FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

TECNO MOBILE LIMITED

ROOM 604 6/F SOUTH TOWER WORLD FINANCE CTR HARBOUR CITY

17 CANTON ROAD TST KL, Hong Kong

FCC ID: 2ADYY-CC6

Report Type:	Product Type:
Original Report	Mobile phone

Report Number:	RGMA190813002-00D
Report Date:	2019-09-09
Reviewed By:	Simon Wang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Mobile phone
Tested Model	CC6
Frequency Range	Cellular: 824-849 MHz PCS: 1850-1910 MHz WCDMA B2/LTE B2: 1850-1910 MHz WCDMA B5/LTE B5: 824-849 MHz WCDMA B4/LTE B4: 1710- 1755 MHz LTE B7: 2500-2570 MHz
Conducted Average Power	GSM850: 32.45dBm(GMSK), 28.54dBm(8PSK) PCS1900: 29.71dBm(GMSK), 26.73dBm(8PSK) WCDMA Band 2: 21.51dBm WCDMA Band 4: 21.68dBm WCDMA Band 5: 22.13dBm LTE Band 2: 21.89dBm LTE Band 4: 21.80dBm LTE Band 5: 22.03dBm LTE Band 7: 21.86dBm
Modulation Technique	2G: GMSK,8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antenna
Voltage Range	DC 3.85V from battery or DC 5.0V from adapter
Date of Test	2019-08-14~2019-08-24
Sample serial number	190813002(Assigned by BACL, Shenzhen)
Received date	2019-08-13
Sample/EUT Status	Good condition
Adapter information	Model: A8A-050200U-US1 Input: AC 100-240V, 50/60Hz, 0.35A Output: DC 5.0V, 2.0A

Objective

This test report is prepared on behalf of *TECNO MOBILE LIMITED* 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 and Part 15.247 DTS submissions with FCC ID: 2ADYY-CC6.

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℃
Humidity		±6%
Supply voltages		±0.4%

Note: 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.

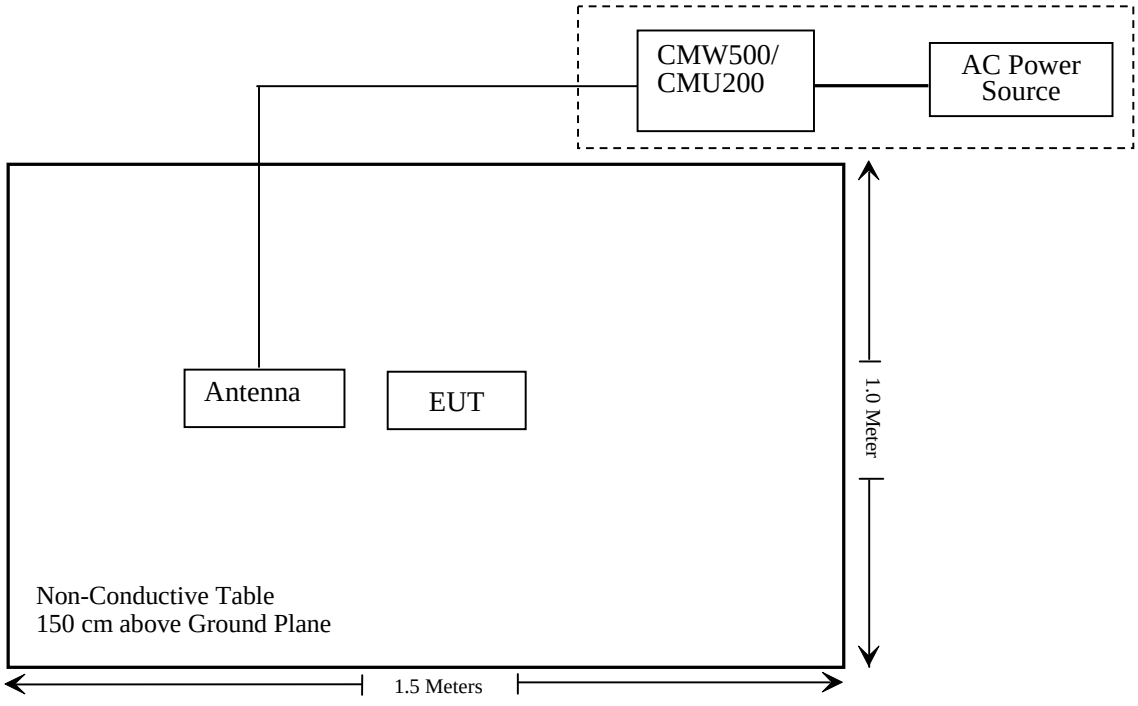
Equipment Modifications

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: RGMA190813002-SA.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017-12-22	2020-12-21
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2019-07-22	2020-07-21
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-11-12	2019-11-12
Sonoma Instrument	Amplifier	310N	186238	2018-11-12	2019-11-12
Agilent	Signal Generator	N5183A	MY51040755	2018-12-03	2019-12-03
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2019-07-09	2020-07-08
COM-POWER	Dipole Antenna	AD-100	41000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
UTiFLEX MICRO-C0AX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-11-12	2019-11-12
Ducommun Technologies	RF Cable	104PEA	218124002	2018-11-12	2019-11-12
Ducommun Technologies	RF Cable	RG-214	1	2019-05-21	2019-11-19
Ducommun Technologies	RF Cable	RG-214	2	2018-11-12	2019-11-12
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-03	2016-11-18	2019-11-18
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Heatsink Required	Amplifier	QLW-18405536-J0	15964001002	2018-11-12	2019-11-12
Unknown	High Pass filter	2.8GHz	Unknown	2019-04-20	2020-04-20
Unknown	High Pass filter	1.3GHz	Unknown	2019-04-20	2020-04-20
Wainwright Germany	Band Reject Filter	WRCG1850/1910-1835/1925-40/8SS	22	2019-03-02	2020-03-01
Wainwright Germany	Band Reject Filter	WRCG823/850-813/860-40/8SS	7	2019-03-02	2020-03-01
Wainwright Germany	Band Reject Filter	WRCG1786-1689/1806	2	2019-03-02	2020-03-01

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2019-03-02	2020-03-01
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2019-01-05	2020-01-05
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2019-04-12	2020-04-12
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2019-01-15	2020-01-15
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2019-07-09	2020-07-08
Ducommun Technologies	RF Cable	RG-214	3	Each Time	
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2018-11-12	2019-11-12
WEINSCHEL	10dB Attenuator	5324	AU 3842	Each Time	
WEINSCHEL	3dB Attenuator	6231	666	Each Time	
Unknown	Power Splitter	1620	129	Each Time	
Wainwright	notch filter	WRCG1850/1910-1835/1925-40/8SS	22	NCR	
Oulitong	notch filter	OBSF-2500-2570-S	OE01601523	NCR	
Wainwright	notch filter	WRCG1709/1786-1689/1806-40/8SS	2	NCR	
Wainwright	notch filter	WRCG823/850-813/860-40/8SS	7	NCR	

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

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

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RGMA190813002-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.

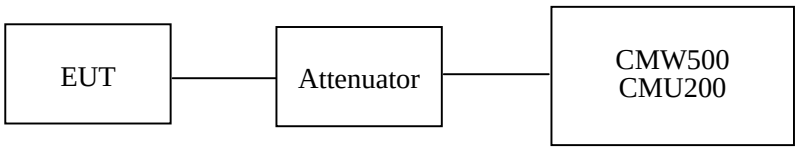
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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:	24~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Leo Huang from 2019-08-17 to 2019-08-24.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.24	38.45
	190	836.6	32.31	38.45
	251	848.8	32.26	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.14	29.89	28.14	25.95	38.45
	190	836.6	32.45	30.43	28.42	26.34	38.45
	251	848.8	32.42	30.51	29.12	26.90	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	28.54	27.36	25.33	23.51	38.45
	190	836.6	28.47	27.24	25.38	23.34	38.45
	251	848.8	28.34	27.26	25.32	23.62	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		22.01	21.98	22.13
		HSDPA	1	20.96	21.03	21.05
			2	20.84	20.91	20.93
			3	21.04	21.11	21.15
			4	20.91	20.99	21.00
		HSUPA	1	20.92	21.06	20.94
			2	20.81	20.93	20.89
			3	20.97	21.14	21.03
			4	20.79	20.97	20.84
			5	21.02	21.17	20.98
		HSPA+	1	20.81	20.93	20.89

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.71	33
	661	1880.0	29.53	33
	810	1909.8	29.29	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.65	27.16	25.39	24.38	33
	661	1880.0	29.54	27.18	25.64	24.50	33
	810	1909.8	29.46	27.24	25.54	24.52	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	26.73	24.87	22.29	21.29	33
	661	1880.0	26.44	24.65	22.61	21.36	33
	810	1909.8	25.32	24.73	22.34	21.15	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		21.43	21.51	21.36
		HSDPA	1	20.57	20.61	20.45
			2	20.53	20.53	20.36
			3	20.66	20.64	20.49
			4	20.54	20.52	20.33
		HSUPA	1	20.43	20.51	20.57
			2	20.30	20.39	20.44
			3	20.50	20.64	20.66
			4	20.39	20.45	20.47
			5	20.46	20.59	20.64
		HSPA+	1	20.50	20.43	20.37

AWS Band (Part 27)

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band IV)	Normal	RMC12.2k		21.68	21.59	21.64
		HSDPA	1	20.71	20.83	20.57
			2	20.63	20.74	20.47
			3	20.74	20.91	20.66
			4	20.62	20.78	20.50
		HSUPA	1	20.53	20.62	20.57
			2	20.46	20.52	20.52
			3	20.61	20.66	20.67
			4	20.49	20.52	20.51
			5	20.62	20.69	20.69
		HSPA+	1	20.46	20.52	20.52

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.31	13
	Middle	1.26	13
	High	1.28	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.06	13
	Middle	1.13	13
	High	0.98	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.35	13
	Middle	3.36	13
	High	3.30	13
HSDPA (16QAM)	Low	3.32	13
	Middle	3.26	13
	High	3.29	13
HSUPA (BPSK)	Low	3.23	13
	Middle	3.27	13
	High	3.34	13
HSPA+	Low	3.10	13
	Middle	3.26	13
	High	3.19	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.41	13
	Middle	1.39	13
	High	1.42	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.22	13
	Middle	1.07	13
	High	1.19	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.28	13
	Middle	3.29	13
	High	3.23	13
HSDPA (16QAM)	Low	3.25	13
	Middle	3.22	13
	High	3.22	13
HSUPA (BPSK)	Low	3.12	13
	Middle	3.17	13
	High	3.26	13
HSPA+	Low	3.19	13
	Middle	3.22	13
	High	3.31	13

AWS Band

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.26	13
	Middle	3.33	13
	High	3.28	13
HSDPA (16QAM)	Low	3.33	13
	Middle	3.28	13
	High	3.31	13
HSUPA (BPSK)	Low	3.23	13
	Middle	3.32	13
	High	3.40	13
HSPA+	Low	3.19	13
	Middle	3.22	13
	High	3.31	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										
836.60	82.67	305	1.7	H	23.3	1.90	0.0	21.40	38.45	17.05
836.60	88.93	331	1.6	V	28.9	1.90	0.0	27.00	38.45	11.45
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	91.79	4	1.5	H	22.1	1.30	9.40	30.20	33	2.80
1880.00	87.82	132	1.2	V	17.9	1.30	9.40	26.00	33	7.00

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.60	77.79	198	1.5	H	18.4	1.90	0.0	16.50	38.45	21.95
836.60	82.53	244	2.0	V	22.5	1.90	0.0	20.60	38.45	17.85
EIRP, PCS Band (Part 24E), Middle Channel										
1880	86.63	84	2.4	H	17.0	1.30	9.40	25.10	33	7.90
1880	82.57	332	1.7	V	12.7	1.30	9.40	20.80	33	12.20

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										
836.60	73.59	133	2.0	H	14.2	1.90	0.0	12.30	38.45	26.15
836.60	79.13	289	1.6	V	19.1	1.90	0.0	17.20	38.45	21.25
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	81.52	182	2.2	H	11.8	1.30	9.40	19.90	33	13.10
1880.00	80.44	278	2.4	V	10.5	1.30	9.40	18.60	33	14.40
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	84.80	287	1.1	H	11.5	1.30	8.90	19.10	30	10.90
1732.60	83.28	67	1.3	V	10.6	1.30	8.90	18.20	30	11.80

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	21.38	21.54	21.63
		RB Size=1, RB Offset=2	21.48	21.71	21.77
		RB Size=1, RB Offset=5	21.14	21.26	21.33
		RB Size=3, RB Offset=0	21.13	21.56	21.70
		RB Size=3, RB Offset=1	21.60	21.50	21.47
		RB Size=3, RB Offset=2	21.50	21.43	21.61
		RB Size=6, RB Offset=0	21.10	21.30	21.42
	16QAM	RB Size=1, RB Offset=0	21.50	21.48	21.56
		RB Size=1, RB Offset=2	21.23	21.26	21.47
		RB Size=1, RB Offset=5	21.47	21.76	21.88
		RB Size=3, RB Offset=0	21.10	21.82	21.39
		RB Size=3, RB Offset=1	21.46	21.38	21.85
		RB Size=3, RB Offset=2	21.47	21.59	21.79
		RB Size=6, RB Offset=0	21.30	21.52	21.88
3.0	QPSK	RB Size=1, RB Offset=0	21.42	21.56	21.65
		RB Size=1, RB Offset=7	21.58	21.47	21.70
		RB Size=1, RB Offset=14	21.60	21.49	21.39
		RB Size=8, RB Offset=0	21.68	21.55	21.39
		RB Size=8, RB Offset=4	21.29	21.42	21.45
		RB Size=8, RB Offset=7	21.37	21.50	21.44
		RB Size=15, RB Offset=0	21.45	21.62	21.39
	16QAM	RB Size=1, RB Offset=0	21.67	21.77	21.55
		RB Size=1, RB Offset=7	21.68	21.85	21.38
		RB Size=1, RB Offset=14	21.67	21.59	21.65
		RB Size=8, RB Offset=0	21.38	21.73	21.49
		RB Size=8, RB Offset=4	21.60	21.49	21.55
		RB Size=8, RB Offset=7	21.21	21.56	21.54
		RB Size=15, RB Offset=0	21.23	21.27	21.74

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.48	21.53	21.61
		RB Size=1, RB Offset=12	21.19	21.61	21.54
		RB Size=1, RB Offset=24	21.36	21.30	21.75
		RB Size=12, RB Offset=0	21.68	21.35	21.48
		RB Size=12, RB Offset=6	21.65	21.61	21.72
		RB Size=12, RB Offset=11	21.32	21.62	21.29
		RB Size=25, RB Offset=0	21.45	21.37	21.51
	16QAM	RB Size=1, RB Offset=0	21.54	21.33	21.49
		RB Size=1, RB Offset=12	21.66	21.5	21.41
		RB Size=1, RB Offset=24	21.77	21.54	21.34
		RB Size=12, RB Offset=0	21.52	21.77	21.89
		RB Size=12, RB Offset=6	21.41	21.44	21.53
		RB Size=12, RB Offset=11	21.41	21.70	21.89
		RB Size=25, RB Offset=0	21.53	21.65	21.54
10.0	QPSK	RB Size=1, RB Offset=0	21.43	21.51	21.58
		RB Size=1, RB Offset=24	21.20	21.30	21.38
		RB Size=1, RB Offset=49	21.61	21.23	21.55
		RB Size=25, RB Offset=0	21.43	21.66	21.68
		RB Size=25, RB Offset=12	21.49	21.44	21.36
		RB Size=25, RB Offset=24	21.23	21.67	21.27
		RB Size=50, RB Offset=0	21.56	21.23	21.53
	16QAM	RB Size=1, RB Offset=0	21.36	21.75	21.33
		RB Size=1, RB Offset=24	21.53	21.28	21.47
		RB Size=1, RB Offset=49	21.26	21.40	21.73
		RB Size=25, RB Offset=0	21.58	21.75	21.44
		RB Size=25, RB Offset=12	21.18	21.57	21.63
		RB Size=25, RB Offset=24	21.17	21.50	21.36
		RB Size=50, RB Offset=0	21.68	21.22	21.59

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	21.45	21.56	21.64
		RB Size=1, RB Offset=37	21.74	21.48	21.37
		RB Size=1, RB Offset=74	21.36	21.67	21.76
		RB Size=36, RB Offset=0	21.64	21.57	21.58
		RB Size=36, RB Offset=18	21.34	21.71	21.76
		RB Size=36, RB Offset=37	21.69	21.50	21.37
		RB Size=75, RB Offset=0	21.24	21.27	21.76
	16QAM	RB Size=1, RB Offset=0	21.61	21.66	21.35
		RB Size=1, RB Offset=37	21.48	21.40	21.60
		RB Size=1, RB Offset=74	21.58	21.63	21.85
		RB Size=36, RB Offset=0	21.32	21.76	21.48
		RB Size=36, RB Offset=18	21.30	21.75	21.68
		RB Size=36, RB Offset=37	21.52	21.79	21.36
		RB Size=75, RB Offset=0	21.45	21.62	21.38
20.0	QPSK	RB Size=1, RB Offset=0	21.38	21.49	21.55
		RB Size=1, RB Offset=49	21.18	21.58	21.31
		RB Size=1, RB Offset=99	21.50	21.65	21.24
		RB Size=50, RB Offset=0	21.61	21.69	21.39
		RB Size=50, RB Offset=24	21.26	21.52	21.60
		RB Size=50, RB Offset=49	21.16	21.40	21.36
		RB Size=100, RB Offset=0	21.31	21.65	21.42
	16QAM	RB Size=1, RB Offset=0	21.38	21.68	21.55
		RB Size=1, RB Offset=49	21.11	21.38	21.58
		RB Size=1, RB Offset=99	21.42	21.38	21.84
		RB Size=50, RB Offset=0	21.29	21.55	21.56
		RB Size=50, RB Offset=24	21.52	21.56	21.37
		RB Size=50, RB Offset=49	21.35	21.77	21.81
		RB Size=100, RB Offset=0	21.13	21.76	21.44

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.7	13	Pass
QPSK (100RB Size)	4.43	13	Pass
16QAM (1RB Size)	4.80	13	Pass
16QAM (100RB Size)	4.49	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	82.23	246	1.2	H	12.6	1.30	9.40	20.70	33
1880.00	82.64	44	2.2	V	12.7	1.30	9.40	20.80	33
3 MHz Bandwidth									
1880.00	81.98	277	1.7	H	12.3	1.30	9.40	20.40	33
1880.00	82.29	284	2.2	V	12.4	1.30	9.40	20.50	33
5 MHz Bandwidth									
1880.00	81.73	221	2.3	H	12.1	1.30	9.40	20.20	33
1880.00	81.85	356	1.2	V	12.0	1.30	9.40	20.10	33
10 MHz Bandwidth									
1880.00	81.53	312	2.1	H	11.9	1.30	9.40	20.00	33
1880.00	81.66	127	1.4	V	11.8	1.30	9.40	19.90	33
15 MHz Bandwidth									
1880.00	81.32	349	1.4	H	11.6	1.30	9.40	19.70	33
1880.00	81.45	318	1.1	V	11.6	1.30	9.40	19.70	33
20 MHz Bandwidth									
1880.00	80.96	72	1.5	H	11.3	1.30	9.40	19.40	33
1880.00	80.79	197	1.6	V	10.9	1.30	9.40	19.00	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	81.93	80	1.3	H	12.3	1.30	9.40	20.40	33
1880.00	82.66	73	1.7	V	12.8	1.30	9.40	20.90	33
3 MHz Bandwidth									
1880.00	81.60	53	1.0	H	11.9	1.30	9.40	20.00	33
1880.00	82.46	16	1.5	V	12.6	1.30	9.40	20.70	33
5 MHz Bandwidth									
1880.00	81.79	179	1.2	H	12.1	1.30	9.40	20.20	33
1880.00	82.33	296	1.6	V	12.4	1.30	9.40	20.50	33
10 MHz Bandwidth									
1880.00	81.42	246	2.1	H	11.7	1.30	9.40	19.80	33
1880.00	81.74	334	1.7	V	11.8	1.30	9.40	19.90	33
15 MHz Bandwidth									
1880.00	81.35	285	2.0	H	11.7	1.30	9.40	19.80	33
1880.00	81.49	182	1.4	V	11.6	1.30	9.40	19.70	33
20 MHz Bandwidth									
1880.00	81.14	178	2.3	H	11.5	1.30	9.40	19.60	33
1880.00	81.23	349	1.9	V	11.3	1.30	9.40	19.40	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	21.26	21.38	21.45
		RB Size=1, RB Offset=2	21.12	21.50	21.12
		RB Size=1, RB Offset=5	21.38	21.29	21.20
		RB Size=3, RB Offset=0	21.36	21.17	21.20
		RB Size=3, RB Offset=1	21.48	21.58	21.40
		RB Size=3, RB Offset=2	21.14	21.13	21.42
		RB Size=6, RB Offset=0	21.55	21.36	21.57
	16QAM	RB Size=1, RB Offset=0	21.36	21.08	21.35
		RB Size=1, RB Offset=2	21.53	21.49	21.36
		RB Size=1, RB Offset=5	21.23	21.63	21.37
		RB Size=3, RB Offset=0	21.01	21.39	21.52
		RB Size=3, RB Offset=1	21.55	21.12	21.53
		RB Size=3, RB Offset=2	21.46	21.36	21.46
		RB Size=6, RB Offset=0	21.37	21.35	21.41
3.0	QPSK	RB Size=1, RB Offset=0	21.29	21.43	21.48
		RB Size=1, RB Offset=7	21.02	21.39	21.16
		RB Size=1, RB Offset=14	21.04	21.30	21.63
		RB Size=8, RB Offset=0	21.24	21.28	21.38
		RB Size=8, RB Offset=4	21.05	21.52	21.36
		RB Size=8, RB Offset=7	21.11	21.15	21.38
		RB Size=15, RB Offset=0	21.56	21.20	21.58
	16QAM	RB Size=1, RB Offset=0	21.25	21.16	21.32
		RB Size=1, RB Offset=7	21.27	21.38	21.32
		RB Size=1, RB Offset=14	21.15	21.66	21.6
		RB Size=8, RB Offset=0	21.08	21.25	21.25
		RB Size=8, RB Offset=4	21.23	21.71	21.55
		RB Size=8, RB Offset=7	21.43	21.28	21.53
		RB Size=15, RB Offset=0	21.17	21.69	21.35

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.35	21.44	21.53
		RB Size=1, RB Offset=12	21.63	21.58	21.23
		RB Size=1, RB Offset=24	21.30	21.30	21.62
		RB Size=12, RB Offset=0	21.59	21.35	21.53
		RB Size=12, RB Offset=6	21.54	21.29	21.66
		RB Size=12, RB Offset=11	21.23	21.56	21.60
		RB Size=25, RB Offset=0	21.32	21.51	21.48
	16QAM	RB Size=1, RB Offset=0	21.11	21.73	21.72
		RB Size=1, RB Offset=12	21.32	21.42	21.29
		RB Size=1, RB Offset=24	21.05	21.66	21.47
		RB Size=12, RB Offset=0	21.10	21.56	21.49
		RB Size=12, RB Offset=6	21.12	21.31	21.70
		RB Size=12, RB Offset=11	21.17	21.17	21.53
		RB Size=25, RB Offset=0	21.21	21.55	21.26
10.0	QPSK	RB Size=1, RB Offset=0	21.42	21.48	21.55
		RB Size=1, RB Offset=24	21.60	21.54	21.51
		RB Size=1, RB Offset=49	21.71	21.39	21.62
		RB Size=25, RB Offset=0	21.28	21.35	21.69
		RB Size=25, RB Offset=12	21.71	21.44	21.61
		RB Size=25, RB Offset=24	21.15	21.56	21.63
		RB Size=50, RB Offset=0	21.19	21.23	21.39
	16QAM	RB Size=1, RB Offset=0	21.48	21.65	21.36
		RB Size=1, RB Offset=24	21.32	21.60	21.50
		RB Size=1, RB Offset=49	21.46	21.68	21.75
		RB Size=25, RB Offset=0	21.41	21.48	21.57
		RB Size=25, RB Offset=12	21.37	21.21	21.37
		RB Size=25, RB Offset=24	21.61	21.58	21.47
		RB Size=50, RB Offset=0	21.20	21.27	21.43

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	21.40	21.45	21.58
		RB Size=1, RB Offset=37	21.18	21.34	21.58
		RB Size=1, RB Offset=74	21.15	21.49	21.60
		RB Size=36, RB Offset=0	21.17	21.41	21.39
		RB Size=36, RB Offset=18	21.22	21.24	21.65
		RB Size=36, RB Offset=37	21.23	21.43	21.72
		RB Size=75, RB Offset=0	21.26	21.60	21.41
	16QAM	RB Size=1, RB Offset=0	21.40	21.74	21.53
		RB Size=1, RB Offset=37	21.63	21.35	21.45
		RB Size=1, RB Offset=74	21.18	21.29	21.60
		RB Size=36, RB Offset=0	21.56	21.32	21.60
		RB Size=36, RB Offset=18	21.64	21.64	21.80
		RB Size=36, RB Offset=37	21.61	21.52	21.30
		RB Size=75, RB Offset=0	21.62	21.73	21.43
20.0	QPSK	RB Size=1, RB Offset=0	21.33	21.38	21.49
		RB Size=1, RB Offset=49	21.17	21.53	21.14
		RB Size=1, RB Offset=99	21.19	21.21	21.50
		RB Size=50, RB Offset=0	21.16	21.31	21.32
		RB Size=50, RB Offset=24	21.53	21.26	21.50
		RB Size=50, RB Offset=49	21.48	21.37	21.18
		RB Size=100, RB Offset=0	21.59	21.18	21.61
	16QAM	RB Size=1, RB Offset=0	21.62	21.59	21.50
		RB Size=1, RB Offset=49	21.25	21.35	21.61
		RB Size=1, RB Offset=99	21.28	21.34	21.31
		RB Size=50, RB Offset=0	21.45	21.12	21.42
		RB Size=50, RB Offset=24	21.10	21.18	21.74
		RB Size=50, RB Offset=49	21.43	21.54	21.63
		RB Size=100, RB Offset=0	21.08	21.41	21.68

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.46	13	Pass
QPSK (100RB Size)	4.38	13	Pass
16QAM (1RB Size)	4.44	13	Pass
16QAM (100RB Size)	4.69	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	85.33	220	1.6	H	12.0	1.30	8.90	19.60	30
1732.50	85.71	166	1.2	V	13.0	1.30	8.90	20.60	30
3 MHz Bandwidth									
1732.50	85.15	170	2.0	H	11.8	1.30	8.90	19.40	30
1732.50	85.58	80	1.9	V	12.9	1.30	8.90	20.50	30
5 MHz Bandwidth									
1732.50	85.01	336	1.6	H	11.7	1.30	8.90	19.30	30
1732.50	85.29	331	1.9	V	12.6	1.30	8.90	20.20	30
10 MHz Bandwidth									
1732.50	84.87	155	2.1	H	11.5	1.30	8.90	19.10	30
1732.50	85.03	312	1.0	V	12.3	1.30	8.90	19.90	30
15 MHz Bandwidth									
1732.50	84.62	151	1.7	H	11.3	1.30	8.90	18.90	30
1732.50	84.85	289	1.1	V	12.1	1.30	8.90	19.70	30
20 MHz Bandwidth									
1732.50	84.30	263	1.6	H	11.0	1.30	8.90	18.60	30
1732.50	84.93	97	1.4	V	12.2	1.30	8.90	19.80	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	85.88	290	1.8	H	12.6	1.30	8.90	20.20	30
1732.50	86.10	81	2.0	V	13.4	1.30	8.90	21.00	30
3 MHz Bandwidth									
1732.50	85.60	67	2.0	H	12.3	1.30	8.90	19.90	30
1732.50	85.77	148	1.6	V	13.0	1.30	8.90	20.60	30
5 MHz Bandwidth									
1732.50	85.49	36	1.3	H	12.2	1.30	8.90	19.80	30
1732.50	85.63	354	1.9	V	12.9	1.30	8.90	20.50	30
10 MHz Bandwidth									
1732.50	85.33	350	1.1	H	12.0	1.30	8.90	19.60	30
1732.50	85.15	244	2.3	V	12.4	1.30	8.90	20.00	30
15 MHz Bandwidth									
1732.50	85.16	333	1.7	H	11.8	1.30	8.90	19.40	30
1732.50	84.69	349	2.2	V	12.0	1.30	8.90	19.60	30
20 MHz Bandwidth									
1732.50	84.71	253	1.7	H	11.4	1.30	8.90	19.00	30
1732.50	84.56	330	1.1	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	21.68	21.78	21.56
		RB Size=1, RB Offset=2	21.78	21.88	21.39
		RB Size=1, RB Offset=5	21.97	21.59	21.54
		RB Size=3, RB Offset=0	21.73	21.89	21.55
		RB Size=3, RB Offset=1	21.82	21.77	21.66
		RB Size=3, RB Offset=2	21.82	21.79	21.29
		RB Size=6, RB Offset=0	21.91	21.76	21.26
	16QAM	RB Size=1, RB Offset=0	21.92	21.99	21.77
		RB Size=1, RB Offset=2	21.55	21.50	21.43
		RB Size=1, RB Offset=5	21.70	21.88	21.50
		RB Size=3, RB Offset=0	21.79	21.53	21.80
		RB Size=3, RB Offset=1	21.53	22.03	21.63
		RB Size=3, RB Offset=2	21.84	21.61	21.48
		RB Size=6, RB Offset=0	21.63	21.97	21.82
3.0	QPSK	RB Size=1, RB Offset=0	21.65	21.74	21.58
		RB Size=1, RB Offset=7	21.67	21.81	21.34
		RB Size=1, RB Offset=14	21.61	21.94	21.30
		RB Size=8, RB Offset=0	21.40	21.88	21.53
		RB Size=8, RB Offset=4	21.52	21.94	21.36
		RB Size=8, RB Offset=7	21.44	21.56	21.54
		RB Size=15, RB Offset=0	21.57	21.58	21.61
	16QAM	RB Size=1, RB Offset=0	21.80	21.85	21.76
		RB Size=1, RB Offset=7	21.55	22.02	21.42
		RB Size=1, RB Offset=14	21.62	21.69	21.46
		RB Size=8, RB Offset=0	21.56	21.83	21.57
		RB Size=8, RB Offset=4	21.46	21.87	21.78
		RB Size=8, RB Offset=7	21.56	21.46	21.53
		RB Size=15, RB Offset=0	21.55	21.92	21.29

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.63	21.73	21.56
		RB Size=1, RB Offset=12	21.90	21.90	21.43
		RB Size=1, RB Offset=24	21.35	21.81	21.23
		RB Size=12, RB Offset=0	21.61	21.86	21.49
		RB Size=12, RB Offset=6	21.37	21.60	21.64
		RB Size=12, RB Offset=11	21.80	21.75	21.60
		RB Size=25, RB Offset=0	21.63	21.77	21.54
	16QAM	RB Size=1, RB Offset=0	21.33	21.54	21.74
		RB Size=1, RB Offset=12	21.68	21.77	21.83
		RB Size=1, RB Offset=24	21.37	21.67	21.62
		RB Size=12, RB Offset=0	21.54	21.93	21.77
		RB Size=12, RB Offset=6	21.53	21.72	21.49
		RB Size=12, RB Offset=11	21.40	21.56	21.78
		RB Size=25, RB Offset=0	21.66	21.47	21.54
10.0	QPSK	RB Size=1, RB Offset=0	21.58	21.69	21.59
		RB Size=1, RB Offset=24	21.45	21.58	21.46
		RB Size=1, RB Offset=49	21.75	21.62	21.43
		RB Size=25, RB Offset=0	21.47	21.51	21.27
		RB Size=25, RB Offset=12	21.72	21.45	21.71
		RB Size=25, RB Offset=24	21.82	21.78	21.45
		RB Size=50, RB Offset=0	21.76	21.59	21.58
	16QAM	RB Size=1, RB Offset=0	21.87	21.99	21.77
		RB Size=1, RB Offset=24	21.35	21.88	21.51
		RB Size=1, RB Offset=49	21.70	21.77	21.63
		RB Size=25, RB Offset=0	21.74	21.76	21.51
		RB Size=25, RB Offset=12	21.58	21.68	21.62
		RB Size=25, RB Offset=24	21.86	21.55	21.73
		RB Size=50, RB Offset=0	21.52	21.71	21.74

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.38	13	Pass
QPSK (50RB Size)	4.88	13	Pass
16QAM (1RB Size)	4.49	13	Pass
16QAM (50RB Size)	4.45	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 (dBd)		
Middle Channel									
1.4 MHz Bandwidth									
836.50	73.20	89	1.8	H	13.8	1.90	0.0	11.90	38.45
836.50	78.59	139	1.6	V	18.6	1.90	0.0	16.70	38.45
3 MHz Bandwidth									
836.50	73.18	184	2.4	H	13.8	1.90	0.0	11.90	38.45
836.50	78.93	88	1.2	V	18.9	1.90	0.0	17.00	38.45
5 MHz Bandwidth									
836.50	73.39	39	1.8	H	14.0	1.90	0.0	12.10	38.45
836.50	78.49	24	1.6	V	18.5	1.90	0.0	16.60	38.45
10 MHz Bandwidth									
836.50	72.90	254	2.3	H	13.5	1.90	0.0	11.60	38.45
836.50	78.70	304	2.0	V	18.7	1.90	0.0	16.80	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 (dBd)		
Middle Channel									
1.4 MHz Bandwidth									
836.50	72.90	258	2.3	H	13.5	1.90	0.0	11.60	38.45
836.50	78.40	237	1.3	V	18.4	1.90	0.0	16.50	38.45
3 MHz Bandwidth									
836.50	73.58	105	1.7	H	14.2	1.90	0.0	12.30	38.45
836.50	78.72	266	1.3	V	18.7	1.90	0.0	16.80	38.45
5 MHz Bandwidth									
836.50	73.13	15	1.8	H	13.8	1.90	0.0	11.90	38.45
836.50	78.48	68	1.7	V	18.5	1.90	0.0	16.60	38.45
10 MHz Bandwidth									
836.50	73.79	181	2.0	H	14.4	1.90	0.0	12.50	38.45
836.50	78.19	303	2.0	V	18.2	1.90	0.0	16.30	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	21.48	21.57	21.52
		RB Size=1, RB Offset=12	21.20	21.47	21.47
		RB Size=1, RB Offset=24	21.66	21.53	21.21
		RB Size=12, RB Offset=0	21.54	21.74	21.58
		RB Size=12, RB Offset=6	21.46	21.40	21.35
		RB Size=12, RB Offset=11	21.73	21.68	21.41
		RB Size=25, RB Offset=0	21.69	21.60	21.55
	16QAM	RB Size=1, RB Offset=0	21.18	21.58	21.38
		RB Size=1, RB Offset=12	21.31	21.73	21.79
		RB Size=1, RB Offset=24	21.33	21.76	21.46
		RB Size=12, RB Offset=0	21.30	21.31	21.26
		RB Size=12, RB Offset=6	21.74	21.44	21.59
		RB Size=12, RB Offset=11	21.69	21.75	21.24
		RB Size=25, RB Offset=0	21.64	21.55	21.68
10	QPSK	RB Size=1, RB Offset=0	21.44	21.55	21.48
		RB Size=1, RB Offset=24	21.42	21.44	21.60
		RB Size=1, RB Offset=49	21.31	21.47	21.43
		RB Size=25, RB Offset=0	21.61	21.48	21.23
		RB Size=25, RB Offset=12	21.26	21.41	21.45
		RB Size=25, RB Offset=24	21.21	21.26	21.46
		RB Size=50, RB Offset=0	21.35	21.70	21.43
	16QAM	RB Size=1, RB Offset=0	21.53	21.64	21.75
		RB Size=1, RB Offset=24	21.25	21.65	21.45
		RB Size=1, RB Offset=49	21.59	21.33	21.39
		RB Size=25, RB Offset=0	21.68	21.60	21.78
		RB Size=25, RB Offset=12	21.71	21.67	21.31
		RB Size=25, RB Offset=24	21.18	21.42	21.43
		RB Size=50, RB Offset=0	21.43	21.73	21.73

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	21.46	21.59	21.43
		RB Size=1, RB Offset=37	21.66	21.71	21.53
		RB Size=1, RB Offset=74	21.72	21.58	21.27
		RB Size=36, RB Offset=0	21.64	21.60	21.53
		RB Size=36, RB Offset=18	21.74	21.30	21.21
		RB Size=36, RB Offset=37	21.43	21.55	21.49
		RB Size=75, RB Offset=0	21.29	21.43	21.37
	16QAM	RB Size=1, RB Offset=0	21.70	21.86	21.32
		RB Size=1, RB Offset=37	21.55	21.33	21.59
		RB Size=1, RB Offset=74	21.37	21.65	21.67
		RB Size=36, RB Offset=0	21.22	21.73	21.34
		RB Size=36, RB Offset=18	21.31	21.68	21.4
		RB Size=36, RB Offset=37	21.74	21.73	21.53
		RB Size=75, RB Offset=0	21.20	21.61	21.49
20	QPSK	RB Size=1, RB Offset=0	21.43	21.55	21.38
		RB Size=1, RB Offset=49	21.29	21.64	21.52
		RB Size=1, RB Offset=99	21.47	21.63	21.31
		RB Size=50, RB Offset=0	21.29	21.59	21.06
		RB Size=50, RB Offset=24	21.39	21.40	21.36
		RB Size=50, RB Offset=49	21.38	21.53	21.24
		RB Size=100, RB Offset=0	21.48	21.32	21.50
	16QAM	RB Size=1, RB Offset=0	21.34	21.29	21.25
		RB Size=1, RB Offset=49	21.26	21.39	21.41
		RB Size=1, RB Offset=99	21.36	21.75	21.61
		RB Size=50, RB Offset=0	21.62	21.55	21.62
		RB Size=50, RB Offset=24	21.32	21.65	21.21
		RB Size=50, RB Offset=49	21.33	21.77	21.48
		RB Size=100, RB Offset=0	21.20	21.41	21.33

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.90	13	Pass
QPSK (50RB Size)	4.96	13	Pass
16QAM (1RB Size)	4.78	13	Pass
16QAM (50RB Size)	4.64	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	81.56	157	2.0	H	11.4	2.60	10.20	19.00	33
2535.00	82.22	119	1.8	V	12.7	2.60	10.20	20.30	33
10 MHz Bandwidth									
2535.00	80.61	303	1.1	H	10.4	2.60	10.20	18.00	33
2535.00	81.77	238	1.1	V	12.2	2.60	10.20	19.80	33
15 MHz Bandwidth									
2535.00	80.24	231	1.2	H	10.1	2.60	10.20	17.70	33
2535.00	81.30	215	1.5	V	11.7	2.60	10.20	19.30	33
20 MHz Bandwidth									
2535.00	80.01	251	1.6	H	9.8	2.60	10.20	17.40	33
2535.00	81.12	204	1.2	V	11.6	2.60	10.20	19.20	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	81.66	18	2.4	H	11.5	2.60	10.20	19.10	33
2535.00	82.05	198	2.3	V	12.5	2.60	10.20	20.10	33
10 MHz Bandwidth									
2535.00	80.55	122	2.5	H	10.4	2.60	10.20	18.00	33
2535.00	81.83	275	2.3	V	12.3	2.60	10.20	19.90	33
15 MHz Bandwidth									
2535.00	80.39	283	2.4	H	10.2	2.60	10.20	17.80	33
2535.00	81.62	79	1.3	V	12.1	2.60	10.20	19.70	33
20 MHz Bandwidth									
2535.00	80.20	225	2.5	H	10.0	2.60	10.20	17.60	33
2535.00	81.46	114	1.4	V	11.9	2.60	10.20	19.50	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

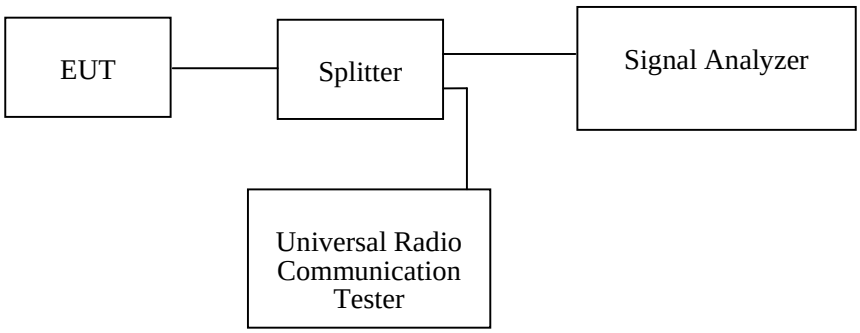
Applicable Standard

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:	24~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Leo Huang from 2019-08-17 to 2019-08-23.

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	248.00	314.28
EGPRS(8PSK)	836.6	250.00	321.79

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.180	4.721
HSUPA (BPSK)	836.6	4.180	4.721
HSDPA (16QAM)	836.6	4.180	4.705

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	244.00	316.42
EGPRS(8PSK)	1880.0	252.00	324.44

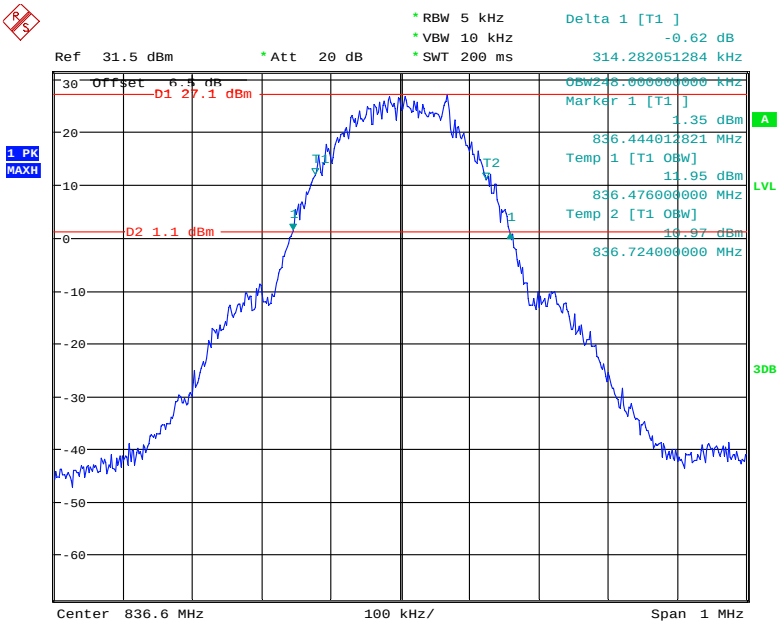
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.180	4.741
HSUPA (BPSK)	1880.0	4.180	4.709
HSDPA (16QAM)	1880.0	4.180	4.741

AWS Band (Part 27)

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1732.6	4.160	4.744
HSUPA (BPSK)	1732.6	4.180	4.744
HSDPA (16QAM)	1732.6	4.200	4.744

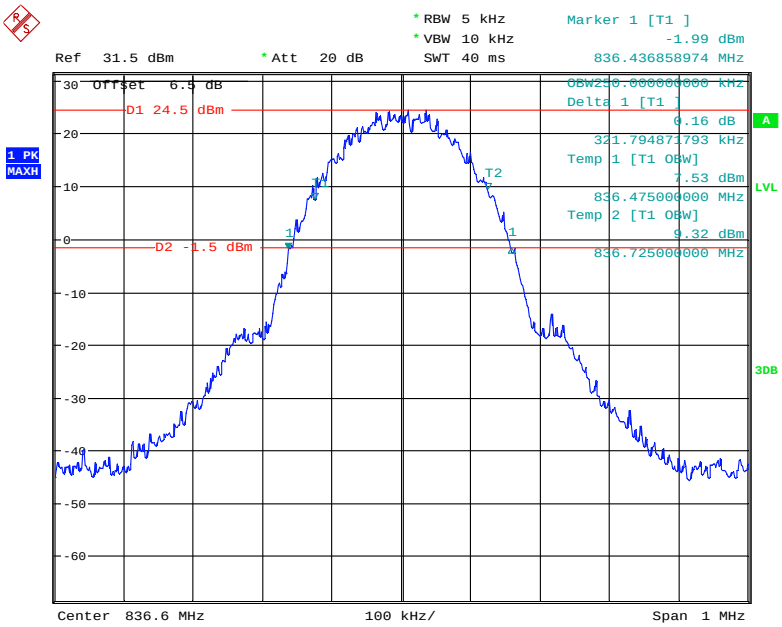
Cellular Band (Part 22H)

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



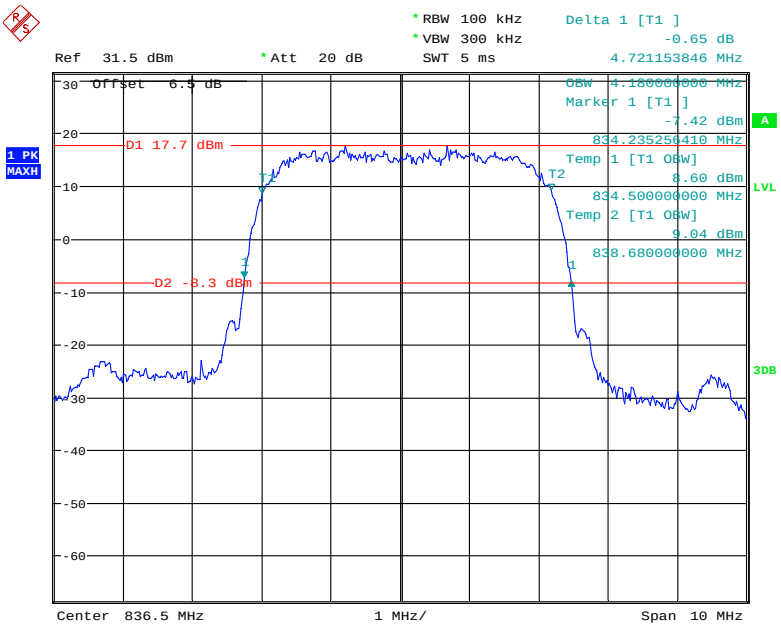
Date: 17.AUG.2019 18:32:00

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



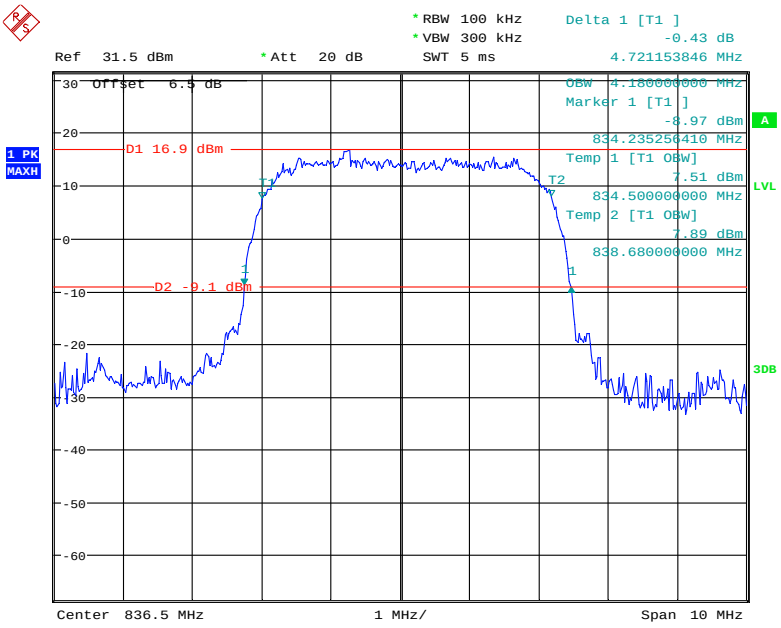
Date: 17.AUG.2019 18:46:47

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



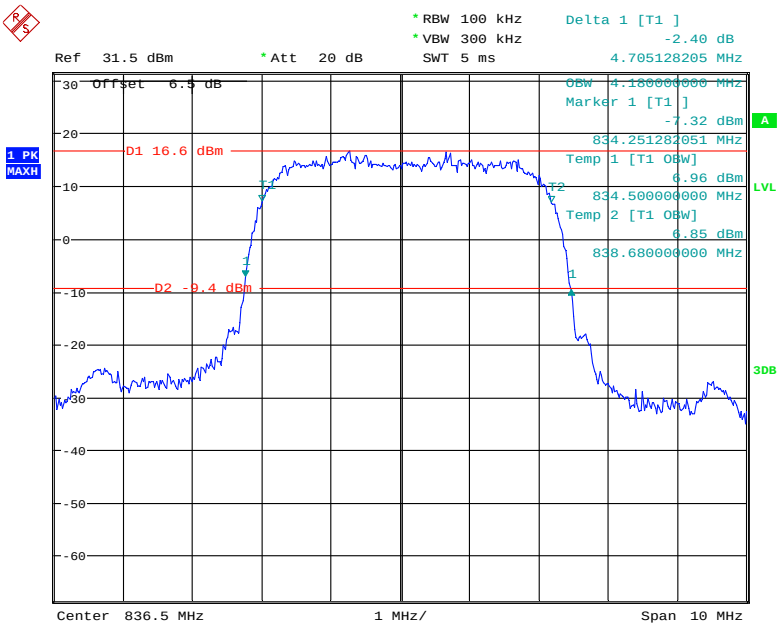
Date: 17.AUG.2019 20:00:28

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



Date: 17.AUG.2019 20:02:24

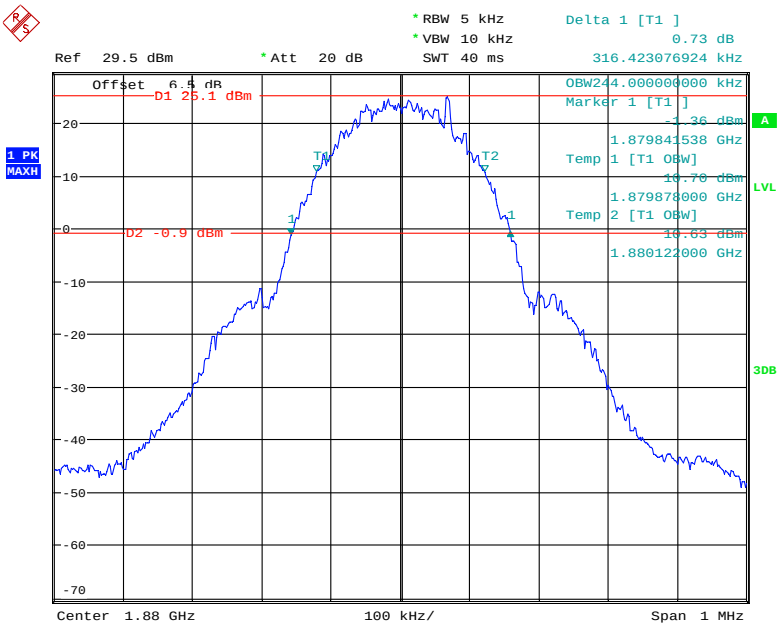
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 17.AUG.2019 20:06:08

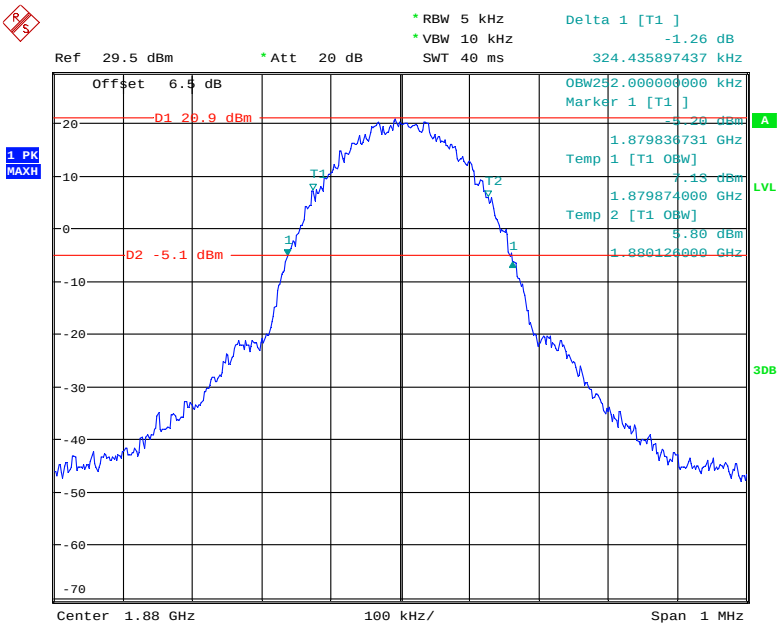
PCS Band (Part 24E)

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



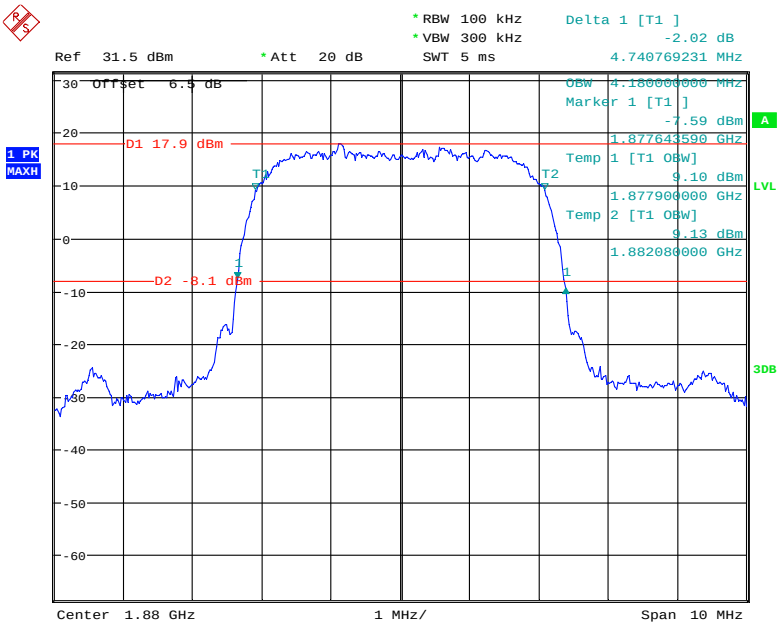
Date: 17.AUG.2019 18:11:27

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



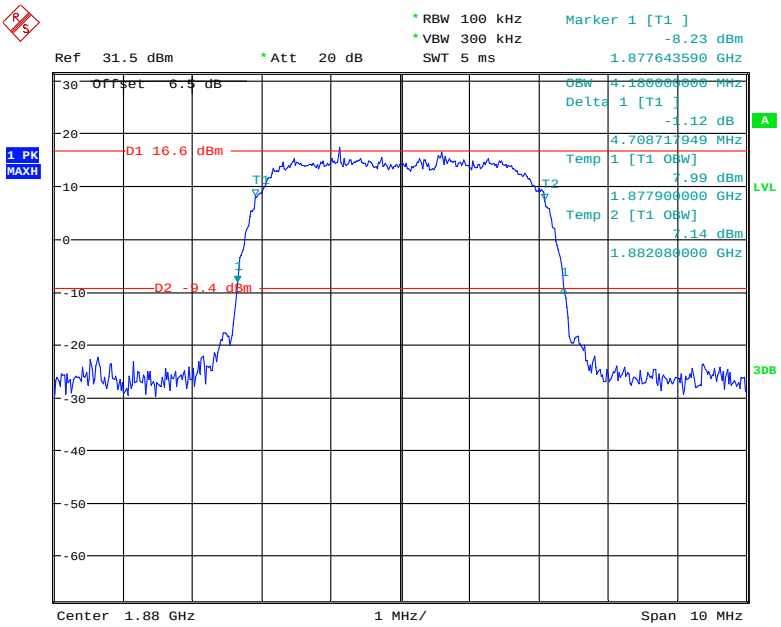
Date: 17.AUG.2019 18:14:55

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



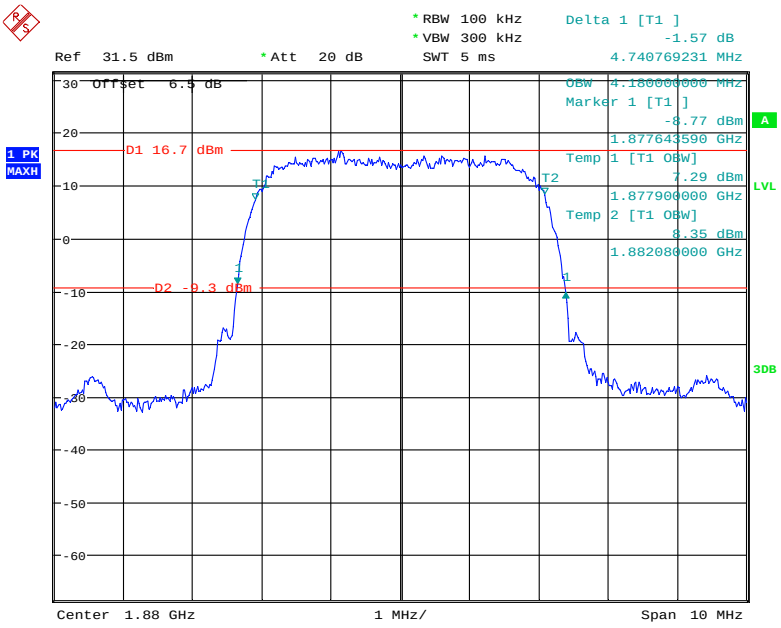
Date: 17.AUG.2019 19:51:19

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



Date: 17.AUG.2019 19:55:40

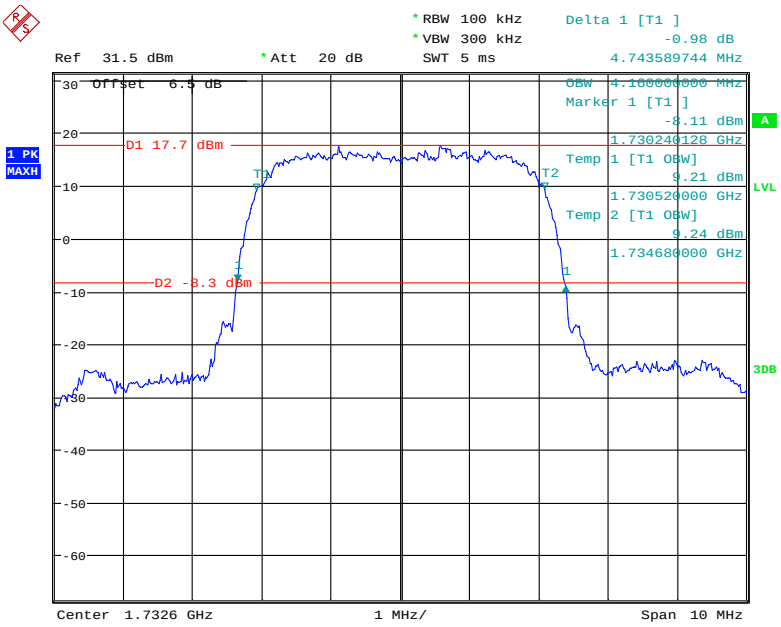
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 17.AUG.2019 19:54:01

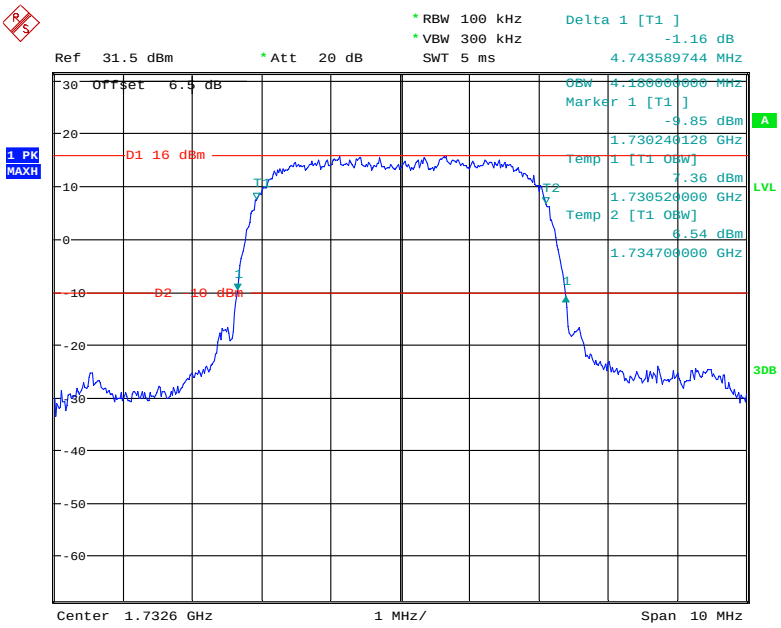
AWS Band (Part 27)

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



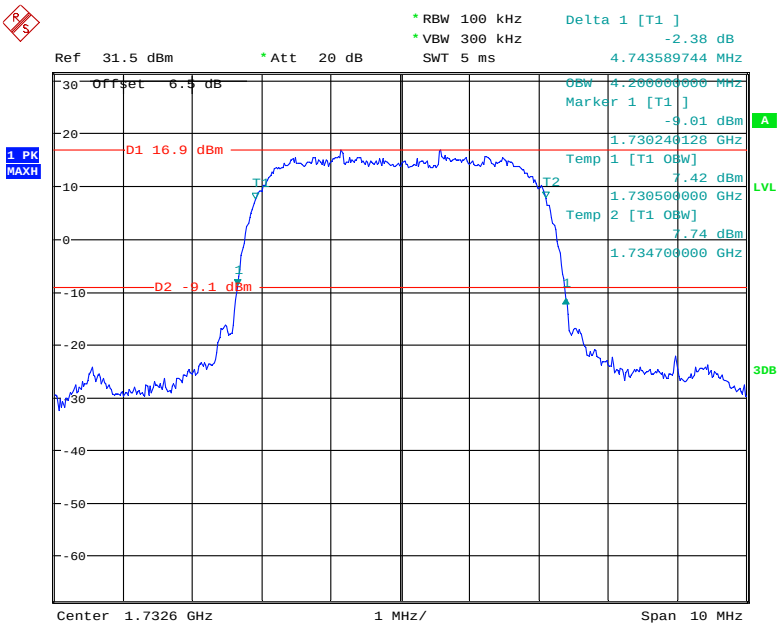
Date: 17.AUG.2019 20:10:08

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



Date: 17.AUG.2019 20:08:55

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

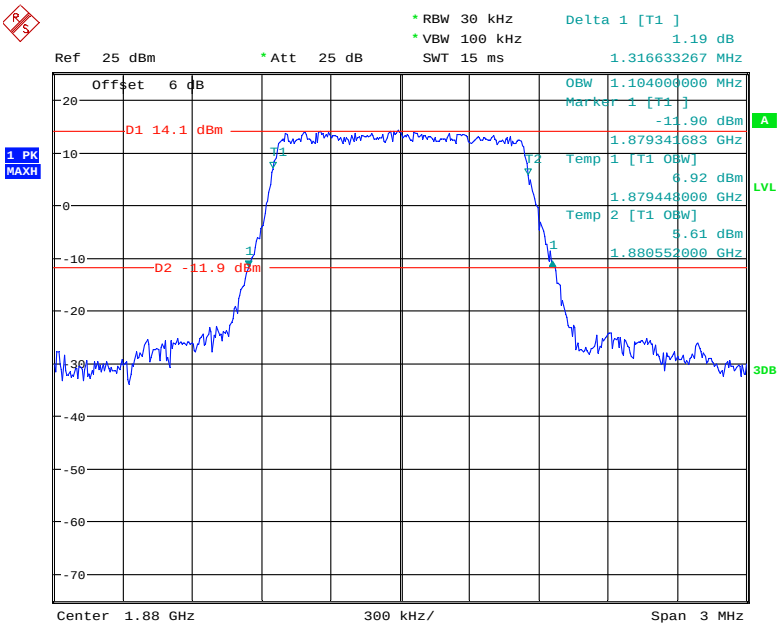


Date: 17.AUG.2019 20:07:57

LTE Band 2: (Middle Channel)

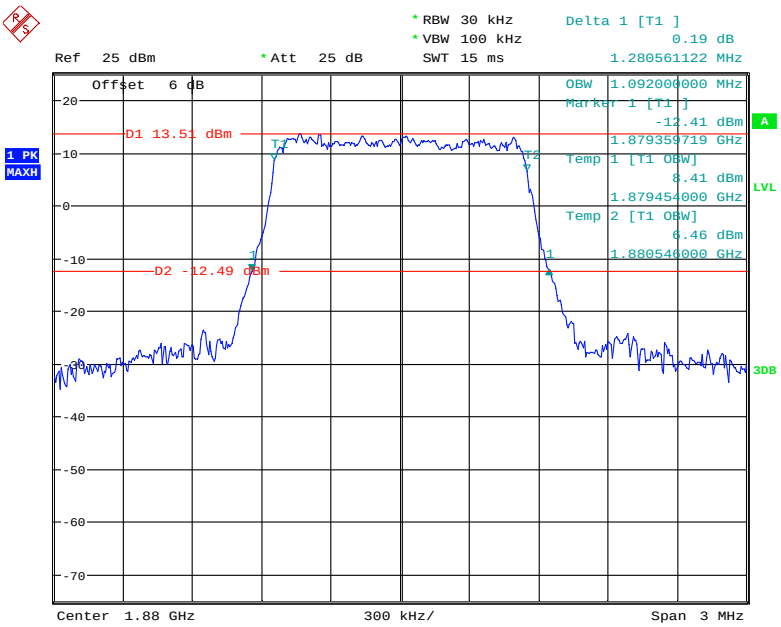
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.104	1.317
	16QAM	1.092	1.281
3.0	QPSK	2.688	2.891
	16QAM	2.688	2.862
5.0	QPSK	4.520	4.892
	16QAM	4.520	4.850
10.0	QPSK	8.960	9.539
	16QAM	8.960	9.459
15.0	QPSK	13.500	14.780
	16QAM	13.500	14.816
20.0	QPSK	18.000	19.078
	16QAM	18.080	19.238

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



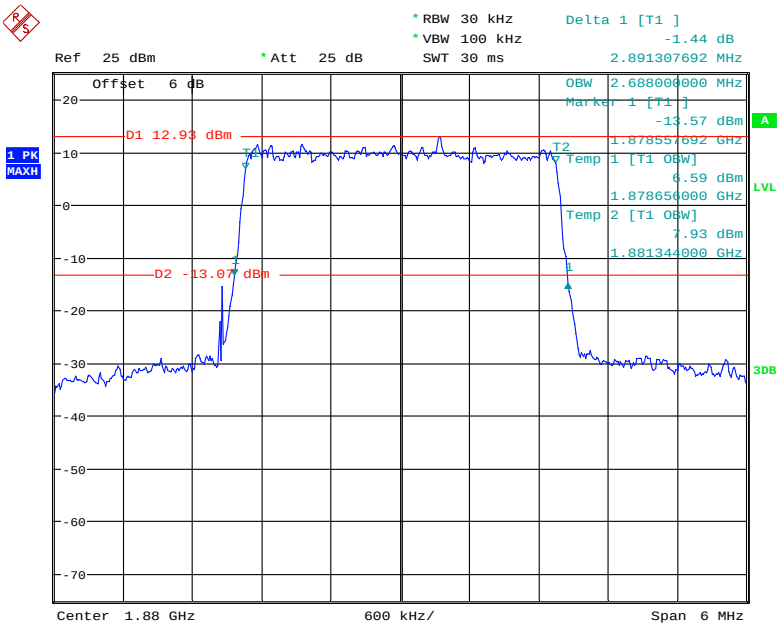
Date: 23.AUG.2019 10:28:29

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



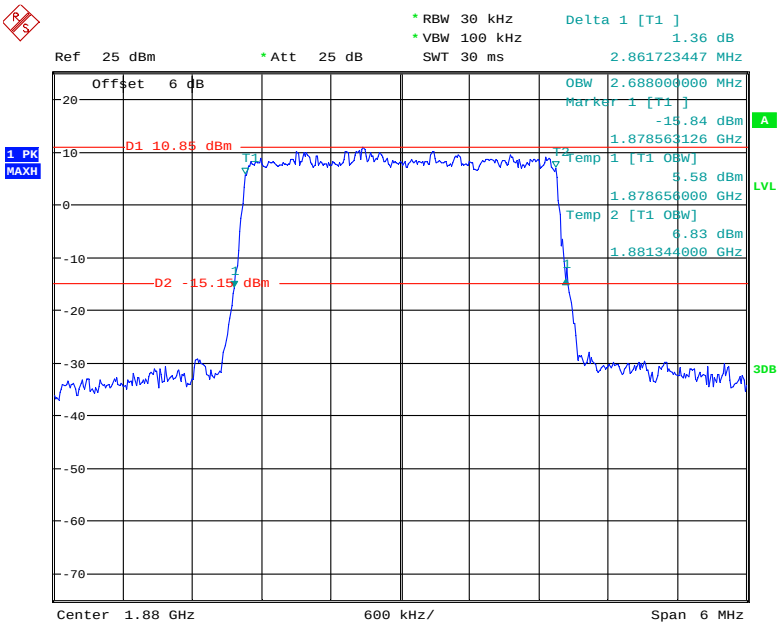
Date: 23.AUG.2019 10:28:51

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



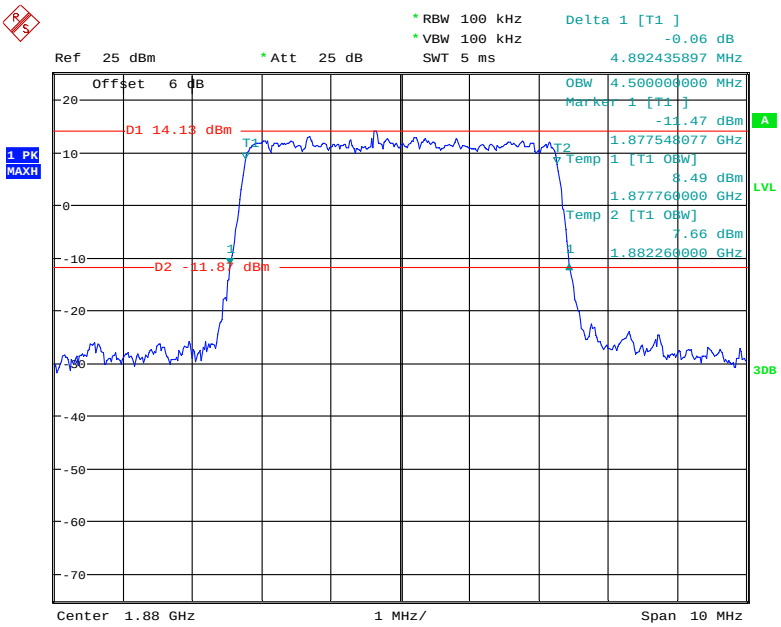
Date: 23.AUG.2019 11:29:08

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



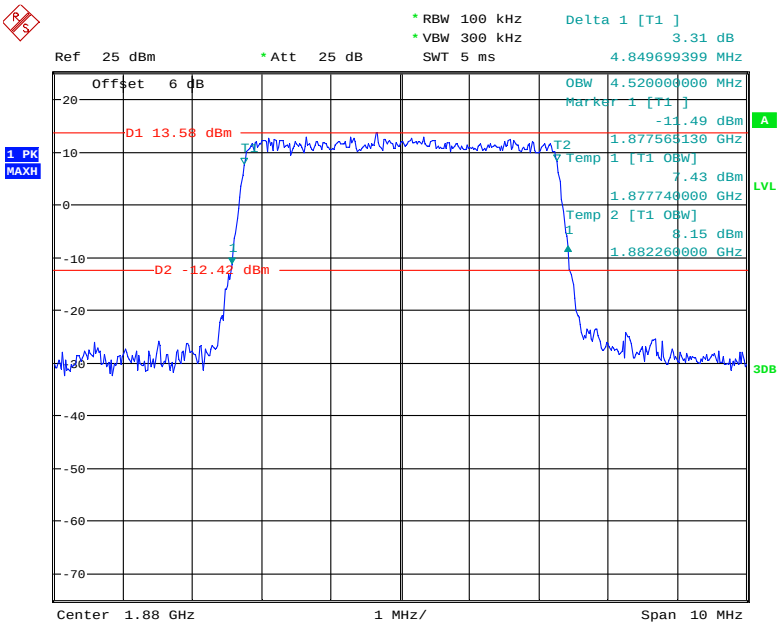
Date: 23.AUG.2019 10:29:26

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



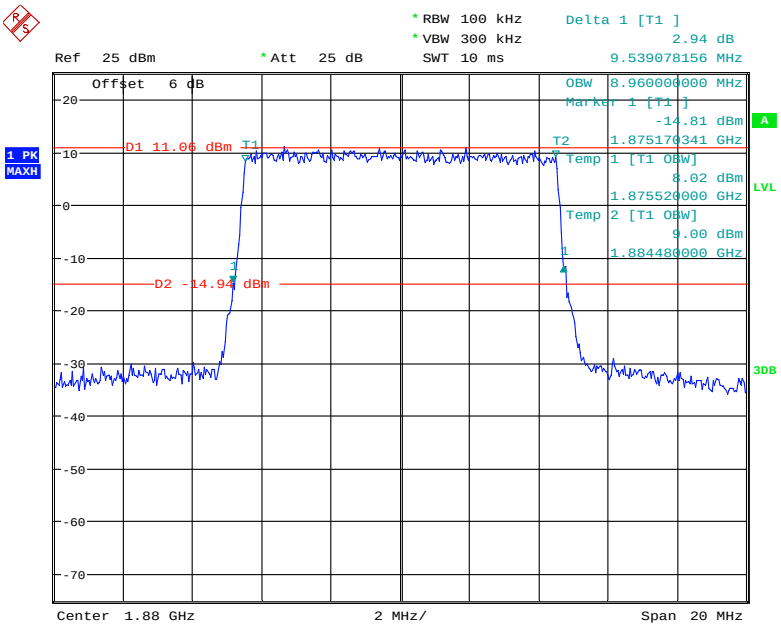
Date: 23.AUG.2019 11:26:47

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



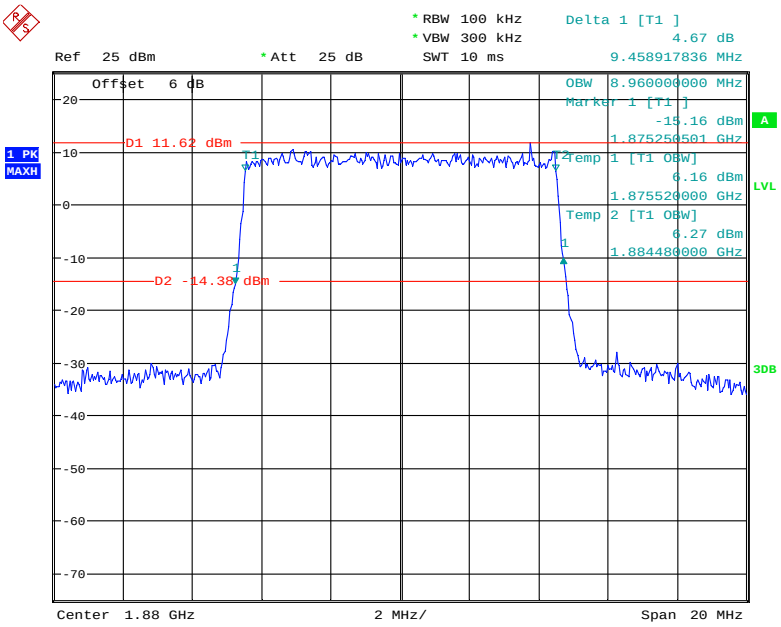
Date: 23.AUG.2019 10:30:04

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



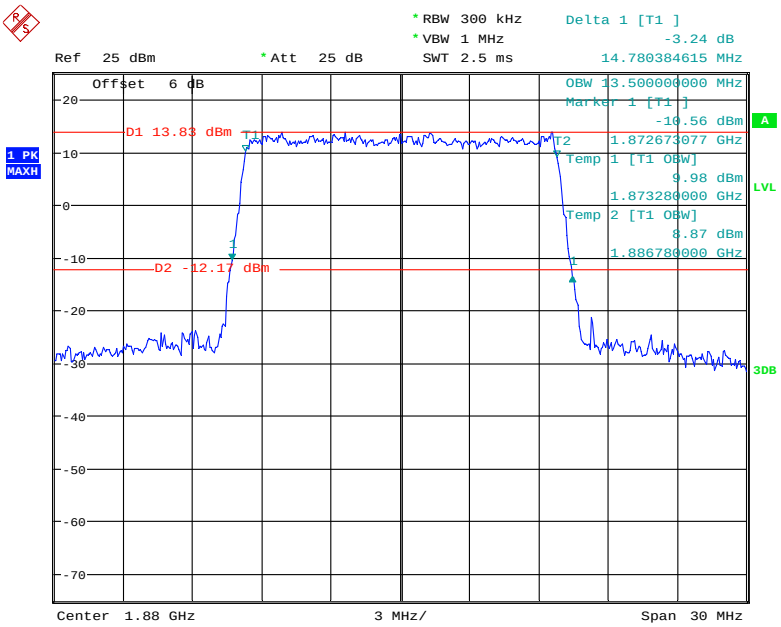
Date: 23.AUG.2019 10:30:25

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



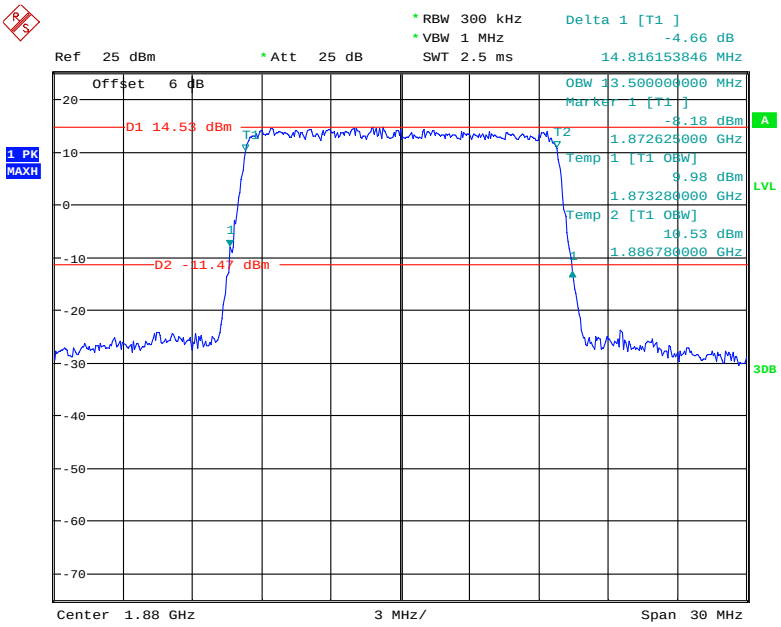
Date: 23.AUG.2019 10:30:44

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



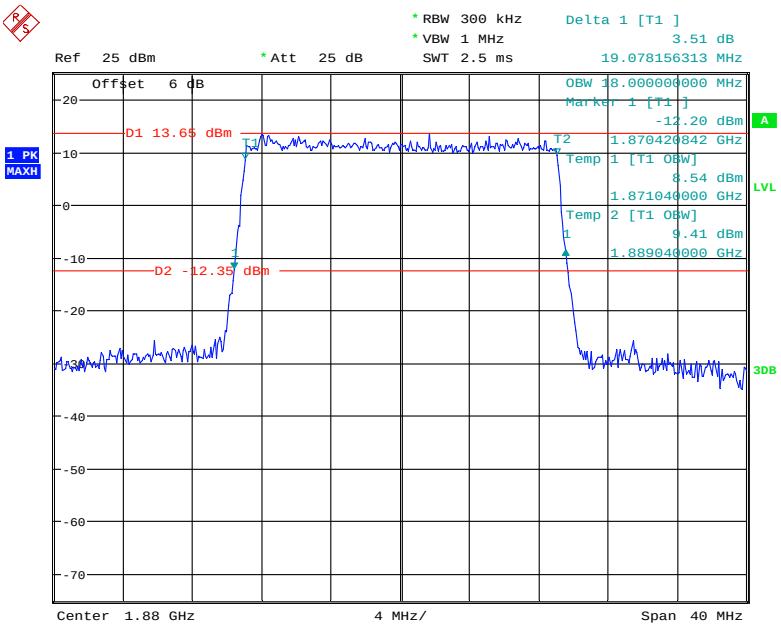
Date: 23.AUG.2019 11:22:09

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



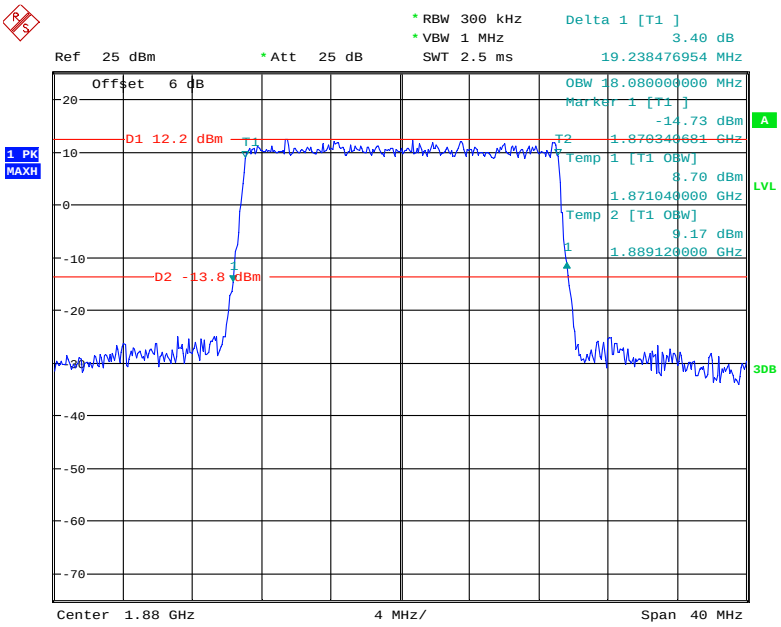
Date: 23.AUG.2019 11:24:14

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



Date: 23.AUG.2019 10:31:57

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

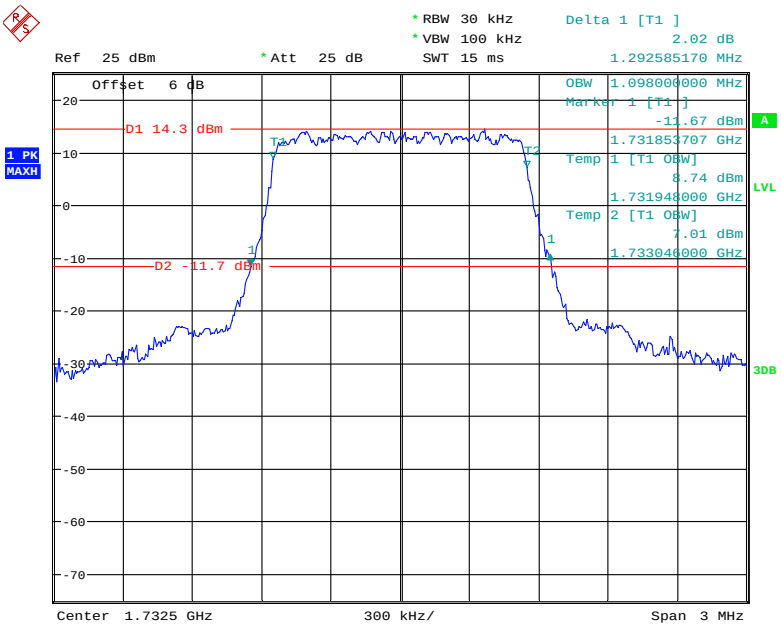


Date: 23.AUG.2019 10:32:18

LTE Band 4: (Middle Channel)

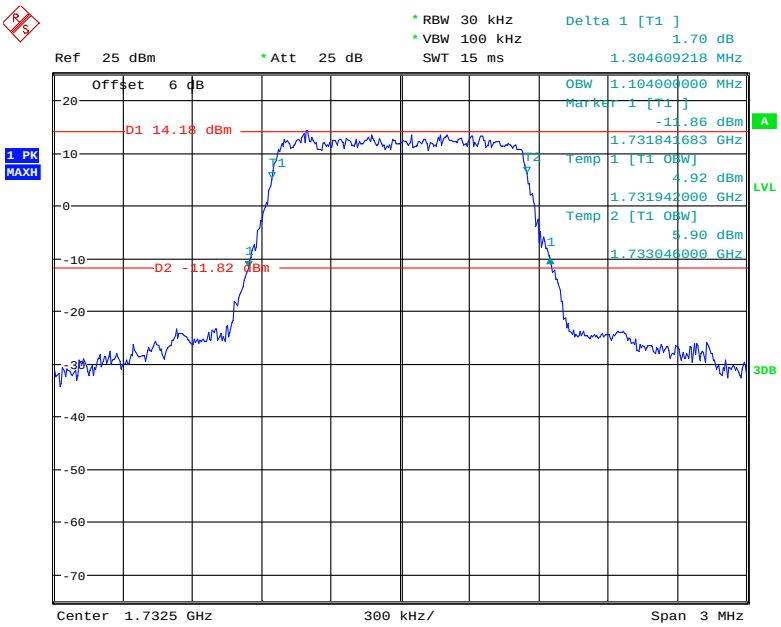
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.098	1.293
	16QAM	1.104	1.305
3.0	QPSK	2.688	2.850
	16QAM	2.688	2.891
5.0	QPSK	4.520	4.890
	16QAM	4.520	5.389
10.0	QPSK	9.000	9.820
	16QAM	8.960	9.499
15.0	QPSK	13.620	16.052
	16QAM	13.620	16.232
20.0	QPSK	18.000	19.158
	16QAM	18.000	19.489

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



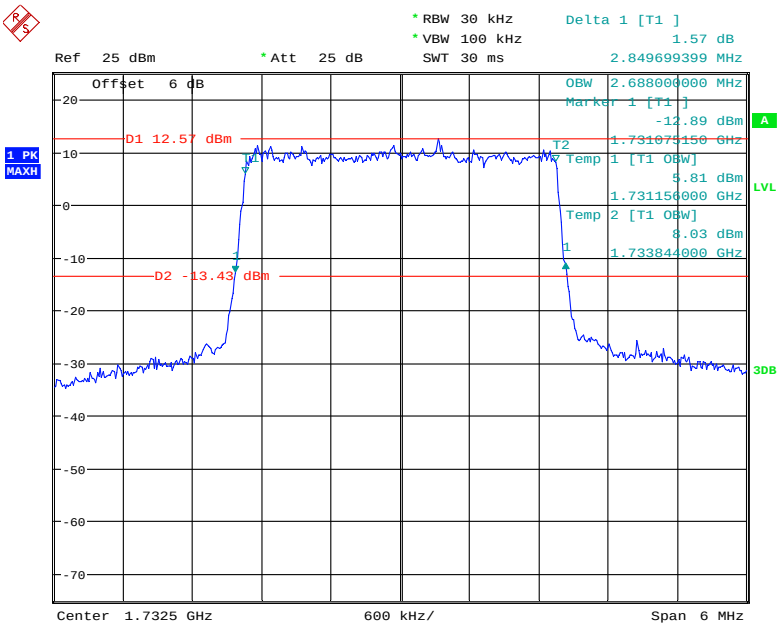
Date: 23.AUG.2019 10:32:39

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



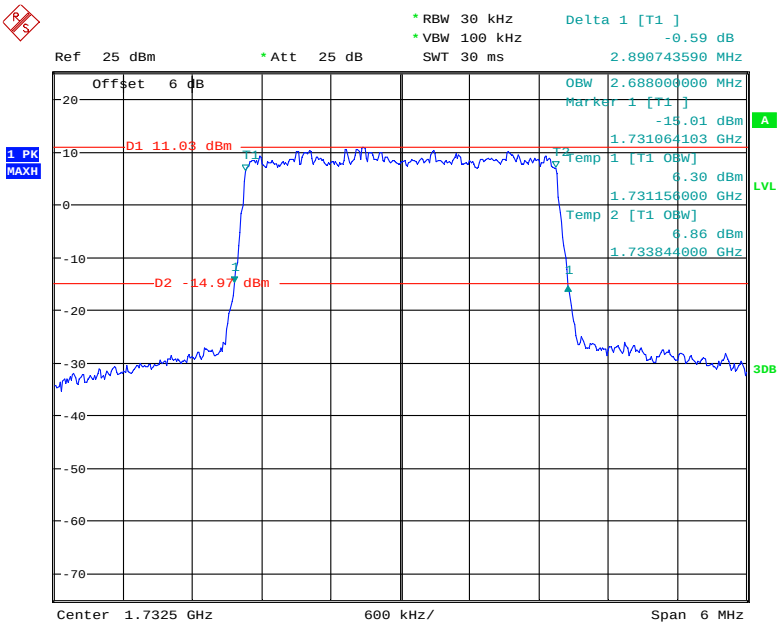
Date: 23.AUG.2019 10:32:56

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



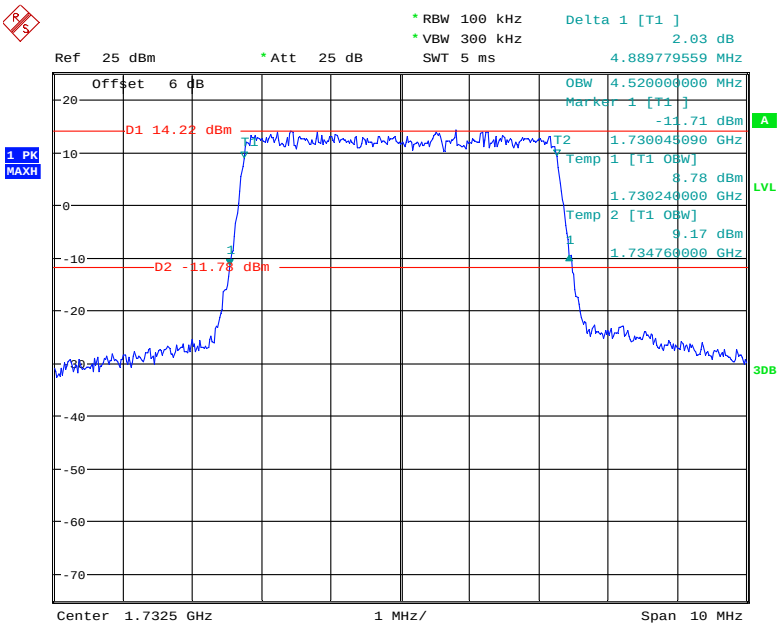
Date: 23.AUG.2019 10:33:16

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



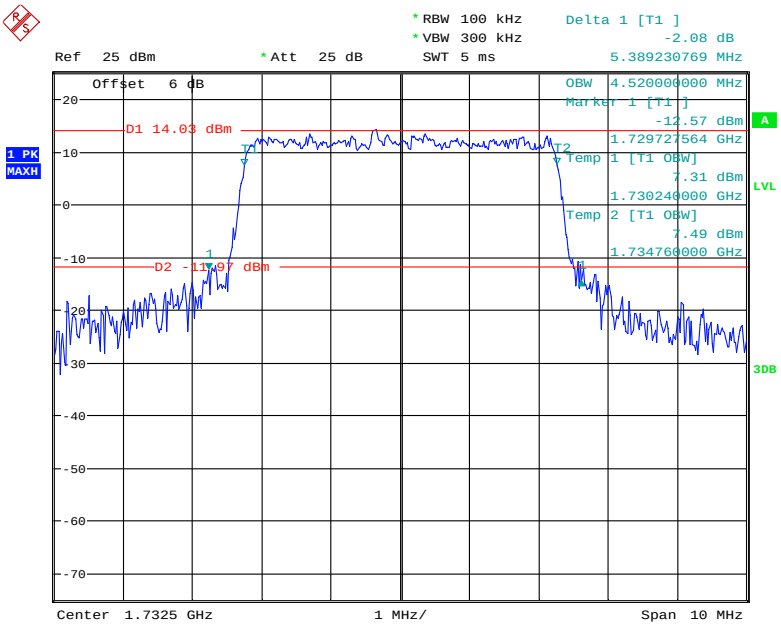
Date: 23.AUG.2019 11:19:30

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



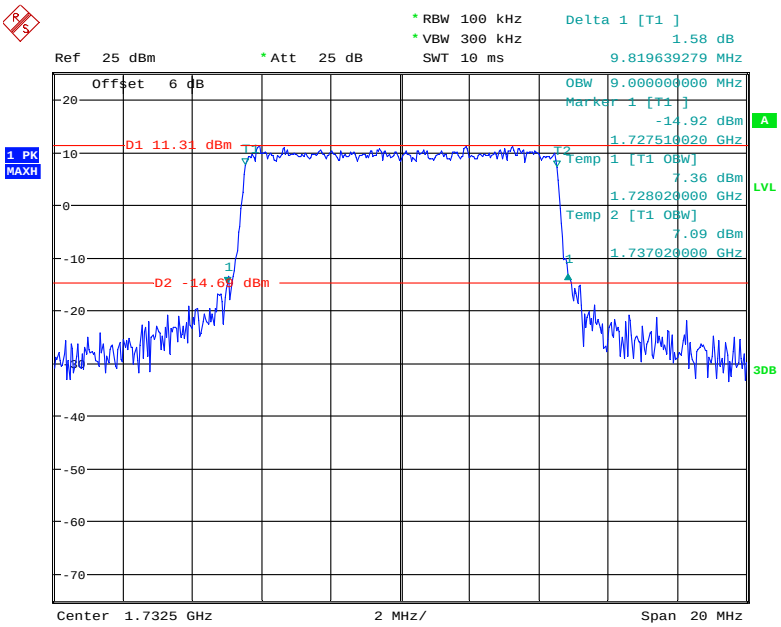
Date: 23.AUG.2019 10:33:54

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



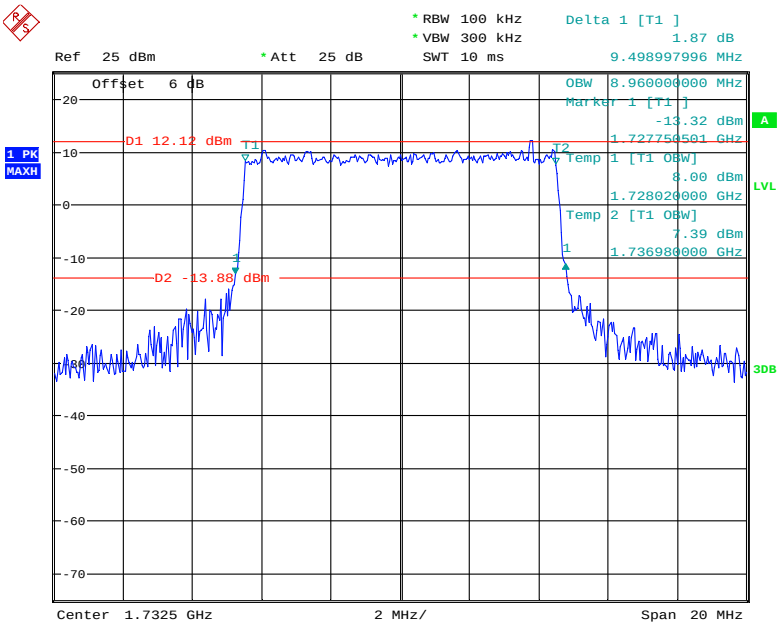
Date: 23.AUG.2019 11:17:07

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



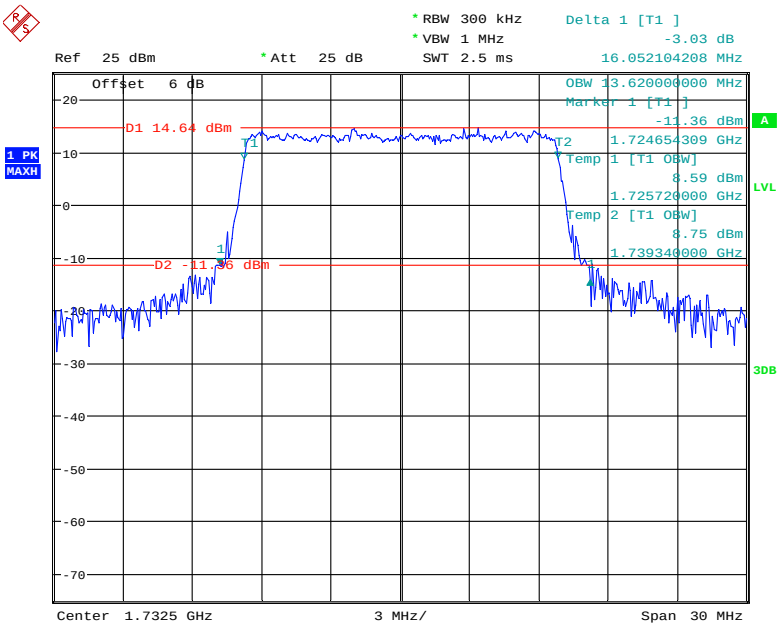
Date: 23.AUG.2019 10:34:42

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



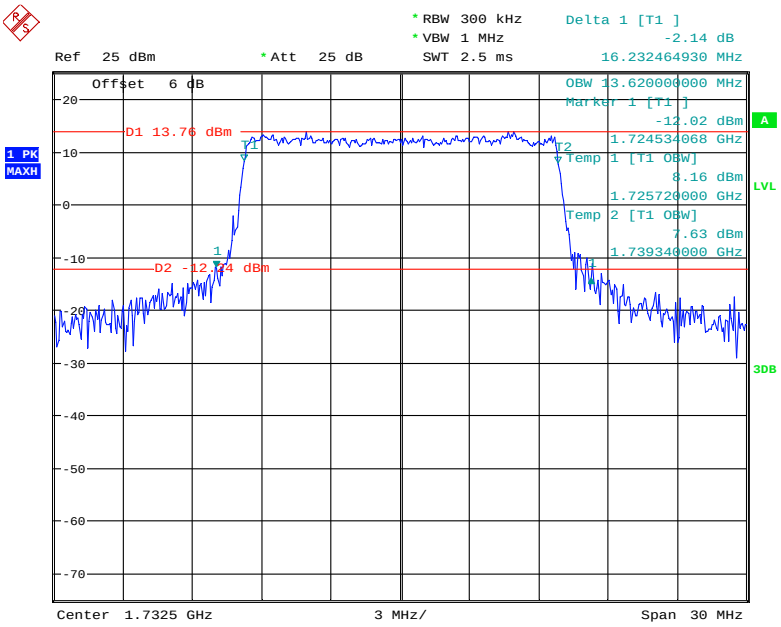
Date: 23.AUG.2019 10:35:13

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



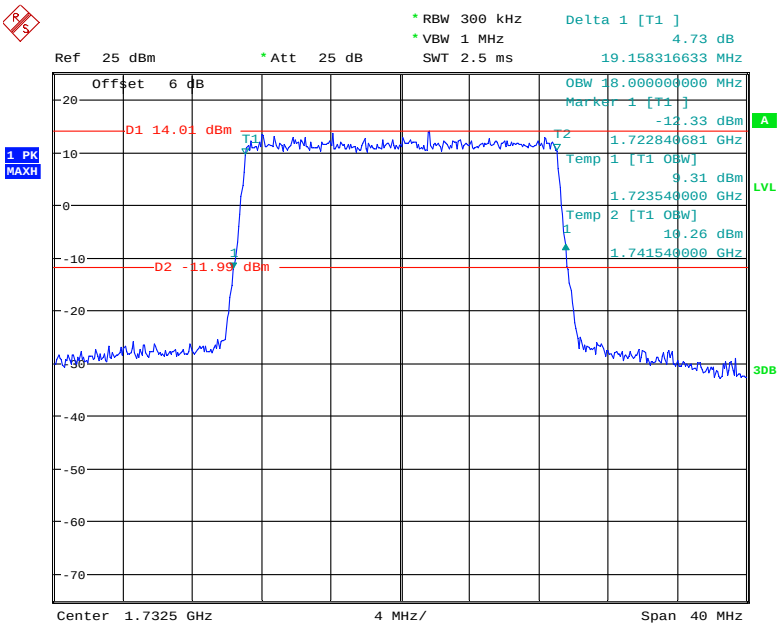
Date: 23.AUG.2019 10:35:58

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



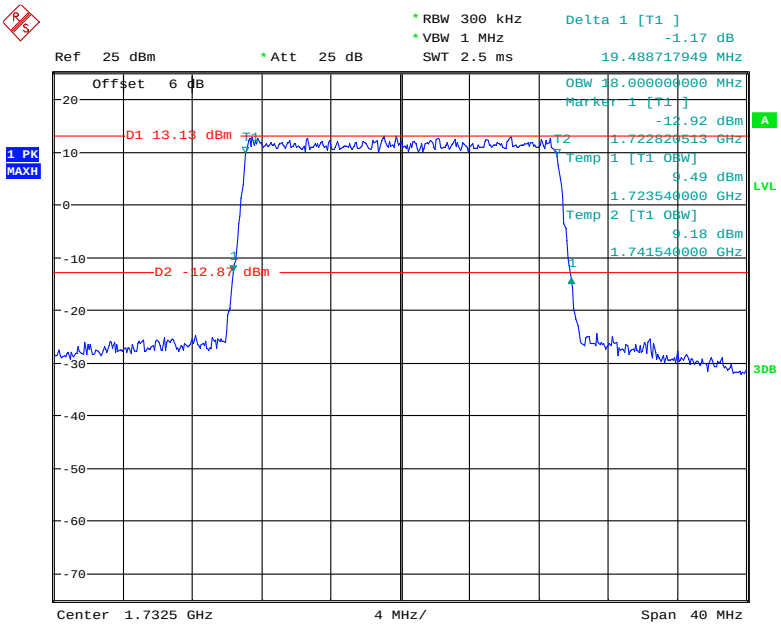
Date: 23.AUG.2019 10:36:40

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



Date: 23.AUG.2019 10:37:03

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

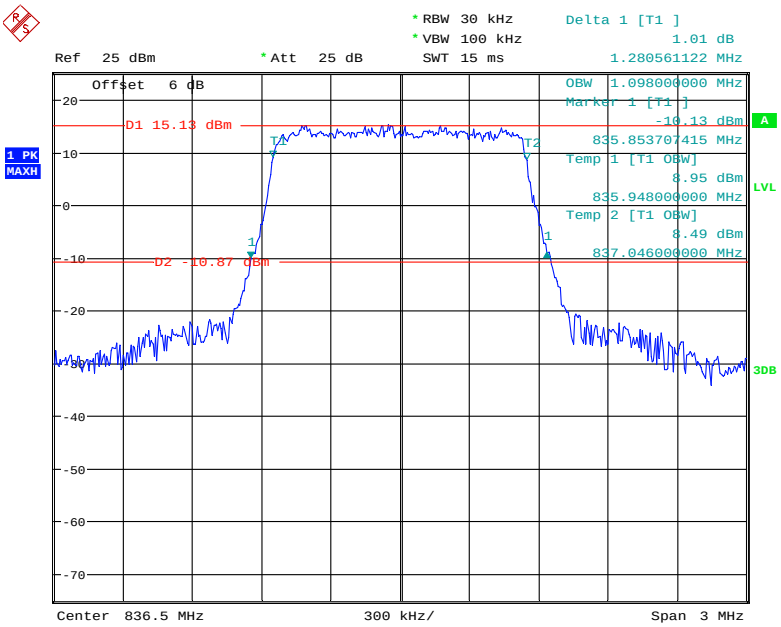


Date: 23.AUG.2019 11:13:15

LTE Band 5: (Middle Channel)

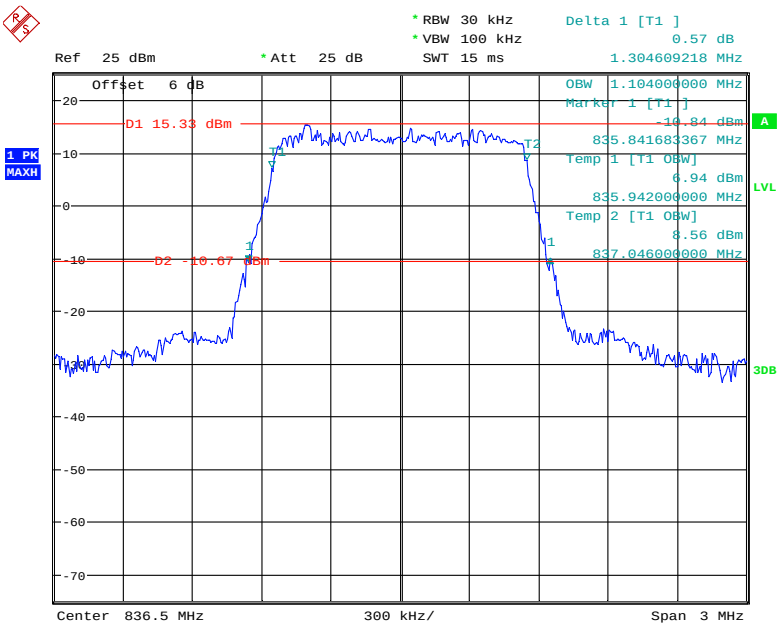
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.098	1.281
	16QAM	1.110	1.305
3.0	QPSK	2.688	2.862
	16QAM	2.688	2.838
5.0	QPSK	4.520	4.870
	16QAM	4.520	4.850
10.0	QPSK	8.960	9.499
	16QAM	8.960	9.499

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



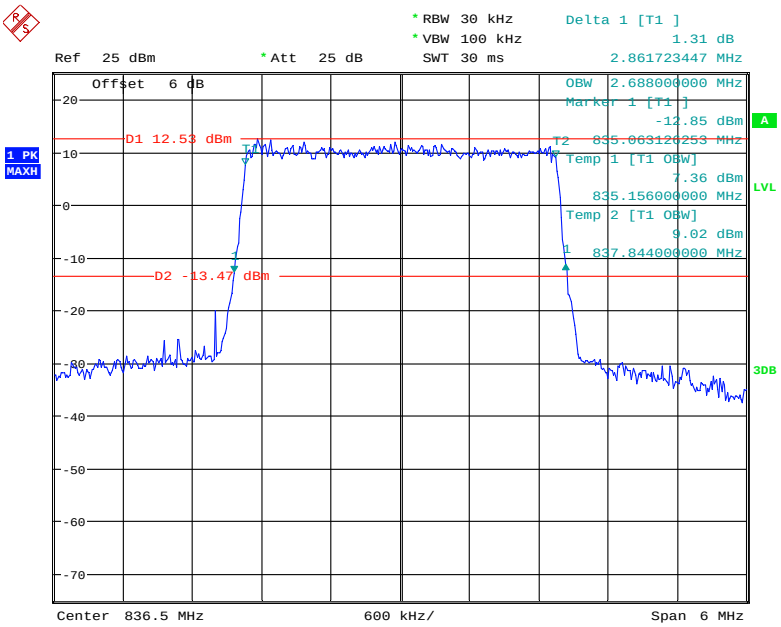
Date: 23.AUG.2019 10:37:48

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



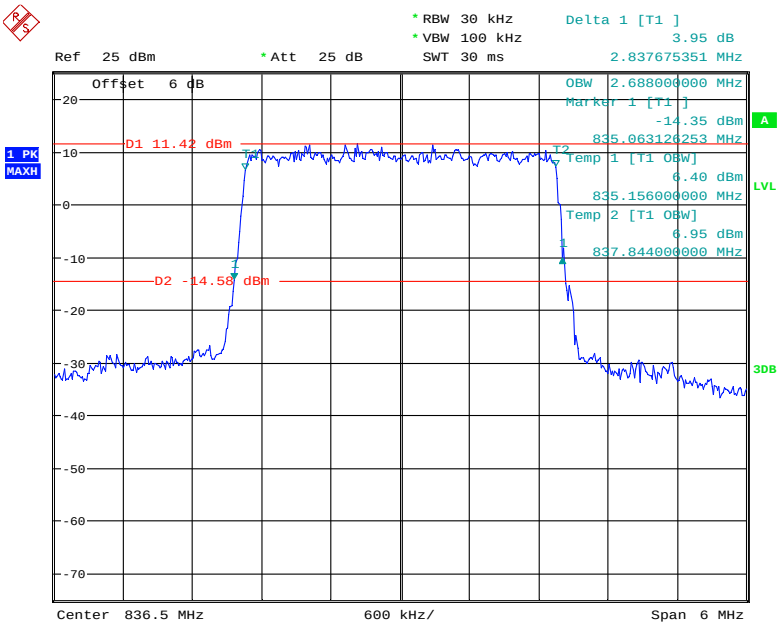
Date: 23.AUG.2019 10:38:06

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



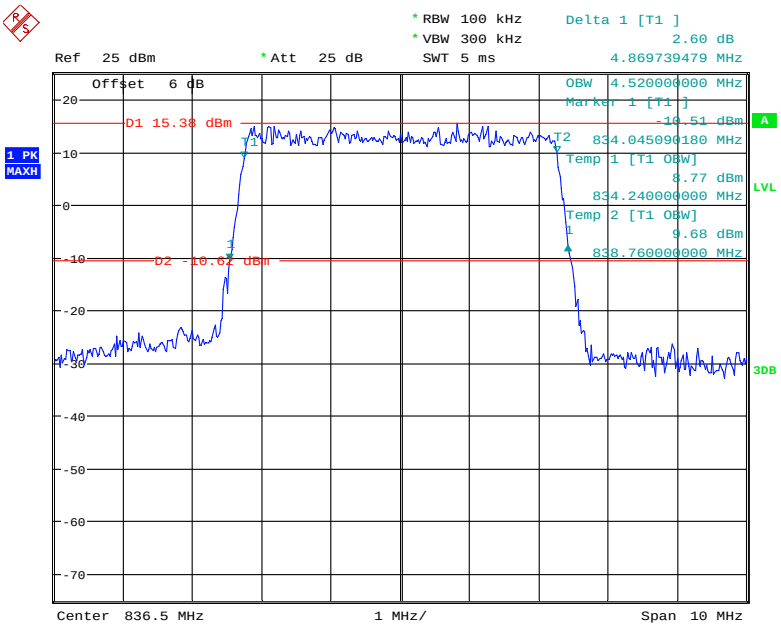
Date: 23.AUG.2019 10:38:26

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



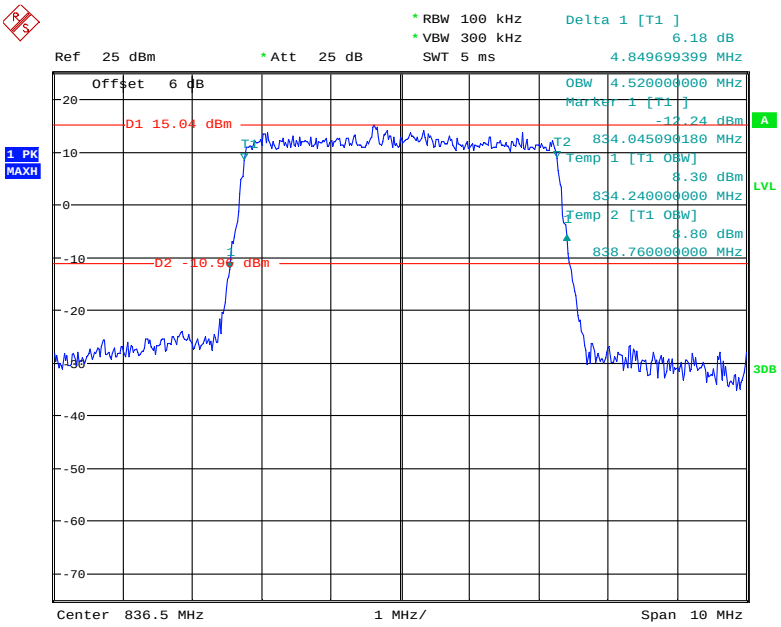
Date: 23.AUG.2019 10:38:43

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



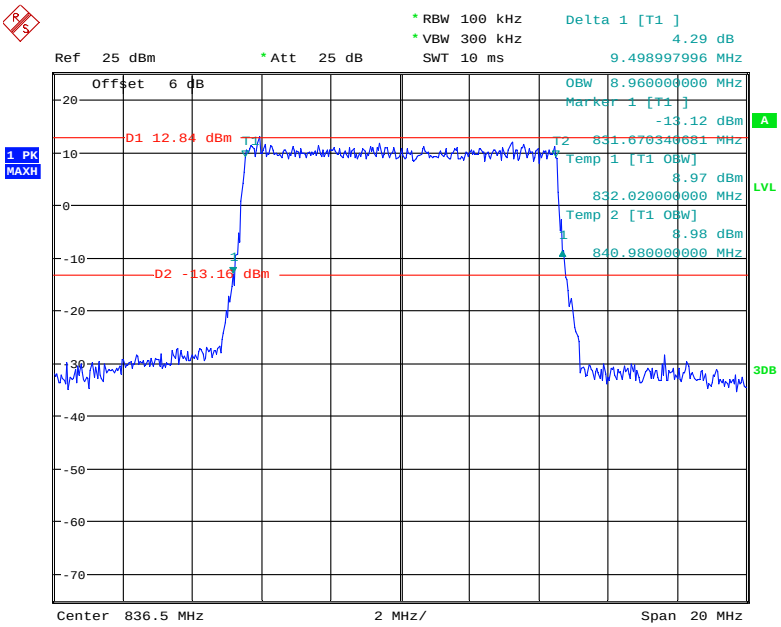
Date: 23.AUG.2019 10:39:06

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



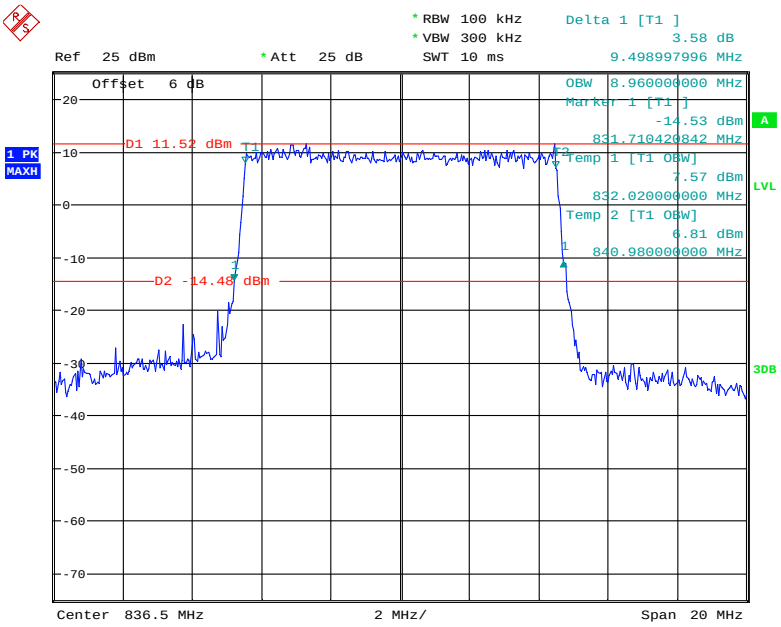
Date: 23.AUG.2019 10:39:24

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



Date: 23.AUG.2019 10:39:45

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

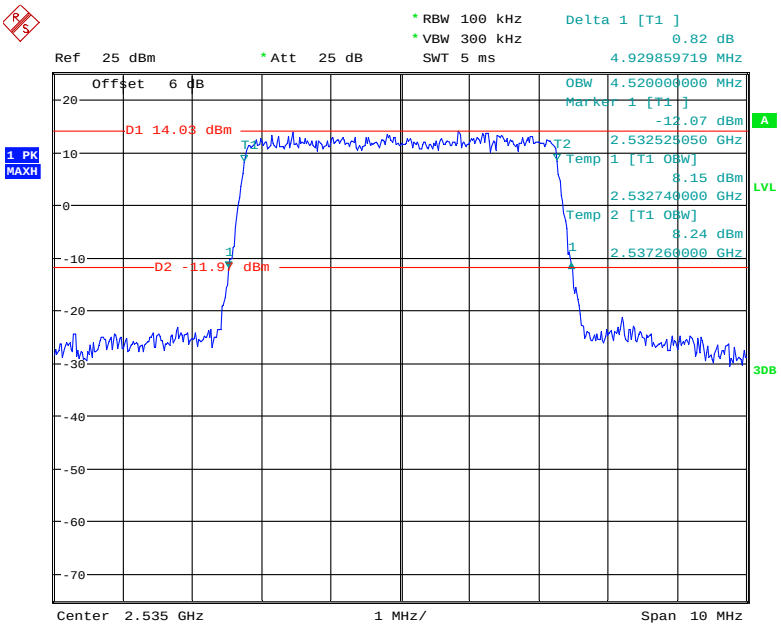


Date: 23.AUG.2019 10:40:04

LTE Band 7: (Middle Channel)

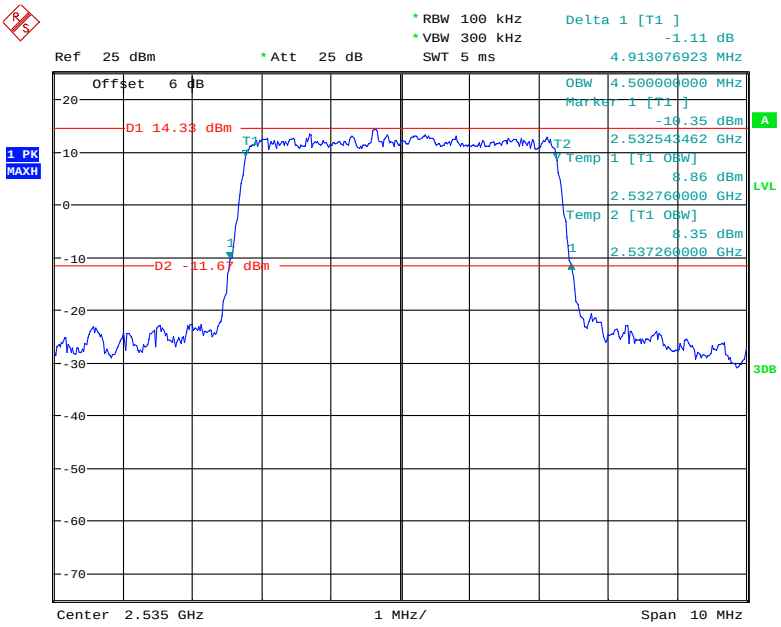
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.520	4.930
	16QAM	4.500	4.913
10.0	QPSK	8.960	9.582
	16QAM	8.960	9.499
15.0	QPSK	13.500	14.910
	16QAM	13.500	14.609
20.0	QPSK	18.000	19.078
	16QAM	18.000	19.536

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



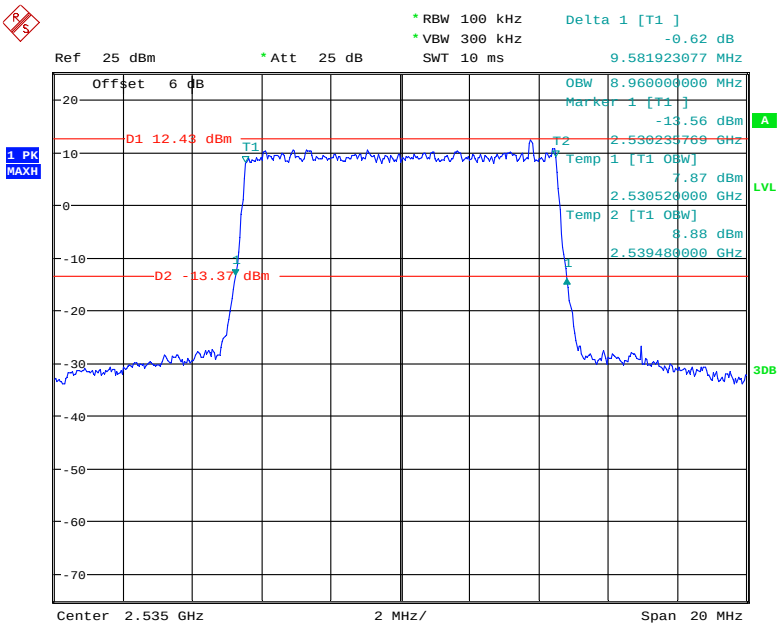
Date: 23.AUG.2019 10:40:28

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



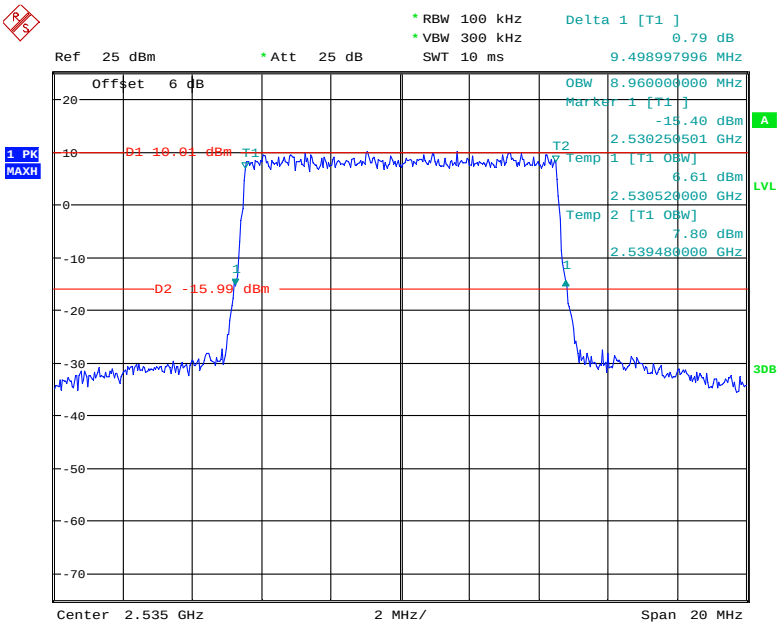
Date: 23.AUG.2019 11:03:00

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



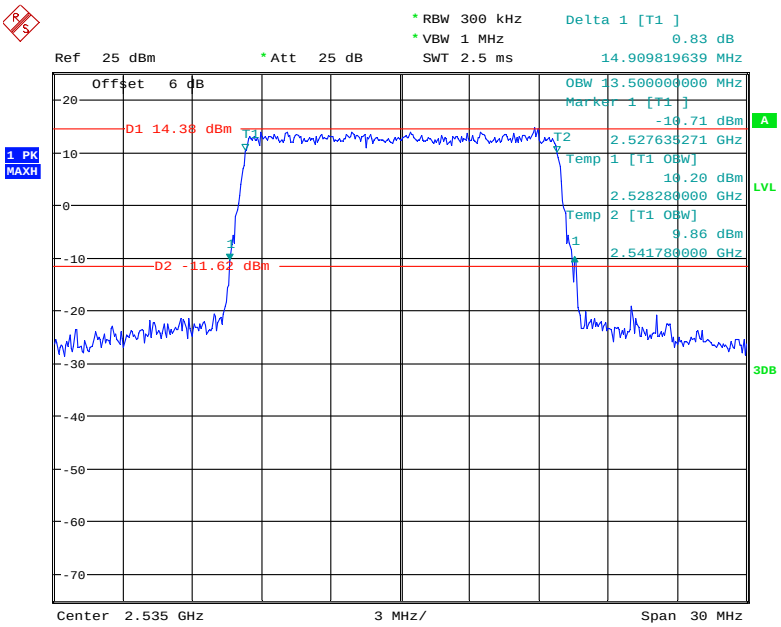
Date: 23.AUG.2019 11:05:43

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



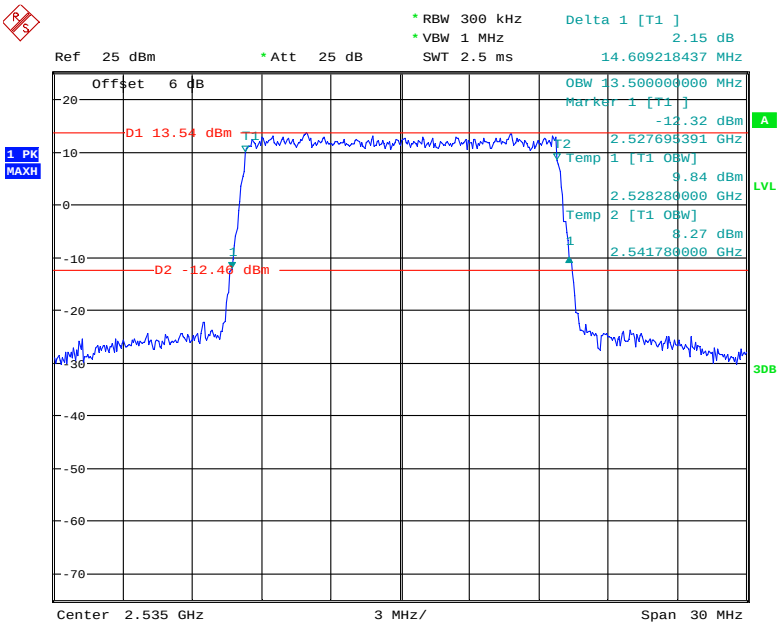
Date: 23.AUG.2019 10:41:28

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



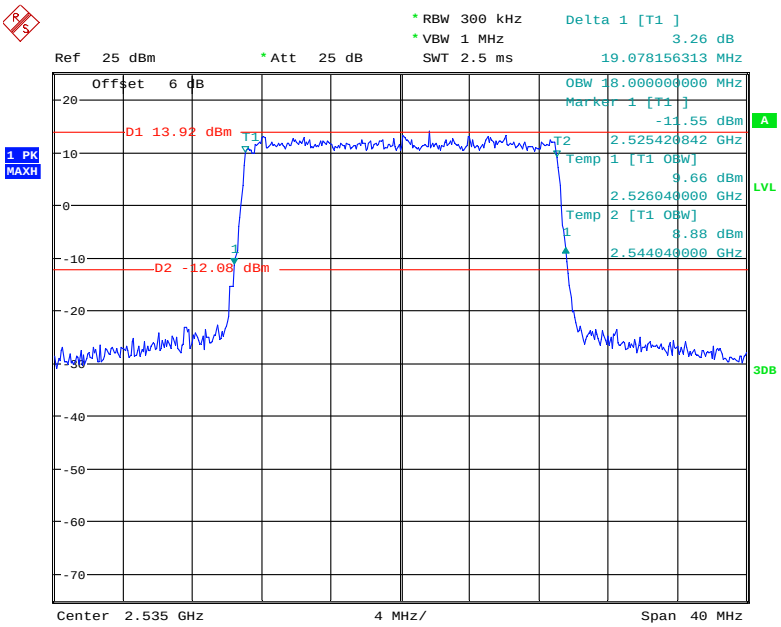
Date: 23.AUG.2019 10:41:55

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



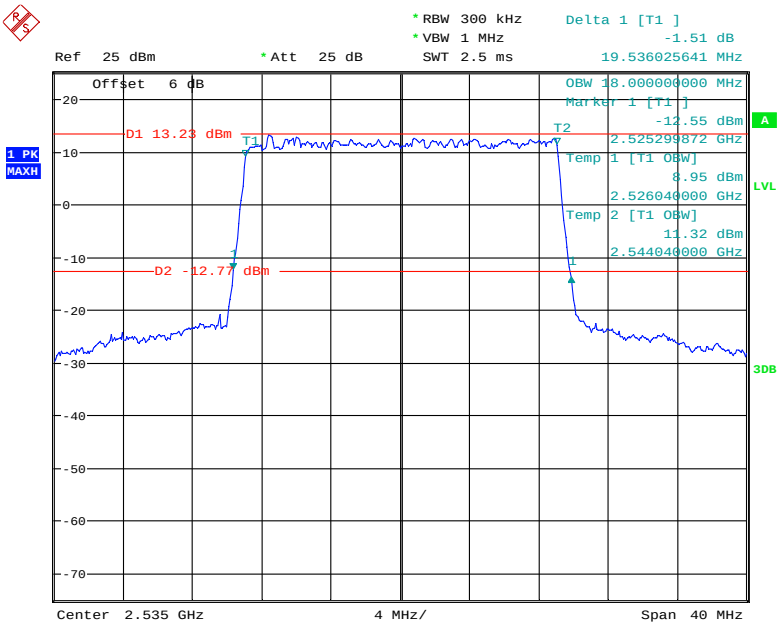
Date: 23.AUG.2019 10:42:19

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



Date: 23.AUG.2019 10:42:46

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



Date: 23.AUG.2019 11:10:38

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

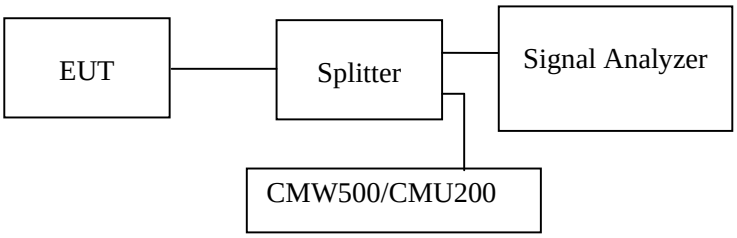
Applicable Standard

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:	24~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Leo Huang from 2019-08-17 to 2019-08-23.

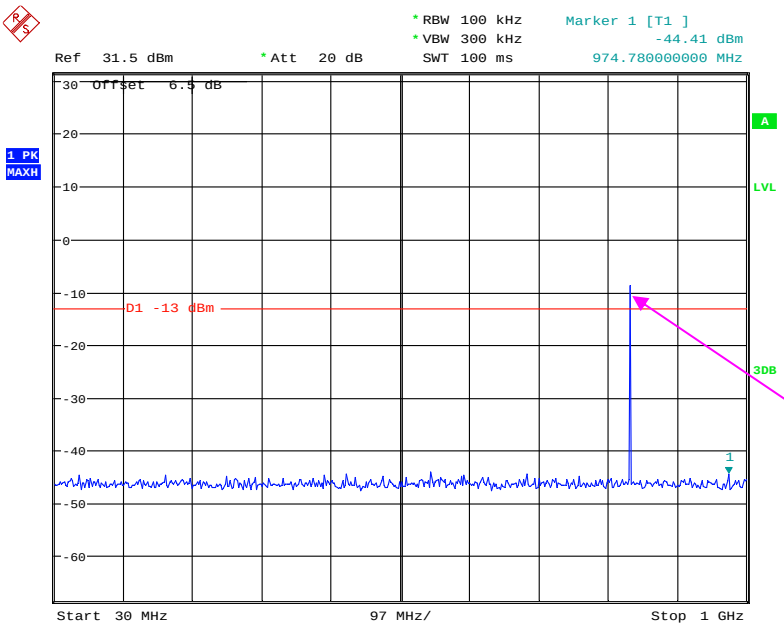
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

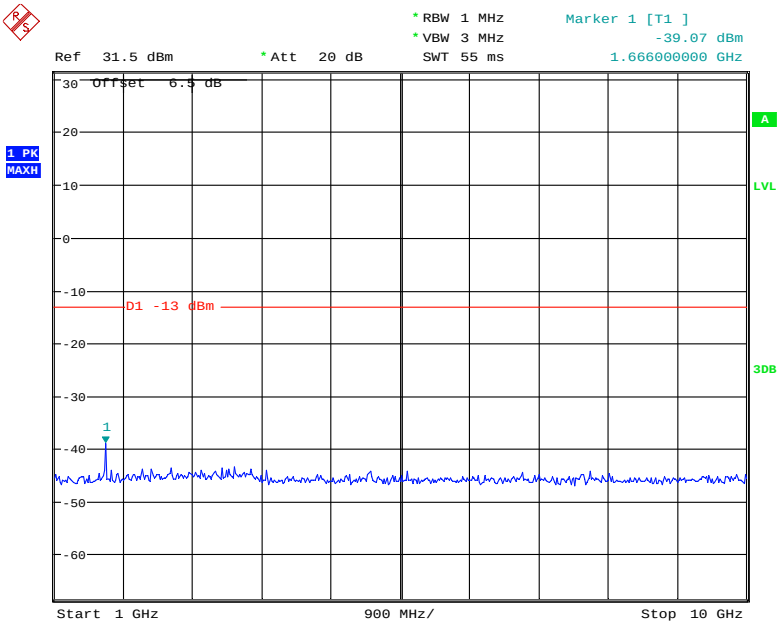
30 MHz – 1 GHz (GSM Mode)



Fundamental test with notch filter

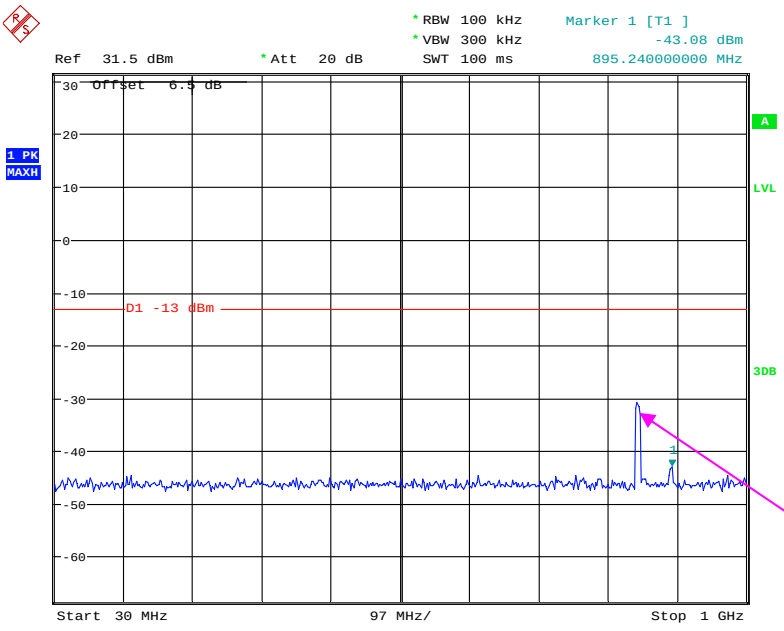
Date: 17.AUG.2019 18:54:23

1 GHz – 10 GHz (GSM Mode)



Date: 17.AUG.2019 19:03:24

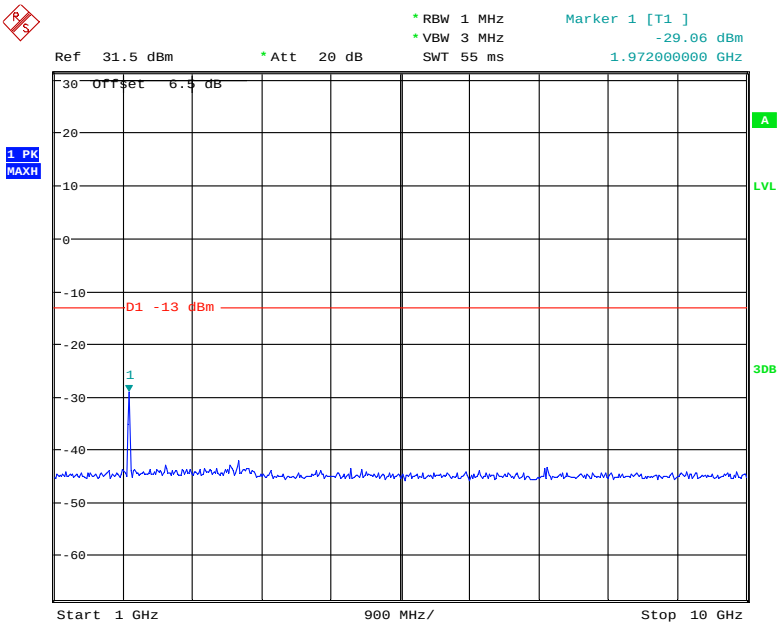
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test with notch filter

Date: 17.AUG.2019 19:29:28

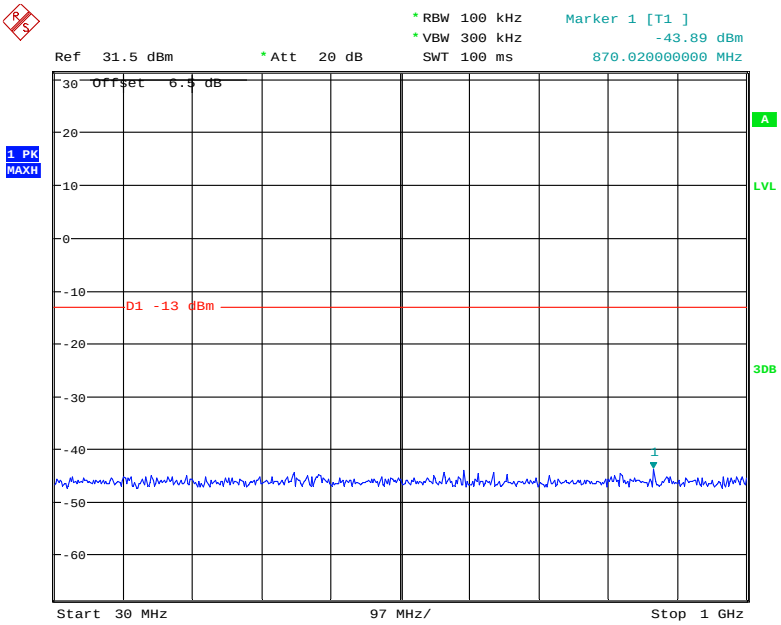
1 GHz – 10 GHz (WCDMA Mode)



Date: 17.AUG.2019 19:24:04

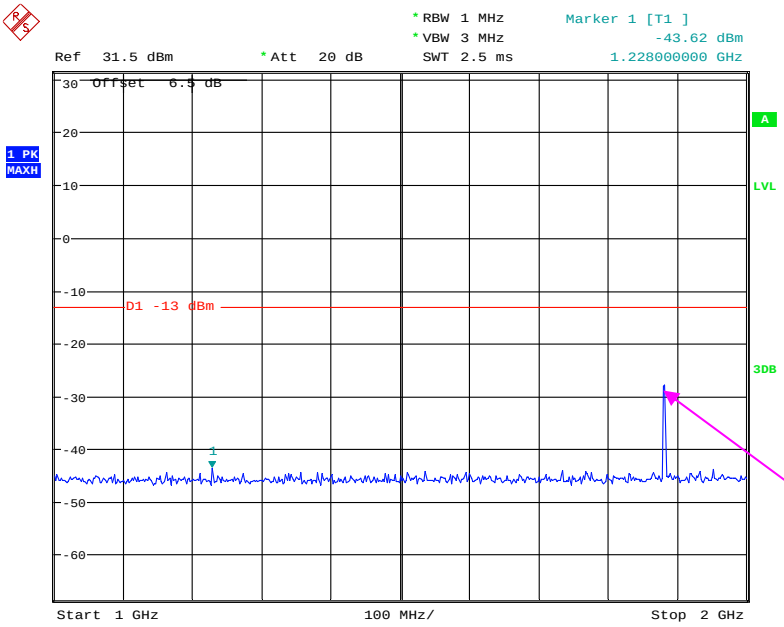
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 17.AUG.2019 19:00:46

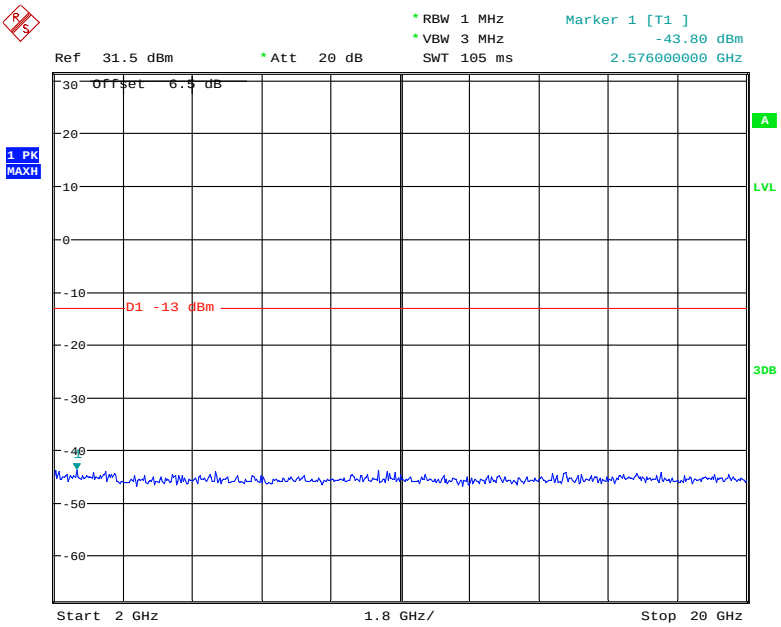
1 GHz – 2 GHz (GSM Mode)



Fundamental test with notch filter

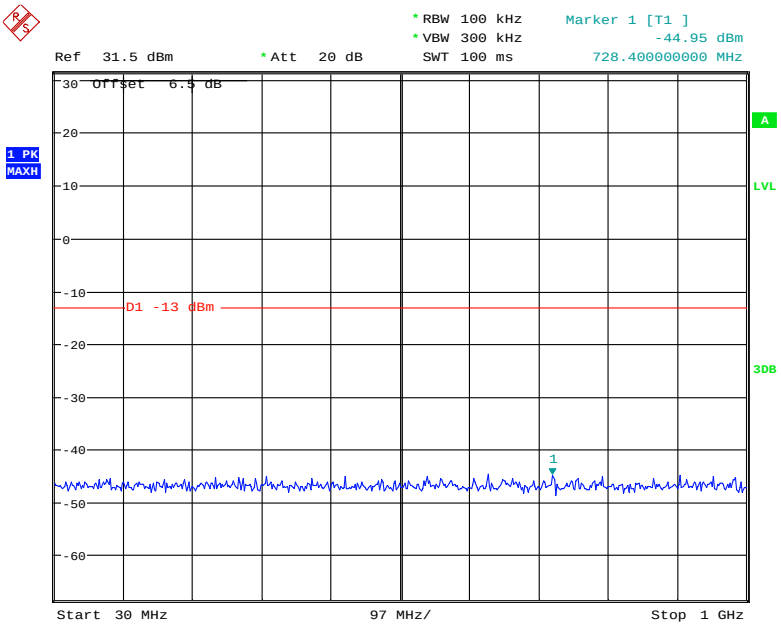
Date: 17.AUG.2019 18:59:18

2 GHz – 20 GHz (GSM Mode)



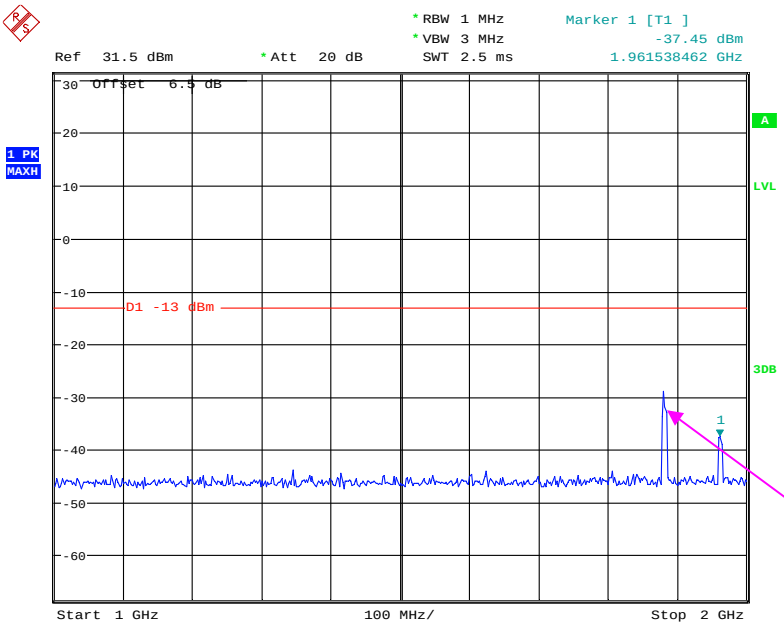
Date: 17.AUG.2019 19:00:05

30 MHz – 1 GHz (WCDMA Mode)



Date: 17.AUG.2019 19:33:27

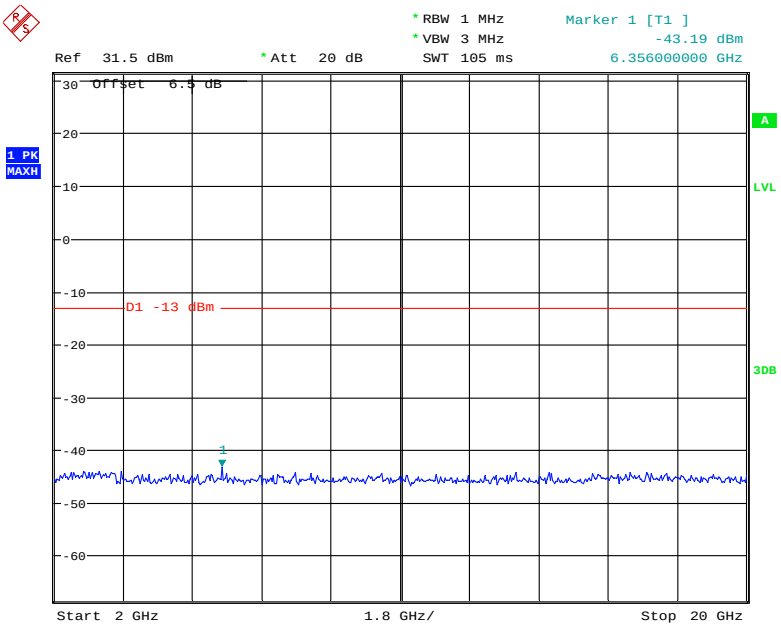
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test with notch filter

Date: 17.AUG.2019 19:35:53

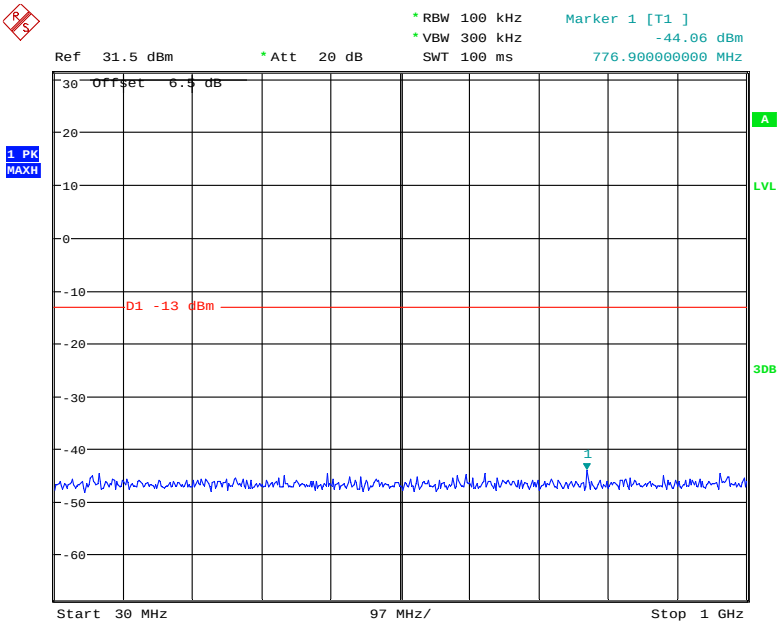
2 GHz – 20 GHz (WCDMA Mode)



Date: 17.AUG.2019 19:35:22

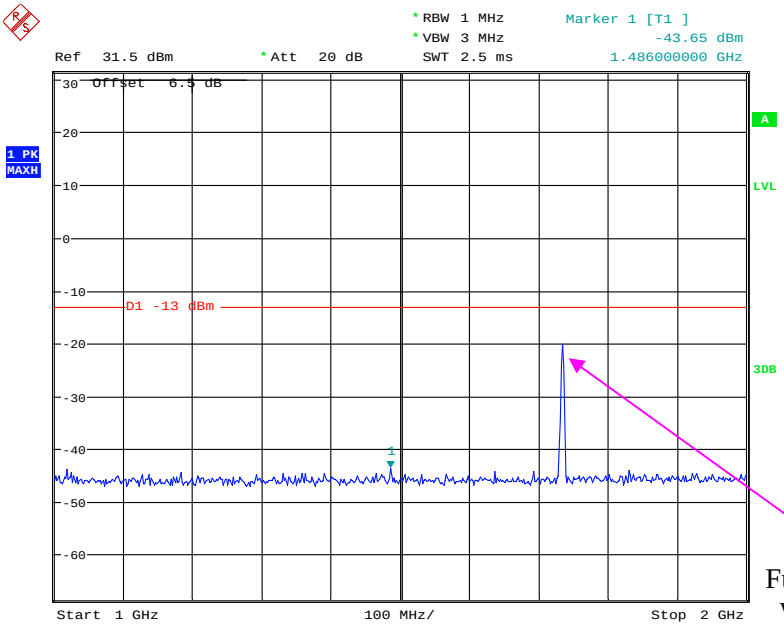
AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)



Date: 17.AUG.2019 19:39:17

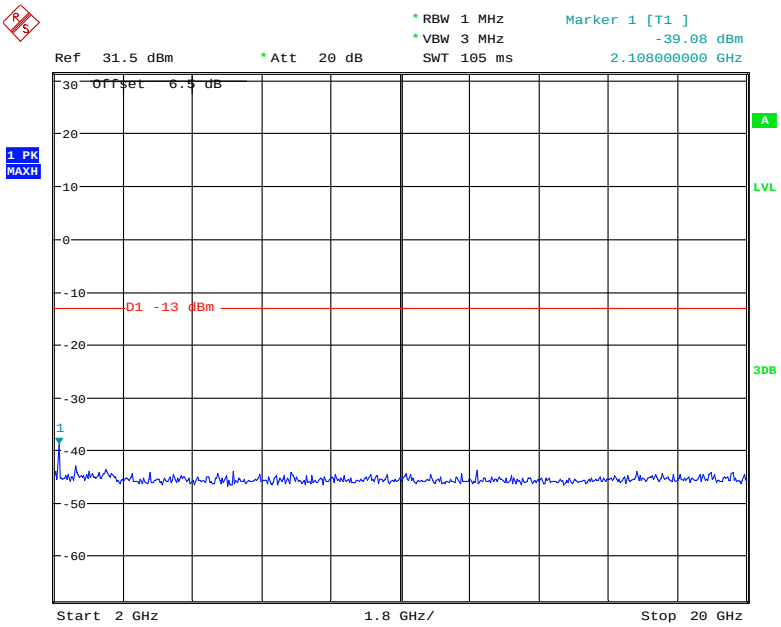
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test with notch filter

Date: 17.AUG.2019 19:37:33

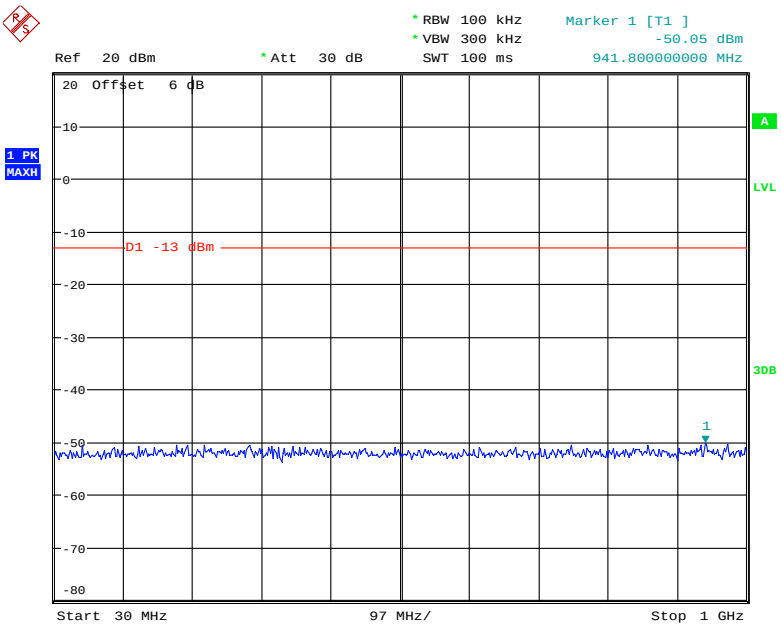
2 GHz – 20 GHz (WCDMA Mode)



Date: 17.AUG.2019 19:37:57

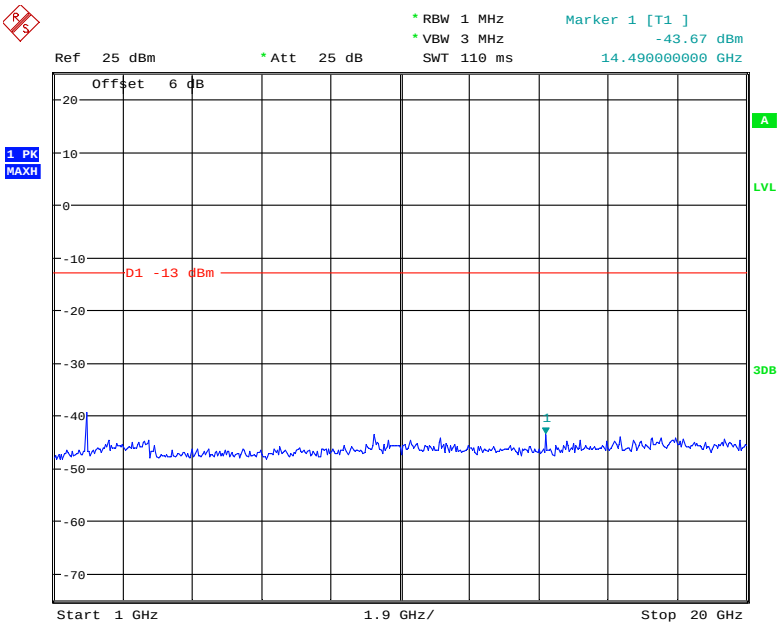
LTE Band 2:

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



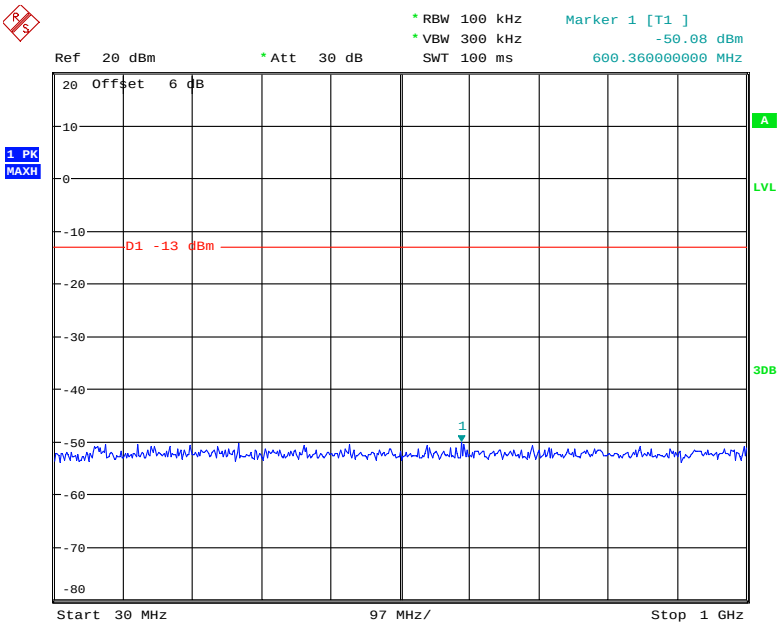
Date: 23.AUG.2019 10:11:21

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



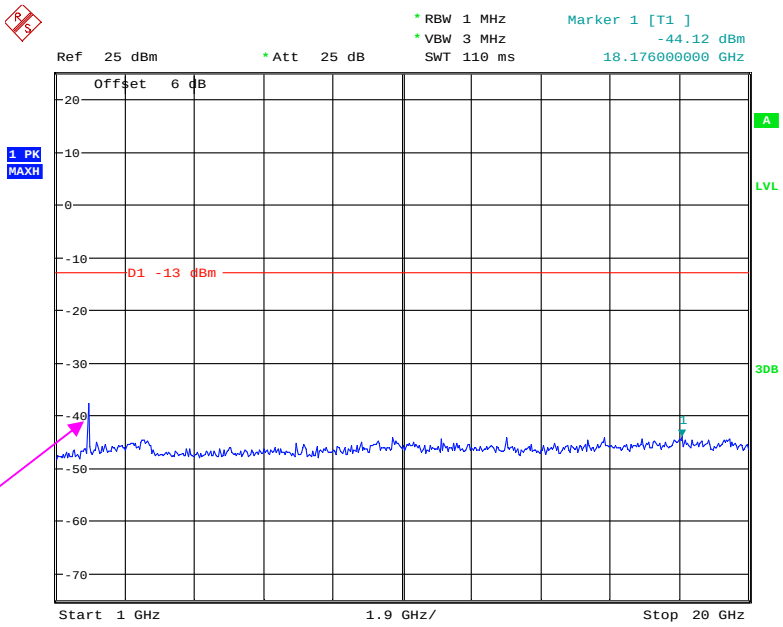
Date: 23.AUG.2019 10:11:30

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



Date: 23.AUG.2019 10:11:46

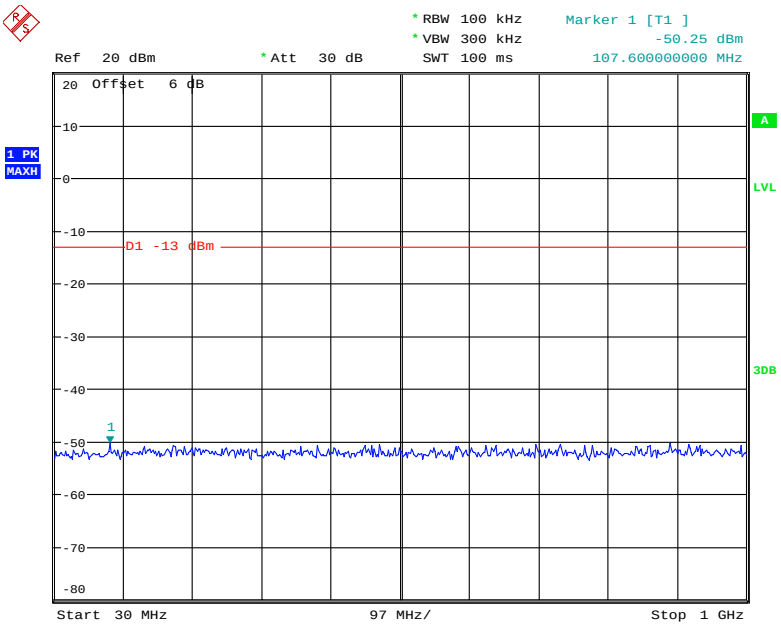
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



Fundamental test with notch filter

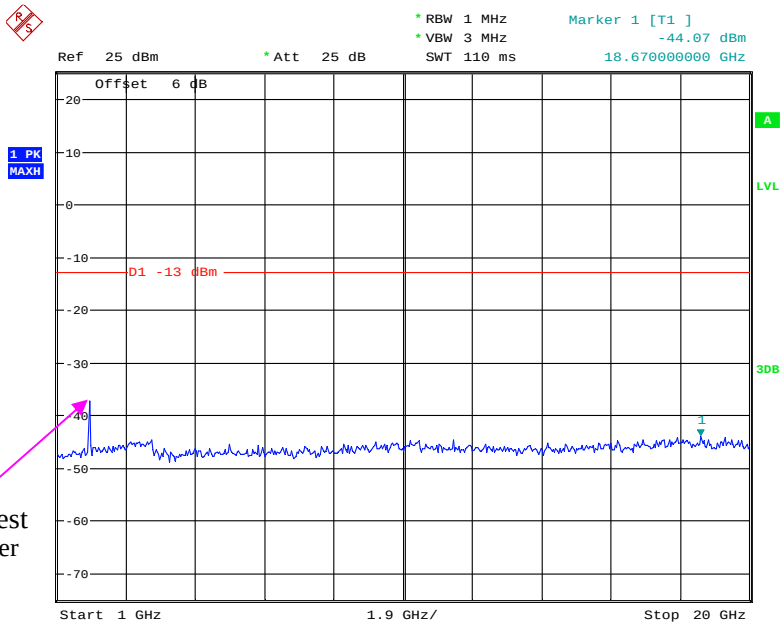
Date: 23.AUG.2019 10:11:55

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



Date: 23.AUG.2019 10:12:13

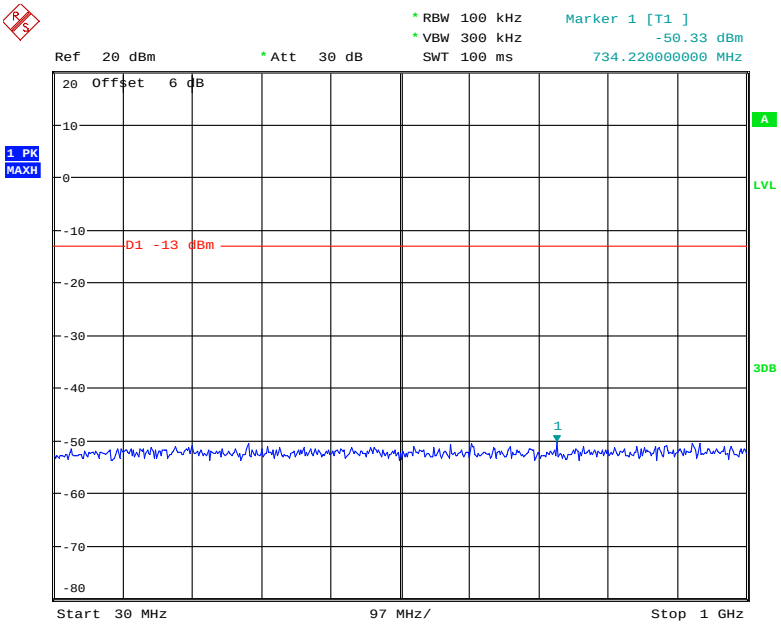
1 GHz – 20 GHz (5.0 MHz, Middle Channel)



Fundamental test with notch filter

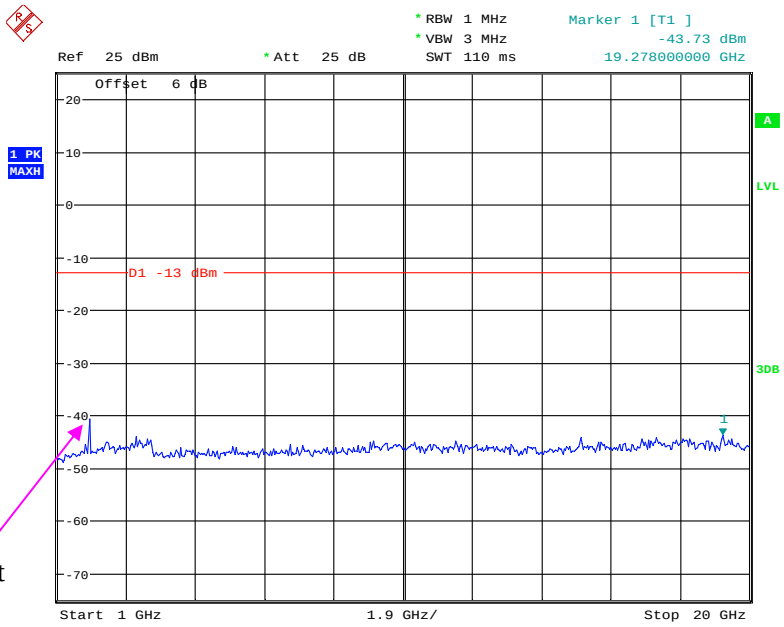
Date: 23.AUG.2019 10:12:22

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



Date: 23.AUG.2019 10:12:39

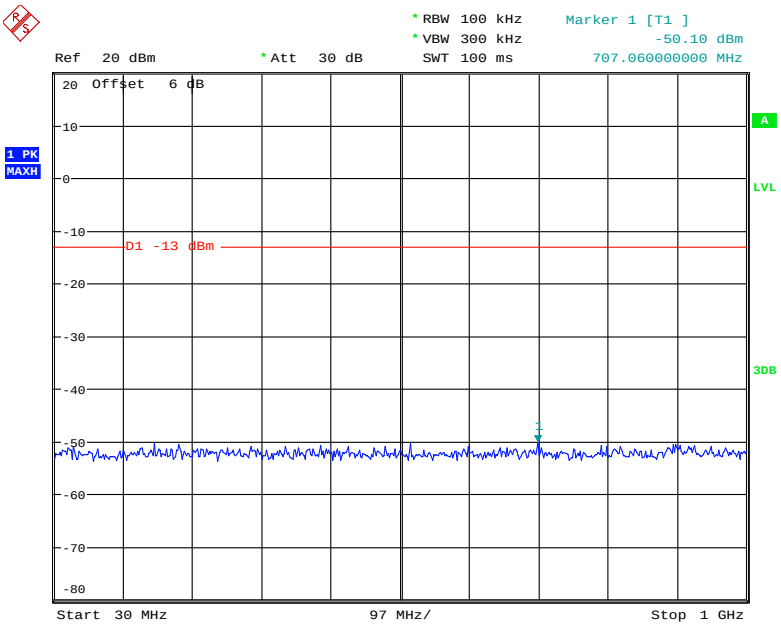
1 GHz – 20 GHz (10.0 MHz, Middle Channel)



Fundamental test with notch filter

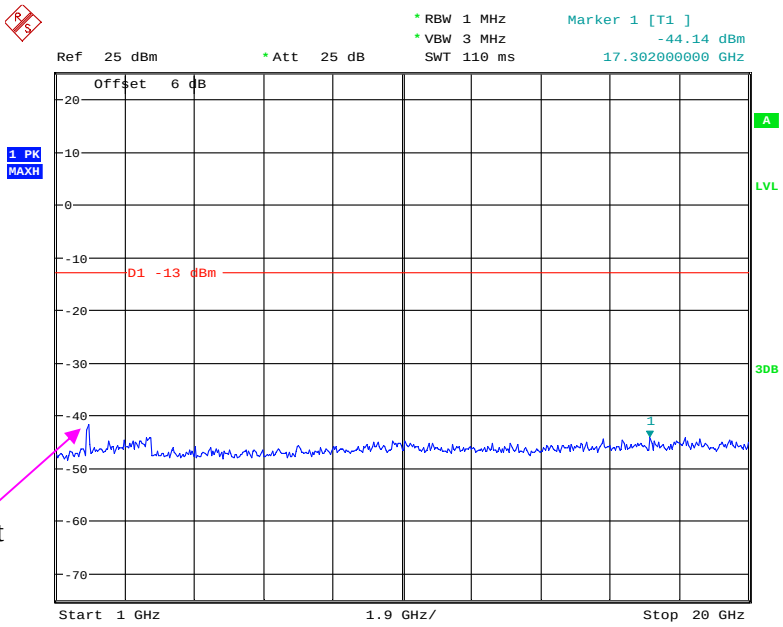
Date: 23.AUG.2019 10:12:48

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



Date: 23.AUG.2019 10:13:06

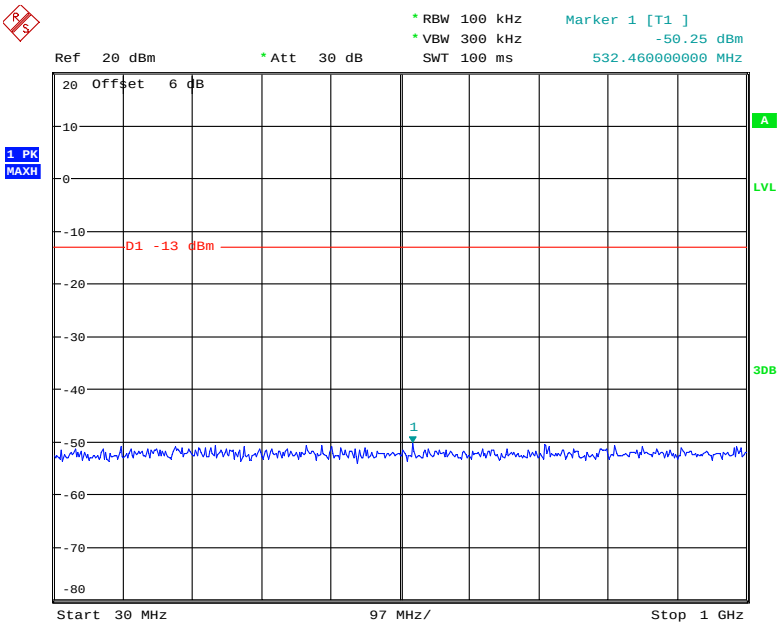
1 GHz – 20 GHz (15.0 MHz, Middle Channel)



Fundamental test with notch filter

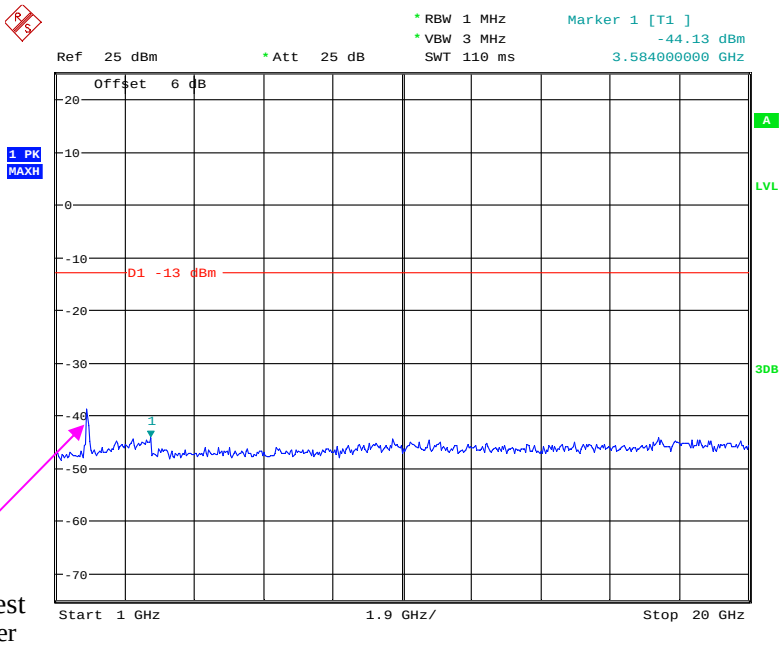
Date: 23.AUG.2019 10:13:15

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



Date: 23.AUG.2019 10:13:35

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

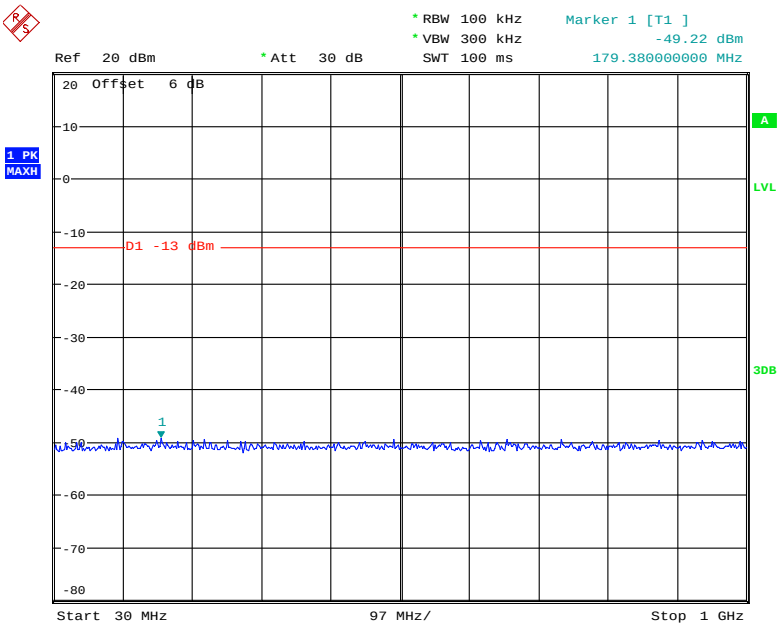


Fundamental test with notch filter

Date: 23.AUG.2019 10:13:44

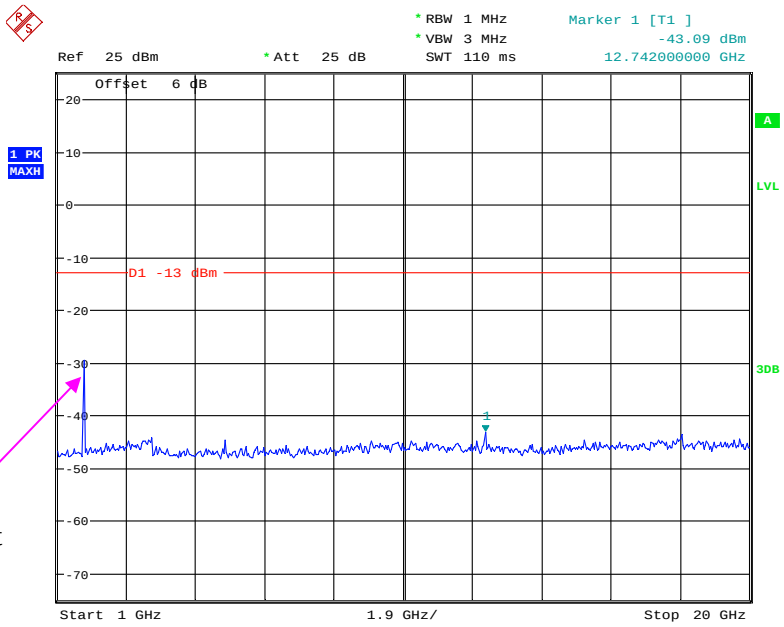
LTE Band 4:

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



Date: 23.AUG.2019 10:17:11

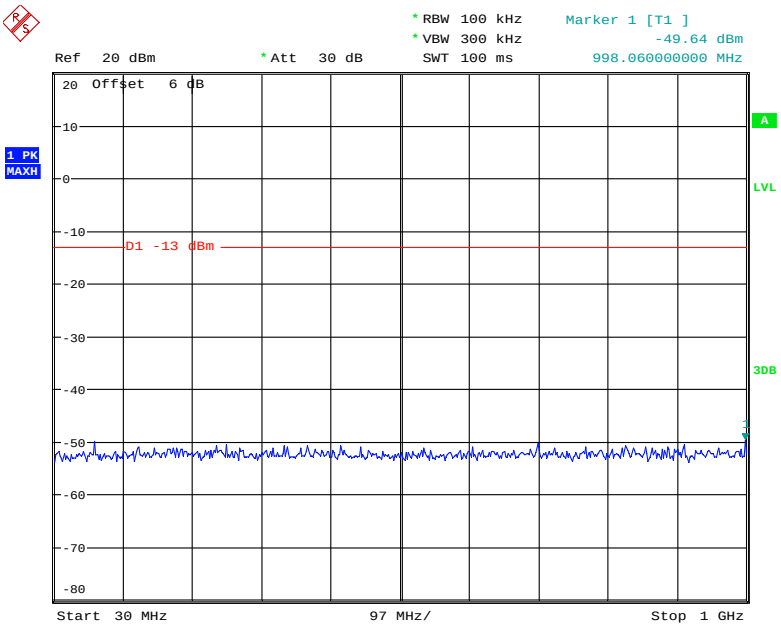
1 GHz – 20 GHz (1.4 MHz, Middle Channel)



Fundamental test with notch filter

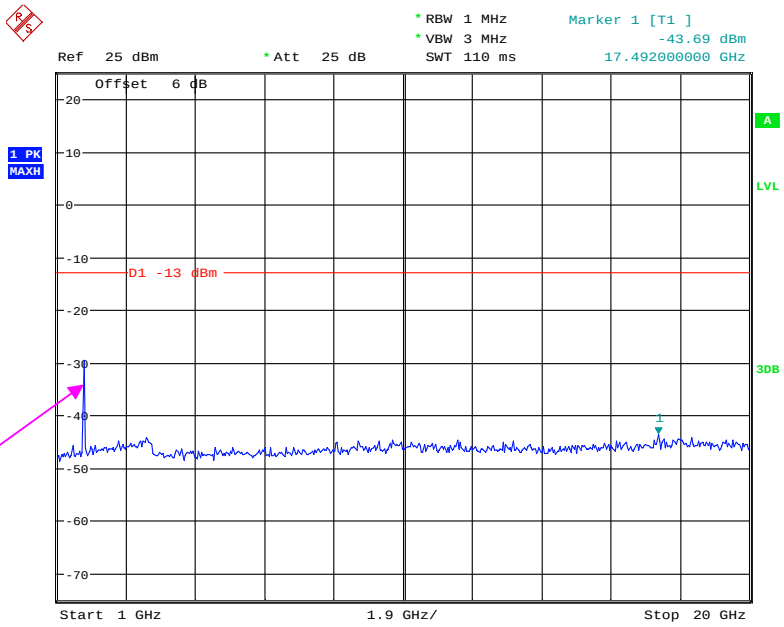
Date: 23.AUG.2019 10:17:20

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



Date: 23.AUG.2019 10:17:35

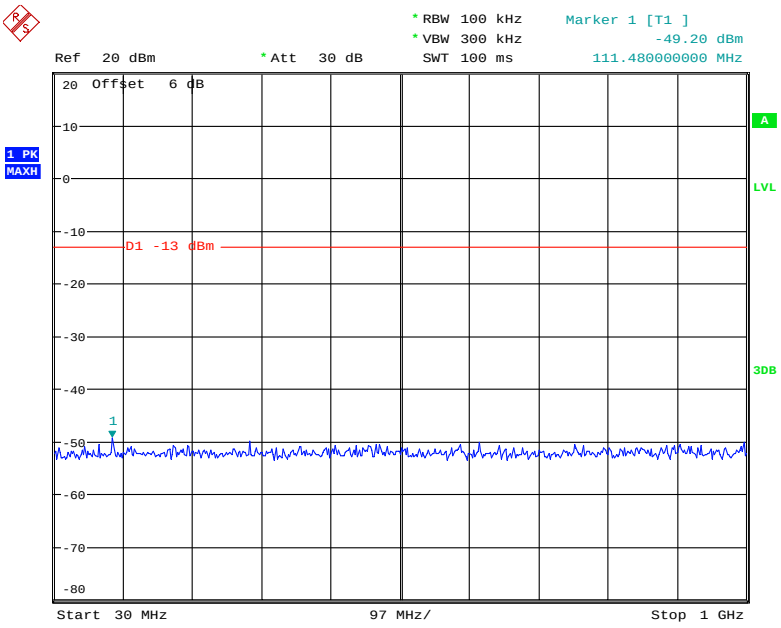
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



Fundamental test with notch filter

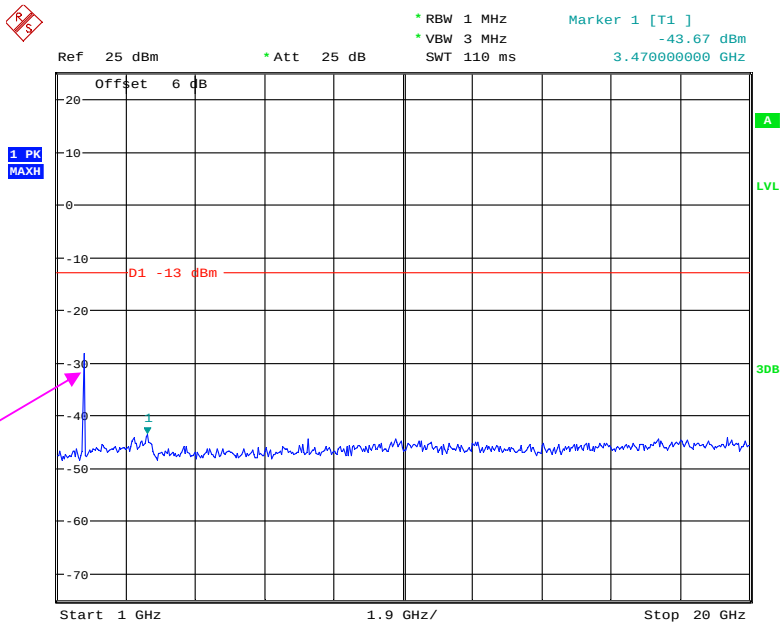
Date: 23.AUG.2019 10:17:44

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



Date: 23.AUG.2019 10:18:03

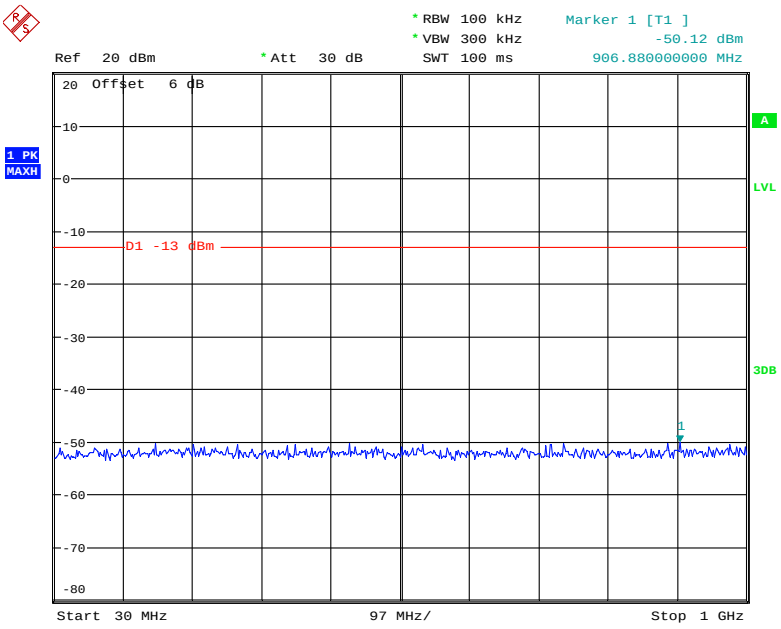
1 GHz – 20 GHz (5.0 MHz, Middle Channel)



Fundamental test with notch filter

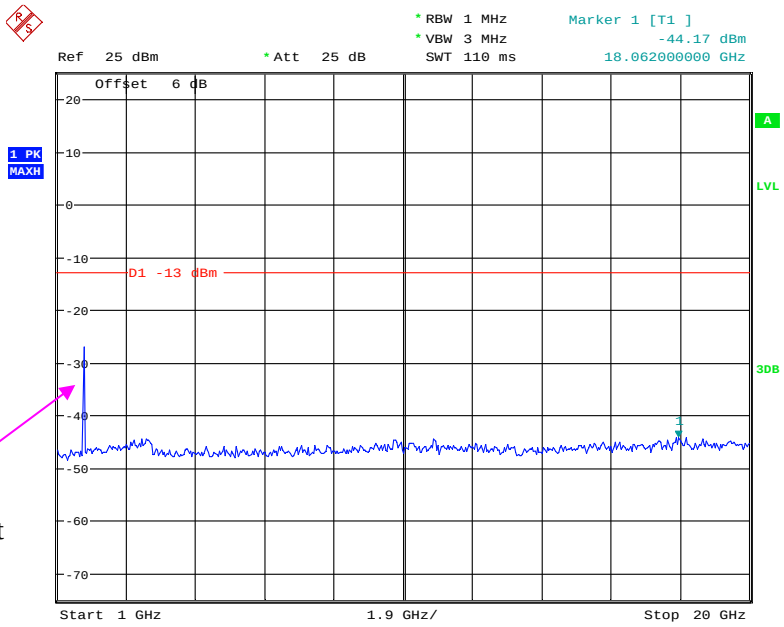
Date: 23.AUG.2019 10:18:12

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



Date: 23.AUG.2019 10:18:31

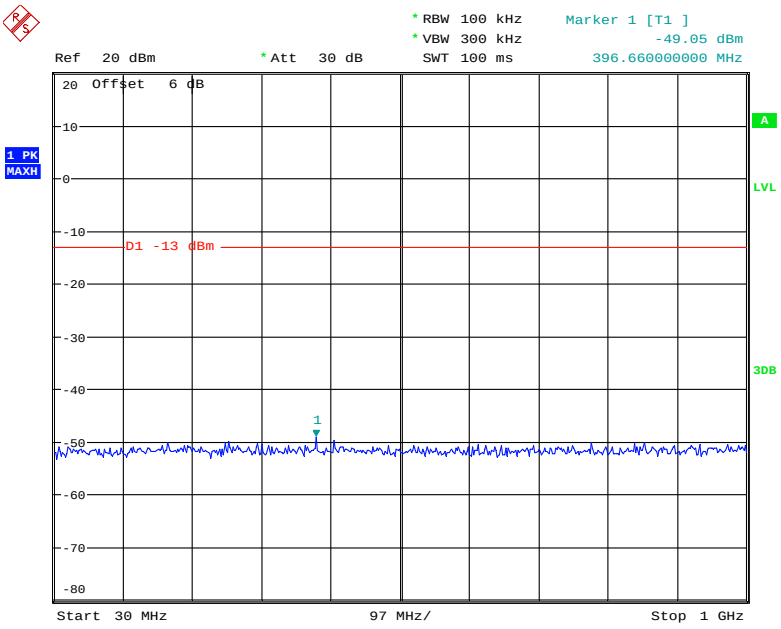
1 GHz – 20 GHz (10.0 MHz, Middle Channel)



Fundamental test with notch filter

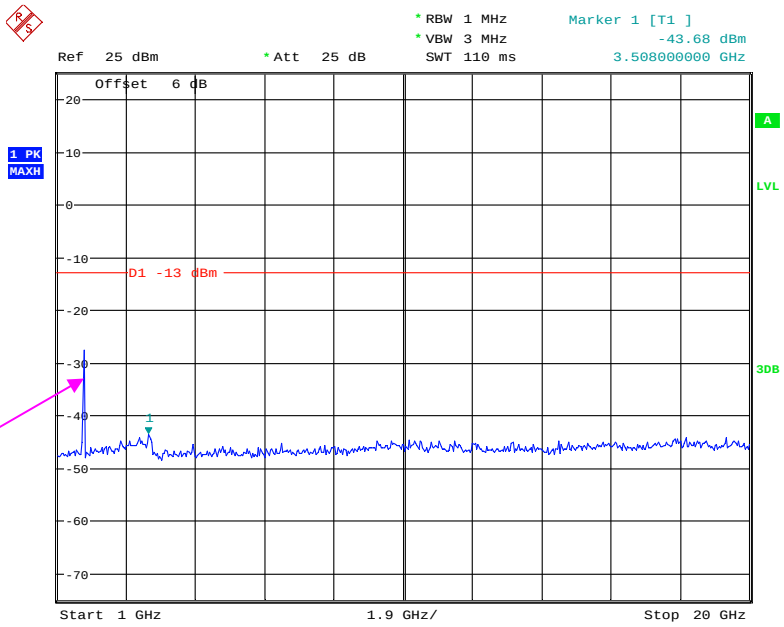
Date: 23.AUG.2019 10:18:40

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



Date: 23.AUG.2019 10:19:17

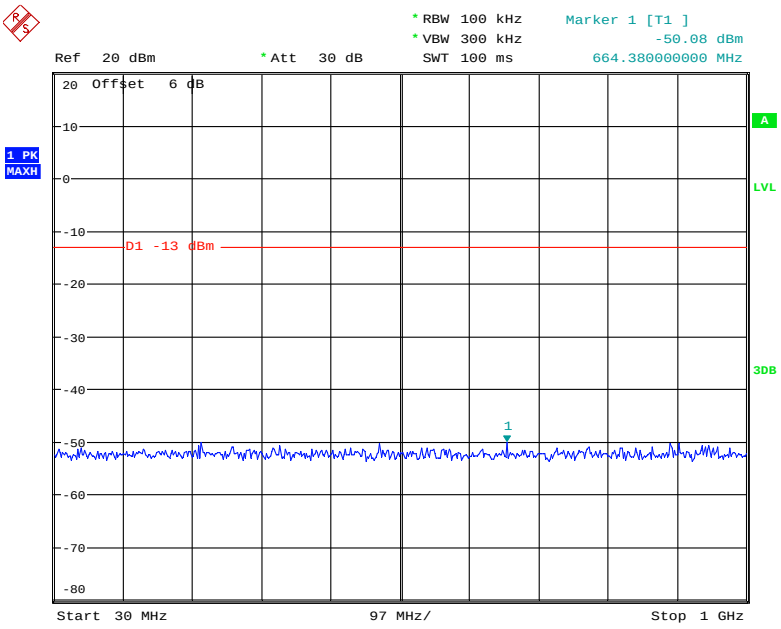
1 GHz – 20 GHz (15.0 MHz, Middle Channel)



Fundamental test with notch filter

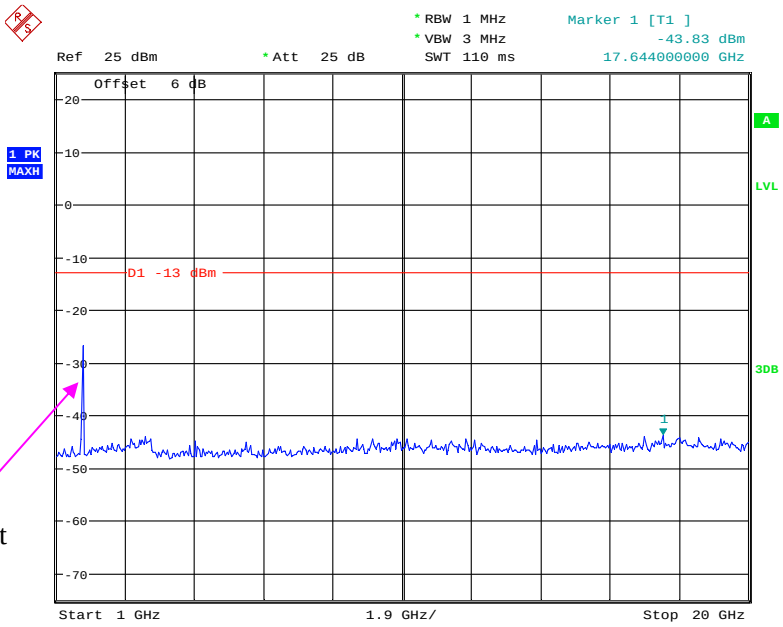
Date: 23.AUG.2019 10:19:26

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



Date: 23.AUG.2019 10:19:45

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

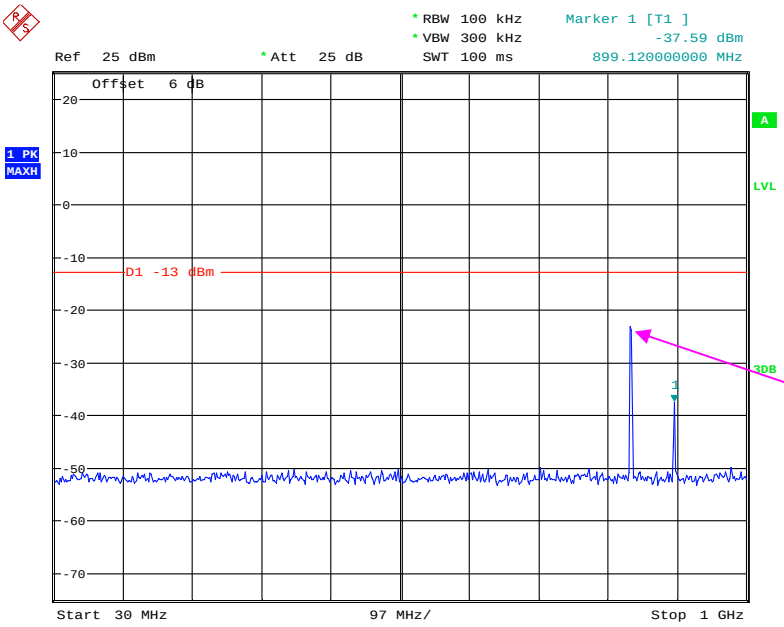


Fundamental test with notch filter

Date: 23.AUG.2019 10:19:54

LTE Band 5:

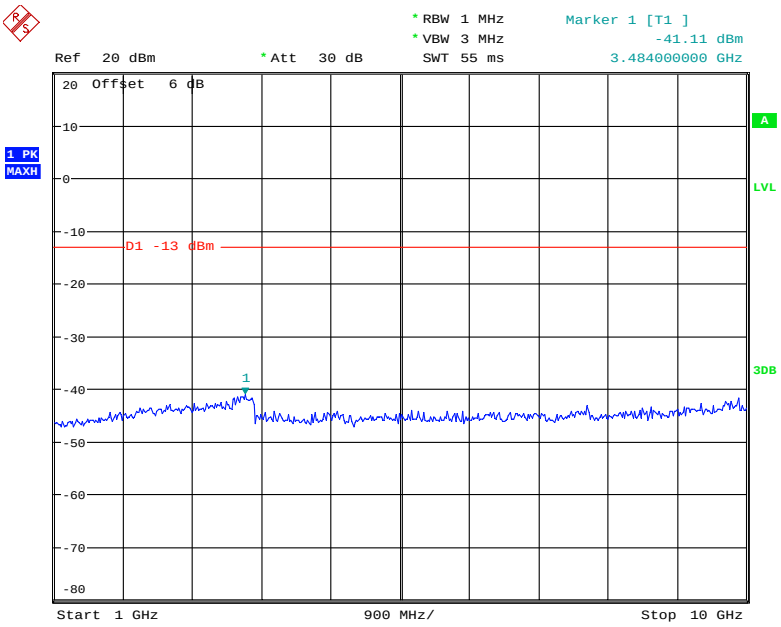
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test with notch filter

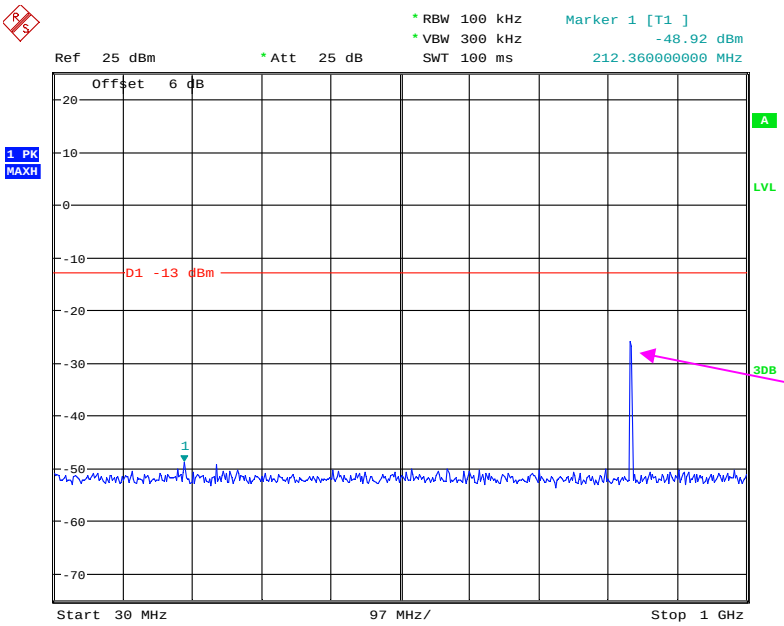
Date: 23.AUG.2019 10:21:52

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



Date: 23.AUG.2019 10:22:01

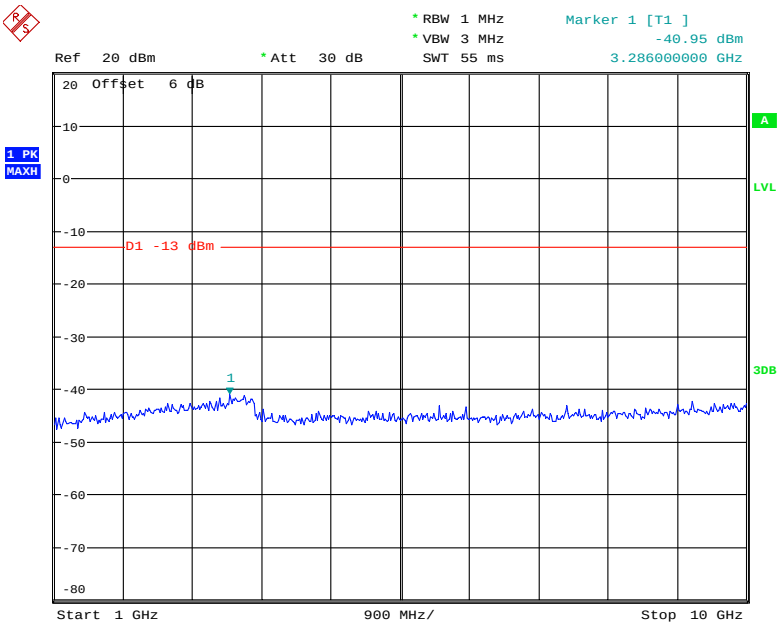
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Fundamental test with notch filter

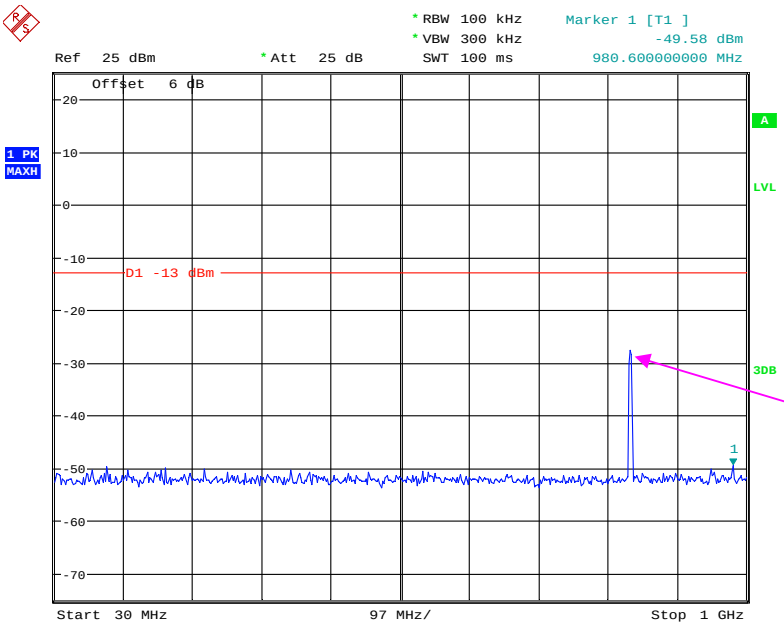
Date: 23.AUG.2019 10:22:20

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



Date: 23.AUG.2019 10:22:29

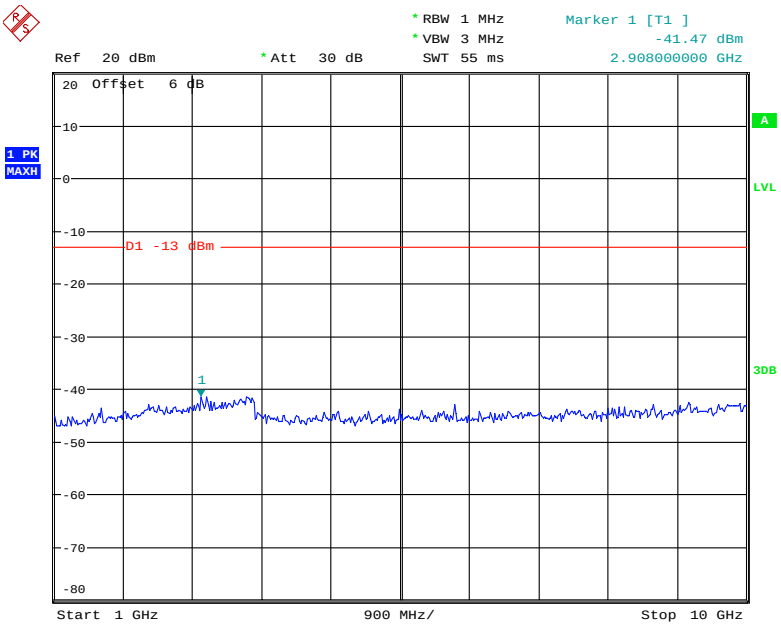
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test with notch filter

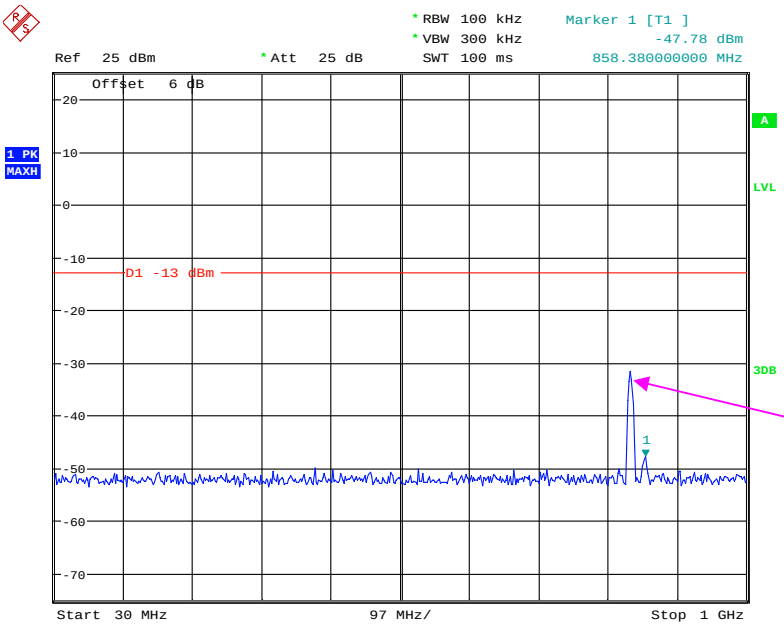
Date: 23.AUG.2019 10:22:44

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



Date: 23.AUG.2019 10:22:53

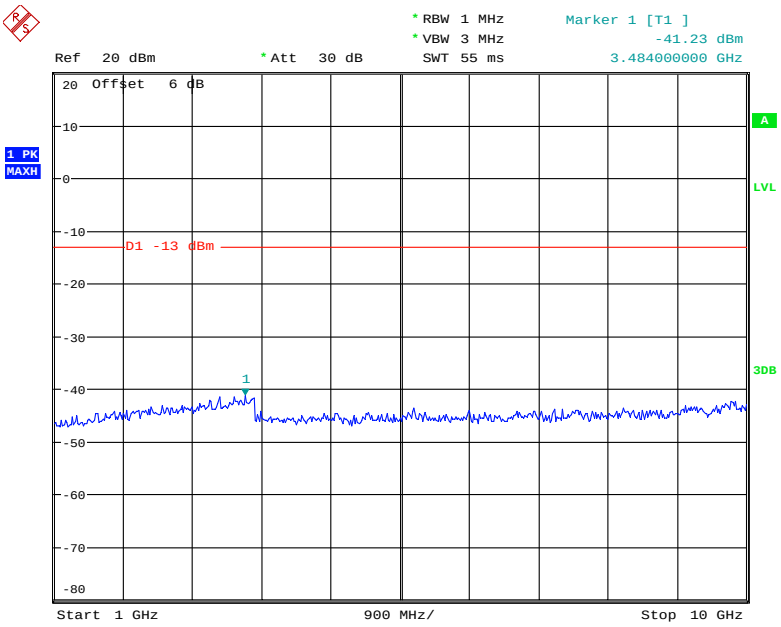
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test with notch filter

Date: 23.AUG.2019 10:23:10

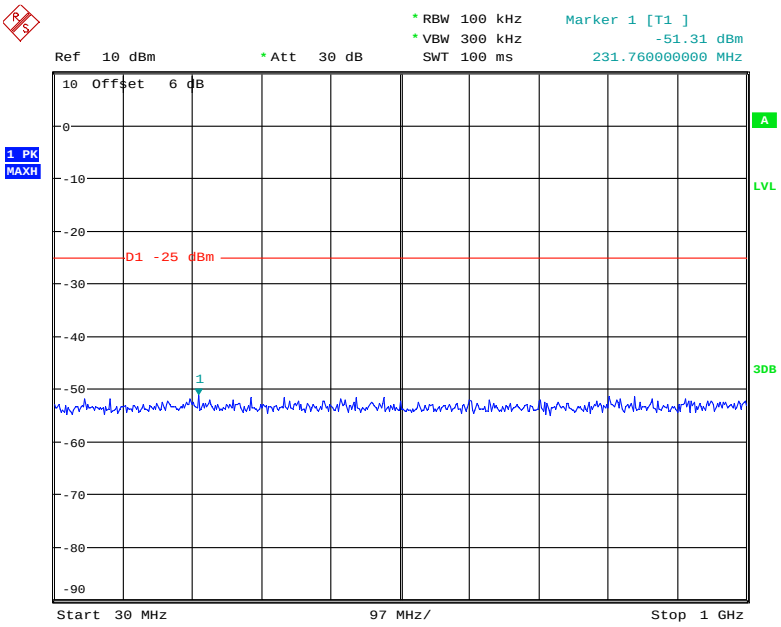
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 23.AUG.2019 10:23:19

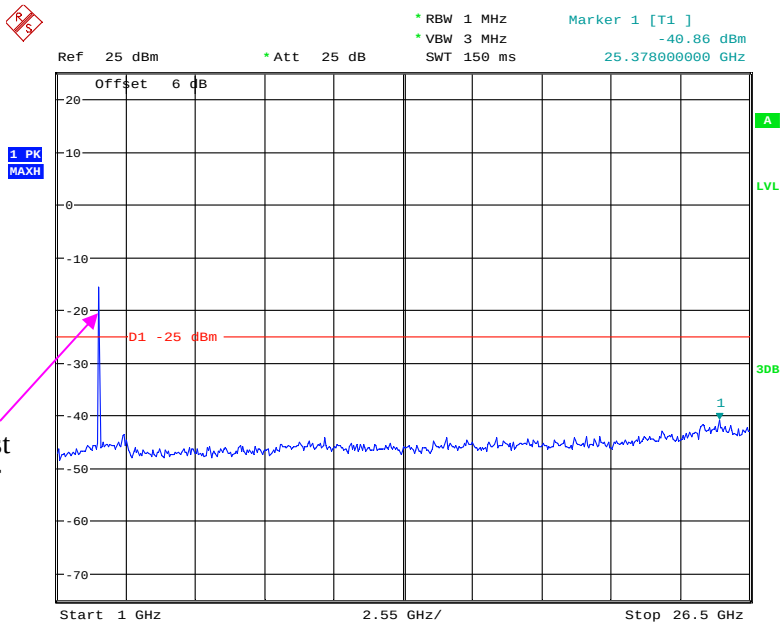
LTE Band 7:

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



Date: 23.AUG.2019 10:24:51

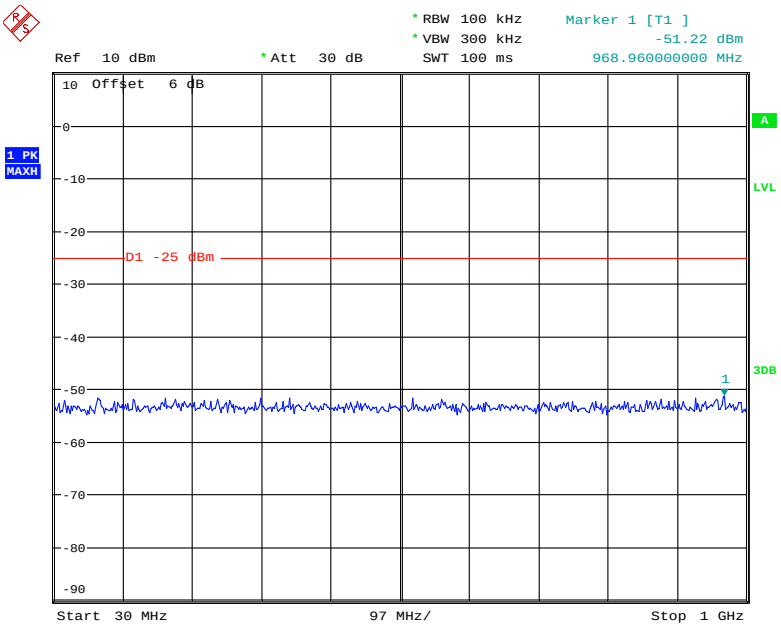
1 GHz – 26.5 GHz (5.0 MHz, Middle Channel)



Fundamental test with notch filter

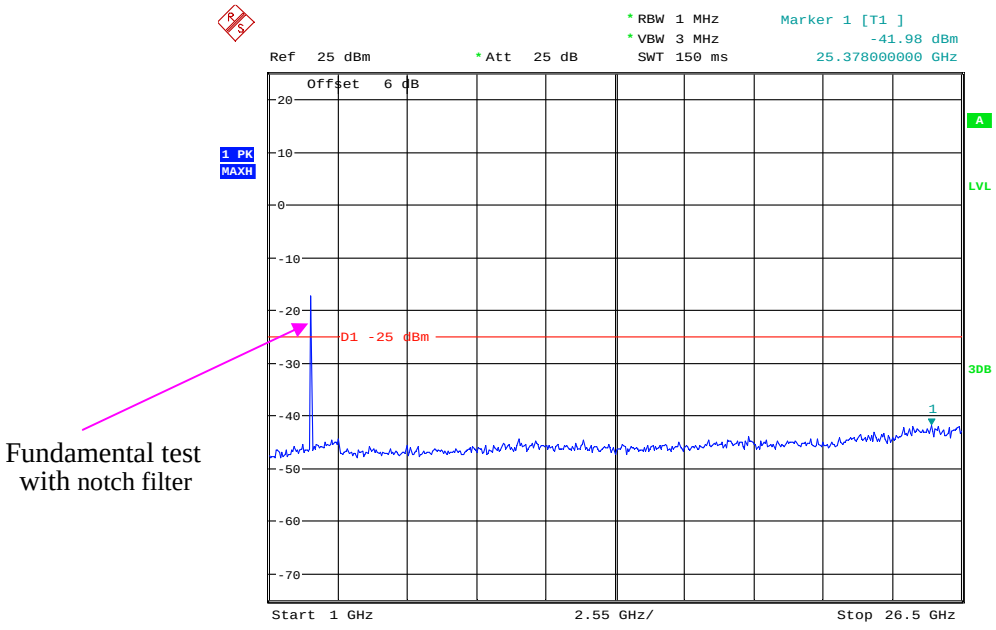
Date: 23.AUG.2019 10:25:00

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



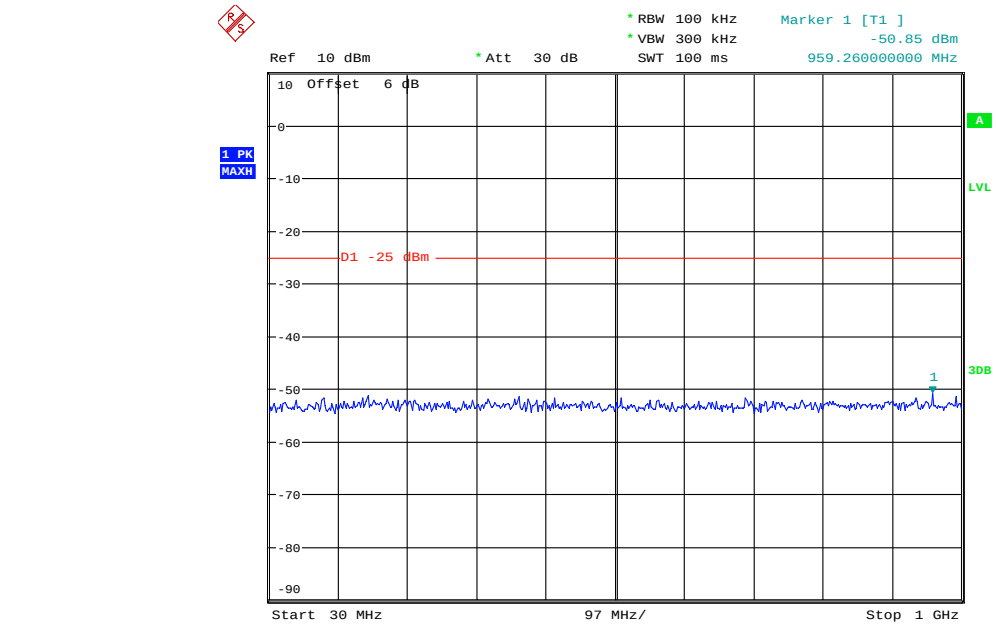
Date: 23.AUG.2019 10:25:17

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



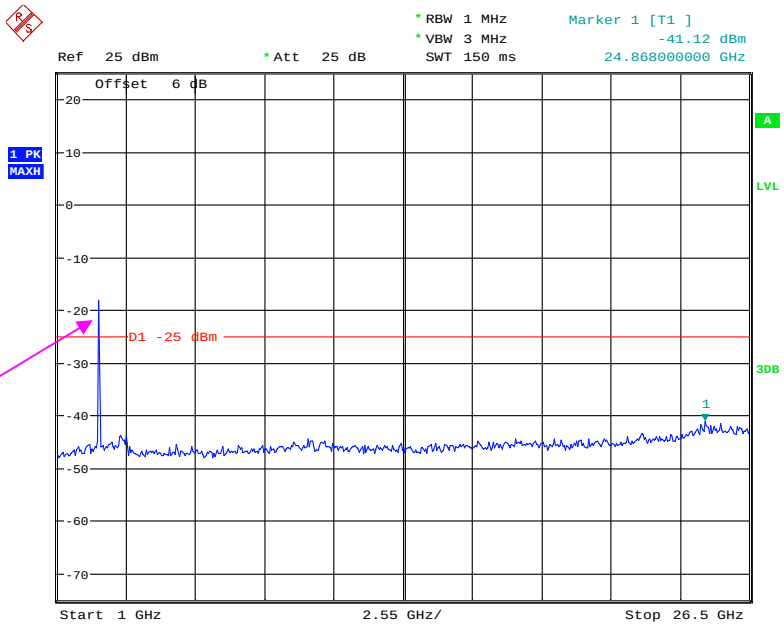
Date: 23.AUG.2019 10:25:26

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



Date: 23.AUG.2019 10:25:48

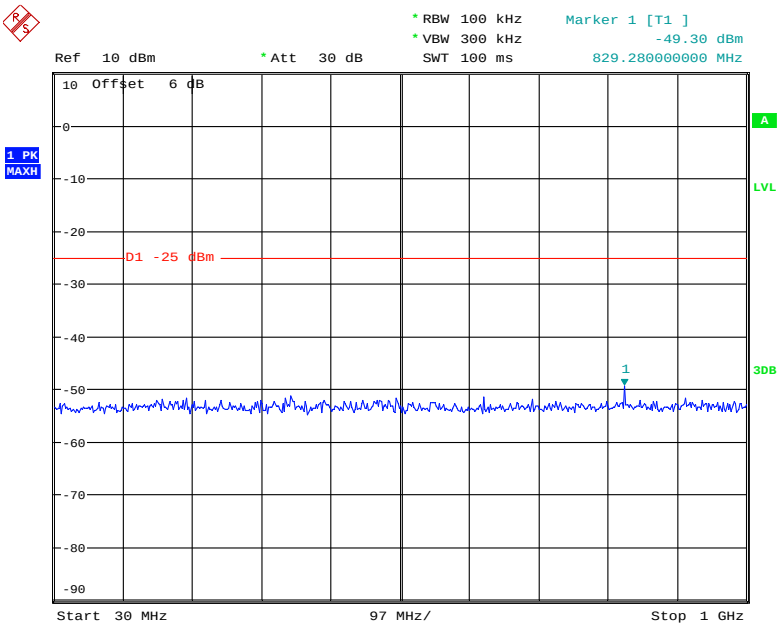
1 GHz – 26.5 GHz (15.0 MHz, Middle Channel)



Fundamental test with notch filter

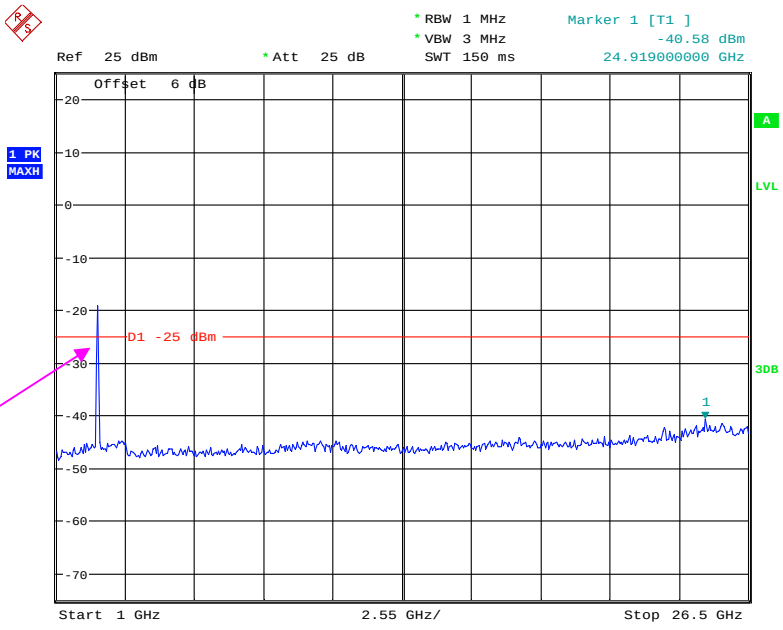
Date: 23.AUG.2019 10:25:57

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



Date: 23.AUG.2019 10:26:16

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



Fundamental test with notch filter

Date: 23.AUG.2019 10:26:25

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

Applicable Standard

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

Test Procedure

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

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

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

Test Data

Environmental Conditions

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

The testing was performed by Curry Xiang on 2019-08-14.

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										
941.36	37.39	23	2.3	H	-63.2	1.37	0.0	-64.57	-13	51.57
941.36	37.72	241	2.3	V	-61.6	1.37	0.0	-62.97	-13	49.97
1673.20	51.48	59	1.8	H	-54.9	1.30	8.90	-47.30	-13	34.30
1673.20	49.22	163	1.9	V	-56.5	1.30	8.90	-48.90	-13	35.90
2509.80	48.26	113	1.1	H	-55.1	2.60	10.20	-47.50	-13	34.50
2509.80	45.05	209	2.2	V	-57.7	2.60	10.20	-50.10	-13	37.10
3346.40	43.76	304	1.9	H	-57.1	1.50	11.70	-46.90	-13	33.90
3346.40	43.22	175	1.3	V	-57.7	1.50	11.70	-47.50	-13	34.50
WCDMA Mode, Middle channel										
938.97	37.04	164	1.9	H	-63.5	1.37	0.0	-64.87	-13	51.87
938.97	36.37	92	2.2	V	-63.0	1.37	0.0	-64.37	-13	51.37
1673.20	43.85	284	1.9	H	-62.5	1.30	8.90	-54.90	-13	41.90
1673.20	44.25	140	1.7	V	-61.5	1.30	8.90	-53.90	-13	40.90
2509.80	51.19	6	2.1	H	-52.2	2.60	10.20	-44.60	-13	31.60
2509.80	45.41	283	2.0	V	-57.3	2.60	10.20	-49.70	-13	36.70
3346.40	43.57	95	2.3	H	-57.3	1.50	11.70	-47.10	-13	34.10
3346.40	43.85	118	2.3	V	-57.1	1.50	11.70	-46.90	-13	33.90

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
941.36	36.35	165	1.0	H	-64.2	1.37	0.0	-65.57	-13	52.57
941.36	37.05	297	1.8	V	-62.3	1.37	0.0	-63.67	-13	50.67
3760.00	45.25	111	1.2	H	-56.8	1.50	11.80	-46.50	-13	33.50
3760.00	44.29	72	2.1	V	-57.3	1.50	11.80	-47.00	-13	34.00
WCDMA Mode Band II, Middle channel										
938.97	36.75	53	1.5	H	-63.8	1.37	0.0	-65.17	-13	52.17
938.97	36.16	208	1.9	V	-63.2	1.37	0.0	-64.57	-13	51.57
3760.00	45.84	245	2.4	H	-56.2	1.50	11.80	-45.90	-13	32.90
3760.00	44.80	317	1.8	V	-56.8	1.50	11.80	-46.50	-13	33.50

30 MHz ~ 20 GHz:

AWS Band (Part 27)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
WCDMA Mode Band IV, Middle channel										
938.97	36.48	187	1.3	H	-64.1	1.37	0.0	-65.47	-13	52.47
938.97	37.23	196	1.7	V	-62.1	1.37	0.0	-63.47	-13	50.47
3465.20	44.42	103	1.4	H	-56.3	1.50	12.00	-45.80	-13	32.80
3465.20	44.07	313	1.2	V	-57.4	1.50	12.00	-46.90	-13	33.90

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										
936.80	37.45	62	1.4	H	-63.1	1.37	0.0	-64.47	-13	51.47
936.80	36.72	238	1.4	V	-62.6	1.37	0.0	-63.97	-13	50.97
3760.00	44.26	26	2.5	H	-57.8	1.50	11.80	-47.50	-13	34.50
3760.00	43.45	210	1.3	V	-58.1	1.50	11.80	-47.80	-13	34.80
Band 4 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 20 GHz										
936.80	36.39	344	1.4	H	-64.2	1.37	0.0	-65.57	-13	52.57
936.80	37.37	183	2.4	V	-62.0	1.37	0.0	-63.37	-13	50.37
3465.00	43.24	61	1.6	H	-57.5	1.50	12.00	-47.00	-13	34.00
3465.00	43.63	148	2.2	V	-57.9	1.50	12.00	-47.40	-13	34.40
Band 5 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 10 GHz										
936.80	36.71	143	1.4	H	-63.9	1.37	0.0	-65.27	-13	52.27
936.80	37.72	195	2.0	V	-61.6	1.37	0.0	-62.97	-13	49.97
1673.00	43.09	359	1.9	H	-63.2	1.30	8.90	-55.60	-13	42.60
1673.00	42.95	89	2.3	V	-62.8	1.30	8.90	-55.20	-13	42.20
2509.50	46.03	312	2.0	H	-57.3	2.60	10.20	-49.70	-13	36.70
2509.50	45.74	334	1.8	V	-57.0	2.60	10.20	-49.40	-13	36.40
3346.00	43.61	185	2.2	H	-57.3	1.50	11.70	-47.10	-13	34.10
3346.00	43.01	341	1.8	V	-57.9	1.50	11.70	-47.70	-13	34.70
Band 7 (5 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 26.5GHz										
936.80	35.97	180	1.1	H	-64.6	1.37	0.0	-65.97	-25	40.97
936.80	36.51	318	1.1	V	-62.8	1.37	0.0	-64.17	-25	39.17
5070.00	43.47	98	1.3	H	-56.5	1.60	12.10	-46.00	-25	21.00
5070.00	42.88	35	1.9	V	-57.1	1.60	12.10	-46.60	-25	21.60

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

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

Applicable Standard

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

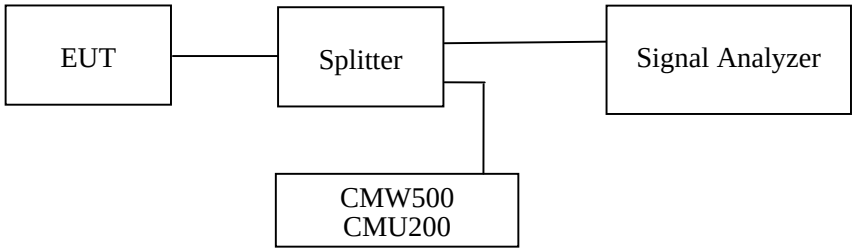
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to FCC §27.53 (h)(m), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Test Procedure

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

The center of the spectrum analyzer was set to block edge frequency



Test Data

Environmental Conditions

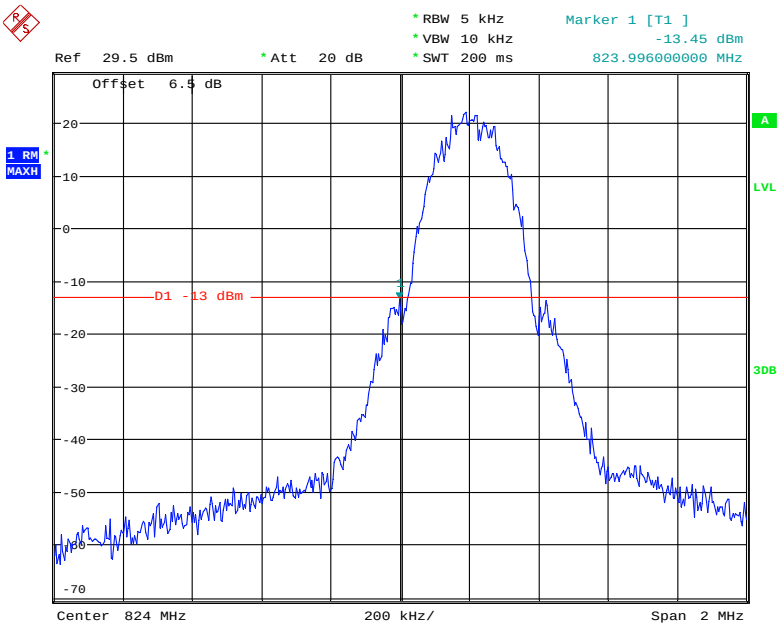
Temperature:	24~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Leo Huang from 2019-08-17 to 2019-08-23.

EUT operation mode: Transmitting

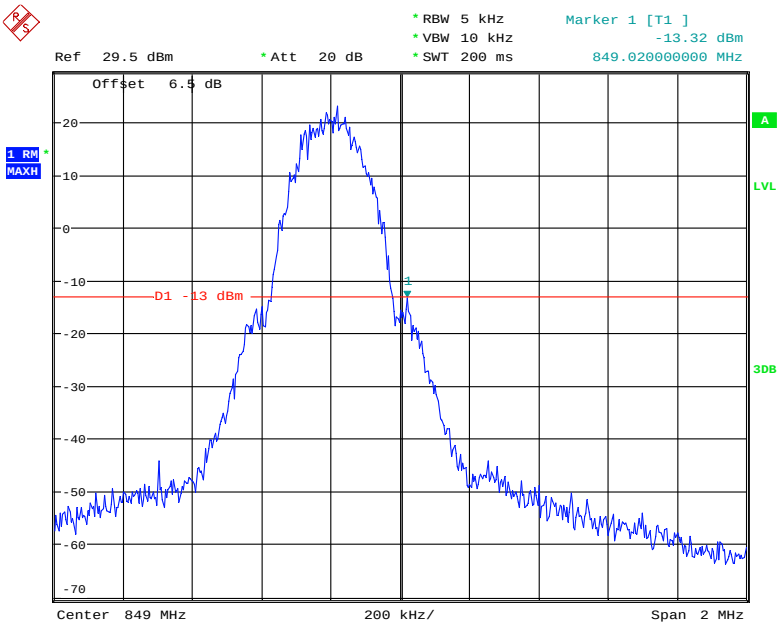
Test Result: Compliance. Please refer to the following plots.

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



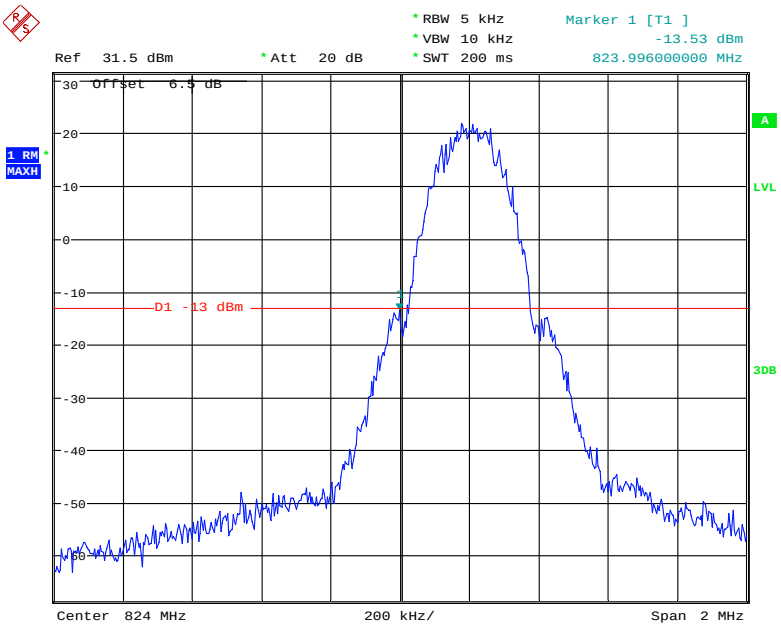
Date: 17.AUG.2019 18:27:25

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



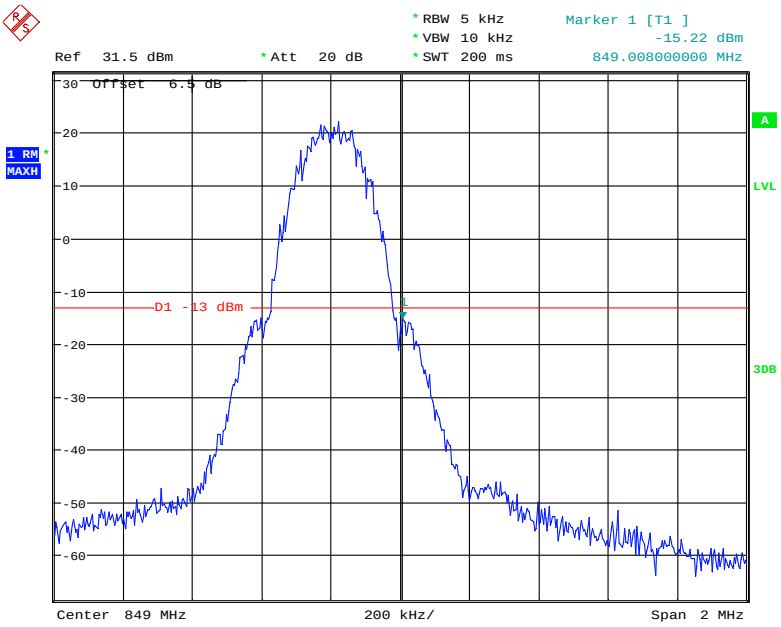
Date: 17.AUG.2019 18:28:51

Cellular Band, Left Band Edge for EDGE Mode



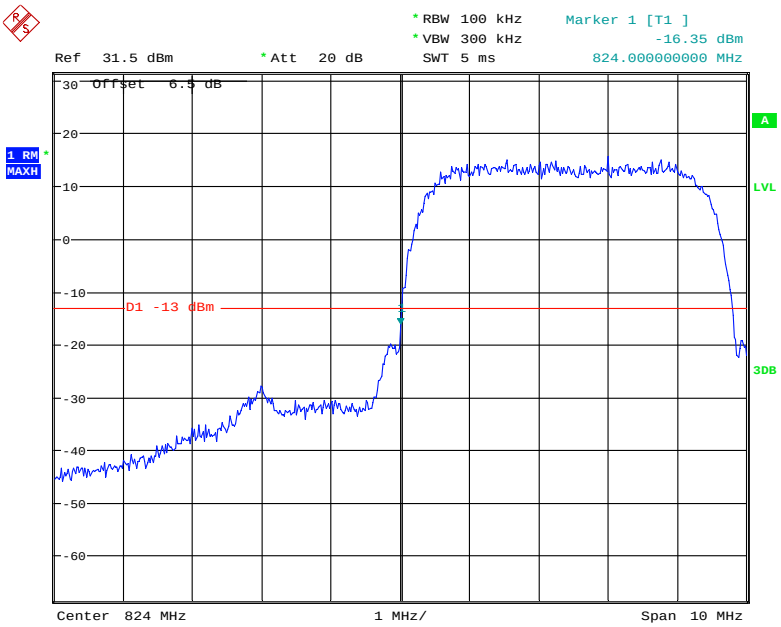
Date: 17.AUG.2019 18:42:28

Cellular Band, Right Band Edge for EDGE Mode



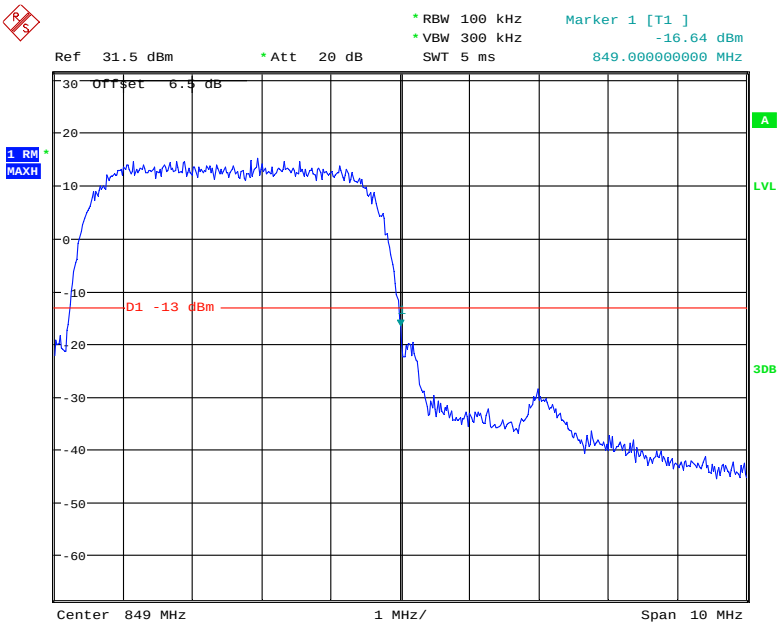
Date: 17.AUG.2019 18:43:13

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



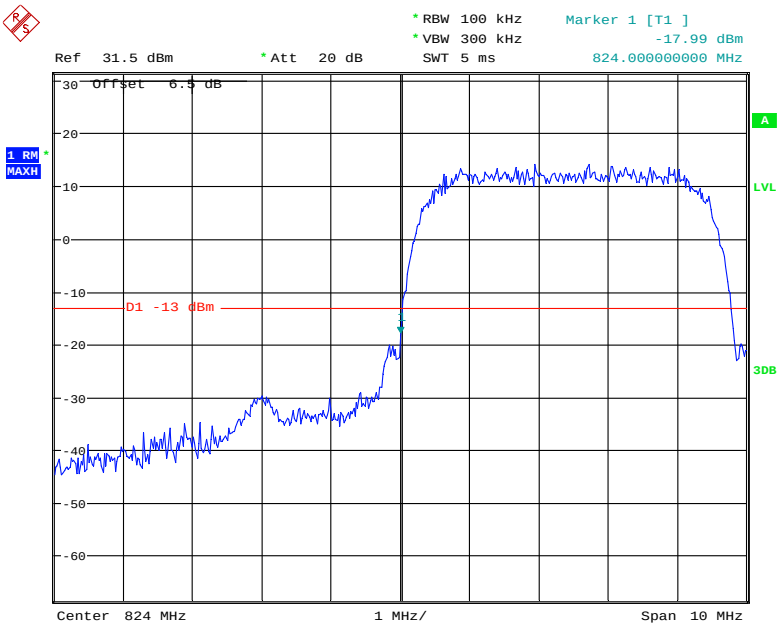
Date: 17.AUG.2019 20:28:12

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



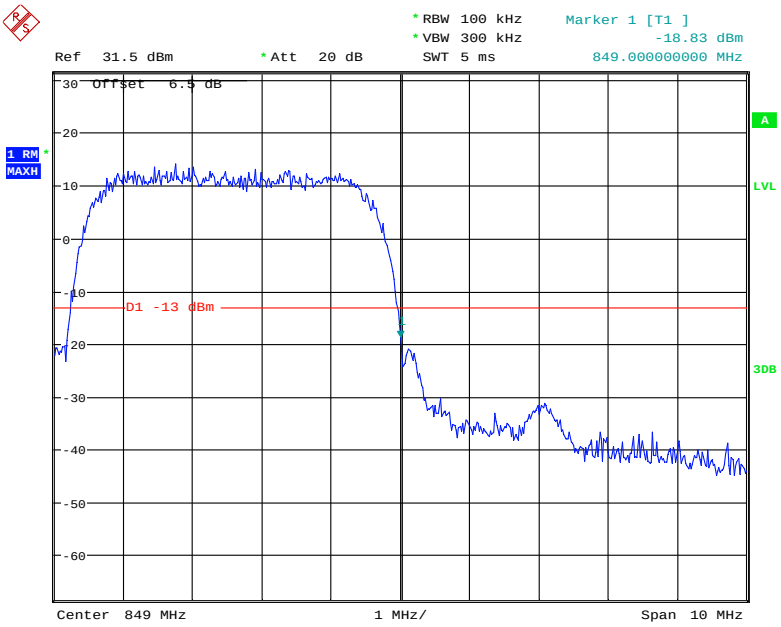
Date: 17.AUG.2019 20:27:46

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



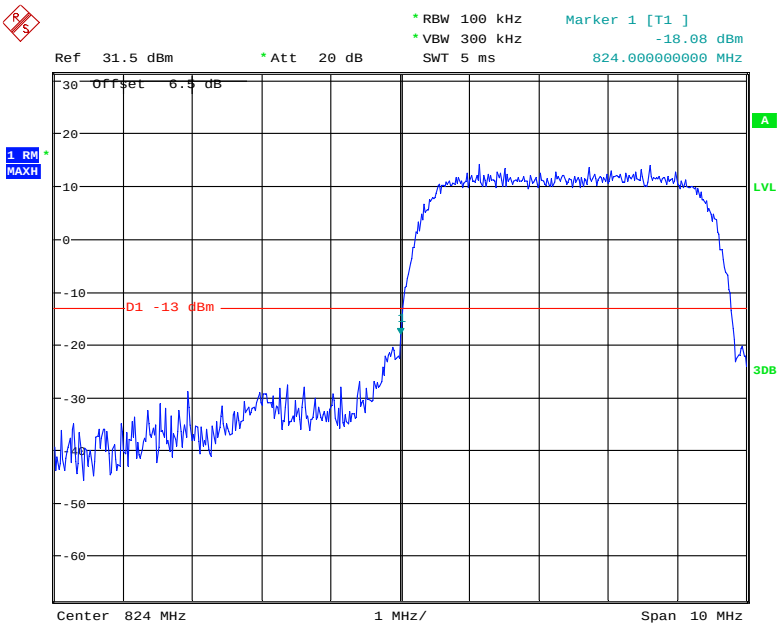
Date: 17.AUG.2019 20:31:40

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



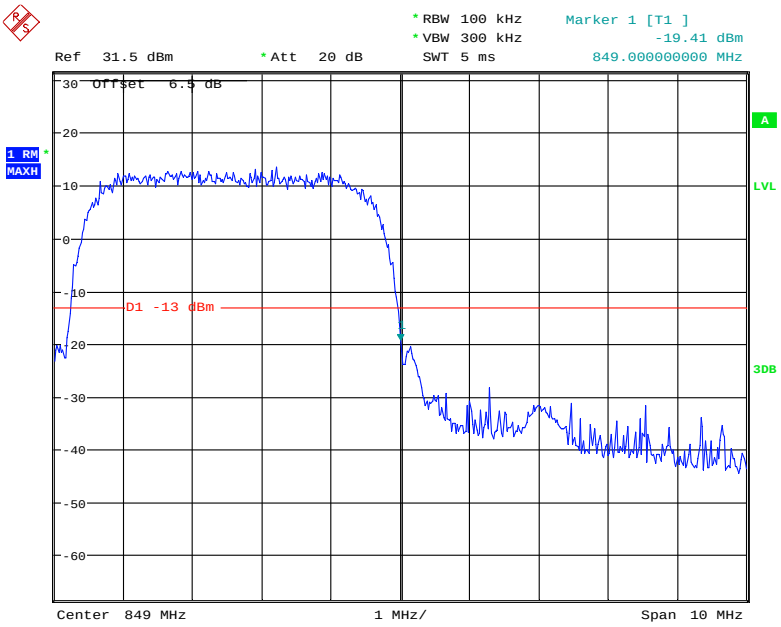
Date: 17.AUG.2019 20:31:13

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



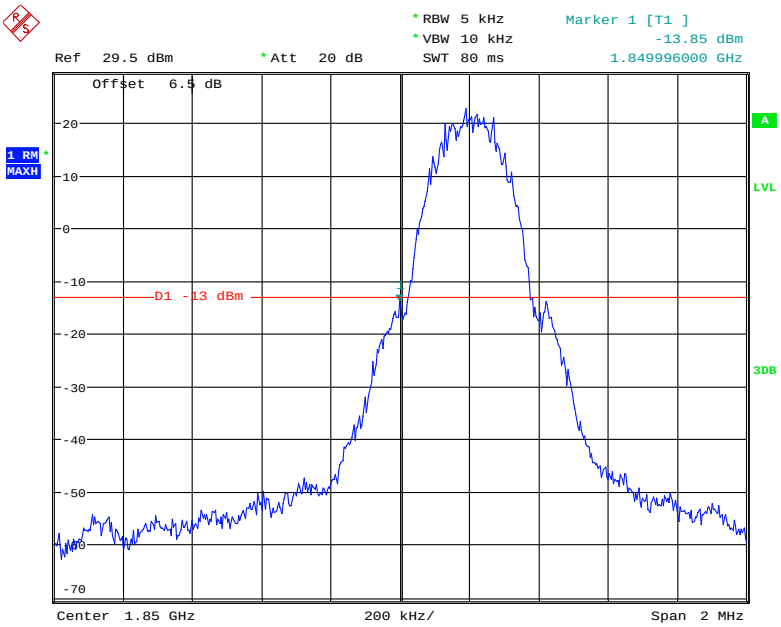
Date: 17.AUG.2019 20:29:09

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



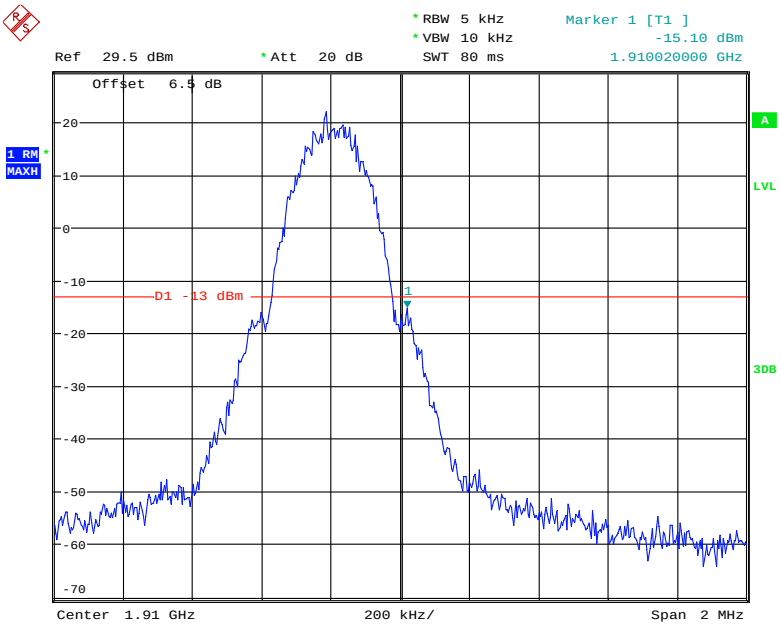
Date: 17.AUG.2019 20:29:45

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



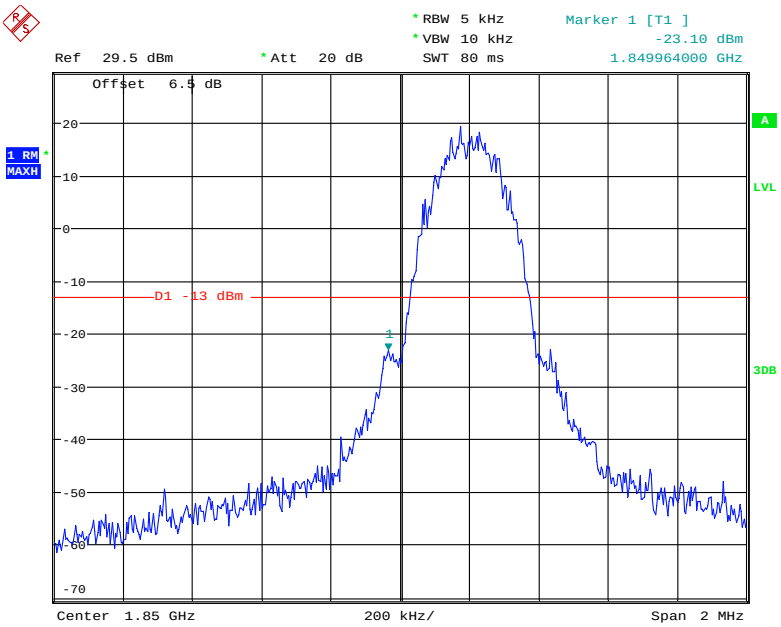
Date: 17.AUG.2019 18:04:56

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



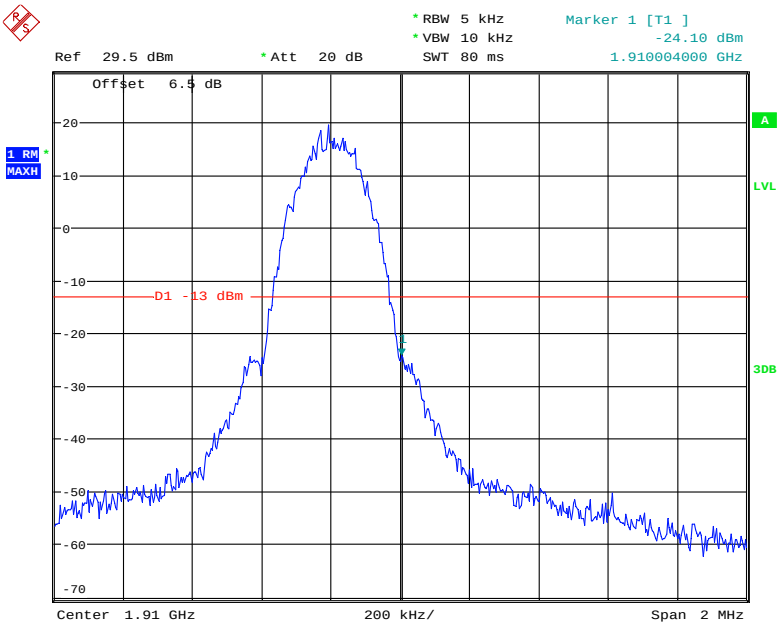
Date: 17.AUG.2019 18:06:22

PCS Band, Left Band Edge for EDGE Mode



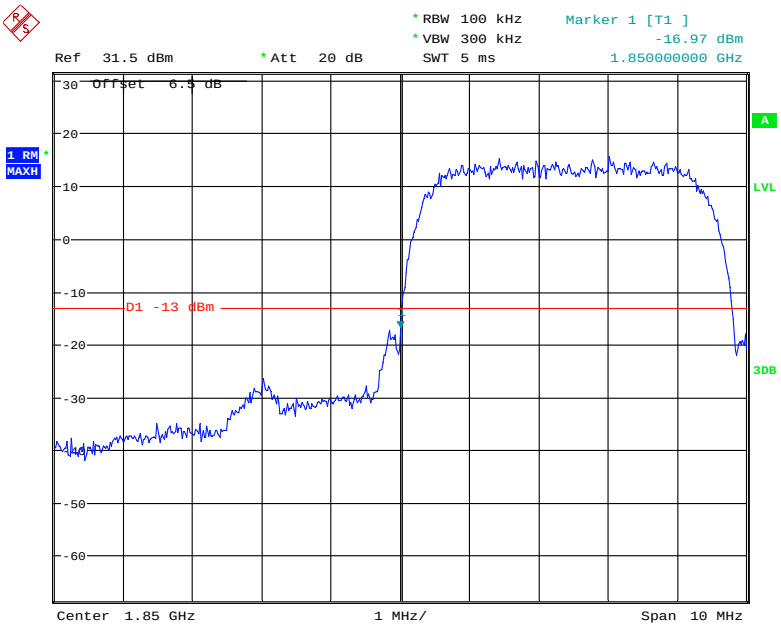
Date: 17.AUG.2019 18:17:50

PCS Band, Right Band Edge for EDGE Mode



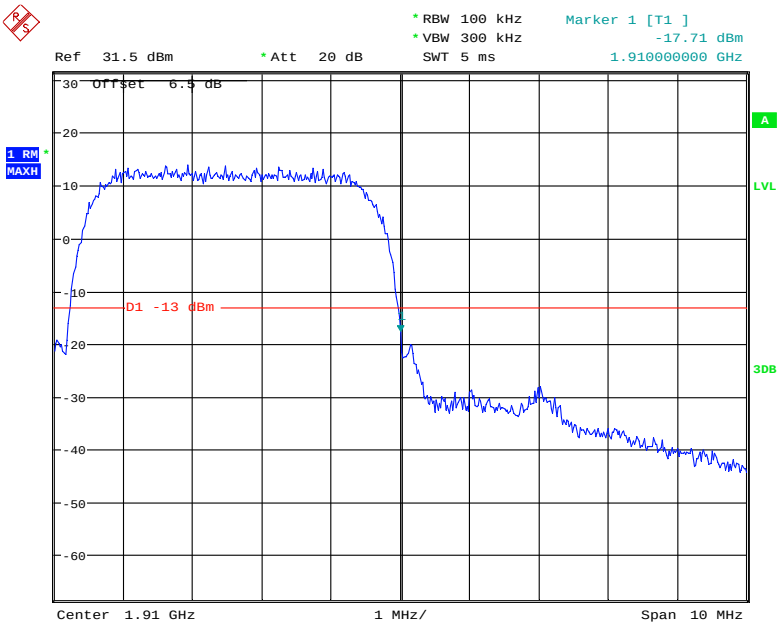
Date: 17.AUG.2019 18:17:08

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



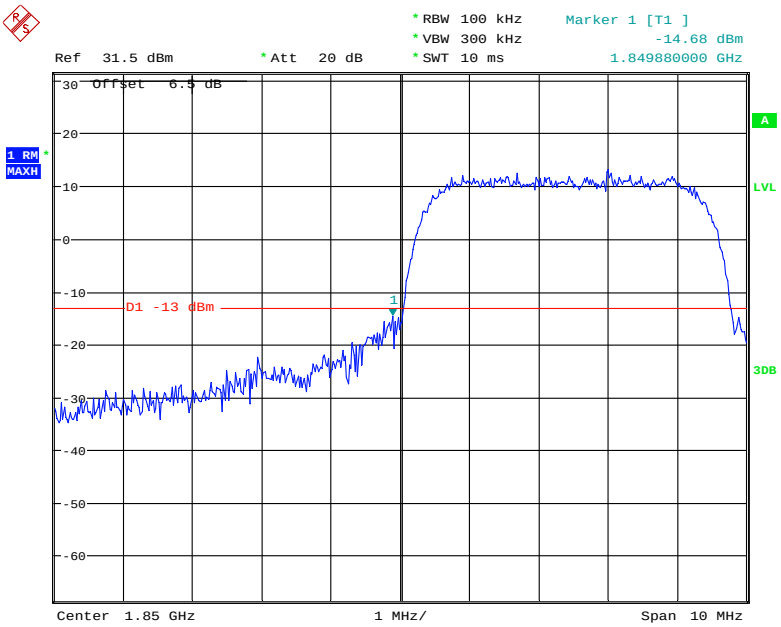
Date: 17.AUG.2019 20:24:48

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



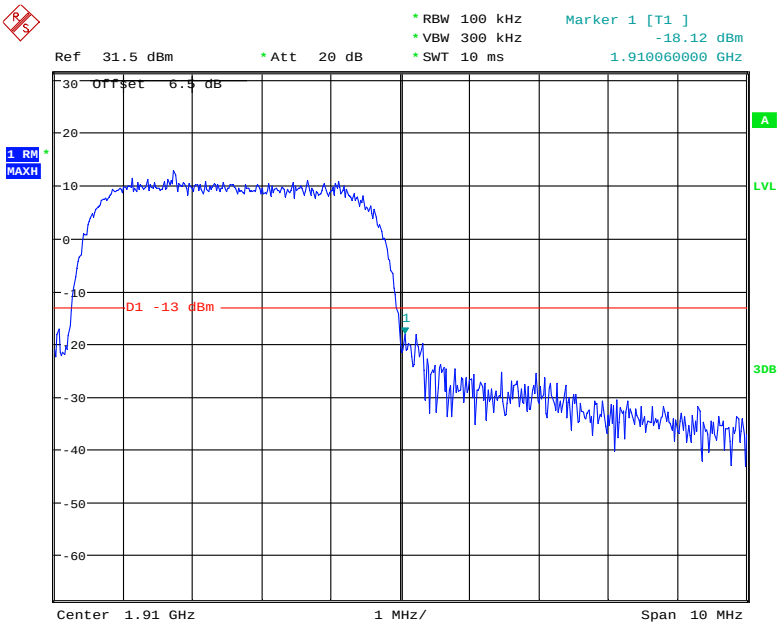
Date: 17.AUG.2019 20:25:43

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



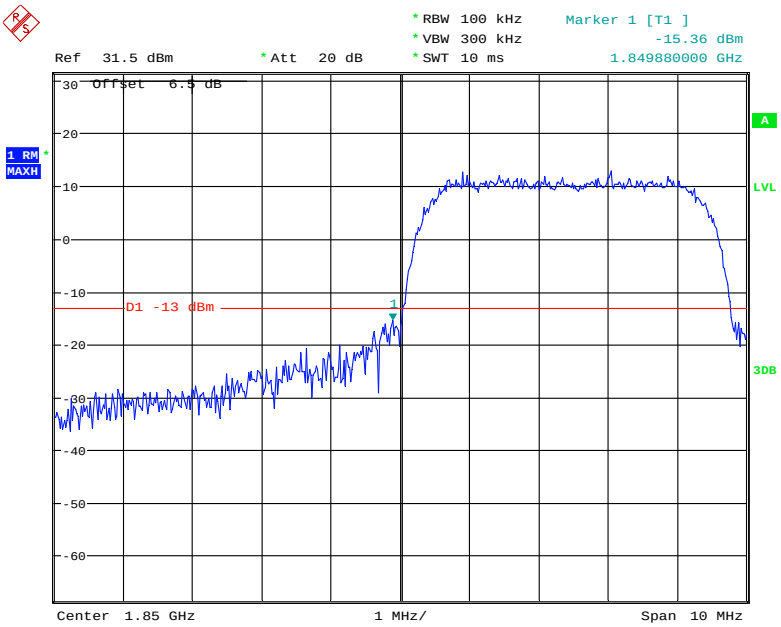
Date: 17.AUG.2019 20:19:03

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



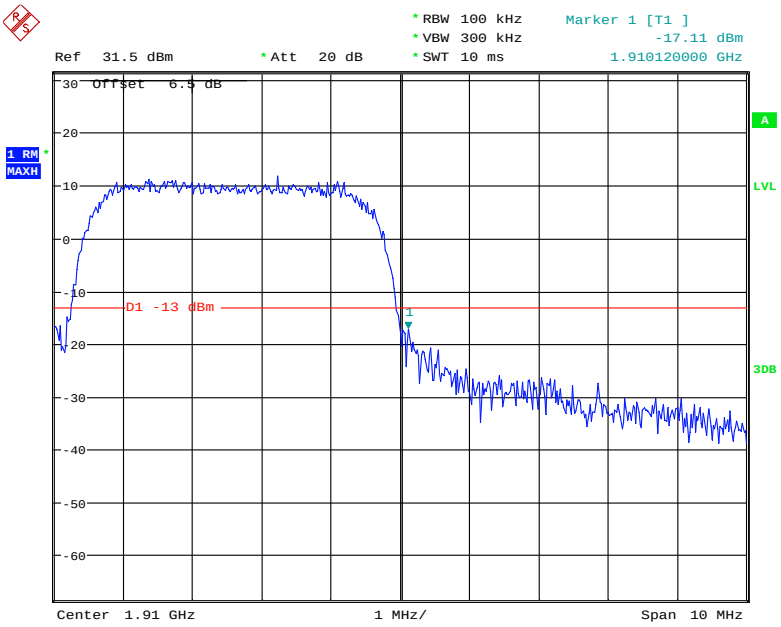
Date: 17.AUG.2019 20:19:49

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



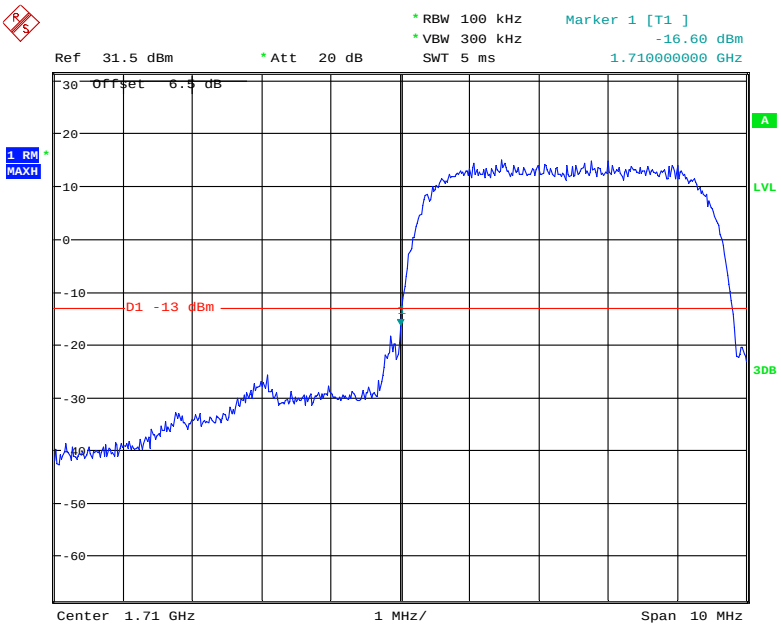
Date: 17.AUG.2019 20:21:45

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



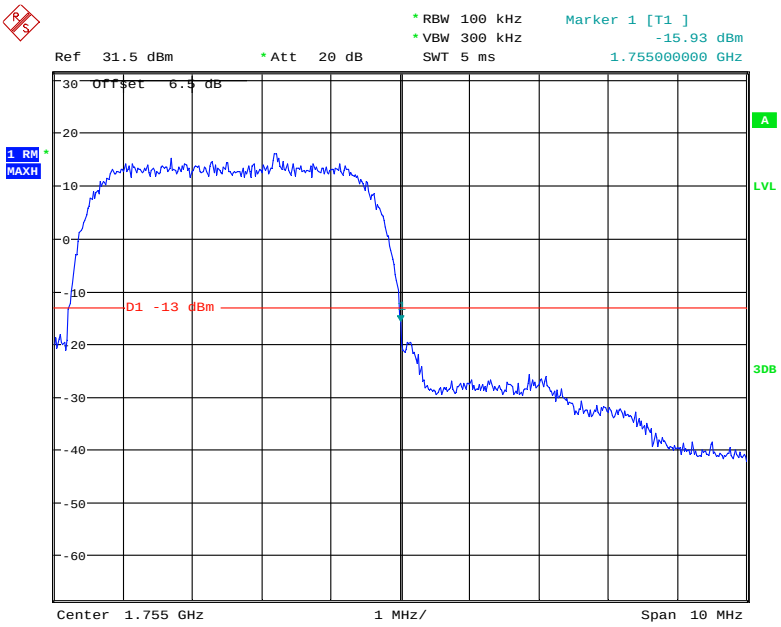
Date: 17.AUG.2019 20:21:04

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



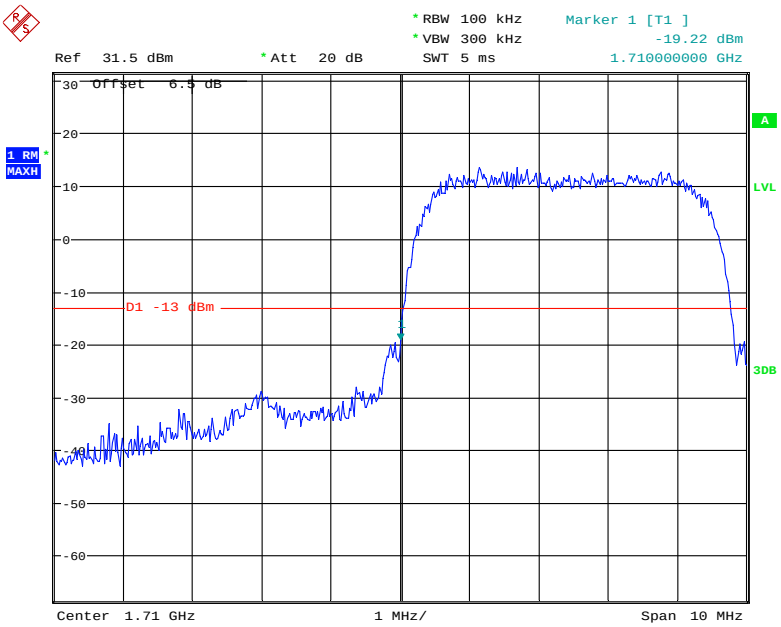
Date: 17.AUG.2019 20:13:52

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



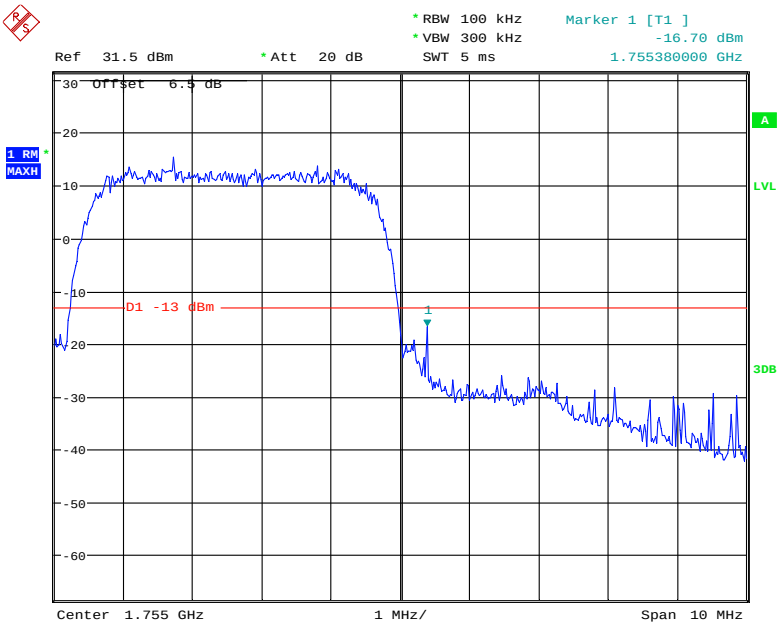
Date: 17.AUG.2019 20:12:47

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



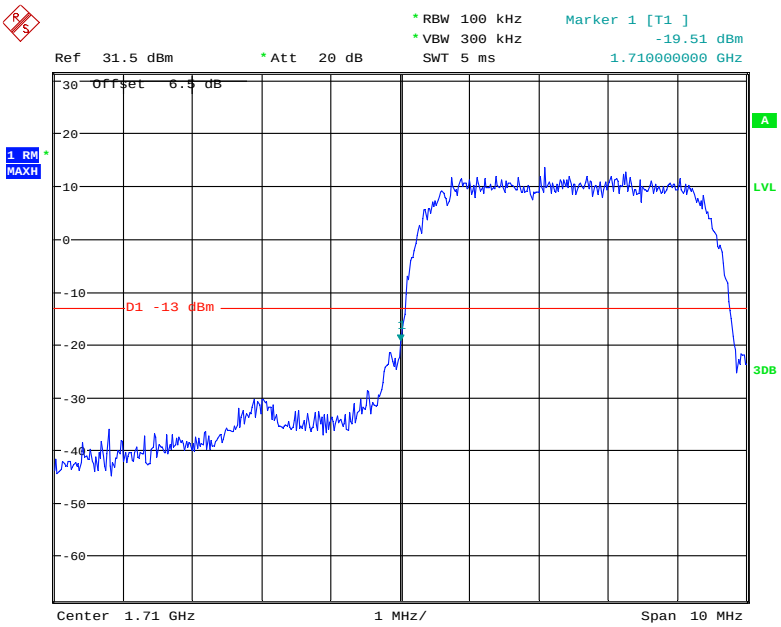
Date: 17.AUG.2019 20:16:52

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



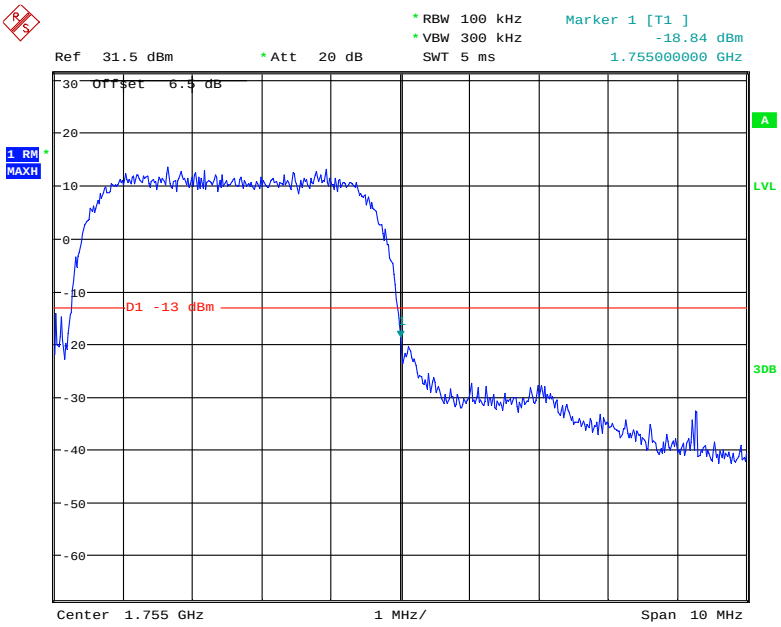
Date: 17.AUG.2019 20:15:47

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



Date: 17.AUG.2019 20:14:24

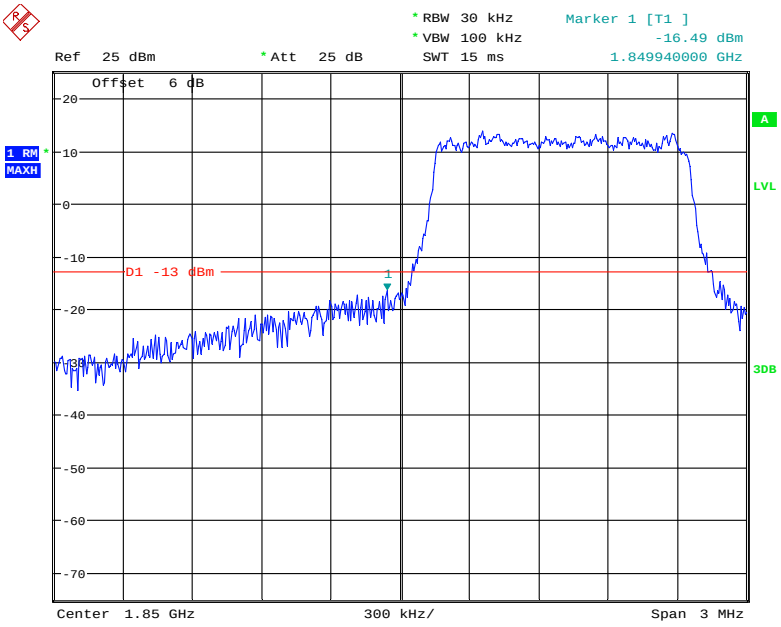
AWS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 17.AUG.2019 20:14:55

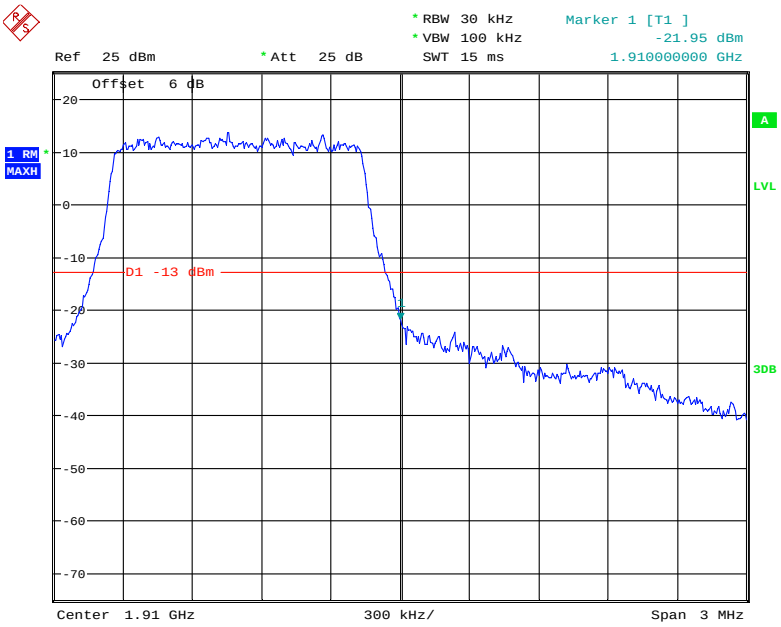
Band 2:

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



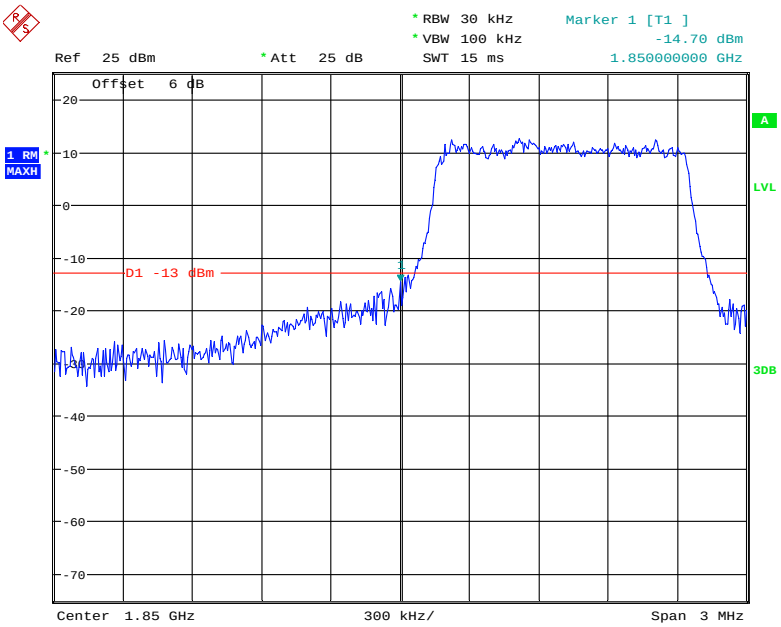
Date: 23.AUG.2019 09:21:02

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



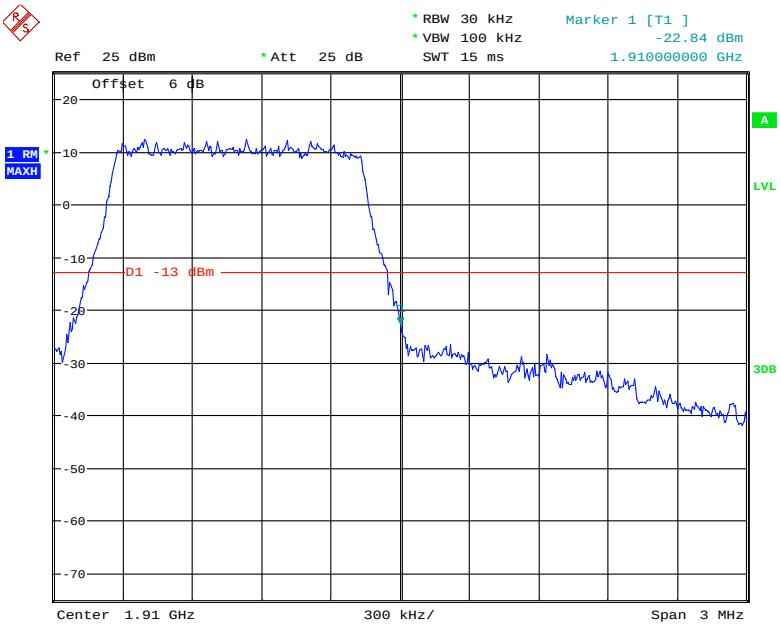
Date: 23.AUG.2019 09:22:16

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



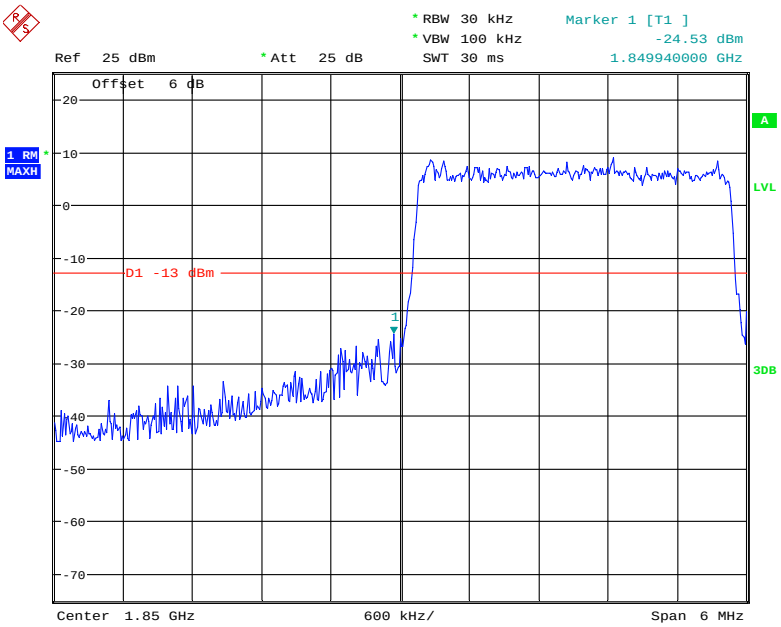
Date: 23.AUG.2019 09:21:40

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



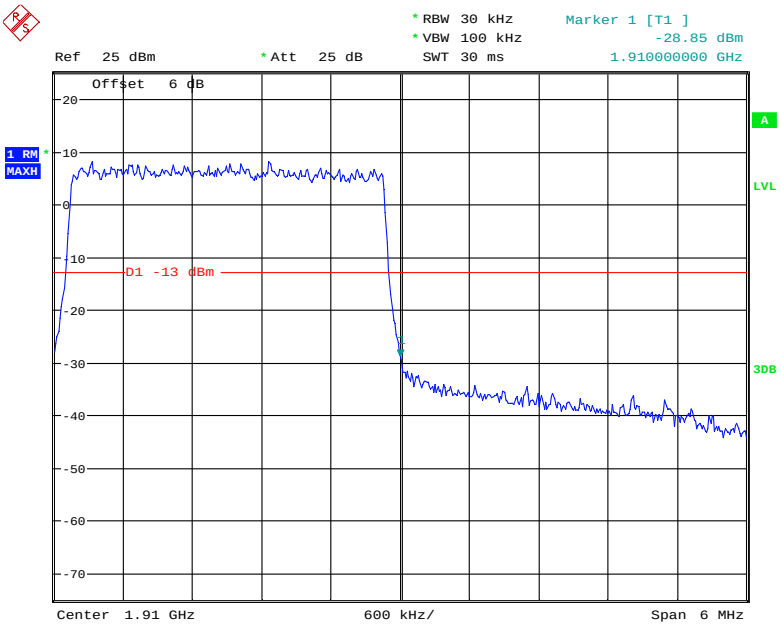
Date: 23.AUG.2019 09:22:45

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



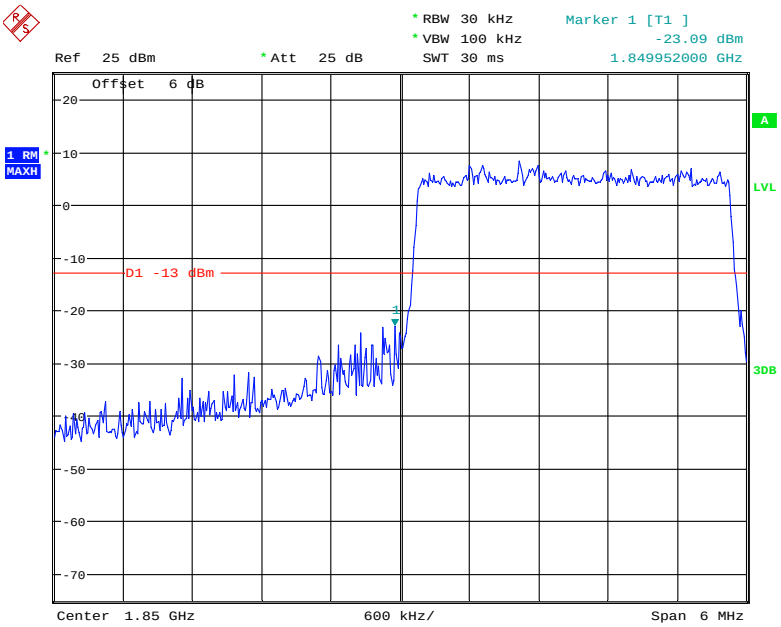
Date: 23.AUG.2019 09:23:10

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



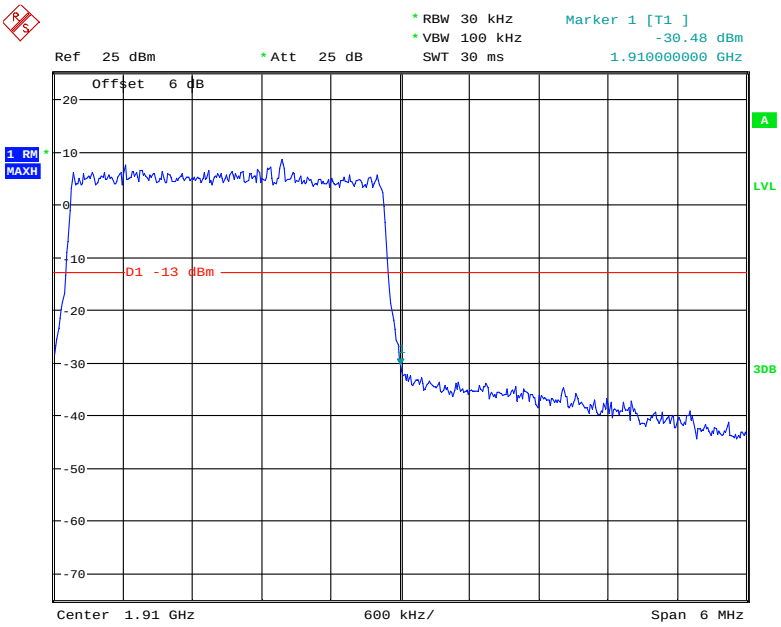
Date: 23.AUG.2019 09:24:15

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



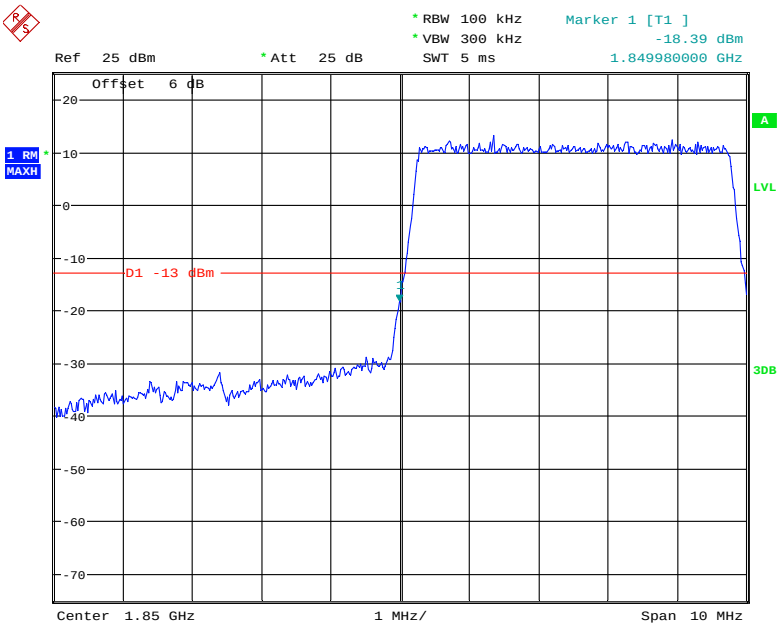
Date: 23.AUG.2019 09:23:45

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



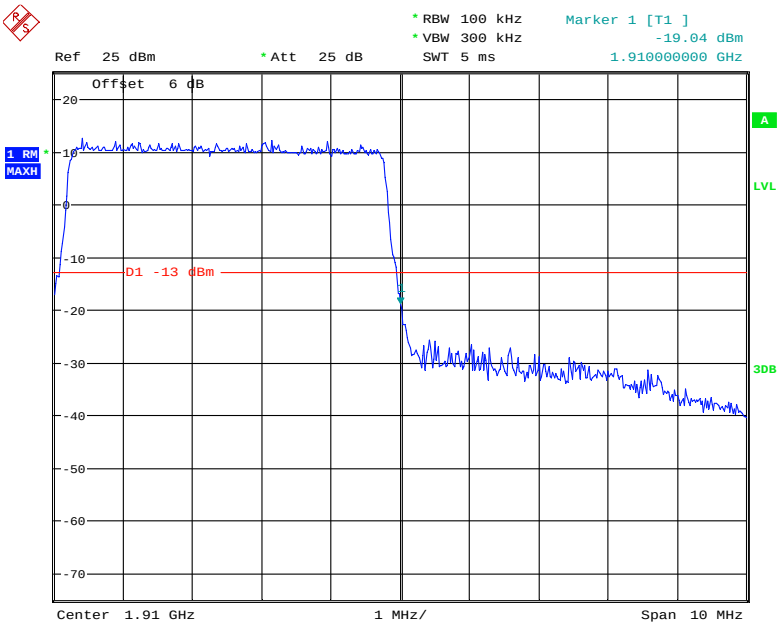
Date: 23.AUG.2019 09:24:40

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



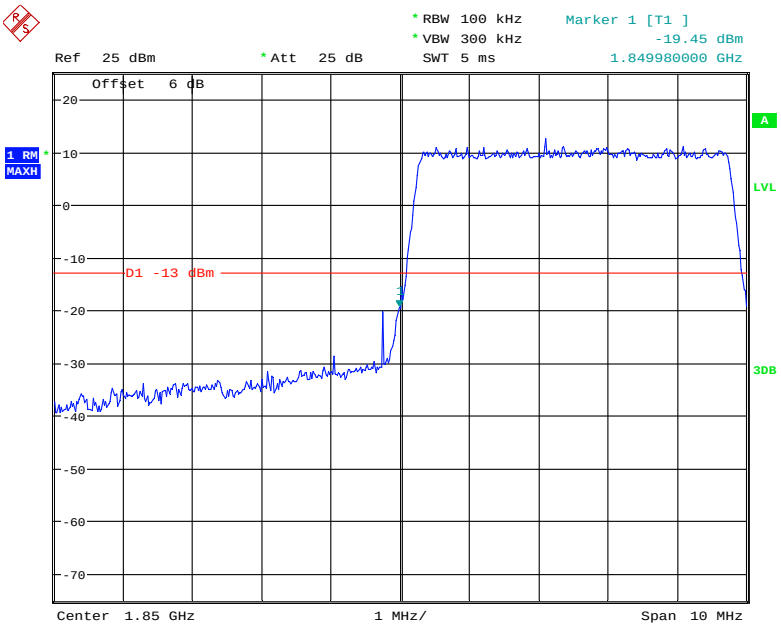
Date: 23.AUG.2019 09:25:21

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



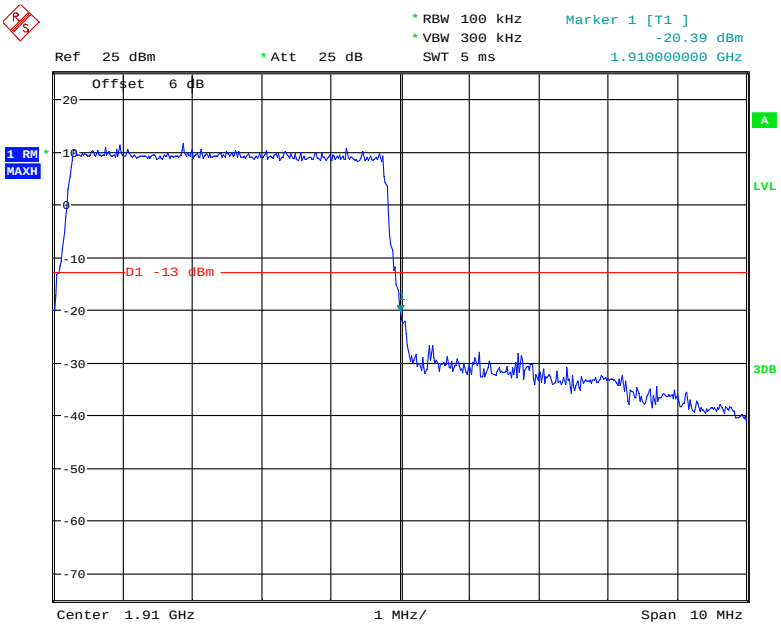
Date: 23.AUG.2019 09:26:25

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



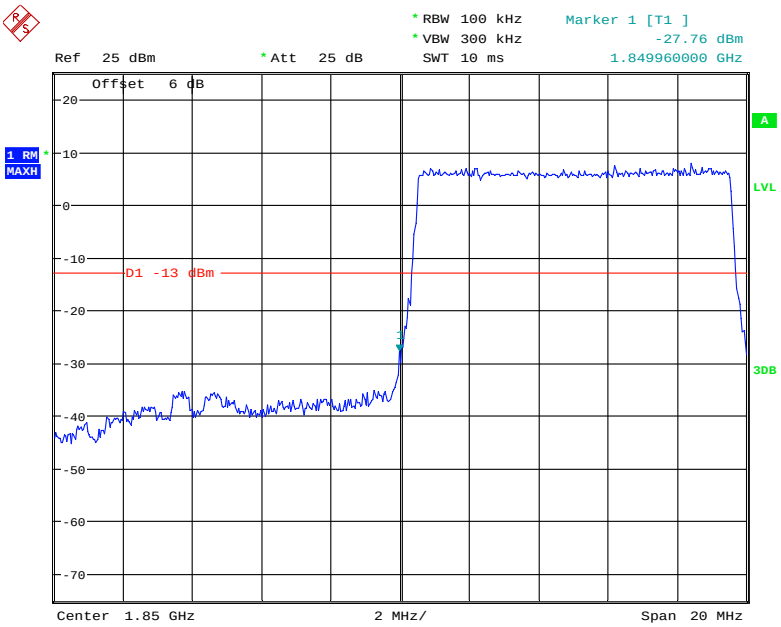
Date: 23.AUG.2019 09:25:56

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



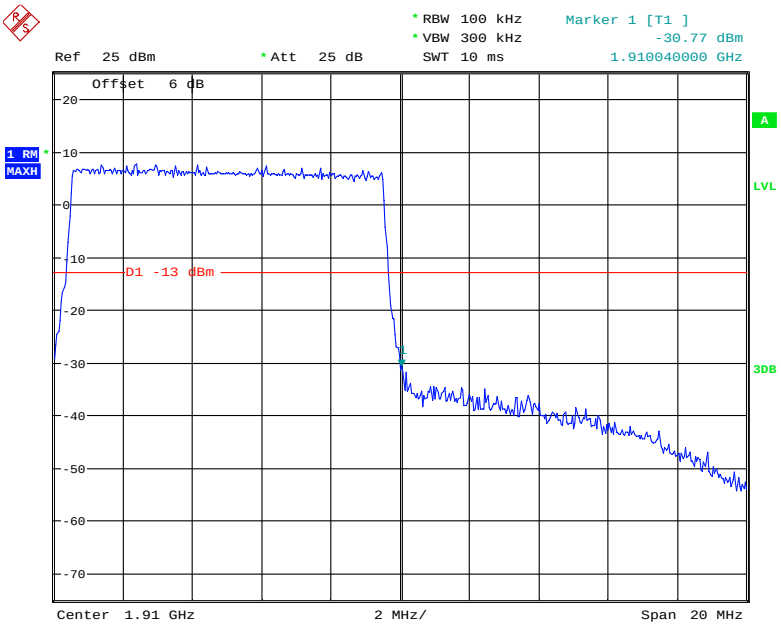
Date: 23.AUG.2019 09:26:51

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



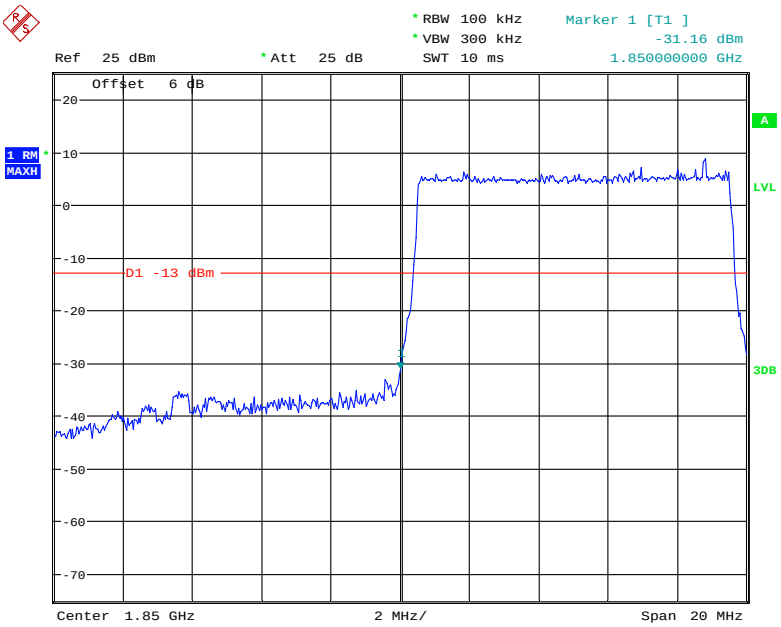
Date: 23.AUG.2019 09:27:24

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



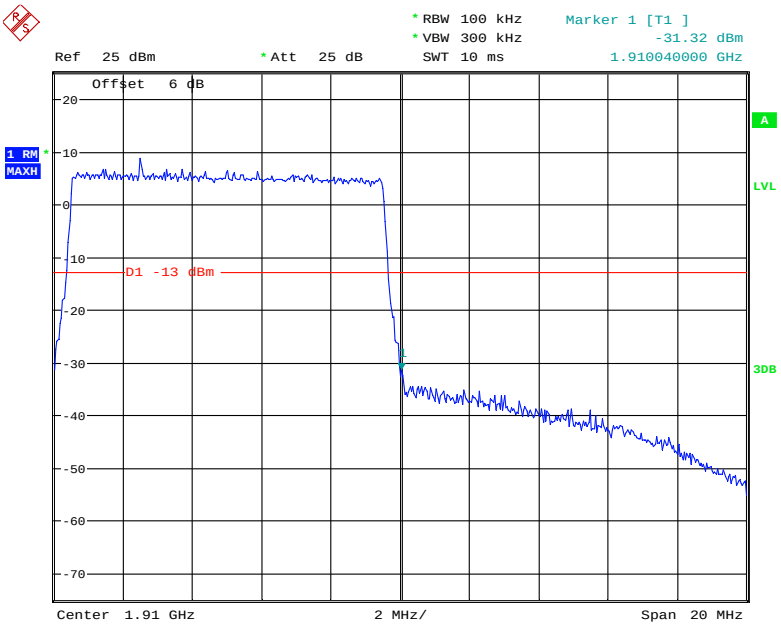
Date: 23.AUG.2019 09:28:15

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



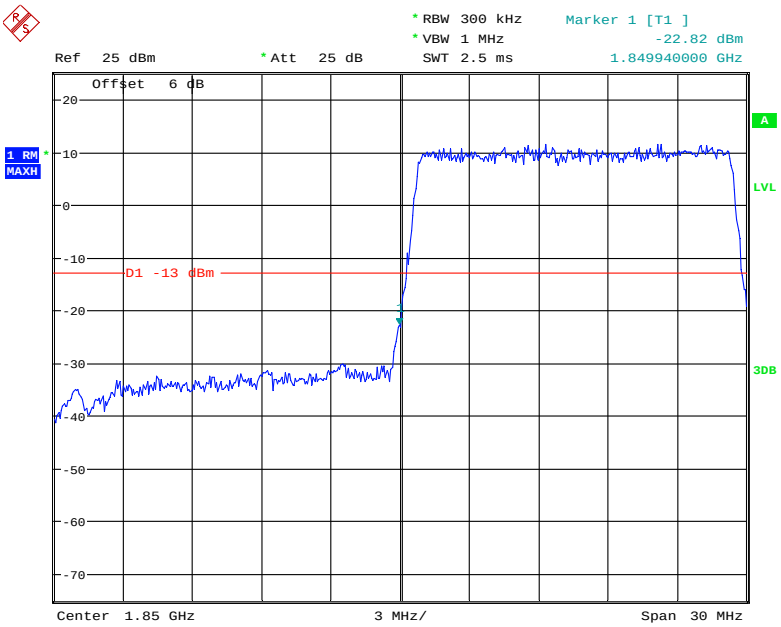
Date: 23.AUG.2019 09:27:47

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



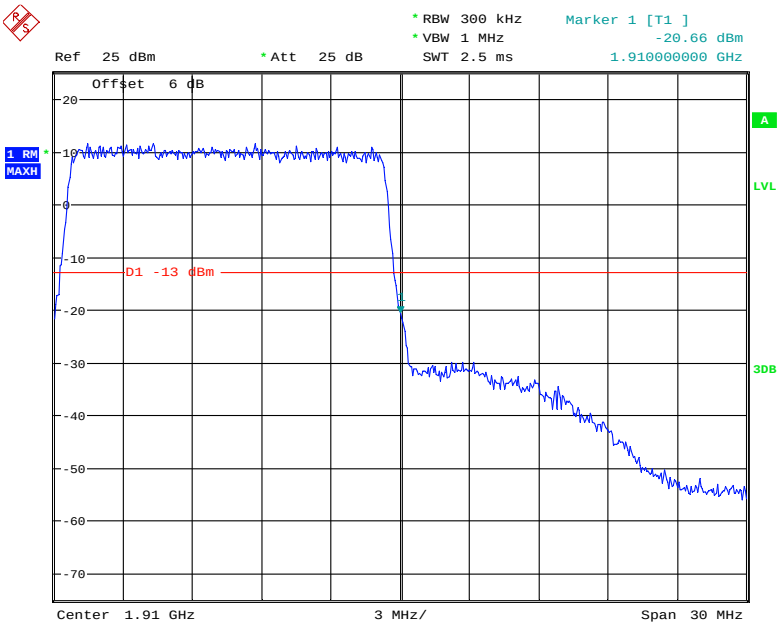
Date: 23.AUG.2019 09:28:45

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



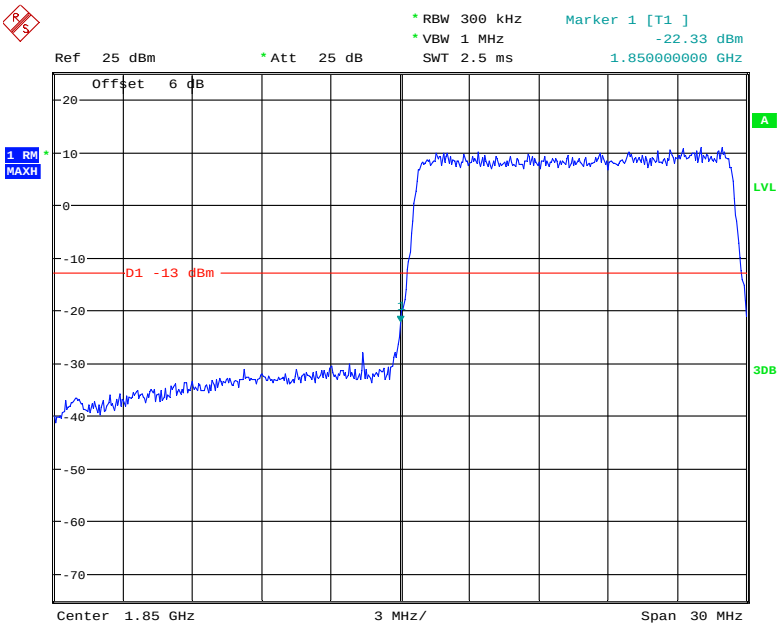
Date: 23.AUG.2019 09:29:22

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



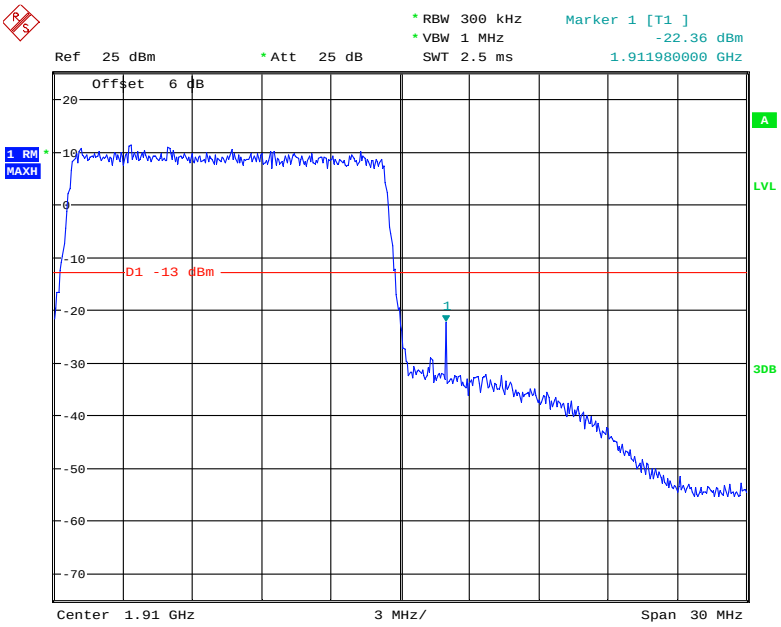
Date: 23.AUG.2019 09:30:30

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



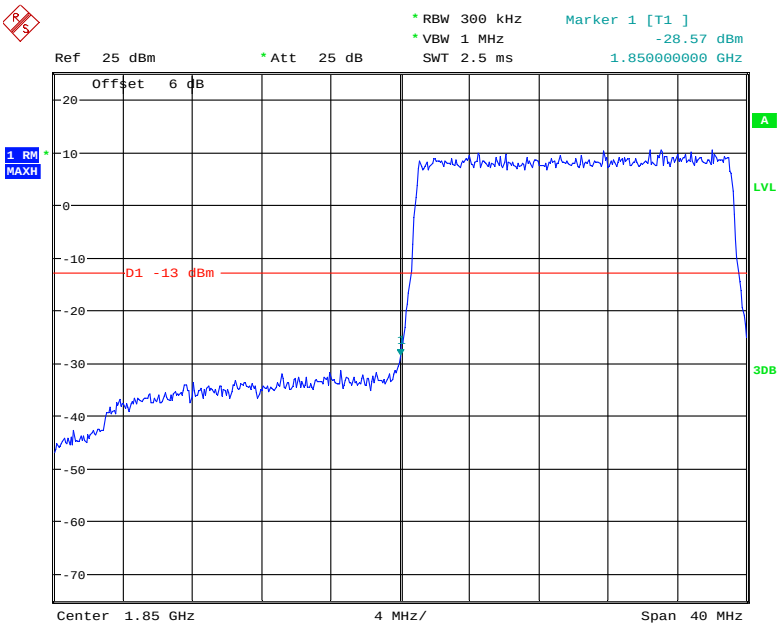
Date: 23.AUG.2019 09:29:55

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



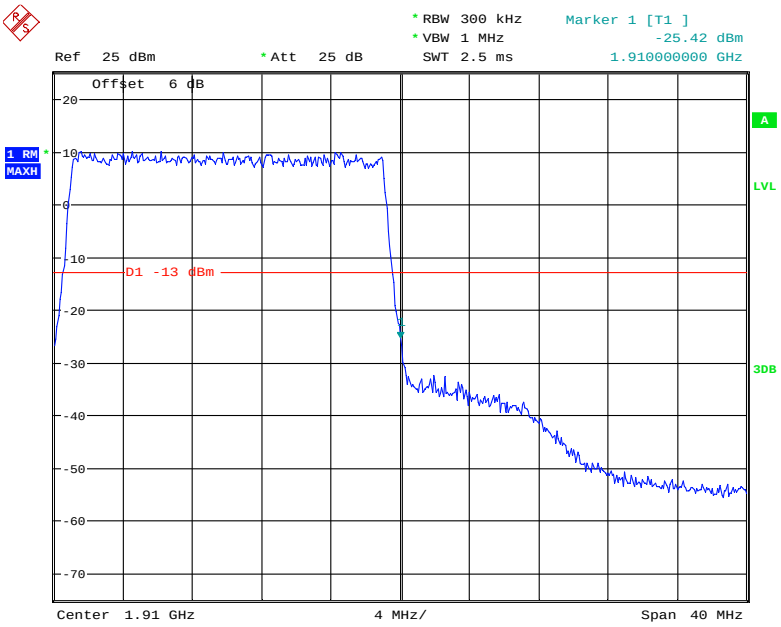
Date: 23.AUG.2019 09:31:06

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



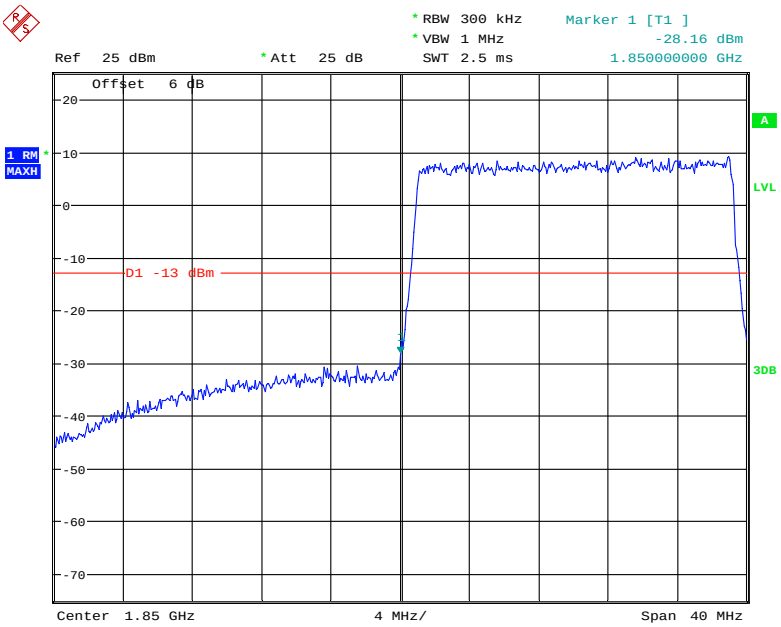
Date: 23.AUG.2019 09:31:41

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



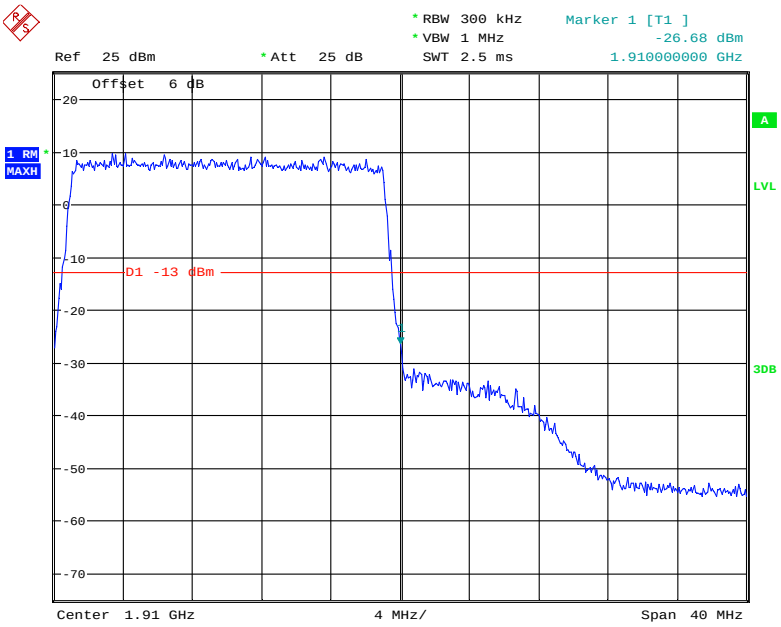
Date: 23.AUG.2019 09:32:49

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



Date: 23.AUG.2019 09:32:13

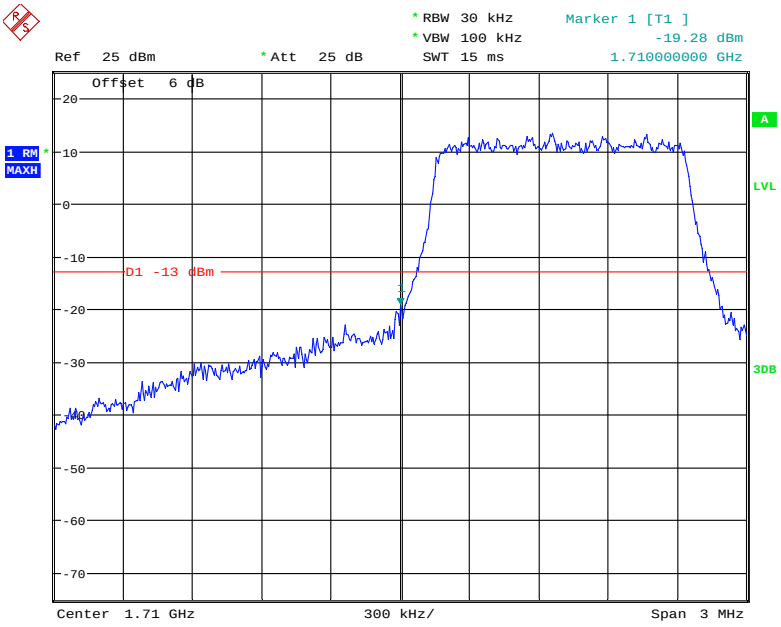
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 23.AUG.2019 09:33:24

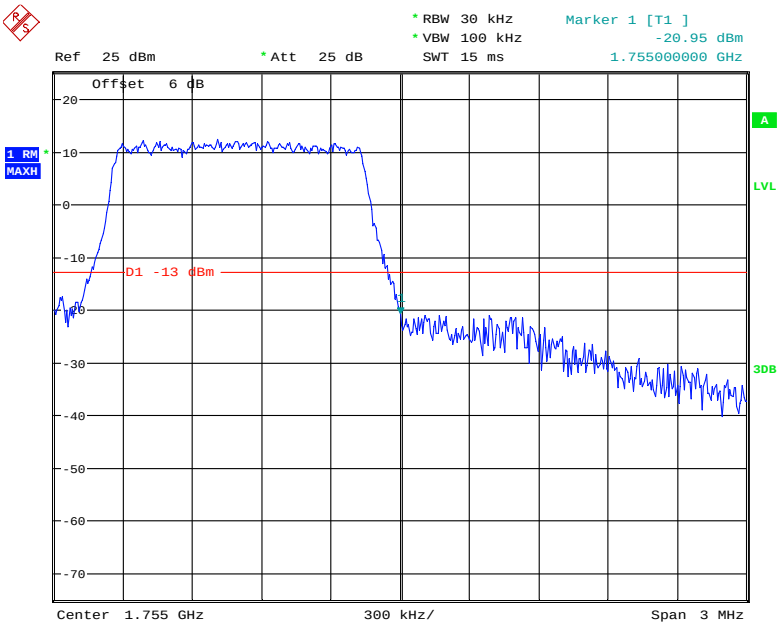
Band 4:

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



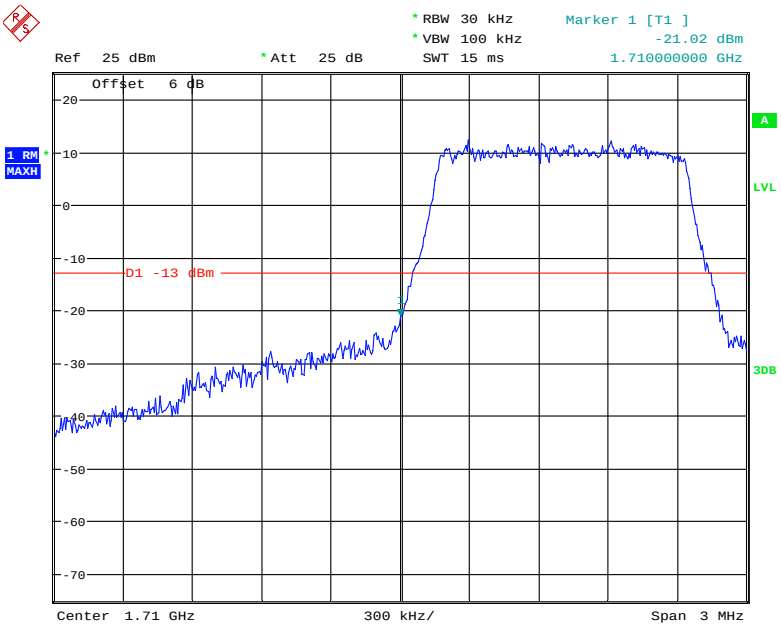
Date: 23.AUG.2019 09:33:59

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



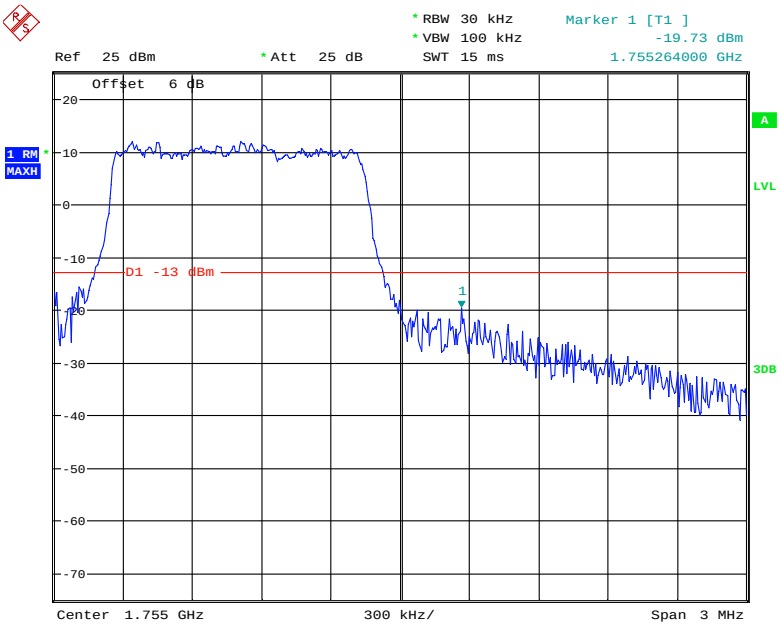
Date: 23.AUG.2019 09:35:10

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



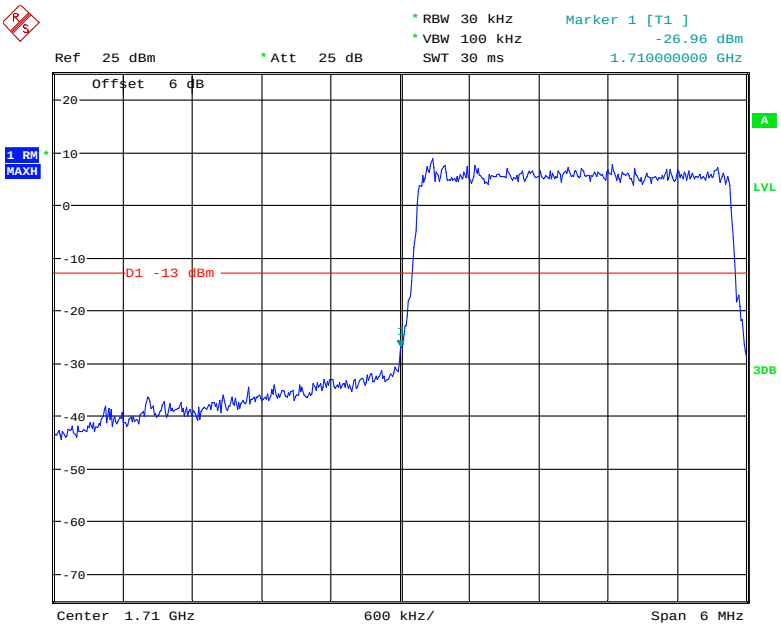
Date: 23.AUG.2019 09:34:25

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



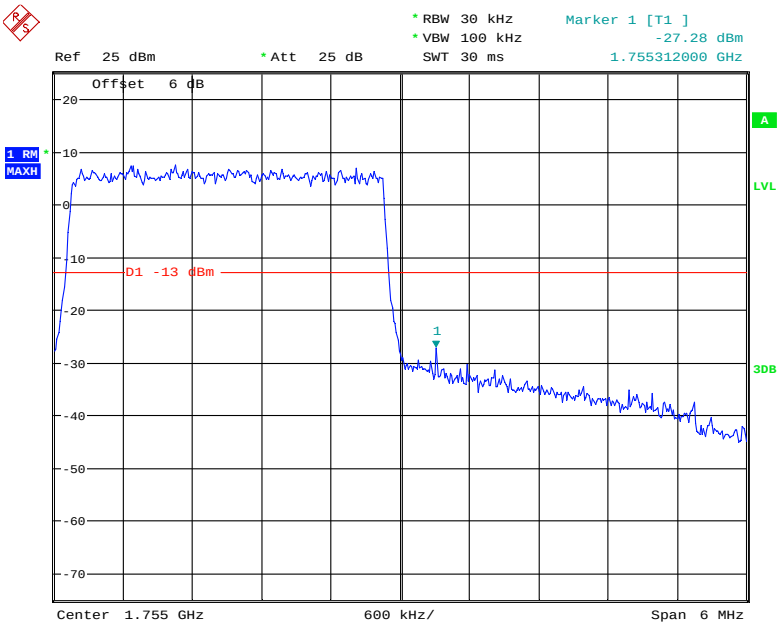
Date: 23.AUG.2019 09:36:06

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



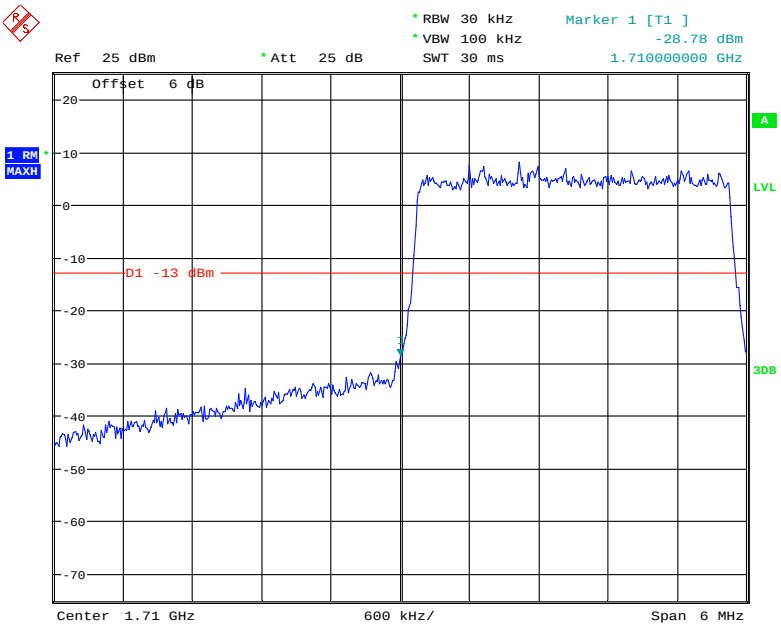
Date: 23.AUG.2019 09:36:34

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



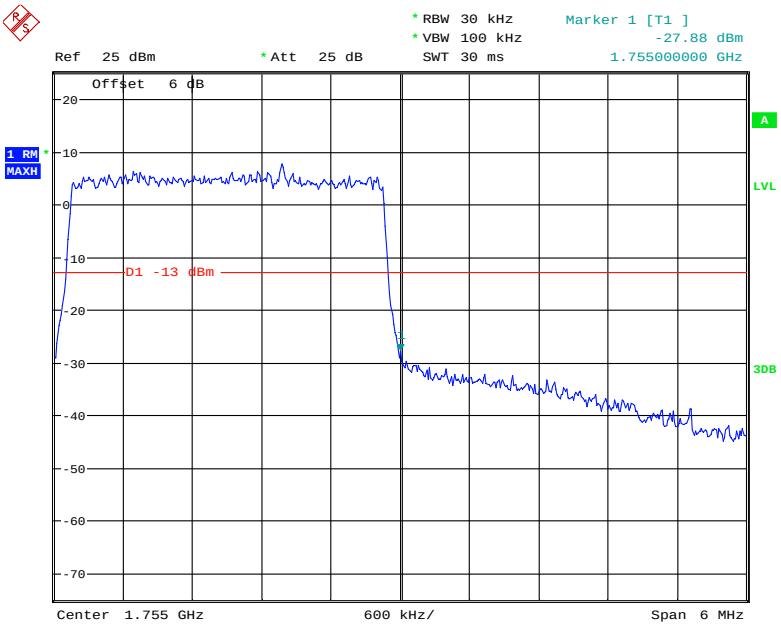
Date: 23.AUG.2019 09:37:23

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



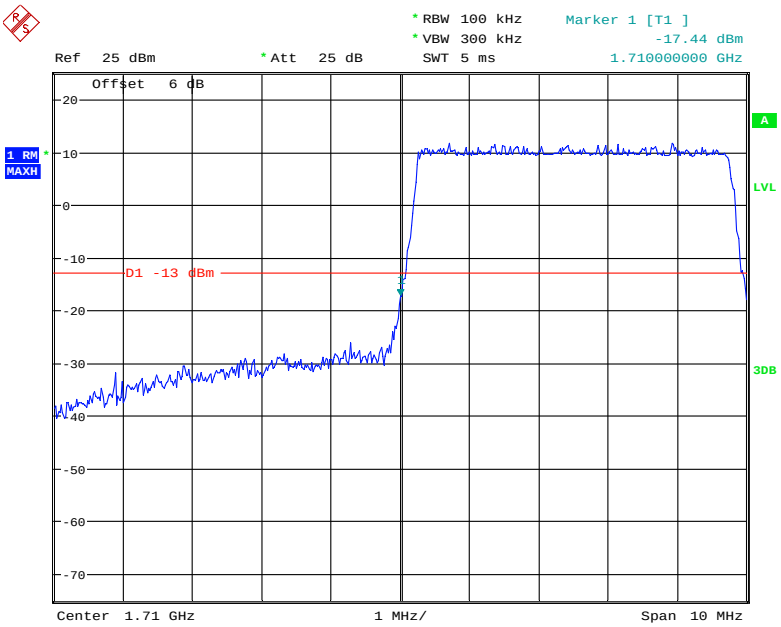
Date: 23.AUG.2019 09:37:03

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



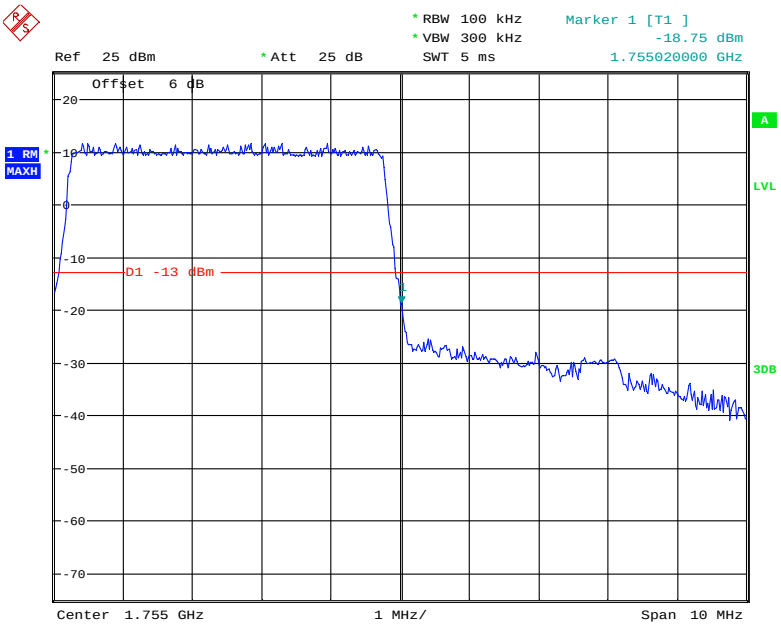
Date: 23.AUG.2019 09:37:49

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



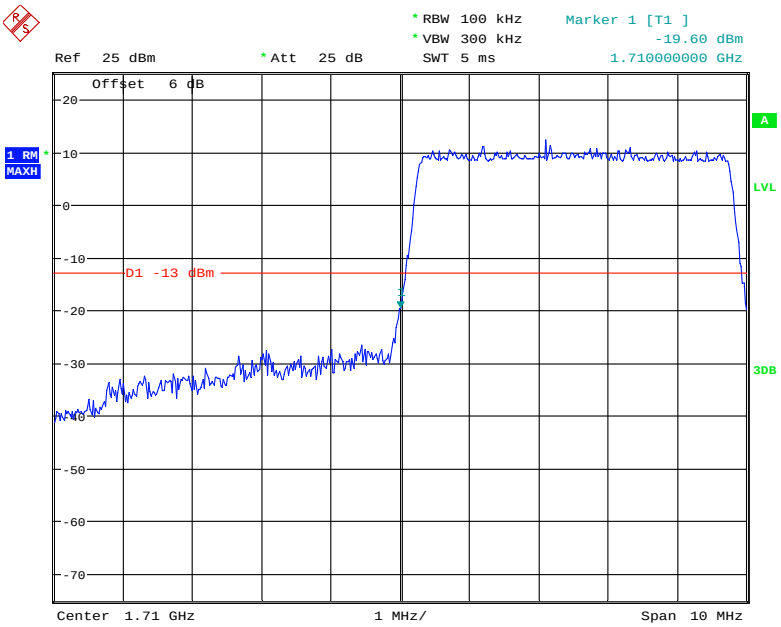
Date: 23.AUG.2019 09:38:21

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



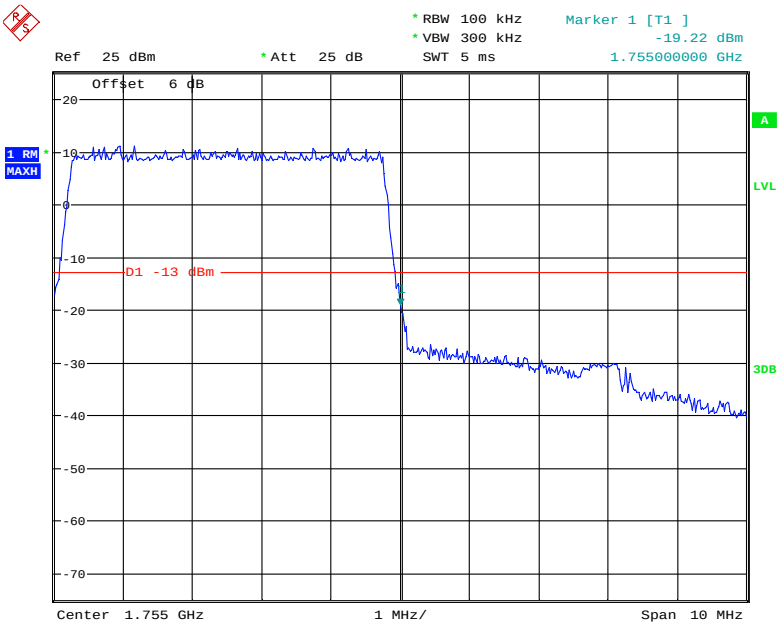
Date: 23.AUG.2019 09:39:28

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



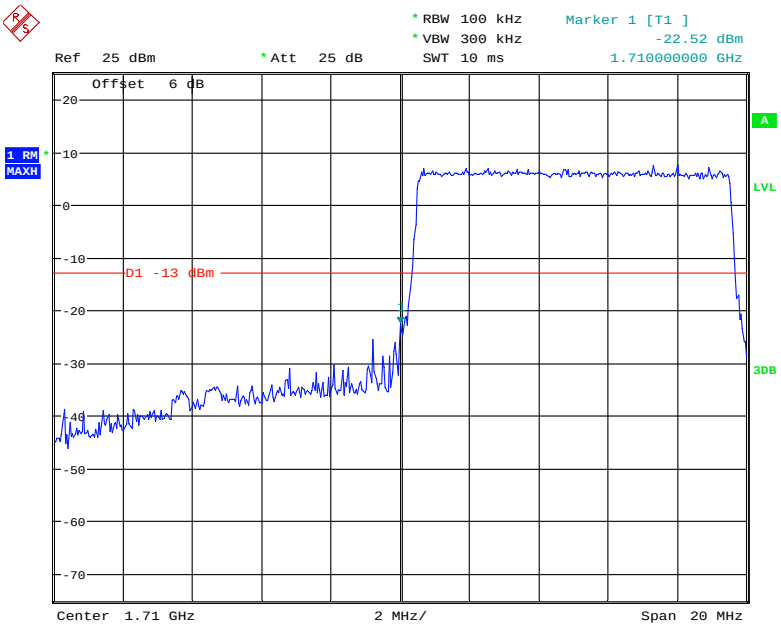
Date: 23.AUG.2019 09:38:52

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



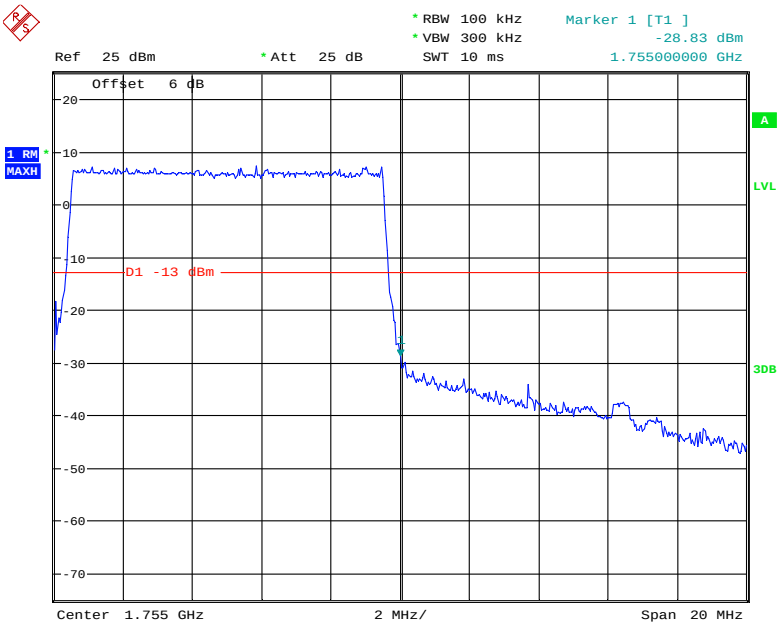
Date: 23.AUG.2019 09:39:57

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



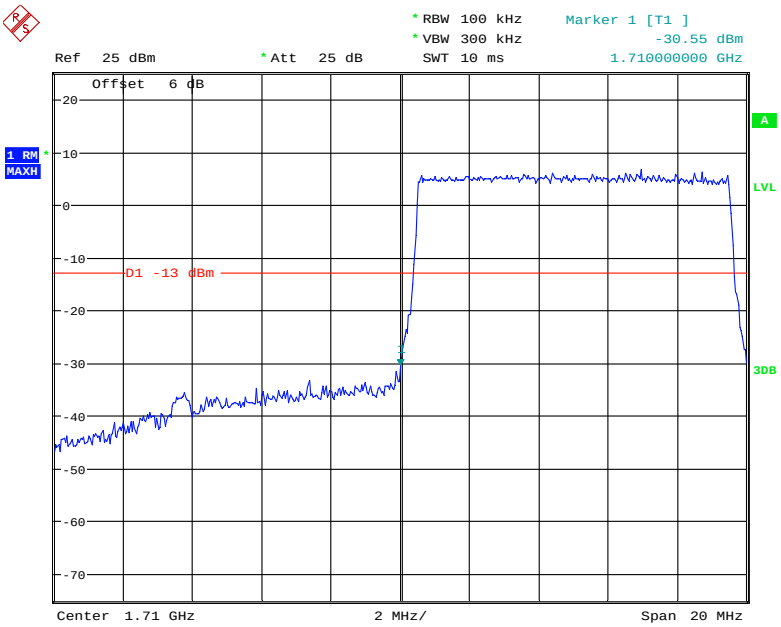
Date: 23.AUG.2019 09:40:23

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



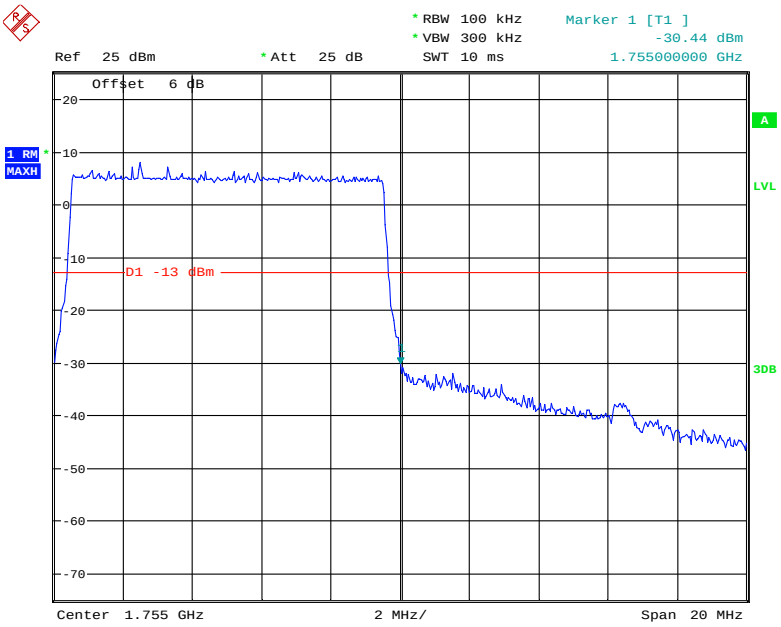
Date: 23.AUG.2019 09:41:21

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



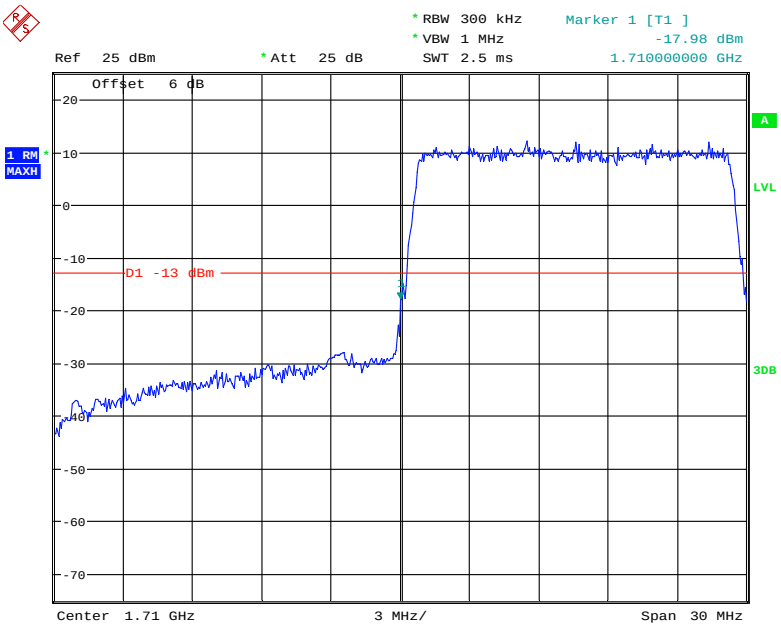
Date: 23.AUG.2019 09:40:50

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



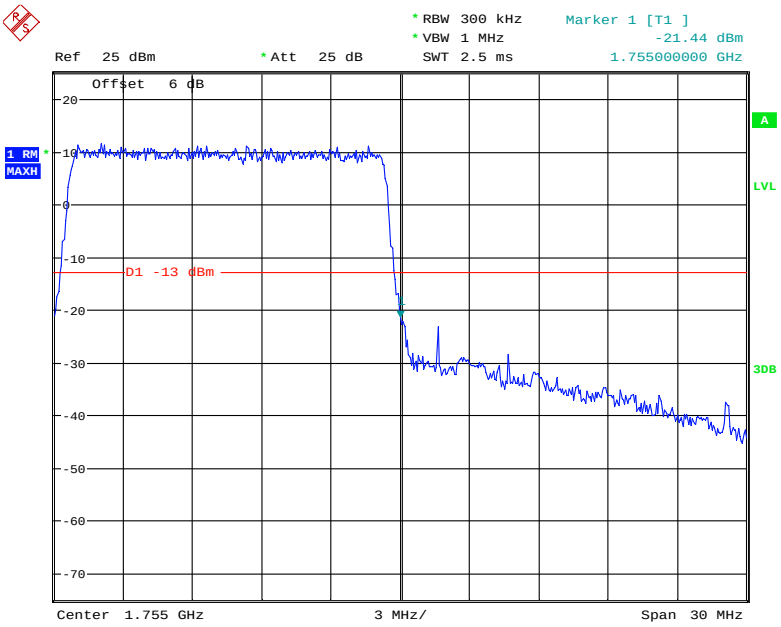
Date: 23.AUG.2019 09:41:54

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



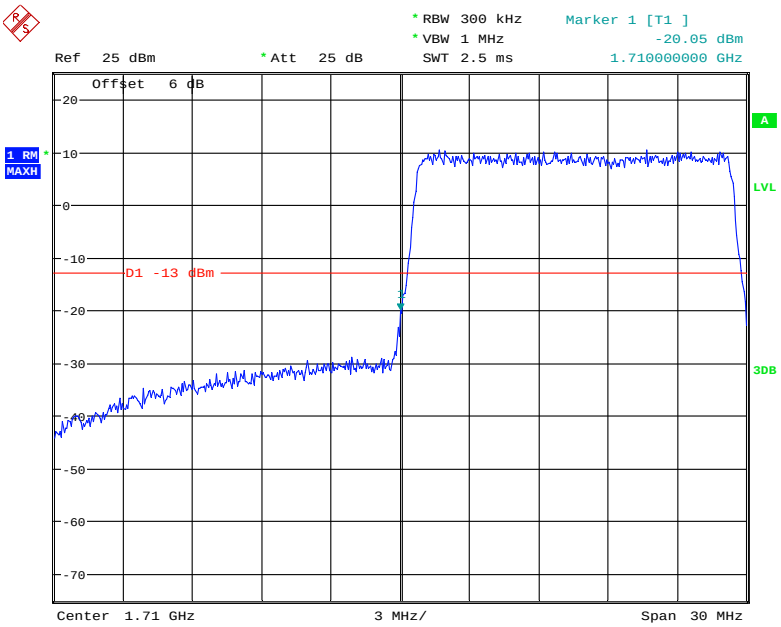
Date: 23.AUG.2019 09:42:20

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



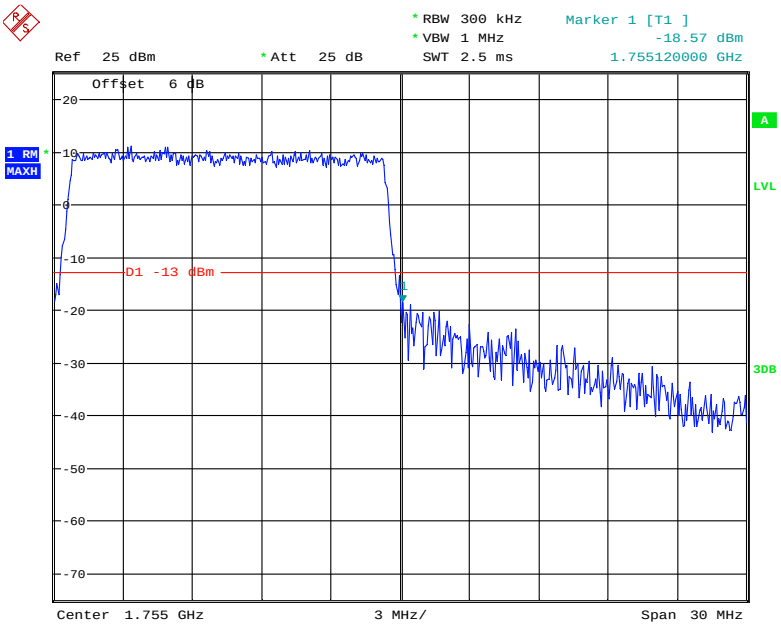
Date: 23.AUG.2019 09:43:22

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



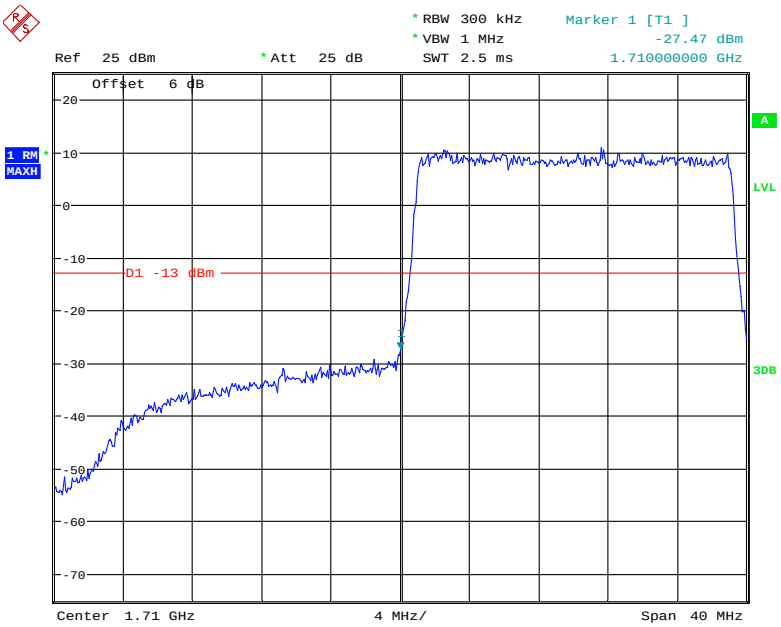
Date: 23.AUG.2019 09:42:49

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



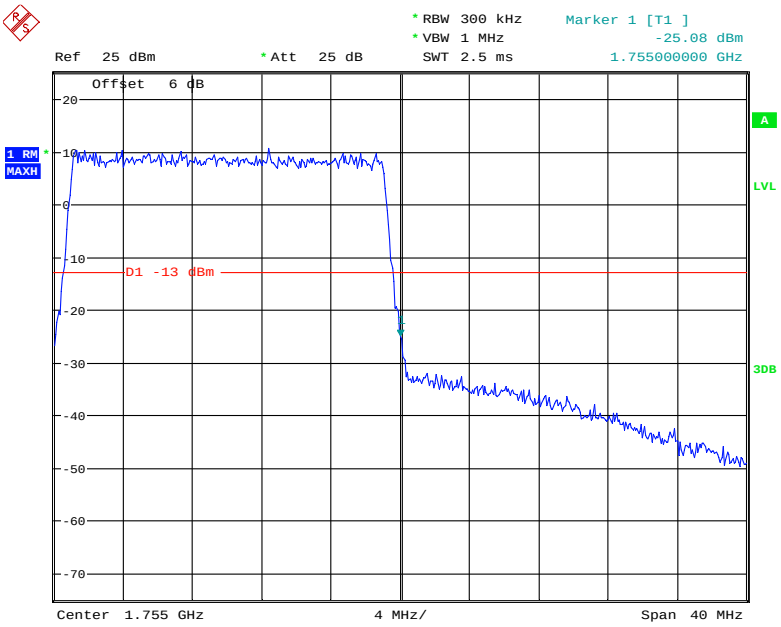
Date: 23.AUG.2019 09:44:09

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



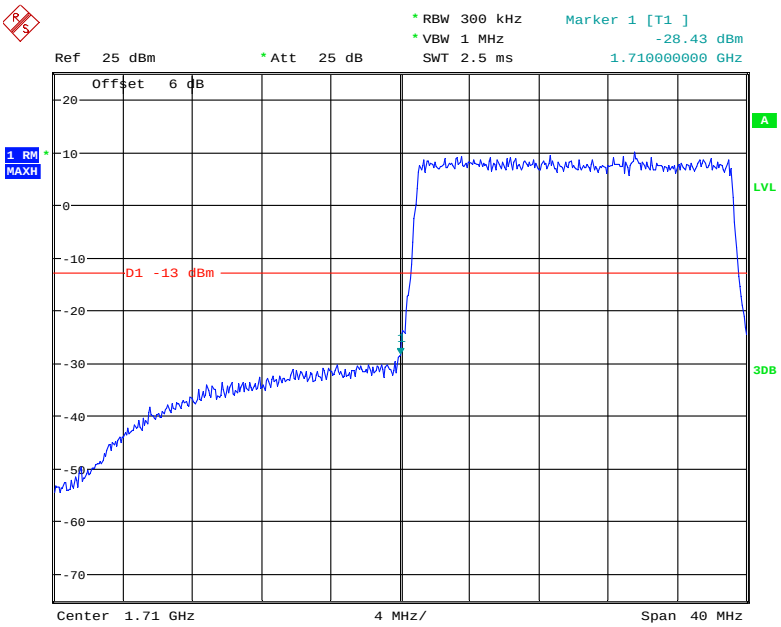
Date: 23.AUG.2019 09:44:44

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



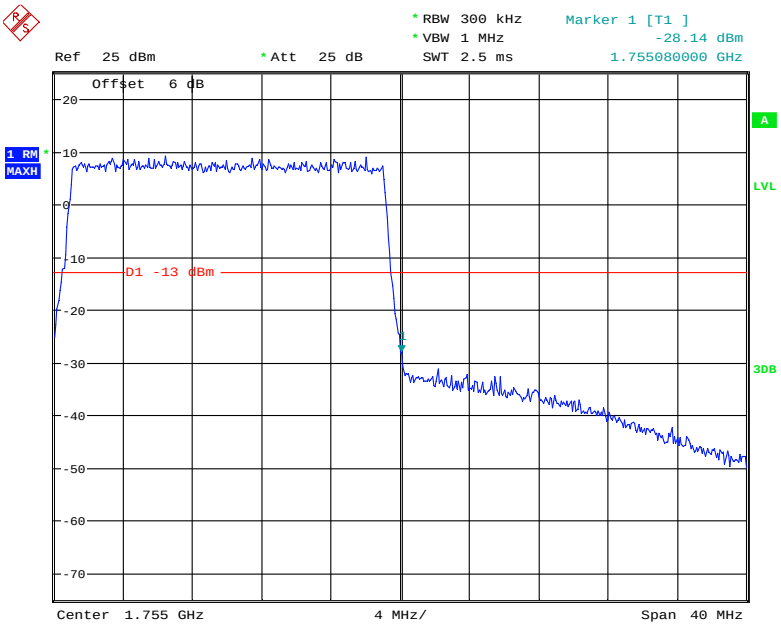
Date: 23.AUG.2019 09:45:46

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



Date: 23.AUG.2019 09:45:16

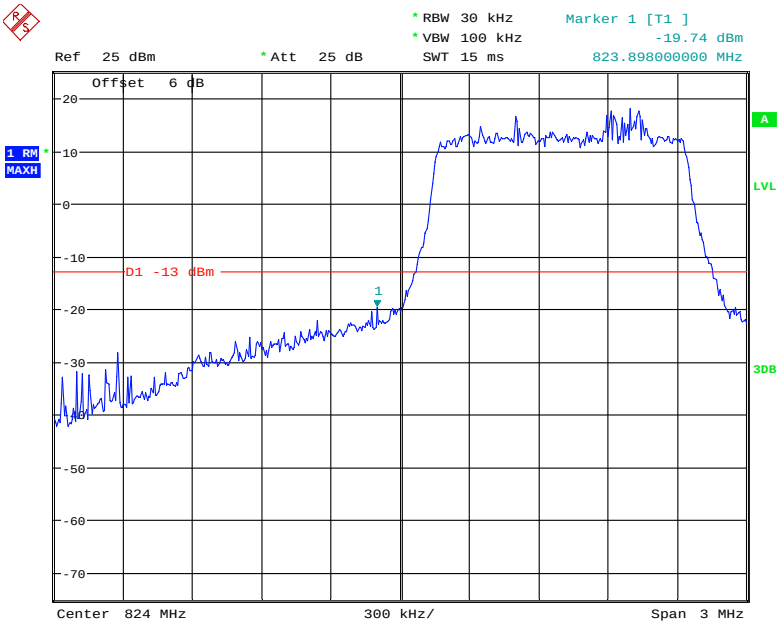
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 23.AUG.2019 09:46:15

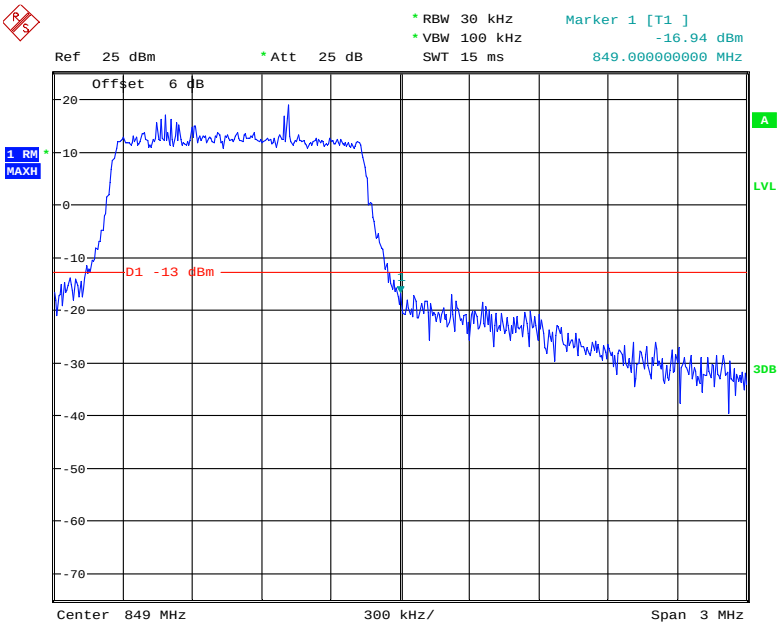
Band 5:

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



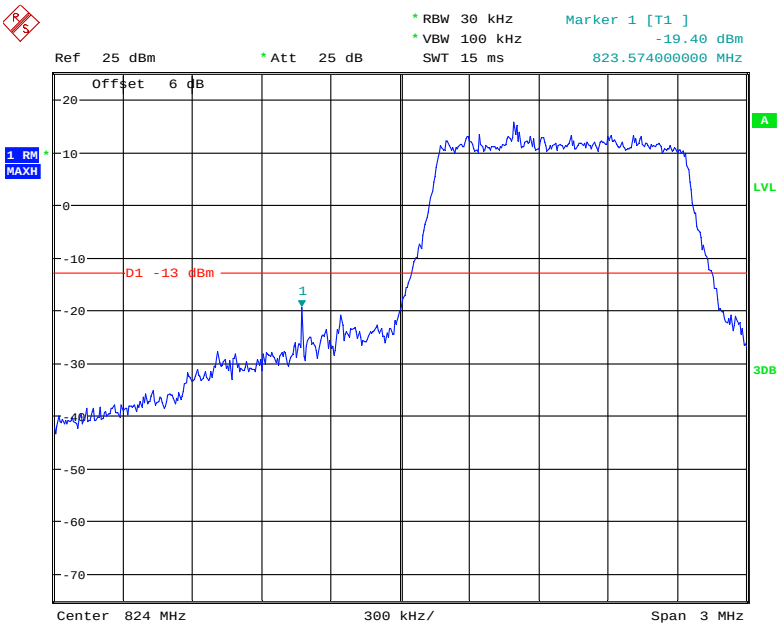
Date: 23.AUG.2019 09:46:50

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



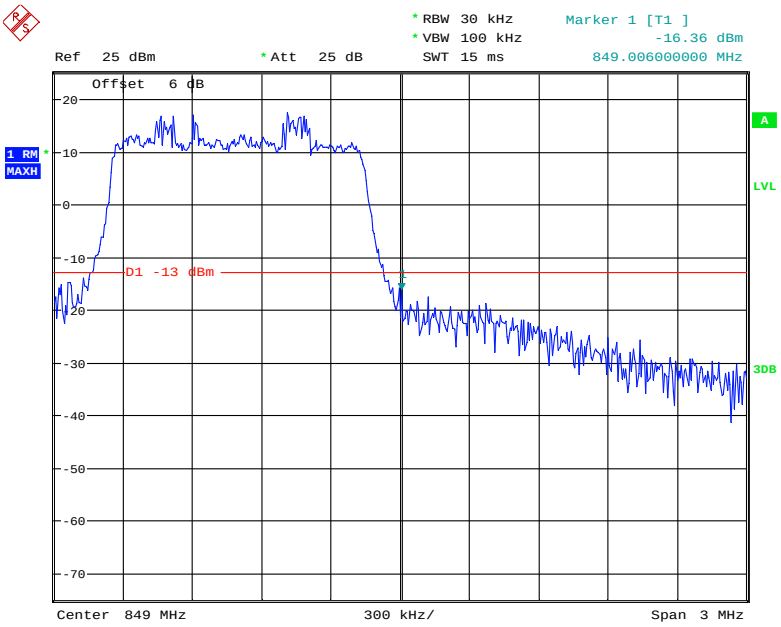
Date: 23.AUG.2019 09:48:01

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



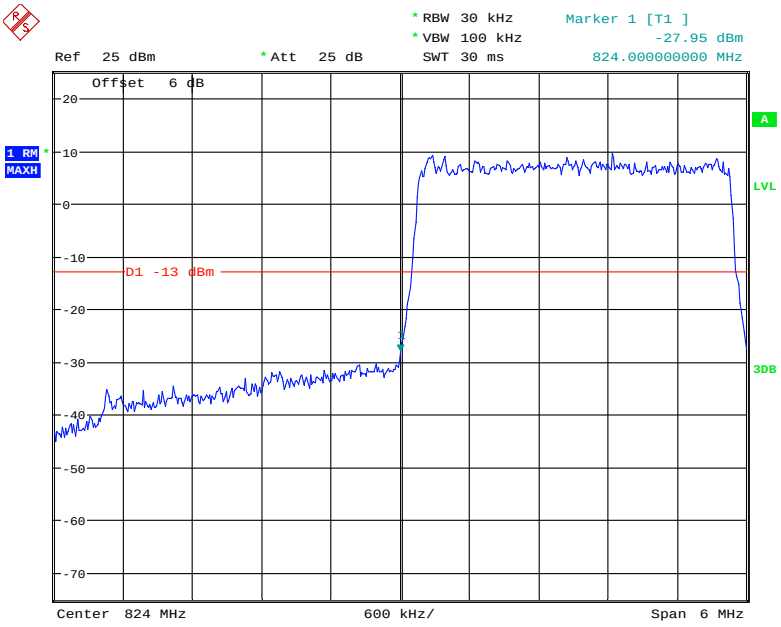
Date: 23.AUG.2019 09:47:22

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



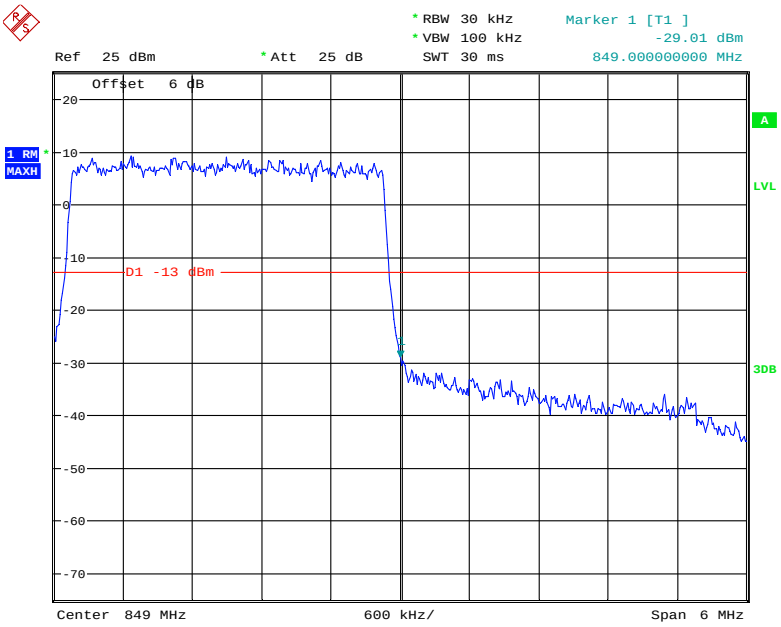
Date: 23.AUG.2019 09:49:00

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



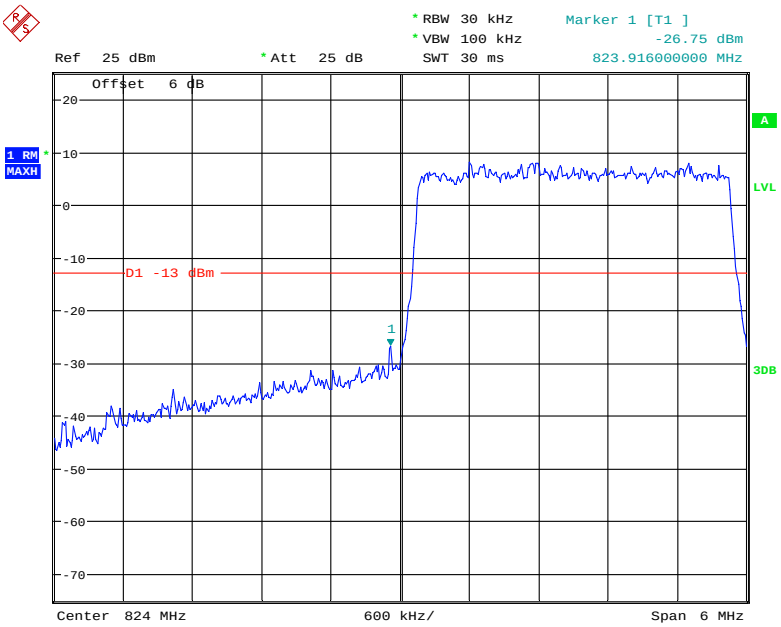
Date: 23.AUG.2019 09:49:25

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



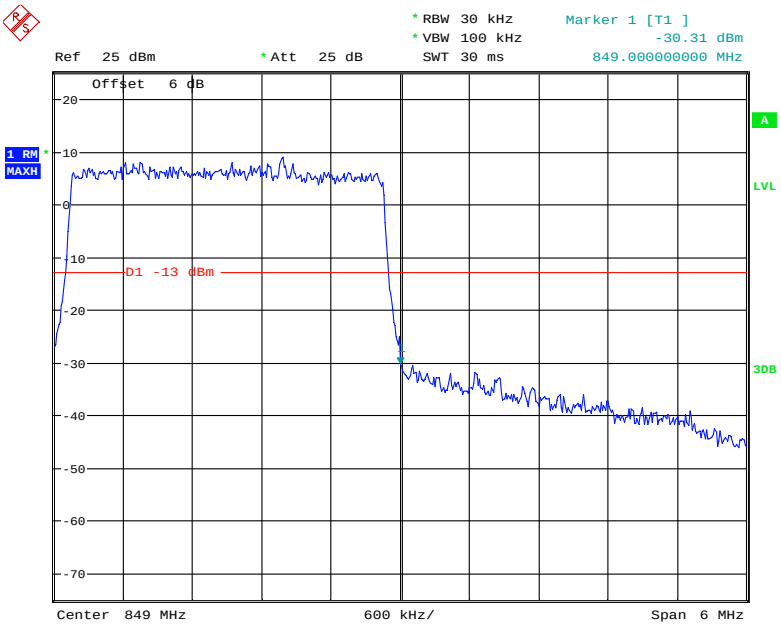
Date: 23.AUG.2019 09:50:26

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



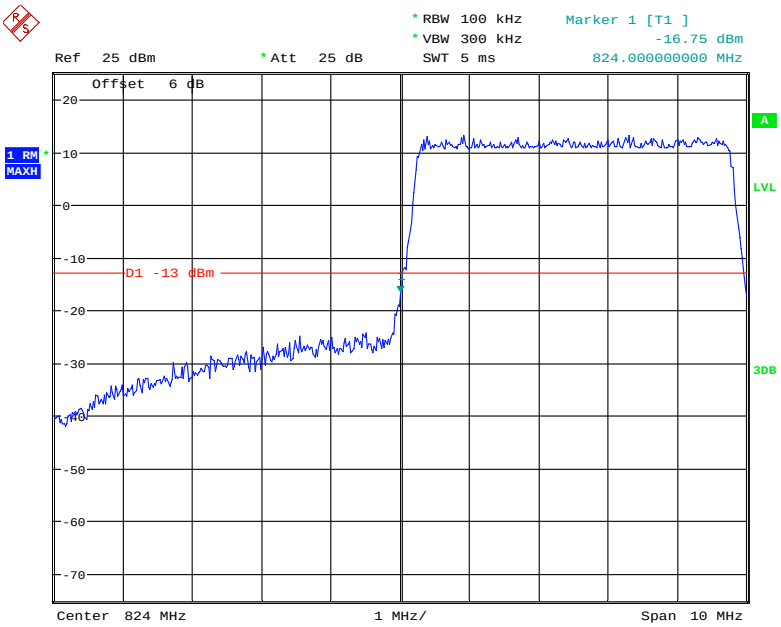
Date: 23.AUG.2019 09:49:54

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



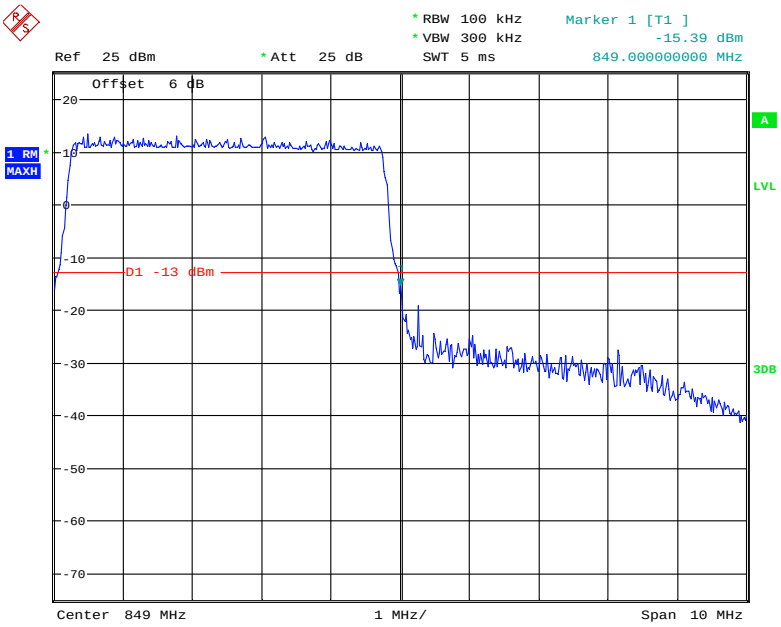
Date: 23.AUG.2019 09:50:58

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



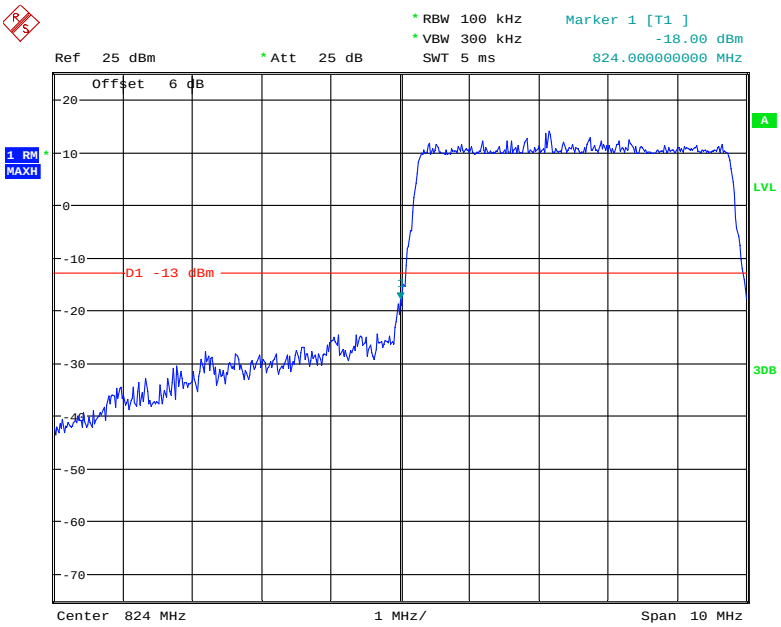
Date: 23.AUG.2019 09:51:33

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



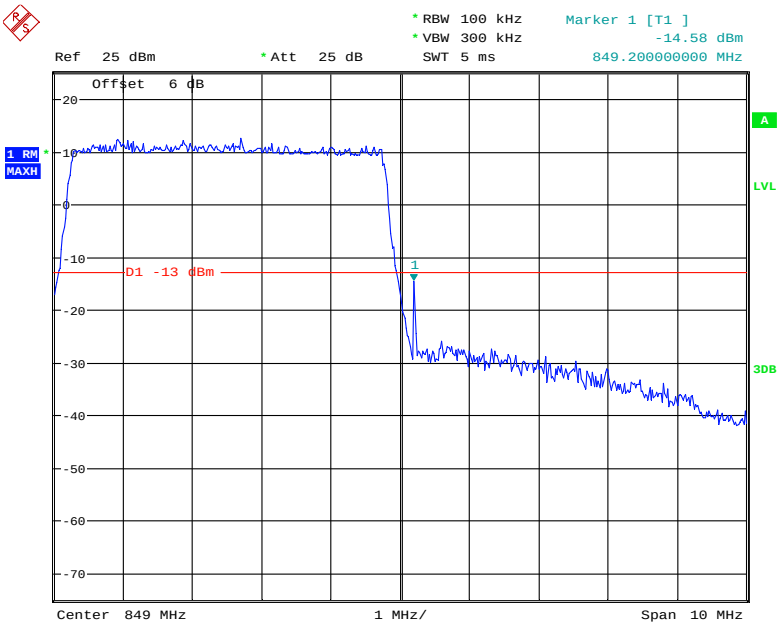
Date: 23.AUG.2019 09:52:28

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



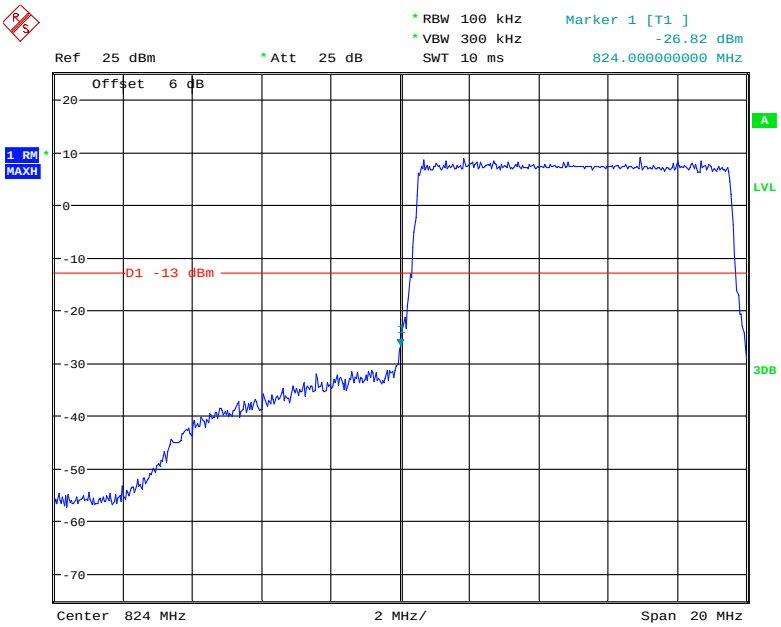
Date: 23.AUG.2019 09:51:58

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



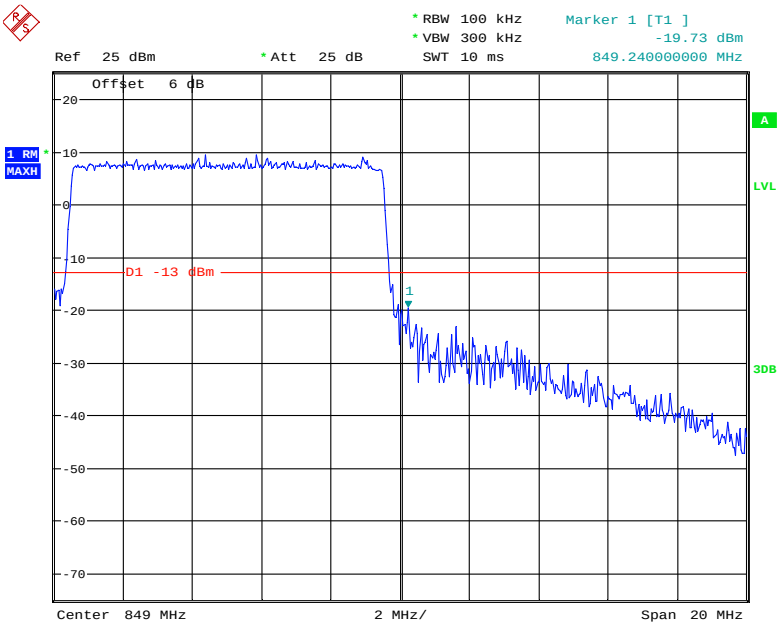
Date: 23.AUG.2019 09:53:06

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



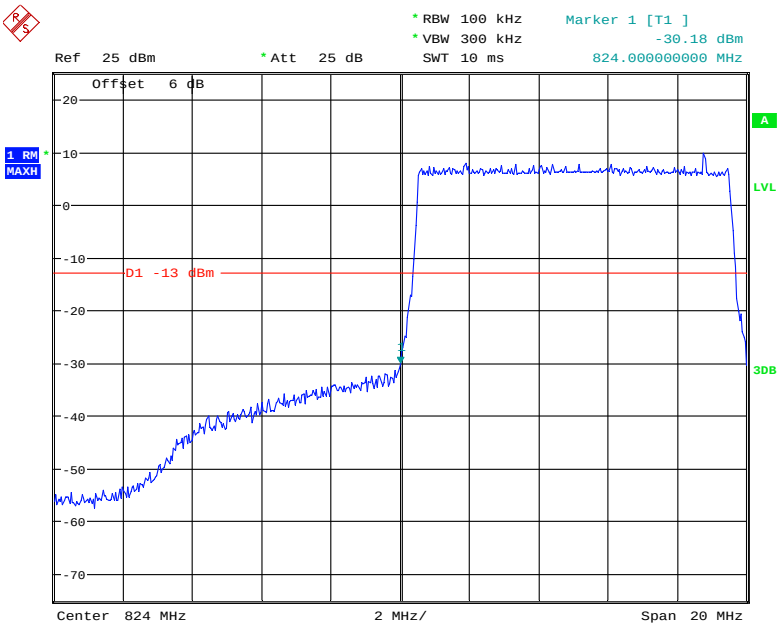
Date: 23.AUG.2019 09:53:36

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



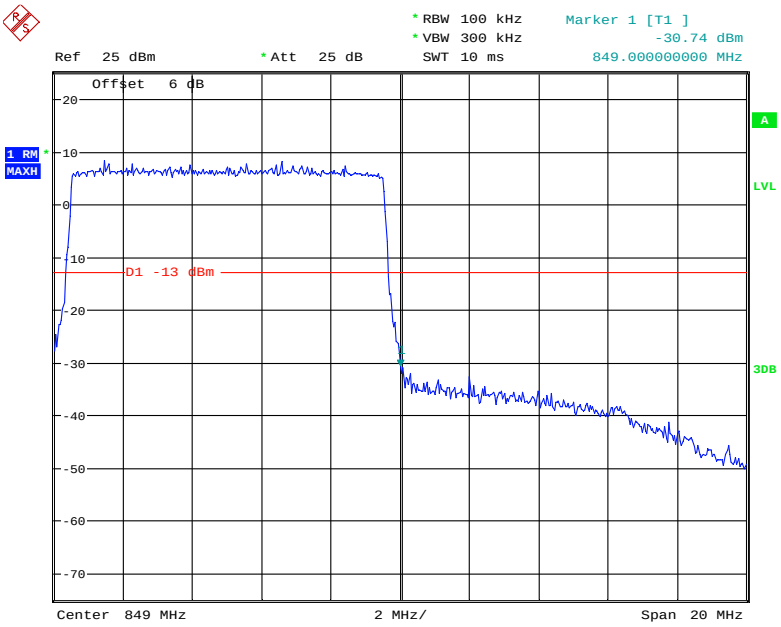
Date: 23.AUG.2019 09:55:01

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



Date: 23.AUG.2019 09:54:09

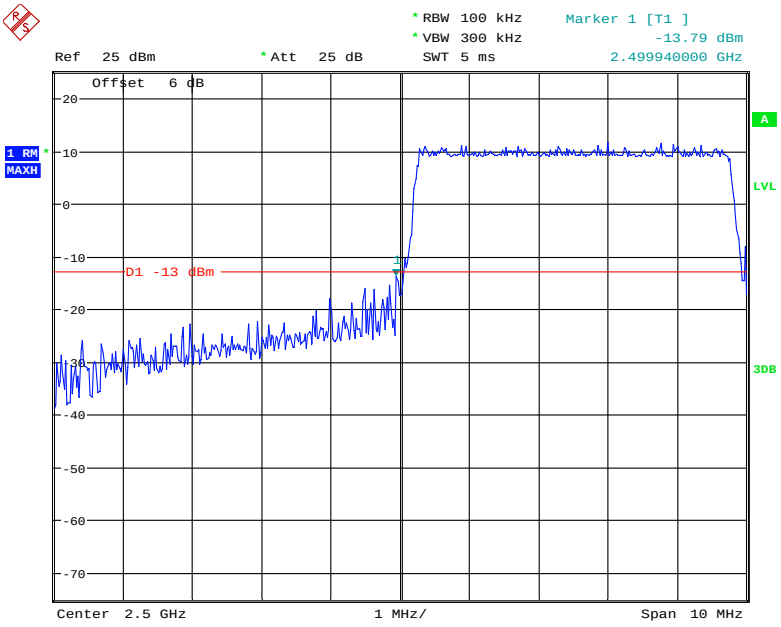
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 23.AUG.2019 09:55:30

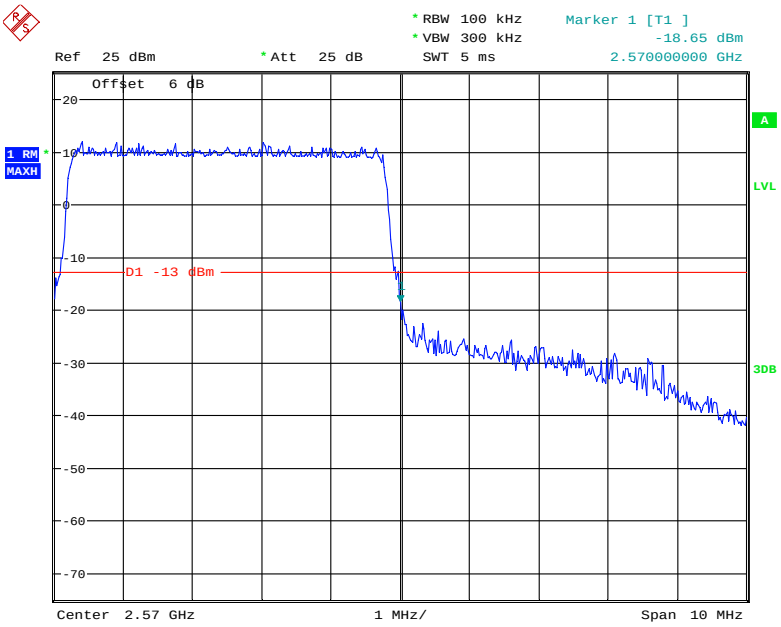
Band 7:

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



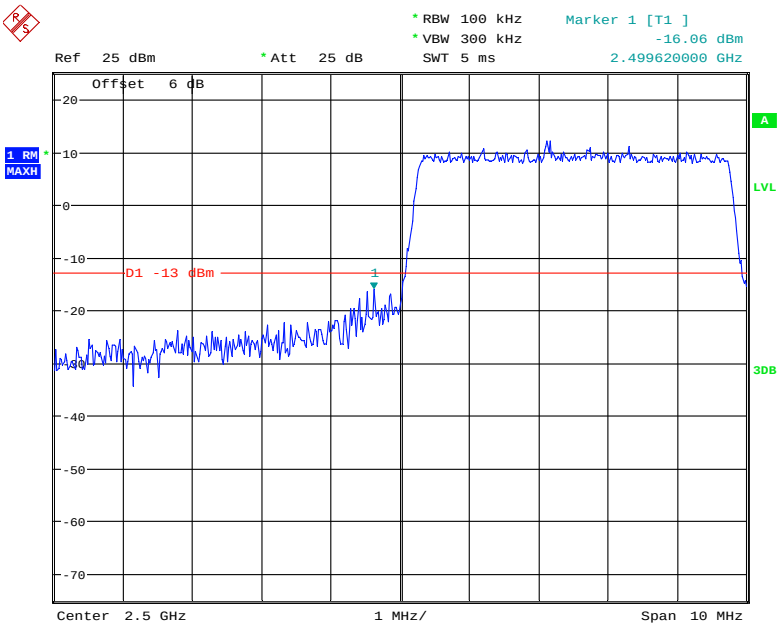
Date: 23.AUG.2019 09:55:59

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



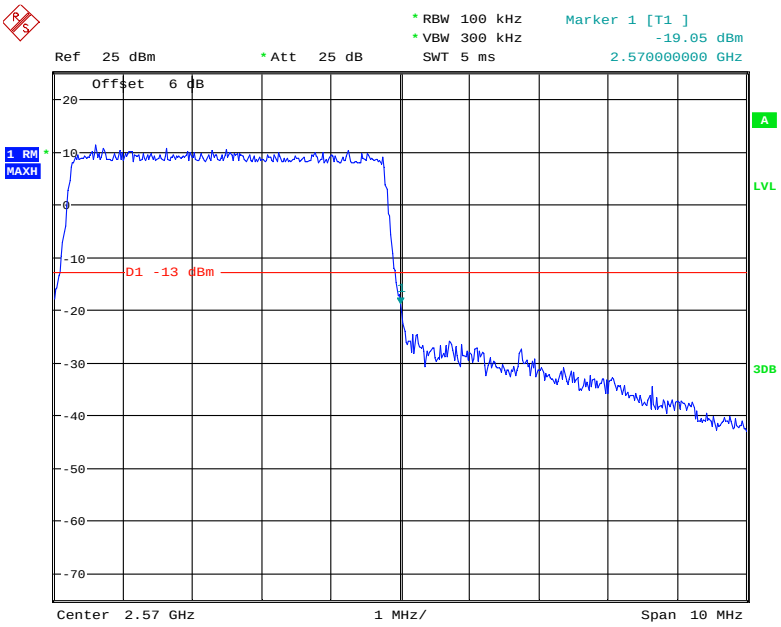
Date: 23.AUG.2019 09:57:22

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



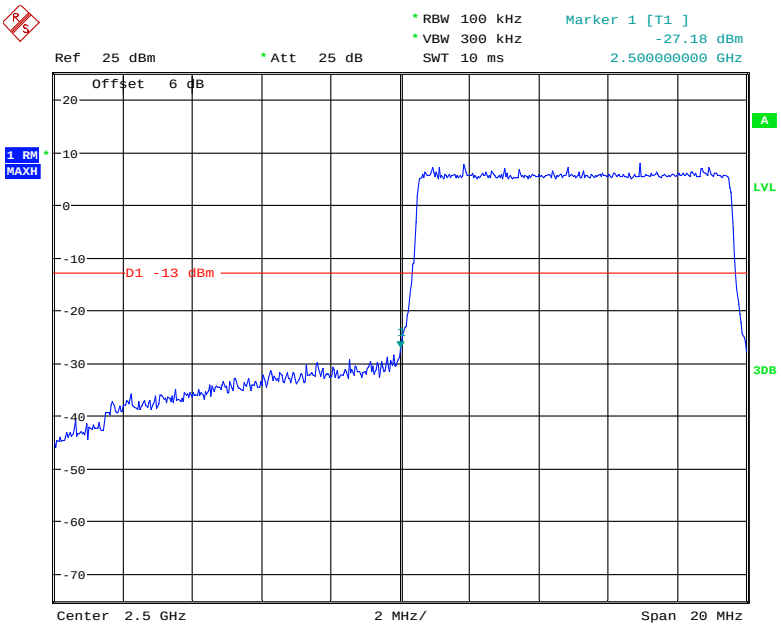
Date: 23.AUG.2019 09:56:49

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



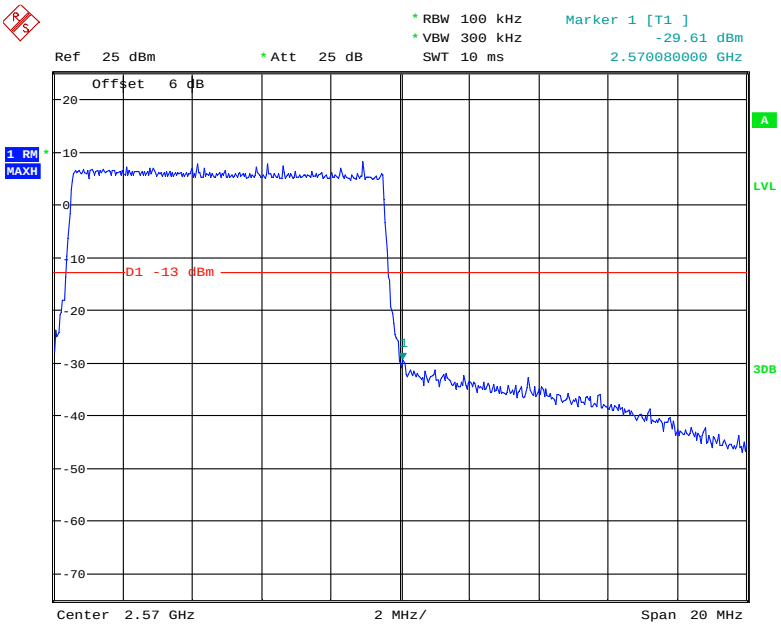
Date: 23.AUG.2019 09:57:57

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



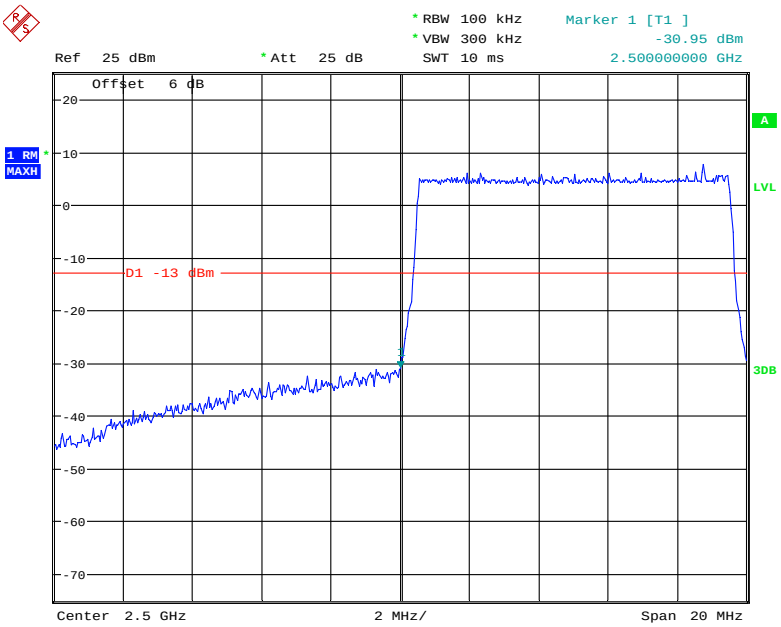
Date: 23.AUG.2019 09:58:27

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



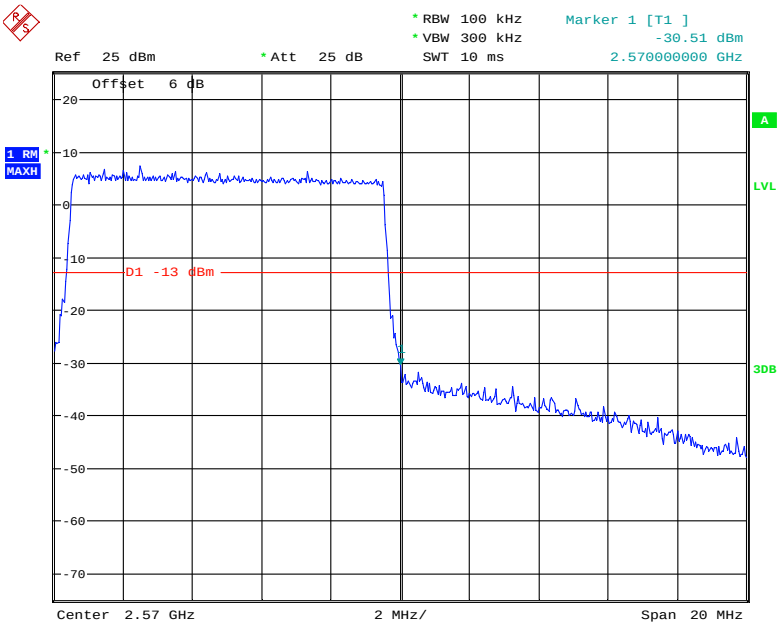
Date: 23.AUG.2019 09:59:27

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



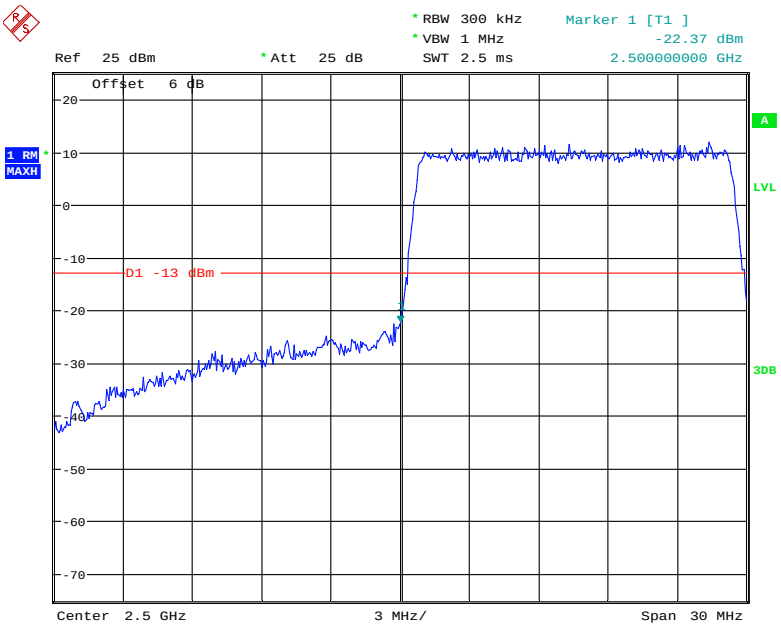
Date: 23.AUG.2019 09:58:53

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



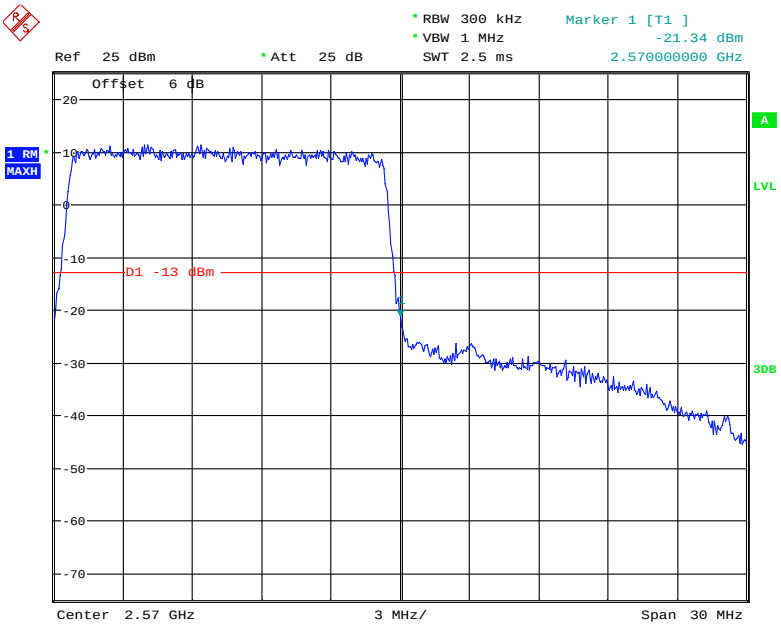
Date: 23.AUG.2019 09:59:57

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



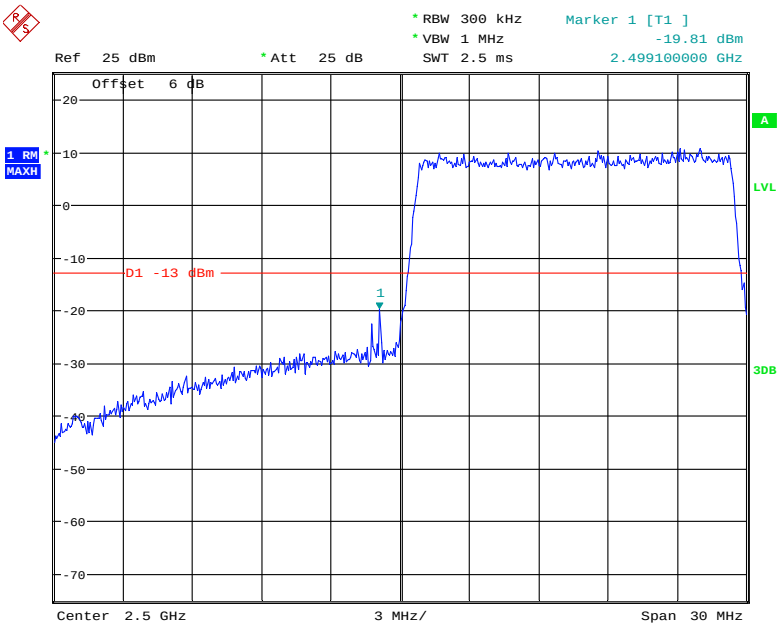
Date: 23.AUG.2019 10:00:35

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



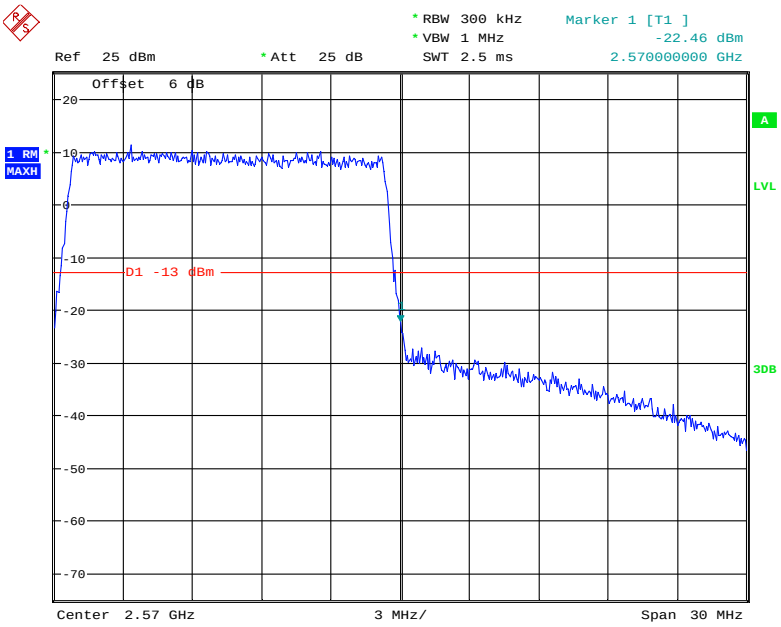
Date: 23.AUG.2019 10:01:34

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



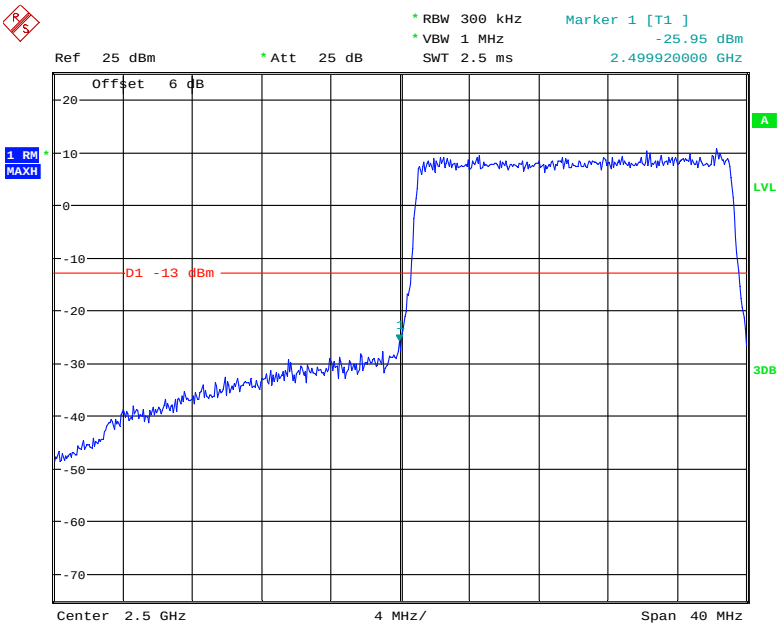
Date: 23.AUG.2019 10:01:04

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



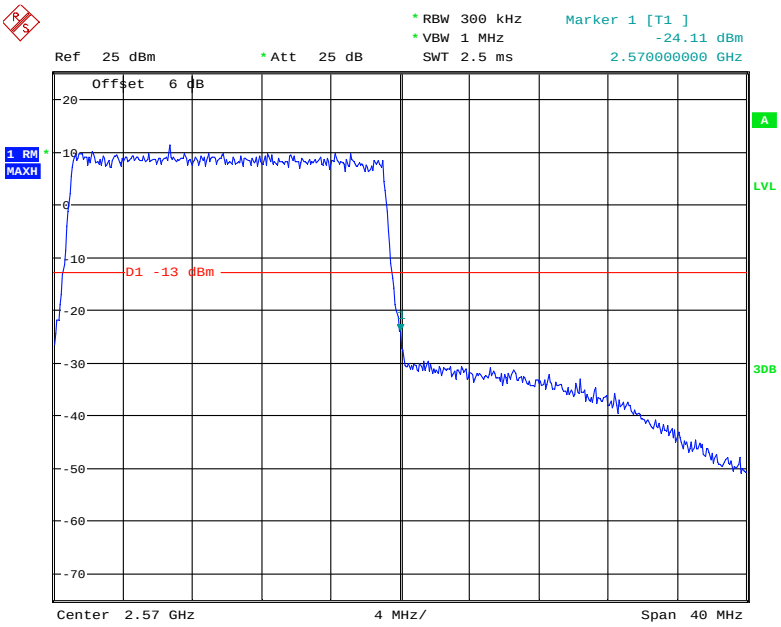
Date: 23.AUG.2019 10:02:12

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



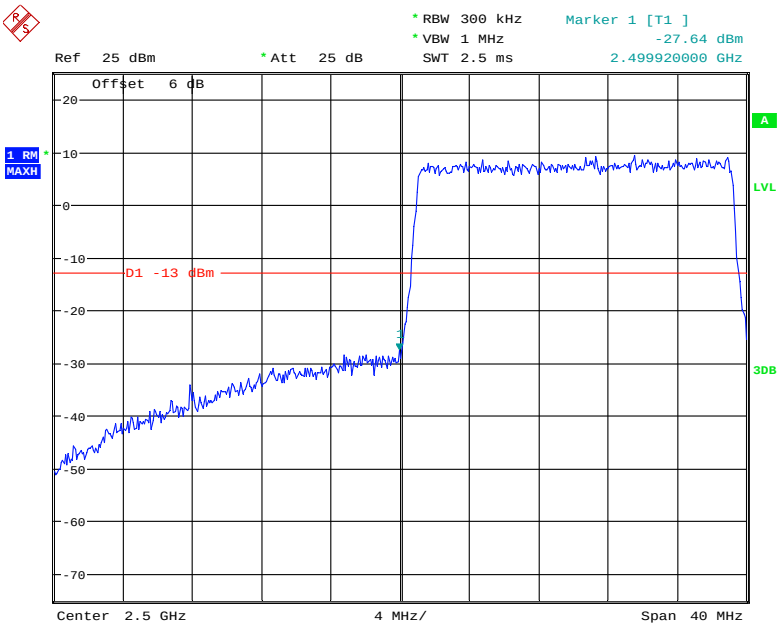
Date: 23.AUG.2019 10:02:44

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



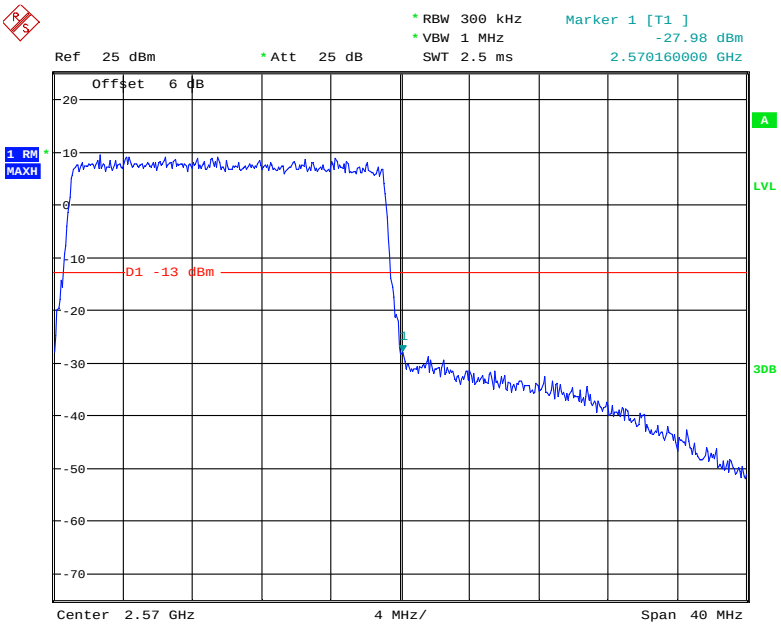
Date: 23.AUG.2019 10:04:01

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



Date: 23.AUG.2019 10:03:22

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



Date: 23.AUG.2019 10:04:43

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

Applicable Standard

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

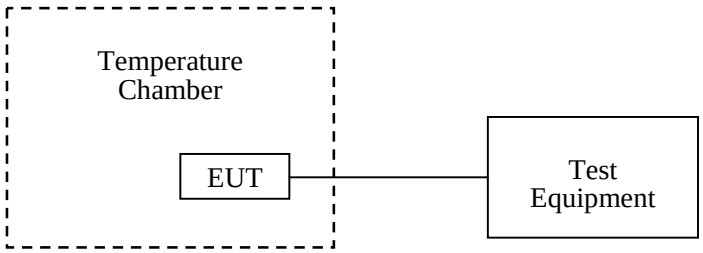
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data

Environmental Conditions

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

The testing was performed by Leo Huang on 2019-08-23.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.85	-3	-0.003586	2.5
-20		-2	-0.002391	2.5
-10		-3	-0.003586	2.5
0		-5	-0.005977	2.5
10		-3	-0.003586	2.5
20		-2	-0.002391	2.5
30		-1	-0.001195	2.5
40		2	0.002391	2.5
50		-3	-0.003586	2.5
20	V min.= 3.5	4	0.004781	2.5
	V max.= 4.4	-3	-0.003586	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.85	2	0.002391	2.5
-20		-3	-0.003586	2.5
-10		-5	-0.005977	2.5
0		1	0.001195	2.5
10		-3	-0.003586	2.5
20		0	0	2.5
30		-4	-0.004781	2.5
40		2	0.002391	2.5
50		6	0.007172	2.5
20	V min.= 3.5	-3	-0.003586	2.5
	V max.= 4.4	-1	-0.001195	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.85	-4	-0.004781	2.5
-20		-3	-0.003586	2.5
-10		-2	-0.002391	2.5
0		-6	-0.007172	2.5
10		-3	-0.003586	2.5
20		-2	-0.002391	2.5
30		-1	-0.001195	2.5
40		-1	-0.001195	2.5
50		-1	-0.001195	2.5
20	V min.= 3.5	-1	-0.001195	2.5
	V max.= 4.4	-4	-0.004781	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.85	-3	-0.001596	pass
-20		-1	-0.000532	pass
-10		0	0	pass
0		-5	-0.002660	pass
10		-2	-0.001064	pass
20		-2	-0.001064	pass
30		0	0	pass
40		-1	-0.000532	pass
50		-1	-0.000532	pass
20	V min.= 3.5	-2	-0.001064	pass
	V max.= 4.4	-3	-0.001596	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.85	3	0.001596	pass
-20		-5	-0.002660	pass
-10		2	0.001064	pass
0		-2	-0.001064	pass
10		3	0.001596	pass
20		0	0	pass
30		-4	-0.002128	pass
40		-1	-0.000532	pass
50		-5	-0.002660	pass
20	V min.= 3.5	2	0.001064	pass
	V max.= 4.4	-3	-0.001596	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.85	-3	-0.001596	pass
-20		-2	-0.001064	pass
-10		-3	-0.001596	pass
0		-5	-0.002660	pass
10		-4	-0.002128	pass
20		-2	-0.001064	pass
30		0	0.000000	pass
40		-2	-0.001064	pass
50		-2	-0.001064	pass
20	V min.= 3.5	-3	-0.001596	pass
	V max.= 4.4	-3	-0.001596	pass

AWS Band (Part 27)

Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.85	1710.0086	1754.9916	1710	1755
-20		1710.0075	1754.9951	1710	1755
-10		1710.0100	1754.9932	1710	1755
0		1710.0111	1754.9923	1710	1755
10		1710.0074	1754.9943	1710	1755
20		1710.0111	1754.9951	1710	1755
30		1710.0120	1754.9942	1710	1755
40		1710.0072	1754.9950	1710	1755
50		1710.0056	1754.9968	1710	1755
20	V min.= 3.5	1710.0117	1754.9975	1710	1755
	V max.= 4.4	1710.0056	1754.9971	1710	1755

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.85	-5	-0.0027	pass
-20		-6	-0.0032	pass
-10		-5	-0.0027	pass
0		-8	-0.0043	pass
10		-5	-0.0027	pass
20		-5	-0.0027	pass
30		-6	-0.0032	pass
40		-3	-0.0016	pass
50		-4	-0.0021	pass
20	V min.= 3.5	-7	-0.0037	pass
	V max.= 4.4	-5	-0.0027	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.85	1710.5248	1754.7572	1710	1755
-20		1710.5254	1754.7575	1710	1755
-10		1710.5268	1754.7569	1710	1755
0		1710.5255	1754.7575	1710	1755
10		1710.5252	1754.7579	1710	1755
20		1710.5267	1754.7575	1710	1755
30		1710.5263	1754.7581	1710	1755
40		1710.5247	1754.7593	1710	1755
50		1710.5254	1754.7569	1710	1755
20	V min.= 3.5	1710.5259	1754.7585	1710	1755
	V max.= 4.4	1710.5246	1754.7581	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o=836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.85	-5	-0.0060	2.5
-20		-2	-0.0024	2.5
-10		-4	-0.0048	2.5
0		-3	-0.0036	2.5
10		-5	-0.0060	2.5
20		-3	-0.0036	2.5
30		-2	-0.0024	2.5
40		-1	-0.0012	2.5
50		-3	-0.0036	2.5
20	V min.= 3.5	-3	-0.0036	2.5
	V max.= 4.4	-5	-0.0060	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.85	2500.4530	2569.7018	2500	2570
-20		2500.4551	2569.7024	2500	2570
-10		2500.4537	2569.7025	2500	2570
0		2500.4526	2569.7038	2500	2570
10		2500.4538	2569.704	2500	2570
20		2500.4539	2569.7029	2500	2570
30		2500.4548	2569.7041	2500	2570
40		2500.4546	2569.7034	2500	2570
50		2500.4538	2569.7026	2500	2570
20	V min.= 3.5	2500.4536	2569.7045	2500	2570
	V max.= 4.4	2500.4536	2569.7020	2500	2570

16QAM:

Band 2:

10.0 MHz Middle Channel, f_o=1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.85	-4	-0.0021	pass
-20		-5	-0.0027	pass
-10		-4	-0.0021	pass
0		-8	-0.0043	pass
10		-4	-0.0021	pass
20		-4	-0.0021	pass
30		-2	-0.0011	pass
40		-4	-0.0021	pass
50		-2	-0.0011	pass
20	V min.= 3.5	-4	-0.0021	pass
	V max.= 4.4	-5	-0.0027	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.85	1710.4381	1754.7812	1710	1755
-20		1710.4392	1754.7828	1710	1755
-10		1710.4397	1754.7817	1710	1755
0		1710.4402	1754.7817	1710	1755
10		1710.4380	1754.7833	1710	1755
20		1710.4394	1754.7831	1710	1755
30		1710.4387	1754.7827	1710	1755
40		1710.4392	1754.7812	1710	1755
50		1710.4383	1754.7817	1710	1755
20	V min.= 3.5	1710.4385	1754.7816	1710	1755
	V max.= 4.4	1710.4396	1754.7830	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o=836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.85	-3	-0.0036	2.5
-20		-1	-0.0012	2.5
-10		-2	-0.0024	2.5
0		-6	-0.0072	2.5
10		-2	-0.0024	2.5
20		-2	-0.0024	2.5
30		-2	-0.0024	2.5
40		-3	-0.0036	2.5
50		-1	-0.0012	2.5
20	V min.= 3.5	-1	-0.0012	2.5
	V max.= 4.4	-3	-0.0036	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.85	2500.4532	2569.7026	2500	2570
-20		2500.4539	2569.7037	2500	2570
-10		2500.4545	2569.7042	2500	2570
0		2500.4541	2569.7042	2500	2570
10		2500.4538	2569.7045	2500	2570
20		2500.4528	2569.7024	2500	2570
30		2500.4540	2569.7026	2500	2570
40		2500.4534	2569.7046	2500	2570
50		2500.4550	2569.7048	2500	2570
20	V min.= 3.5	2500.4536	2569.7029	2500	2570
	V max.= 4.4	2500.4528	2569.7045	2500	2570

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