



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: YHLBLUG50

Report Type: Original Report	Product Type: Mobile Phone
Report Number: RSZ200330006-00D	
Report Date: 2020-05-13	
Jimmy Xiao 	
Reviewed By: 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
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 7: 2500-2570 MHz(TX); 2620-2690 MHz(RX) LTE Band 12: 699-716 MHz(TX) ; 729-746 MHz(RX) LTE Band 17: 704-716 MHz(TX); 734-746 MHz(RX)
Maximum Target Output Power	EGSM850: 33.1dBm(GMSK), 26.7dBm(8PSK) PCS1900: 30.2dBm(GMSK), 25.9dBm(8PSK) WCDMA Band 2: 21.7dBm WCDMA Band 4: 23.4dBm WCDMA Band 5: 23.3dBm LTE Band 2: 21.3dBm LTE Band 4: 21.1dBm LTE Band 5: 21.4dBm LTE Band 7: 21.4dBm LTE Band 12: 21.4dBm LTE Band 17: 21.4dBm
Modulation Technique	2G: GMSK, 8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antennas
Voltage Range	DC 3.85V from battery or DC 5V from adapter
Date of Test	2020-04-07 to 2020-05-12
Sample serial number	RSZ200330006-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2020-03-30
Sample/EUT Status	Good condition
Adapter information	Model: US-WW-2001 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, Part 15.247 DTS and Part 15B JBP submissions with FCC ID: YHLBLUG50.

Test Methodology

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

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

Applicable Standards: TIA/EIA 603-D.

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

Measurement Uncertainty

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

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing according to TIA/EIA-603-D.
The final qualification test was performed with the EUT operating at normal mode.

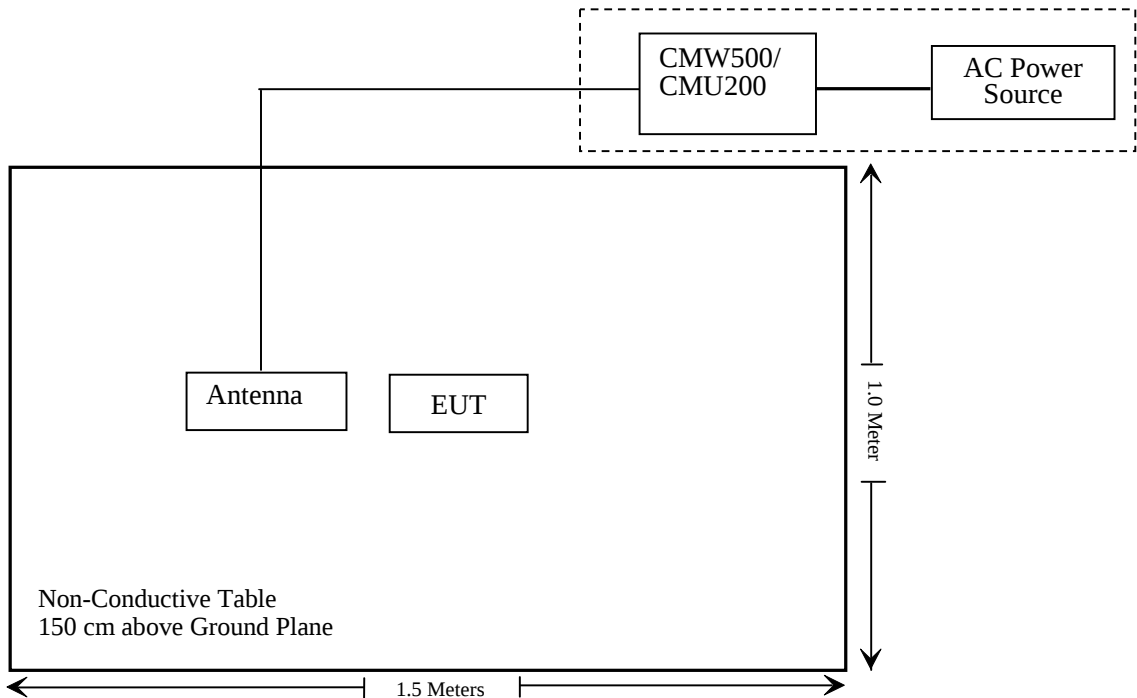
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (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: RSZ200330006-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	2019/4/20	2020/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
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
Insulated 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	2019/4/20	2020/4/20
Unknown	High Pass filter	1.3GHz	101120	2019/4/20	2020/4/20
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-02 1304	2017/12/6	2020/12/5
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-01 1304	2017/12/6	2020/12/5
Agilent	Signal Generator	N5183A	MY51040755	NCR	NCR

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

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

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

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ200330006-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(b), Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

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

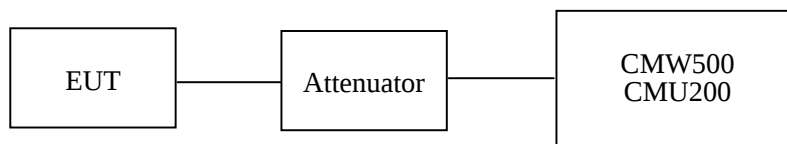
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

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

The testing was performed by Gavin Guo, Charlie Cha, Leo Huang and Zero Yan from 2020-04-07 to 2020-04-15.

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

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.41	38.45
	190	836.6	32.65	38.45
	251	848.8	32.78	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.43	30.45	28.57	26.31	38.45
	190	836.6	32.66	30.47	28.59	26.37	38.45
	251	848.8	32.76	30.47	28.56	26.36	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	26.22	24.55	21.76	19.10	38.45
	190	836.6	26.41	24.82	22.13	19.47	38.45
	251	848.8	26.20	24.63	21.89	19.31	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		23.01	23.08	23.07
		HSDPA	1	22.5	22.46	22.32
			2	22.68	22.54	22.42
			3	22.57	22.51	22.40
			4	22.40	22.44	22.49
		HSUPA	1	22.47	22.47	22.35
			2	22.34	22.71	22.56
			3	22.39	22.57	22.65
			4	22.27	22.65	22.51
			5	22.34	22.66	22.44

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	30.02	33
	661	1880.0	29.95	33
	810	1909.8	29.97	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.83	27.54	25.86	23.72	33
	661	1880.0	29.78	27.42	25.74	23.57	33
	810	1909.8	29.78	27.23	25.56	23.44	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.02	23.21	20.50	17.05	33
	661	1880.0	25.75	23.94	21.28	17.85	33
	810	1909.8	25.10	23.03	20.04	16.12	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		21.49	21.39	21.37
		HSDPA	1	20.84	20.72	20.72
			2	20.80	20.63	20.75
			3	20.87	20.78	20.70
			4	20.74	20.96	20.51
		HSUPA	1	20.9	20.73	20.67
			2	20.73	20.79	20.60
			3	20.84	21.01	20.59
			4	20.89	21.04	20.47
			5	20.98	20.89	20.38

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		23.02	23.04	23.13
		HSDPA	1	21.98	22.66	22.39
			2	21.99	22.63	22.47
			3	22.00	22.62	22.73
			4	22.09	22.55	22.61
		HSUPA	1	22.05	22.65	22.41
			2	22.18	22.62	22.33
			3	21.99	22.80	22.14
			4	21.97	22.95	22.15
			5	22.07	22.81	22.24

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

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.27	13
	Middle	1.23	13
	High	1.20	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.28	13
	Middle	1.20	13
	High	1.31	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.17	13
	Middle	2.98	13
	High	3.13	13
HSDPA (16QAM)	Low	3.24	13
	Middle	3.12	13
	High	2.93	13
HSUPA (BPSK)	Low	3.23	13
	Middle	3.55	13
	High	3.19	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.46	13
	Middle	1.42	13
	High	1.41	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.38	13
	Middle	1.51	13
	High	1.29	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.23	13
	Middle	3.08	13
	High	2.72	13
HSDPA (16QAM)	Low	2.93	13
	Middle	2.77	13
	High	2.68	13
HSUPA (BPSK)	Low	3.05	13
	Middle	3.28	13
	High	2.94	13

AWS Band

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.12	13
	Middle	2.95	13
	High	3.39	13
HSDPA (16QAM)	Low	3.16	13
	Middle	3.07	13
	High	3.04	13
HSUPA (BPSK)	Low	3.21	13
	Middle	3.19	13
	High	3.09	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	91.40	147	1.6	H	31.4	1.90	0.0	29.50	38.45	8.95
836.6	88.93	304	1.2	V	29.6	1.90	0.0	27.70	38.45	10.75
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	91.10	137	2.4	H	21.4	1.30	9.40	29.50	33	3.50
1880.00	89.43	162	2.4	V	19.5	1.30	9.40	27.60	33	5.40

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	85.99	10	1.5	H	26.0	1.9	0	24.1	38.45	14.35
836.6	83.92	296	1.8	V	24.6	1.9	0	22.7	38.45	15.75
EIRP, PCS Band (Part 24E), Middle Channel										
1880	85.71	143	1.8	H	15.4	1.3	9.4	23.5	33	9.5
1880	83.58	247	1.9	V	13.0	1.3	9.4	21.1	33	11.9

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	81.16	7	1.7	H	21.2	1.90	0.0	19.30	38.45	19.15
836.6	72.18	147	1.3	V	12.8	1.90	0.0	10.90	38.45	27.55
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	82.68	265	1.2	H	12.8	1.30	9.40	20.90	33	12.10
1880.00	78.43	89	1.6	V	8.8	1.30	9.40	16.90	33	16.10
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	84.13	76	1.4	H	11.4	1.30	8.90	19.00	30	11.00
1732.60	81.45	76	1.6	V	8.1	1.30	8.90	15.70	30	14.30

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

dBd is for the ERP, dBi is for EIRP.

LTE Band 2:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	20.19	20.46	20.88
		RB Size=1, RB Offset=2	20.21	20.39	20.86
		RB Size=1, RB Offset=5	20.51	20.44	20.83
		RB Size=3, RB Offset=0	20.63	20.31	20.98
		RB Size=3, RB Offset=1	20.52	20.28	20.99
		RB Size=3, RB Offset=2	20.58	20.01	20.83
		RB Size=6, RB Offset=0	20.41	20.66	20.96
	16QAM	RB Size=1, RB Offset=0	20.07	20.49	20.65
		RB Size=1, RB Offset=2	20.33	20.46	20.62
		RB Size=1, RB Offset=5	20.59	20.68	20.65
		RB Size=3, RB Offset=0	20.14	20.12	20.87
		RB Size=3, RB Offset=1	20.03	20.51	20.87
		RB Size=3, RB Offset=2	20.14	20.27	20.23
		RB Size=6, RB Offset=0	20.26	20.18	20.00
3.0	QPSK	RB Size=1, RB Offset=0	20.48	20.25	20.38
		RB Size=1, RB Offset=7	20.17	20.52	20.40
		RB Size=1, RB Offset=14	20.66	20.28	20.57
		RB Size=8, RB Offset=0	20.52	20.57	20.63
		RB Size=8, RB Offset=4	20.64	20.36	20.55
		RB Size=8, RB Offset=7	20.44	20.15	20.19
		RB Size=15, RB Offset=0	20.08	20.53	20.15
	16QAM	RB Size=1, RB Offset=0	20.49	20.35	20.66
		RB Size=1, RB Offset=7	20.41	20.29	20.27
		RB Size=1, RB Offset=14	20.67	20.57	20.49
		RB Size=8, RB Offset=0	20.20	20.29	20.38
		RB Size=8, RB Offset=4	20.50	20.68	20.09
		RB Size=8, RB Offset=7	20.41	20.24	20.13
		RB Size=15, RB Offset=0	20.43	20.28	20.59

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	20.22	20.48	20.23
		RB Size=1, RB Offset=12	20.25	20.38	20.00
		RB Size=1, RB Offset=24	20.61	20.69	20.38
		RB Size=12, RB Offset=0	20.25	20.09	20.40
		RB Size=12, RB Offset=6	20.09	20.63	20.57
		RB Size=12, RB Offset=11	20.06	20.27	20.63
		RB Size=25, RB Offset=0	20.67	20.51	20.55
	16QAM	RB Size=1, RB Offset=0	20.14	20.28	20.19
		RB Size=1, RB Offset=12	20.32	20.41	20.15
		RB Size=1, RB Offset=24	20.32	20.27	20.66
		RB Size=12, RB Offset=0	20.67	20.35	20.27
		RB Size=12, RB Offset=6	20.23	20.24	20.49
		RB Size=12, RB Offset=11	20.40	20.14	20.38
		RB Size=25, RB Offset=0	20.44	20.63	20.09
10.0	QPSK	RB Size=1, RB Offset=0	20.12	20.12	20.13
		RB Size=1, RB Offset=24	20.20	20.58	20.59
		RB Size=1, RB Offset=49	20.44	20.56	20.55
		RB Size=25, RB Offset=0	20.11	20.18	20.48
		RB Size=25, RB Offset=12	20.06	20.40	20.67
		RB Size=25, RB Offset=24	20.14	20.46	20.05
		RB Size=50, RB Offset=0	20.06	20.21	20.55
	16QAM	RB Size=1, RB Offset=0	20.37	20.41	20.52
		RB Size=1, RB Offset=24	20.51	20.35	20.56
		RB Size=1, RB Offset=49	20.10	20.49	20.50
		RB Size=25, RB Offset=0	20.18	20.20	20.54
		RB Size=25, RB Offset=12	20.29	20.09	20.02
		RB Size=25, RB Offset=24	20.40	20.30	20.03
		RB Size=50, RB Offset=0	20.11	20.46	20.41

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	20.22	20.09	20.23
		RB Size=1, RB Offset=37	20.25	20.19	20.00
		RB Size=1, RB Offset=74	20.61	20.43	20.38
		RB Size=36, RB Offset=0	20.25	20.37	20.40
		RB Size=36, RB Offset=18	20.09	20.65	20.57
		RB Size=36, RB Offset=37	20.06	20.10	20.63
		RB Size=75, RB Offset=0	20.67	20.06	20.55
	16QAM	RB Size=1, RB Offset=0	20.14	20.62	20.19
		RB Size=1, RB Offset=37	20.32	20.45	20.15
		RB Size=1, RB Offset=74	20.32	20.13	20.66
		RB Size=36, RB Offset=0	20.67	20.59	20.27
		RB Size=36, RB Offset=18	20.23	20.50	20.49
		RB Size=36, RB Offset=37	20.40	20.31	20.38
		RB Size=75, RB Offset=0	20.44	20.02	20.09
20.0	QPSK	RB Size=1, RB Offset=0	20.12	20.32	20.13
		RB Size=1, RB Offset=49	20.20	20.28	20.59
		RB Size=1, RB Offset=99	20.44	20.28	20.55
		RB Size=50, RB Offset=0	20.11	20.08	20.48
		RB Size=50, RB Offset=24	20.06	20.53	20.67
		RB Size=50, RB Offset=49	20.14	20.21	20.05
		RB Size=100, RB Offset=0	20.06	20.65	20.55
	16QAM	RB Size=1, RB Offset=0	20.37	20.69	20.52
		RB Size=1, RB Offset=49	20.51	20.21	20.56
		RB Size=1, RB Offset=99	20.10	20.45	20.50
		RB Size=50, RB Offset=0	20.18	20.34	20.54
		RB Size=50, RB Offset=24	20.29	20.09	20.02
		RB Size=50, RB Offset=49	20.40	20.15	20.03
		RB Size=100, RB Offset=0	20.11	20.39	20.41

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.86	13	Pass
QPSK (100RB Size)	6.97	13	Pass
16QAM (1RB Size)	7.91	13	Pass
16QAM (100RB Size)	8.04	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	83.61	288	1.8	H	13.9	1.30	9.40	22.00	33
1880.00	80.26	237	1.2	V	10.4	1.30	9.40	18.50	33
3 MHz Bandwidth									
1880.00	83.51	105	1.7	H	13.8	1.30	9.40	21.90	33
1880.00	80.12	280	1.5	V	10.2	1.30	9.40	18.30	33
5 MHz Bandwidth									
1880.00	83.24	56	1.1	H	13.6	1.30	9.40	21.70	33
1880.00	80.06	44	1.3	V	10.2	1.30	9.40	18.30	33
10 MHz Bandwidth									
1880.00	83.06	84	1.0	H	13.4	1.30	9.40	21.50	33
1880.00	79.89	235	2.4	V	10.0	1.30	9.40	18.10	33
15 MHz Bandwidth									
1880.00	82.98	97	2.1	H	13.3	1.30	9.40	21.40	33
1880.00	79.84	229	1.4	V	9.9	1.30	9.40	18.00	33
20 MHz Bandwidth									
1880.00	82.78	20	1.7	H	13.1	1.30	9.40	21.20	33
1880.00	79.69	206	2.3	V	9.8	1.30	9.40	17.90	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	84.36	196	1.3	H	14.7	1.30	9.40	22.80	33
1880.00	80.64	177	1.6	V	10.7	1.30	9.40	18.80	33
3 MHz Bandwidth									
1880.00	84.16	318	1.9	H	14.5	1.30	9.40	22.60	33
1880.00	80.49	232	2.0	V	10.6	1.30	9.40	18.70	33
5 MHz Bandwidth									
1880.00	84.09	25	1.9	H	14.4	1.30	9.40	22.50	33
1880.00	80.38	17	1.3	V	10.5	1.30	9.40	18.60	33
10 MHz Bandwidth									
1880.00	83.87	173	1.0	H	14.2	1.30	9.40	22.30	33
1880.00	80.24	246	2.1	V	10.3	1.30	9.40	18.40	33
15 MHz Bandwidth									
1880.00	83.67	211	1.9	H	14.0	1.30	9.40	22.10	33
1880.00	80.11	307	1.2	V	10.2	1.30	9.40	18.30	33
20 MHz Bandwidth									
1880.00	83.54	332	1.4	H	13.9	1.30	9.40	22.00	33
1880.00	79.94	225	2.4	V	10.0	1.30	9.40	18.10	33

LTE Band 4:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	20.37	20.13	20.11
		RB Size=1, RB Offset=2	20.60	20.39	20.48
		RB Size=1, RB Offset=5	20.66	20.67	20.48
		RB Size=3, RB Offset=0	20.70	20.01	20.29
		RB Size=3, RB Offset=1	20.26	20.54	20.12
		RB Size=3, RB Offset=2	20.52	20.76	20.39
		RB Size=6, RB Offset=0	20.76	20.21	20.43
	16QAM	RB Size=1, RB Offset=0	20.40	20.29	20.30
		RB Size=1, RB Offset=2	20.04	20.44	20.02
		RB Size=1, RB Offset=5	20.22	20.32	20.49
		RB Size=3, RB Offset=0	20.44	20.68	20.02
		RB Size=3, RB Offset=1	20.17	20.59	20.33
		RB Size=3, RB Offset=2	20.19	20.60	20.34
		RB Size=6, RB Offset=0	20.74	20.55	20.46
3.0	QPSK	RB Size=1, RB Offset=0	20.31	20.28	20.42
		RB Size=1, RB Offset=7	20.59	20.02	20.21
		RB Size=1, RB Offset=14	20.22	20.61	20.45
		RB Size=8, RB Offset=0	20.46	20.19	20.24
		RB Size=8, RB Offset=4	20.17	20.12	20.07
		RB Size=8, RB Offset=7	20.05	20.15	20.49
		RB Size=15, RB Offset=0	20.13	20.71	20.50
	16QAM	RB Size=1, RB Offset=0	20.23	20.22	20.27
		RB Size=1, RB Offset=7	20.54	20.78	20.38
		RB Size=1, RB Offset=14	20.71	20.59	20.20
		RB Size=8, RB Offset=0	20.06	20.38	20.26
		RB Size=8, RB Offset=4	20.18	20.46	20.36
		RB Size=8, RB Offset=7	20.06	20.79	20.30
		RB Size=15, RB Offset=0	20.31	20.47	20.33

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	20.37	20.33	20.40
		RB Size=1, RB Offset=12	20.60	20.24	20.46
		RB Size=1, RB Offset=24	20.66	20.58	20.48
		RB Size=12, RB Offset=0	20.70	20.62	20.24
		RB Size=12, RB Offset=6	20.26	20.20	20.44
		RB Size=12, RB Offset=11	20.52	20.73	20.33
		RB Size=25, RB Offset=0	20.76	20.36	20.48
	16QAM	RB Size=1, RB Offset=0	20.40	20.68	20.02
		RB Size=1, RB Offset=12	20.04	20.10	20.36
		RB Size=1, RB Offset=24	20.22	20.23	20.36
		RB Size=12, RB Offset=0	20.44	20.32	20.04
		RB Size=12, RB Offset=6	20.17	20.37	20.36
		RB Size=12, RB Offset=11	20.19	20.60	20.05
		RB Size=25, RB Offset=0	20.74	20.25	20.18
10.0	QPSK	RB Size=1, RB Offset=0	20.31	20.03	20.15
		RB Size=1, RB Offset=24	20.59	20.08	20.14
		RB Size=1, RB Offset=49	20.22	20.03	20.28
		RB Size=25, RB Offset=0	20.46	20.00	20.16
		RB Size=25, RB Offset=12	20.17	20.29	20.18
		RB Size=25, RB Offset=24	20.05	20.75	20.08
		RB Size=50, RB Offset=0	20.13	20.61	20.08
	16QAM	RB Size=1, RB Offset=0	20.23	20.31	20.23
		RB Size=1, RB Offset=24	20.54	20.36	20.46
		RB Size=1, RB Offset=49	20.71	20.73	20.27
		RB Size=25, RB Offset=0	20.06	20.75	20.42
		RB Size=25, RB Offset=12	20.18	20.55	20.32
		RB Size=25, RB Offset=24	20.06	20.74	20.22
		RB Size=50, RB Offset=0	20.31	20.03	20.29

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	20.65	20.20	20.10
		RB Size=1, RB Offset=37	20.40	20.47	20.37
		RB Size=1, RB Offset=74	20.04	20.40	20.47
		RB Size=36, RB Offset=0	20.57	20.76	20.31
		RB Size=36, RB Offset=18	20.37	20.09	20.09
		RB Size=36, RB Offset=37	20.34	20.57	20.48
		RB Size=75, RB Offset=0	20.56	20.35	20.22
	16QAM	RB Size=1, RB Offset=0	20.07	20.36	20.47
		RB Size=1, RB Offset=37	20.34	20.63	20.21
		RB Size=1, RB Offset=74	20.35	20.12	20.25
		RB Size=36, RB Offset=0	20.75	20.47	20.11
		RB Size=36, RB Offset=18	20.03	20.32	20.11
		RB Size=36, RB Offset=37	20.14	20.46	20.06
		RB Size=75, RB Offset=0	20.76	20.57	20.40
20.0	QPSK	RB Size=1, RB Offset=0	20.42	20.49	20.39
		RB Size=1, RB Offset=49	20.25	20.40	20.13
		RB Size=1, RB Offset=99	20.36	20.11	20.38
		RB Size=50, RB Offset=0	20.43	20.11	20.29
		RB Size=50, RB Offset=24	20.19	20.38	20.37
		RB Size=50, RB Offset=49	20.70	20.65	20.28
		RB Size=100, RB Offset=0	20.26	20.57	20.16
	16QAM	RB Size=1, RB Offset=0	20.53	20.48	20.02
		RB Size=1, RB Offset=49	20.35	20.71	20.07
		RB Size=1, RB Offset=99	20.26	20.50	20.09
		RB Size=50, RB Offset=0	20.50	20.54	20.08
		RB Size=50, RB Offset=24	20.65	20.09	20.23
		RB Size=50, RB Offset=49	20.37	20.35	20.06
		RB Size=100, RB Offset=0	20.00	20.19	20.44

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.64	13	Pass
QPSK (100RB Size)	6.71	13	Pass
16QAM (1RB Size)	7.82	13	Pass
16QAM (100RB Size)	8.10	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.43	274	2.2	H	14.1	1.30	8.90	21.70	30
1732.50	83.67	259	1.6	V	10.9	1.30	8.90	18.50	30
3 MHz Bandwidth									
1732.50	87.31	191	1.5	H	14.0	1.30	8.90	21.60	30
1732.50	83.55	59	1.5	V	10.8	1.30	8.90	18.40	30
5 MHz Bandwidth									
1732.50	87.18	204	2.1	H	13.9	1.30	8.90	21.50	30
1732.50	83.35	222	1.7	V	10.6	1.30	8.90	18.20	30
10 MHz Bandwidth									
1732.50	86.84	39	1.5	H	13.5	1.30	8.90	21.10	30
1732.50	83.12	311	1.9	V	10.4	1.30	8.90	18.00	30
15 MHz Bandwidth									
1732.50	86.03	172	1.4	H	12.7	1.30	8.90	20.30	30
1732.50	82.94	204	1.7	V	10.2	1.30	8.90	17.80	30
20 MHz Bandwidth									
1732.50	85.91	52	1.2	H	12.6	1.30	8.90	20.20	30
1732.50	82.87	156	2.3	V	10.1	1.30	8.90	17.70	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.92	180	1.5	H	14.6	1.30	8.90	22.20	30
1732.50	83.46	230	2.0	V	10.7	1.30	8.90	18.30	30
3 MHz Bandwidth									
1732.50	87.71	44	1.6	H	14.4	1.30	8.90	22.00	30
1732.50	83.45	147	2.4	V	10.7	1.30	8.90	18.30	30
5 MHz Bandwidth									
1732.50	87.54	43	1.2	H	14.2	1.30	8.90	21.80	30
1732.50	83.33	299	2.3	V	10.6	1.30	8.90	18.20	30
10 MHz Bandwidth									
1732.50	87.42	150	1.7	H	14.1	1.30	8.90	21.70	30
1732.50	83.29	167	2.1	V	10.6	1.30	8.90	18.20	30
15 MHz Bandwidth									
1732.50	87.29	267	2.4	H	14.0	1.30	8.90	21.60	30
1732.50	83.12	97	1.7	V	10.4	1.30	8.90	18.00	30
20 MHz Bandwidth									
1732.50	87.07	314	2.1	H	13.7	1.30	8.90	21.30	30
1732.50	82.98	179	1.8	V	10.3	1.30	8.90	17.90	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	RB Size=1, RB Offset=0	20.53	20.95	20.52
		RB Size=1, RB Offset=2	20.73	20.74	20.94
		RB Size=1, RB Offset=5	20.90	20.60	20.98
		RB Size=3, RB Offset=0	20.62	20.53	20.86
		RB Size=3, RB Offset=1	20.55	20.75	20.78
		RB Size=3, RB Offset=2	20.89	20.63	20.71
		RB Size=6, RB Offset=0	20.64	20.97	21.00
	16QAM	RB Size=1, RB Offset=0	20.54	20.63	20.96
		RB Size=1, RB Offset=2	21.00	20.68	20.66
		RB Size=1, RB Offset=5	20.97	20.89	20.94
		RB Size=3, RB Offset=0	20.92	20.98	20.82
		RB Size=3, RB Offset=1	20.50	20.86	20.53
		RB Size=3, RB Offset=2	20.93	20.67	20.65
		RB Size=6, RB Offset=0	20.69	20.56	20.51
3.0	QPSK	RB Size=1, RB Offset=0	20.97	20.64	20.97
		RB Size=1, RB Offset=7	20.56	20.65	20.79
		RB Size=1, RB Offset=14	20.91	20.97	20.73
		RB Size=8, RB Offset=0	20.66	20.65	20.99
		RB Size=8, RB Offset=4	20.98	20.90	20.87
		RB Size=8, RB Offset=7	20.63	20.52	20.59
		RB Size=15, RB Offset=0	20.67	20.82	20.97
	16QAM	RB Size=1, RB Offset=0	20.58	20.72	20.59
		RB Size=1, RB Offset=7	20.93	20.84	20.96
		RB Size=1, RB Offset=14	20.85	20.66	20.77
		RB Size=8, RB Offset=0	20.81	20.72	20.98
		RB Size=8, RB Offset=4	20.65	20.67	20.98
		RB Size=8, RB Offset=7	20.94	20.60	20.60
		RB Size=15, RB Offset=0	20.56	20.62	20.83

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	20.98	20.54	20.80
		RB Size=1, RB Offset=12	20.92	20.65	20.70
		RB Size=1, RB Offset=24	20.73	20.82	20.78
		RB Size=12, RB Offset=0	20.72	20.84	20.75
		RB Size=12, RB Offset=6	20.55	20.70	20.68
		RB Size=12, RB Offset=11	20.84	20.60	20.83
		RB Size=25, RB Offset=0	20.76	20.85	20.55
	16QAM	RB Size=1, RB Offset=0	20.58	20.51	20.86
		RB Size=1, RB Offset=12	20.63	20.57	20.73
		RB Size=1, RB Offset=24	20.79	20.77	20.99
		RB Size=12, RB Offset=0	20.77	20.64	20.84
		RB Size=12, RB Offset=6	20.77	20.52	20.65
		RB Size=12, RB Offset=11	20.97	20.87	20.69
		RB Size=25, RB Offset=0	20.74	20.66	20.54
10.0	QPSK	RB Size=1, RB Offset=0	20.63	20.65	20.86
		RB Size=1, RB Offset=24	20.97	20.98	20.58
		RB Size=1, RB Offset=49	20.91	20.91	20.79
		RB Size=25, RB Offset=0	21.00	20.97	20.86
		RB Size=25, RB Offset=12	20.88	20.69	20.73
		RB Size=25, RB Offset=24	20.70	20.65	20.95
		RB Size=50, RB Offset=0	20.91	20.68	20.88
	16QAM	RB Size=1, RB Offset=0	20.96	20.78	20.80
		RB Size=1, RB Offset=24	20.81	20.80	20.74
		RB Size=1, RB Offset=49	20.75	20.58	20.89
		RB Size=25, RB Offset=0	20.83	20.63	20.66
		RB Size=25, RB Offset=12	20.66	20.92	20.55
		RB Size=25, RB Offset=24	20.85	20.64	20.66
		RB Size=50, RB Offset=0	20.63	20.68	20.63

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.77	13	Pass
QPSK (50RB Size)	7.30	13	Pass
16QAM (1RB Size)	7.71	13	Pass
16QAM (50RB Size)	8.04	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	83.51	12	1.9	H	23.25	1.9	0	21.35	38.45
836.5	74.91	0	1.2	V	15.95	1.9	0	14.05	38.45
3 MHz Bandwidth									
836.5	82.47	286	1.2	H	23.28	1.9	0	21.38	38.45
836.5	74.55	315	1.4	V	15.73	1.9	0	13.83	38.45
5 MHz Bandwidth									
836.5	82.92	156	1.1	H	22.54	1.9	0	20.64	38.45
836.5	75.08	335	1.4	V	15.94	1.9	0	14.04	38.45
10 MHz Bandwidth									
836.5	82.93	327	1.2	H	23.66	1.9	0	21.76	38.45
836.5	75.15	295	1.6	V	15.38	1.9	0	13.48	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	83.03	50	1.3	H	22.61	1.9	0	20.71	38.45
836.5	74.61	350	1.8	V	15.46	1.9	0	13.56	38.45
3 MHz Bandwidth									
836.5	82.37	204	1.2	H	22.36	1.9	0	20.46	38.45
836.5	74.27	162	1.9	V	14.95	1.9	0	13.05	38.45
5 MHz Bandwidth									
836.5	83.29	46	1.8	H	22.48	1.9	0	20.58	38.45
836.5	74.72	336	1.1	V	16.07	1.9	0	14.17	38.45
10 MHz Bandwidth									
836.5	82.70	12	1.4	H	23.00	1.9	0	21.10	38.45
836.5	75.00	177	1.4	V	15.88	1.9	0	13.98	38.45

LTE Band 7:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	20.86	20.77	20.72
		RB Size=1, RB Offset=12	20.69	20.93	20.92
		RB Size=1, RB Offset=24	20.68	20.84	20.66
		RB Size=12, RB Offset=0	20.95	20.70	20.88
		RB Size=12, RB Offset=6	20.80	20.95	20.99
		RB Size=12, RB Offset=11	20.89	20.83	20.56
		RB Size=25, RB Offset=0	20.63	20.63	20.66
	16QAM	RB Size=1, RB Offset=0	20.84	20.56	20.72
		RB Size=1, RB Offset=12	20.70	20.76	20.80
		RB Size=1, RB Offset=24	20.54	20.86	20.92
		RB Size=12, RB Offset=0	20.63	20.87	20.82
		RB Size=12, RB Offset=6	20.67	21.00	20.70
		RB Size=12, RB Offset=11	20.87	20.92	20.98
		RB Size=25, RB Offset=0	20.85	20.59	20.78
10	QPSK	RB Size=1, RB Offset=0	20.54	20.54	20.94
		RB Size=1, RB Offset=24	20.64	20.70	20.63
		RB Size=1, RB Offset=49	20.72	20.99	20.79
		RB Size=25, RB Offset=0	20.70	20.67	20.99
		RB Size=25, RB Offset=12	20.73	20.63	20.68
		RB Size=25, RB Offset=24	20.89	20.52	20.73
		RB Size=50, RB Offset=0	20.68	20.81	20.82
	16QAM	RB Size=1, RB Offset=0	20.87	20.73	20.87
		RB Size=1, RB Offset=24	20.75	20.78	20.88
		RB Size=1, RB Offset=49	20.91	20.73	20.52
		RB Size=25, RB Offset=0	20.69	20.54	20.96
		RB Size=25, RB Offset=12	20.80	20.80	20.59
		RB Size=25, RB Offset=24	20.63	20.77	20.70
		RB Size=50, RB Offset=0	20.84	20.62	20.76

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	20.60	20.87	20.54
		RB Size=1, RB Offset=37	20.62	21.00	20.63
		RB Size=1, RB Offset=74	20.76	20.93	20.98
		RB Size=36, RB Offset=0	20.91	20.76	20.51
		RB Size=36, RB Offset=18	20.57	20.93	20.80
		RB Size=36, RB Offset=37	20.91	20.80	20.66
		RB Size=75, RB Offset=0	20.93	20.95	20.75
	16QAM	RB Size=1, RB Offset=0	20.84	20.74	20.64
		RB Size=1, RB Offset=37	20.93	20.85	20.53
		RB Size=1, RB Offset=74	20.74	20.65	20.73
		RB Size=36, RB Offset=0	20.59	20.54	20.87
		RB Size=36, RB Offset=18	20.72	20.93	20.53
		RB Size=36, RB Offset=37	20.51	20.87	20.68
		RB Size=75, RB Offset=0	20.92	20.95	20.97
20	QPSK	RB Size=1, RB Offset=0	20.57	20.56	20.56
		RB Size=1, RB Offset=49	20.75	20.61	20.51
		RB Size=1, RB Offset=99	20.68	20.51	20.95
		RB Size=50, RB Offset=0	20.75	20.75	20.67
		RB Size=50, RB Offset=24	20.70	20.94	20.75
		RB Size=50, RB Offset=49	20.80	20.82	20.62
		RB Size=100, RB Offset=0	20.94	20.69	20.96
	16QAM	RB Size=1, RB Offset=0	20.91	20.66	20.66
		RB Size=1, RB Offset=49	20.52	20.84	20.83
		RB Size=1, RB Offset=99	20.51	20.50	20.83
		RB Size=50, RB Offset=0	20.96	20.74	20.64
		RB Size=50, RB Offset=24	20.88	20.51	21.00
		RB Size=50, RB Offset=49	20.59	20.85	20.52
		RB Size=100, RB Offset=0	20.79	20.53	20.71

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	7.01	13	Pass
QPSK (100RB Size)	6.85	13	Pass
16QAM (1RB Size)	7.26	13	Pass
16QAM (100RB Size)	7.88	13	Pass

EIRP:**QPSK:**

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	79.86	2	1.4	H	9.7	2.60	10.20	17.30	33
2535.00	75.67	108	1.3	V	6.1	2.60	10.20	13.70	33
10 MHz Bandwidth									
2535.00	79.71	150	1.7	H	9.5	2.60	10.20	17.10	33
2535.00	75.42	191	2.4	V	5.9	2.60	10.20	13.50	33
15 MHz Bandwidth									
2535.00	79.57	167	2.2	H	9.4	2.60	10.20	17.00	33
2535.00	75.24	142	2.1	V	5.7	2.60	10.20	13.30	33
20 MHz Bandwidth									
2535.00	79.28	95	2.2	H	9.1	2.60	10.20	16.70	33
2535.00	75.14	266	1.0	V	5.6	2.60	10.20	13.20	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	80.09	290	2.2	H	9.9	2.60	10.20	17.50	33
2535.00	75.59	328	1.2	V	6.0	2.60	10.20	13.60	33
10 MHz Bandwidth									
2535.00	78.67	334	1.1	H	8.5	2.60	10.20	16.10	33
2535.00	74.03	208	2.3	V	4.5	2.60	10.20	12.10	33
15 MHz Bandwidth									
2535.00	78.26	83	1.4	H	8.1	2.60	10.20	15.70	33
2535.00	73.58	117	1.9	V	4.0	2.60	10.20	11.60	33
20 MHz Bandwidth									
2535.00	77.94	164	1.9	H	7.8	2.60	10.20	15.40	33
2535.00	73.29	314	2.2	V	3.7	2.60	10.20	11.30	33

LTE Band 12:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	20.75	20.54	20.91
		RB Size=1, RB Offset=2	20.86	20.66	20.93
		RB Size=1, RB Offset=5	20.64	20.94	20.77
		RB Size=3, RB Offset=0	20.91	20.56	20.70
		RB Size=3, RB Offset=1	20.93	20.95	20.60
		RB Size=3, RB Offset=2	20.66	20.59	20.60
		RB Size=6, RB Offset=0	20.75	20.87	20.57
	16QAM	RB Size=1, RB Offset=0	20.61	20.99	20.70
		RB Size=1, RB Offset=2	20.97	20.73	20.87
		RB Size=1, RB Offset=5	20.89	20.72	20.72
		RB Size=3, RB Offset=0	20.82	20.51	20.90
		RB Size=3, RB Offset=1	20.65	20.91	20.97
		RB Size=3, RB Offset=2	20.57	20.84	20.75
		RB Size=6, RB Offset=0	20.89	20.70	20.51
3.0	QPSK	RB Size=1, RB Offset=0	20.53	20.69	20.99
		RB Size=1, RB Offset=7	20.87	20.94	20.92
		RB Size=1, RB Offset=14	20.82	20.51	20.63
		RB Size=8, RB Offset=0	20.71	20.91	20.99
		RB Size=8, RB Offset=4	20.54	20.70	20.81
		RB Size=8, RB Offset=7	20.69	20.51	20.52
		RB Size=15, RB Offset=0	20.77	20.51	20.87
	16QAM	RB Size=1, RB Offset=0	20.63	20.79	20.73
		RB Size=1, RB Offset=7	20.70	20.85	20.53
		RB Size=1, RB Offset=14	20.69	20.98	20.68
		RB Size=8, RB Offset=0	20.65	20.75	20.82
		RB Size=8, RB Offset=4	20.95	20.53	20.56
		RB Size=8, RB Offset=7	20.84	20.81	20.93
		RB Size=15, RB Offset=0	20.63	20.91	20.71

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	20.55	20.80	20.59
		RB Size=1, RB Offset=12	20.61	20.93	20.95
		RB Size=1, RB Offset=24	20.89	20.81	20.70
		RB Size=12, RB Offset=0	20.82	21.00	20.72
		RB Size=12, RB Offset=6	20.71	20.79	20.94
		RB Size=12, RB Offset=11	20.73	20.81	20.72
		RB Size=25, RB Offset=0	20.54	20.81	20.88
	16QAM	RB Size=1, RB Offset=0	20.94	20.51	20.88
		RB Size=1, RB Offset=12	20.81	20.94	20.60
		RB Size=1, RB Offset=24	20.73	20.71	20.63
		RB Size=12, RB Offset=0	20.89	20.53	20.79
		RB Size=12, RB Offset=6	20.66	20.71	20.55
		RB Size=12, RB Offset=11	20.85	20.99	20.95
		RB Size=25, RB Offset=0	20.58	20.53	20.91
10.0	QPSK	RB Size=1, RB Offset=0	20.59	20.99	20.97
		RB Size=1, RB Offset=24	20.82	20.90	20.82
		RB Size=1, RB Offset=49	20.67	20.74	20.74
		RB Size=25, RB Offset=0	20.80	20.91	20.50
		RB Size=25, RB Offset=12	20.89	20.57	20.73
		RB Size=25, RB Offset=24	20.56	21.00	20.55
		RB Size=50, RB Offset=0	20.88	20.59	20.55
	16QAM	RB Size=1, RB Offset=0	20.54	20.91	20.64
		RB Size=1, RB Offset=24	20.71	20.94	20.92
		RB Size=1, RB Offset=49	20.64	20.85	20.64
		RB Size=25, RB Offset=0	20.58	20.92	20.82
		RB Size=25, RB Offset=12	20.57	20.52	20.63
		RB Size=25, RB Offset=24	20.72	20.57	20.59
		RB Size=50, RB Offset=0	20.84	20.51	20.91

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.61	13	Pass
QPSK (50RB Size)	6.44	13	Pass
16QAM (1RB Size)	7.43	13	Pass
16QAM (50RB Size)	7.54	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	83.54	76	1.1	H	23.22	1.56	0	21.66	34.77
707.5	74.67	116	2.0	V	15.24	1.56	0	13.68	34.77
3 MHz Bandwidth									
707.5	82.52	348	1.2	H	22.79	1.56	0	21.23	34.77
707.5	74.71	146	1.4	V	15.35	1.56	0	13.79	34.77
5 MHz Bandwidth									
707.5	82.56	347	1.0	H	22.36	1.56	0	20.80	34.77
707.5	74.70	149	1.9	V	16.17	1.56	0	14.61	34.77
10 MHz Bandwidth									
707.5	83.36	4	1.3	H	23.16	1.56	0	21.60	34.77
707.5	75.49	43	1.5	V	15.95	1.56	0	14.39	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	83.50	330	1.8	H	23.26	1.56	0	21.70	34.77
707.5	75.21	86	1.8	V	15.60	1.56	0	14.04	34.77
3 MHz Bandwidth									
707.5	83.09	286	1.9	H	23.05	1.56	0	21.49	34.77
707.5	74.52	303	1.5	V	15.31	1.56	0	13.75	34.77
5 MHz Bandwidth									
707.5	82.98	276	1.7	H	22.57	1.56	0	21.01	34.77
707.5	75.61	275	1.8	V	15.85	1.56	0	14.29	34.77
10 MHz Bandwidth									
707.5	82.76	266	1.3	H	23.38	1.56	0	21.82	34.77
707.5	74.86	82	1.9	V	16.12	1.56	0	14.56	34.77

LTE Band 17:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	20.99	20.67	20.85
		RB Size=1, RB Offset=12	20.58	20.72	20.96
		RB Size=1, RB Offset=24	20.89	20.84	20.60
		RB Size=12, RB Offset=0	20.83	20.79	20.87
		RB Size=12, RB Offset=6	20.65	20.80	20.79
		RB Size=12, RB Offset=11	20.67	20.77	20.88
		RB Size=25, RB Offset=0	20.70	20.73	20.81
	16QAM	RB Size=1, RB Offset=0	20.93	20.91	20.64
		RB Size=1, RB Offset=12	20.76	20.84	20.74
		RB Size=1, RB Offset=24	20.52	20.56	20.68
		RB Size=12, RB Offset=0	20.82	20.53	20.68
		RB Size=12, RB Offset=6	20.55	20.88	20.66
		RB Size=12, RB Offset=11	20.55	20.50	20.79
		RB Size=25, RB Offset=0	20.98	20.58	20.79
10	QPSK	RB Size=1, RB Offset=0	20.67	20.71	20.51
		RB Size=1, RB Offset=24	20.87	20.79	20.72
		RB Size=1, RB Offset=49	20.91	20.98	20.87
		RB Size=25, RB Offset=0	20.97	20.68	20.86
		RB Size=25, RB Offset=12	20.72	20.55	20.60
		RB Size=25, RB Offset=24	20.54	20.53	20.52
		RB Size=50, RB Offset=0	20.62	20.80	20.98
	16QAM	RB Size=1, RB Offset=0	20.73	20.79	20.85
		RB Size=1, RB Offset=24	20.96	20.85	20.82
		RB Size=1, RB Offset=49	20.95	20.51	20.81
		RB Size=25, RB Offset=0	20.95	20.54	20.65
		RB Size=25, RB Offset=12	20.63	20.62	20.51
		RB Size=25, RB Offset=24	20.97	20.55	20.59
		RB Size=50, RB Offset=0	20.88	20.66	20.86

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.45	13	Pass
QPSK (50RB Size)	6.69	13	Pass
16QAM (1RB Size)	7.34	13	Pass
16QAM (50RB Size)	7.72	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	83.05	160	1.2	H	23.52	1.56	0	21.96	34.77
710	74.77	240	1.4	V	15.81	1.56	0	14.25	34.77
10 MHz Bandwidth									
710	82.64	61	2.0	H	23.26	1.56	0	21.70	34.77
710	74.17	235	1.4	V	15.44	1.56	0	13.88	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	82.87	140	1.4	H	22.93	1.56	0	21.37	34.77
710	75.08	352	1.0	V	15.55	1.56	0	13.99	34.77
10 MHz Bandwidth									
710	82.28	122	1.7	H	23.12	1.56	0	21.56	34.77
710	74.18	47	1.4	V	15.08	1.56	0	13.52	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

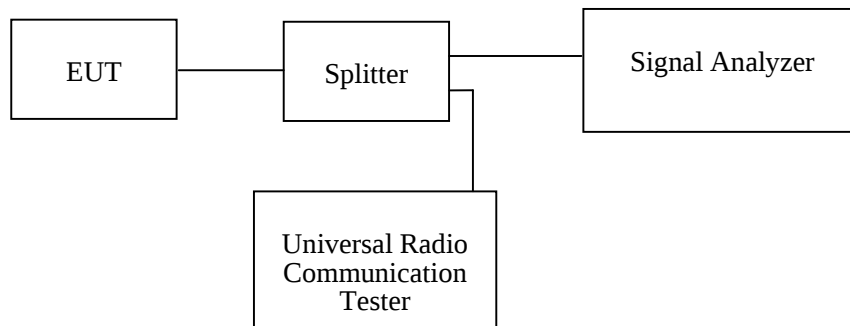
Applicable Standard

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

The testing was performed by Gavin Guo from 2020-04-15 to 2020-04-17.

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	245.19	317.63
EGPRS(8PSK)	836.6	243.59	308.97

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.15	4.69
HSUPA (BPSK)	836.6	4.15	4.69
HSDPA (16QAM)	836.6	4.15	4.68

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	241.99	319.55
EGPRS(8PSK)	1880.0	243.59	313.78

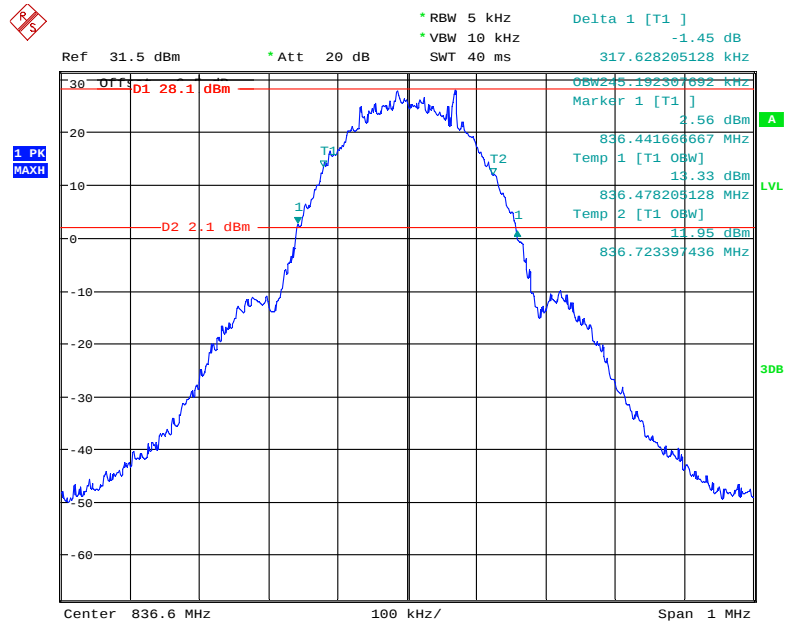
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.17	4.69
HSUPA (BPSK)	1880.0	4.15	4.67
HSDPA (16QAM)	1880.0	4.17	4.69

AWS Band (Part 27)

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1732.6	4.13	4.69
HSUPA (BPSK)	1732.6	4.15	4.67
HSDPA (16QAM)	1732.6	4.15	4.65

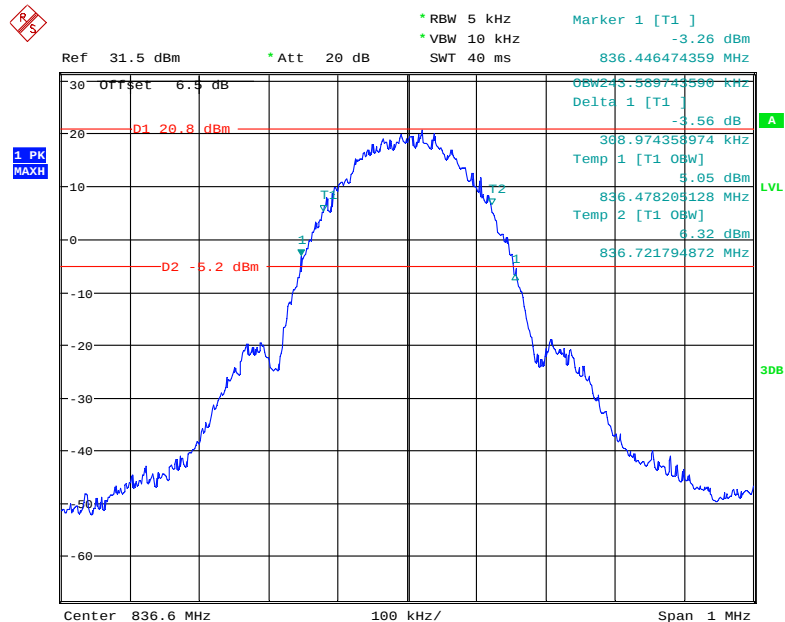
Cellular Band (Part 22H)

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



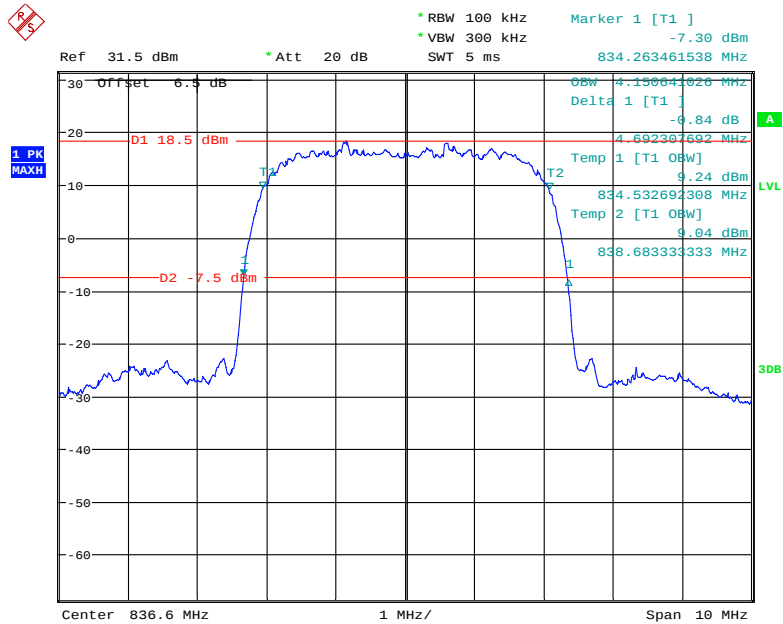
Date: 15.APR.2020 20:56:03

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



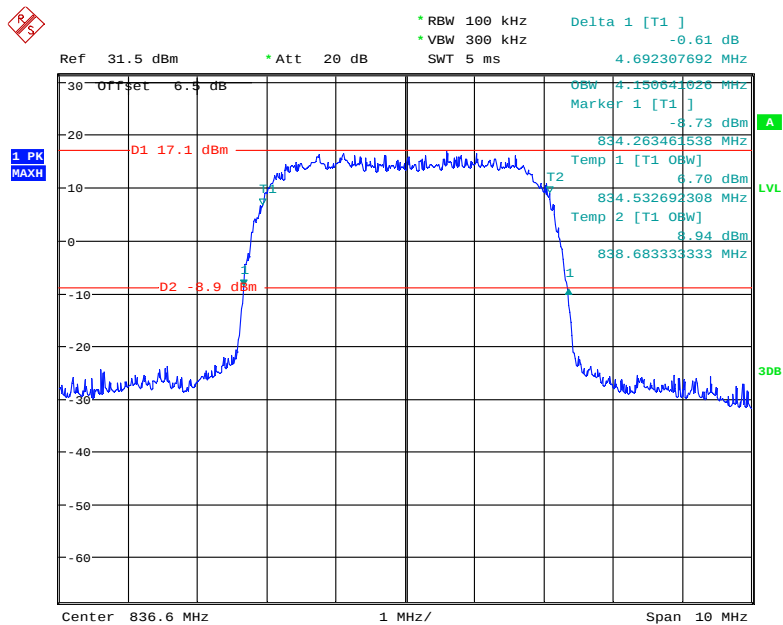
Date: 16.APR.2020 00:25:28

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

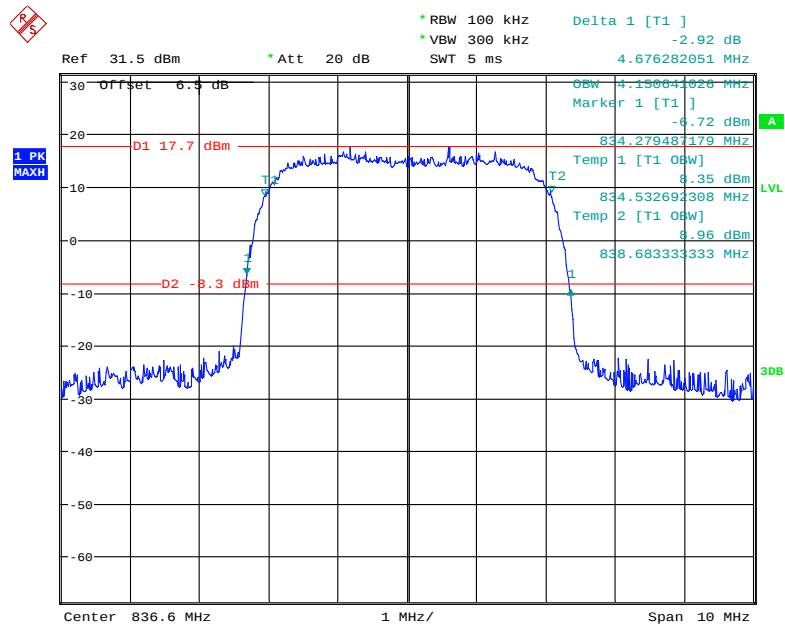


Date: 15.APR.2020 22:15:37

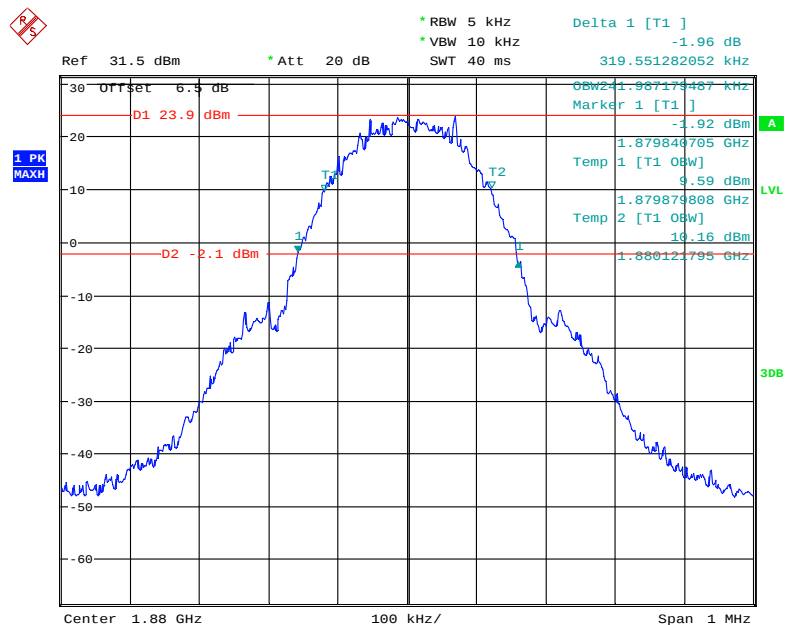
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode



Date: 15.APR.2020 22:20:29

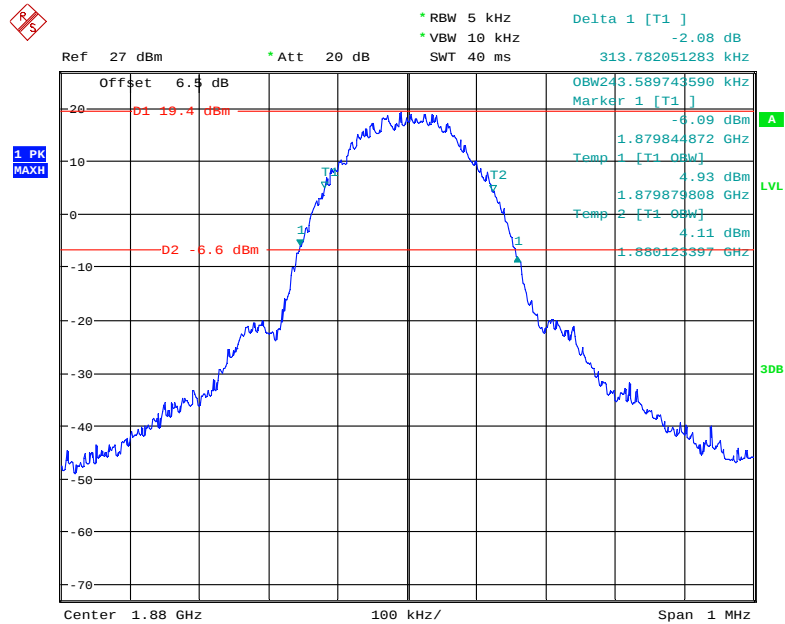
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

Date: 15.APR.2020 22:19:22

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

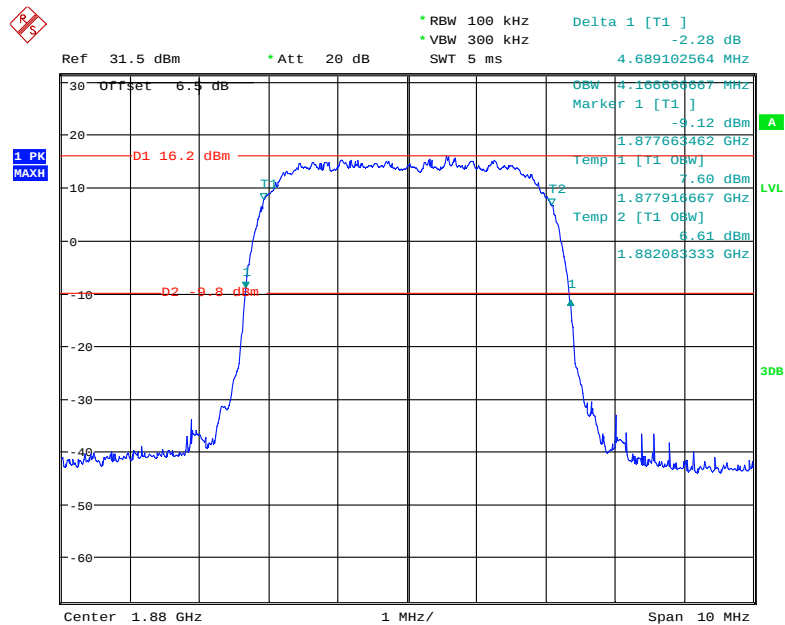
Date: 15.APR.2020 20:40:34

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



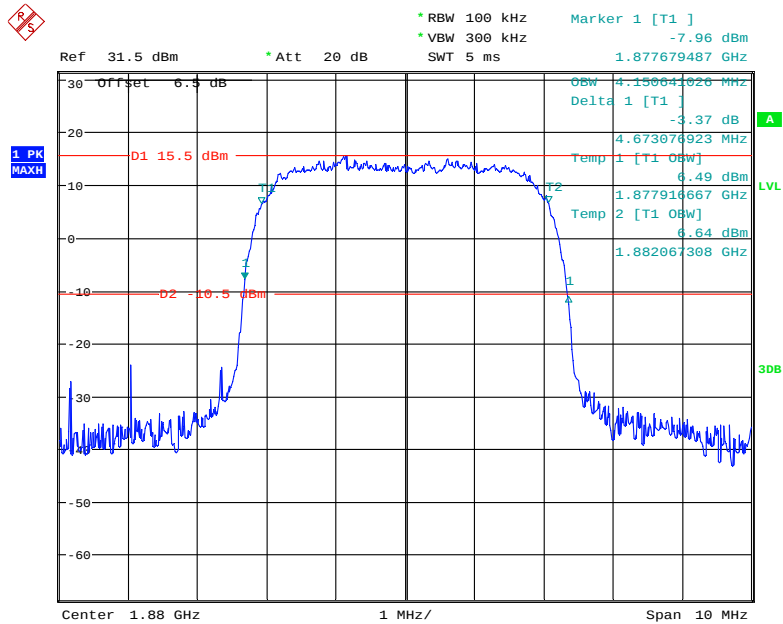
Date: 16.APR.2020 00:07:25

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



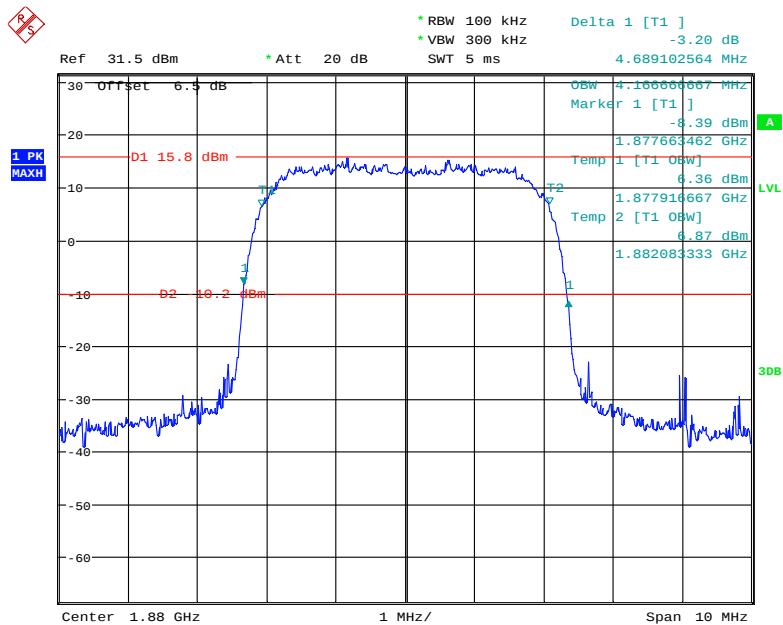
Date: 15.APR.2020 21:16:04

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



Date: 15.APR.2020 21:18:20

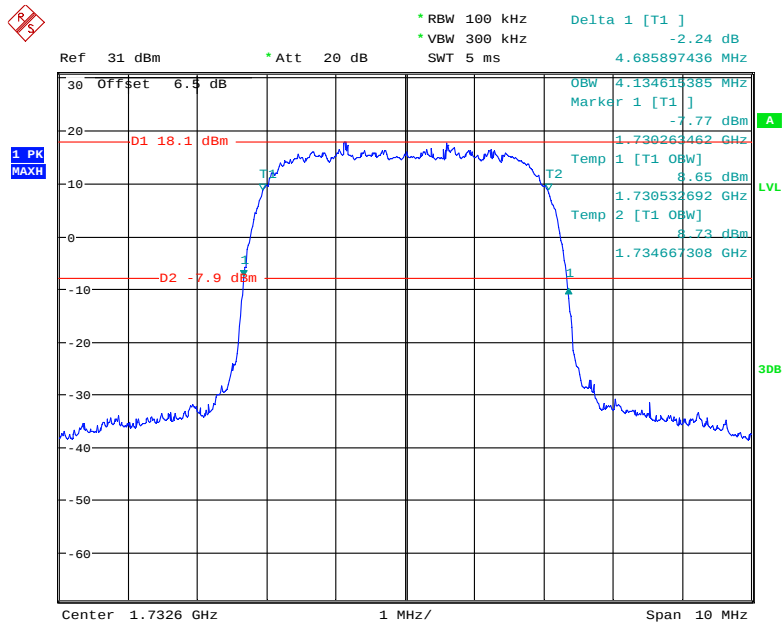
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 15.APR.2020 21:21:28

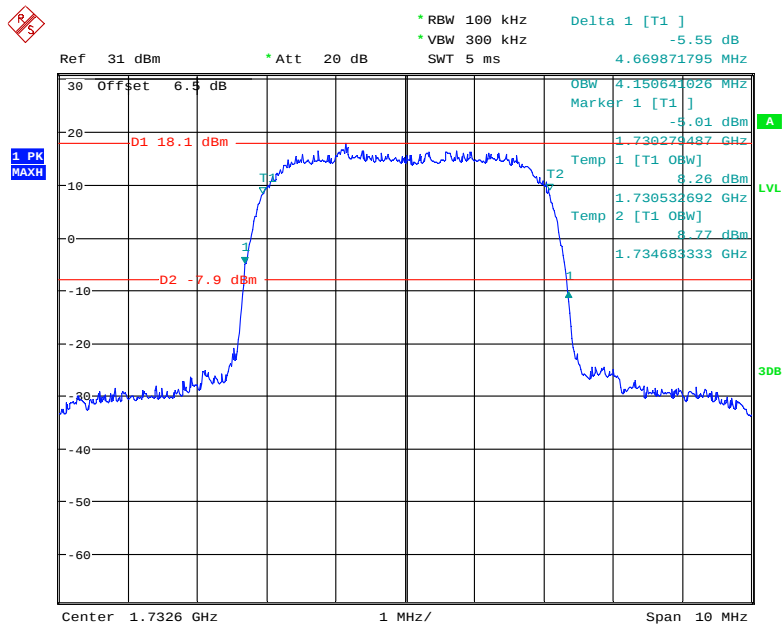
AWS Band (Part 27)

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



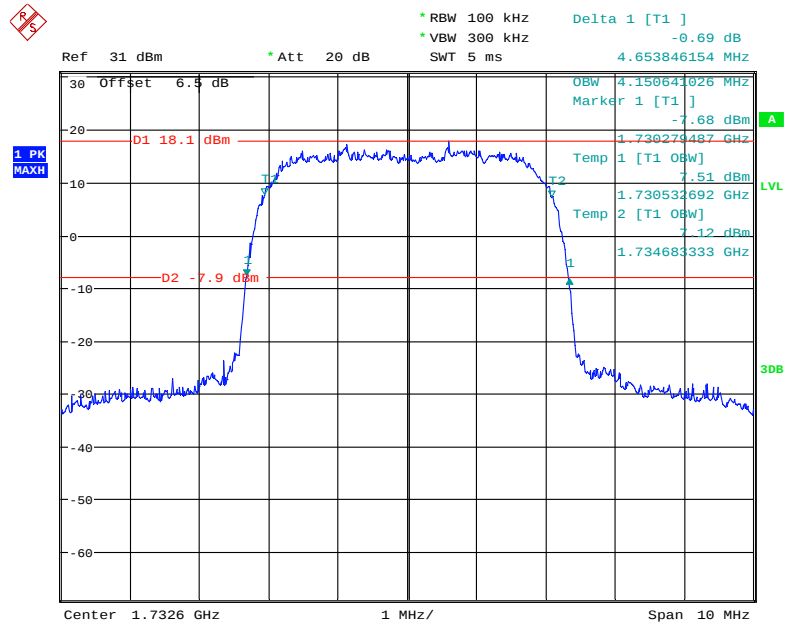
Date: 15.APR.2020 21:44:39

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



Date: 15.APR.2020 21:46:27

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

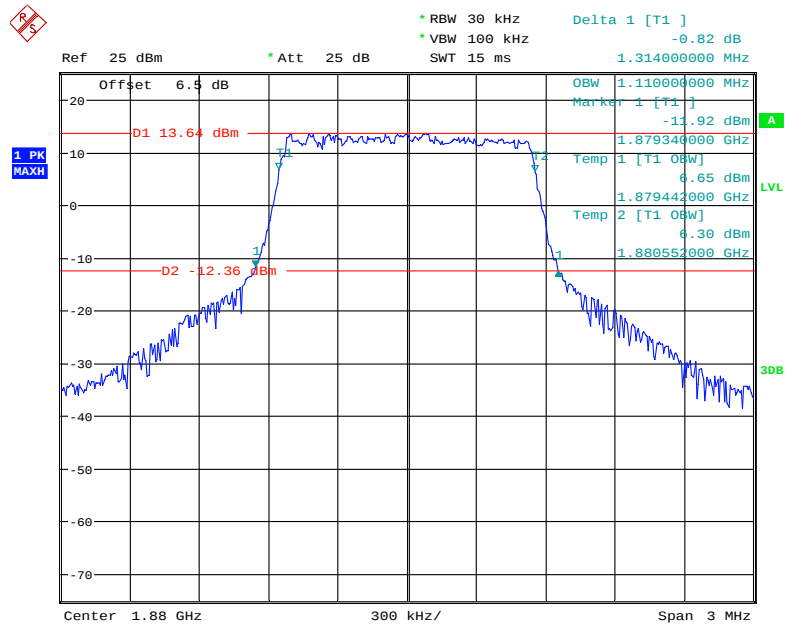


Date: 15.APR.2020 21:47:44

LTE Band 2: (Middle Channel)

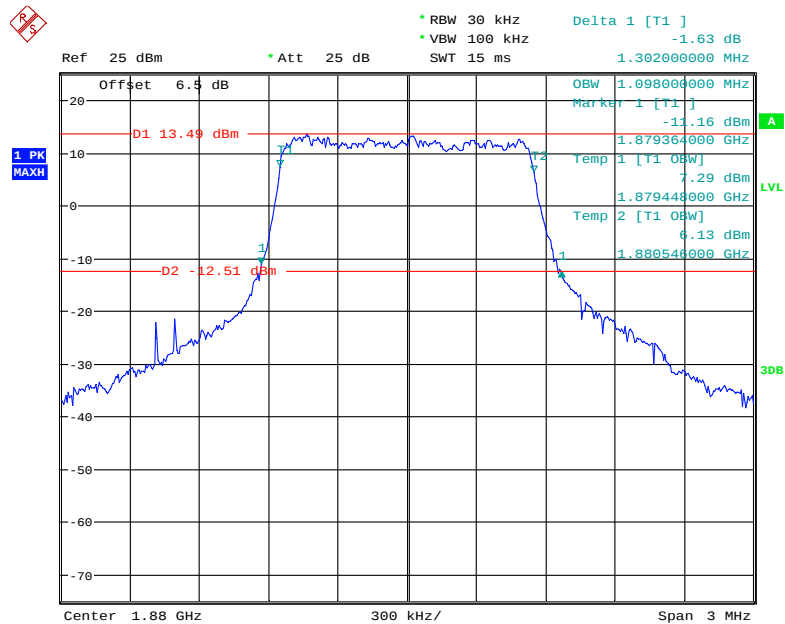
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.110	1.314
	16QAM	1.098	1.302
3.0	QPSK	2.712	3.000
	16QAM	2.700	3.012
5.0	QPSK	4.540	5.340
	16QAM	4.540	5.300
10.0	QPSK	8.960	9.840
	16QAM	8.960	9.960
15.0	QPSK	13.620	15.540
	16QAM	13.560	15.240
20.0	QPSK	18.000	19.920
	16QAM	18.000	20.000

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

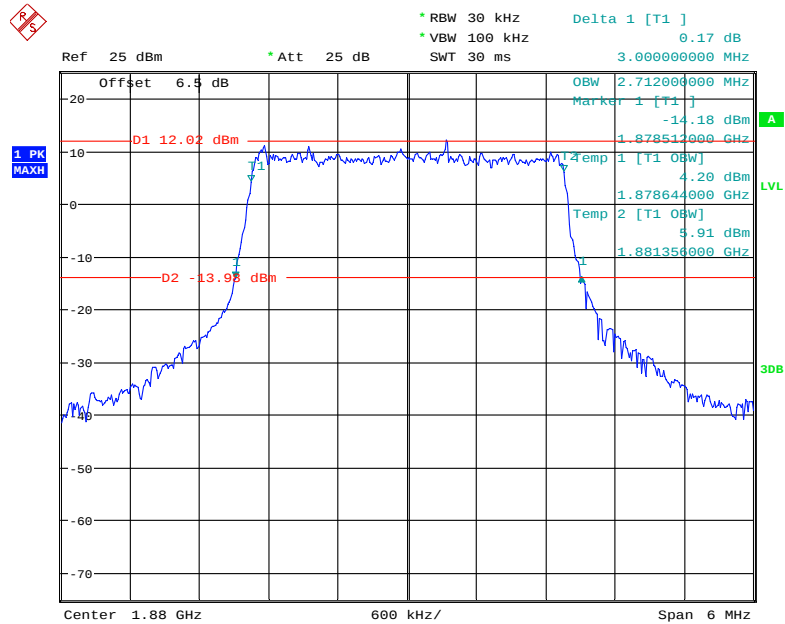


Date: 17.APR.2020 14:54:39

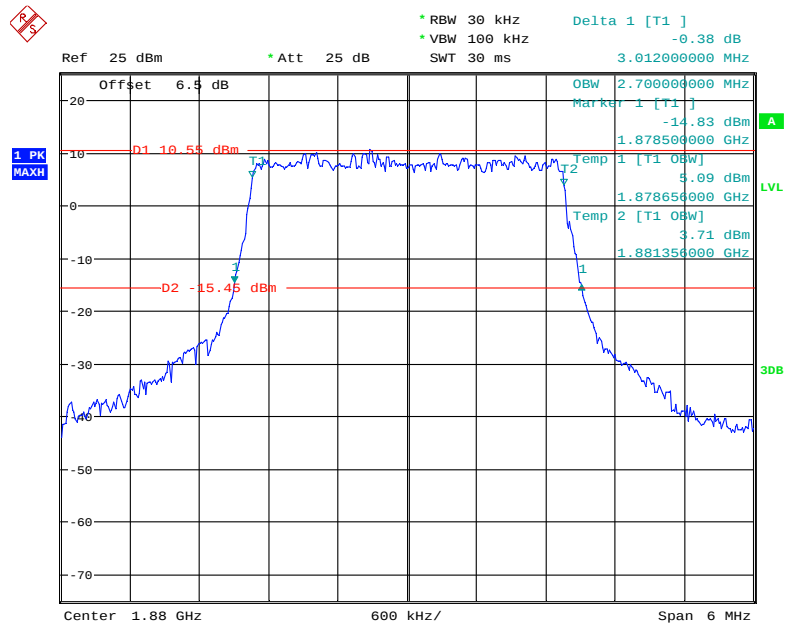
16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 17.APR.2020 14:55:07

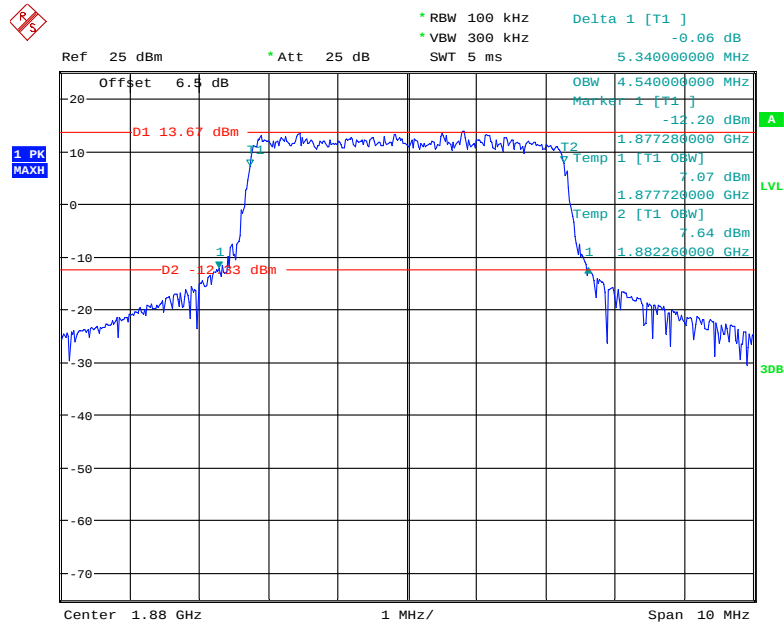
QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 17.APR.2020 14:55:29

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

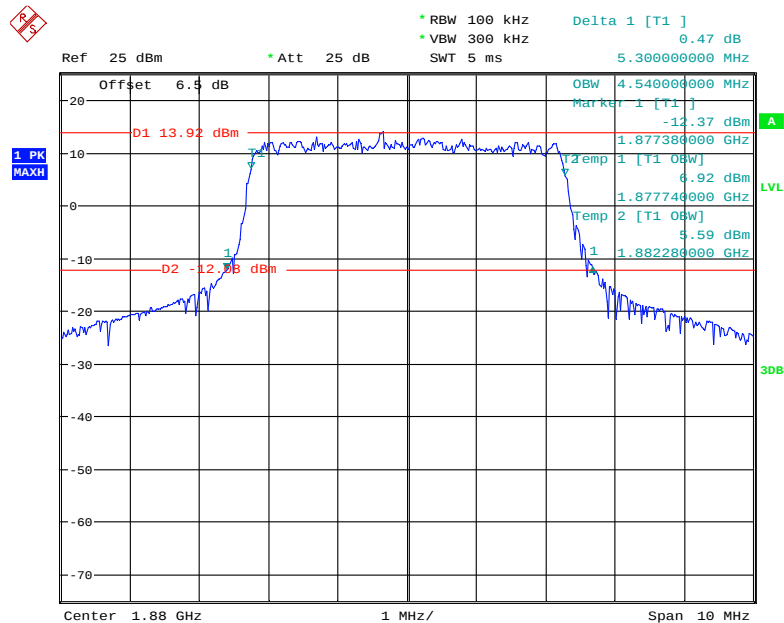
Date: 17.APR.2020 14:55:50

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

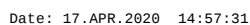
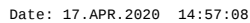


Date: 17.APR.2020 14:56:15

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



Date: 17.APR.2020 14:56:42



Ref 25 dBm * Att 25 dB * RBW 300 KHz VBW 1 MHz SWT 2.5 ms Delta 1 [T1] -0.73 dB

Offset 6.5 dB OBW 13.62000000 MHz Marker 1 [T1] -11.26 dBm A

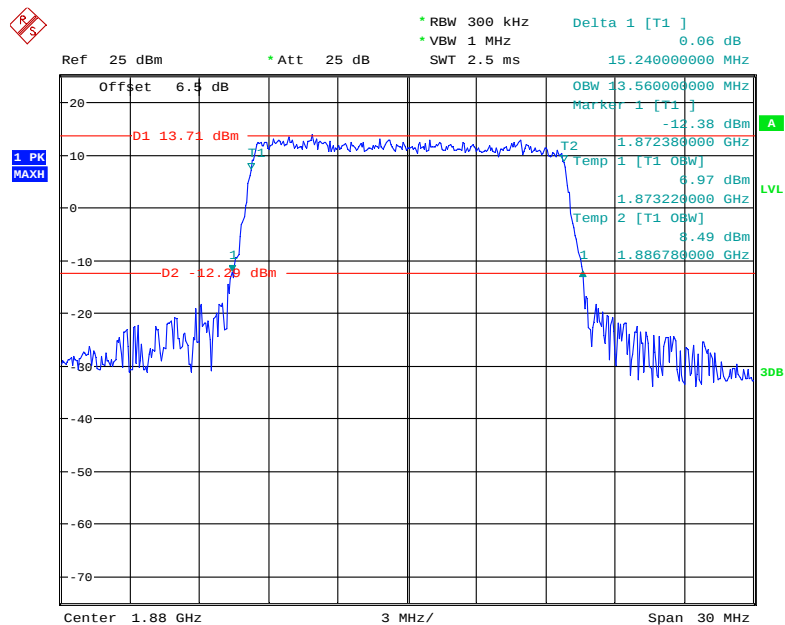
1 PK MAXH 1.872260000 GHz 8.00 dBm LVL

Temp 1 [T1] 1.873220000 GHz 7.60 dBm

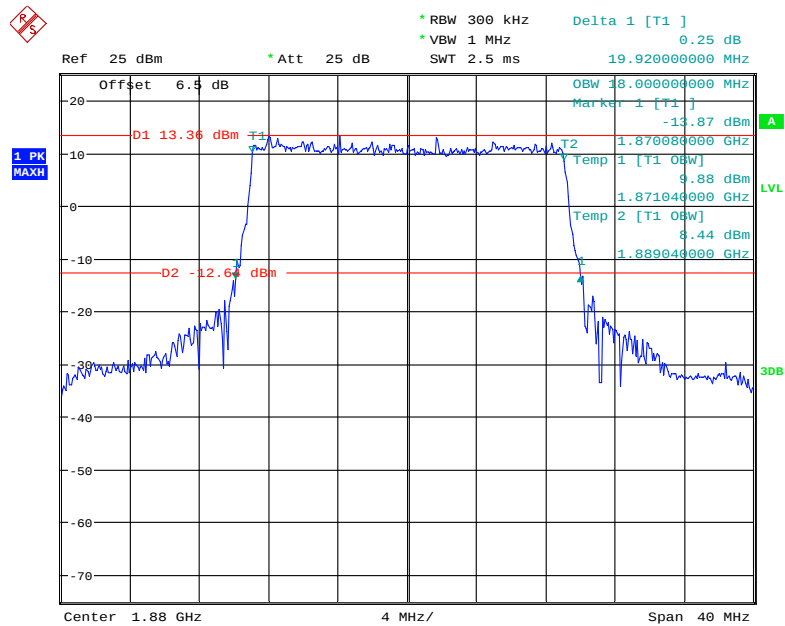
D2 -12.22 dBm 1.886840000 GHz 30B

Center 1.88 GHz 3 MHz/ Span 30 MHz

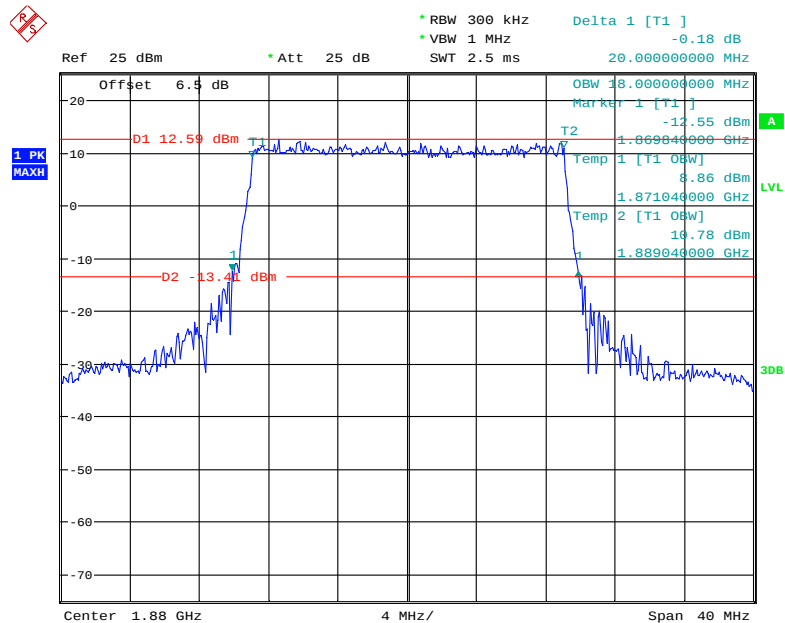
16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



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

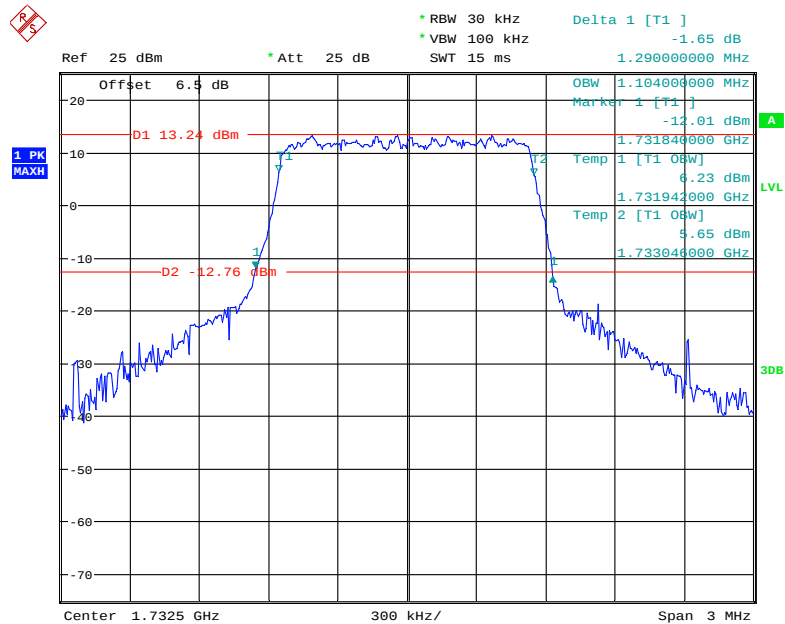
Date: 17.APR.2020 14:58:50

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

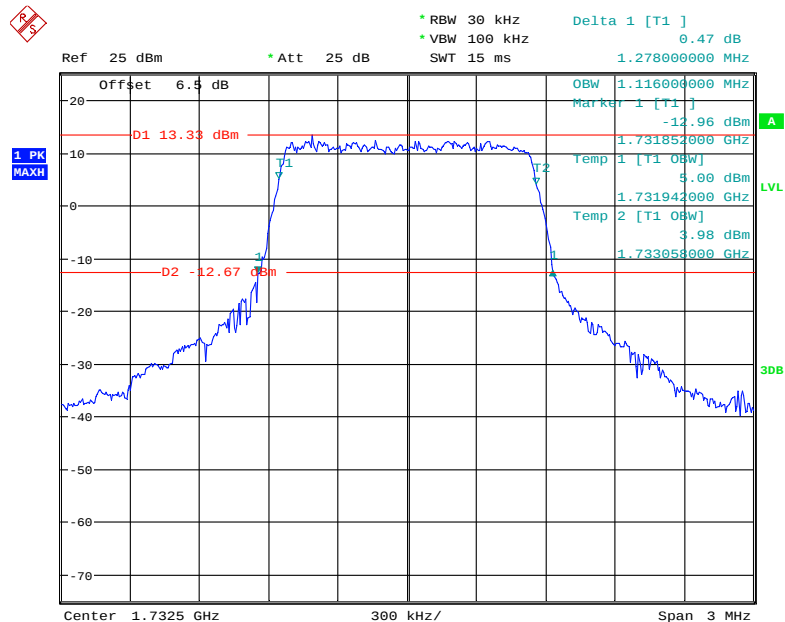
Date: 17.APR.2020 14:59:19

LTE Band 4: (Middle Channel)

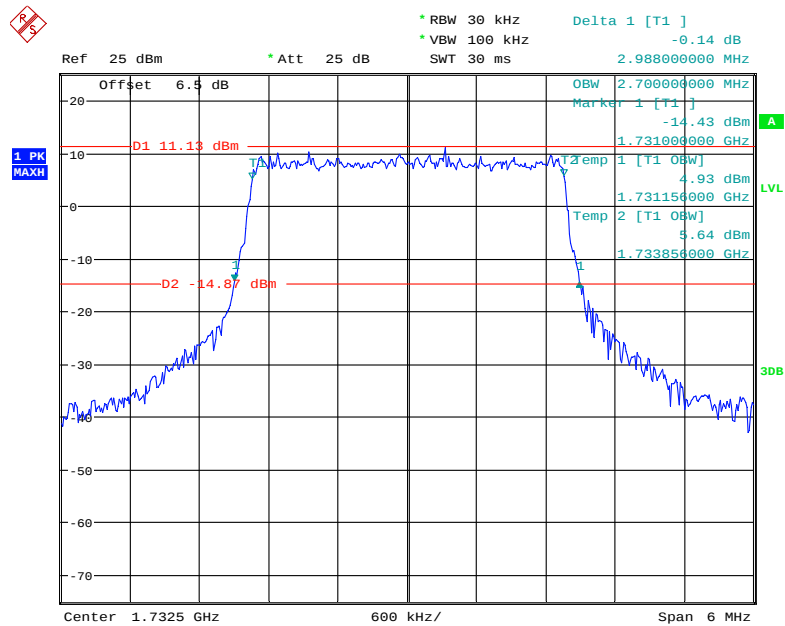
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.104	1.290
	16QAM	1.116	1.278
3.0	QPSK	2.700	2.988
	16QAM	2.700	3.024
5.0	QPSK	4.560	5.220
	16QAM	4.520	5.220
10.0	QPSK	8.960	9.840
	16QAM	8.960	9.920
15.0	QPSK	13.560	15.540
	16QAM	13.500	15.060
20.0	QPSK	18.000	19.840
	16QAM	18.000	19.840

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

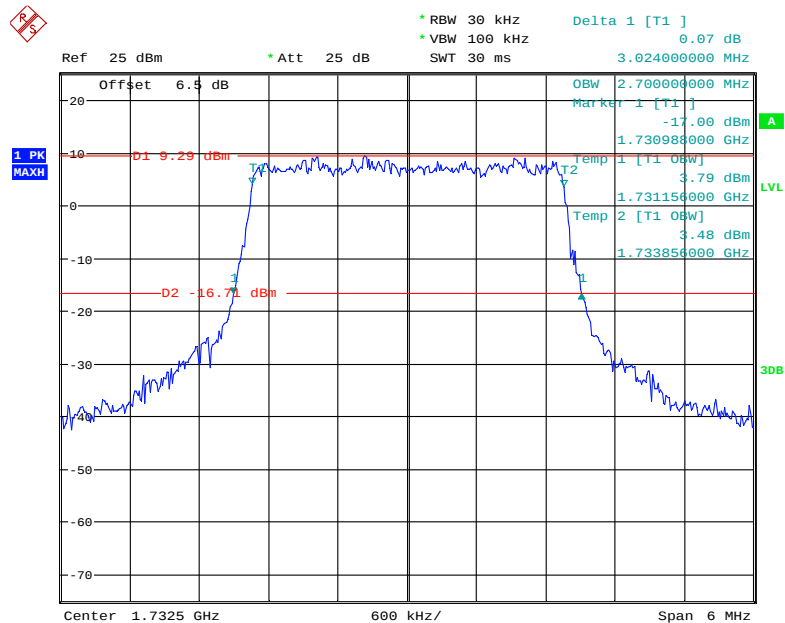
Date: 17.APR.2020 14:59:44

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

Date: 17.APR.2020 15:00:10

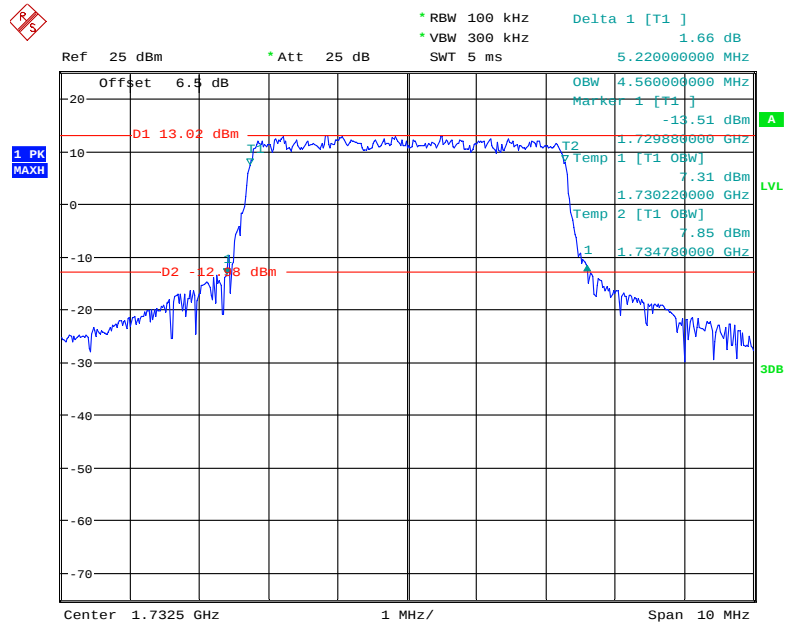
QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 17.APR.2020 15:00:30

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

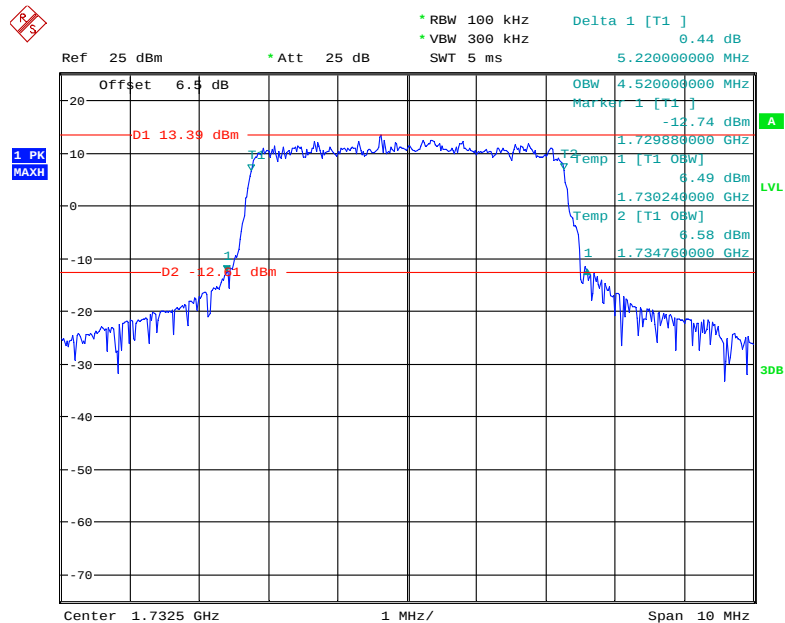
Date: 17.APR.2020 15:00:47

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

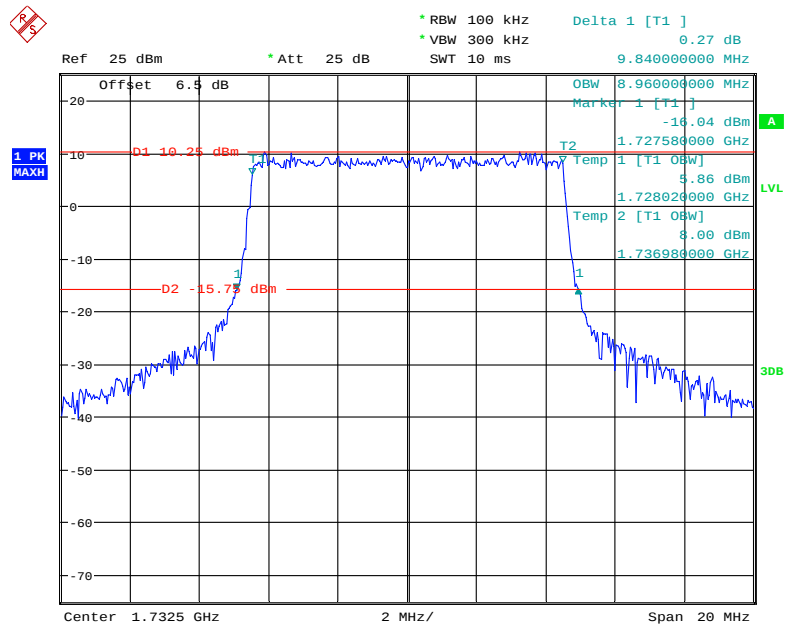


Date: 17.APR.2020 15:01:16

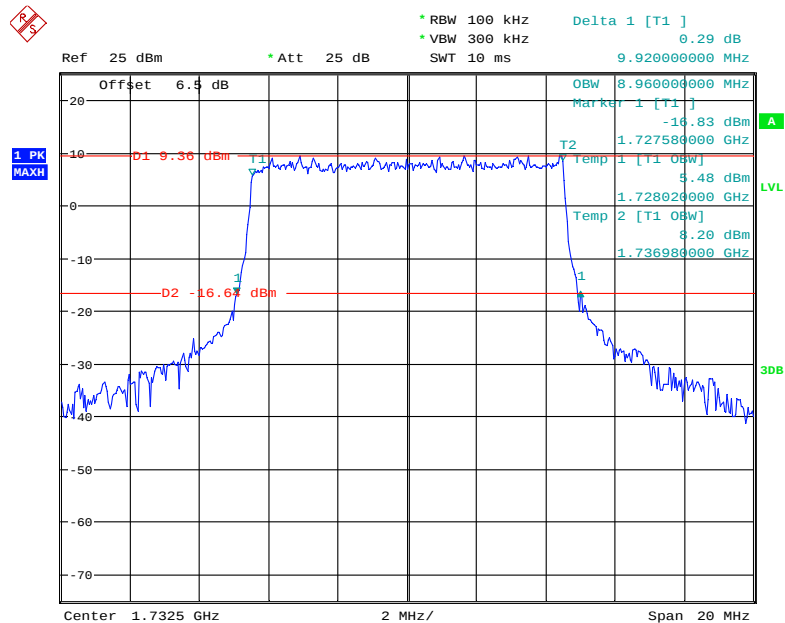
16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 17.APR.2020 15:01:39

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

Date: 17.APR.2020 15:02:02

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

Date: 17.APR.2020 15:02:25

Ref 25 dBm * Att 25 dB * RBW 300 KHz Delta 1 [T1] -0.19 dB
 * VBW 1 MHz 15.540000000 MHz
 SWT 2.5 ms

Offset 6.5 dB

1 PK MAXH

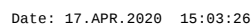
D1 13.45 dBm

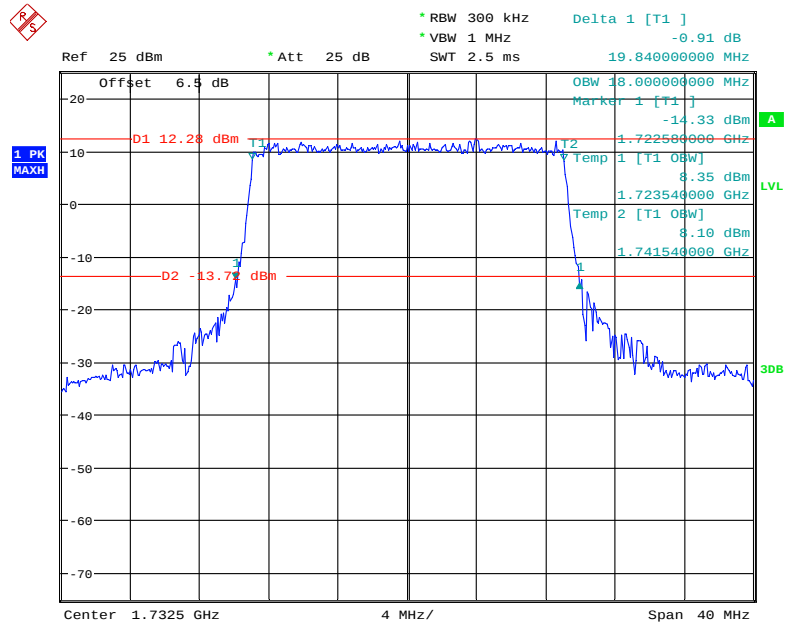
D2 -12.55 dBm

OBW 13.560000000 MHz
 Marker 1 [T1]
 -12.32 dBm
 1.724760000 GHz
 Temp 1 [T1 0BW] 8.24 dBm
 1.725780000 GHz
 Temp 2 [T1 0BW] 6.49 dBm
 1.739340000 GHz

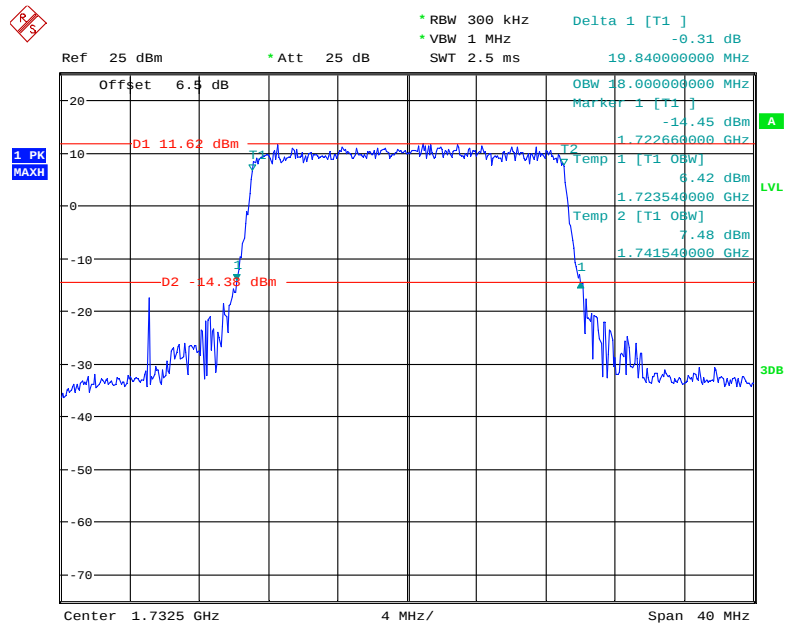
Center 1.7325 GHz 3 MHz/ Span 30 MHz

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



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

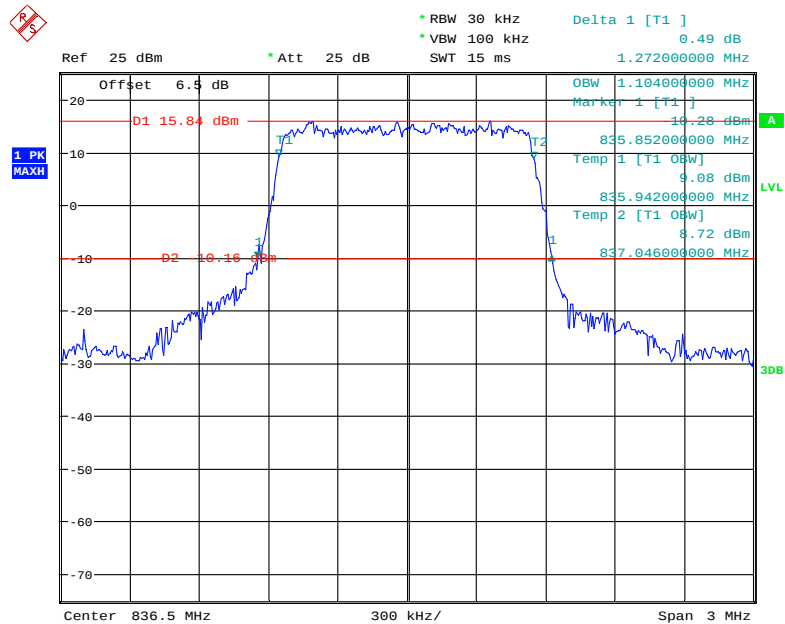
Date: 17.APR.2020 15:03:54

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

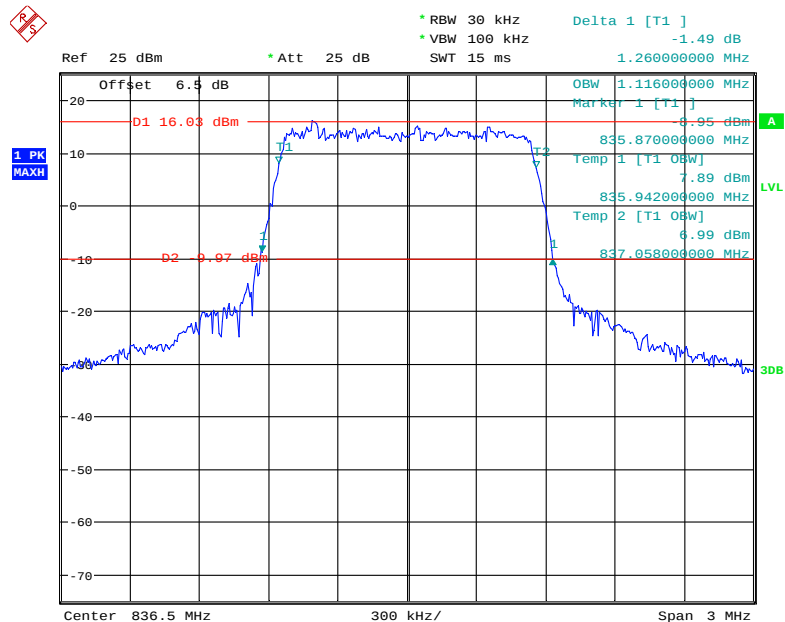
Date: 17.APR.2020 15:04:20

LTE Band 5: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.104	1.272
	16QAM	1.116	1.260
3.0	QPSK	2.700	3.000
	16QAM	2.700	3.012
5.0	QPSK	4.560	5.280
	16QAM	4.520	5.400
10.0	QPSK	8.960	9.760
	16QAM	8.960	9.840

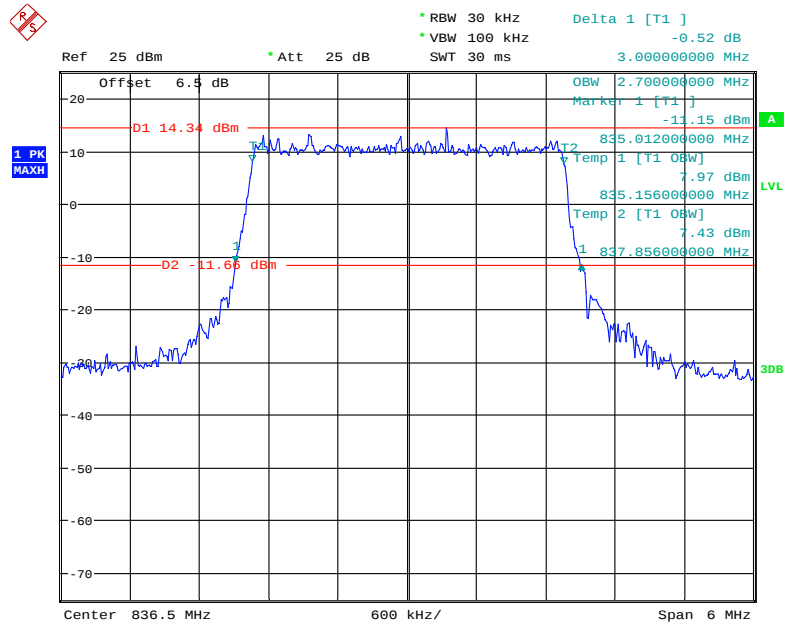
QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 17.APR.2020 15:04:47

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

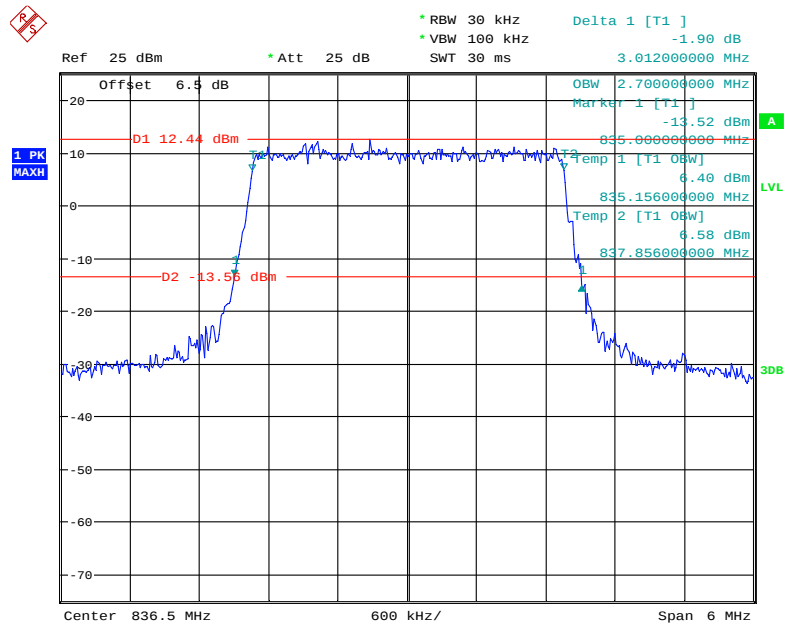
Date: 17.APR.2020 15:05:11

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



Date: 17.APR.2020 15:05:30

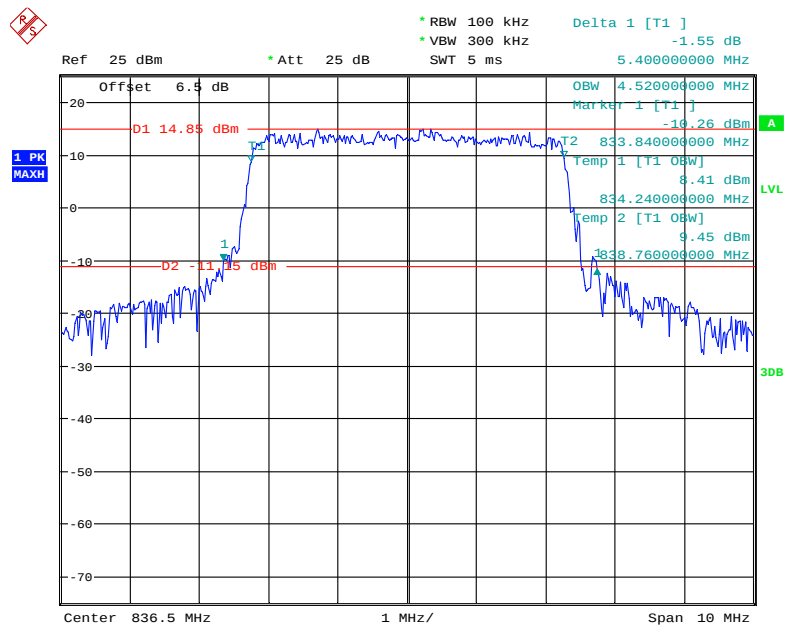
16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 17.APR.2020 15:05:47

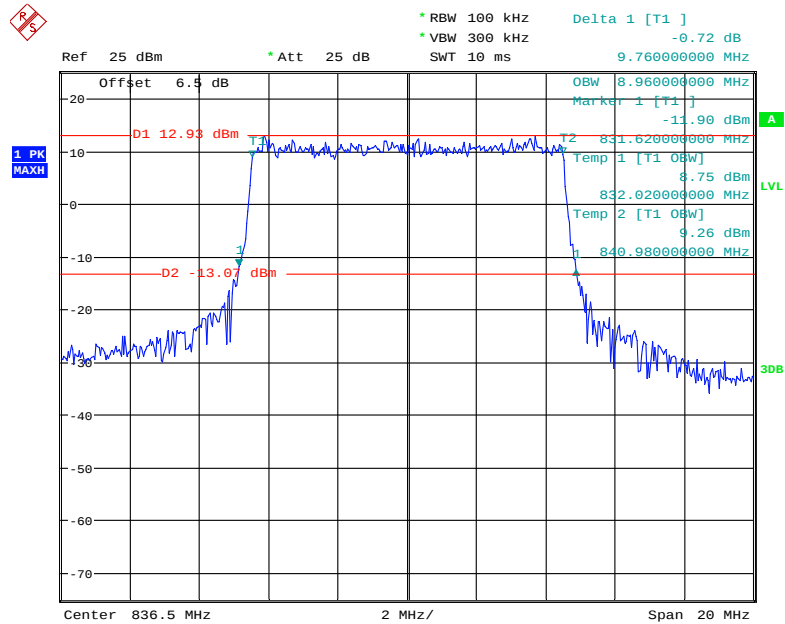
[illegible]

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



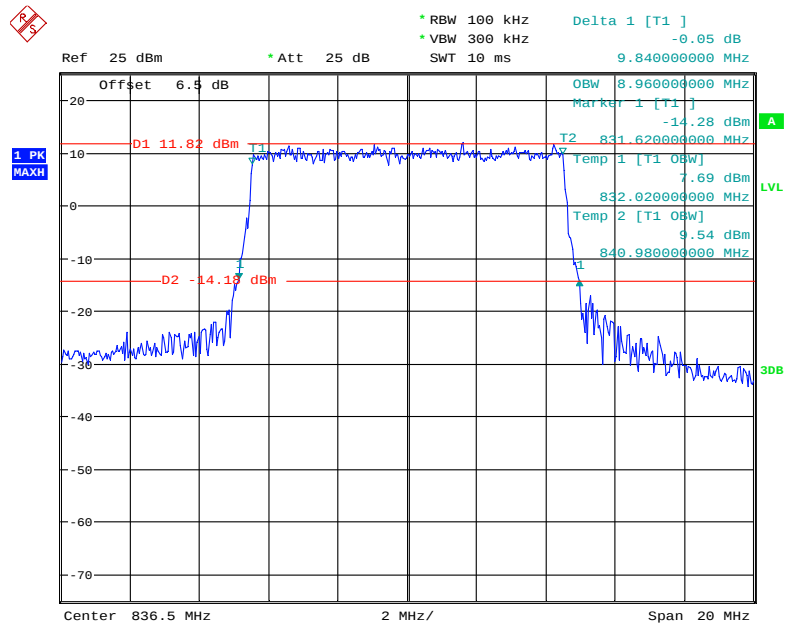
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QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 17.APR.2020 15:07:17

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

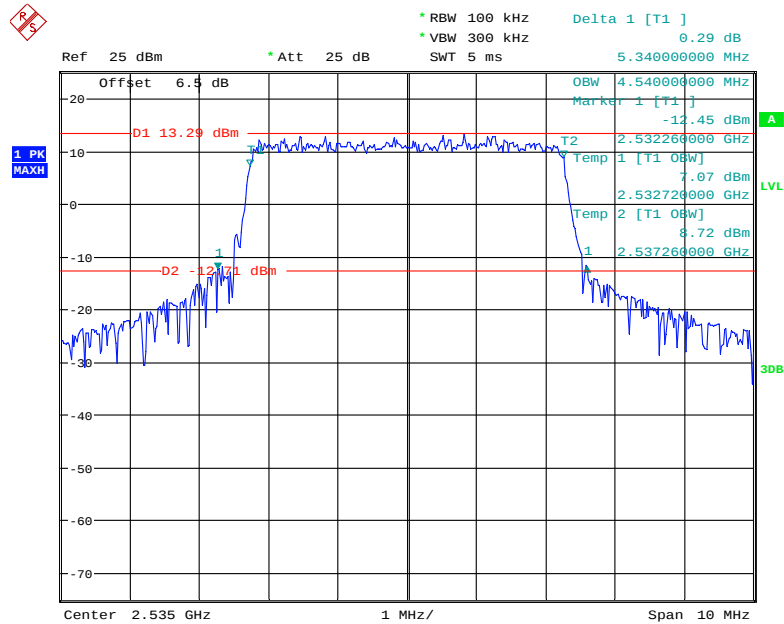


Date: 17.APR.2020 15:07:38

LTE Band 7: (Middle Channel)

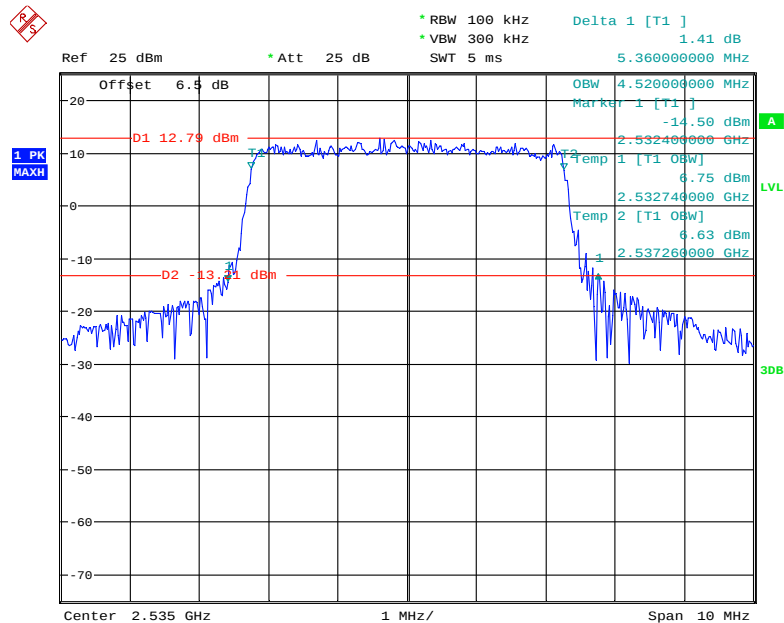
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.540	5.340
	16QAM	4.520	5.360
10.0	QPSK	9.000	9.840
	16QAM	8.960	9.920
15.0	QPSK	13.560	15.660
	16QAM	13.560	15.000
20.0	QPSK	18.000	19.920
	16QAM	18.080	20.160

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



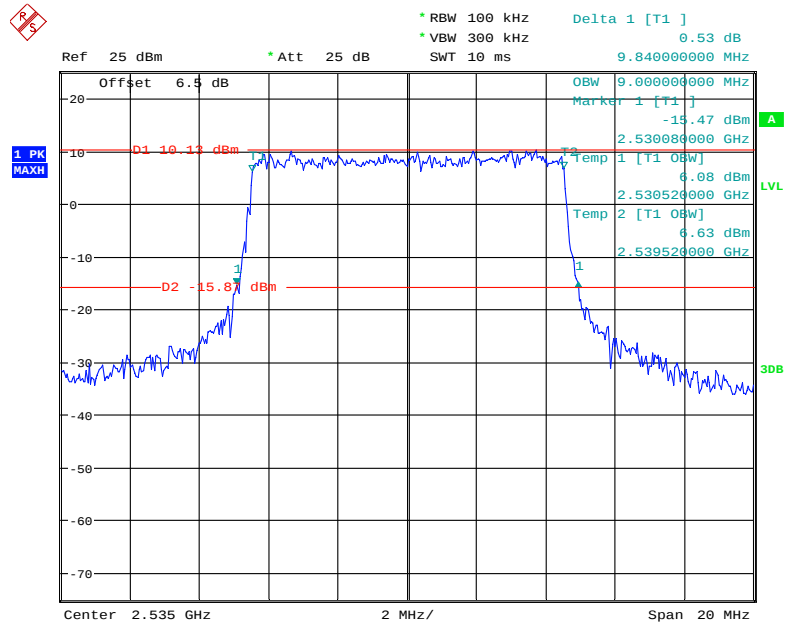
Date: 17.APR.2020 15:08:08

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



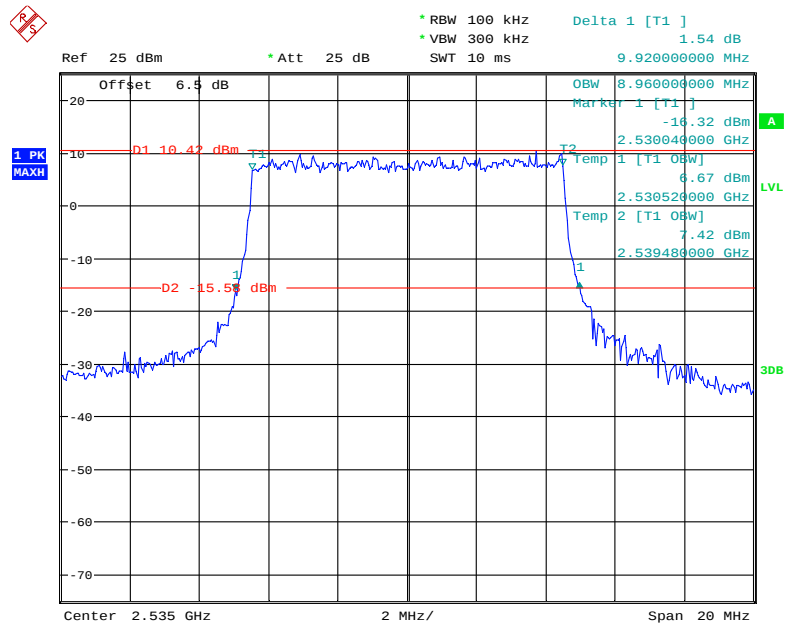
Date: 17.APR.2020 15:08:35

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

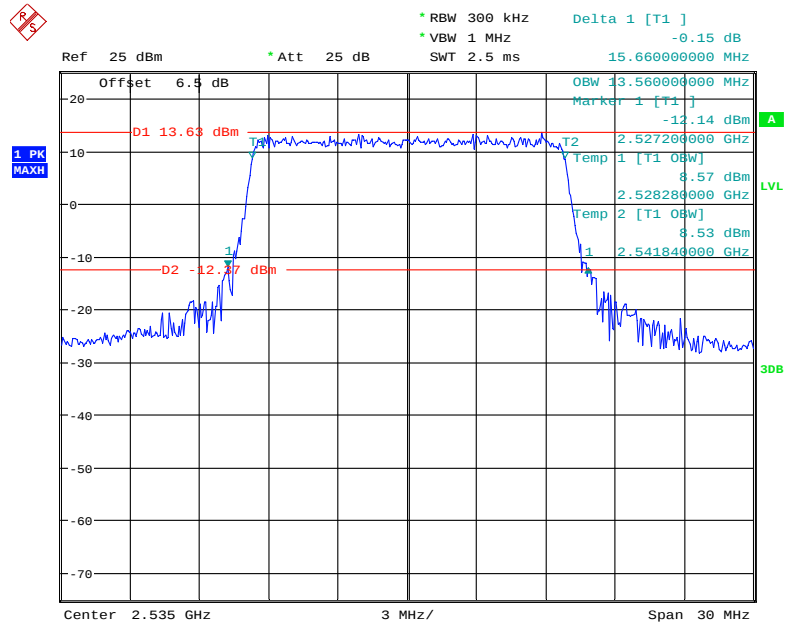


Date: 17.APR.2020 15:09:00

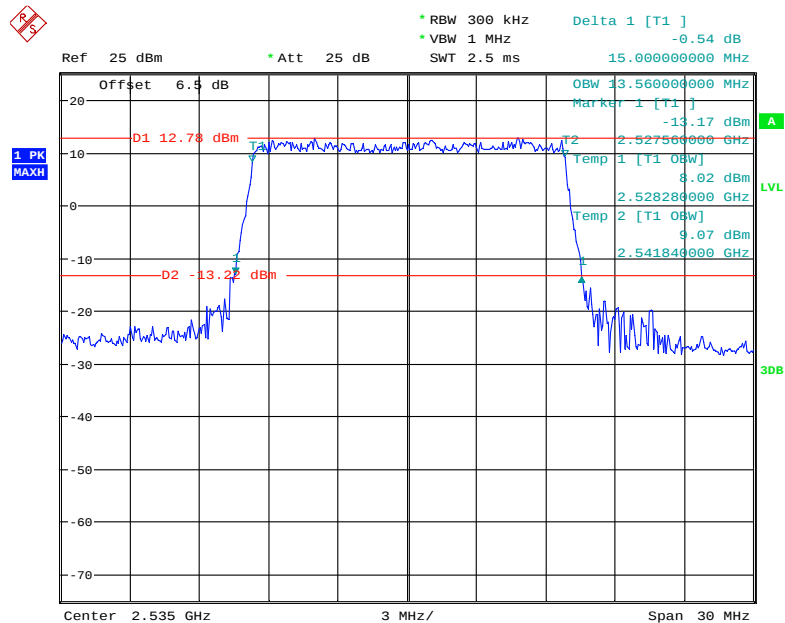
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



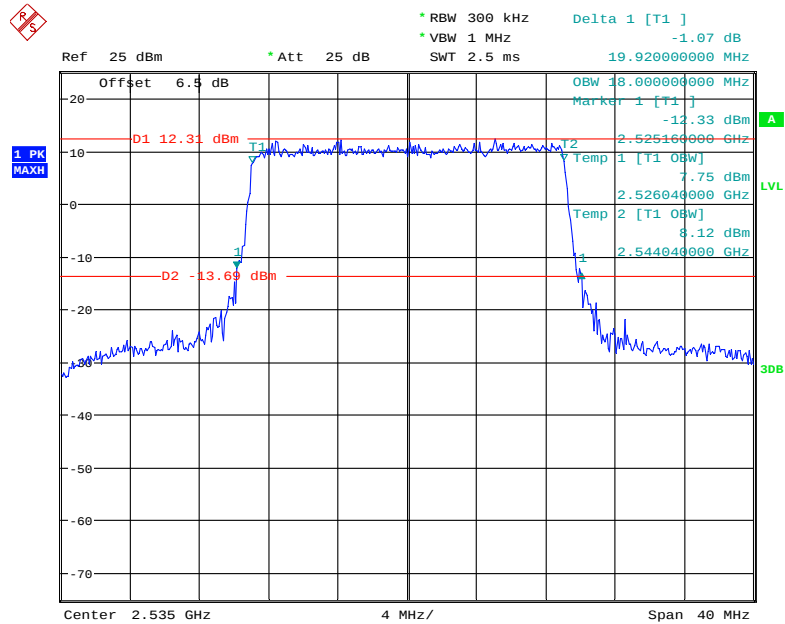
Date: 17.APR.2020 15:09:27

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

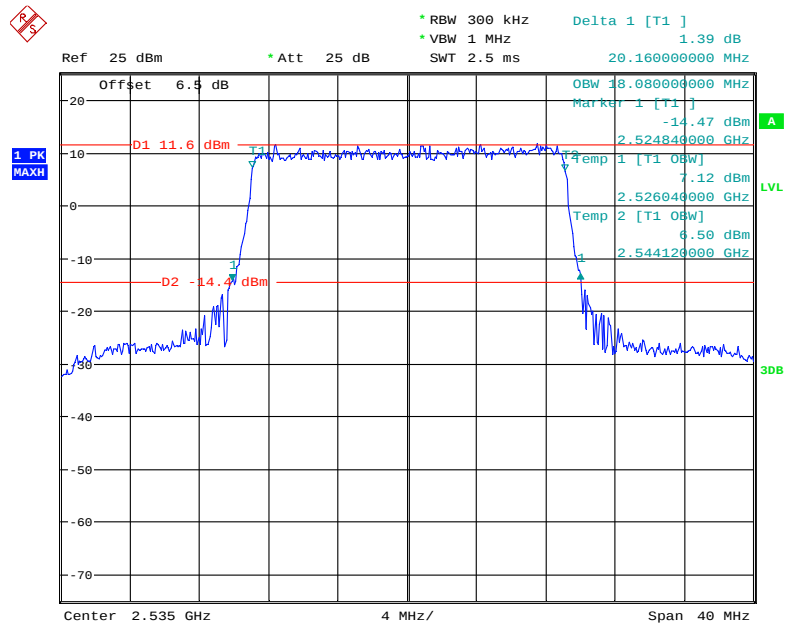
Date: 17.APR.2020 15:09:57

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

Date: 17.APR.2020 15:10:22

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

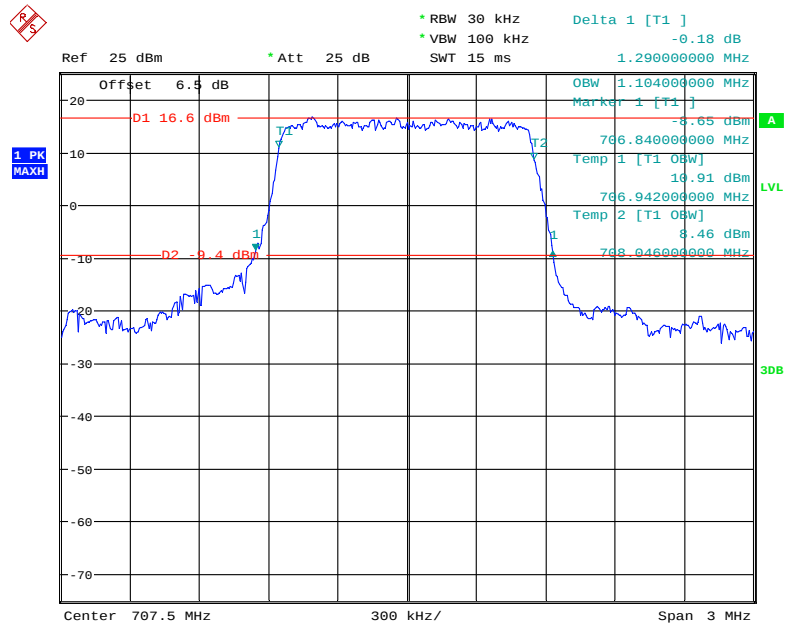
Date: 17.APR.2020 15:10:43

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

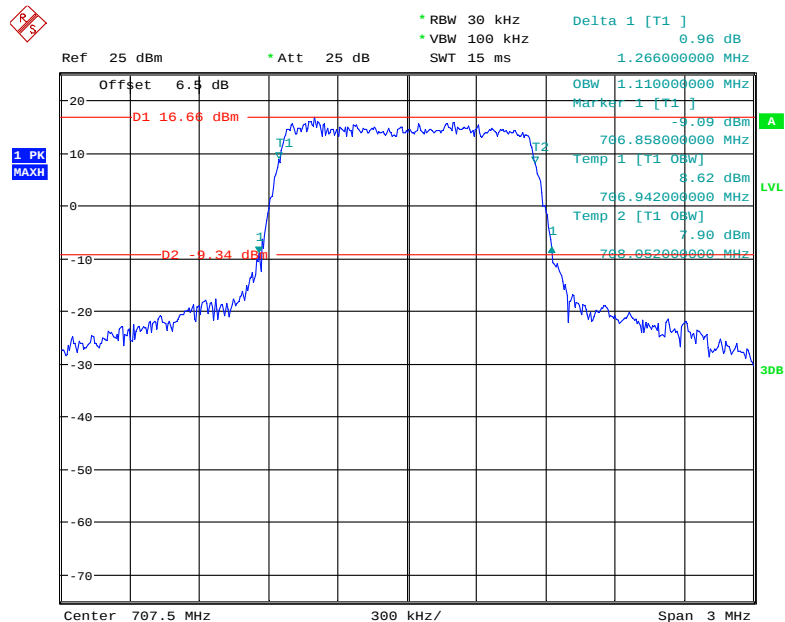
Date: 17.APR.2020 15:11:09

LTE Band 12: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.104	1.290
	16QAM	1.110	1.266
3.0	QPSK	2.688	3.000
	16QAM	2.688	3.024
5.0	QPSK	4.540	5.300
	16QAM	4.540	5.240
10.0	QPSK	8.960	9.800
	16QAM	8.960	9.760

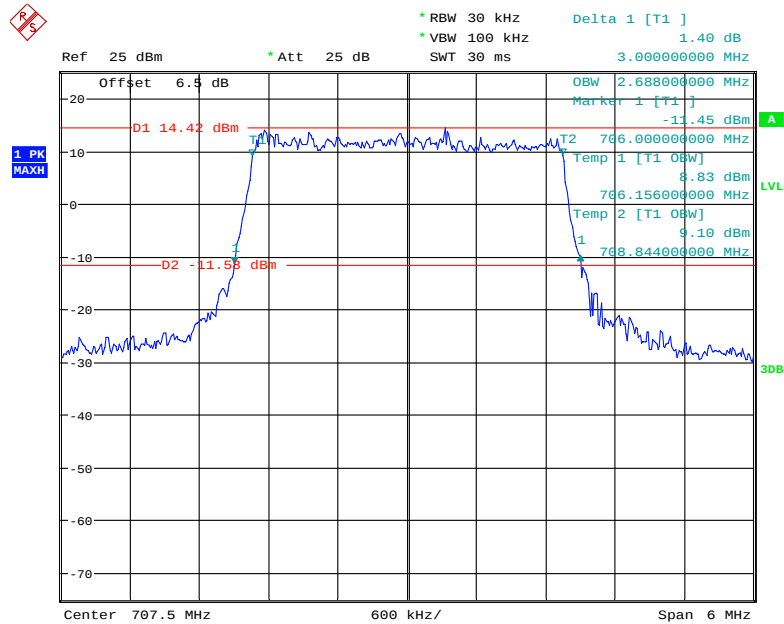
QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 17.APR.2020 15:11:39

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

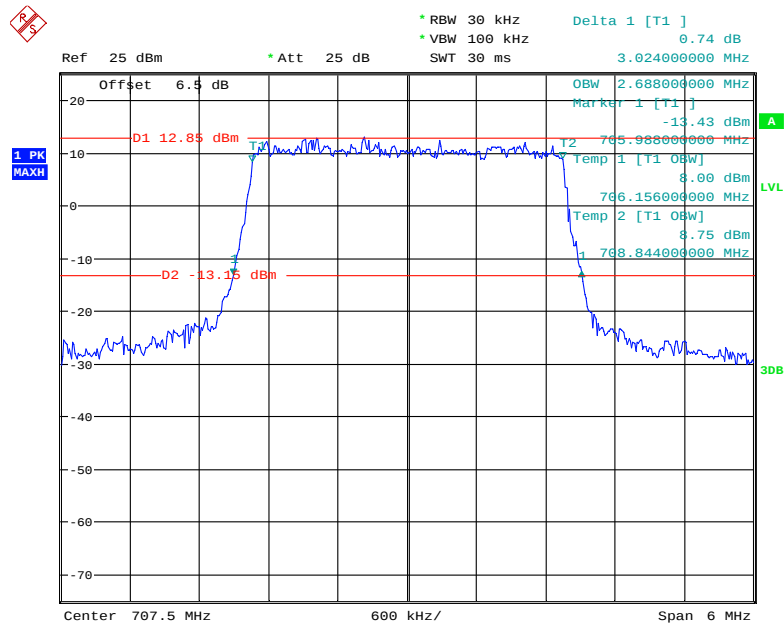
Date: 17.APR.2020 15:11:59

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



Date: 17.APR.2020 15:12:22

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



Date: 17.APR.2020 15:12:39

Delta 1 [T1] -0.62 dB
 5.300000000 MHz
 Ref 25 dBm * Att 25 dB
 * RBW 100 kHz
 * VBW 300 kHz
 SWT 5 ms

Offset 6.4 dB
 D1 16.8 dBm
 D2 -9.16 dBm
 1 PK MAXH
 T1
 T2
 Marker 1 [T1]
 Temp 1 [T1 BW] -8.63 dBm
 764.740000000 MHz
 10.16 dBm
 765.220000000 MHz
 Temp 2 [T1 BW]
 1 10.96 dBm
 769.760000000 MHz
 LVL
 3DB

Center 707.5 MHz 1 MHz/ Span 10 MHz

The screenshot displays a spectrum analyzer interface with a blue trace showing a signal. Two peaks are identified: D1 at 16.63 dBm and D2 at -9.37 dBm. The signal is centered at 707.5 MHz with a span of 10 MHz. The resolution bandwidth (RBW) is 100 kHz, and the video bandwidth (VBW) is 300 kHz. The sweep time (SWT) is 5 ms. The offset is 6.5 dB. The signal is labeled as Delta 1 [T1] with a value of -0.62 dB. The marker 1 [T1] is at 4.540000000 MHz, and the marker 2 [T1] is at 764.900000000 MHz. The signal is also labeled as LVL and 3DB.

Ref 25 dBm * Att 25 dB

* RBW 100 kHz Delta 1 [T1] -0.62 dB

* VBW 300 kHz 5.240000000 MHz

SWT 5 ms

Offset 6.5 dB

D1 16.63 dBm

D2 -9.37 dBm

OBW 4.540000000 MHz

Marker 1 [T1]

Temp 1 [T1] -8.34 dBm

Temp 1 [T1] 764.900000000 MHz

Temp 1 [T1] 9.64 dBm

Temp 1 [T1] 765.220000000 MHz

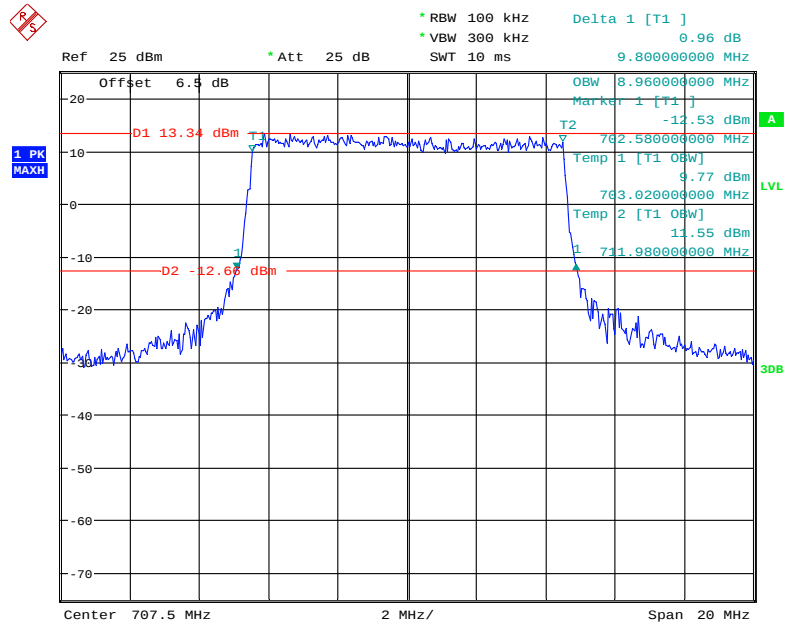
Temp 2 [T1] 8.98 dBm

Temp 2 [T1] 769.760000000 MHz

Center 707.5 MHz 1 MHz/ Span 10 MHz

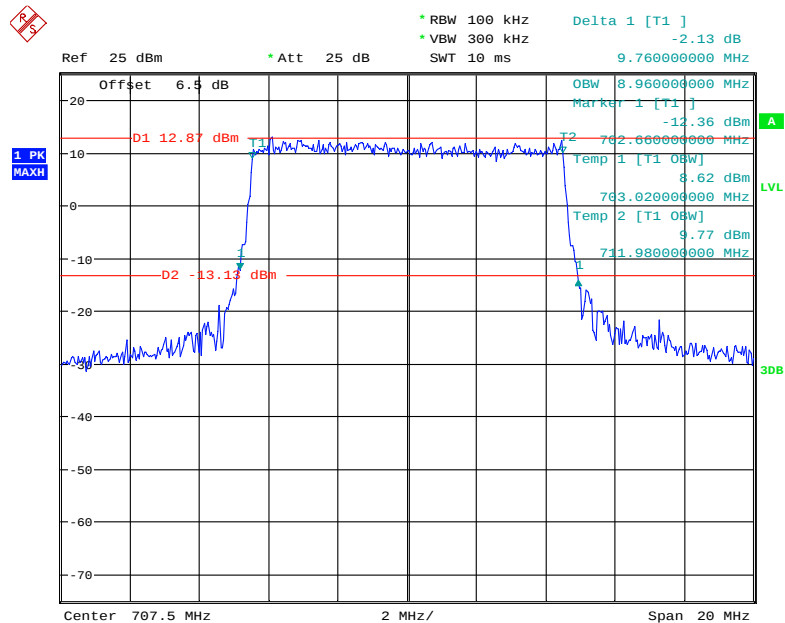
Page 79 of 197

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



Date: 17.APR.2020 15:14:12

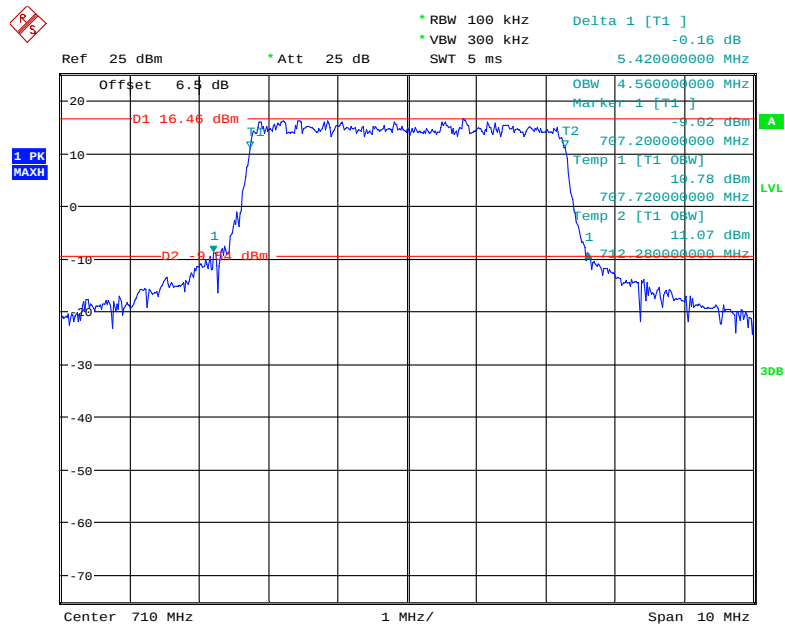
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



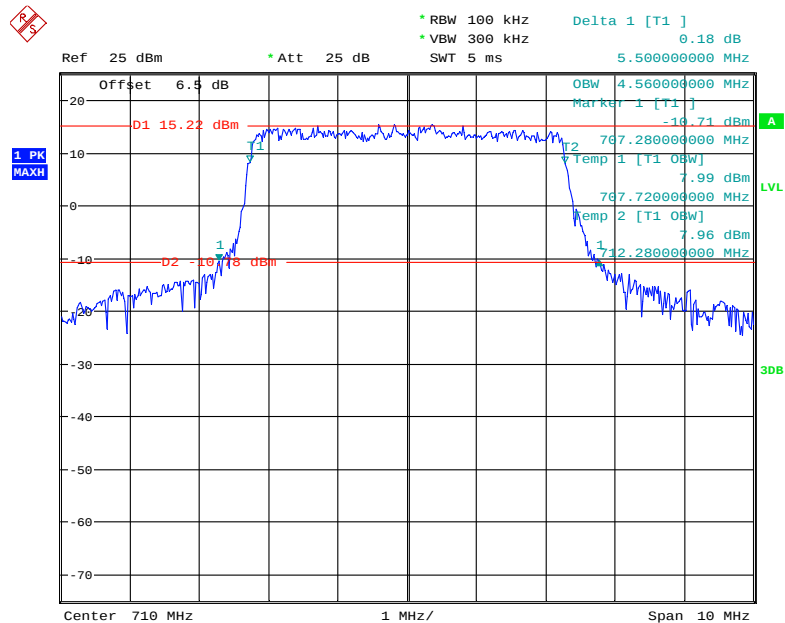
Date: 17.APR.2020 15:14:33

LTE Band 17: (Middle Channel)

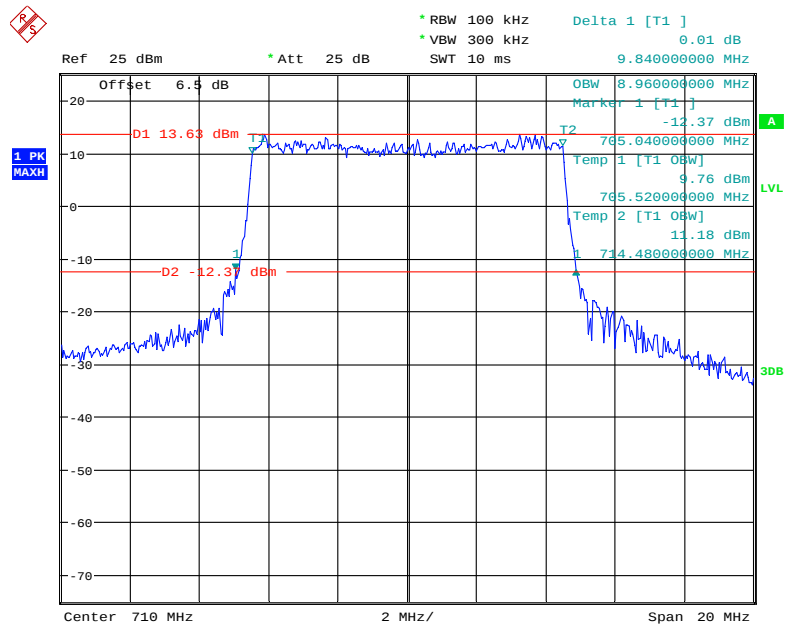
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.560	5.420
	16QAM	4.560	5.500
10.0	QPSK	8.960	9.840
	16QAM	8.960	9.880

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

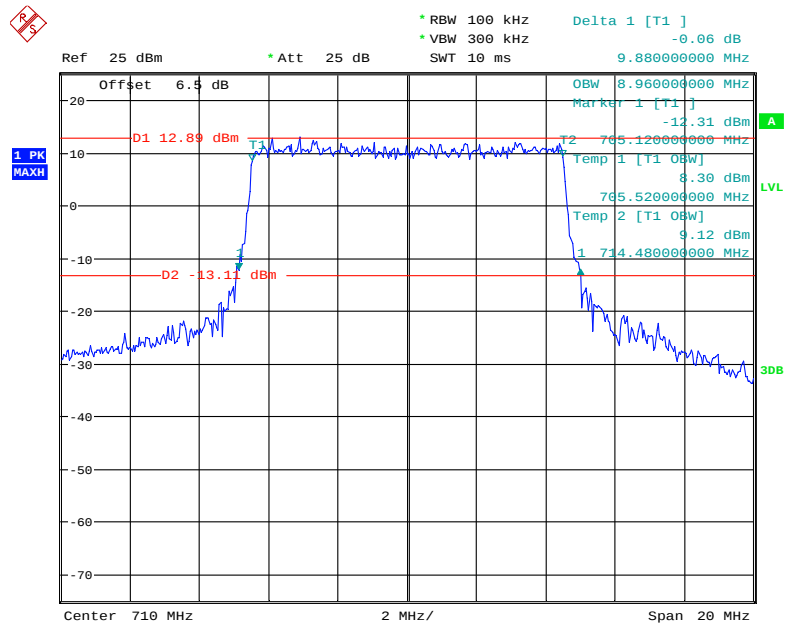
Date: 17.APR.2020 15:15:49

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

Date: 17.APR.2020 15:16:19

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

Date: 17.APR.2020 15:16:42

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

Date: 17.APR.2020 15:17:05

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

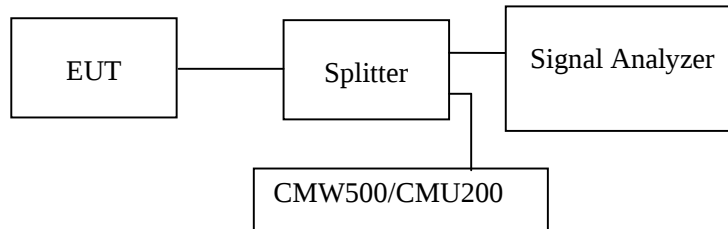
Applicable Standard

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

The testing was performed by Gavin Guo from 2020-04-15 to 2020-04-17.

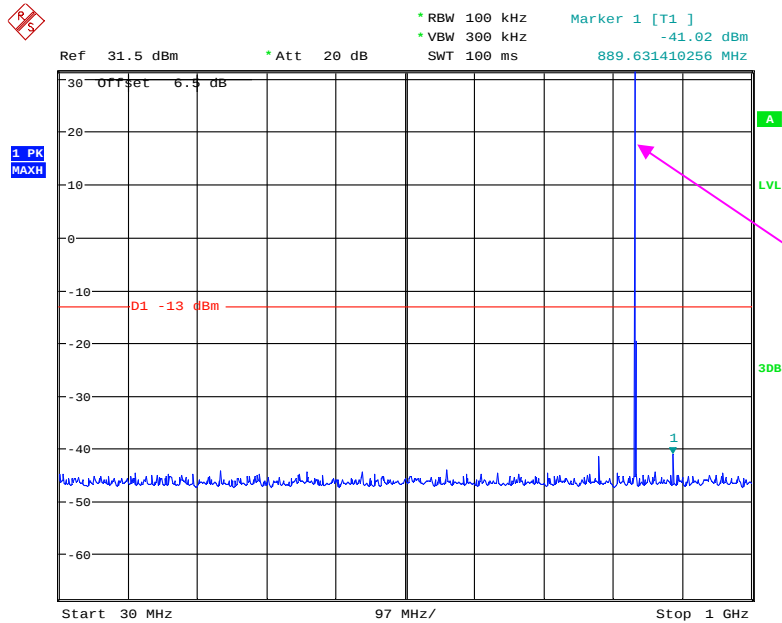
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

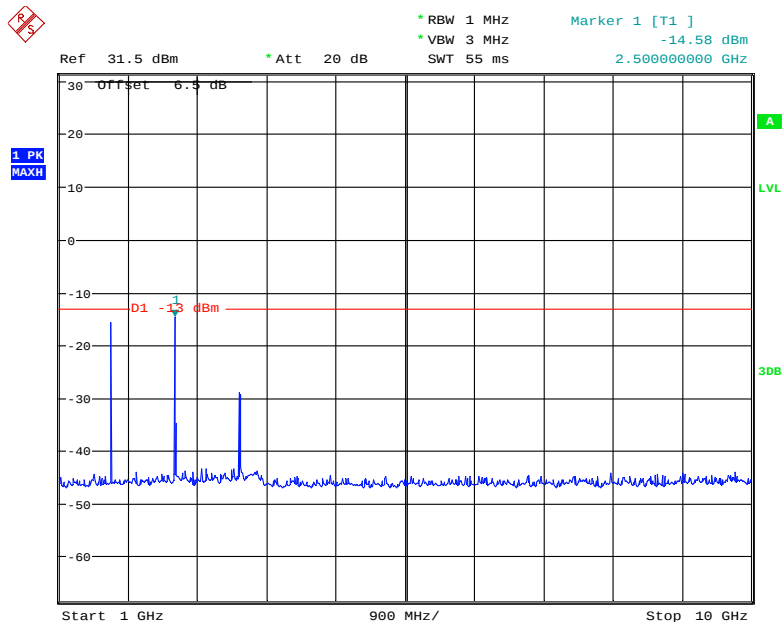
30 MHz – 1 GHz (GSM Mode)



Fundamental test

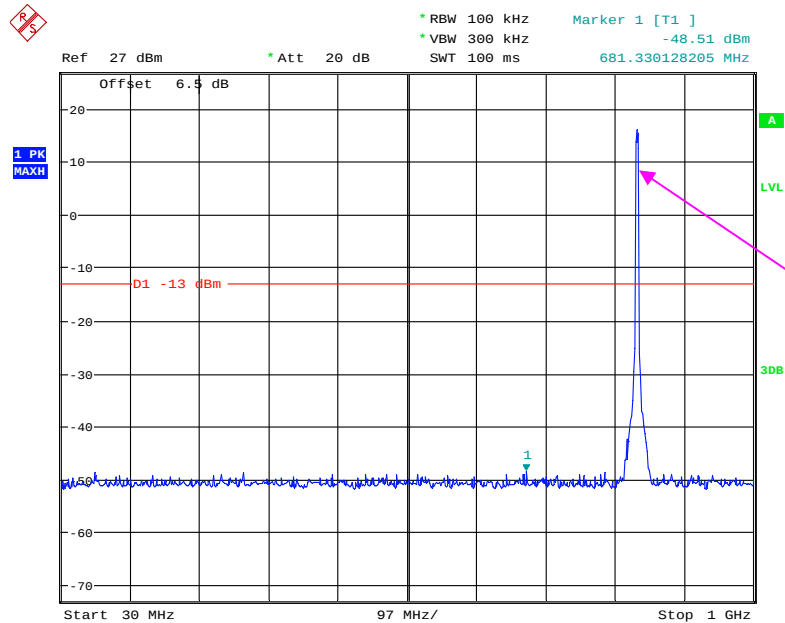
Date: 15.APR.2020 21:07:03

1 GHz – 10 GHz (GSM Mode)



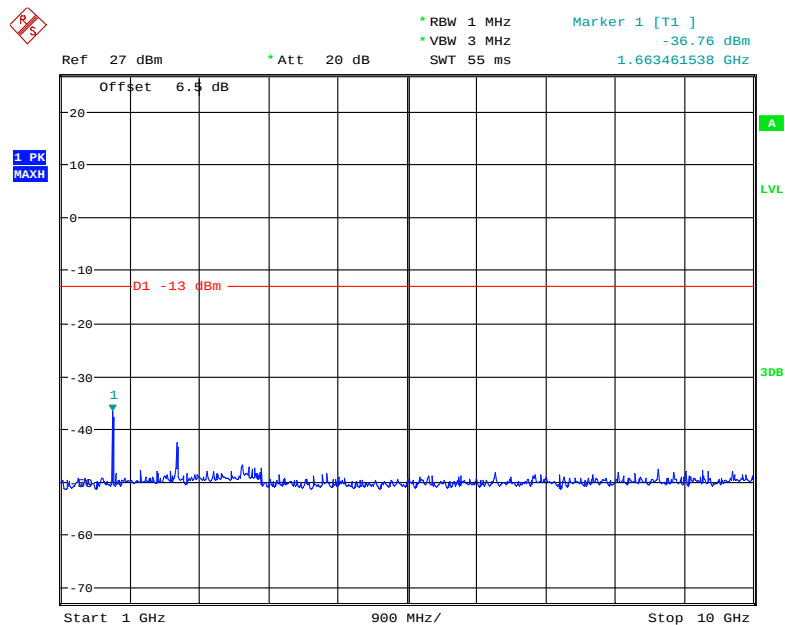
Date: 15.APR.2020 21:08:25

30 MHz – 1 GHz (WCDMA Mode)



Date: 15.APR.2020 22:28:58

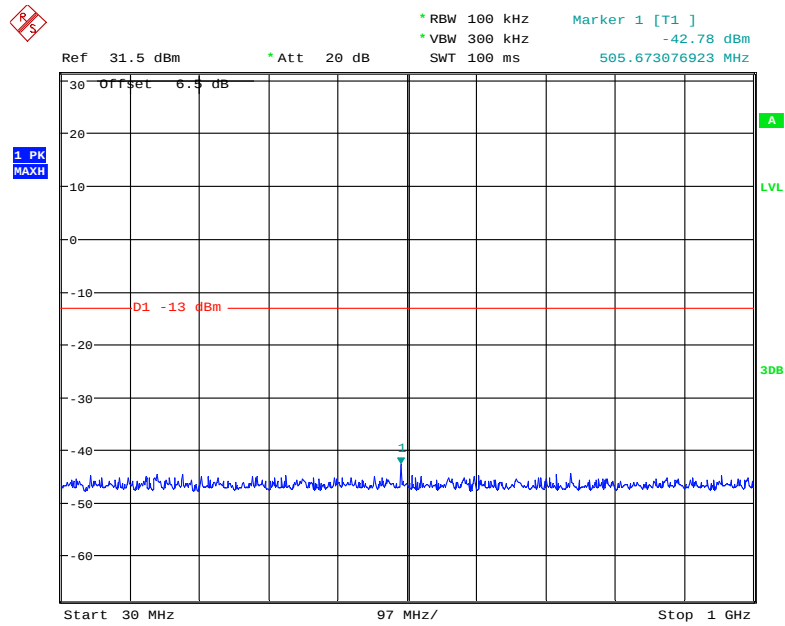
1 GHz – 10 GHz (WCDMA Mode)



Date: 15.APR.2020 22:29:23

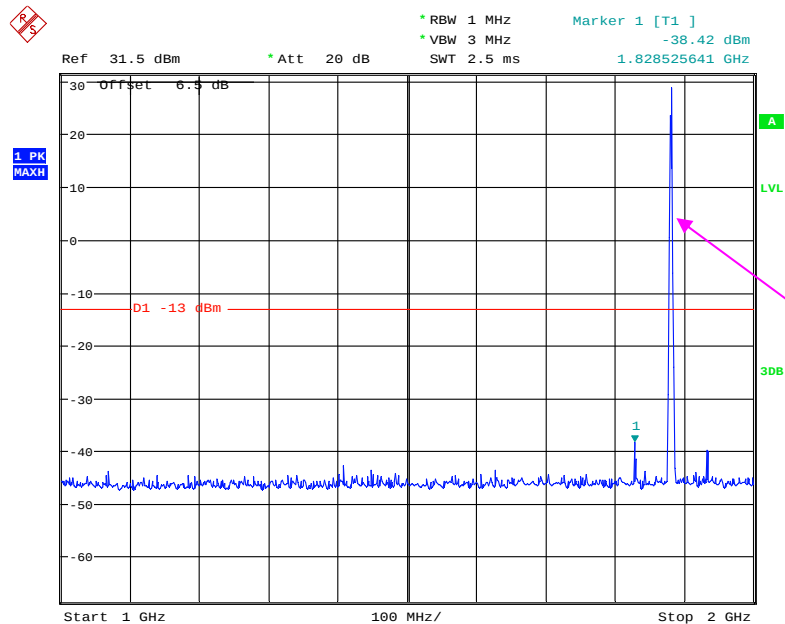
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



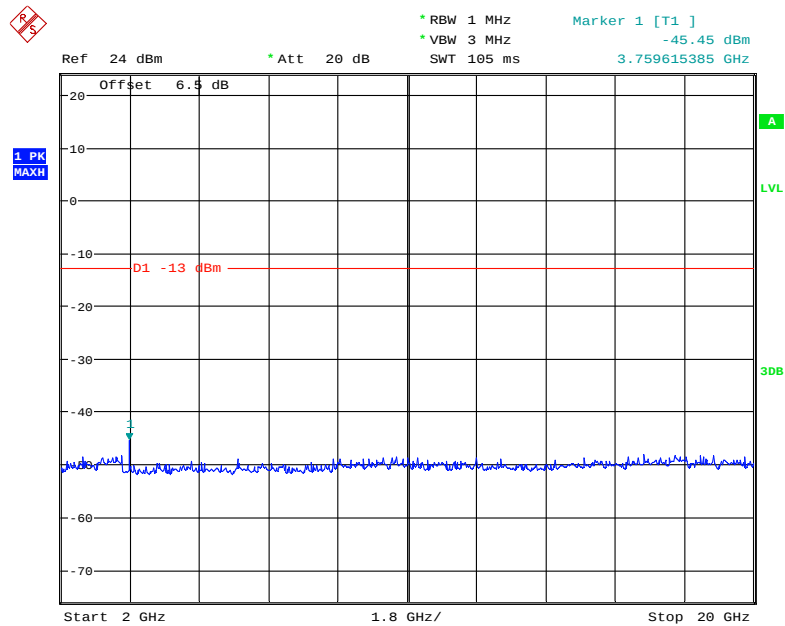
Date: 15.APR.2020 20:46:28

1 GHz – 2 GHz (GSM Mode)



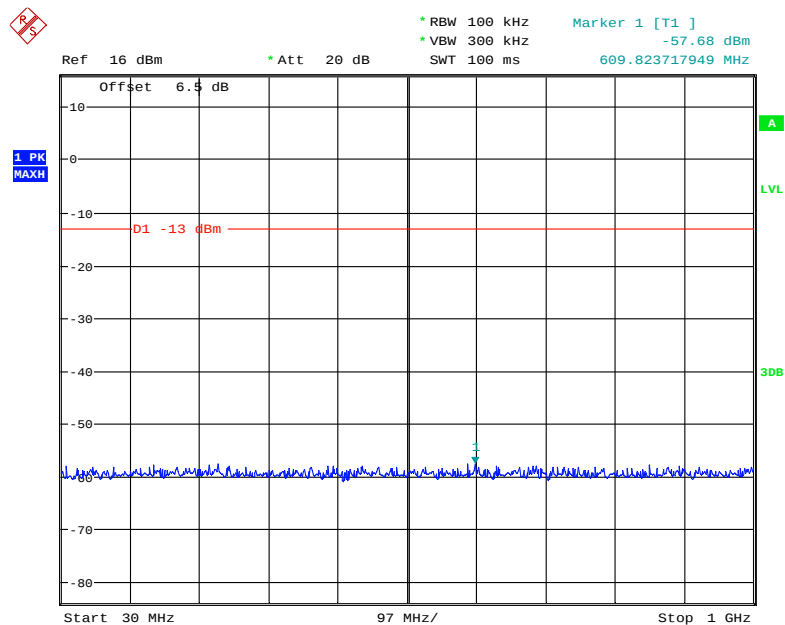
Date: 15.APR.2020 20:47:29

2 GHz – 20 GHz (GSM Mode)



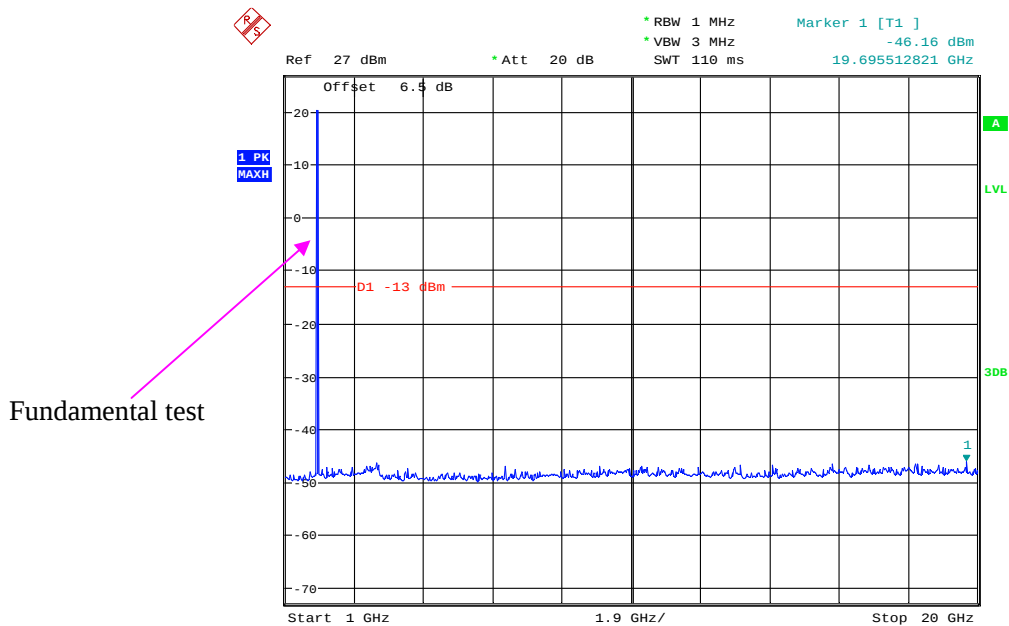
Date: 15.APR.2020 20:49:13

30 MHz – 1 GHz (WCDMA Mode)



Date: 15.APR.2020 21:36:30

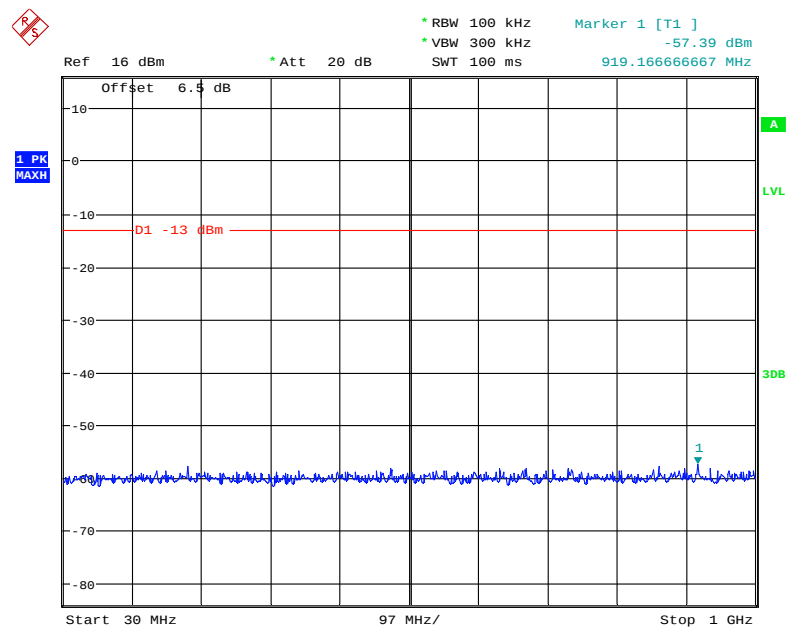
1 GHz – 20 GHz (WCDMA Mode)



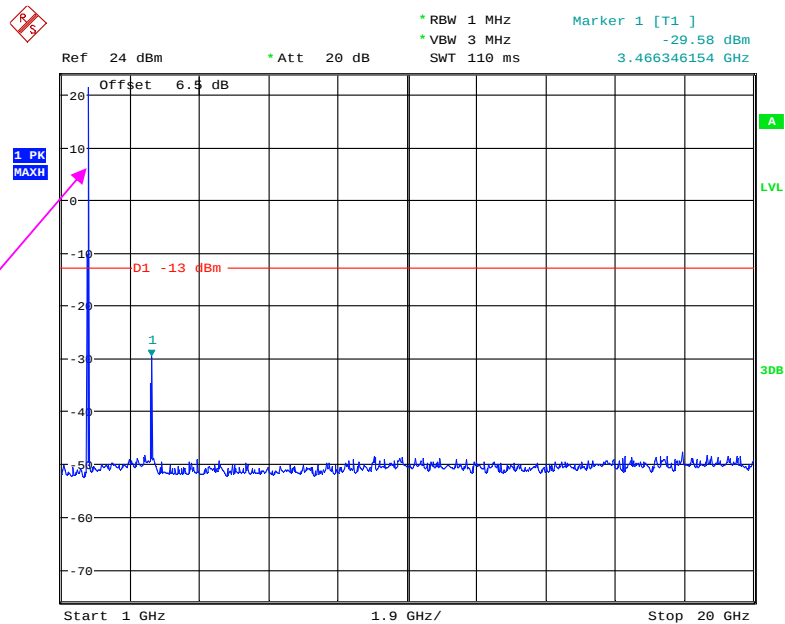
Date: 15.APR.2020 21:37:43

AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)

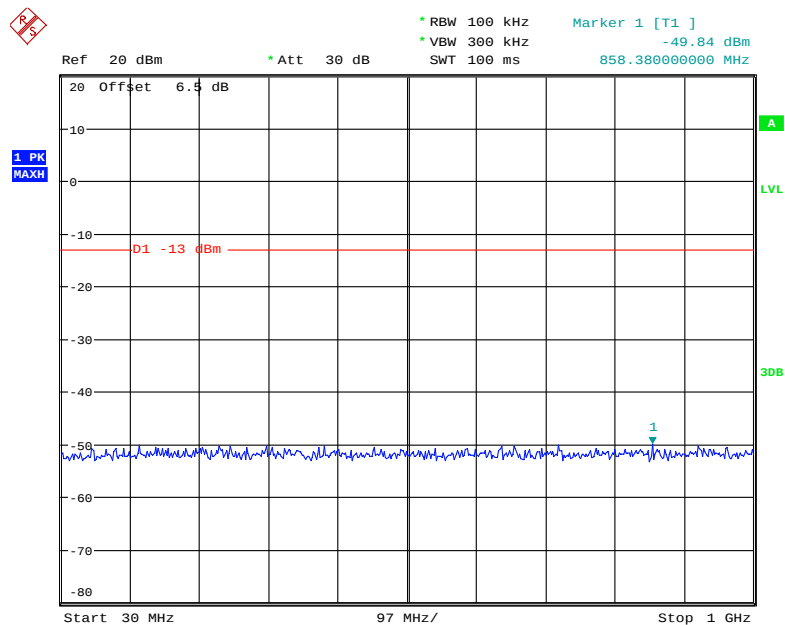


Date: 15.APR.2020 22:04:39

1 GHz – 20 GHz (WCDMA Mode)

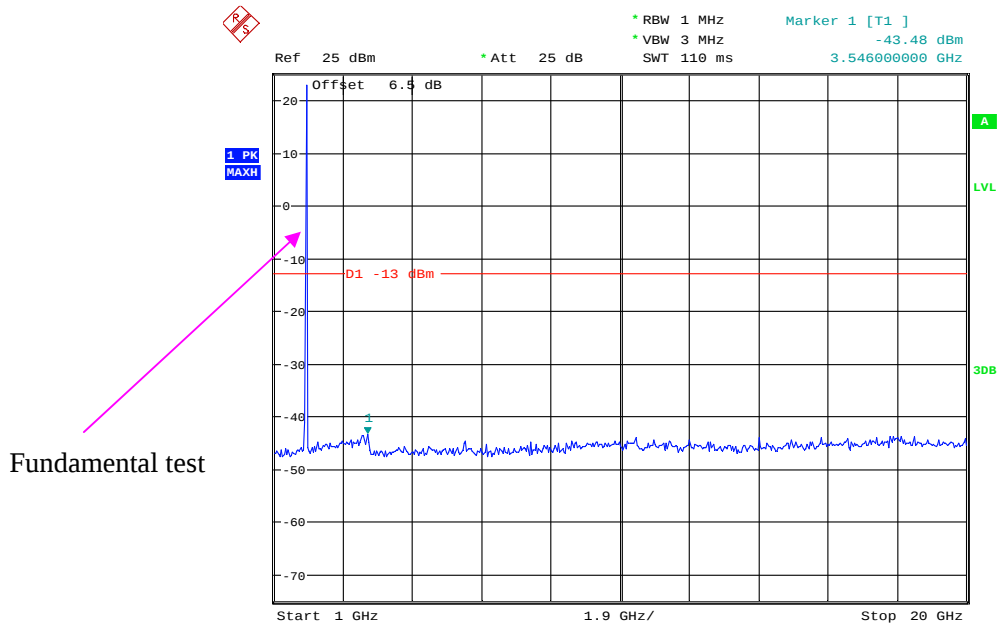
Fundamental test

Date: 15.APR.2020 22:05:33

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

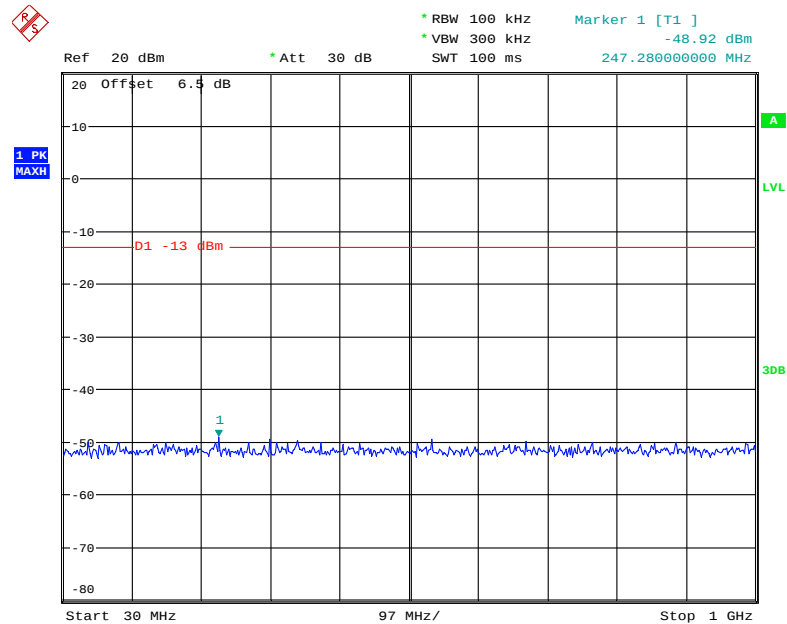
Date: 17.APR.2020 12:51:43

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



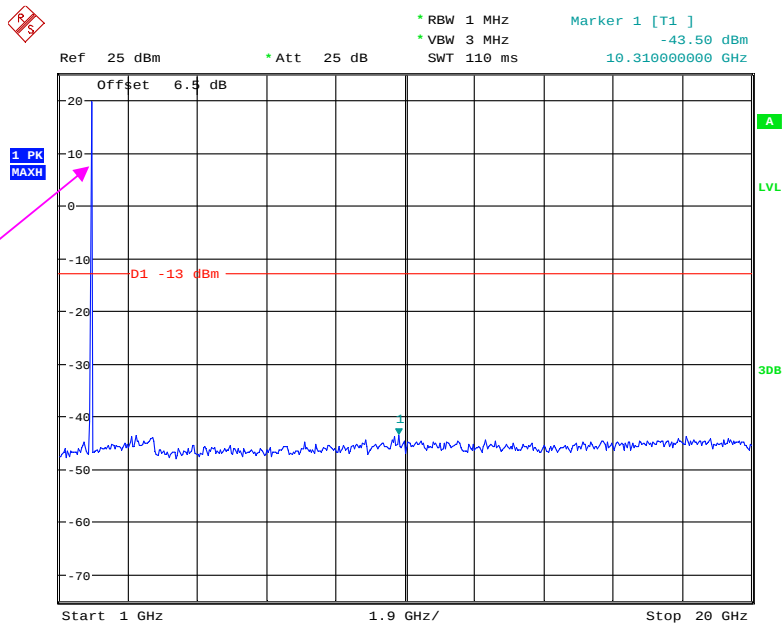
Date: 17.APR.2020 12:51:54

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



Date: 17.APR.2020 12:52:15

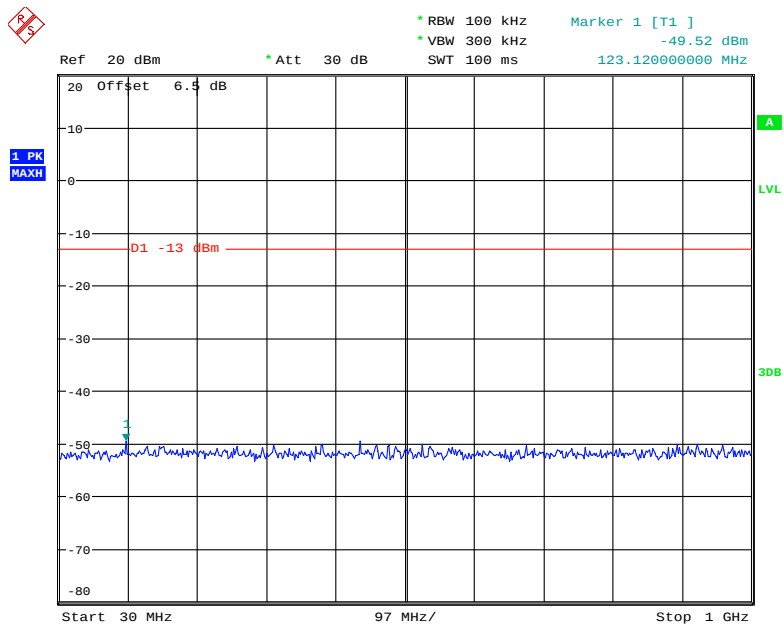
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



Fundamental test

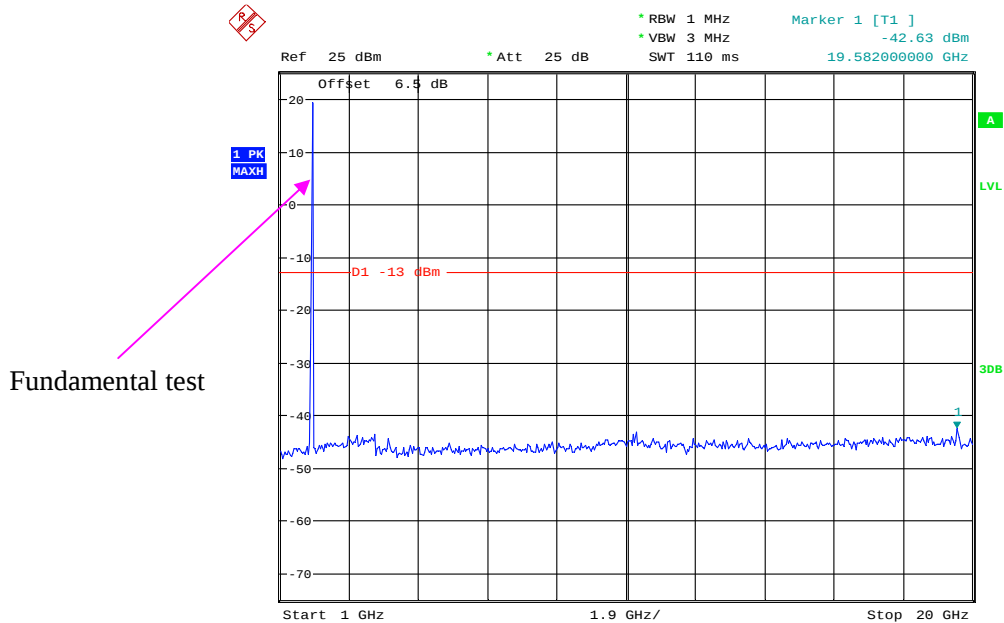
Date: 17.APR.2020 12:52:27

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



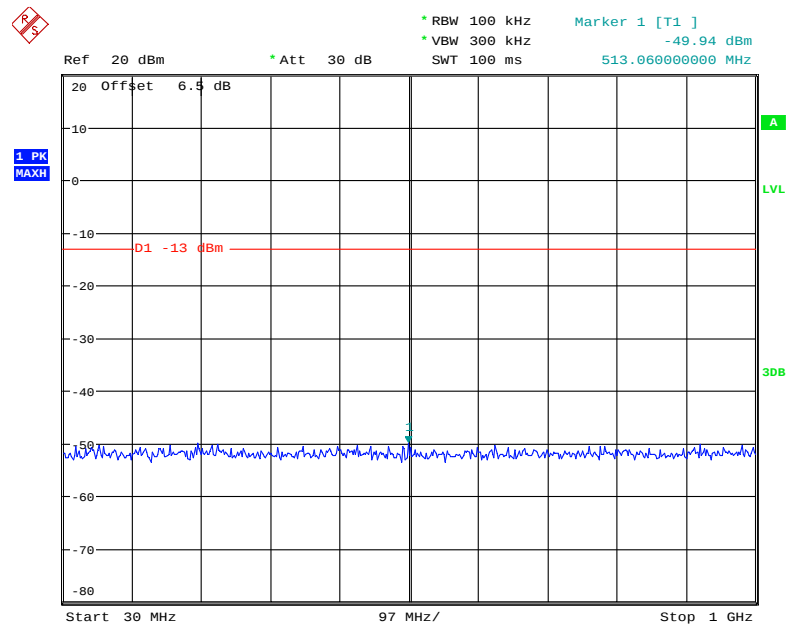
Date: 17.APR.2020 12:52:45

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



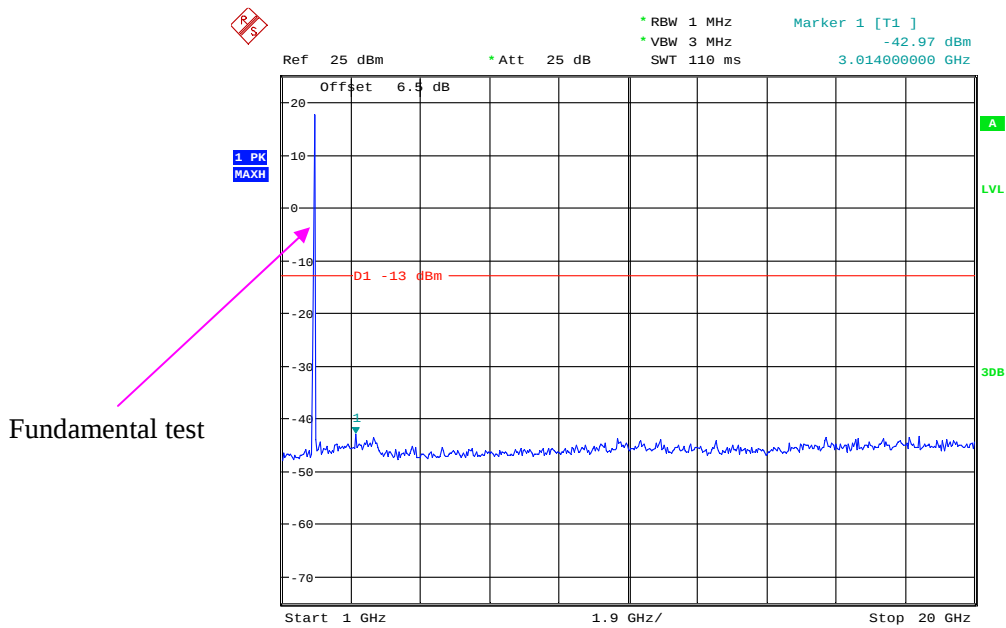
Date: 17.APR.2020 12:52:56

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



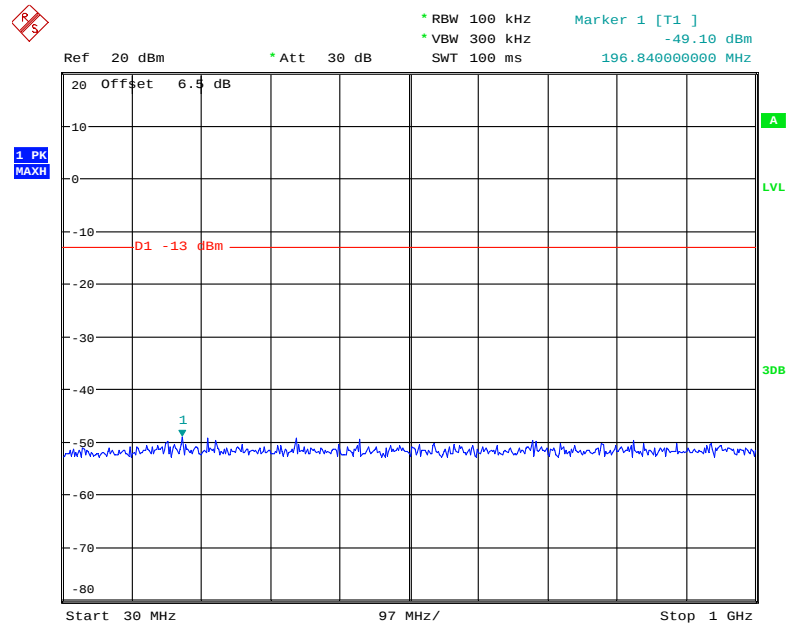
Date: 17.APR.2020 12:53:14

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



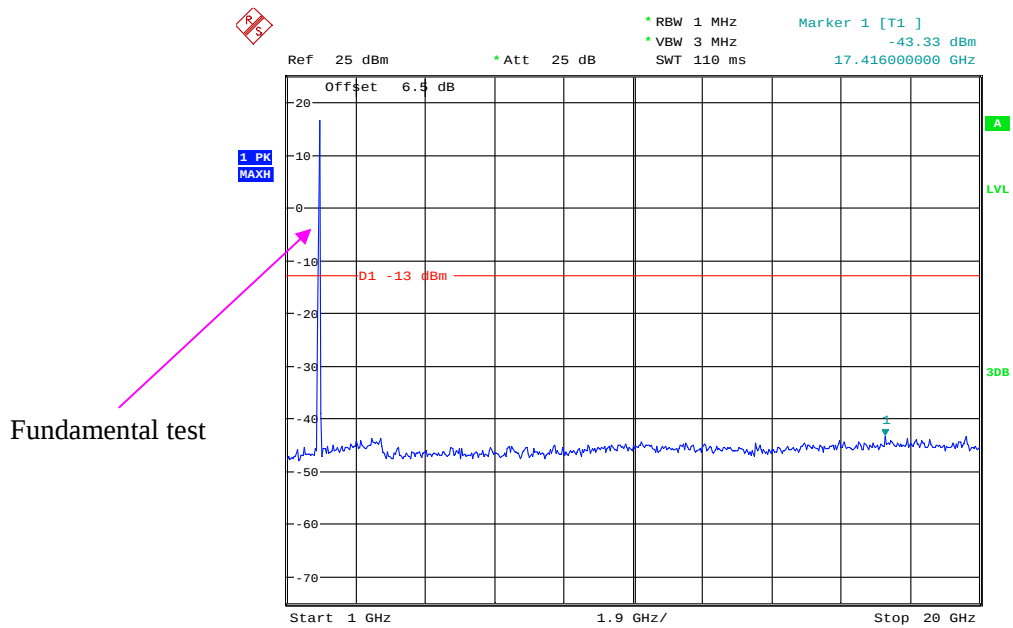
Date: 17.APR.2020 12:53:26

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



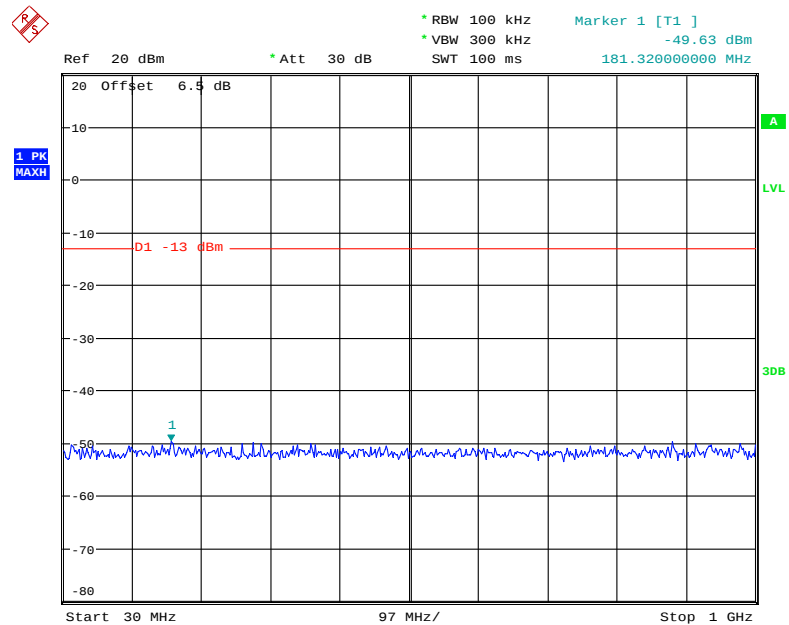
Date: 17.APR.2020 12:53:48

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

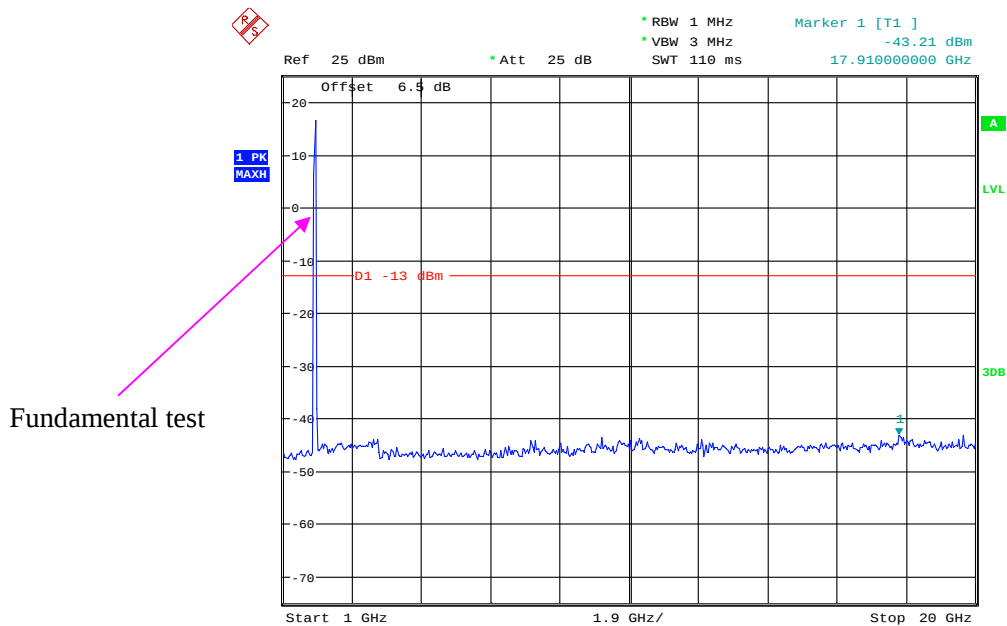


Date: 17.APR.2020 12:54:00

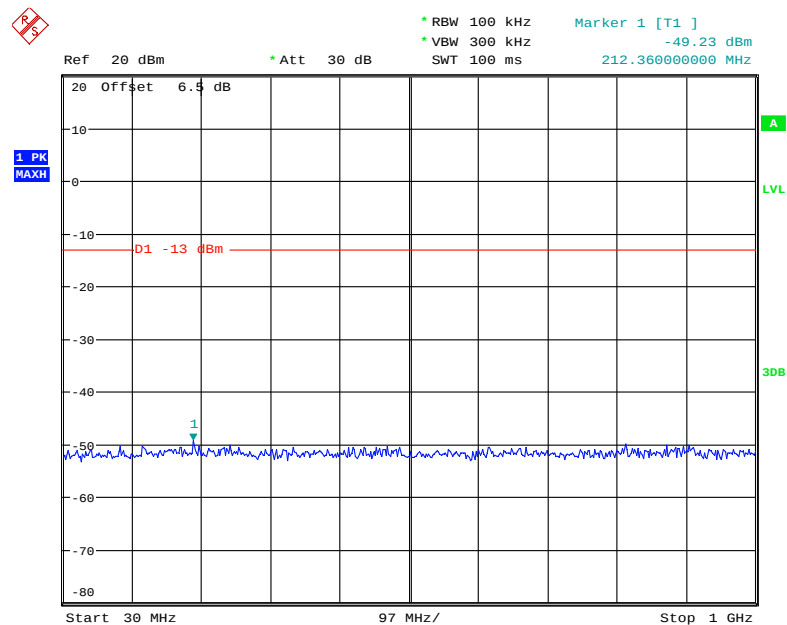
30 MHz - 1 GHz (20.0 MHz, Middle Channel)



Date: 17.APR.2020 12:54:20

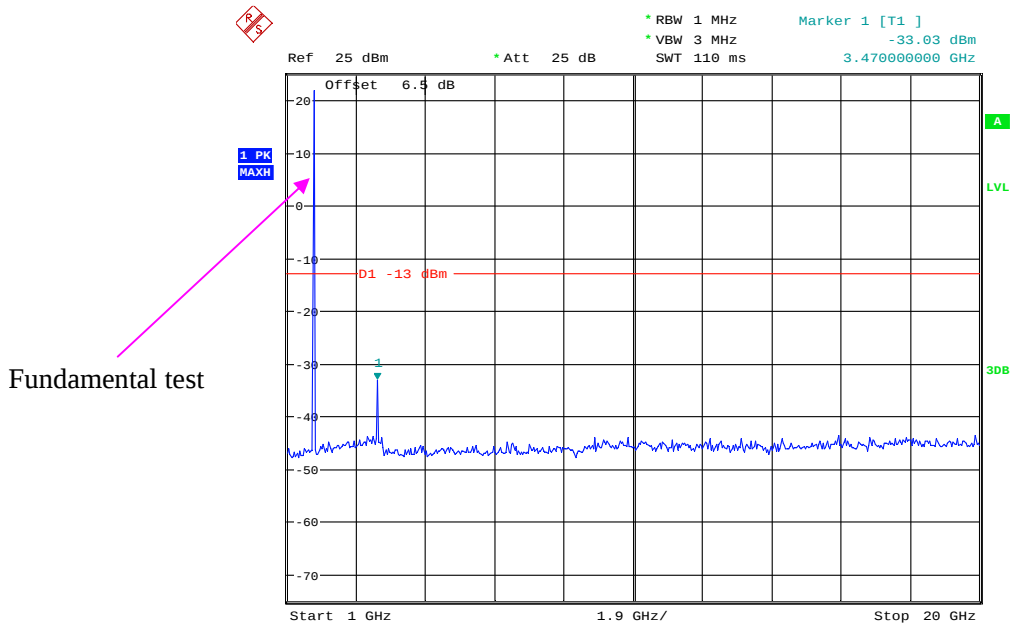
1 GHz – 2 GHz (20.0 MHz, Middle Channel)

Date: 17.APR.2020 12:54:31

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

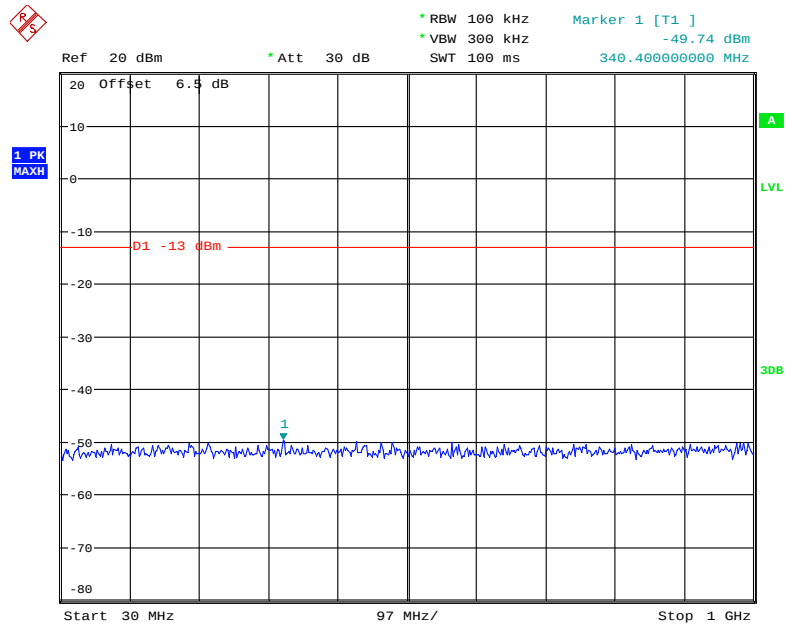
Date: 17.APR.2020 12:54:55

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



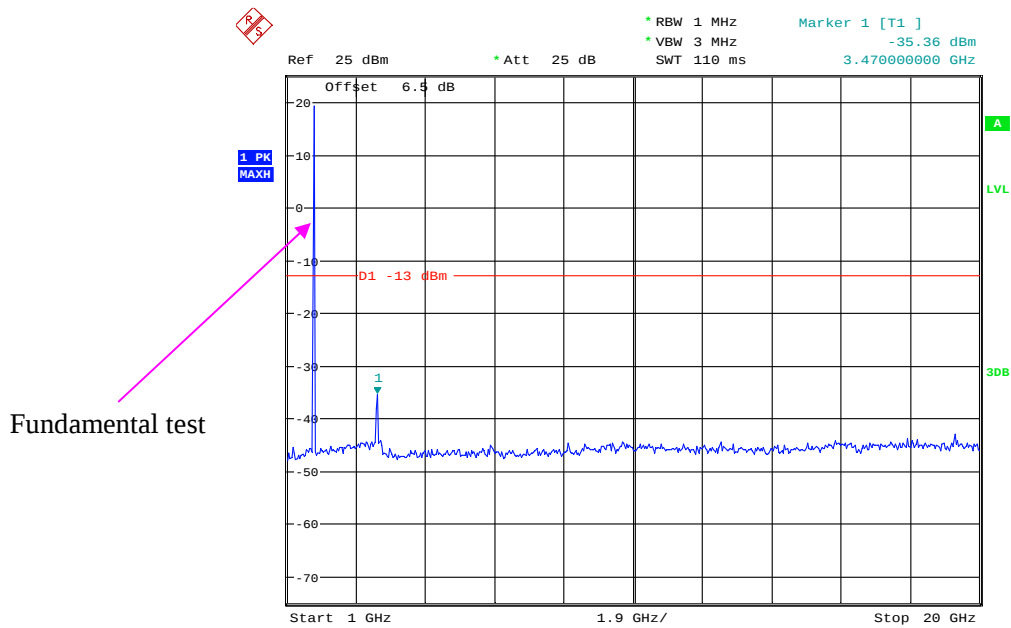
Date: 17.APR.2020 12:55:07

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



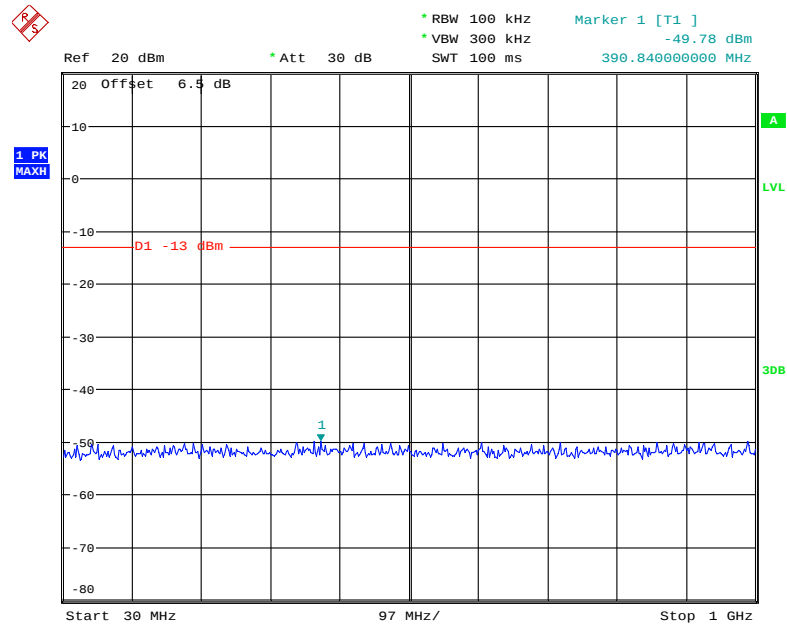
Date: 17.APR.2020 12:55:25

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



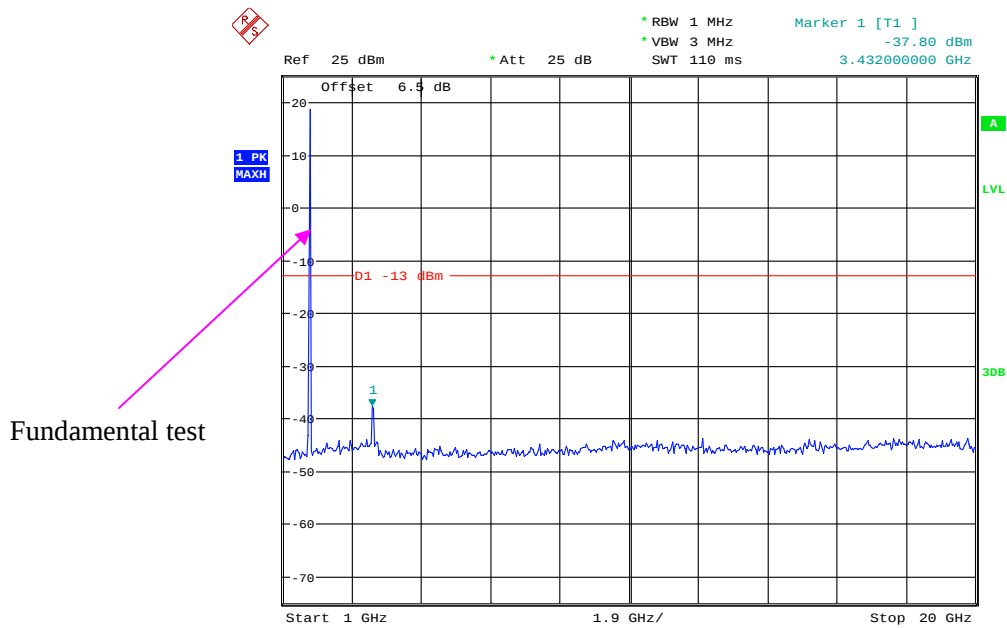
Date: 17.APR.2020 12:55:36

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



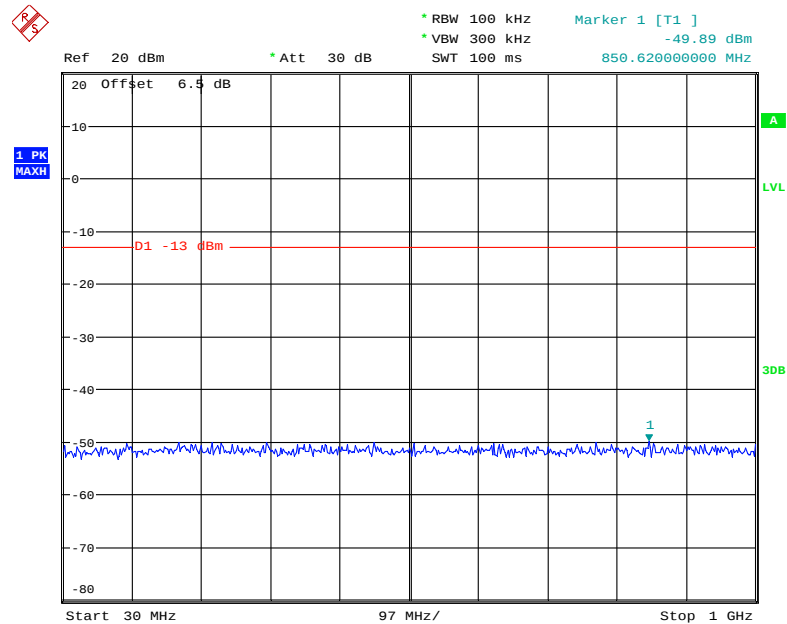
Date: 17.APR.2020 12:55:54

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



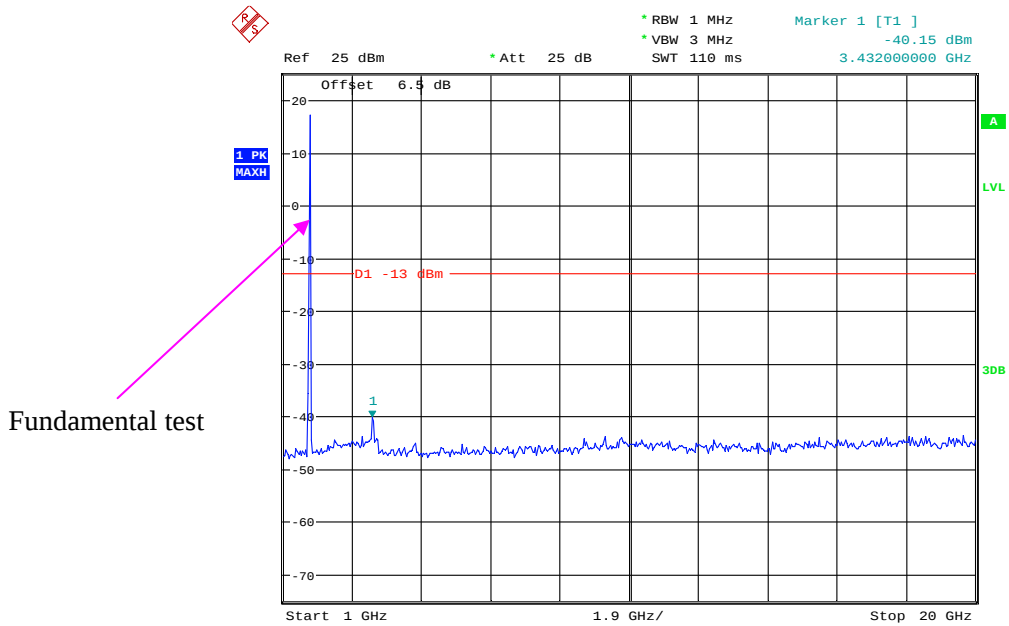
Date: 17.APR.2020 12:56:05

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



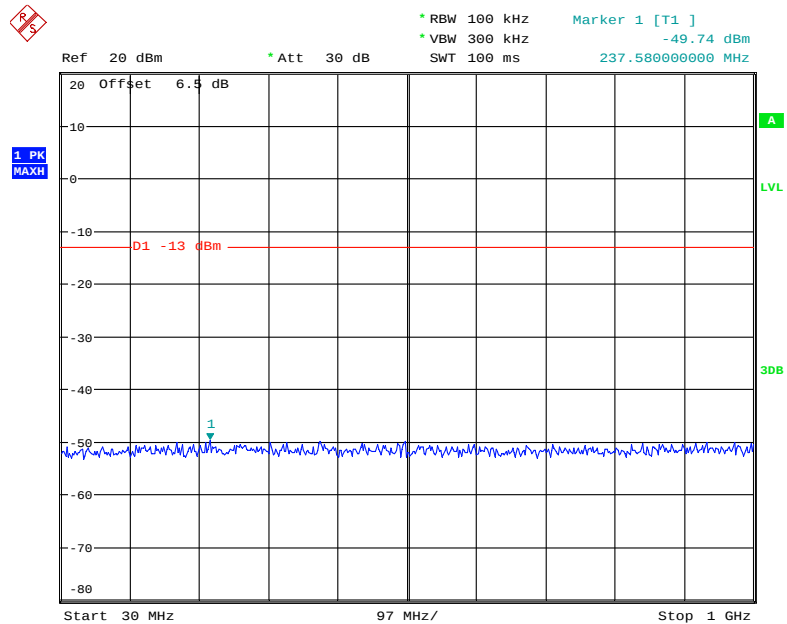
Date: 17.APR.2020 12:56:26

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



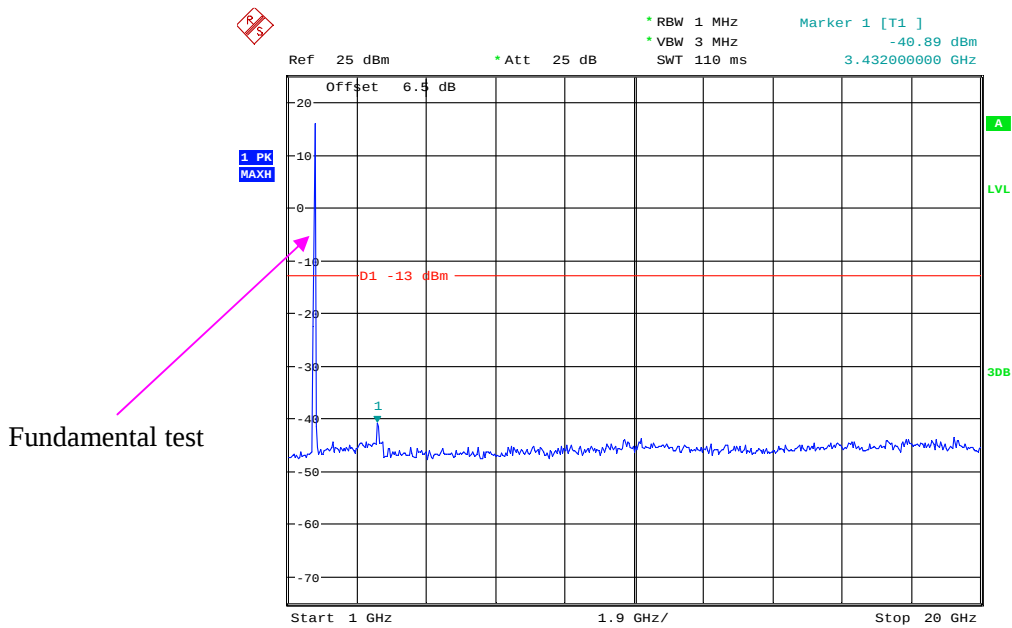
Date: 17.APR.2020 12:56:38

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



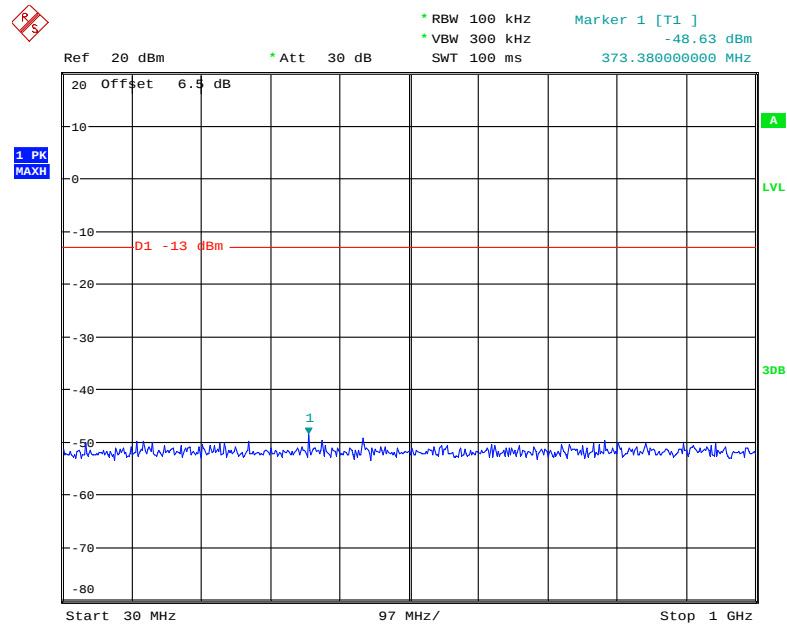
Date: 17.APR.2020 12:57:00

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



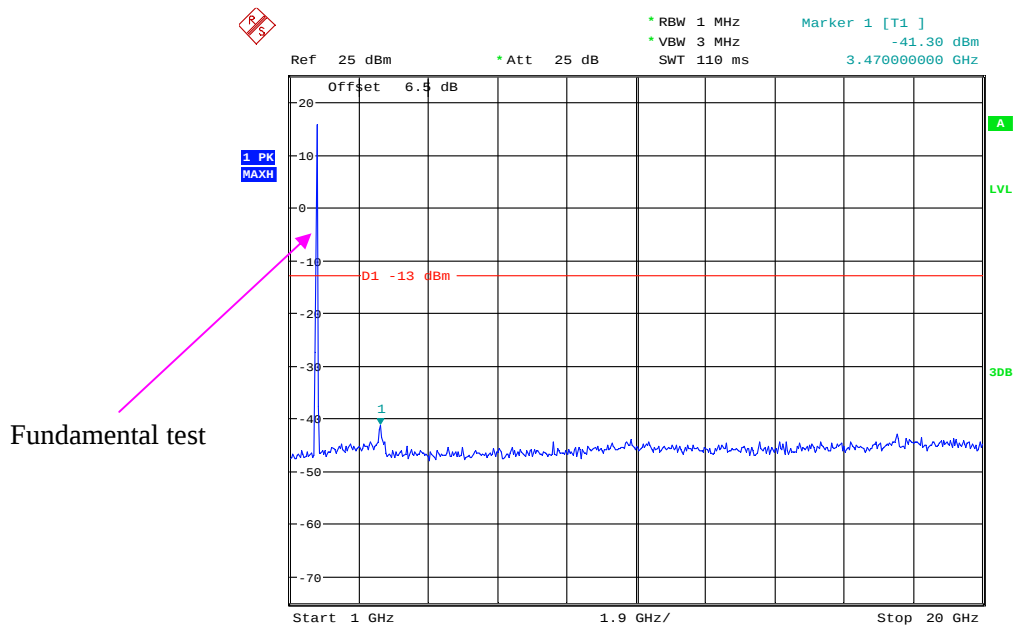
Date: 17.APR.2020 12:57:11

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



Date: 17.APR.2020 12:57:31

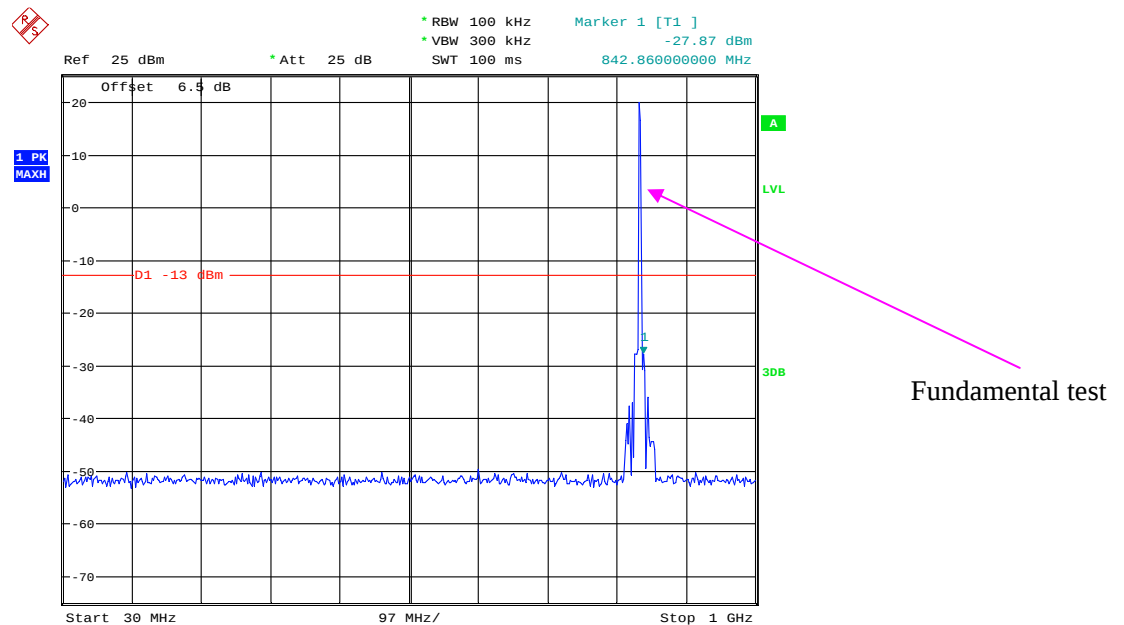
1 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 17.APR.2020 12:57:43

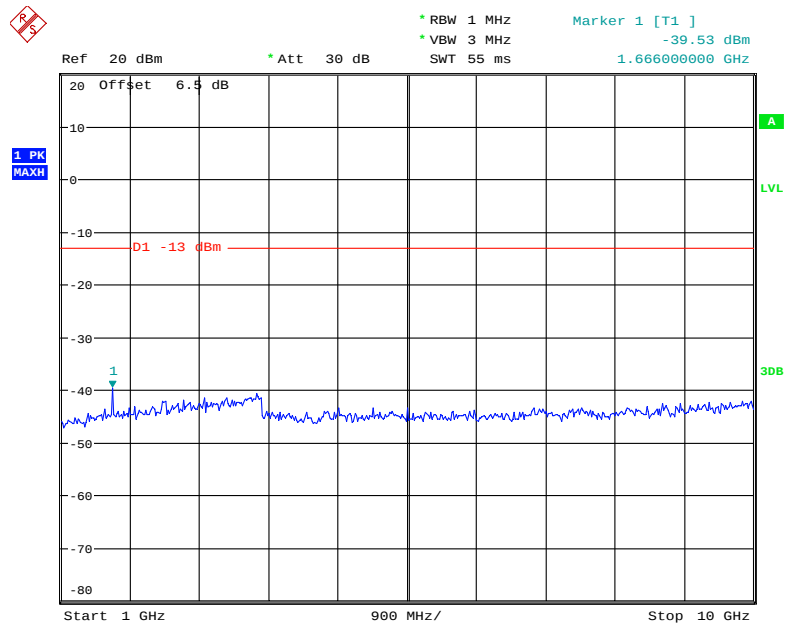
LTE Band 5:

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



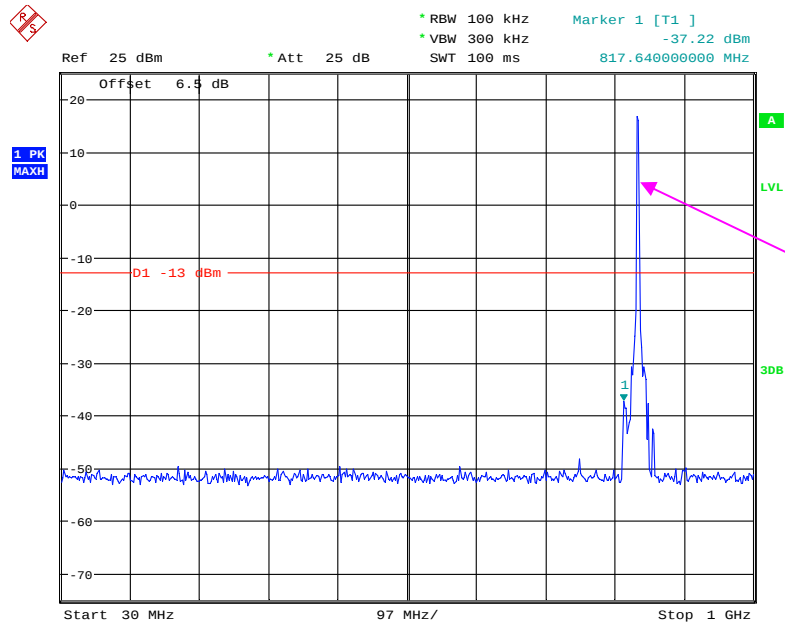
Date: 17.APR.2020 12:58:06

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



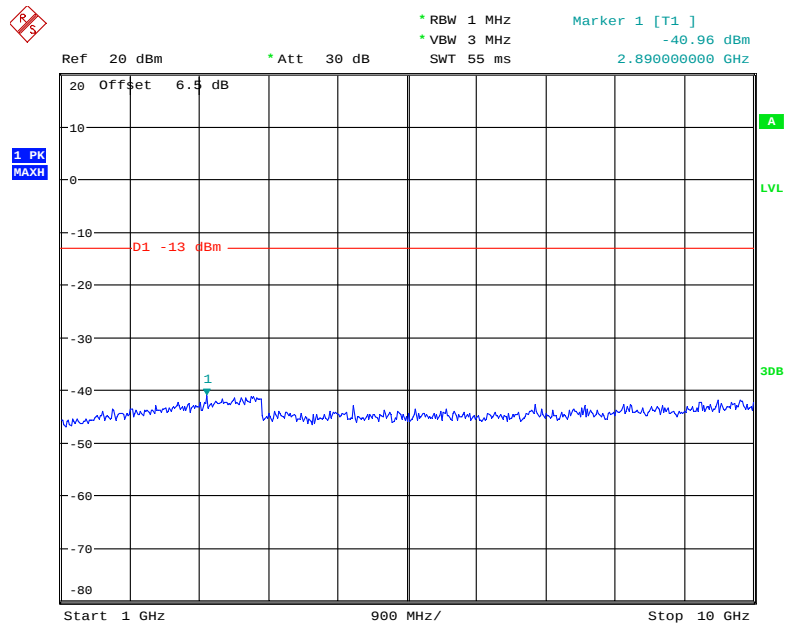
Date: 17.APR.2020 12:58:18

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



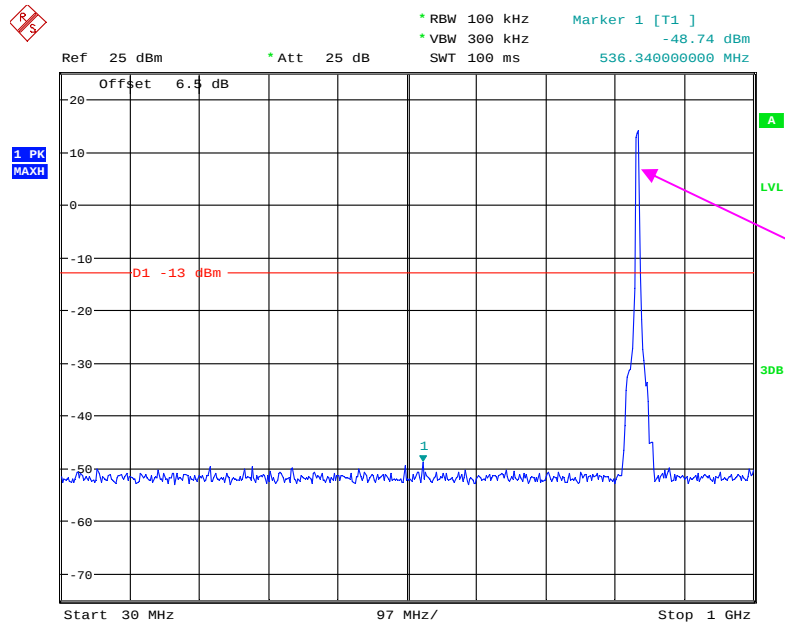
Date: 17.APR.2020 12:58:39

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



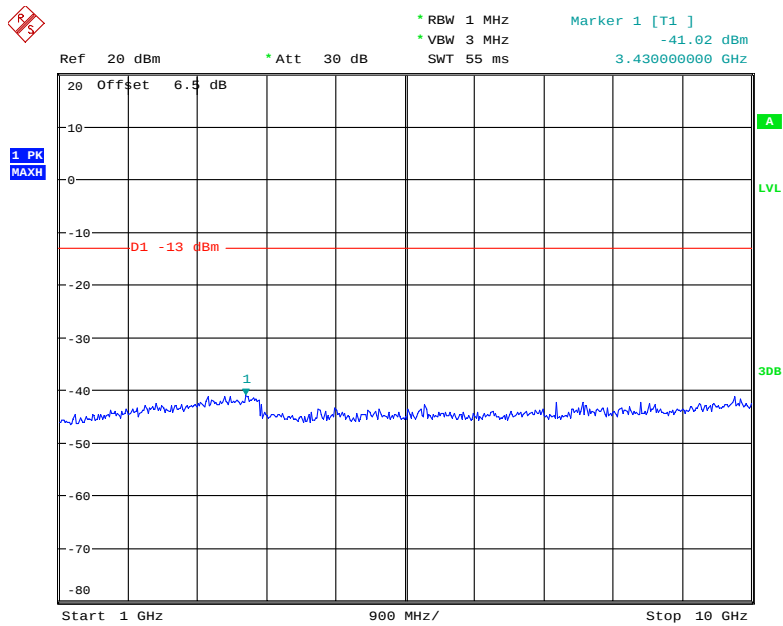
Date: 17.APR.2020 12:58:50

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



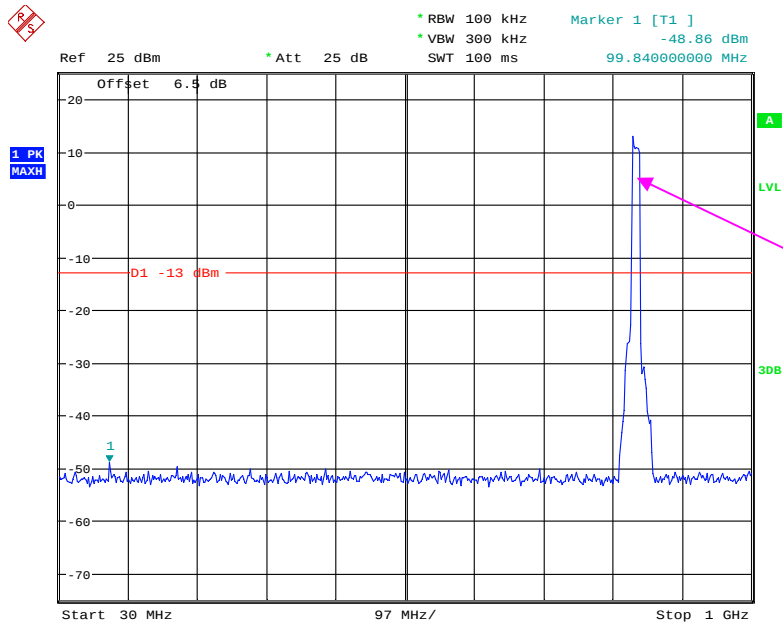
Date: 17.APR.2020 12:59:11

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



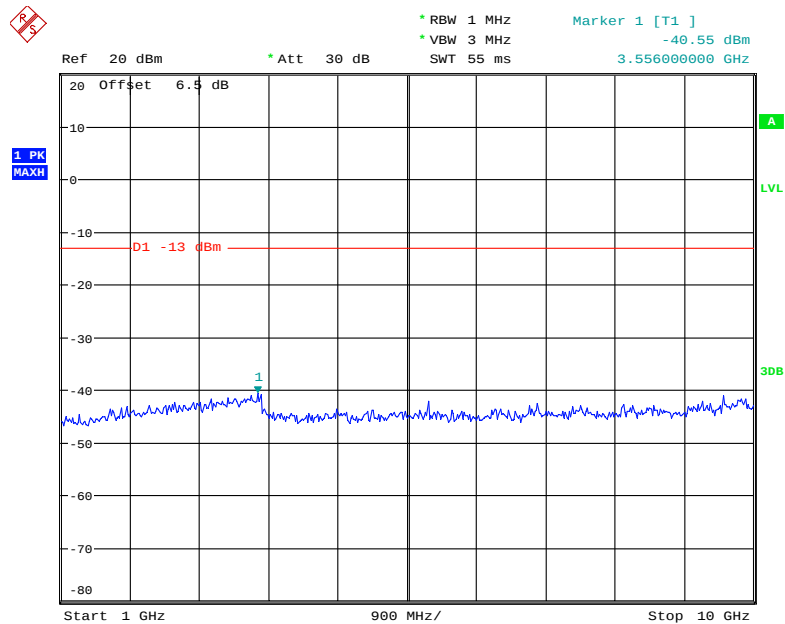
Date: 17.APR.2020 12:59:26

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

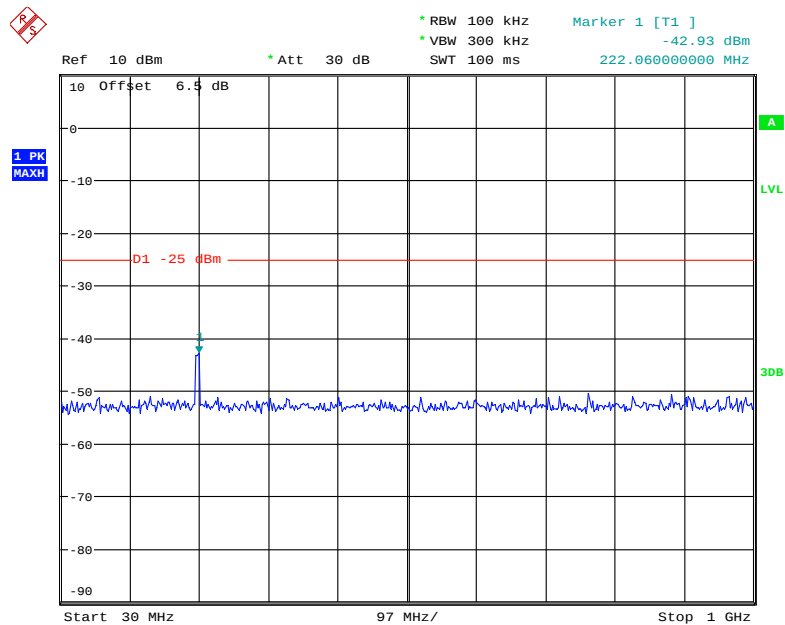


Fundamental test

Date: 17.APR.2020 12:59:43

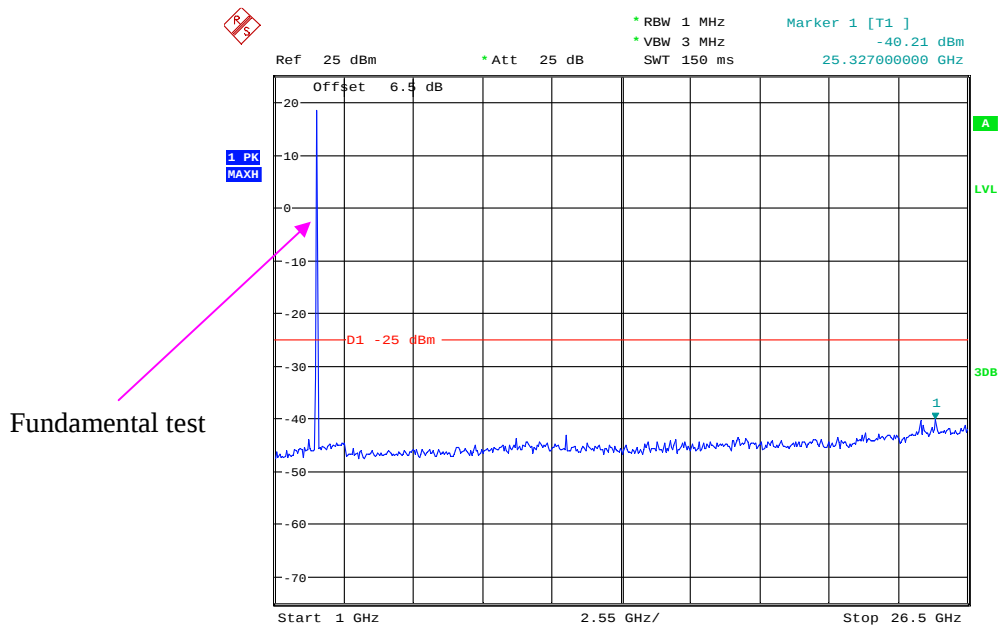
1 GHz – 10 GHz (10.0 MHz, Middle Channel)

Date: 17.APR.2020 12:59:55

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

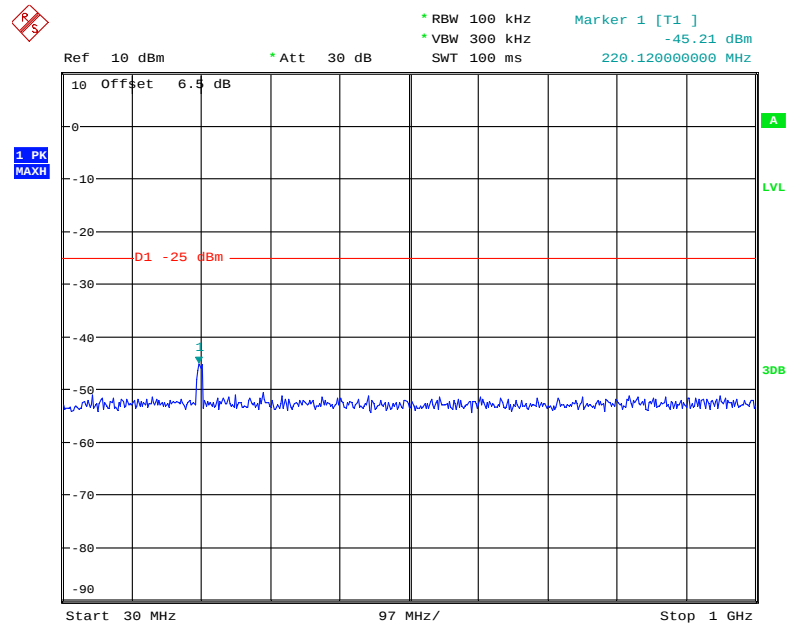
Date: 17.APR.2020 13:00:15

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



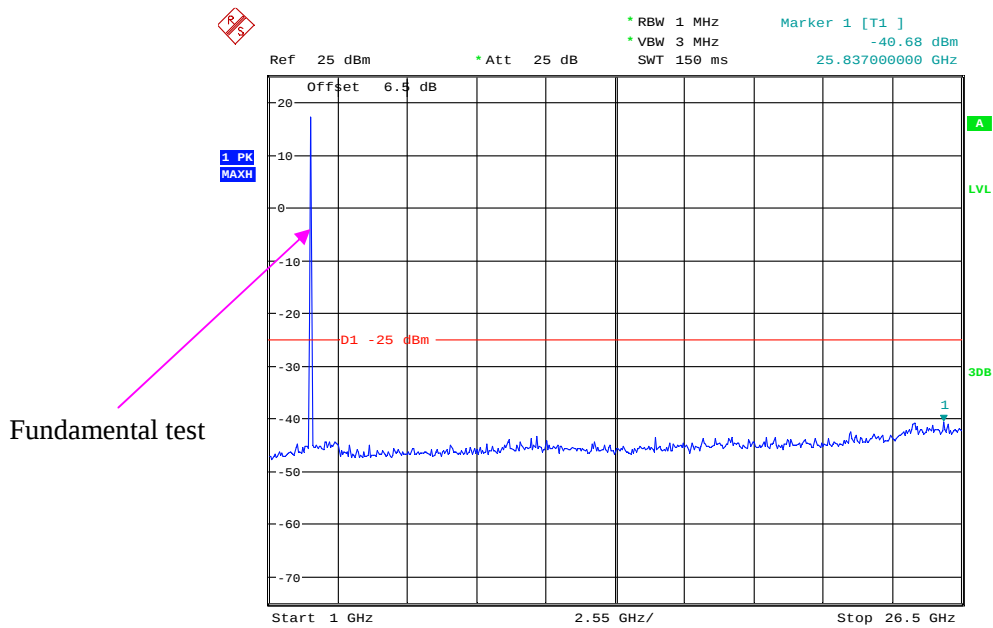
Date: 17.APR.2020 13:00:27

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



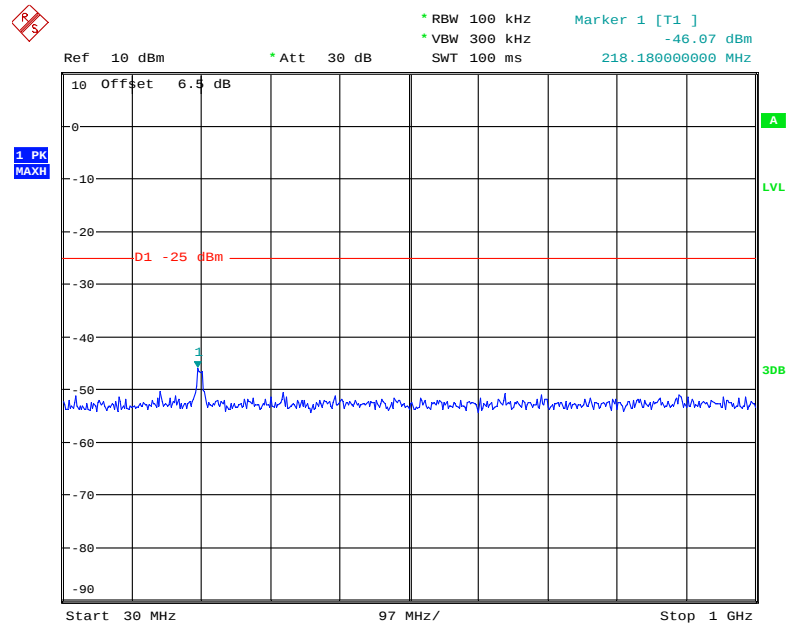
Date: 17.APR.2020 13:00:45

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



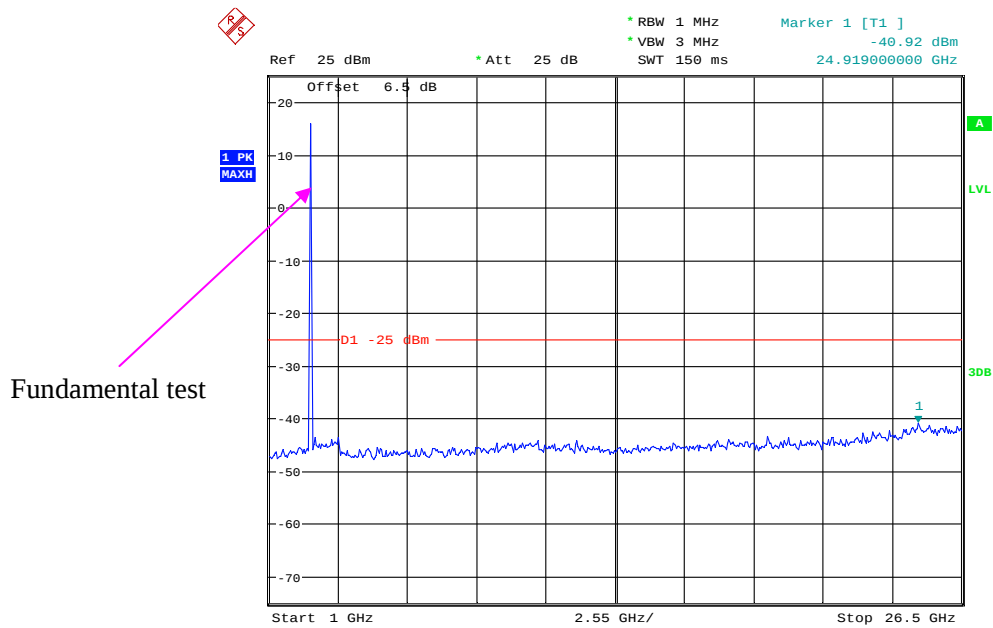
Date: 17.APR.2020 13:00:56

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



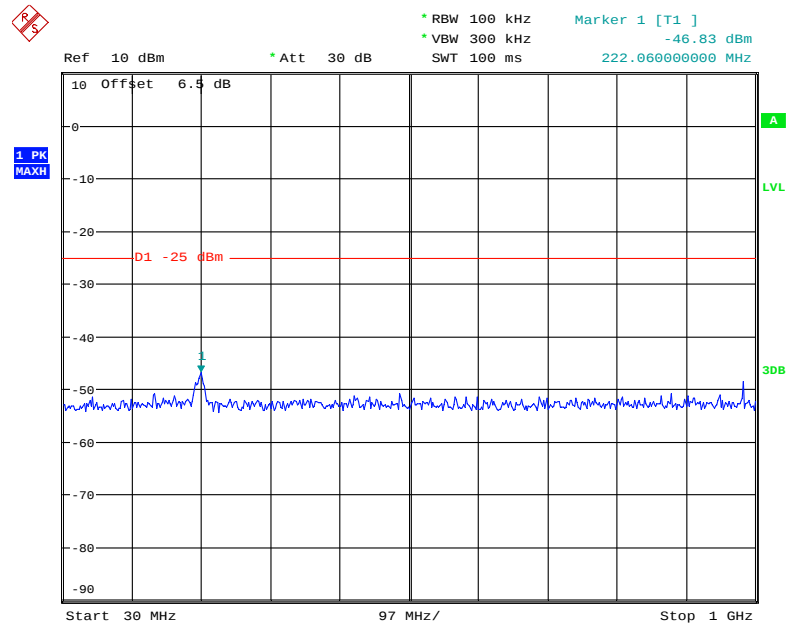
Date: 17.APR.2020 13:01:15

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



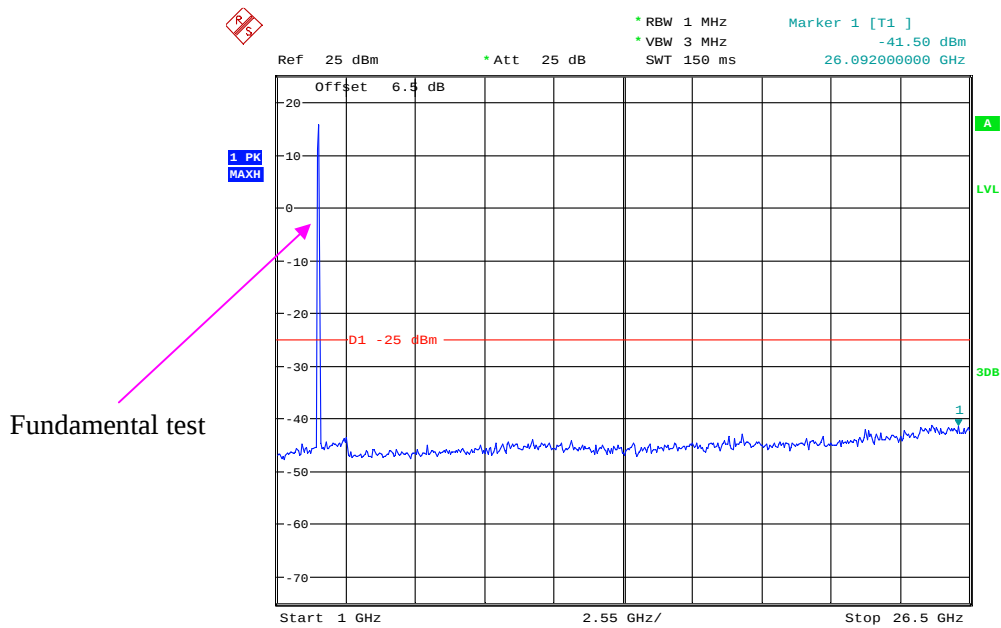
Date: 17.APR.2020 13:01:27

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



Date: 17.APR.2020 13:01:47

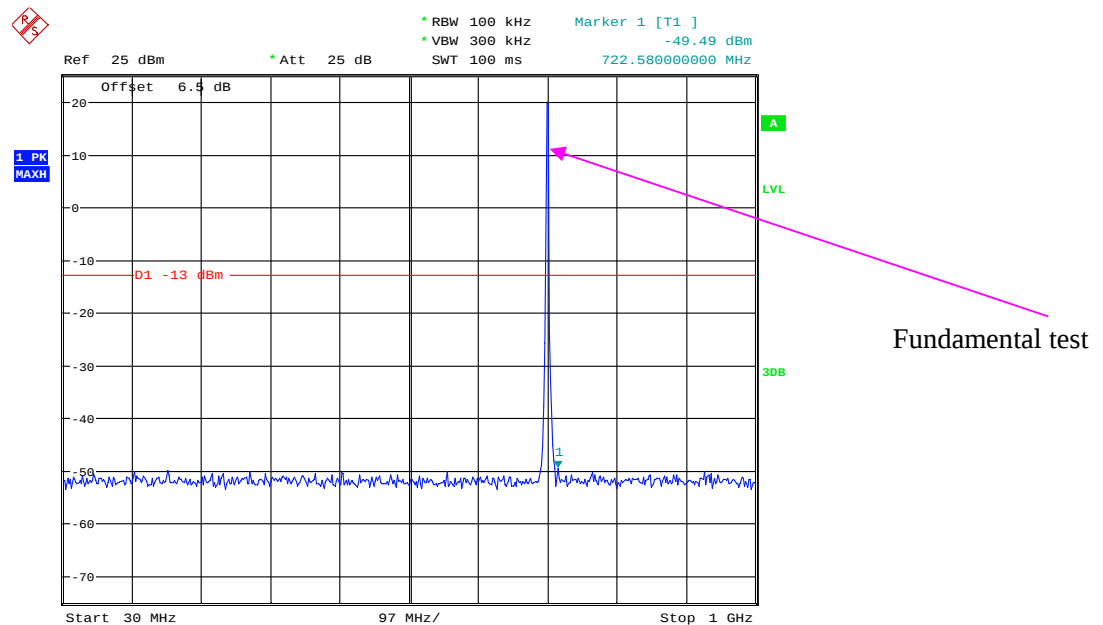
1 GHz – 26.5 GHz (20.0 MHz, Middle Channel)



Date: 17.APR.2020 13:01:58

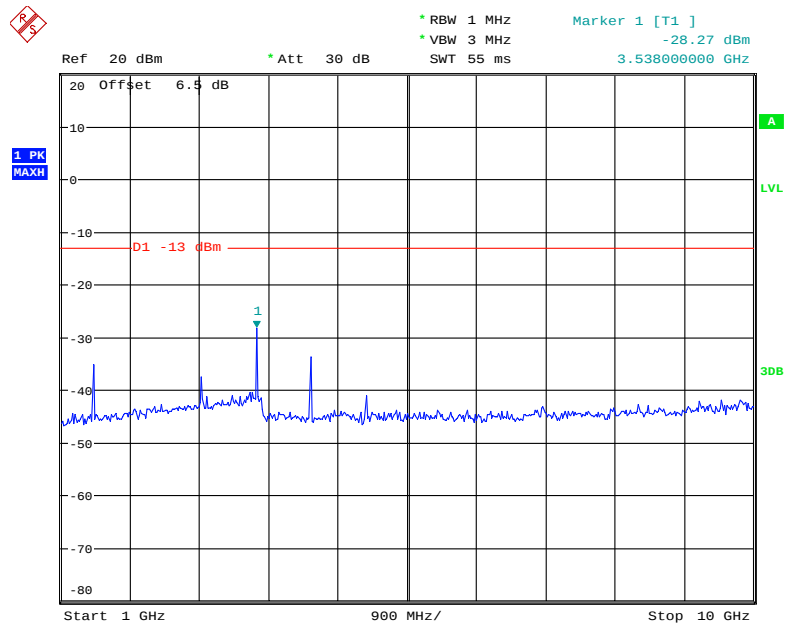
LTE Band 12:

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



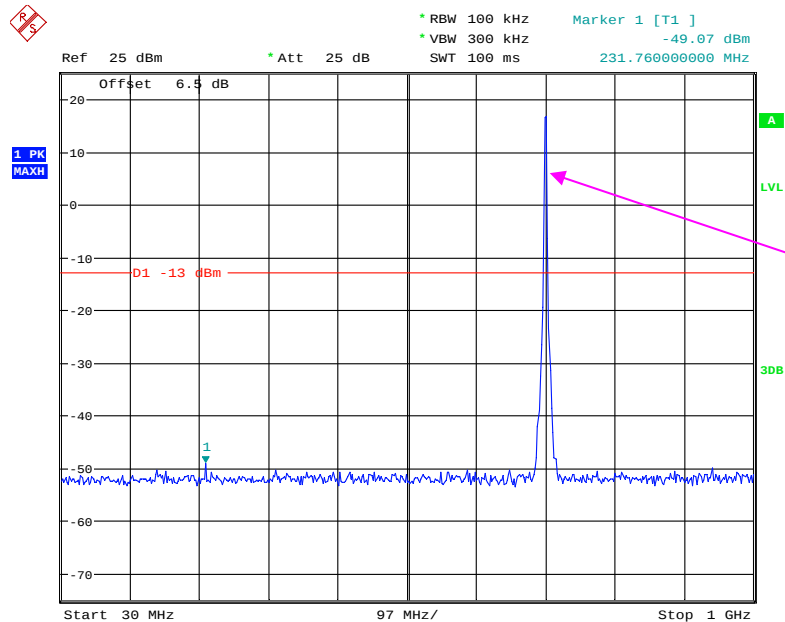
Date: 17.APR.2020 13:02:18

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



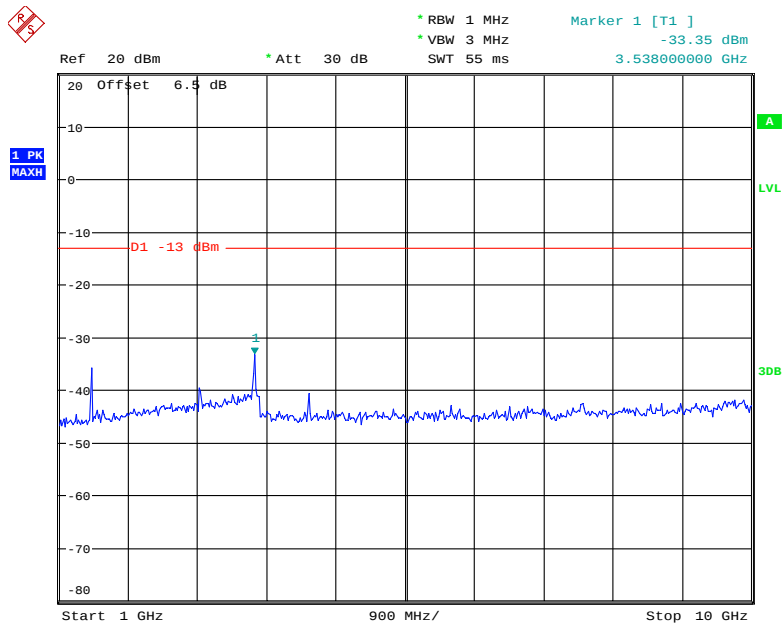
Date: 17.APR.2020 13:02:30

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



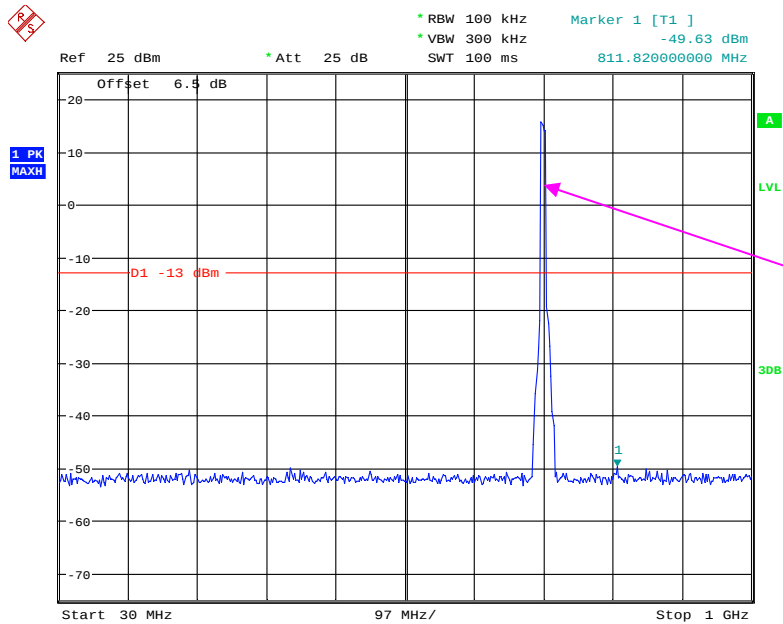
Date: 17.APR.2020 13:02:48

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



Date: 17.APR.2020 13:02:59

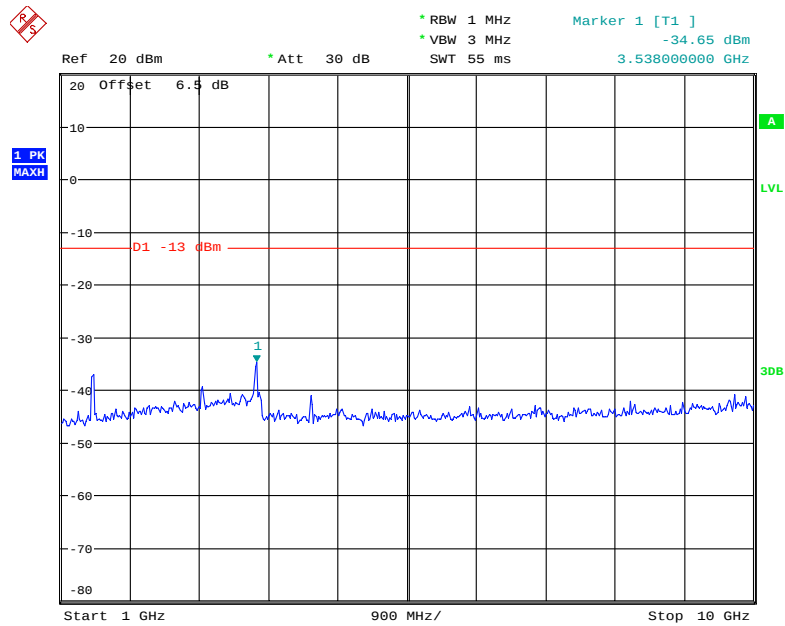
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

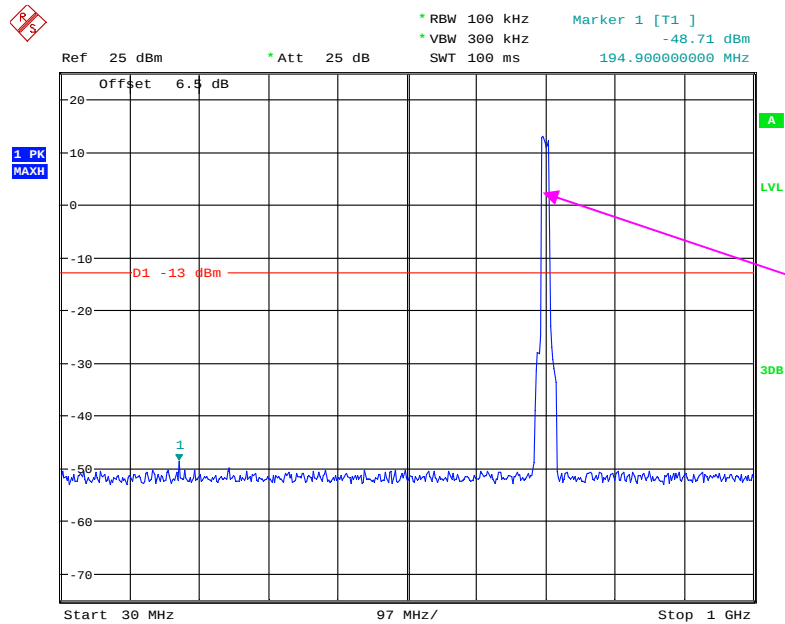
Date: 17.APR.2020 13:03:17

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



Date: 17.APR.2020 13:03:28

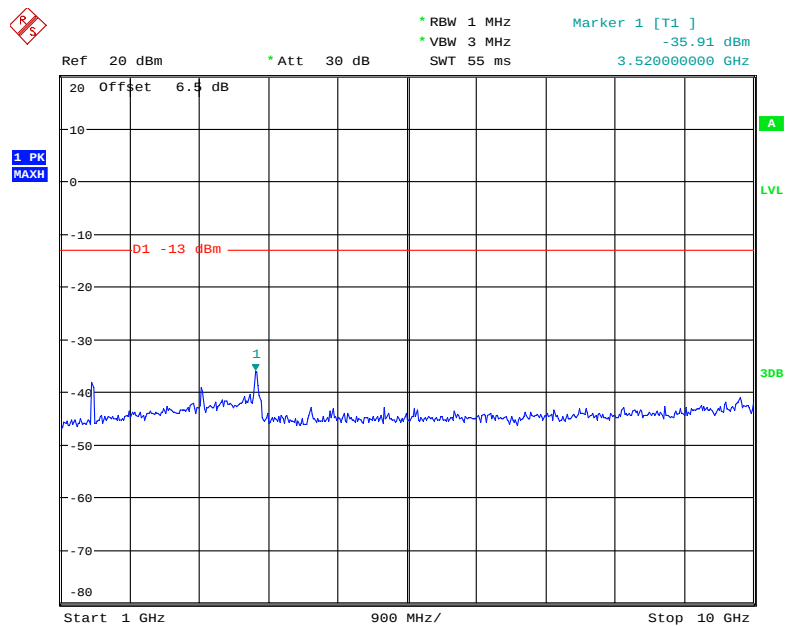
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 17.APR.2020 13:03:49

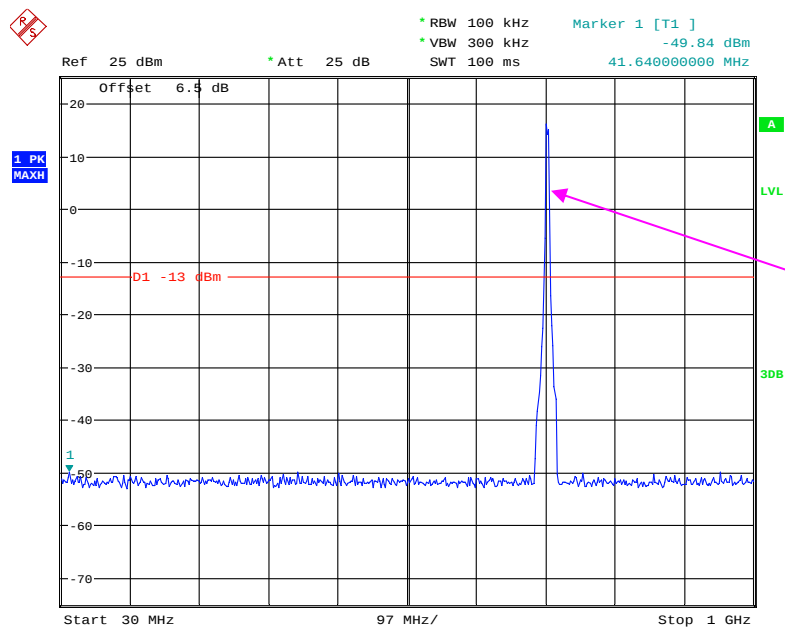
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 17.APR.2020 13:04:01

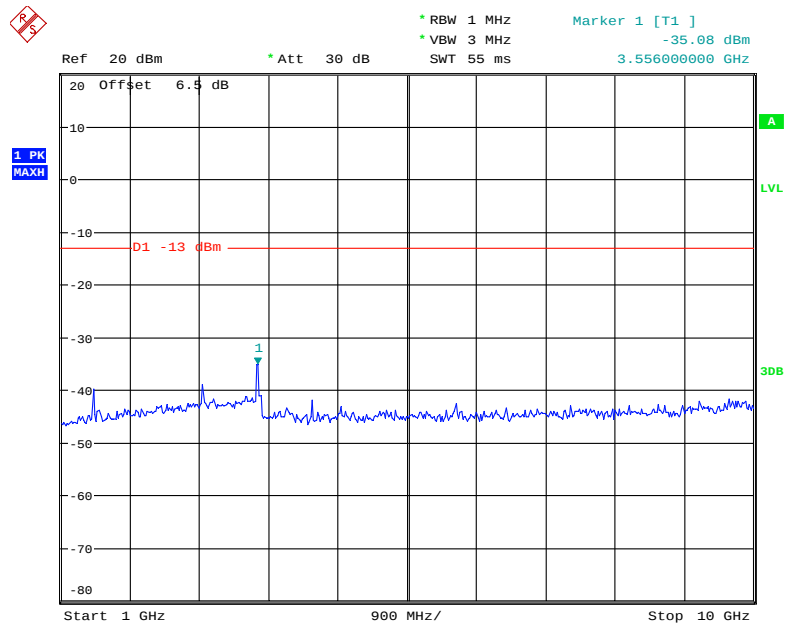
LTE Band 17:

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



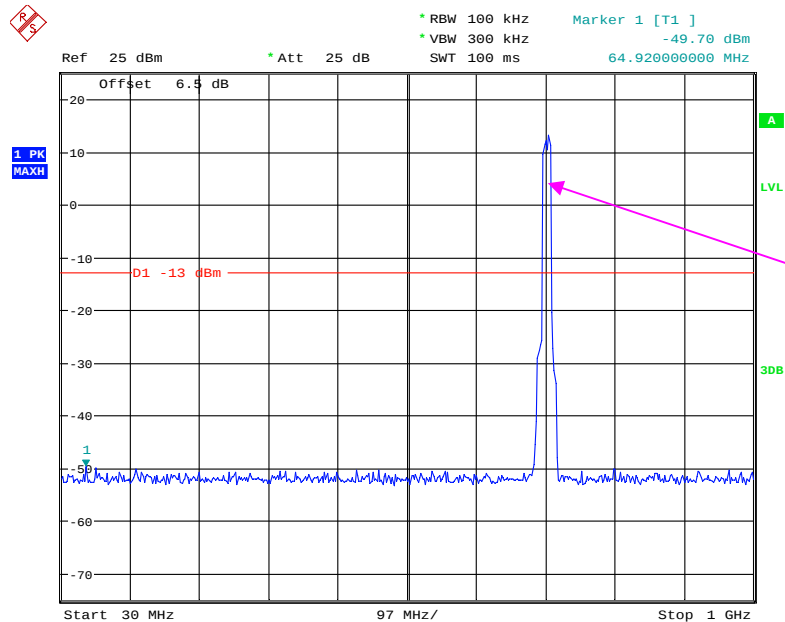
Date: 17.APR.2020 13:04:23

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



Date: 17.APR.2020 13:04:35

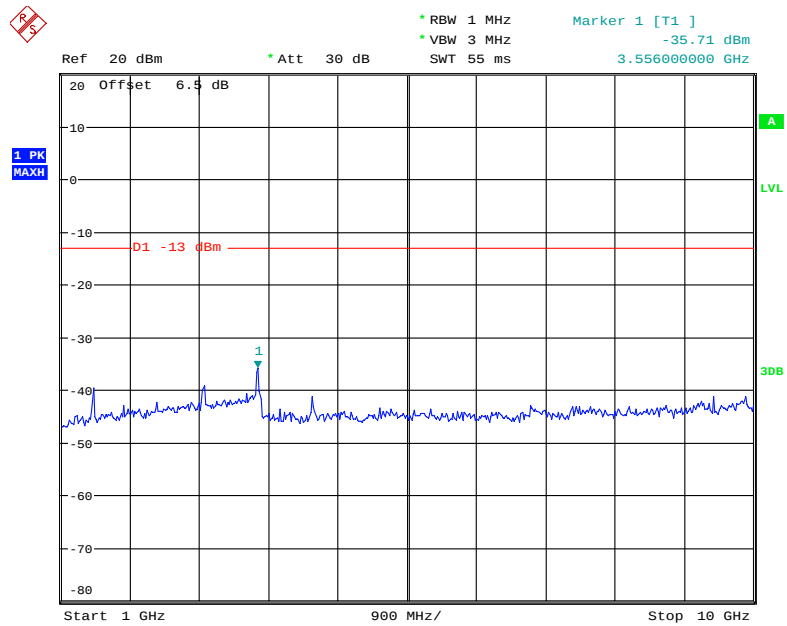
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 17.APR.2020 13:04:52

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



Date: 17.APR.2020 13:05:04

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

The testing was performed by Zero Yan and Leo Huang on 2020-04-07 and 2020-04-08.

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										
952.3	37.25	64	2.2	H	-63.3	1.37	0.0	-64.67	-13	51.67
952.3	38.41	123	1.6	V	-60.9	1.37	0.0	-62.27	-13	49.27
1673.20	50.66	326	2.4	H	-56.1	1.30	8.90	-48.50	-13	35.50
1673.20	45.48	85	1.3	V	-60.7	1.30	8.90	-53.10	-13	40.10
2509.80	45.70	136	1.9	H	-58.3	2.60	10.20	-50.70	-13	37.70
2509.80	46.83	152	2.1	V	-56.6	2.60	10.20	-49.00	-13	36.00
3346.40	43.50	30	2.1	H	-57.5	1.50	11.70	-47.30	-13	34.30
3346.40	44.23	344	2.1	V	-56.8	1.50	11.70	-46.60	-13	33.60
WCDMA Mode, Middle channel										
953.4	37.32	159	1.5	H	-63.3	1.37	0.0	-64.67	-13	51.67
953.4	38.24	288	1.1	V	-61.1	1.37	0.0	-62.47	-13	49.47
3760.00	52.85	2	1.3	H	-49.2	1.50	11.80	-38.90	-13	25.90
3760.00	51.42	39	2.4	V	-50.2	1.50	11.80	-39.90	-13	26.90

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										
962.5	37.32	197	1.8	H	-63.3	1.37	0.0	-64.67	-13	51.67
962.5	38.04	330	2.1	V	-61.3	1.37	0.0	-62.67	-13	49.67
1673.20	44.72	180	1.3	H	-61.6	1.30	8.90	-54.00	-13	41.00
1673.20	43.07	33	1.7	V	-62.7	1.30	8.90	-55.10	-13	42.10
2509.80	43.44	297	1.0	H	-59.9	2.60	10.20	-52.30	-13	39.30
2509.80	46.74	100	1.7	V	-56.0	2.60	10.20	-48.40	-13	35.40
3346.40	46.74	94	2.2	H	-54.2	1.50	11.70	-44.00	-13	31.00
3346.40	42.89	288	2.4	V	-58.0	1.50	11.70	-47.80	-13	34.80
WCDMA Mode Band II, Middle channel										
953.8	37.22	136	1.5	H	-63.4	1.37	0.0	-64.77	-13	51.77
953.8	38.04	250	1.1	V	-61.3	1.37	0.0	-62.67	-13	49.67
3760.00	44.84	237	1.7	H	-57.2	1.50	11.80	-46.90	-13	33.90
3760.00	45.85	157	1.0	V	-55.7	1.50	11.80	-45.40	-13	32.40

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										
946.5	37.02	332	2.3	H	-63.6	1.37	0.0	-64.97	-13	51.97
946.5	38.24	34	1.8	V	-61.1	1.37	0.0	-62.47	-13	49.47
3465.20	44.74	300	1.5	H	-56.0	1.50	12.00	-45.50	-13	32.50
3465.20	45.16	5	2.1	V	-56.3	1.50	12.00	-45.80	-13	32.80

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										
957.4	37.24	128	2.3	H	-63.4	1.37	0.0	-64.77	-13	51.77
957.4	38.26	94	1.9	V	-61.1	1.37	0.0	-62.47	-13	49.47
3760.00	45.25	59	2.1	H	-57.9	1.50	11.80	-47.60	-13	34.60
3760.00	44.24	266	1.2	V	-58.4	1.50	11.80	-48.10	-13	35.10
Band 4 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 20 GHz										
959.3	37.42	91	1.7	H	-63.2	1.37	0.0	-64.57	-13	51.57
959.3	38.19	237	1.7	V	-61.2	1.37	0.0	-62.57	-13	49.57
3465.00	46.66	65	2.2	H	-54.8	1.50	12.00	-44.30	-13	31.30
3465.00	44.57	110	1.4	V	-57.7	1.50	12.00	-47.20	-13	34.20
Band 5 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 10 GHz										
960.0	37.31	102	2.2	H	-63.3	1.37	0.0	-64.67	-13	51.67
960.0	38.63	85	2.3	V	-60.7	1.37	0.0	-62.07	-13	49.07
1673.00	44.12	350	1.6	H	-62.2	1.30	8.90	-54.60	-13	41.60
1673.00	43.85	134	2.4	V	-61.9	1.30	8.90	-54.30	-13	41.30
Band 7 (5 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 26.5GHz										
949.3	37.21	157	2.5	H	-63.4	1.37	0.0	-64.77	-25	39.77
949.3	38.52	175	1.0	V	-60.8	1.37	0.0	-62.17	-25	37.17
5070.00	46.81	333	2.2	H	-53.2	1.60	12.10	-42.70	-25	17.70
5070.00	46.32	122	1.6	V	-53.7	1.60	12.10	-43.20	-25	18.20
Band 12 (1.4 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 10GHz										
956.7	37.29	225	1.4	H	-63.3	1.37	0.0	-64.67	-13	51.67
956.7	38.53	3	1.1	V	-60.8	1.37	0.0	-62.17	-13	49.17
1415.00	52.14	195	1.1	H	-56.0	1.60	7.90	-49.70	-13	36.70
1415.00	48.94	123	1.5	V	-59.5	1.60	7.90	-53.20	-13	40.20
Band 17 (5 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 10GHz										
960.3	37.43	210	1.4	H	-63.2	1.37	0.0	-64.57	-13	51.57
960.3	38.69	180	1.5	V	-60.7	1.37	0.0	-62.07	-13	49.07
1420.00	53.00	114	1.3	H	-56.00	1.6	7.9	-49.70	-13	36.70
1420.00	49.12	226	1.8	V	-58.74	1.6	7.9	-52.44	-13	39.44

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.

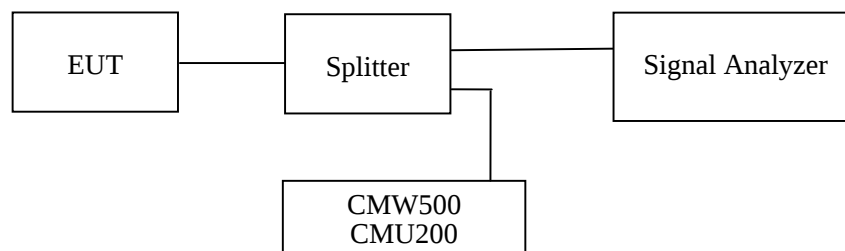
According to § 24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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**

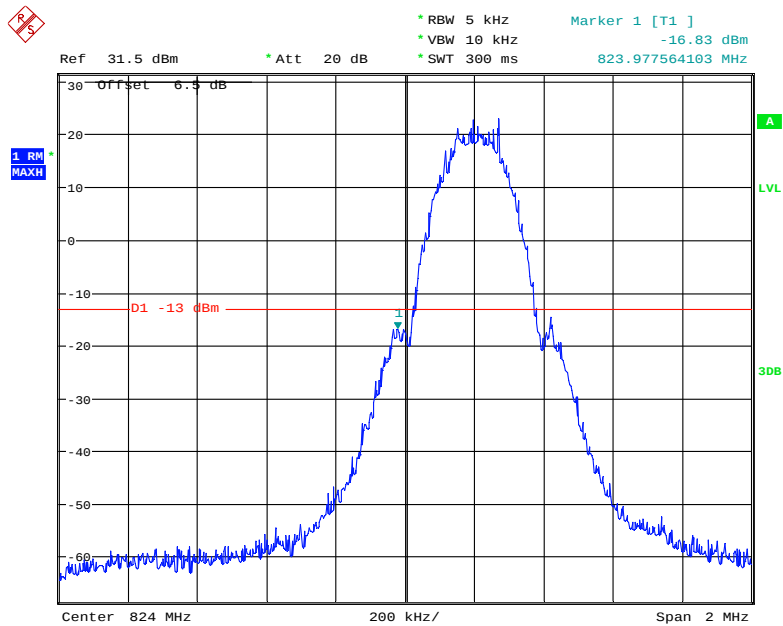
Temperature:	23~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Gavin Guo from 2020-04-15 to 2020-05-12.

EUT operation mode: Transmitting

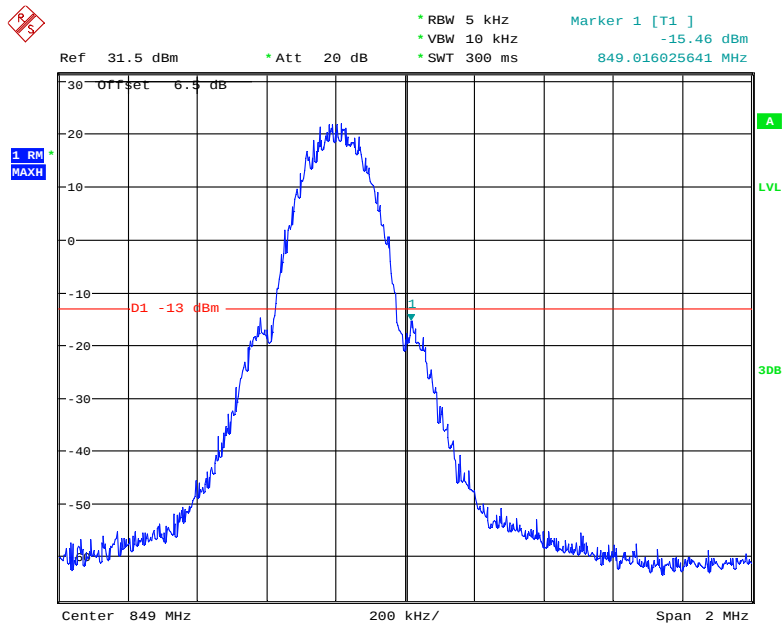
Test Result: Compliance. Please refer to the following plots.

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



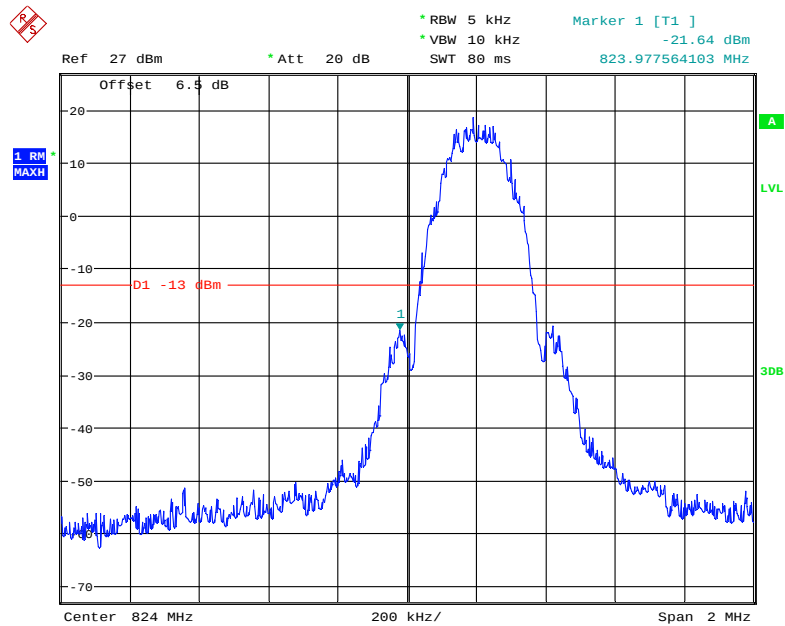
Date: 15.APR.2020 21:04:01

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



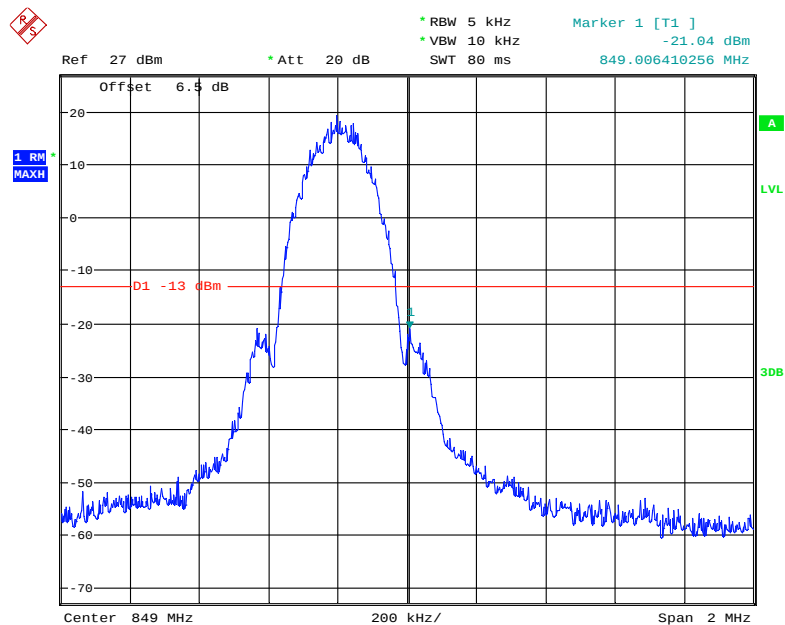
Date: 15.APR.2020 21:05:06

Cellular Band, Left Band Edge for EDGE Mode



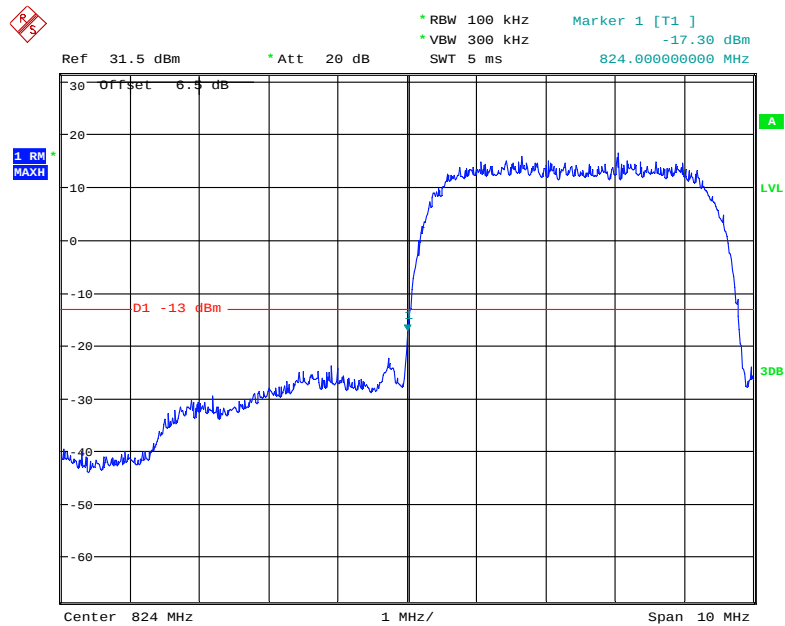
Date: 16.APR.2020 00:18:36

Cellular Band, Right Band Edge for EDGE Mode



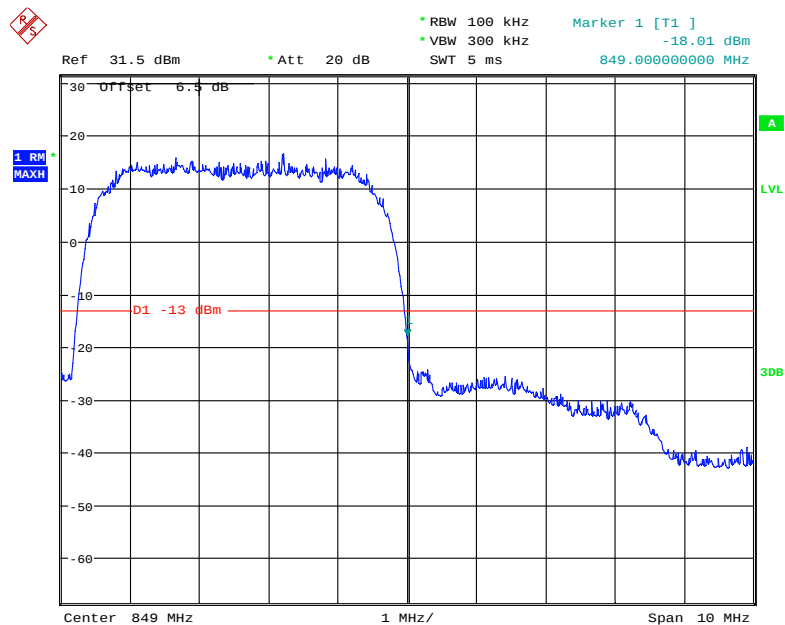
Date: 16.APR.2020 00:19:37

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



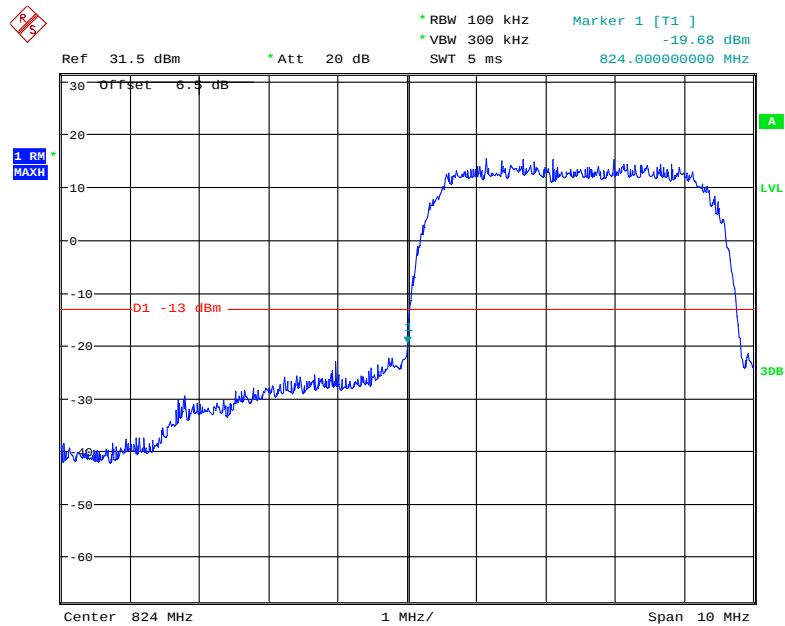
Date: 15.APR.2020 22:23:52

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



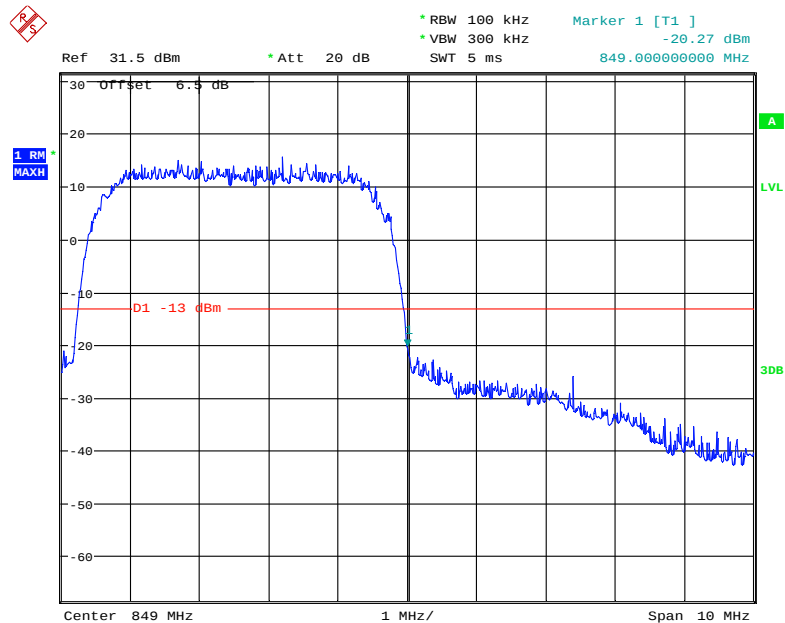
Date: 15.APR.2020 22:24:41

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



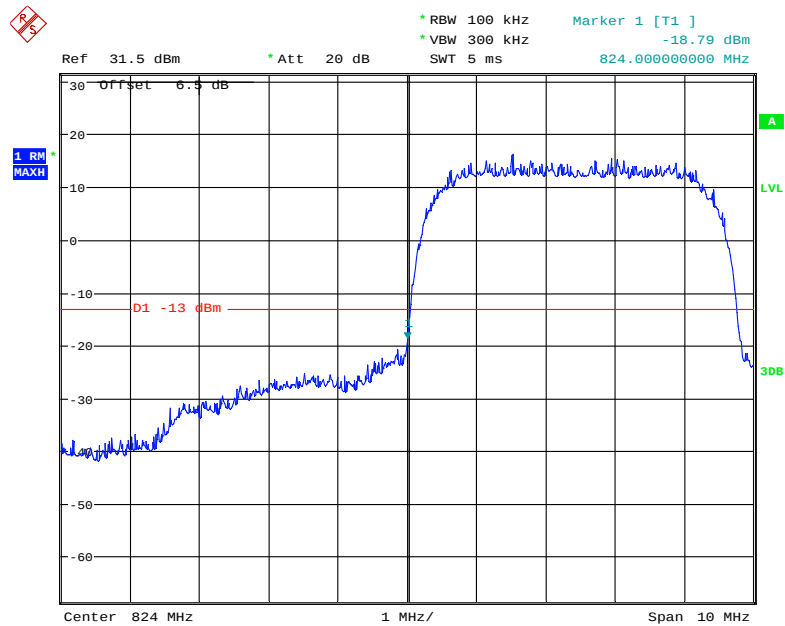
Date: 15.APR.2020 22:23:15

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



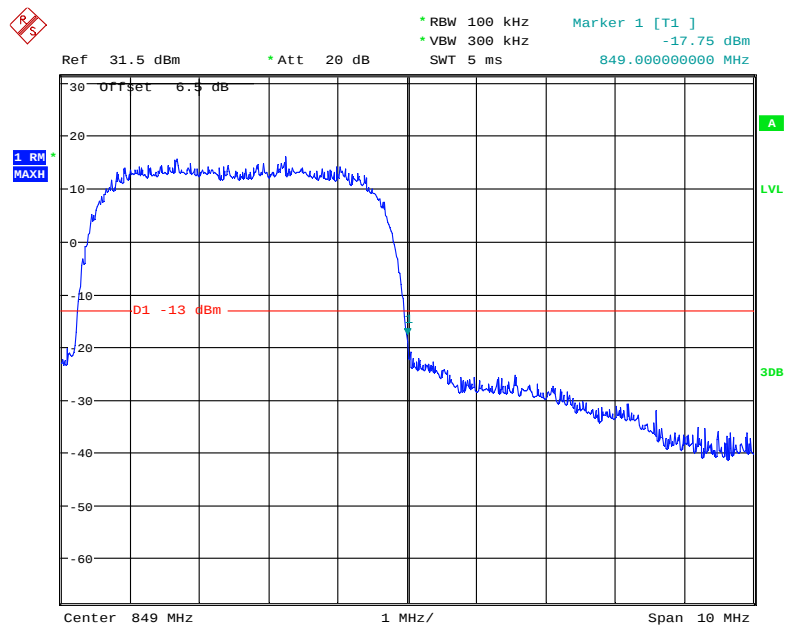
Date: 15.APR.2020 22:25:12

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



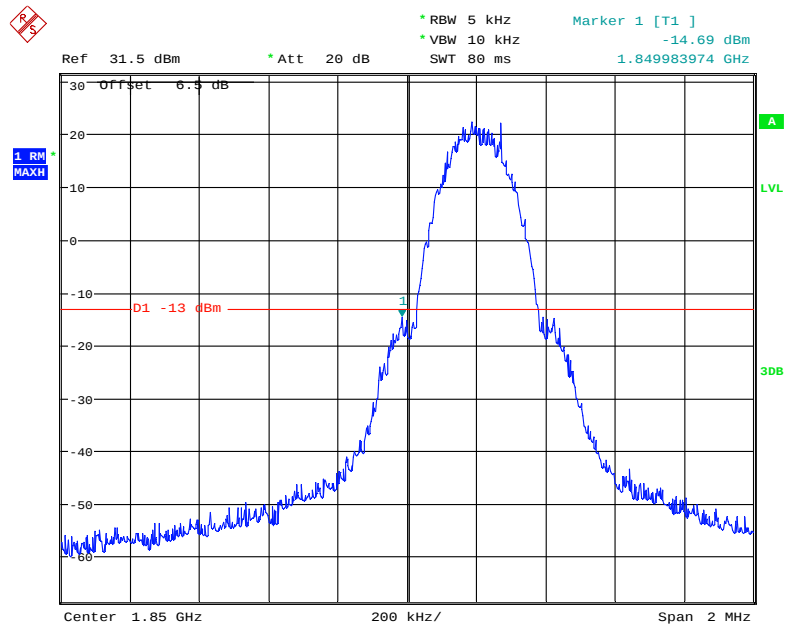
Date: 15.APR.2020 22:22:25

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



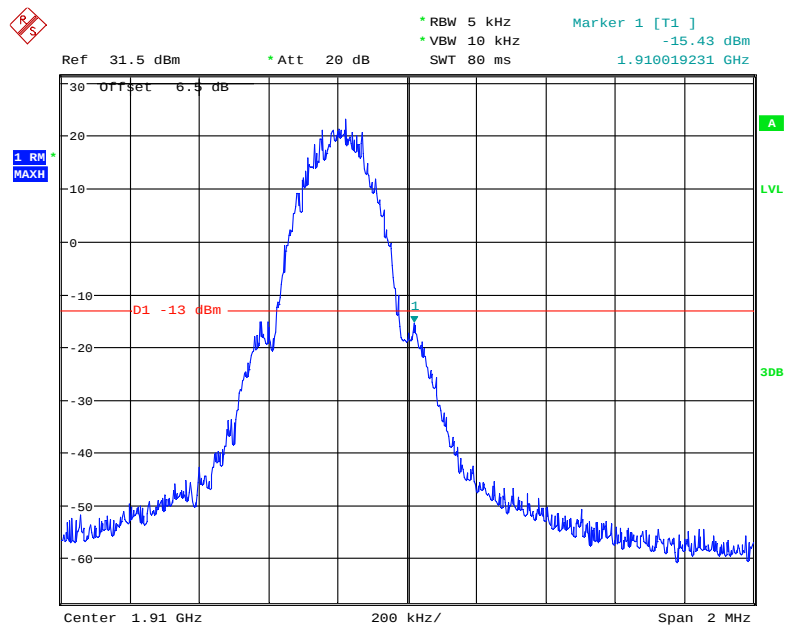
Date: 15.APR.2020 22:26:06

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



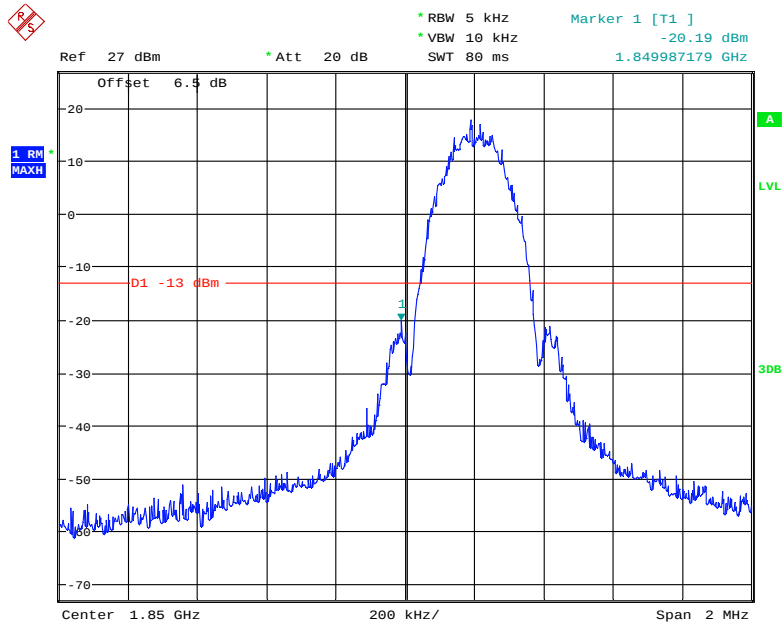
Date: 15.APR.2020 20:44:07

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



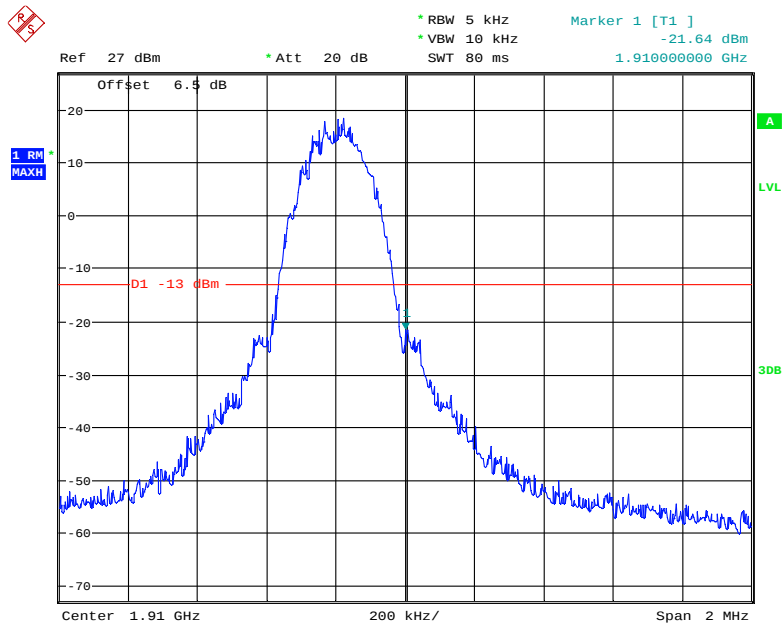
Date: 15.APR.2020 20:45:10

PCS Band, Left Band Edge for EDGE Mode



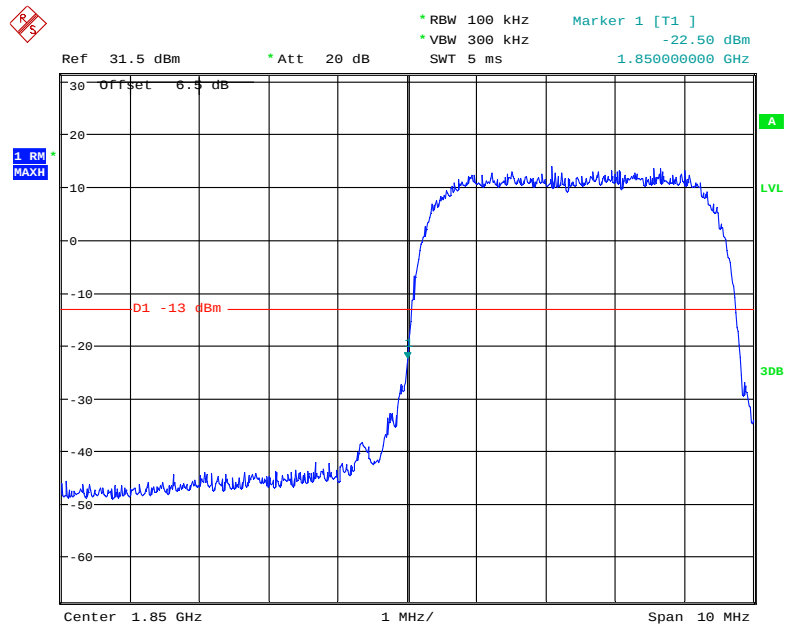
Date: 16.APR.2020 00:09:52

PCS Band, Right Band Edge for EDGE Mode



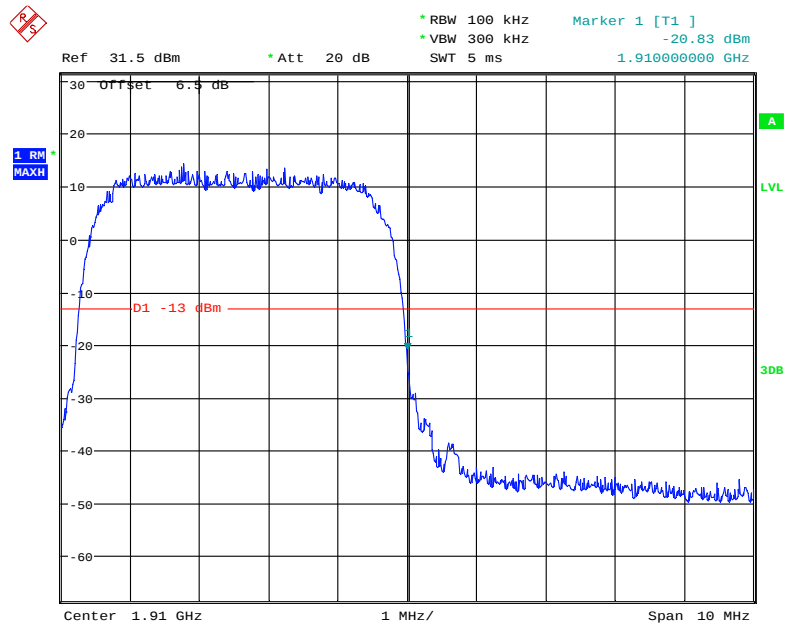
Date: 16.APR.2020 00:11:33

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



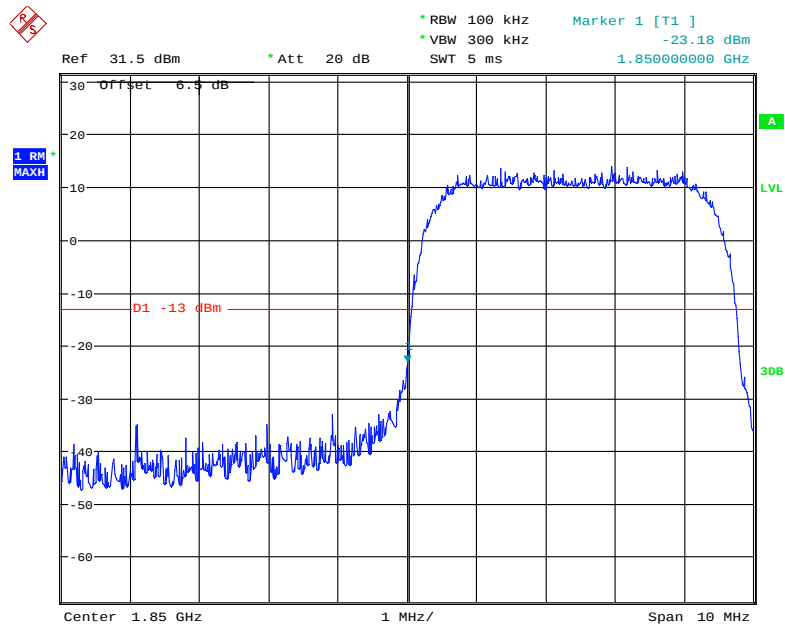
Date: 15.APR.2020 21:28:41

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



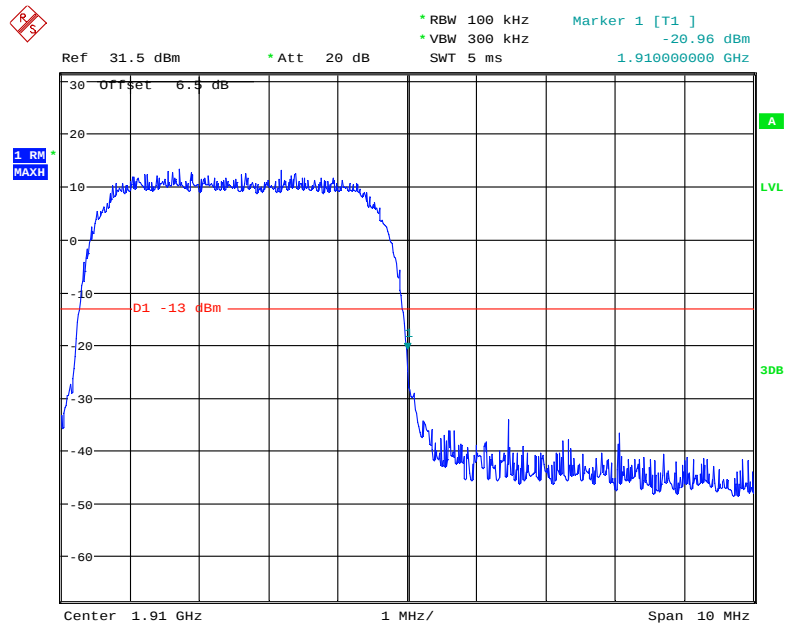
Date: 15.APR.2020 21:26:28

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



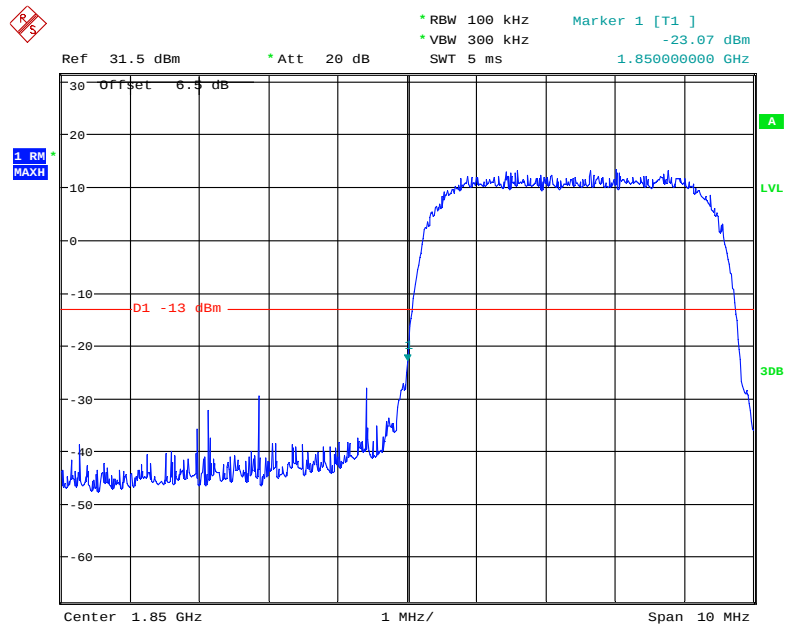
Date: 15.APR.2020 21:24:41

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



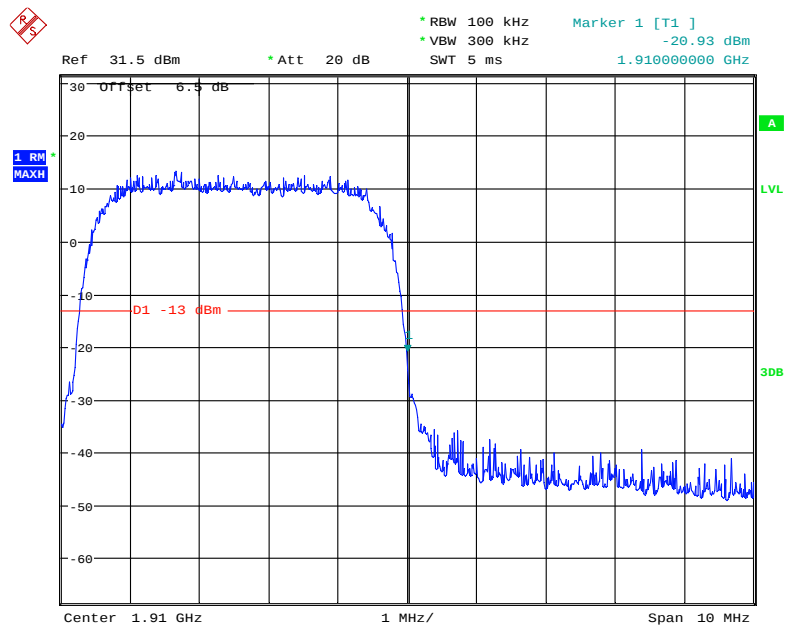
Date: 15.APR.2020 21:25:55

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



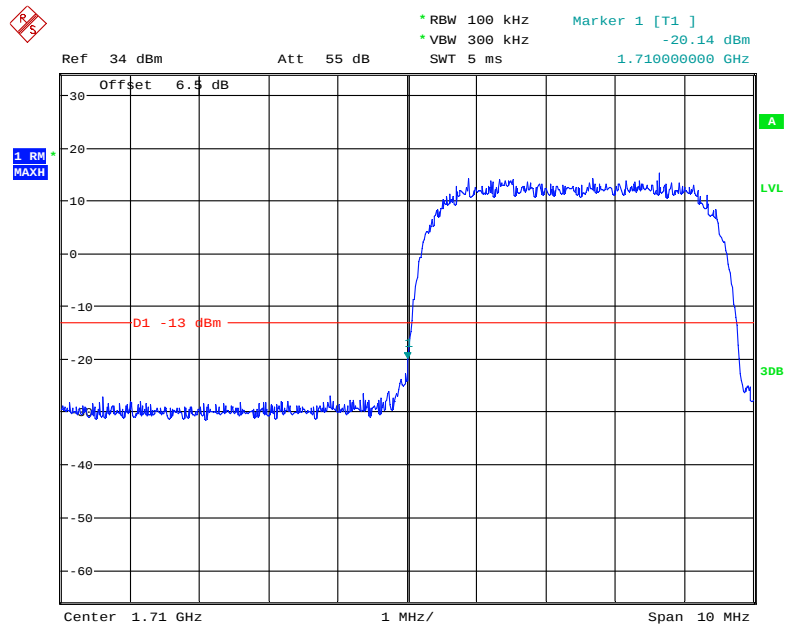
Date: 15.APR.2020 21:28:04

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



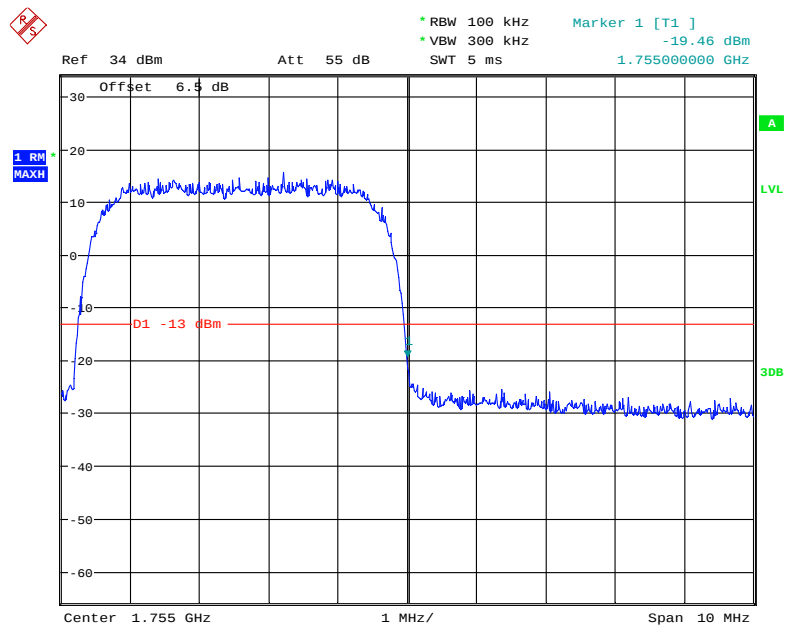
Date: 15.APR.2020 21:27:15

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



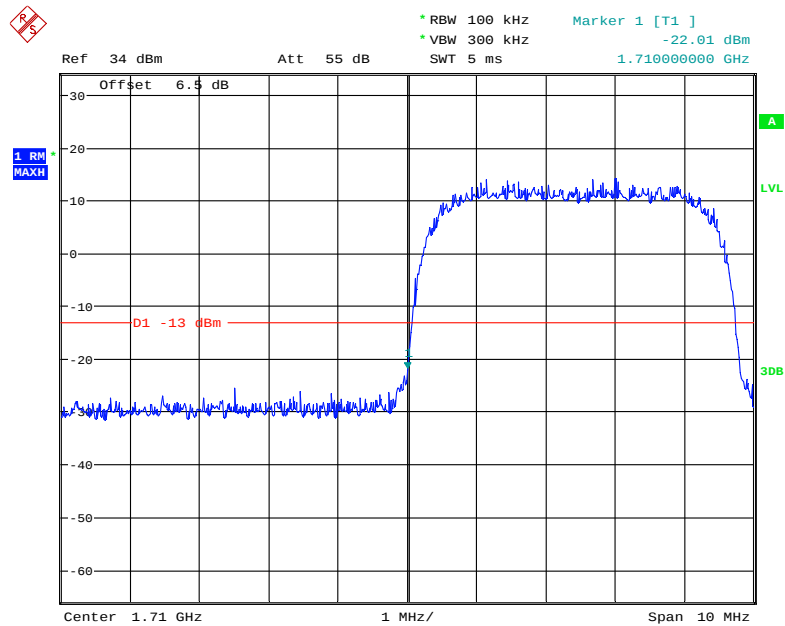
Date: 15.APR.2020 21:57:12

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



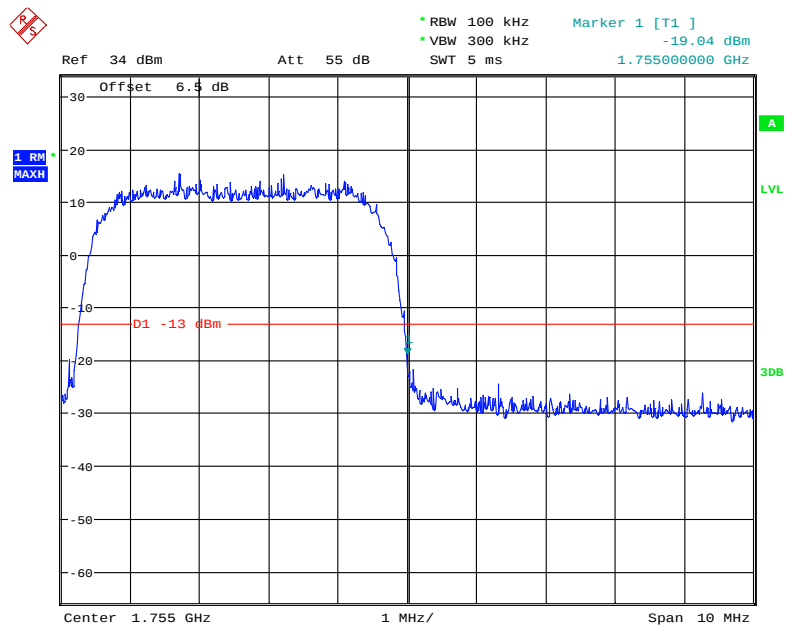
Date: 15.APR.2020 21:58:17

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



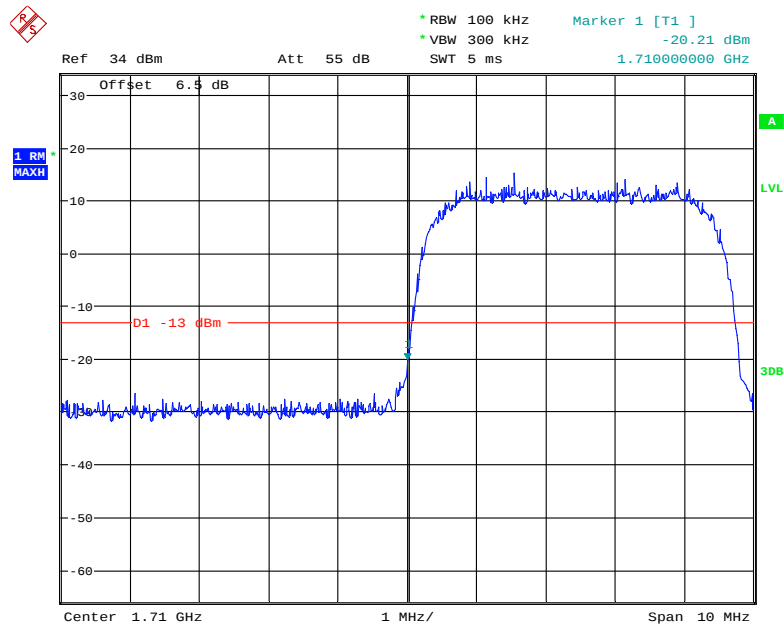
Date: 15.APR.2020 21:55:51

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



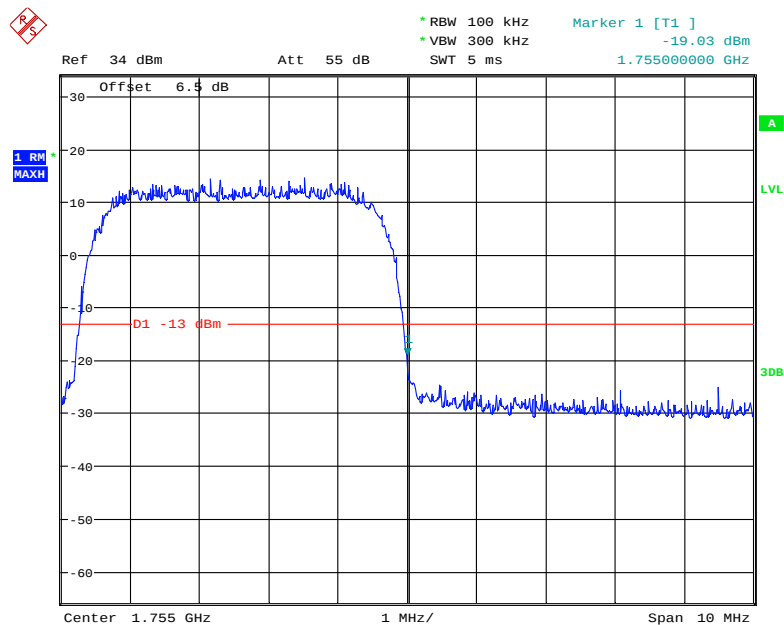
Date: 15.APR.2020 21:59:41

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



Date: 15.APR.2020 21:56:35

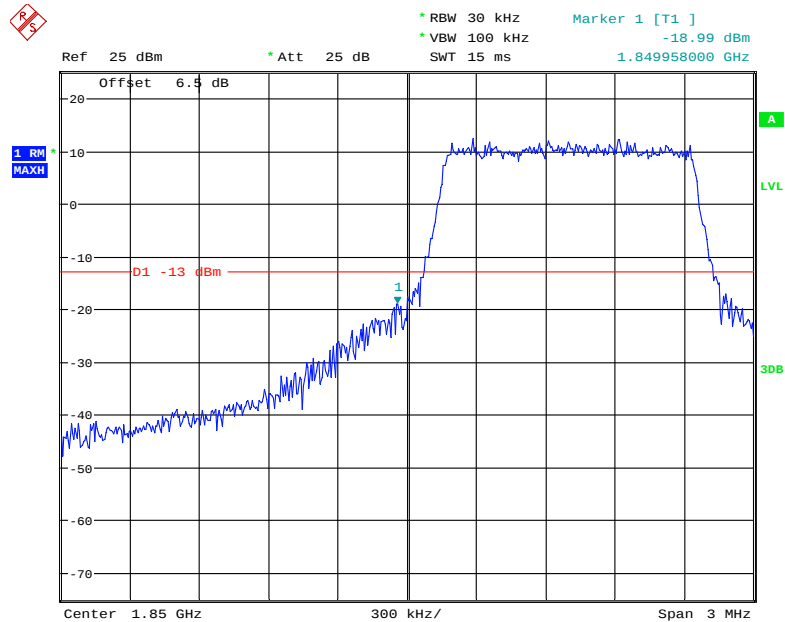
AWS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 15.APR.2020 21:58:50

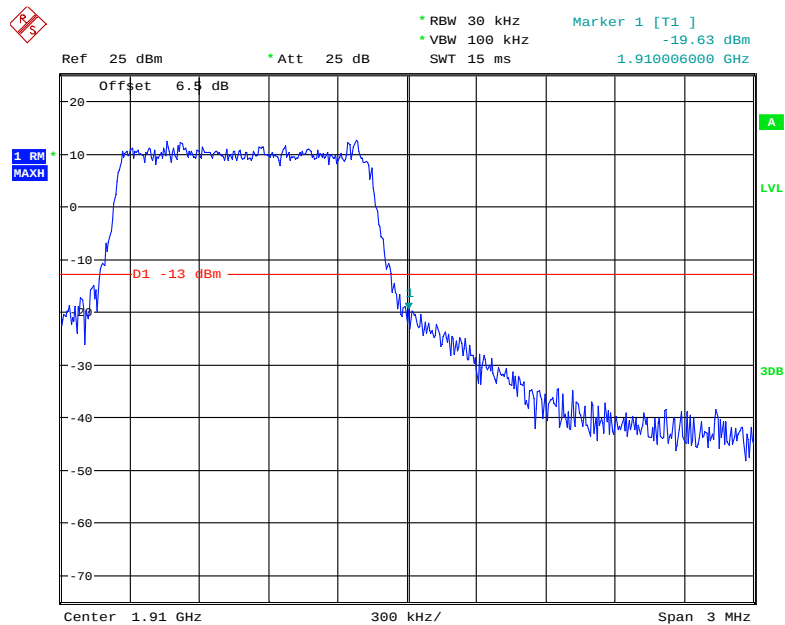
Band 2:

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



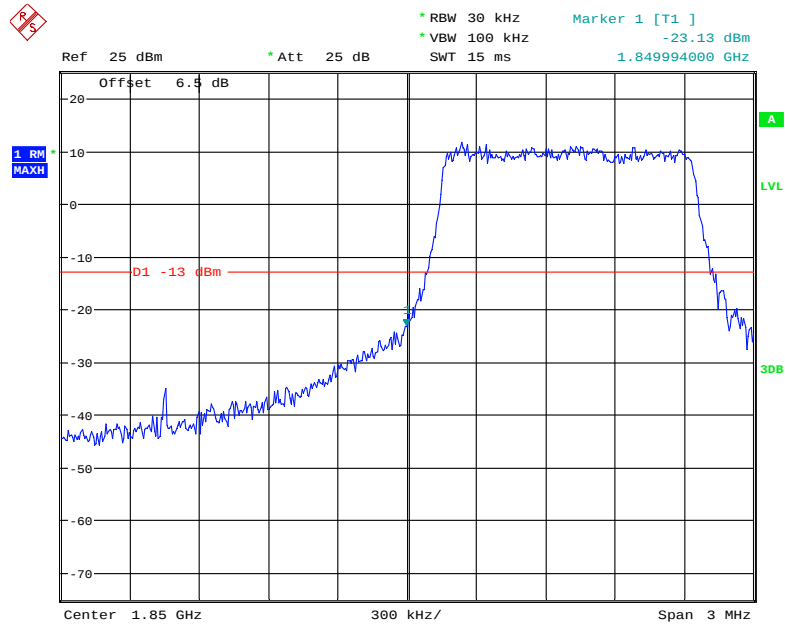
Date: 17.APR.2020 12:14:49

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



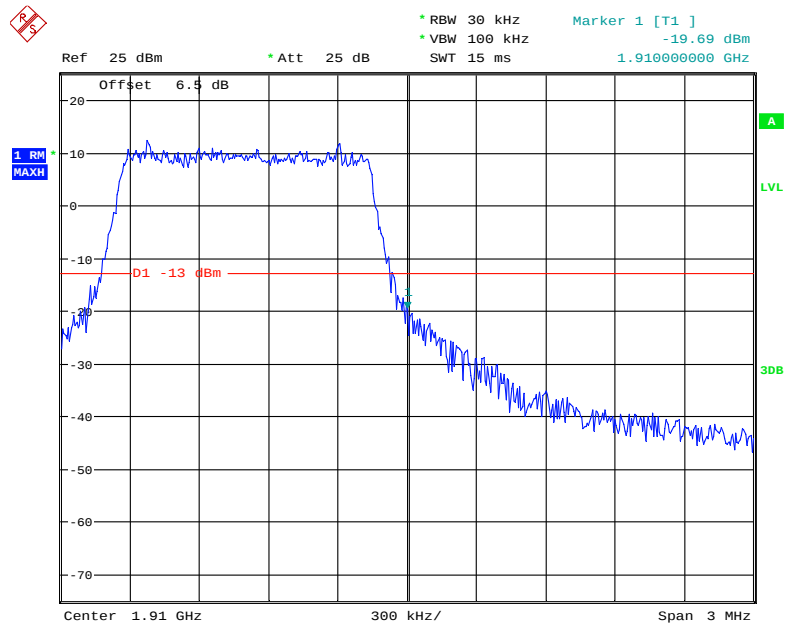
Date: 17.APR.2020 12:15:30

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



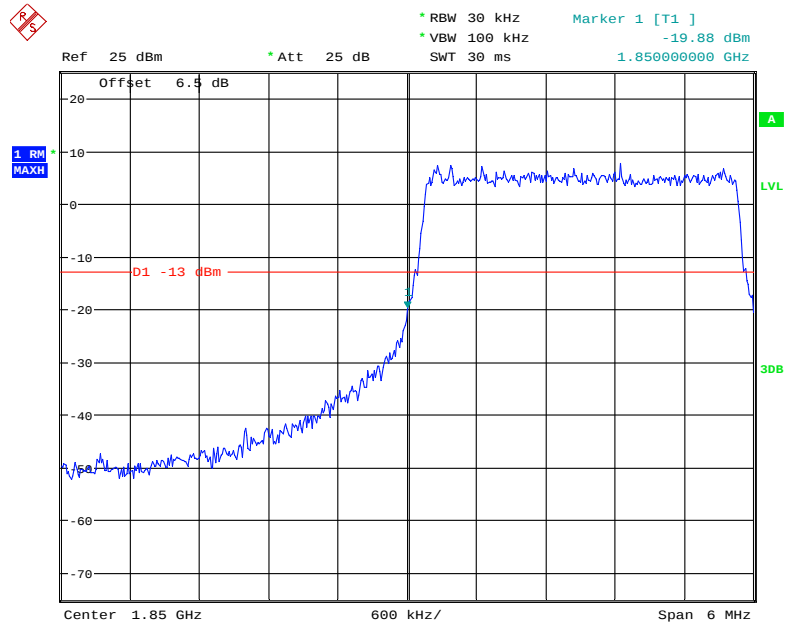
Date: 17.APR.2020 12:15:10

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



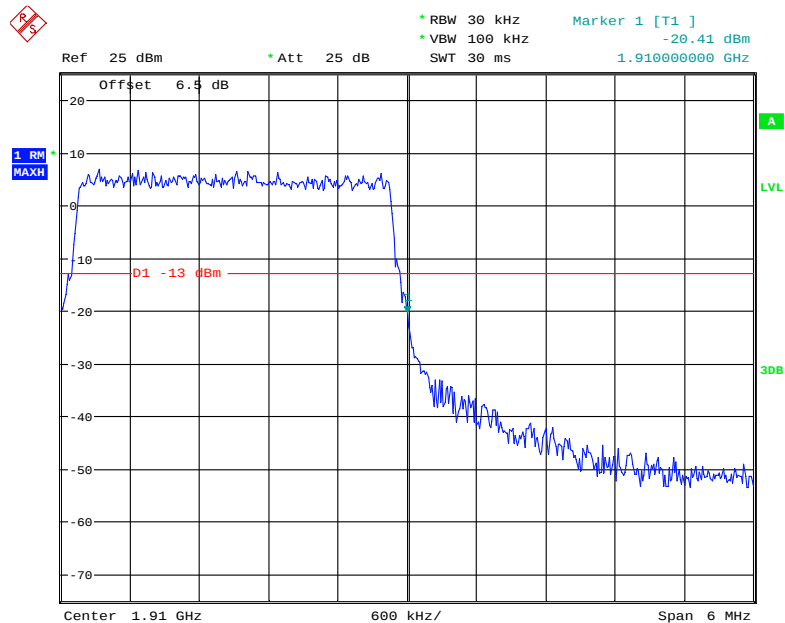
Date: 17.APR.2020 12:15:53

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



Date: 17.APR.2020 12:16:17

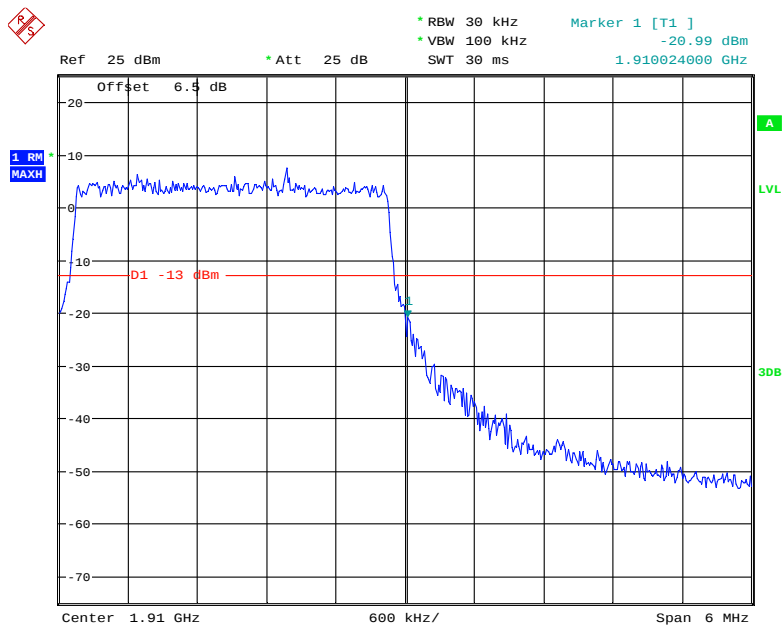
QPSK (3.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2020 12:16:57

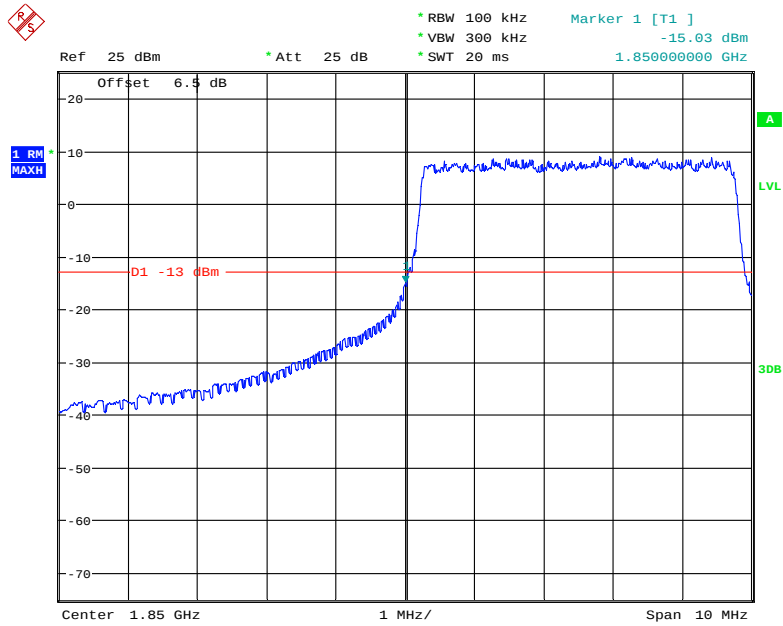
[illegible]

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



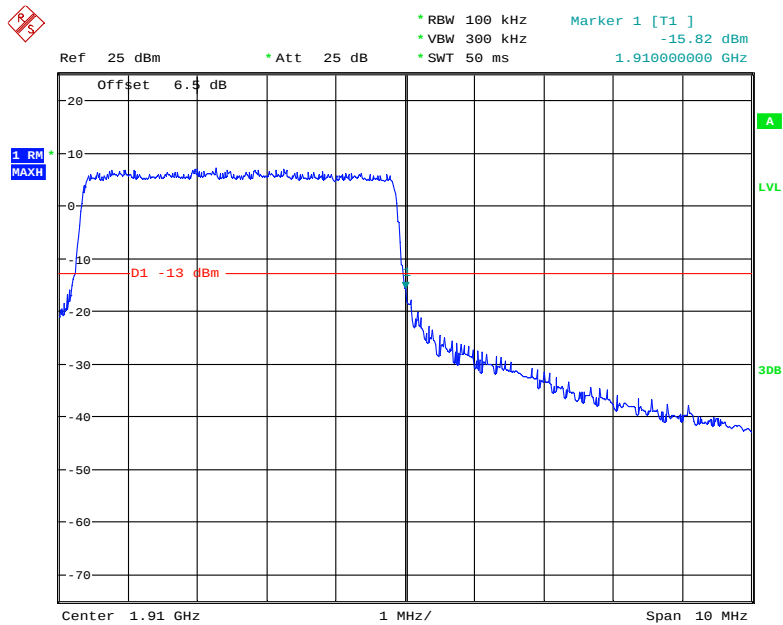
Page 138 of 197

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



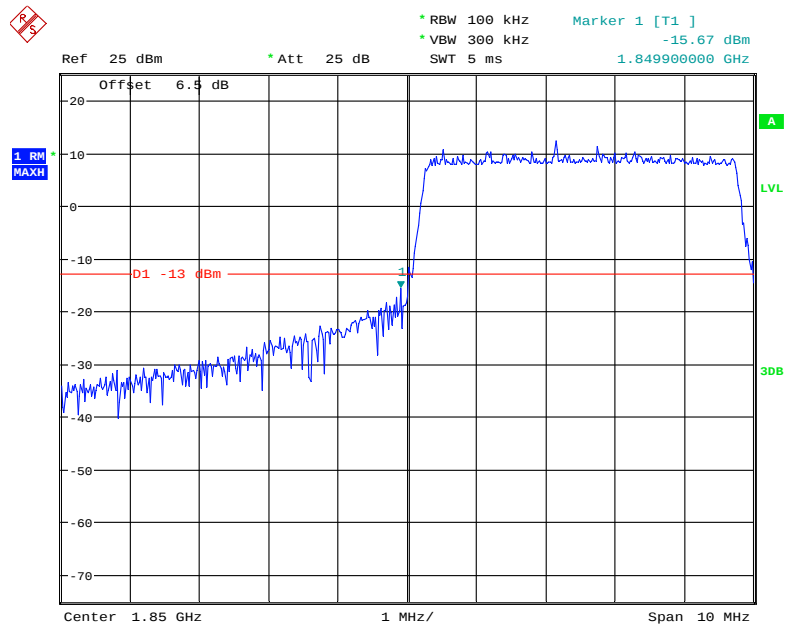
Date: 12.MAY.2020 19:24:13

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



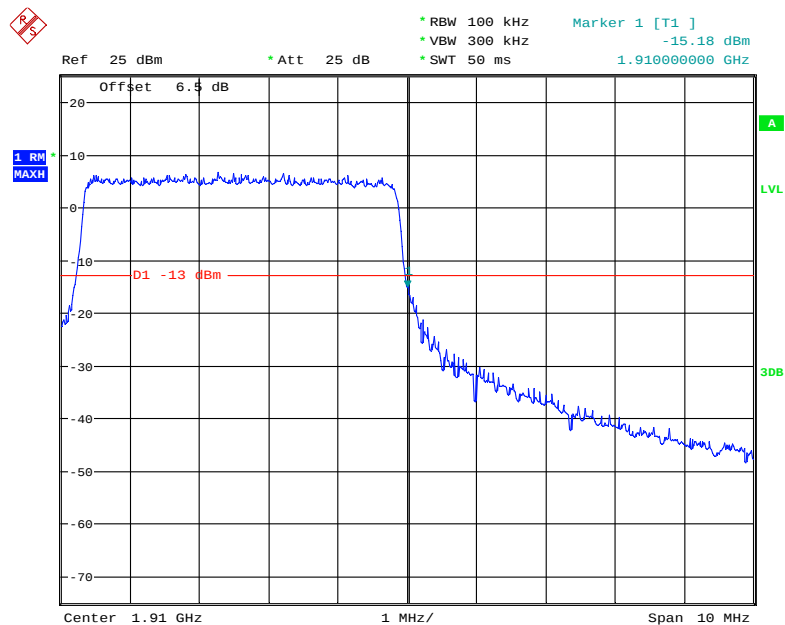
Date: 12.MAY.2020 19:35:55

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



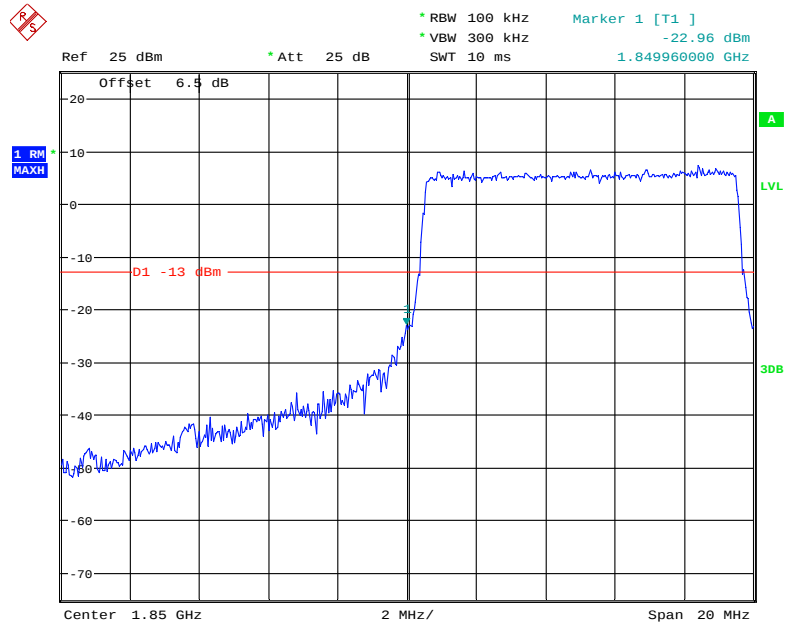
Date: 17.APR.2020 12:18:03

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



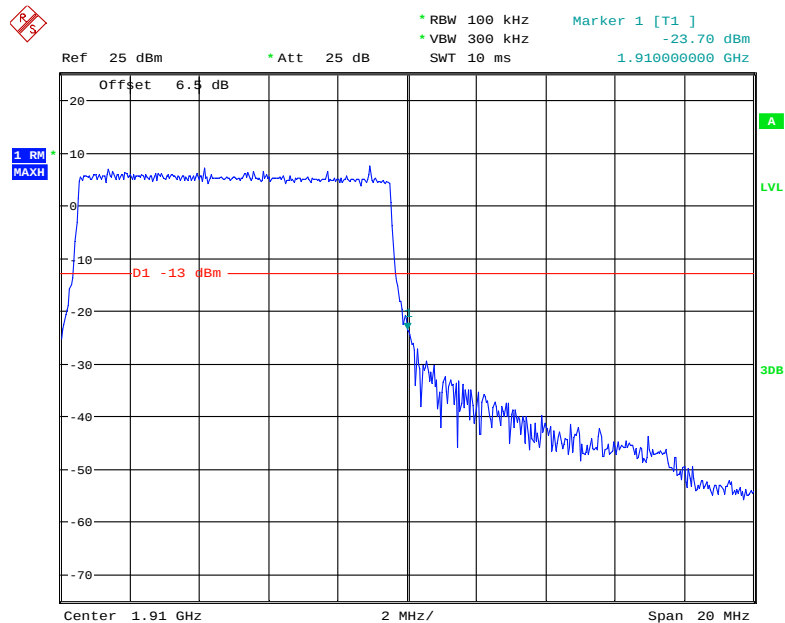
Date: 12.MAY.2020 19:36:59

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



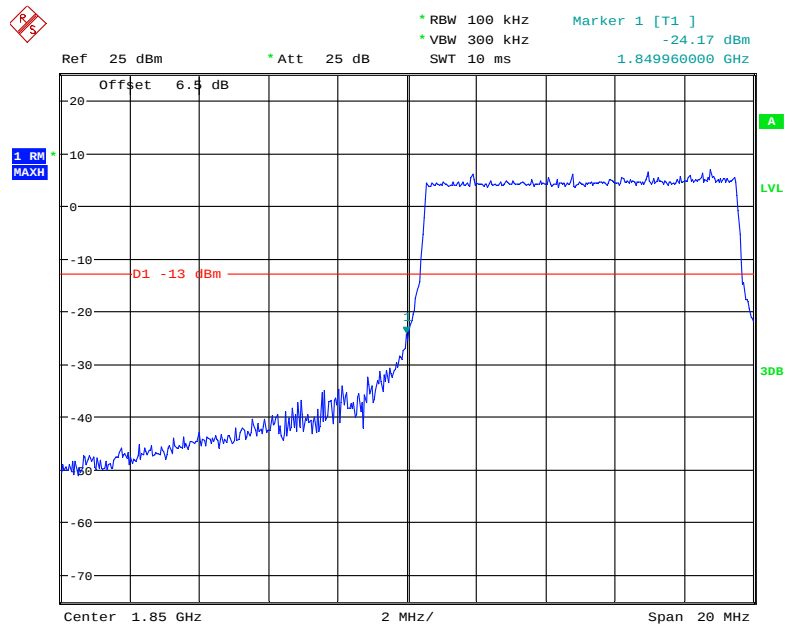
Date: 17.APR.2020 12:19:17

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



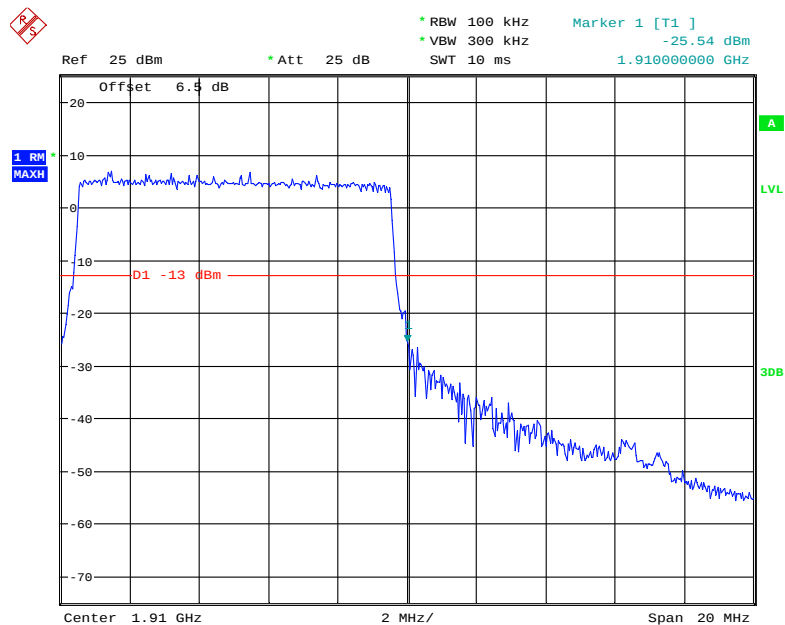
Date: 17.APR.2020 12:20:03

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



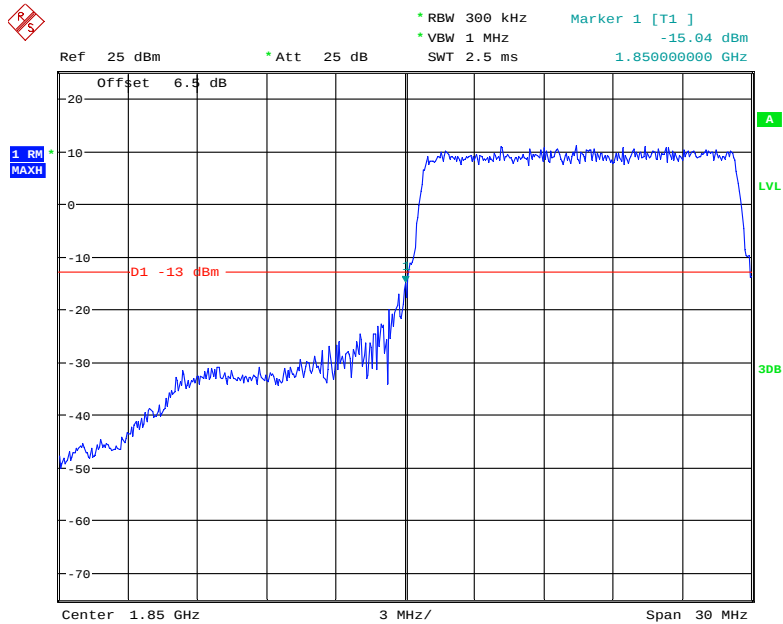
Date: 17.APR.2020 12:19:39

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



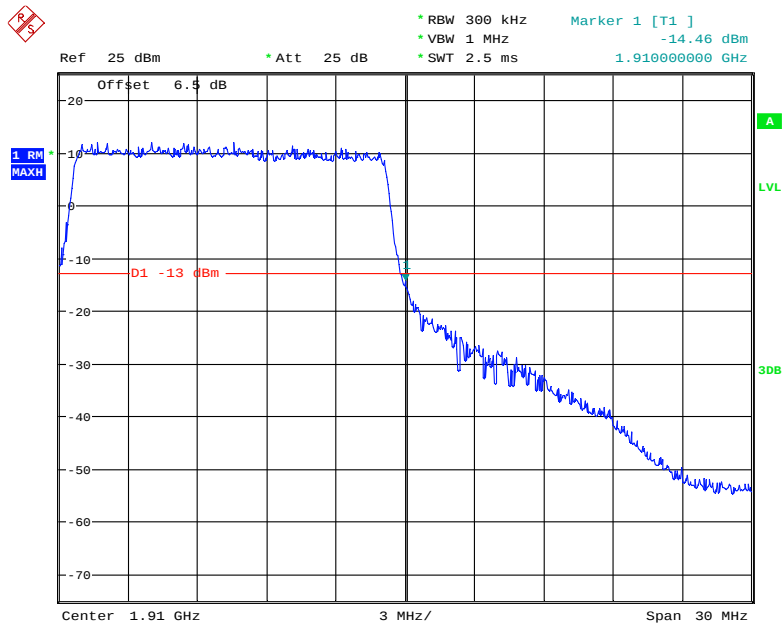
Date: 17.APR.2020 12:20:22

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

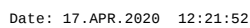
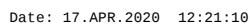


Date: 17.APR.2020 12:20:49

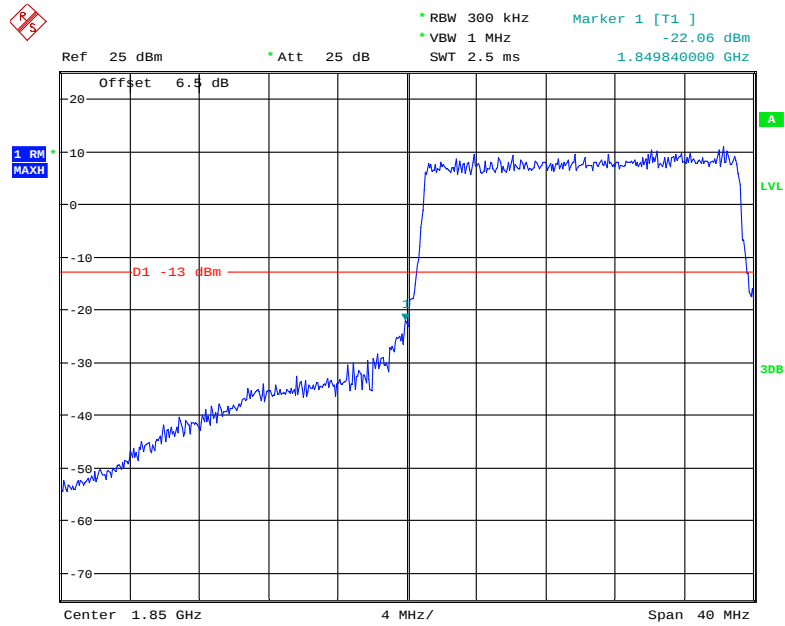
QPSK (15.0 MHz, FULL RB) - Right Band Edge



Date: 12.MAY.2020 19:39:20

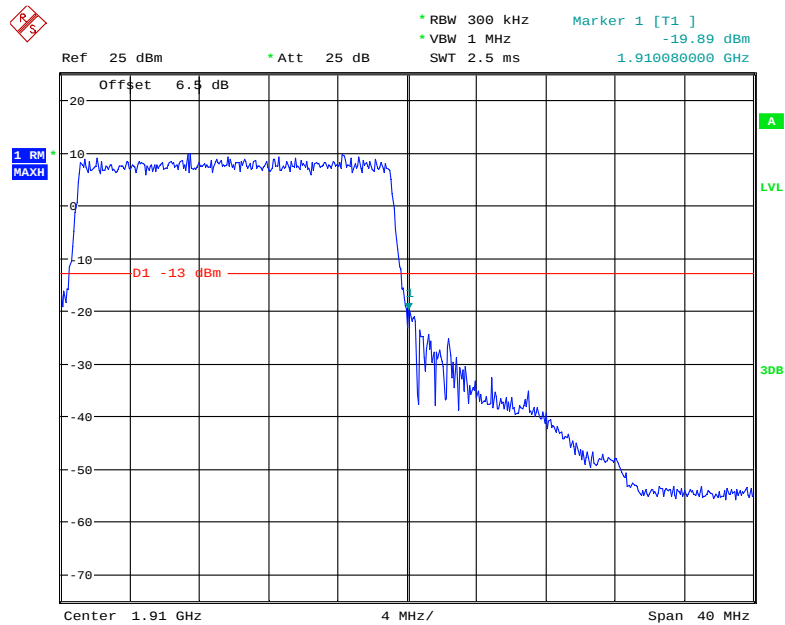


QPSK (20.0 MHz, FULL RB) - Left Band Edge



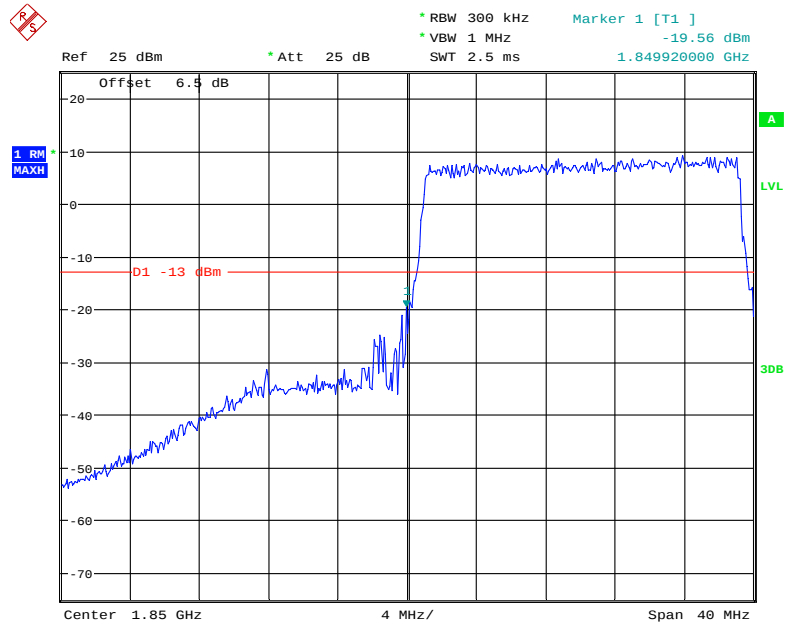
Date: 17.APR.2020 12:22:17

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



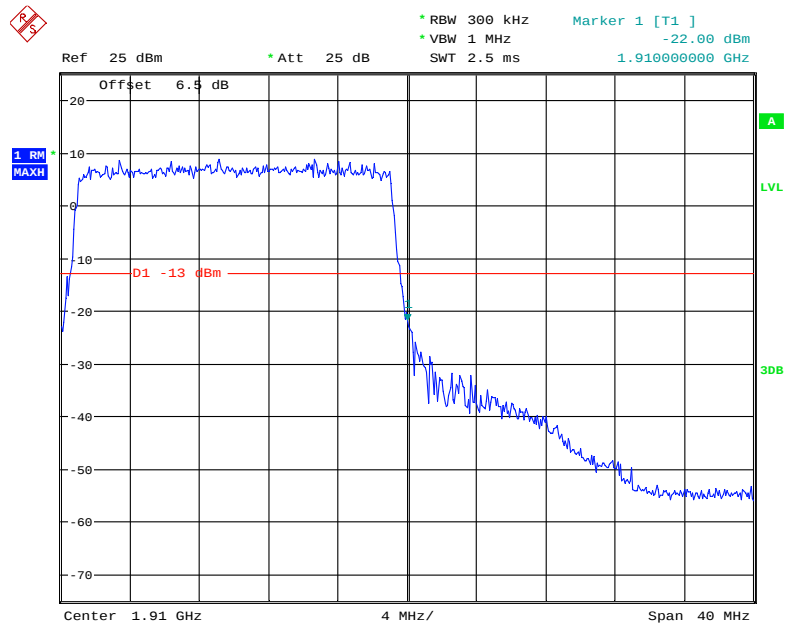
Date: 17.APR.2020 12:23:02

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



Date: 17.APR.2020 12:22:39

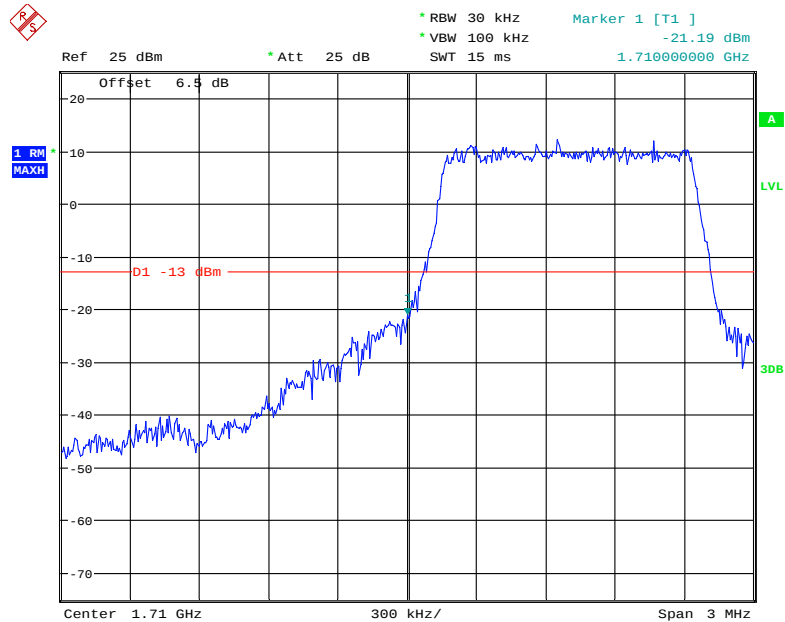
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2020 12:23:23

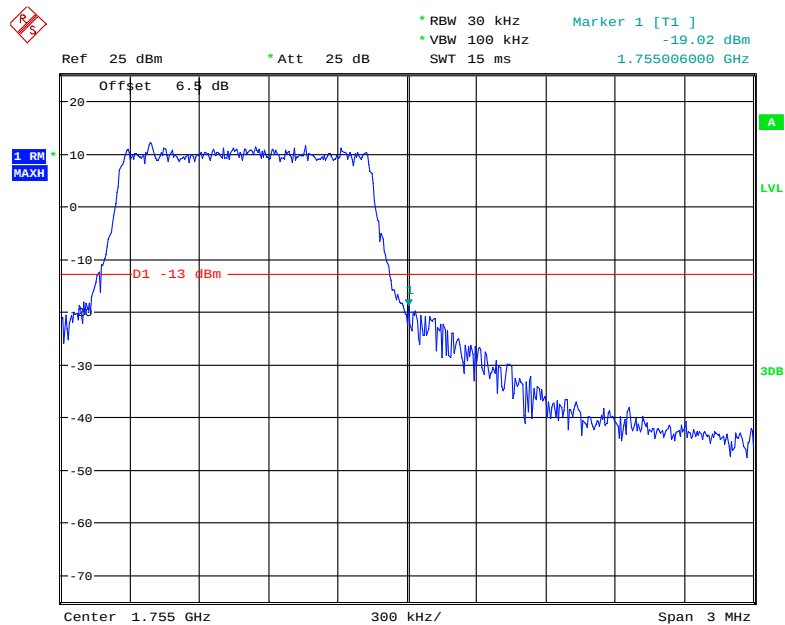
Band 4:

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



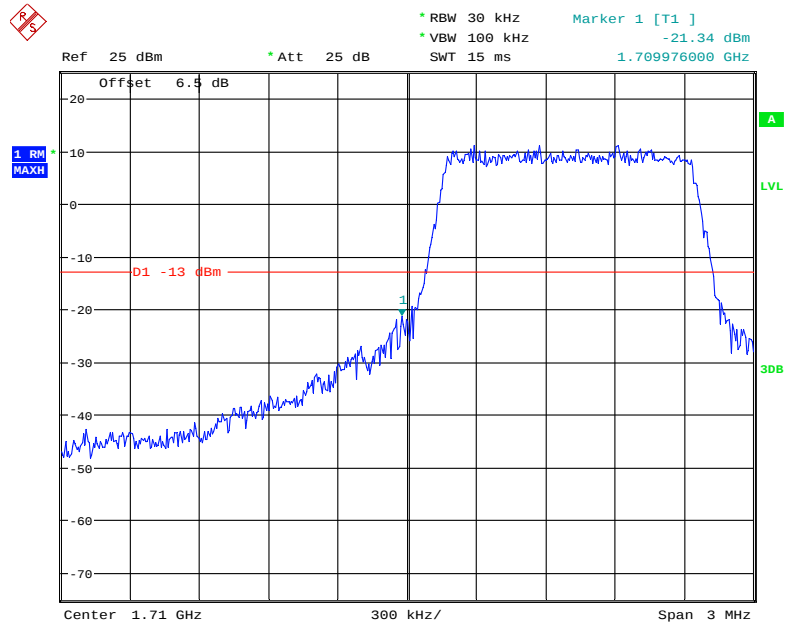
Date: 17.APR.2020 12:23:48

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



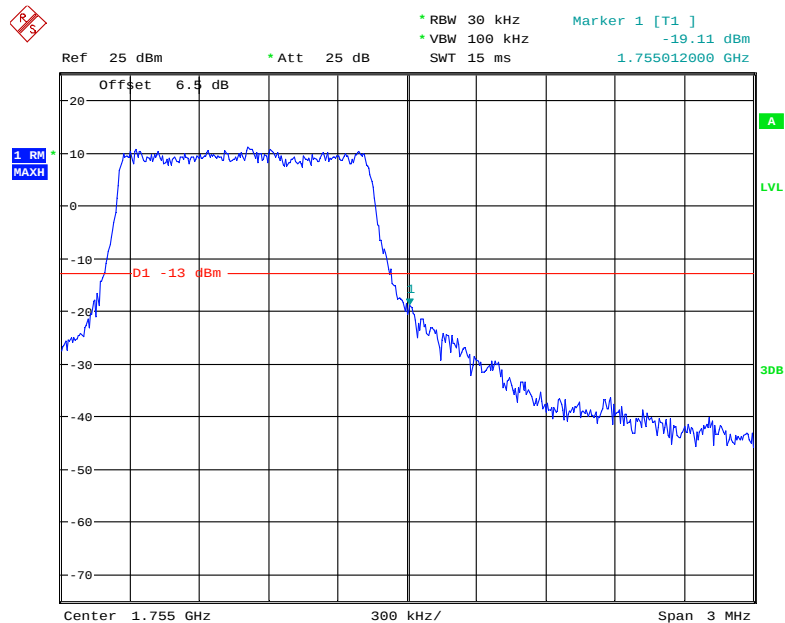
Date: 17.APR.2020 12:24:33

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



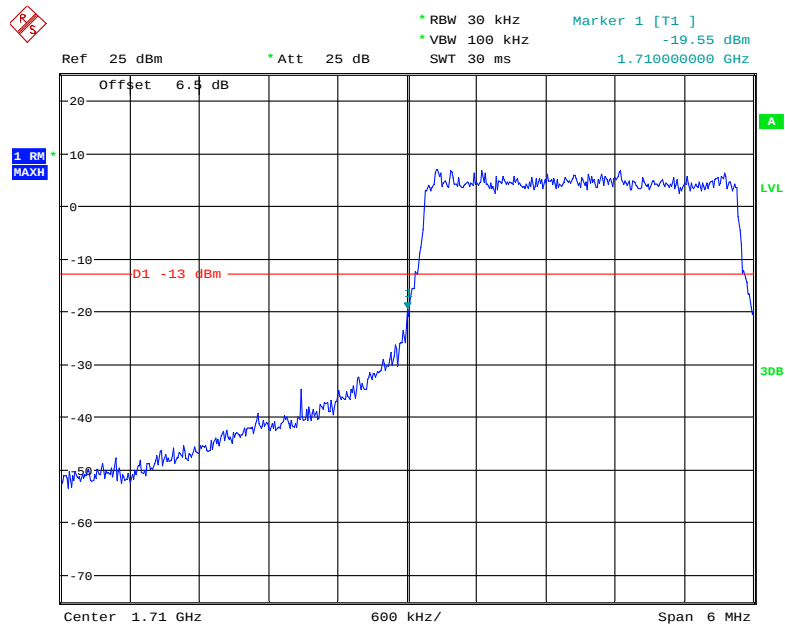
Date: 17.APR.2020 12:24:13

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



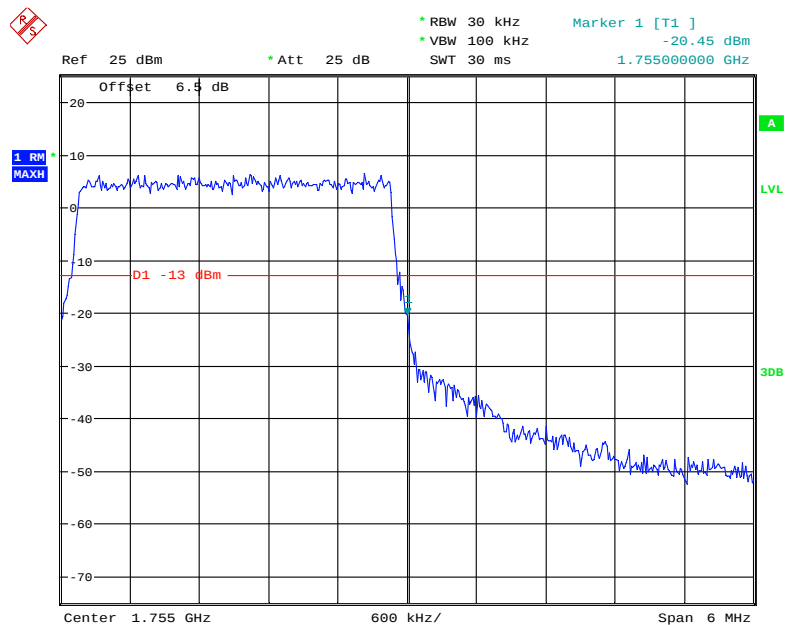
Date: 17.APR.2020 12:24:59

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



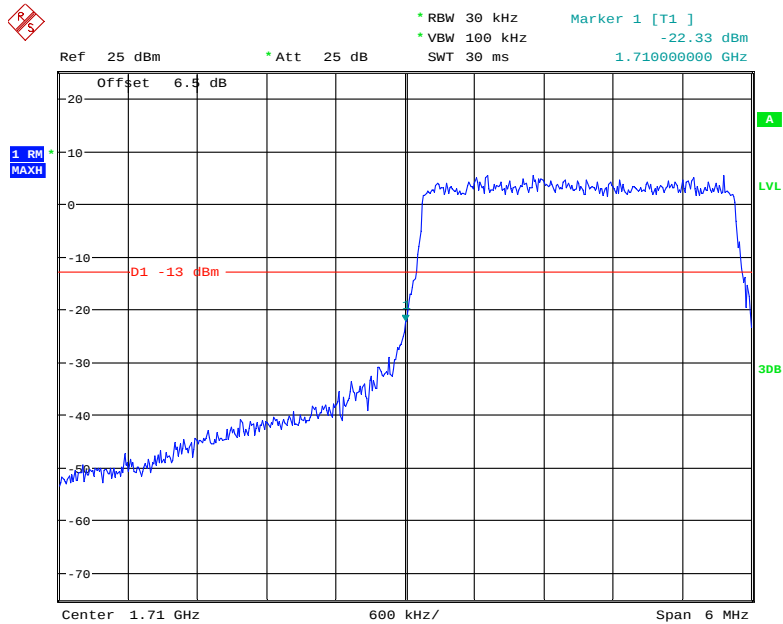
Date: 17.APR.2020 12:25:24

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



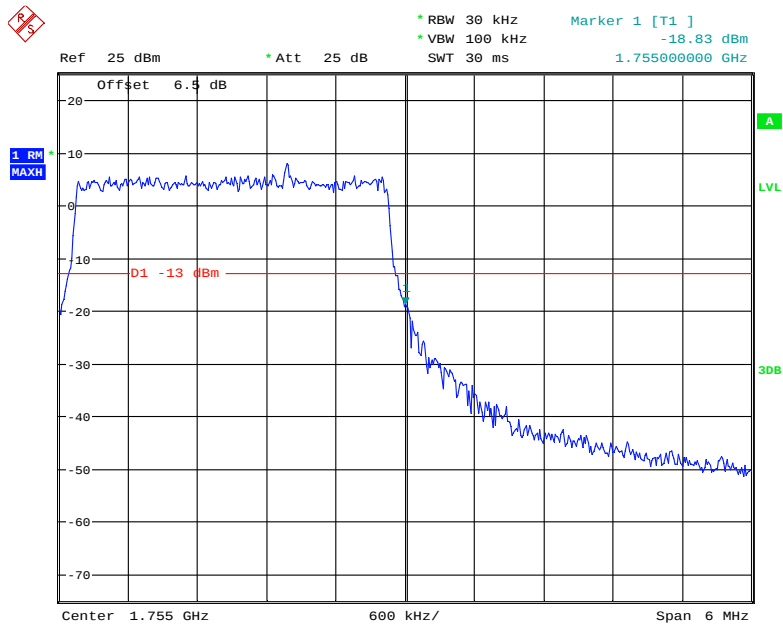
Date: 17.APR.2020 12:25:57

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



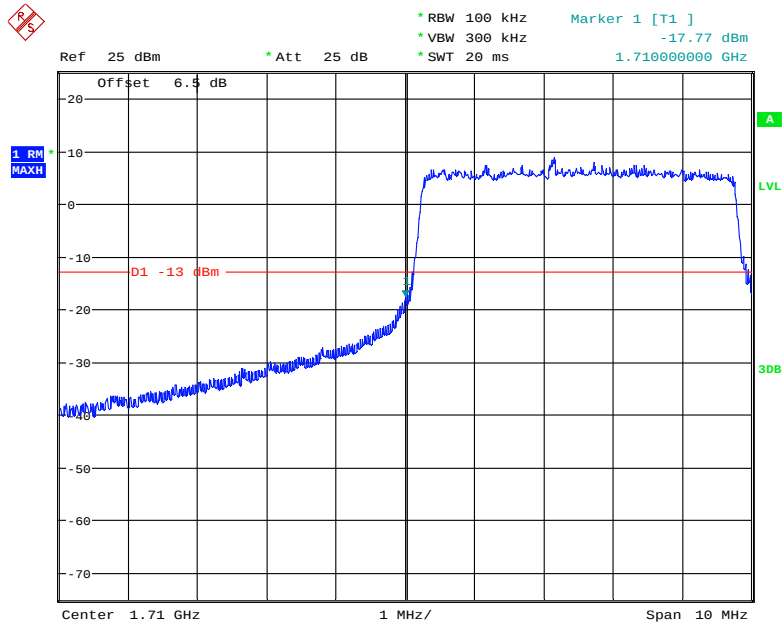
Date: 17.APR.2020 12:25:40

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



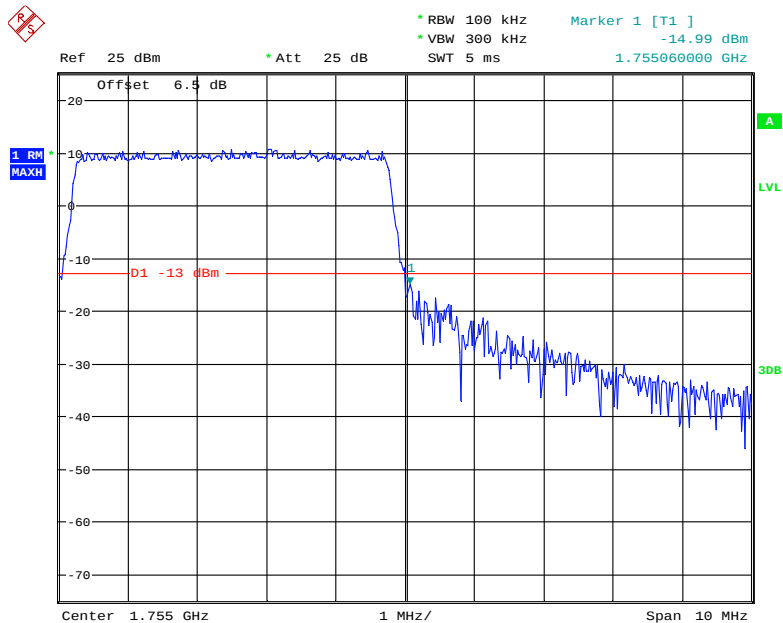
Date: 17.APR.2020 12:26:16

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



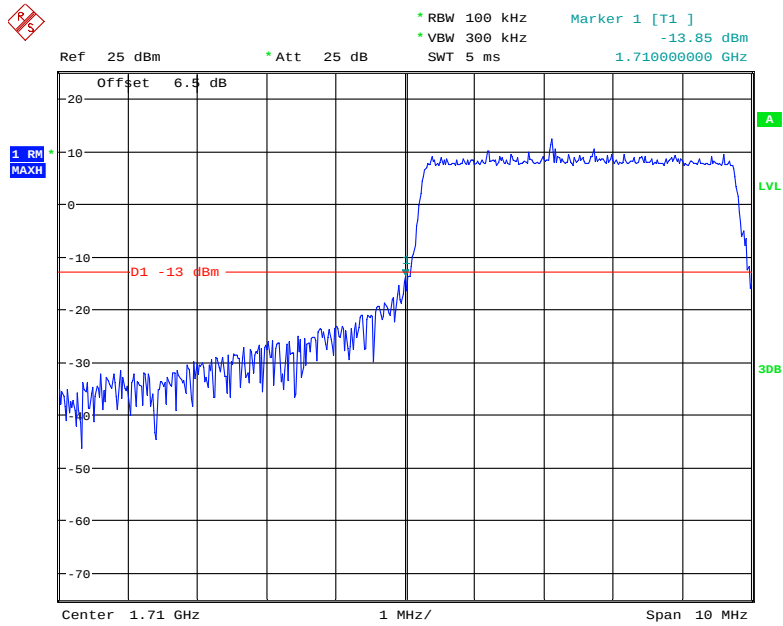
Date: 12.MAY.2020 19:43:52

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



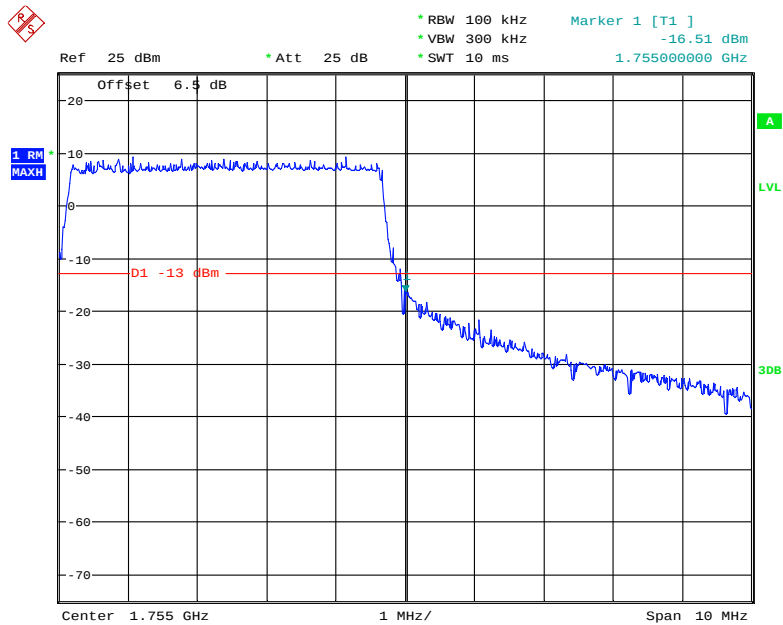
Date: 17.APR.2020 12:27:31

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



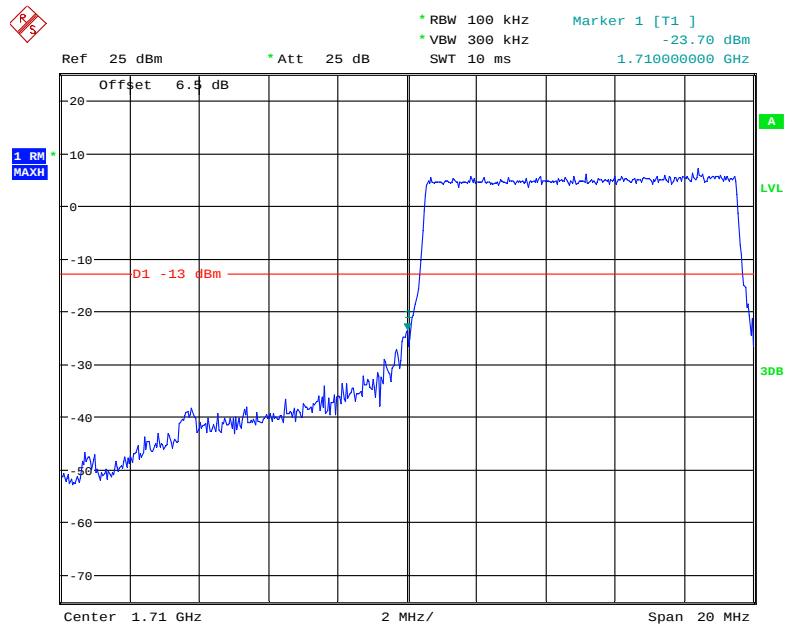
Date: 17.APR.2020 12:27:08

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



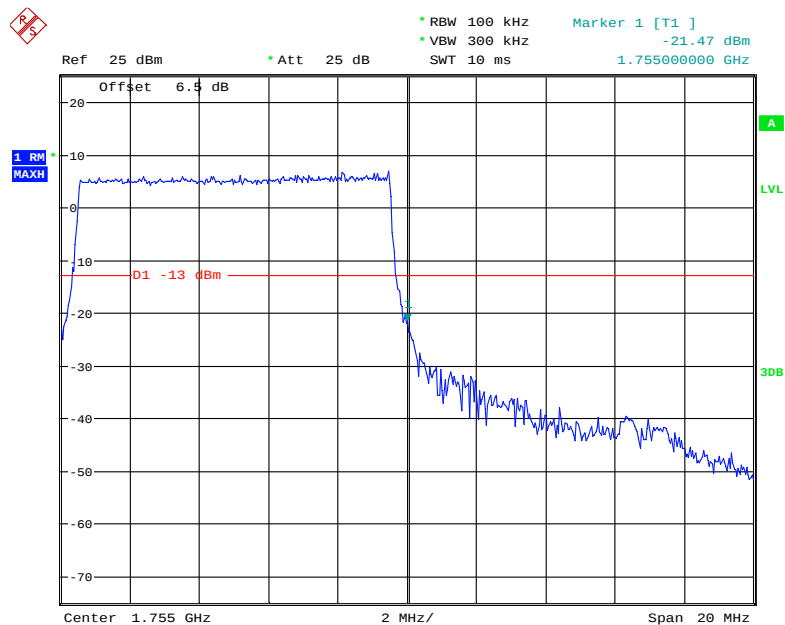
Date: 12.MAY.2020 19:48:08

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



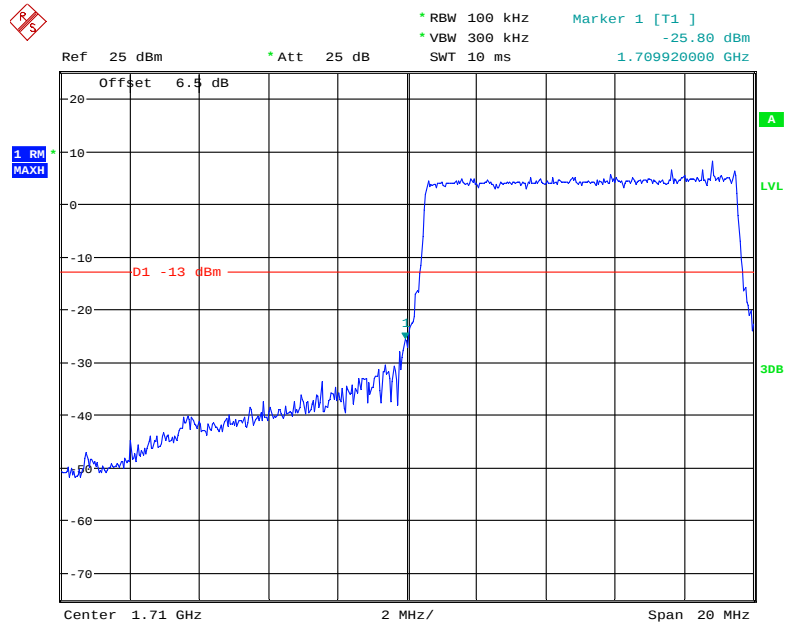
Date: 17.APR.2020 12:28:19

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



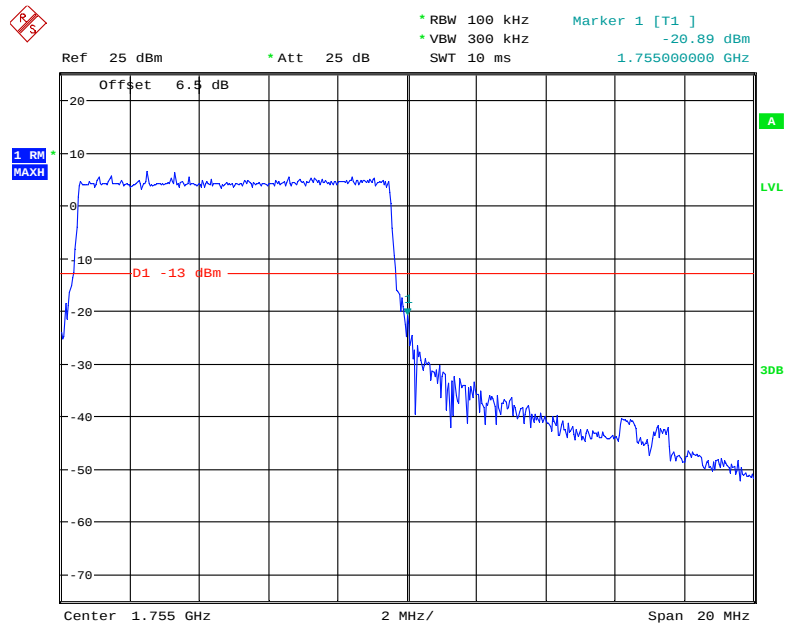
Date: 17.APR.2020 12:29:02

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



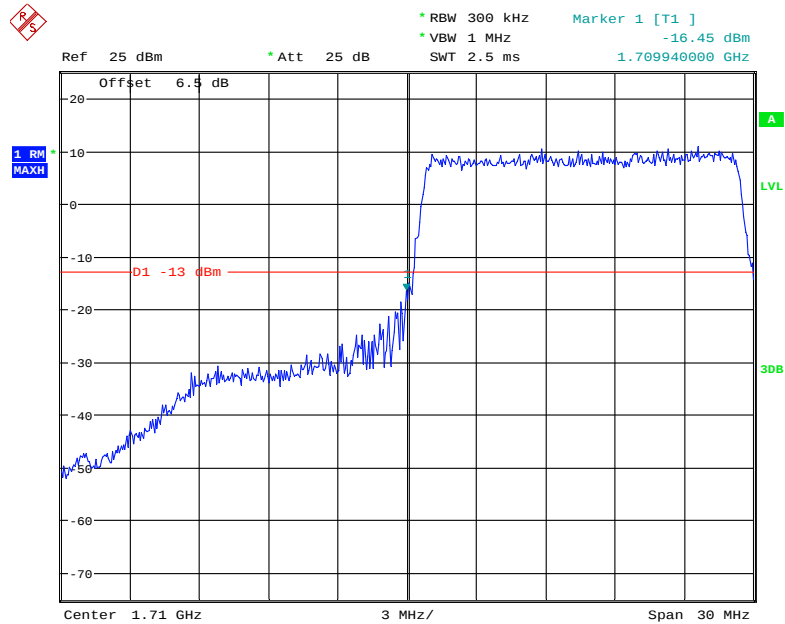
Date: 17.APR.2020 12:28:39

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



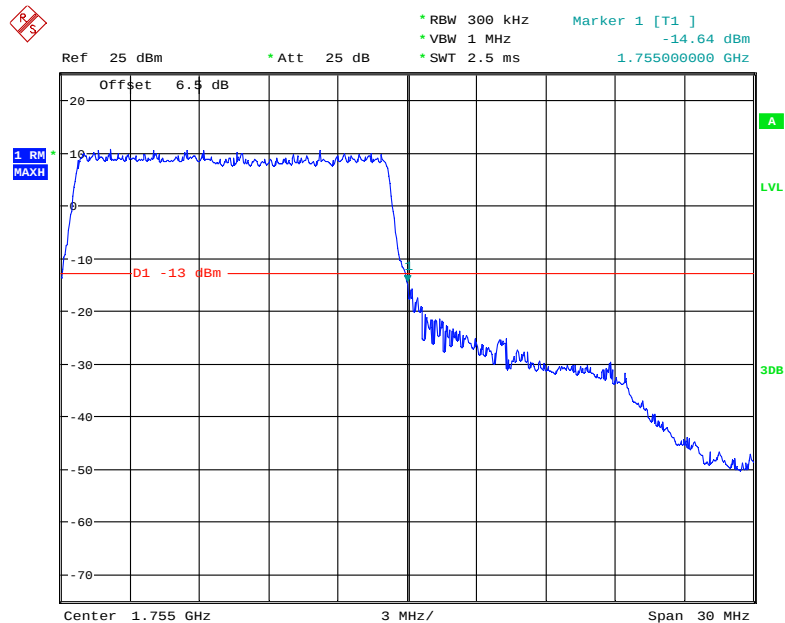
Date: 17.APR.2020 12:29:22

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



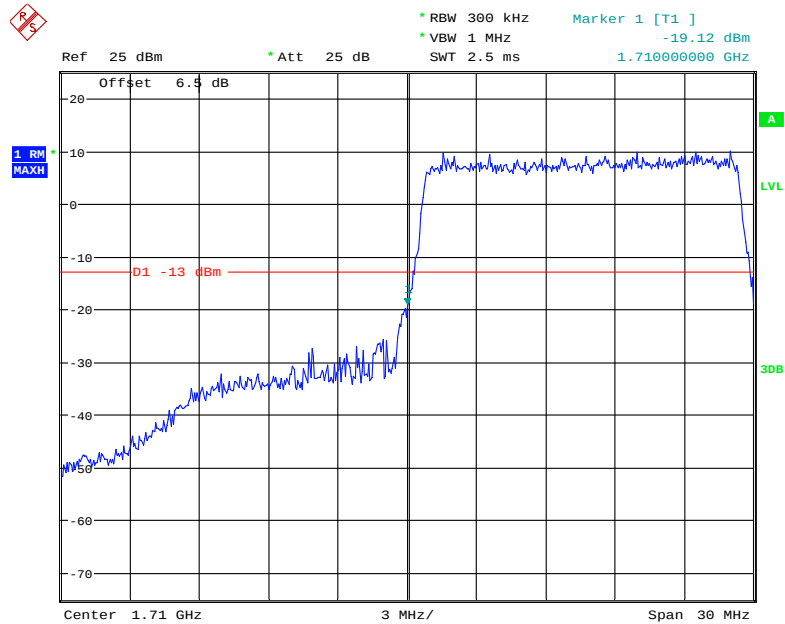
Date: 17.APR.2020 12:29:45

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



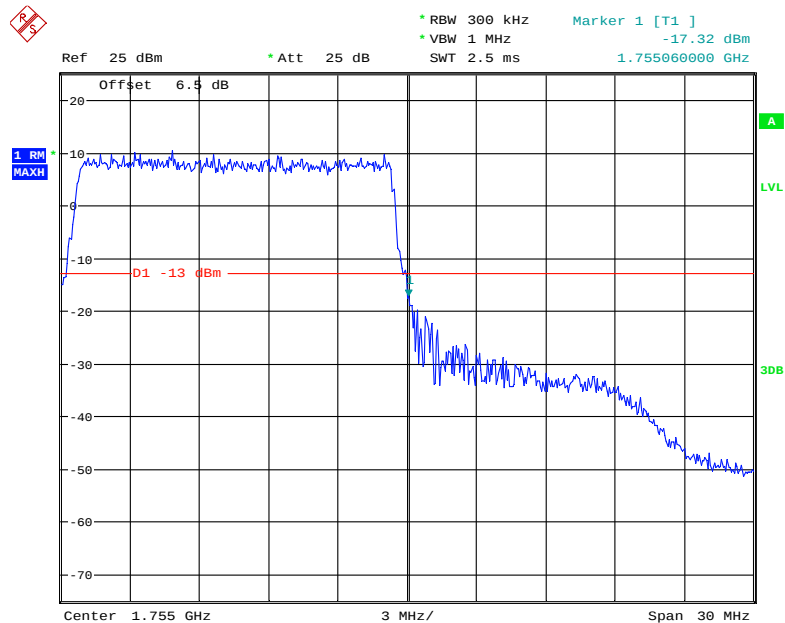
Date: 12.MAY.2020 19:50:31

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



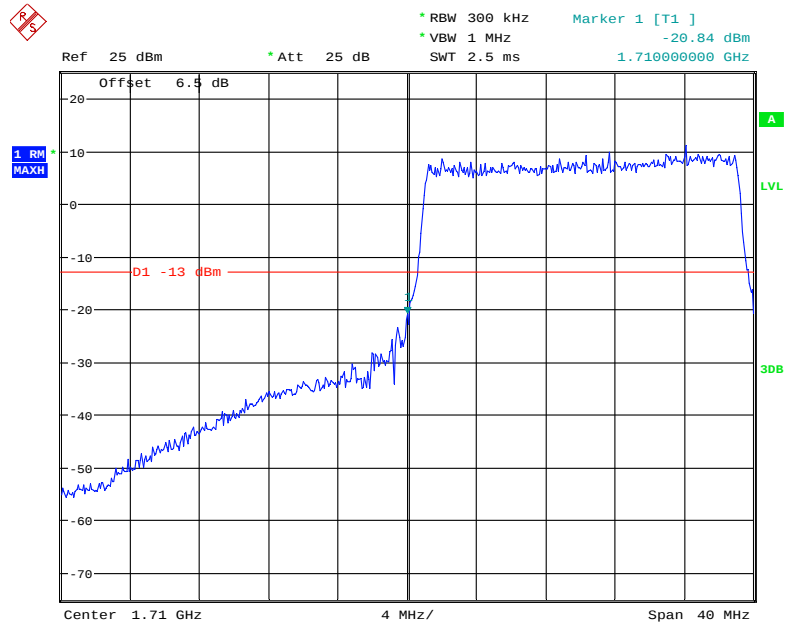
Date: 17.APR.2020 12:30:03

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



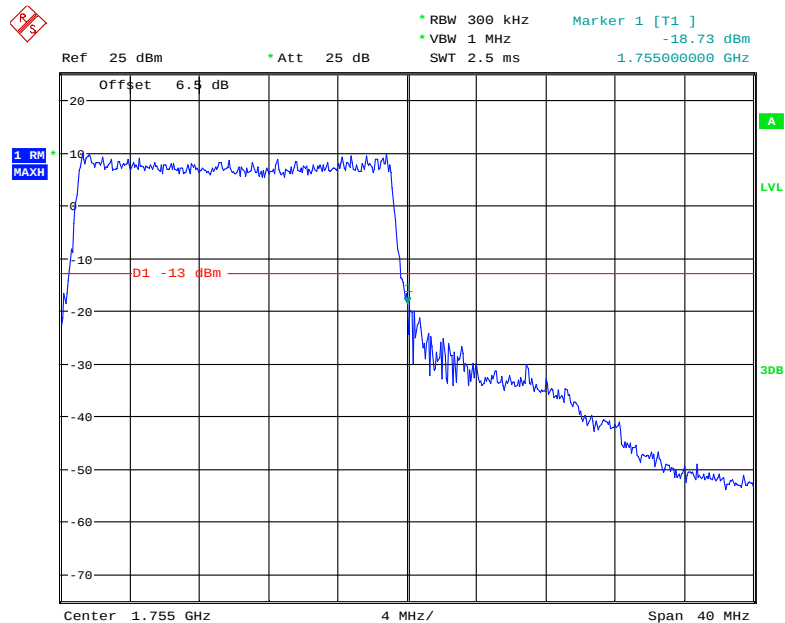
Date: 17.APR.2020 12:30:45

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



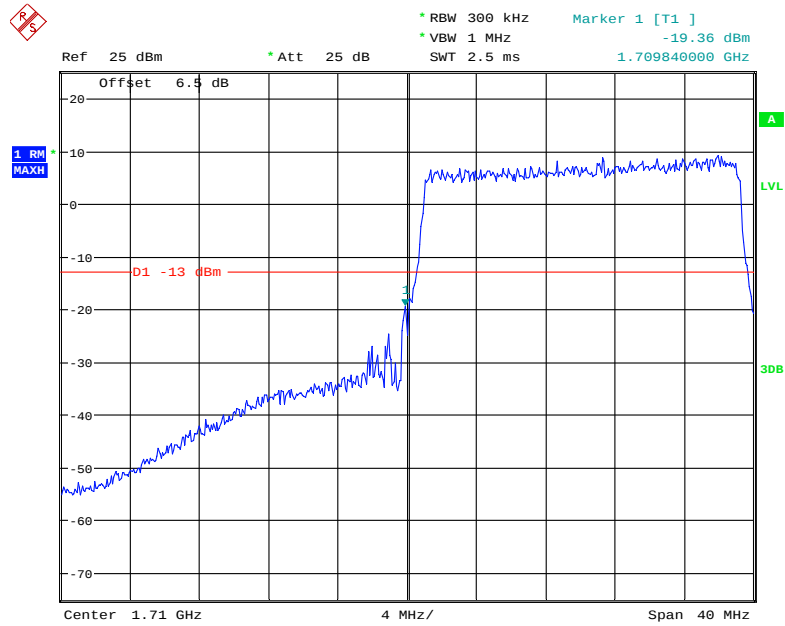
Date: 17.APR.2020 12:31:10

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



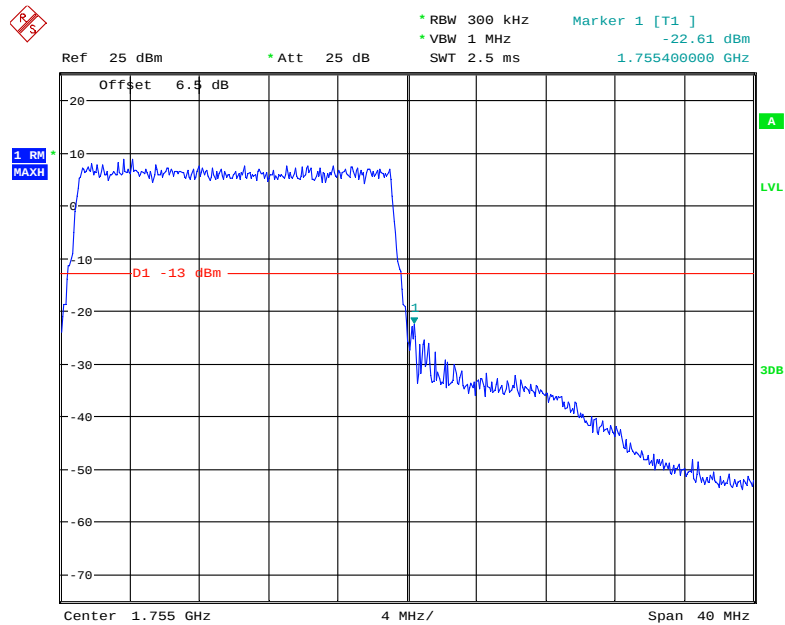
Date: 17.APR.2020 12:31:54

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



Date: 17.APR.2020 12:31:32

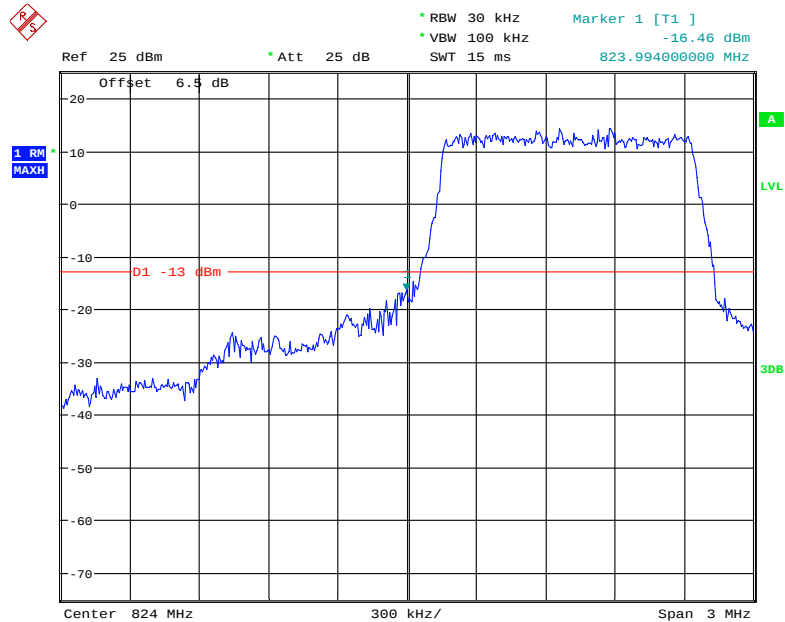
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2020 12:32:13

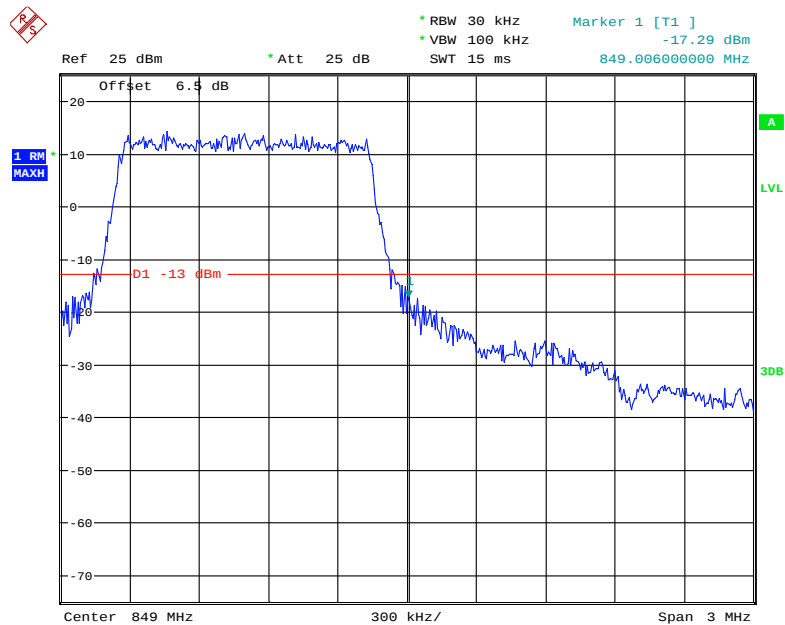
Band 5:

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



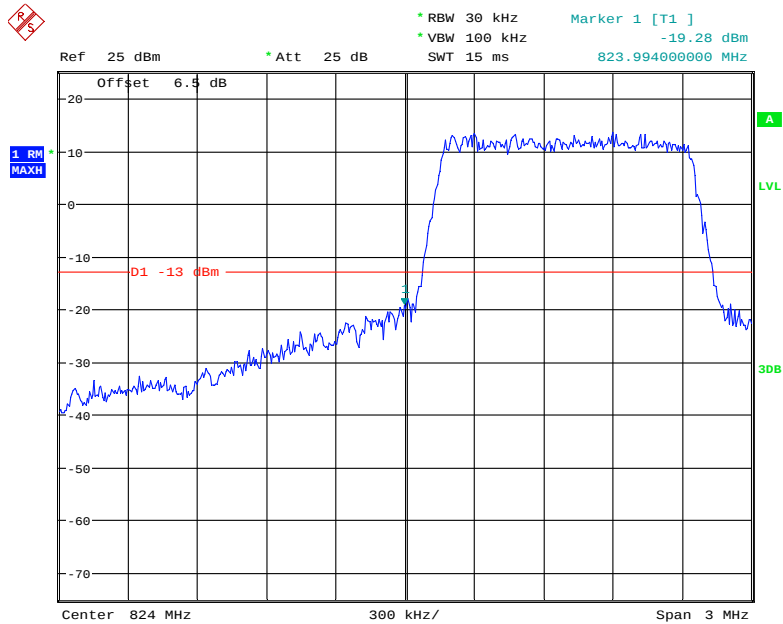
Date: 17.APR.2020 12:32:32

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



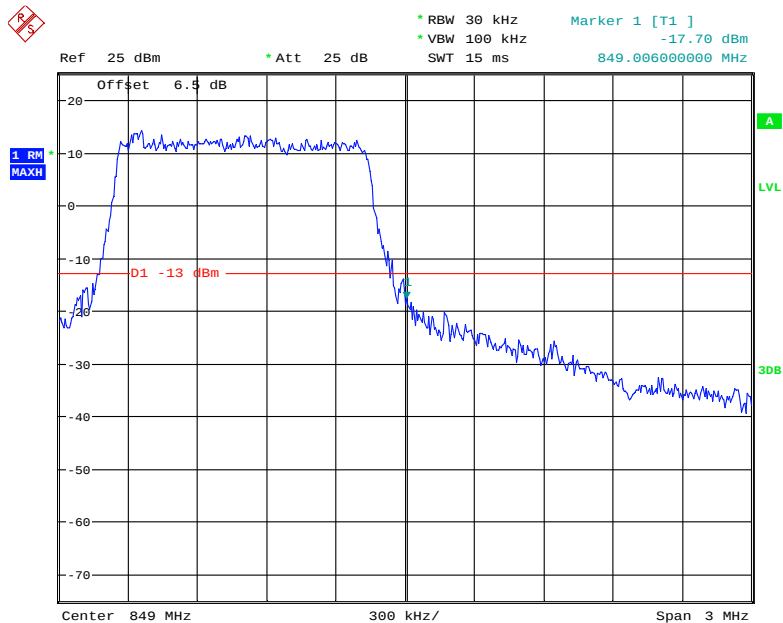
Date: 17.APR.2020 12:33:06

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



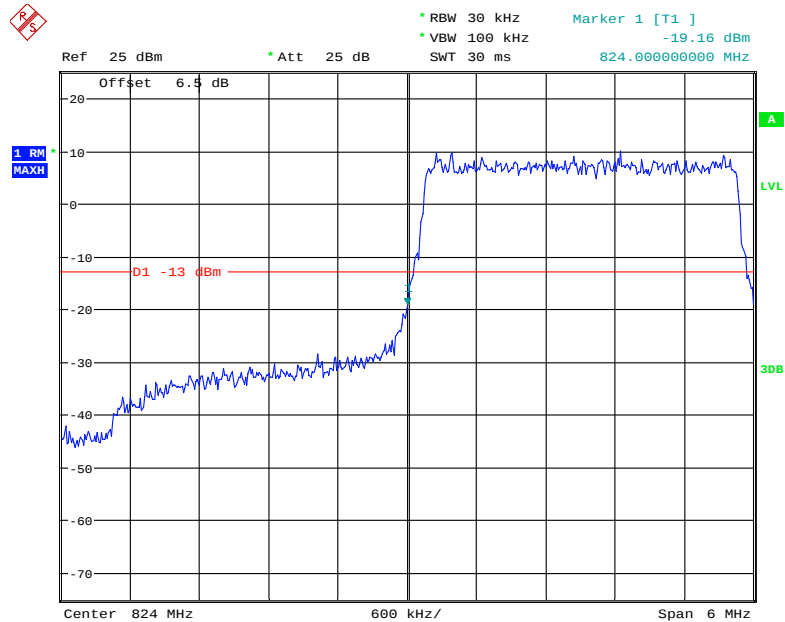
Date: 17.APR.2020 12:32:49

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



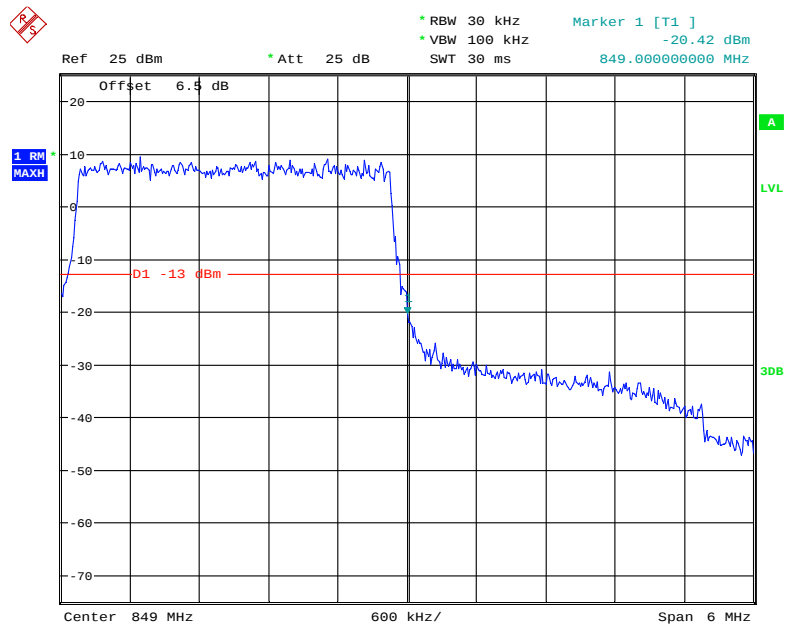
Date: 17.APR.2020 12:33:25

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



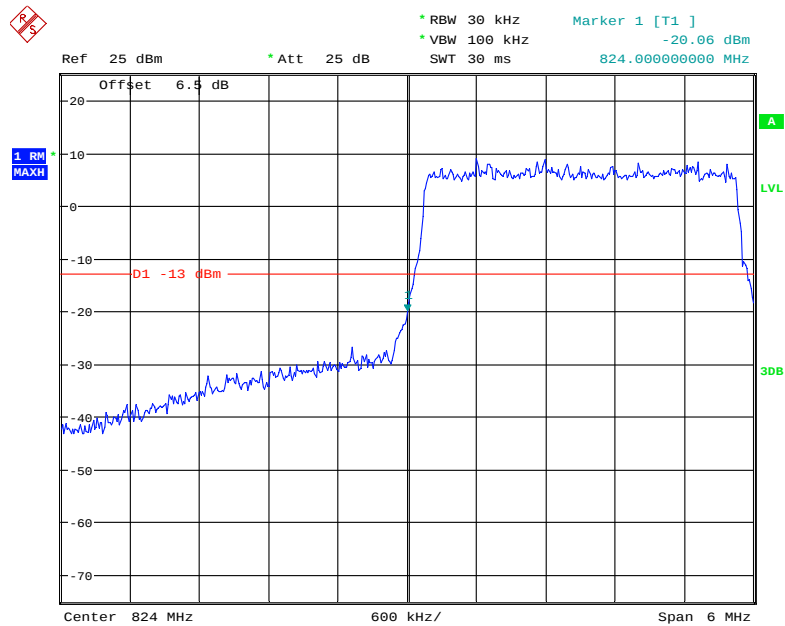
Date: 17.APR.2020 12:33:46

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



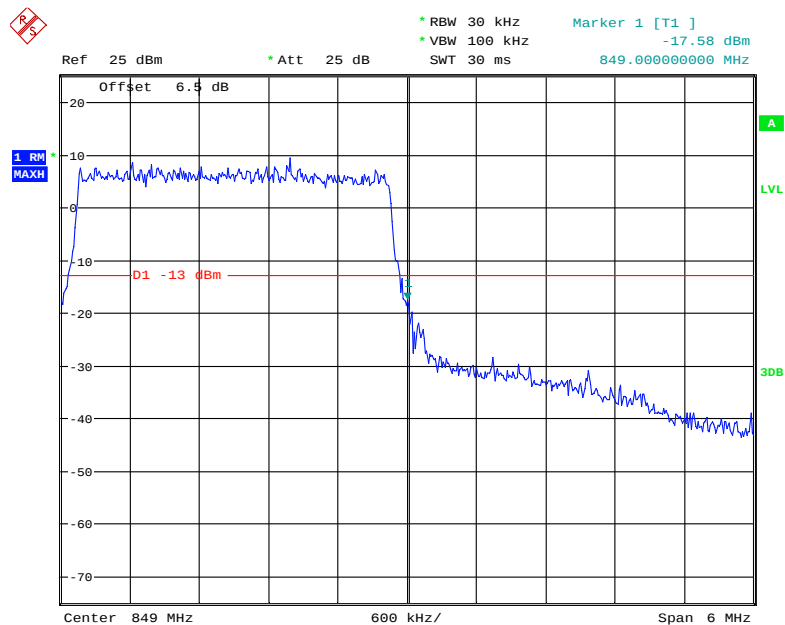
Date: 17.APR.2020 12:34:22

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



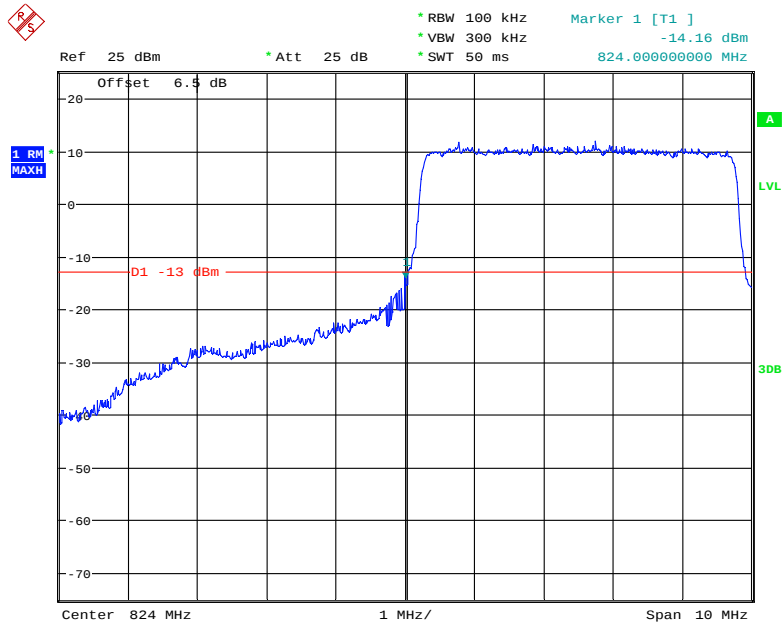
Date: 17.APR.2020 12:34:06

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



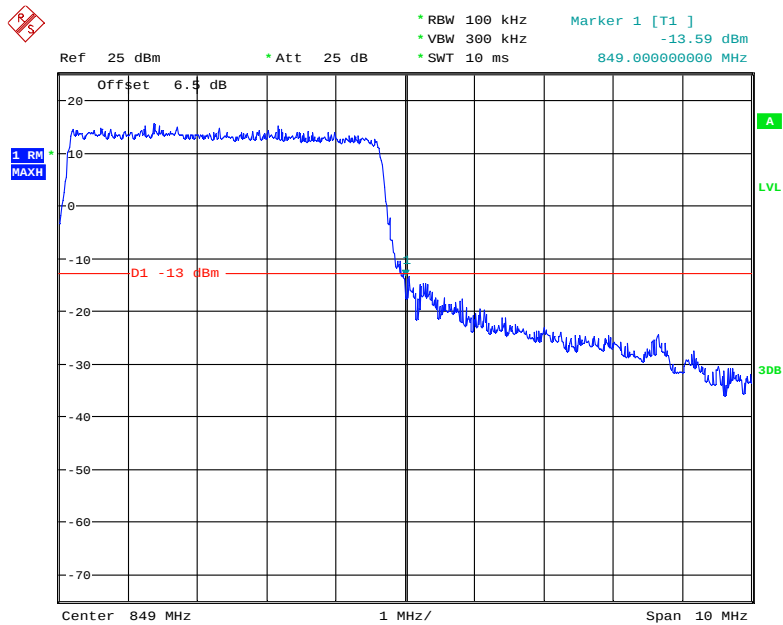
Date: 17.APR.2020 12:34:39

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



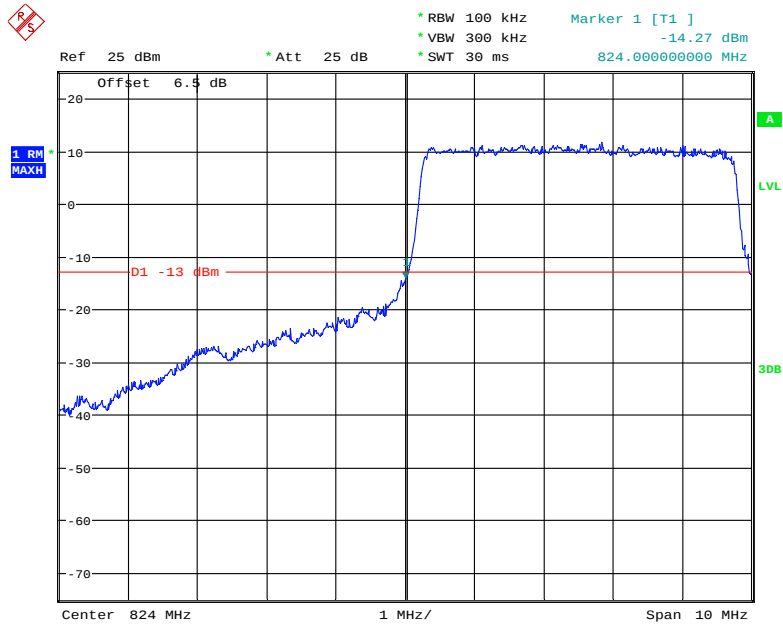
Date: 12.MAY.2020 19:57:05

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



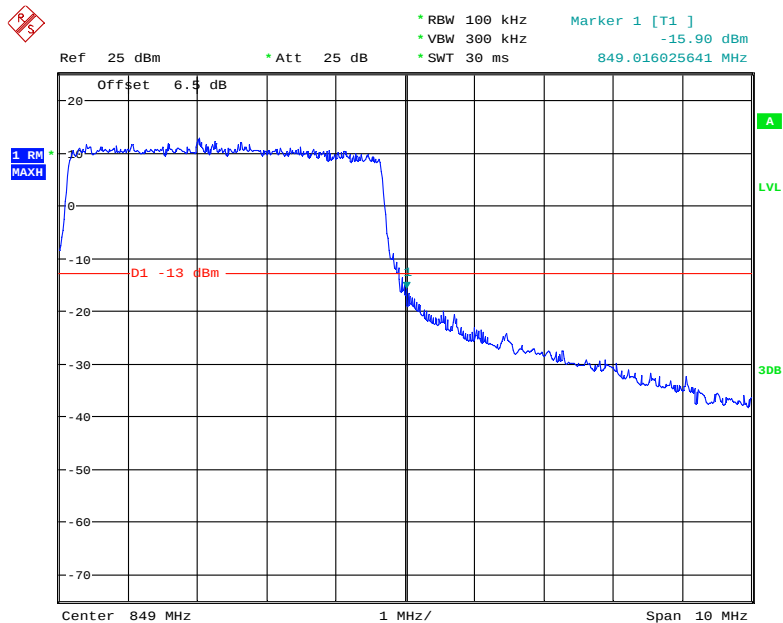
Date: 12.MAY.2020 19:58:32

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



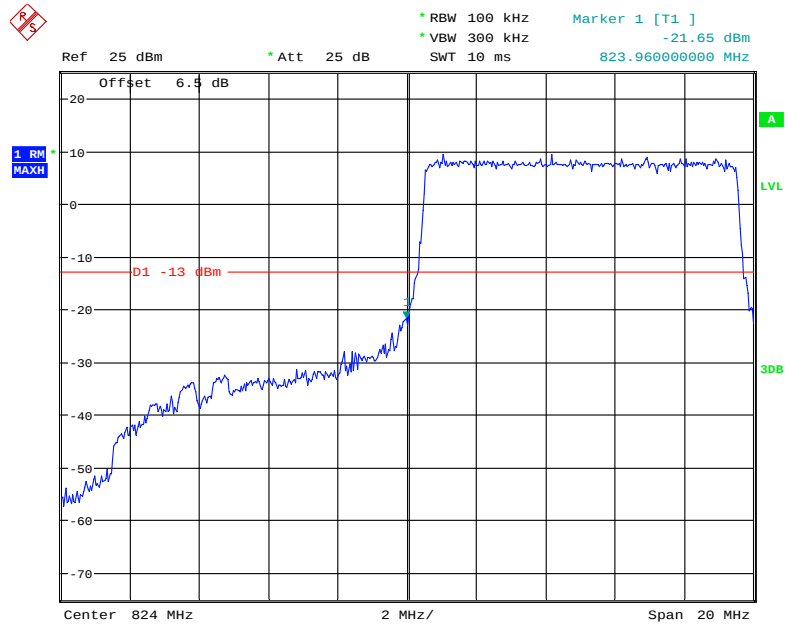
Date: 12.MAY.2020 19:55:36

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



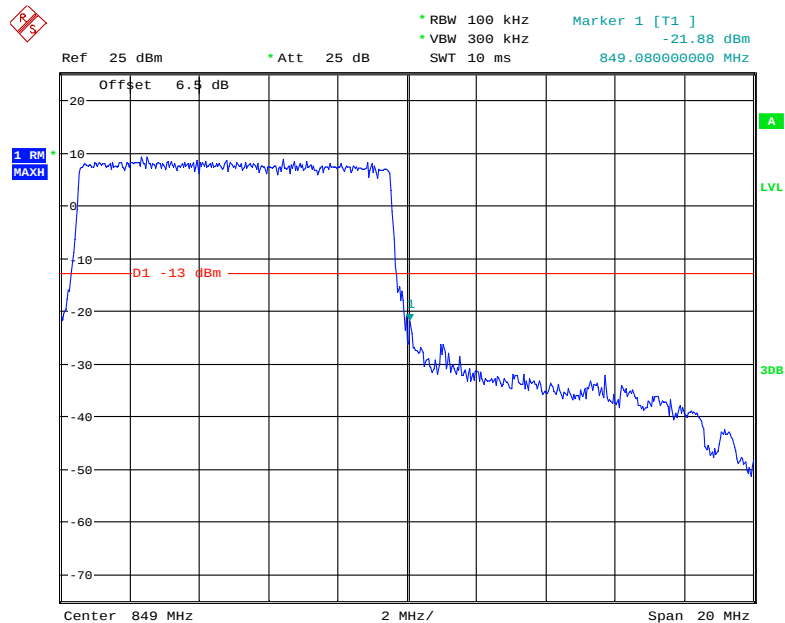
Date: 12.MAY.2020 20:05:11

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

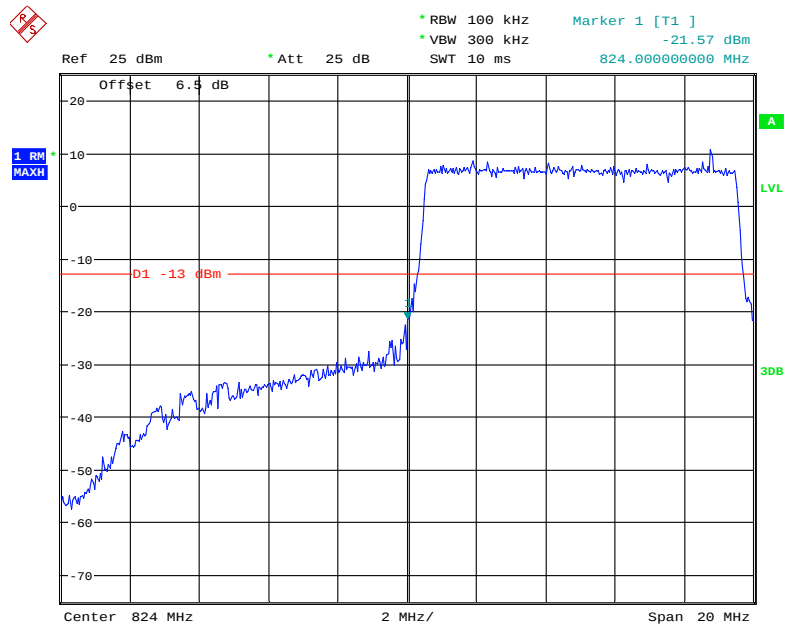


Date: 17.APR.2020 12:36:33

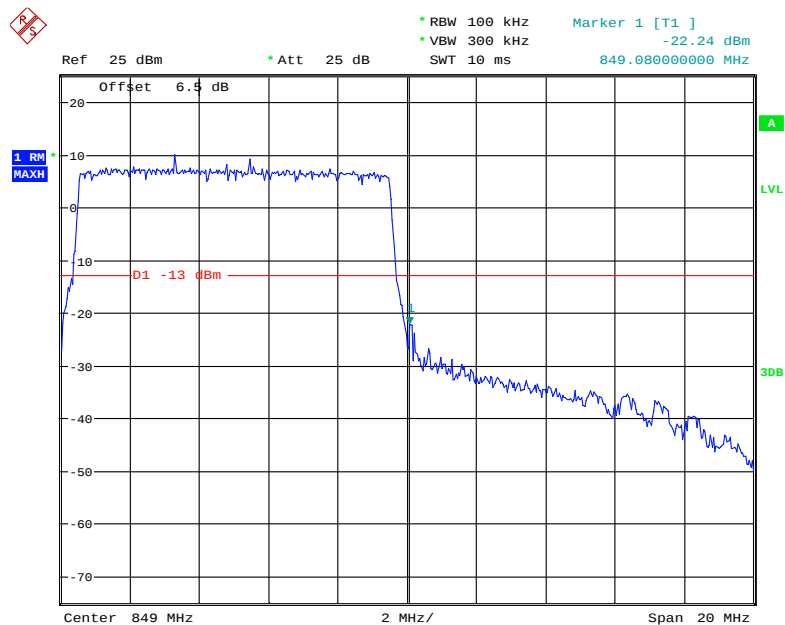
QPSK (10.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2020 12:37:06

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

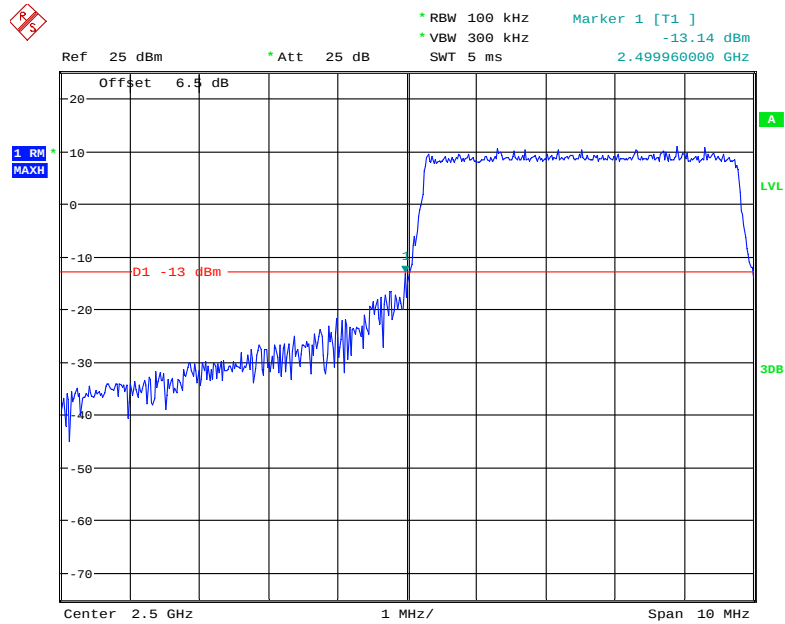
Date: 17.APR.2020 12:36:49

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

Date: 17.APR.2020 12:37:23

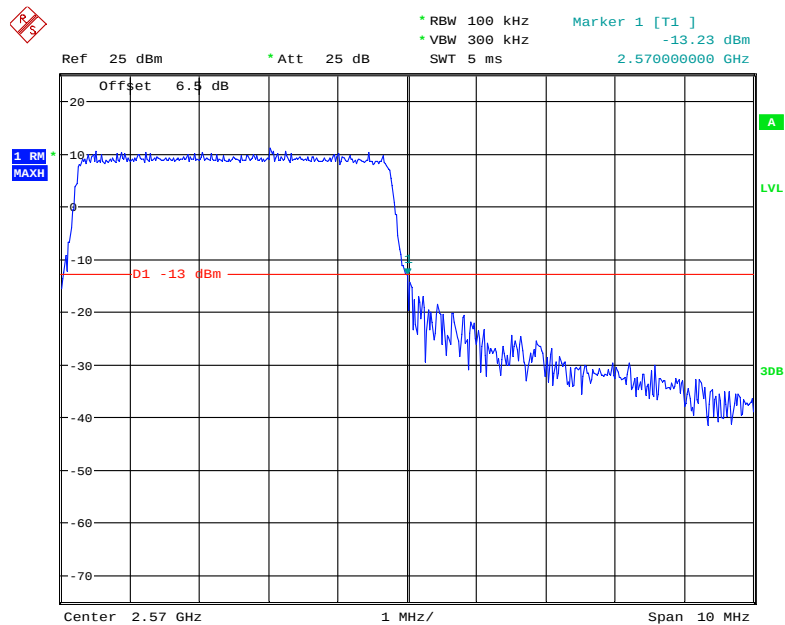
Band 7:

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



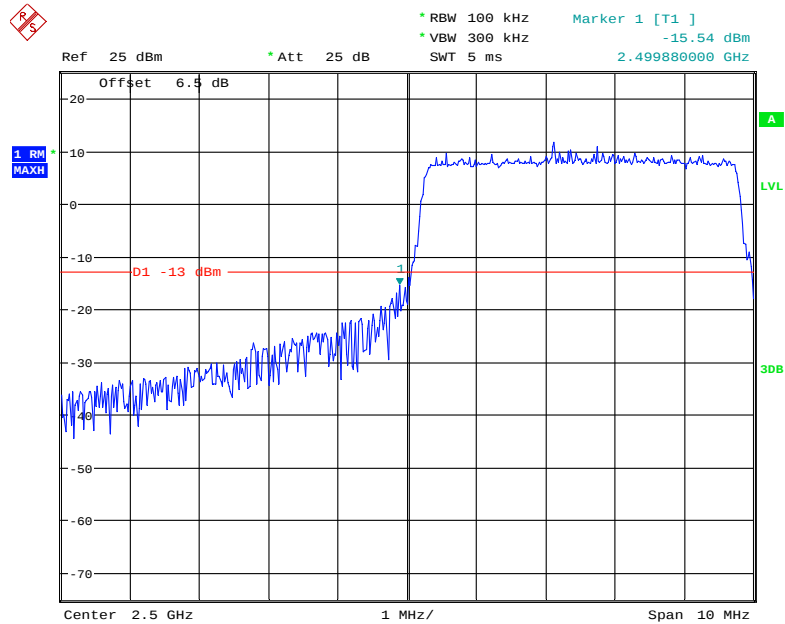
Date: 17.APR.2020 12:37:54

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



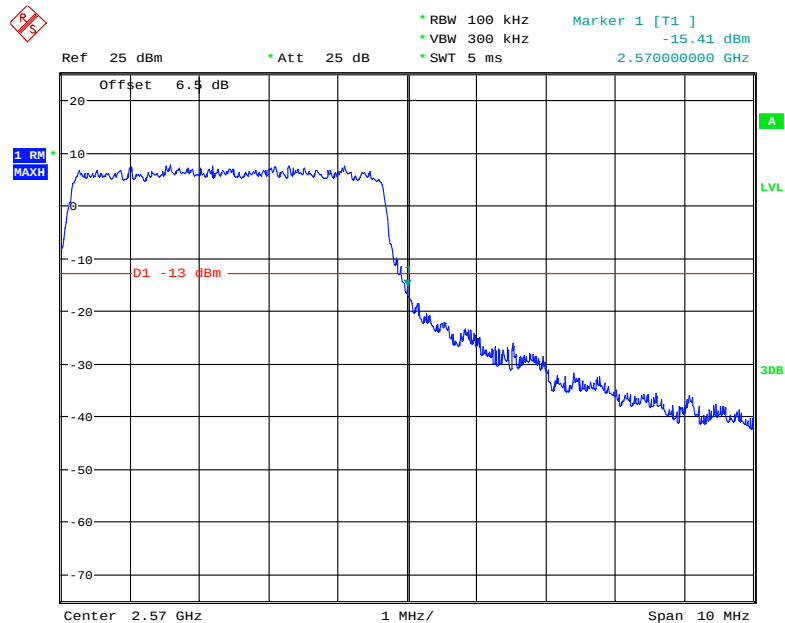
Date: 17.APR.2020 12:38:37

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



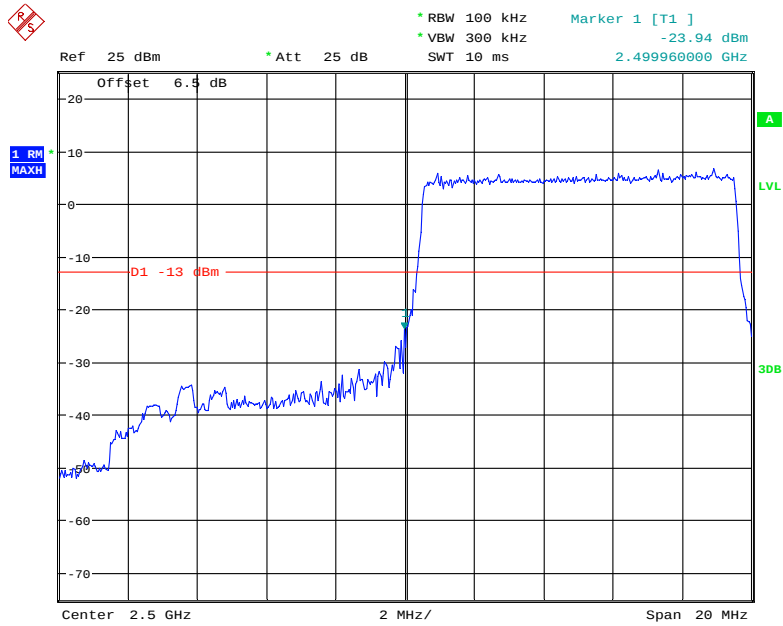
Date: 17.APR.2020 12:38:13

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



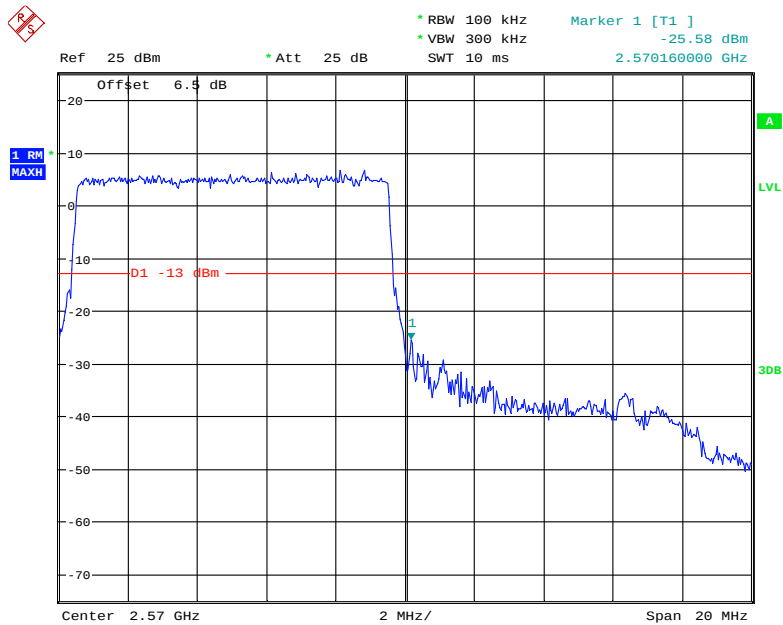
Date: 12.MAY.2020 20:09:19

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



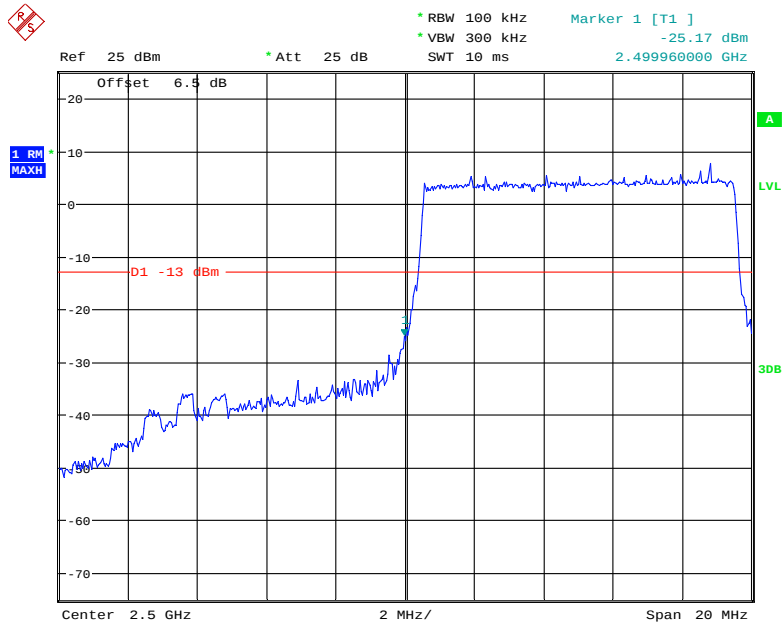
Date: 17.APR.2020 12:39:24

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



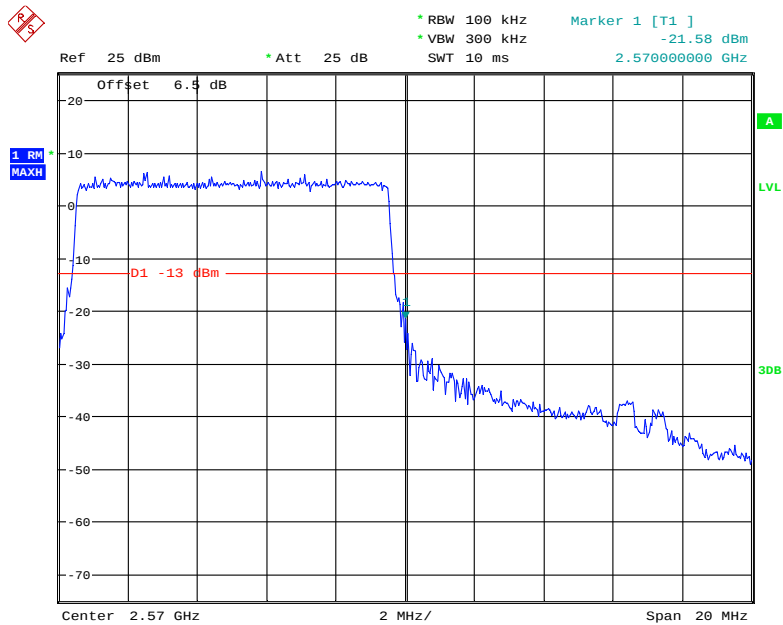
Date: 17.APR.2020 12:40:00

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



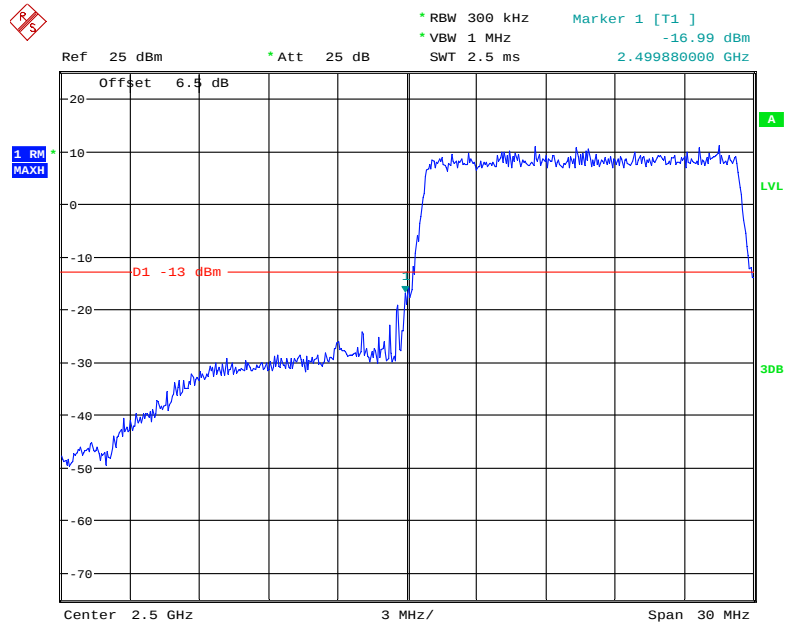
Date: 17.APR.2020 12:39:43

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



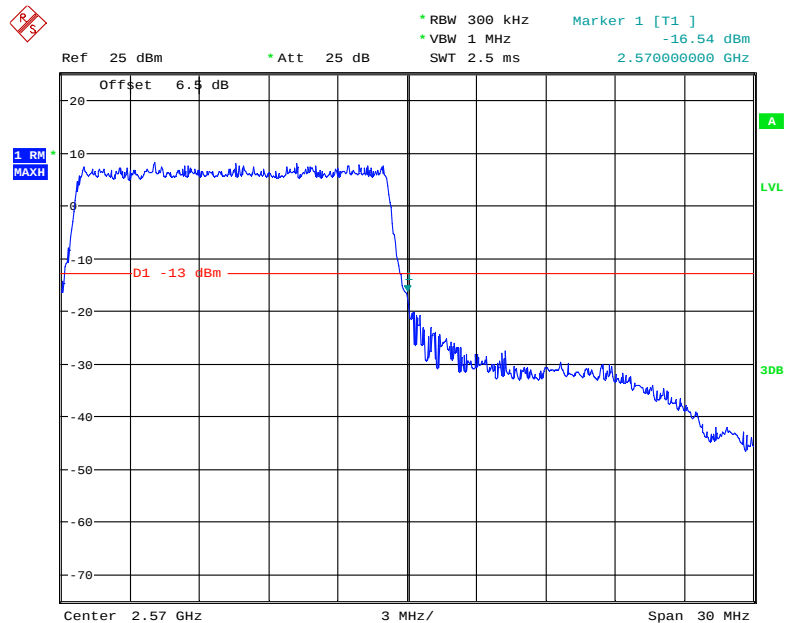
Date: 17.APR.2020 12:40:20

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



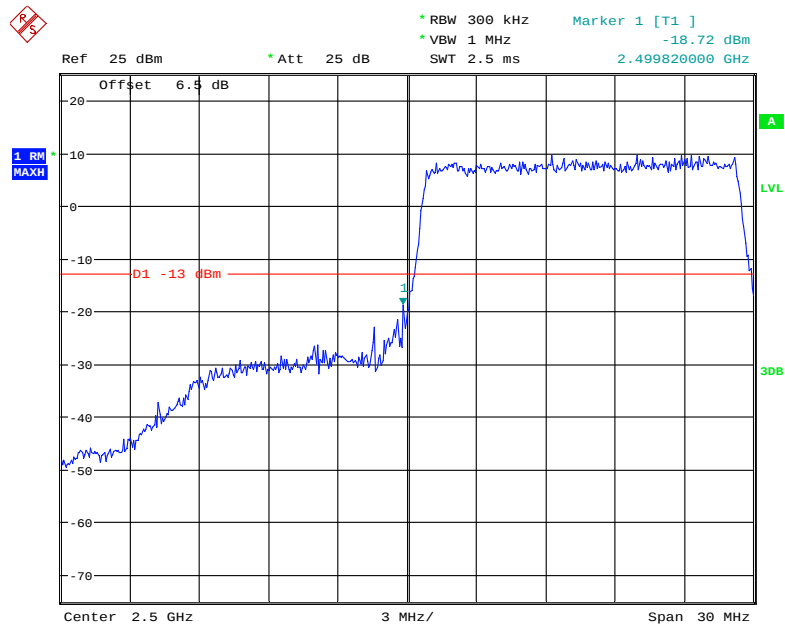
Date: 17.APR.2020 12:40:41

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



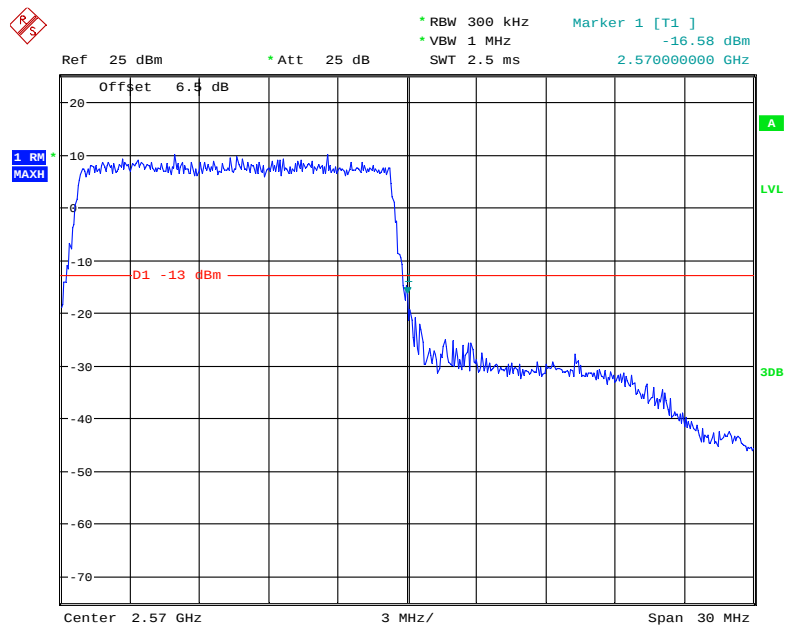
Date: 12.MAY.2020 20:10:47

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



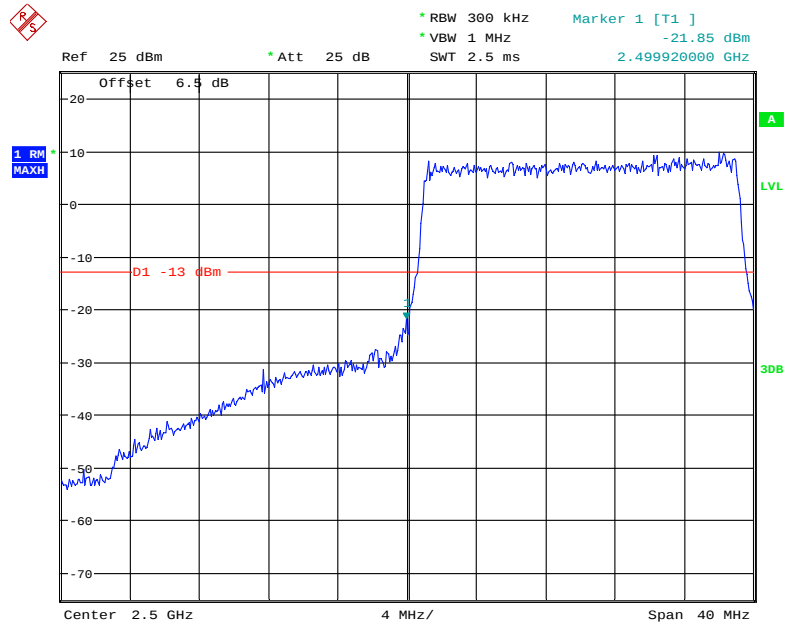
Date: 17.APR.2020 12:41:02

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



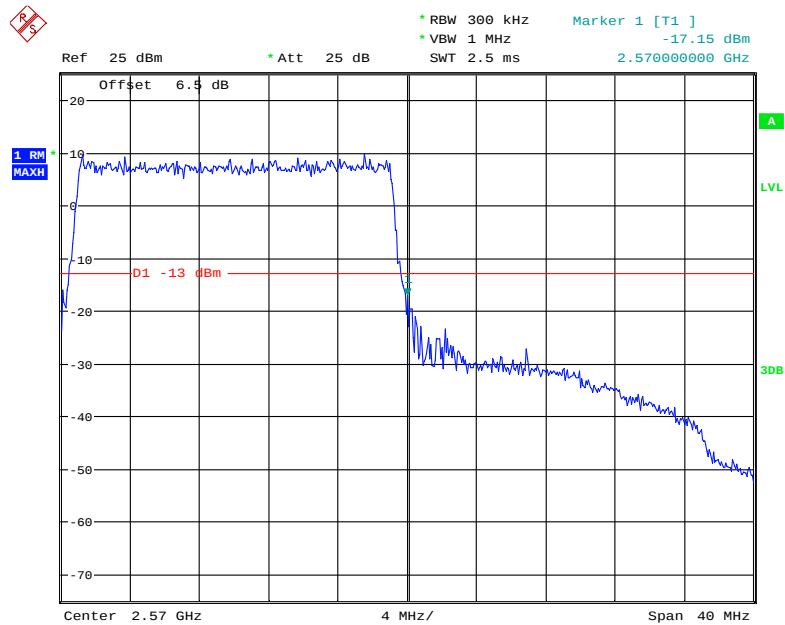
Date: 17.APR.2020 12:41:38

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



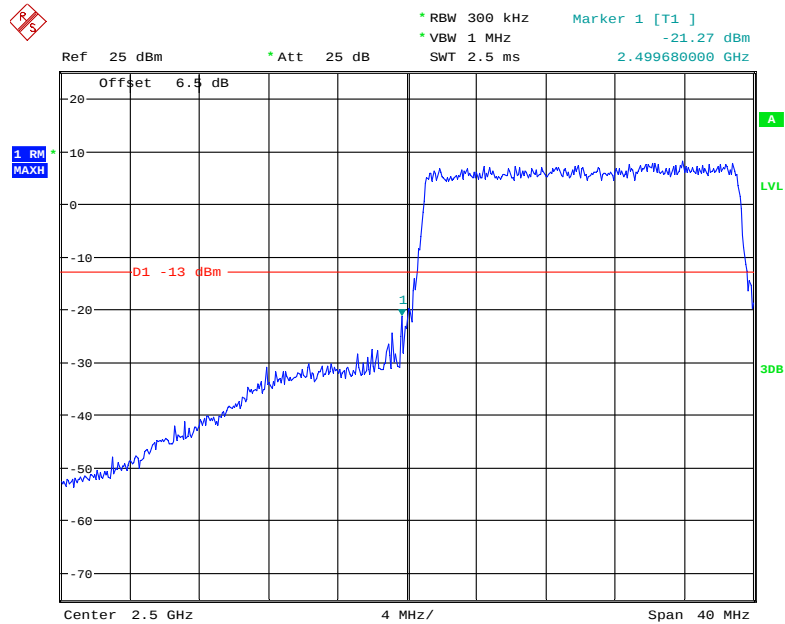
Date: 17.APR.2020 12:42:00

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



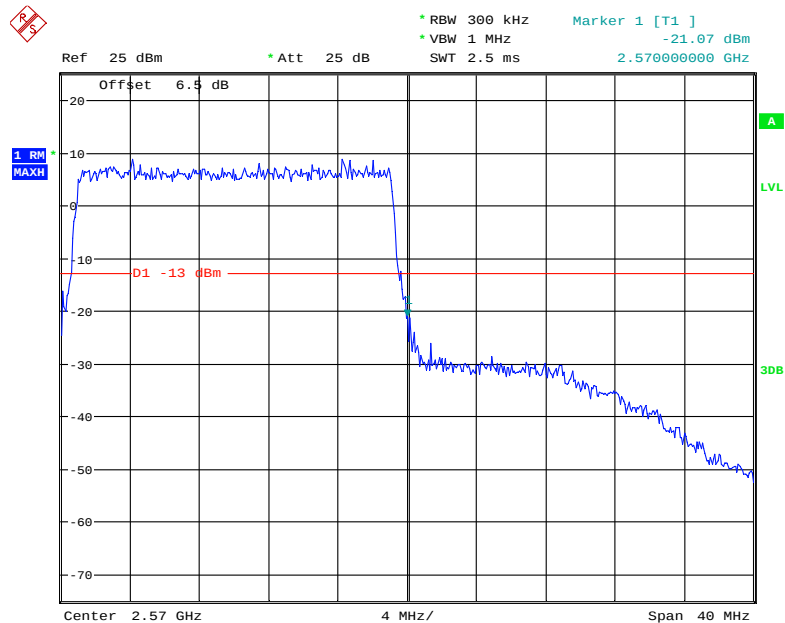
Date: 17.APR.2020 12:42:38

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



Date: 17.APR.2020 12:42:18

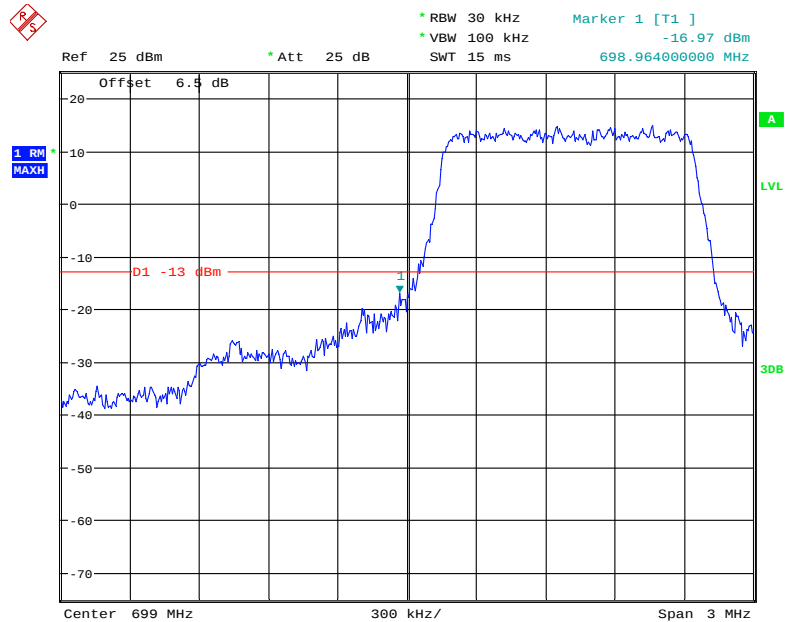
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2020 12:42:56

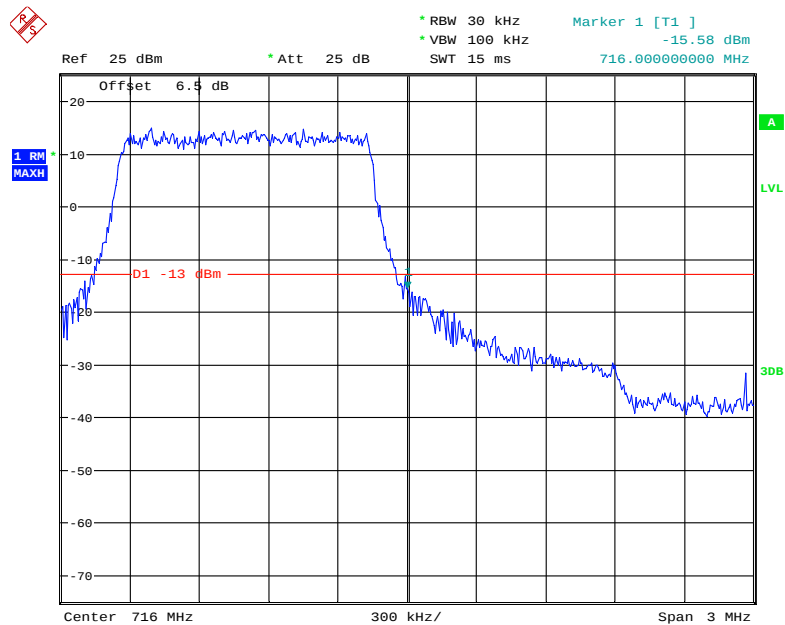
Band 12:

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



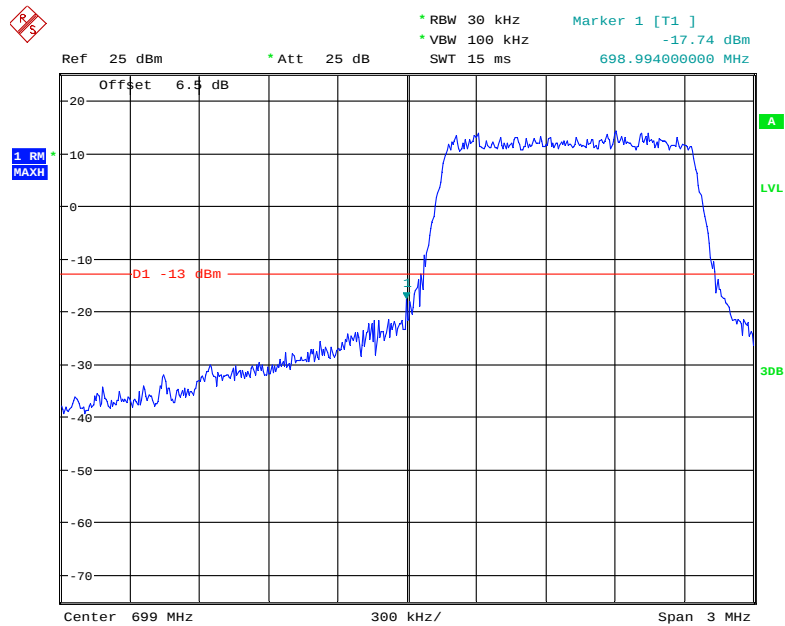
Date: 17.APR.2020 12:43:20

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



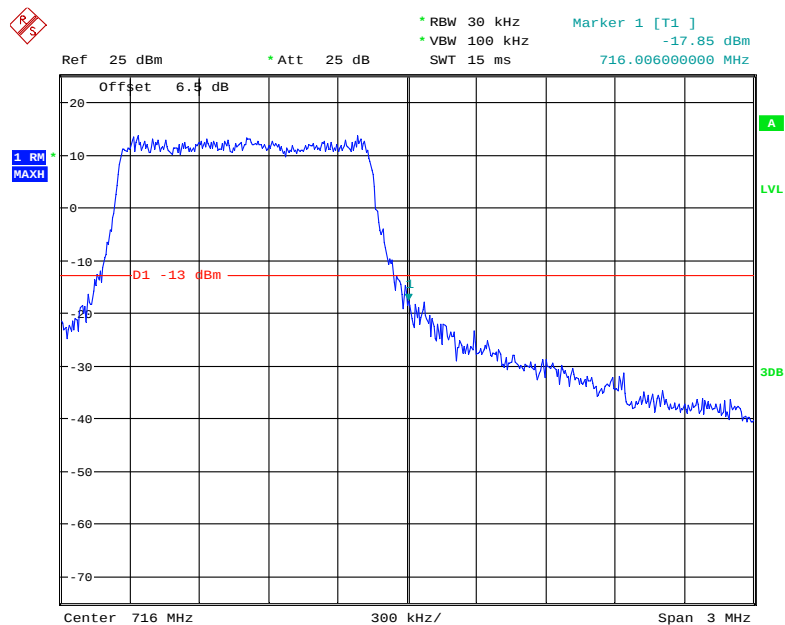
Date: 17.APR.2020 12:44:00

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



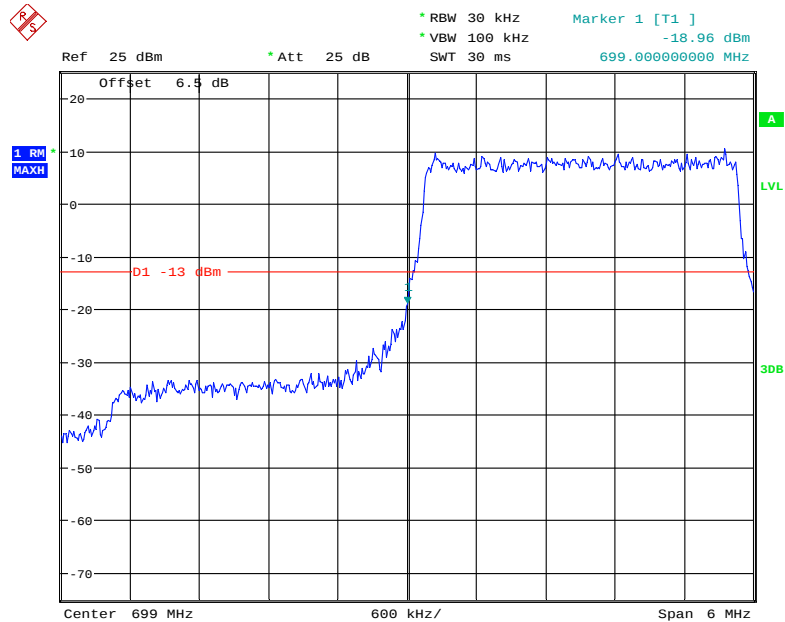
Date: 17.APR.2020 12:43:40

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



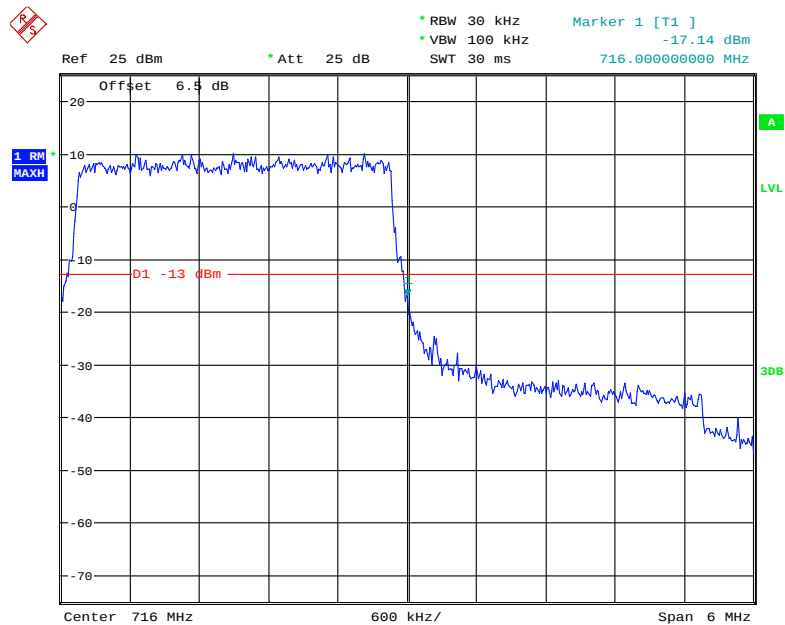
Date: 17.APR.2020 12:44:20

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



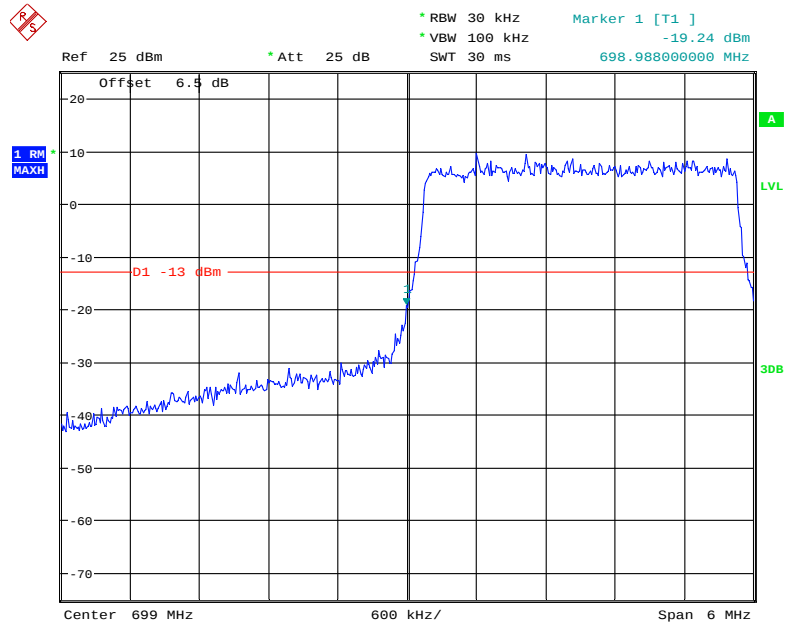
Date: 17.APR.2020 12:44:44

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



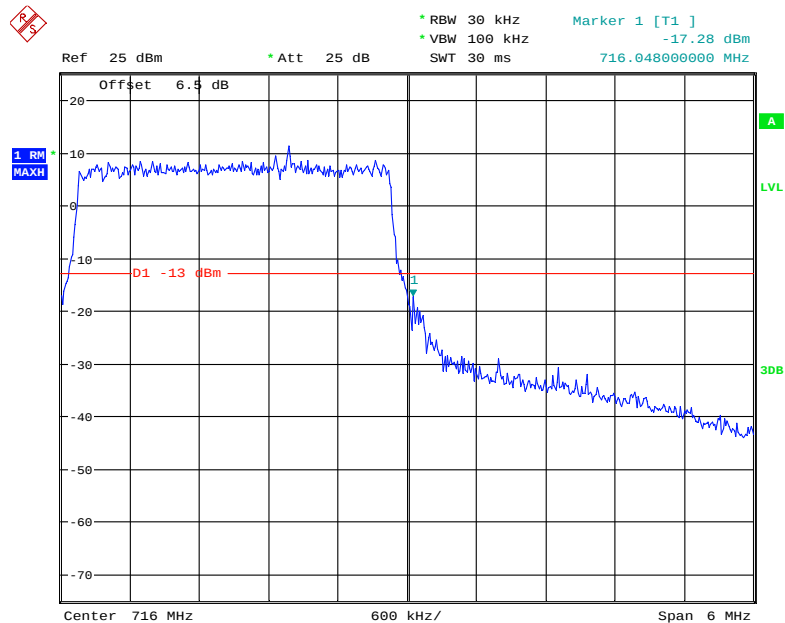
Date: 17.APR.2020 12:45:24

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



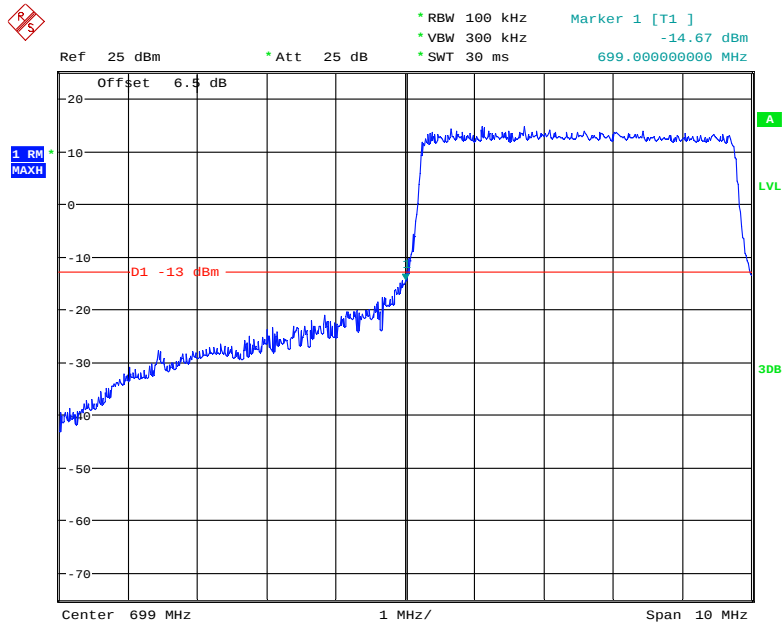
Date: 17.APR.2020 12:45:04

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



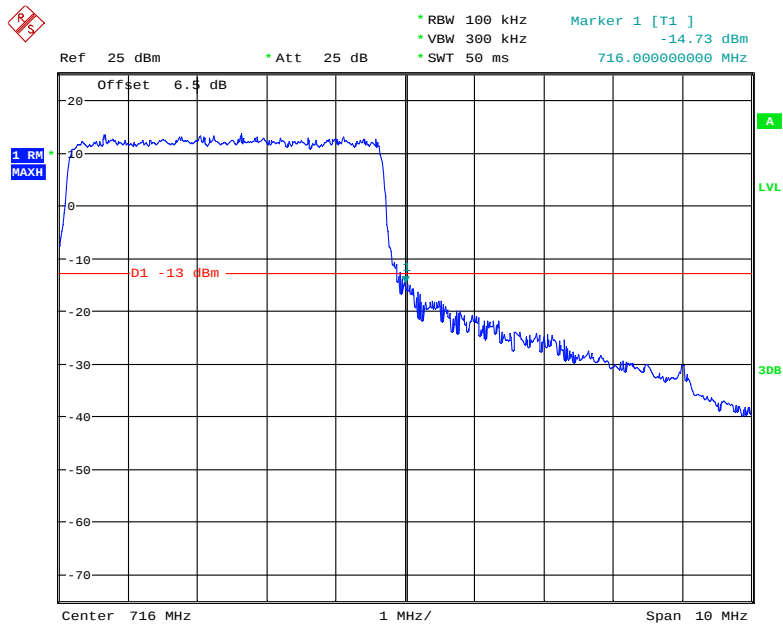
Date: 17.APR.2020 12:45:40

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



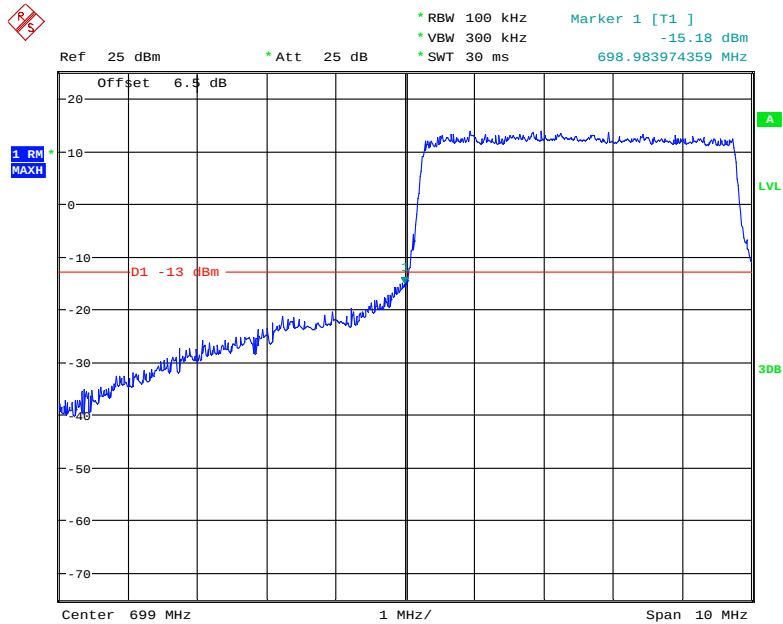
Date: 12.MAY.2020 20:13:43

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



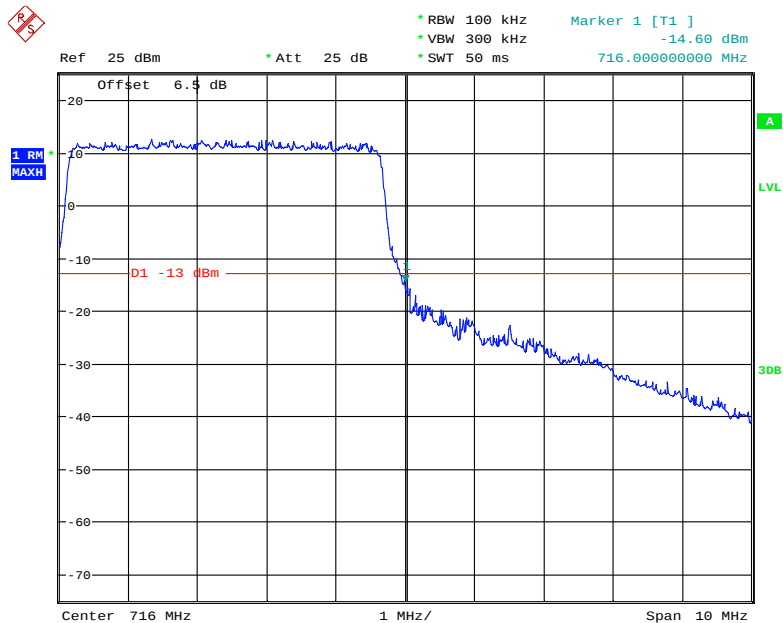
Date: 12.MAY.2020 20:14:59

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



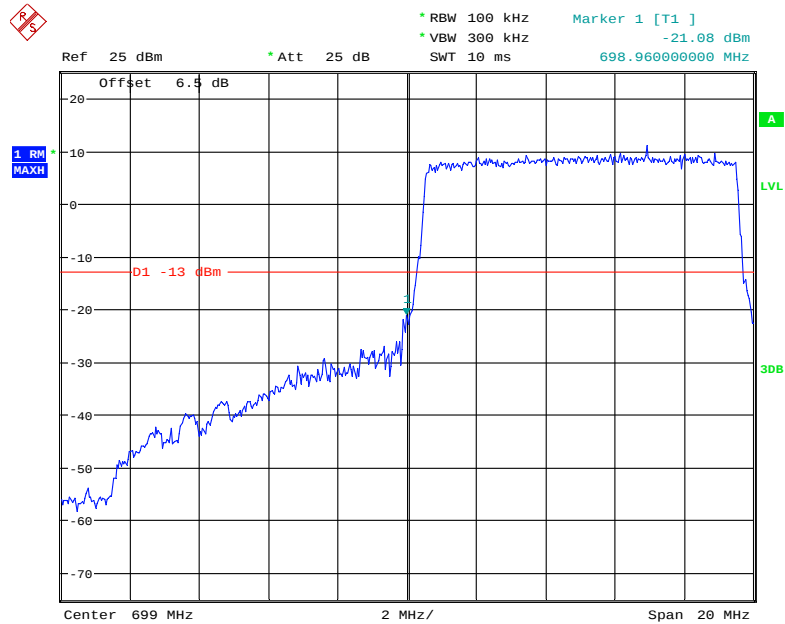
Date: 12.MAY.2020 20:12:30

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



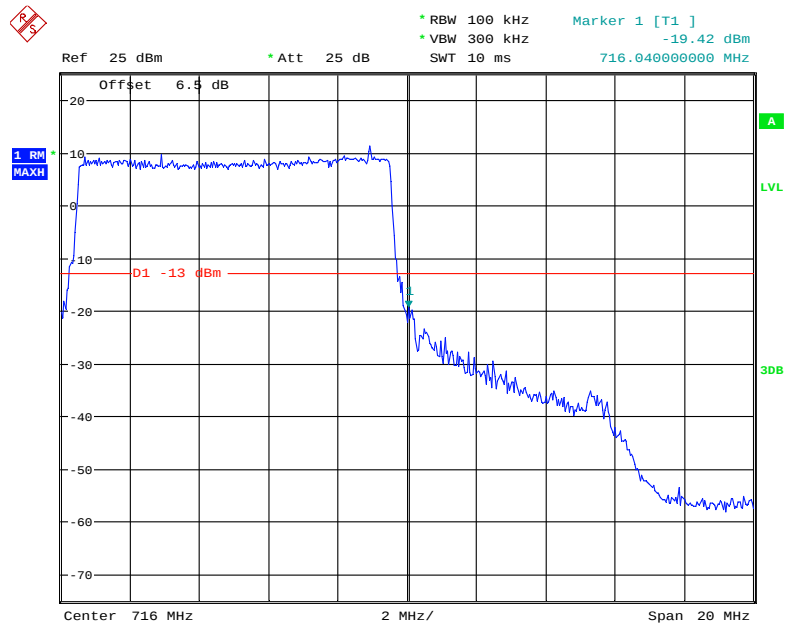
Date: 12.MAY.2020 20:15:38

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



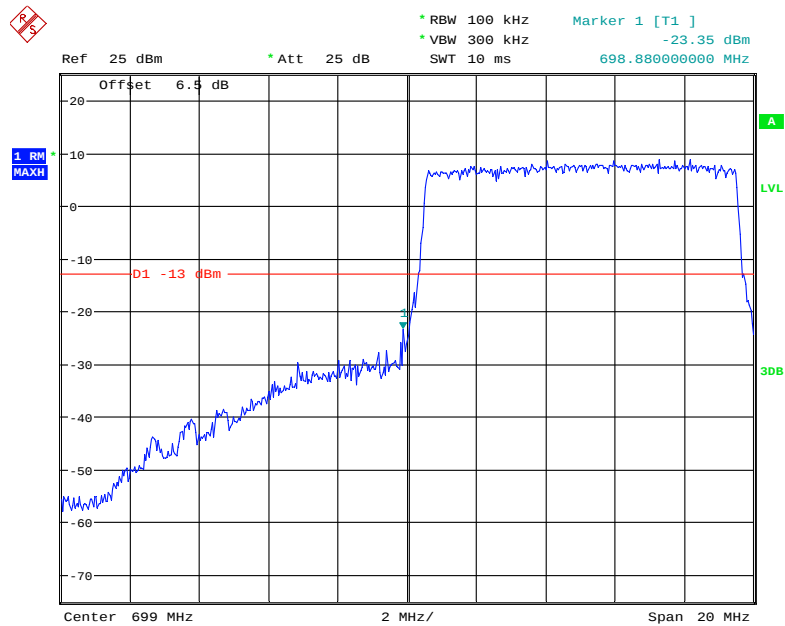
Date: 17.APR.2020 12:47:39

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



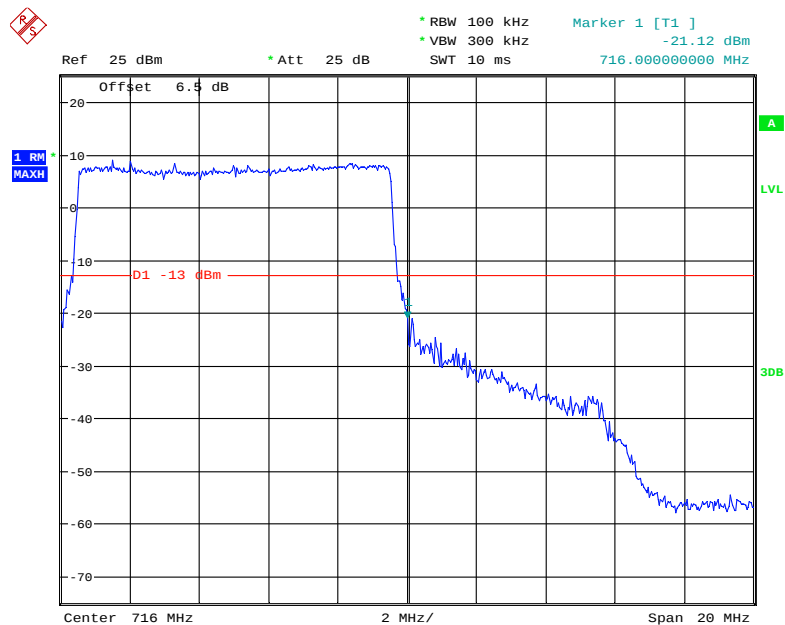
Date: 17.APR.2020 12:48:12

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



Date: 17.APR.2020 12:47:55

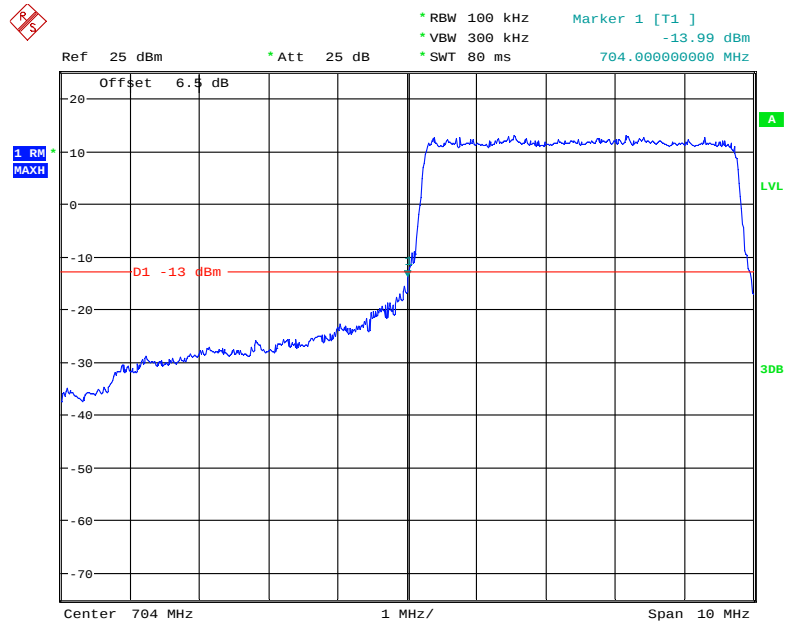
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2020 12:48:29

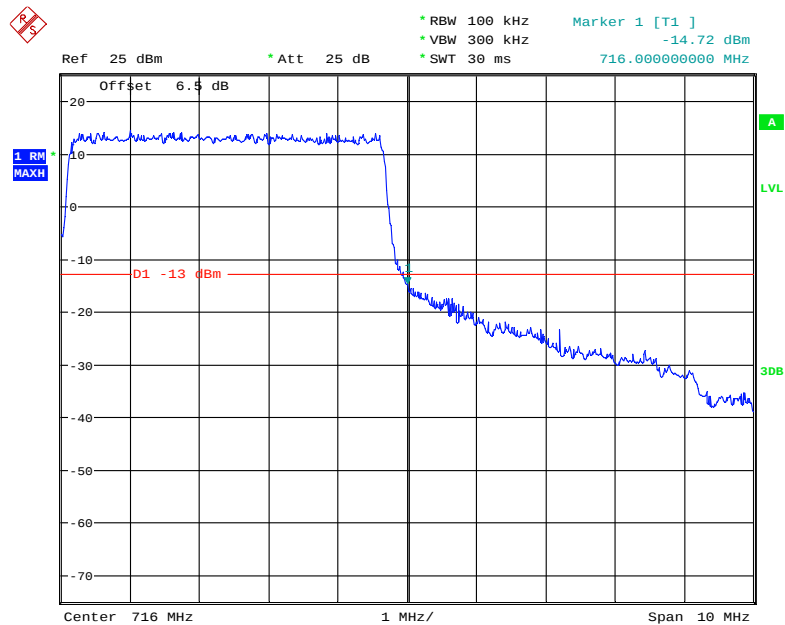
Band 17:

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



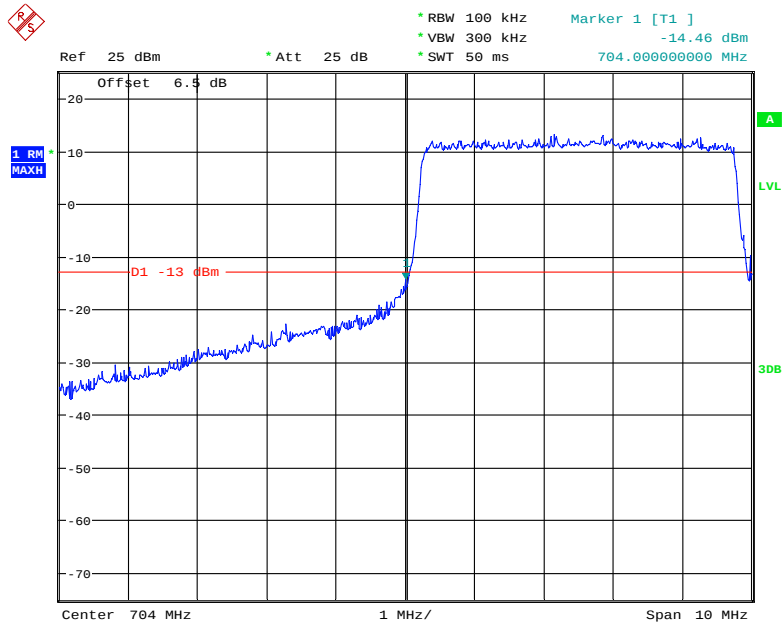
Date: 12.MAY.2020 20:17:58

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



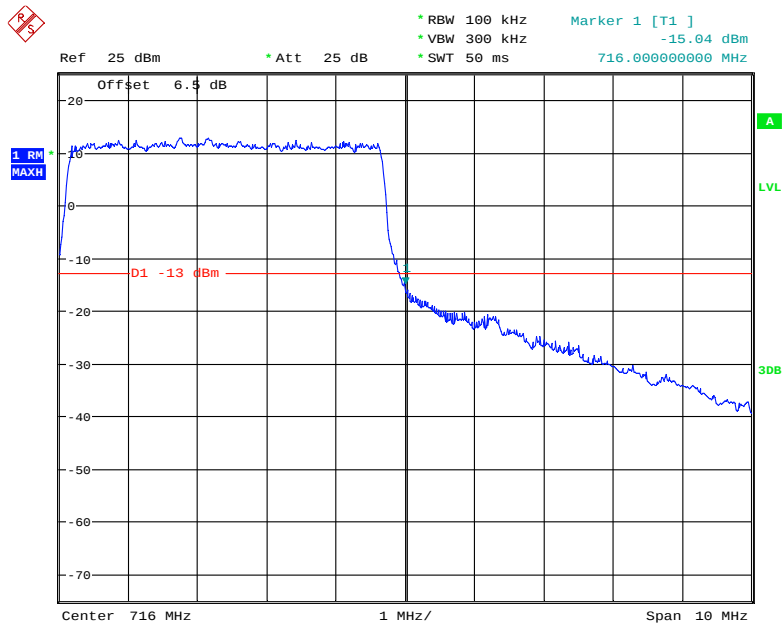
Date: 12.MAY.2020 20:19:23

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



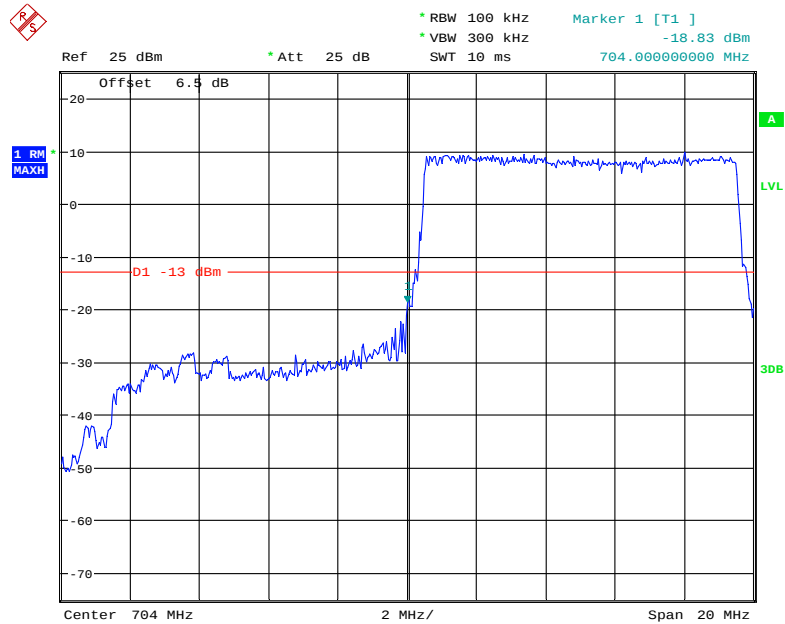
Date: 12.MAY.2020 20:16:43

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



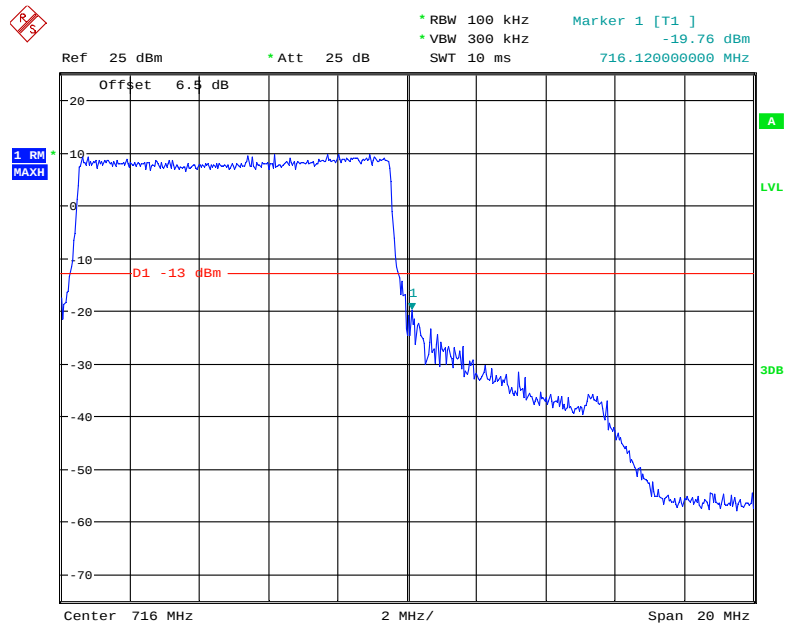
Date: 12.MAY.2020 20:20:26

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



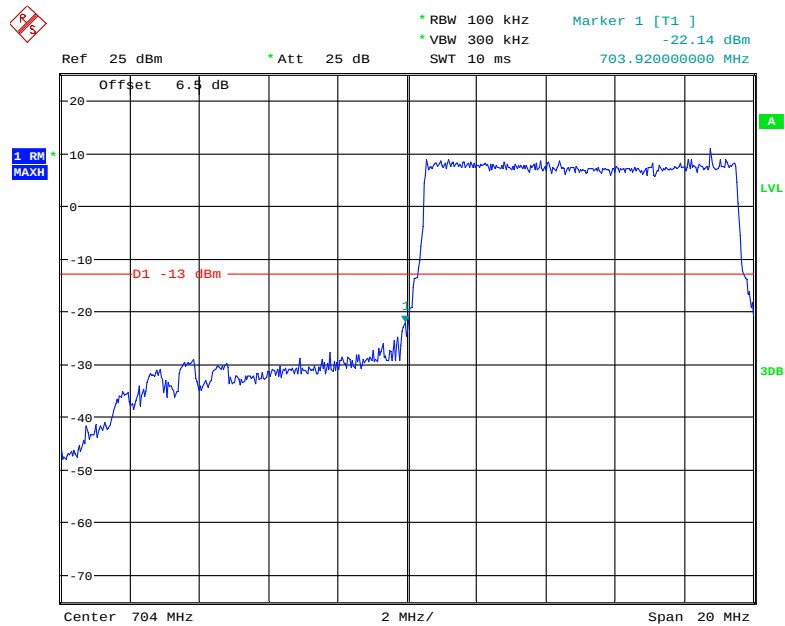
Date: 17.APR.2020 12:50:17

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



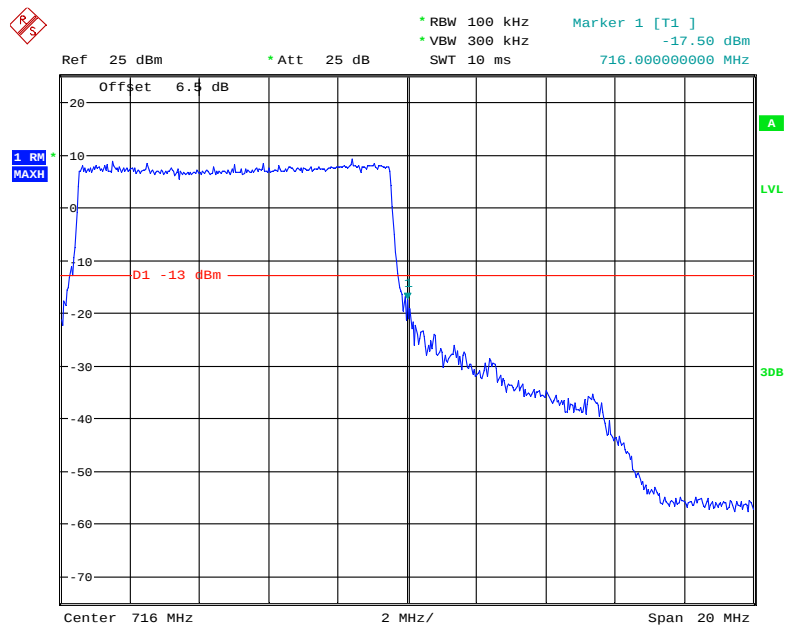
Date: 17.APR.2020 12:50:53

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



Date: 17.APR.2020 12:50:36

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



Date: 17.APR.2020 12:51:13

FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY**Applicable Standard**

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

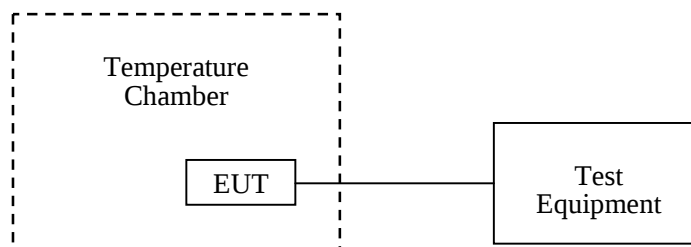
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data**Environmental Conditions**

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

The testing was performed by Gavin Guo on 2020-04-15.

EUT operation mode: Transmitting

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

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

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	2	0.0024	2.5
-20		-2	-0.0024	2.5
-10		3	0.0036	2.5
0		5	0.0060	2.5
10		-1	-0.0012	2.5
20		1	0.0012	2.5
30		-3	-0.0036	2.5
40		5	0.0060	2.5
50		1	0.0012	2.5
20	V min.= 3.5	-7	-0.0084	2.5
	V max.= 4.4	3	0.0036	2.5

EDGE Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	2	0.0024	2.5
-20		-4	-0.0048	2.5
-10		3	0.0036	2.5
0		-5	-0.0060	2.5
10		4	0.0048	2.5
20		-1	-0.0012	2.5
30		8	0.0096	2.5
40		2	0.0024	2.5
50		2	0.0024	2.5
20	V min.= 3.5	4	0.0048	2.5
	V max.= 4.4	2	0.0024	2.5

WCDMA Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	3	0.0036	2.5
-20		1	0.0012	2.5
-10		3	0.0036	2.5
0		5	0.0060	2.5
10		4	0.0048	2.5
20		-2	-0.0024	2.5
30		-5	-0.0060	2.5
40		4	0.0048	2.5
50		5	0.0060	2.5
20	V min.= 3.5	6	0.0072	2.5
	V max.= 4.4	1	0.0012	2.5

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

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.85	2	0.0011	pass
-20		6	0.0032	pass
-10		4	0.0021	pass
0		-2	-0.0011	pass
10		2	0.0011	pass
20		5	0.0027	pass
30		0	0.0000	pass
40		5	0.0027	pass
50		-3	-0.0016	pass
20	V min.= 3.5	5	0.0027	pass
	V max.= 4.4	3	0.0016	pass

EDGE Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.85	3	0.0016	pass
-20		-2	-0.0011	pass
-10		3	0.0016	pass
0		-1	-0.0005	pass
10		3	0.0016	pass
20		0	0.0000	pass
30		0	0.0000	pass
40		5	0.0027	pass
50		-4	-0.0021	pass
20	V min.= 3.5	3	0.0016	pass
	V max.= 4.4	-7	-0.0037	pass

WCDMA Mode

Middle Channel, $f_0=1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.85	6	0.0032	pass
-20		1	0.0005	pass
-10		5	0.0027	pass
0		-3	-0.0016	pass
10		-5	-0.0027	pass
20		6	0.0032	pass
30		4	0.0021	pass
40		2	0.0011	pass
50		3	0.0016	pass
20	V min.= 3.5	-4	-0.0021	pass
	V max.= 4.4	-4	-0.0021	pass

AWS Band (Part 27)

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	1710.164	1754.852	1710	1755
-20		1710.163	1754.853	1710	1755
-10		1710.164	1754.844	1710	1755
0		1710.171	1754.849	1710	1755
10		1710.168	1754.853	1710	1755
20		1710.021	1754.852	1710	1755
30		1710.164	1754.851	1710	1755
40		1710.162	1754.852	1710	1755
50		1710.164	1754.853	1710	1755
20	V min.= 3.5	1710.160	1754.854	1710	1755
	V max.= 4.4	1710.159	1754.845	1710	1755

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, $f_0=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.85	16.19	0.0086	pass
-20		-9.97	-0.0053	pass
-10		-6.13	-0.0033	pass
0		6.17	0.0033	pass
10		7.92	0.0042	pass
20		-21.87	-0.0116	pass
30		-6.52	-0.0035	pass
40		7.18	0.0038	pass
50		-9.69	-0.0052	pass
20	V min.= 3.5	-8.17	-0.0043	pass
	V max.= 4.4	-7.05	-0.0038	pass

Band 4:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	1710.159	1754.843	1710	1755
-20		1710.160	1754.844	1710	1755
-10		1710.161	1754.843	1710	1755
0		1710.161	1754.844	1710	1755
10		1710.160	1754.845	1710	1755
20		1710.017	1754.843	1710	1755
30		1710.160	1754.844	1710	1755
40		1710.159	1754.844	1710	1755
50		1710.161	1754.844	1710	1755
20	V min.= 3.5	1710.159	1754.845	1710	1755
	V max.= 4.4	1710.158	1754.844	1710	1755

Band 5:

10.0 MHz Middle Channel, $f_o = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	9.67	0.0116	2.5
-20		-6.97	-0.0083	2.5
-10		-5.50	-0.0066	2.5
0		6.06	0.0072	2.5
10		9.80	0.0117	2.5
20		-7.37	0.0088	2.5
30		-6.62	-0.0079	2.5
40		-8.73	-0.0104	2.5
50		-7.05	-0.0084	2.5
20	V min.= 3.5	8.99	0.0107	2.5
	V max.= 4.4	-7.17	-0.0086	2.5

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	2500.699	2569.743	2500	2570
-20		2500.700	2569.743	2500	2570
-10		2500.699	2569.743	2500	2570
0		2500.699	2569.743	2500	2570
10		2500.699	2569.743	2500	2570
20		2500.700	2569.743	2500	2570
30		2500.699	2569.743	2500	2570
40		2500.699	2569.743	2500	2570
50		2500.697	2569.742	2500	2570
20	V min.= 3.5	2500.690	2569.743	2500	2570
	V max.= 4.4	2500.700	2569.743	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	699.021	715.887	699	716
-20		699.022	715.889	699	716
-10		699.022	715.889	699	716
0		699.021	715.887	699	716
10		699.022	715.888	699	716
20		699.021	715.889	699	716
30		699.022	715.887	699	716
40		699.024	715.888	699	716
50		699.023	715.888	699	716
20	V min.= 3.5	699.021	715.888	699	716
	V max.= 4.4	699.024	715.887	699	716

Band 17:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	704.018	715.904	704	716
-20		704.015	715.903	704	716
-10		704.017	715.905	704	716
0		704.016	715.905	704	716
10		704.019	715.904	704	716
20		704.018	715.903	704	716
30		704.017	715.902	704	716
40		704.017	715.904	704	716
50		704.018	715.902	704	716
20	V min.= 3.5	704.017	715.904	704	716
	V max.= 4.4	704.019	715.903	704	716

16QAM:**Band 2:**

10.0 MHz Middle Channel, $f_o=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.85	13.65	0.0073	pass
-20		-6.68	-0.0036	pass
-10		9.77	0.0052	pass
0		-7.62	-0.0041	pass
10		-9.91	-0.0053	pass
20		-2.82	-0.0015	pass
30		-6.68	-0.0036	pass
40		-8.85	-0.0047	pass
50		5.67	0.003	pass
20	V min.= 3.5	6.05	0.0032	pass
	V max.= 4.4	7.52	0.004	pass

Band 4:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	1710.131	1754.874	1710	1755
-20		1710.132	1754.874	1710	1755
-10		1710.132	1754.874	1710	1755
0		1710.132	1754.875	1710	1755
10		1710.131	1754.875	1710	1755
20		1710.133	1754.873	1710	1755
30		1710.131	1754.873	1710	1755
40		1710.132	1754.874	1710	1755
50		1710.132	1754.875	1710	1755
20	V min.= 3.5	1710.131	1754.874	1710	1755
	V max.= 4.4	1710.131	1754.874	1710	1755

Band 5:

10.0 MHz Middle Channel, $f_o=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	9.06	0.0108	2.5
-20		8.10	0.0097	2.5
-10		-8.59	-0.0103	2.5
0		9.33	0.0112	2.5
10		-6.94	-0.0083	2.5
20		-15.23	0.0182	2.5
30		6.43	0.0077	2.5
40		-6.17	-0.0074	2.5
50		-6.44	-0.0077	2.5
20	V min.= 3.5	6.34	0.0076	2.5
	V max.= 4.4	-6.89	-0.0082	2.5

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	2500.873	2569.792	2500	2570
-20		2500.875	2569.792	2500	2570
-10		2500.873	2569.794	2500	2570
0		2500.874	2569.794	2500	2570
10		2500.873	2569.793	2500	2570
20		2500.875	2569.795	2500	2570
30		2500.874	2569.794	2500	2570
40		2500.875	2569.795	2500	2570
50		2500.874	2569.795	2500	2570
20	V min.= 3.5	2500.875	2569.794	2500	2570
	V max.= 4.4	2500.876	2569.794	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	699.123	715.869	699	716
-20		699.124	715.867	699	716
-10		699.123	715.869	699	716
0		699.122	715.867	699	716
10		699.127	715.869	699	716
20		699.121	715.868	699	716
30		699.121	715.869	699	716
40		699.123	715.868	699	716
50		699.121	715.868	699	716
20	V min.= 3.5	699.123	715.867	699	716
	V max.= 4.4	699.122	715.869	699	716

Band 17:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.85	704.155	715.891	704	716
-20		704.154	715.892	704	716
-10		704.155	715.892	704	716
0		704.156	715.891	704	716
10		704.157	715.893	704	716
20		704.153	715.890	704	716
30		704.152	715.891	704	716
40		704.154	715.894	704	716
50		704.155	715.892	704	716
20	V min.= 3.5	704.154	715.892	704	716
	V max.= 4.4	704.152	715.891	704	716

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