FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

Epik One America Corporation

170 Ocean Lane Dr. #705, Key Biscayne, FL 33149, Key Biscayne, Florida, United States

FCC ID:2AO6ZX507T

Report Type:	**Product Type:**
Original Report	4G Smart Phone

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	4G Smart Phone
Tested Model	X507T
Frequency Range	Cellular: 824-849 MHz PCS: 1850-1910 MHz WCDMA B2/LTE B2: 1850-1910 MHz WCDMA B5/ LTE B5: 824-849 MHz LTE B4: 1710- 1755 MHz LTE B7: 2500-2570 MHz
Transmit Power	GSM850: 32.5dBm PCS1900: 29.3dBm WCDMA Band 2: 23dBm WCDMA Band 5: 22.9dBm LTE Band 2: 22.3dBm LTE Band 4: 22.4dBm LTE Band 5: 23dBm LTE Band 7: 22.2dBm
Modulation Technique	2G: GMSK,8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: Internal FPC Antenna
Voltage Range	DC 3.7V from battery or DC 5.0V from adapter
Date of Test	2019-03-13~2019-04-18
Sample serial number	190306003
Received date	2019/03/06
Sample/EUT Status	Good condition
Adapter information	Model: HL-0507D-UU Input: AC 100-240V, 50/60Hz, 0.15A Output: DC 5V, 700 mA

Objective

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

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS & DTS submissions with FCC ID: 2AO6ZX507T.

Test Methodology

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

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

Applicable Standards: TIA/EIA 603-D.

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

Measurement Uncertainty

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

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

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

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

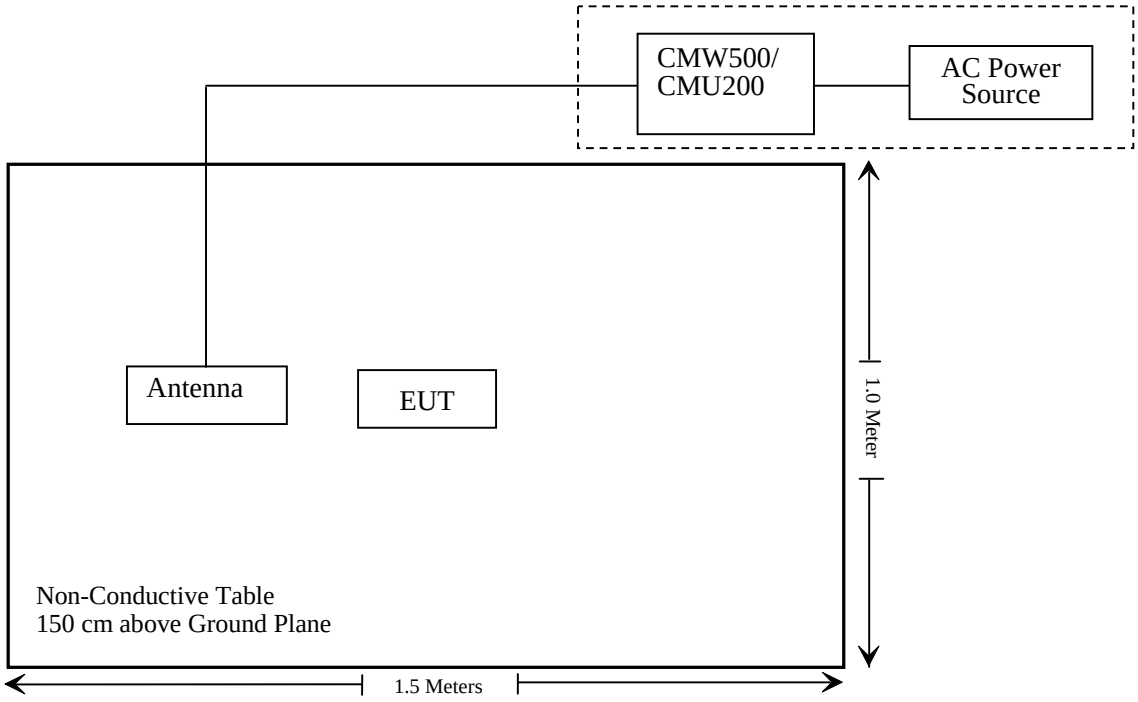
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (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 (h)(m)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	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: RSZ190306003-SA.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017-12-22	2020-12-21
Rohde & Schwarz	Signal Analyzer	FSV40	101473	2019-01-09	2020-01-08
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-11-12	2019-11-12
Sonoma Instrument	Amplifier	310N	186238	2018-11-12	2019-11-12
Anritsu	Signal Generator	68369B	004114	2018-12-24	2019-12-24
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2018-07-11	2019-07-11
COM-POWER	Dipole Antenna	AD-100	41000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
UTiFLEX MICRO-C0AX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-11-12	2019-11-12
Ducommun Technologies	RF Cable	104PEA	218124002	2018-11-12	2019-11-12
Ducommun Technologies	RF Cable	RG-214	1	2018-11-19	2019-05-21
Ducommun Technologies	RF Cable	RG-214	2	2018-11-12	2019-11-12
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	2018-11-12	2019-11-12

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2018-12-24	2019-12-24
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2018-12-21	2019-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2018-12-14	2019-12-14
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2018-06-23	2019-06-23
Ducommun Technologies	RF Cable	RG-214	3	Each Time	
WEINSCHEL	10dB Attenuator	5324	AU 3842	Each Time	
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: RSZ190306003-SA.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

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

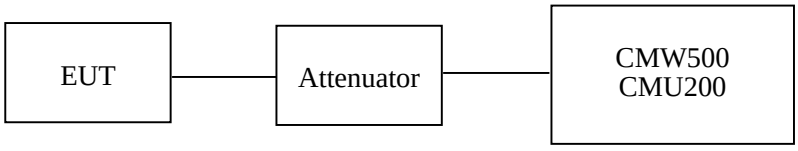
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Shawn Xiao on 2019-03-13.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.40	38.45
	190	836.6	32.20	38.45
	251	848.8	32.00	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.32	30.40	28.52	26.49	38.45
	190	836.6	32.15	30.42	28.45	26.63	38.45
	251	848.8	31.89	30.54	28.53	26.69	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	26.29	25.98	24.93	22.43	38.45
	190	836.6	26.71	26.46	25.36	22.93	38.45
	251	848.8	26.67	26.42	25.35	22.79	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		22.74	22.68	22.19
		HSDPA	1	21.68	21.10	21.53
			2	21.91	21.80	21.56
			3	21.79	21.85	21.24
			4	21.15	21.41	21.66
		HSUPA	1	21.36	21.02	21.57
			2	22.10	21.57	21.84
			3	22.27	21.36	22.04
			4	21.20	21.73	21.34
			5	21.46	21.84	22.17
		HSPA+	1	21.32	20.95	21.15

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.30	33
	661	1880.0	28.72	33
	810	1909.8	29.10	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.28	27.21	26.03	23.92	33
	661	1880.0	28.69	27.48	26.22	24.10	33
	810	1909.8	29.11	27.42	26.16	24.08	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.48	24.79	23.62	21.43	33
	661	1880.0	25.74	24.96	23.74	21.61	33
	810	1909.8	25.64	24.92	23.70	21.52	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		22.87	22.42	22.45
		HSDPA	1	21.18	20.69	20.87
			2	21.61	21.88	21.19
			3	21.43	21.53	21.69
			4	21.37	21.45	21.82
		HSUPA	1	20.96	20.80	20.71
			2	21.75	21.28	21.40
			3	21.41	21.54	21.77
			4	21.71	20.95	20.96
			5	21.32	21.63	21.34
		HSPA+	1	20.68	21.41	20.68

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	7.57	13
	Middle	7.68	13
	High	7.72	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	7.36	13
	Middle	7.38	13
	High	7.41	13

Mode	Channel	PAR(dB)	Limit(dBm)
WCDMA	Low	3.52	13
	Middle	3.21	13
	High	2.77	13
HSDPA	Low	3.44	13
	Middle	3.49	13
	High	2.97	13
HSUPA	Low	3.39	13
	Middle	3.65	13
	High	3.61	13
HSPA+	Low	3.44	13
	Middle	3.38	13
	High	3.57	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	7.55	13
	Middle	7.65	13
	High	7.43	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	7.41	13
	Middle	7.43	13
	High	7.39	13

Mode	Channel	PAR(dB)	Limit(dBm)
WCDMA	Low	2.64	13
	Middle	3.08	13
	High	3.14	13
HSDPA	Low	3.19	13
	Middle	3.19	13
	High	2.69	13
HSUPA	Low	2.71	13
	Middle	3.02	13
	High	2.94	13
HSPA+	Low	3.04	13
	Middle	3.12	13
	High	3.25	13

Radiated Power
GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	91.88	171	1.0	H	29.9	0.7	0.0	29.20	38.45	9.25
836.6	92.61	11	1.6	V	32.2	0.7	0.0	31.50	38.45	6.95
EIRP for PCS Band (Part 24E), Middle Channel										
1880.0	92.99	275	1.9	H	22.9	1.30	9.40	31.00	33	2.00
1880.0	92.05	141	1.1	V	21.8	1.30	9.40	29.90	33	3.10

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	87.76	171	1.0	H	25.8	0.7	0.0	25.10	38.45	13.35
836.6	88.53	11	1.6	V	28.1	0.7	0.0	27.40	38.45	11.05
EIRP, PCS Band (Part 24E), Middle Channel										
1880.0	88.78	275	1.9	H	18.7	1.30	9.40	26.80	33	6.20
1880.0	88.17	141	1.1	V	17.9	1.30	9.40	26.00	33	7.00

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	84.23	320	2.4	H	22.2	0.7	0.0	21.50	38.45	16.95
836.6	83.17	272	1.6	V	22.8	0.7	0.0	22.10	38.45	16.35
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.0	85.23	76	2.3	H	15.2	1.30	9.40	23.30	33	9.70
1880.0	83.51	321	1.6	V	13.2	1.30	9.40	21.30	33	11.70

Note:
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

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	22.10	21.00	21.52
		RB Size=1, RB Offset=2	21.54	21.50	21.84
		RB Size=1, RB Offset=5	21.94	20.55	21.50
		RB Size=3, RB Offset=0	20.97	20.96	20.82
		RB Size=3, RB Offset=1	21.37	21.10	20.81
		RB Size=3, RB Offset=2	21.46	21.11	21.97
		RB Size=6, RB Offset=0	20.95	21.54	21.09
	16QAM	RB Size=1, RB Offset=0	21.48	20.82	21.93
		RB Size=1, RB Offset=2	21.00	21.48	21.42
		RB Size=1, RB Offset=5	21.39	21.31	20.64
		RB Size=3, RB Offset=0	20.83	20.89	20.70
		RB Size=3, RB Offset=1	20.89	21.86	20.53
		RB Size=3, RB Offset=2	20.41	20.83	20.92
		RB Size=6, RB Offset=0	21.12	21.32	21.38
3.0	QPSK	RB Size=1, RB Offset=0	21.66	20.83	21.10
		RB Size=1, RB Offset=7	21.85	21.33	20.27
		RB Size=1, RB Offset=14	21.41	20.66	21.28
		RB Size=8, RB Offset=0	21.93	21.60	20.96
		RB Size=8, RB Offset=4	21.00	20.41	20.85
		RB Size=8, RB Offset=7	20.92	20.71	21.68
		RB Size=15, RB Offset=0	21.24	21.80	20.82
	16QAM	RB Size=1, RB Offset=0	21.27	21.84	21.48
		RB Size=1, RB Offset=7	21.68	20.51	21.23
		RB Size=1, RB Offset=14	21.59	20.98	20.82
		RB Size=8, RB Offset=0	21.03	21.38	21.18
		RB Size=8, RB Offset=4	21.29	20.67	21.42
		RB Size=8, RB Offset=7	20.92	20.52	21.46
		RB Size=15, RB Offset=0	21.16	21.40	20.71

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.53	20.64	21.97
		RB Size=1, RB Offset=12	22.06	22.05	20.39
		RB Size=1, RB Offset=24	21.07	21.17	21.29
		RB Size=12, RB Offset=0	21.54	22.15	20.59
		RB Size=12, RB Offset=6	21.24	20.66	21.50
		RB Size=12, RB Offset=11	21.35	20.58	21.48
		RB Size=25, RB Offset=0	20.80	21.16	20.84
	16QAM	RB Size=1, RB Offset=0	21.12	21.39	21.30
		RB Size=1, RB Offset=12	20.78	21.27	21.26
		RB Size=1, RB Offset=24	20.69	20.91	21.39
		RB Size=12, RB Offset=0	21.02	21.58	21.15
		RB Size=12, RB Offset=6	21.00	21.39	20.94
		RB Size=12, RB Offset=11	21.02	21.02	21.36
		RB Size=25, RB Offset=0	20.92	20.83	21.30
10.0	QPSK	RB Size=1, RB Offset=0	22.13	21.63	21.22
		RB Size=1, RB Offset=24	21.76	21.30	21.64
		RB Size=1, RB Offset=49	21.64	20.63	21.14
		RB Size=25, RB Offset=0	21.62	21.77	21.53
		RB Size=25, RB Offset=12	21.20	21.24	21.06
		RB Size=25, RB Offset=24	20.99	21.57	21.53
		RB Size=50, RB Offset=0	21.73	21.69	20.67
	16QAM	RB Size=1, RB Offset=0	21.62	21.26	21.51
		RB Size=1, RB Offset=24	21.34	21.15	21.07
		RB Size=1, RB Offset=49	21.16	21.16	20.80
		RB Size=25, RB Offset=0	21.20	21.72	20.84
		RB Size=25, RB Offset=12	21.18	21.27	21.69
		RB Size=25, RB Offset=24	20.96	20.94	20.98
		RB Size=50, RB Offset=0	20.98	21.16	20.93

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	21.40	21.09	21.10
		RB Size=1, RB Offset=37	22.05	20.83	21.17
		RB Size=1, RB Offset=74	21.86	20.57	20.87
		RB Size=36, RB Offset=0	21.66	21.38	21.20
		RB Size=36, RB Offset=18	21.57	21.03	21.73
		RB Size=36, RB Offset=37	21.47	20.51	21.19
		RB Size=75, RB Offset=0	20.94	21.11	20.97
	16QAM	RB Size=1, RB Offset=0	21.70	21.12	21.30
		RB Size=1, RB Offset=37	21.45	21.08	21.40
		RB Size=1, RB Offset=74	21.17	20.65	21.36
		RB Size=36, RB Offset=0	21.54	21.26	20.78
		RB Size=36, RB Offset=18	20.76	20.60	21.08
		RB Size=36, RB Offset=37	21.05	21.23	21.51
		RB Size=75, RB Offset=0	21.27	21.25	22.01
20.0	QPSK	RB Size=1, RB Offset=0	22.04	21.84	21.39
		RB Size=1, RB Offset=49	21.16	21.21	21.75
		RB Size=1, RB Offset=99	21.66	21.43	21.54
		RB Size=50, RB Offset=0	21.32	21.86	20.59
		RB Size=50, RB Offset=24	21.15	20.94	21.21
		RB Size=50, RB Offset=49	21.18	21.02	21.57
		RB Size=100, RB Offset=0	21.66	21.58	21.49
	16QAM	RB Size=1, RB Offset=0	21.58	20.69	20.81
		RB Size=1, RB Offset=49	21.46	21.61	20.99
		RB Size=1, RB Offset=99	20.70	21.42	22.12
		RB Size=50, RB Offset=0	20.80	20.96	21.69
		RB Size=50, RB Offset=24	20.98	21.80	21.03
		RB Size=50, RB Offset=49	20.76	21.53	21.30
		RB Size=100, RB Offset=0	21.28	21.24	21.06

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.07	13	Pass
QPSK (100RB Size)	6.27	13	Pass
16QAM (1RB Size)	6.06	13	Pass
16QAM (100RB Size)	5.85	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	82.90	204	1.5	H	12.9	1.30	9.40	21.00	33
1880.00	78.36	345	1.9	V	8.1	1.30	9.40	16.20	33
3 MHz Bandwidth									
1880.00	82.10	321	2.0	H	12.1	1.30	9.40	20.20	33
1880.00	78.50	275	1.1	V	8.2	1.30	9.40	16.30	33
5 MHz Bandwidth									
1880.00	82.63	254	2.0	H	12.6	1.30	9.40	20.70	33
1880.00	78.16	227	1.5	V	7.9	1.30	9.40	16.00	33
10 MHz Bandwidth									
1880.00	82.46	51	1.1	H	12.4	1.30	9.40	20.50	33
1880.00	78.33	128	2.1	V	8.1	1.30	9.40	16.20	33
15 MHz Bandwidth									
1880.00	82.55	74	1.1	H	12.5	1.30	9.40	20.60	33
1880.00	78.26	11	2.0	V	8.0	1.30	9.40	16.10	33
20 MHz Bandwidth									
1880.00	82.10	275	2.2	H	12.1	1.30	9.40	20.20	33
1880.00	78.12	24	2.0	V	7.9	1.30	9.40	16.00	33

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	83.96	147	1.1	H	13.9	1.30	9.40	22.00	33
1880.00	79.30	169	1.6	V	9.0	1.30	9.40	17.10	33
3 MHz Bandwidth									
1880.00	83.20	296	2.1	H	13.2	1.30	9.40	21.30	33
1880.00	79.61	147	1.9	V	9.3	1.30	9.40	17.40	33
5 MHz Bandwidth									
1880.00	83.02	11	2.1	H	13.0	1.30	9.40	21.10	33
1880.00	78.70	223	1.3	V	8.4	1.30	9.40	16.50	33
10 MHz Bandwidth									
1880.00	82.89	350	2.2	H	12.8	1.30	9.40	20.90	33
1880.00	79.36	235	1.7	V	9.1	1.30	9.40	17.20	33
15 MHz Bandwidth									
1880.00	82.89	293	1.6	H	12.8	1.30	9.40	20.90	33
1880.00	79.10	318	1.7	V	8.8	1.30	9.40	16.90	33
20 MHz Bandwidth									
1880.00	82.80	260	1.4	H	12.8	1.30	9.40	20.90	33
1880.00	79.20	270	1.7	V	8.9	1.30	9.40	17.00	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	21.37	20.88	21.21
		RB Size=1, RB Offset=2	21.69	20.72	21.64
		RB Size=1, RB Offset=5	21.78	21.20	21.52
		RB Size=3, RB Offset=0	21.22	21.13	21.37
		RB Size=3, RB Offset=1	21.02	20.44	21.13
		RB Size=3, RB Offset=2	21.22	21.18	20.80
		RB Size=6, RB Offset=0	21.07	21.60	20.96
	16QAM	RB Size=1, RB Offset=0	21.69	22.01	21.58
		RB Size=1, RB Offset=2	21.05	21.05	20.54
		RB Size=1, RB Offset=5	20.75	21.11	20.65
		RB Size=3, RB Offset=0	21.02	20.87	21.77
		RB Size=3, RB Offset=1	20.43	21.44	21.07
		RB Size=3, RB Offset=2	21.30	20.60	20.73
		RB Size=6, RB Offset=0	20.31	21.58	21.90
3.0	QPSK	RB Size=1, RB Offset=0	21.86	21.52	20.94
		RB Size=1, RB Offset=7	21.55	21.76	20.84
		RB Size=1, RB Offset=14	21.60	21.25	21.62
		RB Size=8, RB Offset=0	21.78	21.25	21.05
		RB Size=8, RB Offset=4	21.48	20.36	21.29
		RB Size=8, RB Offset=7	21.48	20.92	21.19
		RB Size=15, RB Offset=0	21.39	21.62	21.63
	16QAM	RB Size=1, RB Offset=0	21.26	21.74	21.12
		RB Size=1, RB Offset=7	20.61	20.42	21.11
		RB Size=1, RB Offset=14	20.84	22.09	21.42
		RB Size=8, RB Offset=0	21.38	21.18	21.54
		RB Size=8, RB Offset=4	20.97	20.87	20.55
		RB Size=8, RB Offset=7	21.11	21.53	21.45
		RB Size=15, RB Offset=0	20.74	20.85	21.31

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.61	21.01	21.15
		RB Size=1, RB Offset=12	21.81	20.49	21.60
		RB Size=1, RB Offset=24	21.27	20.84	20.70
		RB Size=12, RB Offset=0	21.89	21.52	21.78
		RB Size=12, RB Offset=6	21.31	21.23	21.27
		RB Size=12, RB Offset=11	21.56	21.77	21.17
		RB Size=25, RB Offset=0	21.41	21.09	21.09
	16QAM	RB Size=1, RB Offset=0	21.45	21.23	20.51
		RB Size=1, RB Offset=12	21.51	21.24	20.86
		RB Size=1, RB Offset=24	20.97	21.01	21.51
		RB Size=12, RB Offset=0	20.83	21.84	21.33
		RB Size=12, RB Offset=6	21.09	21.54	21.77
		RB Size=12, RB Offset=11	21.09	21.89	21.26
		RB Size=25, RB Offset=0	20.34	21.64	21.70
10.0	QPSK	RB Size=1, RB Offset=0	22.16	21.35	21.86
		RB Size=1, RB Offset=24	21.37	21.75	20.98
		RB Size=1, RB Offset=49	21.98	20.95	21.77
		RB Size=25, RB Offset=0	21.34	20.70	21.20
		RB Size=25, RB Offset=12	21.06	21.42	21.58
		RB Size=25, RB Offset=24	21.34	21.59	21.17
		RB Size=50, RB Offset=0	21.58	21.97	21.81
	16QAM	RB Size=1, RB Offset=0	21.21	21.30	21.52
		RB Size=1, RB Offset=24	21.30	21.23	21.91
		RB Size=1, RB Offset=49	21.02	21.62	21.50
		RB Size=25, RB Offset=0	21.35	21.14	21.28
		RB Size=25, RB Offset=12	20.84	20.63	20.58
		RB Size=25, RB Offset=24	21.23	21.83	20.29
		RB Size=50, RB Offset=0	21.18	21.09	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	22.13	21.33	21.50
		RB Size=1, RB Offset=37	21.94	21.31	20.93
		RB Size=1, RB Offset=74	21.54	21.13	21.00
		RB Size=36, RB Offset=0	21.80	21.86	20.30
		RB Size=36, RB Offset=18	21.08	21.90	21.46
		RB Size=36, RB Offset=37	21.20	21.25	21.36
		RB Size=75, RB Offset=0	21.46	21.33	21.03
	16QAM	RB Size=1, RB Offset=0	21.04	22.11	21.35
		RB Size=1, RB Offset=37	21.66	21.26	21.16
		RB Size=1, RB Offset=74	21.63	21.35	21.04
		RB Size=36, RB Offset=0	21.29	21.87	21.31
		RB Size=36, RB Offset=18	20.83	20.40	21.64
		RB Size=36, RB Offset=37	20.71	20.82	20.52
		RB Size=75, RB Offset=0	20.75	21.47	20.83
20.0	QPSK	RB Size=1, RB Offset=0	22.03	21.79	21.28
		RB Size=1, RB Offset=49	22.02	21.43	21.17
		RB Size=1, RB Offset=99	21.24	21.23	20.65
		RB Size=50, RB Offset=0	21.20	20.90	20.71
		RB Size=50, RB Offset=24	21.54	21.42	21.71
		RB Size=50, RB Offset=49	21.64	21.22	21.40
		RB Size=100, RB Offset=0	21.71	21.08	21.63
	16QAM	RB Size=1, RB Offset=0	21.28	21.44	20.98
		RB Size=1, RB Offset=49	21.38	21.78	21.48
		RB Size=1, RB Offset=99	20.66	20.88	21.59
		RB Size=50, RB Offset=0	20.41	21.85	21.03
		RB Size=50, RB Offset=24	20.81	21.46	20.87
		RB Size=50, RB Offset=49	21.01	21.99	21.13
		RB Size=100, RB Offset=0	20.48	21.15	20.50

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.22	13	Pass
QPSK (100RB Size)	6.05	13	Pass
16QAM (1RB Size)	6.13	13	Pass
16QAM (100RB Size)	5.78	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	84.50	156	1.4	H	11.3	1.30	8.90	18.90	30
1732.50	81.36	296	1.1	V	8.8	1.30	8.90	16.40	30
3 MHz Bandwidth									
1732.50	84.32	37	1.5	H	11.2	1.30	8.90	18.80	30
1732.50	81.26	146	1.0	V	8.7	1.30	8.90	16.30	30
5 MHz Bandwidth									
1732.50	84.16	302	2.2	H	11.0	1.30	8.90	18.60	30
1732.50	80.90	165	2.1	V	8.3	1.30	8.90	15.90	30
10 MHz Bandwidth									
1732.50	84.09	8	1.5	H	10.9	1.30	8.90	18.50	30
1732.50	80.84	358	1.7	V	8.3	1.30	8.90	15.90	30
15 MHz Bandwidth									
1732.50	84.36	80	1.9	H	11.2	1.30	8.90	18.80	30
1732.50	81.24	320	1.9	V	8.7	1.30	8.90	16.30	30
20 MHz Bandwidth									
1732.50	84.06	114	1.0	H	10.9	1.30	8.90	18.50	30
1732.50	81.20	349	2.3	V	8.6	1.30	8.90	16.20	30

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	84.70	158	2.2	H	11.5	1.30	8.90	19.10	30
1732.50	79.30	115	1.8	V	6.7	1.30	8.90	14.30	30
3 MHz Bandwidth									
1732.50	84.56	106	1.5	H	11.4	1.30	8.90	19.00	30
1732.50	79.21	144	1.1	V	6.6	1.30	8.90	14.20	30
5 MHz Bandwidth									
1732.50	84.26	220	1.8	H	11.1	1.30	8.90	18.70	30
1732.50	79.50	261	2.0	V	6.9	1.30	8.90	14.50	30
10 MHz Bandwidth									
1732.50	84.36	47	2.2	H	11.2	1.30	8.90	18.80	30
1732.50	79.15	222	2.0	V	6.6	1.30	8.90	14.20	30
15 MHz Bandwidth									
1732.50	84.04	218	1.0	H	10.9	1.30	8.90	18.50	30
1732.50	79.29	276	1.1	V	6.7	1.30	8.90	14.30	30
20 MHz Bandwidth									
1732.50	84.33	47	2.1	H	11.2	1.30	8.90	18.80	30
1732.50	79.70	8	1.6	V	7.1	1.30	8.90	14.70	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	22.27	21.02	21.63
		RB Size=1, RB Offset=2	22.19	22.01	21.19
		RB Size=1, RB Offset=5	21.97	21.97	21.99
		RB Size=3, RB Offset=0	22.60	22.59	21.86
		RB Size=3, RB Offset=1	21.83	21.39	21.97
		RB Size=3, RB Offset=2	22.54	22.03	21.08
		RB Size=6, RB Offset=0	21.97	22.35	22.23
	16QAM	RB Size=1, RB Offset=0	22.43	21.29	21.40
		RB Size=1, RB Offset=2	22.26	21.87	21.94
		RB Size=1, RB Offset=5	21.39	21.21	21.88
		RB Size=3, RB Offset=0	21.61	21.99	21.94
		RB Size=3, RB Offset=1	21.15	21.50	22.27
		RB Size=3, RB Offset=2	21.57	21.39	21.61
		RB Size=6, RB Offset=0	21.69	22.49	21.50
3.0	QPSK	RB Size=1, RB Offset=0	21.11	22.44	22.07
		RB Size=1, RB Offset=7	22.72	21.26	22.18
		RB Size=1, RB Offset=14	22.25	22.27	22.58
		RB Size=8, RB Offset=0	21.32	21.96	21.10
		RB Size=8, RB Offset=4	21.80	21.74	21.61
		RB Size=8, RB Offset=7	21.60	22.04	21.38
		RB Size=15, RB Offset=0	21.70	21.82	21.20
	16QAM	RB Size=1, RB Offset=0	21.73	22.08	21.08
		RB Size=1, RB Offset=7	21.44	21.37	21.92
		RB Size=1, RB Offset=14	21.92	21.43	21.80
		RB Size=8, RB Offset=0	21.86	22.28	21.28
		RB Size=8, RB Offset=4	20.96	21.35	22.06
		RB Size=8, RB Offset=7	21.05	22.01	21.26
		RB Size=15, RB Offset=0	20.84	21.44	21.48

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	20.99	21.59	21.51
		RB Size=1, RB Offset=12	22.15	21.66	21.88
		RB Size=1, RB Offset=24	22.16	22.01	21.03
		RB Size=12, RB Offset=0	21.66	21.59	21.44
		RB Size=12, RB Offset=6	22.17	21.81	22.53
		RB Size=12, RB Offset=11	22.15	21.76	22.50
		RB Size=25, RB Offset=0	22.04	21.34	21.77
	16QAM	RB Size=1, RB Offset=0	21.46	21.77	22.36
		RB Size=1, RB Offset=12	21.94	21.14	21.89
		RB Size=1, RB Offset=24	21.47	22.25	21.74
		RB Size=12, RB Offset=0	22.01	22.41	21.78
		RB Size=12, RB Offset=6	21.88	21.54	21.62
		RB Size=12, RB Offset=11	21.34	22.00	21.74
		RB Size=25, RB Offset=0	21.64	20.99	21.68
10.0	QPSK	RB Size=1, RB Offset=0	22.46	20.95	21.76
		RB Size=1, RB Offset=24	21.96	22.15	22.03
		RB Size=1, RB Offset=49	21.68	21.54	21.05
		RB Size=25, RB Offset=0	21.60	21.90	21.94
		RB Size=25, RB Offset=12	21.60	21.56	21.71
		RB Size=25, RB Offset=24	21.83	20.89	21.34
		RB Size=50, RB Offset=0	22.19	22.52	21.85
	16QAM	RB Size=1, RB Offset=0	22.03	21.34	21.23
		RB Size=1, RB Offset=24	21.58	21.21	21.68
		RB Size=1, RB Offset=49	21.60	20.89	21.49
		RB Size=25, RB Offset=0	21.93	21.79	21.52
		RB Size=25, RB Offset=12	21.22	21.70	21.15
		RB Size=25, RB Offset=24	21.43	21.64	22.06
		RB Size=50, RB Offset=0	21.02	20.82	22.43

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.14	13	Pass
QPSK (100RB Size)	5.98	13	Pass
16QAM (1RB Size)	6.25	13	Pass
16QAM (100RB Size)	6.09	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.50	83.17	47	2.2	H	23.8	1.88	0	21.92	38.45
836.50	80.58	175	1.1	V	20.6	1.88	0	18.72	38.45
3 MHz Bandwidth									
836.50	83.11	307	1.6	H	23.8	1.88	0	21.92	38.45
836.50	80.56	61	2.2	V	20.6	1.88	0	18.72	38.45
5 MHz Bandwidth									
836.50	83.12	166	2.2	H	23.7	1.88	0	21.82	38.45
836.50	80.61	135	1.5	V	20.6	1.88	0	18.72	38.45
10 MHz Bandwidth									
836.50	83.19	301	1.7	H	23.8	1.88	0	21.92	38.45
836.50	80.70	337	2.3	V	20.7	1.88	0	18.82	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.50	83.09	47	2.2	H	23.7	1.88	0	21.82	38.45
836.50	80.56	175	1.1	V	20.6	1.88	0	18.72	38.45
3 MHz Bandwidth									
836.50	83.14	307	1.6	H	23.8	1.88	0	21.92	38.45
836.50	80.58	61	2.2	V	20.6	1.88	0	18.72	38.45
5 MHz Bandwidth									
836.50	83.05	166	2.2	H	23.7	1.88	0	21.82	38.45
836.50	80.64	135	1.5	V	20.6	1.88	0	18.72	38.45
10 MHz Bandwidth									
836.50	83.17	301	1.7	H	23.8	1.88	0	21.92	38.45
836.50	80.72	337	2.3	V	20.7	1.88	0	18.82	38.45

LTE Band 7:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	21.28	21.24	21.18
		RB Size=1, RB Offset=12	21.51	21.48	21.27
		RB Size=1, RB Offset=24	21.33	21.27	21.81
		RB Size=12, RB Offset=0	21.11	21.06	21.58
		RB Size=12, RB Offset=6	20.94	21.02	20.92
		RB Size=12, RB Offset=11	21.03	21.34	21.53
		RB Size=25, RB Offset=0	21.56	21.05	21.52
	16QAM	RB Size=1, RB Offset=0	21.46	21.38	21.49
		RB Size=1, RB Offset=12	21.66	21.12	21.03
		RB Size=1, RB Offset=24	21.77	21.67	21.10
		RB Size=12, RB Offset=0	21.68	20.77	21.32
		RB Size=12, RB Offset=6	21.37	20.71	21.01
		RB Size=12, RB Offset=11	21.32	20.81	21.32
		RB Size=25, RB Offset=0	20.71	20.84	20.68
10	QPSK	RB Size=1, RB Offset=0	21.43	21.21	21.46
		RB Size=1, RB Offset=24	21.80	21.61	21.12
		RB Size=1, RB Offset=49	21.49	21.71	21.50
		RB Size=25, RB Offset=0	21.17	21.15	21.14
		RB Size=25, RB Offset=12	21.16	21.26	21.22
		RB Size=25, RB Offset=24	21.15	21.48	21.54
		RB Size=50, RB Offset=0	21.34	21.48	21.33
	16QAM	RB Size=1, RB Offset=0	21.05	21.86	21.22
		RB Size=1, RB Offset=24	21.77	21.38	21.84
		RB Size=1, RB Offset=49	21.37	21.85	21.61
		RB Size=25, RB Offset=0	20.56	21.04	21.14
		RB Size=25, RB Offset=12	20.52	20.86	20.91
		RB Size=25, RB Offset=24	20.98	20.39	21.03
		RB Size=50, RB Offset=0	20.68	20.47	20.99

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	21.91	21.70	21.26
		RB Size=1, RB Offset=37	21.50	21.45	21.98
		RB Size=1, RB Offset=74	21.62	21.32	21.43
		RB Size=36, RB Offset=0	21.75	21.31	21.26
		RB Size=36, RB Offset=18	21.62	21.78	21.02
		RB Size=36, RB Offset=37	21.07	21.91	21.03
		RB Size=75, RB Offset=0	21.49	20.47	21.54
	16QAM	RB Size=1, RB Offset=0	21.58	21.40	21.42
		RB Size=1, RB Offset=37	21.51	21.50	21.54
		RB Size=1, RB Offset=74	21.43	21.25	21.40
		RB Size=36, RB Offset=0	20.42	20.45	20.65
		RB Size=36, RB Offset=18	20.49	20.89	20.61
		RB Size=36, RB Offset=37	21.33	21.05	21.15
		RB Size=75, RB Offset=0	20.81	20.61	21.60
20	QPSK	RB Size=1, RB Offset=0	21.69	21.54	21.40
		RB Size=1, RB Offset=49	21.54	21.58	21.41
		RB Size=1, RB Offset=99	21.17	21.22	21.31
		RB Size=50, RB Offset=0	21.60	21.87	21.21
		RB Size=50, RB Offset=24	21.44	21.46	21.71
		RB Size=50, RB Offset=49	21.59	21.97	21.80
		RB Size=100, RB Offset=0	21.61	21.23	21.33
	16QAM	RB Size=1, RB Offset=0	21.31	21.58	21.65
		RB Size=1, RB Offset=49	21.48	21.53	21.44
		RB Size=1, RB Offset=99	21.39	21.27	21.57
		RB Size=50, RB Offset=0	21.17	21.21	21.29
		RB Size=50, RB Offset=24	20.92	21.32	21.07
		RB Size=50, RB Offset=49	21.32	21.18	21.25
		RB Size=100, RB Offset=0	20.93	20.43	21.37

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.69	13	Pass
QPSK (100RB Size)	5.49	13	Pass
16QAM (1RB Size)	6.01	13	Pass
16QAM (100RB Size)	6.14	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 (dBd/dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	82.10	190	1.8	H	12.6	2.60	10.20	20.20	33
2535.00	79.85	84	1.0	V	11.0	2.60	10.20	18.60	33
10 MHz Bandwidth									
2535.00	81.67	310	1.1	H	12.2	2.60	10.20	19.80	33
2535.00	79.65	331	1.3	V	10.8	2.60	10.20	18.40	33
15 MHz Bandwidth									
2535.00	81.80	120	2.0	H	12.3	2.60	10.20	19.90	33
2535.00	79.36	38	1.0	V	10.5	2.60	10.20	18.10	33
20 MHz Bandwidth									
2535.00	81.55	134	1.4	H	12.1	2.60	10.20	19.70	33
2535.00	79.20	48	1.5	V	10.3	2.60	10.20	17.90	33

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	82.90	252	1.0	H	13.4	2.60	10.20	21.00	33
2535.00	80.65	145	1.8	V	11.8	2.60	10.20	19.40	33
10 MHz Bandwidth									
2535.00	82.70	262	2.3	H	13.2	2.60	10.20	20.80	33
2535.00	80.33	331	1.2	V	11.5	2.60	10.20	19.10	33
15 MHz Bandwidth									
2535.00	82.76	238	1.6	H	13.3	2.60	10.20	20.90	33
2535.00	81.02	276	1.9	V	12.1	2.60	10.20	19.70	33
20 MHz Bandwidth									
2535.00	82.66	111	1.4	H	13.2	2.60	10.20	20.80	33
2535.00	80.50	100	1.4	V	11.6	2.60	10.20	19.20	33

Note:
All above data were tested with no amplifier
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level
The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

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

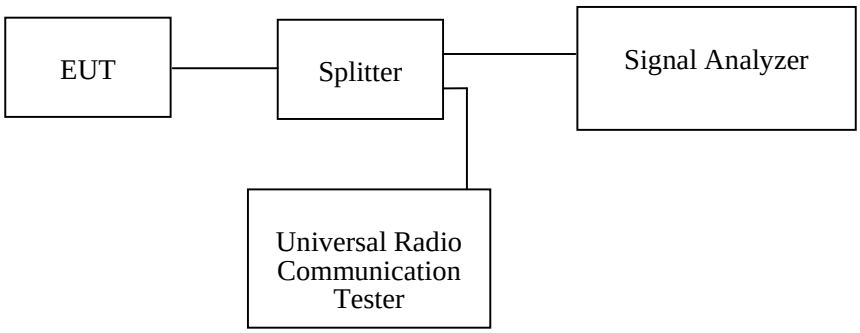
Applicable Standard

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

Test Procedure

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

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



Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	50~55 %
ATM Pressure:	100.9~101.0 kPa

The testing was performed by Shawn Xiao from 2019-03-13 to 2019-04-02.

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	317.31
EGPRS(8PSK)	836.6	245.19	312.50

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.15	4.66
HSUPA (BPSK)	836.6	4.17	4.70
HSDPA (16QAM)	836.6	4.17	4.70

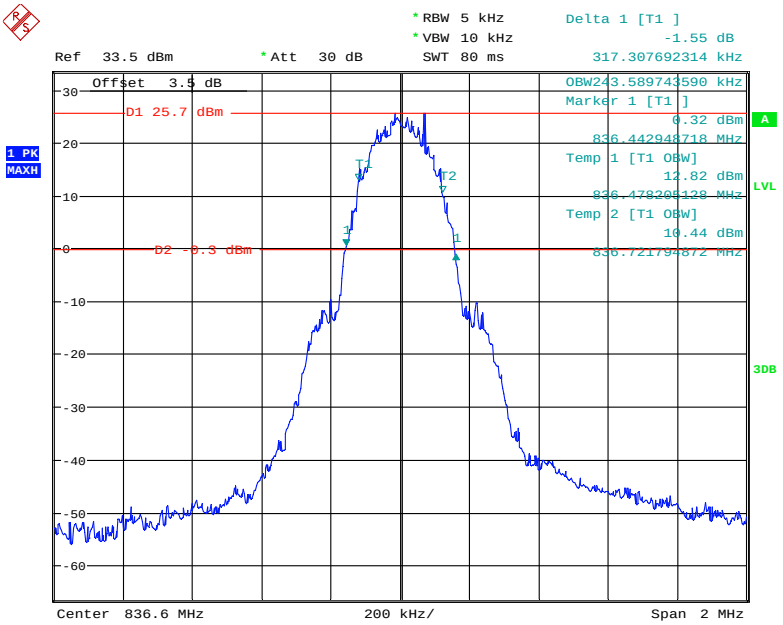
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	246.79	317.31
EGPRS(8PSK)	1880.0	246.79	309.29

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	4.71
HSDPA (16QAM)	1880.0	4.17	4.71

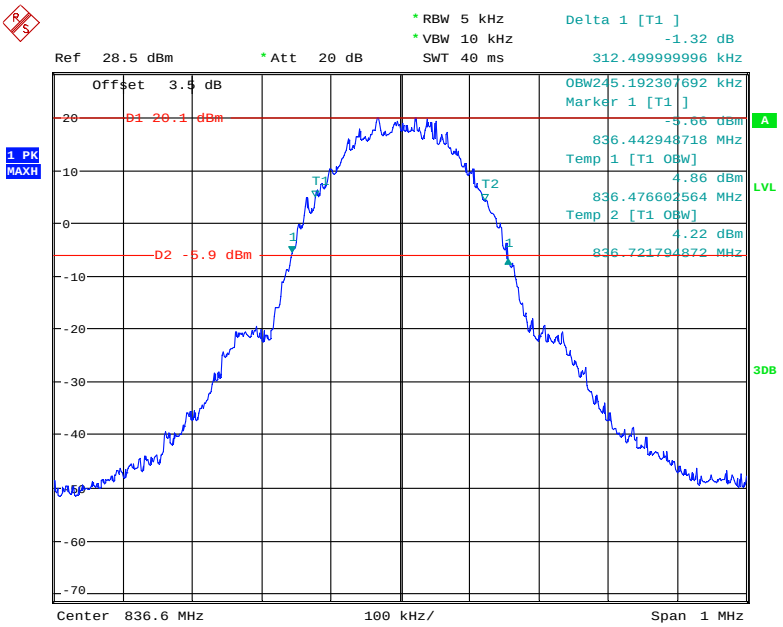
Cellular Band (Part 22H)

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



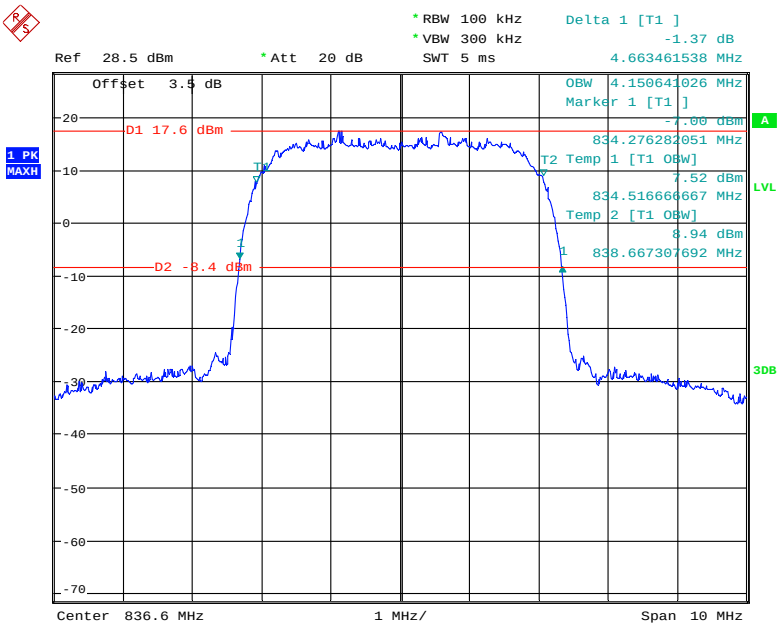
Date: 13.MAR.2019 14:36:12

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



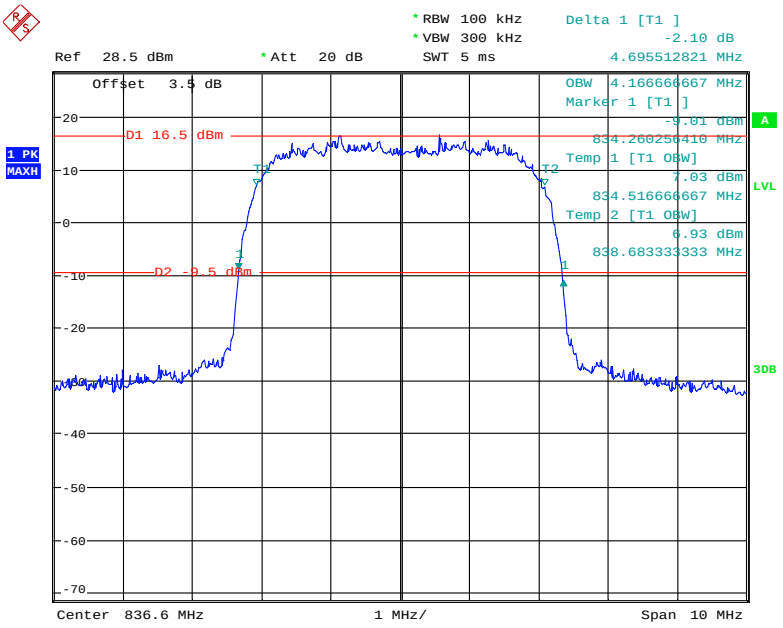
Date: 2.APR.2019 20:34:33

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



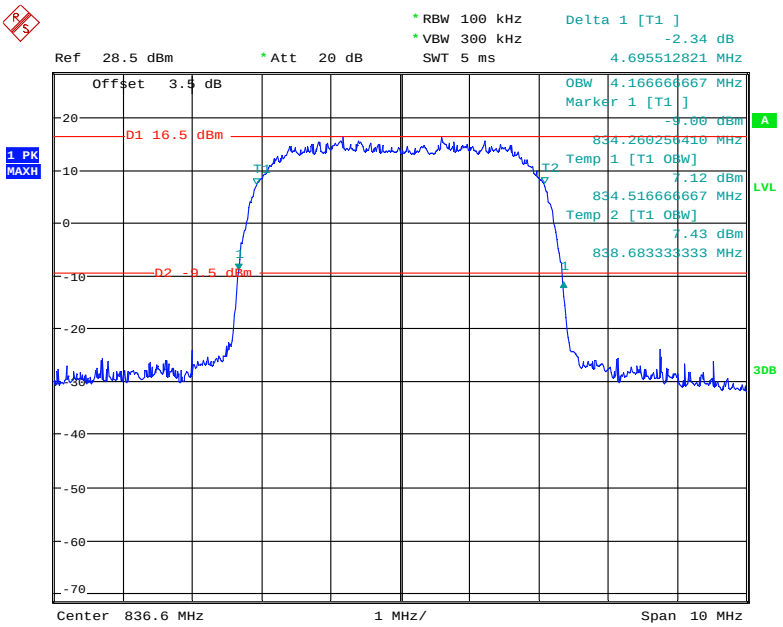
Date: 15.MAR.2019 14:38:01

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



Date: 15.MAR.2019 14:46:03

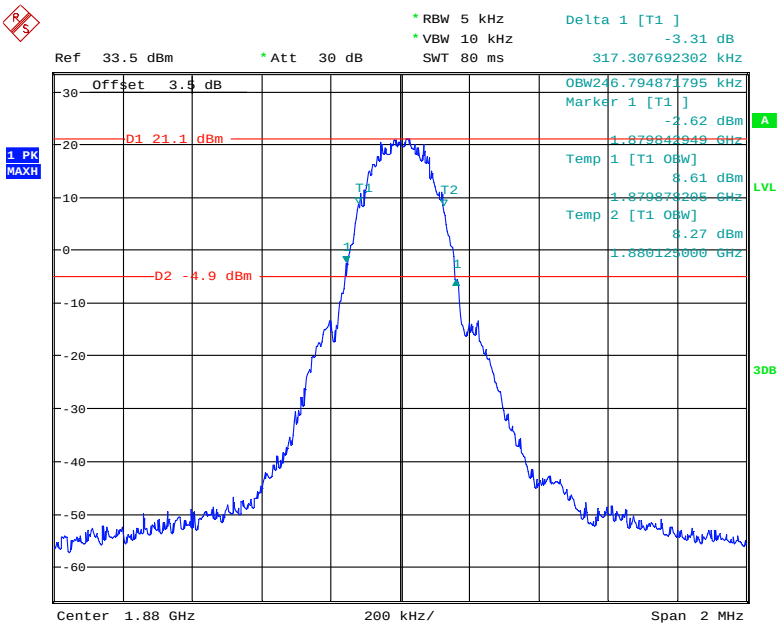
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 15.MAR.2019 14:44:30

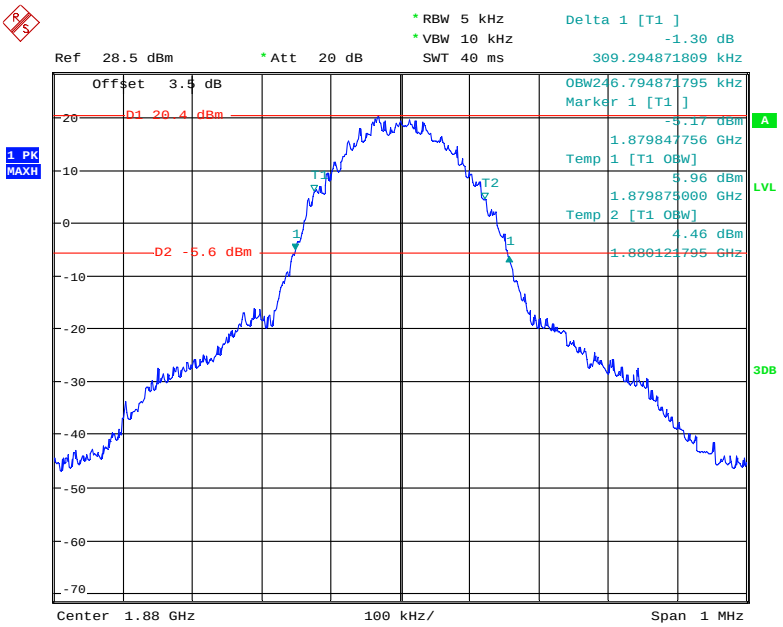
PCS Band (Part 24E)

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



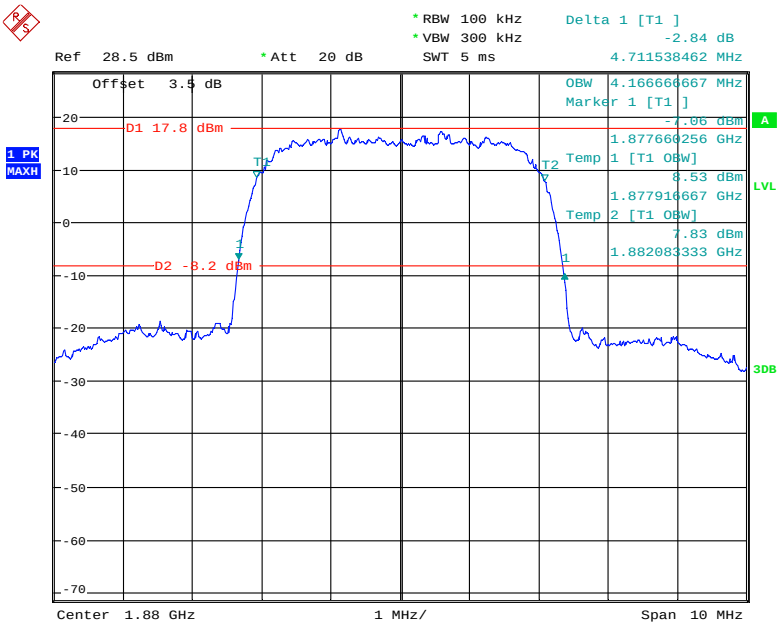
Date: 13.MAR.2019 15:35:04

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



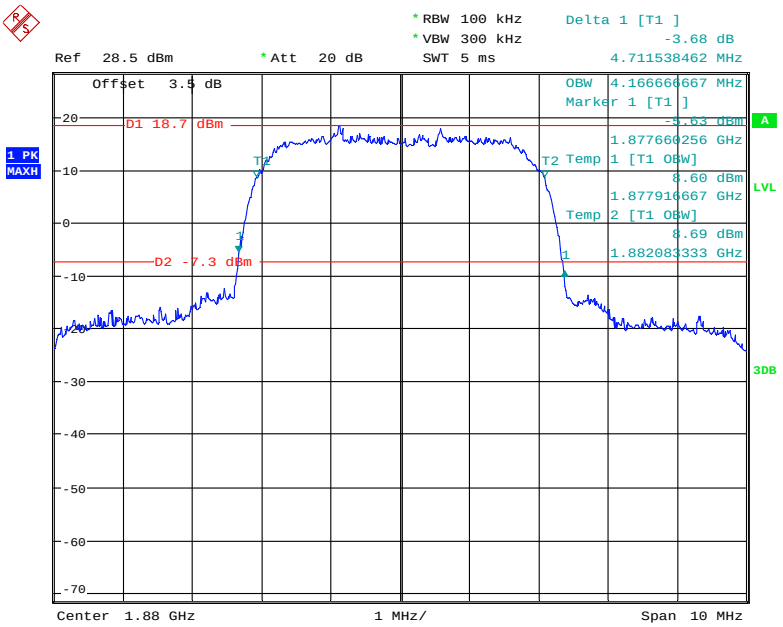
Date: 2.APR.2019 20:46:46

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



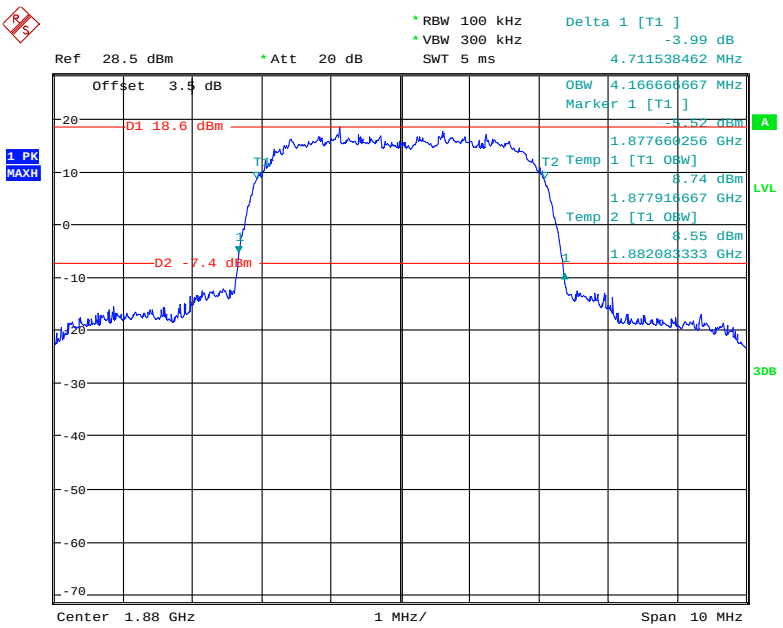
Date: 15.MAR.2019 11:33:40

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



Date: 15.MAR.2019 11:40:18

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

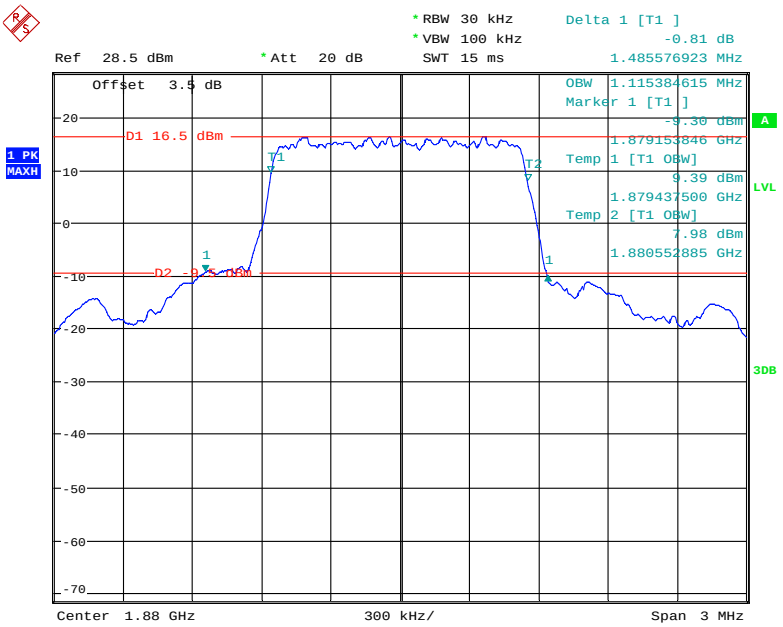


Date: 15.MAR.2019 11:36:37

LTE Band 2: (Middle Channel)

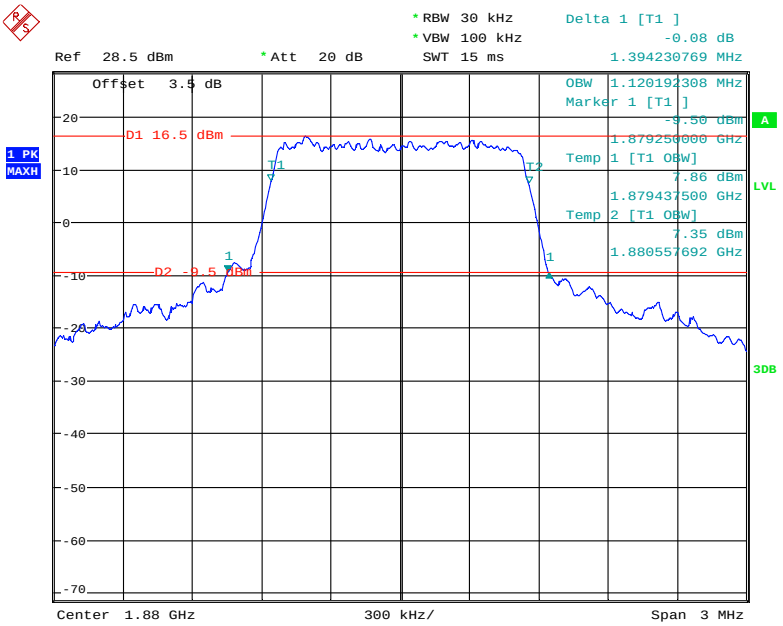
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.12	1.49
	16QAM	1.12	1.39
3.0	QPSK	2.71	3.04
	16QAM	2.70	3.06
5.0	QPSK	4.55	5.44
	16QAM	4.54	5.39
10.0	QPSK	8.97	9.94
	16QAM	8.97	9.81
15.0	QPSK	13.46	15.20
	16QAM	13.51	14.96
20.0	QPSK	17.95	19.48
	16QAM	17.95	19.54

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



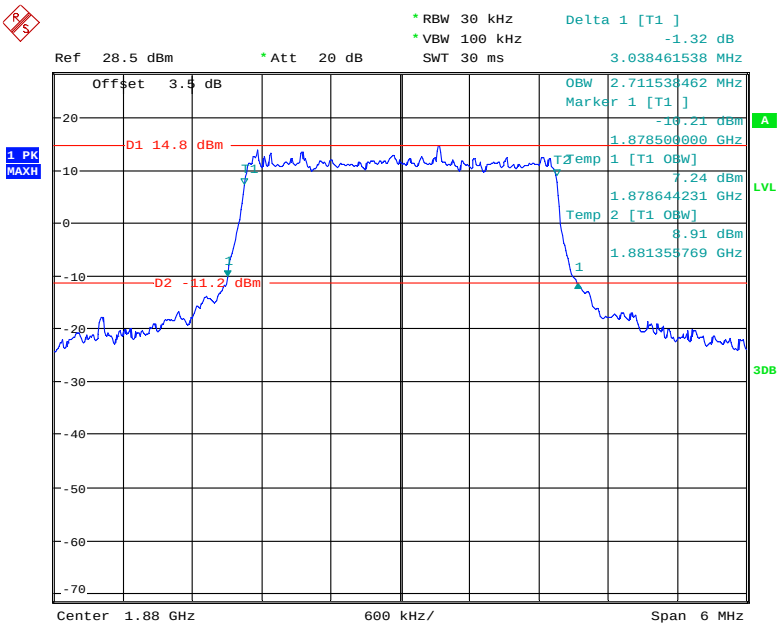
Date: 14.MAR.2019 16:26:23

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



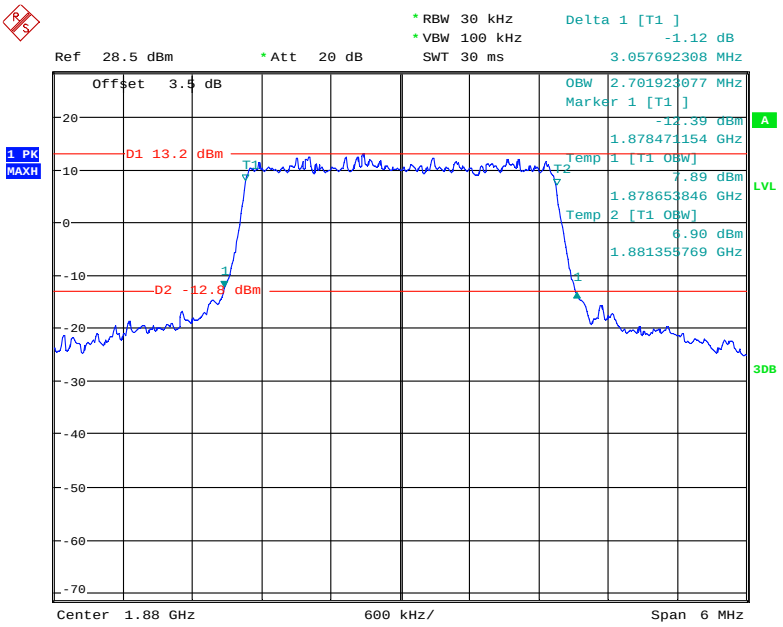
Date: 14.MAR.2019 16:28:20

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



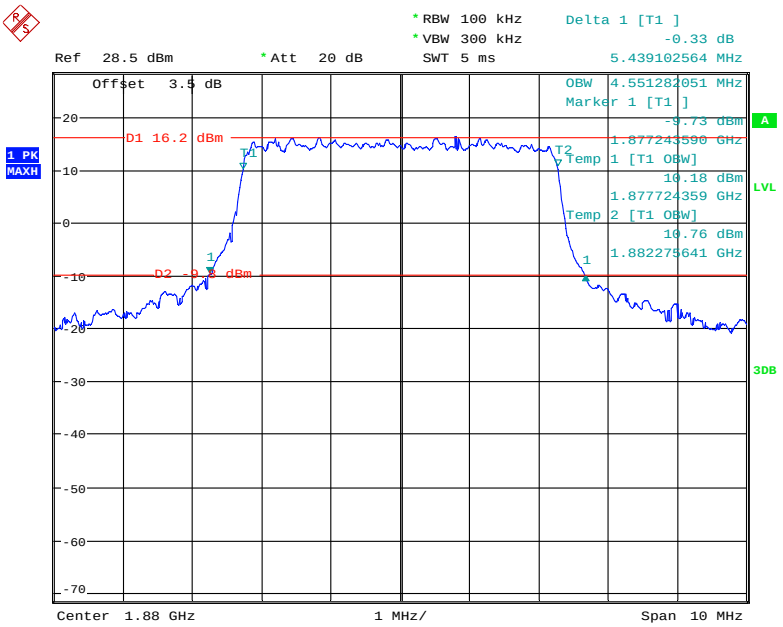
Date: 14.MAR.2019 16:29:59

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



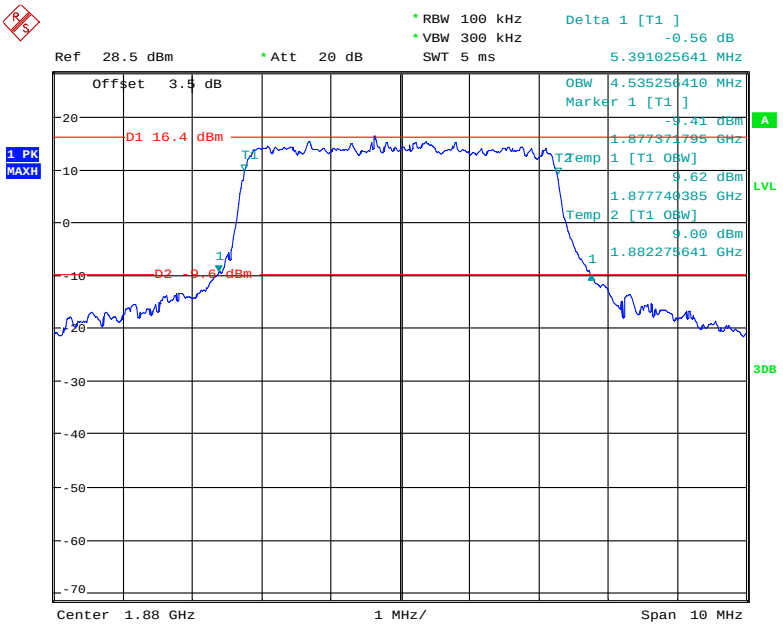
Date: 14.MAR.2019 16:30:55

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



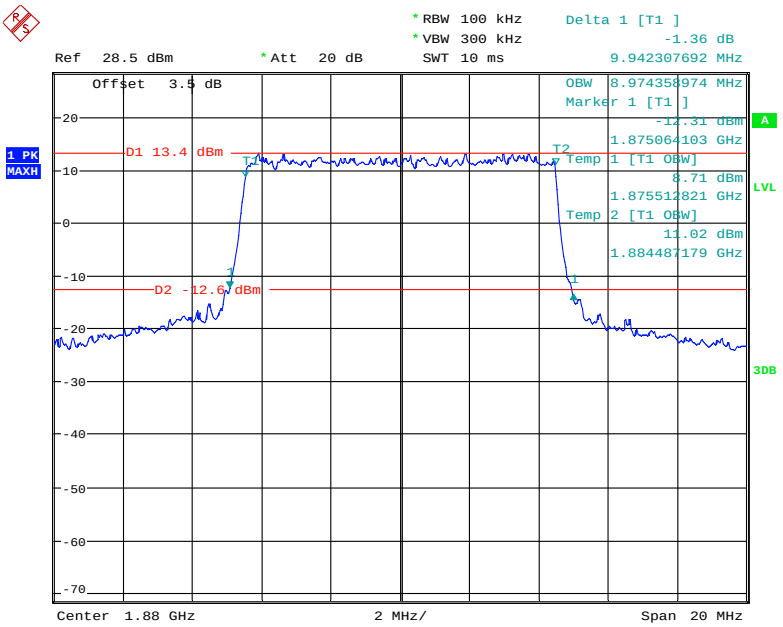
Date: 14.MAR.2019 16:32:10

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



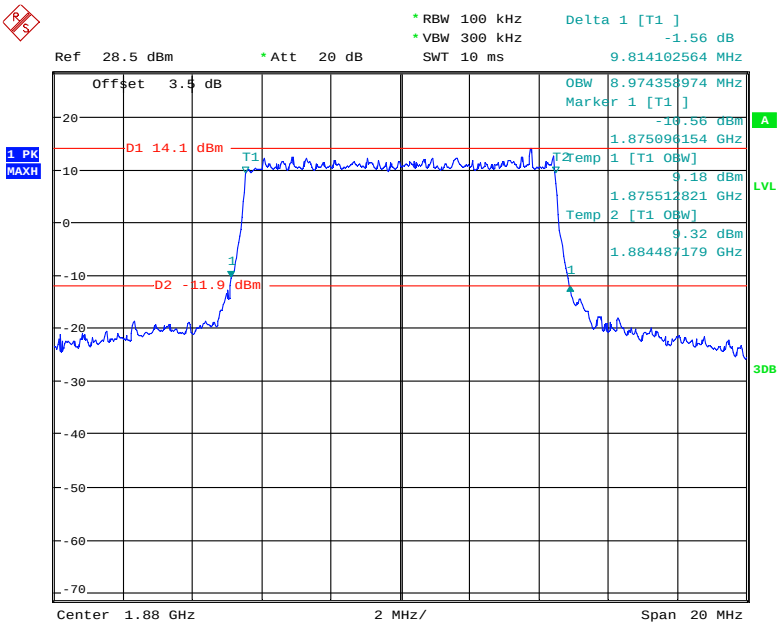
Date: 14.MAR.2019 16:33:12

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



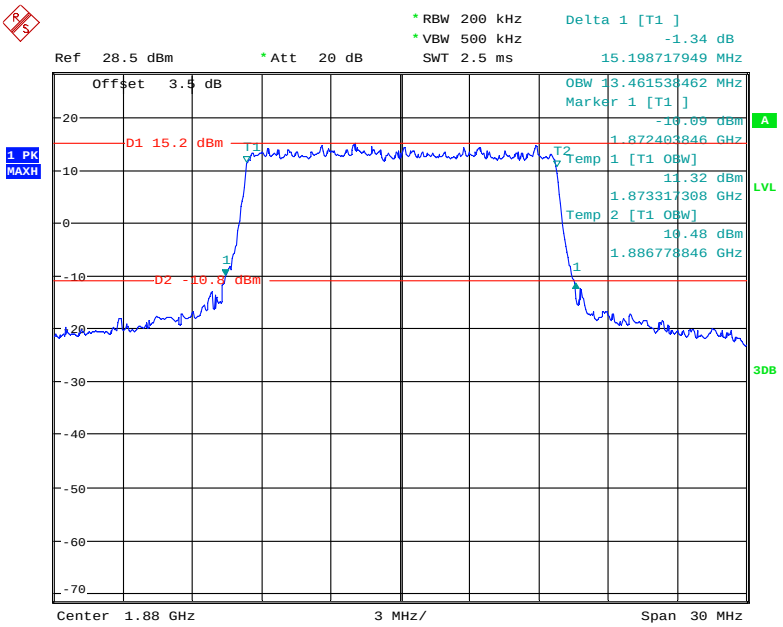
Date: 14.MAR.2019 16:34:35

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



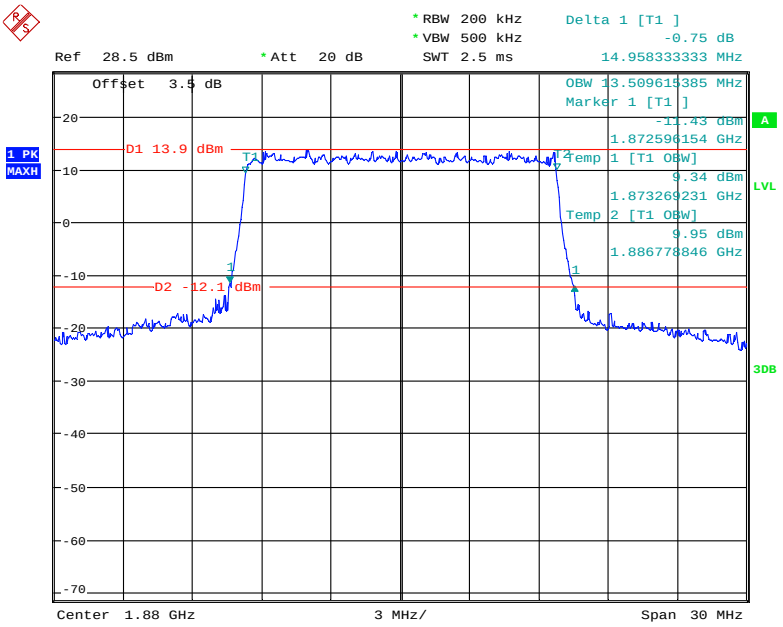
Date: 14.MAR.2019 16:35:36

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



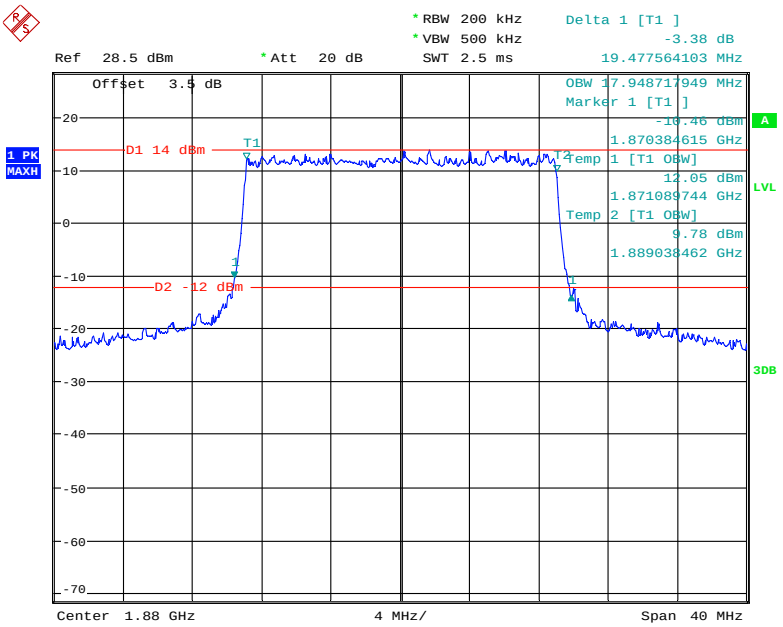
Date: 14.MAR.2019 16:37:10

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



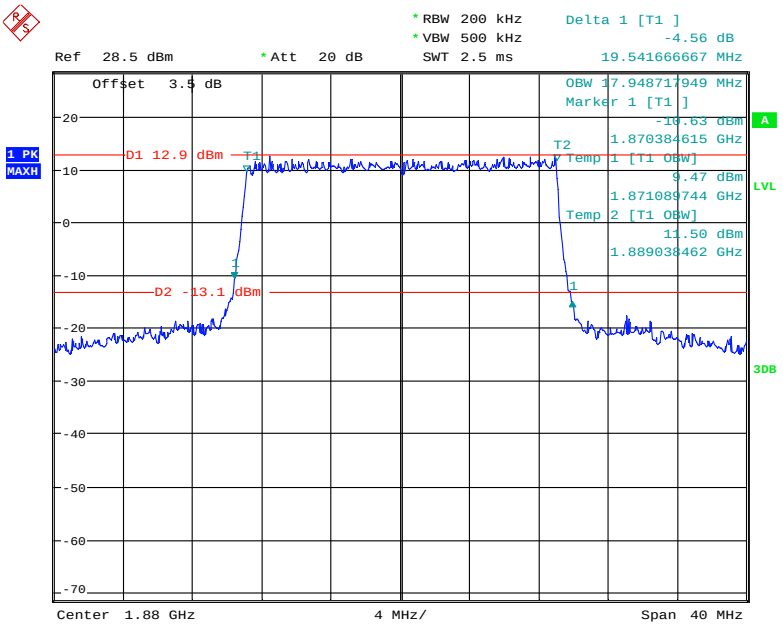
Date: 14.MAR.2019 16:38:04

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



Date: 14.MAR.2019 16:39:47

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

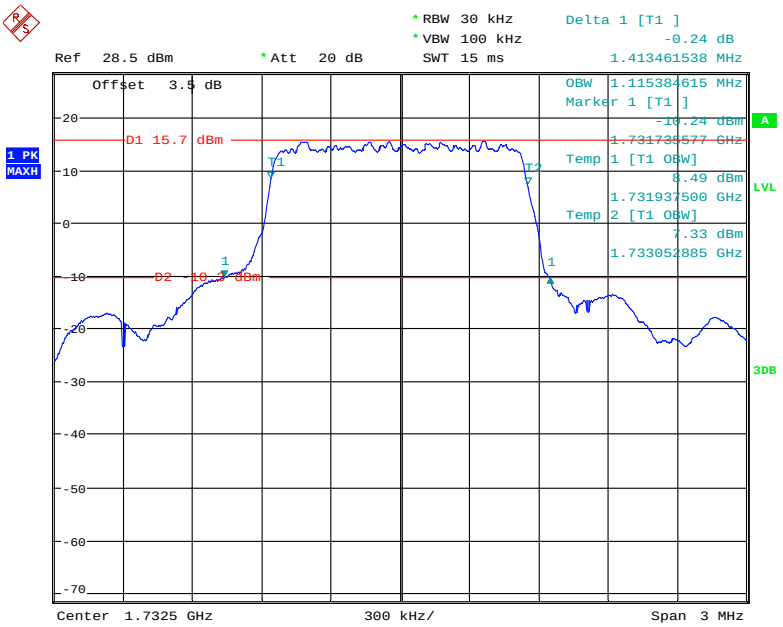


Date: 14.MAR.2019 16:40:46

LTE Band 4: (Middle Channel)

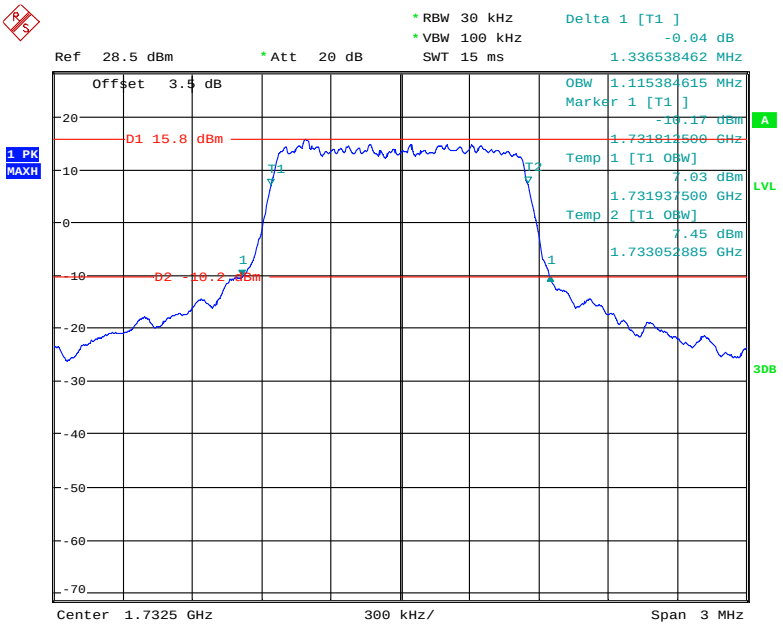
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.12	1.41
	16QAM	1.12	1.34
3.0	QPSK	2.71	3.04
	16QAM	2.70	3.04
5.0	QPSK	4.55	5.35
	16QAM	4.52	5.34
10.0	QPSK	8.97	9.86
	16QAM	8.97	9.79
15.0	QPSK	13.46	14.92
	16QAM	13.46	14.82
20.0	QPSK	17.88	19.23
	16QAM	17.95	19.55

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



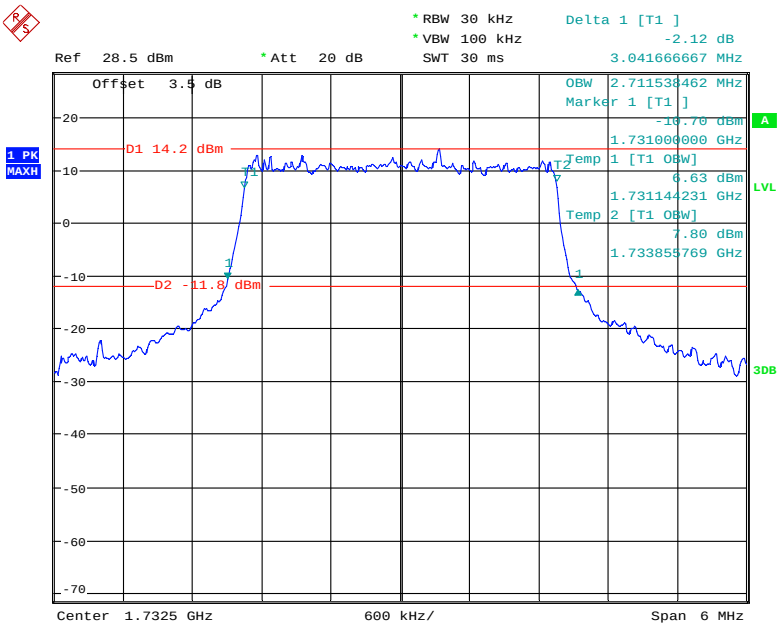
Date: 14.MAR.2019 16:58:29

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



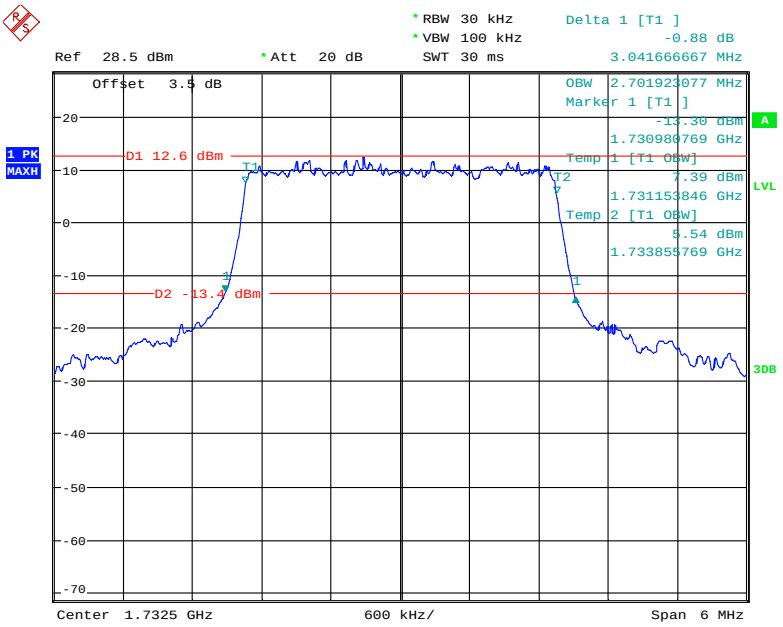
Date: 14.MAR.2019 16:57:26

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



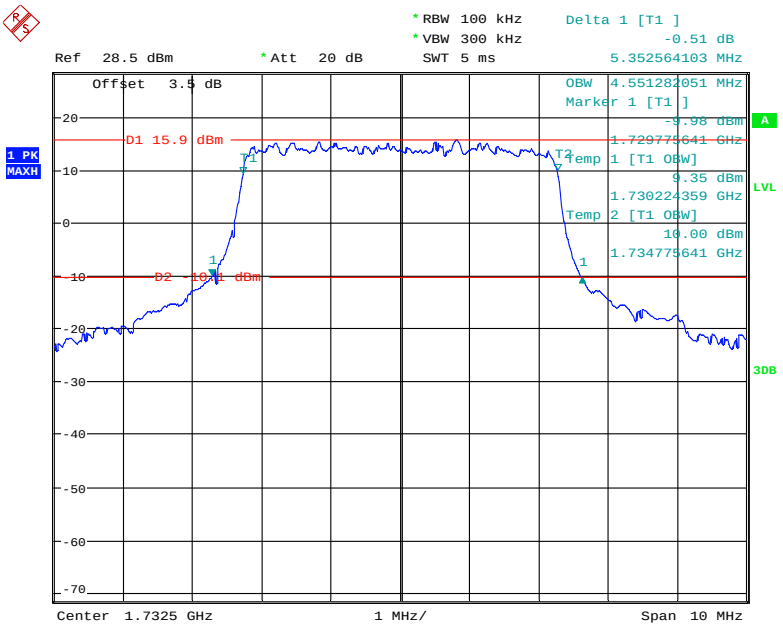
Date: 14.MAR.2019 16:56:08

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



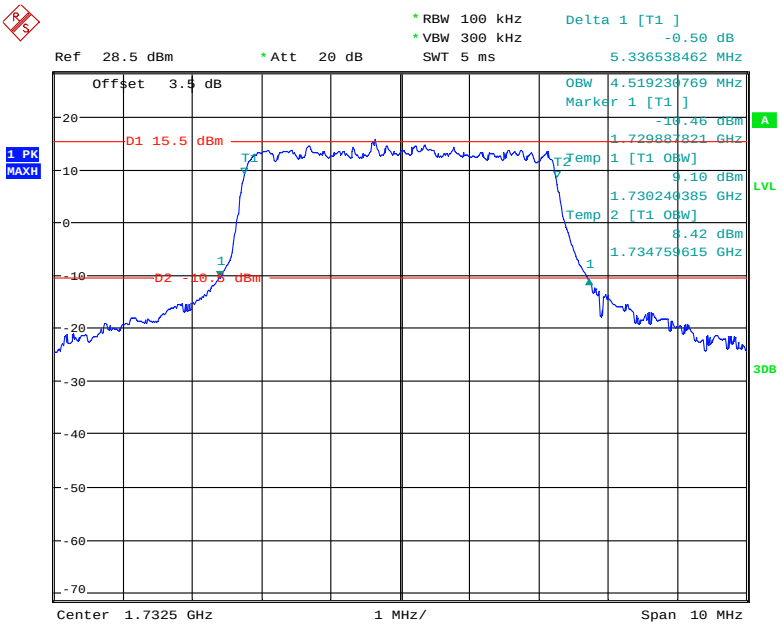
Date: 14.MAR.2019 16:55:06

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



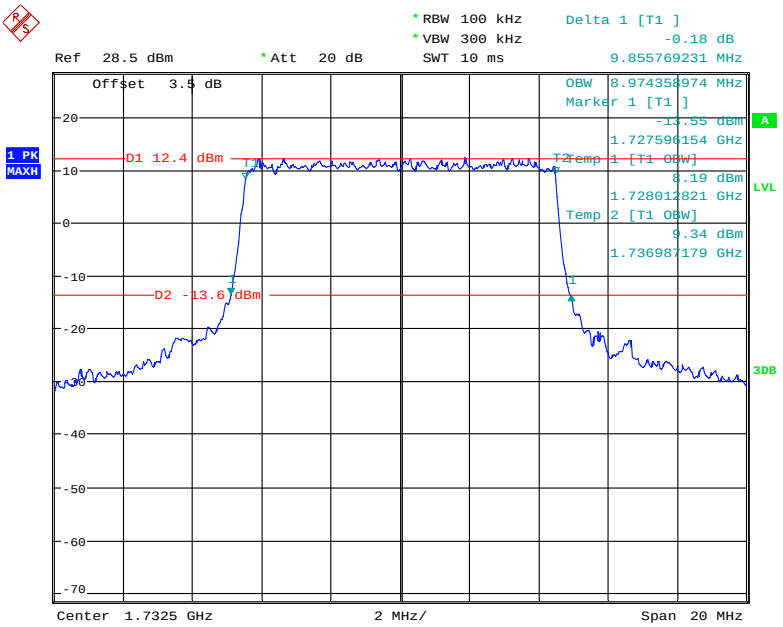
Date: 14.MAR.2019 16:53:28

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



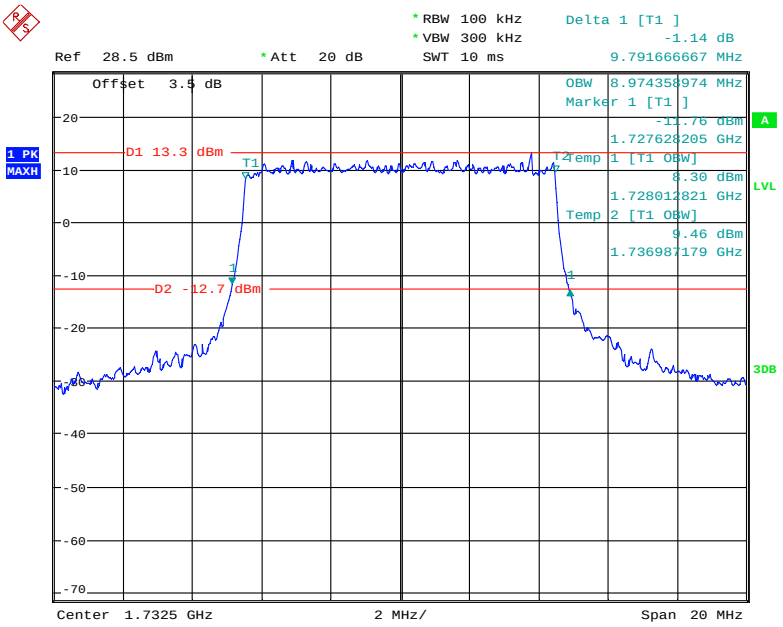
Date: 14.MAR.2019 16:52:18

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



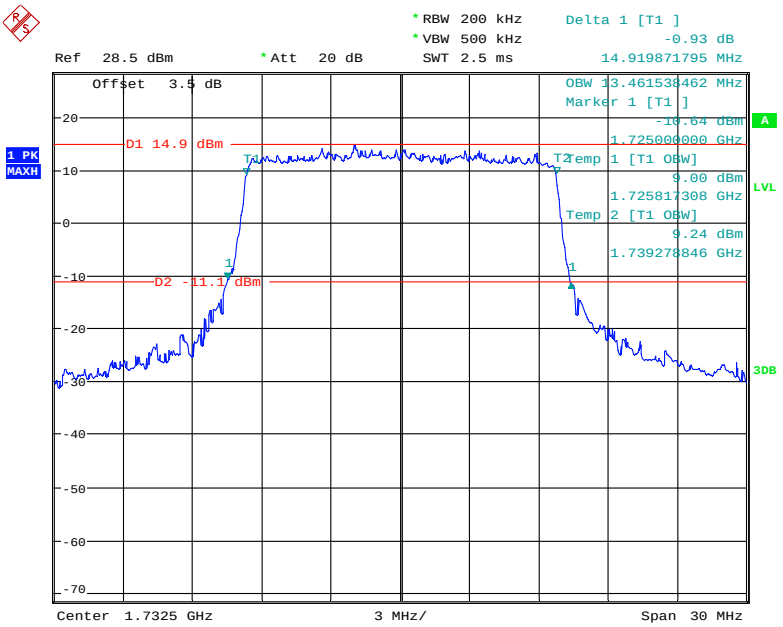
Date: 14.MAR.2019 16:51:20

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



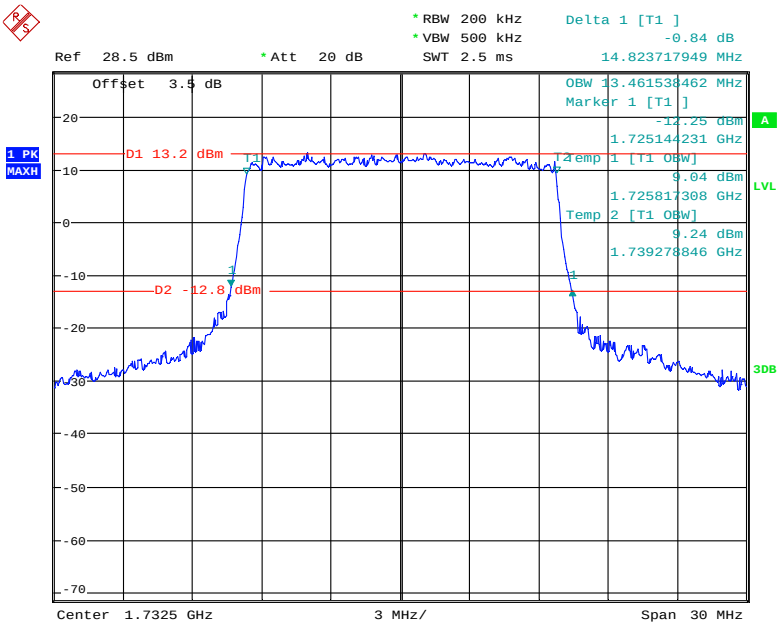
Date: 14.MAR.2019 16:50:11

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



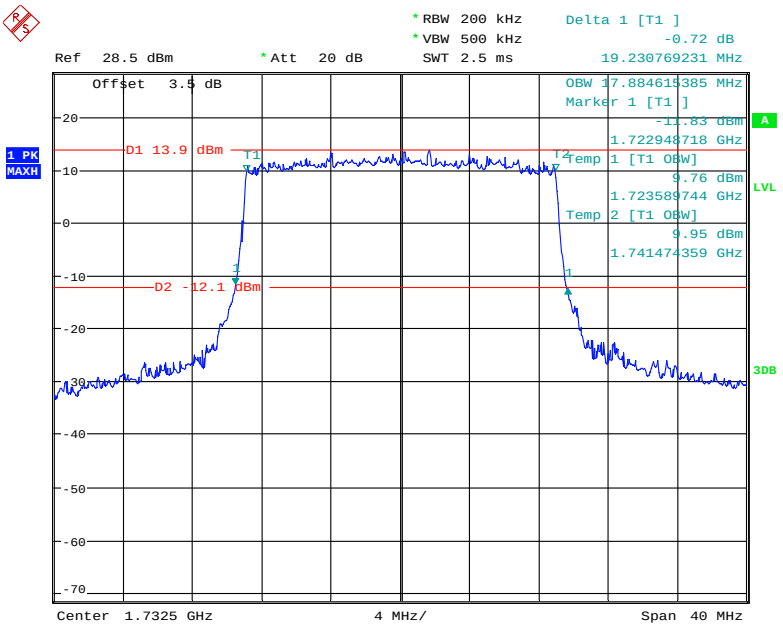
Date: 14.MAR.2019 16:48:53

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



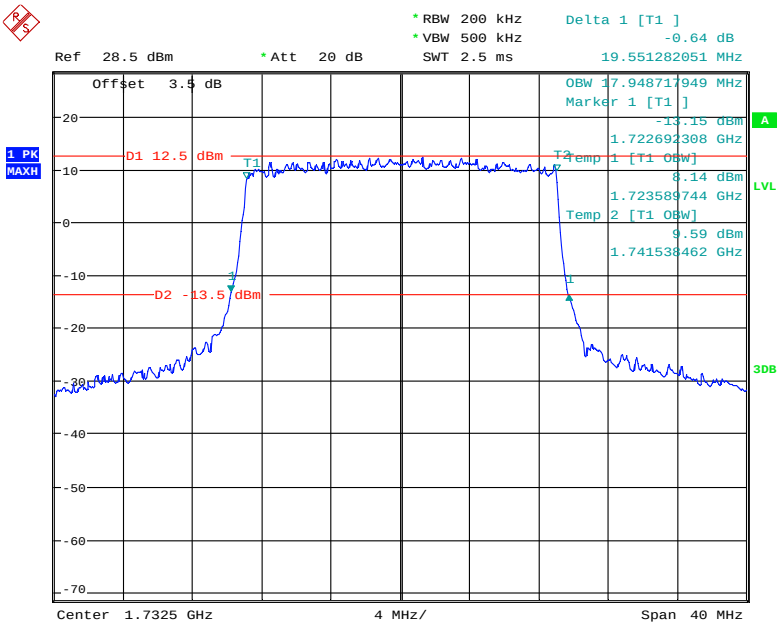
Date: 14.MAR.2019 16:47:46

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



Date: 14.MAR.2019 16:46:22

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

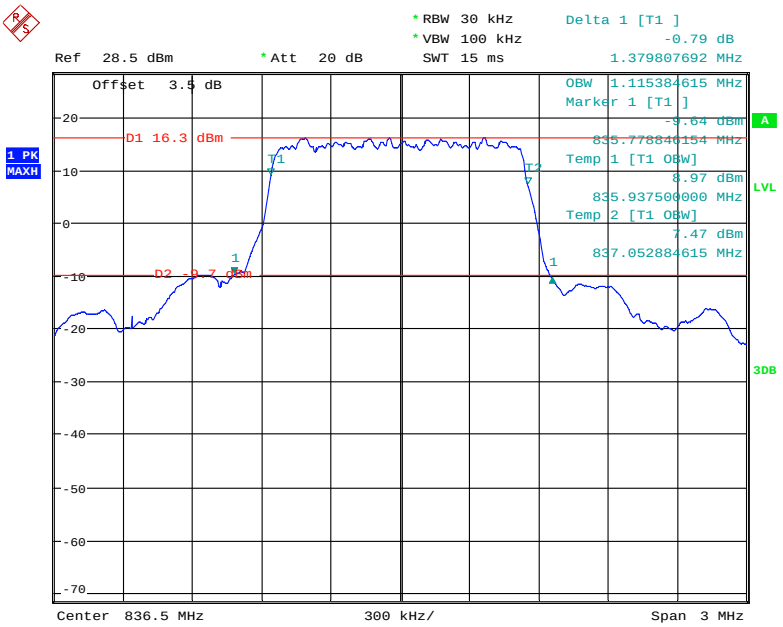


Date: 14.MAR.2019 16:45:01

LTE Band 5: (Middle Channel)

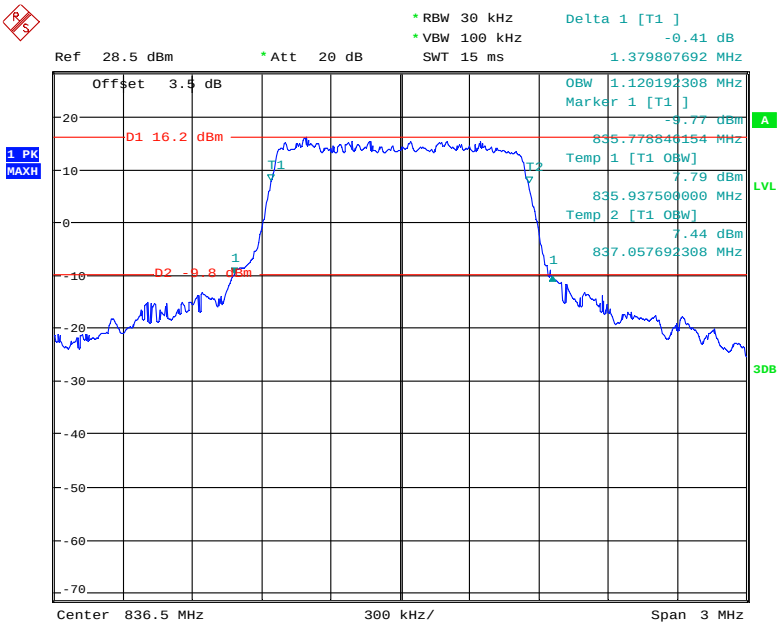
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.12	1.38
	16QAM	1.12	1.38
3.0	QPSK	2.71	3.06
	16QAM	2.70	3.05
5.0	QPSK	4.57	5.47
	16QAM	4.54	5.37
10.0	QPSK	8.97	9.89
	16QAM	8.97	9.89

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



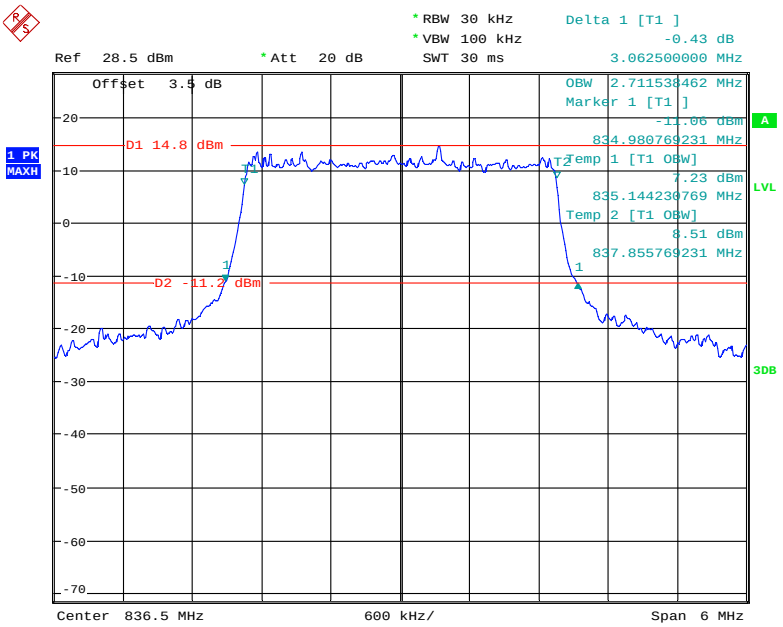
Date: 14.MAR.2019 17:02:50

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



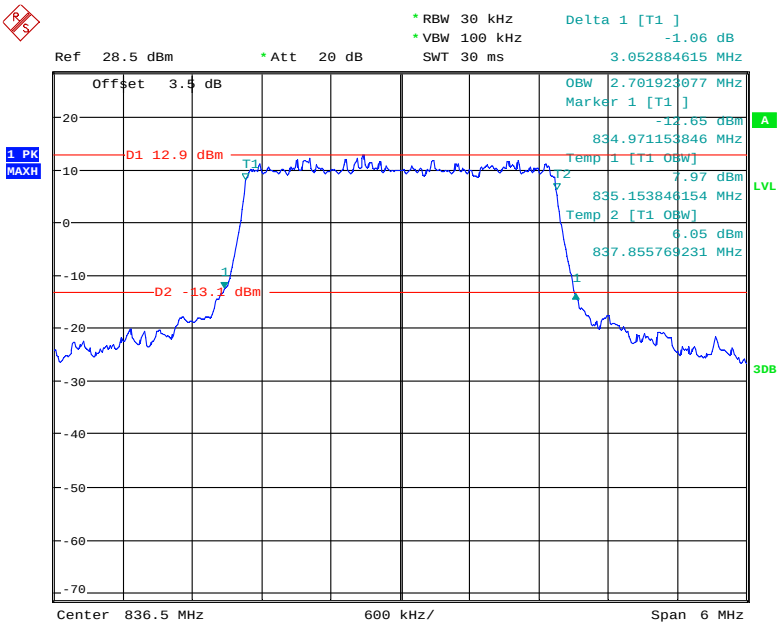
Date: 14.MAR.2019 17:03:44

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



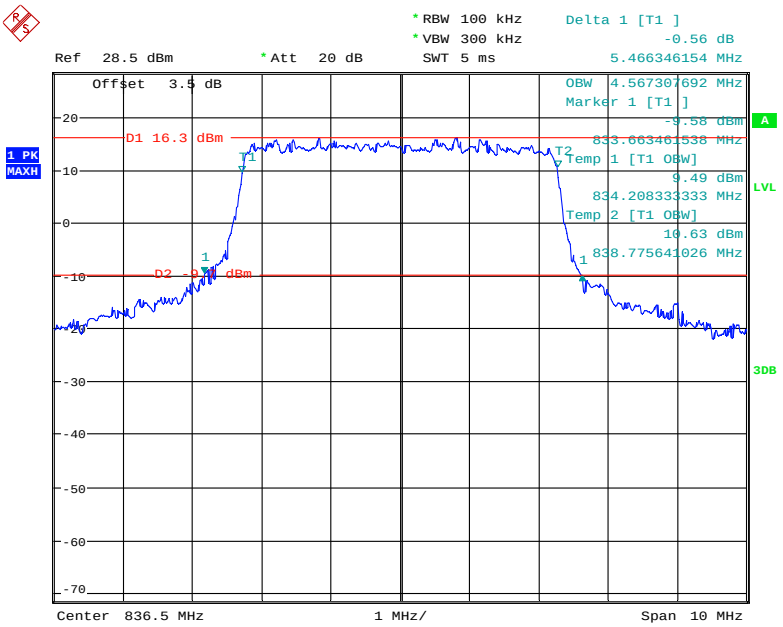
Date: 14.MAR.2019 17:05:48

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



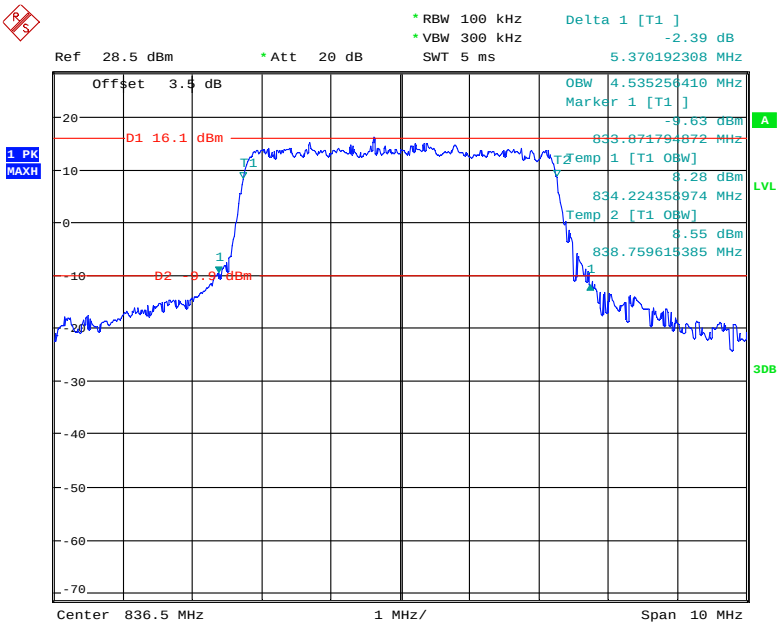
Date: 14.MAR.2019 17:06:56

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



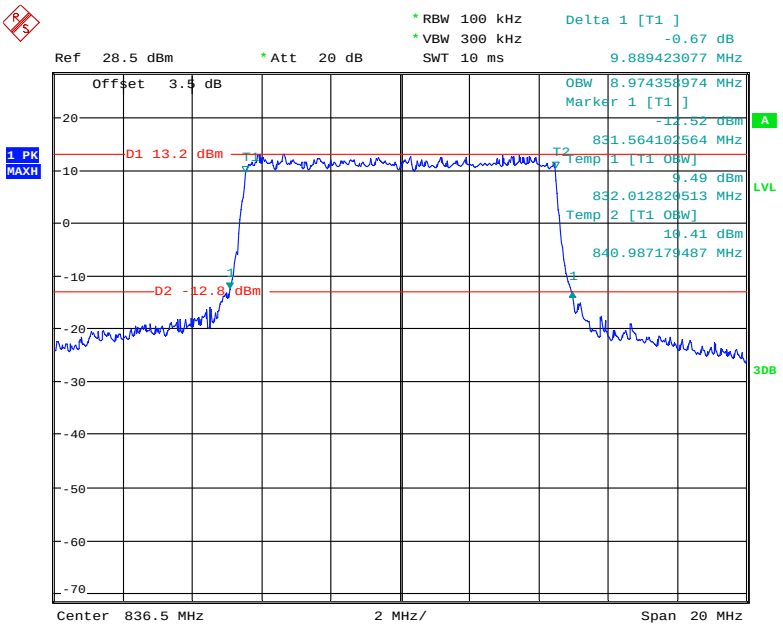
Date: 14.MAR.2019 17:09:06

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



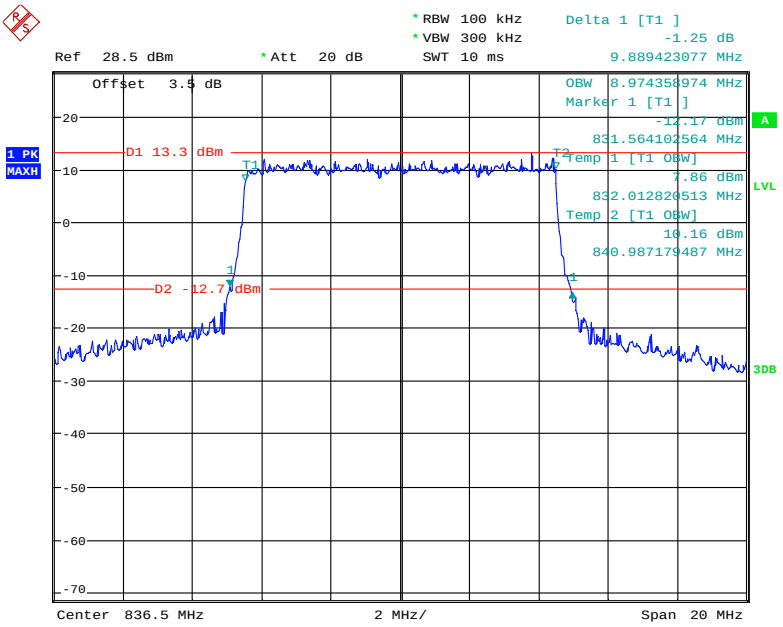
Date: 14.MAR.2019 17:10:33

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



Date: 14.MAR.2019 17:12:10

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

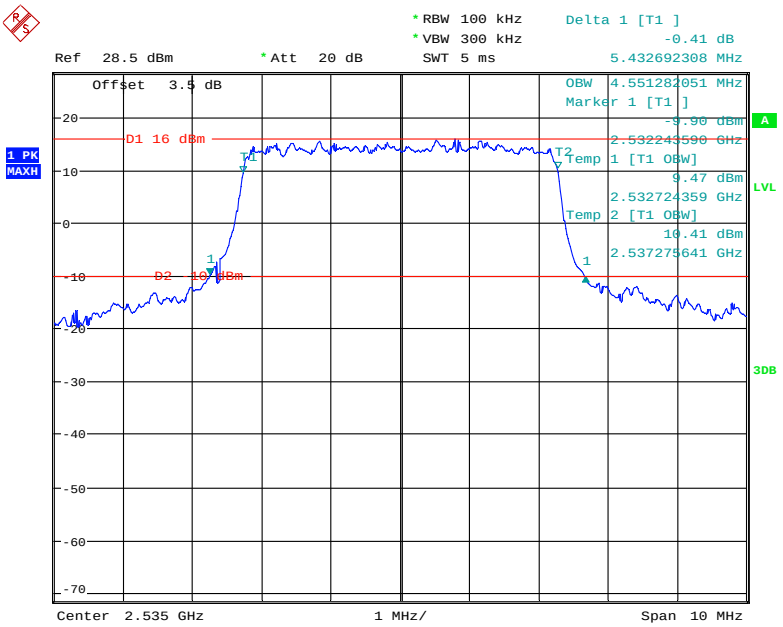


Date: 14.MAR.2019 17:13:03

LTE Band 7: (Middle Channel)

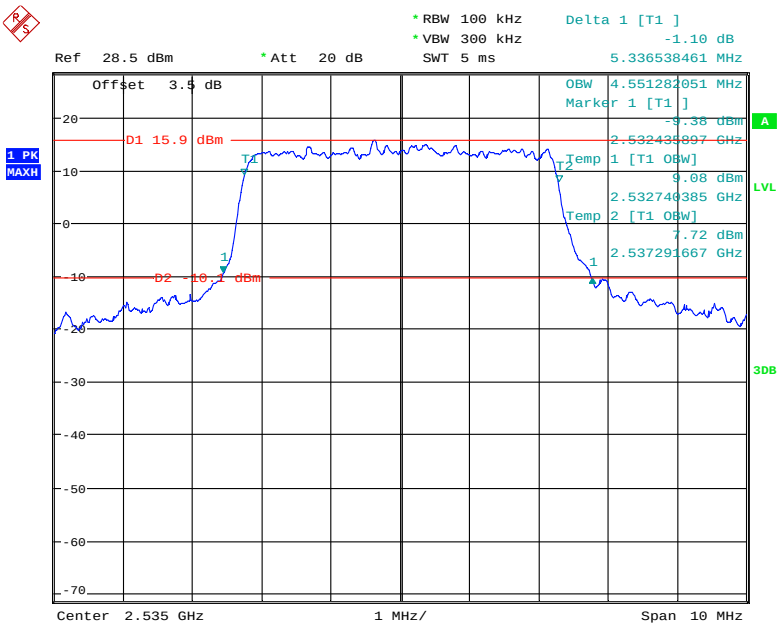
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.55	5.43
	16QAM	4.55	5.34
10.0	QPSK	9.01	9.95
	16QAM	8.97	9.79
15.0	QPSK	13.46	15.05
	16QAM	13.46	15.00
20.0	QPSK	17.95	19.39
	16QAM	17.95	19.46

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



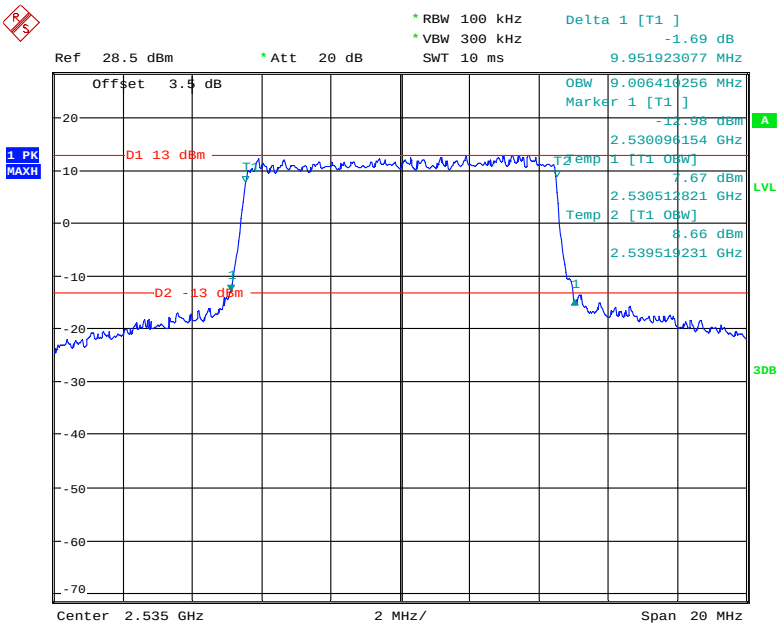
Date: 14.MAR.2019 17:21:12

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



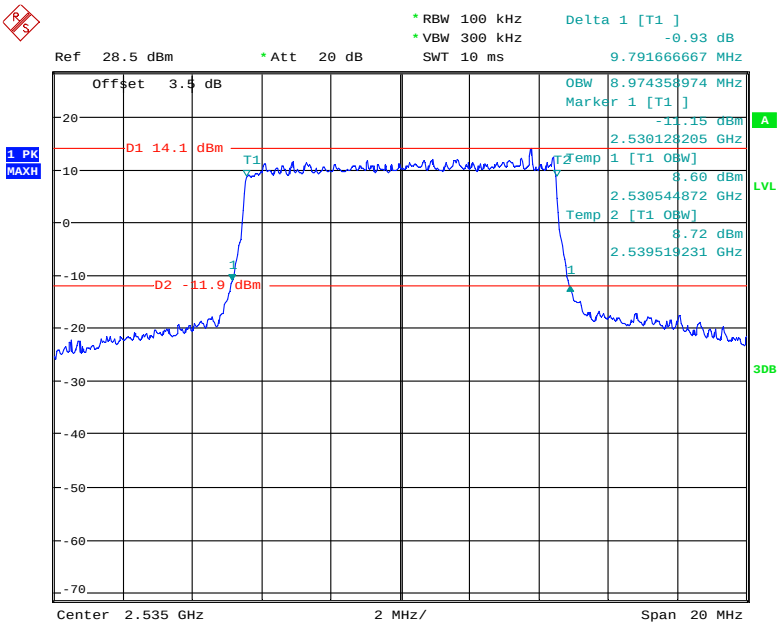
Date: 14.MAR.2019 17:19:25

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



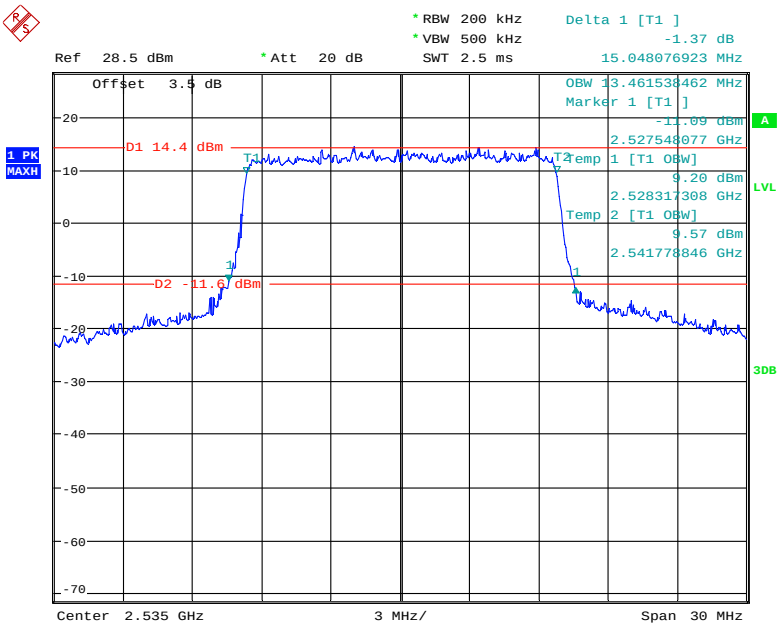
Date: 14.MAR.2019 17:24:29

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



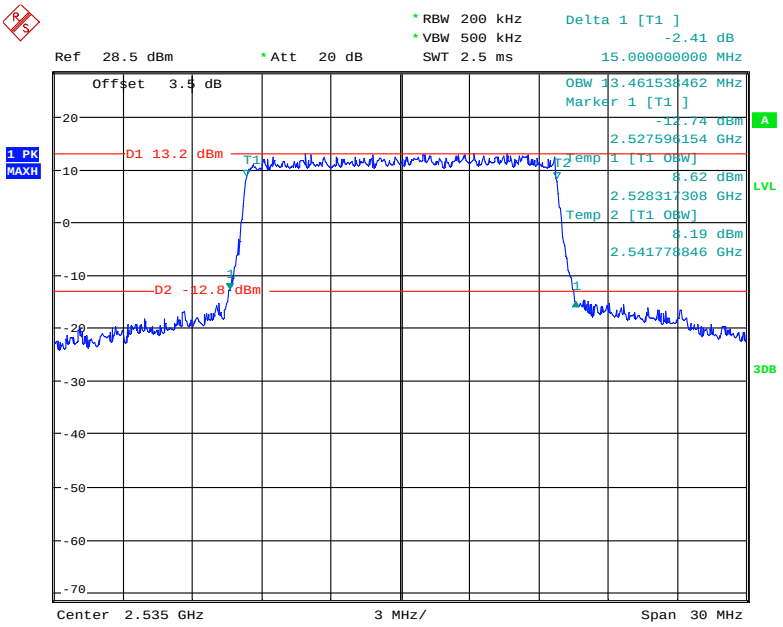
Date: 14.MAR.2019 17:23:02

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



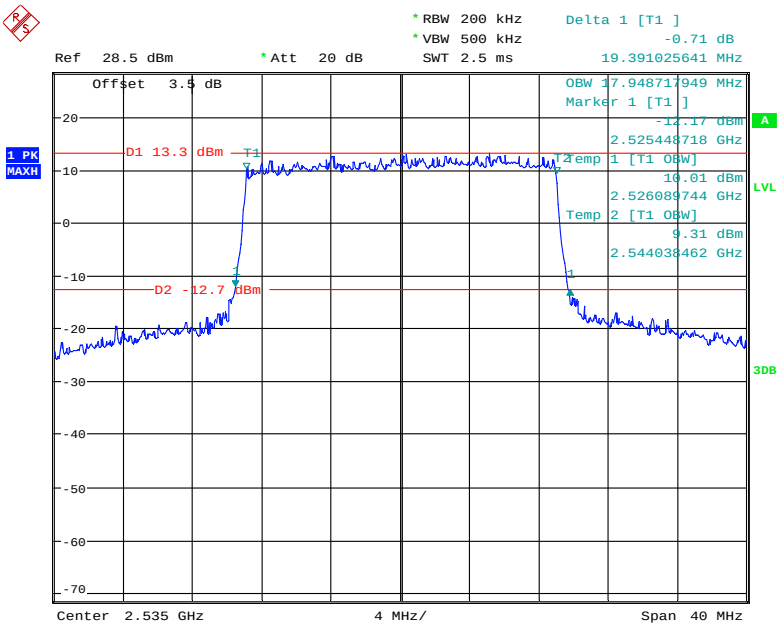
Date: 14.MAR.2019 17:26:32

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



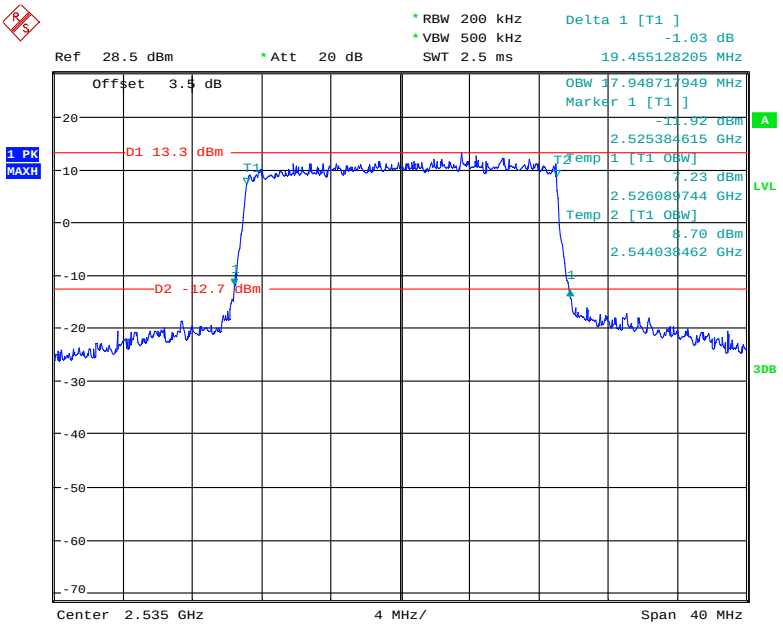
Date: 14.MAR.2019 17:27:31

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



Date: 14.MAR.2019 17:29:14

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



Date: 14.MAR.2019 17:30:34

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

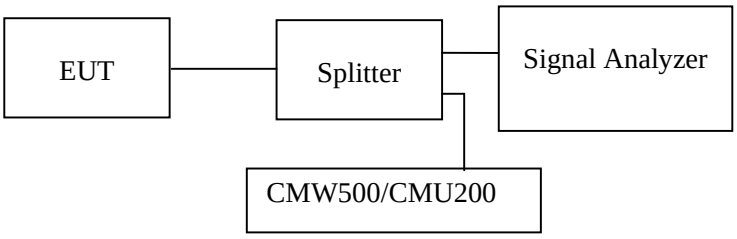
Applicable Standard

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

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 100kHz for below 1GHz and 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	50~55 %
ATM Pressure:	100.9~101.0 kPa

The testing was performed by Shawn Xiao from 2019-03-13 to 2019-04-02.

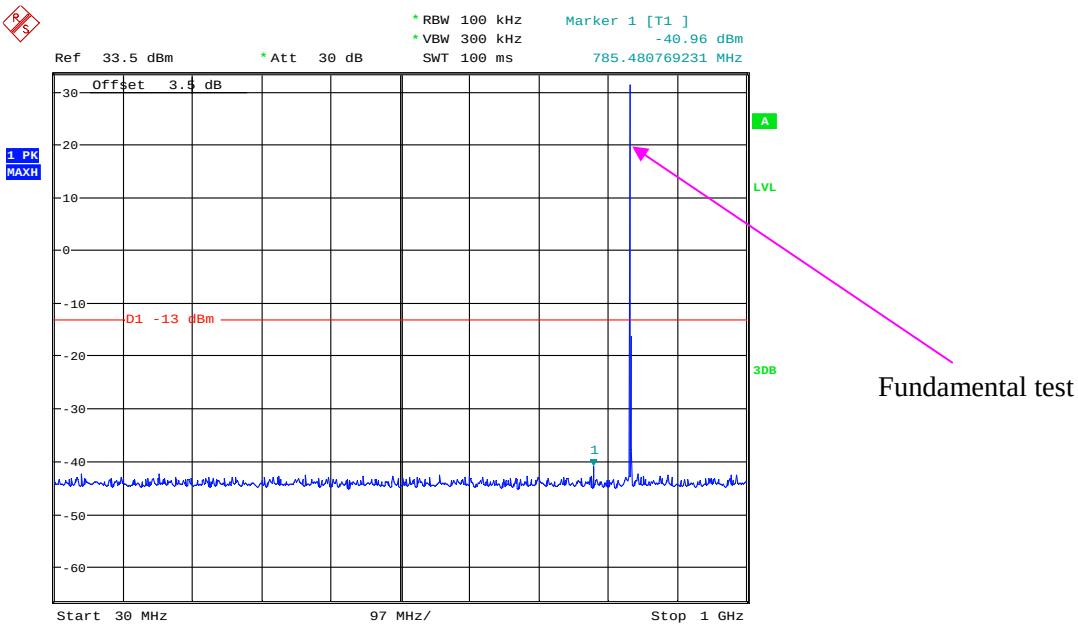
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

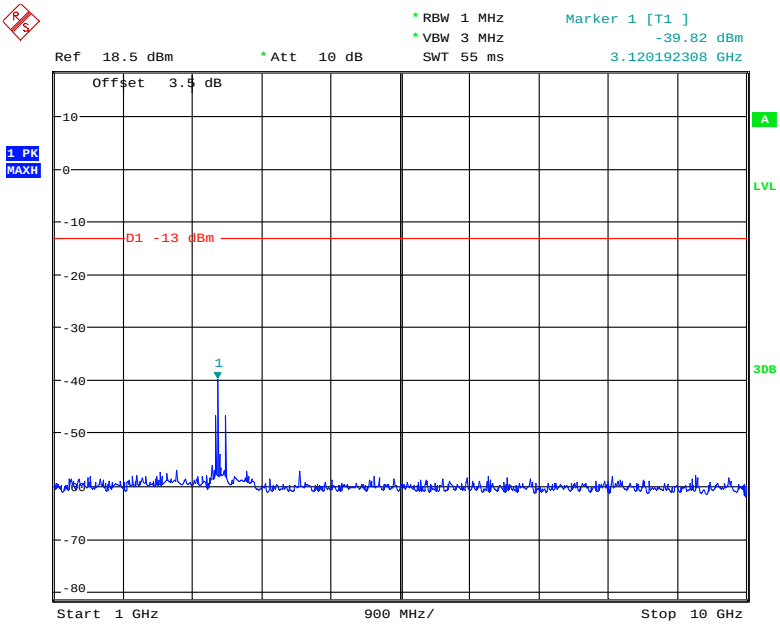
Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode, Middle Channel)



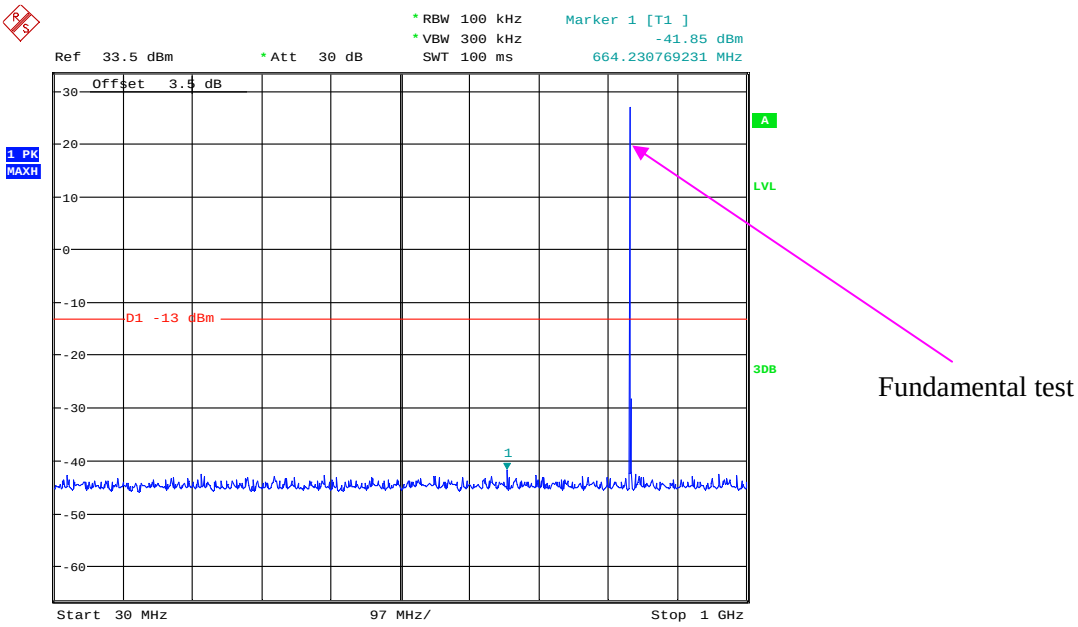
Date: 13.MAR.2019 14:38:50

1 GHz – 10 GHz (GSM Mode, Middle Channel)



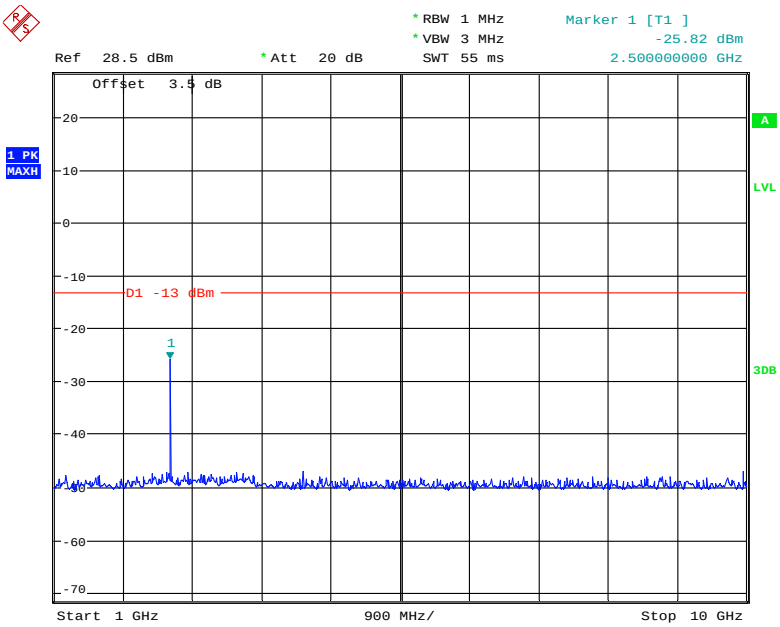
Date: 13.MAR.2019 14:39:54

30 MHz – 1 GHz (EDGE Mode, Middle Channel)



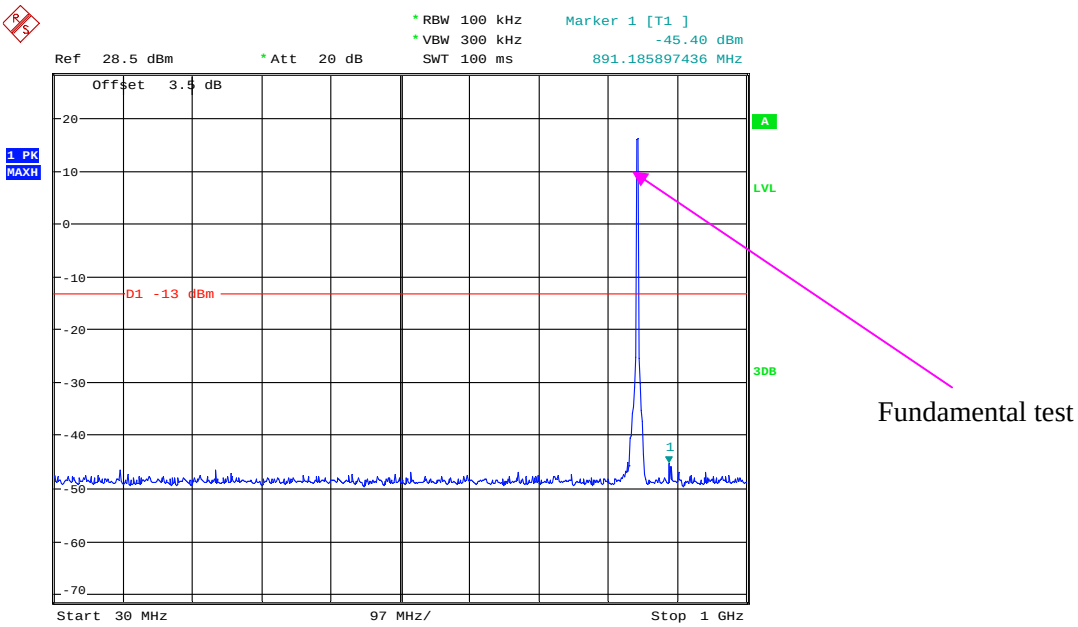
Date: 2.APR.2019 20:39:29

1 GHz – 10 GHz (EDGE Mode, Middle Channel)



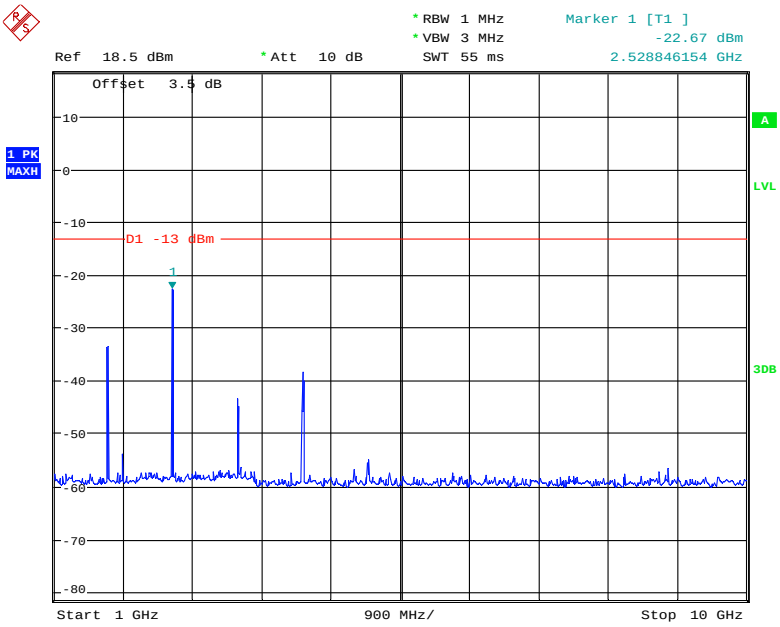
Date: 2.APR.2019 20:40:10

30 MHz – 1 GHz (WCDMA Mode, Middle Channel)



Date: 15.MAR.2019 14:58:20

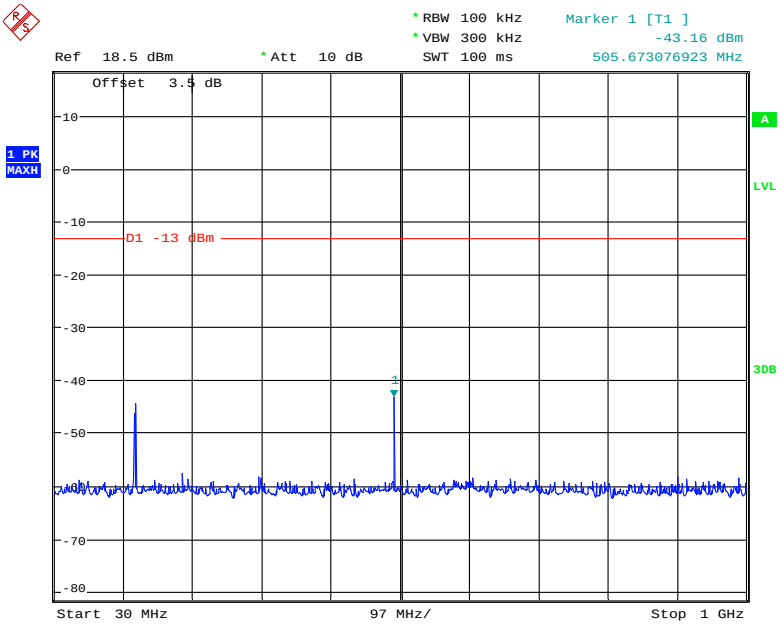
1 GHz – 10 GHz (WCDMA Mode, Middle Channel)



Date: 15.MAR.2019 14:59:19

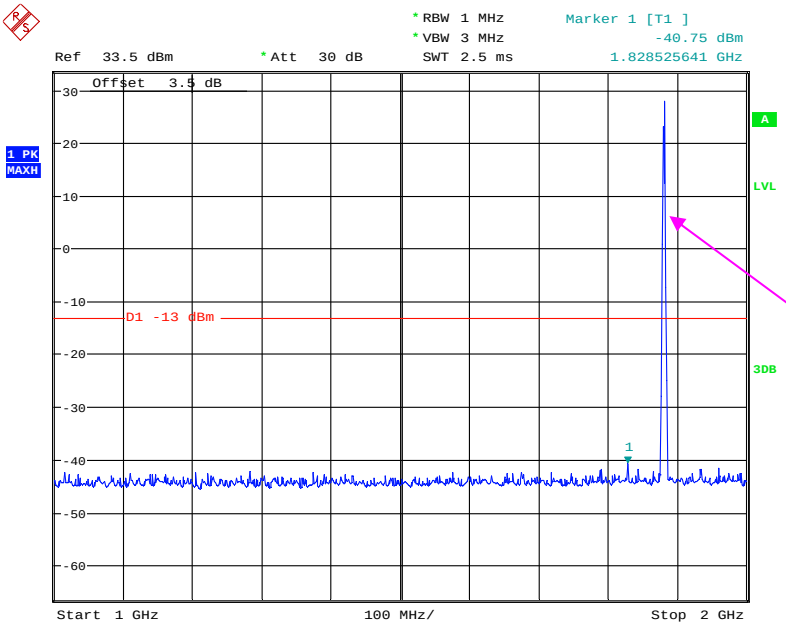
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode, Middle Channel)



Date: 13.MAR.2019 15:38:23

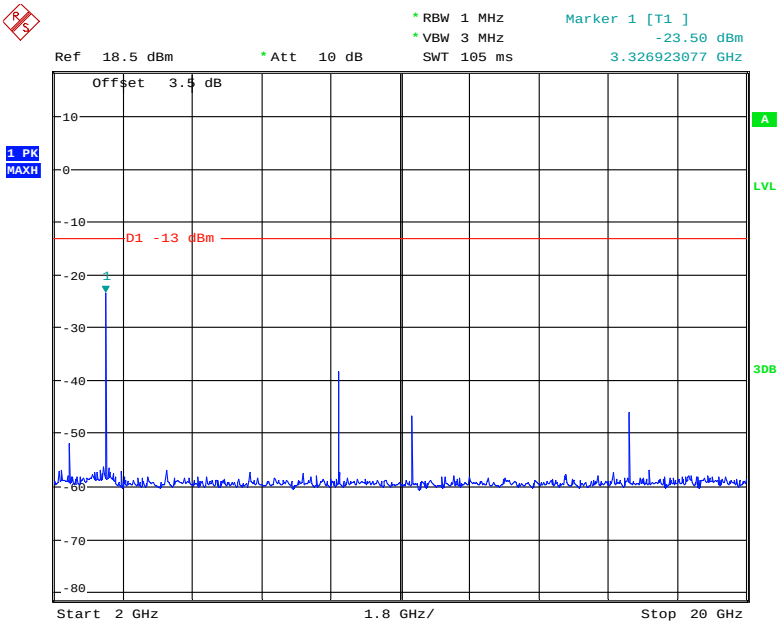
1 GHz – 2 GHz (GSM Mode, Middle Channel)



Fundamental test

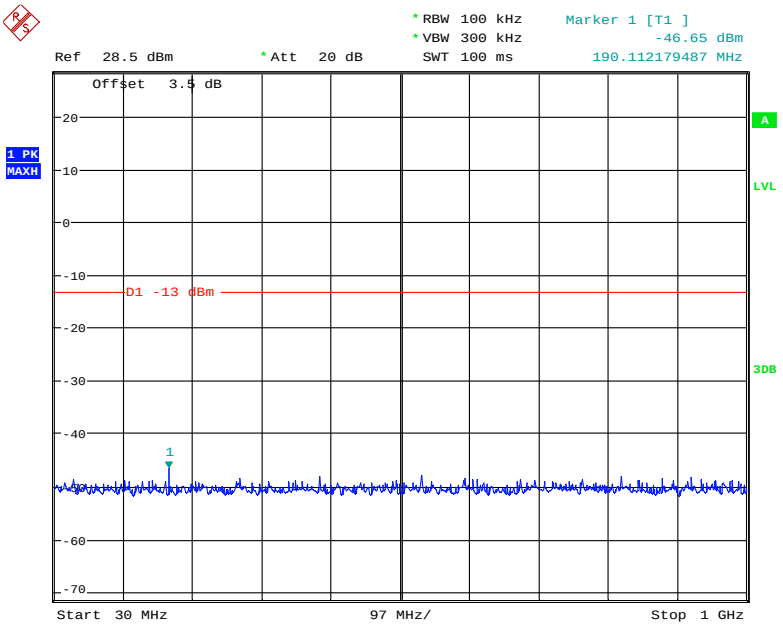
Date: 13.MAR.2019 15:38:54

2 GHz – 20 GHz (GSM Mode, Middle Channel)



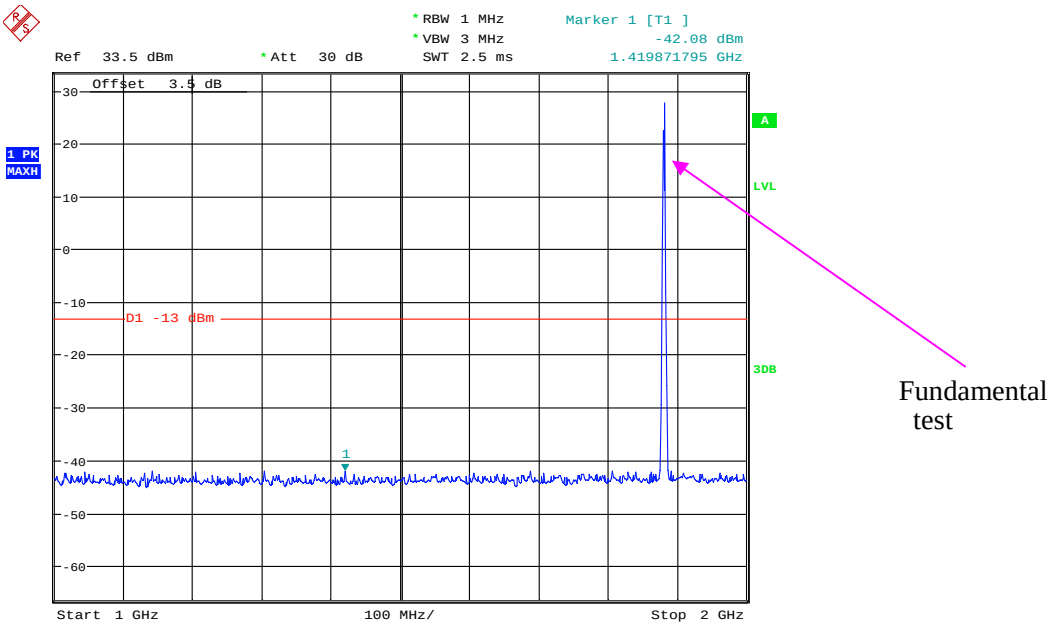
Date: 13.MAR.2019 15:39:34

30 MHz – 1 GHz (EDGE Mode, Middle Channel)



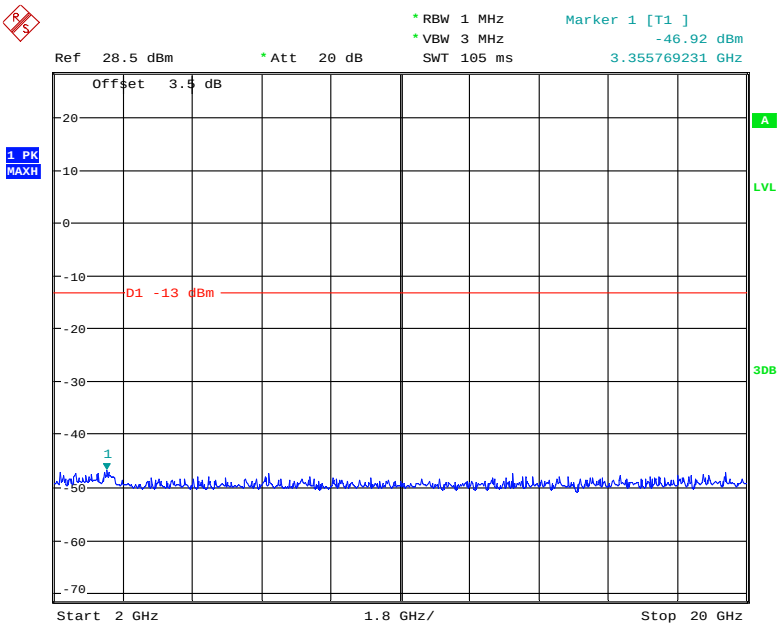
Date: 2.APR.2019 20:43:27

1 GHz – 2 GHz (EDGE Mode, Middle Channel)



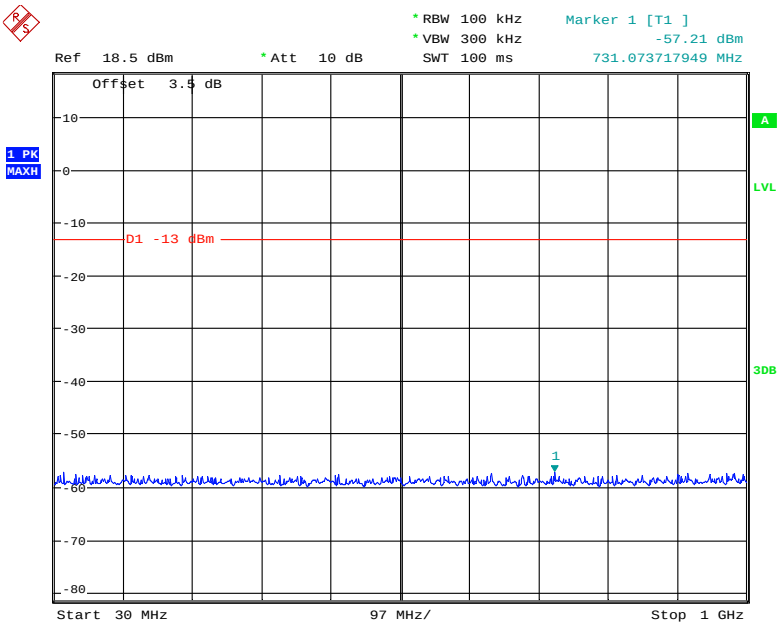
Date: 2.APR.2019 20:44:36

2 GHz – 20 GHz (EDGE Mode, Middle Channel)



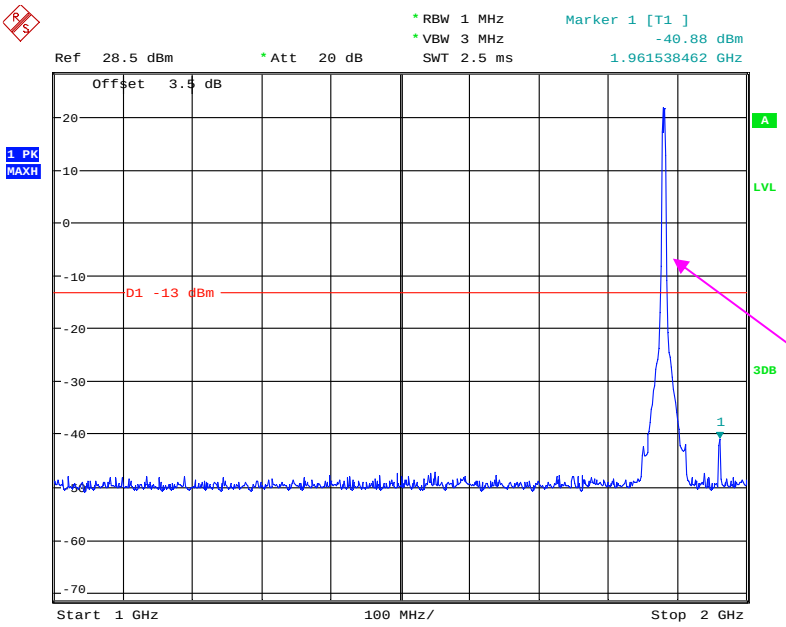
Date: 2.APR.2019 20:45:00

30 MHz – 1 GHz (WCDMA Mode, Middle Channel)



Date: 15.MAR.2019 11:52:49

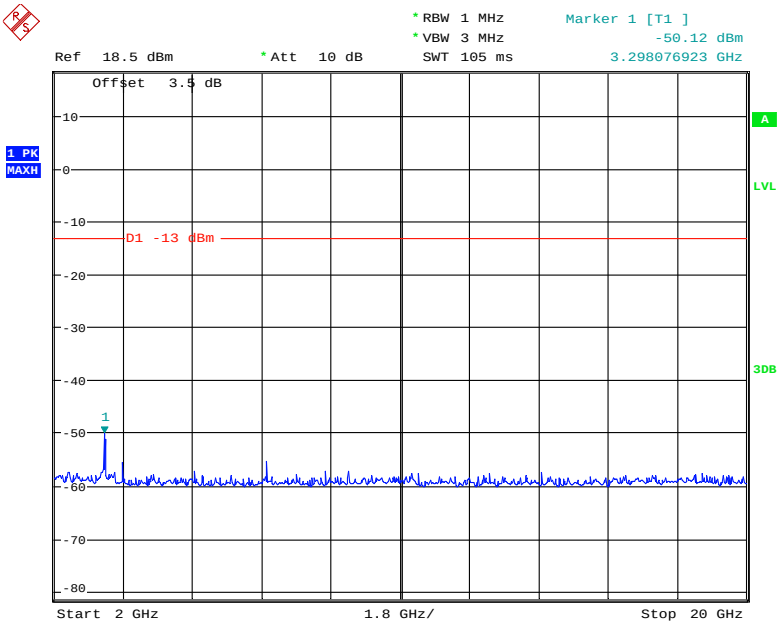
1 GHz – 2 GHz (WCDMA Mode, Middle Channel)



Fundamental test

Date: 15.MAR.2019 11:54:02

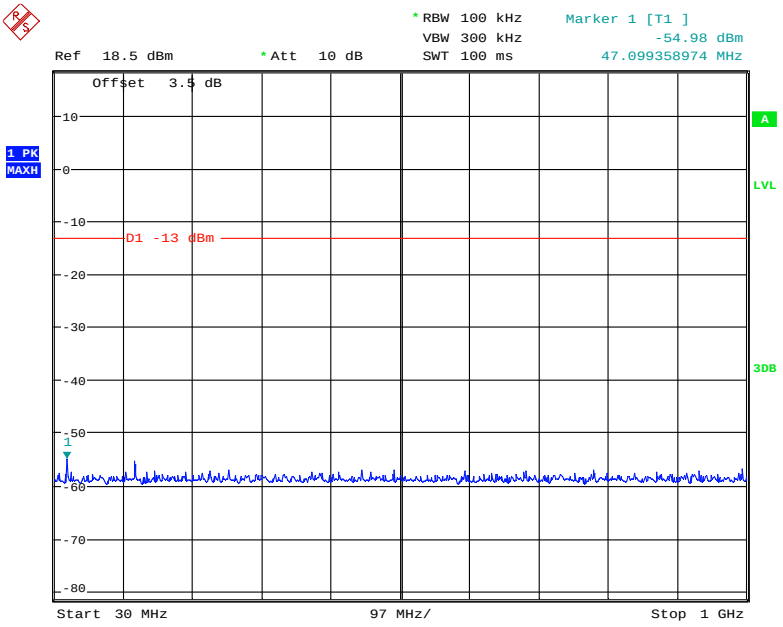
2 GHz – 20 GHz (WCDMA Mode, Middle Channel)



Date: 15.MAR.2019 11:54:37

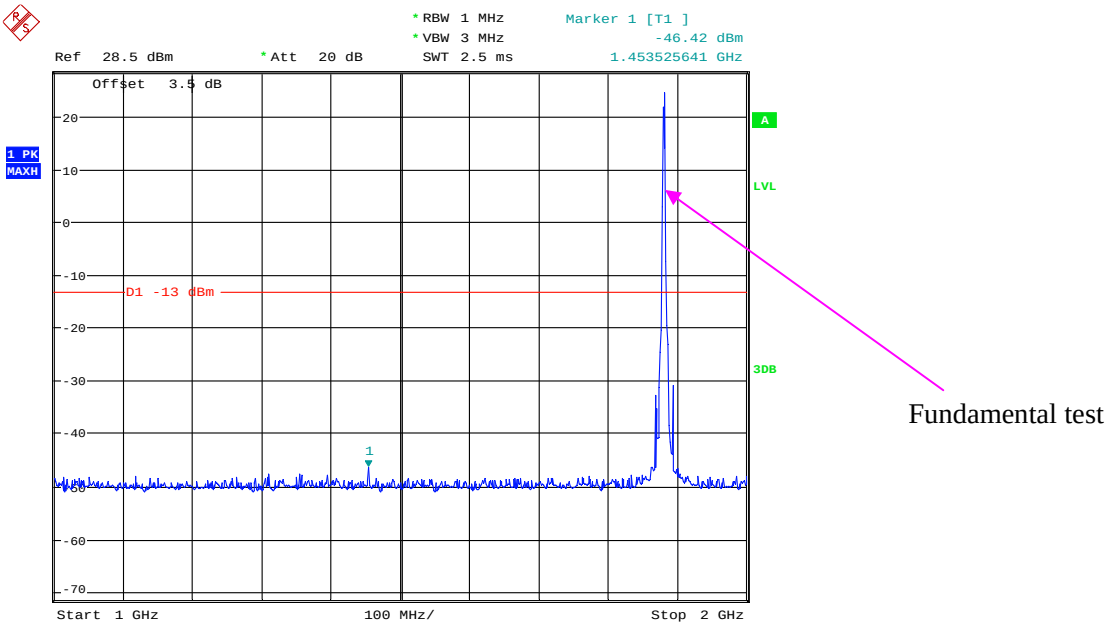
LTE Band 2:

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



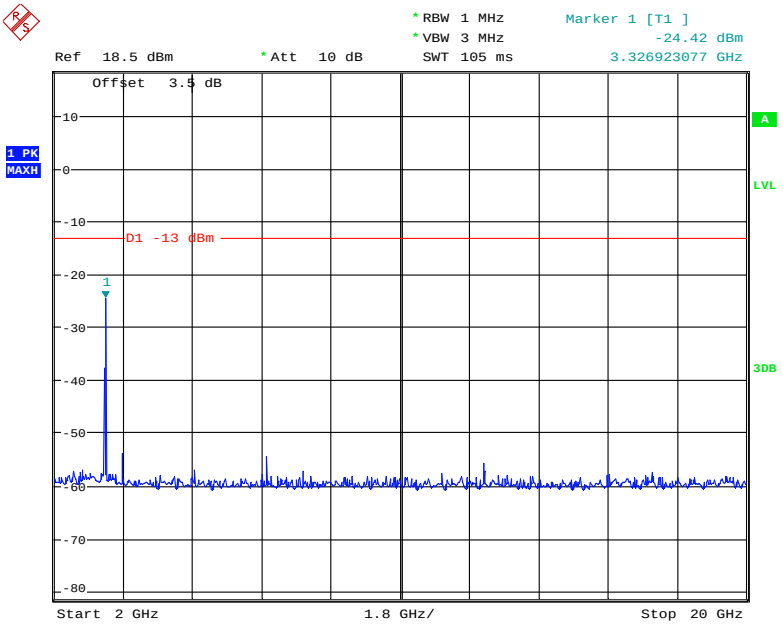
Date: 15.MAR.2019 09:32:59

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



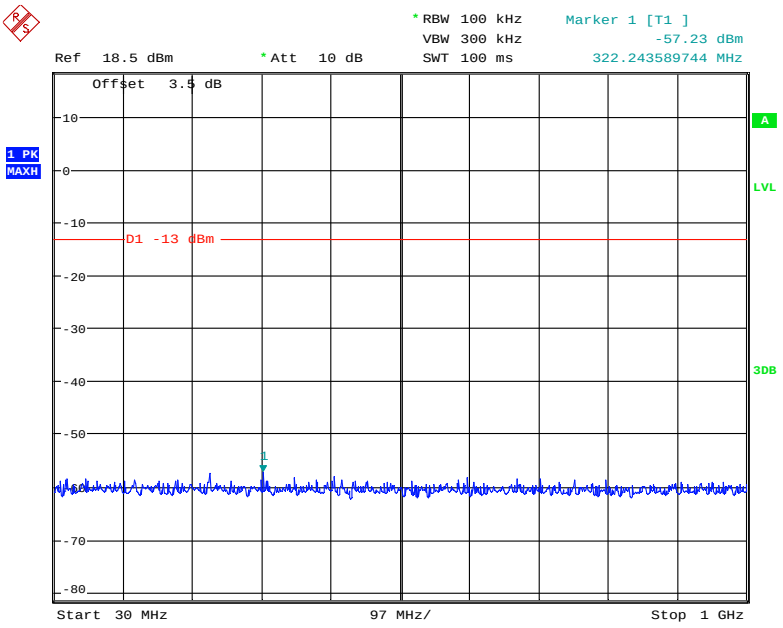
Date: 15.MAR.2019 09:44:32

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



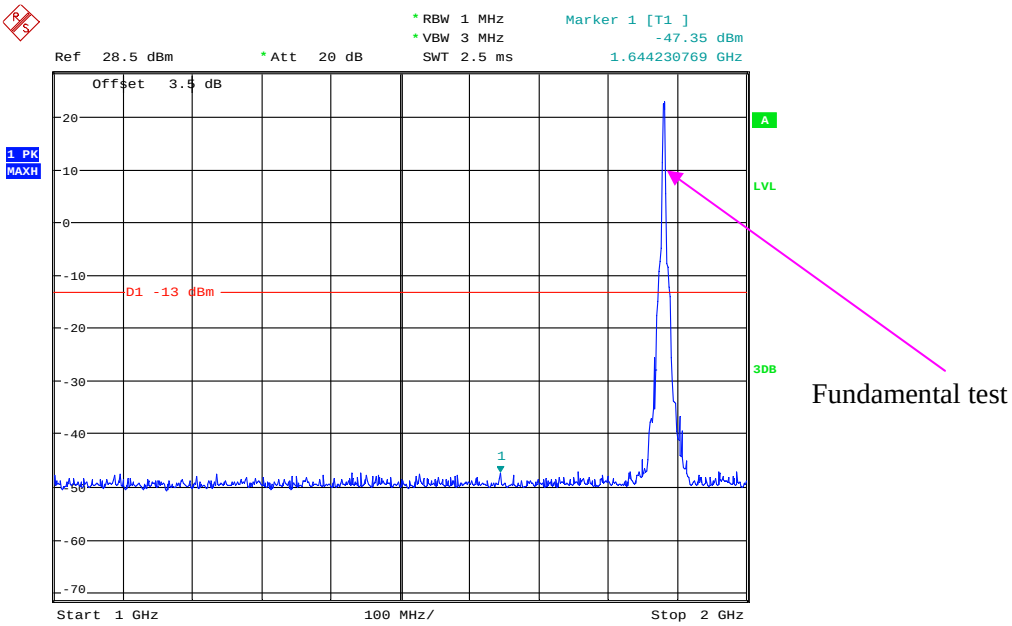
Date: 15.MAR.2019 09:44:56

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



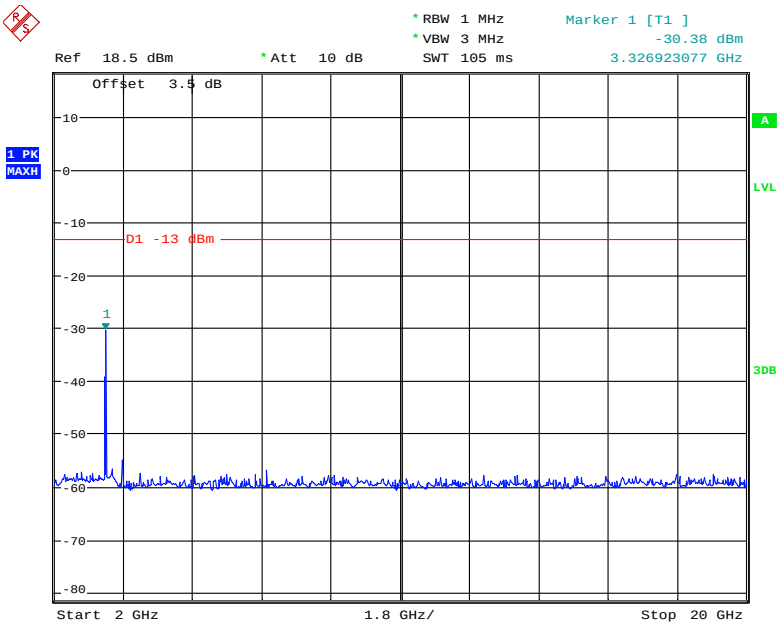
Date: 15.MAR.2019 09:38:13

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



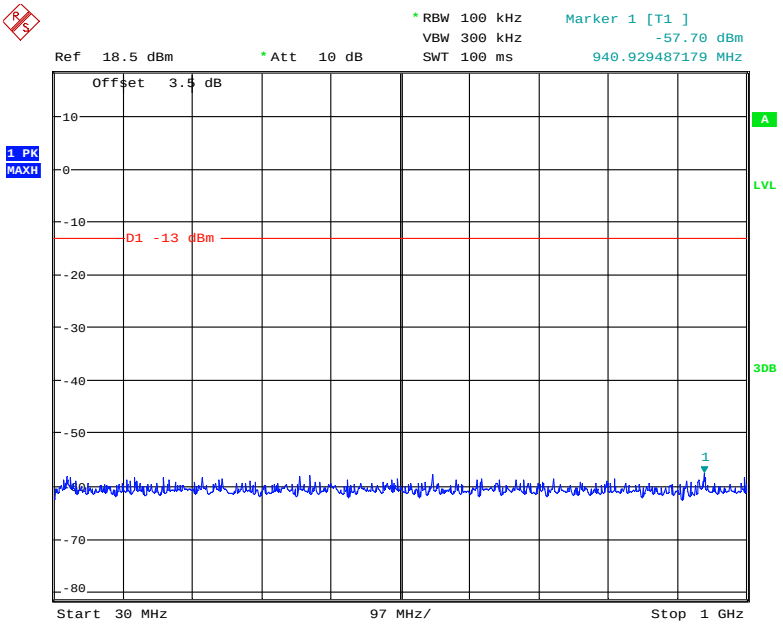
Date: 15.MAR.2019 09:44:14

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



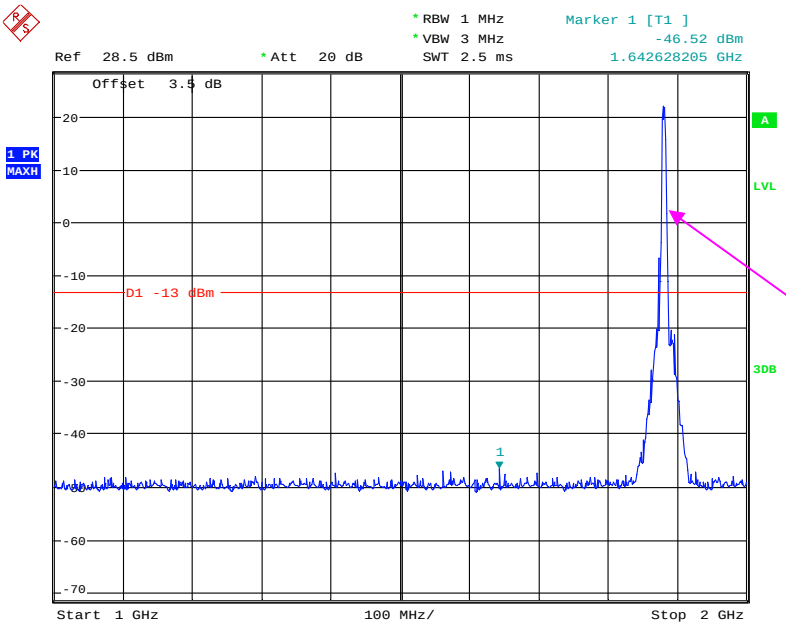
Date: 15.MAR.2019 09:45:16

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



Date: 15.MAR.2019 09:38:30

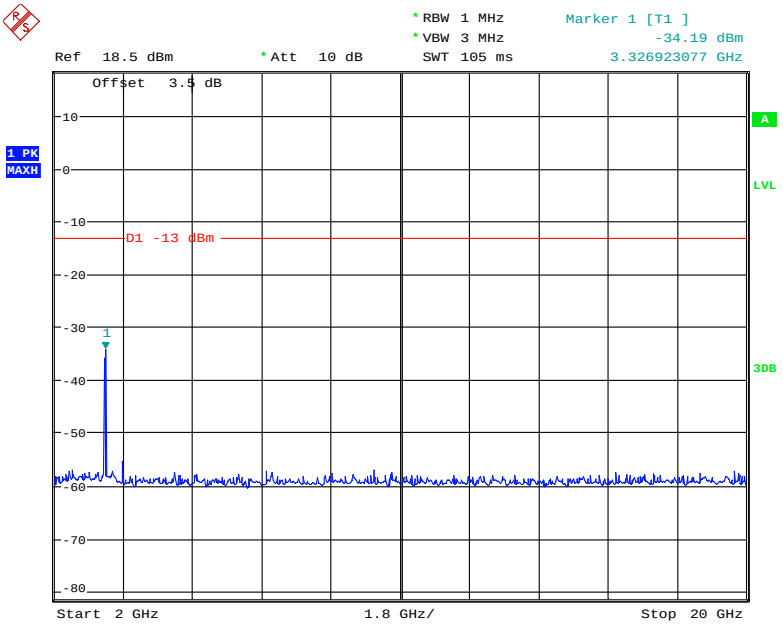
1 GHz – 2 GHz (5.0 MHz, Middle Channel)



Fundamental test

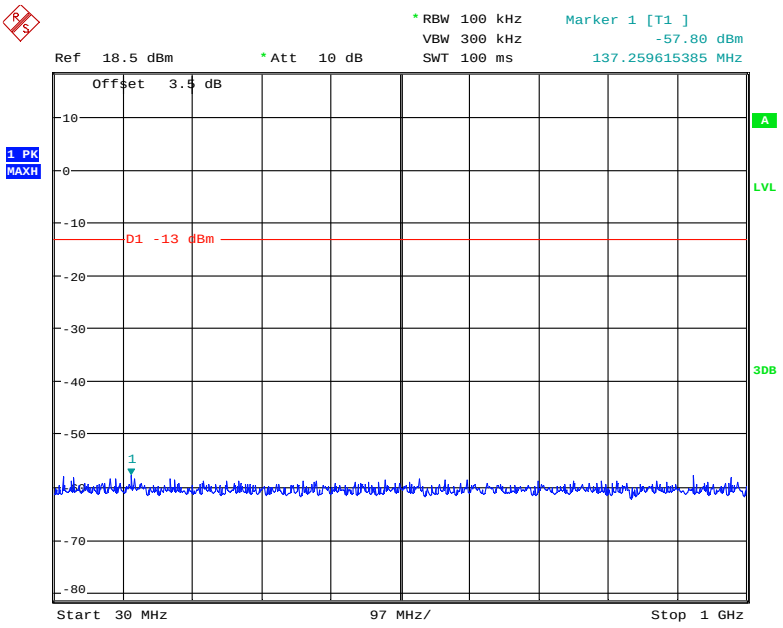
Date: 15.MAR.2019 09:43:52

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



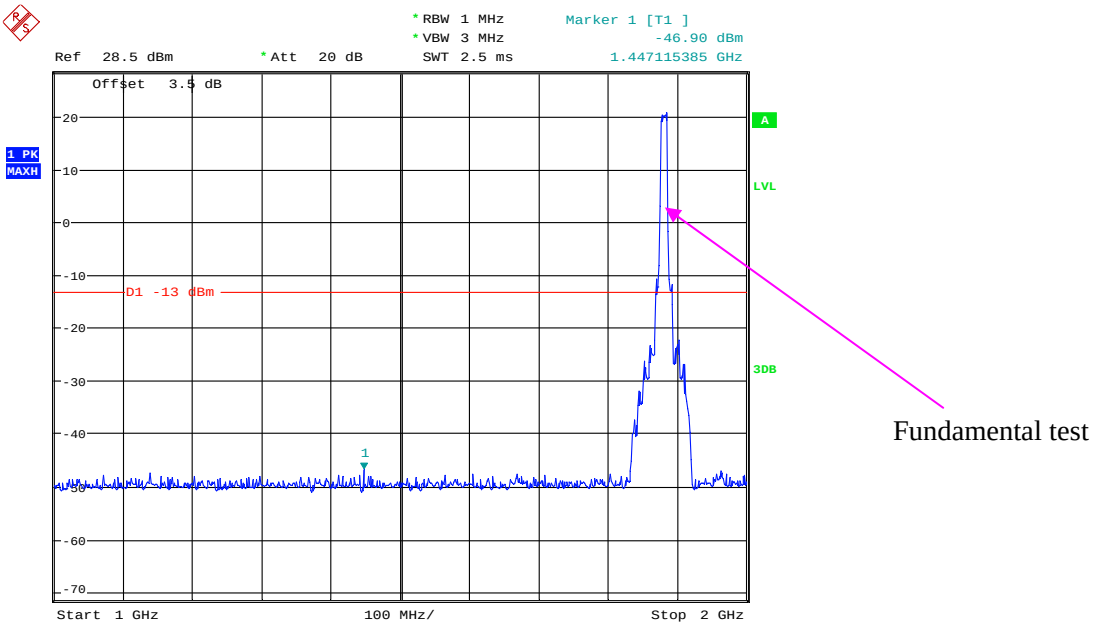
Date: 15.MAR.2019 09:45:30

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



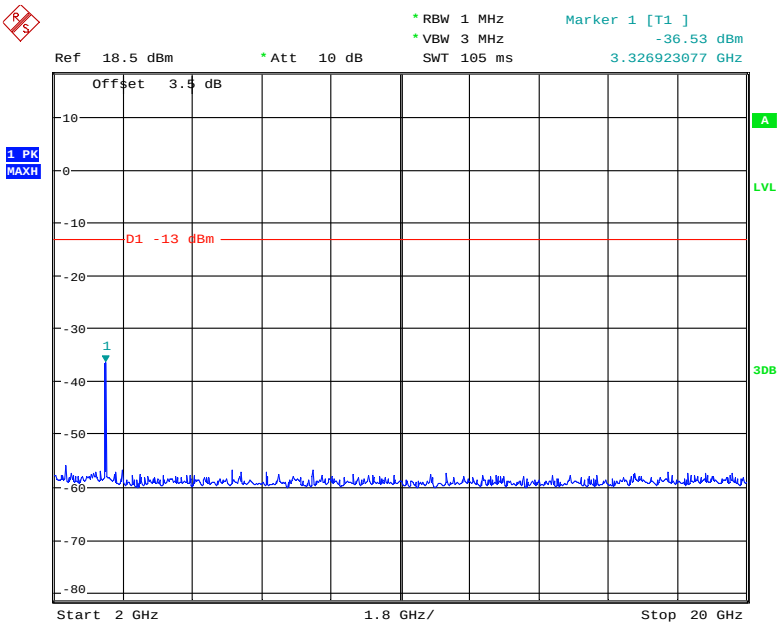
Date: 15.MAR.2019 09:38:47

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



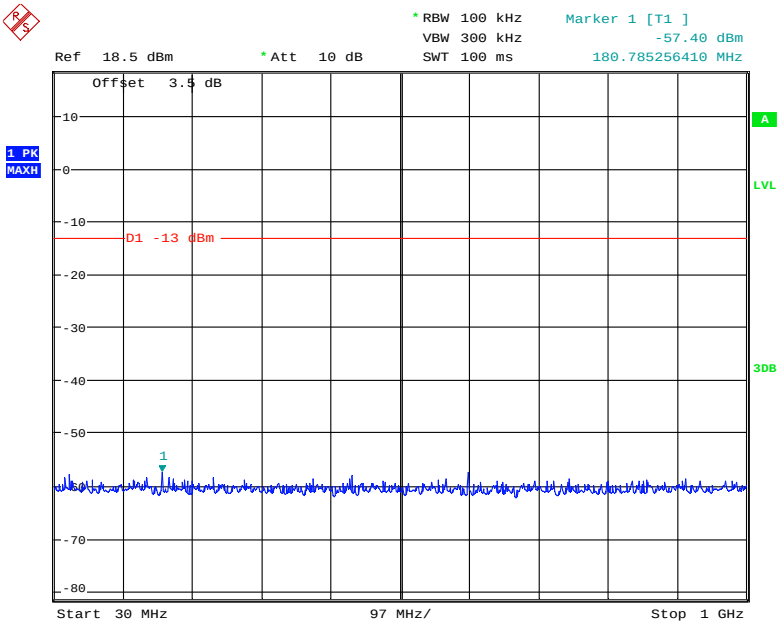
Date: 15.MAR.2019 09:43:34

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



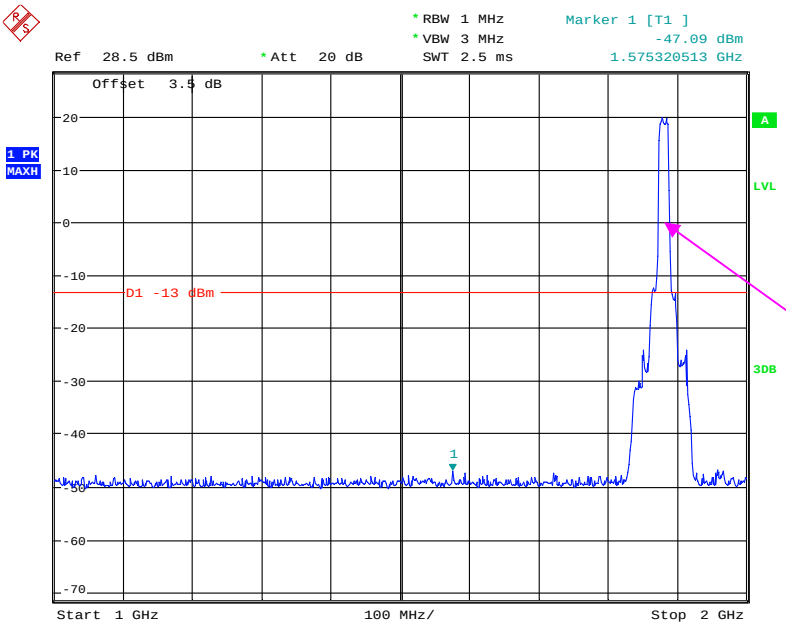
Date: 15.MAR.2019 09:45:45

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



Date: 15.MAR.2019 09:39:06

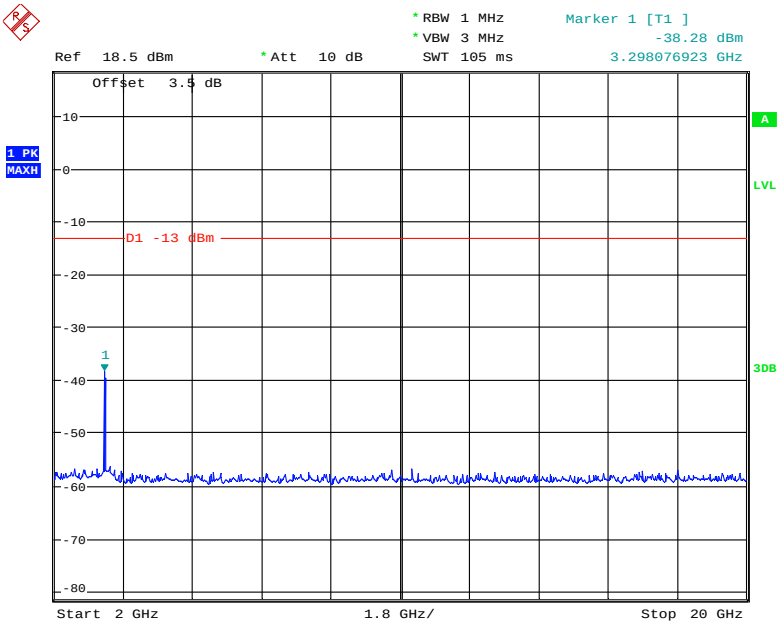
1 GHz – 2 GHz (15.0 MHz, Middle Channel)



Fundamental test

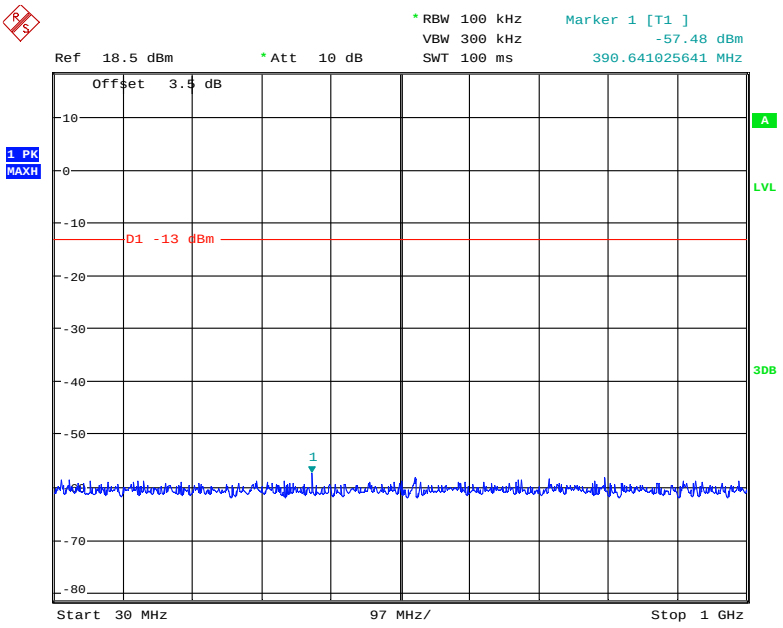
Date: 15.MAR.2019 09:43:12

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



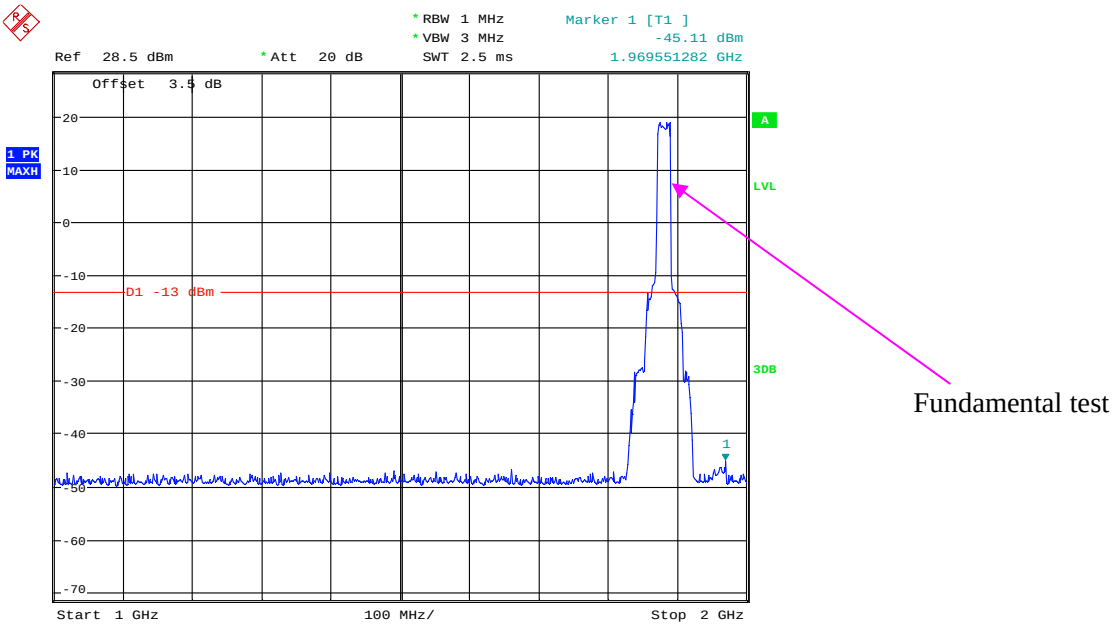
Date: 15.MAR.2019 09:46:29

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



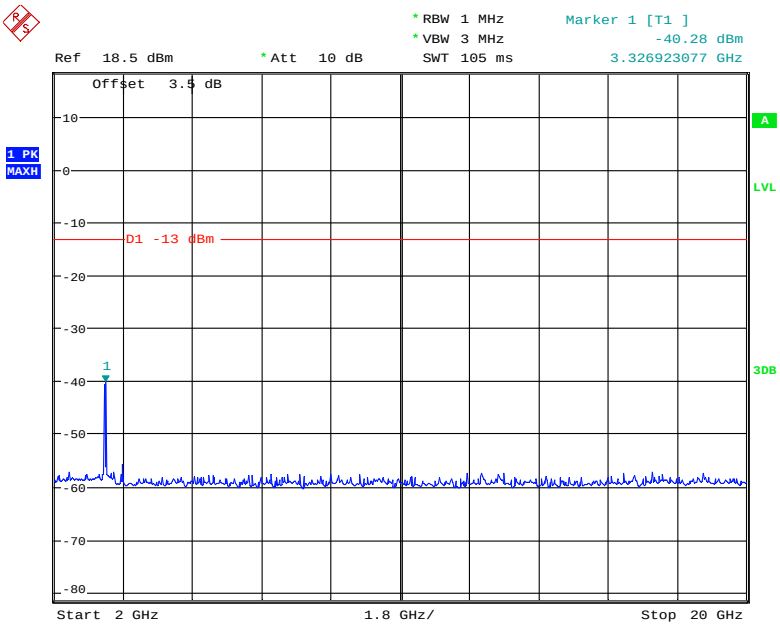
Date: 15.MAR.2019 09:39:24

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



Date: 15.MAR.2019 09:42:44

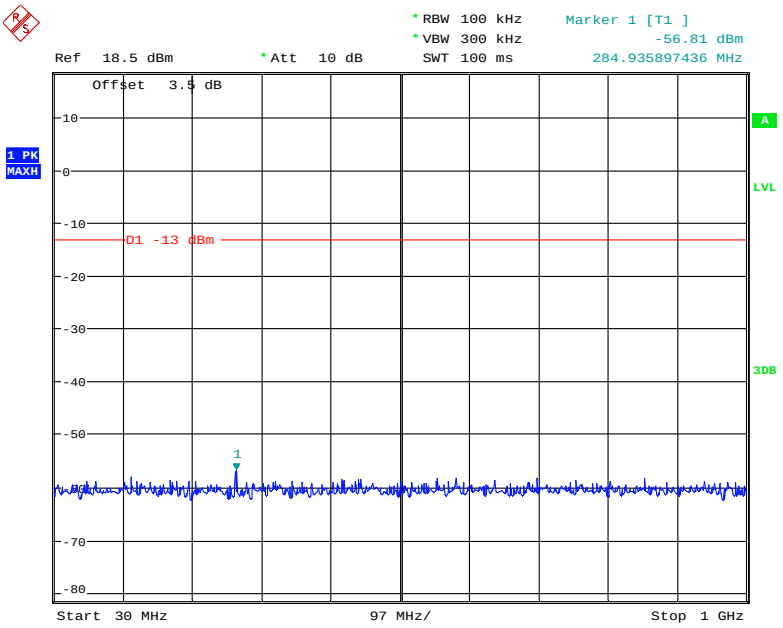
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 15.MAR.2019 09:46:50

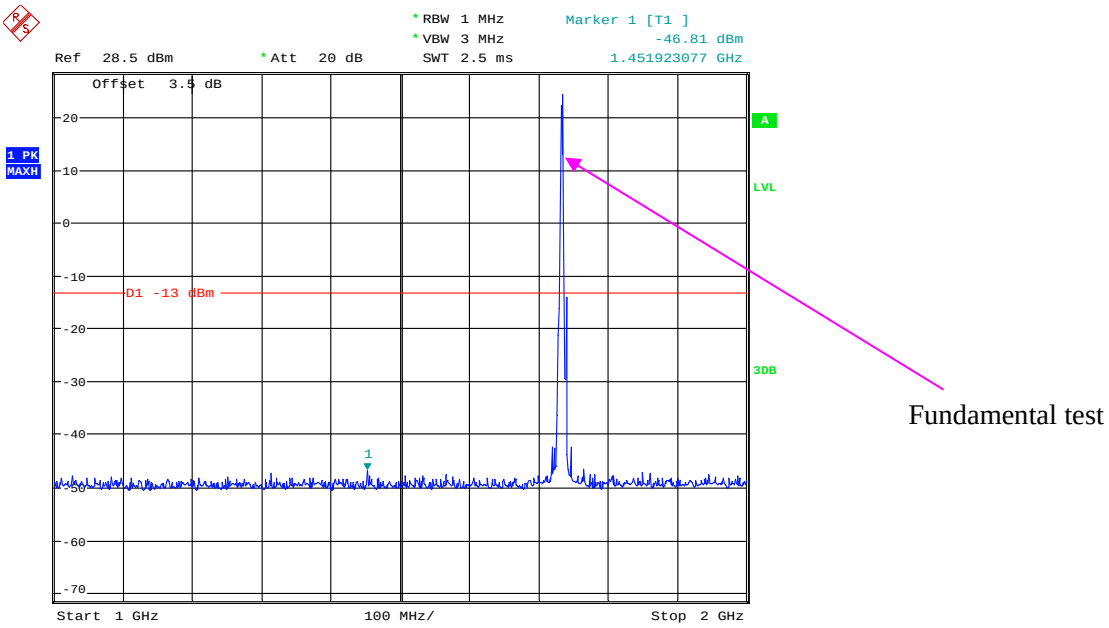
LTE Band 4:

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



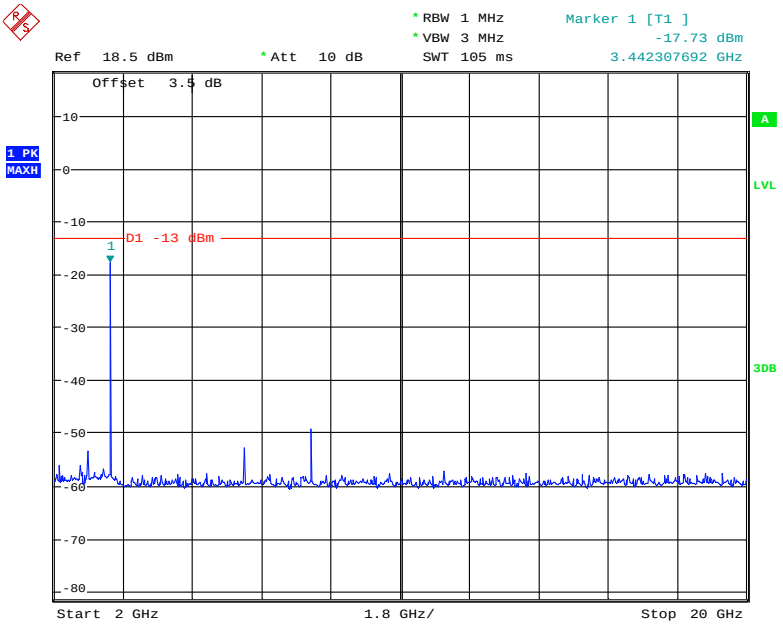
Date: 15.MAR.2019 10:05:54

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



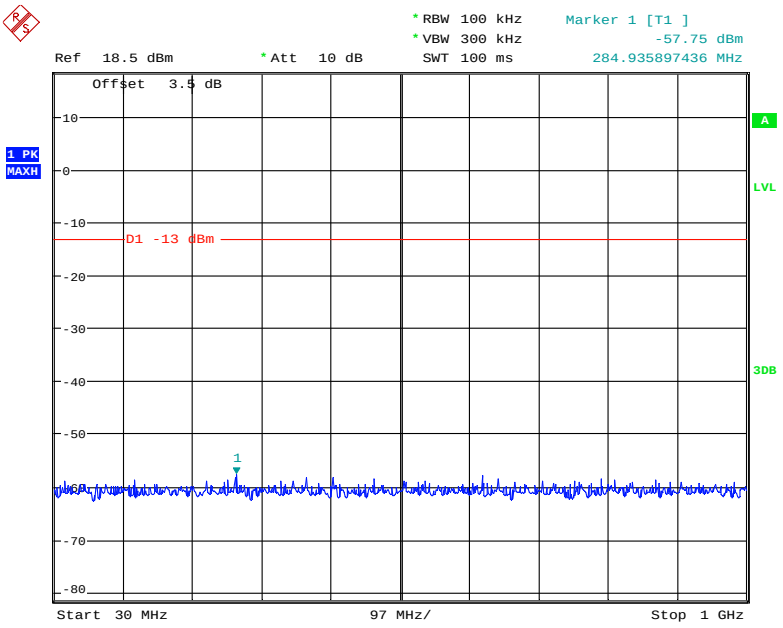
Date: 15.MAR.2019 10:01:32

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



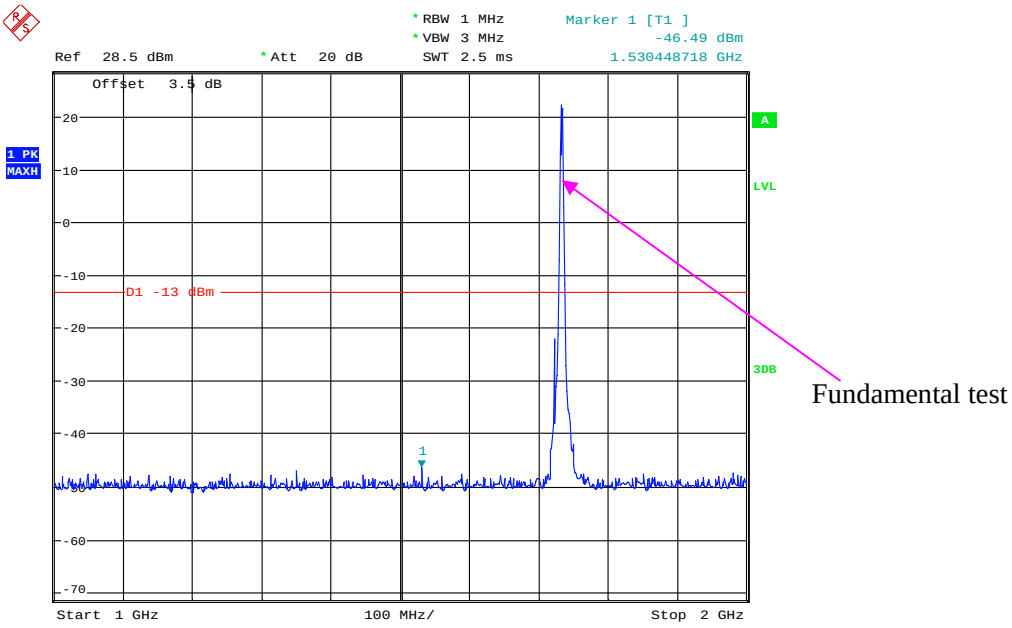
Date: 15.MAR.2019 09:59:54

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



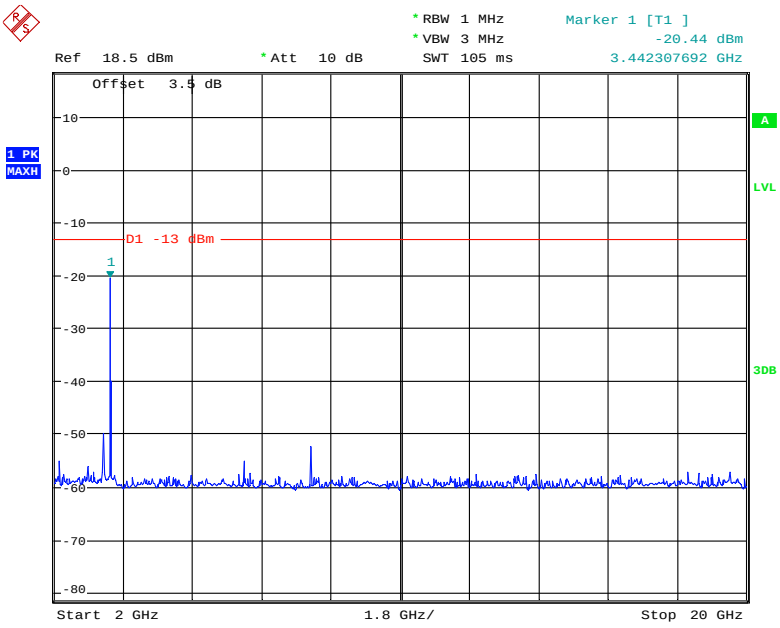
Date: 15.MAR.2019 10:05:41

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



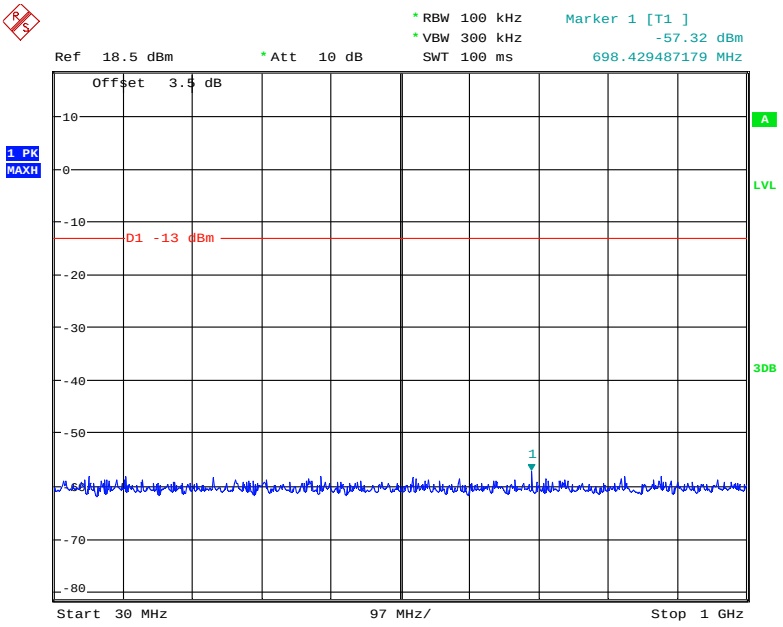
Date: 15.MAR.2019 10:01:54

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



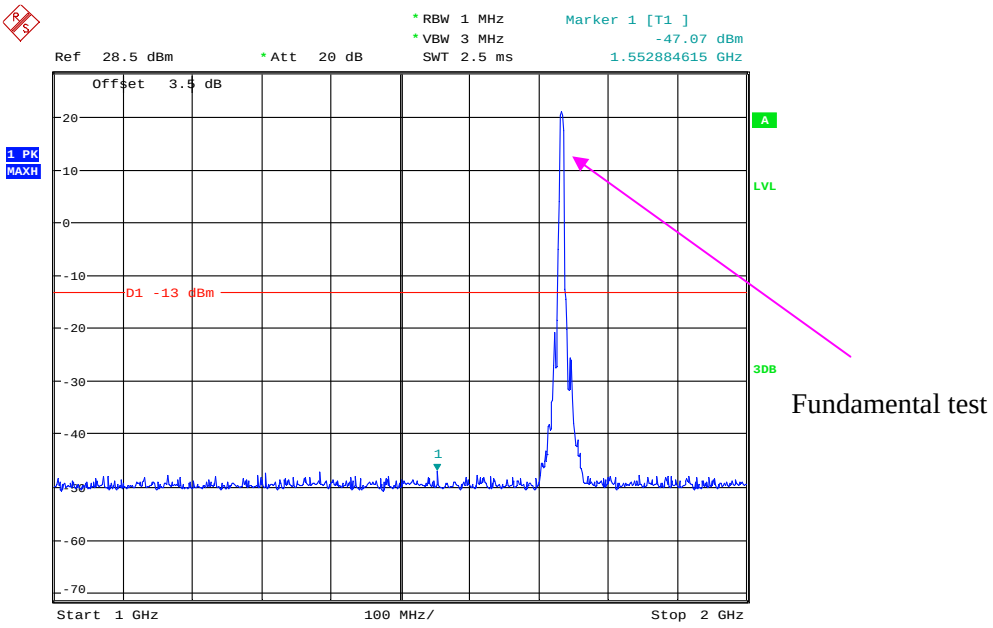
Date: 15.MAR.2019 09:59:39

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



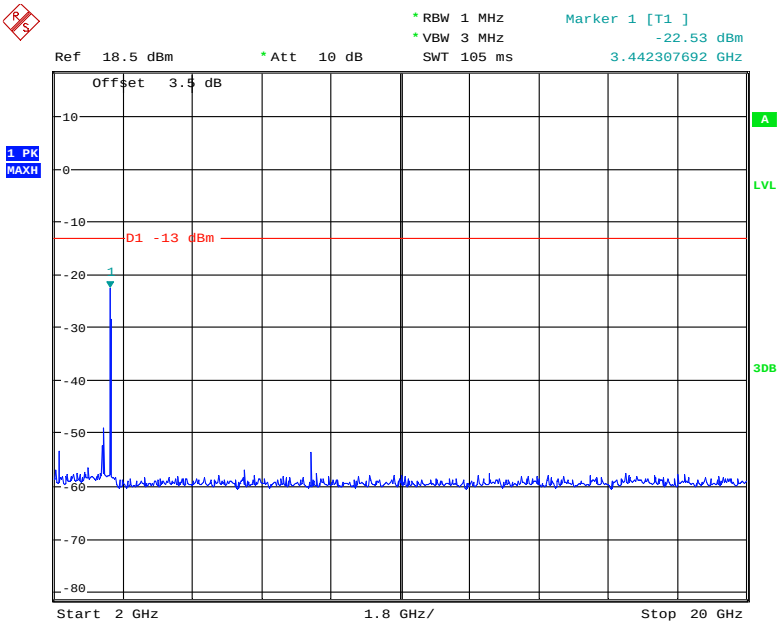
Date: 15.MAR.2019 10:05:27

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



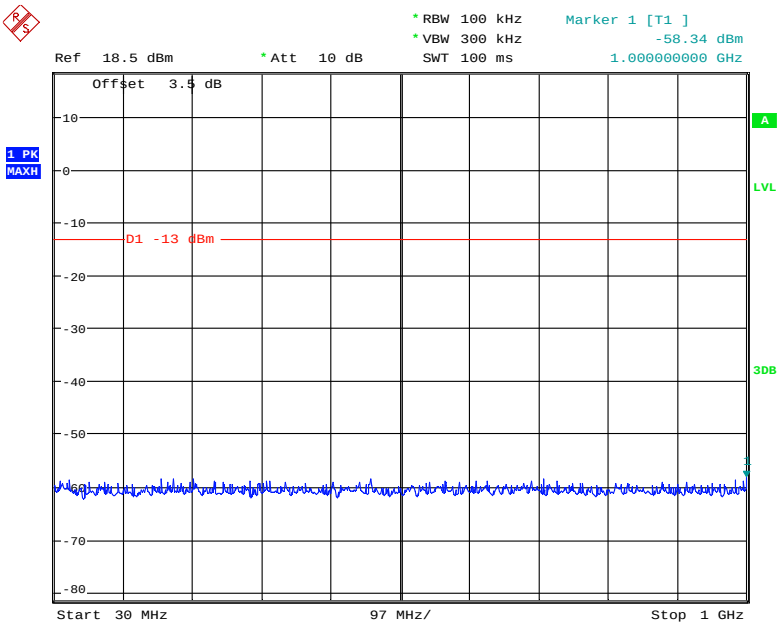
Date: 15.MAR.2019 10:02:14

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



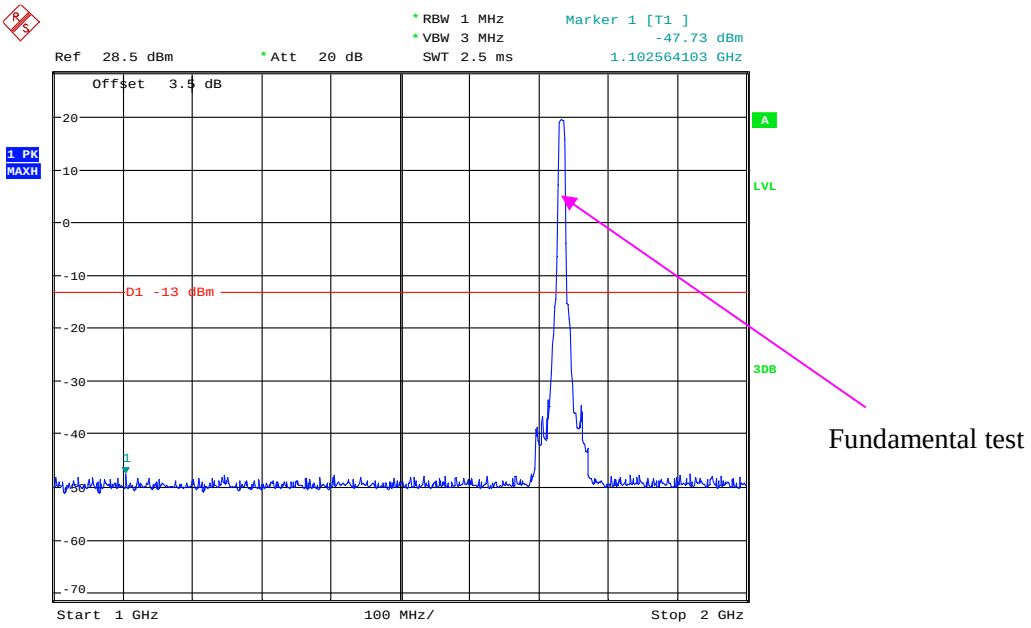
Date: 15.MAR.2019 09:59:25

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



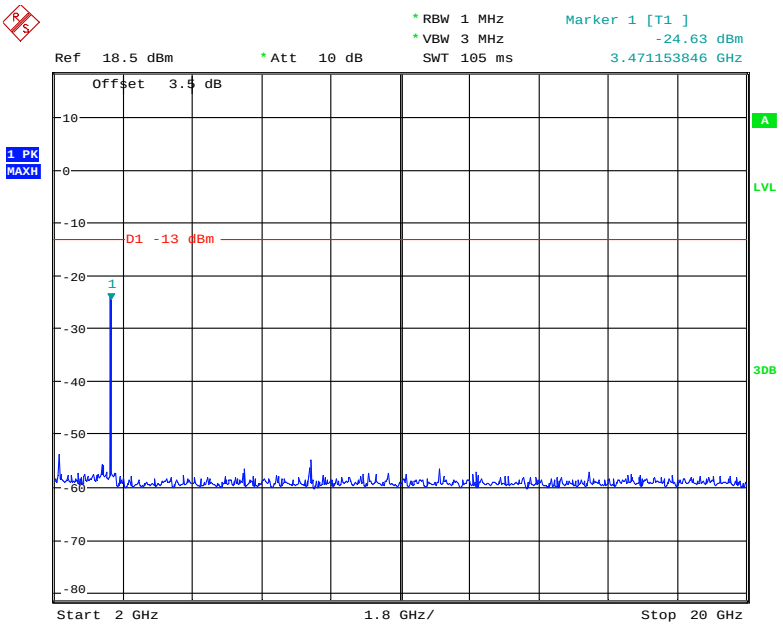
Date: 15.MAR.2019 10:05:14

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



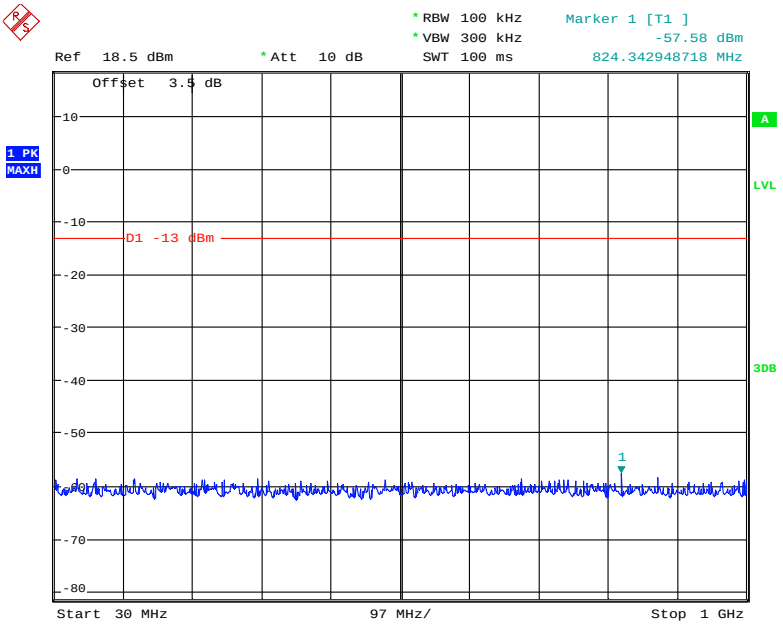
Date: 15.MAR.2019 10:02:31

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



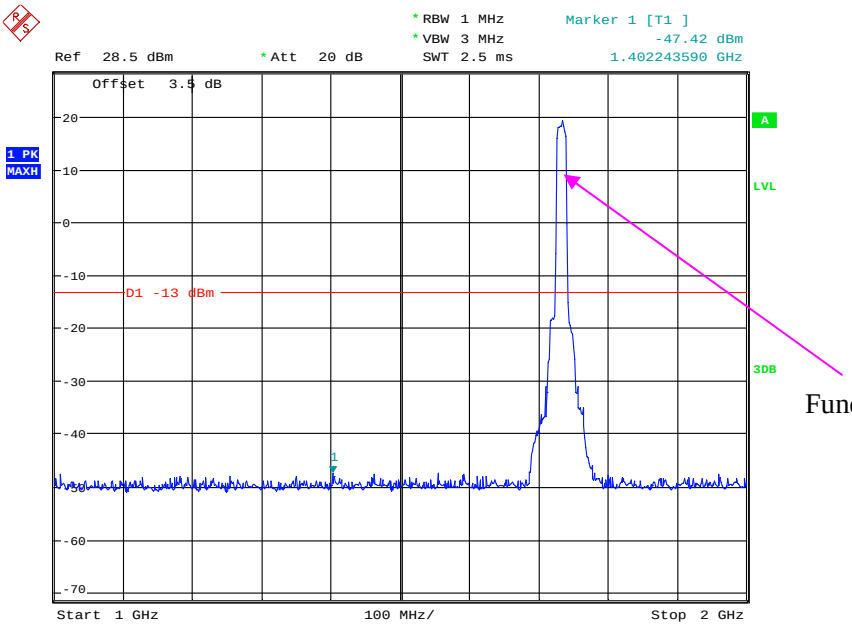
Date: 15.MAR.2019 09:59:10

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



Date: 15.MAR.2019 10:05:01

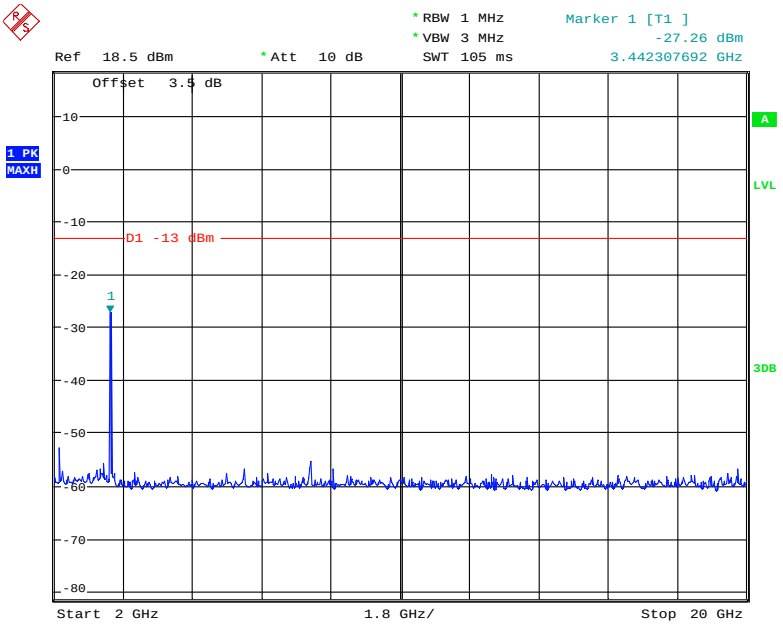
1 GHz – 2 GHz (15.0 MHz, Middle Channel)



Fundamental test

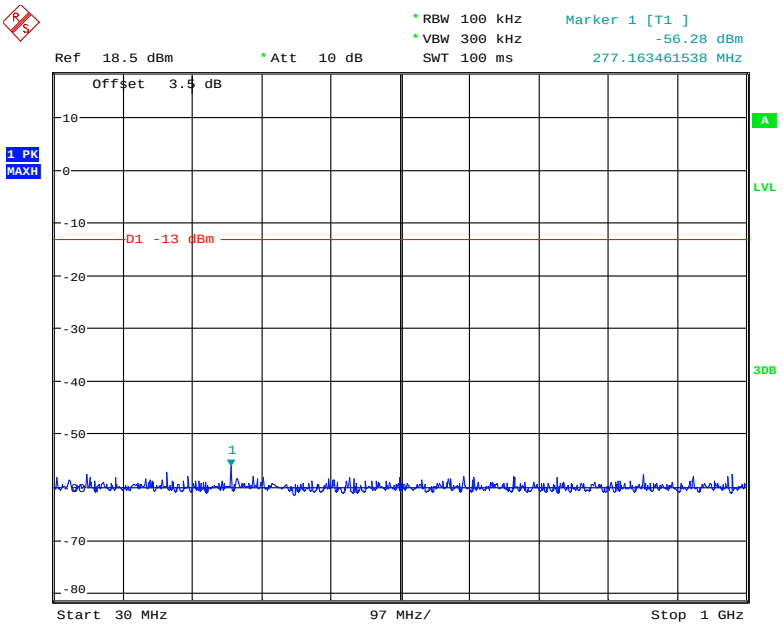
Date: 15.MAR.2019 10:02:45

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



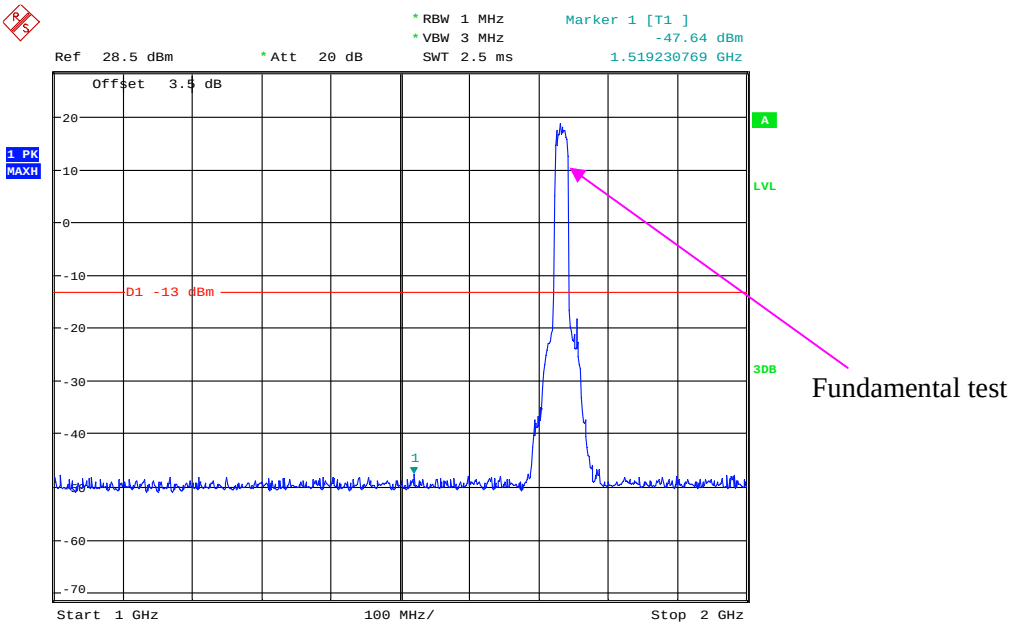
Date: 15.MAR.2019 09:58:56

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



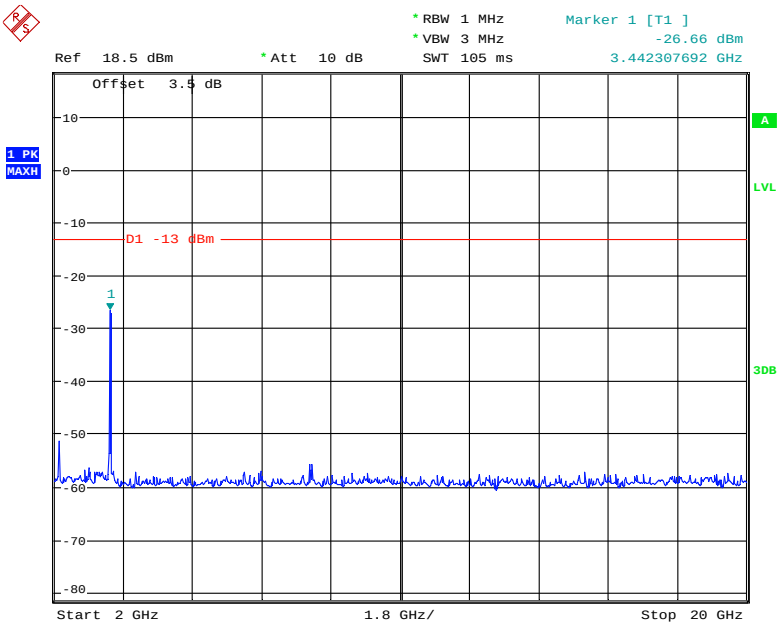
Date: 15.MAR.2019 10:04:48

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



Date: 15.MAR.2019 10:03:00

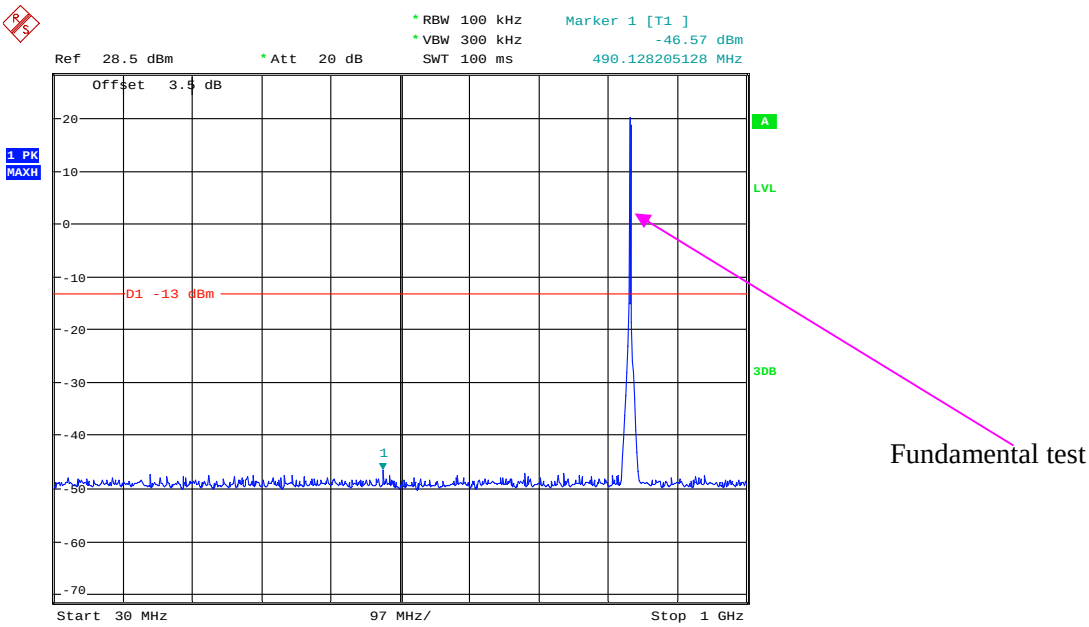
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 15.MAR.2019 09:58:37

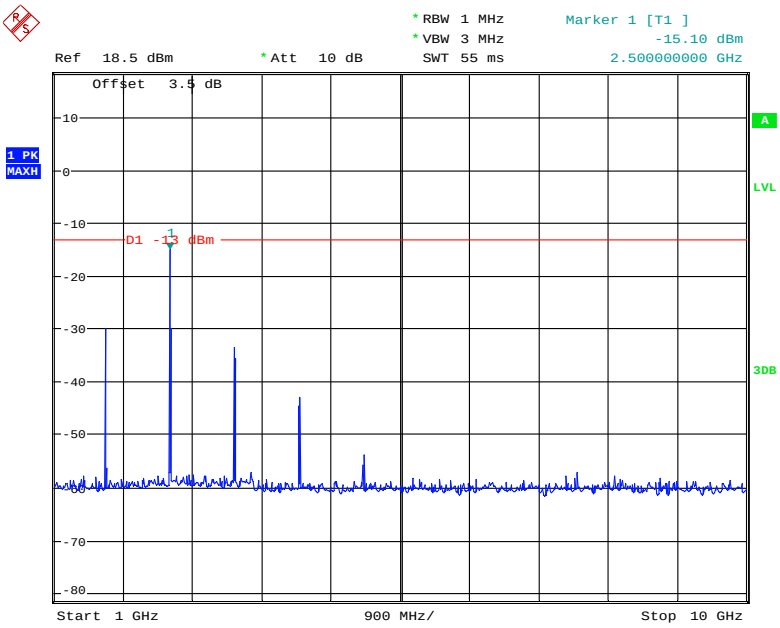
LTE Band 5:

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



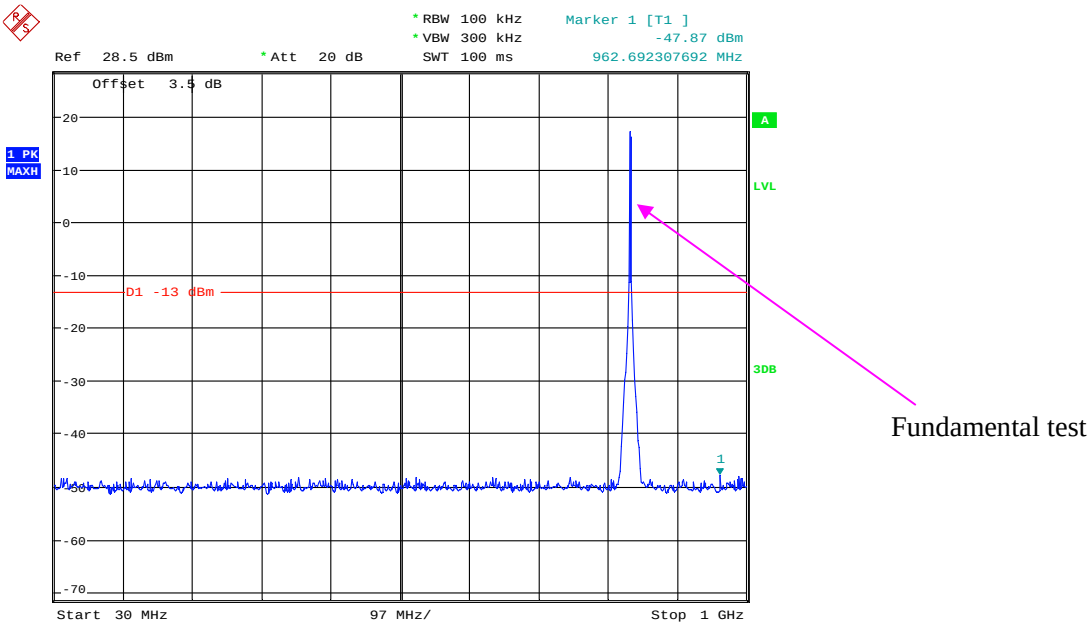
Date: 15.MAR.2019 10:09:52

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



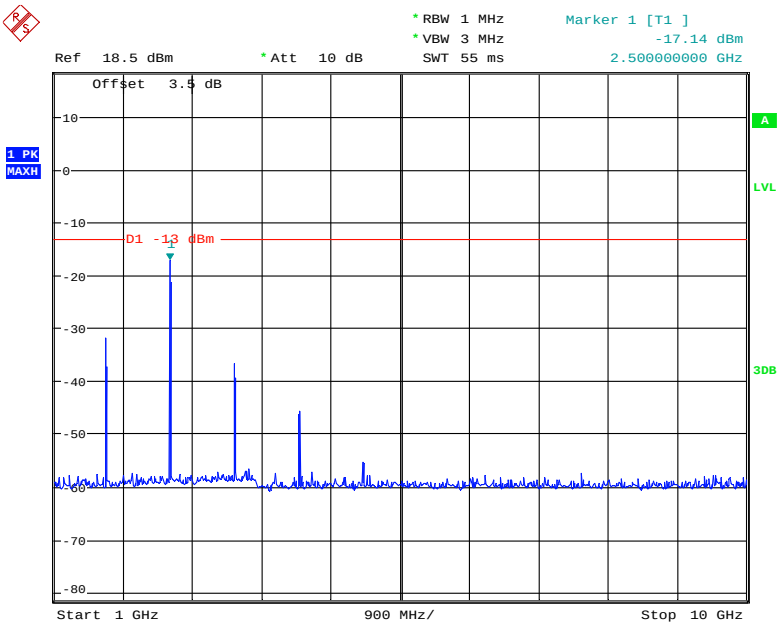
Date: 15.MAR.2019 10:16:09

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



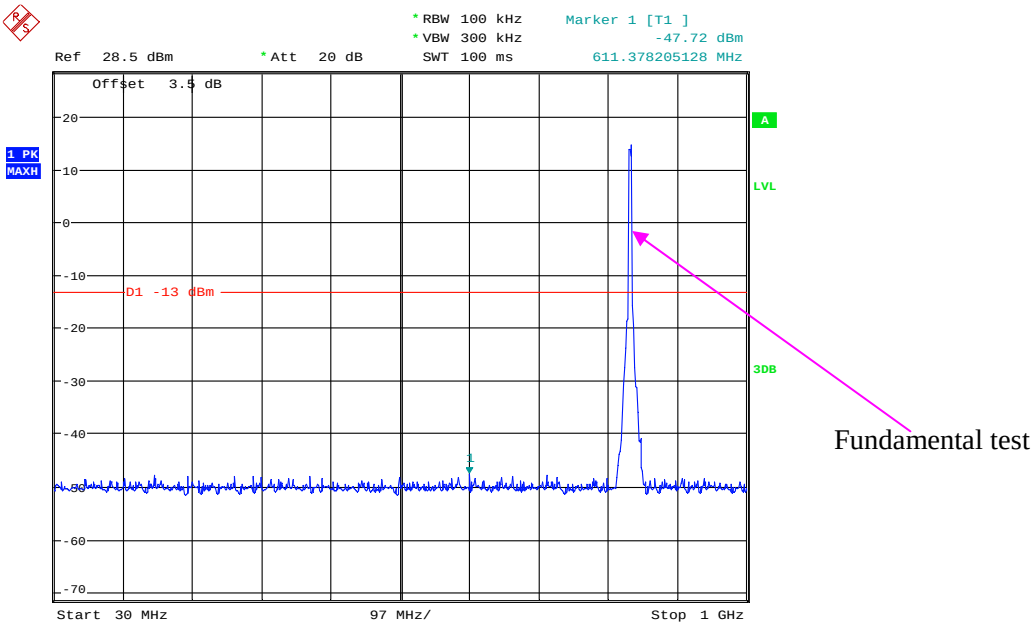
Date: 15.MAR.2019 10:10:14

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



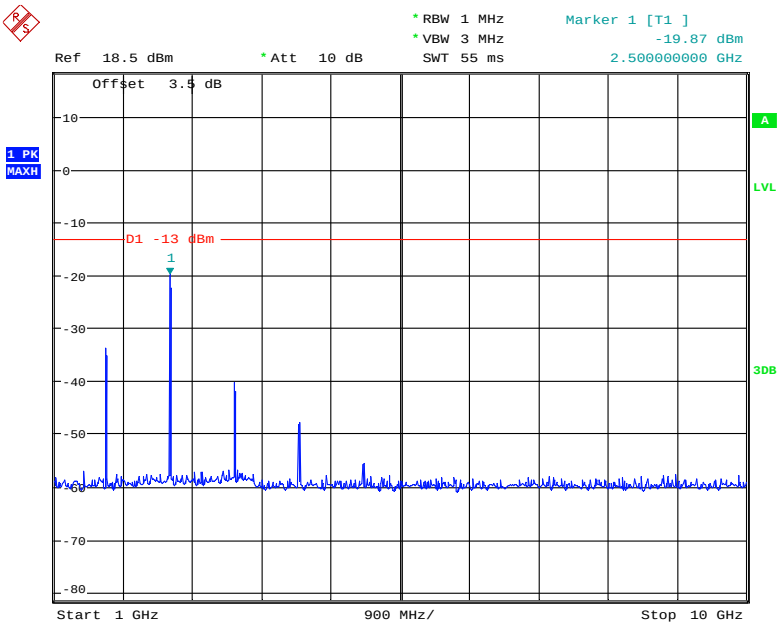
Date: 15.MAR.2019 10:15:53

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



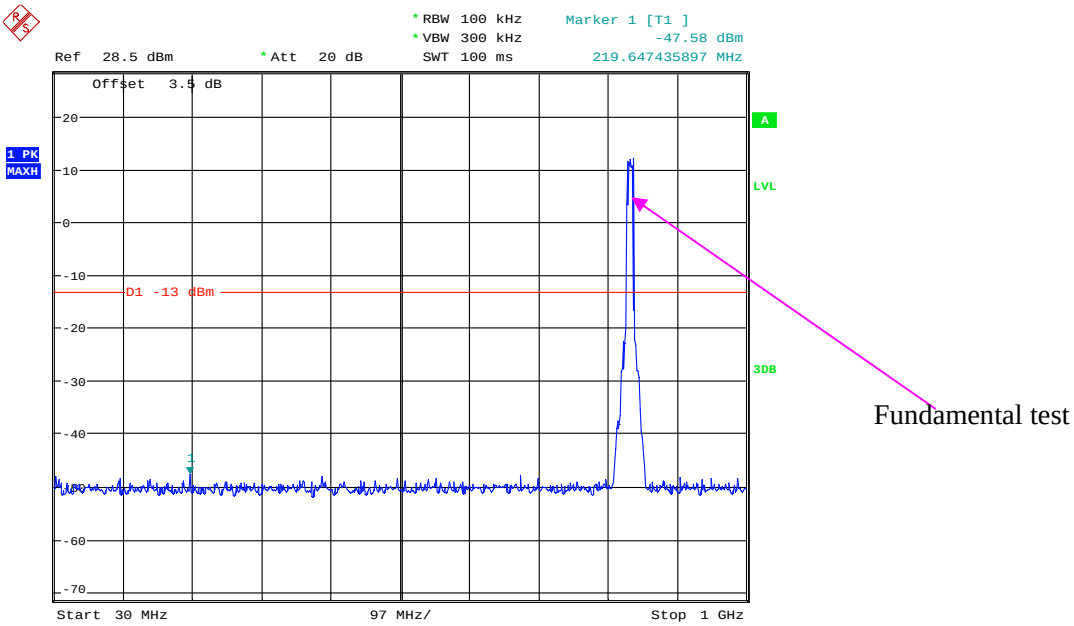
Date: 15.MAR.2019 10:10:29

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



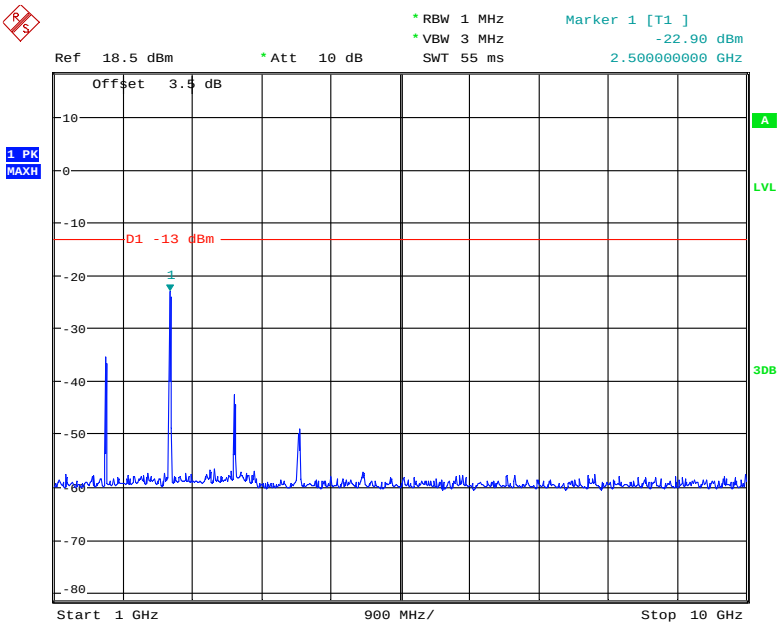
Date: 15.MAR.2019 10:15:40

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



Date: 15.MAR.2019 10:10:44

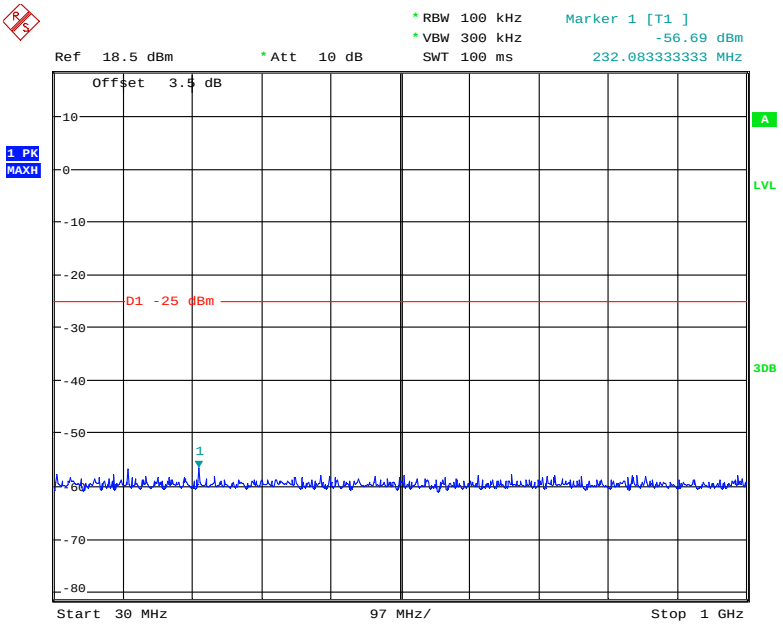
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 15.MAR.2019 10:15:25

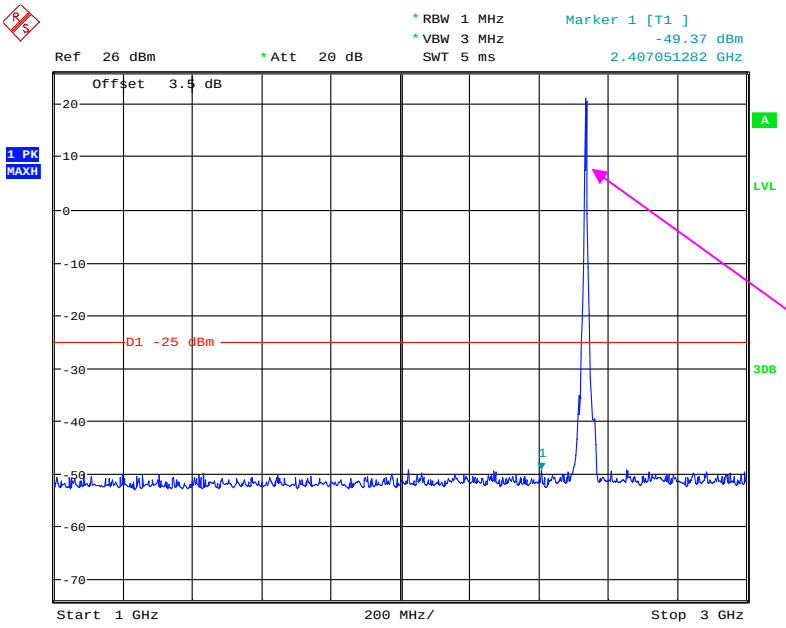
LTE Band 7:

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



Date: 15.MAR.2019 10:26:42

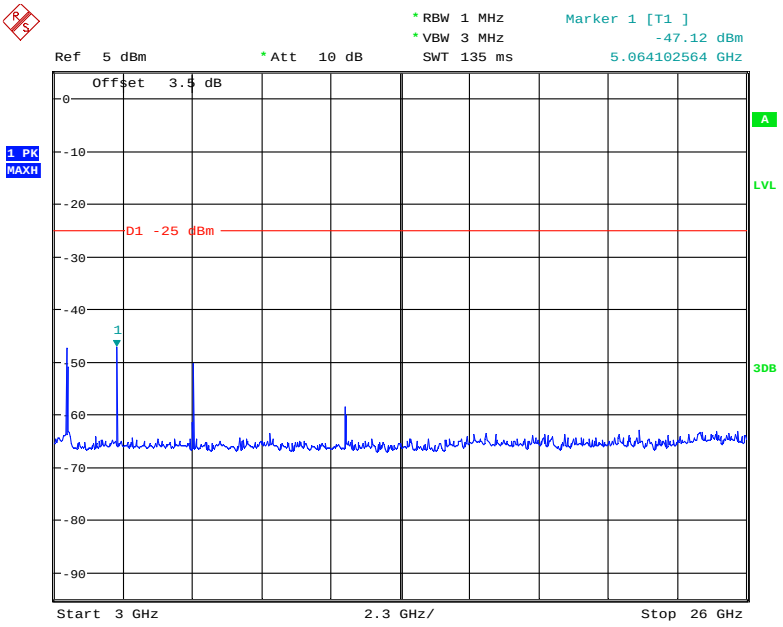
1 GHz – 3.0 GHz (5.0 MHz, Middle Channel)



Fundamental test

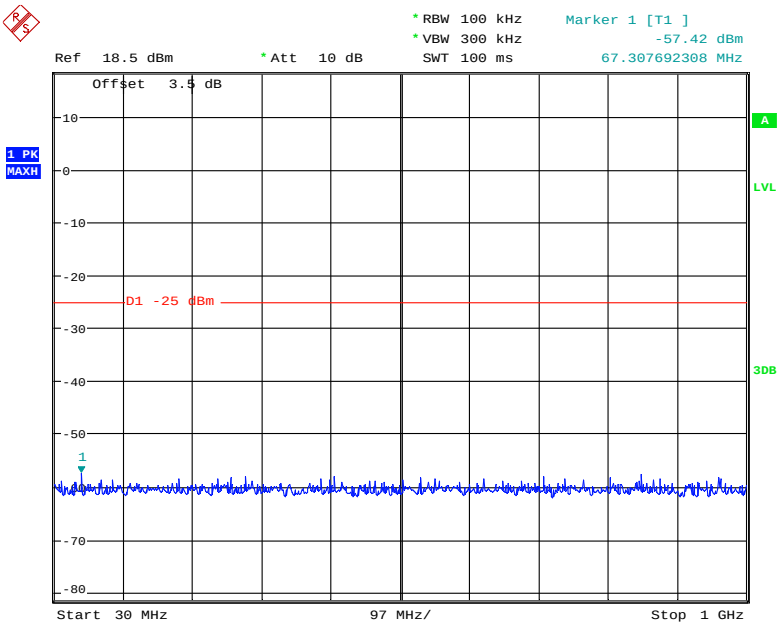
Date: 15.MAR.2019 10:34:17

3.0 GHz – 26 GHz (5.0 MHz, Middle Channel)



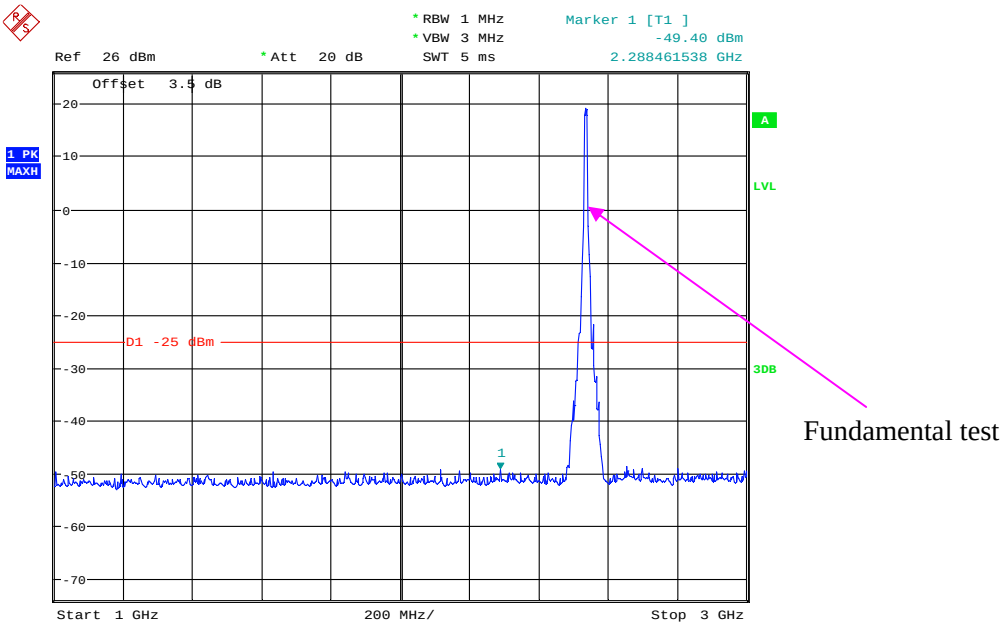
Date: 15.MAR.2019 10:35:39

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



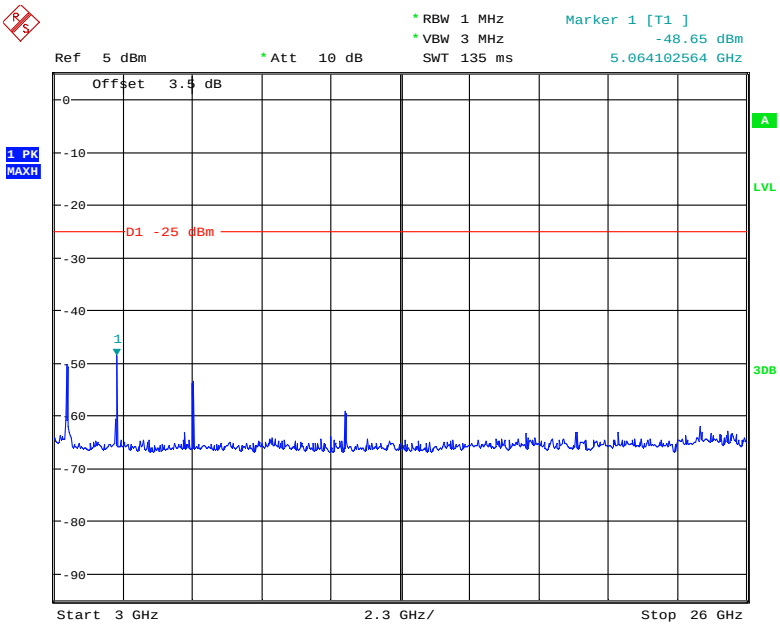
Date: 15.MAR.2019 10:28:53

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



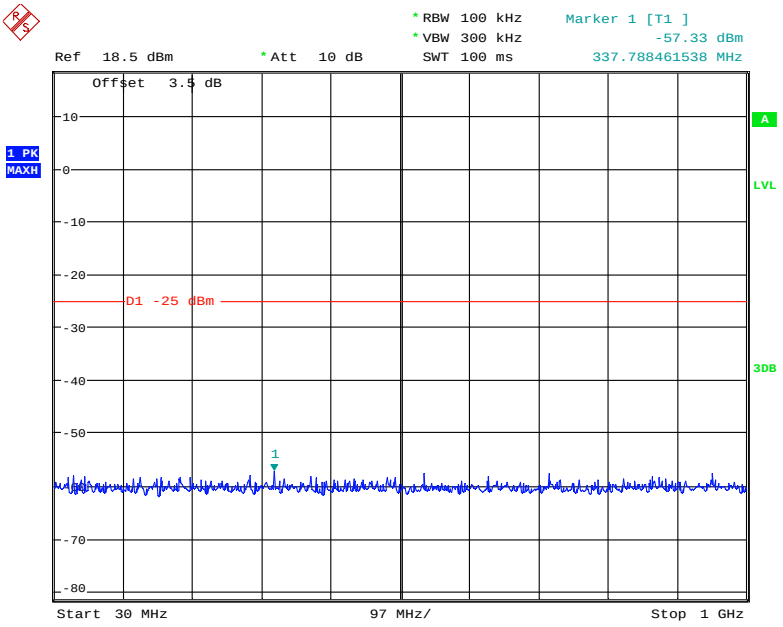
Date: 15.MAR.2019 10:34:03

3 GHz – 26 GHz (10.0 MHz, Middle Channel)



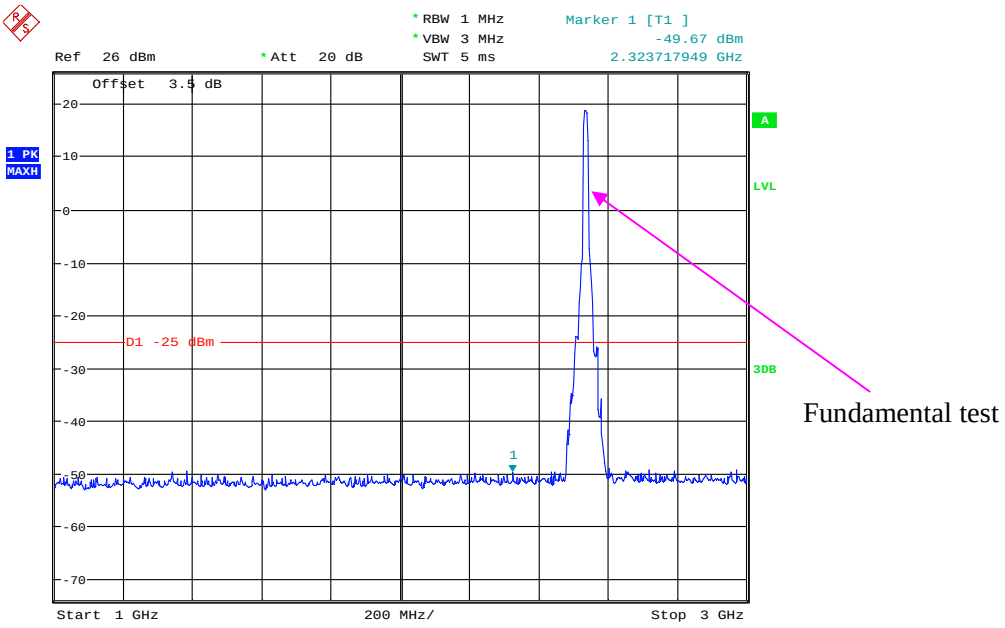
Date: 15.MAR.2019 10:36:03

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



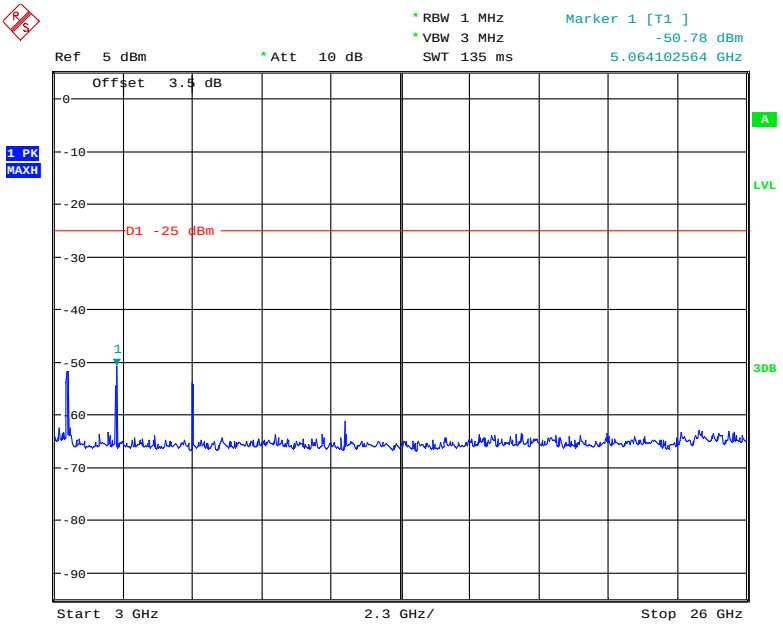
Date: 15.MAR.2019 10:29:13

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



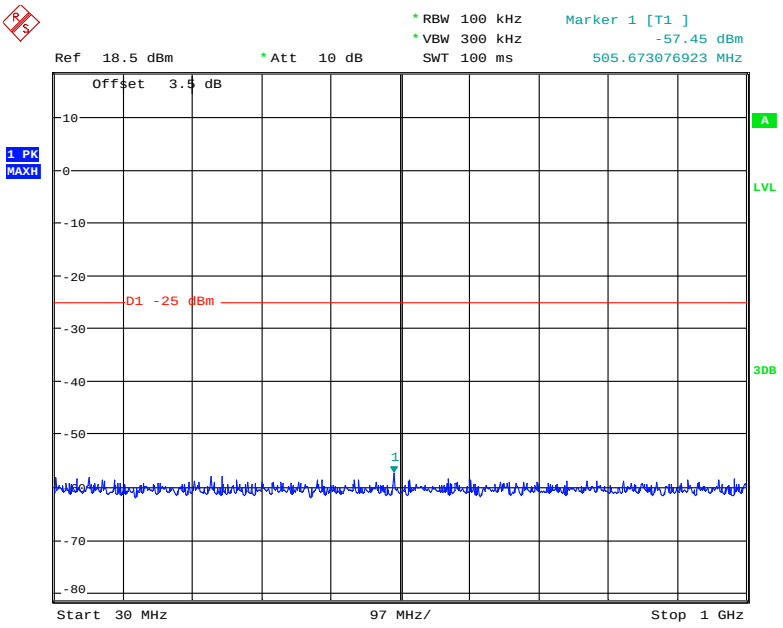
Date: 15.MAR.2019 10:33:48

3 GHz – 26 GHz (15.0 MHz, Middle Channel)



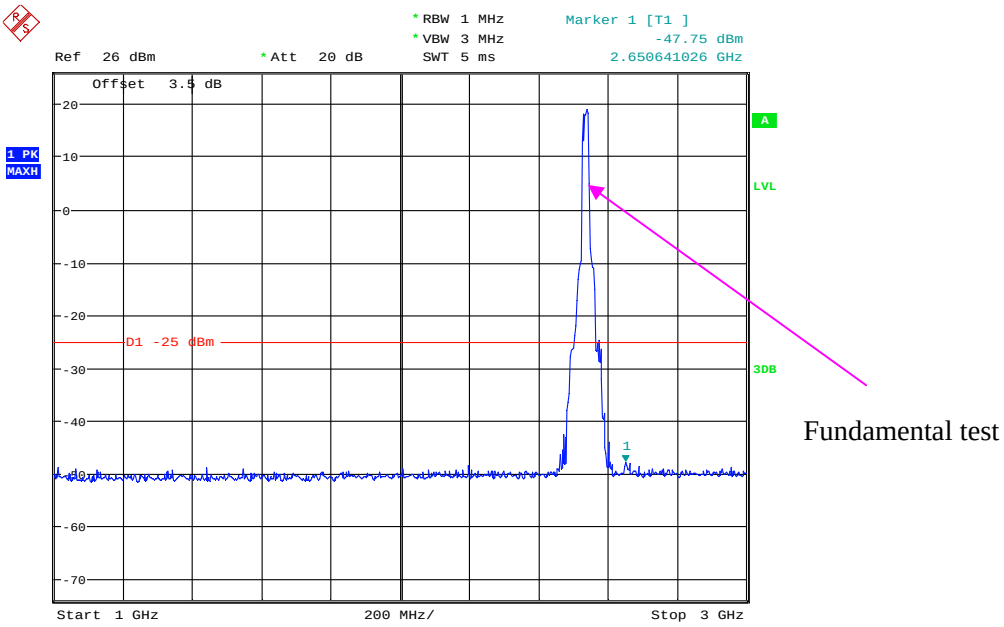
Date: 15.MAR.2019 10:36:15

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



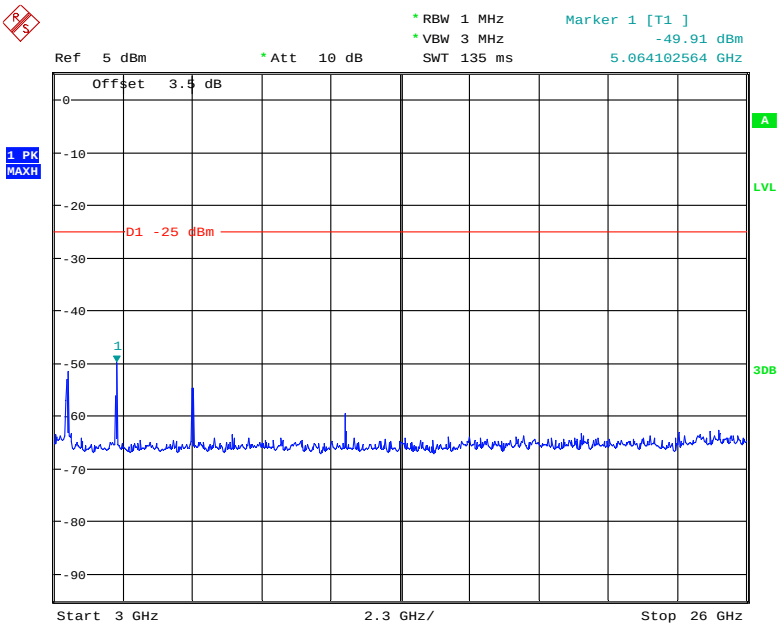
Date: 15.MAR.2019 10:29:28

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



Date: 15.MAR.2019 10:33:29

3 GHz – 26 GHz (20.0 MHz, Middle Channel)



Date: 15.MAR.2019 10:36:26

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

Applicable Standard

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

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:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Leo Huang on 2019-04-18.

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 (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
235.61	38.61	180	1.4	H	-62.4	1.31	0	-63.71	-13	50.71
235.61	39.93	117	1.5	V	-59.9	1.31	0	-61.21	-13	48.21
1673.20	72.10	82	1.1	H	-35.0	1.30	8.90	-27.40	-13	14.40
1673.20	66.85	278	2.2	V	-39.6	1.30	8.90	-32.00	-13	19.00
2509.80	61.25	104	2.0	H	-42.3	2.60	10.20	-34.70	-13	21.70
2509.80	60.57	147	1.8	V	-42.3	2.60	10.20	-34.70	-13	21.70
3346.40	51.90	36	1.3	H	-48.4	1.50	11.70	-38.20	-13	25.20
3346.40	50.13	90	2.0	V	-50.2	1.50	11.70	-40.00	-13	27.00
WCDMA Mode, Middle channel										
235.61	39.96	69	2.2	H	-61.0	1.31	0	-62.31	-13	49.31
235.61	38.52	88	1.8	V	-61.3	1.31	0	-62.61	-13	49.61
1673.20	53.90	189	1.9	H	-53.2	1.30	8.90	-45.60	-13	32.60
1673.20	51.26	313	1.5	V	-55.2	1.30	8.90	-47.60	-13	34.60

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
235.61	39.11	30	2.5	H	-61.9	1.31	0	-63.21	-13	50.21
235.61	39.64	157	2.3	V	-60.2	1.31	0	-61.51	-13	48.51
3760.00	44.36	35	2.4	H	-56.9	1.50	11.80	-46.60	-13	33.60
3760.00	44.20	9	1.3	V	-56.6	1.50	11.80	-46.30	-13	33.30
5640.00	51.62	342	2.2	H	-46.0	1.70	12.40	-35.30	-13	22.30
5640.00	50.33	126	1.4	V	-46.9	1.70	12.40	-36.20	-13	23.20
9400.00	49.90	337	1.5	H	-45.4	2.20	11.50	-36.10	-13	23.10
9400.00	48.23	116	2.4	V	-47.3	2.20	11.50	-38.00	-13	25.00
WCDMA Mode Band II, Middle channel										
235.61	38.77	227	1.0	H	-62.2	1.31	0	-63.51	-13	50.51
235.61	38.69	295	1.3	V	-61.1	1.31	0	-62.41	-13	49.41
3760.00	47.89	337	2.2	H	-53.3	1.50	11.80	-43.00	-13	30.00
3760.00	46.50	169	2.2	V	-54.3	1.50	11.80	-44.00	-13	31.00

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										
Test frequency range:30 MHz ~ 20 GHz										
235.61	39.78	203	1.9	H	-61.2	1.31	0	-62.51	-13	49.51
235.61	39.59	169	2.4	V	-60.2	1.31	0	-61.51	-13	48.51
3760.00	57.11	236	2.4	H	-44.1	1.50	11.80	-33.80	-13	20.80
3760.00	52.90	275	2.2	V	-47.9	1.50	11.80	-37.60	-13	24.60
Band 4										
Test frequency range:30 MHz ~ 20 GHz										
235.61	38.47	1	2.4	H	-62.5	1.31	0	-63.81	-13	50.81
235.61	39.80	238	1.7	V	-60.0	1.31	0	-61.31	-13	48.31
3465.00	56.84	174	2.3	H	-43.5	1.50	12.00	-33.00	-13	20.00
3465.00	55.10	240	1.5	V	-46.0	1.50	12.00	-35.50	-13	22.50
Band 5										
Test frequency range:30 MHz ~ 20 GHz										
235.61	38.40	250	1.1	H	-62.6	1.31	0	-63.91	-13	50.91
235.61	38.25	52	1.5	V	-61.6	1.31	0	-62.91	-13	49.91
1673.00	54.69	226	2.3	H	-62.4	1.30	8.90	-54.80	-13	41.80
1673.00	54.30	290	2.4	V	-62.2	1.30	8.90	-54.60	-13	41.60
Band 7										
Test frequency range: 30 MHz ~ 26GHz										
235.61	38.10	80	1.6	H	-62.9	1.31	0	-64.21	-25	39.21
235.61	39.03	349	1.5	V	-60.8	1.31	0	-62.11	-25	37.11
5070.00	53.60	175	1.1	H	-44.3	1.60	12.10	-33.80	-25	8.80
5070.00	52.20	73	2.0	V	-45.7	1.60	12.10	-35.20	-25	10.20

Note:
1) Absolute Level = Substituted Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level
3) The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

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

Applicable Standard

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

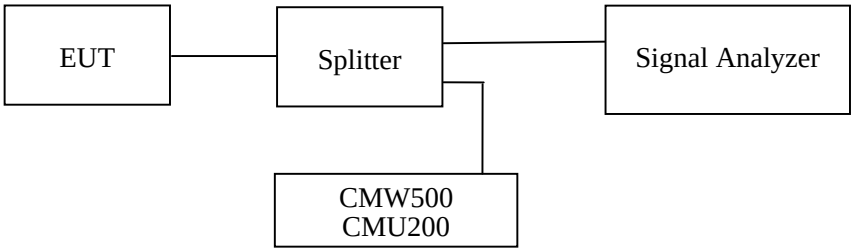
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

Test Procedure

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

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



Test Data

Environmental Conditions

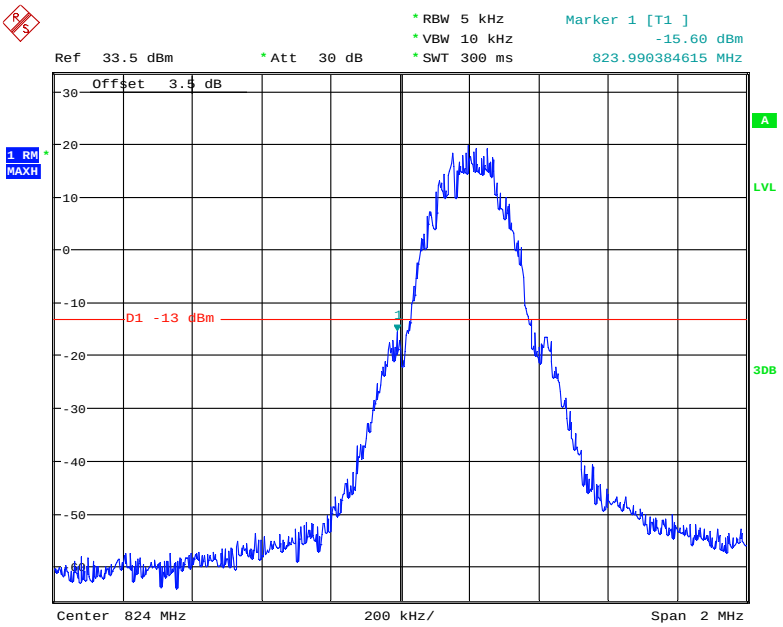
Temperature:	24~25 ℃
Relative Humidity:	50~55 %
ATM Pressure:	100.9~101.0 kPa

The testing was performed by Shawn Xiao from 2019-03-13 to 2019-04-02.

EUT operation mode: Transmitting

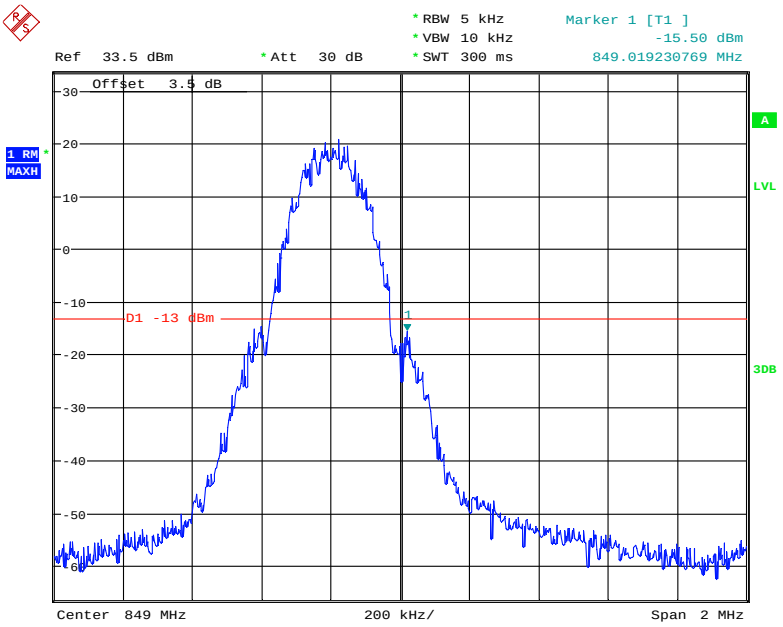
Test Result: Compliance. Please refer to the following plots.

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



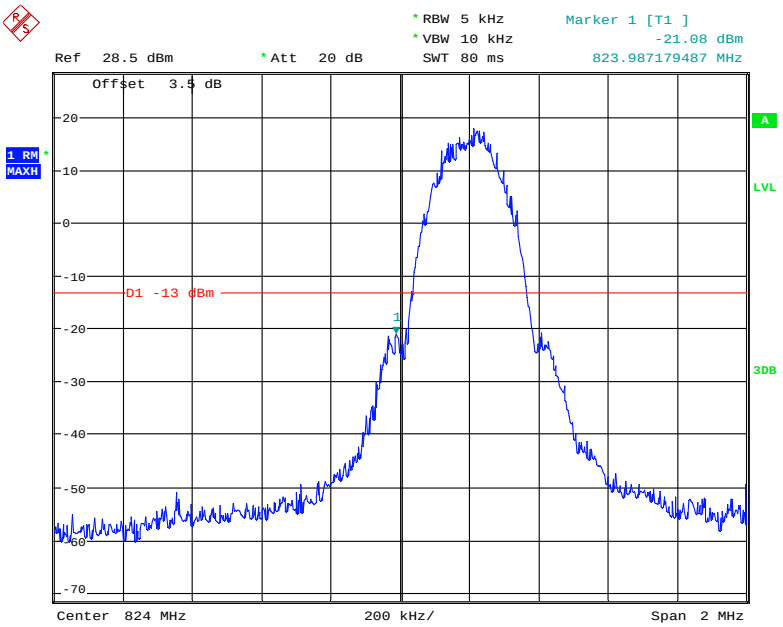
Date: 13.MAR.2019 14:47:42

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



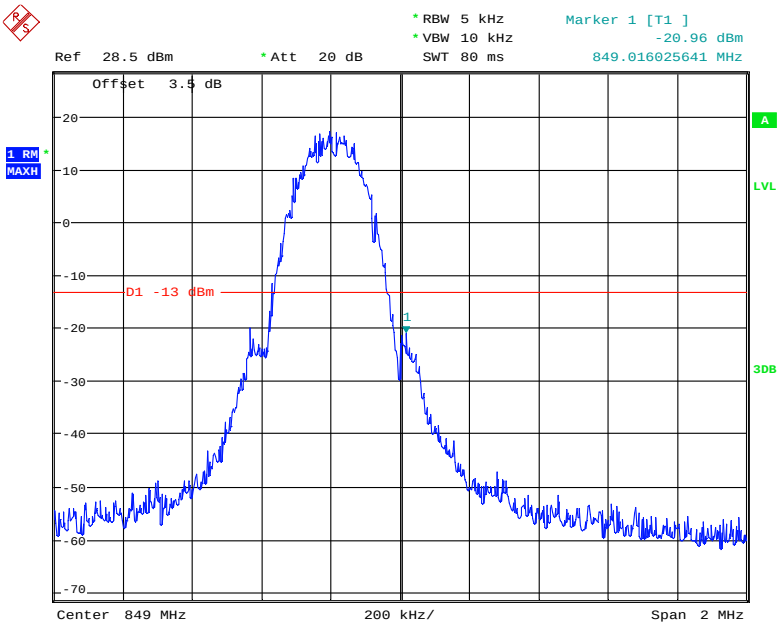
Date: 13.MAR.2019 14:48:34

Cellular Band, Left Band Edge for EDGE Mode



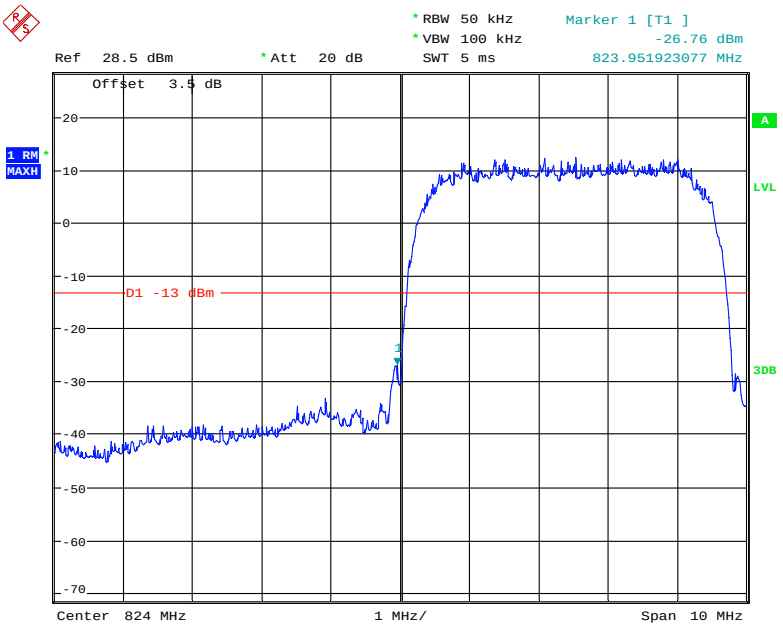
Date: 2.APR.2019 20:36:41

Cellular Band, Right Band Edge for EDGE Mode



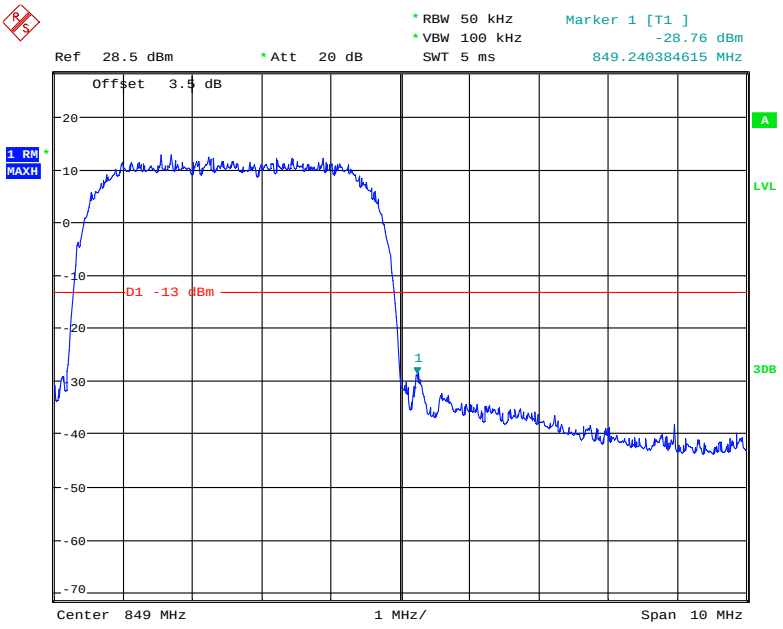
Date: 2.APR.2019 20:37:24

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



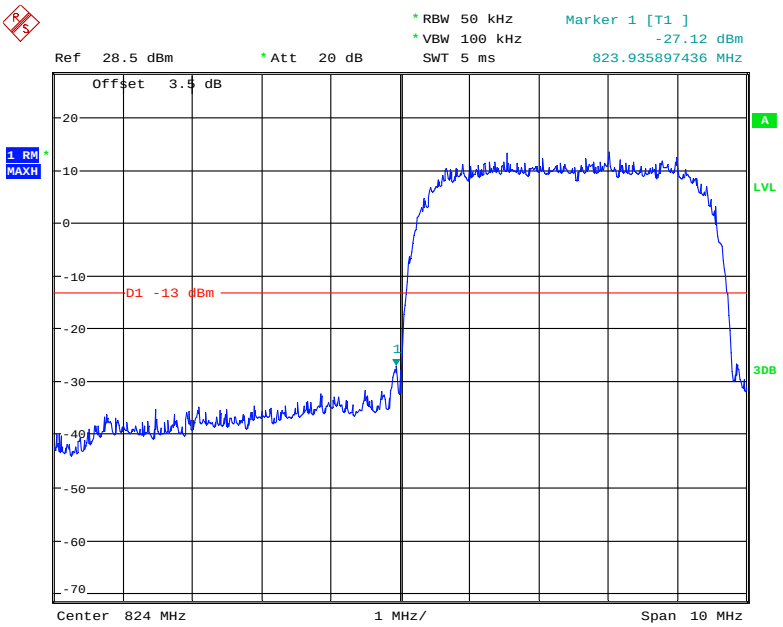
Date: 15.MAR.2019 14:51:44

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



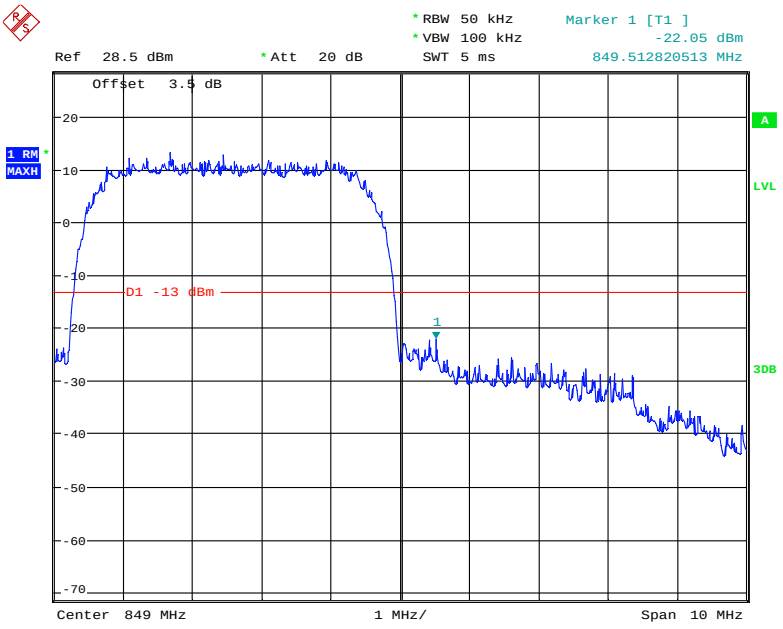
Date: 15.MAR.2019 14:52:45

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



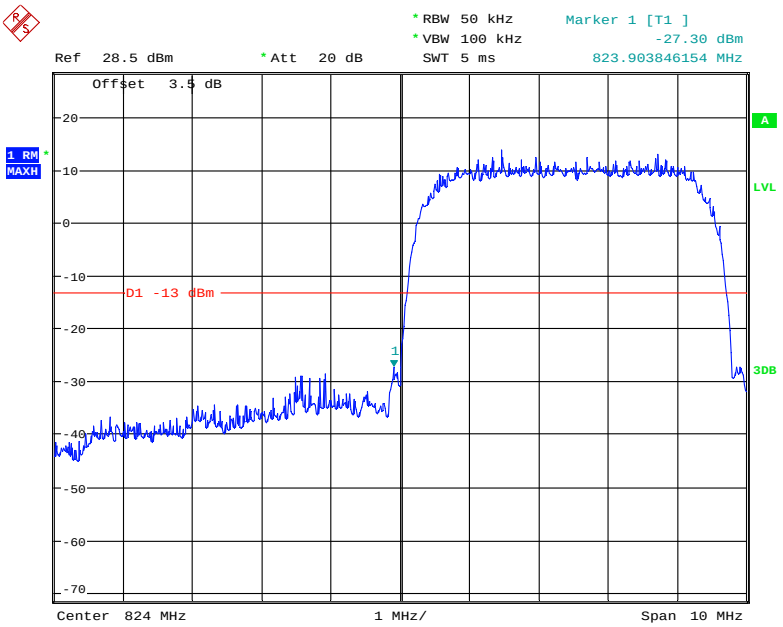
Date: 15.MAR.2019 14:54:22

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



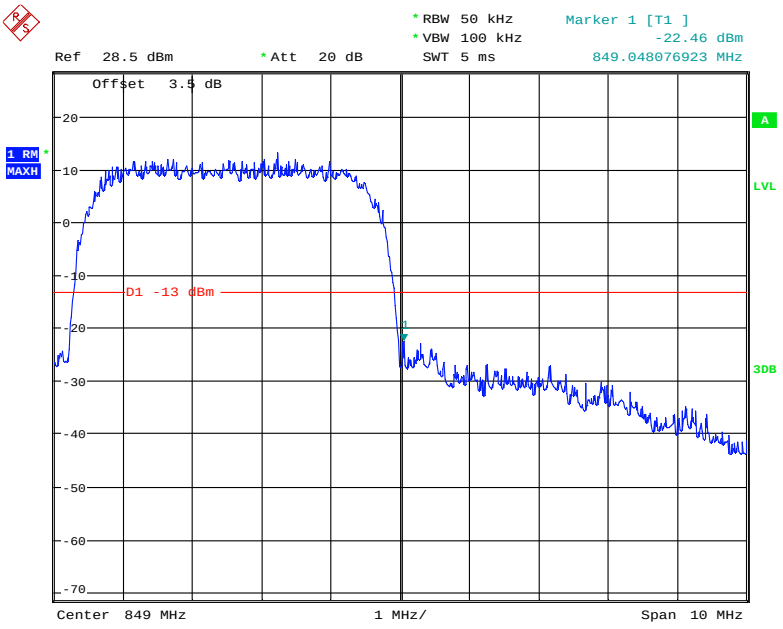
Date: 15.MAR.2019 14:54:51

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



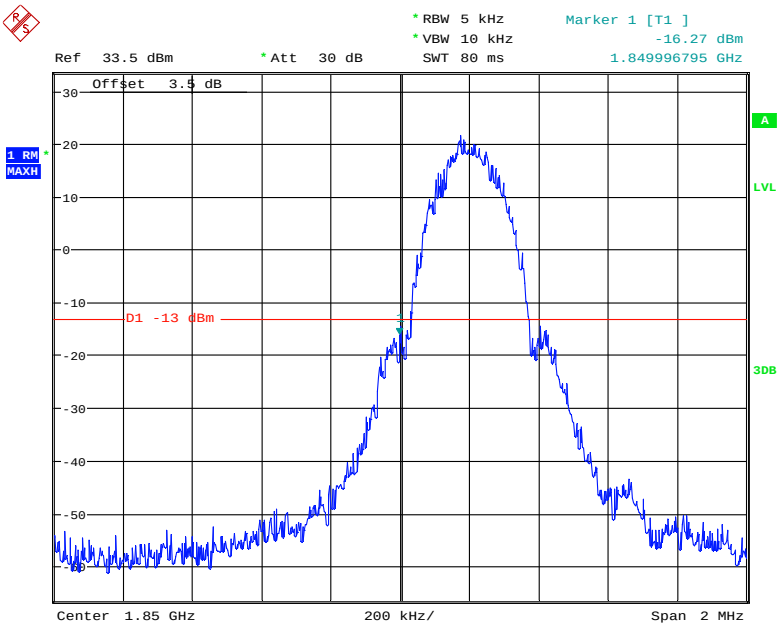
Date: 15.MAR.2019 14:53:36

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



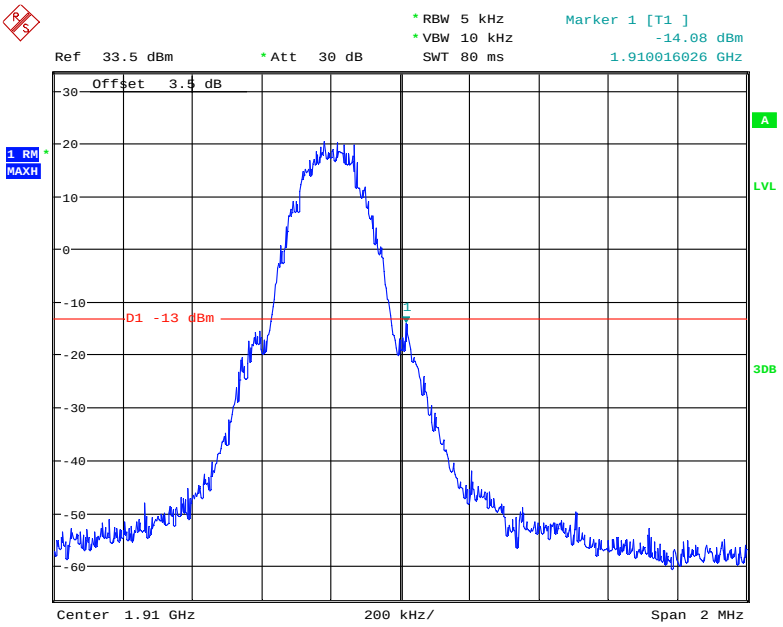
Date: 15.MAR.2019 14:53:14

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



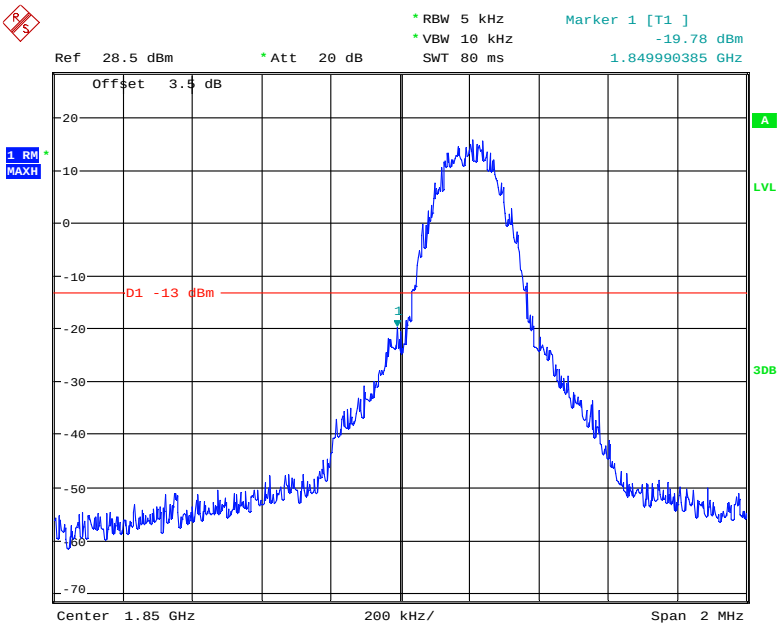
Date: 13.MAR.2019 15:36:22

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



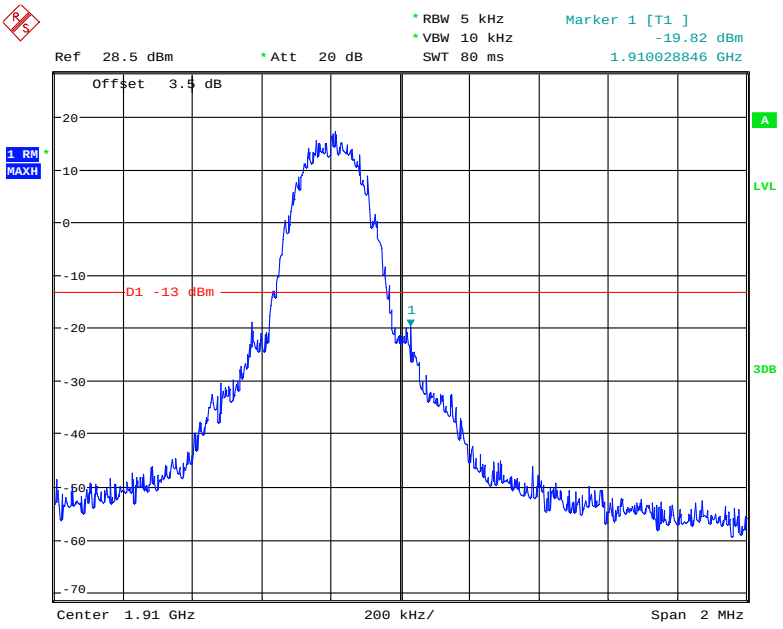
Date: 13.MAR.2019 15:37:04

PCS Band, Left Band Edge for EDGE Mode



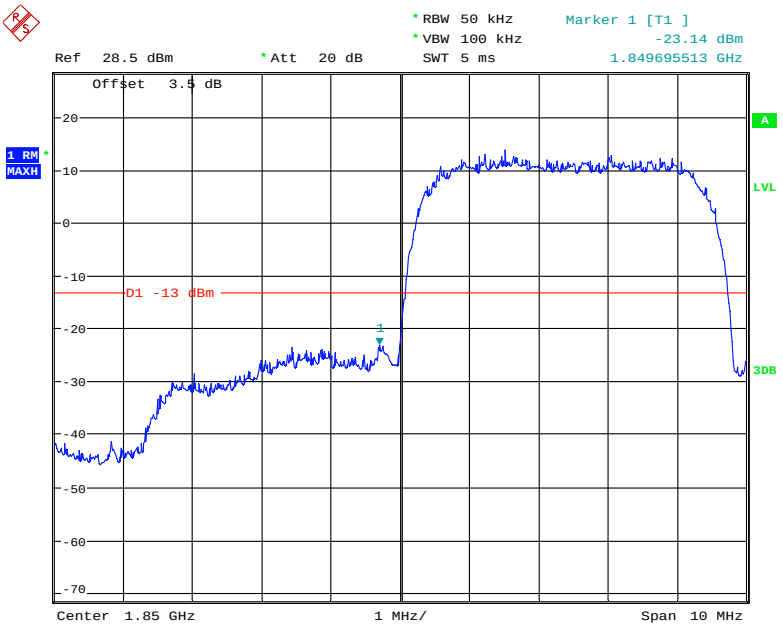
Date: 2.APR.2019 20:48:57

PCS Band, Right Band Edge for EDGE Mode



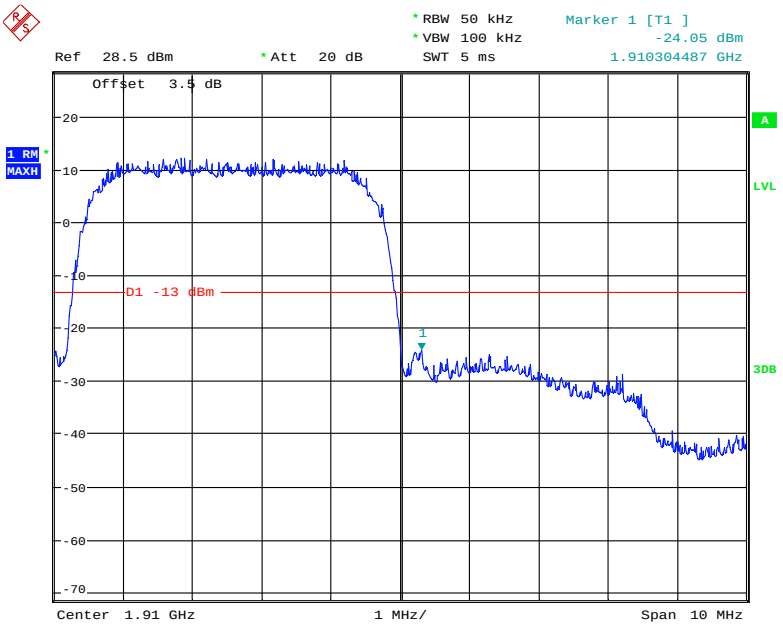
Date: 2.APR.2019 20:50:14

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



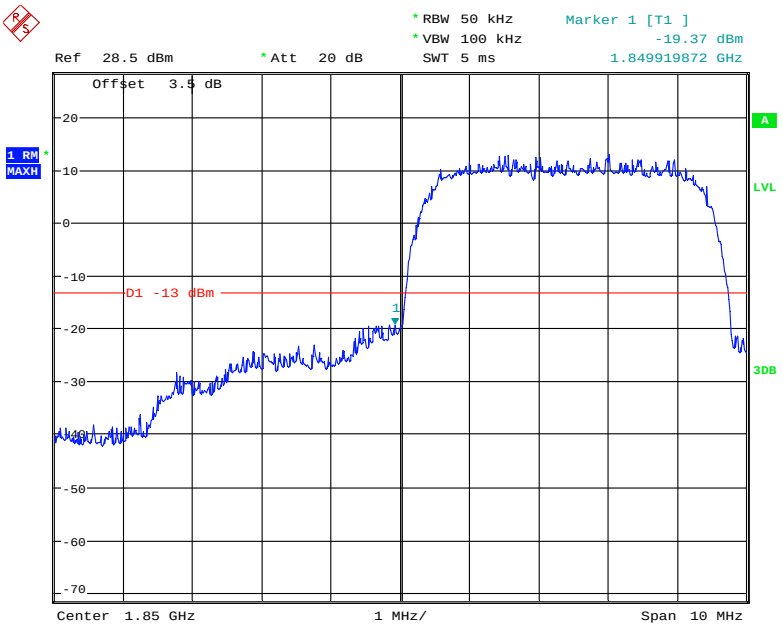
Date: 15.MAR.2019 11:47:16

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



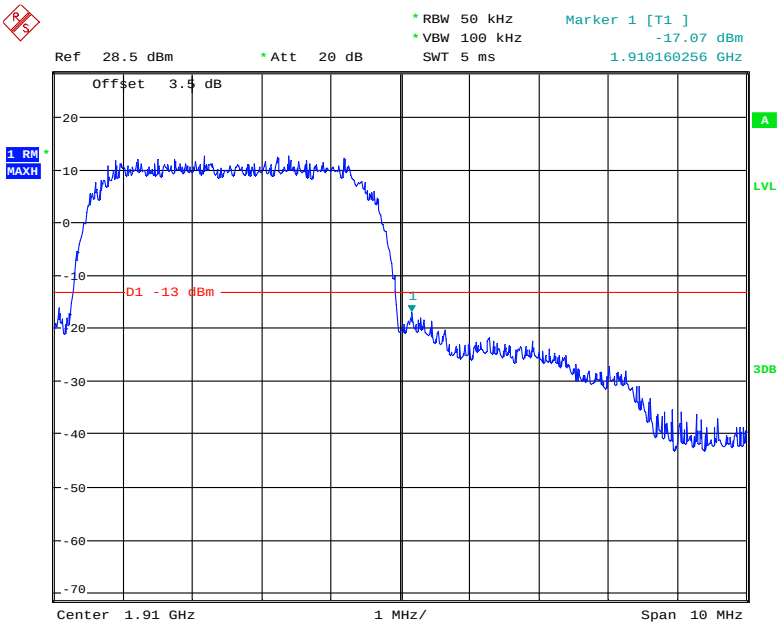
Date: 15.MAR.2019 11:47:53

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



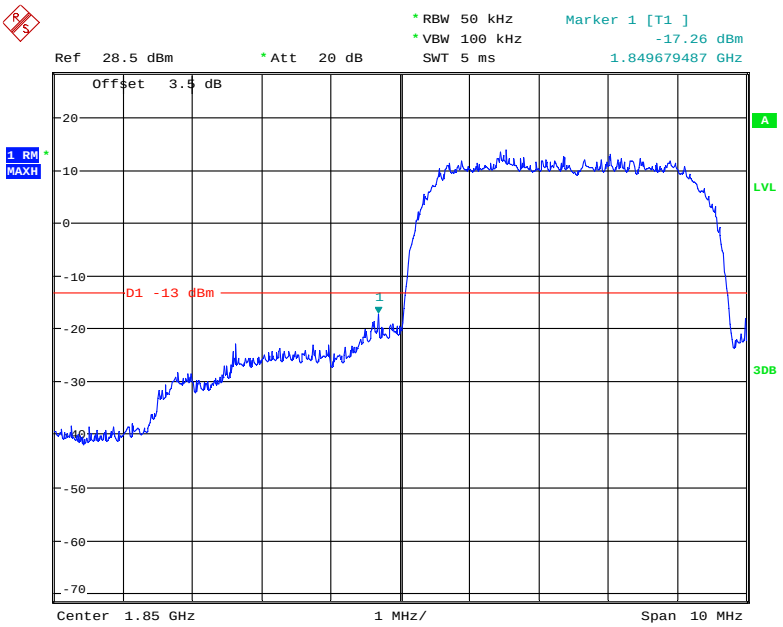
Date: 15.MAR.2019 11:45:03

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



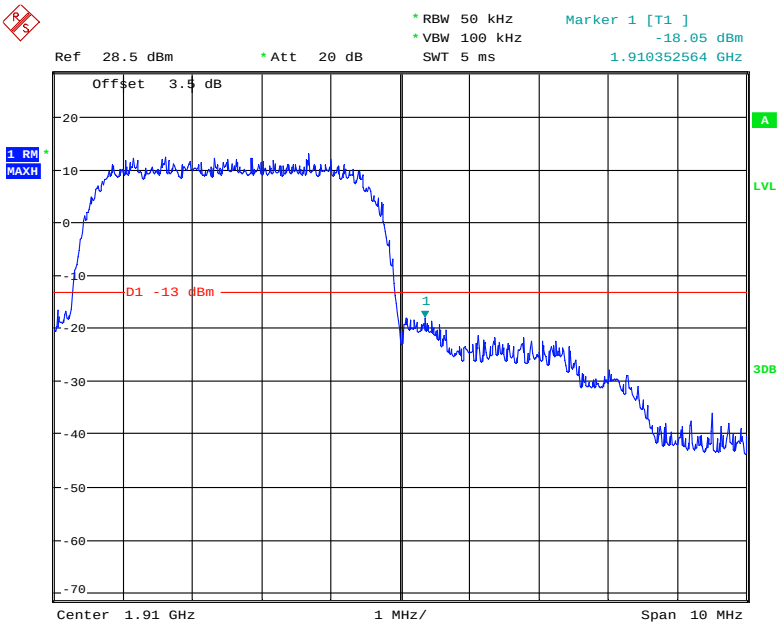
Date: 15.MAR.2019 11:44:35

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



Date: 15.MAR.2019 11:42:49

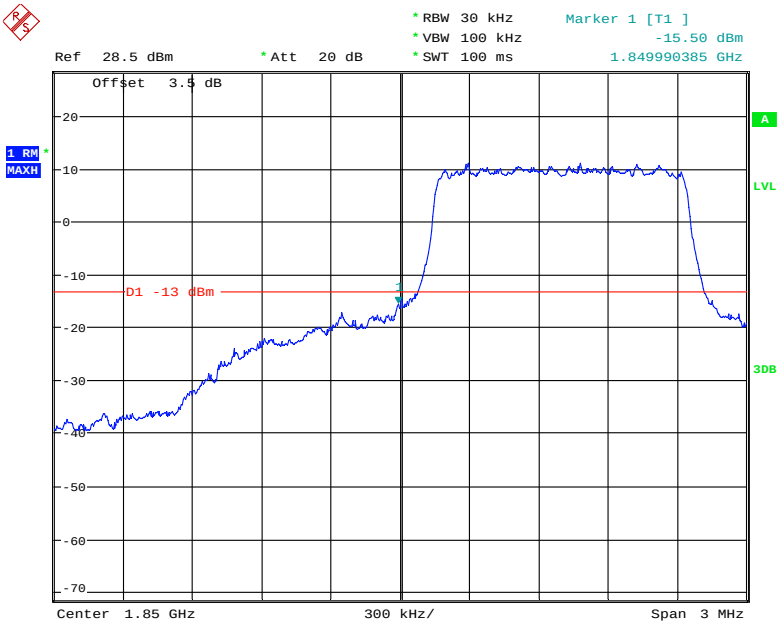
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 15.MAR.2019 11:43:35

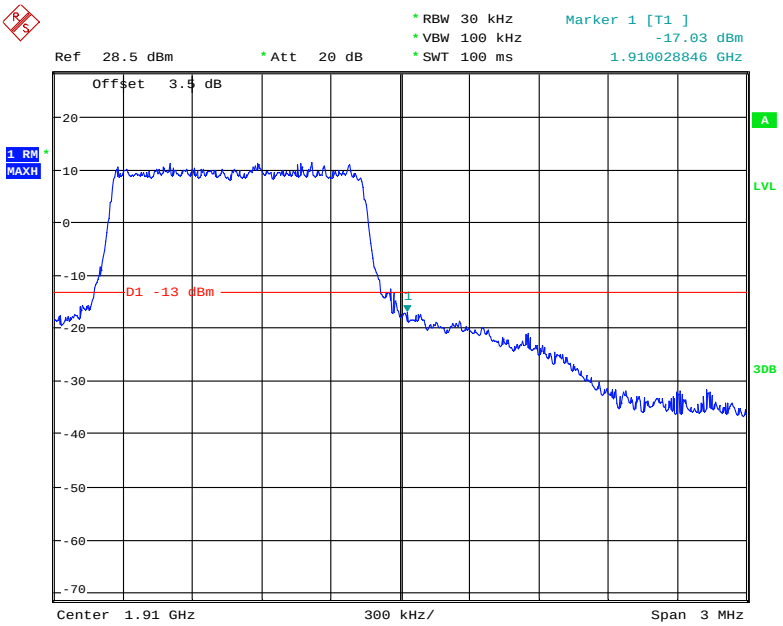
Band 2:

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



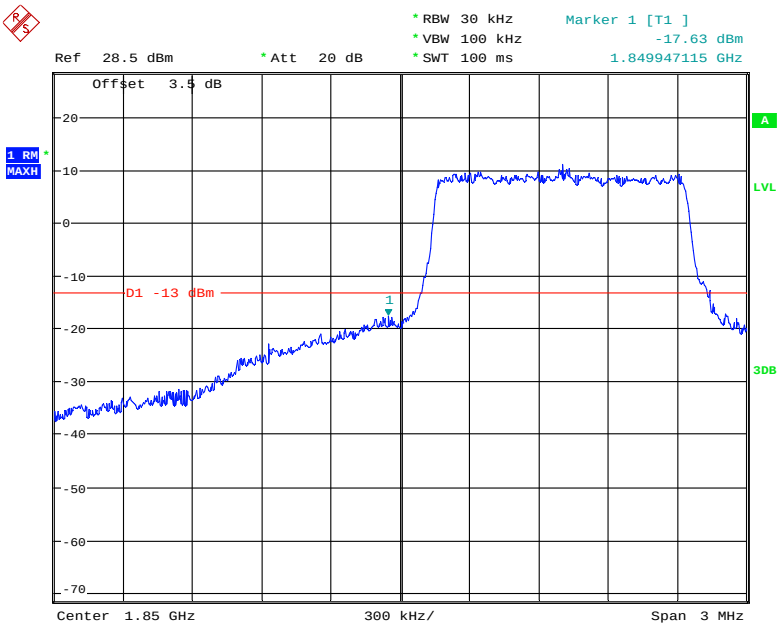
Date: 14.MAR.2019 14:25:02

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



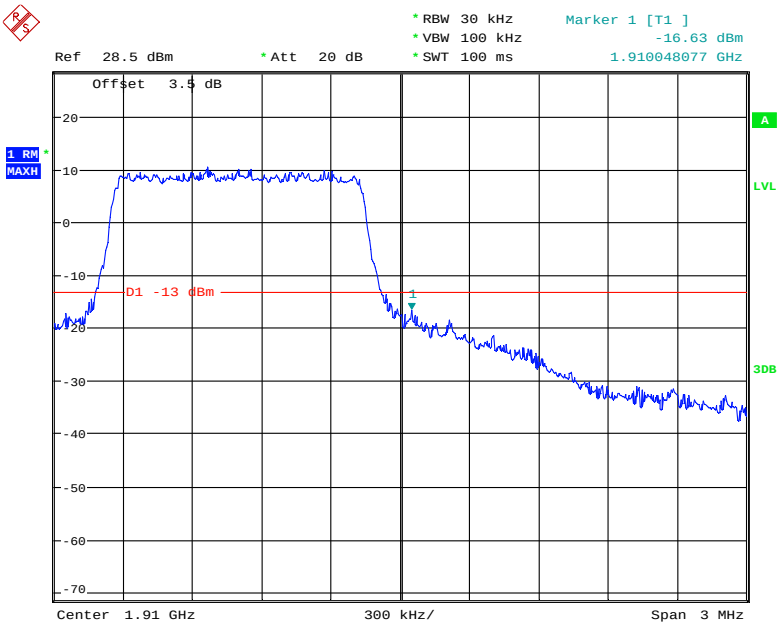
Date: 14.MAR.2019 14:27:08

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



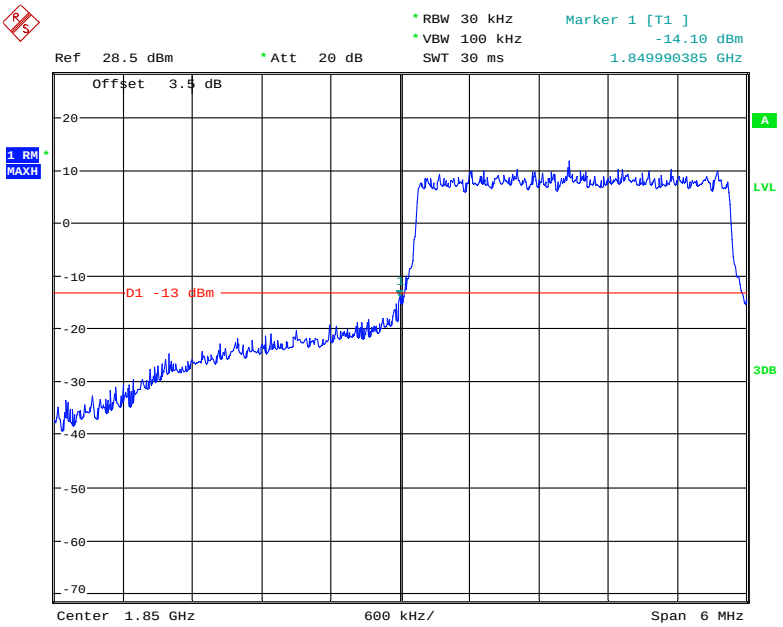
Date: 14.MAR.2019 14:25:59

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



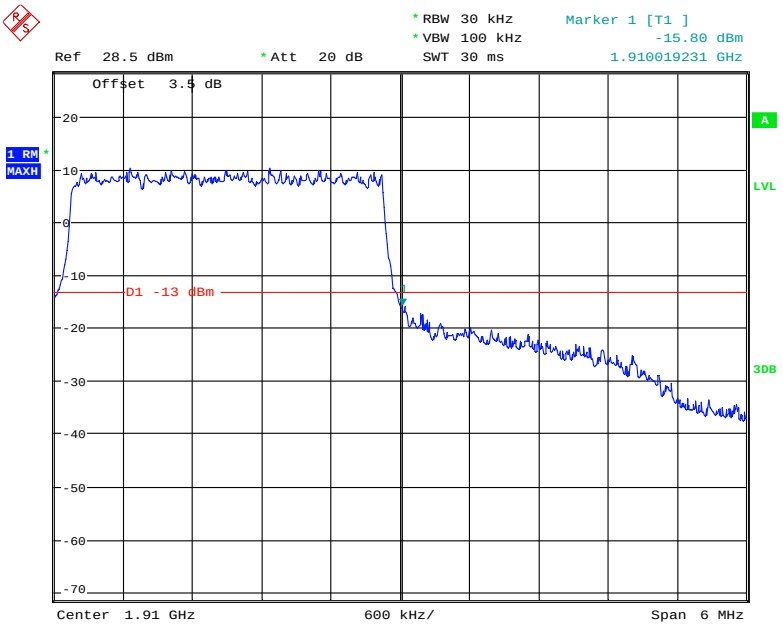
Date: 14.MAR.2019 14:26:46

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



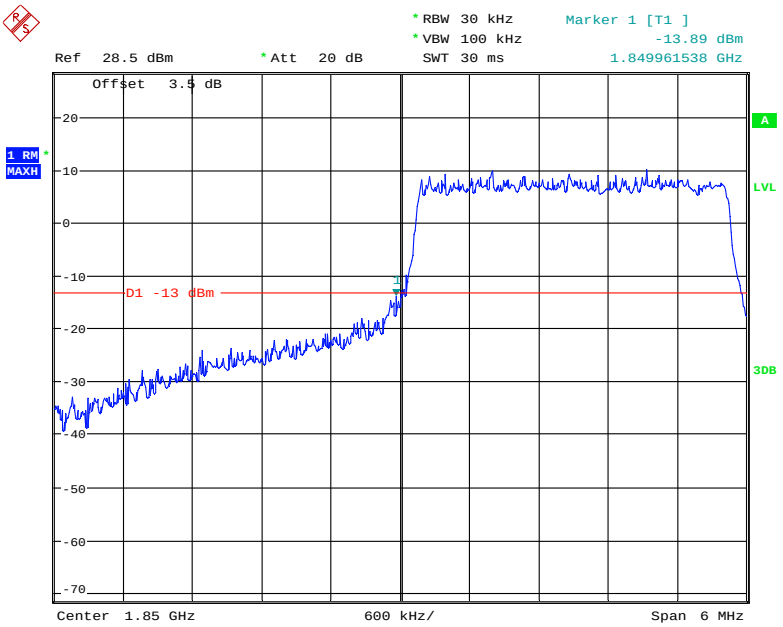
Date: 14.MAR.2019 14:31:21

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



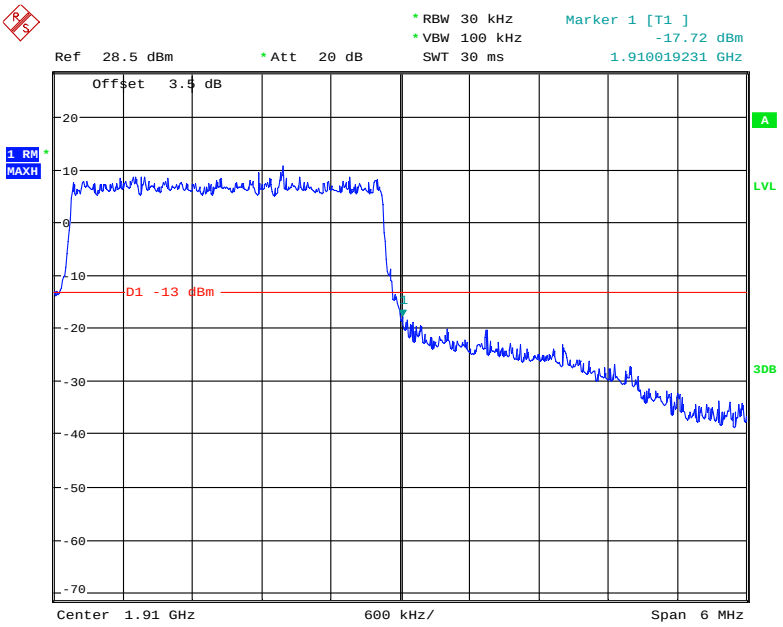
Date: 14.MAR.2019 14:29:33

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



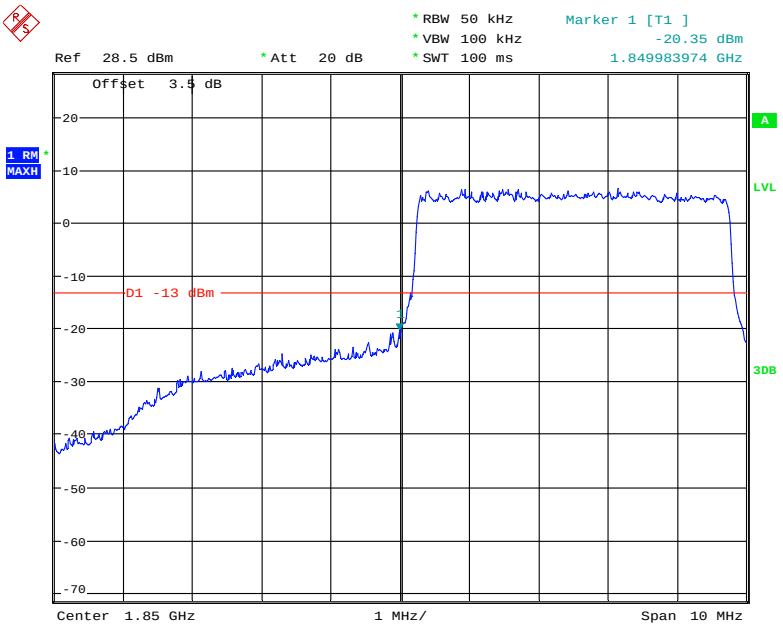
Date: 14.MAR.2019 14:30:48

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



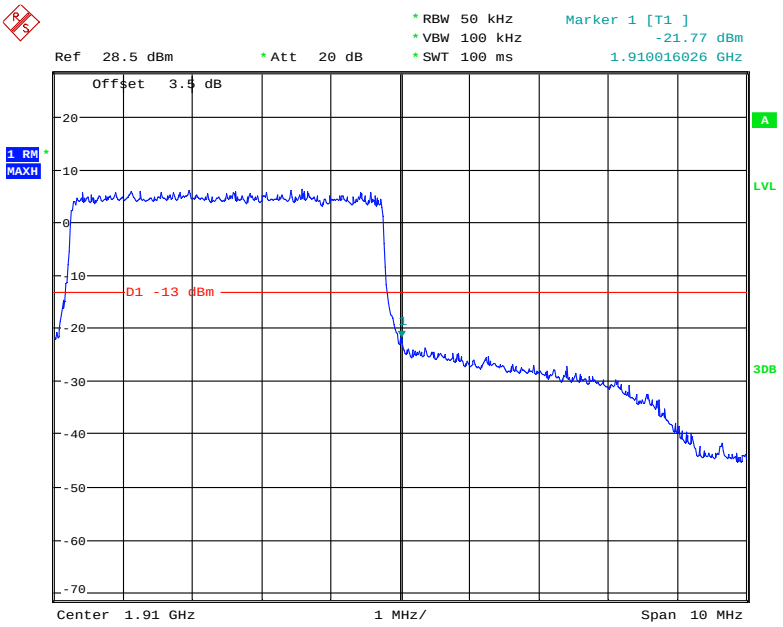
Date: 14.MAR.2019 14:30:01

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



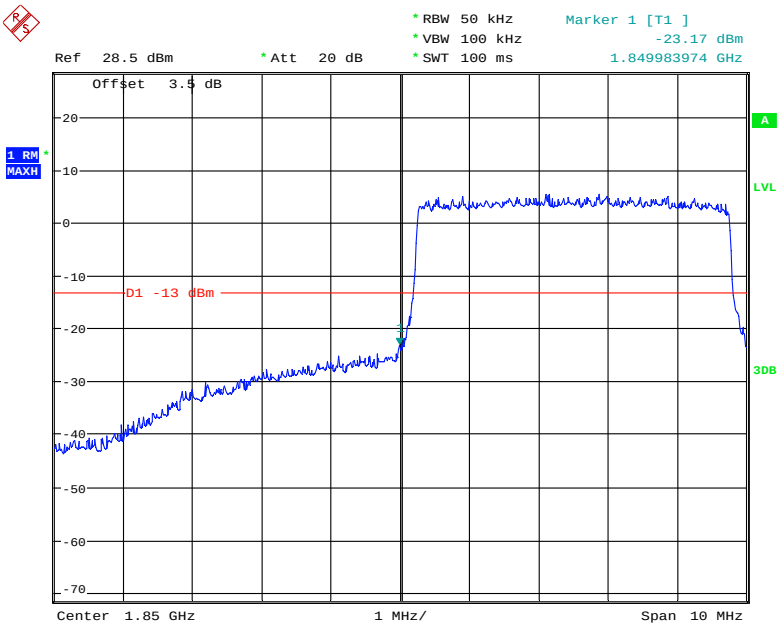
Date: 14.MAR.2019 14:35:11

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



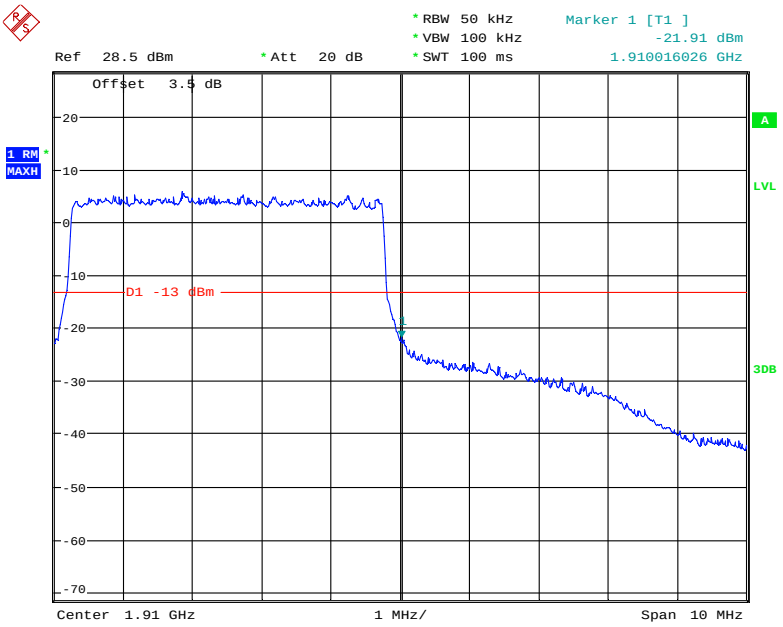
Date: 14.MAR.2019 14:37:02

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



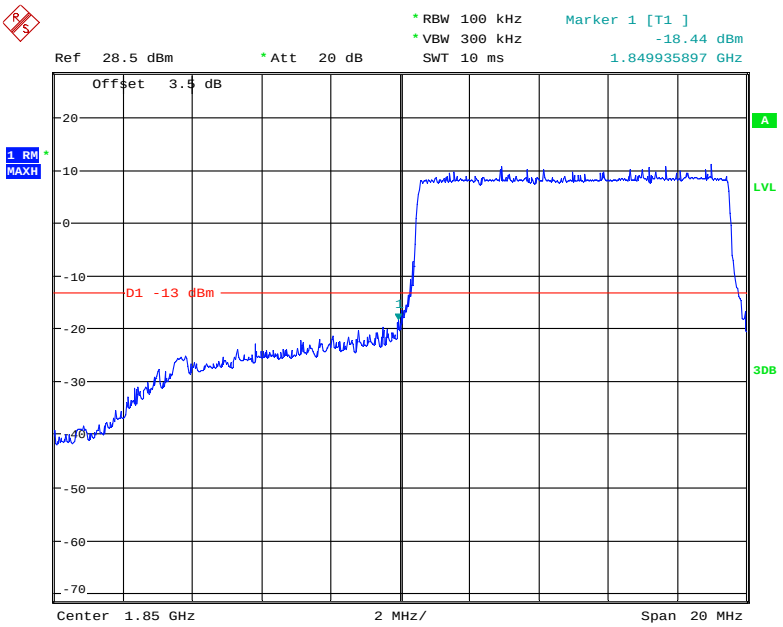
Date: 14.MAR.2019 14:35:51

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



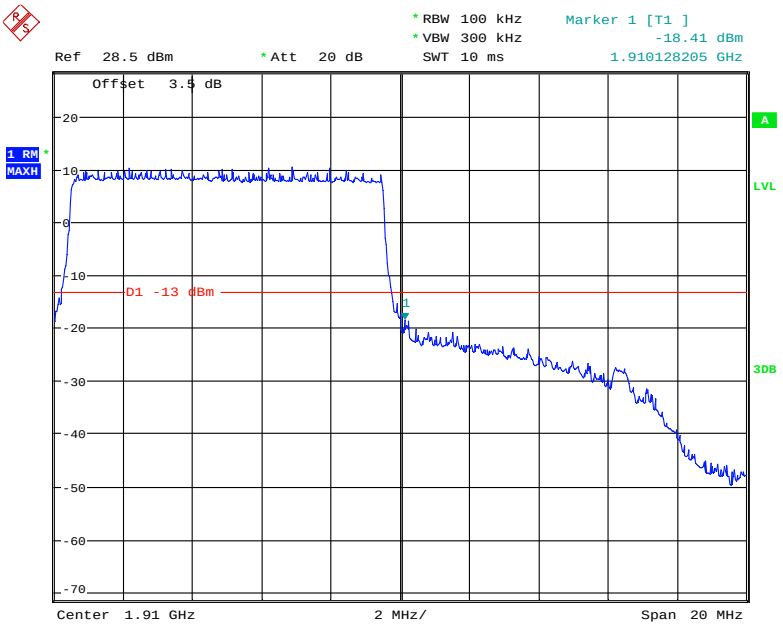
Date: 14.MAR.2019 14:36:34

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



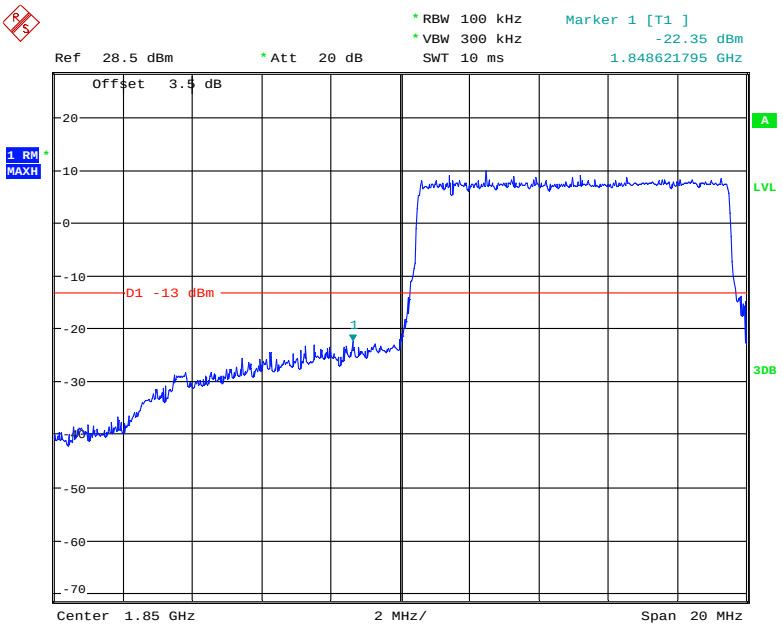
Date: 14.MAR.2019 14:41:47

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



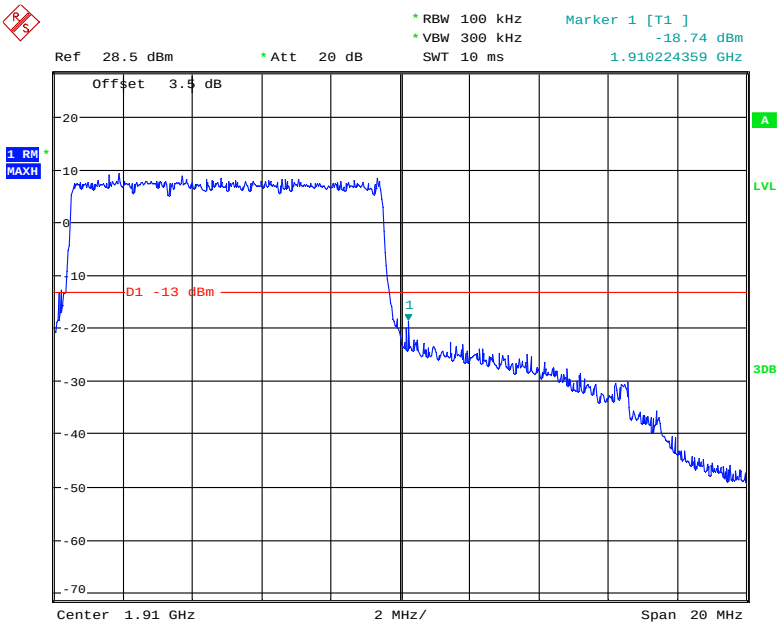
Date: 14.MAR.2019 14:40:23

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



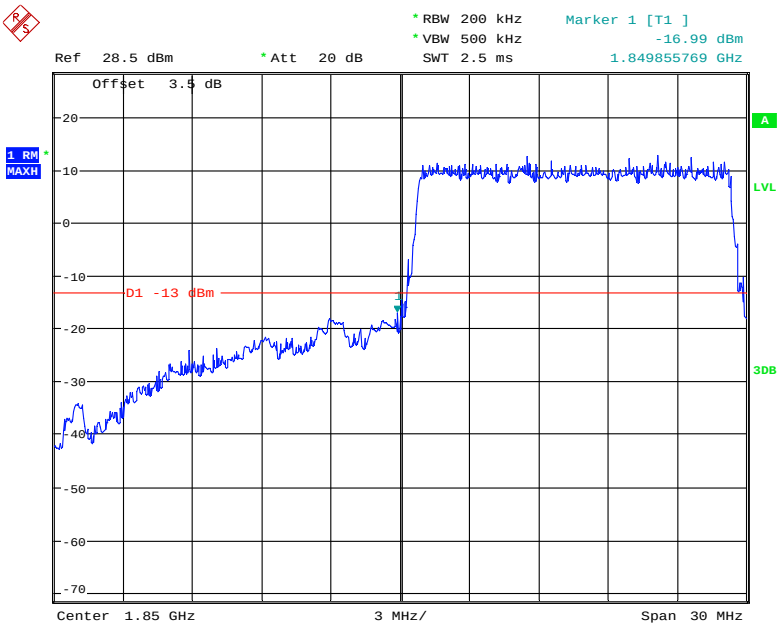
Date: 14.MAR.2019 14:41:20

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



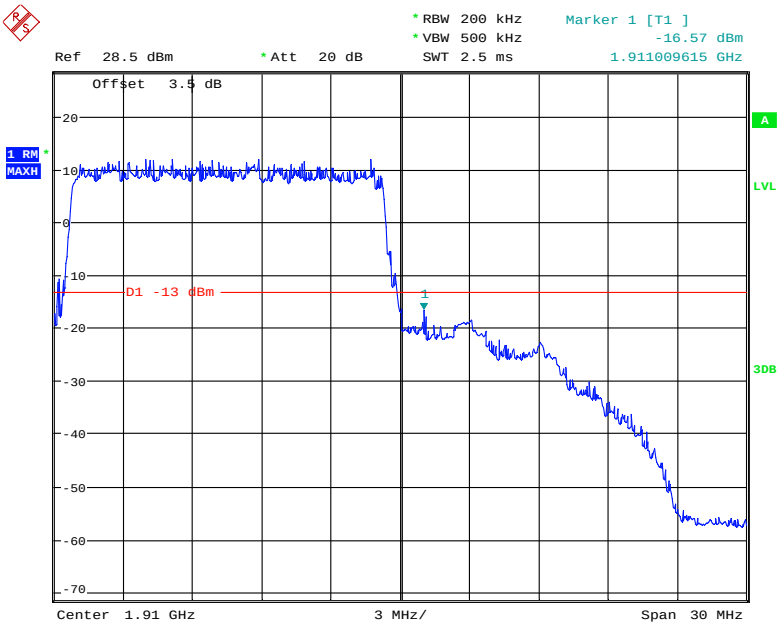
Date: 14.MAR.2019 14:40:36

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



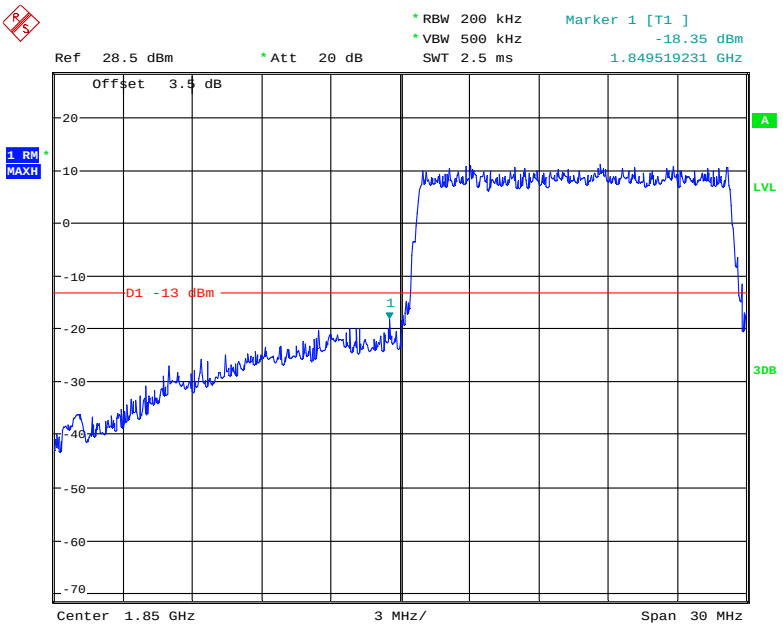
Date: 14.MAR.2019 14:42:34

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



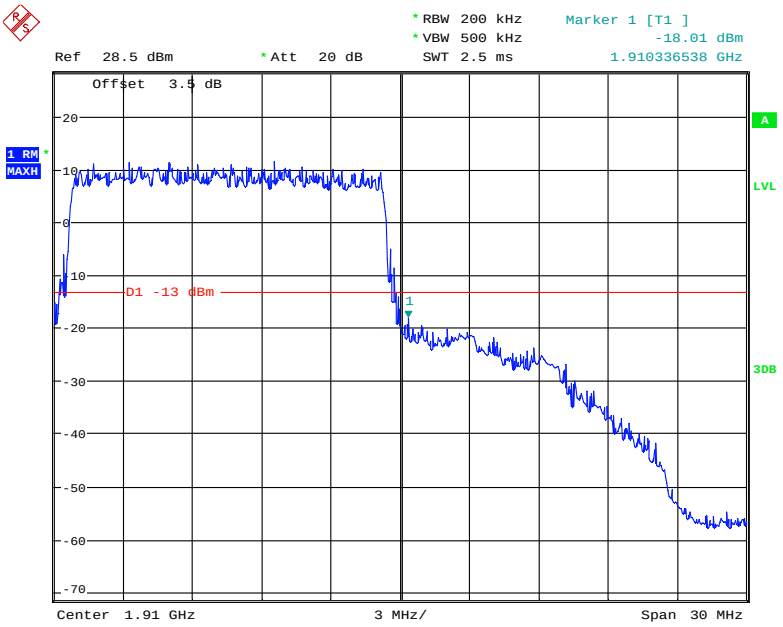
Date: 14.MAR.2019 14:43:52

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



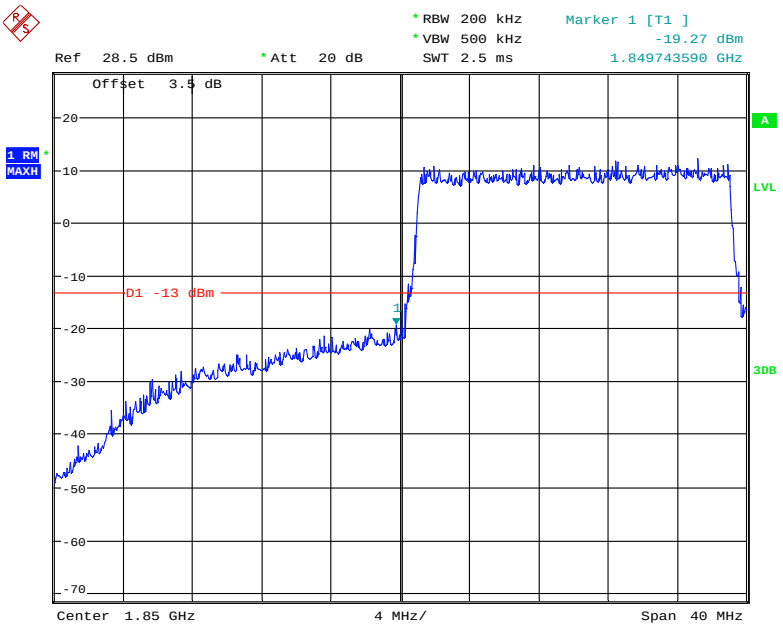
Date: 14.MAR.2019 14:42:55

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



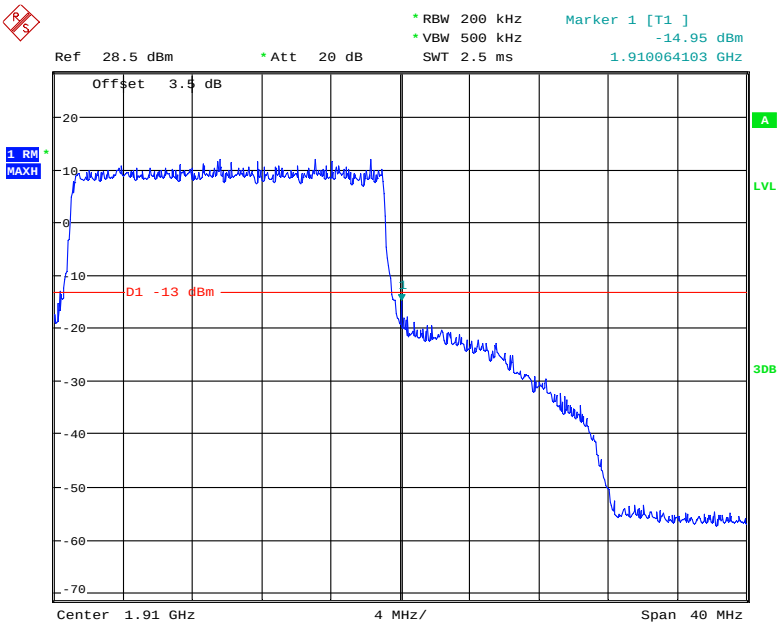
Date: 14.MAR.2019 14:43:35

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



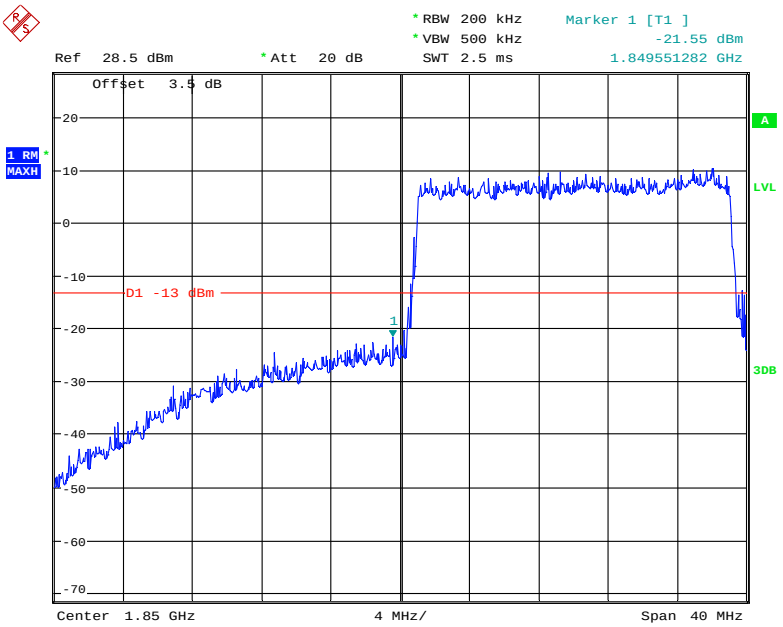
Date: 14.MAR.2019 14:45:56

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



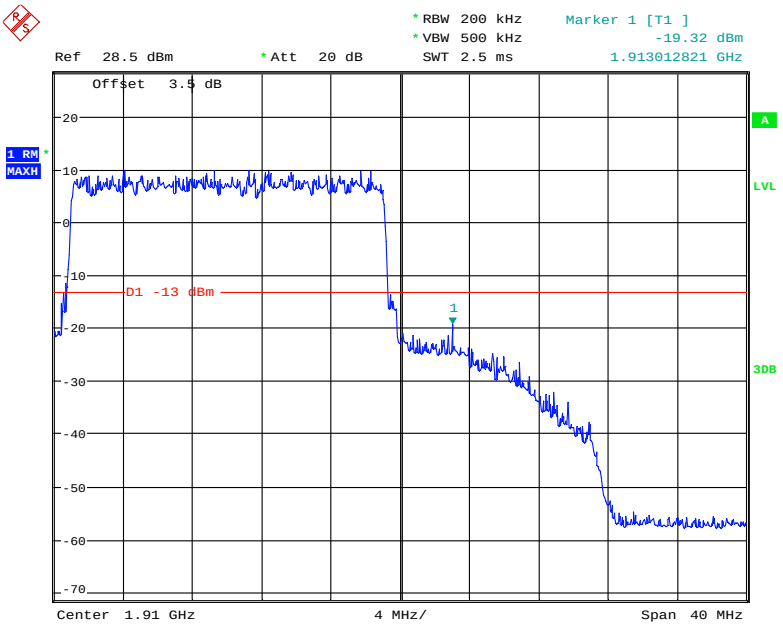
Date: 14.MAR.2019 14:44:51

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



Date: 14.MAR.2019 14:45:31

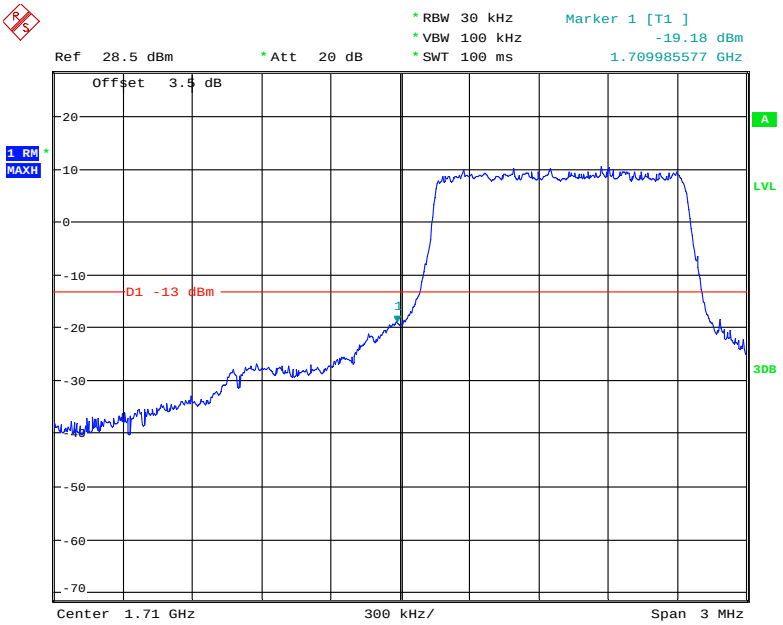
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 14.MAR.2019 14:45:12

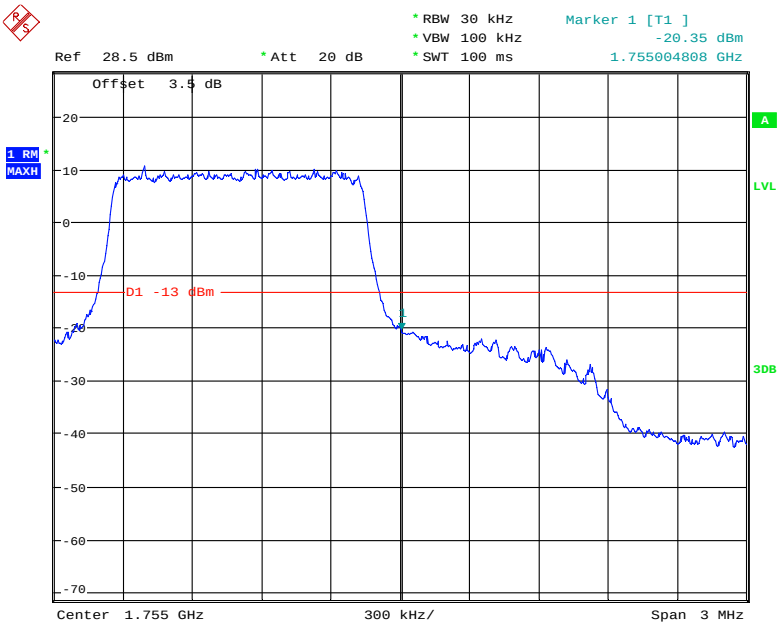
Band 4:

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



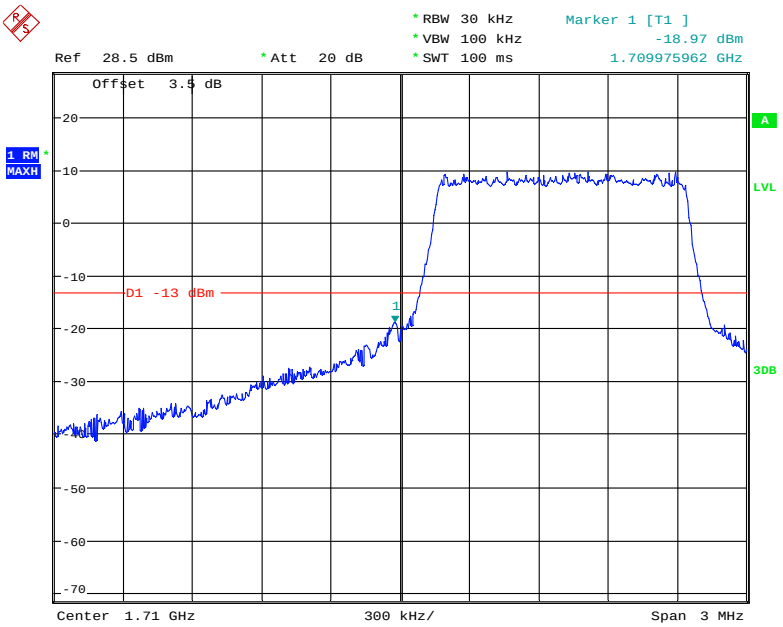
Date: 14.MAR.2019 15:15:25

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



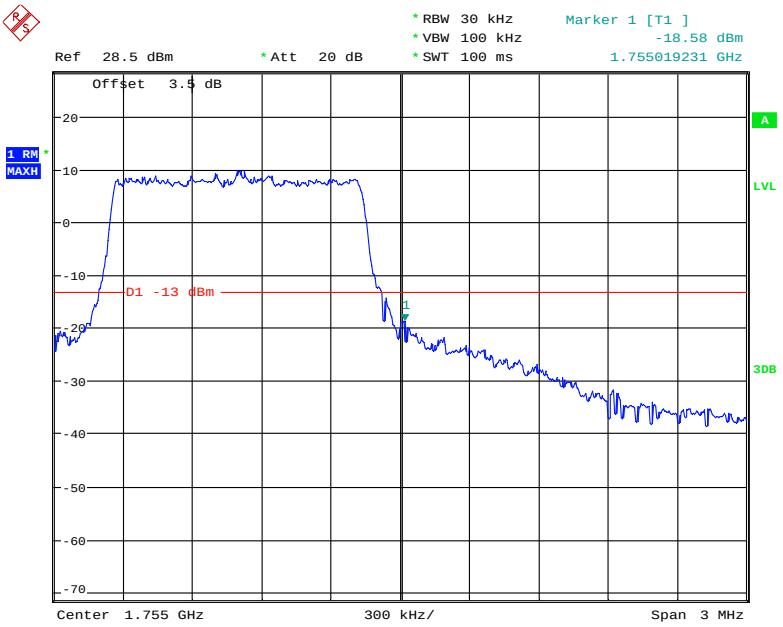
Date: 14.MAR.2019 15:16:56

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



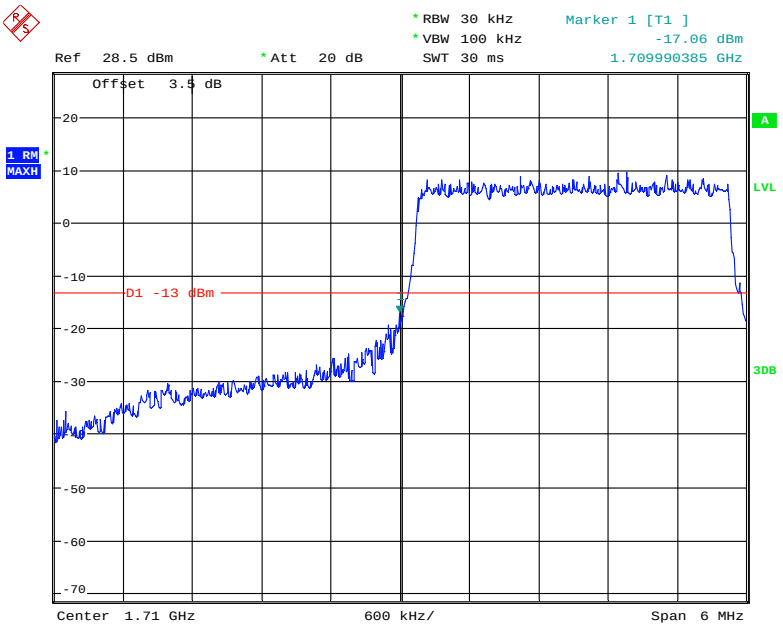
Date: 14.MAR.2019 15:15:40

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



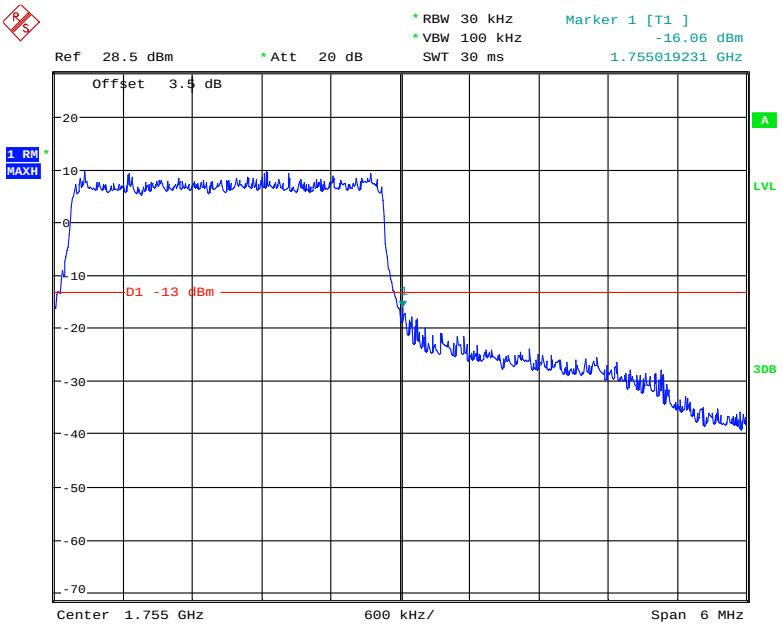
Date: 14.MAR.2019 15:16:24

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



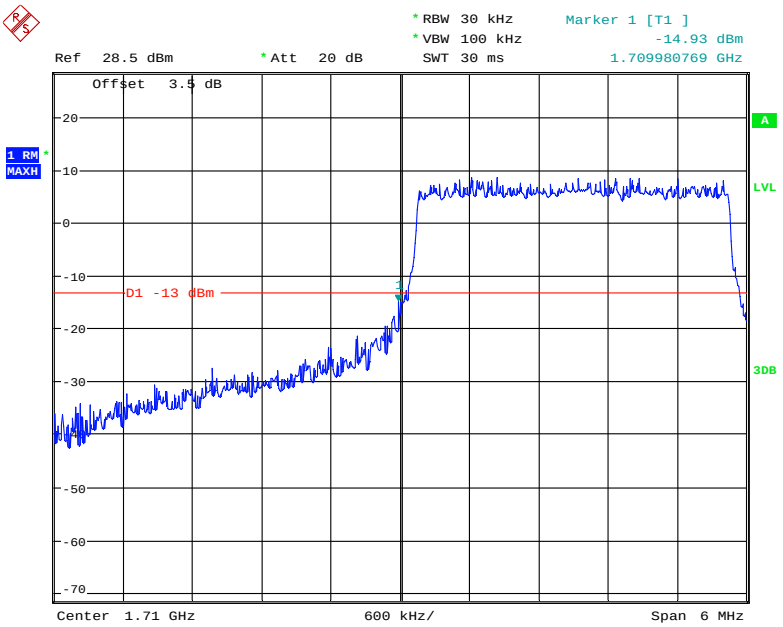
Date: 14.MAR.2019 15:13:07

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



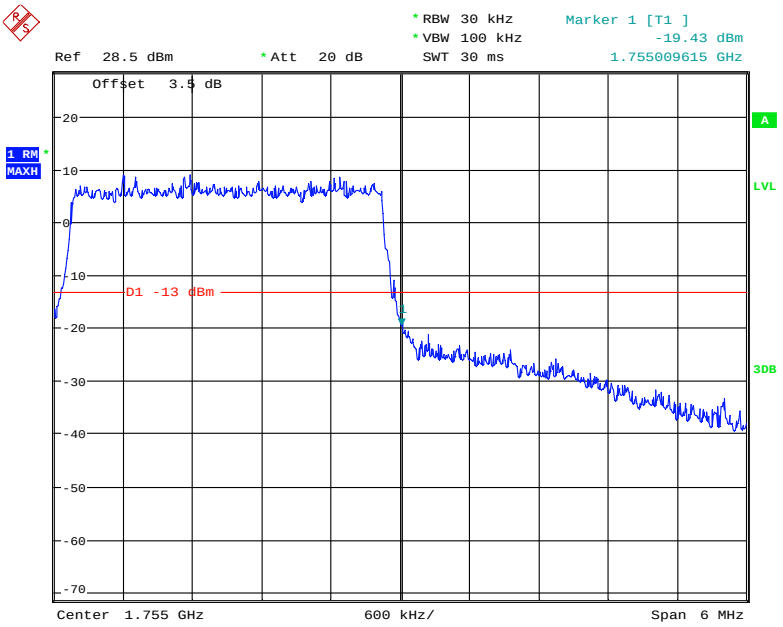
Date: 14.MAR.2019 15:11:35

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



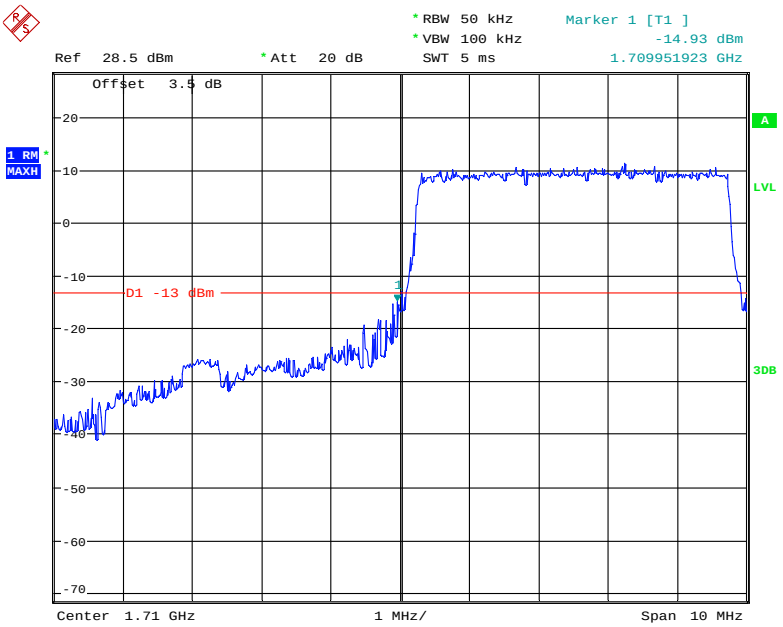
Date: 14.MAR.2019 15:12:49

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



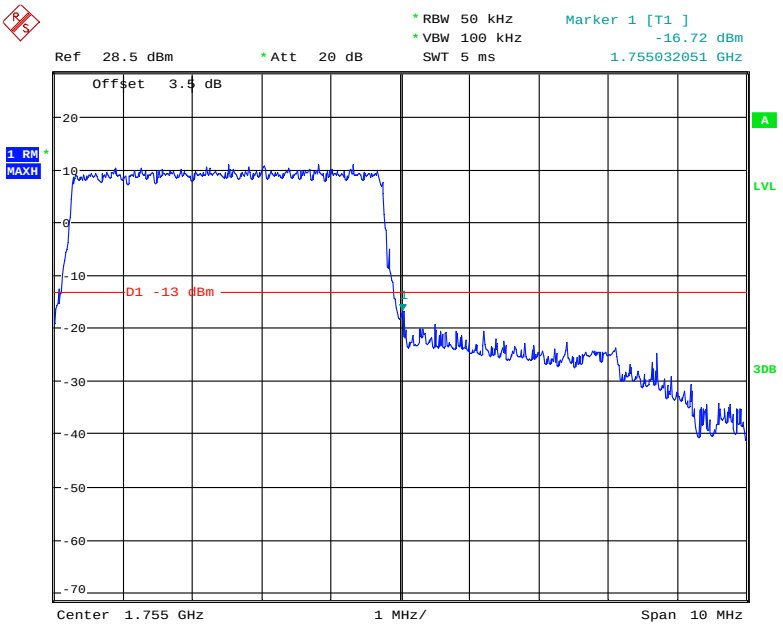
Date: 14.MAR.2019 15:12:15

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



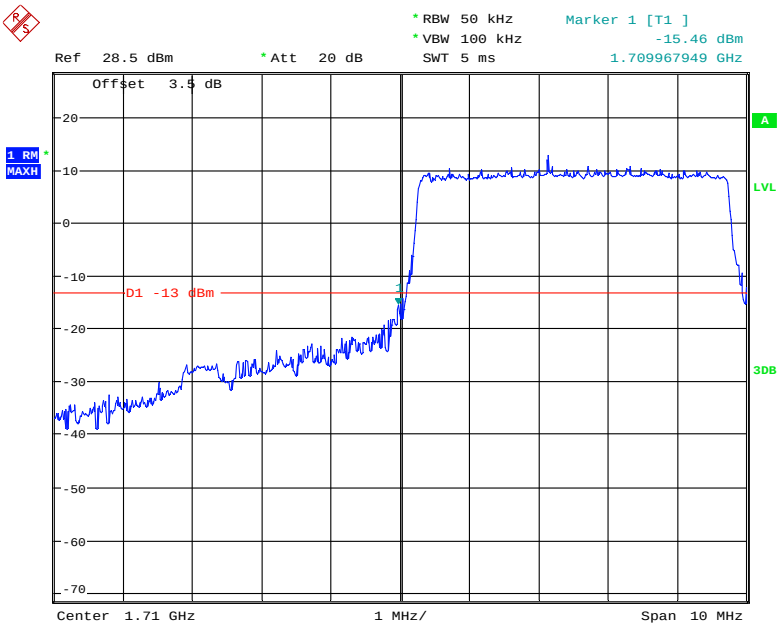
Date: 14.MAR.2019 15:09:13

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



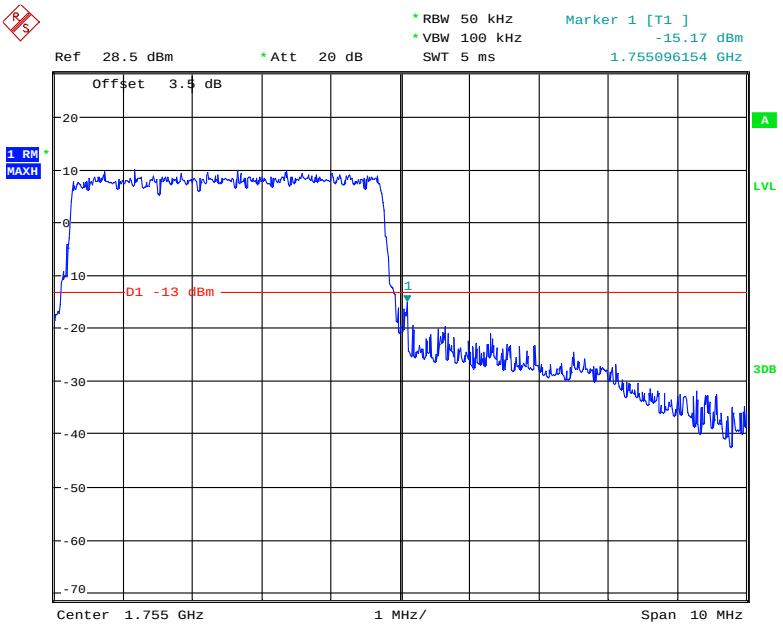
Date: 14.MAR.2019 15:10:40

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



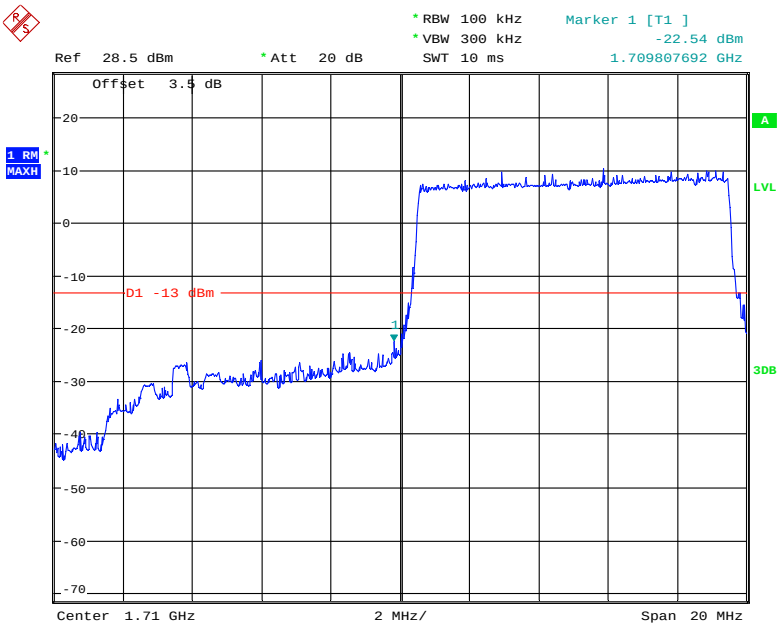
Date: 14.MAR.2019 15:10:01

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



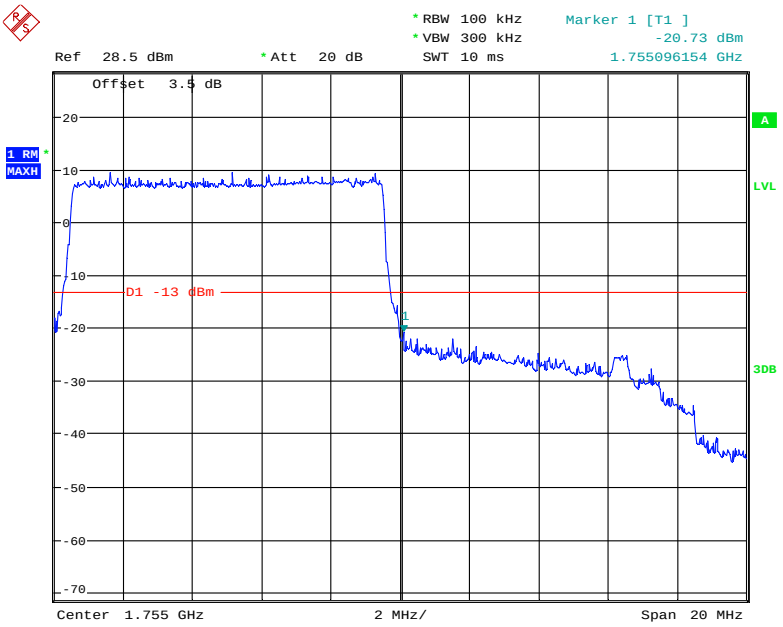
Date: 14.MAR.2019 15:10:22

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



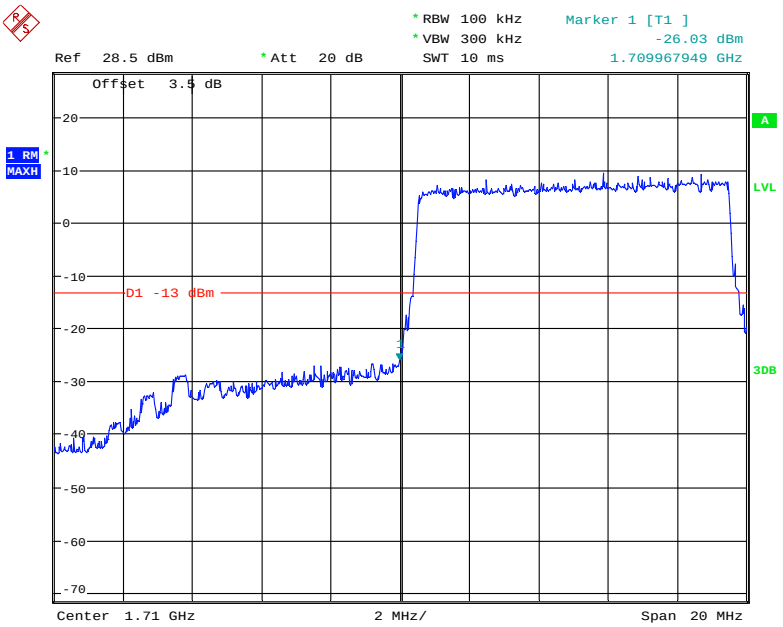
Date: 14.MAR.2019 15:06:59

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



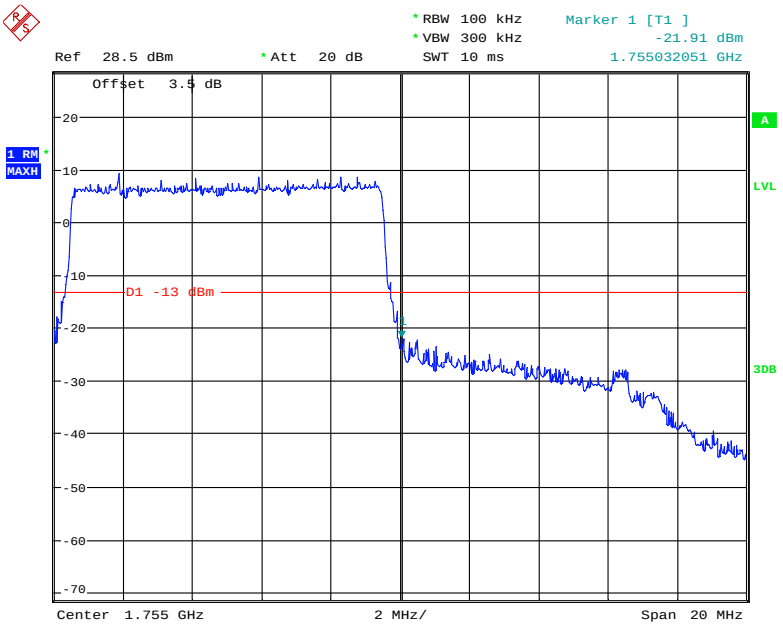
Date: 14.MAR.2019 15:05:45

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



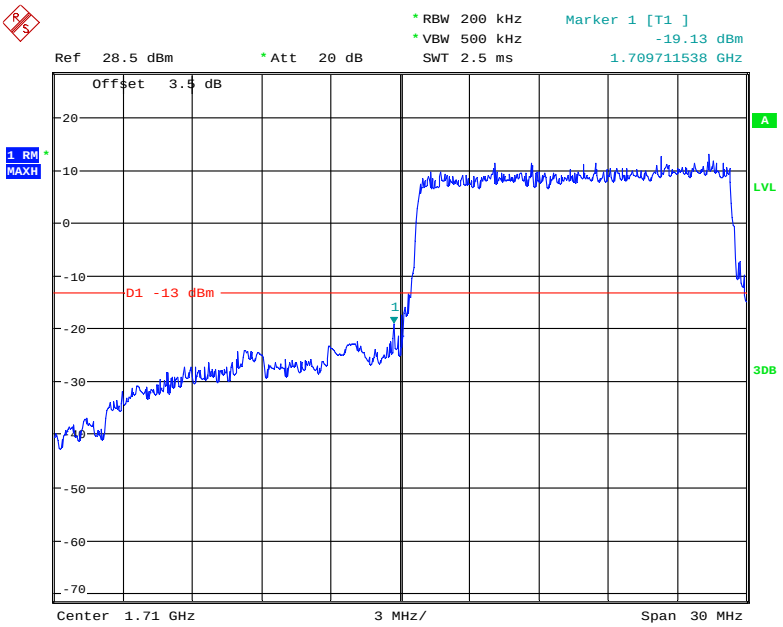
Date: 14.MAR.2019 15:06:29

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



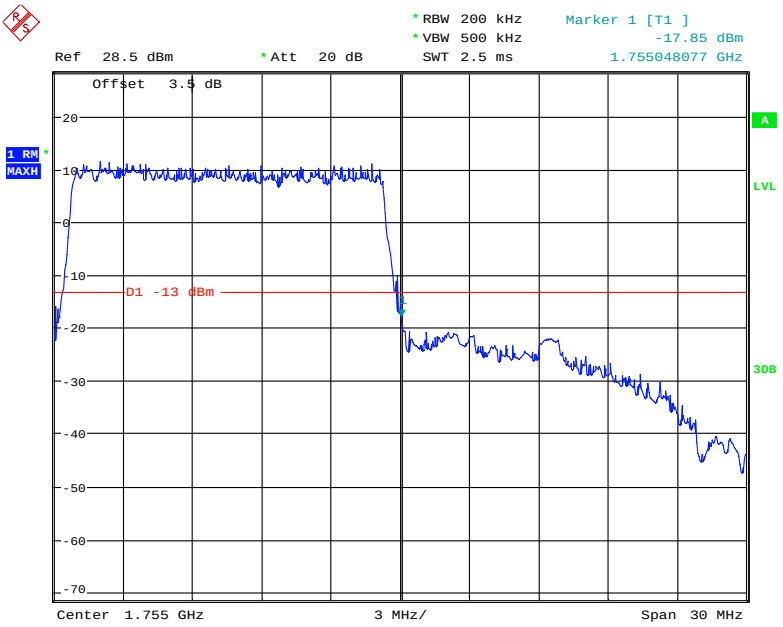
Date: 14.MAR.2019 15:06:04

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



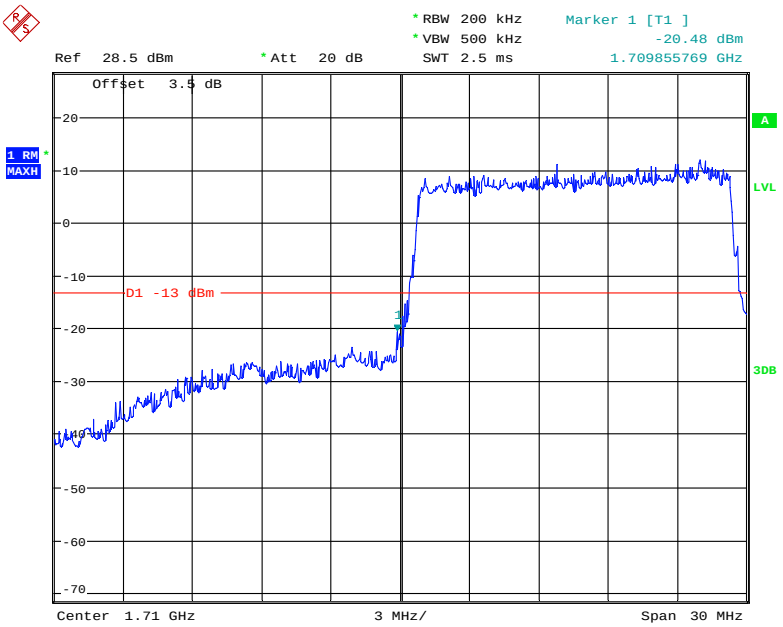
Date: 14.MAR.2019 14:59:19

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



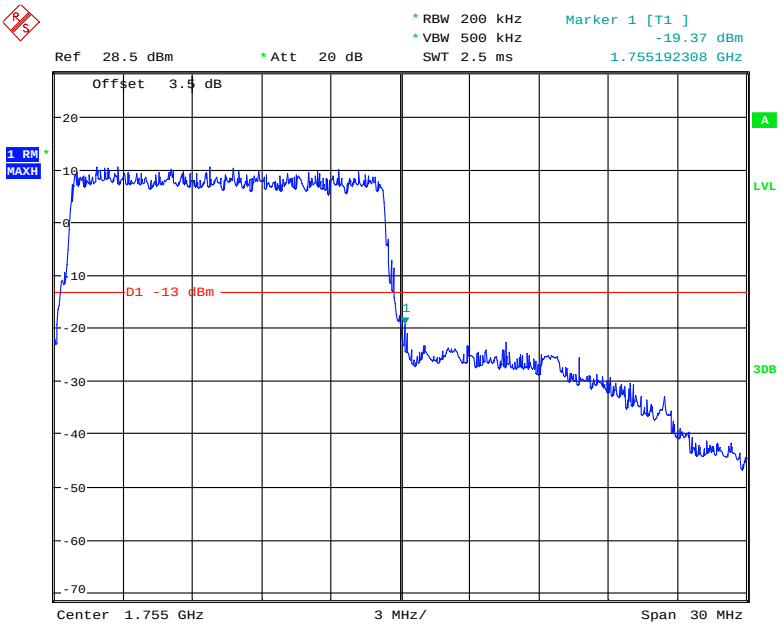
Date: 14.MAR.2019 15:00:24

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



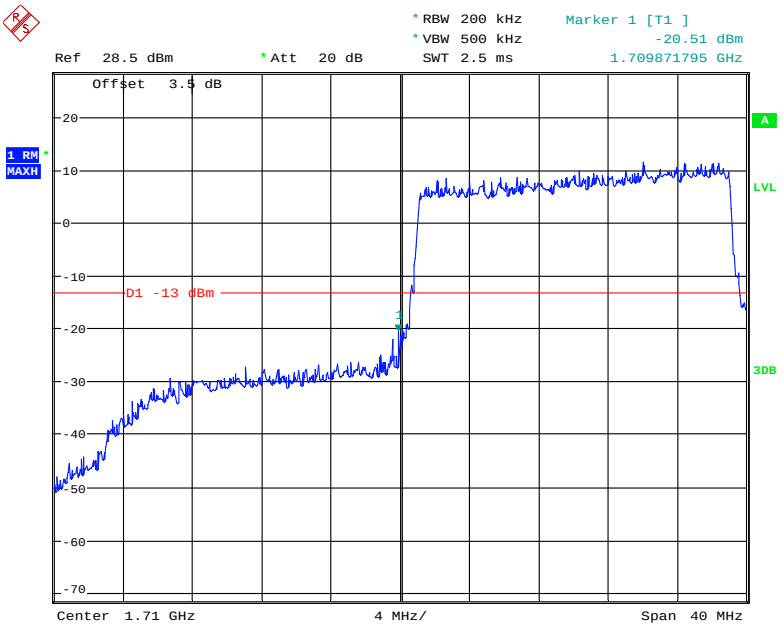
Date: 14.MAR.2019 14:59:41

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



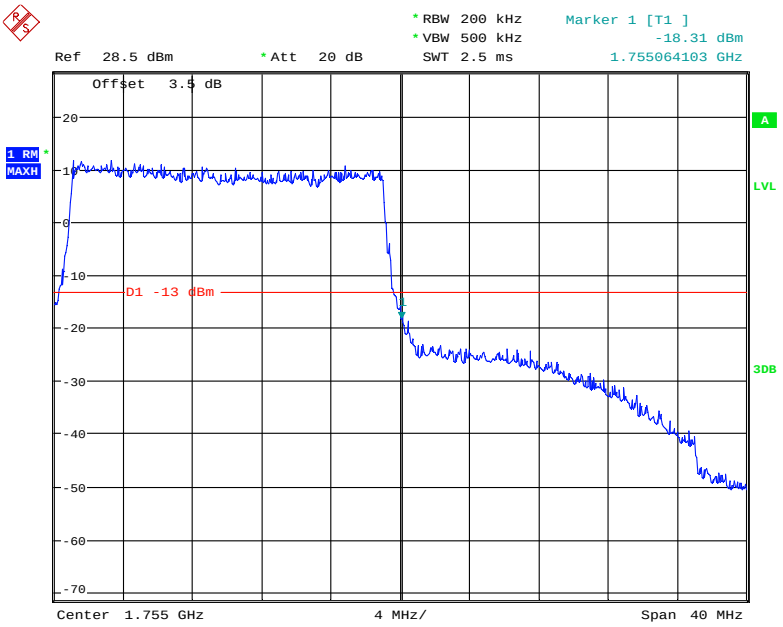
Date: 14.MAR.2019 15:00:05

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



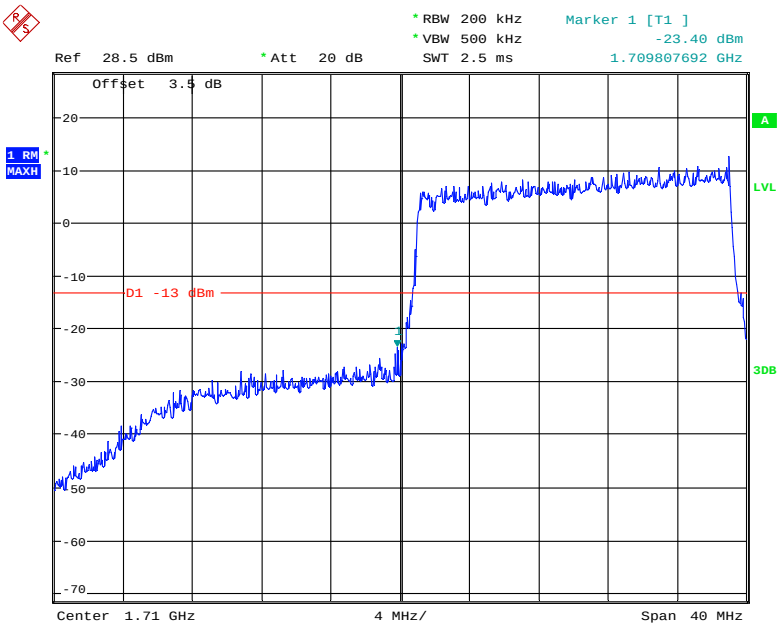
Date: 14.MAR.2019 14:58:22

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



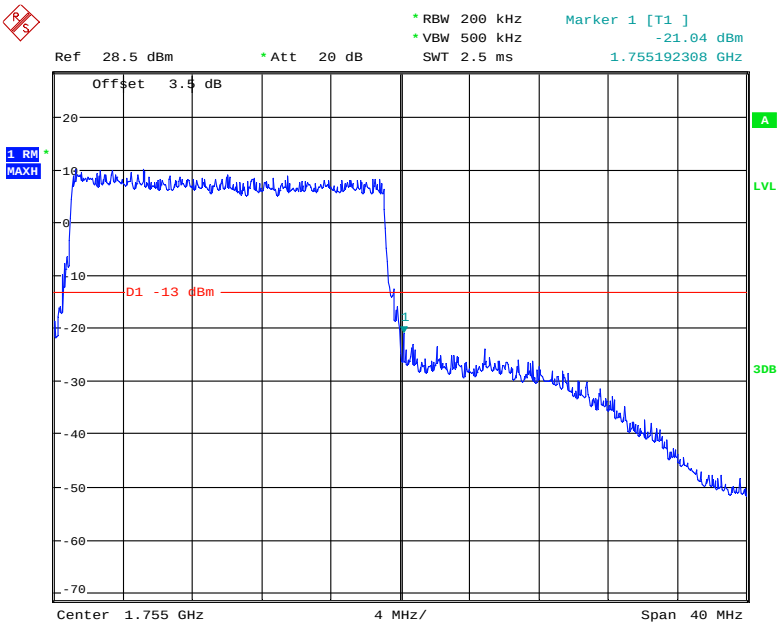
Date: 14.MAR.2019 14:56:23

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



Date: 14.MAR.2019 14:57:51

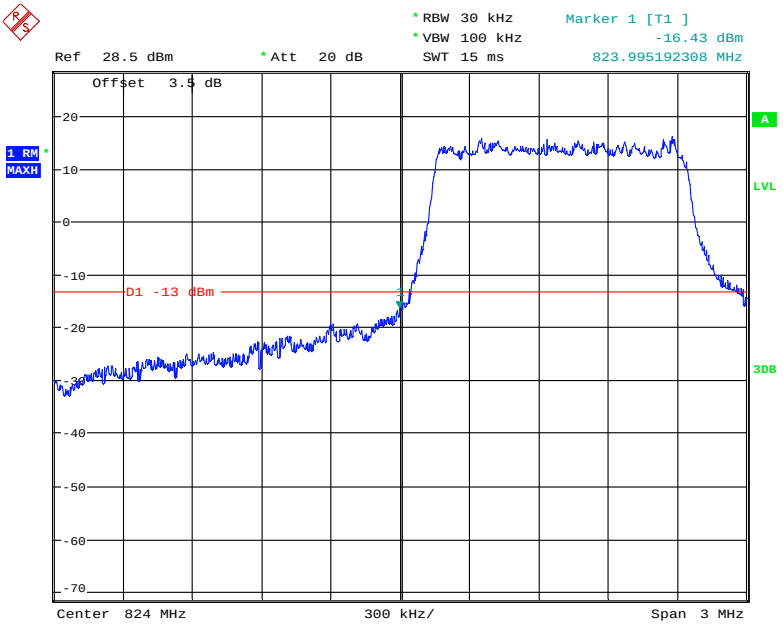
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 14.MAR.2019 14:57:06

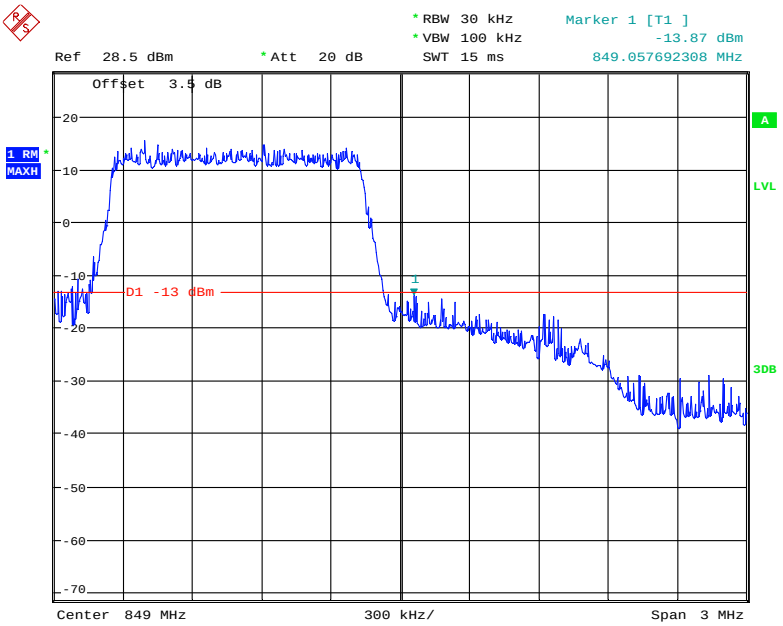
Band 5:

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



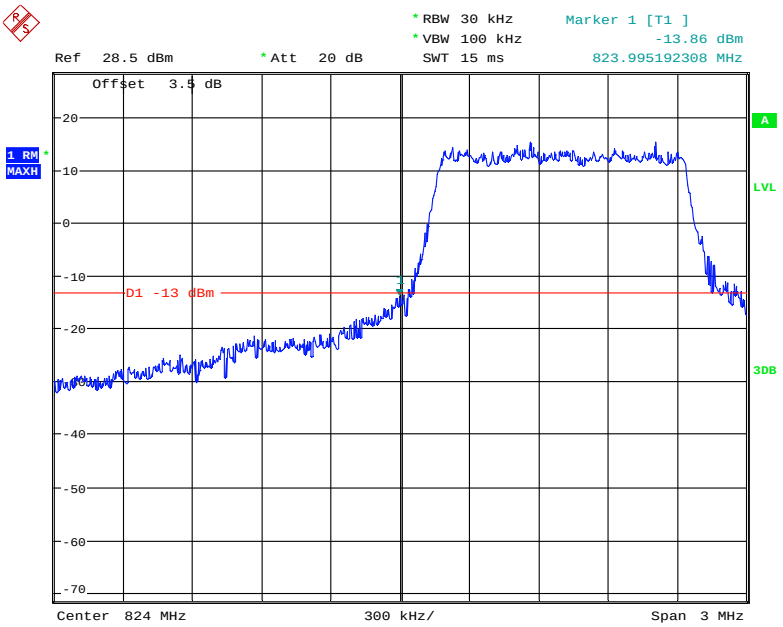
Date: 14.MAR.2019 15:28:26

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



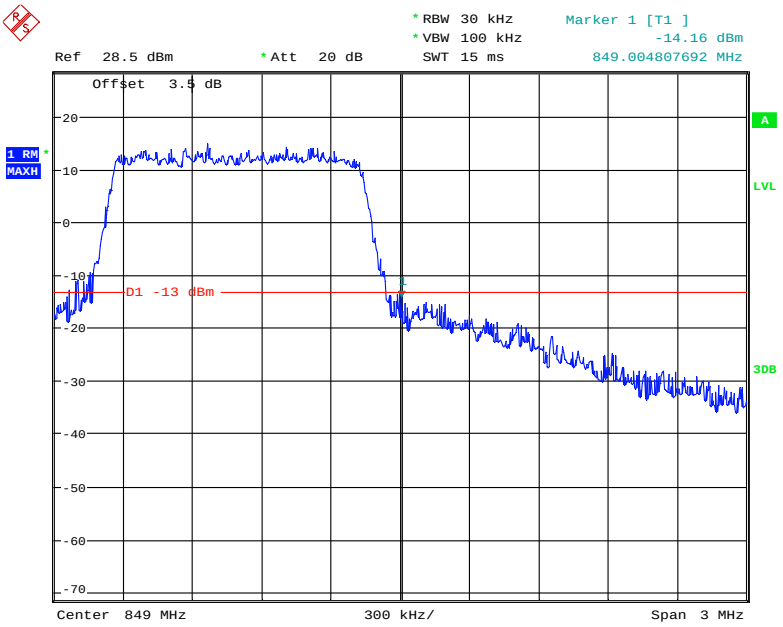
Date: 14.MAR.2019 15:30:04

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



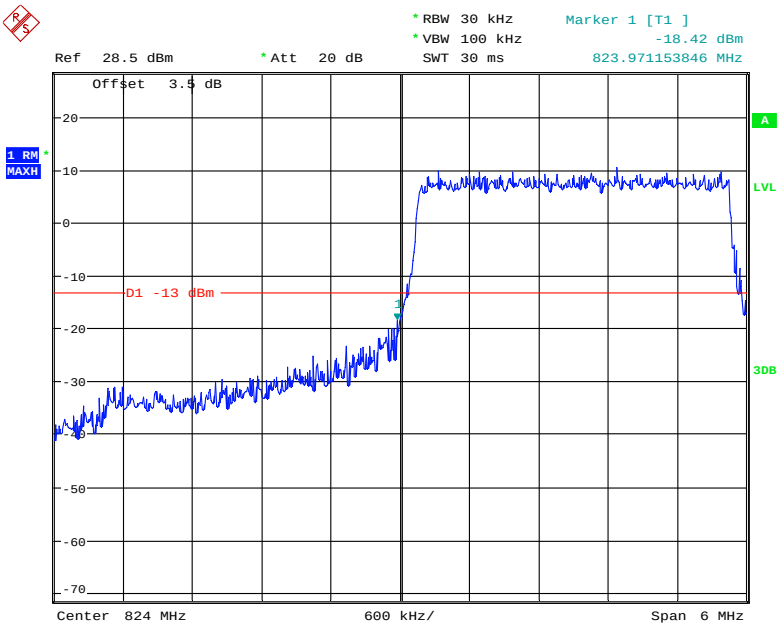
Date: 14.MAR.2019 15:29:01

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



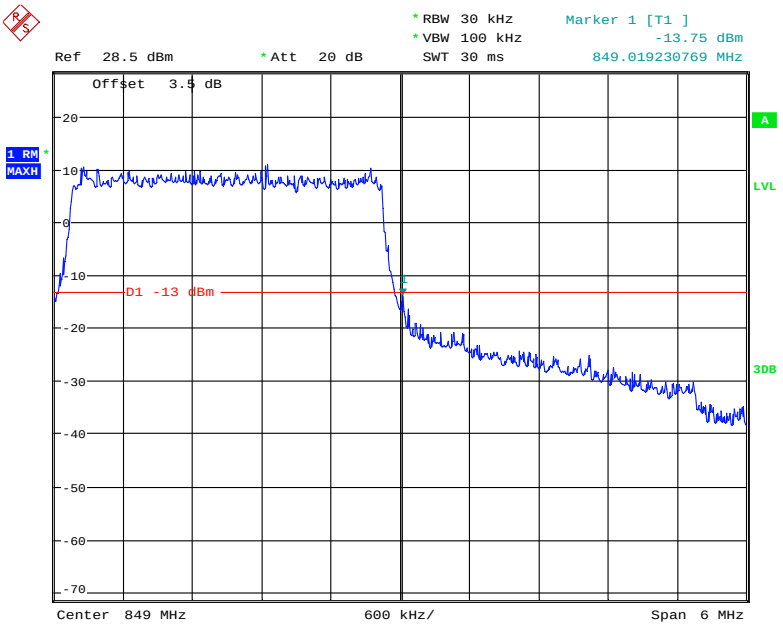
Date: 14.MAR.2019 15:29:32

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



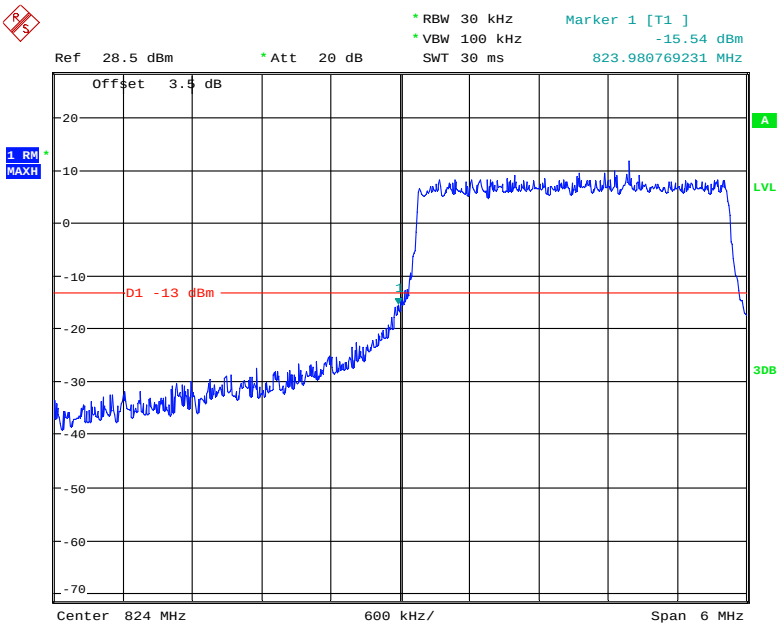
Date: 14.MAR.2019 15:33:58

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



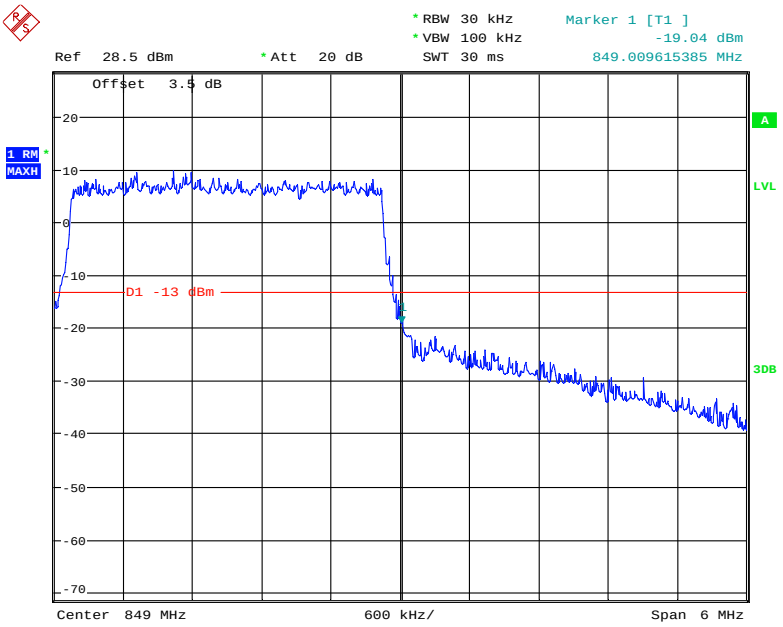
Date: 14.MAR.2019 15:32:46

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



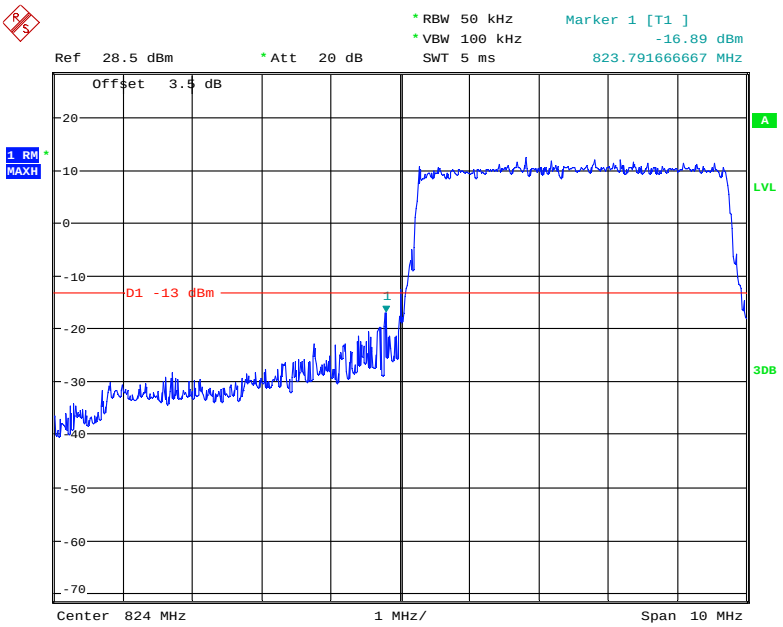
Date: 14.MAR.2019 15:33:41

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



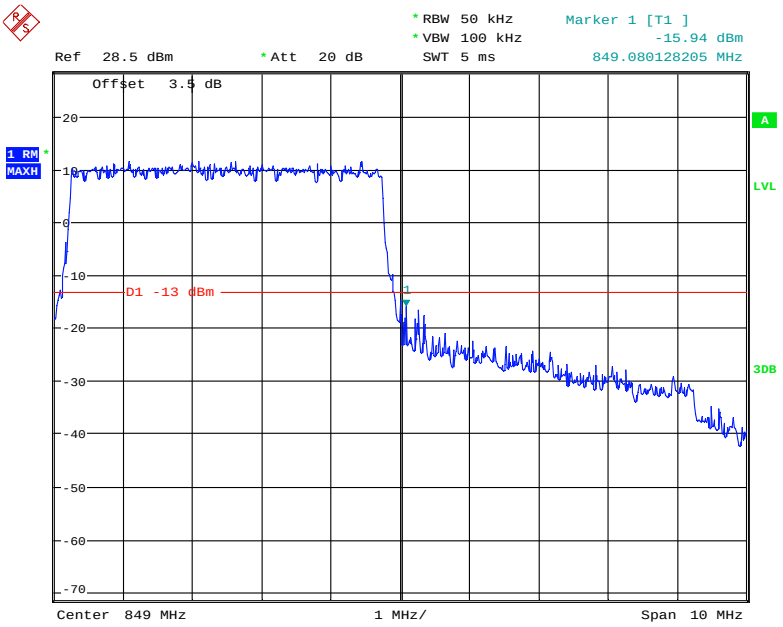
Date: 14.MAR.2019 15:33:10

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



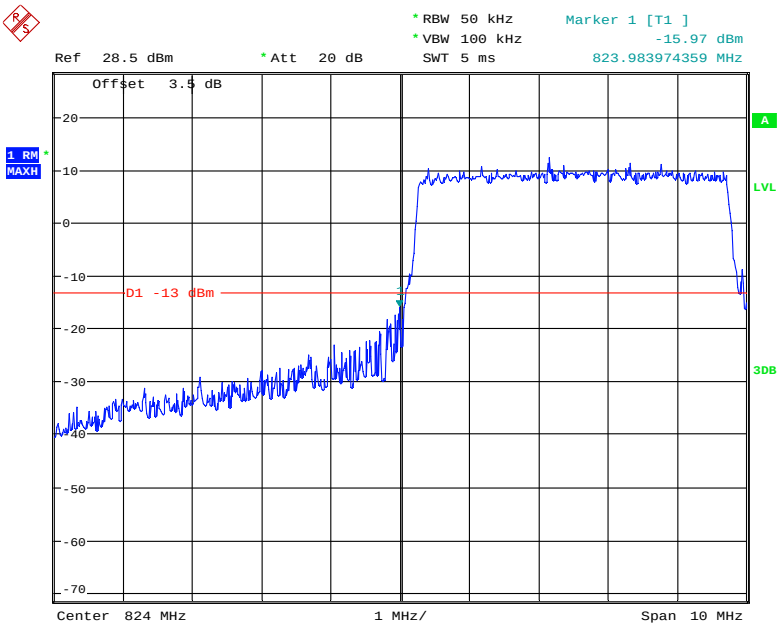
Date: 14.MAR.2019 15:34:49

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



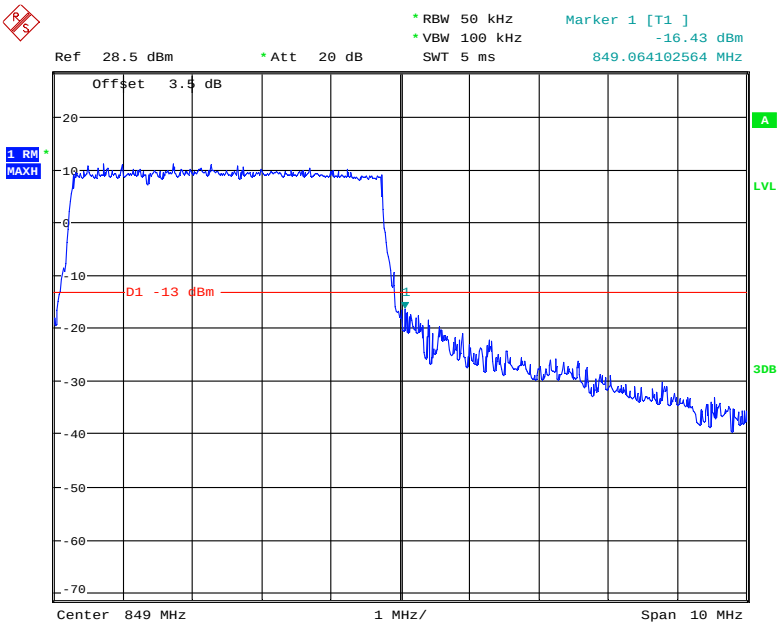
Date: 14.MAR.2019 15:36:16

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



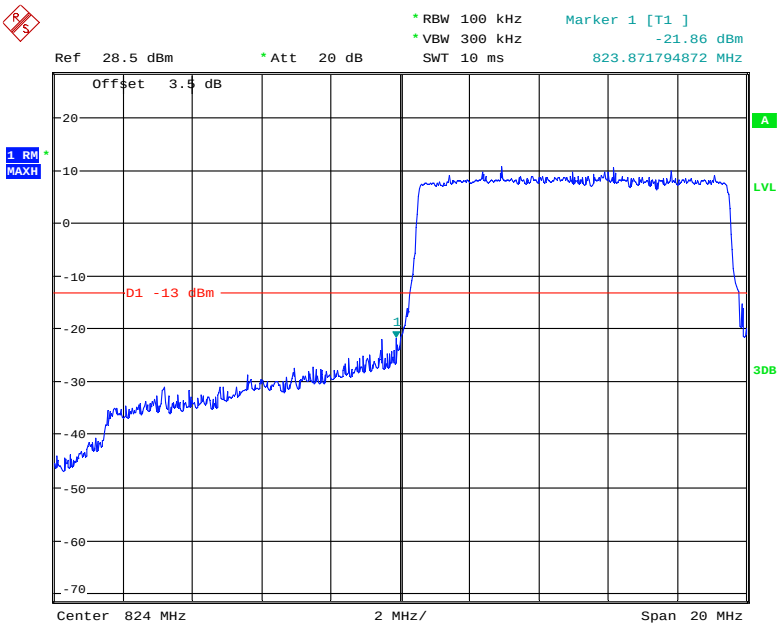
Date: 14.MAR.2019 15:35:11

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



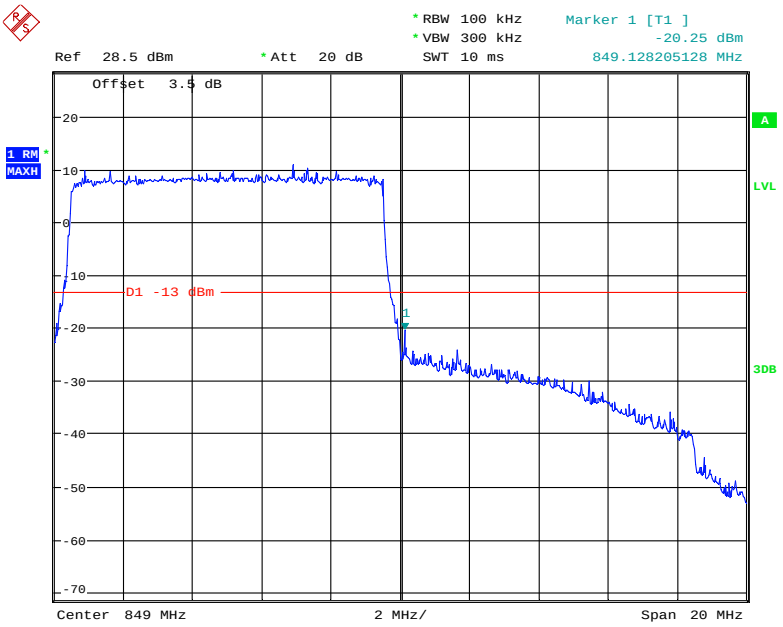
Date: 14.MAR.2019 15:36:00

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



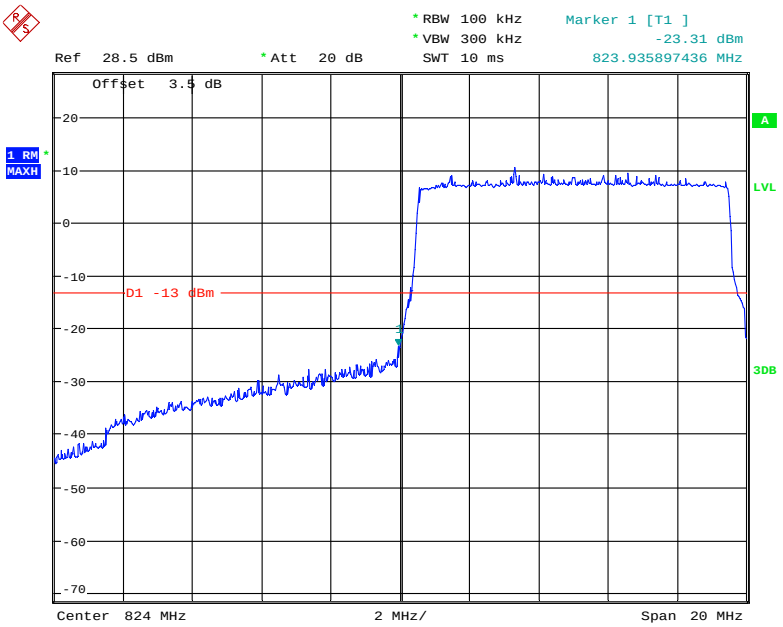
Date: 14.MAR.2019 15:38:20

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



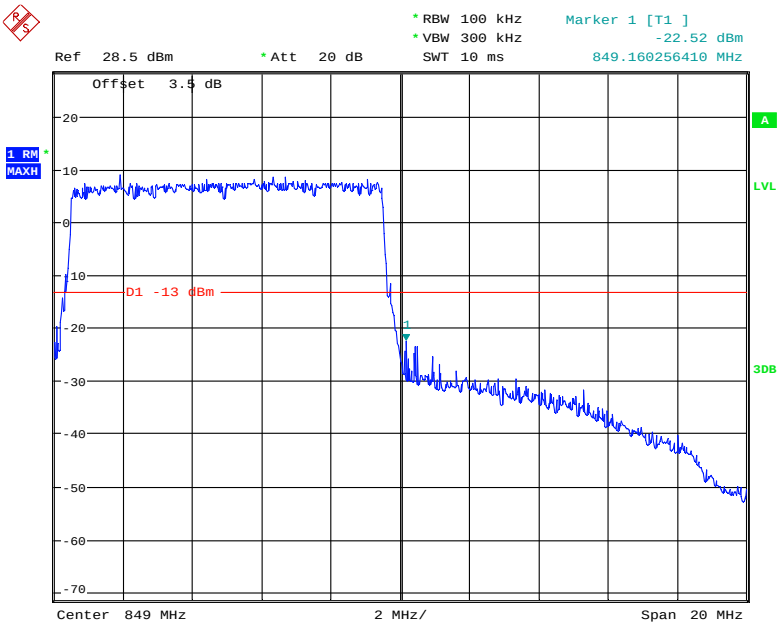
Date: 14.MAR.2019 15:36:50

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



Date: 14.MAR.2019 15:37:54

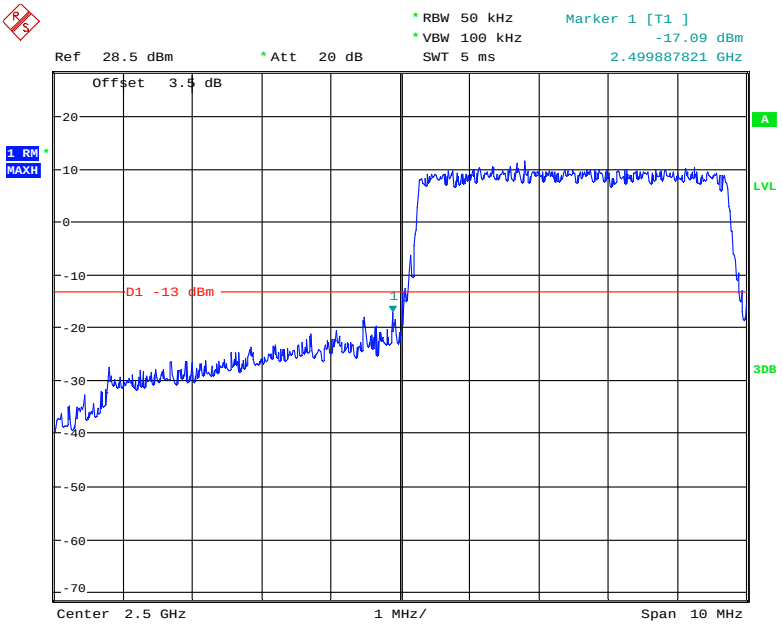
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 14.MAR.2019 15:37:08

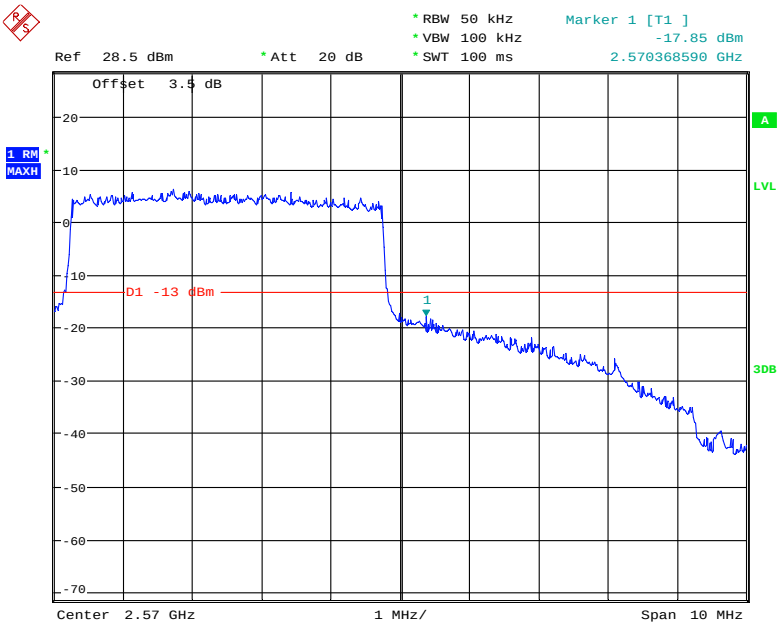
Band 7:

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



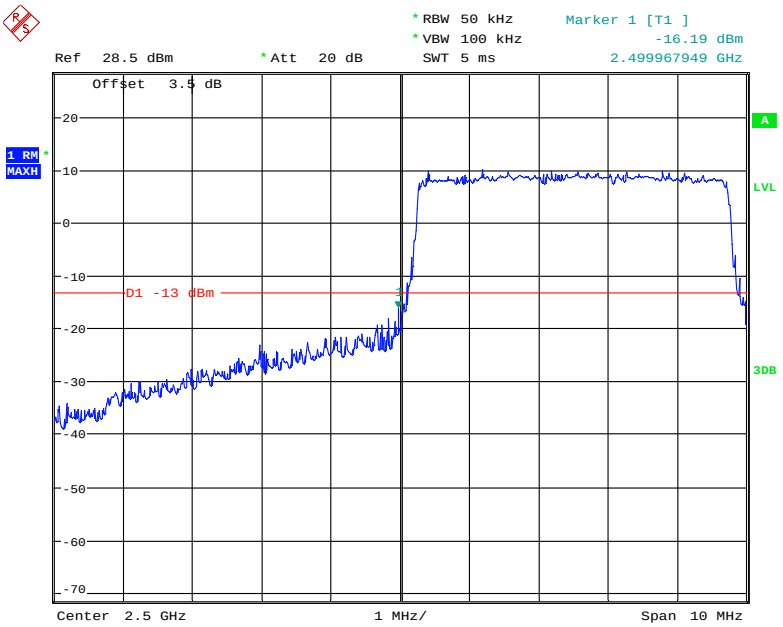
Date: 14.MAR.2019 15:46:37

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



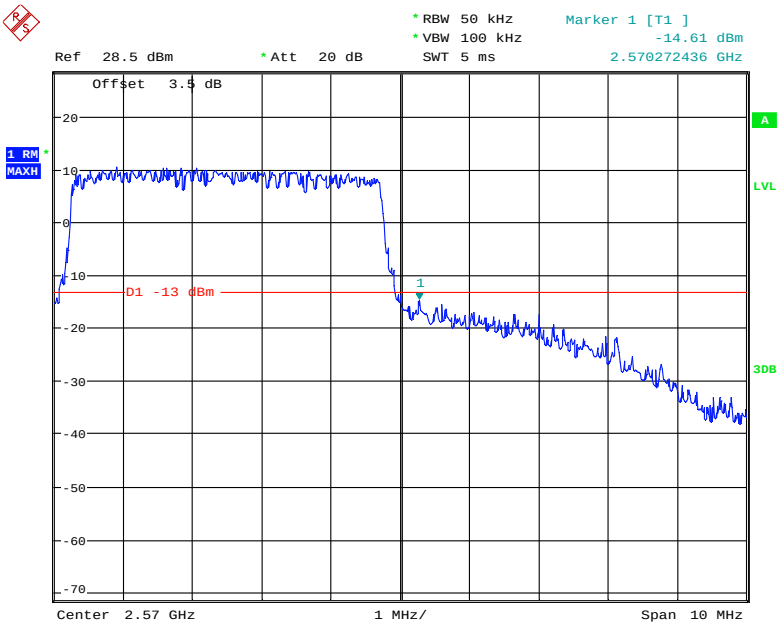
Date: 14.MAR.2019 15:48:55

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



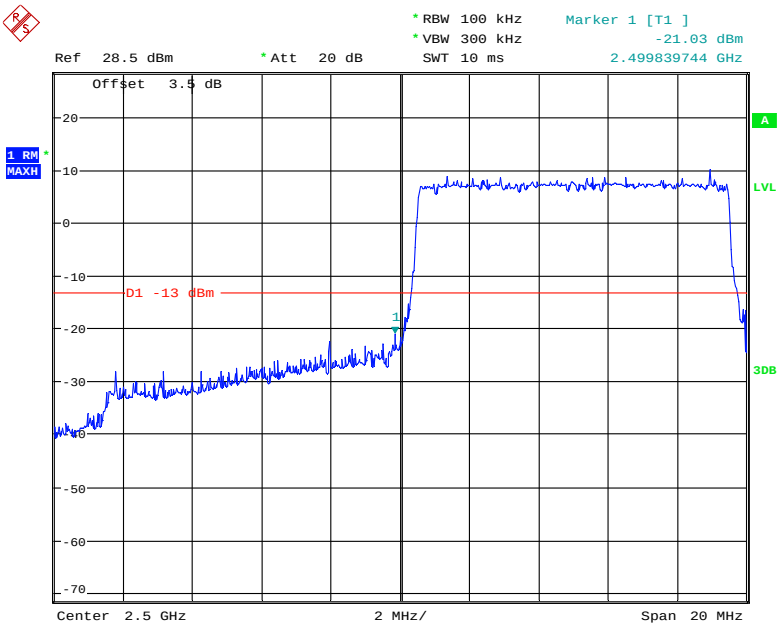
Date: 14.MAR.2019 15:46:59

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



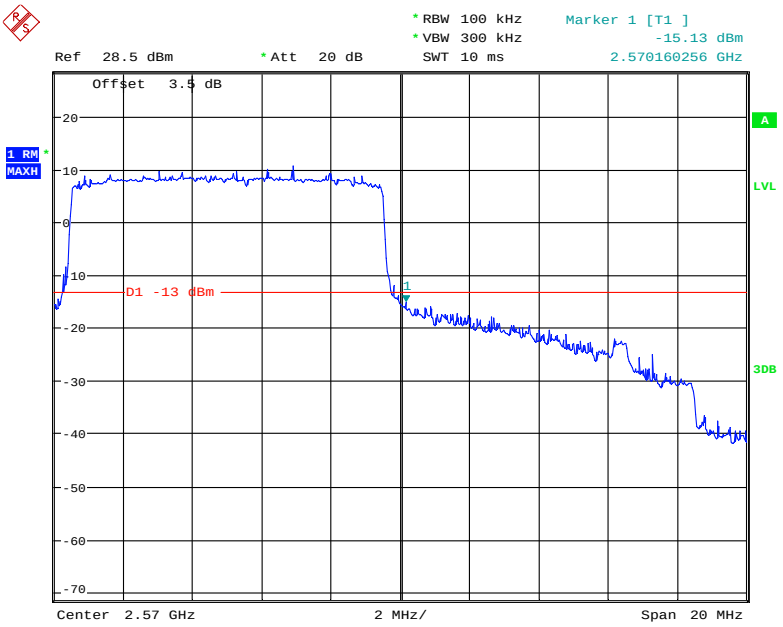
Date: 14.MAR.2019 15:48:04

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



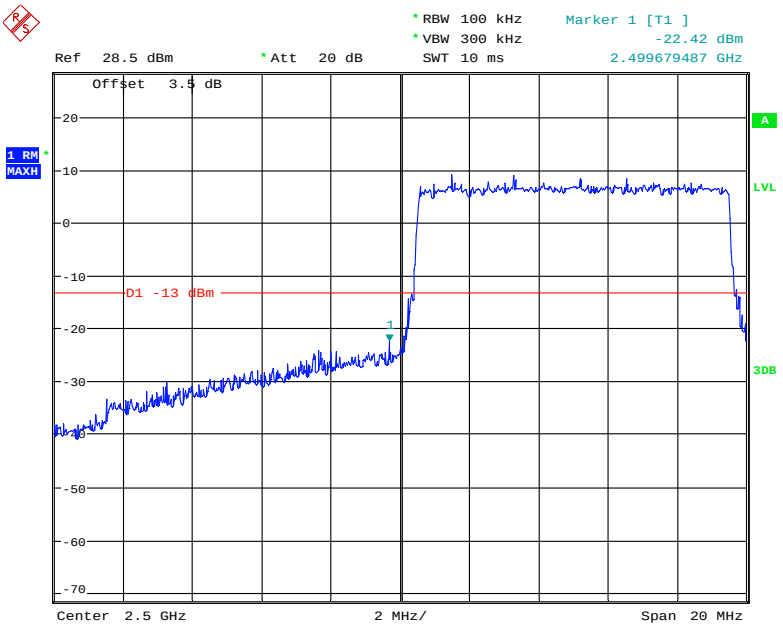
Date: 14.MAR.2019 15:59:38

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



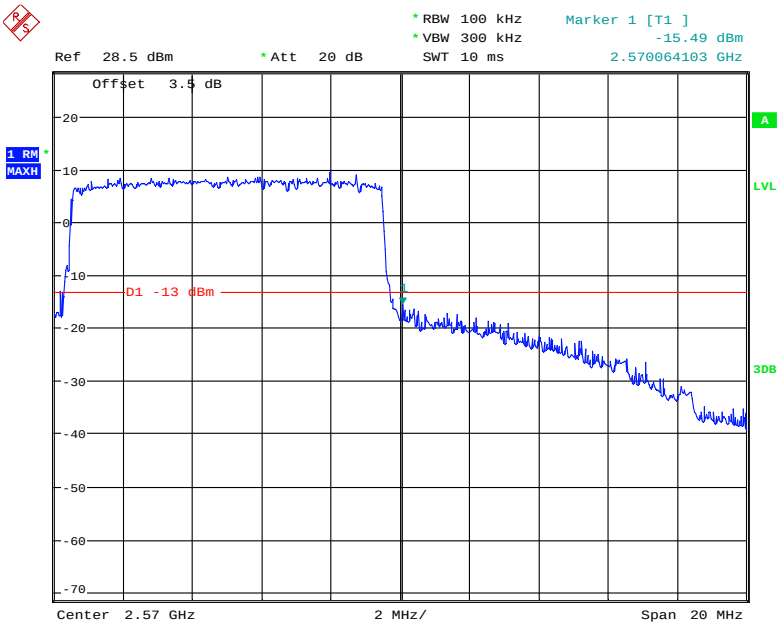
Date: 14.MAR.2019 15:58:33

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



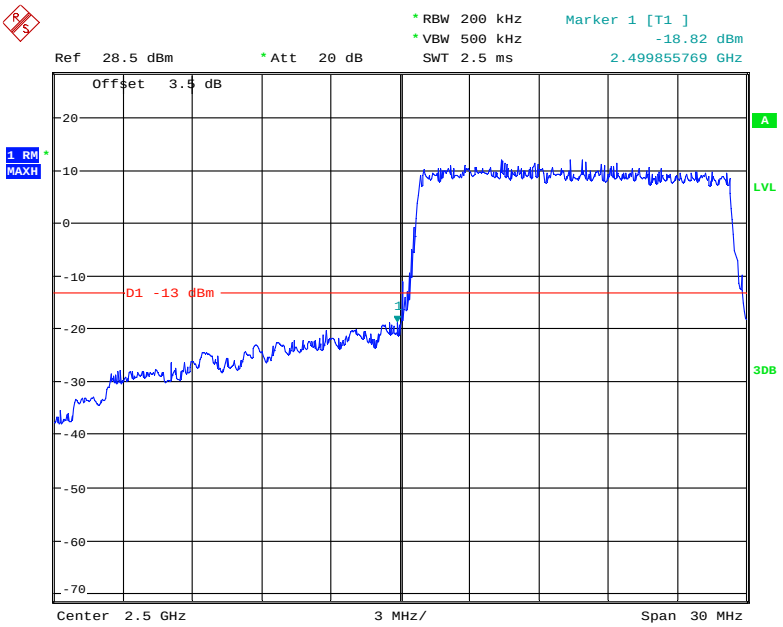
Date: 14.MAR.2019 15:59:19

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



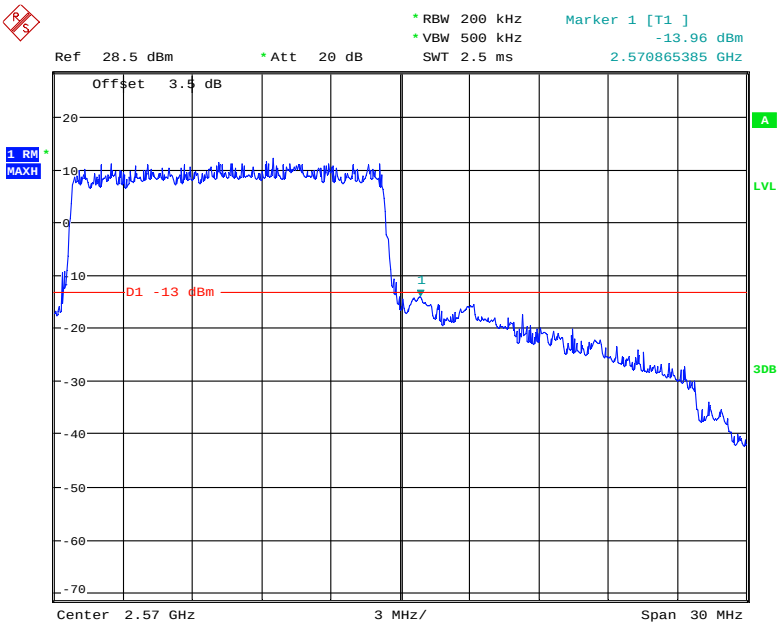
Date: 14.MAR.2019 15:58:54

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



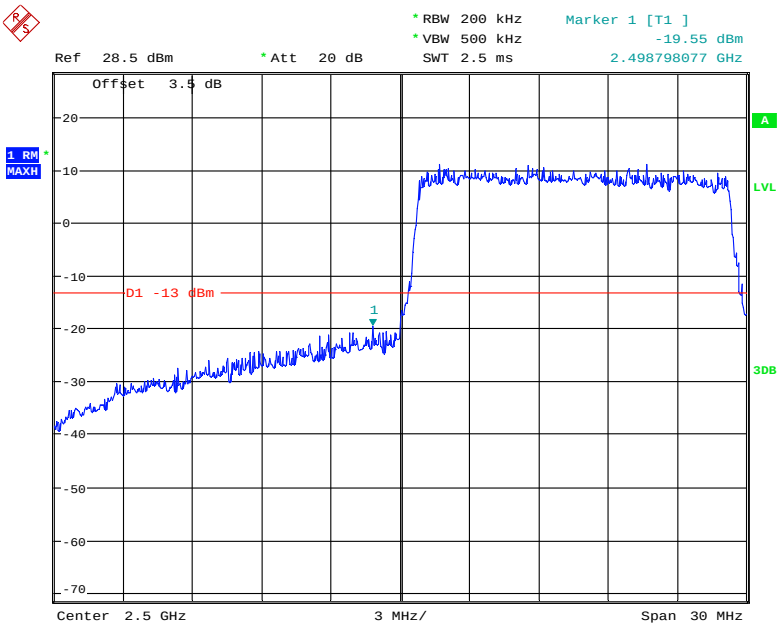
Date: 14.MAR.2019 16:00:15

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



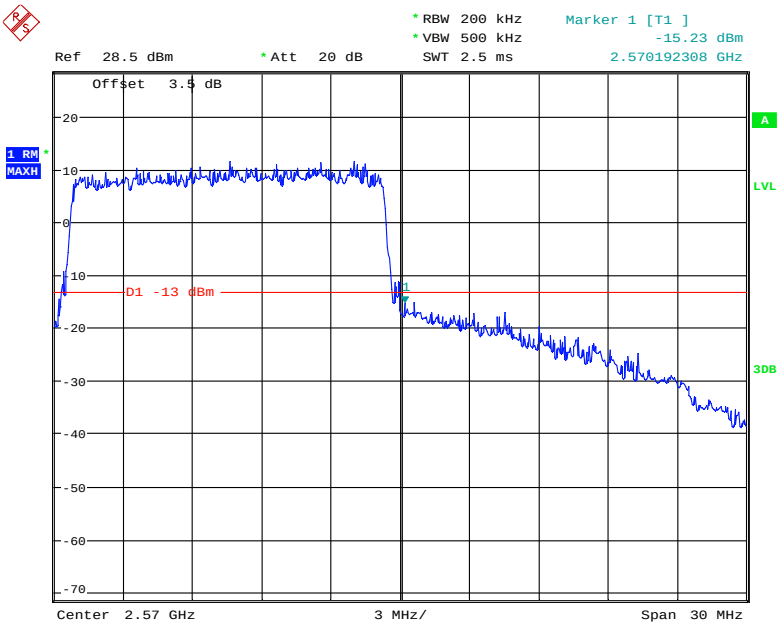
Date: 14.MAR.2019 16:01:14

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



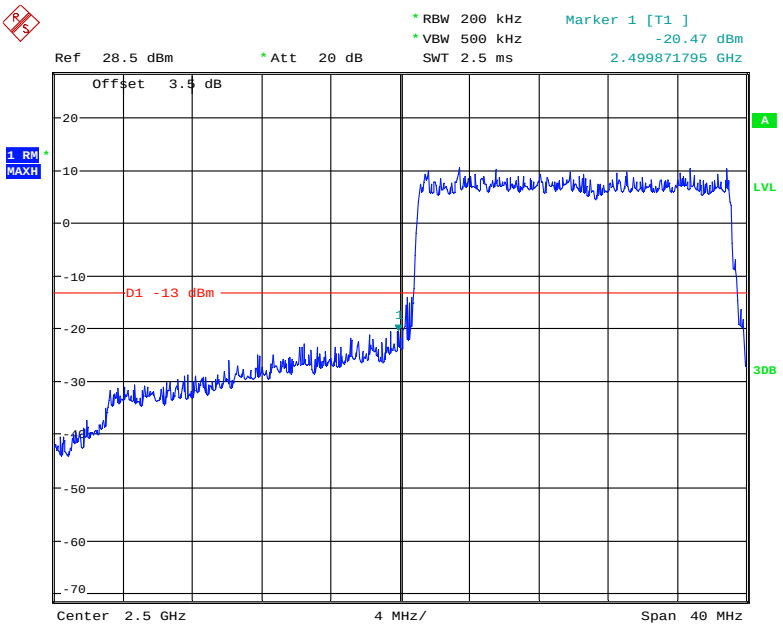
Date: 14.MAR.2019 16:00:37

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



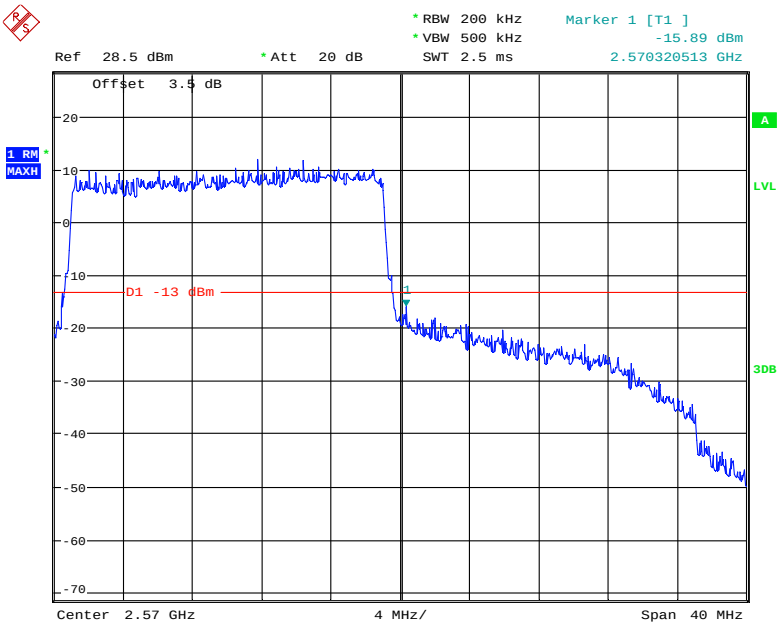
Date: 14.MAR.2019 16:00:59

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



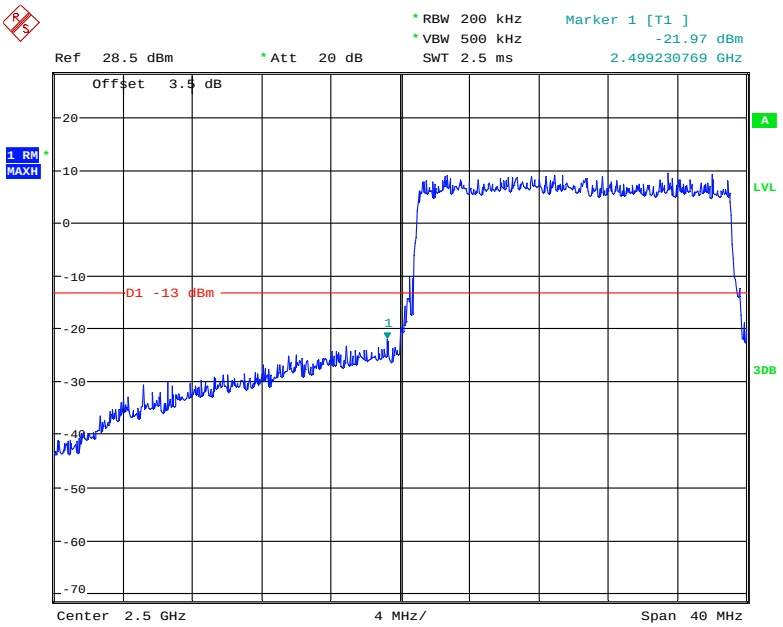
Date: 14.MAR.2019 16:03:03

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



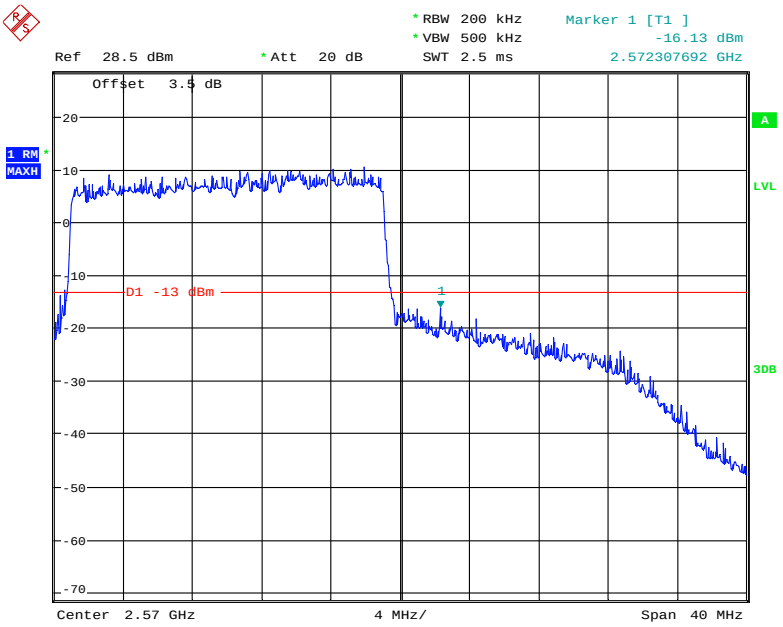
Date: 14.MAR.2019 16:01:56

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



Date: 14.MAR.2019 16:02:45

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



Date: 14.MAR.2019 16:02:20

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

Applicable Standard

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

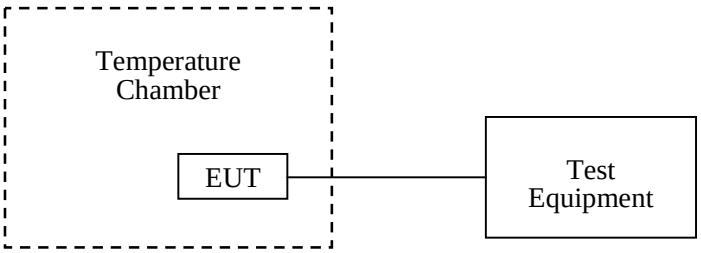
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data

Environmental Conditions

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

The testing was performed by Shawn Xiao on 2019-03-15.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-9	-0.010758	2.5
-20		-5	-0.005977	2.5
-10		-8	-0.009563	2.5
0		-9	-0.010758	2.5
10		-2	-0.002391	2.5
20		-9	-0.010758	2.5
30		-16	-0.019125	2.5
40		-8	-0.009563	2.5
50		-17	-0.020320	2.5
20	V min.= 3.5	-9	-0.010758	2.5
	V max.= 4.2	-7	-0.008367	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-14	-0.0167	2.5
-20		-12	-0.0143	2.5
-10		-9	-0.0108	2.5
0		-8	-0.0096	2.5
10		-7	-0.0084	2.5
20		-6	-0.0072	2.5
30		-3	-0.0036	2.5
40		-2	-0.0024	2.5
50		-1	-0.0012	2.5
20	V min.= 3.5	-4	-0.0048	2.5
	V max.= 4.2	1	0.0012	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	1	0.001195	2.5
-20		-3	-0.003586	2.5
-10		2	0.002391	2.5
0		-5	-0.005977	2.5
10		-6	-0.007172	2.5
20		1	0.001195	2.5
30		3	0.003586	2.5
40		-5	-0.005977	2.5
50		6	0.007172	2.5
20	V min.= 3.5	-3	-0.003586	2.5
	V max.= 4.2	-8	-0.009563	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-13	-0.006915	pass
-20		-10	-0.005319	pass
-10		-15	-0.007979	pass
0		-10	-0.005319	pass
10		-13	-0.006915	pass
20		-10	-0.005319	pass
30		-14	-0.007447	pass
40		-11	-0.005851	pass
50		-12	-0.006383	pass
20	V min.= 3.5	-9	-0.004787	pass
	V max.= 4.2	-13	-0.006915	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-9	-0.0048	pass
-20		-10	-0.0053	pass
-10		-11	-0.0059	pass
0		-8	-0.0043	pass
10		-4	-0.0021	pass
20		-5	-0.0027	pass
30		-2	-0.0011	pass
40		1	0.0005	pass
50		2	0.0011	pass
20	V min.= 3.5	4	0.0021	pass
	V max.= 4.2	5	0.0027	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.7	-2	-0.001064	pass
-20		-6	-0.003191	pass
-10		-4	-0.002128	pass
0		2	0.001064	pass
10		-2	-0.001064	pass
20		-2	-0.001064	pass
30		-9	-0.004787	pass
40		3	0.001596	pass
50		4	0.002128	pass
20	V min.= 3.5	-5	-0.002660	pass
	V max.= 4.2	-3	-0.001596	pass

LTE:
QPSK:
Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.7	-28	-0.014894	pass
-20		-25	-0.013298	pass
-10		-24	-0.012766	pass
0		-19	-0.010106	pass
10		-19	-0.010106	pass
20		-24	-0.012766	pass
30		-26	-0.013830	pass
40		-18	-0.009574	pass
50		-23	-0.012234	pass
20	V min.= 3.5	-21	-0.011170	pass
	V max.= 4.2	-25	-0.013298	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.7	1710.8469	1754.7674	1710	1755
-20		1710.9369	1754.3835	1710	1755
-10		1710.5096	1754.3901	1710	1755
0		1710.6926	1754.4379	1710	1755
10		1710.2875	1754.0123	1710	1755
20		1710.5769	1754.6154	1710	1755
30		1710.9923	1754.3950	1710	1755
40		1710.3371	1754.6665	1710	1755
50		1710.0861	1754.2689	1710	1755
20	V min.= 3.5	1710.2879	1754.6845	1710	1755
	V max.= 4.2	1710.2839	1754.5091	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	6	0.007173	2.5
-20		10	0.011955	2.5
-10		2	0.002391	2.5
0		14	0.016736	2.5
10		4	0.004782	2.5
20		8	0.009564	2.5
30		4	0.004782	2.5
40		14	0.016736	2.5
50		10	0.011955	2.5
20	V min.= 3.5	7	0.008368	2.5
	V max.= 4.2	4	0.004782	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.7	2500.8388	2569.3397	2500	2570
-20		2500.5726	2569.1724	2500	2570
-10		2500.3976	2569.4979	2500	2570
0		2500.9407	2569.5334	2500	2570
10		2500.1352	2569.4829	2500	2570
20		2500.3846	2569.6154	2500	2570
30		2500.9425	2569.6145	2500	2570
40		2500.6082	2569.8911	2500	2570
50		2500.1720	2569.0674	2500	2570
20	V min.= 3.5	2500.2636	2569.8783	2500	2570
	V max.= 4.2	2500.7045	2569.6967	2500	2570

16QAM:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.7	-29	-0.015426	pass
-20		-26	-0.013830	pass
-10		-29	-0.015426	pass
0		-25	-0.013298	pass
10		-20	-0.010638	pass
20		-24	-0.012766	pass
30		-21	-0.011170	pass
40		-26	-0.013830	pass
50		-23	-0.012234	pass
20	V min.= 3.5	-27	-0.014362	pass
	V max.= 4.2	-24	-0.012766	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.7	1710.6865	1754.7566	1710	1755
-20		1710.2148	1754.3406	1710	1755
-10		1710.3347	1754.8653	1710	1755
0		1710.7179	1754.4582	1710	1755
10		1710.0418	1754.5488	1710	1755
20		1710.9601	1754.6568	1710	1755
30		1710.9653	1754.6970	1710	1755
40		1710.5078	1754.6489	1710	1755
50		1710.9809	1754.5360	1710	1755
20	V min.= 3.5	1710.0940	1754.1275	1710	1755
	V max.= 4.2	1710.7595	1754.1198	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	6	0.007173	2.5
-20		13	0.015541	2.5
-10		8	0.009564	2.5
0		7	0.008368	2.5
10		0	0.000000	2.5
20		7	0.008368	2.5
30		1	0.001195	2.5
40		17	0.020323	2.5
50		15	0.017932	2.5
20	V min.= 3.5	-1	-0.001195	2.5
	V max.= 4.2	0	0	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.7	2500.2688	2569.3908	2500	2570
-20		2500.1875	2569.6685	2500	2570
-10		2500.8272	2569.4967	2500	2570
0		2500.2646	2569.3427	2500	2570
10		2500.3364	2569.9046	2500	2570
20		2500.0804	2569.9030	2500	2570
30		2500.8266	2569.6696	2500	2570
40		2500.6800	2569.8746	2500	2570
50		2500.0659	2569.0153	2500	2570
20	V min.= 3.5	2500.1998	2569.2511	2500	2570
	V max.= 4.2	2500.9437	2569.6204	2500	2570

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