FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

BLU Products, Inc.

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

FCC ID: YHLBLUG60

Report Type:	Product Type:
Original Report	Mobile Phone

Report Number:	RSZ191118001-00C
Report Date:	2019-12-11
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Mobile Phone
Tested Model	G60
Multiple Models	V70, VIVO X6
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 LTE B12: 699-716 MHz LTE B17: 704-716MHz
Transmit Power	GSM850: 32.67dBm(GMSK), 27.63dBm(8PSK) PCS1900: 28.92dBm(GMSK), 26.58dBm(8PSK) WCDMA Band 2: 22.76dBm WCDMA Band 4: 22.75dBm WCDMA Band 5: 22.66dBm LTE Band 2: 22.79dBm LTE Band 4: 22.79dBm LTE Band 5: 22.75dBm LTE Band 7: 22.78dBm LTE Band 12: 22.78dBm LTE Band 17: 22.74dBm
Modulation Technique	2G: GMSK,8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antennas
Voltage Range	Powered: DC 3.85V by internal rechargeable Li-ion battery Recharged: DC 5.0V by adapter
Date of Test	2019/11/27~2019/12/02
Sample serial number	1234567890123 (Assigned by applicant)
Received date	2019/11/18
Sample/EUT Status	Good condition
Normal/Extreme Condition	N.V.: Nominal Voltage: 3.85V_{DC} L.V.: Low Voltage: 3.3V_{DC} H.V.: High Voltage: 4.4V_{DC}
Adapter information	Model: US-CR-2000 Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2000mA

Notes: This series products model: V70, VIVO X6 and G60 are electrically identical, model G60 was selected for fully testing, the detailed information can be referred to the declaration which was stated and guaranteed by the applicant.

Objective

This test report is prepared on behalf of *BLU Products, Inc.* in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Subpart 27 of the Federal Communication Commissions rules.

The objective is to determine the compliance of the EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability and band edge.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS&DTS and Part 15B JBP submissions with FCC ID: YHLBLUG60.

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

Test Facility

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

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing according to TIA/EIA-603-D.

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

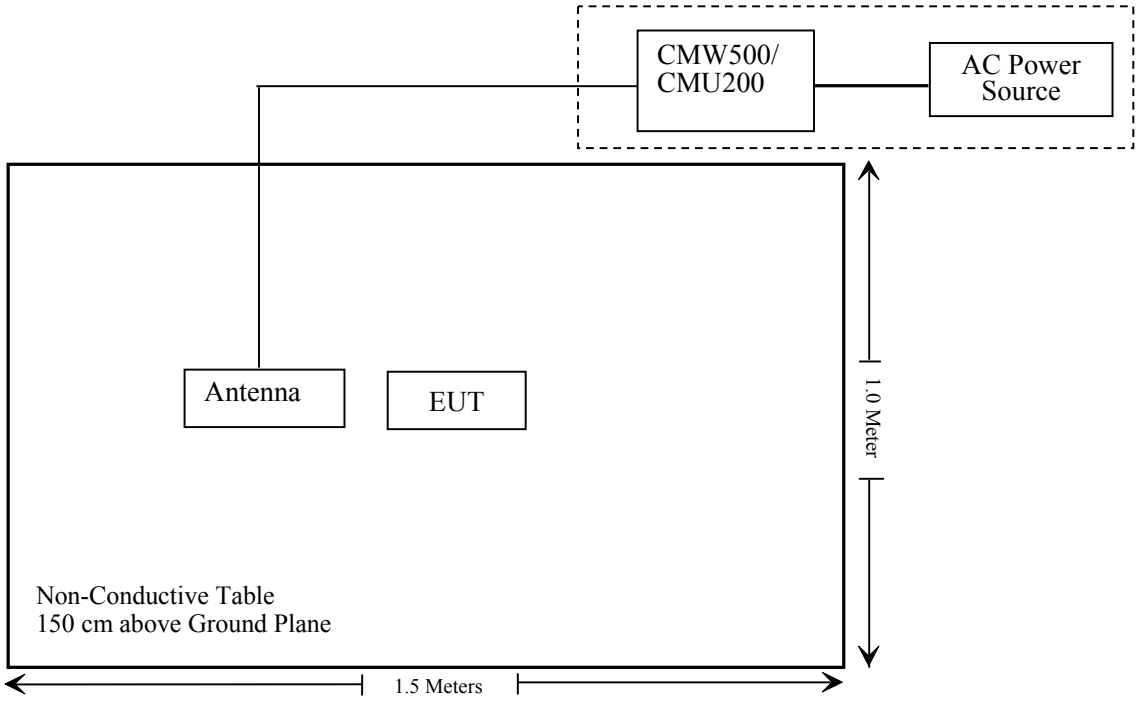
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (c) (d) (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53	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: RSZ191118001-20.

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	Signal Analyzer	FSEM	845987/005	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	2019-04-20	2020-04-20
Sonoma Instrument	Amplifier	310 N	186238	2019-04-20	2020-04-20
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	2019-11-12	2020-11-12
Ducommun Technologies	RF Cable	104PEA	218124002	2019-11-12	2020-11-12
Ducommun Technologies	RF Cable	RG-214	1	2019-11-12	2020-11-12
Ducommun Technologies	RF Cable	RG-214	2	2019-11-12	2020-11-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2017-12-29	2020-12-28
Heatsink Required	Amplifier	QLW-18405536-J0	15964001002	2019-11-12	2020-11-12
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

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	2018-12-27	2019-12-26
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	2019-11-12	2020-11-12
WEINSCHEL	3dB Attenuator	6231	666	Each Time	
Unknown	Power Splitter	1620	129	Each Time	

*** 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: RSZ191118001-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50 (c) (d) (h) - RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

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

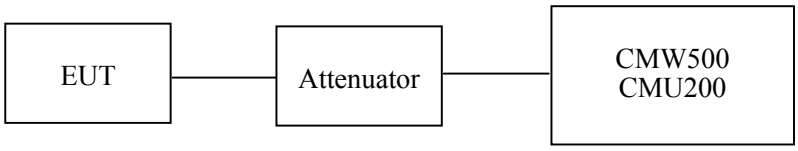
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

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

The testing was performed by George Zhong on 2019-11-28.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.63	38.45
	190	836.6	32.25	38.45
	251	848.8	32.51	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.58	28.63	28.18	27.33	38.45
	190	836.6	32.67	28.44	28.27	27.15	38.45
	251	848.8	32.44	28.55	28.12	27.34	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	27.36	25.17	23.88	21.19	38.45
	190	836.6	27.37	25.24	23.87	21.27	38.45
	251	848.8	27.63	25.15	23.94	21.18	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		22.63	22.66	22.56
		HSDPA	1	21.47	21.38	21.58
			2	21.38	21.55	21.55
			3	21.49	21.64	21.44
			4	21.45	21.62	21.61
			5	21.42	21.51	21.52
		HSUPA	1	21.44	21.20	21.40
			2	21.42	21.24	21.24
			3	21.50	21.25	21.18
			4	21.51	21.37	21.41
			5	21.67	21.38	21.56
		HSPA+	1	21.42	21.51	21.35

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.92	33
	661	1880.0	28.48	33
	810	1909.8	28.75	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.77	26.14	24.87	22.58	33
	661	1880.0	28.35	26.25	24.91	22.65	33
	810	1909.8	28.64	26.18	24.95	22.74	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	26.42	24.57	22.13	20.67	33
	661	1880.0	26.54	24.48	22.34	20.58	33
	810	1909.8	26.58	24.62	22.21	20.46	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		22.76	22.66	22.66
		HSDPA	1	21.67	21.54	21.75
			2	21.58	21.72	21.42
			3	21.35	21.83	21.47
			4	21.52	21.81	21.54
			5	21.34	21.85	21.51
		HSUPA	1	21.15	2.14	21.19
			2	21.26	21.32	21.15
			3	21.27	21.40	21.28
			4	21.38	21.48	21.32
			5	21.34	21.55	21.30
		HSPA+	1	21.53	21.35	21.41

AWS Band (Part 27)

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band IV)	Normal	RMC12.2k		22.53	22.75	22.66
		HSDPA	1	21.45	21.54	21.48
			2	21.54	21.68	21.45
			3	21.48	21.41	21.52
			4	21.41	21.62	21.34
			5	21.42	21.50	21.51
		HSUPA	1	21.10	21.12	21.20
			2	21.21	21.15	21.34
			3	21.14	21.28	21.28
			4	21.08	21.17	21.19
			5	21.18	21.35	21.27
		HSPA+	1	21.36	21.28	21.24

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.38	13
	Middle	1.44	13
	High	1.37	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.28	13
	Middle	1.36	13
	High	1.25	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.26	13
	Middle	3.55	13
	High	3.42	13
HSDPA (16QAM)	Low	3.04	13
	Middle	3.05	13
	High	3.07	13
HSUPA (BPSK)	Low	2.98	13
	Middle	3.05	13
	High	2.99	13
HSPA+	Low	3.21	13
	Middle	3.16	13
	High	3.33	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.66	13
	Middle	1.44	13
	High	1.58	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.45	13
	Middle	1.53	13
	High	1.68	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.18	13
	Middle	3.17	13
	High	3.25	13
HSDPA (16QAM)	Low	2.92	13
	Middle	2.94	13
	High	3.00	13
HSUPA (BPSK)	Low	3.15	13
	Middle	2.94	13
	High	3.28	13
HSPA+	Low	3.26	13
	Middle	3.14	13
	High	3.27	13

AWS Band

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.99	13
	Middle	2.97	13
	High	3.15	13
HSDPA (16QAM)	Low	3.03	13
	Middle	3.02	13
	High	3.14	13
HSUPA (BPSK)	Low	2.91	13
	Middle	2.80	13
	High	3.08	13
HSPA+	Low	3.25	13
	Middle	3.21	13
	High	3.54	13

Radiated Power
GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	87.25	127	1.7	H	27.9	1.35	0.0	26.55	38.45	11.90
836.6	88.48	347	2.1	V	28.5	1.35	0.0	27.15	38.45	11.30
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	86.54	141	1.9	H	16.9	1.30	9.40	25.00	33	8.00
1880.00	86.49	215	1.2	V	16.6	1.30	9.40	24.70	33	8.30

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	83.21	100	2.0	H	23.8	1.35	0.0	22.45	38.45	16.00
836.6	82.54	242	1.1	V	22.5	1.35	0.0	21.15	38.45	17.30
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	82.54	155	2.3	H	12.9	1.30	9.40	21.00	33	12.00
1880.00	81.68	179	1.4	V	11.8	1.30	9.40	19.90	33	13.10

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	81.54	182	2.2	H	22.2	1.35	0.0	20.85	38.45	17.60
836.6	82.47	108	1.8	V	22.5	1.35	0.0	21.15	38.45	17.30
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	80.96	268	2.5	H	11.3	1.30	9.40	19.40	33	13.60
1880.00	79.25	311	1.3	V	9.4	1.30	9.40	17.50	33	15.50
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	82.56	46	1.5	H	9.2	1.30	8.90	16.80	30	13.20
1732.60	83.02	294	1.9	V	10.3	1.30	8.90	17.90	30	12.10

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

LTE Band 2:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.59	22.73	22.51
		RB Size=1, RB Offset=2	22.68	22.30	22.27
		RB Size=1, RB Offset=5	22.59	22.53	22.76
		RB Size=3, RB Offset=0	21.08	21.64	21.13
		RB Size=3, RB Offset=1	21.71	21.49	21.49
		RB Size=3, RB Offset=2	21.78	21.36	21.39
		RB Size=6, RB Offset=0	21.66	21.23	21.26
	16QAM	RB Size=1, RB Offset=0	22.42	22.25	22.23
		RB Size=1, RB Offset=2	22.49	22.67	22.5
		RB Size=1, RB Offset=5	22.09	22.45	22.09
		RB Size=3, RB Offset=0	21.16	21.68	21.02
		RB Size=3, RB Offset=1	21.28	21.09	21.27
		RB Size=3, RB Offset=2	21.72	21	21.63
		RB Size=6, RB Offset=0	21.28	21.27	21.2
3.0	QPSK	RB Size=1, RB Offset=0	22.34	22.24	22.4
		RB Size=1, RB Offset=7	22.42	22.71	22.05
		RB Size=1, RB Offset=14	22.16	22.42	**22.79**
		RB Size=8, RB Offset=0	21.36	21.24	21.38
		RB Size=8, RB Offset=4	21.59	21.75	21.62
		RB Size=8, RB Offset=7	21.32	21.23	21.41
		RB Size=15, RB Offset=0	21.5	21.22	21.11
	16QAM	RB Size=1, RB Offset=0	22.47	22.73	22.13
		RB Size=1, RB Offset=7	22.71	22.21	22.05
		RB Size=1, RB Offset=14	22.38	22.63	22.38
		RB Size=8, RB Offset=0	21.79	21.11	21.69
		RB Size=8, RB Offset=4	21.01	21.74	21.04
		RB Size=8, RB Offset=7	21.54	21.61	21.25
		RB Size=15, RB Offset=0	21.46	21.36	21.18

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.58	22.14	22.73
		RB Size=1, RB Offset=12	22.51	22.23	22.62
		RB Size=1, RB Offset=24	22.58	22.5	22.46
		RB Size=12, RB Offset=0	21.78	21.13	21.51
		RB Size=12, RB Offset=6	21.01	21.76	21.03
		RB Size=12, RB Offset=11	21.76	21.76	21.22
		RB Size=25, RB Offset=0	21.48	21.59	21.56
	16QAM	RB Size=1, RB Offset=0	22.05	22.1	22.4
		RB Size=1, RB Offset=12	22.07	22.67	22.61
		RB Size=1, RB Offset=24	22.24	22.46	22.62
		RB Size=12, RB Offset=0	21.59	21.32	21.14
		RB Size=12, RB Offset=6	21.33	21.44	21.18
		RB Size=12, RB Offset=11	21.23	21.37	21.45
		RB Size=25, RB Offset=0	21.53	21.62	21.38
10.0	QPSK	RB Size=1, RB Offset=0	22.67	22.46	22.17
		RB Size=1, RB Offset=24	22.12	22.48	22.33
		RB Size=1, RB Offset=49	22.46	22.43	22.65
		RB Size=25, RB Offset=0	21.59	21.71	21.44
		RB Size=25, RB Offset=12	21.01	21.49	21.04
		RB Size=25, RB Offset=24	21.11	21.39	21.7
		RB Size=50, RB Offset=0	21.31	21.35	21.57
	16QAM	RB Size=1, RB Offset=0	22.4	22.09	22.73
		RB Size=1, RB Offset=24	22.18	22.54	22.15
		RB Size=1, RB Offset=49	22.29	22.63	22.18
		RB Size=25, RB Offset=0	21.79	21.44	21.24
		RB Size=25, RB Offset=12	21.22	21.38	21.39
		RB Size=25, RB Offset=24	21.7	21.17	21.5
		RB Size=50, RB Offset=0	21.57	21.33	21.61

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.14	22.46	22.32
		RB Size=1, RB Offset=37	22.78	22.71	22.67
		RB Size=1, RB Offset=74	22.63	22.05	22.46
		RB Size=36, RB Offset=0	21.26	21.31	21.21
		RB Size=36, RB Offset=18	21.68	21.63	21.49
		RB Size=36, RB Offset=37	21.71	21.36	21.43
		RB Size=75, RB Offset=0	21.71	21.55	21.77
	16QAM	RB Size=1, RB Offset=0	22.39	22.36	22.58
		RB Size=1, RB Offset=37	22.64	22.32	22.03
		RB Size=1, RB Offset=74	22.3	22.46	22.67
		RB Size=36, RB Offset=0	21.13	21.42	21.09
		RB Size=36, RB Offset=18	21.77	21.28	21.38
		RB Size=36, RB Offset=37	21.49	21.43	21.58
		RB Size=75, RB Offset=0	21.11	21.33	21.49
20.0	QPSK	RB Size=1, RB Offset=0	22.14	22.11	22.45
		RB Size=1, RB Offset=49	22.16	22.09	22.5
		RB Size=1, RB Offset=99	22.56	22.51	22.72
		RB Size=50, RB Offset=0	21.46	21.59	21.34
		RB Size=50, RB Offset=24	21.21	21.11	21.26
		RB Size=50, RB Offset=49	21.43	21.77	21.23
		RB Size=100, RB Offset=0	21.72	21.5	21.38
	16QAM	RB Size=1, RB Offset=0	22.47	22.11	22.48
		RB Size=1, RB Offset=49	22.04	22.55	22.08
		RB Size=1, RB Offset=99	22.23	22.38	22.45
		RB Size=50, RB Offset=0	21.11	21.77	21.34
		RB Size=50, RB Offset=24	21.74	21.52	21.15
		RB Size=50, RB Offset=49	21.3	21.59	21.48
		RB Size=100, RB Offset=0	21	21.56	21.57

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.67	13	Pass
QPSK (100RB Size)	6.04	13	Pass
16QAM (1RB Size)	7.11	13	Pass
16QAM (1000RB Size)	6.52	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	82.62	135	1.4	H	12.9	1.30	9.40	21.00	33
1880.00	82.43	287	2.0	V	12.5	1.30	9.40	20.60	33
3 MHz Bandwidth									
1880.00	82.37	182	1.1	H	12.7	1.30	9.40	20.80	33
1880.00	82.06	353	2.4	V	12.2	1.30	9.40	20.30	33
5 MHz Bandwidth									
1880.00	82.29	273	1.3	H	12.6	1.30	9.40	20.70	33
1880.00	81.96	256	2.3	V	12.1	1.30	9.40	20.20	33
10 MHz Bandwidth									
1880.00	82.11	345	1.2	H	12.4	1.30	9.40	20.50	33
1880.00	81.92	69	1.8	V	12.0	1.30	9.40	20.10	33
15 MHz Bandwidth									
1880.00	82.03	147	2.1	H	12.4	1.30	9.40	20.50	33
1880.00	81.85	291	1.1	V	12.0	1.30	9.40	20.10	33
20 MHz Bandwidth									
1880.00	82.10	94	2.1	H	12.4	1.30	9.40	20.50	33
1880.00	81.93	359	1.7	V	12.0	1.30	9.40	20.10	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	82.46	152	1.3	H	12.8	1.30	9.40	20.90	33
1880.00	81.97	288	2.2	V	12.1	1.30	9.40	20.20	33
3 MHz Bandwidth									
1880.00	82.08	68	1.2	H	12.4	1.30	9.40	20.50	33
1880.00	81.69	166	2.4	V	11.8	1.30	9.40	19.90	33
5 MHz Bandwidth									
1880.00	81.74	5	1.6	H	12.1	1.30	9.40	20.20	33
1880.00	81.24	108	1.0	V	11.3	1.30	9.40	19.40	33
10 MHz Bandwidth									
1880.00	81.58	146	2.1	H	11.9	1.30	9.40	20.00	33
1880.00	81.04	269	1.2	V	11.1	1.30	9.40	19.20	33
15 MHz Bandwidth									
1880.00	82.03	309	2.4	H	12.4	1.30	9.40	20.50	33
1880.00	81.85	5	2.3	V	12.0	1.30	9.40	20.10	33
20 MHz Bandwidth									
1880.00	82.03	347	1.6	H	12.4	1.30	9.40	20.50	33
1880.00	81.85	100	2.3	V	12.0	1.30	9.40	20.10	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.65	22.68	22.52
		RB Size=1, RB Offset=2	22.04	22.12	22.71
		RB Size=1, RB Offset=5	22.35	22.45	22.65
		RB Size=3, RB Offset=0	21.10	21.6	21.36
		RB Size=3, RB Offset=1	21.26	21.47	21.79
		RB Size=3, RB Offset=2	21.7	21.65	21.47
		RB Size=6, RB Offset=0	21.74	21.66	21.36
	16QAM	RB Size=1, RB Offset=0	22.53	22.55	22.53
		RB Size=1, RB Offset=2	22.33	22.53	22.51
		RB Size=1, RB Offset=5	22.67	22.61	22.47
		RB Size=3, RB Offset=0	21.31	21.07	21.77
		RB Size=3, RB Offset=1	21.76	21.66	21.55
		RB Size=3, RB Offset=2	21.59	21.54	21.41
		RB Size=6, RB Offset=0	21.56	21.6	21.79
3.0	QPSK	RB Size=1, RB Offset=0	22.52	22.71	22.11
		RB Size=1, RB Offset=7	22.6	22.35	22.6
		RB Size=1, RB Offset=14	22.72	22.64	22.53
		RB Size=8, RB Offset=0	21.13	21.77	21.58
		RB Size=8, RB Offset=4	21.62	21.25	21.54
		RB Size=8, RB Offset=7	21.51	21.58	21.01
		RB Size=15, RB Offset=0	21.32	21.2	21.75
	16QAM	RB Size=1, RB Offset=0	22.43	22.47	22.03
		RB Size=1, RB Offset=7	22.73	22.57	22.17
		RB Size=1, RB Offset=14	22.7	22.52	22.36
		RB Size=8, RB Offset=0	21.43	21.2	21.31
		RB Size=8, RB Offset=4	21.35	21.74	21.51
		RB Size=8, RB Offset=7	21.35	21.14	21.37
		RB Size=15, RB Offset=0	21.19	21.31	21.21

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.22	22.19	22.45
		RB Size=1, RB Offset=12	**22.79**	22.28	22.22
		RB Size=1, RB Offset=24	22.64	22.3	22.34
		RB Size=12, RB Offset=0	21.36	21.43	21.04
		RB Size=12, RB Offset=6	21.55	21.77	21.21
		RB Size=12, RB Offset=11	21.37	21.08	21.04
		RB Size=25, RB Offset=0	21.3	21.13	21.47
	16QAM	RB Size=1, RB Offset=0	22.39	22.67	22.39
		RB Size=1, RB Offset=12	22.61	22.03	22.28
		RB Size=1, RB Offset=24	22.66	22.76	22.66
		RB Size=12, RB Offset=0	21.46	21.76	21.15
		RB Size=12, RB Offset=6	21.43	21.49	21.63
		RB Size=12, RB Offset=11	21.4	21.34	21.51
		RB Size=25, RB Offset=0	21.73	21.61	21.62
10.0	QPSK	RB Size=1, RB Offset=0	22.19	22.56	22.25
		RB Size=1, RB Offset=24	22.04	22.71	22.08
		RB Size=1, RB Offset=49	22.57	22.28	22.75
		RB Size=25, RB Offset=0	21.3	21.62	21.35
		RB Size=25, RB Offset=12	21.56	21.42	21.02
		RB Size=25, RB Offset=24	21.43	21.07	21.36
		RB Size=50, RB Offset=0	21.01	21.23	21.41
	16QAM	RB Size=1, RB Offset=0	22.03	22.31	22.46
		RB Size=1, RB Offset=24	22.24	22.15	22.56
		RB Size=1, RB Offset=49	22.58	22.18	22.33
		RB Size=25, RB Offset=0	21.34	21.59	21.2
		RB Size=25, RB Offset=12	21.57	21.43	21.53
		RB Size=25, RB Offset=24	21.39	21.28	21.02
		RB Size=50, RB Offset=0	21.17	21.77	21.01

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.24	22.33	22.47
		RB Size=1, RB Offset=37	22.56	22.15	22.54
		RB Size=1, RB Offset=74	22.44	22.45	22.24
		RB Size=36, RB Offset=0	21.65	21.21	21.76
		RB Size=36, RB Offset=18	21.64	21.46	21.25
		RB Size=36, RB Offset=37	21.76	21.37	21.23
		RB Size=75, RB Offset=0	21.32	21.06	21.1
	16QAM	RB Size=1, RB Offset=0	22.49	22.52	22.16
		RB Size=1, RB Offset=37	22.1	22.35	22.78
		RB Size=1, RB Offset=74	22.36	22.03	22.41
		RB Size=36, RB Offset=0	21.59	21.45	21.3
		RB Size=36, RB Offset=18	21.05	21.58	21.54
		RB Size=36, RB Offset=37	21.12	21.34	21.62
		RB Size=75, RB Offset=0	21.12	21.32	21.35
20.0	QPSK	RB Size=1, RB Offset=0	22.09	22.55	22.57
		RB Size=1, RB Offset=49	22.12	22.24	22.15
		RB Size=1, RB Offset=99	22.13	22.78	22.49
		RB Size=50, RB Offset=0	21.18	21.7	21.09
		RB Size=50, RB Offset=24	21.22	21.4	21.56
		RB Size=50, RB Offset=49	21.65	21.04	21.21
		RB Size=100, RB Offset=0	21.11	21.41	21.66
	16QAM	RB Size=1, RB Offset=0	22.27	22.44	22.13
		RB Size=1, RB Offset=49	22.46	22.71	22.44
		RB Size=1, RB Offset=99	22.31	22.4	22.32
		RB Size=50, RB Offset=0	21.41	21.08	21.52
		RB Size=50, RB Offset=24	21.63	21.6	21.72
		RB Size=50, RB Offset=49	21.45	21	21.09
		RB Size=100, RB Offset=0	21.32	21.51	21.21

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.92	13	Pass
QPSK (100RB Size)	5.74	13	Pass
16QAM (1RB Size)	6.74	13	Pass
16QAM (100RB Size)	7.02	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									
1732.5	85.43	133	1.6	H	12.1	1.30	8.90	19.70	30
1732.5	84.59	347	2.2	V	11.9	1.30	8.90	19.50	30
3 MHz Bandwidth									
1732.5	85.73	64	1.4	H	12.4	1.30	8.90	20.00	30
1732.5	84.77	113	1.4	V	12.0	1.30	8.90	19.60	30
5 MHz Bandwidth									
1732.5	85.76	260	1.9	H	12.4	1.30	8.90	20.00	30
1732.5	84.86	315	1.9	V	12.1	1.30	8.90	19.70	30
10 MHz Bandwidth									
1732.5	85.49	42	1.1	H	12.2	1.30	8.90	19.80	30
1732.5	84.51	9	2.0	V	11.8	1.30	8.90	19.40	30
15 MHz Bandwidth									
1732.5	85.73	244	2.0	H	12.4	1.30	8.90	20.00	30
1732.5	84.72	33	2.2	V	12.0	1.30	8.90	19.60	30
20 MHz Bandwidth									
1732.5	85.96	316	1.7	H	12.6	1.30	8.90	20.20	30
1732.5	84.87	205	2.0	V	12.1	1.30	8.90	19.70	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	84.88	46	1.6	H	11.6	1.30	8.90	19.20	30
1732.50	83.61	316	2.2	V	10.9	1.30	8.90	18.50	30
3 MHz Bandwidth									
1732.50	85.30	318	1.7	H	12.0	1.30	8.90	19.60	30
1732.50	83.81	194	1.8	V	11.1	1.30	8.90	18.70	30
5 MHz Bandwidth									
1732.50	85.08	146	1.5	H	11.7	1.30	8.90	19.30	30
1732.50	84.28	140	1.4	V	11.5	1.30	8.90	19.10	30
10 MHz Bandwidth									
1732.50	84.51	263	2.1	H	11.2	1.30	8.90	18.80	30
1732.50	83.93	0	1.7	V	11.2	1.30	8.90	18.80	30
15 MHz Bandwidth									
1732.50	84.79	161	1.7	H	11.5	1.30	8.90	19.10	30
1732.50	83.76	146	2.0	V	11.0	1.30	8.90	18.60	30
20 MHz Bandwidth									
1732.50	85.94	318	1.6	H	12.6	1.30	8.90	20.20	30
1732.50	84.64	132	1.4	V	11.9	1.30	8.90	19.50	30

LTE Band 5:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.12	22.48	22.04
		RB Size=1, RB Offset=2	22.26	22.23	22.09
		RB Size=1, RB Offset=5	22.22	22.08	22.50
		RB Size=3, RB Offset=0	21.26	21.07	21.75
		RB Size=3, RB Offset=1	21.21	21.67	21.02
		RB Size=3, RB Offset=2	21.73	21.72	21.50
		RB Size=6, RB Offset=0	21.54	21.16	21.24
	16QAM	RB Size=1, RB Offset=0	22.01	22.17	22.49
		RB Size=1, RB Offset=2	22.11	22.54	22.72
		RB Size=1, RB Offset=5	22.28	22.11	22.57
		RB Size=3, RB Offset=0	21.72	21.46	21.75
		RB Size=3, RB Offset=1	21.61	21.11	21.18
		RB Size=3, RB Offset=2	21.73	21.19	21.23
		RB Size=6, RB Offset=0	21.05	21.34	21.71
3.0	QPSK	RB Size=1, RB Offset=0	22.27	22.1	22.54
		RB Size=1, RB Offset=7	22.12	22.23	22.51
		RB Size=1, RB Offset=14	22.55	22.59	22.26
		RB Size=8, RB Offset=0	21.19	21.21	21.09
		RB Size=8, RB Offset=4	21.36	21.6	21.05
		RB Size=8, RB Offset=7	21.29	21.55	21.23
		RB Size=15, RB Offset=0	21.16	21.4	21.46
	16QAM	RB Size=1, RB Offset=0	22.39	22.48	22.76
		RB Size=1, RB Offset=7	22.28	22.33	22.62
		RB Size=1, RB Offset=14	22.22	22.1	22.53
		RB Size=8, RB Offset=0	21.18	21.77	21.06
		RB Size=8, RB Offset=4	21.68	21.22	21.22
		RB Size=8, RB Offset=7	21.01	21.19	21.22
		RB Size=15, RB Offset=0	21.6	21.21	21.59

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.36	22.16	22.36
		RB Size=1, RB Offset=12	22.37	**22.75**	22.64
		RB Size=1, RB Offset=24	22.46	22.48	22.38
		RB Size=12, RB Offset=0	21.67	21.64	21.75
		RB Size=12, RB Offset=6	21.12	21.41	21.78
		RB Size=12, RB Offset=11	21.31	21.44	21.6
		RB Size=25, RB Offset=0	21.51	21.01	21.48
	16QAM	RB Size=1, RB Offset=0	22.41	22.42	22.34
		RB Size=1, RB Offset=12	22.41	22.69	22.34
		RB Size=1, RB Offset=24	22.21	22.28	22.38
		RB Size=12, RB Offset=0	21.12	21.78	21.40
		RB Size=12, RB Offset=6	21.63	21.06	21.34
		RB Size=12, RB Offset=11	21.04	21.74	21.02
		RB Size=25, RB Offset=0	21.14	21.64	21.46
10.0	QPSK	RB Size=1, RB Offset=0	22.71	22.1	22.4
		RB Size=1, RB Offset=24	22.08	22.12	22.44
		RB Size=1, RB Offset=49	22.08	22.61	22.13
		RB Size=25, RB Offset=0	21.62	21.74	21.44
		RB Size=25, RB Offset=12	21.76	21.36	21.75
		RB Size=25, RB Offset=24	21.63	21.6	21.08
		RB Size=50, RB Offset=0	21.68	21.48	21.05
	16QAM	RB Size=1, RB Offset=0	22.30	22.11	22.39
		RB Size=1, RB Offset=24	22.50	22.11	22.33
		RB Size=1, RB Offset=49	22.10	22.27	22.47
		RB Size=25, RB Offset=0	21.61	21.44	21.22
		RB Size=25, RB Offset=12	21.29	21.62	21.33
		RB Size=25, RB Offset=24	21.05	21.27	21.56
		RB Size=50, RB Offset=0	21.62	21.72	21.7

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.02	13	Pass
QPSK (50RB Size)	6.21	13	Pass
16QAM (1RB Size)	6.61	13	Pass
16QAM (50RB Size)	7.05	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	83.51	73	2.3	H	24.1	1.90	0.0	22.20	38.45
836.5	76.34	108	2.3	V	16.3	1.90	0.0	14.40	38.45
3 MHz Bandwidth									
836.5	82.66	315	1.8	H	23.3	1.90	0.0	21.40	38.45
836.5	74.85	39	2.0	V	14.9	1.90	0.0	13.00	38.45
5 MHz Bandwidth									
836.5	84.57	218	1.4	H	27.2	1.90	0.0	23.30	38.45
836.5	75.33	229	1.1	V	15.3	1.90	0.0	13.40	38.45
10 MHz Bandwidth									
836.5	84.65	195	2.5	H	25.3	1.90	0.0	23.40	38.45
836.5	73.59	315	2.1	V	13.6	1.90	0.0	11.70	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	83.45	242	1.5	H	24.1	1.90	0.0	22.20	38.45
836.5	76.39	109	1.7	V	16.4	1.90	0.0	14.50	38.45
3 MHz Bandwidth									
836.5	82.69	337	1.4	H	23.3	1.90	0.0	21.40	38.45
836.5	79.42	117	1.1	V	19.4	1.90	0.0	17.50	38.45
5 MHz Bandwidth									
836.5	84.53	139	1.8	H	25.2	1.90	0.0	23.30	38.45
836.5	78.34	188	2.4	V	18.3	1.90	0.0	16.40	38.45
10 MHz Bandwidth									
836.5	82.41	101	1.0	H	23.0	1.90	0.0	21.10	38.45
836.5	73.68	292	1.1	V	13.7	1.90	0.0	11.80	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	22.23	22.24	22.51
		RB Size=1, RB Offset=12	22.09	22.34	22.46
		RB Size=1, RB Offset=24	22.74	22.47	22.49
		RB Size=12, RB Offset=0	21.23	21.71	21.02
		RB Size=12, RB Offset=6	21.12	21.69	21.64
		RB Size=12, RB Offset=11	21.36	21.54	21.19
		RB Size=25, RB Offset=0	21.05	21.37	21.03
	16QAM	RB Size=1, RB Offset=0	22.72	22.52	22.32
		RB Size=1, RB Offset=12	22.23	22.35	22.35
		RB Size=1, RB Offset=24	22.03	22.05	22.67
		RB Size=12, RB Offset=0	21.36	21.65	21.52
		RB Size=12, RB Offset=6	21.28	21.59	21.37
		RB Size=12, RB Offset=11	21.05	21.78	21.23
		RB Size=25, RB Offset=0	21.48	21.12	21.79
10	QPSK	RB Size=1, RB Offset=0	22.59	22.54	22.61
		RB Size=1, RB Offset=24	22.36	22.17	22.52
		RB Size=1, RB Offset=49	22.51	22.64	22.71
		RB Size=25, RB Offset=0	21.28	21.39	21.46
		RB Size=25, RB Offset=12	21.56	21.53	21.63
		RB Size=25, RB Offset=24	21.24	21.69	21.05
		RB Size=50, RB Offset=0	21.29	21.68	21.14
	16QAM	RB Size=1, RB Offset=0	22.22	22.12	22.28
		RB Size=1, RB Offset=24	22.47	22.29	22.53
		RB Size=1, RB Offset=49	22.51	22.52	22.49
		RB Size=25, RB Offset=0	21.17	21.31	21.62
		RB Size=25, RB Offset=12	21.19	21.18	21.51
		RB Size=25, RB Offset=24	21.28	21.30	21.04
		RB Size=50, RB Offset=0	21.45	21.42	21.72

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	22.21	22.57	22.17
		RB Size=1, RB Offset=37	22.31	22.63	22.05
		RB Size=1, RB Offset=74	22.50	22.73	22.58
		RB Size=36, RB Offset=0	21.25	21.23	21.35
		RB Size=36, RB Offset=18	21.37	21.57	21.52
		RB Size=36, RB Offset=37	21.21	21.20	21.05
		RB Size=75, RB Offset=0	21.33	21.25	21.66
	16QAM	RB Size=1, RB Offset=0	22.02	22.21	22.27
		RB Size=1, RB Offset=37	22.26	22.39	22.03
		RB Size=1, RB Offset=74	22.68	22.73	22.42
		RB Size=36, RB Offset=0	21.28	21.05	21.36
		RB Size=36, RB Offset=18	21.42	21.08	21.04
		RB Size=36, RB Offset=37	21.15	21.41	21.74
		RB Size=75, RB Offset=0	21.56	21.62	21.11
20	QPSK	RB Size=1, RB Offset=0	22.13	22.49	22.26
		RB Size=1, RB Offset=49	22.31	22.16	22.22
		RB Size=1, RB Offset=99	22.48	22.16	22.38
		RB Size=50, RB Offset=0	21.61	21.45	21.28
		RB Size=50, RB Offset=24	21.68	21.04	21.70
		RB Size=50, RB Offset=49	21.57	21.20	21.24
		RB Size=100, RB Offset=0	21.49	21.12	21.64
	16QAM	RB Size=1, RB Offset=0	22.76	22.78	22.44
		RB Size=1, RB Offset=49	22.57	22.21	22.55
		RB Size=1, RB Offset=99	22.39	22.77	**22.78**
		RB Size=50, RB Offset=0	21.36	21.19	21.55
		RB Size=50, RB Offset=24	21.05	21.46	21.73
		RB Size=50, RB Offset=49	21.59	21.66	21.67
		RB Size=100, RB Offset=0	21.44	21.43	21.52

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.56	13	Pass
QPSK (50RB Size)	6.1	13	Pass
16QAM (1RB Size)	6.98	13	Pass
16QAM (50RB Size)	6.95	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	81.19	234	2.2	H	11.0	2.60	10.20	18.60	33
2535.00	80.69	261	1.9	V	11.1	2.60	10.20	18.70	33
10 MHz Bandwidth									
2535.00	81.69	12	2.2	H	11.5	2.60	10.20	19.10	33
2535.00	80.89	68	1.7	V	11.3	2.60	10.20	18.90	33
15 MHz Bandwidth									
2535.00	81.53	147	1.7	H	11.4	2.60	10.20	19.00	33
2535.00	80.29	139	1.1	V	10.7	2.60	10.20	18.30	33
20 MHz Bandwidth									
2535.00	81.19	147	1.9	H	11.0	2.60	10.20	18.60	33
2535.00	80.33	322	2.3	V	10.8	2.60	10.20	18.40	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	80.88	275	1.6	H	10.7	2.60	10.20	18.30	33
2535.00	80.38	46	2.0	V	10.8	2.60	10.20	18.40	33
10 MHz Bandwidth									
2535.00	81.45	347	2.4	H	11.3	2.60	10.20	18.90	33
2535.00	80.23	159	1.4	V	10.7	2.60	10.20	18.30	33
15 MHz Bandwidth									
2535.00	81.53	152	1.8	H	11.4	2.60	10.20	19.00	33
2535.00	79.96	276	2.3	V	10.4	2.60	10.20	18.00	33
20 MHz Bandwidth									
2535.00	80.98	161	2.2	H	10.8	2.60	10.20	18.40	33
2535.00	79.33	341	1.1	V	9.8	2.60	10.20	17.40	33

LTE Band 12:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.20	22.07	22.21
		RB Size=1, RB Offset=2	22.43	22.43	22.77
		RB Size=1, RB Offset=5	22.45	22.48	22.42
		RB Size=3, RB Offset=0	21.36	21.10	21.78
		RB Size=3, RB Offset=1	21.30	21.22	21.48
		RB Size=3, RB Offset=2	21.07	21.34	21.69
		RB Size=6, RB Offset=0	21.34	21.33	21.70
	16QAM	RB Size=1, RB Offset=0	22.41	**22.78**	22.66
		RB Size=1, RB Offset=2	22.57	22.44	22.60
		RB Size=1, RB Offset=5	22.10	22.79	22.58
		RB Size=3, RB Offset=0	21.48	21.65	21.29
		RB Size=3, RB Offset=1	21.38	21.53	21.40
		RB Size=3, RB Offset=2	21.54	21.31	21.27
		RB Size=6, RB Offset=0	21.75	21.06	21.22
3.0	QPSK	RB Size=1, RB Offset=0	22.61	22.27	22.25
		RB Size=1, RB Offset=7	22.53	22.77	22.22
		RB Size=1, RB Offset=14	22.46	22.07	22.56
		RB Size=8, RB Offset=0	21.10	21.49	21.36
		RB Size=8, RB Offset=4	21.59	21.25	21.52
		RB Size=8, RB Offset=7	21.49	21.32	21.06
		RB Size=15, RB Offset=0	21.03	21.45	21.08
	16QAM	RB Size=1, RB Offset=0	22.24	22.78	22.52
		RB Size=1, RB Offset=7	22.31	22.76	22.54
		RB Size=1, RB Offset=14	22.06	22.12	22.18
		RB Size=8, RB Offset=0	21.62	21.48	21.55
		RB Size=8, RB Offset=4	21.56	21.17	21.7
		RB Size=8, RB Offset=7	21.33	21.29	21.24
		RB Size=15, RB Offset=0	21.67	21.55	21.77

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.14	22.01	22.41
		RB Size=1, RB Offset=12	22.24	22.66	22.23
		RB Size=1, RB Offset=24	22.26	22.64	22.21
		RB Size=12, RB Offset=0	21.63	21.47	21.61
		RB Size=12, RB Offset=6	21.69	21.64	21.77
		RB Size=12, RB Offset=11	21.59	21.57	21.68
		RB Size=25, RB Offset=0	21.63	21.00	21.24
	16QAM	RB Size=1, RB Offset=0	22.56	22.31	22.03
		RB Size=1, RB Offset=12	22.44	22.55	22.26
		RB Size=1, RB Offset=24	22.56	22.34	22.21
		RB Size=12, RB Offset=0	21.41	21.43	21.06
		RB Size=12, RB Offset=6	21.69	21.70	21.41
		RB Size=12, RB Offset=11	21.65	21.28	21.19
		RB Size=25, RB Offset=0	21.67	21.04	21.21
10.0	QPSK	RB Size=1, RB Offset=0	22.71	22.24	22.57
		RB Size=1, RB Offset=24	22.42	22.32	22.11
		RB Size=1, RB Offset=49	22.25	22.14	22.75
		RB Size=25, RB Offset=0	21.64	21.12	21.12
		RB Size=25, RB Offset=12	21.16	21.12	21.76
		RB Size=25, RB Offset=24	21.59	21.36	21.2
		RB Size=50, RB Offset=0	21.70	21.51	21.67
	16QAM	RB Size=1, RB Offset=0	22.27	22.46	22.7
		RB Size=1, RB Offset=24	22.77	22.44	22.39
		RB Size=1, RB Offset=49	22.19	22.18	22.72
		RB Size=25, RB Offset=0	21.76	21.18	21.41
		RB Size=25, RB Offset=12	21.68	21.46	21.47
		RB Size=25, RB Offset=24	21.64	21.76	21.70
		RB Size=50, RB Offset=0	21.70	21.30	21.69

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.05	13	Pass
QPSK (50RB Size)	5.82	13	Pass
16QAM (1RB Size)	6.85	13	Pass
16QAM (50RB Size)	6.63	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	90.33	353	1.0	H	22.5	1.56	0.0	20.94	34.77
707.5	80.42	216	2.3	V	14.1	1.56	0.0	12.54	34.77
3 MHz Bandwidth									
707.5	89.34	193	1.1	H	21.6	1.56	0.0	20.04	34.77
707.5	78.68	71	1.1	V	12.3	1.56	0.0	10.74	34.77
5 MHz Bandwidth									
707.5	90.22	119	1.8	H	22.4	1.56	0.0	20.84	34.77
707.5	79.68	66	1.2	V	13.3	1.56	0.0	11.74	34.77
10 MHz Bandwidth									
707.5	89.69	292	2.1	H	21.9	1.56	0.0	20.34	34.77
707.5	80.42	166	1.2	V	14.1	1.56	0.0	12.54	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	89.34	33	1.7	H	21.6	1.56	0.0	20.04	34.77
707.5	79.66	108	2.5	V	13.3	1.56	0.0	11.74	34.77
3 MHz Bandwidth									
707.5	88.91	217	2.0	H	21.1	1.56	0.0	19.54	34.77
707.5	78.69	71	2.0	V	12.4	1.56	0.0	10.84	34.77
5 MHz Bandwidth									
707.5	90.48	229	1.0	H	22.7	1.56	0.0	21.14	34.77
707.5	79.82	234	1.6	V	13.5	1.56	0.0	11.94	34.77
10 MHz Bandwidth									
707.5	89.67	8	2.3	H	21.9	1.56	0.0	20.34	34.77
707.5	80.16	250	2.4	V	13.8	1.56	0.0	12.24	34.77

LTE Band 17:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	22.07	22.53	22.32
		RB Size=1, RB Offset=12	22.63	22.52	22.05
		RB Size=1, RB Offset=24	**22.74**	22.28	22.04
		RB Size=12, RB Offset=0	21.42	21.10	21.05
		RB Size=12, RB Offset=6	21.70	21.04	21.34
		RB Size=12, RB Offset=11	21.38	21.44	21.05
		RB Size=25, RB Offset=0	21.08	21.23	21.00
	16QAM	RB Size=1, RB Offset=0	22.02	22.67	22.1
		RB Size=1, RB Offset=12	22.41	22.35	22.01
		RB Size=1, RB Offset=24	22.62	22.48	22.65
		RB Size=12, RB Offset=0	21.04	21.27	21.07
		RB Size=12, RB Offset=6	21.51	21.05	21.78
		RB Size=12, RB Offset=11	21.38	21.36	21.52
		RB Size=25, RB Offset=0	21.14	21.09	21.10
10	QPSK	RB Size=1, RB Offset=0	22.62	22.08	22.49
		RB Size=1, RB Offset=24	22.71	22.24	22.23
		RB Size=1, RB Offset=49	22.63	22.13	22.06
		RB Size=25, RB Offset=0	21.58	21.69	21.08
		RB Size=25, RB Offset=12	21.13	21.43	21.56
		RB Size=25, RB Offset=24	21.37	21.15	21.10
		RB Size=50, RB Offset=0	21.21	21.43	21.16
	16QAM	RB Size=1, RB Offset=0	22.70	22.76	22.4
		RB Size=1, RB Offset=24	22.09	22.52	22.42
		RB Size=1, RB Offset=49	22.08	22.31	22.52
		RB Size=25, RB Offset=0	21.41	21.64	21.07
		RB Size=25, RB Offset=12	21.36	21.37	21.44
		RB Size=25, RB Offset=24	21.42	21.63	21.33
		RB Size=50, RB Offset=0	21.44	21.52	21.30

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.94	13	Pass
QPSK (50RB Size)	5.95	13	Pass
16QAM (1RB Size)	6.98	13	Pass
16QAM (50RB Size)	6.95	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									
710.0	91.51	7	2.3	H	23.7	1.56	0.0	22.14	34.77
710.0	82.24	212	1.6	V	15.9	1.56	0.0	14.34	34.77
10 MHz Bandwidth									
710.0	90.21	132	1.1	H	22.4	1.56	0.0	20.84	34.77
710.0	79.66	301	2.1	V	13.3	1.56	0.0	11.74	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
710.0	91.20	283	2.3	H	23.4	1.56	0.0	21.84	34.77
710.0	81.32	173	1.3	V	15.0	1.56	0.0	13.44	34.77
10 MHz Bandwidth									
710.0	89.55	3	2.5	H	21.8	1.56	0.0	20.24	34.77
710.0	79.62	30	1.8	V	13.3	1.56	0.0	11.74	34.77

Note:
All above data were tested with no amplifier
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53 - OCCUPIED BANDWIDTH

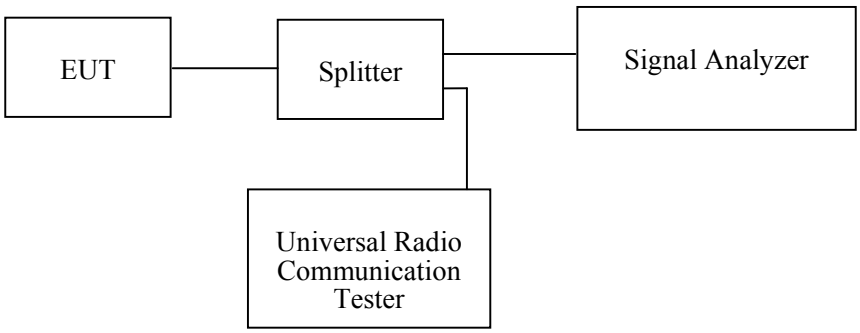
Applicable Standard

FCC 47 §2.1049, §22.917, §22.905, §24.238 and §27.53.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	52~55 %
ATM Pressure:	101.0 kPa

The testing was performed by George Zhong from 2019-11-27 to 2019-12-02.

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	243.59	318.27
EGPRS(8PSK)	836.6	245.19	316.03

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.15	4.68
HSUPA (BPSK)	836.6	4.17	4.70
HSDPA (16QAM)	836.6	4.17	4.71

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	241.99	314.42
EGPRS(8PSK)	1880.0	243.59	310.26

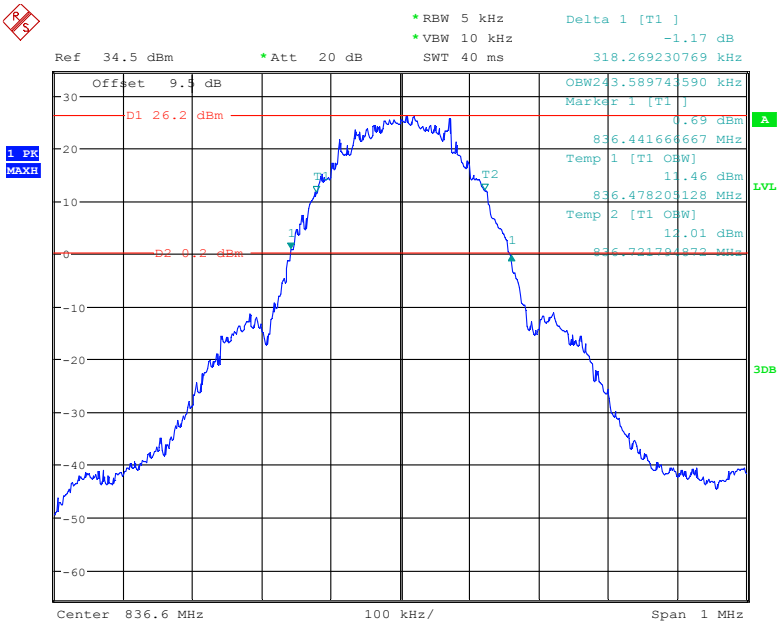
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.17	4.71
HSUPA (BPSK)	1880.0	4.17	4.70
HSDPA (16QAM)	1880.0	4.17	4.71

AWS Band (Part 27)

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1732.6	4.17	4.70
HSUPA (BPSK)	1732.6	4.15	4.66
HSDPA (16QAM)	1732.6	4.17	4.66

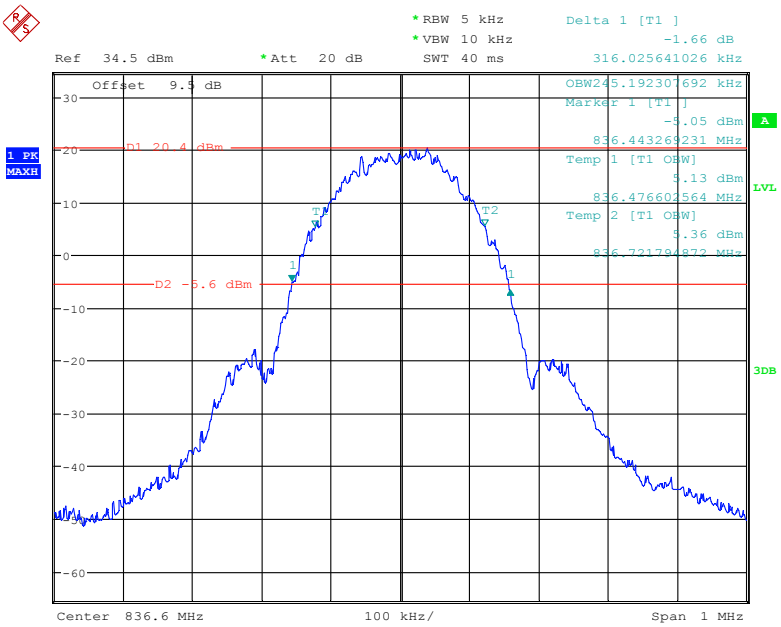
Cellular Band (Part 22H)

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



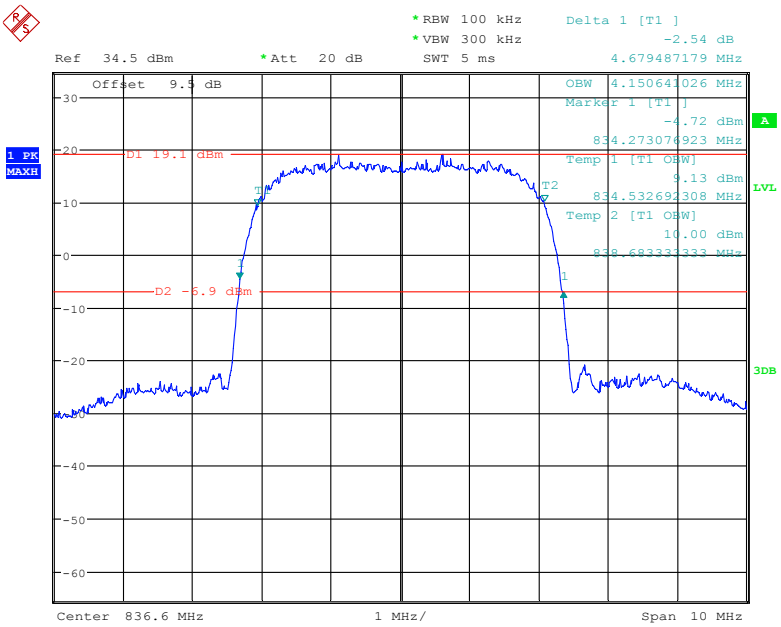
Date: 27.NOV.2019 21:08:59

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



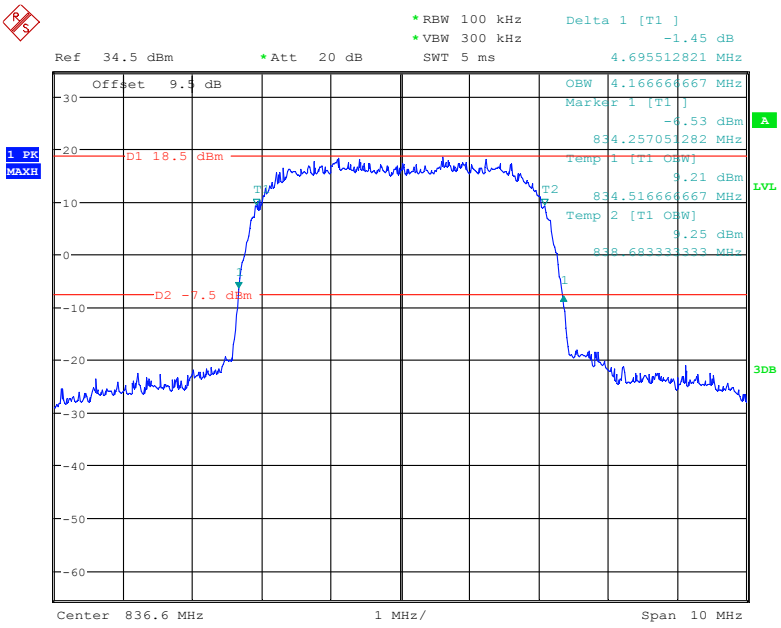
Date: 27.NOV.2019 21:35:39

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



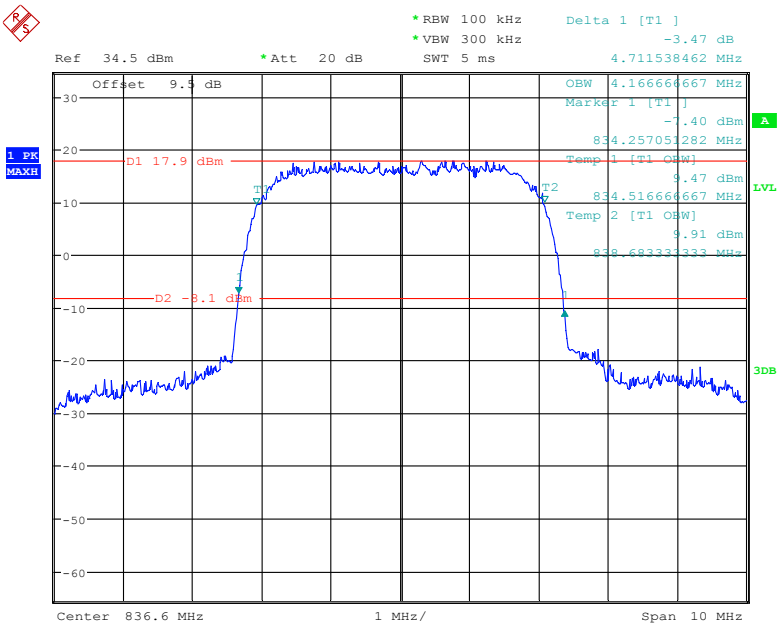
Date: 27.NOV.2019 22:38:48

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



Date: 27.NOV.2019 22:40:10

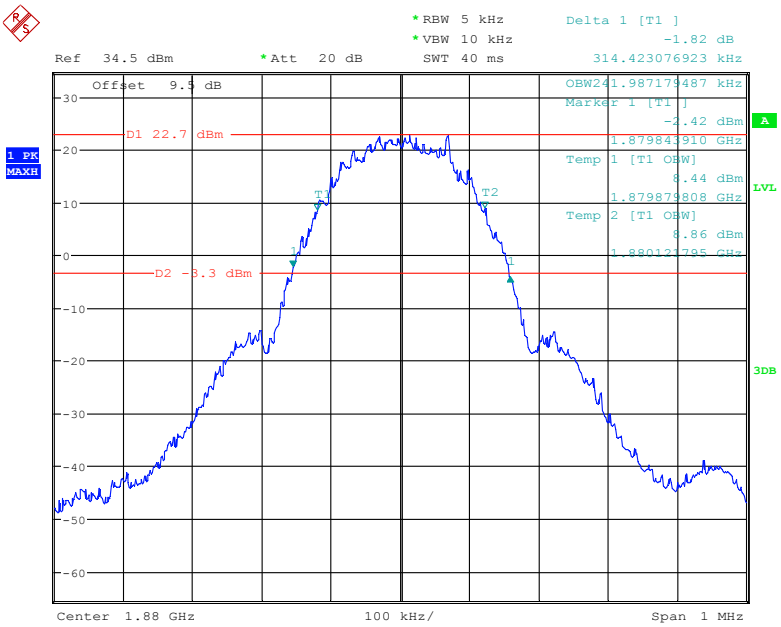
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 27.NOV.2019 22:41:29

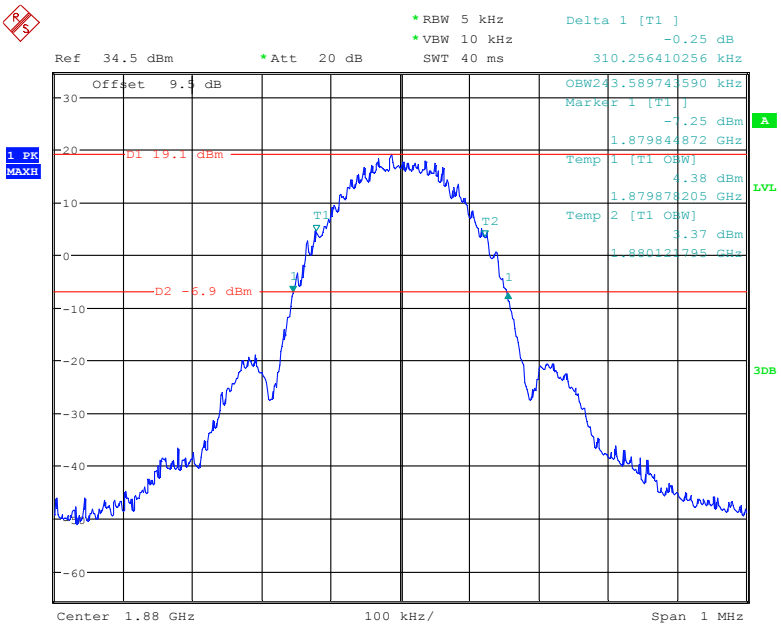
PCS Band (Part 24E)

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



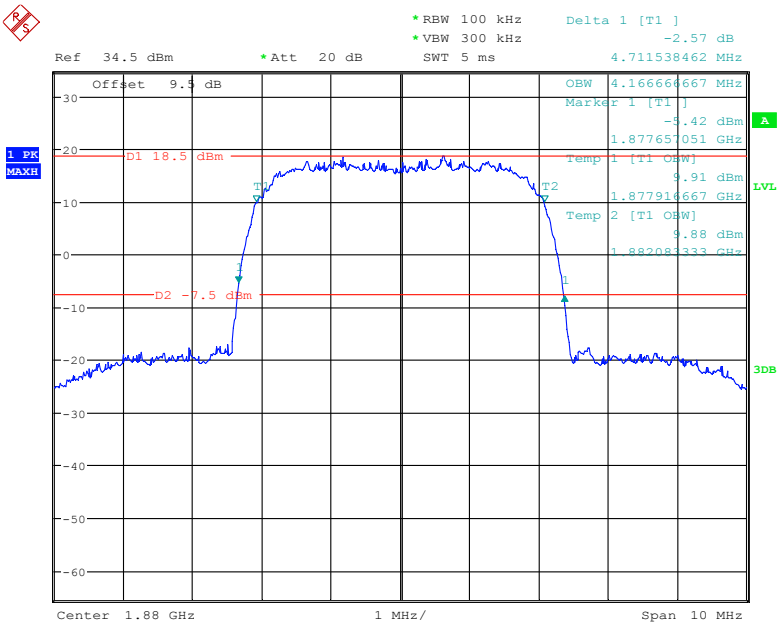
Date: 27.NOV.2019 21:17:16

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



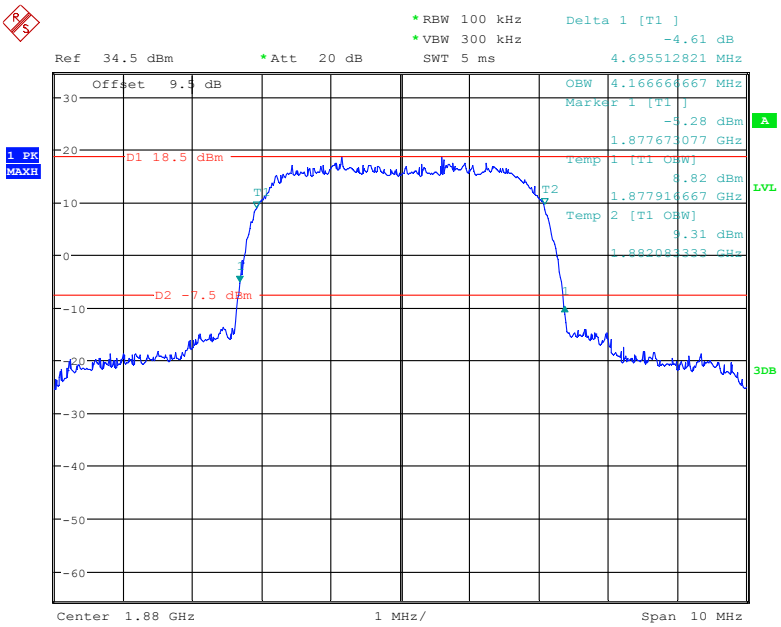
Date: 27.NOV.2019 21:26:08

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



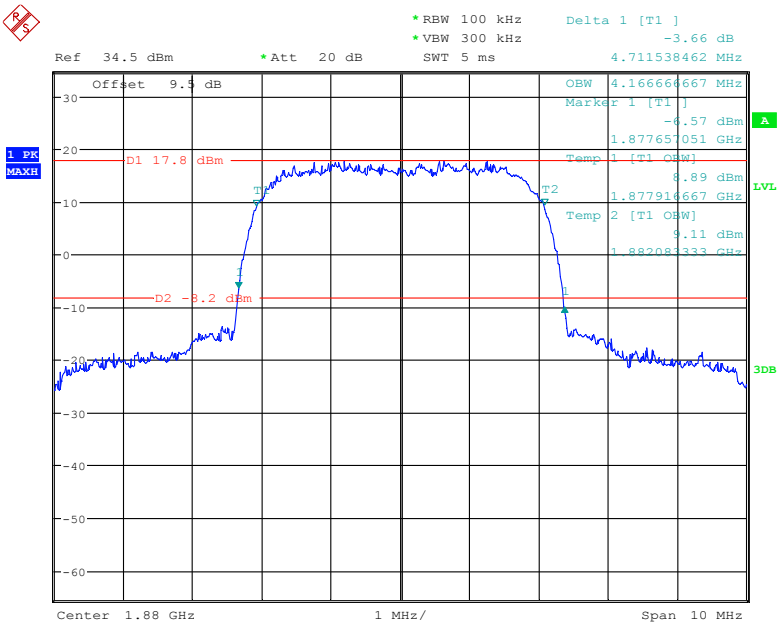
Date: 27.NOV.2019 22:21:11

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



Date: 27.NOV.2019 22:23:36

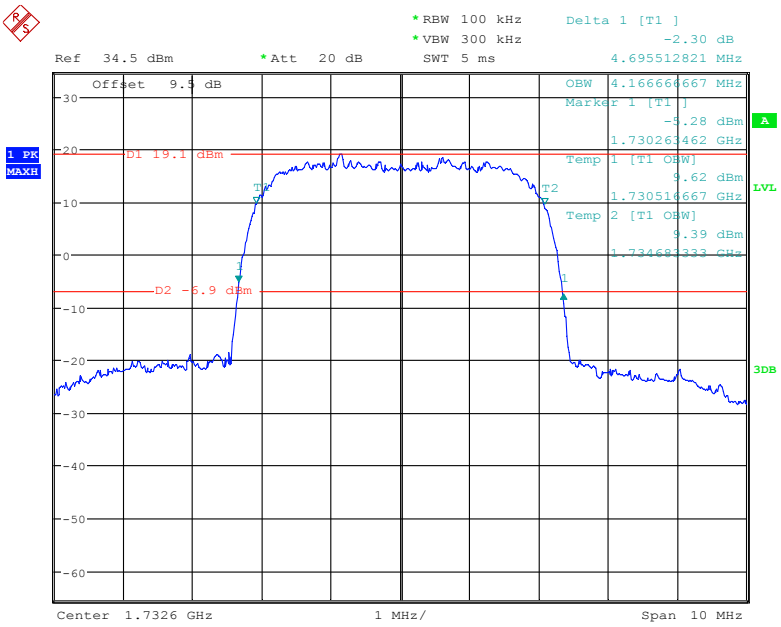
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 27.NOV.2019 22:22:26

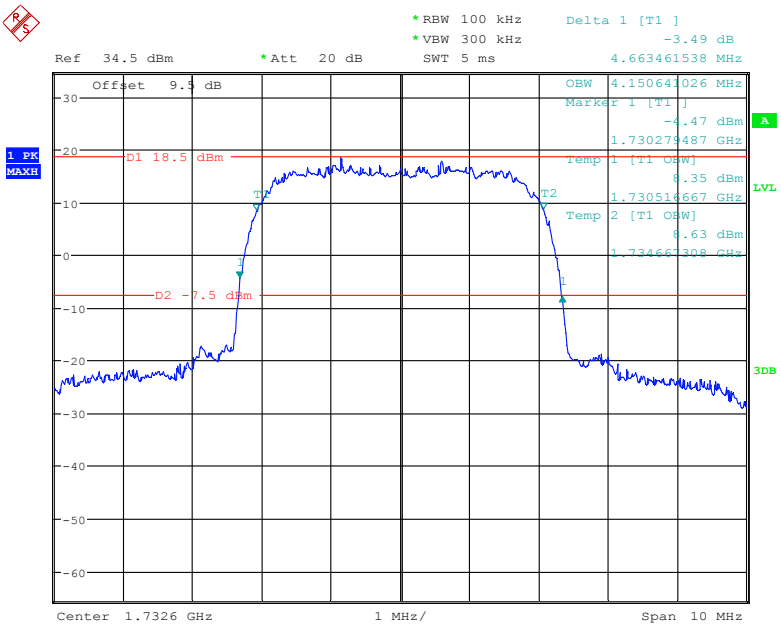
AWS Band (Part 27)

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



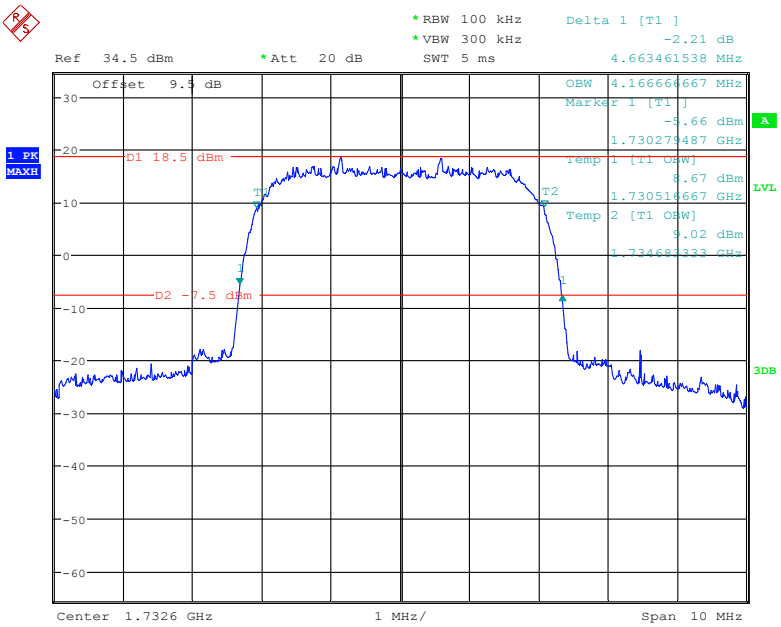
Date: 27.NOV.2019 21:57:24

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



Date: 27.NOV.2019 22:01:00

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

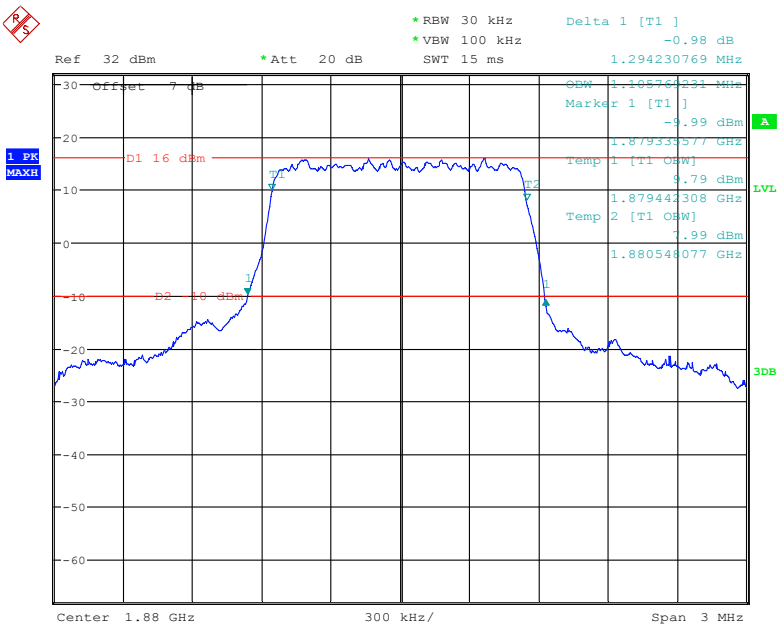


Date: 27.NOV.2019 22:02:22

LTE Band 2: (Middle Channel)

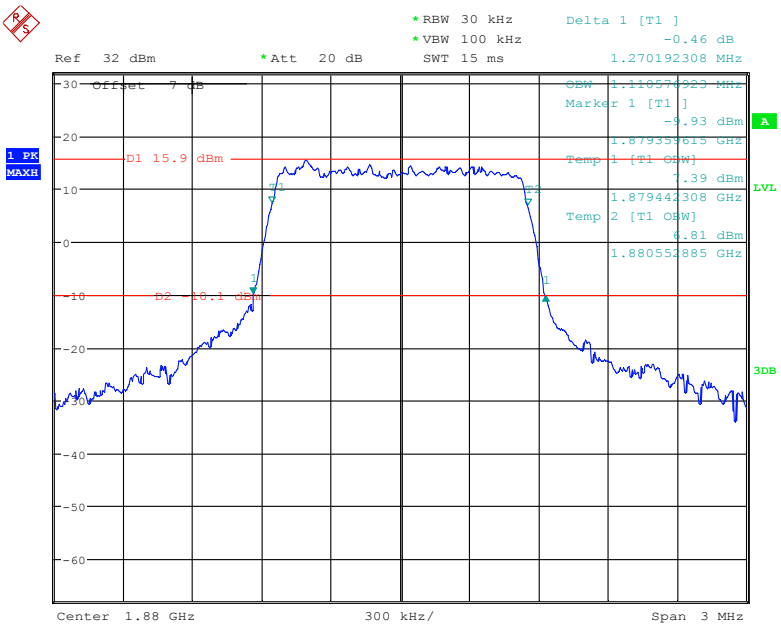
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.29
	16QAM	1.11	1.27
3.0	QPSK	2.70	3.00
	16QAM	2.70	3.02
5.0	QPSK	4.50	5.07
	16QAM	4.41	4.99
10.0	QPSK	8.97	9.84
	16QAM	8.97	9.78
15.0	QPSK	13.51	15.12
	16QAM	13.46	14.88
20.0	QPSK	18.01	19.94
	16QAM	18.08	20.07

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



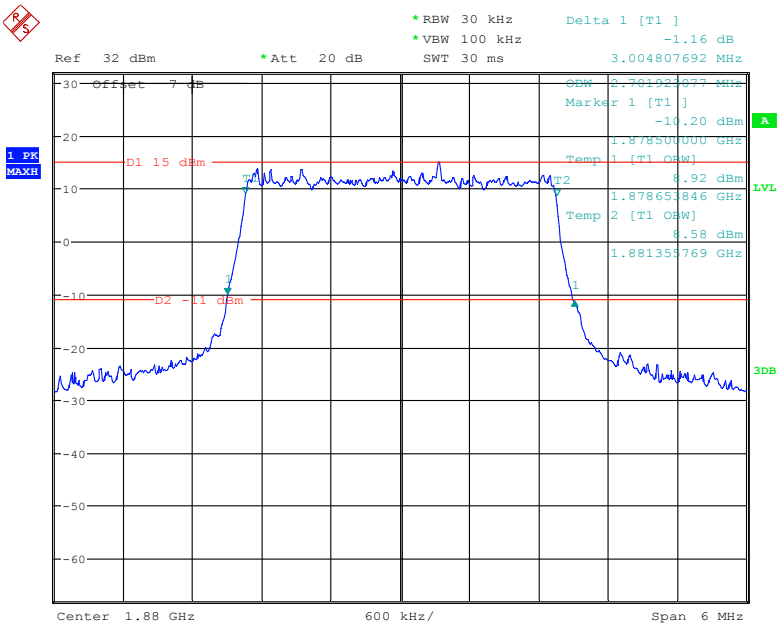
Date: 2.DEC.2019 19:27:41

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



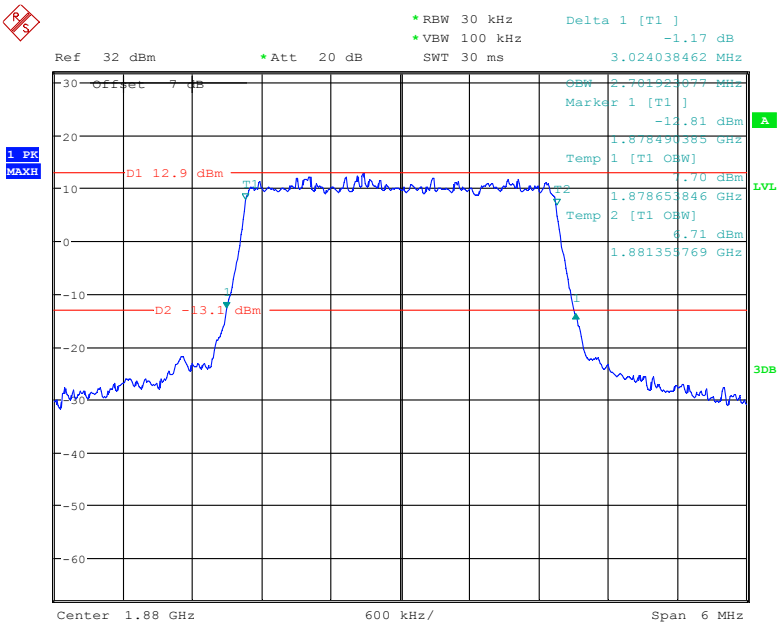
Date: 2.DEC.2019 19:29:17

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



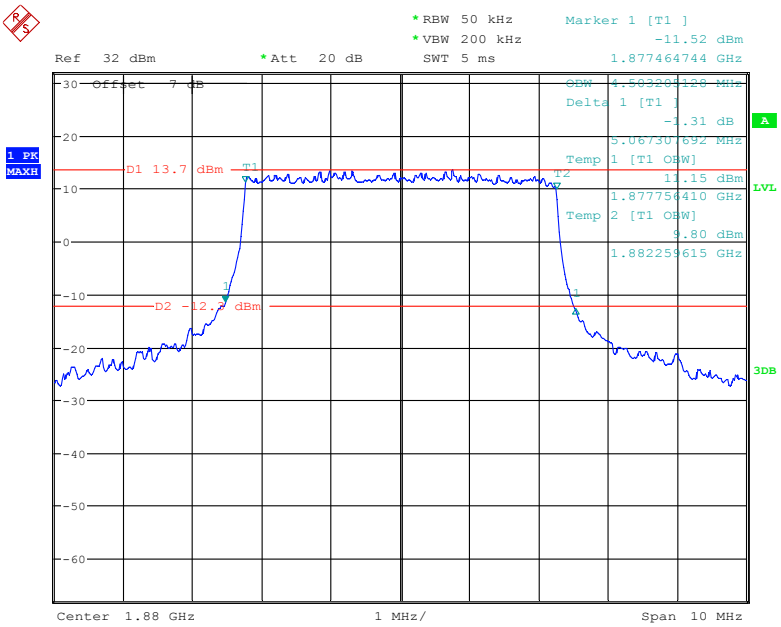
Date: 2.DEC.2019 19:32:58

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



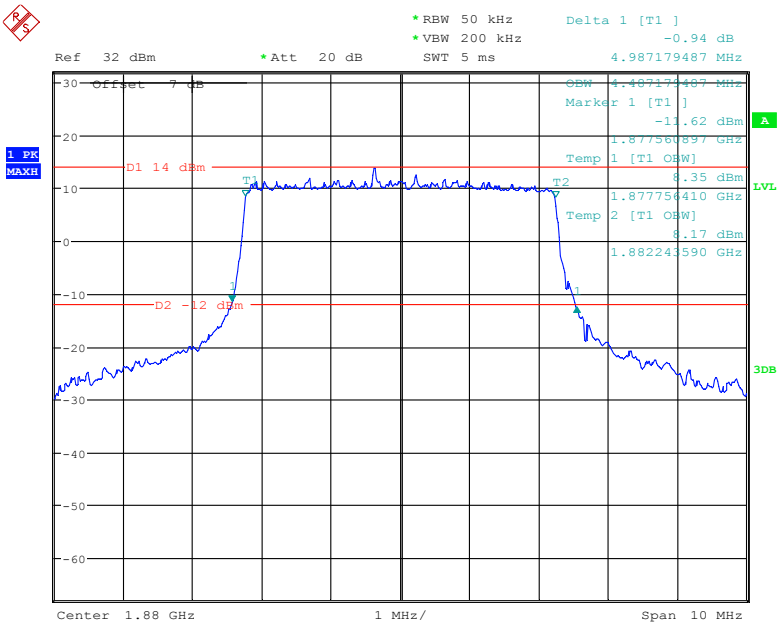
Date: 2.DEC.2019 19:34:13

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



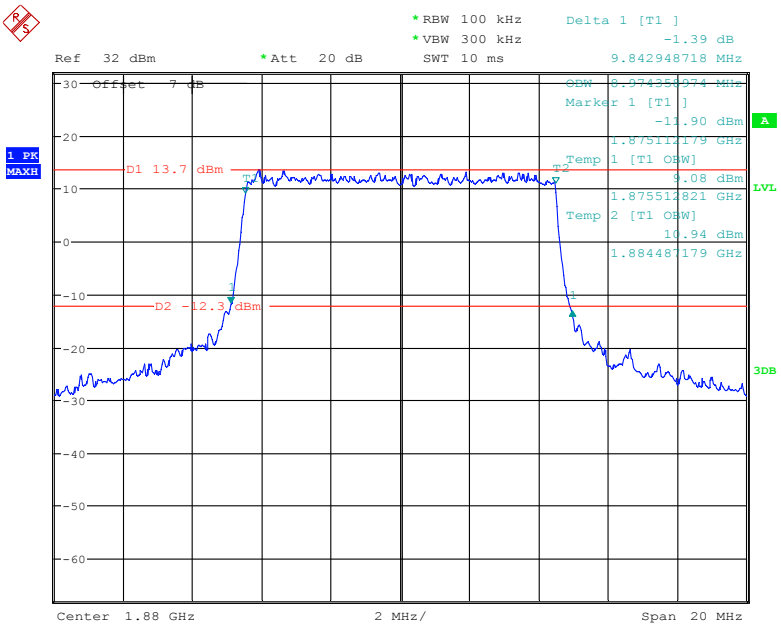
Date: 2.DEC.2019 19:49:03

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



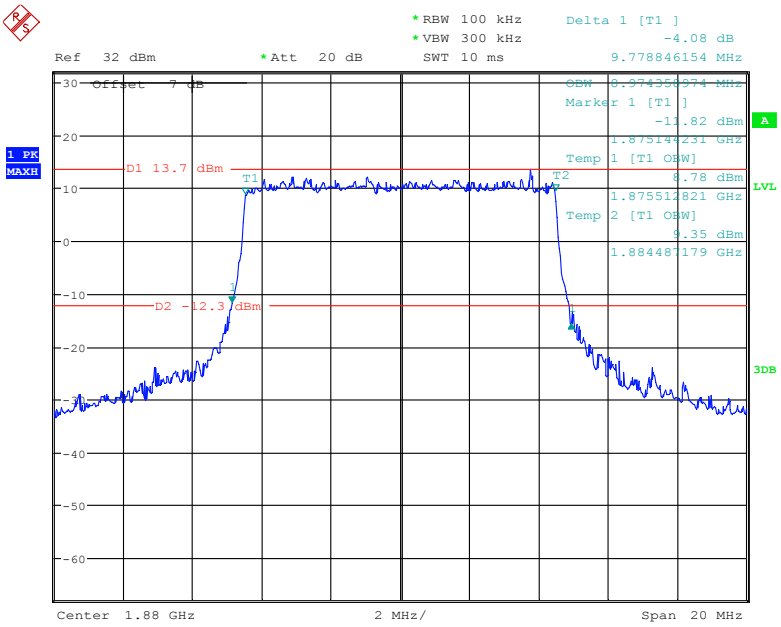
Date: 2.DEC.2019 19:51:03

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



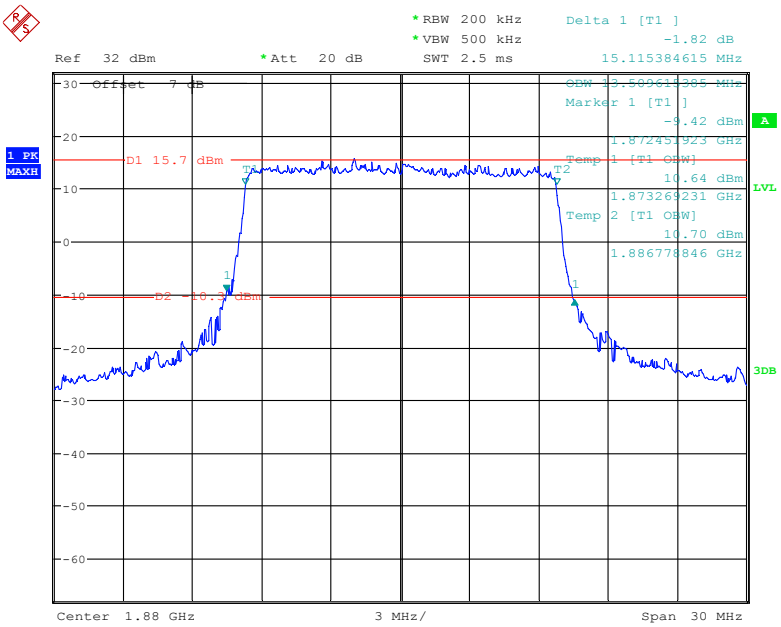
Date: 2.DEC.2019 19:55:12

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



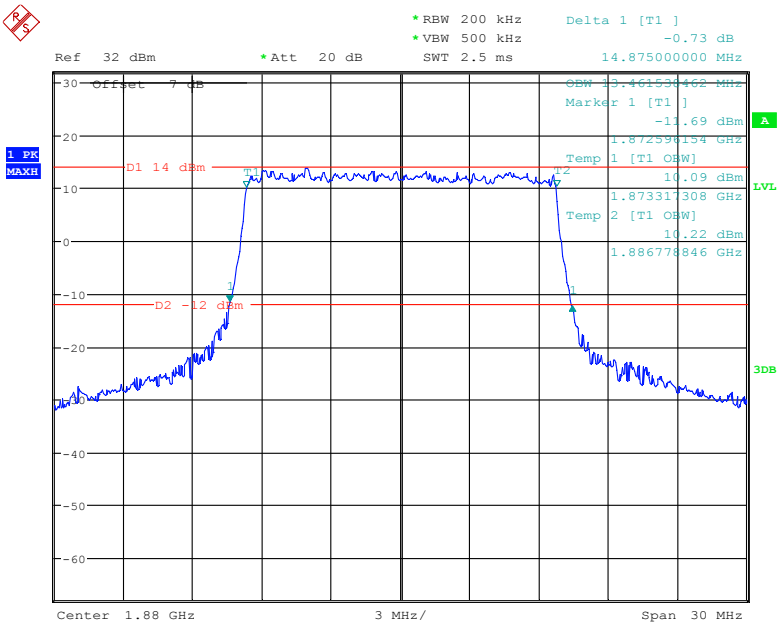
Date: 2.DEC.2019 19:56:04

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



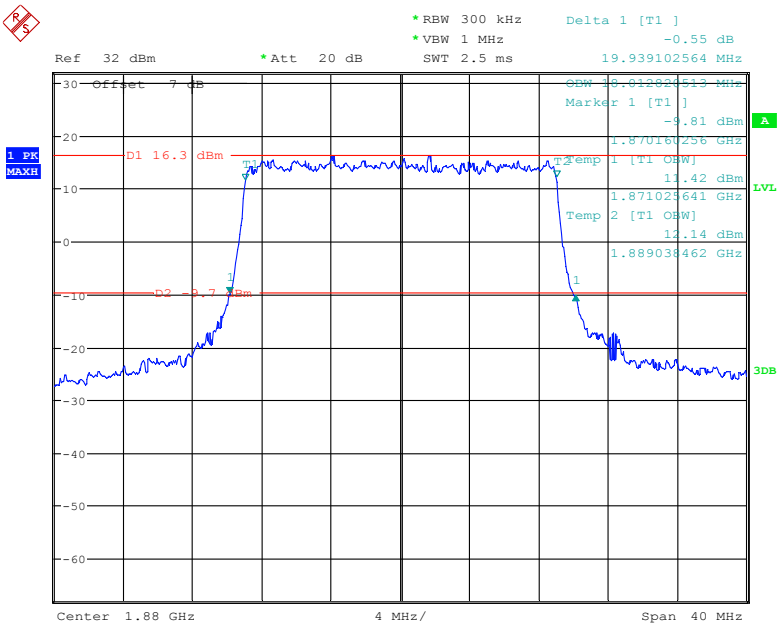
Date: 2.DEC.2019 19:57:51

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



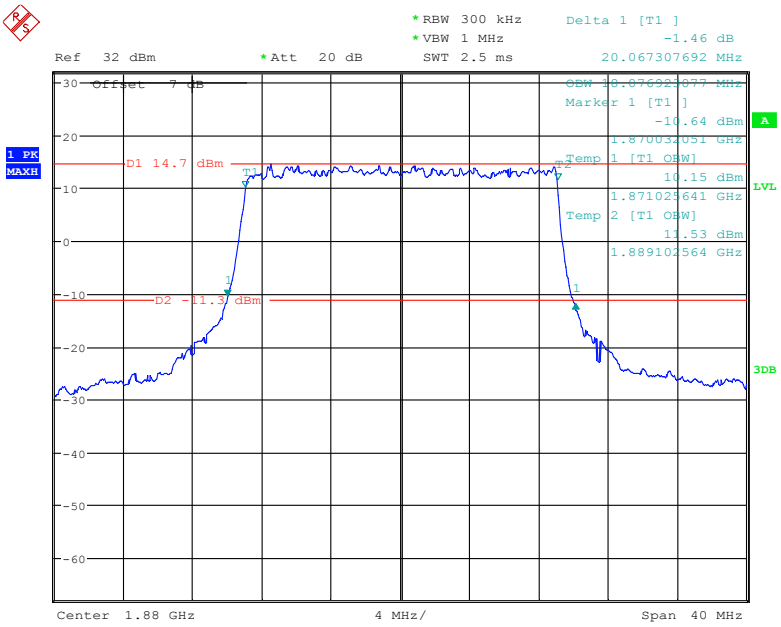
Date: 2.DEC.2019 19:59:26

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



Date: 2.DEC.2019 20:01:41

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

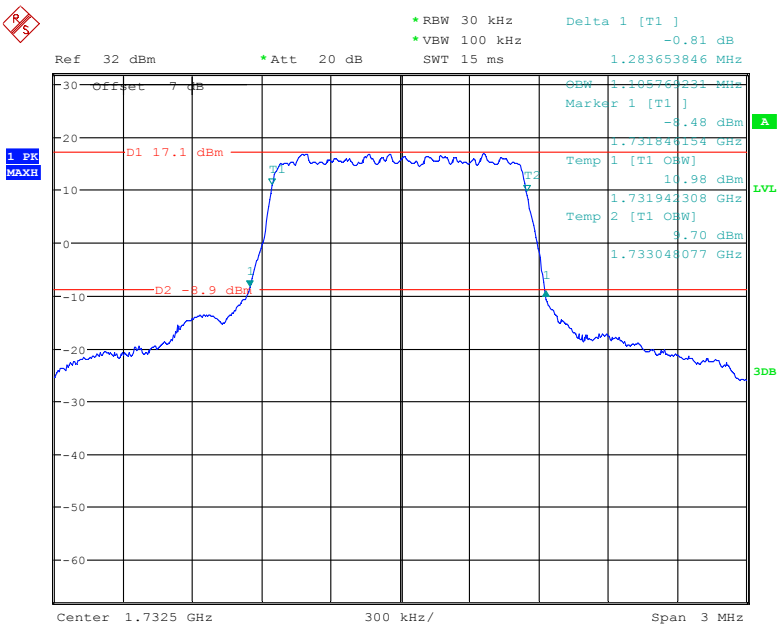


Date: 2.DEC.2019 20:04:56

LTE Band 4: (Middle Channel)

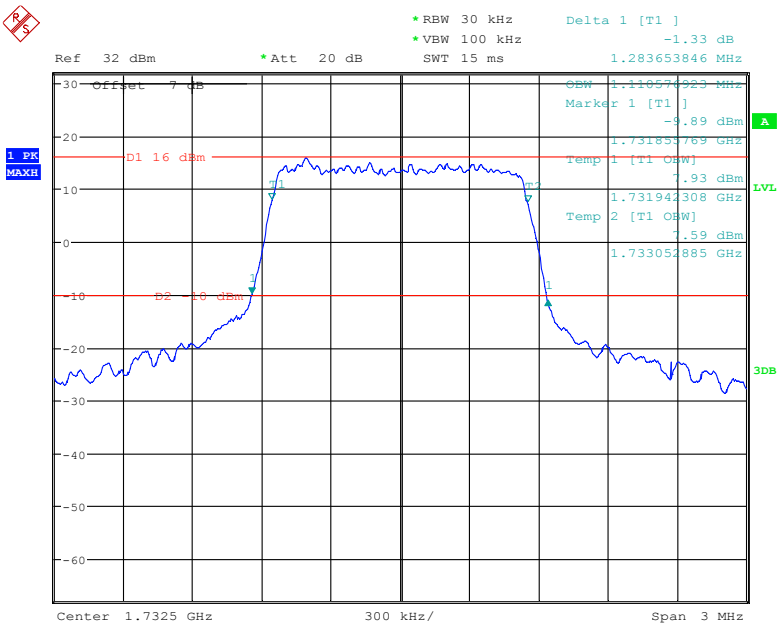
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.28
	16QAM	1.11	1.28
3.0	QPSK	2.72	3.05
	16QAM	2.72	3.06
5.0	QPSK	4.50	5.05
	16QAM	4.41	5.00
10.0	QPSK	8.97	9.76
	16QAM	8.97	9.86
15.0	QPSK	13.46	15.15
	16QAM	13.46	14.76
20.0	QPSK	17.94	20.05
	16QAM	17.94	19.99

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



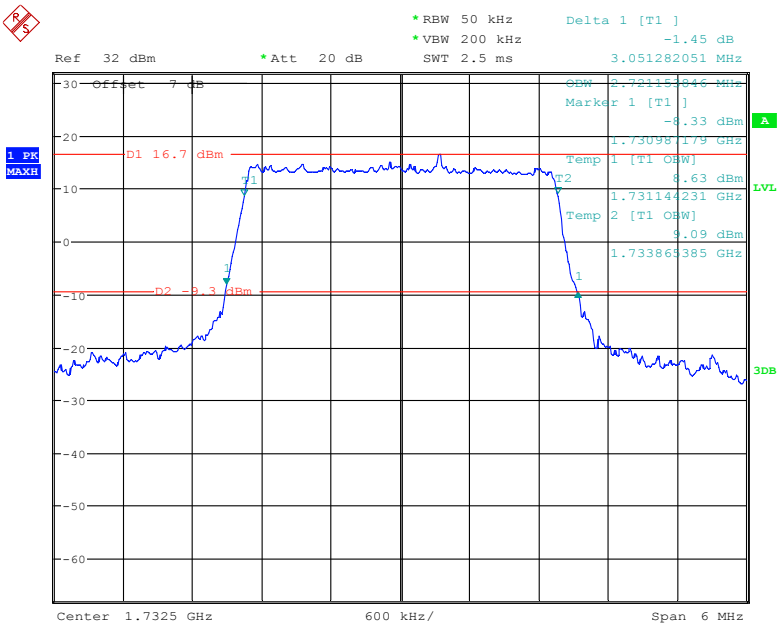
Date: 2.DEC.2019 20:28:54

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



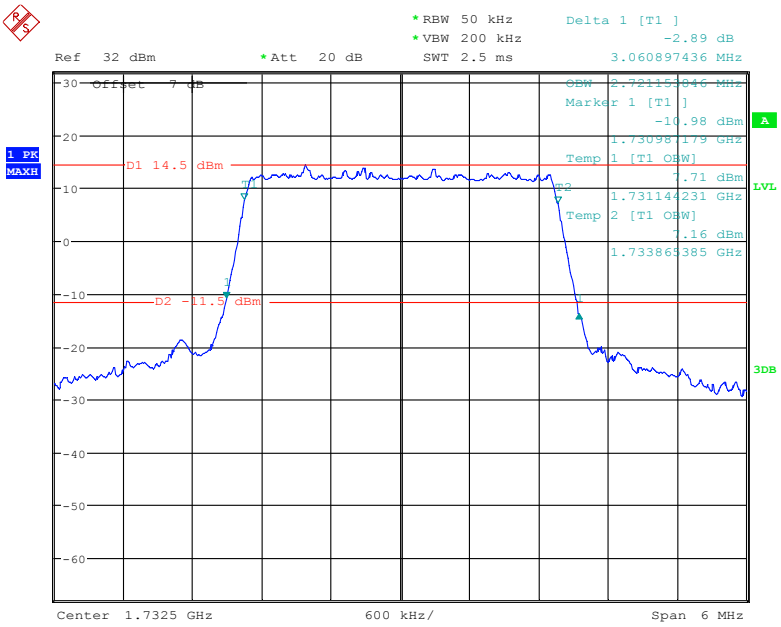
Date: 2.DEC.2019 20:26:34

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



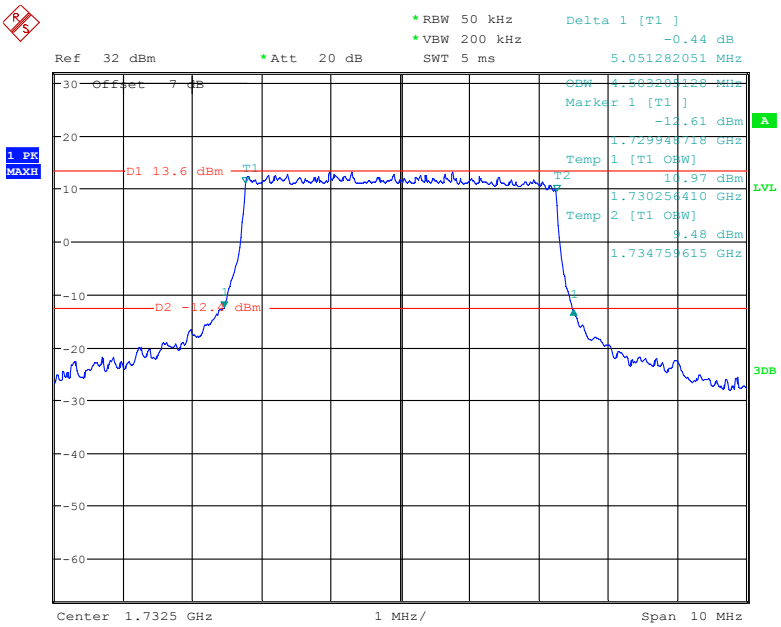
Date: 2.DEC.2019 20:24:24

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



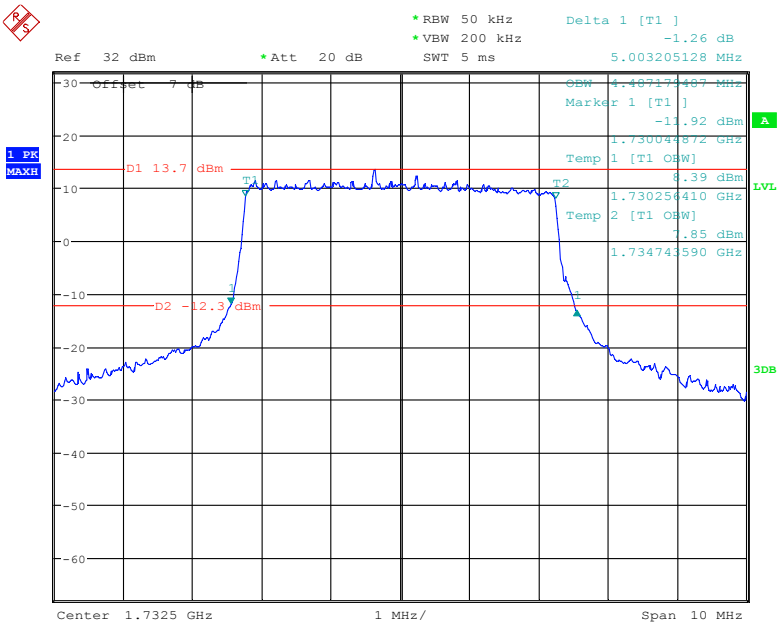
Date: 2.DEC.2019 20:22:55

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



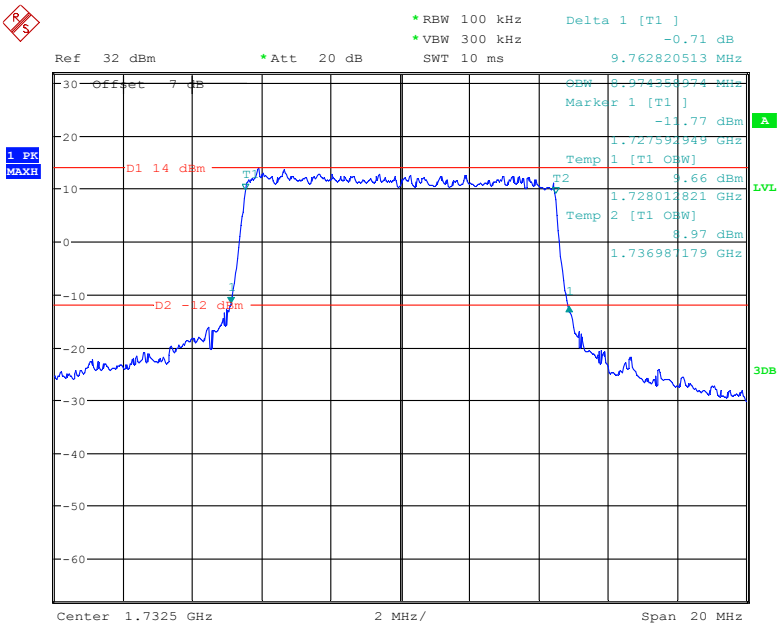
Date: 2.DEC.2019 20:20:54

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



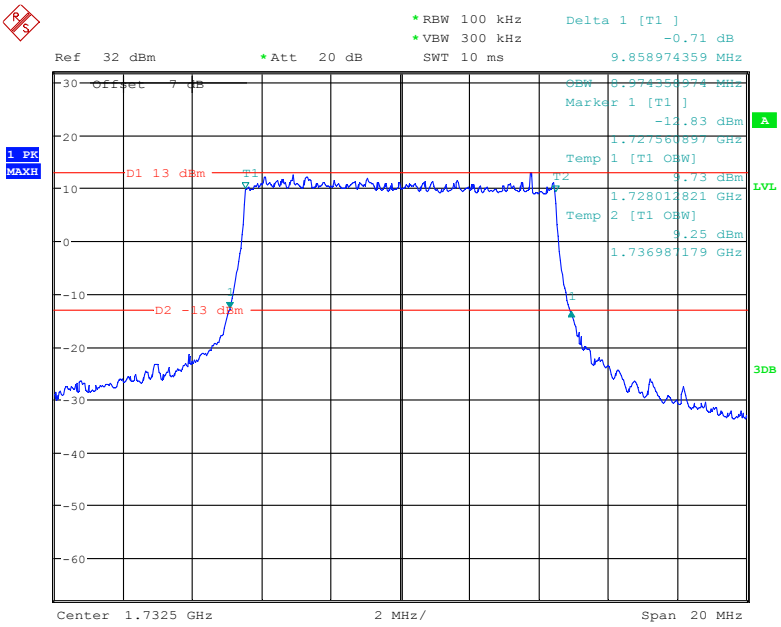
Date: 2.DEC.2019 20:18:55

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



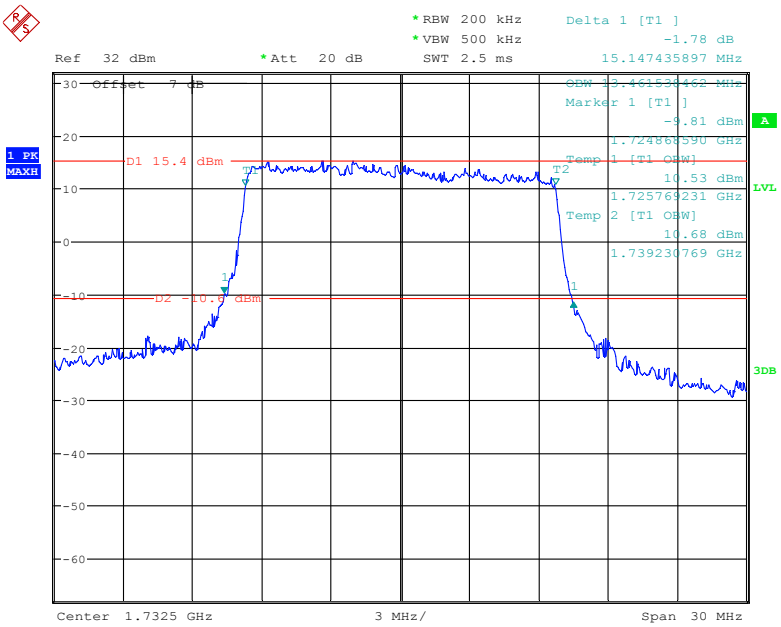
Date: 2.DEC.2019 20:16:40

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



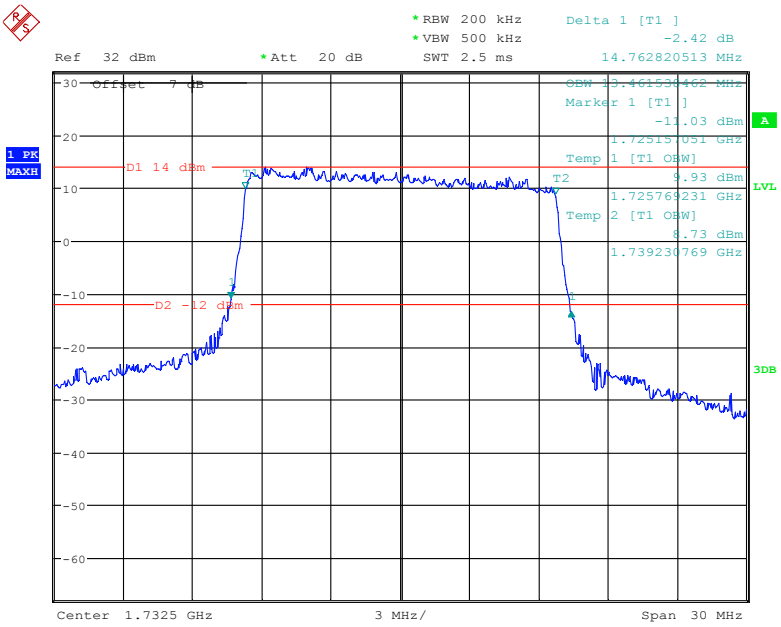
Date: 2.DEC.2019 20:15:03

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



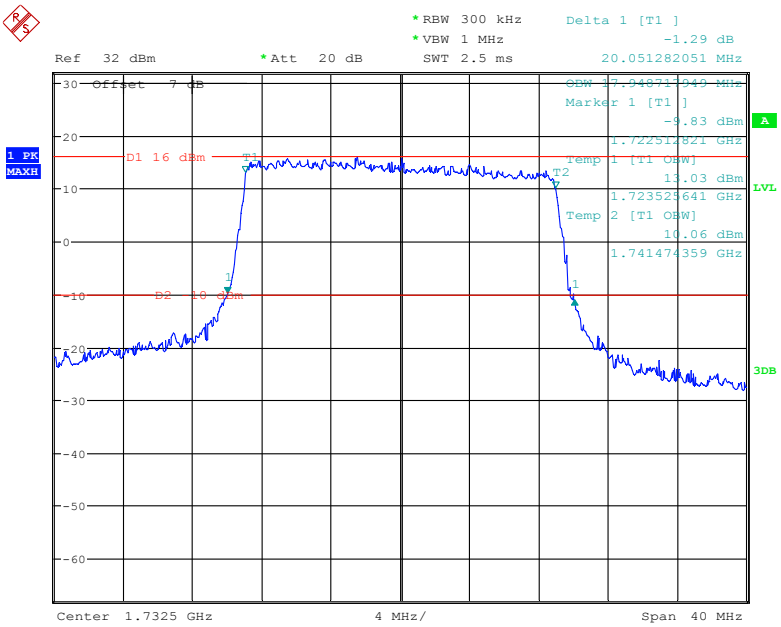
Date: 2.DEC.2019 20:13:25

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



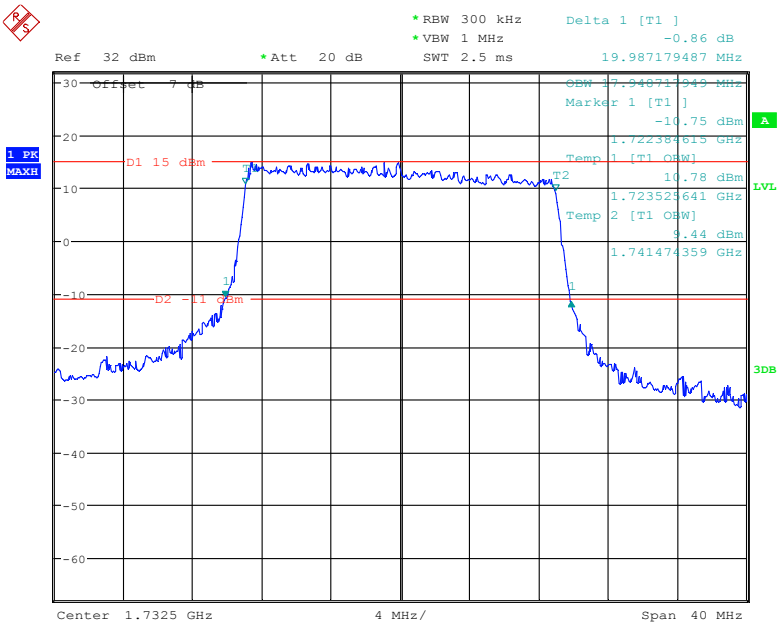
Date: 2.DEC.2019 20:10:57

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



Date: 2.DEC.2019 20:09:34

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

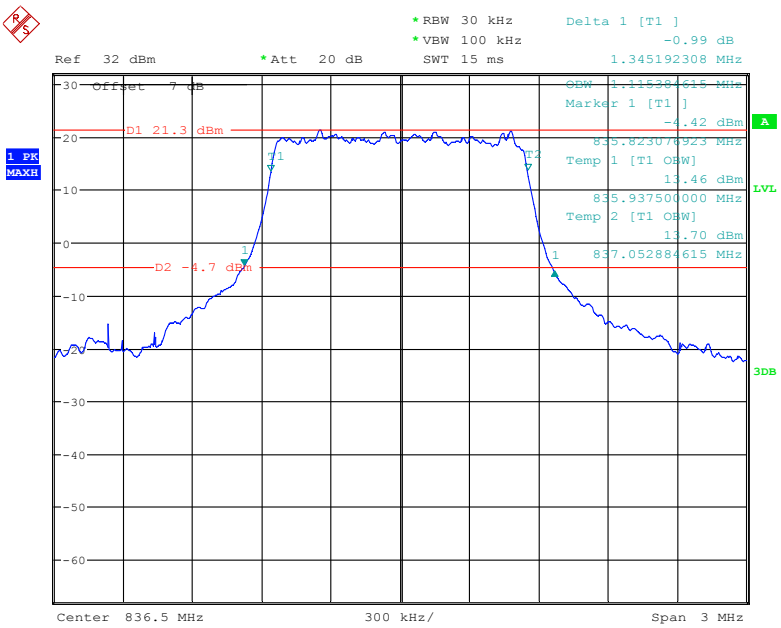


Date: 2.DEC.2019 20:08:20

LTE Band 5: (Middle Channel)

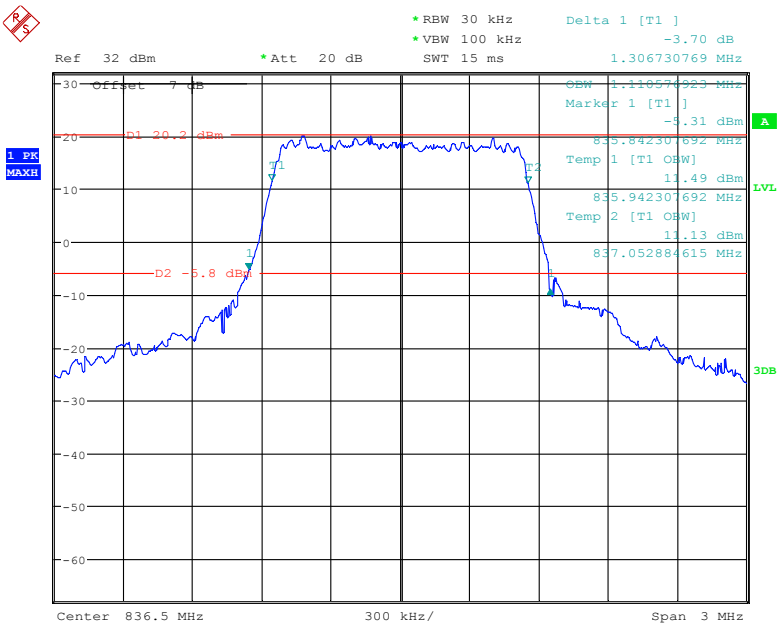
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.35
	16QAM	1.11	1.31
3.0	QPSK	2.70	3.02
	16QAM	2.70	3.02
5.0	QPSK	4.50	5.05
	16QAM	4.49	4.99
10.0	QPSK	8.97	9.83
	16QAM	8.97	9.77

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



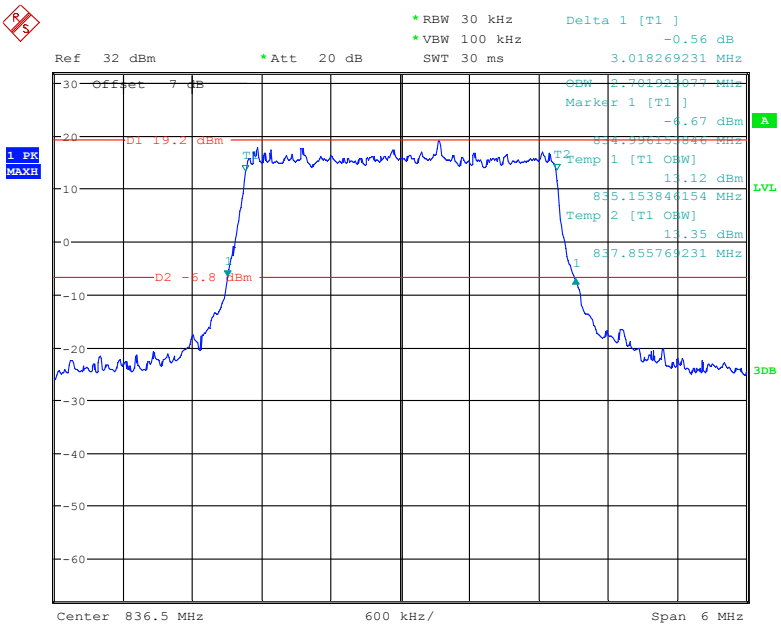
Date: 2.DEC.2019 20:37:23

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



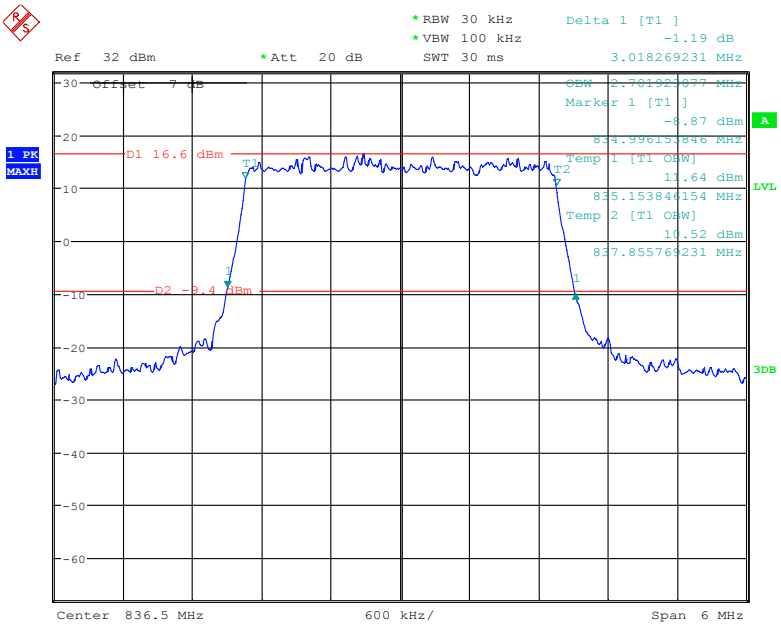
Date: 2.DEC.2019 20:38:40

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



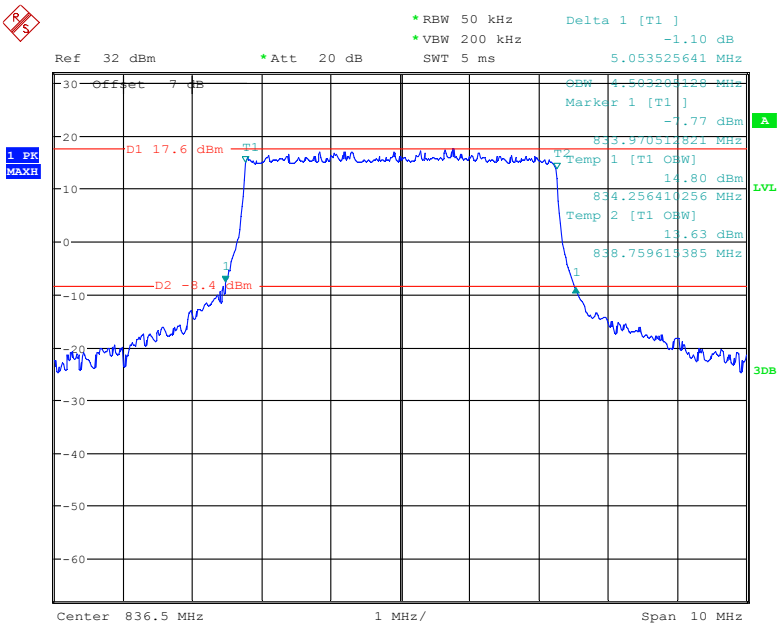
Date: 2.DEC.2019 20:40:44

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



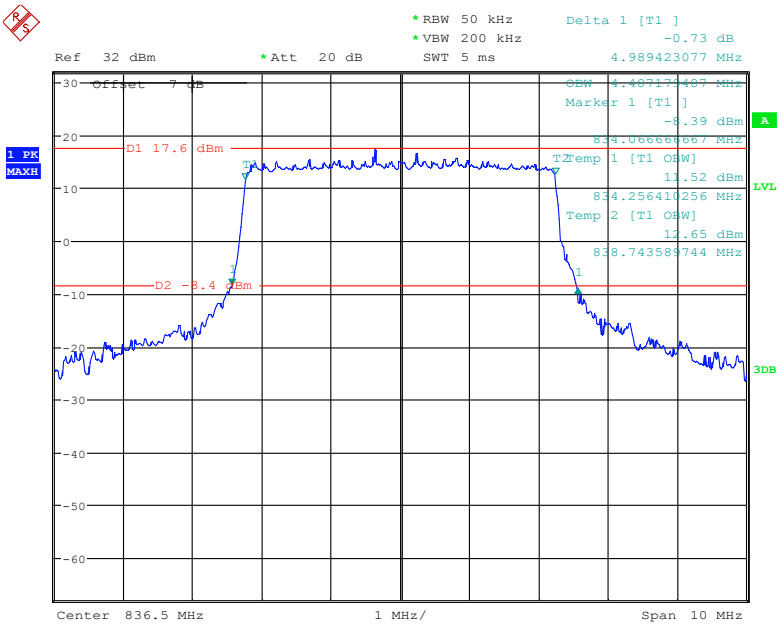
Date: 2.DEC.2019 20:42:32

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



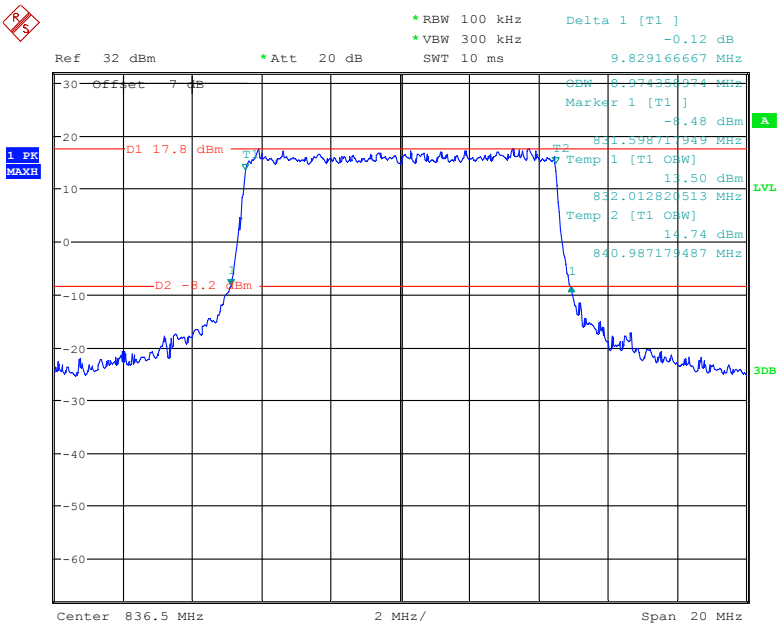
Date: 2.DEC.2019 20:45:07

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



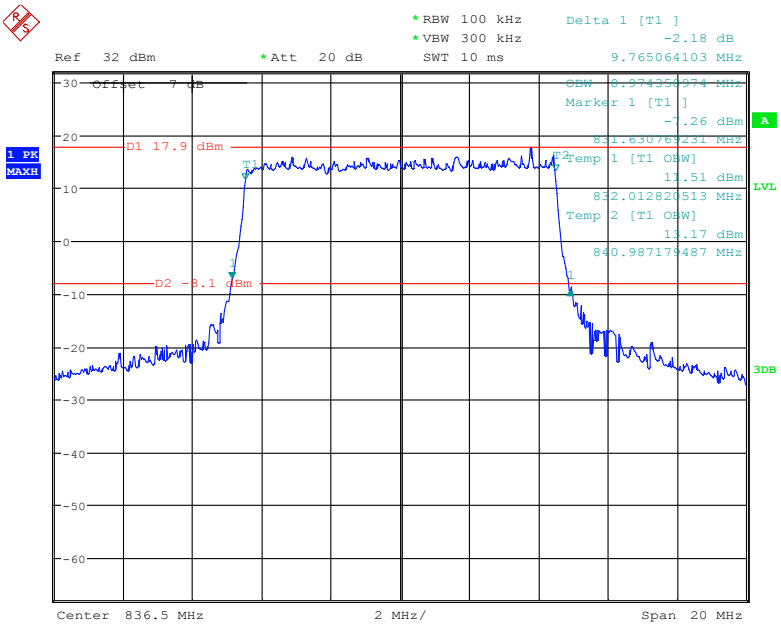
Date: 2.DEC.2019 20:47:40

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



Date: 2.DEC.2019 20:49:32

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

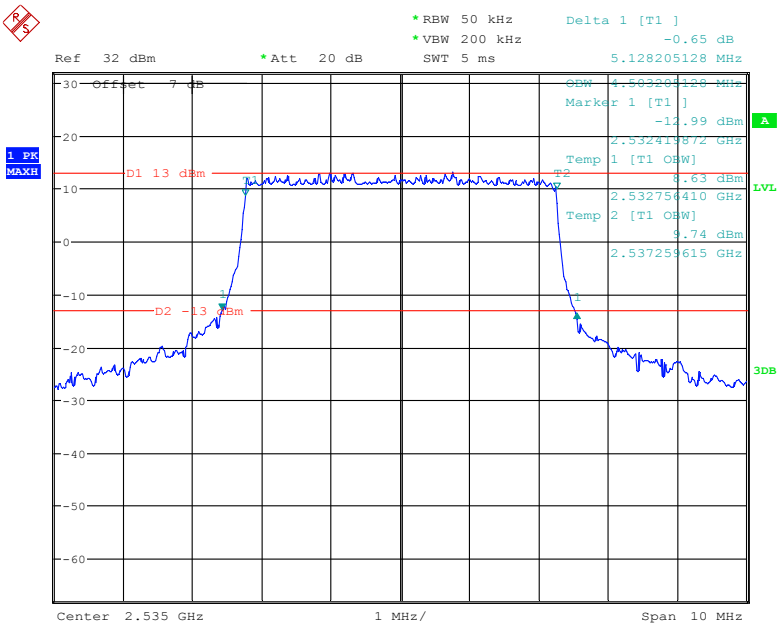


Date: 2.DEC.2019 20:51:14

LTE Band 7: (Middle Channel)

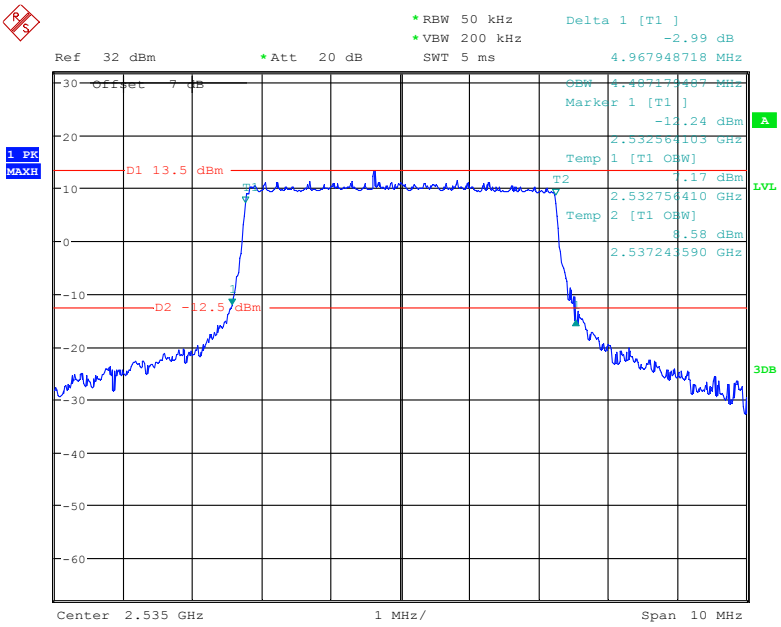
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.50	5.13
	16QAM	4.41	4.97
10.0	QPSK	8.97	9.90
	16QAM	8.97	9.87
15.0	QPSK	13.51	15.29
	16QAM	13.51	14.86
20.0	QPSK	18.01	20.18
	16QAM	18.08	20.18

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



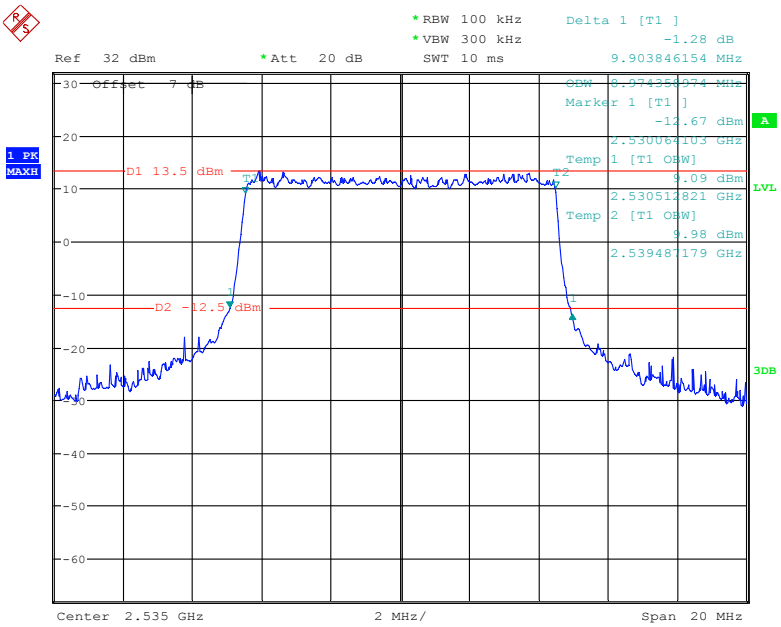
Date: 2.DEC.2019 20:57:13

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



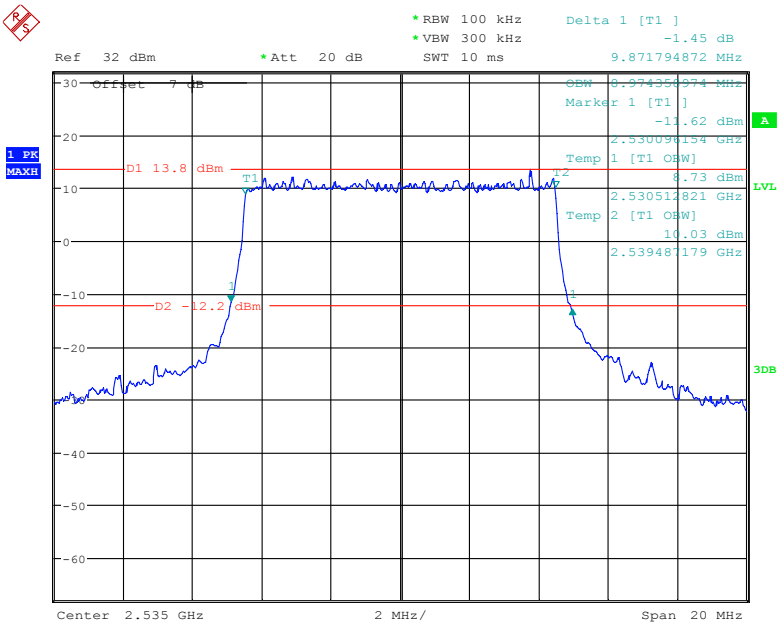
Date: 2.DEC.2019 20:58:29

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



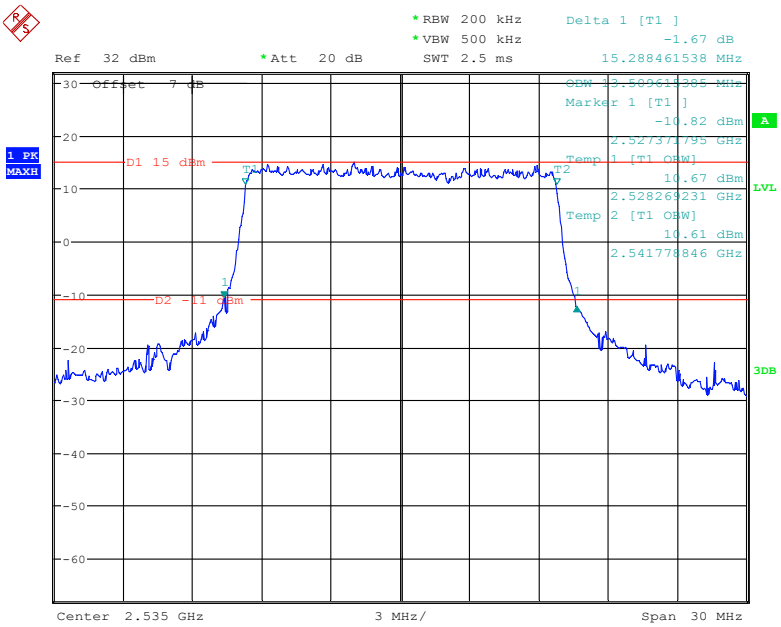
Date: 2.DEC.2019 21:03:14

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



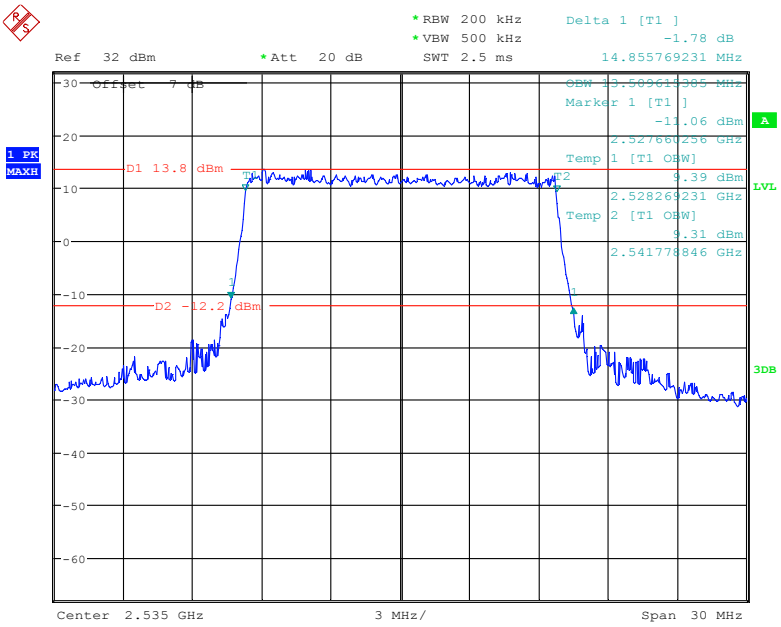
Date: 2.DEC.2019 21:01:16

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



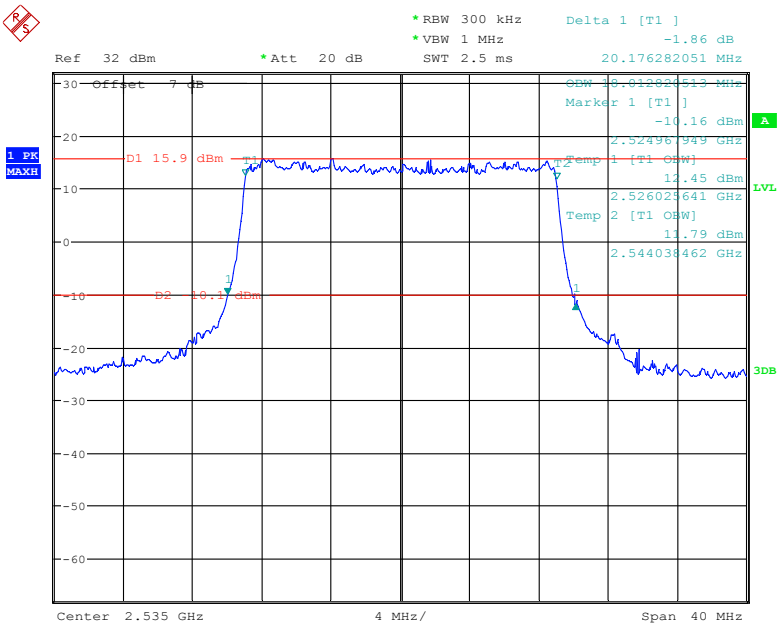
Date: 2.DEC.2019 21:06:48

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



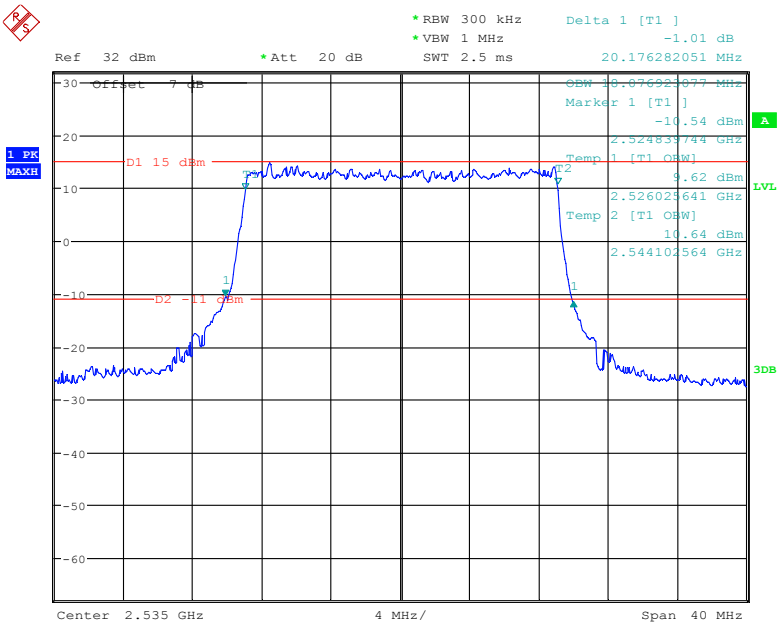
Date: 2.DEC.2019 21:08:41

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



Date: 2.DEC.2019 21:11:08

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

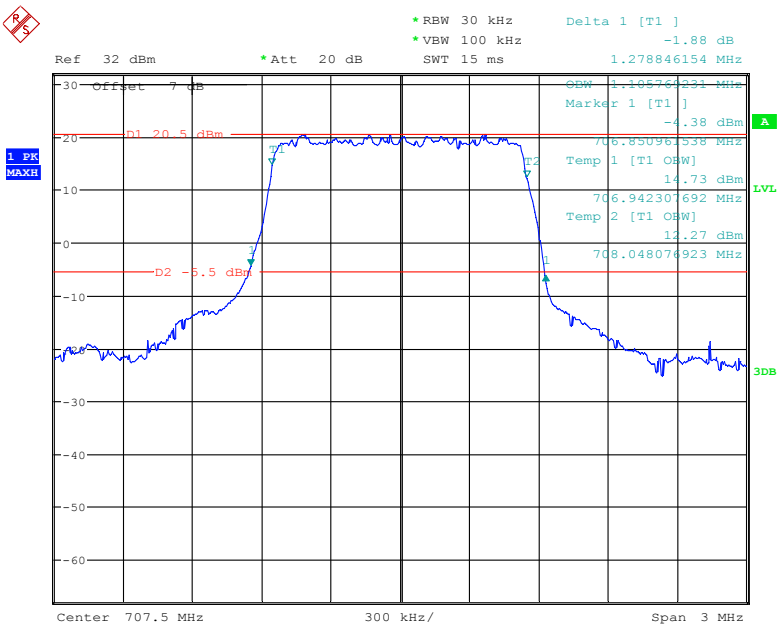


Date: 2.DEC.2019 21:12:58

LTE Band 12: (Middle Channel)

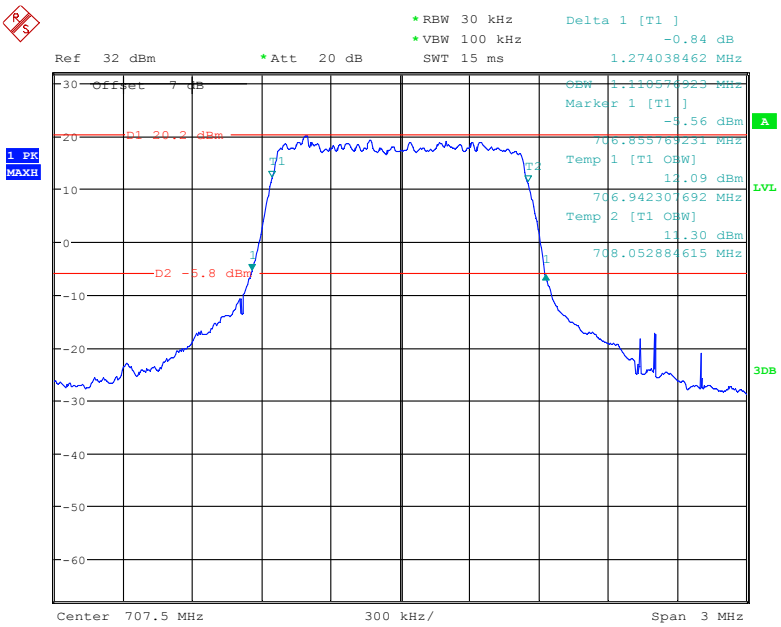
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.28
	16QAM	1.11	1.27
3.0	QPSK	2.71	3.02
	16QAM	2.70	3.01
5.0	QPSK	4.41	5.16
	16QAM	4.41	5.02
10.0	QPSK	8.97	9.82
	16QAM	8.97	9.82

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



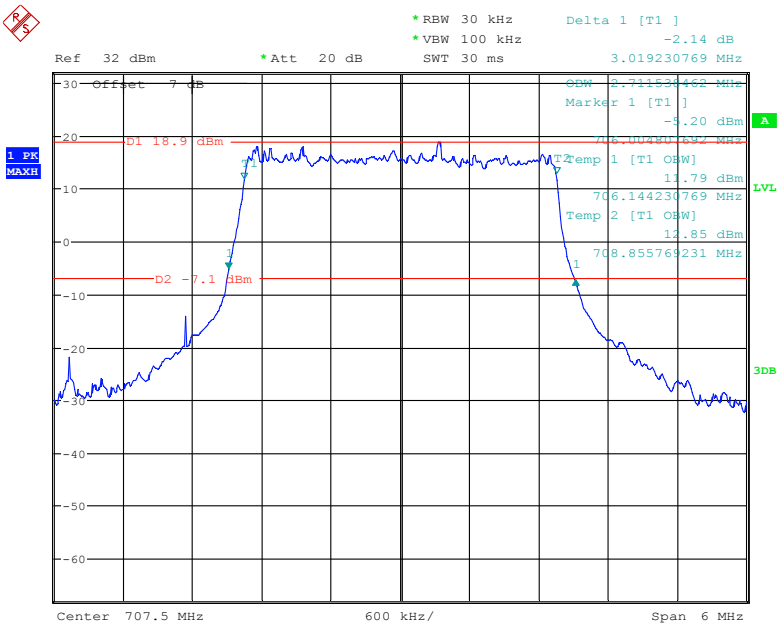
Date: 2.DEC.2019 21:49:33

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



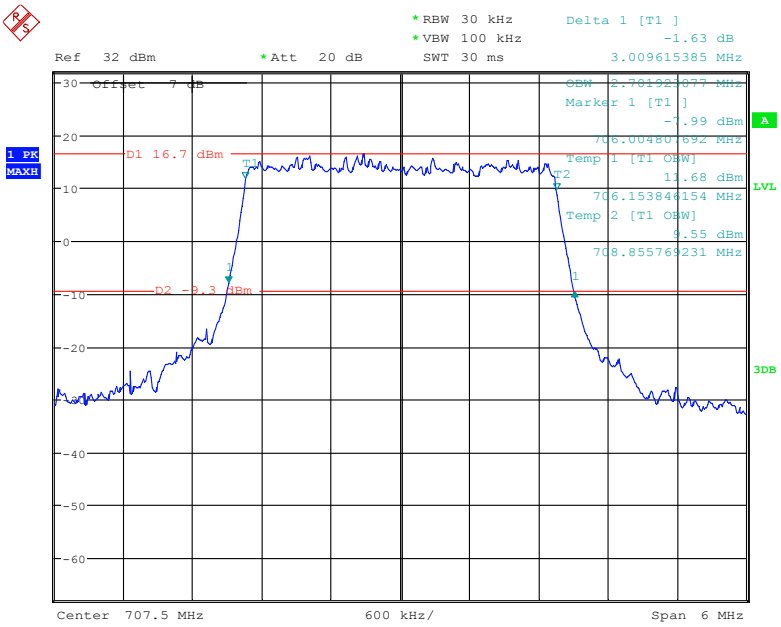
Date: 2.DEC.2019 21:48:21

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



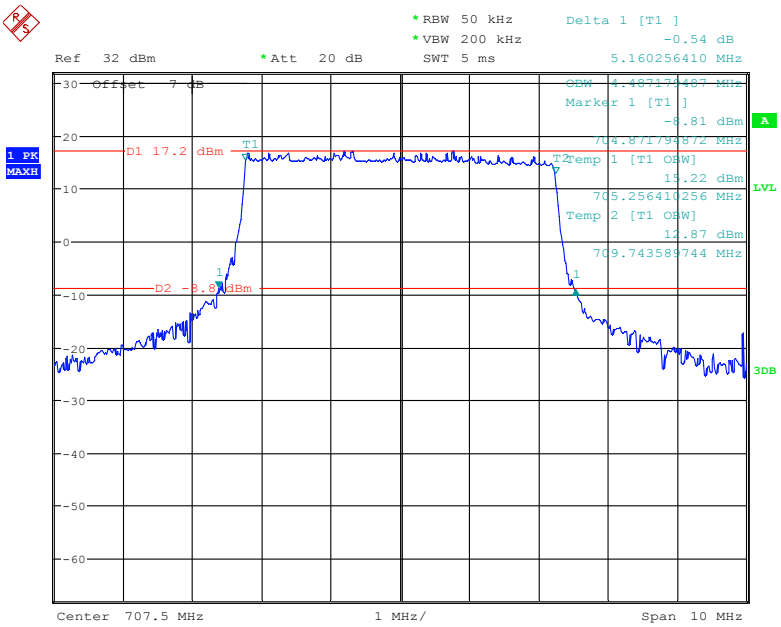
Date: 2.DEC.2019 21:53:20

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



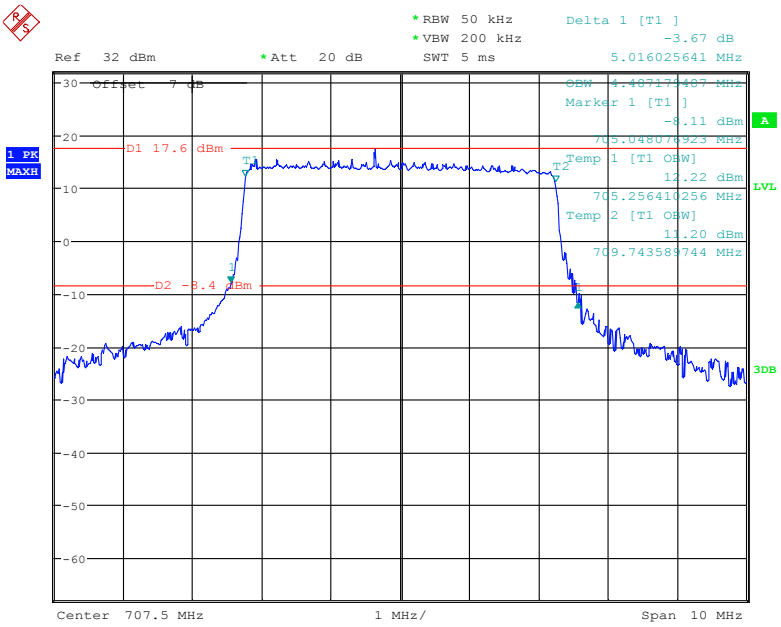
Date: 2.DEC.2019 21:51:26

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



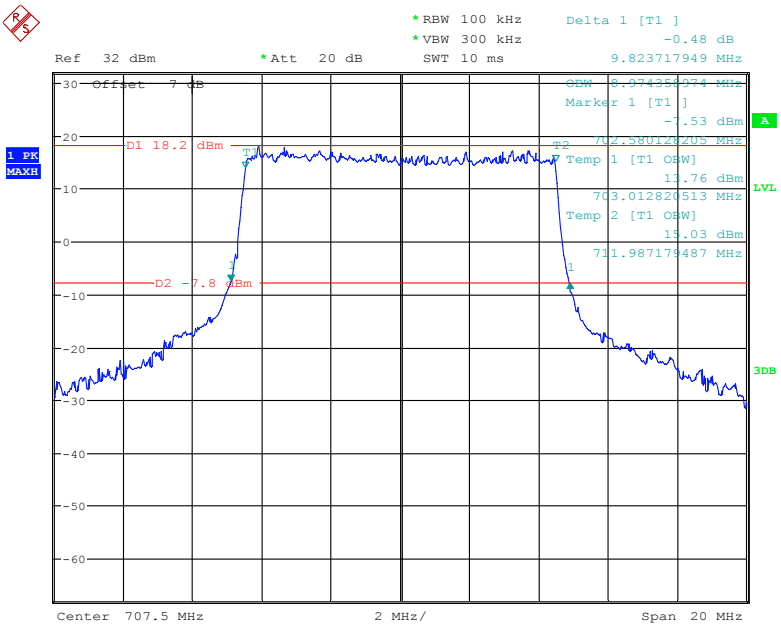
Date: 2.DEC.2019 21:40:54

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



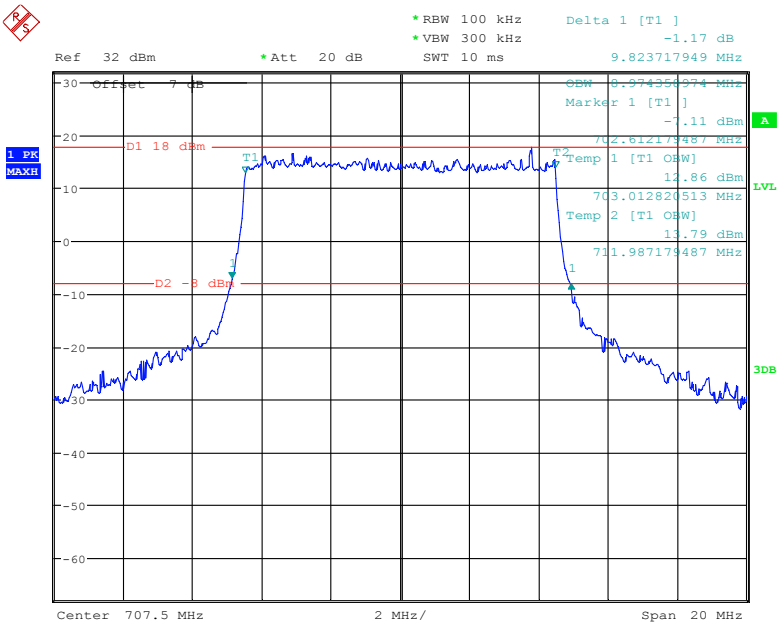
Date: 2.DEC.2019 21:42:15

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



Date: 2.DEC.2019 21:44:30

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

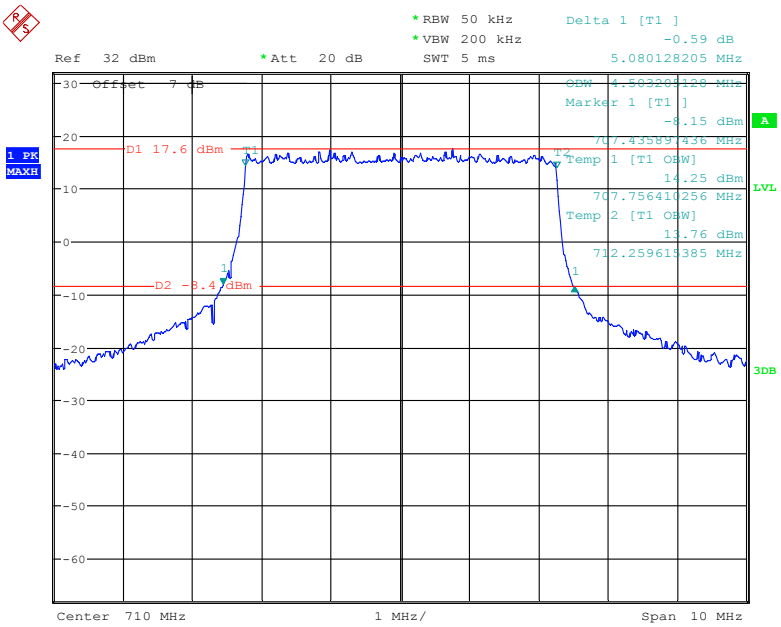


Date: 2.DEC.2019 21:46:27

LTE Band 17: (Middle Channel)

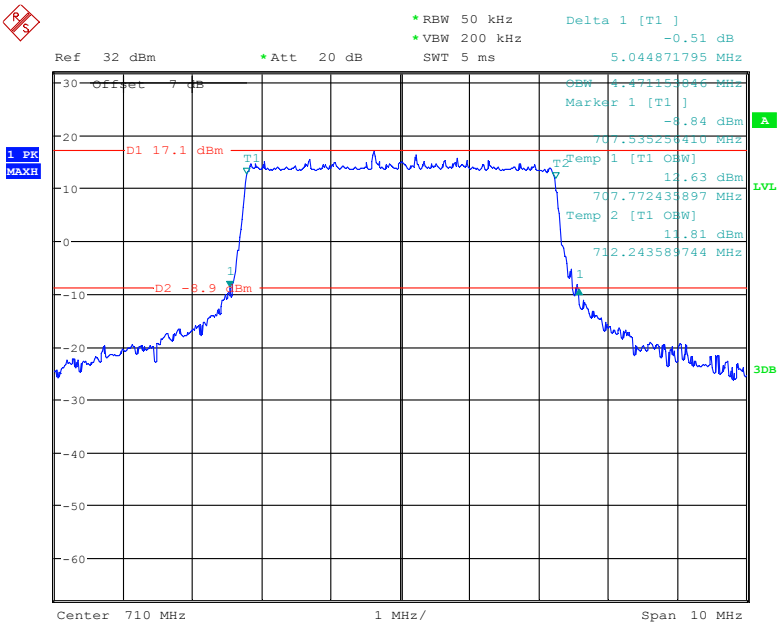
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.50	5.08
	16QAM	4.47	5.04
10.0	QPSK	8.97	9.76
	16QAM	8.97	9.82

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



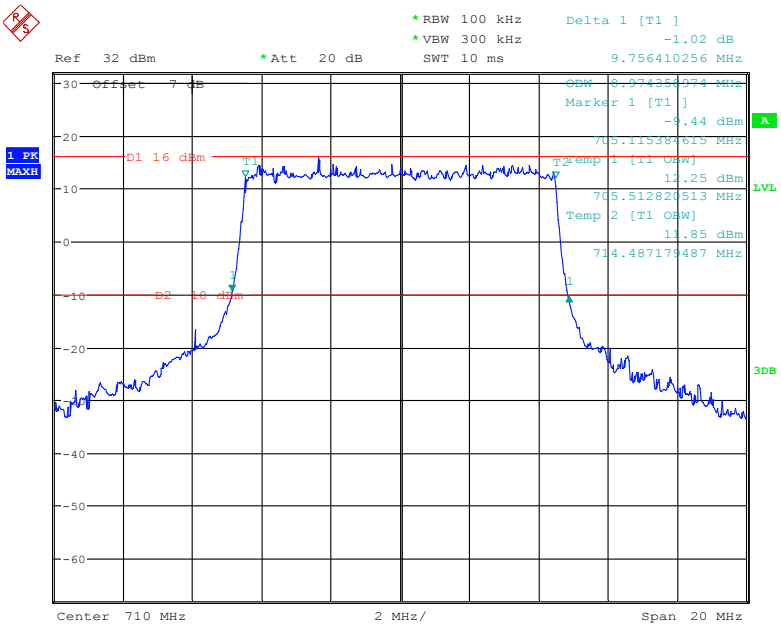
Date: 2.DEC.2019 21:32:30

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



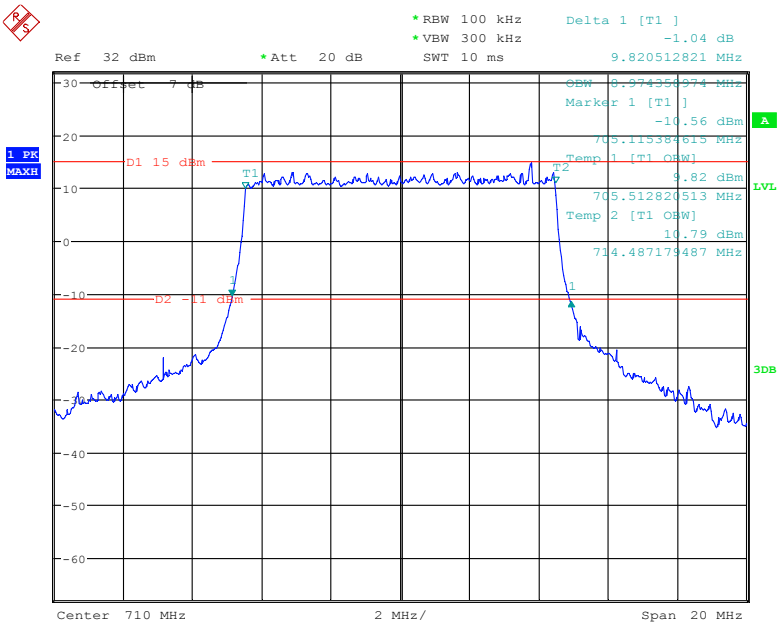
Date: 2.DEC.2019 21:21:16

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



Date: 2.DEC.2019 21:25:25

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



Date: 2.DEC.2019 21:27:51

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

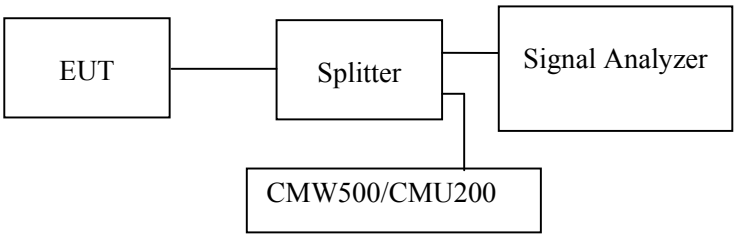
Applicable Standard

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:	52~56 %
ATM Pressure:	101.0 kPa

The testing was performed by George Zhong from 2019-11-27 to 2019-11-30.

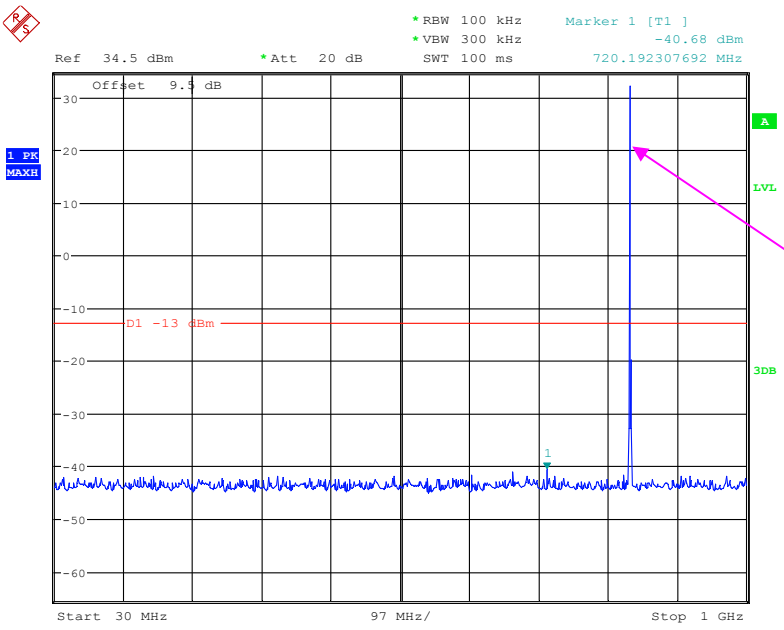
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

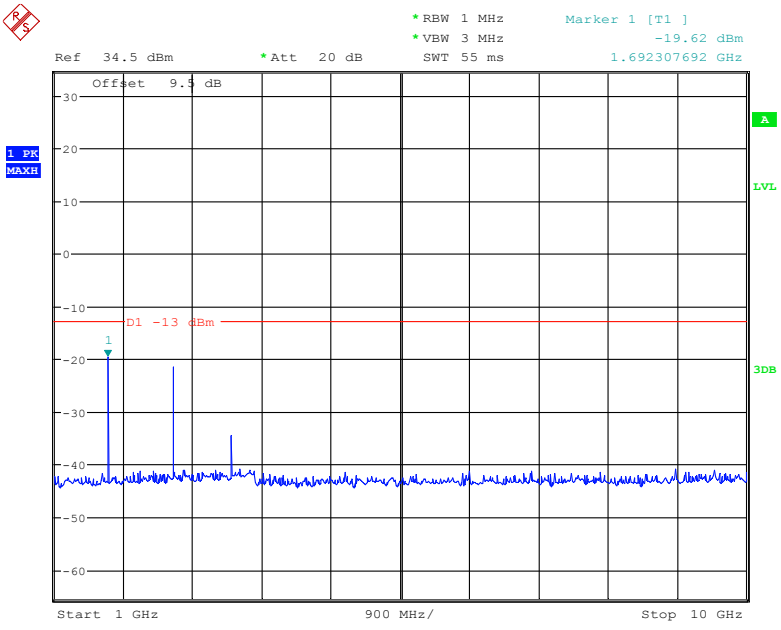
30 MHz – 1 GHz (GSM Mode)



Fundamental test

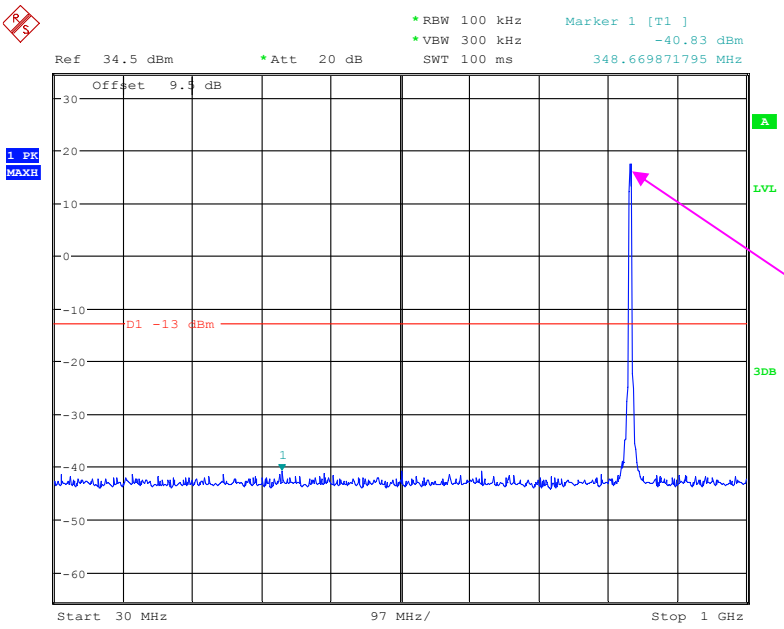
Date: 27.NOV.2019 21:06:41

1 GHz – 10 GHz (GSM Mode)



Date: 27.NOV.2019 21:05:00

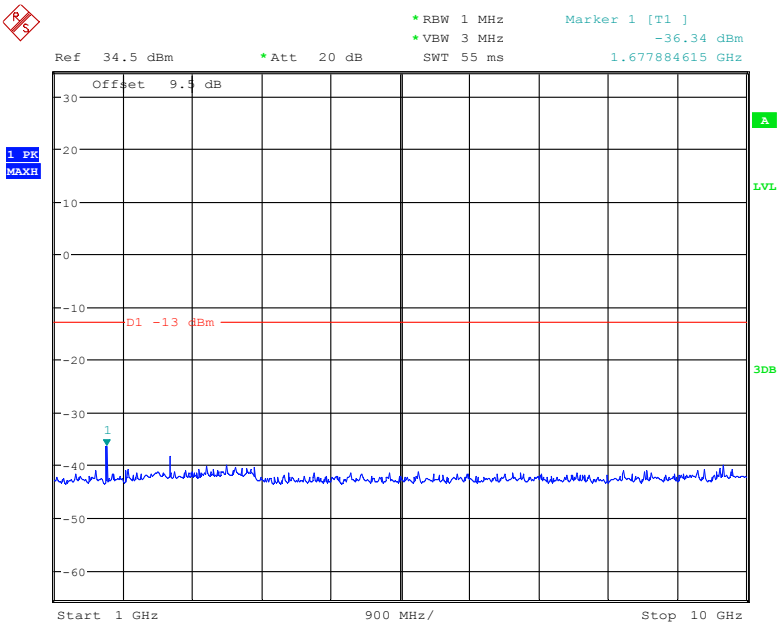
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 27.NOV.2019 22:42:38

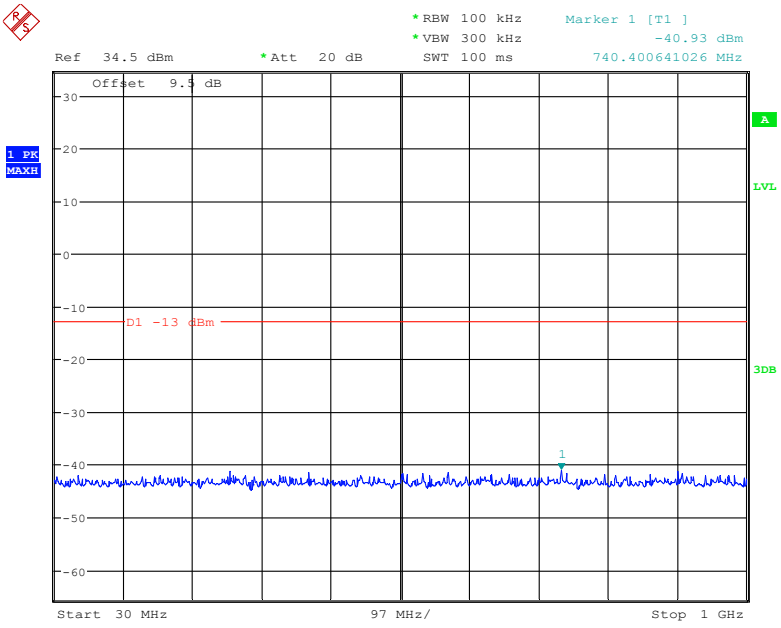
1 GHz – 10 GHz (WCDMA Mode)



Date: 27.NOV.2019 22:43:12

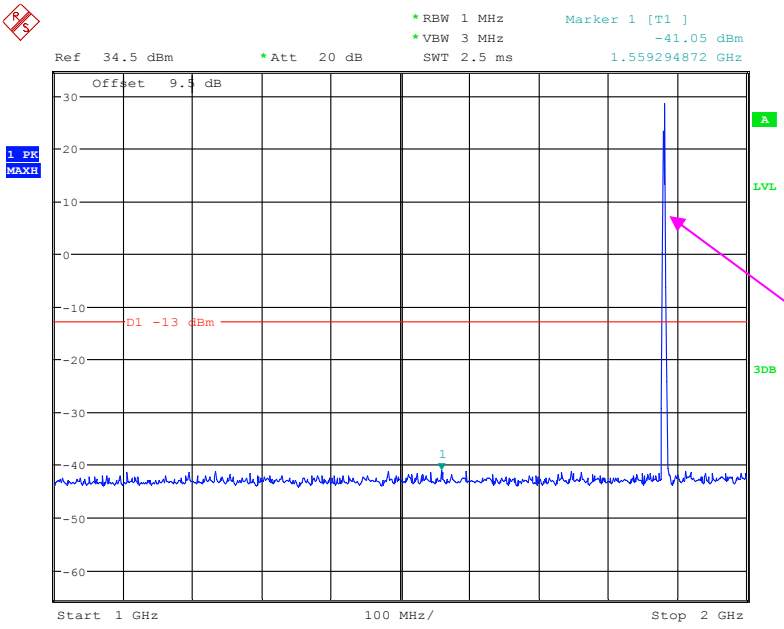
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 27.NOV.2019 21:19:30

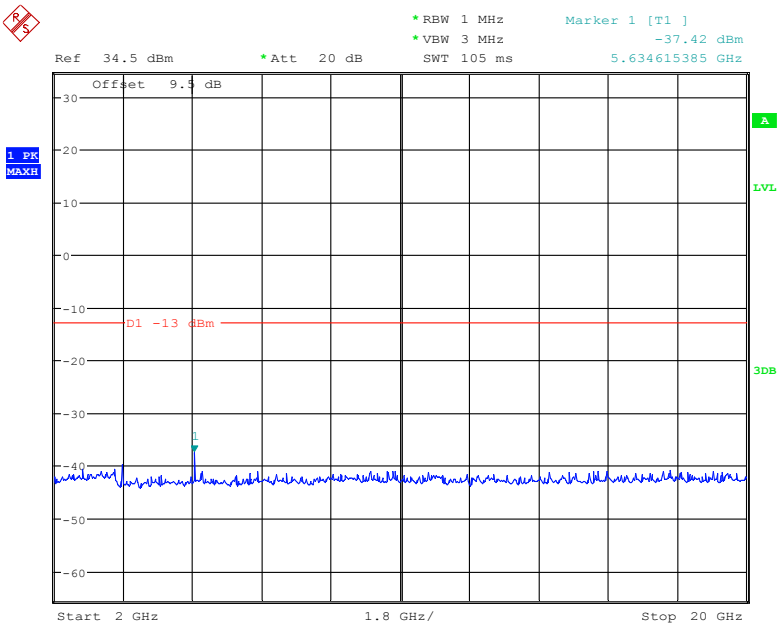
1 GHz – 2 GHz (GSM Mode)



Fundamental test

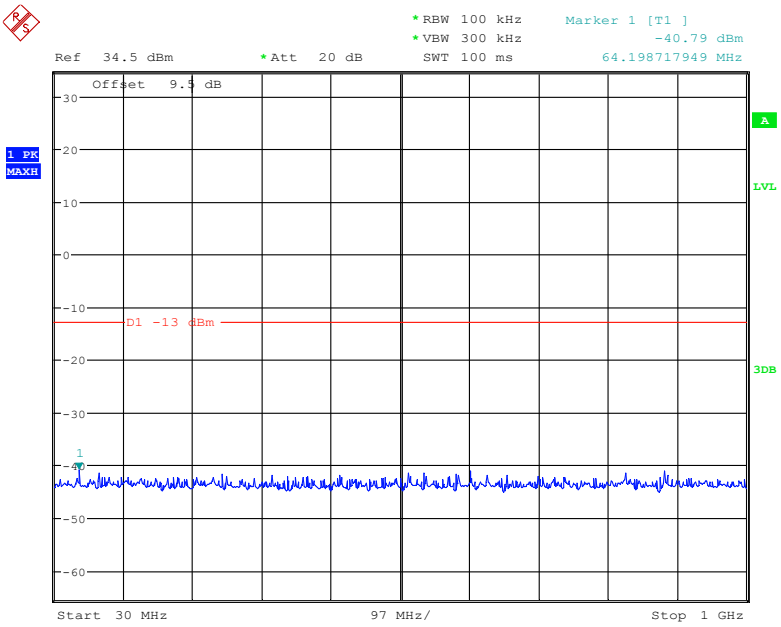
Date: 27.NOV.2019 21:20:28

2 GHz – 20 GHz (GSM Mode)



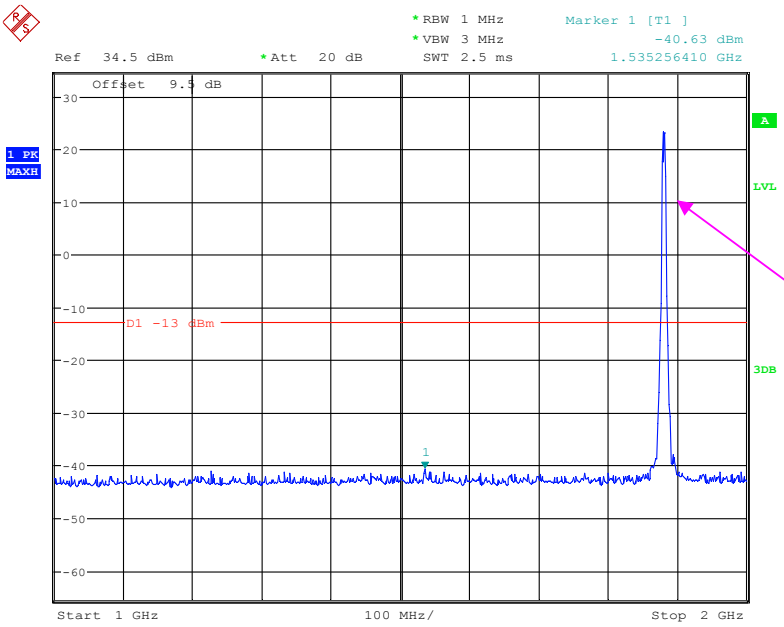
Date: 27.NOV.2019 21:20:46

30 MHz – 1 GHz (WCDMA Mode)



Date: 27.NOV.2019 22:10:09

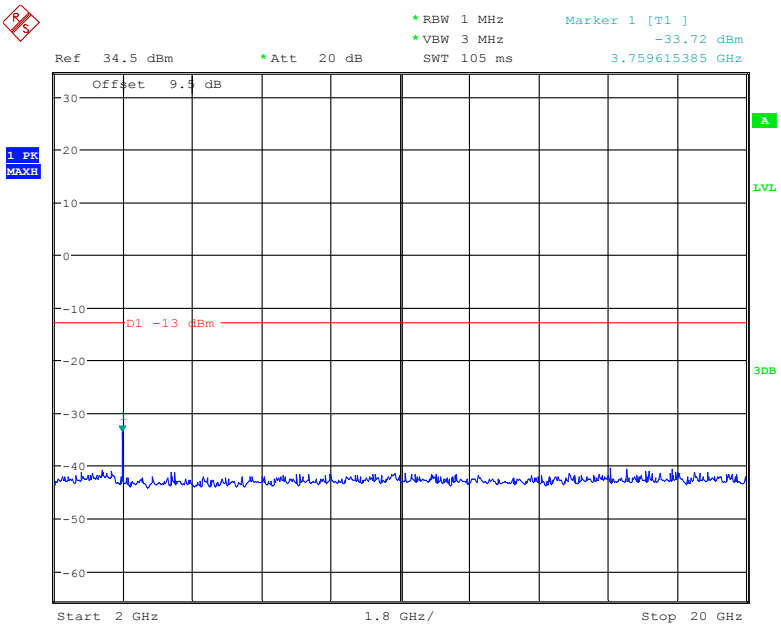
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 27.NOV.2019 22:09:27

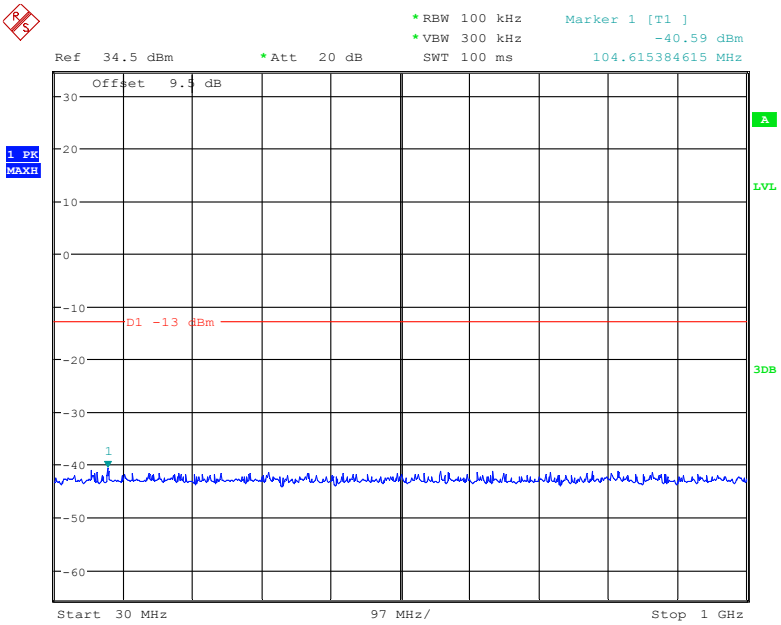
2 GHz – 20 GHz (WCDMA Mode)



Date: 27.NOV.2019 22:08:41

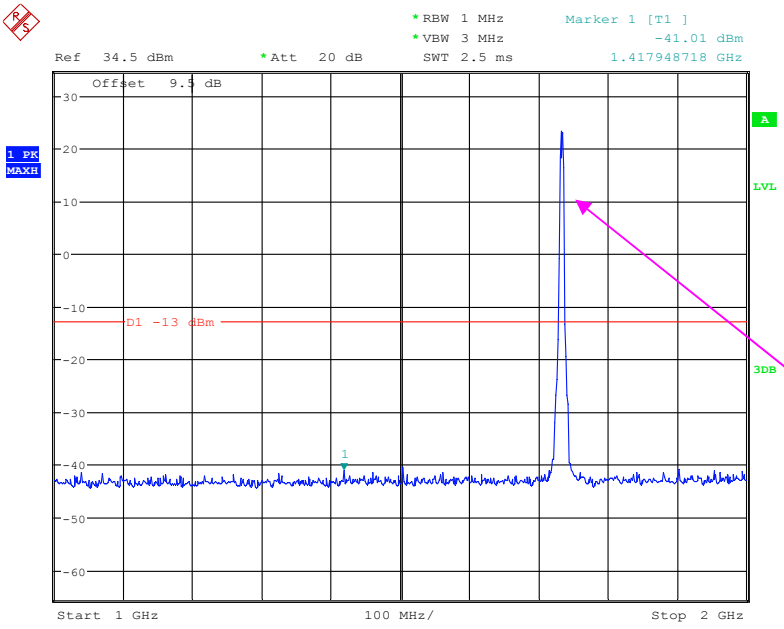
AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)



Date: 27.NOV.2019 22:04:12

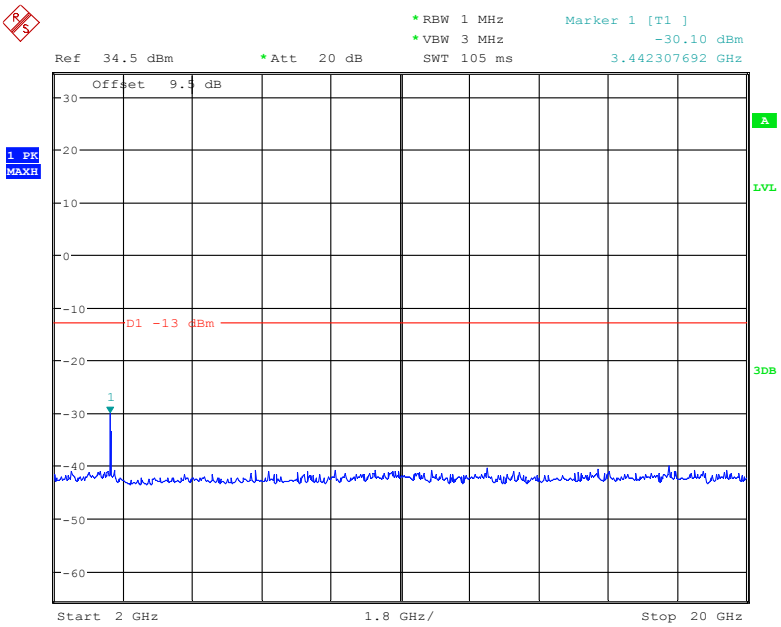
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 27.NOV.2019 22:04:43

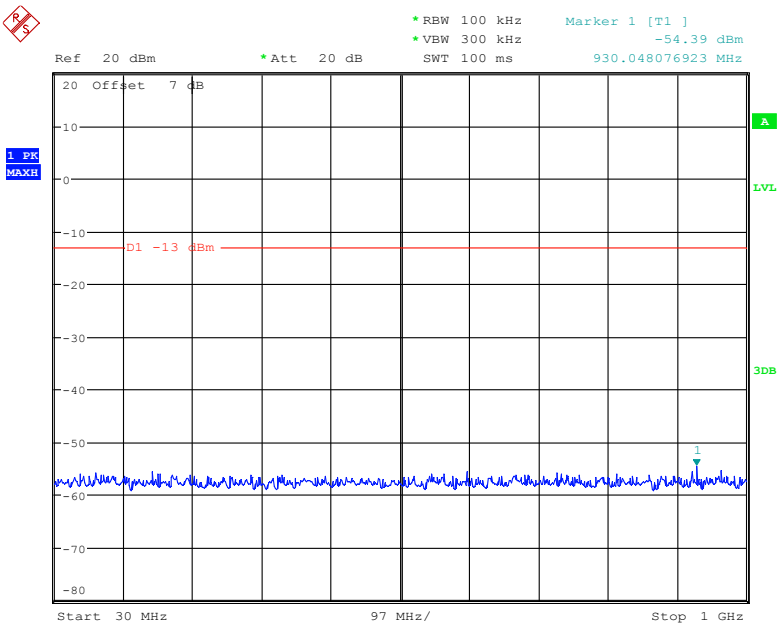
2 GHz – 20 GHz (WCDMA Mode)



Date: 27.NOV.2019 22:05:05

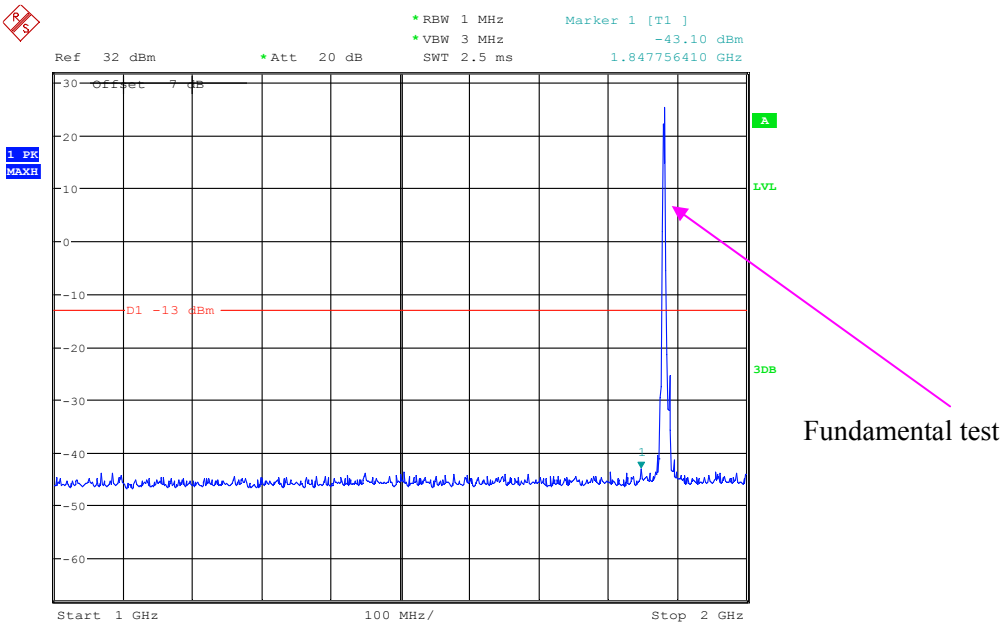
LTE Band 2:

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



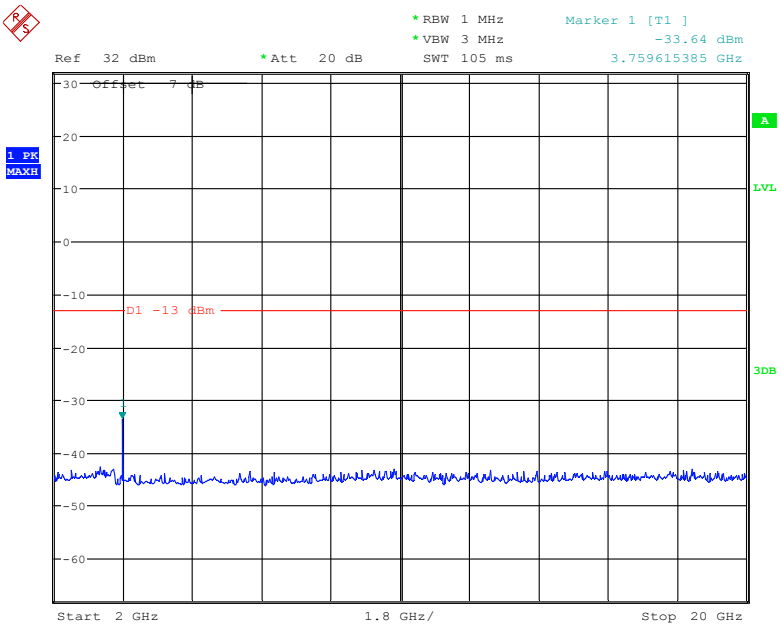
Date: 29.NOV.2019 23:15:43

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



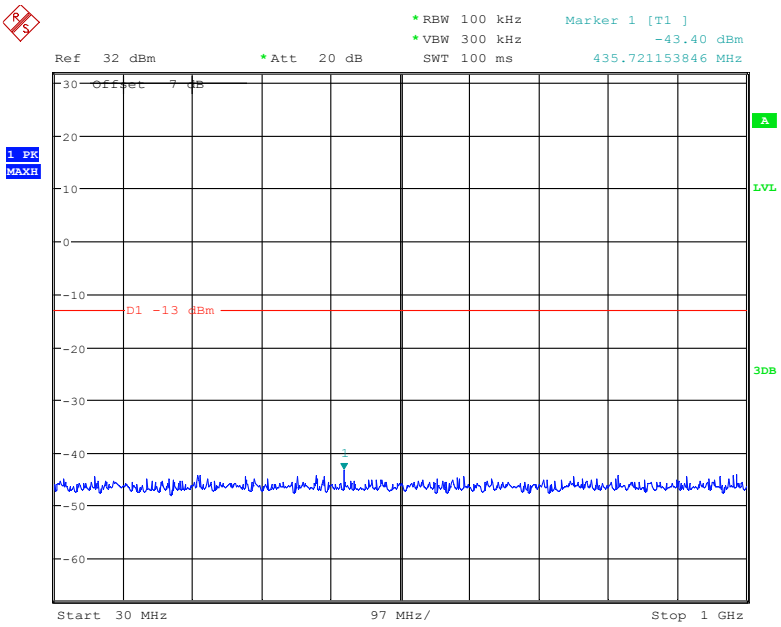
Date: 29.NOV.2019 23:16:42

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



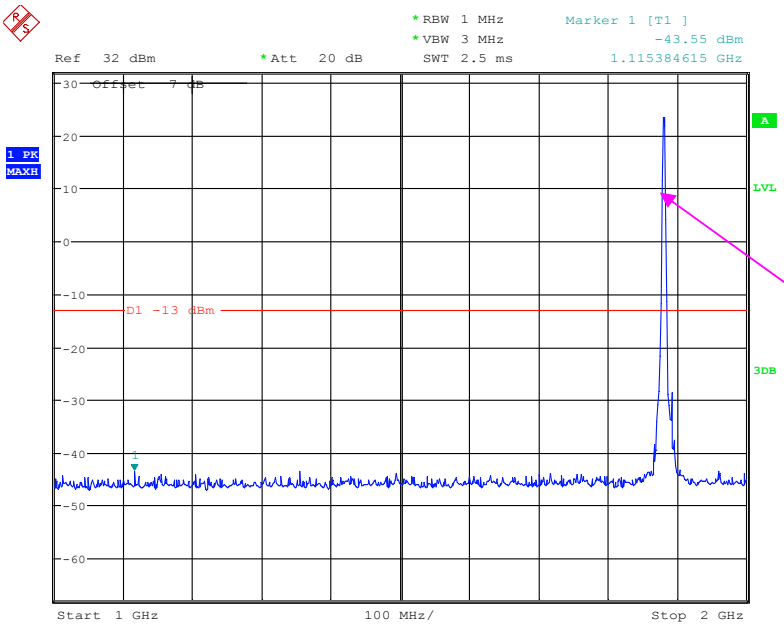
Date: 29.NOV.2019 23:17:15

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



Date: 29.NOV.2019 23:18:57

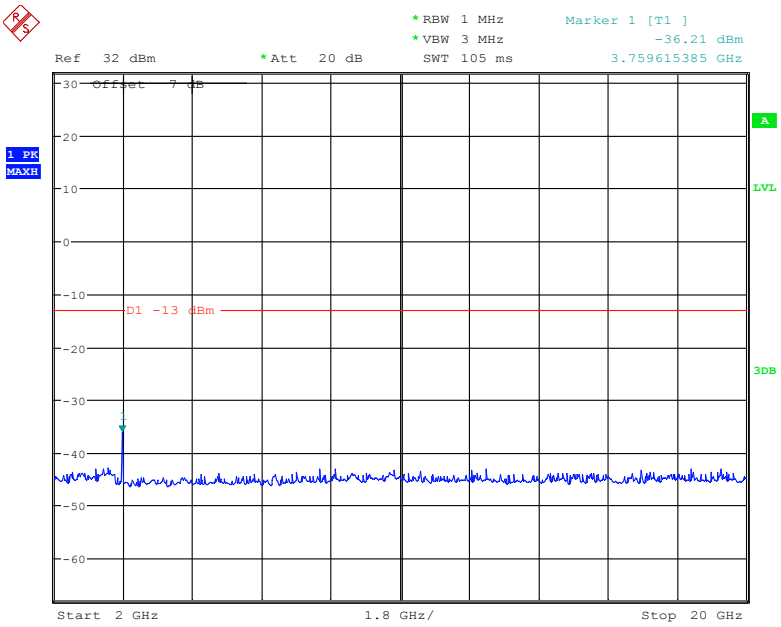
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



Fundamental test

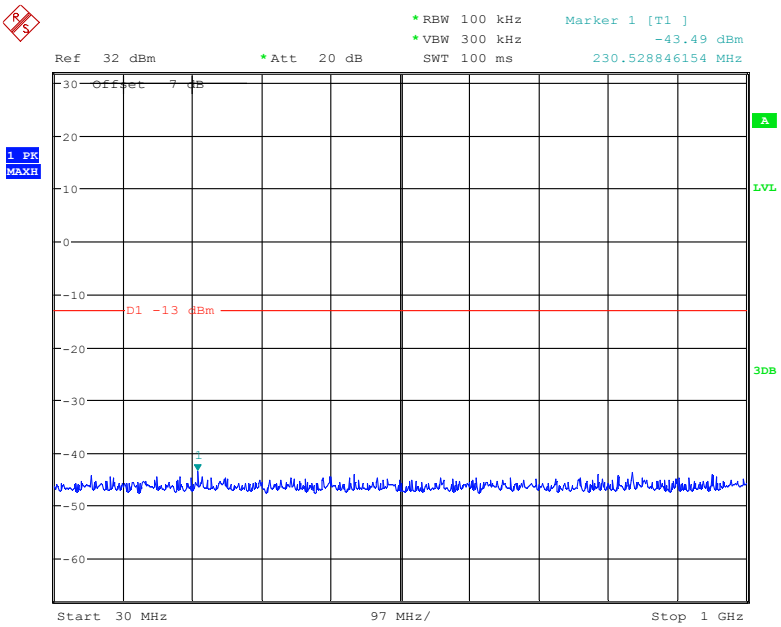
Date: 29.NOV.2019 23:18:32

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



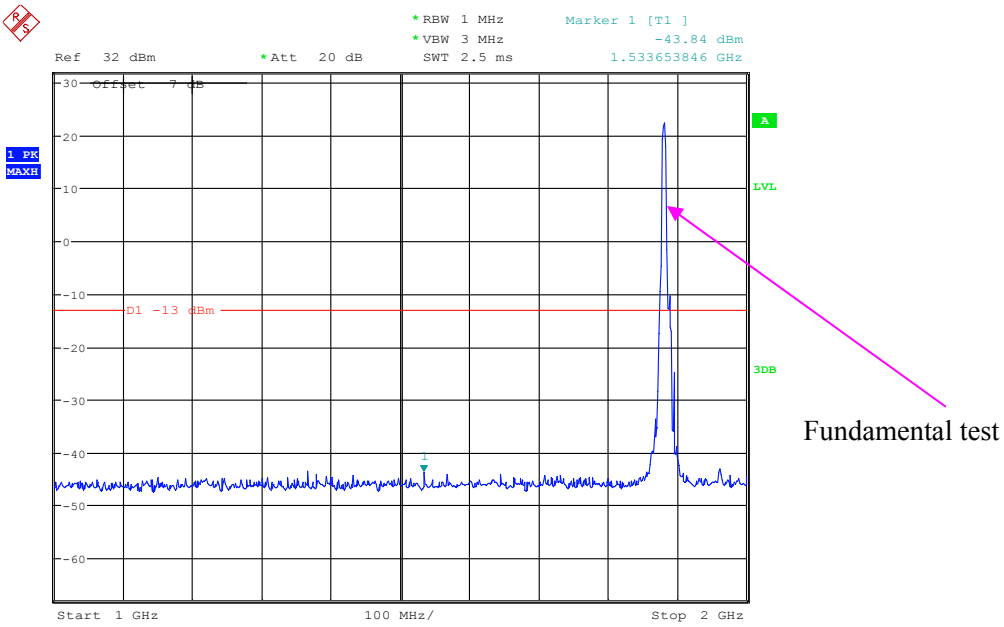
Date: 29.NOV.2019 23:18:06

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



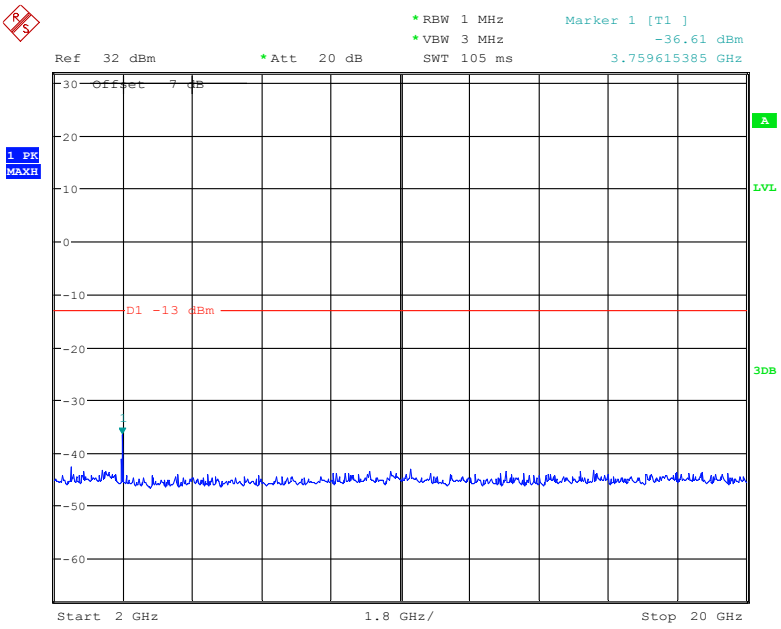
Date: 29.NOV.2019 23:19:46

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



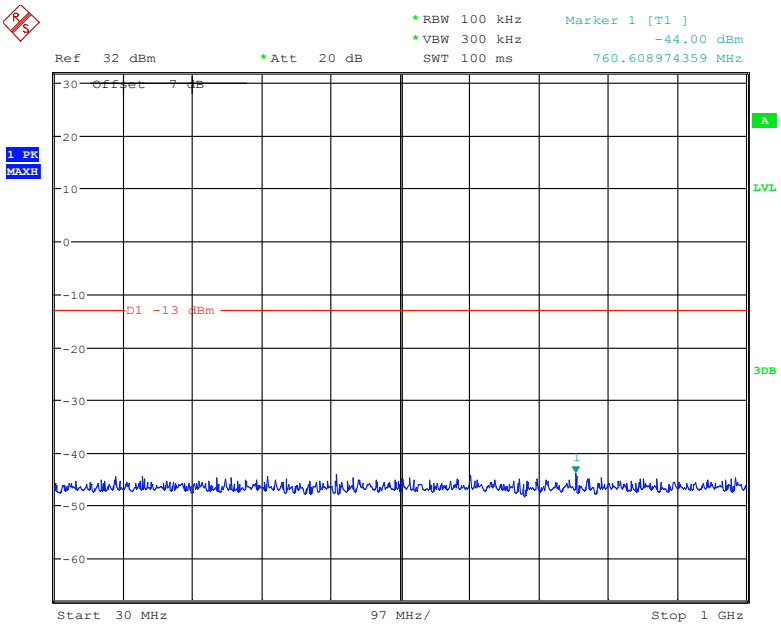
Date: 29.NOV.2019 23:20:07

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



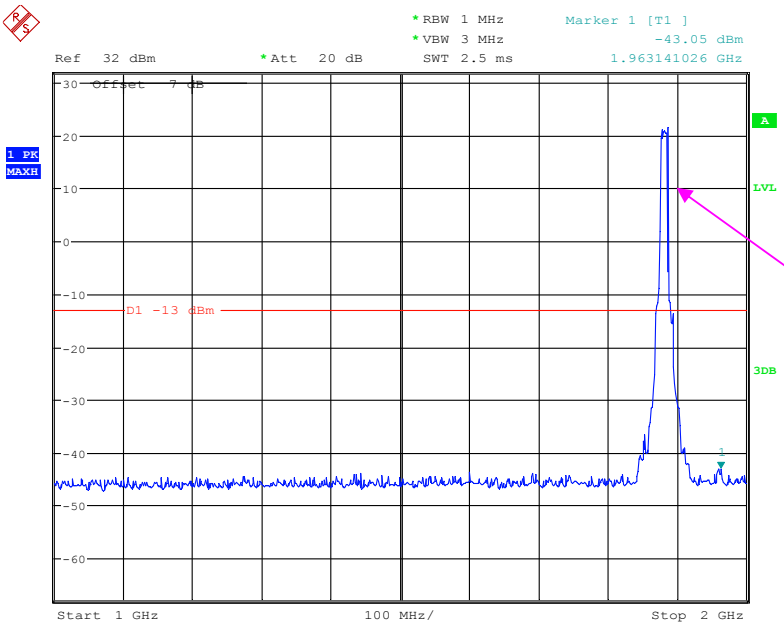
Date: 29.NOV.2019 23:20:23

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



Date: 29.NOV.2019 23:21:45

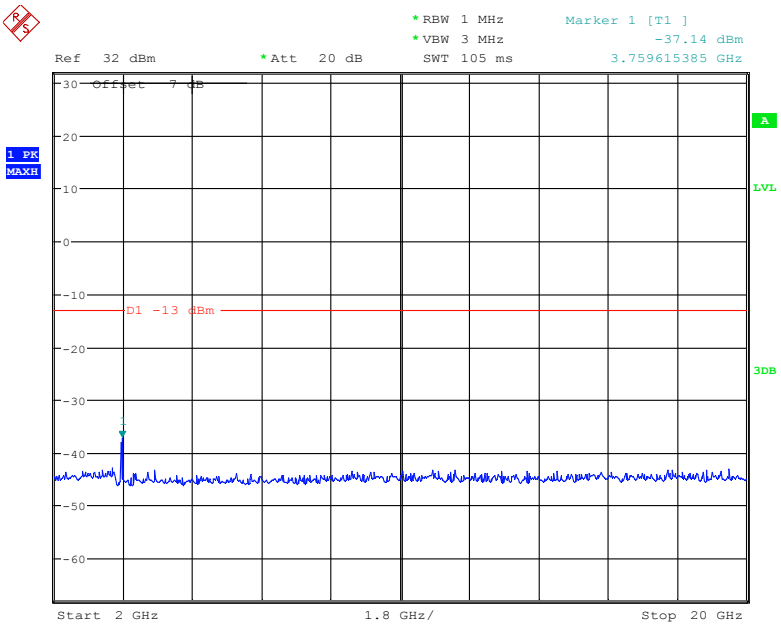
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



Fundamental test

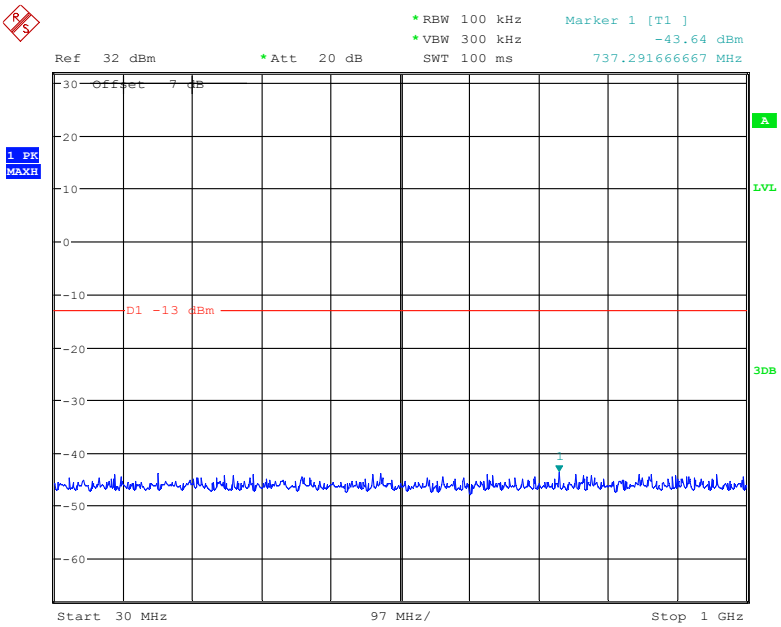
Date: 29.NOV.2019 23:21:25

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



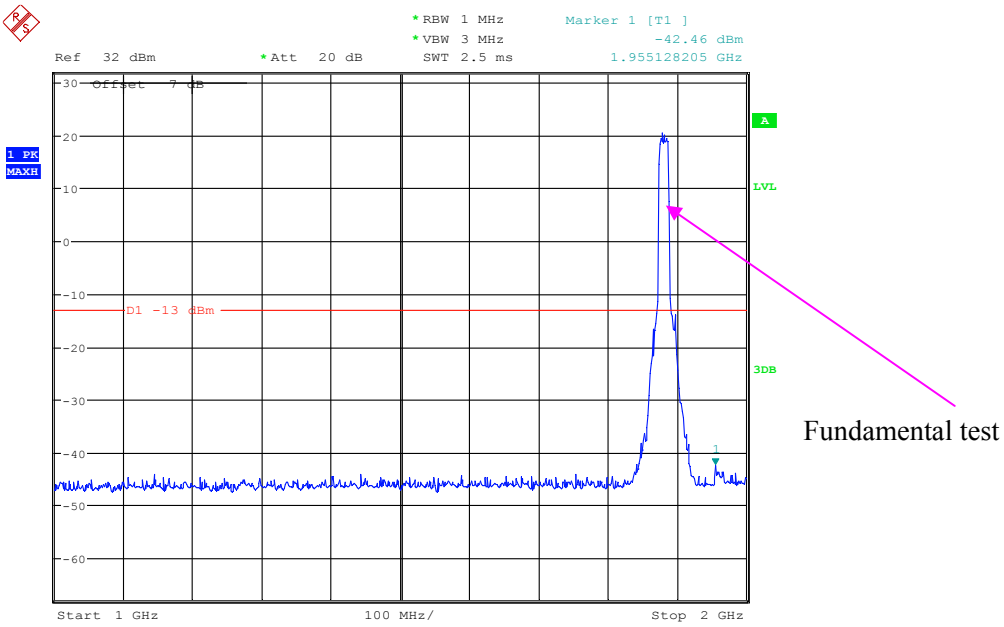
Date: 29.NOV.2019 23:20:58

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



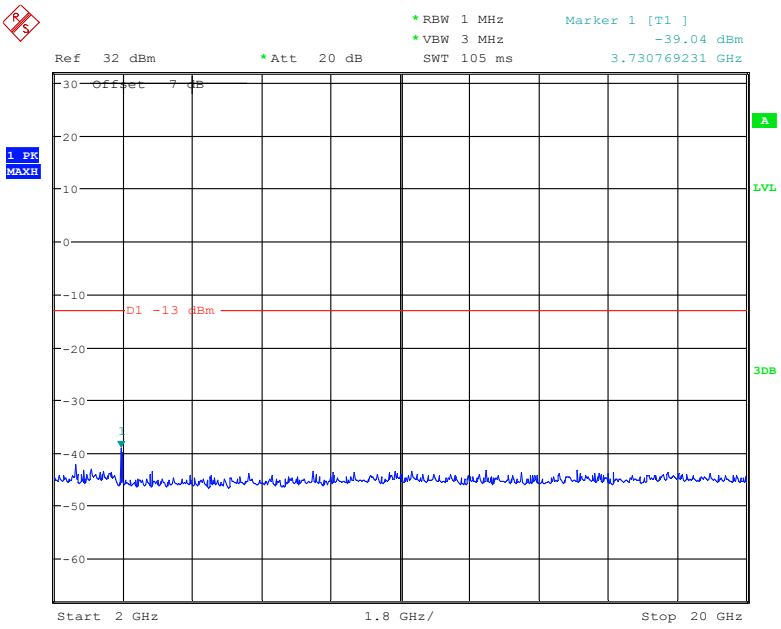
Date: 29.NOV.2019 23:22:46

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



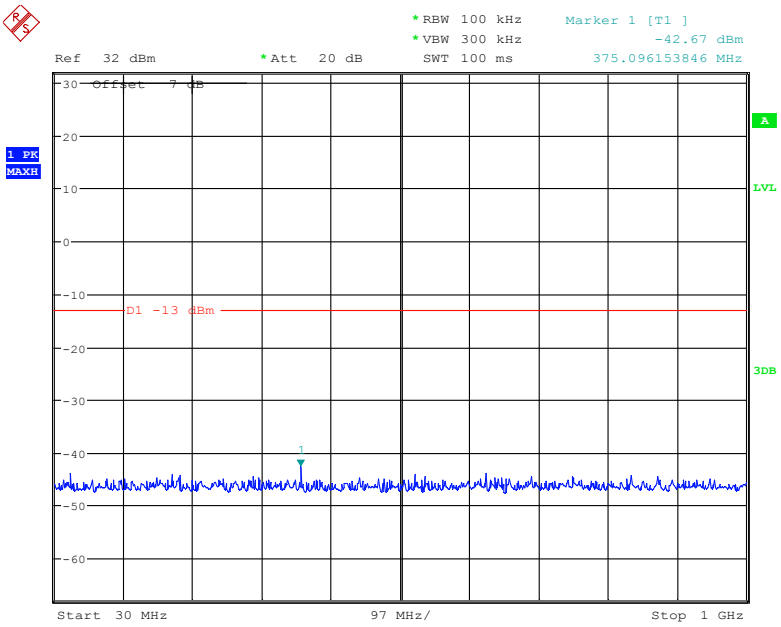
Date: 29.NOV.2019 23:23:07

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



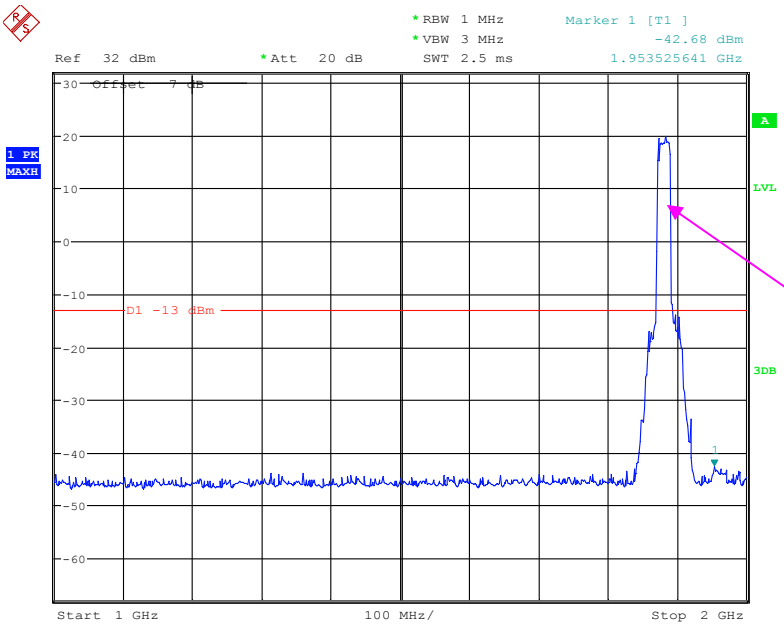
Date: 29.NOV.2019 23:23:24

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



Date: 29.NOV.2019 23:24:30

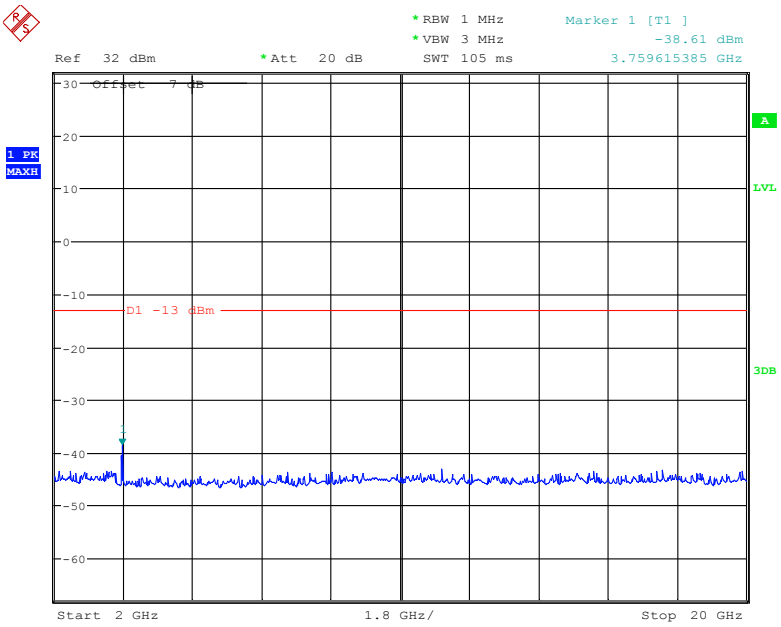
1 GHz – 2 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 29.NOV.2019 23:24:07

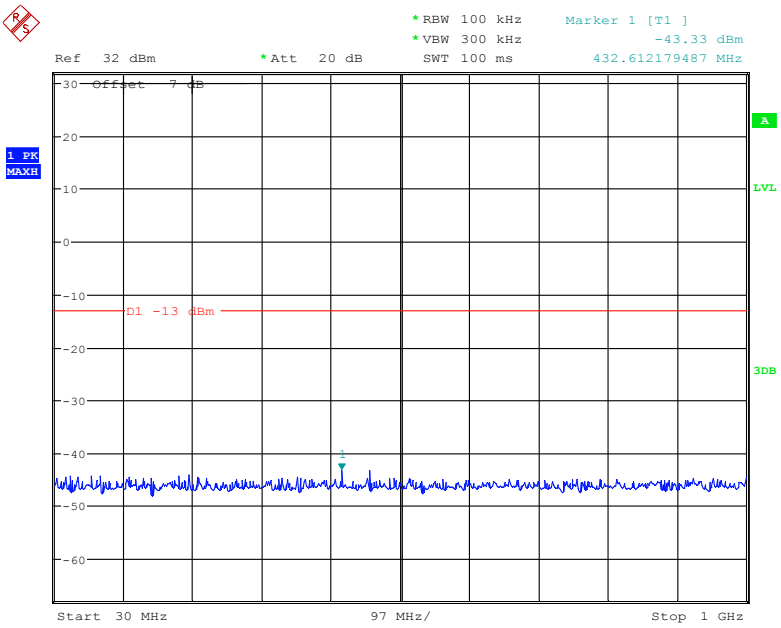
2 GHz - 20 GHz (20.0 MHz, Middle Channel)



Date: 29.NOV.2019 23:23:43

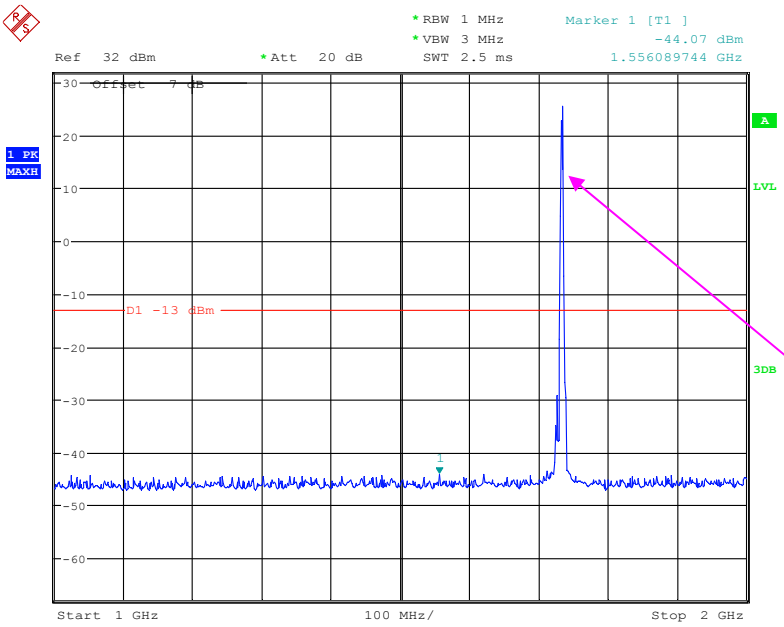
LTE Band 4:

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



Date: 29.NOV.2019 23:26:02

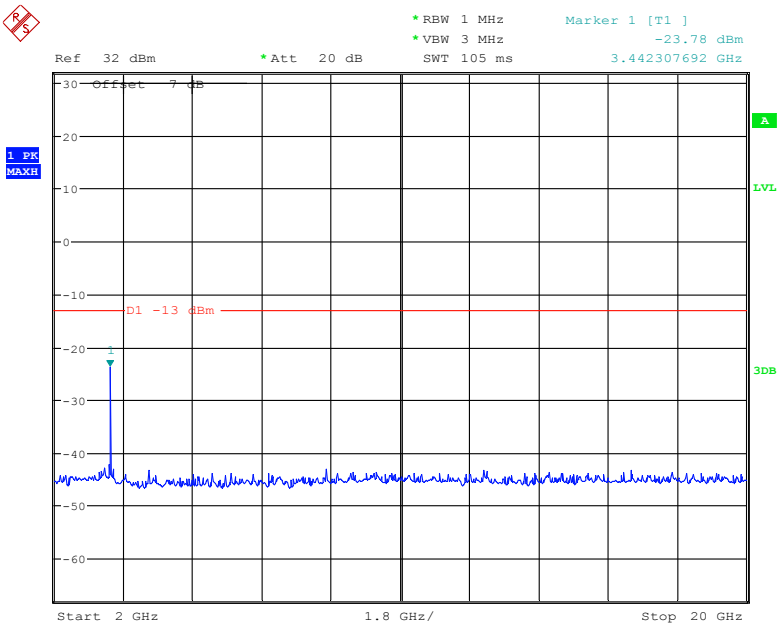
1 GHz – 2 GHz (1.4 MHz, Middle Channel)



Fundamental test

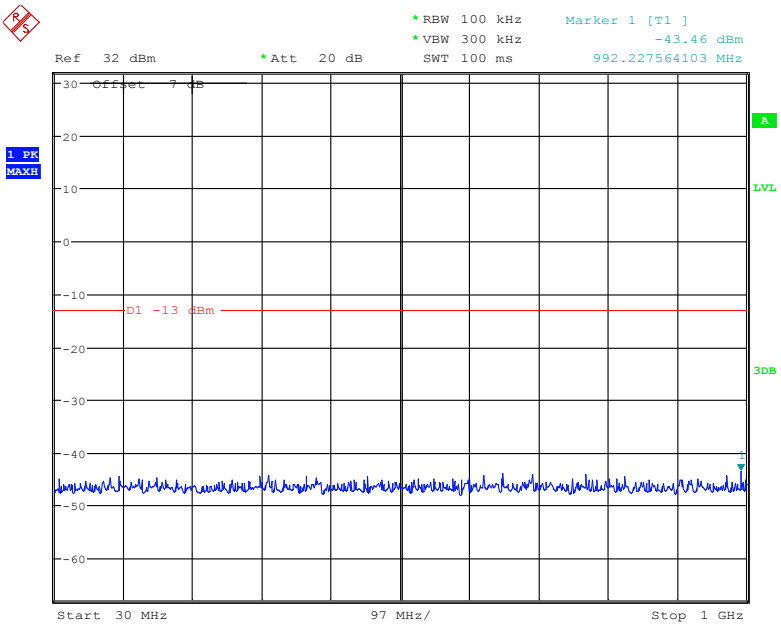
Date: 29.NOV.2019 23:26:30

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



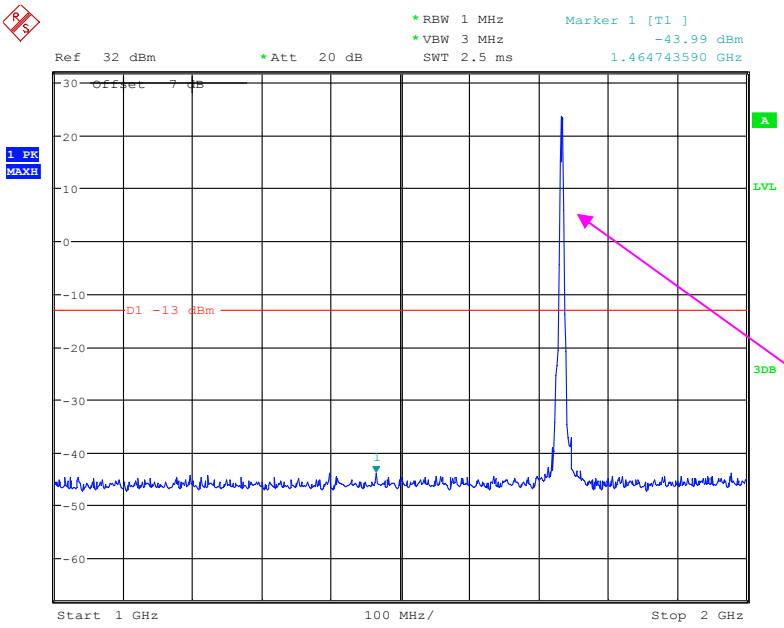
Date: 29.NOV.2019 23:26:46

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



Date: 29.NOV.2019 23:27:48

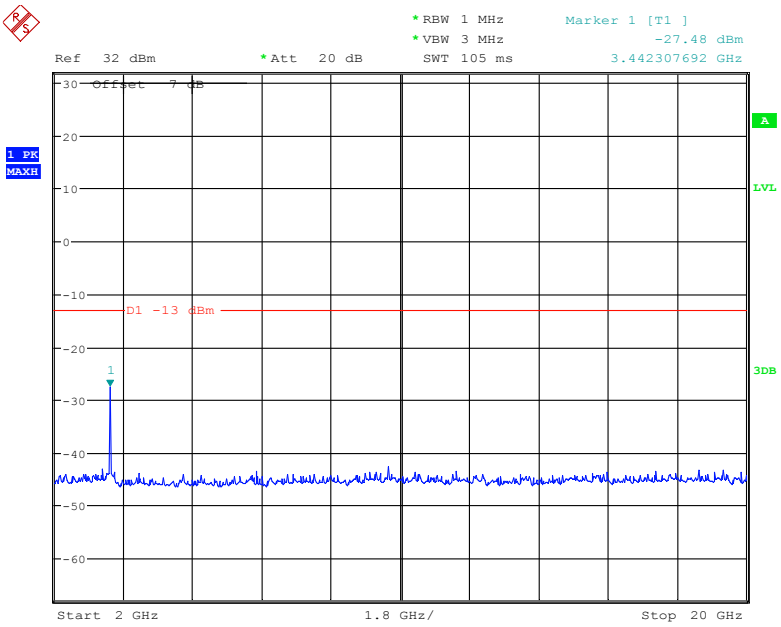
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



Fundamental test

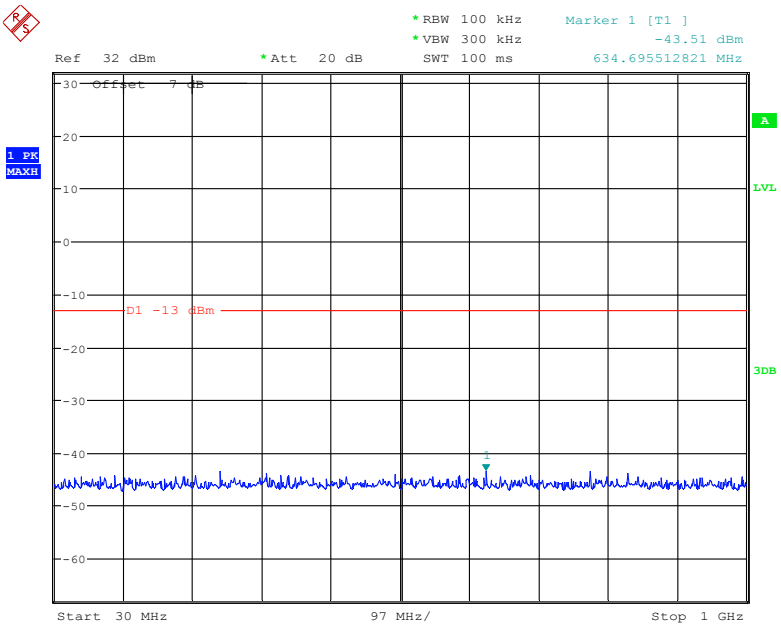
Date: 29.NOV.2019 23:27:24

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



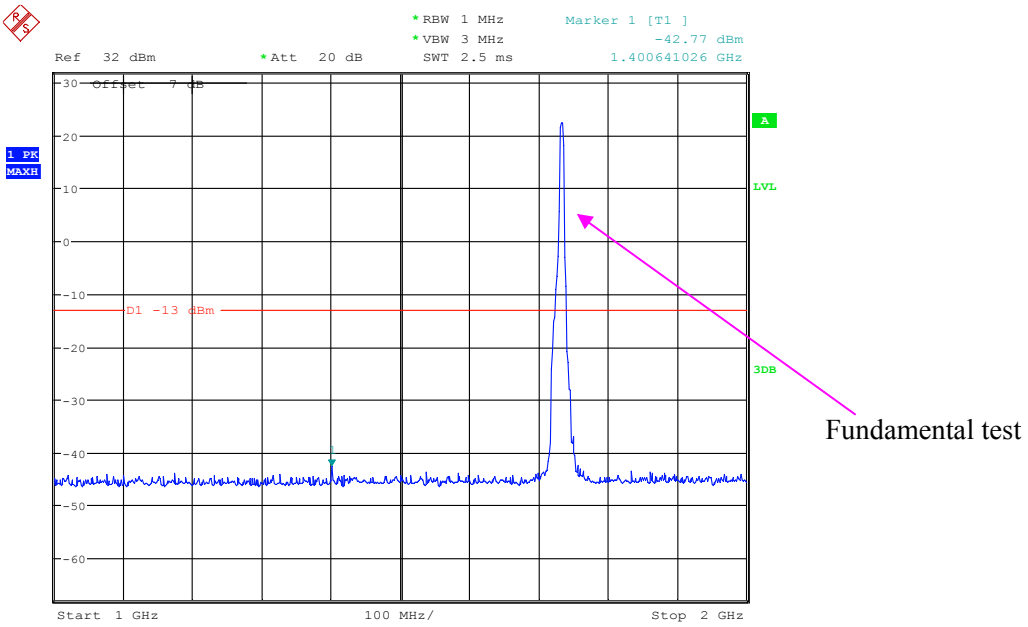
Date: 29.NOV.2019 23:27:03

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



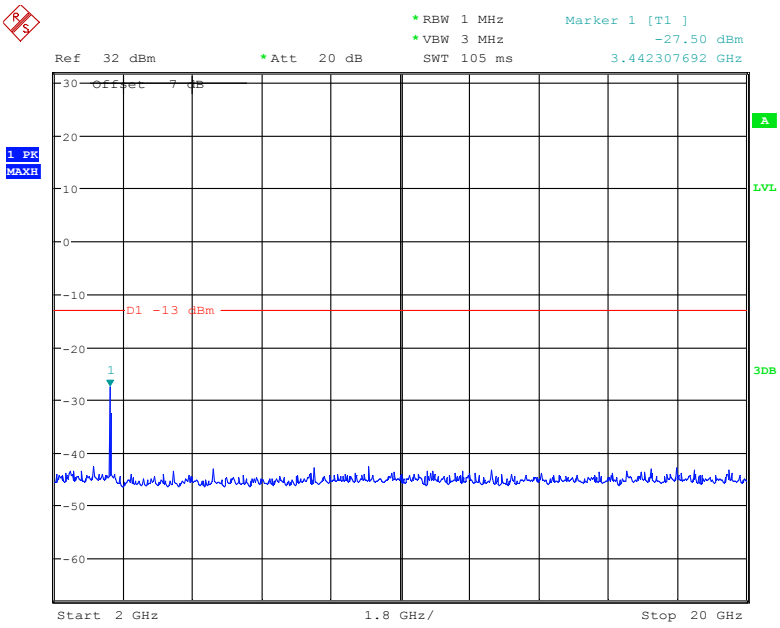
Date: 29.NOV.2019 23:28:31

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



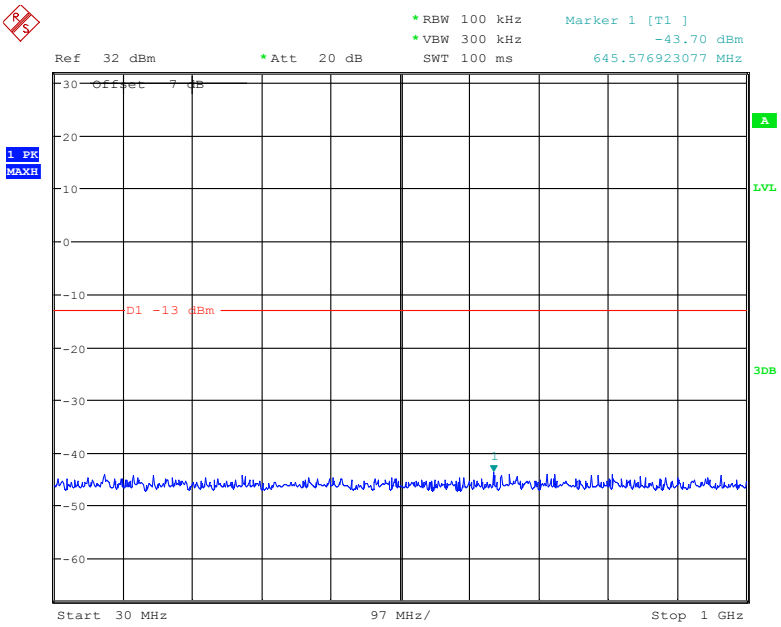
Date: 29.NOV.2019 23:29:16

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



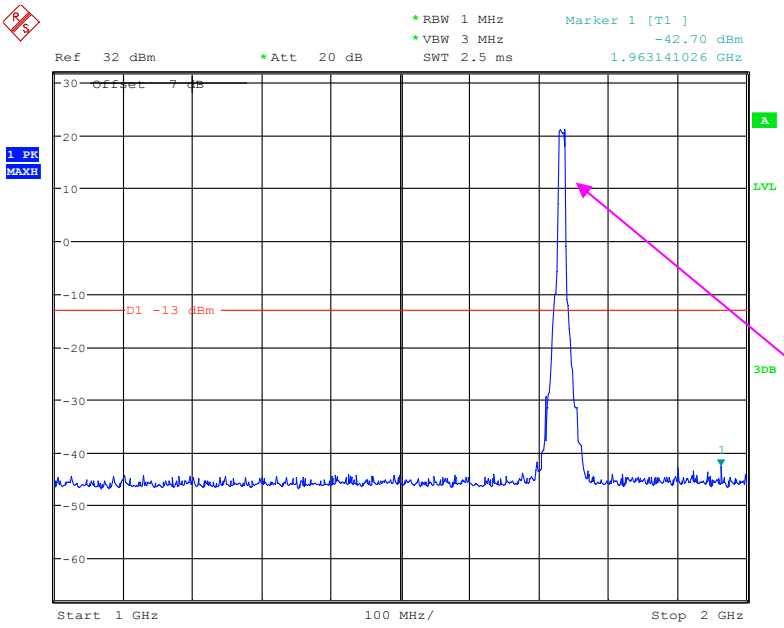
Date: 29.NOV.2019 23:29:35

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



Date: 29.NOV.2019 23:50:38

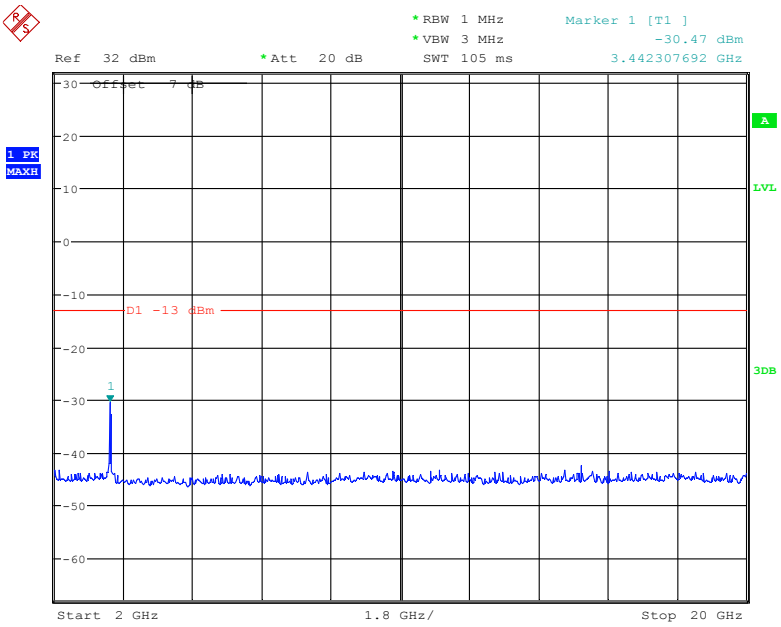
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



Fundamental test

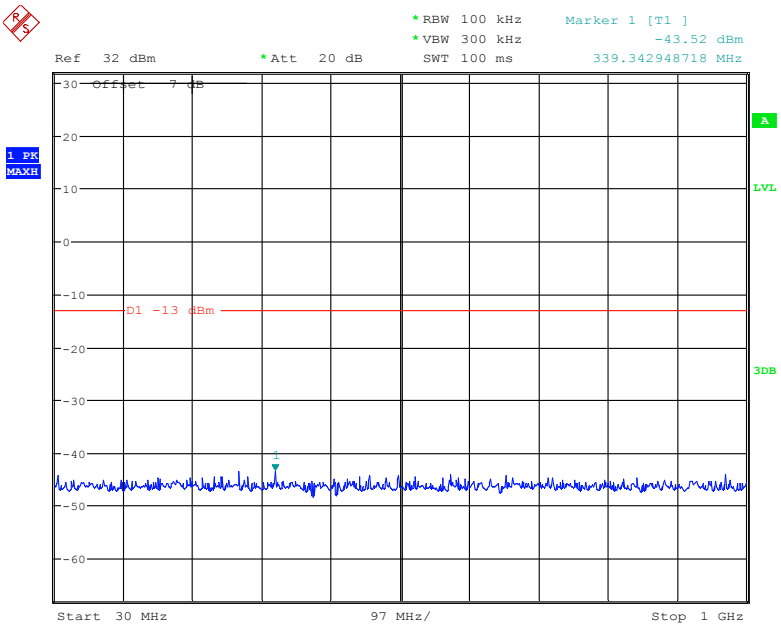
Date: 29.NOV.2019 23:50:12

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



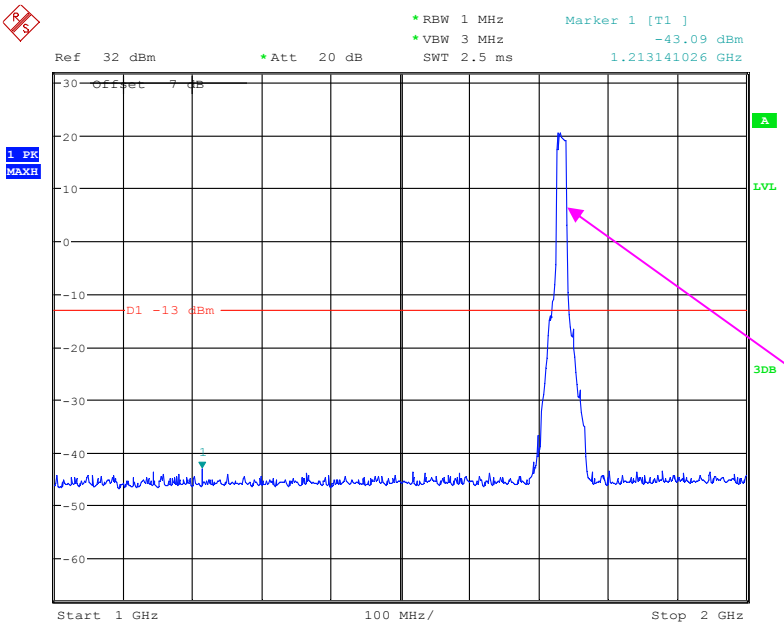
Date: 29.NOV.2019 23:49:43

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



Date: 29.NOV.2019 23:51:02

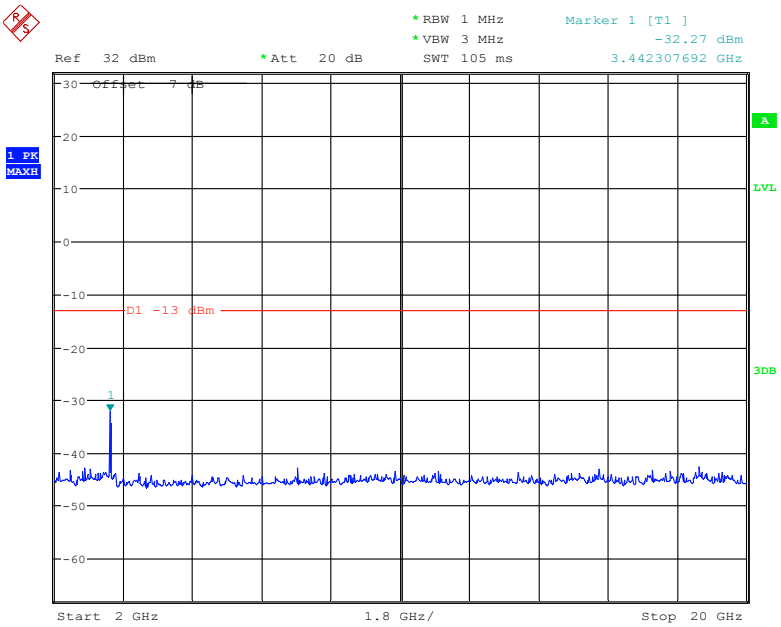
1 GHz – 2 GHz (15.0 MHz, Middle Channel)



Fundamental test

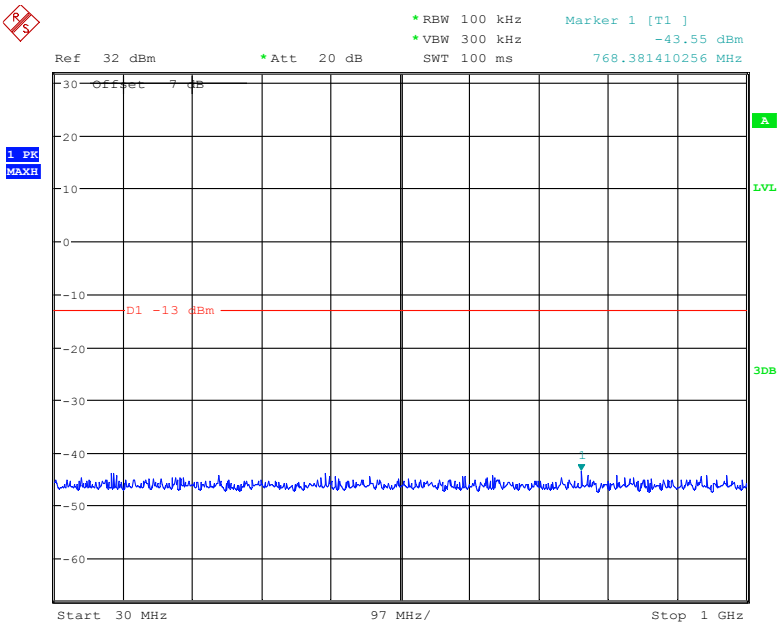
Date: 29.NOV.2019 23:51:34

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



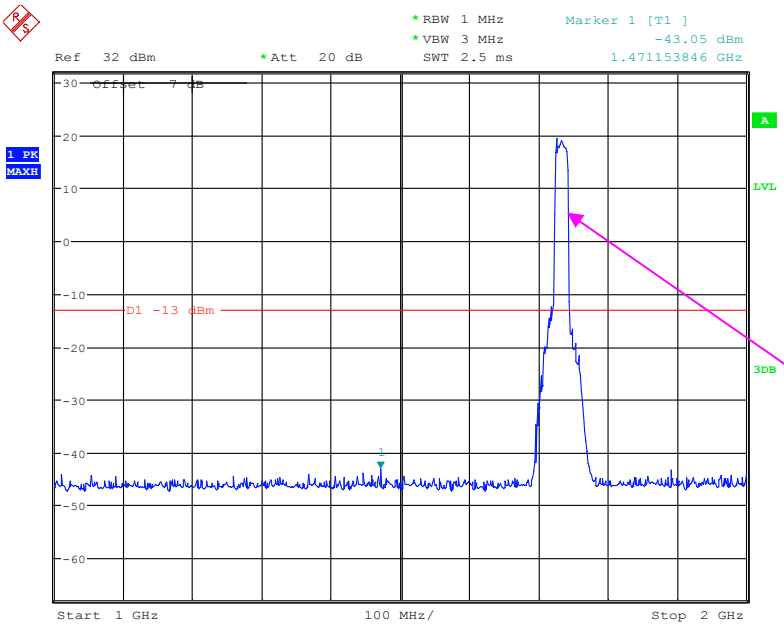
Date: 29.NOV.2019 23:51:49

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



Date: 29.NOV.2019 23:52:48

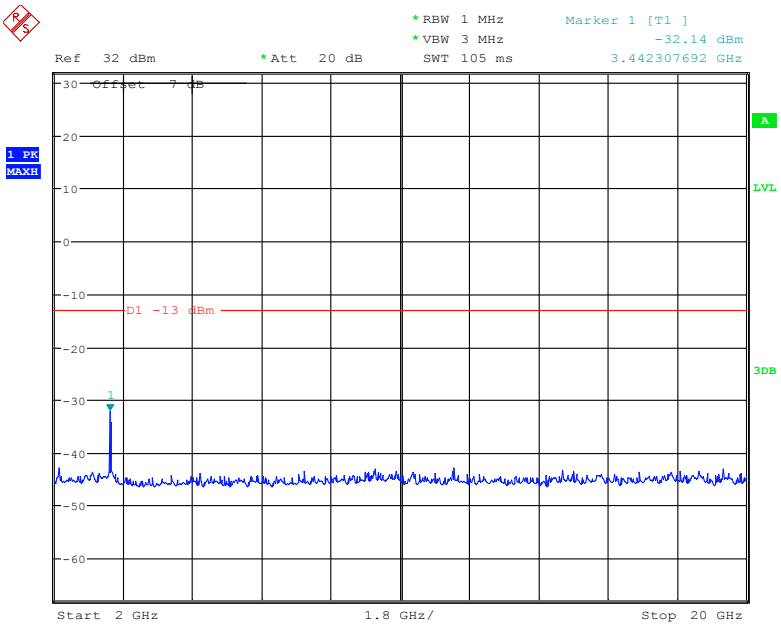
1 GHz – 2 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 29.NOV.2019 23:52:26

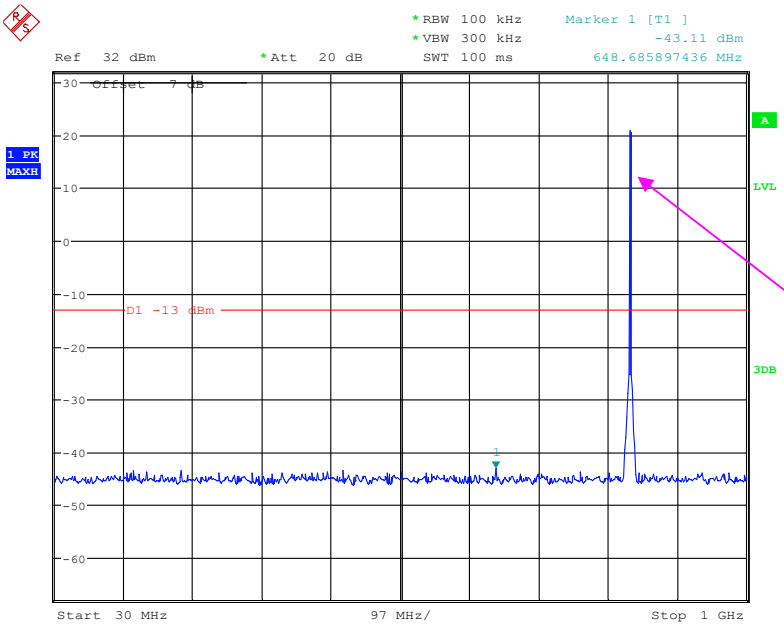
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 29.NOV.2019 23:52:04

LTE Band 5:

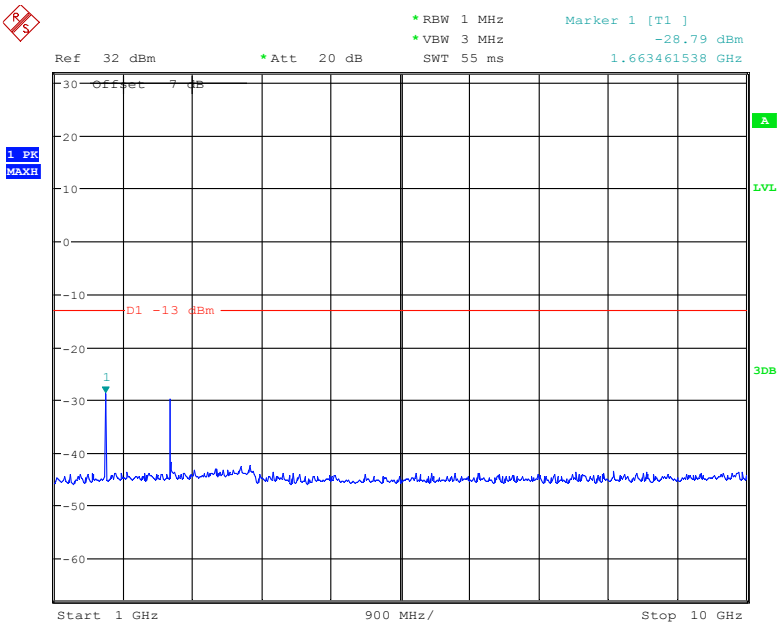
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

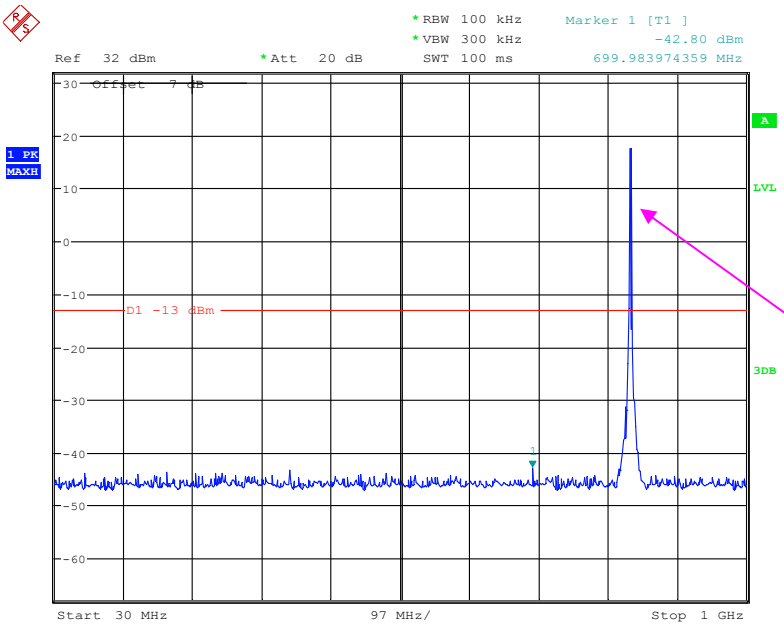
Date: 29.NOV.2019 23:55:00

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



Date: 29.NOV.2019 23:55:49

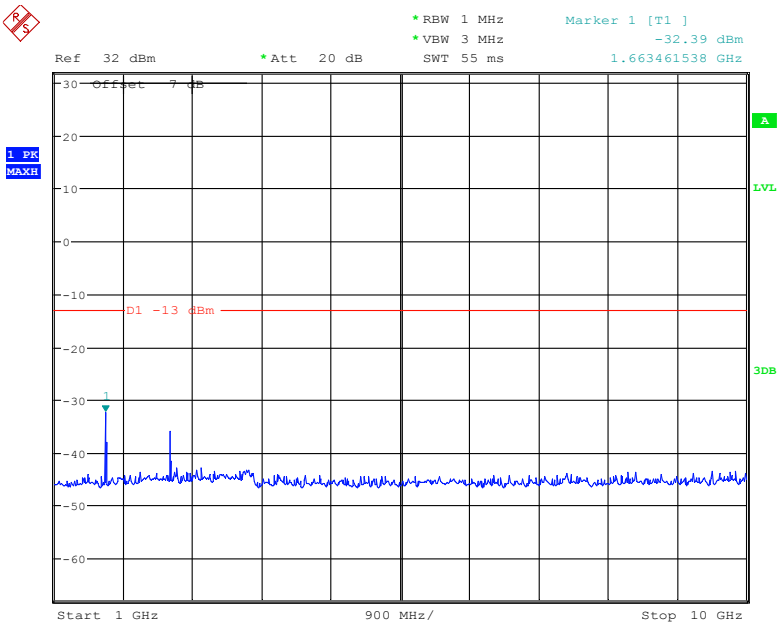
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Fundamental test

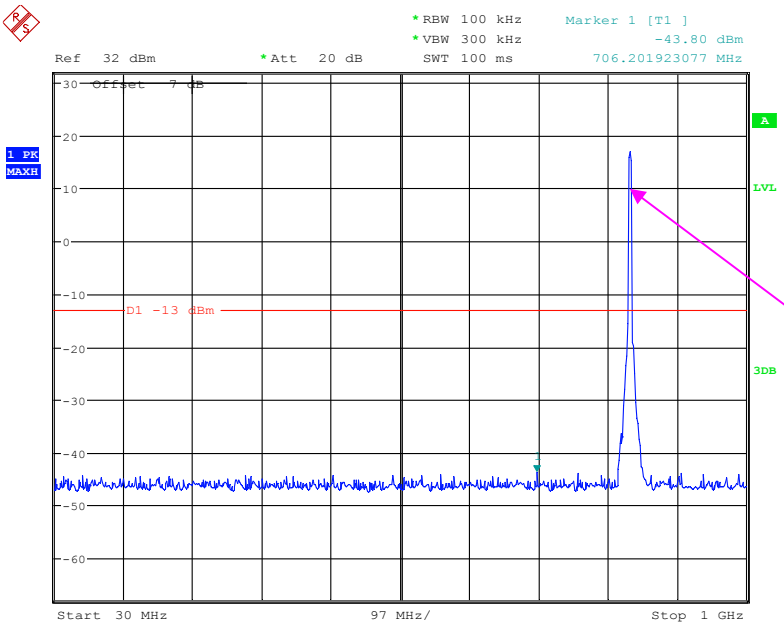
Date: 30.NOV.2019 00:02:42

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



Date: 29.NOV.2019 23:56:29

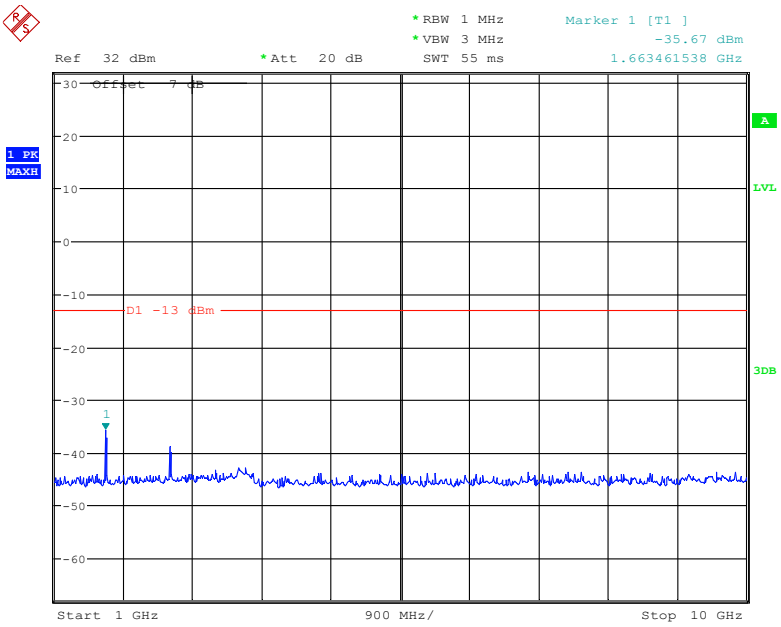
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

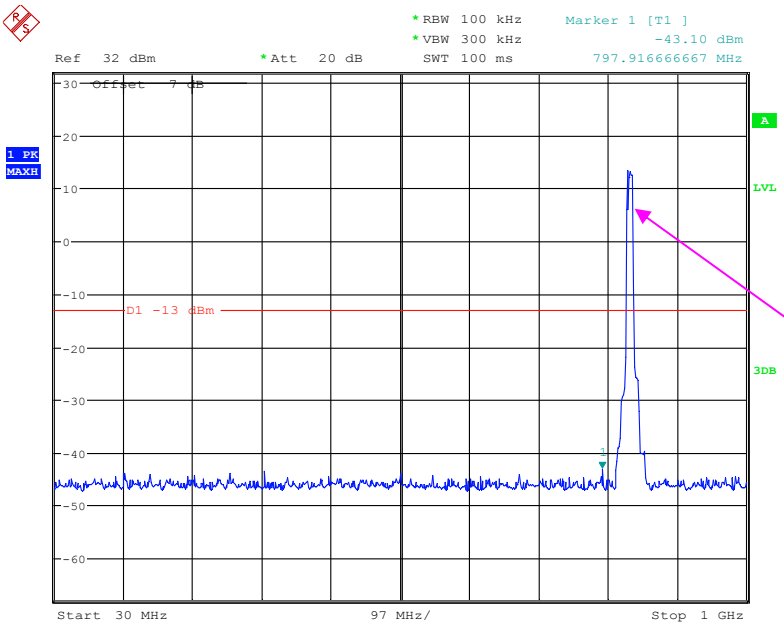
Date: 30.NOV.2019 00:03:15

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



Date: 30.NOV.2019 00:03:43

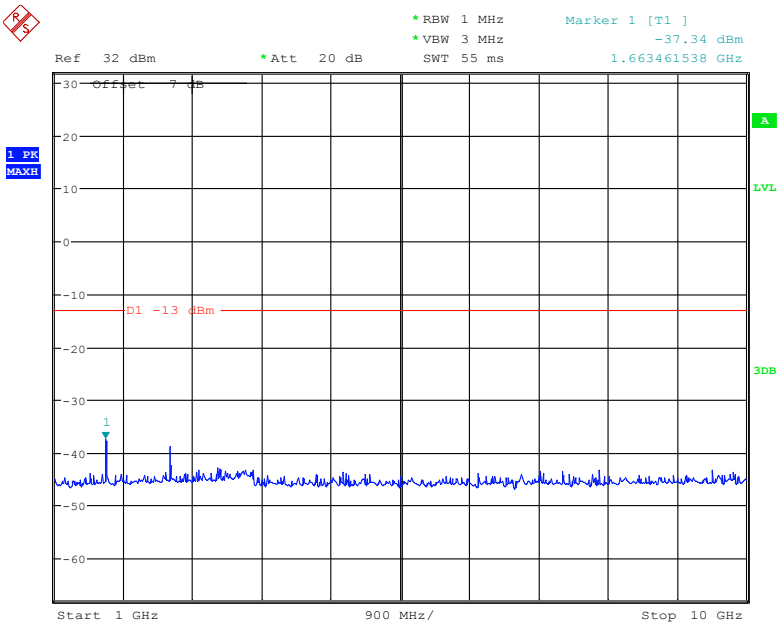
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 30.NOV.2019 00:04:42

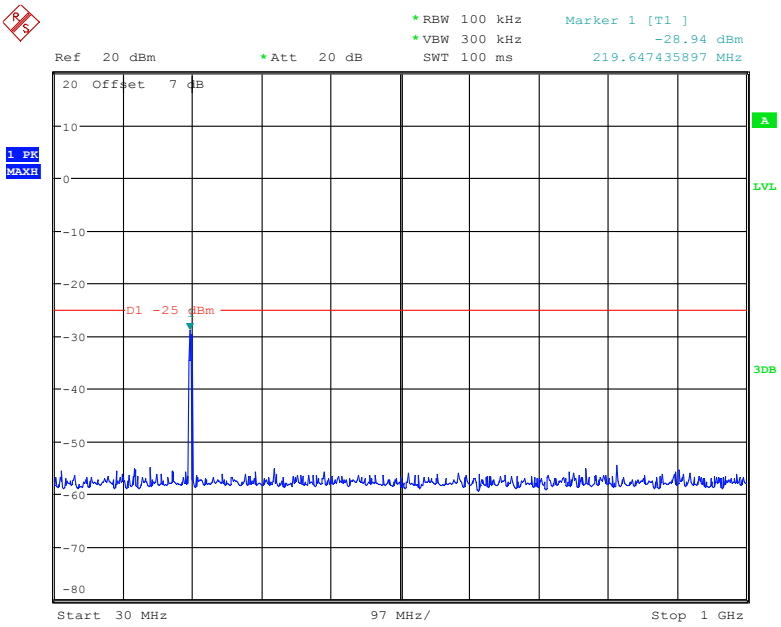
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 30.NOV.2019 00:04:12

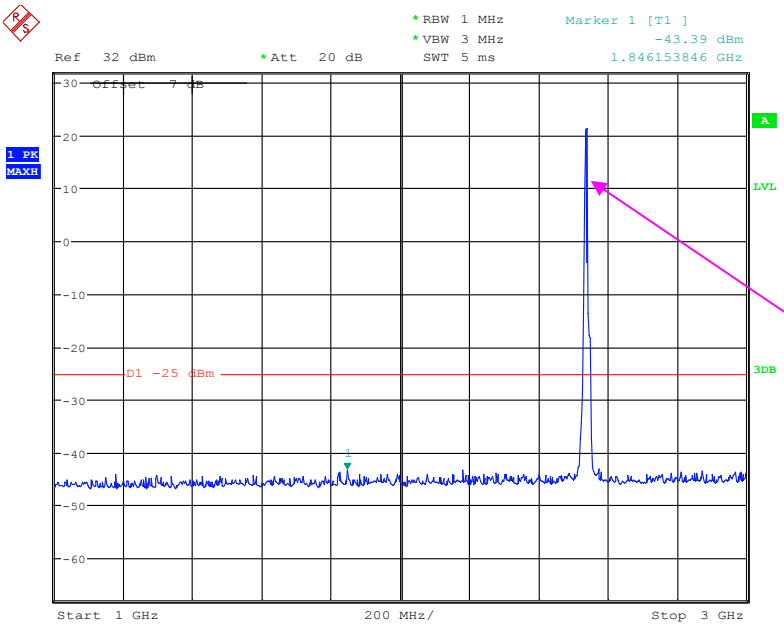
LTE Band 7:

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



Date: 30.NOV.2019 13:26:37

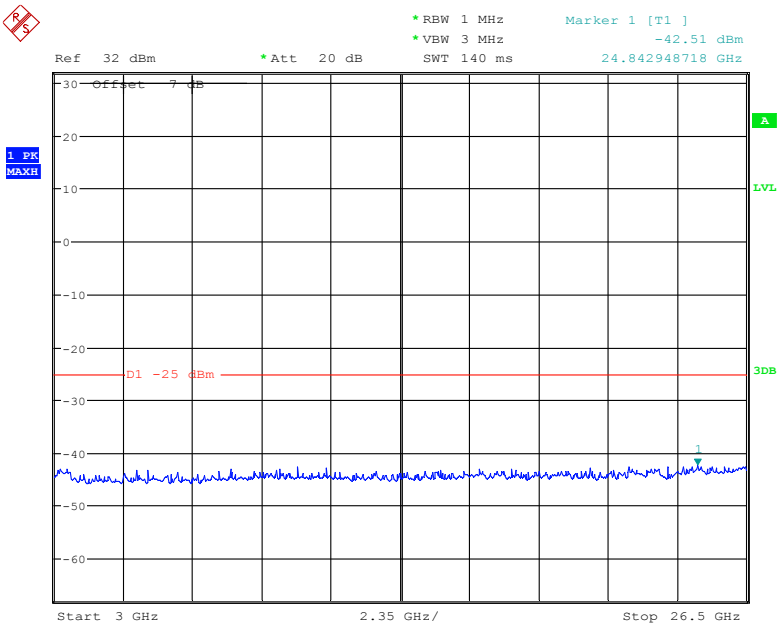
1 GHz – 3.0 GHz (5.0 MHz, Middle Channel)



Fundamental test

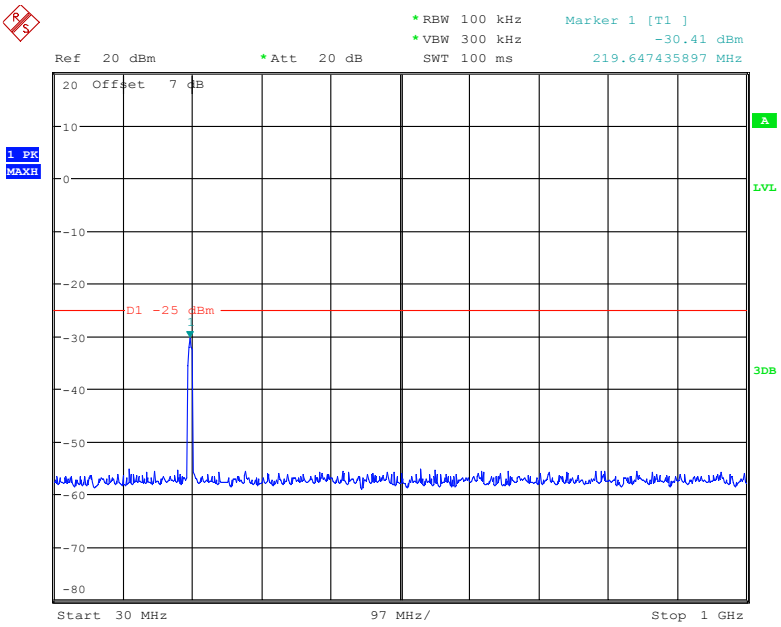
Date: 30.NOV.2019 13:31:24

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



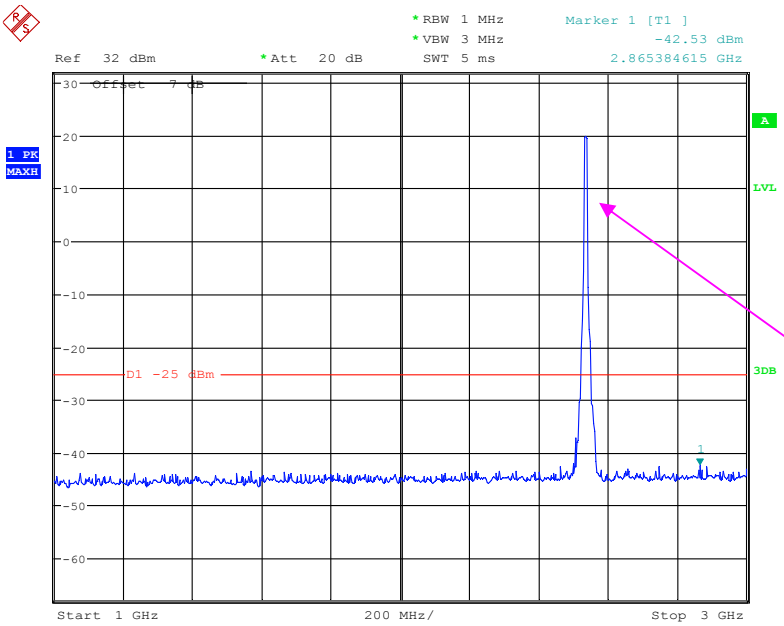
Date: 30.NOV.2019 13:31:56

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



Date: 30.NOV.2019 13:27:38

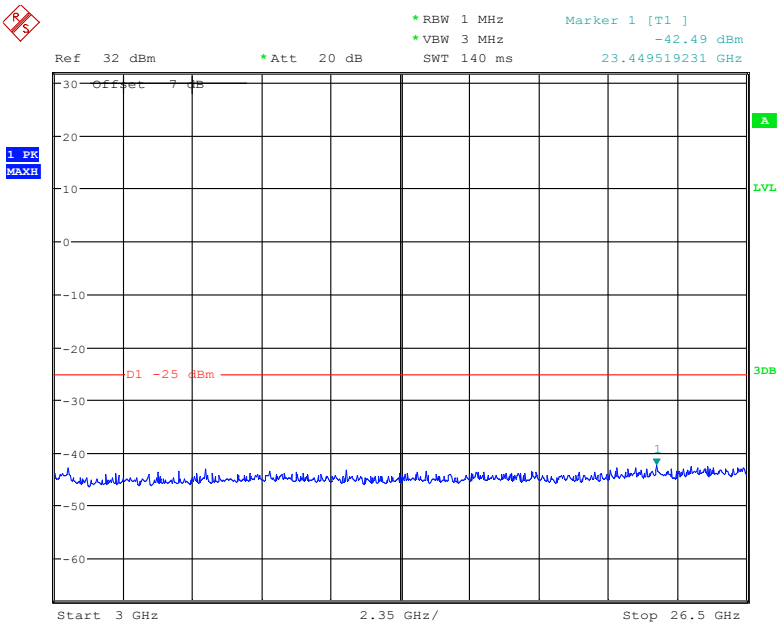
1 GHz – 3 GHz (10.0 MHz, Middle Channel)



Fundamental test

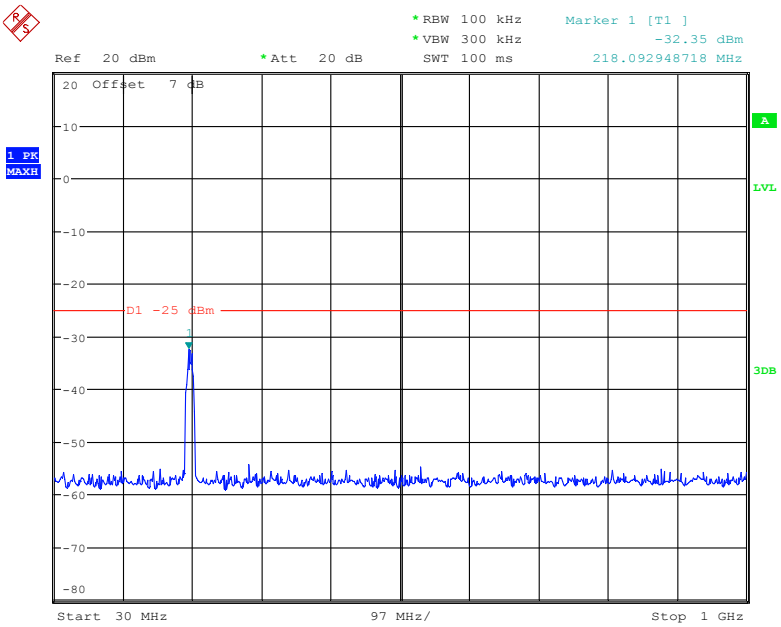
Date: 30.NOV.2019 13:30:25

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



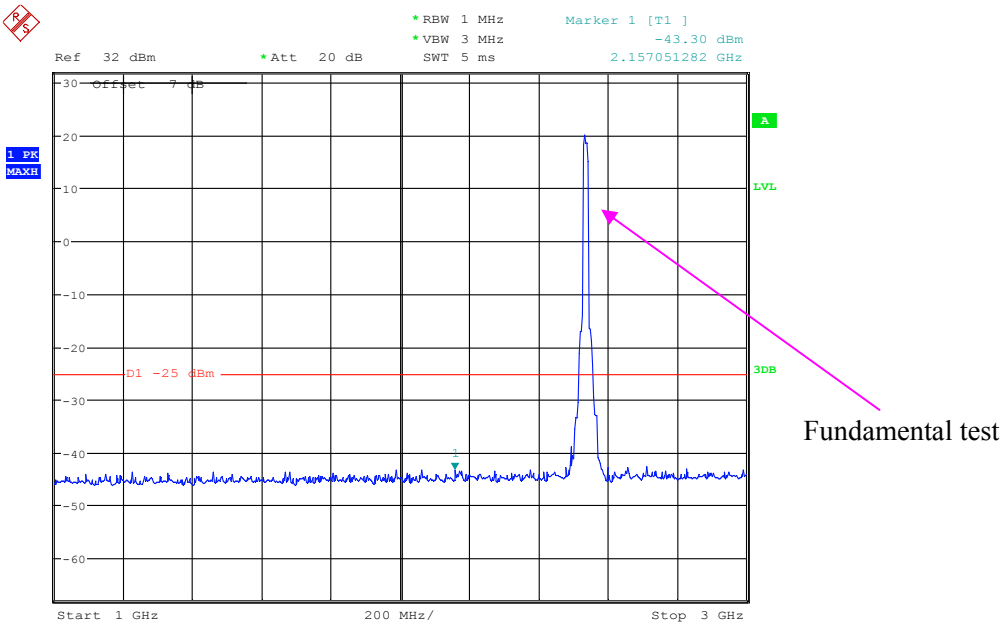
Date: 30.NOV.2019 13:32:16

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



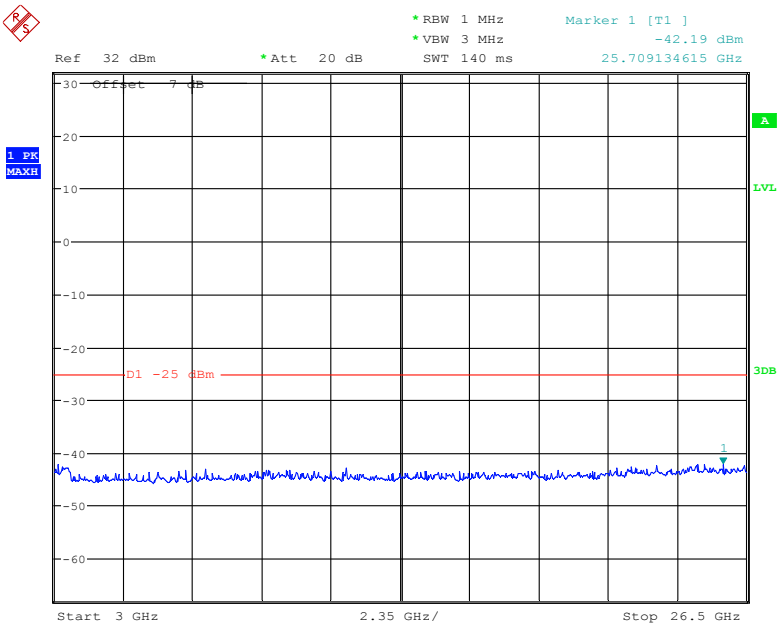
Date: 30.NOV.2019 13:27:59

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



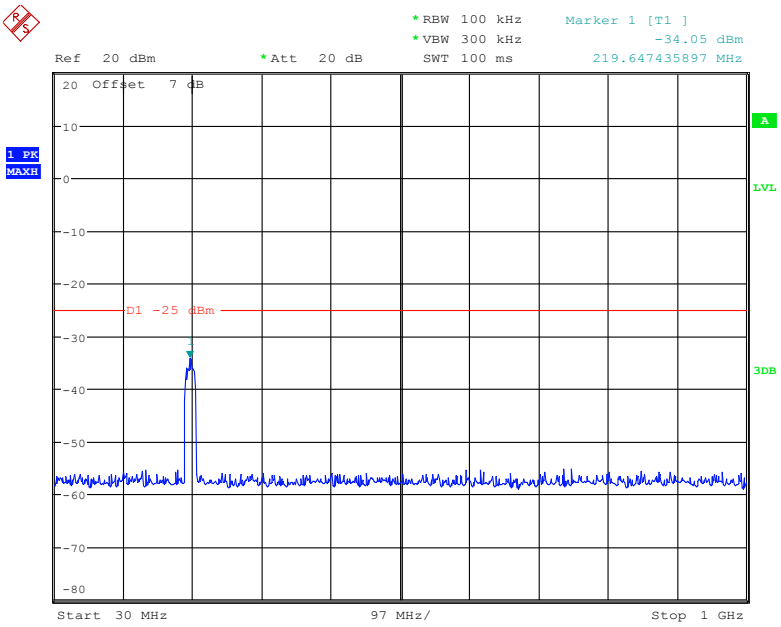
Date: 30.NOV.2019 13:29:46

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



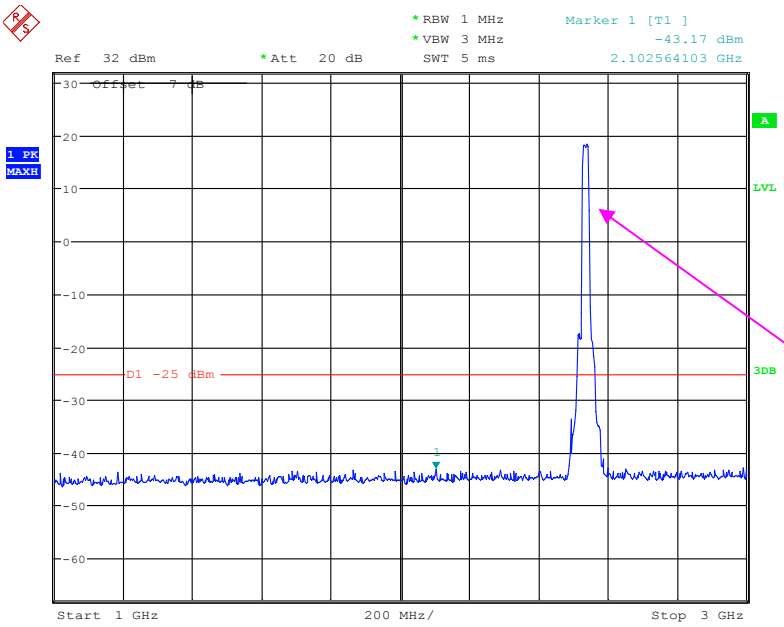
Date: 30.NOV.2019 13:32:25

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



Date: 30.NOV.2019 13:28:16

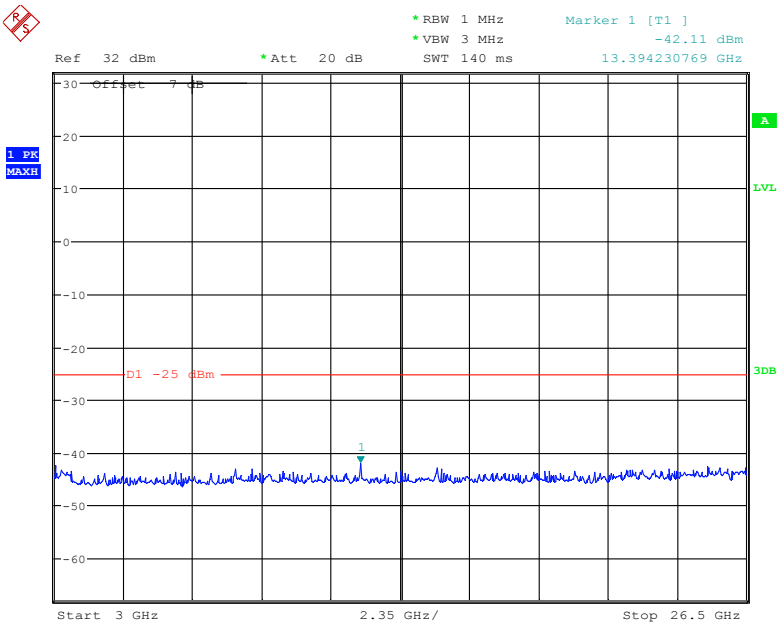
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 30.NOV.2019 13:29:00

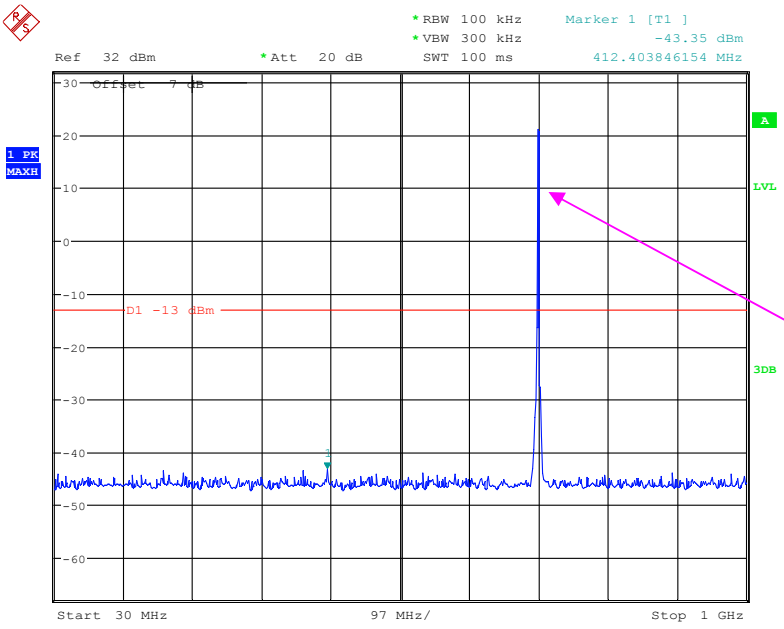
3 GHz – 26.5 GHz (20.0 MHz, Middle Channel)



Date: 30.NOV.2019 13:32:38

LTE Band 12:

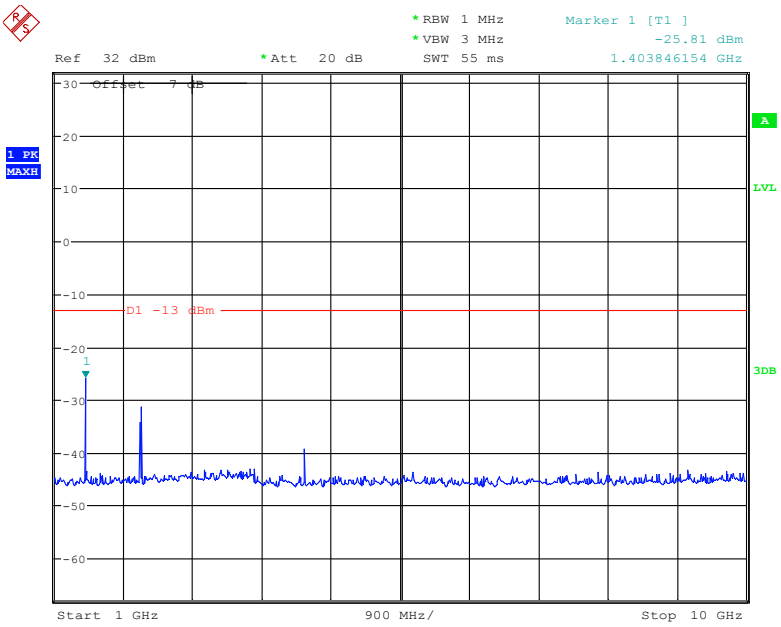
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

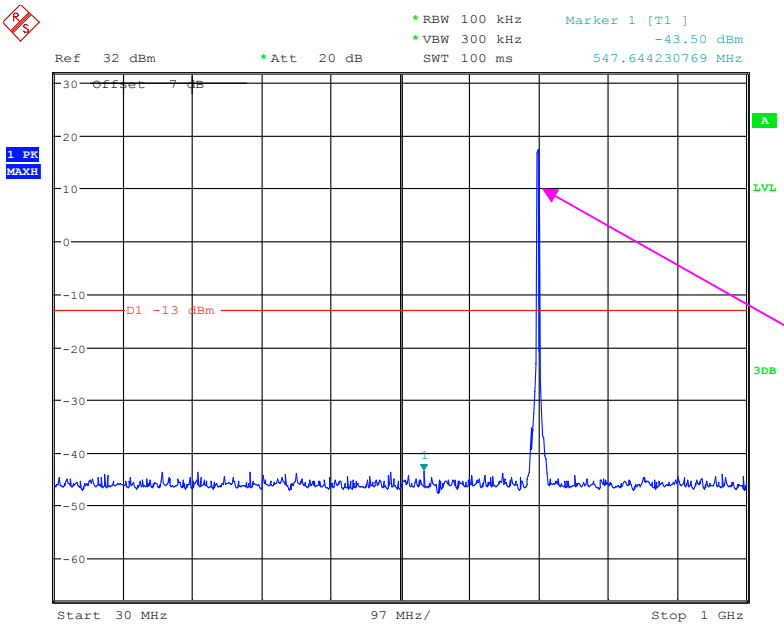
Date: 30.NOV.2019 00:08:17

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



Date: 30.NOV.2019 00:08:50

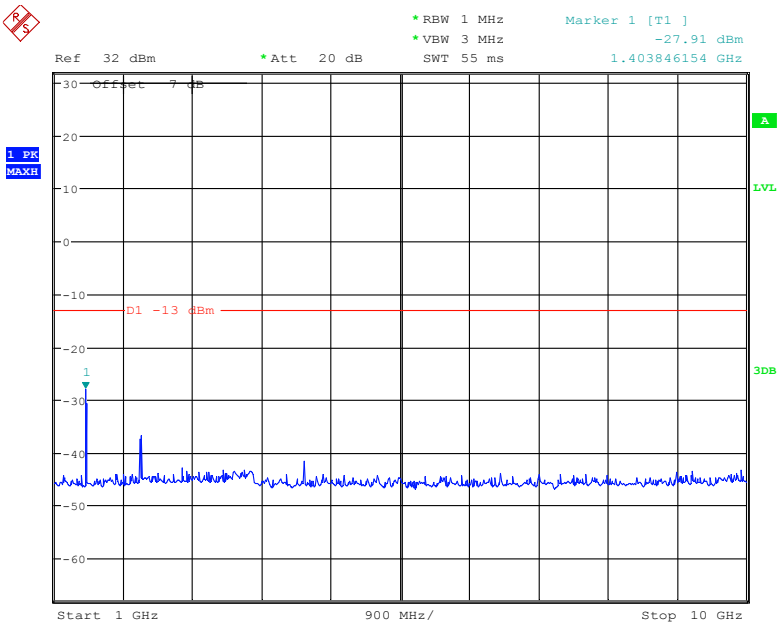
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Fundamental test

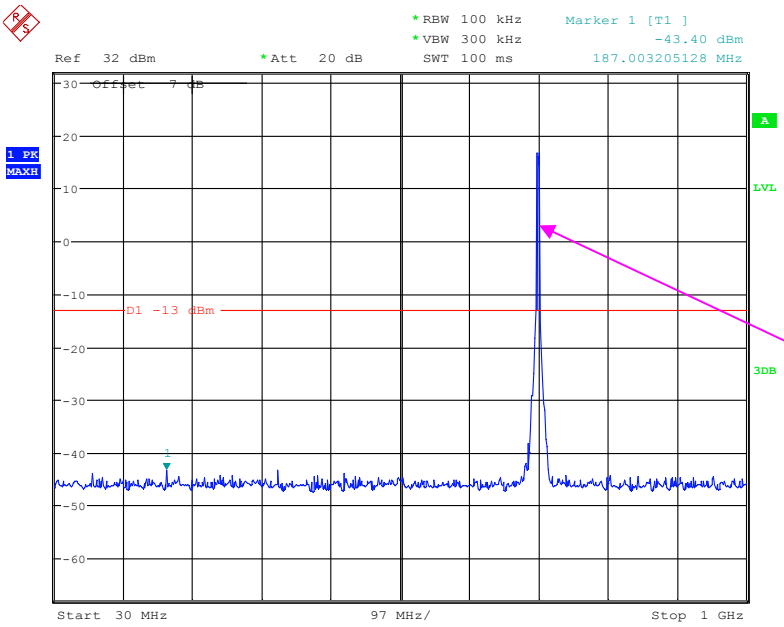
Date: 30.NOV.2019 00:07:53

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



Date: 30.NOV.2019 00:09:08

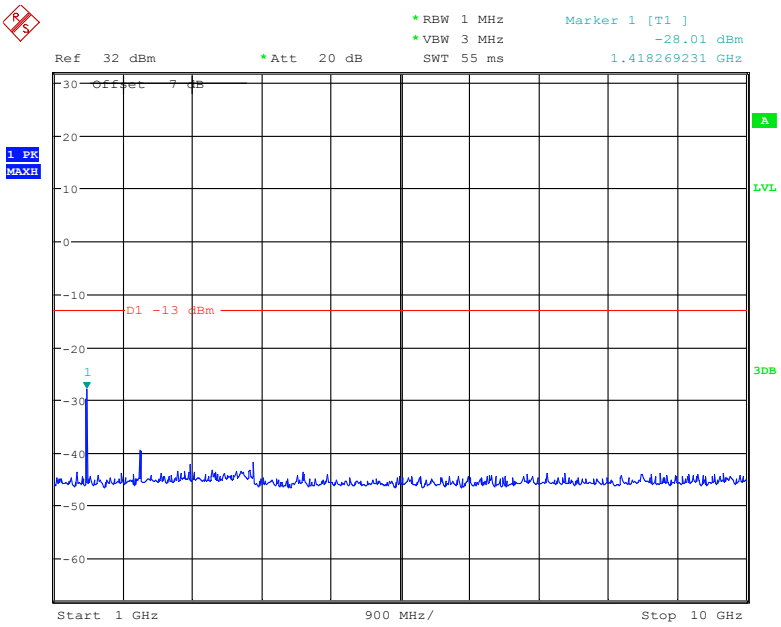
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

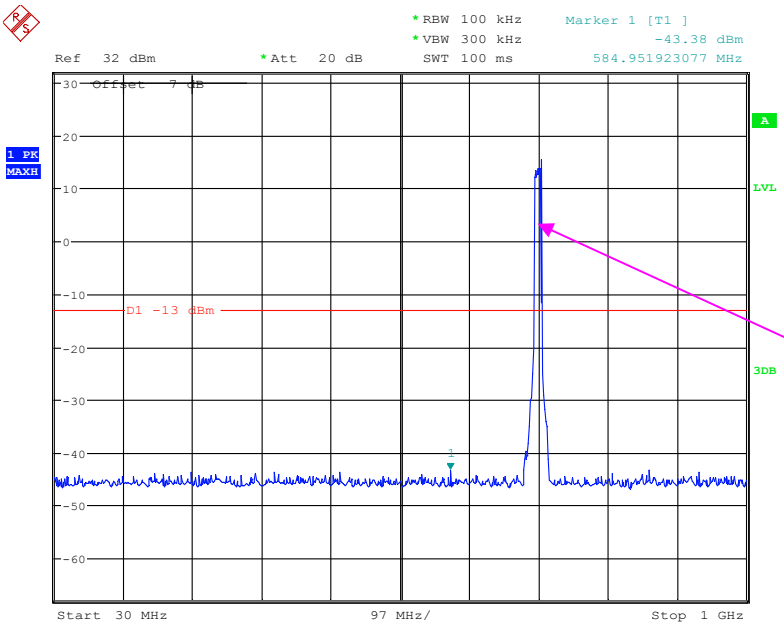
Date: 30.NOV.2019 00:07:28

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



Date: 30.NOV.2019 00:09:25

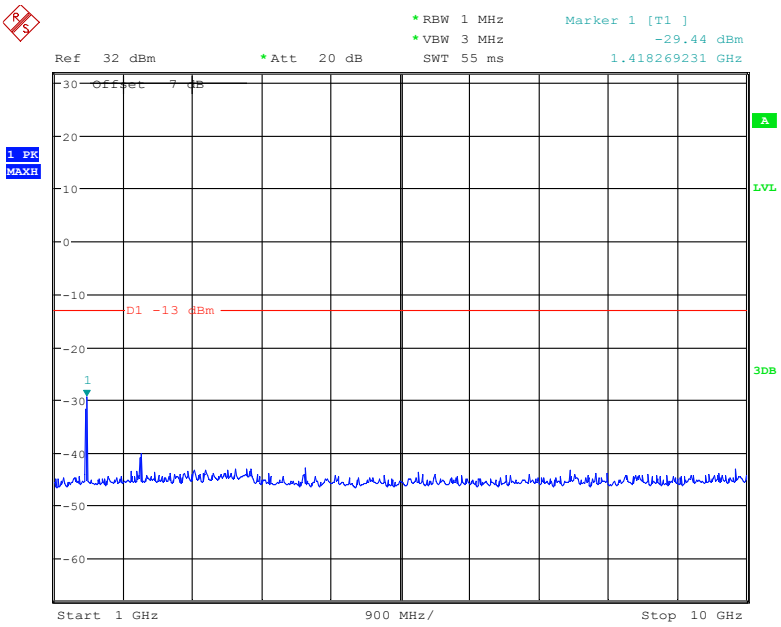
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 30.NOV.2019 00:06:42

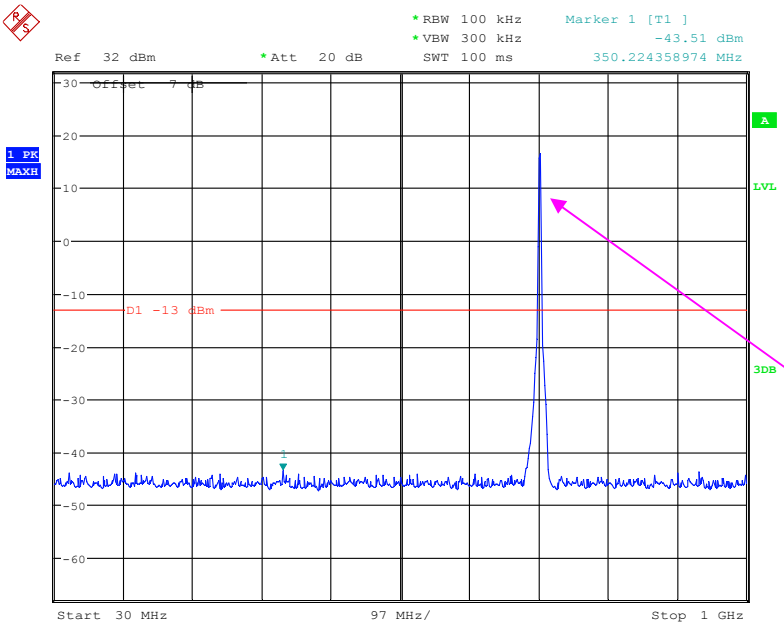
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 30.NOV.2019 00:09:41

LTE Band 17:

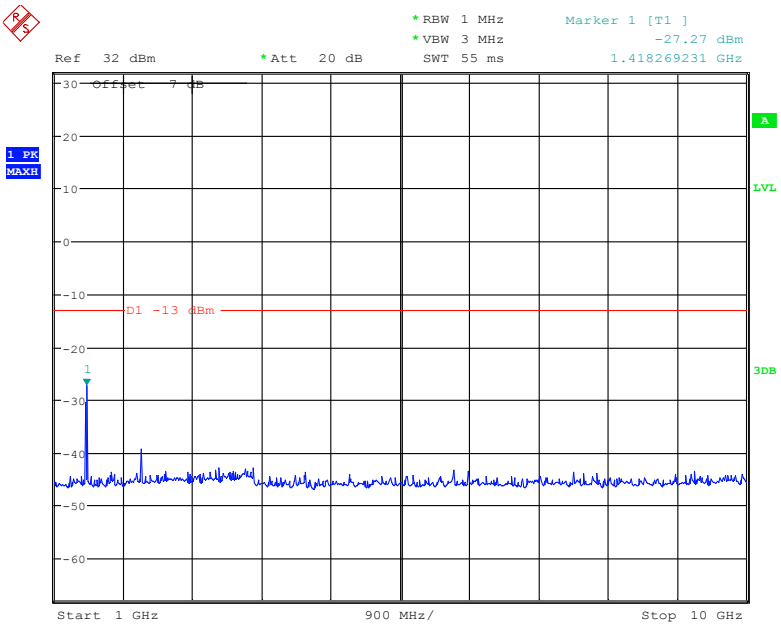
30 MHz – 1.0 GHz (5.0 MHz, Middle Channel)



Fundamental test

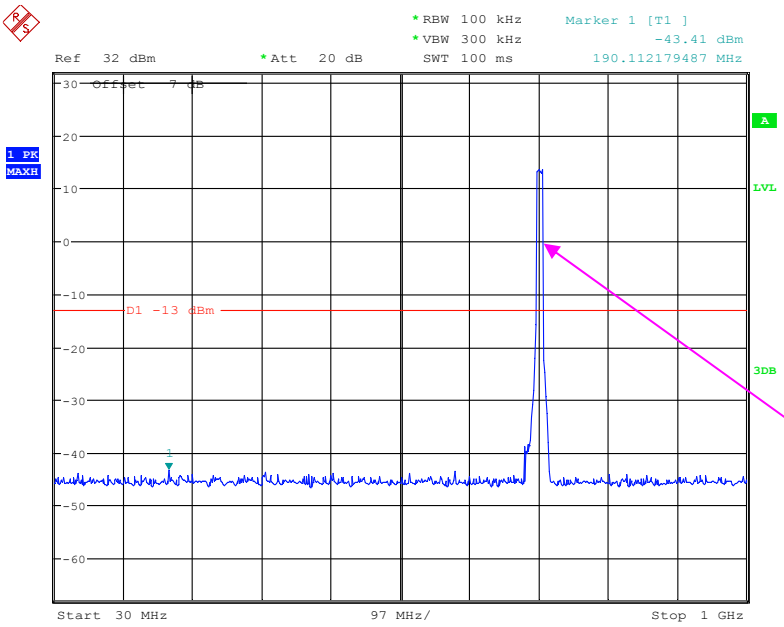
Date: 30.NOV.2019 00:11:42

1 GHz – 10GHz (5 MHz, Middle Channel)



Date: 30.NOV.2019 00:11:15

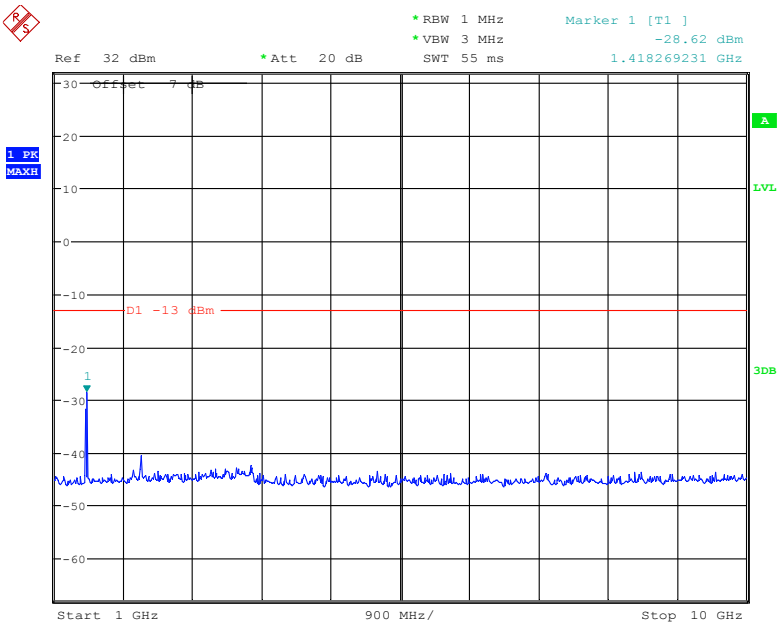
30 MHz – 1.0 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 30.NOV.2019 00:12:33

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



Date: 30.NOV.2019 00:10:54

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 Charlie Cha on 2019-11-27.

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										
368.47	37.74	115	1.5	H	-59.3	0.40	0	-59.70	-13	46.70
368.47	36.02	87	2.3	V	-61.0	0.40	0	-61.40	-13	48.40
1673.20	50.75	247	1.7	H	-55.6	1.30	8.90	-48.00	-13	35.00
1673.20	49.61	44	2.5	V	-56.1	1.30	8.90	-48.50	-13	35.50
2509.80	50.94	134	1.5	H	-52.4	2.60	10.20	-44.80	-13	31.80
2509.80	51.50	219	1.4	V	-51.2	2.60	10.20	-43.60	-13	30.60
3346.40	50.14	171	2.2	H	-50.8	1.50	11.70	-40.60	-13	27.60
3346.40	49.86	281	1.6	V	-51.1	1.50	11.70	-40.90	-13	27.90
WCDMA Mode, Middle channel										
368.47	36.44	256	1.9	H	-60.6	0.40	0	-61.00	-13	48.00
368.47	36.64	219	1.4	V	-60.4	0.40	0	-60.80	-13	47.80
1673.20	46.39	16	1.7	H	-59.9	1.30	8.90	-52.30	-13	39.30
1673.20	44.96	268	2.1	V	-60.8	1.30	8.90	-53.20	-13	40.20
2509.80	53.82	64	1.8	H	-49.5	2.60	10.20	-41.90	-13	28.90
2509.80	47.56	271	2.2	V	-55.2	2.60	10.20	-47.60	-13	34.60
3346.40	44.98	199	2.5	H	-55.9	1.50	11.70	-45.70	-13	32.70
3346.40	45.59	191	1.2	V	-55.3	1.50	11.70	-45.10	-13	32.10

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										
368.47	37.03	74	1.9	H	-60.0	0.40	0	-60.40	-13	47.40
368.47	37.74	306	1.7	V	-59.3	0.40	0	-59.70	-13	46.70
3760.00	57.11	199	1.7	H	-44.9	1.50	11.80	-34.60	-13	21.60
3760.00	56.22	186	2.3	V	-45.4	1.50	11.80	-35.10	-13	22.10
5640.00	51.07	100	2.0	H	-48.6	1.70	12.40	-37.90	-13	24.90
5640.00	51.10	162	2.3	V	-48.2	1.70	12.40	-37.50	-13	24.50
7520.00	56.40	37	2.3	H	-39.5	1.90	10.70	-30.70	-13	17.70
7520.00	57.13	285	1.3	V	-38.4	1.90	10.70	-29.60	-13	16.60
WCDMA Mode Band II, Middle channel										
368.47	37.96	37	2.5	H	-59.0	0.40	0	-59.40	-13	46.40
368.47	37.31	77	1.8	V	-59.7	0.40	0	-60.10	-13	47.10
3760.00	49.76	342	2.4	H	-52.3	1.50	11.80	-42.00	-13	29.00
3760.00	48.94	179	1.7	V	-52.6	1.50	11.80	-42.30	-13	29.30

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										
368.47	37.74	110	1.7	H	-59.3	0.40	0	-59.70	-13	46.70
368.47	36.52	80	2.0	V	-60.5	0.40	0	-60.90	-13	47.90
3465.20	49.85	76	2.1	H	-50.9	1.50	12.00	-40.40	-13	27.40
3465.20	48.23	251	1.7	V	-53.3	1.50	12.00	-42.80	-13	29.80

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
Band 2(1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 20 GHz										
368.47	36.80	186	1.8	H	-60.2	0.40	0	-60.60	-13	47.60
368.47	37.61	217	1.9	V	-59.4	0.40	0	-59.80	-13	46.80
3760.00	53.38	160	1.4	H	-48.7	1.50	11.80	-38.40	-13	25.40
3760.00	48.51	331	2.4	V	-53.1	1.50	11.80	-42.80	-13	29.80
Band 4(1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 20 GHz										
368.47	37.43	348	1.2	H	-59.6	0.40	0	-60.00	-13	47.00
368.47	36.30	330	2.1	V	-60.7	0.40	0	-61.10	-13	48.10
3465.00	54.88	70	1.7	H	-45.9	1.50	12.00	-35.40	-13	22.40
3465.00	49.24	52	2.3	V	-52.3	1.50	12.00	-41.80	-13	28.80
Band 5(1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 10 GHz										
368.47	37.72	343	2.4	H	-59.3	0.40	0	-59.70	-13	46.70
368.47	36.48	197	2.0	V	-60.5	0.40	0	-60.90	-13	47.90
1673.00	50.87	289	1.8	H	-55.5	1.30	8.90	-47.90	-13	34.90
1673.00	53.92	164	2.1	V	-51.8	1.30	8.90	-44.20	-13	31.20
2509.50	48.90	300	2.3	H	-54.5	2.60	10.20	-46.90	-13	33.90
2509.50	47.50	109	2.2	V	-55.2	2.60	10.20	-47.60	-13	34.60
3346.00	43.20	313	1.2	H	-57.7	1.50	11.70	-47.50	-13	34.50
3346.00	43.61	298	2.3	V	-57.3	1.50	11.70	-47.10	-13	34.10
Band 7(5 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 26.5GHz										
368.47	36.38	85	1.3	H	-60.6	0.40	0	-61.00	-25	36.00
368.47	37.93	146	2.3	V	-59.1	0.40	0	-59.50	-25	34.50
5070.00	57.15	122	1.8	H	-42.9	1.60	12.10	-32.40	-25	7.40
5070.00	53.92	0	1.7	V	-46.1	1.60	12.10	-35.60	-25	10.60
Band 12(1.4 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 10GHz										
368.47	37.27	216	1.7	H	-59.7	0.40	0	-60.10	-13	47.10
368.47	37.64	225	1.8	V	-59.4	0.40	0	-59.80	-13	46.80
1415.00	58.89	303	1.1	H	-49.3	1.60	7.90	-43.00	-13	30.00
1415.00	62.32	338	1.9	V	-46.1	1.60	7.90	-39.80	-13	26.80
2122.50	43.17	336	1.7	H	-58.0	1.30	9.70	-49.60	-13	36.60
2122.50	43.34	275	2.2	V	-58.6	1.30	9.70	-50.20	-13	37.20
2830.00	44.01	59	1.4	H	-59.9	1.80	10.50	-51.20	-13	38.20
2830.00	44.25	7	2.2	V	-59.4	1.80	10.50	-50.70	-13	37.70
3537.50	43.32	296	2.4	H	-57.6	1.50	12.00	-47.10	-13	34.10
3537.50	43.85	221	1.2	V	-57.8	1.50	12.00	-47.30	-13	34.30

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 17(5 MHz, Middle Channel)										
Test frequency range: 30 MHz ~ 10GHz										
368.47	36.91	226	1.8	H	-60.1	0.40	0	-60.50	-13	47.50
368.47	36.25	39	1.5	V	-60.8	0.40	0	-61.20	-13	48.20
1420.00	62.95	87	1.1	H	-45.2	1.60	7.90	-38.90	-13	25.90
1420.00	65.34	210	2.2	V	-43.1	1.60	7.90	-36.80	-13	23.80
2130.00	43.06	215	1.6	H	-58.1	1.30	9.70	-49.70	-13	36.70
2130.00	43.27	258	2.3	V	-58.7	1.30	9.70	-50.30	-13	37.30
2840.00	43.55	120	1.1	H	-60.4	1.80	10.50	-51.70	-13	38.70
2840.00	43.97	122	1.1	V	-59.6	1.80	10.50	-50.90	-13	37.90
3550.00	43.32	181	1.2	H	-58.4	1.50	12.10	-47.80	-13	34.80
3550.00	43.78	99	1.0	V	-57.4	1.50	12.10	-46.80	-13	33.80

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

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

Applicable Standard

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

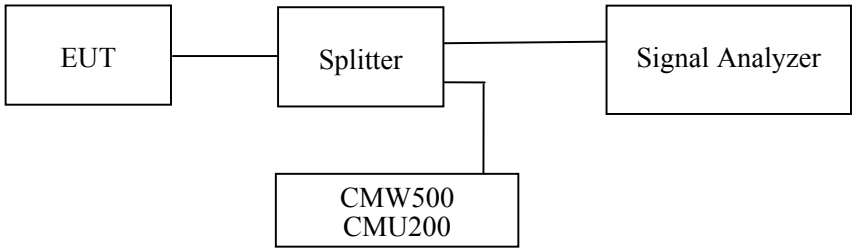
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

Test Procedure

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

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



Test Data

Environmental Conditions

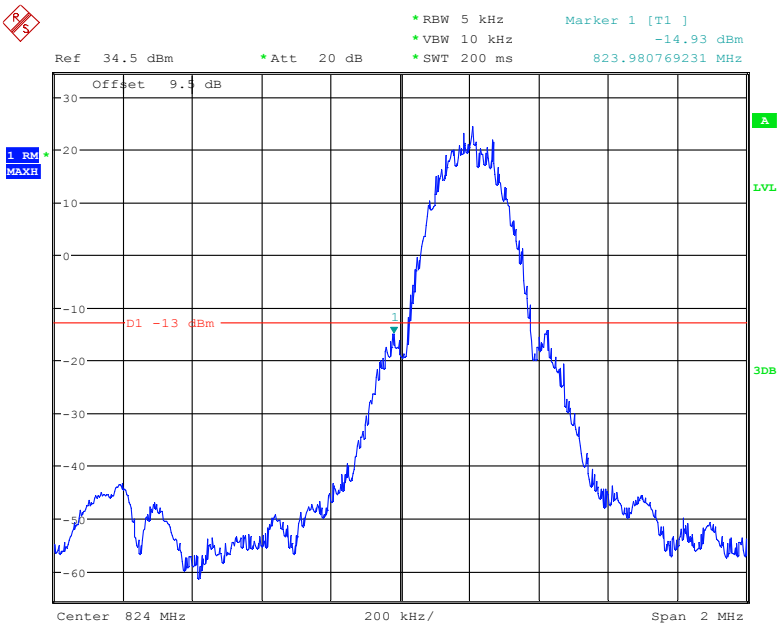
Temperature:	24~25 ℃
Relative Humidity:	52~56 %
ATM Pressure:	101.0 kPa

The testing was performed by George Zhong from 2019-11-27 to 2019-11-30.

EUT operation mode: Transmitting

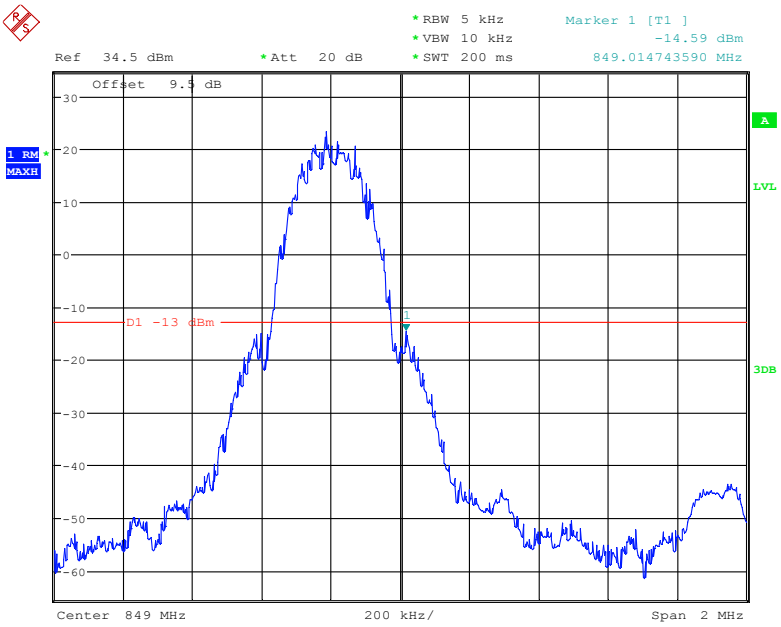
Test Result: Compliance. Please refer to the following plots.

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



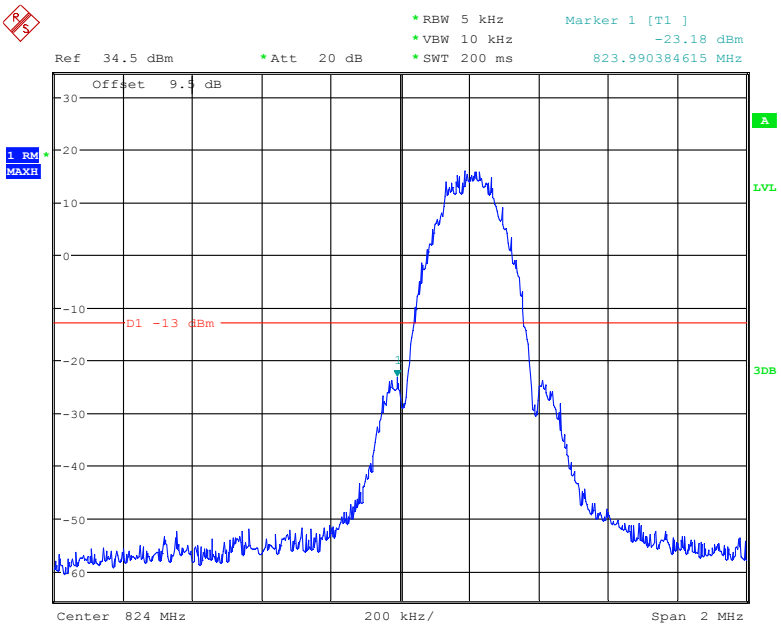
Date: 27.NOV.2019 21:10:49

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



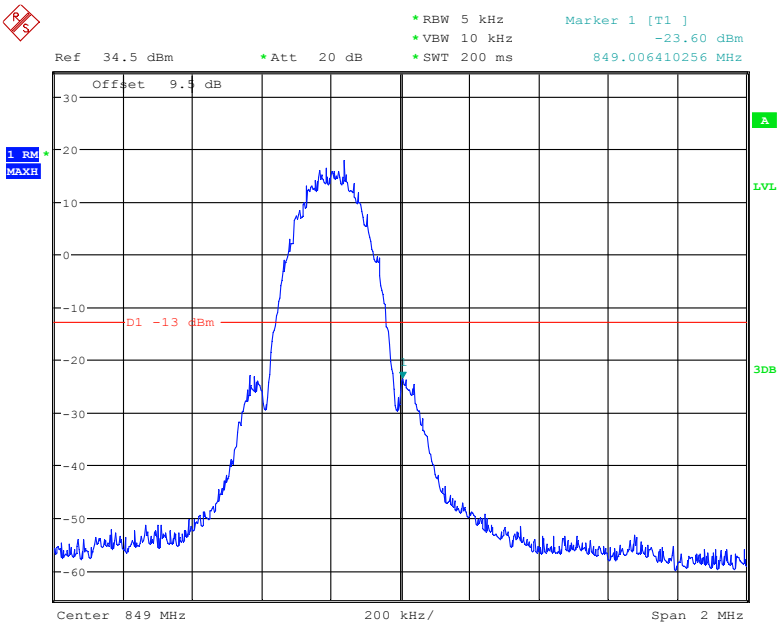
Date: 27.NOV.2019 21:11:35

Cellular Band, Left Band Edge for EDGE Mode



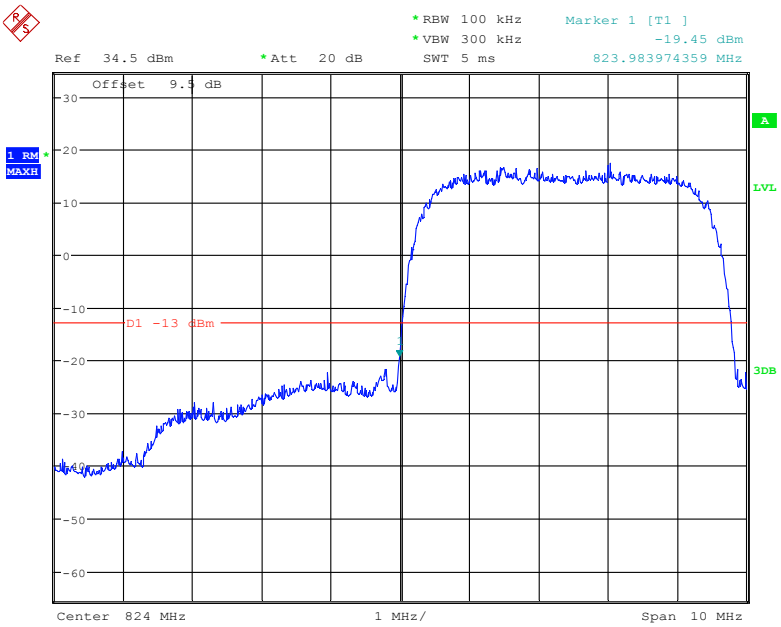
Date: 27.NOV.2019 21:32:09

Cellular Band, Right Band Edge for EDGE Mode



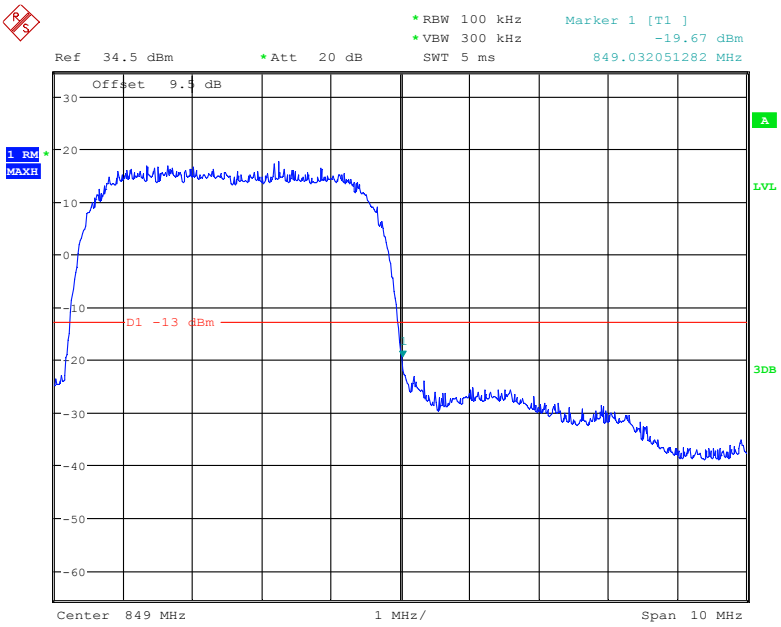
Date: 27.NOV.2019 21:33:17

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



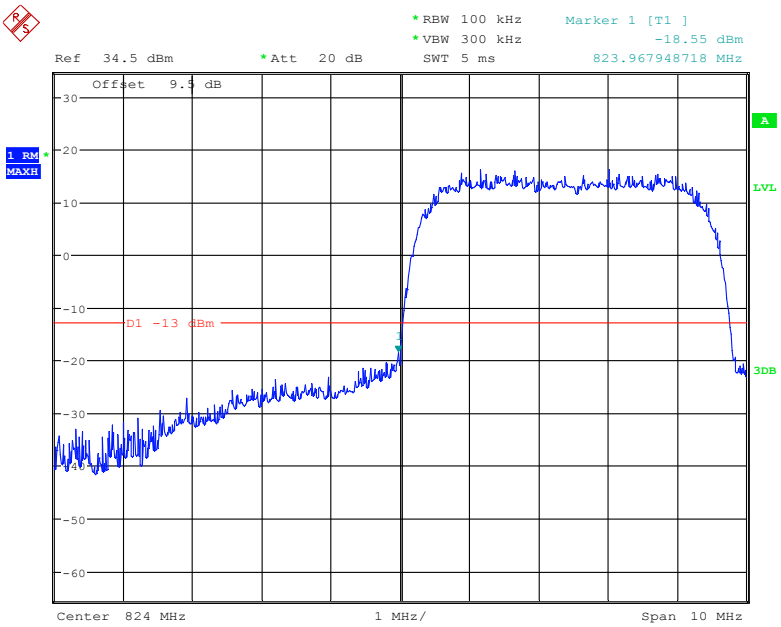
Date: 27.NOV.2019 22:36:14

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



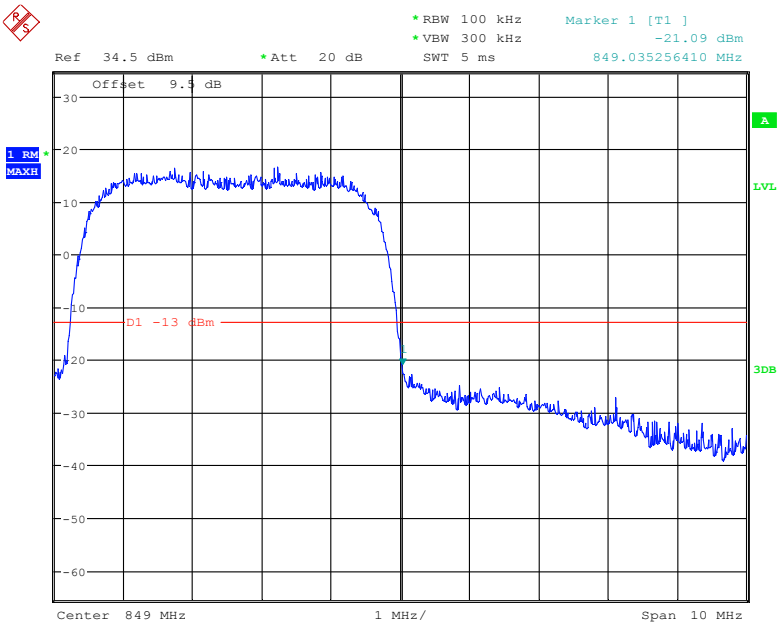
Date: 27.NOV.2019 22:37:00

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



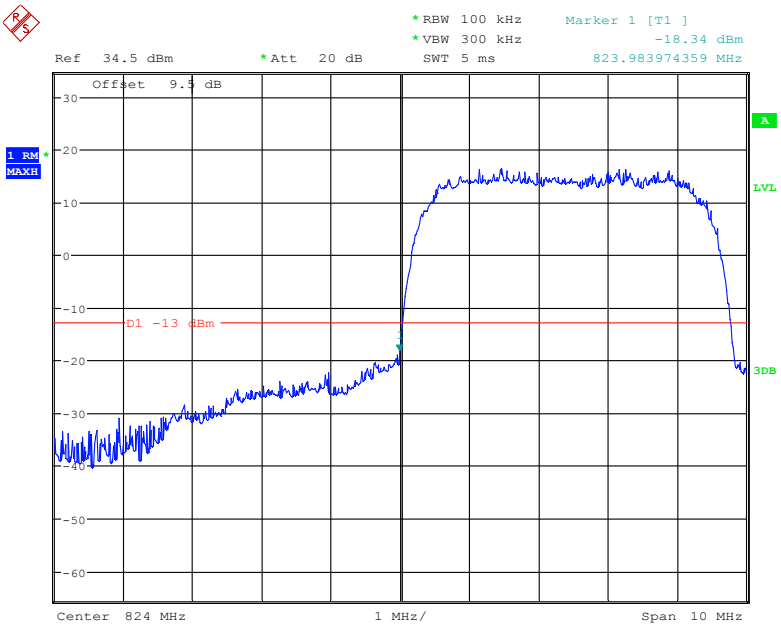
Date: 27.NOV.2019 22:32:11

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



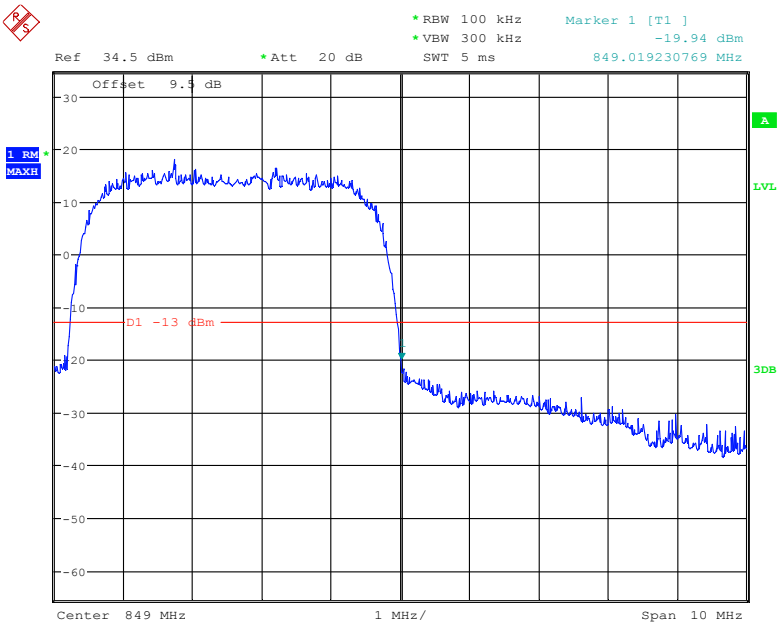
Date: 27.NOV.2019 22:33:04

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



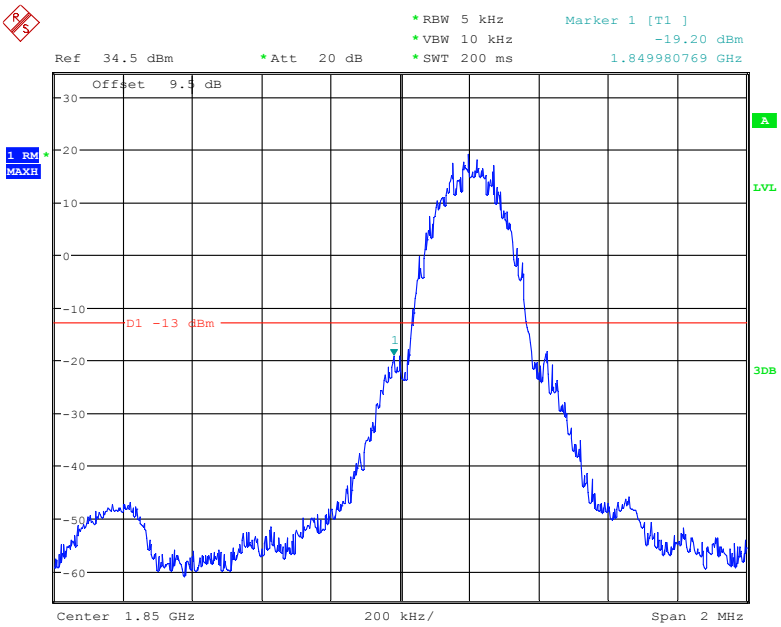
Date: 27.NOV.2019 22:35:15

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



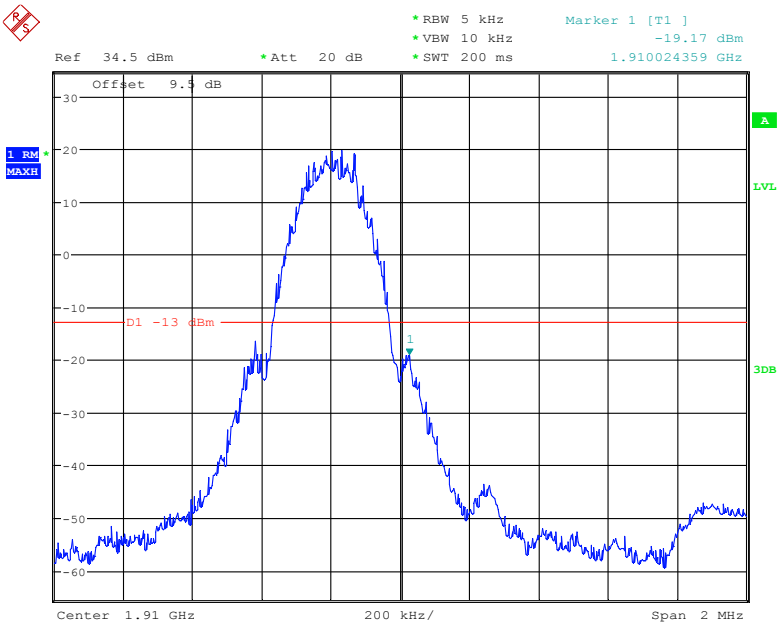
Date: 27.NOV.2019 22:34:09

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



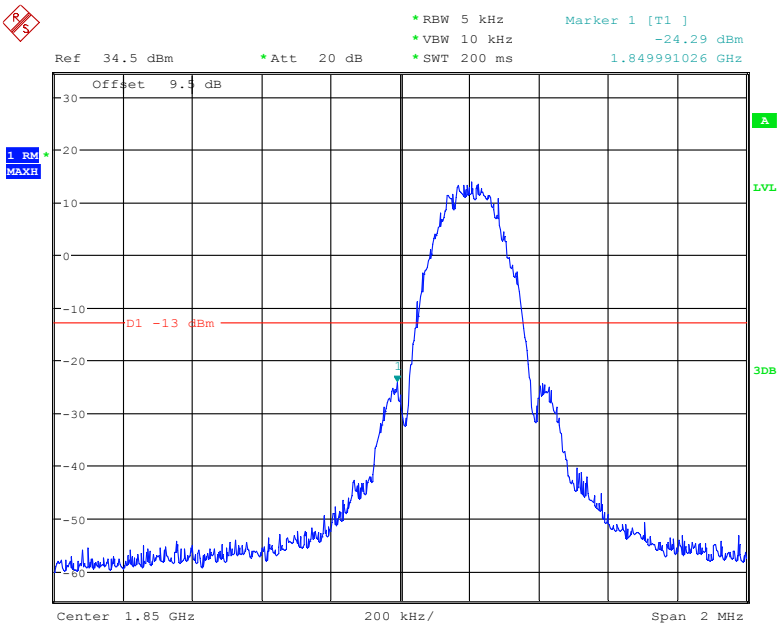
Date: 27.NOV.2019 21:15:54

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



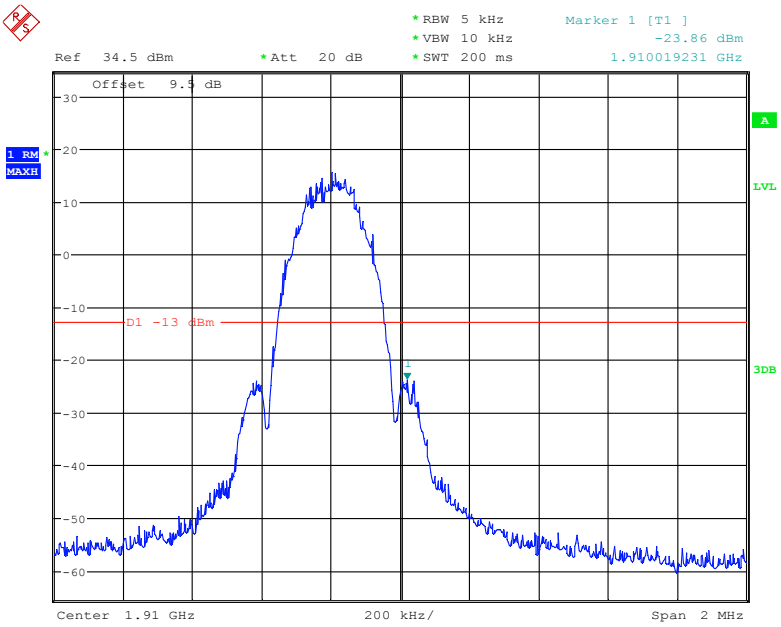
Date: 27.NOV.2019 21:15:22

PCS Band, Left Band Edge for EDGE Mode



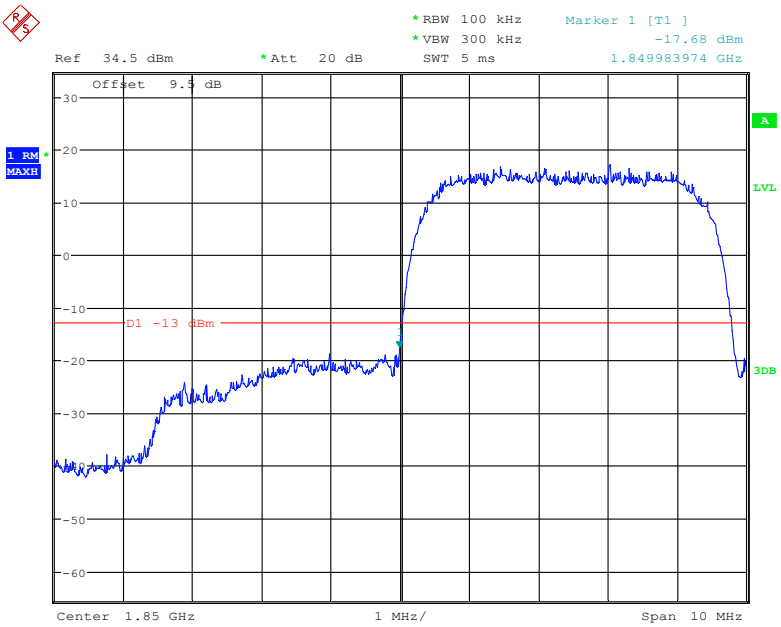
Date: 27.NOV.2019 21:28:03

PCS Band, Right Band Edge for EDGE Mode



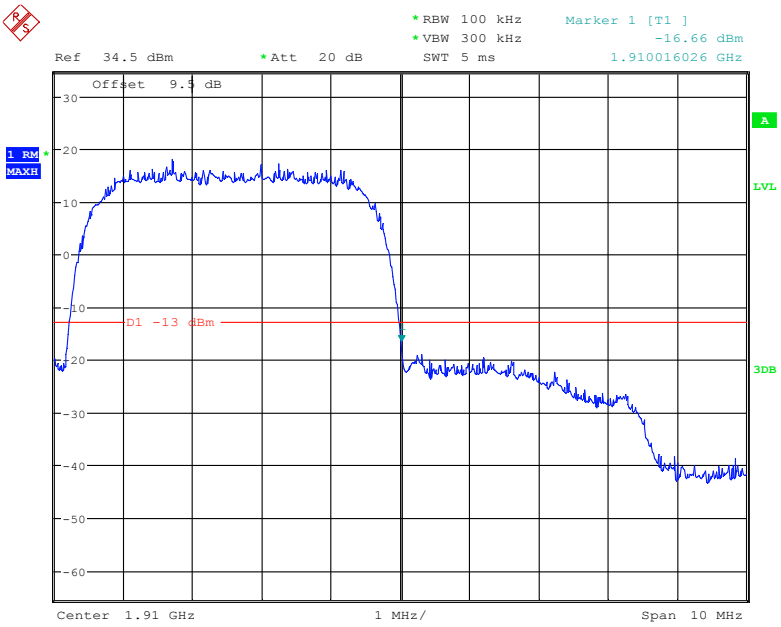
Date: 27.NOV.2019 21:29:30

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



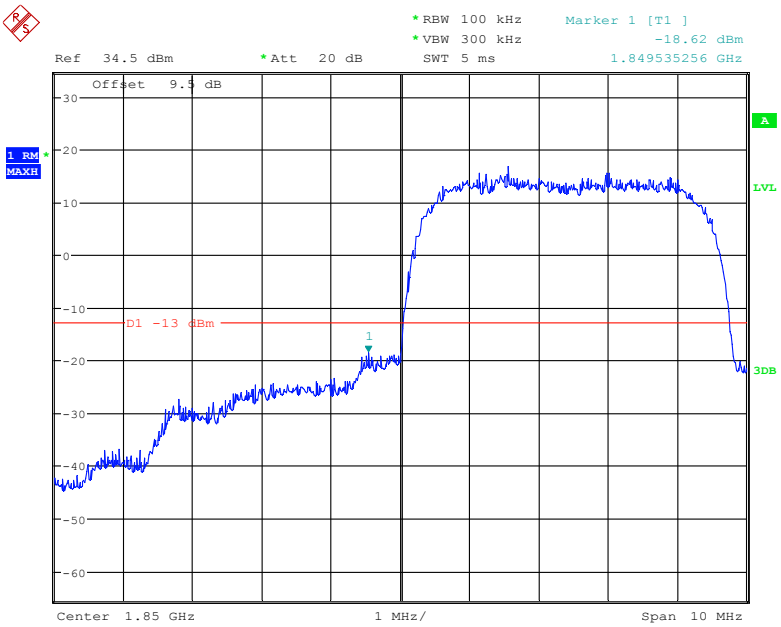
Date: 27.NOV.2019 22:29:39

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



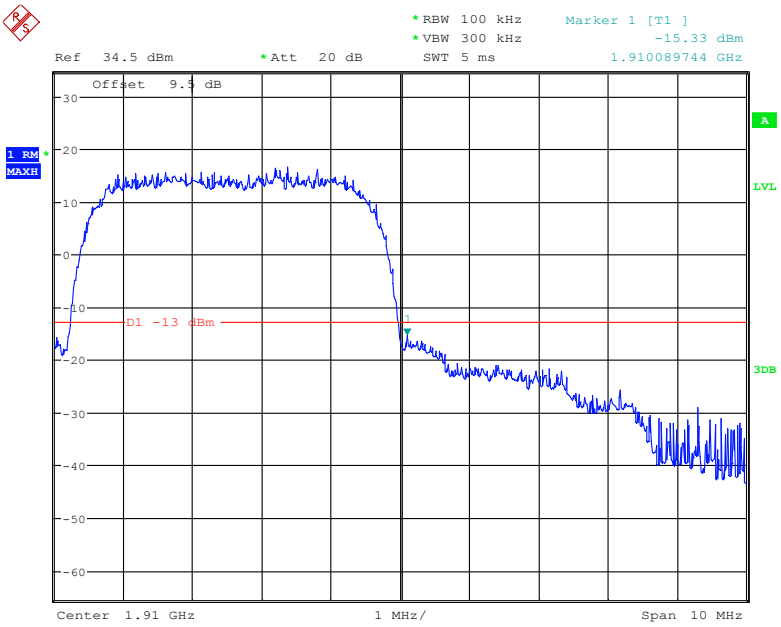
Date: 27.NOV.2019 22:30:32

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



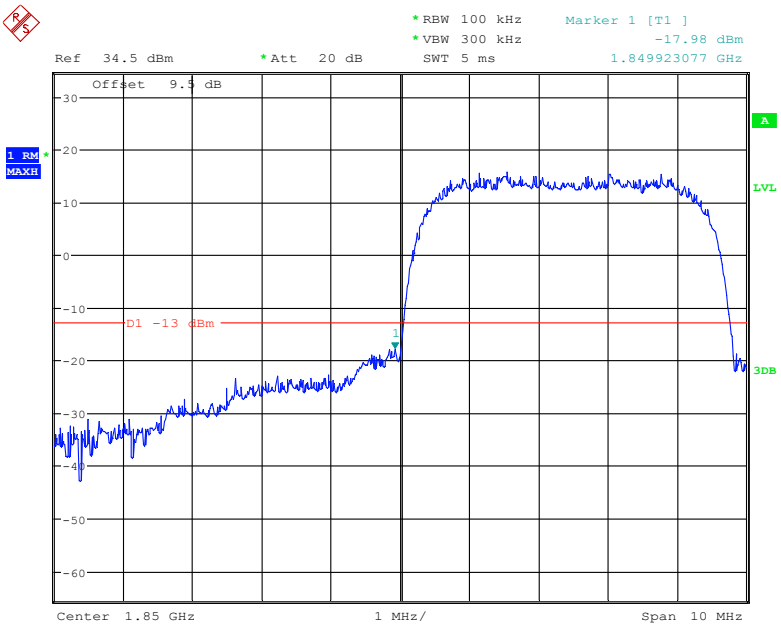
Date: 27.NOV.2019 22:28:33

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



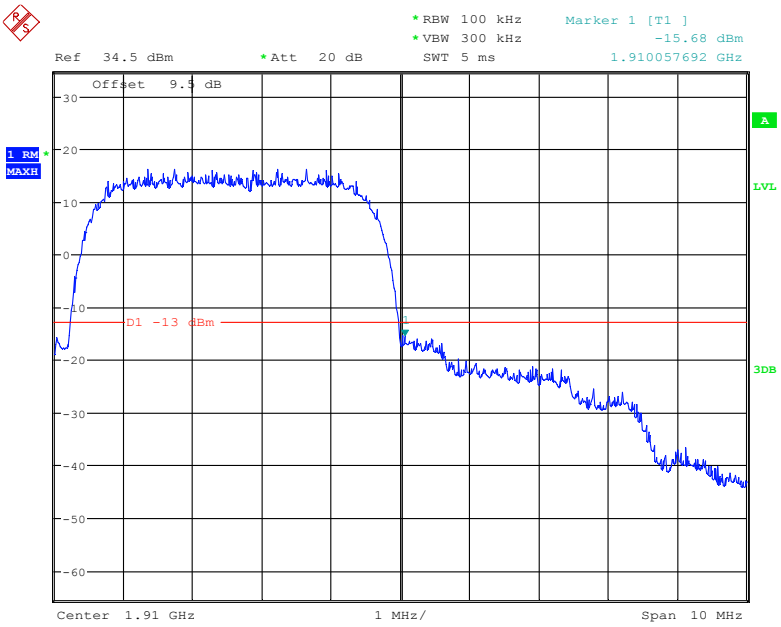
Date: 27.NOV.2019 22:27:37

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



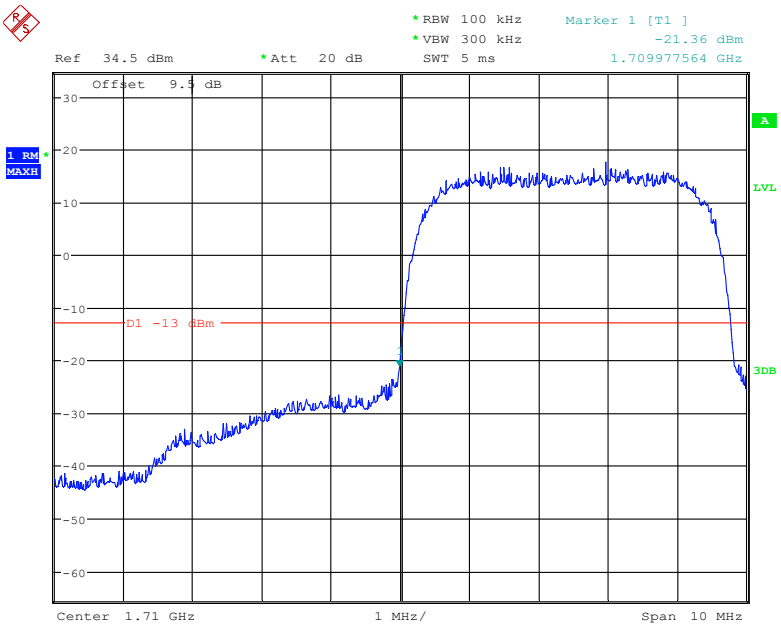
Date: 27.NOV.2019 22:25:14

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



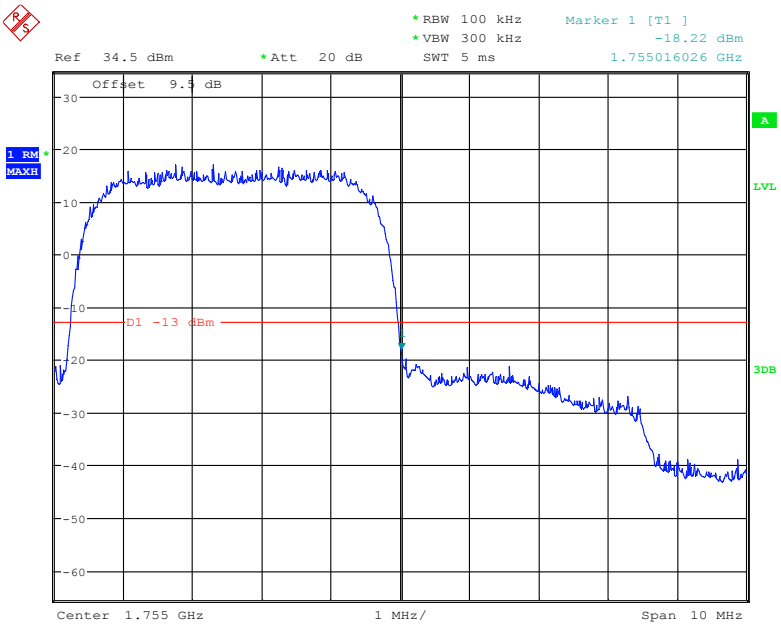
Date: 27.NOV.2019 22:26:16

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



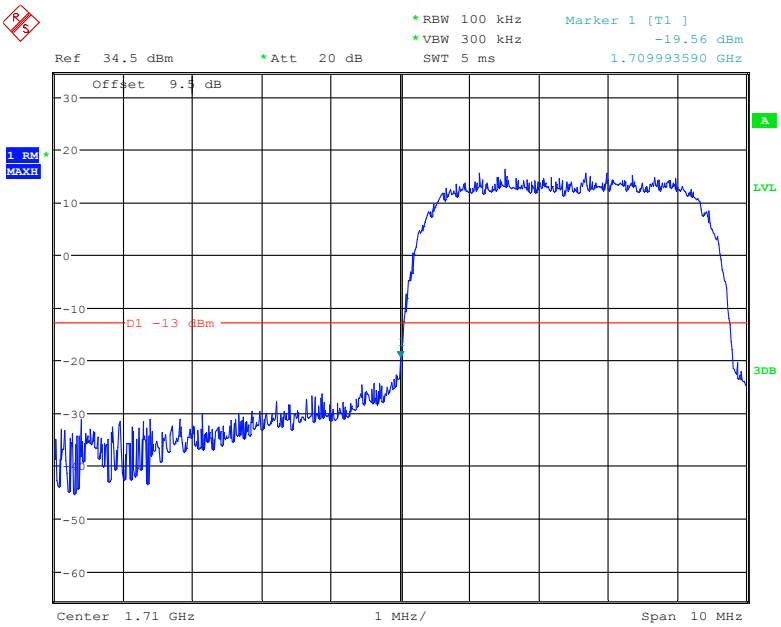
Date: 27.NOV.2019 21:53:17

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



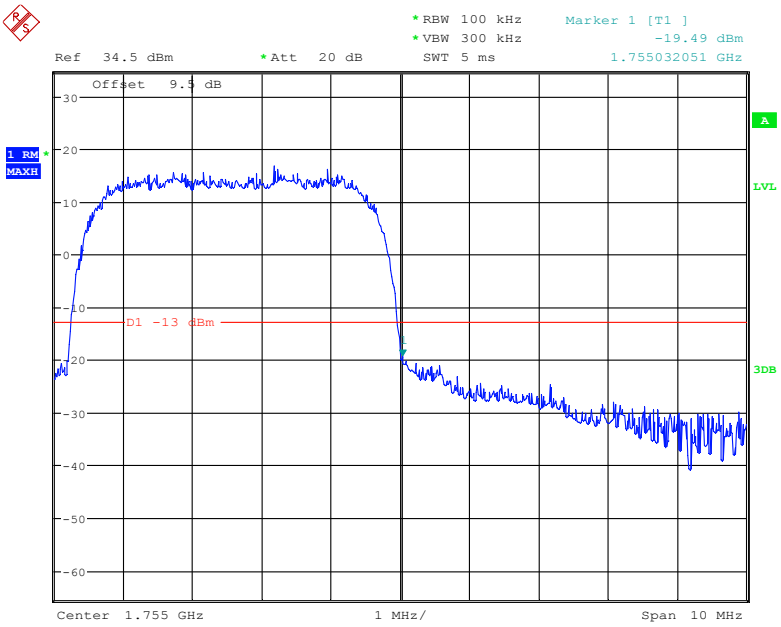
Date: 27.NOV.2019 21:54:34

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



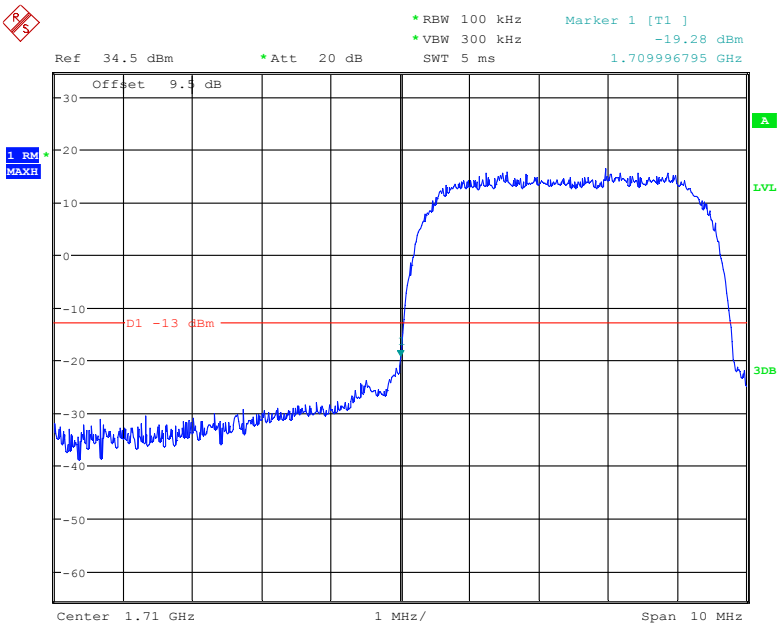
Date: 27.NOV.2019 21:52:06

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



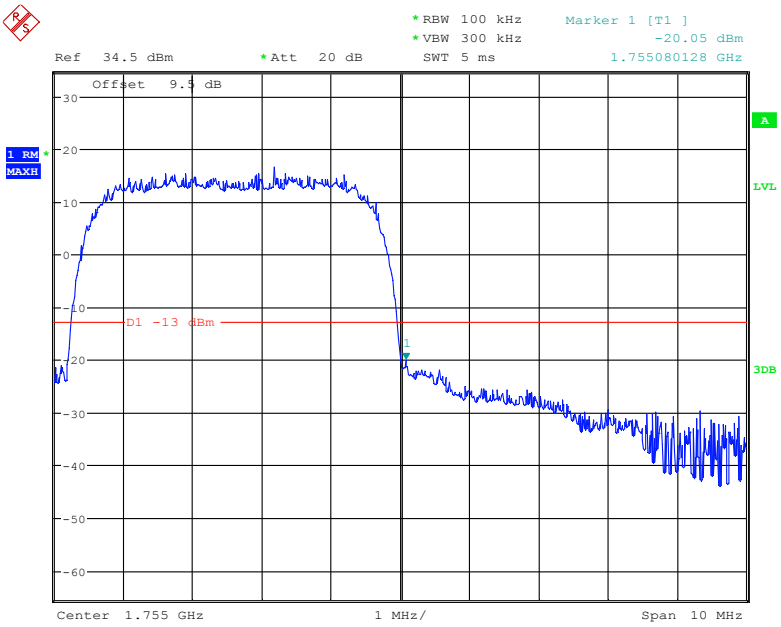
Date: 27.NOV.2019 21:51:02

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



Date: 27.NOV.2019 21:48:38

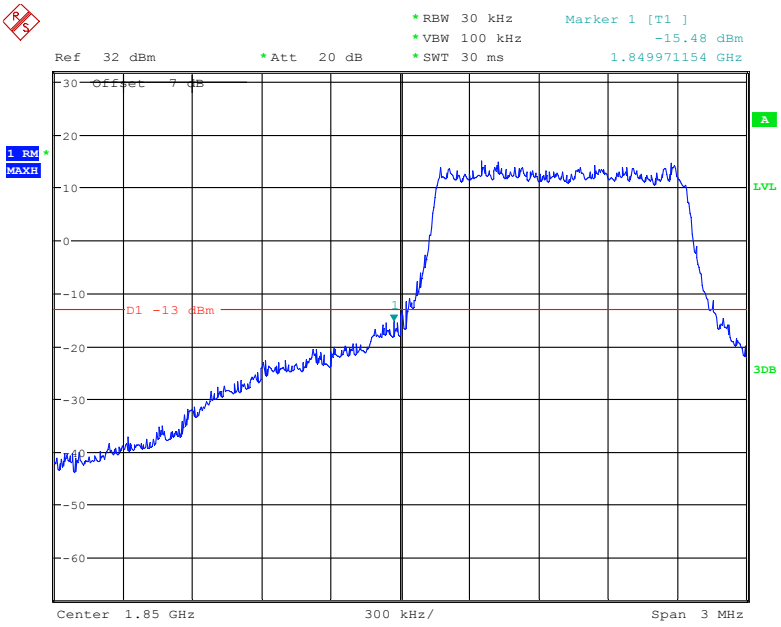
AWS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 27.NOV.2019 21:49:37

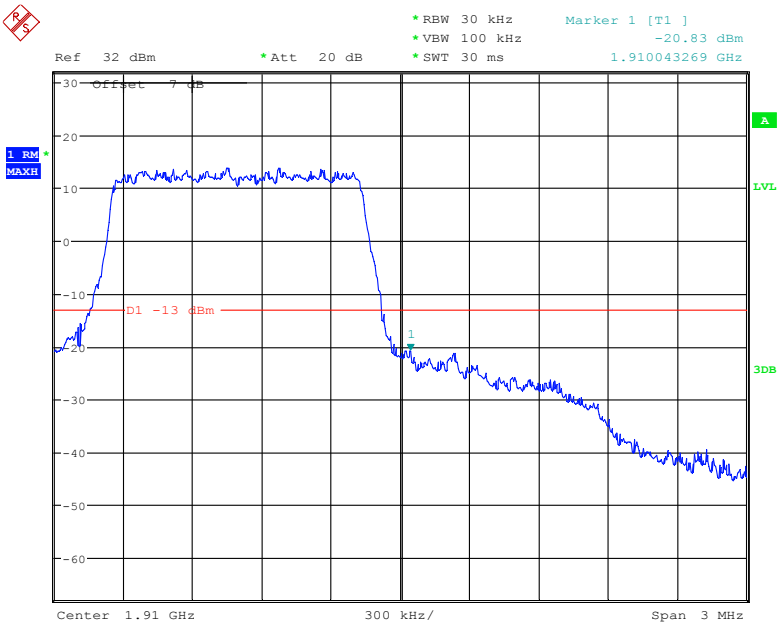
Band 2:

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



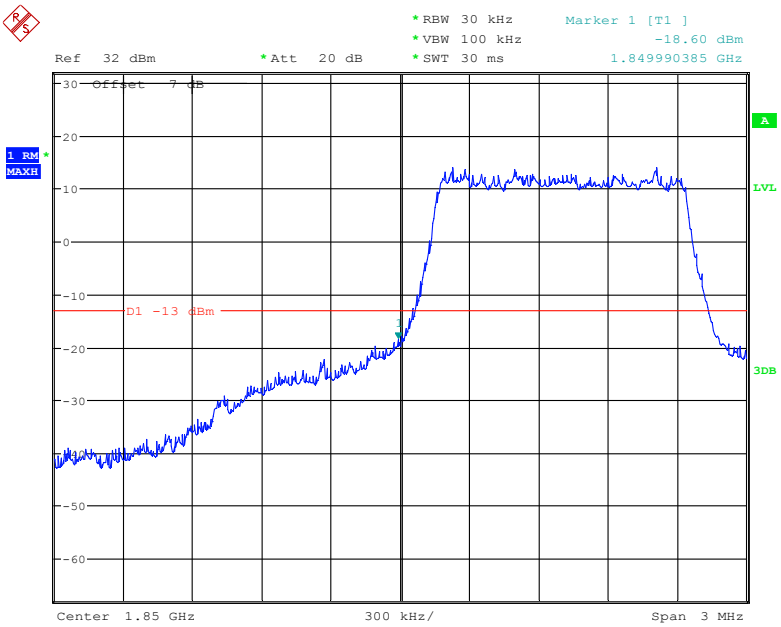
Date: 30.NOV.2019 15:06:09

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



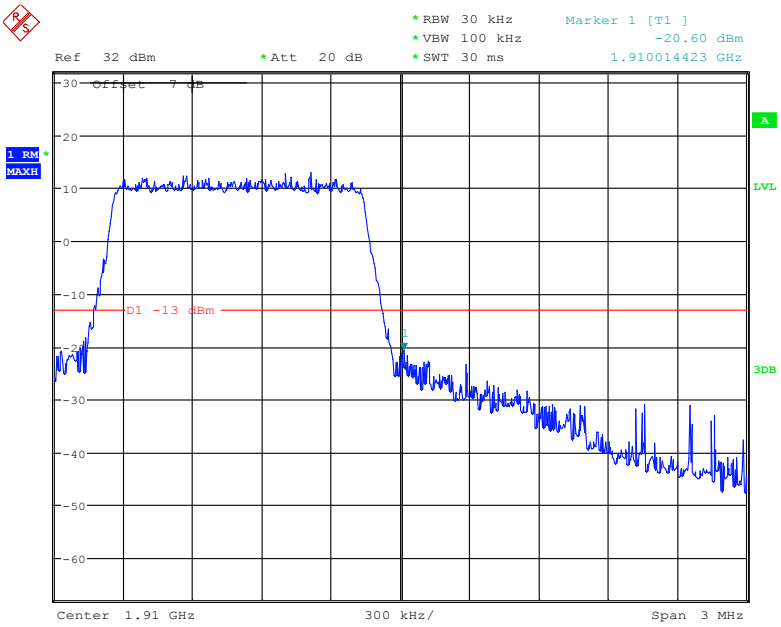
Date: 30.NOV.2019 15:09:03

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



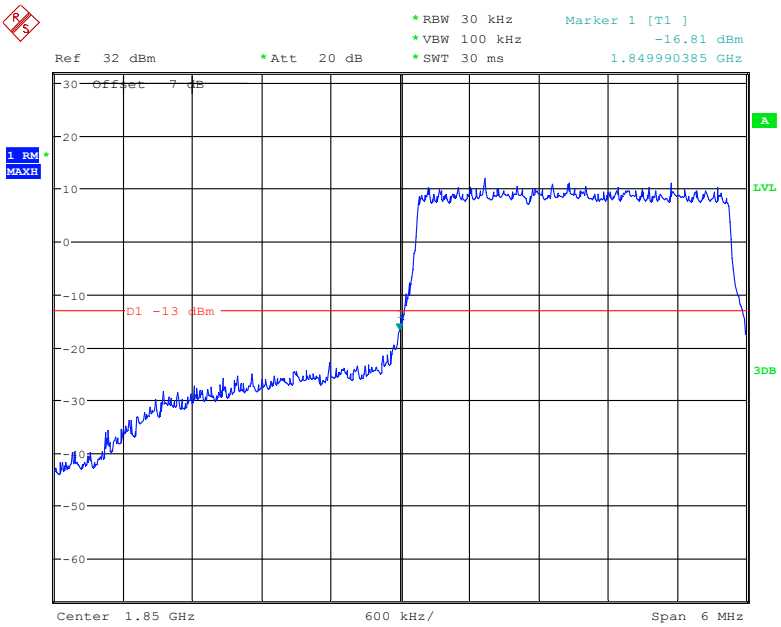
Date: 30.NOV.2019 15:07:30

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



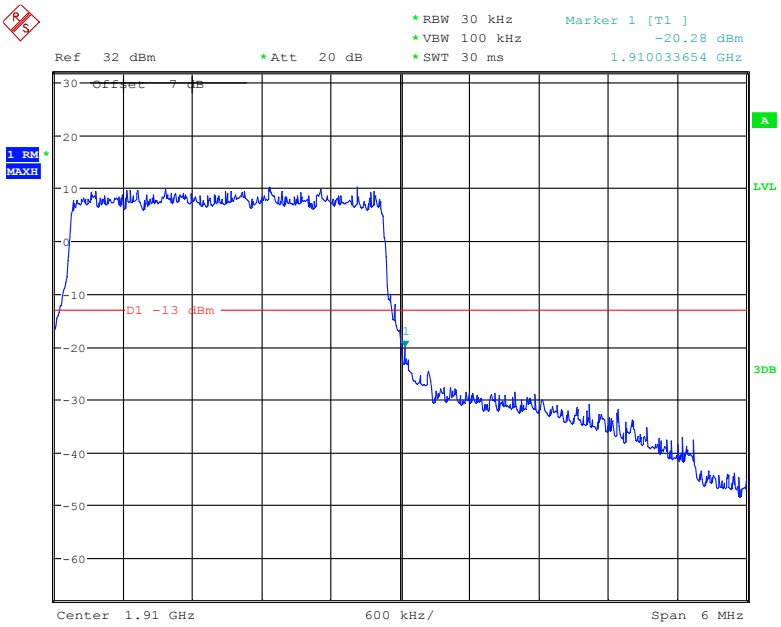
Date: 30.NOV.2019 15:08:19

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



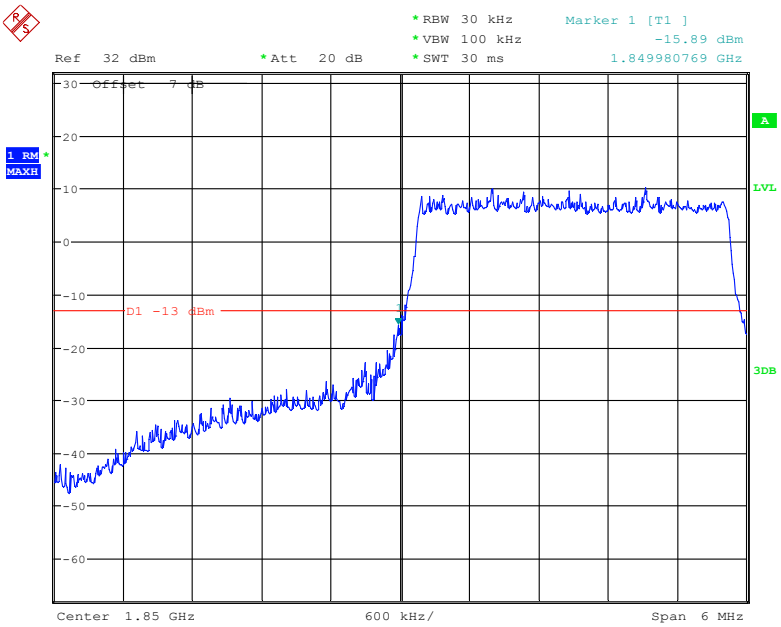
Date: 30.NOV.2019 15:12:55

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



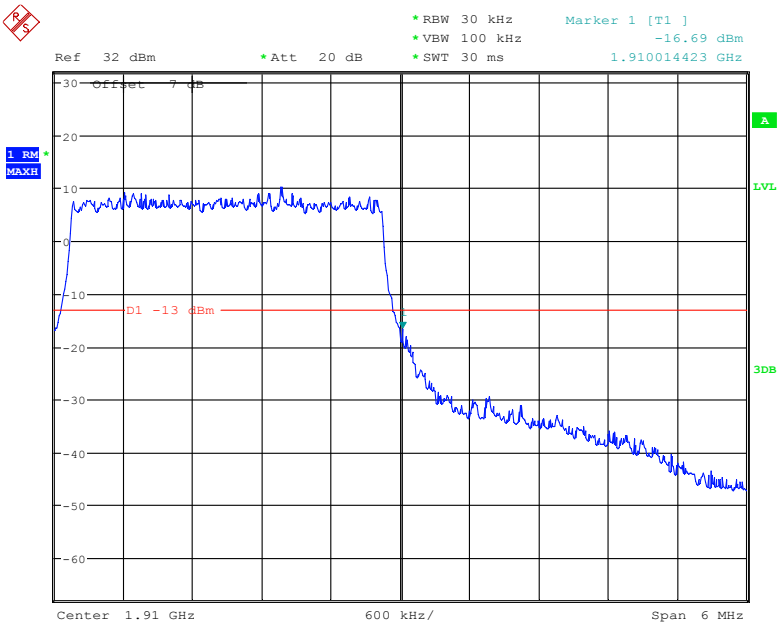
Date: 30.NOV.2019 15:10:07

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



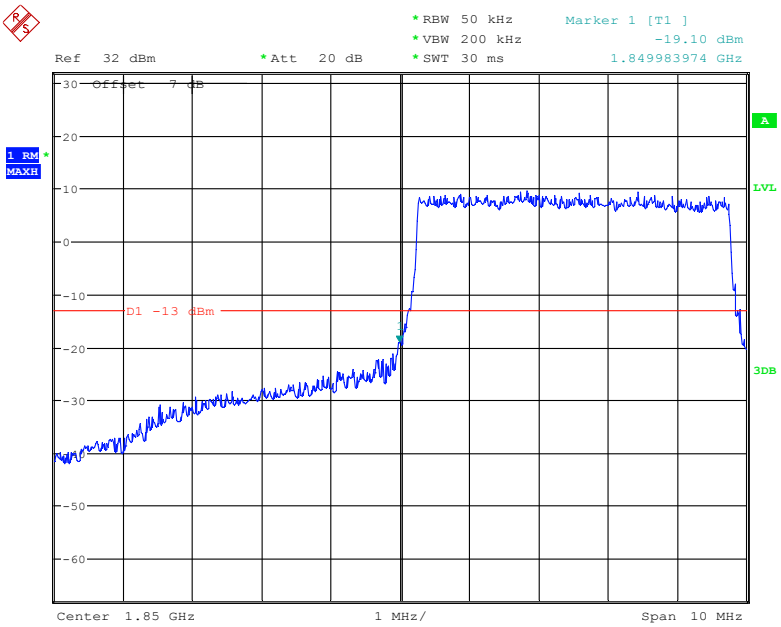
Date: 30.NOV.2019 15:12:00

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



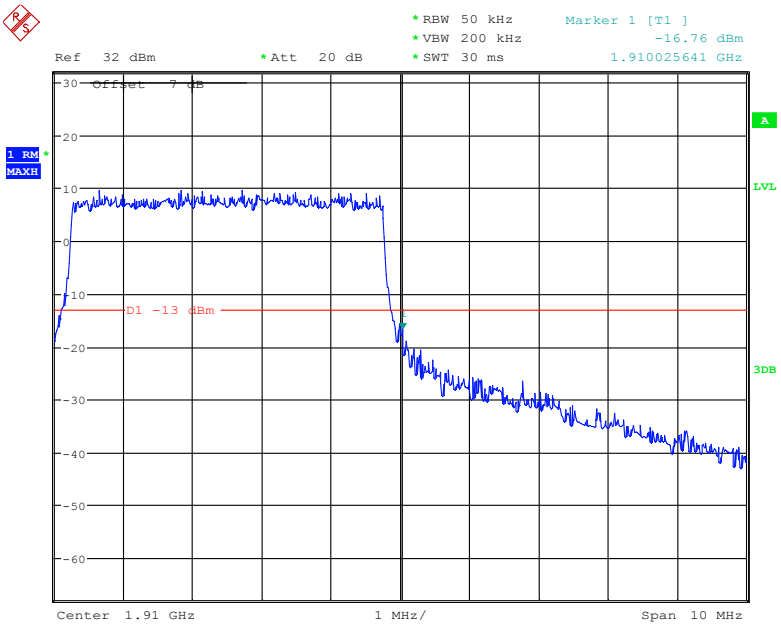
Date: 30.NOV.2019 15:10:55

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



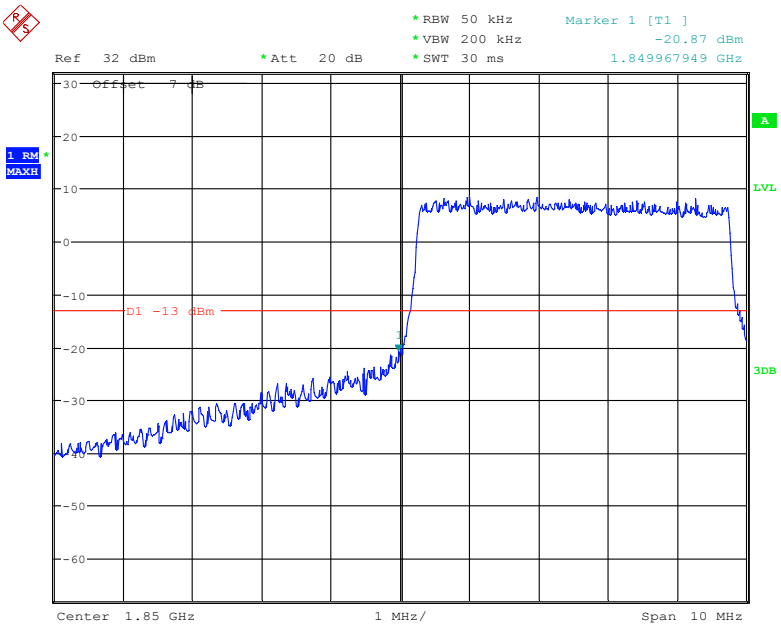
Date: 30.NOV.2019 15:13:53

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



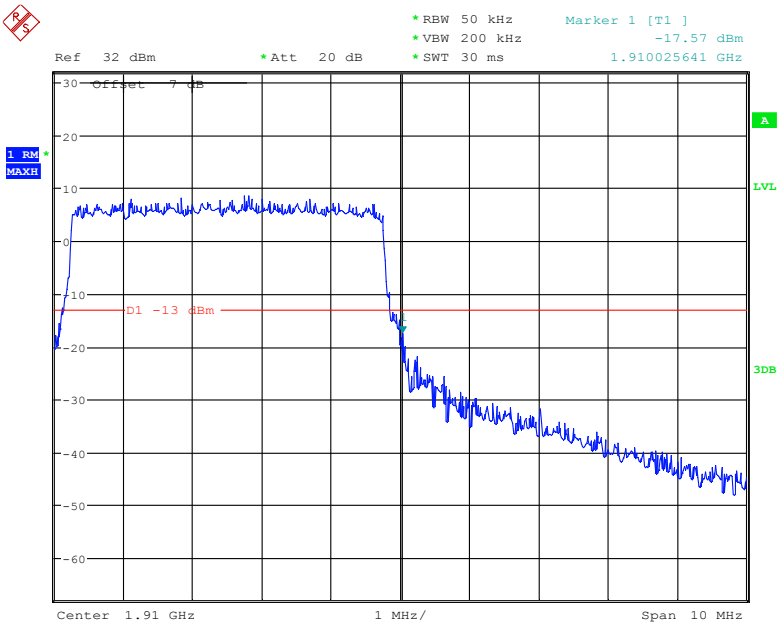
Date: 30.NOV.2019 15:16:15

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



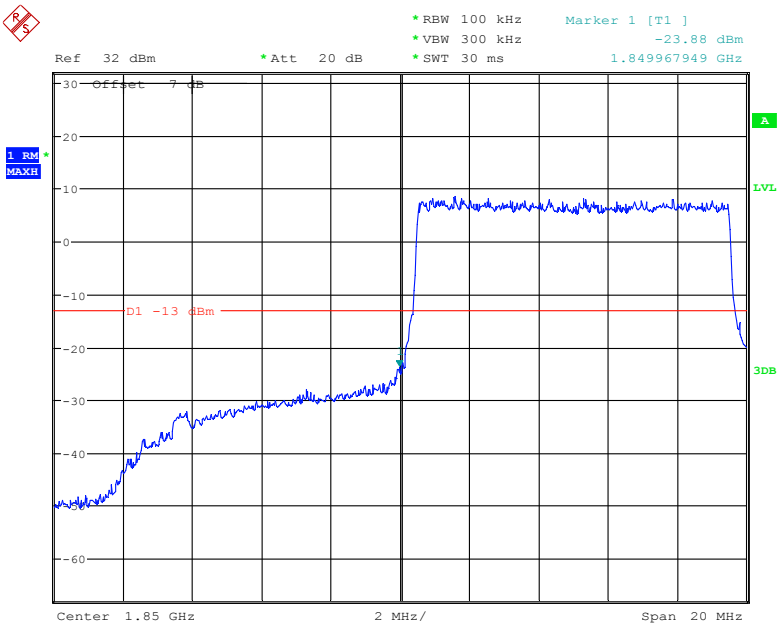
Date: 30.NOV.2019 15:14:38

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



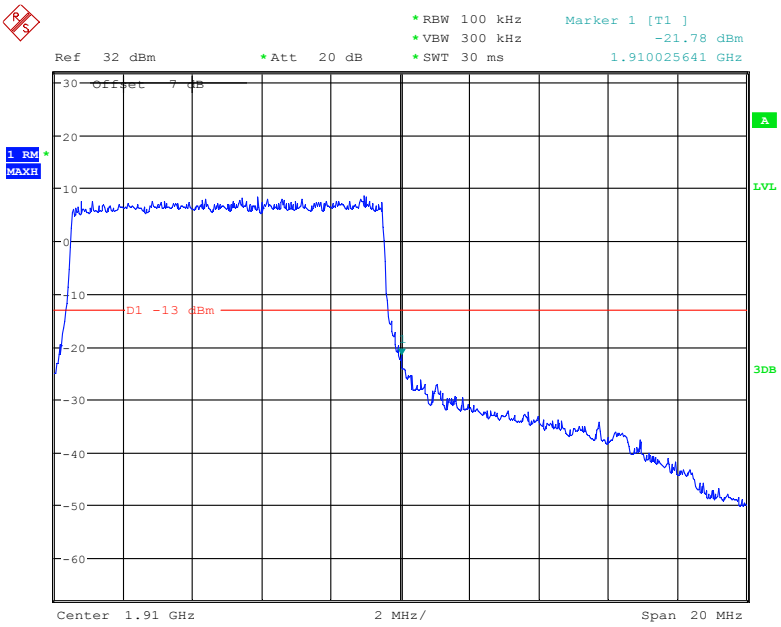
Date: 30.NOV.2019 15:15:40

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



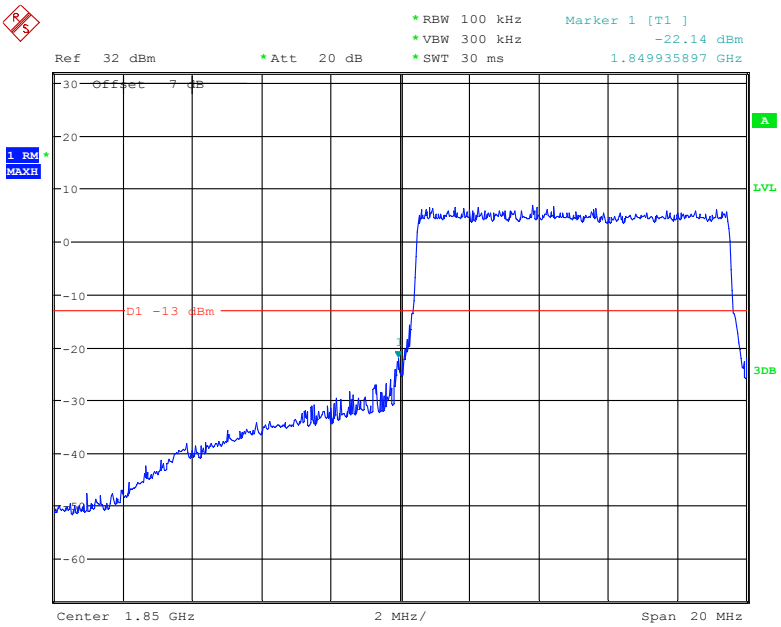
Date: 30.NOV.2019 15:20:21

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



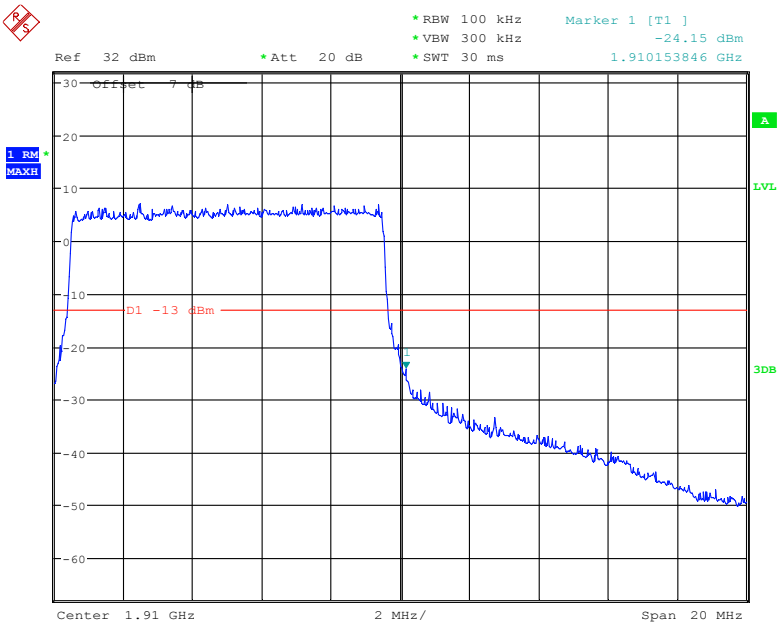
Date: 30.NOV.2019 15:17:37

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



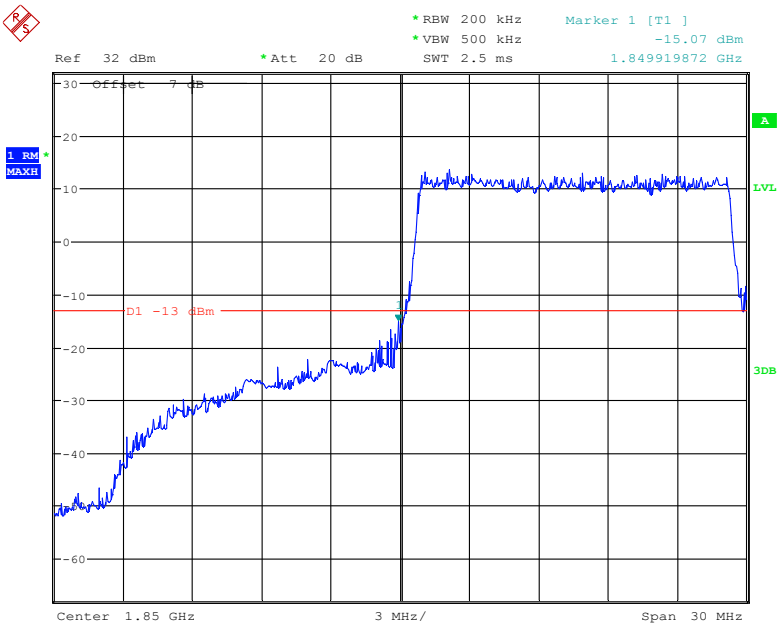
Date: 30.NOV.2019 15:19:40

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



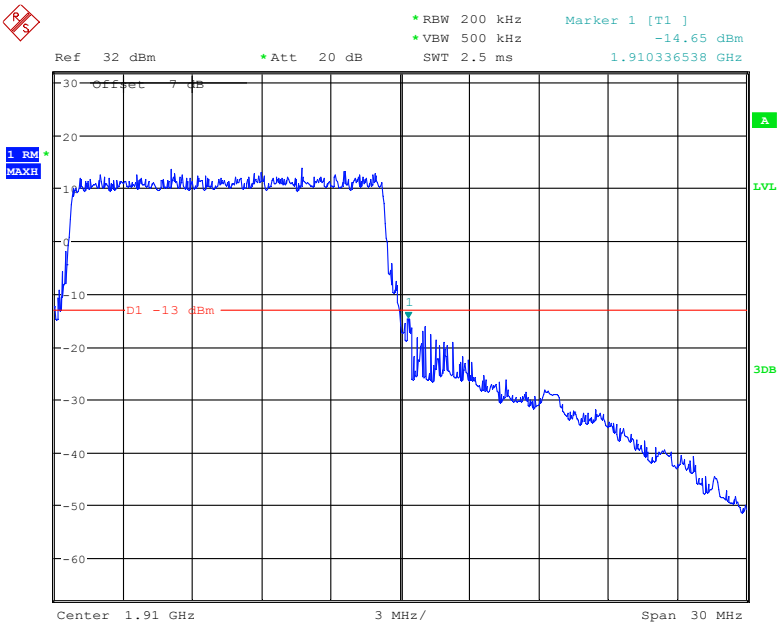
Date: 30.NOV.2019 15:18:56

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



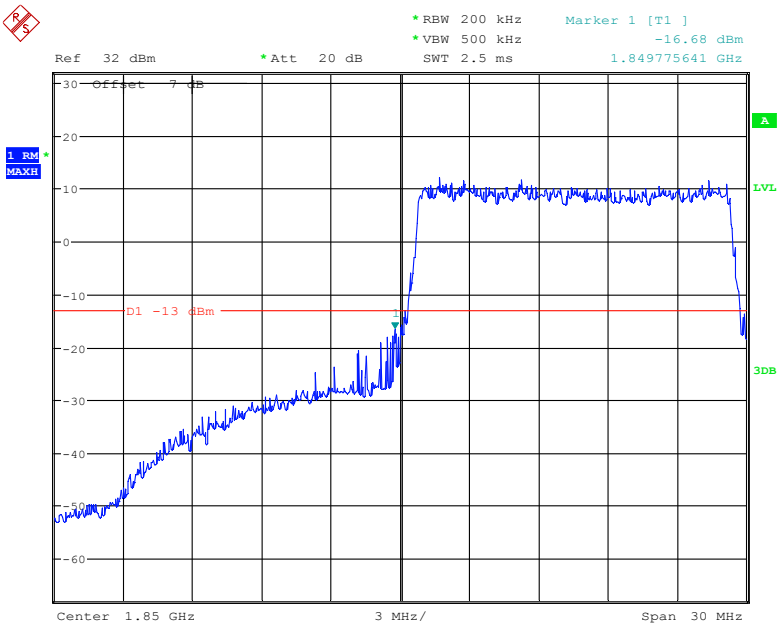
Date: 30.NOV.2019 15:21:50

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



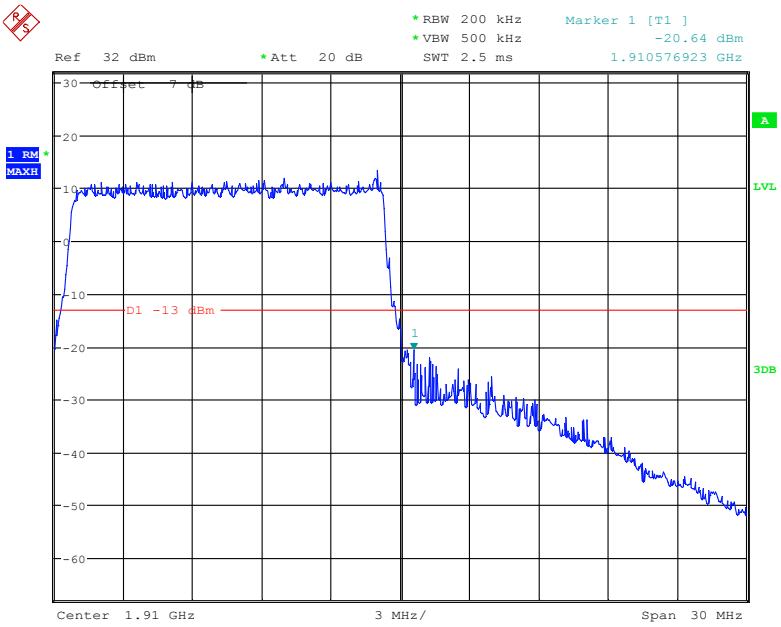
Date: 30.NOV.2019 15:24:34

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



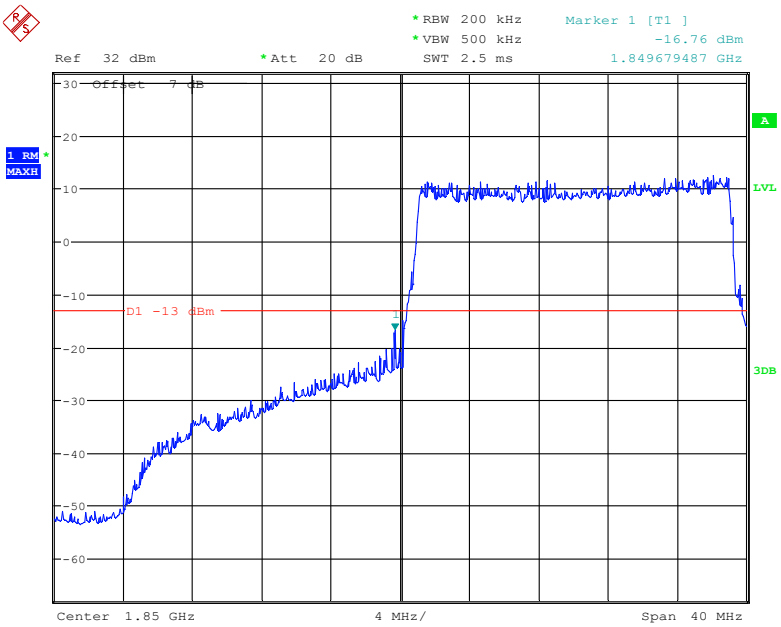
Date: 30.NOV.2019 15:22:37

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



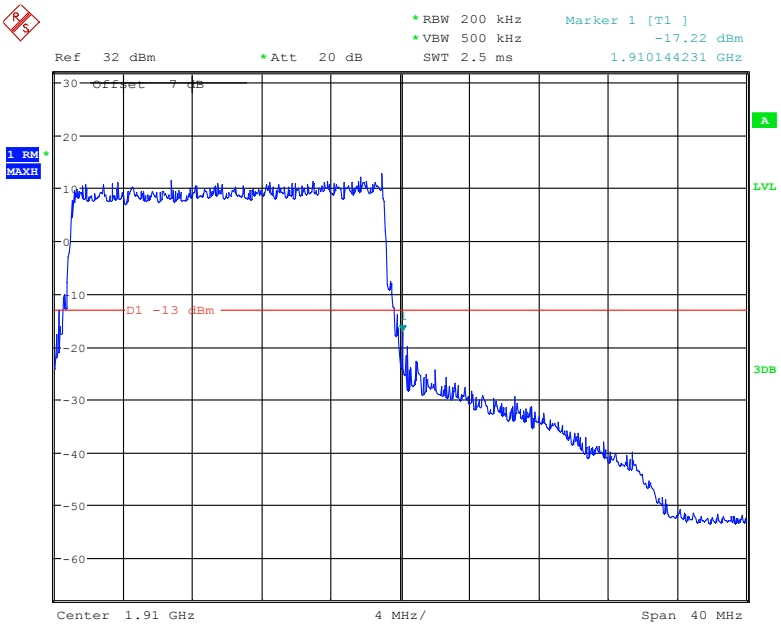
Date: 30.NOV.2019 15:23:40

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



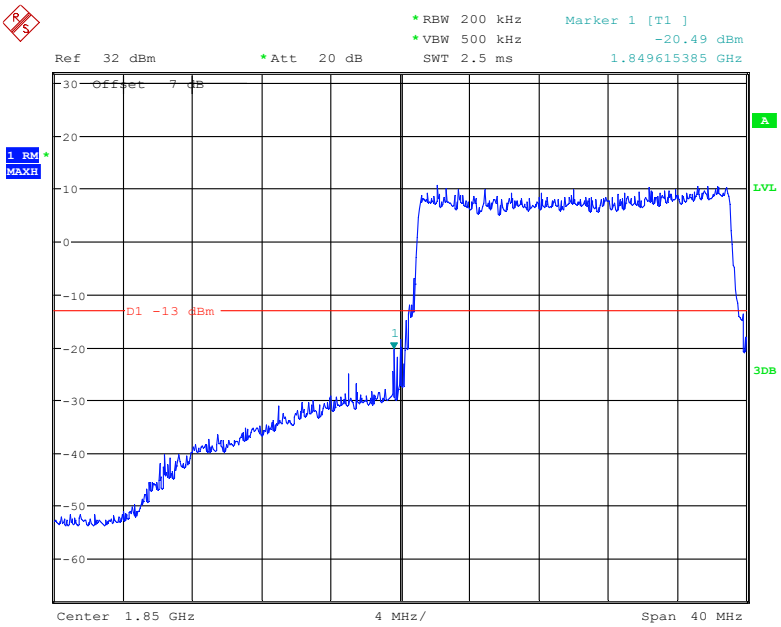
Date: 30.NOV.2019 15:27:33

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



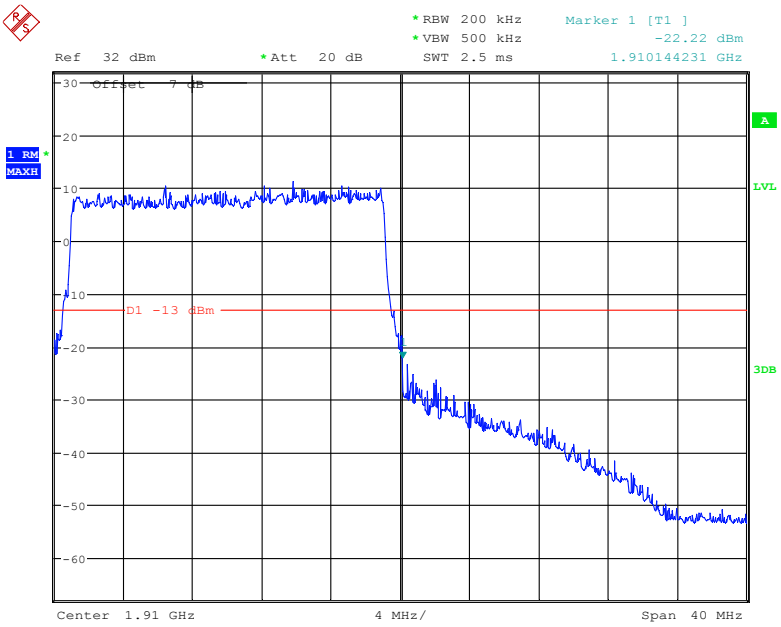
Date: 30.NOV.2019 15:25:31

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



Date: 30.NOV.2019 15:26:56

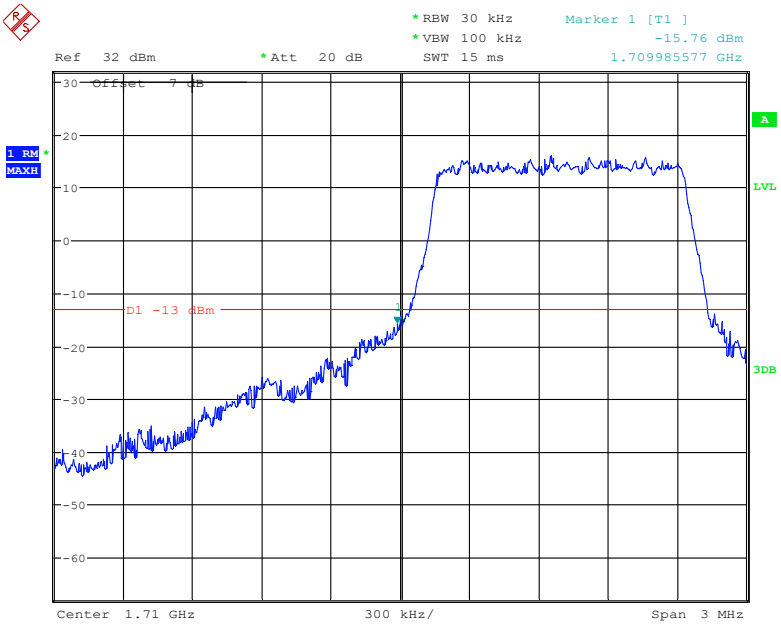
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 30.NOV.2019 15:26:09

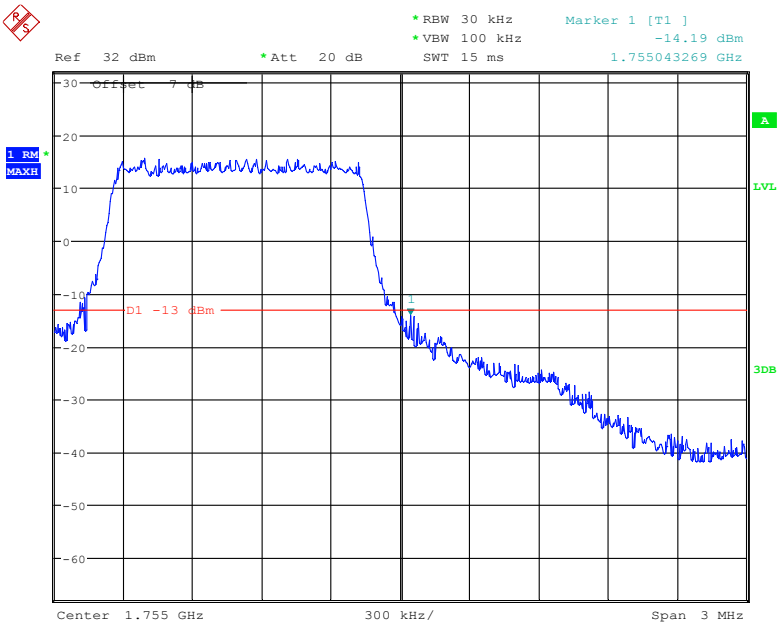
Band 4:

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



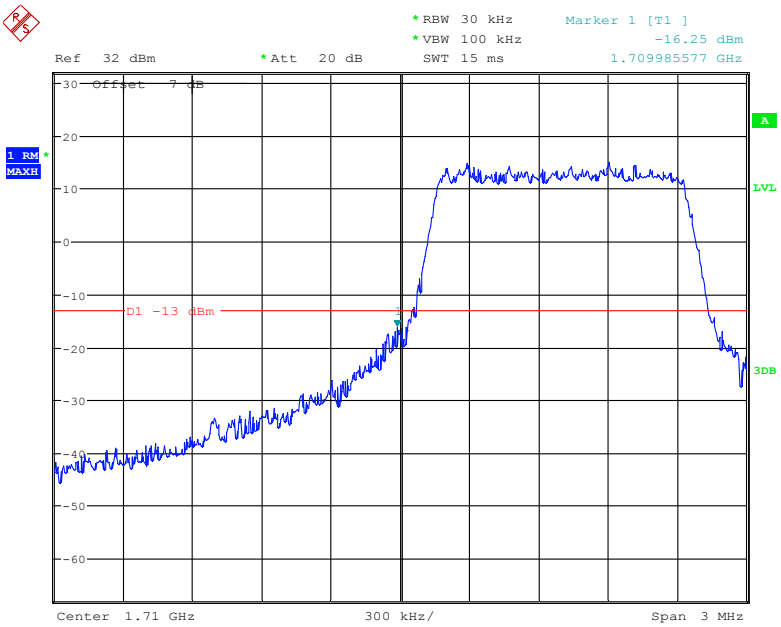
Date: 30.NOV.2019 16:08:33

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



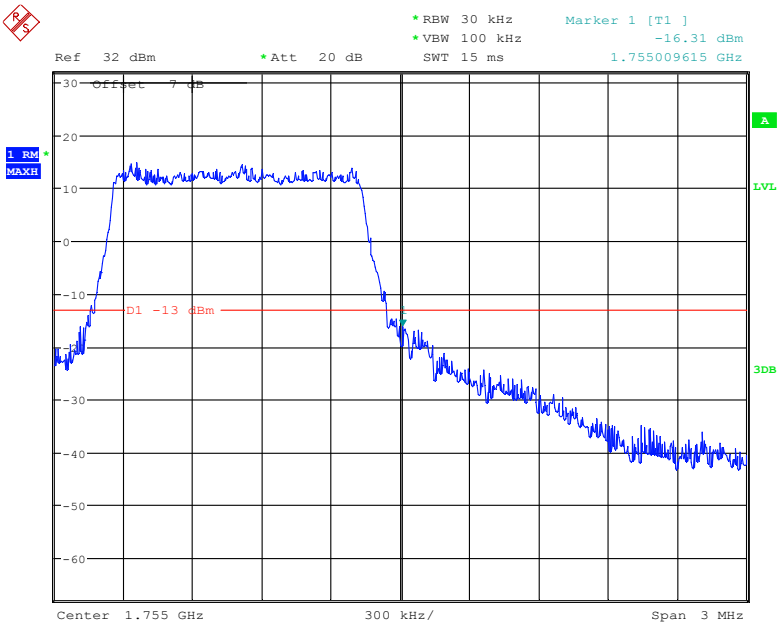
Date: 30.NOV.2019 16:10:43

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



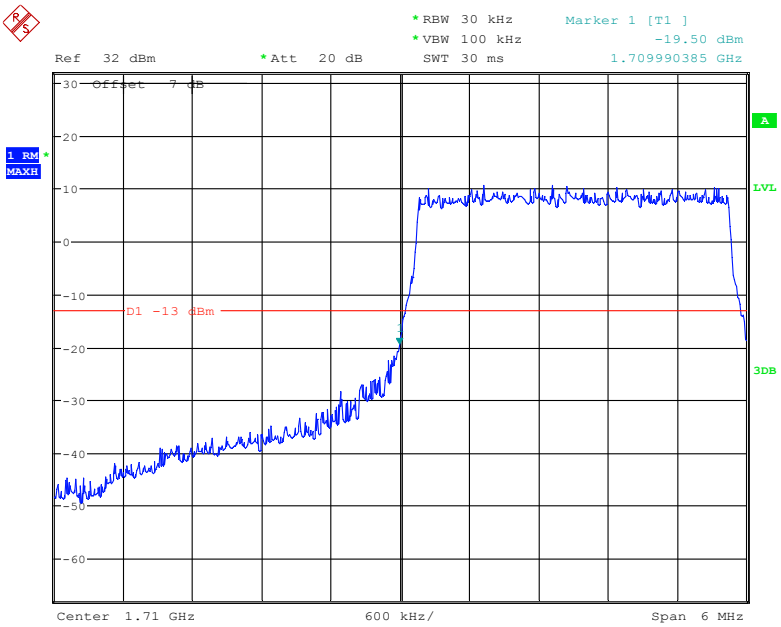
Date: 30.NOV.2019 16:09:31

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



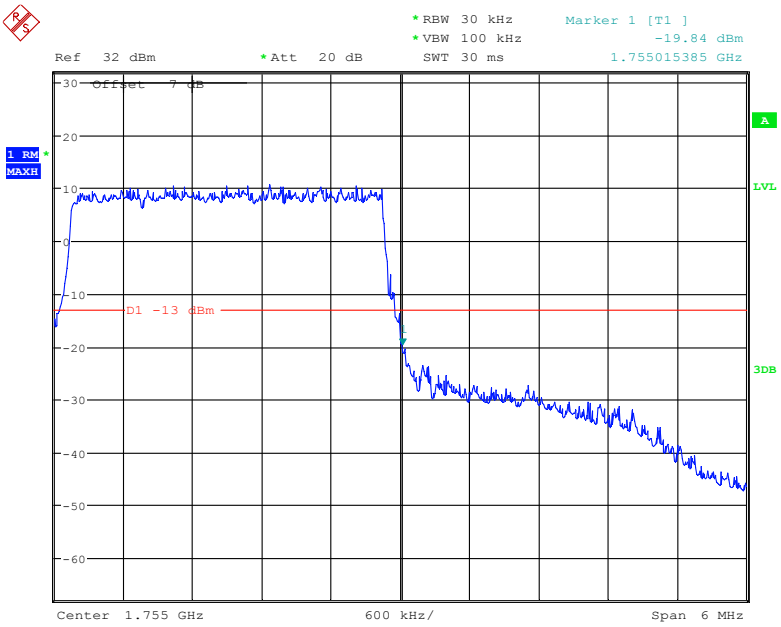
Date: 30.NOV.2019 16:10:08

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



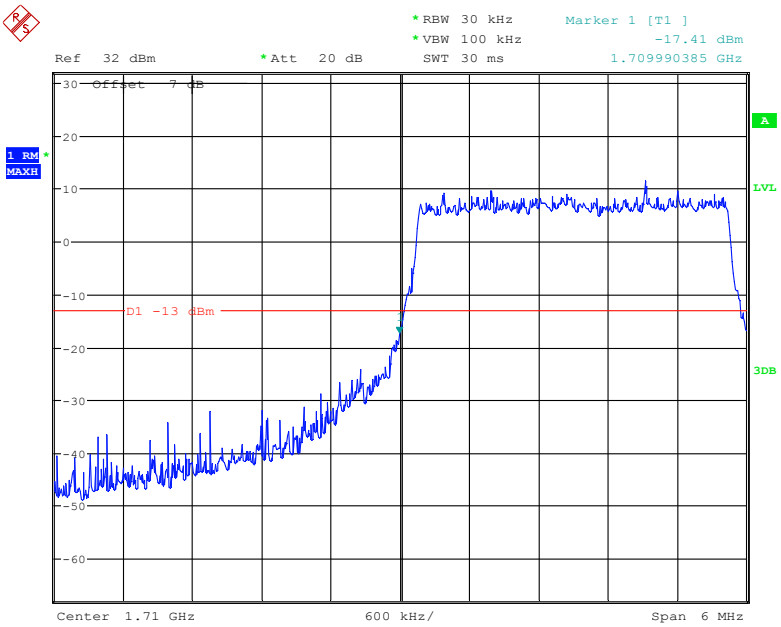
Date: 30.NOV.2019 16:13:19

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



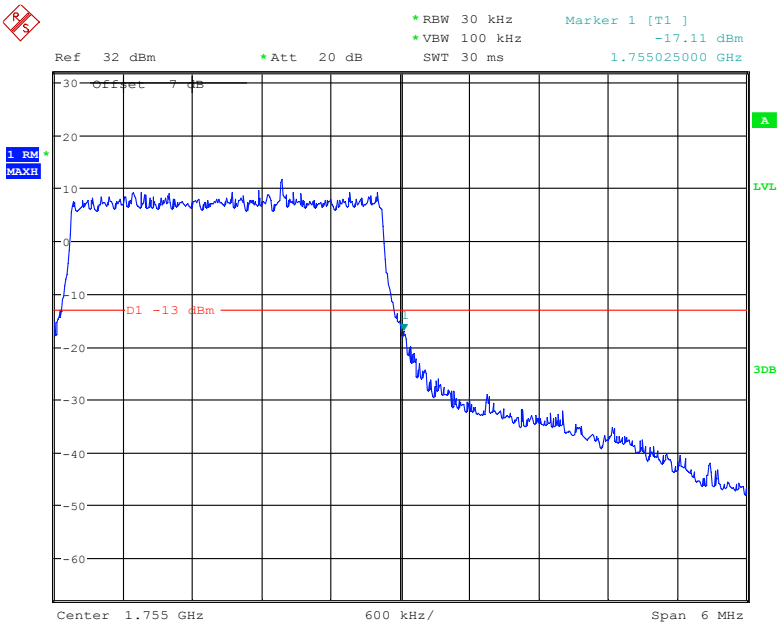
Date: 30.NOV.2019 16:11:43

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



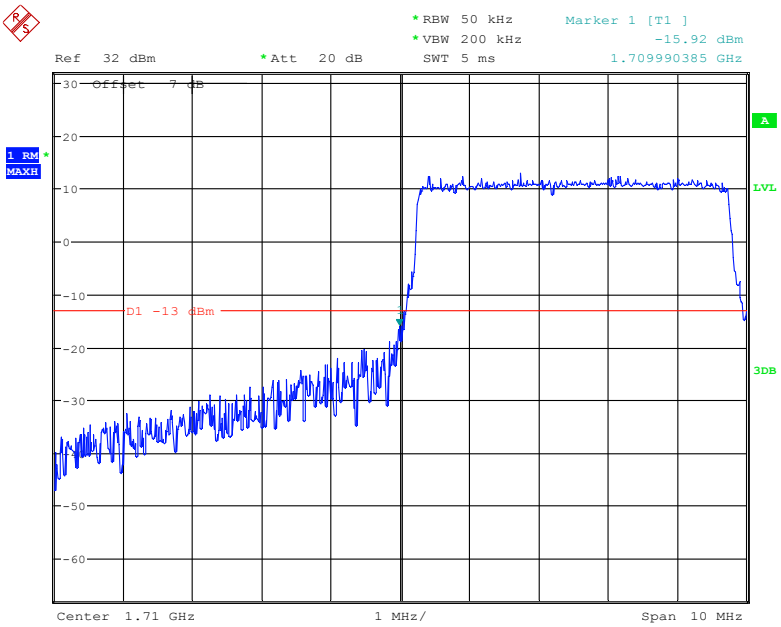
Date: 30.NOV.2019 16:12:53

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



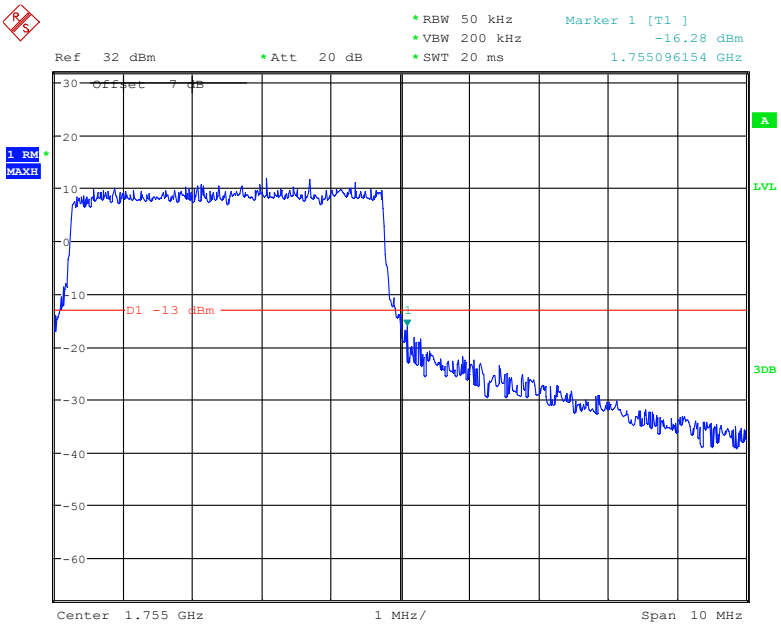
Date: 30.NOV.2019 16:12:18

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



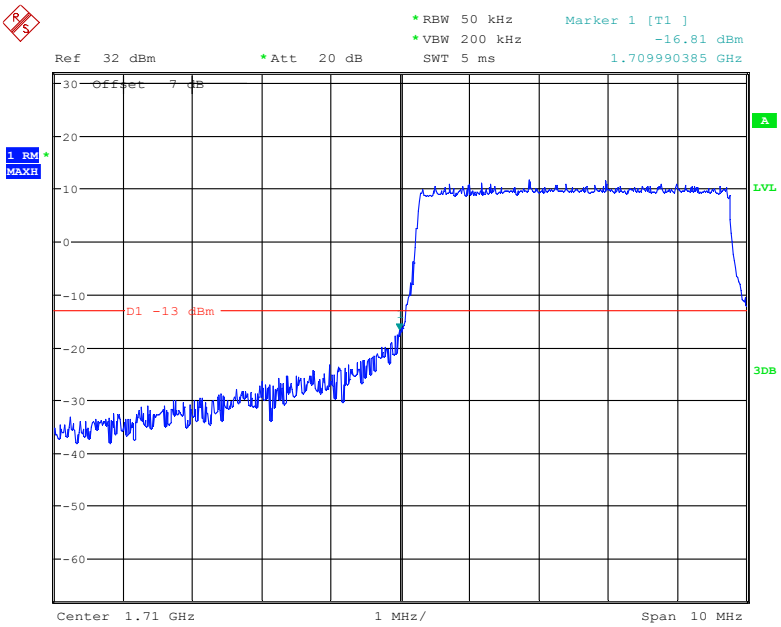
Date: 30.NOV.2019 16:14:27

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



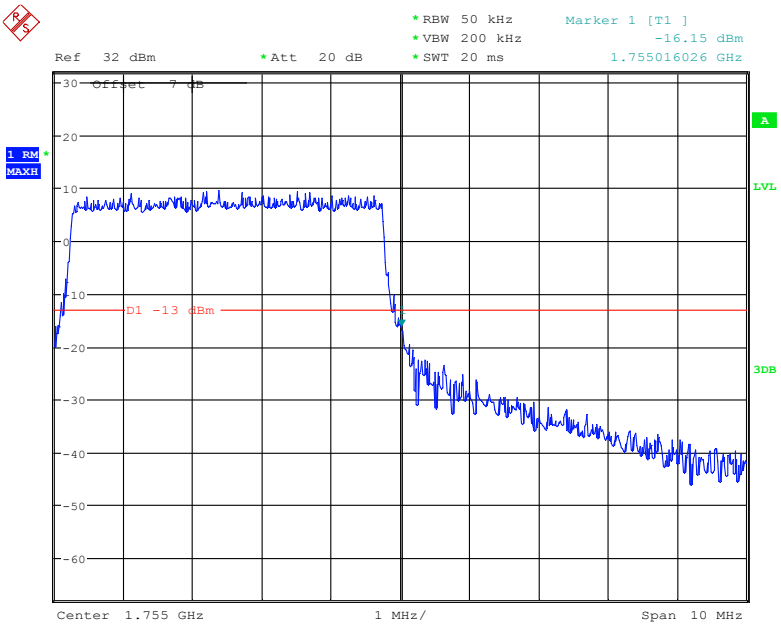
Date: 30.NOV.2019 16:16:47

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



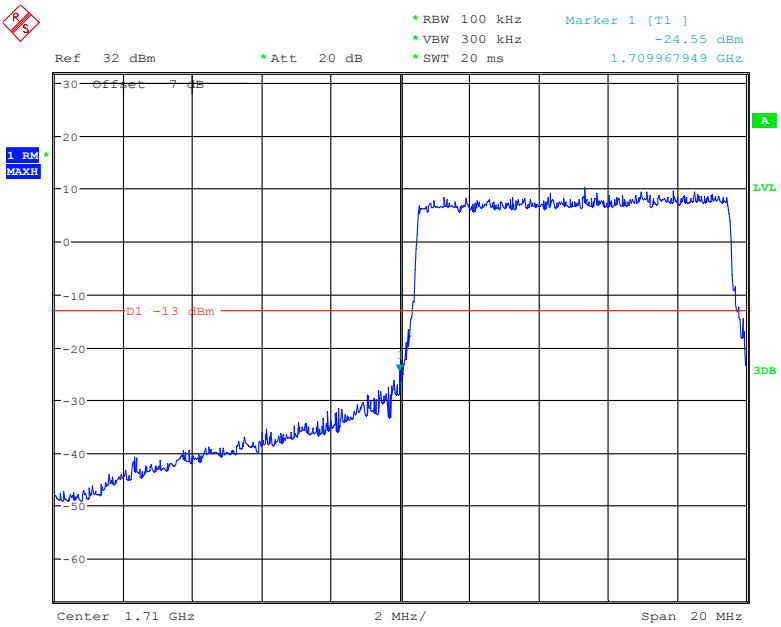
Date: 30.NOV.2019 16:15:09

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



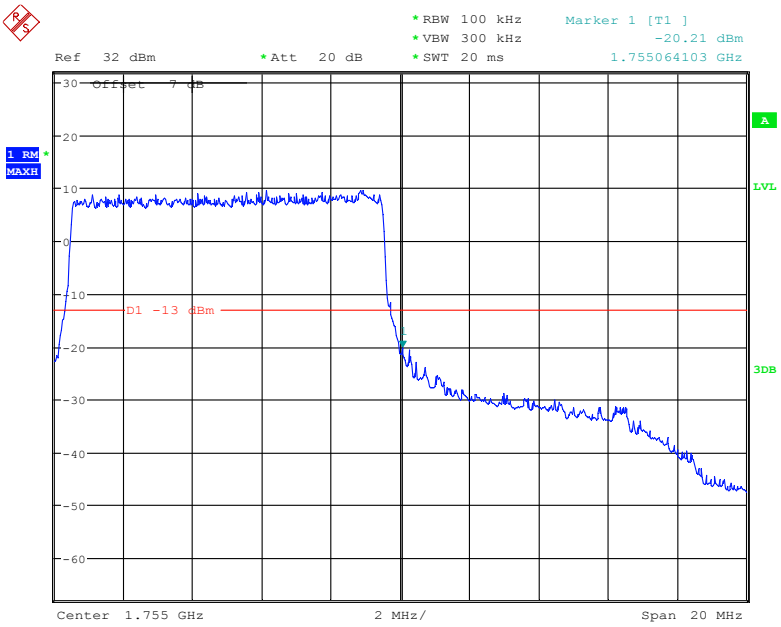
Date: 30.NOV.2019 16:16:13

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



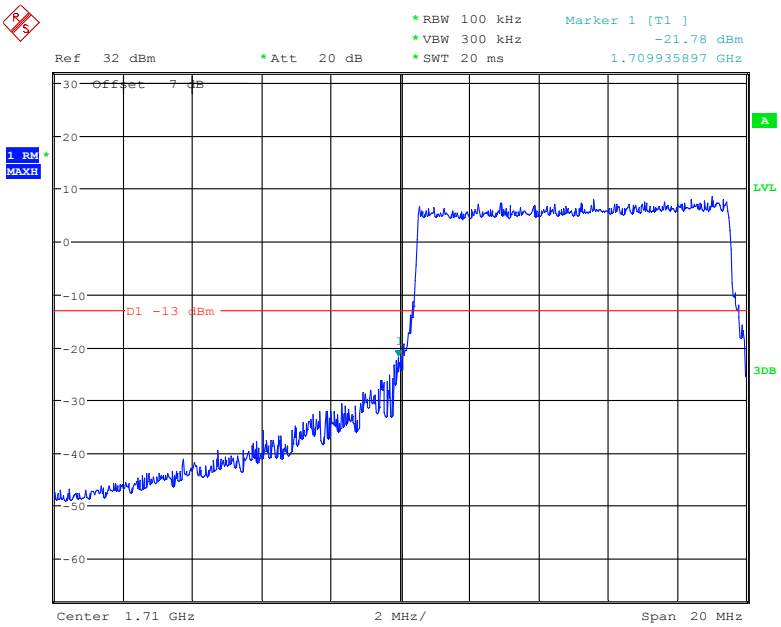
Date: 30.NOV.2019 16:20:20

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



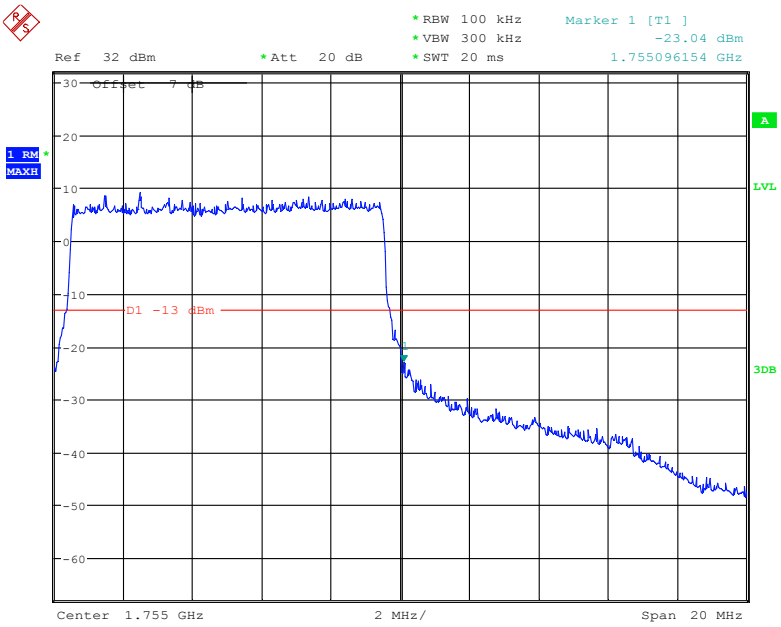
Date: 30.NOV.2019 16:18:19

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



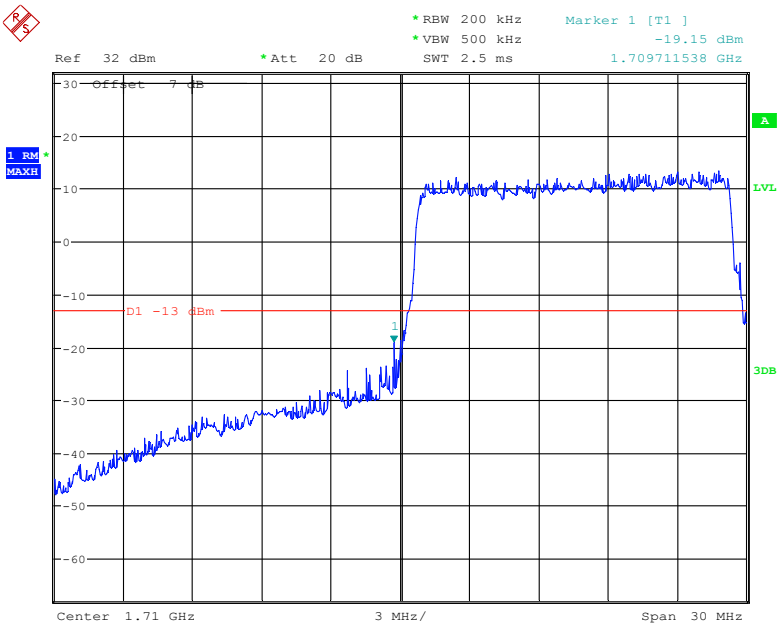
Date: 30.NOV.2019 16:19:50

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



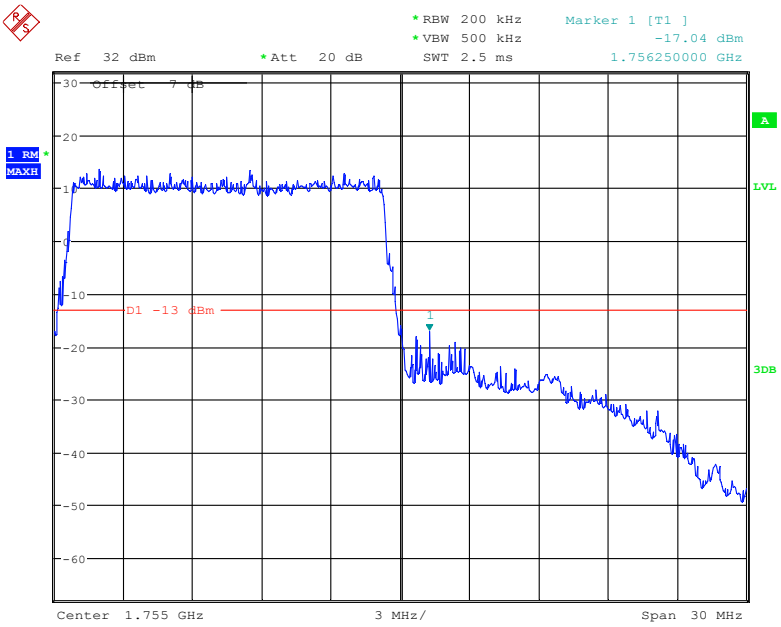
Date: 30.NOV.2019 16:18:55

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



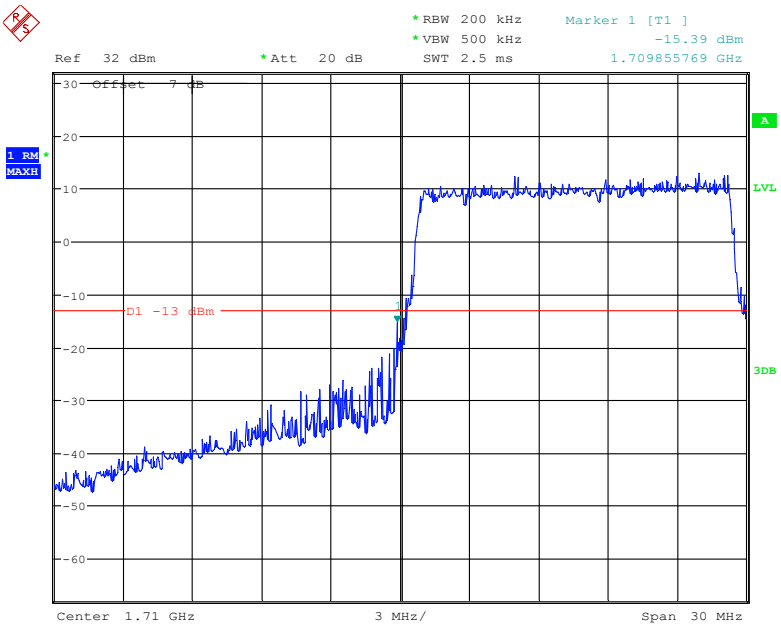
Date: 30.NOV.2019 16:21:24

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



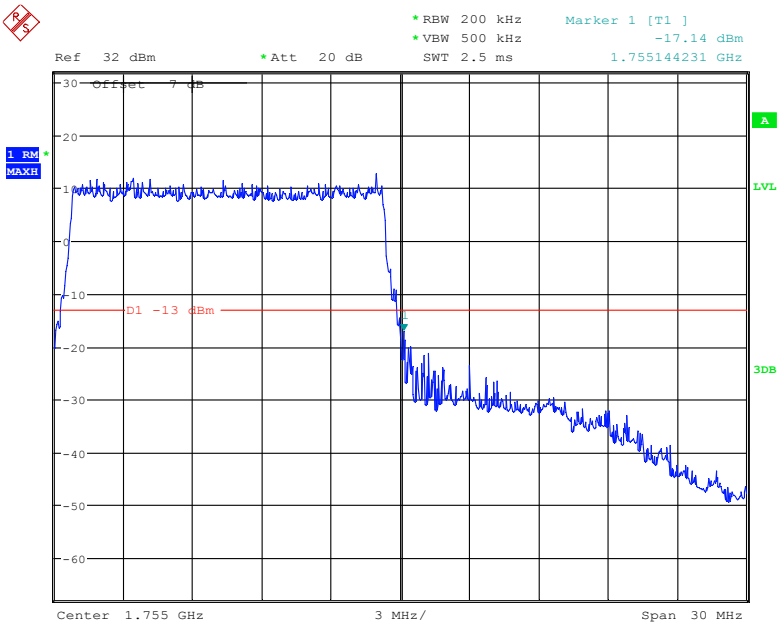
Date: 30.NOV.2019 16:23:32

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



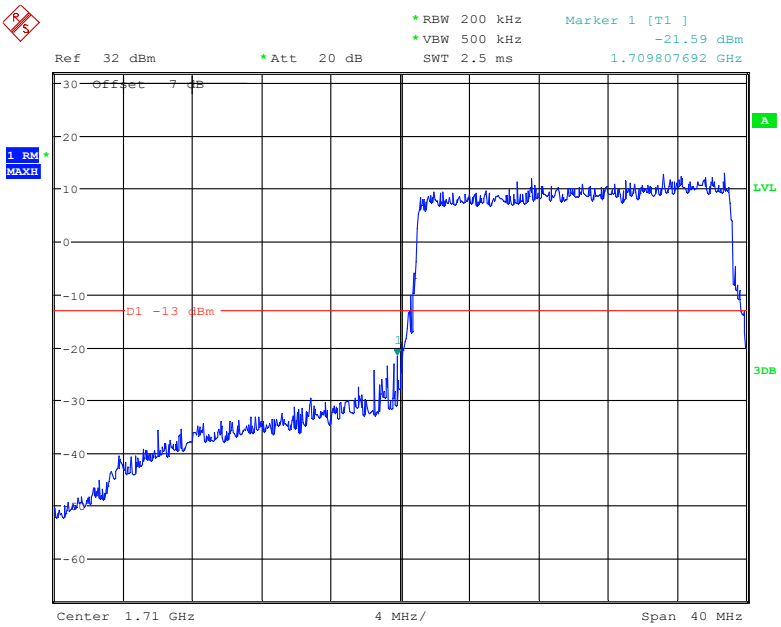
Date: 30.NOV.2019 16:21:59

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



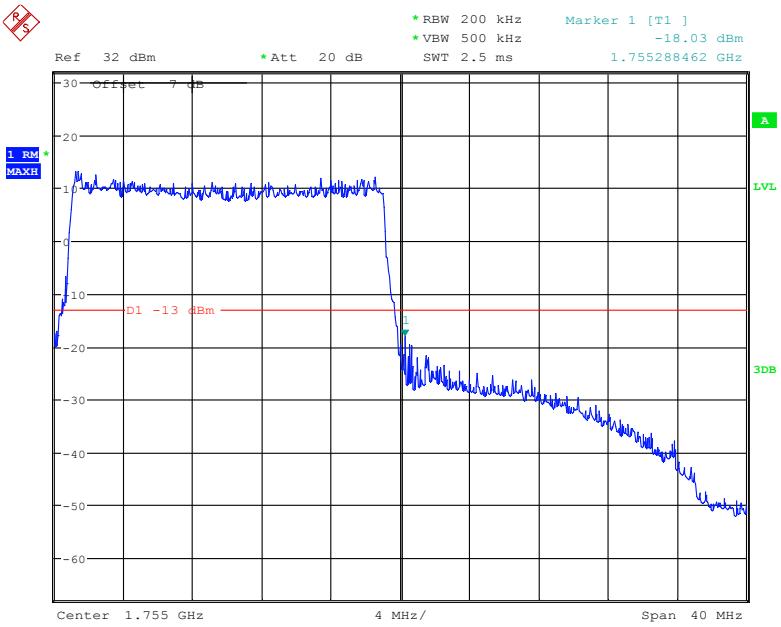
Date: 30.NOV.2019 16:22:45

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



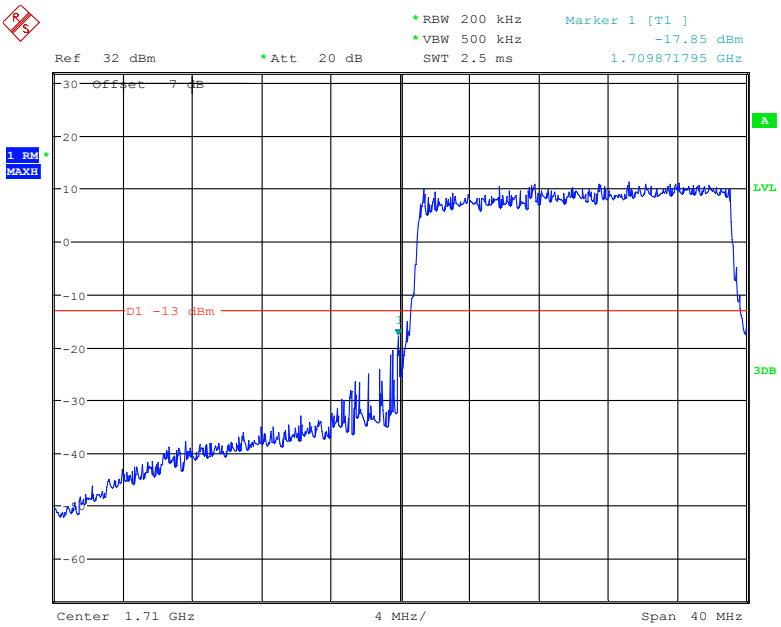
Date: 30.NOV.2019 16:27:29

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



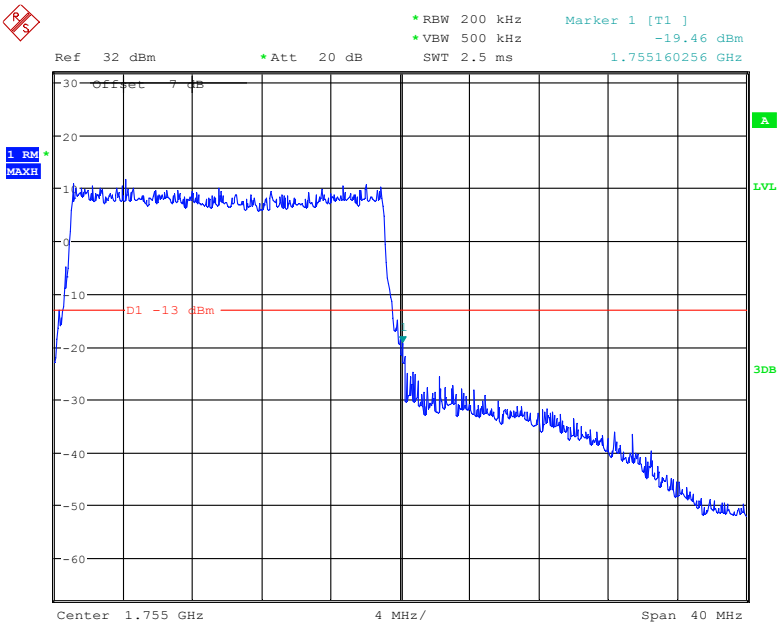
Date: 30.NOV.2019 16:25:48

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



Date: 30.NOV.2019 16:27:07

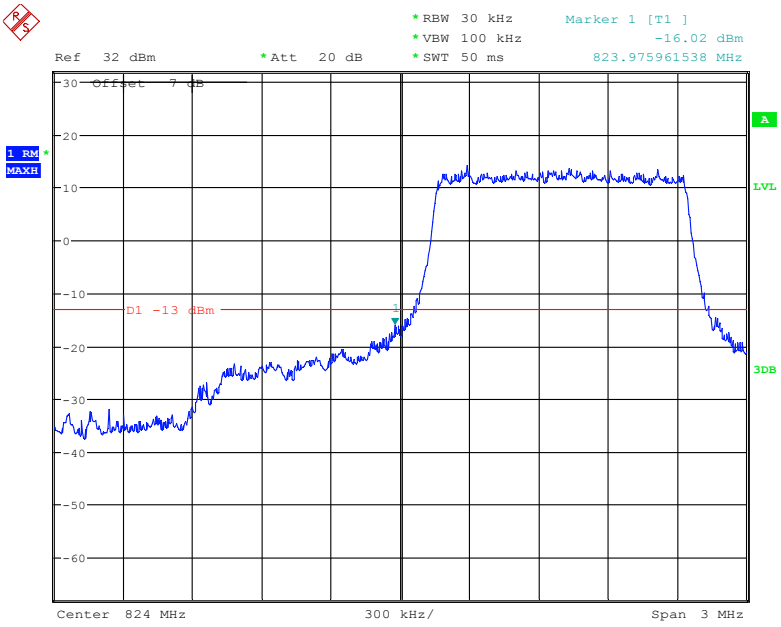
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 30.NOV.2019 16:26:19

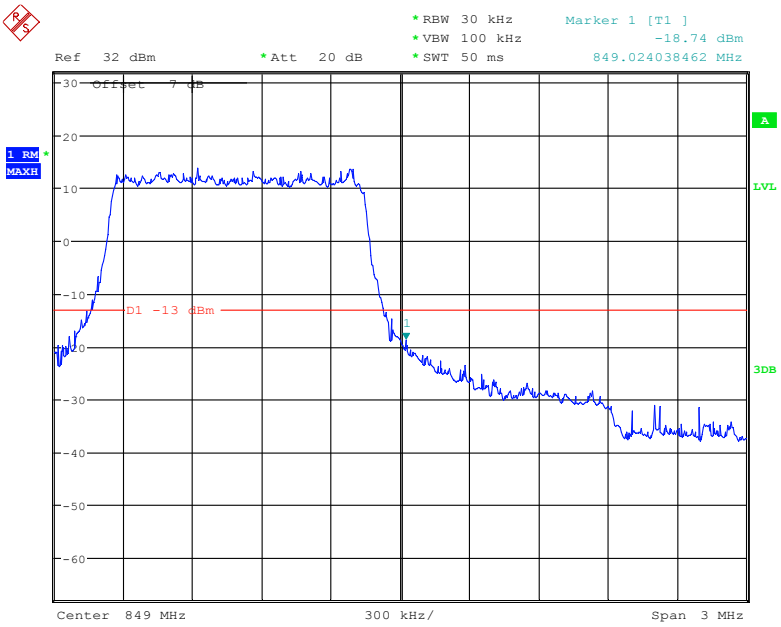
Band 5:

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



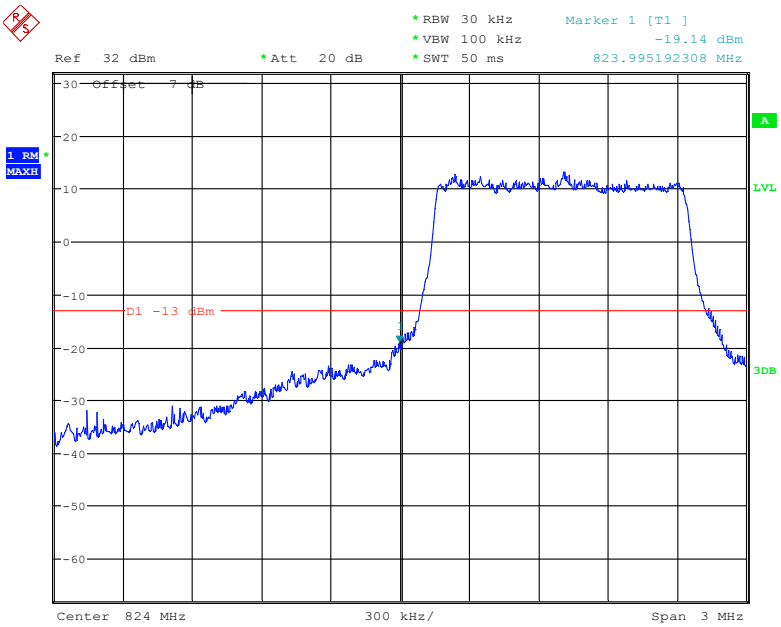
Date: 30.NOV.2019 14:36:13

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



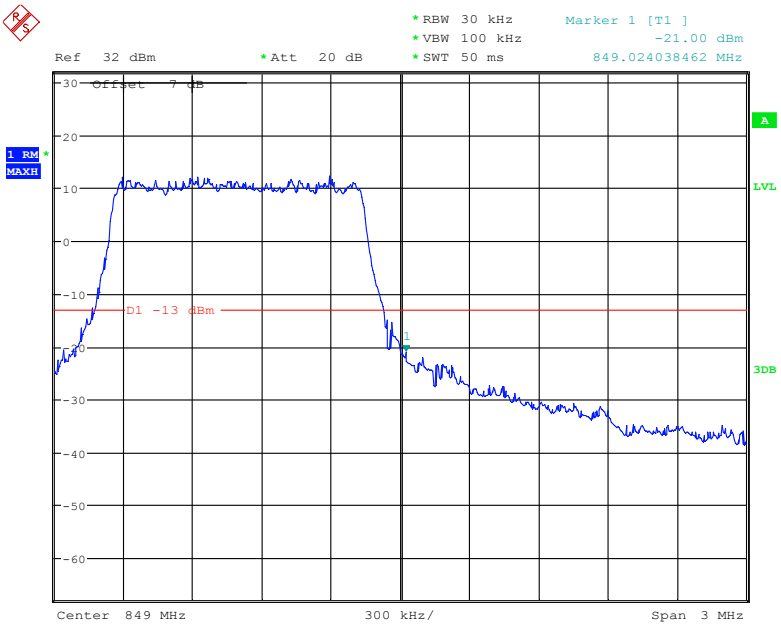
Date: 30.NOV.2019 14:40:00

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



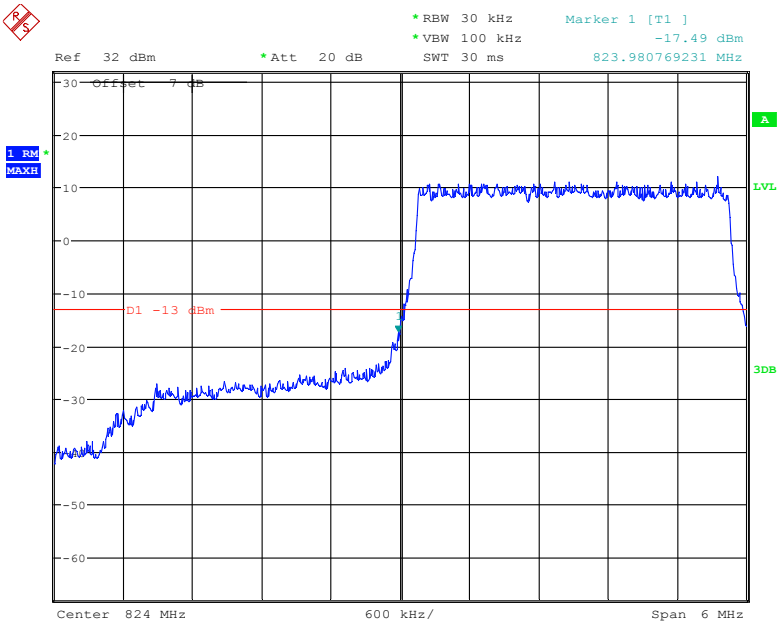
Date: 30.NOV.2019 14:38:03

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



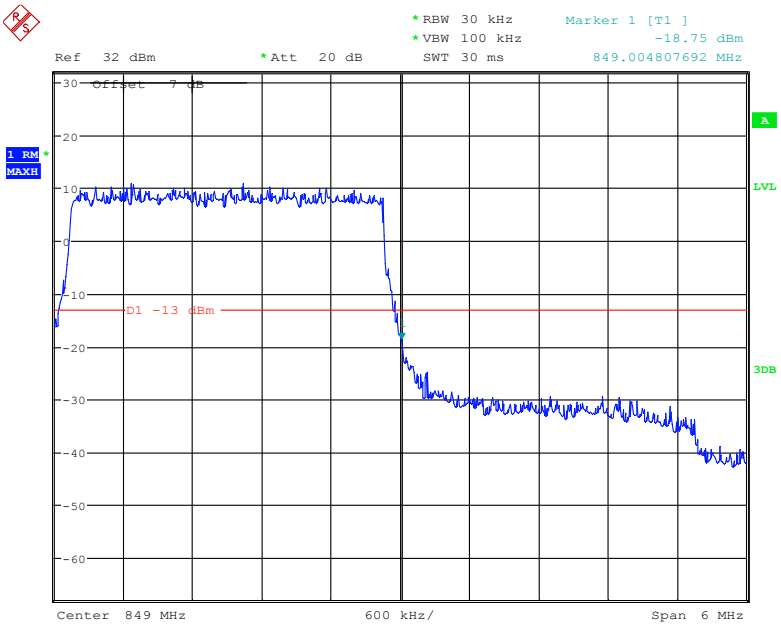
Date: 30.NOV.2019 14:39:14

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



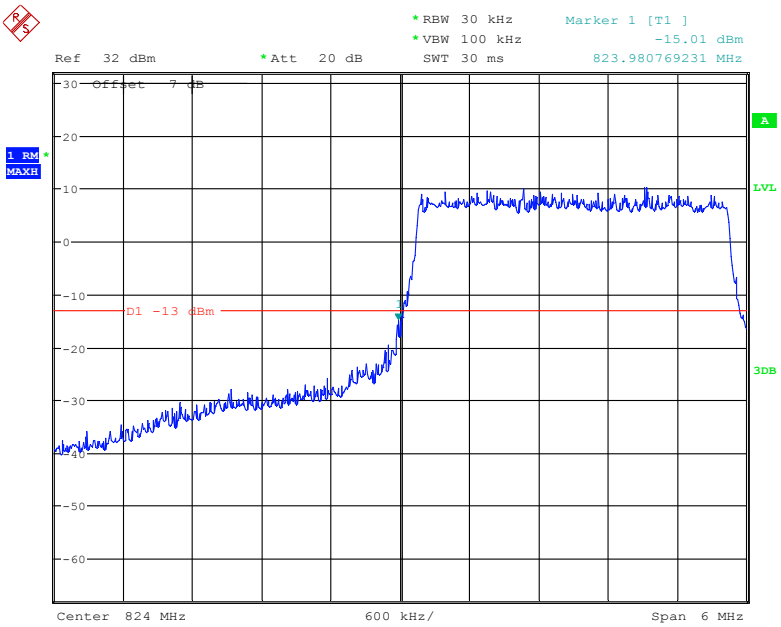
Date: 30.NOV.2019 14:55:20

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



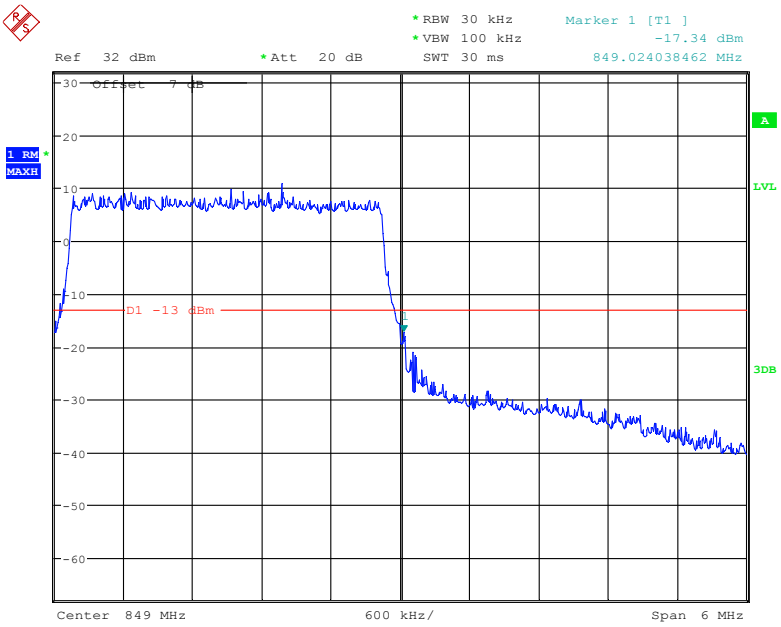
Date: 30.NOV.2019 14:53:34

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



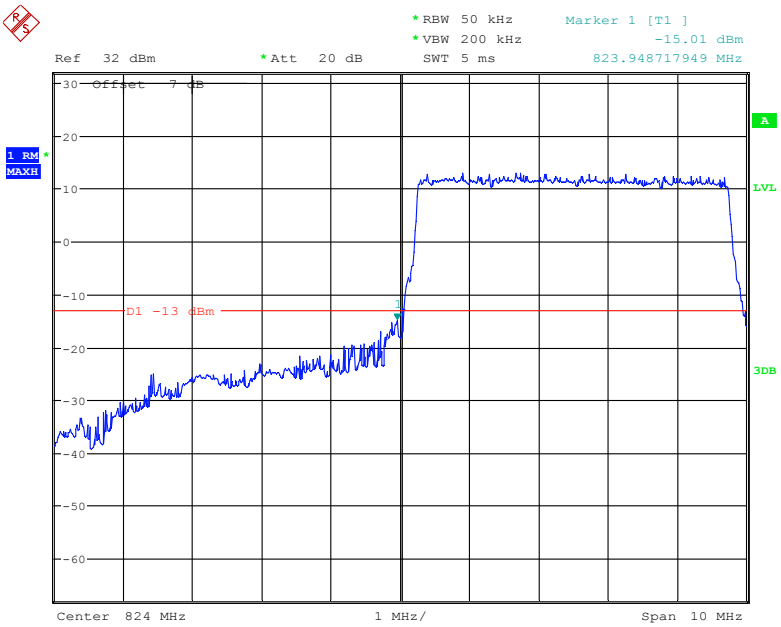
Date: 30.NOV.2019 14:54:43

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



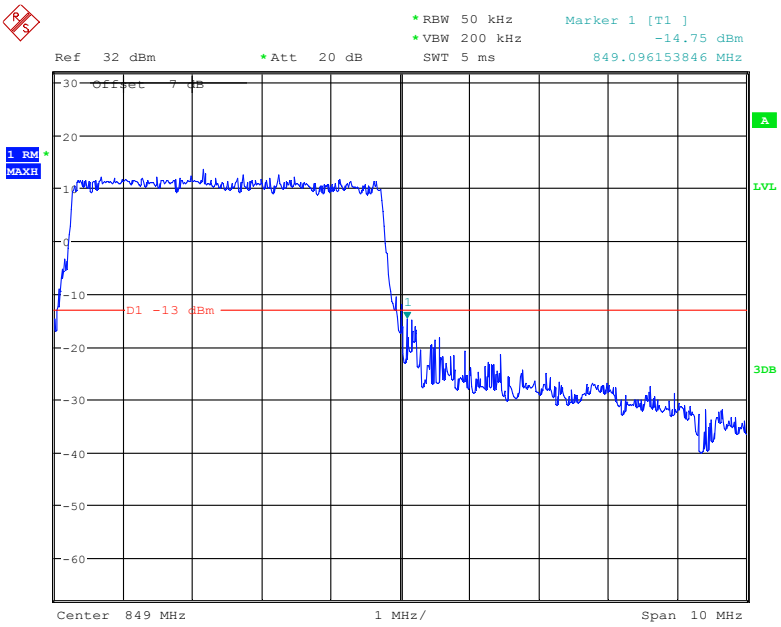
Date: 30.NOV.2019 14:54:09

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



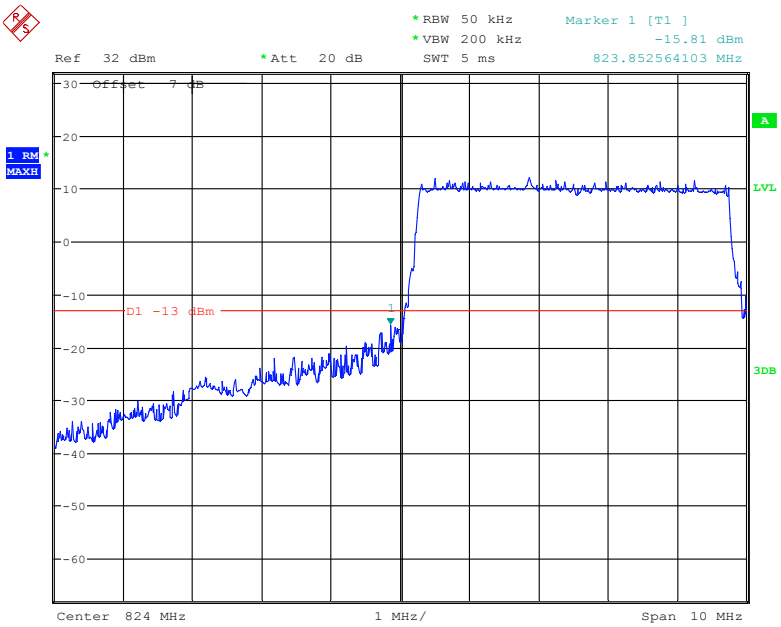
Date: 30.NOV.2019 14:56:23

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



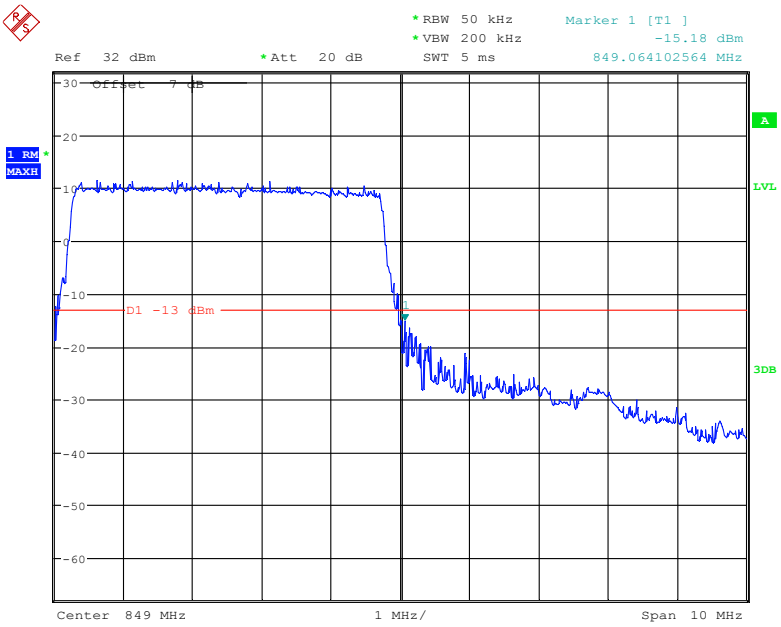
Date: 30.NOV.2019 14:58:49

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



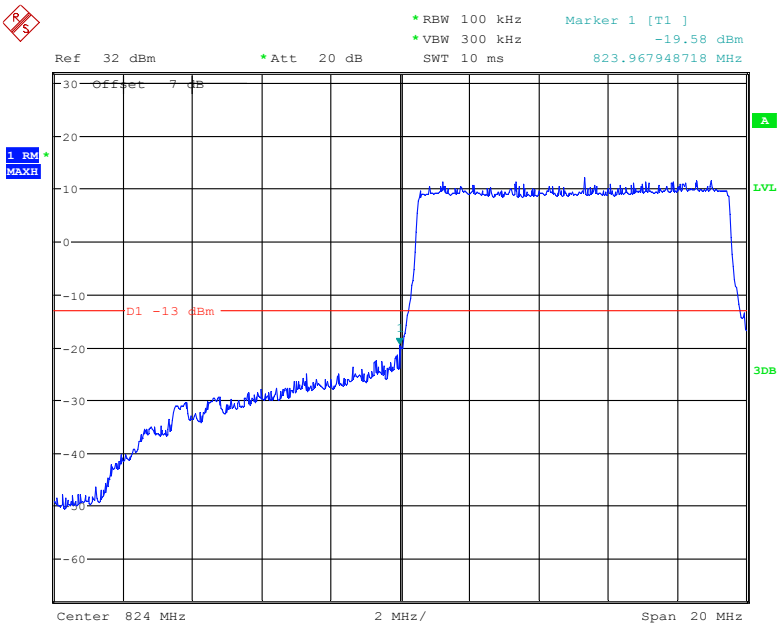
Date: 30.NOV.2019 14:56:53

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



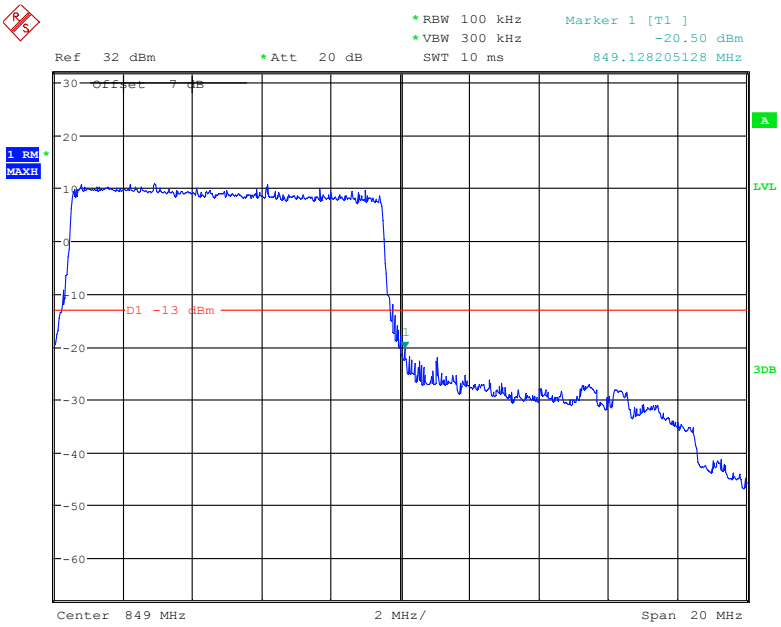
Date: 30.NOV.2019 14:58:23

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



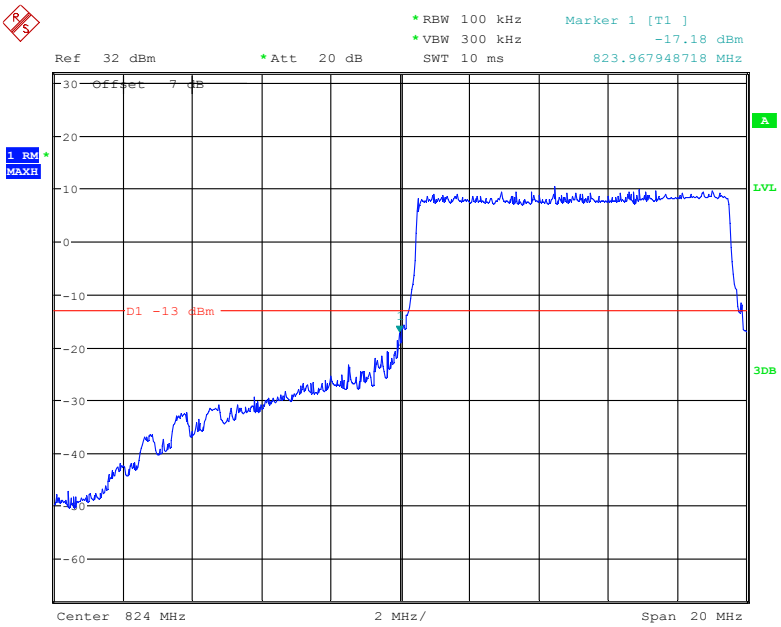
Date: 30.NOV.2019 15:02:48

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



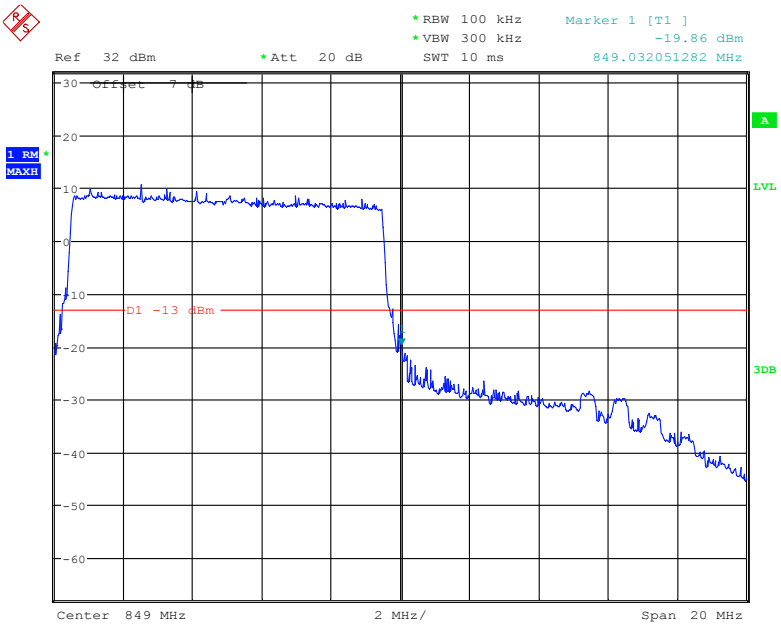
Date: 30.NOV.2019 15:00:13

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



Date: 30.NOV.2019 15:02:05

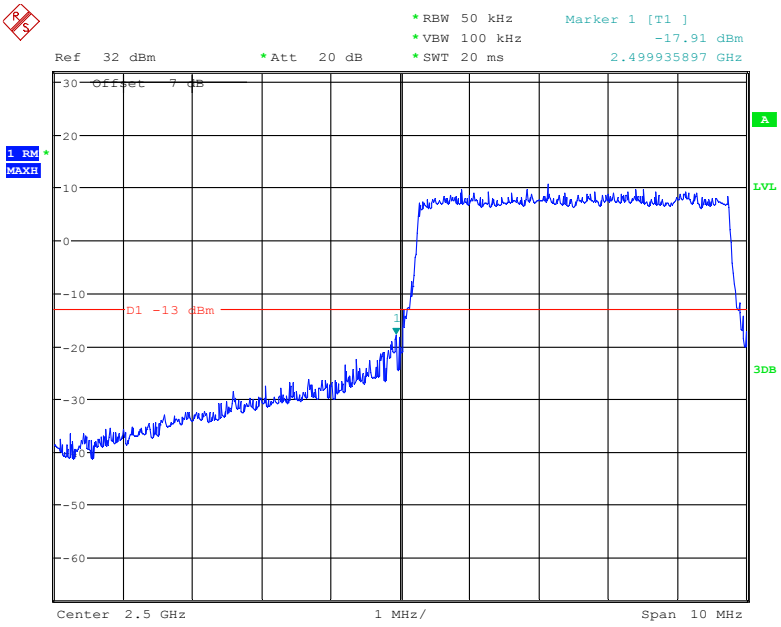
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 30.NOV.2019 15:00:49

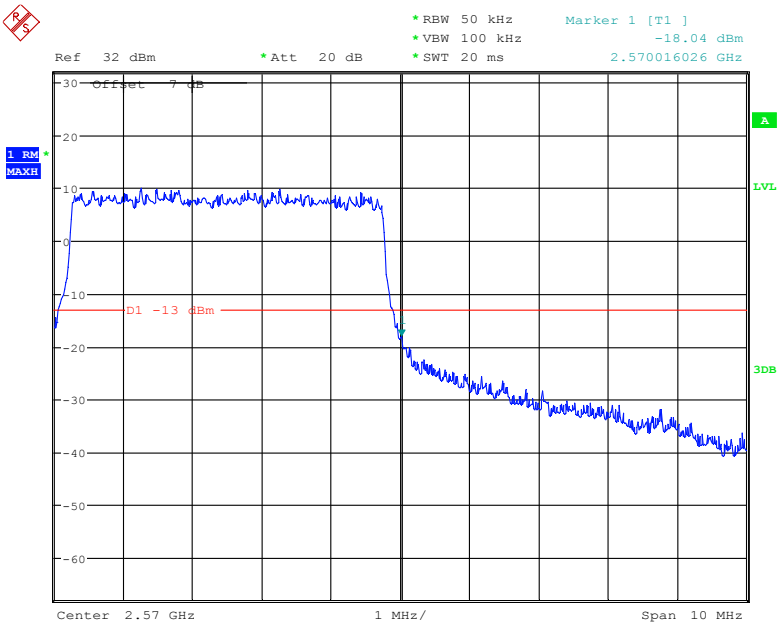
Band 7:

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



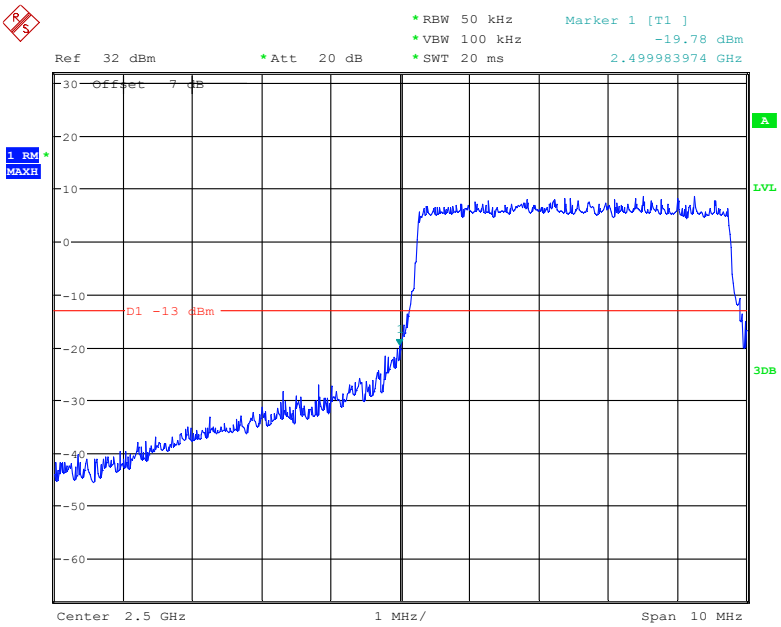
Date: 30.NOV.2019 13:39:48

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



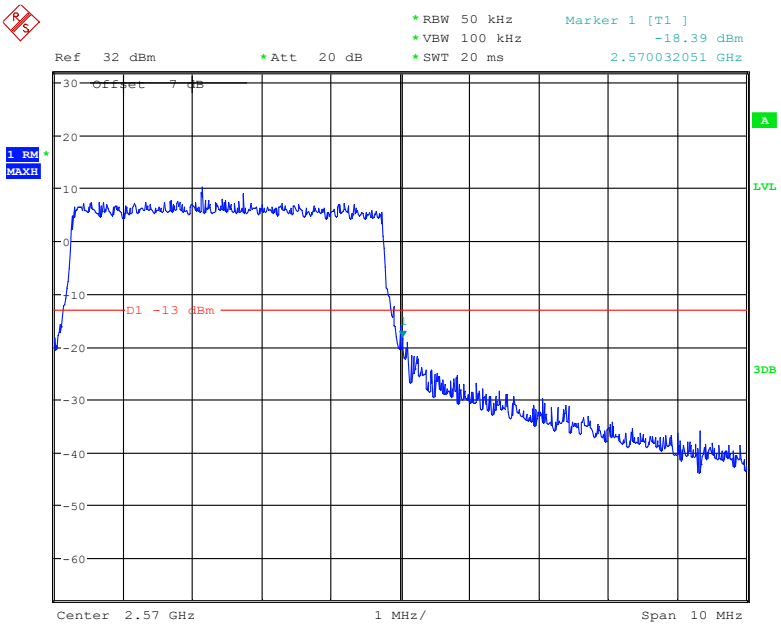
Date: 30.NOV.2019 13:44:29

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



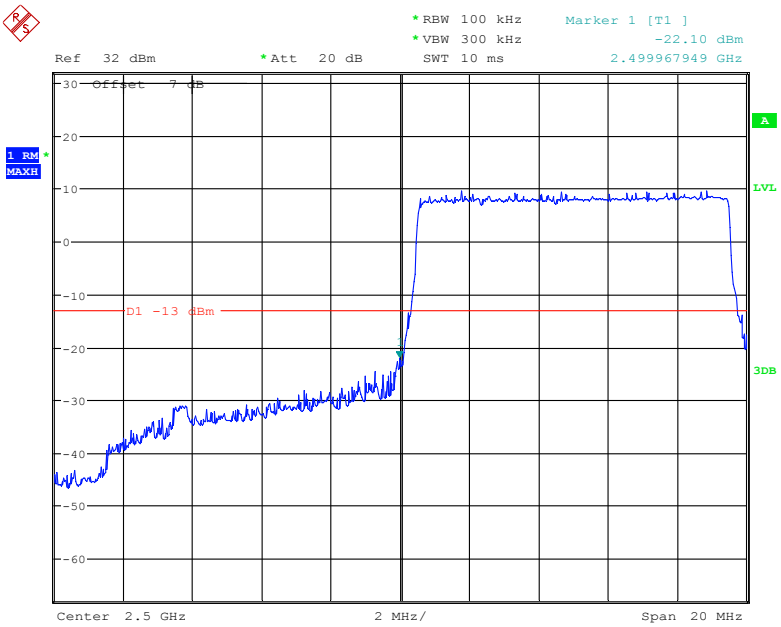
Date: 30.NOV.2019 13:40:43

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



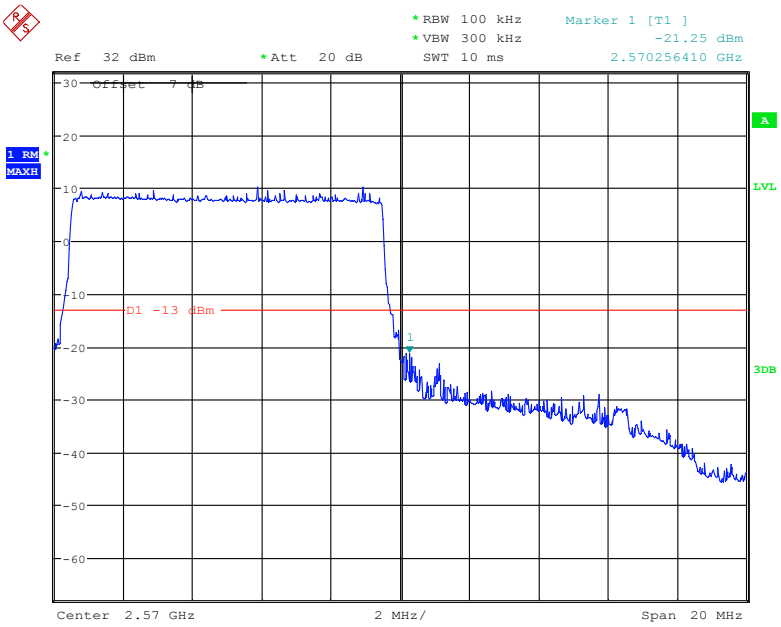
Date: 30.NOV.2019 13:42:47

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



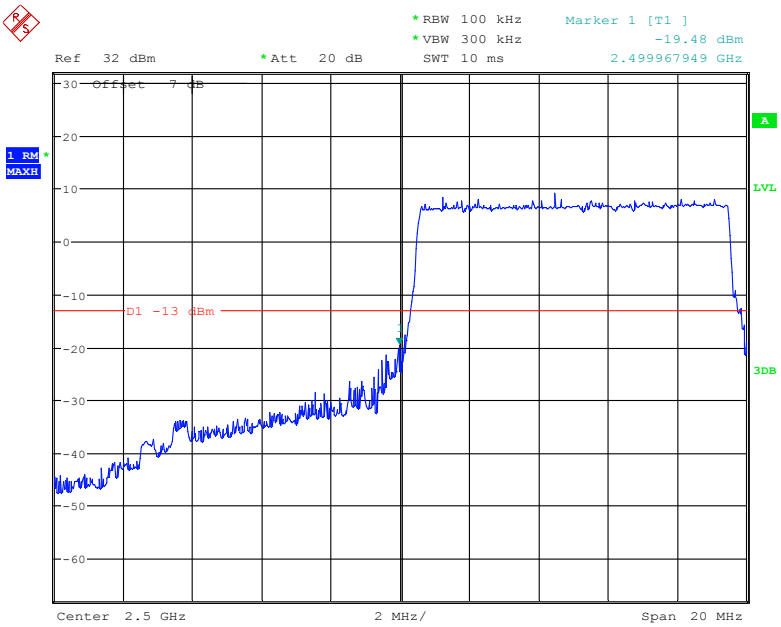
Date: 30.NOV.2019 13:49:29

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



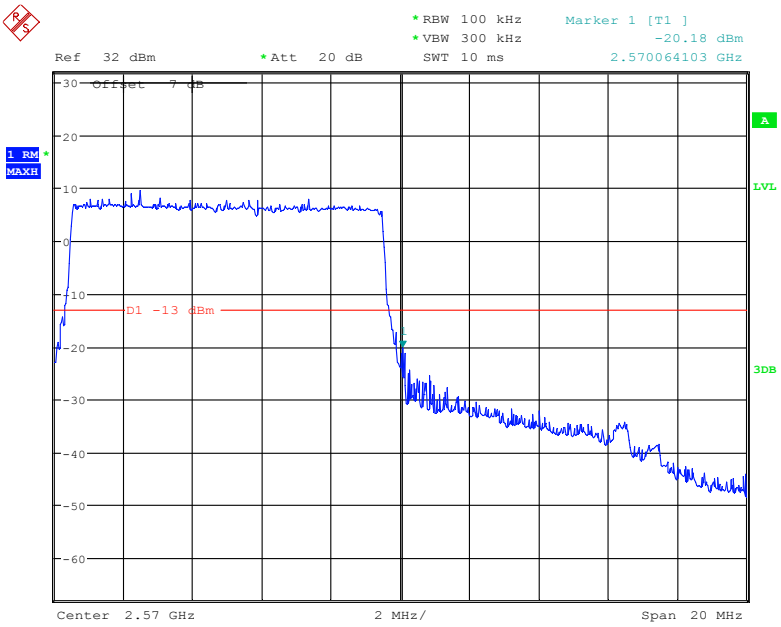
Date: 30.NOV.2019 13:47:41

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



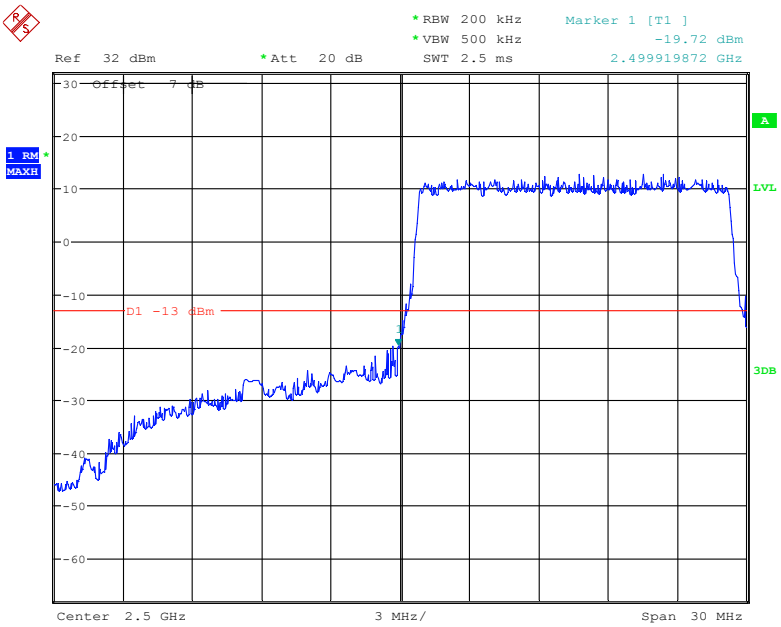
Date: 30.NOV.2019 13:49:01

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



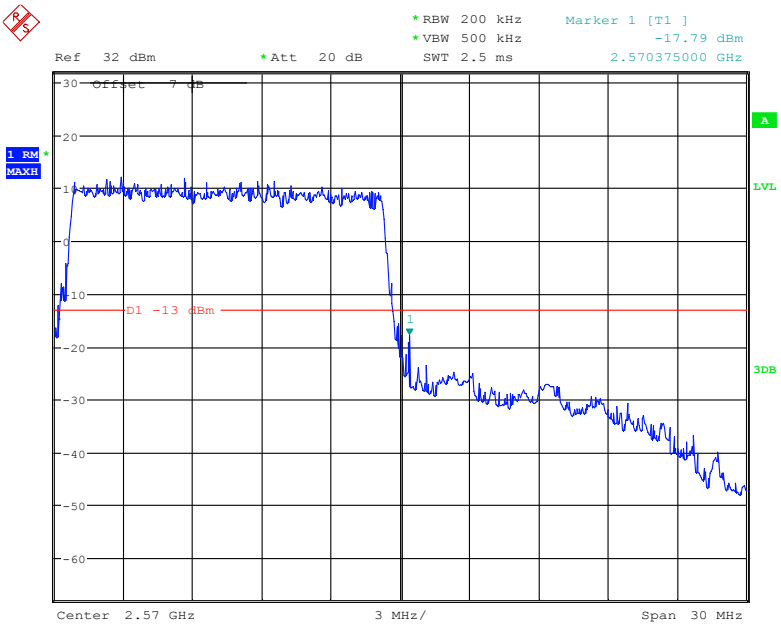
Date: 30.NOV.2019 13:48:13

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



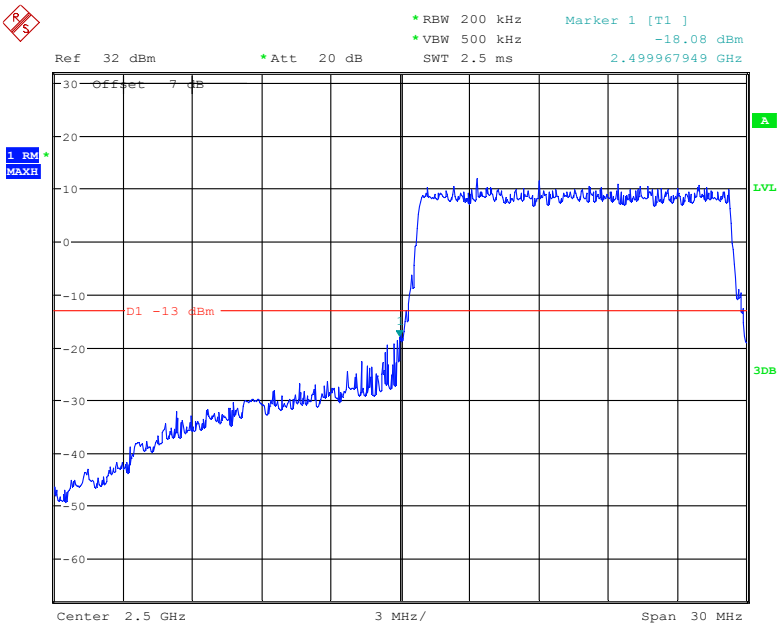
Date: 30.NOV.2019 13:50:43

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



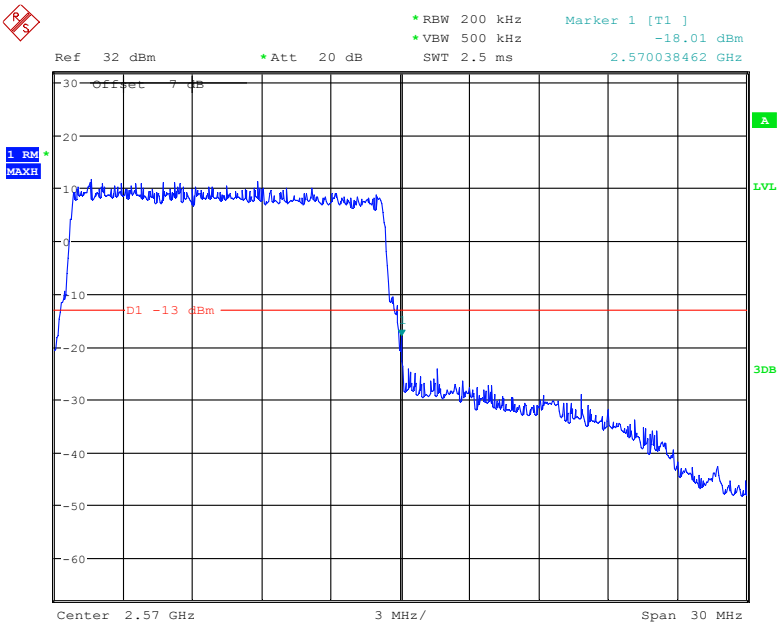
Date: 30.NOV.2019 13:53:16

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



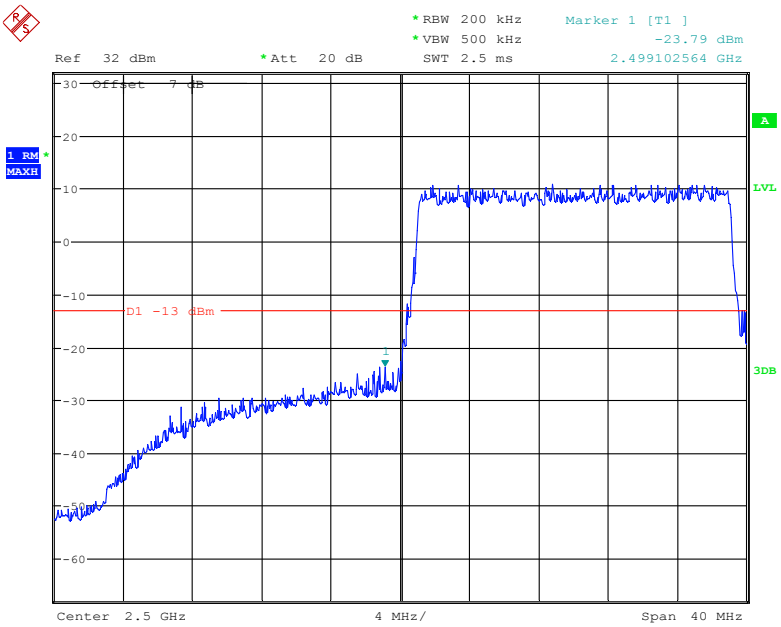
Date: 30.NOV.2019 13:51:18

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



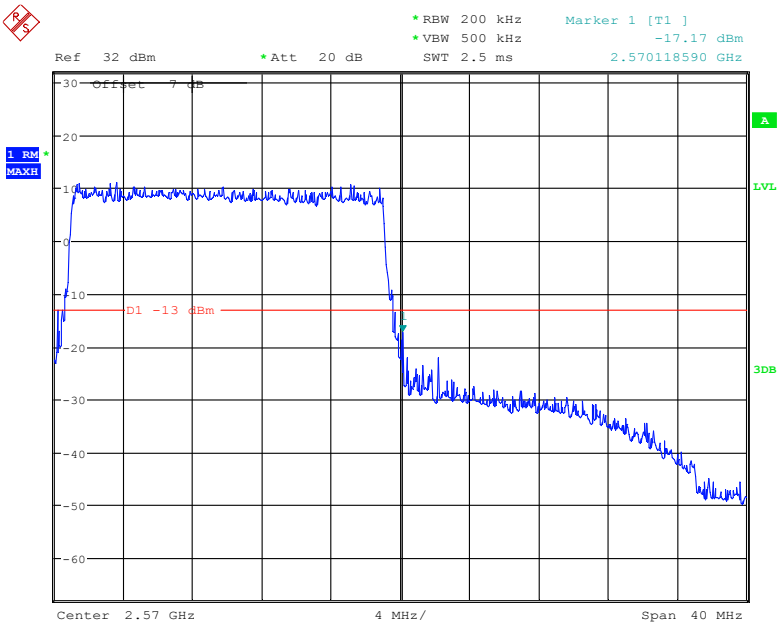
Date: 30.NOV.2019 13:52:03

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



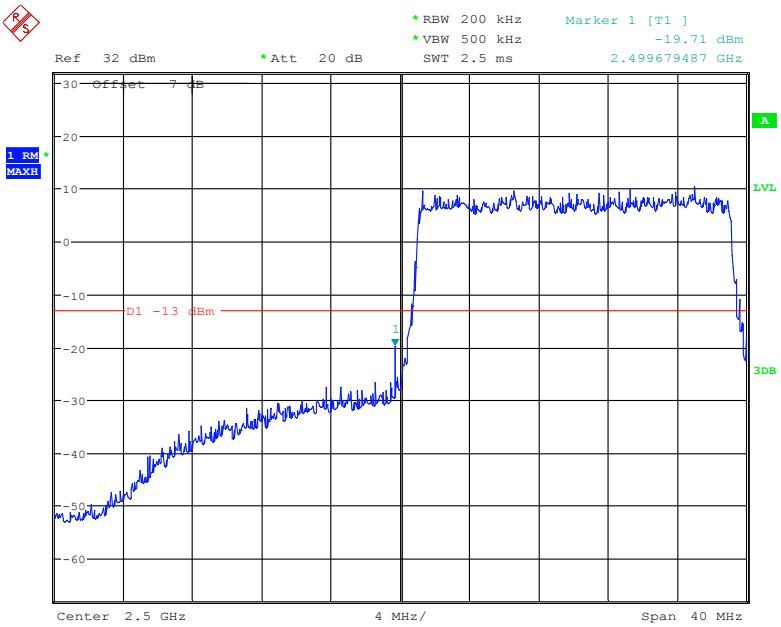
Date: 30.NOV.2019 13:56:45

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



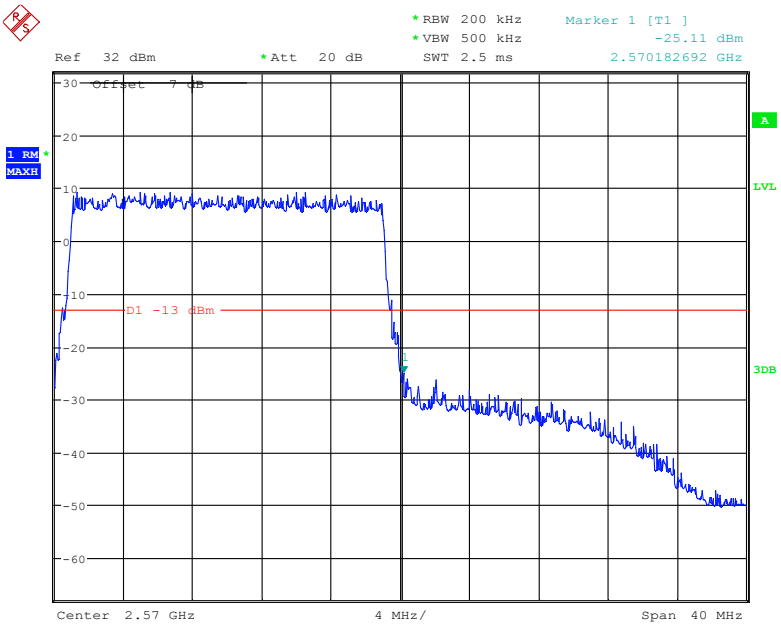
Date: 30.NOV.2019 13:54:42

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



Date: 30.NOV.2019 13:56:15

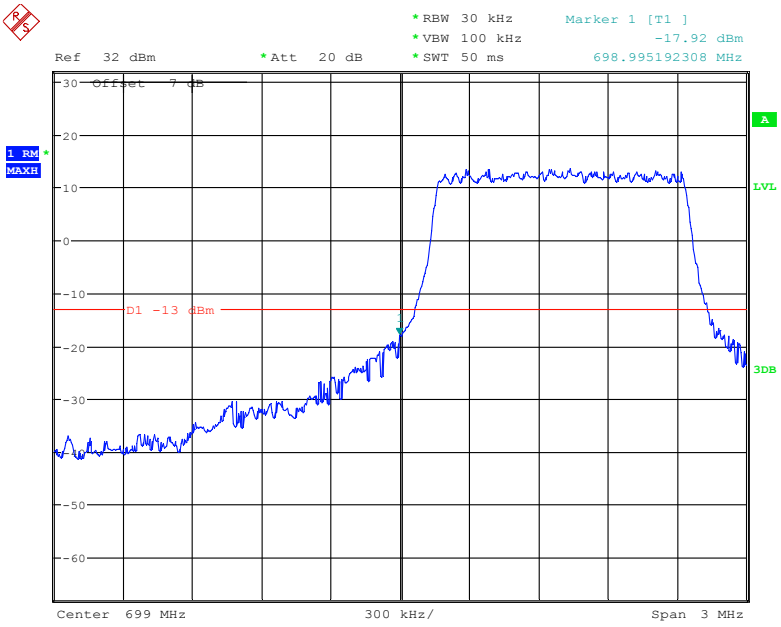
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 30.NOV.2019 13:55:18

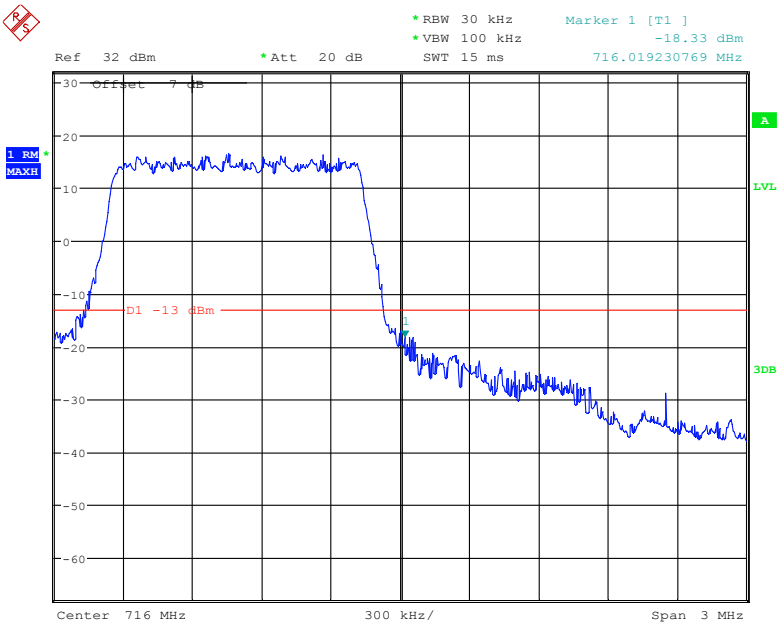
Band 12:

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



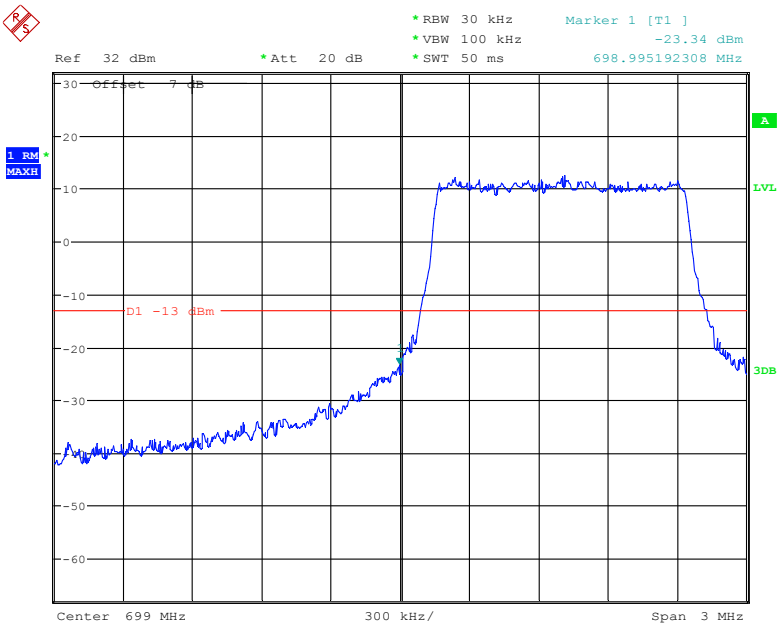
Date: 30.NOV.2019 13:59:21

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



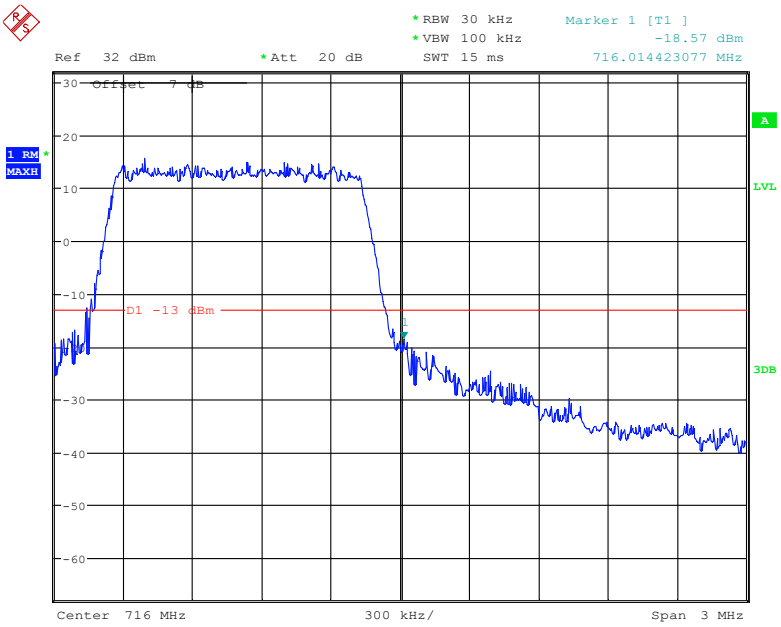
Date: 30.NOV.2019 14:02:35

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



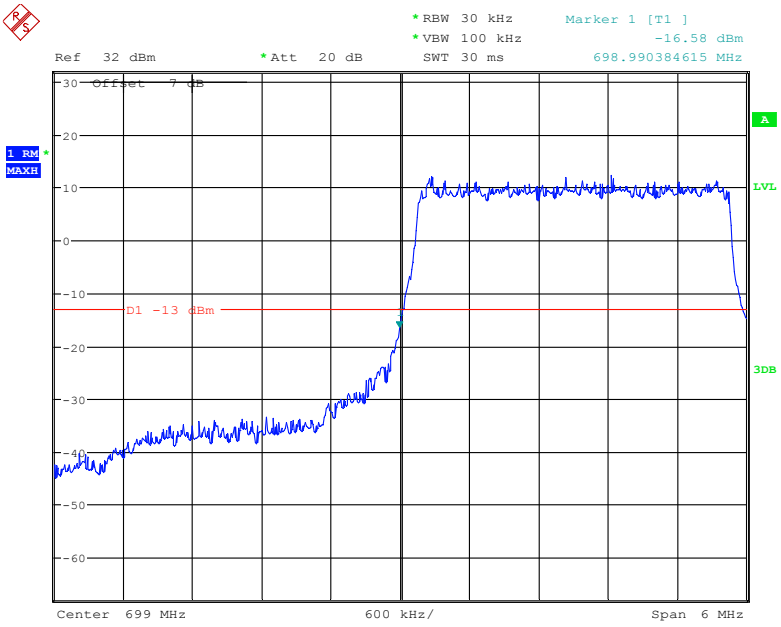
Date: 30.NOV.2019 14:00:01

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



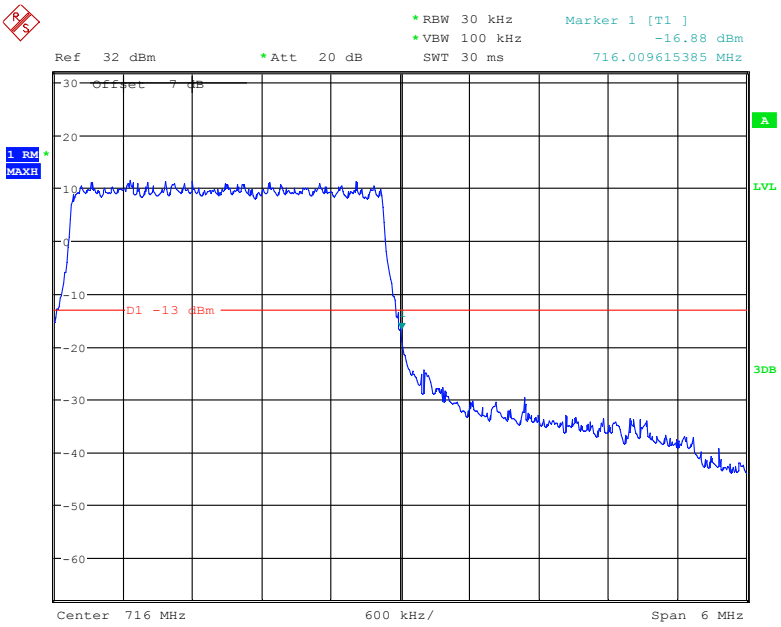
Date: 30.NOV.2019 14:02:05

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



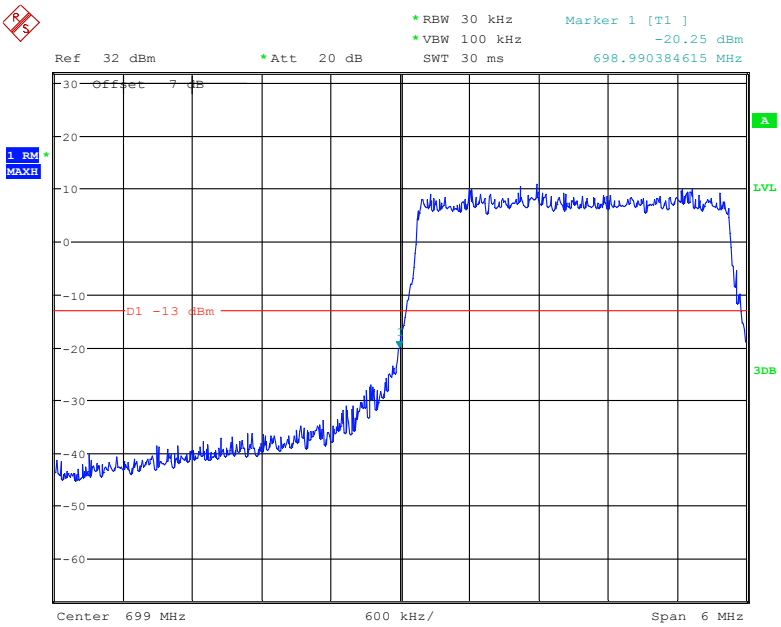
Date: 30.NOV.2019 14:06:12

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



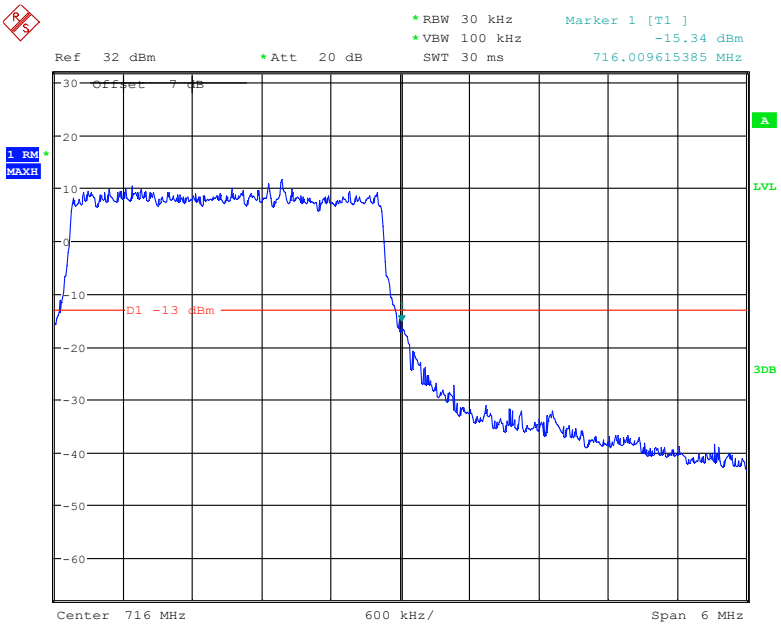
Date: 30.NOV.2019 14:03:48

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



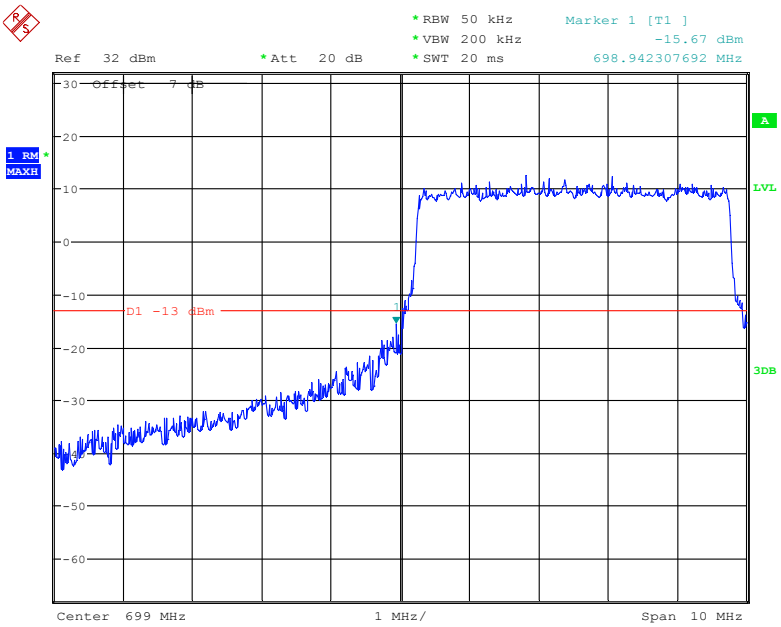
Date: 30.NOV.2019 14:05:37

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



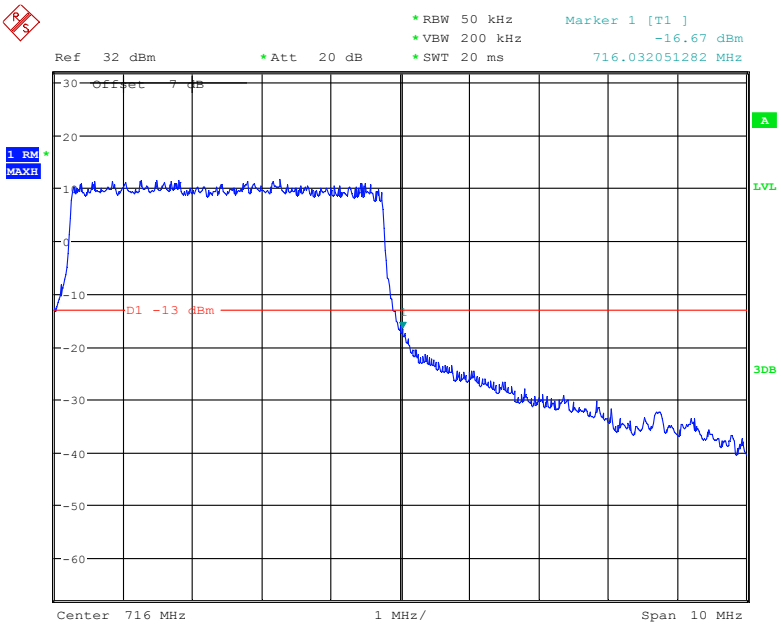
Date: 30.NOV.2019 14:04:28

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



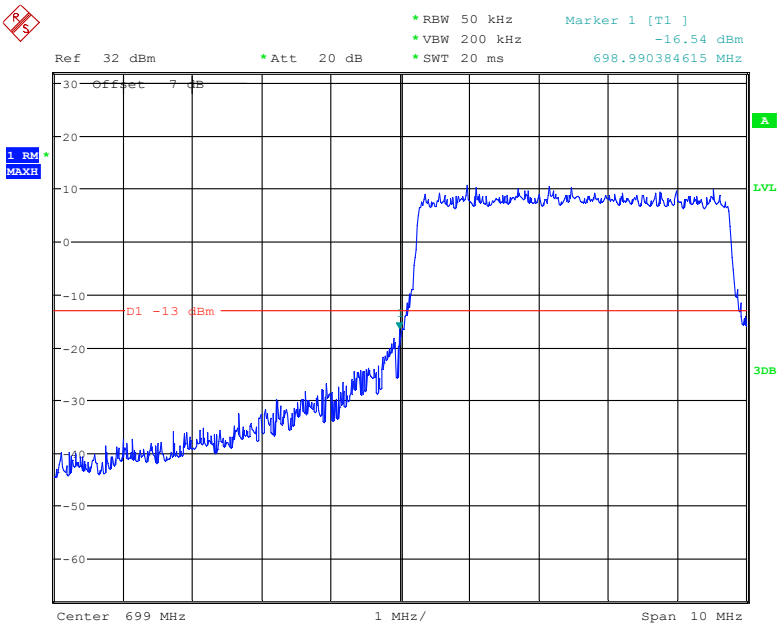
Date: 30.NOV.2019 14:08:44

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



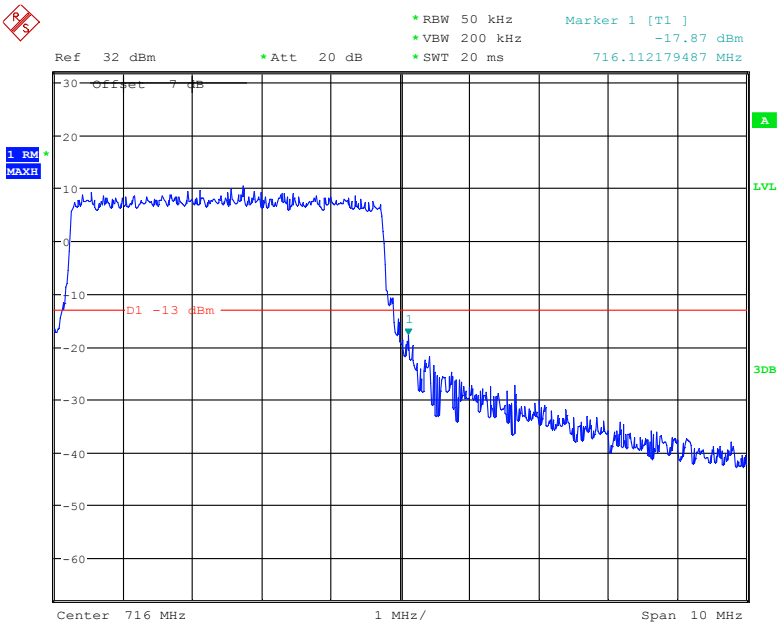
Date: 30.NOV.2019 14:12:05

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



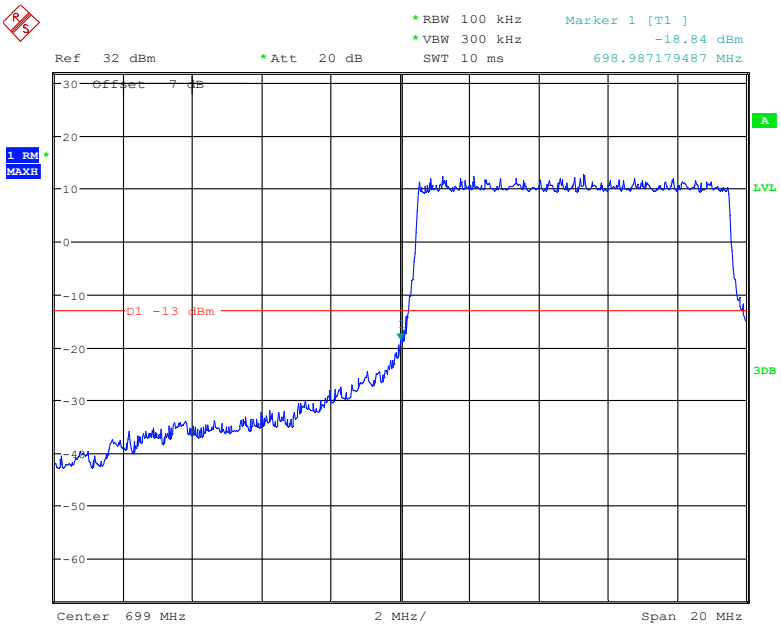
Date: 30.NOV.2019 14:09:25

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



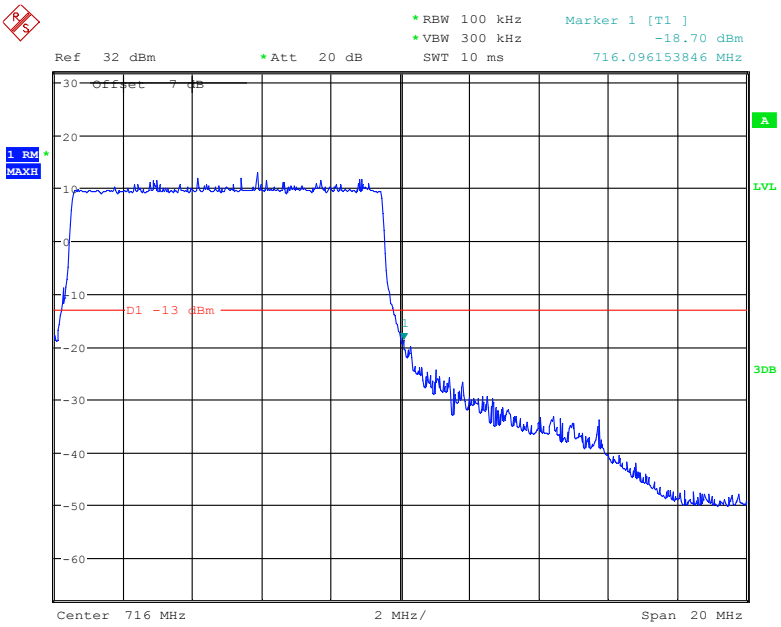
Date: 30.NOV.2019 14:10:04

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



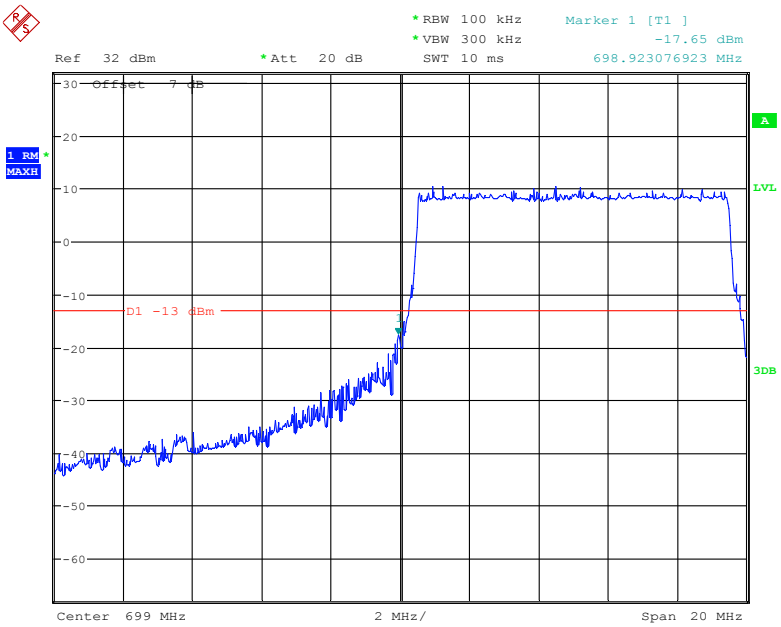
Date: 30.NOV.2019 14:24:28

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



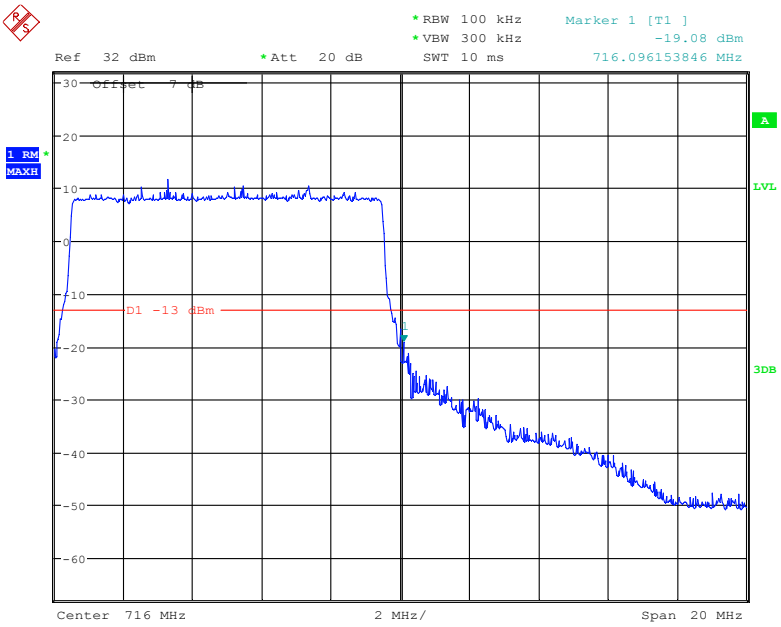
Date: 30.NOV.2019 14:13:31

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



Date: 30.NOV.2019 14:16:23

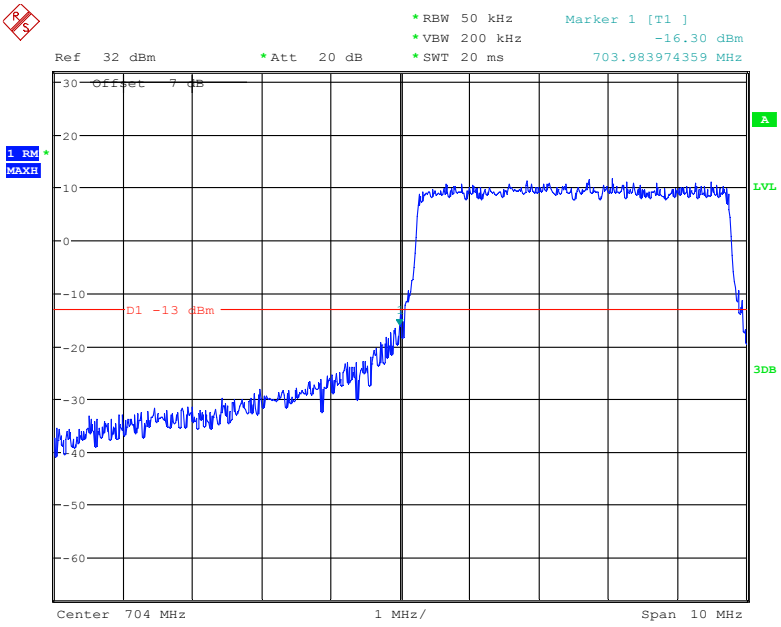
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 30.NOV.2019 14:13:54

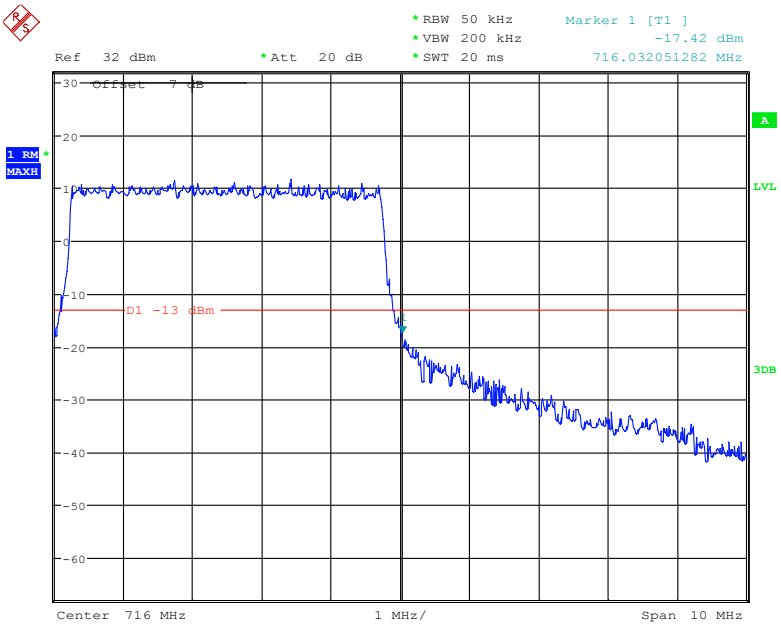
Band 17:

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



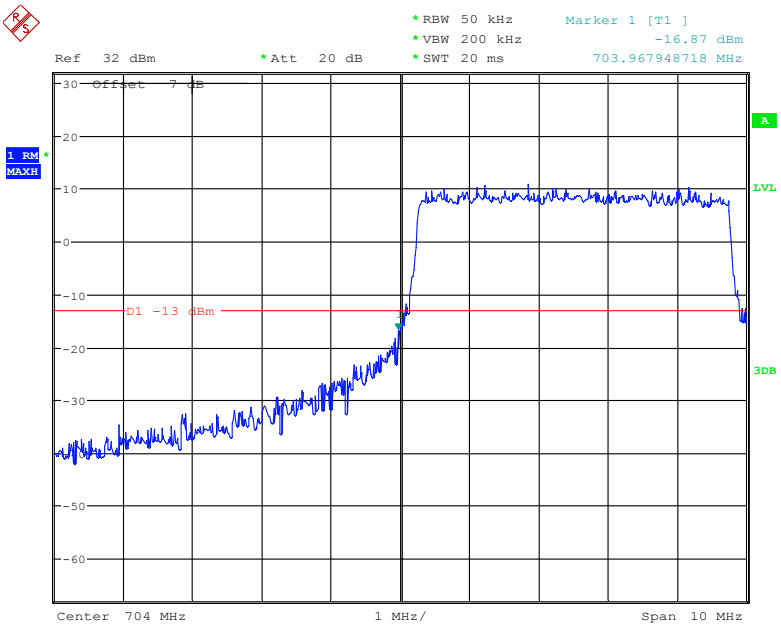
Date: 30.NOV.2019 14:32:25

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



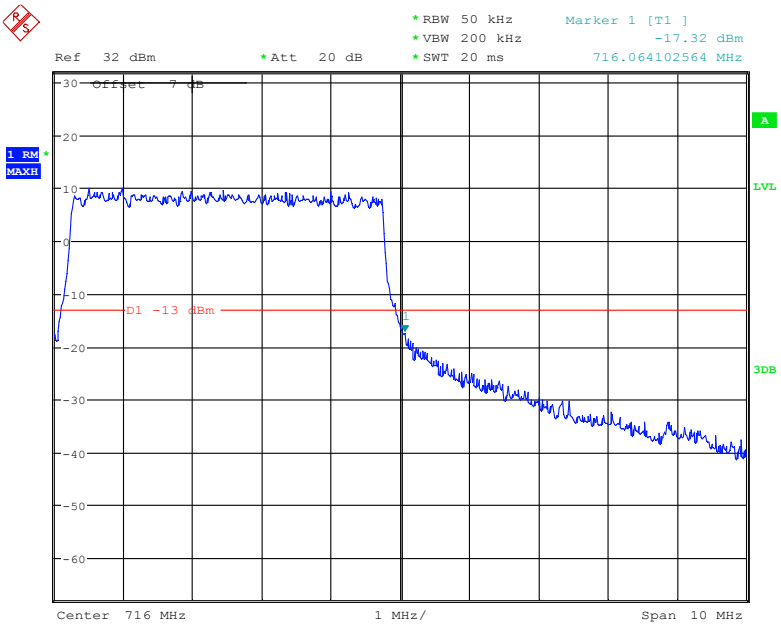
Date: 30.NOV.2019 14:29:47

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



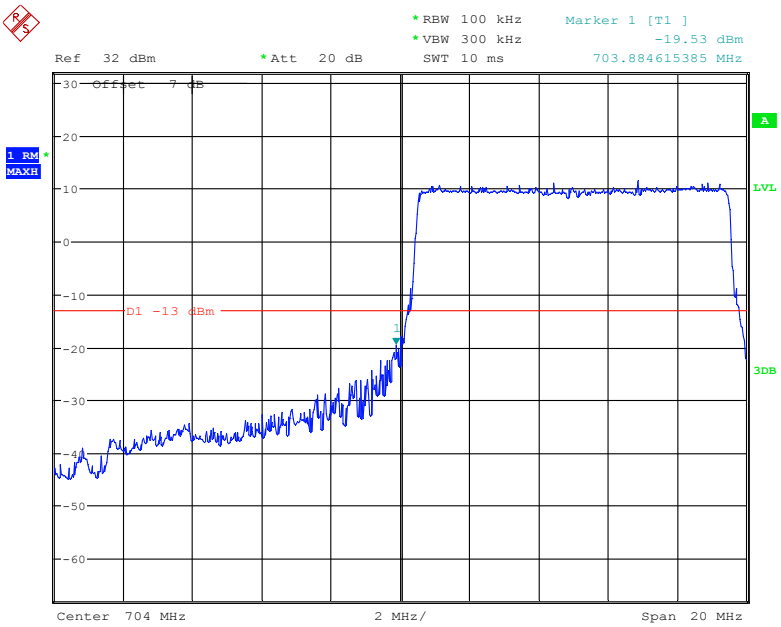
Date: 30.NOV.2019 14:31:23

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



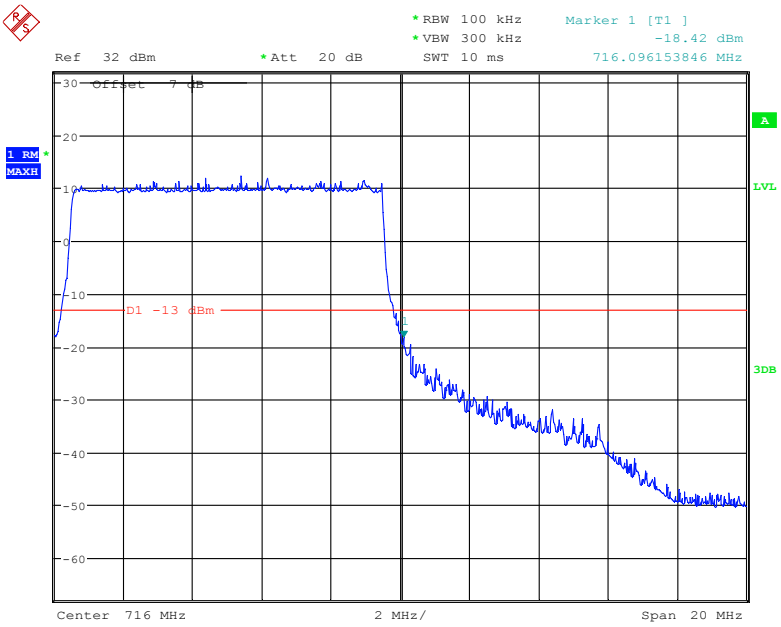
Date: 30.NOV.2019 14:30:29

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



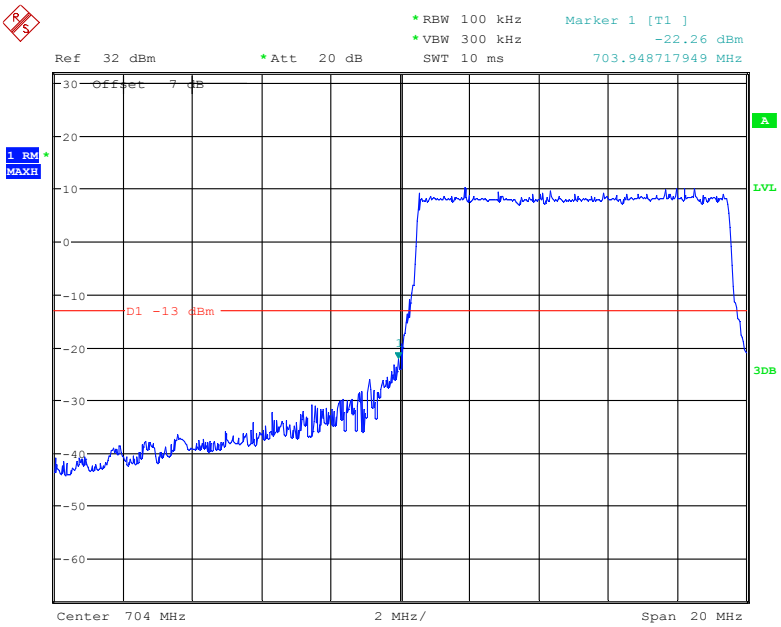
Date: 30.NOV.2019 14:25:55

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



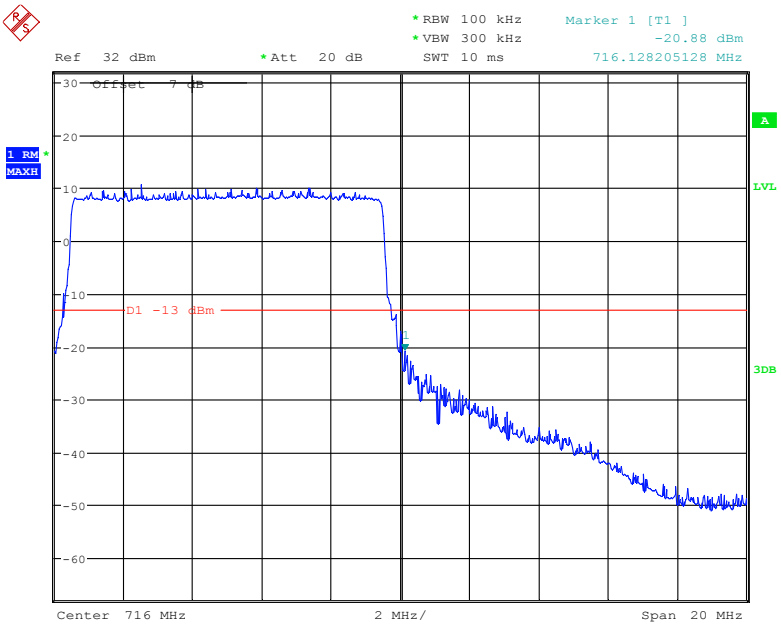
Date: 30.NOV.2019 14:28:32

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



Date: 30.NOV.2019 14:26:41

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



Date: 30.NOV.2019 14:27:45

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

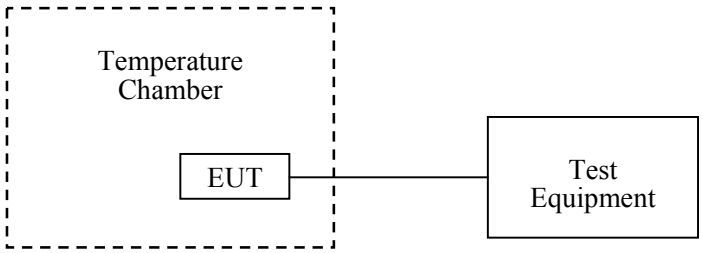
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 George Zhong on 2019-11-28.

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 (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	6	0.0072	2.5
-20		2	0.0024	2.5
-10		-1	-0.0012	2.5
0		3	0.0036	2.5
10		1	0.0012	2.5
20		4	0.0048	2.5
30		-5	-0.0060	2.5
40		2	0.0024	2.5
50		3	0.0036	2.5
20	L.V.	6	0.0072	2.5
	H.V.	2	0.0024	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	3	0.0036	2.5
-20		-2	-0.0024	2.5
-10		1	0.0012	2.5
0		-5	-0.0060	2.5
10		4	0.0048	2.5
20		1	0.0012	2.5
30		6	0.0072	2.5
40		2	0.0024	2.5
50		3	0.0036	2.5
20	L.V.	6	0.0072	2.5
	H.V.	2	0.0024	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	6	0.0072	2.5
-20		-2	-0.0024	2.5
-10		3	0.0036	2.5
0		-1	-0.0012	2.5
10		4	0.0048	2.5
20		2	0.0024	2.5
30		-5	-0.0060	2.5
40		1	0.0012	2.5
50		-5	-0.0060	2.5
20	L.V.	4	0.0048	2.5
	H.V.	3	0.0036	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	6	0.0032	pass
-20		2	0.0011	pass
-10		1	0.0005	pass
0		5	0.0027	pass
10		3	0.0016	pass
20		-2	-0.0011	pass
30		-5	-0.0027	pass
40		1	0.0005	pass
50		3	0.0016	pass
20	L.V.	6	0.0032	pass
	H.V.	-5	-0.0027	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	5	0.0027	pass
-20		-2	-0.0011	pass
-10		3	0.0016	pass
0		-1	-0.0005	pass
10		4	0.0021	pass
20		-2	-0.0011	pass
30		1	0.0005	pass
40		5	0.0027	pass
50		-4	-0.0021	pass
20	L.V.	3	0.0016	pass
	H.V.	-5	-0.0027	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	3	0.0016	pass
-20		1	0.0005	pass
-10		2	0.0011	pass
0		-4	-0.0021	pass
10		-5	-0.0027	pass
20		1	0.0005	pass
30		-6	-0.0032	pass
40		2	0.0011	pass
50		-5	-0.0027	pass
20	L.V.	3	0.0016	pass
	H.V.	4	0.0021	pass

AWS Band (Part 27)

Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	1710.1118	1754.9988	1710	1755
-20		1710.0754	1754.9977	1710	1755
-10		1710.0125	1754.9971	1710	1755
0		1710.2682	1754.9952	1710	1755
10		1710.2084	1754.9940	1710	1755
20		1710.2965	1754.9984	1710	1755
30		1710.2586	1754.9967	1710	1755
40		1710.0331	1754.9978	1710	1755
50		1710.1565	1754.9982	1710	1755
20	L.V.	1710.0620	1754.9966	1710	1755
	H.V.	1710.2774	1754.9982	1710	1755

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, f_o=1880MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	3	0.0016	pass
-20		-5	-0.0027	pass
-10		1	0.0005	pass
0		-4	-0.0021	pass
10		6	0.0032	pass
20		2	0.0011	pass
30		-3	-0.0016	pass
40		1	0.0005	pass
50		5	0.0027	pass
20	L.V.	6	0.0037	pass
	H.V.	11	0.0059	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	1710.3393	1754.5366	1710	1755
-20		1710.4026	1754.4366	1710	1755
-10		1710.3949	1754.5228	1710	1755
0		1710.4094	1754.3420	1710	1755
10		1710.3214	1754.3361	1710	1755
20		1710.3990	1754.5075	1710	1755
30		1710.5486	1754.4264	1710	1755
40		1710.3699	1754.3810	1710	1755
50		1710.3942	1754.5723	1710	1755
20	L.V.	1710.5247	1754.3042	1710	1755
	H.V.	1710.5543	1754.4430	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	2	0.0024	2.5
-20		6	0.0072	2.5
-10		-3	-0.0036	2.5
0		-5	-0.0060	2.5
10		4	0.0048	2.5
20		-9	-0.0108	2.5
30		5	0.0060	2.5
40		-8	-0.0096	2.5
50		2	0.0024	2.5
20	L.V.	6	0.0027	2.5
	H.V.	7	0.0043	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	2500.3949	2569.4363	2500	2570
-20		2500.5878	2569.4019	2500	2570
-10		2500.3474	2569.536	2500	2570
0		2500.3523	2569.5065	2500	2570
10		2500.4732	2569.3155	2500	2570
20		2500.3068	2569.5486	2500	2570
30		2500.5092	2569.5295	2500	2570
40		2500.3383	2569.3492	2500	2570
50		2500.3137	2569.5675	2500	2570
20	L.V.	2500.3185	2569.5299	2500	2570
	H.V.	2500.4825	2569.5292	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	699.4949	715.4604	699	716
-20		699.7170	715.3038	699	716
-10		699.7210	715.3018	699	716
0		699.7494	715.5814	699	716
10		699.6083	715.5472	699	716
20		699.7250	715.5140	699	716
30		699.4697	715.3741	699	716
40		699.4983	715.5936	699	716
50		699.4805	715.4952	699	716
20	L.V.	699.7339	715.5582	699	716
	H.V.	699.5527	715.5918	699	716

Band 17:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	704.5855	715.5741	704	716
-20		704.3683	715.5652	704	716
-10		704.568	715.5447	704	716
0		704.5846	715.4129	704	716
10		704.5864	715.3469	704	716
20		704.5401	715.3440	704	716
30		704.5501	715.5870	704	716
40		704.5441	715.3866	704	716
50		704.5773	715.4145	704	716
20	L.V.	704.4228	715.3756	704	716
	H.V.	704.5695	715.3208	704	716

16QAM:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	6	0.0032	pass
-20		1	0.0005	pass
-10		-2	-0.0011	pass
0		-4	-0.0021	pass
10		5	0.0027	pass
20		-3	-0.0016	pass
30		2	0.0011	pass
40		-3	-0.0016	pass
50		5	0.0027	pass
20	L.V.	7	0.0037	pass
	H.V.	11	0.0059	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	1710.7252	1754.6245	1710	1755
-20		1710.7154	1754.7366	1710	1755
-10		1710.5313	1754.7761	1710	1755
0		1710.736	1754.7646	1710	1755
10		1710.7477	1754.5698	1710	1755
20		1710.5684	1754.6637	1710	1755
30		1710.6388	1754.6665	1710	1755
40		1710.623	1754.5749	1710	1755
50		1710.7297	1754.6916	1710	1755
20	L.V.	1710.6442	1754.5742	1710	1755
	H.V.	1710.7955	1754.5908	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	**Power Supplied**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	3	0.0036	2.5
-20		5	0.0060	2.5
-10		-6	-0.0072	2.5
0		1	0.0012	2.5
10		4	0.0048	2.5
20		-2	-0.0024	2.5
30		5	0.0060	2.5
40		-4	-0.0048	2.5
50		8	0.0096	2.5
20	L.V.	5	0.0027	2.5
	H.V.	8	0.0096	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	2500.7565	2569.3912	2500	2570
-20		2500.8377	2569.4742	2500	2570
-10		2500.8317	2569.4693	2500	2570
0		2500.7751	2569.3392	2500	2570
10		2500.9538	2569.3487	2500	2570
20		2500.9591	2569.5546	2500	2570
30		2500.7877	2569.6054	2500	2570
40		2501.0152	2569.4518	2500	2570
50		2500.7527	2569.634	2500	2570
20	L.V.	2501.0192	2569.5605	2500	2570
	H.V.	2500.8752	2569.3362	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	699.5094	715.4243	699	716
-20		699.5195	715.3177	699	716
-10		699.7468	715.3132	699	716
0		699.7375	715.3923	699	716
10		699.4798	715.3748	699	716
20		699.5317	715.3081	699	716
30		699.5422	715.3203	699	716
40		699.4858	715.3364	699	716
50		699.7240	715.5130	699	716
20	L.V.	699.6333	715.3475	699	716
	H.V.	699.7225	715.4906	699	716

Band 17:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	704.579	715.3915	704	716
-20		704.3731	715.5682	704	716
-10		704.5758	715.4969	704	716
0		704.3516	715.5524	704	716
10		704.5007	715.383	704	716
20		704.4708	715.5964	704	716
30		704.4623	715.3074	704	716
40		704.4274	715.3939	704	716
50		704.5553	715.4011	704	716
20	L.V.	704.4223	715.4589	704	716
	H.V.	704.4866	715.4973	704	716

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