FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

INFINIX MOBILITY LIMITED

ROOM 604 6/F SOUTH TOWER WORLD FINANCE CTR HARBOUR CITY 17 CANTON ROAD TST KL, Hong Kong

FCC ID: 2AIZN-X627

Report Type:	Product Type:
Original Report	Mobile phone

Report Number:	RSZ190125002-00D
Report Date:	2019-03-04
Reviewed By:	Rocky Kang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Mobile phone
Tested Model	X627
Frequency Range	Cellular: 824-849 MHz PCS: 1850-1910 MHz WCDMA B2/LTE B2: 1850-1910 MHz WCDMA B5/LTE B5: 824-849 MHz WCDMA B4/LTE B4: 1710- 1755 MHz LTE B7: 2500-2570 MHz
Transmit Power	GSM850: 33dBm PCS1900: 30dBm WCDMA/LTE: 24dBm
Modulation Technique	2G: GMSK,8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G:FPC Antennas
Voltage Range	DC 3.8V from battery or DC 5.0V from adapter
Date of Test	Jan 24, 2019~ Jan 27, 2019
Sample serial number	190125002
Received date	2019-01-25
Sample/EUT Status	Good condition
Adapter information	Model: CU-52JT Input: AC 100-240V, 50/60Hz, 200mA Output: DC 5.0V, 1.2A

Objective

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

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS, Part 15.247 DTS and Part 15B JBP submissions with FCC ID: 2AIZN-X627.

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		±0.5dB
Unwanted Emission, conducted		±1.5dB
Radiated Emissions	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±3℃
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.

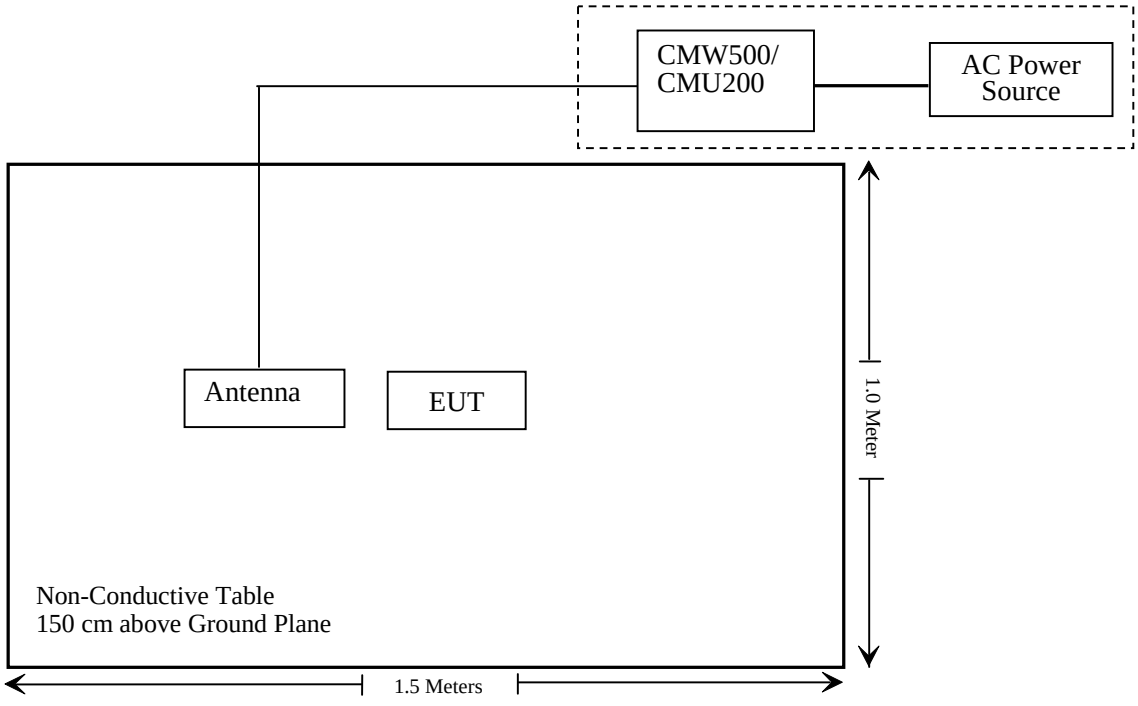
Equipment Modifications

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: RSZ190125002-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	FSEM	845987/005	2018-06-23	2019-06-23
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	ESCI	101120	2019-01-11	2020-01-11
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	2018-07-11	2021-07-10
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: RSZ190125002-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.

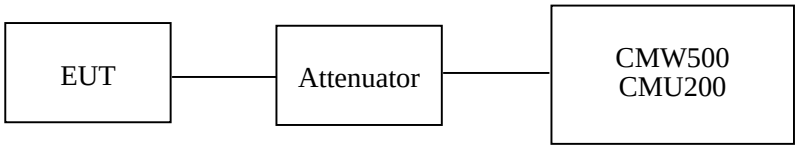
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Kiki Kong on 2019-01-25.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.98	38.45
	190	836.6	33.18	38.45
	251	848.8	33.26	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	33.18	32.18	30.07	28.67	38.45
	190	836.6	33.35	32.34	30.23	28.91	38.45
	251	848.8	33.44	32.44	30.30	28.95	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	27.12	26.04	24.04	22.64	38.45
	190	836.6	27.06	25.81	23.95	22.58	38.45
	251	848.8	26.97	25.84	23.92	22.55	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		22.39	22.14	22.35
		HSDPA	1	21.65	21.53	21.59
			2	21.71	21.59	21.63
			3	21.77	21.64	21.70
			4	21.82	21.67	21.72
		HSUPA	1	21.58	21.49	21.48
			2	21.61	21.51	21.55
			3	21.66	21.58	21.59
			4	21.71	21.60	21.67
			5	21.73	21.65	21.74

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.71	33
	661	1880.0	28.39	33
	810	1909.8	28.11	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.74	27.79	25.71	24.65	33
	661	1880.0	28.39	27.52	25.52	24.49	33
	810	1909.8	28.08	27.27	25.35	24.29	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.16	23.96	21.82	20.63	33
	661	1880.0	24.91	23.76	21.67	20.45	33
	810	1909.8	24.57	23.46	21.37	20.20	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		22.22	22.26	22.30
		HSDPA	1	21.27	21.32	21.44
			2	21.34	21.36	21.49
			3	21.37	21.42	21.56
			4	21.42	21.49	21.59
		HSUPA	1	21.33	21.35	21.39
			2	21.35	21.41	21.43
			3	21.40	21.49	21.48
			4	21.46	21.53	21.52
			5	21.49	21.55	21.54

AWS Band (Part 27)

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band IV)	Normal	RMC12.2k		22.26	22.24	22.27
		HSDPA	1	21.44	21.43	21.4
			2	21.49	21.45	21.47
			3	21.53	21.52	21.50
			4	21.56	21.54	21.54
		HSUPA	1	21.33	21.31	21.37
			2	21.39	21.37	21.43
			3	21.42	21.39	21.51
			4	21.44	21.44	21.53
			5	21.47	21.47	21.56

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.42	13
	Middle	1.47	13
	High	1.45	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.35	13
	Middle	1.38	13
	High	1.39	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.34	13
	Middle	3.33	13
	High	3.32	13
HSDPA (16QAM)	Low	3.33	13
	Middle	3.33	13
	High	3.33	13
HSUPA (BPSK)	Low	3.33	13
	Middle	3.33	13
	High	3.33	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.45	13
	Middle	1.44	13
	High	1.46	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.33	13
	Middle	1.31	13
	High	1.34	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.22	13
	Middle	3.21	13
	High	3.22	13
HSDPA (16QAM)	Low	3.23	13
	Middle	3.23	13
	High	3.25	13
HSUPA (BPSK)	Low	3.24	13
	Middle	3.24	13
	High	3.25	13

AWS Band

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.18	13
	Middle	3.18	13
	High	3.17	13
HSDPA (16QAM)	Low	3.18	13
	Middle	3.19	13
	High	3.19	13
HSUPA (BPSK)	Low	3.19	13
	Middle	3.20	13
	High	3.21	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 (dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	85.23	100	2.2	H	25.9	1.90	0.0	24.00	38.45	14.45
836.6	92.08	279	2.0	V	32.1	1.90	0.0	30.20	38.45	8.25
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	87.22	348	1.1	H	17.2	1.30	9.40	25.30	33	7.70
1880.00	82.33	55	1.7	V	12.1	1.30	9.40	20.20	33	12.80

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	80.67	344	1.8	H	20.7	1.90	0.0	18.80	38.45	19.55
836.6	85.92	326	1.6	V	26.5	1.90	0.0	24.60	38.45	13.75
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	84.89	94	1.1	H	14.8	1.30	9.40	22.90	33	10.10
1880.00	78.14	195	1.8	V	7.9	1.30	9.40	16.00	33	17.00

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 (dBi)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	77.34	262	1.4	H	18.0	1.90	0.0	16.10	38.45	22.35
836.6	82.25	15	1.8	V	22.3	1.90	0.0	20.40	38.45	18.05
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	80.10	231	2.0	H	6.9	1.30	8.90	14.50	30	15.50
1732.60	85.47	14	1.5	V	12.9	1.30	8.90	20.50	30	9.50
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	76.12	239	2.3	H	6.1	1.30	9.40	14.20	33	18.80
1880.00	83.08	64	1.6	V	12.8	1.30	9.40	20.90	33	12.10

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	22.70	22.79	22.70
		RB Size=1, RB Offset=2	22.66	22.71	22.67
		RB Size=1, RB Offset=5	22.30	22.79	22.60
		RB Size=3, RB Offset=0	22.54	22.33	22.24
		RB Size=3, RB Offset=1	22.32	22.43	22.33
		RB Size=3, RB Offset=2	22.32	22.23	22.28
		RB Size=6, RB Offset=0	22.22	22.26	22.08
	16QAM	RB Size=1, RB Offset=0	22.44	22.30	22.26
		RB Size=1, RB Offset=2	22.08	22.19	22.04
		RB Size=1, RB Offset=5	22.14	21.87	23.06
		RB Size=3, RB Offset=0	21.79	21.85	22.92
		RB Size=3, RB Offset=1	21.98	21.93	22.03
		RB Size=3, RB Offset=2	21.92	21.87	21.78
		RB Size=6, RB Offset=0	21.78	21.84	22.06
3.0	QPSK	RB Size=1, RB Offset=0	22.84	22.72	23.05
		RB Size=1, RB Offset=7	22.77	22.91	22.89
		RB Size=1, RB Offset=14	22.55	22.56	22.82
		RB Size=8, RB Offset=0	22.08	22.03	21.88
		RB Size=8, RB Offset=4	21.99	21.84	21.76
		RB Size=8, RB Offset=7	21.53	21.68	21.65
		RB Size=15, RB Offset=0	21.86	21.85	21.86
	16QAM	RB Size=1, RB Offset=0	22.09	22.04	22.04
		RB Size=1, RB Offset=7	22.14	21.93	22.08
		RB Size=1, RB Offset=14	22.11	21.79	21.97
		RB Size=8, RB Offset=0	21.04	20.96	21.08
		RB Size=8, RB Offset=4	20.79	20.80	21.00
		RB Size=8, RB Offset=7	20.51	20.60	20.76
		RB Size=15, RB Offset=0	20.70	20.91	20.70

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.96	22.89	22.86
		RB Size=1, RB Offset=12	22.88	22.78	22.70
		RB Size=1, RB Offset=24	22.58	22.95	22.31
		RB Size=12, RB Offset=0	21.73	21.82	22.04
		RB Size=12, RB Offset=6	21.89	21.68	21.82
		RB Size=12, RB Offset=11	21.91	21.59	21.62
		RB Size=25, RB Offset=0	21.72	21.89	21.81
	16QAM	RB Size=1, RB Offset=0	22.14	21.73	21.66
		RB Size=1, RB Offset=12	21.91	21.59	21.68
		RB Size=1, RB Offset=24	21.83	21.52	21.67
		RB Size=12, RB Offset=0	21.03	20.89	20.92
		RB Size=12, RB Offset=6	20.70	20.66	20.85
		RB Size=12, RB Offset=11	20.79	20.58	20.56
		RB Size=25, RB Offset=0	20.84	20.82	20.96
10.0	QPSK	RB Size=1, RB Offset=0	22.84	22.79	22.75
		RB Size=1, RB Offset=24	22.84	22.84	22.59
		RB Size=1, RB Offset=49	22.65	22.79	22.57
		RB Size=25, RB Offset=0	21.88	21.73	21.73
		RB Size=25, RB Offset=12	21.93	21.84	21.61
		RB Size=25, RB Offset=24	21.96	21.56	21.69
		RB Size=50, RB Offset=0	21.77	21.52	21.75
	16QAM	RB Size=1, RB Offset=0	21.63	21.66	21.70
		RB Size=1, RB Offset=24	21.80	21.72	21.58
		RB Size=1, RB Offset=49	21.29	21.58	21.93
		RB Size=25, RB Offset=0	22.81	20.71	20.77
		RB Size=25, RB Offset=12	22.57	20.48	20.61
		RB Size=25, RB Offset=24	22.48	20.35	20.41
		RB Size=50, RB Offset=0	20.54	20.62	20.51

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	22.02	22.16	22.39
		RB Size=1, RB Offset=37	22.08	21.90	22.22
		RB Size=1, RB Offset=74	22.08	22.01	22.37
		RB Size=36, RB Offset=0	22.13	21.99	22.12
		RB Size=36, RB Offset=18	22.13	21.97	21.93
		RB Size=36, RB Offset=37	22.20	21.87	21.64
		RB Size=75, RB Offset=0	22.04	22.02	22.14
	16QAM	RB Size=1, RB Offset=0	21.84	21.86	21.77
		RB Size=1, RB Offset=37	21.78	22.00	21.57
		RB Size=1, RB Offset=74	21.97	21.82	21.60
		RB Size=36, RB Offset=0	21.71	21.96	22.13
		RB Size=36, RB Offset=18	21.87	21.73	21.97
		RB Size=36, RB Offset=37	21.47	21.67	22.03
		RB Size=75, RB Offset=0	21.36	21.22	21.23
20.0	QPSK	RB Size=1, RB Offset=0	22.95	22.79	23.16
		RB Size=1, RB Offset=49	22.88	23.02	22.96
		RB Size=1, RB Offset=99	22.98	22.86	22.75
		RB Size=50, RB Offset=0	21.81	21.84	22.03
		RB Size=50, RB Offset=24	21.87	21.88	22.06
		RB Size=50, RB Offset=49	21.73	21.67	21.75
		RB Size=100, RB Offset=0	21.93	21.73	21.93
	16QAM	RB Size=1, RB Offset=0	22.06	22.07	22.11
		RB Size=1, RB Offset=49	22.06	21.97	22.01
		RB Size=1, RB Offset=99	22.06	21.77	21.98
		RB Size=50, RB Offset=0	20.95	21.10	20.99
		RB Size=50, RB Offset=24	20.79	20.98	21.01
		RB Size=50, RB Offset=49	20.54	20.79	20.81
		RB Size=100, RB Offset=0	21.10	20.79	20.99

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.88	13	Pass
QPSK (100RB Size)	5.93	13	Pass
16QAM (1RB Size)	7.02	13	Pass
16QAM (100RB Size)	7.07	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	78.19	3	1.9	H	8.1	1.30	9.40	16.20	33
1880.00	82.29	10	1.9	V	12.0	1.30	9.40	20.10	33
3 MHz Bandwidth									
1880.00	78.69	152	1.5	H	8.6	1.30	9.40	16.70	33
1880.00	83.15	38	2.4	V	12.9	1.30	9.40	21.00	33
5 MHz Bandwidth									
1880.00	78.61	335	1.3	H	8.6	1.30	9.40	16.70	33
1880.00	82.94	188	1.0	V	12.7	1.30	9.40	20.80	33
10 MHz Bandwidth									
1880.00	78.86	130	1.9	H	8.8	1.30	9.40	16.90	33
1880.00	83.12	128	1.0	V	12.9	1.30	9.40	21.00	33
15 MHz Bandwidth									
1880.00	78.51	17	1.7	H	8.5	1.30	9.40	16.60	33
1880.00	82.00	9	1.5	V	11.7	1.30	9.40	19.80	33
20 MHz Bandwidth									
1880.00	78.96	2	1.7	H	8.9	1.30	9.40	17.00	33
1880.00	83.39	243	1.7	V	13.1	1.30	9.40	21.20	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	78.43	169	1.5	H	8.4	1.30	9.40	16.50	33
1880.00	82.21	322	2.0	V	11.9	1.30	9.40	20.00	33
3 MHz Bandwidth									
1880.00	78.32	26	1.7	H	8.3	1.30	9.40	16.40	33
1880.00	82.16	145	2.3	V	11.9	1.30	9.40	20.00	33
5 MHz Bandwidth									
1880.00	78.24	58	1.4	H	8.2	1.30	9.40	16.30	33
1880.00	81.69	12	1.9	V	11.4	1.30	9.40	19.50	33
10 MHz Bandwidth									
1880.00	78.36	336	1.6	H	8.3	1.30	9.40	16.40	33
1880.00	81.84	236	1.8	V	11.6	1.30	9.40	19.70	33
15 MHz Bandwidth									
1880.00	78.25	268	1.8	H	8.2	1.30	9.40	16.30	33
1880.00	81.69	307	1.8	V	11.4	1.30	9.40	19.50	33
20 MHz Bandwidth									
1880.00	78.19	209	1.1	H	8.1	1.30	9.40	16.20	33
1880.00	81.81	44	1.5	V	11.5	1.30	9.40	19.60	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.43	22.35	22.63
		RB Size=1, RB Offset=2	22.51	22.30	22.66
		RB Size=1, RB Offset=5	22.60	22.07	22.66
		RB Size=3, RB Offset=0	22.76	22.77	22.65
		RB Size=3, RB Offset=1	22.48	22.74	22.66
		RB Size=3, RB Offset=2	22.42	22.60	22.48
		RB Size=6, RB Offset=0	21.45	21.56	21.45
	16QAM	RB Size=1, RB Offset=0	22.01	21.95	22.07
		RB Size=1, RB Offset=2	21.92	22.06	21.76
		RB Size=1, RB Offset=5	21.84	21.93	22.04
		RB Size=3, RB Offset=0	22.94	21.96	21.73
		RB Size=3, RB Offset=1	22.99	21.76	22.11
		RB Size=3, RB Offset=2	22.61	21.90	21.72
		RB Size=6, RB Offset=0	20.65	20.68	20.81
3.0	QPSK	RB Size=1, RB Offset=0	22.48	22.39	22.61
		RB Size=1, RB Offset=7	22.29	22.49	22.36
		RB Size=1, RB Offset=14	22.31	22.24	22.24
		RB Size=8, RB Offset=0	21.50	21.77	21.62
		RB Size=8, RB Offset=4	21.43	21.60	21.77
		RB Size=8, RB Offset=7	21.60	21.28	21.64
		RB Size=15, RB Offset=0	21.65	21.52	21.91
	16QAM	RB Size=1, RB Offset=0	21.81	21.65	21.70
		RB Size=1, RB Offset=7	21.76	21.79	21.41
		RB Size=1, RB Offset=14	21.69	21.48	21.30
		RB Size=8, RB Offset=0	20.74	20.81	20.82
		RB Size=8, RB Offset=4	20.61	20.64	20.79
		RB Size=8, RB Offset=7	20.69	20.74	20.68
		RB Size=15, RB Offset=0	21.04	20.90	20.79

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.70	22.77	22.96
		RB Size=1, RB Offset=12	22.60	22.63	22.72
		RB Size=1, RB Offset=24	22.67	22.53	22.69
		RB Size=12, RB Offset=0	21.83	21.63	21.72
		RB Size=12, RB Offset=6	21.75	21.72	21.69
		RB Size=12, RB Offset=11	21.68	21.76	21.56
		RB Size=25, RB Offset=0	21.78	21.80	21.77
	16QAM	RB Size=1, RB Offset=0	22.12	22.07	21.96
		RB Size=1, RB Offset=12	21.87	21.73	21.61
		RB Size=1, RB Offset=24	21.90	21.72	21.71
		RB Size=12, RB Offset=0	20.92	21.10	21.00
		RB Size=12, RB Offset=6	20.86	20.91	20.90
		RB Size=12, RB Offset=11	20.74	20.81	20.88
		RB Size=25, RB Offset=0	20.93	20.77	20.61
10.0	QPSK	RB Size=1, RB Offset=0	22.65	22.72	22.88
		RB Size=1, RB Offset=24	22.81	22.70	22.68
		RB Size=1, RB Offset=49	22.49	22.84	22.78
		RB Size=25, RB Offset=0	21.65	21.72	21.76
		RB Size=25, RB Offset=12	21.81	22.01	21.64
		RB Size=25, RB Offset=24	21.62	21.41	21.76
		RB Size=50, RB Offset=0	21.71	21.79	21.80
	16QAM	RB Size=1, RB Offset=0	22.23	22.32	22.23
		RB Size=1, RB Offset=24	22.20	22.13	22.24
		RB Size=1, RB Offset=49	22.24	22.34	22.01
		RB Size=25, RB Offset=0	20.85	20.69	20.77
		RB Size=25, RB Offset=12	20.71	20.77	20.83
		RB Size=25, RB Offset=24	20.60	20.74	20.81
		RB Size=50, RB Offset=0	20.94	20.96	20.99

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	22.64	22.70	22.63
		RB Size=1, RB Offset=37	22.60	22.42	22.54
		RB Size=1, RB Offset=74	22.61	22.47	22.42
		RB Size=36, RB Offset=0	22.02	22.06	21.92
		RB Size=36, RB Offset=18	21.89	21.84	21.94
		RB Size=36, RB Offset=37	22.00	21.79	21.79
		RB Size=75, RB Offset=0	21.70	21.55	21.57
	16QAM	RB Size=1, RB Offset=0	21.79	21.63	21.60
		RB Size=1, RB Offset=37	21.69	21.64	21.59
		RB Size=1, RB Offset=74	21.46	21.46	21.74
		RB Size=36, RB Offset=0	21.01	20.79	20.69
		RB Size=36, RB Offset=18	20.74	20.60	20.71
		RB Size=36, RB Offset=37	20.46	20.53	20.67
		RB Size=75, RB Offset=0	20.83	21.03	20.82
20.0	QPSK	RB Size=1, RB Offset=0	22.88	22.39	22.53
		RB Size=1, RB Offset=49	22.89	22.42	22.32
		RB Size=1, RB Offset=99	22.87	22.50	22.37
		RB Size=50, RB Offset=0	22.03	22.17	21.82
		RB Size=50, RB Offset=24	21.96	21.91	22.05
		RB Size=50, RB Offset=49	21.73	21.95	21.73
		RB Size=100, RB Offset=0	21.80	21.41	21.72
	16QAM	RB Size=1, RB Offset=0	22.39	22.16	22.34
		RB Size=1, RB Offset=49	22.18	22.32	22.43
		RB Size=1, RB Offset=99	22.08	22.35	22.23
		RB Size=50, RB Offset=0	21.00	21.14	21.13
		RB Size=50, RB Offset=24	21.02	20.92	21.09
		RB Size=50, RB Offset=49	21.01	21.24	21.07
		RB Size=100, RB Offset=0	20.85	20.93	20.85

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.38	13	Pass
QPSK (100RB Size)	6.43	13	Pass
16QAM (1RB Size)	7.34	13	Pass
16QAM (100RB Size)	7.36	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	82.69	344	2.1	H	9.5	1.30	8.90	17.10	30
1732.50	85.96	348	2.5	V	13.4	1.30	8.90	21.00	30
3 MHz Bandwidth									
1732.50	81.59	231	1.8	H	8.4	1.30	8.90	16.00	30
1732.50	85.59	269	1.9	V	13.0	1.30	8.90	20.60	30
5 MHz Bandwidth									
1732.50	81.63	96	1.6	H	8.5	1.30	8.90	16.10	30
1732.50	85.14	275	2.4	V	12.6	1.30	8.90	20.20	30
10 MHz Bandwidth									
1732.50	81.47	175	1.6	H	8.3	1.30	8.90	15.90	30
1732.50	85.03	296	1.9	V	12.5	1.30	8.90	20.10	30
15 MHz Bandwidth									
1732.50	82.15	221	1.8	H	9.0	1.30	8.90	16.60	30
1732.50	86.34	157	2.0	V	13.8	1.30	8.90	21.40	30
20 MHz Bandwidth									
1732.50	82.63	227	1.2	H	9.5	1.30	8.90	17.10	30
1732.50	85.91	118	1.2	V	13.3	1.30	8.90	20.90	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	82.39	357	1.4	H	9.2	1.30	8.90	16.80	30
1732.50	85.29	56	1.4	V	12.7	1.30	8.90	20.30	30
3 MHz Bandwidth									
1732.50	82.67	191	2.3	H	9.5	1.30	8.90	17.10	30
1732.50	85.15	235	1.9	V	12.6	1.30	8.90	20.20	30
5 MHz Bandwidth									
1732.50	81.28	154	1.8	H	8.1	1.30	8.90	15.70	30
1732.50	85.19	337	1.9	V	12.6	1.30	8.90	20.20	30
10 MHz Bandwidth									
1732.50	81.25	126	1.8	H	8.1	1.30	8.90	15.70	30
1732.50	85.06	150	1.5	V	12.5	1.30	8.90	20.10	30
15 MHz Bandwidth									
1732.50	81.96	211	2.1	H	8.8	1.30	8.90	16.40	30
1732.50	85.16	13	2.0	V	12.6	1.30	8.90	20.20	30
20 MHz Bandwidth									
1732.50	82.05	185	1.9	H	8.9	1.30	8.90	16.50	30
1732.50	85.64	320	2.3	V	13.1	1.30	8.90	20.70	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	22.95	23.19	23.06
		RB Size=1, RB Offset=2	23.12	23.01	23.04
		RB Size=1, RB Offset=5	23.04	23.12	23.15
		RB Size=3, RB Offset=0	23.11	23.03	23.23
		RB Size=3, RB Offset=1	22.78	23.02	22.98
		RB Size=3, RB Offset=2	22.87	22.71	23.06
		RB Size=6, RB Offset=0	21.97	22.09	22.14
	16QAM	RB Size=1, RB Offset=0	21.96	21.89	21.94
		RB Size=1, RB Offset=2	21.94	21.87	21.87
		RB Size=1, RB Offset=5	21.97	21.65	21.95
		RB Size=3, RB Offset=0	22.11	22.25	22.27
		RB Size=3, RB Offset=1	22.13	22.21	22.30
		RB Size=3, RB Offset=2	21.95	22.11	22.19
		RB Size=6, RB Offset=0	20.97	21.25	21.00
3.0	QPSK	RB Size=1, RB Offset=0	23.14	22.97	23.11
		RB Size=1, RB Offset=7	22.69	23.19	22.99
		RB Size=1, RB Offset=14	22.52	22.87	22.67
		RB Size=8, RB Offset=0	22.04	21.93	22.01
		RB Size=8, RB Offset=4	22.10	21.96	22.12
		RB Size=8, RB Offset=7	22.28	21.85	21.86
		RB Size=15, RB Offset=0	22.15	22.18	22.03
	16QAM	RB Size=1, RB Offset=0	22.67	22.63	22.52
		RB Size=1, RB Offset=7	22.48	22.36	22.50
		RB Size=1, RB Offset=14	22.17	22.23	22.46
		RB Size=8, RB Offset=0	21.15	21.34	21.18
		RB Size=8, RB Offset=4	21.10	21.16	21.11
		RB Size=8, RB Offset=7	21.14	21.15	21.36
		RB Size=15, RB Offset=0	21.13	21.08	21.24

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.23	22.12	22.00
		RB Size=1, RB Offset=12	22.04	21.92	21.87
		RB Size=1, RB Offset=24	21.91	21.91	21.89
		RB Size=12, RB Offset=0	21.36	21.24	21.06
		RB Size=12, RB Offset=6	20.95	21.32	21.06
		RB Size=12, RB Offset=11	20.93	21.09	21.01
		RB Size=25, RB Offset=0	22.14	22.27	22.01
	16QAM	RB Size=1, RB Offset=0	22.08	22.11	21.98
		RB Size=1, RB Offset=12	21.93	21.92	21.96
		RB Size=1, RB Offset=24	22.10	21.48	22.18
		RB Size=12, RB Offset=0	21.41	21.05	21.40
		RB Size=12, RB Offset=6	20.90	21.18	21.26
		RB Size=12, RB Offset=11	20.89	21.04	20.92
		RB Size=25, RB Offset=0	21.12	21.13	21.11
10.0	QPSK	RB Size=1, RB Offset=0	22.68	22.78	22.85
		RB Size=1, RB Offset=24	22.79	22.57	22.65
		RB Size=1, RB Offset=49	22.52	22.79	22.76
		RB Size=25, RB Offset=0	21.70	21.63	21.77
		RB Size=25, RB Offset=12	21.83	21.91	21.67
		RB Size=25, RB Offset=24	21.69	21.48	21.90
		RB Size=50, RB Offset=0	21.91	21.68	21.80
	16QAM	RB Size=1, RB Offset=0	22.39	22.40	22.19
		RB Size=1, RB Offset=24	22.20	22.14	22.16
		RB Size=1, RB Offset=49	22.08	22.34	22.01
		RB Size=25, RB Offset=0	20.73	20.74	20.78
		RB Size=25, RB Offset=12	20.69	20.65	20.93
		RB Size=25, RB Offset=24	20.48	20.83	20.76
		RB Size=50, RB Offset=0	20.96	20.99	20.80

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.33	13	Pass
QPSK (50RB Size)	6.37	13	Pass
16QAM (1RB Size)	7.39	13	Pass
16QAM (50RB Size)	7.44	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	77.82	175	2.5	H	18.4	1.90	0.0	16.50	38.45
836.5	80.63	56	1.6	V	20.6	1.90	0.0	18.70	38.45
3 MHz Bandwidth									
836.5	77.25	116	1.6	H	17.9	1.90	0.0	16.00	38.45
836.5	80.67	127	1.3	V	20.7	1.90	0.0	18.80	38.45
5 MHz Bandwidth									
836.5	77.56	146	1.7	H	18.2	1.90	0.0	16.30	38.45
836.5	80.88	309	1.4	V	20.9	1.90	0.0	19.00	38.45
10 MHz Bandwidth									
836.5	77.16	315	1.1	H	17.8	1.90	0.0	15.90	38.45
836.5	80.29	8	2.0	V	20.3	1.90	0.0	18.40	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	77.78	114	2.4	H	18.4	1.90	0.0	16.50	38.45
836.5	80.49	338	2.3	V	20.5	1.90	0.0	18.60	38.45
3 MHz Bandwidth									
836.5	77.17	47	1.3	H	17.8	1.90	0.0	15.90	38.45
836.5	80.39	259	2.0	V	20.4	1.90	0.0	18.50	38.45
5 MHz Bandwidth									
836.5	77.59	286	2.2	H	18.2	1.90	0.0	16.30	38.45
836.5	80.55	316	2.2	V	20.6	1.90	0.0	18.70	38.45
10 MHz Bandwidth									
836.5	77.71	83	1.2	H	18.3	1.90	0.0	16.40	38.45
836.5	80.80	174	2.0	V	20.8	1.90	0.0	18.90	38.45

LTE Band 7:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	23.25	22.98	22.73
		RB Size=1, RB Offset=12	22.82	22.43	22.31
		RB Size=1, RB Offset=24	23.39	23.00	23.01
		RB Size=12, RB Offset=0	22.11	21.63	21.28
		RB Size=12, RB Offset=6	21.89	21.59	21.58
		RB Size=12, RB Offset=11	22.13	21.63	21.55
		RB Size=25, RB Offset=0	21.98	21.58	22.36
	16QAM	RB Size=1, RB Offset=0	22.71	21.90	22.11
		RB Size=1, RB Offset=12	22.51	21.88	22.14
		RB Size=1, RB Offset=24	22.68	21.95	22.36
		RB Size=12, RB Offset=0	21.81	21.02	21.34
		RB Size=12, RB Offset=6	21.78	21.16	21.40
		RB Size=12, RB Offset=11	21.79	21.09	21.58
		RB Size=25, RB Offset=0	21.06	20.72	20.71
10	QPSK	RB Size=1, RB Offset=0	22.76	22.46	22.98
		RB Size=1, RB Offset=24	22.85	22.38	22.66
		RB Size=1, RB Offset=49	22.51	22.28	22.91
		RB Size=25, RB Offset=0	22.01	21.77	22.13
		RB Size=25, RB Offset=12	21.82	21.88	22.01
		RB Size=25, RB Offset=24	21.91	21.73	22.14
		RB Size=50, RB Offset=0	22.29	21.47	21.68
	16QAM	RB Size=1, RB Offset=0	21.82	22.17	21.89
		RB Size=1, RB Offset=24	21.59	22.37	21.99
		RB Size=1, RB Offset=49	21.81	22.12	21.99
		RB Size=25, RB Offset=0	21.25	21.25	21.36
		RB Size=25, RB Offset=12	21.38	21.19	21.09
		RB Size=25, RB Offset=24	21.27	21.44	21.36
		RB Size=50, RB Offset=0	21.25	20.43	20.76

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	22.79	22.83	24.04
		RB Size=1, RB Offset=37	22.52	22.84	23.71
		RB Size=1, RB Offset=74	22.78	22.80	23.89
		RB Size=36, RB Offset=0	22.12	22.07	23.03
		RB Size=36, RB Offset=18	21.93	21.82	23.21
		RB Size=36, RB Offset=37	22.18	22.06	23.03
		RB Size=75, RB Offset=0	22.07	21.45	22.22
	16QAM	RB Size=1, RB Offset=0	22.11	21.91	22.71
		RB Size=1, RB Offset=37	21.90	21.53	22.91
		RB Size=1, RB Offset=74	22.05	21.55	23.05
		RB Size=36, RB Offset=0	21.26	20.98	22.04
		RB Size=36, RB Offset=18	21.37	21.04	21.79
		RB Size=36, RB Offset=37	21.21	21.20	21.97
		RB Size=75, RB Offset=0	20.83	20.56	21.56
20	QPSK	RB Size=1, RB Offset=0	22.65	23.16	23.69
		RB Size=1, RB Offset=49	22.67	22.98	23.31
		RB Size=1, RB Offset=99	22.93	23.17	23.69
		RB Size=50, RB Offset=0	22.10	22.30	22.80
		RB Size=50, RB Offset=24	22.24	22.18	22.86
		RB Size=50, RB Offset=49	22.03	22.24	22.91
		RB Size=100, RB Offset=0	22.34	21.76	22.48
	16QAM	RB Size=1, RB Offset=0	22.17	22.40	22.94
		RB Size=1, RB Offset=49	21.99	22.27	22.78
		RB Size=1, RB Offset=99	22.09	22.24	23.01
		RB Size=50, RB Offset=0	21.33	21.43	22.27
		RB Size=50, RB Offset=24	21.37	21.55	22.16
		RB Size=50, RB Offset=49	21.21	21.51	22.09
		RB Size=100, RB Offset=0	21.31	20.72	21.51

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	79.39	121	1.7	H	9.9	2.60	10.20	17.50	33
2535.00	81.34	158	2.0	V	12.5	2.60	10.20	20.10	33
10 MHz Bandwidth									
2535.00	79.01	35	2.1	H	9.5	2.60	10.20	17.10	33
2535.00	81.15	78	1.8	V	12.3	2.60	10.20	19.90	33
15 MHz Bandwidth									
2535.00	79.61	94	1.8	H	10.1	2.60	10.20	17.70	33
2535.00	81.28	27	2.5	V	12.4	2.60	10.20	20.00	33
20 MHz Bandwidth									
2535.00	79.18	336	2.1	H	9.7	2.60	10.20	17.30	33
2535.00	81.00	191	1.5	V	12.1	2.60	10.20	19.70	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	78.29	69	1.1	H	8.8	2.60	10.20	16.40	33
2535.00	81.31	78	1.9	V	12.4	2.60	10.20	20.00	33
10 MHz Bandwidth									
2535.00	78.96	65	2.2	H	9.5	2.60	10.20	17.10	33
2535.00	82.18	13	1.2	V	13.3	2.60	10.20	20.90	33
15 MHz Bandwidth									
2535.00	78.49	342	1.3	H	9.0	2.60	10.20	16.60	33
2535.00	81.18	265	1.2	V	12.3	2.60	10.20	19.90	33
20 MHz Bandwidth									
2535.00	78.39	58	1.8	H	8.9	2.60	10.20	16.50	33
2535.00	81.02	179	2.2	V	12.1	2.60	10.20	19.70	33

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

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

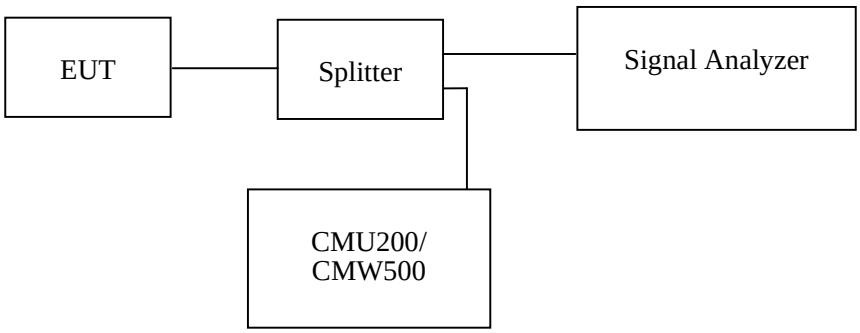
Applicable Standard

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

Test Procedure

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

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



Test Data

Environmental Conditions

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

The testing was performed by Kiki Kong on 2019-01-25 to 2019-01-27.

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	246.8	318.9
EGPRS(8PSK)	836.6	256.4	331.7

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.199	4.728
HSUPA (BPSK)	836.6	4.231	5.673
HSDPA (16QAM)	836.6	4.231	5.609

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	246.8	320.5
EGPRS(8PSK)	1880.0	246.8	317.3

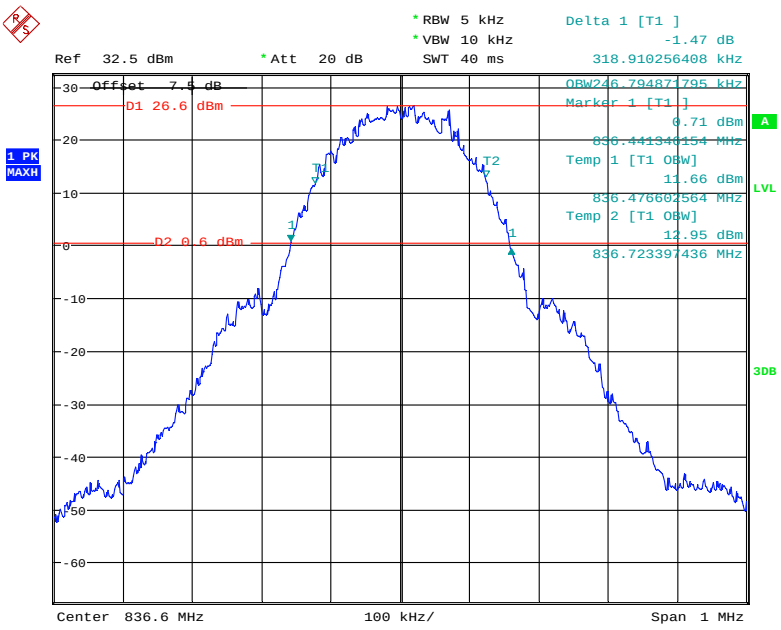
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.167	4.728
HSUPA (BPSK)	1880.0	4.199	4.872
HSDPA (16QAM)	1880.0	4.199	4.776

AWS Band (Part 27)

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1732.6	4.183	4.712
HSUPA (BPSK)	1732.6	4.215	5.176
HSDPA (16QAM)	1732.6	4.215	5.481

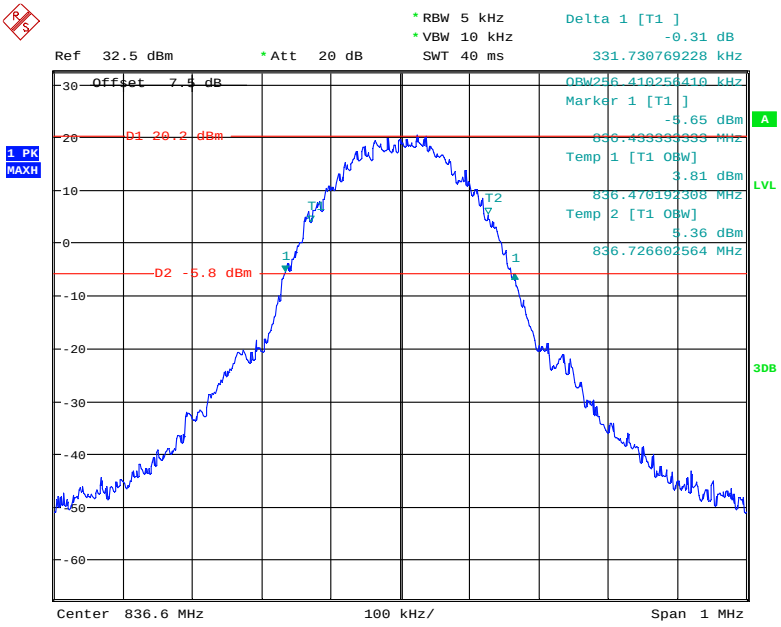
Cellular Band (Part 22H)

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



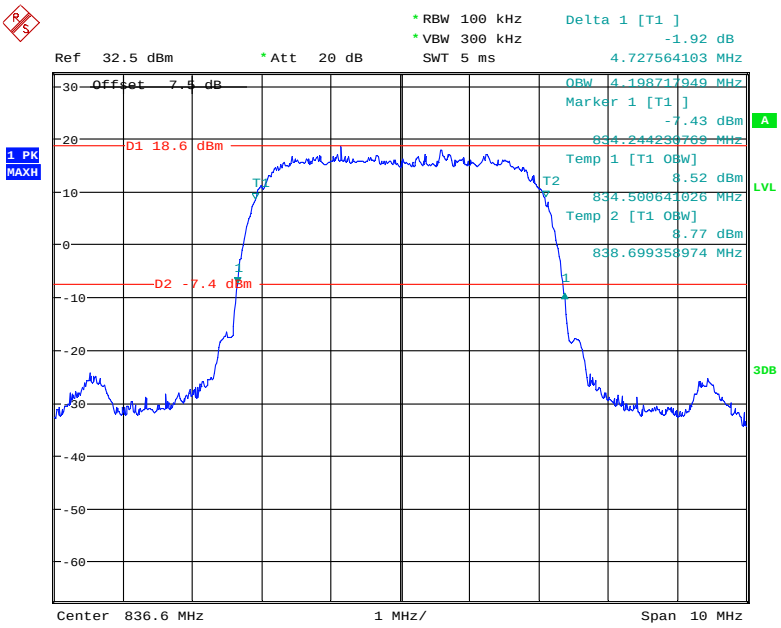
Date: 26.JAN.2019 00:17:14

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



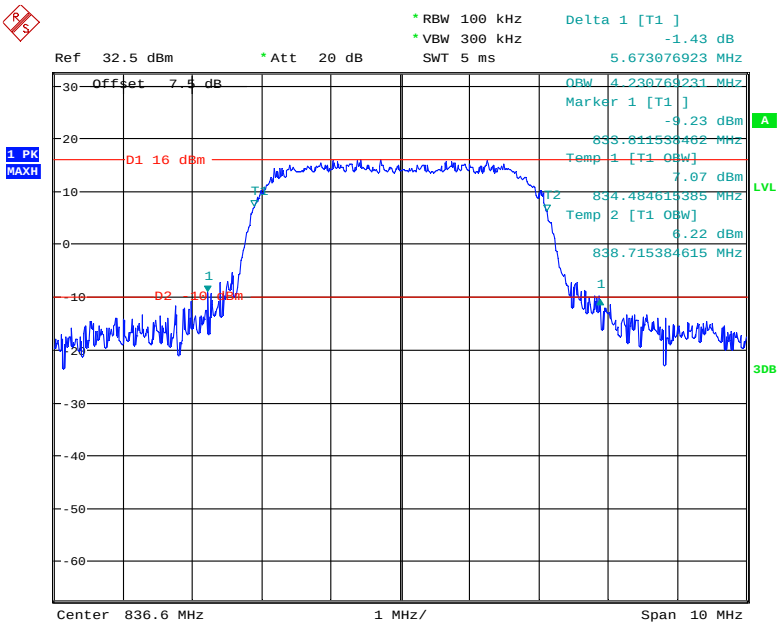
Date: 26.JAN.2019 00:14:07

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



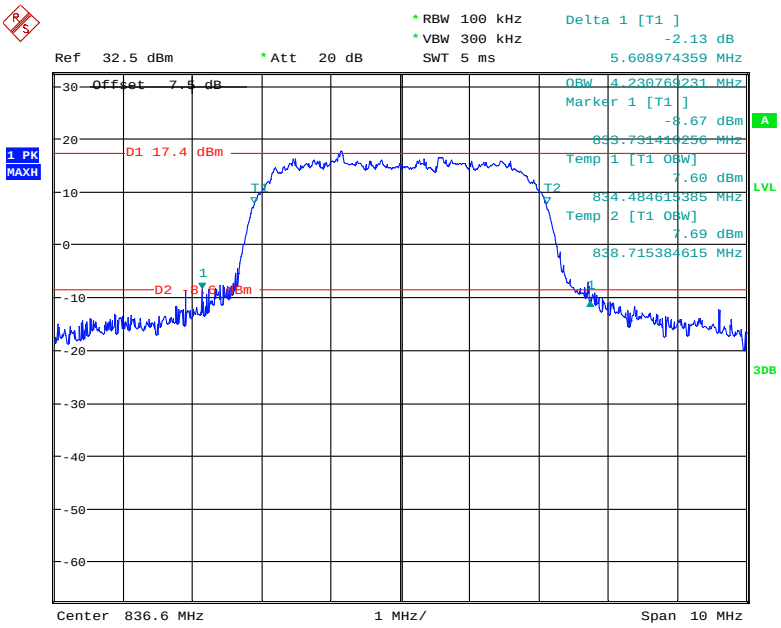
Date: 27.JAN.2019 10:23:05

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



Date: 27.JAN.2019 10:32:04

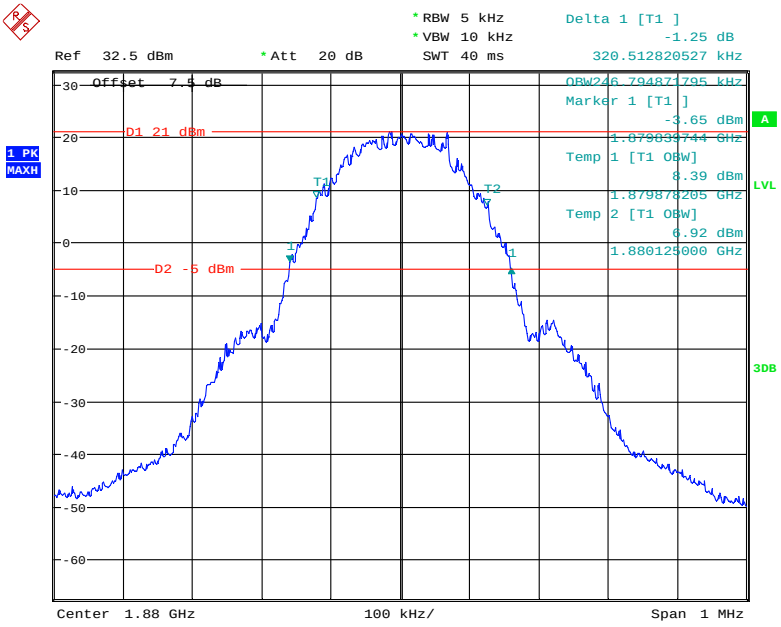
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 27.JAN.2019 10:27:03

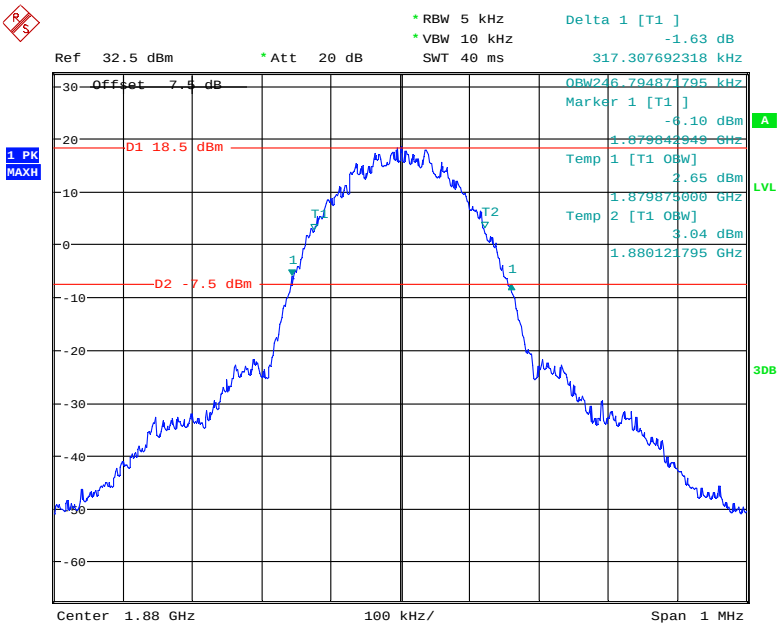
PCS Band (Part 24E)

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



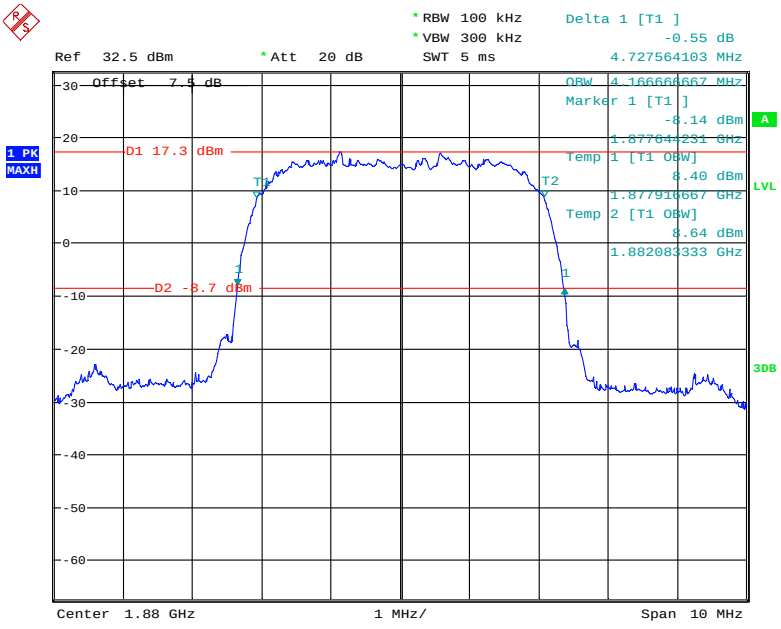
Date: 25.JAN.2019 23:44:41

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



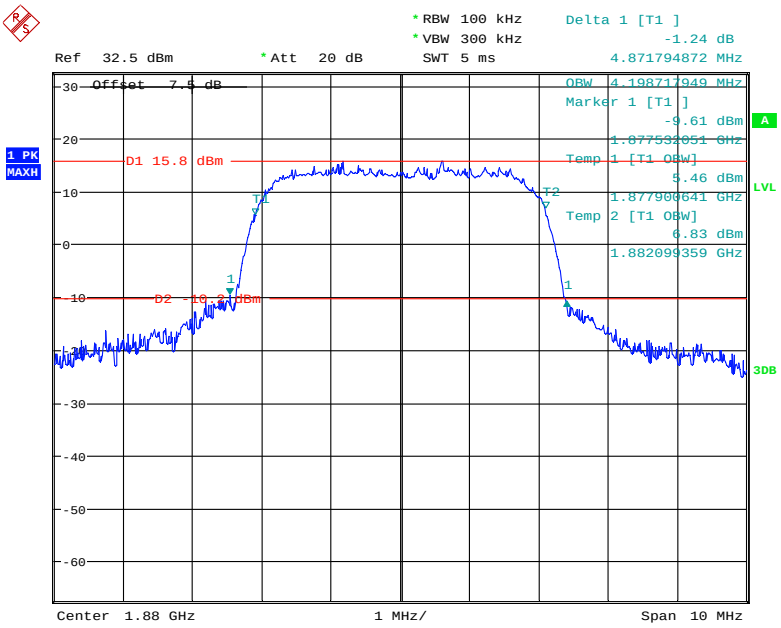
Date: 26.JAN.2019 00:12:03

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



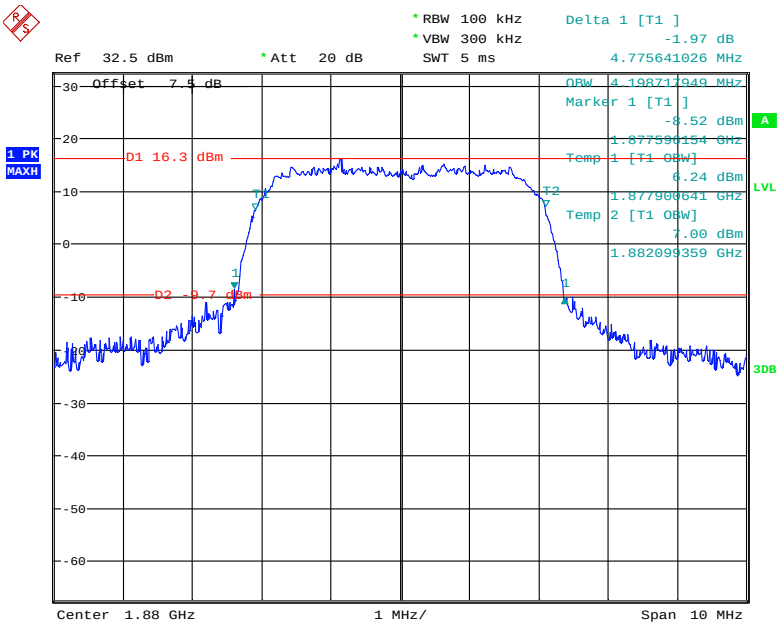
Date: 27.JAN.2019 09:27:30

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



Date: 27.JAN.2019 09:33:34

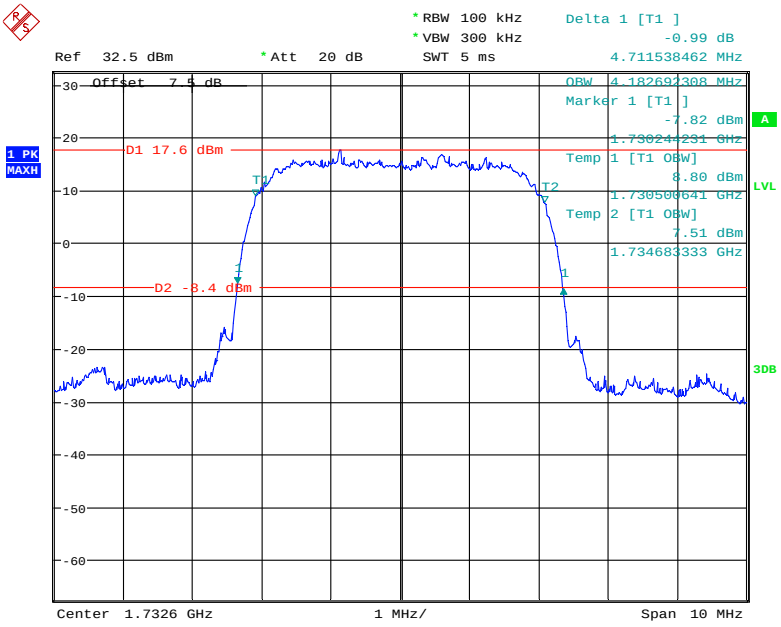
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 27.JAN.2019 09:31:26

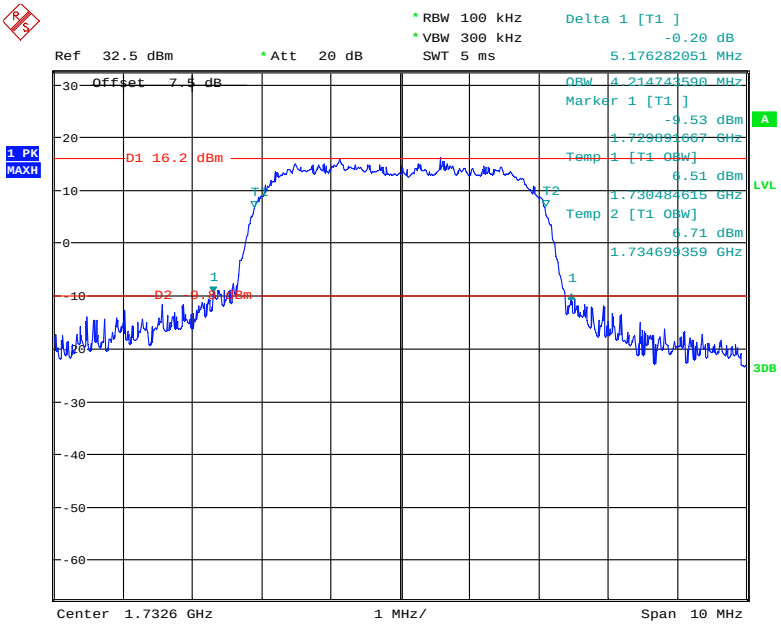
AWS Band (Part 27)

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



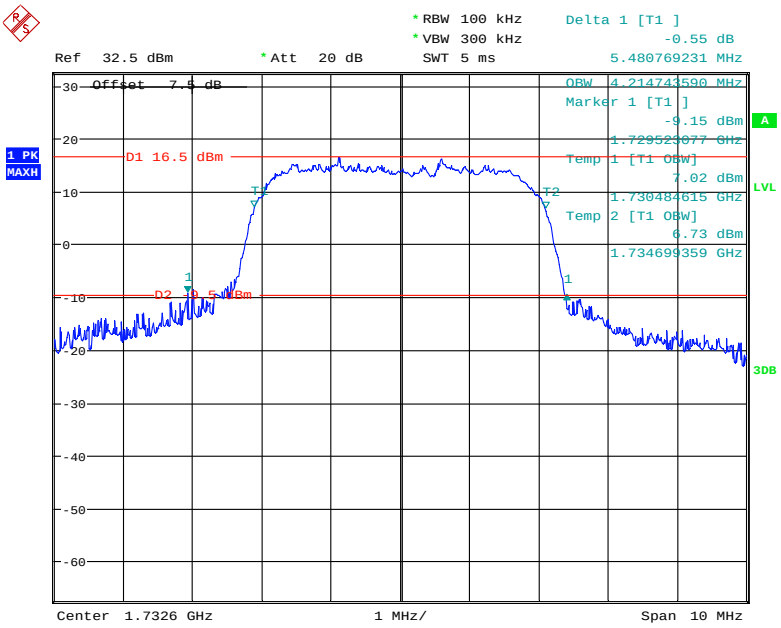
Date: 27.JAN.2019 09:50:57

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



Date: 27.JAN.2019 09:56:25

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

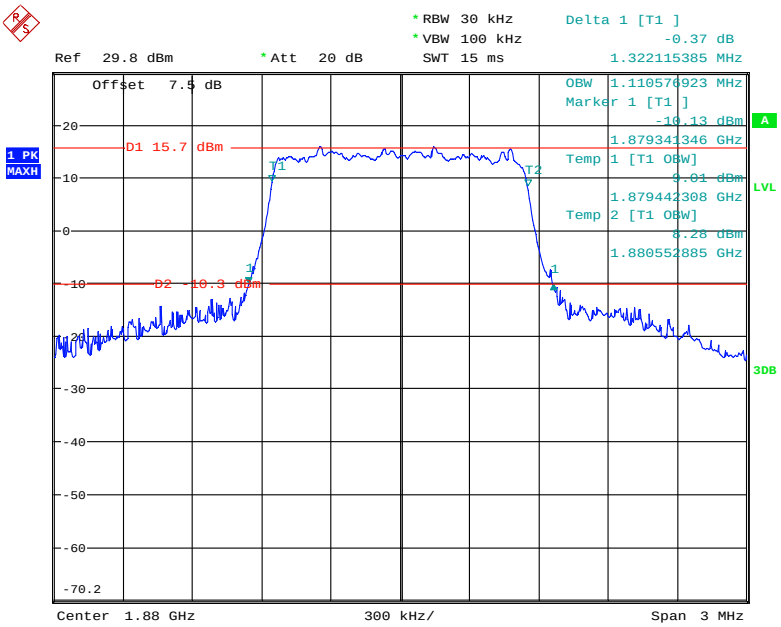


Date: 27.JAN.2019 09:53:16

LTE Band 2: (Middle Channel)

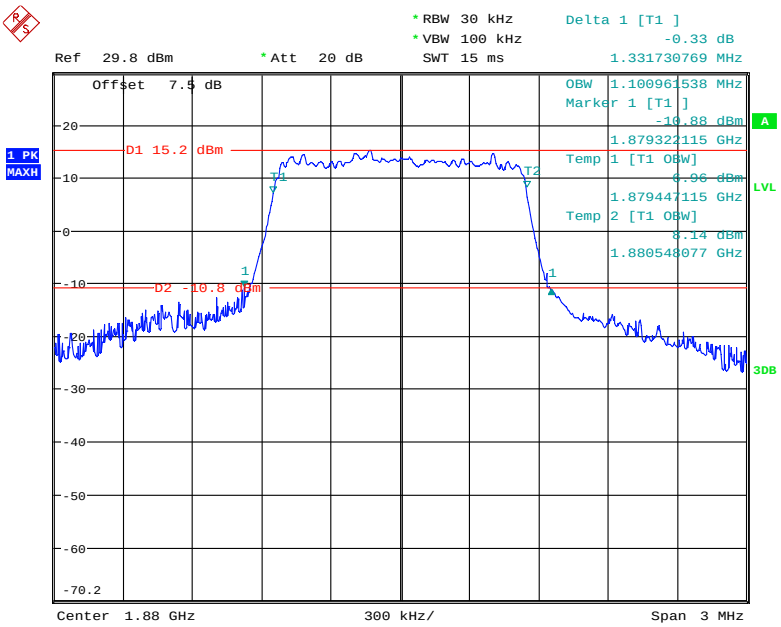
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.111	1.322
	16QAM	1.101	1.332
3.0	QPSK	2.683	2.885
	16QAM	2.683	2.904
5.0	QPSK	4.535	5.000
	16QAM	4.503	4.984
10.0	QPSK	8.974	9.776
	16QAM	8.974	9.583
15.0	QPSK	13.510	14.663
	16QAM	13.462	14.567
20.0	QPSK	17.949	18.974
	16QAM	17.949	19.103

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



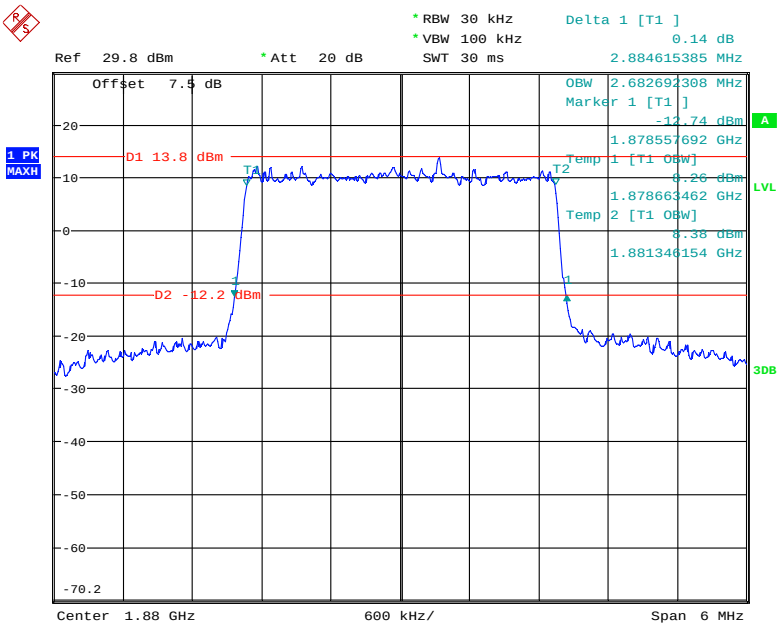
Date: 27.JAN.2019 10:58:03

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



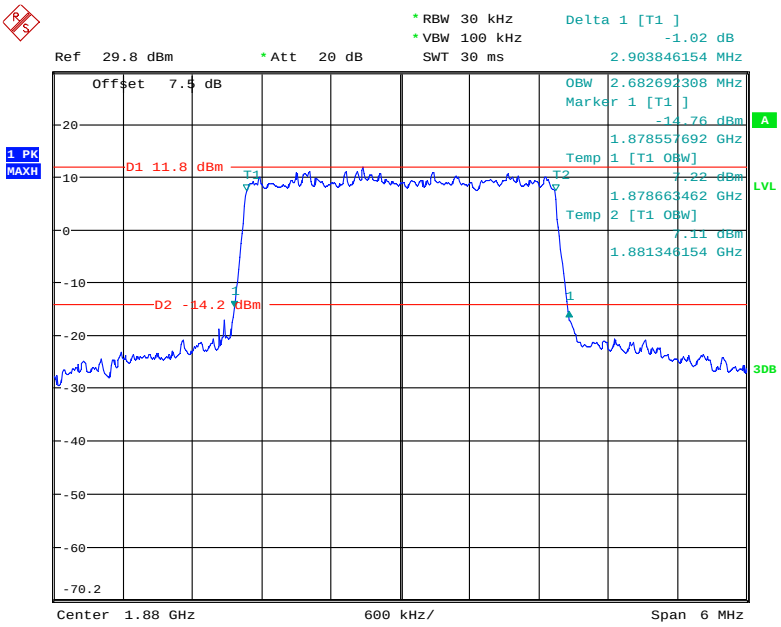
Date: 27.JAN.2019 10:59:08

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



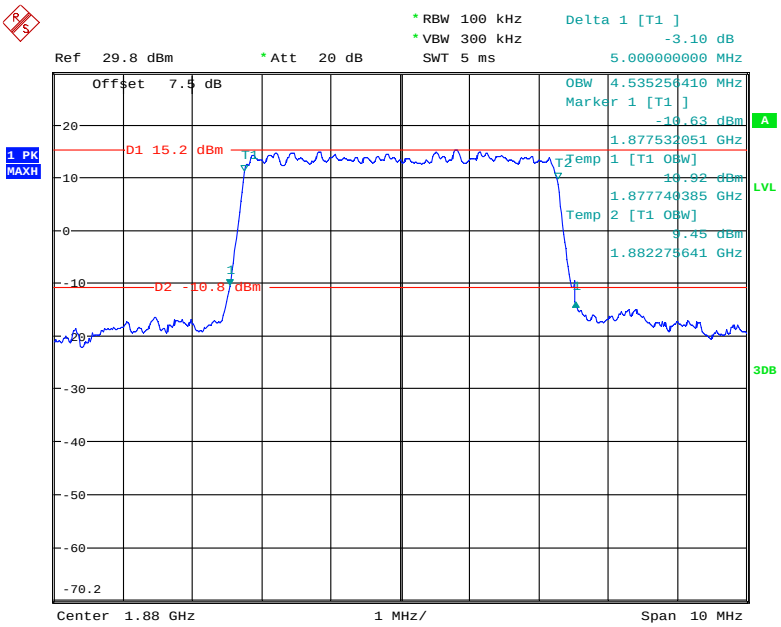
Date: 27.JAN.2019 11:02:09

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



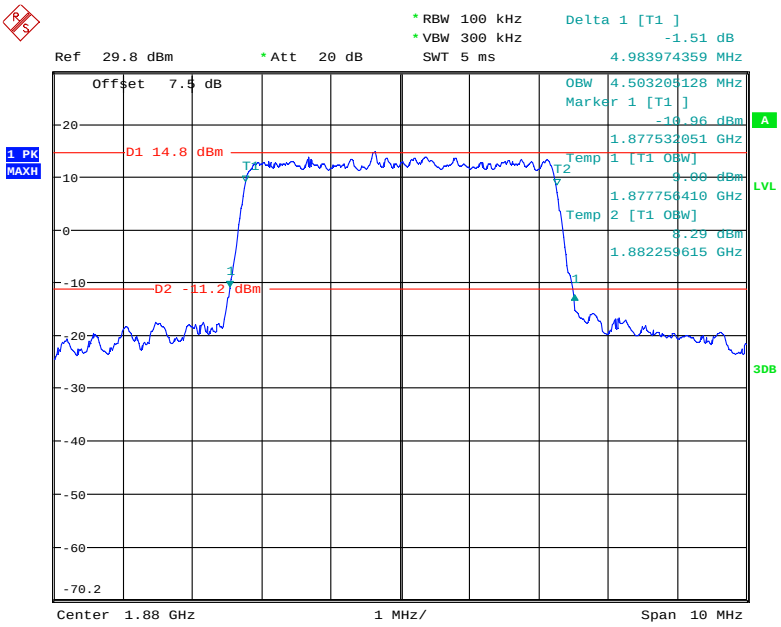
Date: 27.JAN.2019 11:00:52

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



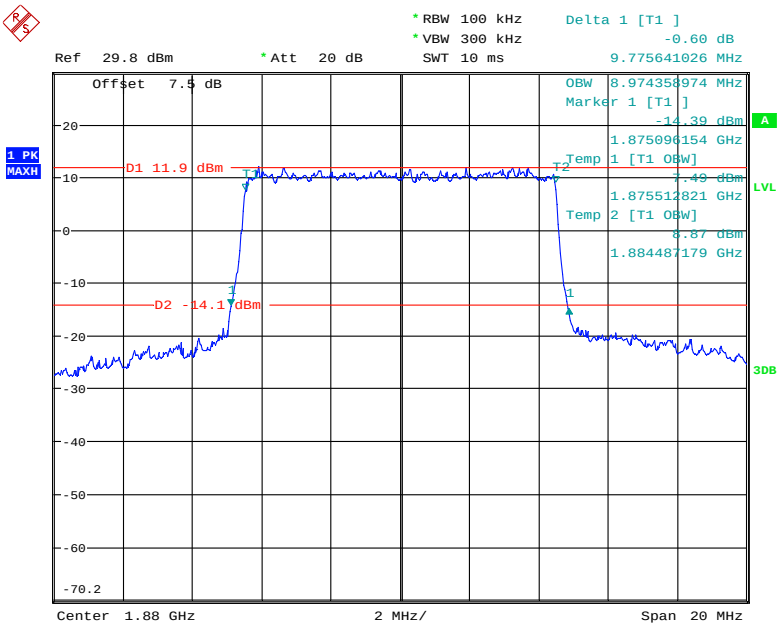
Date: 27.JAN.2019 11:06:14

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



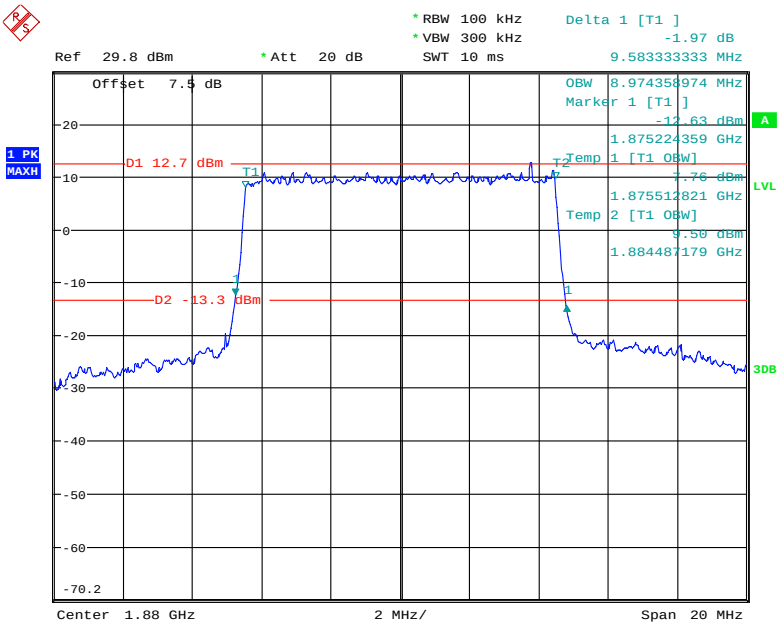
Date: 27.JAN.2019 11:03:37

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



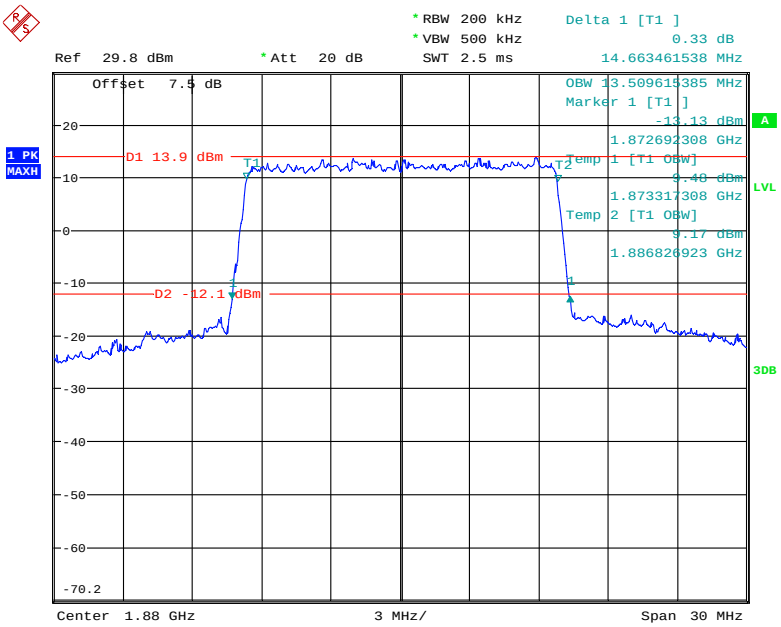
Date: 27.JAN.2019 11:09:39

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

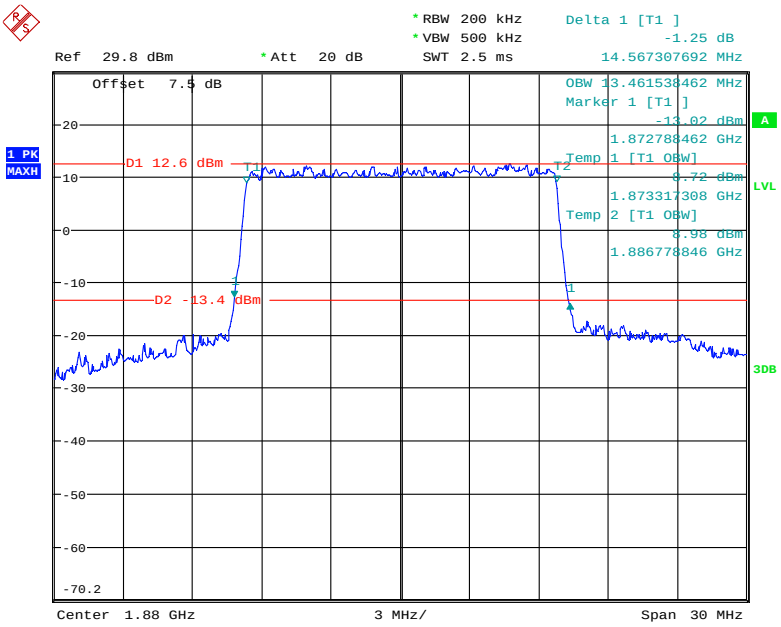


Date: 27.JAN.2019 11:08:43

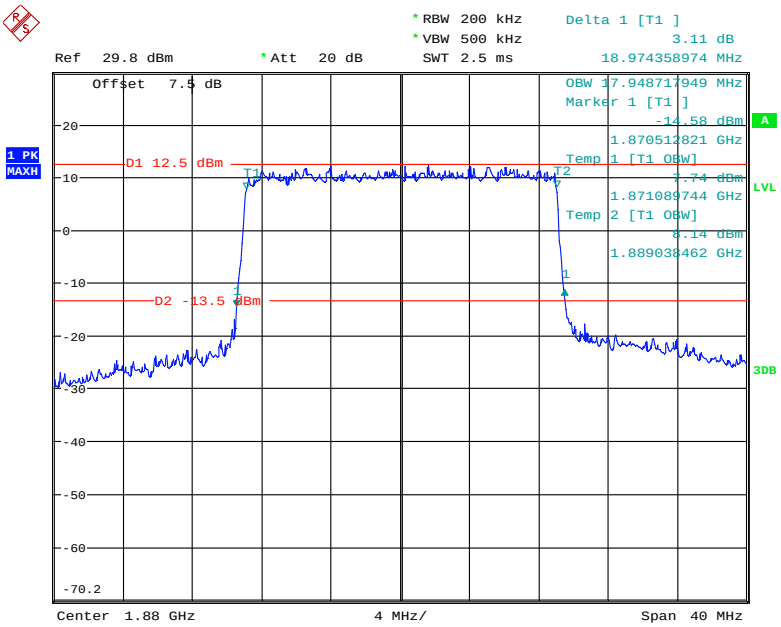
QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



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

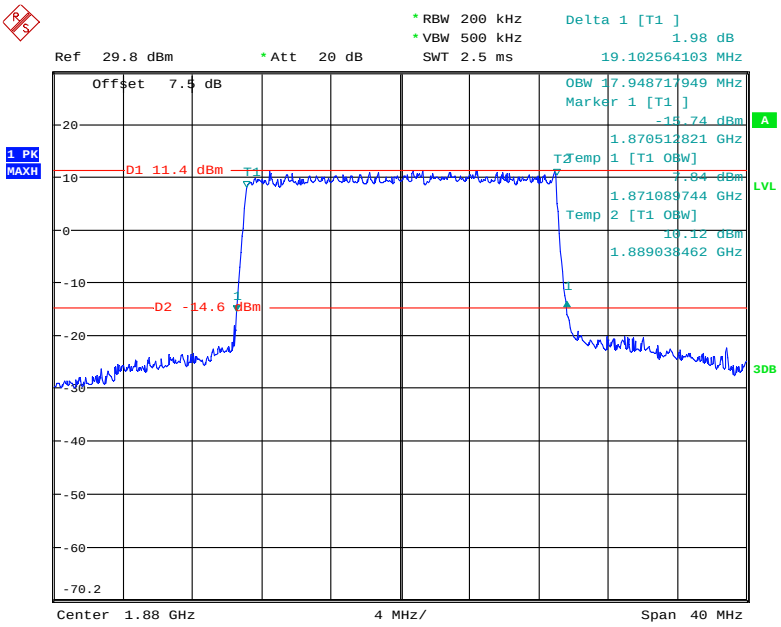


QPSK (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 27.JAN.2019 11:13:50

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

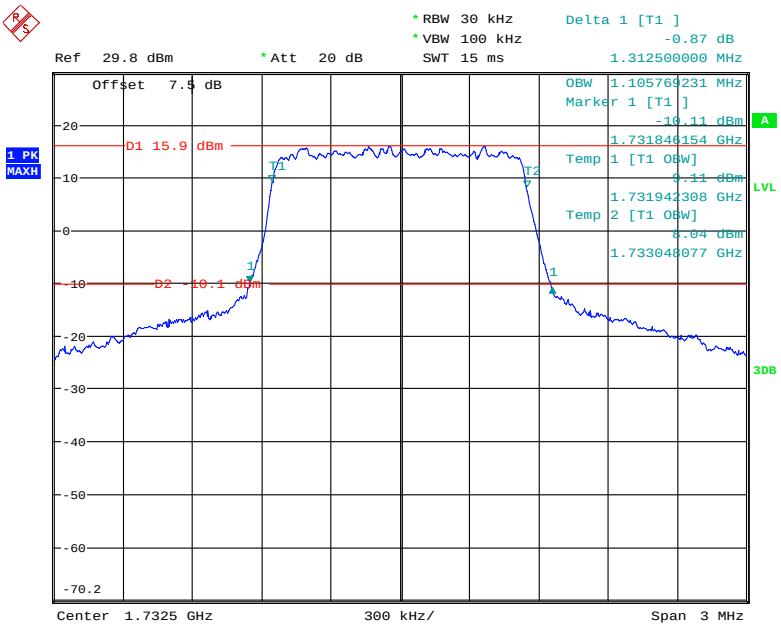


Date: 27.JAN.2019 11:15:32

LTE Band 4: (Middle Channel)

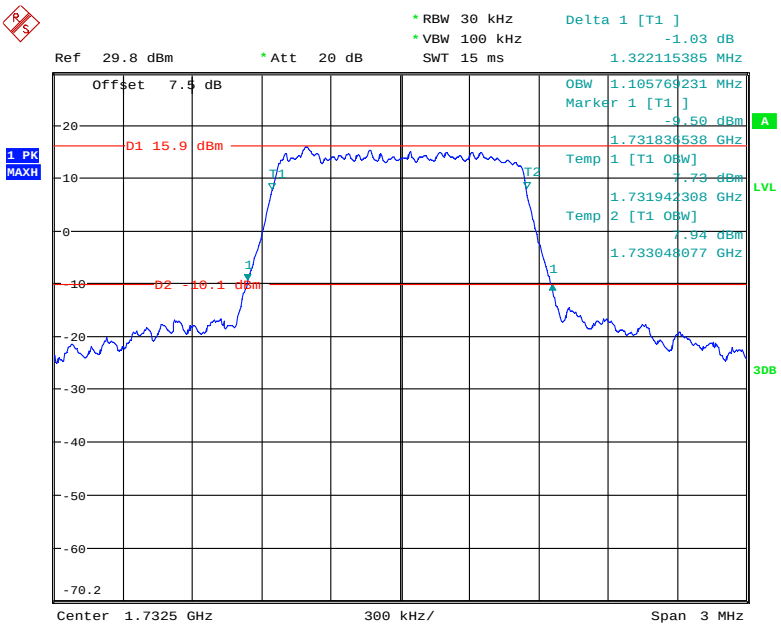
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.106	1.313
	16QAM	1.106	1.322
3.0	QPSK	2.692	2.885
	16QAM	2.692	2.894
5.0	QPSK	4.519	4.984
	16QAM	4.503	4.936
10.0	QPSK	8.974	9.679
	16QAM	8.974	9.647
15.0	QPSK	13.510	14.615
	16QAM	13.462	14.519
20.0	QPSK	17.885	19.128
	16QAM	17.949	19.038

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



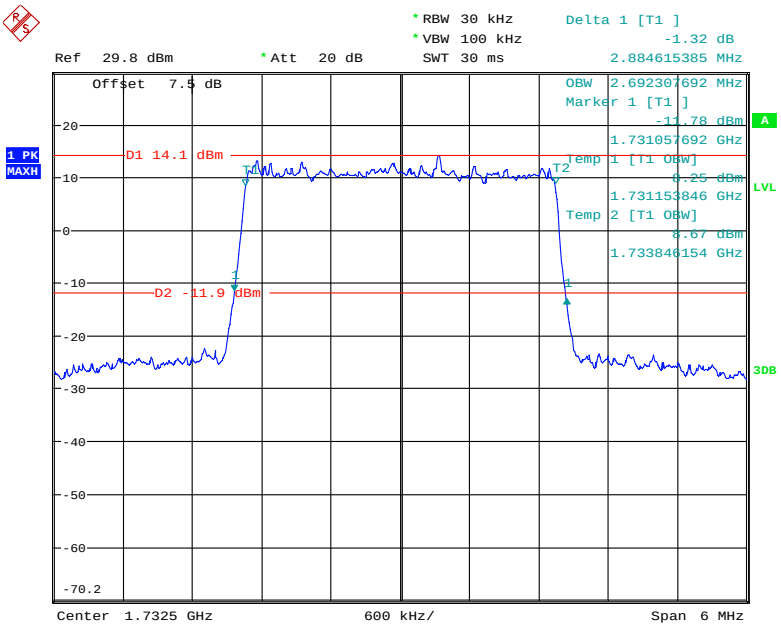
Date: 27.JAN.2019 11:20:33

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



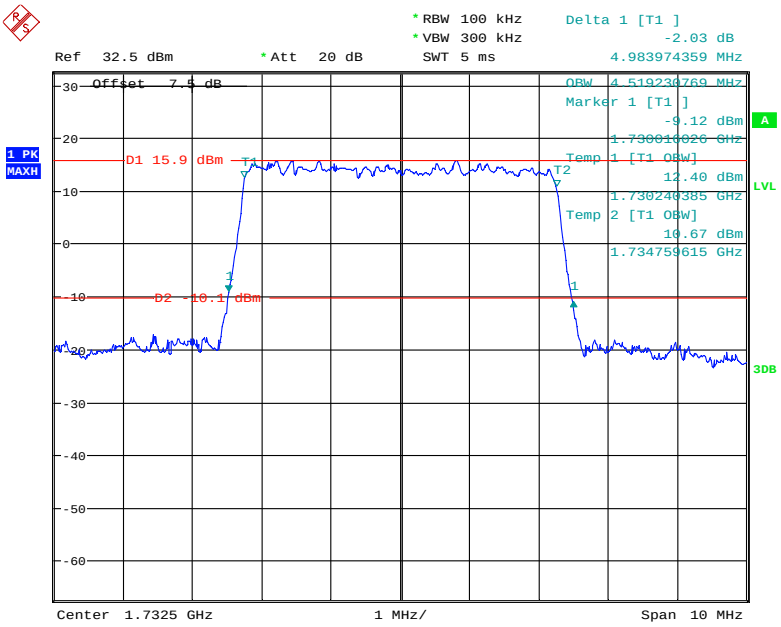
Date: 27.JAN.2019 11:18:19

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



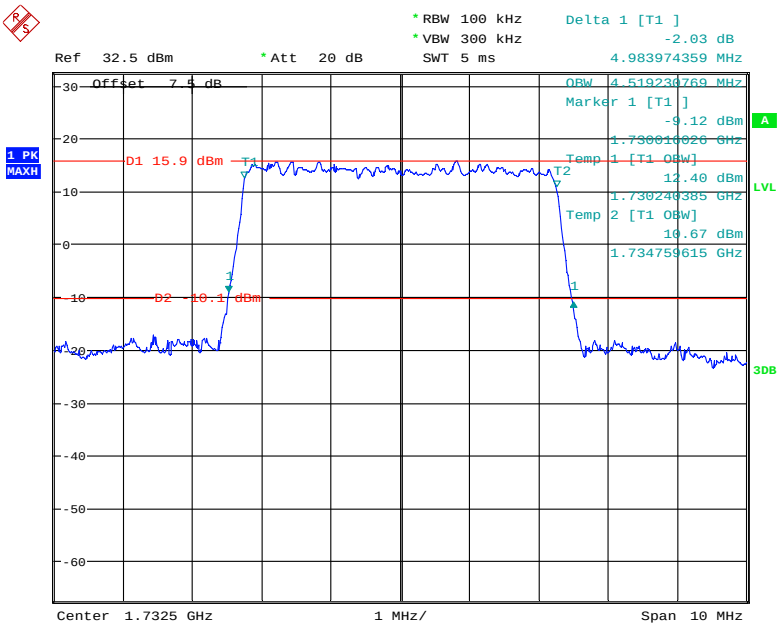
Date: 27.JAN.2019 11:21:32

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



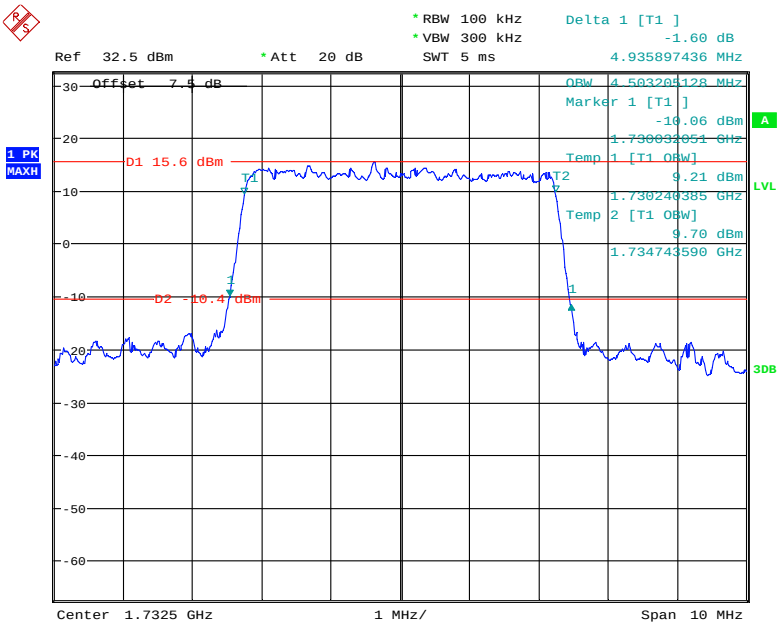
Date: 27.JAN.2019 11:25:02

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



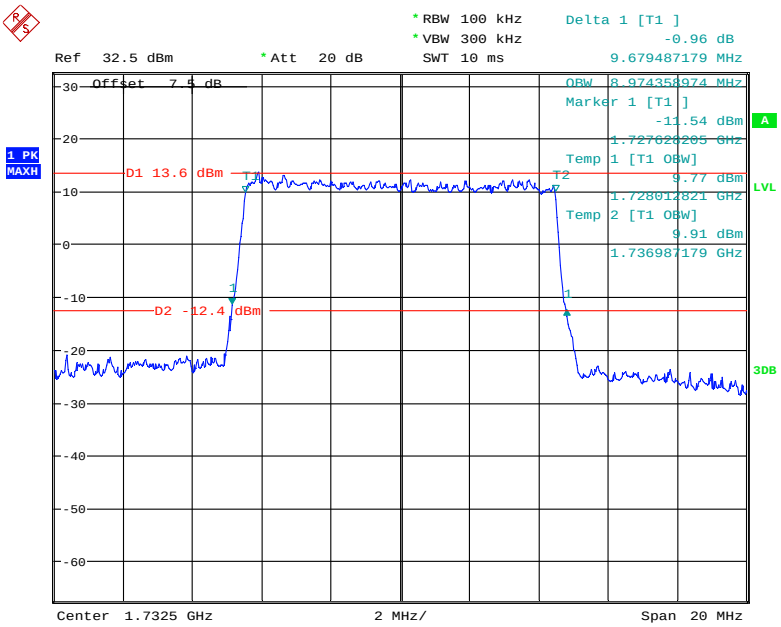
Date: 27.JAN.2019 11:25:02

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



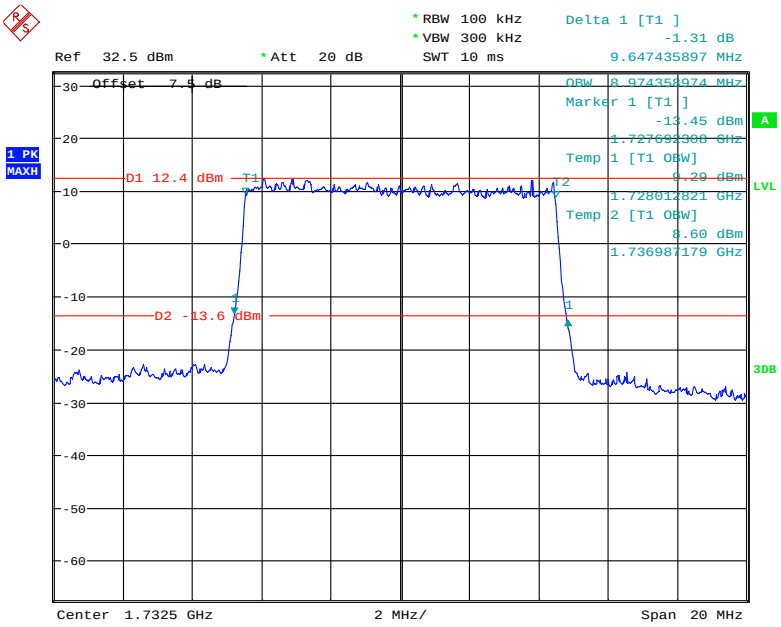
Date: 27.JAN.2019 11:26:10

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



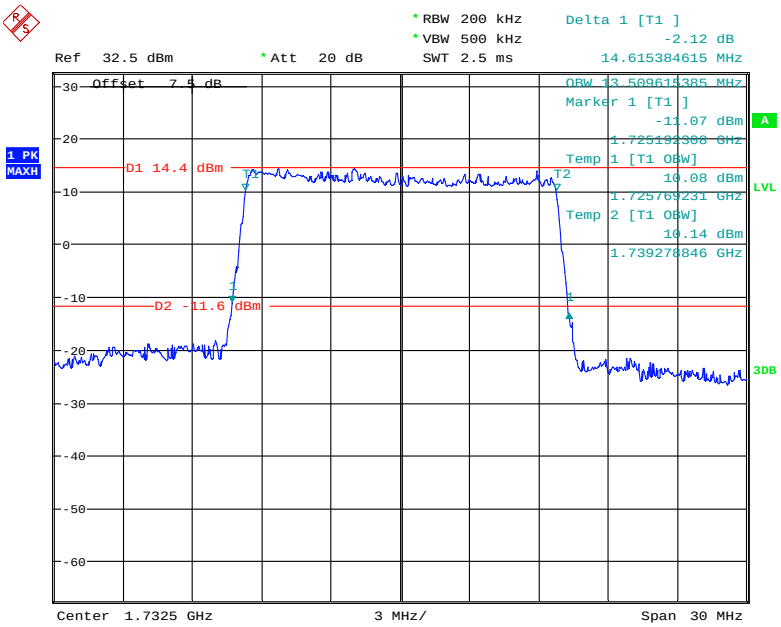
Date: 27.JAN.2019 11:27:30

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



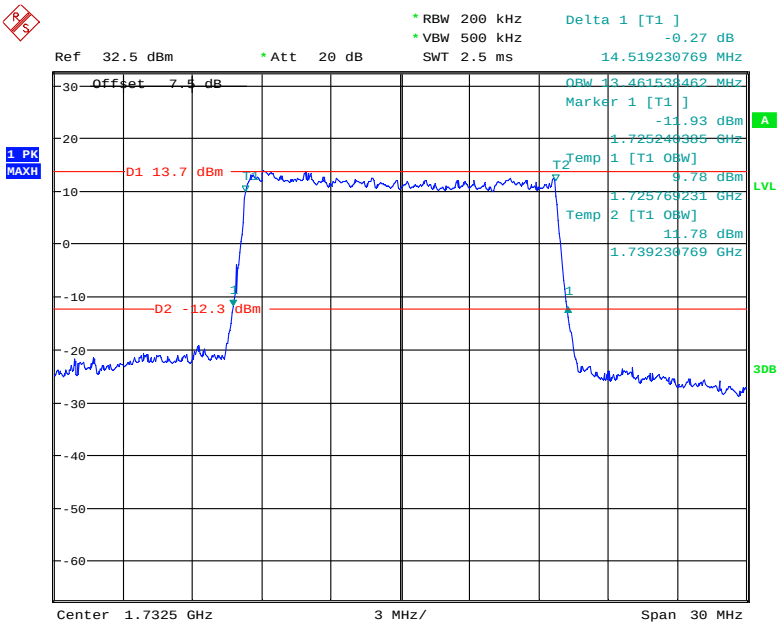
Date: 27.JAN.2019 11:28:31

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



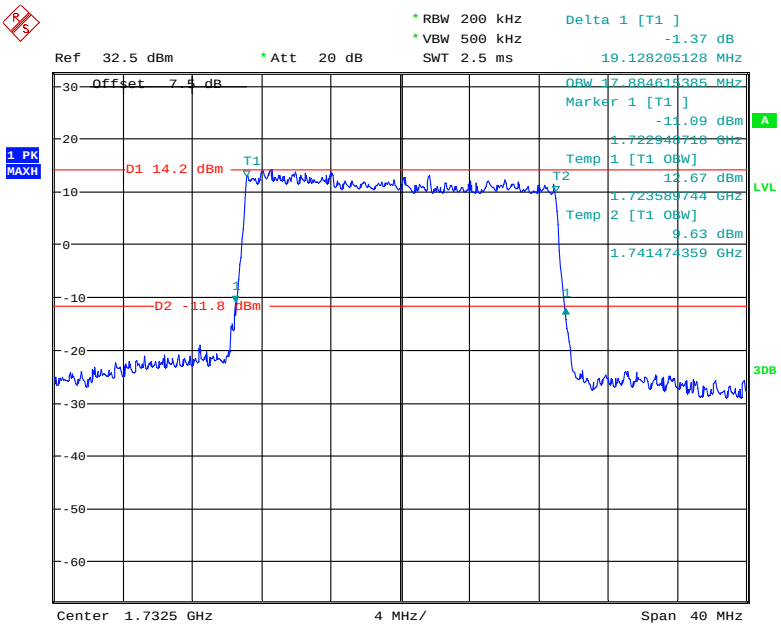
Date: 27.JAN.2019 11:31:25

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



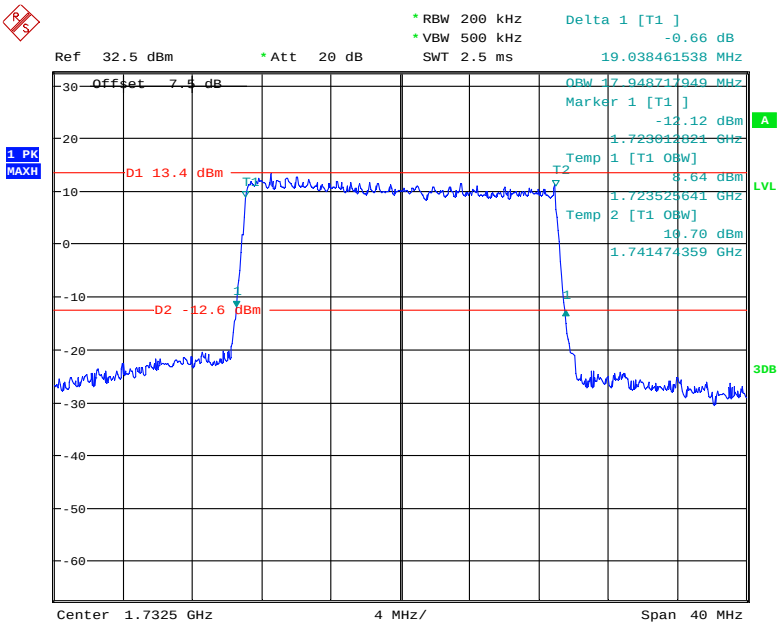
Date: 27.JAN.2019 11:30:20

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



Date: 27.JAN.2019 11:34:19

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

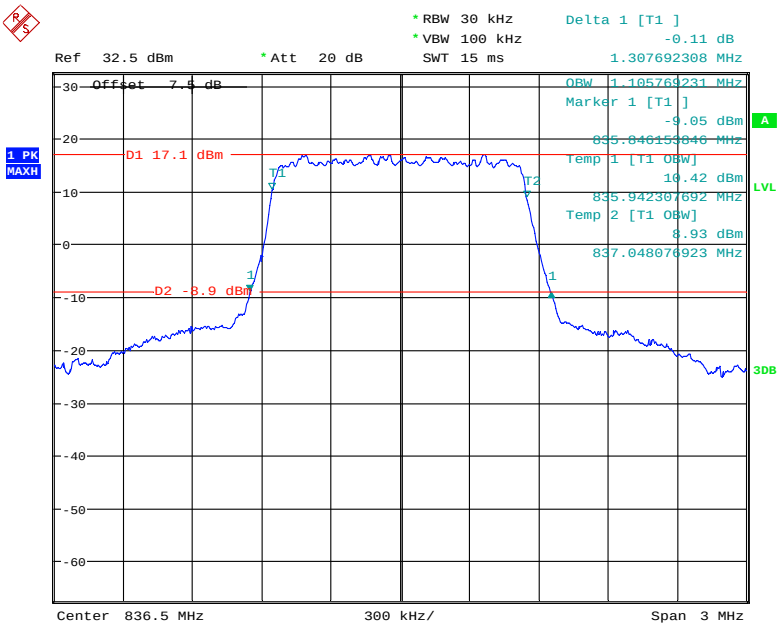


Date: 27.JAN.2019 11:32:37

LTE Band 5: (Middle Channel)

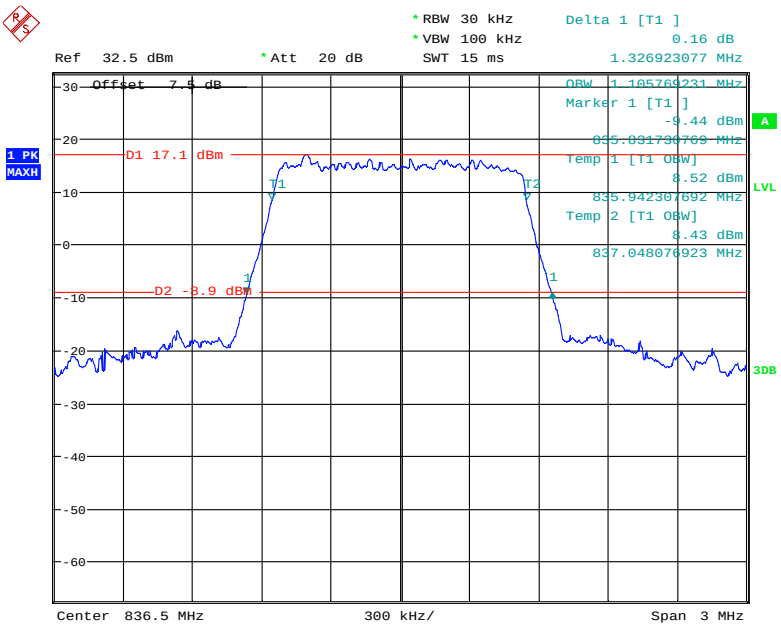
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.106	1.308
	16QAM	1.106	1.327
3.0	QPSK	2.692	2.875
	16QAM	2.692	2.894
5.0	QPSK	4.519	4.952
	16QAM	4.503	4.936
10.0	QPSK	8.974	9.679
	16QAM	8.974	9.615

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



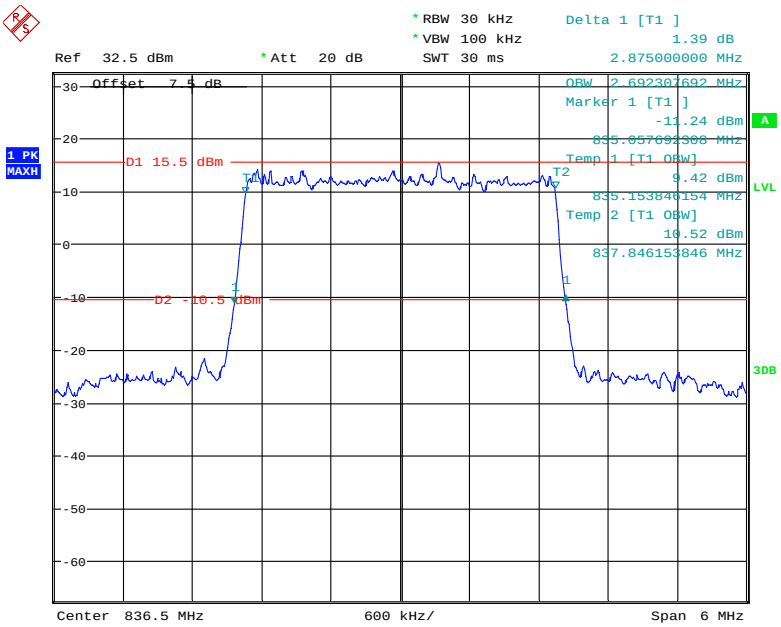
Date: 27.JAN.2019 11:36:43

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



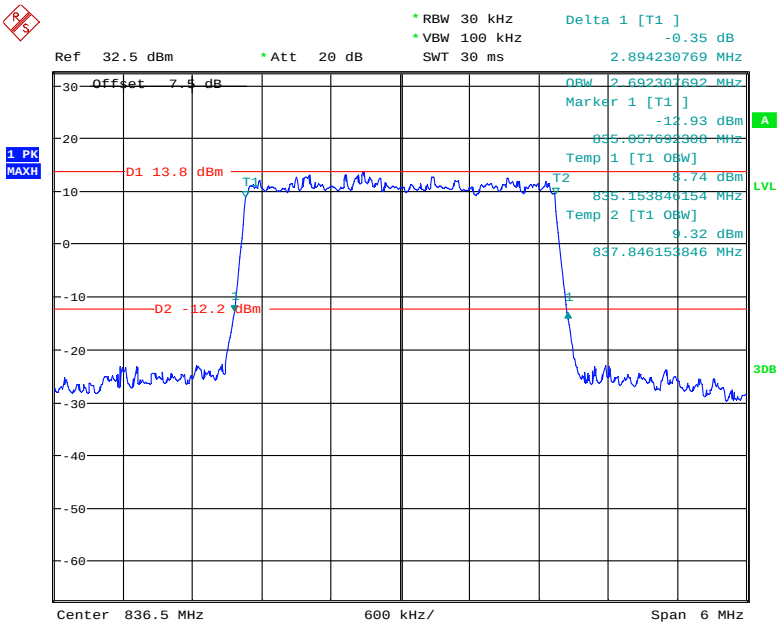
Date: 27.JAN.2019 11:38:16

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



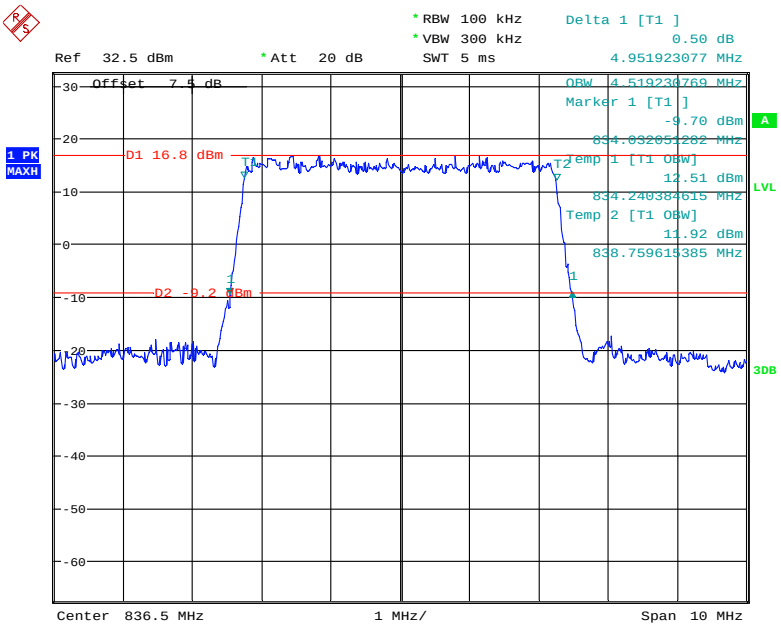
Date: 27.JAN.2019 11:41:26

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



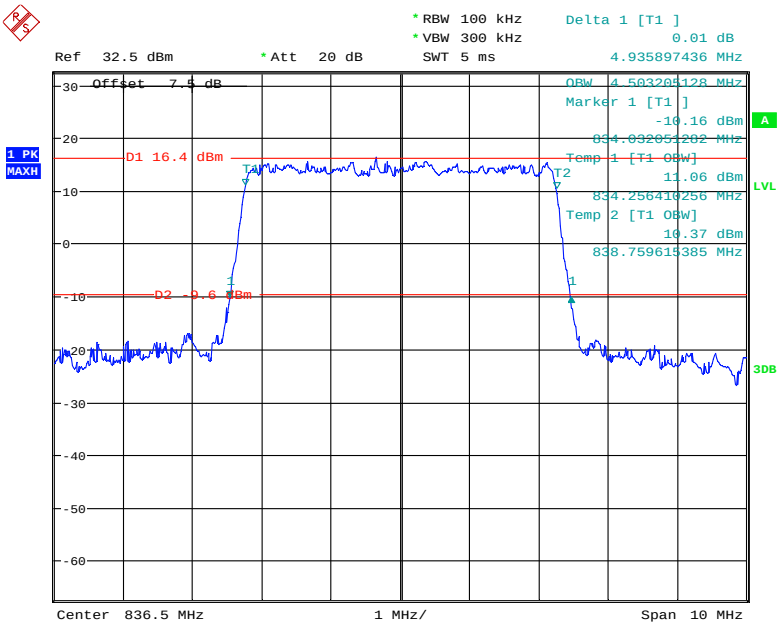
Date: 27.JAN.2019 11:39:14

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



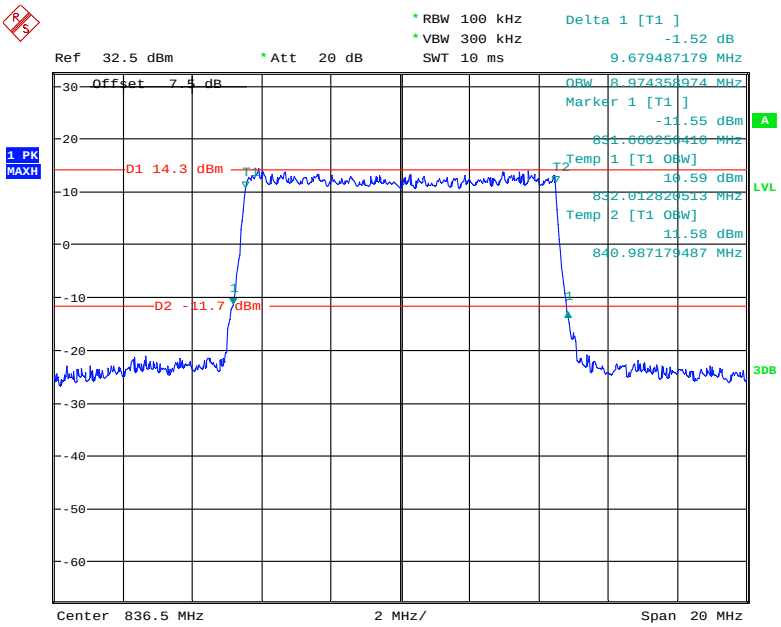
Date: 27.JAN.2019 11:44:31

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



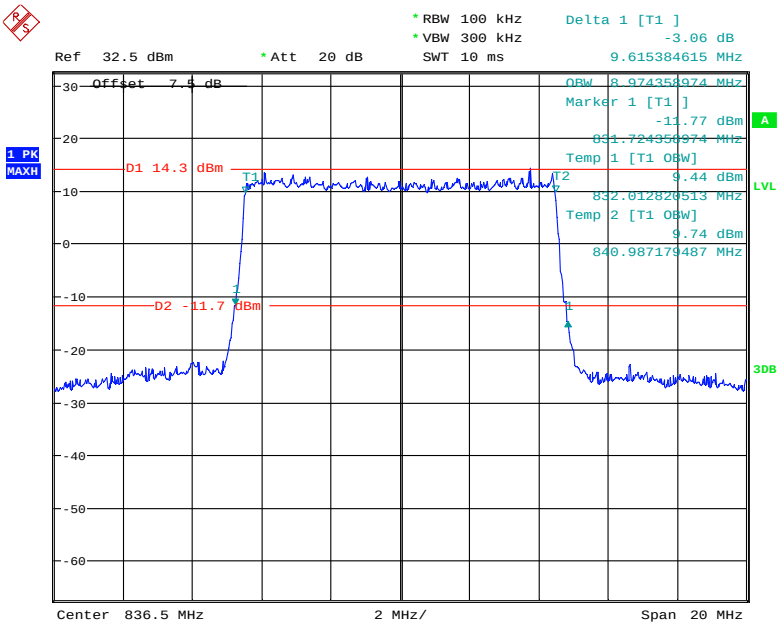
Date: 27.JAN.2019 11:42:49

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



Date: 27.JAN.2019 11:48:17

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

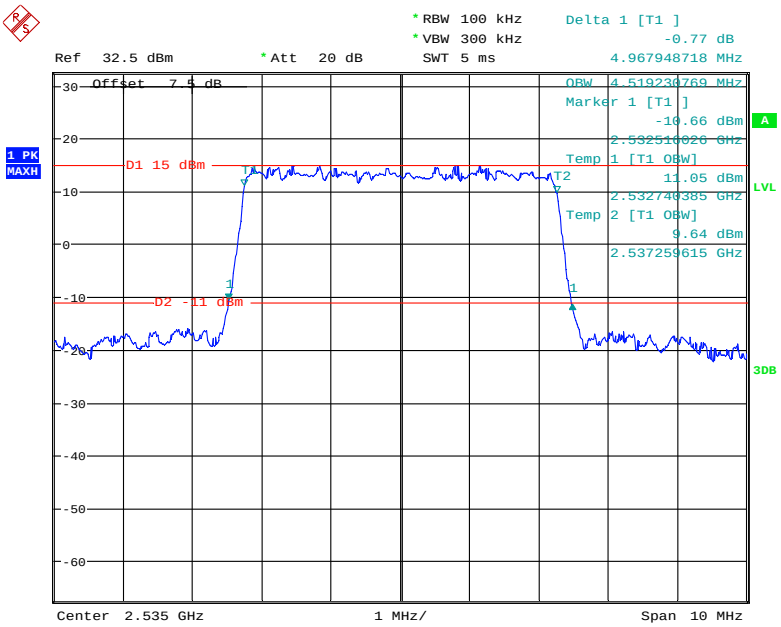


Date: 27.JAN.2019 11:47:01

LTE Band 7: (Middle Channel)

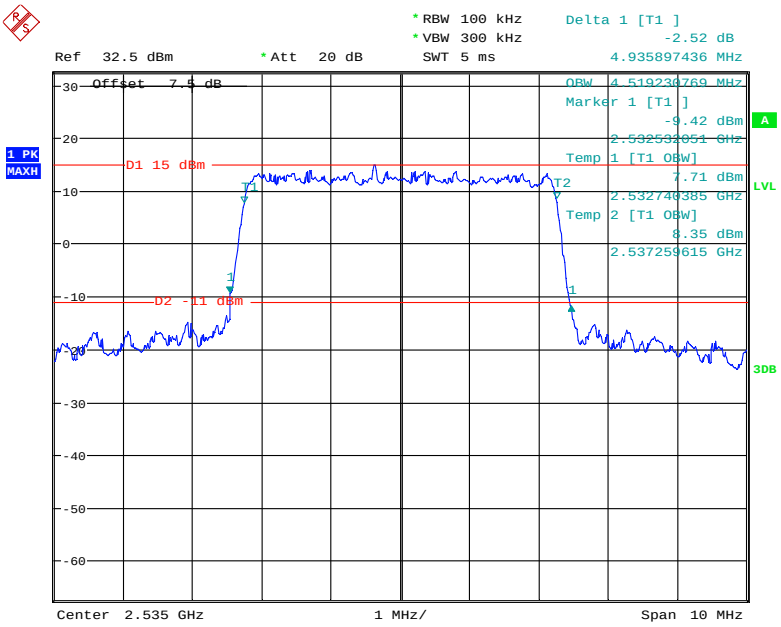
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.519	4.968
	16QAM	4.519	4.936
10.0	QPSK	8.974	9.679
	16QAM	8.974	9.583
15.0	QPSK	13.558	14.663
	16QAM	13.510	14.567
20.0	QPSK	18.013	19.167
	16QAM	17.949	19.103

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



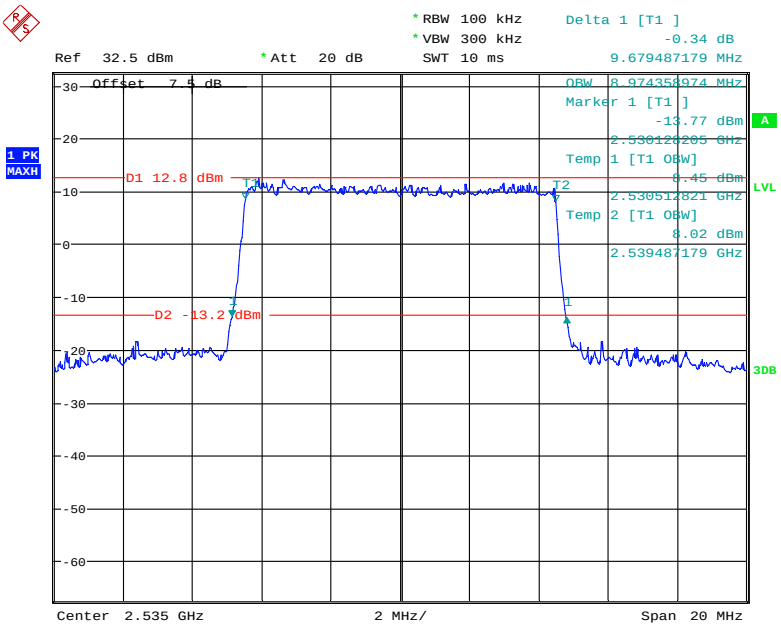
Date: 27.JAN.2019 13:06:05

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



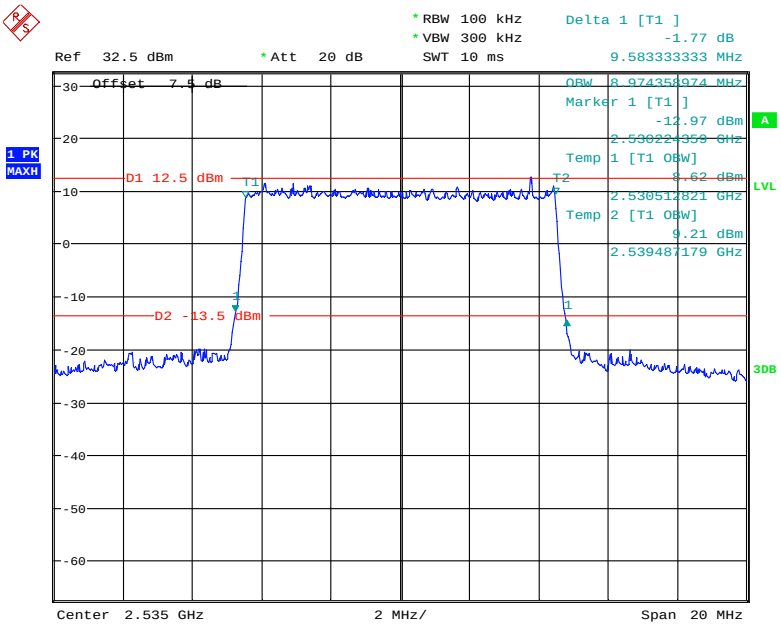
Date: 27.JAN.2019 13:08:13

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



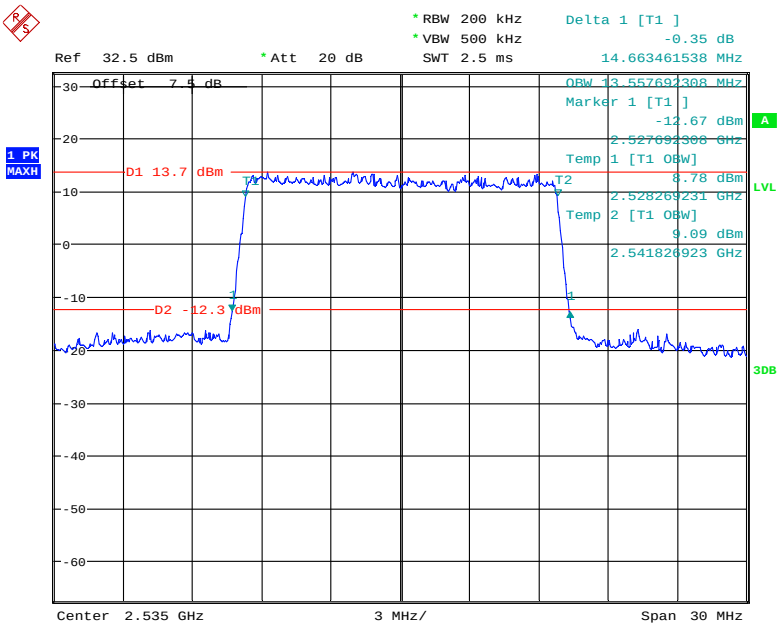
Date: 27.JAN.2019 13:09:44

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



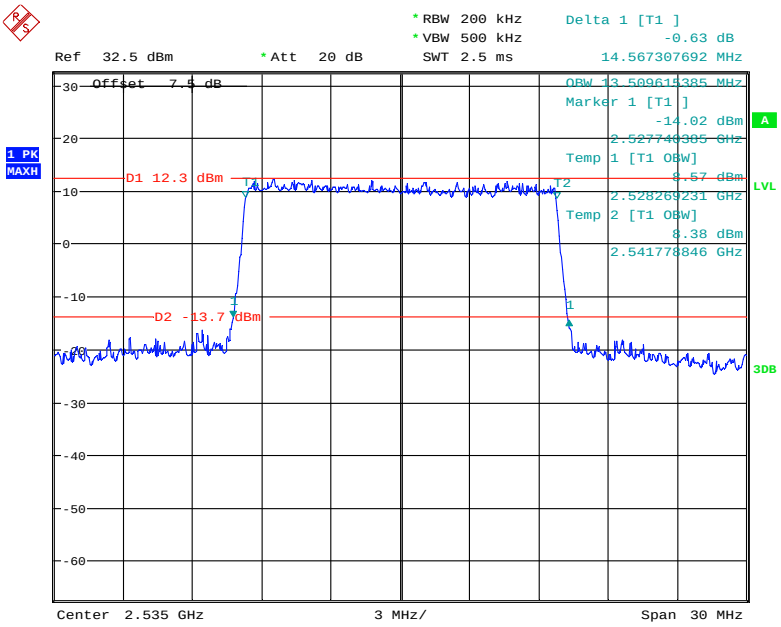
Date: 27.JAN.2019 13:11:08

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



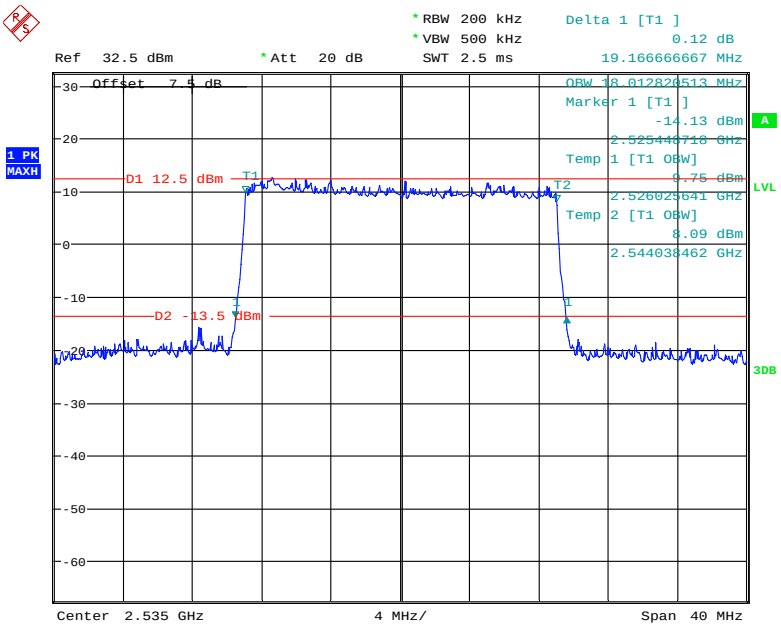
Date: 27.JAN.2019 13:14:02

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



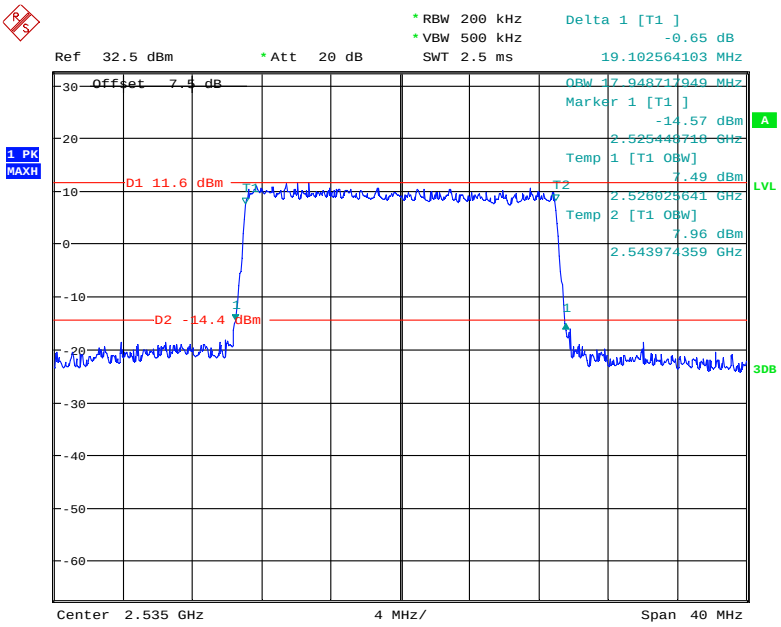
Date: 27.JAN.2019 13:12:22

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



Date: 27.JAN.2019 13:16:20

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



Date: 27.JAN.2019 13:15:04

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

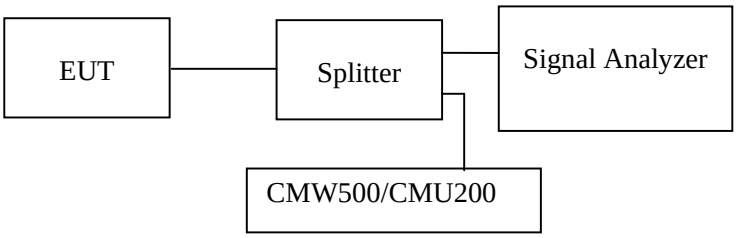
Applicable Standard

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 1MHz. Sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.



Test Data

Environmental Conditions

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

The testing was performed by Kiki Kong from 2019-01-25 to 2019-01-27.

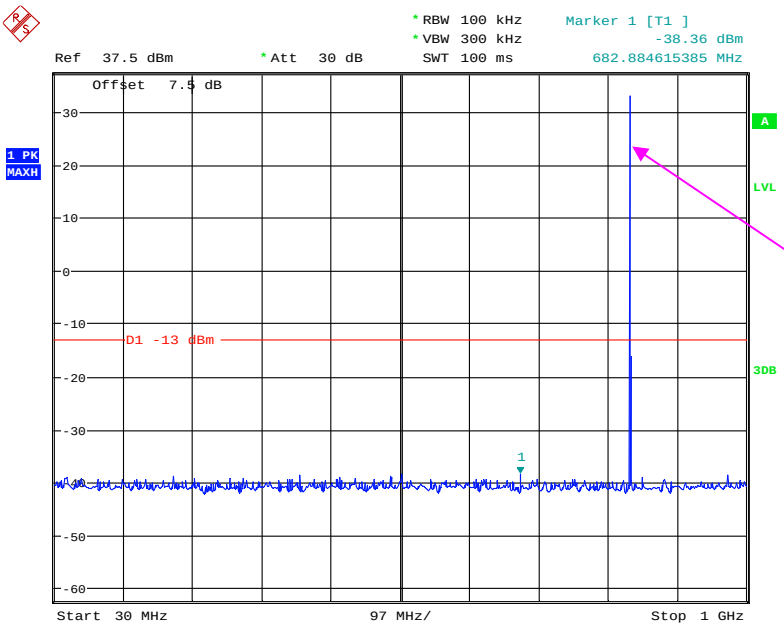
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

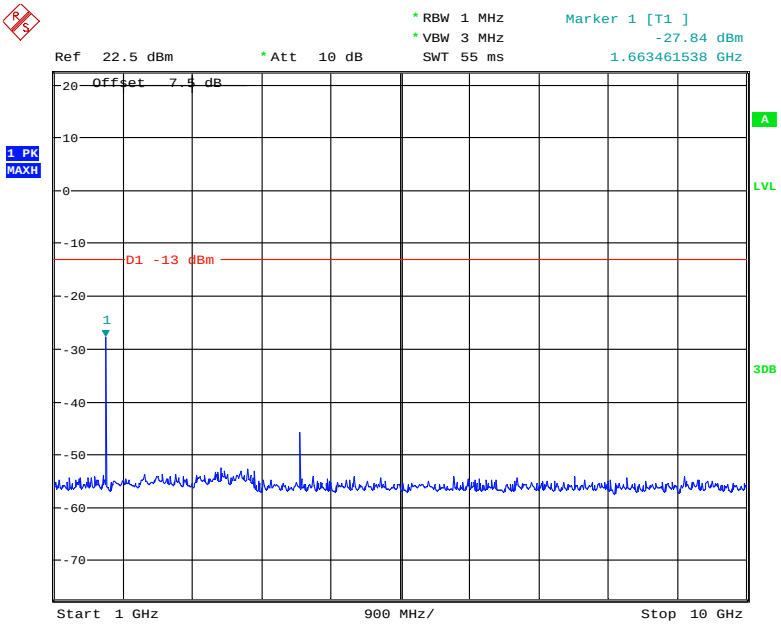
30 MHz – 1 GHz (GSM Mode)



Fundamental test

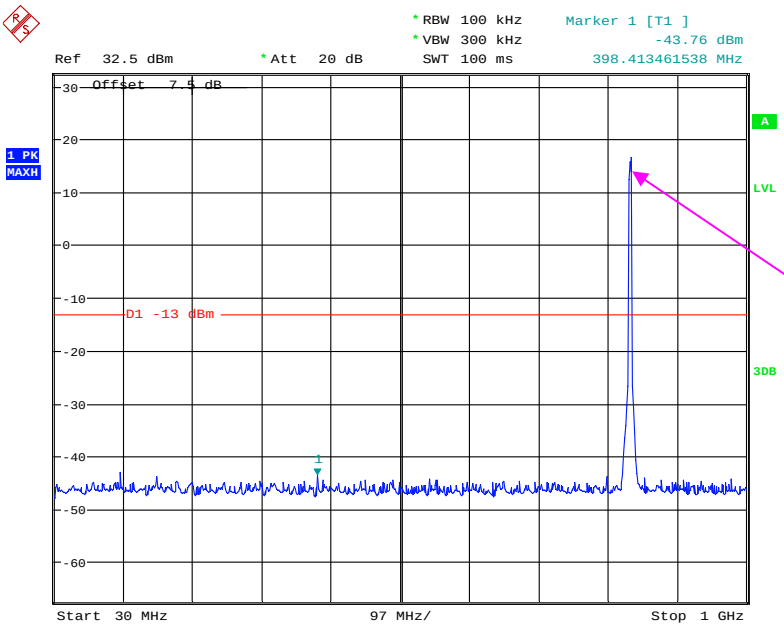
Date: 26.JAN.2019 00:18:22

1 GHz – 10 GHz (GSM Mode)



Date: 26.JAN.2019 00:19:01

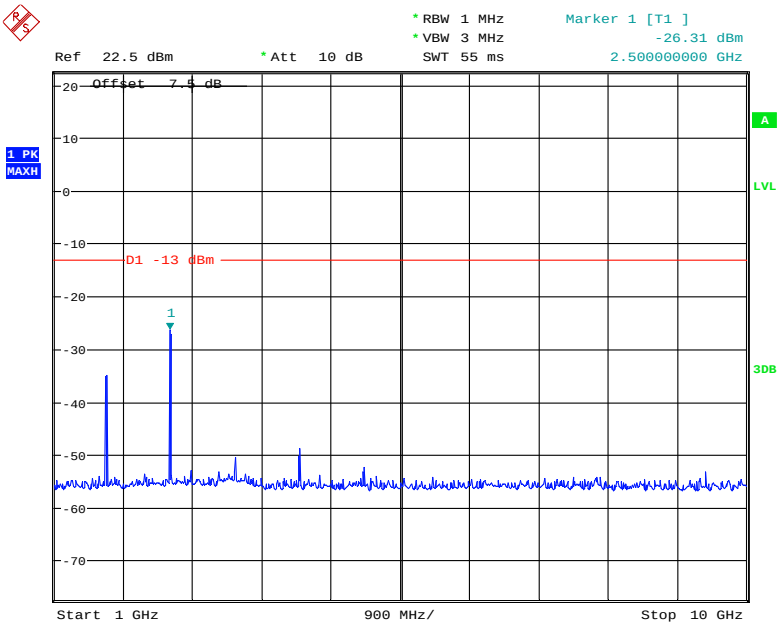
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 27.JAN.2019 10:48:19

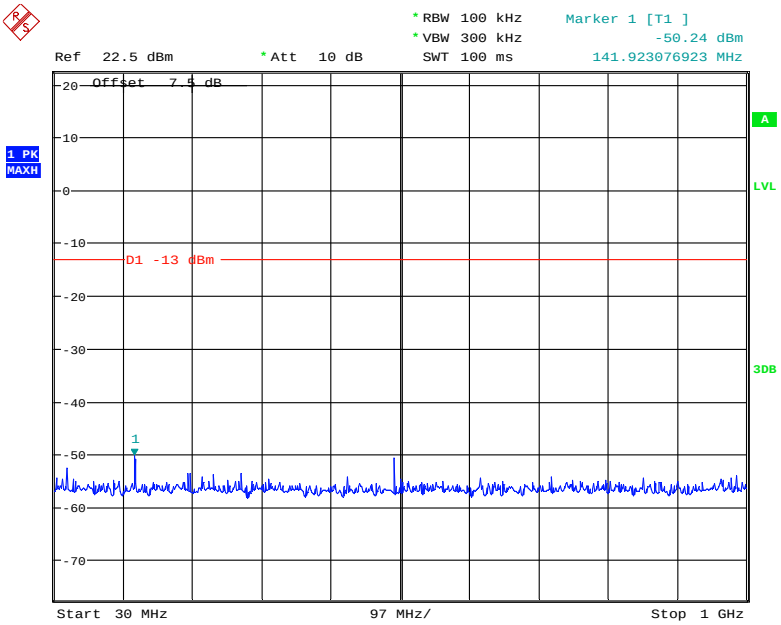
1 GHz – 10 GHz (WCDMA Mode)



Date: 27.JAN.2019 10:48:35

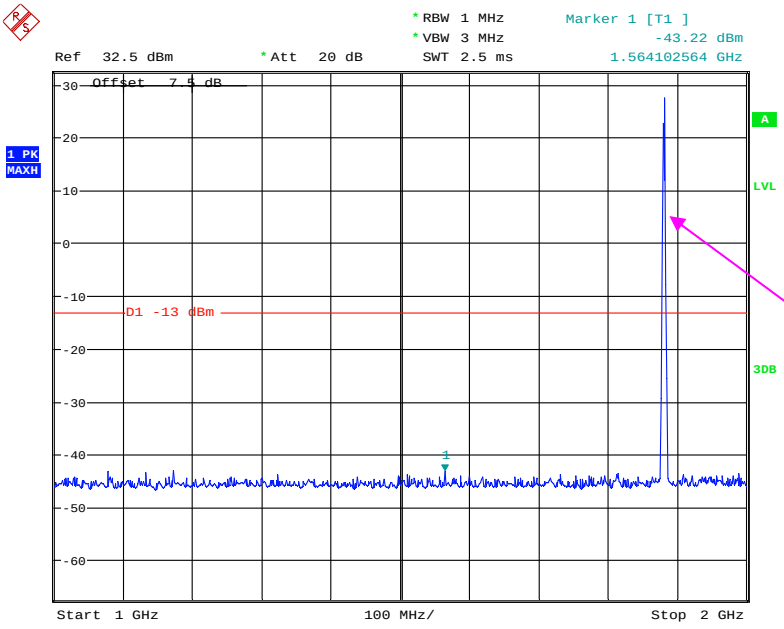
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 25.JAN.2019 23:46:36

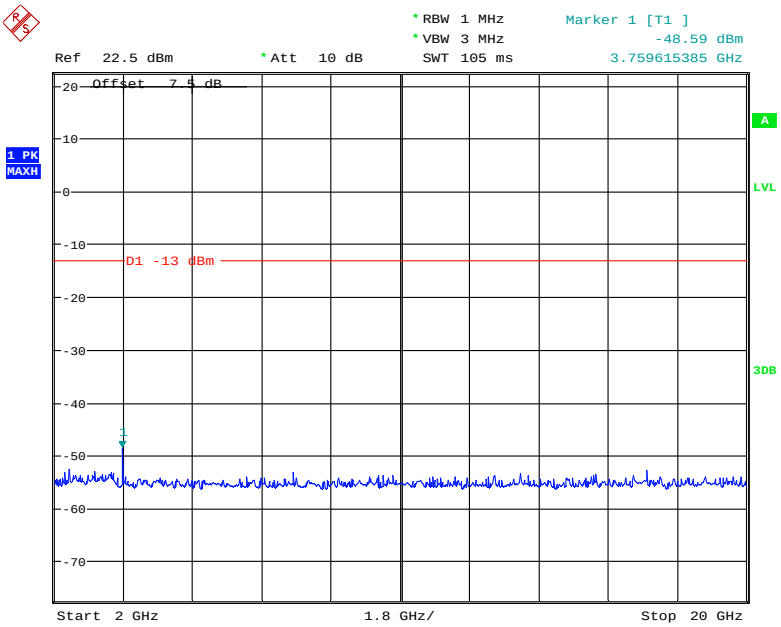
1 GHz – 2 GHz (GSM Mode)



Fundamental test

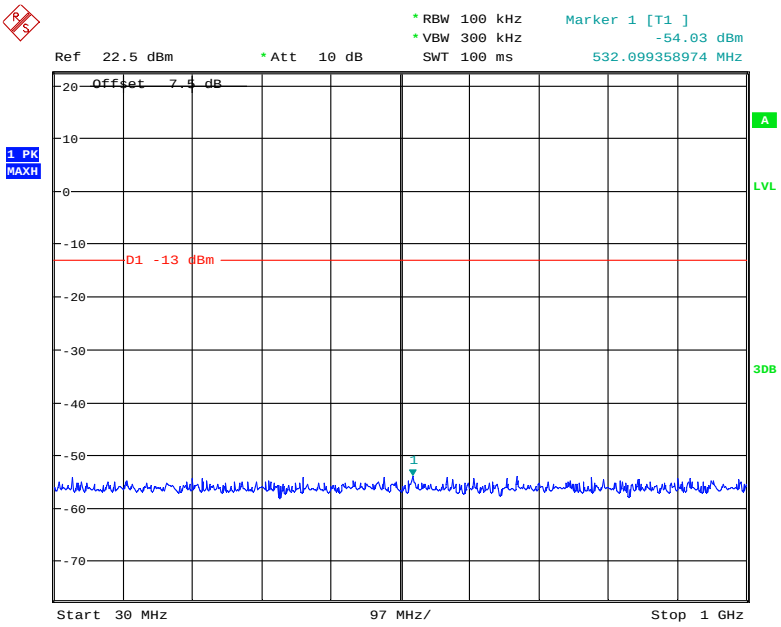
Date: 25.JAN.2019 23:47:10

2 GHz – 20 GHz (GSM Mode)



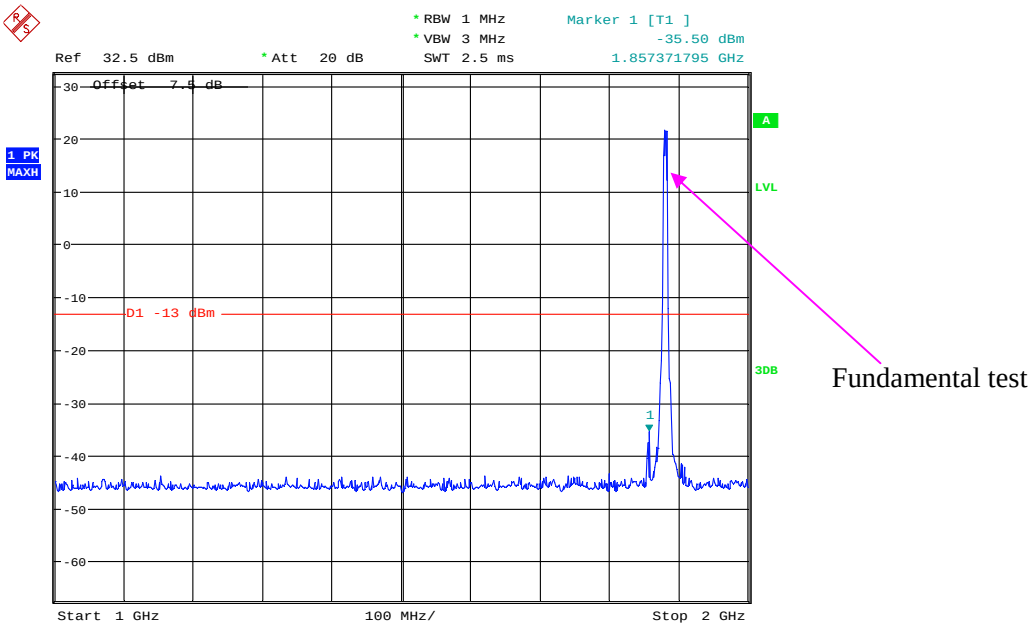
Date: 25.JAN.2019 23:47:33

30 MHz – 1 GHz (WCDMA Mode)



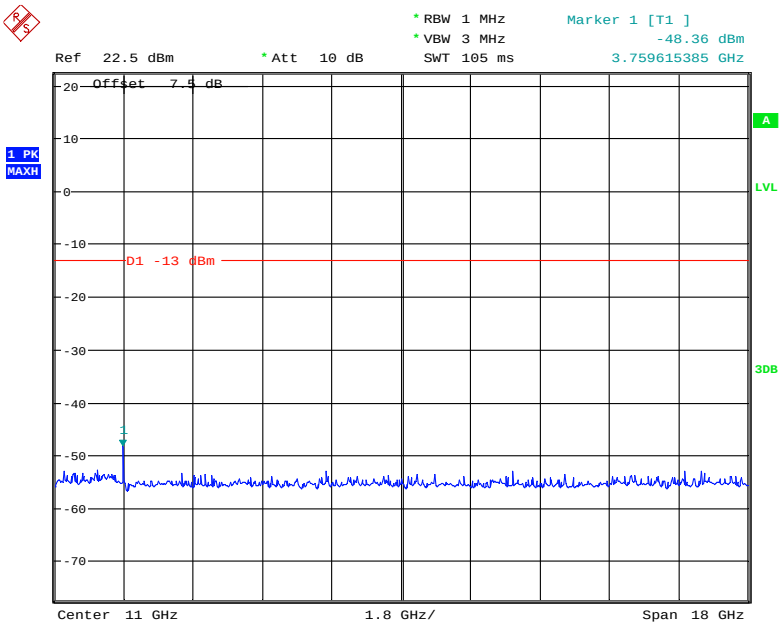
Date: 27.JAN.2019 09:43:20

1 GHz – 2 GHz (WCDMA Mode)



Date: 27.JAN.2019 09:44:19

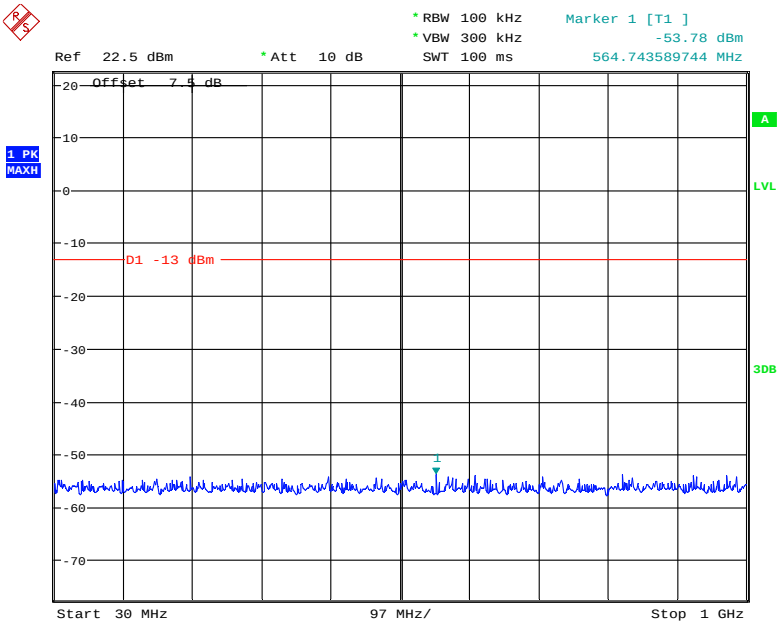
2 GHz – 20 GHz (WCDMA Mode)



Date: 27.JAN.2019 09:44:44

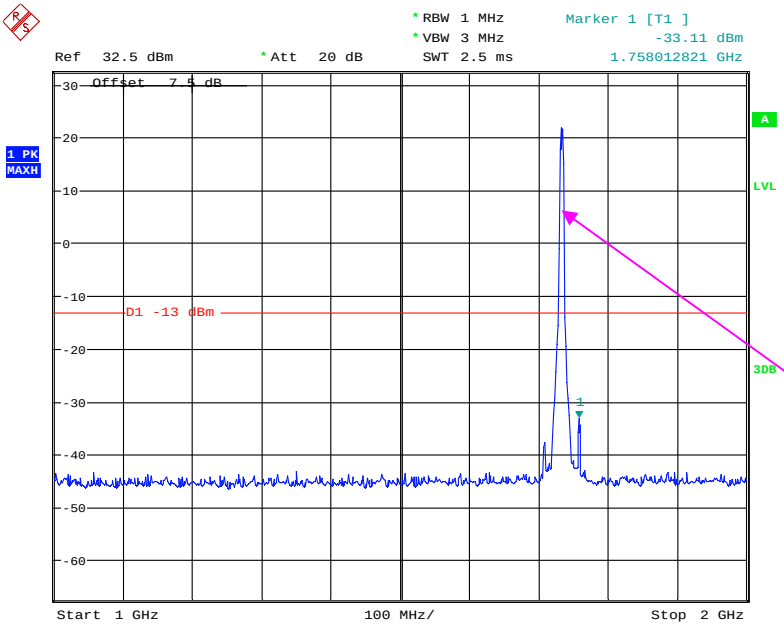
AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)



Date: 27.JAN.2019 10:06:21

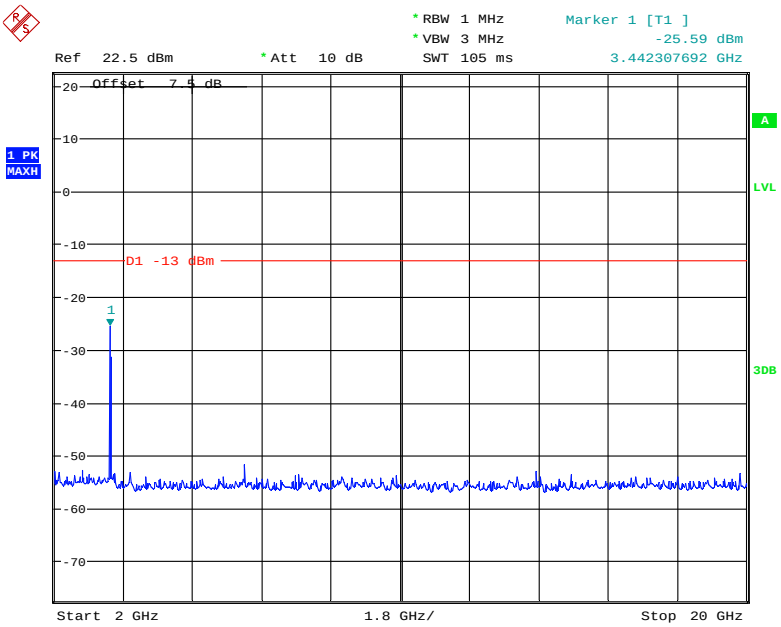
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 27.JAN.2019 10:07:27

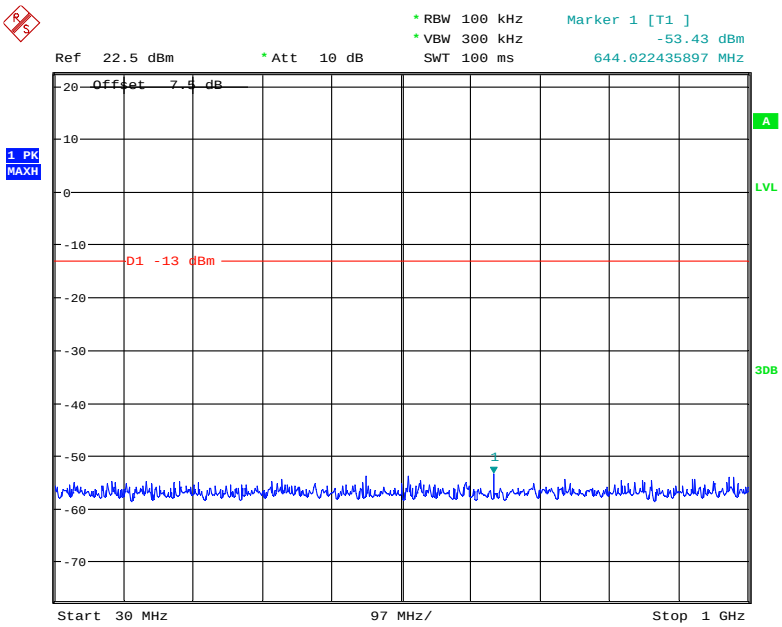
2 GHz – 20 GHz (WCDMA Mode)



Date: 27.JAN.2019 10:07:55

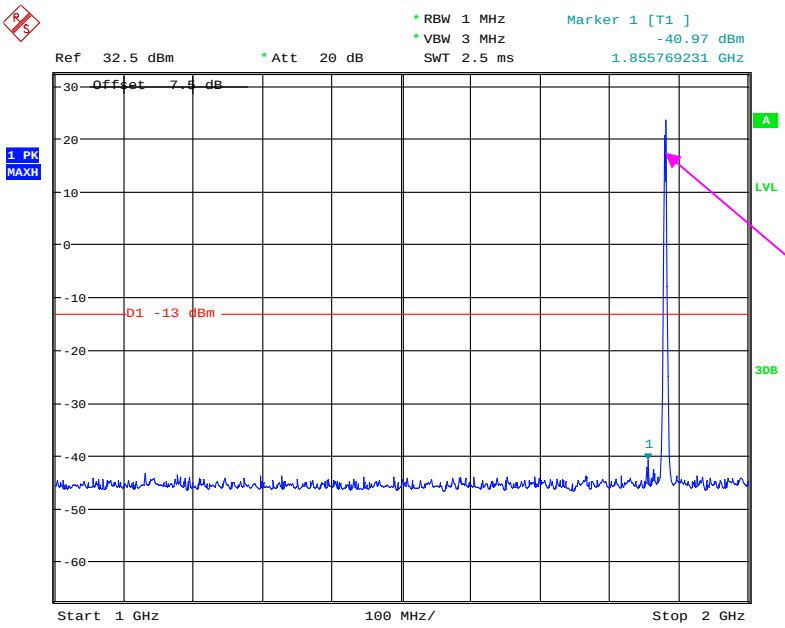
LTE Band 2:

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



Date: 27.JAN.2019 15:37:41

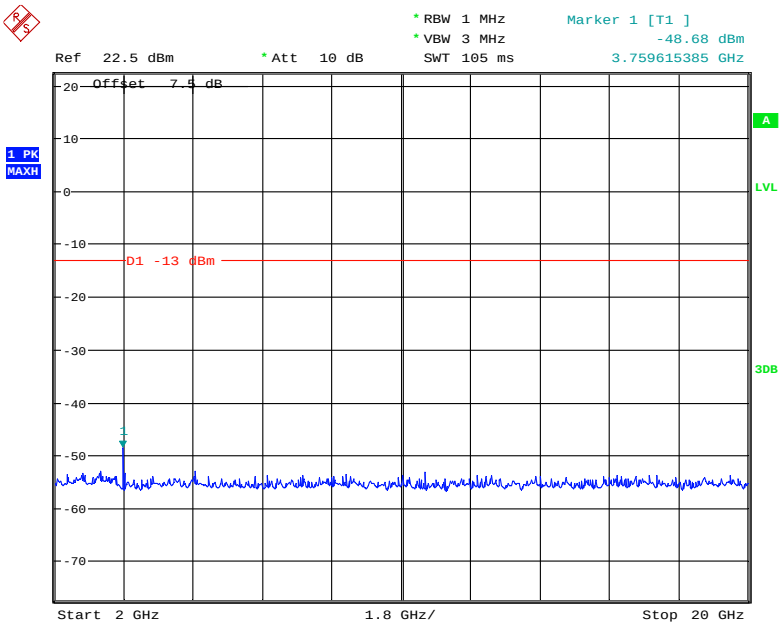
1 GHz – 2 GHz (1.4 MHz, Middle Channel)



Fundamental test

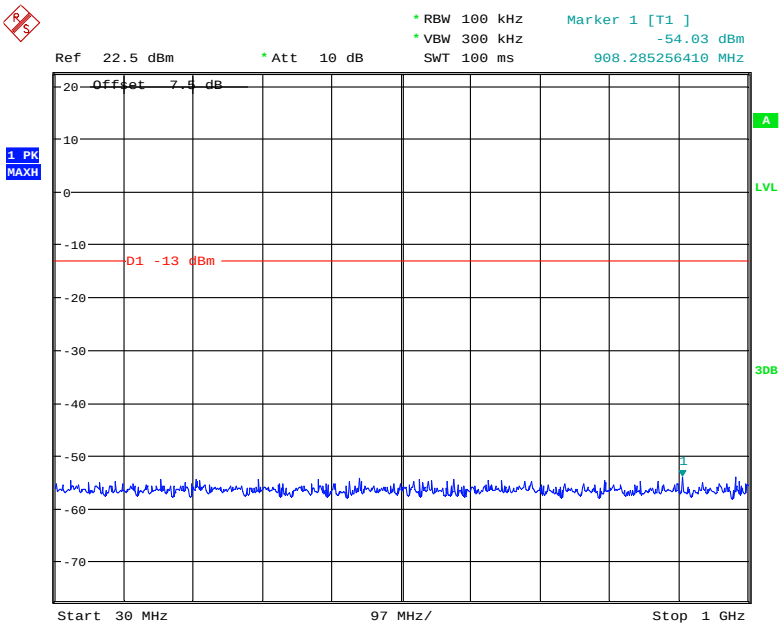
Date: 27.JAN.2019 15:44:46

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



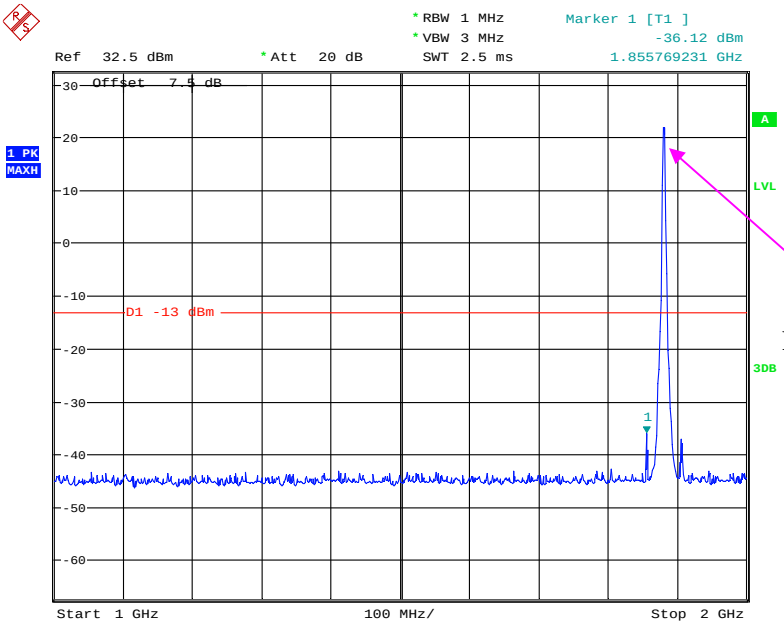
Date: 27.JAN.2019 15:48:24

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



Date: 27.JAN.2019 15:38:09

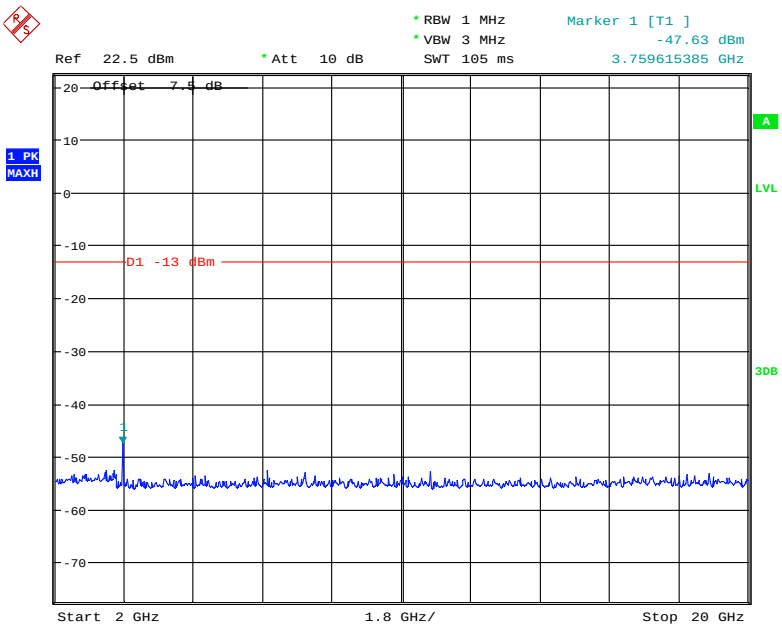
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



Fundamental test

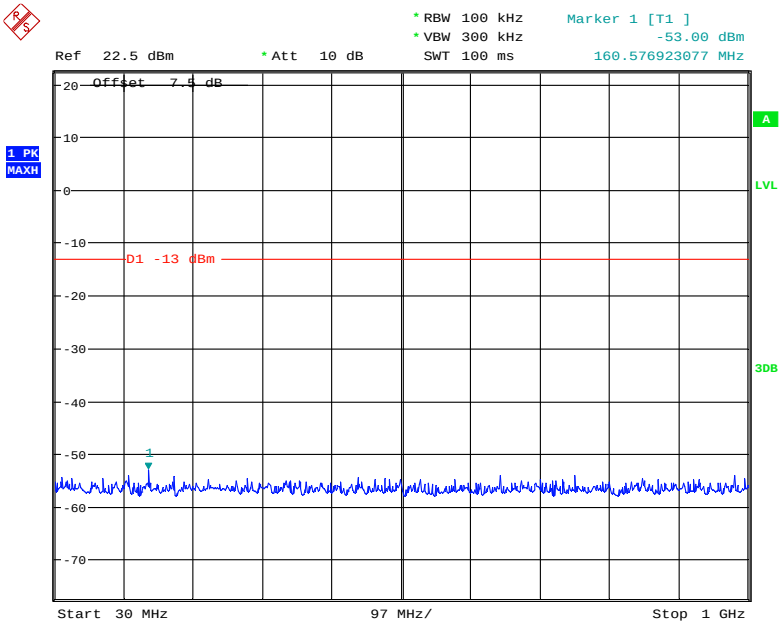
Date: 27.JAN.2019 15:44:09

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



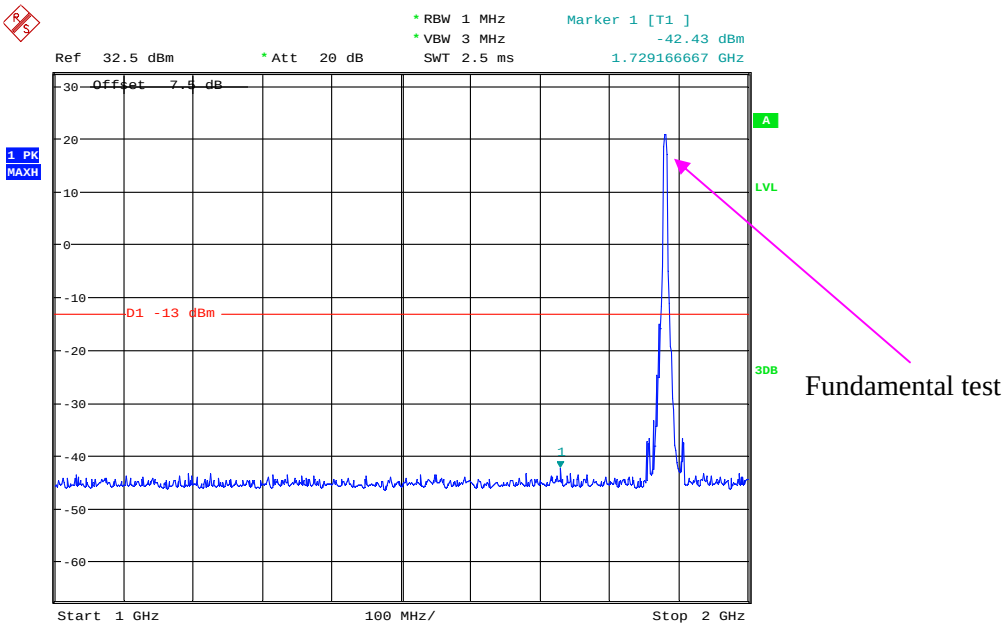
Date: 27.JAN.2019 15:48:51

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



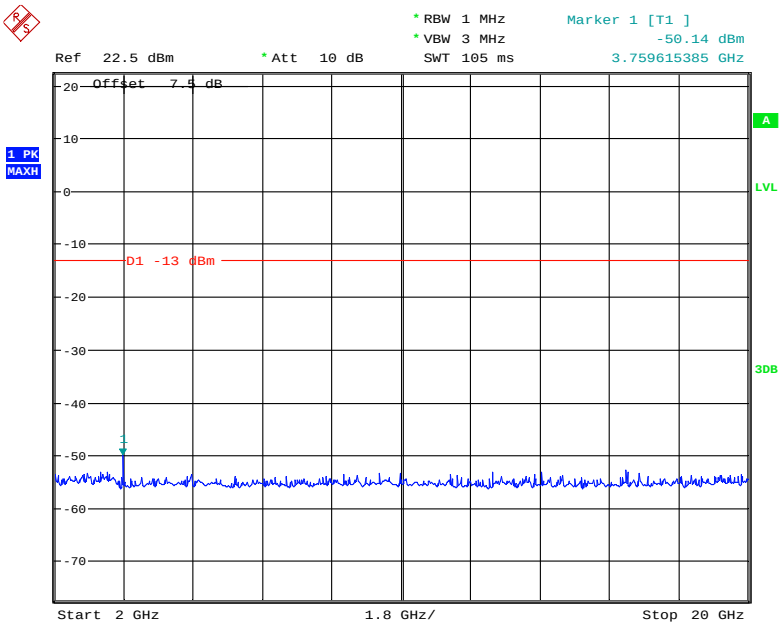
Date: 27.JAN.2019 15:38:24

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



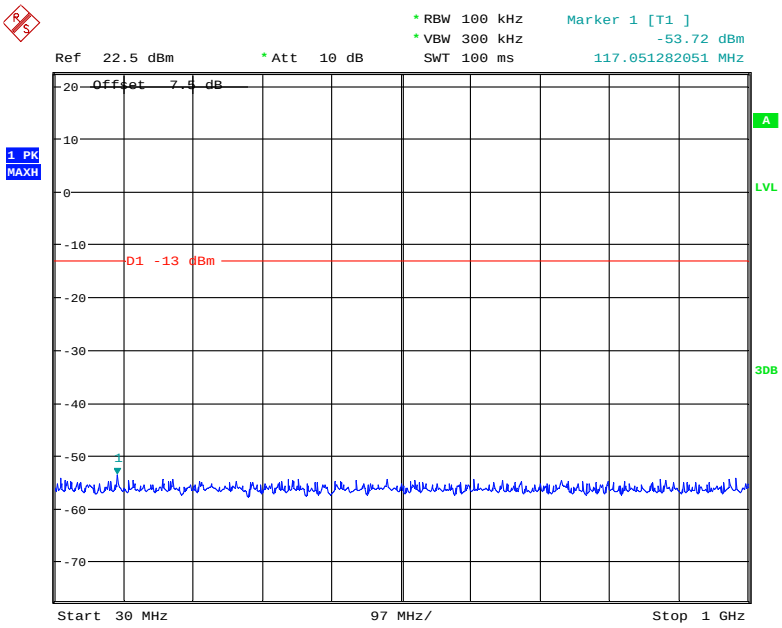
Date: 27.JAN.2019 15:43:34

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



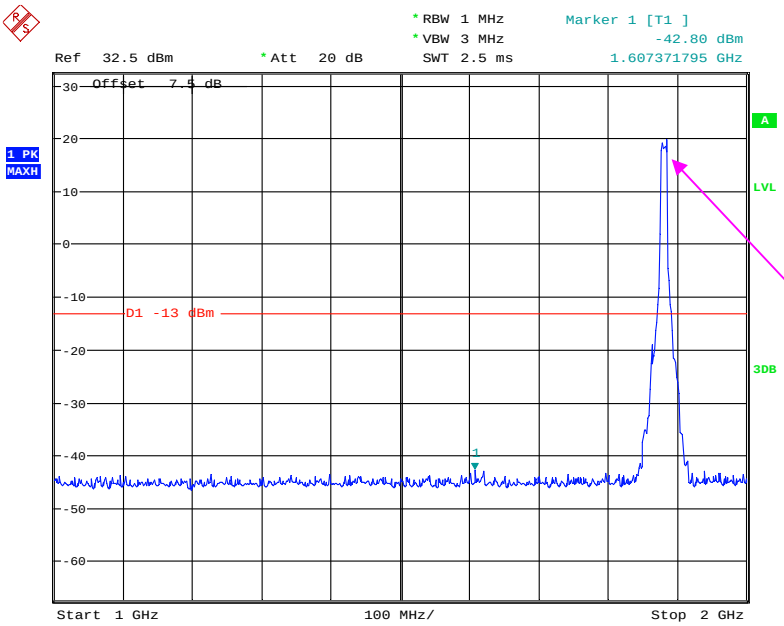
Date: 27.JAN.2019 15:49:06

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



Date: 27.JAN.2019 15:38:37

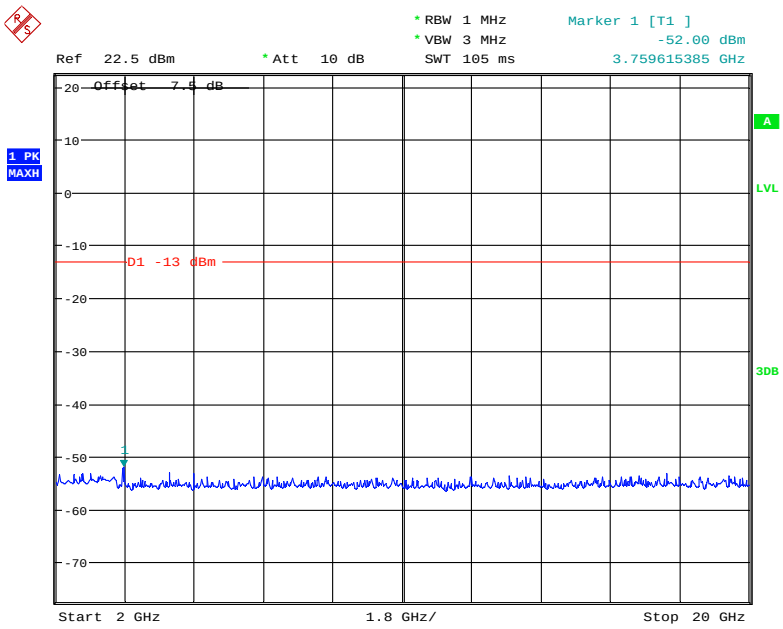
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



Fundamental test

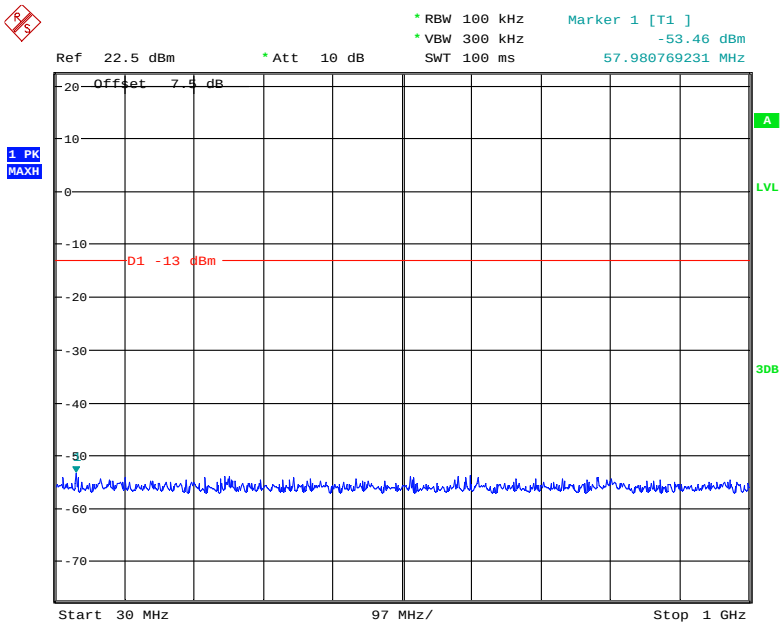
Date: 27.JAN.2019 15:43:00

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



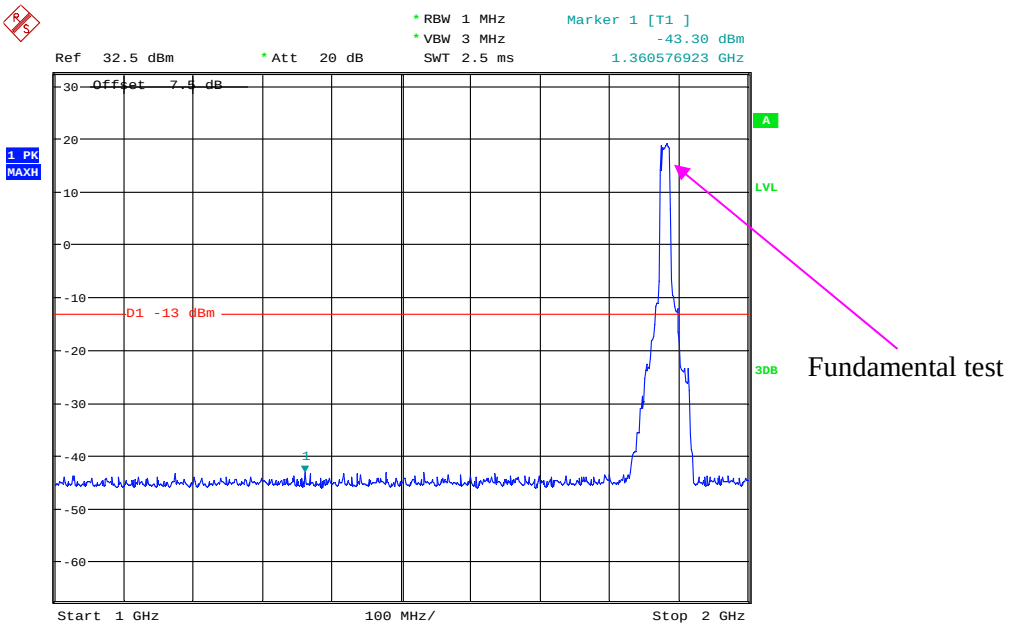
Date: 27.JAN.2019 15:49:29

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



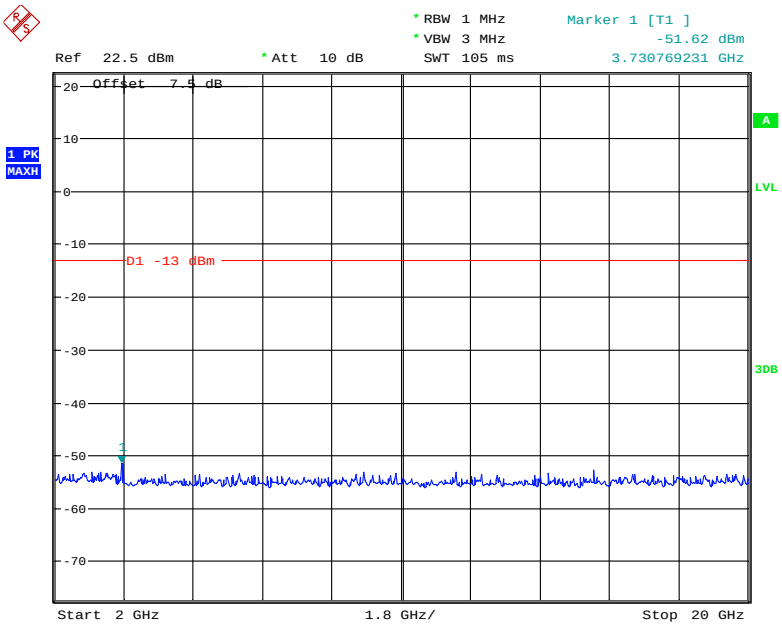
Date: 27.JAN.2019 15:38:53

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



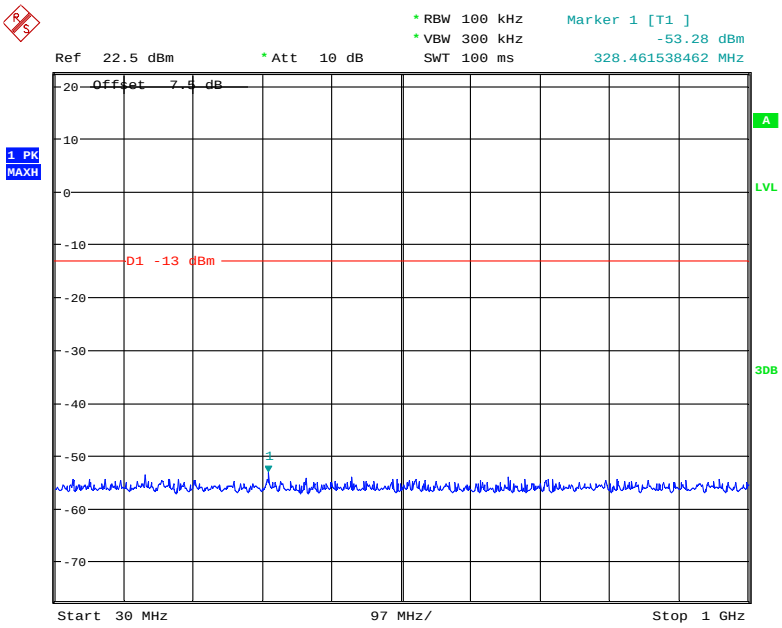
Date: 27.JAN.2019 15:42:25

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



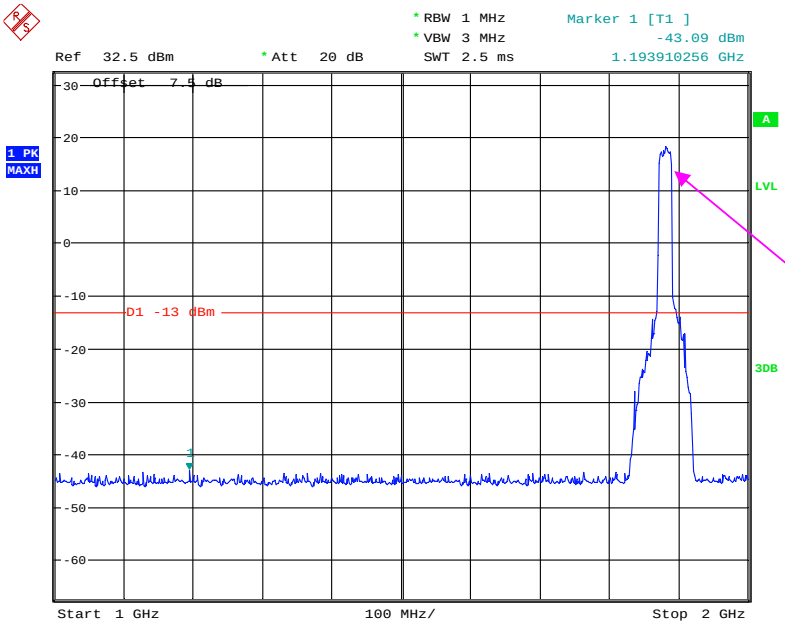
Date: 27.JAN.2019 15:50:04

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



Date: 27.JAN.2019 15:39:13

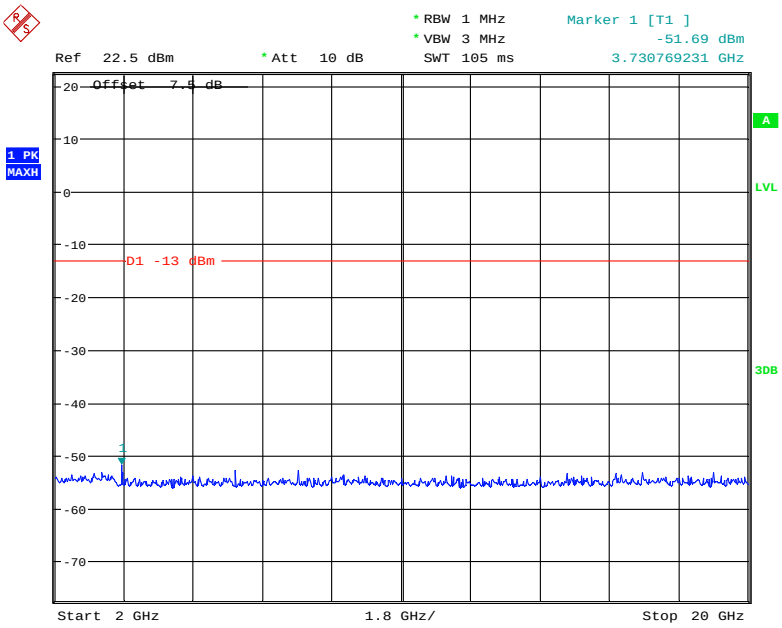
1 GHz – 2 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 27.JAN.2019 15:41:47

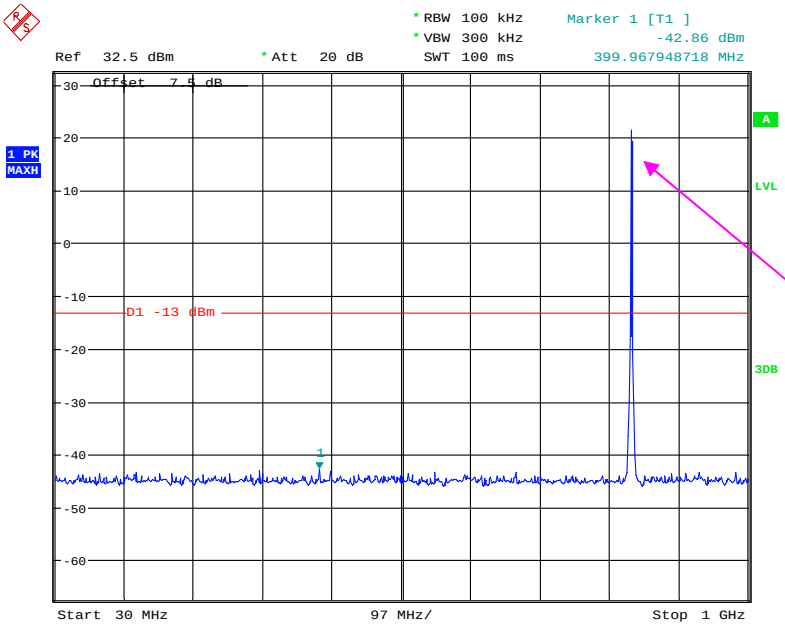
2 GHz –20 GHz (20.0 MHz, Middle Channel)



Date: 27.JAN.2019 15:54:14

LTE Band 5:

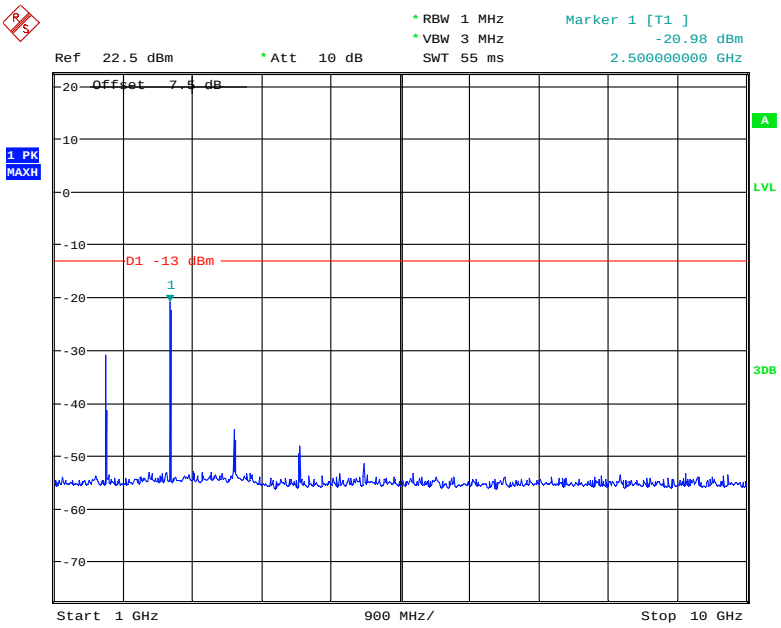
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

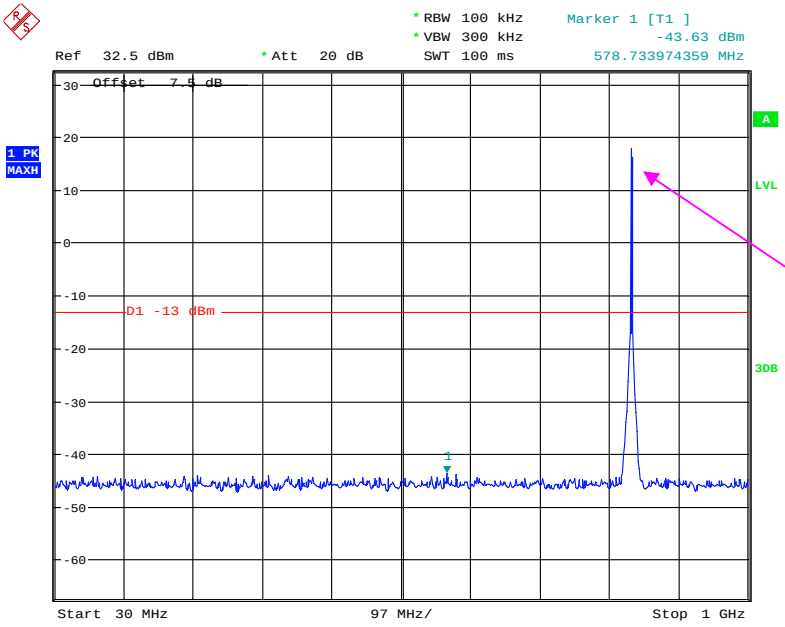
Date: 27.JAN.2019 16:17:50

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



Date: 27.JAN.2019 16:21:28

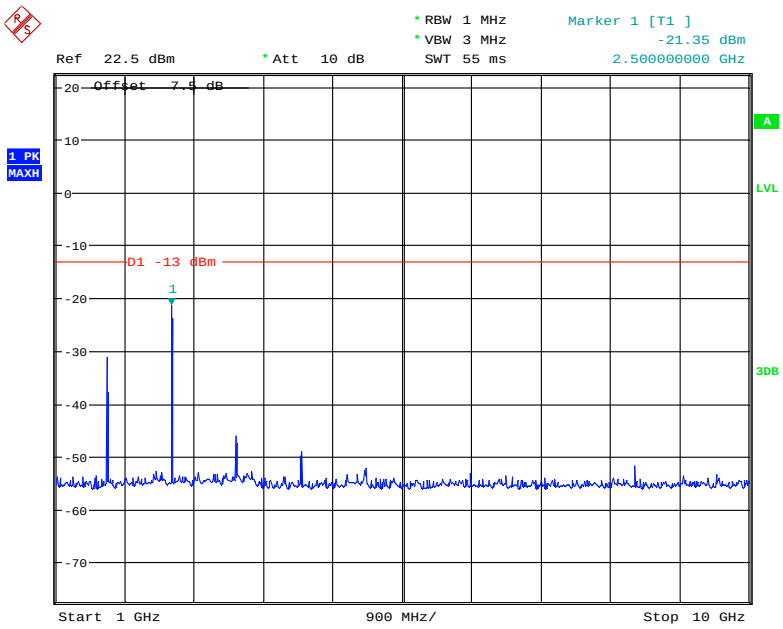
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Fundamental test

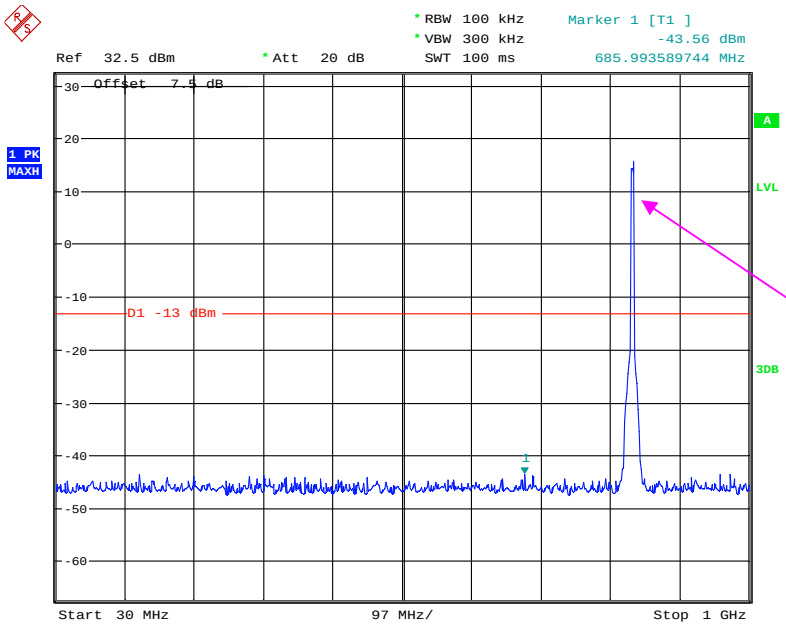
Date: 27.JAN.2019 16:19:23

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



Date: 27.JAN.2019 16:21:16

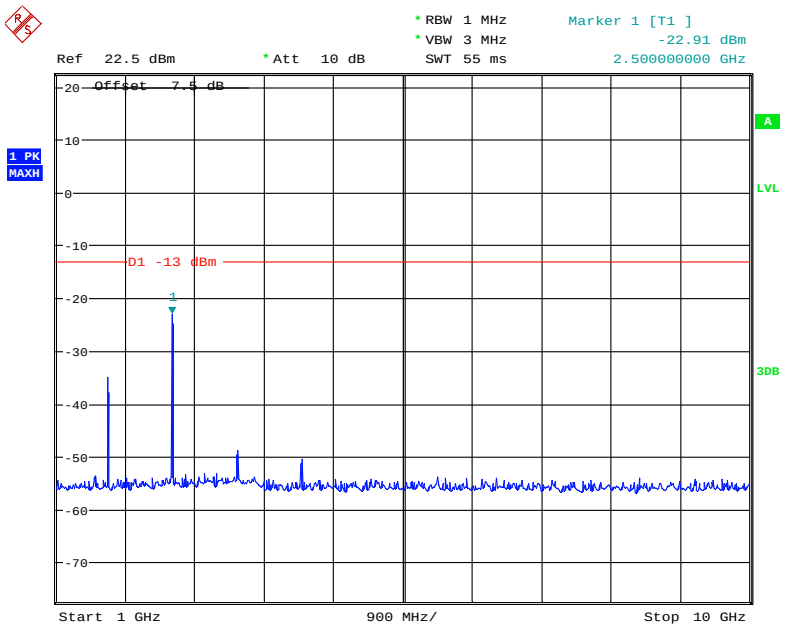
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

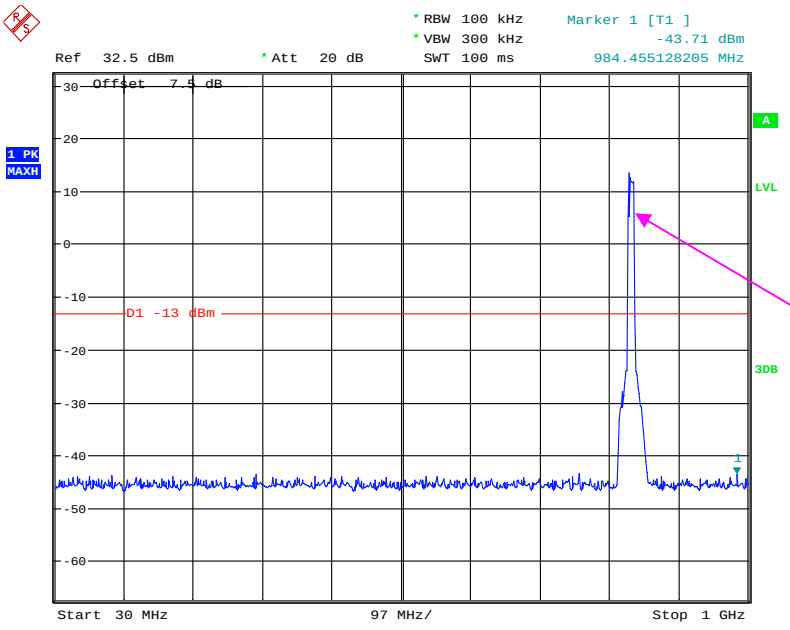
Date: 27.JAN.2019 16:19:39

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



Date: 27.JAN.2019 16:20:59

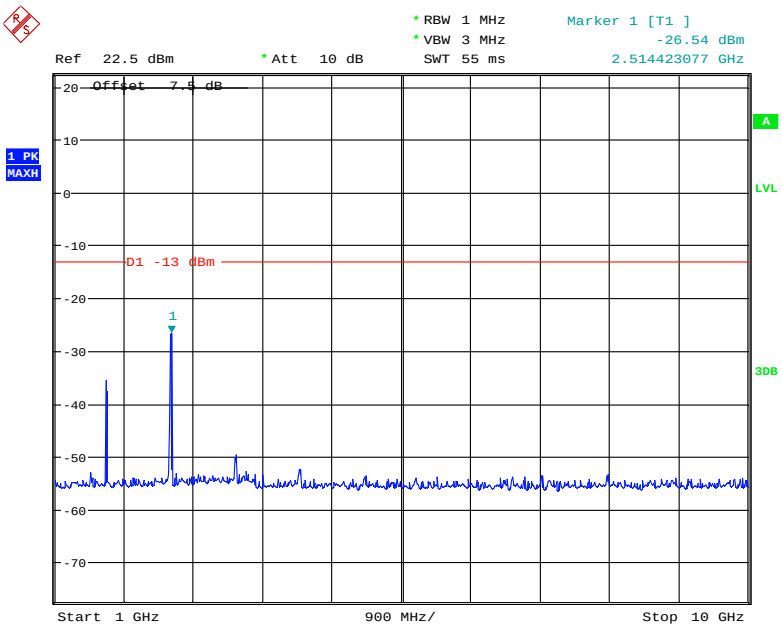
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 27.JAN.2019 16:20:06

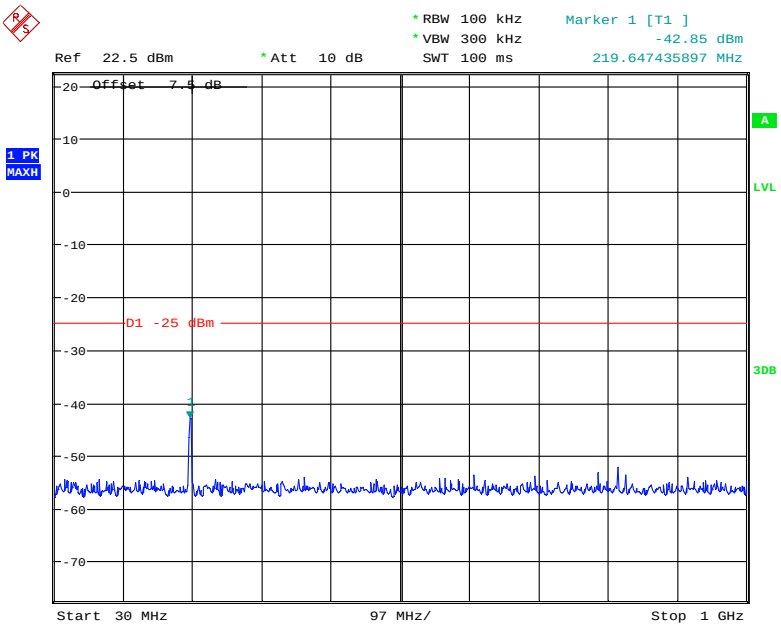
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 27.JAN.2019 16:20:39

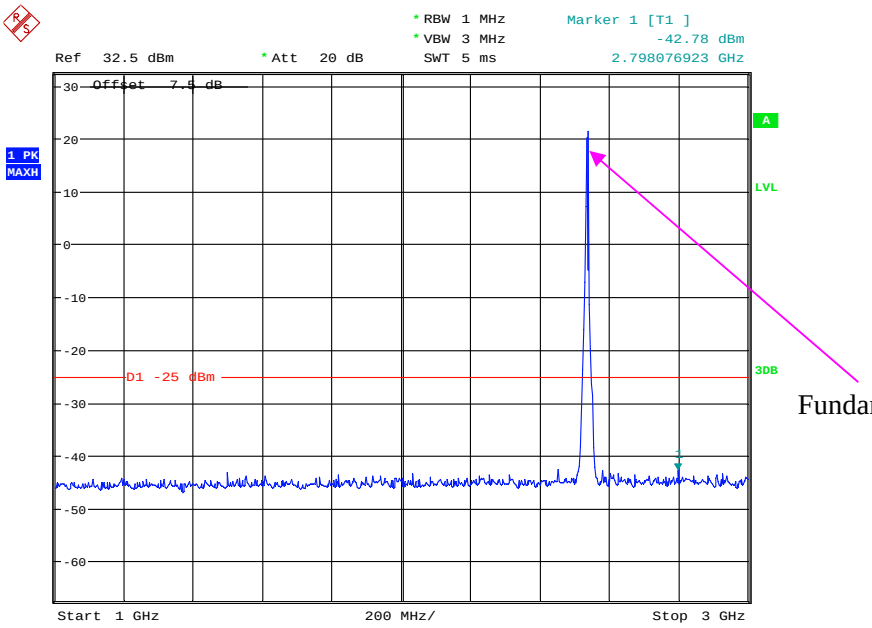
LTE Band 7:

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



Date: 27.JAN.2019 16:31:54

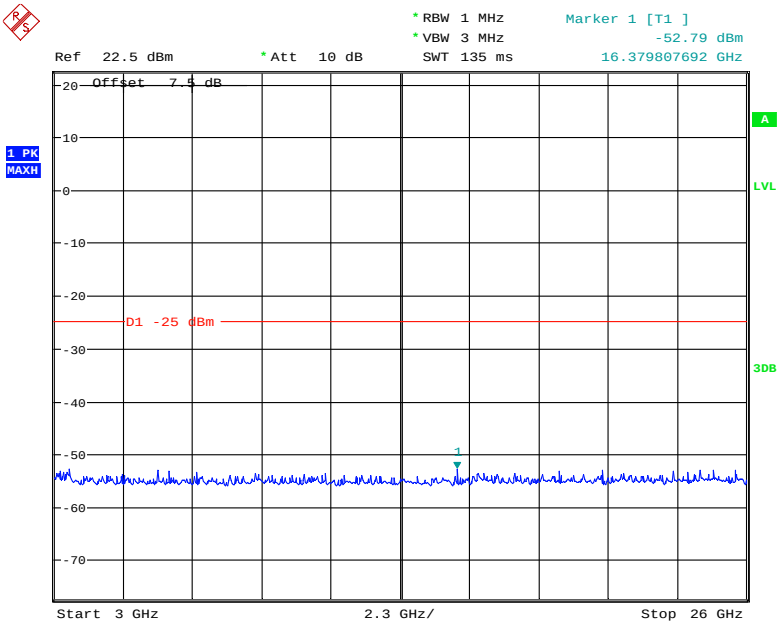
1 GHz – 3.0 GHz (5.0 MHz, Middle Channel)



Fundamental test

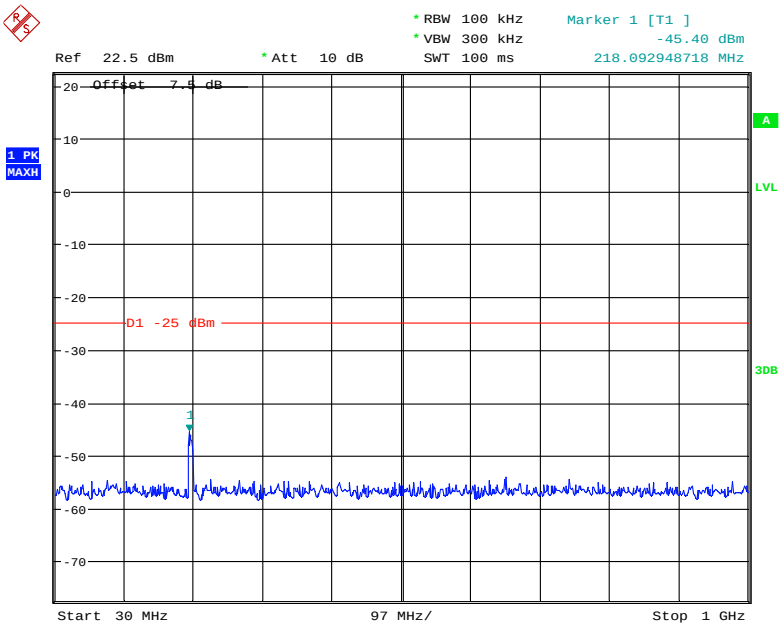
Date: 27.JAN.2019 16:30:39

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



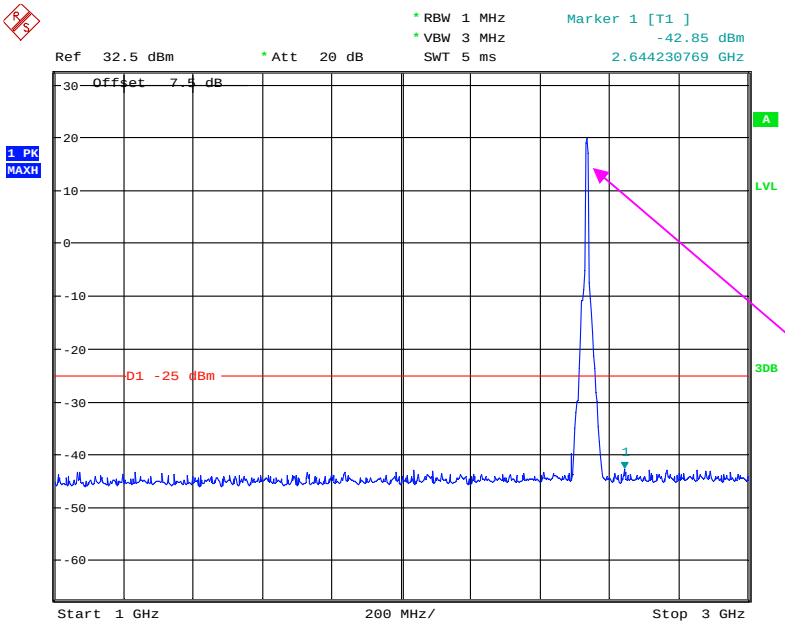
Date: 27.JAN.2019 16:28:32

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



Date: 27.JAN.2019 16:32:10

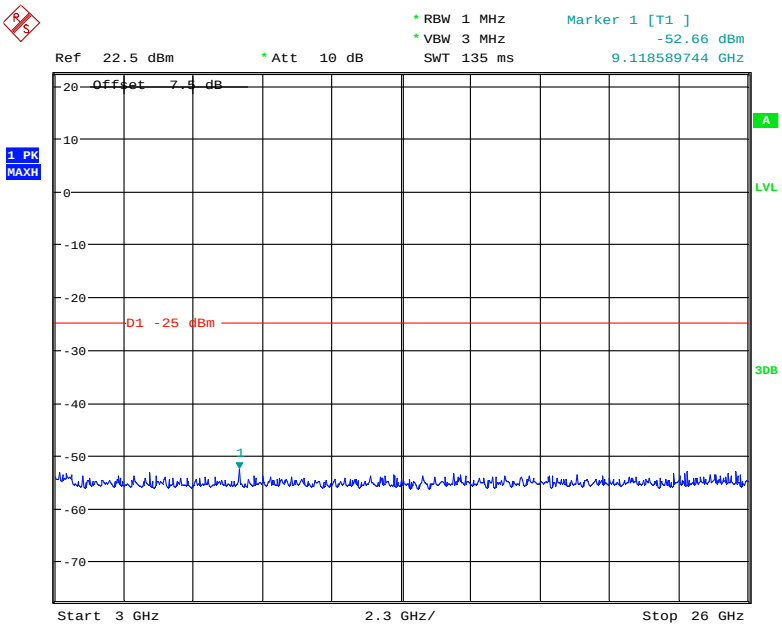
1 GHz – 3 GHz (10.0 MHz, Middle Channel)



Fundamental test

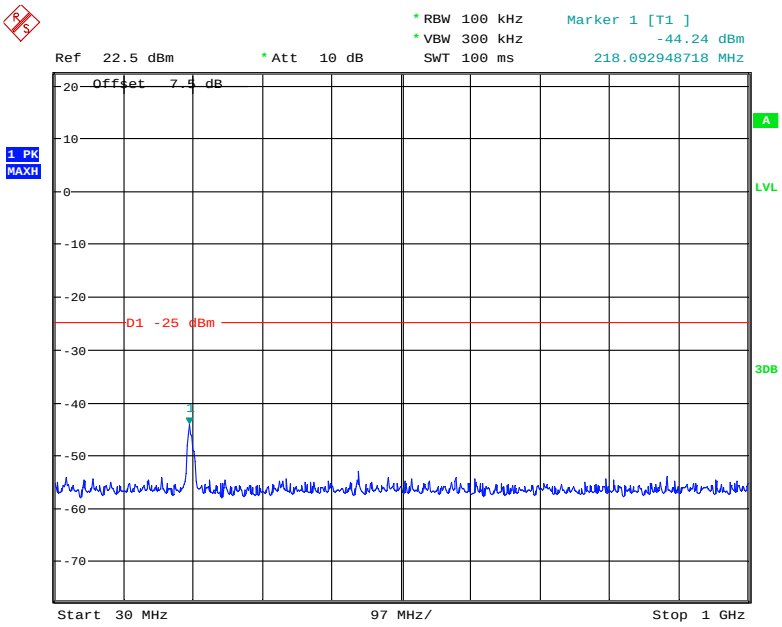
Date: 27.JAN.2019 16:30:25

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



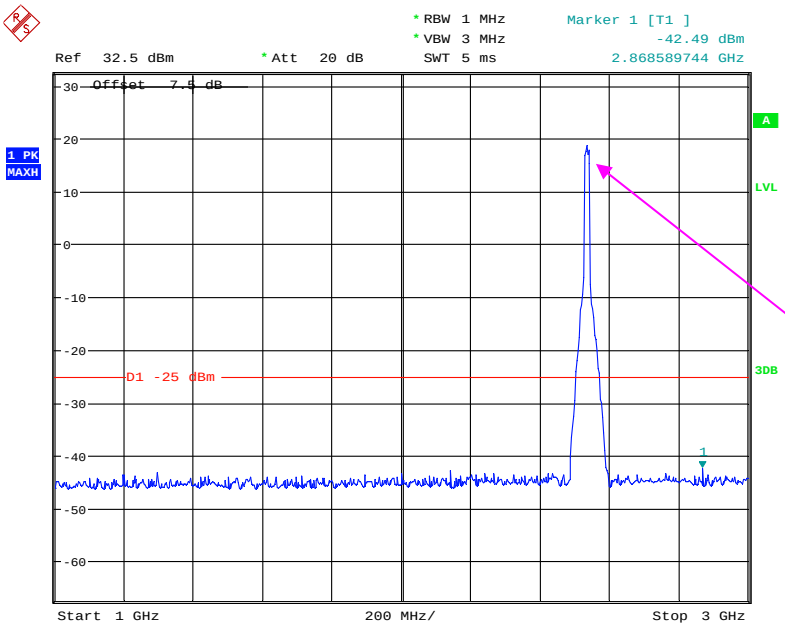
Date: 27.JAN.2019 16:28:48

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



Date: 27.JAN.2019 16:32:22

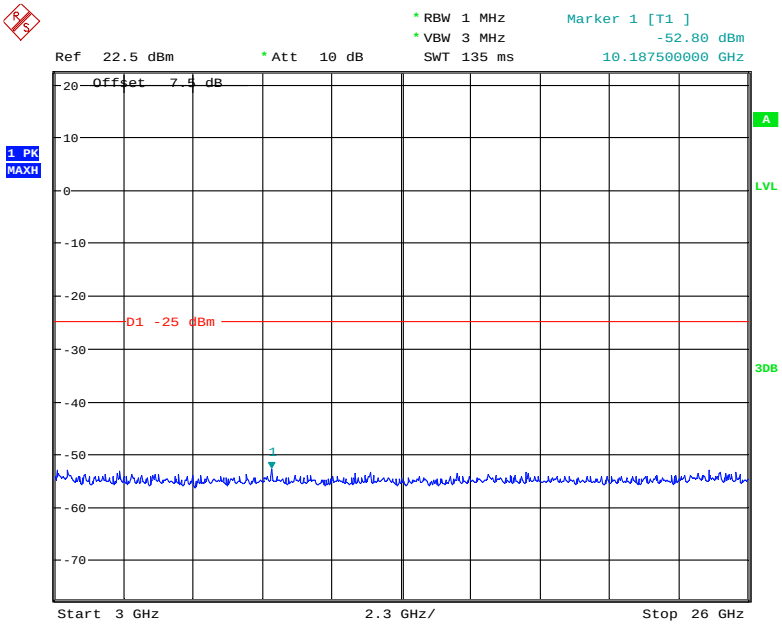
1 GHz – 3 GHz (15.0 MHz, Middle Channel)



Fundamental test

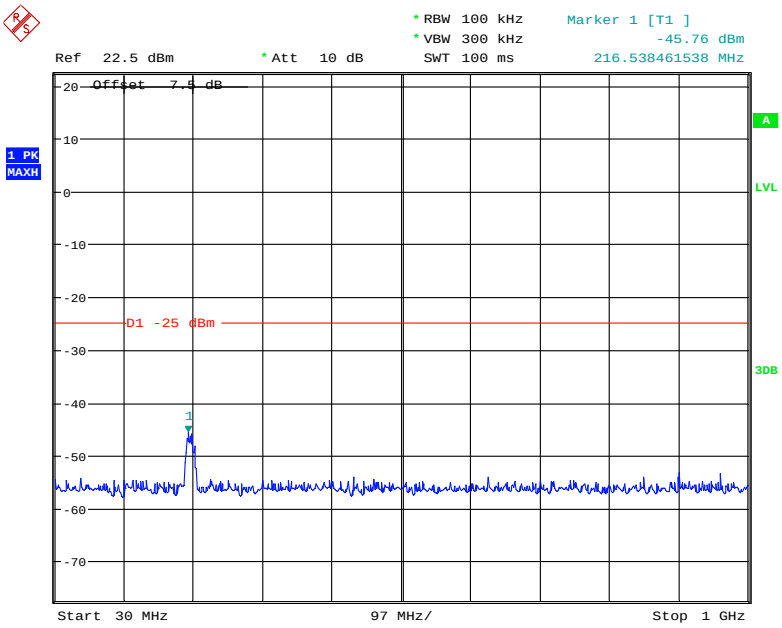
Date: 27.JAN.2019 16:30:06

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



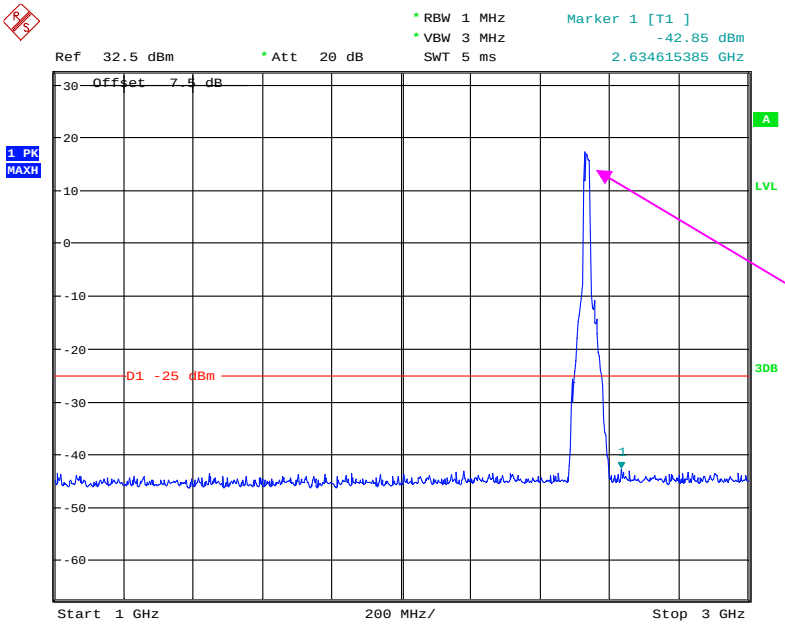
Date: 27.JAN.2019 16:29:03

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



Date: 27.JAN.2019 16:32:36

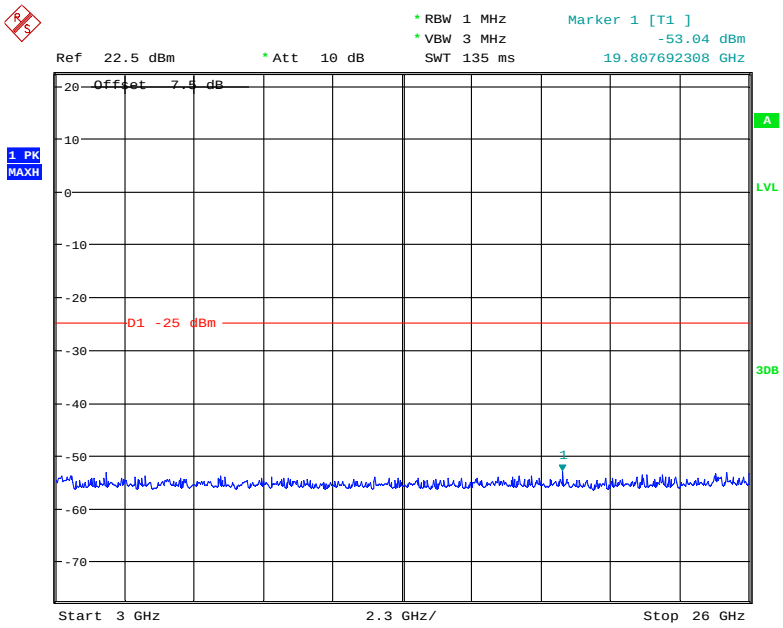
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 27.JAN.2019 16:29:39

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



Date: 27.JAN.2019 16:29:14

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 Kiki Kong on 2019-01-31.

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										
263.29	31.92	130	1.2	H	-65.1	0.32	0	-65.42	-13	52.42
263.29	31.00	40	1.4	V	-66.0	0.32	0	-66.32	-13	53.32
1673.20	66.03	120	1.6	H	-41.0	1.30	8.90	-33.40	-13	20.40
1673.20	66.03	227	2.4	V	-40.4	1.30	8.90	-32.80	-13	19.80
2509.80	48.08	26	1.9	H	-55.4	2.60	10.20	-47.80	-13	34.80
2509.80	48.53	233	1.6	V	-54.4	2.60	10.20	-46.80	-13	33.80
WCDMA Mode, Middle channel										
263.29	32.69	6	2.3	H	-64.3	0.32	0	-64.62	-13	51.62
263.29	31.74	260	1.3	V	-65.3	0.32	0	-65.62	-13	52.62
1673.20	53.90	281	1.4	H	-53.2	1.30	8.90	-45.60	-13	32.60
1673.20	54.52	115	1.5	V	-52.0	1.30	8.90	-44.40	-13	31.40
2509.80	57.38	230	1.8	H	-46.1	2.60	10.20	-38.50	-13	25.50
2509.80	56.73	116	1.7	V	-46.2	2.60	10.20	-38.60	-13	25.60

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										
263.29	32.15	210	1.2	H	-64.9	0.32	0	-65.22	-13	52.22
263.29	31.62	260	2.5	V	-65.4	0.32	0	-65.72	-13	52.72
3760.00	45.88	193	1.5	H	-55.3	1.50	11.80	-45.00	-13	32.00
3760.00	46.14	46	1.2	V	-54.6	1.50	11.80	-44.30	-13	31.30
WCDMA Mode Band II, Middle channel										
263.29	32.61	6	2.2	H	-64.4	0.32	0	-64.72	-13	51.72
263.29	31.47	339	1.5	V	-65.5	0.32	0	-65.82	-13	52.82
3760.00	44.60	273	2.1	H	-56.6	1.50	11.80	-46.30	-13	33.30
3760.00	45.30	239	2.1	V	-55.5	1.50	11.80	-45.20	-13	32.20

30 MHz ~ 20 GHz:

AWS Band (Part 27)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
WCDMA Mode Band IV, Middle channel										
263.29	32.15	257	2.4	H	-64.9	0.32	0	-65.22	-13	52.22
263.29	31.26	93	1.3	V	-65.7	0.32	0	-66.02	-13	53.02
3465.20	51.64	243	1.2	H	-48.7	1.50	12.00	-38.20	-13	25.20
3465.20	50.84	295	1.8	V	-50.3	1.50	12.00	-39.80	-13	26.80

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)			
Band 2										
Test frequency range:30 MHz ~ 20 GHz										
263.29	32.61	272	1.3	H	-64.4	0.32	0	-64.72	-13	51.72
263.29	31.81	51	2.1	V	-65.2	0.32	0	-65.52	-13	52.52
3760.00	43.63	85	2.2	H	-57.6	1.50	11.80	-47.30	-13	34.30
3760.00	44.09	306	2.2	V	-56.7	1.50	11.80	-46.40	-13	33.40
Band 4										
Test frequency range:30 MHz ~ 18 GHz										
263.29	32.19	190	2.3	H	-64.8	0.32	0	-65.12	-13	52.12
263.29	31.54	126	1.1	V	-65.5	0.32	0	-65.82	-13	52.82
3465.00	48.65	172	1.2	H	-51.7	1.50	12.00	-41.20	-13	28.20
3465.00	49.38	96	1.2	V	-51.8	1.50	12.00	-41.30	-13	28.30
Band 5										
Test frequency range:30 MHz ~ 10 GHz										
263.29	31.94	154	1.5	H	-65.1	0.32	0	-65.42	-13	52.42
263.29	31.52	153	1.8	V	-65.5	0.32	0	-65.82	-13	52.82
1673.00	47.39	235	1.4	H	-59.7	1.30	8.90	-52.10	-13	39.10
1673.00	45.21	183	2.1	V	-61.3	1.30	8.90	-53.70	-13	40.70
2509.50	44.49	297	1.5	H	-59.0	2.60	10.20	-51.40	-13	38.40
2509.50	45.40	143	1.7	V	-57.5	2.60	10.20	-49.90	-13	36.90
Band 7										
Test frequency range: 30 MHz ~ 26GHz										
149.56	33.55	29	1.5	H	-63.40	0.26	0	-63.66	-25	38.66
149.56	30.47	339	1.3	V	-66.50	0.26	0	-66.76	-25	41.76
5070.00	46.01	8	1.5	H	-51.9	1.60	12.10	-41.40	-25	16.40
5070.00	45.36	240	1.2	V	-52.5	1.60	12.10	-42.00	-25	17.00

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

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.

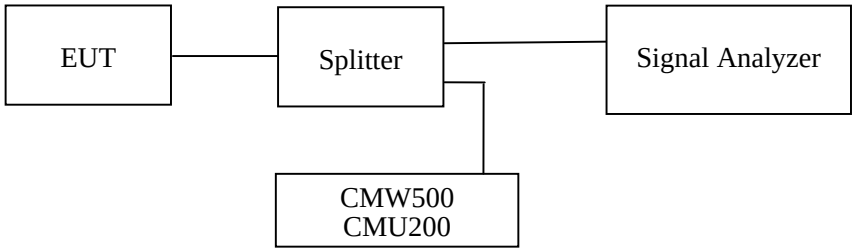
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

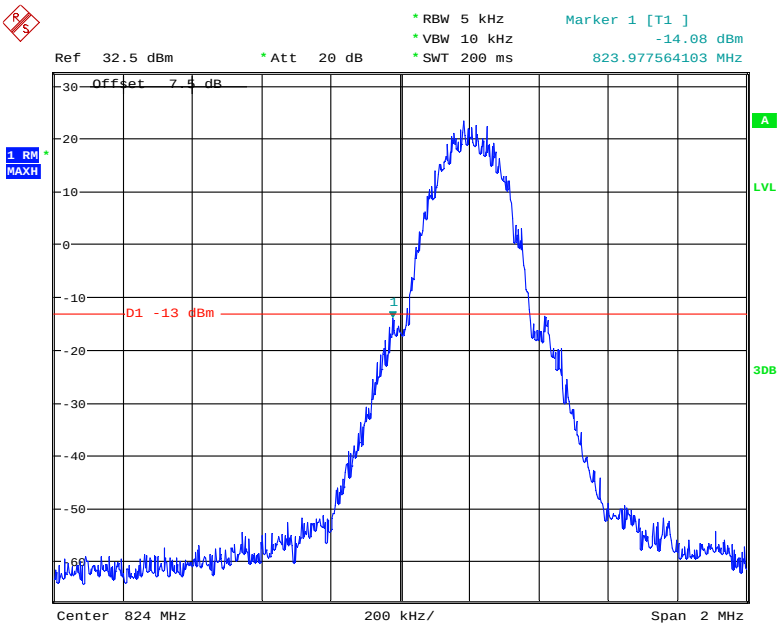
Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Kiki Kong on 2019-01-25 to 2019-01-27.

EUT operation mode: Transmitting

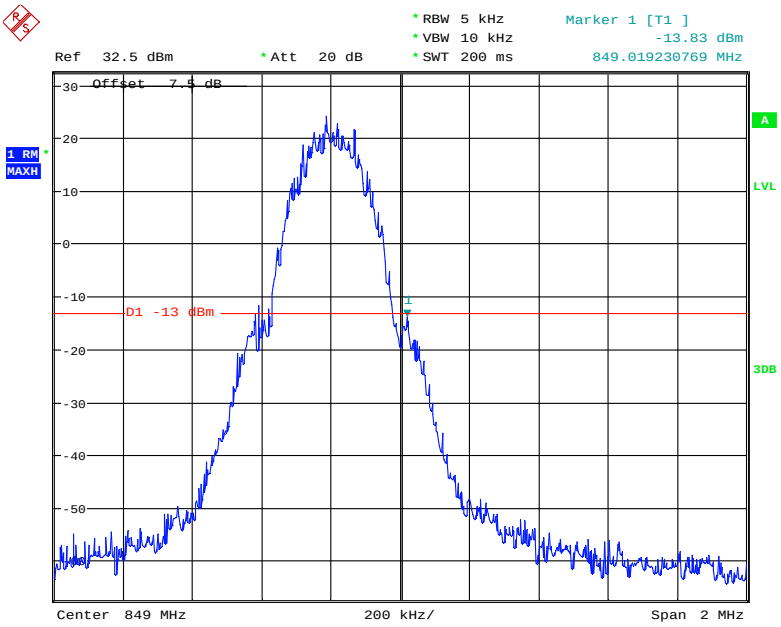
Test Result: Compliance. Please refer to the following plots.

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



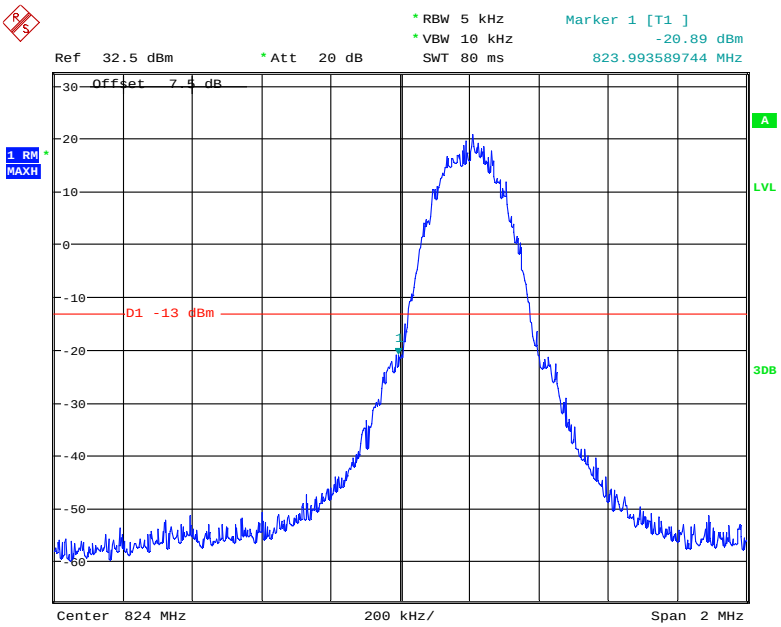
Date: 26.JAN.2019 00:21:46

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



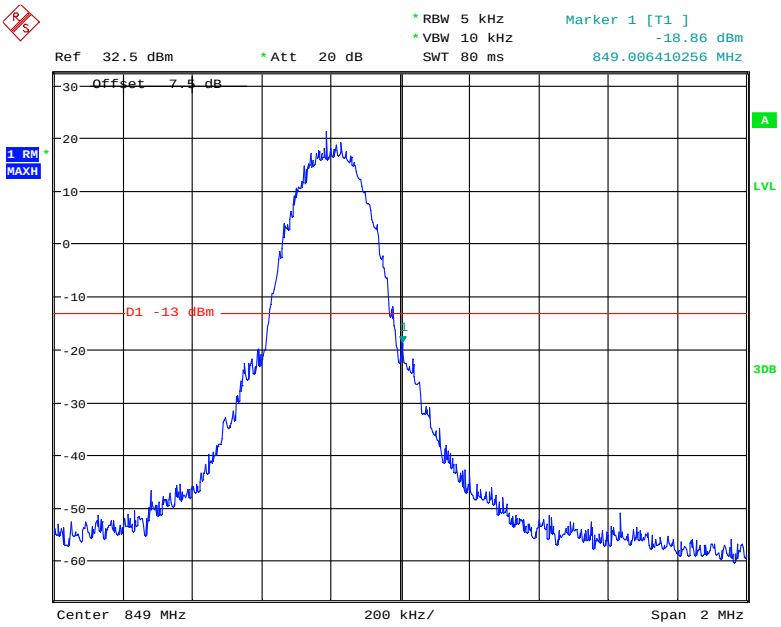
Date: 26.JAN.2019 00:22:40

Cellular Band, Left Band Edge for EDGE Mode



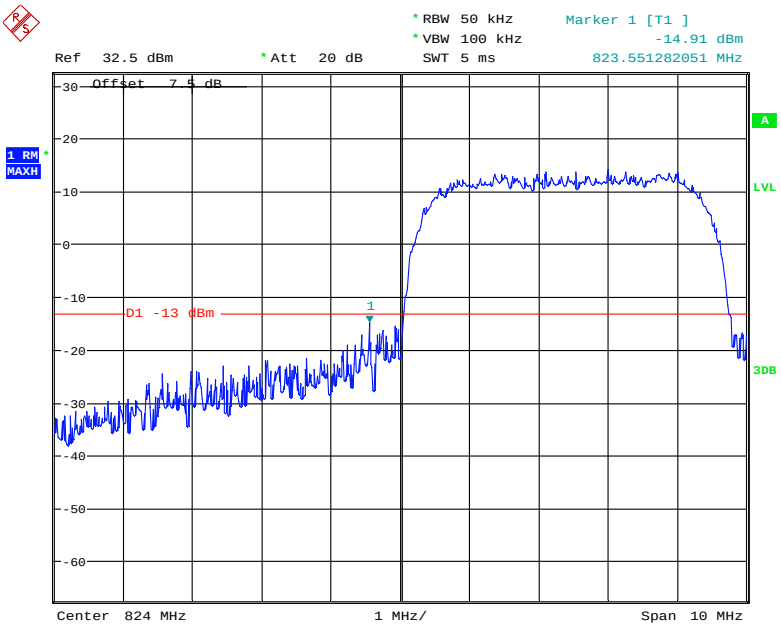
Date: 26.JAN.2019 00:05:53

Cellular Band, Right Band Edge for EDGE Mode



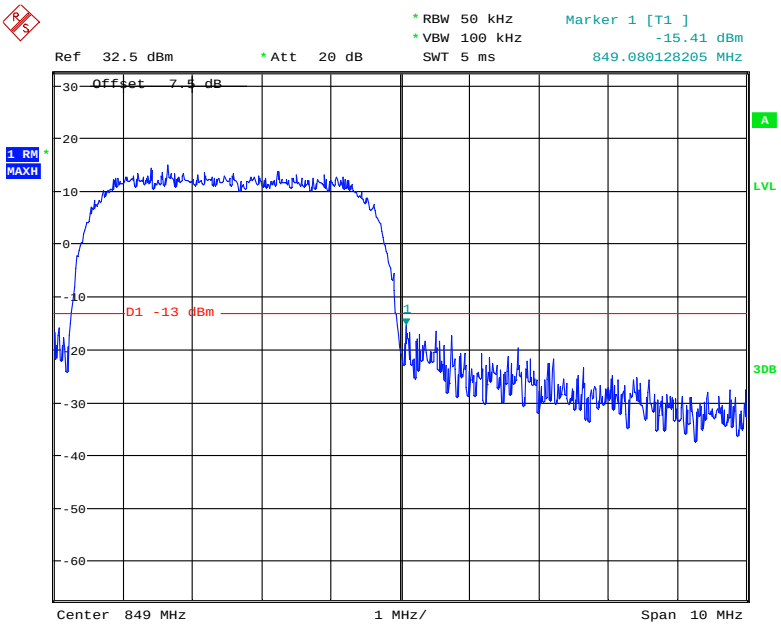
Date: 26.JAN.2019 00:07:21

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



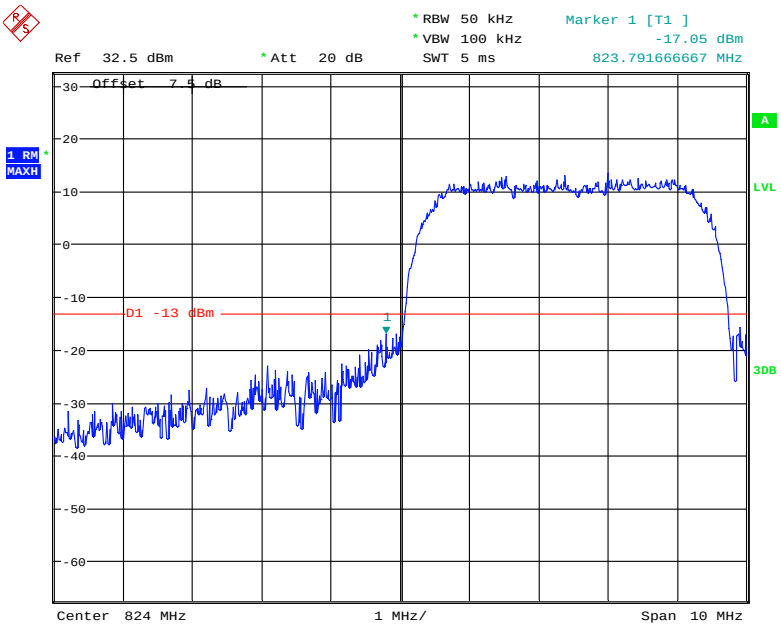
Date: 27.JAN.2019 10:41:06

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



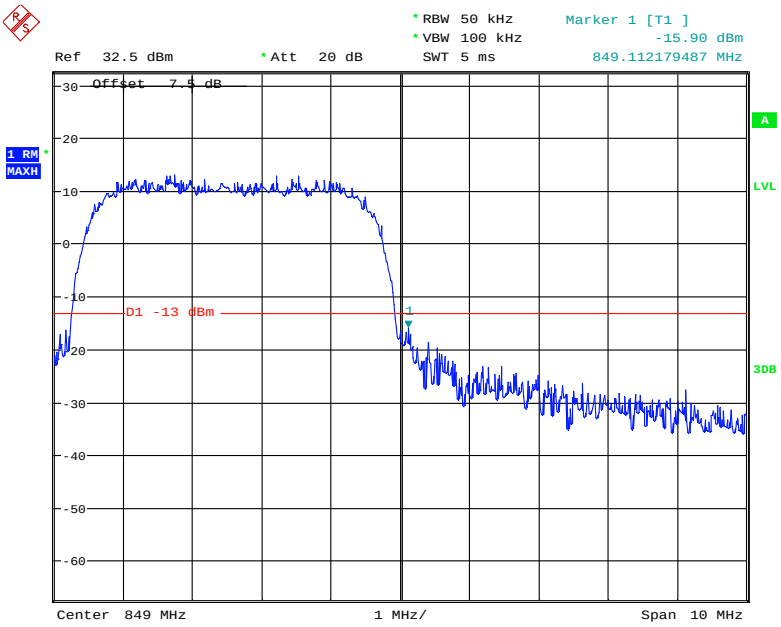
Date: 27.JAN.2019 10:41:47

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



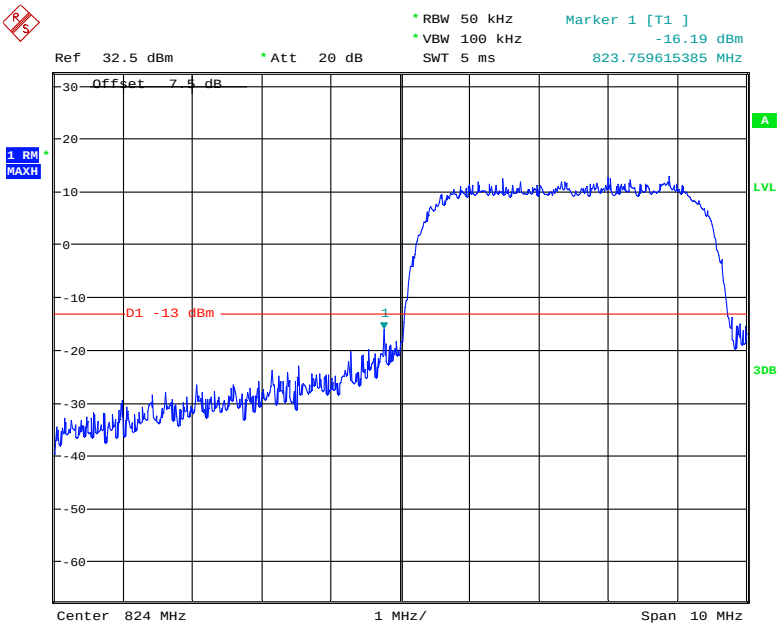
Date: 27.JAN.2019 10:39:53

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



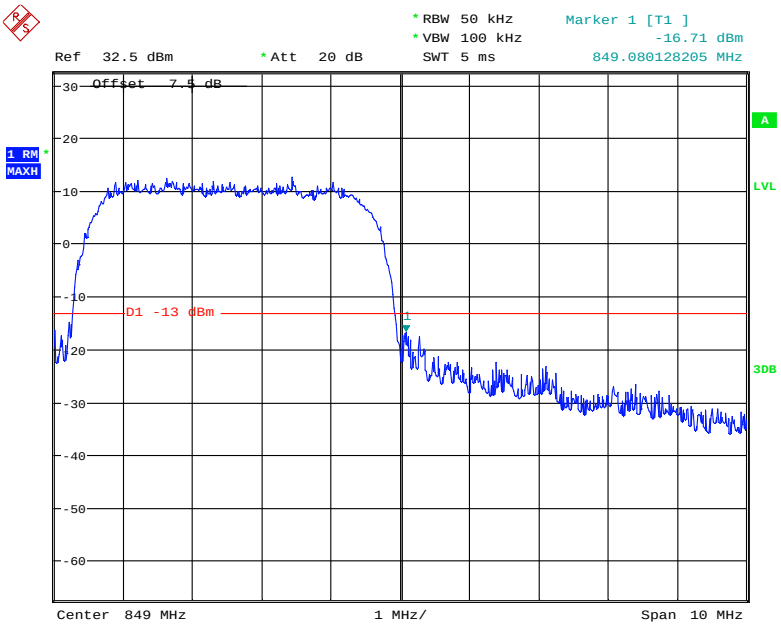
Date: 27.JAN.2019 10:39:02

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



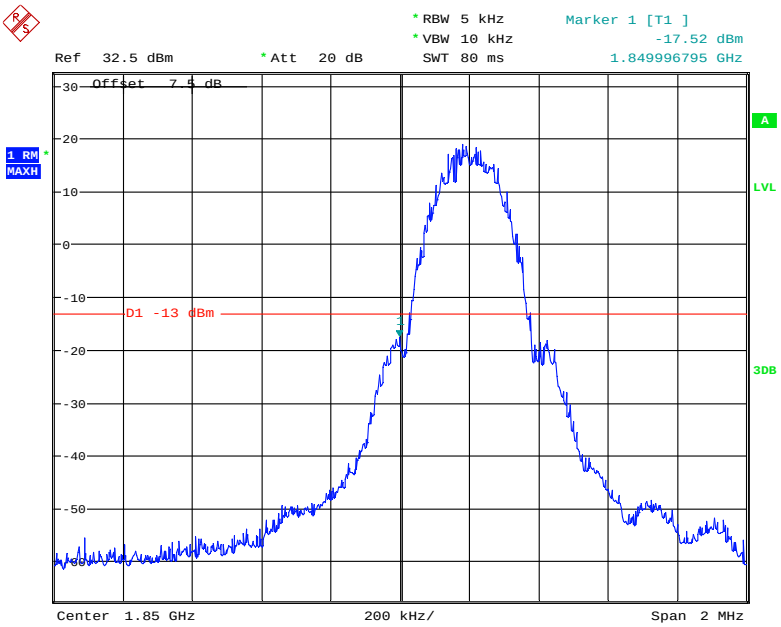
Date: 27.JAN.2019 10:35:27

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



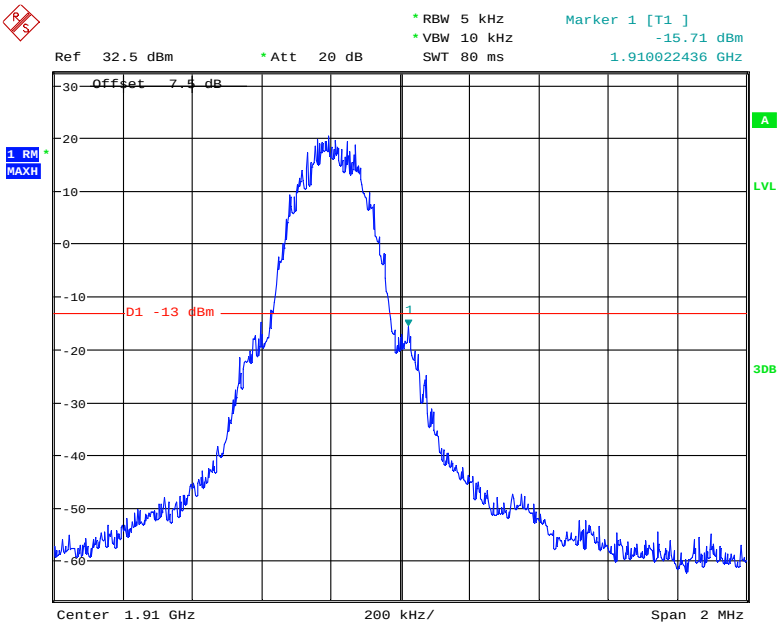
Date: 27.JAN.2019 10:36:14

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



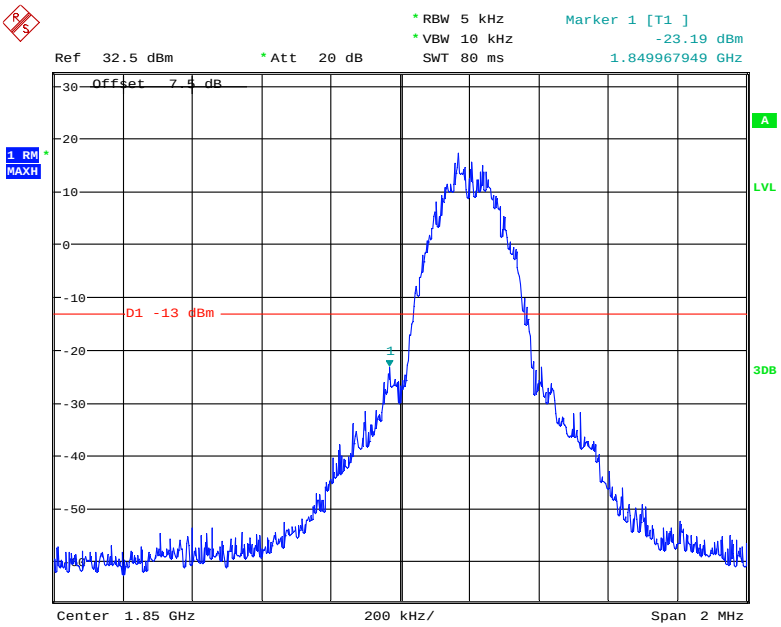
Date: 25.JAN.2019 23:59:51

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



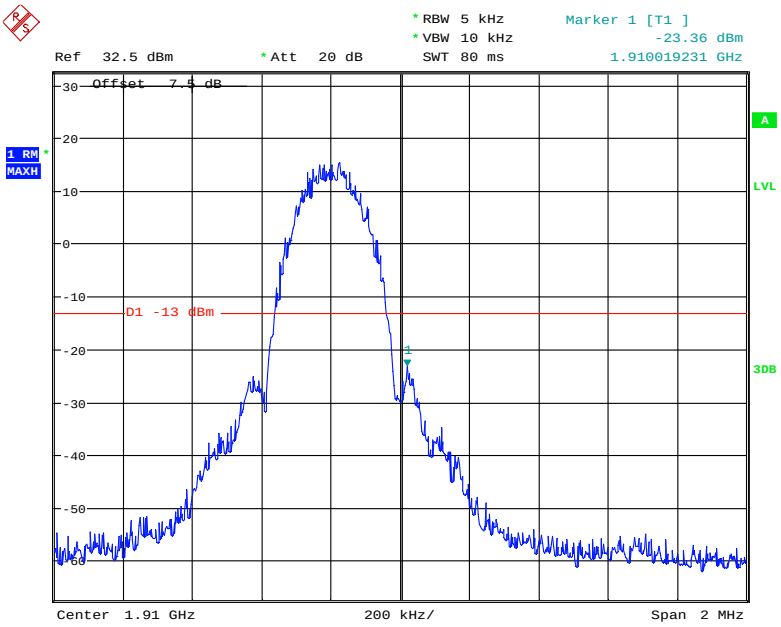
Date: 26.JAN.2019 00:01:12

PCS Band, Left Band Edge for EDGE Mode



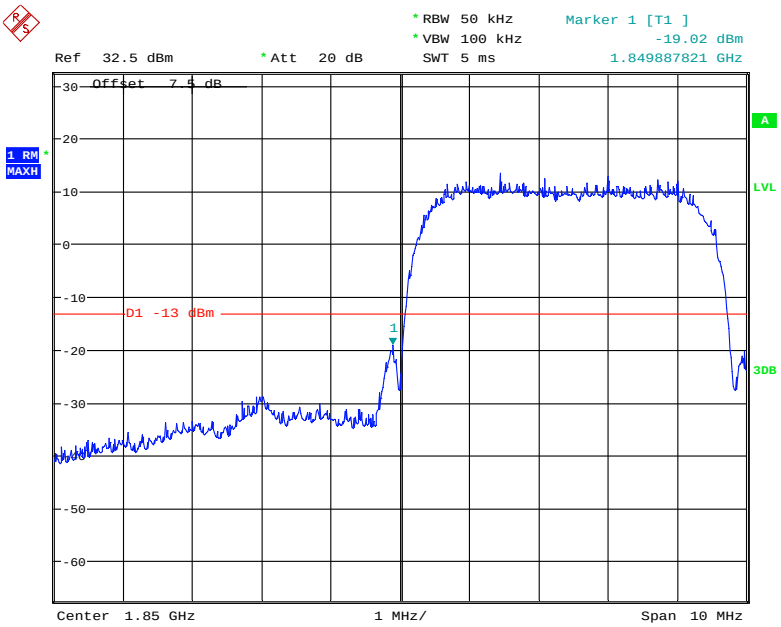
Date: 25.JAN.2019 23:54:26

PCS Band, Right Band Edge for EDGE Mode



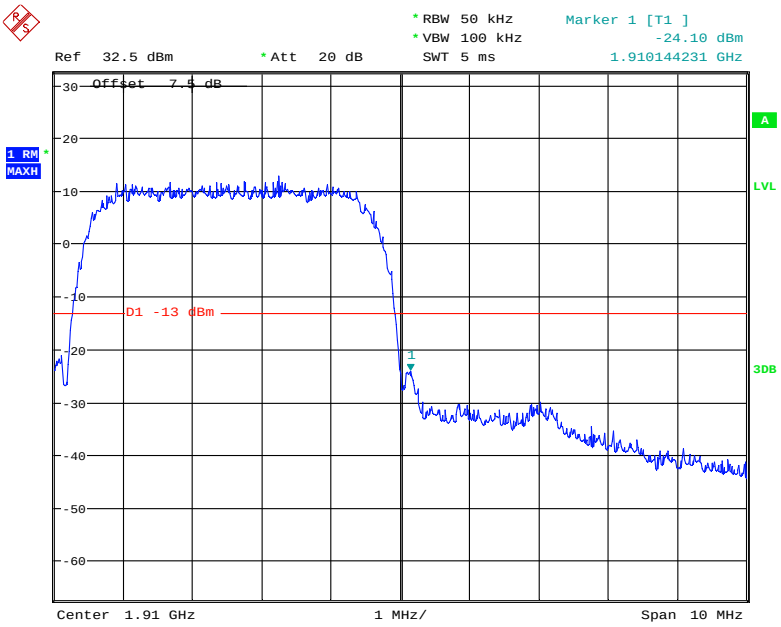
Date: 25.JAN.2019 23:54:03

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



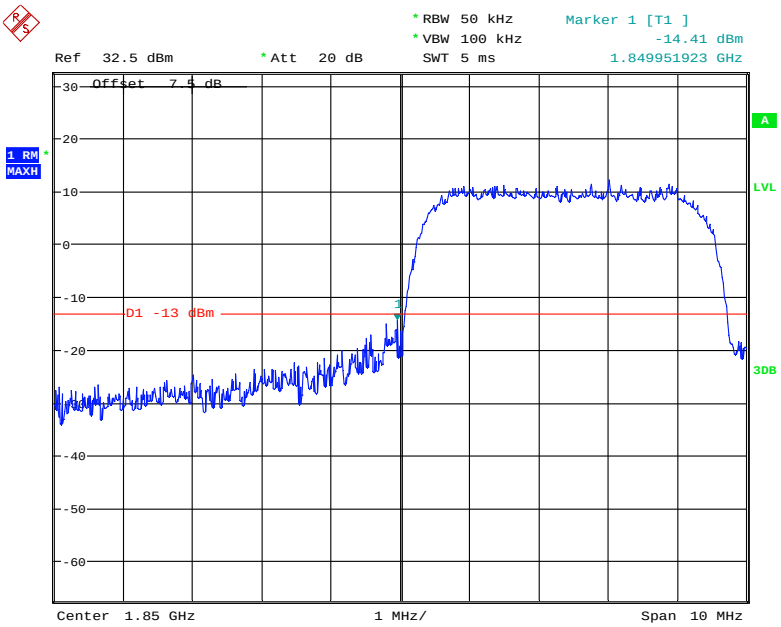
Date: 27.JAN.2019 09:40:56

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



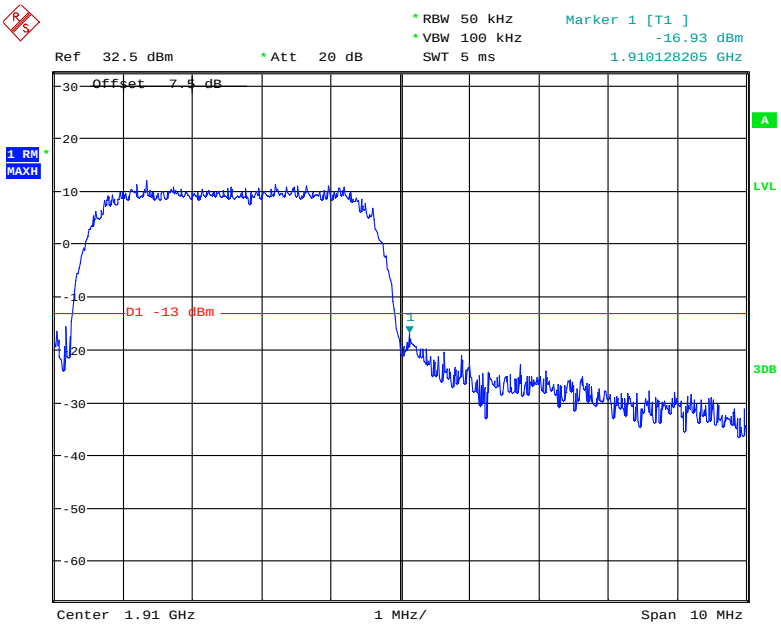
Date: 27.JAN.2019 09:41:24

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



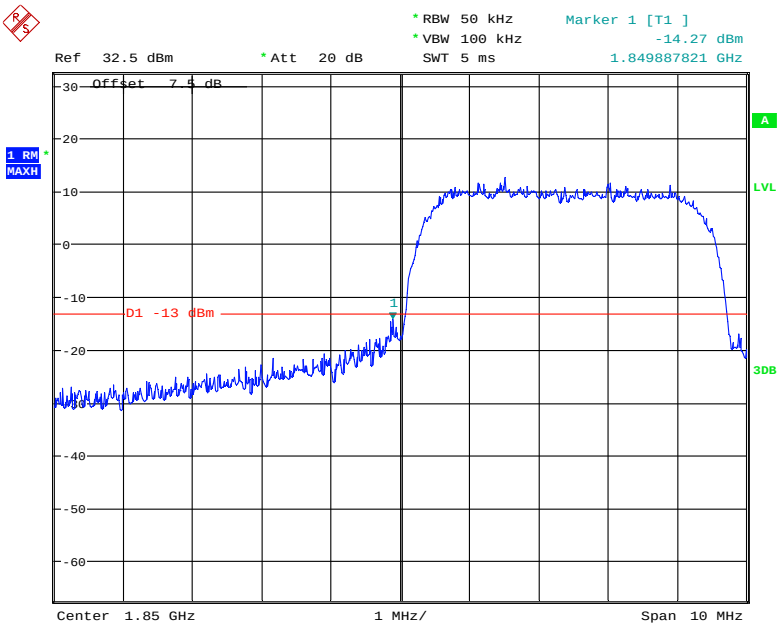
Date: 27.JAN.2019 09:40:06

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



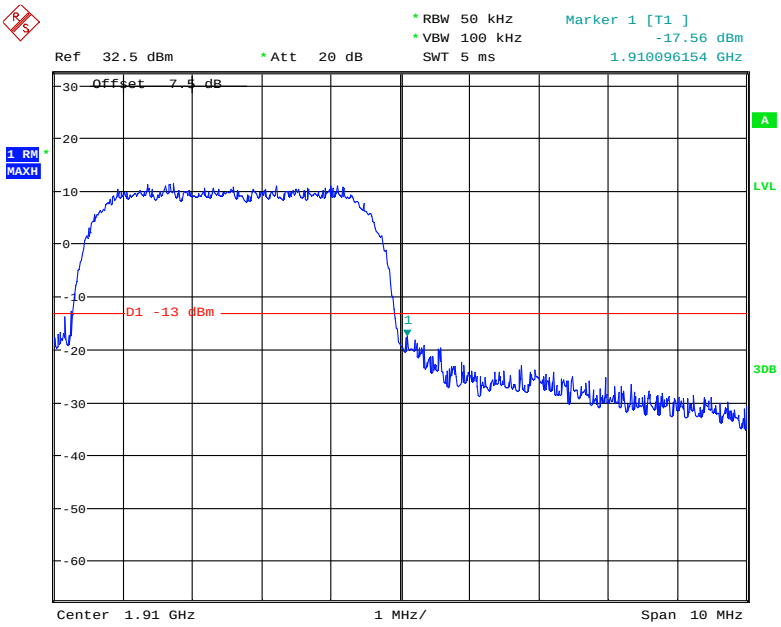
Date: 27.JAN.2019 09:39:20

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



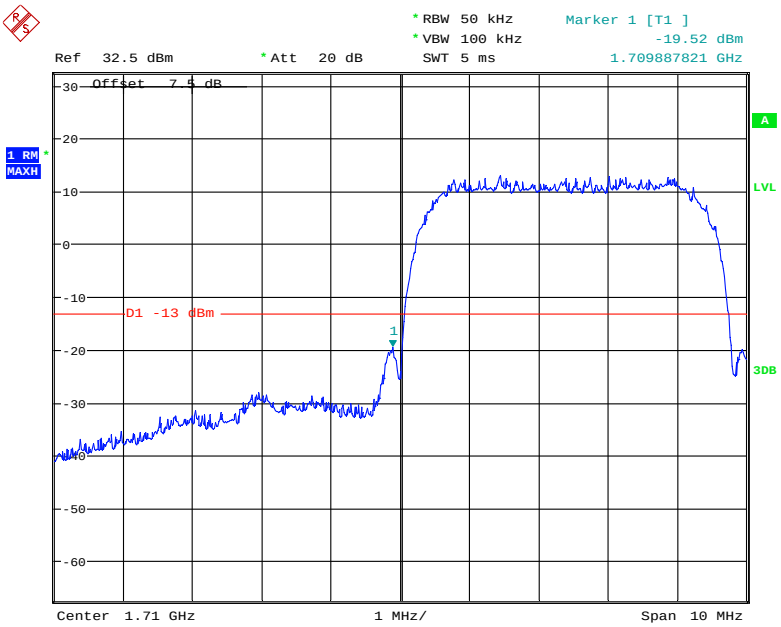
Date: 27.JAN.2019 09:35:33

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



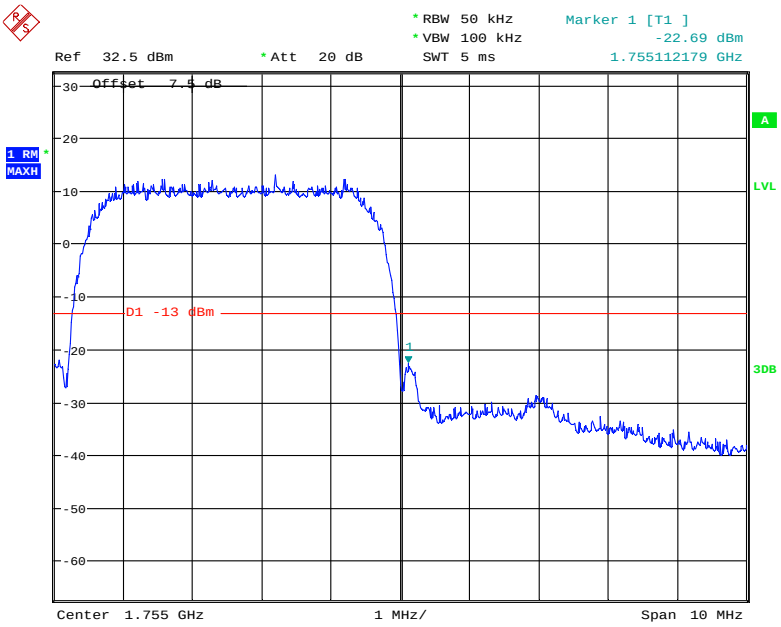
Date: 27.JAN.2019 09:38:10

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



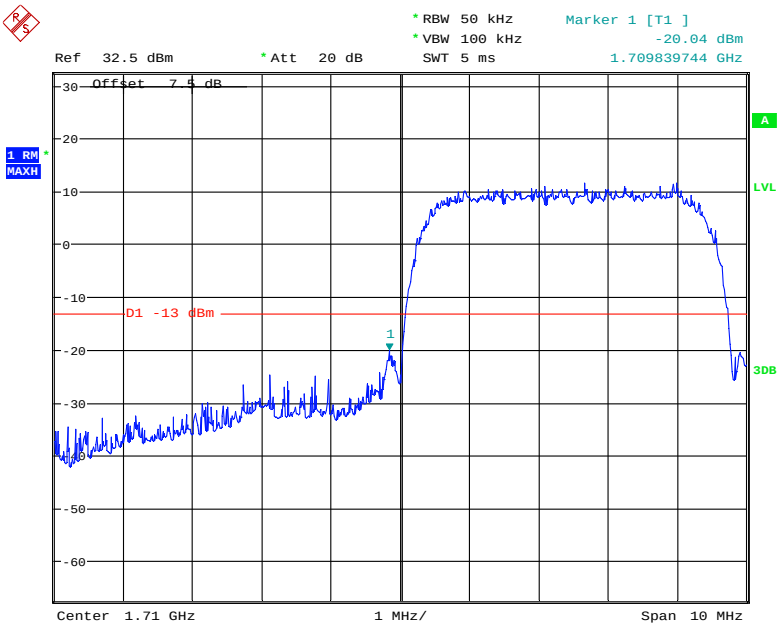
Date: 27.JAN.2019 10:03:22

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



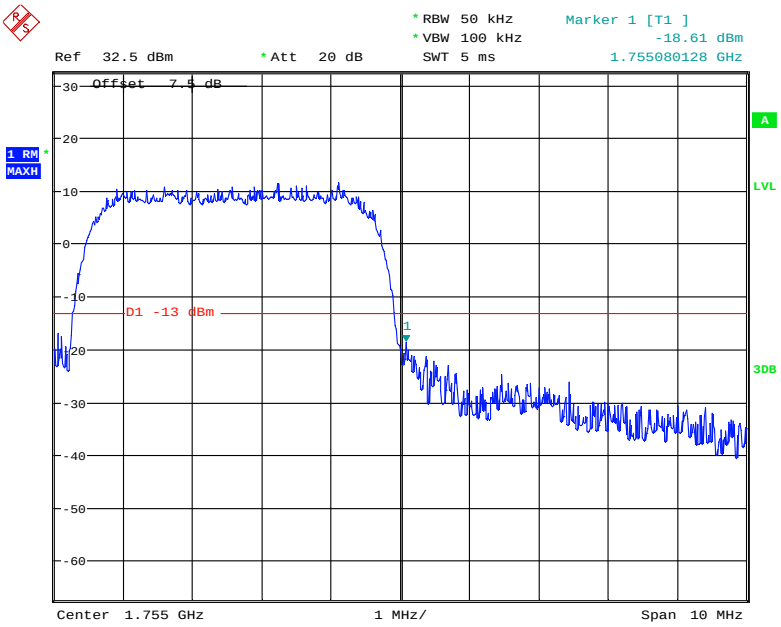
Date: 27.JAN.2019 10:04:01

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



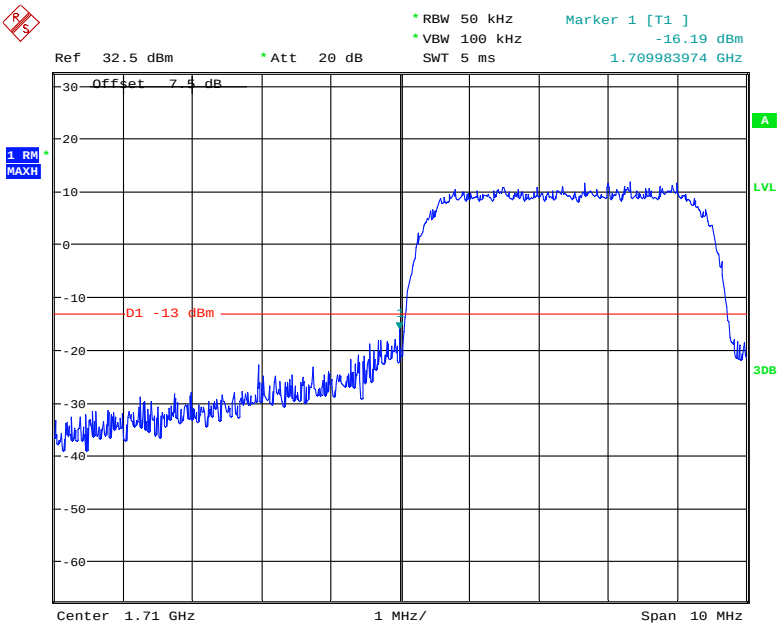
Date: 27.JAN.2019 10:00:03

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



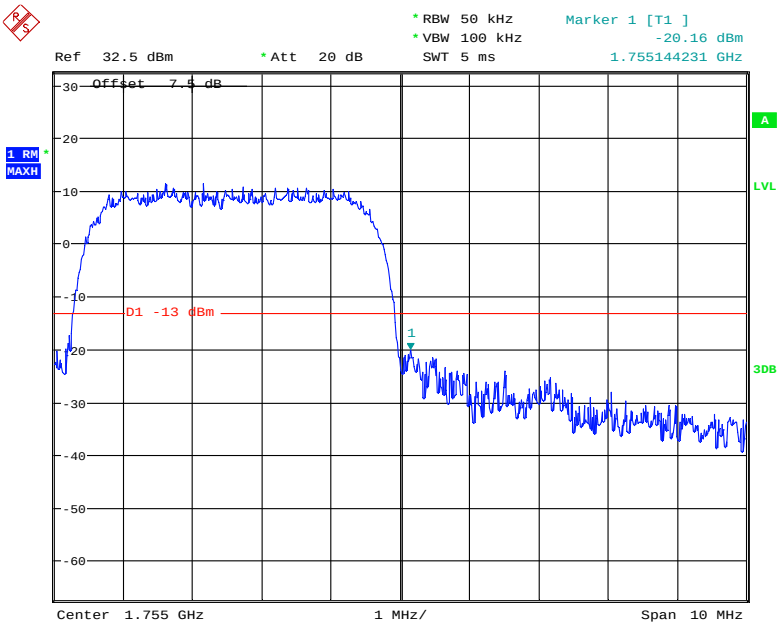
Date: 27.JAN.2019 09:59:22

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



Date: 27.JAN.2019 09:57:50

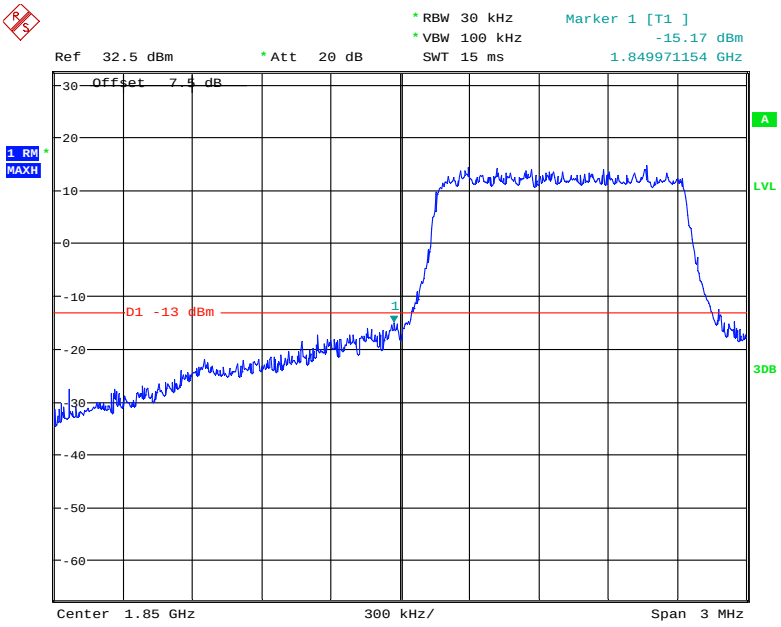
AWS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 27.JAN.2019 09:58:43

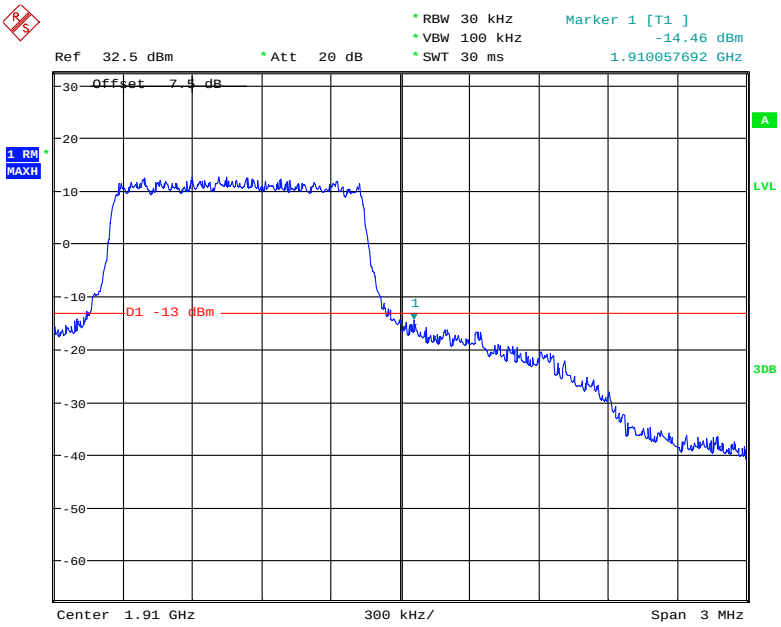
Band 2:

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



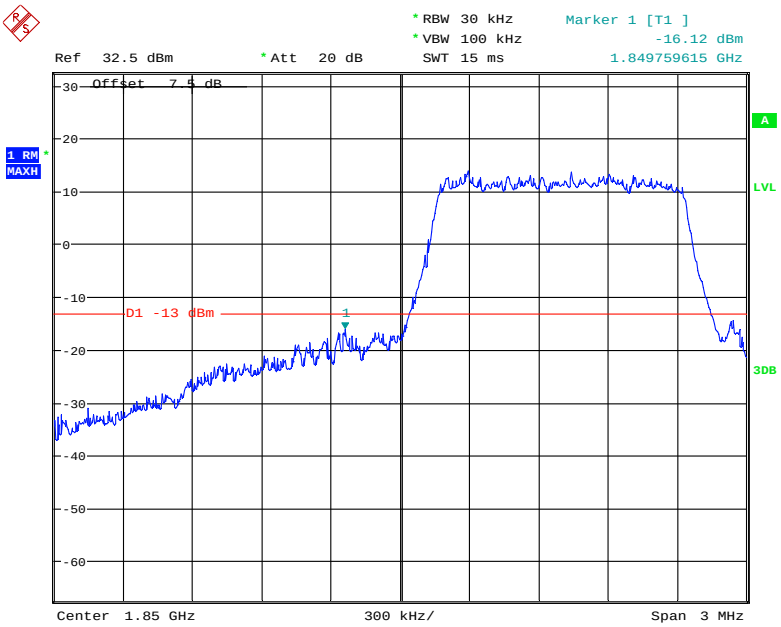
Date: 27.JAN.2019 15:02:08

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



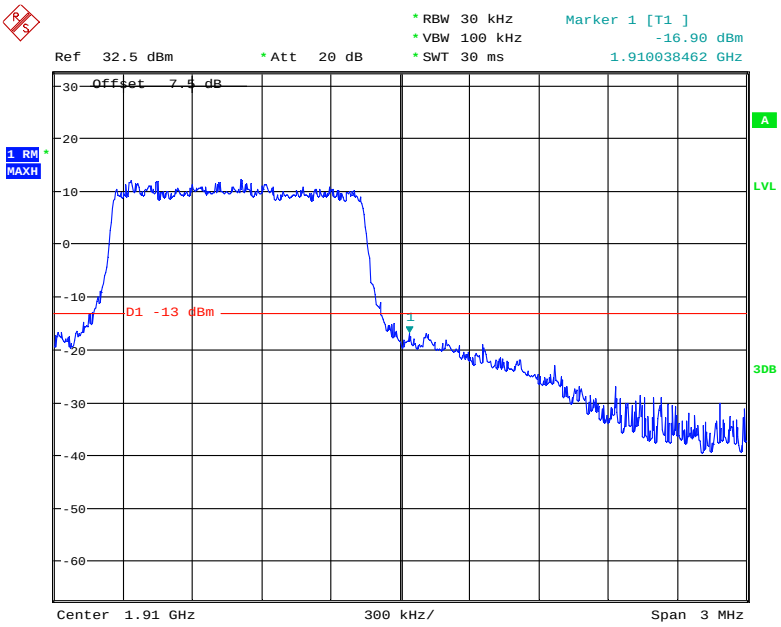
Date: 27.JAN.2019 15:02:49

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



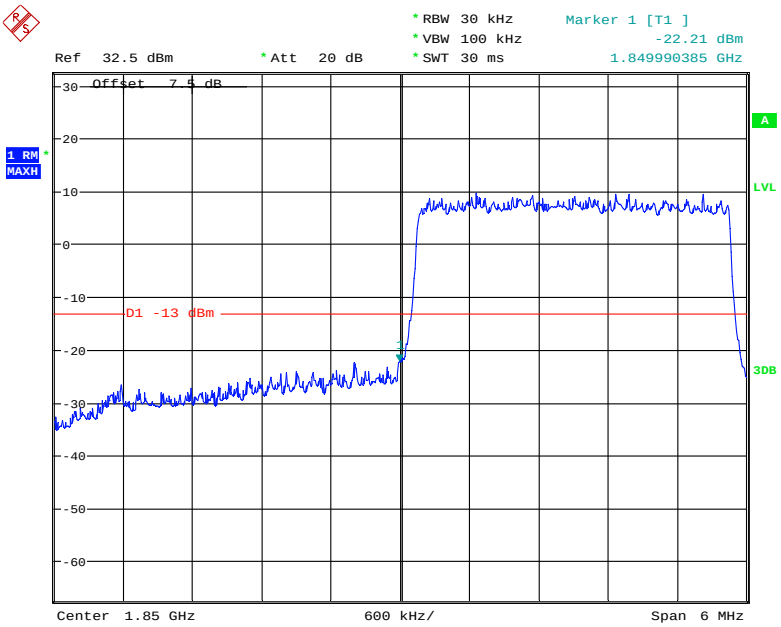
Date: 27.JAN.2019 15:01:30

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



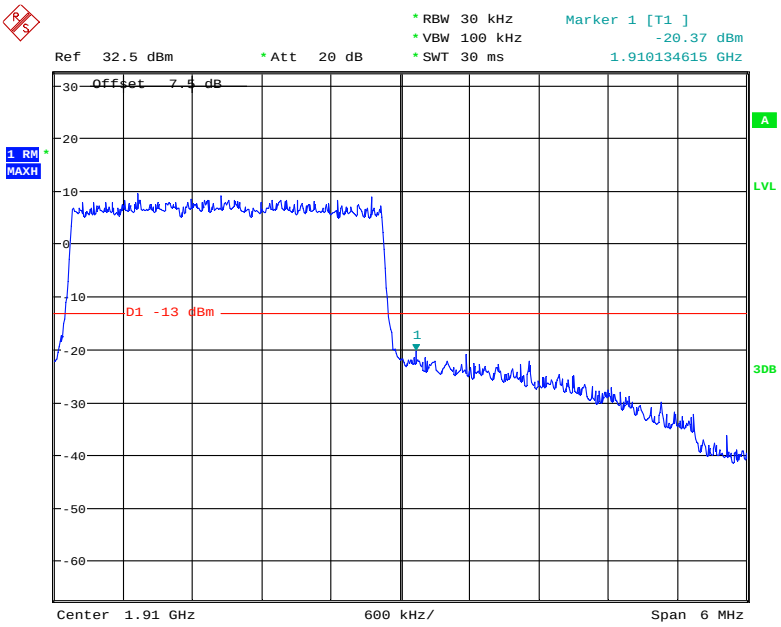
Date: 27.JAN.2019 15:03:22

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



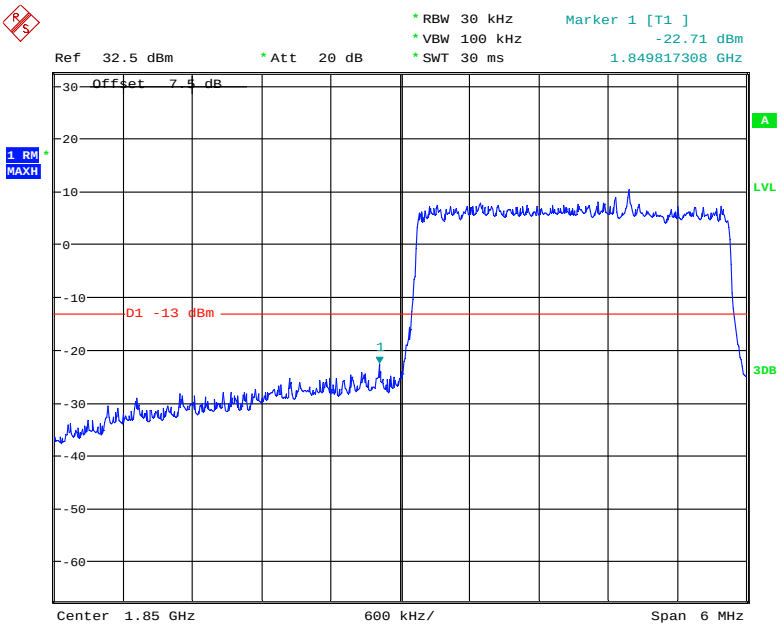
Date: 27.JAN.2019 15:04:37

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



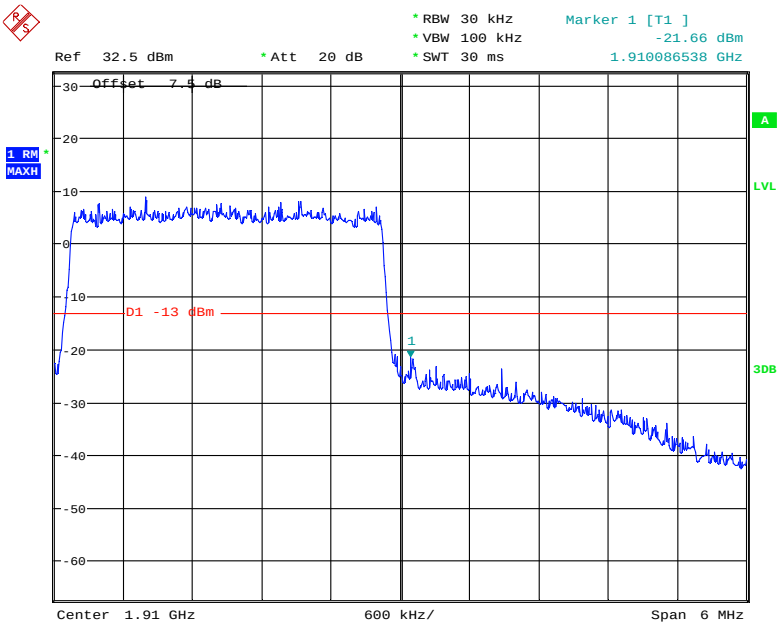
Date: 27.JAN.2019 15:07:28

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



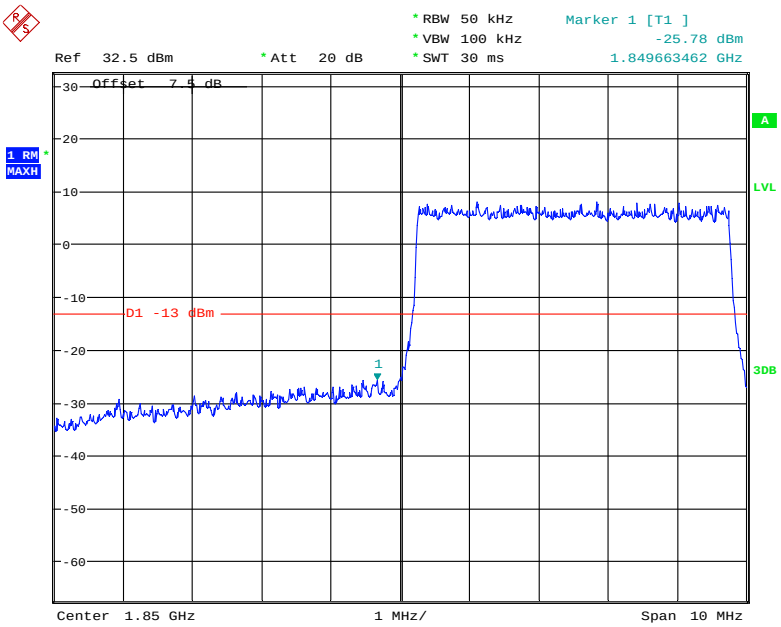
Date: 27.JAN.2019 15:06:12

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



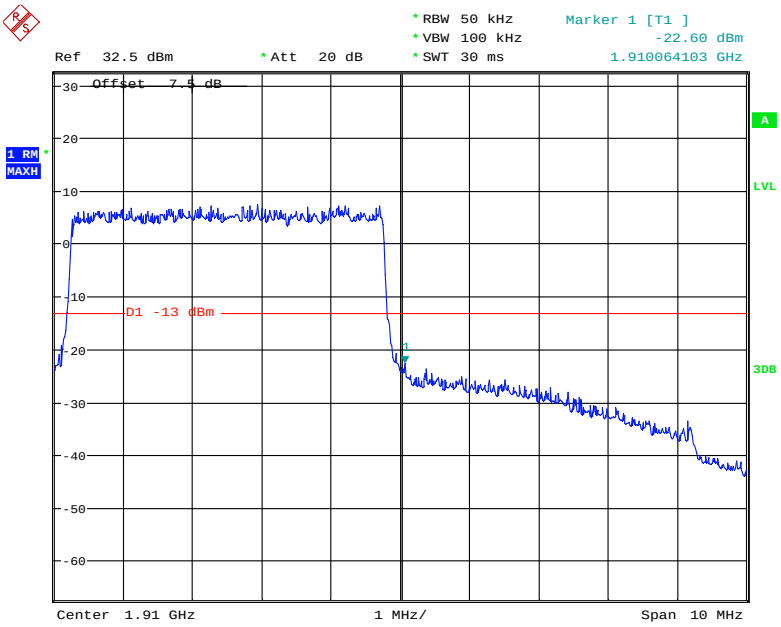
Date: 27.JAN.2019 15:07:02

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



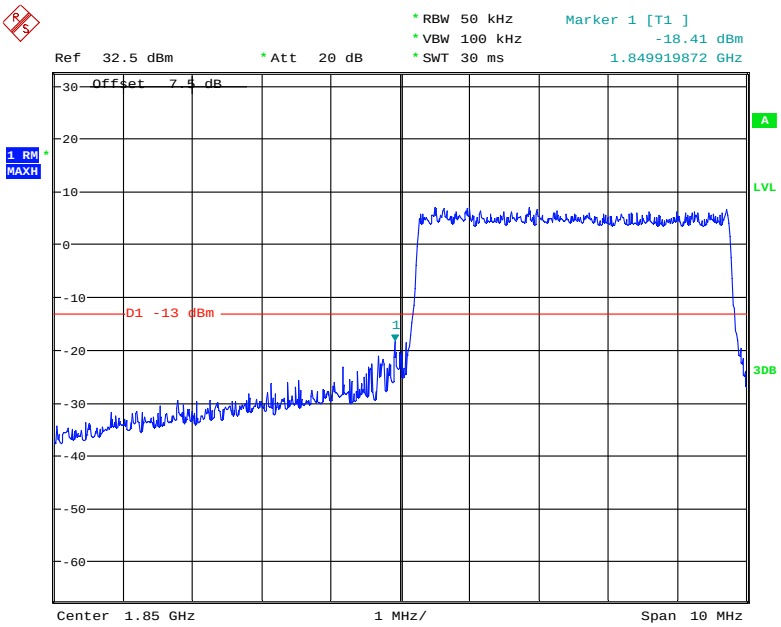
Date: 27.JAN.2019 15:10:20

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



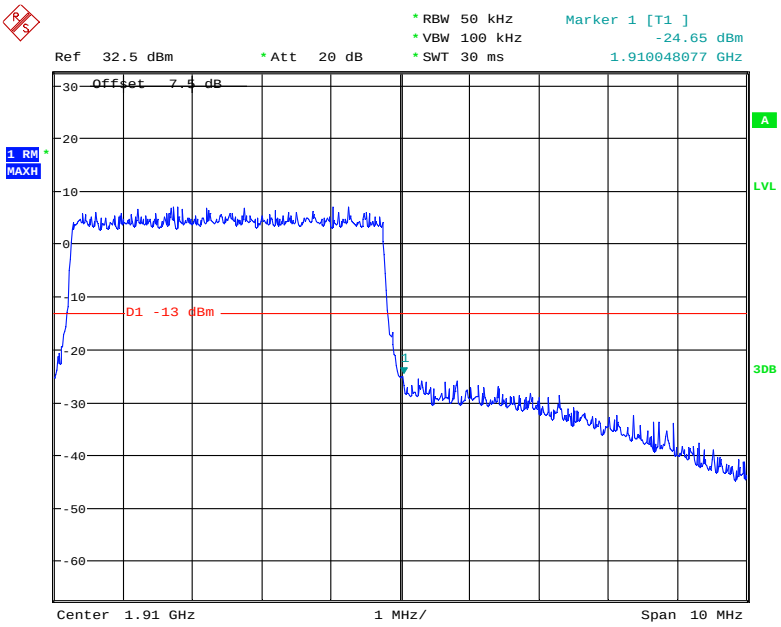
Date: 27.JAN.2019 15:10:56

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



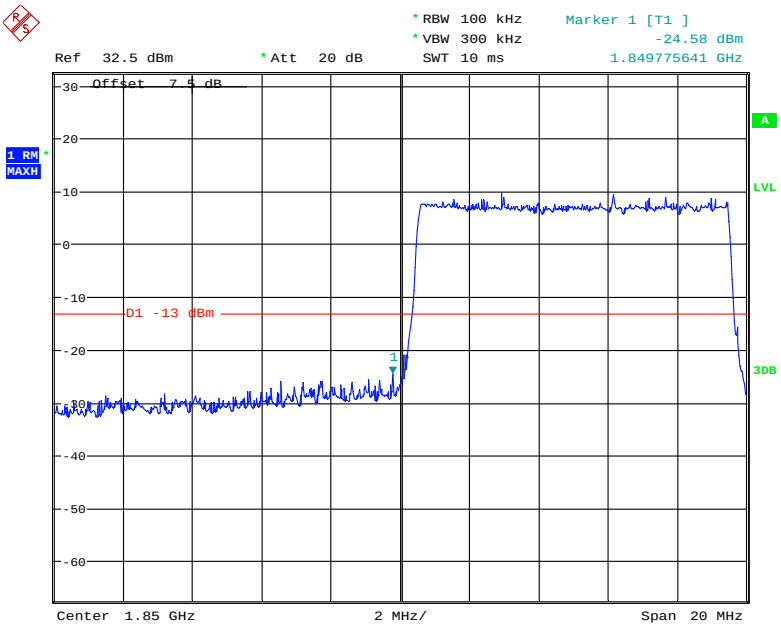
Date: 27.JAN.2019 15:09:26

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



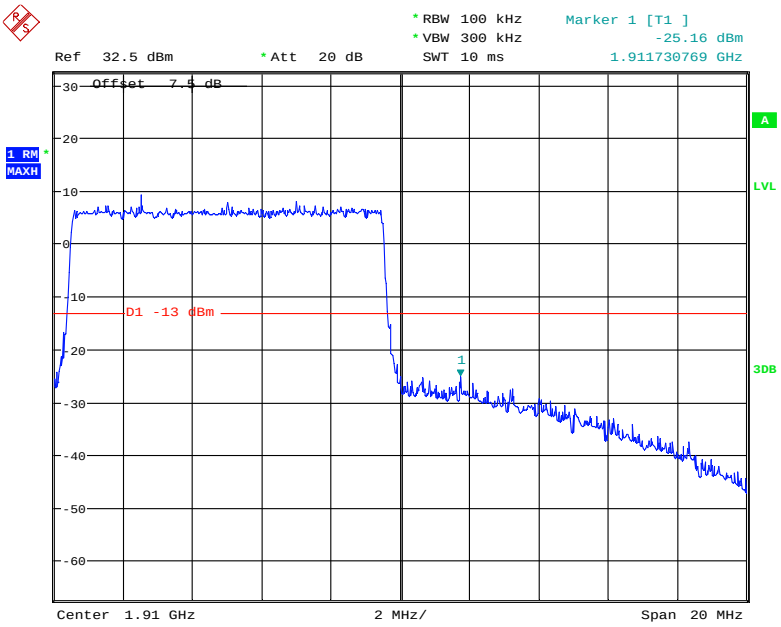
Date: 27.JAN.2019 15:11:20

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



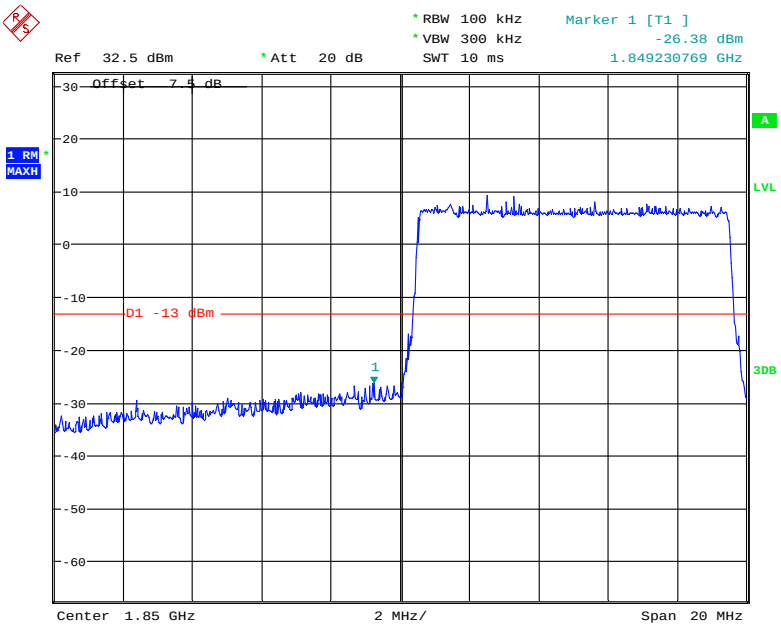
Date: 27.JAN.2019 15:13:13

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



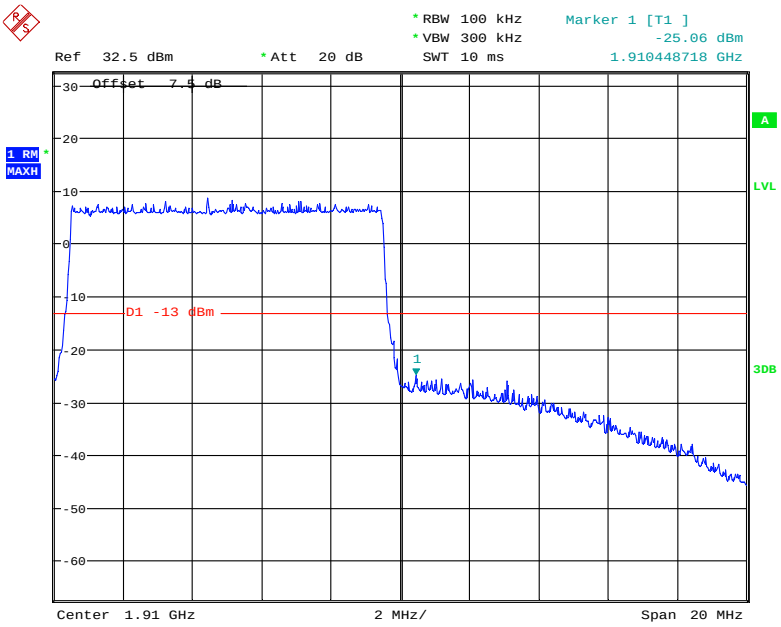
Date: 27.JAN.2019 15:19:18

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



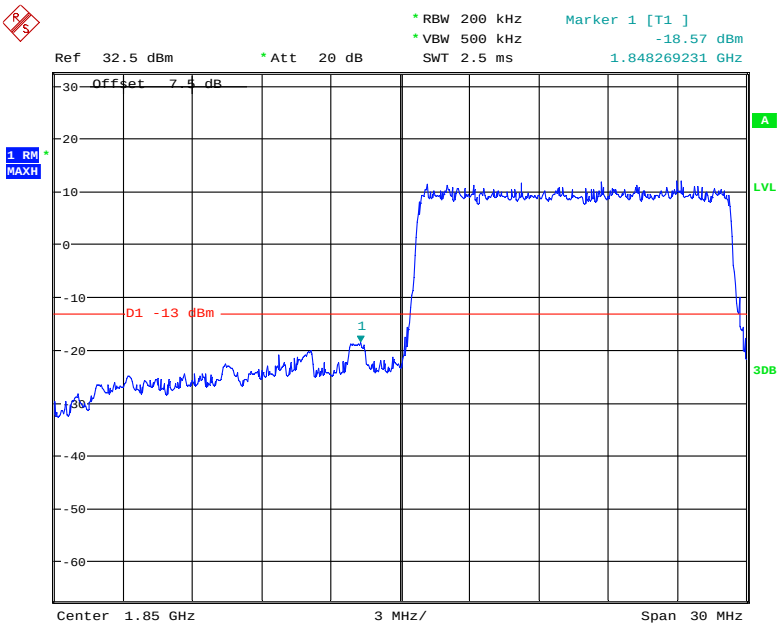
Date: 27.JAN.2019 15:12:27

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



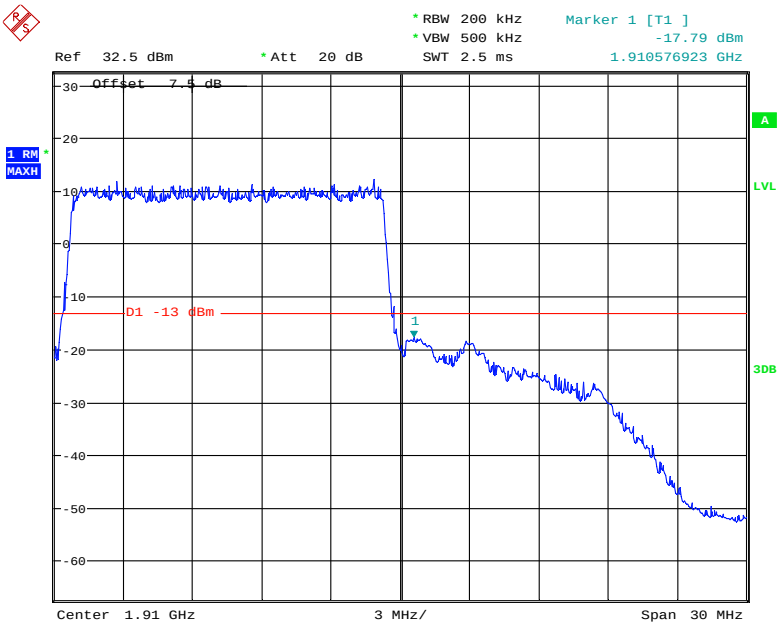
Date: 27.JAN.2019 15:14:32

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



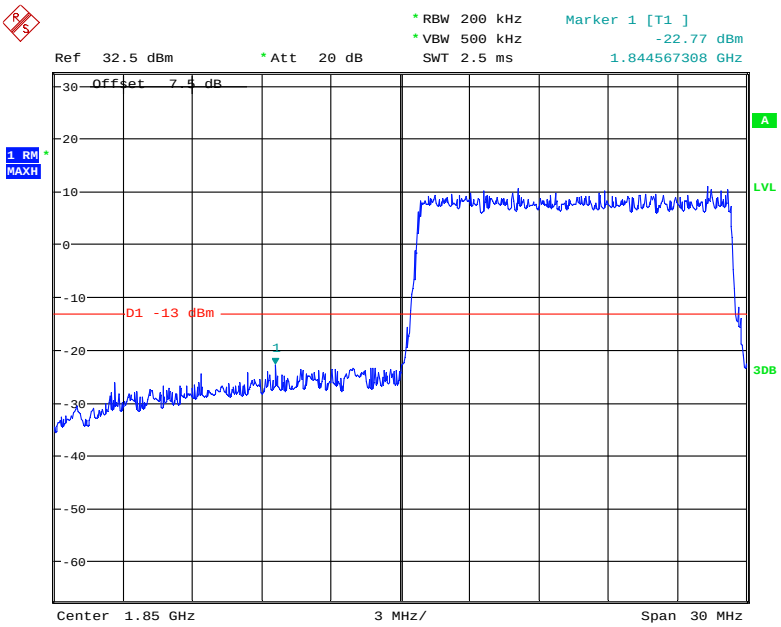
Date: 27.JAN.2019 15:24:17

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



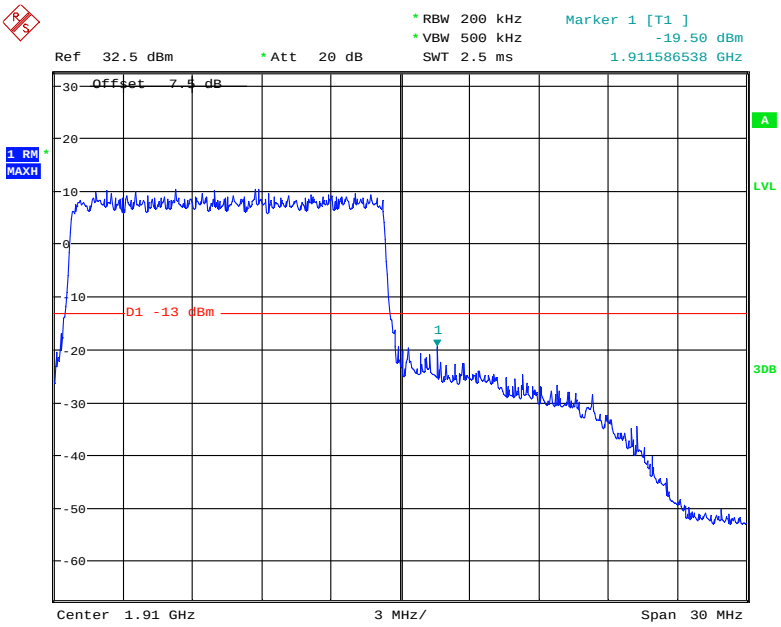
Date: 27.JAN.2019 15:26:42

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



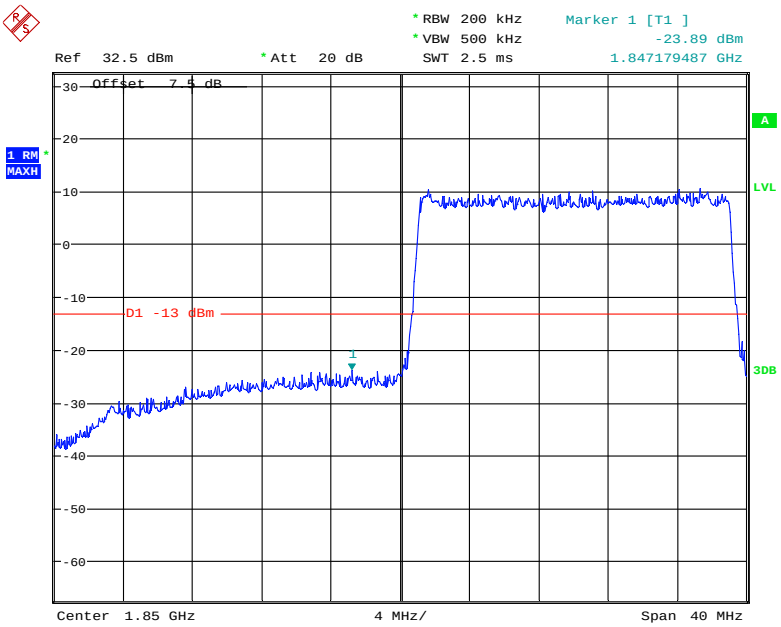
Date: 27.JAN.2019 15:24:56

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



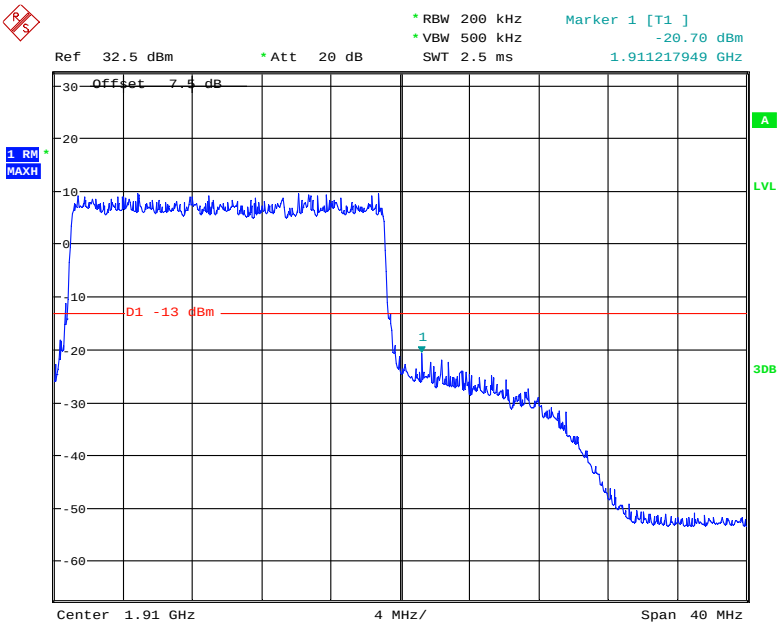
Date: 27.JAN.2019 15:25:48

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



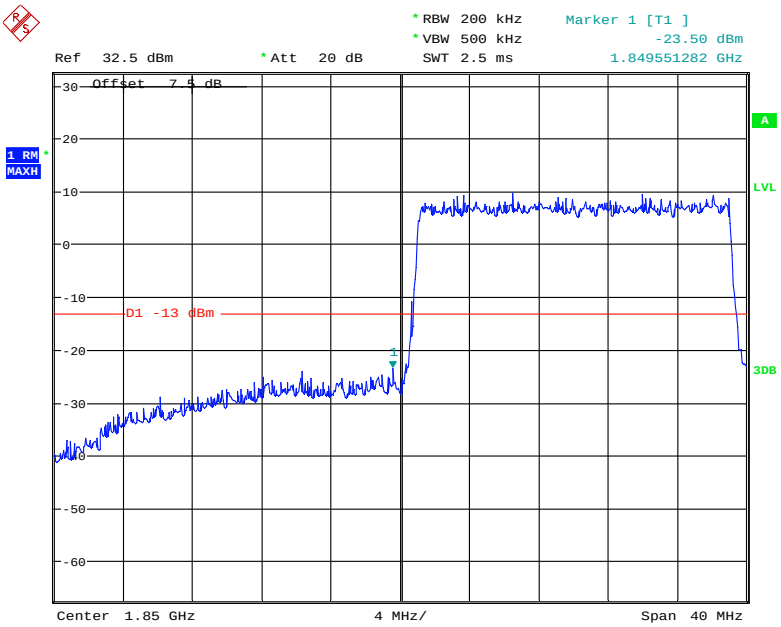
Date: 27.JAN.2019 15:29:38

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



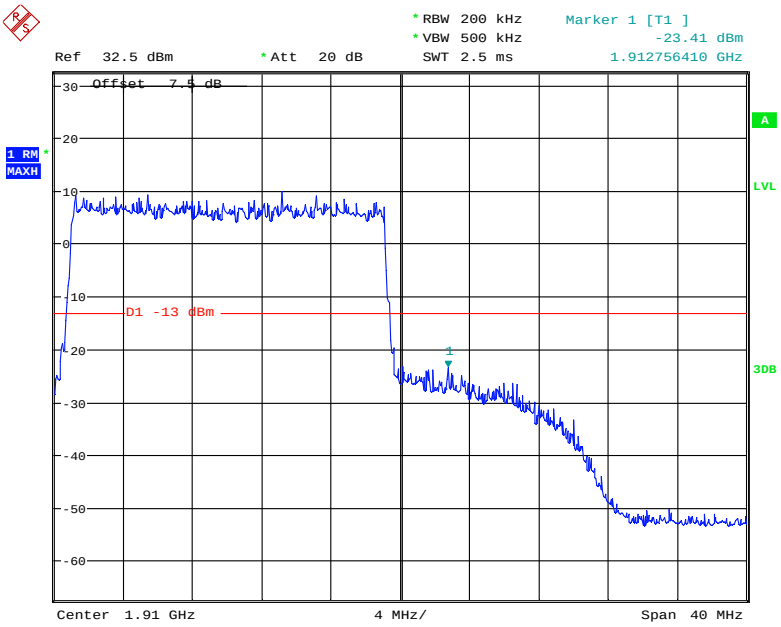
Date: 27.JAN.2019 15:36:02

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



Date: 27.JAN.2019 15:32:55

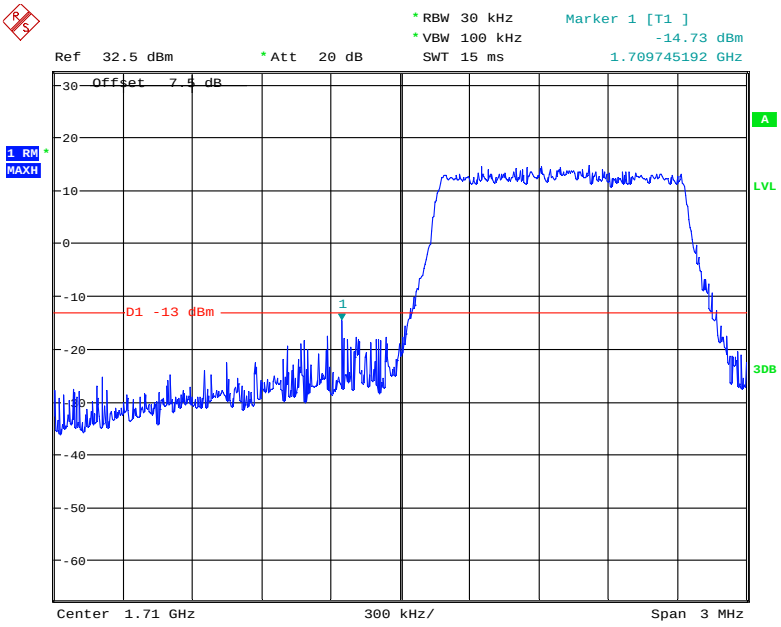
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 27.JAN.2019 15:33:41

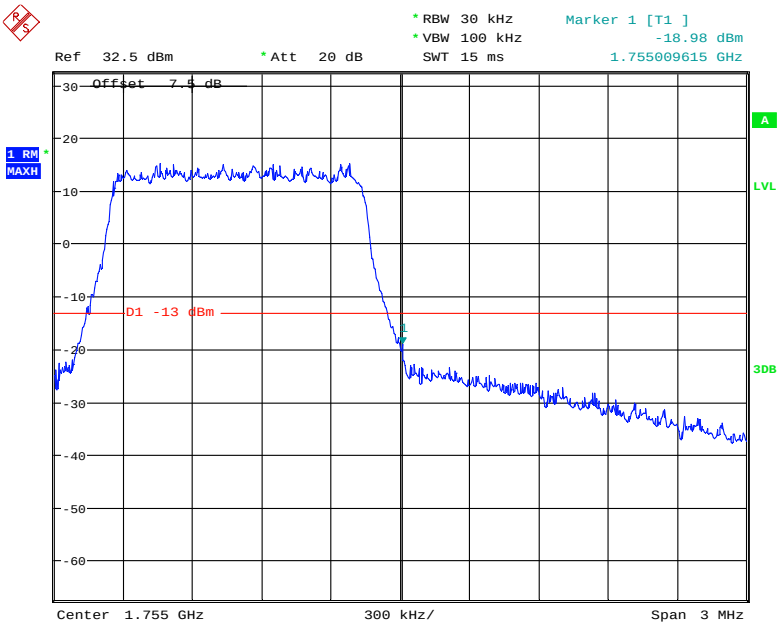
Band 4:

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



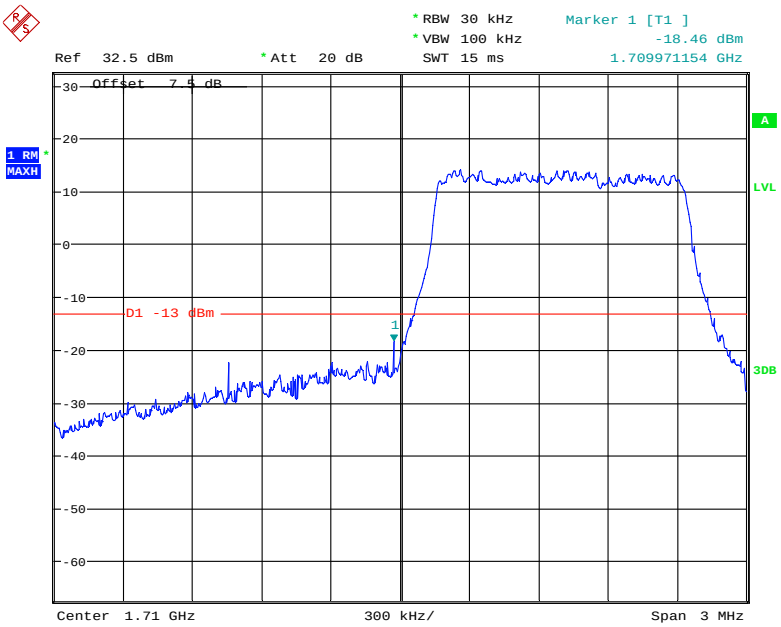
Date: 27.JAN.2019 14:18:22

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



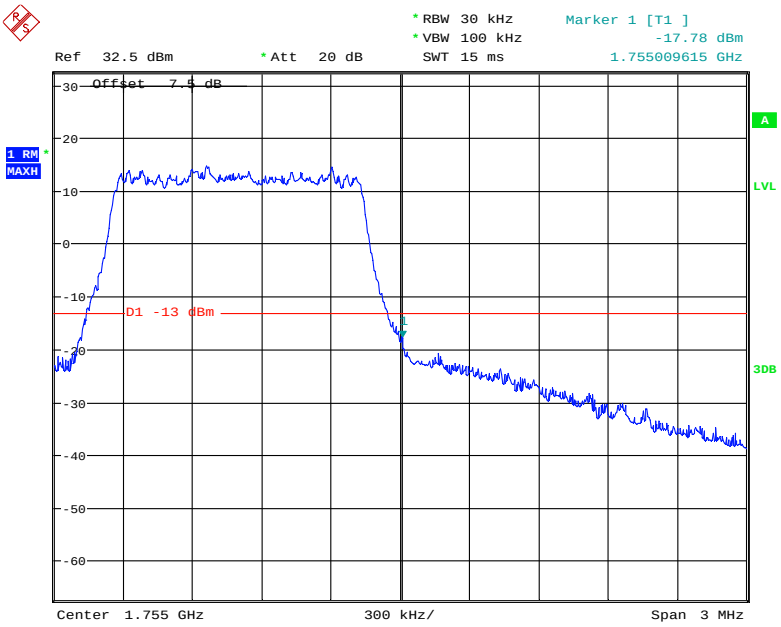
Date: 27.JAN.2019 14:19:11

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



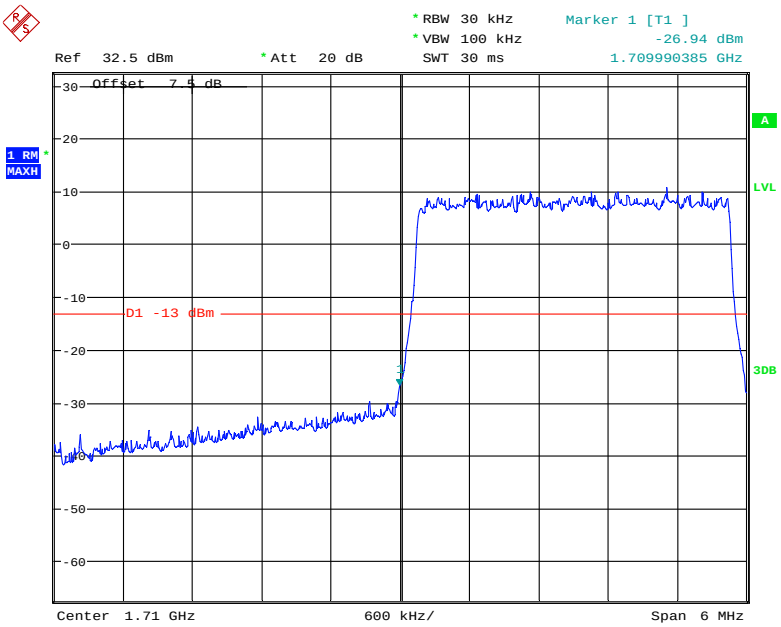
Date: 27.JAN.2019 14:17:11

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



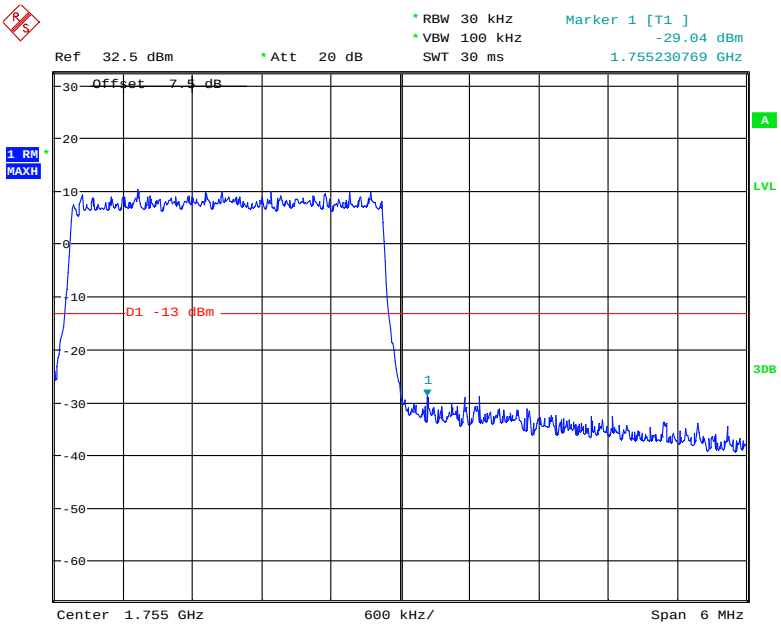
Date: 27.JAN.2019 14:20:11

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



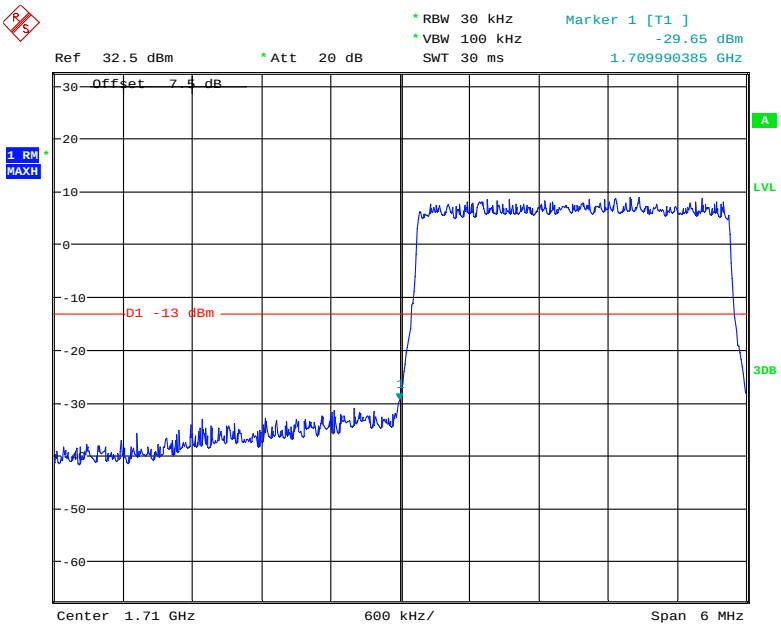
Date: 27.JAN.2019 14:22:48

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



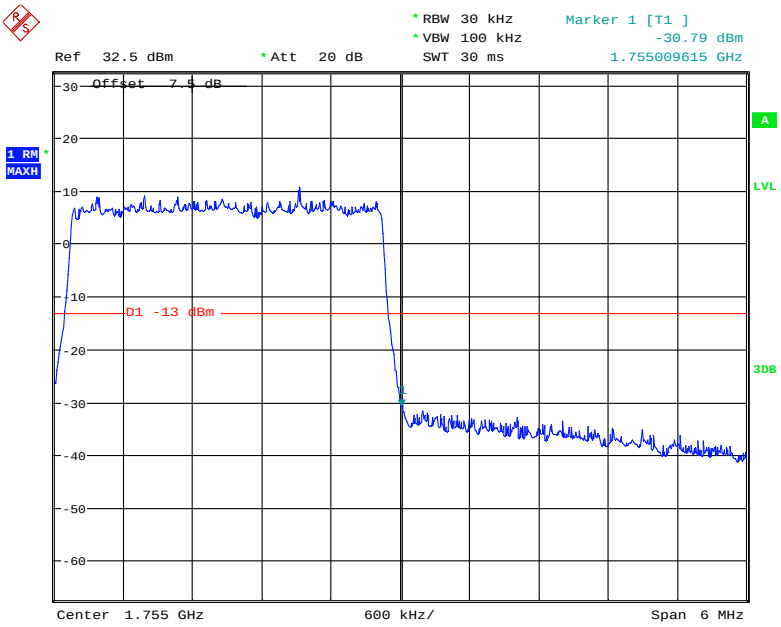
Date: 27.JAN.2019 14:26:00

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



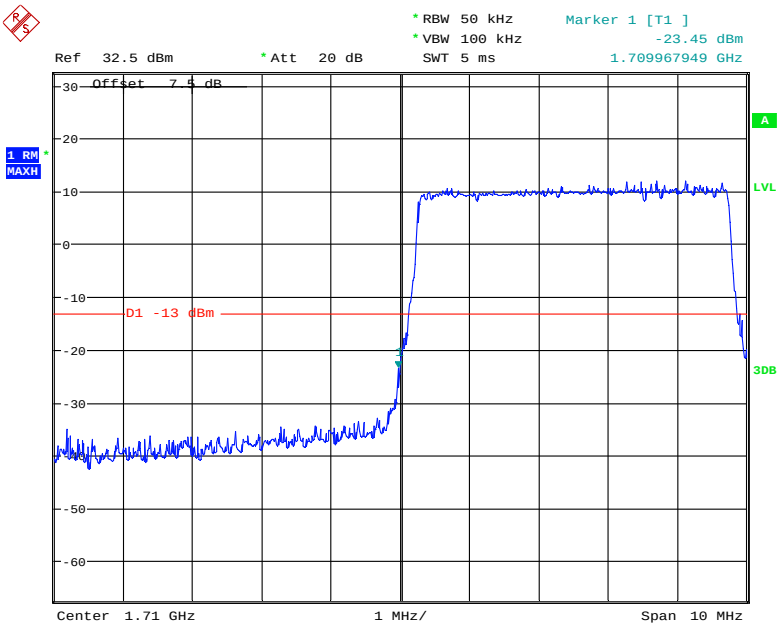
Date: 27.JAN.2019 14:24:21

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



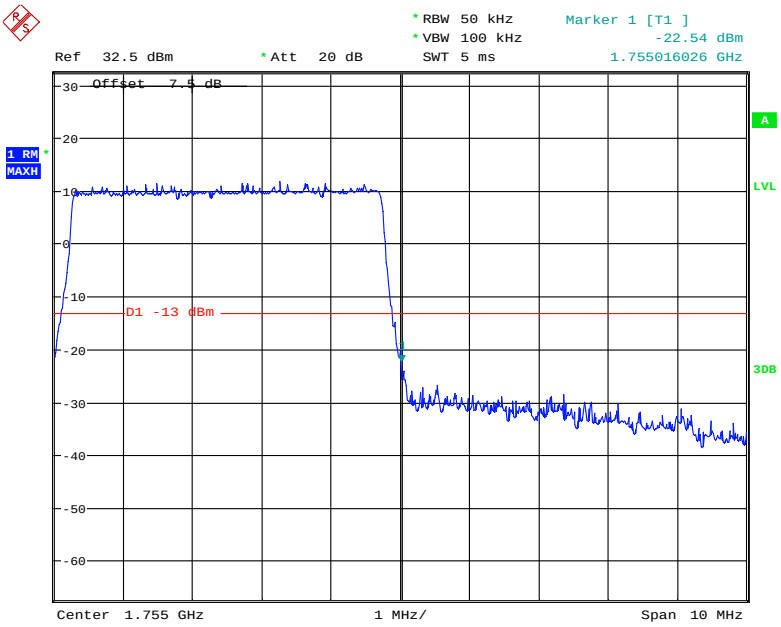
Date: 27.JAN.2019 14:25:11

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



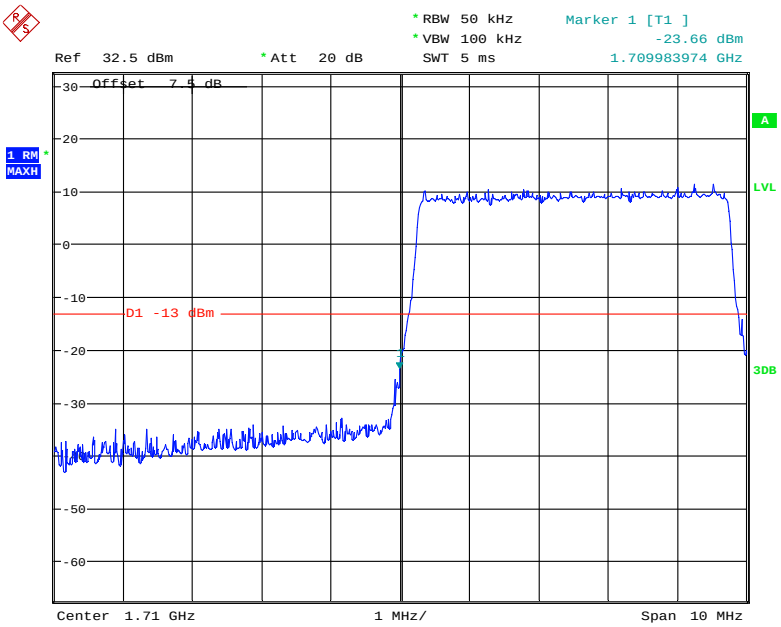
Date: 27.JAN.2019 14:28:23

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



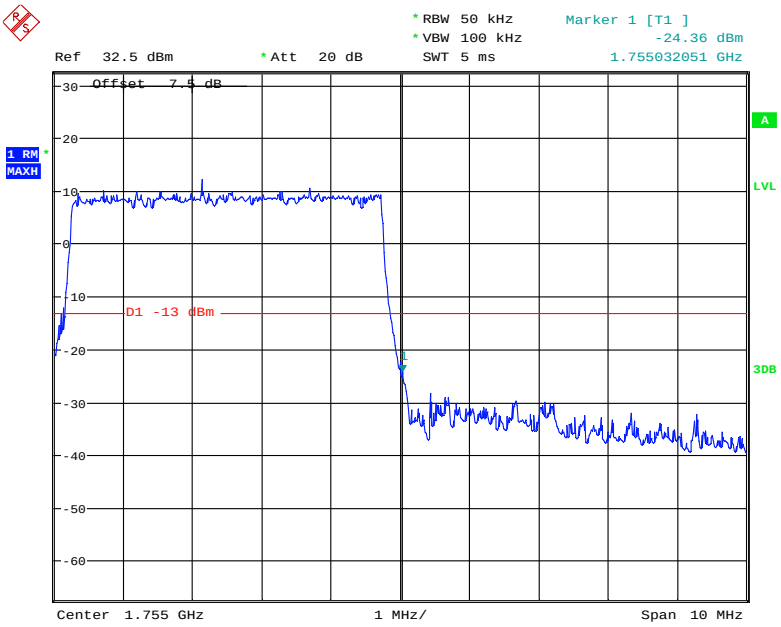
Date: 27.JAN.2019 14:29:05

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



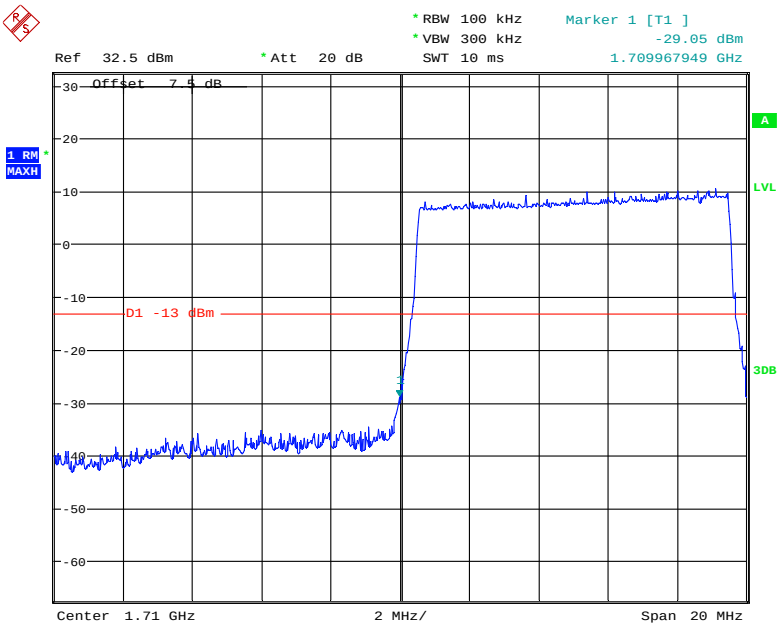
Date: 27.JAN.2019 14:27:26

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



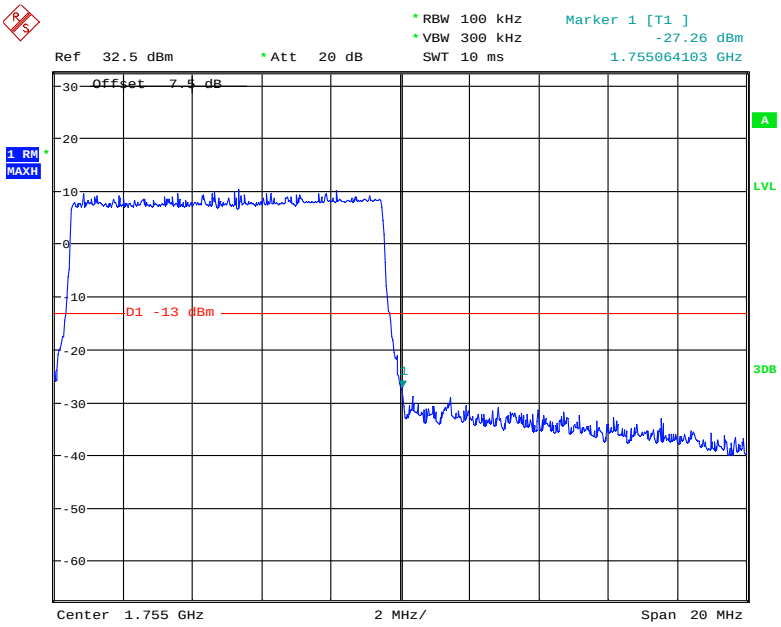
Date: 27.JAN.2019 14:33:47

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



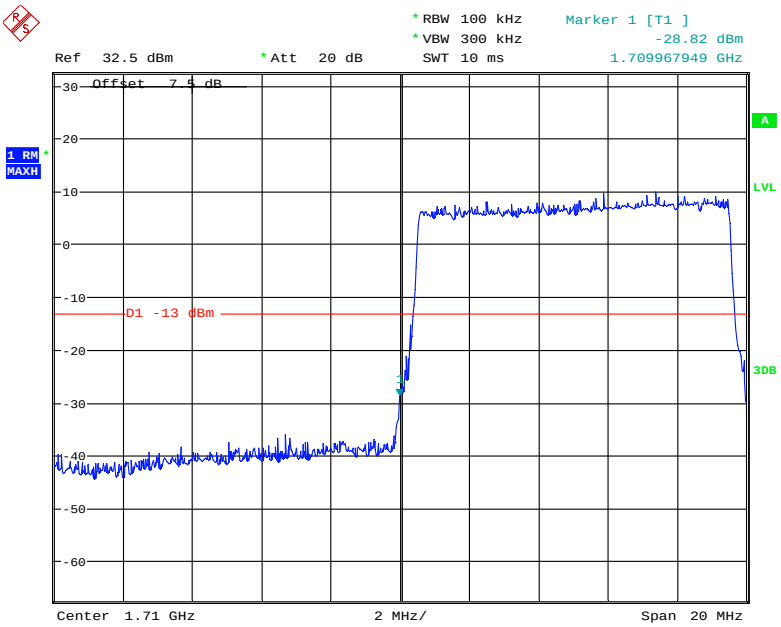
Date: 27.JAN.2019 14:36:00

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



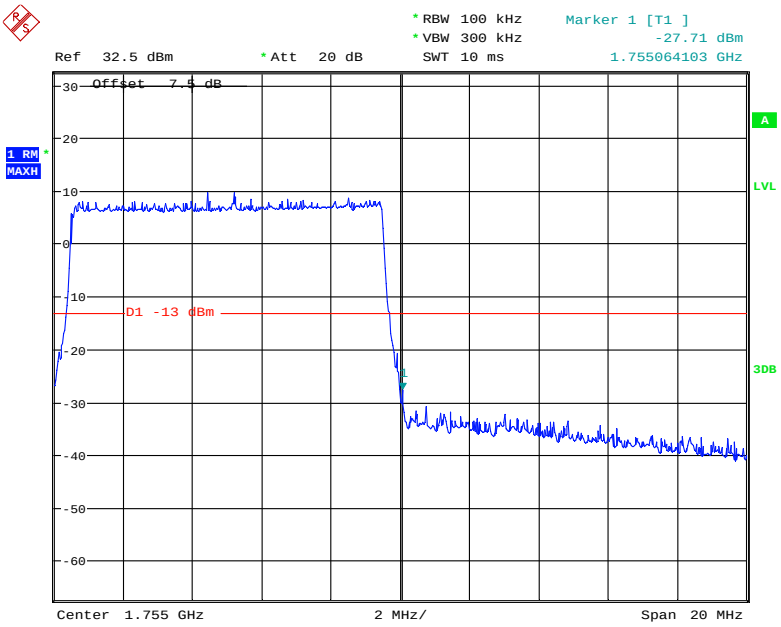
Date: 27.JAN.2019 14:36:58

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



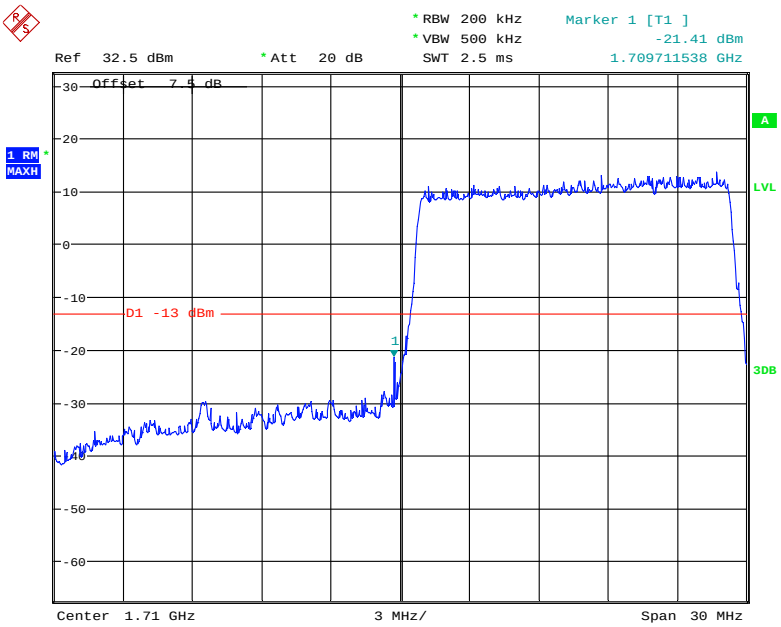
Date: 27.JAN.2019 14:34:57

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



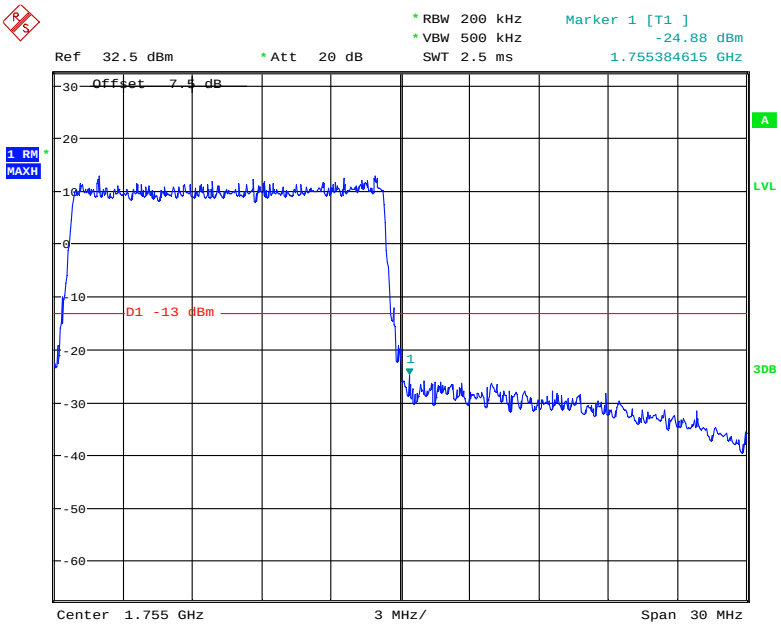
Date: 27.JAN.2019 14:37:43

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



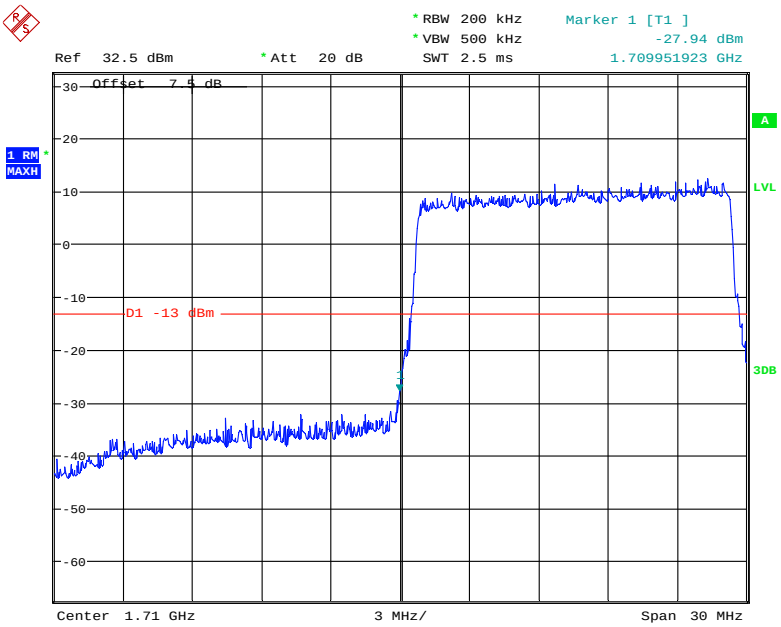
Date: 27.JAN.2019 14:39:51

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



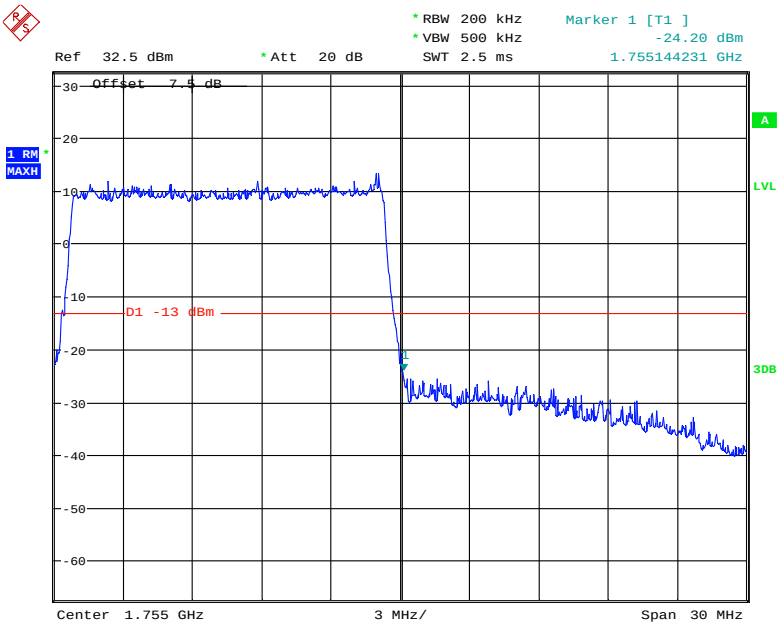
Date: 27.JAN.2019 14:43:59

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



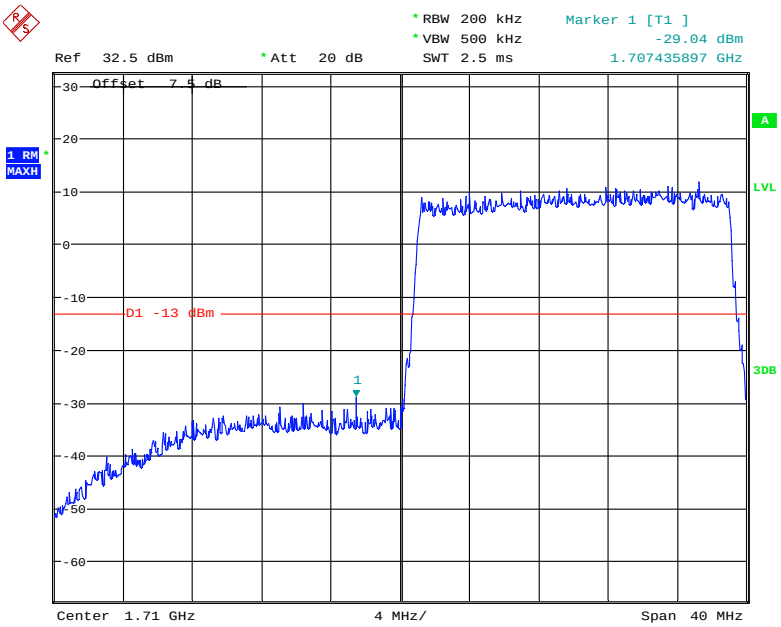
Date: 27.JAN.2019 14:40:46

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



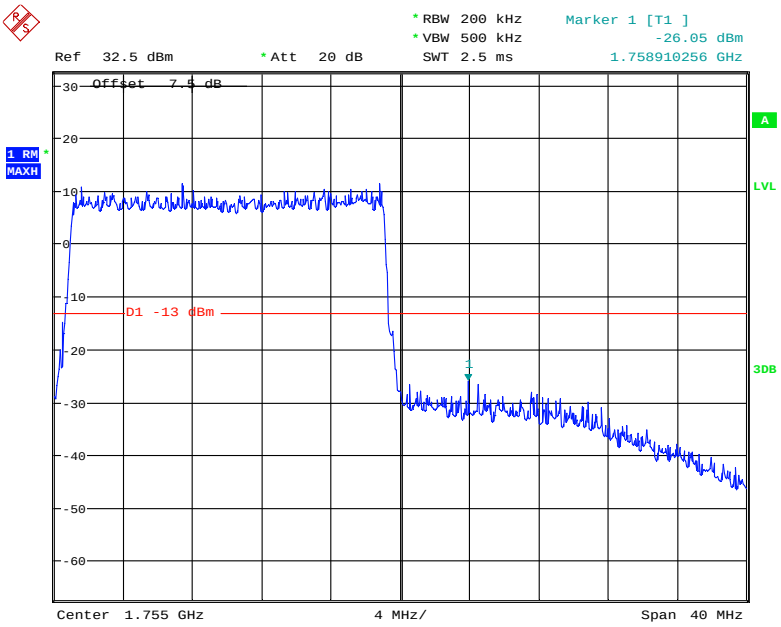
Date: 27.JAN.2019 14:42:54

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



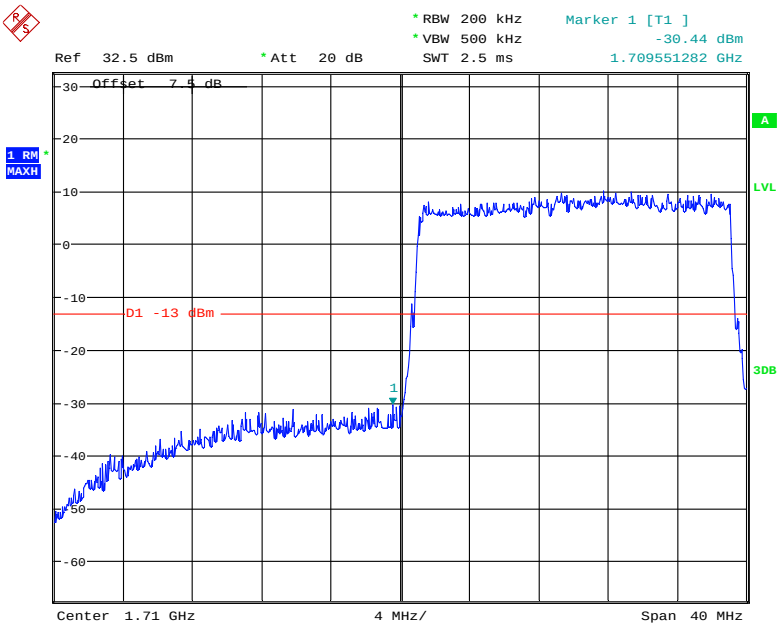
Date: 27.JAN.2019 14:55:28

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



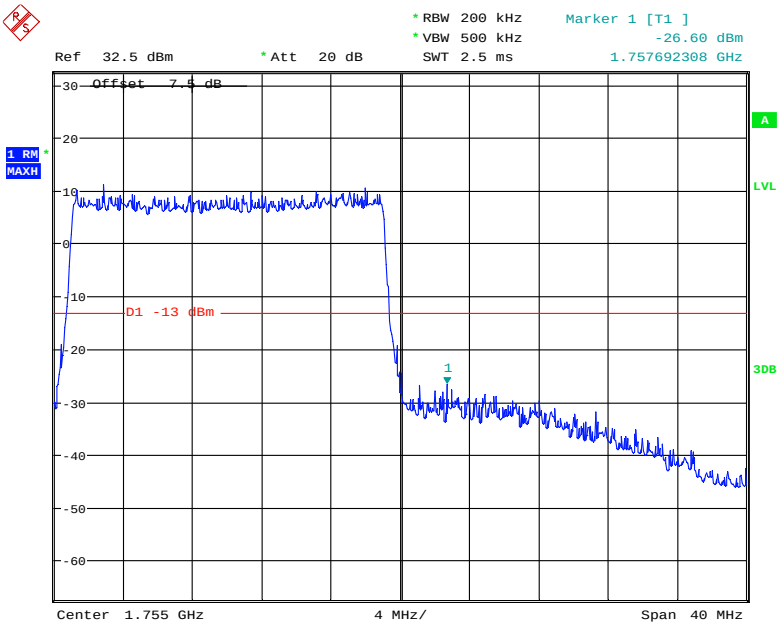
Date: 27.JAN.2019 14:59:18

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



Date: 27.JAN.2019 14:56:12

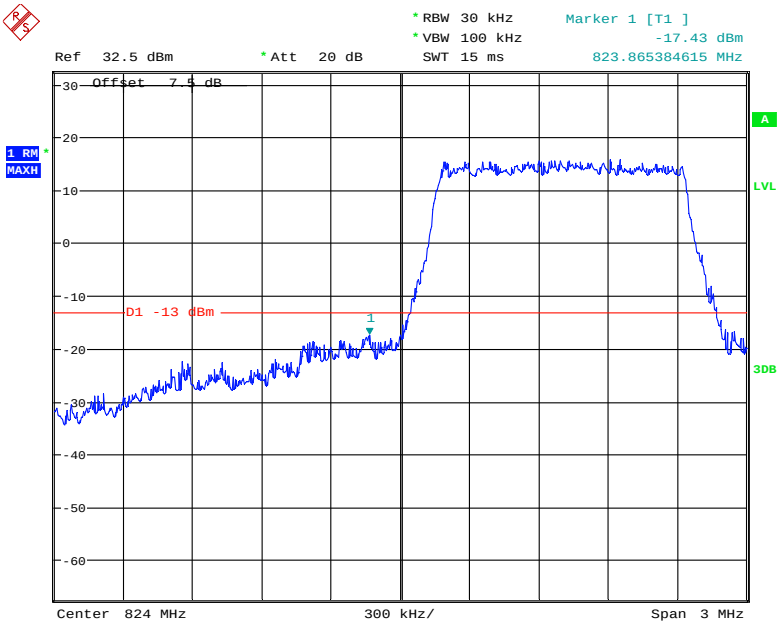
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 27.JAN.2019 14:56:58

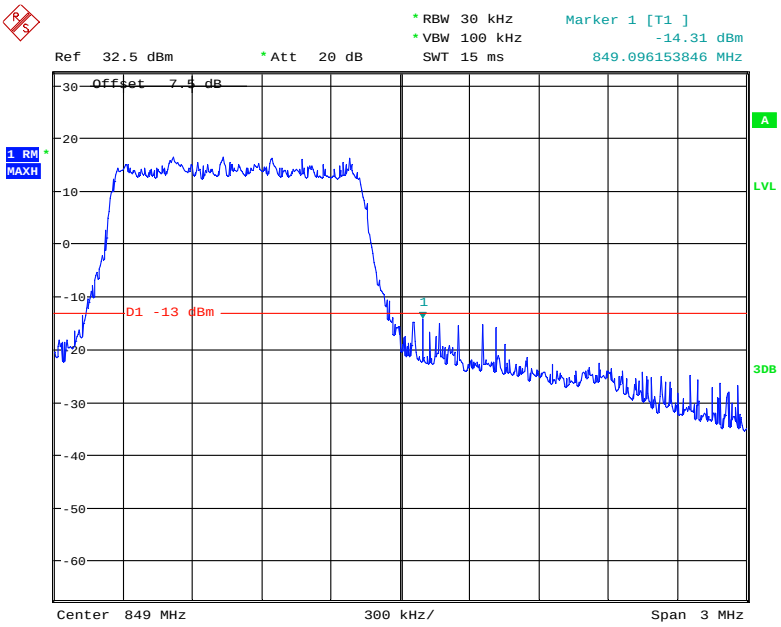
Band 5:

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



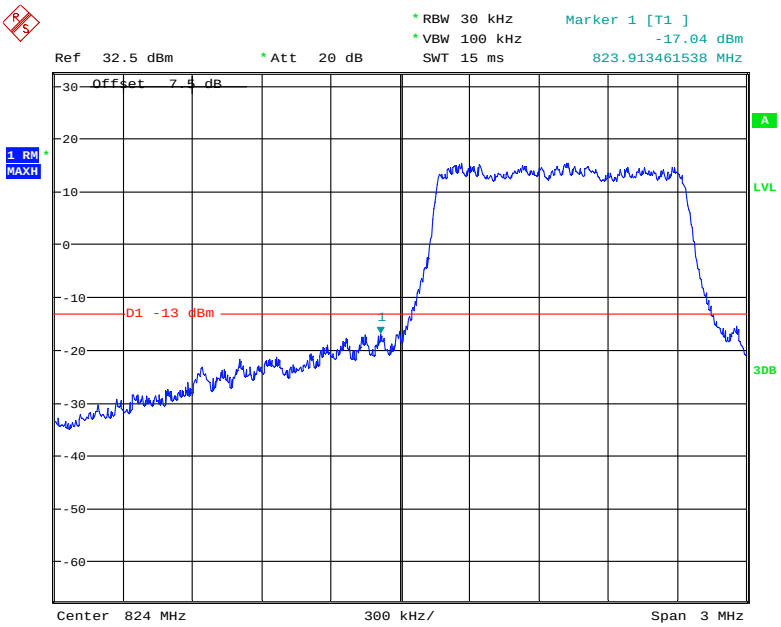
Date: 27.JAN.2019 13:52:11

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



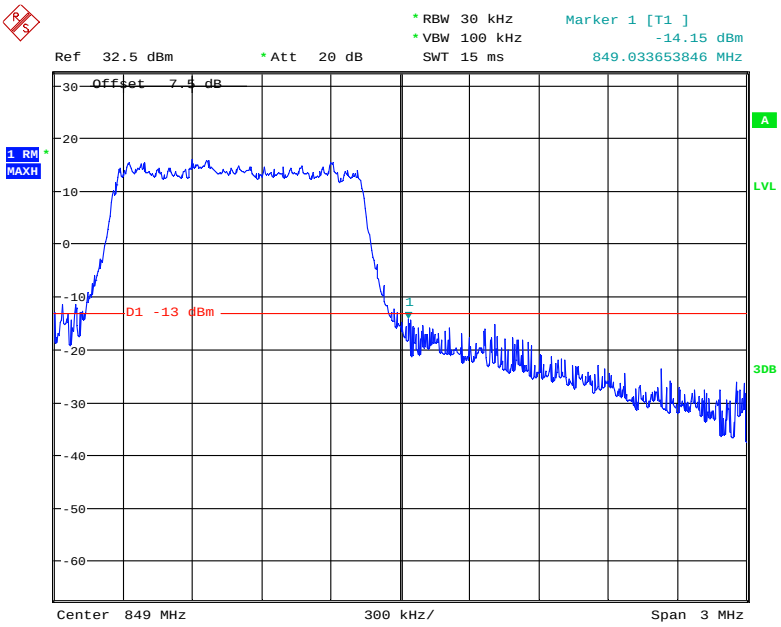
Date: 27.JAN.2019 13:55:26

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



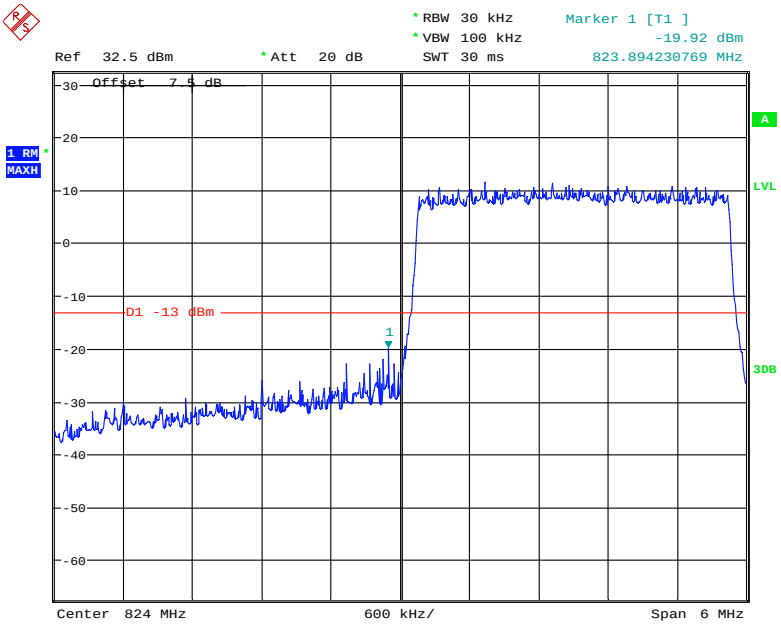
Date: 27.JAN.2019 13:51:40

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



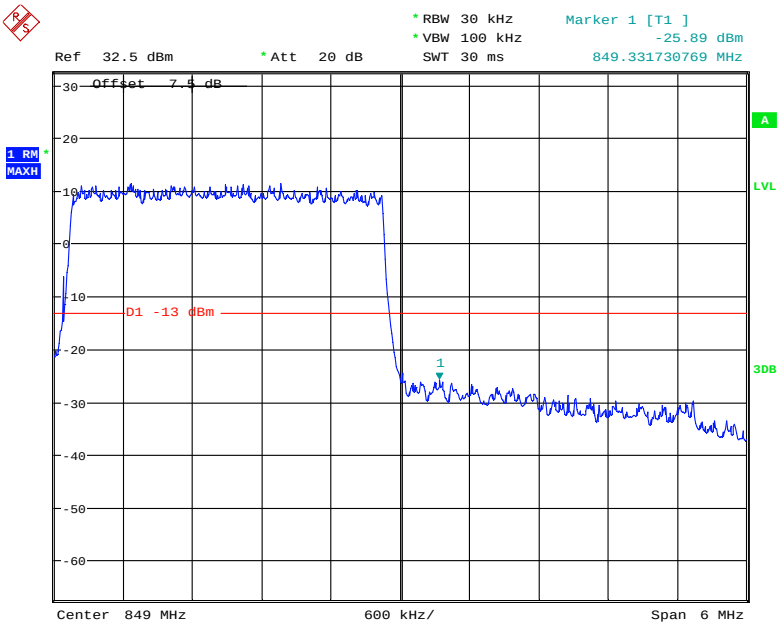
Date: 27.JAN.2019 13:56:28

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



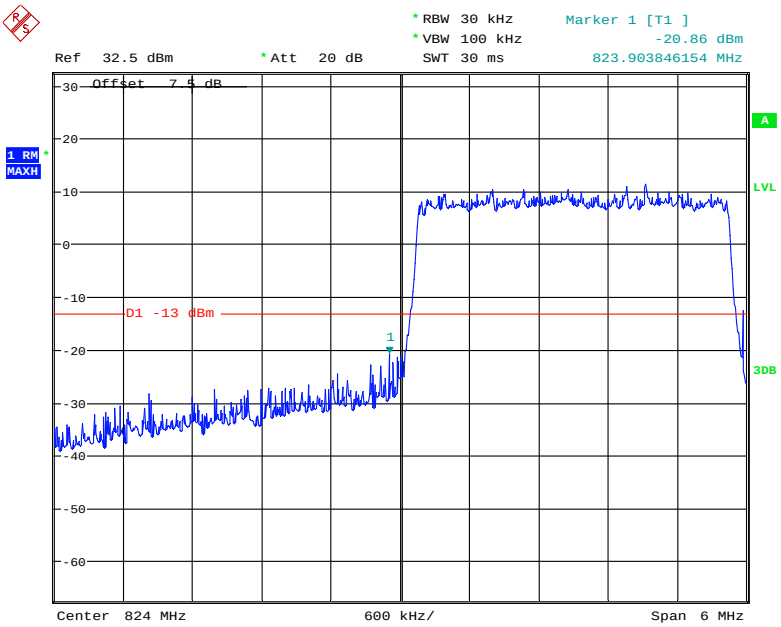
Date: 27.JAN.2019 13:59:37

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



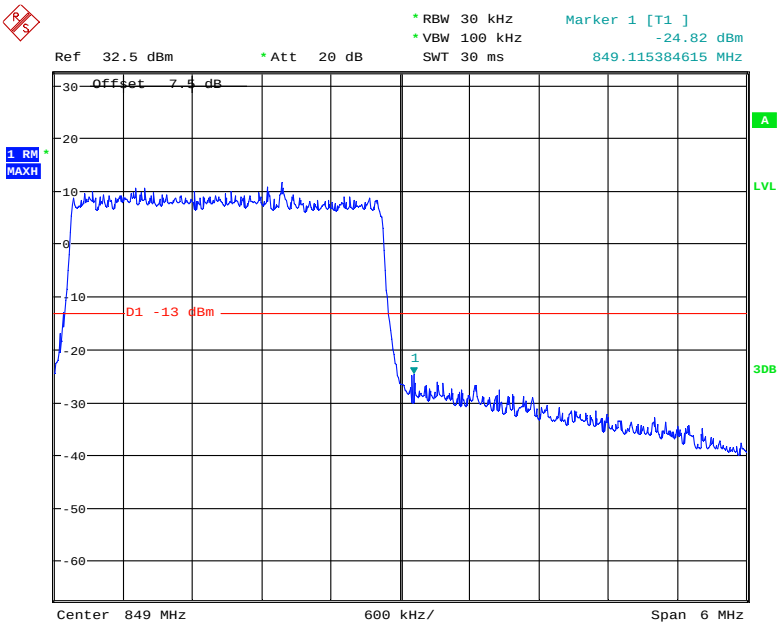
Date: 27.JAN.2019 13:57:50

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



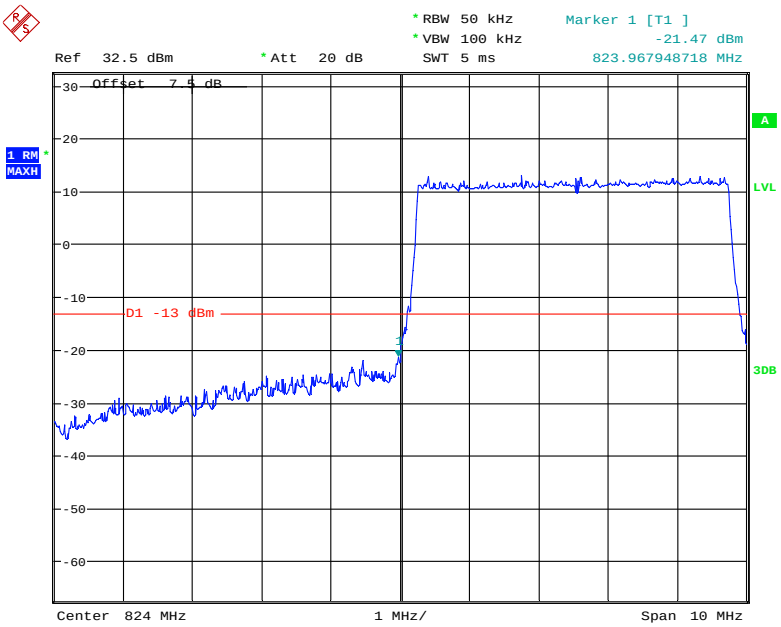
Date: 27.JAN.2019 13:59:10

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



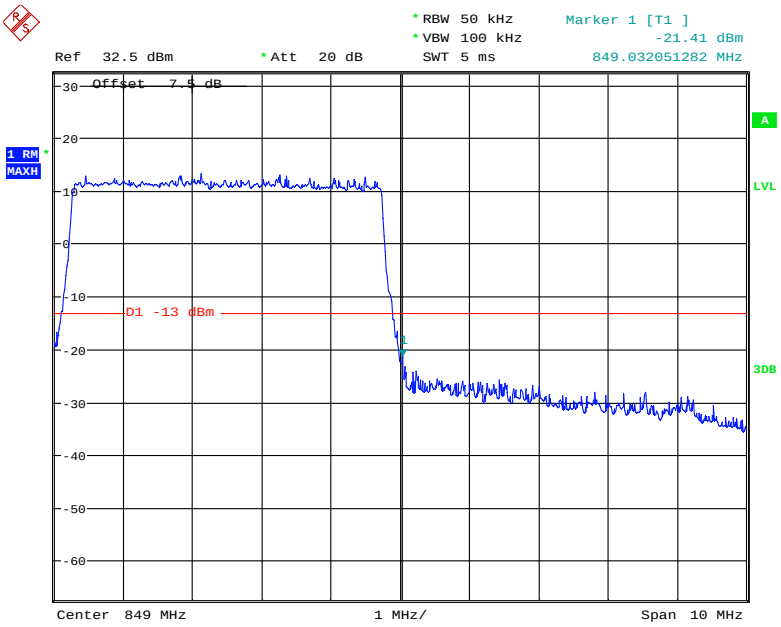
Date: 27.JAN.2019 13:58:26

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



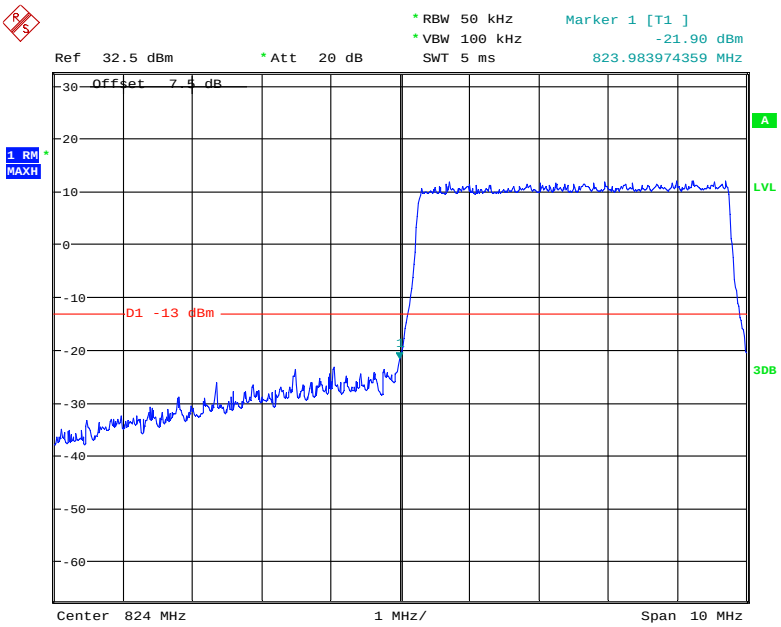
Date: 27.JAN.2019 14:04:17

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



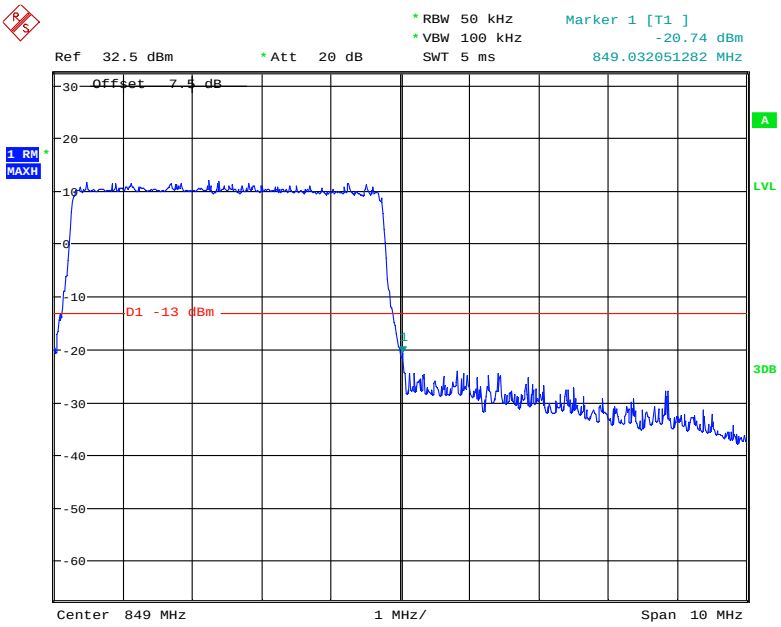
Date: 27.JAN.2019 14:05:12

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



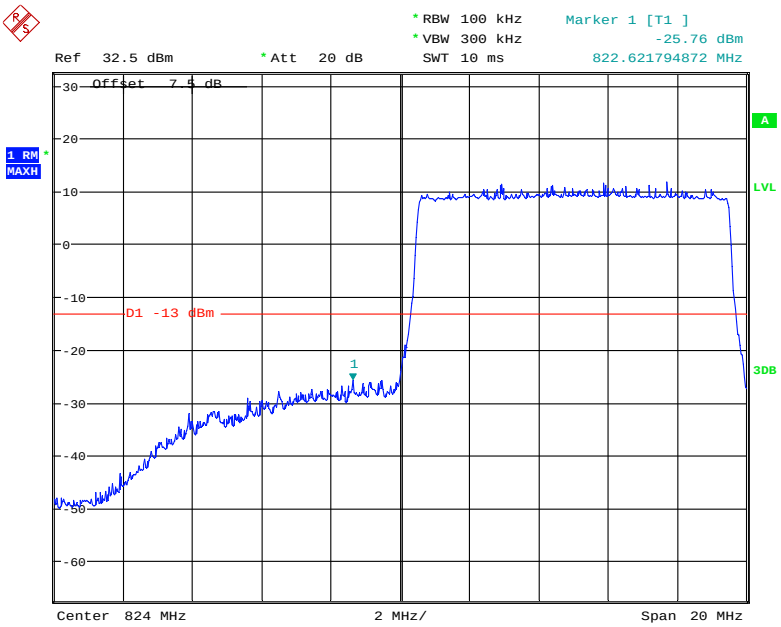
Date: 27.JAN.2019 14:01:03

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



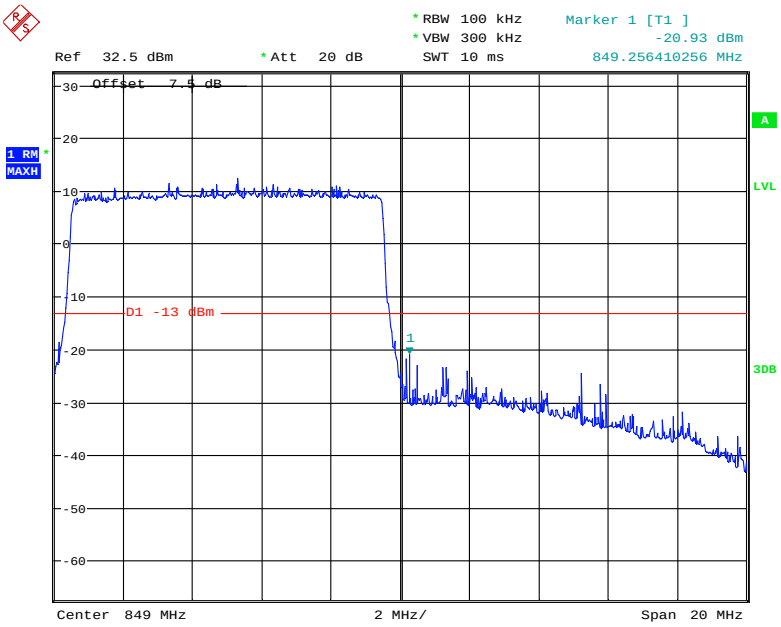
Date: 27.JAN.2019 14:06:01

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



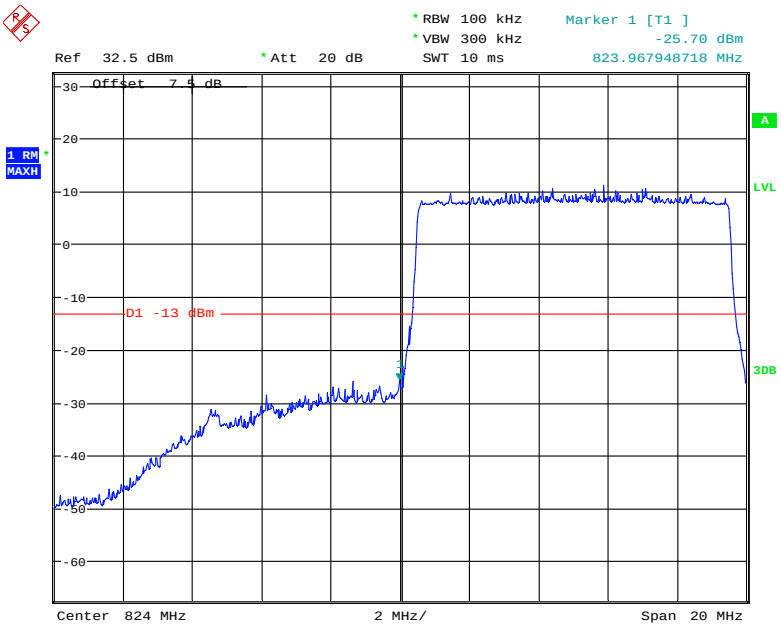
Date: 27.JAN.2019 14:08:42

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



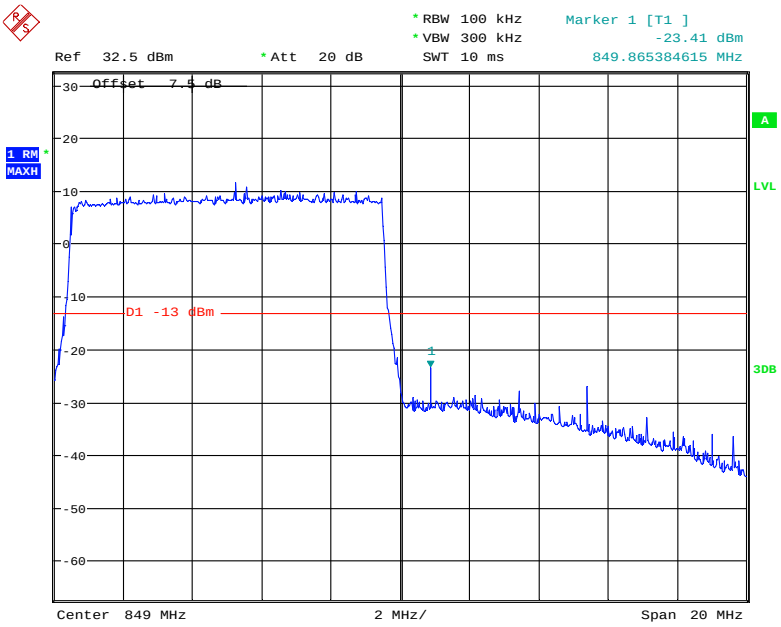
Date: 27.JAN.2019 14:09:26

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



Date: 27.JAN.2019 14:07:24

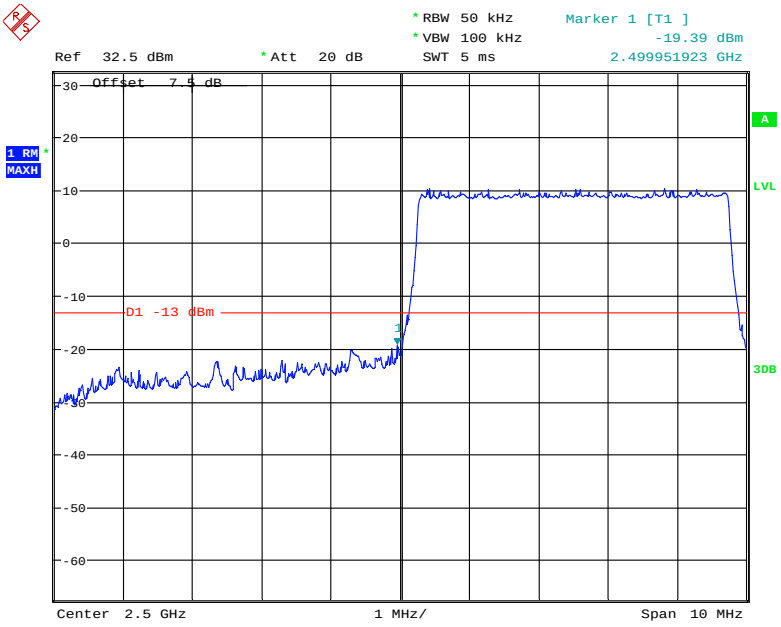
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 27.JAN.2019 14:10:57

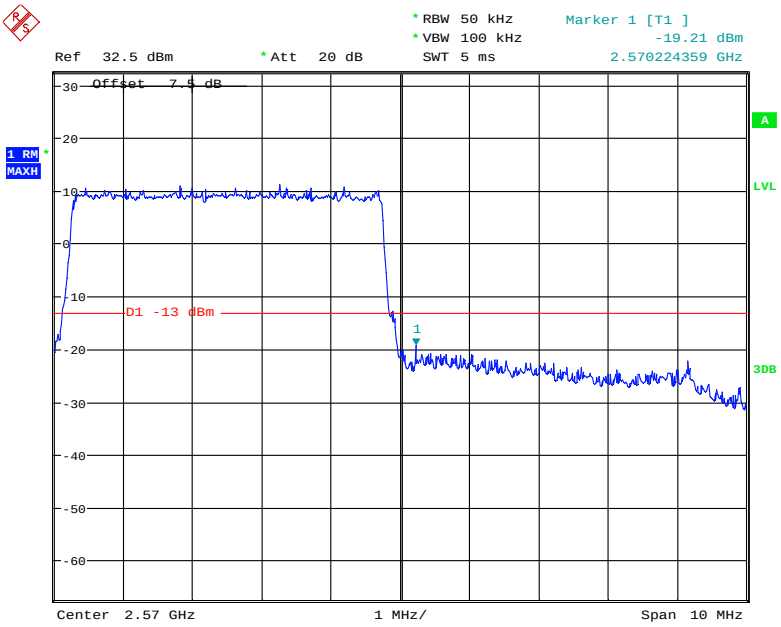
Band 7:

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



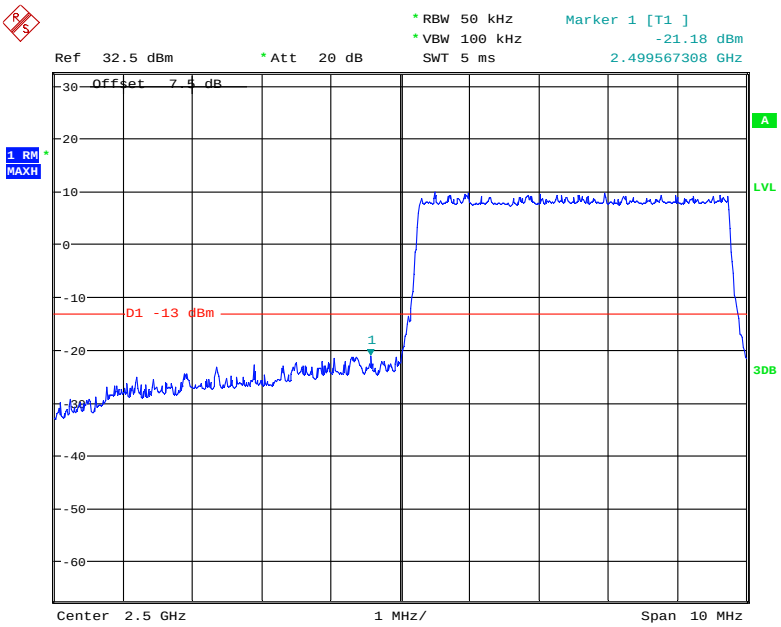
Date: 27.JAN.2019 13:27:31

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



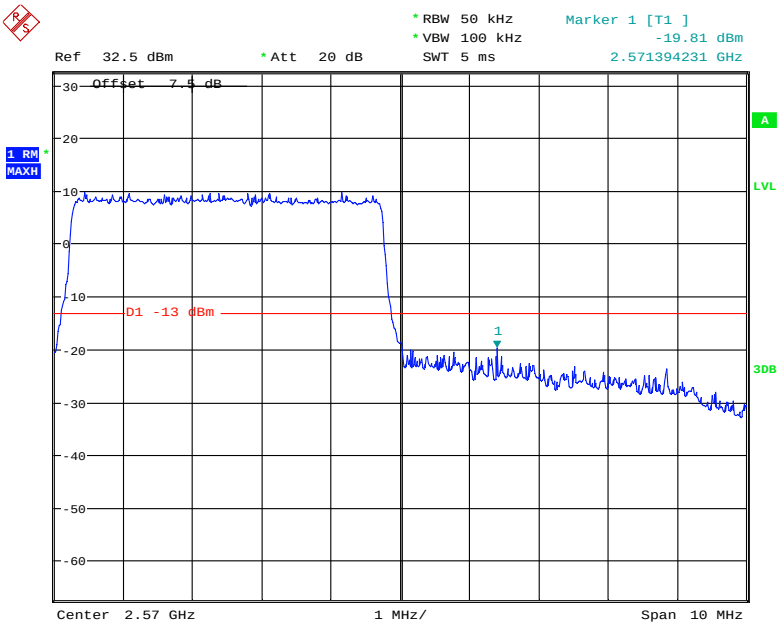
Date: 27.JAN.2019 13:28:30

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



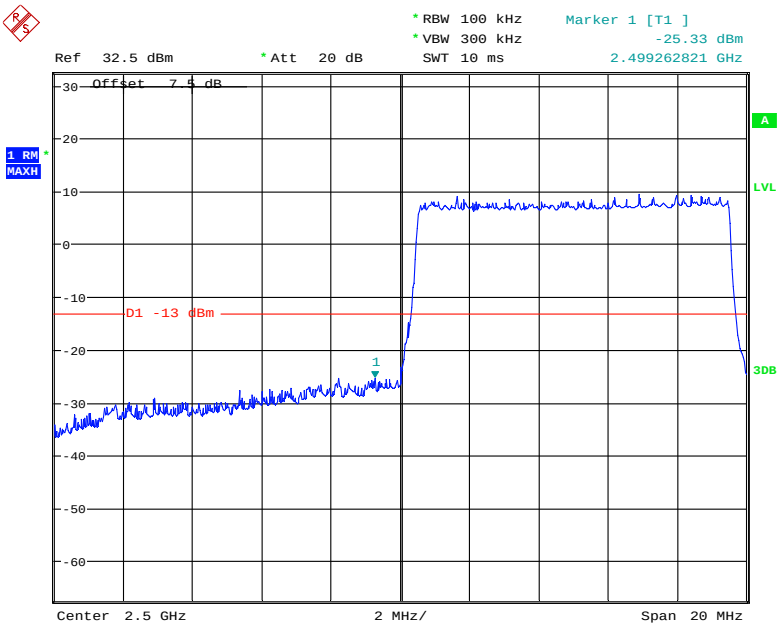
Date: 27.JAN.2019 13:26:28

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



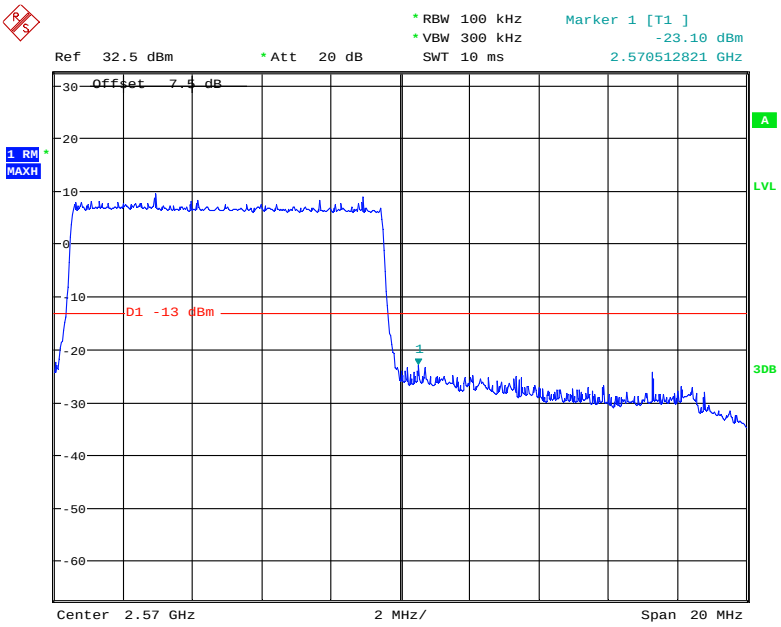
Date: 27.JAN.2019 13:30:58

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



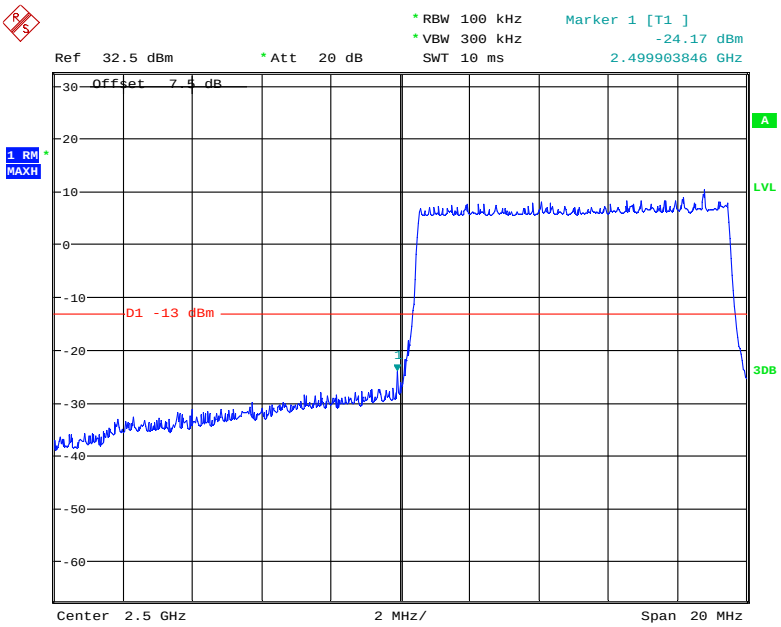
Date: 27.JAN.2019 13:38:38

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



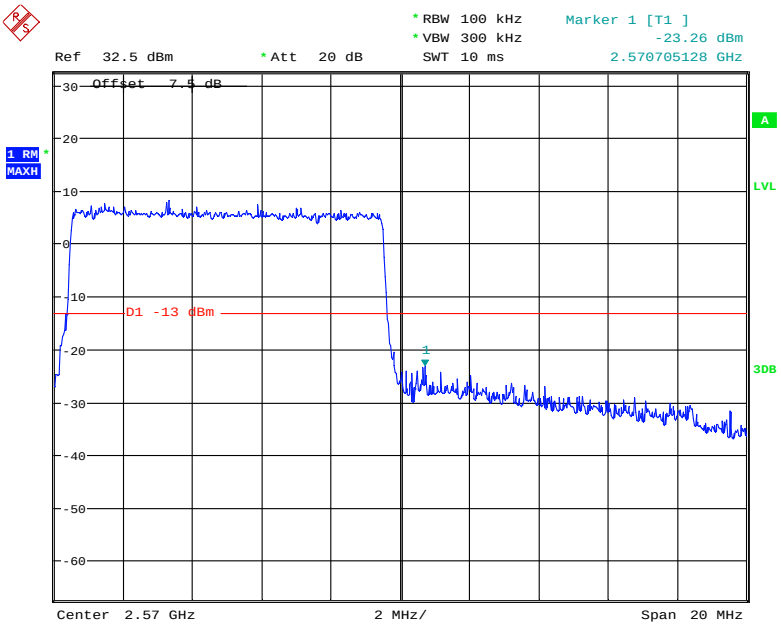
Date: 27.JAN.2019 13:39:32

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



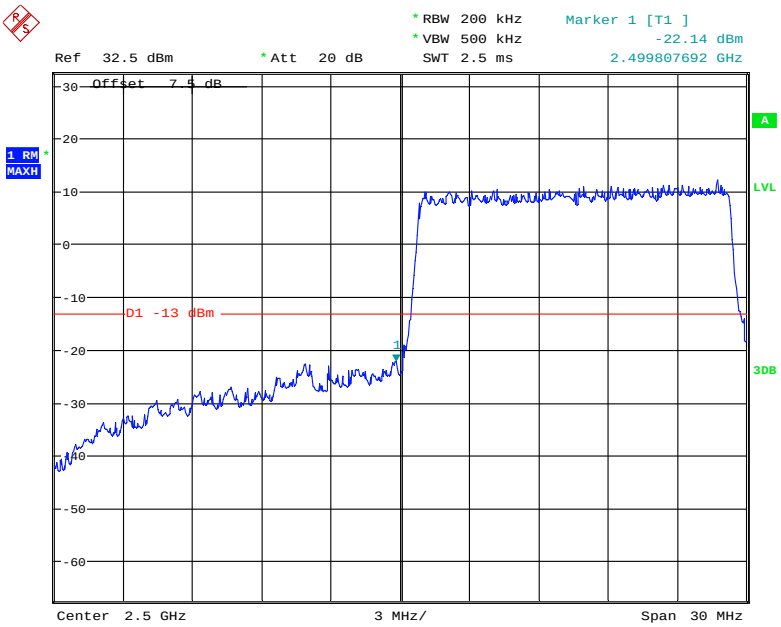
Date: 27.JAN.2019 13:35:38

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



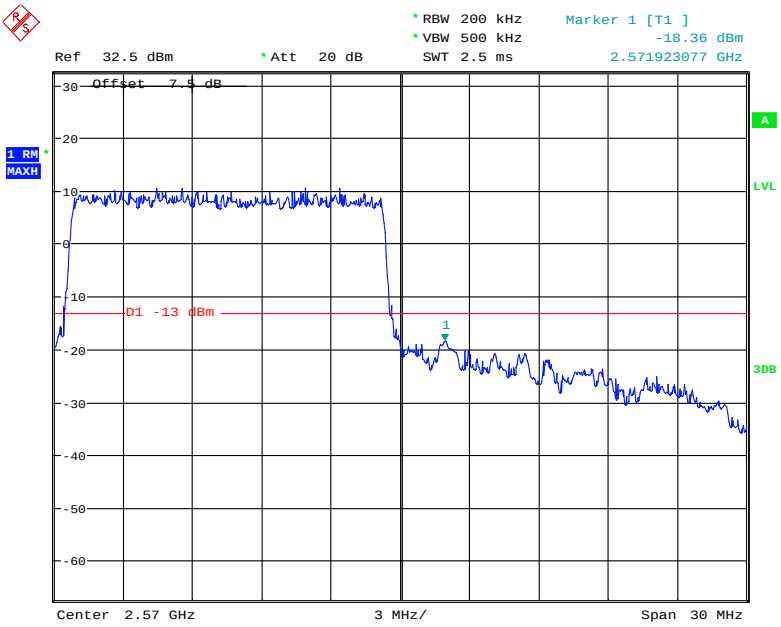
Date: 27.JAN.2019 13:40:07

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



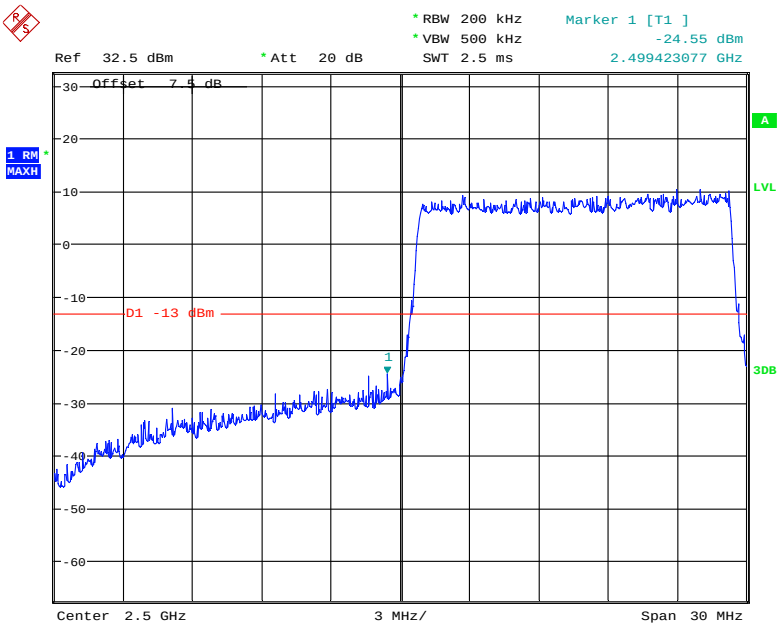
Date: 27.JAN.2019 13:43:35

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



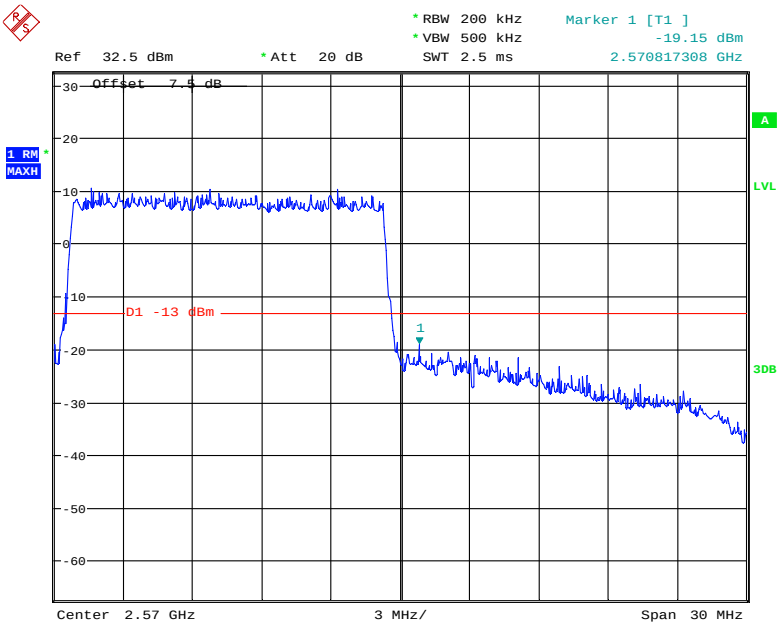
Date: 27.JAN.2019 13:45:50

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



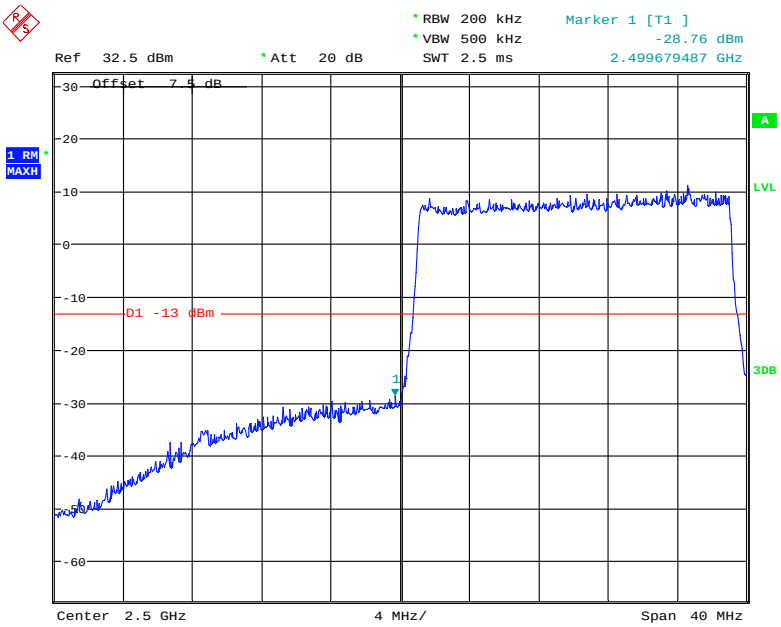
Date: 27.JAN.2019 13:44:21

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



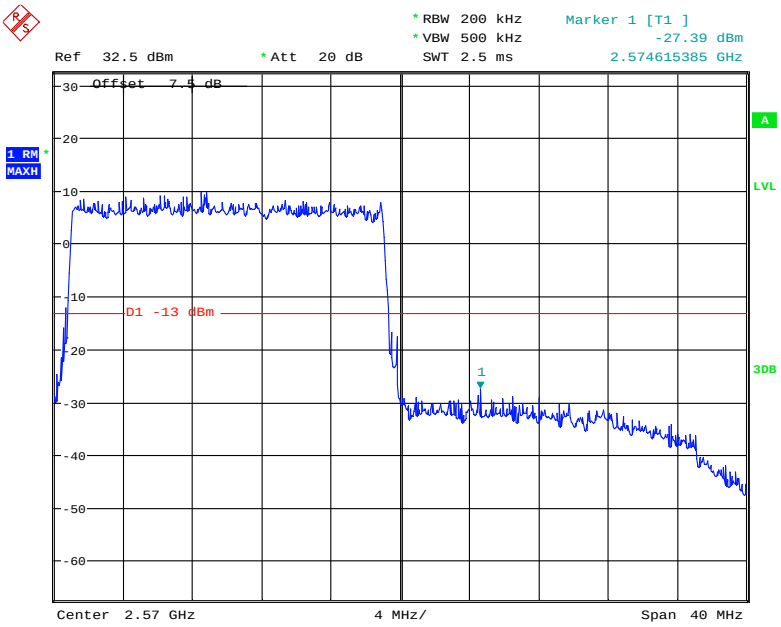
Date: 27.JAN.2019 13:45:24

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



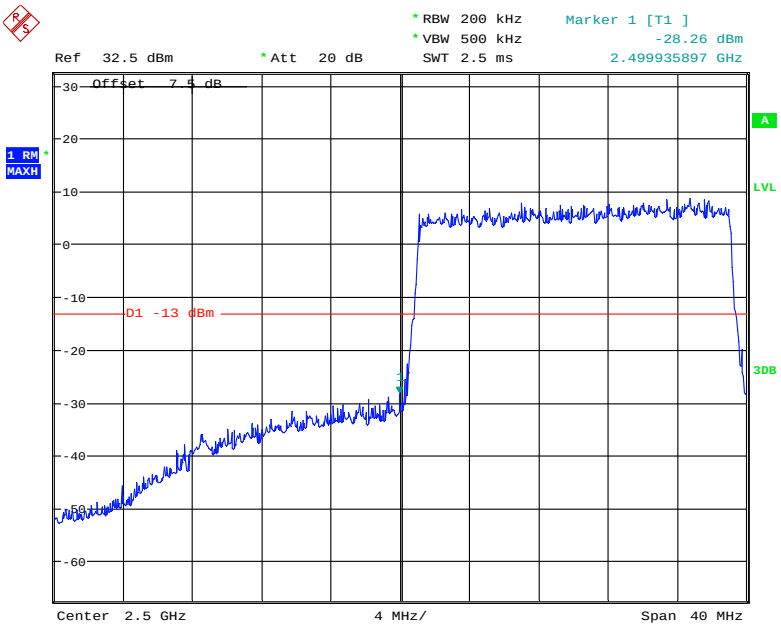
Date: 27.JAN.2019 13:47:43

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



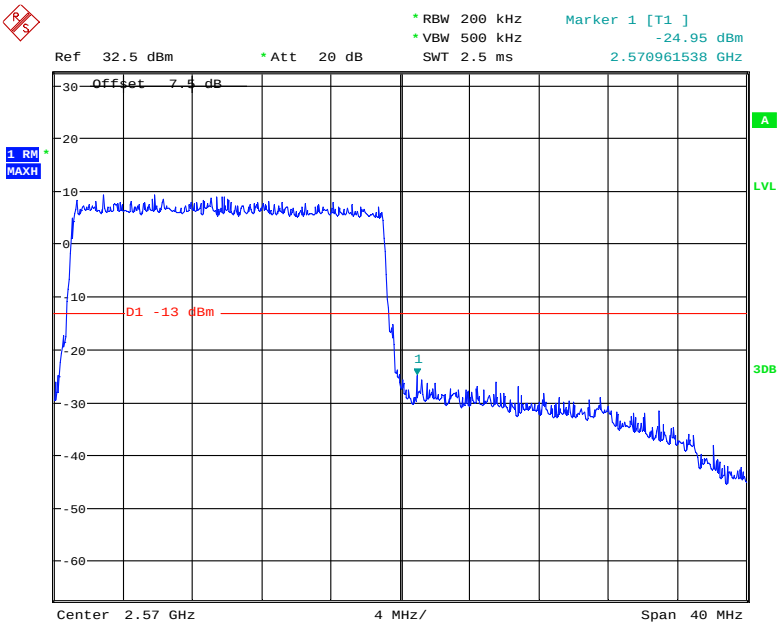
Date: 27.JAN.2019 13:50:00

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



Date: 27.JAN.2019 13:48:17

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



Date: 27.JAN.2019 13:49:31

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

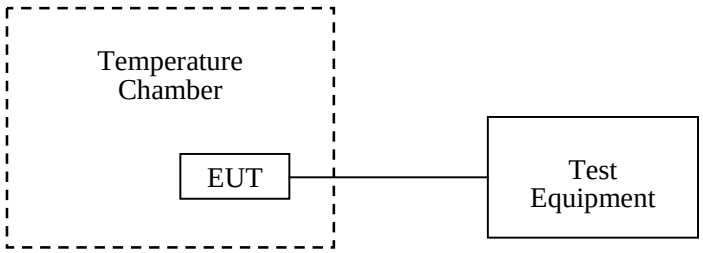
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 Kiki Kong on 2019-01-24.

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	3.8	8	0.0096	2.5
-20		10	0.0120	2.5
-10		11	0.0131	2.5
0		13	0.0155	2.5
10		14	0.0167	2.5
20		17	0.0203	2.5
30		16	0.0191	2.5
40		18	0.0215	2.5
50		21	0.0251	2.5
20	V min.= 3.5	22	0.0263	2.5
	V max.= 4.35	24	0.0287	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	15	0.0179	2.5
-20		17	0.0203	2.5
-10		19	0.0227	2.5
0		21	0.0251	2.5
10		20	0.0239	2.5
20		24	0.0287	2.5
30		25	0.0299	2.5
40		26	0.0311	2.5
50		28	0.0335	2.5
20	V min.= 3.5	31	0.0371	2.5
	V max.= 4.35	34	0.0406	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-5	-0.0060	2.5
-20		-3	-0.0036	2.5
-10		-1	-0.0012	2.5
0		1	0.0012	2.5
10		2	0.0024	2.5
20		4	0.0048	2.5
30		5	0.0060	2.5
40		7	0.0084	2.5
50		9	0.0108	2.5
20	V min.= 3.5	11	0.0131	2.5
	V max.= 4.35	13	0.0155	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	3.8	18	0.0096	pass
-20		20	0.0106	pass
-10		21	0.0112	pass
0		22	0.0117	pass
10		25	0.0133	pass
20		26	0.0138	pass
30		27	0.0144	pass
40		31	0.0165	pass
50		28	0.0149	pass
20	V min.= 3.5	32	0.0170	pass
	V max.= 4.35	33	0.0176	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	14	0.0074	pass
-20		15	0.0080	pass
-10		17	0.0090	pass
0		20	0.0106	pass
10		21	0.0112	pass
20		23	0.0122	pass
30		25	0.0133	pass
40		26	0.0138	pass
50		28	0.0149	pass
20	V min.= 3.5	29	0.0154	pass
	V max.= 4.35	32	0.0170	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-9	-0.0048	pass
-20		-7	-0.0037	pass
-10		-4	-0.0021	pass
0		-2	-0.0011	pass
10		2	0.0011	pass
20		5	0.0027	pass
30		6	0.0032	pass
40		8	0.0043	pass
50		9	0.0048	pass
20	V min.= 3.5	11	0.0059	pass
	V max.= 4.35	14	0.0074	pass

AWS Band (Part 27)

Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.8	1710.1352	1754.8753	1710.0000	1755.0000
-20		1710.1494	1754.8080	1710.0000	1755.0000
-10		1710.1402	1754.7575	1710.0000	1755.0000
0		1710.1075	1754.7532	1710.0000	1755.0000
10		1710.0785	1754.6890	1710.0000	1755.0000
20		1710.0779	1754.0160	1710.0000	1755.0000
30		1710.1802	1754.8386	1710.0000	1755.0000
40		1710.1786	1754.7870	1710.0000	1755.0000
50		1710.1304	1754.7608	1710.0000	1755.0000
20	V min.= 3.5	1710.0853	1754.7250	1710.0000	1755.0000
	V max.= 4.35	1710.0694	1754.6812	1710.0000	1755.0000

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	3.8	-3	-0.0016	pass
-20		-1	-0.0005	pass
-10		2	0.0011	pass
0		4	0.0021	pass
10		6	0.0032	pass
20		8	0.0043	pass
30		9	0.0048	pass
40		11	0.0059	pass
50		12	0.0064	pass
20	V min.= 3.5	13	0.0069	pass
	V max.= 4.35	15	0.0080	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	3.8	1710.2463	1754.1541	1710	1755
-20		1710.2272	1754.1454	1710	1755
-10		1710.2378	1754.1427	1710	1755
0		1710.2299	1754.1456	1710	1755
10		1710.2251	1754.1322	1710	1755
20		1710.2308	1754.1500	1710	1755
30		1710.2384	1754.1418	1710	1755
40		1710.2458	1754.1350	1710	1755
50		1710.2266	1754.1502	1710	1755
20	V min.= 3.5	1710.2258	1754.1472	1710	1755
	V max.= 4.35	1710.2385	1754.1479	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o=836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-5	-0.0060	2.5
-20		-3	-0.0036	2.5
-10		-2	-0.0024	2.5
0		1	0.0012	2.5
10		2	0.0024	2.5
20		5	0.0060	2.5
30		7	0.0084	2.5
40		9	0.0108	2.5
50		8	0.0096	2.5
20	V min.= 3.5	13	0.0155	2.5
	V max.= 4.35	14	0.0167	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	3.8	2500.3158	2569.3030	2500	2570
-20		2500.3264	2569.2924	2500	2570
-10		2500.3220	2569.2939	2500	2570
0		2500.3119	2569.3079	2500	2570
10		2500.3161	2569.2889	2500	2570
20		2500.3215	2569.3083	2500	2570
30		2500.3262	2569.3066	2500	2570
40		2500.3167	2569.3018	2500	2570
50		2500.3202	2569.2963	2500	2570
20	V min.= 3.5	2500.3217	2569.3023	2500	2570
	V max.= 4.35	2500.3234	2569.3013	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	3.8	-7	-0.0039	pass
-20		-8	-0.0044	pass
-10		-5	-0.0028	pass
0		-6	-0.0033	pass
10		-2	-0.0011	pass
20		-4	-0.0022	pass
30		-1	-0.0006	pass
40		1	0.0006	pass
50		4	0.0022	pass
20	V min.= 3.5	7	0.0039	pass
	V max.= 4.35	6	0.0033	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	3.8	1710.4421	1754.9931	1710	1755
-20		1710.4404	1754.9992	1710	1755
-10		1710.4432	1754.9999	1710	1755
0		1710.4430	1754.9906	1710	1755
10		1710.4455	1754.9940	1710	1755
20		1710.4407	1754.9994	1710	1755
30		1710.4340	1754.9990	1710	1755
40		1710.4339	1755.0067	1710	1755
50		1710.4485	1754.9915	1710	1755
20	V min.= 3.5	1710.4450	1755.0081	1710	1755
	V max.= 4.35	1710.4423	1755.0021	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-13	-0.0155	-13
-20		-14	-0.0167	-14
-10		-12	-0.0143	-12
0		-11	-0.0132	-11
10		-8	-0.0096	-8
20		-6	-0.0072	-6
30		-2	-0.0024	-2
40		1	0.0012	1
50		4	0.0048	4
20	V min.= 3.5	7	0.0084	7
	V max.= 4.35	9	0.0108	9

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	3.8	2500.4808	2569.5209	2500	2570
-20		2500.4692	2569.5232	2500	2570
-10		2500.4861	2569.5105	2500	2570
0		2500.4703	2569.5191	2500	2570
10		2500.4674	2569.5154	2500	2570
20		2500.4869	2569.5047	2500	2570
30		2500.4665	2569.5210	2500	2570
40		2500.4705	2569.5110	2500	2570
50		2500.4755	2569.5095	2500	2570
20	V min.= 3.5	2500.4705	2569.5225	2500	2570
	V max.= 4.35	2500.4661	2569.5186	2500	2570

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