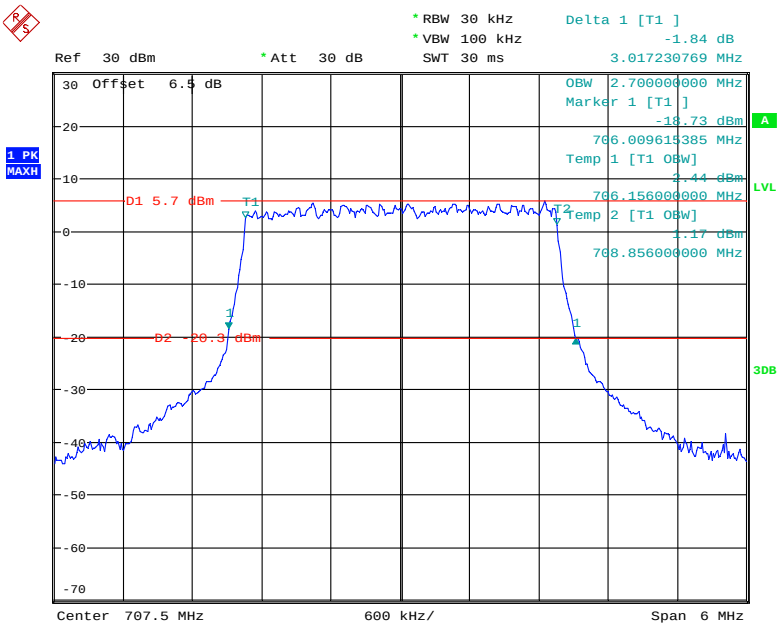
Date: 10.JUN.2020 09:54:14

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



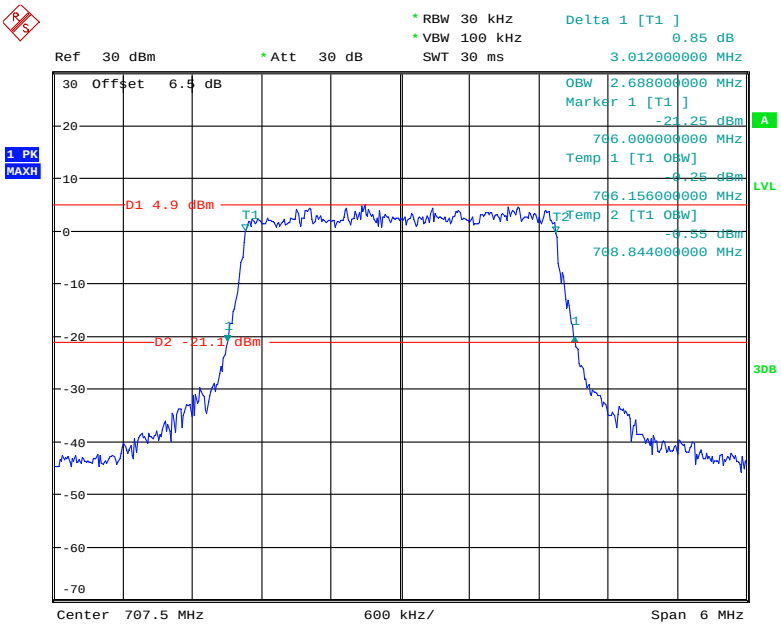
Date: 10.JUN.2020 09:54:37

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



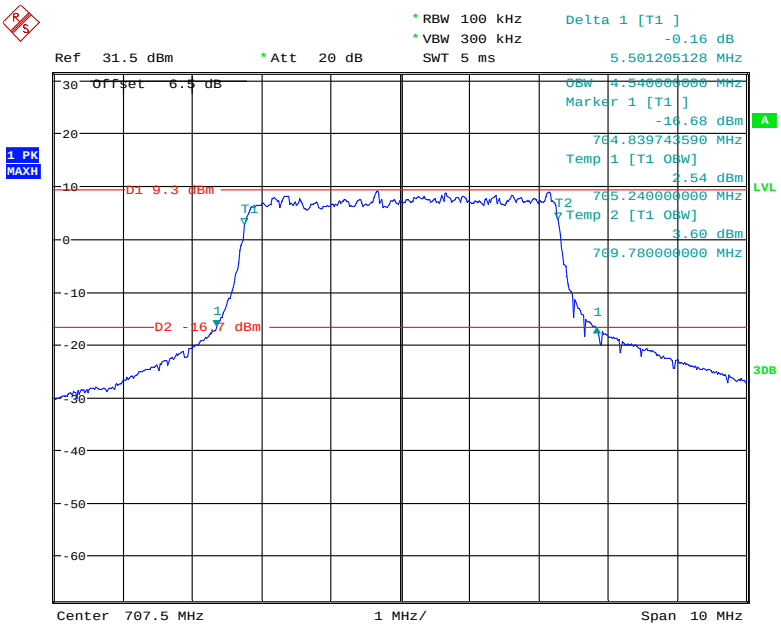
Date: 10.JUN.2020 13:16:11

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



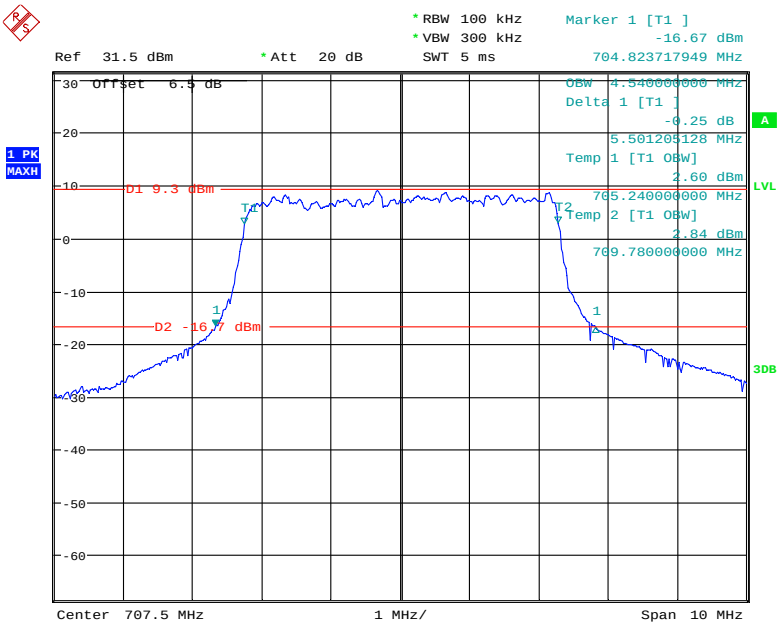
Date: 10.JUN.2020 09:55:20

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



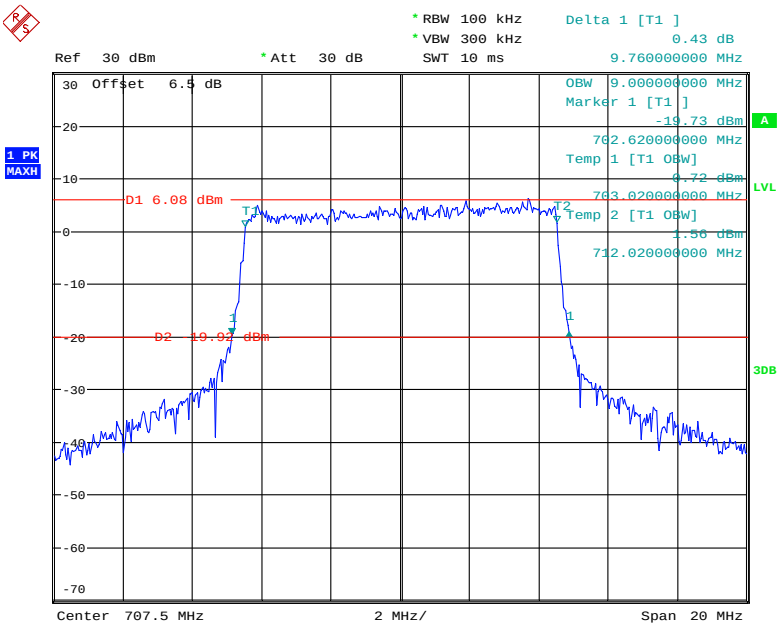
Date: 10.JUN.2020 13:22:55

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



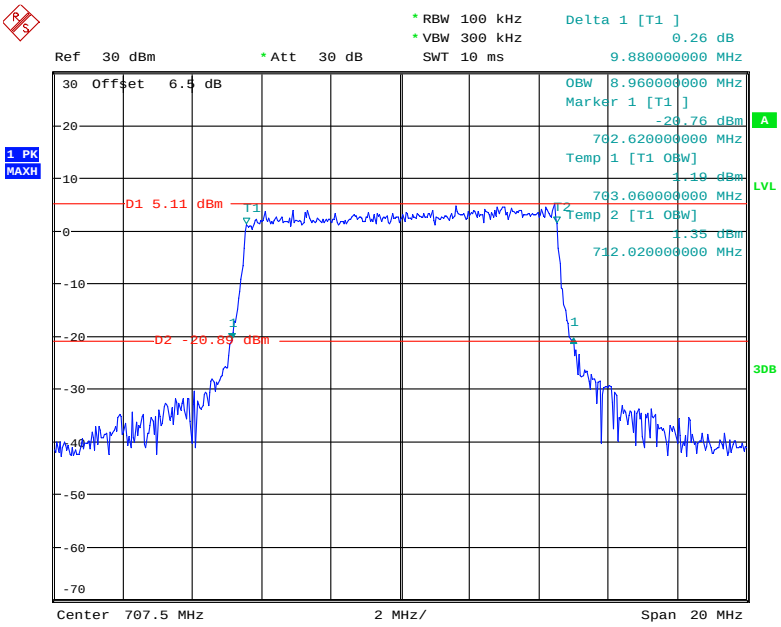
Date: 10.JUN.2020 13:26:03

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



Date: 10.JUN.2020 09:56:49

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

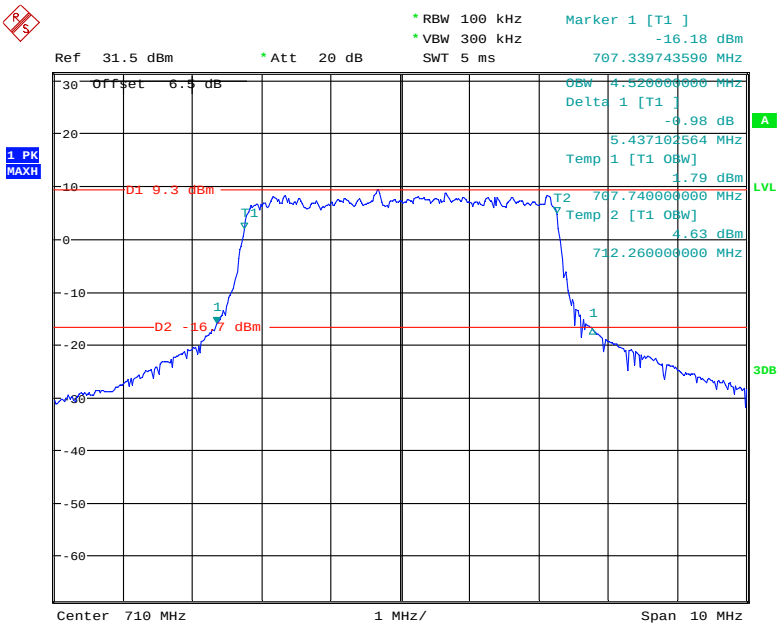


Date: 10.JUN.2020 09:57:17

LTE Band 17: (Middle Channel)

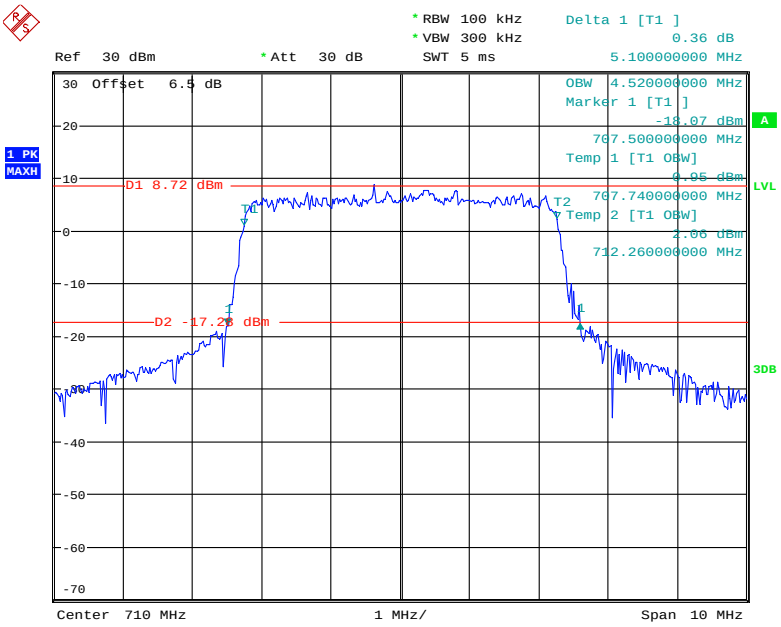
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.520	5.437
	16QAM	4.520	5.100
10.0	QPSK	8.960	9.800
	16QAM	8.960	9.800

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



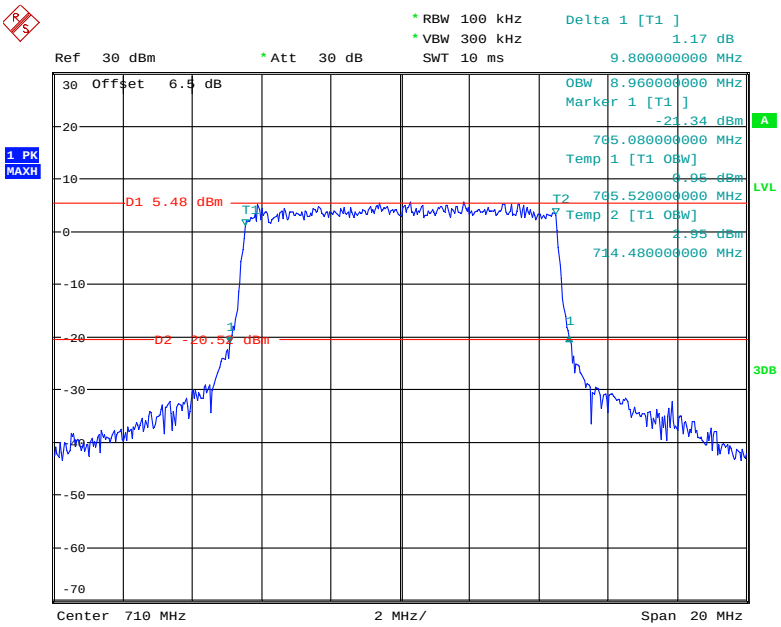
Date: 10.JUN.2020 13:28:52

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



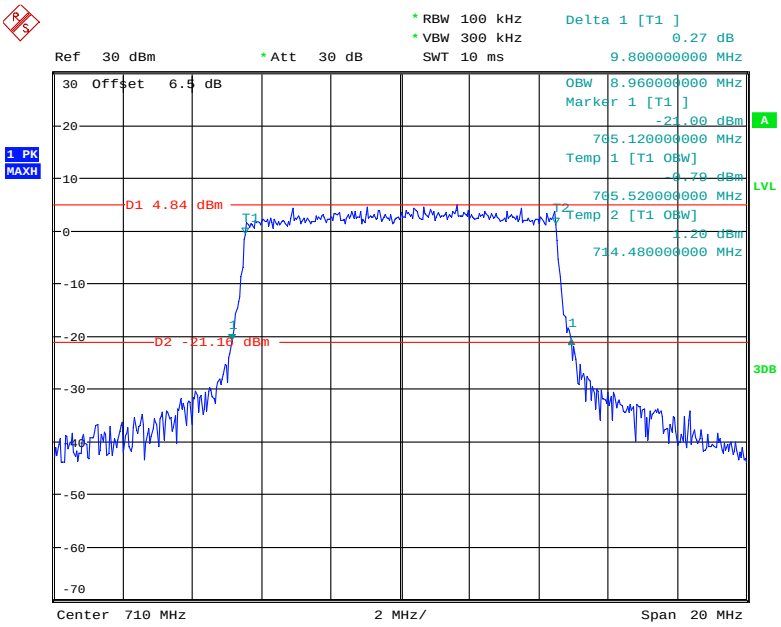
Date: 10.JUN.2020 09:58:13

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



Date: 10.JUN.2020 09:58:43

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



Date: 10.JUN.2020 09:59:07

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

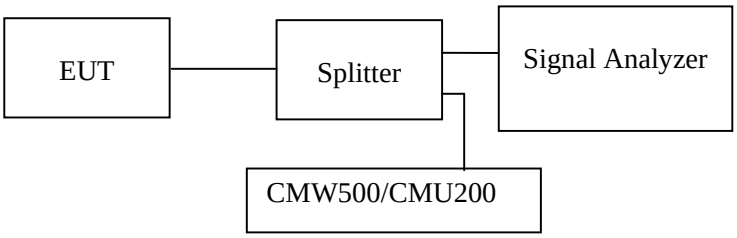
Applicable Standard

FCC §2.1051, §22.917(a) and §24.238(a) and §27.53.

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:	23~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Gavin Guo from 2020-06-10 to 2020-07-06.

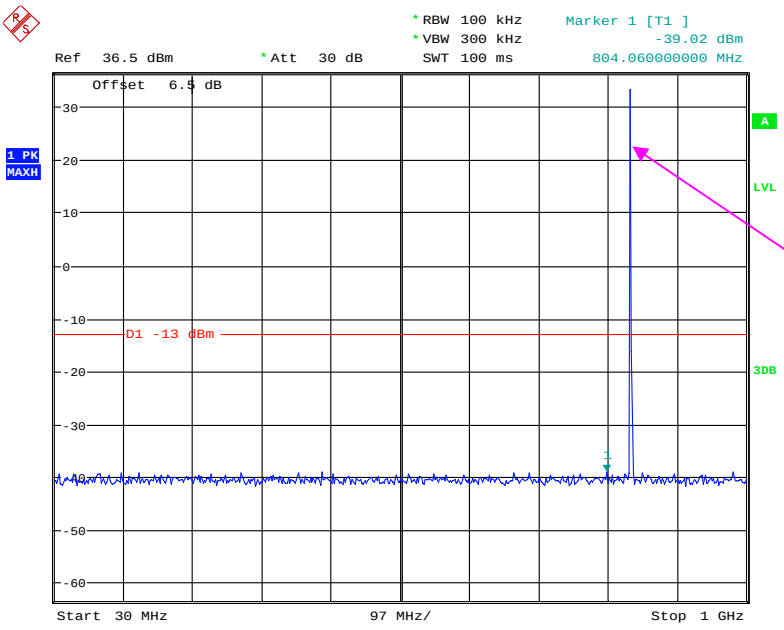
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

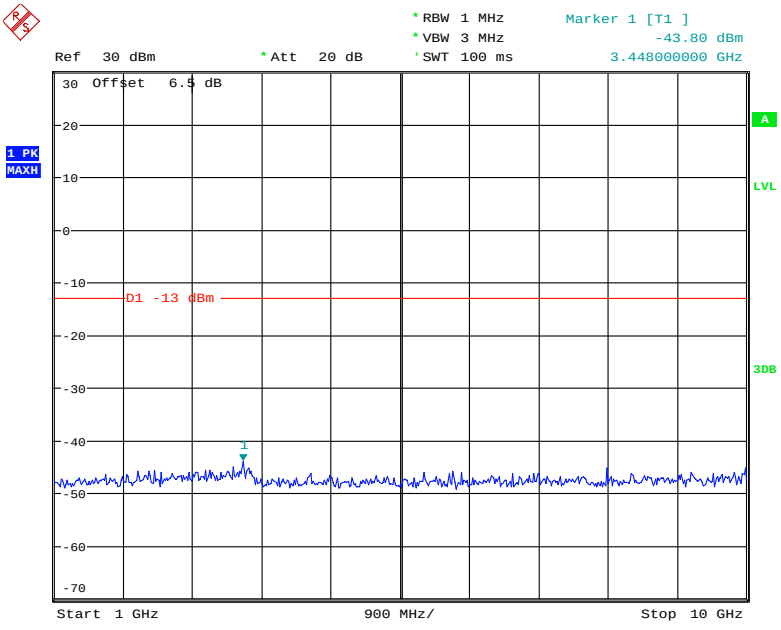
30 MHz – 1 GHz (GSM Mode)



Fundamental test

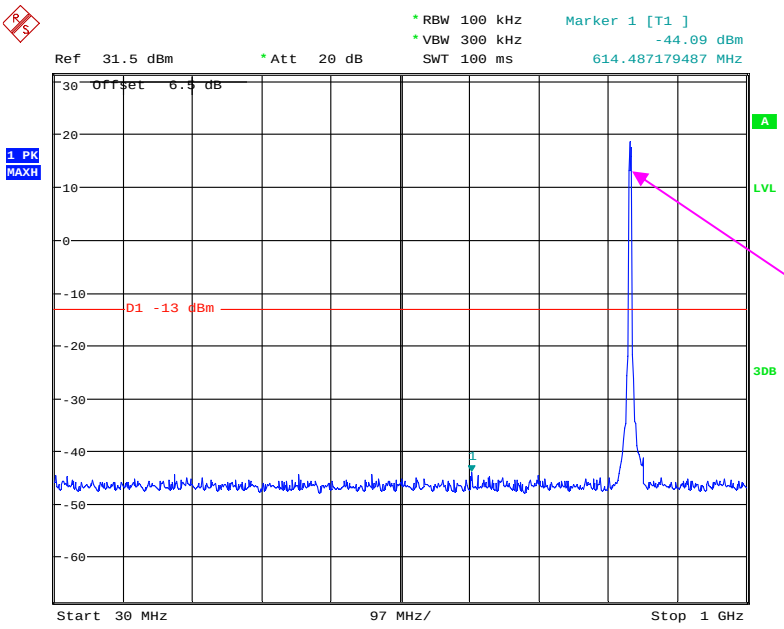
Date: 10.JUN.2020 15:38:39

1 GHz – 10 GHz (GSM Mode)



Date: 6.JUL.2020 13:35:50

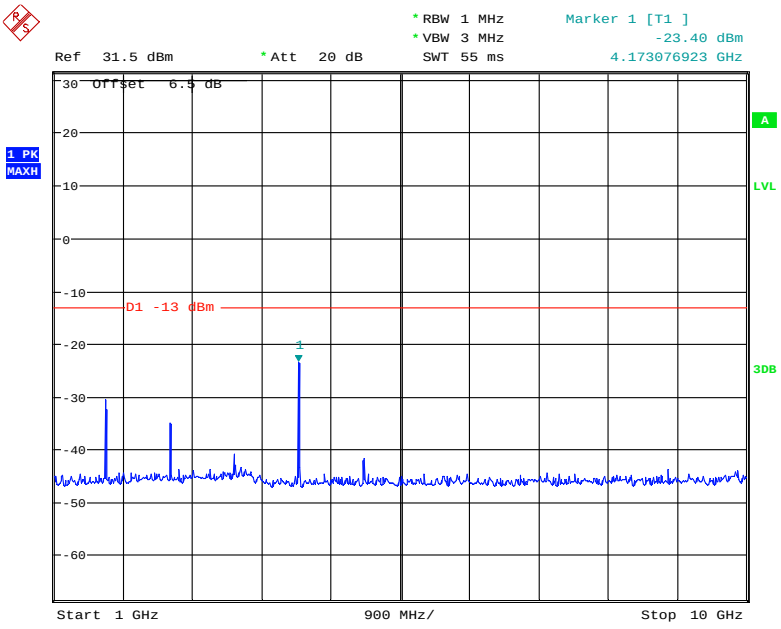
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 11.JUN.2020 15:54:02

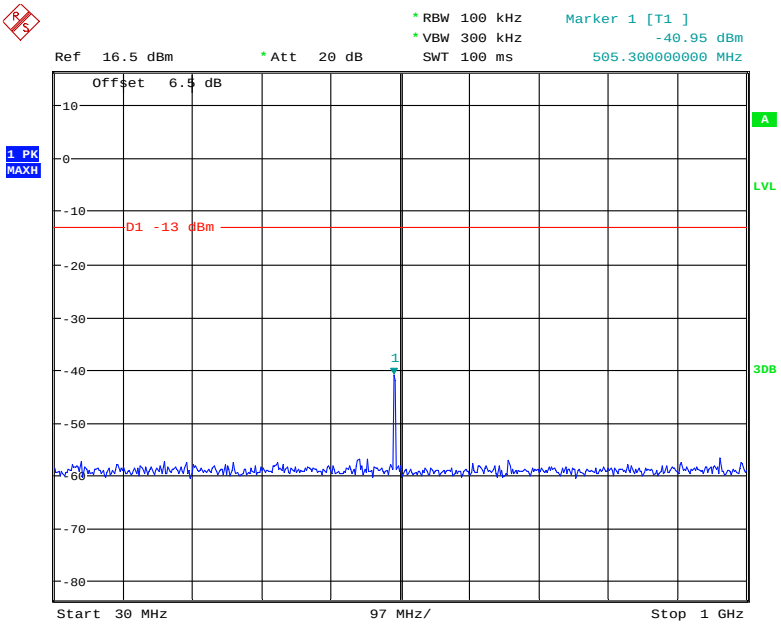
1 GHz – 10 GHz (WCDMA Mode)



Date: 11.JUN.2020 15:53:20

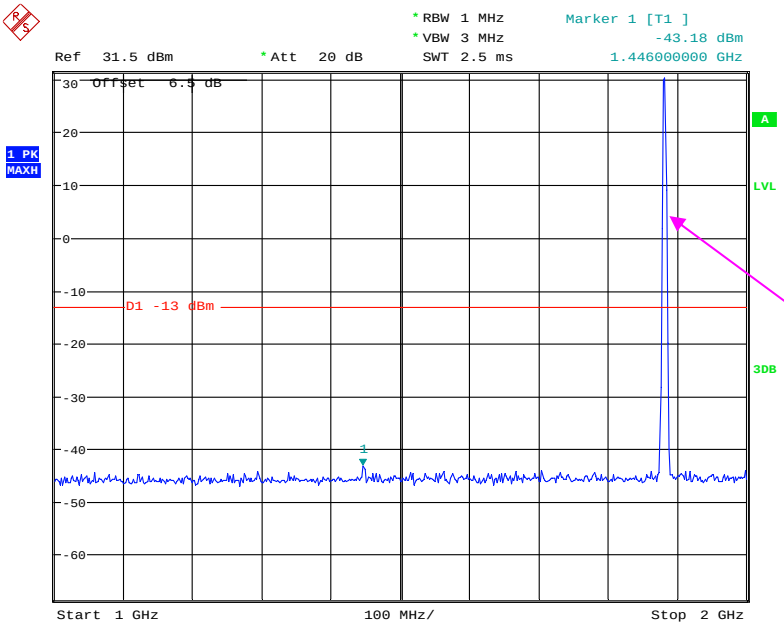
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 10.JUN.2020 15:41:55

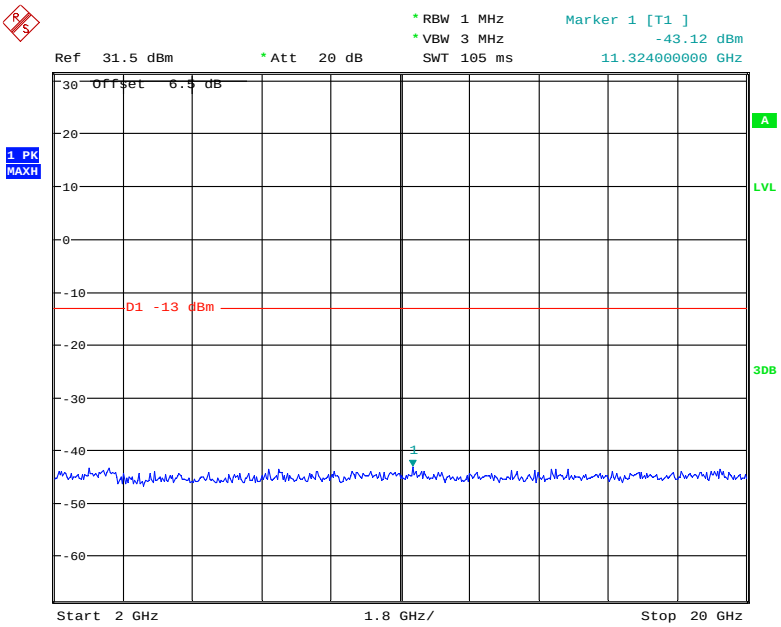
1 GHz – 2 GHz (GSM Mode)



Fundamental test

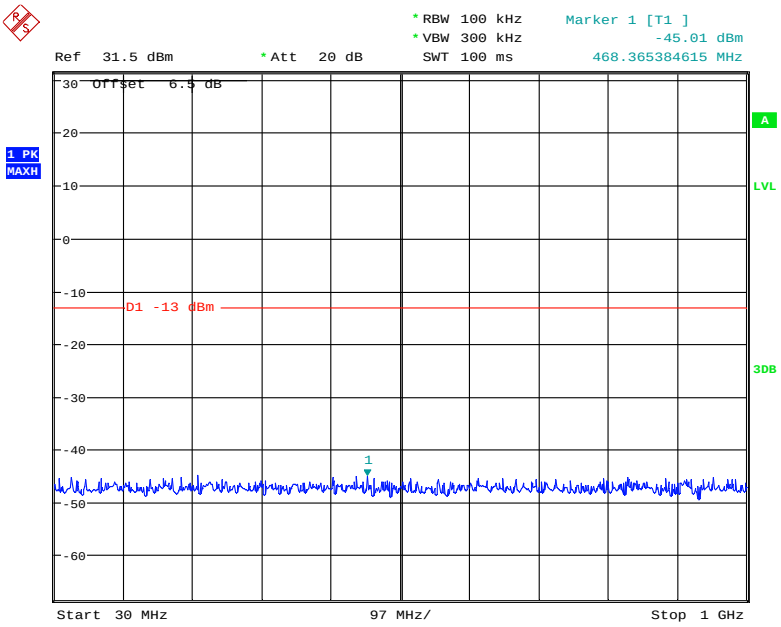
Date: 10.JUN.2020 15:43:38

2 GHz – 20 GHz (GSM Mode)



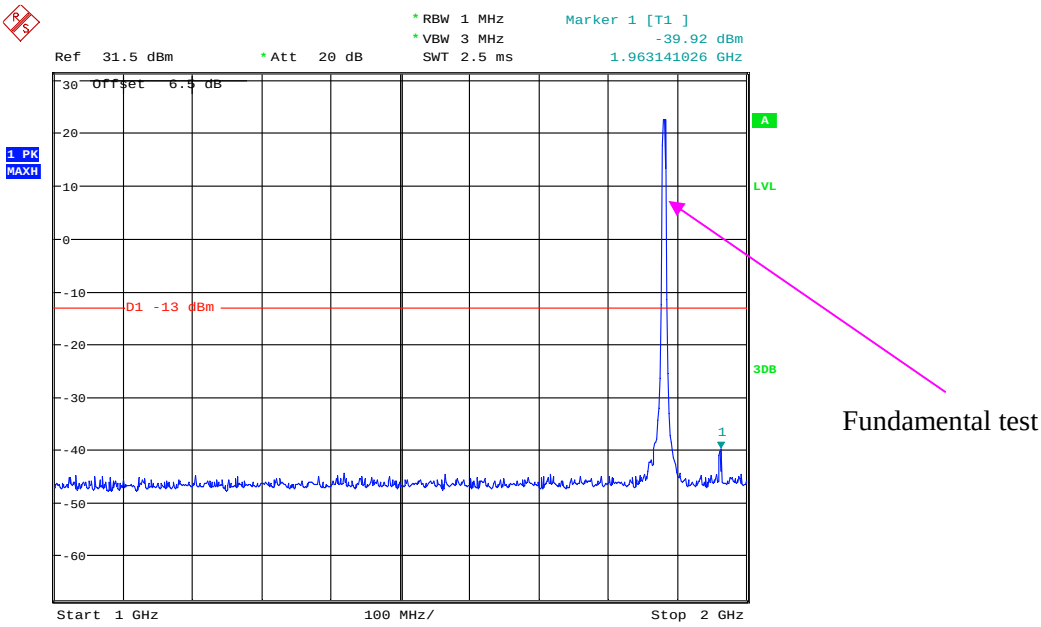
Date: 10.JUN.2020 15:44:13

30 MHz – 1 GHz (WCDMA Mode)



Date: 11.JUN.2020 15:25:54

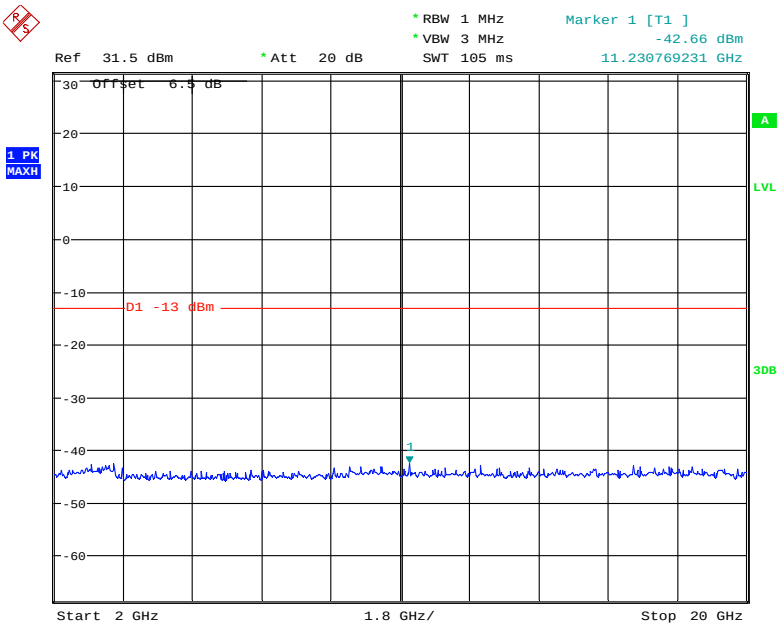
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 11.JUN.2020 15:25:34

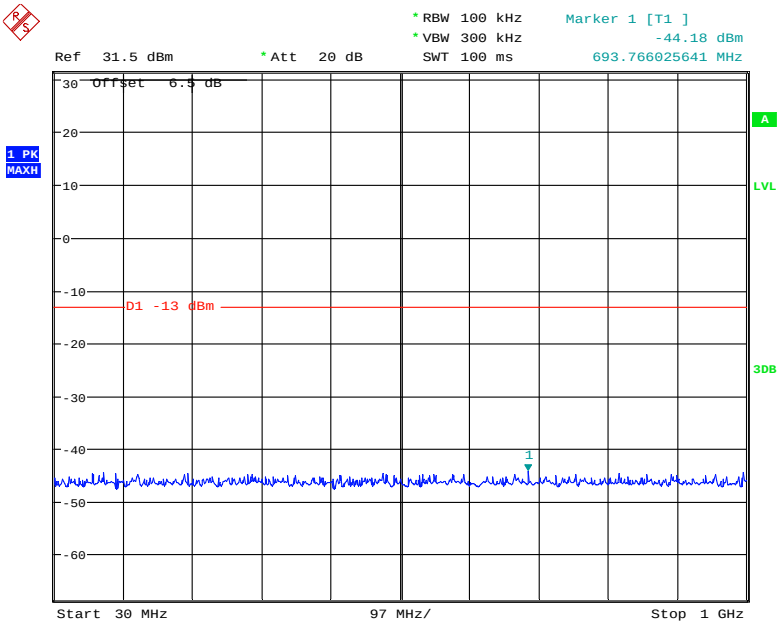
2 GHz – 20 GHz (WCDMA Mode)



Date: 11.JUN.2020 15:26:46

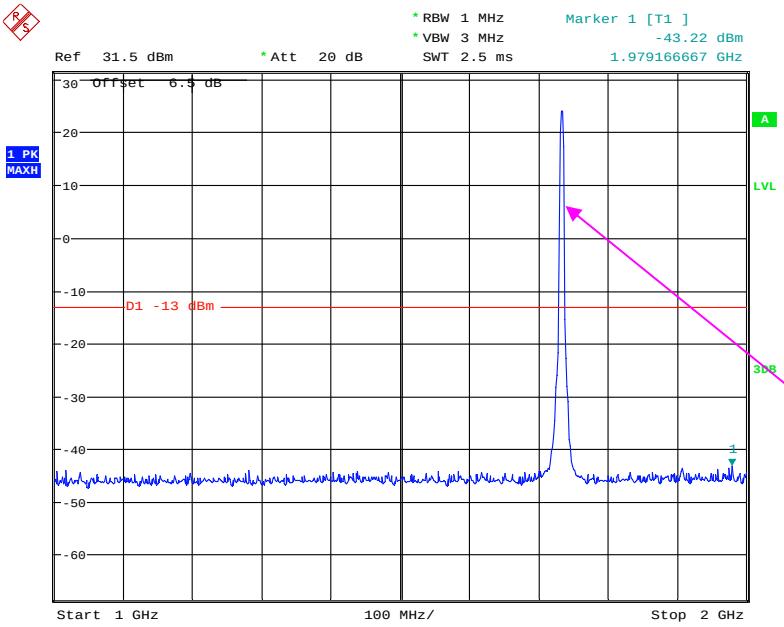
AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)



Date: 11.JUN.2020 15:49:44

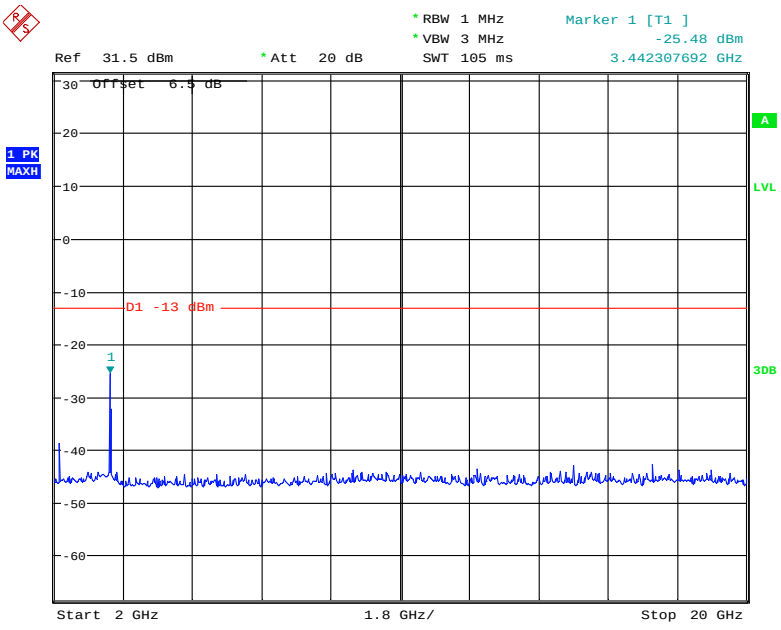
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 11.JUN.2020 15:50:37

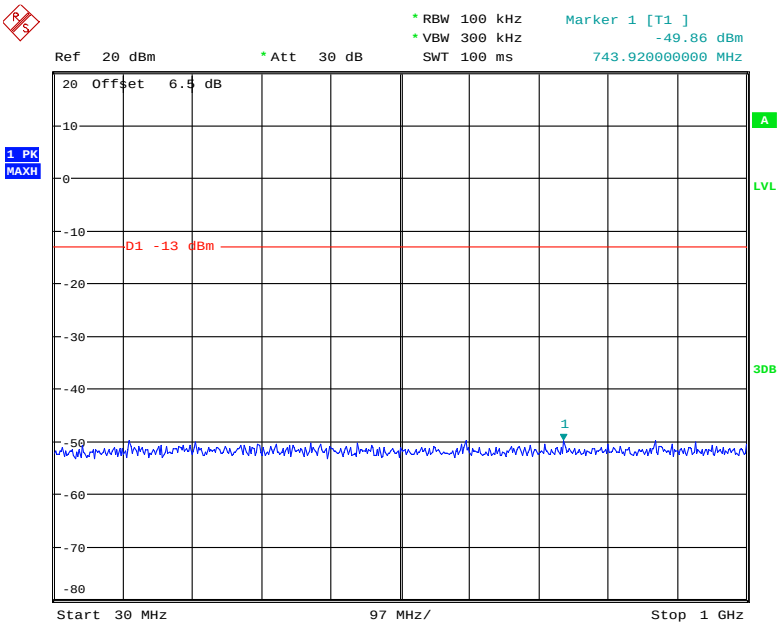
2 GHz – 20 GHz (WCDMA Mode)



Date: 11.JUN.2020 15:51:06

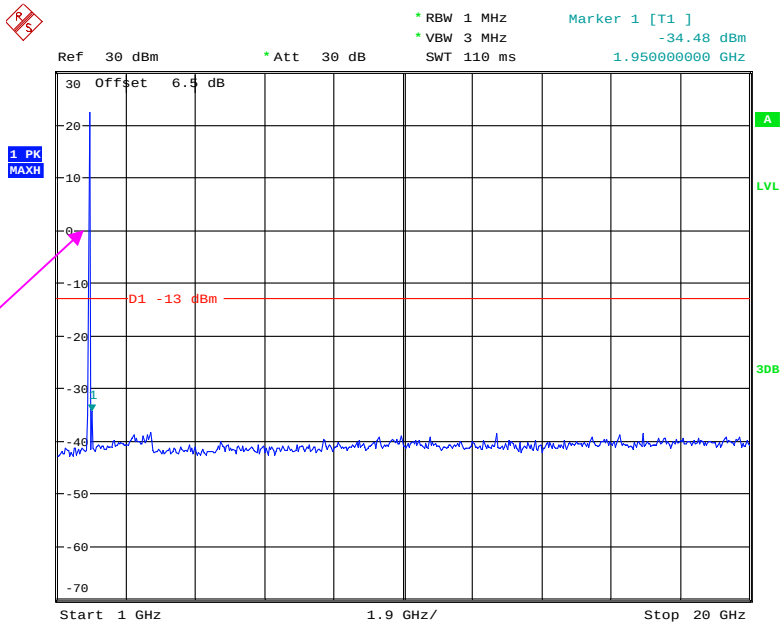
LTE Band 2:

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



Date: 10.JUN.2020 11:18:35

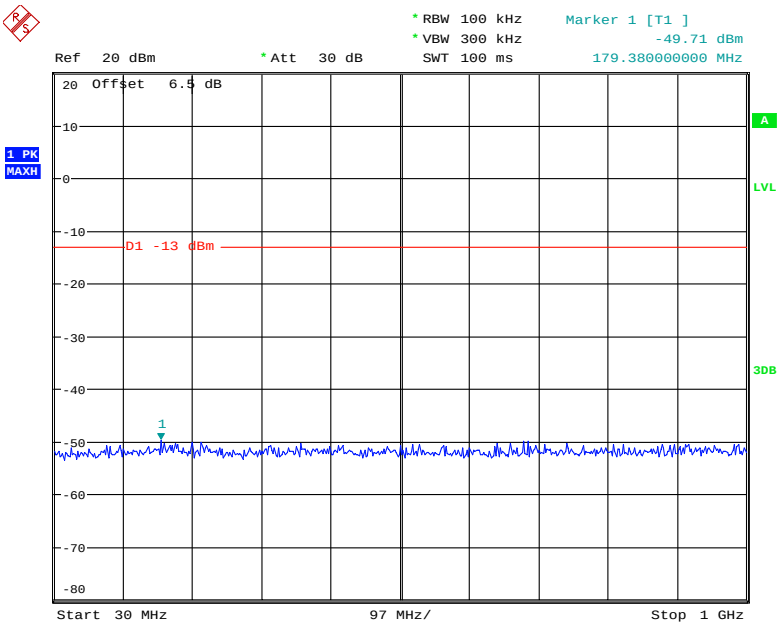
1 GHz – 20 GHz (1.4 MHz, Middle Channel)



Fundamental test

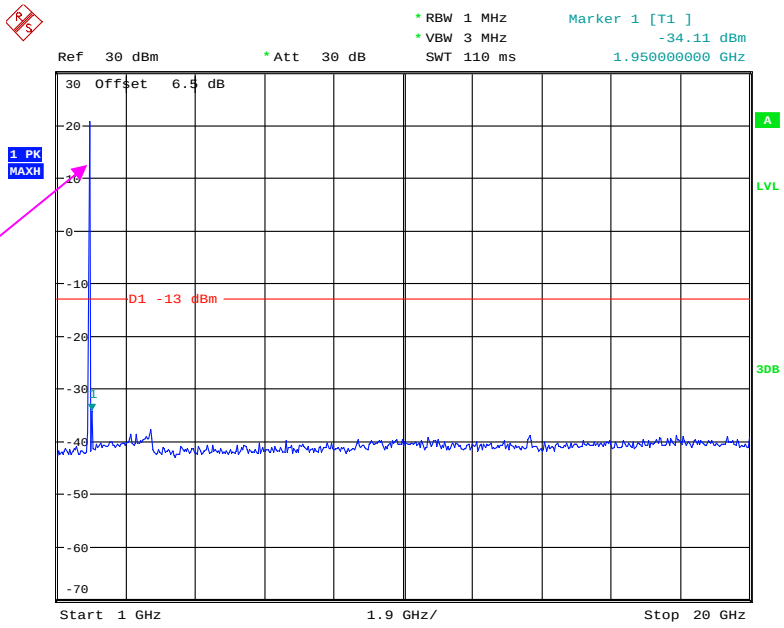
Date: 10.JUN.2020 11:18:46

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



Date: 10.JUN.2020 11:19:05

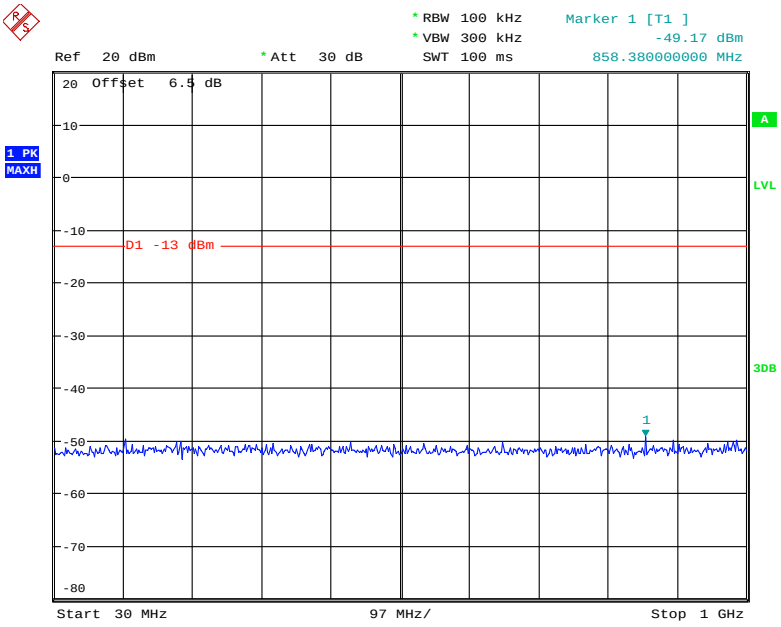
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



Fundamental test

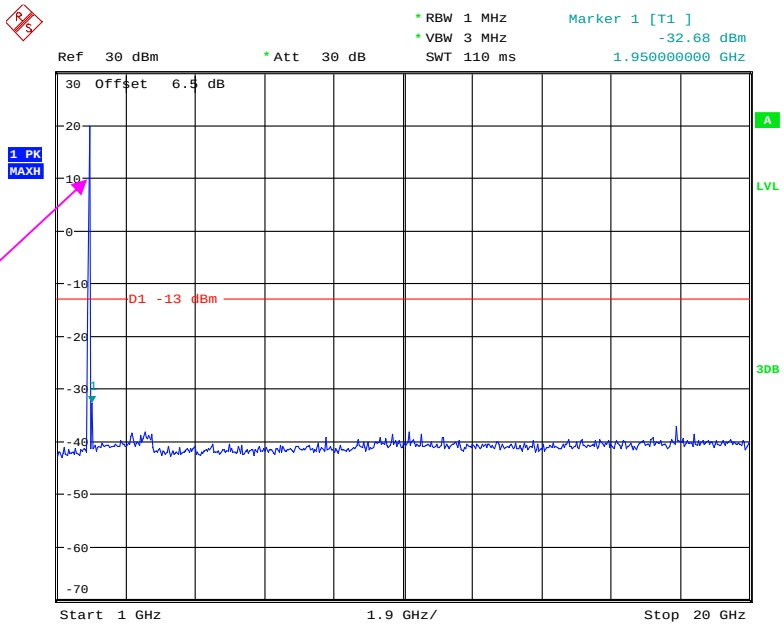
Date: 10.JUN.2020 11:19:16

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



Date: 10.JUN.2020 11:19:35

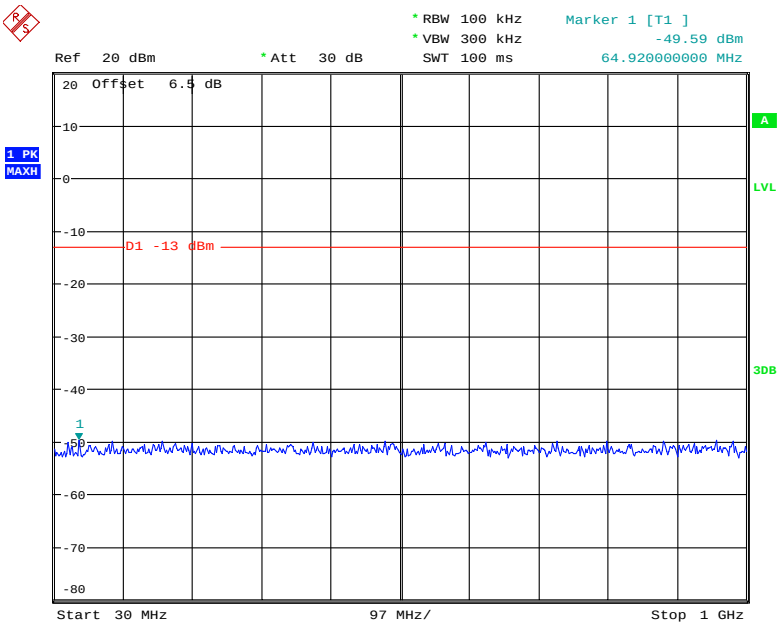
1 GHz – 20 GHz (5.0 MHz, Middle Channel)



Fundamental test

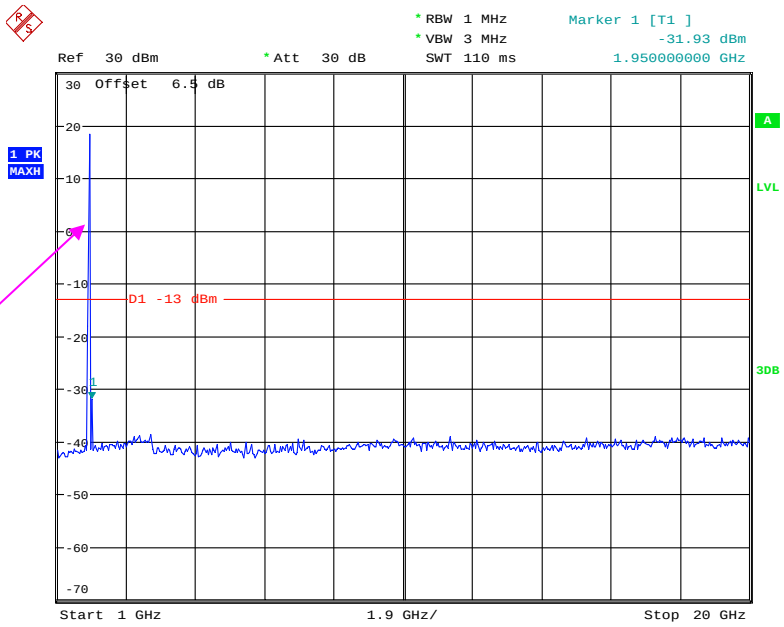
Date: 10.JUN.2020 11:19:47

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



Date: 10.JUN.2020 11:20:09

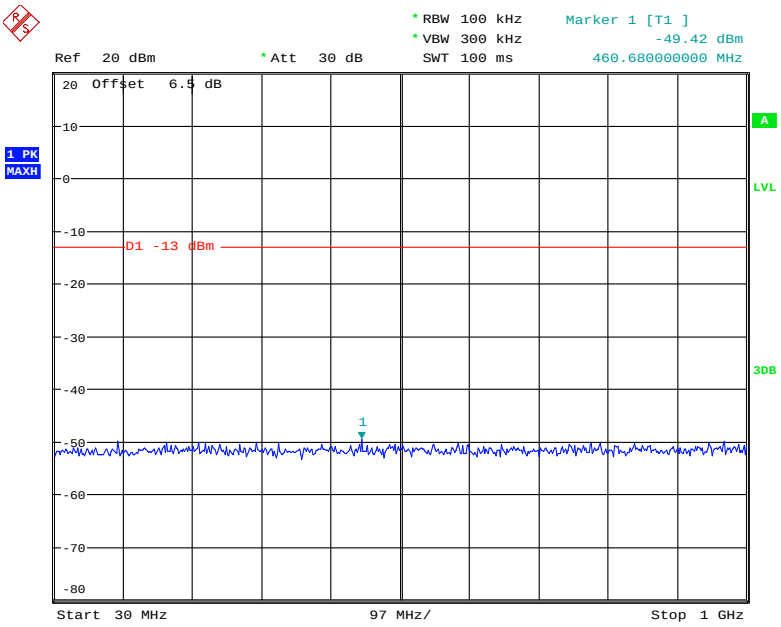
1 GHz – 20 GHz (10.0 MHz, Middle Channel)



Fundamental test

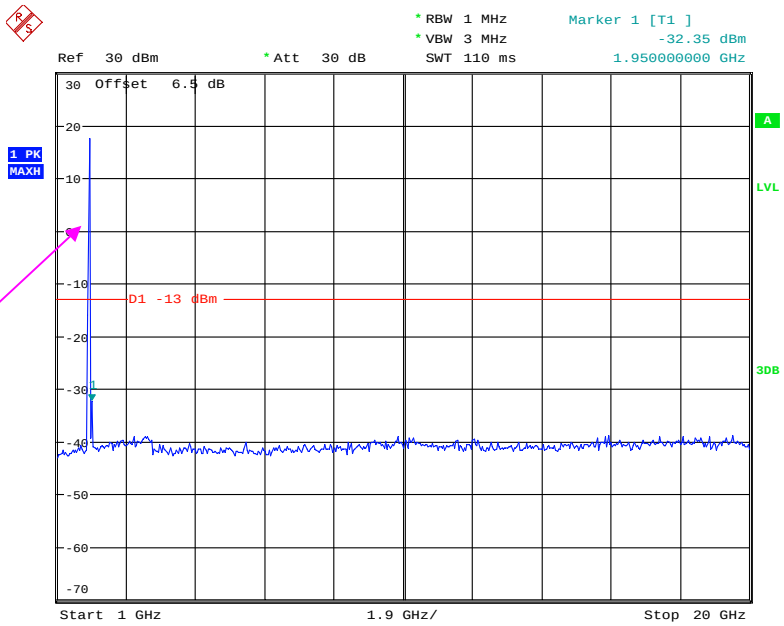
Date: 10.JUN.2020 11:20:21

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



Date: 10.JUN.2020 11:20:47

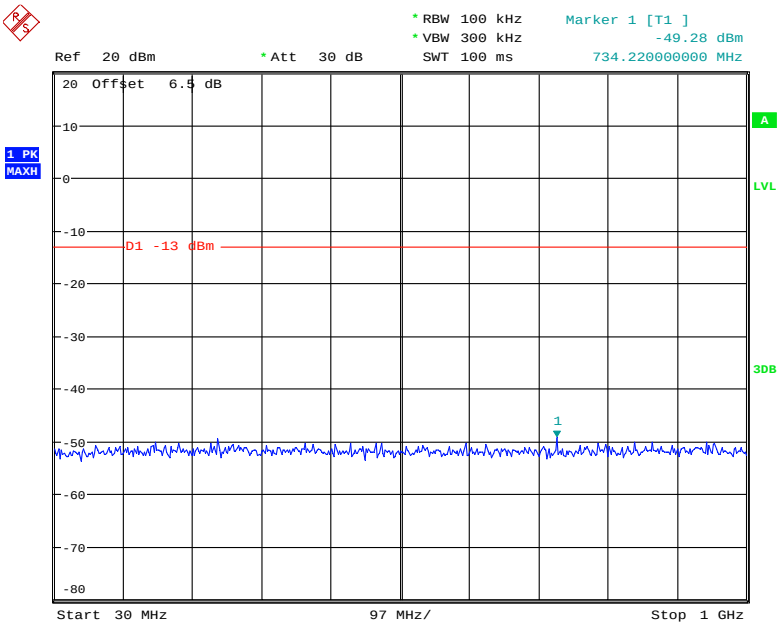
1 GHz – 20 GHz (15.0 MHz, Middle Channel)



Fundamental test

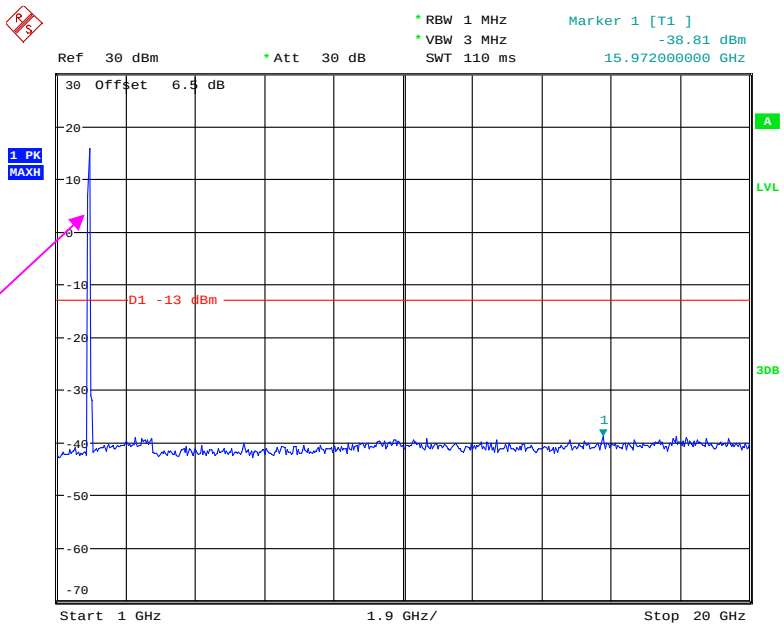
Date: 10.JUN.2020 11:20:58

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



Date: 10.JUN.2020 11:21:21

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

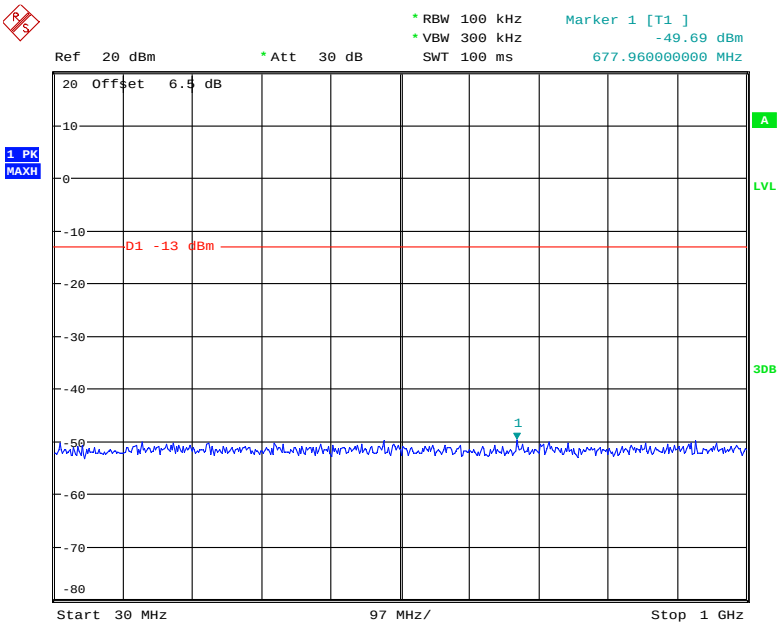


Fundamental test

Date: 10.JUN.2020 11:21:32

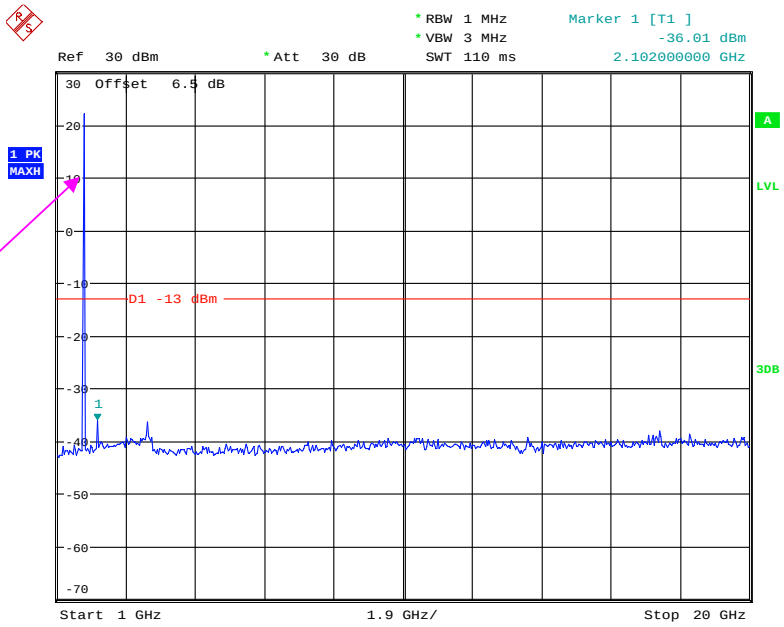
LTE Band 4:

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



Date: 10.JUN.2020 11:21:55

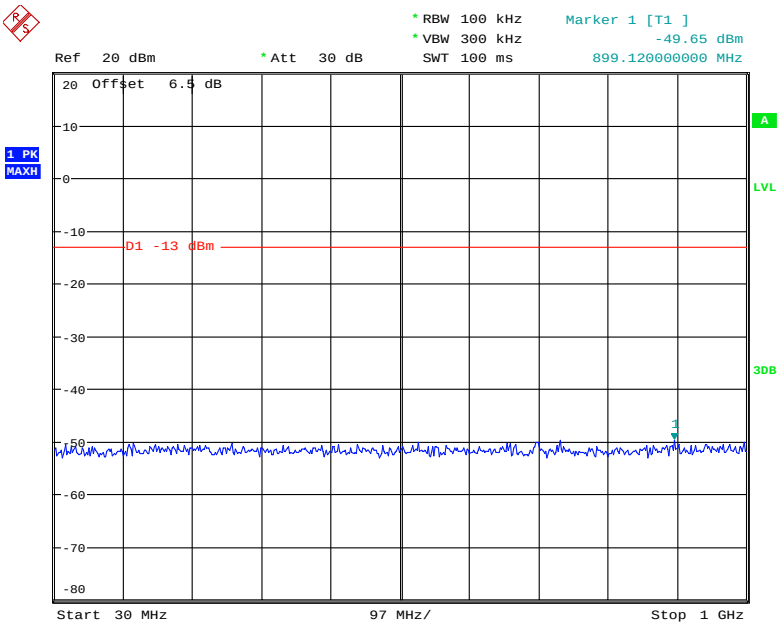
1 GHz – 20 GHz (1.4 MHz, Middle Channel)



Fundamental test

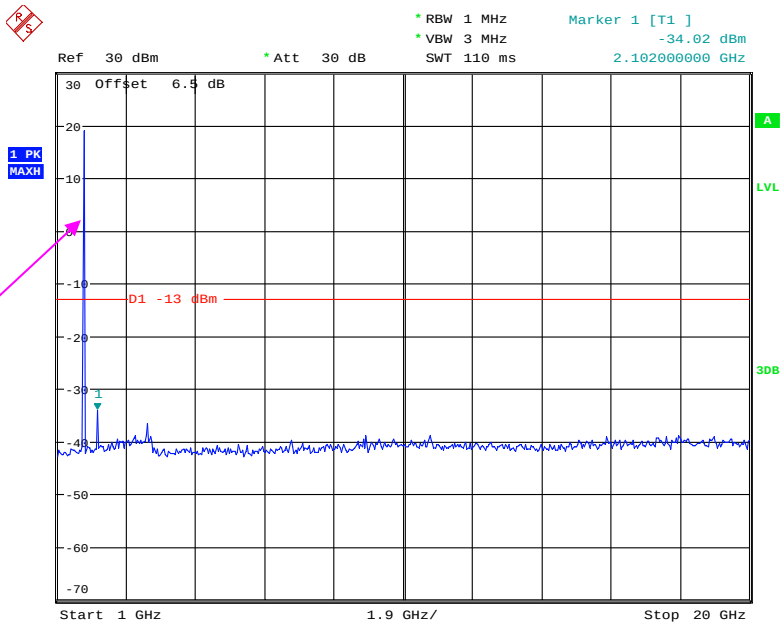
Date: 10.JUN.2020 11:22:07

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



Date: 10.JUN.2020 11:22:28

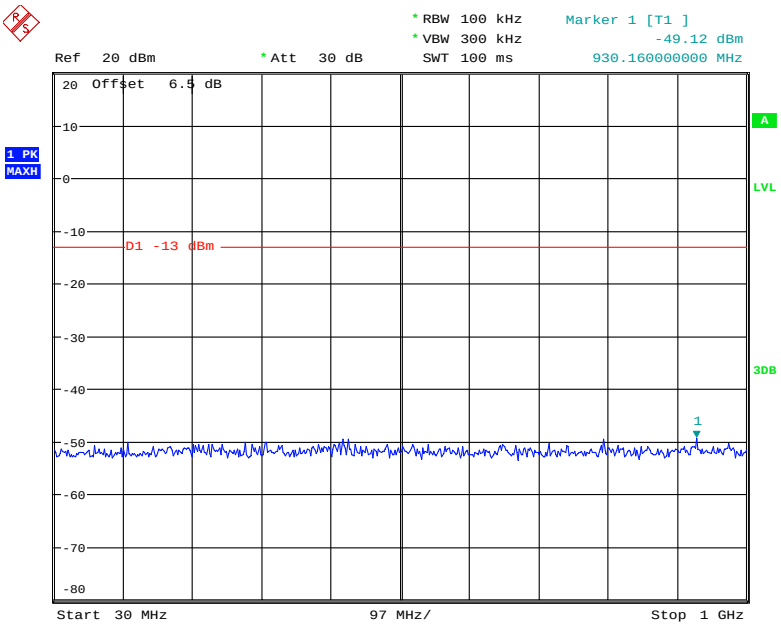
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



Fundamental test

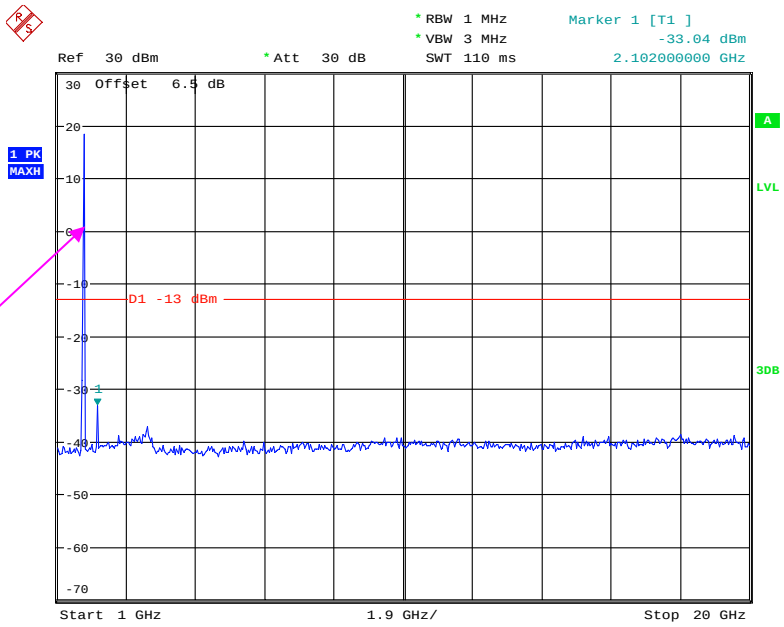
Date: 10.JUN.2020 11:22:39

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



Date: 10.JUN.2020 11:22:58

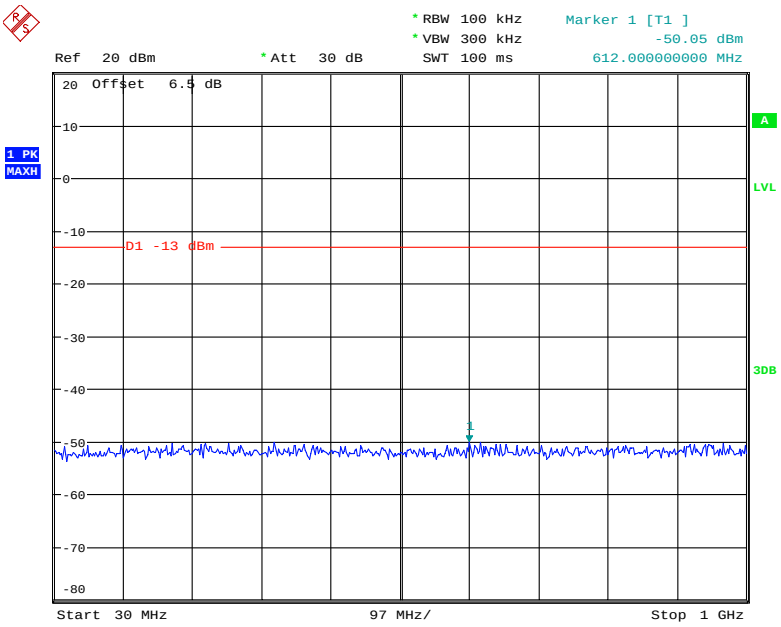
1 GHz – 20 GHz (5.0 MHz, Middle Channel)



Fundamental test

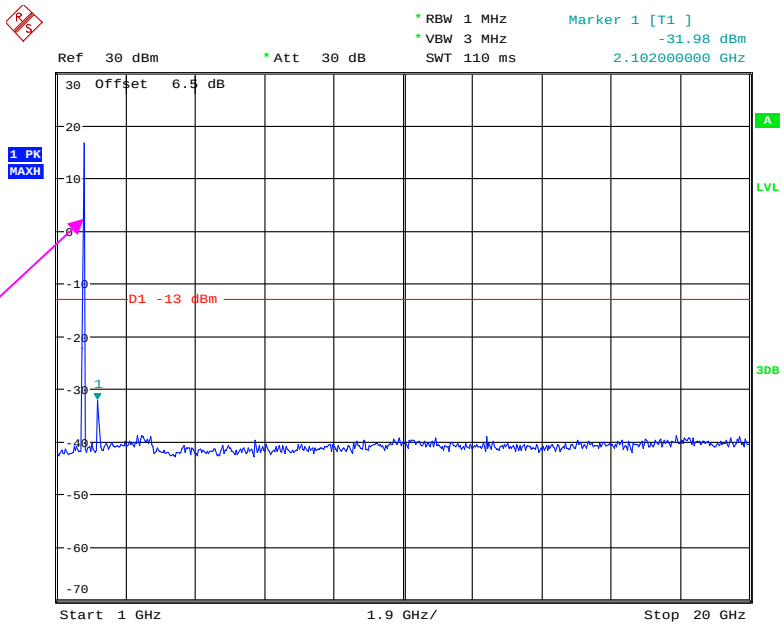
Date: 10.JUN.2020 11:23:13

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



Date: 10.JUN.2020 11:23:32

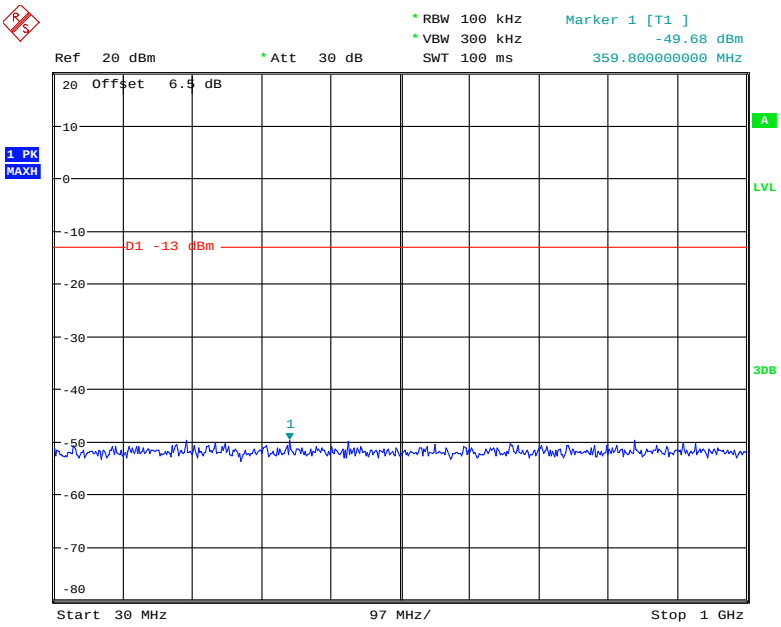
1 GHz – 20 GHz (10.0 MHz, Middle Channel)



Fundamental test

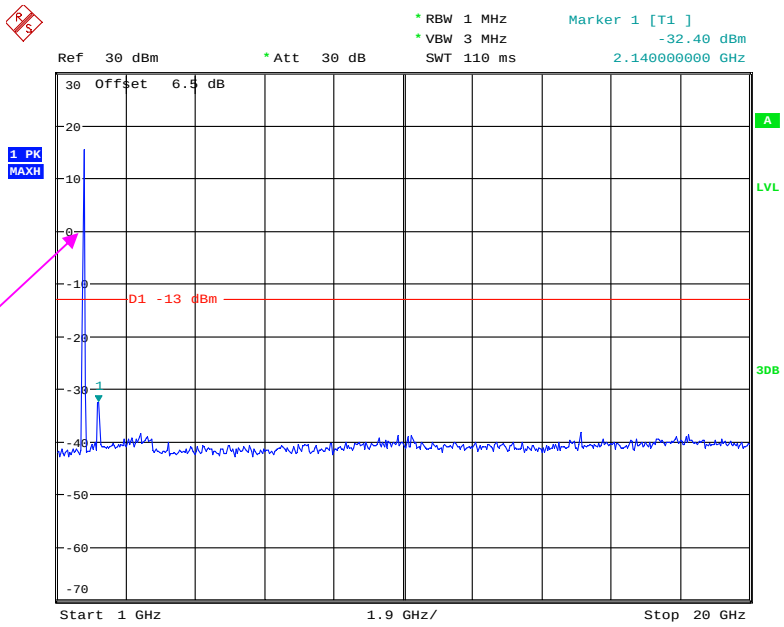
Date: 10.JUN.2020 11:23:44

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



Date: 10.JUN.2020 11:24:06

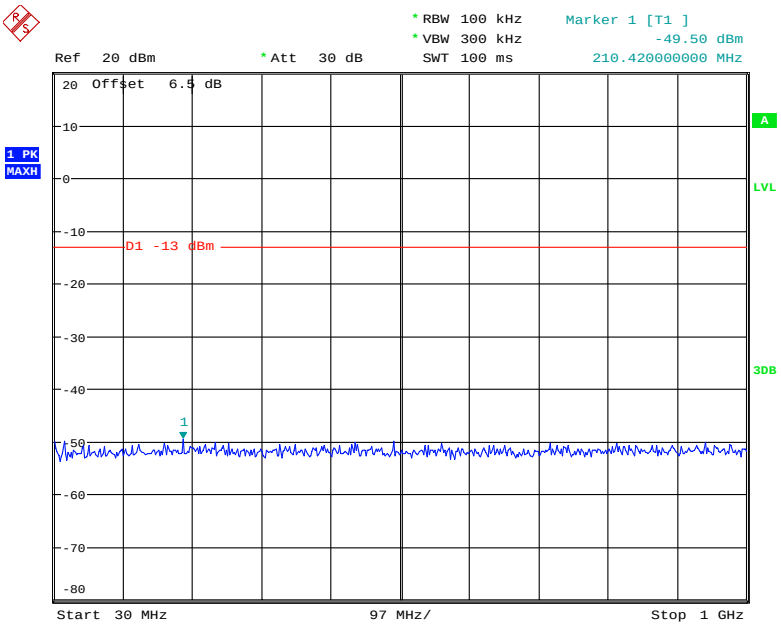
1 GHz – 20 GHz (15.0 MHz, Middle Channel)



Fundamental test

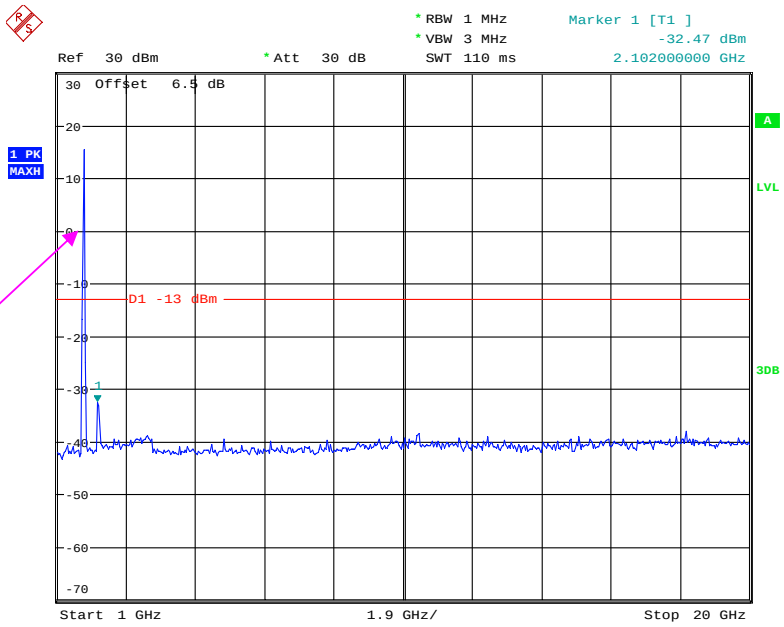
Date: 10.JUN.2020 11:24:18

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



Date: 10.JUN.2020 11:24:40

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

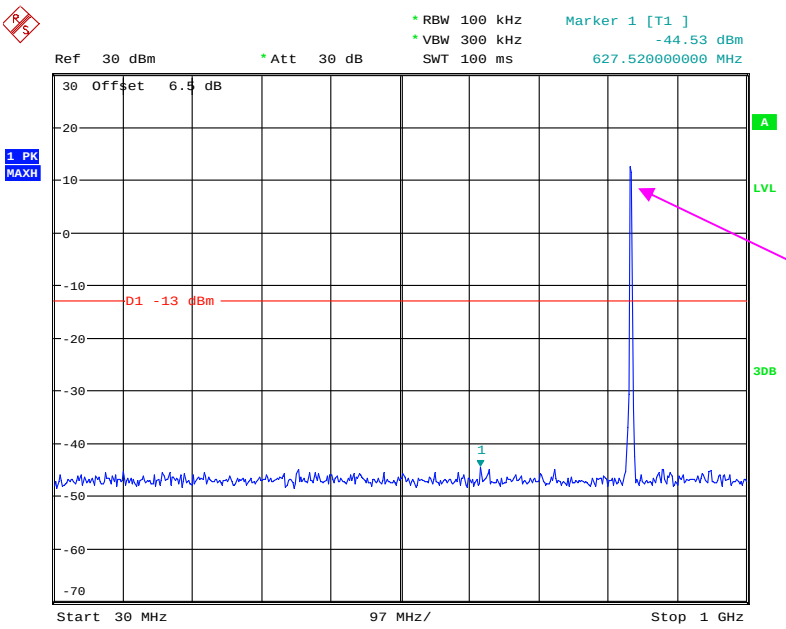


Fundamental test

Date: 10.JUN.2020 11:24:52

LTE Band 5:

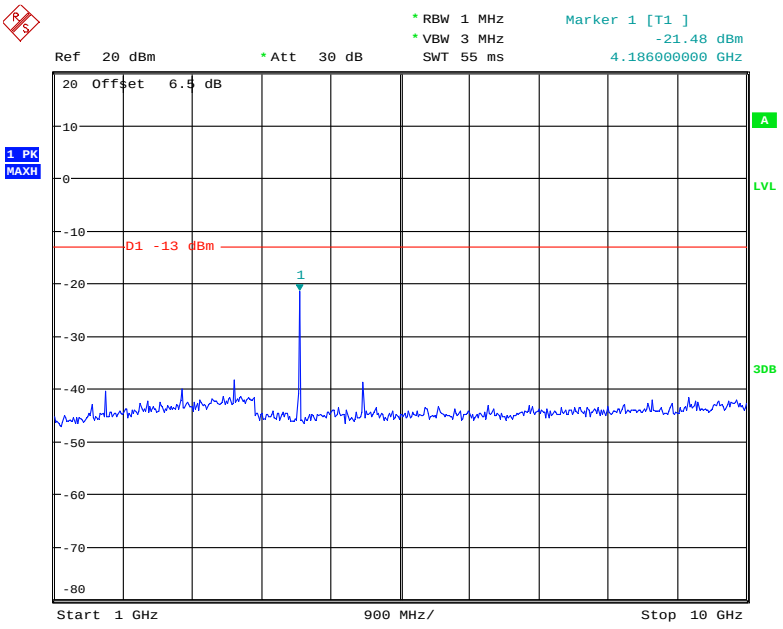
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

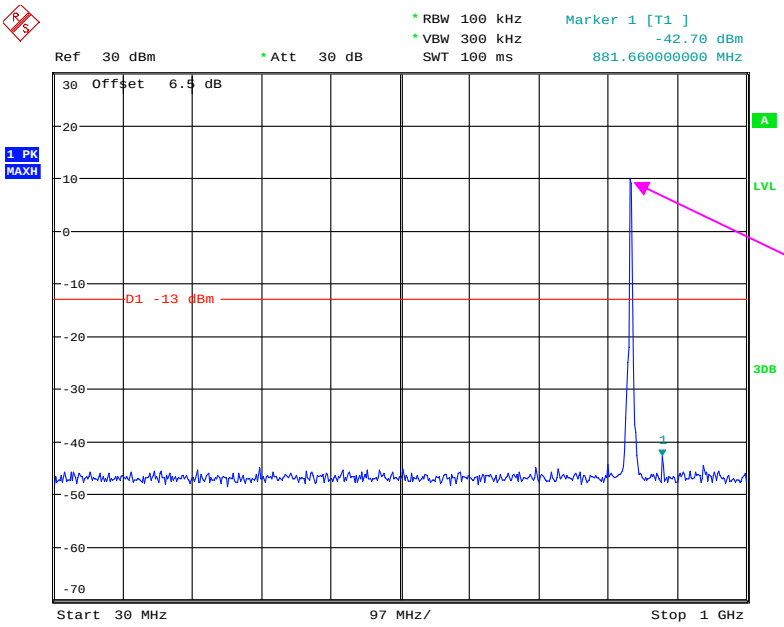
Date: 10.JUN.2020 11:25:10

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



Date: 10.JUN.2020 11:25:22

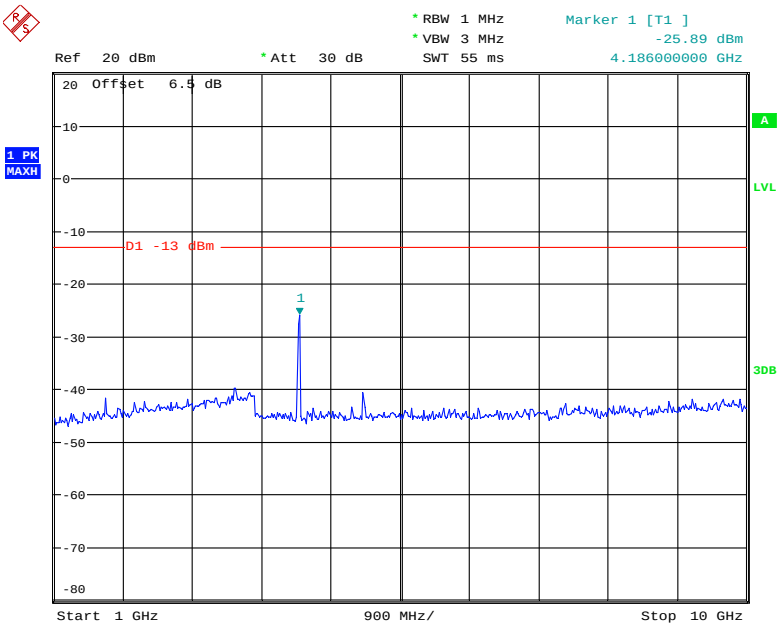
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Fundamental test

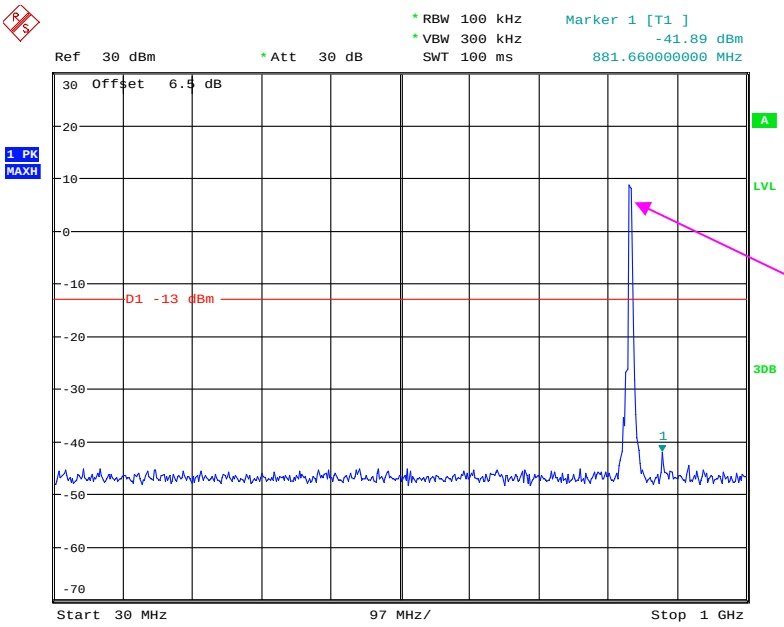
Date: 10.JUN.2020 11:25:43

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



Date: 10.JUN.2020 11:25:54

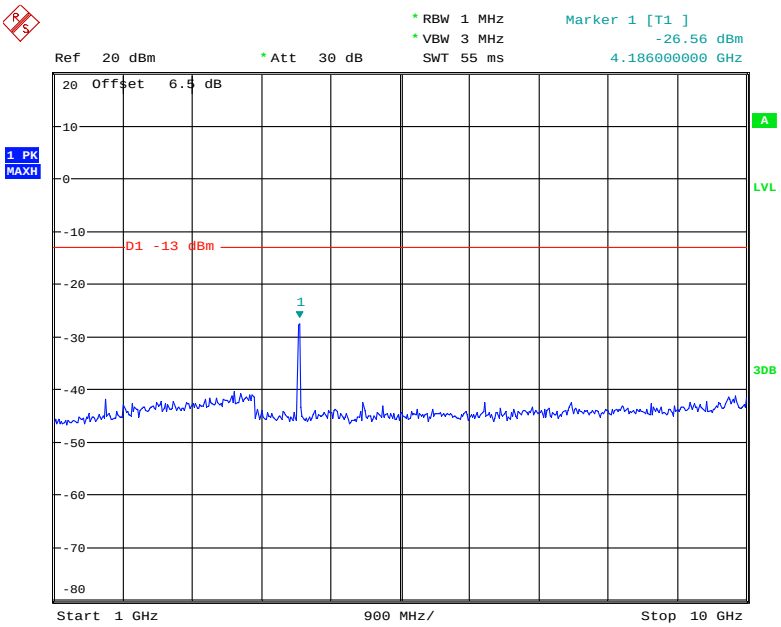
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

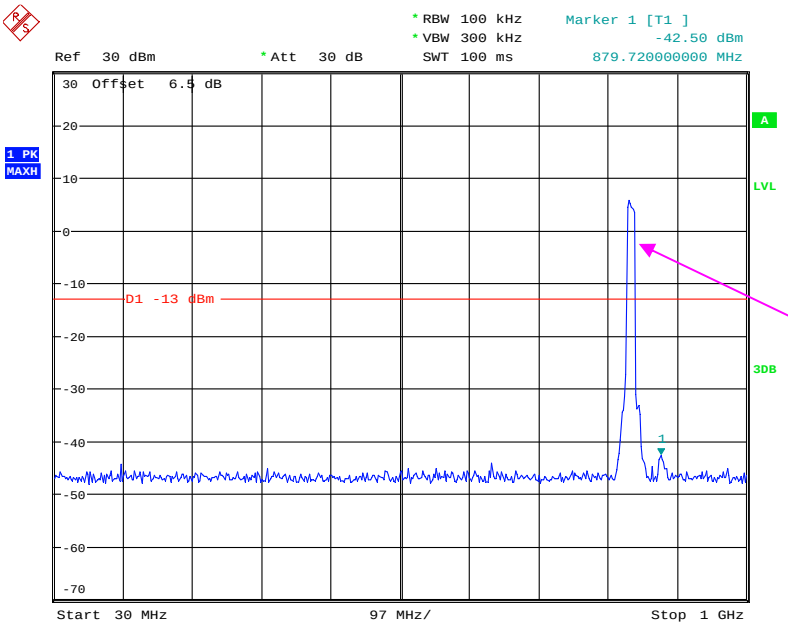
Date: 10.JUN.2020 11:26:16

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



Date: 10.JUN.2020 11:26:28

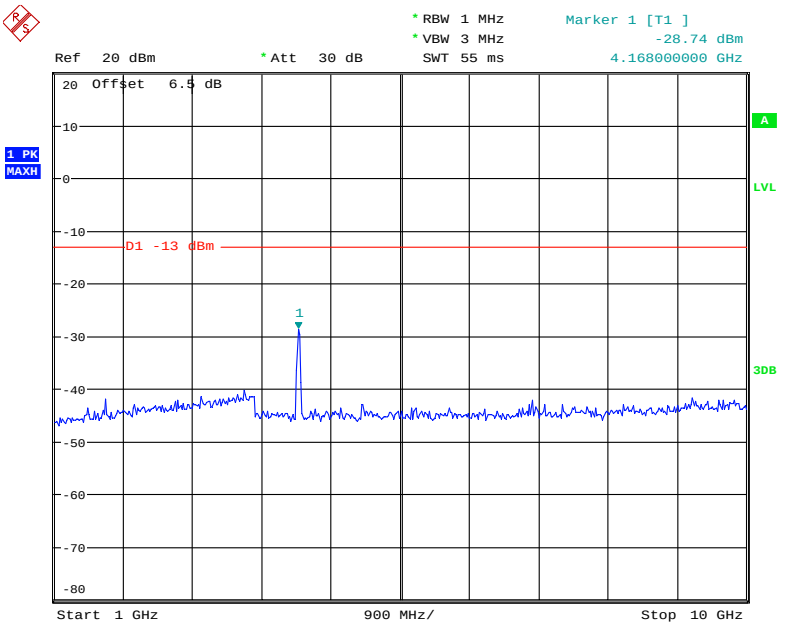
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 10.JUN.2020 11:26:50

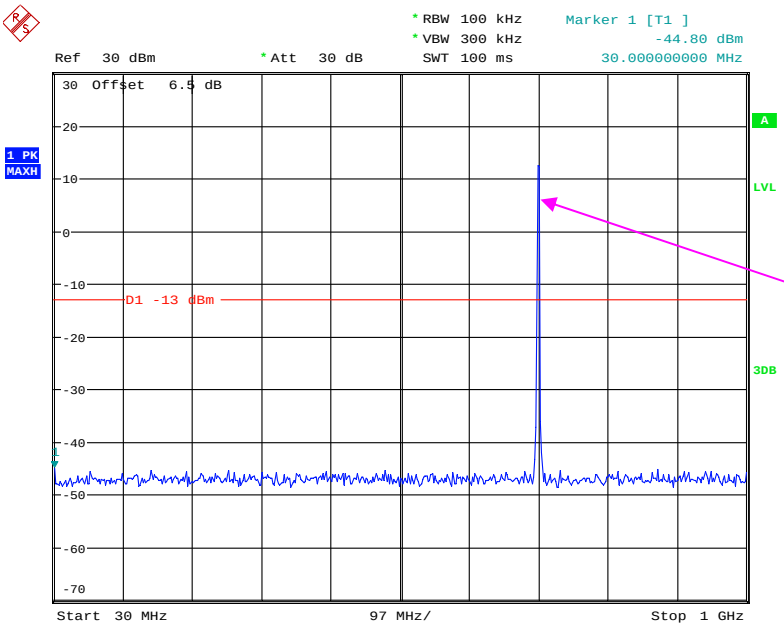
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 10.JUN.2020 11:27:02

LTE Band 12:

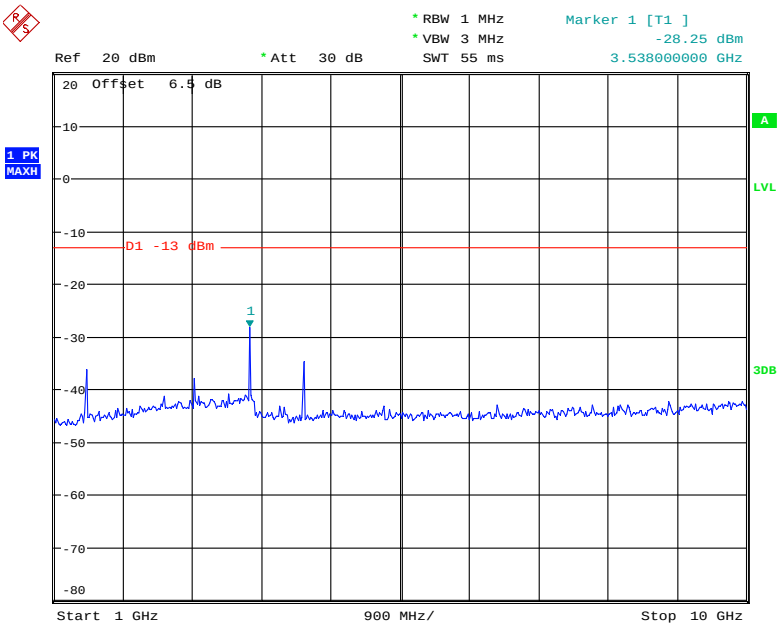
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

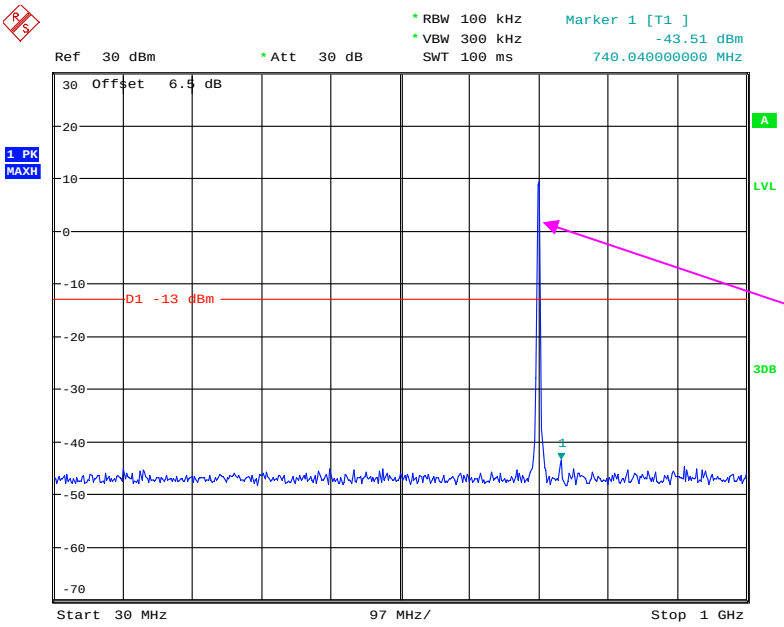
Date: 10.JUN.2020 11:27:20

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



Date: 10.JUN.2020 11:27:32

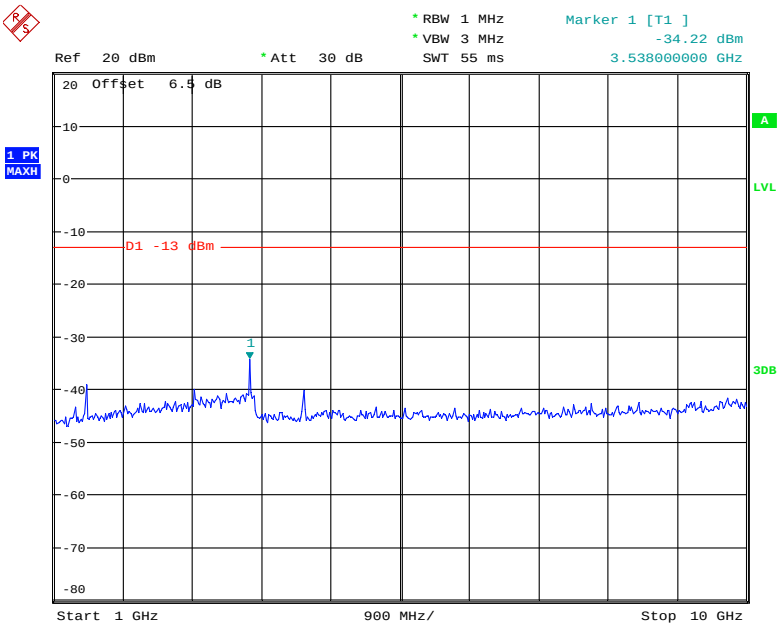
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Fundamental test

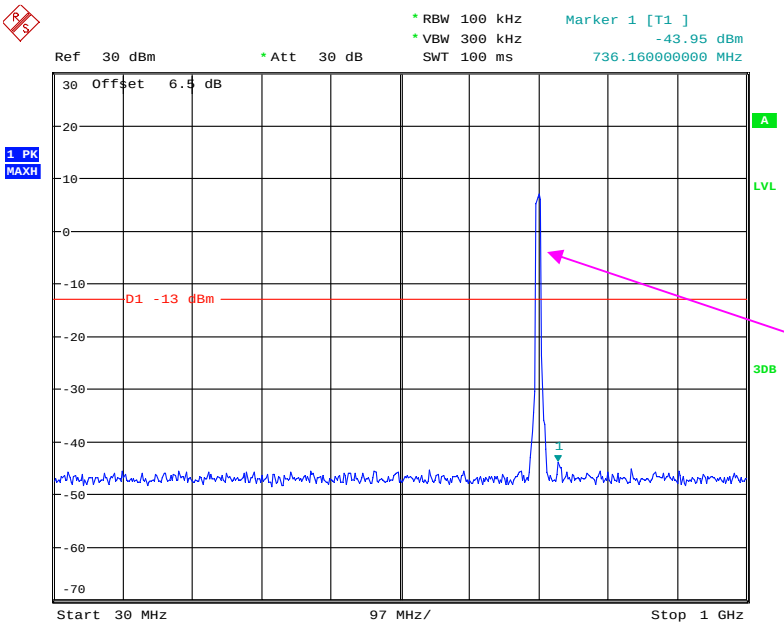
Date: 10.JUN.2020 11:27:50

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



Date: 10.JUN.2020 11:28:01

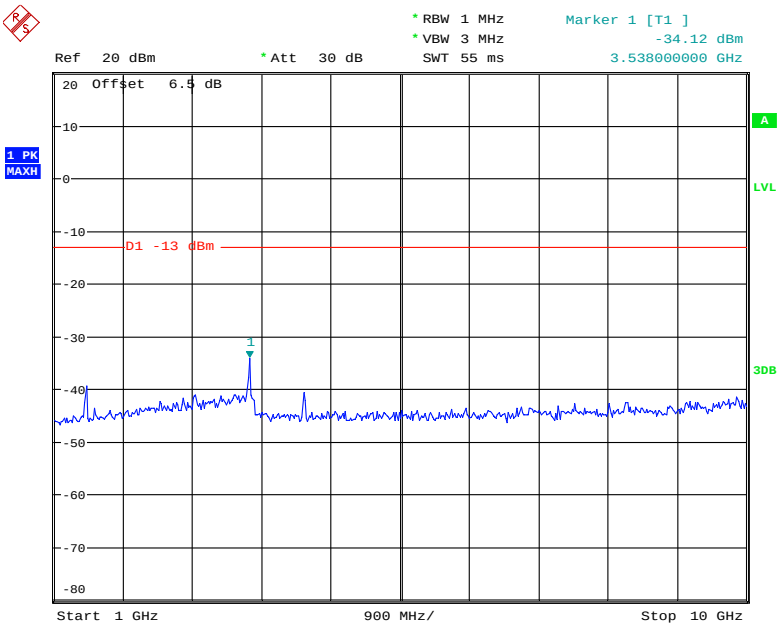
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

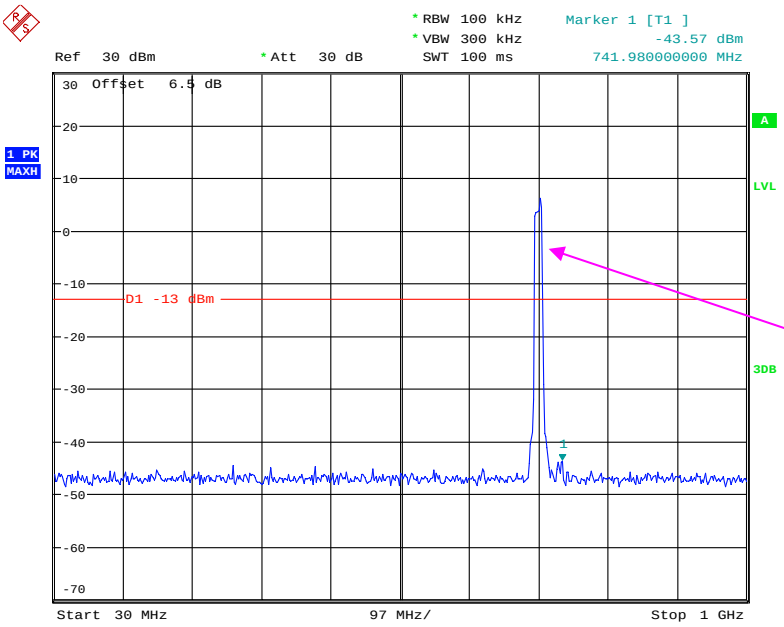
Date: 10.JUN.2020 11:28:20

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



Date: 10.JUN.2020 11:28:32

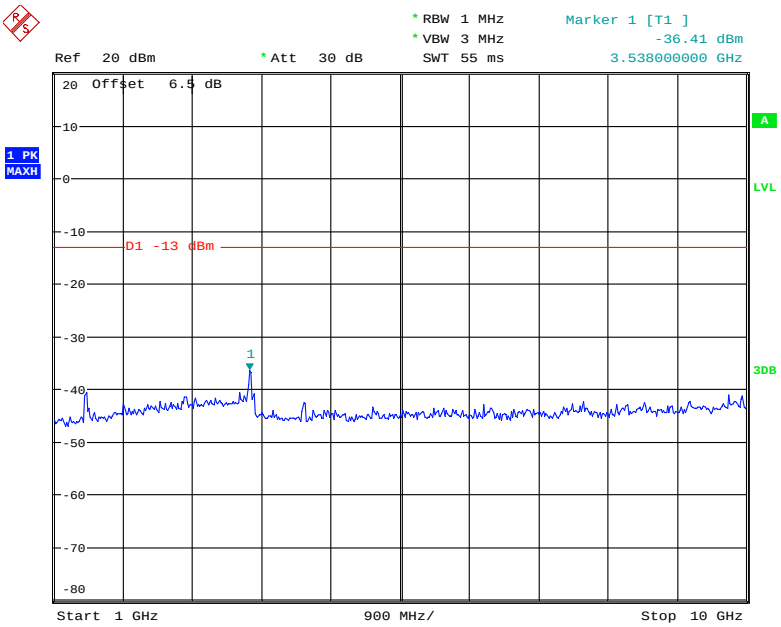
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 10.JUN.2020 11:28:51

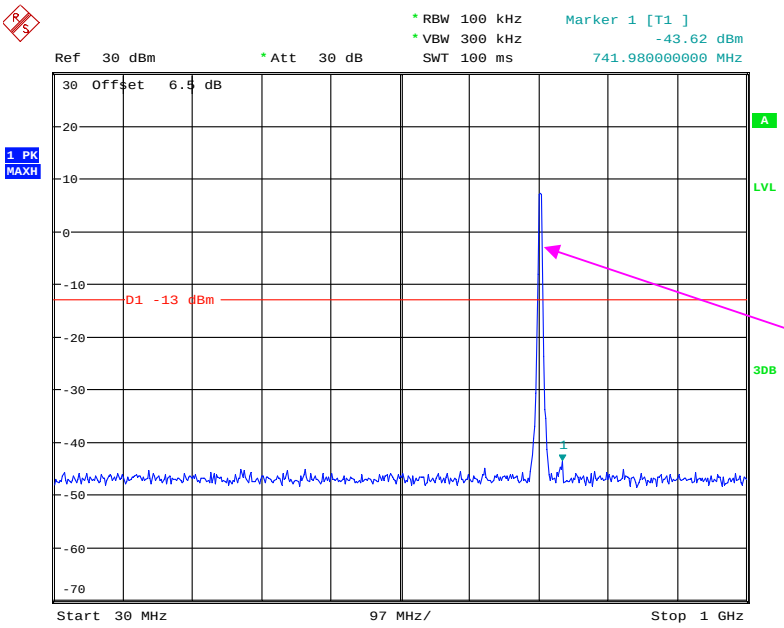
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 10.JUN.2020 11:29:03

LTE Band 17:

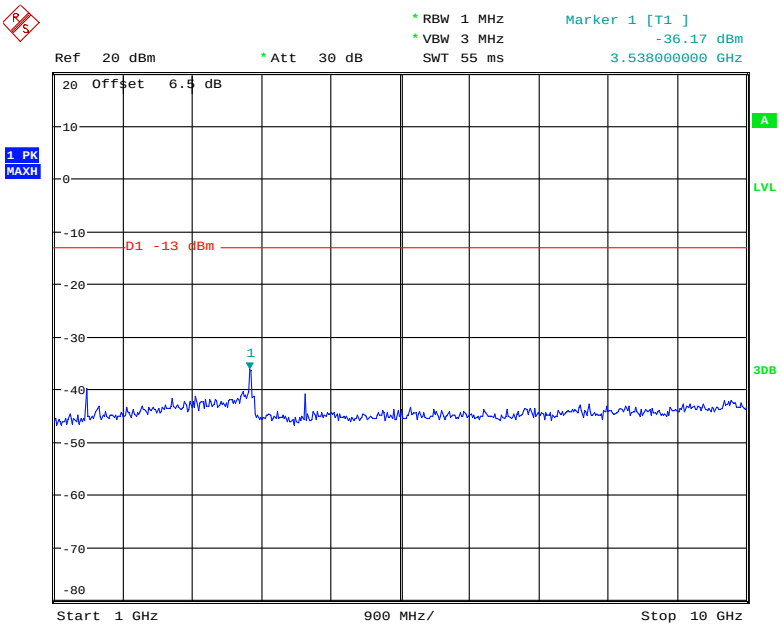
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

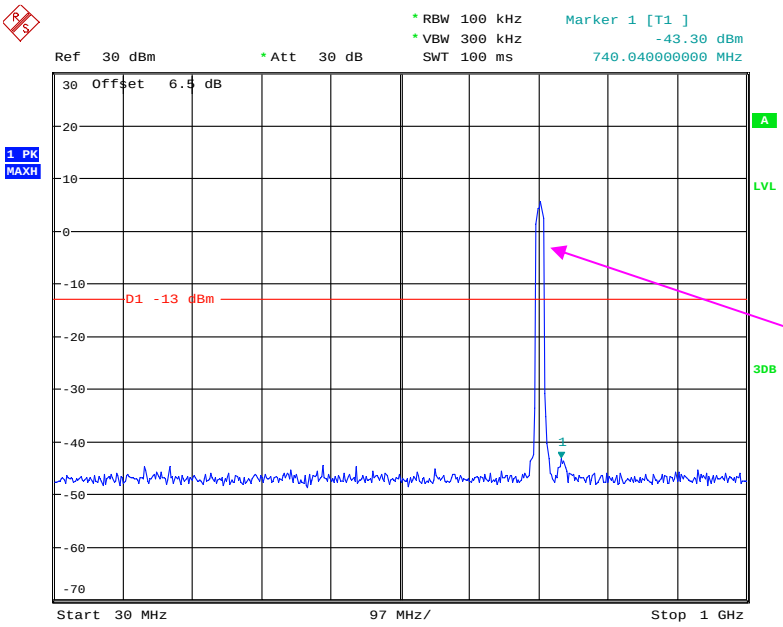
Date: 10.JUN.2020 11:29:23

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



Date: 10.JUN.2020 11:29:35

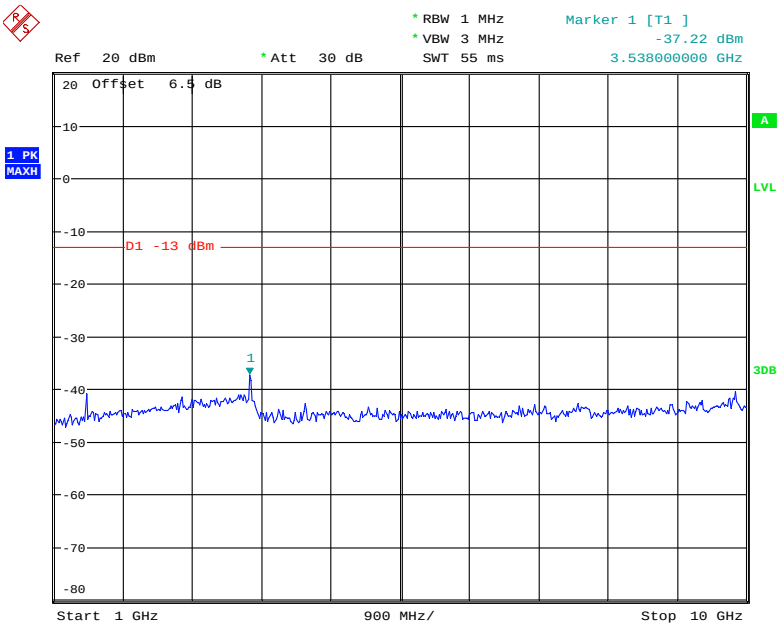
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 10.JUN.2020 11:29:54

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



Date: 10.JUN.2020 11:30:05

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

Applicable Standard

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

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:	23~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Holland Yang and Leo Huang from 2020-06-09 to 2020-06-11.

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										
959.6	37.57	99	1.1	H	-63.0	1.37	0.0	-64.37	-13	51.37
959.6	38.23	251	2.0	V	-61.1	1.37	0.0	-62.47	-13	49.47
1673.20	47.50	257	2.3	H	-58.8	1.30	8.90	-51.20	-13	38.20
1673.20	51.86	37	2.4	V	-53.9	1.30	8.90	-46.30	-13	33.30
2509.80	52.32	139	1.1	H	-51.0	2.60	10.20	-43.40	-13	30.40
2509.80	50.61	201	1.4	V	-52.1	2.60	10.20	-44.50	-13	31.50
3346.40	43.67	329	2.4	H	-57.2	1.50	11.70	-47.00	-13	34.00
3346.40	43.06	51	1.4	V	-57.9	1.50	11.70	-47.70	-13	34.70
WCDMA Mode, Middle channel										
959.6	37.62	129	1.7	H	-63.0	1.37	0.0	-64.37	-13	51.37
959.6	38.45	98	1.7	V	-60.9	1.37	0.0	-62.27	-13	49.27
1673.20	45.46	307	1.2	H	-60.9	1.30	8.90	-53.30	-13	40.30
1673.20	46.69	341	1.3	V	-59.0	1.30	8.90	-51.40	-13	38.40
2509.80	47.73	285	1.9	H	-55.6	2.60	10.20	-48.00	-13	35.00
2509.80	45.35	126	1.4	V	-57.4	2.60	10.20	-49.80	-13	36.80
3346.40	42.97	268	2.4	H	-57.9	1.50	11.70	-47.70	-13	34.70
3346.40	43.37	189	2.4	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										
961.2	37.91	202	1.3	H	-62.7	1.37	0.0	-64.07	-13	51.07
961.2	38.49	322	2.2	V	-60.9	1.37	0.0	-62.27	-13	49.27
3760.00	44.07	207	1.4	H	-58.0	1.50	11.80	-47.70	-13	34.70
3760.00	43.37	252	2.0	V	-58.2	1.50	11.80	-47.90	-13	34.90
WCDMA Mode Band II, Middle channel										
960.6	37.28	139	2.3	H	-63.3	1.37	0.0	-64.67	-13	51.67
960.6	38.84	162	1.8	V	-60.5	1.37	0.0	-61.87	-13	48.87
3760.00	43.25	193	1.3	H	-58.8	1.50	11.80	-48.50	-13	35.50
3760.00	42.89	2	1.3	V	-58.7	1.50	11.80	-48.40	-13	35.40

30 MHz ~ 20 GHz:

AWS Band (Part 27)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
WCDMA Mode Band IV, Middle channel										
958.4	37.08	337	1.7	H	-63.5	1.37	0.0	-64.87	-13	51.87
958.4	38.42	42	1.5	V	-60.9	1.37	0.0	-62.27	-13	49.27
3465.20	43.07	147	1.1	H	-57.7	1.50	12.00	-47.20	-13	34.20
3465.20	43.84	295	2.2	V	-57.7	1.50	12.00	-47.20	-13	34.20

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 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 20 GHz										
958.7	37.54	243	1.3	H	-63.1	1.37	0.0	-64.47	-13	51.47
958.7	38.26	120	1.8	V	-61.1	1.37	0.0	-62.47	-13	49.47
3760.00	42.47	137	2.4	H	-59.6	1.50	11.80	-49.30	-13	36.30
3760.00	43.24	242	1.5	V	-58.3	1.50	11.80	-48.00	-13	35.00
Band 4 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 20 GHz										
961.3	37.48	201	2.0	H	-63.1	1.37	0.0	-64.47	-13	51.47
961.3	38.15	223	1.5	V	-61.2	1.37	0.0	-62.57	-13	49.57
3465.00	43.37	299	1.4	H	-57.4	1.50	12.00	-46.90	-13	33.90
3465.00	43.69	68	2.5	V	-57.8	1.50	12.00	-47.30	-13	34.30
Band 5 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 10 GHz										
959.4	37.63	284	2.0	H	-63.0	1.37	0.0	-64.37	-13	51.37
959.4	38.52	38	2.3	V	-60.8	1.37	0.0	-62.17	-13	49.17
1673.00	44.95	126	1.7	H	-61.4	1.30	8.90	-53.80	-13	40.80
1673.00	45.03	263	1.1	V	-60.7	1.30	8.90	-53.10	-13	40.10
Band 12 (1.4 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 10GHz										
962.5	37.34	154	1.2	H	-63.3	1.37	0.0	-64.67	-13	51.67
962.5	38.78	159	2.3	V	-60.6	1.37	0.0	-61.97	-13	48.97
1415.00	53.57	36	1.7	H	-54.6	1.60	7.90	-48.30	-13	35.30
1415.00	51.85	227	2.4	V	-56.6	1.60	7.90	-50.30	-13	37.30
Band 17 (5 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 10GHz										
961.7	37.39	173	1.8	H	-63.2	1.37	0.0	-64.57	-13	51.57
961.7	38.46	5	1.8	V	-60.9	1.37	0.0	-62.27	-13	49.27
1420.00	52.41	125	1.9	H	-55.8	1.60	7.90	-49.50	-13	36.50
1420.00	53.34	84	2.1	V	-55.1	1.60	7.90	-48.80	-13	35.80

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.

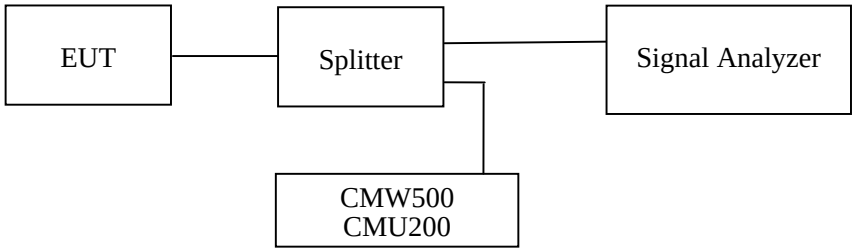
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

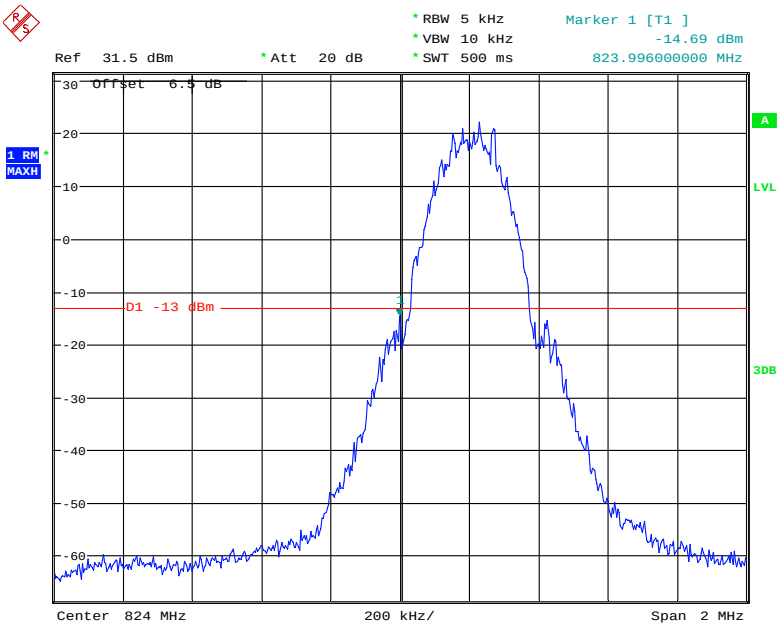
Temperature:	23~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Gavin Guo from 2020-06-10 to 2020-07-17.

EUT operation mode: Transmitting

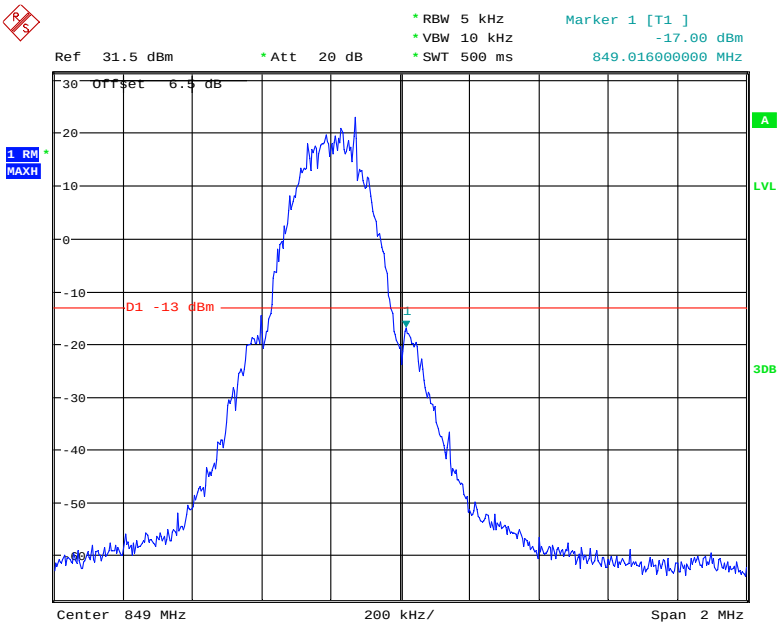
Test Result: Compliance. Please refer to the following plots.

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



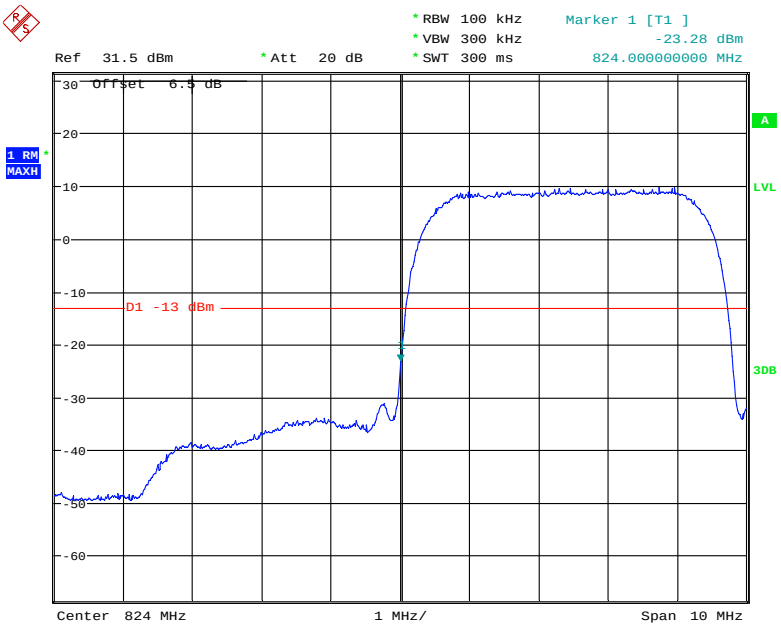
Date: 10.JUN.2020 15:20:51

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



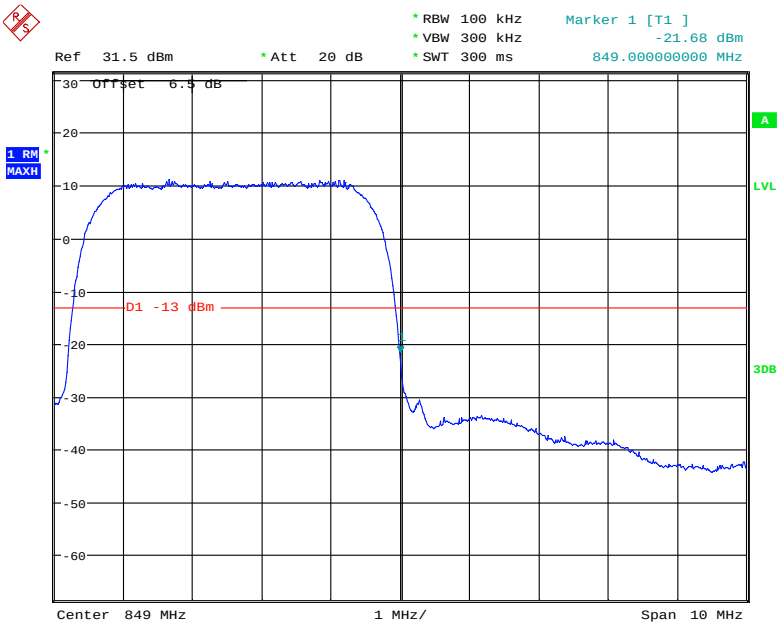
Date: 10.JUN.2020 15:22:14

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



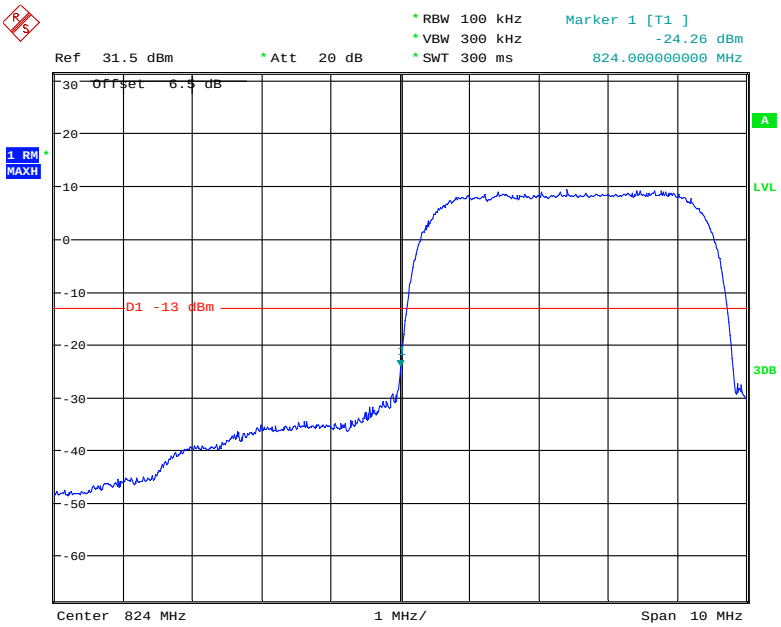
Date: 11.JUN.2020 16:04:07

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



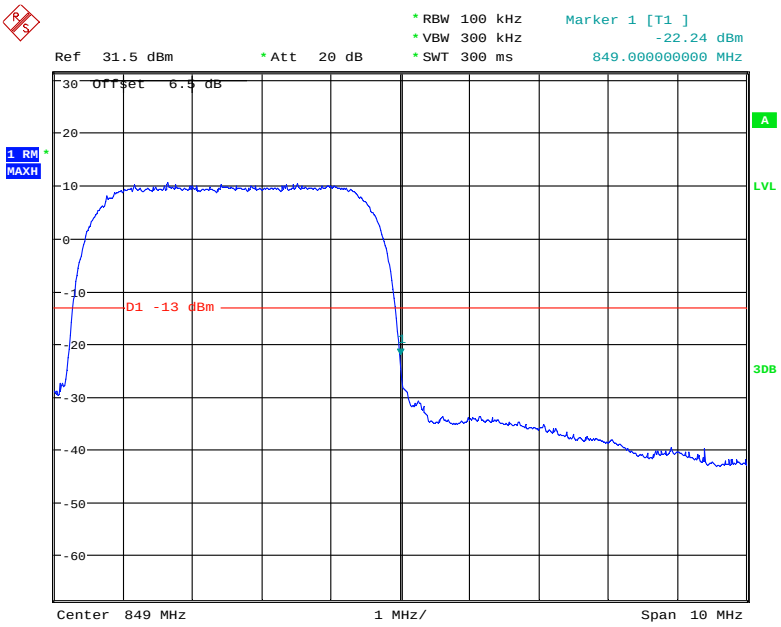
Date: 11.JUN.2020 16:07:12

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



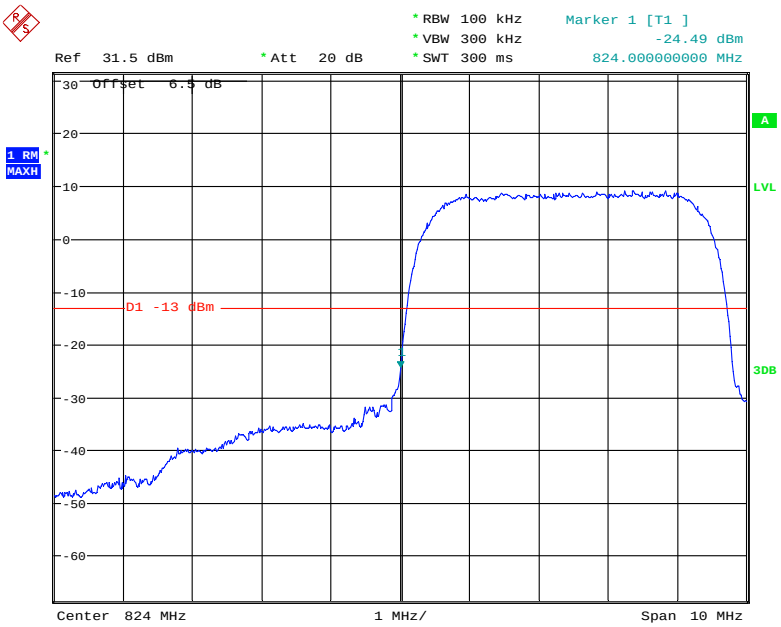
Date: 11.JUN.2020 16:03:35

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



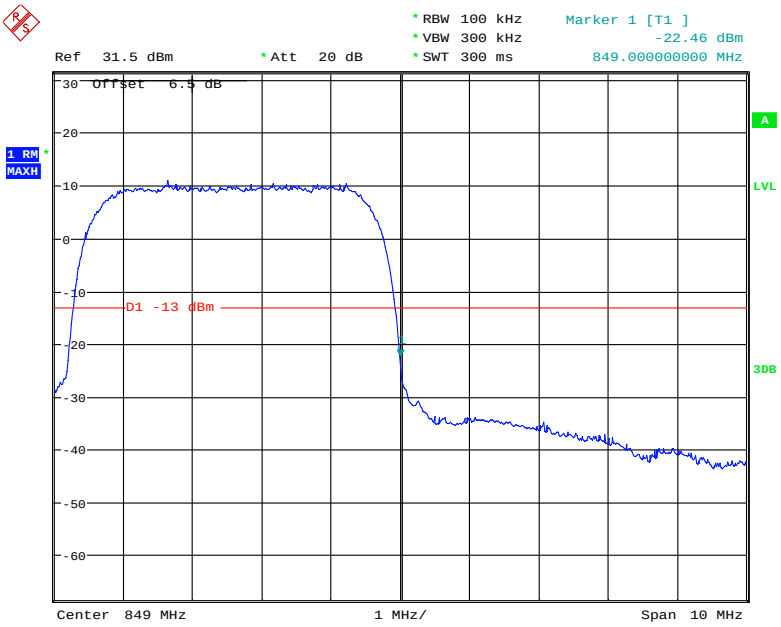
Date: 11.JUN.2020 16:06:46

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



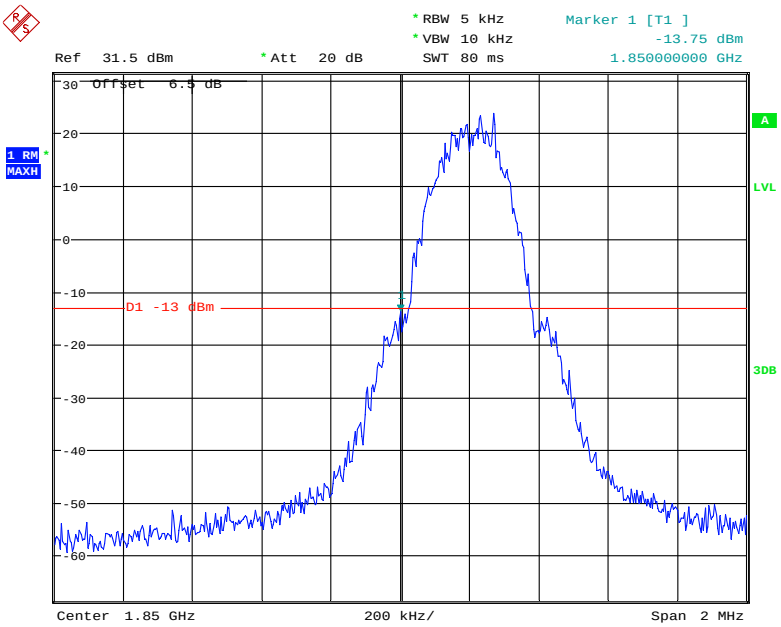
Date: 11.JUN.2020 16:05:08

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



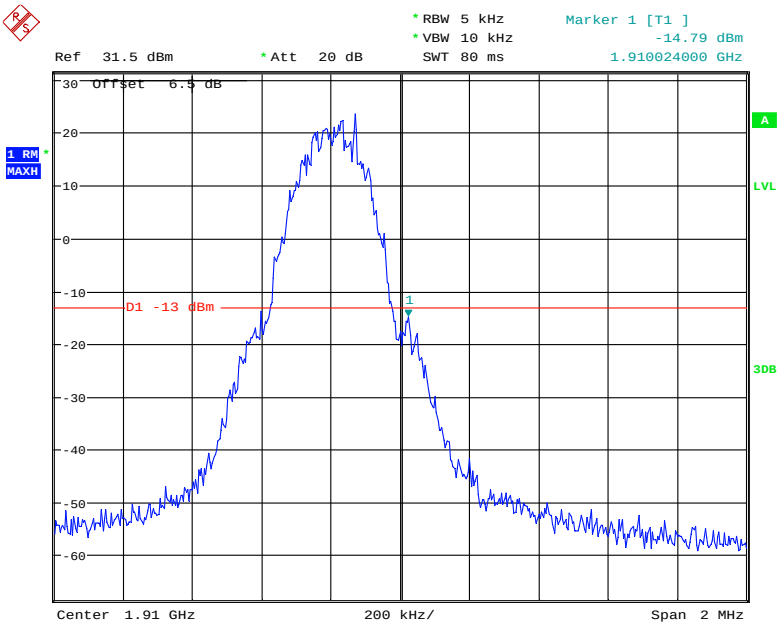
Date: 11.JUN.2020 16:05:40

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



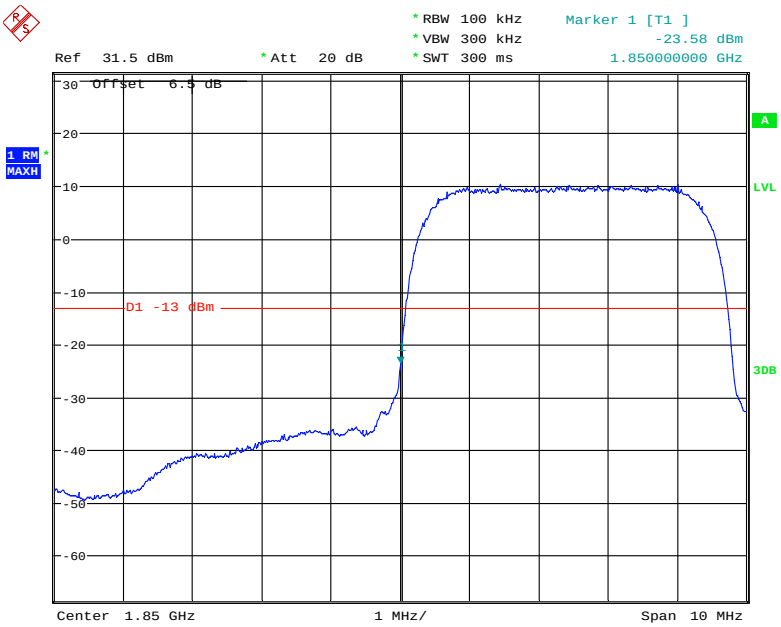
Date: 10.JUN.2020 15:49:15

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



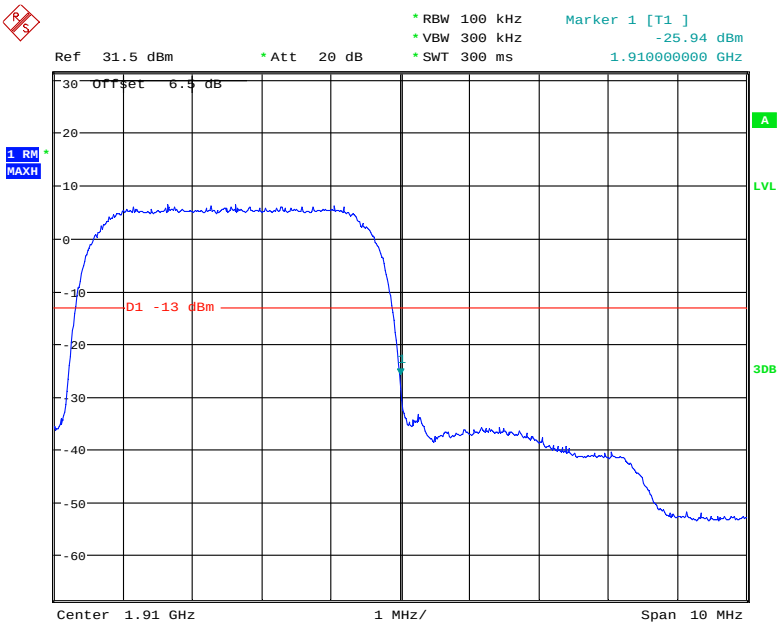
Date: 10.JUN.2020 15:50:14

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



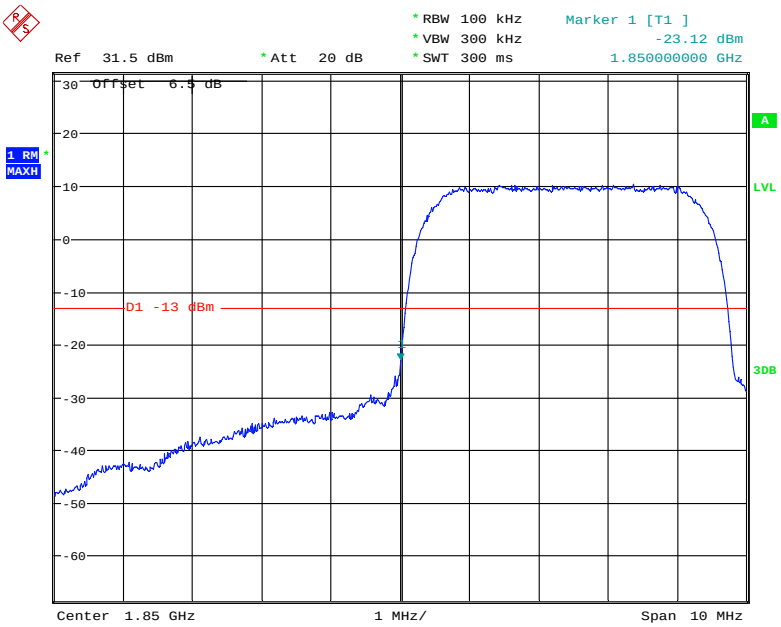
Date: 11.JUN.2020 15:19:18

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



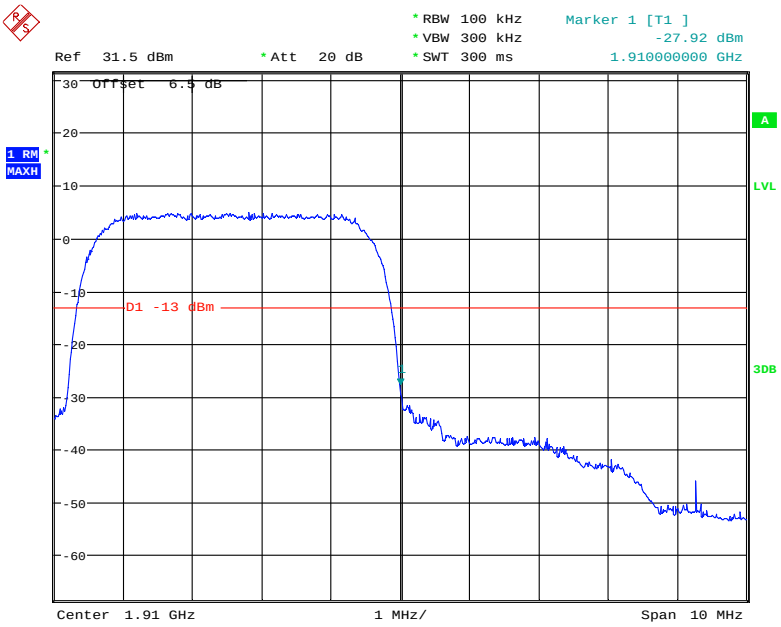
Date: 11.JUN.2020 15:19:43

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



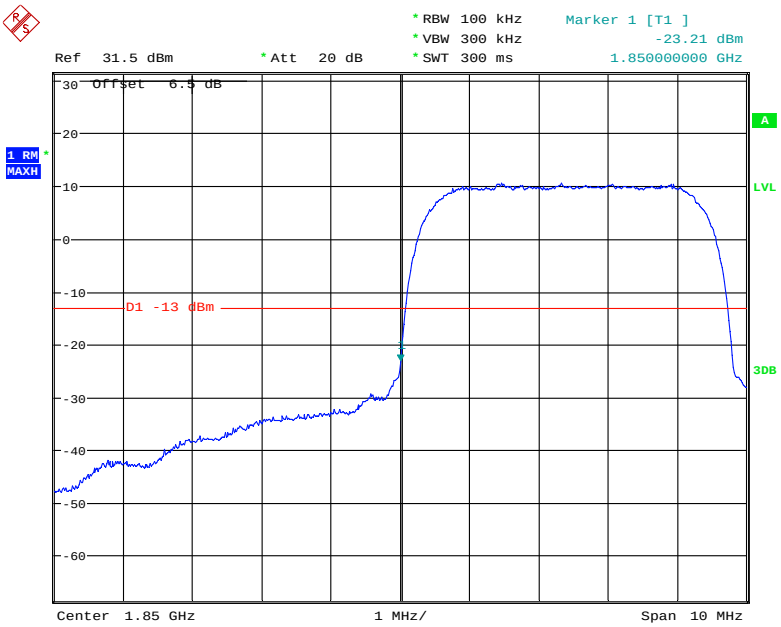
Date: 11.JUN.2020 15:18:49

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



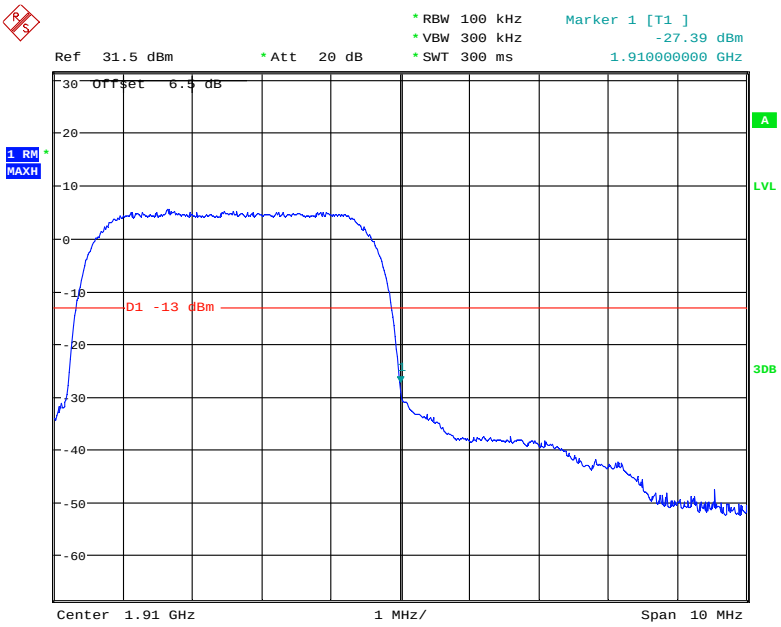
Date: 11.JUN.2020 15:18:06

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



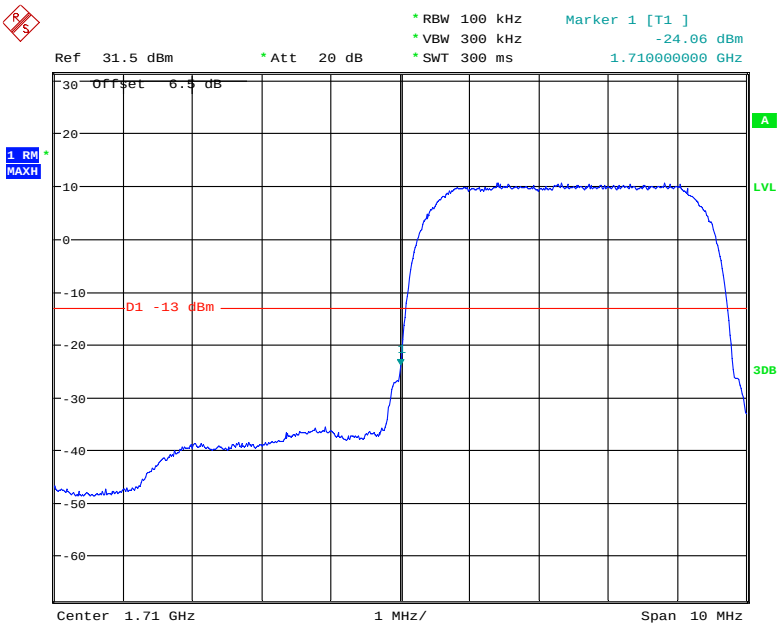
Date: 11.JUN.2020 15:15:59

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



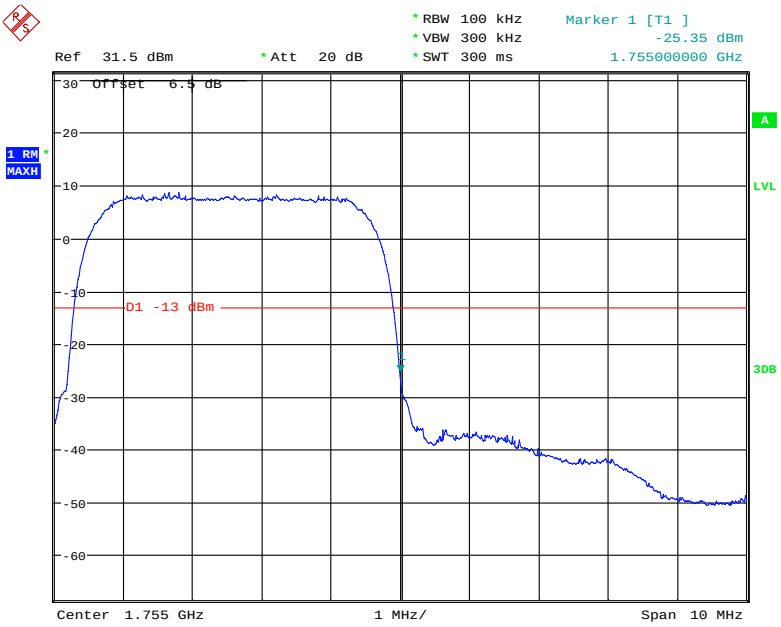
Date: 11.JUN.2020 15:17:25

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



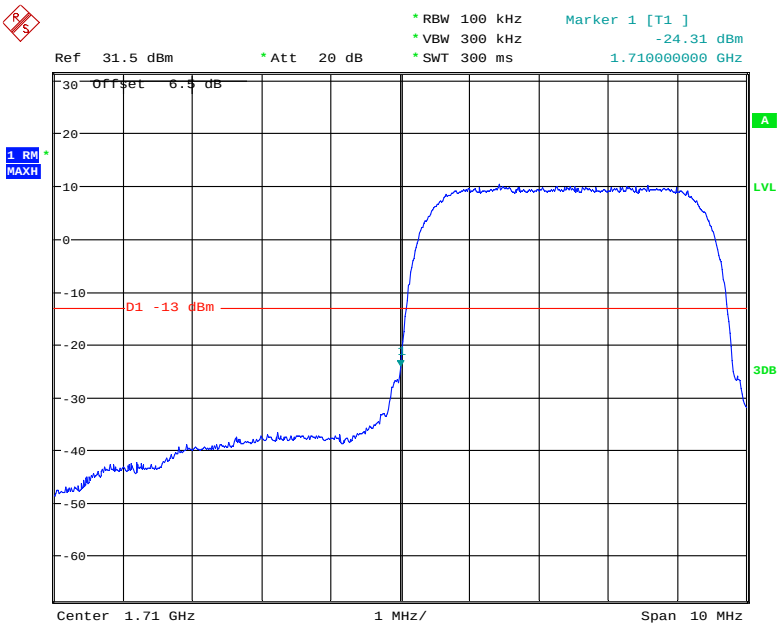
Date: 11.JUN.2020 15:40:24

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



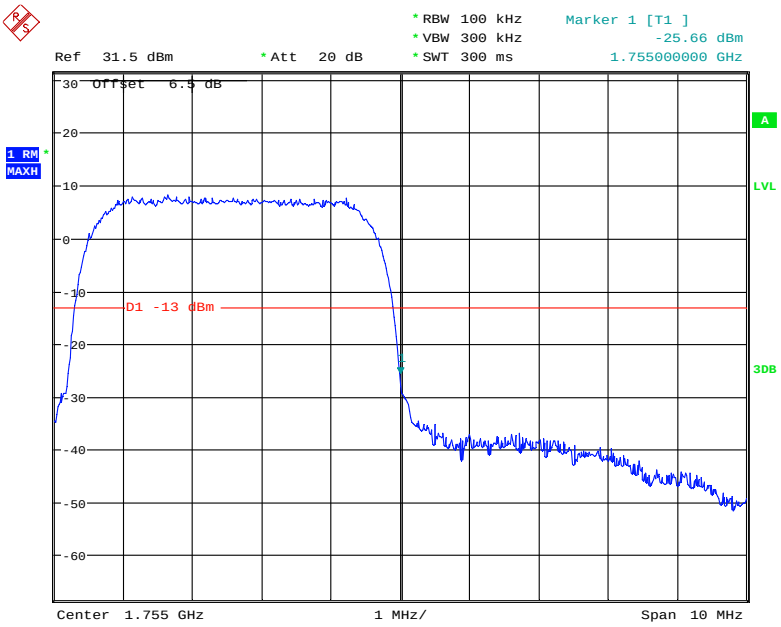
Date: 11.JUN.2020 15:41:11

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



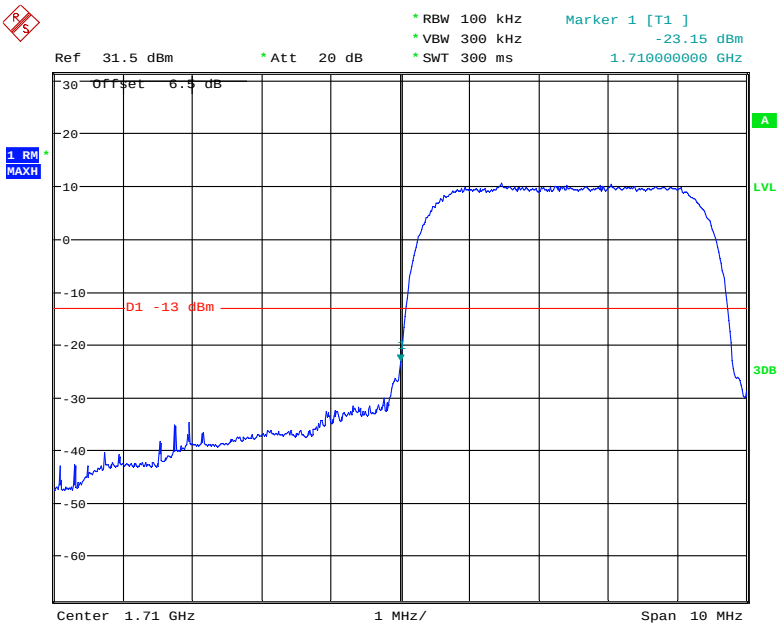
Date: 11.JUN.2020 15:39:57

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



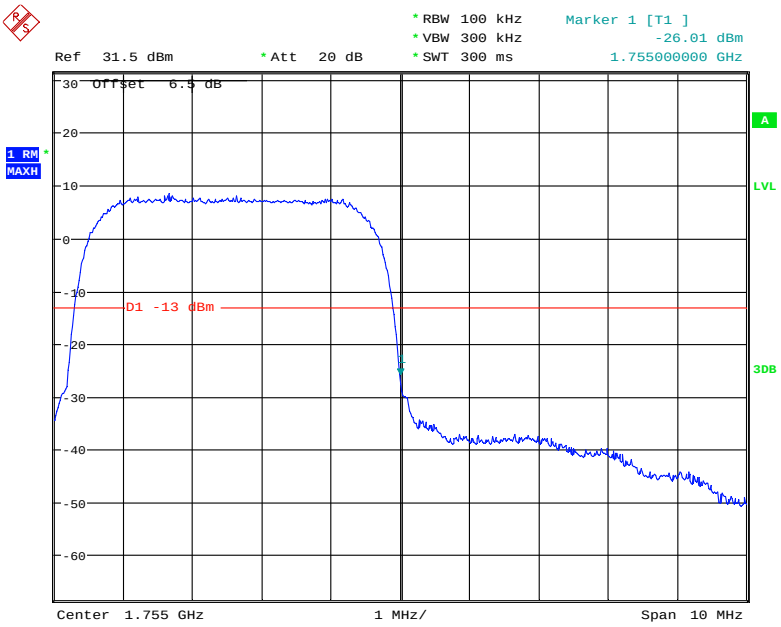
Date: 11.JUN.2020 15:41:39

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



Date: 11.JUN.2020 15:37:53

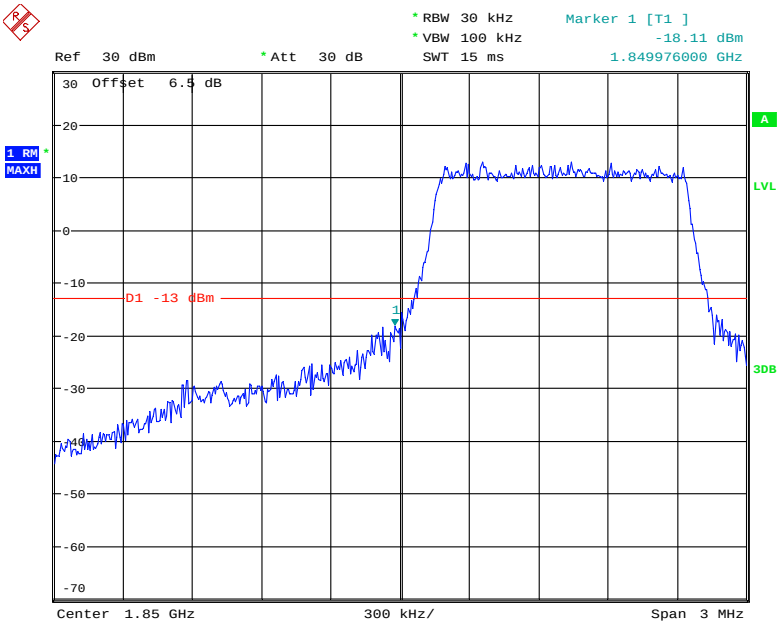
AWS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 11.JUN.2020 15:46:19

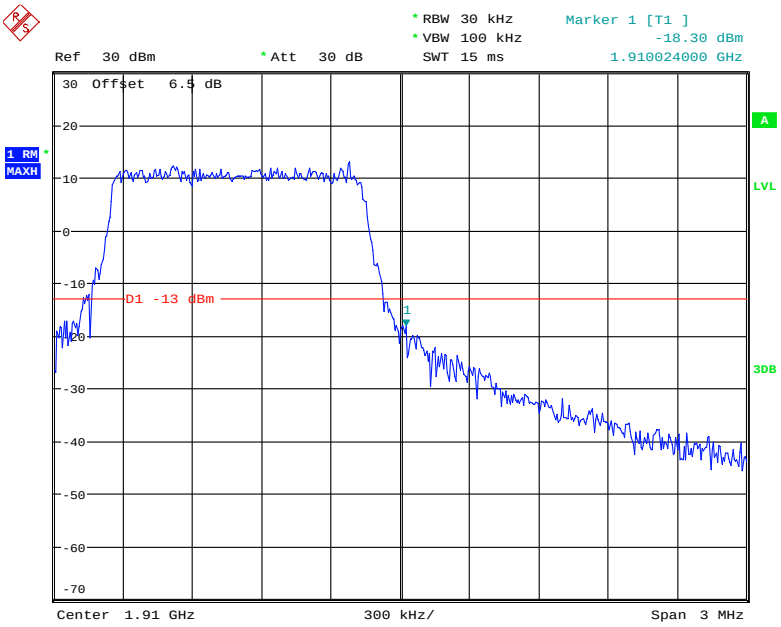
Band 2:

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



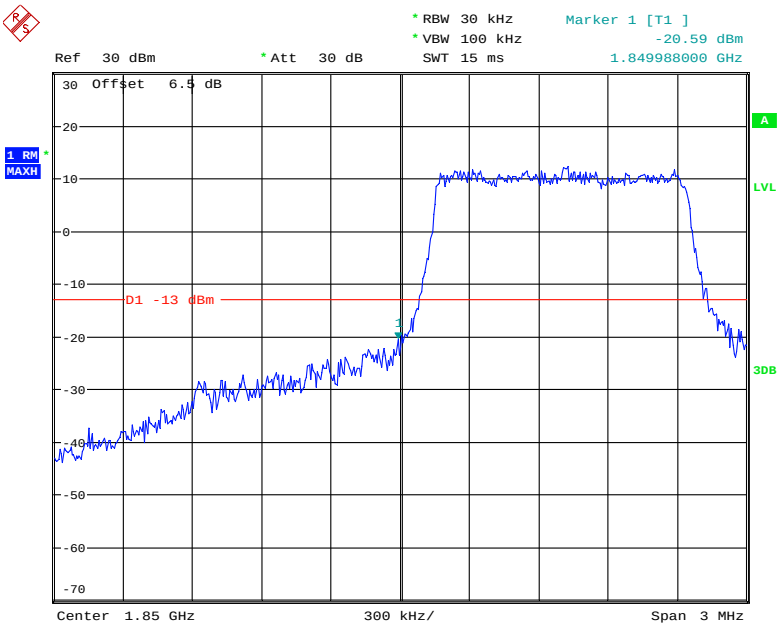
Date: 10.JUN.2020 10:21:39

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



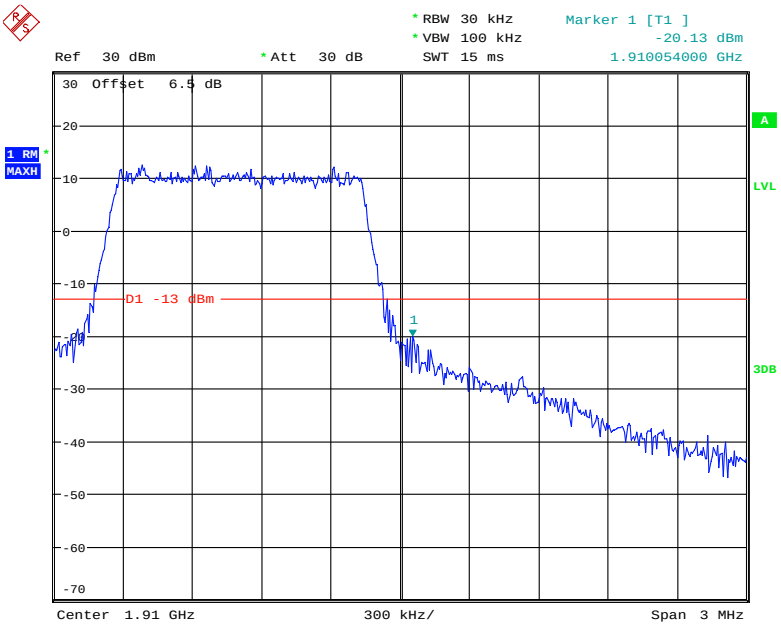
Date: 10.JUN.2020 10:22:19

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



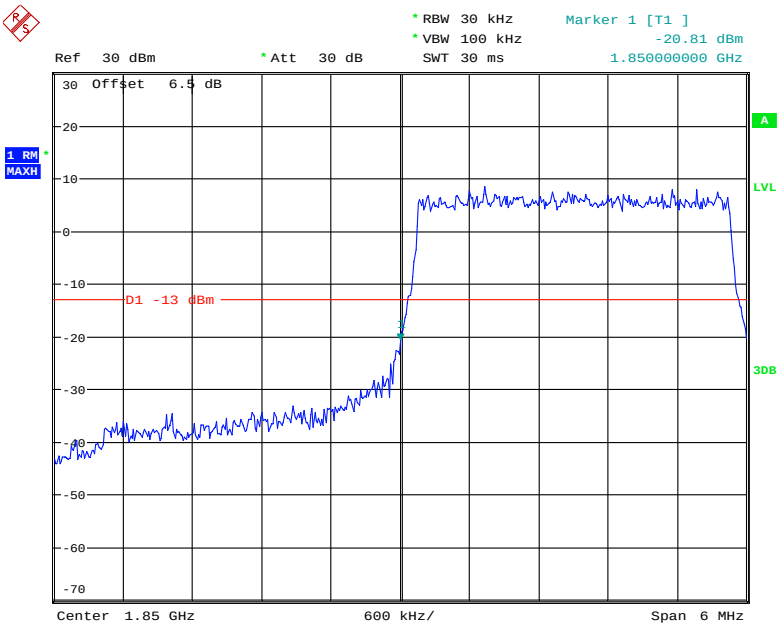
Date: 10.JUN.2020 10:21:59

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



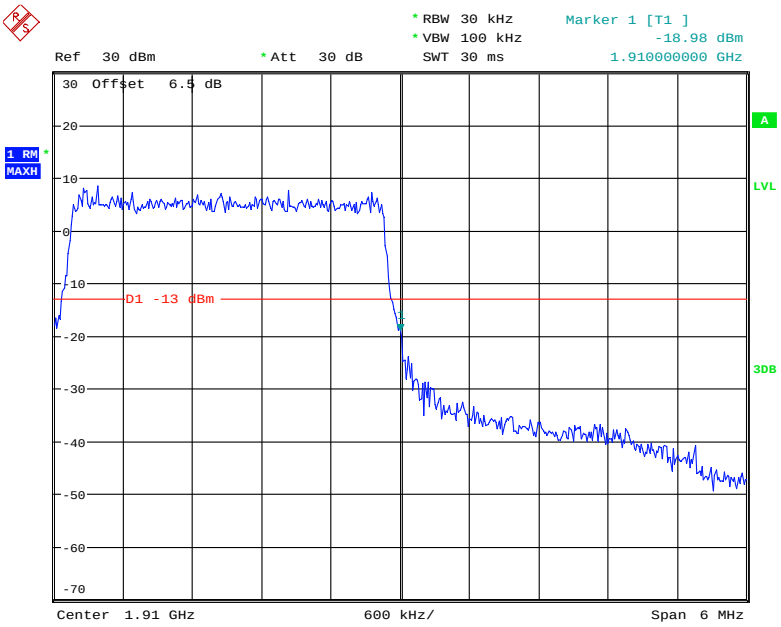
Date: 10.JUN.2020 10:22:39

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



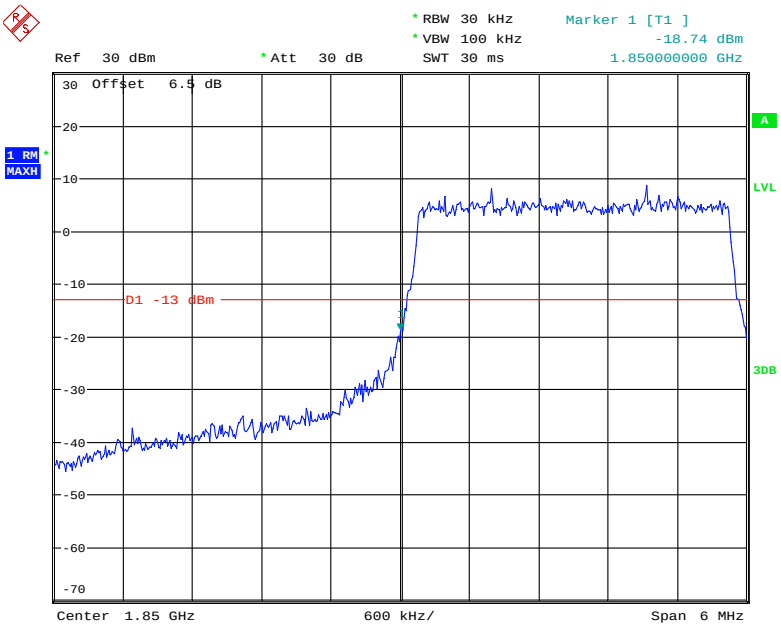
Date: 10.JUN.2020 10:23:49

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



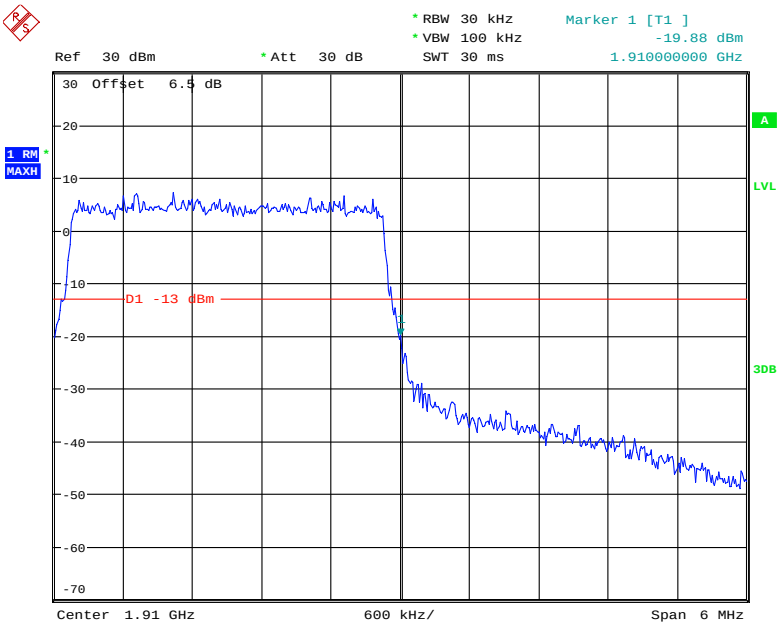
Date: 10.JUN.2020 10:24:23

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



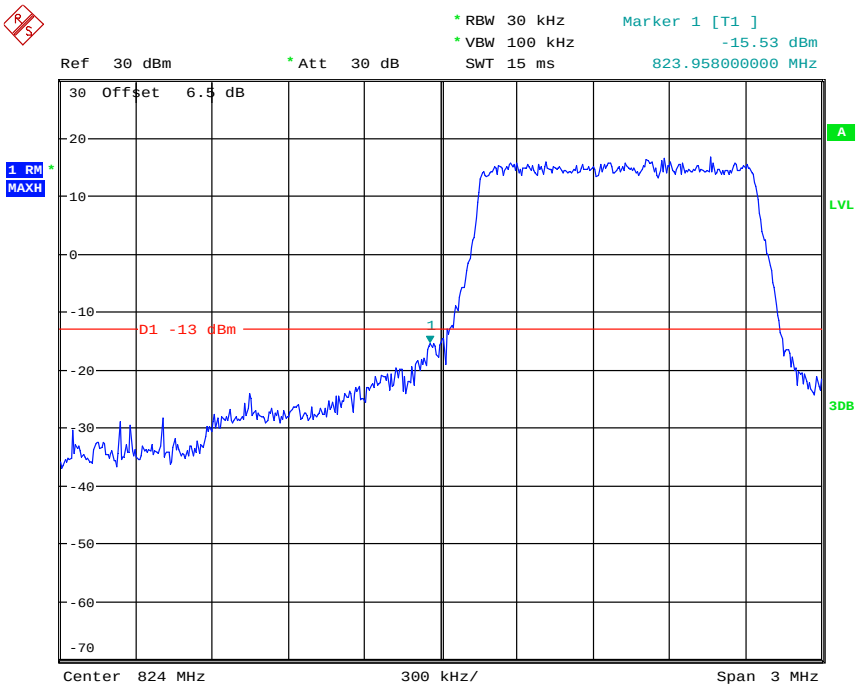
Date: 10.JUN.2020 10:24:05

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

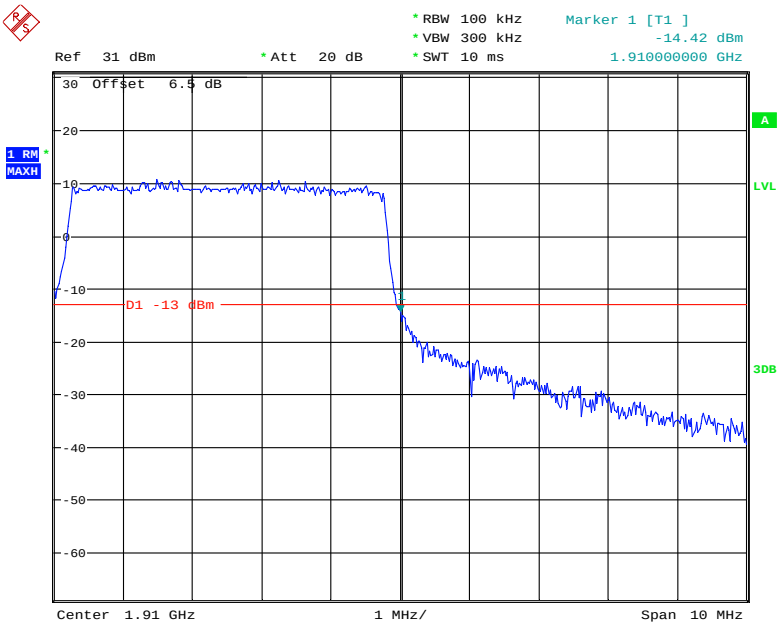


Date: 10.JUN.2020 10:24:42

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

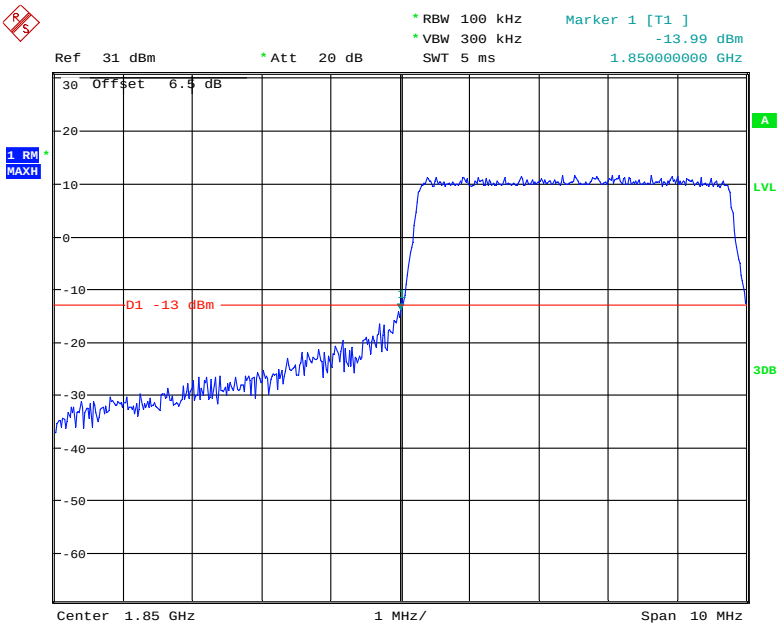


QPSK (5.0 MHz, FULL RB) - Right Band Edge



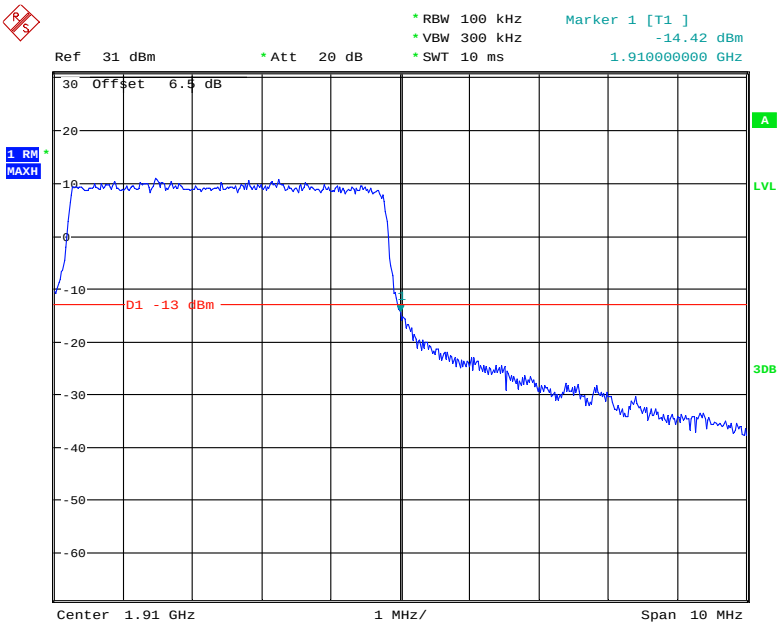
Date: 10.JUN.2020 14:05:13

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



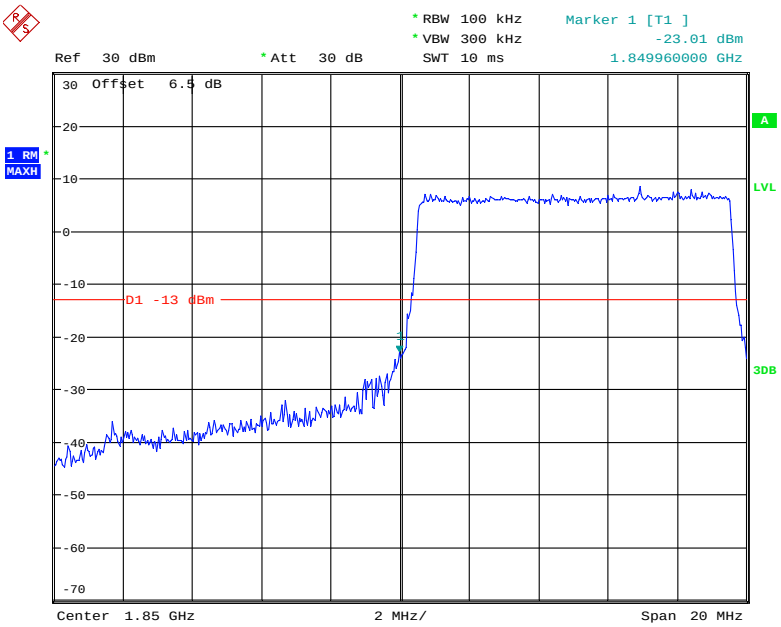
Date: 10.JUN.2020 14:03:06

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



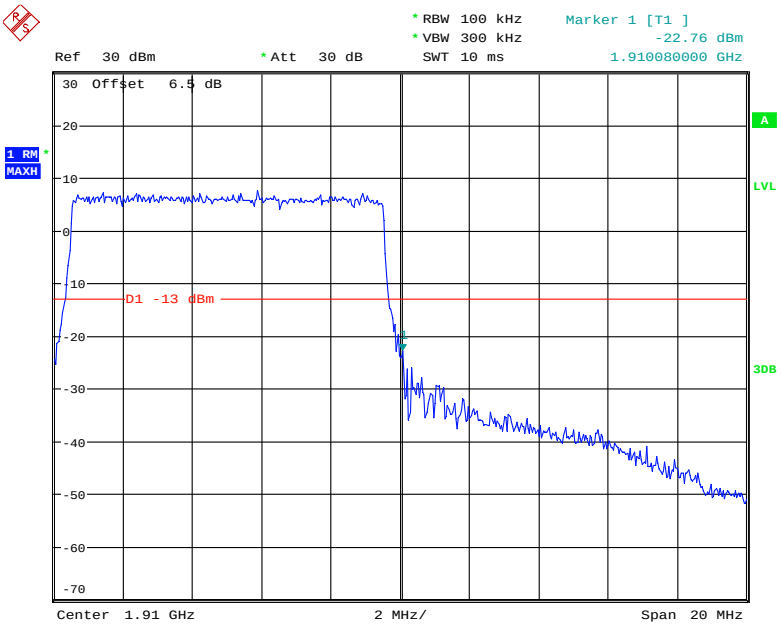
Date: 10.JUN.2020 14:07:07

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



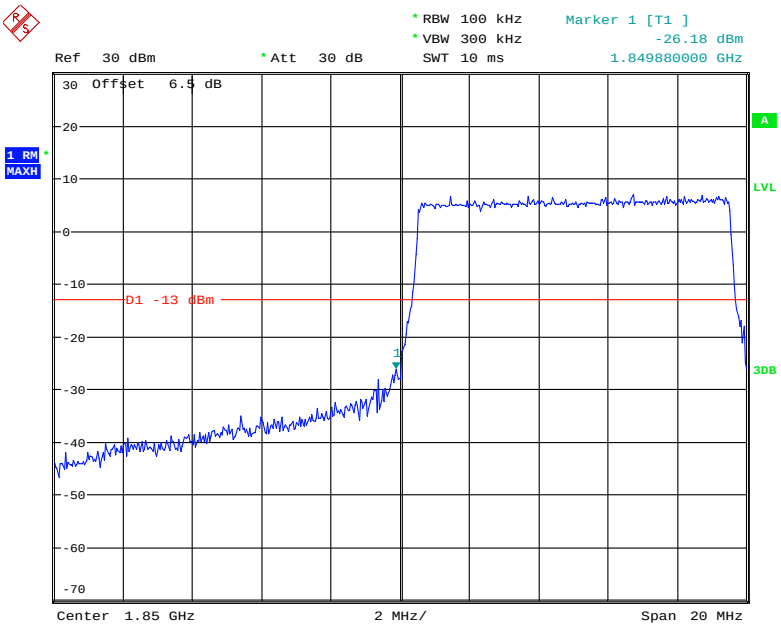
Date: 10.JUN.2020 10:26:49

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



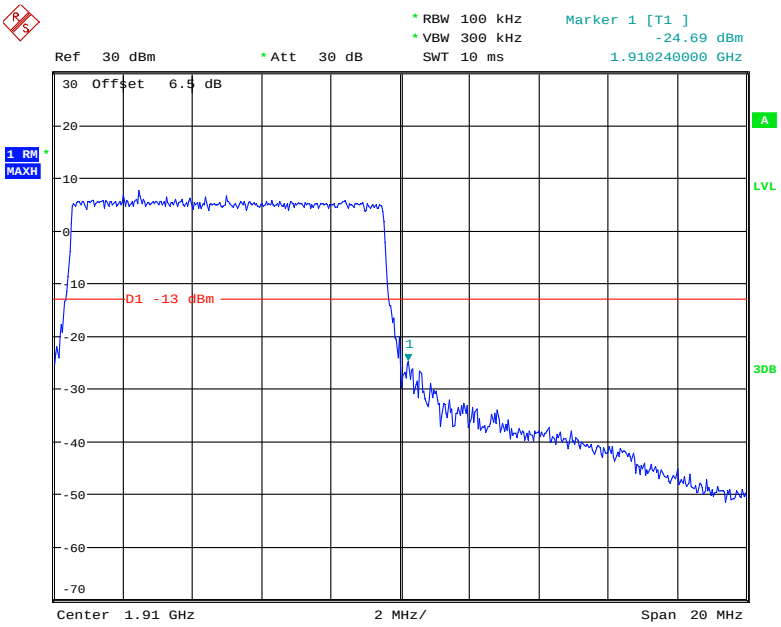
Date: 10.JUN.2020 10:27:31

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



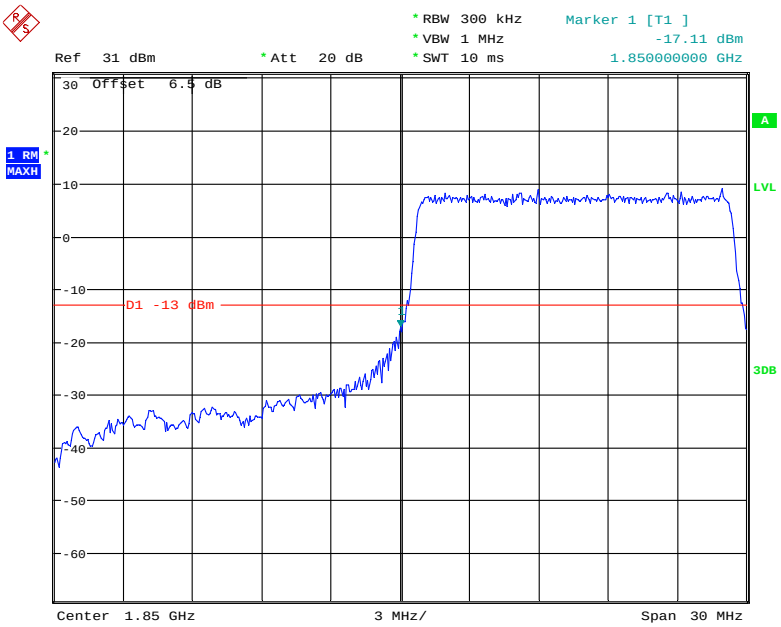
Date: 10.JUN.2020 10:27:10

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



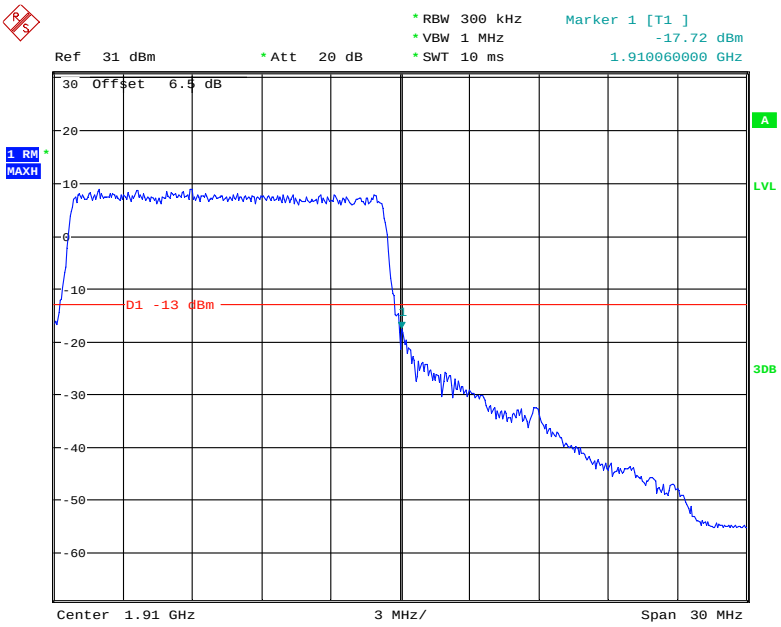
Date: 10.JUN.2020 10:27:52

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



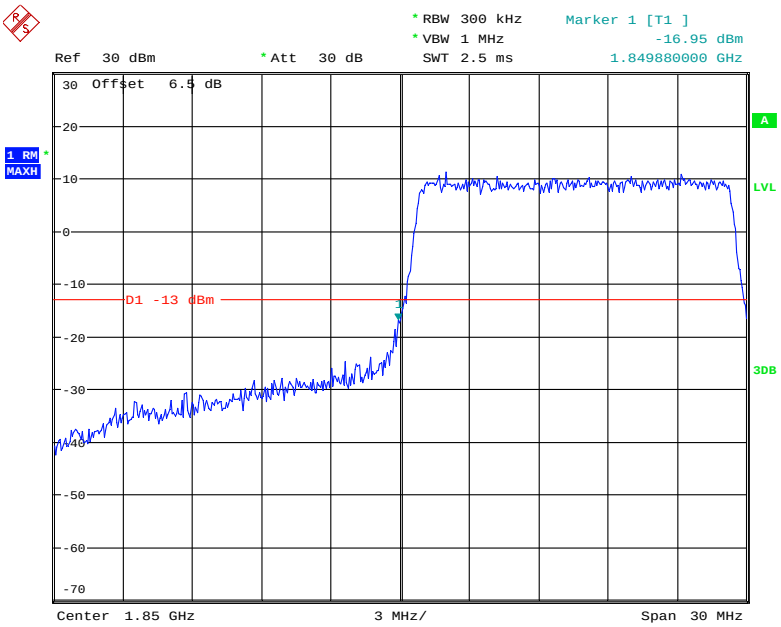
Date: 10.JUN.2020 14:11:22

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



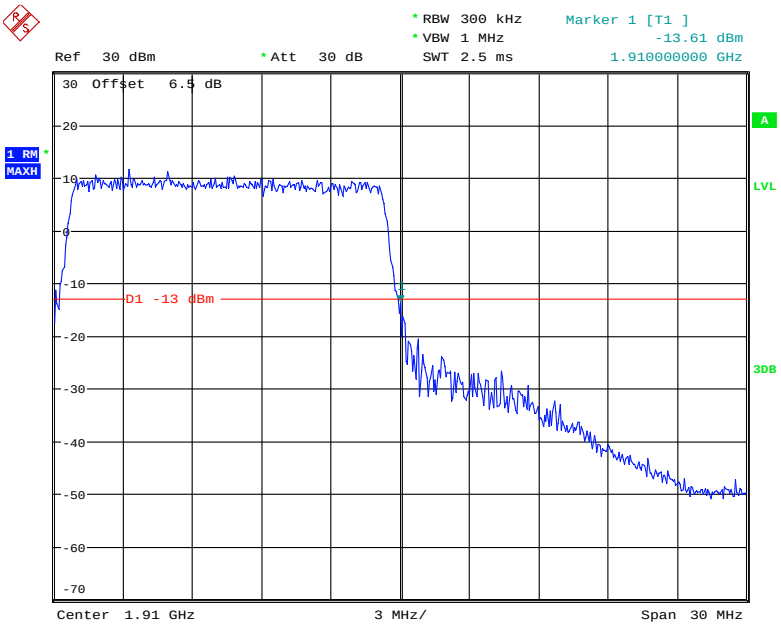
Date: 10.JUN.2020 14:10:17

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



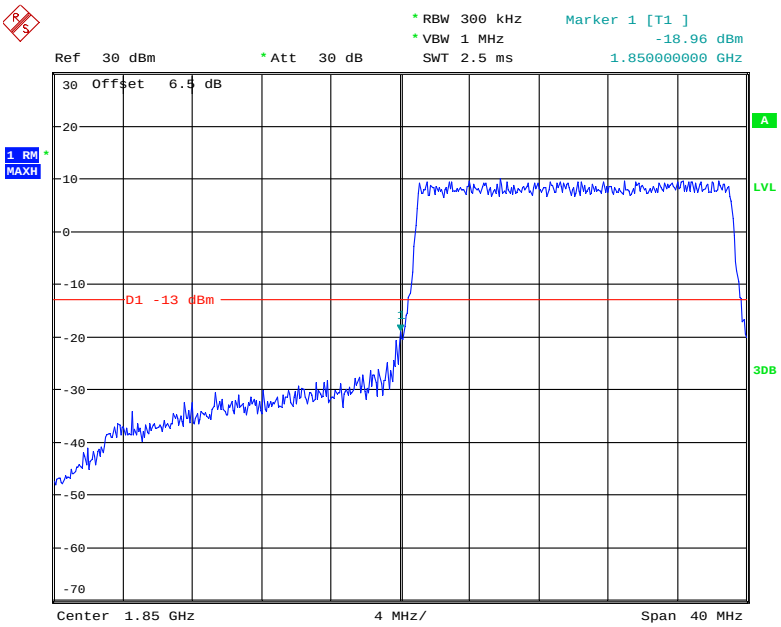
Date: 10.JUN.2020 10:29:42

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



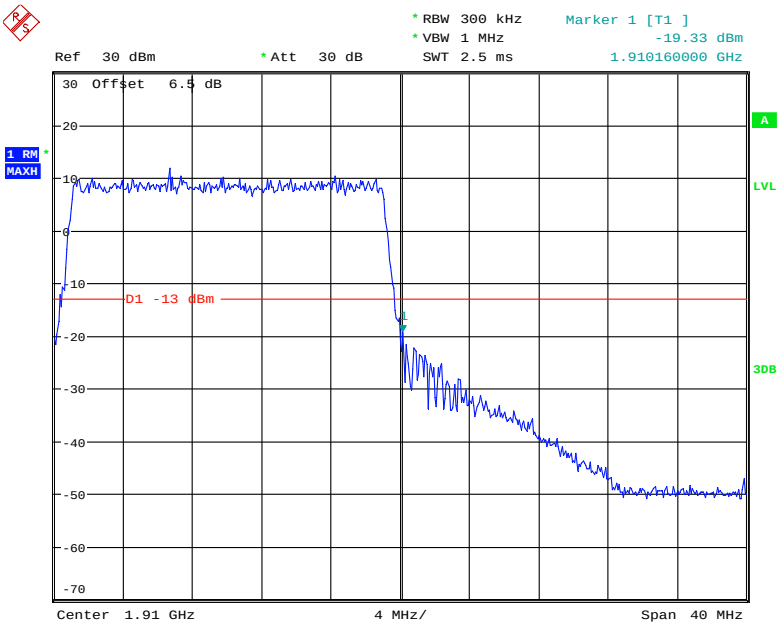
Date: 10.JUN.2020 10:30:31

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



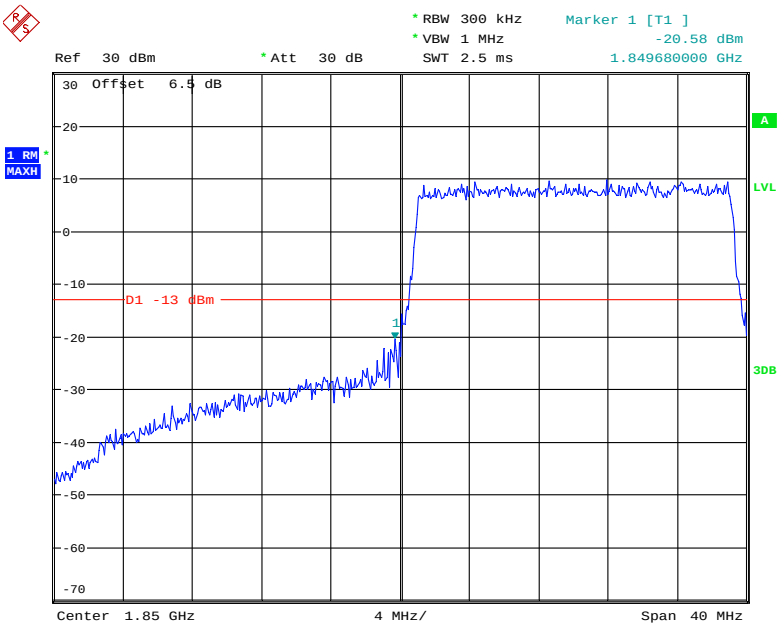
Date: 10.JUN.2020 10:30:56

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



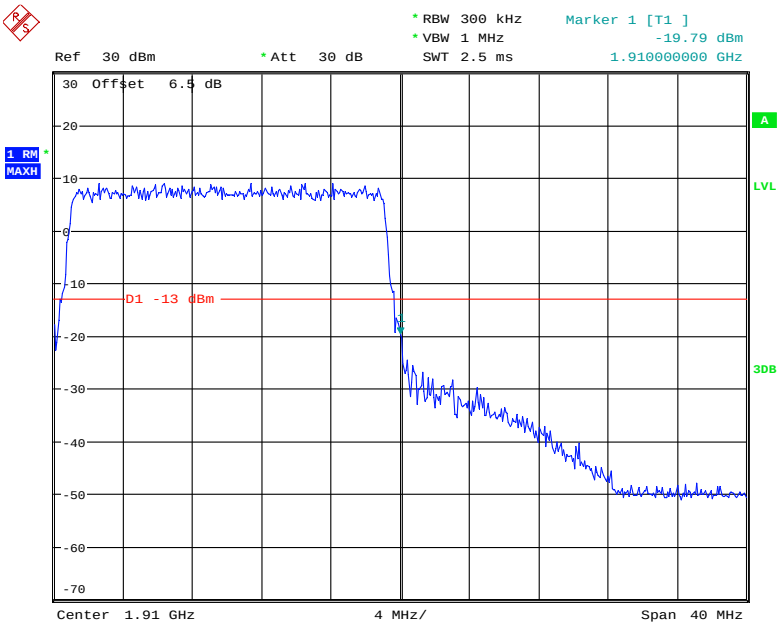
Date: 10.JUN.2020 10:31:45

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



Date: 10.JUN.2020 10:31:20

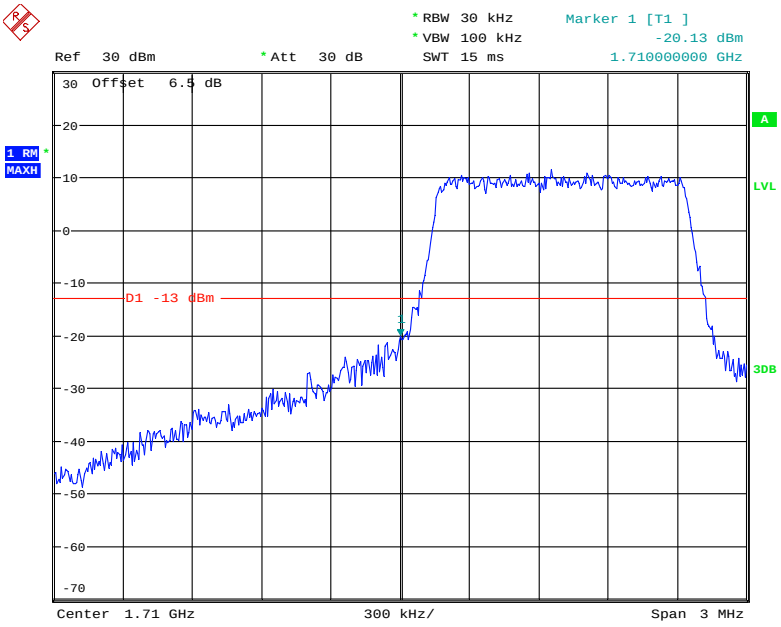
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 10.JUN.2020 10:32:06

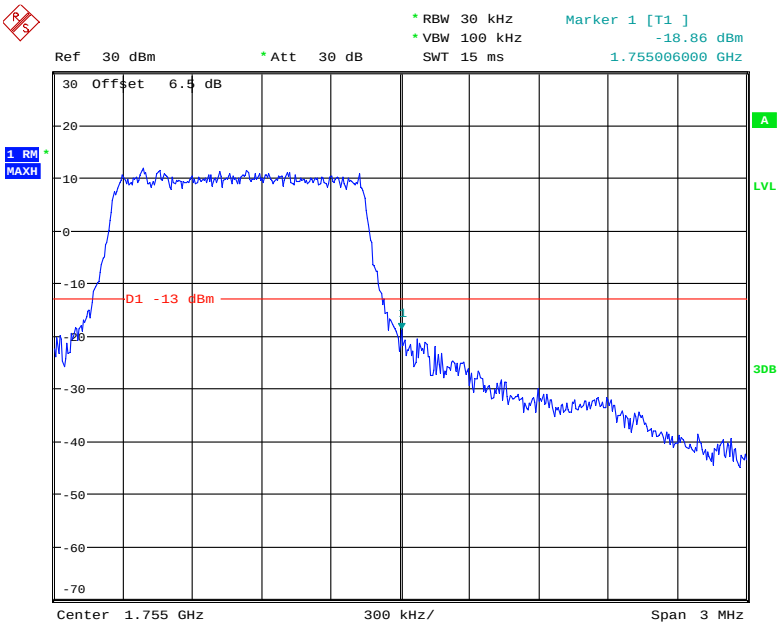
Band 4:

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



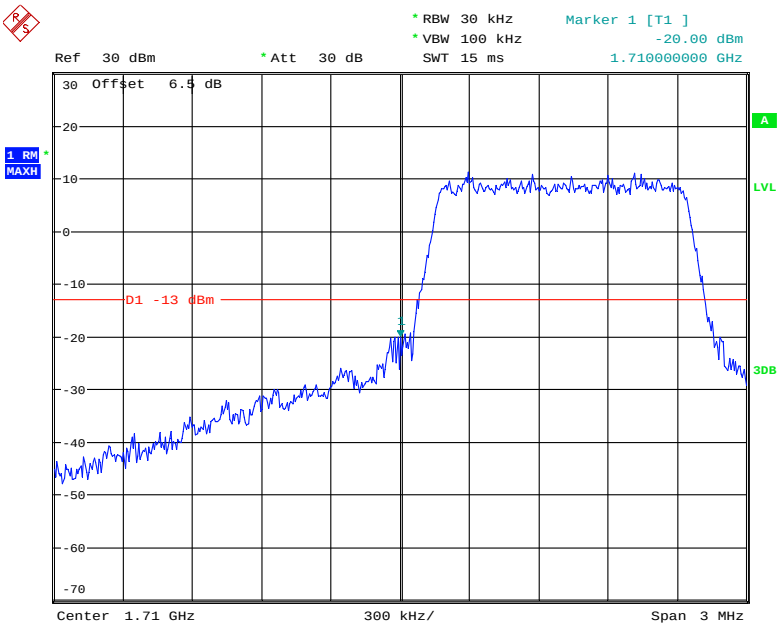
Date: 10.JUN.2020 10:32:29

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



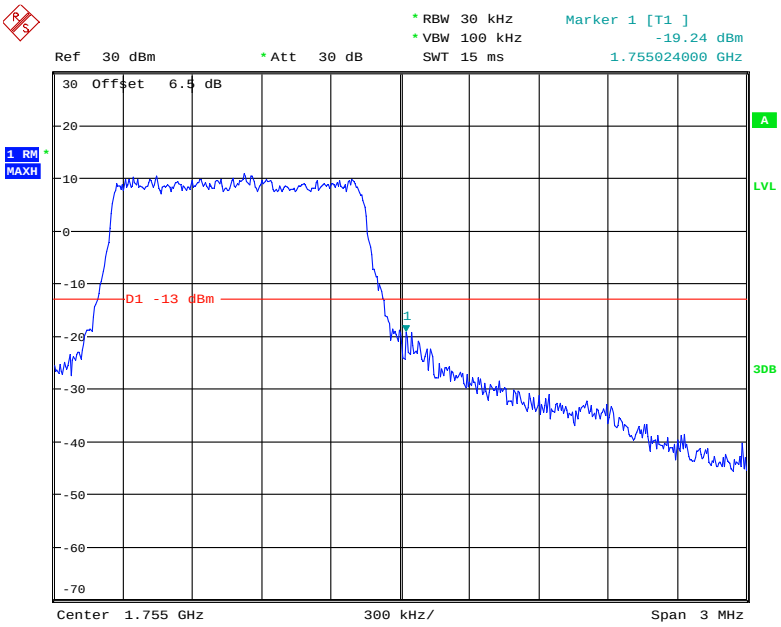
Date: 10.JUN.2020 10:33:09

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



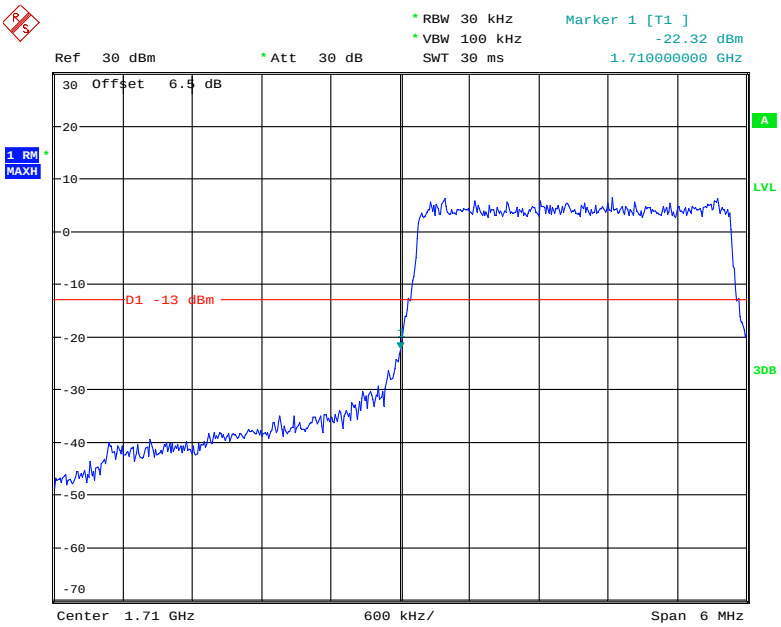
Date: 10.JUN.2020 10:32:48

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



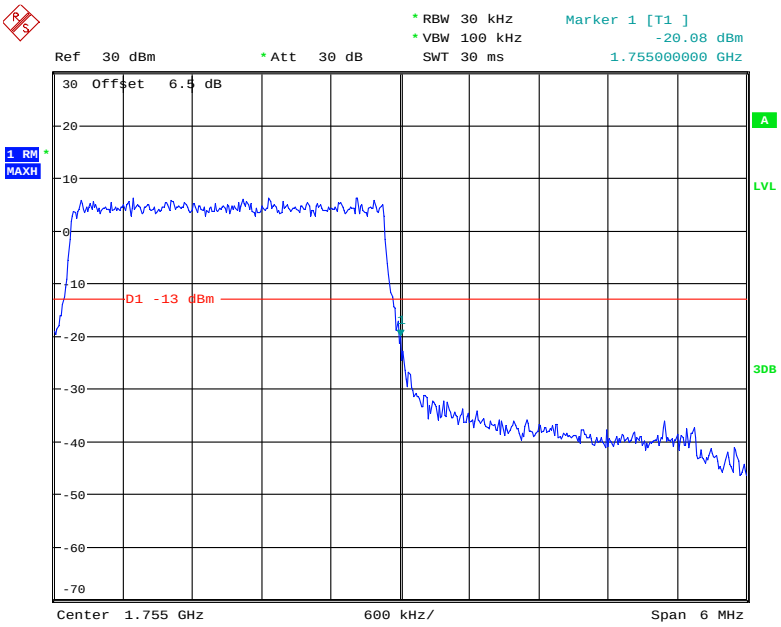
Date: 10.JUN.2020 10:33:28

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



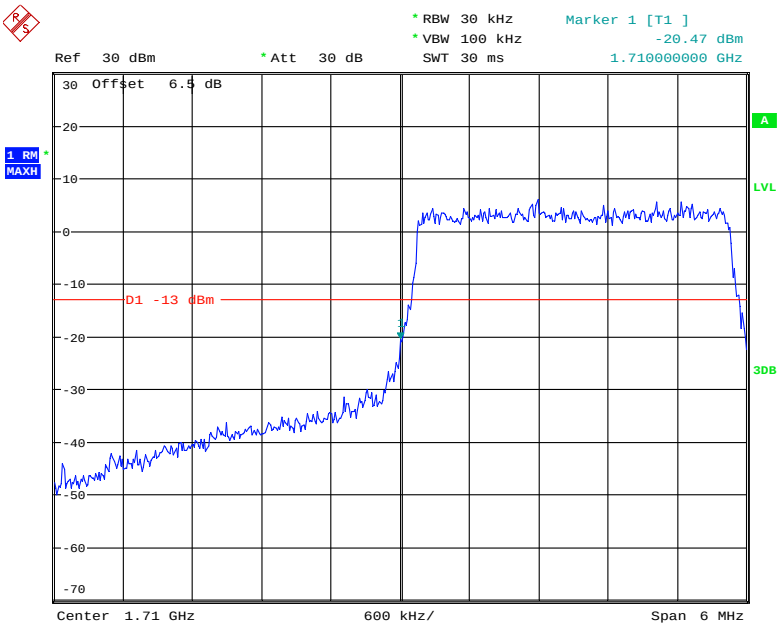
Date: 10.JUN.2020 10:33:52

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



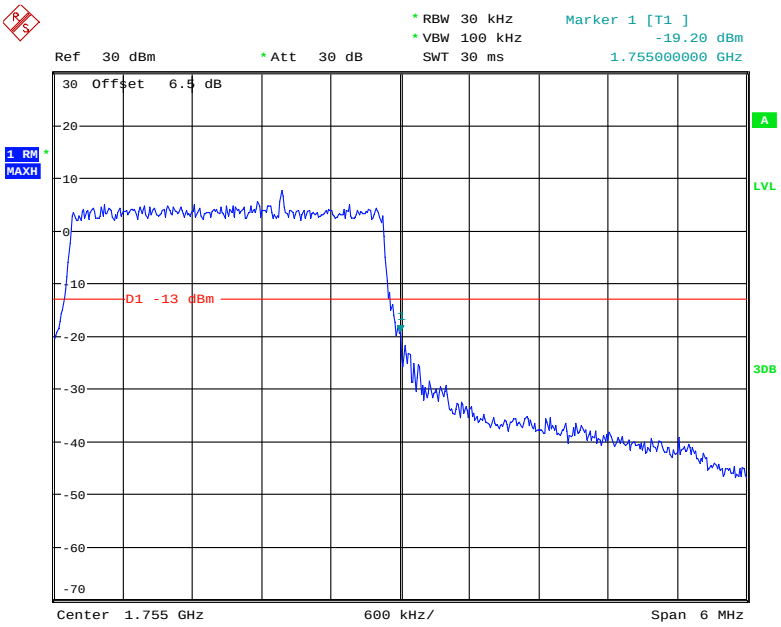
Date: 10.JUN.2020 10:34:25

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



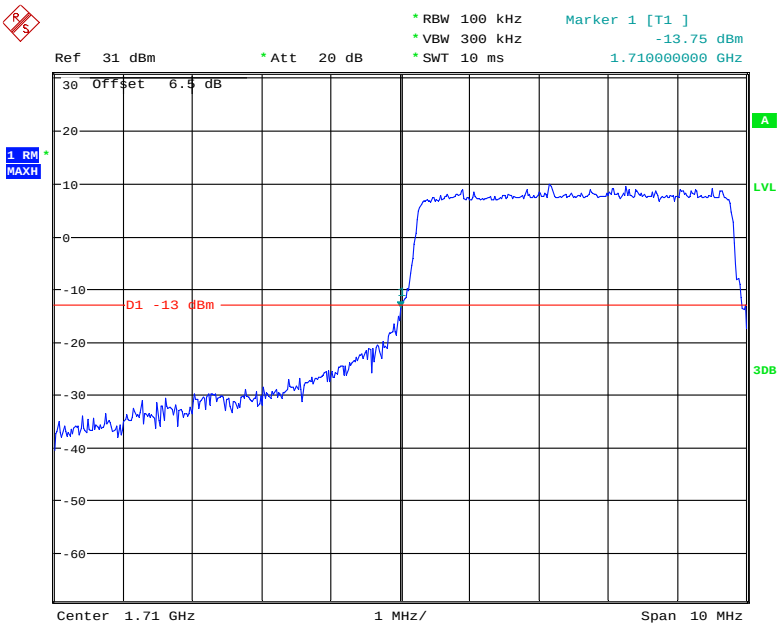
Date: 10.JUN.2020 10:34:08

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



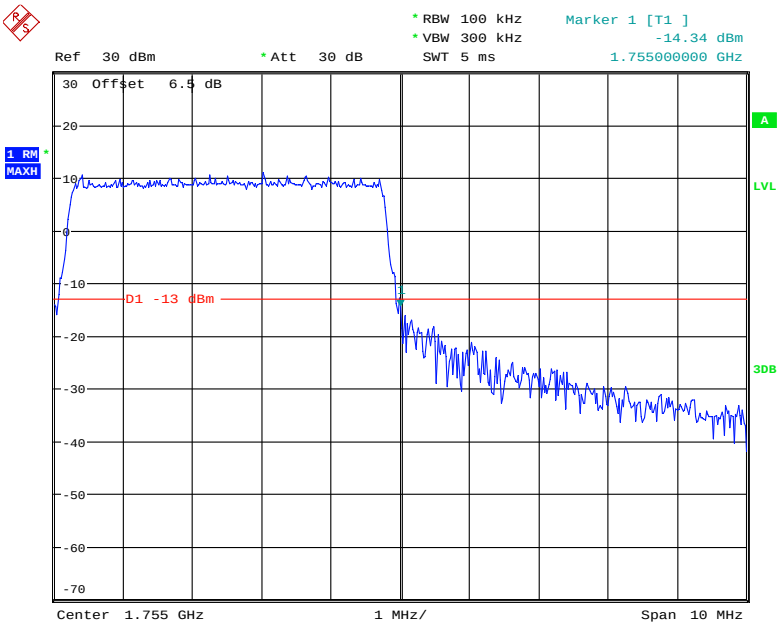
Date: 10.JUN.2020 10:34:42

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



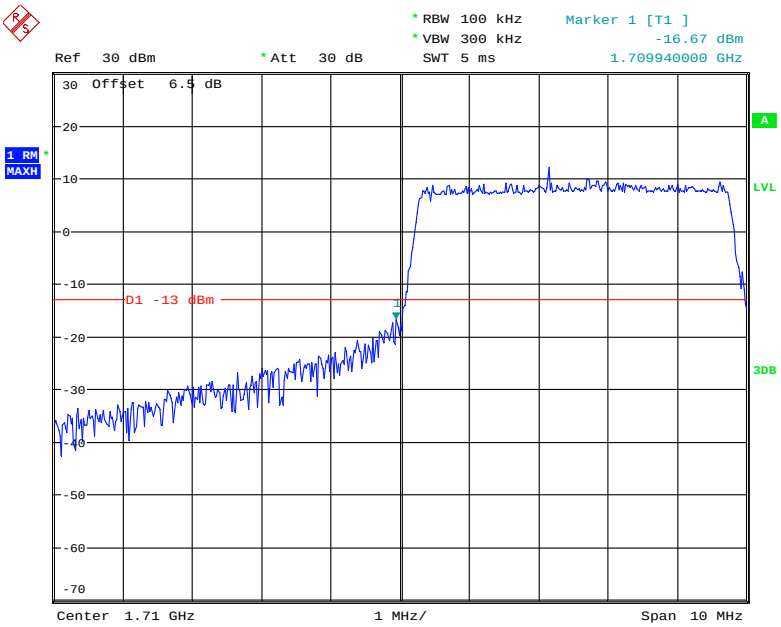
Date: 10.JUN.2020 14:13:50

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



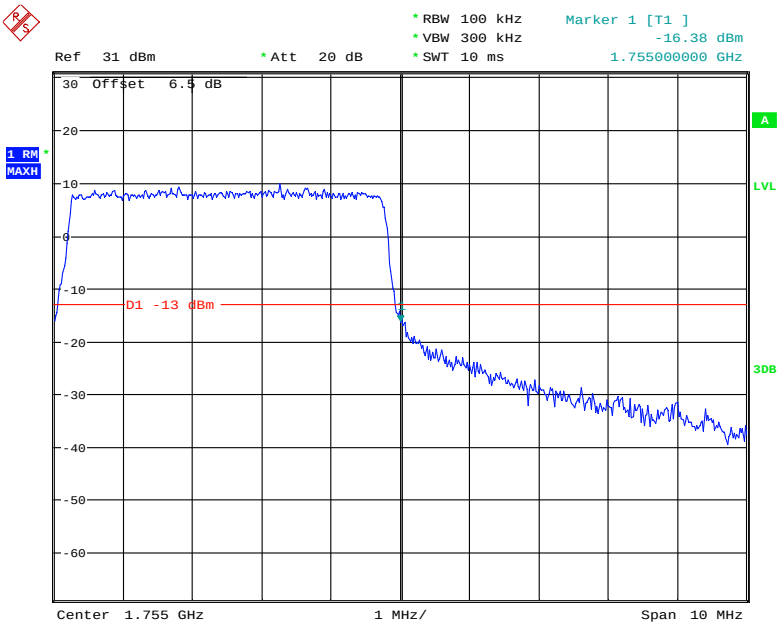
Date: 10.JUN.2020 10:36:01

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



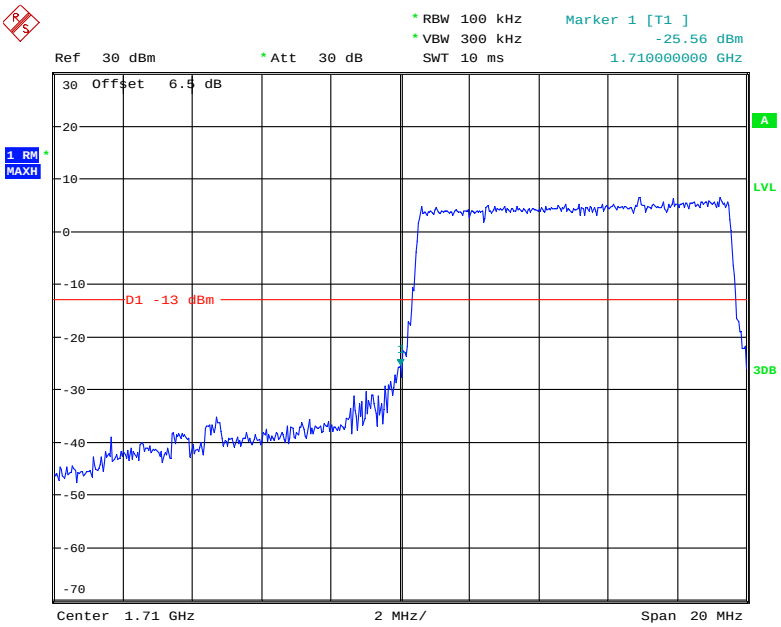
Date: 10.JUN.2020 10:35:36

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



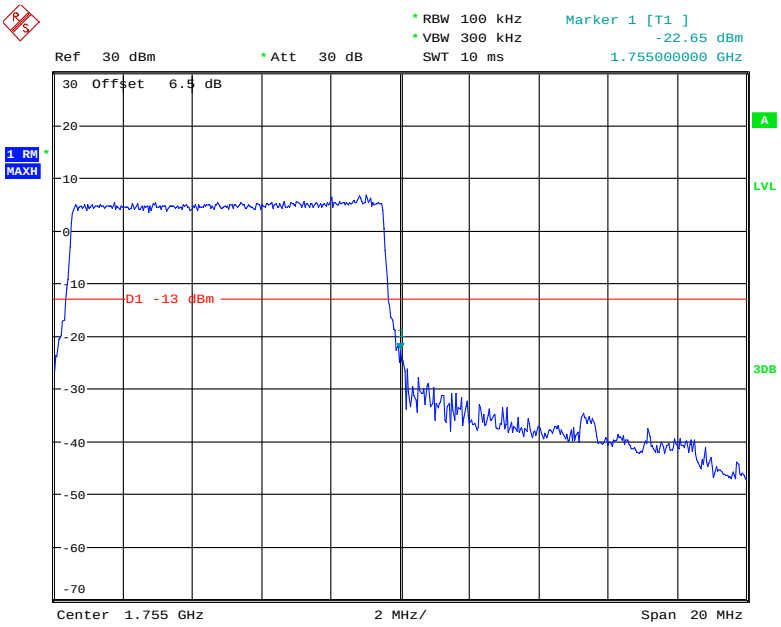
Date: 10.JUN.2020 14:15:39

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



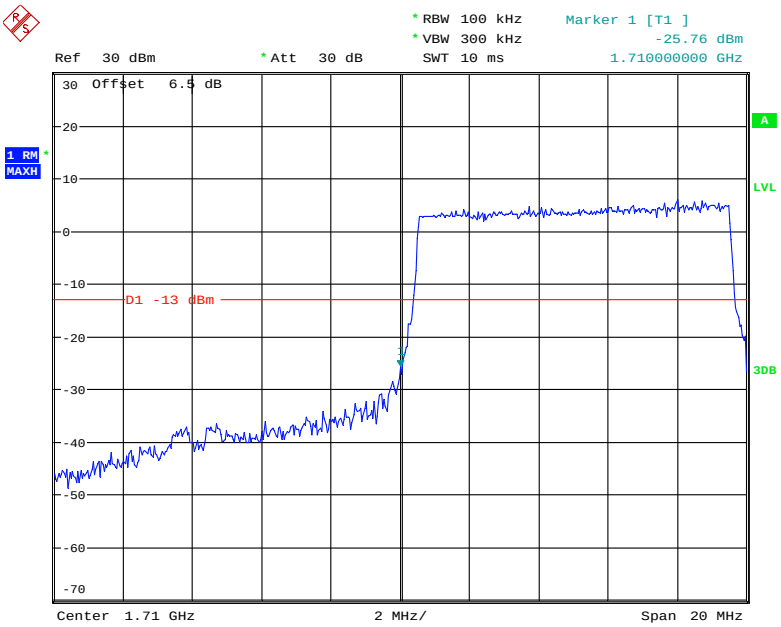
Date: 10.JUN.2020 10:36:49

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



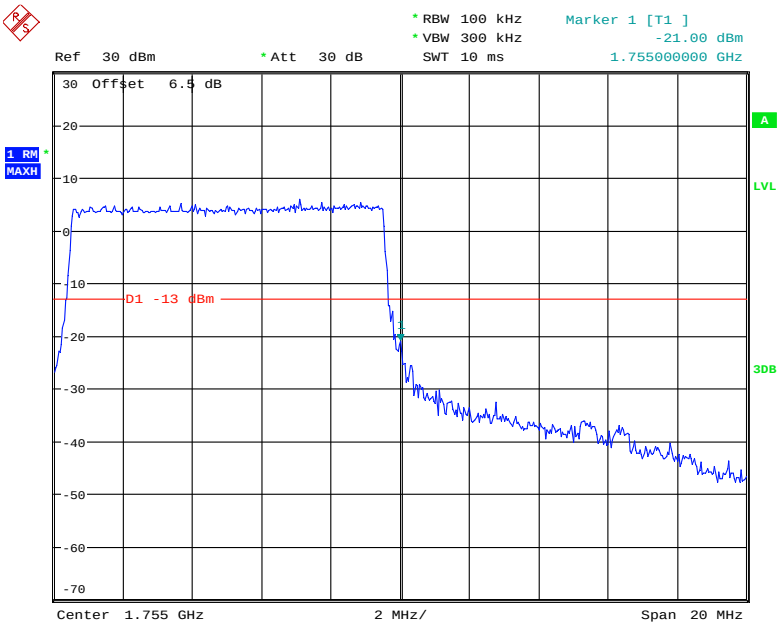
Date: 10.JUN.2020 10:37:28

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



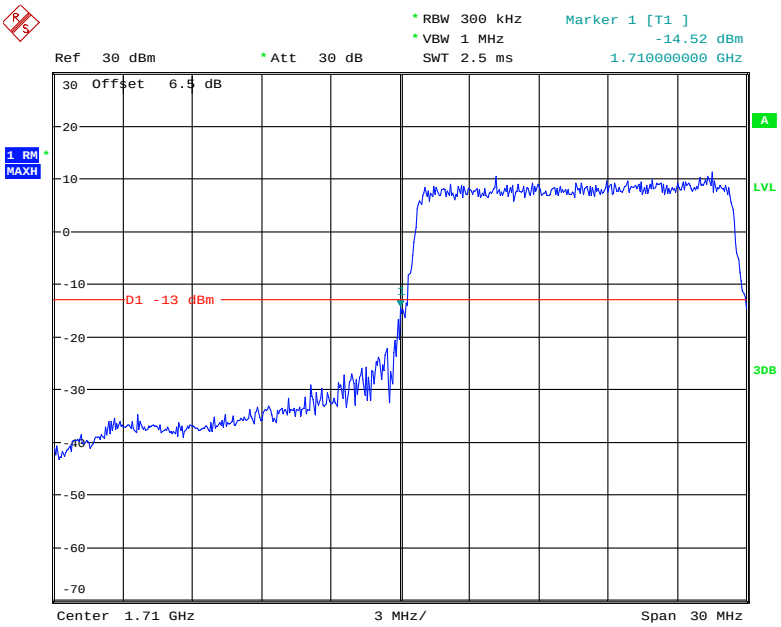
Date: 10.JUN.2020 10:37:09

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



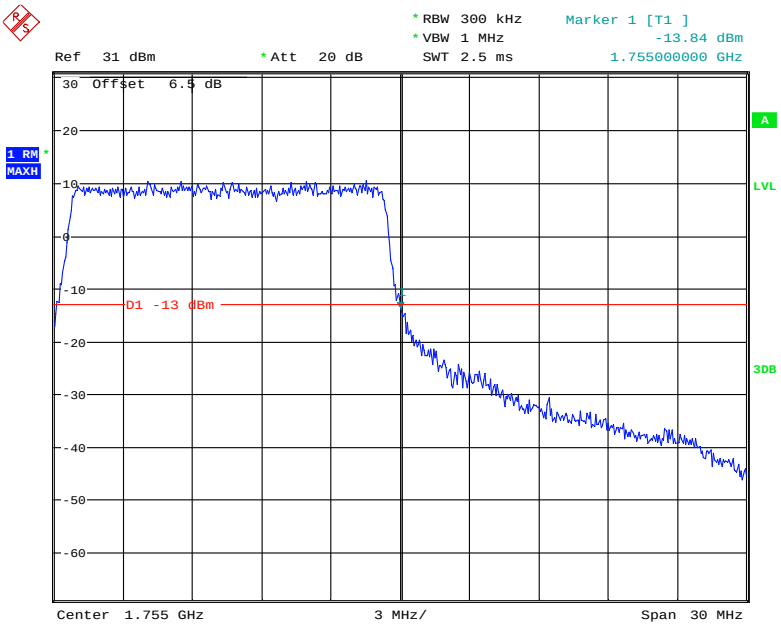
Date: 10.JUN.2020 10:37:49

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



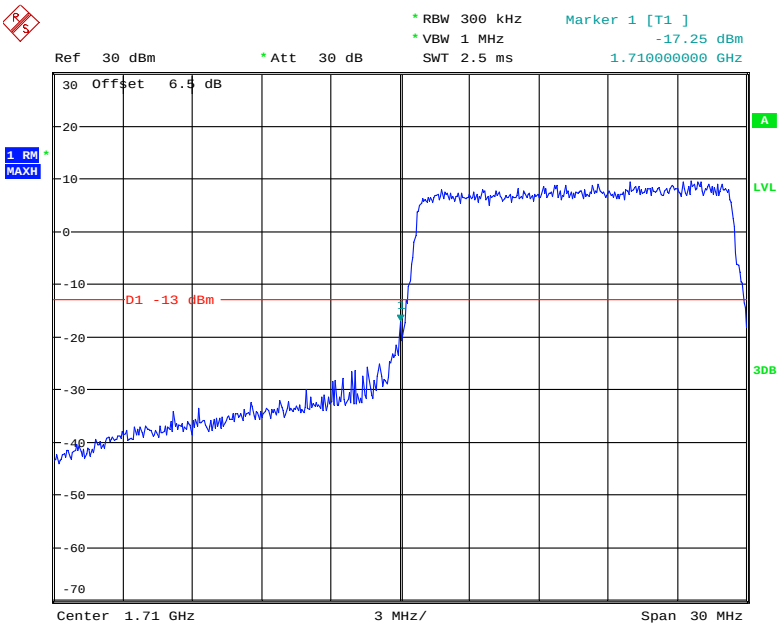
Date: 10.JUN.2020 10:38:16

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



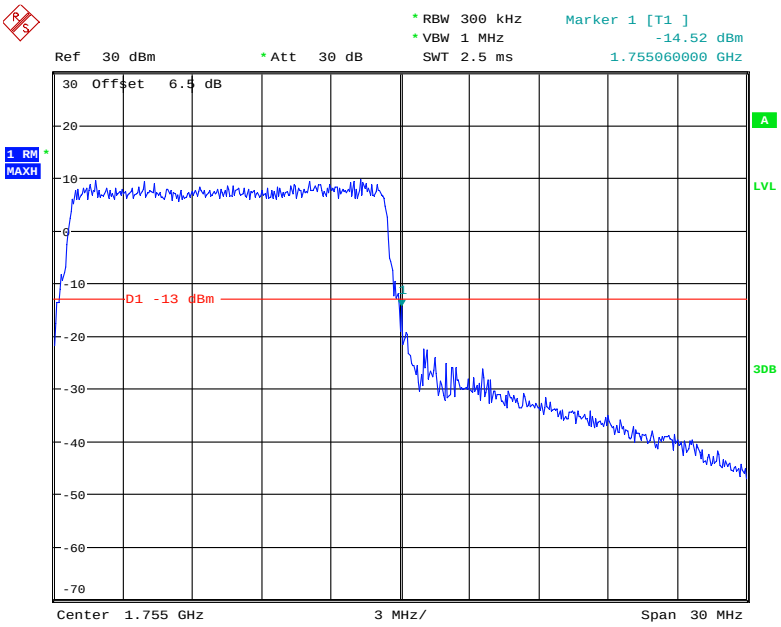
Date: 10.JUN.2020 14:17:27

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



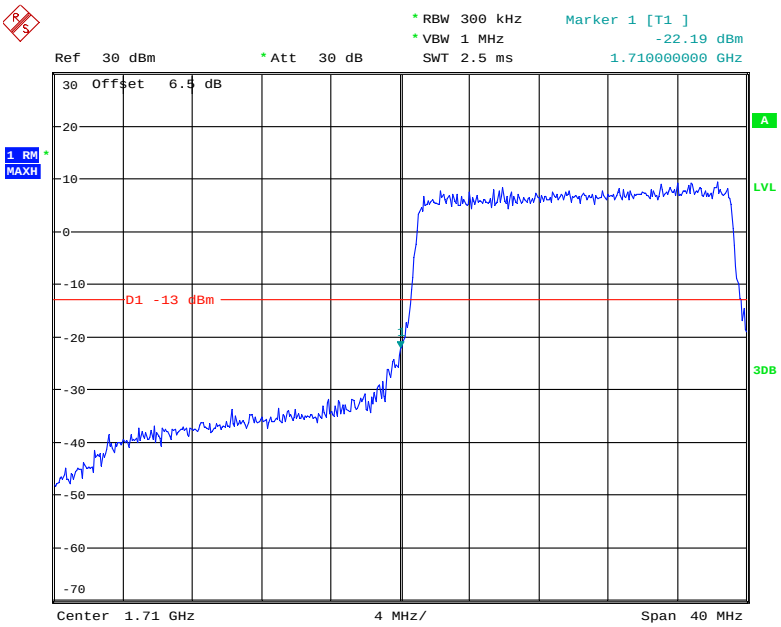
Date: 10.JUN.2020 10:38:40

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



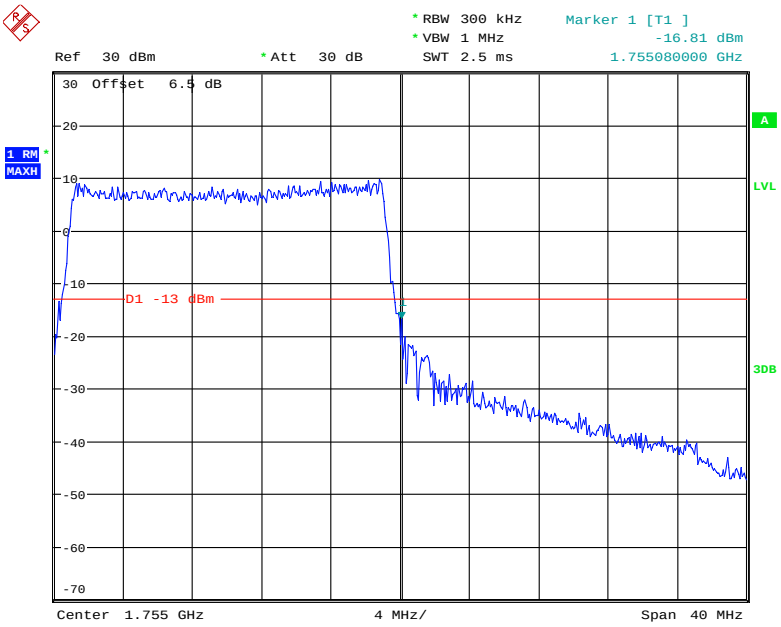
Date: 10.JUN.2020 10:39:26

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



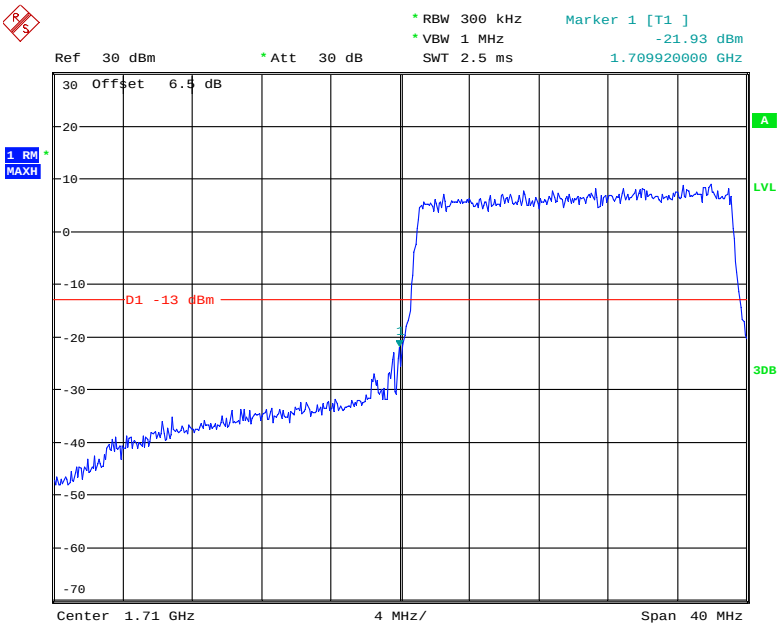
Date: 10.JUN.2020 10:39:51

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



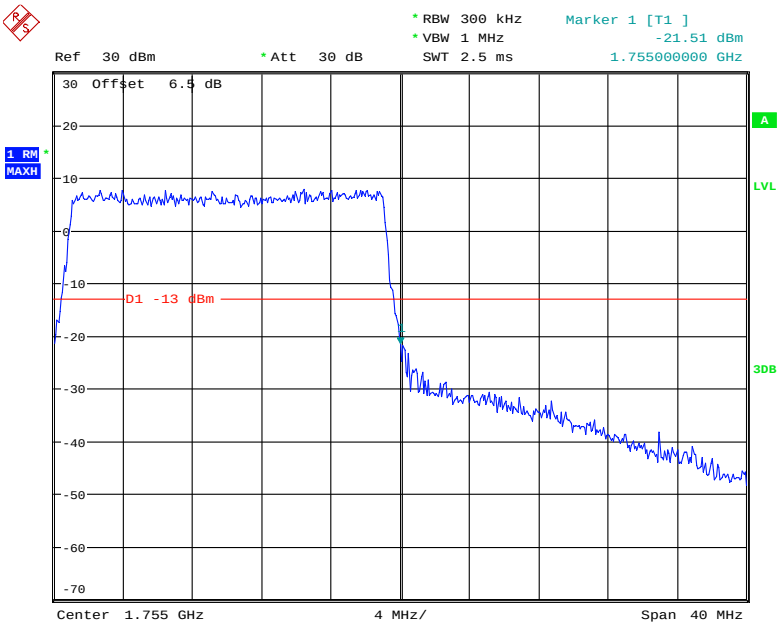
Date: 10.JUN.2020 10:40:40

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



Date: 10.JUN.2020 10:40:15

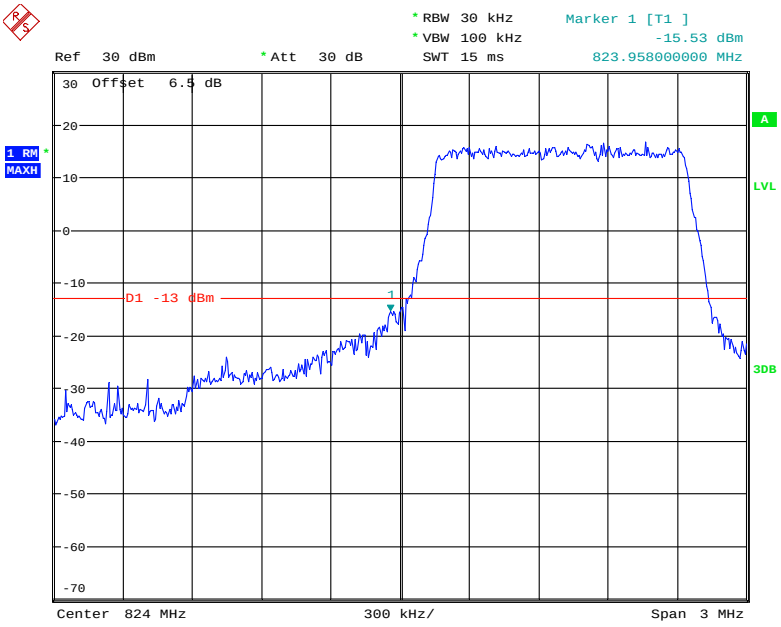
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 10.JUN.2020 10:41:04

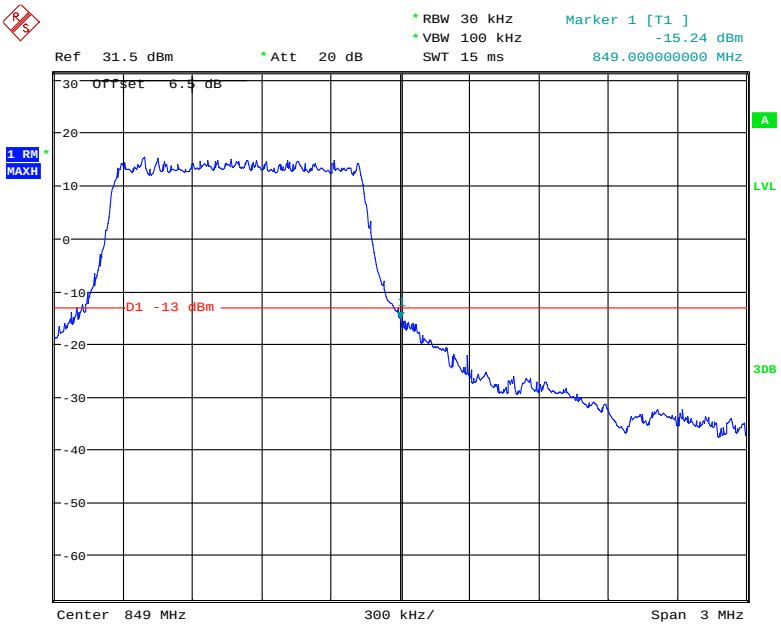
Band 5:

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



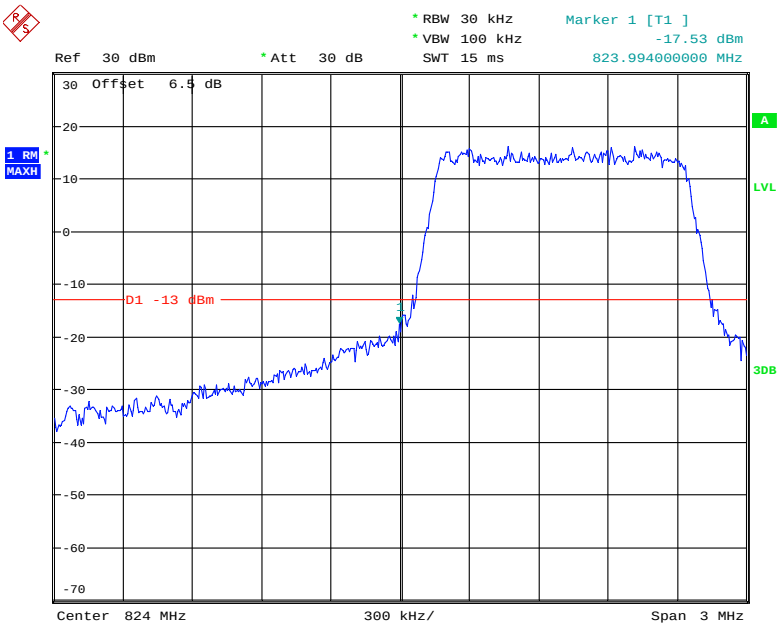
Date: 6.JUL.2020 12:11:02

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



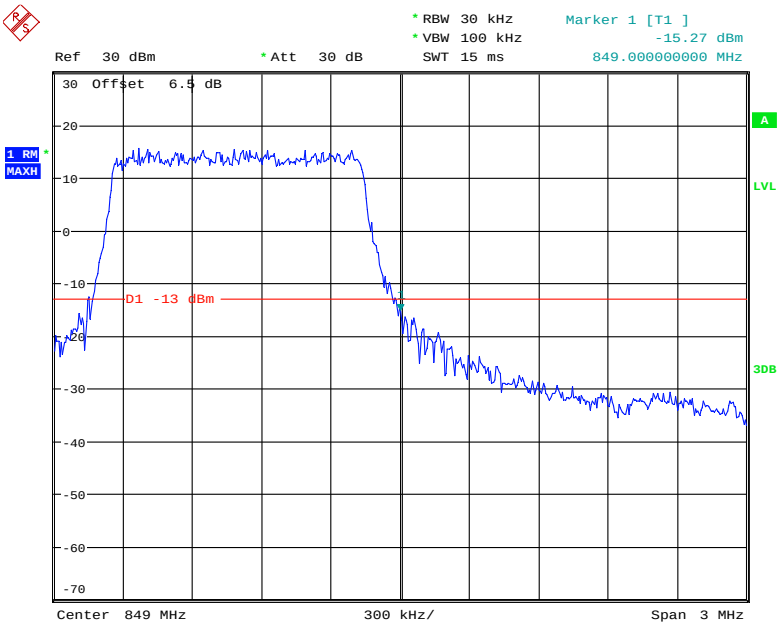
Date: 17.JUL.2020 13:13:58

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



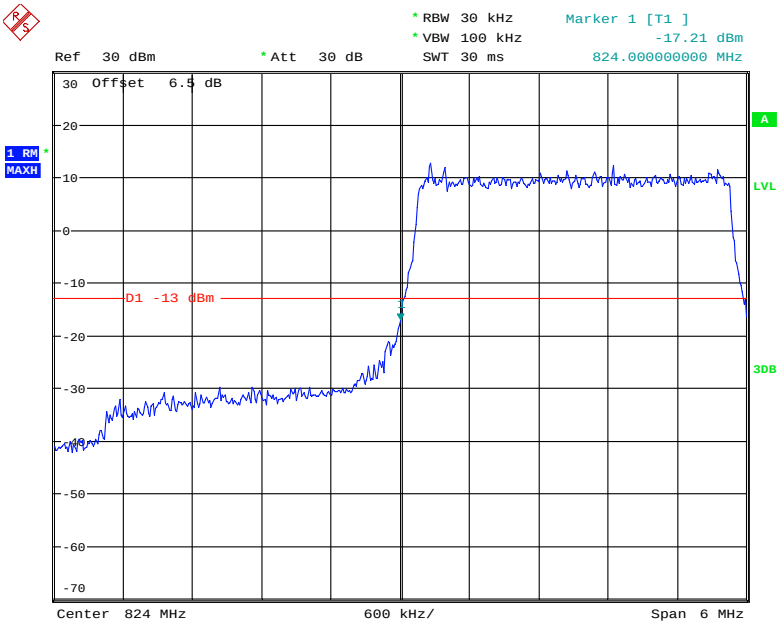
Date: 6.JUL.2020 12:11:21

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



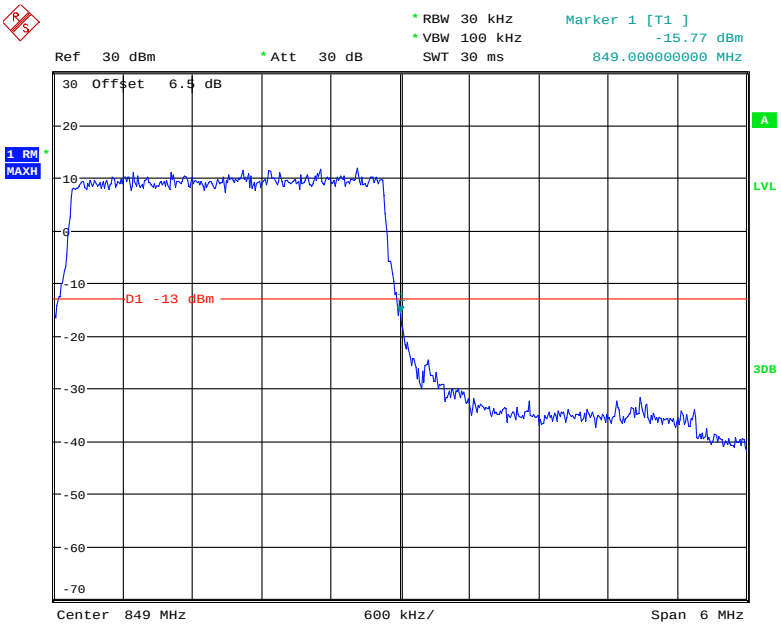
Date: 6.JUL.2020 12:11:58

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



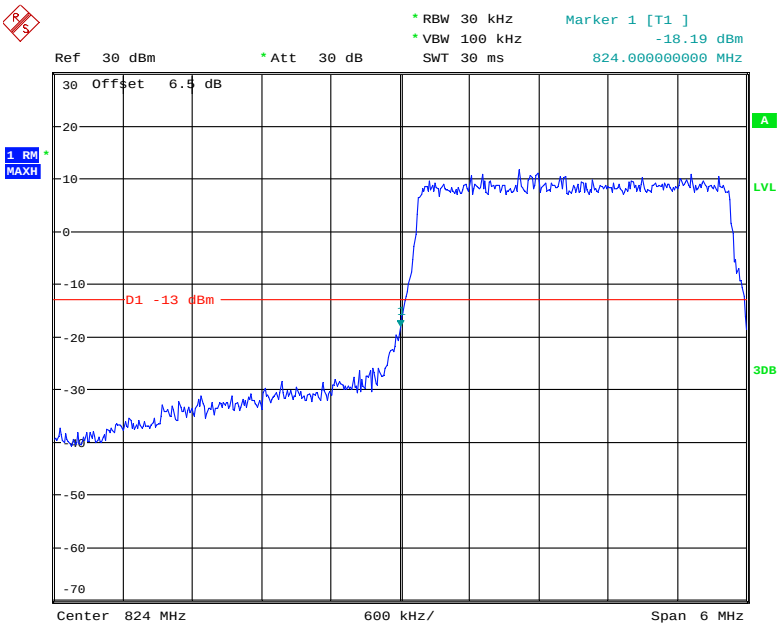
Date: 6.JUL.2020 12:12:18

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



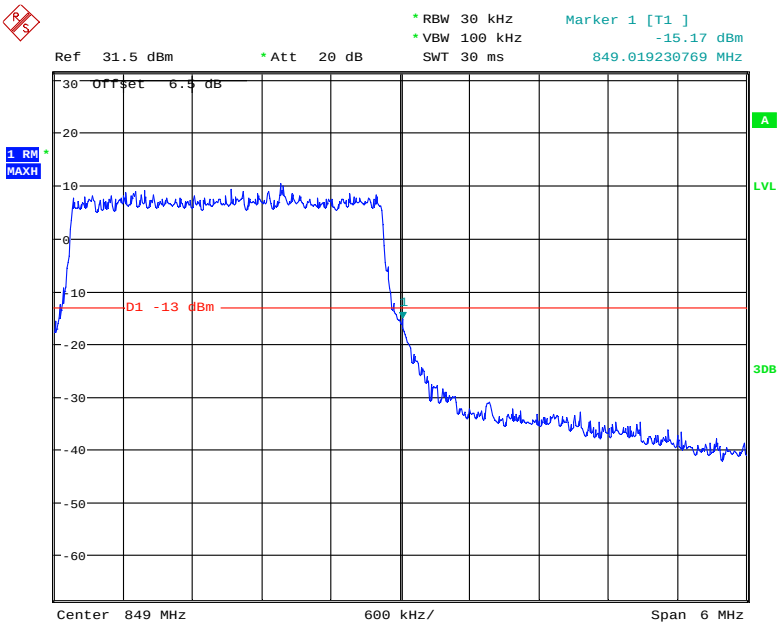
Date: 6.JUL.2020 12:12:54

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



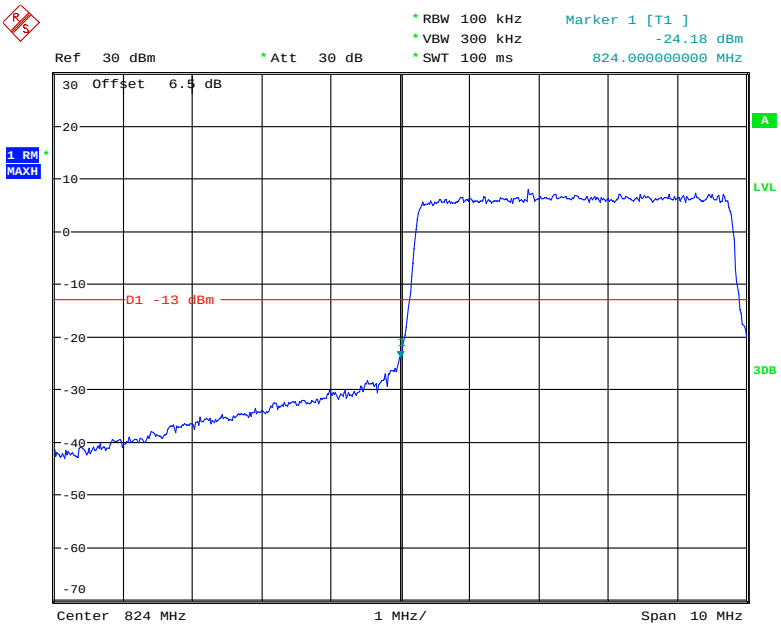
Date: 6.JUL.2020 12:12:34

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



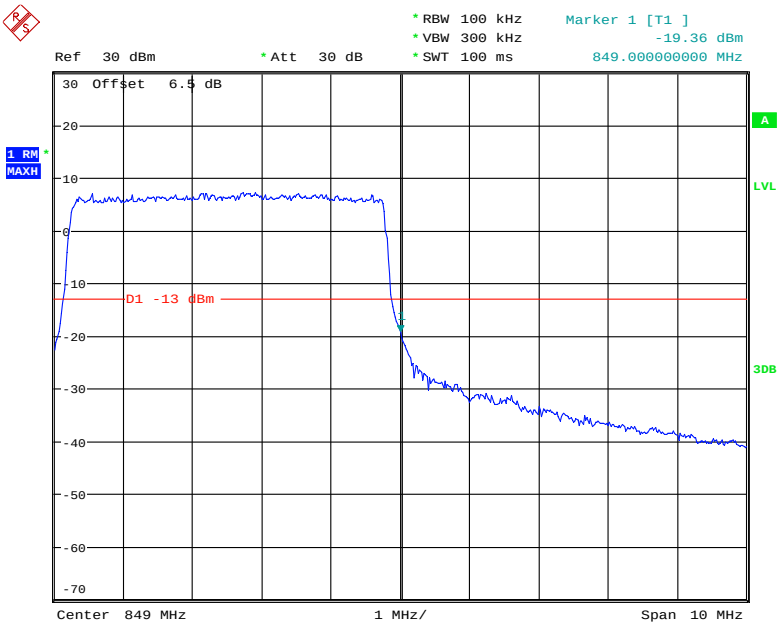
Date: 17.JUL.2020 13:43:57

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



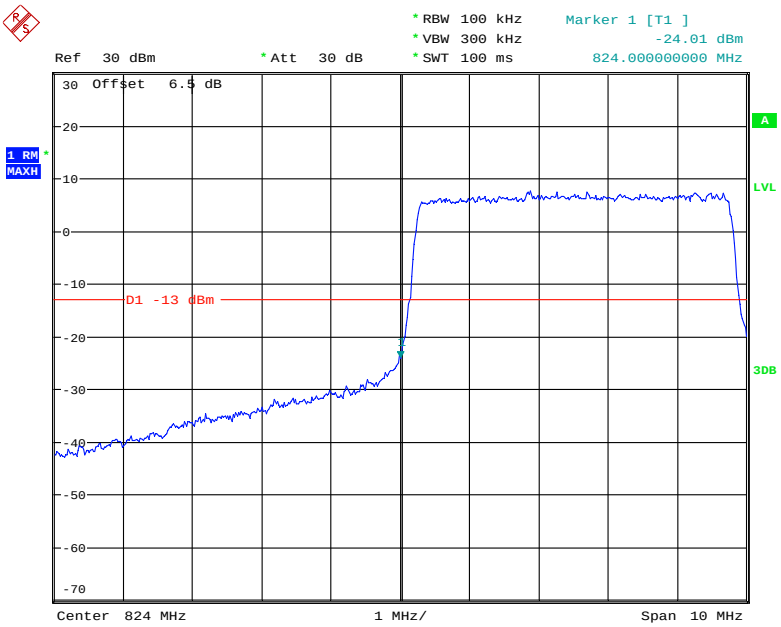
Date: 6.JUL.2020 13:18:07

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



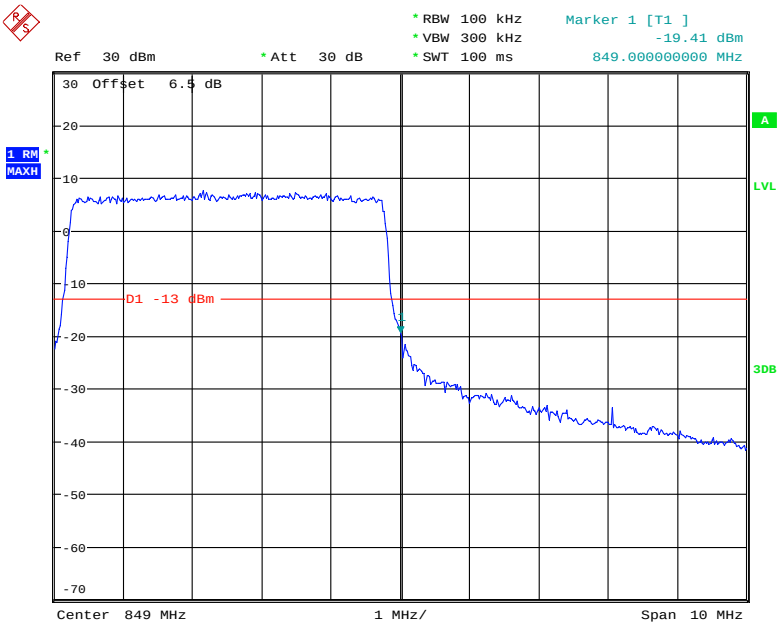
Date: 6.JUL.2020 13:18:58

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



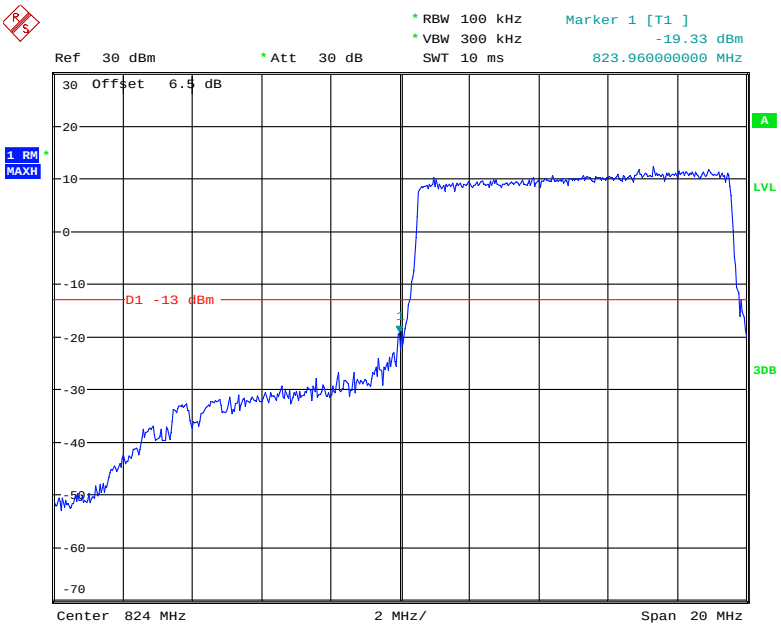
Date: 6.JUL.2020 13:17:44

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



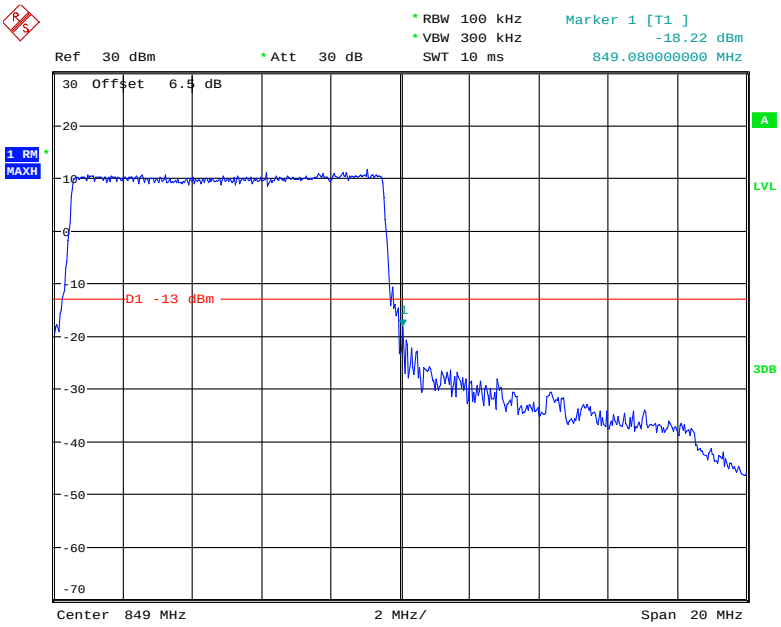
Date: 6.JUL.2020 13:19:27

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



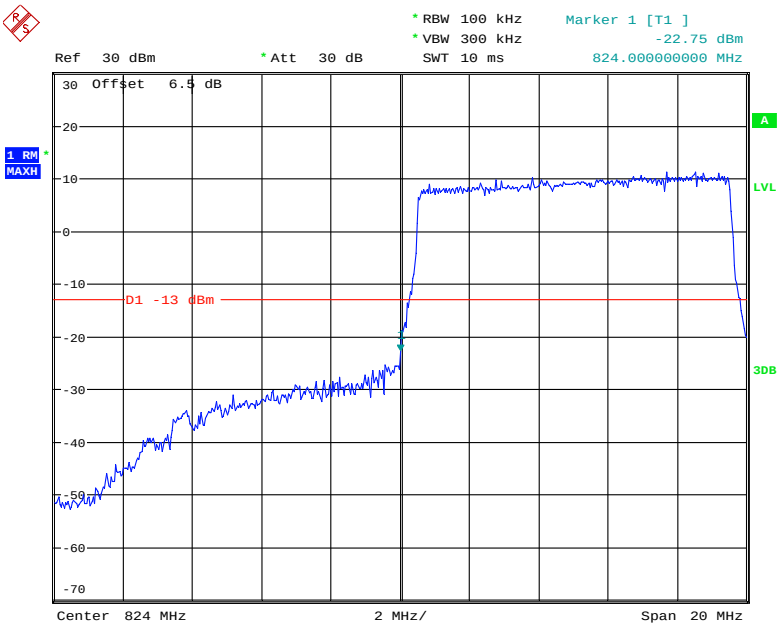
Date: 6.JUL.2020 12:15:11

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



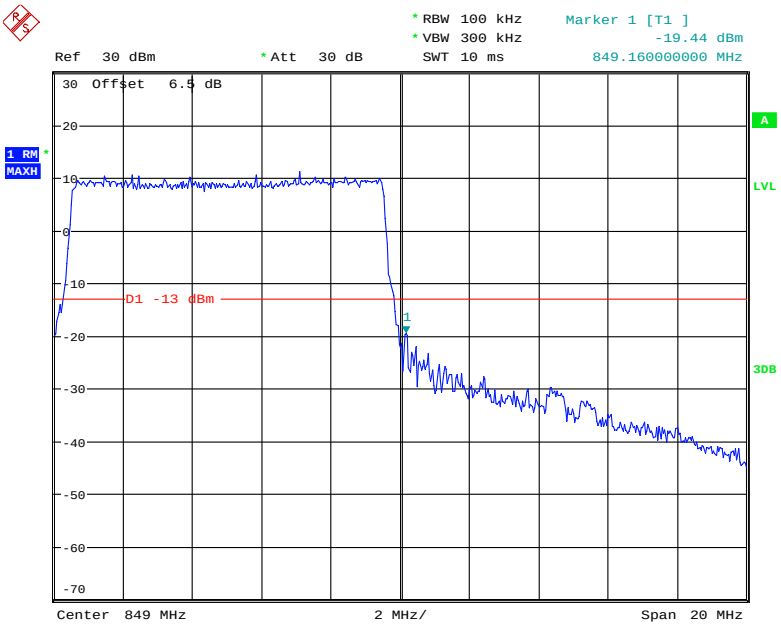
Date: 6.JUL.2020 12:15:50

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



Date: 6.JUL.2020 12:15:29

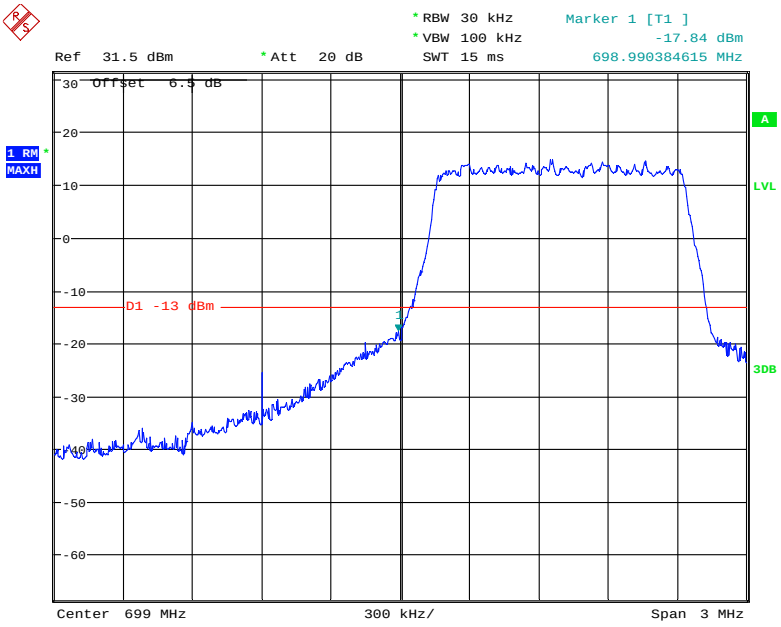
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 6.JUL.2020 12:16:11

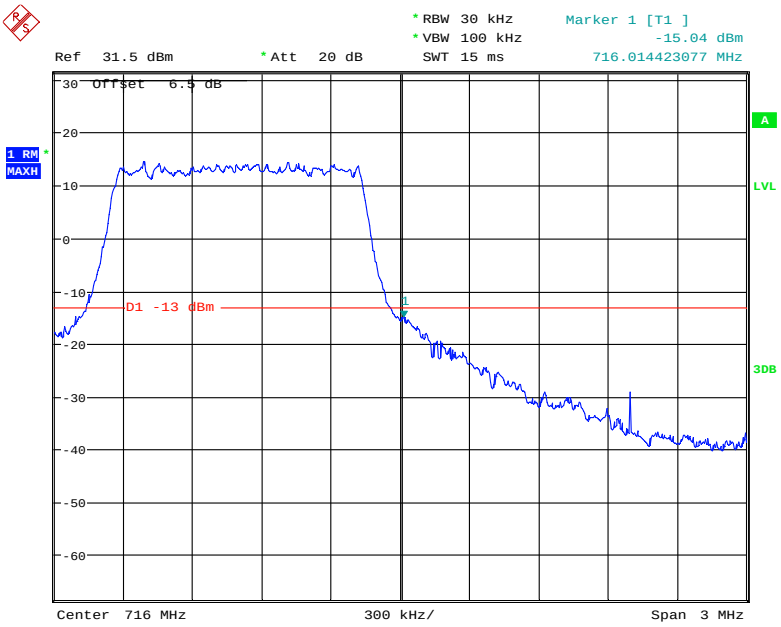
Band 12:

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



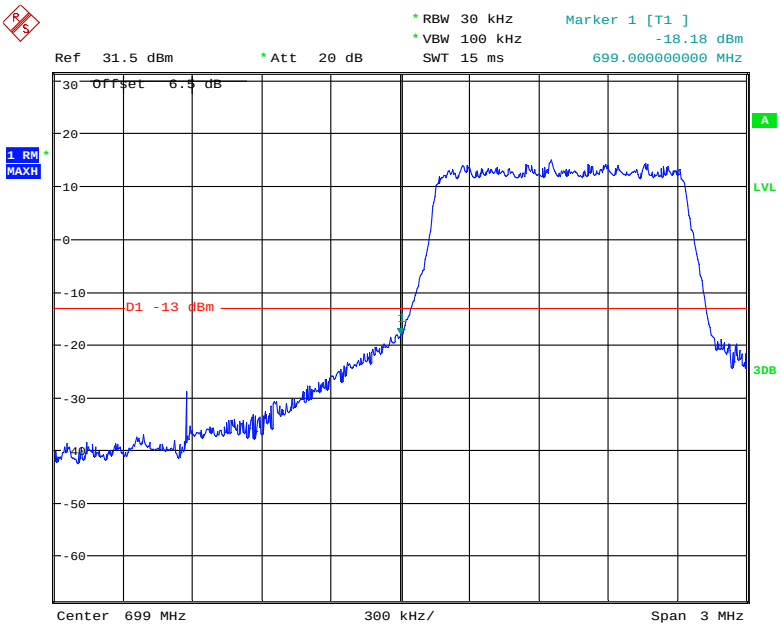
Date: 17.JUL.2020 13:47:03

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



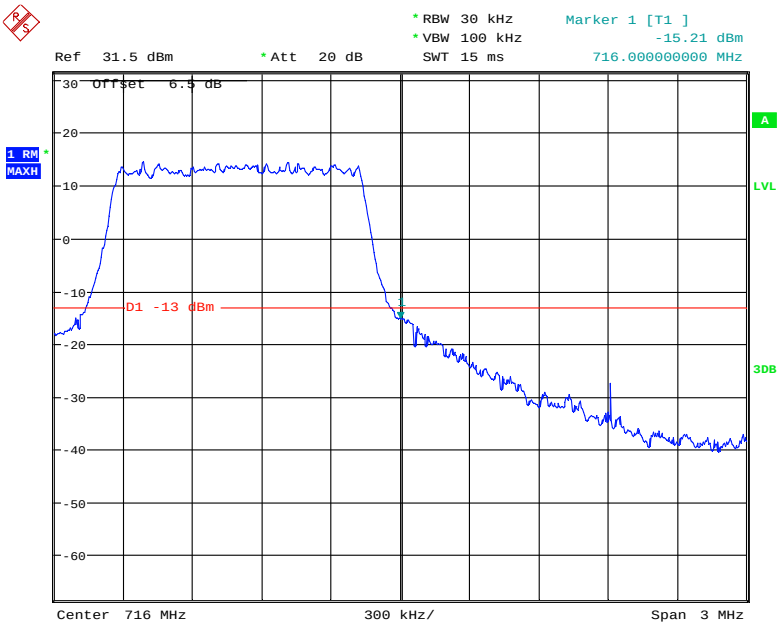
Date: 17.JUL.2020 13:22:50

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



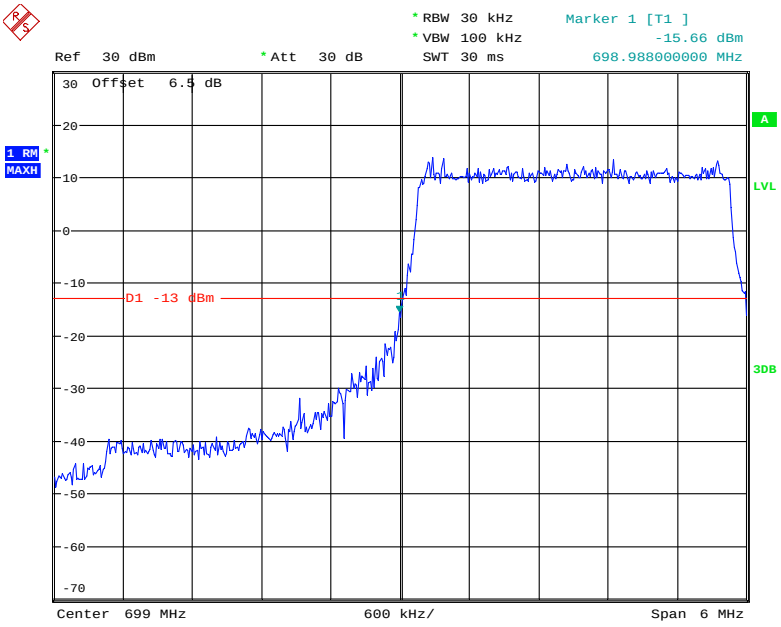
Date: 17.JUL.2020 13:20:11

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



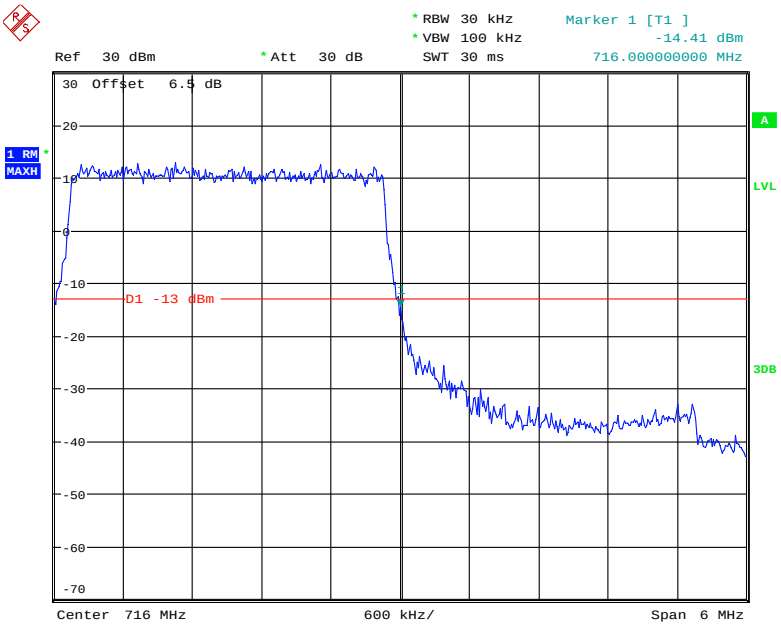
Date: 17.JUL.2020 13:24:25

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



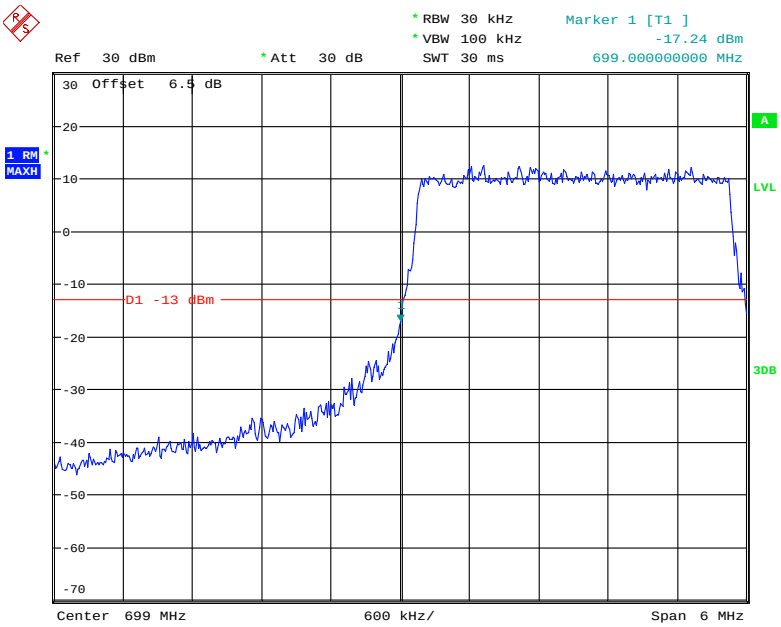
Date: 6.JUL.2020 12:17:53

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



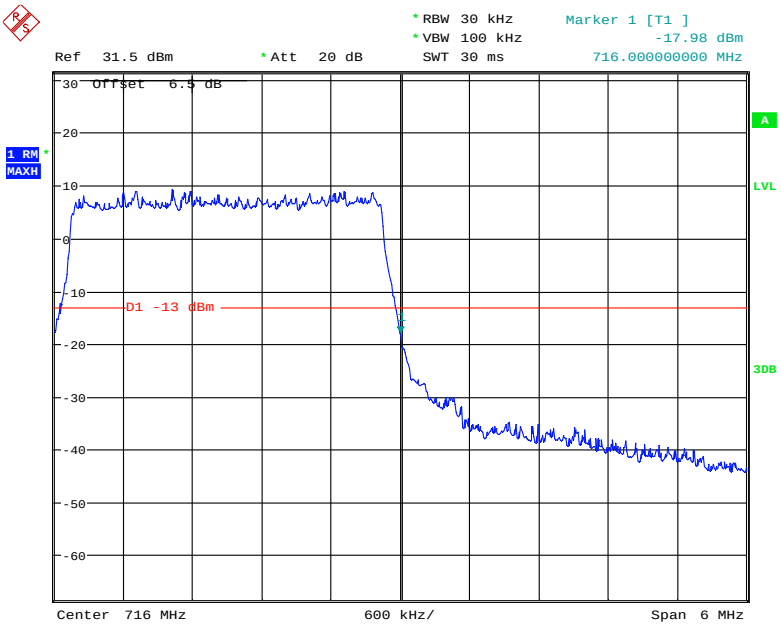
Date: 6.JUL.2020 12:18:29

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



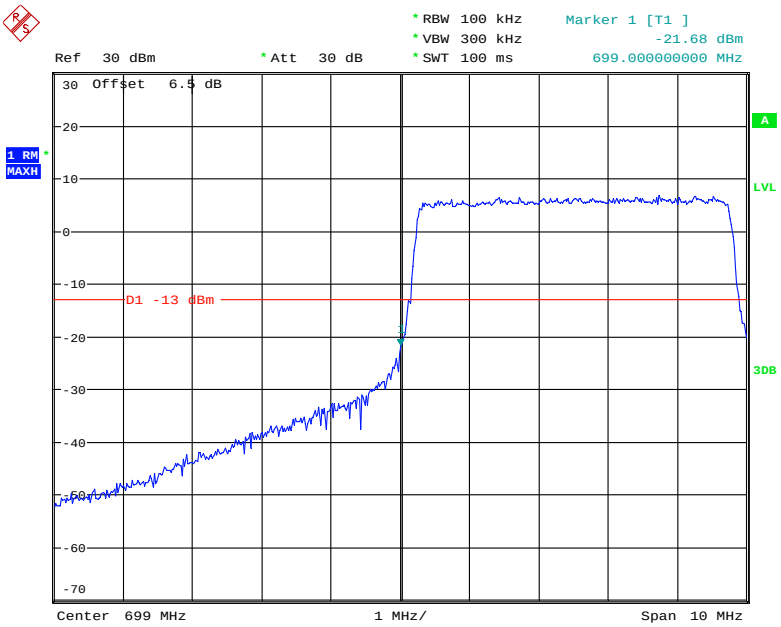
Date: 6.JUL.2020 12:18:12

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



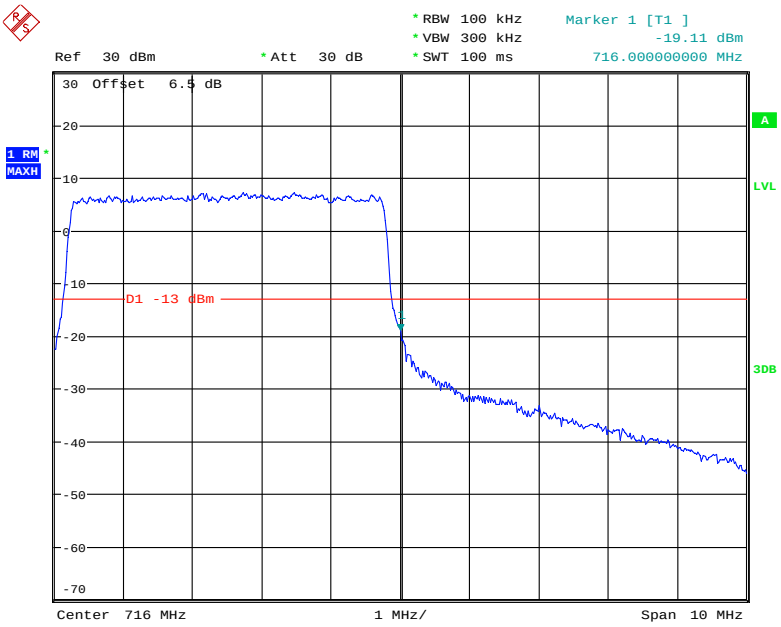
Date: 17.JUL.2020 13:26:51

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



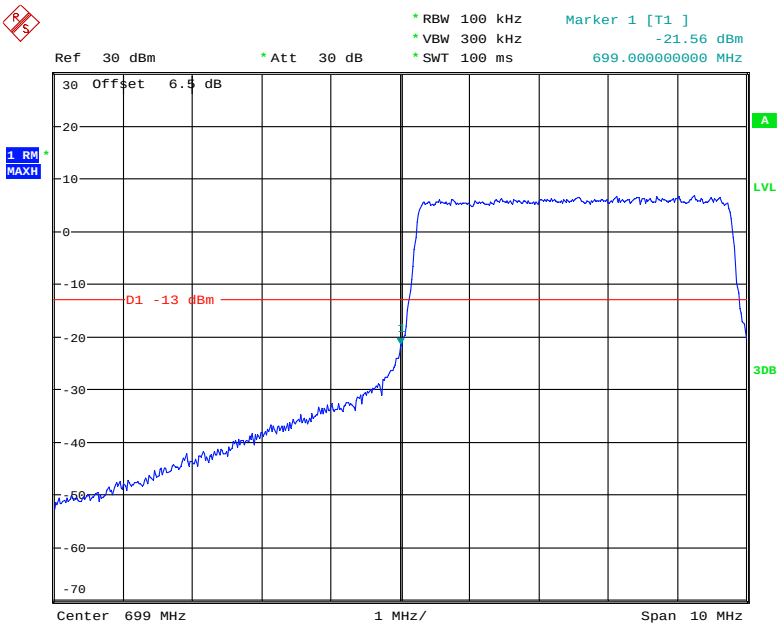
Date: 6.JUL.2020 13:14:52

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



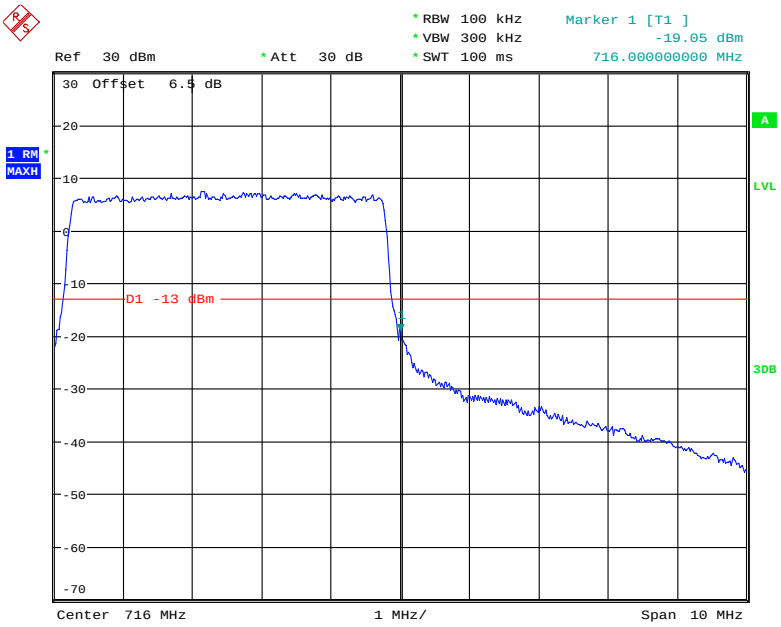
Date: 6.JUL.2020 13:15:30

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



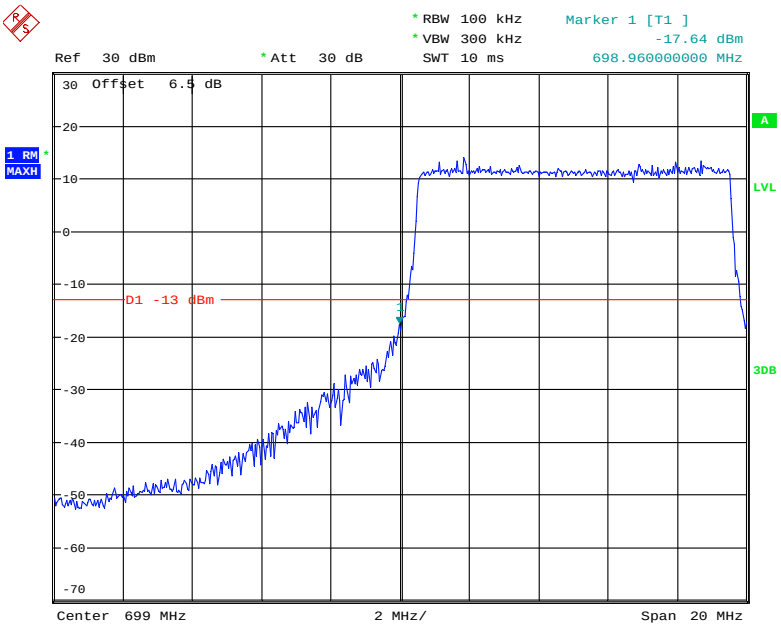
Date: 6.JUL.2020 13:14:27

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



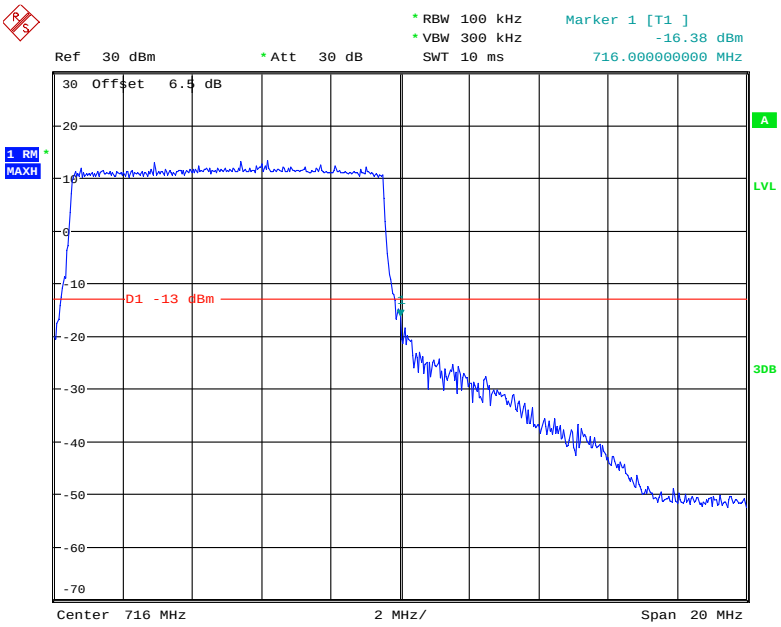
Date: 6.JUL.2020 13:16:18

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



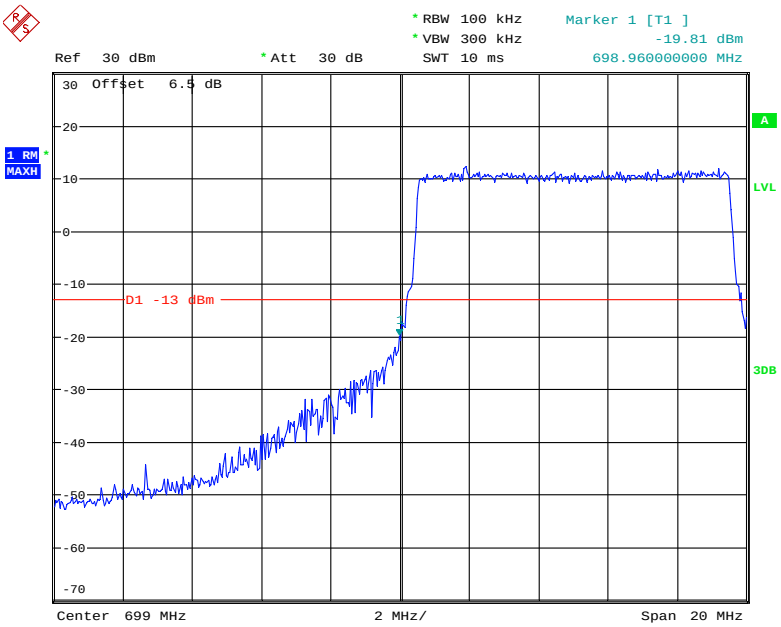
Date: 6.JUL.2020 12:21:02

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



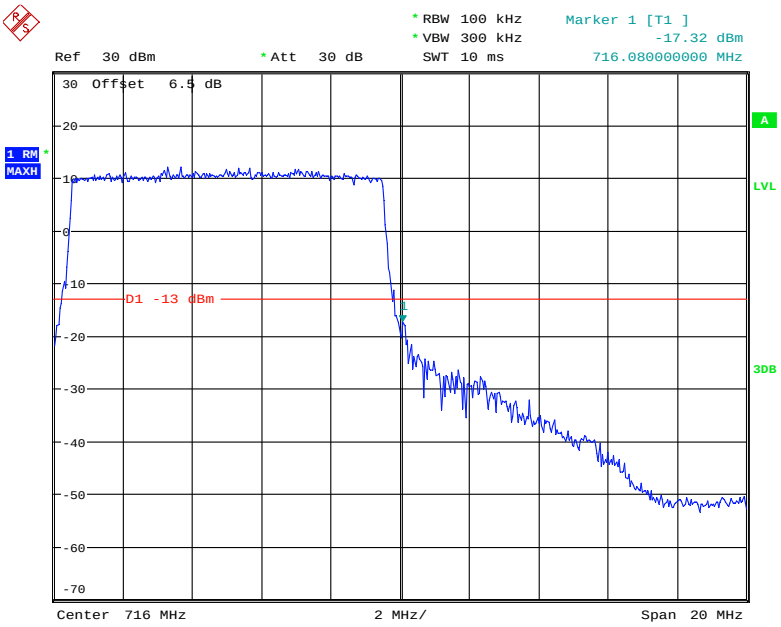
Date: 6.JUL.2020 12:21:51

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



Date: 6.JUL.2020 12:21:26

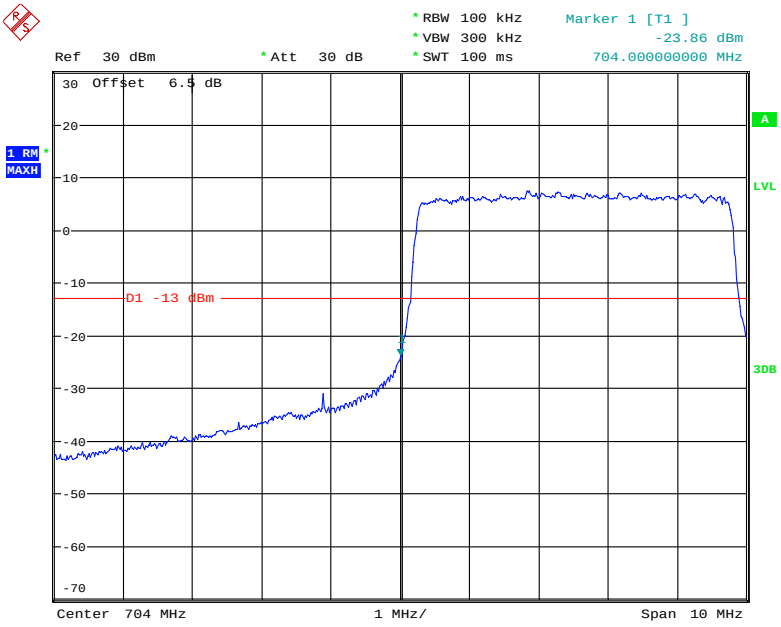
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 6.JUL.2020 12:22:08

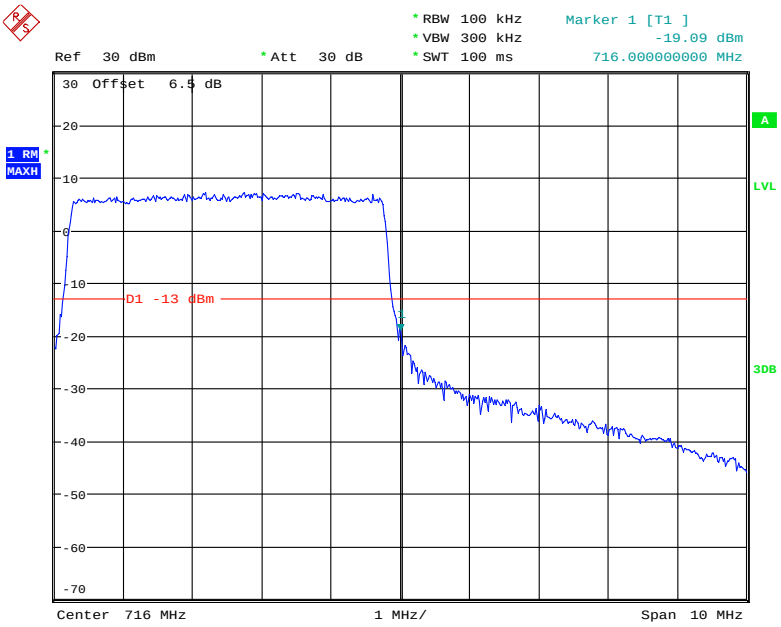
Band 17:

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



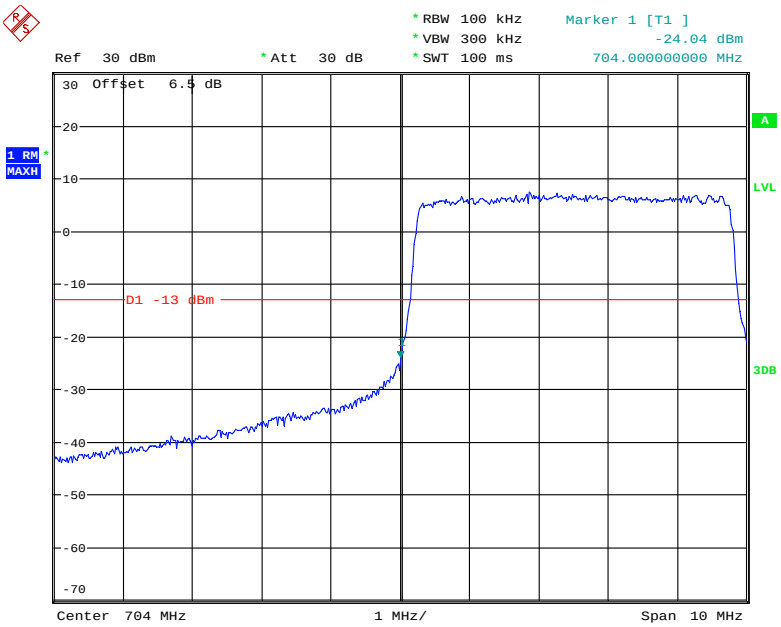
Date: 6.JUL.2020 13:11:13

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



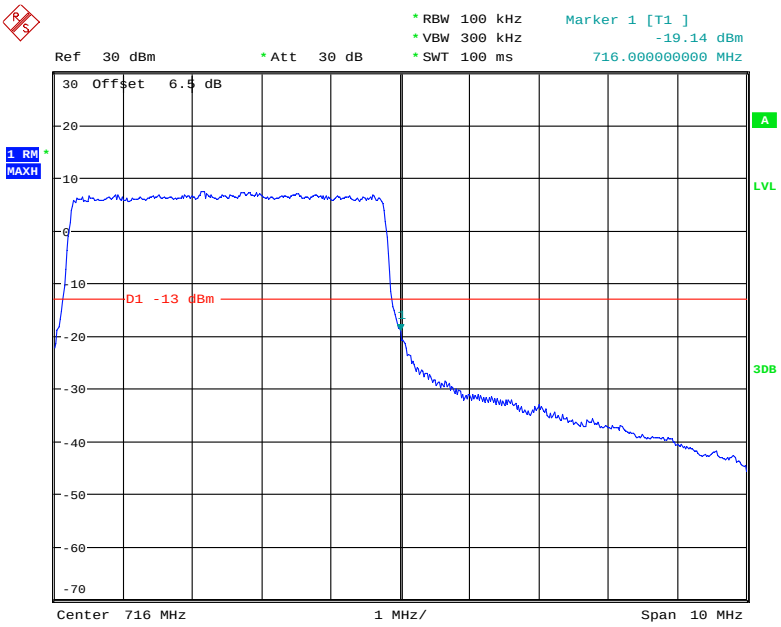
Date: 6.JUL.2020 13:10:08

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



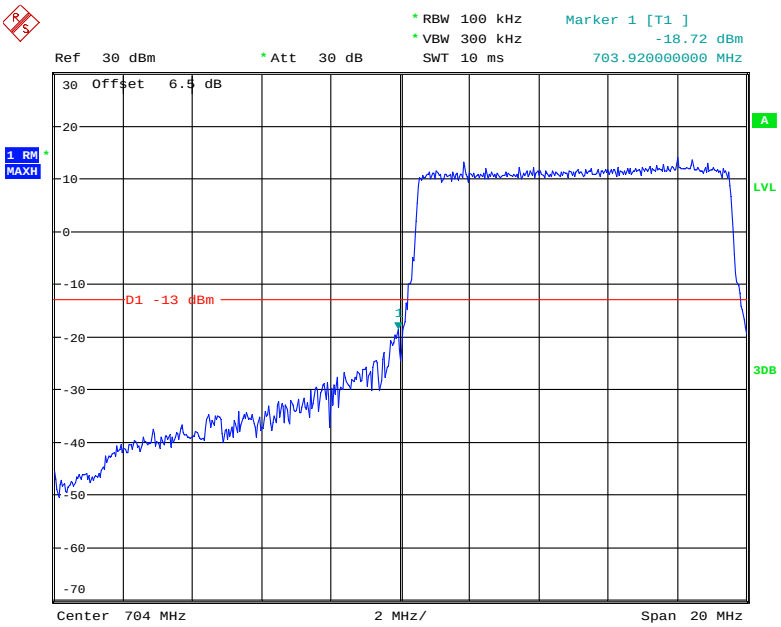
Date: 6.JUL.2020 13:11:56

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



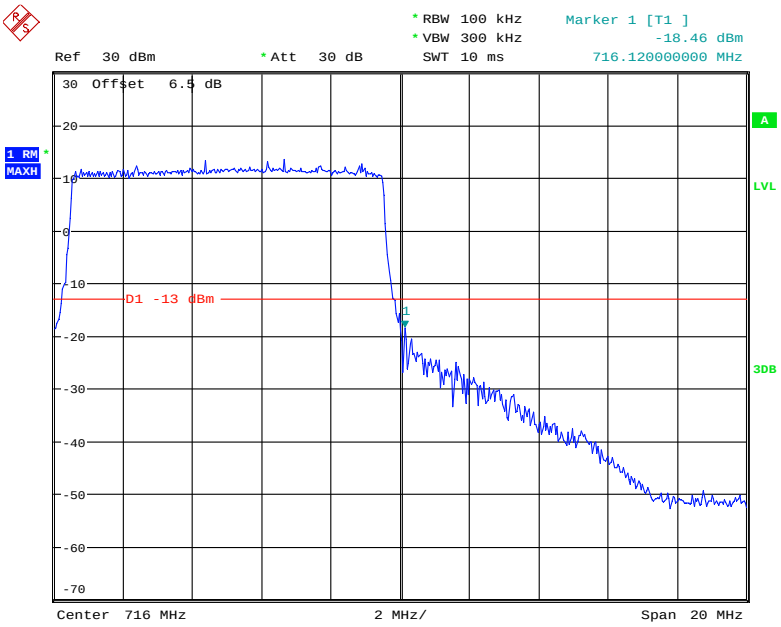
Date: 6.JUL.2020 13:09:26

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



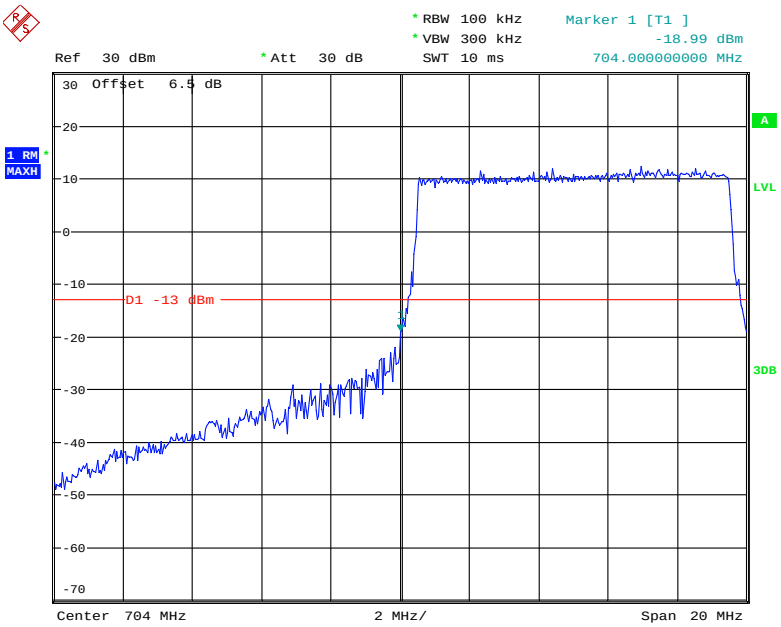
Date: 6.JUL.2020 12:24:34

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



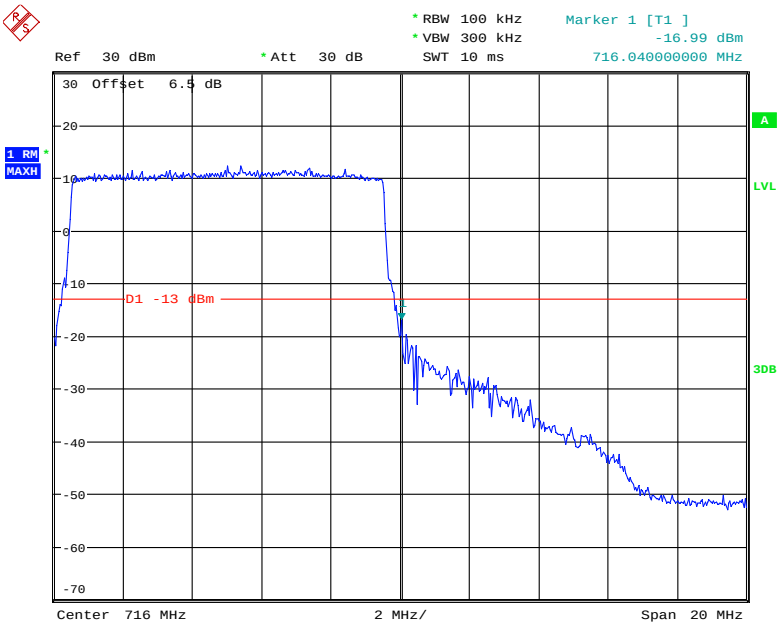
Date: 6.JUL.2020 12:25:16

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



Date: 6.JUL.2020 12:24:54

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



Date: 6.JUL.2020 12:25:36

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

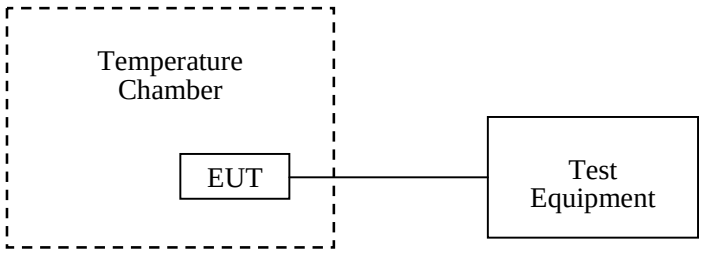
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Gavin Guo on 2020-06-11.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	NV	3	0.0036	2.5
-20		-4	-0.0048	2.5
-10		3	0.0036	2.5
0		6	0.0072	2.5
10		-2	-0.0024	2.5
20		7	0.0084	2.5
30		-1	-0.0012	2.5
40		2	0.0024	2.5
50		-2	-0.0024	2.5
20	LV	4	0.0048	2.5
	HV	2	0.0024	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	NV	8	0.0096	2.5
-20		-4	-0.0048	2.5
-10		3	0.0036	2.5
0		5	0.0060	2.5
10		7	0.0084	2.5
20		3	0.0036	2.5
30		4	0.0048	2.5
40		2	0.0024	2.5
50		-3	-0.0036	2.5
20	LV	5	0.0060	2.5
	HV	-6	-0.0072	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	NV	5	0.0027	pass
-20		1	0.0005	pass
-10		5	0.0027	pass
0		-2	-0.0011	pass
10		4	0.0021	pass
20		5	0.0027	pass
30		3	0.0016	pass
40		0	0.0000	pass
50		9	0.0048	pass
20	LV	-2	-0.0011	pass
	HV	4	0.0021	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	NV	4	0.0021	pass
-20		6	0.0032	pass
-10		-5	-0.0027	pass
0		5	0.0027	pass
10		3	0.0016	pass
20		6	0.0032	pass
30		-4	-0.0021	pass
40		6	0.0032	pass
50		3	0.0016	pass
20	LV	-5	-0.0027	pass
	HV	5	0.0027	pass

AWS Band (Part 27)

Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	NV	1710.009245	1754.993047	1710	1755
-20		1710.005552	1754.993837	1710	1755
-10		1710.007246	1754.992278	1710	1755
0		1710.005281	1754.991212	1710	1755
10		1710.006126	1754.996211	1710	1755
20		1710.008521	1754.996250	1710	1755
30		1710.008295	1754.994167	1710	1755
40		1710.008417	1754.996768	1710	1755
50		1710.006822	1754.998499	1710	1755
20	LV	1710.004500	1754.994863	1710	1755
	HV	1710.005732	1754.995538	1710	1755

LTE:

Band 2:

Modulation	Test condition	Channel	Frequency (MHz)	Frequency error (Hz)	Frequency error (ppm)
QPSK	-30℃/ N.V.	Middle	1880	28.70	0.0153
	-20℃/ N.V.	Middle	1880	-9.97	-0.0053
	-10℃/ N.V.	Middle	1880	-6.13	-0.0033
	0℃/ N.V.	Middle	1880	6.17	0.0033
	10℃/ N.V.	Middle	1880	7.92	0.0042
	20℃/ N.V.	Middle	1880	6.46	0.0034
	30℃/ N.V.	Middle	1880	-6.52	-0.0035
	40℃/ N.V.	Middle	1880	7.18	0.0038
	50℃/ N.V.	Middle	1880	-9.69	-0.0052
	20℃/ L.V.	Middle	1880	-8.17	-0.0043
	20℃/ H.V.	Middle	1880	-7.05	-0.0038
16QAM	-30℃/ N.V.	Middle	1880	-36.09	-0.0192
	-20℃/ N.V.	Middle	1880	-6.68	-0.0036
	-10℃/ N.V.	Middle	1880	9.77	0.0052
	0℃/ N.V.	Middle	1880	-7.62	-0.0041
	10℃/ N.V.	Middle	1880	-9.91	-0.0053
	20℃/ N.V.	Middle	1880	-9.82	-0.0052
	30℃/ N.V.	Middle	1880	-6.68	-0.0036
	40℃/ N.V.	Middle	1880	-8.85	-0.0047
	50℃/ N.V.	Middle	1880	5.67	0.003
	20℃/ L.V.	Middle	1880	6.05	0.0032
	20℃/ H.V.	Middle	1880	7.52	0.004

Band 4:

Modulation	Test condition	Channel	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
QPSK	-30℃/ N.V.	Low/High	1710.4308	1754.8073	1710	1755
	-20℃/ N.V.	Low/High	1710.1634	1754.7172	1710	1755
	-10℃/ N.V.	Low/High	1710.2043	1754.8348	1710	1755
	0℃/ N.V.	Low/High	1710.2254	1754.6631	1710	1755
	10℃/ N.V.	Low/High	1710.3930	1754.9296	1710	1755
	20℃/ N.V.	Low/High	1710.1901	1754.5200	1710	1755
	30℃/ N.V.	Low/High	1710.1782	1754.6692	1710	1755
	40℃/ N.V.	Low/High	1710.1967	1754.6541	1710	1755
	50℃/ N.V.	Low/High	1710.1921	1754.7152	1710	1755
	20℃/ L.V.	Low/High	1710.0612	1754.9611	1710	1755
	20℃/ H.V.	Low/High	1710.1779	1754.9040	1710	1755
16QAM	-30℃/ N.V.	Low/High	1710.1566	1754.7773	1710	1755
	-20℃/ N.V.	Low/High	1710.0777	1754.9908	1710	1755
	-10℃/ N.V.	Low/High	1710.1182	1754.9188	1710	1755
	0℃/ N.V.	Low/High	1710.1069	1754.6191	1710	1755
	10℃/ N.V.	Low/High	1710.1286	1754.7363	1710	1755
	20℃/ N.V.	Low/High	1710.2716	1754.6035	1710	1755
	30℃/ N.V.	Low/High	1710.1206	1754.5976	1710	1755
	40℃/ N.V.	Low/High	1710.3374	1754.7827	1710	1755
	50℃/ N.V.	Low/High	1710.1548	1754.7034	1710	1755
	20℃/ L.V.	Low/High	1710.1400	1754.6122	1710	1755
	20℃/ H.V.	Low/High	1710.0256	1754.9588	1710	1755

Band 5:

Modulation	Test condition	Channel	Frequency (MHz)	Frequency error (Hz)	Frequency error (ppm)	Limit (ppm)
QPSK	-30℃/ N.V.	Middle	836.5	9.35	0.0112	2.5
	-20℃/ N.V.	Middle	836.5	-6.97	-0.0083	2.5
	-10℃/ N.V.	Middle	836.5	-5.50	-0.0066	2.5
	0℃/ N.V.	Middle	836.5	6.06	0.0072	2.5
	10℃/ N.V.	Middle	836.5	9.80	0.0117	2.5
	20℃/ N.V.	Middle	836.5	5.03	0.0060	2.5
	30℃/ N.V.	Middle	836.5	-6.62	-0.0079	2.5
	40℃/ N.V.	Middle	836.5	-8.73	-0.0104	2.5
	50℃/ N.V.	Middle	836.5	-7.05	-0.0084	2.5
	20℃/ L.V.	Middle	836.5	8.99	0.0107	2.5
	20℃/ H.V.	Middle	836.5	-7.17	-0.0086	2.5
16QAM	-30℃/ N.V.	Middle	836.5	7.75	0.0093	2.5
	-20℃/ N.V.	Middle	836.5	8.10	0.0097	2.5
	-10℃/ N.V.	Middle	836.5	-8.59	-0.0103	2.5
	0℃/ N.V.	Middle	836.5	9.33	0.0112	2.5
	10℃/ N.V.	Middle	836.5	-6.94	-0.0083	2.5
	20℃/ N.V.	Middle	836.5	7.54	0.009	2.5
	30℃/ N.V.	Middle	836.5	6.43	0.0077	2.5
	40℃/ N.V.	Middle	836.5	-6.17	-0.0074	2.5
	50℃/ N.V.	Middle	836.5	-6.44	-0.0077	2.5
	20℃/ L.V.	Middle	836.5	6.34	0.0076	2.5
	20℃/ H.V.	Middle	836.5	-6.89	-0.0082	2.5

Band 12:

Modulation	Test condition	Channel	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
QPSK	-30℃/ N.V.	Low/High	699.5262	715.5845	699	716
	-20℃/ N.V.	Low/High	699.5223	715.5897	699	716
	-10℃/ N.V.	Low/High	699.5220	715.5904	699	716
	0℃/ N.V.	Low/High	699.5206	715.5895	699	716
	10℃/ N.V.	Low/High	699.5237	715.5860	699	716
	20℃/ N.V.	Low/High	699.5214	715.5894	699	716
	30℃/ N.V.	Low/High	699.5211	715.5868	699	716
	40℃/ N.V.	Low/High	699.5238	715.5876	699	716
	50℃/ N.V.	Low/High	699.5241	715.5850	699	716
	20℃/ L.V.	Low/High	699.5270	715.5900	699	716
	20℃/ H.V.	Low/High	699.5233	715.5828	699	716
16QAM	-30℃/ N.V.	Low/High	699.5251	715.5874	699	716
	-20℃/ N.V.	Low/High	699.5235	715.5820	699	716
	-10℃/ N.V.	Low/High	699.5236	715.5868	699	716
	0℃/ N.V.	Low/High	699.5232	715.5859	699	716
	10℃/ N.V.	Low/High	699.5244	715.5901	699	716
	20℃/ N.V.	Low/High	699.5263	715.5875	699	716
	30℃/ N.V.	Low/High	699.5210	715.5870	699	716
	40℃/ N.V.	Low/High	699.5200	715.5871	699	716
	50℃/ N.V.	Low/High	699.5258	715.5896	699	716
	20℃/ L.V.	Low/High	699.5211	715.5867	699	716
	20℃/ H.V.	Low/High	699.5240	715.5897	699	716

Band 17:

Modulation	Test condition	Channel	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
QPSK	-30℃/ N.V.	Low/High	704.3855	715.7268	704	716
	-20℃/ N.V.	Low/High	704.3832	715.7279	704	716
	-10℃/ N.V.	Low/High	704.3893	715.7221	704	716
	0℃/ N.V.	Low/High	704.3868	715.7239	704	716
	10℃/ N.V.	Low/High	704.3896	715.7291	704	716
	20℃/ N.V.	Low/High	704.3838	715.7246	704	716
	30℃/ N.V.	Low/High	704.3888	715.7269	704	716
	40℃/ N.V.	Low/High	704.3846	715.7184	704	716
	50℃/ N.V.	Low/High	704.3871	715.7275	704	716
	20℃/ L.V.	Low/High	704.3910	715.7247	704	716
	20℃/ H.V.	Low/High	704.3861	715.7269	704	716
16QAM	-30℃/ N.V.	Low/High	704.3925	715.7224	704	716
	-20℃/ N.V.	Low/High	704.3881	715.7263	704	716
	-10℃/ N.V.	Low/High	704.3880	715.7237	704	716
	0℃/ N.V.	Low/High	704.3884	715.7219	704	716
	10℃/ N.V.	Low/High	704.3907	715.7248	704	716
	20℃/ N.V.	Low/High	704.3874	715.7258	704	716
	30℃/ N.V.	Low/High	704.3845	715.7275	704	716
	40℃/ N.V.	Low/High	704.3865	715.7238	704	716
	50℃/ N.V.	Low/High	704.3885	715.7269	704	716
	20℃/ L.V.	Low/High	704.3868	715.7262	704	716
	20℃/ H.V.	Low/High	704.3889	715.7266	704	716

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