



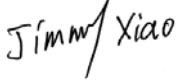
FCC PART 27
FCC PART 22H, PART 24E
TEST REPORT

For

Epik One America Corporation

801 Brickell Ave. #900 Miami Florida United States 33131

FCC ID: 2AO6ZX610

Report Type: Original Report	Product Type: 4G Smart Phone
Report Number: RSZ191204002-00D	
Report Date: 2020-01-17	
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	4G Smart Phone
Tested Model	X610
Frequency Range	EGSM850/WCDMA B5/LTE B5: 824-849MHz(TX)/869-894MHz(RX) PCS1900/WCDMA B2/LTE B2: 1850-1910MHz(TX)/1930-1990MHz(RX) LTE B4: 1710- 1755MHz(TX)/2110-2155MHz(RX) LTE B7: 2500-2570MHz(TX)/2620-2690MHz(RX)
Conducted Average Power	EGSM850: 32.35dBm(GMSK), 28.22dBm(8PSK) PCS1900: 29.79dBm(GMSK), 25.39dBm(8PSK) WCDMA Band 2: 21.58dBm WCDMA Band 5: 22.53dBm LTE Band 2: 22.99dBm LTE Band 4: 22.86dBm LTE Band 5: 23.19dBm LTE Band 7: 23.76dBm
Modulation Technique	2G: GMSK, 8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	FPC Antennas
Voltage Range	DC 3.8 V from battery or DC 5V from adapter
Date of Test	2019-12-12 to 2020-01-17
Sample serial number	RSZ191204002-RF-S5 (Assigned by BACL, Shenzhen)
Received date	2019-12-05
Sample/EUT Status	Good condition
Adapter information	Model: YMK-6W050100 Input: AC 100-240V, 50/60Hz, 0.2A Output: DC 5V, 1000mA

Objective

This test report is prepared on behalf of *Epik One America Corporation* 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 submissions with FCC ID: 2AO6ZX610.

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.

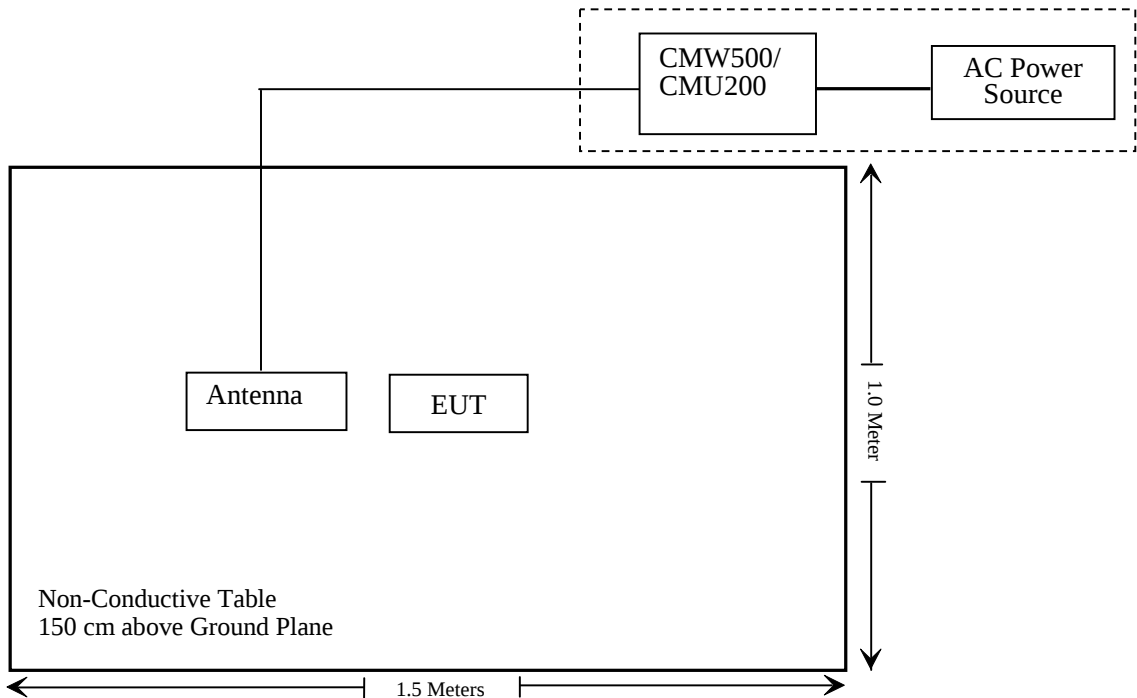
Equipment Modifications

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: RSZ191204002-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
Unknown	Cable 2	RF Cable 2	F-03-EM197	2019/11/29	2020/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2019/11/29	2020/11/28
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2019/7/22	2020/07/21
COM-POWER	Pre-amplifier	PA-122	181919	2019/11/29	2020/11/28
COM-POWER	Amplifier	QLW-18405536-J0	15964001002	2019/11/29	2020/11/28
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017/12/22	2020/12/21
A.H.System	Horn Antenna	SAS-200/571	135	2018/9/1	2021/8/31
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2019/11/29	2020/11/28
Unknown	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-2823-02	1007726-02 1302	2017/12/6	2020/12/5
Rohde & Schwarz	Wideband Radio Communication Tester	CMU200	106891	2019/9/12	2020/9/11
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2019/7/9	2020/7/8
Agilent	Signal Generator	N5183A	MY51040755	2019-12-03	2020-12-03

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2019/3/2	2020/3/1
Unknown	RF Cable	Unknown	2301 276	2019/11/29	2020/11/28
Weinschel	Power divider	1515	RH386	2019/4/20	2020/4/20
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200982	2019/3/2	2020/3/2
Unknown	RF Cable	Unknown	DLO J5/W6102	2019/11/29	2020/11/28
Weinschel	Power divider	1515	MY628	2019/11/29	2020/11/28
Rohde & Schwarz	Wideband Radio Communication Tester	CMU200	106891	2019/9/12	2020/9/11
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2019/7/9	2020/7/8
Yijia	Temperature & Humidity Meter	10316377	T-03-EM397	2019/10/14	2020/10/13
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2019/04/12	2020/04/12

* 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: RSZ191204002-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.

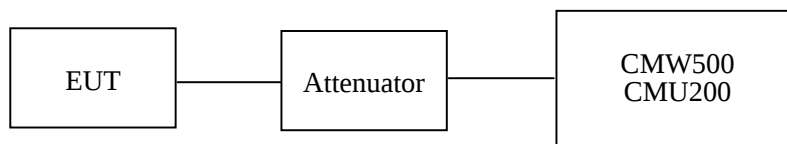
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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:	21~25 °C
Relative Humidity:	20~52 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu, Zero Yan, Charlie Cha and Leo Huang from 2019-12-12 to 2020-01-09.

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

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.28	38.45
	190	836.6	32.19	38.45
	251	848.8	32.22	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.35	30.29	28.31	27.23	38.45
	190	836.6	32.26	30.32	28.28	27.27	38.45
	251	848.8	32.29	30.38	28.22	27.18	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	28.13	25.13	23.53	21.22	38.45
	190	836.6	28.22	25.28	23.61	21.34	38.45
	251	848.8	28.10	25.39	23.75	21.16	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		22.53	22.39	22.38
		HSDPA	1	21.52	21.38	21.36
			2	21.46	21.39	21.33
			3	21.50	21.37	21.36
			4	21.49	21.36	21.35
		HSUPA	1	21.51	21.39	21.36
			2	21.52	21.33	21.38
			3	21.51	21.38	21.37
			4	21.53	21.37	21.35
			5	21.52	21.32	21.38
		HSPA+	1	21.51	21.38	21.36

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.33	33
	661	1880.0	29.21	33
	810	1909.8	29.03	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.16	27.18	24.88	23.76	33
	661	1880.0	29.43	27.62	25.31	24.28	33
	810	1909.8	29.79	27.93	25.83	24.76	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.36	23.53	21.25	19.23	33
	661	1880.0	25.33	23.65	21.36	19.48	33
	810	1909.8	25.39	23.62	21.33	19.76	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		21.46	21.57	21.26
		HSDPA	1	21.41	21.53	21.25
			2	21.45	21.56	21.24
			3	21.46	21.55	21.25
			4	21.44	21.54	21.24
		HSUPA	1	21.45	21.55	21.23
			2	21.46	21.53	21.25
			3	21.44	21.56	21.26
			4	21.45	21.58	21.23
			5	21.46	21.55	21.21
		HSPA+	1	21.45	21.57	21.26

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

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.32	13
	Middle	1.44	13
	High	1.41	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.44	13
	Middle	1.17	13
	High	1.51	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.13	13
	Middle	3.26	13
	High	3.58	13
HSDPA (16QAM)	Low	3.42	13
	Middle	3.41	13
	High	3.38	13
HSUPA (BPSK)	Low	3.02	13
	Middle	3.15	13
	High	3.42	13
HSPA+	Low	3.18	13
	Middle	3.29	13
	High	3.17	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.26	13
	Middle	1.37	13
	High	1.51	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.53	13
	Middle	1.29	13
	High	1.38	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.21	13
	Middle	3.61	13
	High	3.50	13
HSDPA (16QAM)	Low	3.22	13
	Middle	3.28	13
	High	3.17	13
HSUPA (BPSK)	Low	3.15	13
	Middle	3.17	13
	High	3.08	13
HSPA+	Low	3.19	13
	Middle	3.44	13
	High	3.57	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	81.10	127	1.5	H	21.7	1.90	0.0	19.80	38.45	18.65
836.6	90.15	241	1.8	V	30.2	1.90	0.0	28.30	38.45	10.15
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	85.54	150	2.3	H	15.9	1.30	9.40	24.00	33	9.00
1880.00	88.73	245	2.1	V	18.8	1.30	9.40	26.90	33	6.10

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	77.66	295	1.0	H	18.3	1.90	0.0	16.40	38.45	22.05
836.6	86.48	131	2.3	V	26.5	1.90	0.0	24.60	38.45	13.85
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	80.38	153	1.9	H	10.7	1.30	9.40	18.80	33	14.20
1880.00	84.29	31	1.4	V	14.4	1.30	9.40	22.50	33	10.50

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	71.66	184	2.4	H	12.3	1.90	0.0	10.40	38.45	28.05
836.6	80.25	280	1.5	V	20.3	1.90	0.0	18.40	38.45	20.05
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	80.22	313	2.4	H	10.5	1.30	9.40	18.60	33	14.40
1880.00	79.07	195	1.8	V	9.2	1.30	9.40	17.30	33	15.70

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit - Absolute Level

dBd is for the ERP, dBi is for EIRP.

LTE Band 2:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.75	22.63	22.63
		RB Size=1, RB Offset=2	22.69	22.48	22.68
		RB Size=1, RB Offset=5	22.25	22.55	22.64
		RB Size=3, RB Offset=0	22.56	22.32	22.30
		RB Size=3, RB Offset=1	22.25	22.42	22.28
		RB Size=3, RB Offset=2	22.09	22.07	22.32
		RB Size=6, RB Offset=0	22.13	22.19	22.15
	16QAM	RB Size=1, RB Offset=0	22.17	22.10	22.09
		RB Size=1, RB Offset=2	22.10	22.06	22.03
		RB Size=1, RB Offset=5	22.15	21.97	23.05
		RB Size=3, RB Offset=0	21.73	21.65	22.89
		RB Size=3, RB Offset=1	21.92	21.90	21.87
		RB Size=3, RB Offset=2	21.91	21.86	21.82
		RB Size=6, RB Offset=0	21.71	21.78	21.82
3.0	QPSK	RB Size=1, RB Offset=0	22.80	22.78	22.81
		RB Size=1, RB Offset=7	22.84	22.66	22.91
		RB Size=1, RB Offset=14	22.50	22.64	22.79
		RB Size=8, RB Offset=0	21.86	21.86	21.94
		RB Size=8, RB Offset=4	21.78	21.63	21.89
		RB Size=8, RB Offset=7	21.65	21.69	21.84
		RB Size=15, RB Offset=0	21.87	21.76	21.72
	16QAM	RB Size=1, RB Offset=0	22.17	22.08	21.99
		RB Size=1, RB Offset=7	22.18	22.05	22.15
		RB Size=1, RB Offset=14	22.24	21.85	21.90
		RB Size=8, RB Offset=0	20.88	20.76	20.91
		RB Size=8, RB Offset=4	20.65	20.93	20.95
		RB Size=8, RB Offset=7	20.52	20.70	20.83
		RB Size=15, RB Offset=0	20.67	20.78	20.82

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.86	22.84	22.89
		RB Size=1, RB Offset=12	22.86	22.80	22.71
		RB Size=1, RB Offset=24	22.61	22.95	22.34
		RB Size=12, RB Offset=0	21.91	21.84	22.00
		RB Size=12, RB Offset=6	21.80	21.73	21.67
		RB Size=12, RB Offset=11	21.75	21.64	21.85
		RB Size=25, RB Offset=0	21.84	21.74	21.88
	16QAM	RB Size=1, RB Offset=0	22.08	21.64	21.58
		RB Size=1, RB Offset=12	21.84	21.49	21.66
		RB Size=1, RB Offset=24	21.84	21.34	21.57
		RB Size=12, RB Offset=0	20.92	20.80	20.79
		RB Size=12, RB Offset=6	20.75	20.79	20.69
		RB Size=12, RB Offset=11	20.65	20.61	20.66
		RB Size=25, RB Offset=0	20.88	20.63	20.88
10.0	QPSK	RB Size=1, RB Offset=0	22.76	22.85	22.78
		RB Size=1, RB Offset=24	22.65	22.89	22.78
		RB Size=1, RB Offset=49	22.67	22.86	22.73
		RB Size=25, RB Offset=0	21.78	21.81	21.72
		RB Size=25, RB Offset=12	21.84	21.80	21.65
		RB Size=25, RB Offset=24	21.92	21.54	21.66
		RB Size=50, RB Offset=0	21.56	21.55	21.59
	16QAM	RB Size=1, RB Offset=0	21.76	21.66	21.71
		RB Size=1, RB Offset=24	21.68	21.52	21.63
		RB Size=1, RB Offset=49	21.34	21.41	21.72
		RB Size=25, RB Offset=0	22.61	20.64	20.69
		RB Size=25, RB Offset=12	22.55	20.46	20.52
		RB Size=25, RB Offset=24	22.64	20.37	20.41
		RB Size=50, RB Offset=0	20.65	20.57	20.55

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.08	22.06	22.36
		RB Size=1, RB Offset=37	22.11	21.97	22.15
		RB Size=1, RB Offset=74	21.97	22.00	22.16
		RB Size=36, RB Offset=0	22.15	22.13	22.00
		RB Size=36, RB Offset=18	22.05	21.89	22.06
		RB Size=36, RB Offset=37	22.26	21.67	21.63
		RB Size=75, RB Offset=0	21.92	21.88	22.12
	16QAM	RB Size=1, RB Offset=0	21.93	21.83	21.69
		RB Size=1, RB Offset=37	21.78	21.83	21.71
		RB Size=1, RB Offset=74	21.73	21.77	21.41
		RB Size=36, RB Offset=0	21.71	21.84	22.17
		RB Size=36, RB Offset=18	21.96	21.68	22.07
		RB Size=36, RB Offset=37	21.53	21.63	21.89
		RB Size=75, RB Offset=0	21.32	21.27	21.03
20.0	QPSK	RB Size=1, RB Offset=0	22.98	22.90	22.99
		RB Size=1, RB Offset=49	22.99	22.94	22.95
		RB Size=1, RB Offset=99	22.78	22.84	22.86
		RB Size=50, RB Offset=0	21.90	21.80	22.04
		RB Size=50, RB Offset=24	21.89	21.91	21.86
		RB Size=50, RB Offset=49	21.77	21.73	21.77
		RB Size=100, RB Offset=0	21.74	21.81	21.88
	16QAM	RB Size=1, RB Offset=0	22.02	22.05	22.14
		RB Size=1, RB Offset=49	22.02	21.87	21.98
		RB Size=1, RB Offset=99	22.04	21.75	21.88
		RB Size=50, RB Offset=0	20.88	20.96	21.04
		RB Size=50, RB Offset=24	20.88	20.86	21.08
		RB Size=50, RB Offset=49	20.51	20.64	20.93
		RB Size=100, RB Offset=0	20.91	20.84	20.92

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.51	13	Pass
QPSK (100RB Size)	6.69	13	Pass
16QAM (1RB Size)	7.47	13	Pass
16QAM (100RB 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									
1880.00	84.13	192	1.9	H	14.5	1.30	9.40	22.60	33
1880.00	80.12	0	2.5	V	10.2	1.30	9.40	18.30	33
3 MHz Bandwidth									
1880.00	83.81	357	1.9	H	14.1	1.30	9.40	22.20	33
1880.00	78.94	28	1.5	V	9.0	1.30	9.40	17.10	33
5 MHz Bandwidth									
1880.00	83.57	203	2.2	H	13.9	1.30	9.40	22.00	33
1880.00	78.63	210	2.2	V	8.7	1.30	9.40	16.80	33
10 MHz Bandwidth									
1880.00	83.13	336	2.0	H	13.5	1.30	9.40	21.60	33
1880.00	78.06	58	2.0	V	8.2	1.30	9.40	16.30	33
15 MHz Bandwidth									
1880.00	83.79	135	1.4	H	14.1	1.30	9.40	22.20	33
1880.00	78.62	302	2.0	V	8.7	1.30	9.40	16.80	33
20 MHz Bandwidth									
1880.00	83.43	141	2.4	H	13.8	1.30	9.40	21.90	33
1880.00	78.54	300	1.6	V	8.6	1.30	9.40	16.70	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	84.05	288	1.5	H	14.4	1.30	9.40	22.50	33
1880.00	79.13	320	2.2	V	9.2	1.30	9.40	17.30	33
3 MHz Bandwidth									
1880.00	83.96	356	1.6	H	14.3	1.30	9.40	22.40	33
1880.00	79.78	27	2.0	V	9.9	1.30	9.40	18.00	33
5 MHz Bandwidth									
1880.00	83.21	75	2.0	H	13.5	1.30	9.40	21.60	33
1880.00	79.76	262	1.3	V	9.9	1.30	9.40	18.00	33
10 MHz Bandwidth									
1880.00	83.90	132	1.3	H	14.2	1.30	9.40	22.30	33
1880.00	79.53	101	1.3	V	9.6	1.30	9.40	17.70	33
15 MHz Bandwidth									
1880.00	83.18	325	2.4	H	13.5	1.30	9.40	21.60	33
1880.00	79.38	282	1.1	V	9.5	1.30	9.40	17.60	33
20 MHz Bandwidth									
1880.00	82.69	232	1.3	H	13.0	1.30	9.40	21.10	33
1880.00	79.22	39	2.0	V	9.3	1.30	9.40	17.40	33

LTE Band 4:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.50	22.51	22.54
		RB Size=1, RB Offset=2	22.40	22.19	22.52
		RB Size=1, RB Offset=5	22.41	21.93	22.55
		RB Size=3, RB Offset=0	22.56	22.70	22.69
		RB Size=3, RB Offset=1	22.46	22.66	22.64
		RB Size=3, RB Offset=2	22.51	22.57	22.55
		RB Size=6, RB Offset=0	21.38	21.35	21.40
	16QAM	RB Size=1, RB Offset=0	21.91	21.91	22.03
		RB Size=1, RB Offset=2	21.79	21.81	21.89
		RB Size=1, RB Offset=5	21.66	21.91	21.90
		RB Size=3, RB Offset=0	22.80	21.76	21.89
		RB Size=3, RB Offset=1	22.79	21.74	21.94
		RB Size=3, RB Offset=2	22.64	21.78	21.55
		RB Size=6, RB Offset=0	20.62	20.57	20.71
3.0	QPSK	RB Size=1, RB Offset=0	22.58	22.59	22.43
		RB Size=1, RB Offset=7	22.24	22.43	22.22
		RB Size=1, RB Offset=14	22.39	22.17	22.21
		RB Size=8, RB Offset=0	21.55	21.67	21.68
		RB Size=8, RB Offset=4	21.42	21.57	21.58
		RB Size=8, RB Offset=7	21.31	21.40	21.69
		RB Size=15, RB Offset=0	21.72	21.71	21.66
	16QAM	RB Size=1, RB Offset=0	21.59	21.62	21.72
		RB Size=1, RB Offset=7	21.72	21.54	21.41
		RB Size=1, RB Offset=14	21.68	21.44	21.19
		RB Size=8, RB Offset=0	20.66	20.61	20.64
		RB Size=8, RB Offset=4	20.61	20.67	20.76
		RB Size=8, RB Offset=7	20.64	20.86	20.67
		RB Size=15, RB Offset=0	20.70	20.84	20.67

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.69	22.66	22.66
		RB Size=1, RB Offset=12	22.63	22.54	22.70
		RB Size=1, RB Offset=24	22.47	22.60	22.70
		RB Size=12, RB Offset=0	21.86	21.68	21.74
		RB Size=12, RB Offset=6	21.80	21.69	21.71
		RB Size=12, RB Offset=11	21.56	21.75	21.58
		RB Size=25, RB Offset=0	21.74	21.70	21.78
	16QAM	RB Size=1, RB Offset=0	21.93	21.84	21.95
		RB Size=1, RB Offset=12	21.84	21.72	21.65
		RB Size=1, RB Offset=24	21.62	21.65	21.75
		RB Size=12, RB Offset=0	20.94	21.05	21.06
		RB Size=12, RB Offset=6	20.72	21.02	20.92
		RB Size=12, RB Offset=11	20.69	20.82	20.78
		RB Size=25, RB Offset=0	20.79	20.61	20.73
10.0	QPSK	RB Size=1, RB Offset=0	22.79	22.70	22.86
		RB Size=1, RB Offset=24	22.74	22.67	22.66
		RB Size=1, RB Offset=49	22.69	22.71	22.77
		RB Size=25, RB Offset=0	21.82	21.74	21.70
		RB Size=25, RB Offset=12	21.54	21.77	21.81
		RB Size=25, RB Offset=24	21.69	21.45	21.73
		RB Size=50, RB Offset=0	21.78	21.78	21.71
	16QAM	RB Size=1, RB Offset=0	22.14	22.26	22.33
		RB Size=1, RB Offset=24	22.18	22.10	22.30
		RB Size=1, RB Offset=49	22.25	22.18	22.03
		RB Size=25, RB Offset=0	20.82	20.86	20.80
		RB Size=25, RB Offset=12	20.59	20.59	20.91
		RB Size=25, RB Offset=24	20.47	20.66	20.62
		RB Size=50, RB Offset=0	21.02	20.95	20.92

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.71	22.62	22.63
		RB Size=1, RB Offset=37	22.65	22.36	22.52
		RB Size=1, RB Offset=74	22.60	22.39	22.47
		RB Size=36, RB Offset=0	21.90	21.94	21.91
		RB Size=36, RB Offset=18	21.89	21.83	21.75
		RB Size=36, RB Offset=37	22.05	21.63	21.65
		RB Size=75, RB Offset=0	21.81	21.65	21.50
	16QAM	RB Size=1, RB Offset=0	21.80	21.69	21.72
		RB Size=1, RB Offset=37	21.52	21.52	21.56
		RB Size=1, RB Offset=74	21.53	21.45	21.51
		RB Size=36, RB Offset=0	20.90	20.69	20.71
		RB Size=36, RB Offset=18	20.78	20.51	20.65
		RB Size=36, RB Offset=37	20.49	20.46	20.49
		RB Size=75, RB Offset=0	20.63	20.70	20.84
20.0	QPSK	RB Size=1, RB Offset=0	22.59	22.33	22.43
		RB Size=1, RB Offset=49	22.61	22.26	22.52
		RB Size=1, RB Offset=99	22.72	22.33	22.10
		RB Size=50, RB Offset=0	21.78	21.94	21.92
		RB Size=50, RB Offset=24	21.77	21.92	21.91
		RB Size=50, RB Offset=49	21.65	21.89	21.78
		RB Size=100, RB Offset=0	21.84	21.50	21.56
	16QAM	RB Size=1, RB Offset=0	22.34	22.15	22.28
		RB Size=1, RB Offset=49	22.08	22.14	22.34
		RB Size=1, RB Offset=99	21.93	22.19	22.41
		RB Size=50, RB Offset=0	20.97	21.09	21.04
		RB Size=50, RB Offset=24	20.94	21.02	21.01
		RB Size=50, RB Offset=49	20.92	20.98	21.11
		RB Size=100, RB Offset=0	20.81	20.69	20.74

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.13	13	Pass
QPSK (100RB Size)	6.42	13	Pass
16QAM (1RB Size)	7.41	13	Pass
16QAM (100RB Size)	7.17	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	86.73	211	2.4	H	13.4	1.30	8.90	21.00	30
1732.50	85.35	19	1.7	V	12.6	1.30	8.90	20.20	30
3 MHz Bandwidth									
1732.50	86.46	189	2.5	H	13.1	1.30	8.90	20.70	30
1732.50	85.11	162	1.1	V	12.4	1.30	8.90	20.00	30
5 MHz Bandwidth									
1732.50	86.01	355	1.9	H	12.7	1.30	8.90	20.30	30
1732.50	84.94	56	1.5	V	12.2	1.30	8.90	19.80	30
10 MHz Bandwidth									
1732.50	85.79	309	1.5	H	12.5	1.30	8.90	20.10	30
1732.50	84.63	52	1.8	V	11.9	1.30	8.90	19.50	30
15 MHz Bandwidth									
1732.50	85.61	14	1.4	H	12.3	1.30	8.90	19.90	30
1732.50	84.45	66	1.1	V	11.7	1.30	8.90	19.30	30
20 MHz Bandwidth									
1732.50	85.46	218	2.5	H	12.1	1.30	8.90	19.70	30
1732.50	84.30	50	2.5	V	11.6	1.30	8.90	19.20	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.64	39	1.5	H	14.3	1.30	8.90	21.90	30
1732.50	85.78	3	2.1	V	13.1	1.30	8.90	20.70	30
3 MHz Bandwidth									
1732.50	87.48	185	2.4	H	14.2	1.30	8.90	21.80	30
1732.50	85.66	198	2.2	V	12.9	1.30	8.90	20.50	30
5 MHz Bandwidth									
1732.50	87.23	209	1.2	H	13.9	1.30	8.90	21.50	30
1732.50	85.42	4	1.9	V	12.7	1.30	8.90	20.30	30
10 MHz Bandwidth									
1732.50	86.79	338	1.5	H	13.5	1.30	8.90	21.10	30
1732.50	84.82	238	1.8	V	12.1	1.30	8.90	19.70	30
15 MHz Bandwidth									
1732.50	86.20	112	1.6	H	12.9	1.30	8.90	20.50	30
1732.50	84.77	78	2.1	V	12.0	1.30	8.90	19.60	30
20 MHz Bandwidth									
1732.50	85.78	160	1.9	H	12.5	1.30	8.90	20.10	30
1732.50	84.50	65	1.6	V	11.8	1.30	8.90	19.40	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	23.01	23.11	22.94
		RB Size=1, RB Offset=2	23.03	23.07	23.02
		RB Size=1, RB Offset=5	23.00	22.97	22.82
		RB Size=3, RB Offset=0	22.99	23.03	23.19
		RB Size=3, RB Offset=1	22.86	23.13	23.14
		RB Size=3, RB Offset=2	22.69	22.69	22.94
		RB Size=6, RB Offset=0	22.10	22.11	21.97
	16QAM	RB Size=1, RB Offset=0	22.07	21.97	21.92
		RB Size=1, RB Offset=2	22.01	21.97	21.80
		RB Size=1, RB Offset=5	22.05	21.69	21.83
		RB Size=3, RB Offset=0	22.10	22.20	22.34
		RB Size=3, RB Offset=1	22.08	22.16	22.08
		RB Size=3, RB Offset=2	21.95	22.11	22.02
		RB Size=6, RB Offset=0	20.87	20.99	20.89
3.0	QPSK	RB Size=1, RB Offset=0	22.93	23.09	23.05
		RB Size=1, RB Offset=7	22.87	22.93	22.88
		RB Size=1, RB Offset=14	22.56	22.75	22.82
		RB Size=8, RB Offset=0	22.04	22.06	22.02
		RB Size=8, RB Offset=4	22.10	22.02	21.97
		RB Size=8, RB Offset=7	22.04	21.77	21.94
		RB Size=15, RB Offset=0	22.07	22.03	22.04
	16QAM	RB Size=1, RB Offset=0	22.39	22.52	22.59
		RB Size=1, RB Offset=7	22.38	22.38	22.57
		RB Size=1, RB Offset=14	22.33	22.20	22.26
		RB Size=8, RB Offset=0	21.14	21.09	21.09
		RB Size=8, RB Offset=4	21.02	21.04	21.07
		RB Size=8, RB Offset=7	21.07	21.17	21.10
		RB Size=15, RB Offset=0	21.01	21.09	21.08

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.09	22.01	22.06
		RB Size=1, RB Offset=12	21.95	21.92	21.84
		RB Size=1, RB Offset=24	21.88	21.79	21.68
		RB Size=12, RB Offset=0	21.12	21.19	21.32
		RB Size=12, RB Offset=6	21.00	21.09	21.14
		RB Size=12, RB Offset=11	20.85	21.05	21.10
		RB Size=25, RB Offset=0	22.11	22.07	22.08
	16QAM	RB Size=1, RB Offset=0	22.05	22.04	21.97
		RB Size=1, RB Offset=12	21.84	21.82	21.88
		RB Size=1, RB Offset=24	21.94	21.67	21.90
		RB Size=12, RB Offset=0	21.24	21.13	21.29
		RB Size=12, RB Offset=6	20.98	21.01	21.07
		RB Size=12, RB Offset=11	20.96	21.10	20.93
		RB Size=25, RB Offset=0	21.17	21.06	21.05
10.0	QPSK	RB Size=1, RB Offset=0	23.09	23.13	23.06
		RB Size=1, RB Offset=24	23.07	23.07	22.88
		RB Size=1, RB Offset=49	22.94	22.94	22.93
		RB Size=25, RB Offset=0	22.01	22.05	21.94
		RB Size=25, RB Offset=12	21.97	21.98	22.16
		RB Size=25, RB Offset=24	21.79	21.81	21.95
		RB Size=50, RB Offset=0	22.15	22.00	22.19
	16QAM	RB Size=1, RB Offset=0	22.50	22.61	22.59
		RB Size=1, RB Offset=24	22.47	22.33	22.53
		RB Size=1, RB Offset=49	22.52	22.30	22.30
		RB Size=25, RB Offset=0	21.11	21.07	21.12
		RB Size=25, RB Offset=12	21.00	21.33	21.10
		RB Size=25, RB Offset=24	20.96	21.25	20.97
		RB Size=50, RB Offset=0	21.16	21.05	21.20

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.59	13	Pass
QPSK (50RB Size)	6.42	13	Pass
16QAM (1RB Size)	7.46	13	Pass
16QAM (50RB Size)	7.42	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	72.36	90	1.7	H	13.0	1.90	0.0	11.10	38.45
836.5	80.63	66	1.9	V	20.6	1.90	0.0	18.70	38.45
3 MHz Bandwidth									
836.5	72.14	110	2.3	H	12.8	1.90	0.0	10.90	38.45
836.5	80.28	13	1.7	V	20.3	1.90	0.0	18.40	38.45
5 MHz Bandwidth									
836.5	72.69	189	2.3	H	13.3	1.90	0.0	11.40	38.45
836.5	80.31	176	2.5	V	20.3	1.90	0.0	18.40	38.45
10 MHz Bandwidth									
836.5	72.53	109	2.5	H	13.2	1.90	0.0	11.30	38.45
836.5	80.69	345	1.9	V	20.7	1.90	0.0	18.80	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	71.92	21	1.8	H	12.5	1.90	0.0	10.60	38.45
836.5	80.13	347	1.8	V	20.1	1.90	0.0	18.20	38.45
3 MHz Bandwidth									
836.5	71.62	236	1.2	H	12.2	1.90	0.0	10.30	38.45
836.5	80.02	265	2.1	V	20.0	1.90	0.0	18.10	38.45
5 MHz Bandwidth									
836.5	71.48	44	1.2	H	12.1	1.90	0.0	10.20	38.45
836.5	80.37	160	1.9	V	20.4	1.90	0.0	18.50	38.45
10 MHz Bandwidth									
836.5	71.77	23	2.2	H	12.4	1.90	0.0	10.50	38.45
836.5	80.46	179	1.5	V	20.5	1.90	0.0	18.60	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	23.23	23.03	22.44
		RB Size=1, RB Offset=12	22.84	22.39	22.34
		RB Size=1, RB Offset=24	23.39	23.01	22.94
		RB Size=12, RB Offset=0	21.98	21.46	21.38
		RB Size=12, RB Offset=6	22.06	21.61	21.44
		RB Size=12, RB Offset=11	22.15	21.51	21.57
		RB Size=25, RB Offset=0	22.08	21.66	22.36
	16QAM	RB Size=1, RB Offset=0	22.48	21.91	22.23
		RB Size=1, RB Offset=12	22.47	21.72	22.18
		RB Size=1, RB Offset=24	22.54	22.01	22.39
		RB Size=12, RB Offset=0	21.90	20.93	21.27
		RB Size=12, RB Offset=6	21.74	21.11	21.38
		RB Size=12, RB Offset=11	21.58	20.85	21.33
		RB Size=25, RB Offset=0	21.14	20.88	20.54
10	QPSK	RB Size=1, RB Offset=0	22.60	22.35	22.91
		RB Size=1, RB Offset=24	22.78	22.35	22.70
		RB Size=1, RB Offset=49	22.53	22.30	22.73
		RB Size=25, RB Offset=0	21.88	21.54	21.95
		RB Size=25, RB Offset=12	21.80	21.91	21.89
		RB Size=25, RB Offset=24	21.73	21.83	22.08
		RB Size=50, RB Offset=0	22.01	21.41	21.51
	16QAM	RB Size=1, RB Offset=0	21.72	21.95	21.99
		RB Size=1, RB Offset=24	21.78	22.17	22.04
		RB Size=1, RB Offset=49	21.72	22.23	21.98
		RB Size=25, RB Offset=0	21.12	21.18	21.17
		RB Size=25, RB Offset=12	21.09	21.28	21.17
		RB Size=25, RB Offset=24	21.10	21.38	21.30
		RB Size=50, RB Offset=0	21.20	20.53	20.57

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	22.73	22.63	23.81
		RB Size=1, RB Offset=37	22.70	22.62	23.54
		RB Size=1, RB Offset=74	22.83	22.73	23.90
		RB Size=36, RB Offset=0	21.91	22.00	22.93
		RB Size=36, RB Offset=18	22.08	21.82	23.05
		RB Size=36, RB Offset=37	22.11	22.00	23.02
		RB Size=75, RB Offset=0	22.22	21.33	22.17
	16QAM	RB Size=1, RB Offset=0	22.06	21.76	22.66
		RB Size=1, RB Offset=37	21.96	21.58	22.70
		RB Size=1, RB Offset=74	22.11	21.61	22.71
		RB Size=36, RB Offset=0	21.21	20.91	21.89
		RB Size=36, RB Offset=18	21.19	20.95	21.77
		RB Size=36, RB Offset=37	21.16	21.02	21.82
		RB Size=75, RB Offset=0	20.65	20.51	21.34
20	QPSK	RB Size=1, RB Offset=0	22.90	23.07	23.67
		RB Size=1, RB Offset=49	22.71	22.86	23.48
		RB Size=1, RB Offset=99	23.05	23.03	23.76
		RB Size=50, RB Offset=0	22.05	22.14	22.78
		RB Size=50, RB Offset=24	22.11	22.18	22.88
		RB Size=50, RB Offset=49	22.07	22.14	22.78
		RB Size=100, RB Offset=0	22.30	21.59	22.43
	16QAM	RB Size=1, RB Offset=0	22.15	22.25	22.88
		RB Size=1, RB Offset=49	21.84	22.30	22.59
		RB Size=1, RB Offset=99	22.15	22.28	22.87
		RB Size=50, RB Offset=0	21.25	21.38	22.15
		RB Size=50, RB Offset=24	21.35	21.64	22.11
		RB Size=50, RB Offset=49	21.11	21.39	21.89
		RB Size=100, RB Offset=0	20.93	20.97	20.94

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.86	13	Pass
QPSK (100RB Size)	6.68	13	Pass
16QAM (1RB Size)	7.55	13	Pass
16QAM (100RB Size)	7.58	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	83.11	9	1.8	H	12.9	2.60	10.20	20.50	33
2535.00	84.13	58	2.4	V	14.6	2.60	10.20	22.20	33
10 MHz Bandwidth									
2535.00	82.72	270	2.5	H	12.6	2.60	10.20	20.20	33
2535.00	83.87	186	1.1	V	14.3	2.60	10.20	21.90	33
15 MHz Bandwidth									
2535.00	82.46	45	1.2	H	12.3	2.60	10.20	19.90	33
2535.00	83.55	159	1.0	V	14.0	2.60	10.20	21.60	33
20 MHz Bandwidth									
2535.00	82.58	336	1.8	H	12.4	2.60	10.20	20.00	33
2535.00	83.31	133	1.3	V	13.8	2.60	10.20	21.40	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	83.43	100	2.4	H	13.3	2.60	10.20	20.90	33
2535.00	84.12	303	2.2	V	14.6	2.60	10.20	22.20	33
10 MHz Bandwidth									
2535.00	83.15	205	2.1	H	13.0	2.60	10.20	20.60	33
2535.00	83.88	228	1.8	V	14.3	2.60	10.20	21.90	33
15 MHz Bandwidth									
2535.00	82.93	191	2.2	H	12.8	2.60	10.20	20.40	33
2535.00	83.49	155	1.3	V	13.9	2.60	10.20	21.50	33
20 MHz Bandwidth									
2535.00	82.71	314	1.5	H	12.5	2.60	10.20	20.10	33
2535.00	83.38	305	1.9	V	13.8	2.60	10.20	21.40	33

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

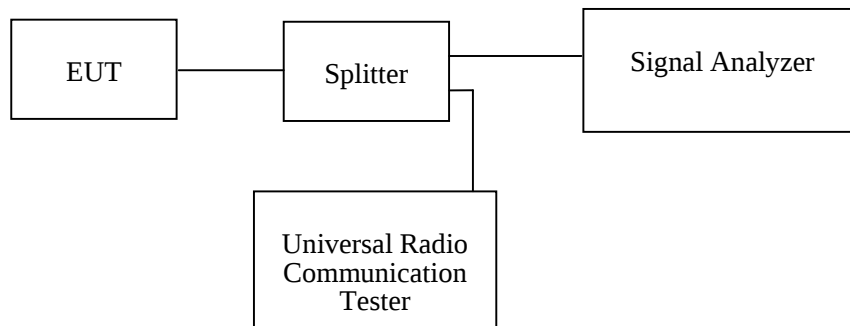
Applicable Standard

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:	21~25 °C
Relative Humidity:	20~52 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu and Leo Huang from 2019-12-12 to 2020-01-04.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	244.00	316.32
EGPRS(8PSK)	836.6	244.00	319.53

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.167	4.696
HSUPA (BPSK)	836.6	4.167	4.689
HSDPA (16QAM)	836.6	4.167	4.679

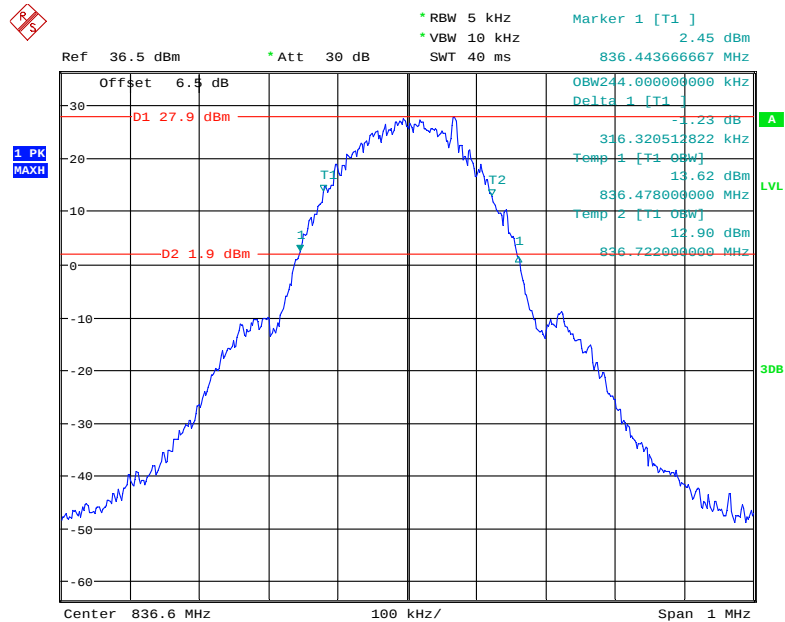
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	245.19	313.46
EGPRS(8PSK)	1880.0	245.19	316.67

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.151	4.696
HSUPA (BPSK)	1880.0	4.151	4.712
HSDPA (16QAM)	1880.0	4.151	4.689

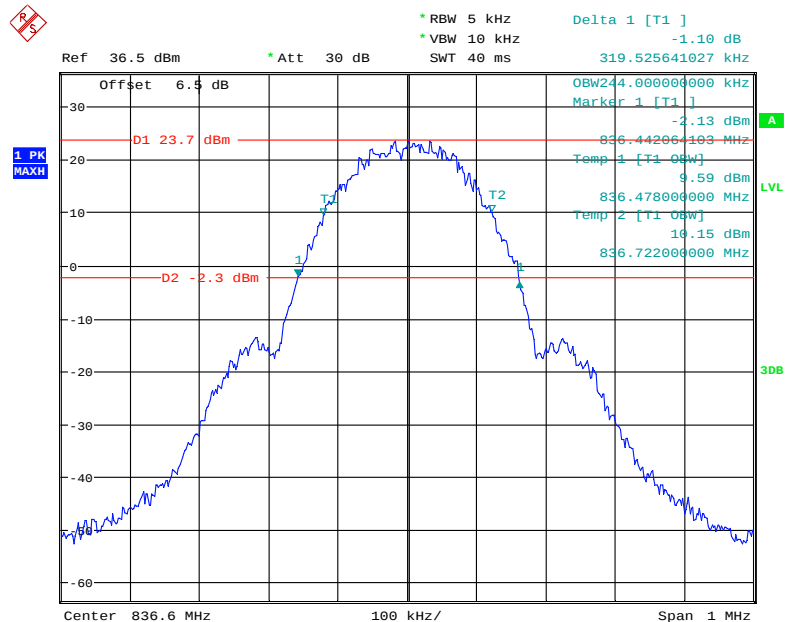
Cellular Band (Part 22H)

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



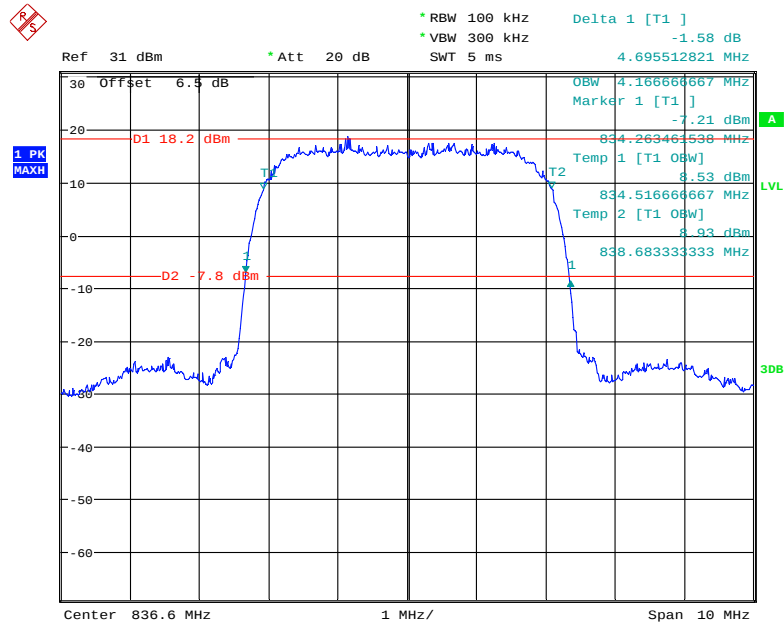
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26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



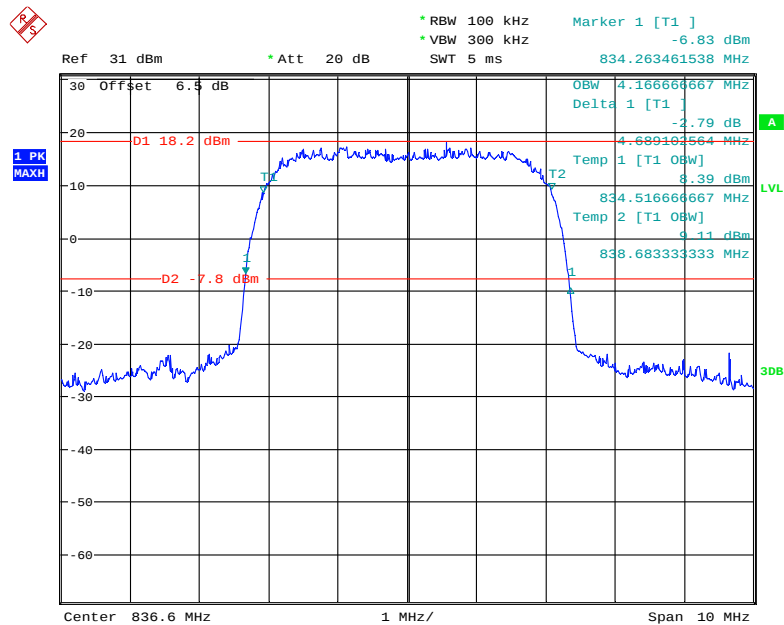
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26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode

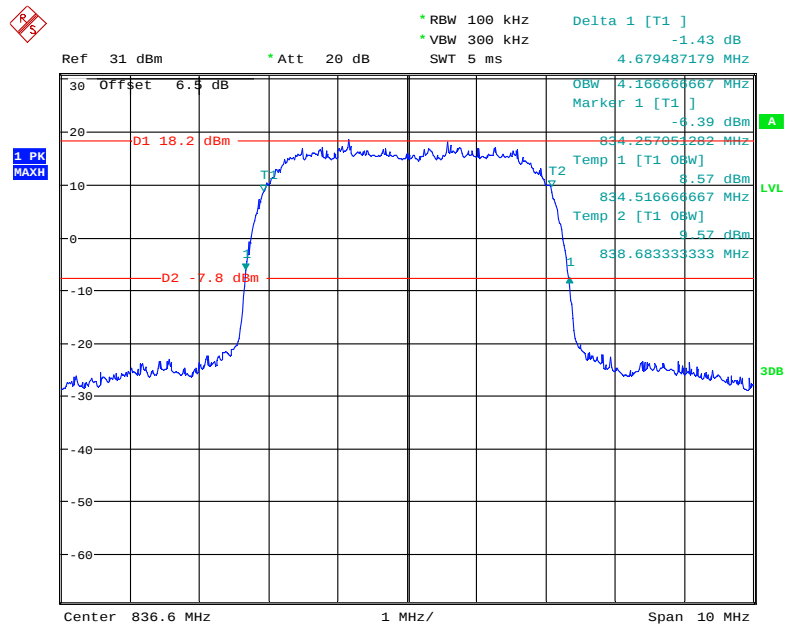


Date: 12.DEC.2019 11:23:34

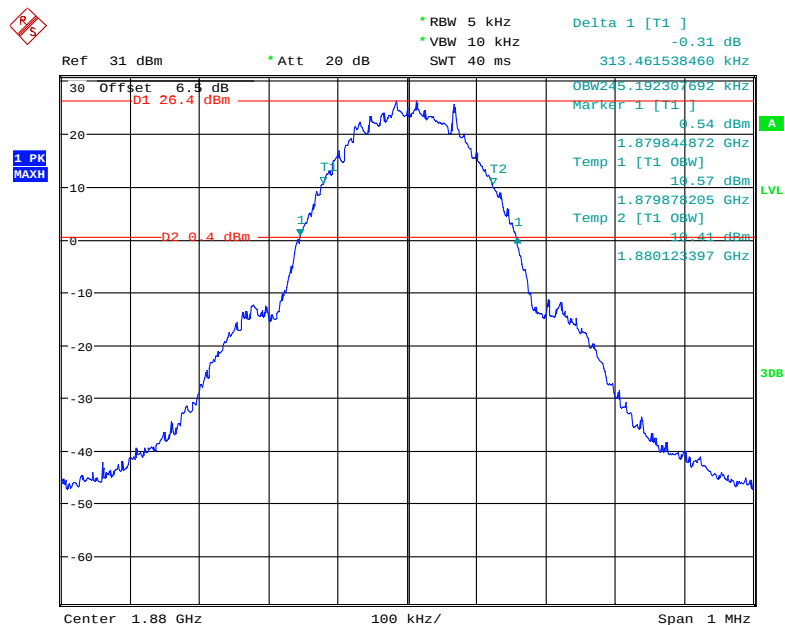
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode



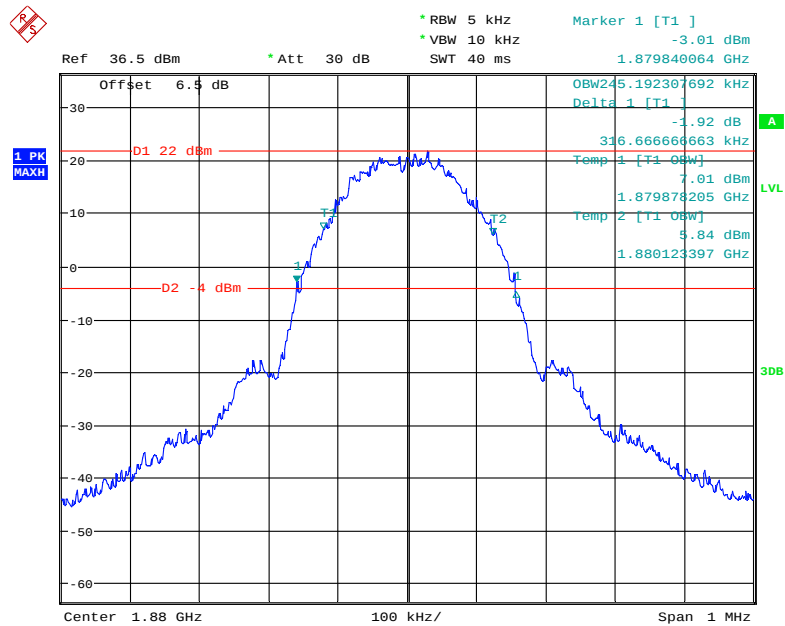
Date: 12.DEC.2019 13:32:18

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

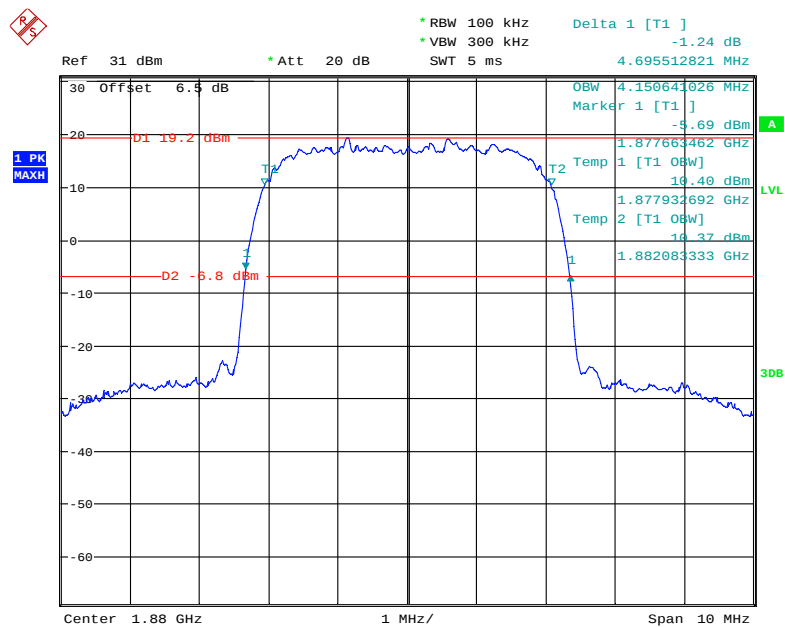
Date: 12.DEC.2019 13:39:02

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

Date: 12.DEC.2019 13:57:34

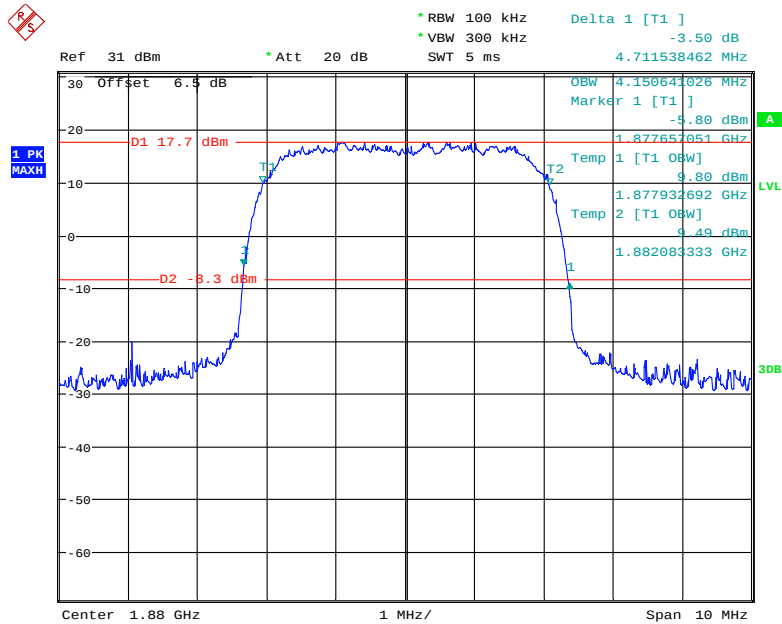
26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode

Date: 12.DEC.2019 14:13:11

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

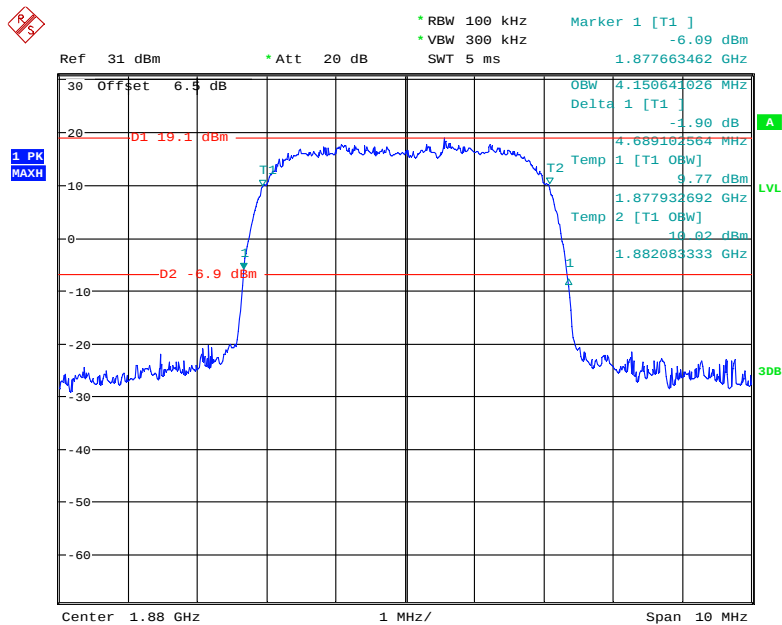
Date: 12.DEC.2019 11:15:22

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



Date: 12.DEC.2019 13:30:21

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

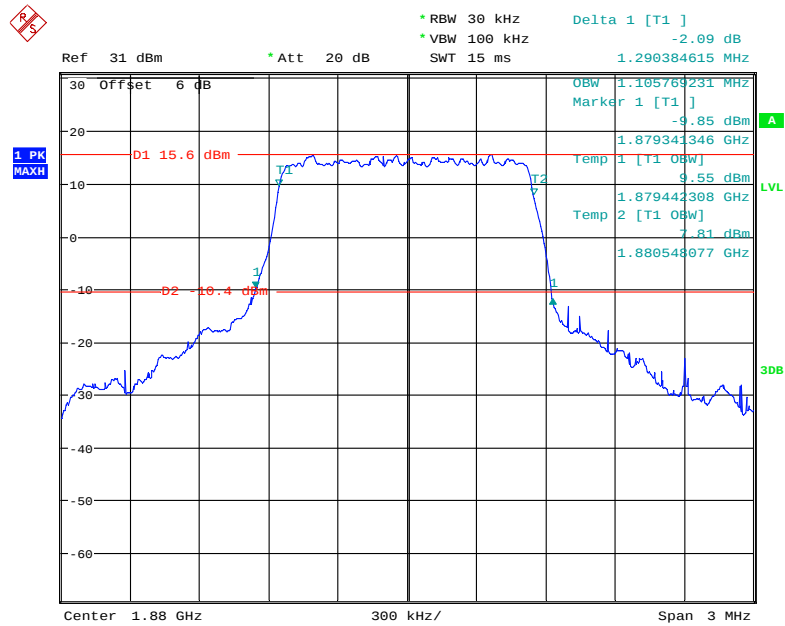


Date: 12.DEC.2019 13:45:18

LTE Band 2: (Middle Channel)

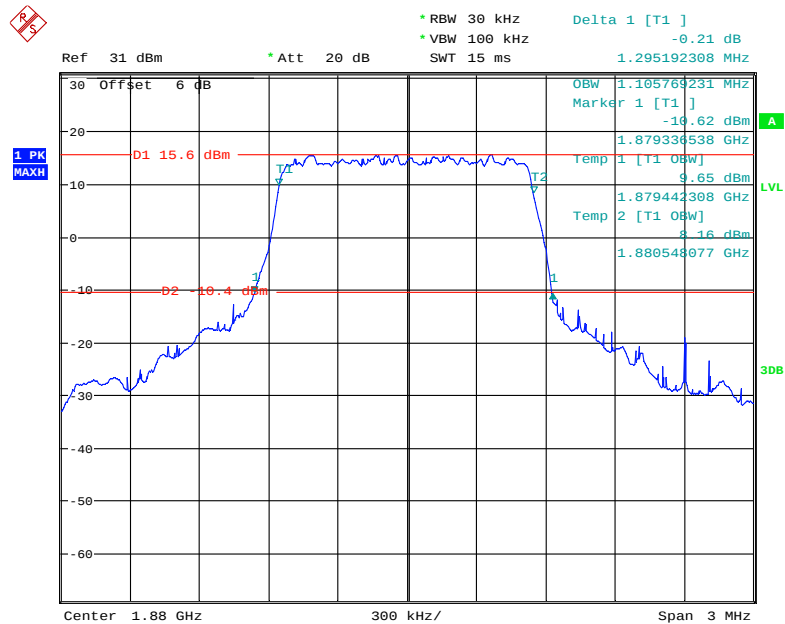
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.106	1.290
	16QAM	1.106	1.295
3.0	QPSK	2.702	3.017
	16QAM	2.701	3.021
5.0	QPSK	4.551	5.388
	16QAM	4.551	5.356
10.0	QPSK	8.974	9.917
	16QAM	8.974	9.840
15.0	QPSK	13.510	15.163
	16QAM	13.461	15.000
20.0	QPSK	18.013	19.615
	16QAM	17.949	19.833

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

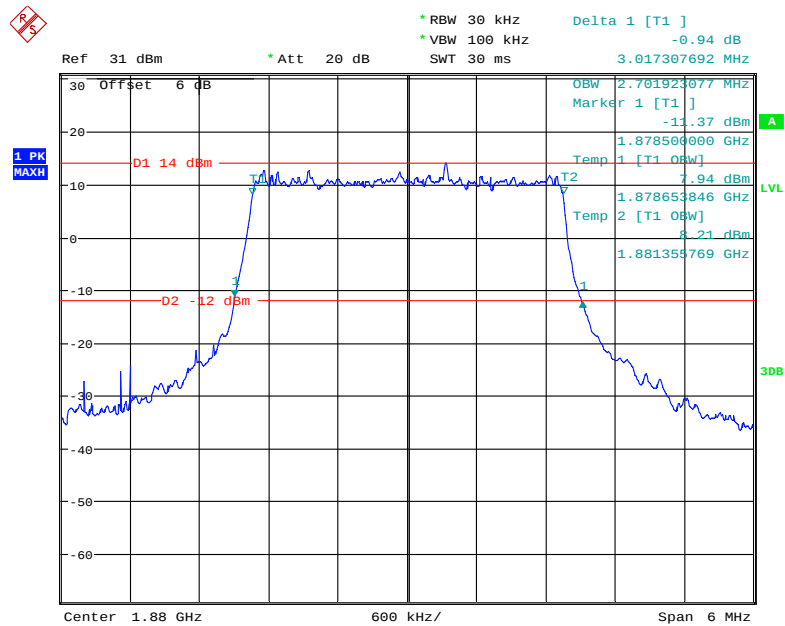


Date: 16.DEC.2019 20:53:51

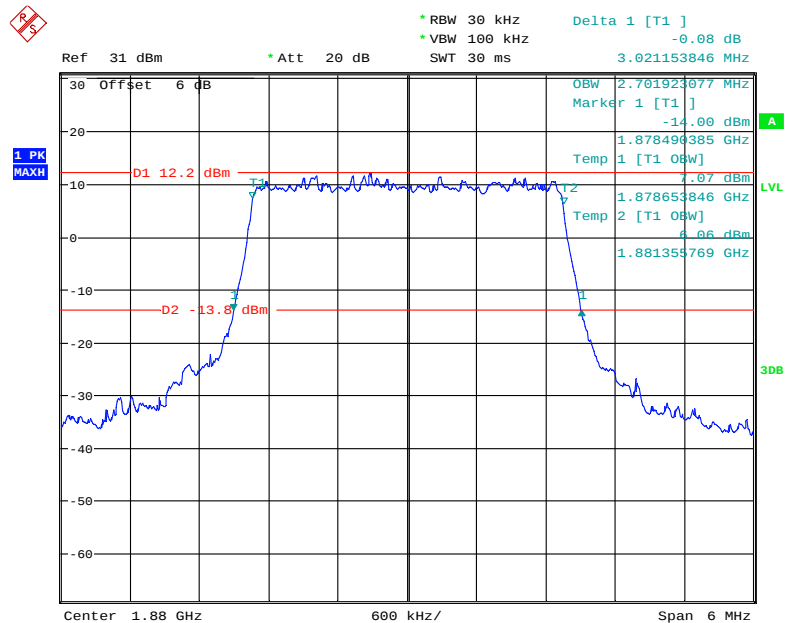
16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



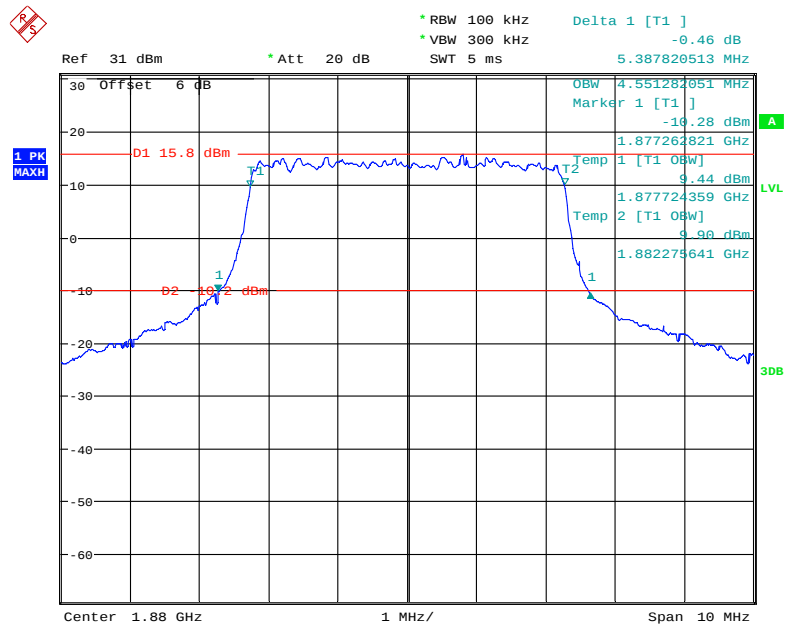
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QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

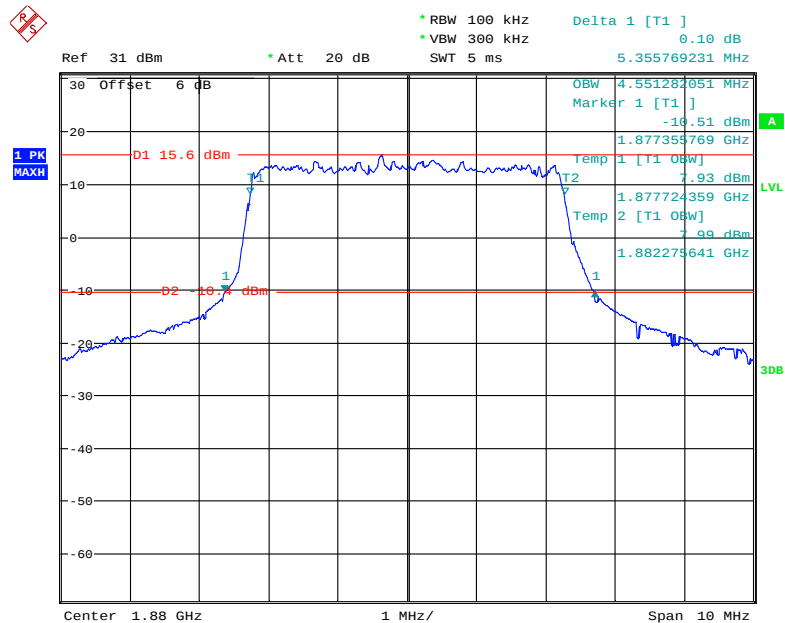
Date: 16.DEC.2019 21:11:34

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

Date: 16.DEC.2019 21:10:15

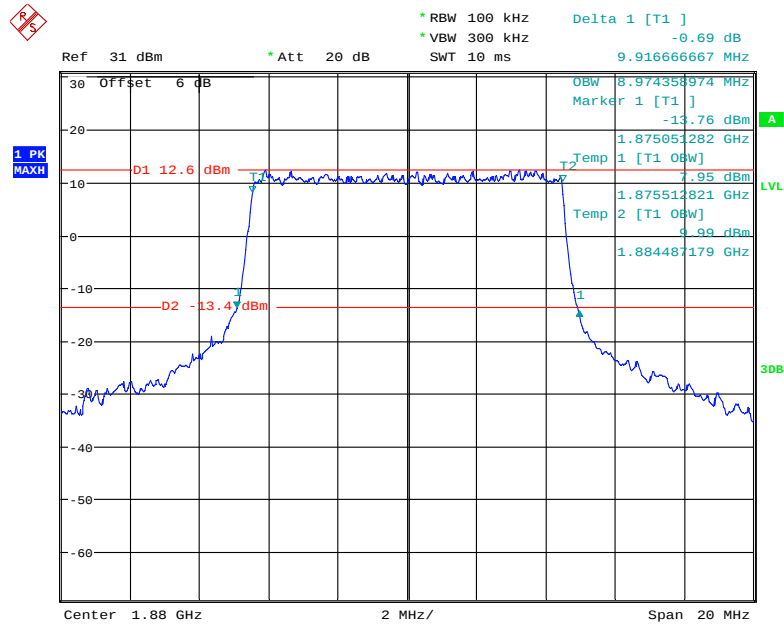
QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.DEC.2019 21:12:57

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

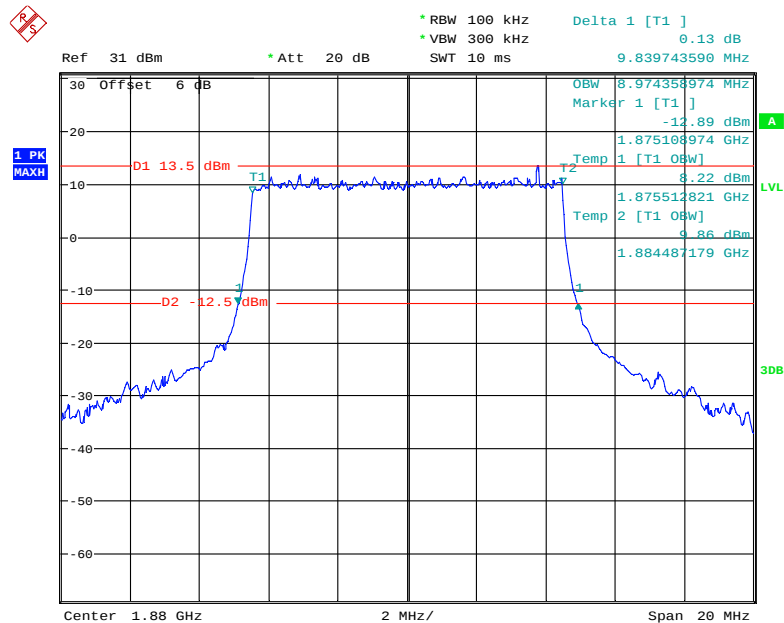
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QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

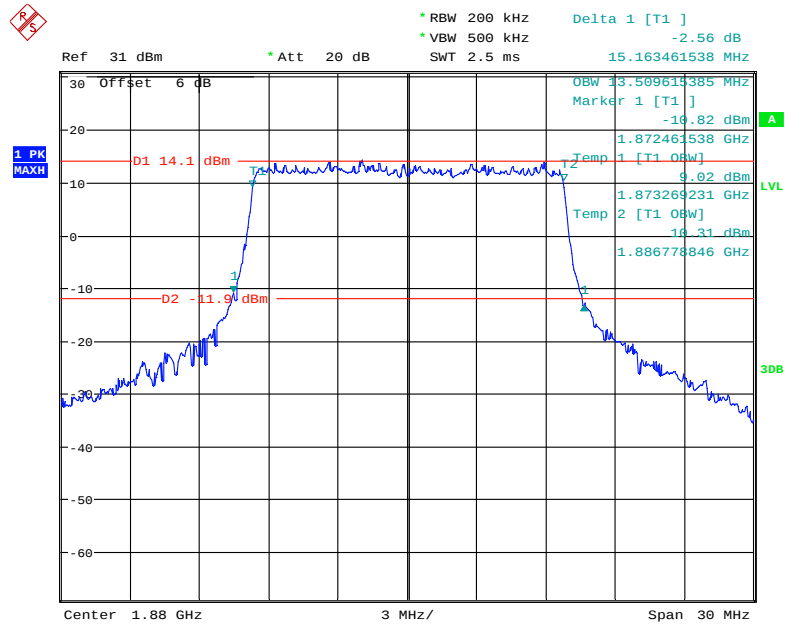


Date: 16.DEC.2019 21:17:09

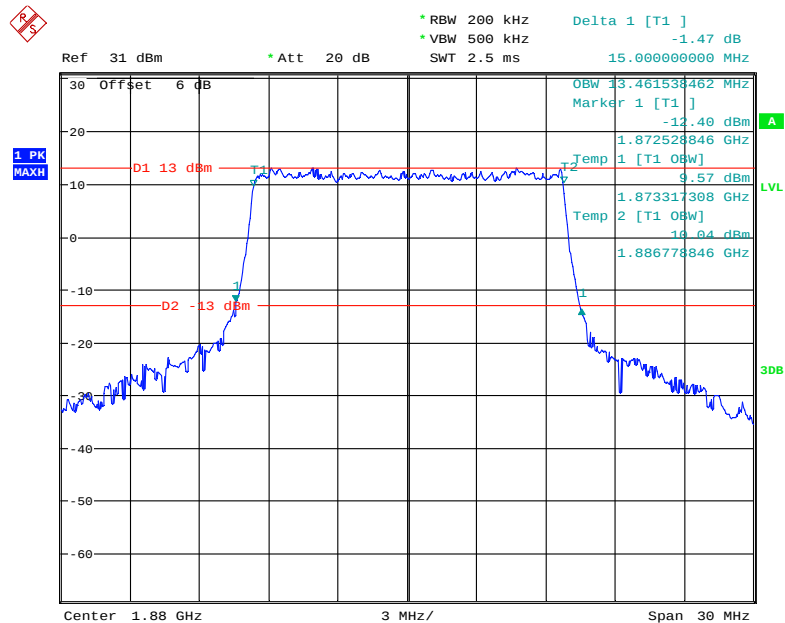
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



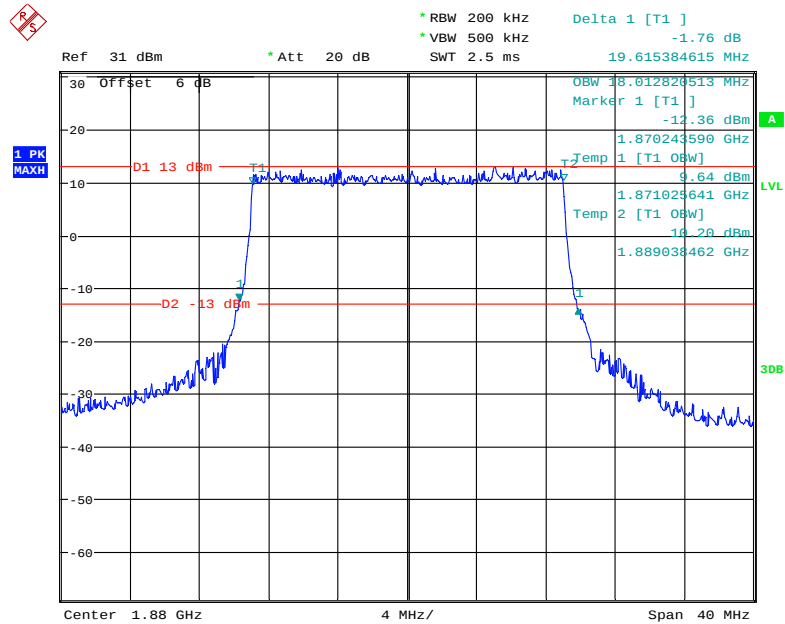
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QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

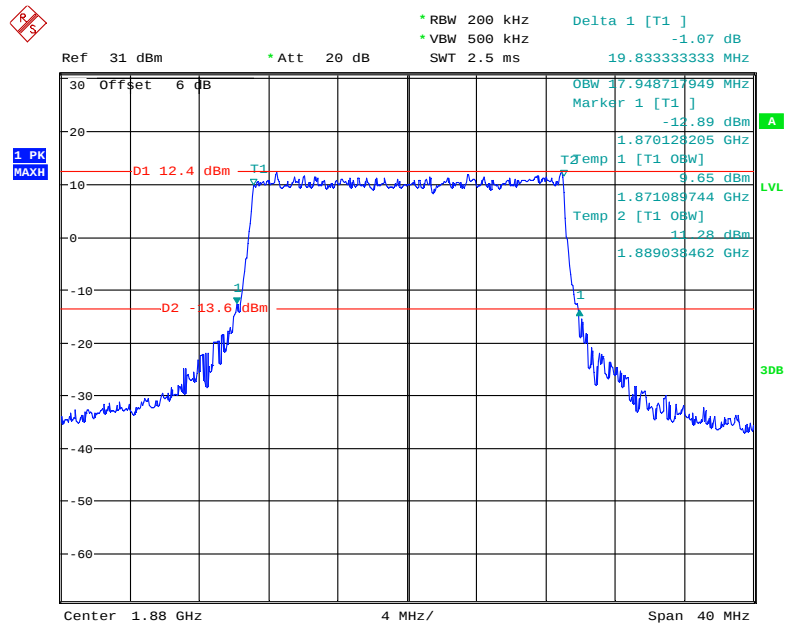
Date: 16.DEC.2019 21:18:30

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

Date: 16.DEC.2019 21:19:46

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

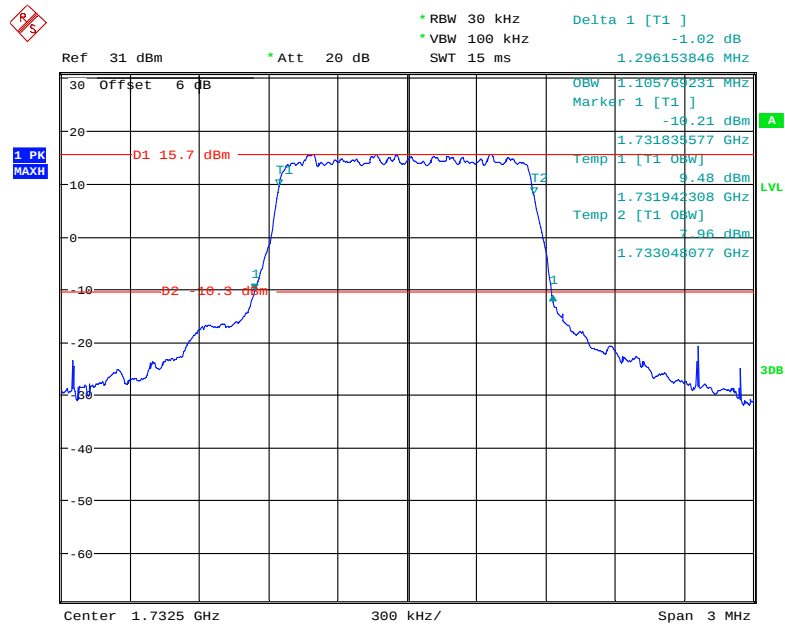
Date: 16.DEC.2019 21:24:24

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

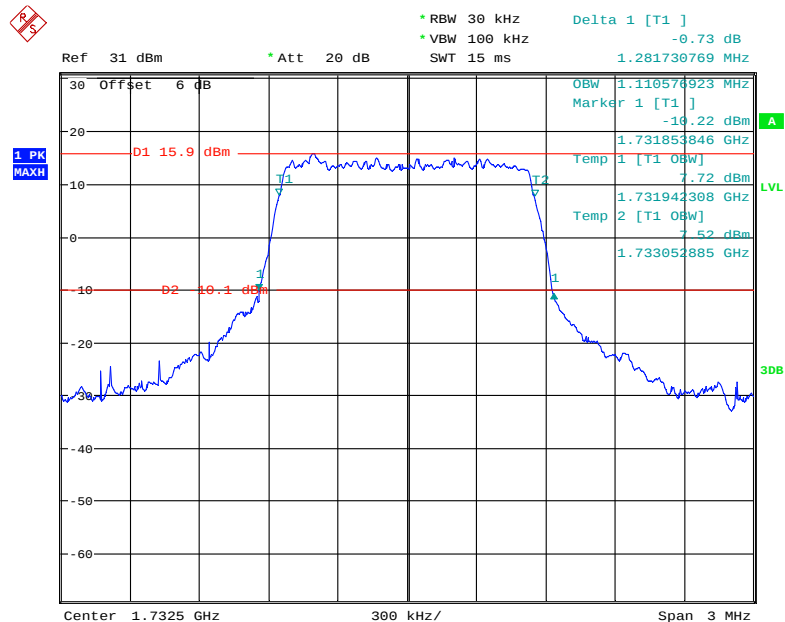
Date: 16.DEC.2019 21:26:12

LTE Band 4: (Middle Channel)

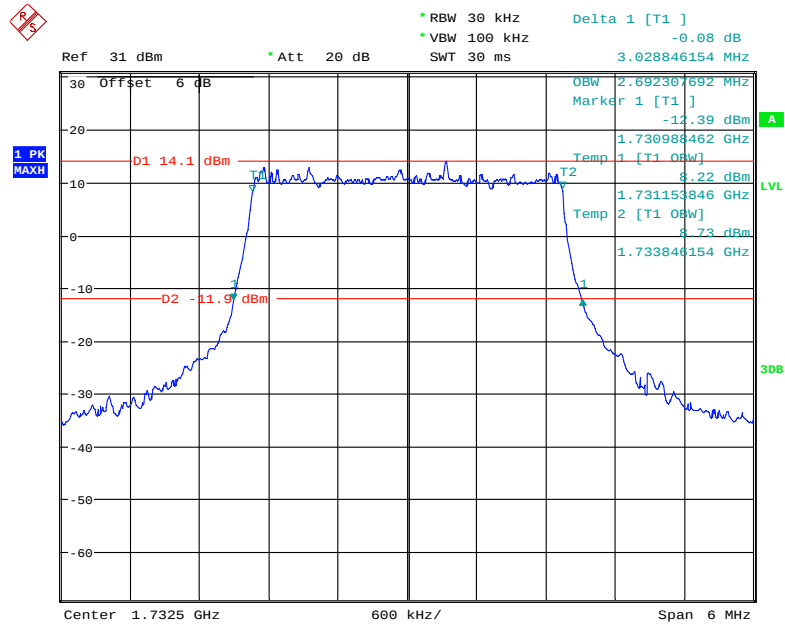
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.106	1.296
	16QAM	1.111	1.282
3.0	QPSK	2.392	3.029
	16QAM	2.702	3.021
5.0	QPSK	4.551	5.369
	16QAM	4.551	5.324
10.0	QPSK	8.974	9.949
	16QAM	8.974	9.853
15.0	QPSK	13.510	15.269
	16QAM	13.510	14.875
20.0	QPSK	17.949	20.026
	16QAM	17.949	20.000

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

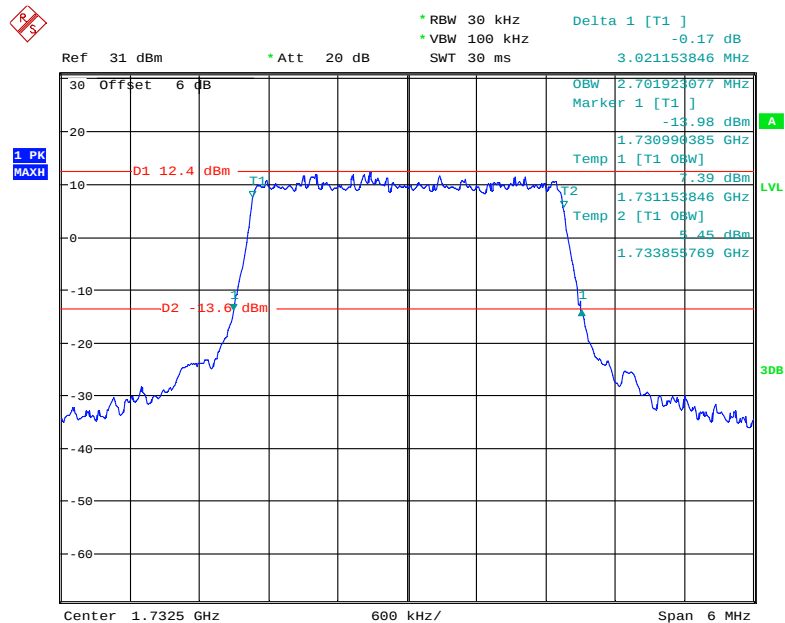
Date: 16.DEC.2019 21:55:13

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

Date: 16.DEC.2019 21:56:21

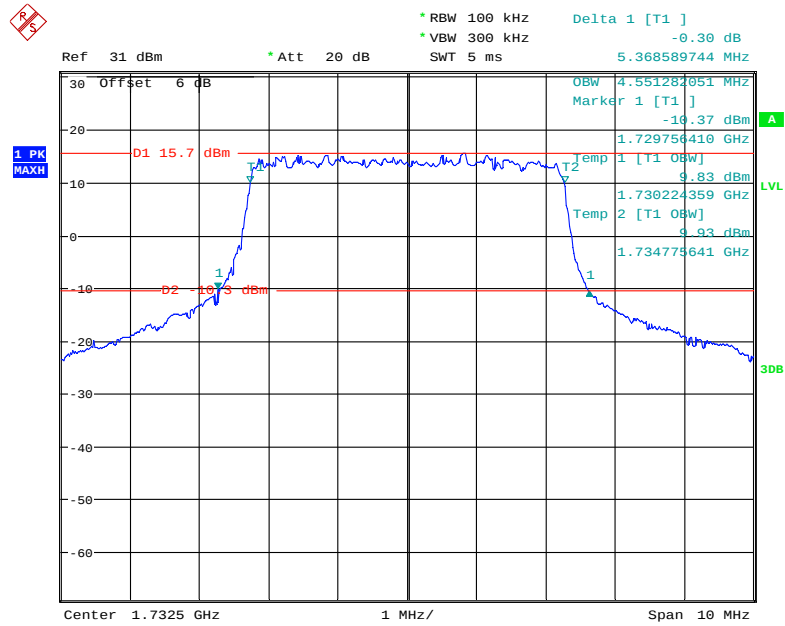
QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.DEC.2019 21:52:47

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

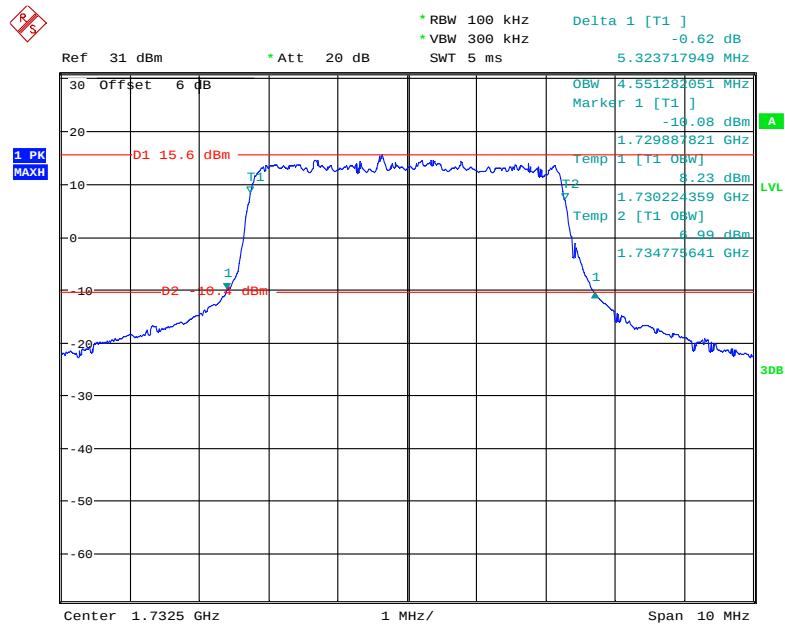
Date: 16.DEC.2019 21:53:52

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



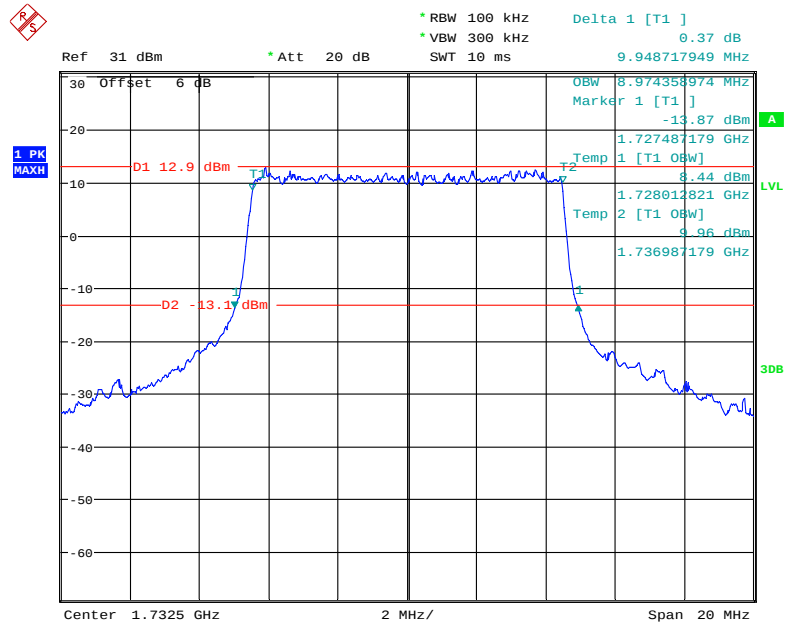
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16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



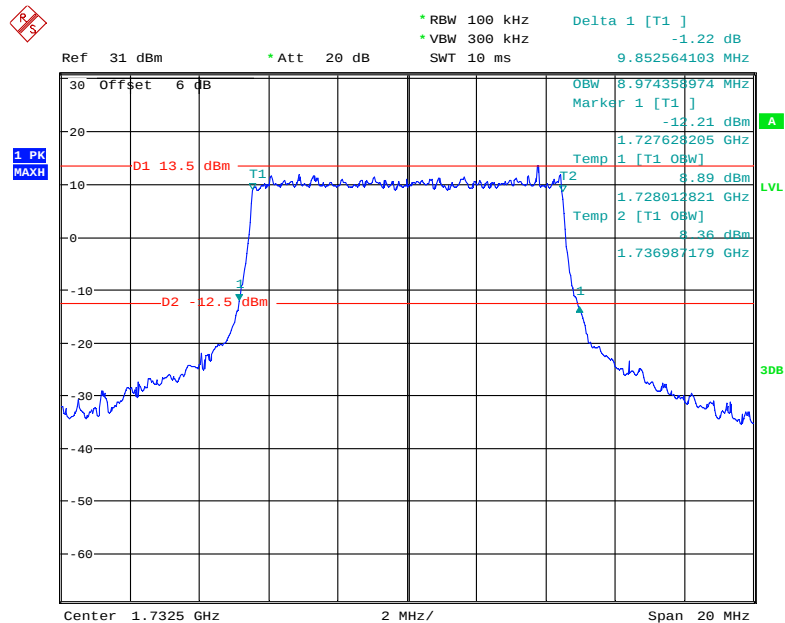
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QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

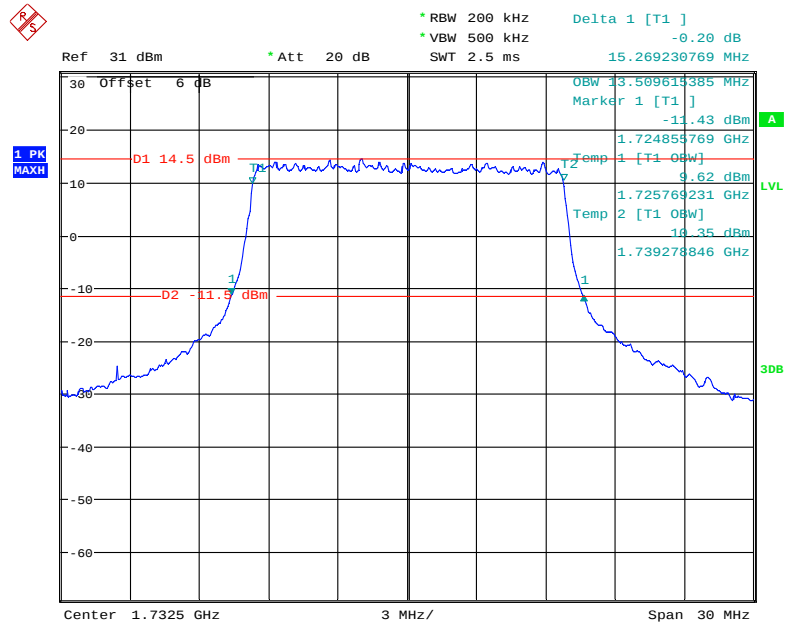


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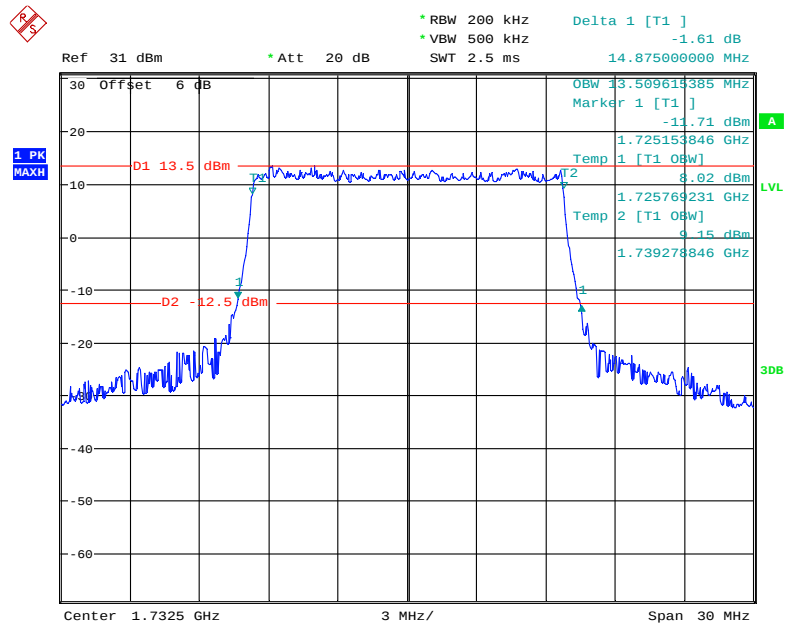
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



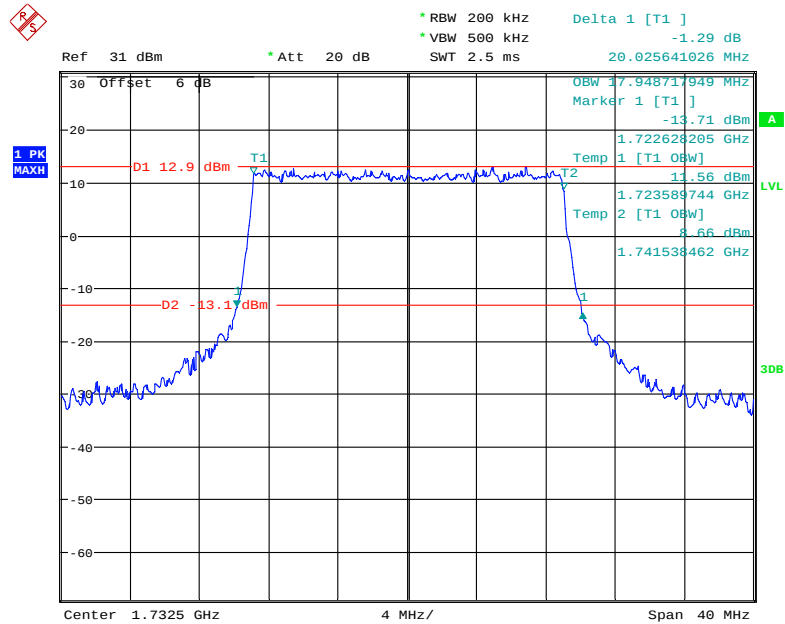
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QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

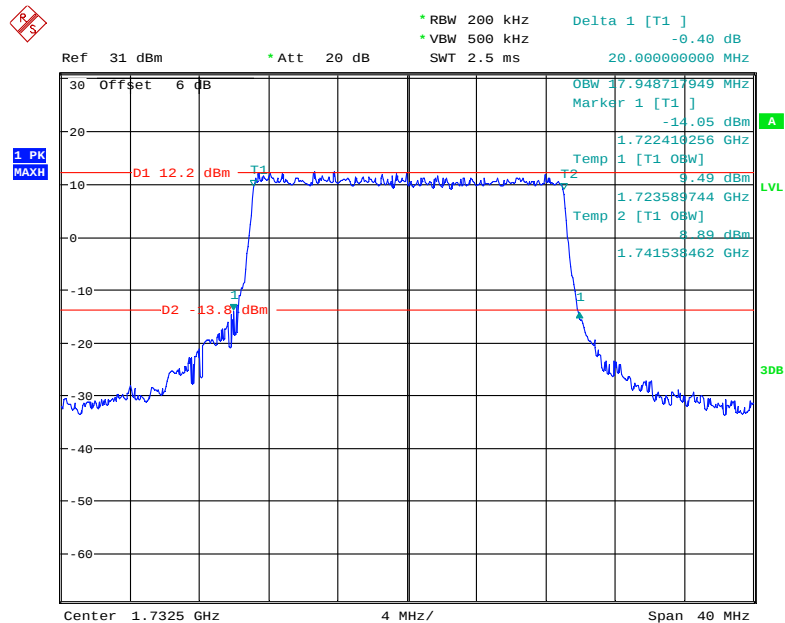
Date: 16.DEC.2019 21:41:20

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

Date: 16.DEC.2019 21:31:38

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

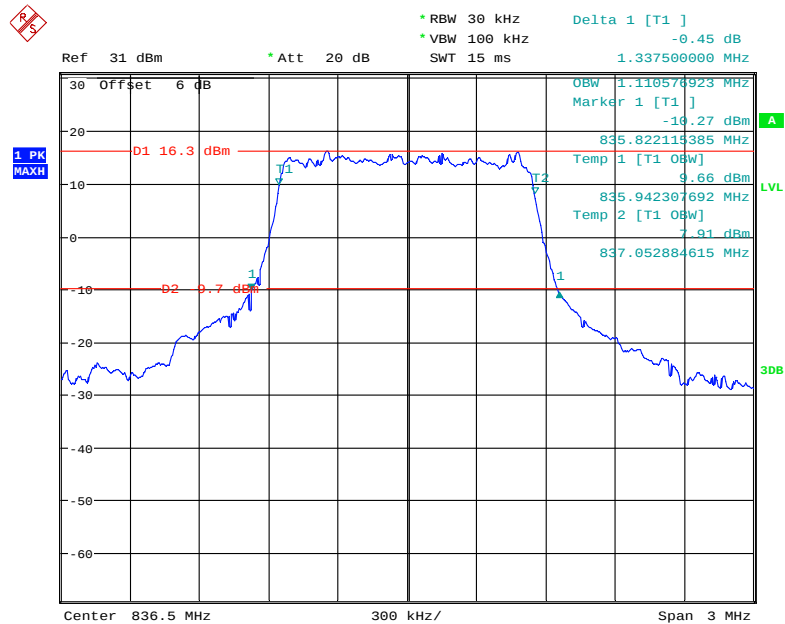
Date: 16.DEC.2019 21:30:30

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

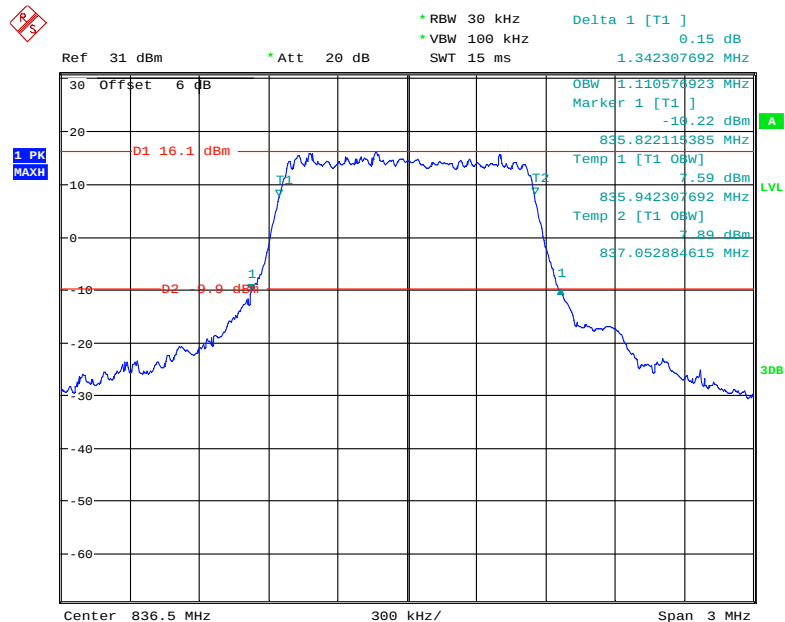
Date: 16.DEC.2019 21:28:28

LTE Band 5: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.111	1.338
	16QAM	1.111	1.342
3.0	QPSK	2.702	3.017
	16QAM	2.702	3.031
5.0	QPSK	4.551	5.397
	16QAM	4.535	5.295
10.0	QPSK	9.006	9.853
	16QAM	8.974	9.885

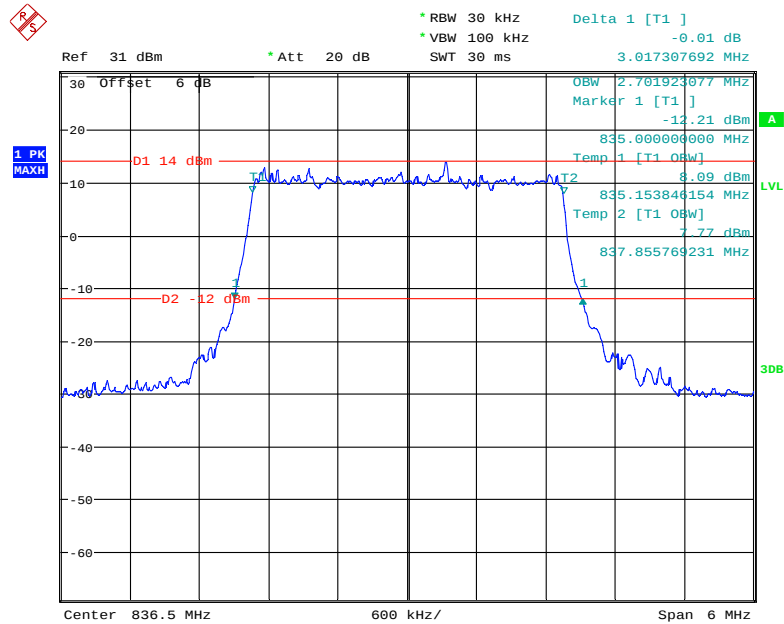
QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.DEC.2019 22:11:35

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

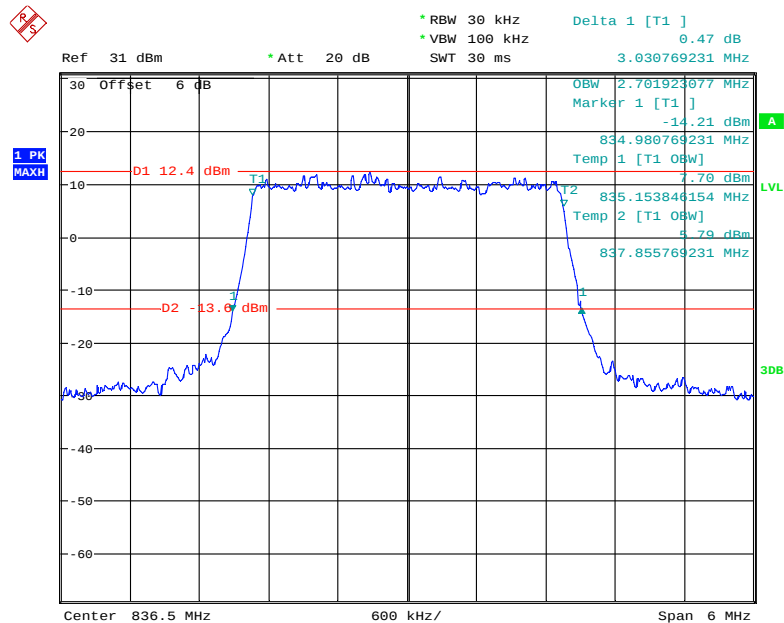
Date: 16.DEC.2019 22:10:21

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

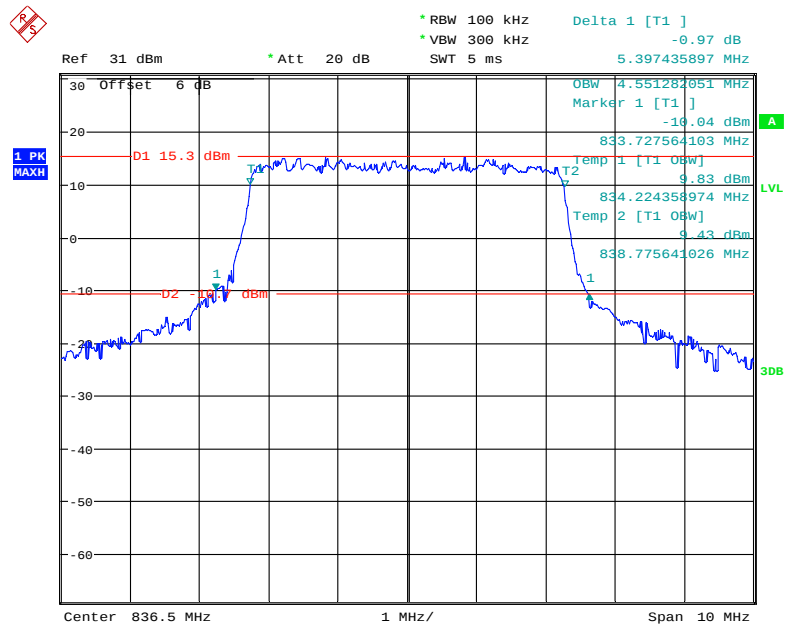


Date: 16.DEC.2019 22:14:10

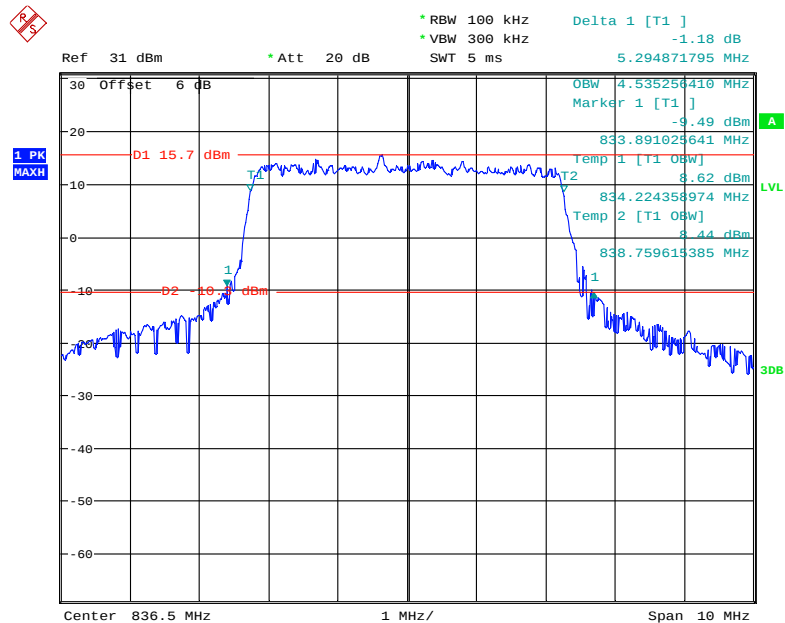
16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



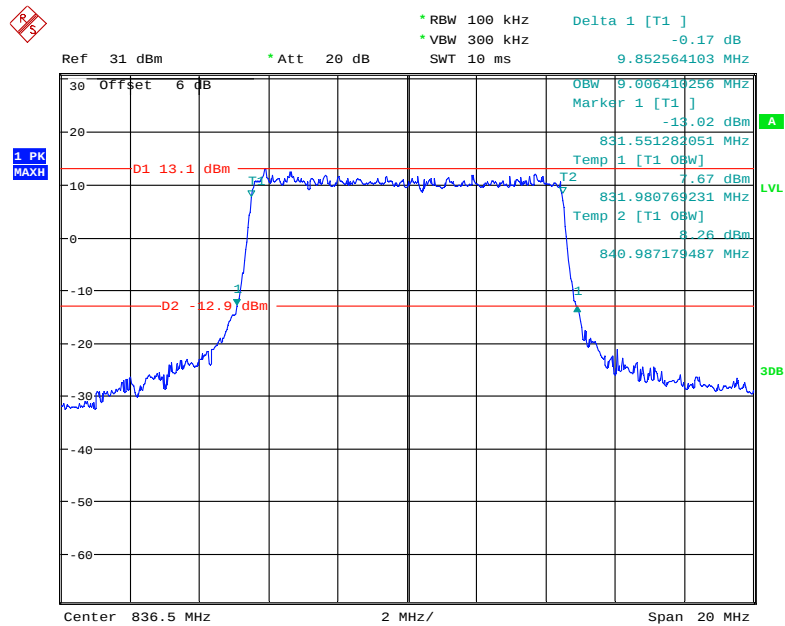
Date: 16.DEC.2019 22:12:58

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

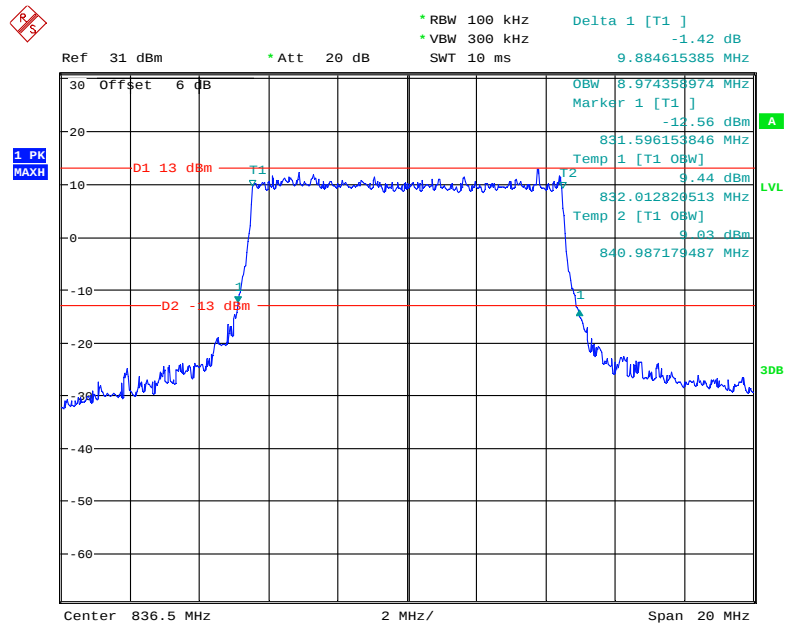
Date: 16.DEC.2019 22:15:44

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

Date: 16.DEC.2019 22:17:09

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

Date: 16.DEC.2019 22:20:54

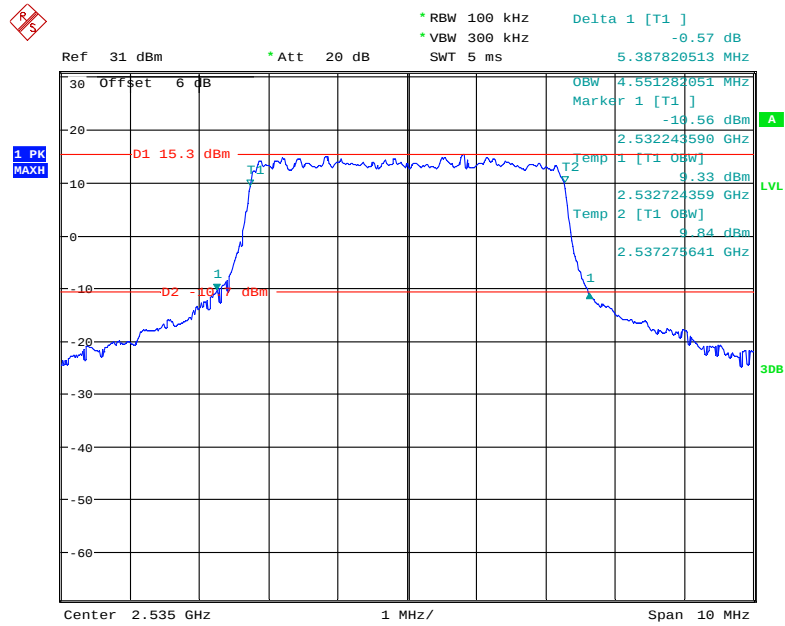
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.DEC.2019 22:18:34

LTE Band 7: (Middle Channel)

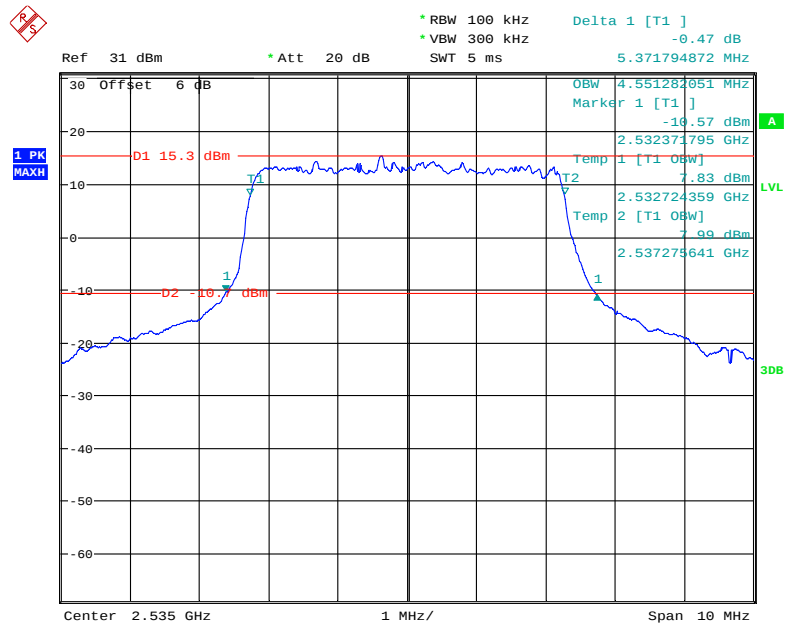
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.551	5.388
	16QAM	4.551	5.372
10.0	QPSK	8.974	9.917
	16QAM	8.974	9.929
15.0	QPSK	13.462	14.904
	16QAM	13.462	14.904
20.0	QPSK	17.949	19.833
	16QAM	17.949	19.679

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

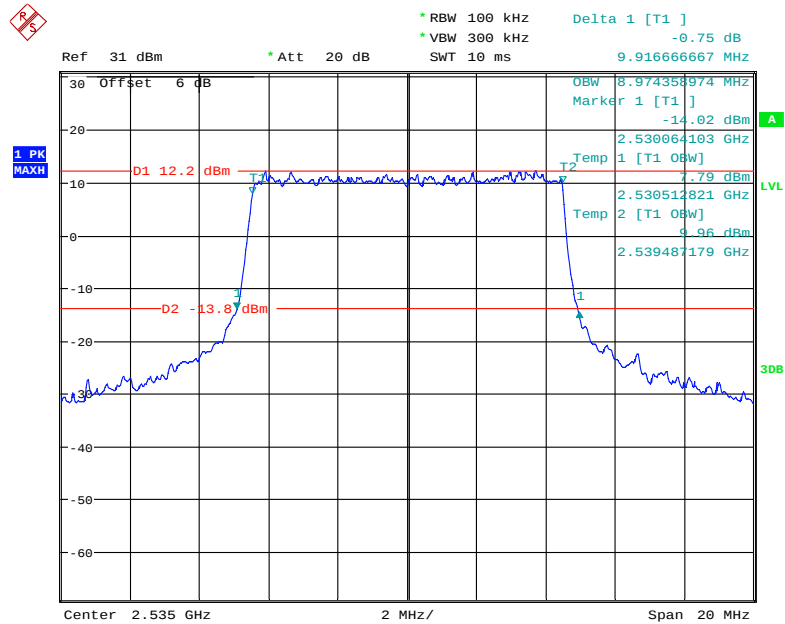


Date: 16.DEC.2019 23:02:30

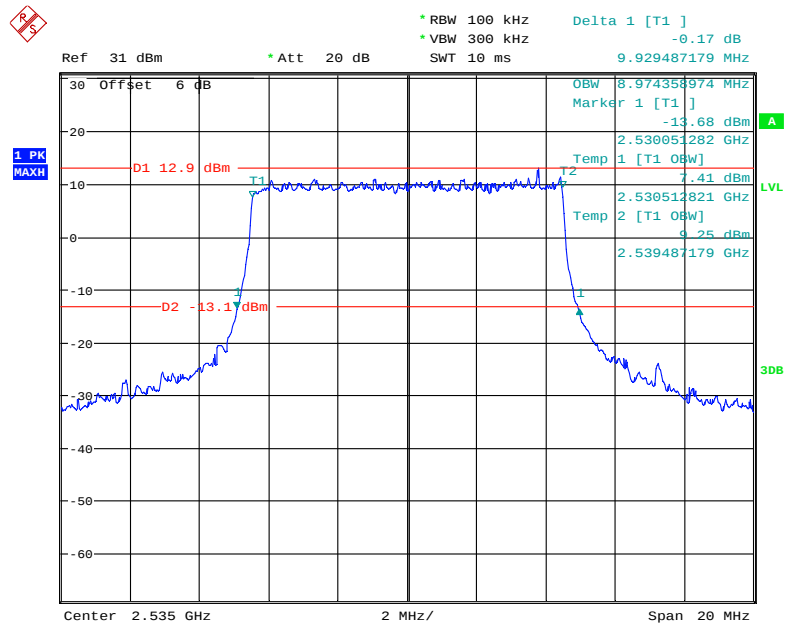
16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 16.DEC.2019 23:00:55

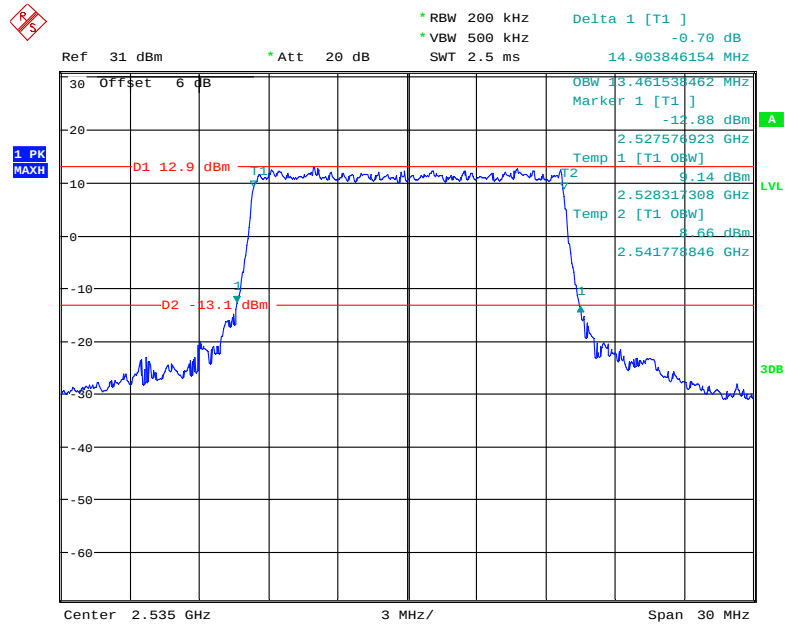
QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.DEC.2019 22:55:31

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

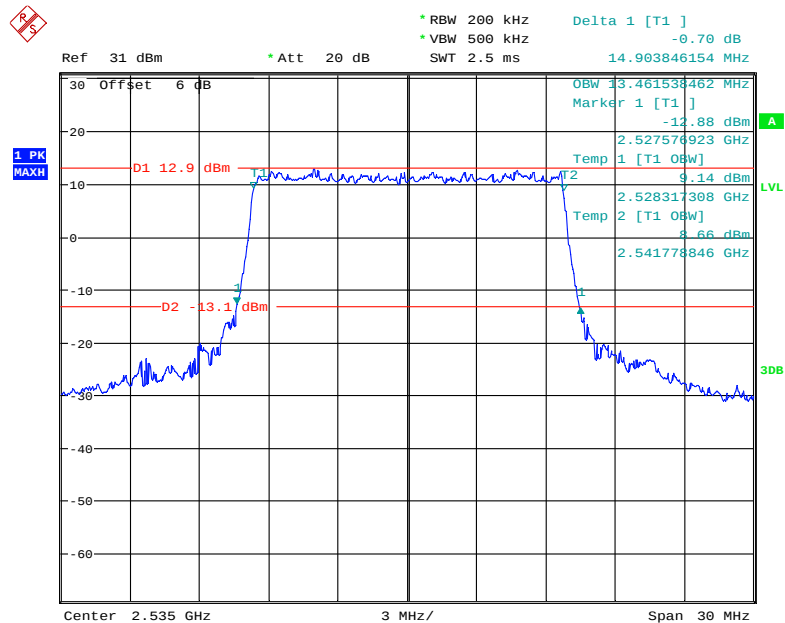
Date: 16.DEC.2019 22:57:06

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

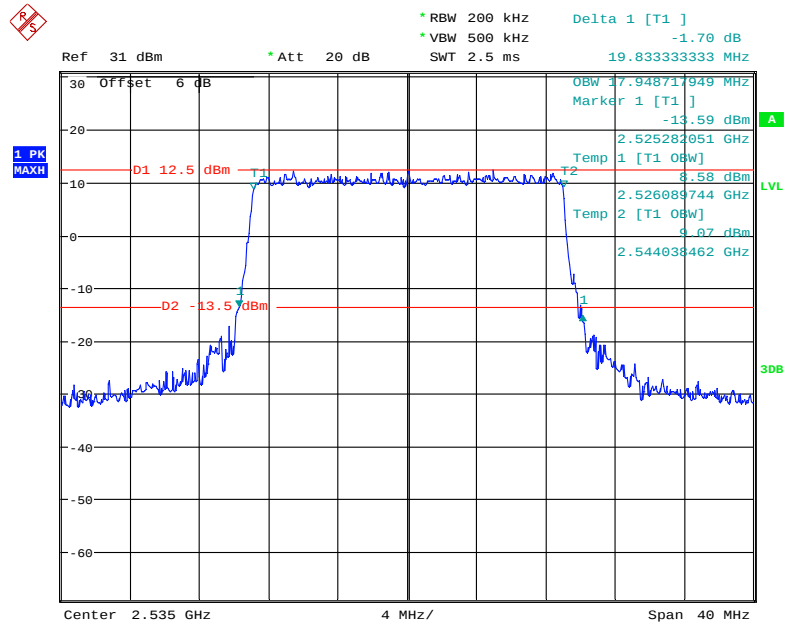


Date: 16.DEC.2019 22:43:10

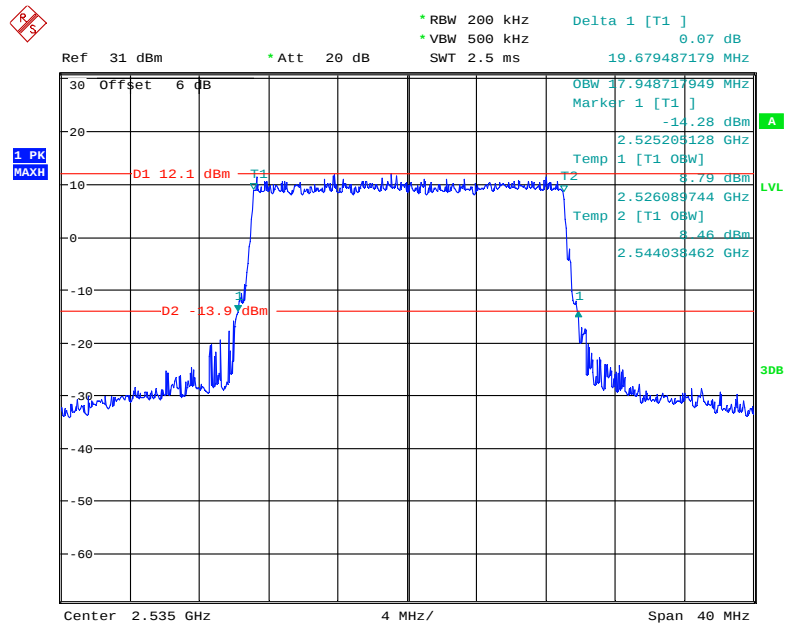
16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 16.DEC.2019 22:43:10

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

Date: 16.DEC.2019 22:40:26

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

Date: 16.DEC.2019 22:37:15

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

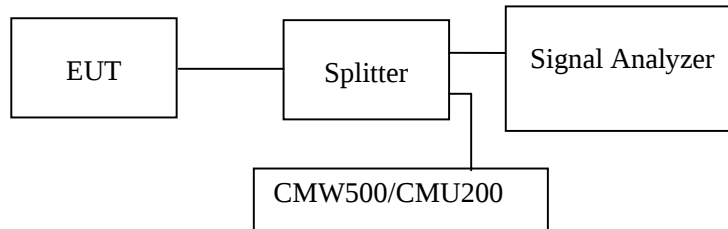
Applicable Standard

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:	21~25 °C
Relative Humidity:	20~52 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu and Leo Huang from 2019-12-12 to 2020-01-17.

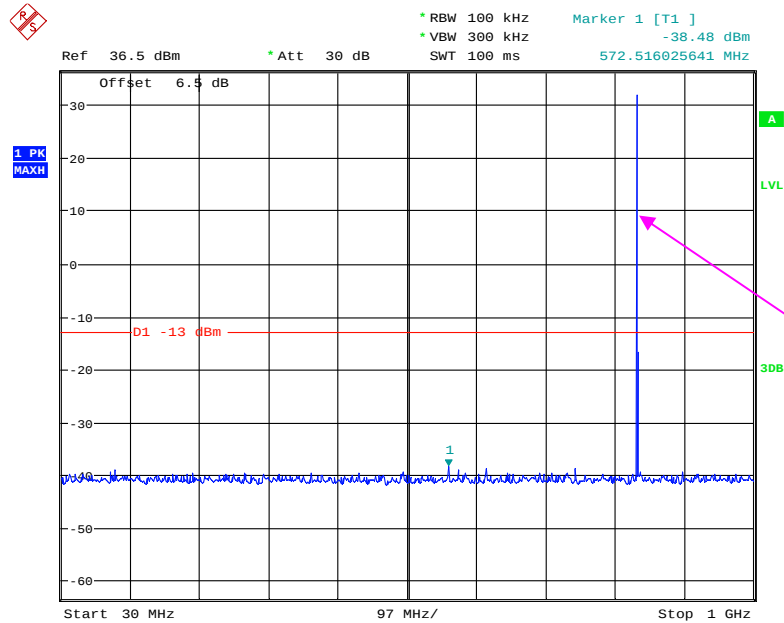
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

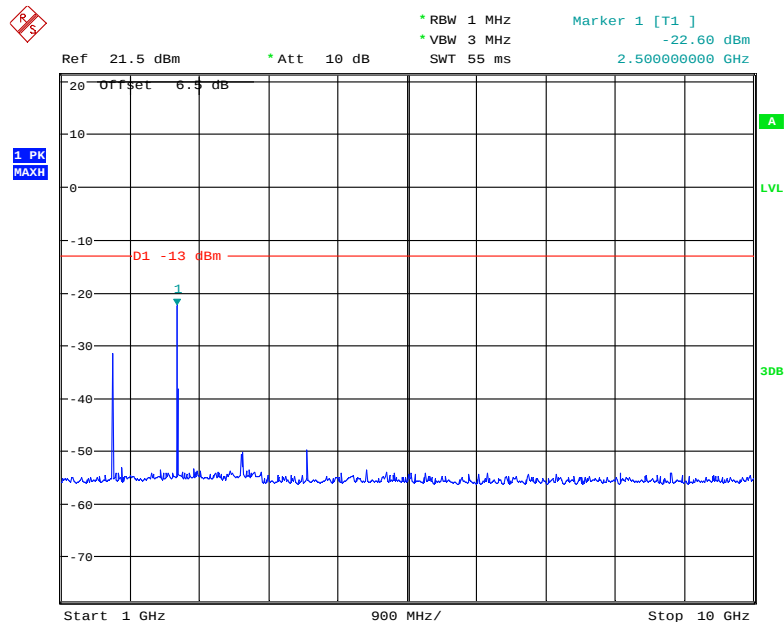
Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode)



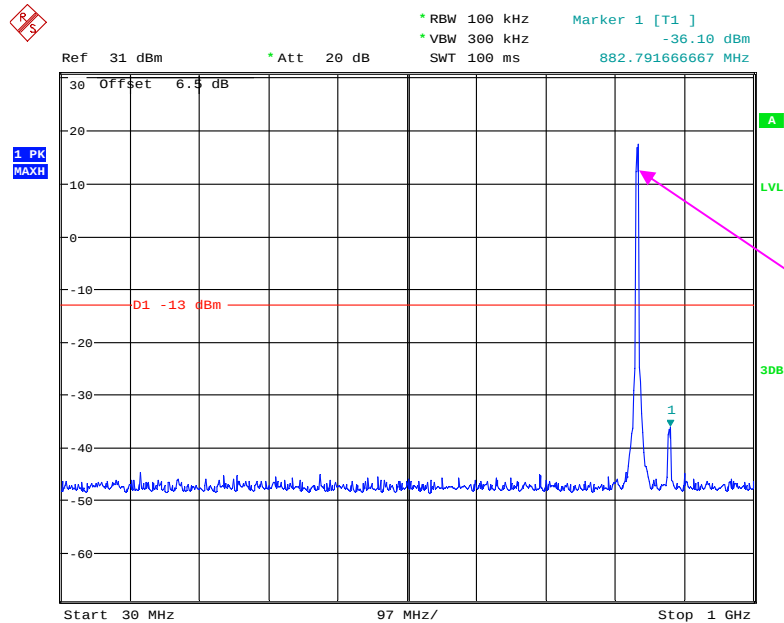
Date: 17.JAN.2020 11:23:06

1 GHz – 10 GHz (GSM Mode)



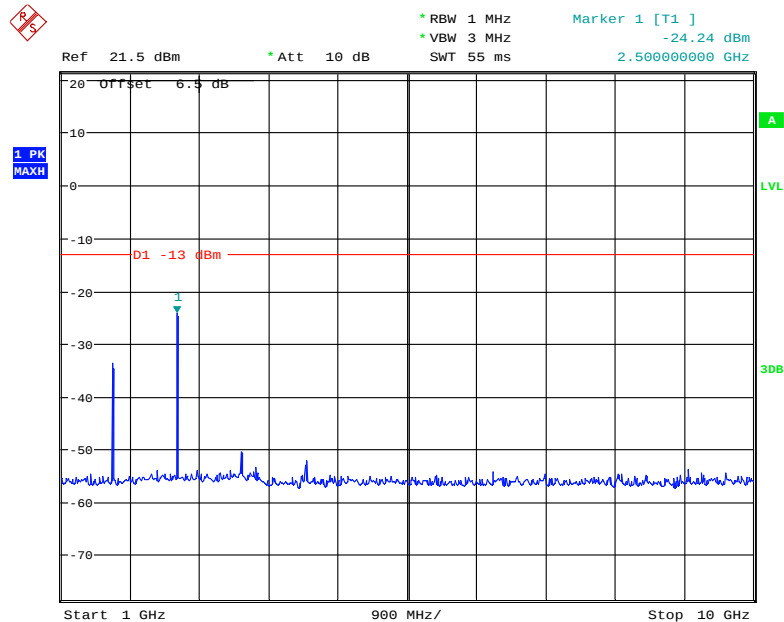
Date: 17.JAN.2020 11:31:59

30 MHz – 1 GHz (WCDMA Mode)



Date: 12.DEC.2019 11:09:33

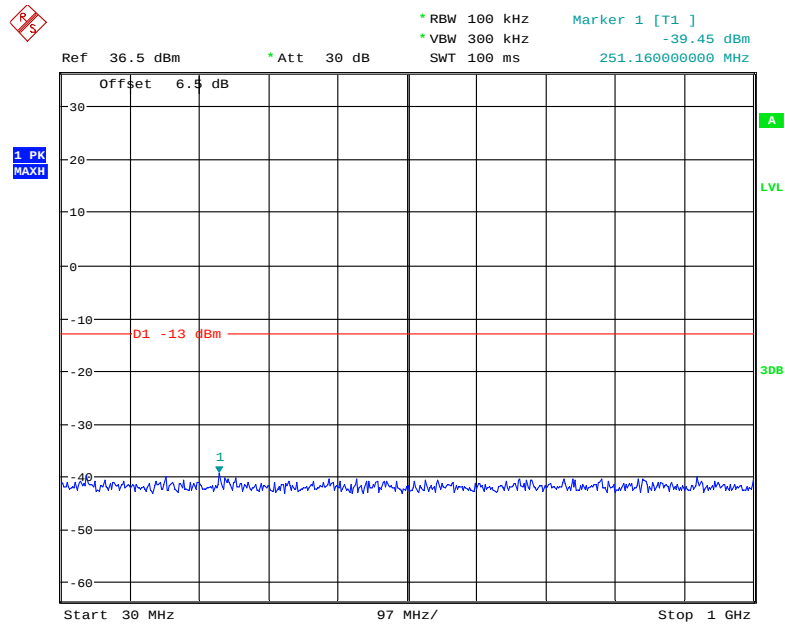
1 GHz – 10 GHz (WCDMA Mode)



Date: 17.JAN.2020 11:46:15

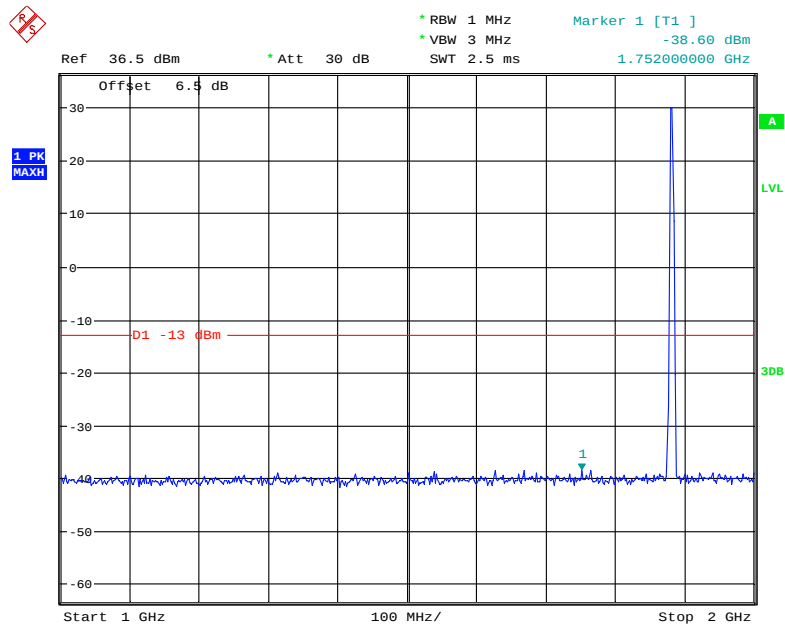
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



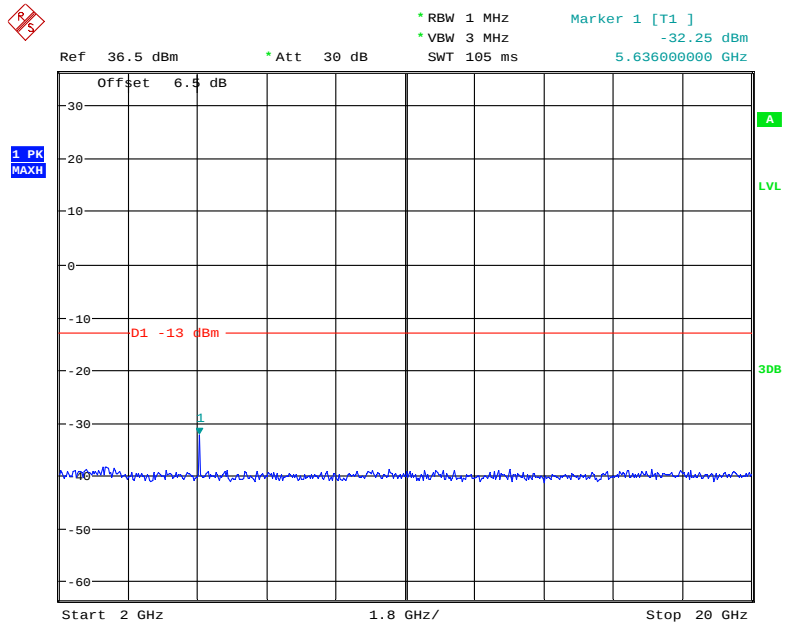
Date: 4.JAN.2020 17:29:15

1 GHz – 2 GHz (GSM Mode)



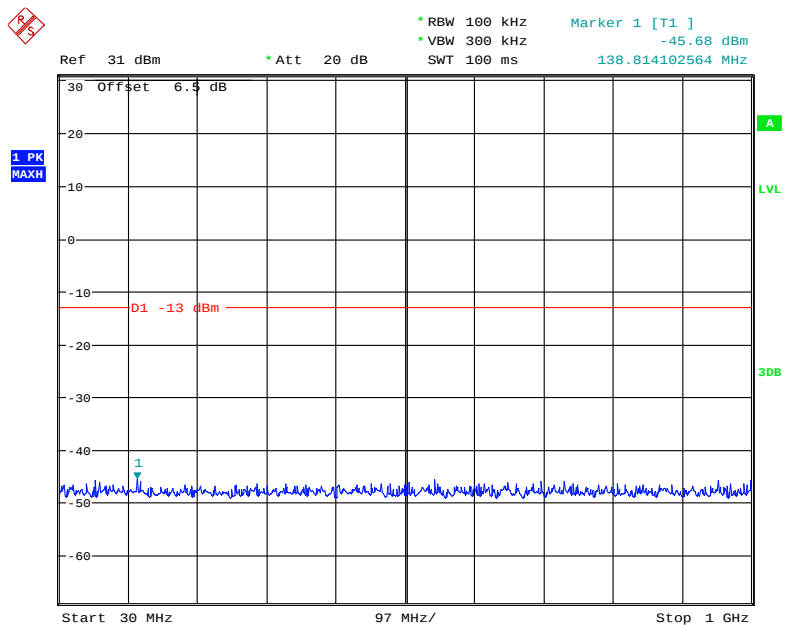
Date: 4.JAN.2020 17:28:14

2 GHz – 20 GHz (GSM Mode)



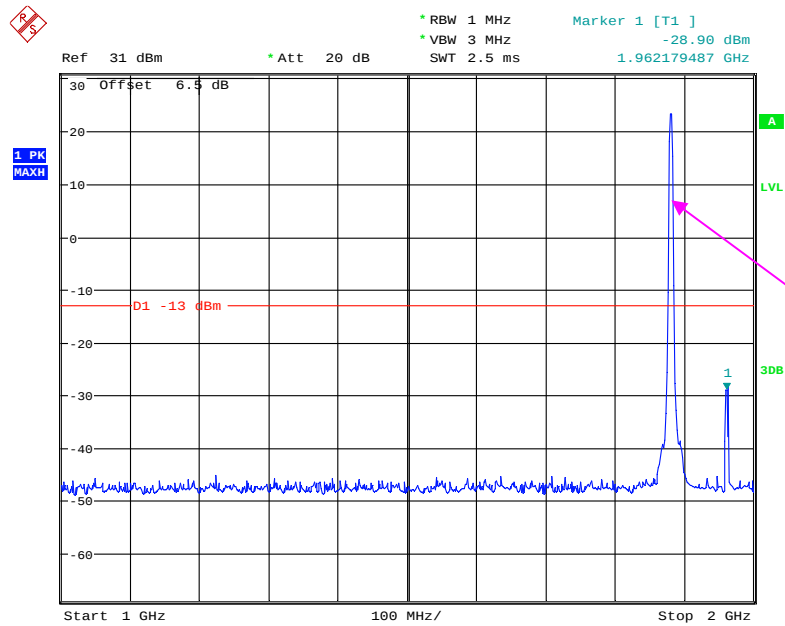
Date: 4.JAN.2020 17:28:43

30 MHz – 1 GHz (WCDMA Mode)



Date: 12.DEC.2019 11:10:03

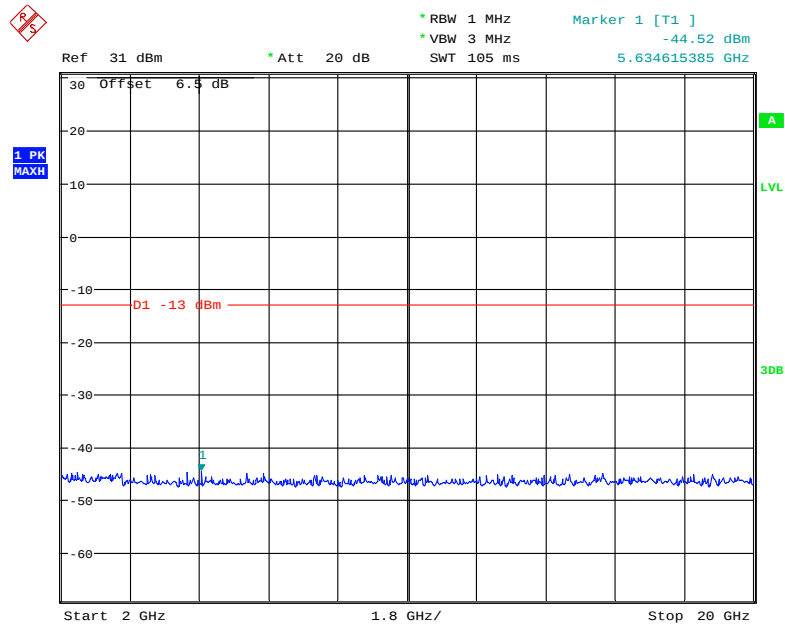
1 GHz – 2 GHz (WCDMA Mode)



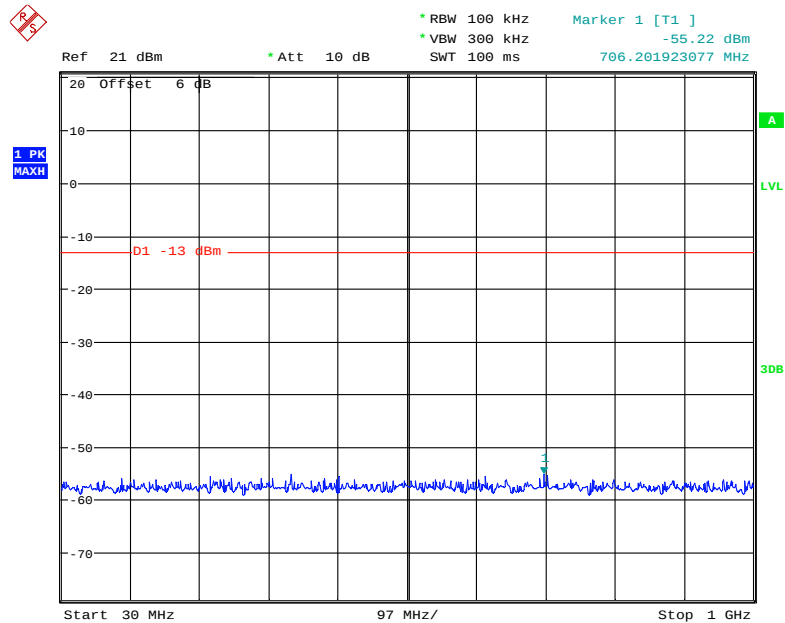
Fundamental test

Date: 12.DEC.2019 11:10:29

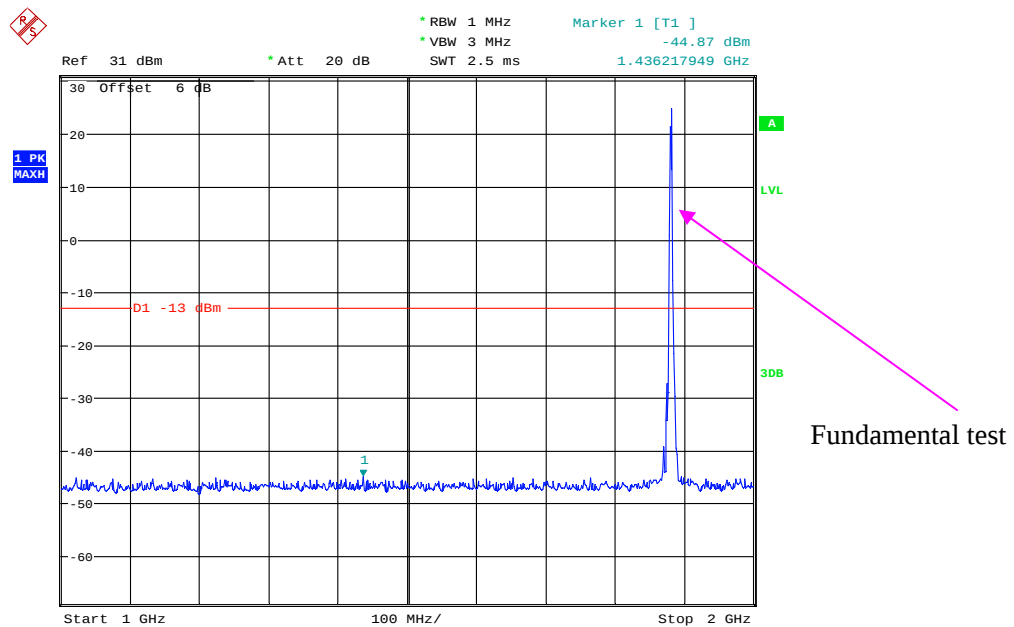
2 GHz – 20 GHz (WCDMA Mode)



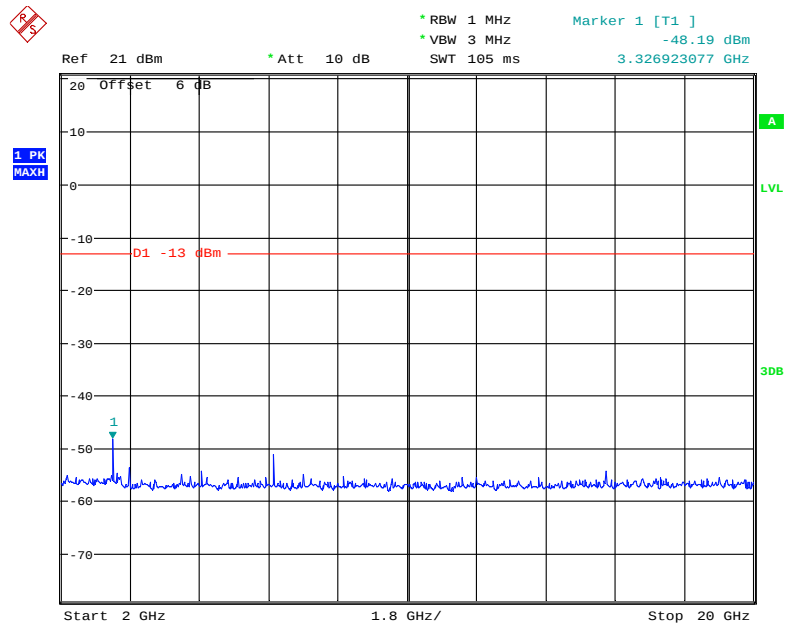
Date: 12.DEC.2019 11:11:02

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

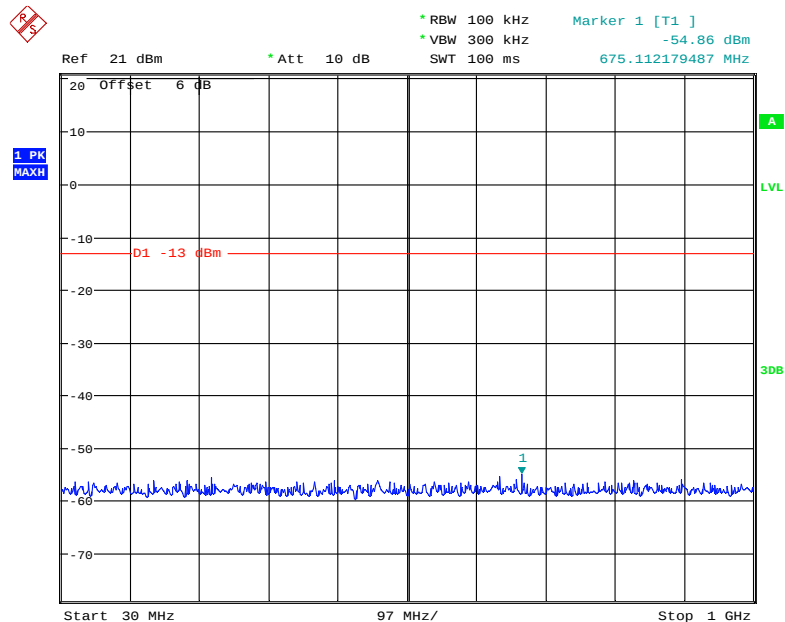
Date: 22.DEC.2019 11:10:28

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

Date: 22.DEC.2019 11:16:35

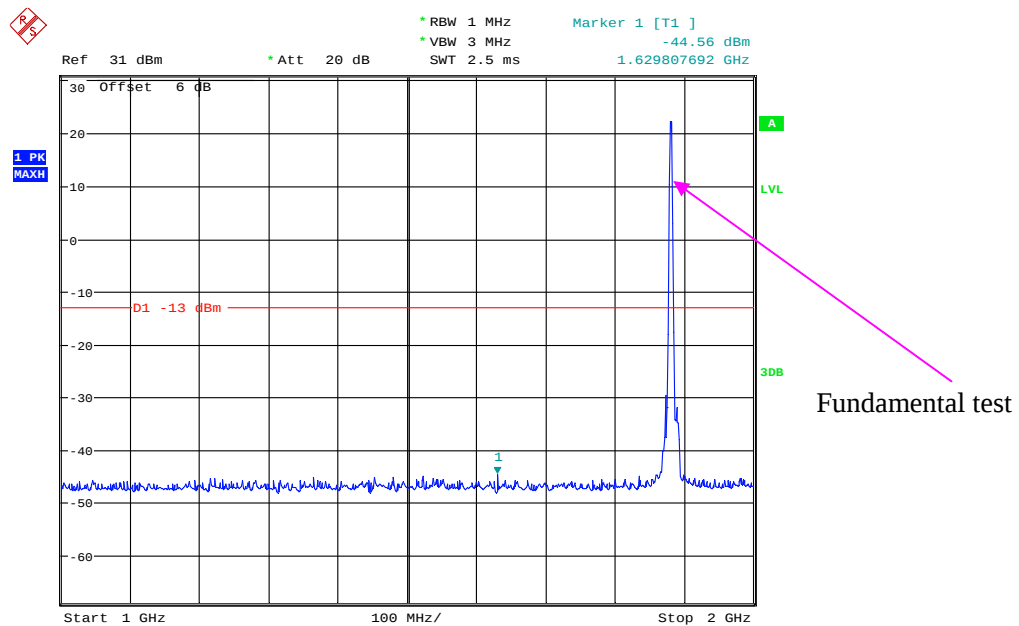
2 GHz – 20 GHz (1.4 MHz, Middle Channel)

Date: 22.DEC.2019 11:17:09

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

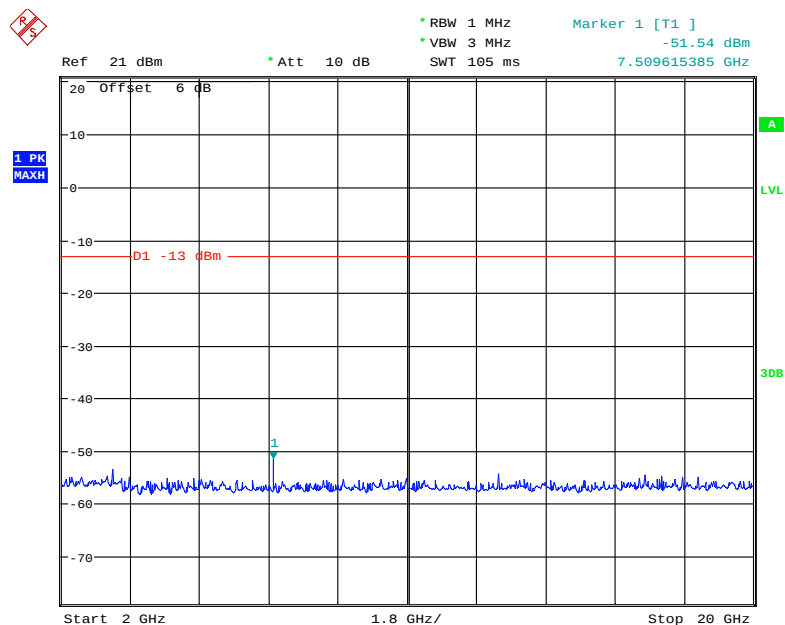
Date: 22.DEC.2019 11:10:48

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



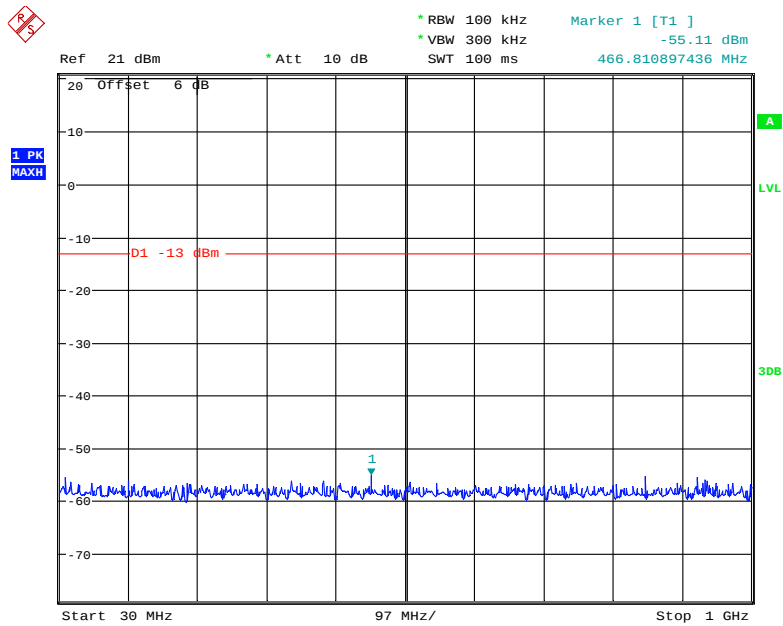
Date: 22.DEC.2019 11:16:10

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



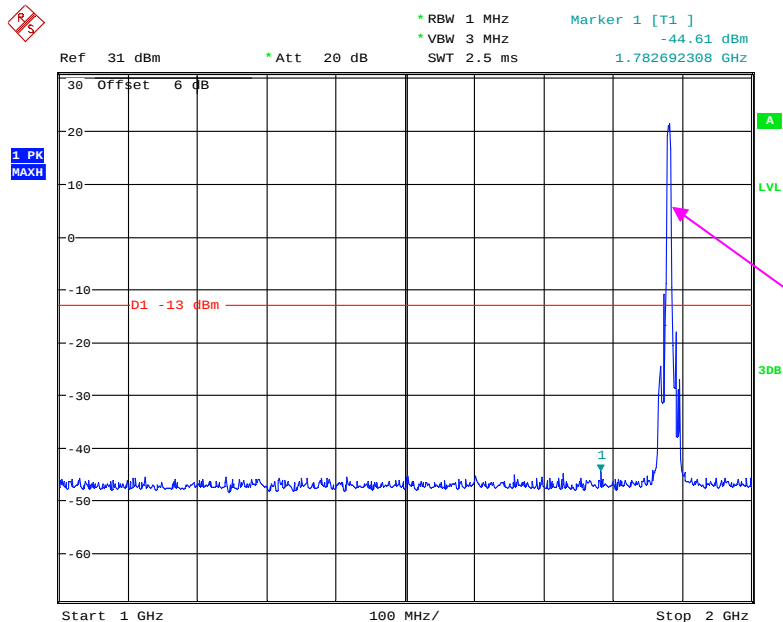
Date: 22.DEC.2019 11:17:23

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

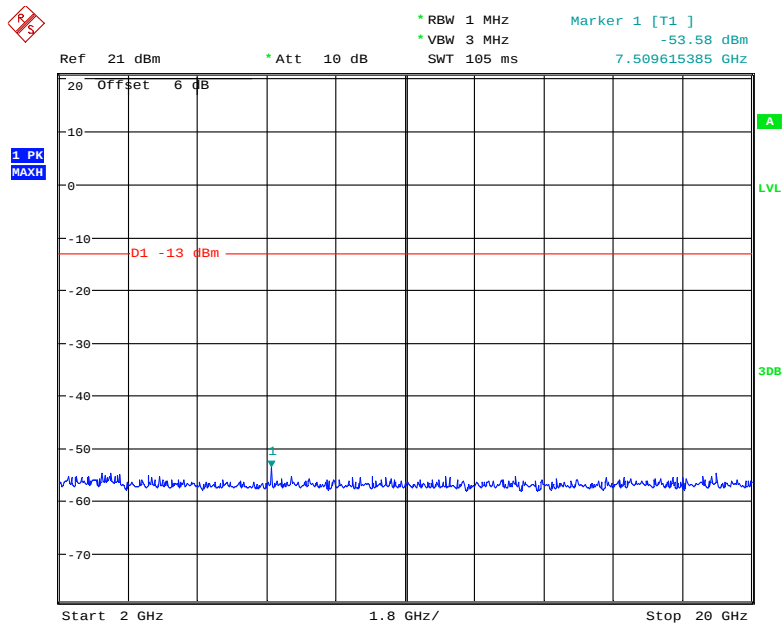


Date: 22.DEC.2019 11:10:58

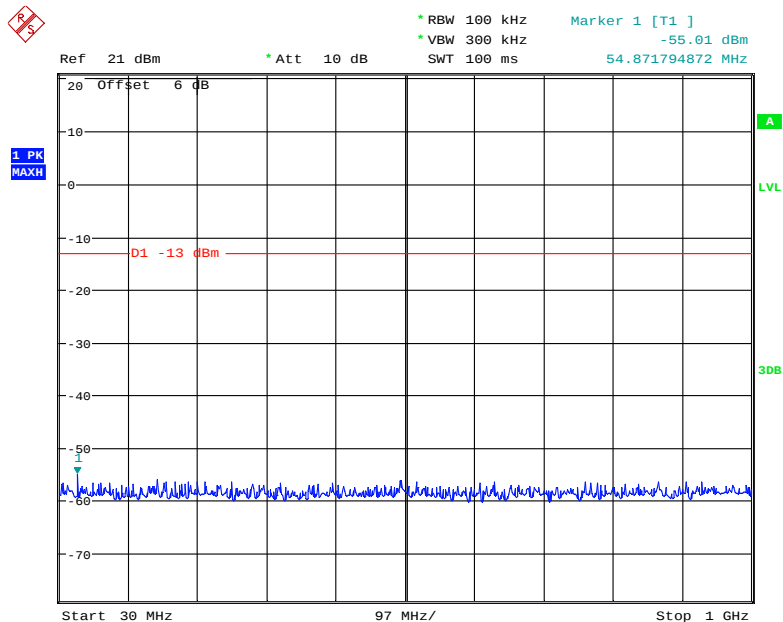
1 GHz - 2 GHz (5.0 MHz, Middle Channel)



Date: 22.DEC.2019 11:15:50

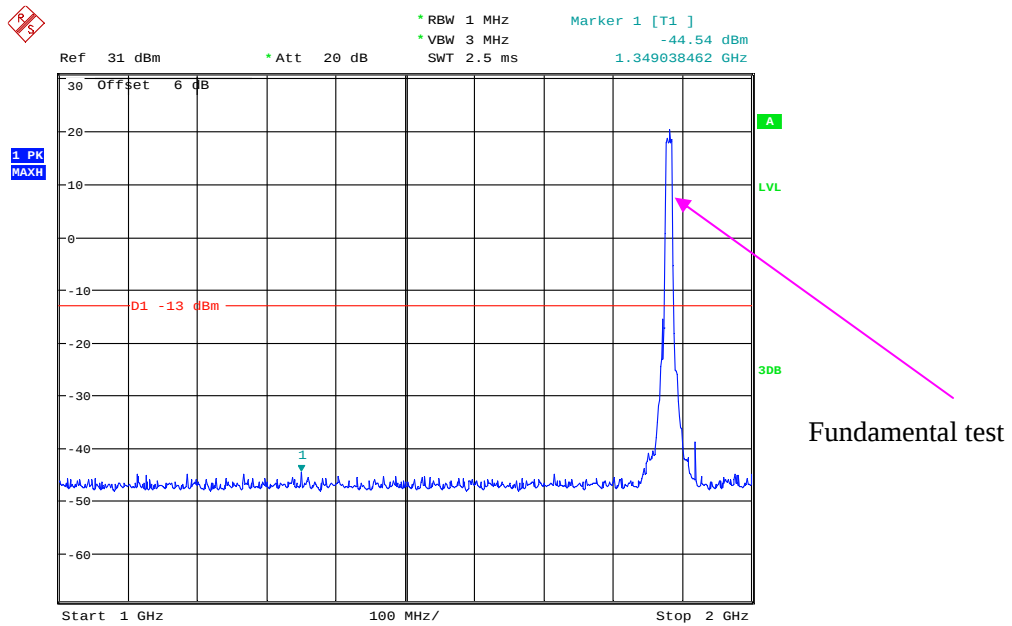
2 GHz – 20 GHz (5.0 MHz, Middle Channel)

Date: 22.DEC.2019 11:17:39

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

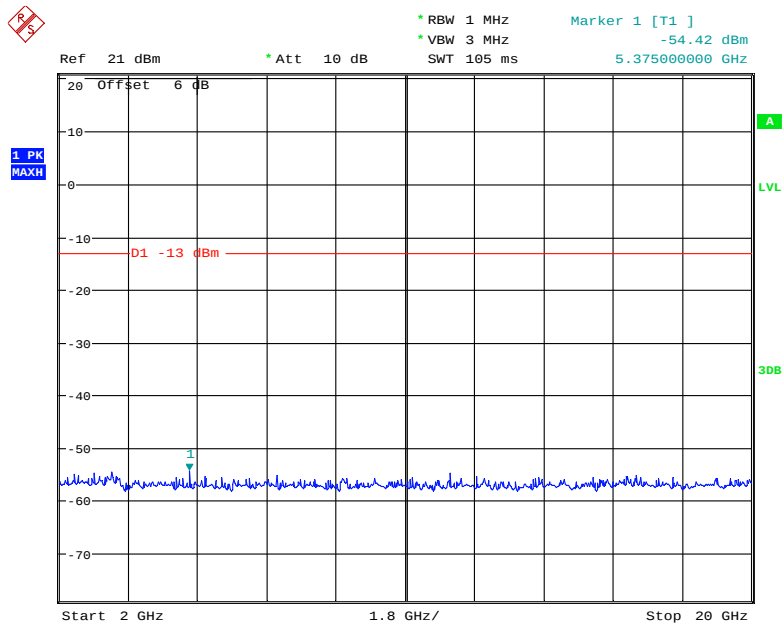
Date: 22.DEC.2019 11:11:11

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



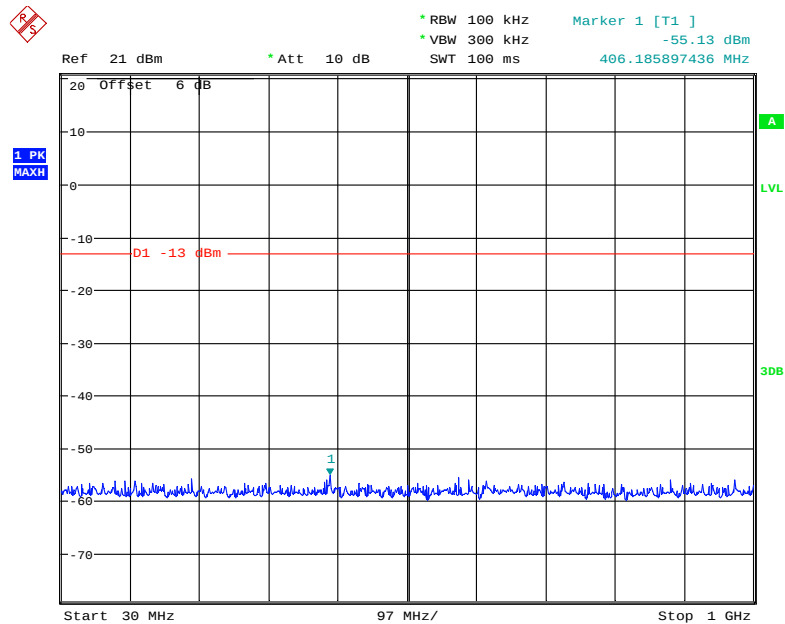
Date: 22.DEC.2019 11:15:33

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



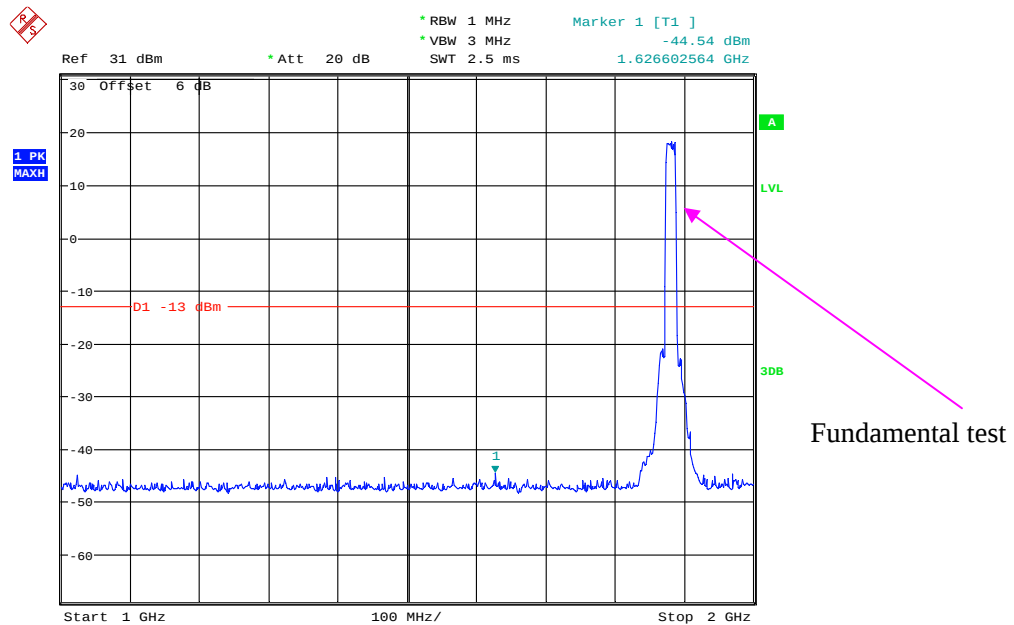
Date: 22.DEC.2019 11:17:50

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



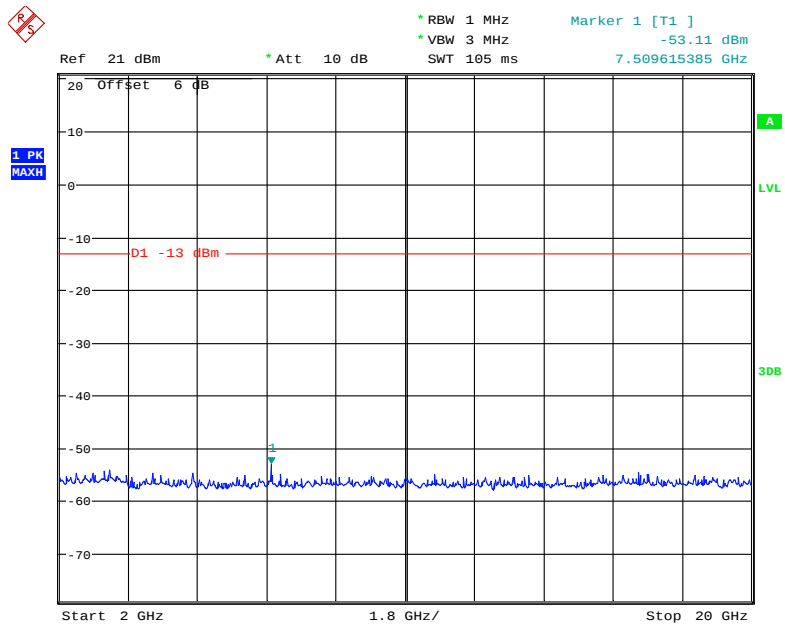
Date: 22.DEC.2019 11:11:22

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



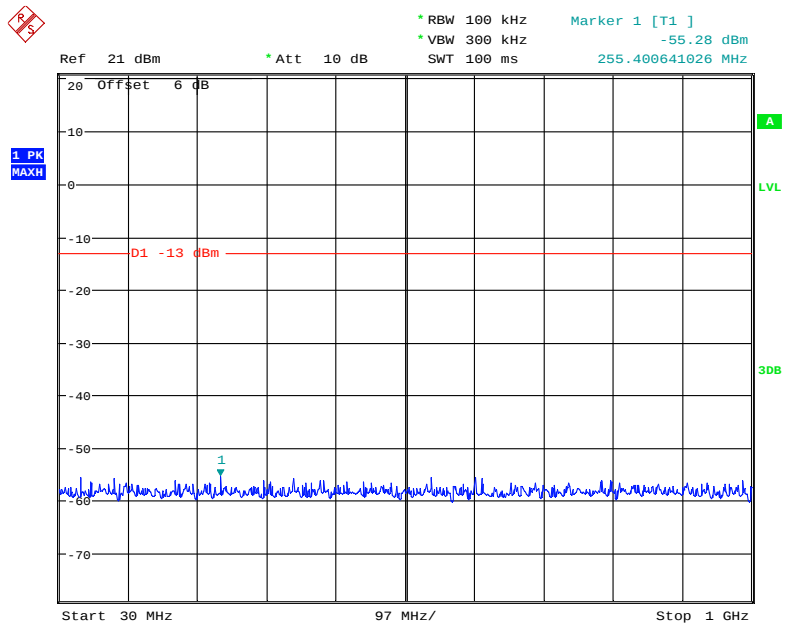
Date: 22.DEC.2019 11:15:16

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



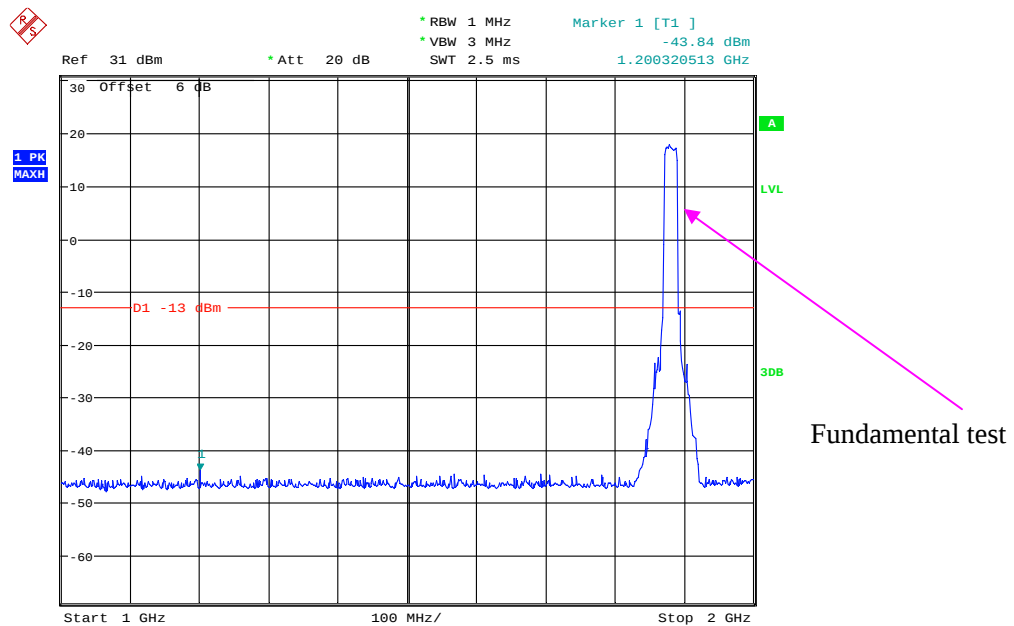
Date: 22.DEC.2019 11:18:05

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



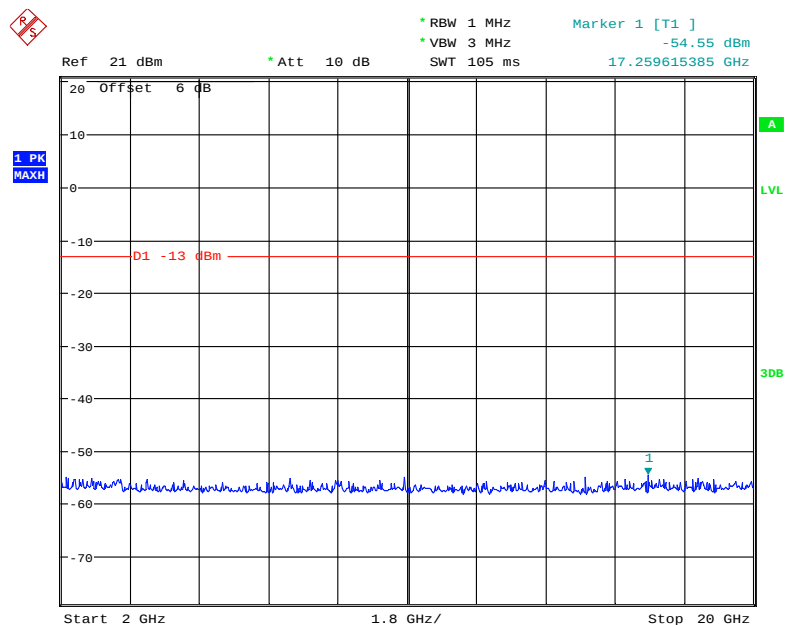
Date: 22.DEC.2019 11:11:35

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



Date: 22.DEC.2019 11:14:43

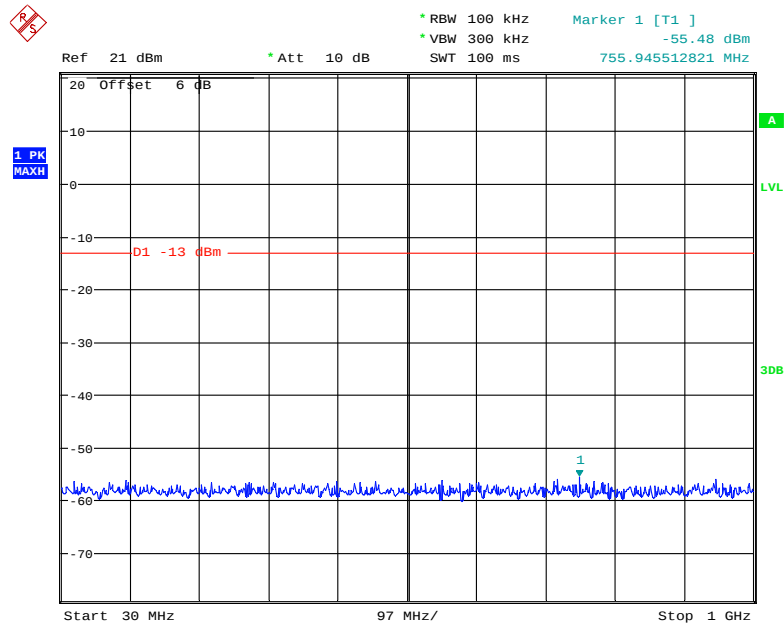
2 GHz - 20 GHz (20.0 MHz, Middle Channel)



Date: 22.DEC.2019 11:18:31

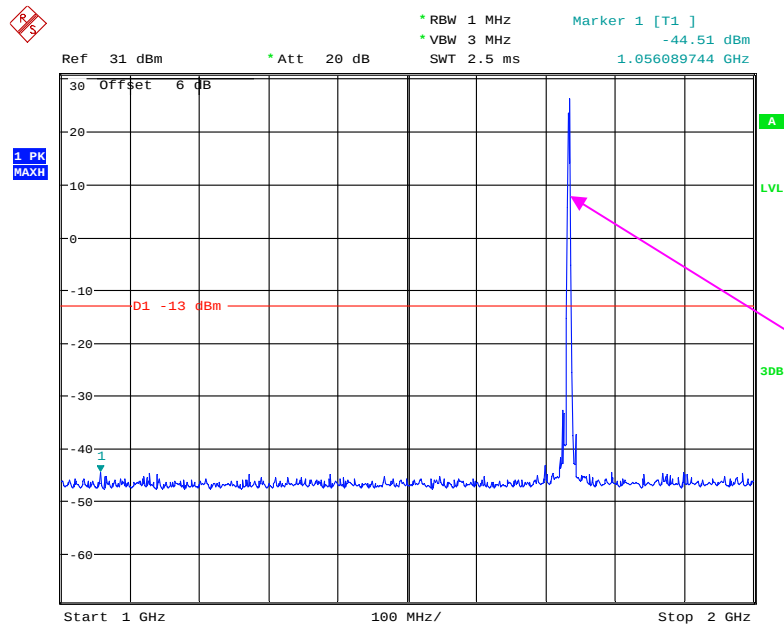
LTE Band 4:

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



Date: 22.DEC.2019 11:28:15

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



Date: 22.DEC.2019 11:32:30

Ref 21 dBm * Att 10 dB RBW 1 MHz VBW 3 MHz SWT 105 ms Marker 1 [T1] -19.88 dBm 3.442307692 GHz

Offset 6 dB

1 PK MAXH

D1 -13 dBm

Start 2 GHz 1.8 GHz/ Stop 20 GHz

Ref 21 dBm * Att 10 dB * RBW 100 kHz * VBW 300 kHz SWT 100 ms Marker 1 [T1] -55.54 dBm 981.346153846 MHz

20 Offset 6 dB

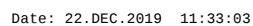
1 PK MAXH

D1 -13 dBm

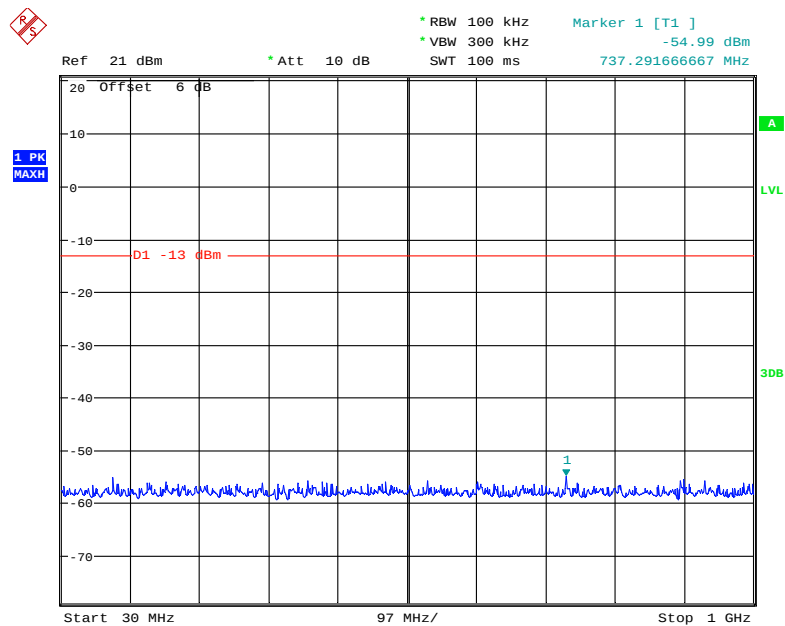
1

Start 30 MHz 97 MHz/ Stop 1 GHz

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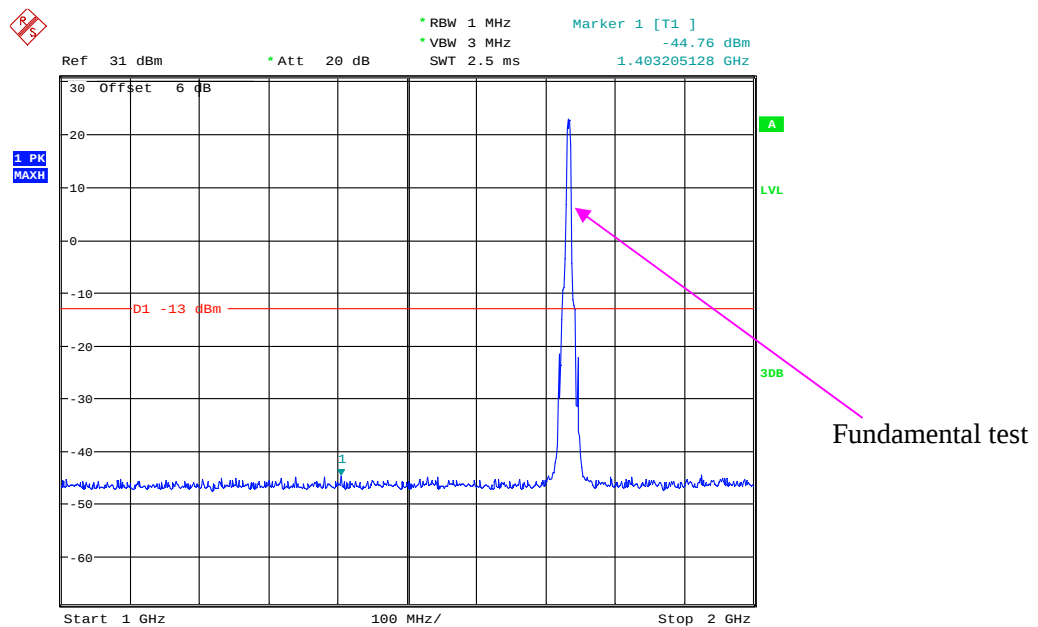


30 MHz - 1 GHz (5.0 MHz, Middle Channel)



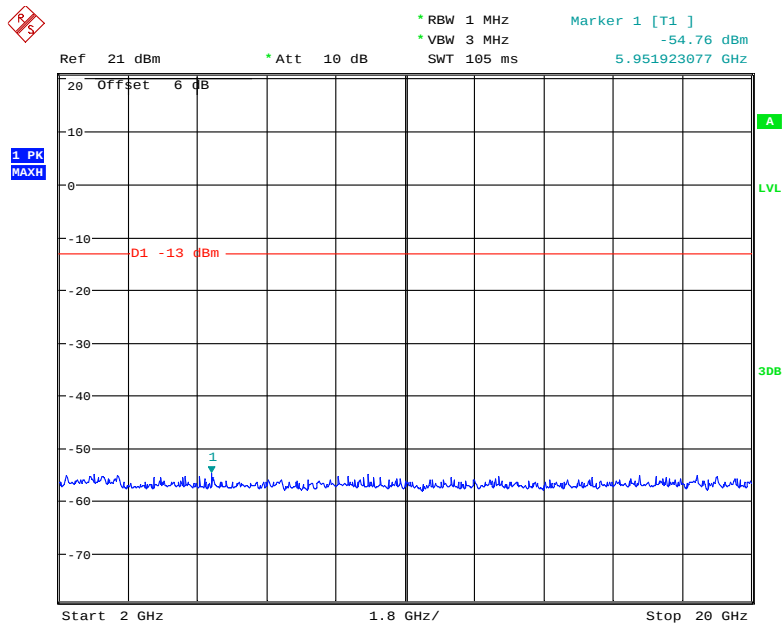
Date: 22.DEC.2019 11:28:44

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



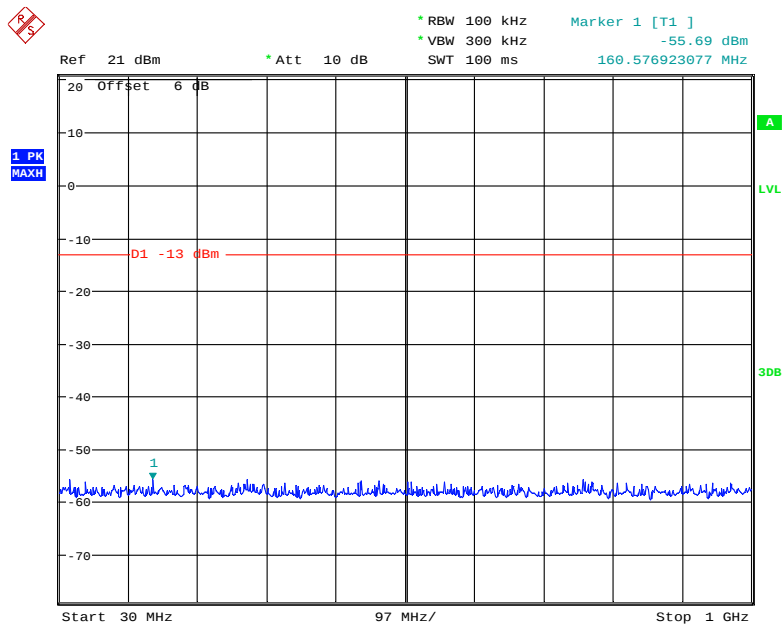
Date: 22.DEC.2019 11:31:37

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



Date: 22.DEC.2019 11:33:15

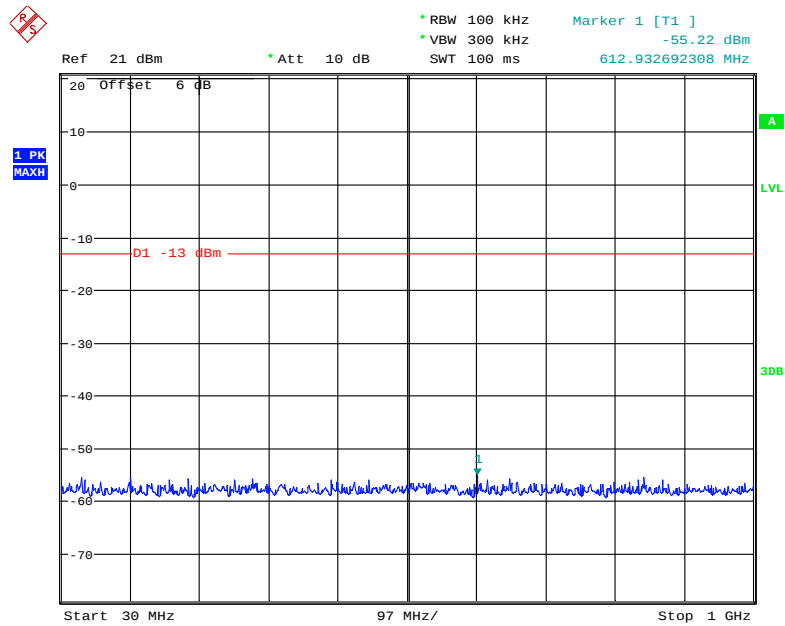
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Date: 22.DEC.2019 11:28:56

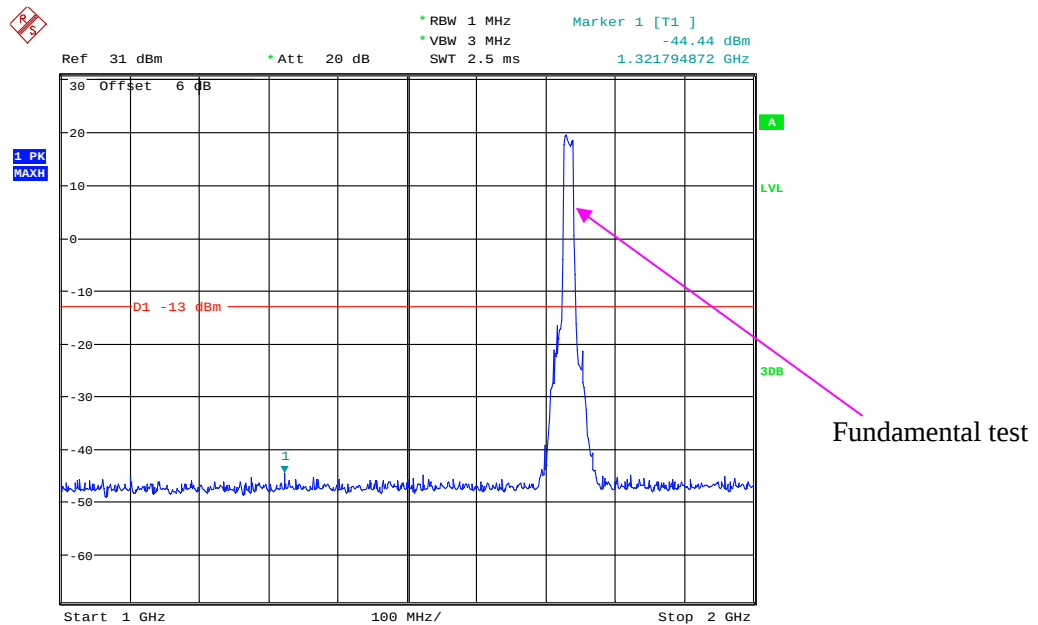


30 MHz - 1 GHz (15.0 MHz, Middle Channel)



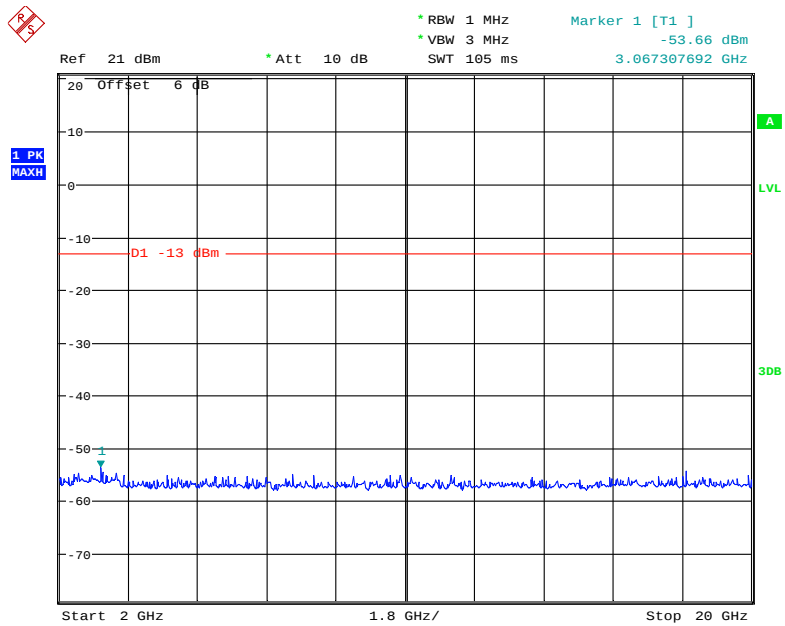
Date: 22.DEC.2019 11:29:21

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



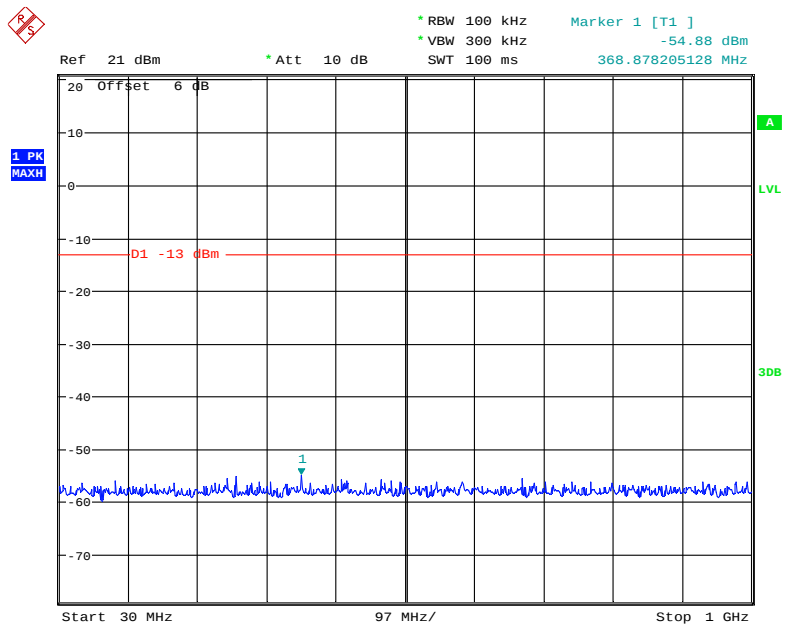
Date: 22.DEC.2019 11:30:32

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



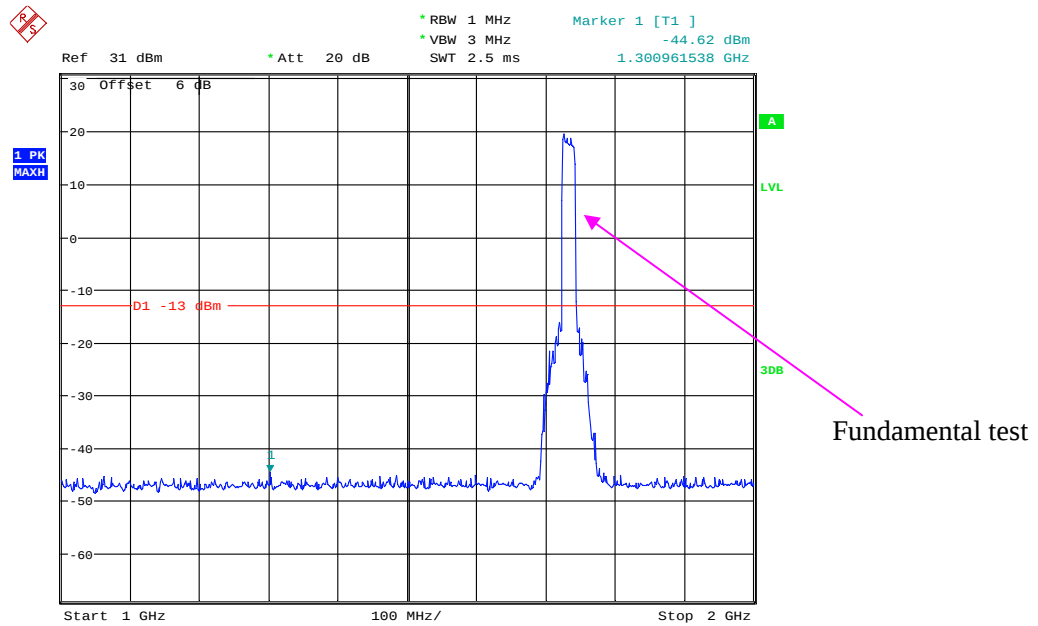
Date: 22.DEC.2019 11:33:39

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



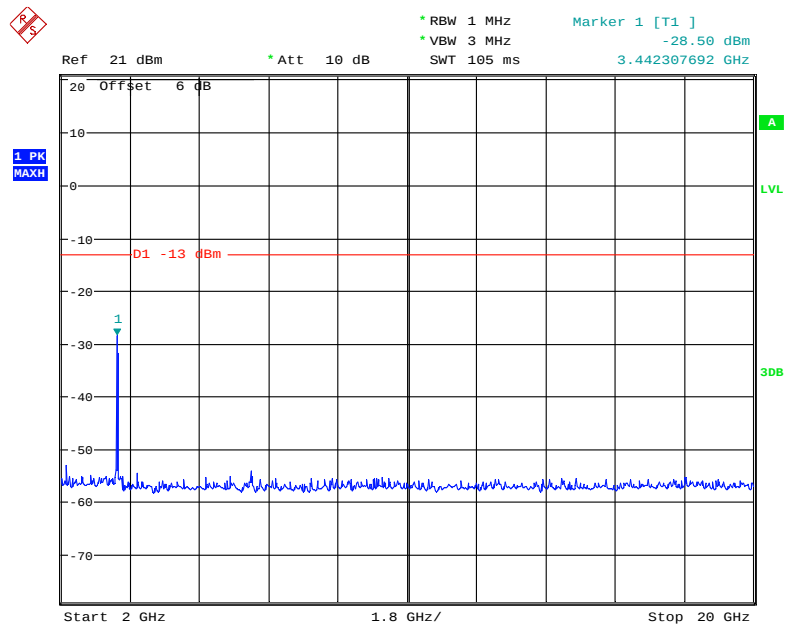
Date: 22.DEC.2019 11:29:33

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

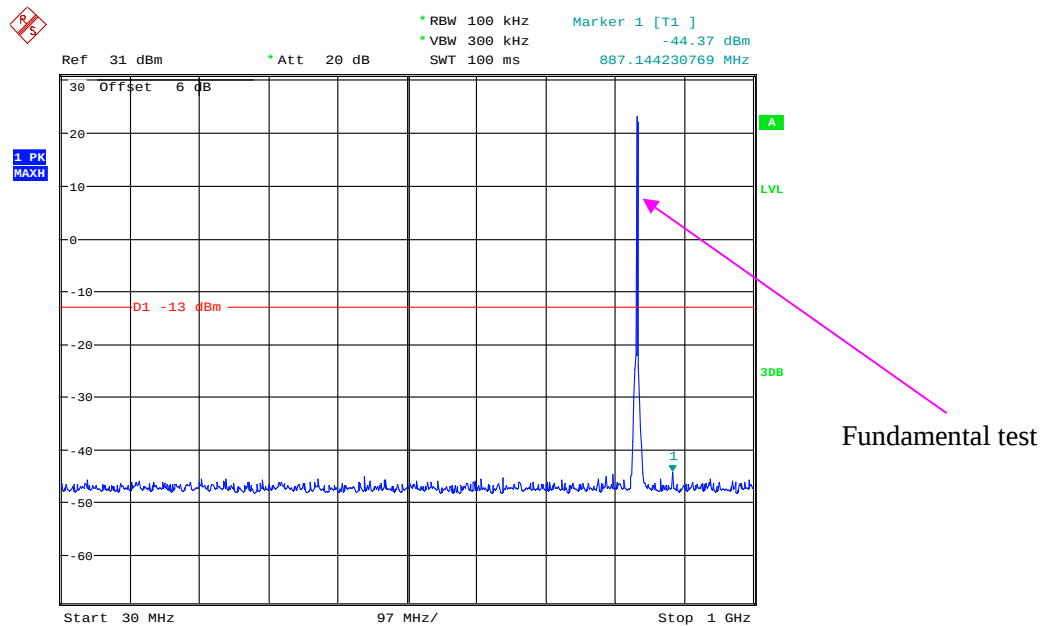


Date: 22.DEC.2019 11:30:17

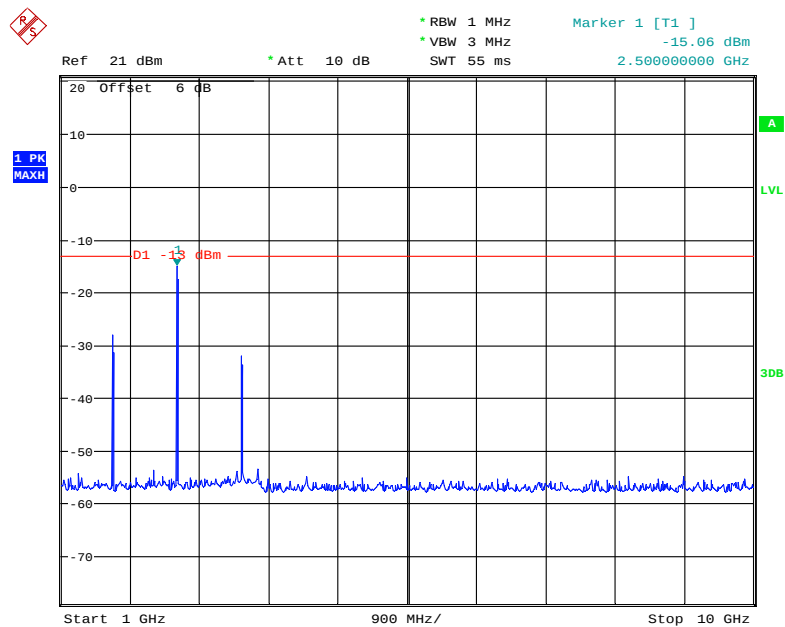
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 22.DEC.2019 11:33:50

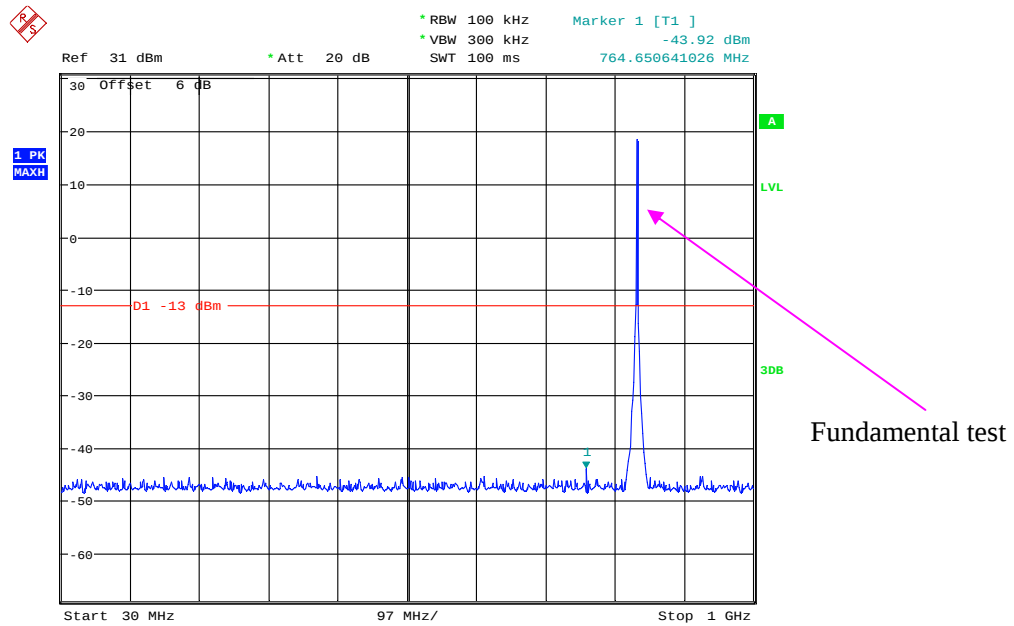
LTE Band 5:**30 MHz - 1 GHz (1.4 MHz, Middle Channel)**

Date: 22.DEC.2019 11:34:44

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

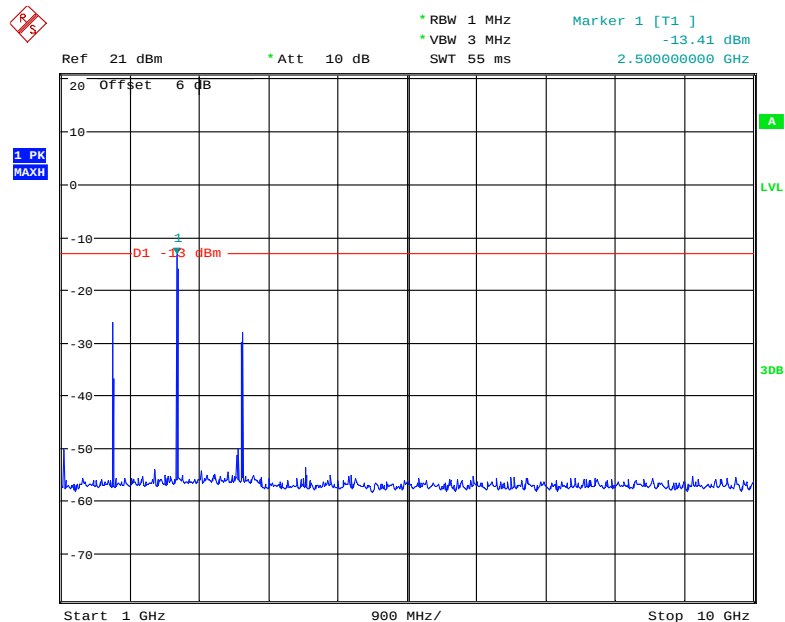
Date: 22.DEC.2019 11:37:56

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



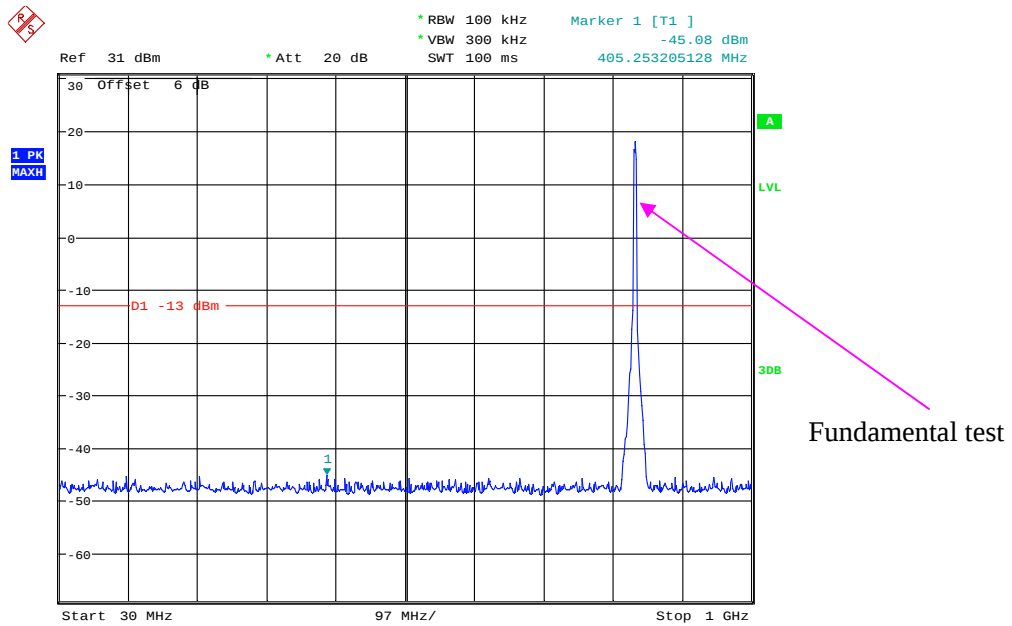
Date: 22.DEC.2019 11:35:19

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



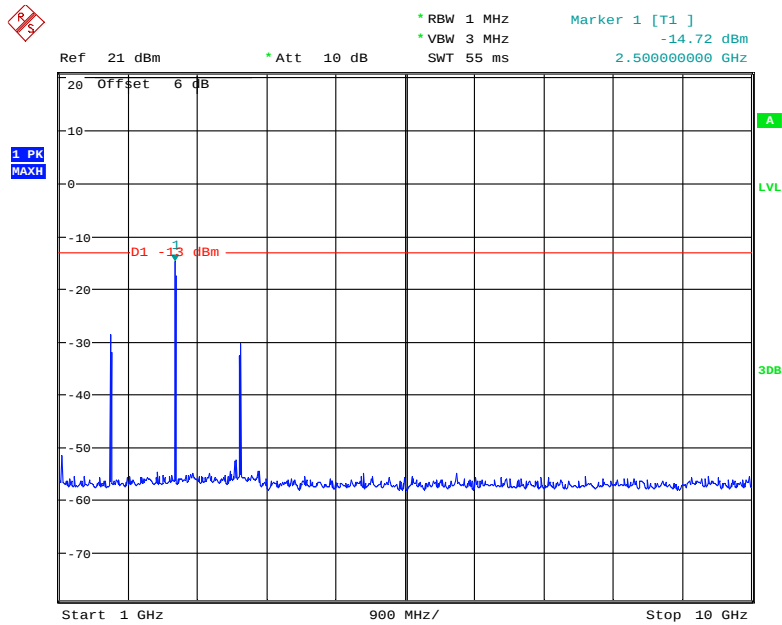
Date: 22.DEC.2019 11:36:43

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



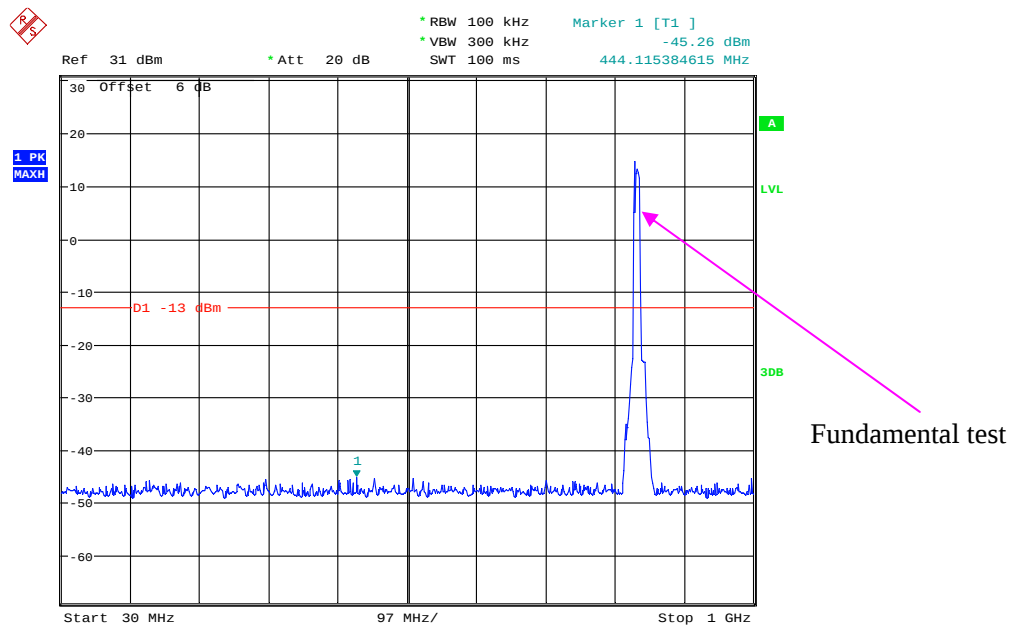
Date: 22.DEC.2019 11:35:36

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



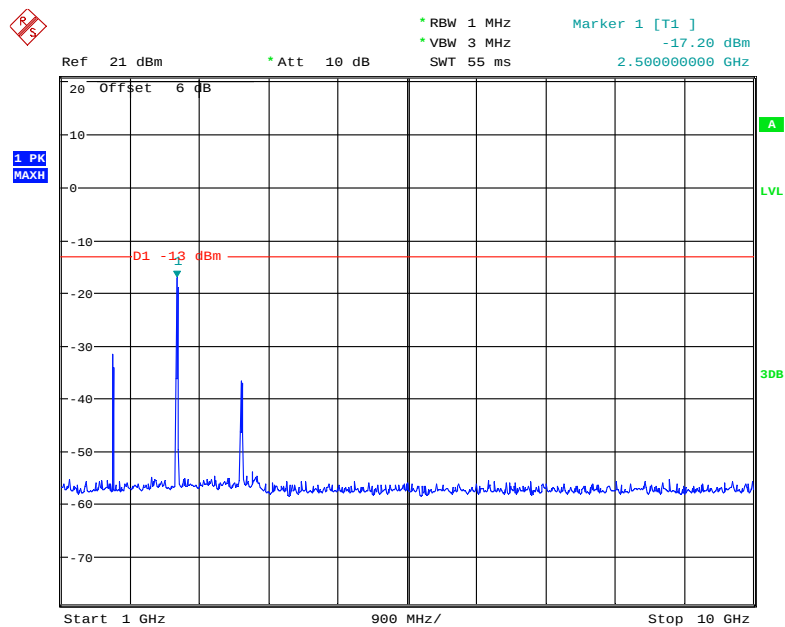
Date: 22.DEC.2019 11:36:31

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



Date: 22.DEC.2019 11:35:54

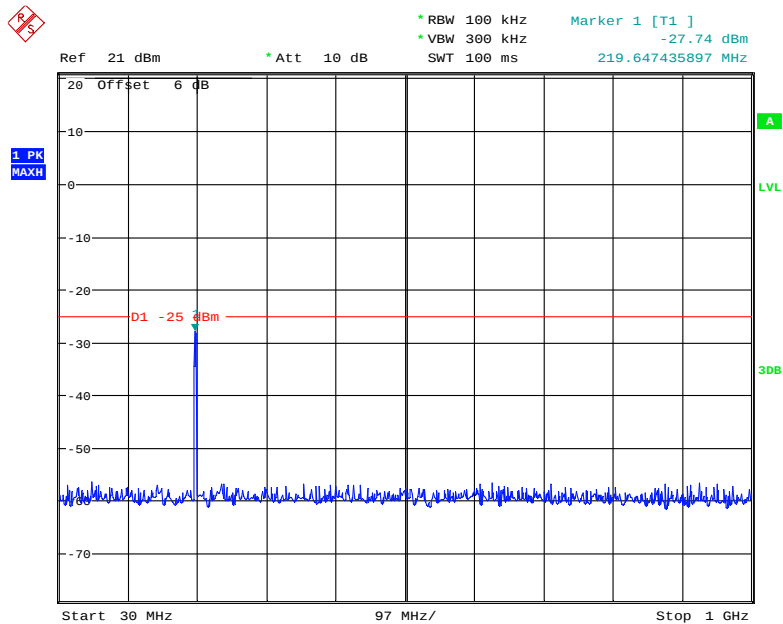
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 22.DEC.2019 11:36:18

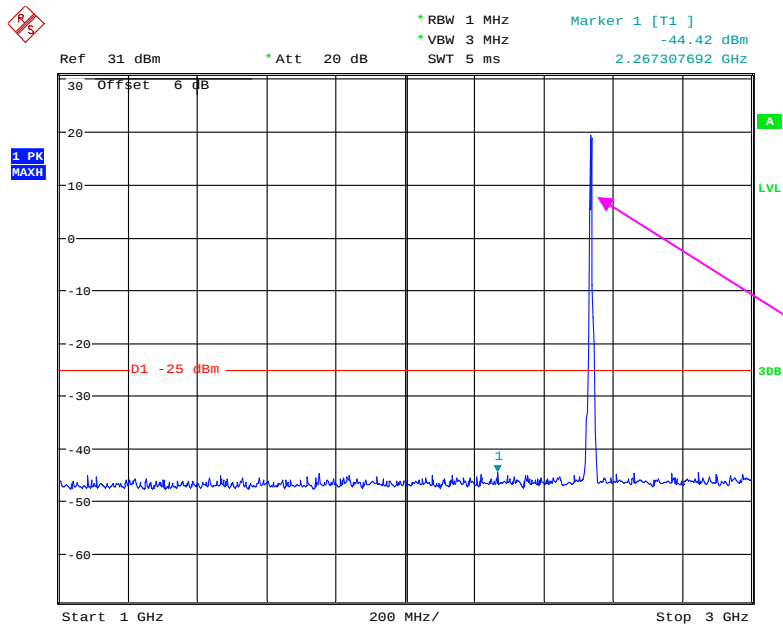
LTE Band 7:

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



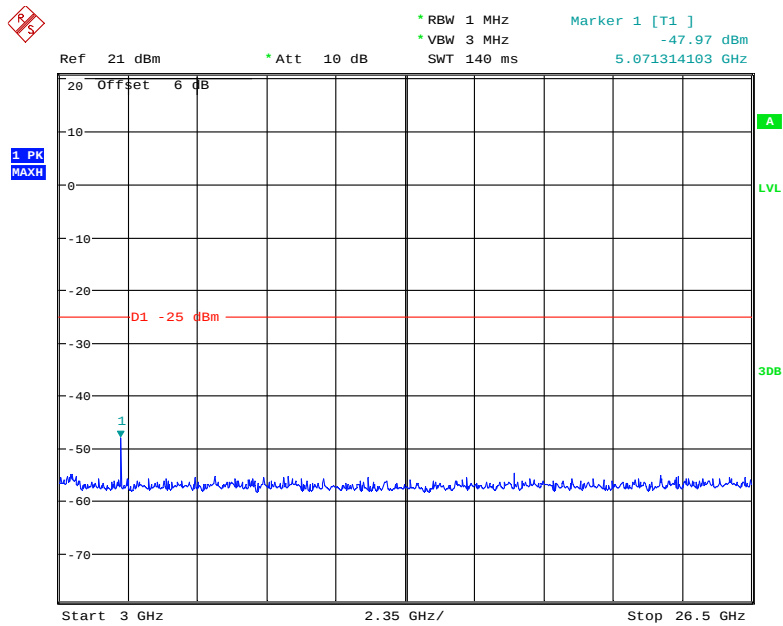
Date: 22.DEC.2019 11:49:29

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



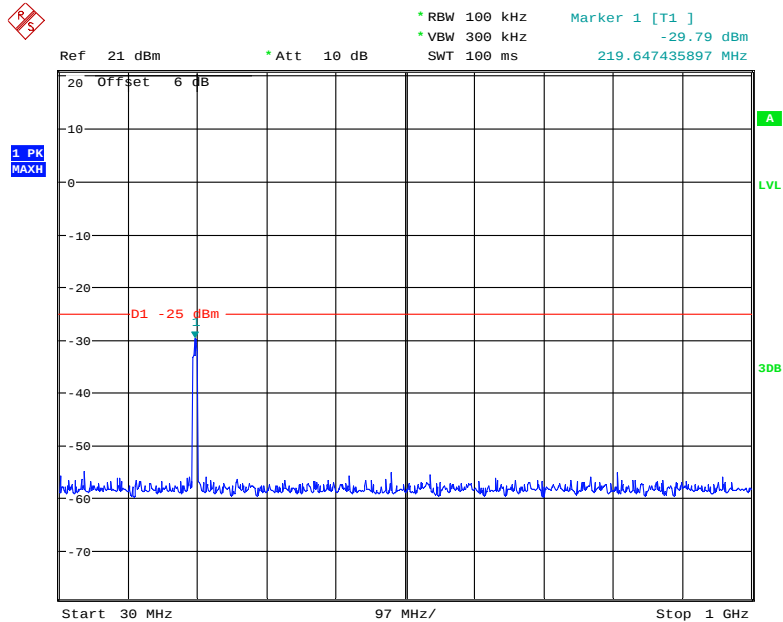
Date: 22.DEC.2019 11:51:56

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



Date: 22.DEC.2019 11:52:24

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



Date: 22.DEC.2019 11:49:51

Ref 31 dBm * Att 20 dB * RBW 1 MHz VBW 3 MHz SWT 5 ms Marker 1 [T1] -44.80 dBm

1.835897436 GHz

1 PK MAXH

D1 -25 dBm

Marker 1 [T1] -44.80 dBm

1.835897436 GHz

Start 1 GHz 200 MHz/ Stop 3 GHz

Fundamental test

Ref 21 dBm * Att 10 dB

* RBW 1 MHz * VBW 3 MHz * Marker 1 [T1] -49.38 dBm

SWT 140 ms 5.071314103 GHz

20 Offset 6 dB

1 PK MAXH

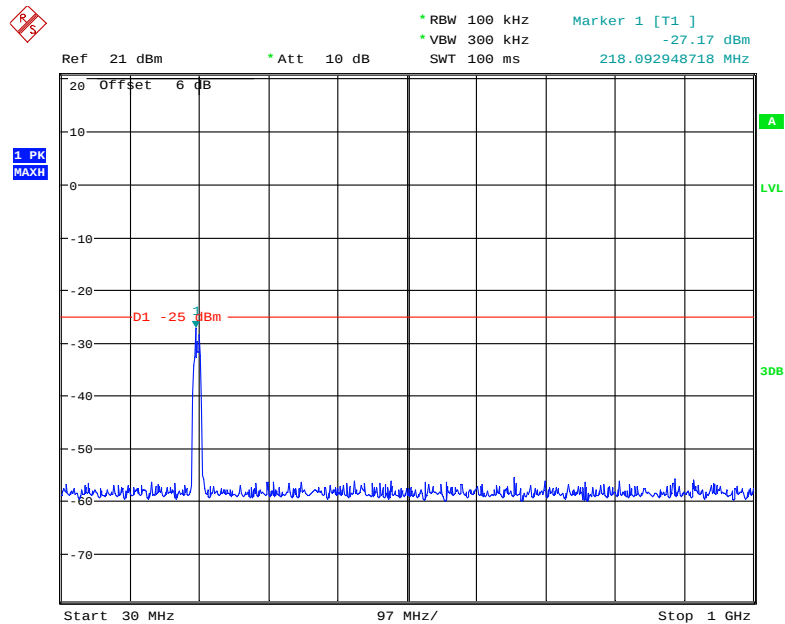
D1 -25 dBm

1

Start 3 GHz 2.35 GHz/ Stop 26.5 GHz

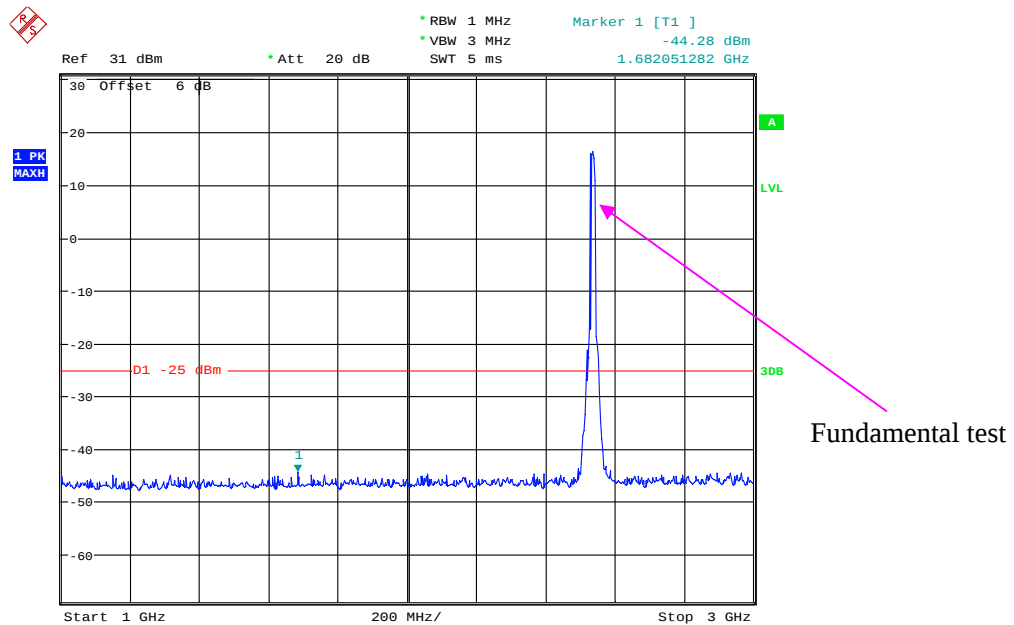
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30 MHz – 1 GHz (15.0 MHz, Middle Channel)



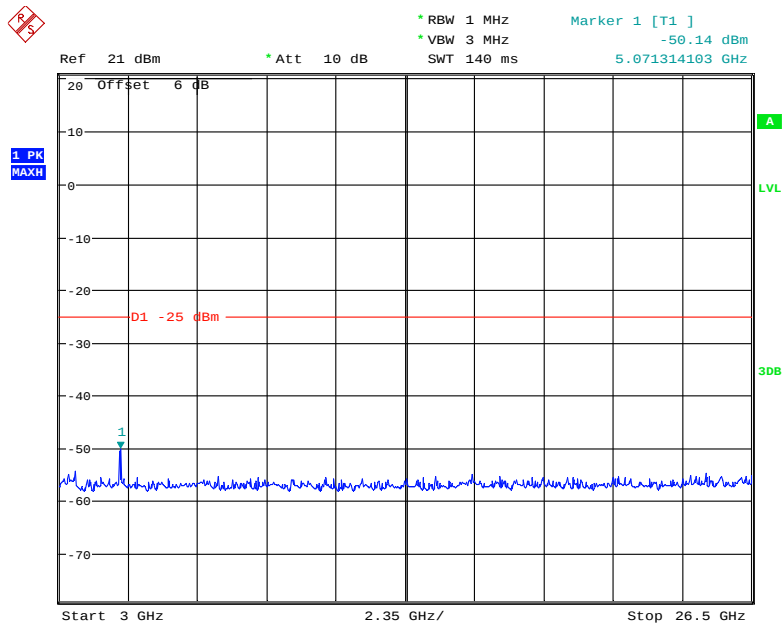
Date: 22.DEC.2019 11:50:02

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



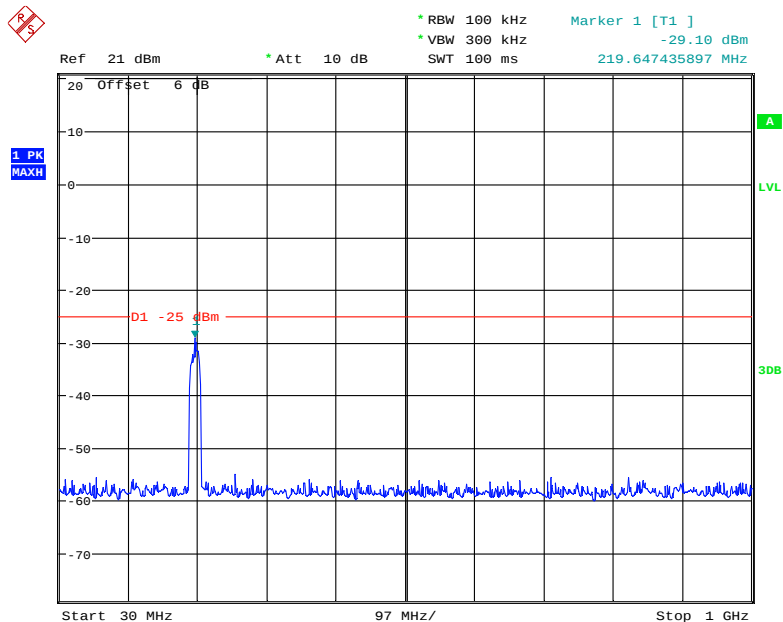
Date: 22.DEC.2019 11:51:09

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



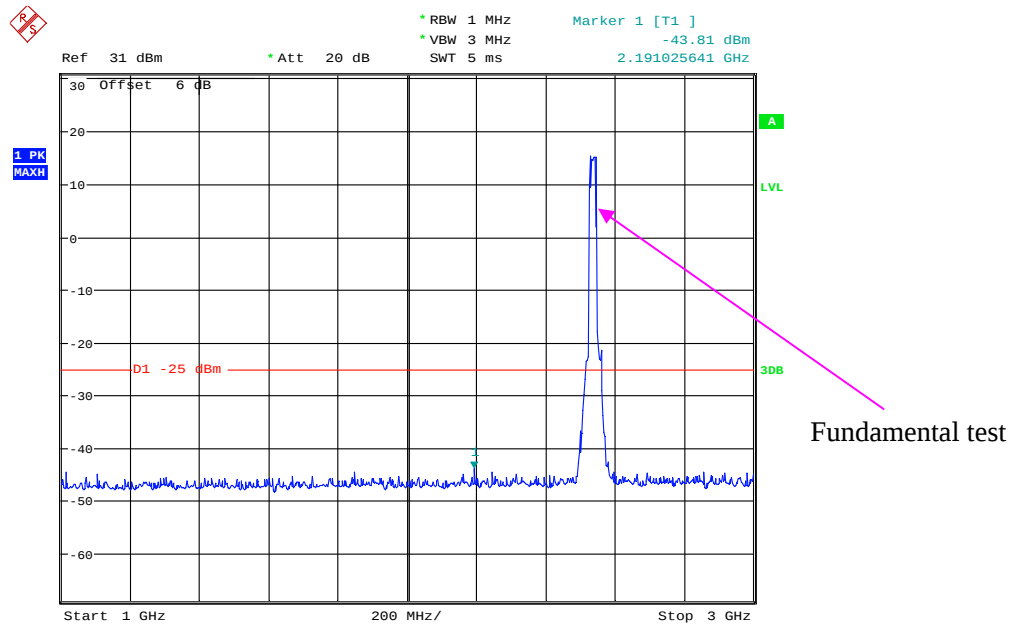
Date: 22.DEC.2019 11:52:50

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



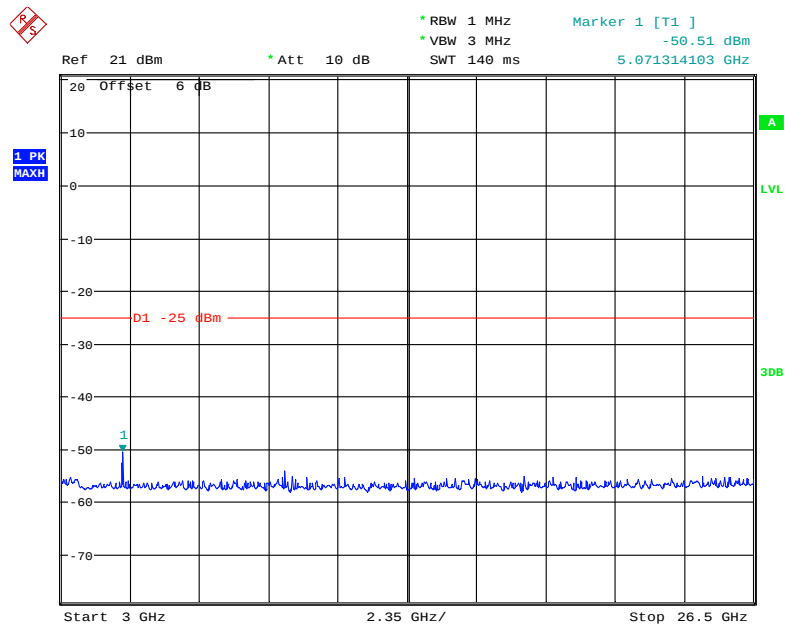
Date: 22.DEC.2019 11:50:13

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



Date: 22.DEC.2019 11:50:40

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



Date: 22.DEC.2019 11:53:01

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

Applicable Standard

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

Test Procedure

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

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

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

Test Data**Environmental Conditions**

Temperature:	23 °C
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Zero Yan and Charlie Cha on 2020-01-07 and 2020-01-09.

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										
316.2	33.26	81	1.7	H	-68.2	0.71	0.0	-68.91	-13	55.91
316.2	34.19	242	2.2	V	-65.7	0.71	0.0	-66.41	-13	53.41
1673.20	59.34	348	1.4	H	-47.0	1.30	8.90	-39.40	-13	26.40
1673.20	54.33	348	1.4	V	-51.4	1.30	8.90	-43.80	-13	30.80
2509.80	49.93	211	2.0	H	-53.4	2.60	10.20	-45.80	-13	32.80
2509.80	47.98	186	1.6	V	-54.8	2.60	10.20	-47.20	-13	34.20
3346.40	48.86	75	2.3	H	-52.0	1.50	11.70	-41.80	-13	28.80
3346.40	51.30	55	1.6	V	-49.6	1.50	11.70	-39.40	-13	26.40
WCDMA Mode, Middle channel										
316.3	33.51	130	1.6	H	-68.0	0.71	0.0	-68.71	-13	55.71
316.3	34.42	136	1.3	V	-65.4	0.71	0.0	-66.11	-13	53.11
1673.20	43.13	270	1.4	H	-63.2	1.30	8.90	-55.60	-13	42.60
1673.20	43.64	291	2.3	V	-62.1	1.30	8.90	-54.50	-13	41.50
2509.80	47.49	35	1.1	H	-55.9	2.60	10.20	-48.30	-13	35.30
2509.80	48.22	119	1.0	V	-54.5	2.60	10.20	-46.90	-13	33.90
3346.40	44.61	141	1.7	H	-56.3	1.50	11.70	-46.10	-13	33.10
3346.40	46.15	10	2.4	V	-54.8	1.50	11.70	-44.60	-13	31.60

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

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
321.5	33.54	53	1.5	H	-67.9	0.71	0.0	-68.61	-13	55.61
321.5	34.36	165	2.0	V	-65.5	0.71	0.0	-66.21	-13	53.21
3760.00	47.93	230	1.7	H	-54.1	1.50	11.80	-43.80	-13	30.80
3760.00	46.82	19	1.1	V	-54.8	1.50	11.80	-44.50	-13	31.50
WCDMA Mode Band II, Middle channel										
312.6	33.42	299	1.5	H	-68.1	0.71	0.0	-68.81	-13	55.81
312.6	34.35	150	2.5	V	-65.5	0.71	0.0	-66.21	-13	53.21
3760.00	45.44	39	2.2	H	-56.6	1.50	11.80	-46.30	-13	33.30
3760.00	44.89	58	1.8	V	-56.7	1.50	11.80	-46.40	-13	33.40

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										
320.6	33.53	30	1.3	H	-68.0	0.71	0.0	-68.71	-13	55.71
320.6	34.38	150	2.3	V	-65.5	0.71	0.0	-66.21	-13	53.21
3760.00	46.52	258	2.1	H	-55.5	1.50	11.80	-45.20	-13	32.20
3760.00	45.99	73	2.0	V	-55.6	1.50	11.80	-45.30	-13	32.30
Band 4 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 20 GHz										
315.6	33.26	27	2.3	H	-68.2	0.71	0.0	-68.91	-13	55.91
315.6	34.43	85	2.0	V	-65.4	0.71	0.0	-66.11	-13	53.11
3465.00	50.94	331	1.0	H	-49.8	1.50	12.00	-39.30	-13	26.30
3465.00	53.63	261	1.2	V	-47.9	1.50	12.00	-37.40	-13	24.40
Band 5 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 10 GHz										
316.1	33.33	74	2.3	H	-68.2	0.71	0.0	-68.91	-13	55.91
316.1	34.39	24	1.9	V	-65.5	0.71	0.0	-66.21	-13	53.21
1673.00	44.51	289	2.2	H	-61.8	1.30	8.90	-54.20	-13	41.20
1673.00	43.49	311	2.3	V	-62.2	1.30	8.90	-54.60	-13	41.60
2509.50	49.10	276	1.0	H	-54.3	2.60	10.20	-46.70	-13	33.70
2509.50	48.22	159	2.1	V	-54.5	2.60	10.20	-46.90	-13	33.90
3346.00	44.39	265	2.1	H	-56.5	1.50	11.70	-46.30	-13	33.30
3346.00	44.26	339	2.5	V	-56.7	1.50	11.70	-46.50	-13	33.50
Band 7 (5 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 26.5GHz										
318.2	33.26	286	2.0	H	-68.2	0.71	0.0	-68.91	-25	43.91
318.2	34.37	273	2.3	V	-65.5	0.71	0.0	-66.21	-25	41.21
5070.00	45.27	154	1.9	H	-54.7	1.60	12.10	-44.20	-25	19.20
5070.00	44.16	55	1.2	V	-55.9	1.60	12.10	-45.40	-25	20.40

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.

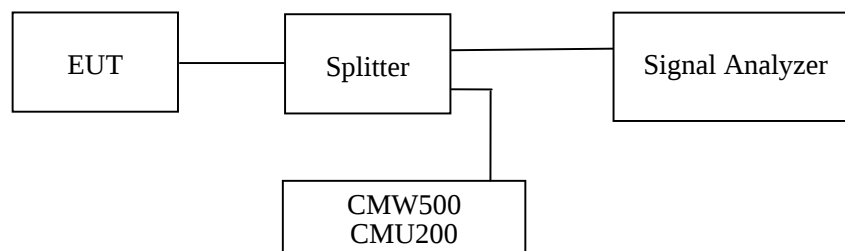
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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**

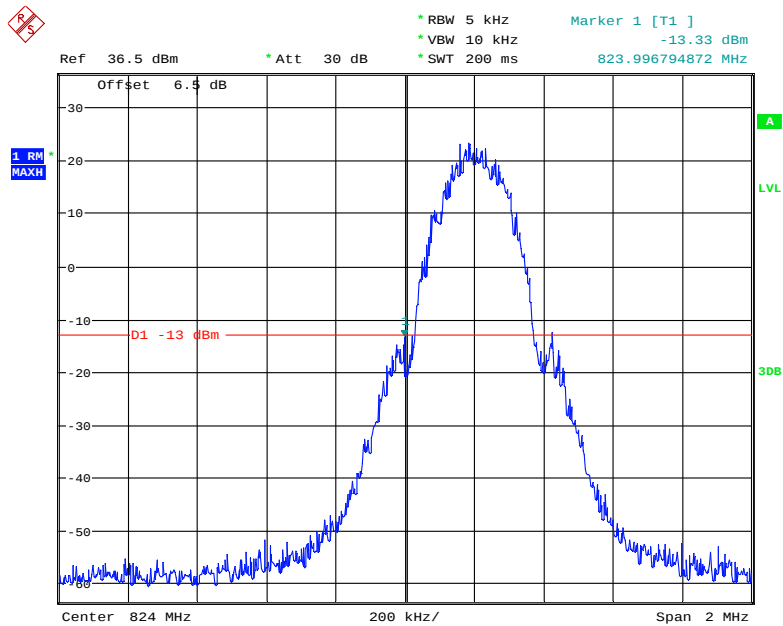
Temperature:	21~25 °C
Relative Humidity:	20~52 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu and Leo Huang on 2019-12-12 to 2019-12-22.

EUT operation mode: Transmitting

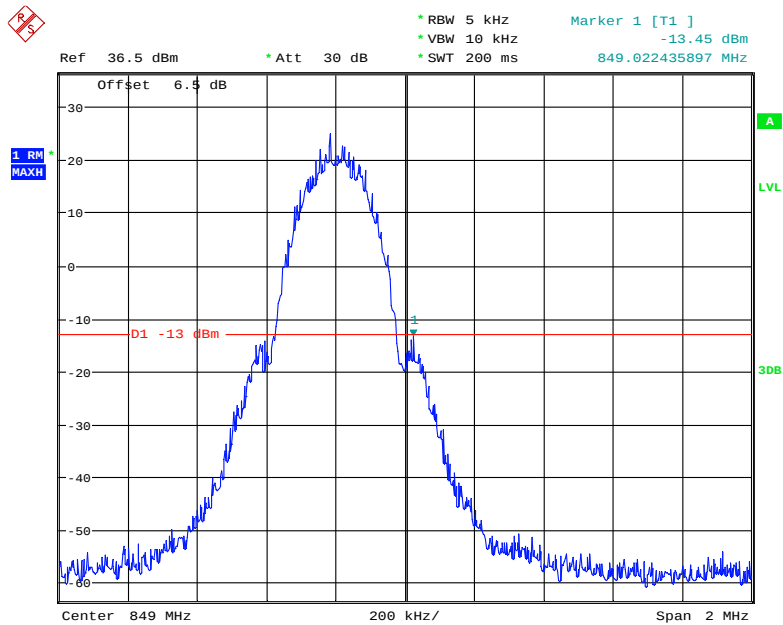
Test Result: Compliance. Please refer to the following plots.

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



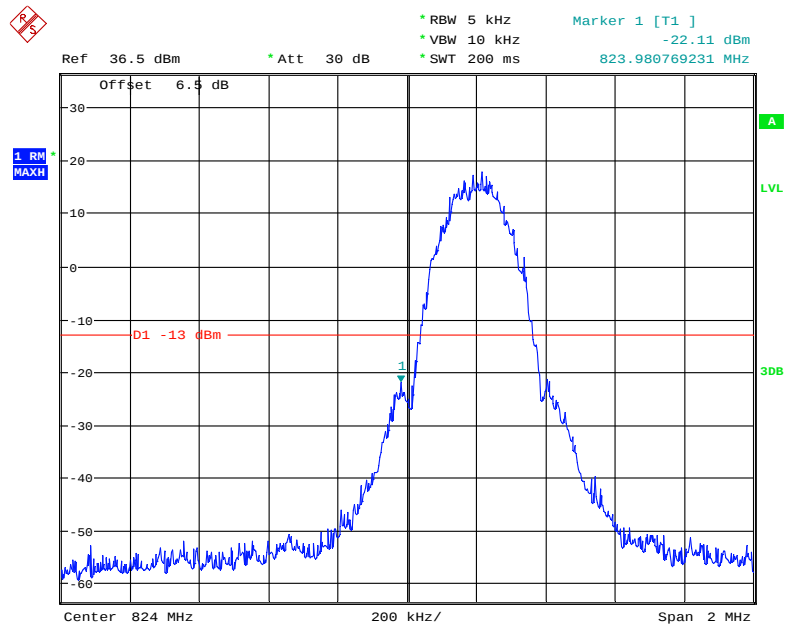
Date: 12.DEC.2019 14:51:20

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



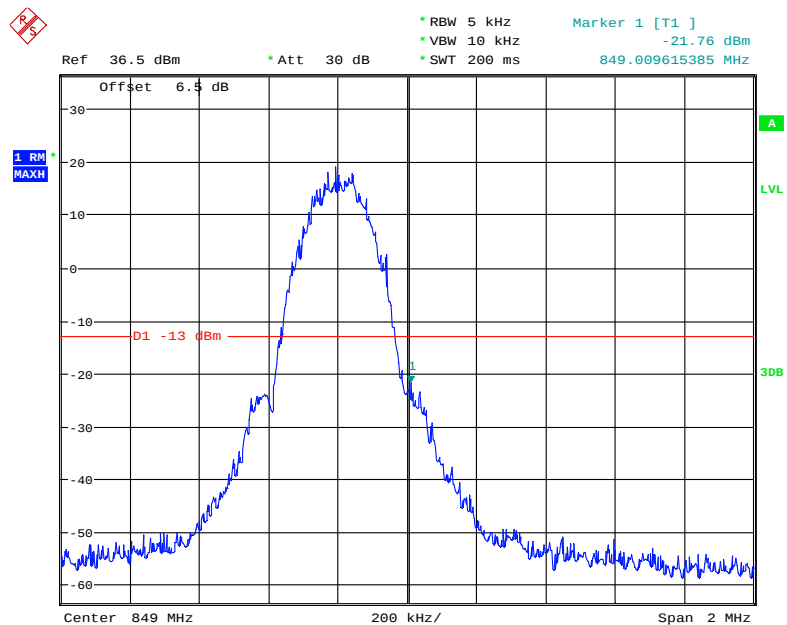
Date: 12.DEC.2019 14:50:59

Cellular Band, Left Band Edge for EDGE Mode



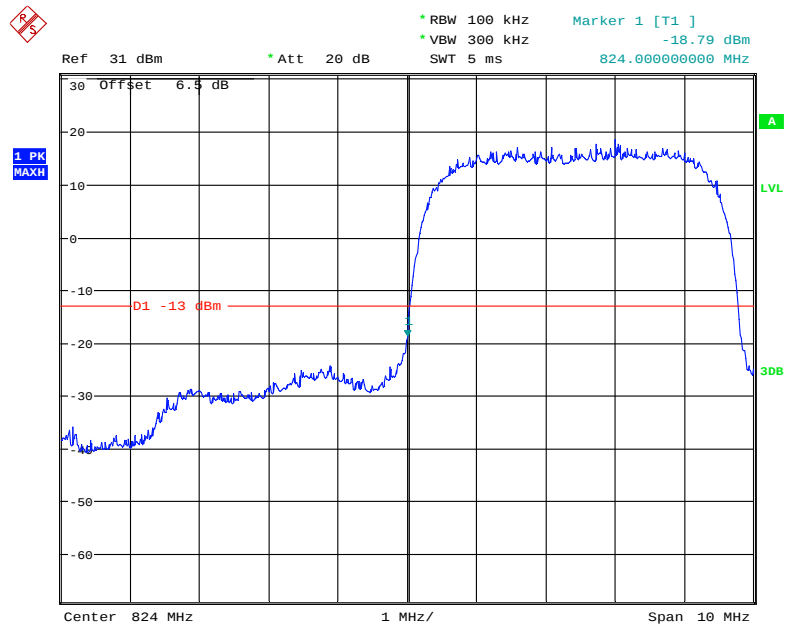
Date: 12.DEC.2019 15:14:45

Cellular Band, Right Band Edge for EDGE Mode



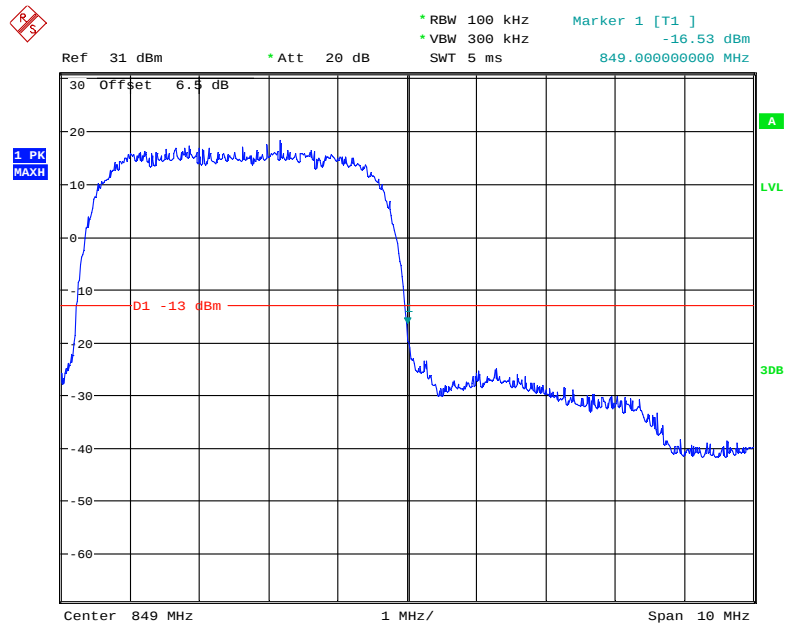
Date: 12.DEC.2019 15:15:37

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



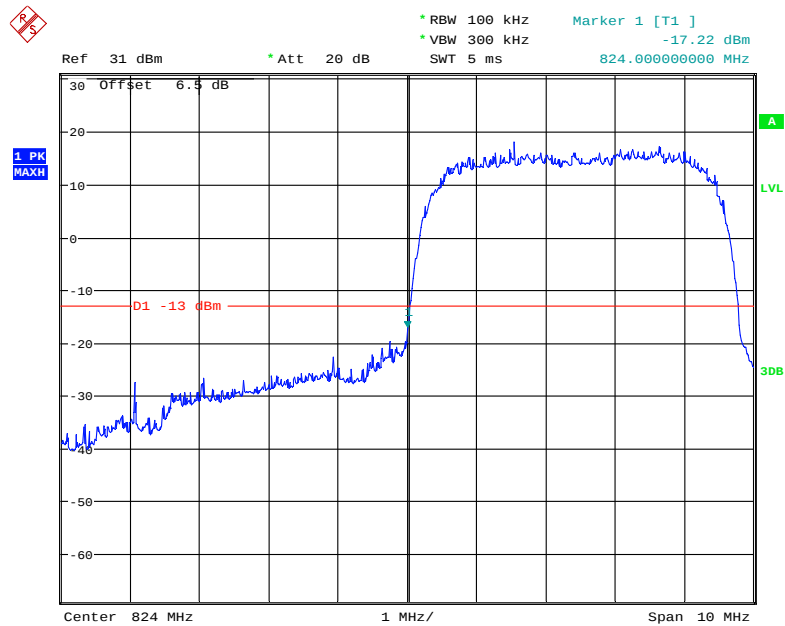
Date: 12.DEC.2019 11:21:34

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



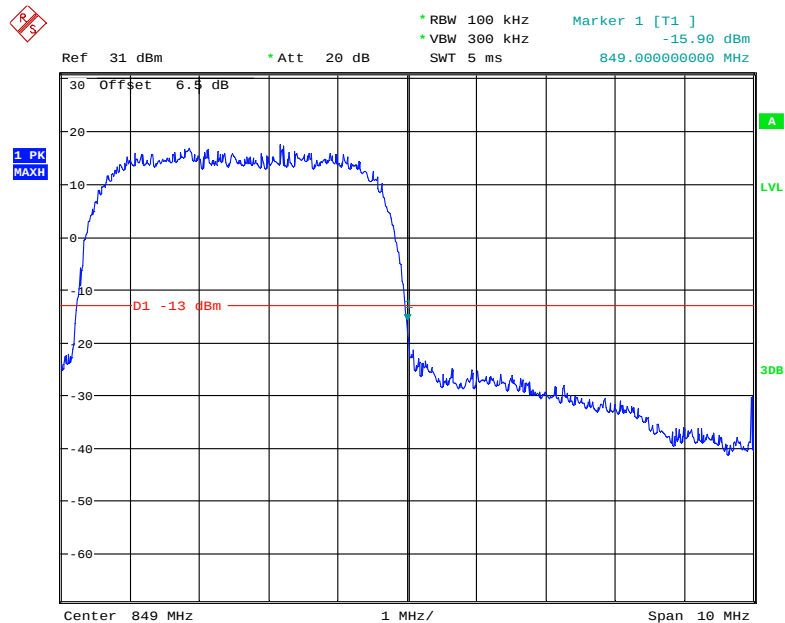
Date: 12.DEC.2019 11:22:01

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



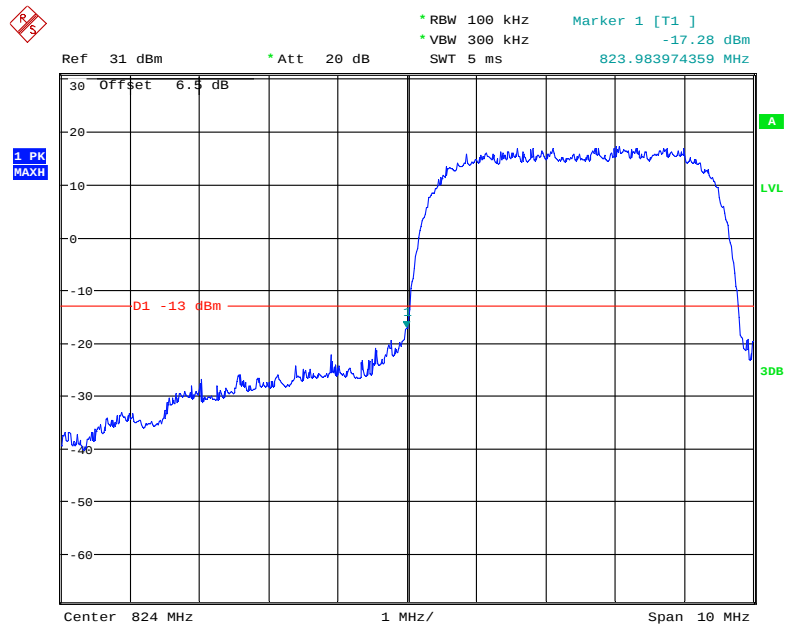
Date: 12.DEC.2019 13:36:23

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



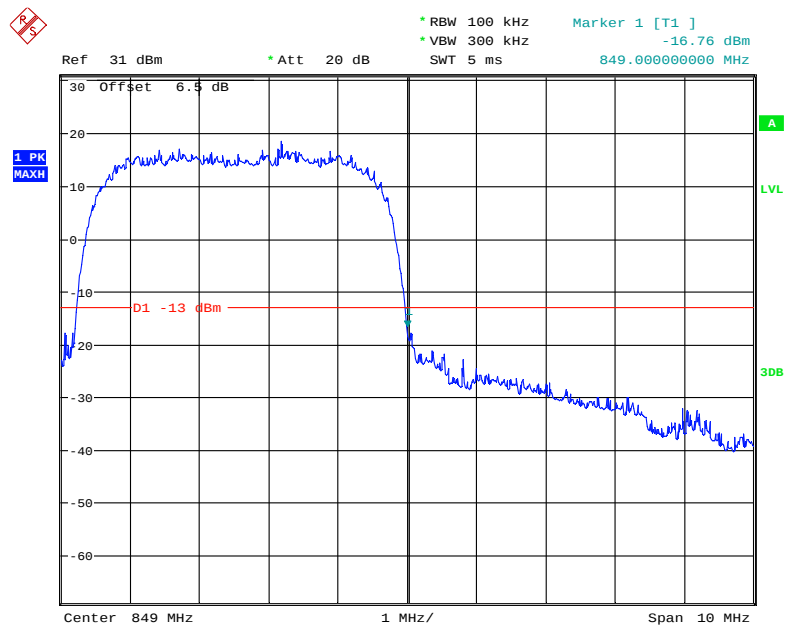
Date: 12.DEC.2019 13:34:27

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



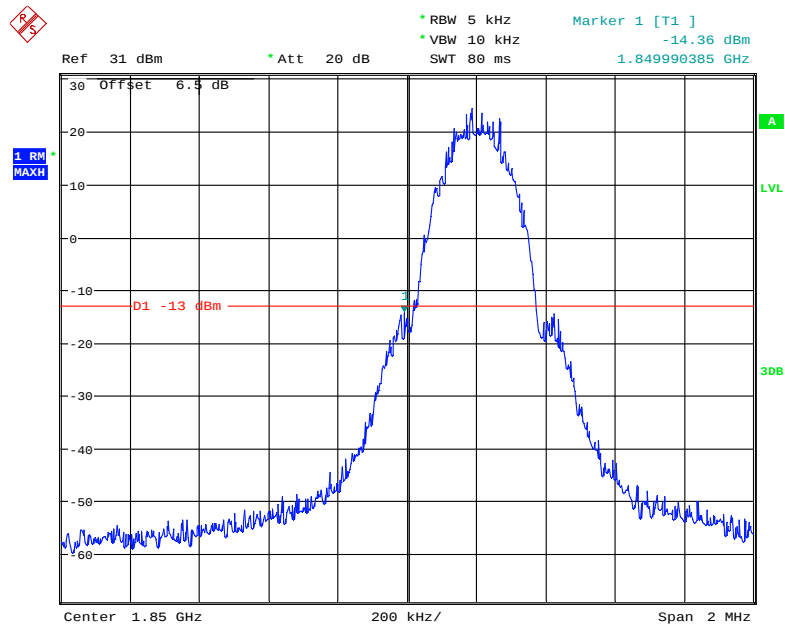
Date: 12.DEC.2019 13:32:59

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



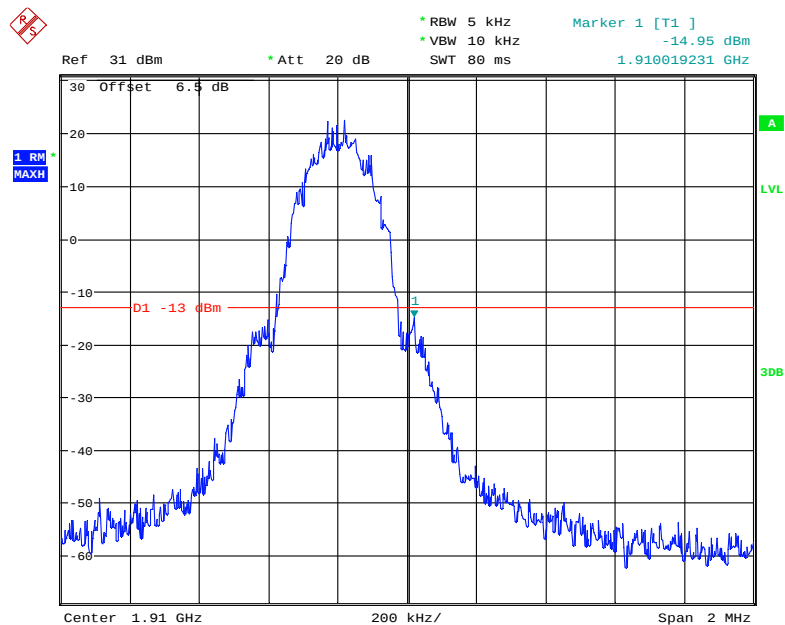
Date: 12.DEC.2019 13:33:27

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



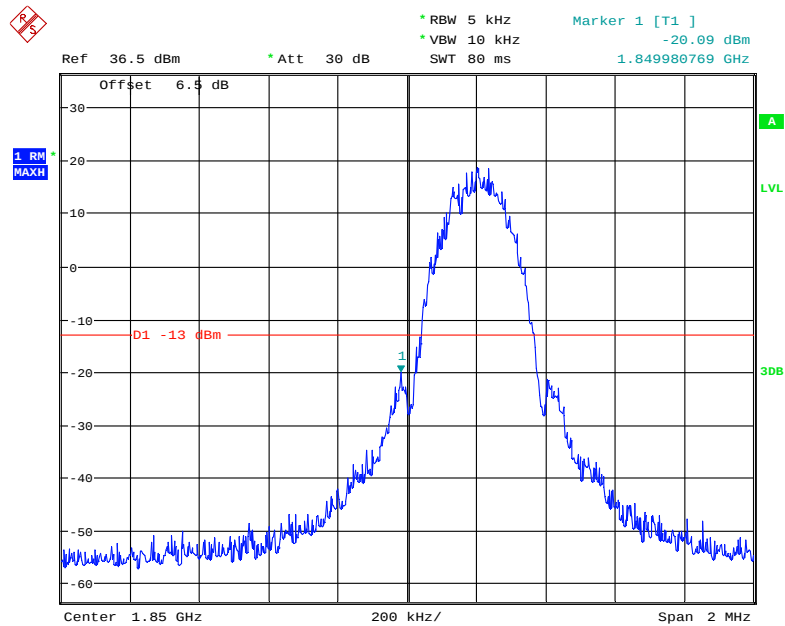
Date: 12.DEC.2019 14:00:29

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



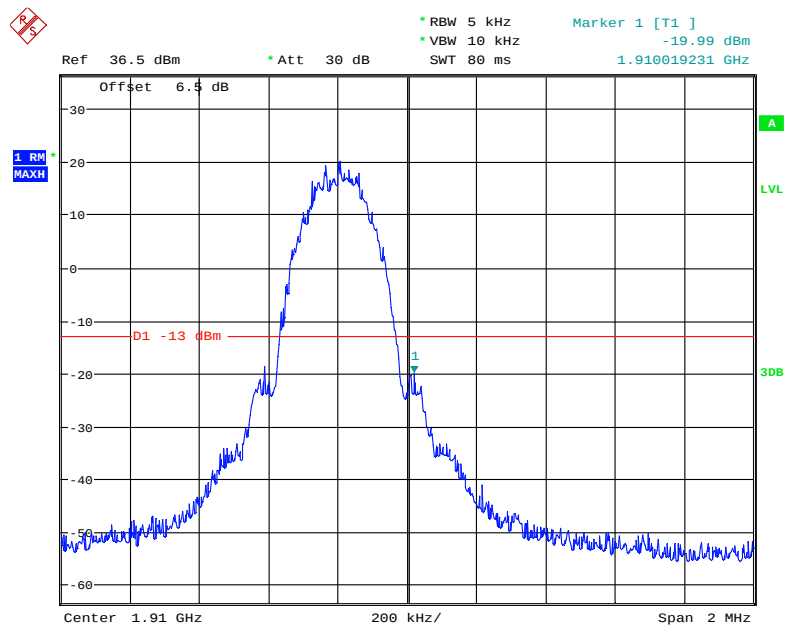
Date: 12.DEC.2019 14:01:22

PCS Band, Left Band Edge for EDGE Mode



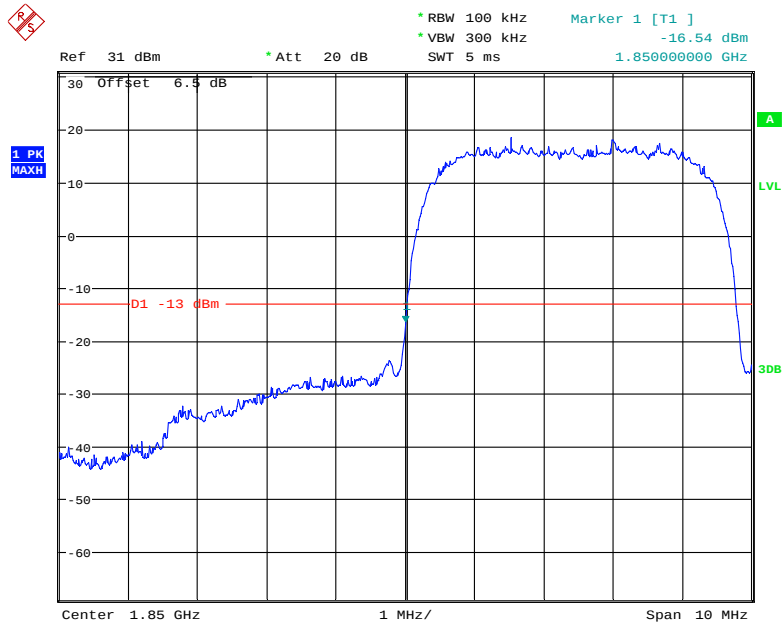
Date: 12.DEC.2019 14:15:13

PCS Band, Right Band Edge for EDGE Mode



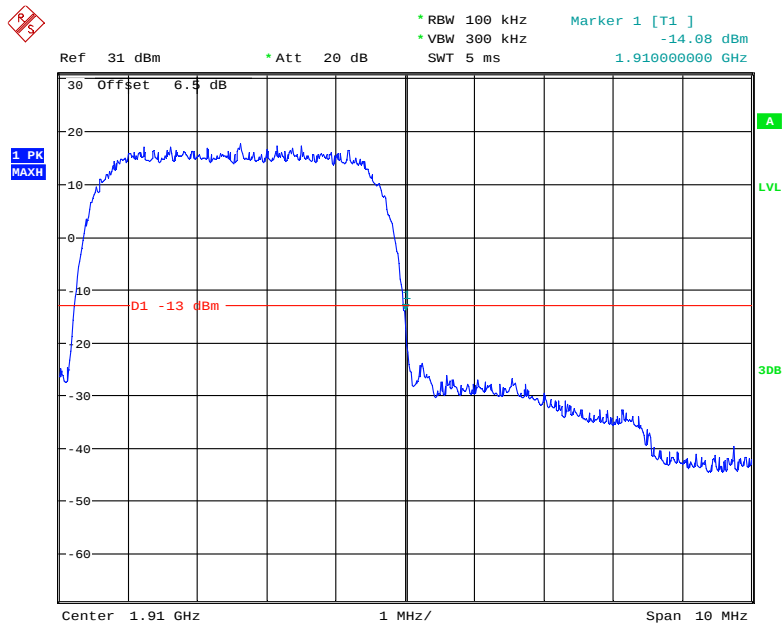
Date: 12.DEC.2019 14:16:23

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



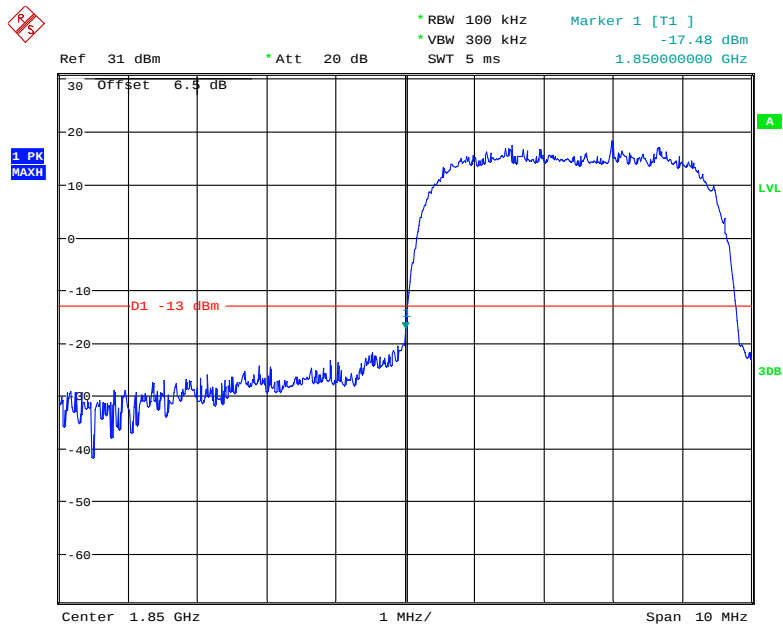
Date: 12.DEC.2019 11:20:16

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



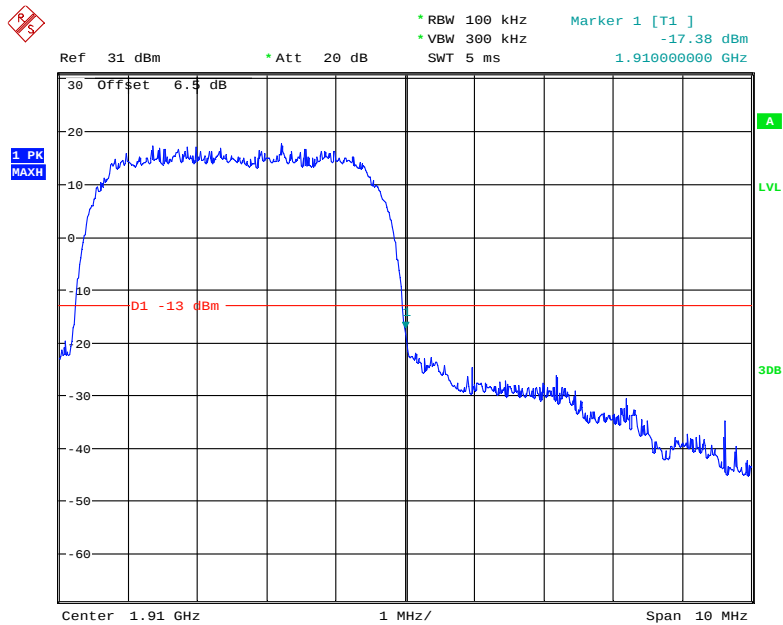
Date: 12.DEC.2019 11:20:47

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



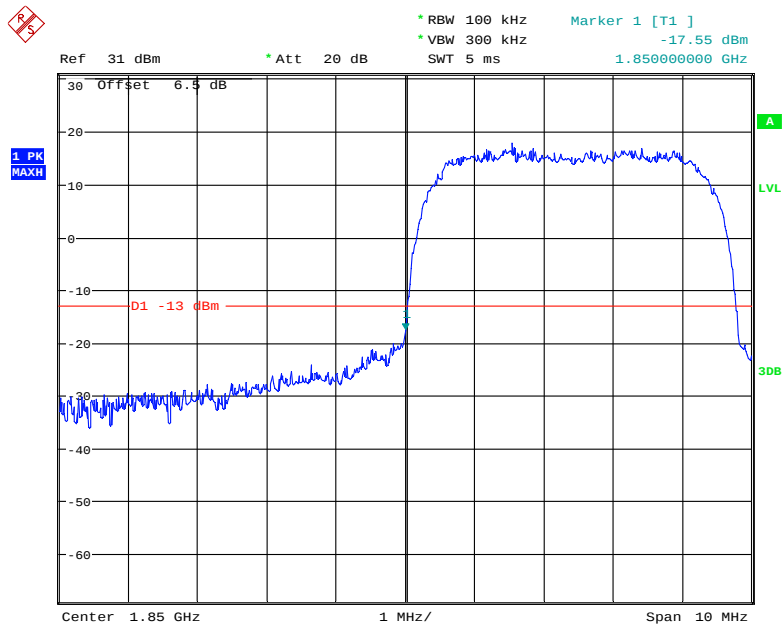
Date: 12.DEC.2019 13:46:05

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



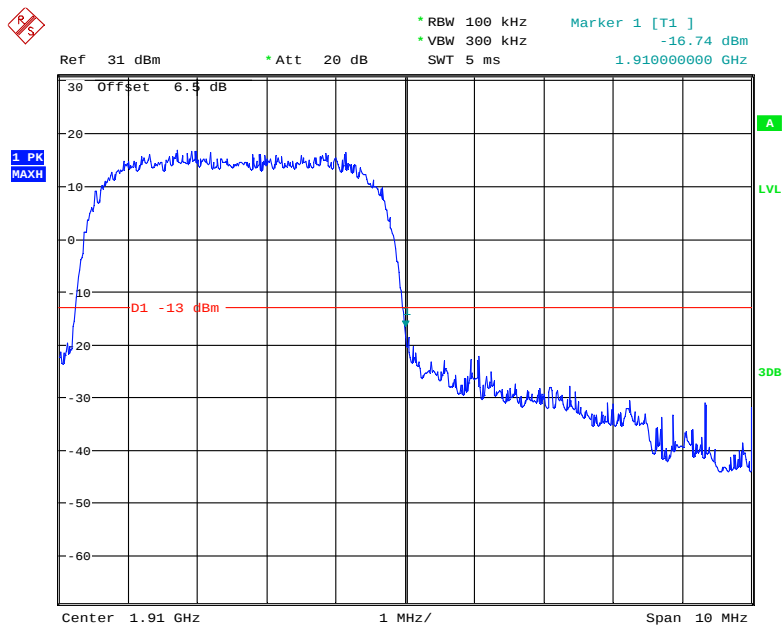
Date: 12.DEC.2019 13:48:21

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



Date: 12.DEC.2019 13:27:30

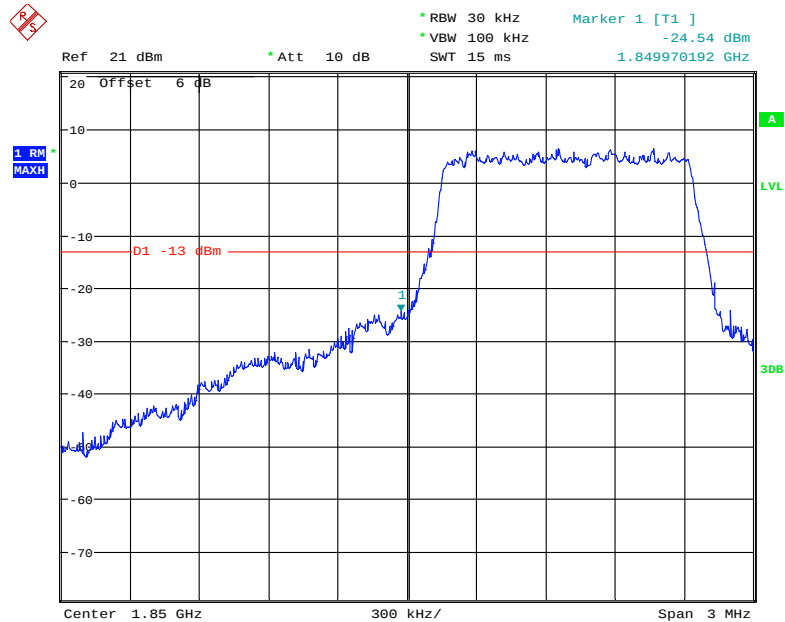
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 12.DEC.2019 13:28:10

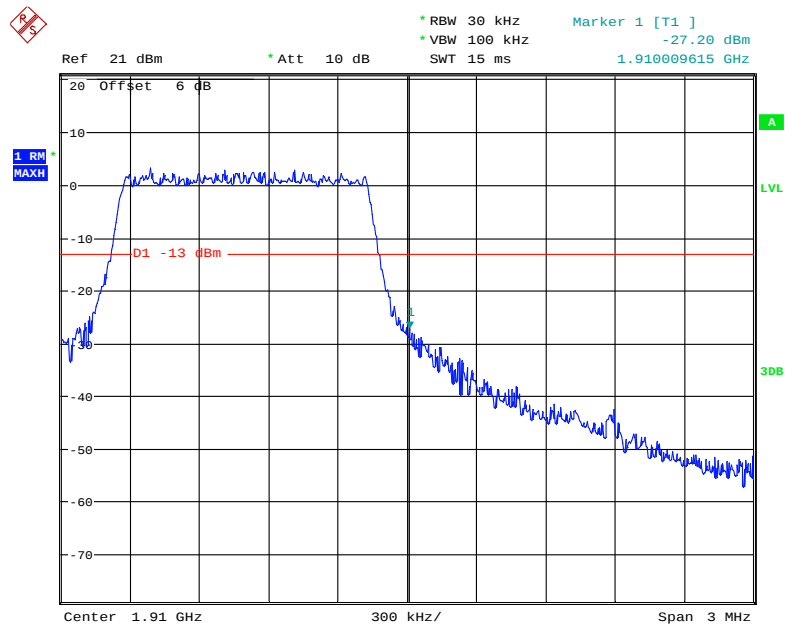
Band 2:

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



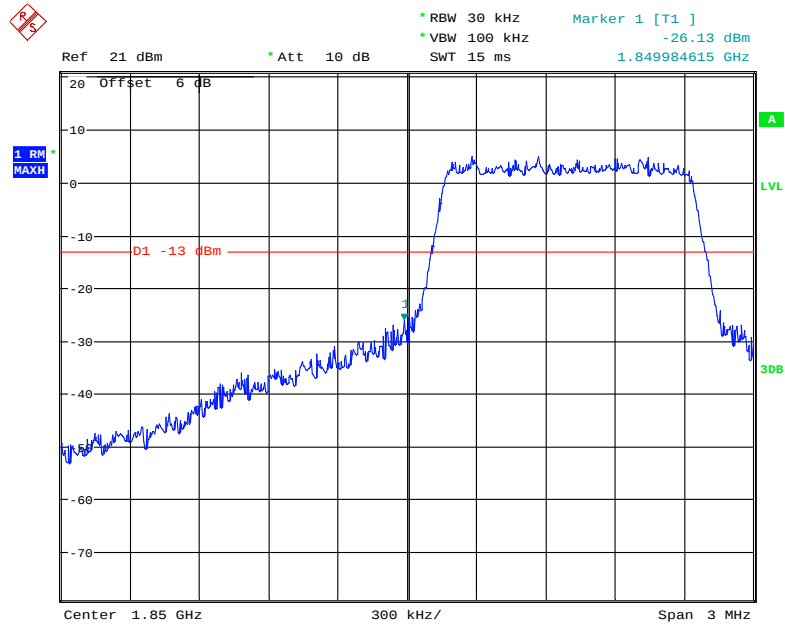
Date: 22.DEC.2019 10:16:35

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



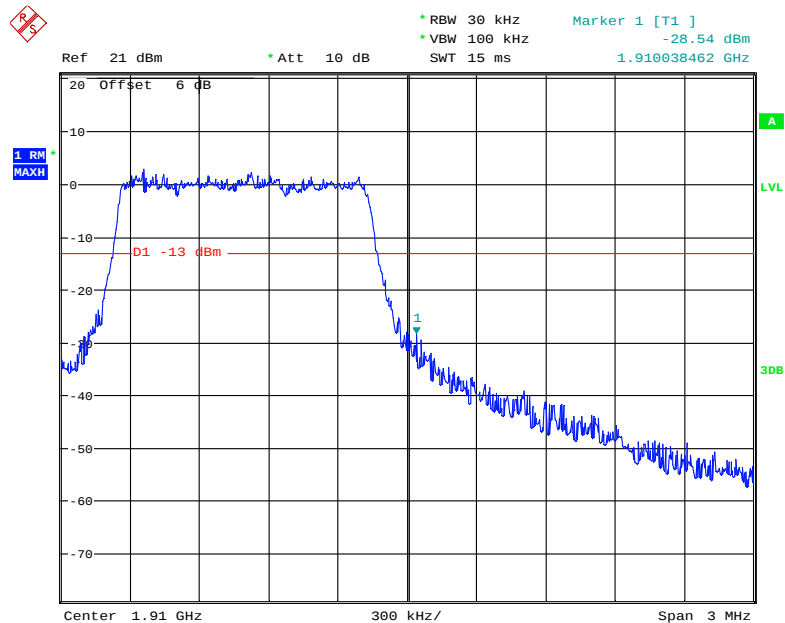
Date: 22.DEC.2019 10:19:08

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



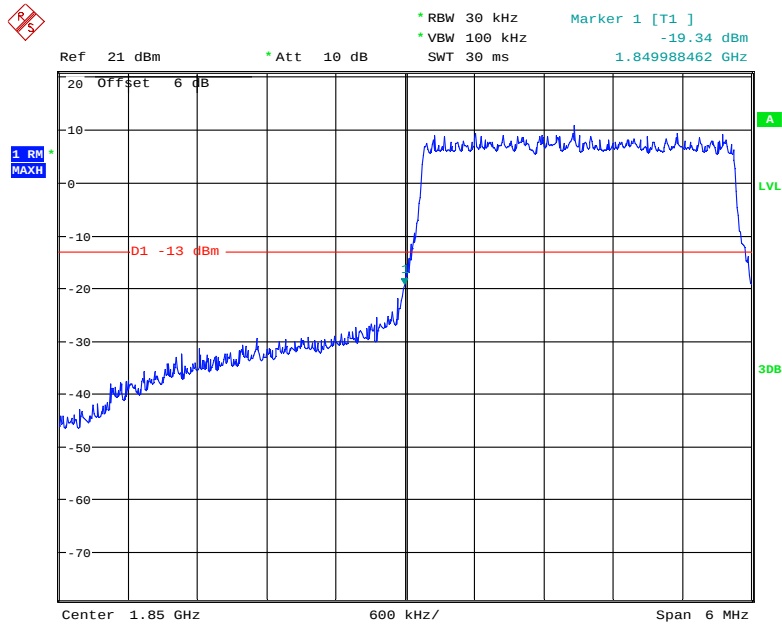
Date: 22.DEC.2019 10:17:48

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



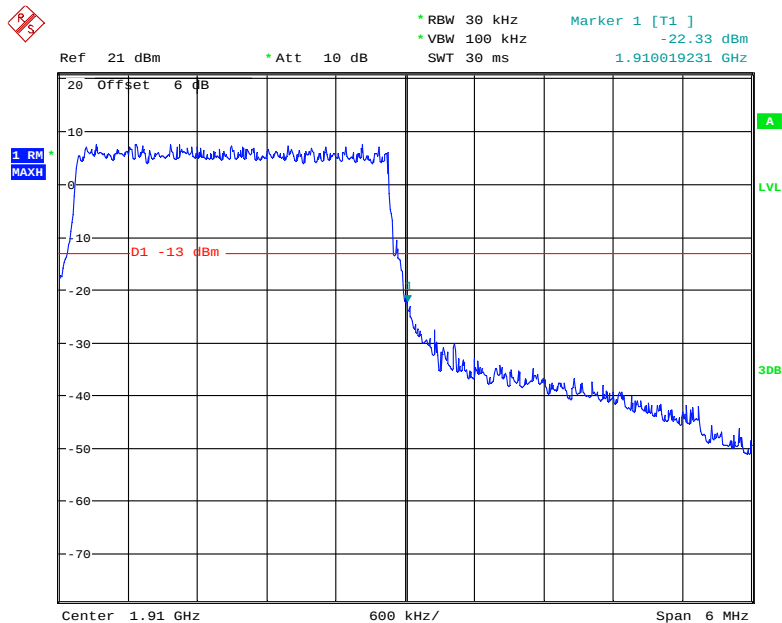
Date: 22.DEC.2019 10:18:26

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



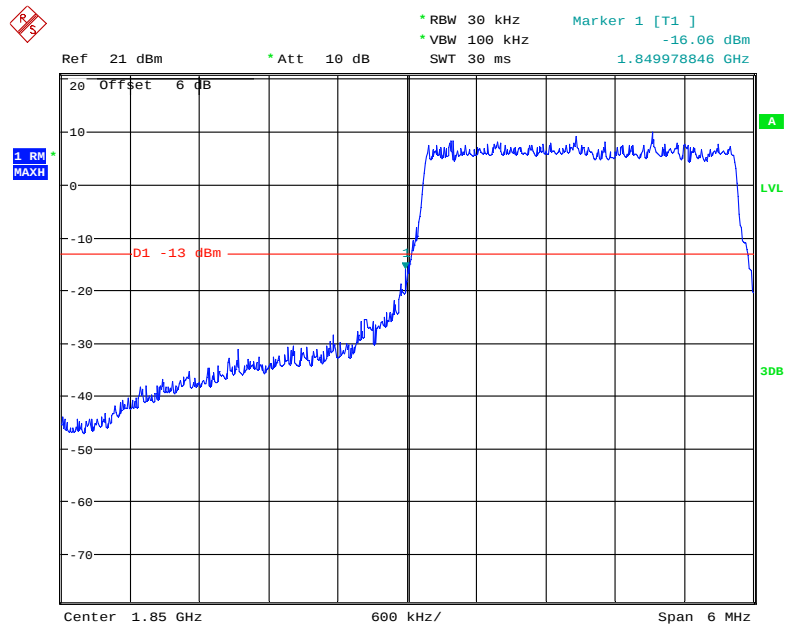
Date: 22.DEC.2019 10:21:52

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



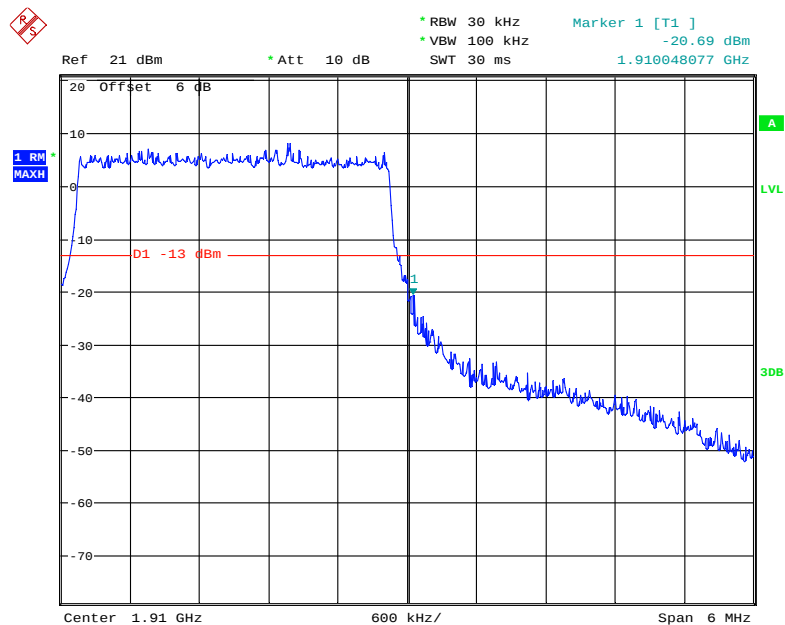
Date: 22.DEC.2019 10:21:24

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



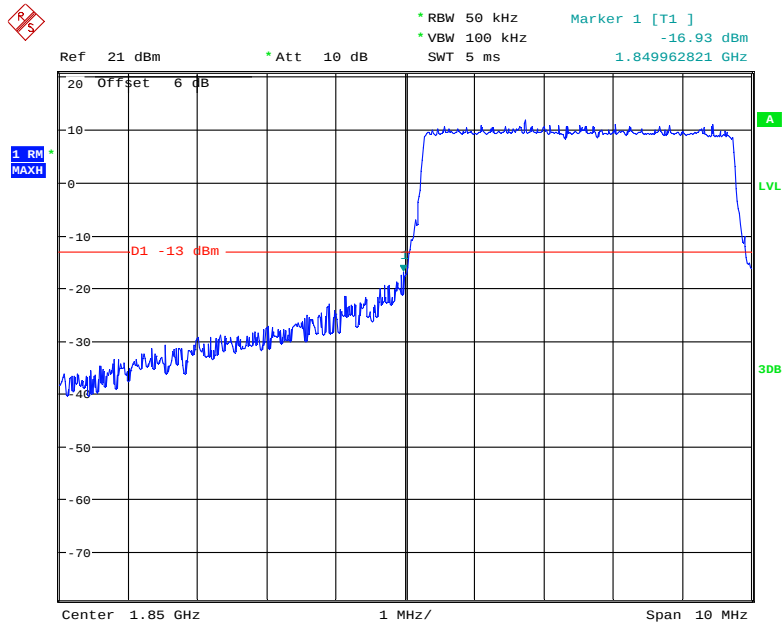
Date: 22.DEC.2019 10:22:17

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



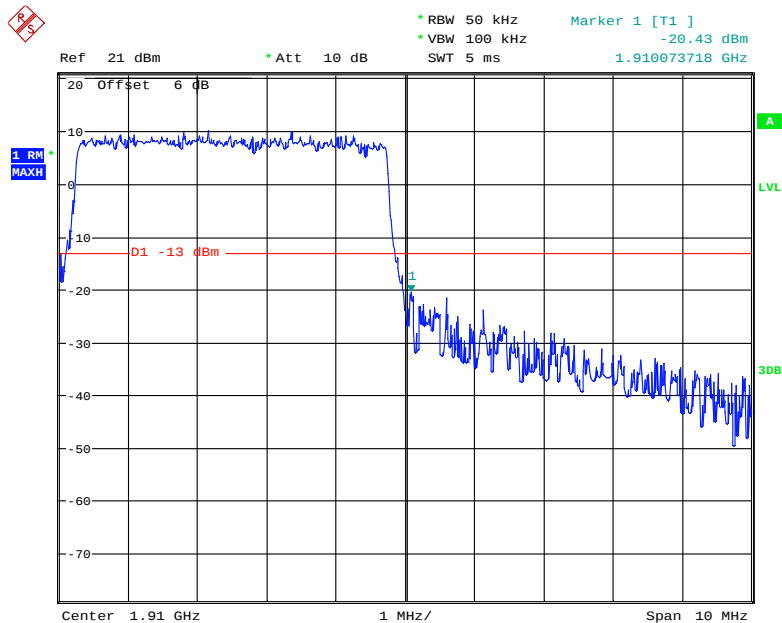
Date: 22.DEC.2019 10:20:52

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



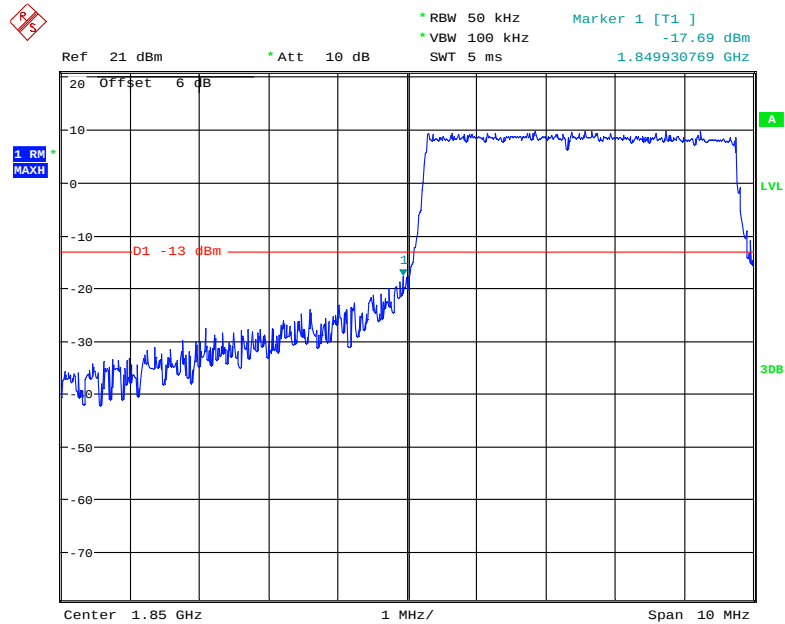
Date: 22.DEC.2019 10:23:44

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



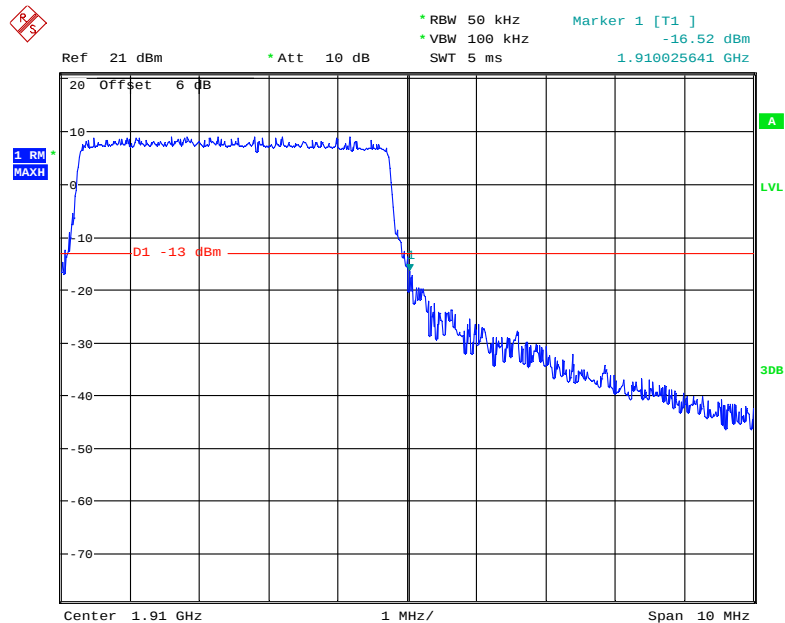
Date: 22.DEC.2019 10:32:12

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



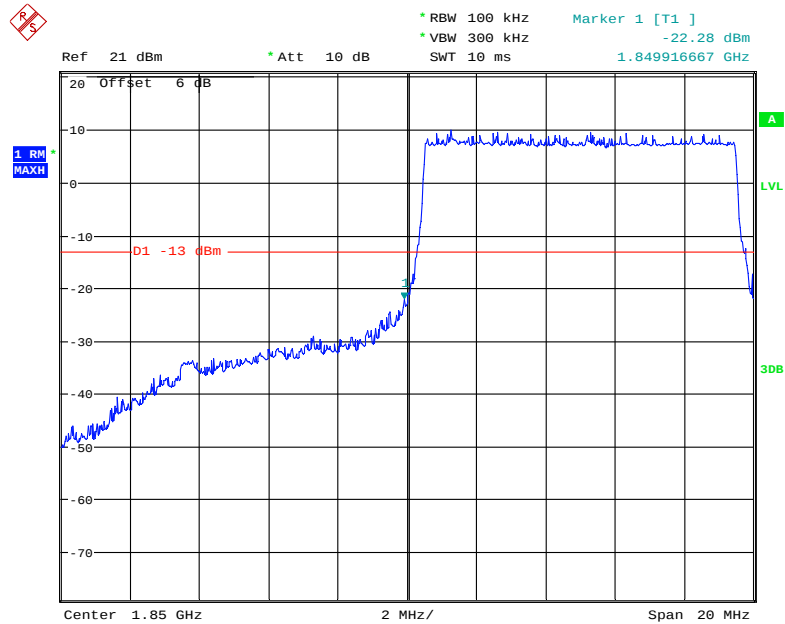
Date: 22.DEC.2019 10:23:10

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



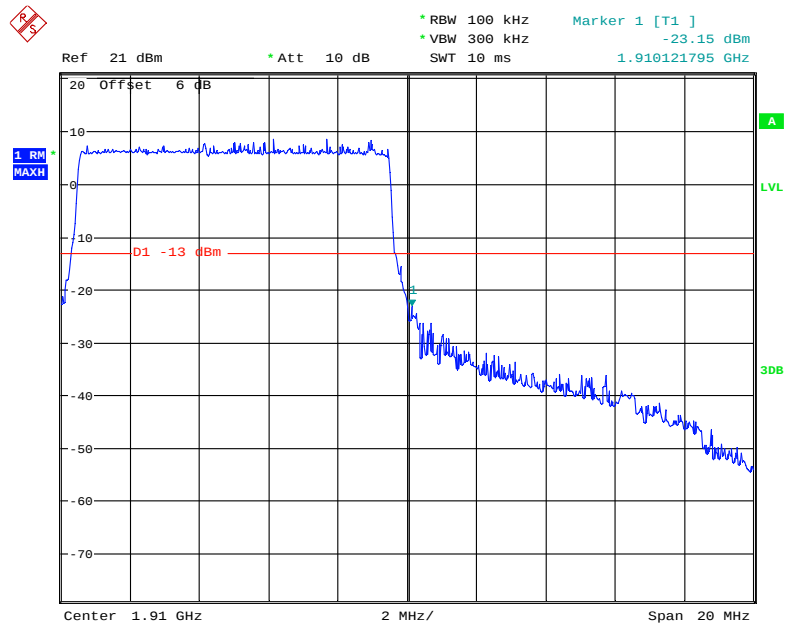
Date: 22.DEC.2019 10:32:57

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



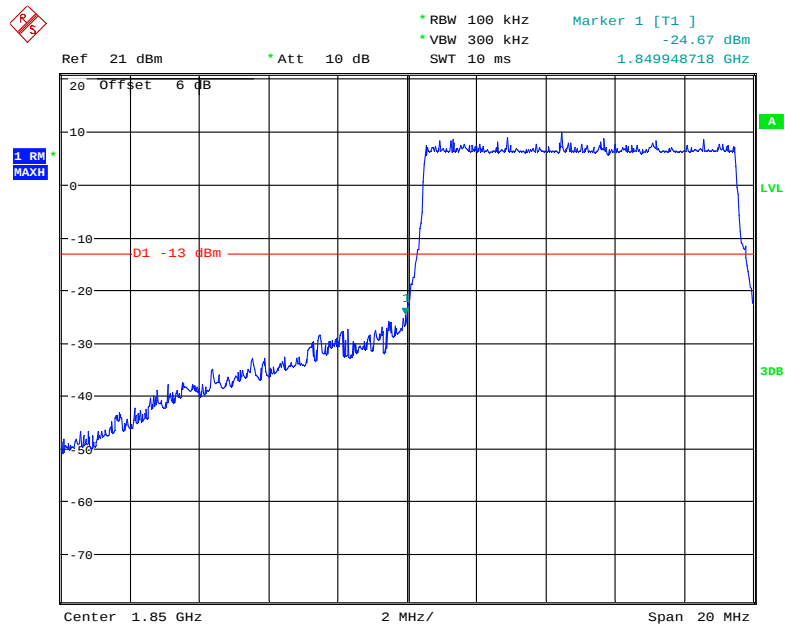
Date: 22.DEC.2019 10:36:13

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



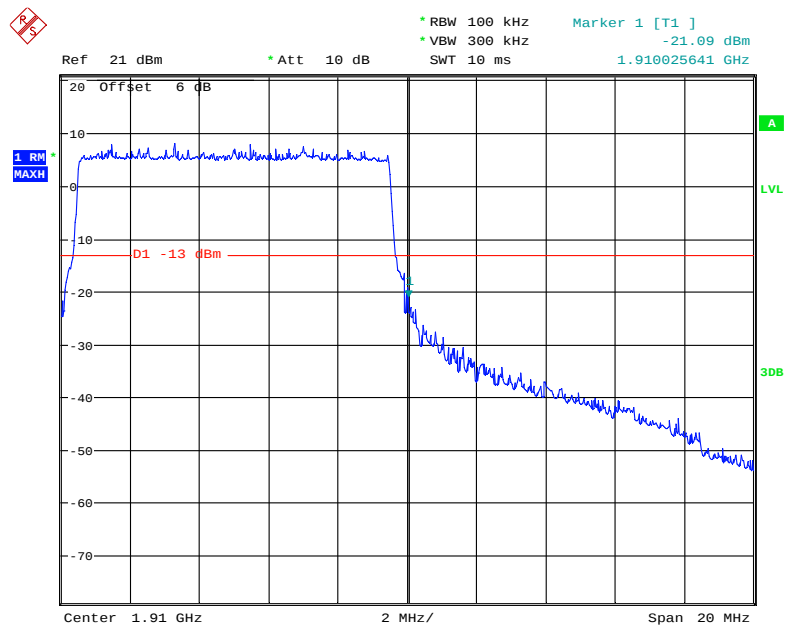
Date: 22.DEC.2019 10:35:26

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



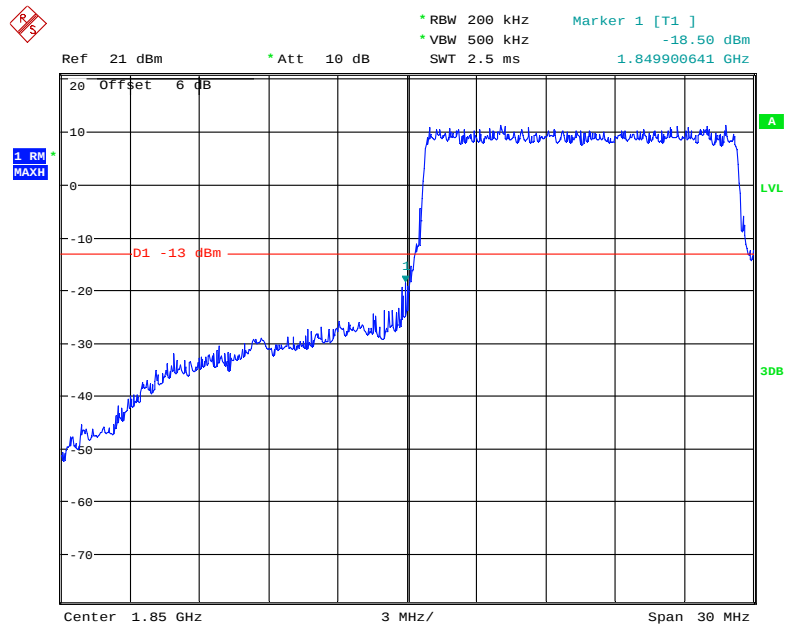
Date: 22.DEC.2019 10:36:55

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



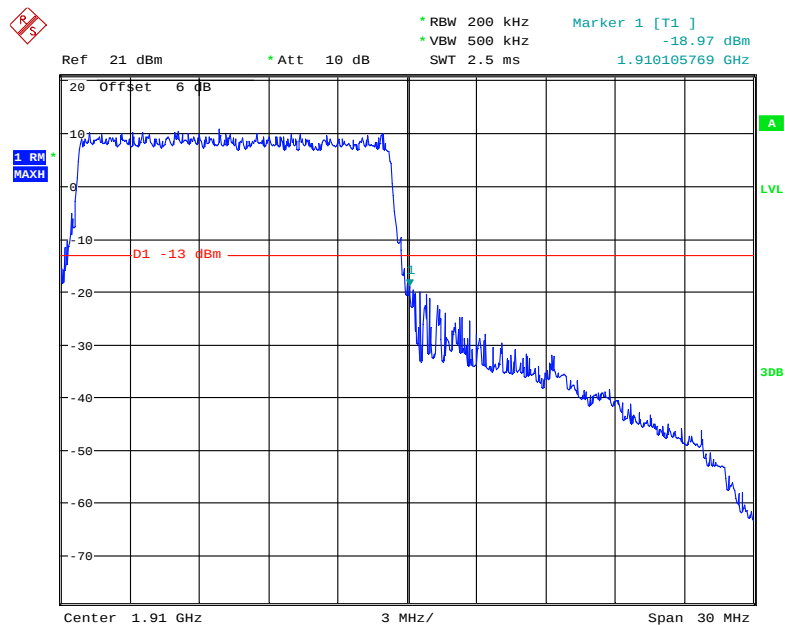
Date: 22.DEC.2019 10:34:24

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



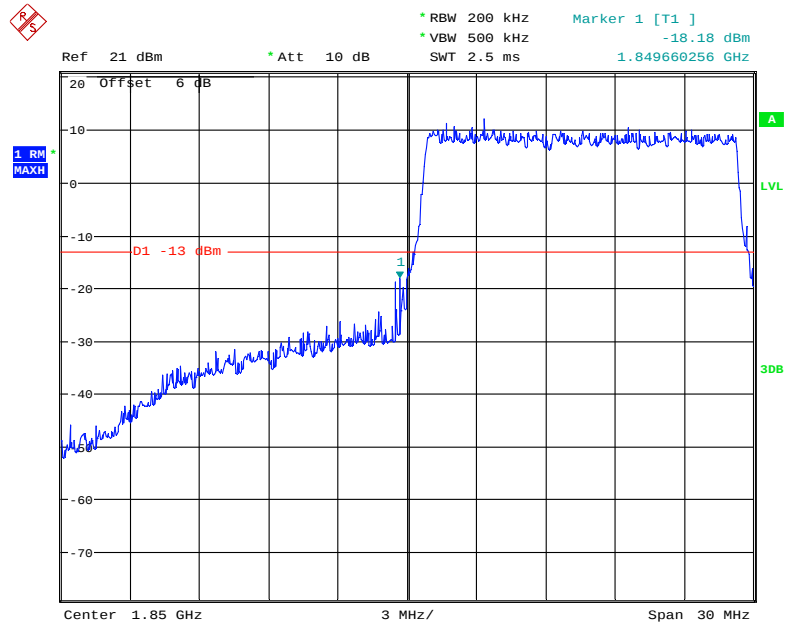
Date: 22.DEC.2019 10:37:51

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



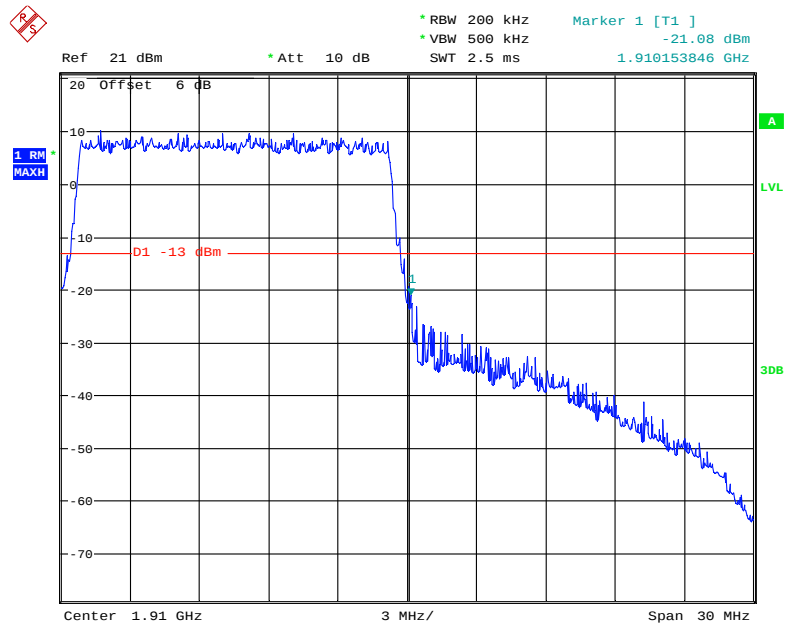
Date: 22.DEC.2019 10:40:29

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



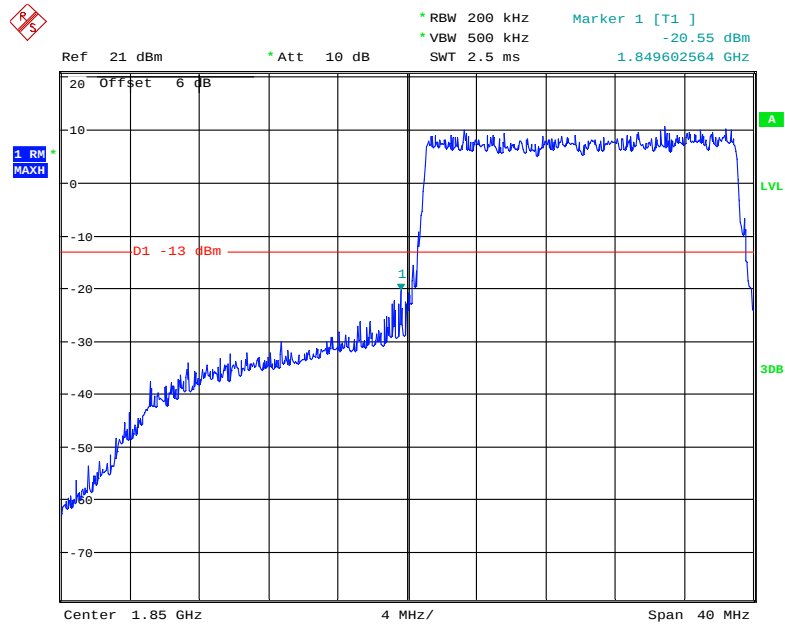
Date: 22.DEC.2019 10:38:32

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



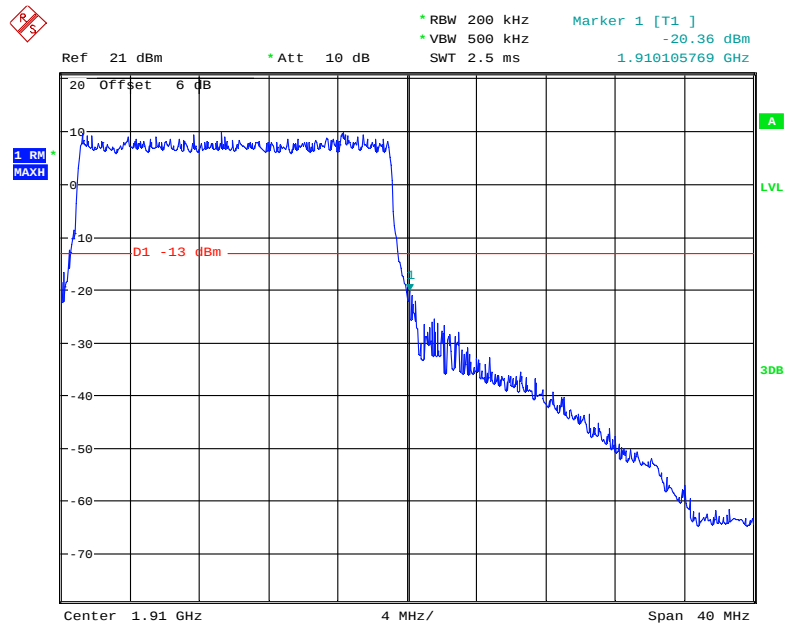
Date: 22.DEC.2019 10:39:42

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

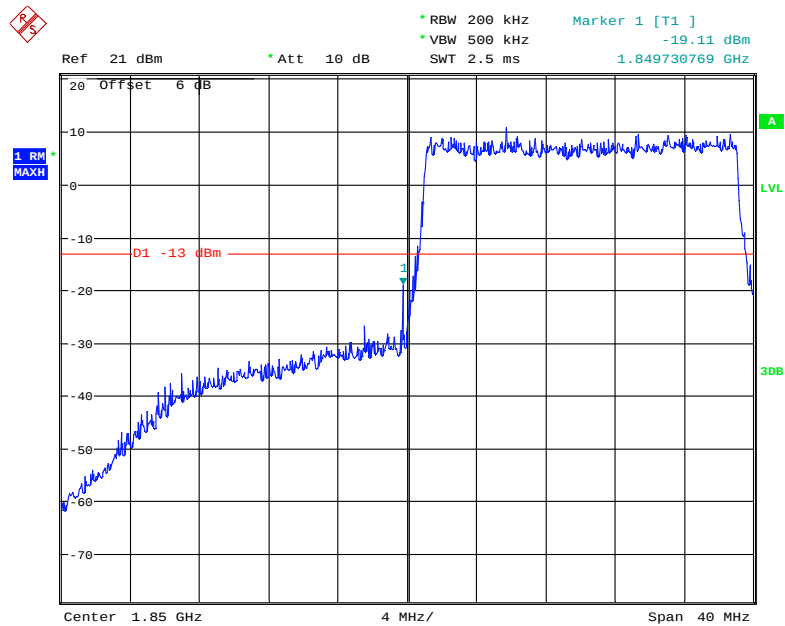


Date: 22.DEC.2019 10:44:35

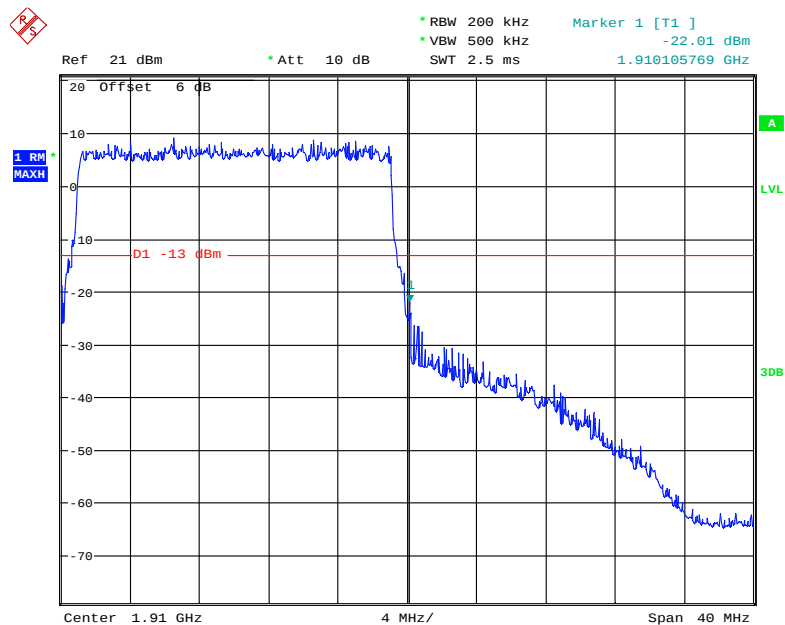
QPSK (20.0 MHz, FULL RB) - Right Band Edge



Date: 22.DEC.2019 10:42:56

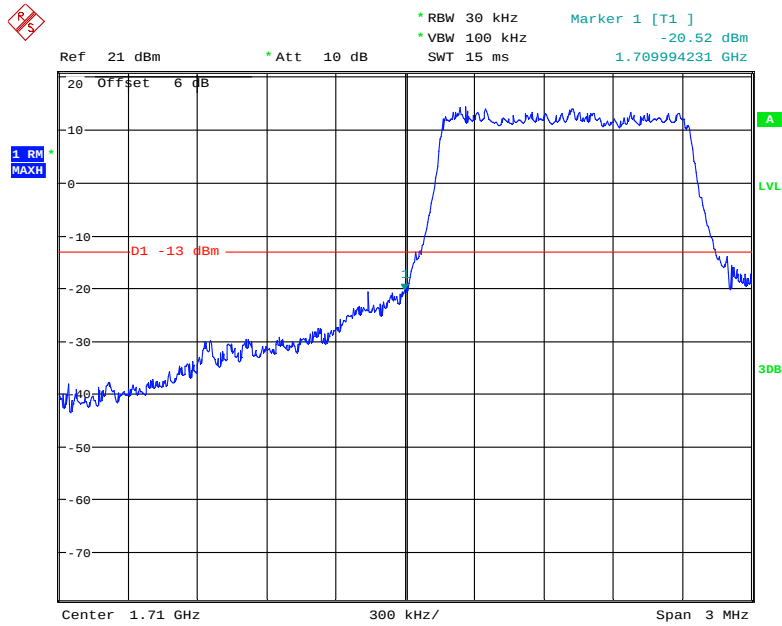
16-QAM (20.0 MHz, FULL RB) - Left Band Edge

Date: 22.DEC.2019 10:44:07

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

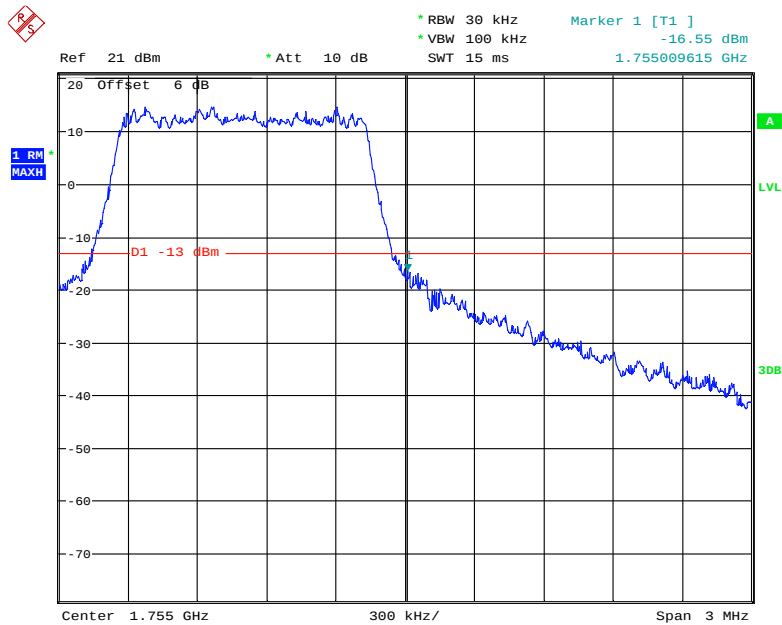
Date: 22.DEC.2019 10:43:35

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



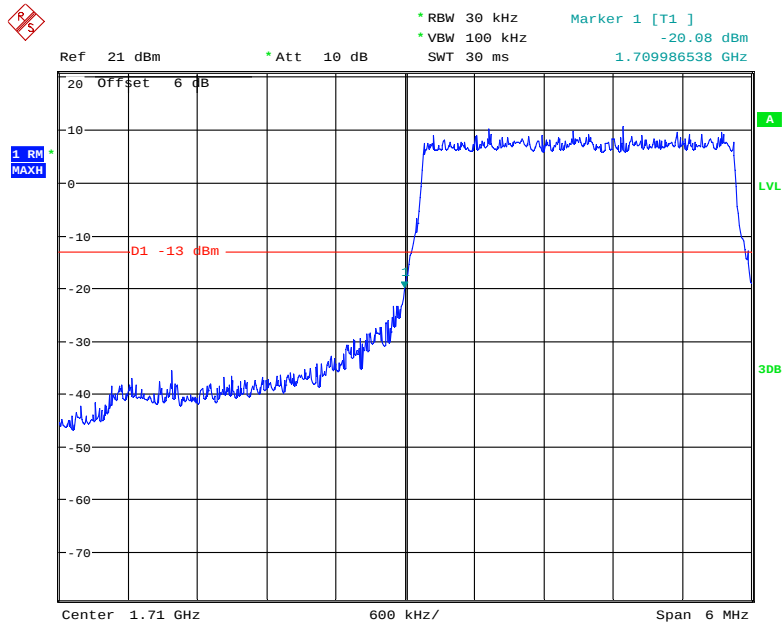
Date: 22.DEC.2019 10:47:22

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



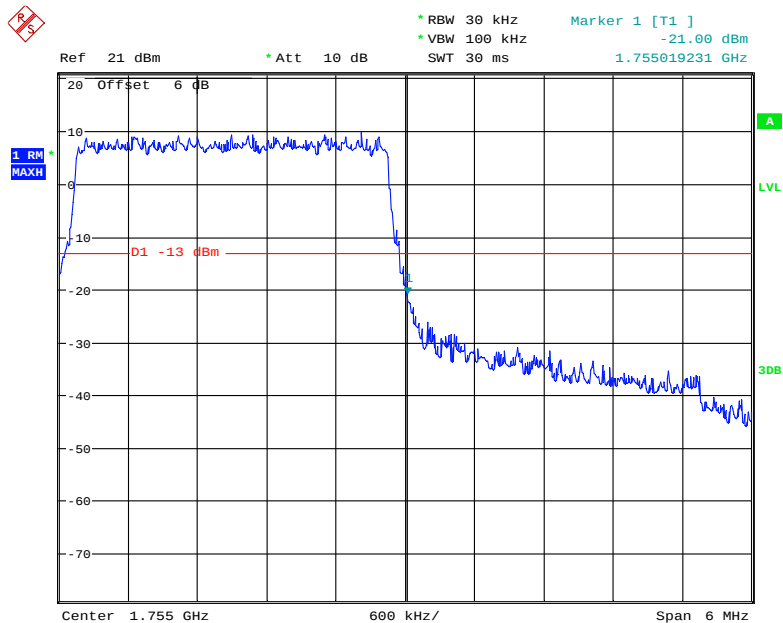
Date: 22.DEC.2019 10:48:28

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



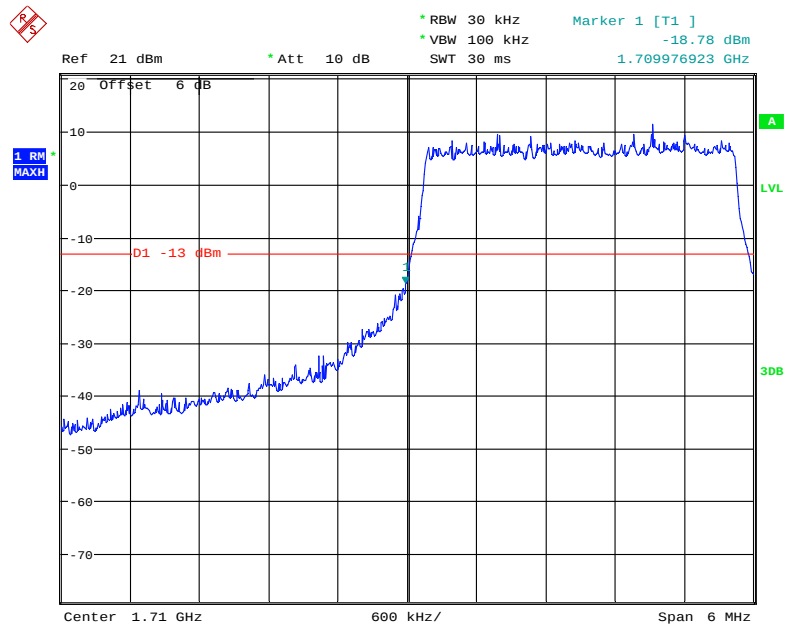
Date: 22.DEC.2019 10:52:15

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



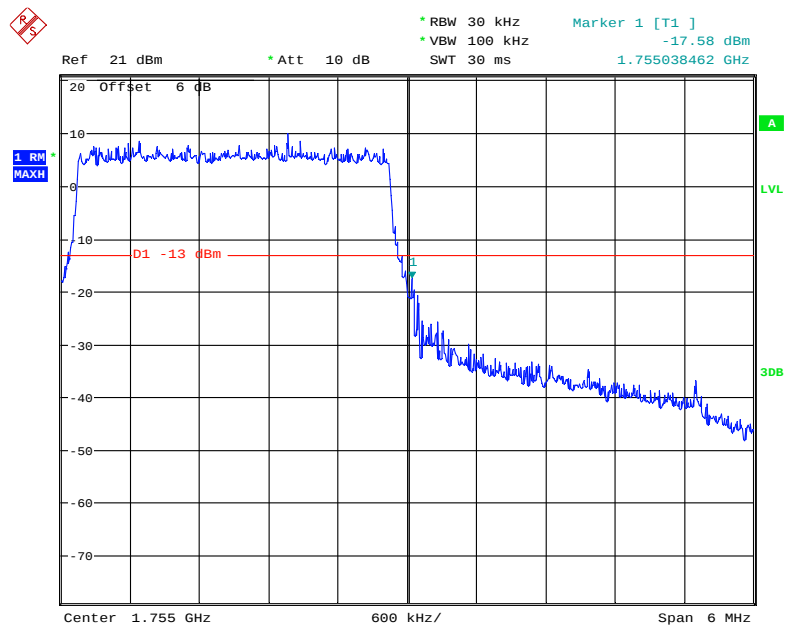
Date: 22.DEC.2019 10:51:30

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



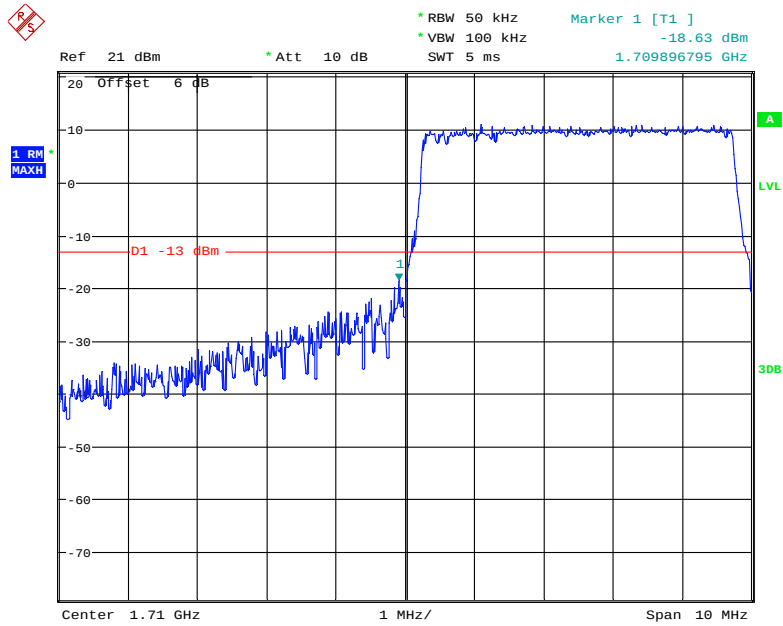
Date: 22.DEC.2019 10:52:51

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



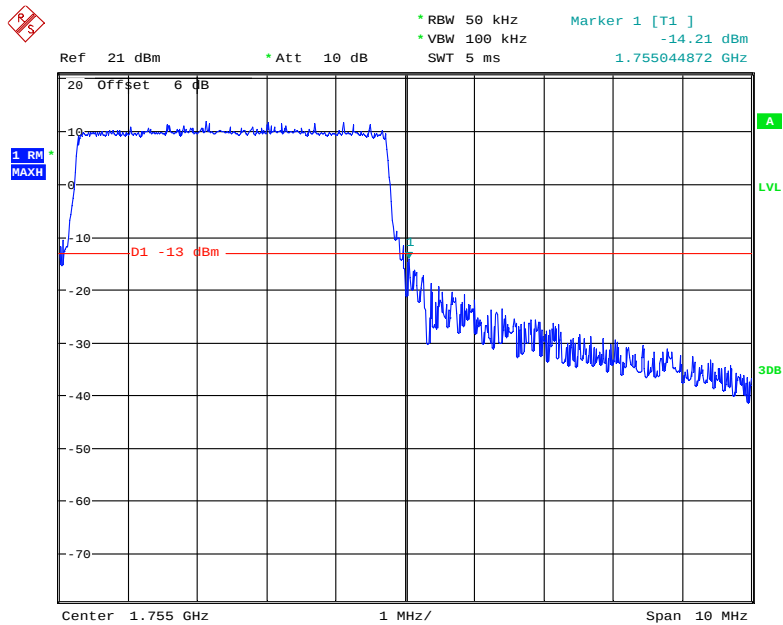
Date: 22.DEC.2019 10:51:04

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



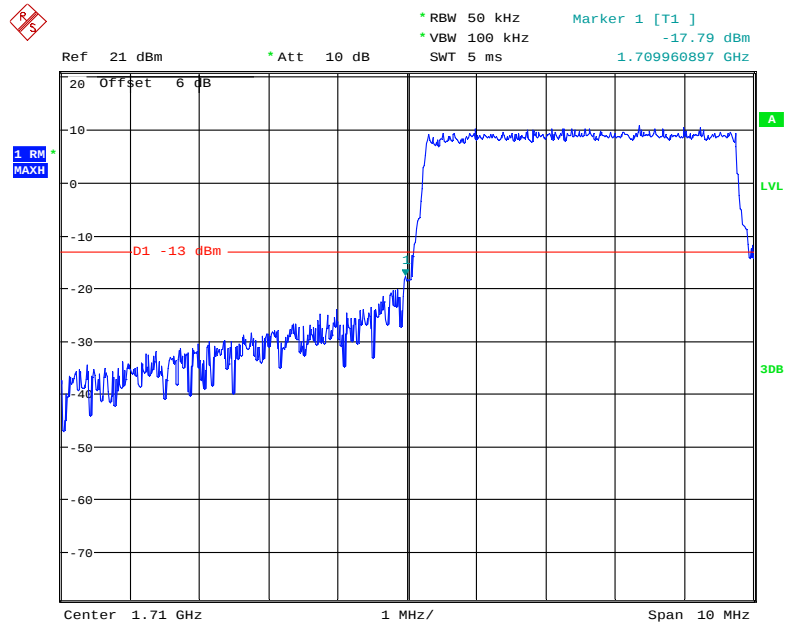
Date: 22.DEC.2019 10:56:34

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



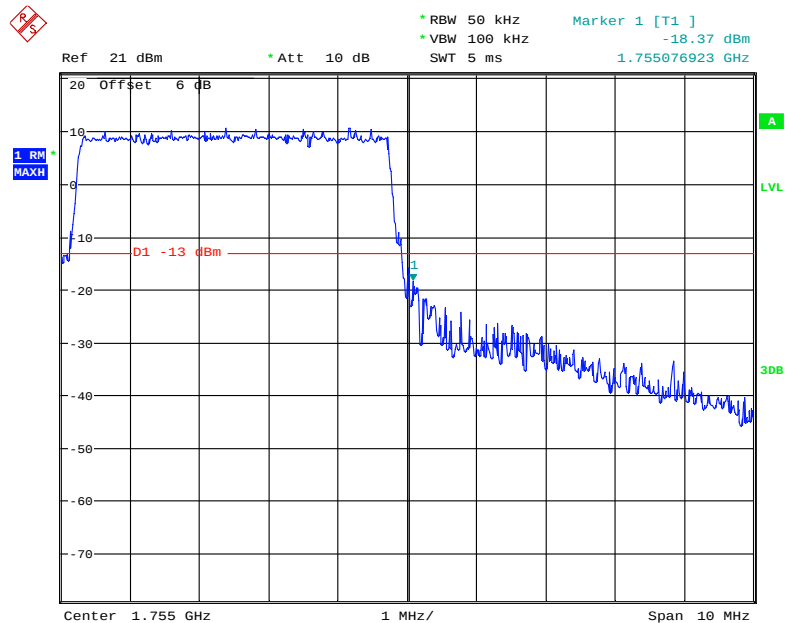
Date: 22.DEC.2019 10:57:06

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



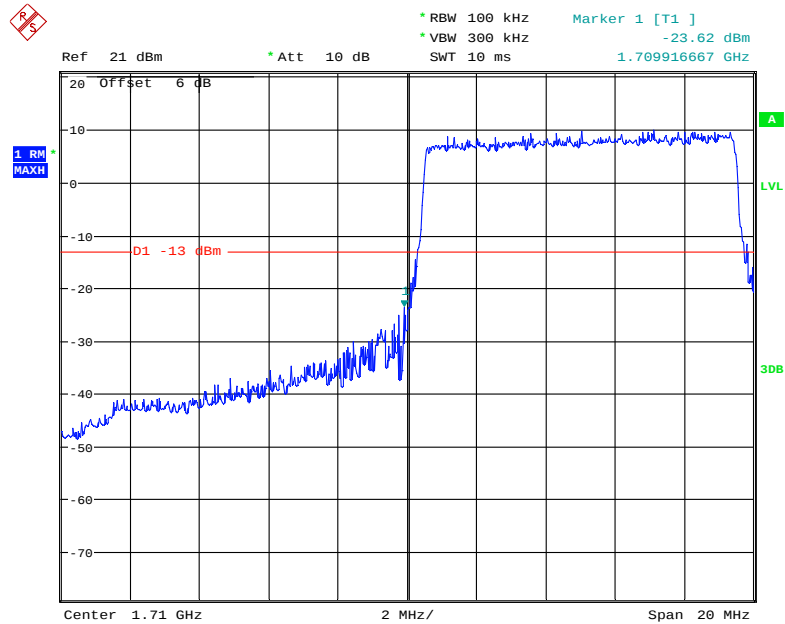
Date: 22.DEC.2019 10:56:11

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



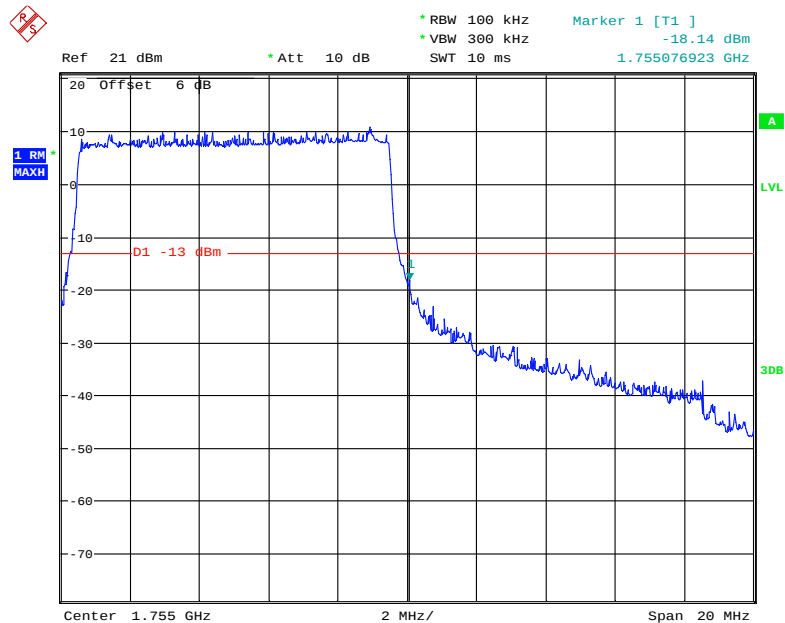
Date: 22.DEC.2019 10:57:28

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



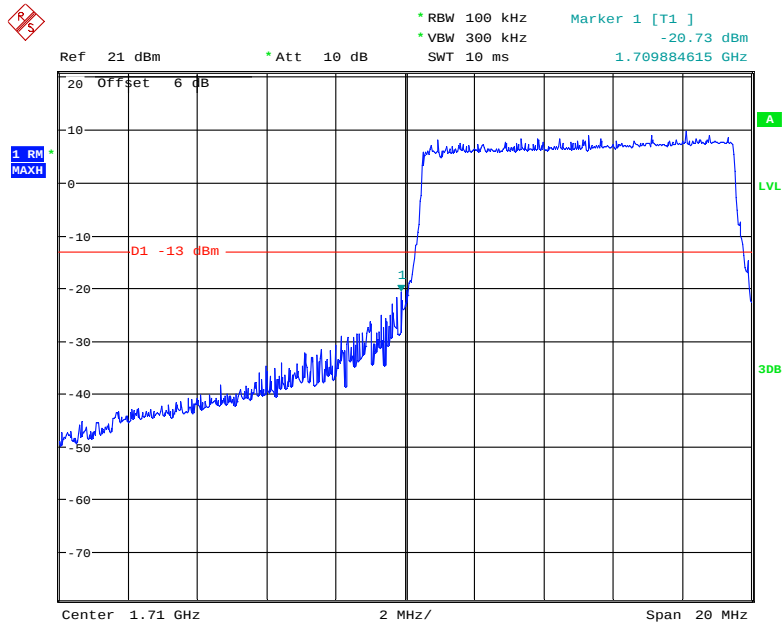
Date: 22.DEC.2019 10:59:48

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



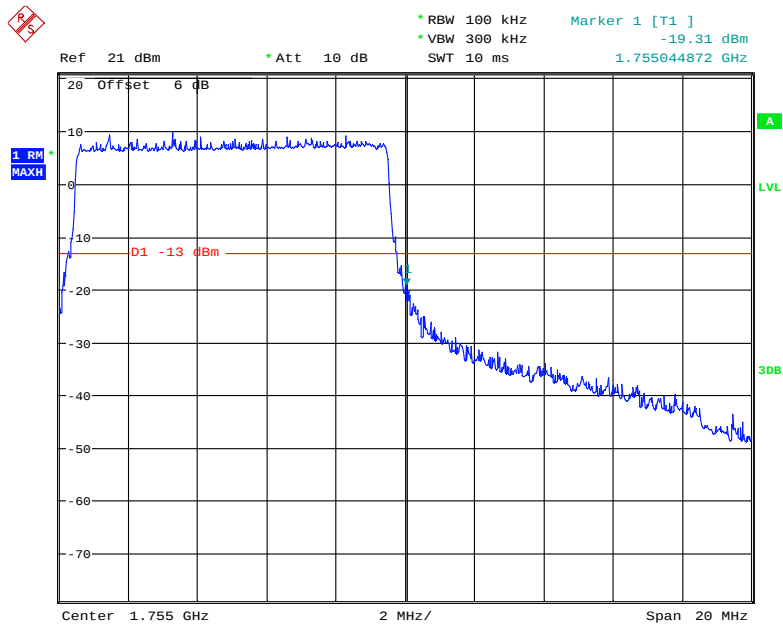
Date: 22.DEC.2019 10:59:20

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



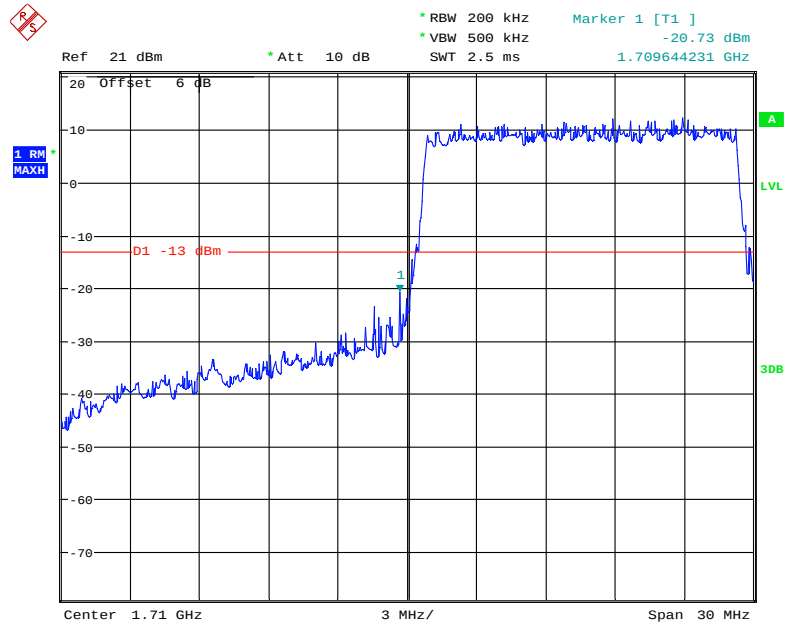
Date: 22.DEC.2019 11:00:17

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



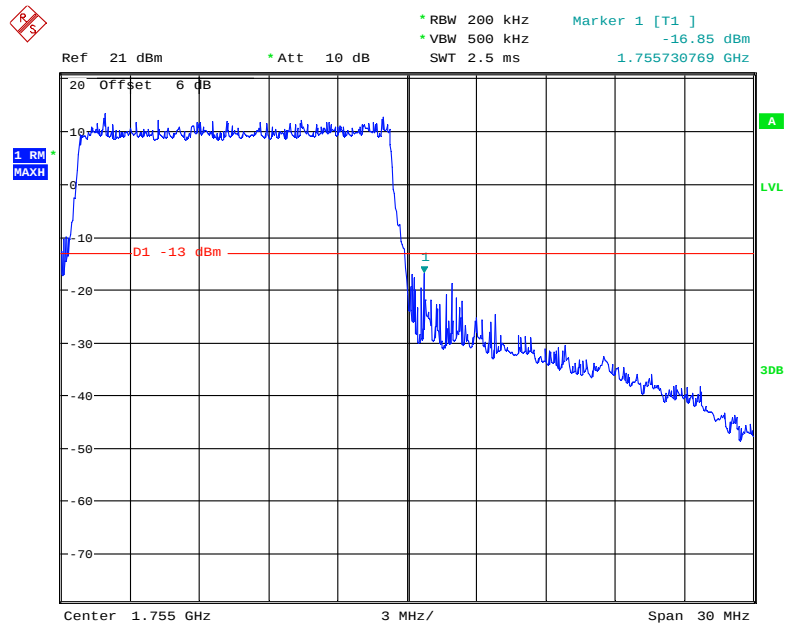
Date: 22.DEC.2019 10:58:28

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



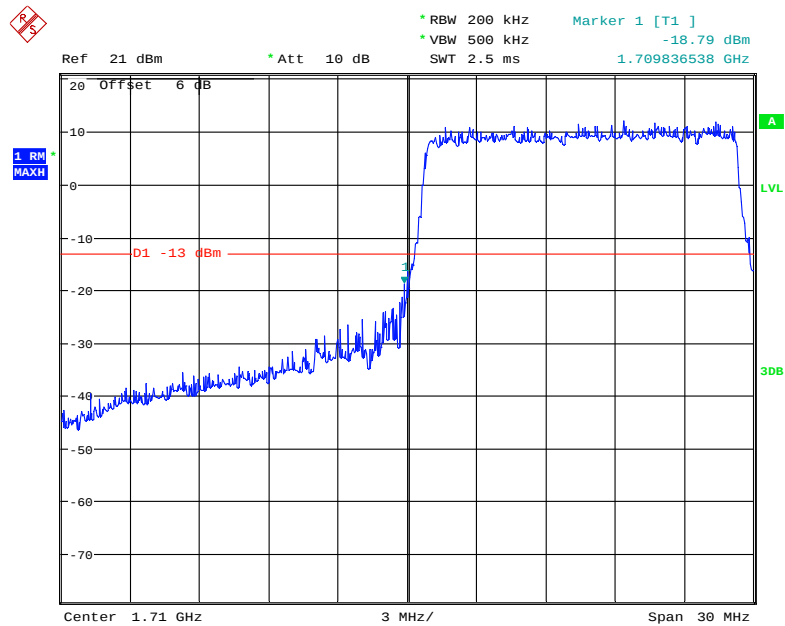
Date: 22.DEC.2019 11:04:11

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



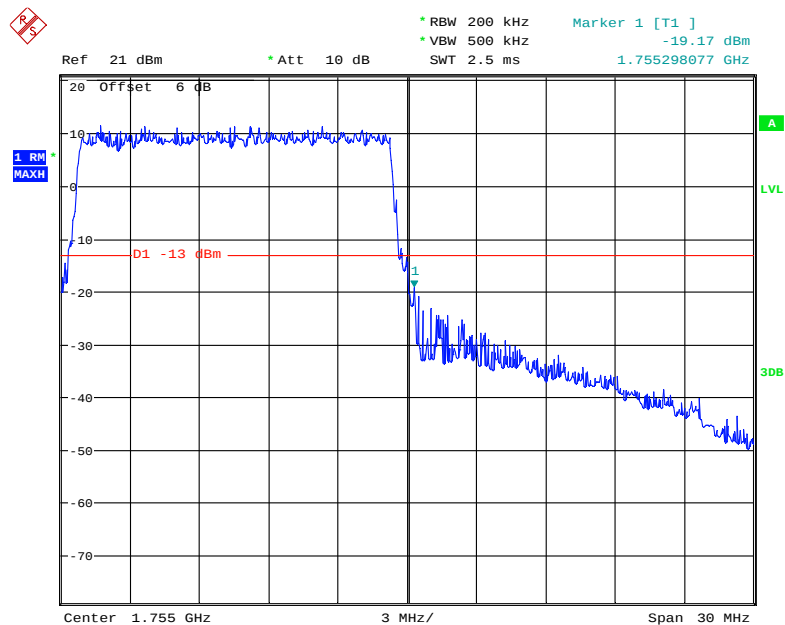
Date: 22.DEC.2019 11:07:24

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



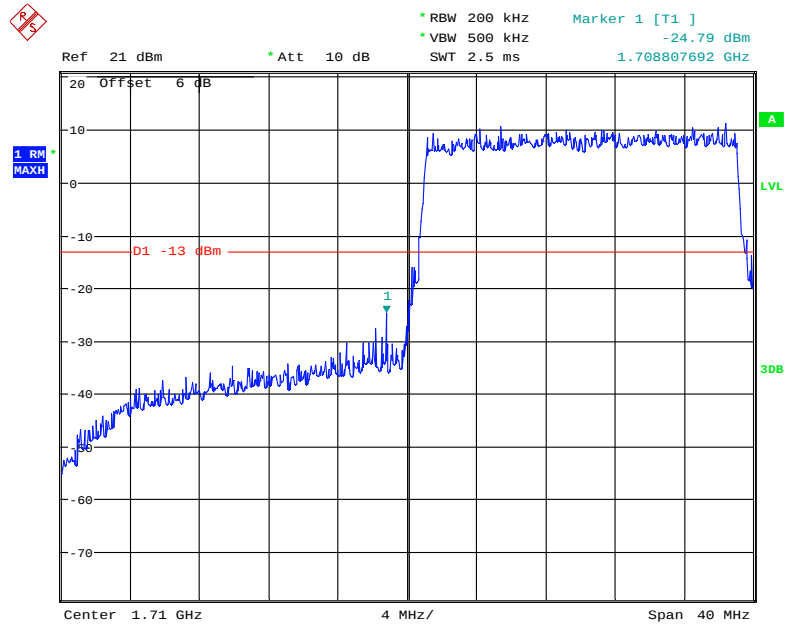
Date: 22.DEC.2019 11:04:49

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



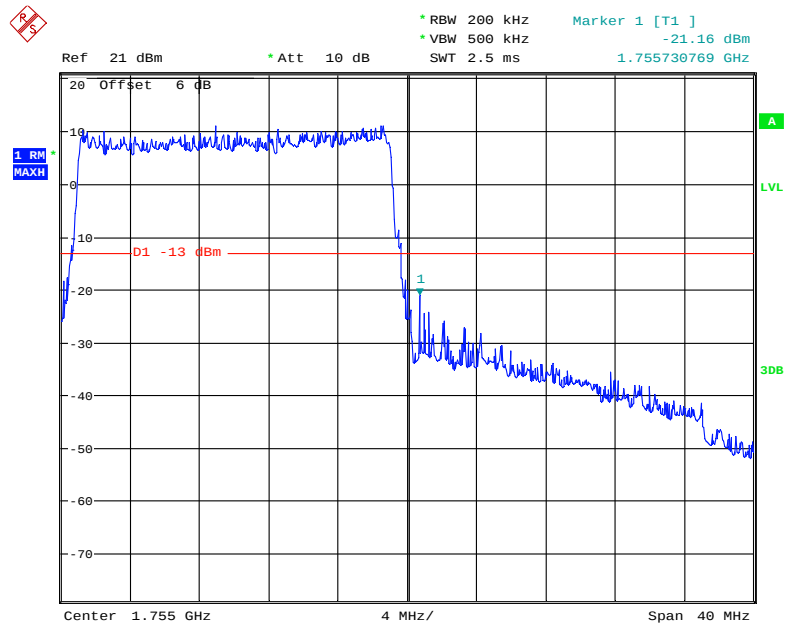
Date: 22.DEC.2019 11:05:45

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



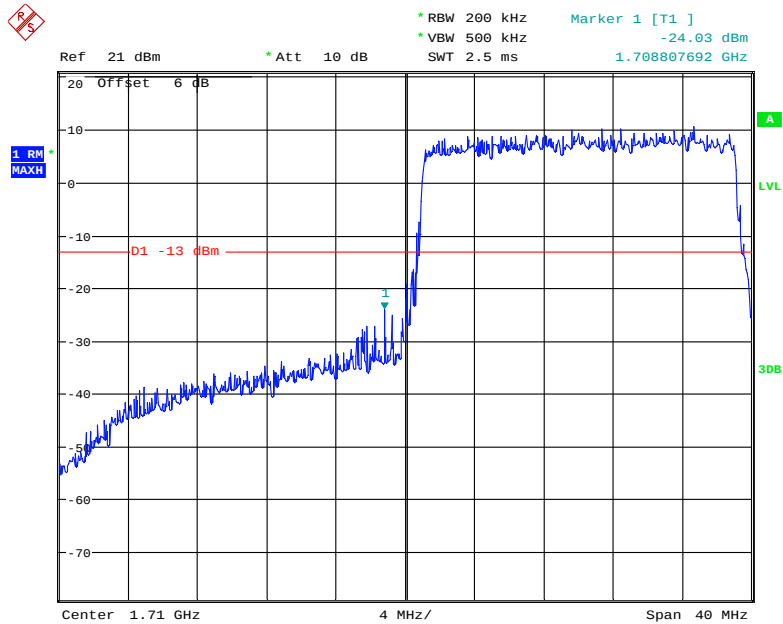
Date: 22.DEC.2019 11:09:39

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



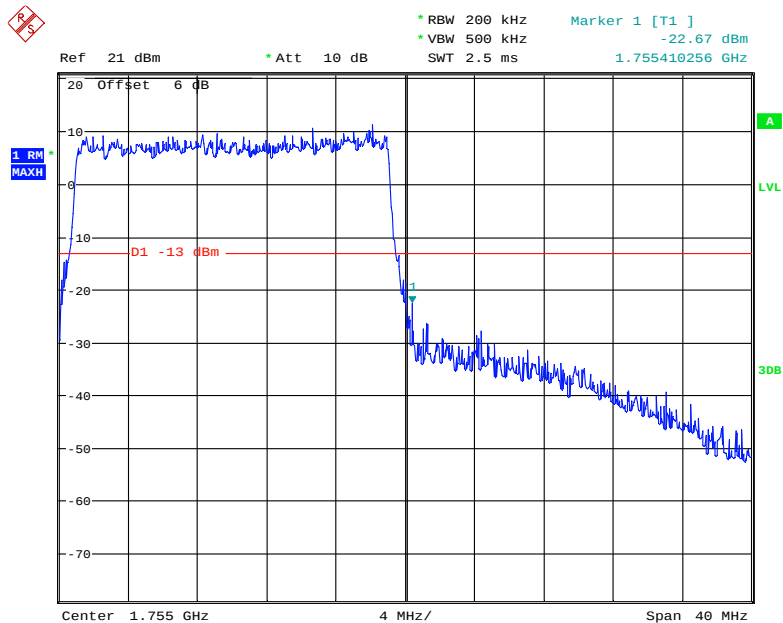
Date: 22.DEC.2019 11:08:25

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



Date: 22.DEC.2019 11:09:18

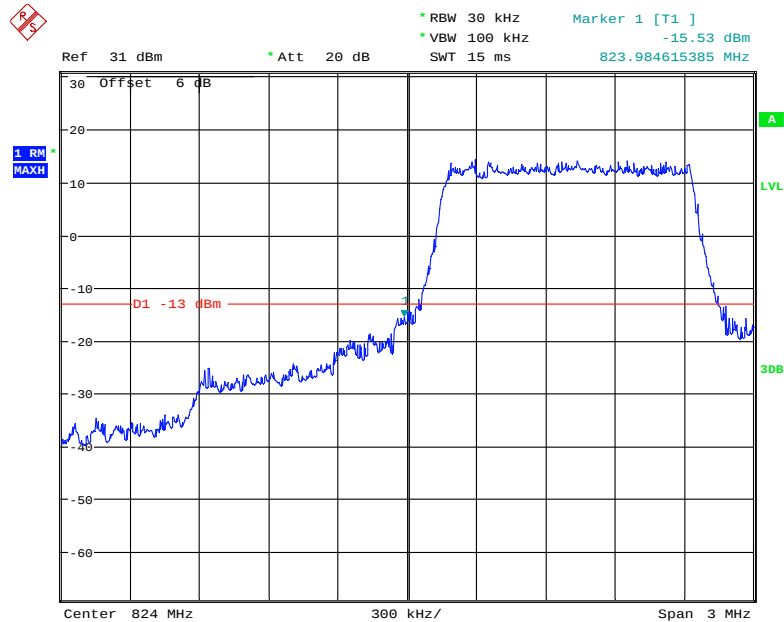
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 22.DEC.2019 11:08:53

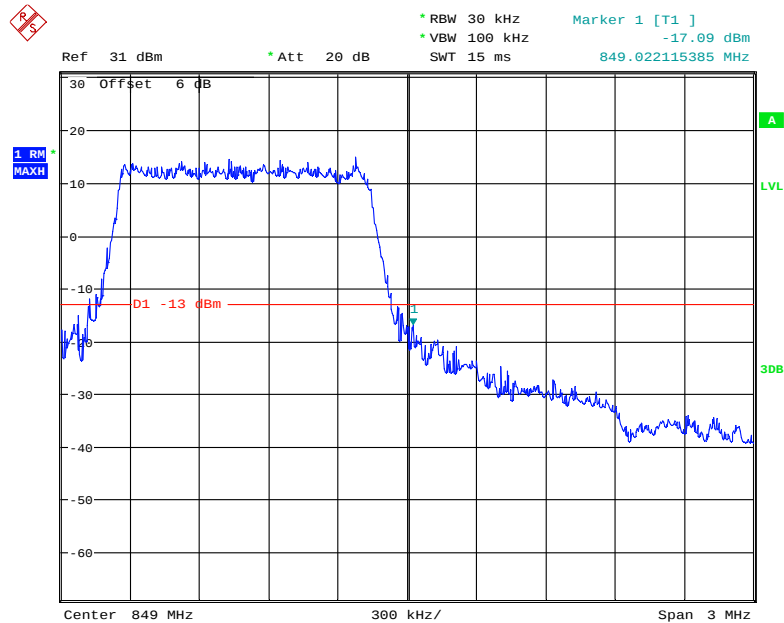
Band 5:

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



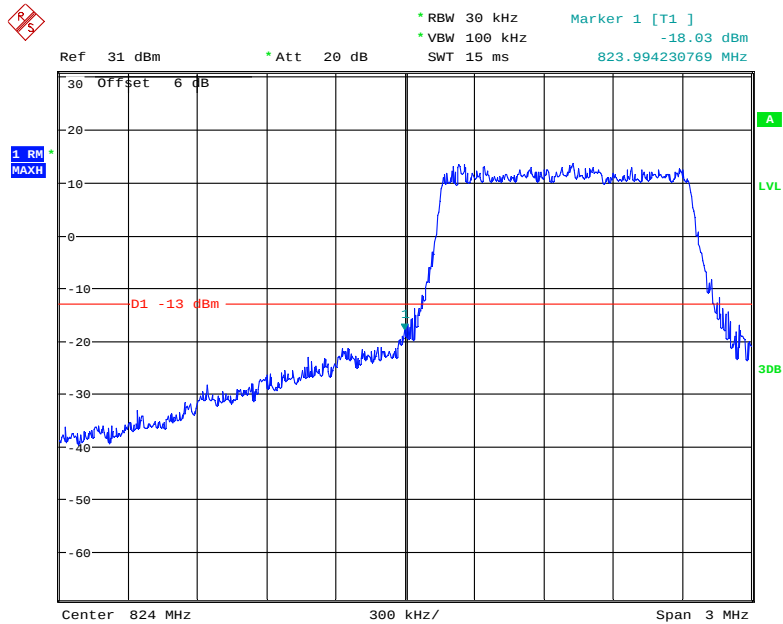
Date: 16.DEC.2019 23:51:05

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



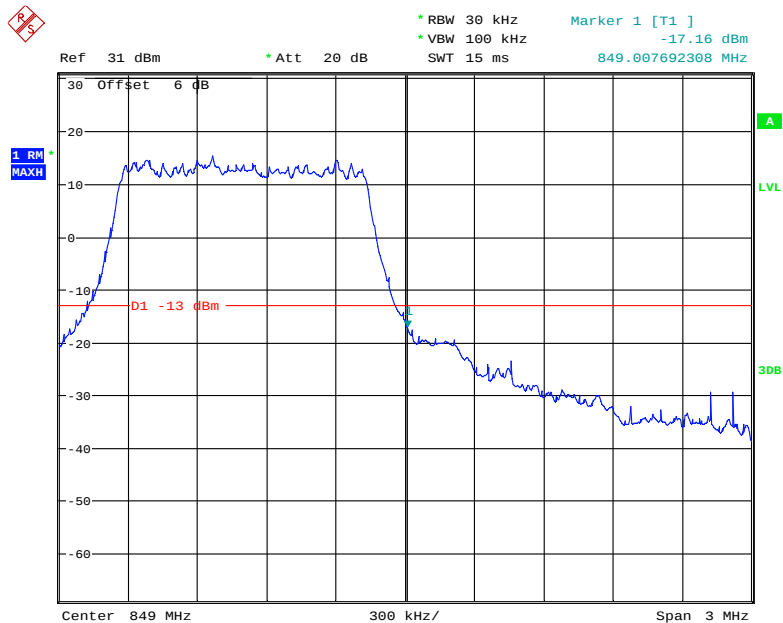
Date: 17.DEC.2019 00:31:49

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



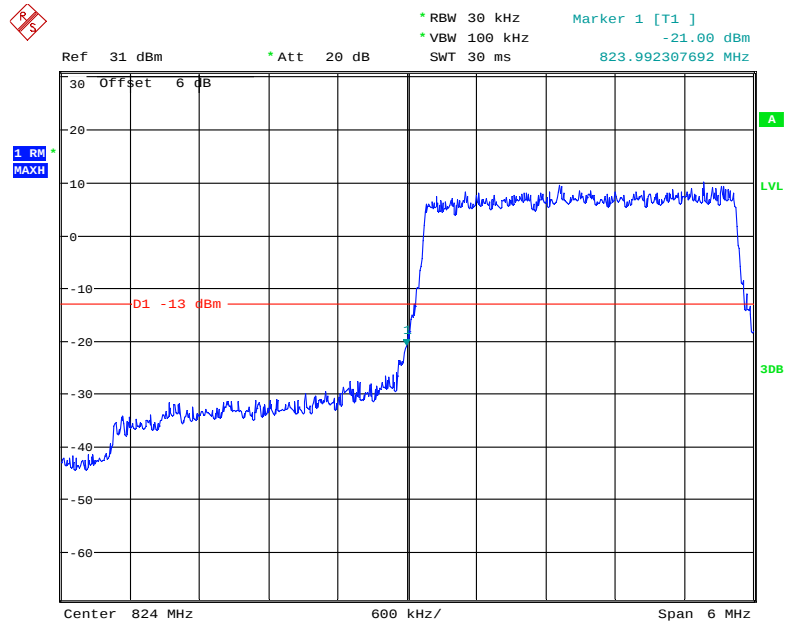
Date: 17.DEC.2019 00:23:47

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



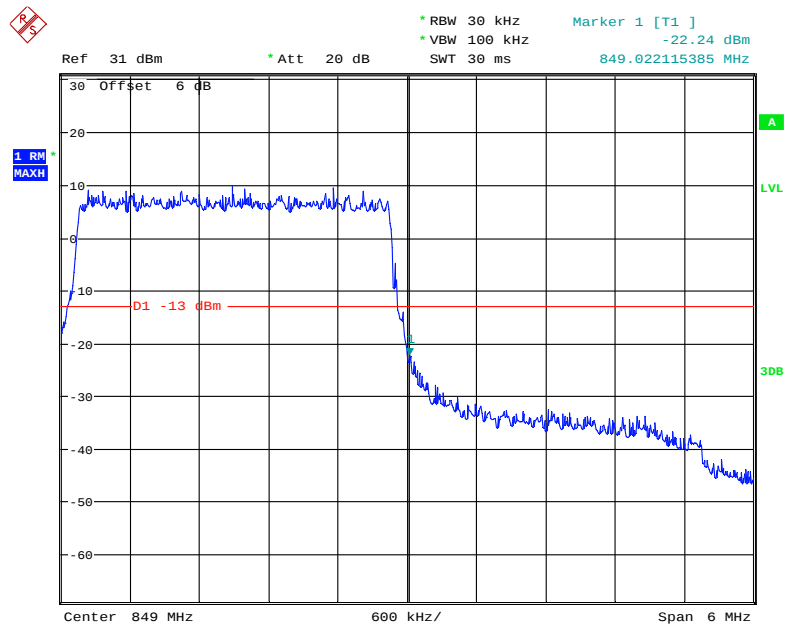
Date: 17.DEC.2019 00:31:30

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



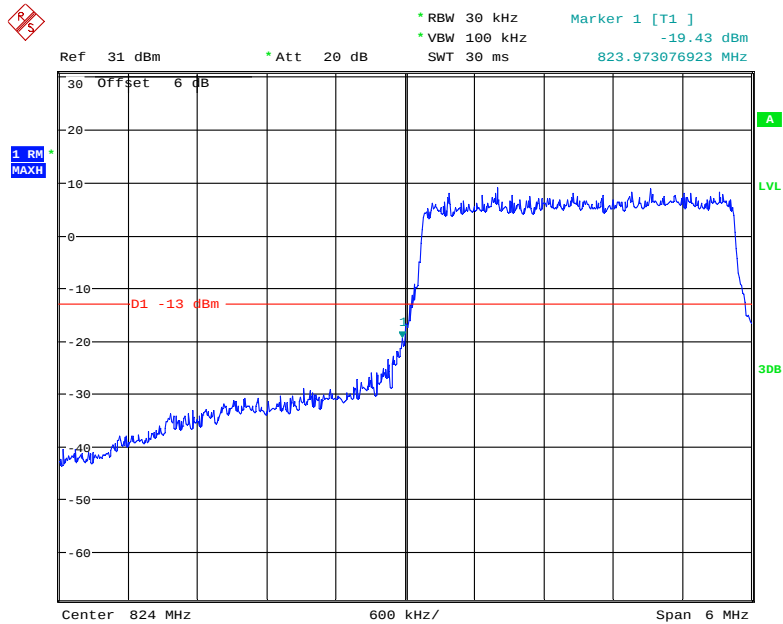
Date: 17.DEC.2019 00:33:24

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



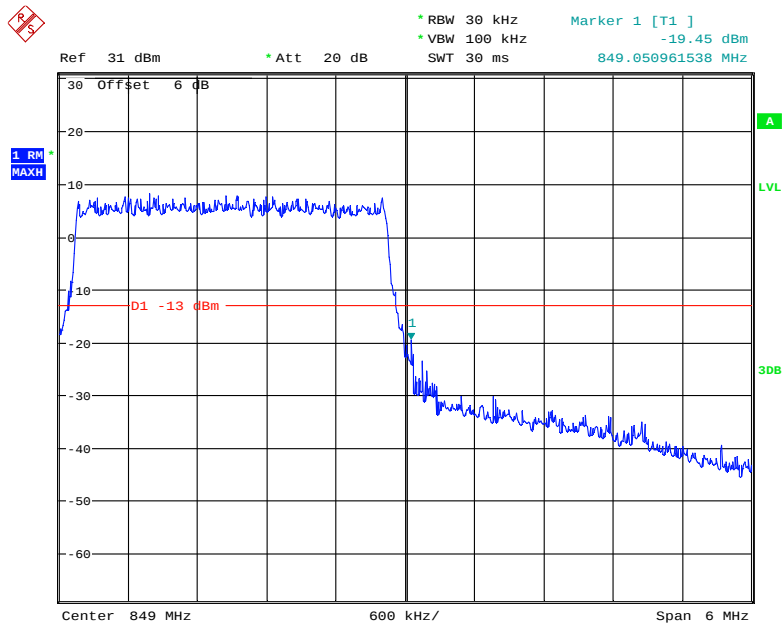
Date: 17.DEC.2019 00:32:25

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



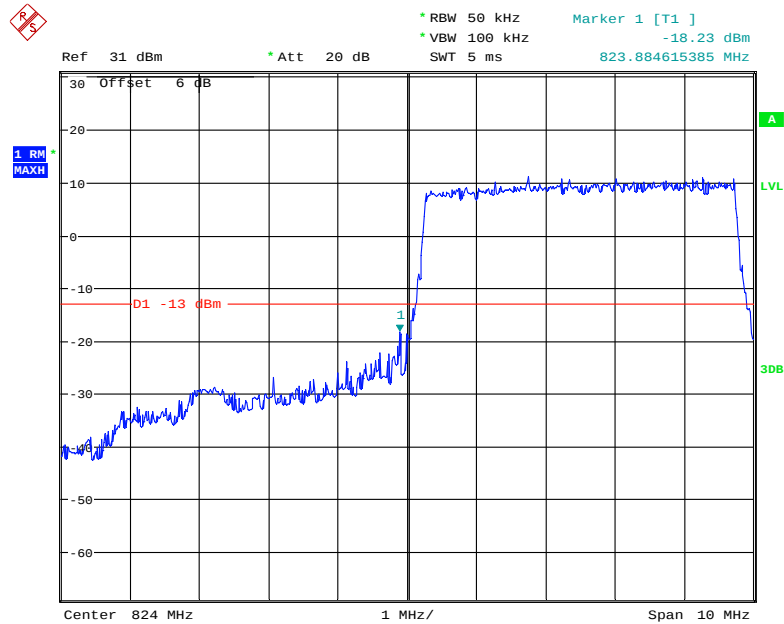
Date: 17.DEC.2019 00:33:04

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



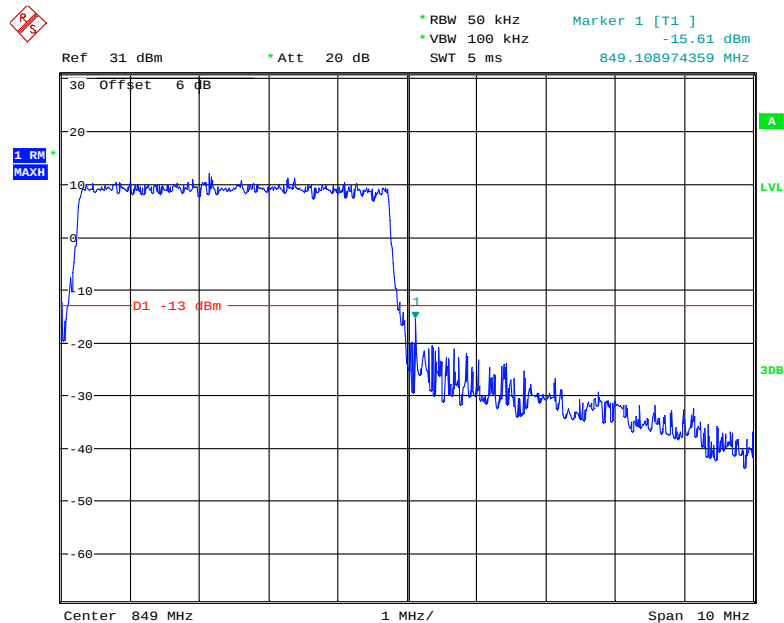
Date: 17.DEC.2019 00:32:41

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



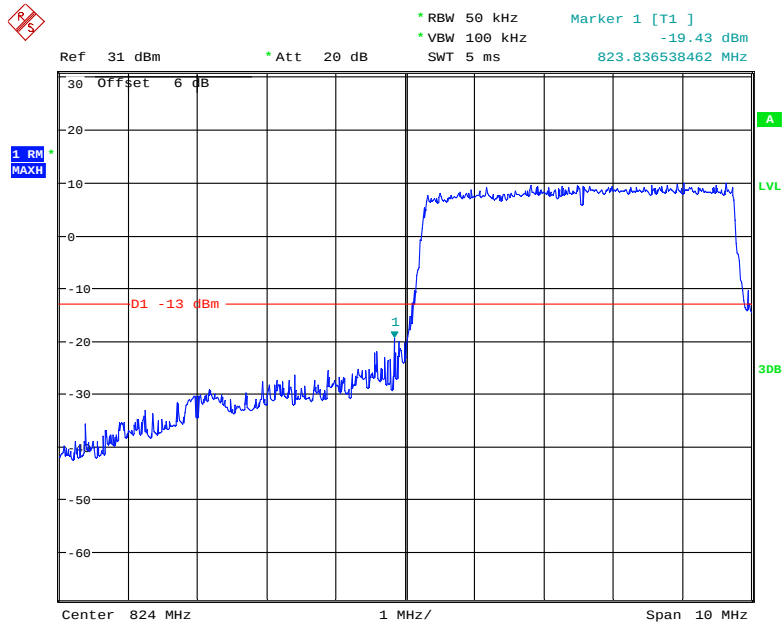
Date: 17.DEC.2019 00:35:45

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



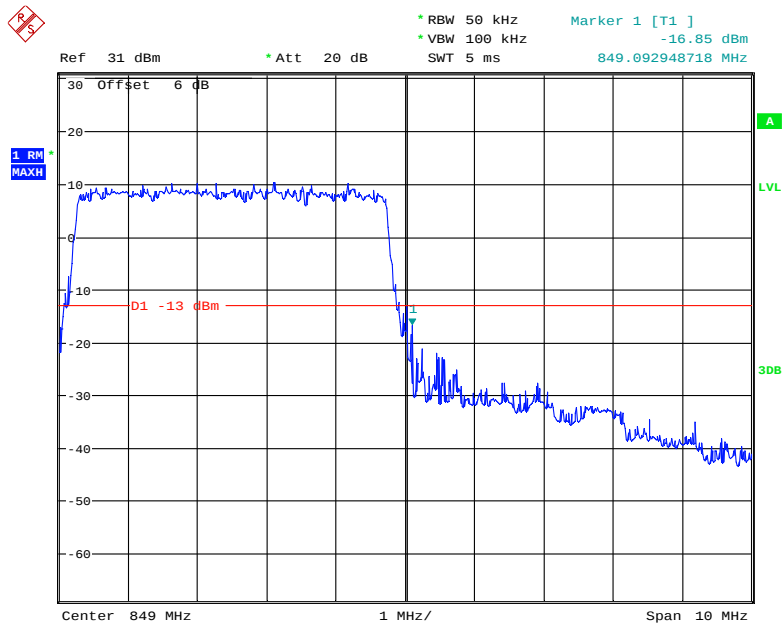
Date: 17.DEC.2019 00:36:55

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



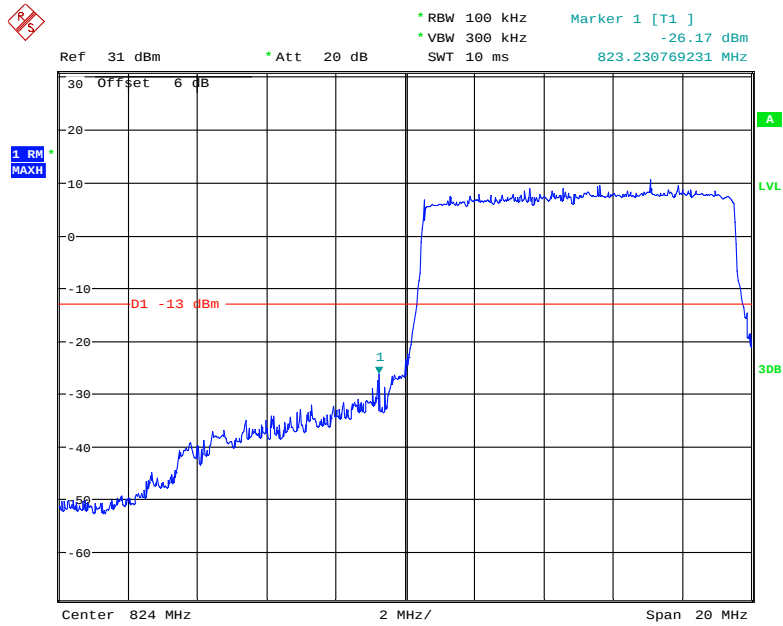
Date: 17.DEC.2019 00:36:02

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



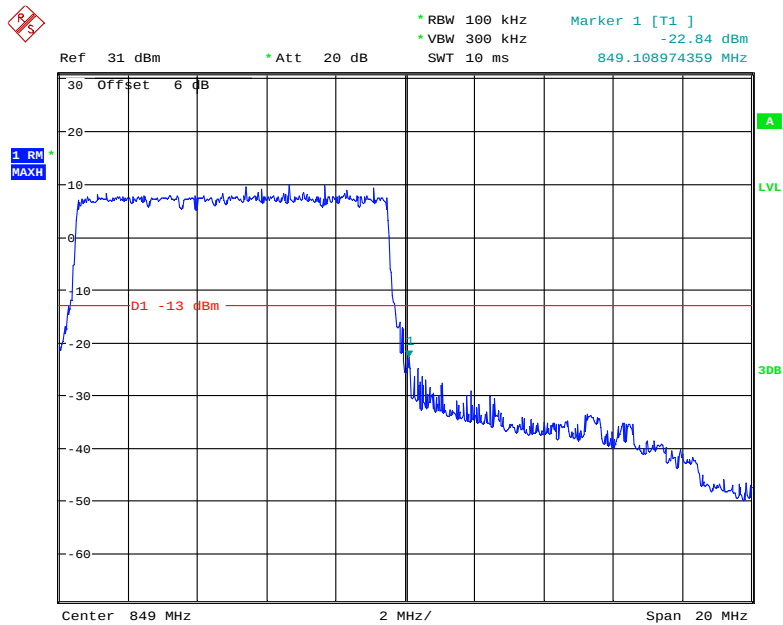
Date: 17.DEC.2019 00:36:36

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



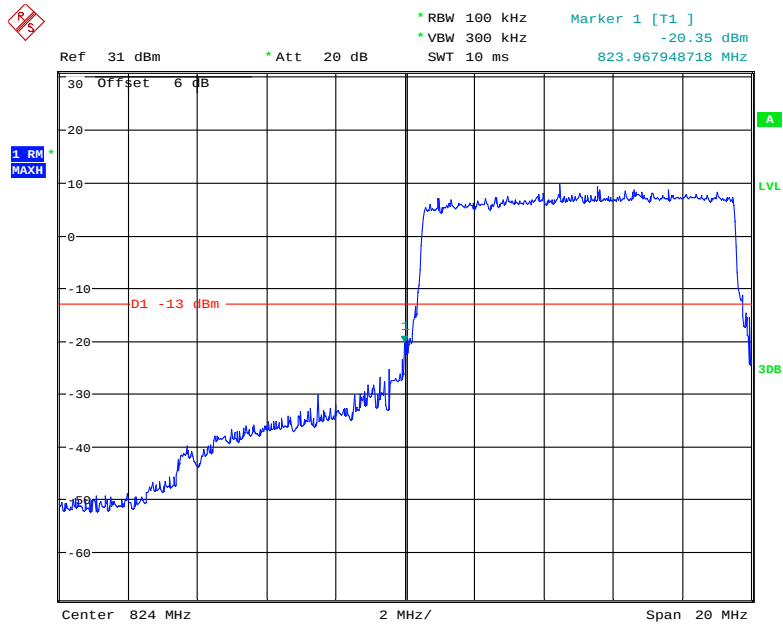
Date: 17.DEC.2019 00:38:27

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



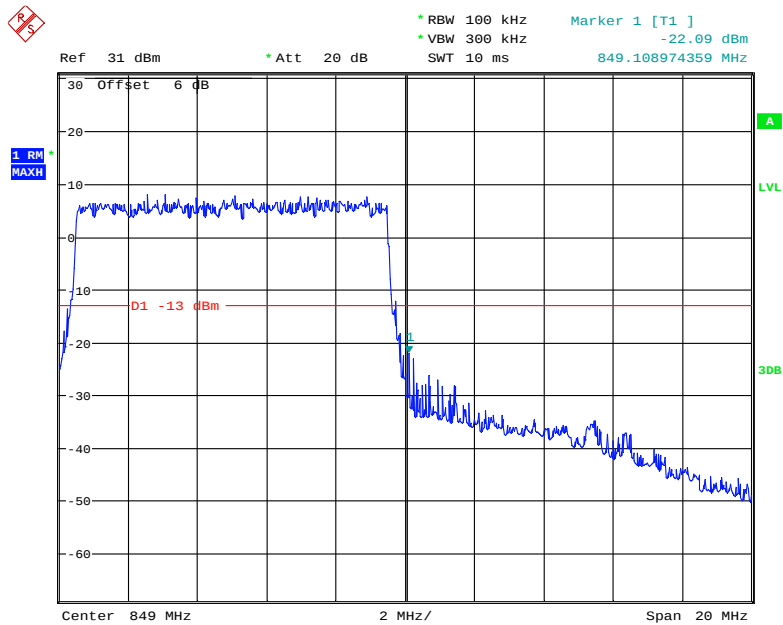
Date: 17.DEC.2019 00:37:58

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



Date: 17.DEC.2019 00:38:50

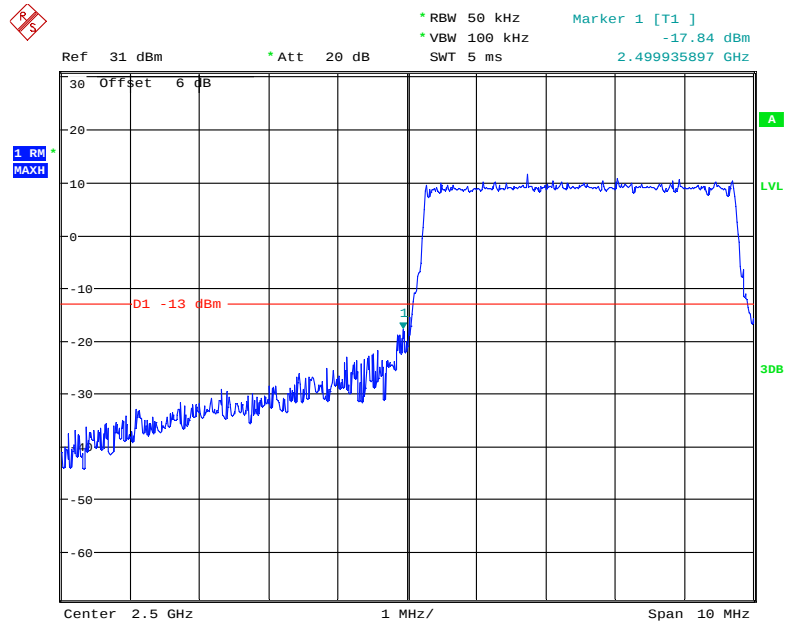
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 17.DEC.2019 00:37:35

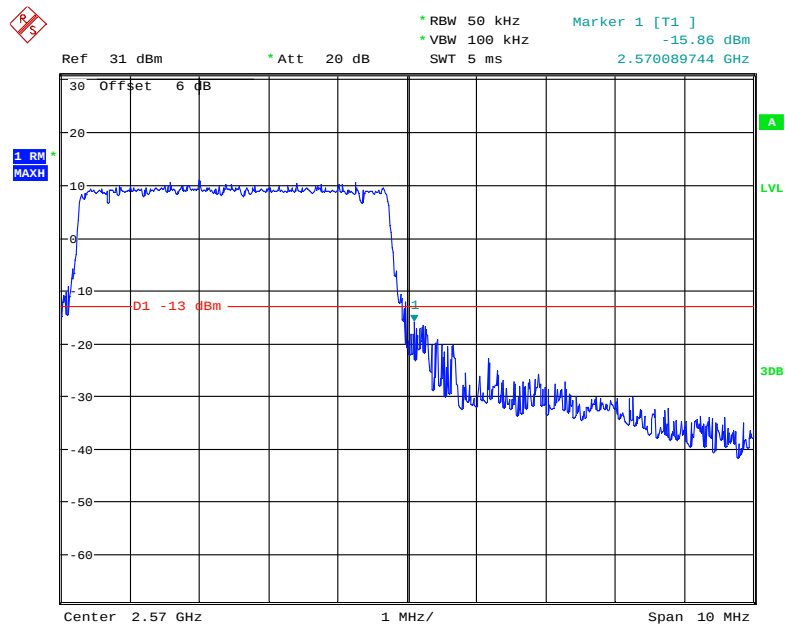
Band 7:

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



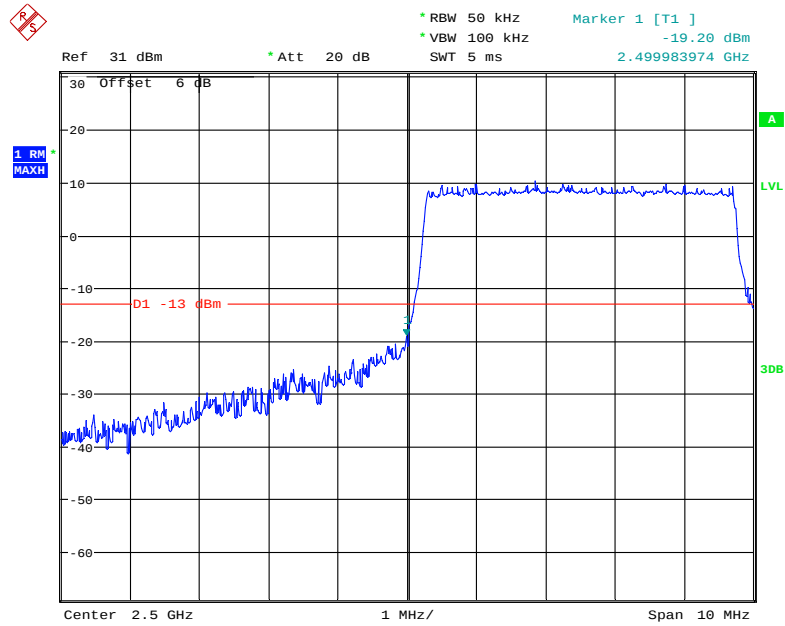
Date: 16.DEC.2019 23:15:53

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



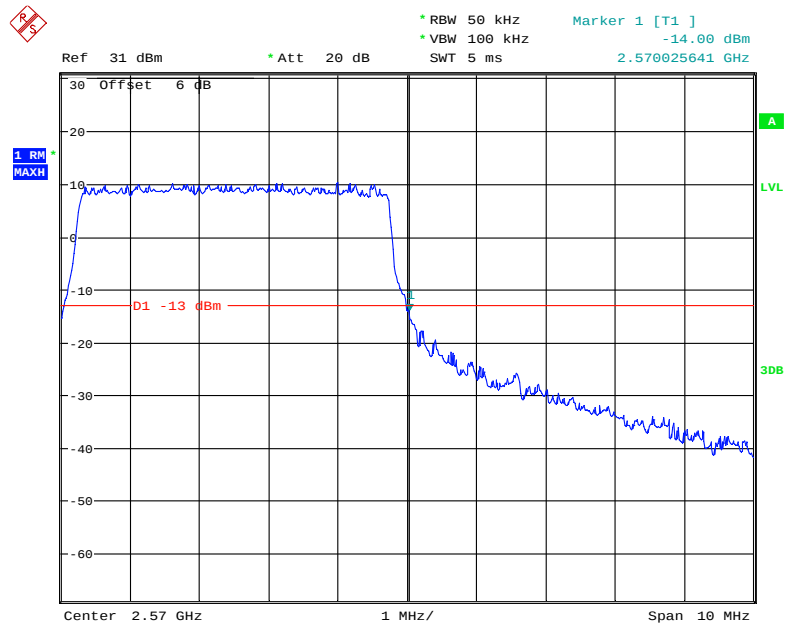
Date: 16.DEC.2019 23:19:16

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



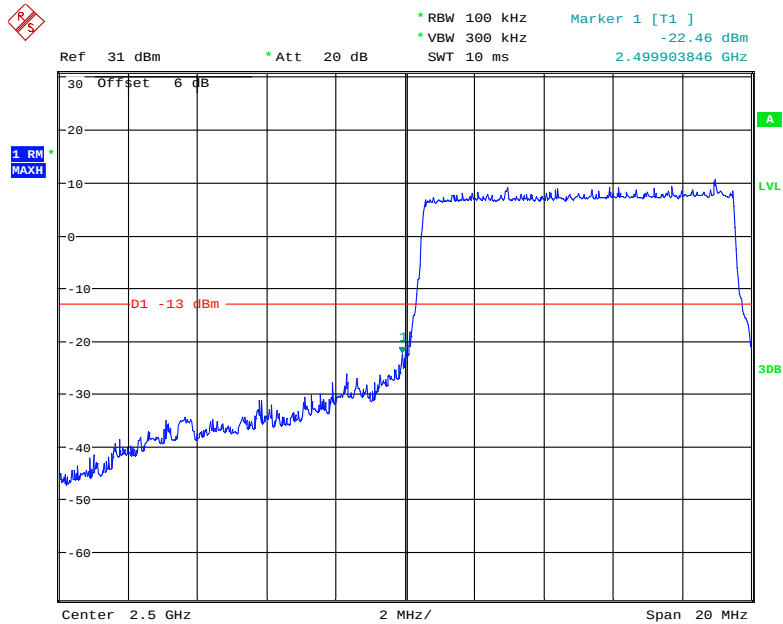
Date: 16.DEC.2019 23:16:45

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



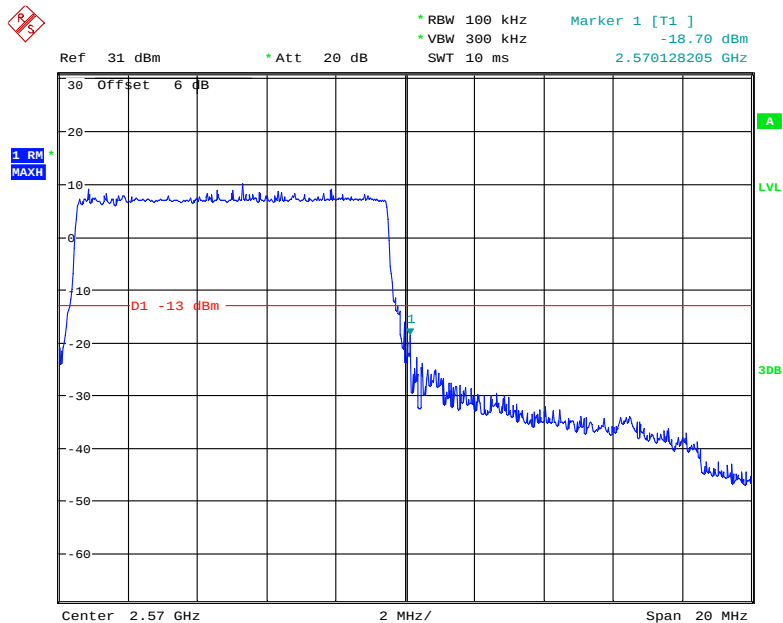
Date: 16.DEC.2019 23:18:53

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

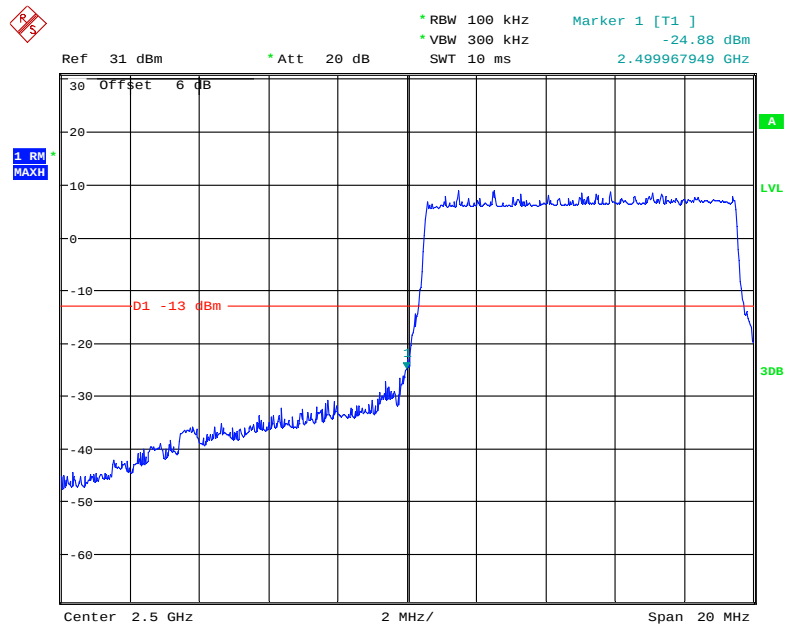


Date: 16.DEC.2019 23:23:43

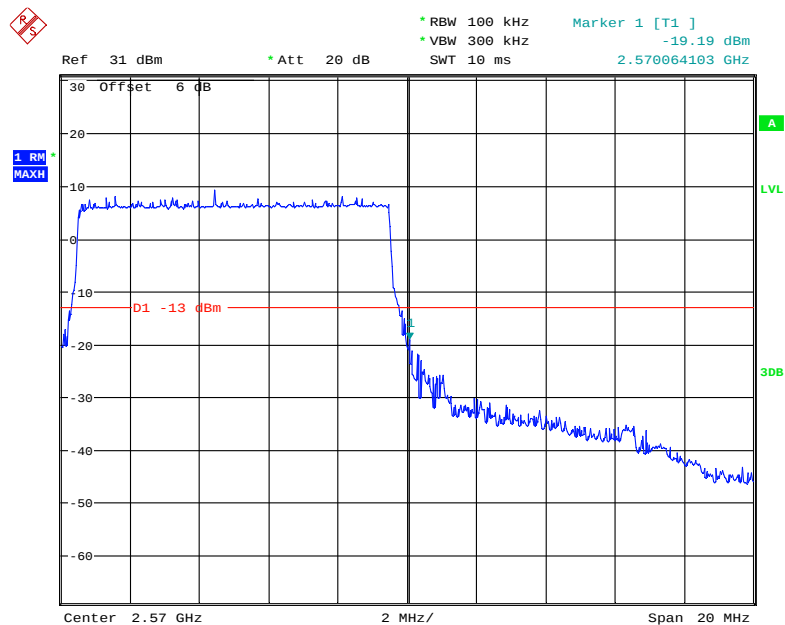
QPSK (10.0 MHz, FULL RB) - Right Band Edge



Date: 16.DEC.2019 23:24:41

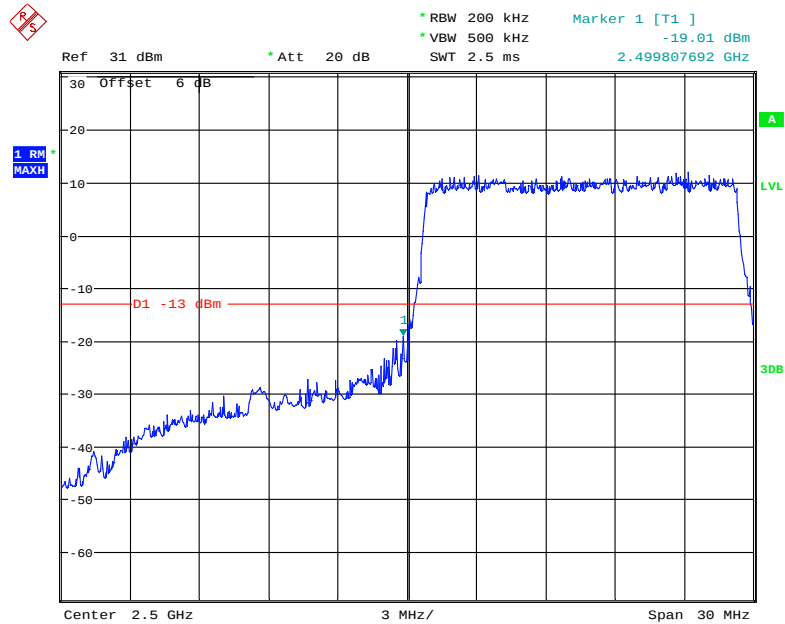
16-QAM (10.0 MHz, FULL RB) - Left Band Edge

Date: 16.DEC.2019 23:22:50

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

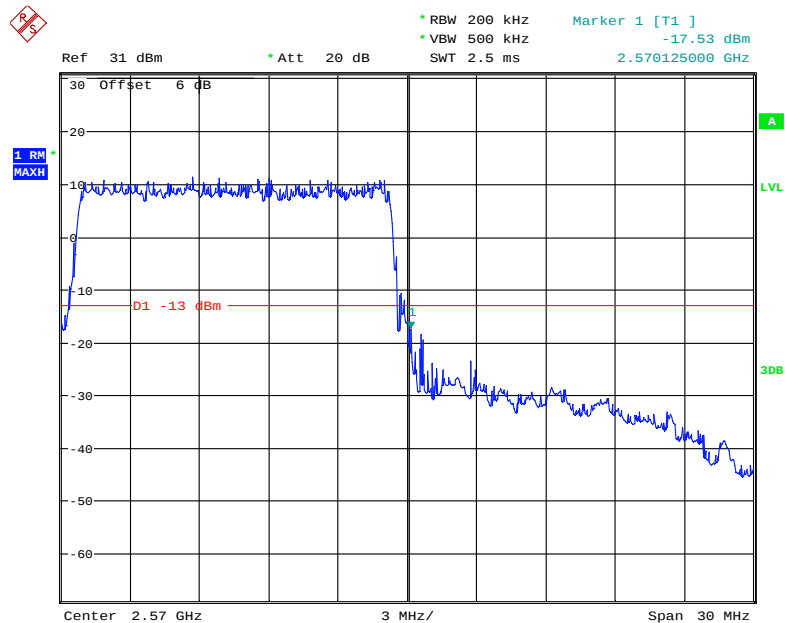
Date: 16.DEC.2019 23:27:50

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



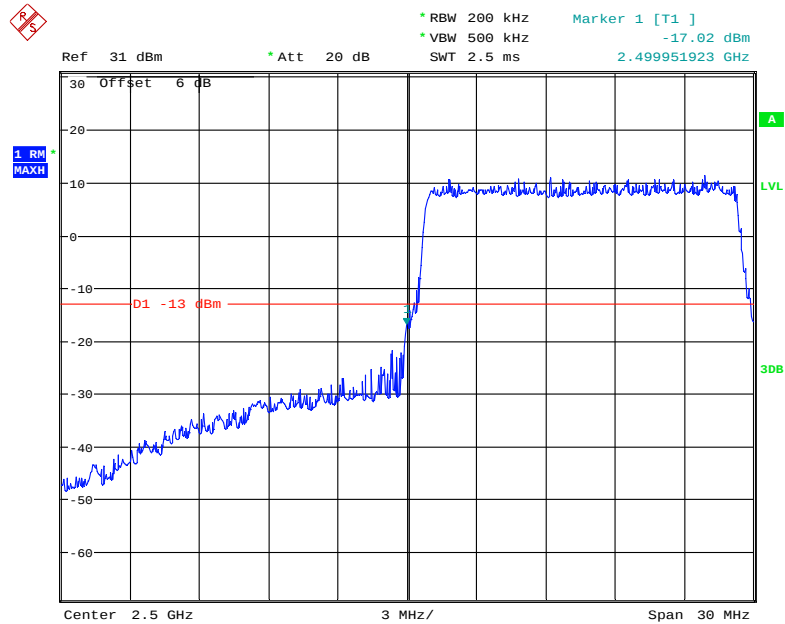
Date: 16.DEC.2019 23:30:21

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



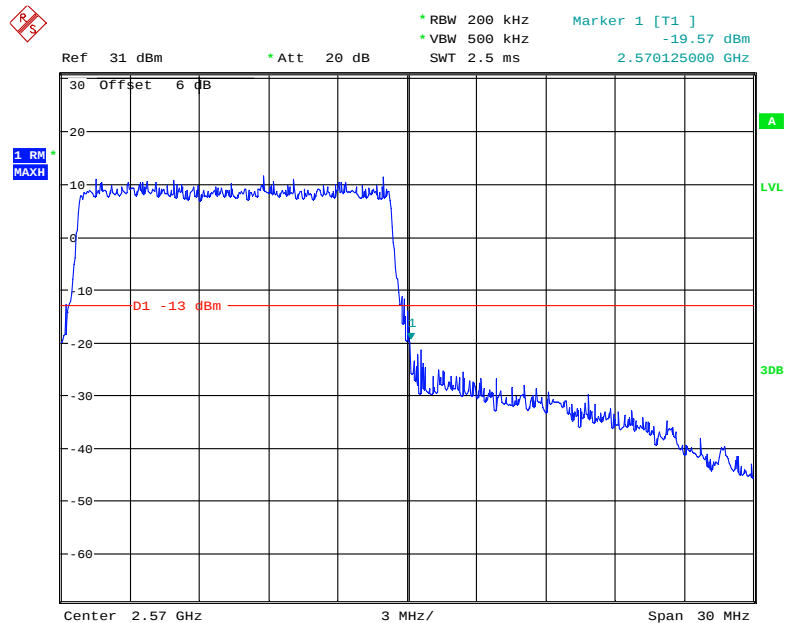
Date: 16.DEC.2019 23:36:21

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



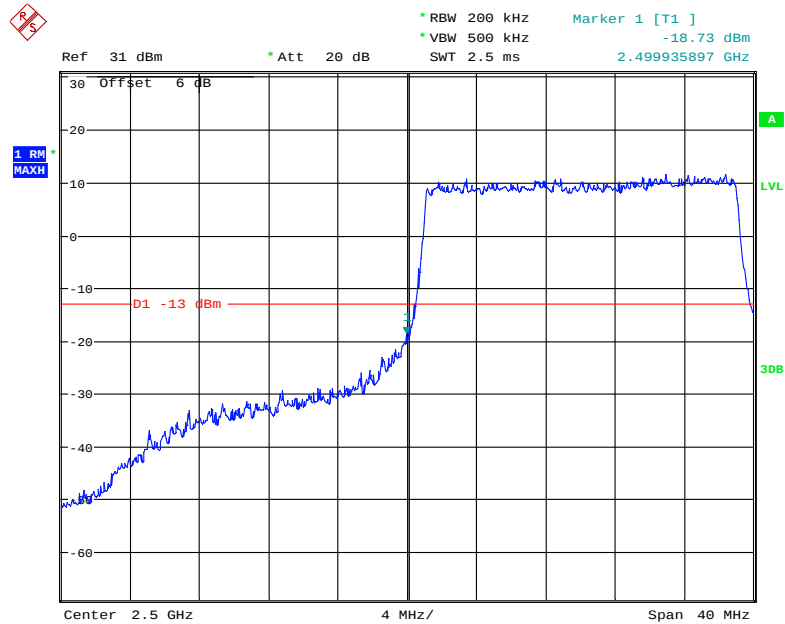
Date: 16.DEC.2019 23:33:22

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



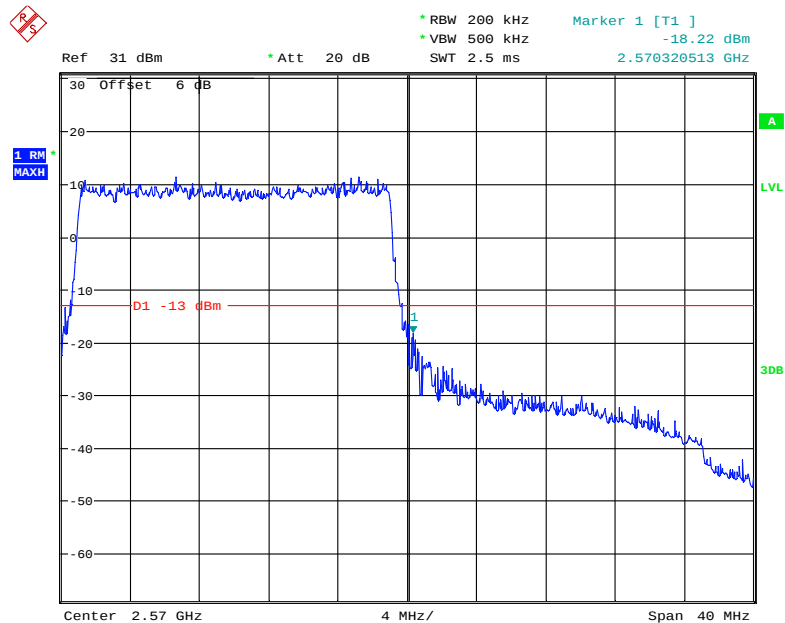
Date: 16.DEC.2019 23:34:17

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



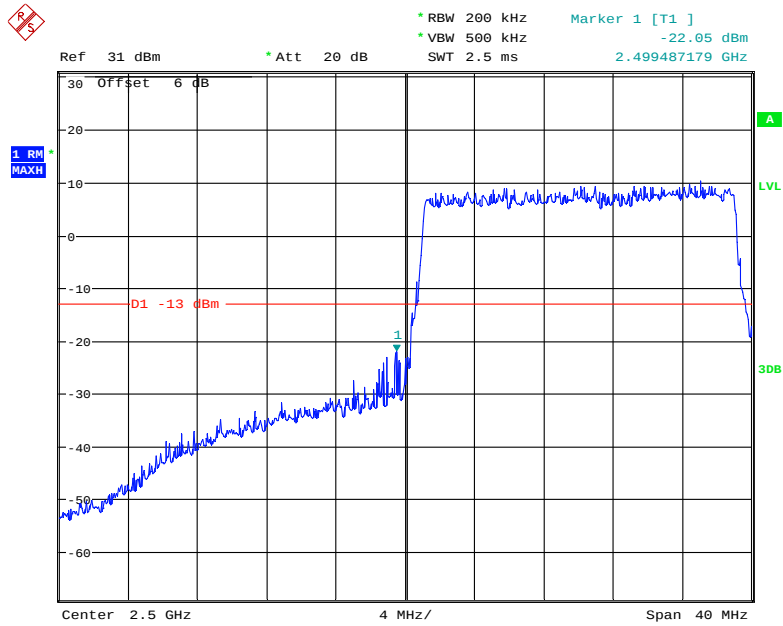
Date: 16.DEC.2019 23:49:43

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



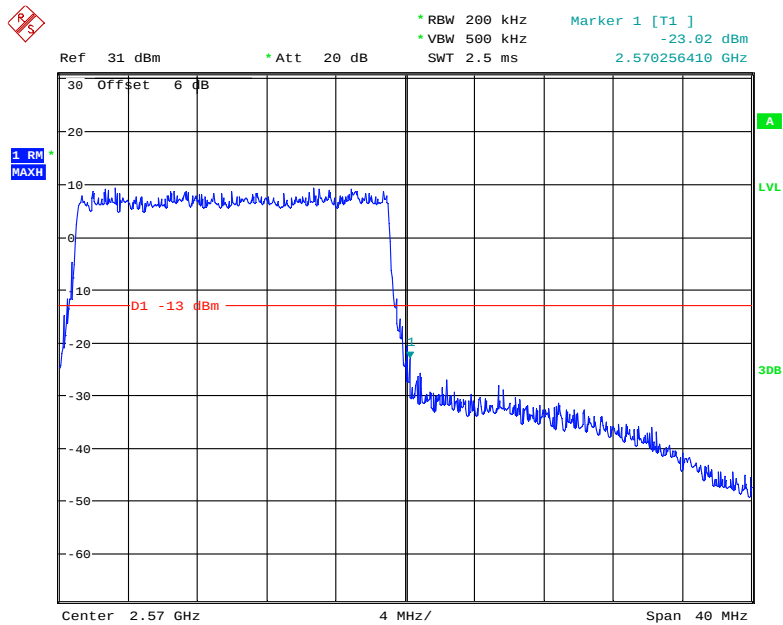
Date: 16.DEC.2019 23:37:52

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



Date: 16.DEC.2019 23:40:40

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



Date: 16.DEC.2019 23:38:35

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

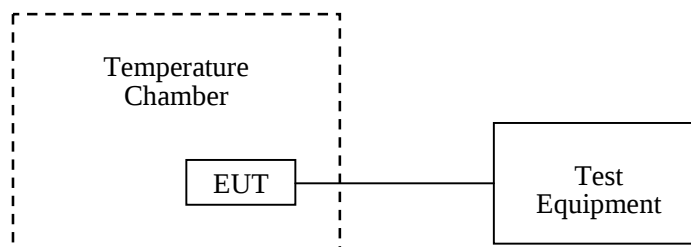
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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:	21~25 °C
Relative Humidity:	20~52 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu and Leo Huang on 2019-12-12 and 2019-12-22.

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	3.8	2	0.0024	2.5
-20		4	0.0048	2.5
-10		8	0.0096	2.5
0		5	0.0060	2.5
10		4	0.0048	2.5
20		3	0.0036	2.5
30		2	0.0024	2.5
40		1	0.0012	2.5
50		-2	-0.0024	2.5
20	V min.= 3.6	1	0.0012	2.5
	V max.= 4.35	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	3.8	2	0.0024	2.5
-20		1	0.0012	2.5
-10		4	0.0048	2.5
0		5	0.0060	2.5
10		1	0.0012	2.5
20		2	0.0024	2.5
30		3	0.0036	2.5
40		6	0.0072	2.5
50		2	0.0024	2.5
20	V min.= 3.6	4	0.0048	2.5
	V max.= 4.35	7	0.0084	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	3.8	3	0.0036	2.5
-20		4	0.0048	2.5
-10		2	0.0024	2.5
0		3	0.0036	2.5
10		5	0.0060	2.5
20		4	0.0048	2.5
30		2	0.0024	2.5
40		3	0.0036	2.5
50		4	0.0048	2.5
20	V min.= 3.6	2	0.0024	2.5
	V max.= 4.35	5	0.0060	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	3.8	3	0.0016	pass
-20		4	0.0021	pass
-10		6	0.0032	pass
0		7	0.0037	pass
10		5	0.0027	pass
20		2	0.0011	pass
30		2	0.0011	pass
40		5	0.0027	pass
50		-1	-0.0005	pass
20	V min.= 3.6	3	0.0016	pass
	V max.= 4.35	8	0.0043	pass

EDGE Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	9	0.0048	pass
-20		3	0.0016	pass
-10		8	0.0043	pass
0		4	0.0021	pass
10		6	0.0032	pass
20		2	0.0011	pass
30		1	0.0005	pass
40		6	0.0032	pass
50		5	0.0027	pass
20	V min.= 3.6	2	0.0011	pass
	V max.= 4.35	4	0.0021	pass

WCDMA Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	2	0.0011	pass
-20		4	0.0021	pass
-10		3	0.0016	pass
0		2	0.0011	pass
10		5	0.0027	pass
20		3	0.0016	pass
30		4	0.0021	pass
40		3	0.0016	pass
50		4	0.0021	pass
20	V min.= 3.6	3	0.0016	pass
	V max.= 4.35	5	0.0027	pass

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, $f_0=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	-18	-0.0096	pass
-20		-15	-0.0080	pass
-10		-12	-0.0064	pass
0		-13	-0.0069	pass
10		-9	-0.0048	pass
20		-5	-0.0027	pass
30		-4	-0.0021	pass
40		-1	-0.0005	pass
50		4	0.0021	pass
20	V min.= 3.6	5	0.0027	pass
	V max.= 4.35	7	0.0037	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	3.8	1710.5239	1754.7568	1710	1755
-20		1710.5249	1754.7578	1710	1755
-10		1710.5255	1754.7598	1710	1755
0		1710.5230	1754.7577	1710	1755
10		1710.5241	1754.7581	1710	1755
20		1710.5260	1754.7595	1710	1755
30		1710.5256	1754.7602	1710	1755
40		1710.5246	1754.7567	1710	1755
50		1710.5265	1754.7613	1710	1755
20	V min.= 3.6	1710.5263	1754.7594	1710	1755
	V max.= 4.35	1710.5224	1754.7601	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	3.8	-12	-0.0143	2.5
-20		-8	-0.0096	2.5
-10		-6	-0.0072	2.5
0		-5	-0.0060	2.5
10		-2	-0.0024	2.5
20		1	0.0012	2.5
30		3	0.0036	2.5
40		4	0.0048	2.5
50		7	0.0084	2.5
20	V min.= 3.6	8	0.0096	2.5
	V max.= 4.35	11	0.0132	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	3.8	2500.4556	2569.7038	2500	2570
-20		2500.4551	2569.7039	2500	2570
-10		2500.4563	2569.7024	2500	2570
0		2500.4564	2569.7057	2500	2570
10		2500.4556	2569.7033	2500	2570
20		2500.4568	2569.7068	2500	2570
30		2500.4568	2569.7035	2500	2570
40		2500.4536	2569.7032	2500	2570
50		2500.4551	2569.7028	2500	2570
20	V min.= 3.6	2500.4542	2569.7023	2500	2570
	V max.= 4.35	2500.4560	2569.7025	2500	2570

16QAM:**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	3.8	-14	-0.0074	pass
-20		-11	-0.0059	pass
-10		-12	-0.0064	pass
0		-8	-0.0043	pass
10		-5	-0.0027	pass
20		-4	-0.0021	pass
30		-1	-0.0005	pass
40		3	0.0016	pass
50		2	0.0011	pass
20	V min.= 3.6	5	0.0027	pass
	V max.= 4.35	8	0.0043	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	3.8	1710.4906	1754.5288	1710	1755
-20		1710.4878	1754.5273	1710	1755
-10		1710.4927	1754.5271	1710	1755
0		1710.4896	1754.5276	1710	1755
10		1710.4905	1754.5270	1710	1755
20		1710.4903	1754.5300	1710	1755
30		1710.4903	1754.5301	1710	1755
40		1710.4902	1754.5267	1710	1755
50		1710.4894	1754.5286	1710	1755
20	V min.= 3.6	1710.4925	1754.5286	1710	1755
	V max.= 4.35	1710.4907	1754.5253	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	3.8	-14	-0.0167	2.5
-20		-13	-0.0155	2.5
-10		-8	-0.0096	2.5
0		-11	-0.0131	2.5
10		-7	-0.0084	2.5
20		-5	-0.0060	2.5
30		-2	-0.0024	2.5
40		-1	-0.0012	2.5
50		2	0.0024	2.5
20	V min.= 3.6	4	0.0048	2.5
	V max.= 4.35	7	0.0084	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	3.8	2500.4539	2569.7010	2500	2570
-20		2500.4543	2569.7010	2500	2570
-10		2500.4562	2569.7042	2500	2570
0		2500.4523	2569.7014	2500	2570
10		2500.4538	2569.7010	2500	2570
20		2500.4563	2569.6999	2500	2570
30		2500.4532	2569.7012	2500	2570
40		2500.4529	2569.6991	2500	2570
50		2500.4520	2569.6994	2500	2570
20	V min.= 3.6	2500.4536	2569.7021	2500	2570
	V max.= 4.35	2500.4523	2569.6996	2500	2570

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