FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

Sun Cupid Technology (HK) Ltd.

16/F, CEO Tower, 77 Wing Hong St, Cheung Sha Wan, Kowloon, Hong Kong

FCC ID: 2ADINS2801L

Report Type:	**Product Type:**
Original Report	LTE Mobile Phone

Report Number:	RGMA190605001-00C
Report Date:	2019-09-11
Reviewed By:	Simon Wang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	LTE Mobile Phone
Tested Model	S2801L
Multiple Models#	NUU F4L, F4L
Frequency Range	Cellular: 824-849 MHz PCS: 1850-1910 MHz WCDMA Band 2/LTE Band 2: 1850-1910 MHz WCDMA Band 5/LTE Band 5: 824-849 MHz WCDMA Band 4/LTE Band 4: 1710- 1755 MHz LTE Band 12: 699-716 MHz LTE Band 13: 777-787 MHz LTE Band 17: 704-716 MHz LTE Band 66: 1710-1780 MHz
Conducted Average Power	GSM850: 33.14dBm(GMSK), 27.53dBm(8PSK) PCS1900: 29.42dBm(GMSK), 26.55dBm(8PSK) WCDMA Band 2: 23.17dBm WCDMA Band 4: 23.29dBm WCDMA Band 5: 22.73dBm LTE Band 2: 23.08dBm LTE Band 4: 22.87dBm LTE Band 5: 22.91dBm LTE Band 12: 23.16dBm LTE Band 13: 23.01dBm LTE Band 17: 23.09dBm LTE Band 66: 22.89 dBm
Modulation Technique	2G: GMSK,8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antennas
LTE Antenna gain	B2/4/66:1dBi B5/12/13/17:-1dBi
Voltage Range	Powered: DC 3.8V by internal rechargeable Li-ion battery Recharged: DC 5V by adapter
Date of Test	2019/06/20~2019/09/11
Sample serial number	MBF4L1929000045 (Assigned by applicant)
Received date	2019/06/05
Sample/EUT Status	Good condition
Adapter information	Model: A31A-050055W-US1 Input: AC 100-240V, 50/60Hz, 0.2A Output: DC 5V, 550mA

Notes: This series products model: NUU F4L, F4L and S2801L are electrically identical, model S2801L was selected for fully testing, the detailed information can be referred to the declaration which was stated and guaranteed by the applicant.

Objective

This test report is prepared on behalf of *Sun Cupid Technology (HK) Ltd.* in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Subpart 27 of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS&DTS submissions with FCC ID: 2ADINS2801L.

Test Methodology

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

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

Applicable Standards: TIA/EIA 603-D.

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

Measurement Uncertainty

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

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

Test Facility

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

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

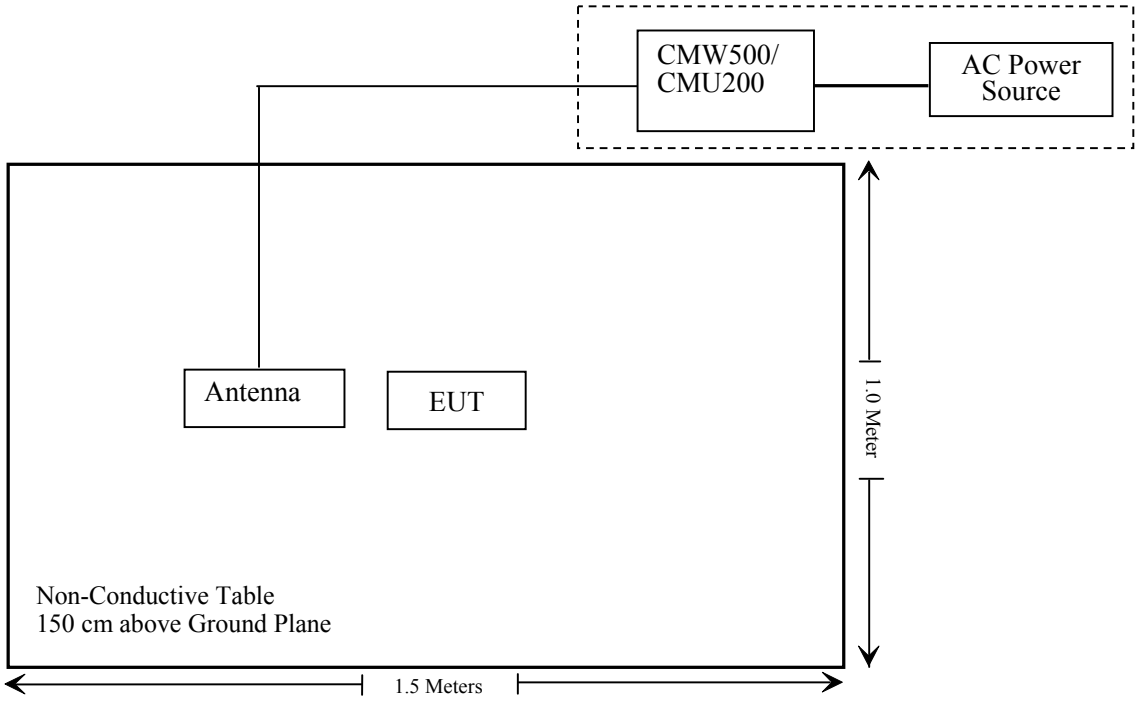
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (b (c) (d) (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a); §27.53(h)	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: RGMA190605001-20.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017-12-22	2020-12-21
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2019-07-22	2020-07-21
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-11-12	2019-11-12
Sonoma Instrument	Amplifier	310N	186238	2018-11-12	2019-11-12
Agilent	Signal Generator	N5183A	MY51040755	2018-12-03	2019-12-03
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2019-07-09	2020-07-08
COM-POWER	Dipole Antenna	AD-100	41000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
UTiFLEX MICRO-C0AX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-11-12	2019-11-12
Ducommun Technologies	RF Cable	104PEA	218124002	2018-11-12	2019-11-12
Ducommun technologies	RF Cable	RG-214	1	2018-11-12	2019-11-12
Ducommun technologies	RF Cable	RG-214	2	2018-11-12	2019-11-12
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-03	2016-11-18	2019-11-18
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Heatsink Required	Amplifier	QLW-18405536-J0	15964001002	2018-11-12	2019-11-12
Unknown	High Pass filter	2.8GHz	Unknown	2019-04-20	2020-04-20
Unknown	High Pass filter	1.3GHz	Unknown	2019-04-20	2020-04-20

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2019-03-02	2020-03-01
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2019-01-05	2020-01-05
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2019-01-15	2020-01-15
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2019-07-09	2020-07-09
Ducommun Technologies	RF Cable	RG-214	3	Each Time	
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2018-11-12	2019-11-12
WEINSCHEL	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: RGMA190605001-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

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

Applicable Standard

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

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

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

According to §27.50(b), Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

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

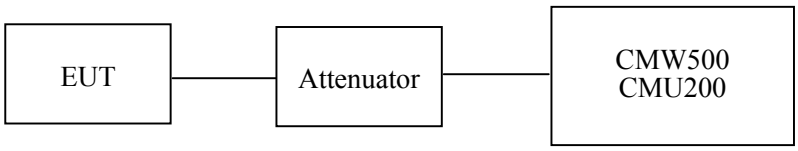
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	50~60 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu from 2019-06-20 to 2019-08-07.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	33.11	38.45
	190	836.6	33.13	38.45
	251	848.8	33.07	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	33.12	32.31	30.57	29.36	38.45
	190	836.6	33.14	32.36	30.58	29.43	38.45
	251	848.8	33.08	32.29	30.54	29.41	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	27.50	26.39	25.22	24.48	38.45
	190	836.6	27.53	26.37	25.19	24.47	38.45
	251	848.8	27.50	26.33	25.18	24.45	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		22.73	22.62	22.60
		HSDPA	1	21.72	21.62	21.57
			2	21.76	21.66	21.63
			3	21.80	21.69	21.67
			4	21.87	21.74	21.69
		HSUPA	1	21.24	21.19	21.20
			2	21.31	21.27	21.28
			3	21.34	21.31	21.30
			4	21.39	21.37	21.35
		HSPA+	1	21.43	21.44	21.40

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.42	33
	661	1880.0	29.31	33
	810	1909.8	29.12	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.41	28.83	27.17	26.18	33
	661	1880.0	29.31	28.71	27.08	26.07	33
	810	1909.8	29.16	28.54	26.95	25.92	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	26.55	25.45	24.32	23.52	33
	661	1880.0	26.30	25.04	24.31	23.48	33
	810	1909.8	26.14	24.94	24.28	23.44	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		23.17	23.10	23.08
		HSDPA	1	22.11	22.03	21.98
			2	22.19	22.08	22.02
			3	22.25	22.12	22.04
			4	22.32	22.19	22.09
		HSUPA	1	21.69	21.62	21.54
			2	21.74	21.64	21.56
			3	21.81	21.70	21.64
			4	21.86	21.74	21.67
		HSPA+	1	21.91	21.81	21.75

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		23.29	23.18	23.27
		HSDPA	1	22.29	22.14	22.22
			2	22.36	22.19	22.28
			3	22.41	22.26	22.31
			4	22.45	22.33	22.36
		HSUPA	1	21.86	21.68	21.89
			2	21.89	21.73	21.96
			3	21.97	21.78	22.01
			4	22.02	21.81	22.06
		HSPA+	1	22.08	21.86	22.09

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.32	13
	Middle	1.35	13
	High	1.36	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.41	13
	Middle	1.39	13
	High	1.44	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.89	13
	Middle	2.88	13
	High	2.91	13
HSDPA (16QAM)	Low	3.62	13
	Middle	3.64	13
	High	3.67	13
HSUPA (BPSK)	Low	3.61	13
	Middle	3.58	13
	High	3.63	13
HSPA+	/	3.45	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.38	13
	Middle	1.42	13
	High	1.46	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.41	13
	Middle	1.45	13
	High	1.47	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.37	13
	Middle	3.36	13
	High	3.39	13
HSDPA (16QAM)	Low	3.67	13
	Middle	3.64	13
	High	3.68	13
HSUPA (BPSK)	Low	3.75	13
	Middle	3.72	13
	High	3.77	13
HSPA+	/	3.45	13

AWS Band

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.33	13
	Middle	2.99	13
	High	3.01	13
HSDPA (16QAM)	Low	3.79	13
	Middle	3.76	13
	High	3.78	13
HSUPA (BPSK)	Low	3.97	13
	Middle	3.94	13
	High	3.95	13
HSPA+	/	3.67	13

Radiated Power
GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	91.56	171	1	H	29.6	0.7	0	28.9	38.45	9.55
836.6	92.75	11	1.6	V	32.4	0.7	0	31.7	38.45	6.75
EIRP for PCS Band (Part 24E), Middle Channel										
1880	90.15	248	1.4	H	20.5	1.30	9.40	28.60	33	4.40
1880	90.96	209	2.3	V	21.1	1.30	9.40	29.20	33	3.80

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	79.94	191	1.5	H	19.9	0.6	0.0	19.3	38.45	19.15
836.6	90.37	146	2.0	V	31.1	0.6	0.0	30.5	38.45	7.95
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	88.71	335	1.9	H	18.7	1.30	8.50	25.90	33	7.10
1880.00	87.33	356	2.1	V	17.1	1.30	8.50	24.30	33	8.70

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	84.55	171	1	H	22.6	0.7	0	21.9	38.45	16.55
836.6	83.4	11	1.6	V	23	0.7	0	22.3	38.45	16.15
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	85.54	278	1.0	H	15.9	1.30	9.40	24.00	33	9.0
1880.00	84.89	88	1.5	V	15.0	1.30	9.40	23.10	33	9.9
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	87.27	40	1.4	H	13.9	1.30	8.90	21.50	30	8.5
1732.60	85.57	54	1.4	V	12.8	1.30	8.90	20.40	30	9.6

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

LTE Band 2:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.62	22.57	22.56
		RB Size=1, RB Offset=2	22.56	22.55	22.70
		RB Size=1, RB Offset=5	22.28	22.63	22.69
		RB Size=3, RB Offset=0	22.39	22.41	22.47
		RB Size=3, RB Offset=1	22.37	22.29	22.25
		RB Size=3, RB Offset=2	22.28	22.24	22.30
		RB Size=6, RB Offset=0	22.20	22.15	22.15
	16QAM	RB Size=1, RB Offset=0	22.18	22.12	22.11
		RB Size=1, RB Offset=2	22.10	22.02	22.04
		RB Size=1, RB Offset=5	21.96	22.03	23.08
		RB Size=3, RB Offset=0	21.74	21.88	22.85
		RB Size=3, RB Offset=1	21.77	21.90	21.82
		RB Size=3, RB Offset=2	21.90	21.87	21.69
		RB Size=6, RB Offset=0	21.75	21.67	21.81
3.0	QPSK	RB Size=1, RB Offset=0	22.71	22.77	22.84
		RB Size=1, RB Offset=7	22.89	22.69	22.80
		RB Size=1, RB Offset=14	22.65	22.72	22.78
		RB Size=8, RB Offset=0	21.88	22.02	21.92
		RB Size=8, RB Offset=4	21.76	21.76	21.78
		RB Size=8, RB Offset=7	21.58	21.62	21.85
		RB Size=15, RB Offset=0	21.77	21.77	21.85
	16QAM	RB Size=1, RB Offset=0	22.15	22.08	22.11
		RB Size=1, RB Offset=7	22.10	21.99	22.09
		RB Size=1, RB Offset=14	22.23	21.85	21.96
		RB Size=8, RB Offset=0	20.88	20.85	21.05
		RB Size=8, RB Offset=4	20.56	20.80	20.88
		RB Size=8, RB Offset=7	20.46	20.58	20.81
		RB Size=15, RB Offset=0	20.85	20.87	20.83

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	22.84	22.74	22.85
		RB Size=1, RB Offset=12	22.91	22.89	22.70
		RB Size=1, RB Offset=24	22.56	22.83	22.52
		RB Size=12, RB Offset=0	21.74	21.96	21.88
		RB Size=12, RB Offset=6	21.82	21.72	21.78
		RB Size=12, RB Offset=11	21.82	21.53	21.79
		RB Size=25, RB Offset=0	21.69	21.82	21.73
	16QAM	RB Size=1, RB Offset=0	21.98	21.69	21.68
		RB Size=1, RB Offset=12	21.76	21.39	21.79
		RB Size=1, RB Offset=24	21.90	21.40	21.66
		RB Size=12, RB Offset=0	20.83	20.76	20.87
		RB Size=12, RB Offset=6	20.85	20.61	20.66
		RB Size=12, RB Offset=11	20.63	20.46	20.60
		RB Size=25, RB Offset=0	20.64	20.67	20.72
10.0	QPSK	RB Size=1, RB Offset=0	22.89	22.80	22.66
		RB Size=1, RB Offset=24	22.67	22.95	22.62
		RB Size=1, RB Offset=49	22.68	22.77	22.52
		RB Size=25, RB Offset=0	21.83	21.80	21.78
		RB Size=25, RB Offset=12	21.78	21.64	21.64
		RB Size=25, RB Offset=24	21.84	21.63	21.58
		RB Size=50, RB Offset=0	21.59	21.57	21.58
	16QAM	RB Size=1, RB Offset=0	21.76	21.68	21.60
		RB Size=1, RB Offset=24	21.69	21.60	21.69
		RB Size=1, RB Offset=49	21.47	21.54	21.74
		RB Size=25, RB Offset=0	22.65	20.66	20.67
		RB Size=25, RB Offset=12	22.50	20.53	20.67
		RB Size=25, RB Offset=24	22.62	20.34	20.47
		RB Size=50, RB Offset=0	20.41	20.44	20.48

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	22.18	21.98	22.32
		RB Size=1, RB Offset=37	22.03	21.87	22.28
		RB Size=1, RB Offset=74	21.92	21.99	22.29
		RB Size=36, RB Offset=0	22.11	22.08	22.10
		RB Size=36, RB Offset=18	22.13	22.01	21.82
		RB Size=36, RB Offset=37	22.11	21.75	21.71
		RB Size=75, RB Offset=0	21.86	21.96	22.08
	16QAM	RB Size=1, RB Offset=0	21.86	21.87	21.85
		RB Size=1, RB Offset=37	21.92	21.96	21.55
		RB Size=1, RB Offset=74	21.75	21.93	21.44
		RB Size=36, RB Offset=0	21.72	21.92	21.98
		RB Size=36, RB Offset=18	21.79	21.69	22.09
		RB Size=36, RB Offset=37	21.56	21.61	21.83
		RB Size=75, RB Offset=0	21.16	21.15	20.95
20.0	QPSK	RB Size=1, RB Offset=0	22.87	22.95	22.92
		RB Size=1, RB Offset=49	22.96	22.89	22.80
		RB Size=1, RB Offset=99	22.80	22.91	22.80
		RB Size=50, RB Offset=0	21.92	21.91	21.97
		RB Size=50, RB Offset=24	21.81	21.83	21.89
		RB Size=50, RB Offset=49	21.68	21.66	21.65
		RB Size=100, RB Offset=0	21.84	21.82	21.89
	16QAM	RB Size=1, RB Offset=0	22.12	22.02	22.13
		RB Size=1, RB Offset=49	21.92	21.88	21.96
		RB Size=1, RB Offset=99	21.92	21.79	21.94
		RB Size=50, RB Offset=0	20.91	20.80	20.98
		RB Size=50, RB Offset=24	20.72	20.86	20.94
		RB Size=50, RB Offset=49	20.41	20.84	20.92
		RB Size=100, RB Offset=0	20.84	20.93	21.06

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.82	13	Pass
QPSK (100RB Size)	5.90	13	Pass
16QAM (1RB Size)	7.25	13	Pass
16QAM (100RB Size)	7.35	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	82.72	288	2.4	H	13.0	1.30	9.40	21.10	33
1880	82.31	78	1.3	V	12.4	1.30	9.40	20.50	33
3 MHz Bandwidth									
1880	82.51	171	1.3	H	12.8	1.30	9.40	20.90	33
1880	82.19	28	2.3	V	12.3	1.30	9.40	20.40	33
5 MHz Bandwidth									
1880	82.28	22	2.1	H	12.6	1.30	9.40	20.70	33
1880	82.03	78	1.9	V	12.1	1.30	9.40	20.20	33
10 MHz Bandwidth									
1880	82.21	60	1.6	H	12.5	1.30	9.40	20.60	33
1880	81.89	334	1.9	V	12.0	1.30	9.40	20.10	33
15 MHz Bandwidth									
1880	82.14	96	1.3	H	12.5	1.30	9.40	20.60	33
1880	81.75	249	1.1	V	11.9	1.30	9.40	20.00	33
20 MHz Bandwidth									
1880	82.04	320	1.1	H	12.4	1.30	9.40	20.50	33
1880	81.67	229	2.2	V	11.8	1.30	9.40	19.90	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	82.85	21	1.4	H	13.2	1.30	9.40	21.30	33
1880.00	82.50	181	1.7	V	12.6	1.30	9.40	20.70	33
1880.00	82.76	98	2.1	H	13.1	1.30	9.40	21.20	33
1880.00	82.41	341	1.2	V	12.5	1.30	9.40	20.60	33
5 MHz Bandwidth									
1880.00	82.60	255	2.4	H	12.9	1.30	9.40	21.00	33
1880.00	82.31	189	1.2	V	12.4	1.30	9.40	20.50	33
10 MHz Bandwidth									
1880.00	82.51	38	2.1	H	12.8	1.30	9.40	20.90	33
1880.00	82.64	271	1.6	V	12.7	1.30	9.40	20.80	33
15 MHz Bandwidth									
1880.00	82.42	10	1.8	H	12.7	1.30	9.40	20.80	33
1880.00	82.50	307	2.2	V	12.6	1.30	9.40	20.70	33
20 MHz Bandwidth									
1880.00	82.31	32	1.6	H	12.6	1.30	9.40	20.70	33
1880.00	82.34	354	2.3	V	12.4	1.30	9.40	20.50	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	22.35	22.48	22.57
		RB Size=1, RB Offset=2	22.46	22.29	22.54
		RB Size=1, RB Offset=5	22.46	22.02	22.60
		RB Size=3, RB Offset=0	22.78	22.66	22.66
		RB Size=3, RB Offset=1	22.69	22.72	22.72
		RB Size=3, RB Offset=2	22.40	22.54	22.40
		RB Size=6, RB Offset=0	21.56	21.42	21.54
	16QAM	RB Size=1, RB Offset=0	21.97	21.90	21.90
		RB Size=1, RB Offset=2	21.76	21.73	21.72
		RB Size=1, RB Offset=5	21.83	21.79	21.95
		RB Size=3, RB Offset=0	22.81	21.87	21.90
		RB Size=3, RB Offset=1	22.87	21.70	21.81
		RB Size=3, RB Offset=2	22.69	21.74	21.60
		RB Size=6, RB Offset=0	20.69	20.74	20.72
3.0	QPSK	RB Size=1, RB Offset=0	22.50	22.42	22.39
		RB Size=1, RB Offset=7	22.21	22.38	22.15
		RB Size=1, RB Offset=14	22.48	22.22	22.28
		RB Size=8, RB Offset=0	21.70	21.63	21.63
		RB Size=8, RB Offset=4	21.62	21.46	21.72
		RB Size=8, RB Offset=7	21.48	21.33	21.64
		RB Size=15, RB Offset=0	21.62	21.70	21.69
	16QAM	RB Size=1, RB Offset=0	21.74	21.68	21.62
		RB Size=1, RB Offset=7	21.71	21.72	21.55
		RB Size=1, RB Offset=14	21.72	21.39	21.22
		RB Size=8, RB Offset=0	20.66	20.75	20.83
		RB Size=8, RB Offset=4	20.63	20.55	20.75
		RB Size=8, RB Offset=7	20.65	20.84	20.67
		RB Size=15, RB Offset=0	20.81	20.80	20.69

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	22.81	22.68	22.81
		RB Size=1, RB Offset=12	22.60	22.49	22.66
		RB Size=1, RB Offset=24	22.42	22.64	22.64
		RB Size=12, RB Offset=0	21.80	21.70	21.76
		RB Size=12, RB Offset=6	21.67	21.68	21.61
		RB Size=12, RB Offset=11	21.53	21.83	21.55
		RB Size=25, RB Offset=0	21.90	21.83	21.66
	16QAM	RB Size=1, RB Offset=0	22.05	21.80	22.00
		RB Size=1, RB Offset=12	21.85	21.82	21.77
		RB Size=1, RB Offset=24	21.67	21.81	21.69
		RB Size=12, RB Offset=0	20.94	21.04	21.07
		RB Size=12, RB Offset=6	20.77	20.89	20.90
		RB Size=12, RB Offset=11	20.82	20.68	20.89
		RB Size=25, RB Offset=0	20.87	20.57	20.59
10.0	QPSK	RB Size=1, RB Offset=0	22.73	22.69	22.83
		RB Size=1, RB Offset=24	22.68	22.63	22.83
		RB Size=1, RB Offset=49	22.57	22.66	22.80
		RB Size=25, RB Offset=0	21.68	21.84	21.82
		RB Size=25, RB Offset=12	21.65	21.89	21.78
		RB Size=25, RB Offset=24	21.53	21.48	21.74
		RB Size=50, RB Offset=0	21.88	21.75	21.87
	16QAM	RB Size=1, RB Offset=0	22.30	22.14	22.24
		RB Size=1, RB Offset=24	22.08	22.22	22.18
		RB Size=1, RB Offset=49	22.18	22.10	22.04
		RB Size=25, RB Offset=0	20.83	20.94	20.80
		RB Size=25, RB Offset=12	20.75	20.56	20.97
		RB Size=25, RB Offset=24	20.52	20.57	20.58
		RB Size=50, RB Offset=0	20.99	21.00	20.93

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.65	22.59	22.61
		RB Size=1, RB Offset=37	22.73	22.46	22.48
		RB Size=1, RB Offset=74	22.56	22.36	22.49
		RB Size=36, RB Offset=0	21.93	21.89	21.78
		RB Size=36, RB Offset=18	21.86	21.78	21.79
		RB Size=36, RB Offset=37	21.92	21.75	21.82
		RB Size=75, RB Offset=0	21.66	21.70	21.54
	16QAM	RB Size=1, RB Offset=0	21.75	21.59	21.69
		RB Size=1, RB Offset=37	21.68	21.46	21.63
		RB Size=1, RB Offset=74	21.46	21.41	21.49
		RB Size=36, RB Offset=0	20.86	20.61	20.62
		RB Size=36, RB Offset=18	20.86	20.50	20.60
		RB Size=36, RB Offset=37	20.42	20.45	20.48
		RB Size=75, RB Offset=0	20.85	20.75	20.89
20.0	QPSK	RB Size=1, RB Offset=0	22.68	22.37	22.43
		RB Size=1, RB Offset=49	22.68	22.41	22.43
		RB Size=1, RB Offset=99	22.75	22.37	22.17
		RB Size=50, RB Offset=0	21.86	21.83	21.90
		RB Size=50, RB Offset=24	21.83	21.85	21.79
		RB Size=50, RB Offset=49	21.73	21.93	21.75
		RB Size=100, RB Offset=0	21.76	21.48	21.49
	16QAM	RB Size=1, RB Offset=0	22.21	22.34	22.20
		RB Size=1, RB Offset=49	22.25	22.13	22.44
		RB Size=1, RB Offset=99	22.09	22.12	22.31
		RB Size=50, RB Offset=0	21.08	21.04	21.10
		RB Size=50, RB Offset=24	20.88	21.09	21.07
		RB Size=50, RB Offset=49	20.92	20.95	21.05
		RB Size=100, RB Offset=0	20.80	20.83	20.74

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.22	13	Pass
QPSK (100RB Size)	6.28	13	Pass
16QAM (1RB Size)	7.51	13	Pass
16QAM (100RB Size)	7.57	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	86.44	104	1.8	H	13.1	1.30	8.90	20.70	30
1732.50	85.61	85	1.2	V	12.9	1.30	8.90	20.50	30
3 MHz Bandwidth									
1732.50	86.31	231	1.4	H	13.0	1.30	8.90	20.60	30
1732.50	85.50	193	1.4	V	12.8	1.30	8.90	20.40	30
5 MHz Bandwidth									
1732.50	86.2	41	1.2	H	12.9	1.30	8.90	20.50	30
1732.50	85.1	3	1.4	V	12.4	1.30	8.90	20.00	30
10 MHz Bandwidth									
1732.50	85.38	258	2.0	H	12.1	1.30	8.90	19.70	30
1732.50	84.12	36	1.1	V	11.4	1.30	8.90	19.00	30
15 MHz Bandwidth									
1732.50	84.97	322	1.6	H	14.6	1.30	8.90	19.20	30
1732.50	83.99	64	1.3	V	11.3	1.30	8.90	18.90	30
20 MHz Bandwidth									
1732.50	84.36	95	2.3	H	14.0	1.30	8.90	18.60	30
1732.50	83.78	359	2.4	V	14.1	1.30	8.90	18.70	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.5	86.57	87	1.7	H	13.2	1.30	8.90	20.80	30
1732.5	85.87	79	2.0	V	13.1	1.30	8.90	20.70	30
3 MHz Bandwidth									
1732.5	86.43	299	1.3	H	13.1	1.30	8.90	20.70	30
1732.5	85.67	287	1.5	V	12.9	1.30	8.90	20.50	30
5 MHz Bandwidth									
1732.5	86.34	324	1.4	H	13.0	1.30	8.90	20.60	30
1732.5	85.51	229	1.5	V	12.8	1.30	8.90	20.40	30
10 MHz Bandwidth									
1732.50	85.65	342	1.3	H	12.3	1.30	8.90	19.90	30
1732.50	82.74	322	1.5	V	10.0	1.30	8.90	17.60	30
15 MHz Bandwidth									
1732.50	85.37	250	1.4	H	12.0	1.30	8.90	19.60	30
1732.50	82.55	212	2.2	V	9.8	1.30	8.90	17.40	30
20 MHz Bandwidth									
1732.5	84.62	350	2.5	H	11.3	1.30	8.90	18.90	30
1732.5	82.17	193	1.4	V	9.4	1.30	8.90	17.00	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	22.48	22.55	22.63
		RB Size=1, RB Offset=2	22.61	22.32	22.62
		RB Size=1, RB Offset=5	22.49	22.11	22.68
		RB Size=3, RB Offset=0	22.82	22.75	22.67
		RB Size=3, RB Offset=1	22.76	22.84	22.79
		RB Size=3, RB Offset=2	22.49	22.59	22.4
		RB Size=6, RB Offset=0	21.60	21.6	21.73
	16QAM	RB Size=1, RB Offset=0	22.06	22.06	21.91
		RB Size=1, RB Offset=2	21.91	21.80	21.73
		RB Size=1, RB Offset=5	21.87	21.94	22.01
		RB Size=3, RB Offset=0	22.95	21.90	22.02
		RB Size=3, RB Offset=1	22.95	21.82	21.95
		RB Size=3, RB Offset=2	22.72	21.86	21.78
		RB Size=6, RB Offset=0	20.81	20.71	20.78
3.0	QPSK	RB Size=1, RB Offset=0	22.43	22.56	22.43
		RB Size=1, RB Offset=7	22.38	22.46	22.33
		RB Size=1, RB Offset=14	22.59	22.21	22.35
		RB Size=8, RB Offset=0	21.86	21.78	21.56
		RB Size=8, RB Offset=4	21.65	21.4	21.89
		RB Size=8, RB Offset=7	21.67	21.29	21.77
		RB Size=15, RB Offset=0	21.68	21.79	21.82
	16QAM	RB Size=1, RB Offset=0	21.82	21.77	21.61
		RB Size=1, RB Offset=7	21.74	21.72	21.65
		RB Size=1, RB Offset=14	21.76	21.41	21.32
		RB Size=8, RB Offset=0	20.75	20.85	20.92
		RB Size=8, RB Offset=4	20.67	20.69	20.8
		RB Size=8, RB Offset=7	20.61	20.85	20.79
		RB Size=15, RB Offset=0	20.88	20.83	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	22.91	22.81	22.85
		RB Size=1, RB Offset=12	22.59	22.46	22.80
		RB Size=1, RB Offset=24	22.36	22.60	22.78
		RB Size=12, RB Offset=0	21.77	21.81	21.86
		RB Size=12, RB Offset=6	21.81	21.73	21.75
		RB Size=12, RB Offset=11	21.67	21.99	21.58
		RB Size=25, RB Offset=0	21.85	21.90	21.67
	16QAM	RB Size=1, RB Offset=0	22.11	21.78	21.98
		RB Size=1, RB Offset=12	21.92	21.78	21.89
		RB Size=1, RB Offset=24	21.75	21.92	21.81
		RB Size=12, RB Offset=0	20.92	21.06	21.15
		RB Size=12, RB Offset=6	20.89	21.07	20.92
		RB Size=12, RB Offset=11	20.87	20.78	20.99
		RB Size=25, RB Offset=0	20.98	20.65	20.71
10.0	QPSK	RB Size=1, RB Offset=0	22.73	22.65	22.83
		RB Size=1, RB Offset=24	22.78	22.59	22.76
		RB Size=1, RB Offset=49	22.68	22.67	22.91
		RB Size=25, RB Offset=0	21.72	21.87	21.79
		RB Size=25, RB Offset=12	21.84	21.96	21.84
		RB Size=25, RB Offset=24	21.60	21.56	21.88
		RB Size=50, RB Offset=0	21.86	21.88	21.88
	16QAM	RB Size=1, RB Offset=0	22.45	22.23	22.26
		RB Size=1, RB Offset=24	22.19	22.37	22.13
		RB Size=1, RB Offset=49	22.29	22.05	22.03
		RB Size=25, RB Offset=0	20.99	21.07	20.90
		RB Size=25, RB Offset=12	20.81	20.55	20.95
		RB Size=25, RB Offset=24	20.68	20.70	20.66
		RB Size=50, RB Offset=0	21.07	21.03	20.93

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.15	13	Pass
QPSK (50RB Size)	6.26	13	Pass
16QAM (1RB Size)	7.17	13	Pass
16QAM (50RB Size)	7.23	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	82.52	5	2.0	H	20.5	0.7	0	19.8	38.45
836.5	81.5	225	1.6	V	21.1	0.7	0	20.4	38.45
3 MHz Bandwidth									
836.5	82.41	57	2.4	H	20.4	0.7	0	19.7	38.45
836.5	81.37	194	1.5	V	21	0.7	0	20.3	38.45
5 MHz Bandwidth									
836.5	82.32	241	1.1	H	20.3	0.7	0	19.6	38.45
836.5	81.29	93	2.4	V	20.9	0.7	0	20.2	38.45
10 MHz Bandwidth									
836.5	82.20	310	1.9	H	20.2	0.7	0	19.5	38.45
836.5	81.16	231	1.9	V	20.8	0.7	0	20.1	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	82.06	233	1.9	H	20.1	0.7	0	19.4	38.45
836.5	81.28	216	1.7	V	20.9	0.7	0	20.2	38.45
3 MHz Bandwidth									
836.5	81.85	297	1.0	H	19.9	0.7	0	19.2	38.45
836.5	81.1	89	1.1	V	20.7	0.7	0	20.0	38.45
5 MHz Bandwidth									
836.5	81.79	321	2.2	H	19.8	0.7	0	19.1	38.45
836.5	81.02	318	1.1	V	20.6	0.7	0	19.9	38.45
10 MHz Bandwidth									
836.5	81.65	228	2.3	H	19.7	0.7	0	19.0	38.45
836.5	80.87	229	1.6	V	20.5	0.7	0	19.8	38.45

LTE Band 12:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.35	22.48	22.57
		RB Size=1, RB Offset=2	22.46	22.29	22.54
		RB Size=1, RB Offset=5	22.46	22.02	22.60
		RB Size=3, RB Offset=0	22.78	22.66	22.66
		RB Size=3, RB Offset=1	22.69	22.72	22.72
		RB Size=3, RB Offset=2	22.40	22.54	22.40
		RB Size=6, RB Offset=0	21.56	21.42	21.54
	16QAM	RB Size=1, RB Offset=0	21.97	21.90	21.90
		RB Size=1, RB Offset=2	21.76	21.73	21.72
		RB Size=1, RB Offset=5	21.83	21.79	21.95
		RB Size=3, RB Offset=0	22.81	21.87	21.90
		RB Size=3, RB Offset=1	22.87	21.70	21.81
		RB Size=3, RB Offset=2	22.69	21.74	21.60
		RB Size=6, RB Offset=0	20.69	20.74	20.72
3.0	QPSK	RB Size=1, RB Offset=0	22.50	22.42	22.39
		RB Size=1, RB Offset=7	22.21	22.38	22.15
		RB Size=1, RB Offset=14	22.48	22.22	22.28
		RB Size=8, RB Offset=0	21.70	21.63	21.63
		RB Size=8, RB Offset=4	21.62	21.46	21.72
		RB Size=8, RB Offset=7	21.48	21.33	21.64
		RB Size=15, RB Offset=0	21.62	21.70	21.69
	16QAM	RB Size=1, RB Offset=0	21.74	21.68	21.62
		RB Size=1, RB Offset=7	21.71	21.72	21.55
		RB Size=1, RB Offset=14	21.72	21.39	21.22
		RB Size=8, RB Offset=0	20.66	20.75	20.83
		RB Size=8, RB Offset=4	20.63	20.55	20.75
		RB Size=8, RB Offset=7	20.65	20.84	20.69
		RB Size=15, RB Offset=0	20.81	20.80	20.69

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	22.08	21.96	22.15
		RB Size=1, RB Offset=12	22.13	21.90	21.93
		RB Size=1, RB Offset=24	21.80	21.89	21.76
		RB Size=12, RB Offset=0	21.11	21.18	21.12
		RB Size=12, RB Offset=6	20.97	21.12	21.04
		RB Size=12, RB Offset=11	20.81	21.10	21.05
		RB Size=25, RB Offset=0	21.98	22.10	22.11
	16QAM	RB Size=1, RB Offset=0	21.92	22.00	22.01
		RB Size=1, RB Offset=12	21.91	21.75	21.90
		RB Size=1, RB Offset=24	22.00	21.51	22.06
		RB Size=12, RB Offset=0	21.10	21.07	21.15
		RB Size=12, RB Offset=6	21.07	21.14	21.23
		RB Size=12, RB Offset=11	20.96	21.00	20.97
		RB Size=25, RB Offset=0	21.09	21.07	21.25
10.0	QPSK	RB Size=1, RB Offset=0	23.16	23.09	23.08
		RB Size=1, RB Offset=24	23.14	23.07	23.00
		RB Size=1, RB Offset=49	22.90	22.97	22.86
		RB Size=25, RB Offset=0	22.05	21.99	21.94
		RB Size=25, RB Offset=12	22.04	22.00	22.08
		RB Size=25, RB Offset=24	21.76	21.86	21.92
		RB Size=50, RB Offset=0	22.19	22.08	22.09
	16QAM	RB Size=1, RB Offset=0	22.56	22.63	22.49
		RB Size=1, RB Offset=24	22.57	22.32	22.46
		RB Size=1, RB Offset=49	22.57	22.31	22.28
		RB Size=25, RB Offset=0	21.20	21.19	21.17
		RB Size=25, RB Offset=12	20.90	21.28	21.08
		RB Size=25, RB Offset=24	21.08	21.34	21.09
		RB Size=50, RB Offset=0	21.16	21.16	21.22

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.13	13	Pass
QPSK (50RB Size)	6.24	13	Pass
16QAM (1RB Size)	7.08	13	Pass
16QAM (50RB Size)	7.15	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	85.22	22	2.5	H	20.2	0.63	0	19.57	34.77
707.5	89.71	359	1.5	V	21.7	0.63	0	21.07	34.77
3 MHz Bandwidth									
707.5	85.1	322	2.5	H	20.1	0.63	0	19.47	34.77
707.5	89.64	238	1.1	V	21.6	0.63	0	20.97	34.77
5 MHz Bandwidth									
707.5	85.03	141	1.8	H	20	0.63	0	19.37	34.77
707.5	89.51	225	1.5	V	21.5	0.63	0	20.87	34.77
10 MHz Bandwidth									
707.5	84.92	270	2.1	H	19.9	0.63	0	19.27	34.77
707.5	89.3	114	2.0	V	21.3	0.63	0	20.67	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	85.31	6	1.7	H	20.3	0.63	0	19.67	34.77
707.5	89.87	28	1.5	V	21.9	0.63	0	21.27	34.77
3 MHz Bandwidth									
707.5	85.19	227	1.9	H	20	0.63	0	19.37	34.77
707.5	89.71	268	2.3	V	21.7	0.63	0	21.07	34.77
5 MHz Bandwidth									
707.5	85.01	154	1.4	H	20	0.63	0	19.37	34.77
707.5	89.49	307	1.5	V	21.5	0.63	0	20.87	34.77
10 MHz Bandwidth									
707.5	84.89	182	1.3	H	19.9	0.63	0	19.27	34.77
707.5	89.36	147	1.2	V	21.4	0.63	0	20.77	34.77

LTE Band 13:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	21.97	21.97	22.00
		RB Size=1, RB Offset=12	21.95	21.86	21.81
		RB Size=1, RB Offset=24	21.87	21.82	21.76
		RB Size=12, RB Offset=0	21.17	21.12	21.14
		RB Size=12, RB Offset=6	20.96	21.11	21.06
		RB Size=12, RB Offset=11	20.70	21.10	20.96
		RB Size=25, RB Offset=0	22.01	21.97	21.96
	16QAM	RB Size=1, RB Offset=0	21.93	21.93	21.97
		RB Size=1, RB Offset=12	21.84	21.73	21.92
		RB Size=1, RB Offset=24	21.95	21.59	21.93
		RB Size=12, RB Offset=0	21.17	21.12	21.17
		RB Size=12, RB Offset=6	20.96	21.05	21.10
		RB Size=12, RB Offset=11	20.90	20.96	20.91
		RB Size=25, RB Offset=0	21.07	21.03	21.08
10	QPSK	RB Size=1, RB Offset=0	/	23.01	/
		RB Size=1, RB Offset=24	/	22.96	/
		RB Size=1, RB Offset=49	/	23.00	/
		RB Size=25, RB Offset=0	/	21.99	/
		RB Size=25, RB Offset=12	/	21.95	/
		RB Size=25, RB Offset=24	/	21.86	/
		RB Size=50, RB Offset=0	/	22.02	/
	16QAM	RB Size=1, RB Offset=0	/	22.58	/
		RB Size=1, RB Offset=24	/	22.38	/
		RB Size=1, RB Offset=49	/	22.20	/
		RB Size=25, RB Offset=0	/	21.09	/
		RB Size=25, RB Offset=12	/	21.16	/
		RB Size=25, RB Offset=24	/	21.22	/
		RB Size=50, RB Offset=0	/	21.05	/

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.08	13	Pass
QPSK (50RB Size)	6.17	13	Pass
16QAM (1RB Size)	6.96	13	Pass
16QAM (50RB Size)	7.06	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
782	85.2	20	2.1	H	15.5	0.66	0	14.84	34.77
782	89.61	245	1.1	V	19.9	0.66	0	19.24	34.77
10 MHz Bandwidth									
782	85.07	176	1.4	H	15.4	0.66	0	14.74	34.77
782	89.5	139	1.8	V	19.8	0.66	0	19.14	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
782	85.58	75	1.5	H	15.9	0.66	0	15.24	34.77
782	89.87	169	1.7	V	20.2	0.66	0	19.54	34.77
10 MHz Bandwidth									
782	85.41	232	2.5	H	15.7	0.66	0	15.04	34.77
782	89.73	206	2.4	V	20	0.66	0	19.34	34.77

LTE Band 17:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	21.97	22.06	21.95
		RB Size=1, RB Offset=12	21.90	21.89	21.80
		RB Size=1, RB Offset=24	21.88	21.81	21.75
		RB Size=12, RB Offset=0	21.22	21.24	21.29
		RB Size=12, RB Offset=6	20.92	21.13	21.02
		RB Size=12, RB Offset=11	20.69	21.12	21.07
		RB Size=25, RB Offset=0	22.13	22.04	22.01
	16QAM	RB Size=1, RB Offset=0	21.95	21.90	22.04
		RB Size=1, RB Offset=12	21.97	21.83	21.92
		RB Size=1, RB Offset=24	22.06	21.62	21.89
		RB Size=12, RB Offset=0	21.24	21.19	21.32
		RB Size=12, RB Offset=6	20.96	21.20	21.24
		RB Size=12, RB Offset=11	20.97	21.04	21.06
		RB Size=25, RB Offset=0	21.09	21.04	21.08
10	QPSK	RB Size=1, RB Offset=0	23.15	23.08	23.13
		RB Size=1, RB Offset=24	23.12	22.97	22.89
		RB Size=1, RB Offset=49	22.98	23.09	22.74
		RB Size=25, RB Offset=0	22.19	22.03	21.97
		RB Size=25, RB Offset=12	22.07	22.02	22.02
		RB Size=25, RB Offset=24	21.85	21.79	21.76
		RB Size=50, RB Offset=0	22.16	22.13	22.15
	16QAM	RB Size=1, RB Offset=0	22.72	22.68	22.54
		RB Size=1, RB Offset=24	22.54	22.56	22.51
		RB Size=1, RB Offset=49	22.39	22.28	22.19
		RB Size=25, RB Offset=0	21.24	21.00	21.19
		RB Size=25, RB Offset=12	21.12	21.33	20.99
		RB Size=25, RB Offset=24	21.07	21.33	20.90
		RB Size=50, RB Offset=0	21.03	21.12	21.19

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.09	13	Pass
QPSK (50RB Size)	6.08	13	Pass
16QAM (1RB Size)	7.51	13	Pass
16QAM (50RB Size)	7.48	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
710	84.47	266	2.1	H	14.8	0.63	0	14.17	34.77
710	88.91	276	2.0	V	19.2	0.63	0	18.57	34.77
10 MHz Bandwidth									
710	84.33	281	2.4	H	14.6	0.63	0	13.97	34.77
710	88.8	3	2.5	V	19.1	0.63	0	18.47	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
710	84.24	343	1.6	H	14.5	0.67	0	13.83	34.77
710	88.68	310	1.4	V	19	0.67	0	18.33	34.77
10 MHz Bandwidth									
710	84.1	250	1.8	H	14.4	0.67	0	13.73	34.77
710	88.78	162	1.2	V	19.1	0.67	0	18.43	34.77

LTE Band 66:

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	22.35	22.52	22.63
		RB Size=1, RB Offset=2	22.51	22.32	22.57
		RB Size=1, RB Offset=5	22.48	22.08	22.60
		RB Size=3, RB Offset=0	22.82	22.70	22.72
		RB Size=3, RB Offset=1	22.73	22.73	22.74
		RB Size=3, RB Offset=2	22.46	22.56	22.41
		RB Size=6, RB Offset=0	21.60	21.46	21.56
	16QAM	RB Size=1, RB Offset=0	22.01	21.93	21.95
		RB Size=1, RB Offset=2	21.79	21.75	21.73
		RB Size=1, RB Offset=5	21.85	21.81	22.00
		RB Size=3, RB Offset=0	22.84	21.92	21.92
		RB Size=3, RB Offset=1	22.89	21.75	21.82
		RB Size=3, RB Offset=2	22.73	21.8	21.62
		RB Size=6, RB Offset=0	20.73	20.76	20.72
3	QPSK	RB Size=1, RB Offset=0	22.54	22.46	22.42
		RB Size=1, RB Offset=7	22.22	22.39	22.18
		RB Size=1, RB Offset=14	22.50	22.25	22.33
		RB Size=8, RB Offset=0	21.71	21.69	21.65
		RB Size=8, RB Offset=4	21.64	21.51	21.75
		RB Size=8, RB Offset=7	21.52	21.38	21.67
		RB Size=15, RB Offset=0	21.65	21.72	21.73
	16QAM	RB Size=1, RB Offset=0	21.77	21.72	21.63
		RB Size=1, RB Offset=7	21.73	21.75	21.60
		RB Size=1, RB Offset=14	21.78	21.41	21.26
		RB Size=8, RB Offset=0	20.69	20.75	20.83
		RB Size=8, RB Offset=4	20.63	20.55	20.79
		RB Size=8, RB Offset=7	20.66	20.86	20.75
		RB Size=15, RB Offset=0	20.87	20.82	20.73

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	22.11	21.98	22.19
		RB Size=1, RB Offset=12	22.16	21.95	21.96
		RB Size=1, RB Offset=24	21.85	21.9	21.82
		RB Size=12, RB Offset=0	21.13	21.21	21.12
		RB Size=12, RB Offset=6	21.04	21.17	21.06
		RB Size=12, RB Offset=11	20.86	21.13	21.06
		RB Size=25, RB Offset=0	22.03	22.13	22.14
	16QAM	RB Size=1, RB Offset=0	21.94	22.03	22.02
		RB Size=1, RB Offset=12	21.94	21.76	21.92
		RB Size=1, RB Offset=24	22.02	21.57	22.11
		RB Size=12, RB Offset=0	21.13	21.11	21.18
		RB Size=12, RB Offset=6	21.1	21.17	21.29
		RB Size=12, RB Offset=11	20.99	21.01	21.01
		RB Size=25, RB Offset=0	21.11	21.08	21.28
10	QPSK	RB Size=1, RB Offset=0	22.71	22.73	22.80
		RB Size=1, RB Offset=24	22.81	22.59	22.71
		RB Size=1, RB Offset=49	22.58	22.67	22.83
		RB Size=25, RB Offset=0	21.74	21.75	21.70
		RB Size=25, RB Offset=12	21.55	21.90	21.77
		RB Size=25, RB Offset=24	21.64	21.41	21.73
		RB Size=50, RB Offset=0	21.73	21.77	21.87
	16QAM	RB Size=1, RB Offset=0	22.17	22.18	22.19
		RB Size=1, RB Offset=24	22.01	22.10	22.32
		RB Size=1, RB Offset=49	22.22	22.17	22.02
		RB Size=25, RB Offset=0	20.95	20.76	20.88
		RB Size=25, RB Offset=12	20.70	20.63	20.99
		RB Size=25, RB Offset=24	20.57	20.82	20.76
		RB Size=50, RB Offset=0	20.85	20.89	20.99

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	22.77	22.58	22.58
		RB Size=1, RB Offset=37	22.79	22.50	22.38
		RB Size=1, RB Offset=74	22.41	22.45	22.56
		RB Size=36, RB Offset=0	22.06	21.85	21.94
		RB Size=36, RB Offset=18	21.97	21.71	21.69
		RB Size=36, RB Offset=37	21.86	21.62	21.80
		RB Size=75, RB Offset=0	21.74	21.46	21.71
	16QAM	RB Size=1, RB Offset=0	21.77	21.56	21.60
		RB Size=1, RB Offset=37	21.74	21.47	21.57
		RB Size=1, RB Offset=74	21.54	21.49	21.65
		RB Size=36, RB Offset=0	20.79	20.57	20.80
		RB Size=36, RB Offset=18	20.71	20.68	20.61
		RB Size=36, RB Offset=37	20.58	20.62	20.44
		RB Size=75, RB Offset=0	20.78	20.77	20.81
20	QPSK	RB Size=1, RB Offset=0	22.74	22.43	22.42
		RB Size=1, RB Offset=49	22.66	22.19	22.57
		RB Size=1, RB Offset=99	22.70	22.30	22.25
		RB Size=50, RB Offset=0	21.84	21.88	21.98
		RB Size=50, RB Offset=24	21.90	21.92	21.81
		RB Size=50, RB Offset=49	21.66	21.96	21.75
		RB Size=100, RB Offset=0	21.82	21.41	21.53
	16QAM	RB Size=1, RB Offset=0	22.29	22.14	22.32
		RB Size=1, RB Offset=49	22.24	22.29	22.39
		RB Size=1, RB Offset=99	21.95	22.21	22.33
		RB Size=50, RB Offset=0	21.09	21.03	20.96
		RB Size=50, RB Offset=24	20.98	21.00	21.05
		RB Size=50, RB Offset=49	20.85	21.13	21.01
		RB Size=100, RB Offset=0	20.91	20.72	20.89

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.31	13	Pass
QPSK (100RB Size)	6.42	13	Pass
16QAM (1RB Size)	7.52	13	Pass
16QAM (100RB Size)	7.61	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1745.00	84.93	131	1.5	H	11.6	1.30	8.90	19.20	30
1745.00	86.11	92	2.2	V	13.4	1.30	8.90	21.00	30
3 MHz Bandwidth									
1745.00	84.28	106	1.6	H	11.0	1.30	8.90	18.60	30
1745.00	85.94	241	1.4	V	13.2	1.30	8.90	20.80	30
5 MHz Bandwidth									
1745	84.32	257	1.3	H	11.0	1.30	8.90	18.60	30
1745	85.78	267	1.3	V	13.1	1.30	8.90	20.70	30
10 MHz Bandwidth									
1745.00	84.10	59	1.9	H	10.8	1.30	8.90	18.40	30
1745	85.69	39	1.2	V	13.0	1.30	8.90	20.60	30
15 MHz Bandwidth									
1745.00	83.94	33	1.5	H	10.6	1.30	8.90	18.20	30
1745	85.25	201	2.0	V	12.5	1.30	8.90	20.10	30
20 MHz Bandwidth									
1745.00	83.82	228	2.2	H	10.5	1.30	8.90	18.10	30
1745	85.02	340	1.3	V	12.3	1.30	8.90	19.90	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1745.00	85.01	301	1.3	H	11.7	1.30	8.90	19.30	30
1745.00	86.35	300	2.2	V	13.6	1.30	8.90	21.20	30
3 MHz Bandwidth									
1745.00	84.89	342	1.2	H	11.6	1.30	8.90	19.20	30
1745.00	86.21	334	2.0	V	13.5	1.30	8.90	21.10	30
5 MHz Bandwidth									
1745	84.86	213	1.3	H	11.5	1.30	8.90	19.10	30
1745	86.12	114	1.8	V	13.4	1.30	8.90	21.00	30
10 MHz Bandwidth									
1745	84.72	83	1.7	H	11.4	1.30	8.90	19.00	30
1745	85.91	331	1.6	V	13.2	1.30	8.90	20.80	30
15 MHz Bandwidth									
1745	84.64	358	1.3	H	11.3	1.30	8.90	18.90	30
1745	85.8	65	1.1	V	13.1	1.30	8.90	20.70	30
20 MHz Bandwidth									
1745	84.58	259	1.3	H	11.3	1.30	8.90	18.90	30
1745	85.73	21	1.5	V	13.0	1.30	8.90	20.60	30

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

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

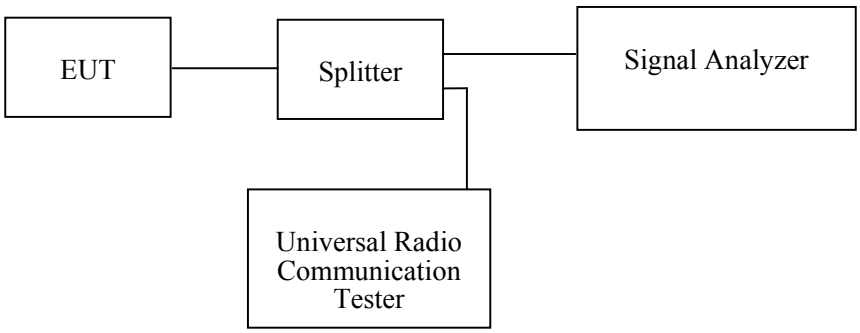
Applicable Standard

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

Test Procedure

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

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



Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	50~56 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu from 2019-06-20 to 2019-08-27.

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	243.59	317.31
EGPRS(8PSK)	836.6	250.00	331.73

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.16	4.74
HSUPA (BPSK)	836.6	4.20	4.73
HSDPA (16QAM)	836.6	4.16	4.71

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	245.19	317.31
EGPRS(8PSK)	1880.0	248.40	320.51

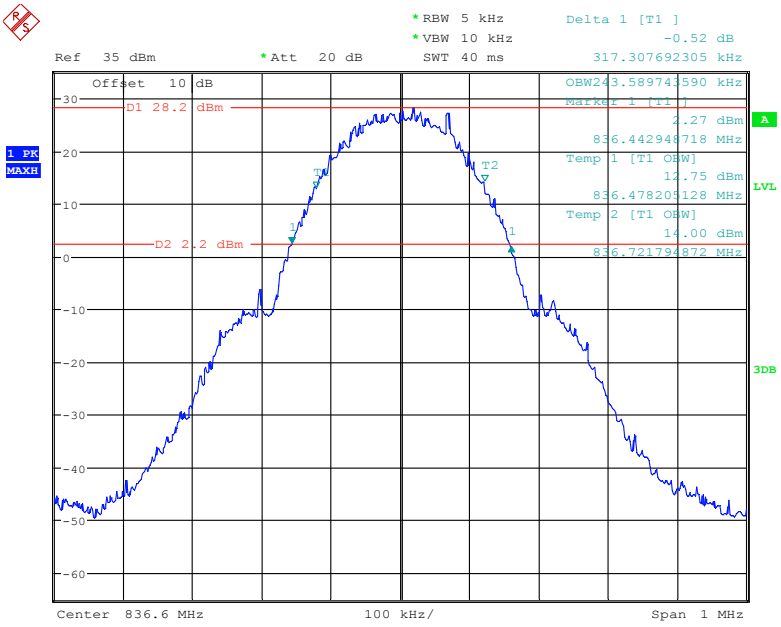
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.16	4.73
HSUPA (BPSK)	1880.0	4.22	5.11
HSDPA (16QAM)	1880.0	4.22	5.13

AWS Band (Part 27)

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1732.6	4.16	4.74
HSUPA (BPSK)	1732.6	4.20	4.93
HSDPA (16QAM)	1732.6	4.18	4.73

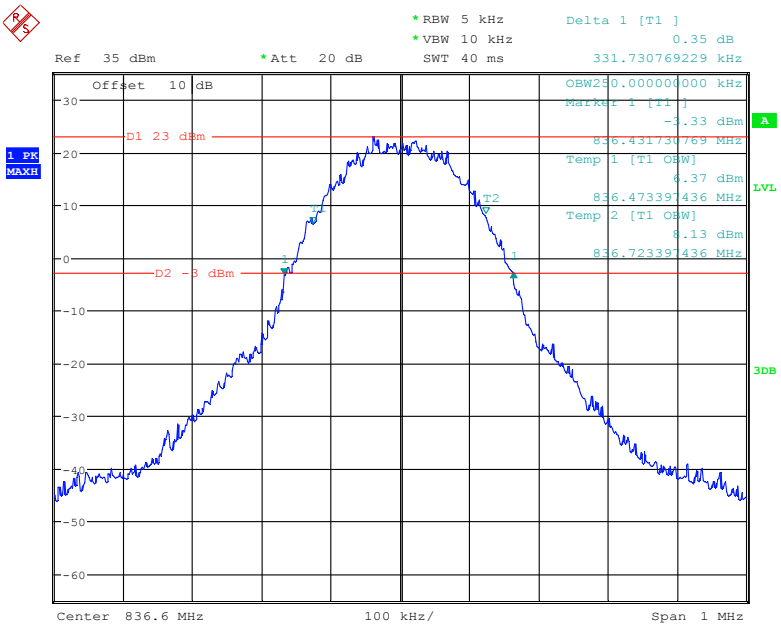
Cellular Band (Part 22H)

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



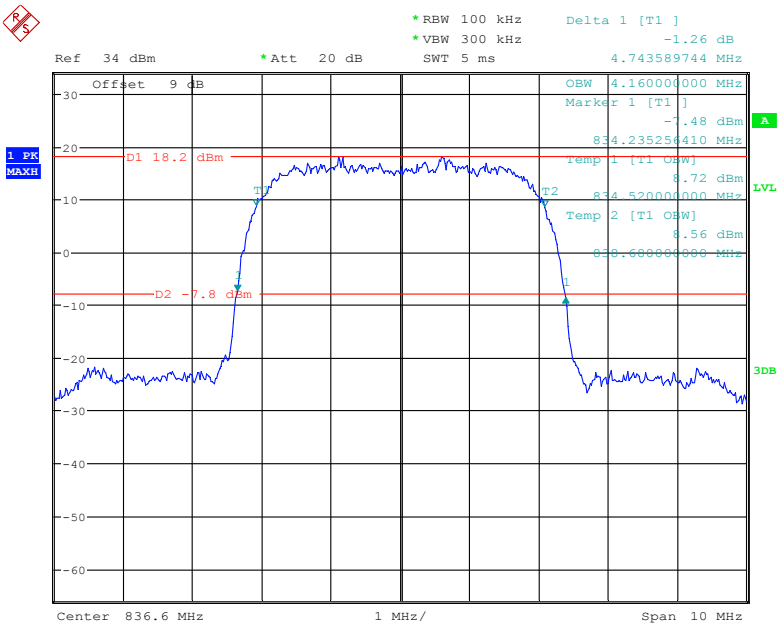
Date: 20.JUN.2019 22:37:52

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



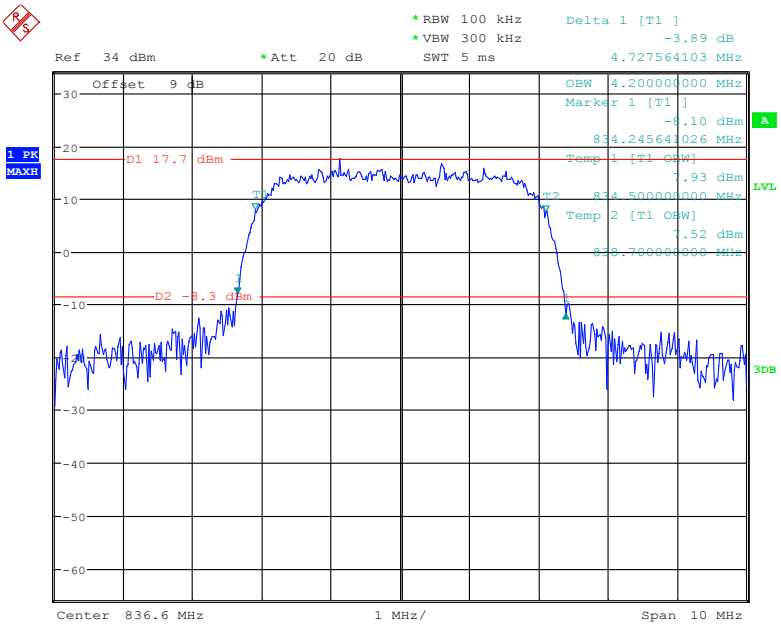
Date: 20.JUN.2019 22:43:23

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



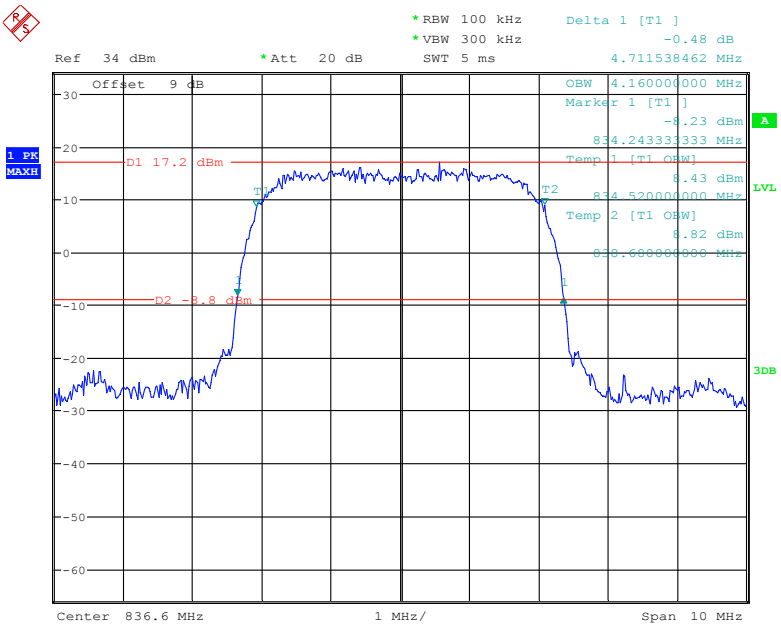
Date: 8.JUL.2019 23:19:31

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



Date: 8.JUL.2019 23:15:08

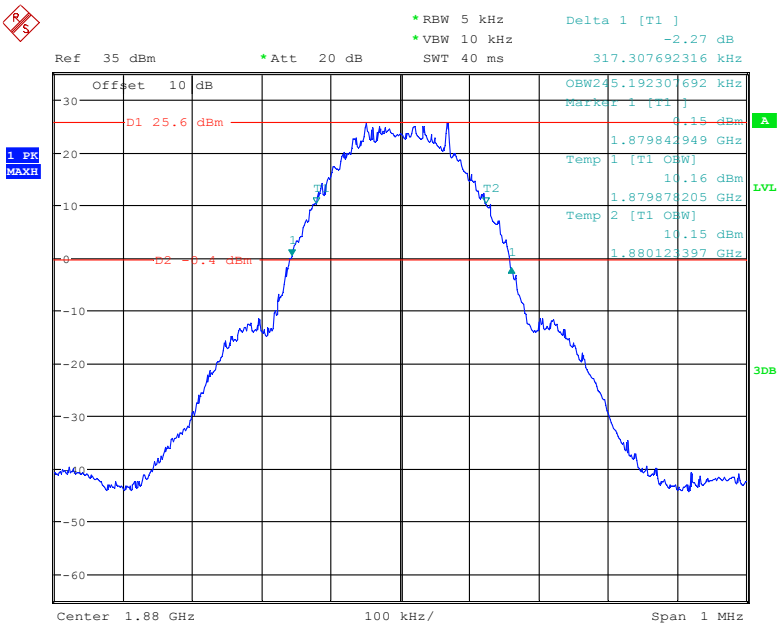
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 8.JUL.2019 23:16:23

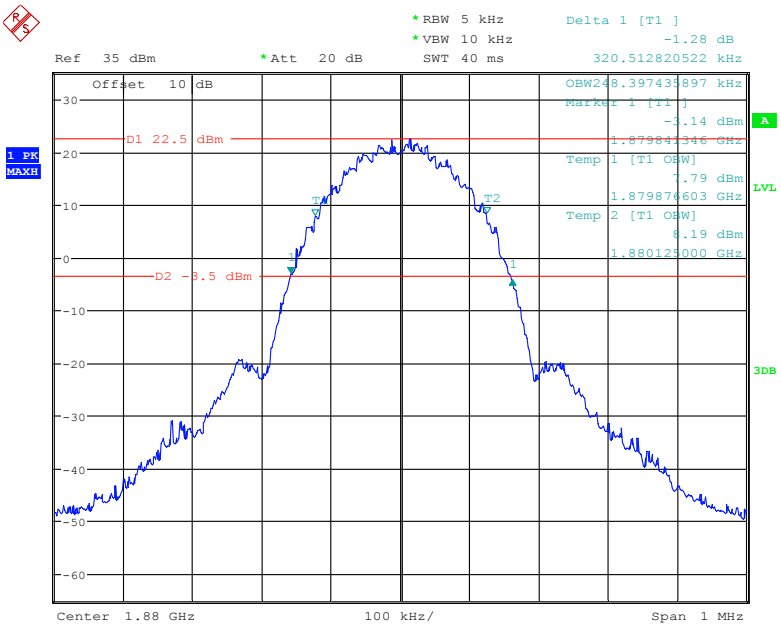
PCS Band (Part 24E)

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



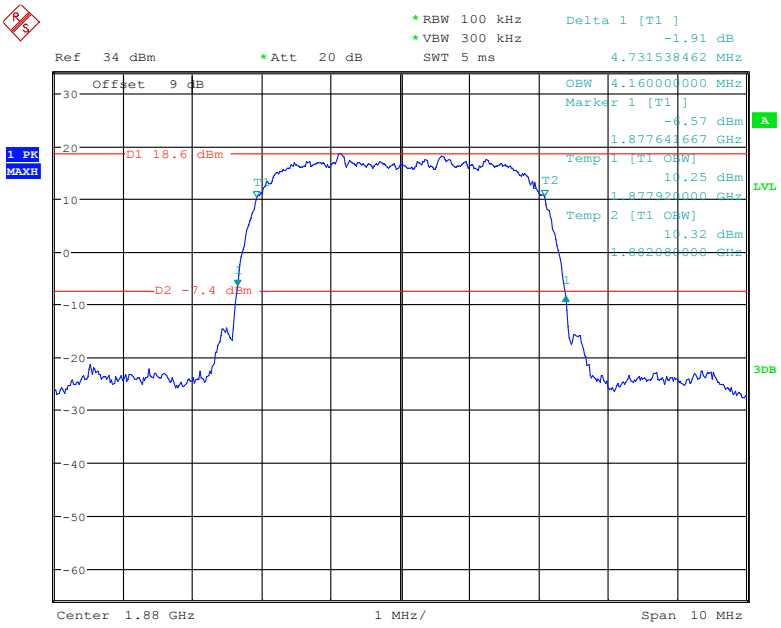
Date: 20.JUN.2019 22:19:30

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



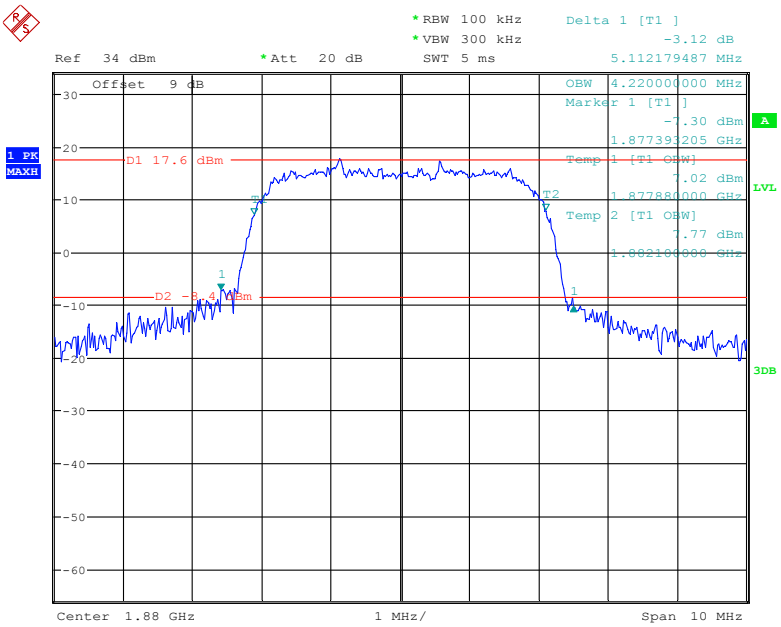
Date: 20.JUN.2019 22:29:37

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



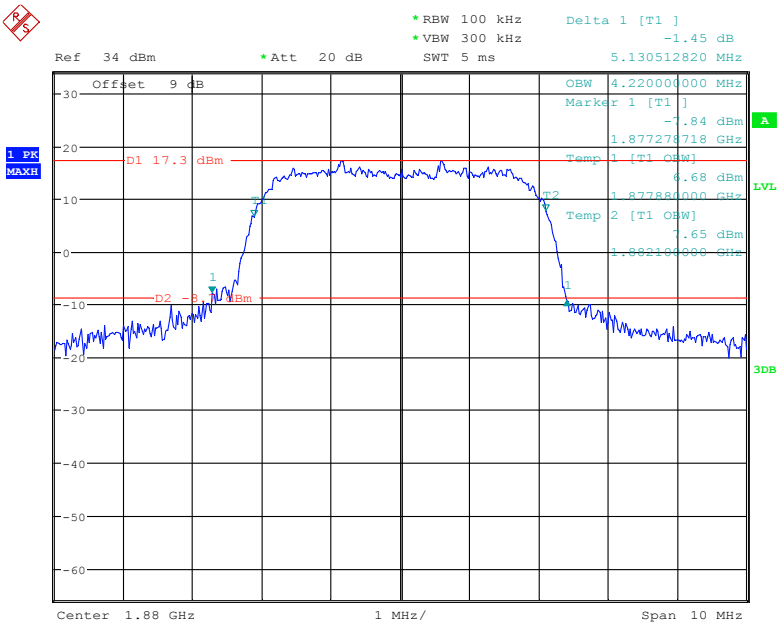
Date: 8.JUL.2019 23:53:06

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



Date: 8.JUL.2019 23:51:04

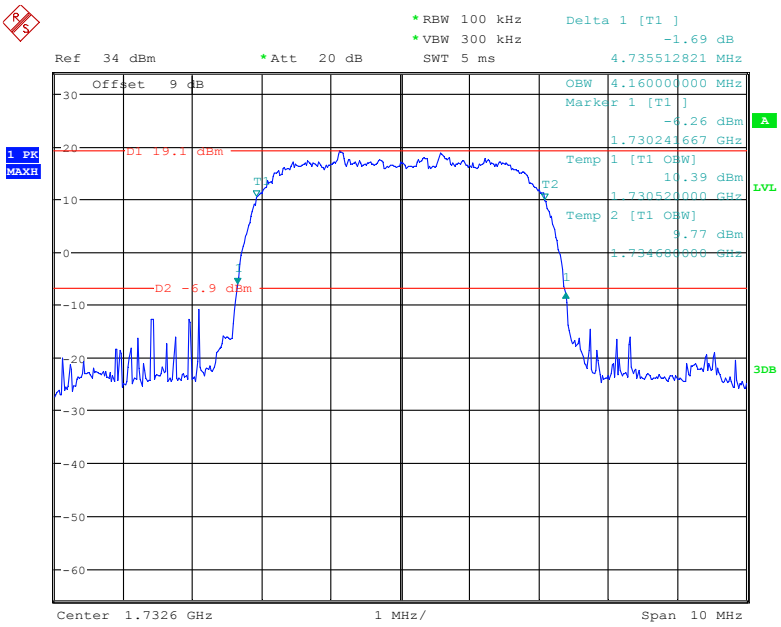
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 8.JUL.2019 23:49:25

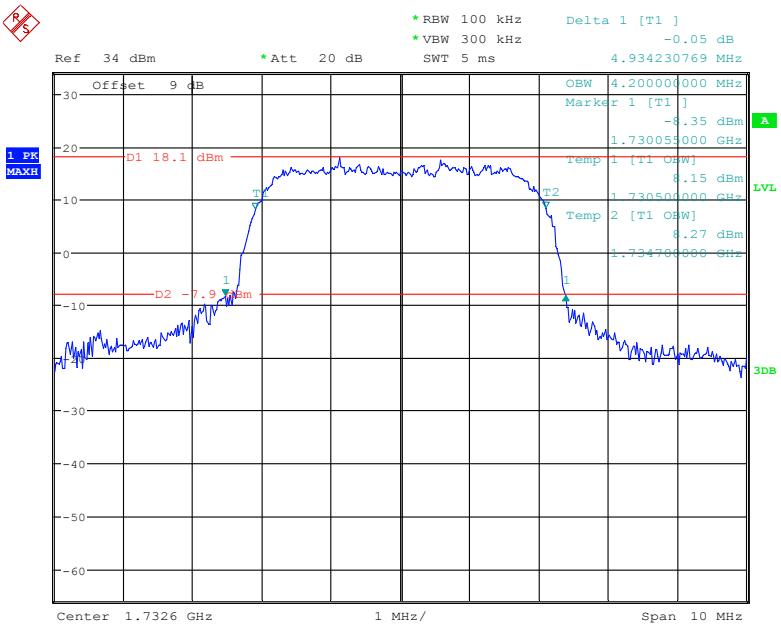
AWS Band (Part 27)

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



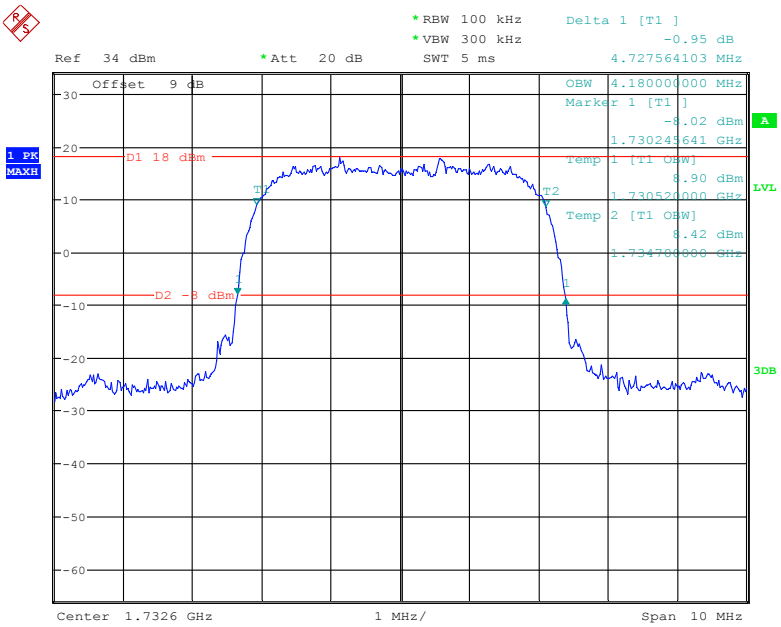
Date: 8.JUL.2019 22:57:58

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



Date: 8.JUL.2019 23:00:14

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

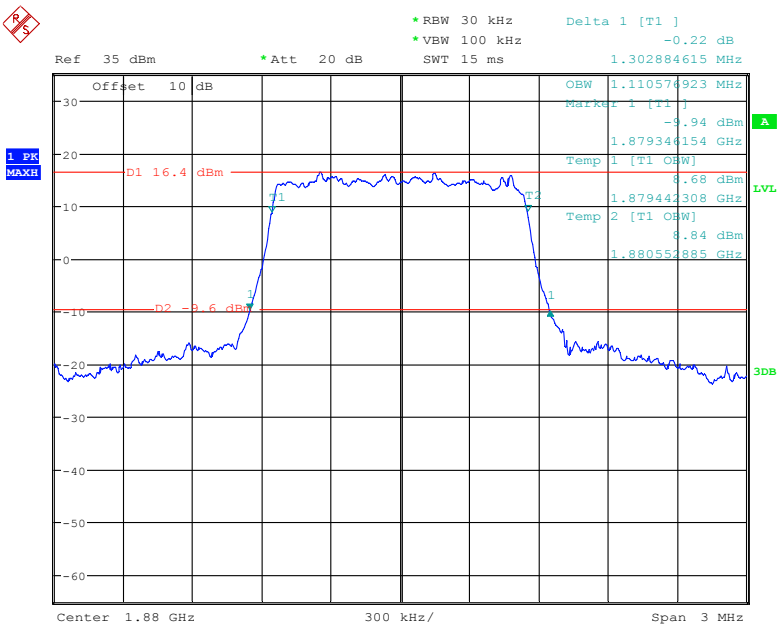


Date: 8.JUL.2019 23:01:24

LTE Band 2: (Middle Channel)

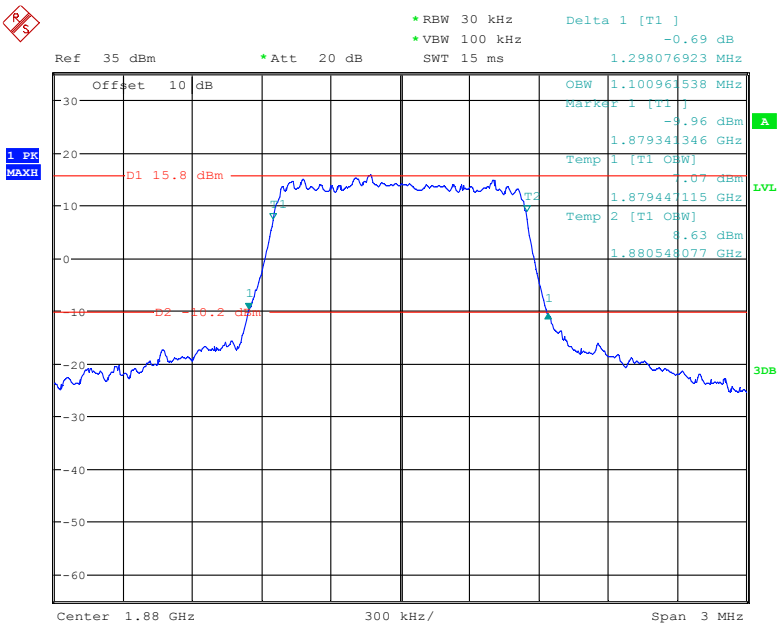
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.111	1.303
	16QAM	1.100	1.298
3.0	QPSK	2.692	2.885
	16QAM	2.683	2.894
5.0	QPSK	4.551	5.256
	16QAM	4.535	5.208
10.0	QPSK	9.006	10.000
	16QAM	8.974	9.808
15.0	QPSK	13.510	15.048
	16QAM	13.510	14.904
20.0	QPSK	17.949	19.487
	16QAM	18.013	19.487

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



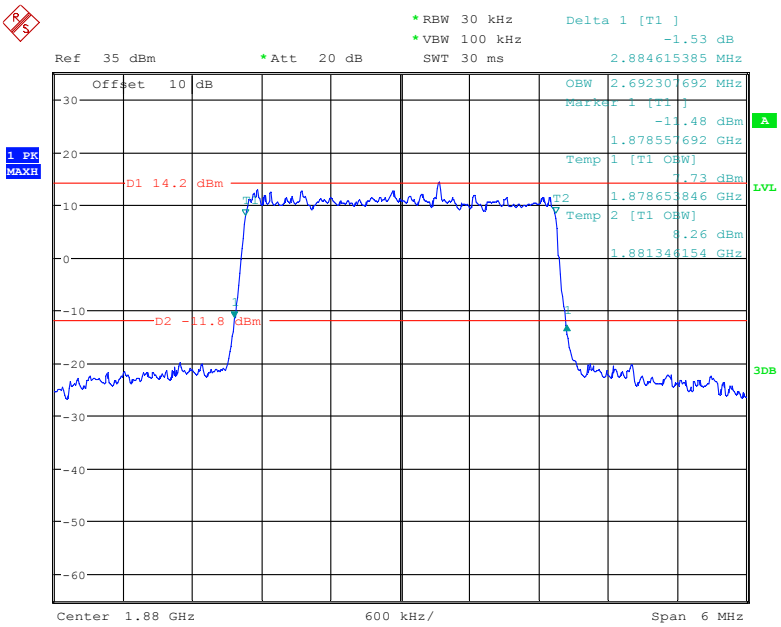
Date: 21.JUN.2019 00:26:56

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



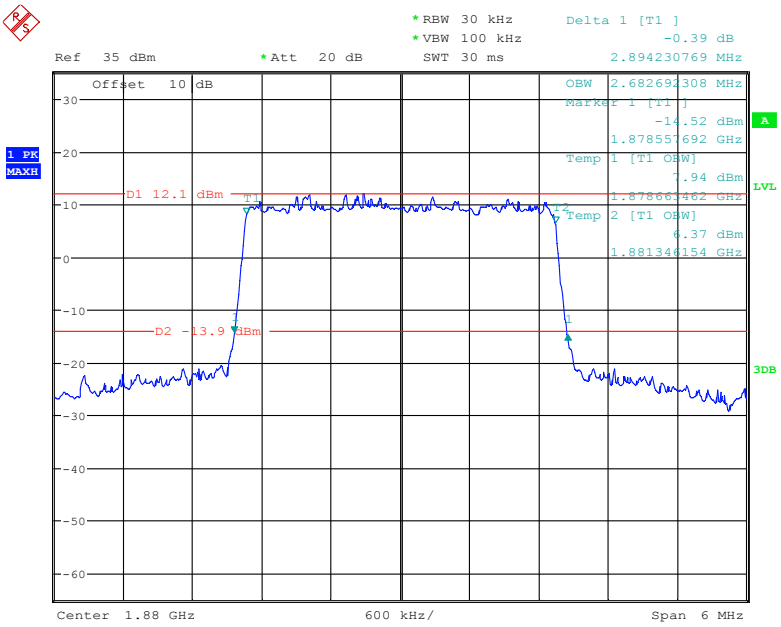
Date: 21.JUN.2019 00:25:57

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



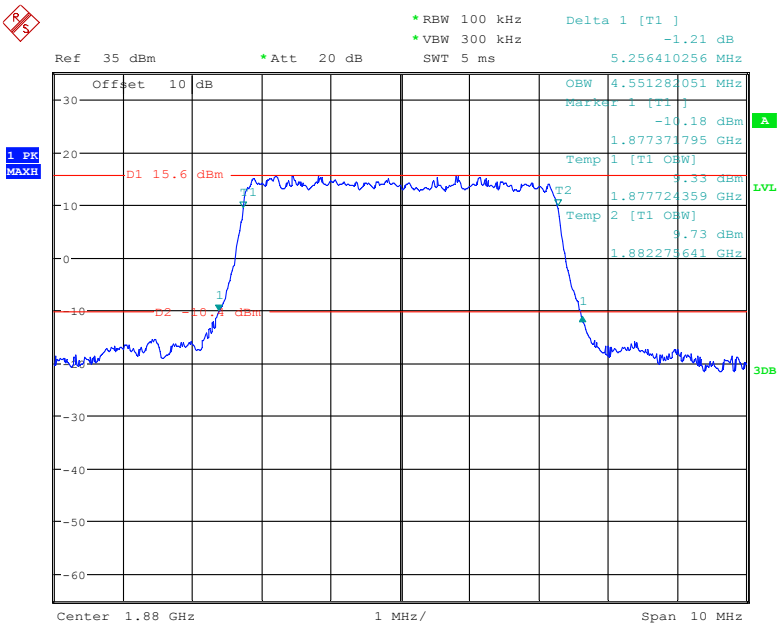
Date: 21.JUN.2019 00:28:40

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



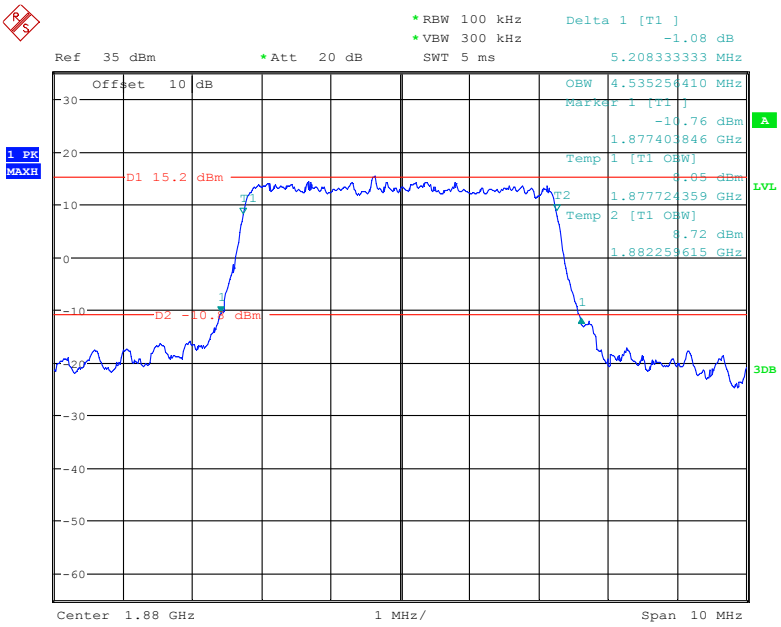
Date: 21.JUN.2019 00:27:37

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



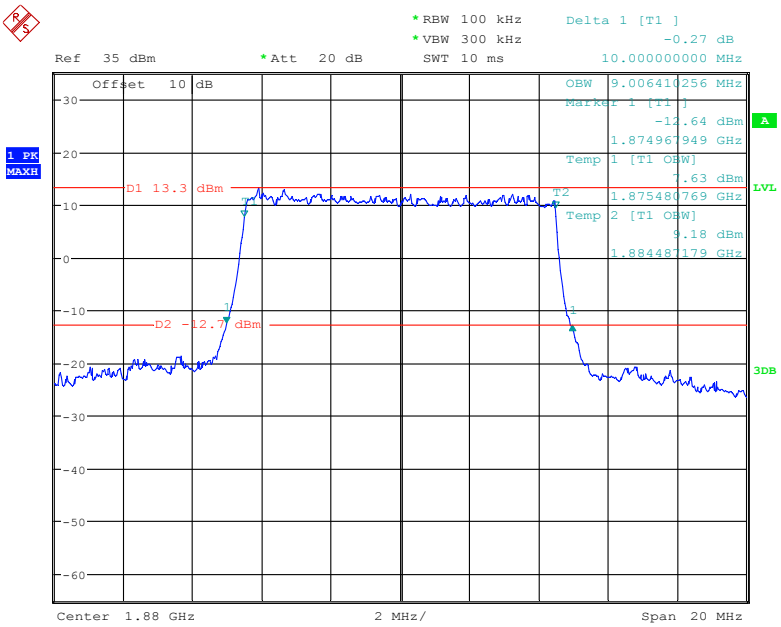
Date: 21.JUN.2019 00:30:50

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



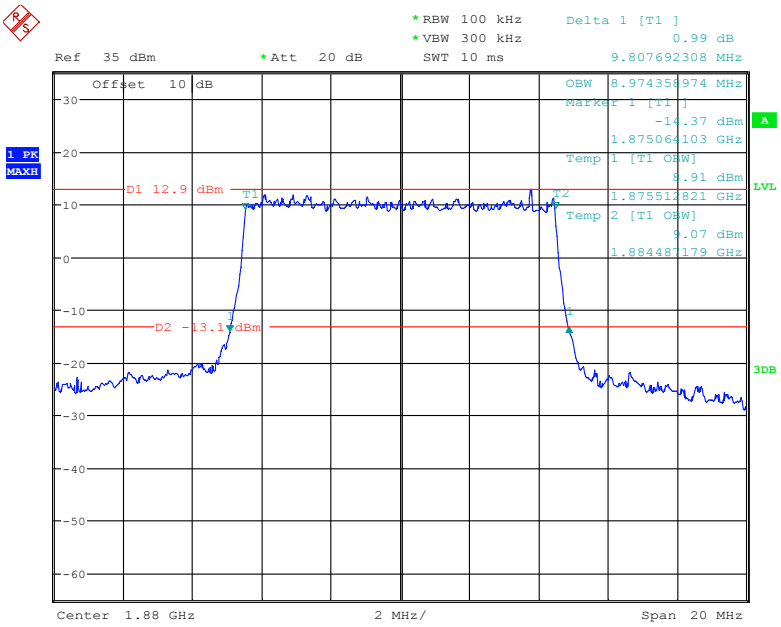
Date: 21.JUN.2019 00:29:58

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



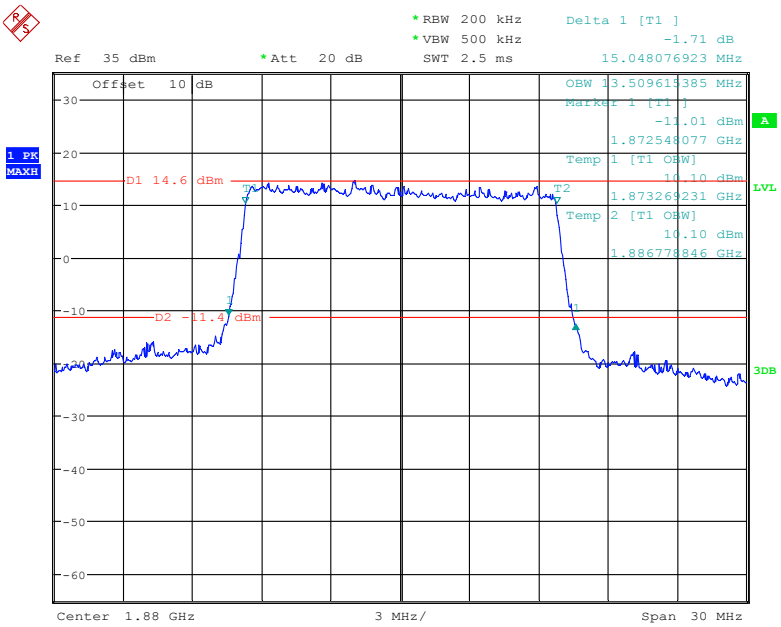
Date: 21.JUN.2019 00:32:51

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



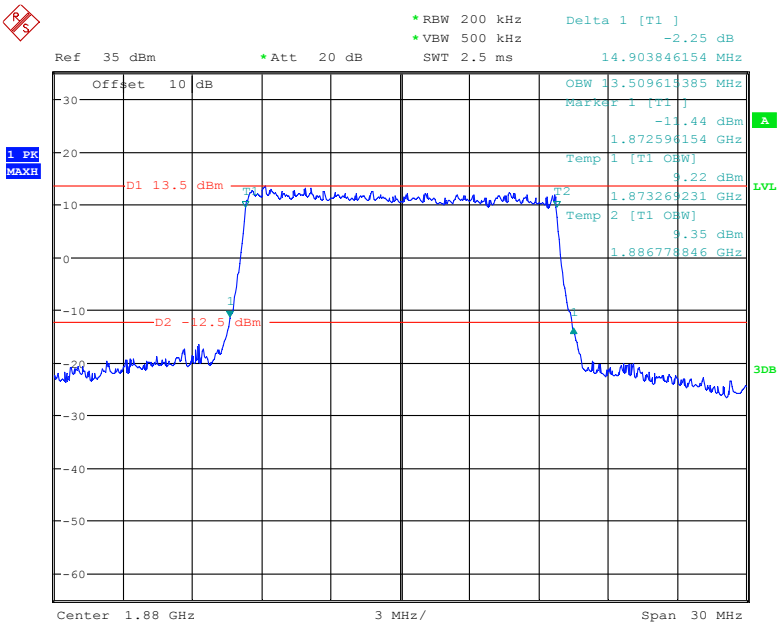
Date: 21.JUN.2019 00:31:50

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



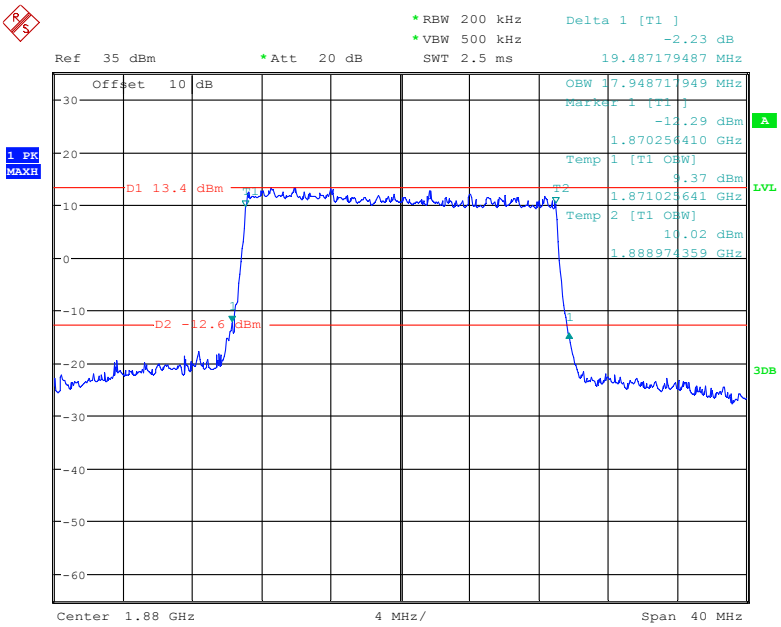
Date: 21.JUN.2019 00:35:39

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



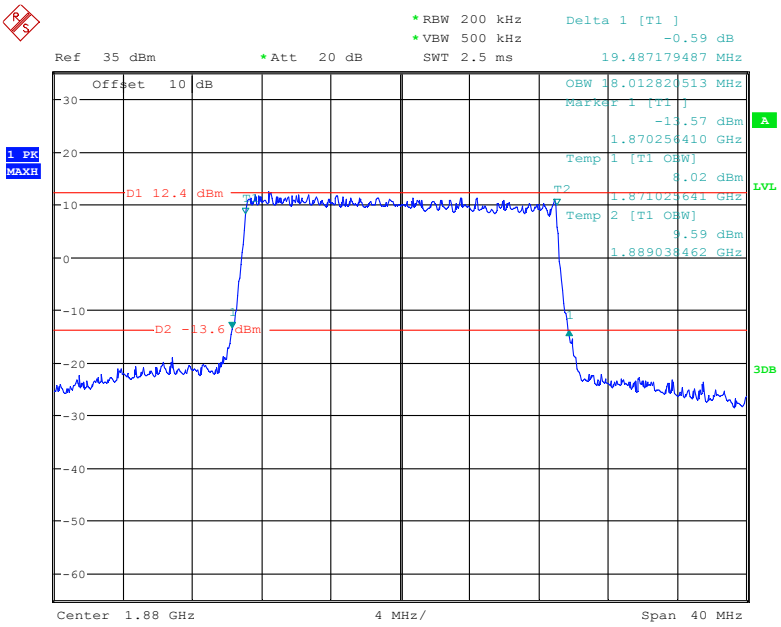
Date: 21.JUN.2019 00:34:02

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



Date: 21.JUN.2019 00:37:53

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

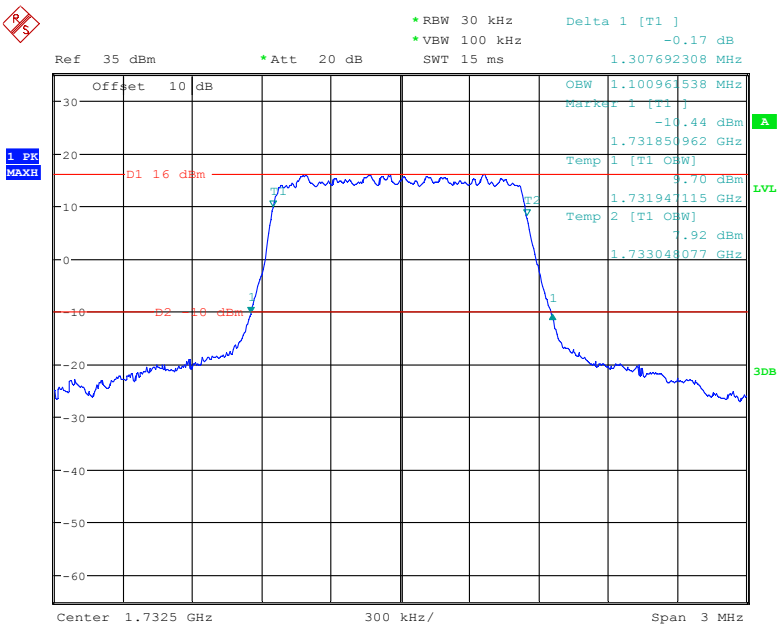


Date: 21.JUN.2019 00:39:39

LTE Band 4: (Middle Channel)

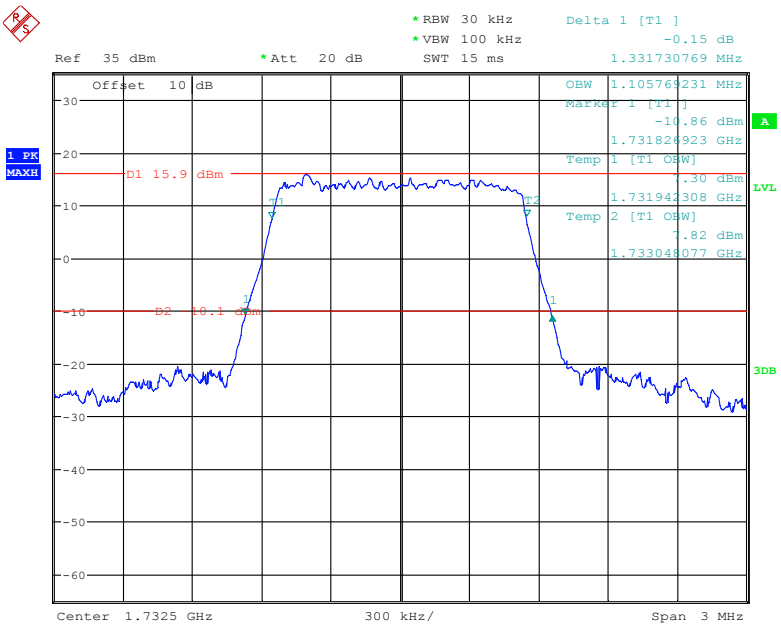
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.308
	16QAM	1.106	1.332
3.0	QPSK	2.692	2.885
	16QAM	2.692	2.894
5.0	QPSK	4.551	5.224
	16QAM	4.535	5.192
10.0	QPSK	8.974	9.968
	16QAM	8.974	9.808
15.0	QPSK	13.558	15.048
	16QAM	13.510	15.000
20.0	QPSK	18.013	19.423
	16QAM	17.949	19.487

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



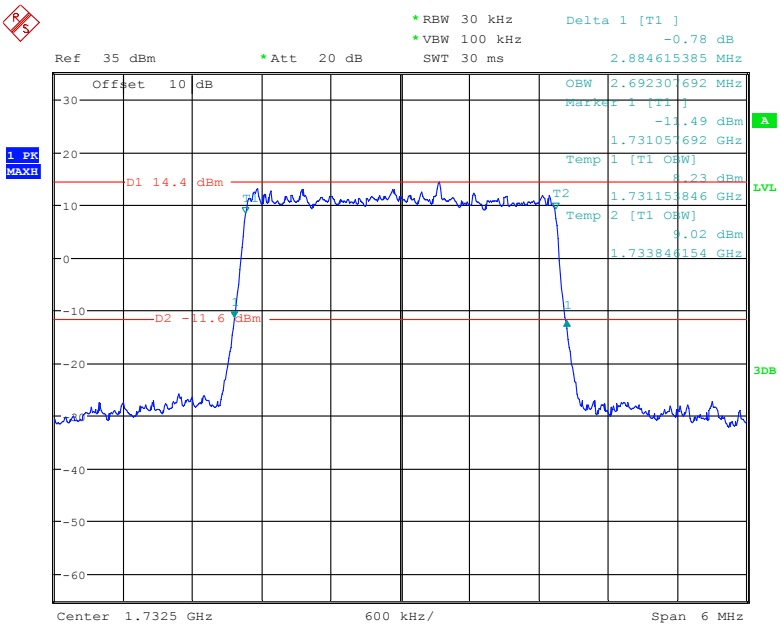
Date: 21.JUN.2019 00:23:58

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



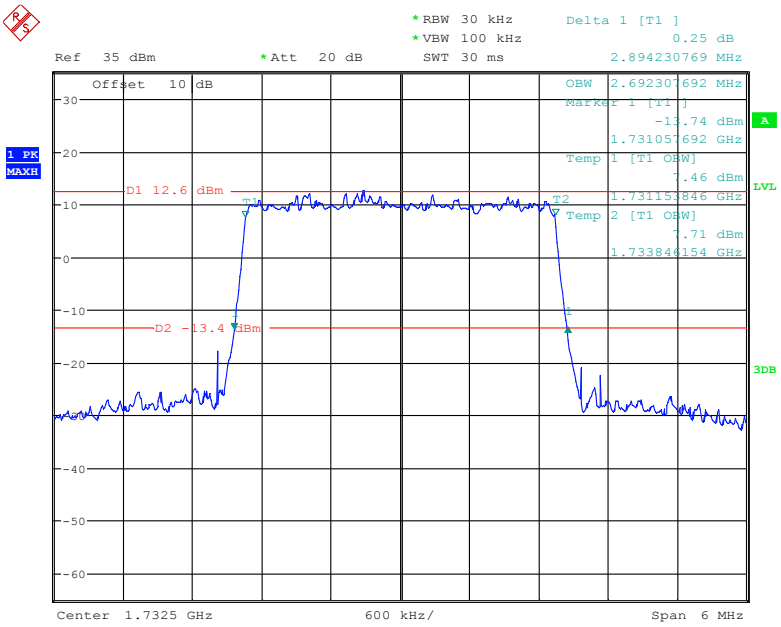
Date: 21.JUN.2019 00:24:49

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



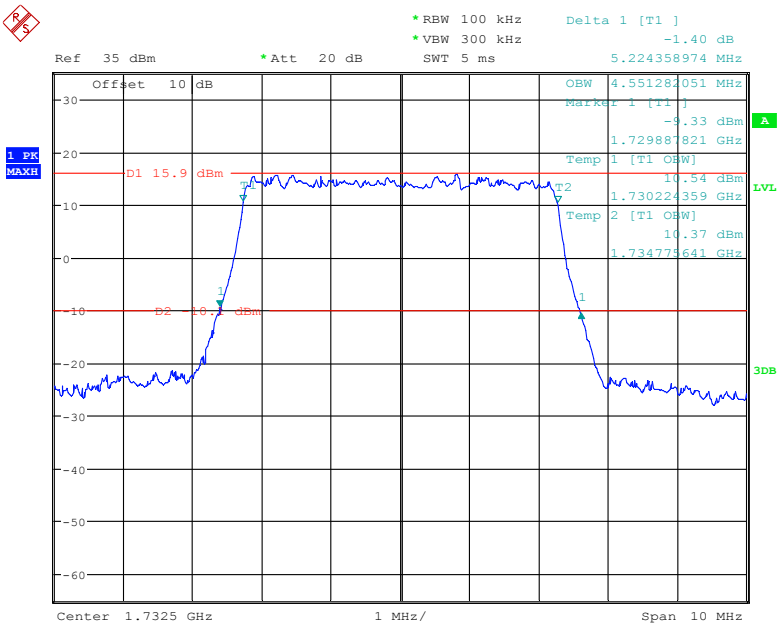
Date: 21.JUN.2019 00:22:01

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



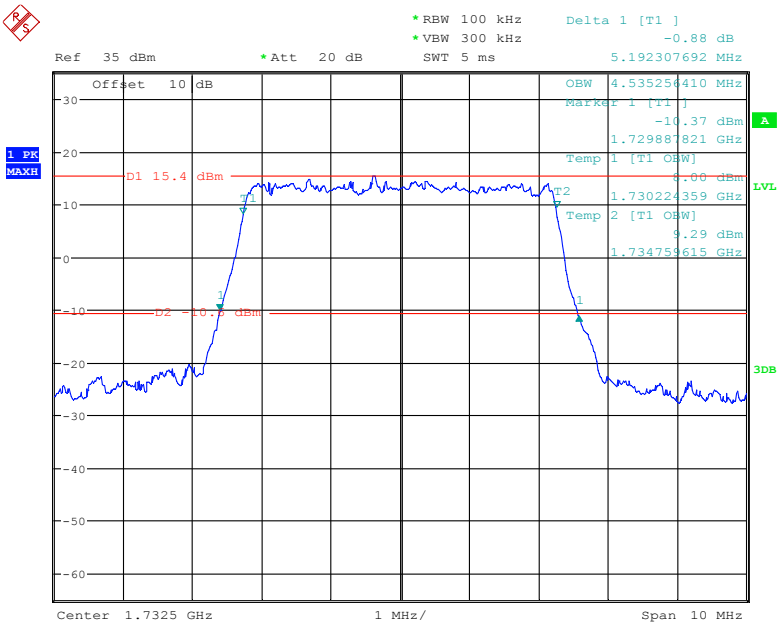
Date: 21.JUN.2019 00:23:03

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



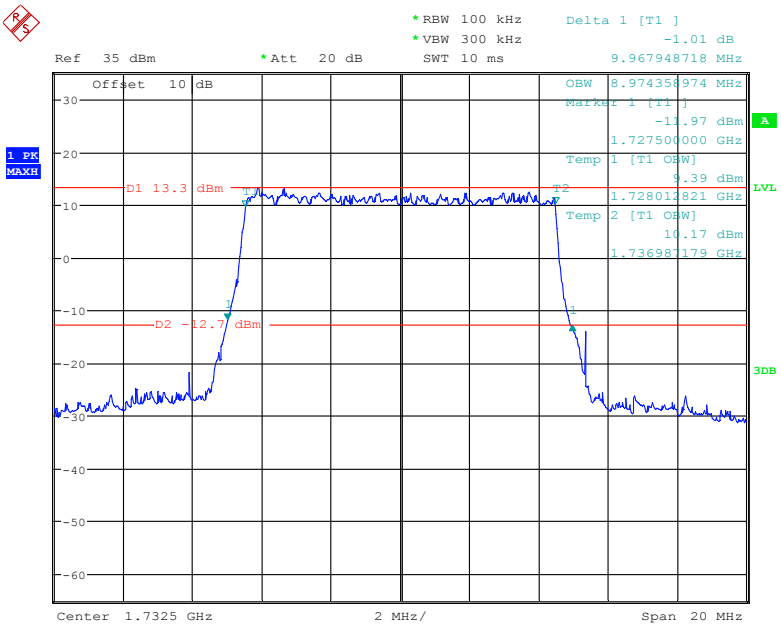
Date: 21.JUN.2019 00:19:55

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



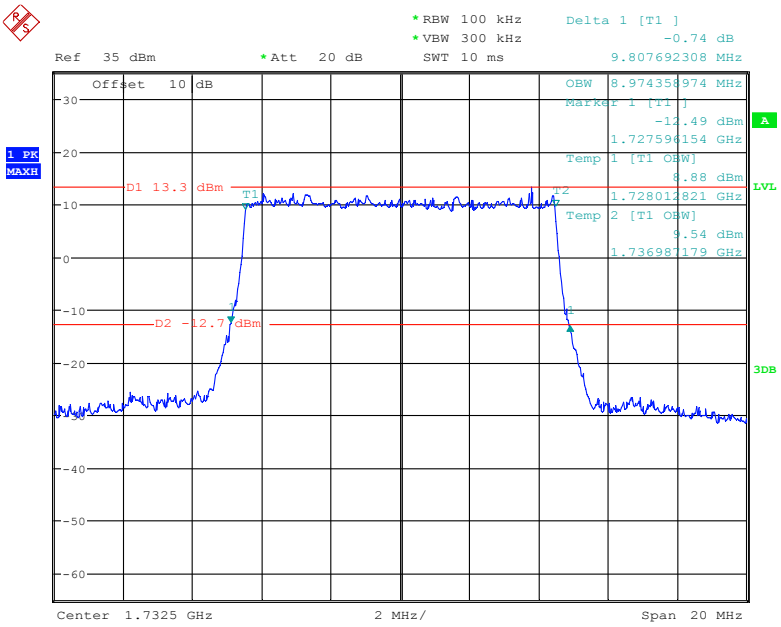
Date: 21.JUN.2019 00:21:01

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



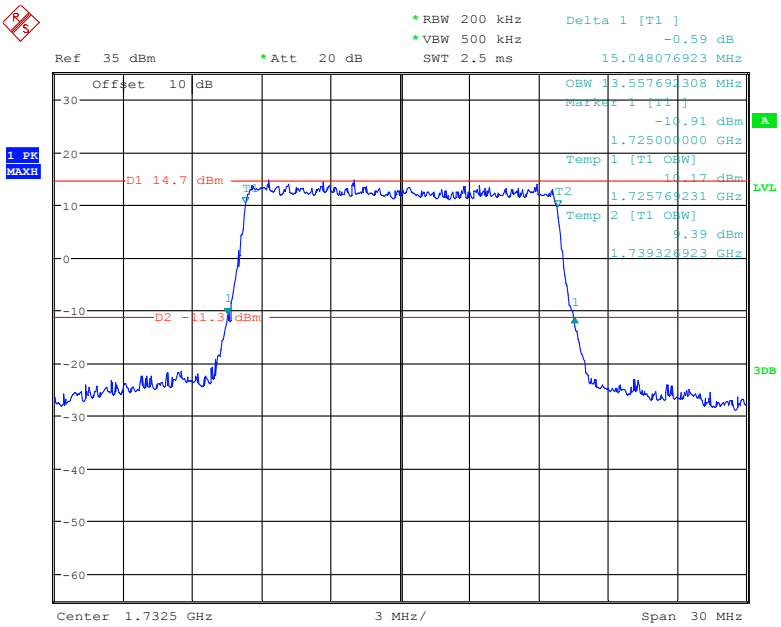
Date: 21.JUN.2019 00:18:00

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



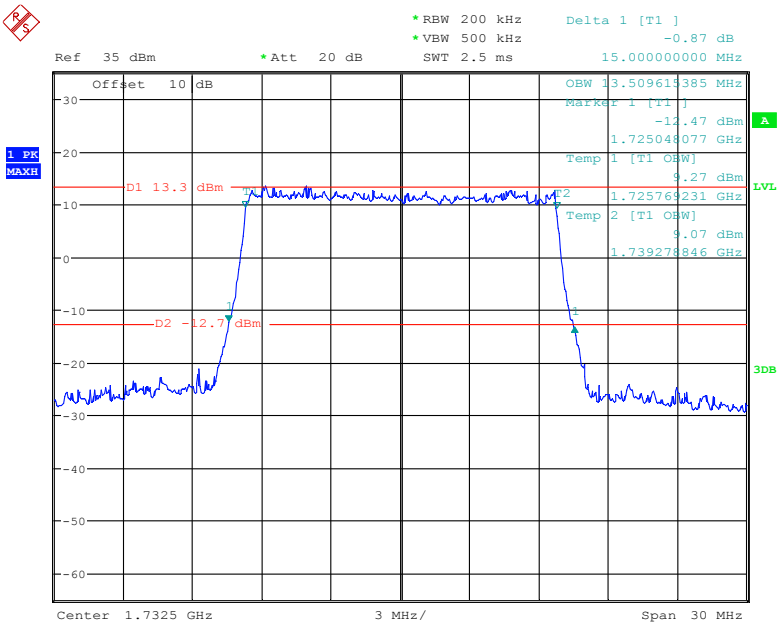
Date: 21.JUN.2019 00:18:45

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



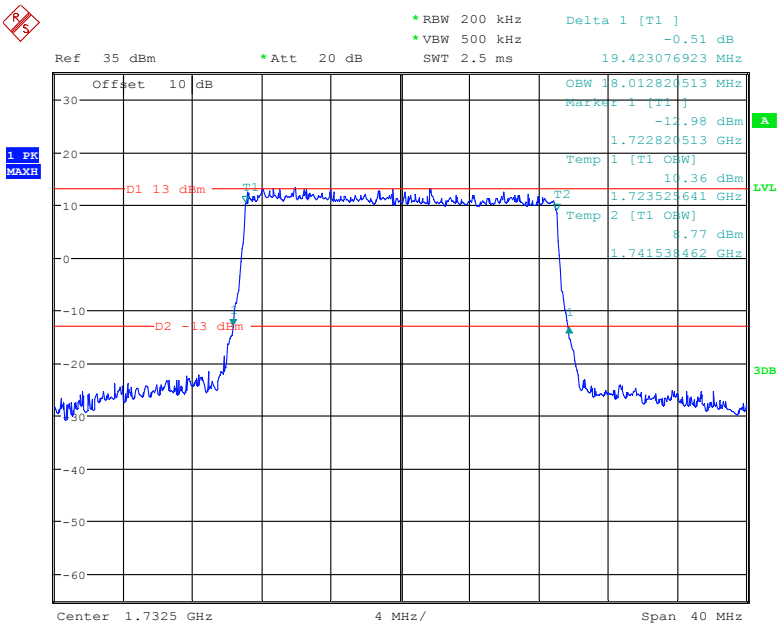
Date: 21.JUN.2019 00:16:16

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



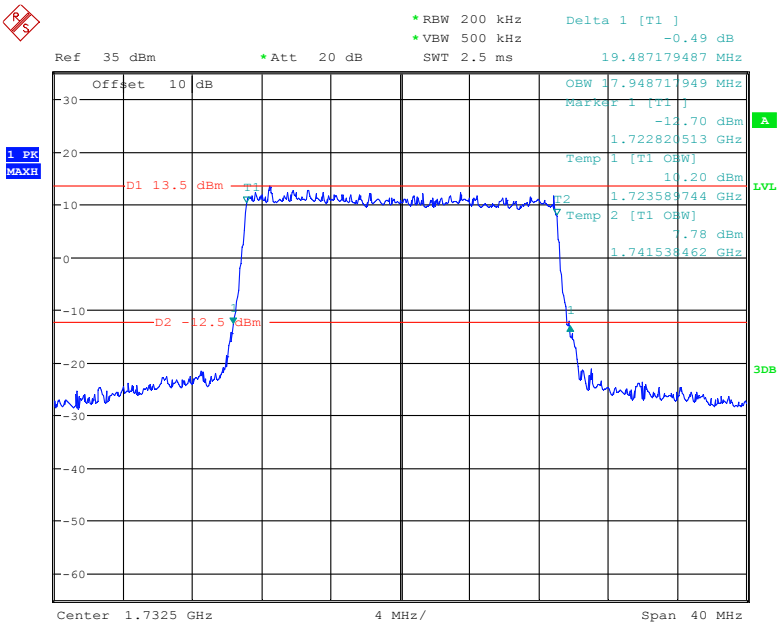
Date: 21.JUN.2019 00:17:12

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



Date: 21.JUN.2019 00:15:18

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

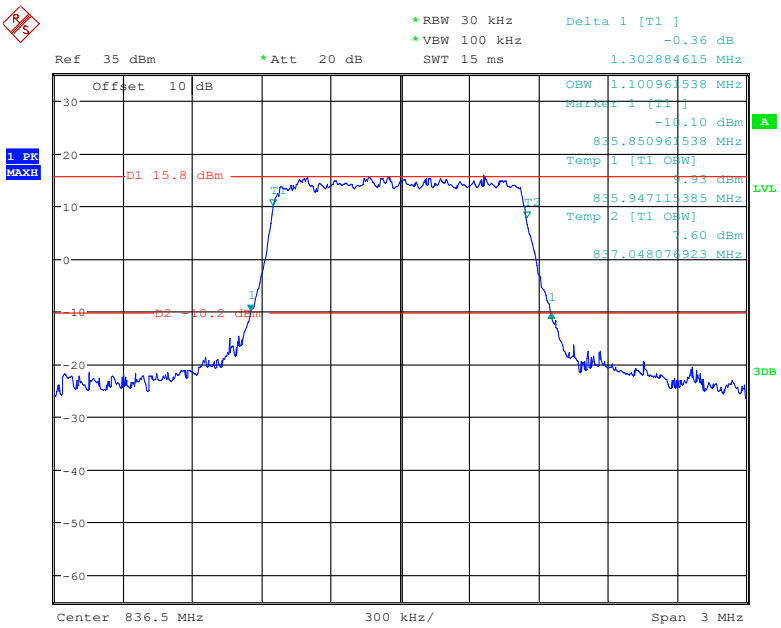


Date: 21.JUN.2019 00:14:20

LTE Band 5: (Middle Channel)

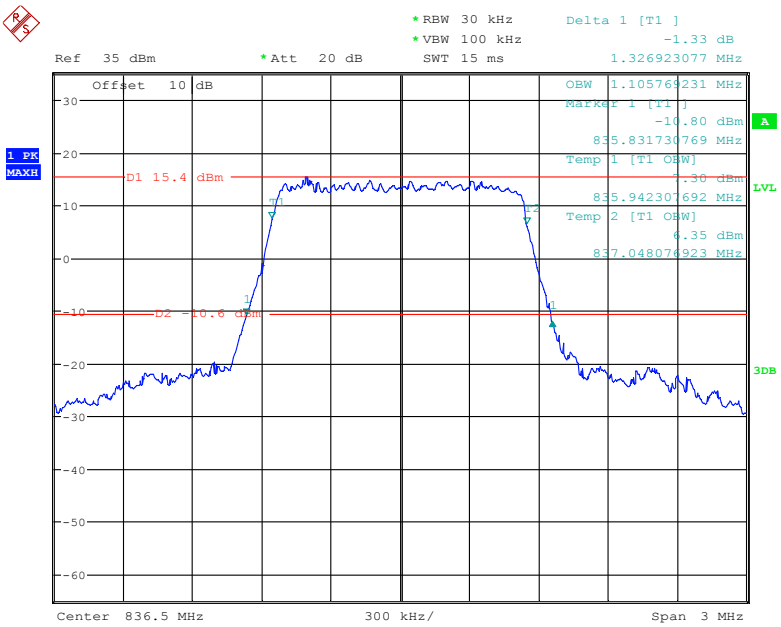
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.303
	16QAM	1.106	1.327
3.0	QPSK	2.683	2.875
	16QAM	2.683	2.885
5.0	QPSK	4.535	5.192
	16QAM	4.519	5.208
10.0	QPSK	8.974	10.096
	16QAM	8.974	9.744

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



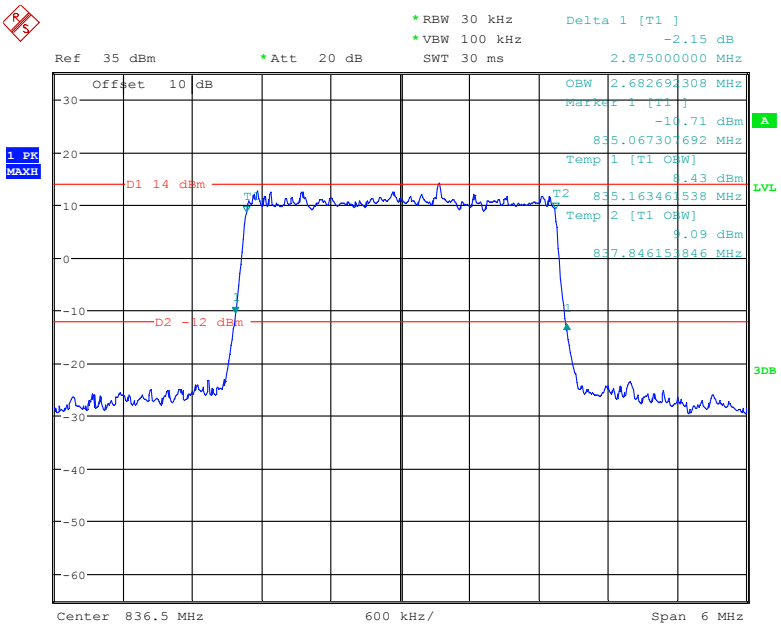
Date: 21.JUN.2019 00:41:19

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



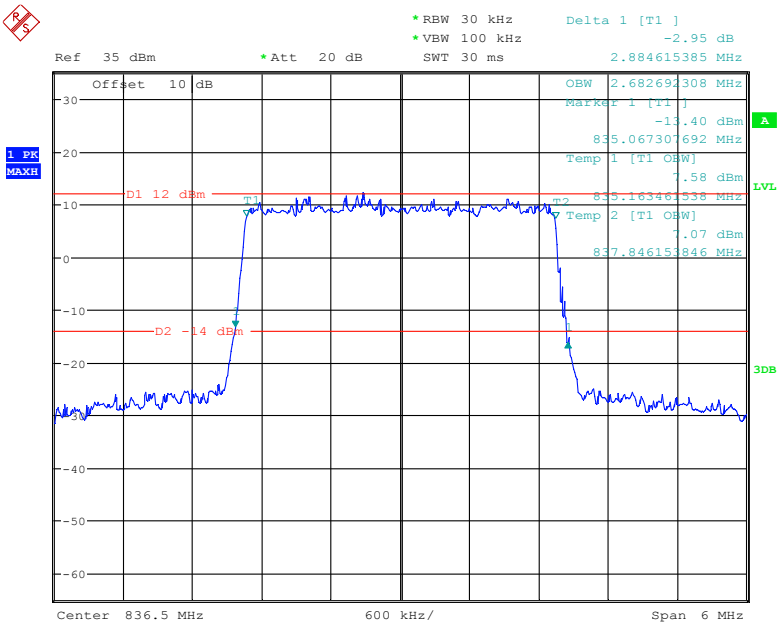
Date: 21.JUN.2019 00:42:23

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



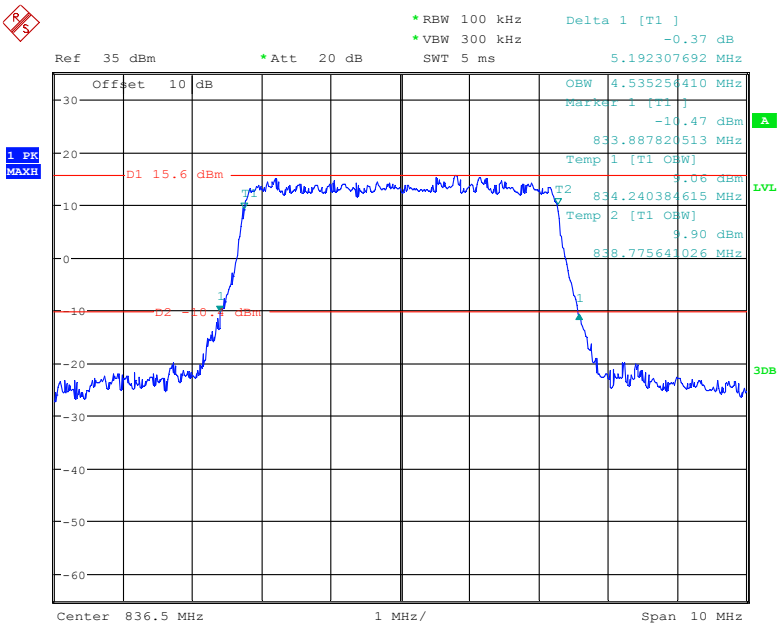
Date: 21.JUN.2019 00:43:51

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



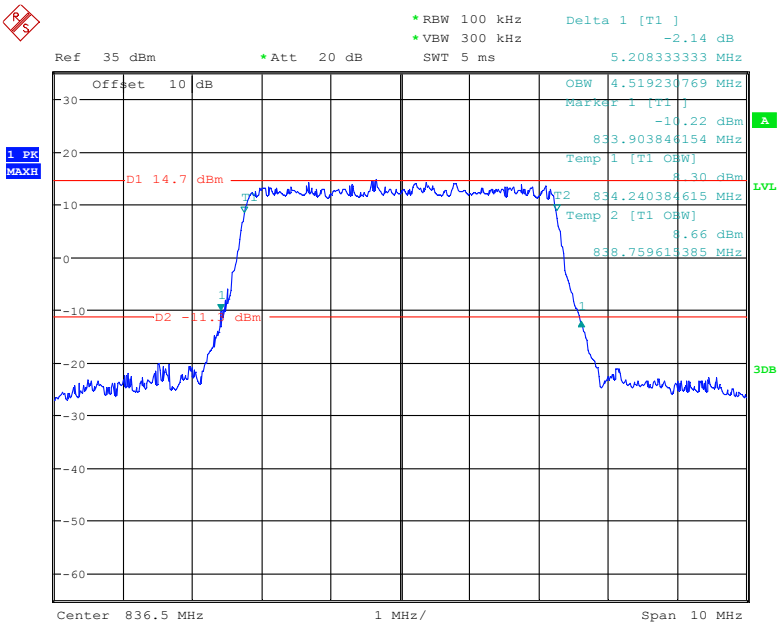
Date: 21.JUN.2019 00:44:47

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



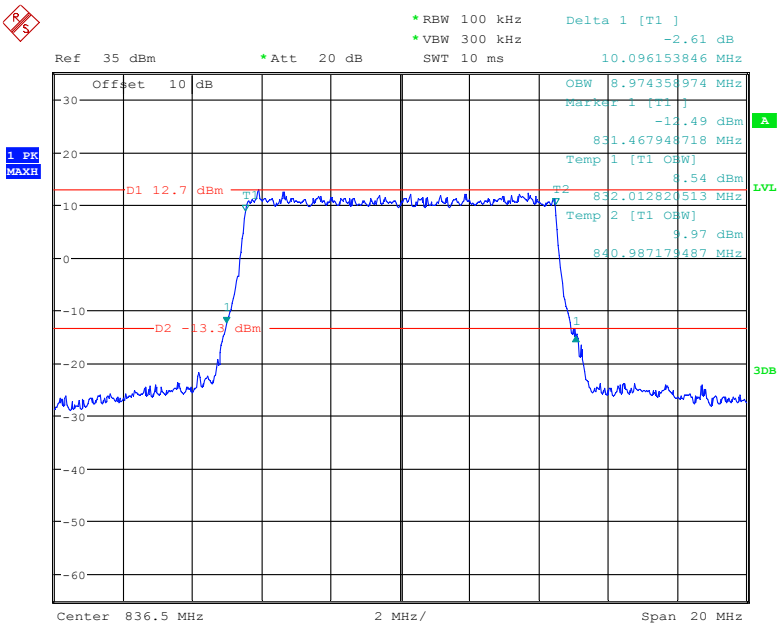
Date: 21.JUN.2019 00:45:46

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



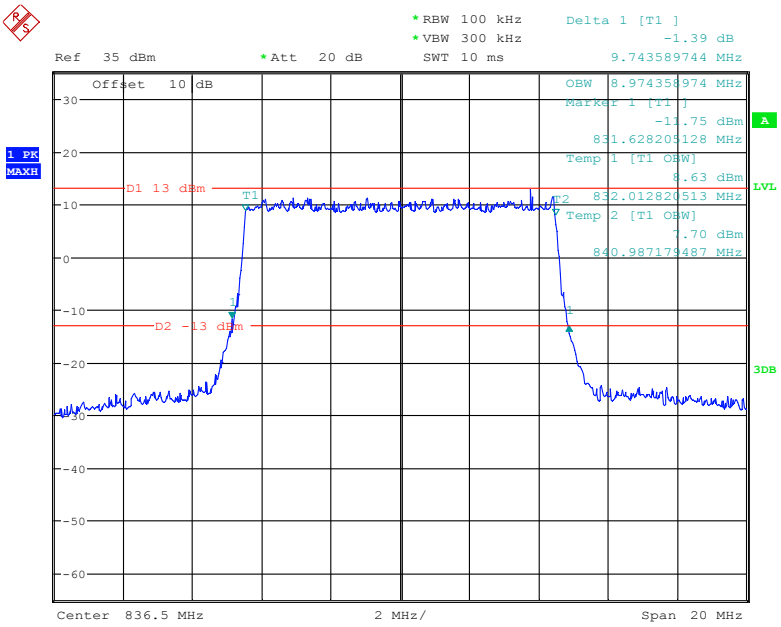
Date: 21.JUN.2019 00:47:05

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



Date: 21.JUN.2019 00:48:52

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

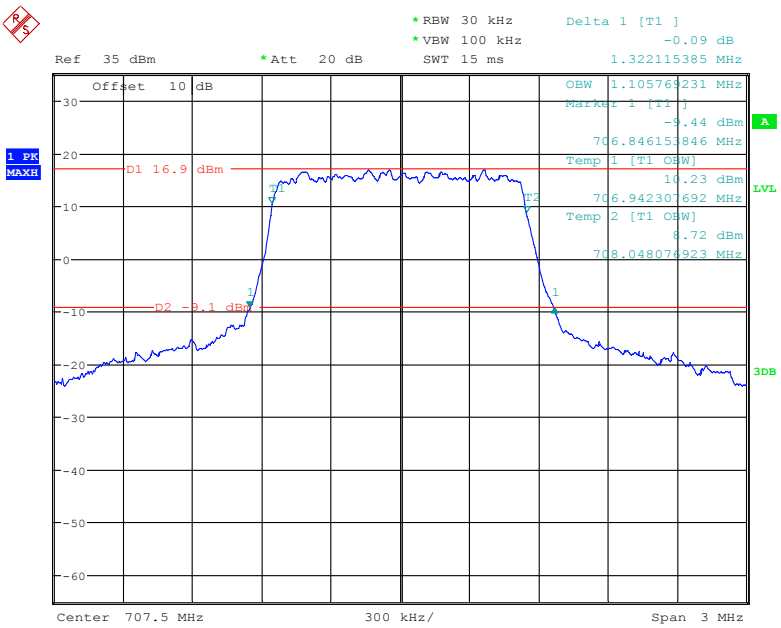


Date: 21.JUN.2019 00:50:07

LTE Band 12: (Middle Channel)

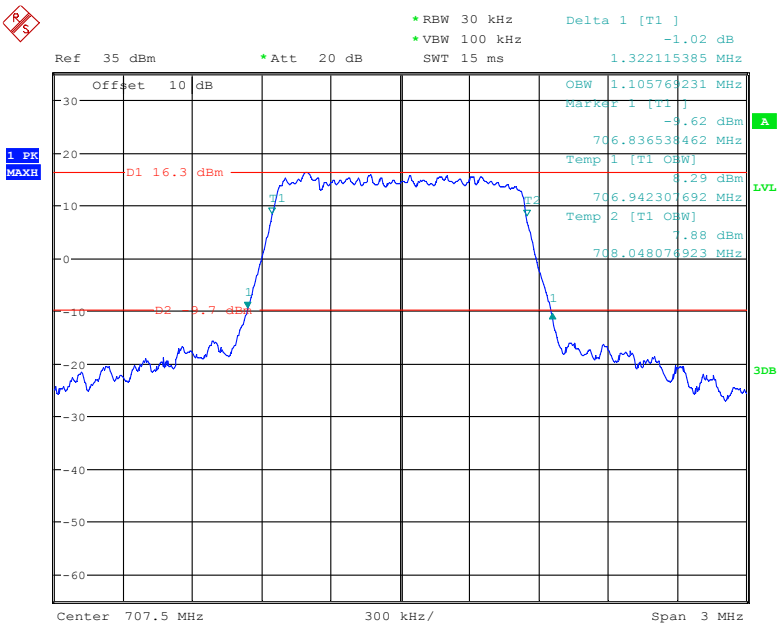
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.106	1.322
	16QAM	1.106	1.322
3.0	QPSK	2.683	2.875
	16QAM	2.683	2.885
5.0	QPSK	4.551	5.192
	16QAM	4.535	5.176
10.0	QPSK	8.974	10.064
	16QAM	8.974	9.776

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



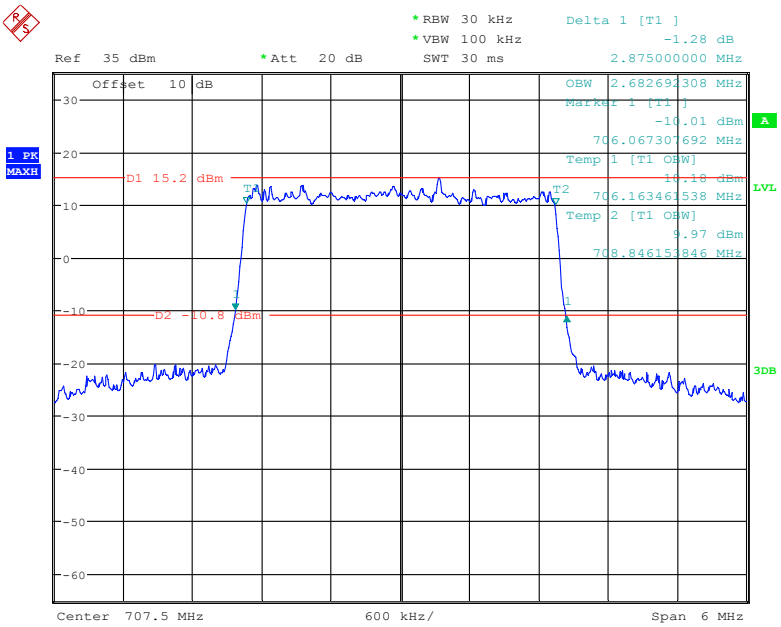
Date: 21.JUN.2019 19:58:27

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



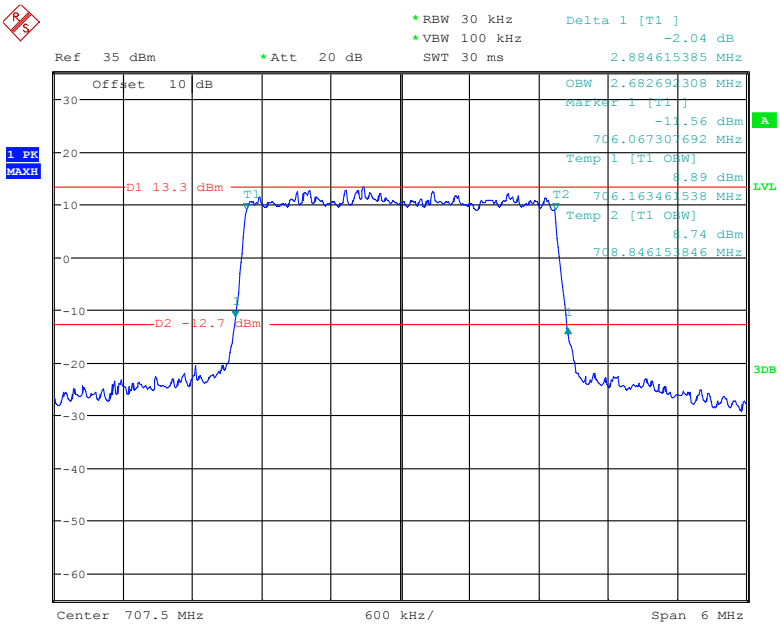
Date: 21.JUN.2019 19:55:44

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



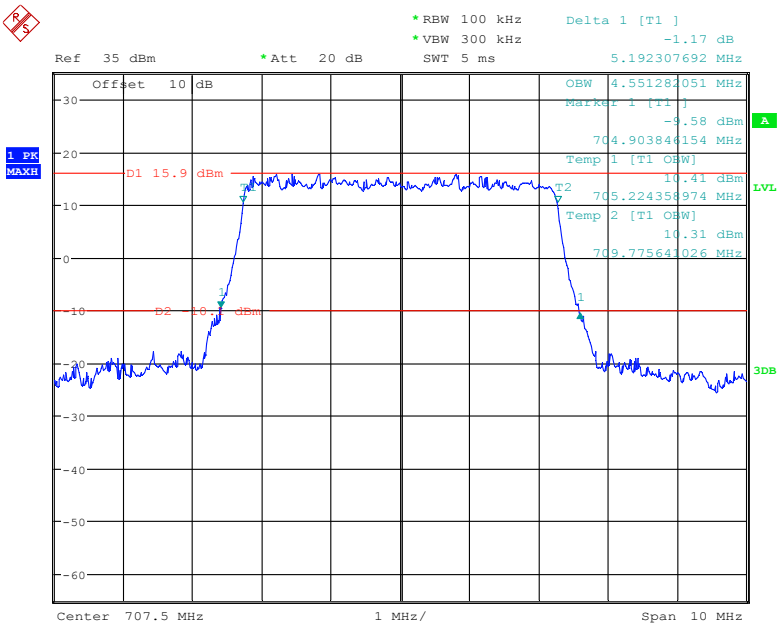
Date: 21.JUN.2019 20:02:32

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



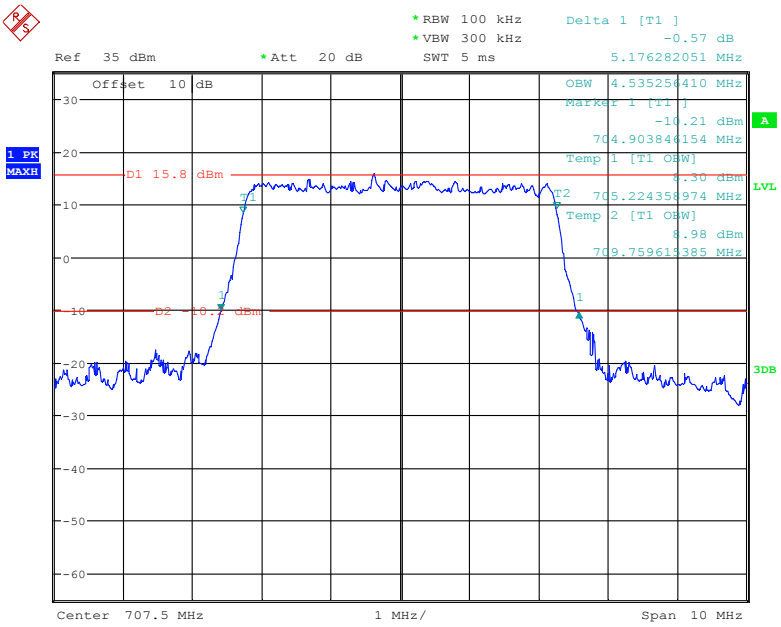
Date: 21.JUN.2019 20:00:26

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



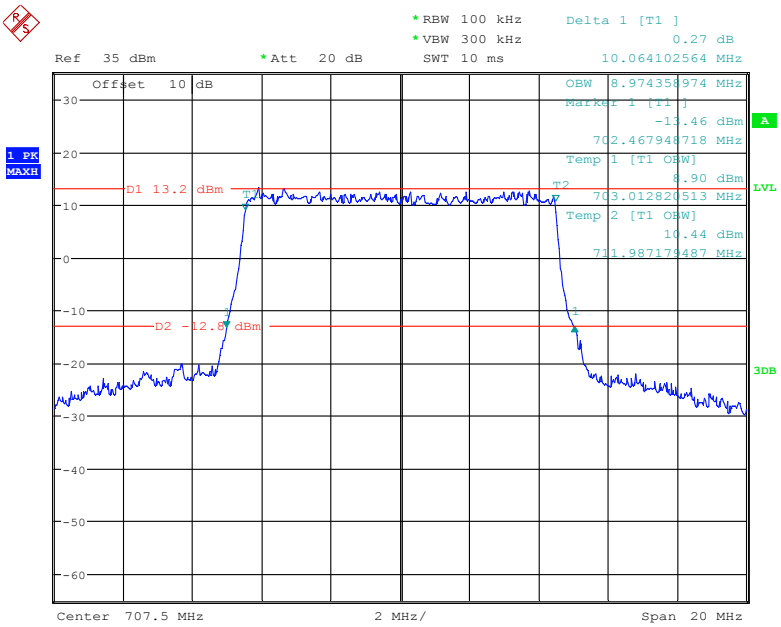
Date: 21.JUN.2019 20:05:49

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



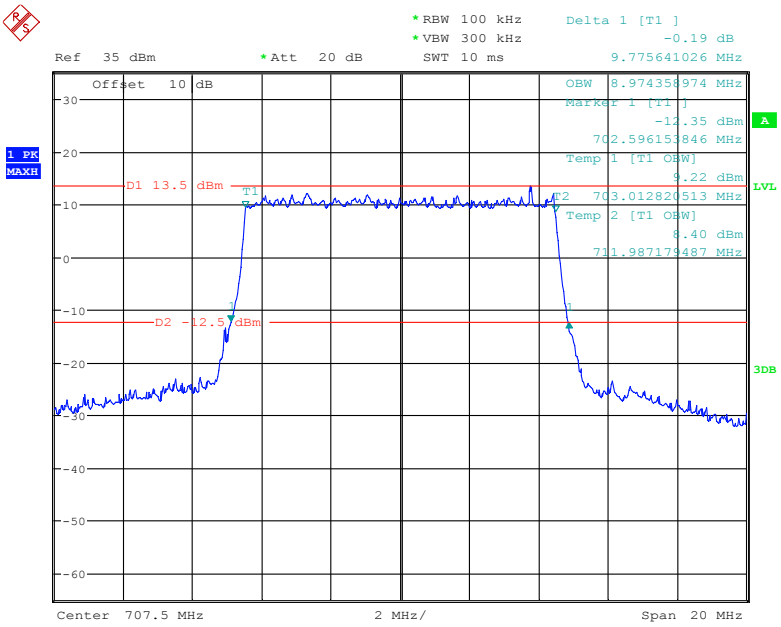
Date: 21.JUN.2019 20:04:48

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



Date: 21.JUN.2019 20:09:51

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

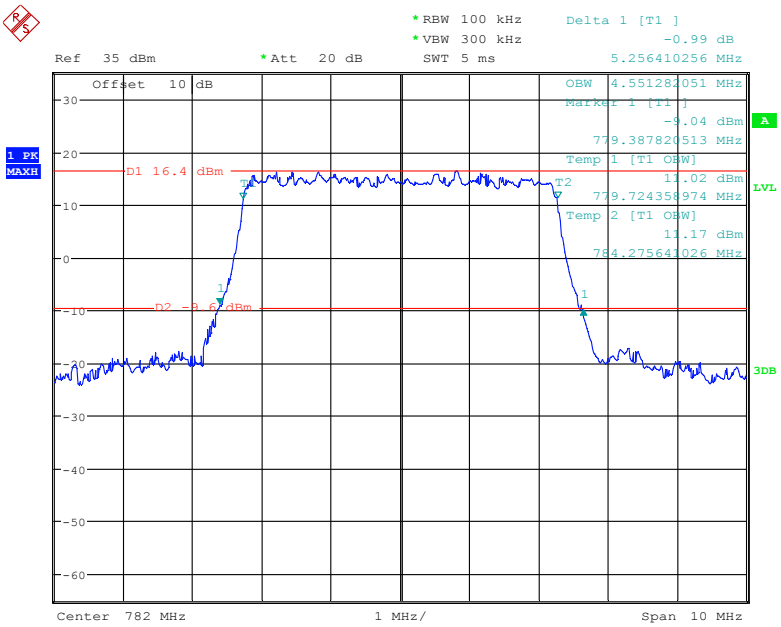


Date: 21.JUN.2019 20:07:48

LTE Band 13: (Middle Channel)

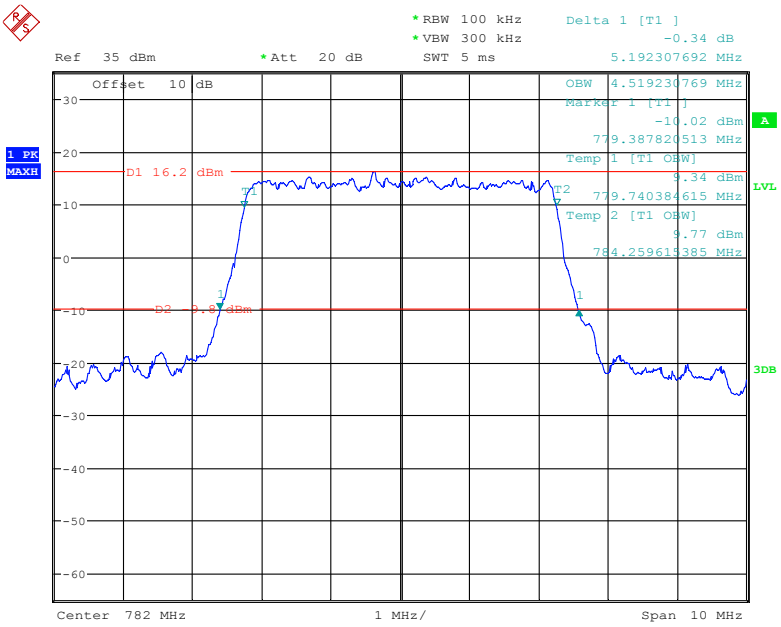
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.551	5.256
	16QAM	4.519	5.192
10.0	QPSK	8.974	10.077
	16QAM	8.974	9.615

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



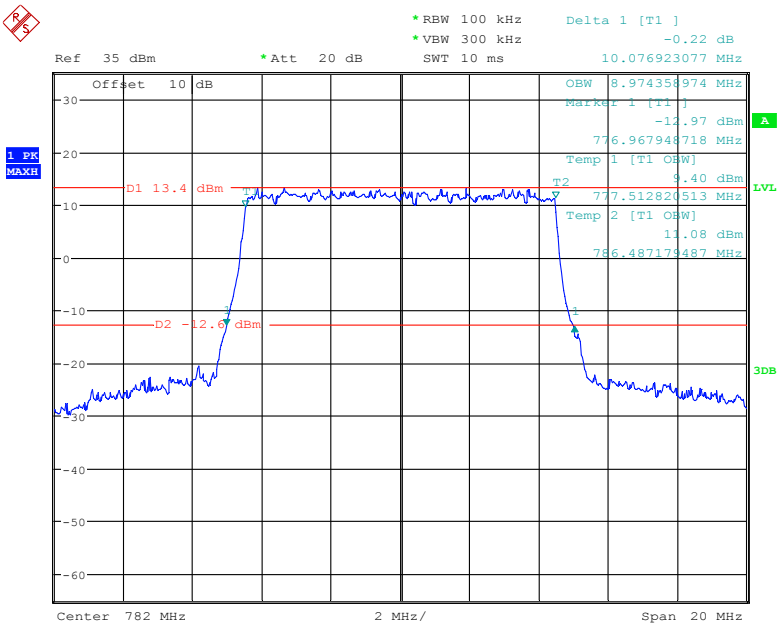
Date: 21.JUN.2019 20:23:03

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



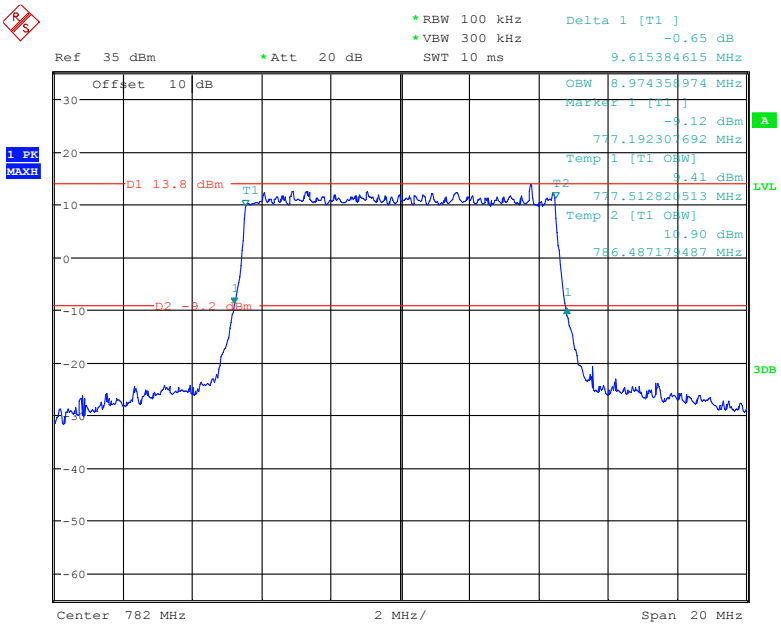
Date: 21.JUN.2019 20:24:45

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



Date: 21.JUN.2019 20:25:54

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

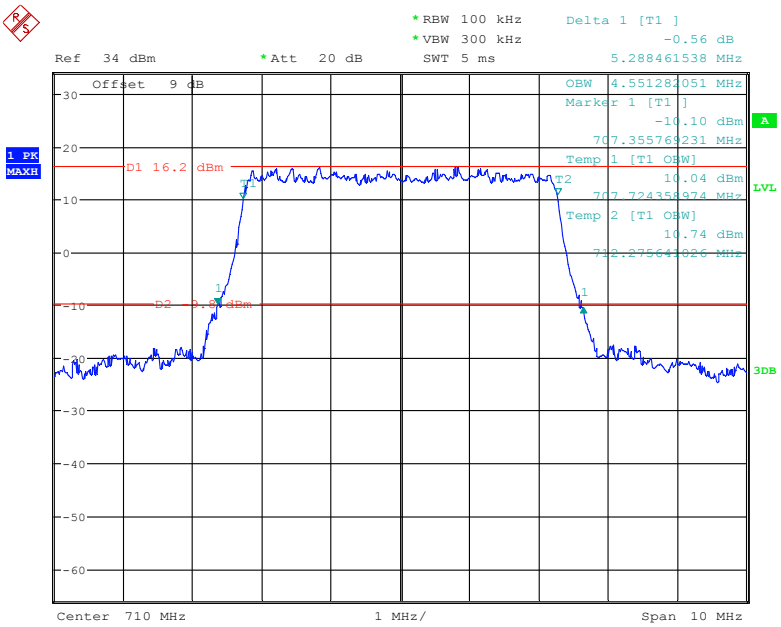


Date: 21.JUN.2019 20:27:20

LTE Band 17: (Middle Channel)

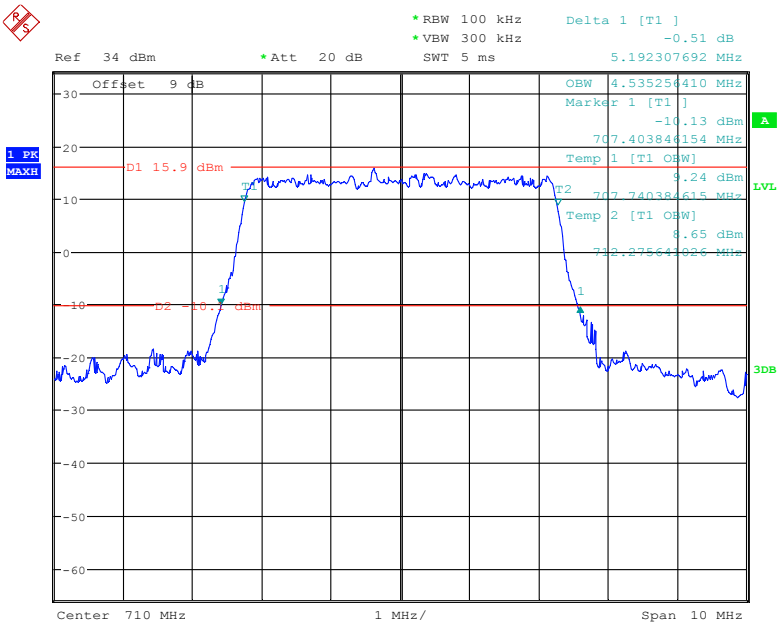
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.55	5.29
	16QAM	4.54	5.19
10.0	QPSK	8.97	9.97
	16QAM	8.97	9.81

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



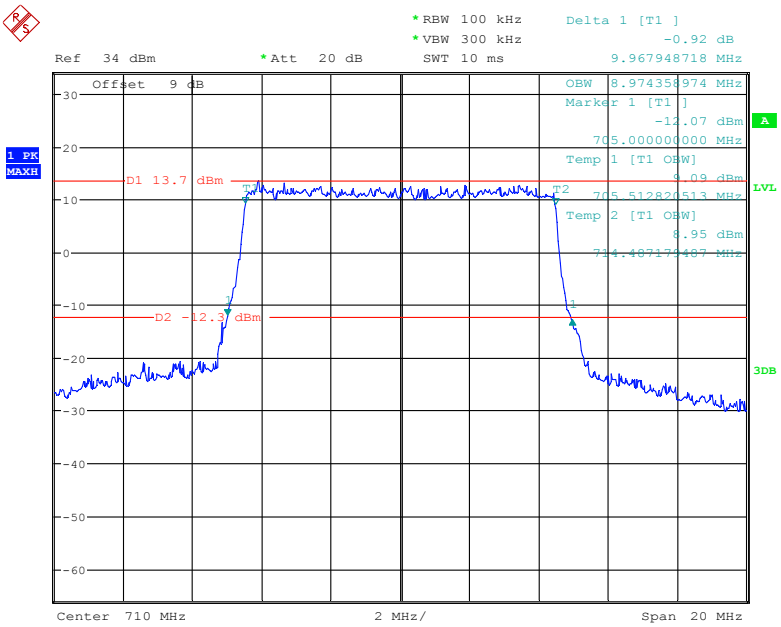
Date: 8.JUL.2019 20:56:44

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



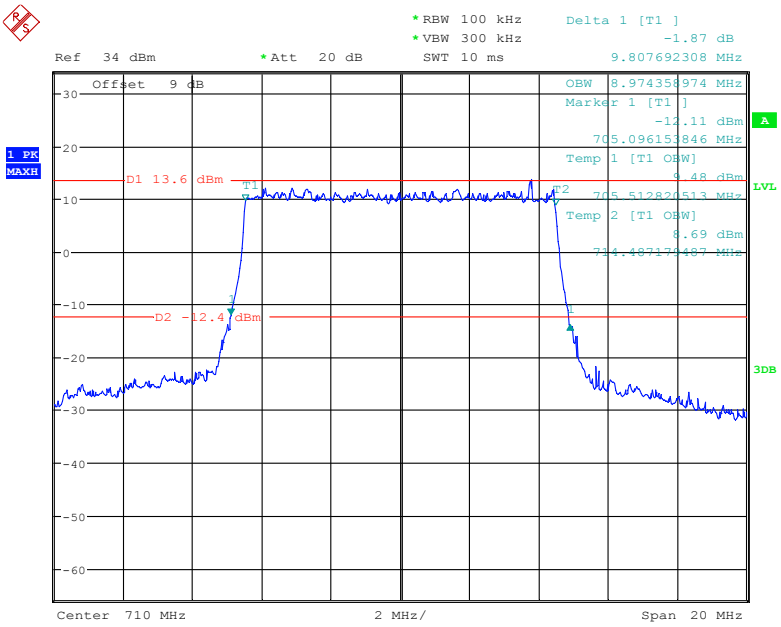
Date: 8.JUL.2019 20:57:55

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



Date: 8.JUL.2019 20:59:26

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

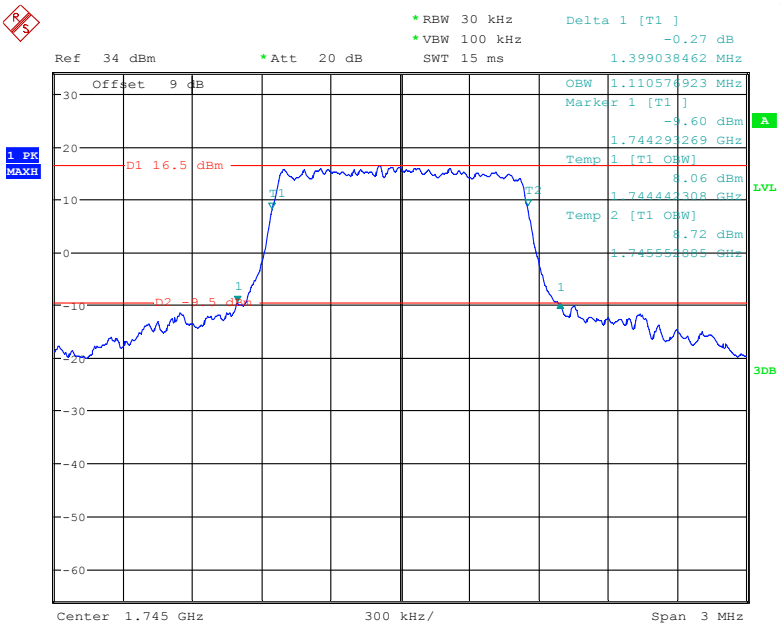


Date: 8.JUL.2019 21:00:56

LTE Band 66: (Middle Channel)

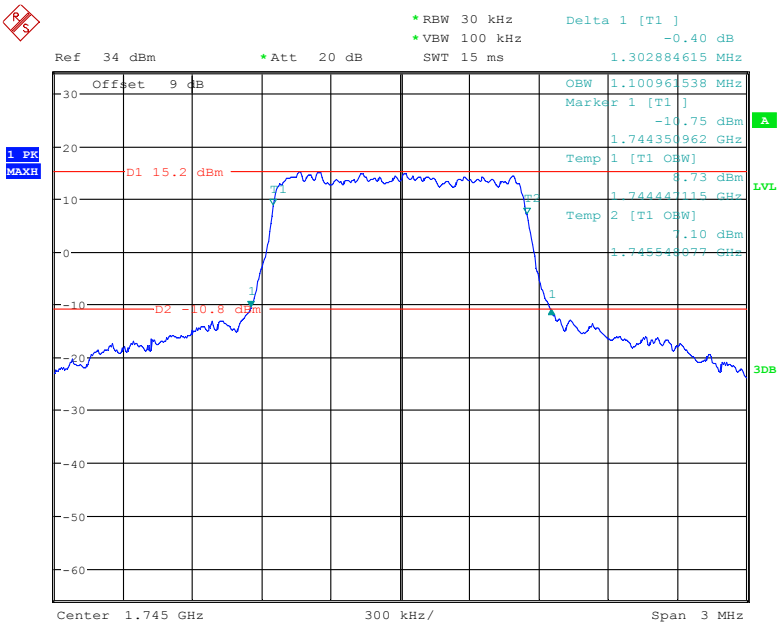
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.111	1.399
	16QAM	1.101	1.303
3.0	QPSK	2.692	2.894
	16QAM	2.692	2.894
5.0	QPSK	4.551	5.272
	16QAM	4.535	5.176
10.0	QPSK	8.974	10.128
	16QAM	8.974	9.776
15.0	QPSK	13.510	15.048
	16QAM	13.510	15.019
20.0	QPSK	17.949	19.487
	16QAM	17.949	19.615

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



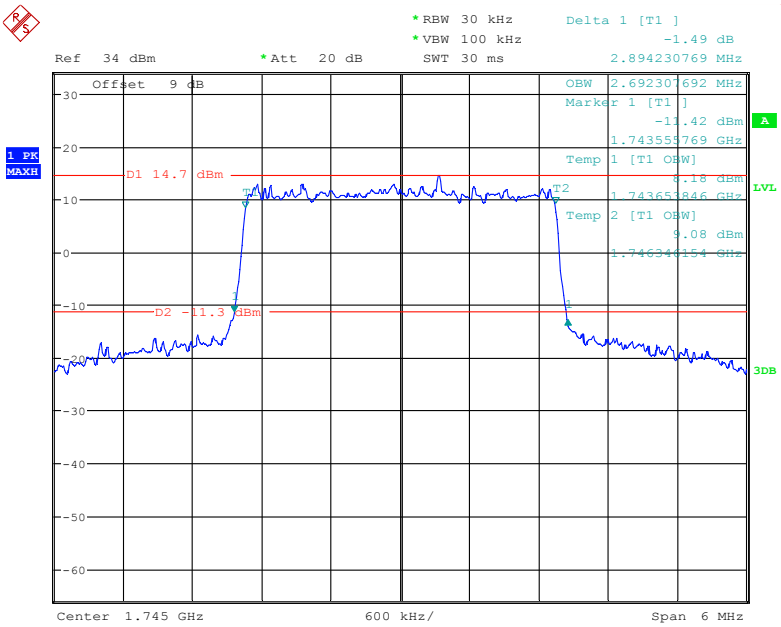
Date: 27.AUG.2019 23:11:20

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



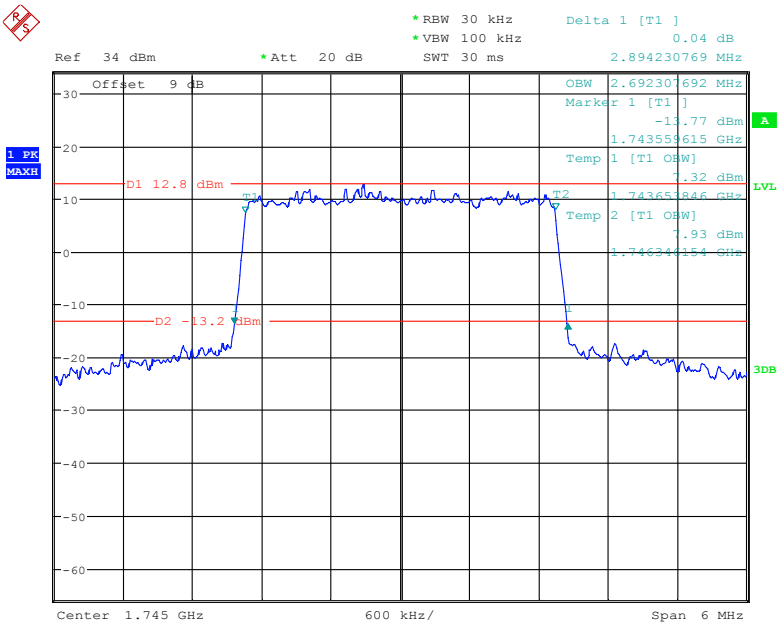
Date: 27.AUG.2019 23:10:15

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



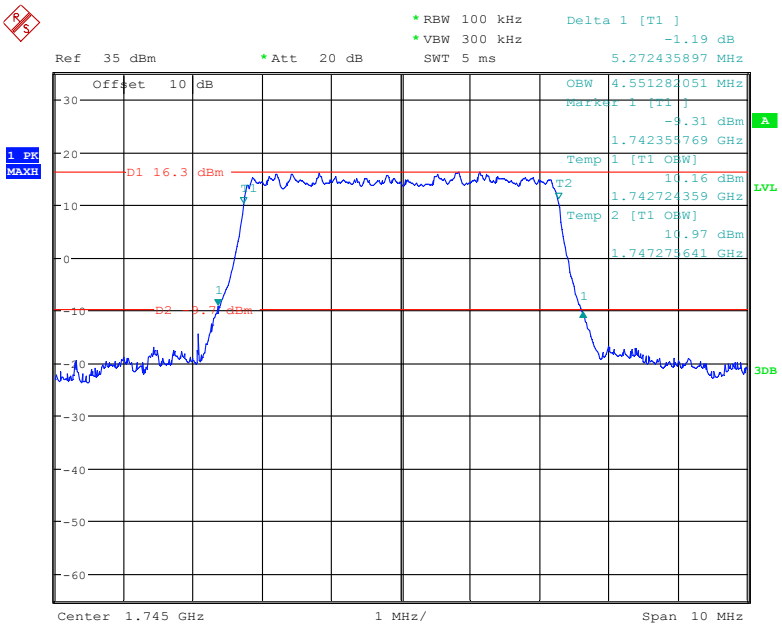
Date: 27.AUG.2019 23:13:48

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



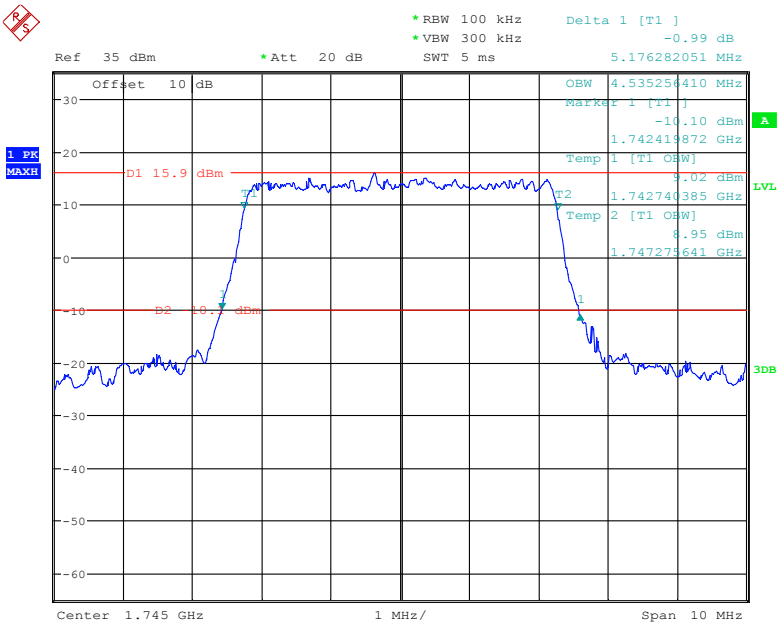
Date: 27.AUG.2019 23:16:52

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



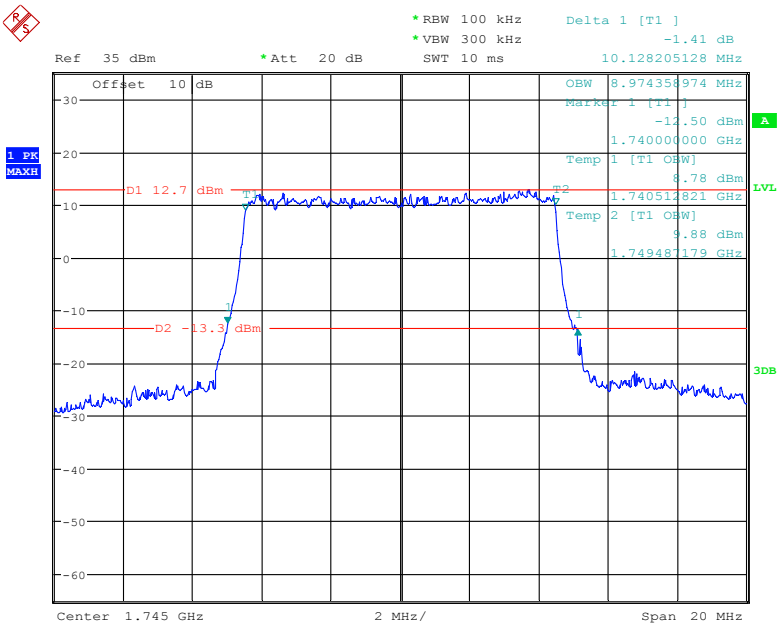
Date: 23.JUN.2019 09:33:05

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



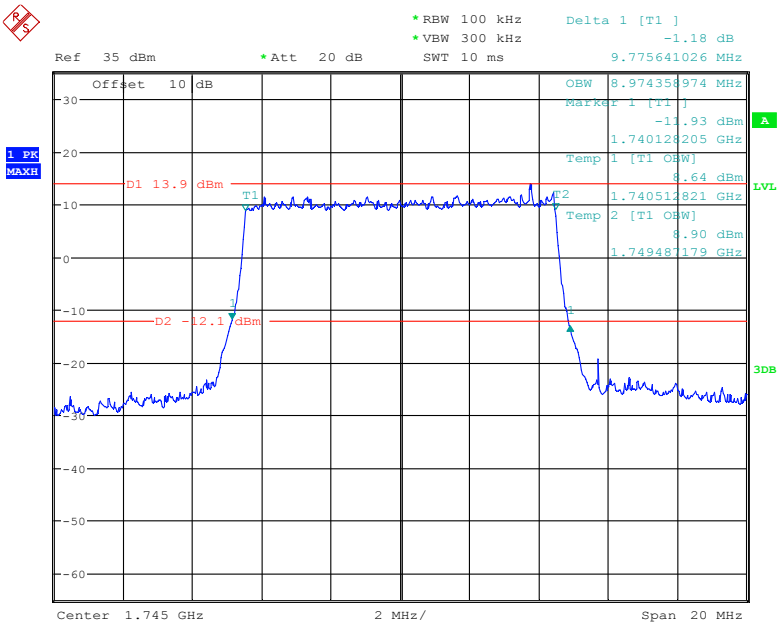
Date: 23.JUN.2019 09:22:38

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



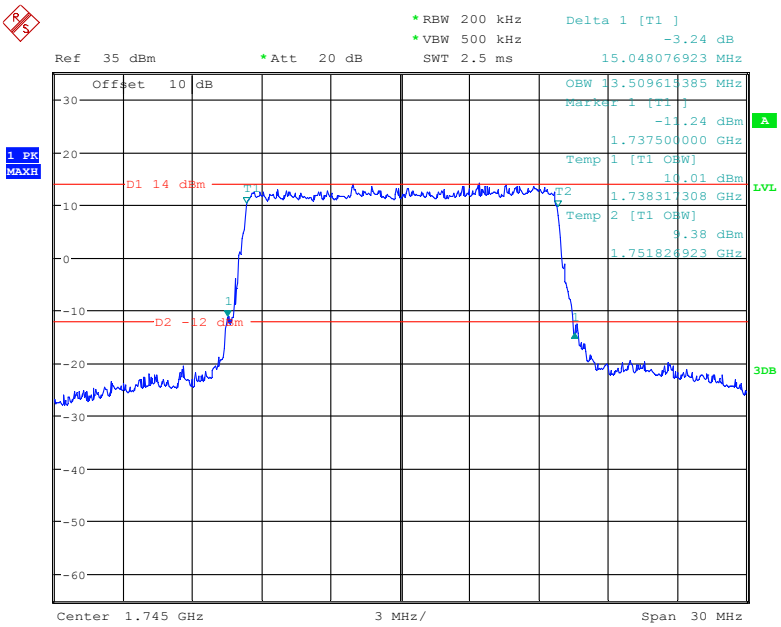
Date: 23.JUN.2019 09:35:17

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



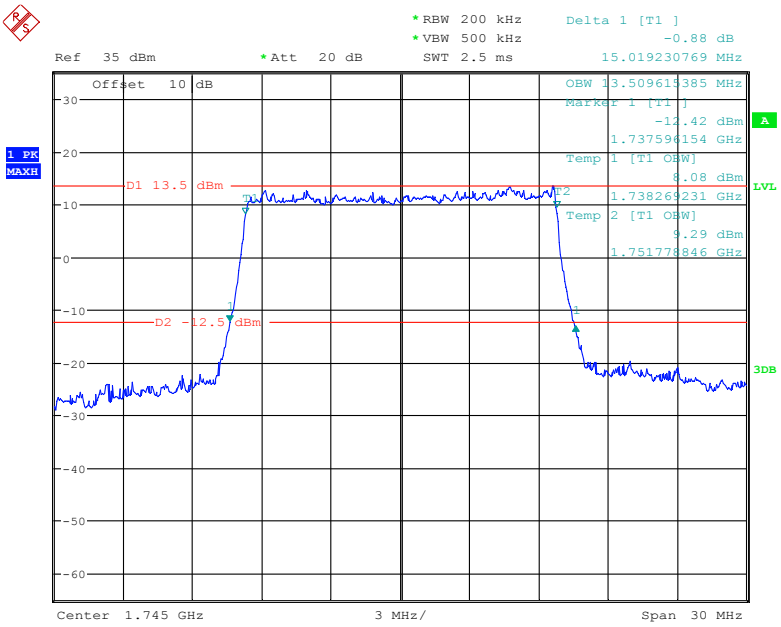
Date: 23.JUN.2019 09:34:20

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



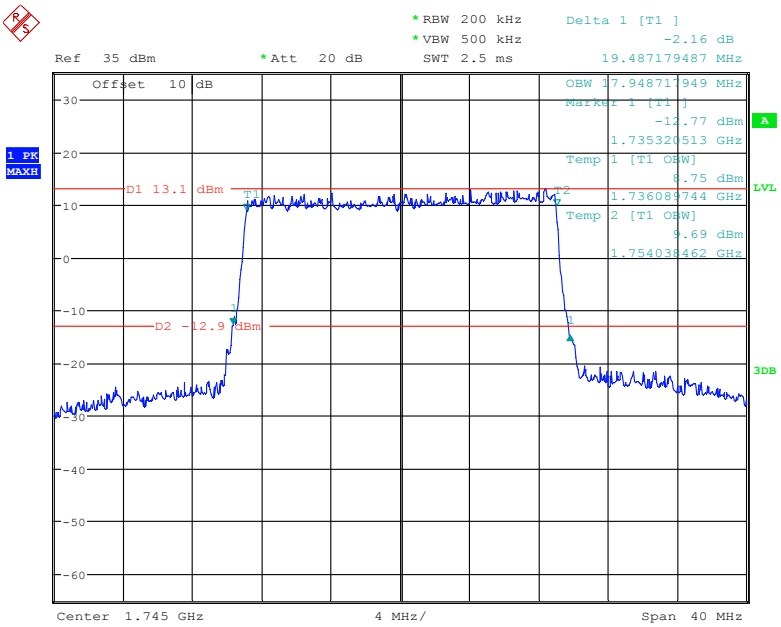
Date: 23.JUN.2019 09:37:59

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



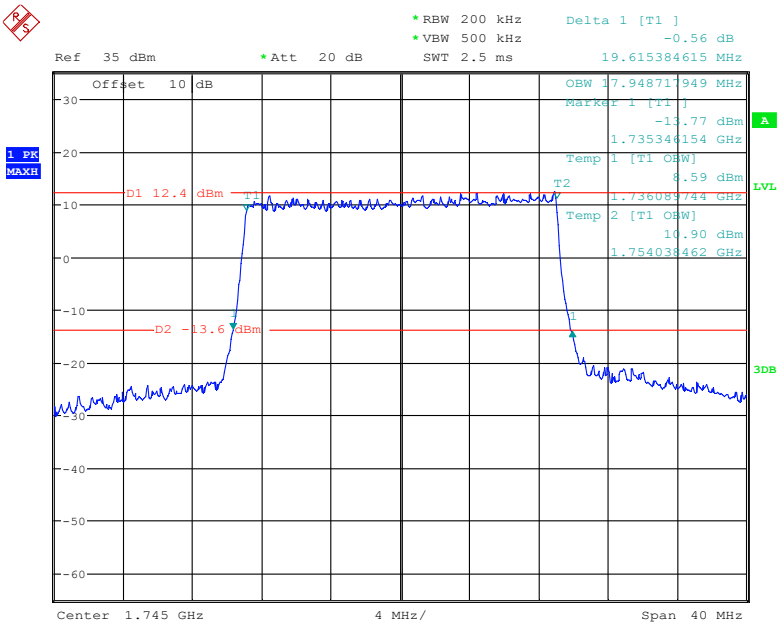
Date: 23.JUN.2019 09:36:48

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



Date: 23.JUN.2019 09:42:25

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



Date: 23.JUN.2019 09:41:36

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

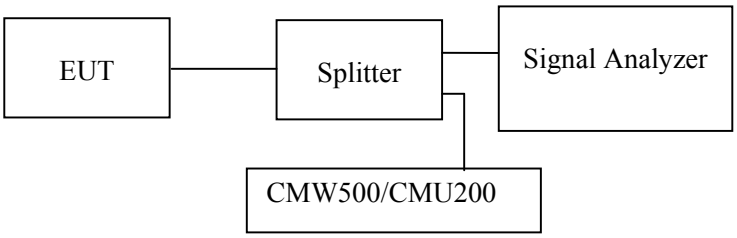
Applicable Standard

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

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.



Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	50~56 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu from 2019-06-20 to 2019-09-11.

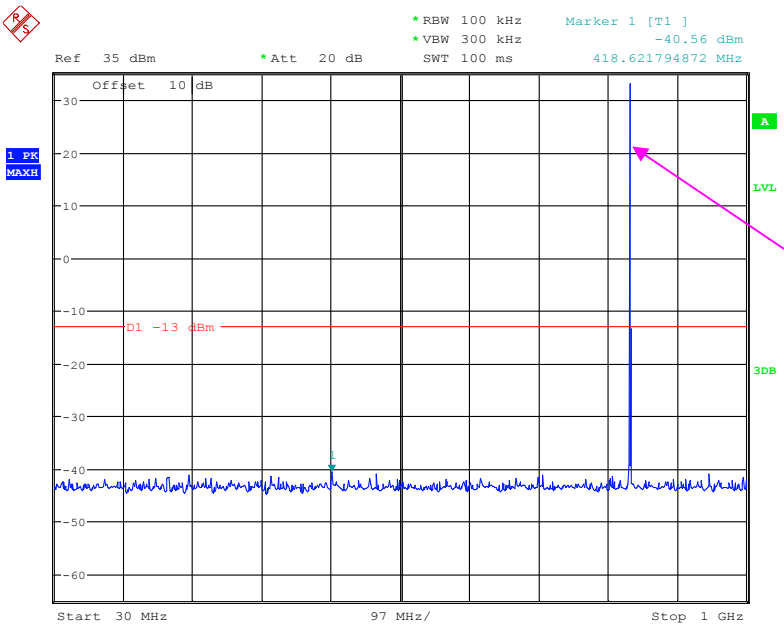
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

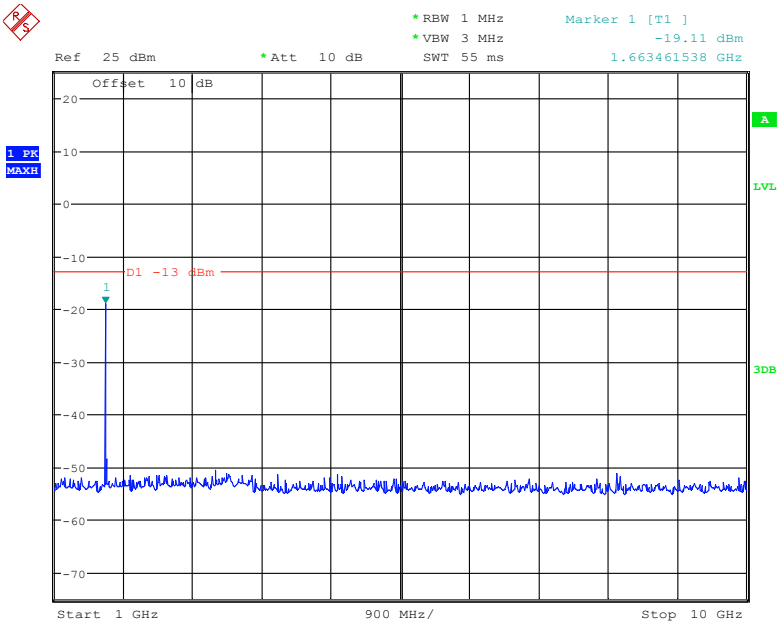
30 MHz – 1 GHz (GSM Mode)



Fundamental test

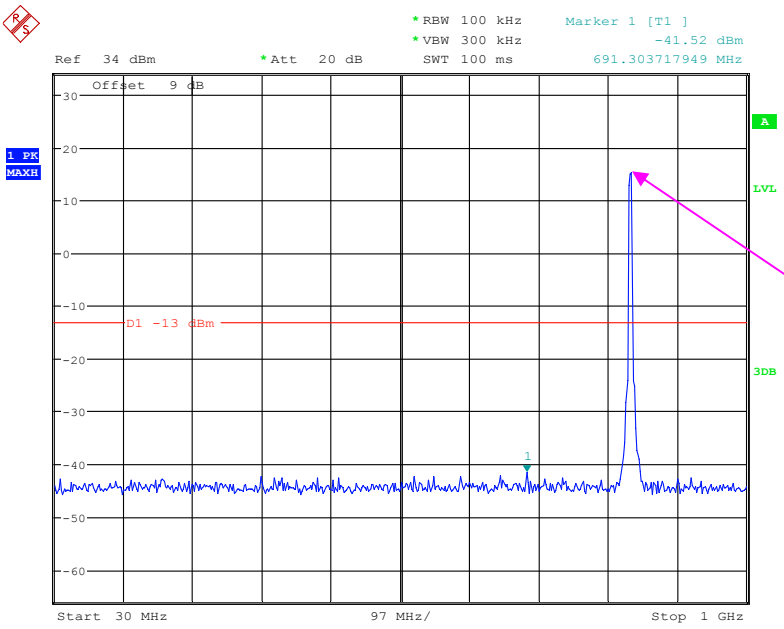
Date: 20.JUN.2019 22:38:39

1 GHz – 10 GHz (GSM Mode)



Date: 20.JUN.2019 22:39:24

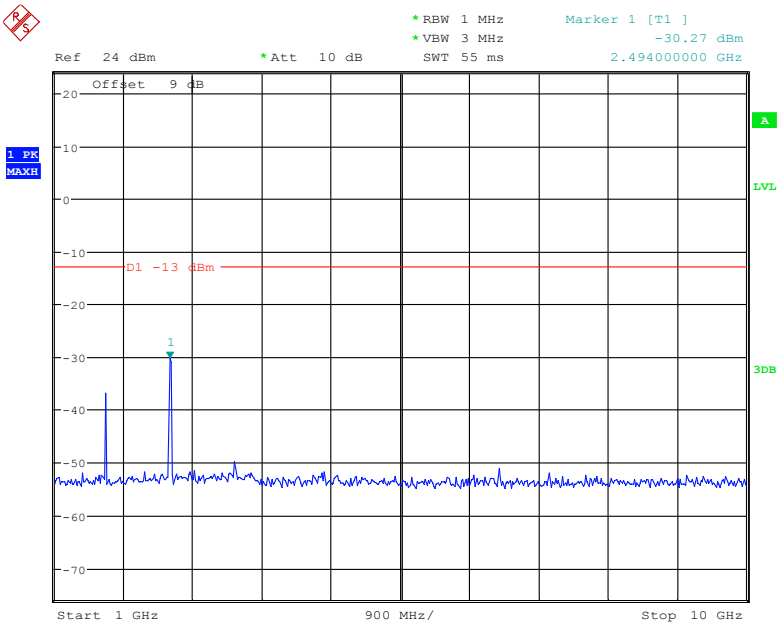
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 8.JUL.2019 23:20:11

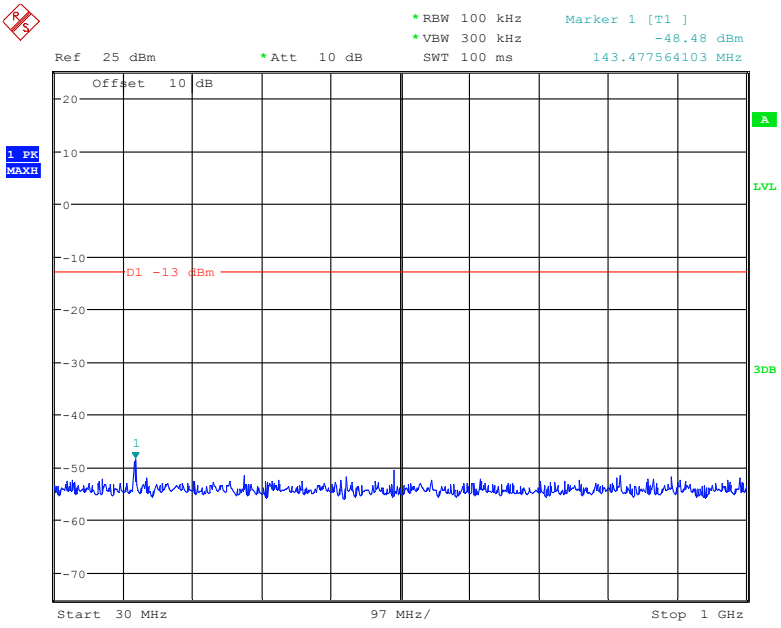
1 GHz – 10 GHz (WCDMA Mode)



Date: 8.JUL.2019 23:20:39

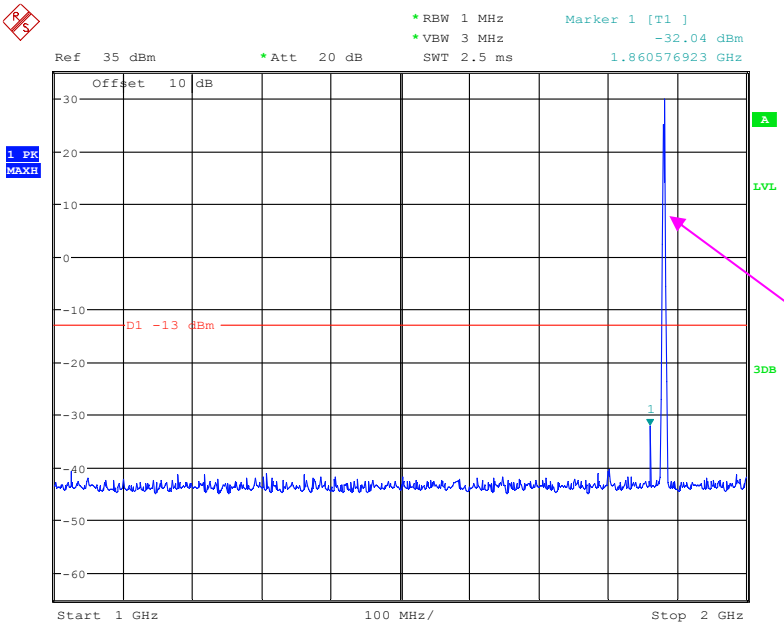
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 20.JUN.2019 22:20:24

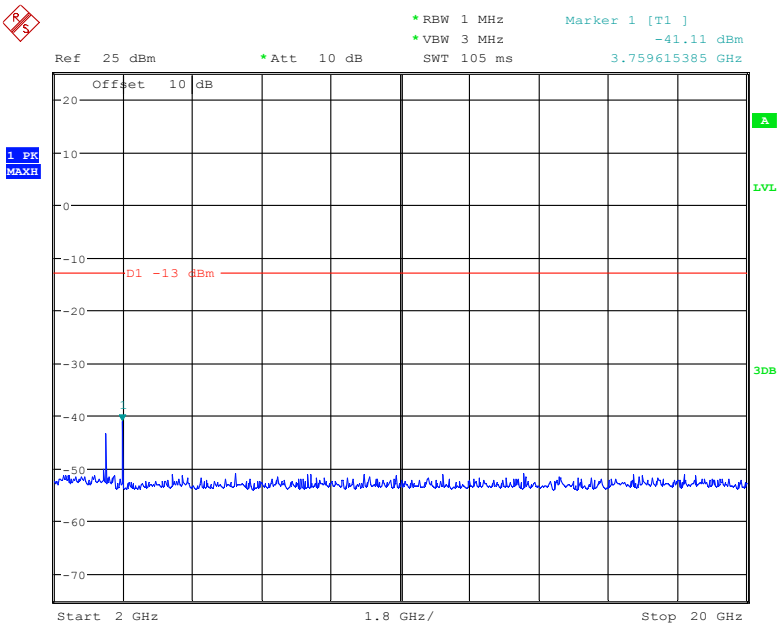
1 GHz – 2 GHz (GSM Mode)



Fundamental test

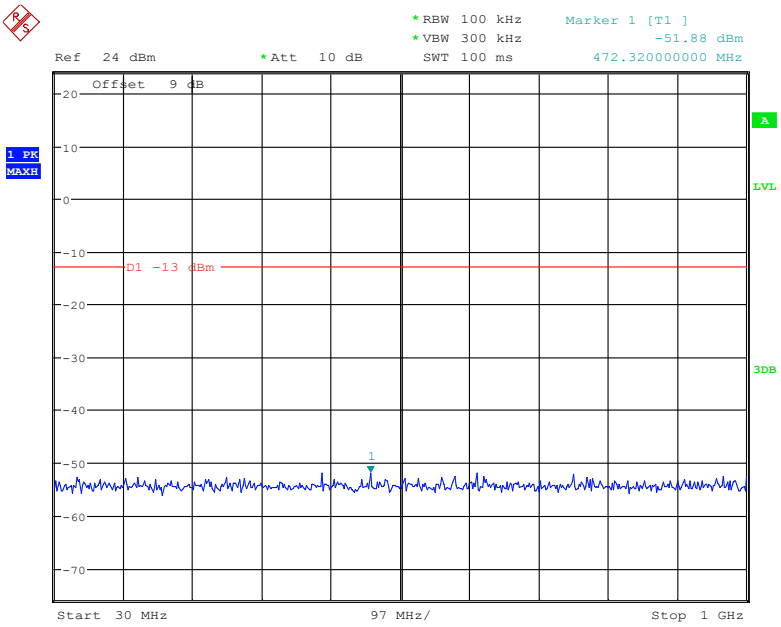
Date: 20.JUN.2019 22:21:53

2 GHz – 20 GHz (GSM Mode)



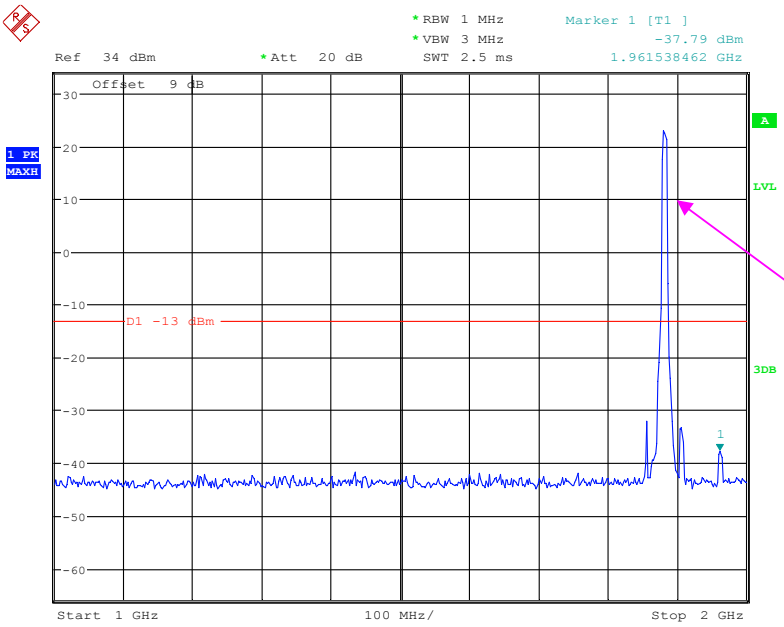
Date: 20.JUN.2019 22:22:16

30 MHz – 1 GHz (WCDMA Mode)



Date: 8.JUL.2019 23:53:35

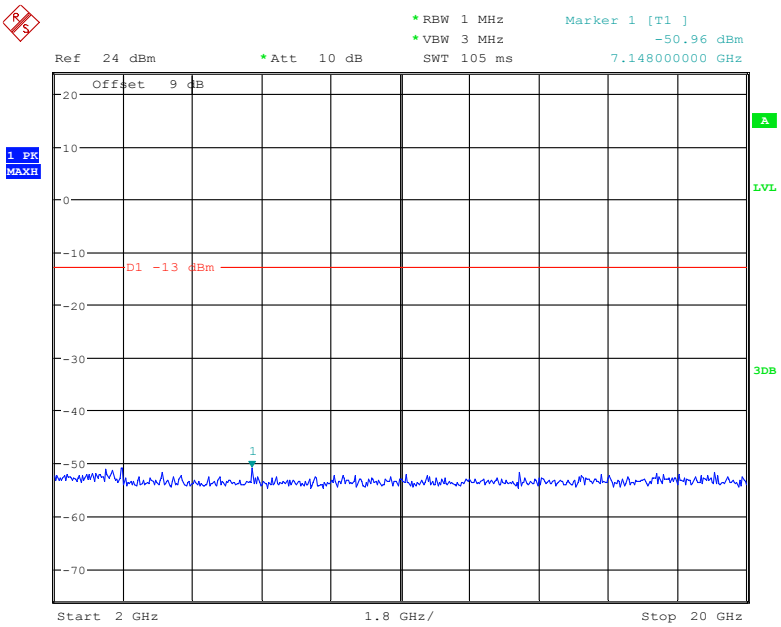
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 8.JUL.2019 23:54:12

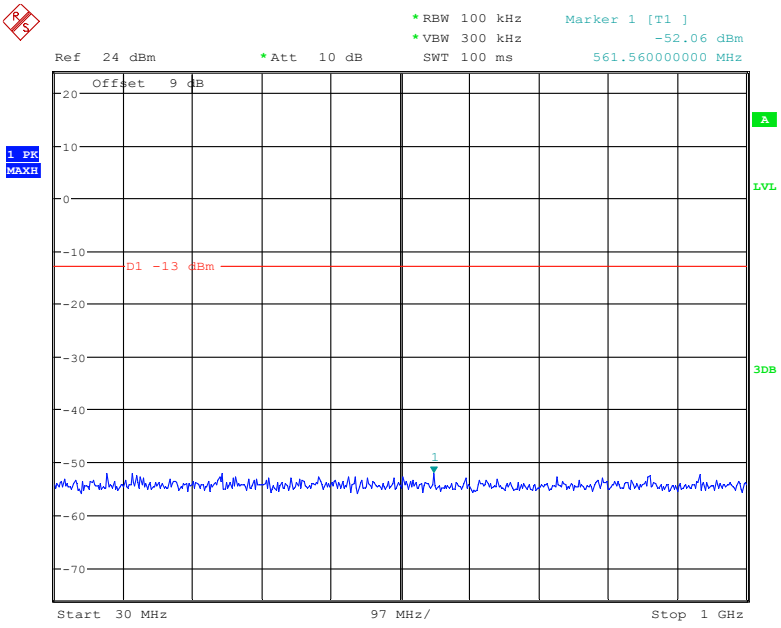
2 GHz – 20 GHz (WCDMA Mode)



Date: 8.JUL.2019 23:54:29

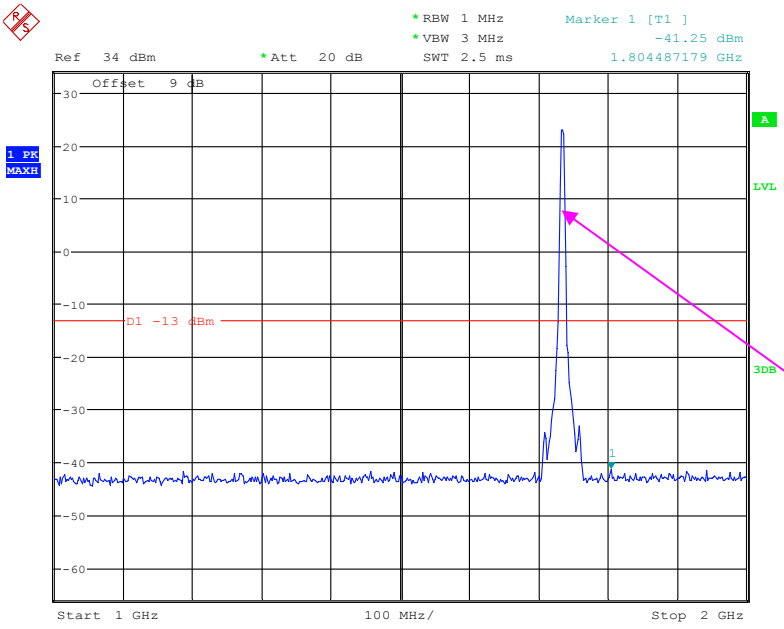
AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)



Date: 8.JUL.2019 23:08:56

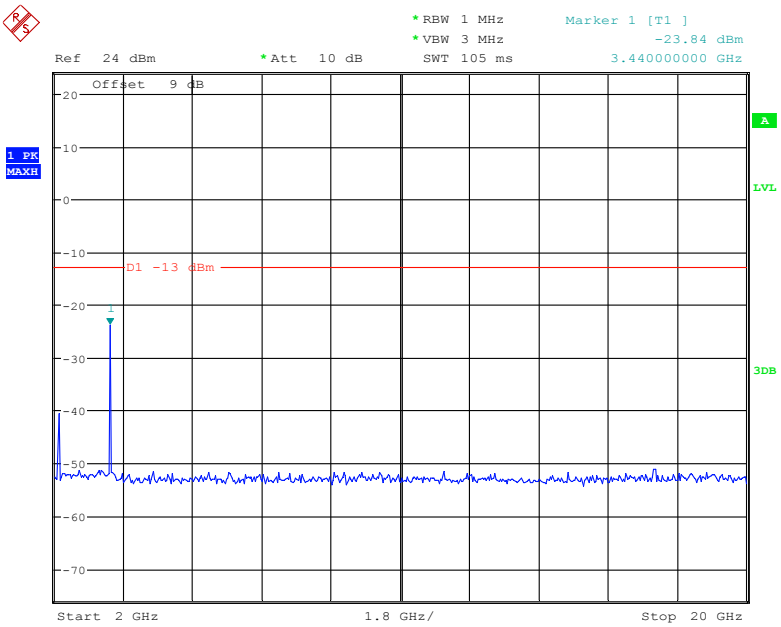
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 8.JUL.2019 23:07:59

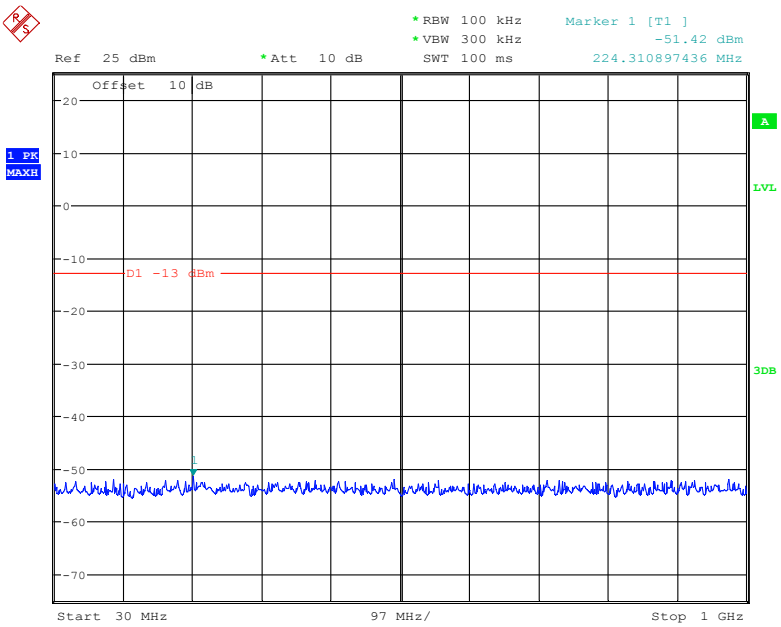
2 GHz – 20 GHz (WCDMA Mode)



Date: 8.JUL.2019 23:09:29

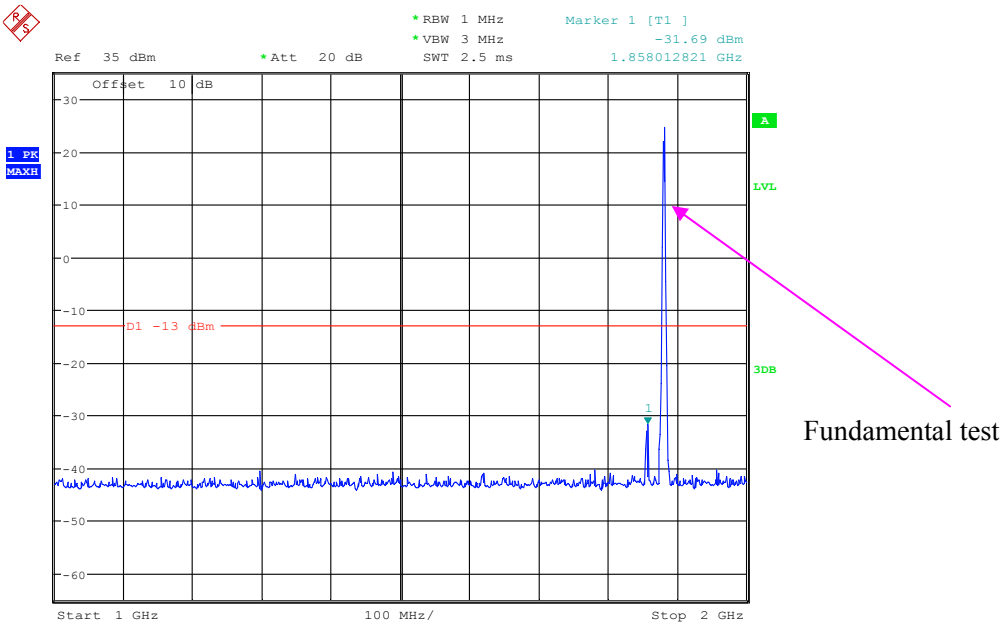
LTE Band 2:

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



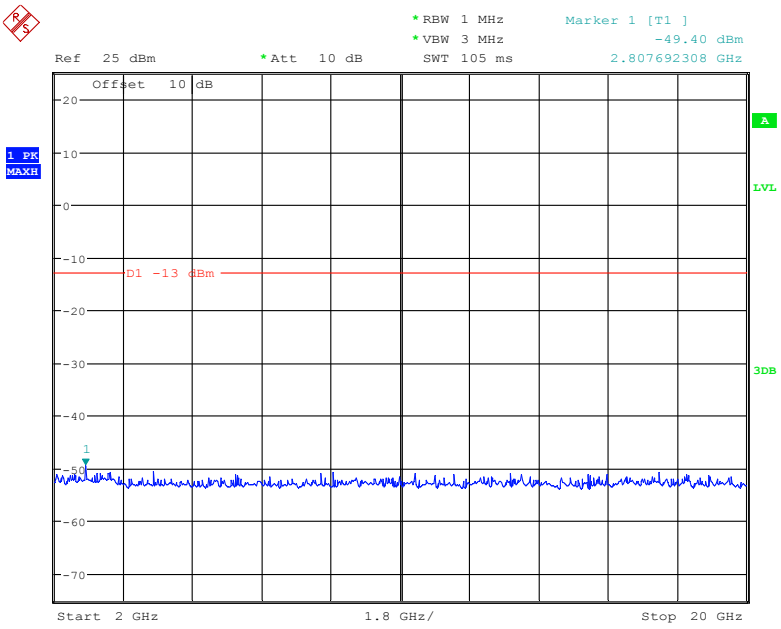
Date: 21.JUN.2019 20:55:05

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



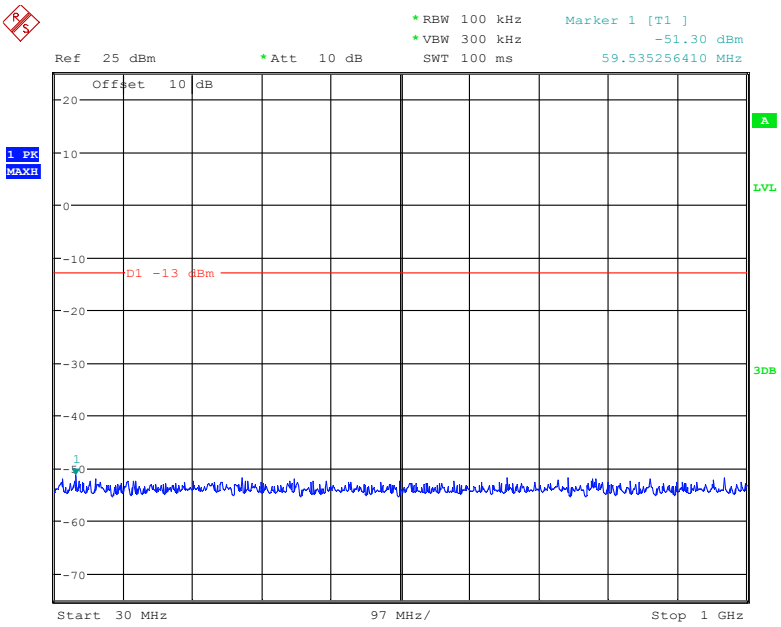
Date: 21.JUN.2019 21:03:46

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



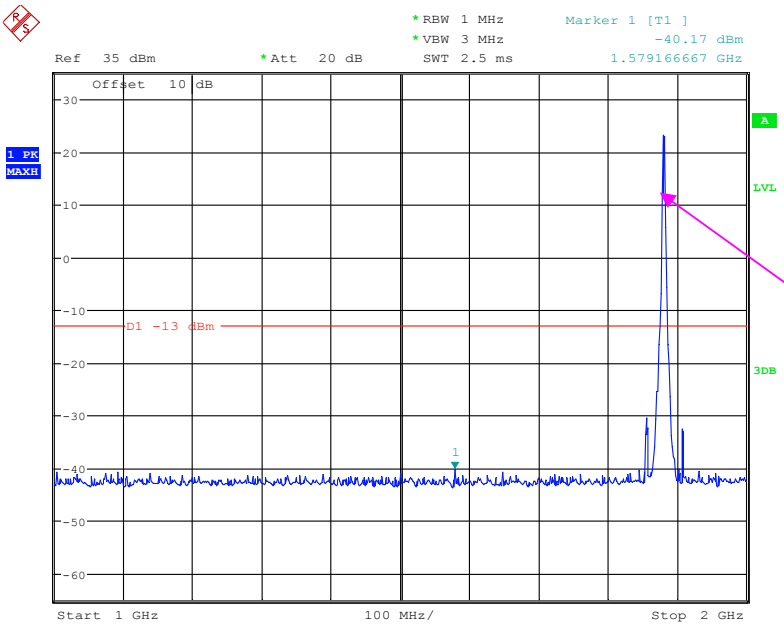
Date: 21.JUN.2019 21:04:09

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



Date: 21.JUN.2019 20:55:45

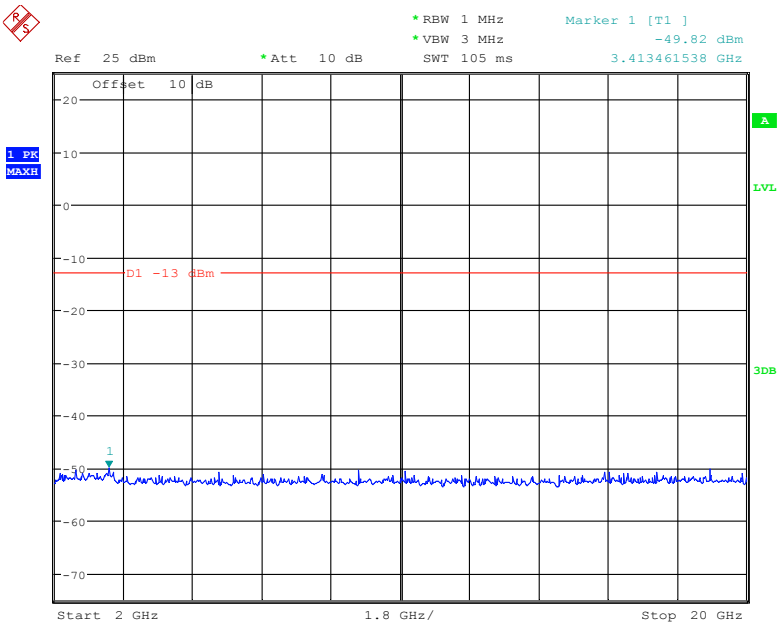
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



Fundamental test

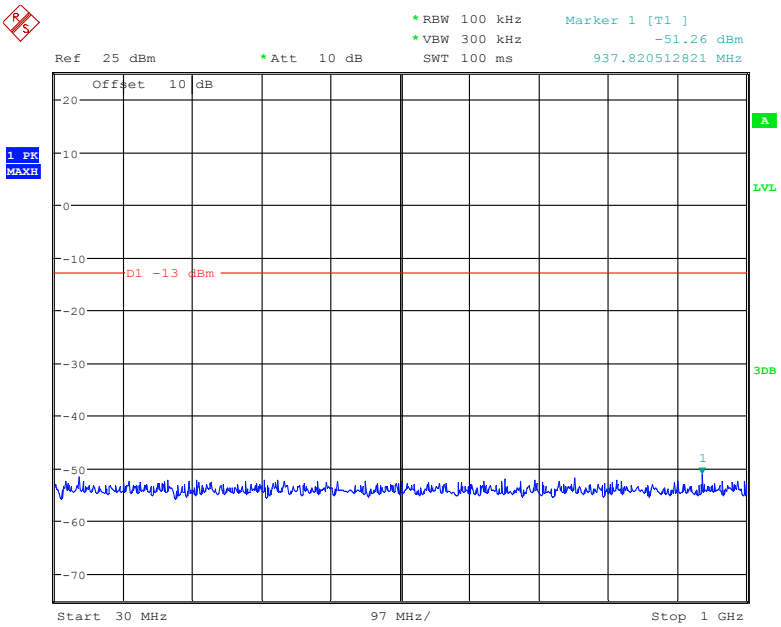
Date: 21.JUN.2019 21:03:14

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



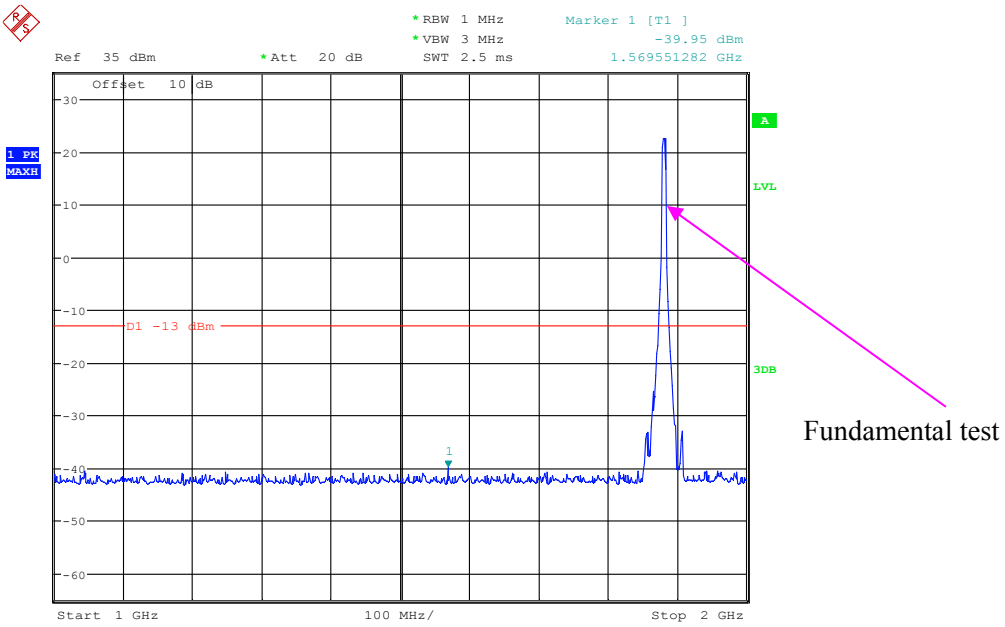
Date: 21.JUN.2019 21:05:11

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



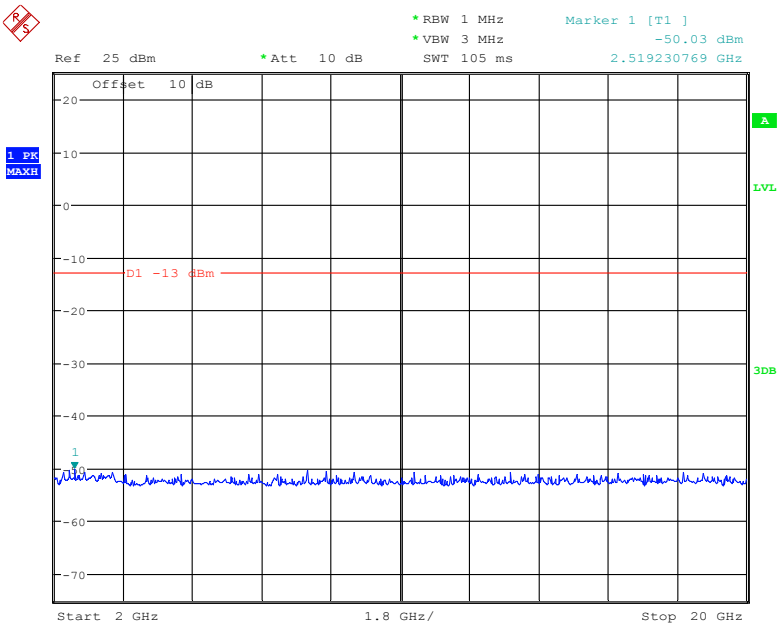
Date: 21.JUN.2019 20:55:54

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



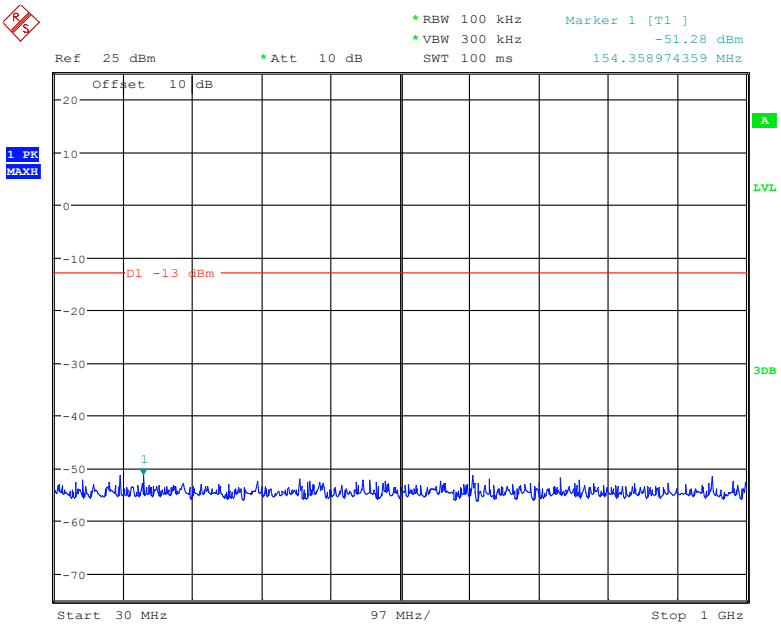
Date: 21.JUN.2019 21:02:20

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



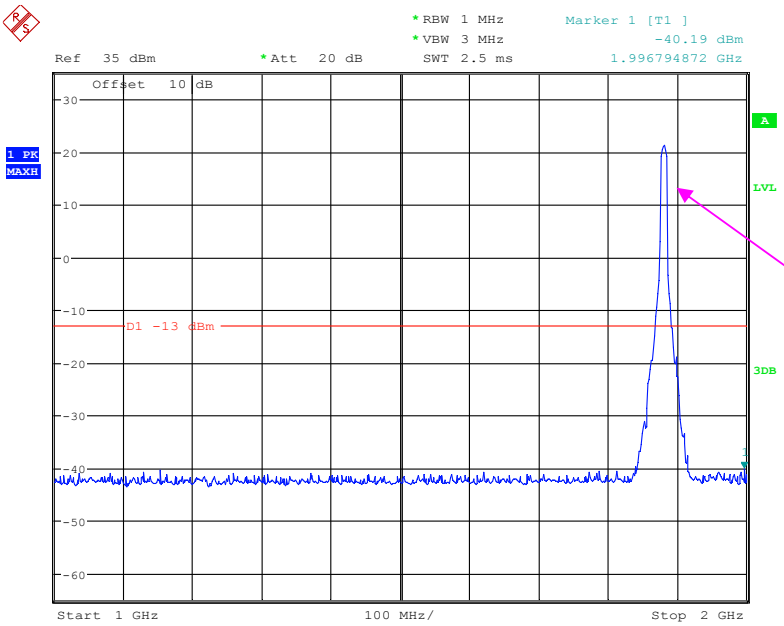
Date: 21.JUN.2019 21:05:30

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



Date: 21.JUN.2019 20:56:14

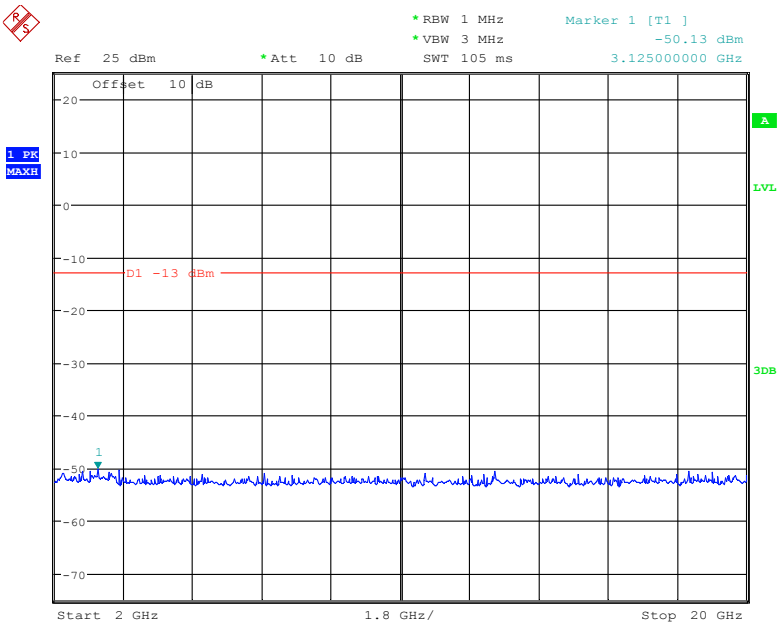
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



Fundamental test

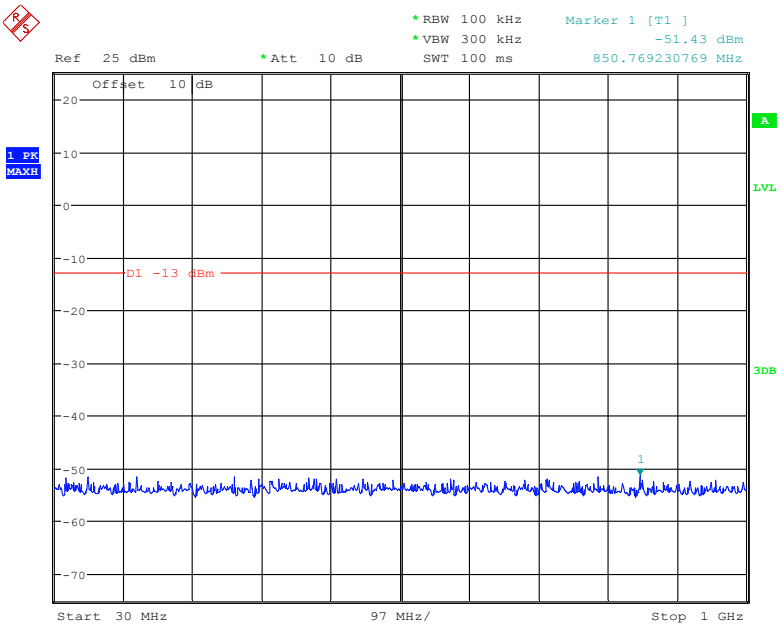
Date: 21.JUN.2019 21:01:26

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



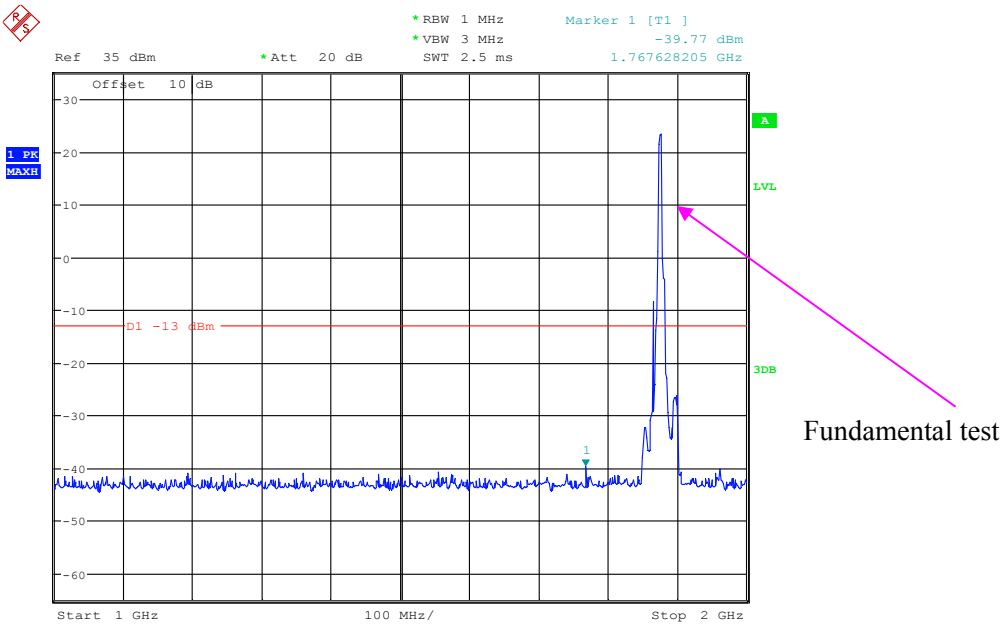
Date: 21.JUN.2019 21:05:46

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



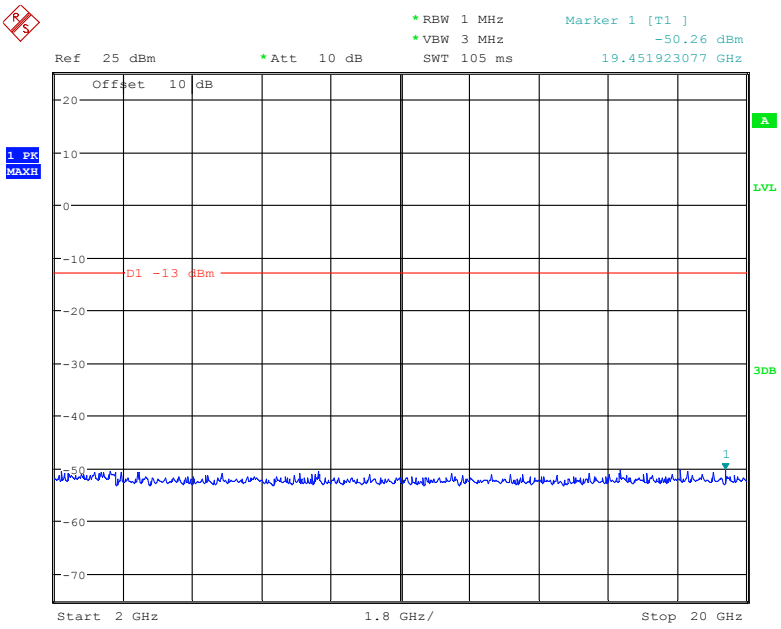
Date: 21.JUN.2019 20:56:36

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



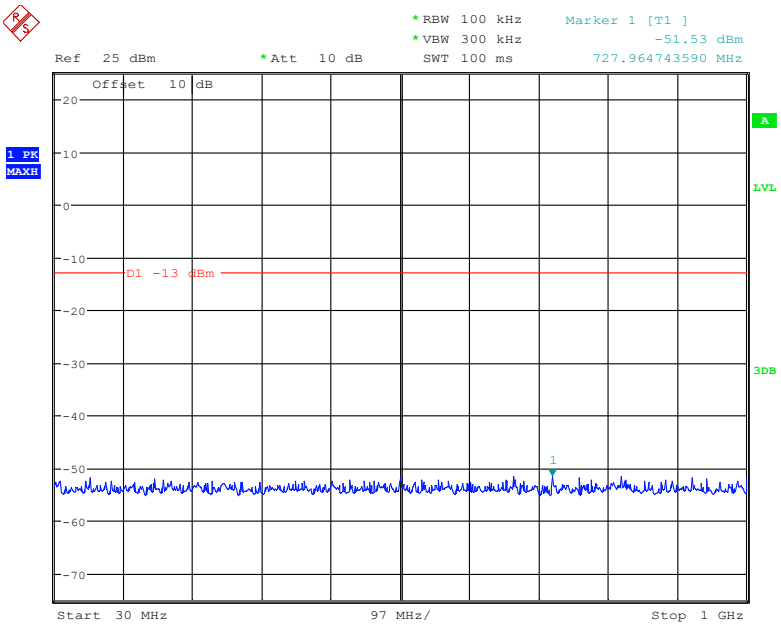
Date: 21.JUN.2019 21:00:35

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



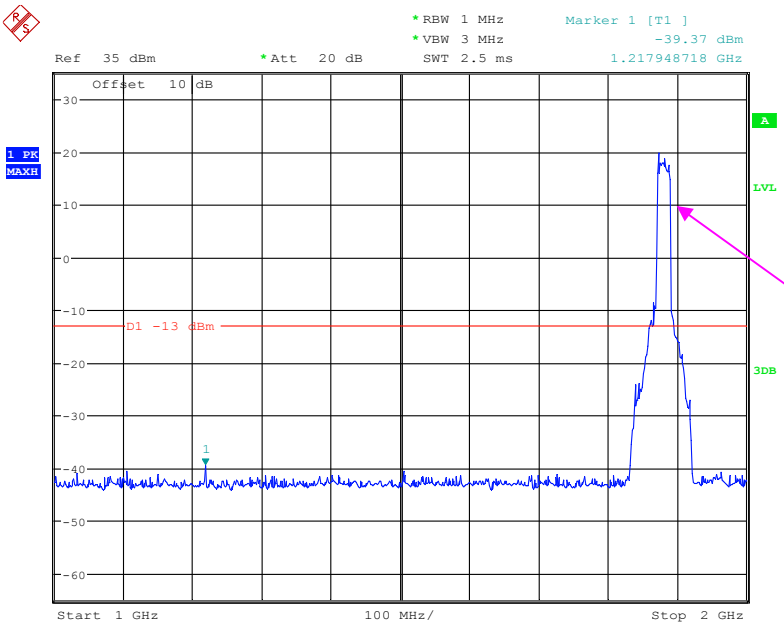
Date: 21.JUN.2019 21:06:06

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



Date: 21.JUN.2019 20:56:52

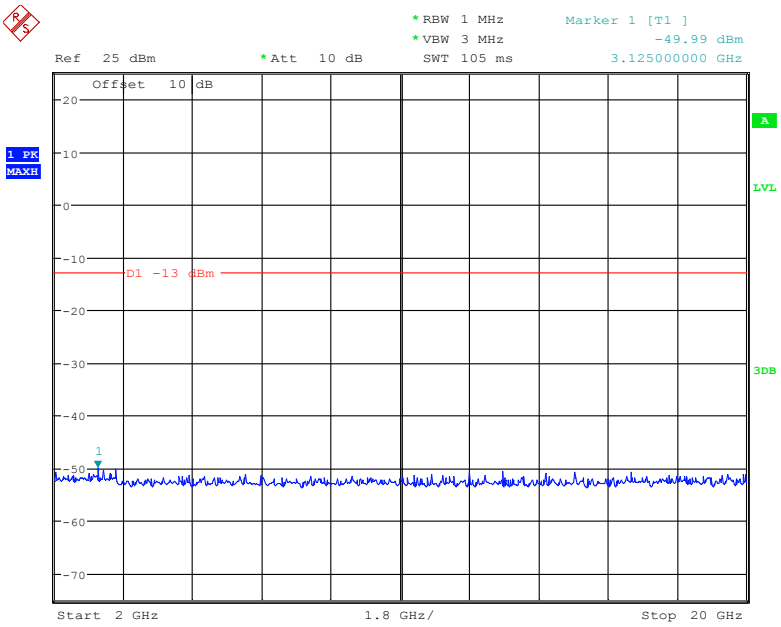
1 GHz – 2 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 21.JUN.2019 21:00:16

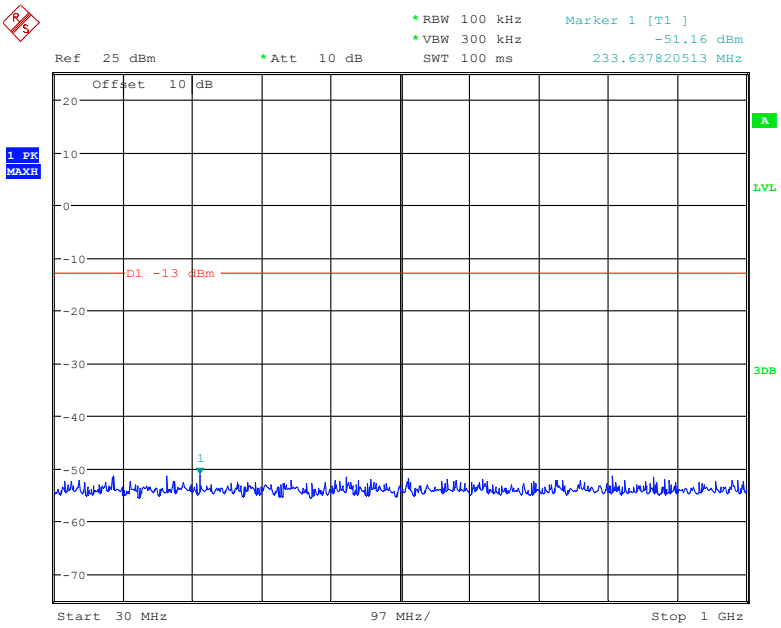
2 GHz - 20 GHz (20.0 MHz, Middle Channel)



Date: 21.JUN.2019 21:06:22

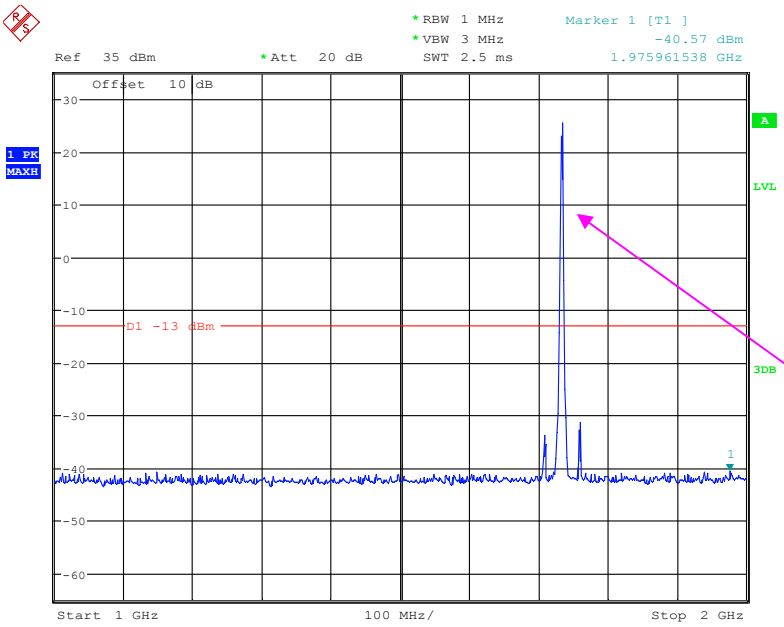
LTE Band 4:

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



Date: 21.JUN.2019 21:10:40

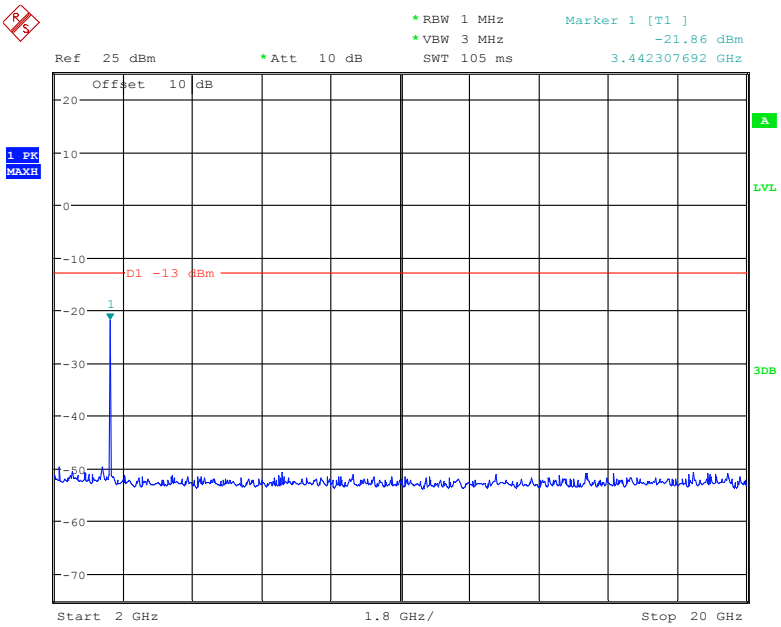
1 GHz – 2 GHz (1.4 MHz, Middle Channel)



Fundamental test

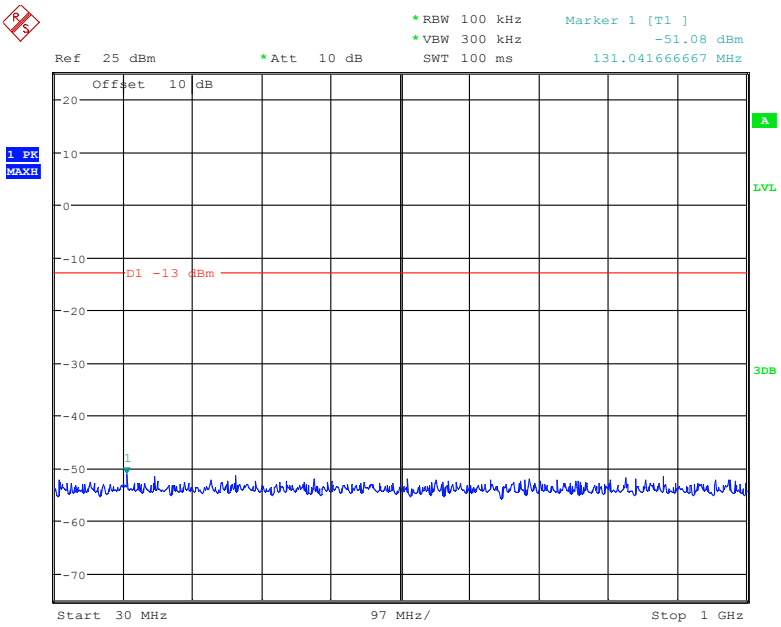
Date: 21.JUN.2019 21:19:27

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



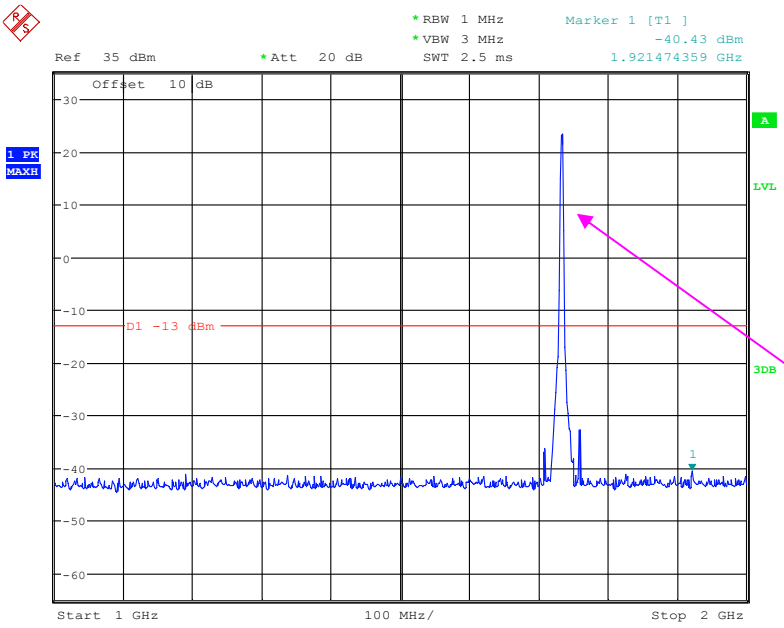
Date: 21.JUN.2019 21:21:51

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



Date: 21.JUN.2019 21:11:03

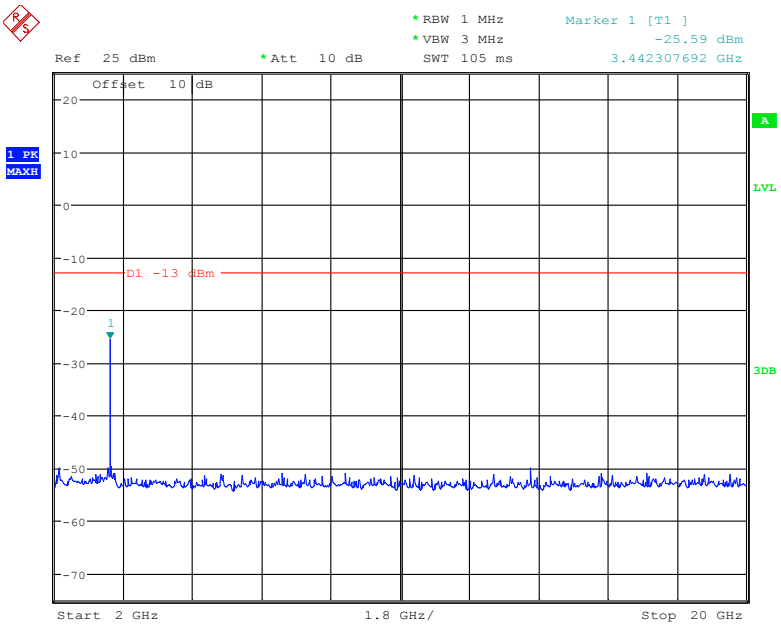
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



Fundamental test

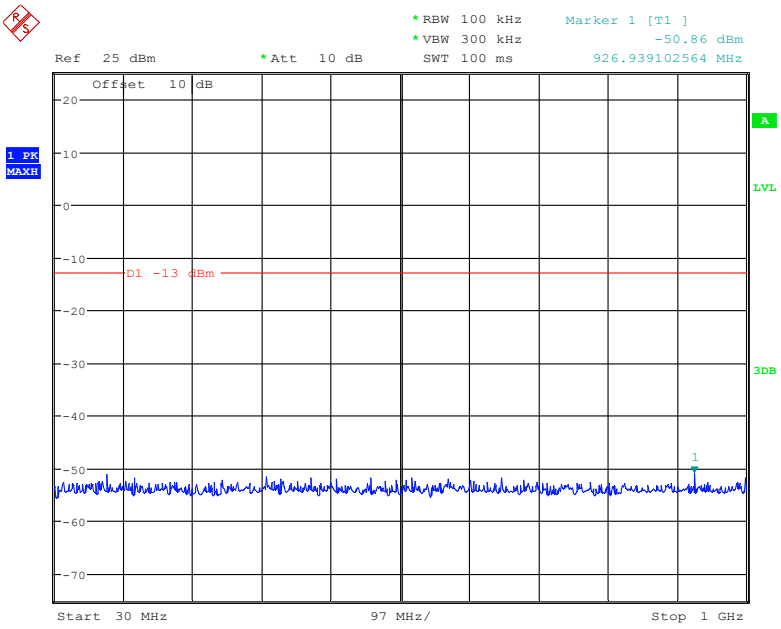
Date: 21.JUN.2019 21:18:40

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



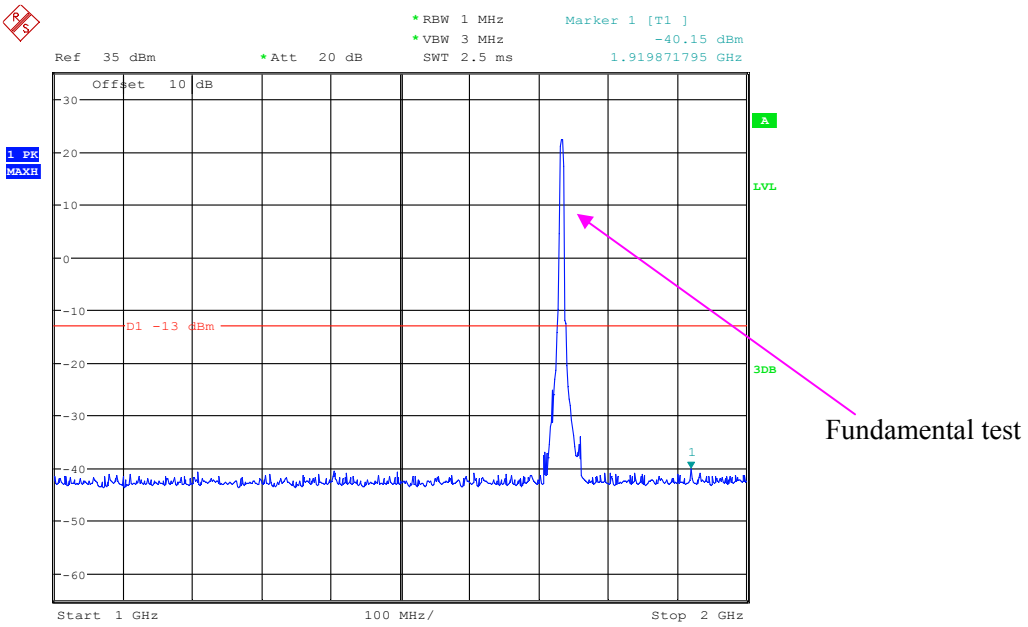
Date: 21.JUN.2019 21:22:09

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



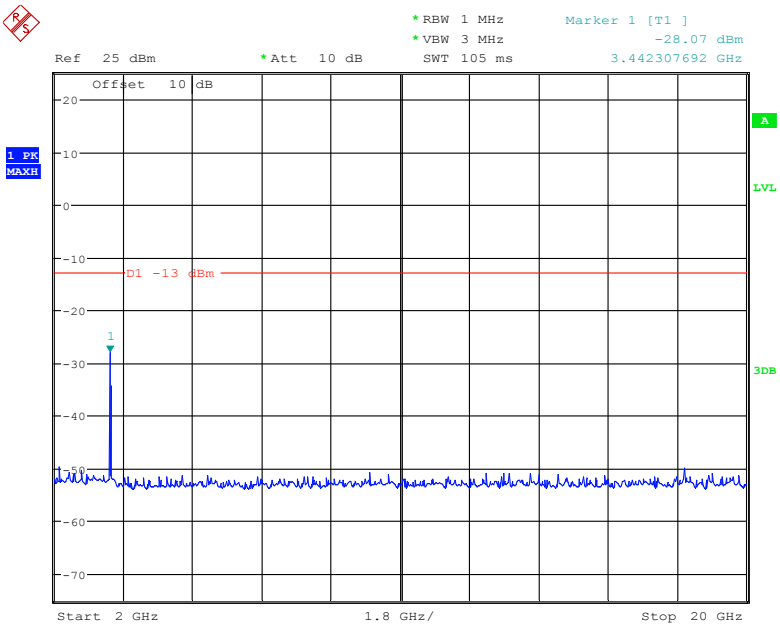
Date: 21.JUN.2019 21:13:17

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



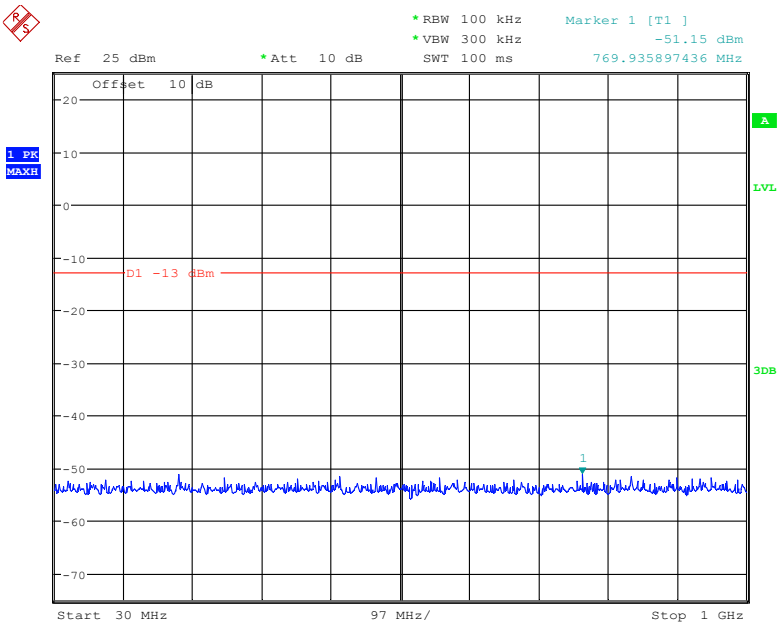
Date: 21.JUN.2019 21:18:23

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



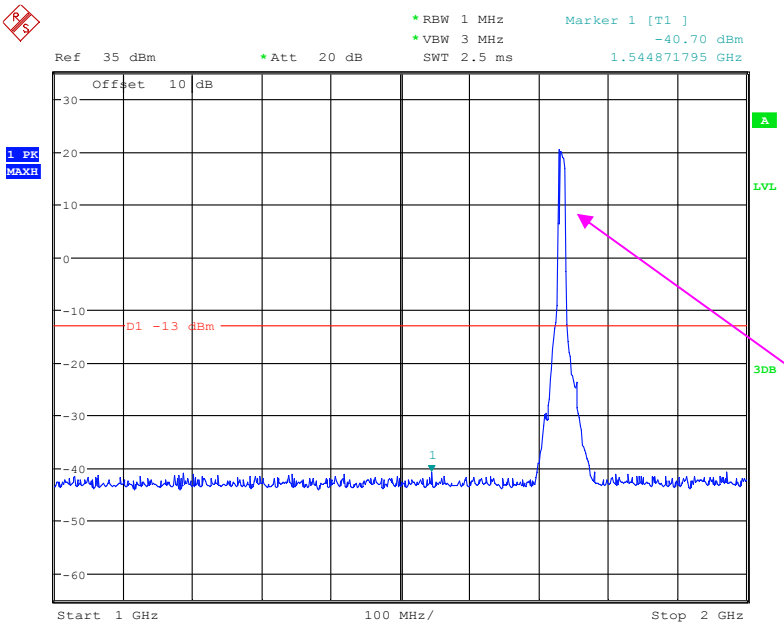
Date: 21.JUN.2019 21:22:21

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



Date: 21.JUN.2019 21:13:33

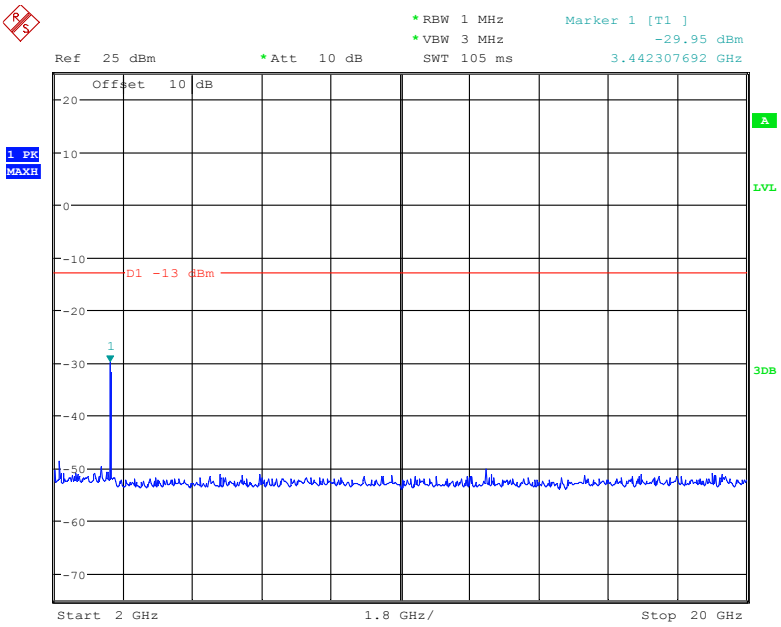
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



Fundamental test

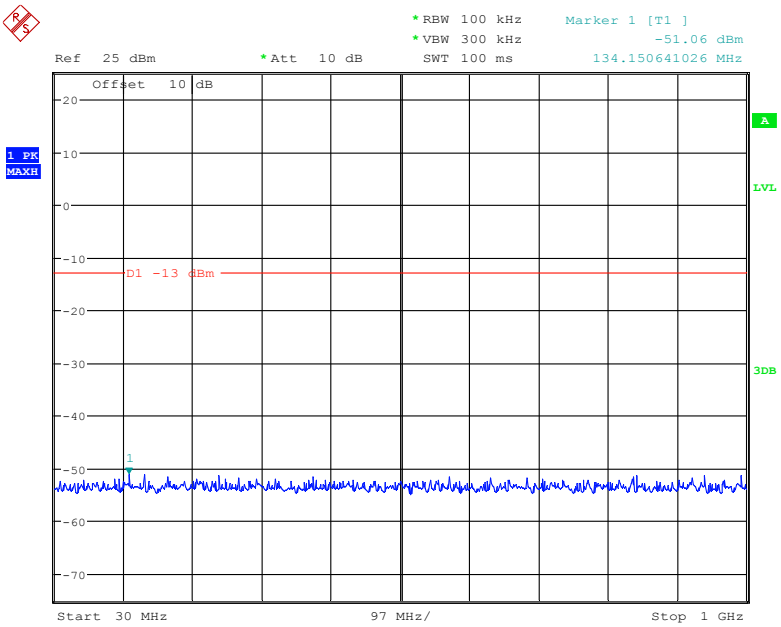
Date: 21.JUN.2019 21:17:49

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



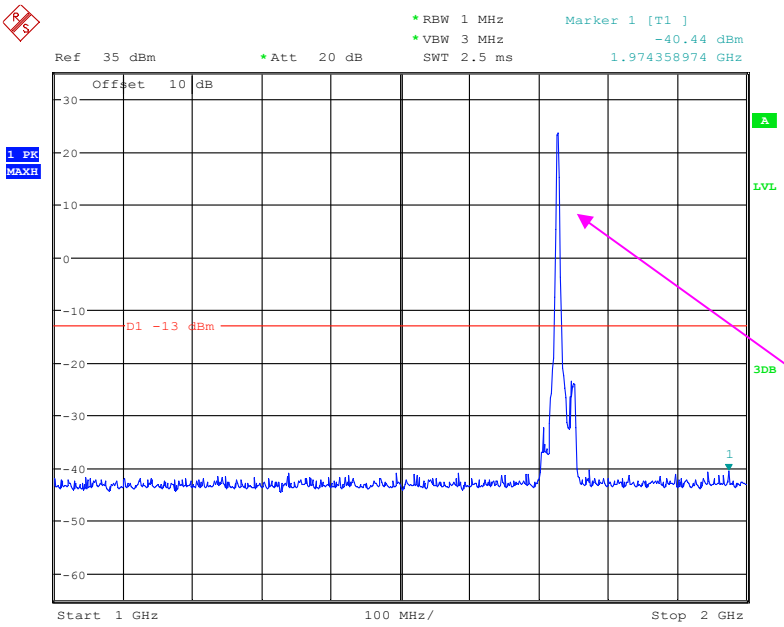
Date: 21.JUN.2019 21:22:34

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



Date: 21.JUN.2019 21:13:51

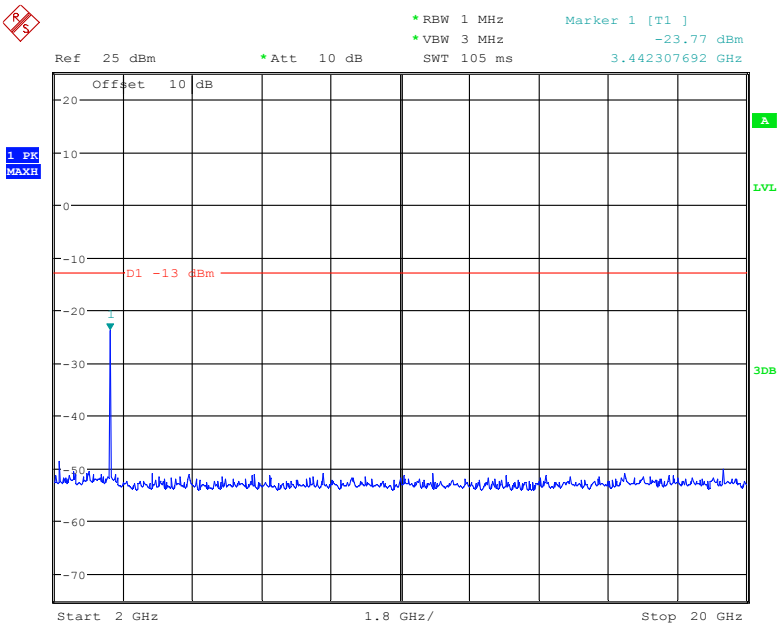
1 GHz – 2 GHz (15.0 MHz, Middle Channel)



Fundamental test

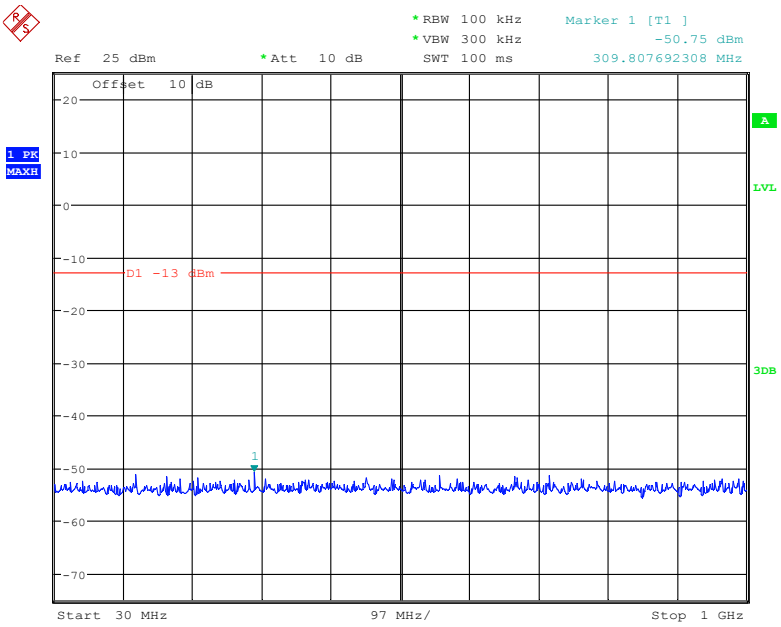
Date: 21.JUN.2019 21:15:27

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



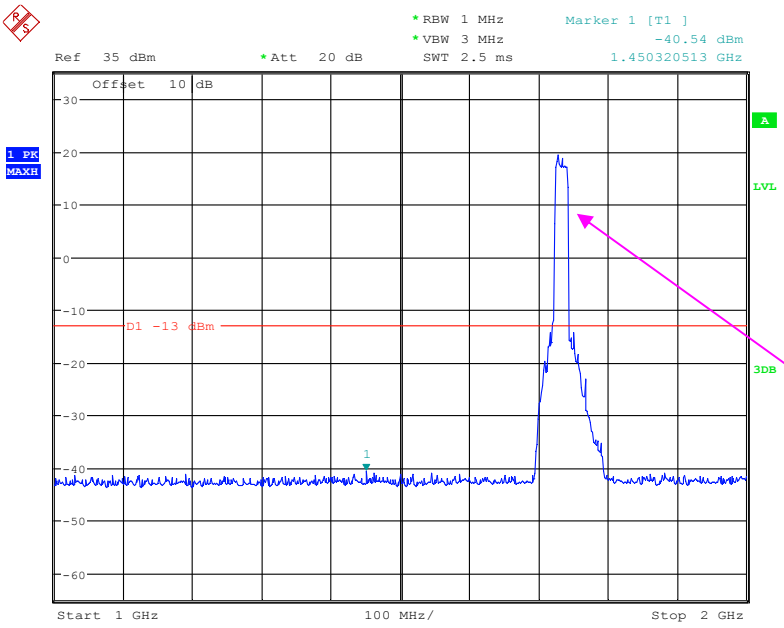
Date: 21.JUN.2019 21:25:48

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



Date: 21.JUN.2019 21:14:04

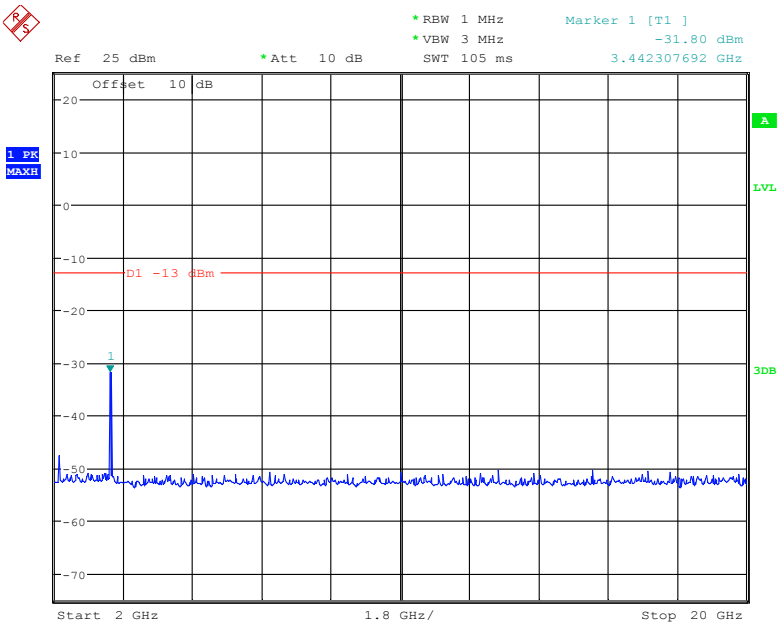
1 GHz – 2 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 21.JUN.2019 21:14:54

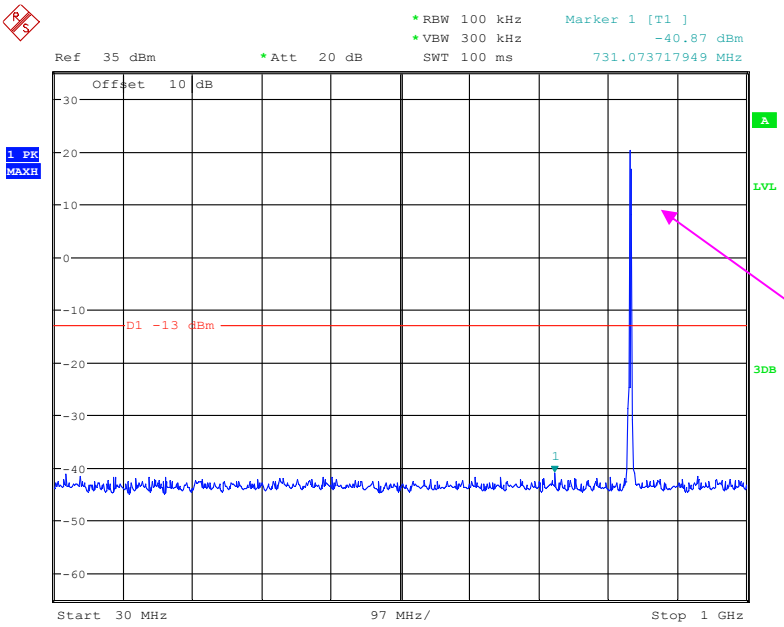
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 21.JUN.2019 21:26:02

LTE Band 5:

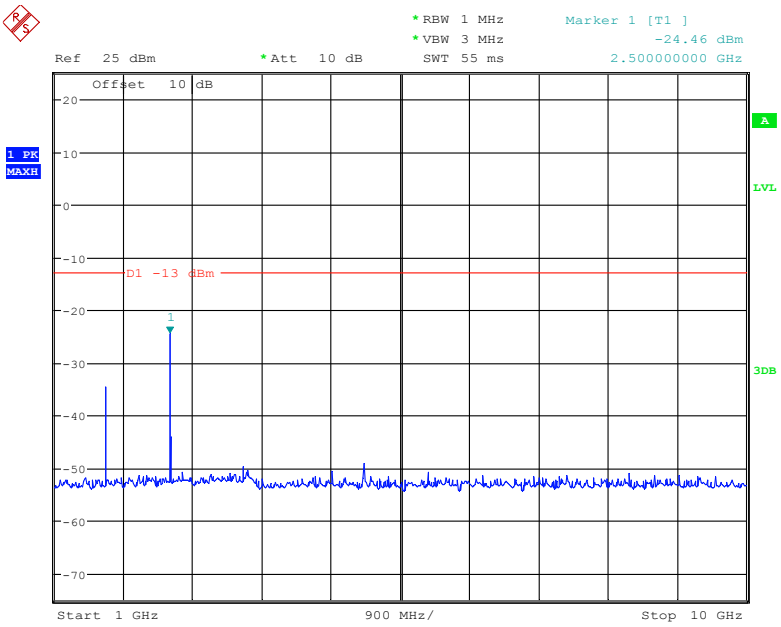
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

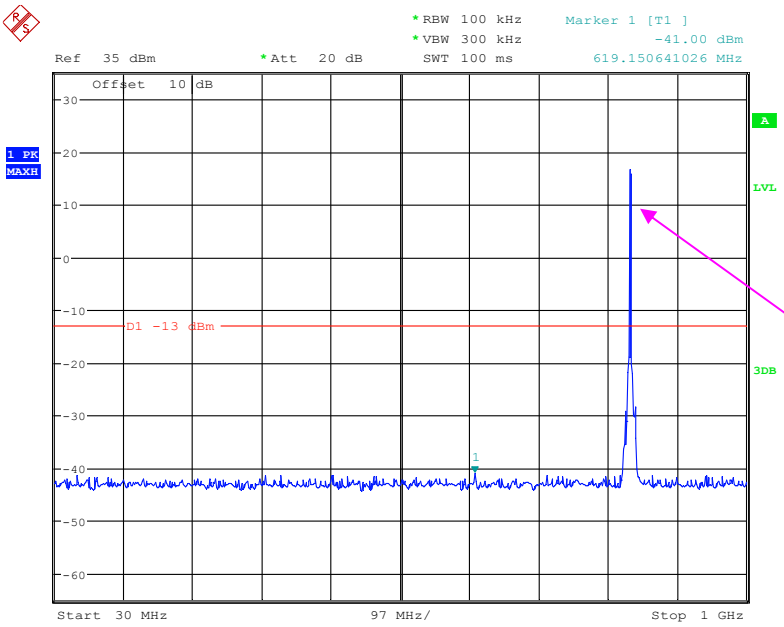
Date: 21.JUN.2019 21:30:30

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



Date: 21.JUN.2019 21:35:55

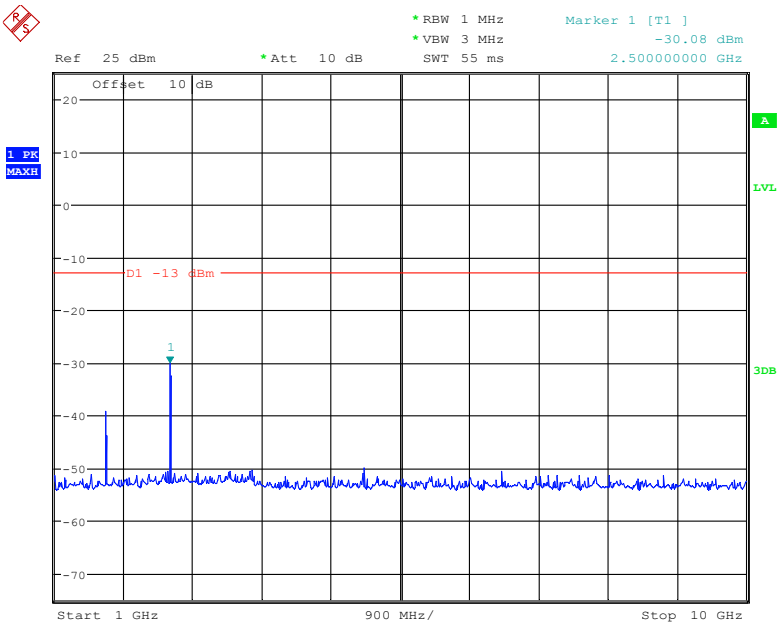
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Fundamental test

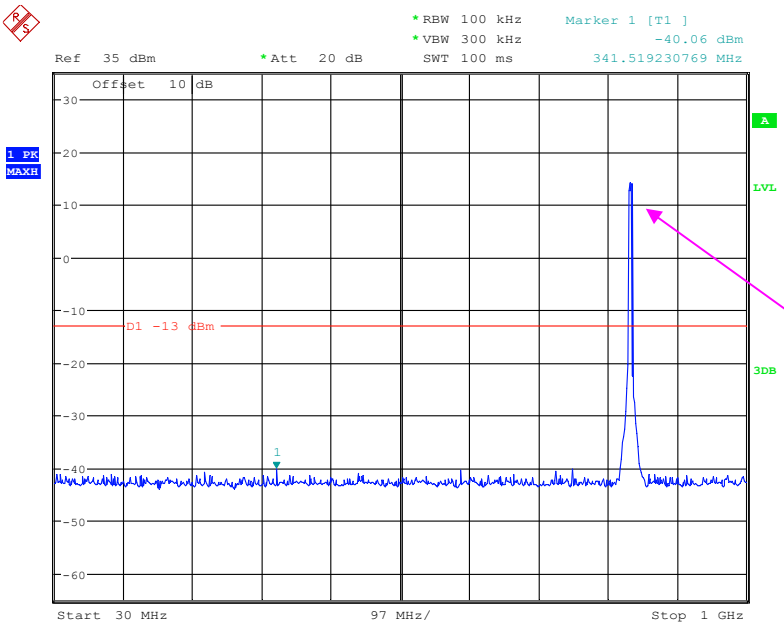
Date: 21.JUN.2019 21:31:08

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



Date: 21.JUN.2019 21:35:41

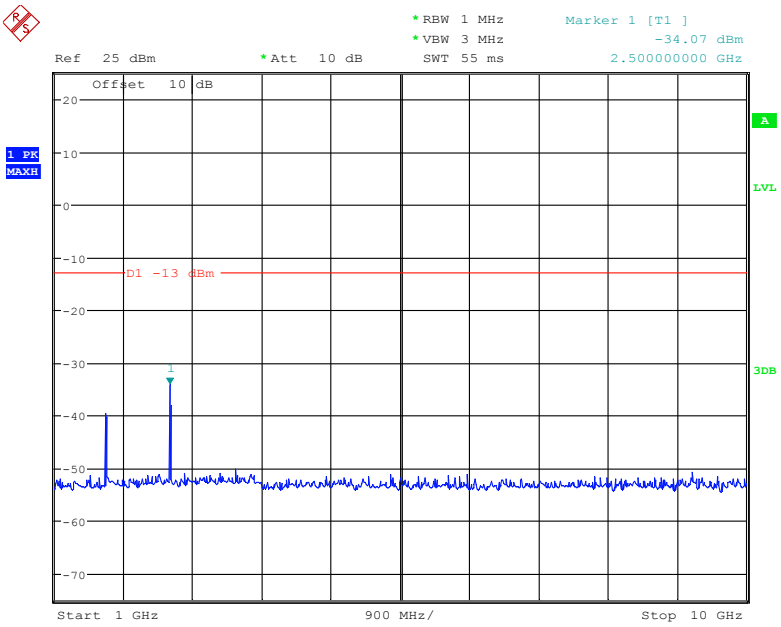
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

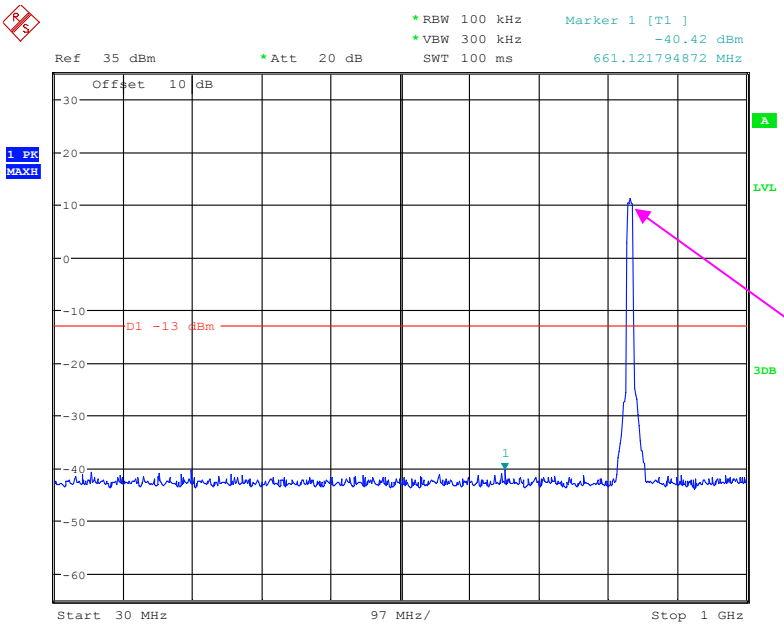
Date: 21.JUN.2019 21:31:56

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



Date: 21.JUN.2019 21:35:29

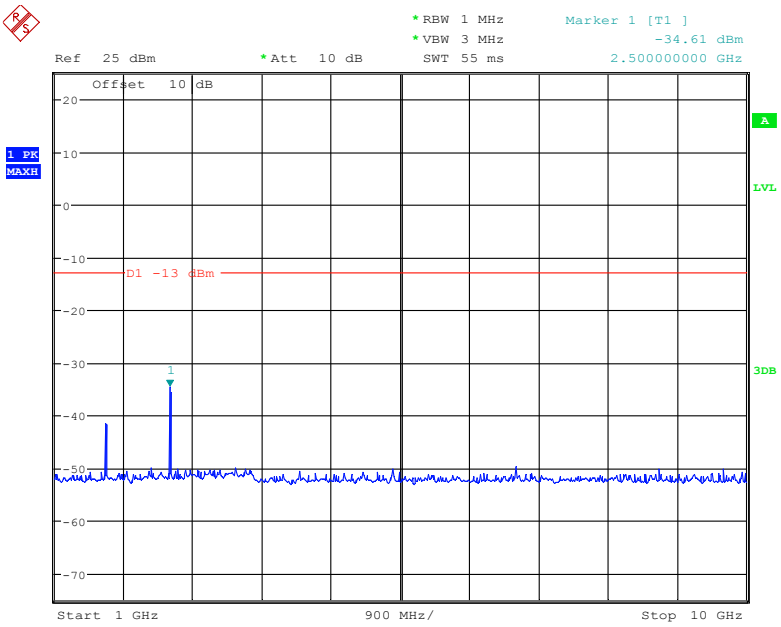
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 21.JUN.2019 21:34:29

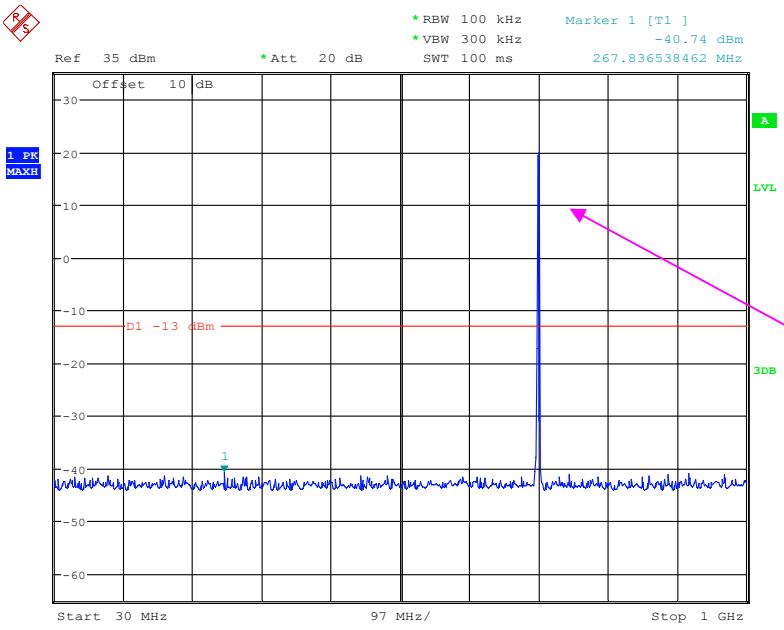
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 21.JUN.2019 21:35:15

LTE Band 12:

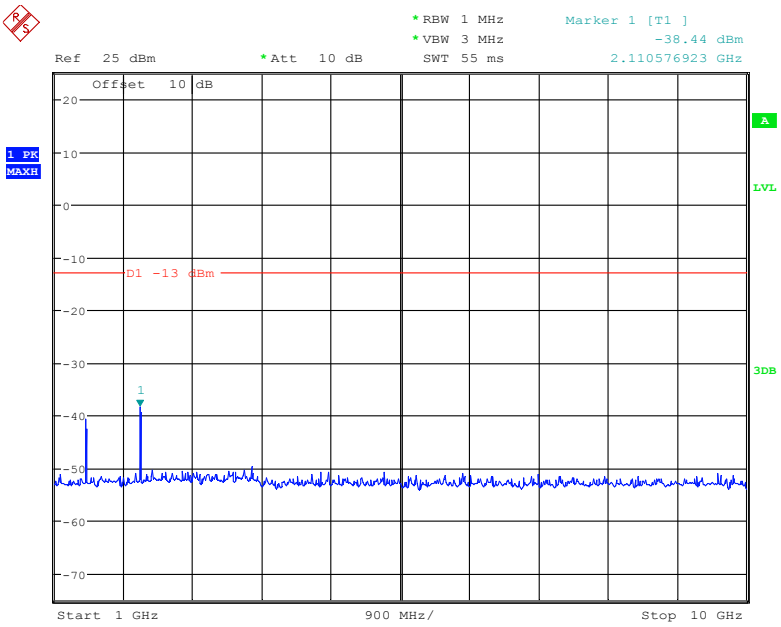
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

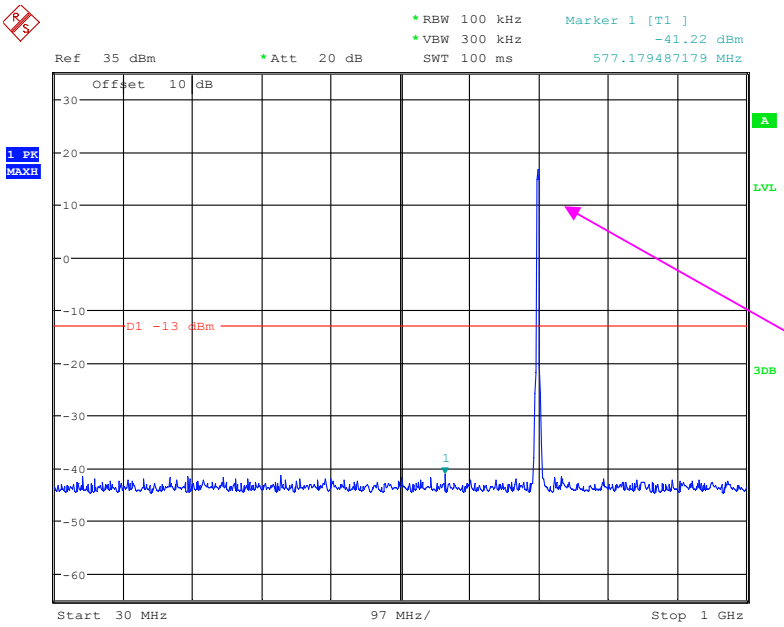
Date: 21.JUN.2019 21:37:41

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



Date: 21.JUN.2019 21:40:19

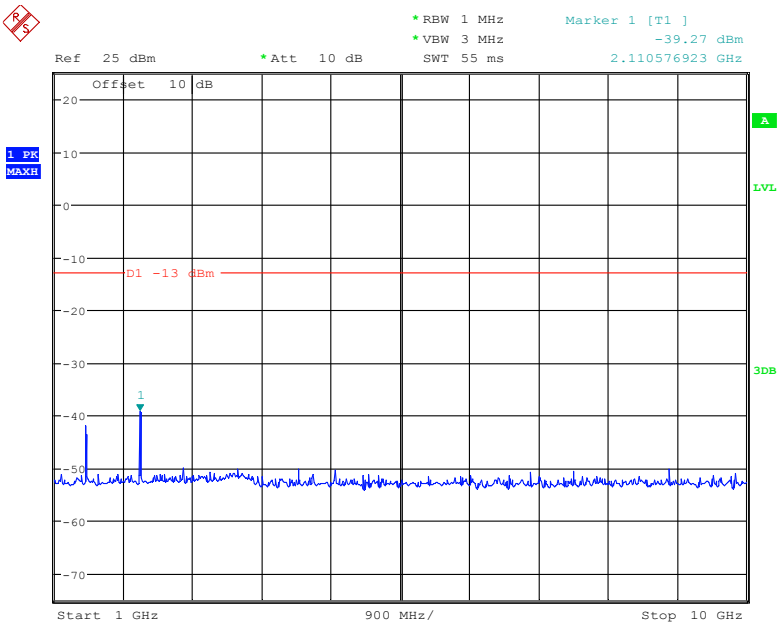
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Fundamental test

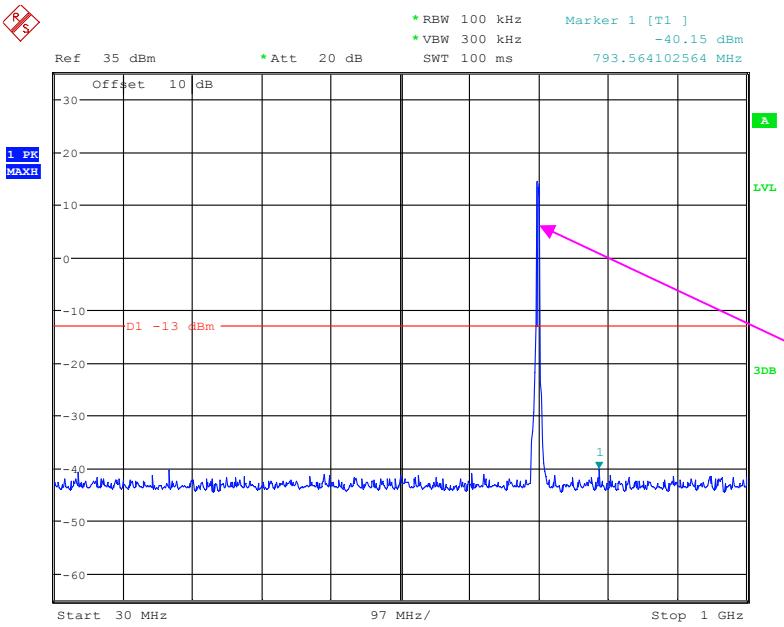
Date: 21.JUN.2019 21:38:12

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



Date: 21.JUN.2019 21:40:09

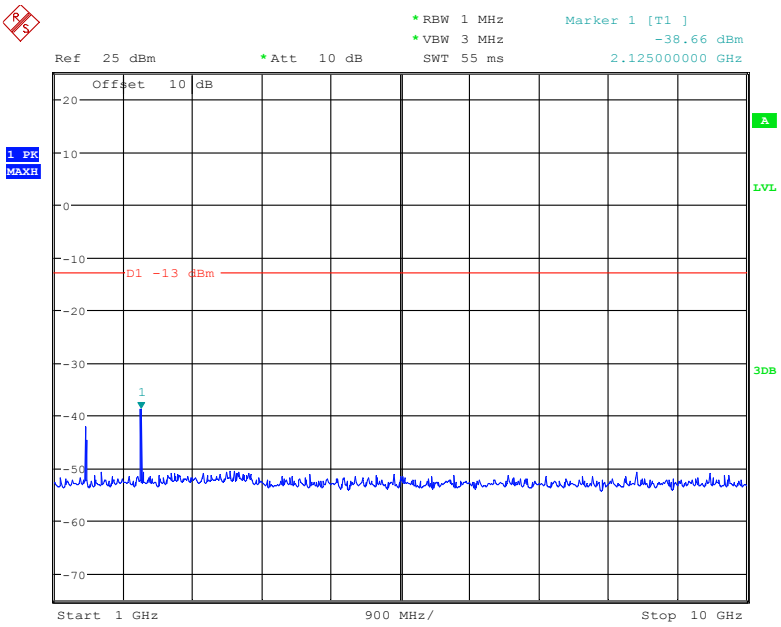
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

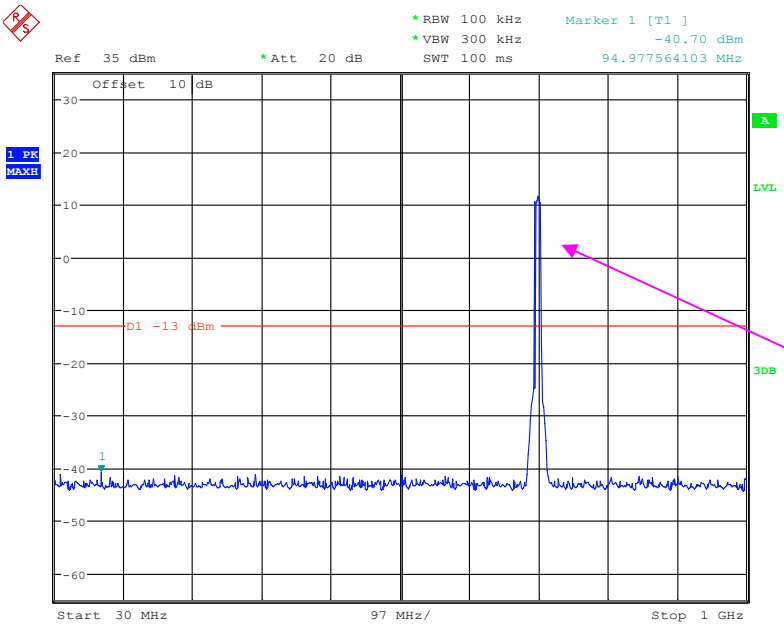
Date: 21.JUN.2019 21:38:47

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



Date: 21.JUN.2019 21:39:59

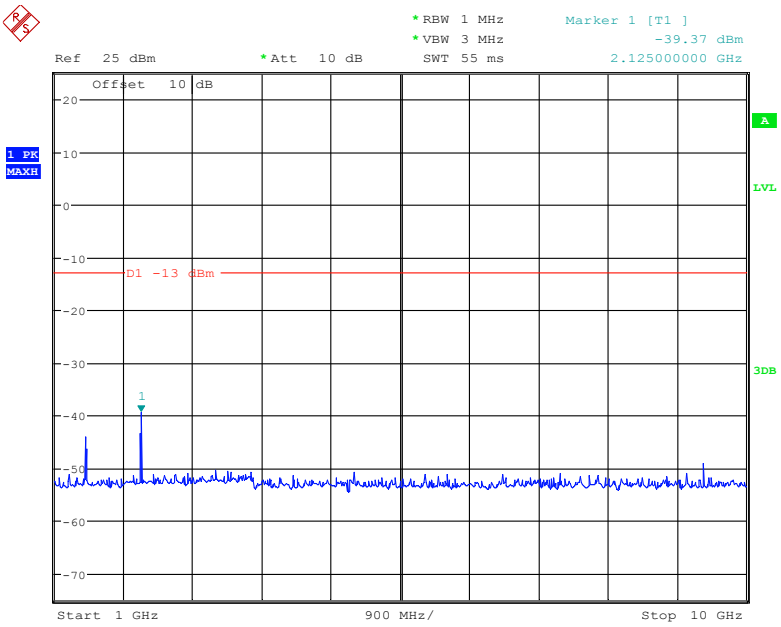
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 21.JUN.2019 21:39:19

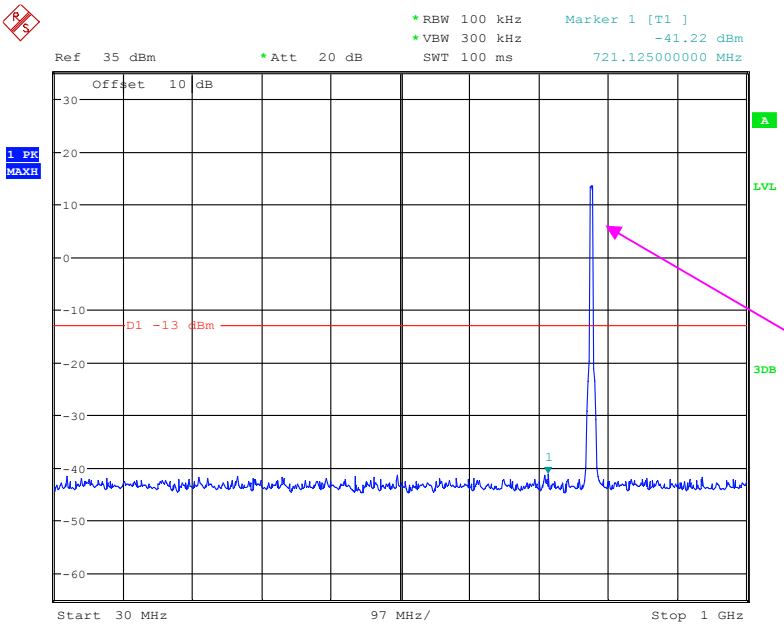
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 21.JUN.2019 21:39:42

LTE Band 13:

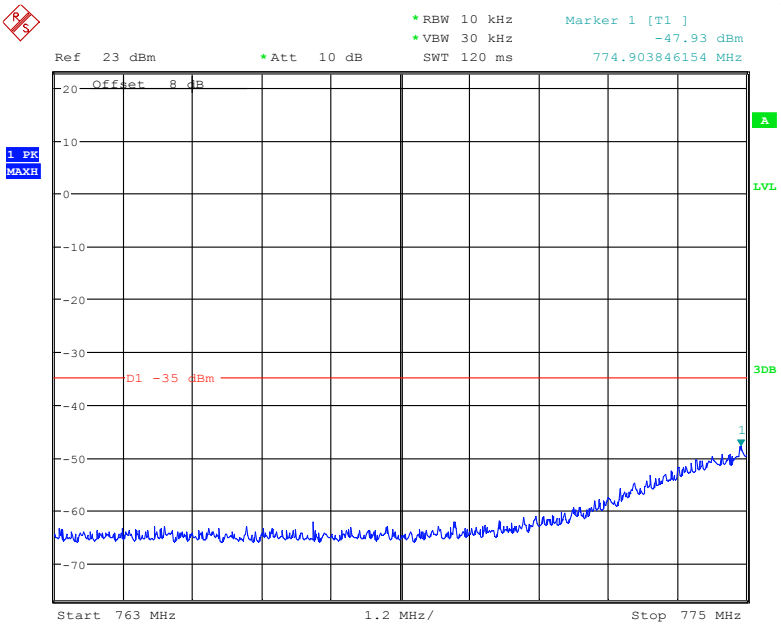
30 MHz – 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

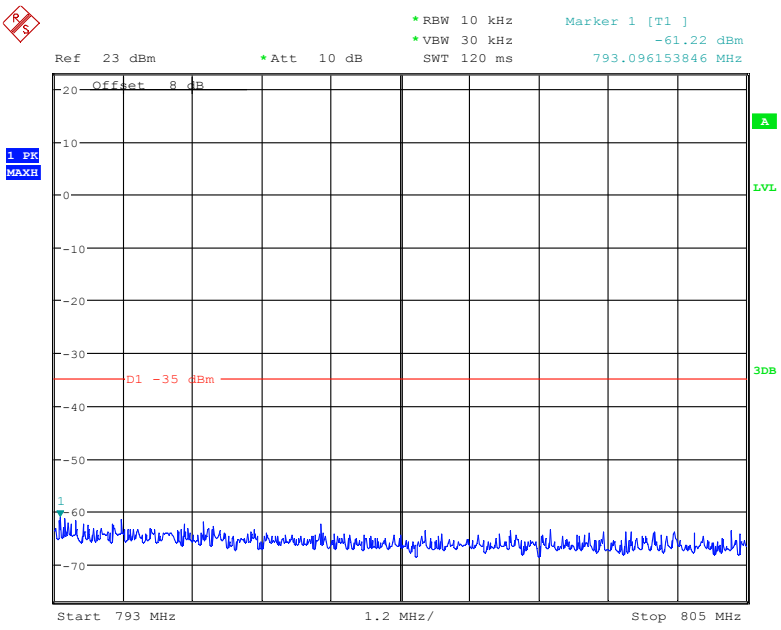
Date: 21.JUN.2019 22:02:45

763 MHz – 775 MHz (5.0 MHz, Middle Channel)



Date: 11.SEP.2019 18:51:31

793 MHz – 805 MHz (5.0 MHz, Middle Channel)

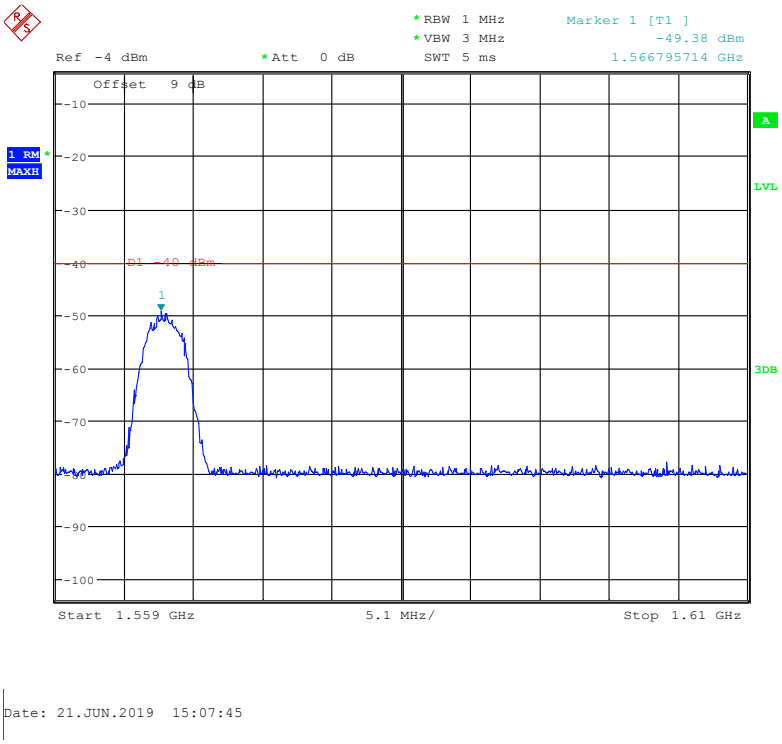


Date: 11.SEP.2019 18:53:20

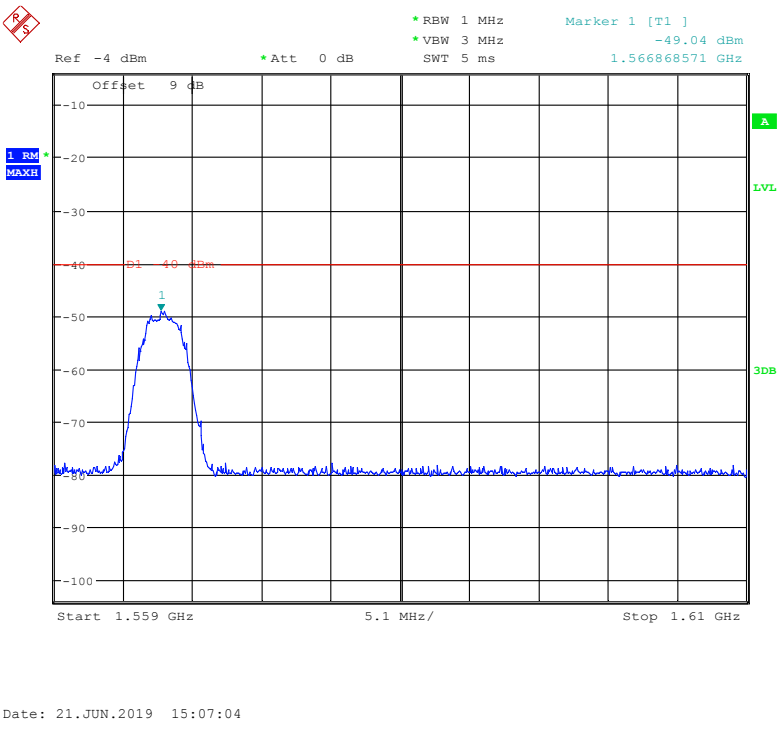
Note: The factor of the RBW from 6.25 kHz to 10 kHz was added in the offset.

Additional band emission (add antenna gain for below two plots):

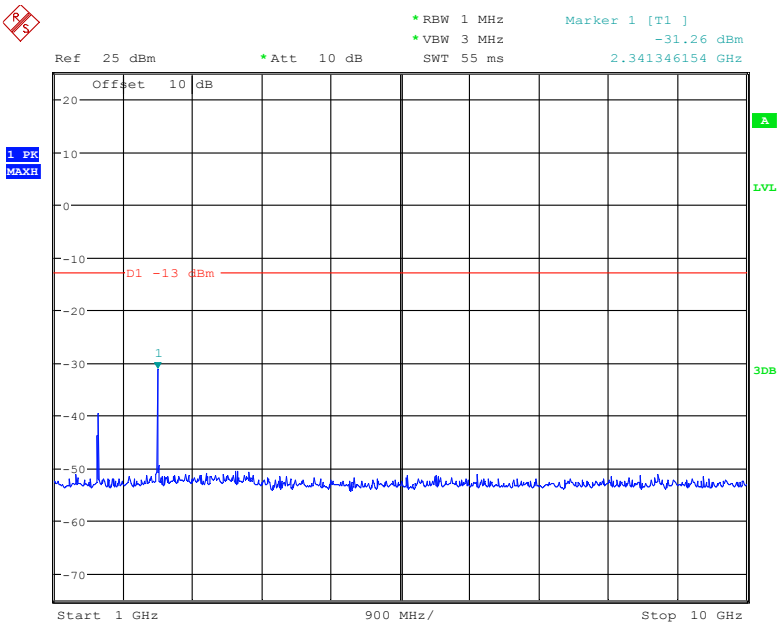
1.559 GHz – 1.61 GHz (5.0 MHz, Middle Channel, 16QAM)



1.559 GHz – 1.61 GHz (5.0 MHz, Middle Channel, QPSK)

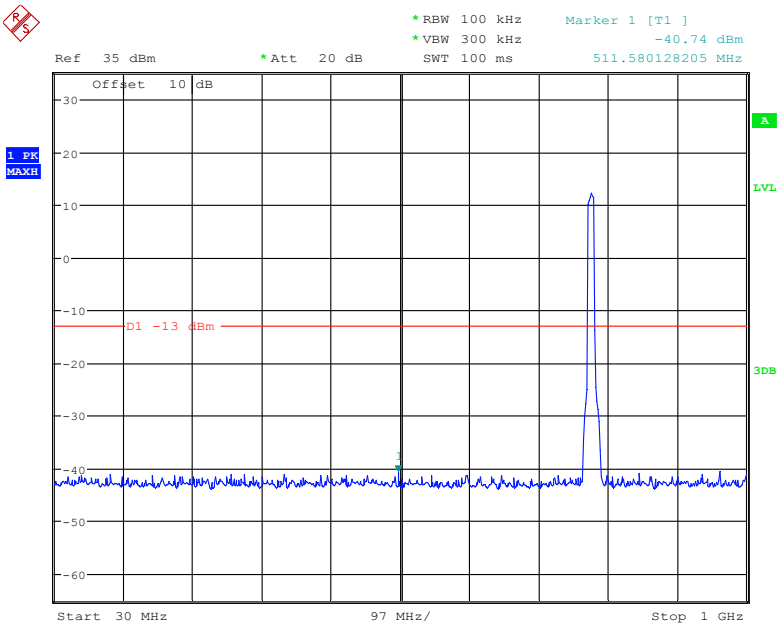


1 GHz – 10.0 GHz (5.0 MHz, Middle Channel)



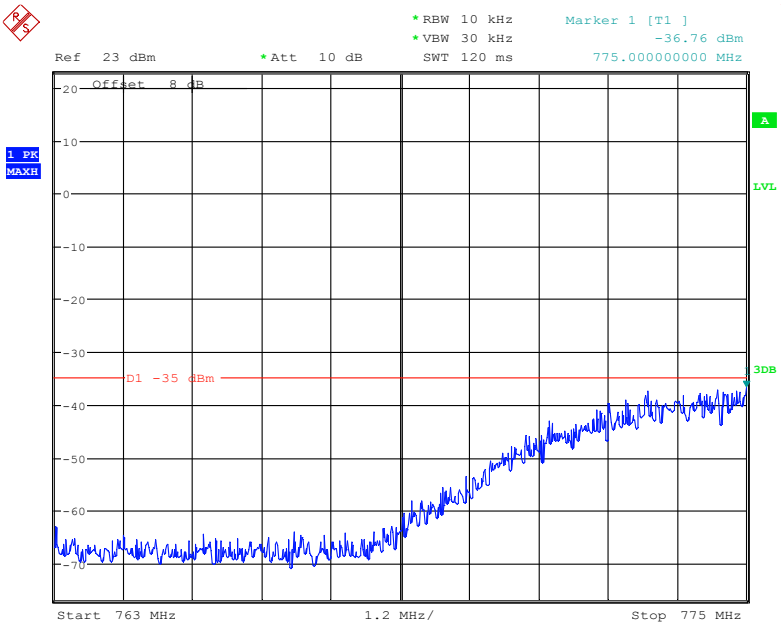
Date: 21.JUN.2019 22:03:08

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



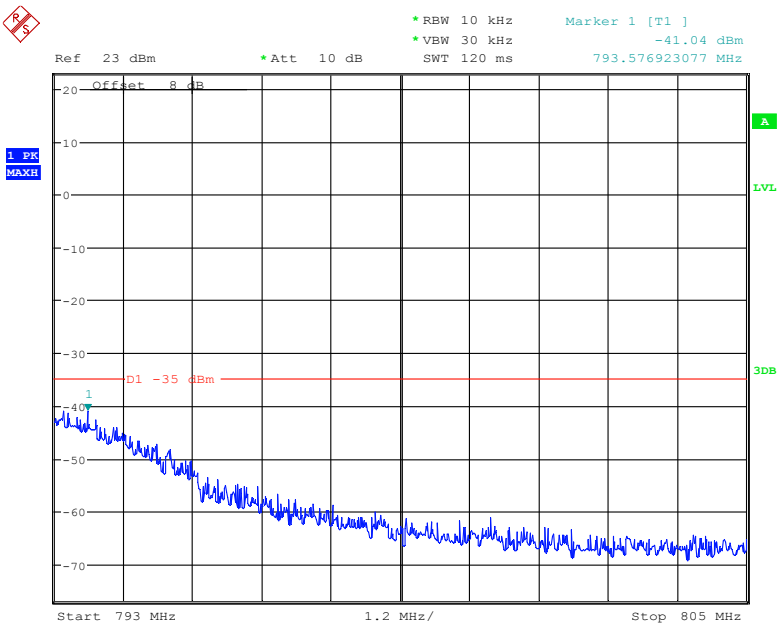
Date: 21.JUN.2019 22:02:26

763 MHz – 775 MHz (10.0 MHz, Middle Channel)



Date: 11.SEP.2019 18:52:17

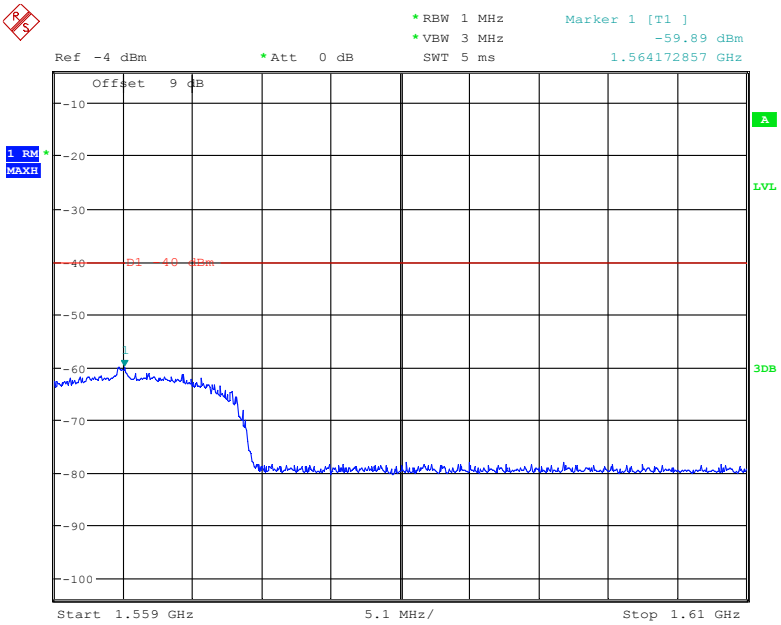
793 MHz – 805 MHz (10.0 MHz, Middle Channel)



Date: 11.SEP.2019 18:53:00

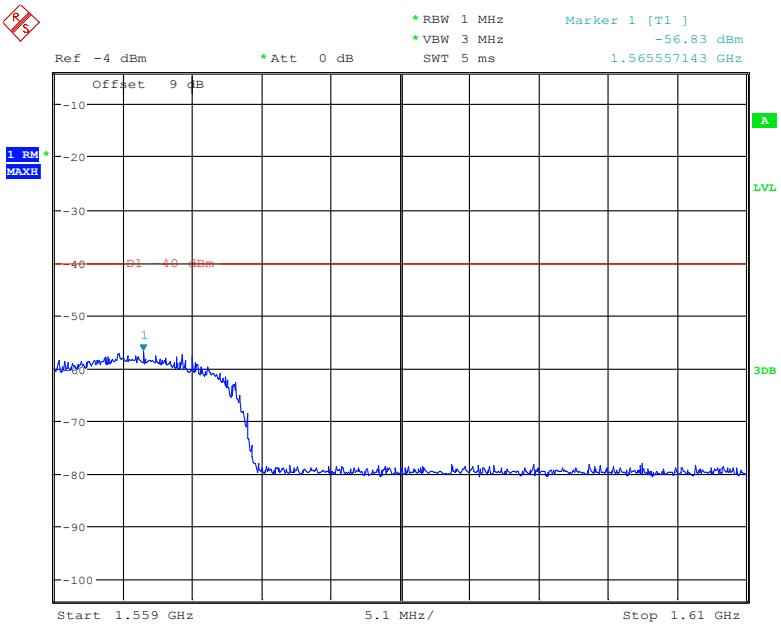
Additional band emission (add antenna gain for belowtwo plots):

1.559 GHz – 1.61 GHz (10.0 MHz, Middle Channel, 16QAM)



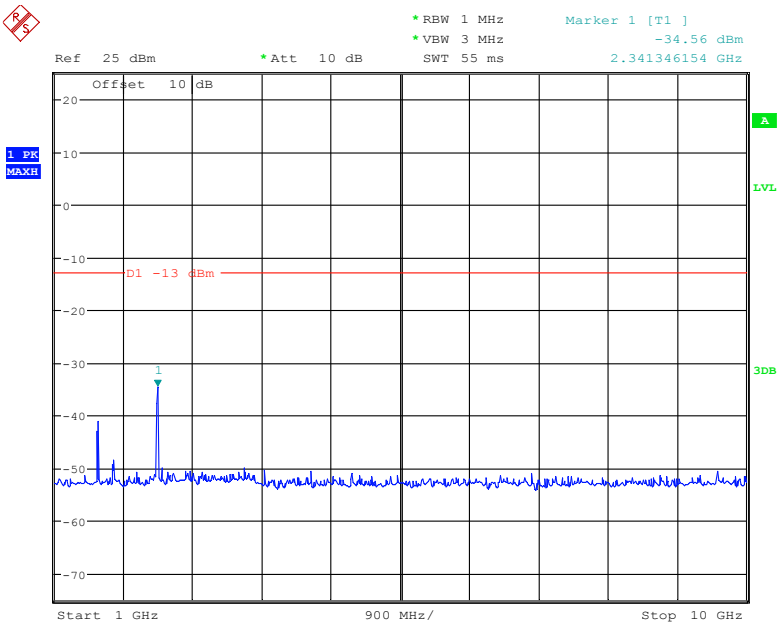
Date: 21.JUN.2019 15:08:25

1.559 GHz – 1.61 GHz (10.0 MHz, Middle Channel, QPSK)



Date: 21.JUN.2019 15:09:08

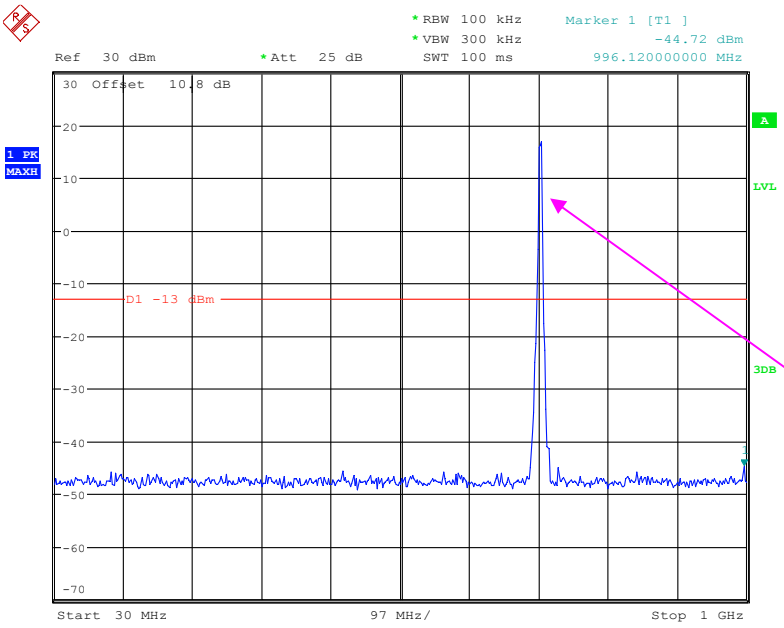
1 GHz – 10.0 GHz (10.0 MHz, Middle Channel)



Date: 21.JUN.2019 22:03:22

LTE Band 17:

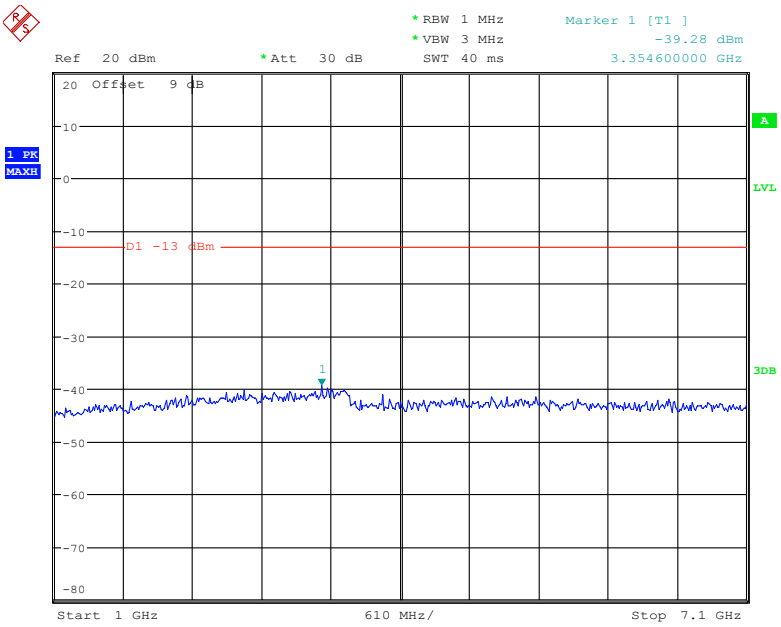
30 MHz – 1.0 GHz (5.0 MHz, Middle Channel)



Fundamental test

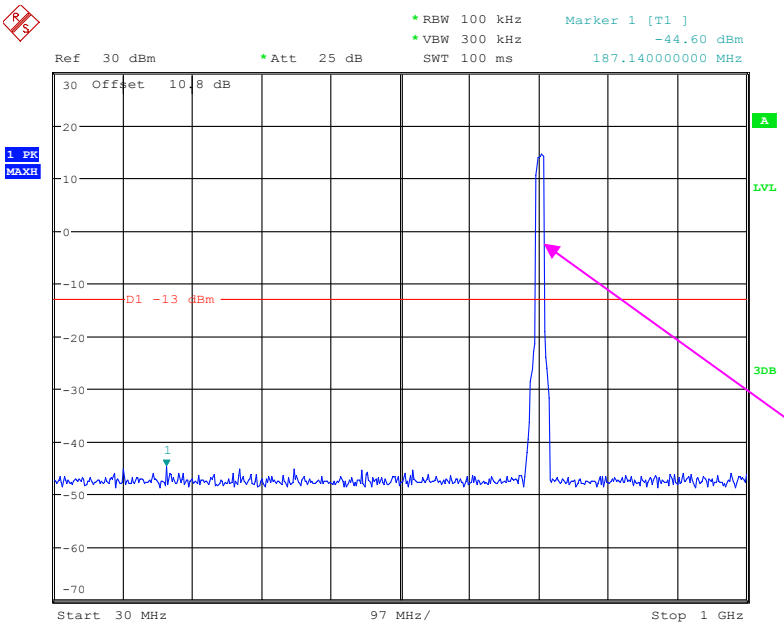
Date: 8.JUL.2019 21:34:09

1 GHz – 7.1GHz (5 MHz, Middle Channel)



Date: 8.JUL.2019 21:34:17

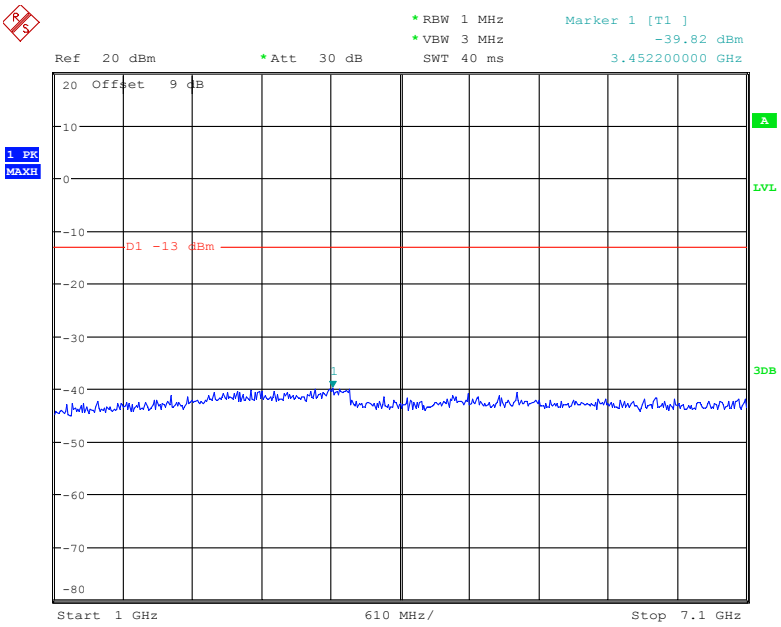
30 MHz – 1.0 GHz (10.0 MHz, Middle Channel)



Fundamental test

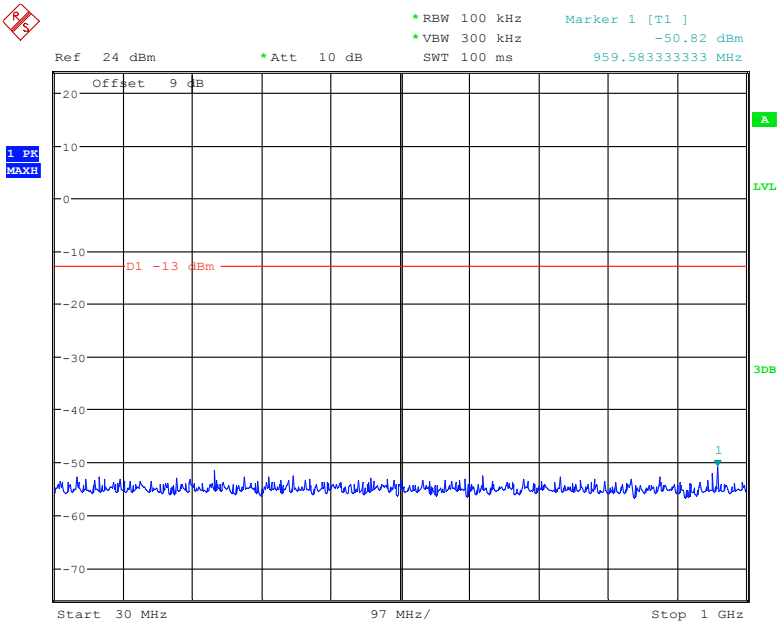
Date: 8.JUL.2019 21:34:36

1 GHz – 7.1 GHz (10.0 MHz, Middle Channel)

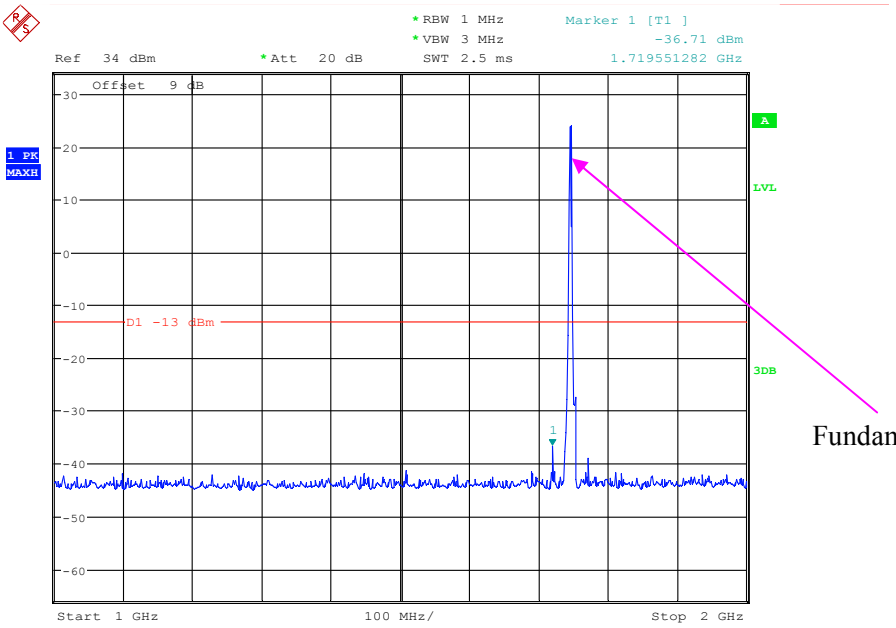


LTE Band 66:

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

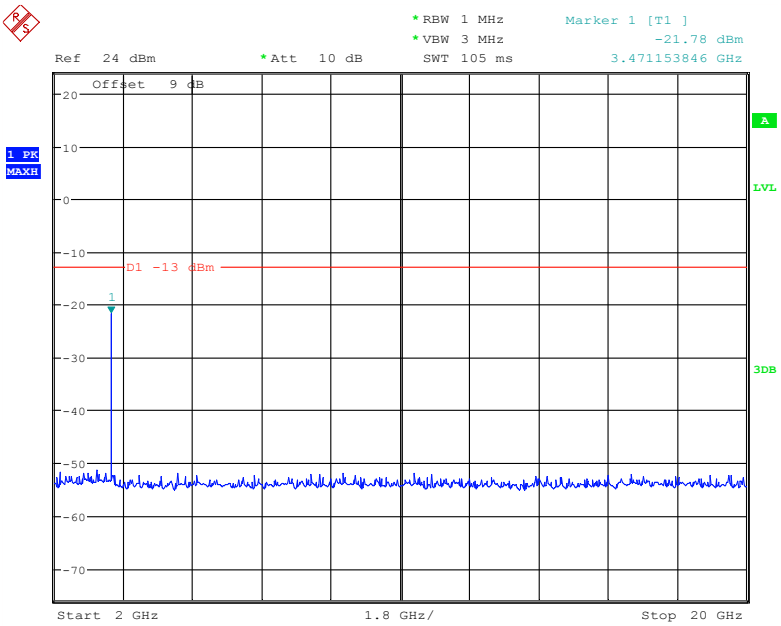


1 GHz – 2 GHz (1.4 MHz, Middle Channel)



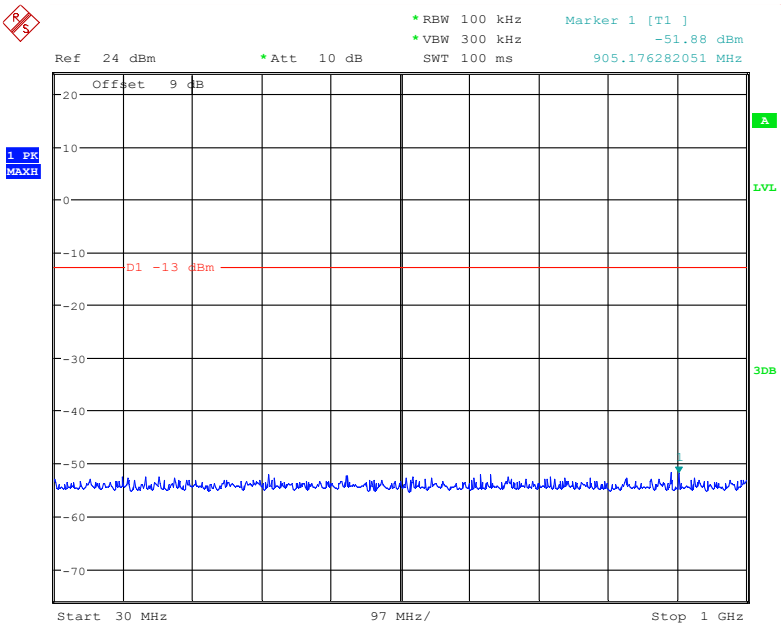
Date: 27.AUG.2019 23:32:39

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



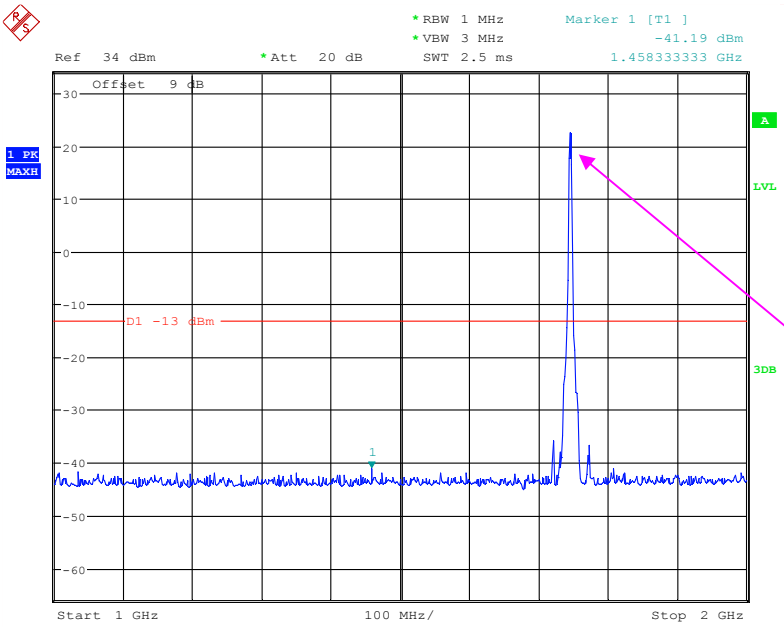
Date: 27.AUG.2019 23:33:10

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



Date: 27.AUG.2019 23:34:08

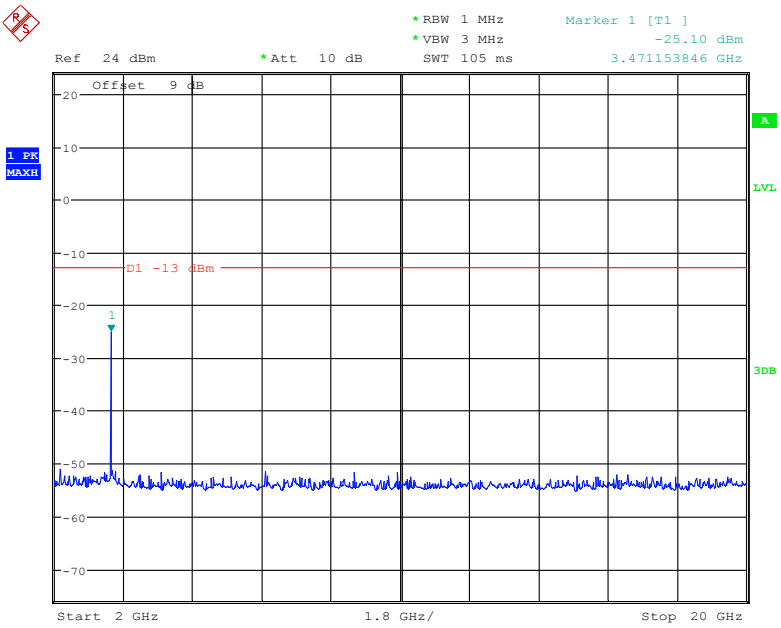
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



Fundamental test

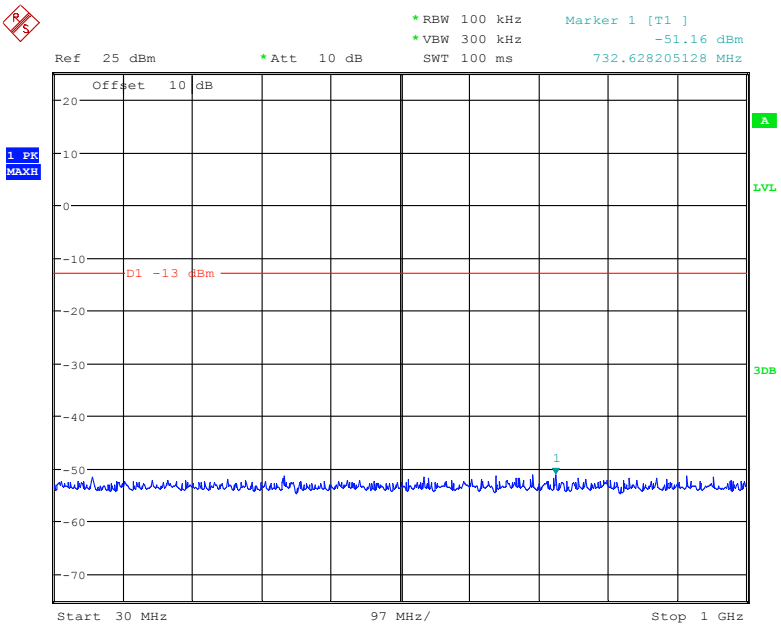
Date: 27.AUG.2019 23:35:15

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



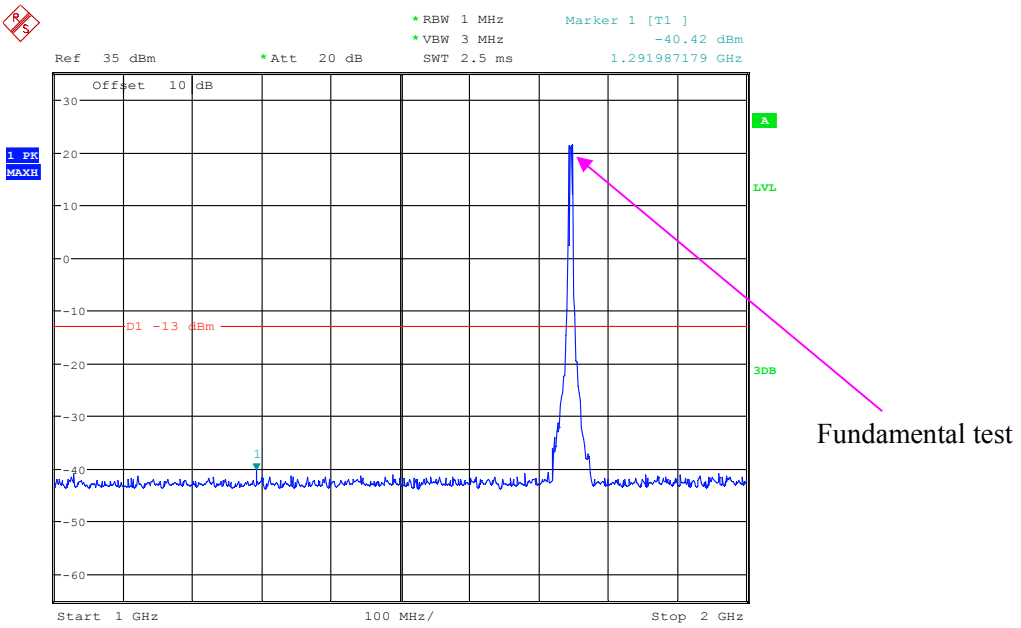
Date: 27.AUG.2019 23:35:31

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



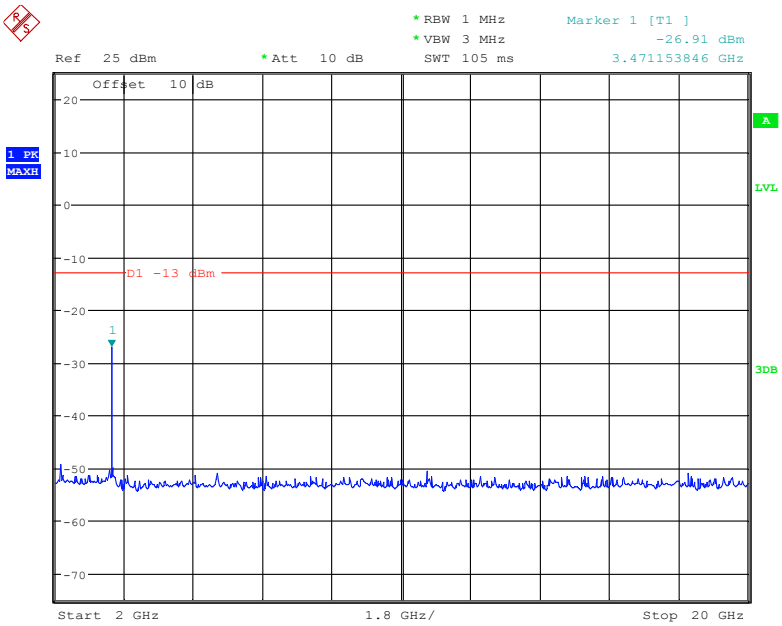
Date: 23.JUN.2019 09:52:00

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



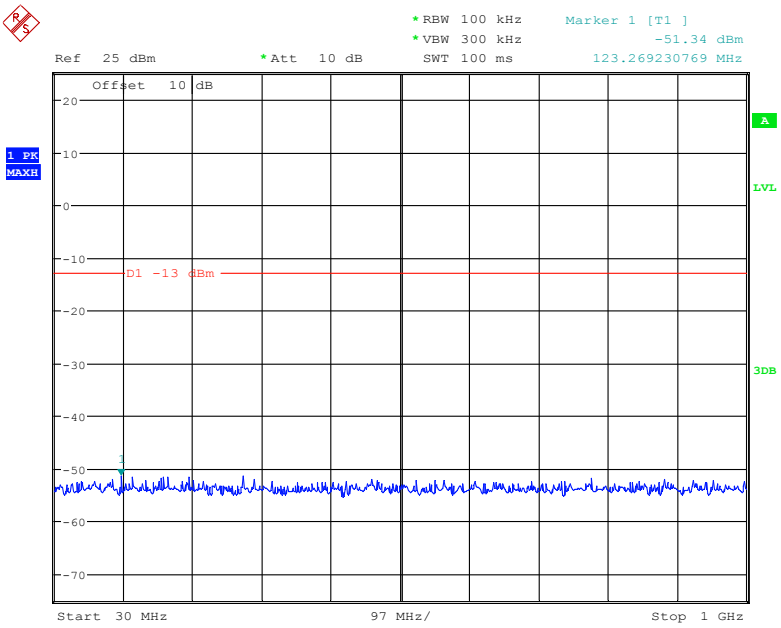
Date: 23.JUN.2019 09:52:35

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



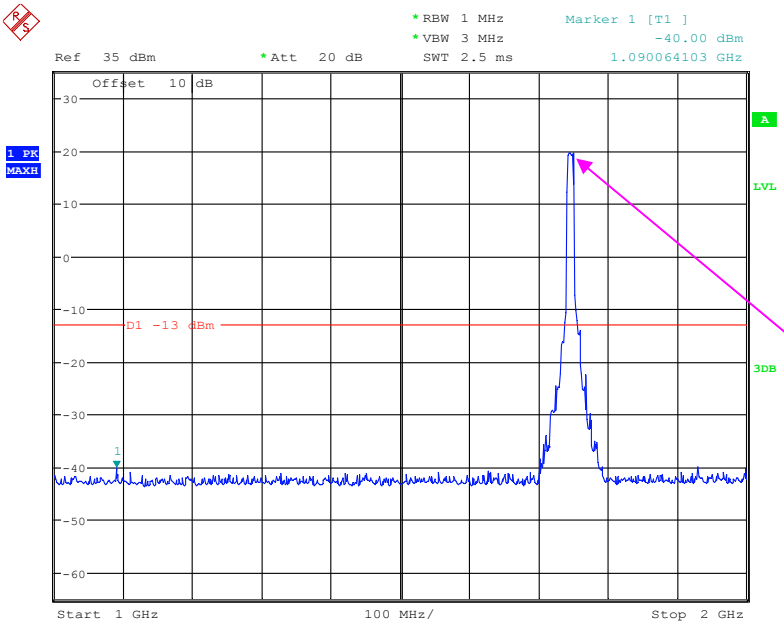
Date: 23.JUN.2019 09:58:53

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



Date: 23.JUN.2019 09:51:37

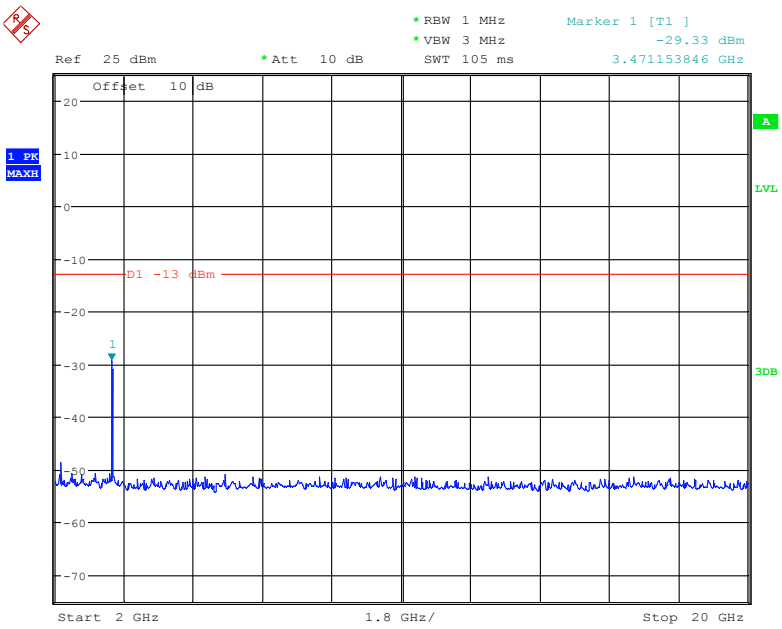
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



Fundamental test

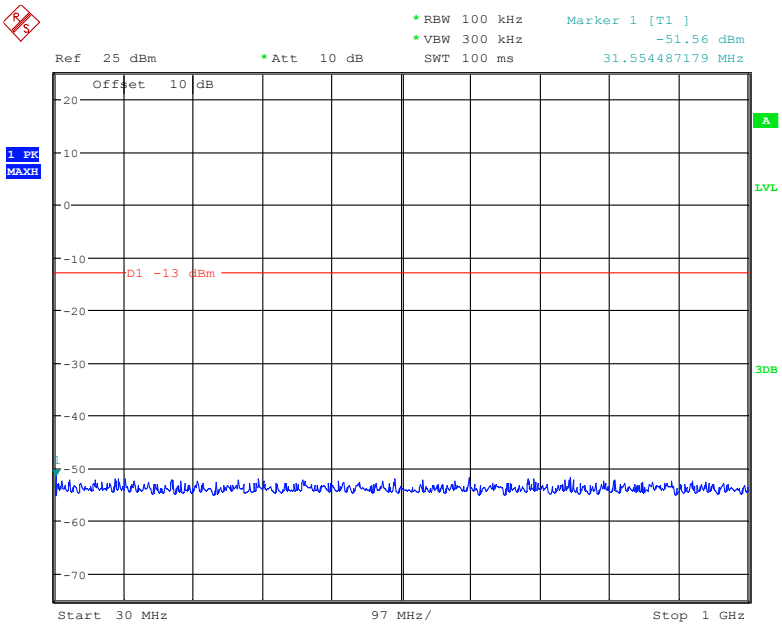
Date: 23.JUN.2019 09:53:03

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



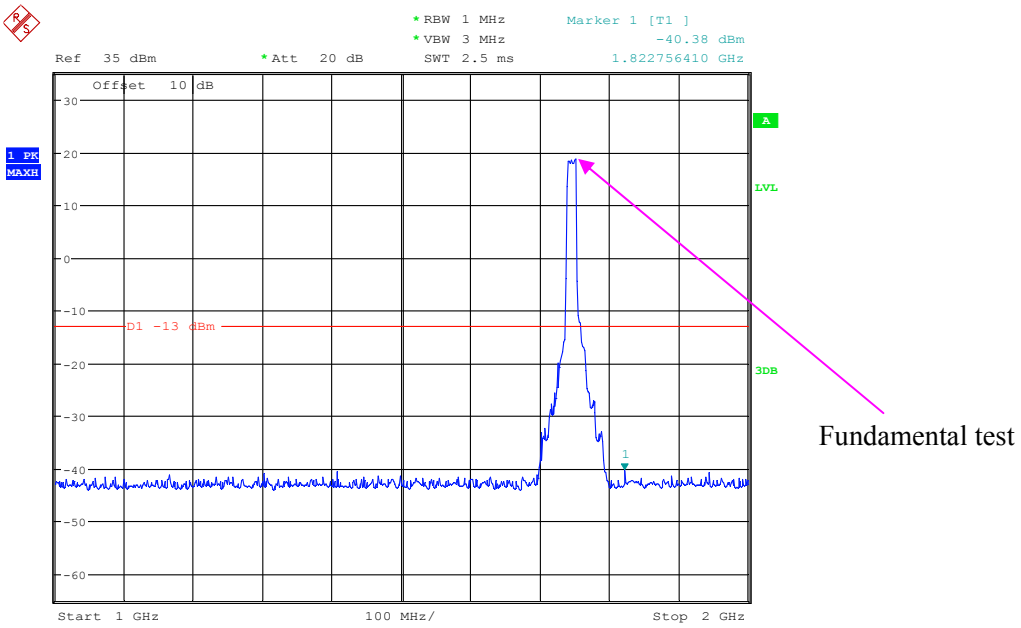
Date: 23.JUN.2019 09:58:37

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



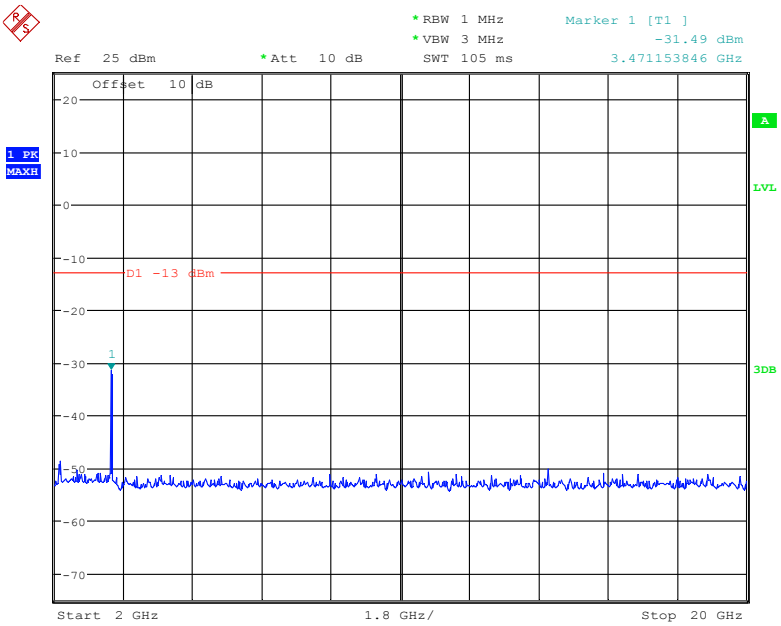
Date: 23.JUN.2019 09:51:21

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



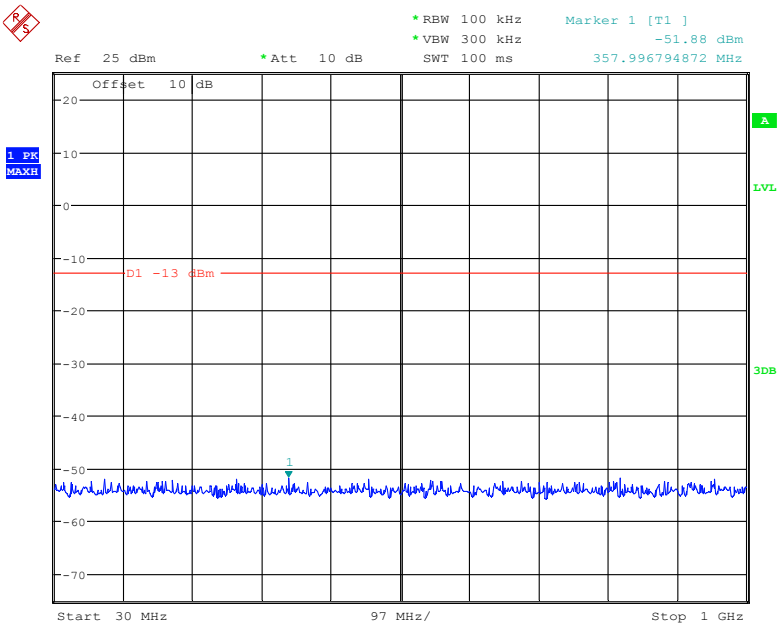
Date: 23.JUN.2019 09:53:21

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



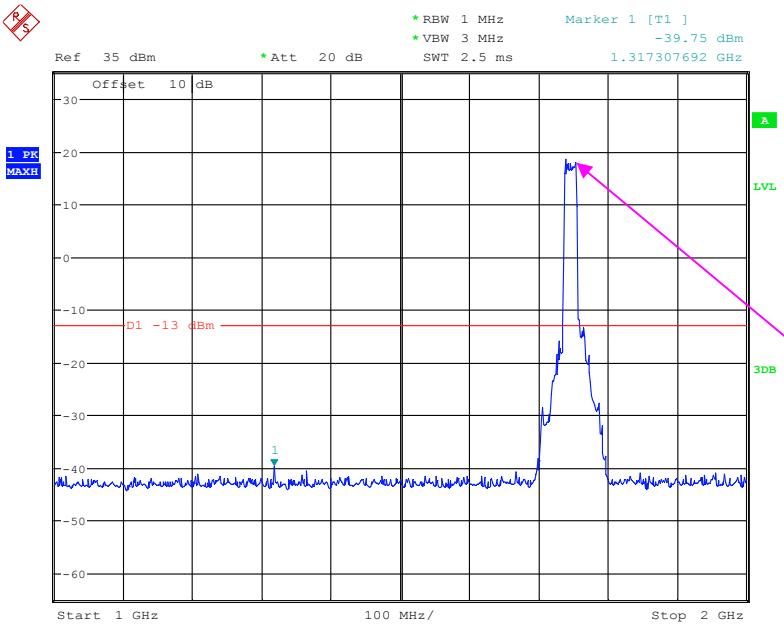
Date: 23.JUN.2019 09:58:24

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



Date: 23.JUN.2019 09:50:42

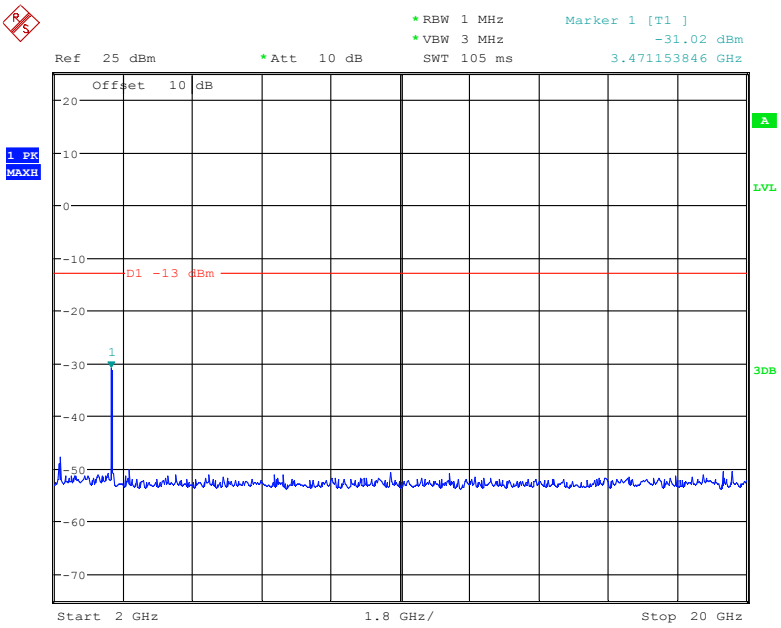
1 GHz – 2 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 23.JUN.2019 09:53:42

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



Date: 23.JUN.2019 09:58:11

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

Applicable Standard

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

Test Procedure

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

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

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

Test Data

Environmental Conditions

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

The testing was performed by Curry Xiang on 2019-08-07.

EUT operation mode: Transmitting

Pre-scan with Low, Middle and High channel, the worst case as below:

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
396.1	34.9	60	2.2	H	-64.6	1.08	0.0	-65.68	-13	52.68
396.1	33.77	139	2.2	V	-64.5	1.08	0.0	-65.58	-13	52.58
1673.20	58.82	241	2.0	H	-47.5	1.30	8.90	-39.90	-13	26.90
1673.20	56.66	143	1.2	V	-49.1	1.30	8.90	-41.50	-13	28.50
2509.80	49.05	295	1.3	H	-54.3	2.60	10.20	-46.70	-13	33.70
2509.80	52.20	328	1.3	V	-50.5	2.60	10.20	-42.90	-13	29.90
3346.40	42.70	12	1.3	H	-58.2	1.50	11.70	-48.00	-13	35.00
3346.40	44.16	82	1.4	V	-56.8	1.50	11.70	-46.60	-13	33.60
WCDMA Mode, Middle channel										
367.1	32.6	327	1.3	H	-66.9	1.08	0.0	-67.98	-13	54.98
367.1	33.17	308	2.1	V	-65.1	1.08	0.0	-66.18	-13	53.18
1673.20	46.11	153	1.3	H	-60.2	1.30	8.90	-52.60	-13	39.60
1673.20	46.73	4	1.8	V	-59.0	1.30	8.90	-51.40	-13	38.40
2509.80	51.75	292	1.3	H	-51.6	2.60	10.20	-44.00	-13	31.00
2509.80	51.01	226	1.7	V	-51.7	2.60	10.20	-44.10	-13	31.10
3346.40	43.54	335	1.4	H	-57.4	1.50	11.70	-47.20	-13	34.20
3346.40	43.11	19	2.0	V	-57.8	1.50	11.70	-47.60	-13	34.60

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
396.1	34.74	72	1.6	H	-64.8	1.08	0.0	-65.88	-13	52.88
396.1	33.91	254	1.4	V	-64.4	1.08	0.0	-65.48	-13	52.48
3760.00	44.20	282	2.5	H	-57.9	1.50	11.80	-47.60	-13	34.60
3760.00	45.25	328	1.1	V	-56.3	1.50	11.80	-46.00	-13	33.00
WCDMA Mode Band II, Middle channel										
367.1	33.46	235	1.8	H	-66.1	1.08	0.0	-67.18	-13	54.18
367.1	33.2	4	1.5	V	-65.1	1.08	0.0	-66.18	-13	53.18
3760.00	44.83	225	1.7	H	-57.2	1.50	11.80	-46.90	-13	33.90
3760.00	43.99	268	1.1	V	-57.6	1.50	11.80	-47.30	-13	34.30

30 MHz ~ 20 GHz:

AWS Band (Part 27)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
WCDMA Mode Band IV, Middle channel										
367.1	32.81	290	1.2	H	-66.7	1.08	0.0	-67.78	-13	54.78
367.1	33.04	128	1.5	V	-65.3	1.08	0.0	-66.38	-13	53.38
3465.00	43.82	247	1.4	H	-56.9	1.50	12.00	-46.40	-13	33.40
3465.00	43.32	101	2.3	V	-58.2	1.50	12.00	-47.70	-13	34.70

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
Band 2										
Test frequency range:30 MHz ~ 20 GHz										
360.5	32.15	119	2.5	H	-67.4	1.08	0.0	-68.48	-13	55.48
360.5	32.87	322	1.5	V	-65.4	1.08	0.0	-66.48	-13	53.48
3760.00	43.77	36	2.0	H	-58.3	1.50	11.80	-48.00	-13	35.00
3760.00	43.57	66	2.0	V	-58.0	1.50	11.80	-47.70	-13	34.70
Band 4										
Test frequency range:30 MHz ~ 20 GHz										
360.5	32.71	120	1.3	H	-66.8	1.08	0.0	-67.88	-13	54.88
360.5	32.24	298	1.7	V	-66.1	1.08	0.0	-67.18	-13	54.18
3465.00	44.12	223	1.1	H	-56.6	1.50	12.00	-46.10	-13	33.10
3465.00	44.97	193	1.9	V	-56.5	1.50	12.00	-46.00	-13	33.00
Band 5										
Test frequency range:30 MHz ~ 10 GHz										
360.5	33.02	348	1.2	H	-66.5	1.08	0.0	-67.58	-13	54.58
360.5	32.26	214	1.3	V	-66.0	1.08	0.0	-67.08	-13	54.08
1673.00	48.06	294	1.2	H	-58.3	1.30	8.90	-50.70	-13	37.70
1673.00	46.60	196	1.5	V	-59.1	1.30	8.90	-51.50	-13	38.50
2509.50	45.28	63	1.4	H	-58.1	2.60	10.20	-50.50	-13	37.50
2509.50	46.22	319	2.5	V	-56.5	2.60	10.20	-48.90	-13	35.90
3346.00	42.97	343	2.3	H	-57.9	1.50	11.70	-47.70	-13	34.70
3346.00	43.10	11	2.1	V	-57.8	1.50	11.70	-47.60	-13	34.60
Band 12										
Test frequency range: 30 MHz ~ 10GHz										
360.5	33.48	114	1.5	H	-66.0	1.08	0.0	-67.08	-13	54.08
360.5	33.59	65	2.2	V	-64.7	1.08	0.0	-65.78	-13	52.78
1415.00	42.26	101	1.2	H	-65.9	1.60	7.90	-59.60	-13	46.60
1415.00	42.77	189	1.3	V	-65.7	1.60	7.90	-59.40	-13	46.40
2122.50	42.85	33	1.7	H	-58.3	1.30	9.70	-49.90	-13	36.90
2122.50	43.87	352	1.1	V	-58.1	1.30	9.70	-49.70	-13	36.70
2830.00	43.12	112	1.3	H	-60.8	1.80	10.50	-52.10	-13	39.10
2830.00	42.60	268	1.1	V	-61.0	1.80	10.50	-52.30	-13	39.30
3537.50	42.72	339	1.0	H	-58.2	1.50	12.00	-47.70	-13	34.70
3537.50	43.16	117	1.6	V	-58.5	1.50	12.00	-48.00	-13	35.00

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
Band 13										
Test frequency range:30 MHz ~ 10 GHz										
360.5	33.91	115	2.4	H	-65.6	1.08	0.0	-66.68	-13	53.68
360.5	33.68	26	1.1	V	-64.6	1.08	0.0	-65.68	-13	52.68
1564.00	43.44	10	1.3	H	-64.6	1.40	8.70	-57.30	-40	17.30
1564.00	43.61	153	1.0	V	-64.2	1.40	8.70	-56.90	-40	16.90
2346.00	42.23	84	1.5	H	-63.0	1.30	10.00	-54.30	-13	41.30
2346.00	42.38	166	1.6	V	-62.8	1.30	10.00	-54.10	-13	41.10
3128.00	43.32	327	1.5	H	-58.3	1.70	11.30	-48.70	-13	35.70
3128.00	42.95	114	1.1	V	-58.5	1.70	11.30	-48.90	-13	35.90
3910.00	43.67	120	2.5	H	-58.2	1.60	11.90	-47.90	-13	34.90
3910.00	43.20	163	1.0	V	-58.6	1.60	11.90	-48.30	-13	35.30
Band 17										
Test frequency range: 30 MHz ~ 10GHz										
360.5	33.98	301	1.0	H	-65.5	1.08	0.0	-66.58	-13	53.58
360.5	33.31	220	1.6	V	-65.0	1.08	0.0	-66.08	-13	53.08
1420.00	43.10	353	2.4	H	-65.1	1.60	7.90	-58.80	-13	45.80
1420.00	44.64	29	2.0	V	-63.8	1.60	7.90	-57.50	-13	44.50
2130.00	42.56	358	1.9	H	-58.6	1.30	9.70	-50.20	-13	37.20
2130.00	43.03	30	1.9	V	-58.9	1.30	9.70	-50.50	-13	37.50
2840.00	43.51	63	2.4	H	-60.4	1.80	10.50	-51.70	-13	38.70
2840.00	43.05	316	1.5	V	-60.6	1.80	10.50	-51.90	-13	38.90
3550.00	43.23	244	2.3	H	-58.5	1.50	12.10	-47.90	-13	34.90
3550.00	43.51	350	1.5	V	-57.7	1.50	12.10	-47.10	-13	34.10
Band 66										
Test frequency range: 30 MHz ~ 20GHz										
360.5	34.11	39	2.1	H	-65.4	1.08	0.0	-66.48	-13	53.48
360.5	33.7	344	1.8	V	-64.6	1.08	0.0	-65.68	-13	52.68
3490.00	42.69	133	2.2	H	-58.1	1.50	12.00	-47.60	-13	34.60
3490.00	43.53	285	1.1	V	-58.0	1.50	12.00	-47.50	-13	34.50

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

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

Applicable Standard

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

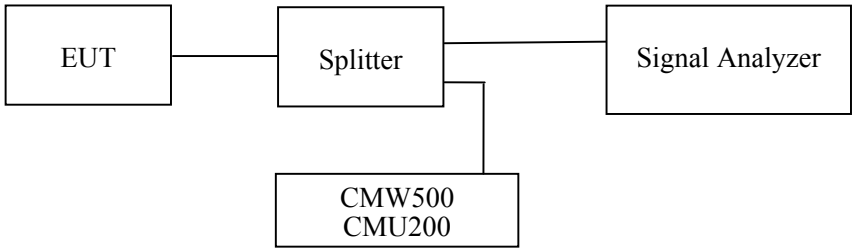
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

Test Procedure

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

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



Test Data

Environmental Conditions

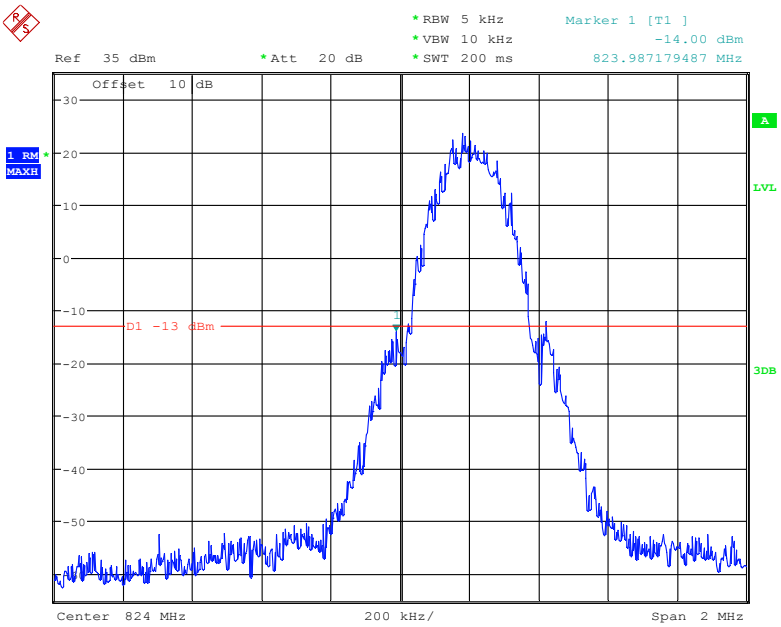
Temperature:	24~25 ℃
Relative Humidity:	50~56 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu from 2019-06-20 to 2019-08-27.

EUT operation mode: Transmitting

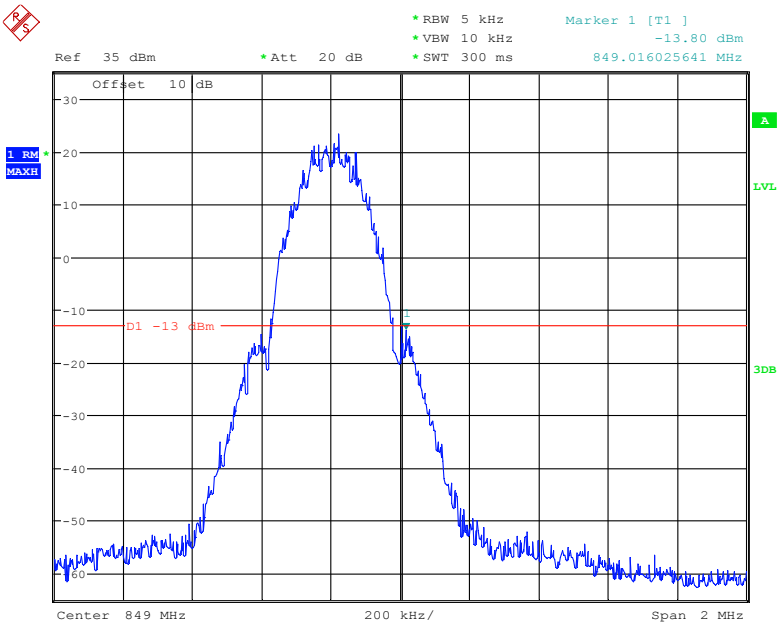
Test Result: Compliance. Please refer to the following plots.

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



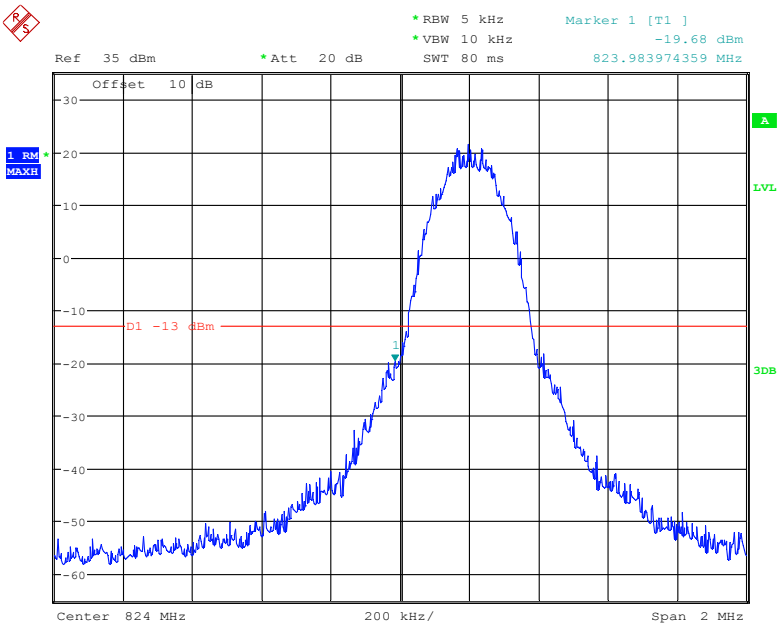
Date: 20.JUN.2019 22:34:28

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



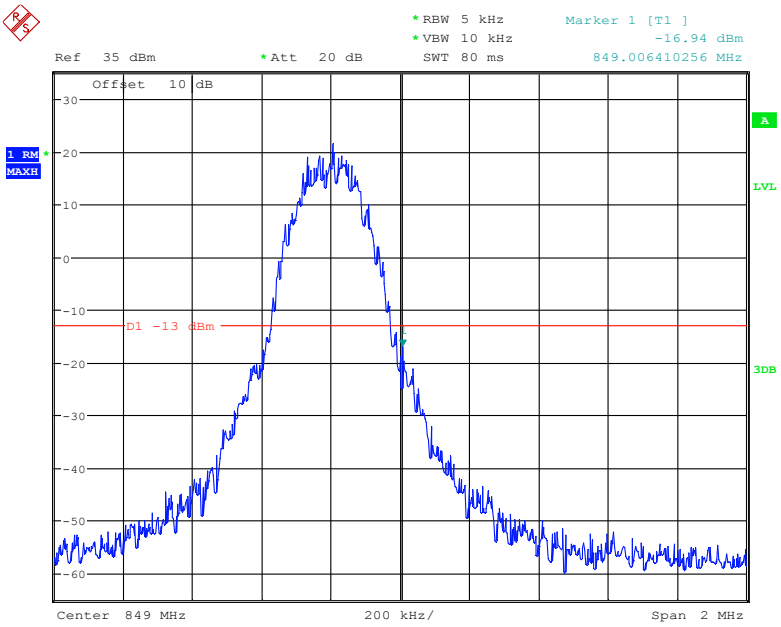
Date: 20.JUN.2019 22:35:22

Cellular Band, Left Band Edge for EDGE Mode



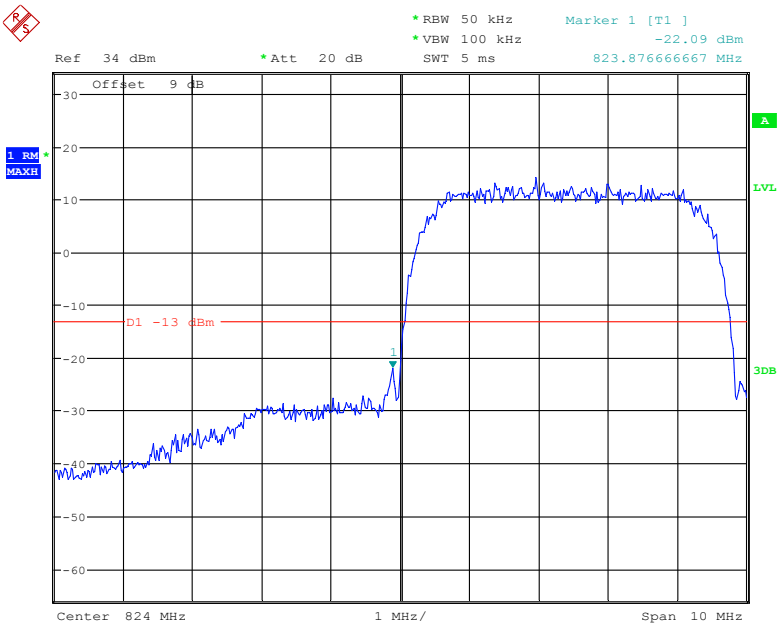
Date: 20.JUN.2019 22:44:22

Cellular Band, Right Band Edge for EDGE Mode



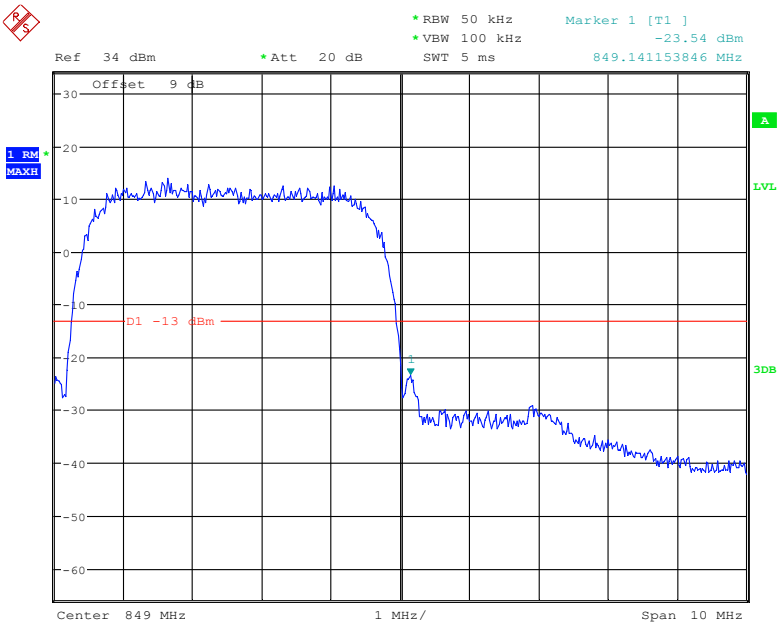
Date: 20.JUN.2019 22:44:51

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



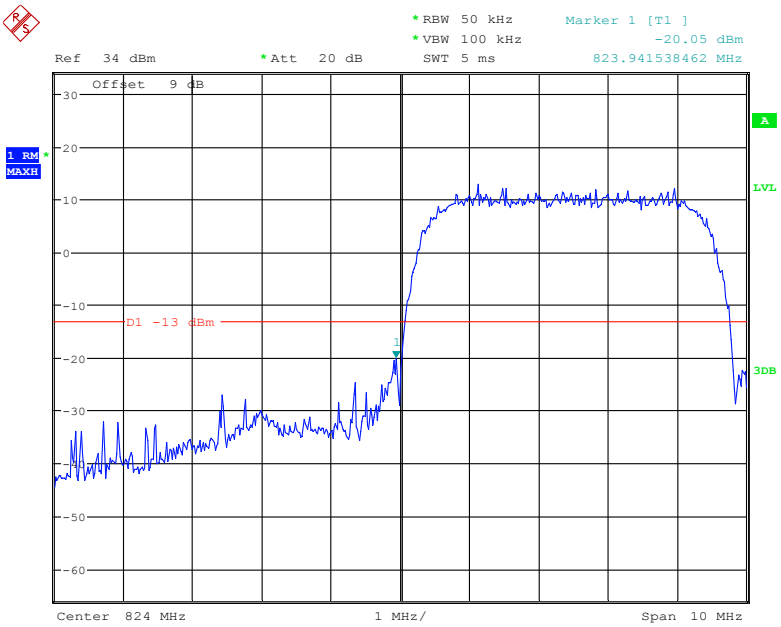
Date: 8.JUL.2019 23:21:15

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



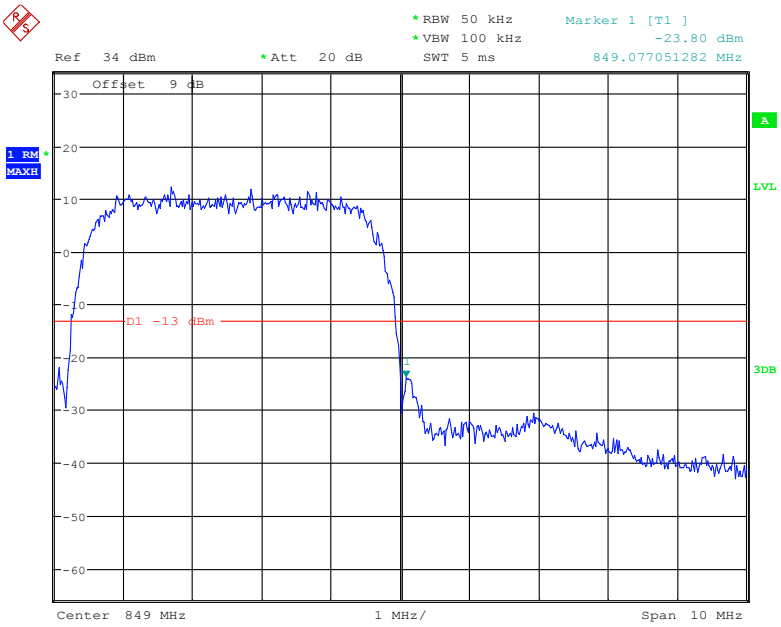
Date: 8.JUL.2019 23:23:05

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



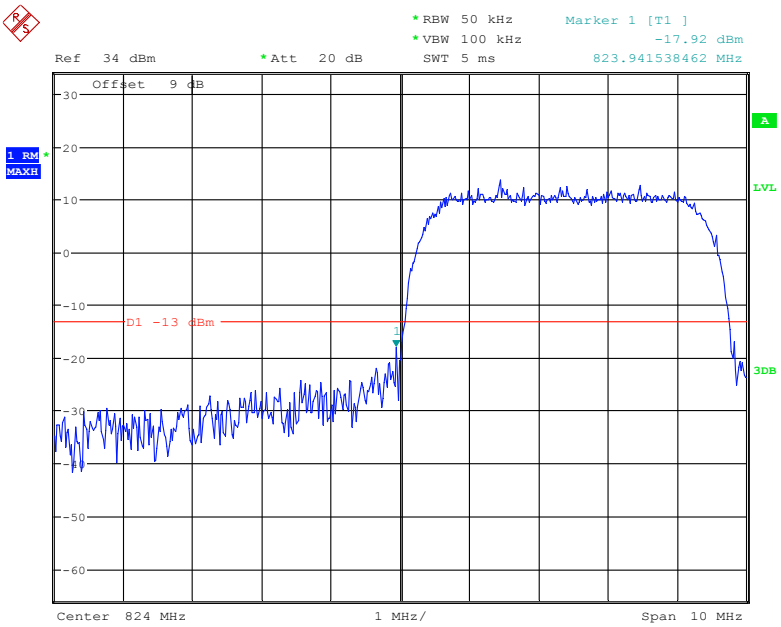
Date: 8.JUL.2019 23:26:13

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



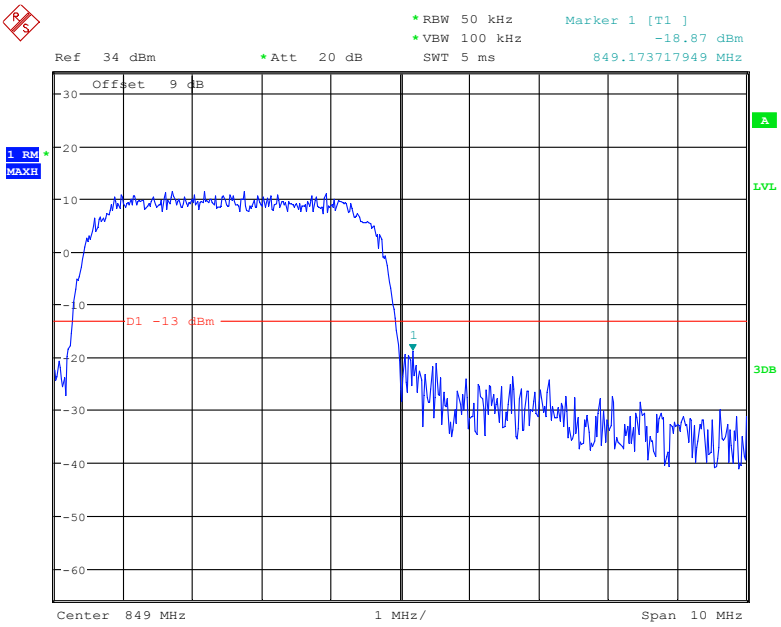
Date: 8.JUL.2019 23:25:52

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



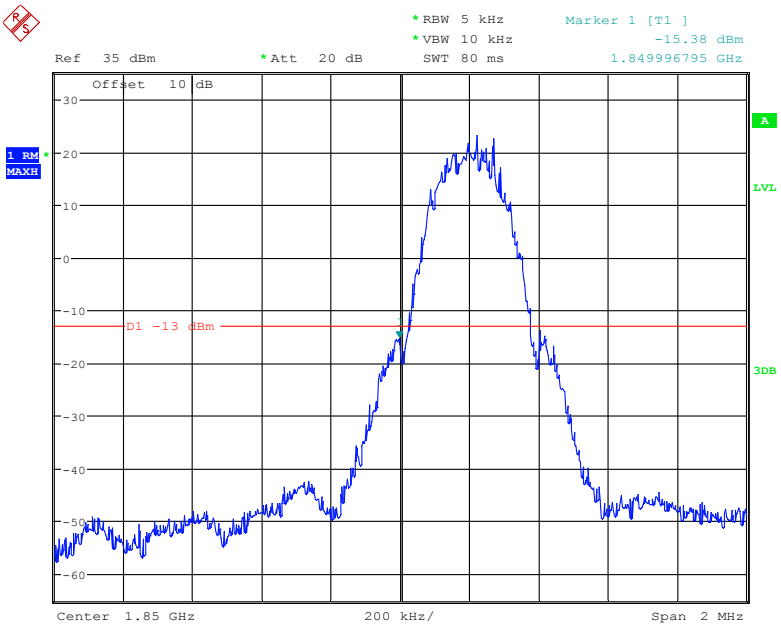
Date: 8.JUL.2019 23:27:00

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



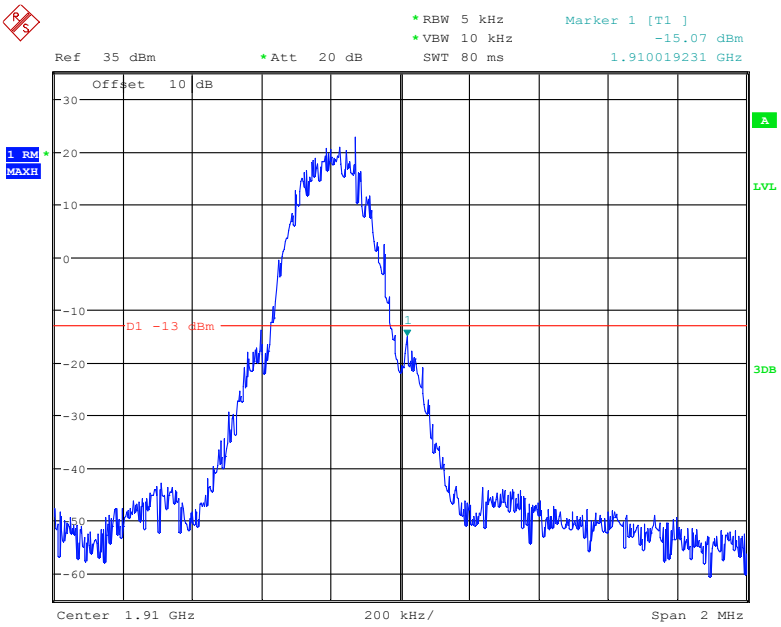
Date: 8.JUL.2019 23:27:30

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



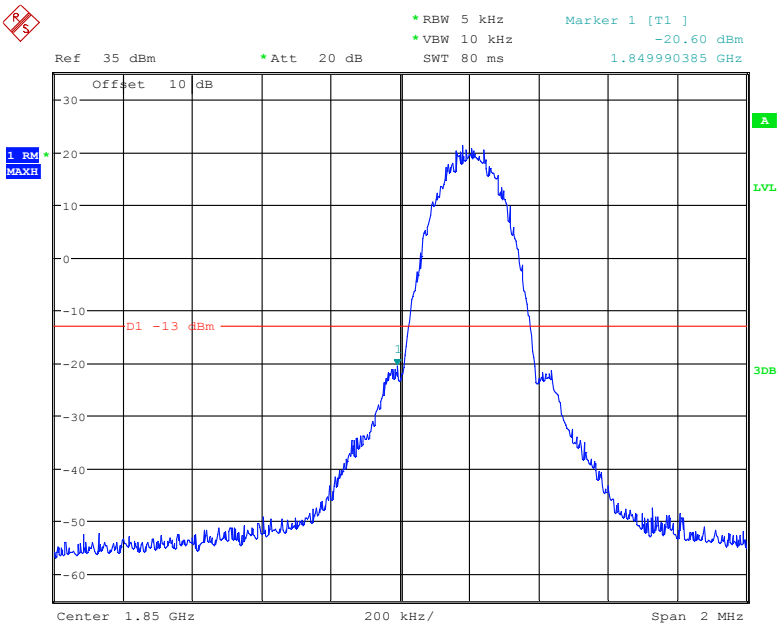
Date: 20.JUN.2019 22:11:34

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



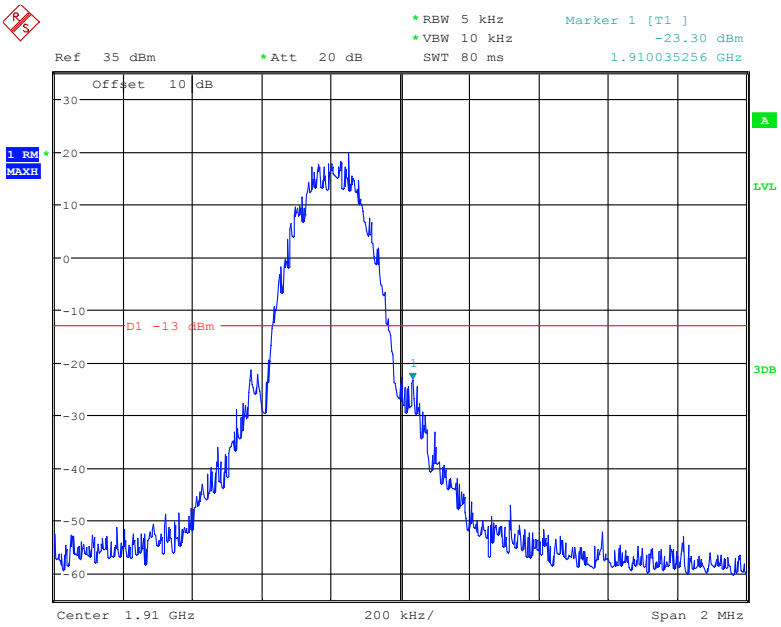
Date: 20.JUN.2019 22:10:53

PCS Band, Left Band Edge for EDGE Mode



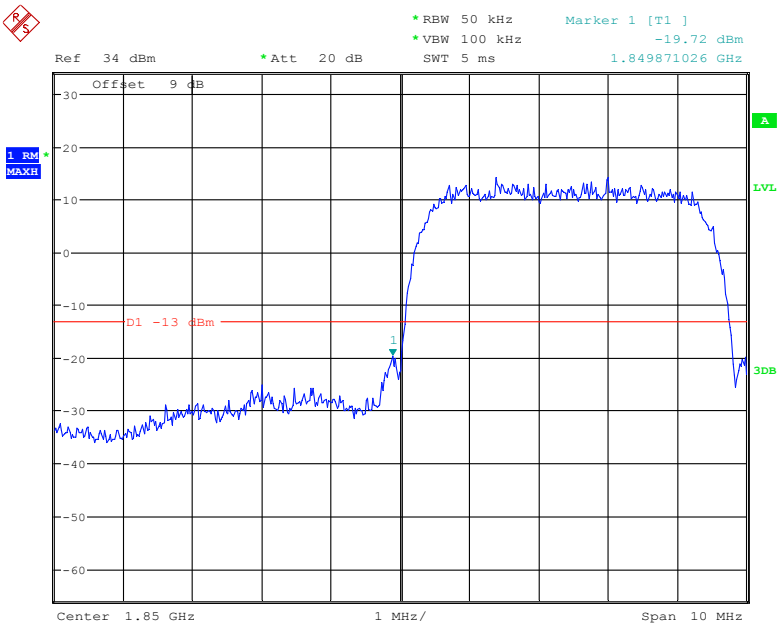
Date: 20.JUN.2019 22:32:42

PCS Band, Right Band Edge for EDGE Mode



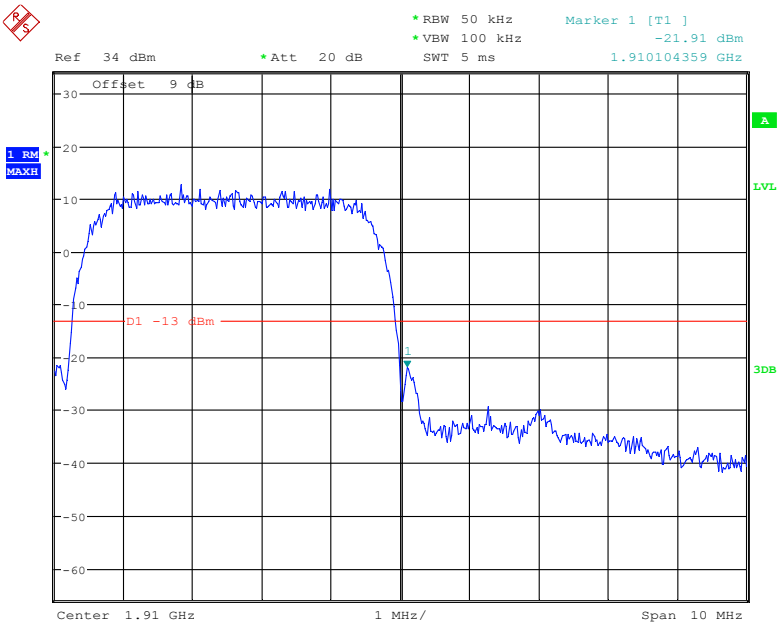
Date: 20.JUN.2019 22:33:06

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



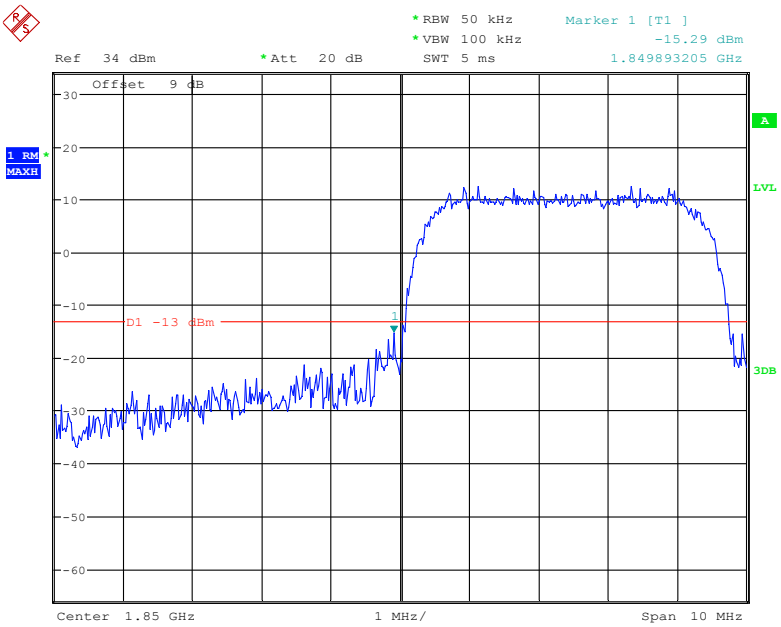
Date: 8.JUL.2019 23:41:12

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



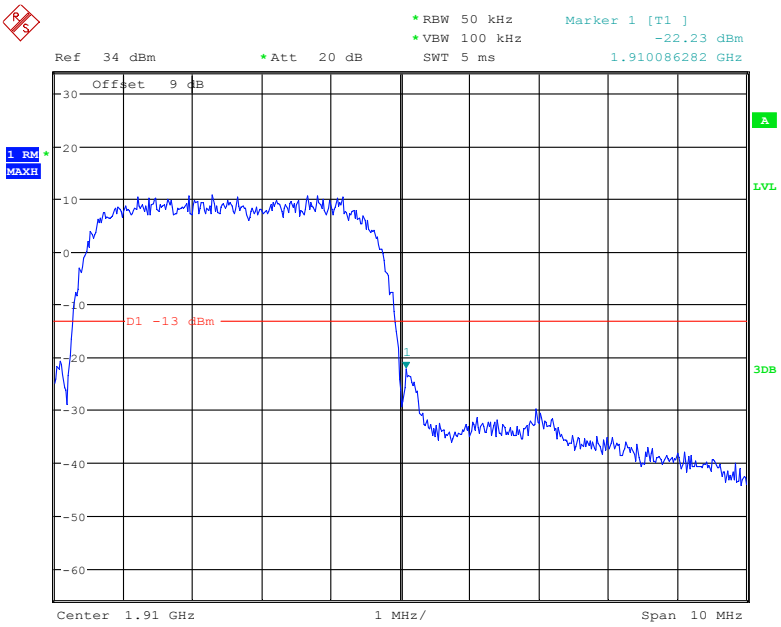
Date: 8.JUL.2019 23:40:51

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



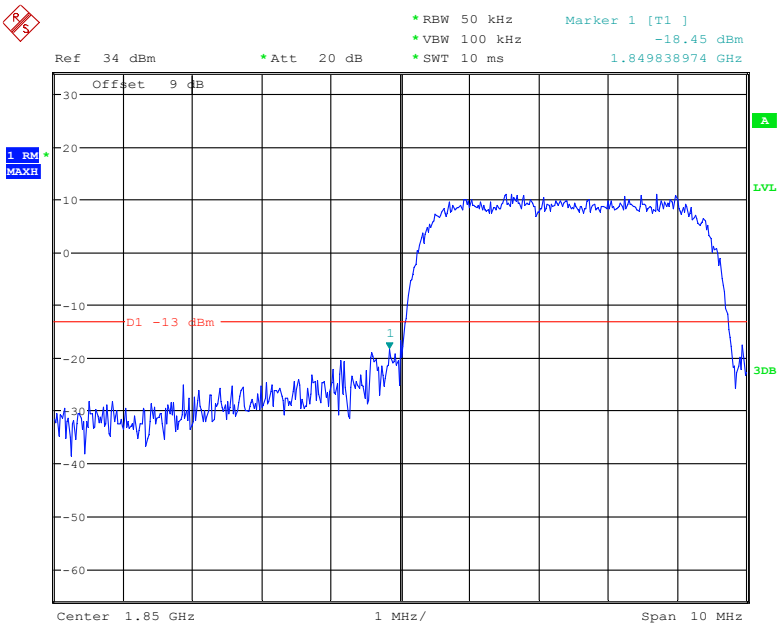
Date: 8.JUL.2019 23:48:02

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



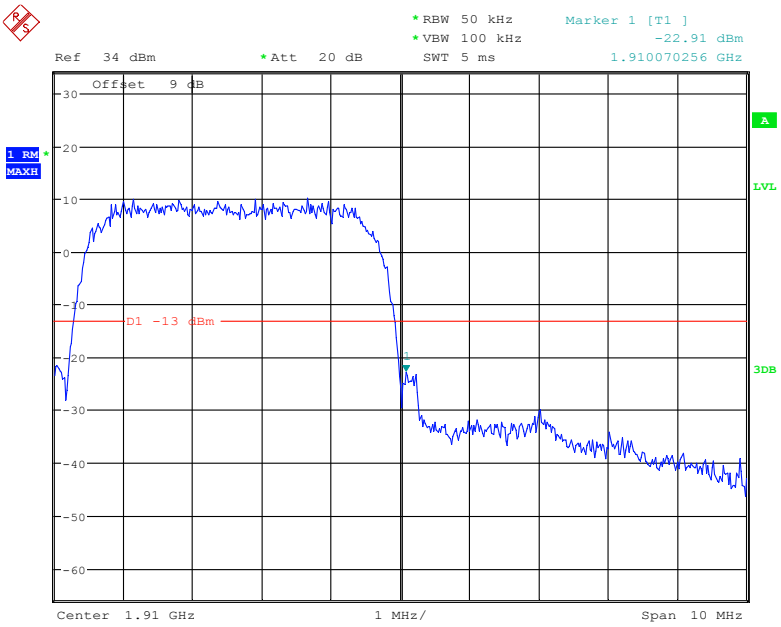
Date: 8.JUL.2019 23:47:41

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



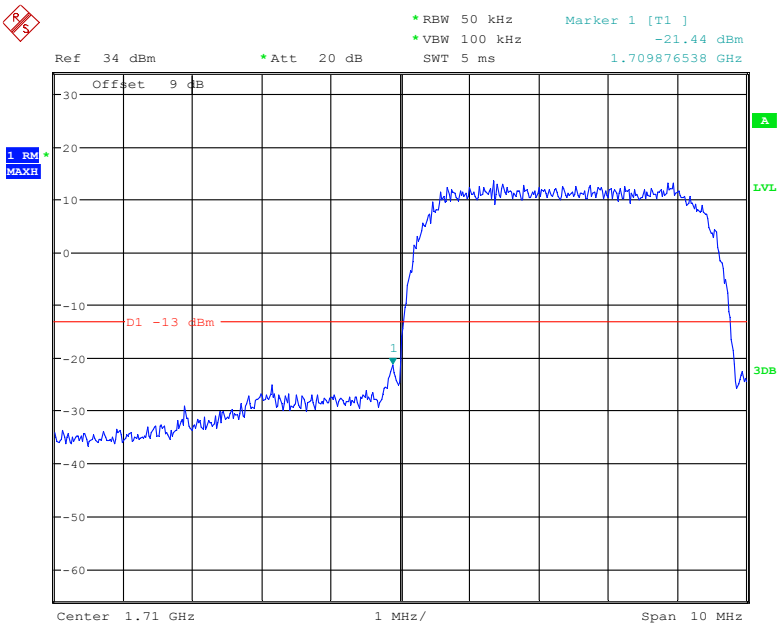
Date: 8.JUL.2019 23:43:14

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



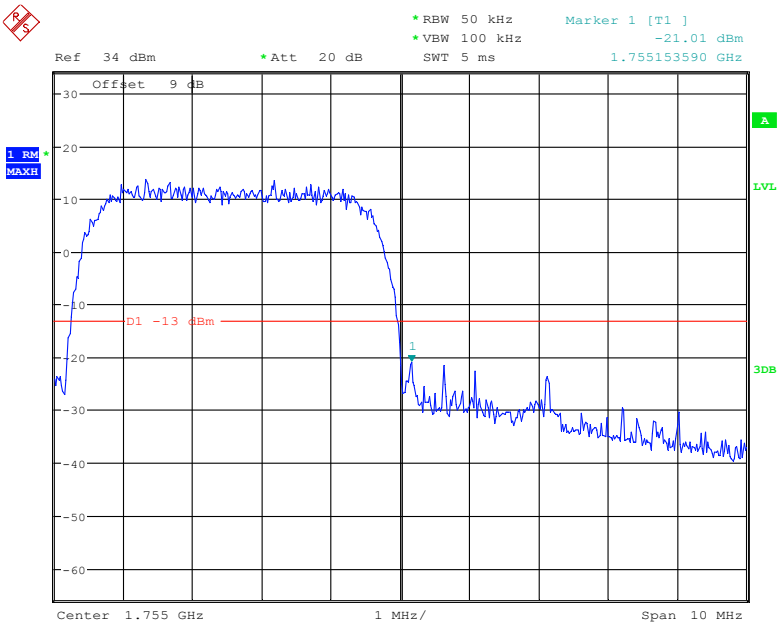
Date: 8.JUL.2019 23:43:47

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



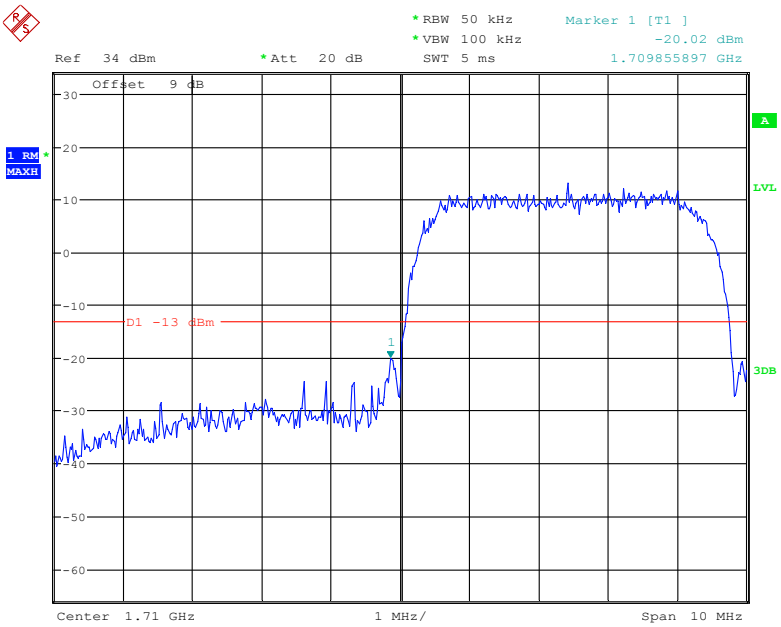
Date: 8.JUL.2019 23:04:38

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



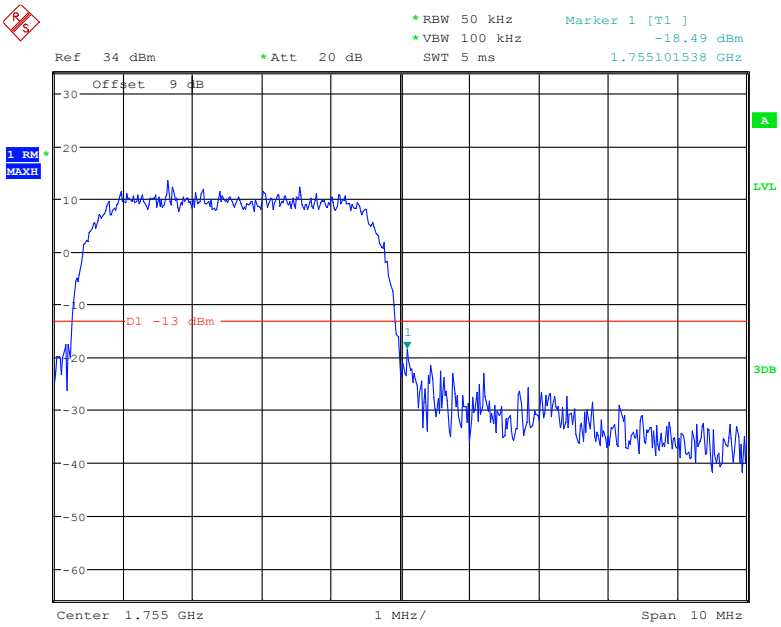
Date: 8.JUL.2019 23:04:58

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



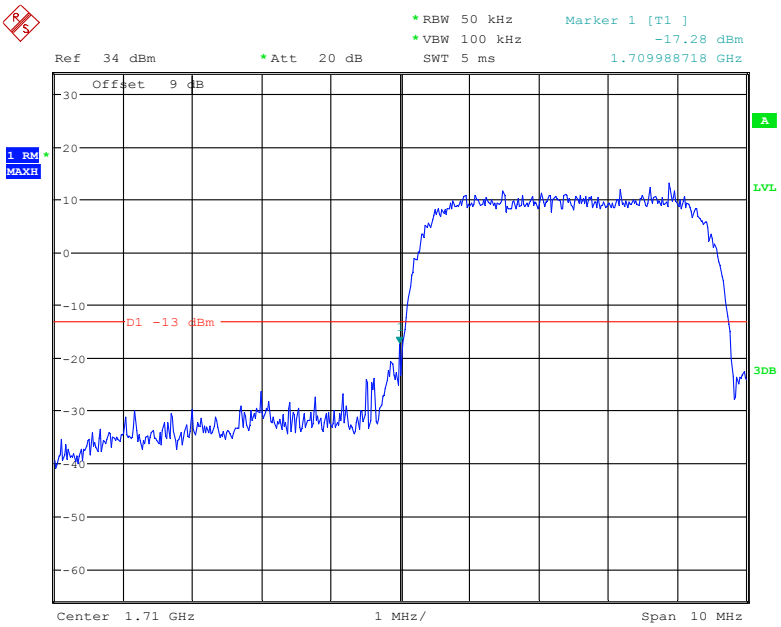
Date: 8.JUL.2019 23:02:43

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



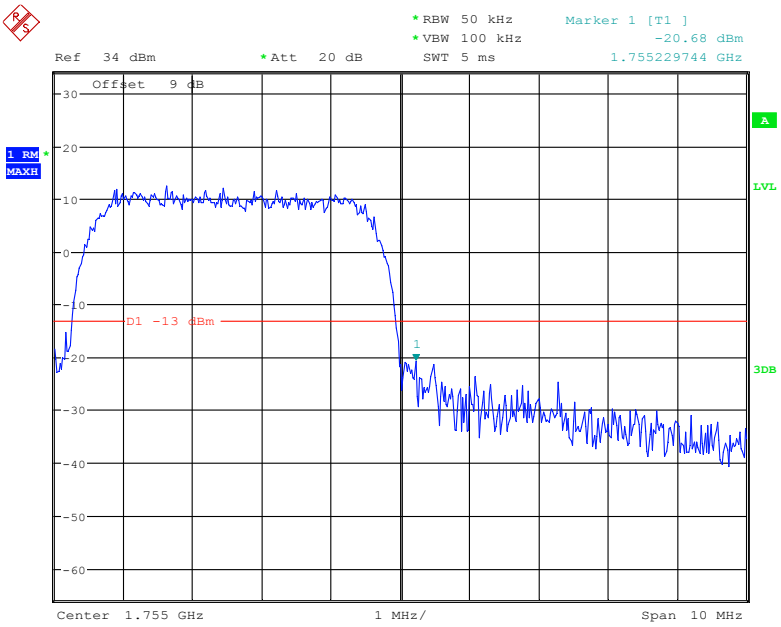
Date: 8.JUL.2019 23:03:17

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



Date: 8.JUL.2019 23:04:08

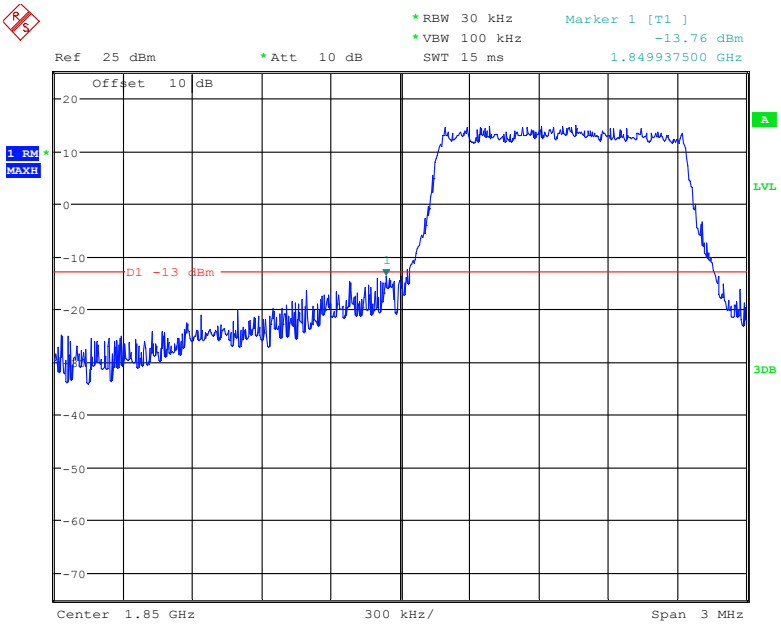
AWS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 8.JUL.2019 23:03:48

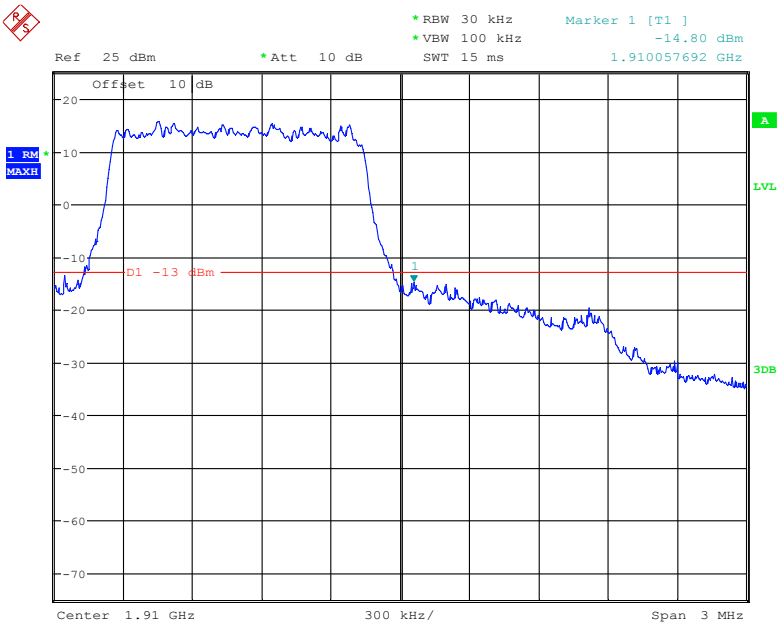
Band 2:

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



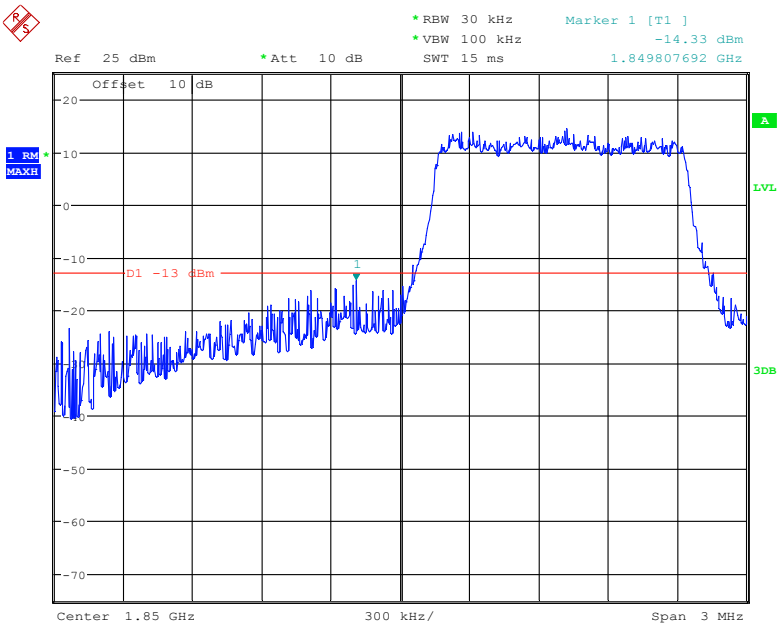
Date: 22.JUN.2019 00:06:39

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



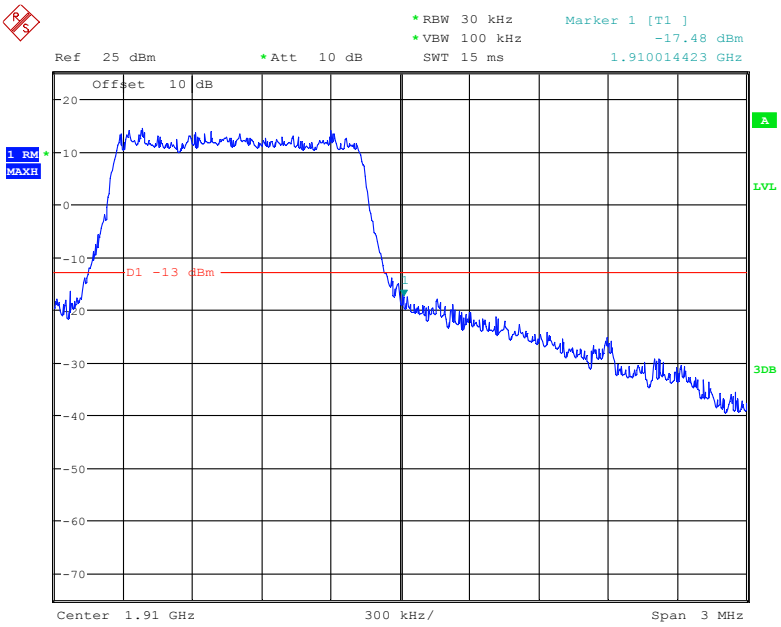
Date: 22.JUN.2019 00:11:01

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



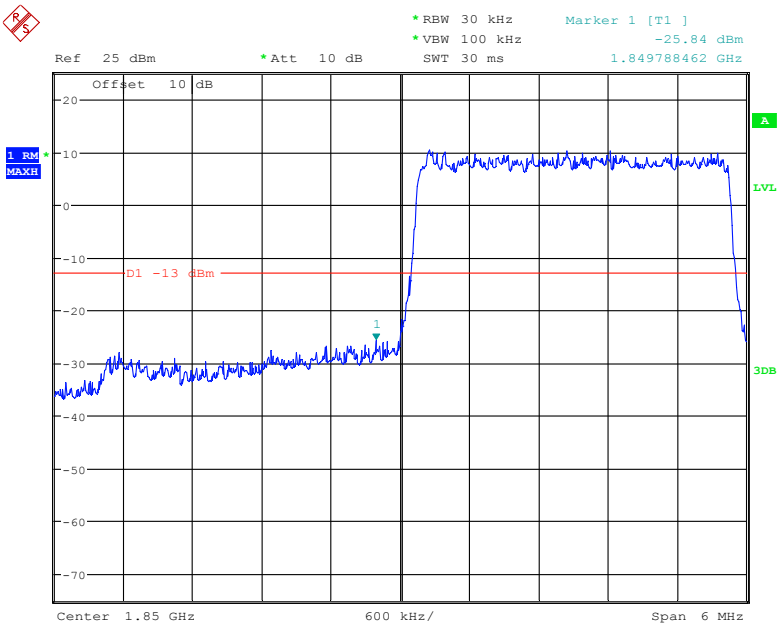
Date: 22.JUN.2019 00:07:10

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



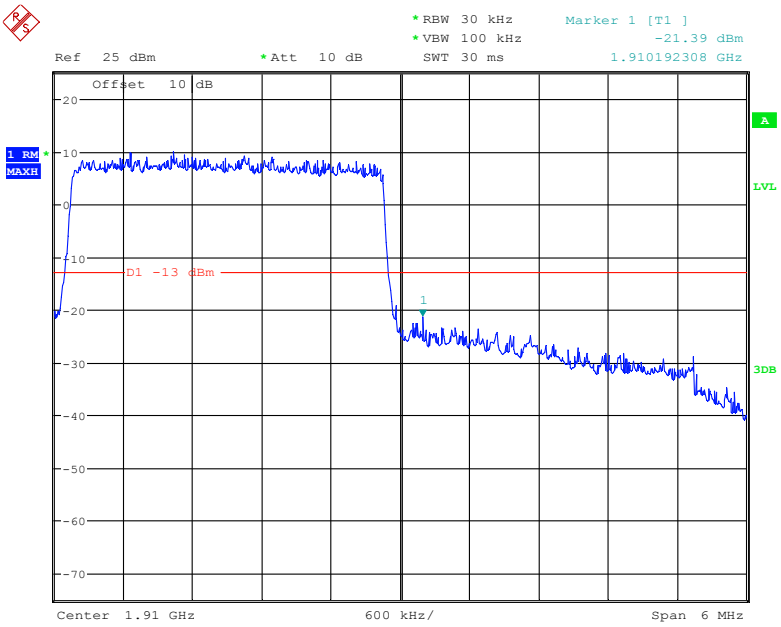
Date: 22.JUN.2019 00:07:43

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



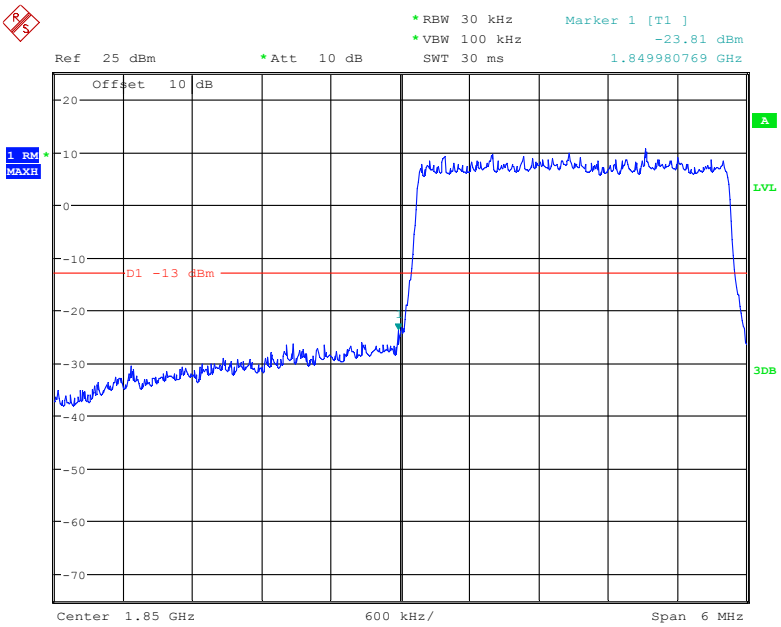
Date: 22.JUN.2019 00:19:49

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



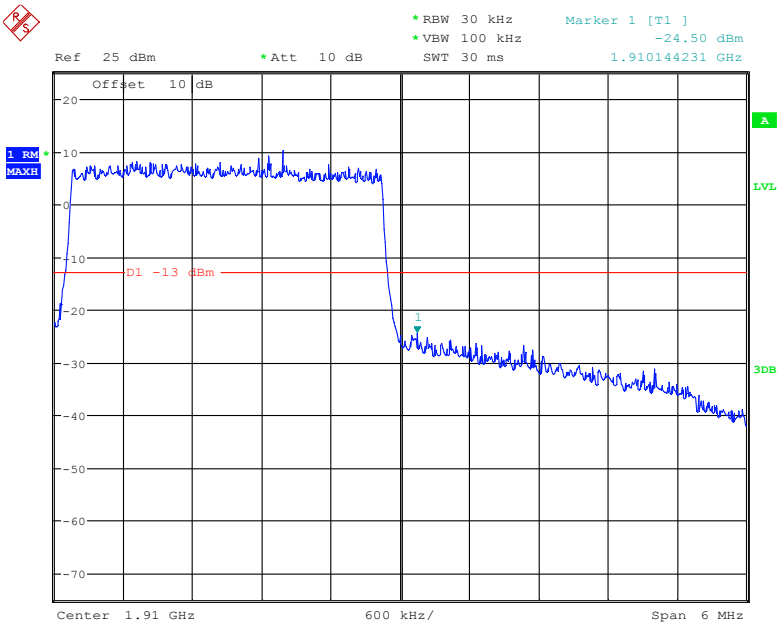
Date: 22.JUN.2019 00:11:55

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



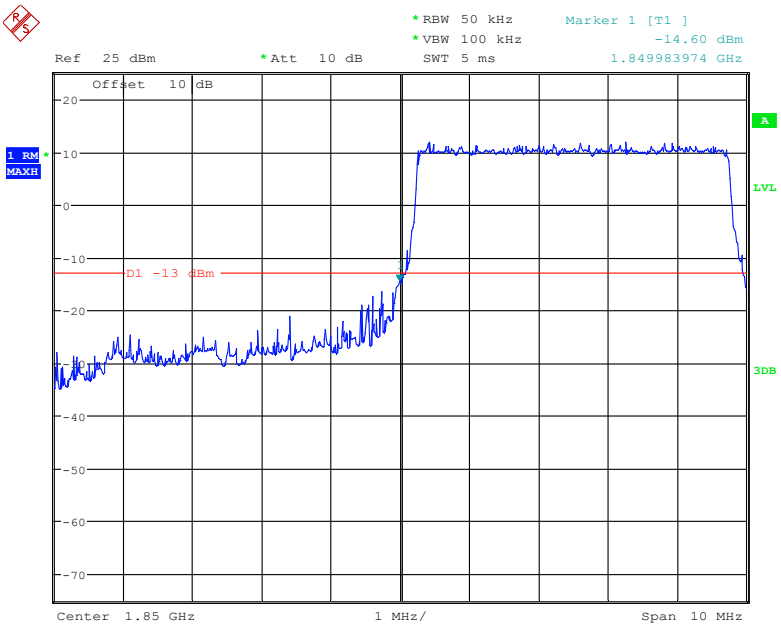
Date: 22.JUN.2019 00:16:04

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



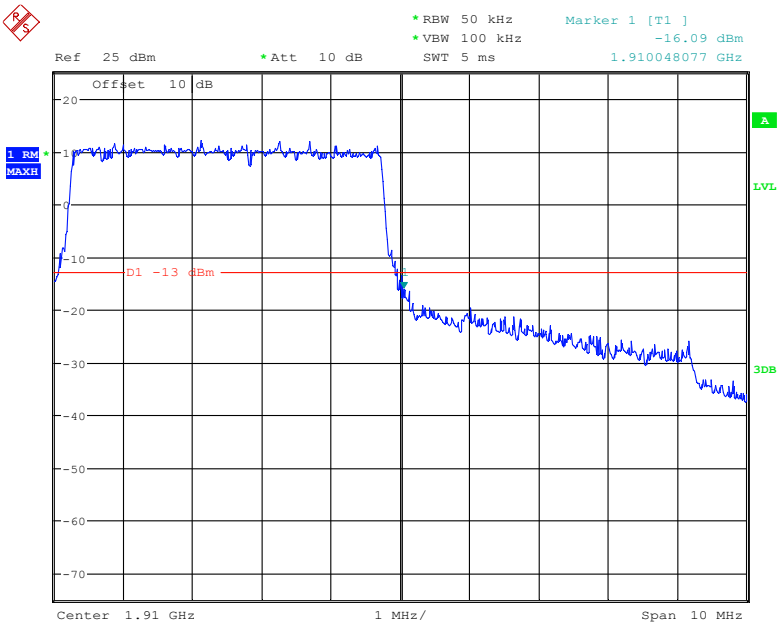
Date: 22.JUN.2019 00:12:25

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



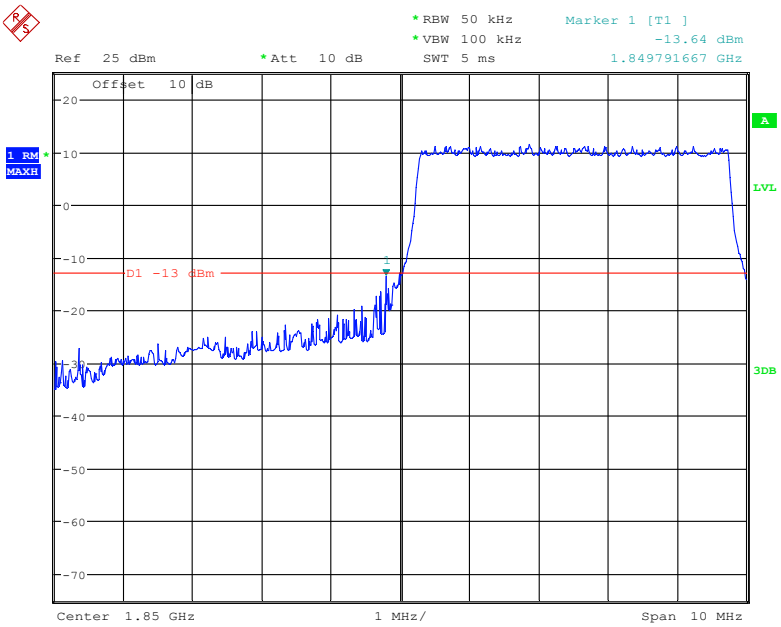
Date: 22.JUN.2019 00:22:37

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



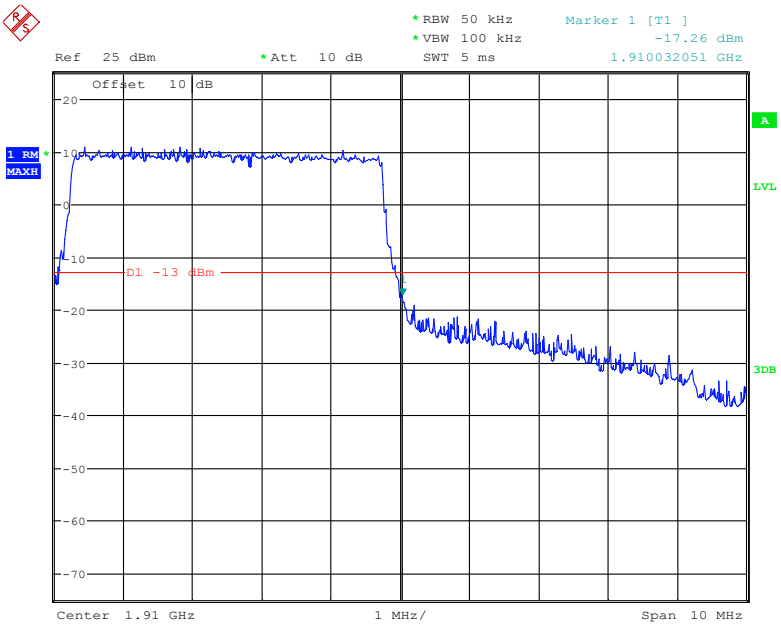
Date: 22.JUN.2019 00:23:06

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



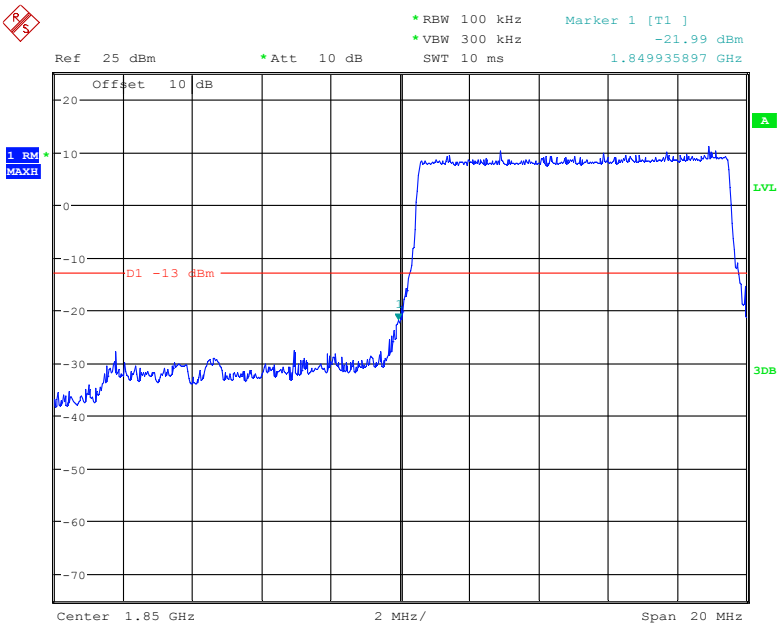
Date: 22.JUN.2019 00:22:10

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



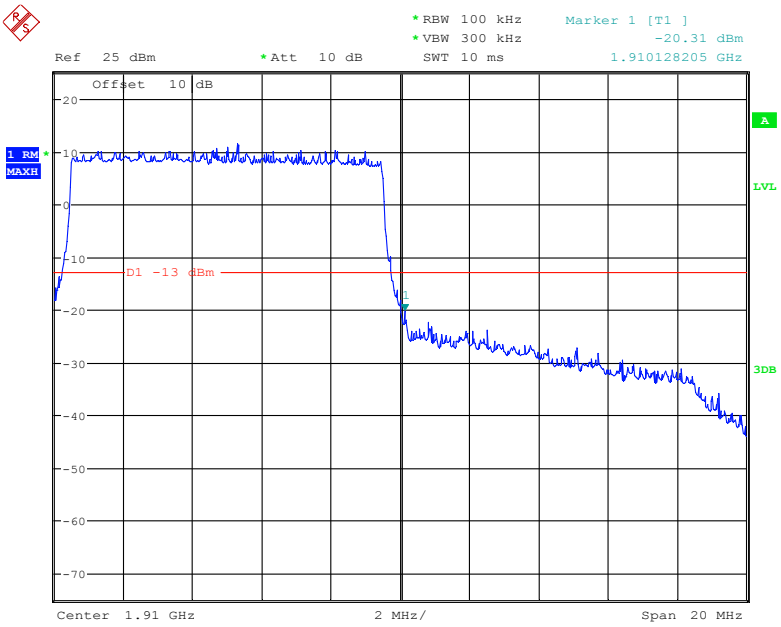
Date: 22.JUN.2019 00:23:34

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



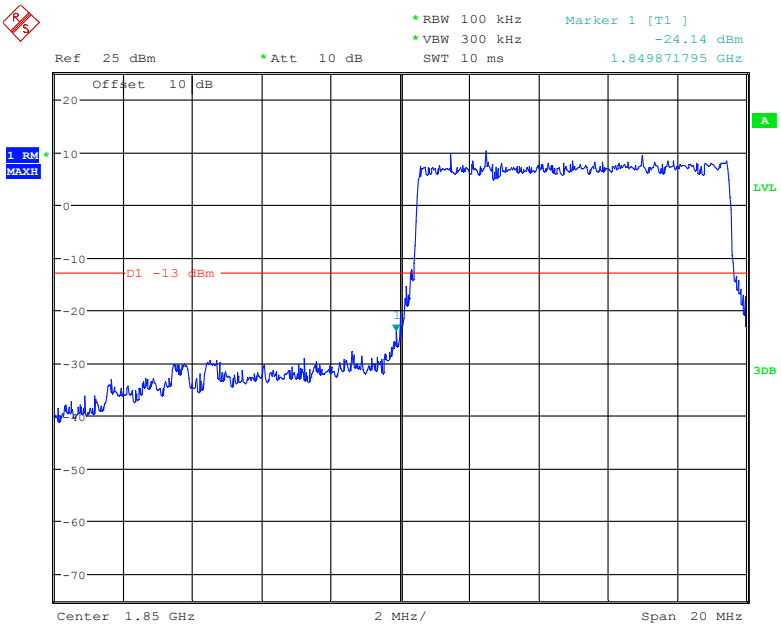
Date: 22.JUN.2019 00:30:57

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



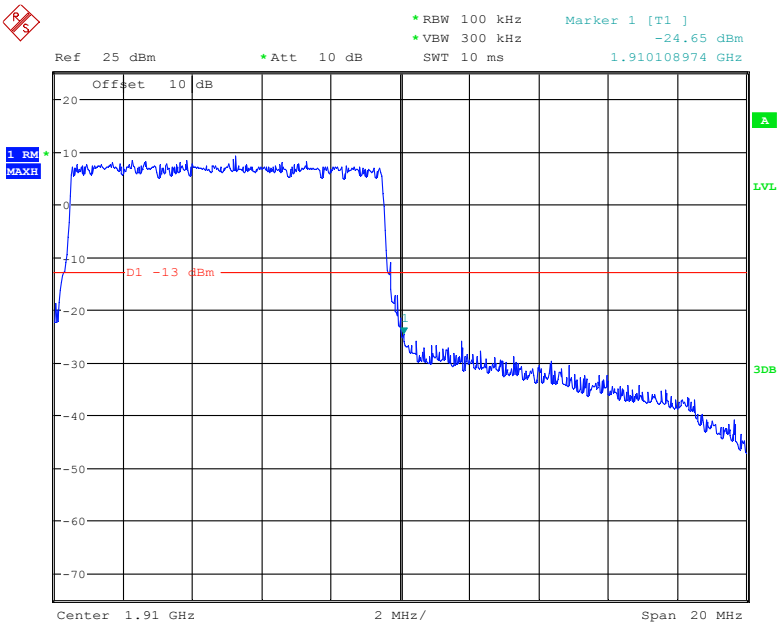
Date: 22.JUN.2019 00:32:52

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



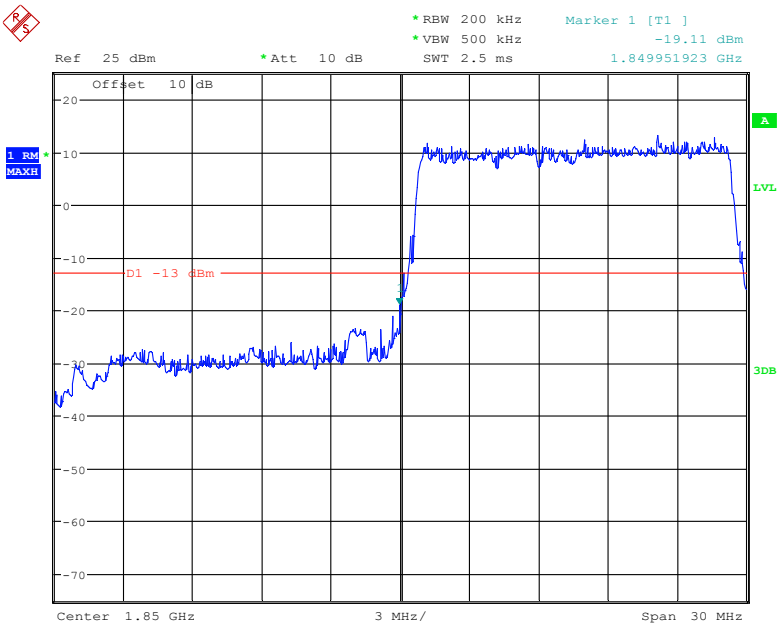
Date: 22.JUN.2019 00:30:23

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



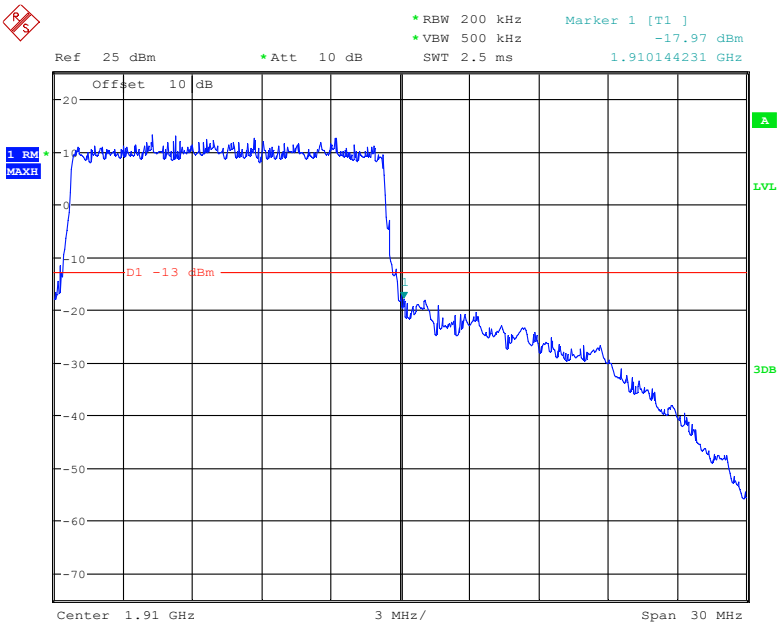
Date: 22.JUN.2019 00:34:16

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



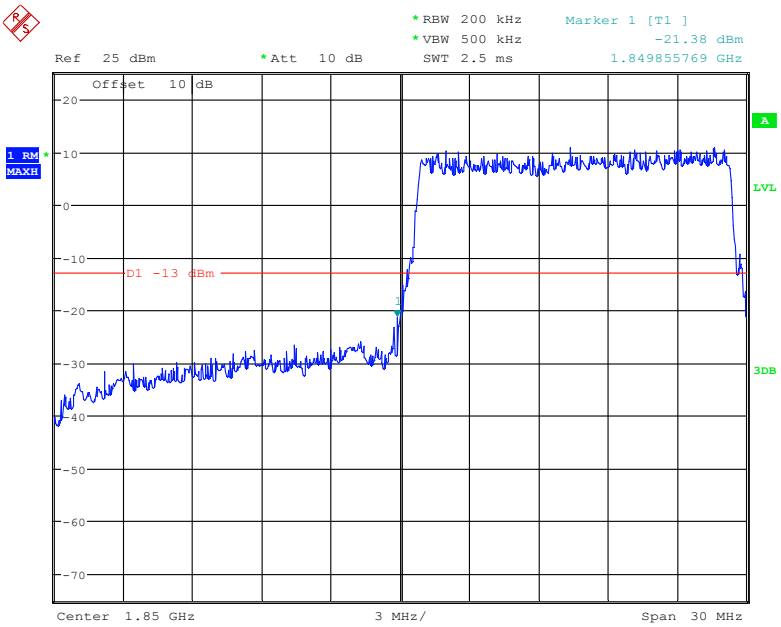
Date: 22.JUN.2019 00:38:53

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



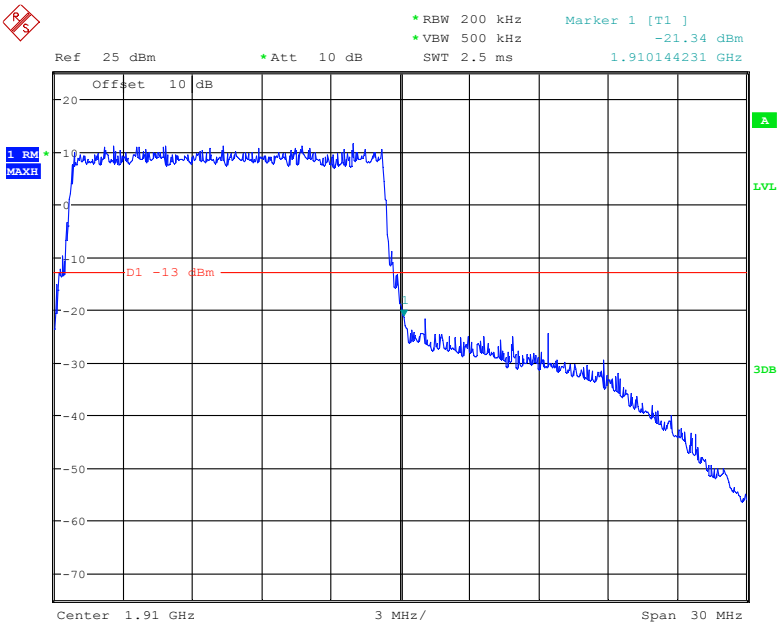
Date: 22.JUN.2019 00:40:11

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



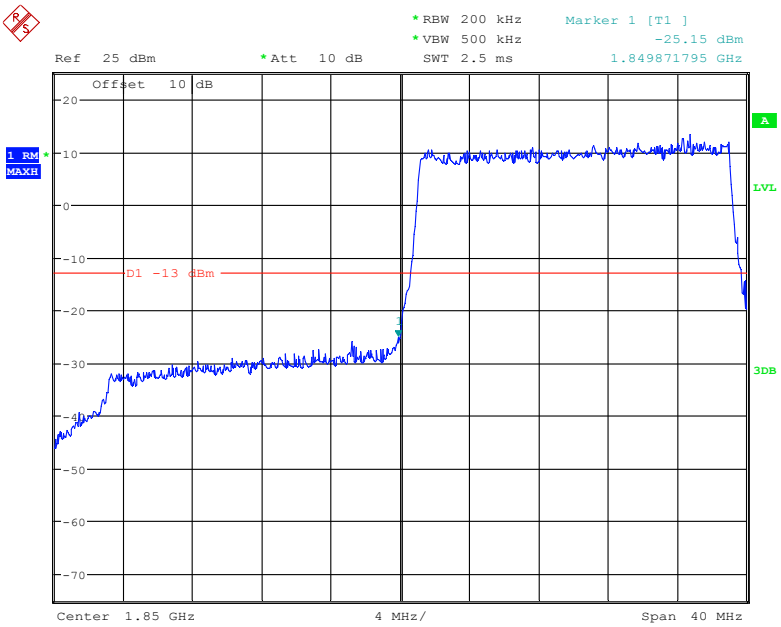
Date: 22.JUN.2019 00:39:15

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



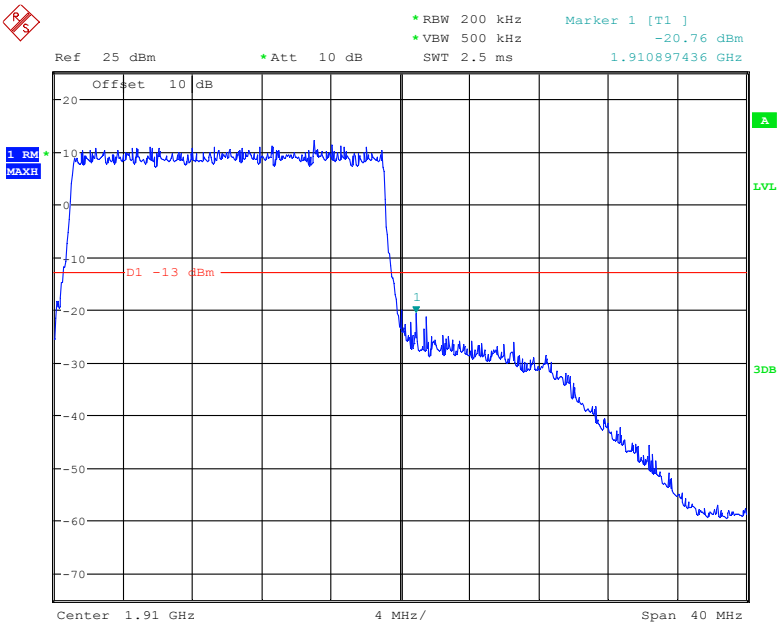
Date: 22.JUN.2019 00:39:46

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



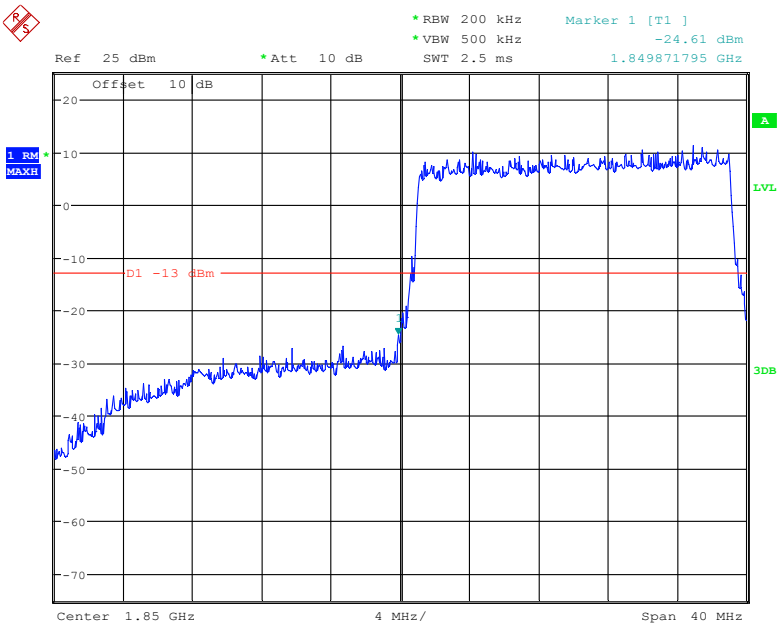
Date: 22.JUN.2019 00:42:31

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



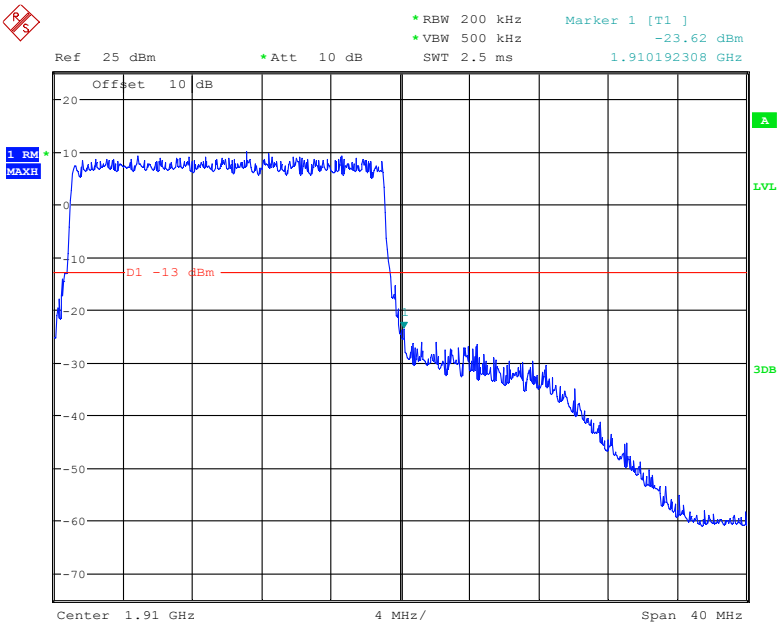
Date: 22.JUN.2019 00:46:51

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



Date: 22.JUN.2019 00:40:50

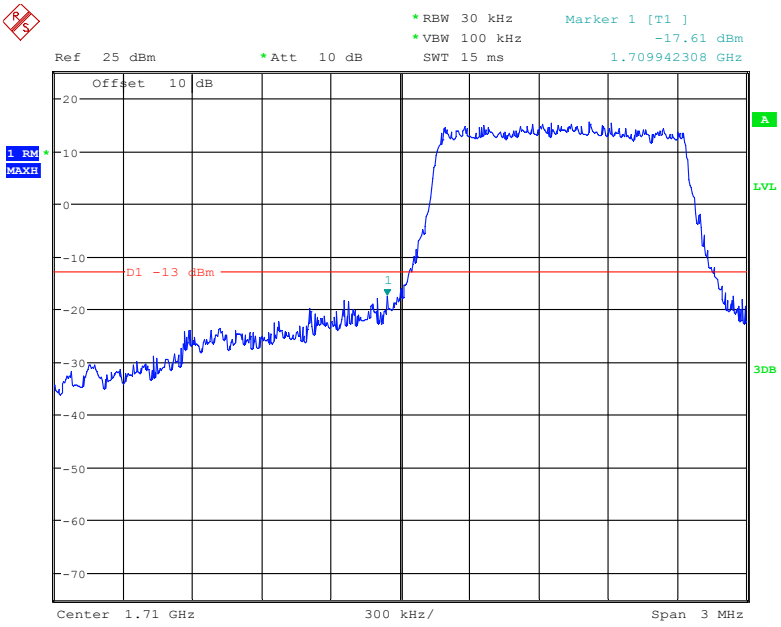
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 22.JUN.2019 00:47:13

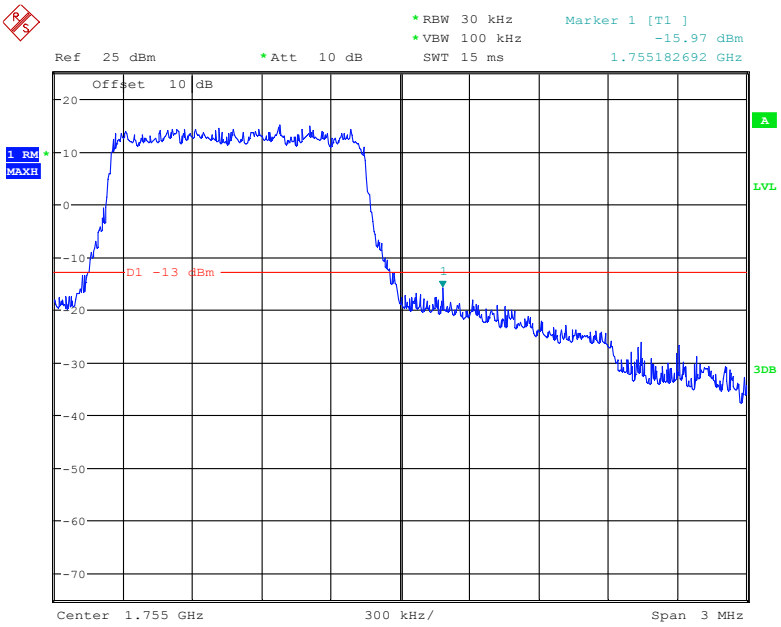
Band 4:

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



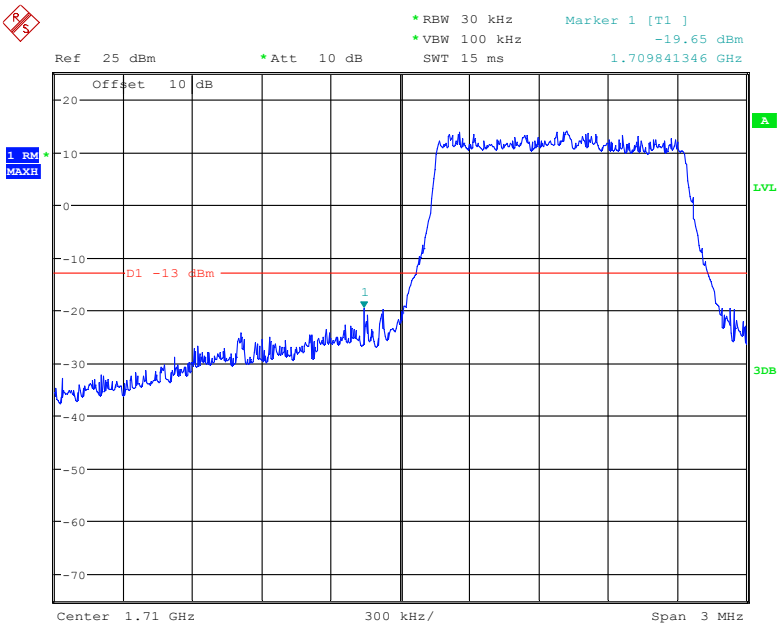
Date: 21.JUN.2019 23:12:21

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



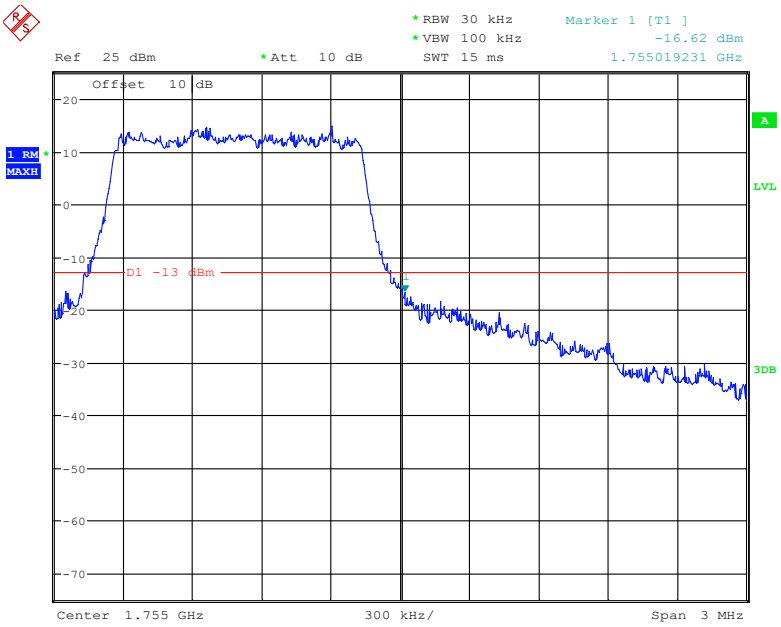
Date: 21.JUN.2019 23:15:03

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



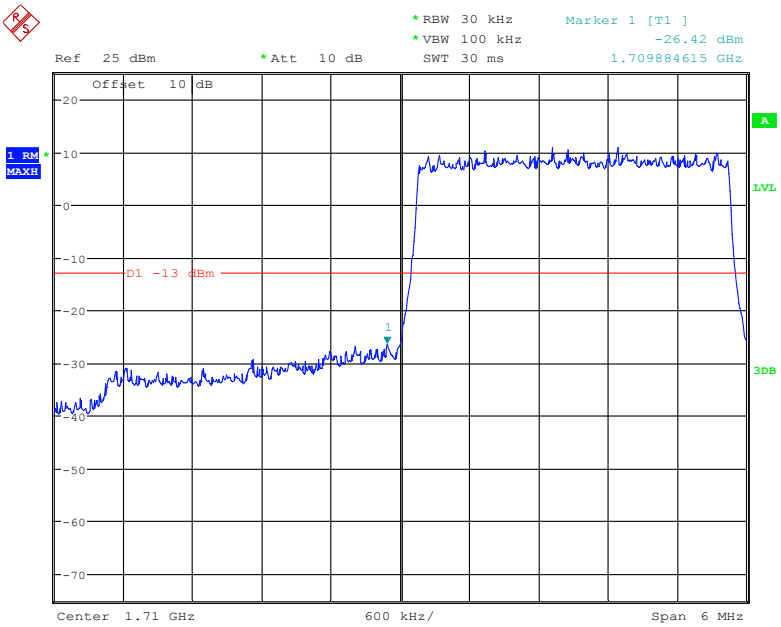
Date: 21.JUN.2019 23:14:04

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



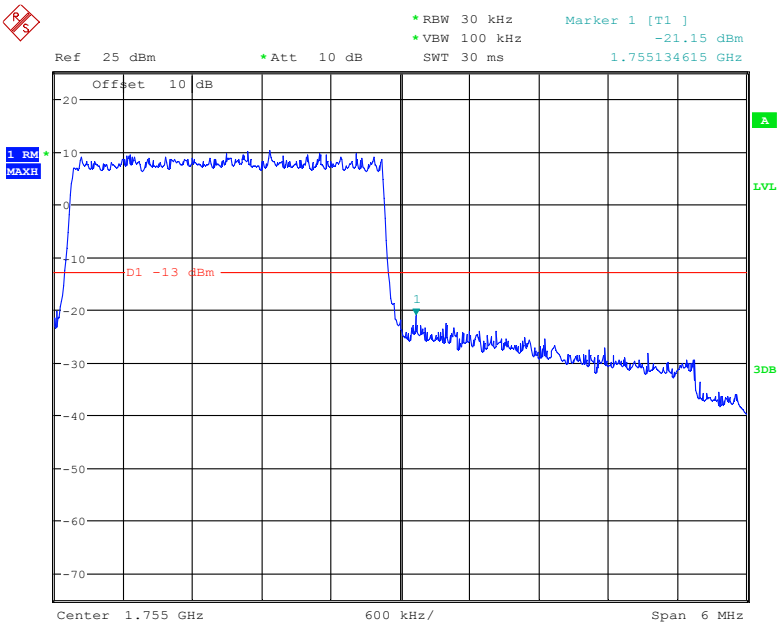
Date: 21.JUN.2019 23:14:43

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



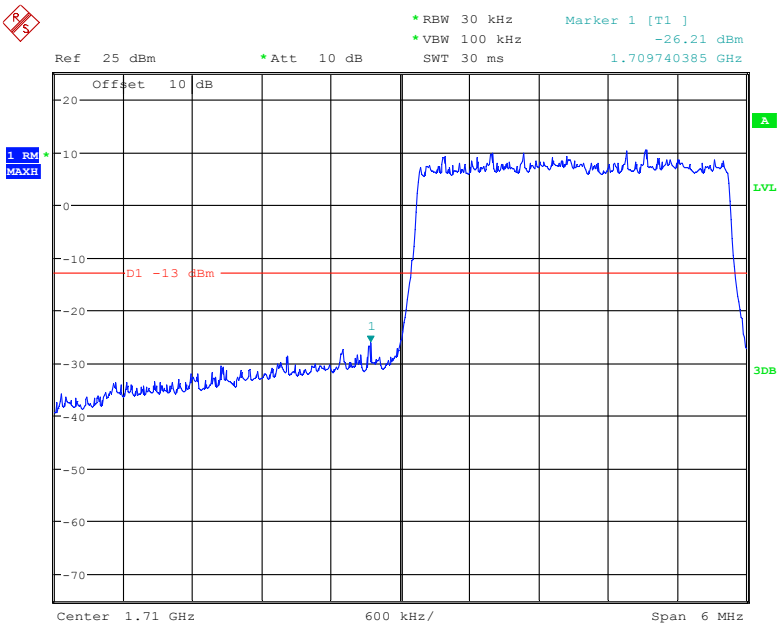
Date: 21.JUN.2019 23:20:58

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



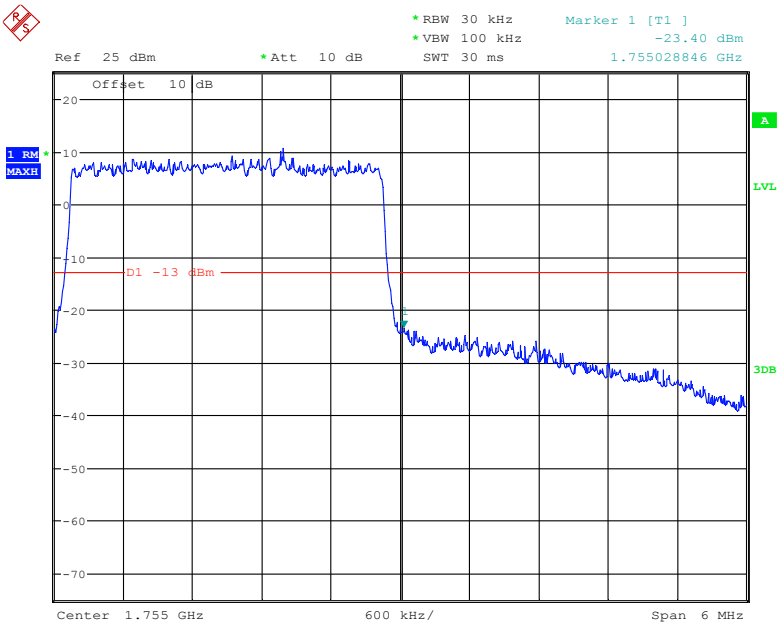
Date: 21.JUN.2019 23:16:29

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



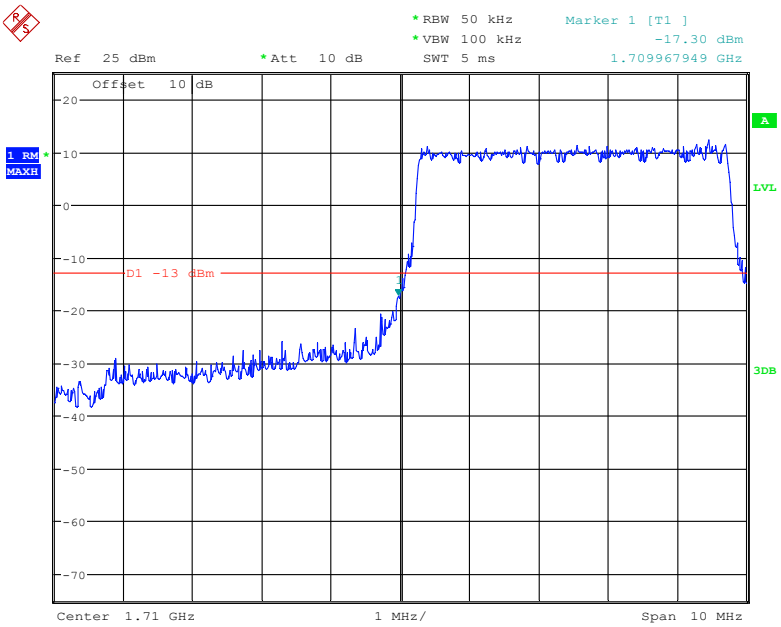
Date: 21.JUN.2019 23:20:13

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



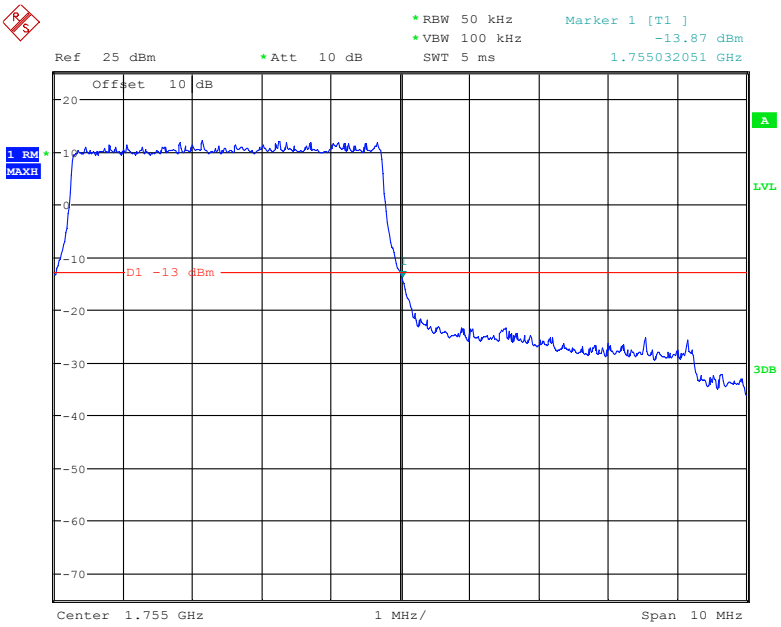
Date: 21.JUN.2019 23:19:00

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



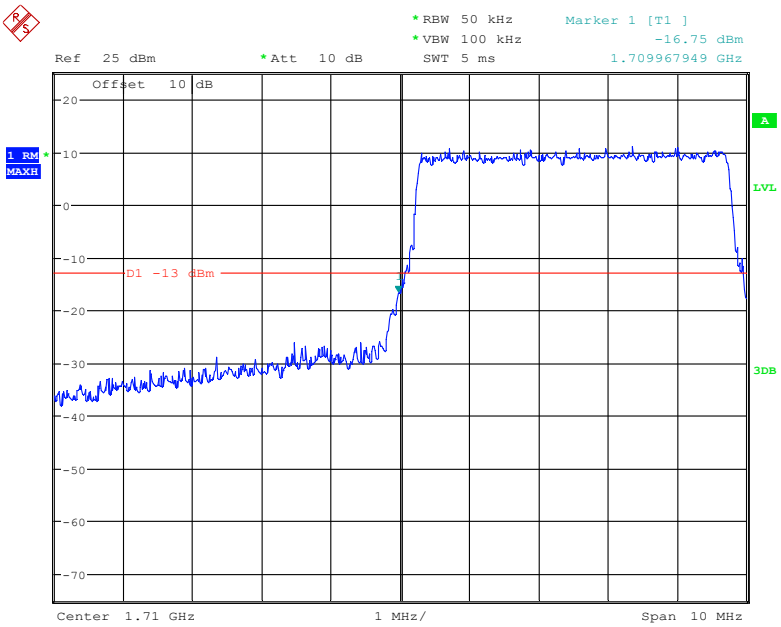
Date: 21.JUN.2019 23:24:39

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



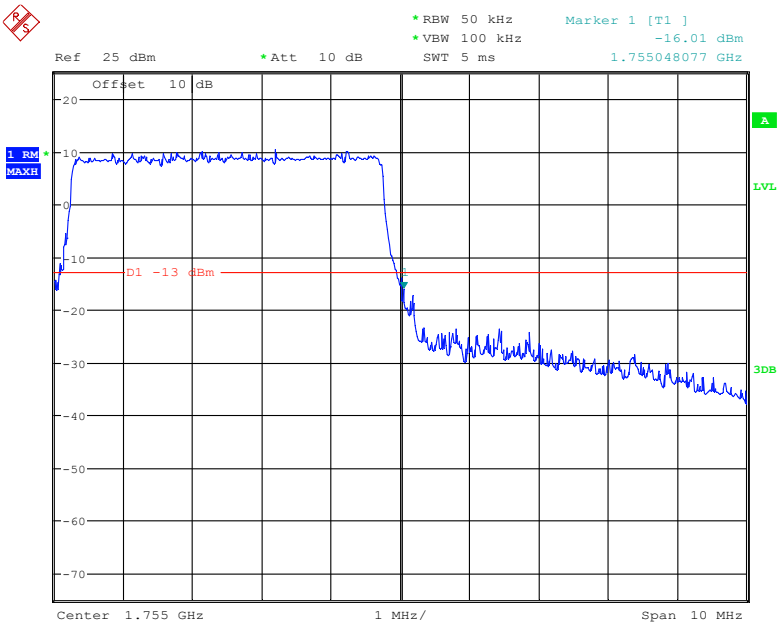
Date: 21.JUN.2019 23:28:01

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



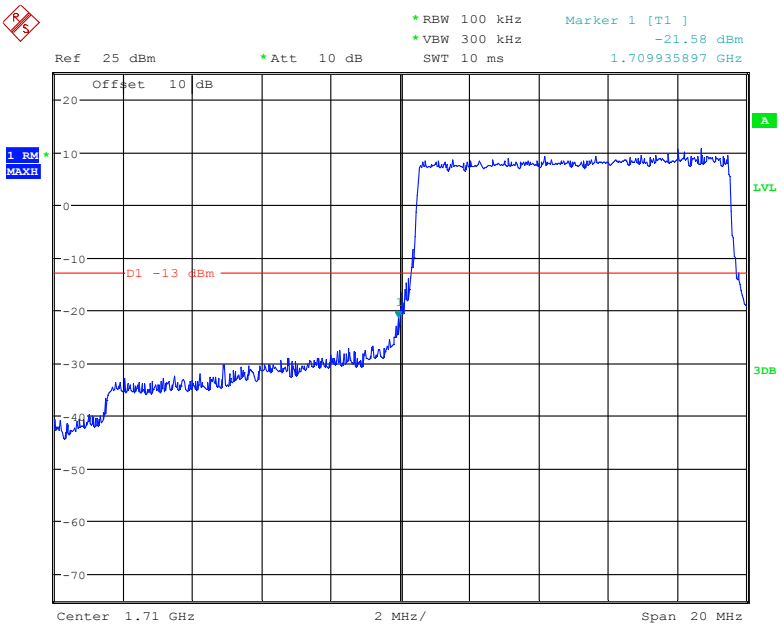
Date: 21.JUN.2019 23:21:47

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



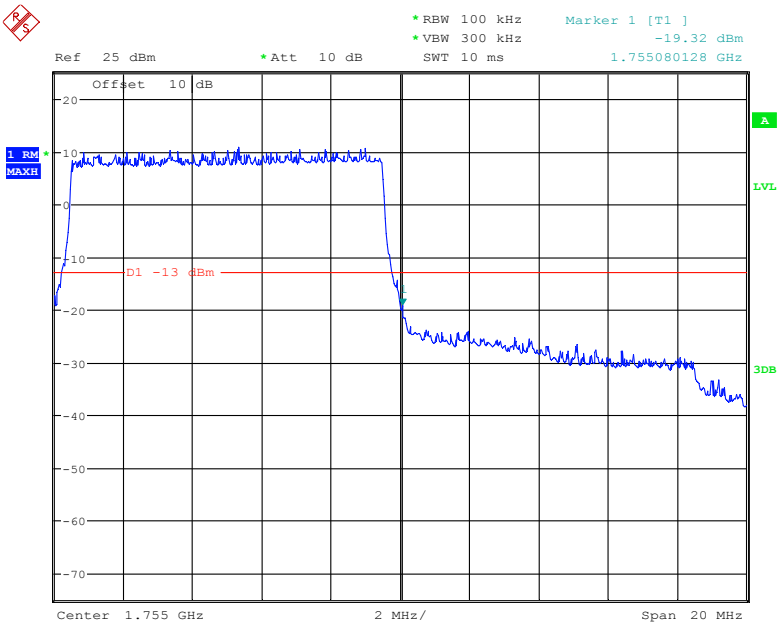
Date: 21.JUN.2019 23:28:28

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



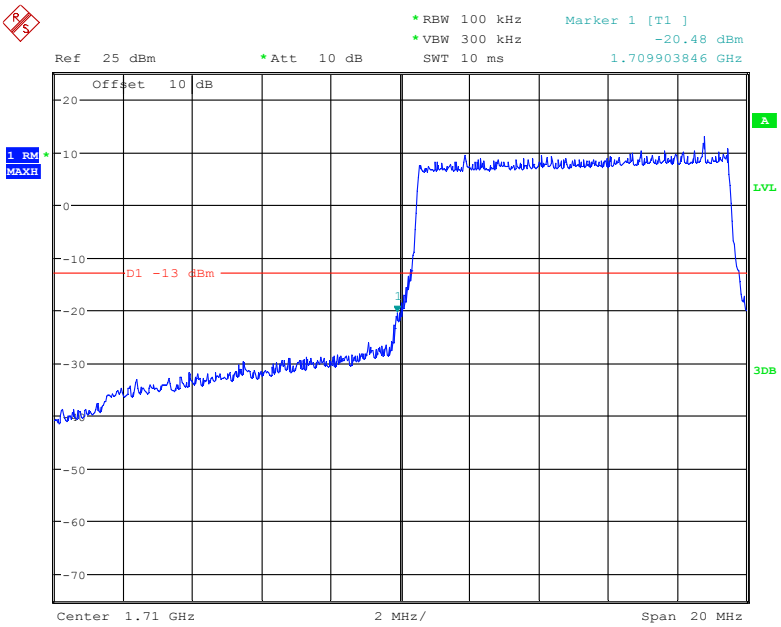
Date: 21.JUN.2019 23:37:00

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



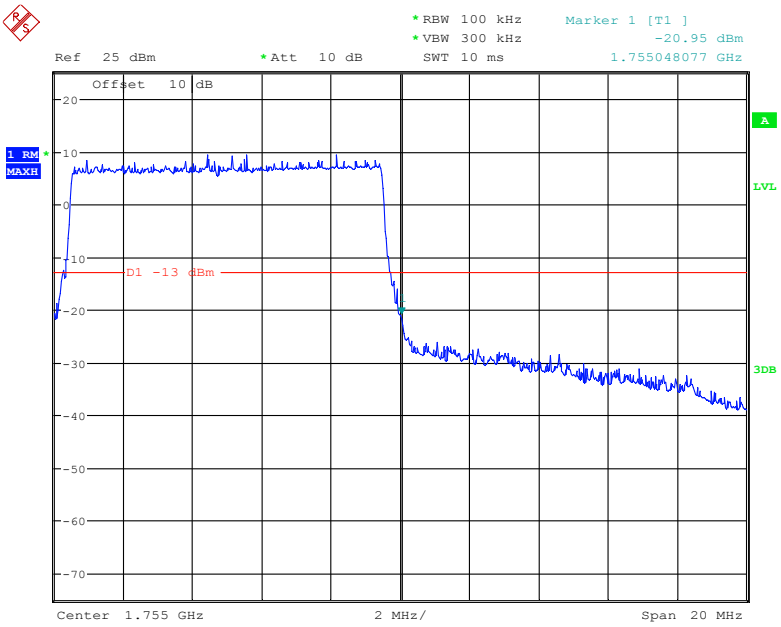
Date: 21.JUN.2019 23:36:33

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



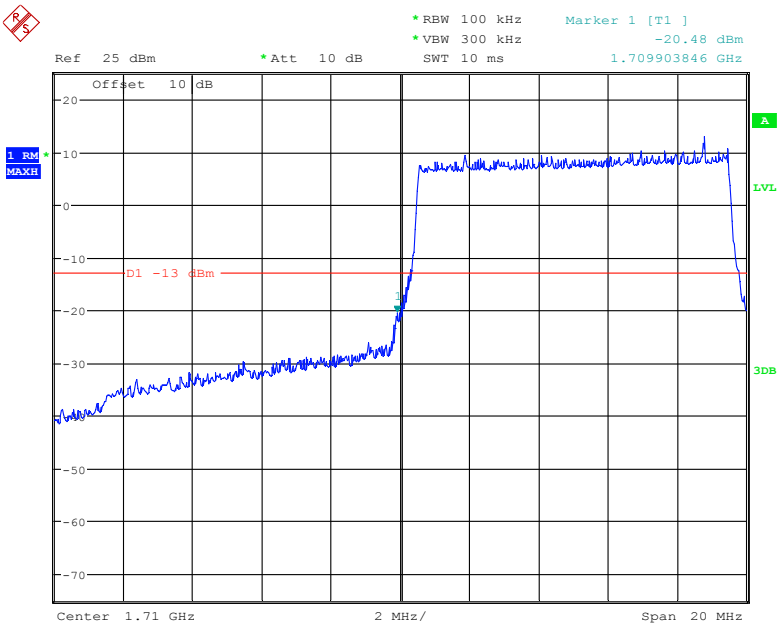
Date: 21.JUN.2019 23:42:05

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



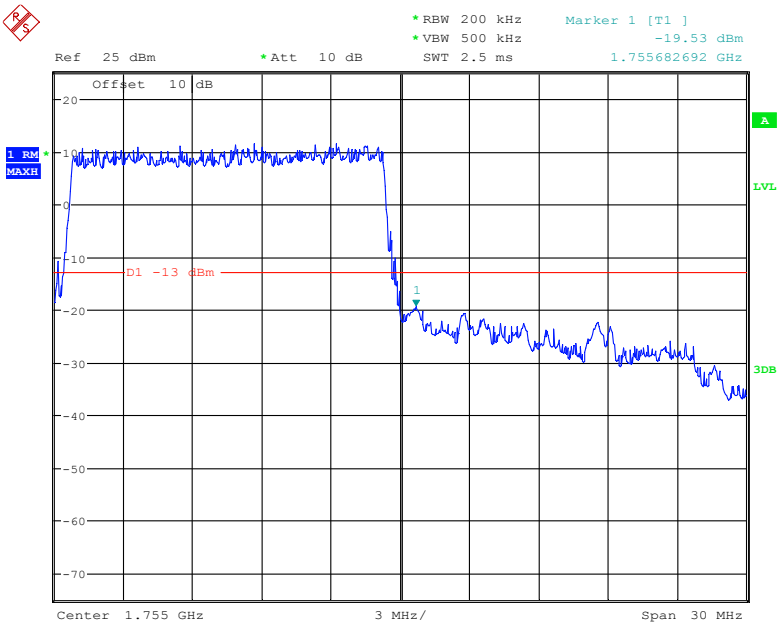
Date: 21.JUN.2019 23:32:01

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



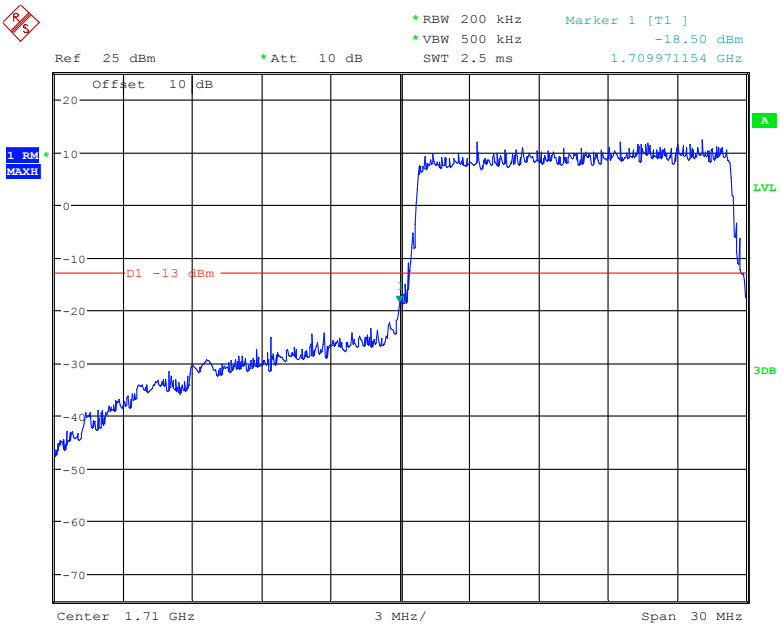
Date: 21.JUN.2019 23:42:05

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



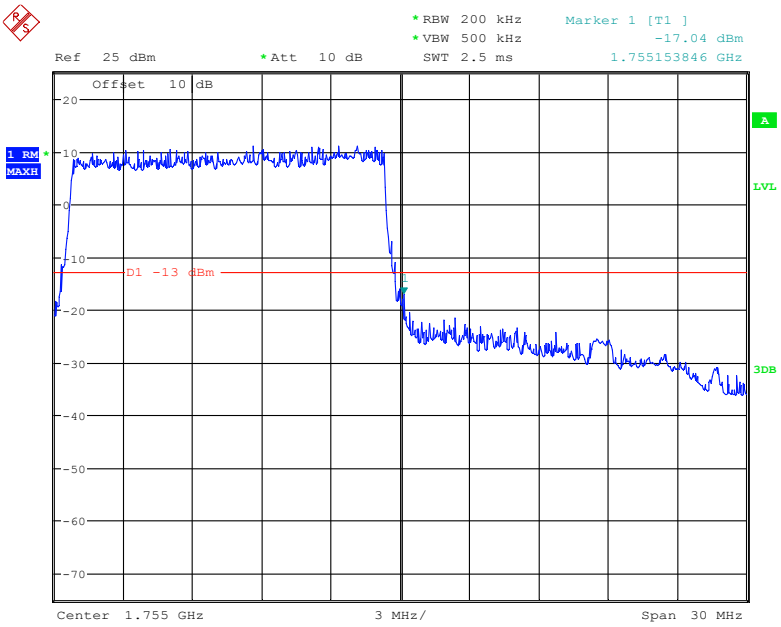
Date: 21.JUN.2019 23:58:22

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



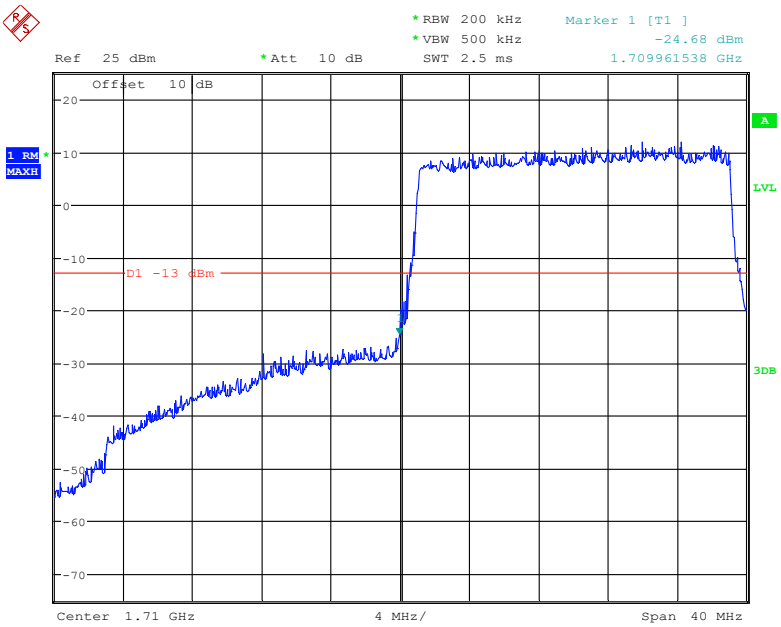
Date: 21.JUN.2019 23:57:41

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



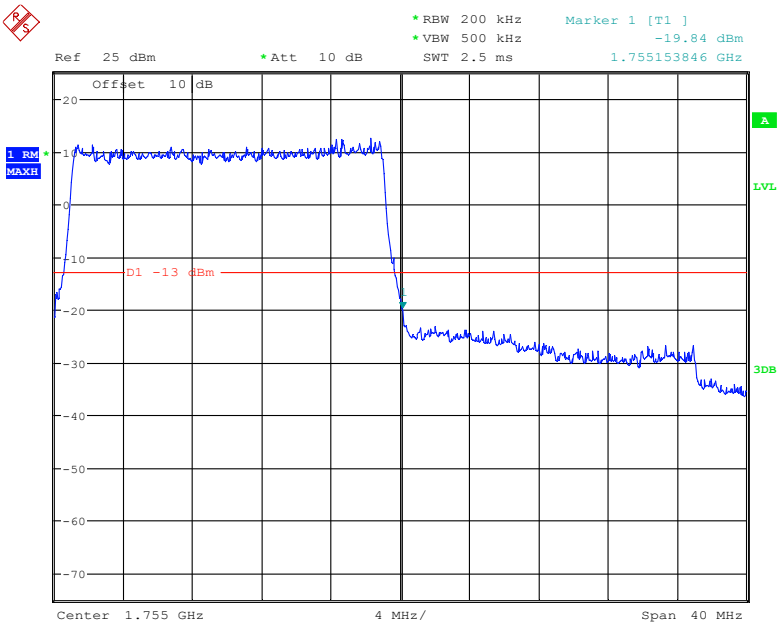
Date: 21.JUN.2019 23:58:05

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



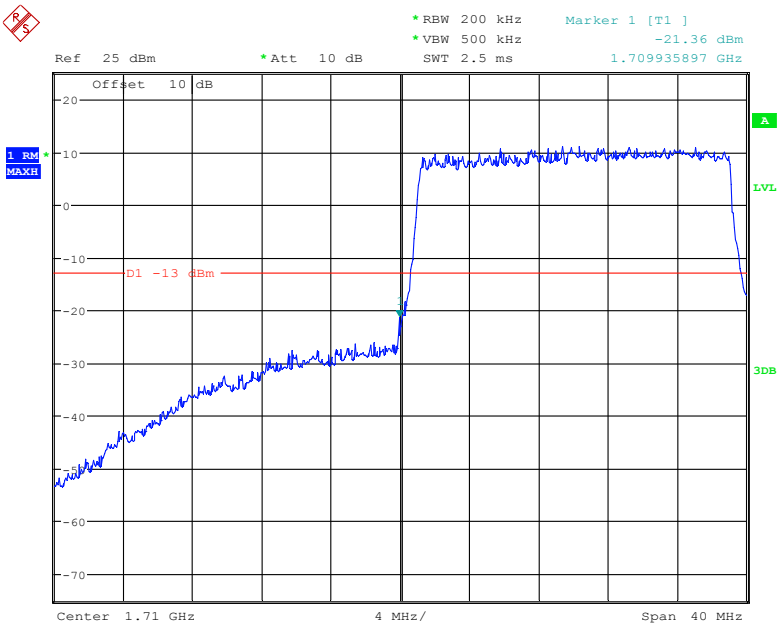
Date: 22.JUN.2019 00:02:11

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



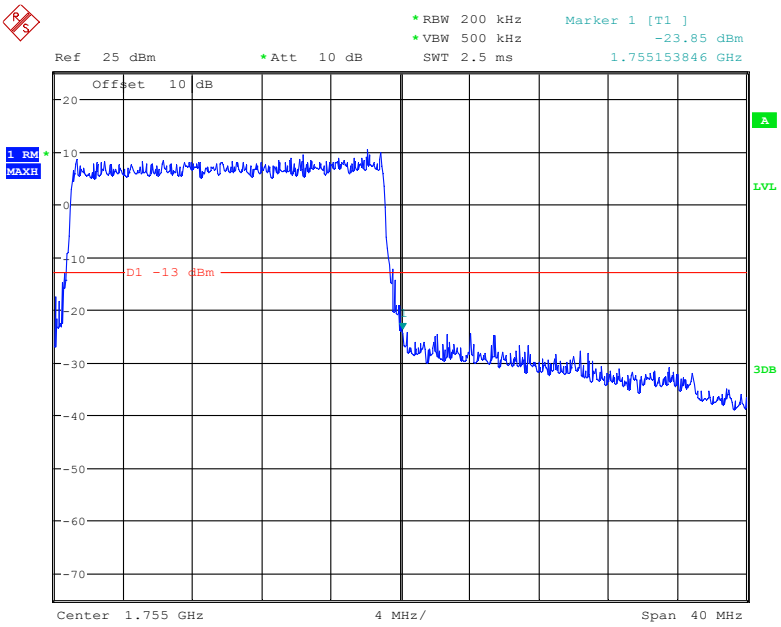
Date: 22.JUN.2019 00:01:34

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



Date: 22.JUN.2019 00:05:42

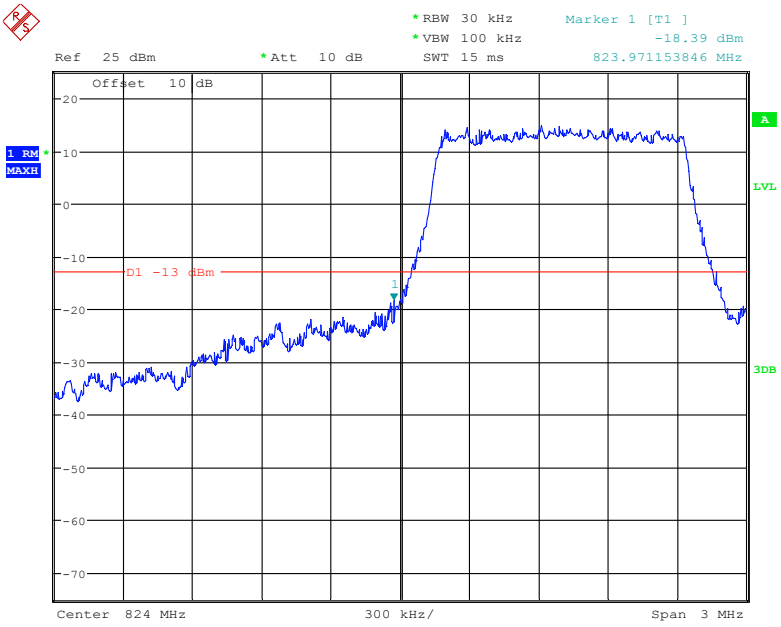
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 21.JUN.2019 23:59:00

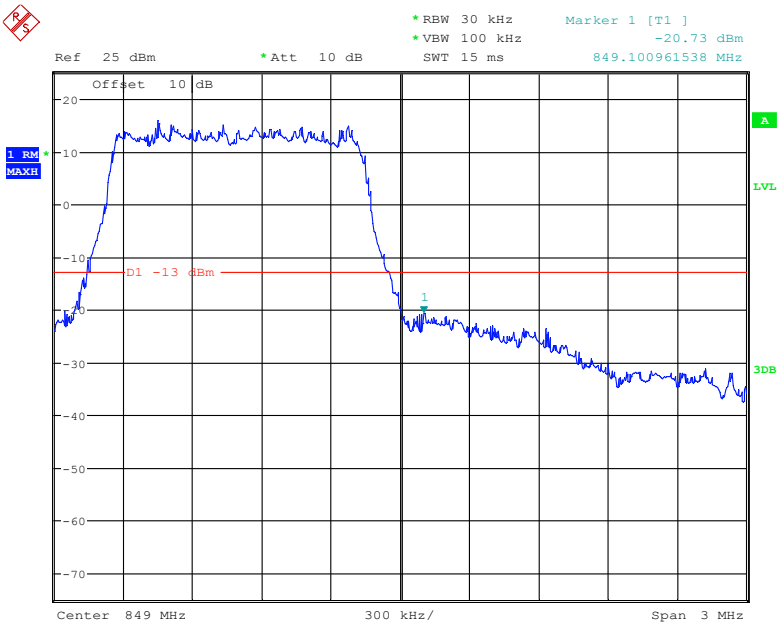
Band 5:

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



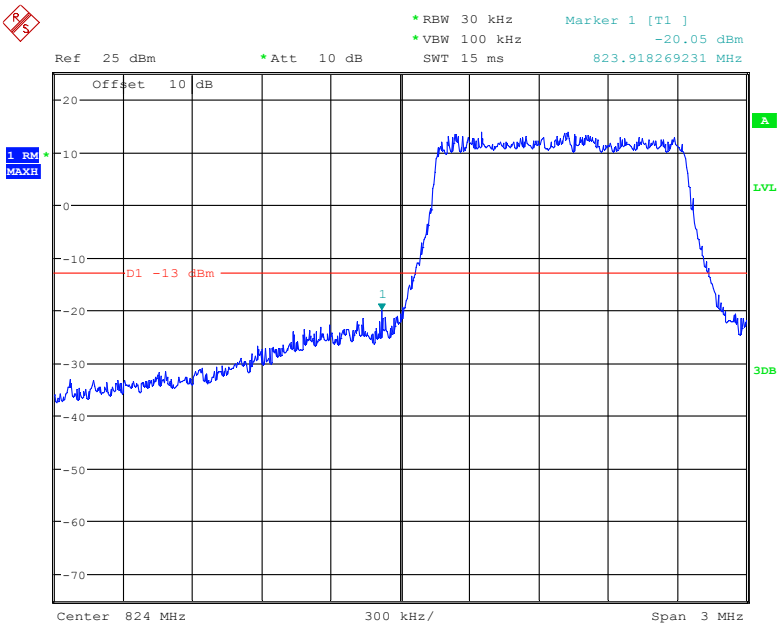
Date: 21.JUN.2019 22:28:00

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



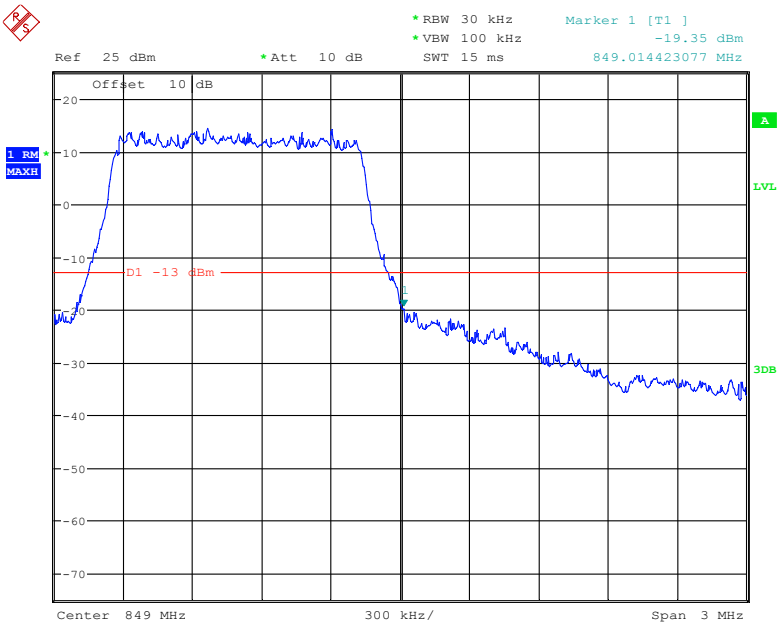
Date: 21.JUN.2019 22:33:35

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



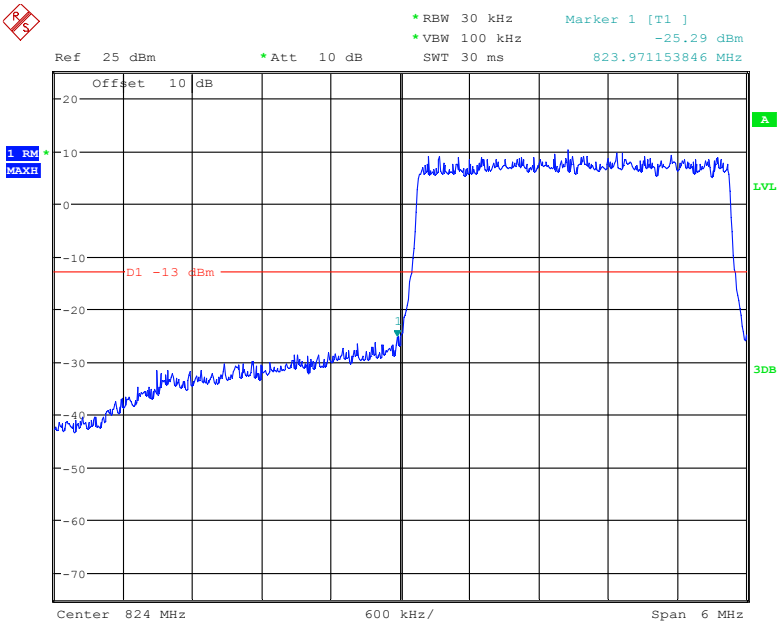
Date: 21.JUN.2019 22:29:17

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



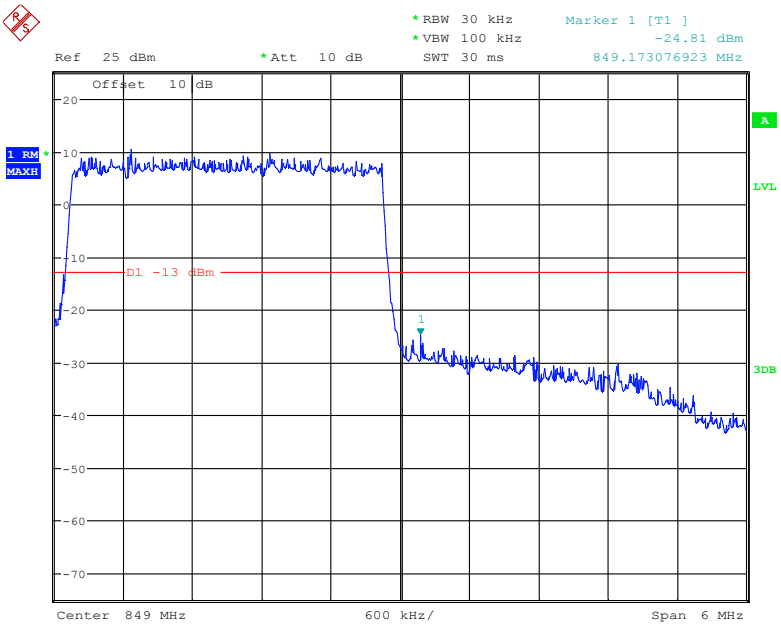
Date: 21.JUN.2019 22:30:01

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



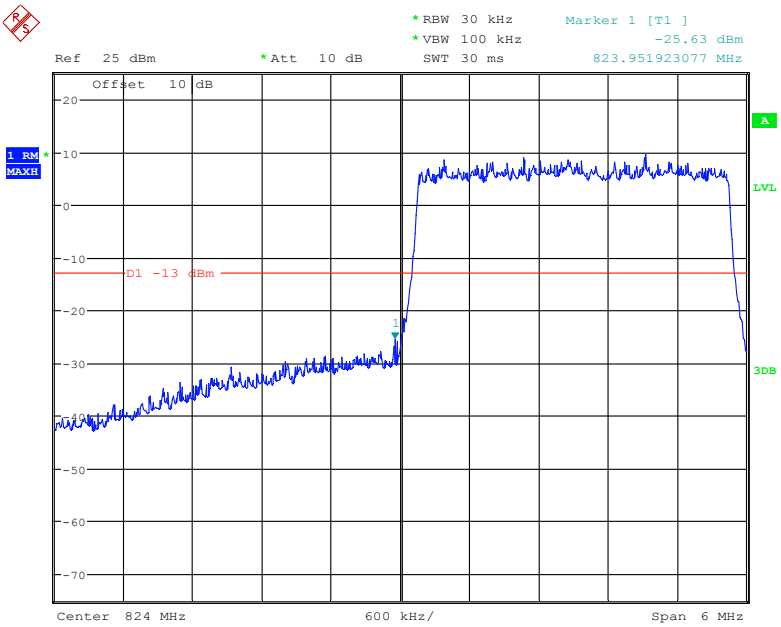
Date: 21.JUN.2019 22:36:57

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



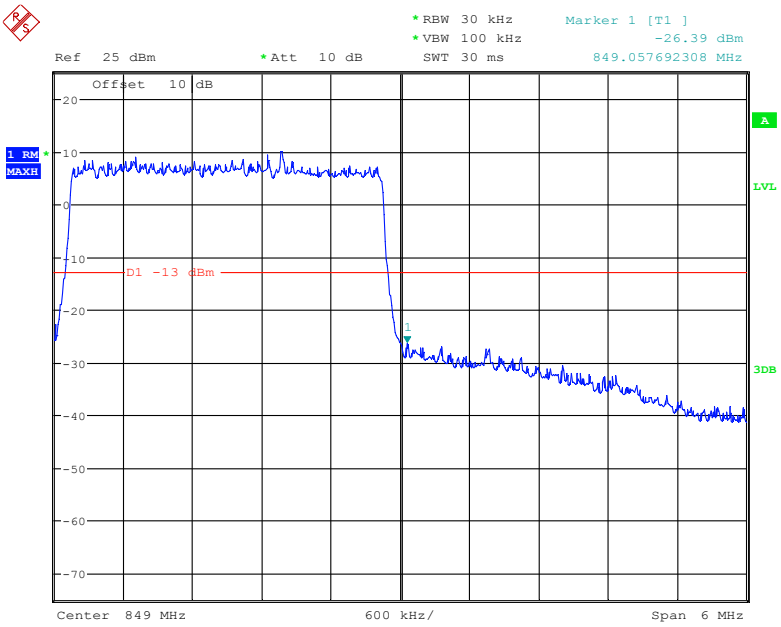
Date: 21.JUN.2019 22:34:16

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



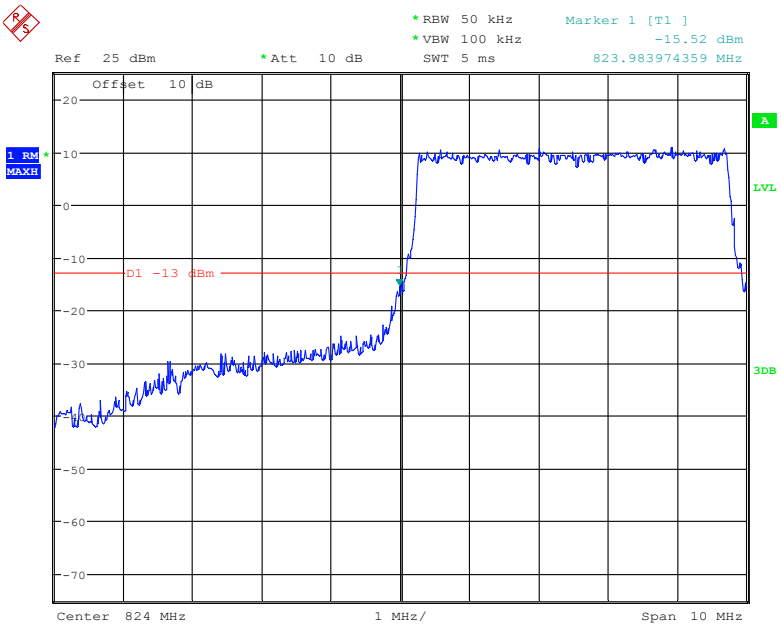
Date: 21.JUN.2019 22:36:29

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



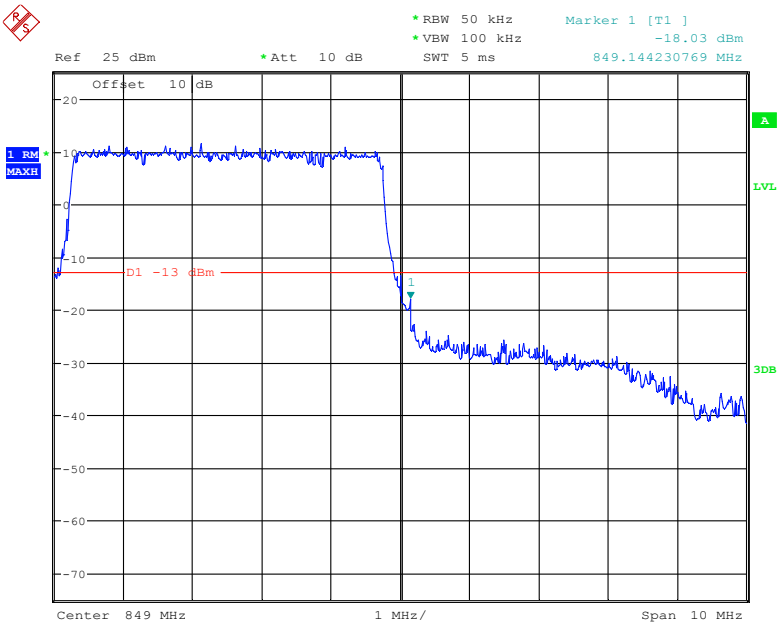
Date: 21.JUN.2019 22:34:58

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



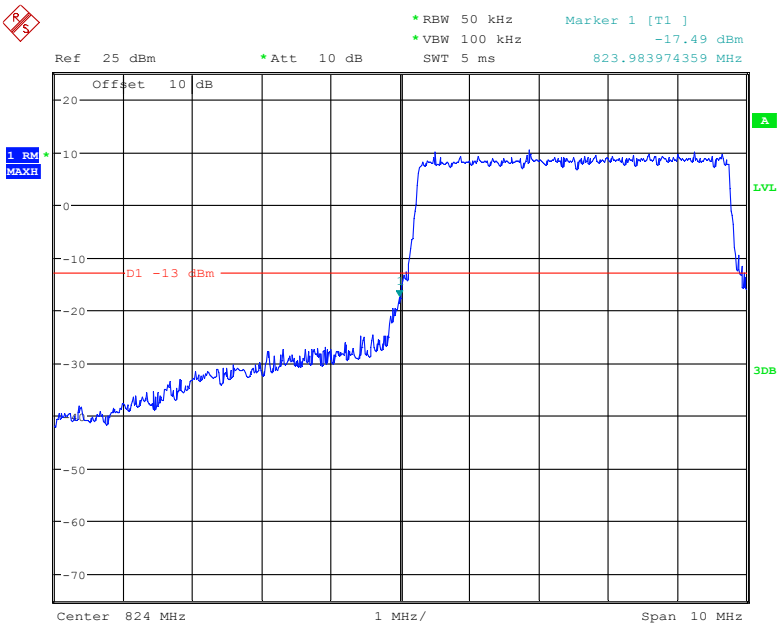
Date: 21.JUN.2019 22:42:37

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



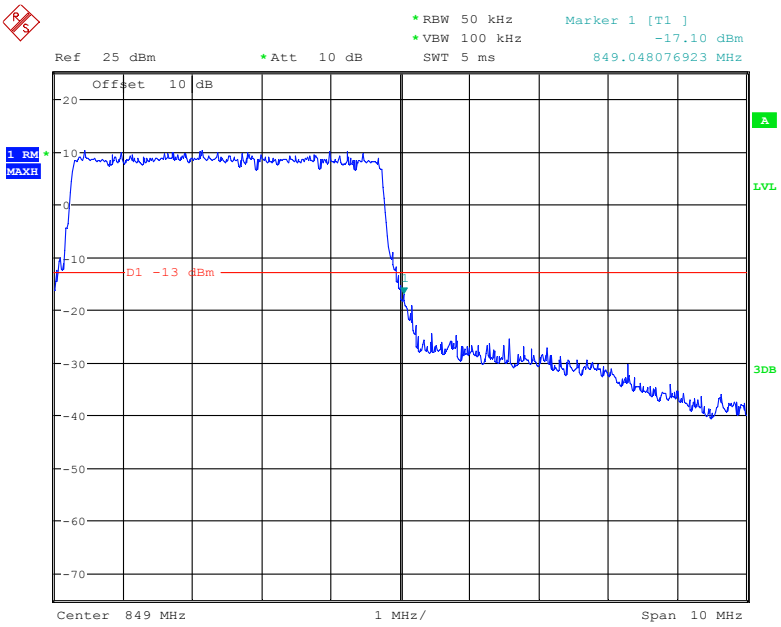
Date: 21.JUN.2019 22:43:20

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



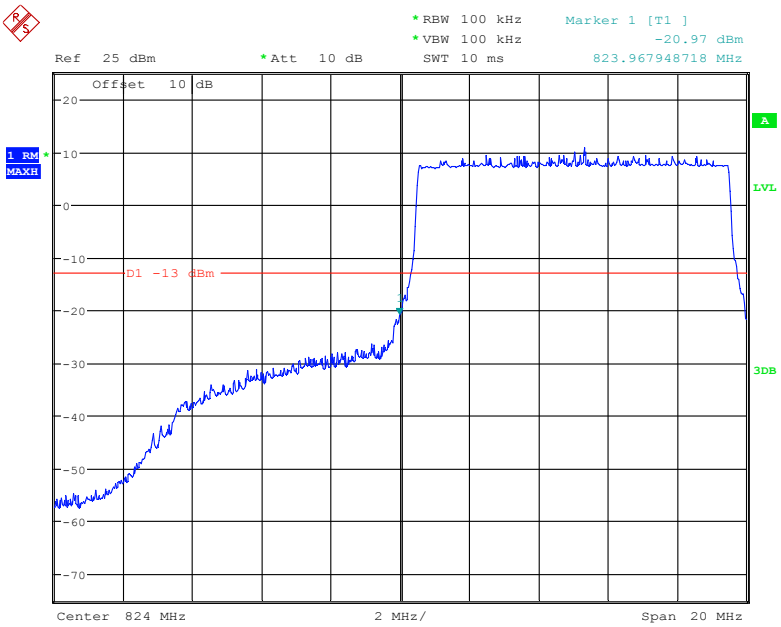
Date: 21.JUN.2019 22:38:40

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



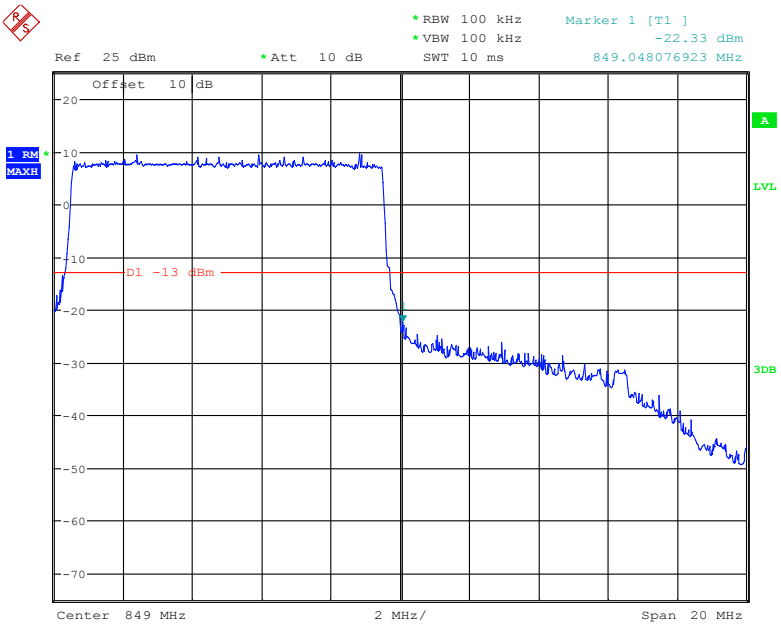
Date: 21.JUN.2019 22:44:48

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



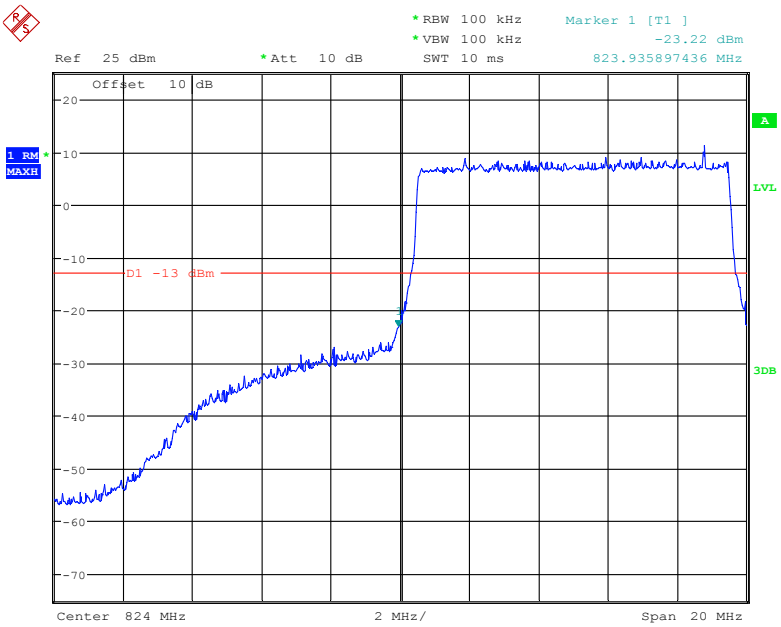
Date: 21.JUN.2019 22:49:42

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



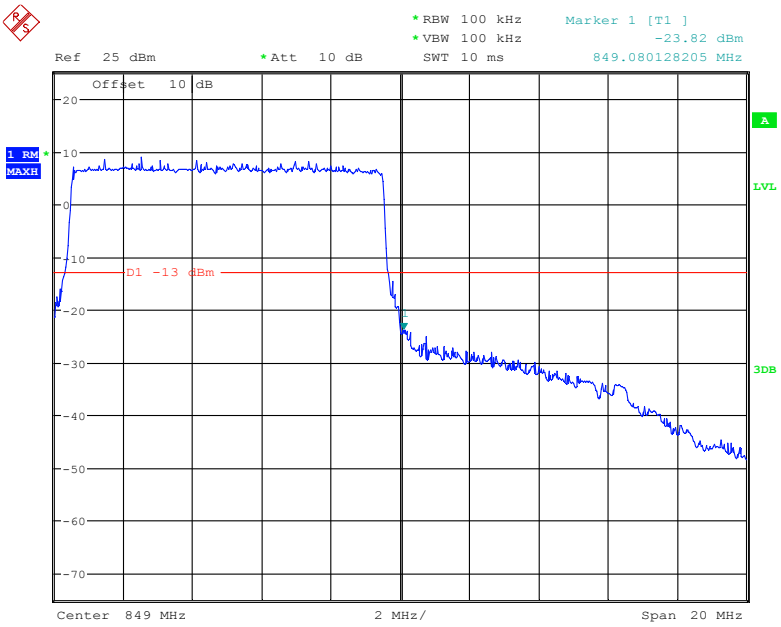
Date: 21.JUN.2019 22:48:43

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



Date: 21.JUN.2019 22:55:55

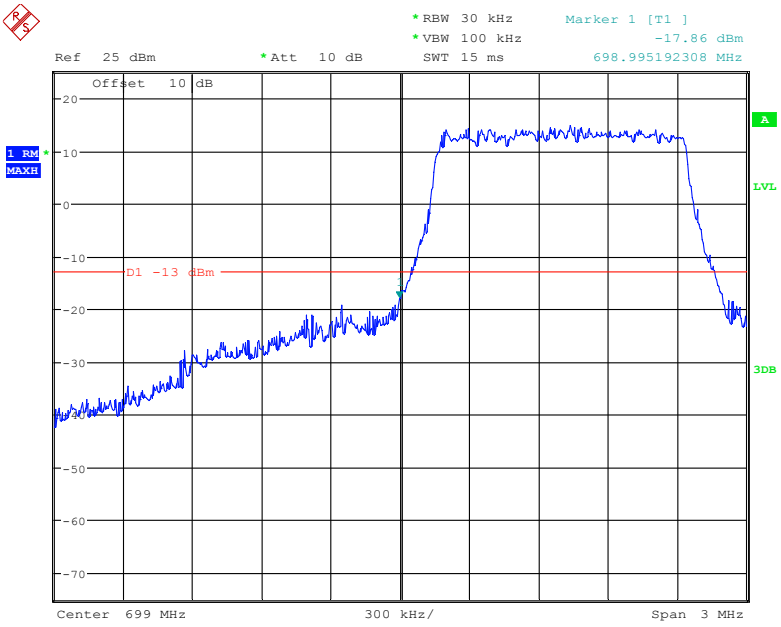
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 21.JUN.2019 22:47:58

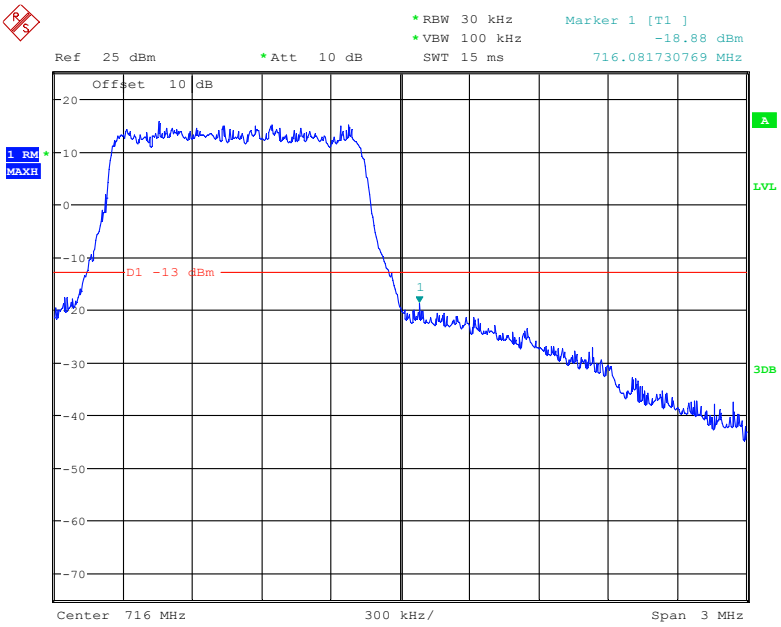
Band 12:

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



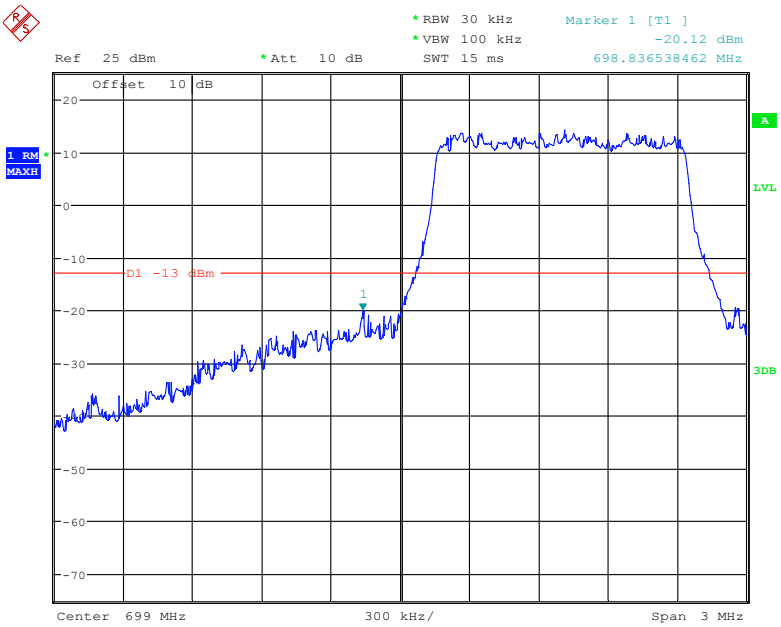
Date: 21.JUN.2019 22:13:25

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



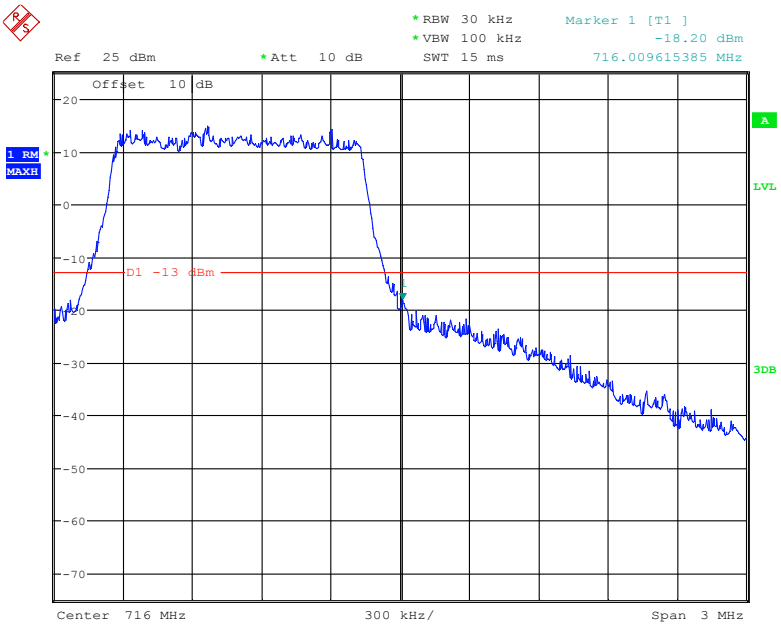
Date: 21.JUN.2019 22:16:53

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



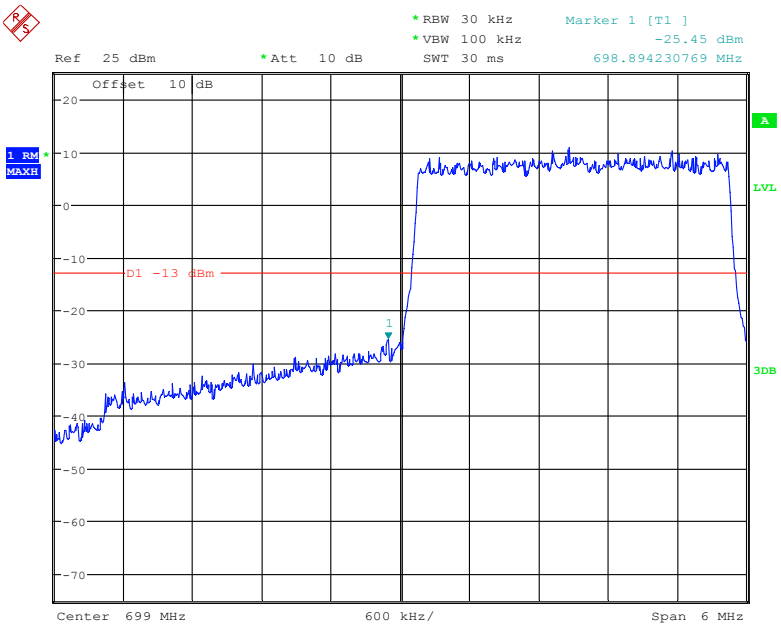
Date: 21.JUN.2019 22:15:50

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



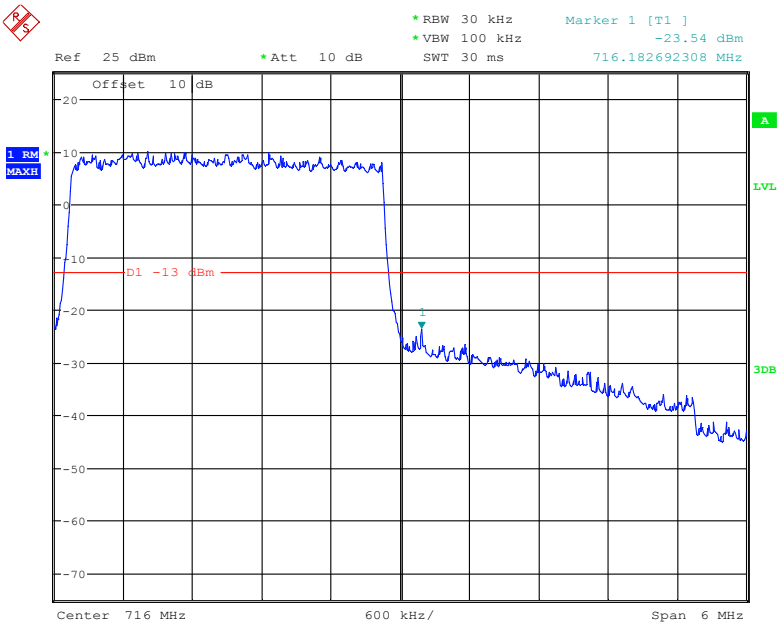
Date: 21.JUN.2019 22:16:29

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



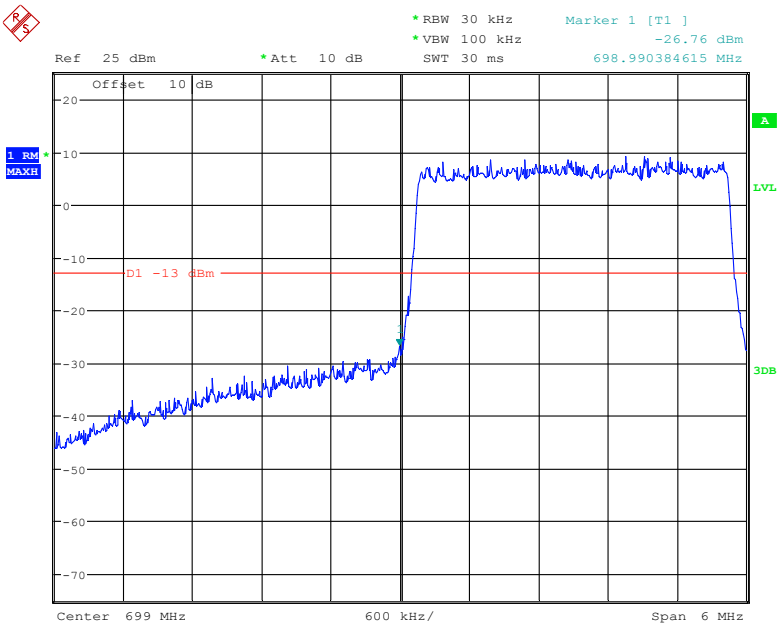
Date: 21.JUN.2019 22:19:57

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



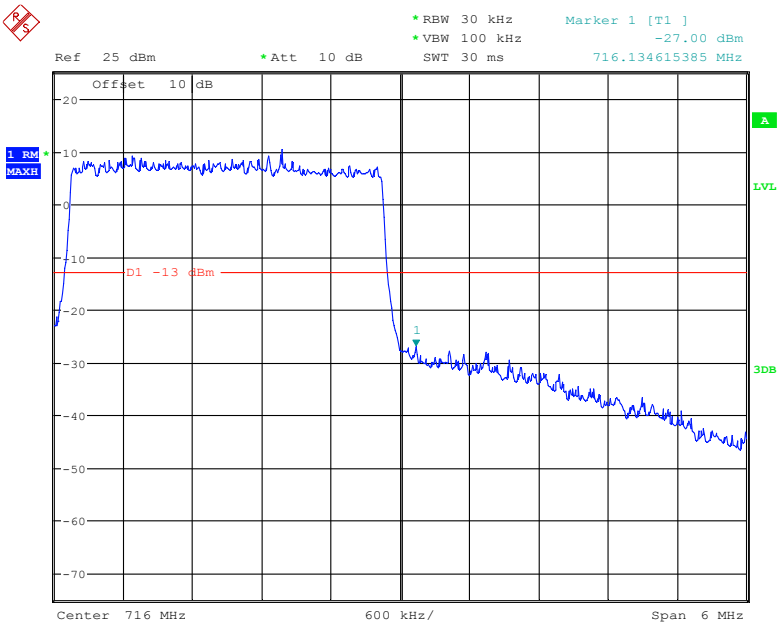
Date: 21.JUN.2019 22:17:52

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



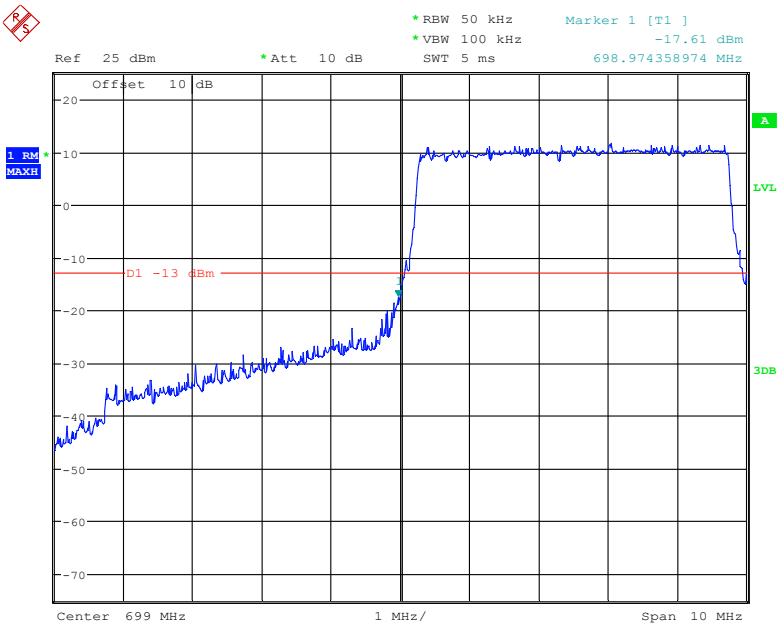
Date: 21.JUN.2019 22:19:33

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



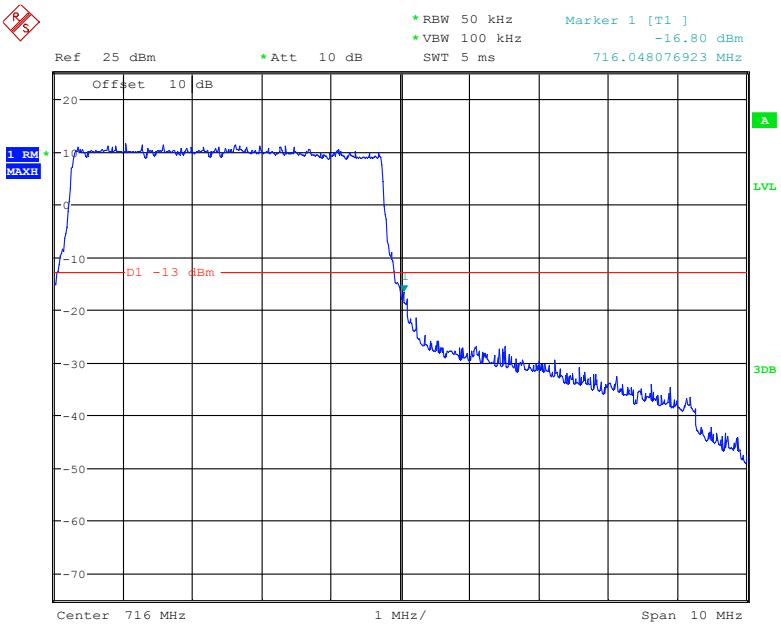
Date: 21.JUN.2019 22:19:03

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



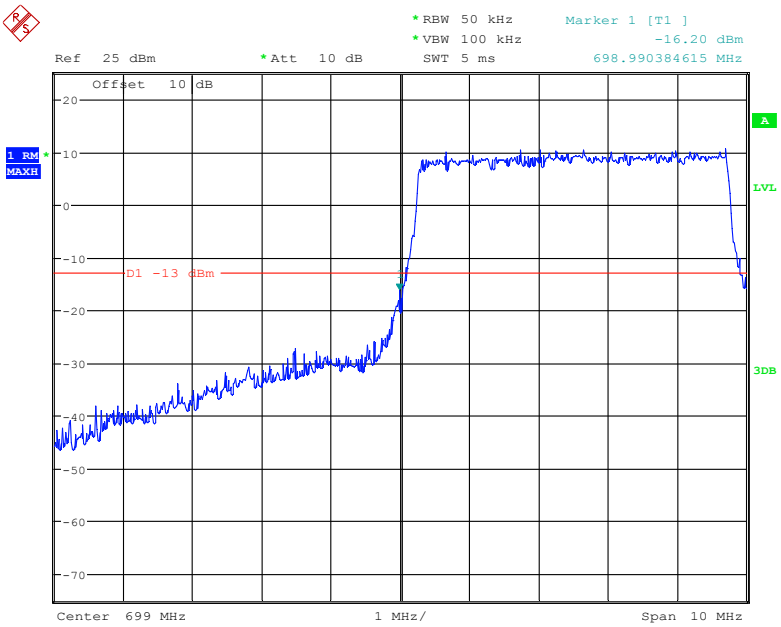
Date: 21.JUN.2019 22:21:52

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



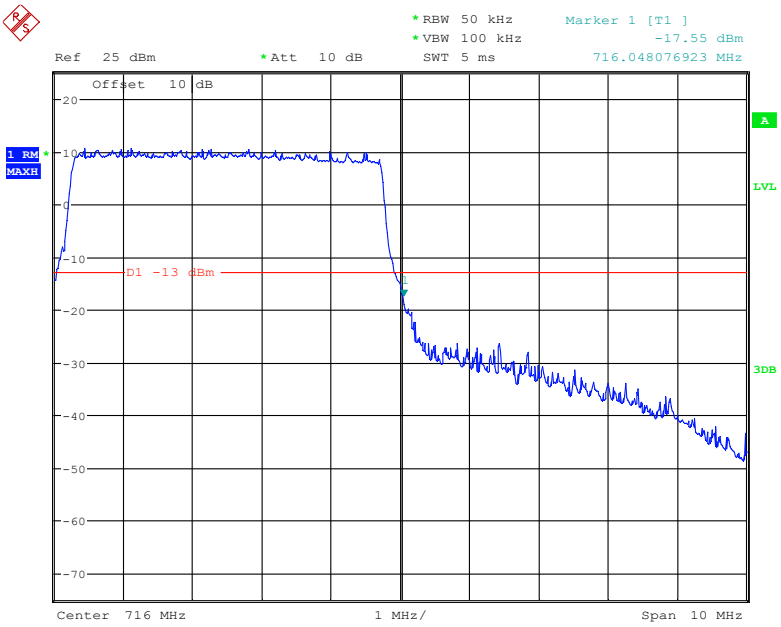
Date: 21.JUN.2019 22:22:25

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



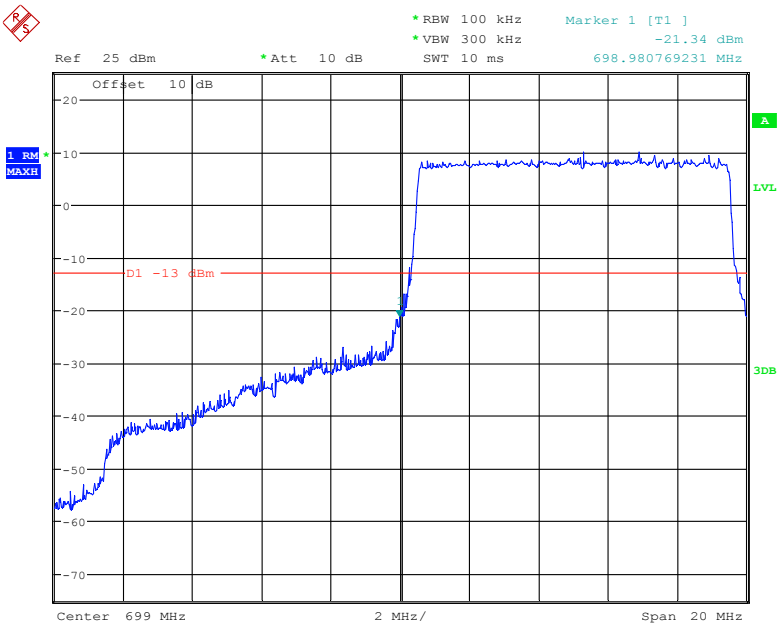
Date: 21.JUN.2019 22:21:03

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



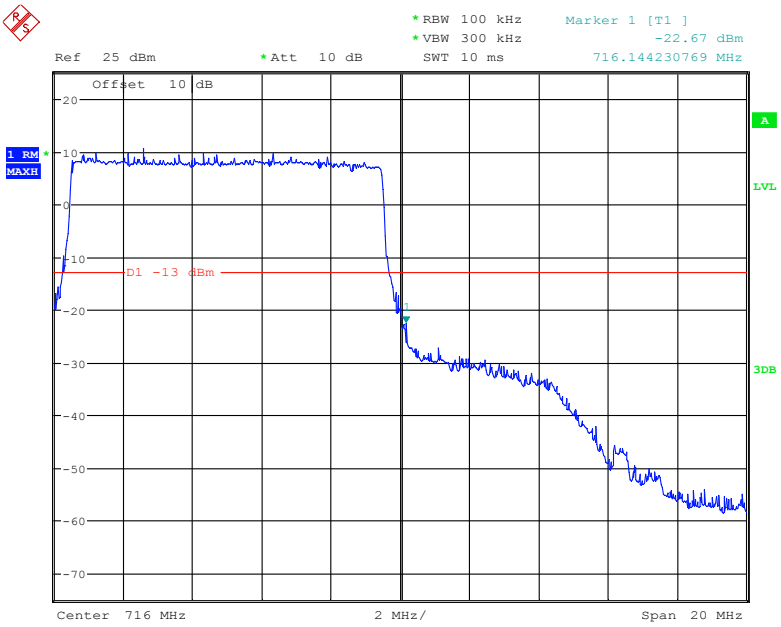
Date: 21.JUN.2019 22:22:56

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



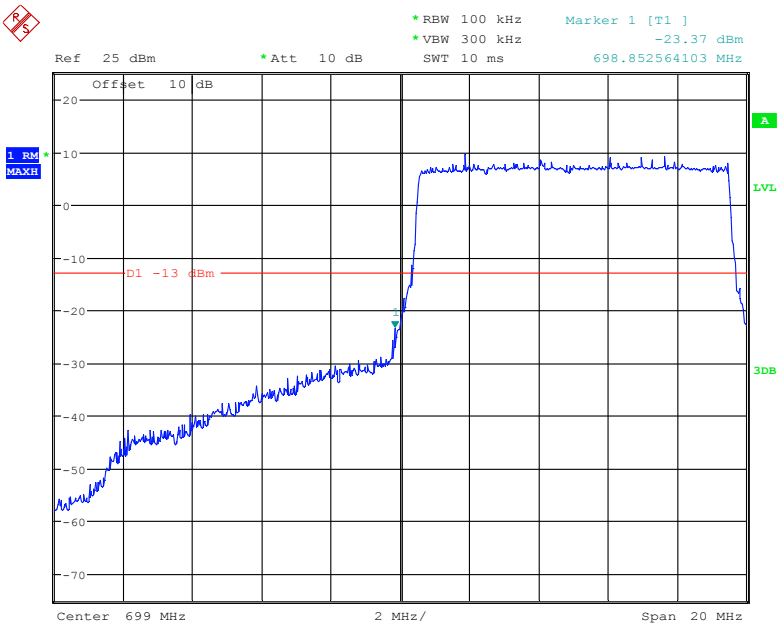
Date: 21.JUN.2019 22:25:30

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



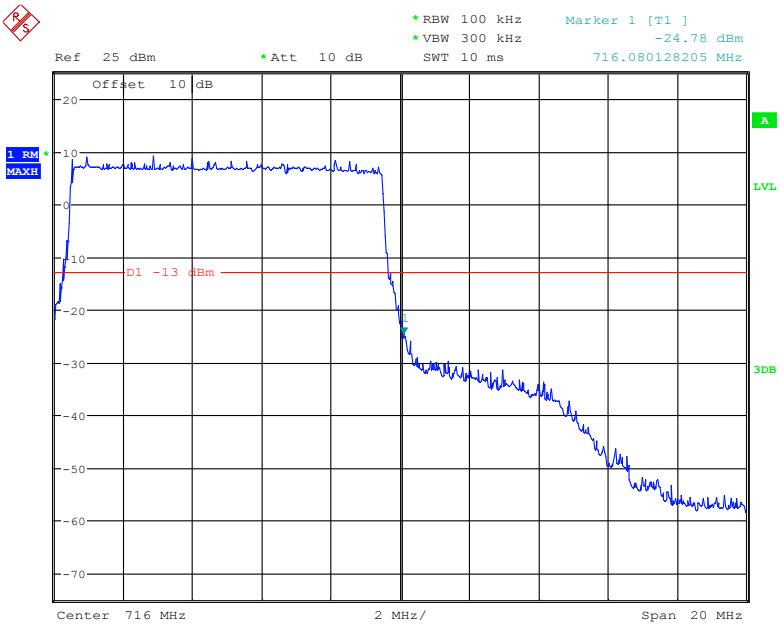
Date: 21.JUN.2019 22:24:23

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



Date: 21.JUN.2019 22:26:02

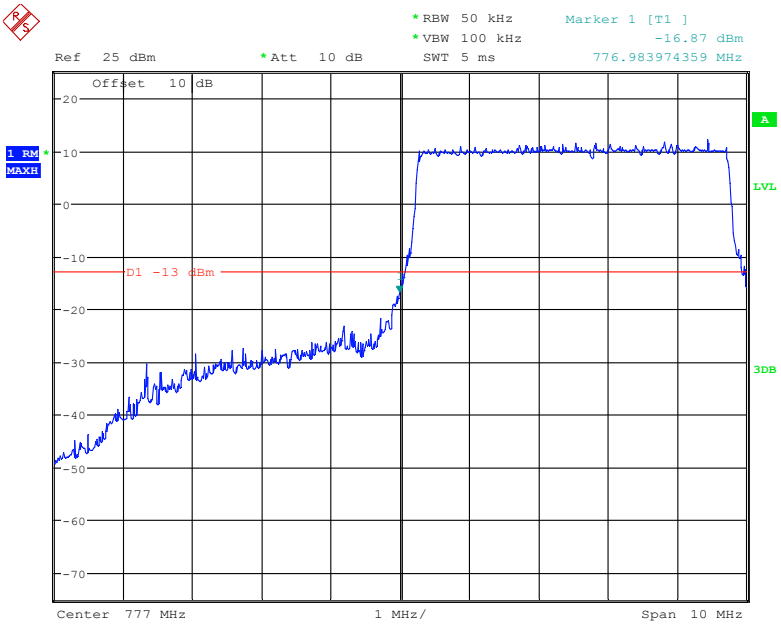
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 21.JUN.2019 22:23:52

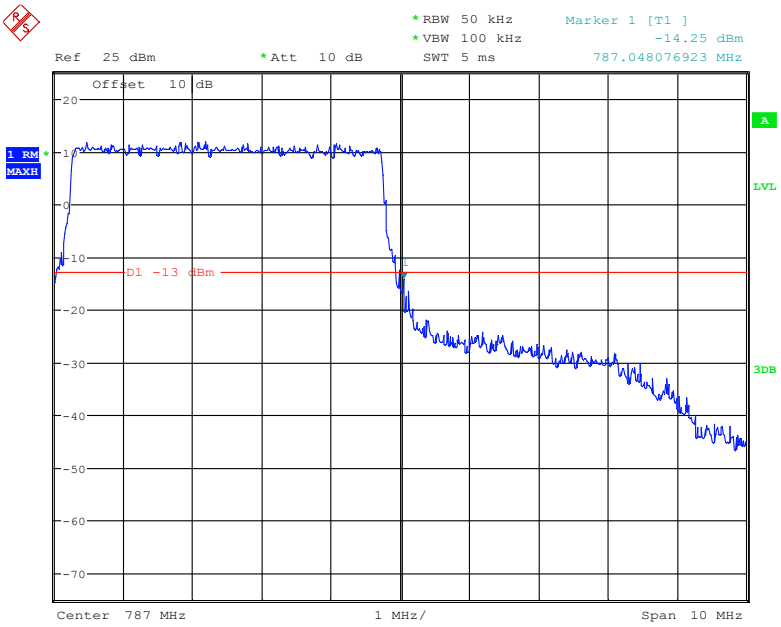
Band 13:

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



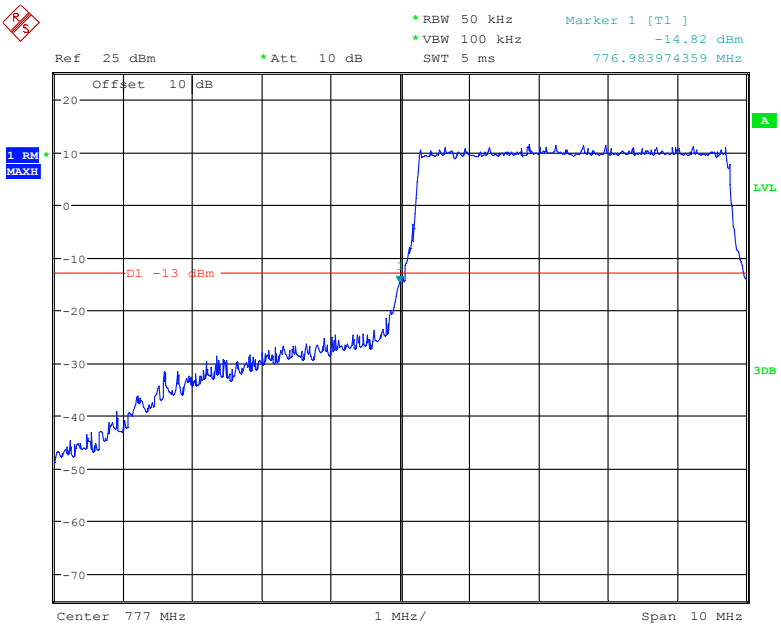
Date: 21.JUN.2019 22:05:51

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



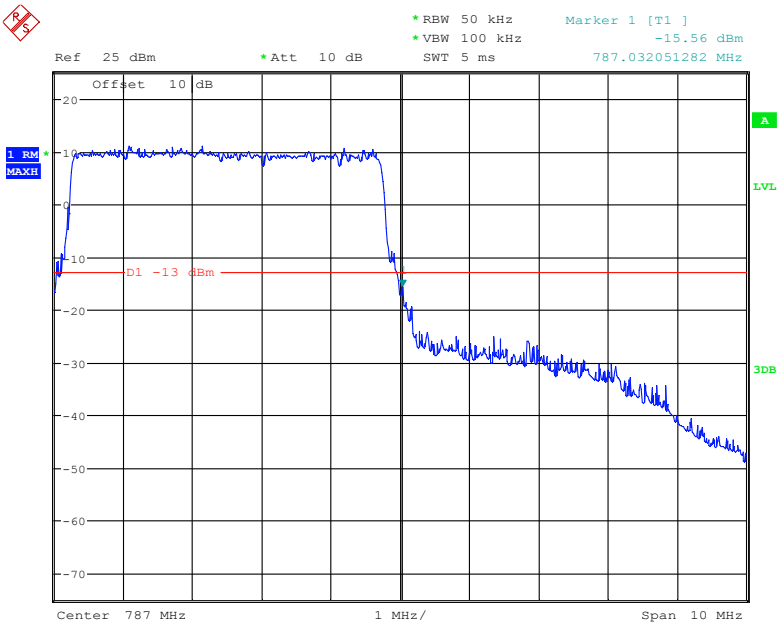
Date: 21.JUN.2019 22:07:35

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



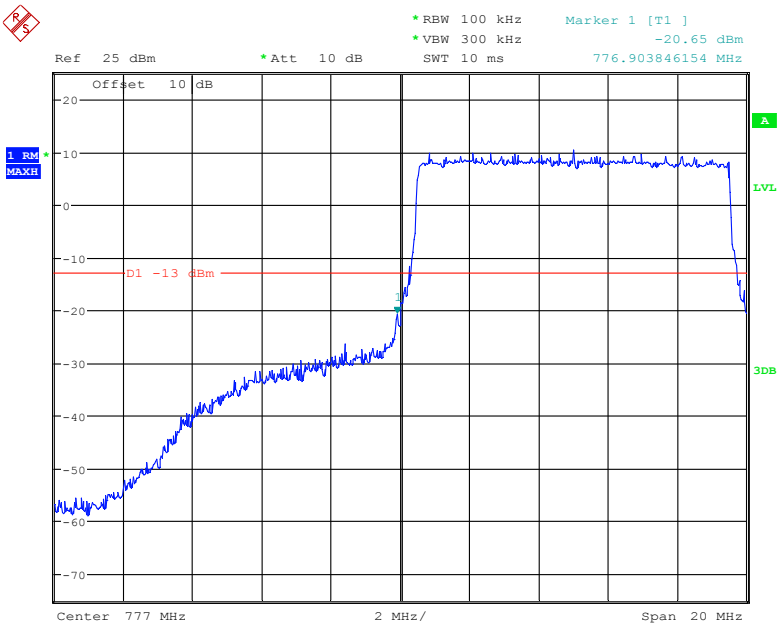
Date: 21.JUN.2019 22:05:16

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



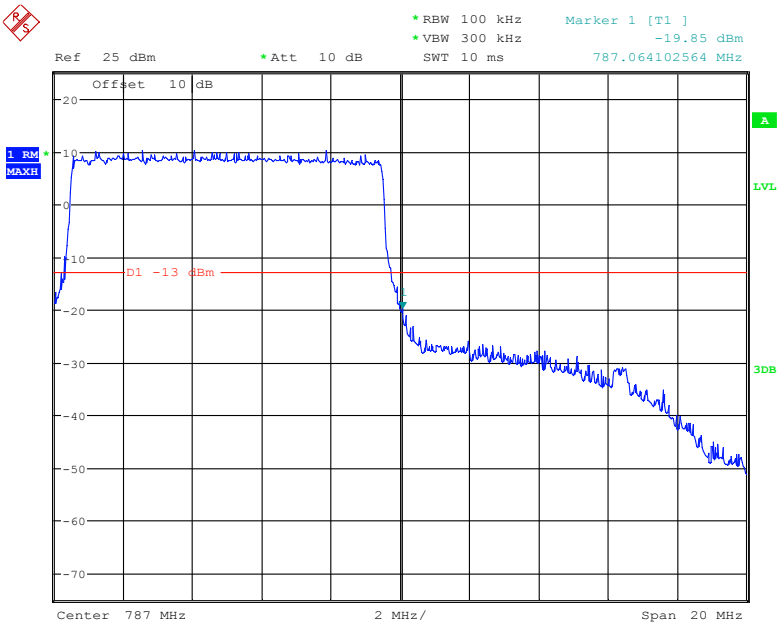
Date: 21.JUN.2019 22:07:58

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



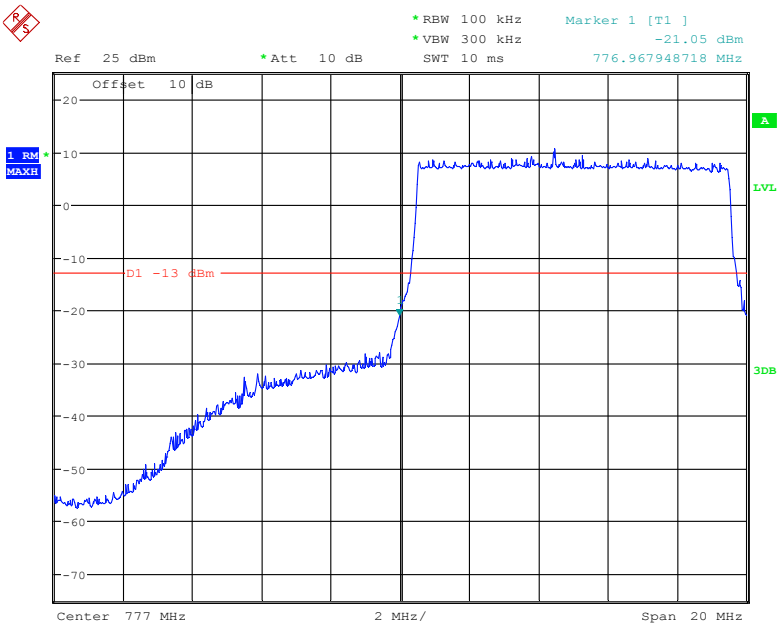
Date: 21.JUN.2019 22:09:54

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



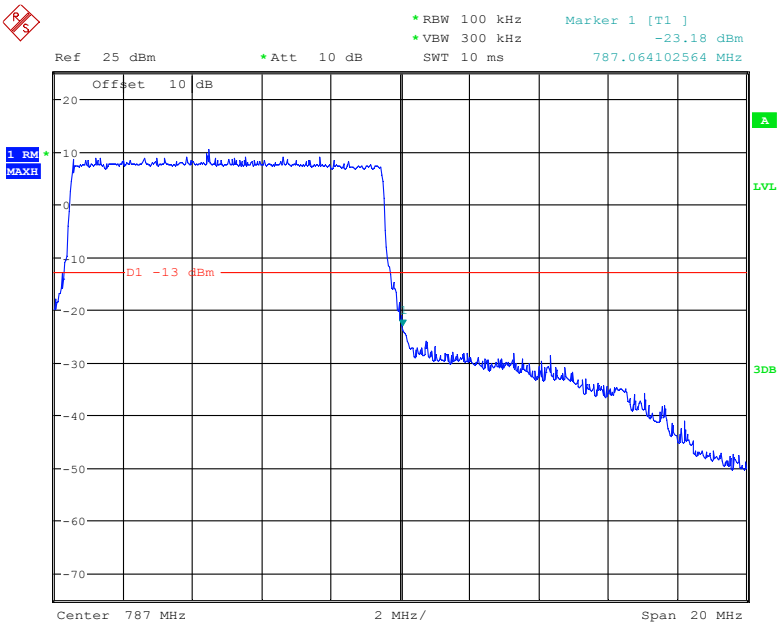
Date: 21.JUN.2019 22:09:23

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



Date: 21.JUN.2019 22:10:58

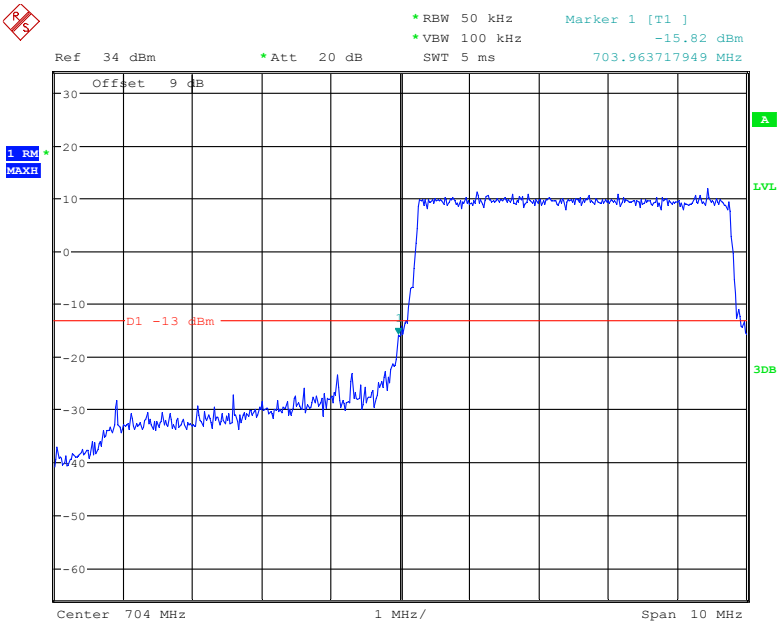
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 21.JUN.2019 22:08:54

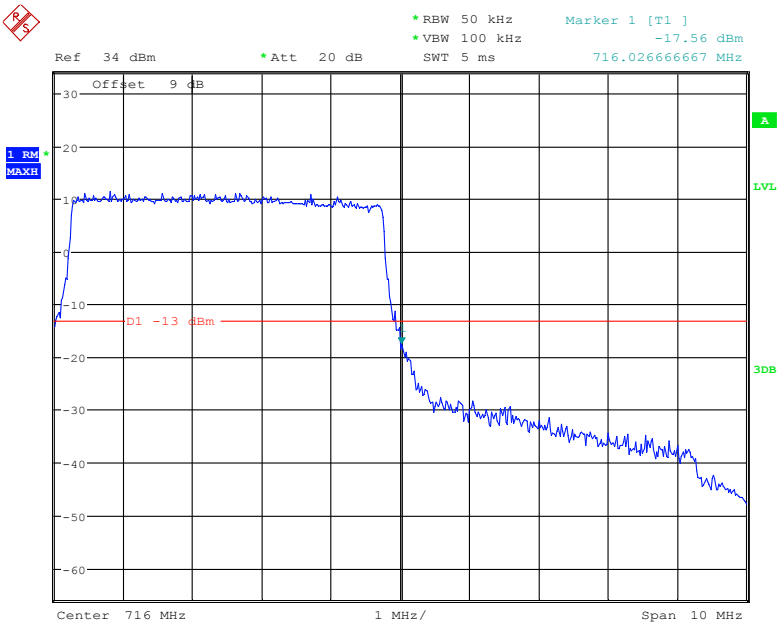
Band 17:

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



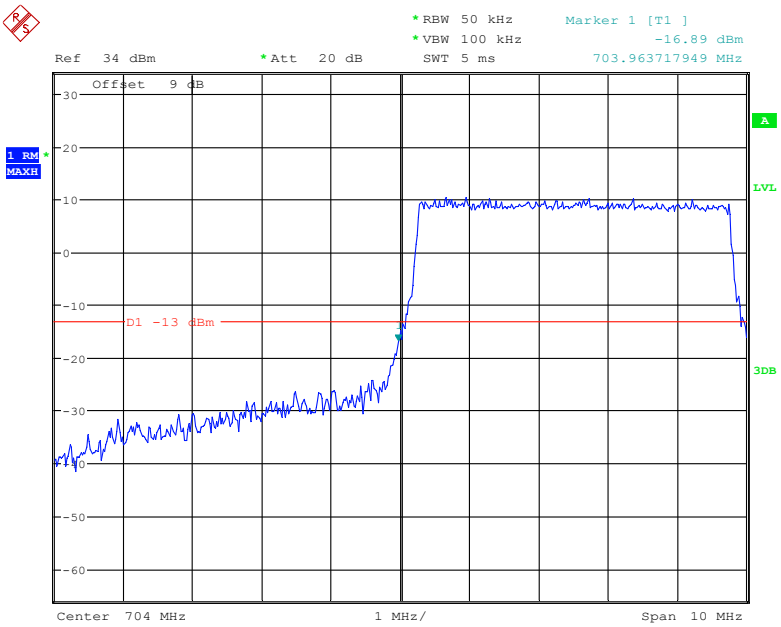
Date: 8.JUL.2019 21:53:08

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



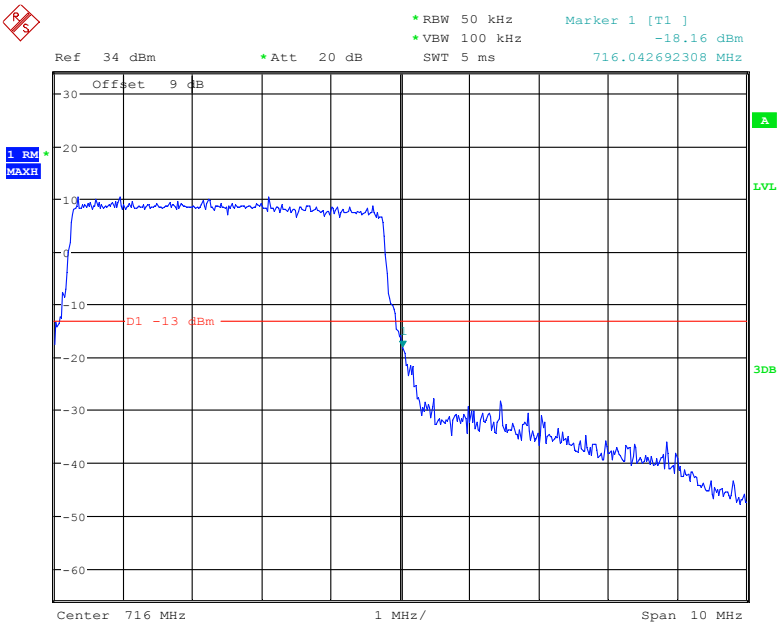
Date: 8.JUL.2019 21:53:45

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



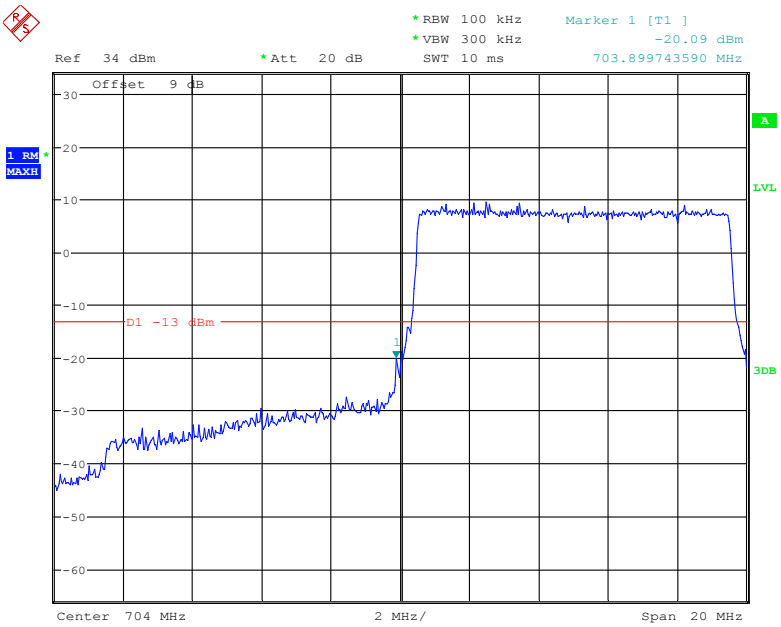
Date: 8.JUL.2019 21:52:27

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



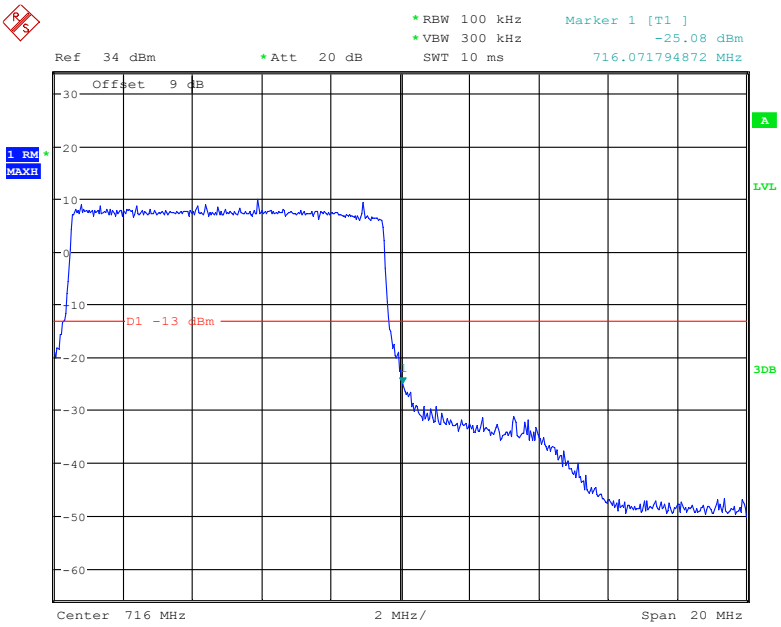
Date: 8.JUL.2019 21:54:05

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



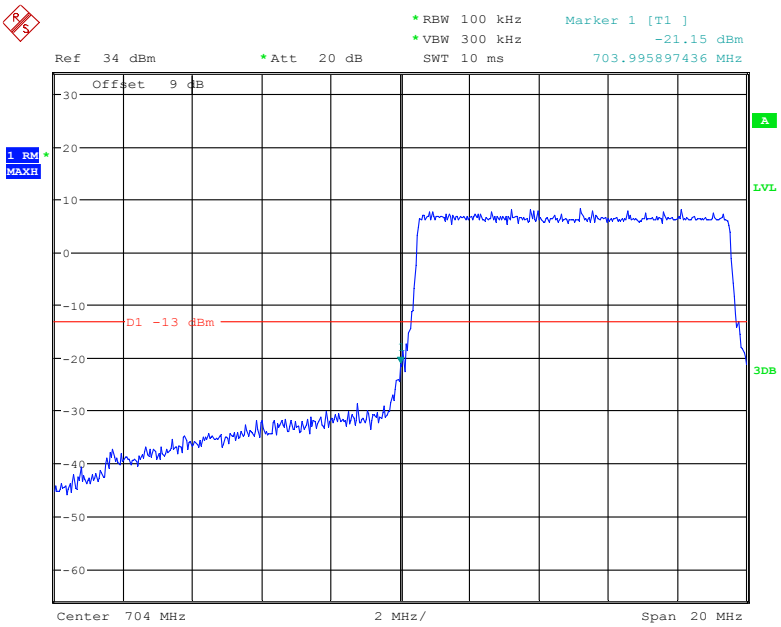
Date: 8.JUL.2019 21:56:30

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



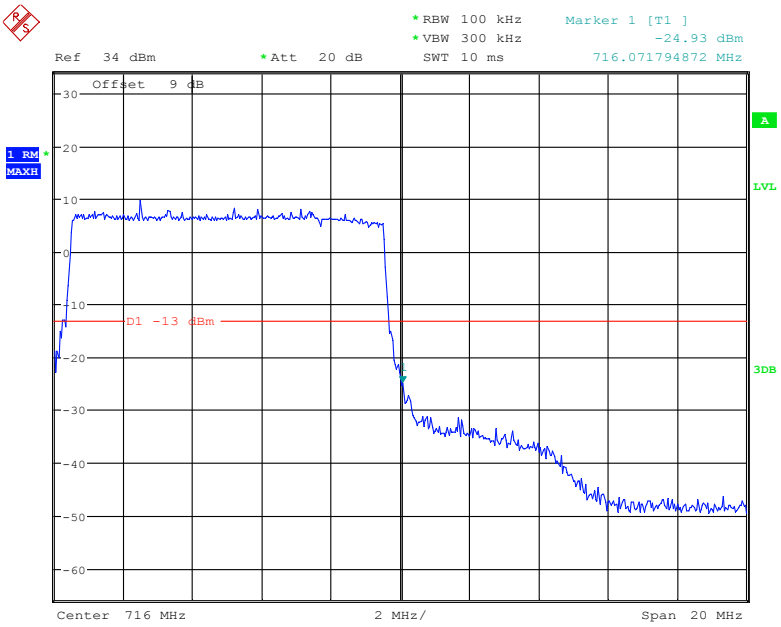
Date: 8.JUL.2019 21:55:43

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



Date: 8.JUL.2019 21:57:05

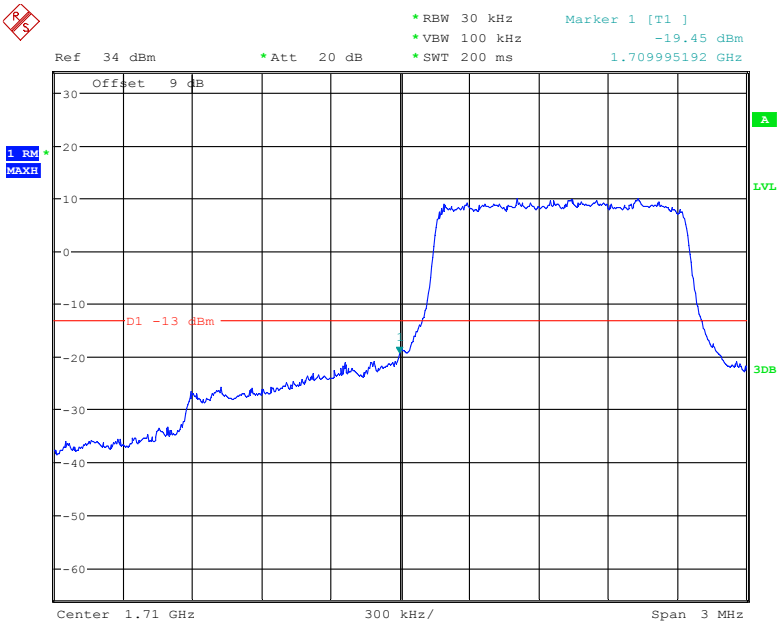
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 8.JUL.2019 21:55:00

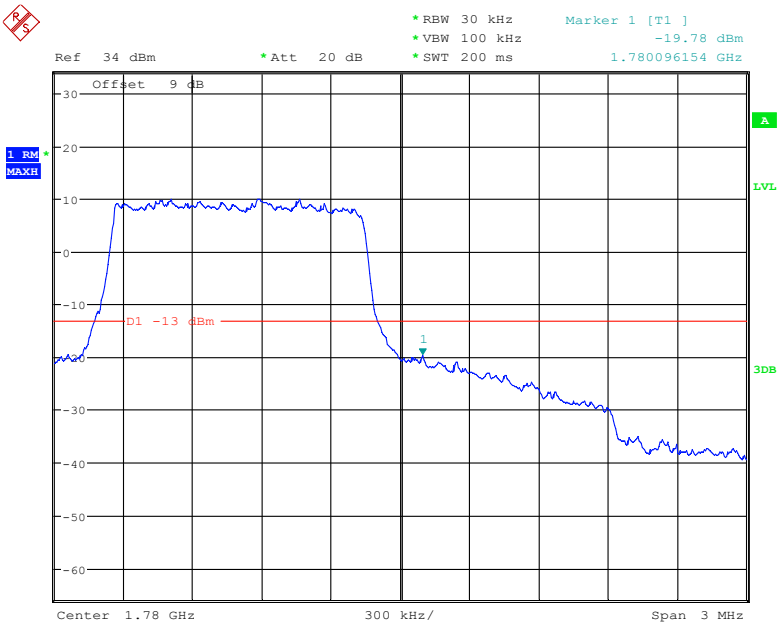
Band 66:

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



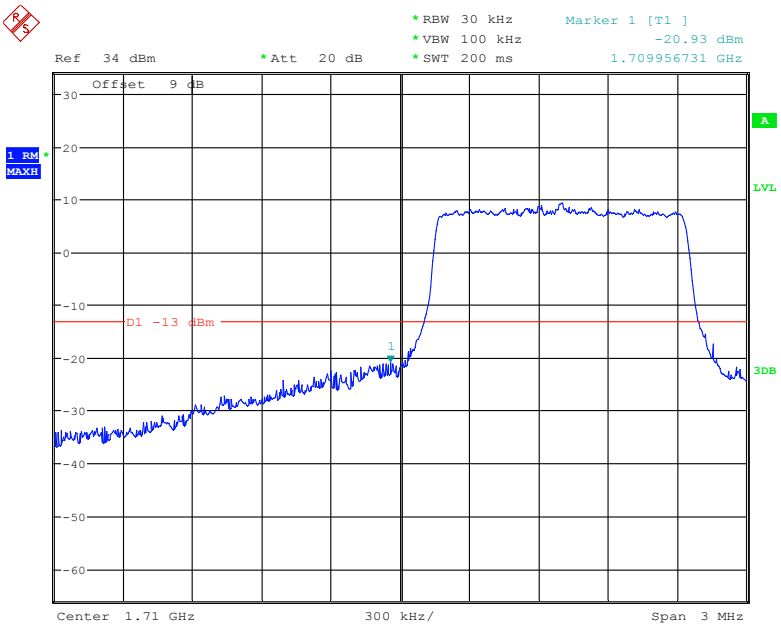
Date: 27.AUG.2019 23:18:34

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



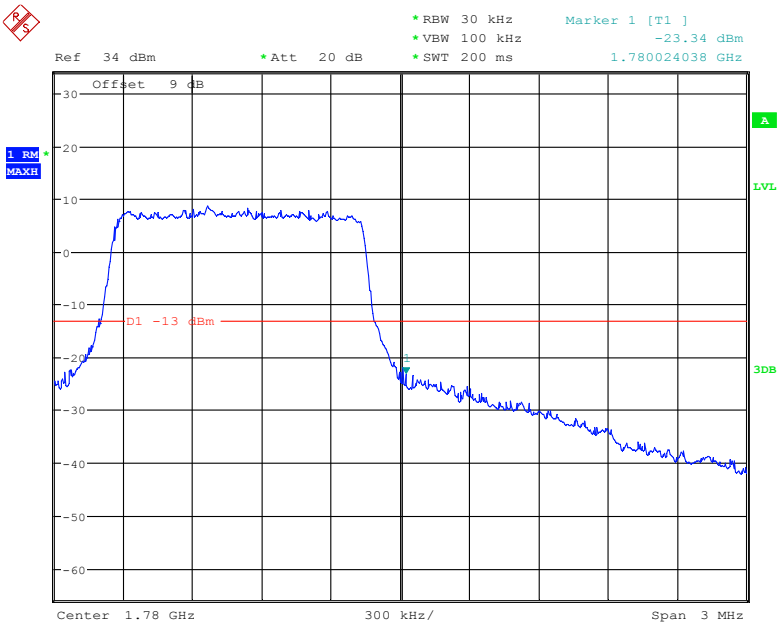
Date: 27.AUG.2019 23:21:37

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



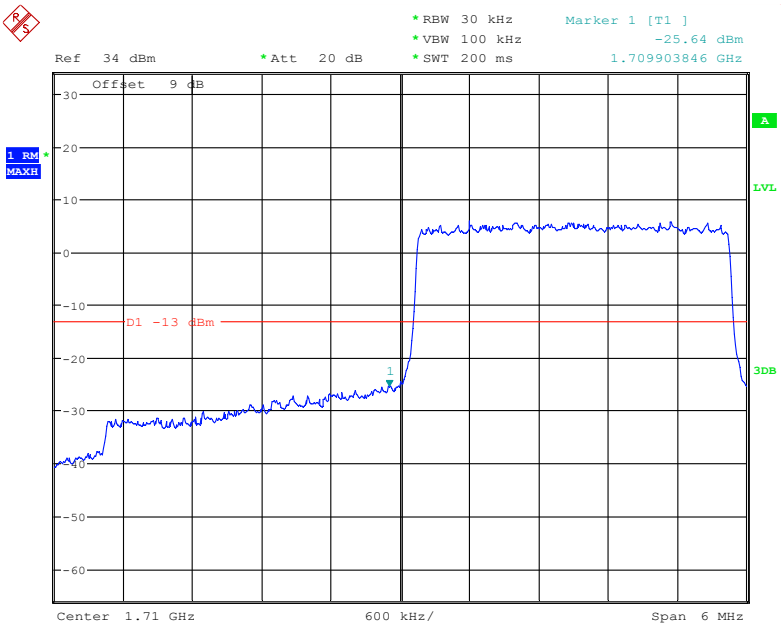
Date: 27.AUG.2019 23:19:28

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



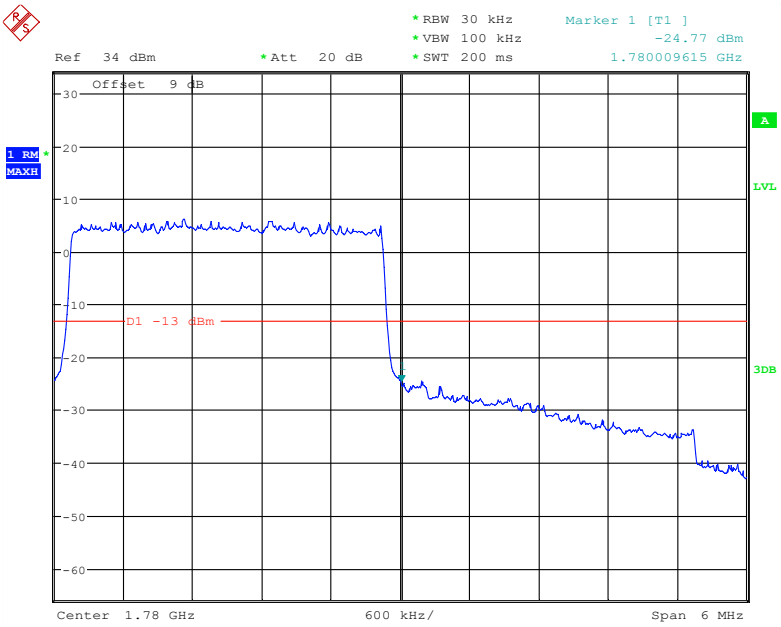
Date: 27.AUG.2019 23:19:56

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



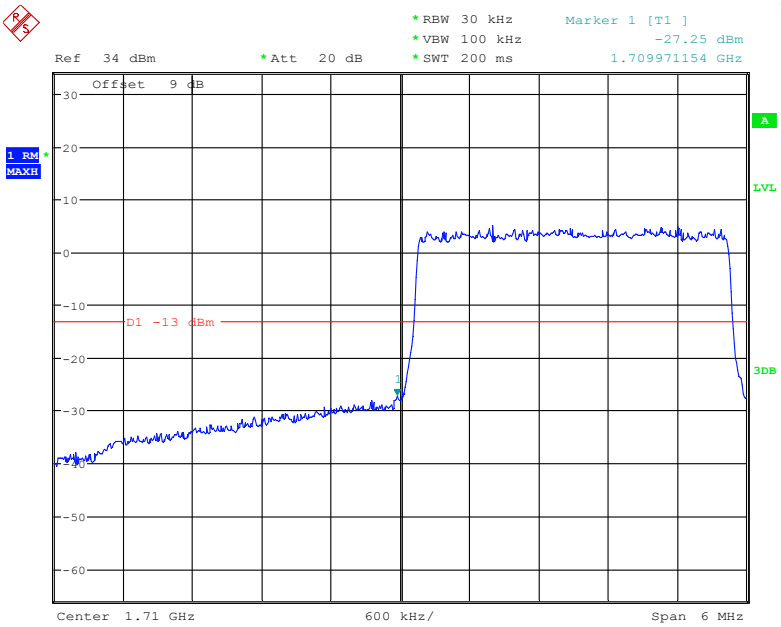
Date: 27.AUG.2019 23:25:49

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



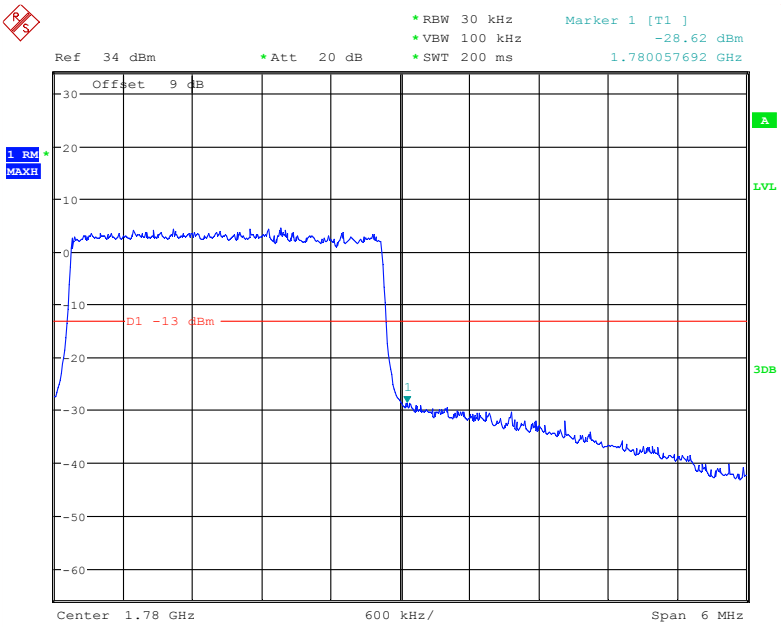
Date: 27.AUG.2019 23:24:52

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



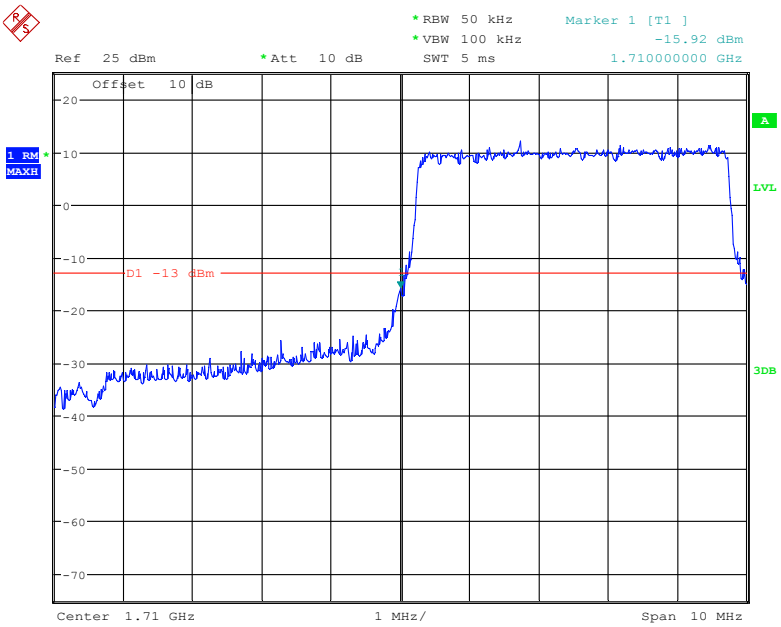
Date: 27.AUG.2019 23:26:07

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



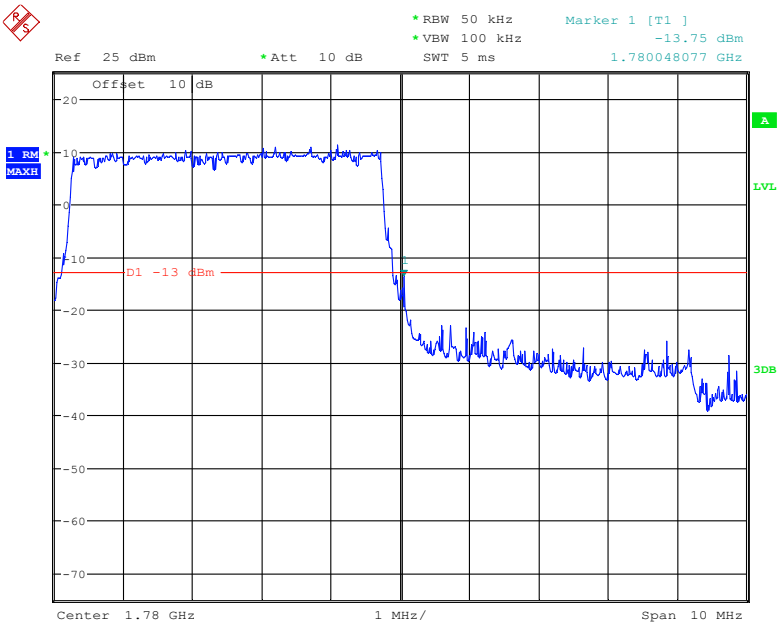
Date: 27.AUG.2019 23:23:40

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



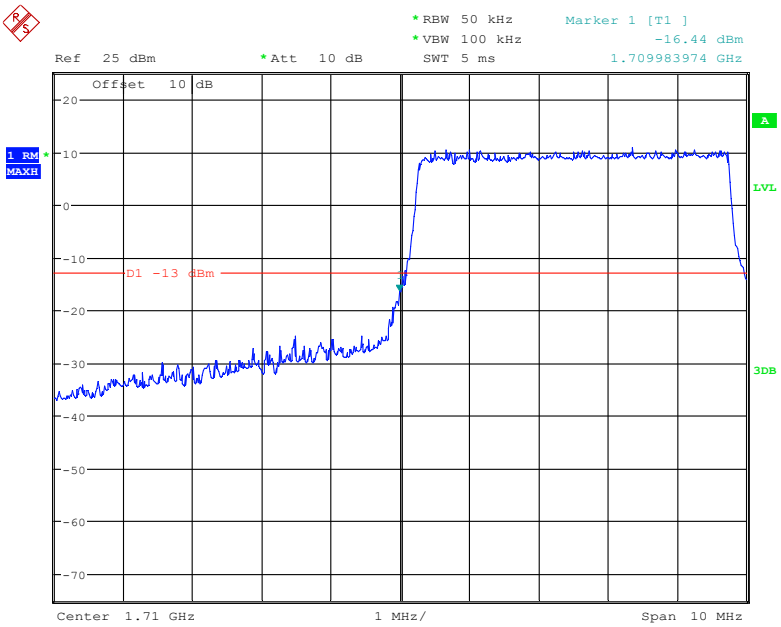
Date: 23.JUN.2019 09:59:48

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



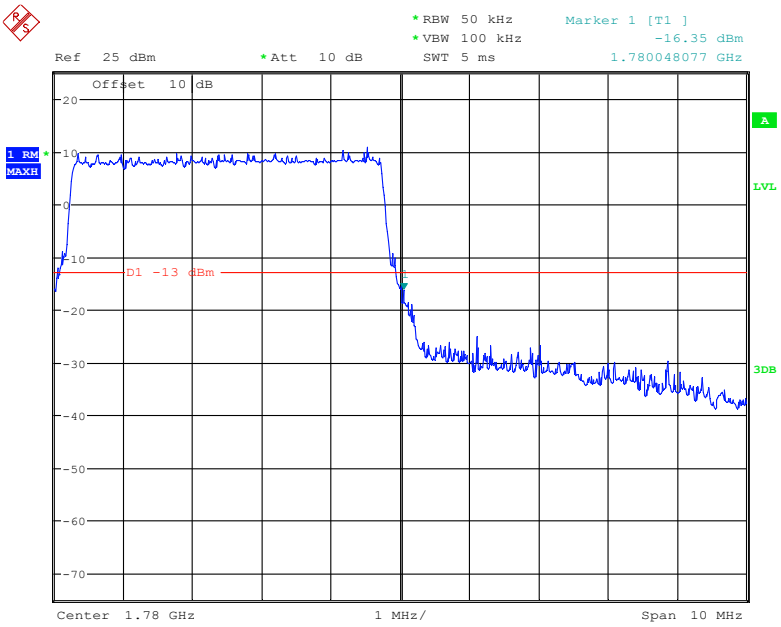
Date: 23.JUN.2019 10:09:00

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



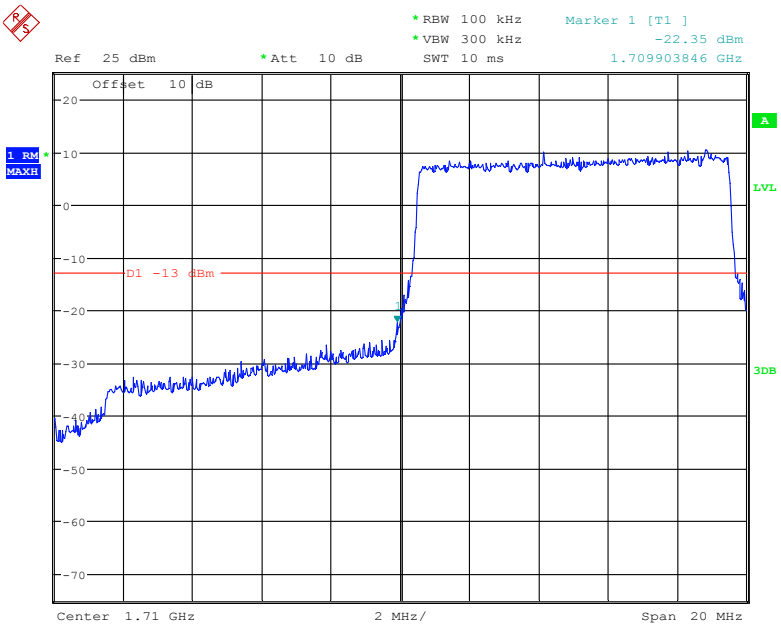
Date: 23.JUN.2019 10:00:37

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



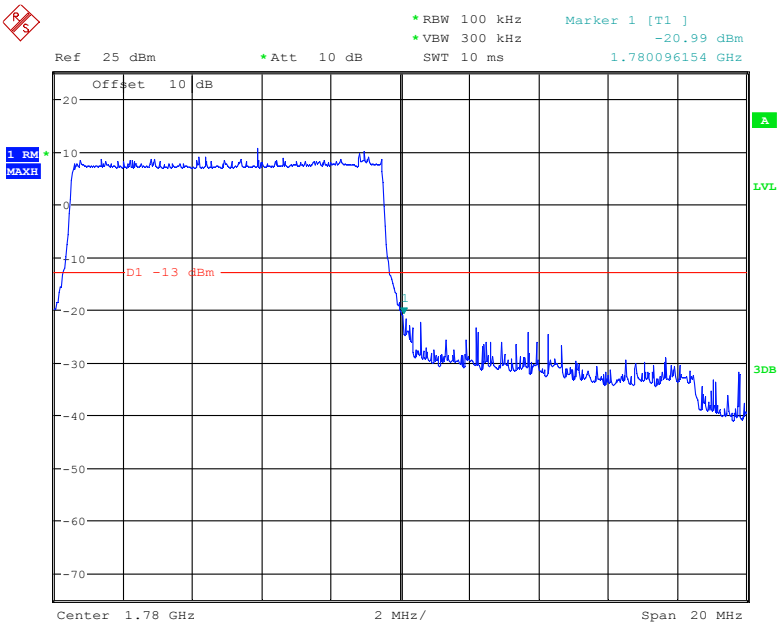
Date: 23.JUN.2019 10:01:14

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



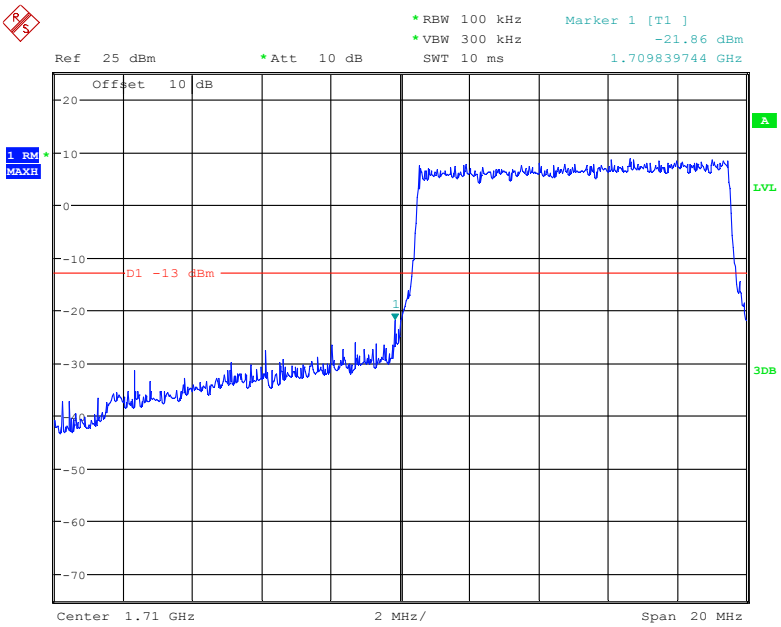
Date: 23.JUN.2019 10:09:37

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



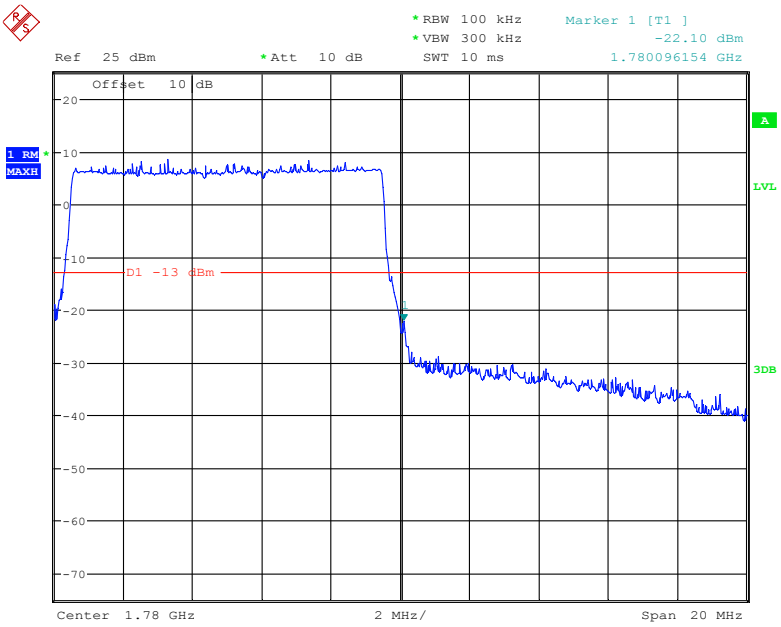
Date: 23.JUN.2019 10:16:23

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



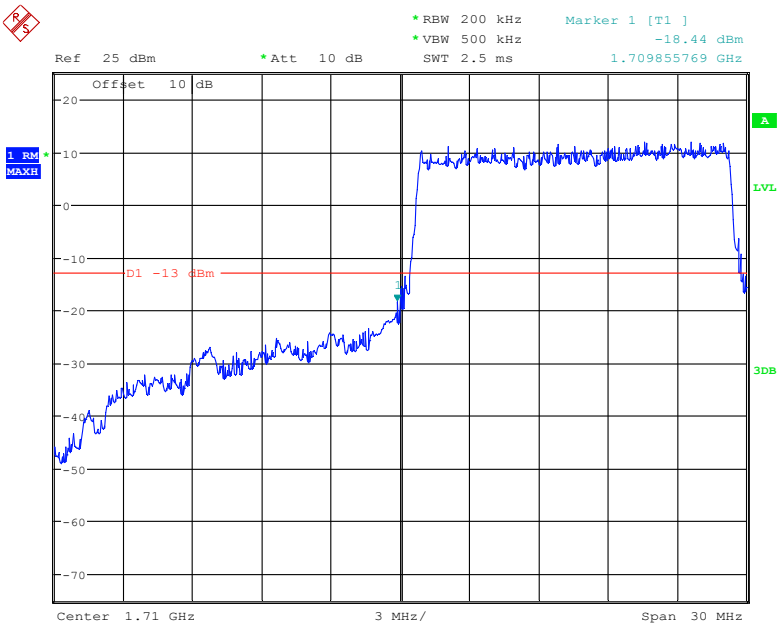
Date: 23.JUN.2019 10:14:23

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



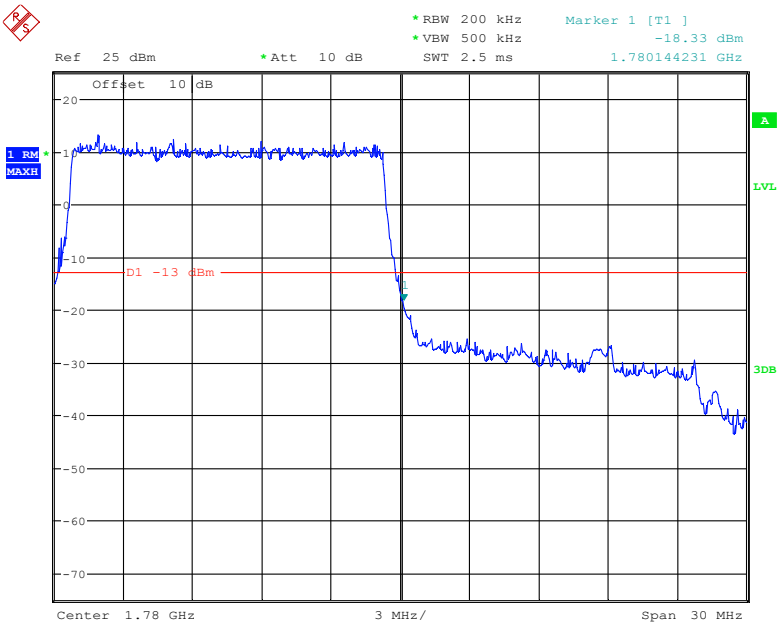
Date: 23.JUN.2019 10:15:16

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



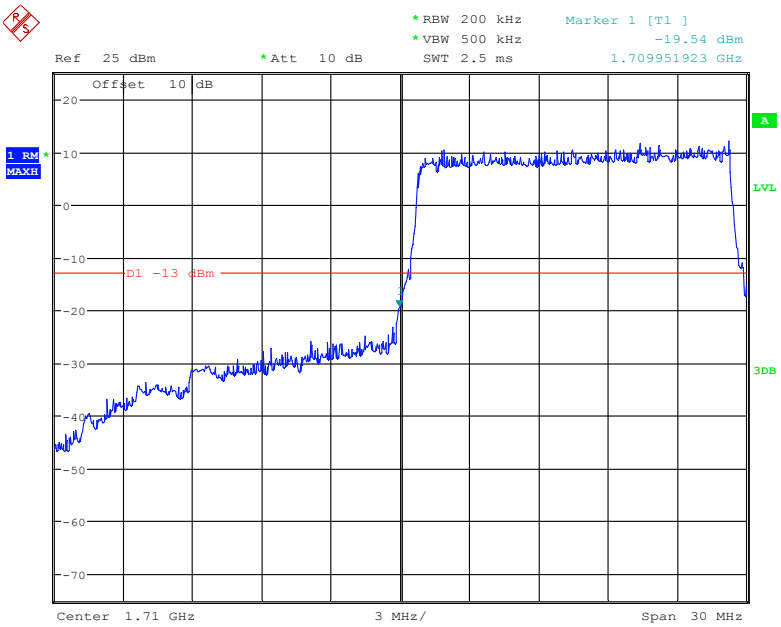
Date: 23.JUN.2019 10:33:52

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



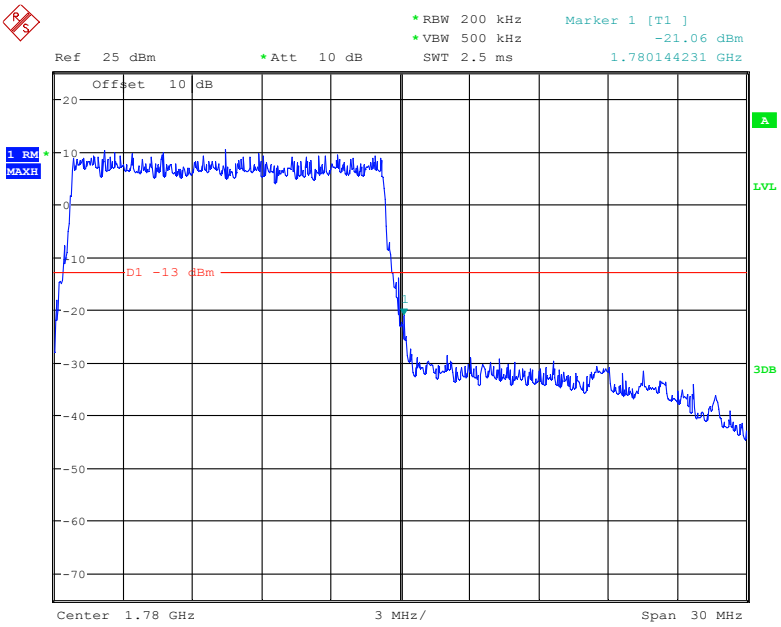
Date: 23.JUN.2019 10:36:24

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



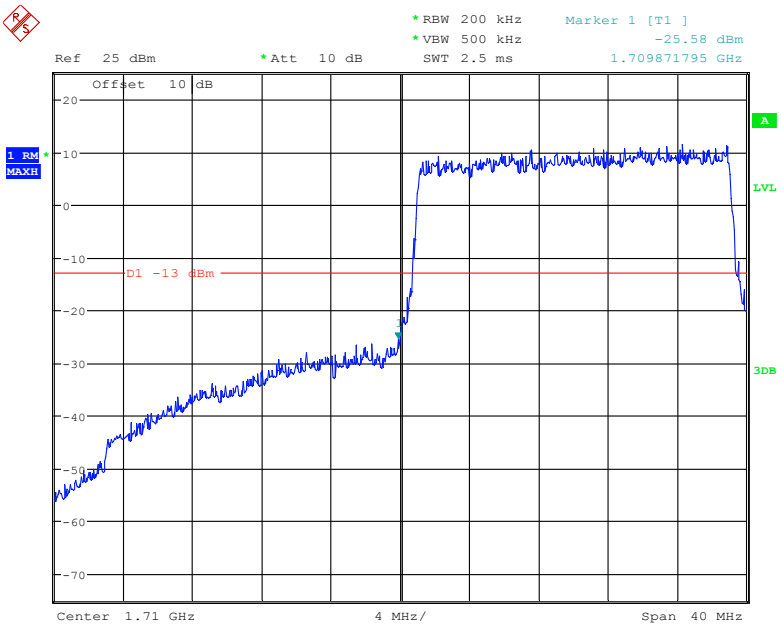
Date: 23.JUN.2019 10:34:24

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



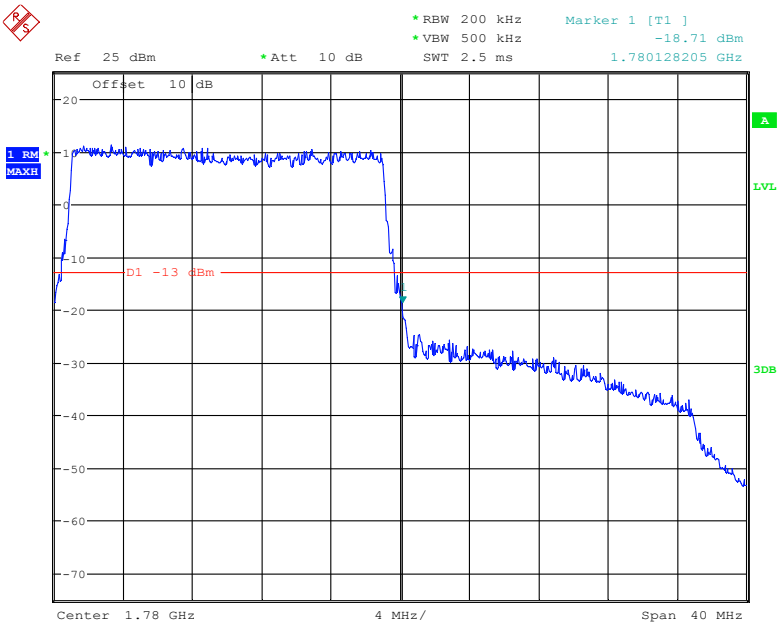
Date: 23.JUN.2019 10:34:51

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



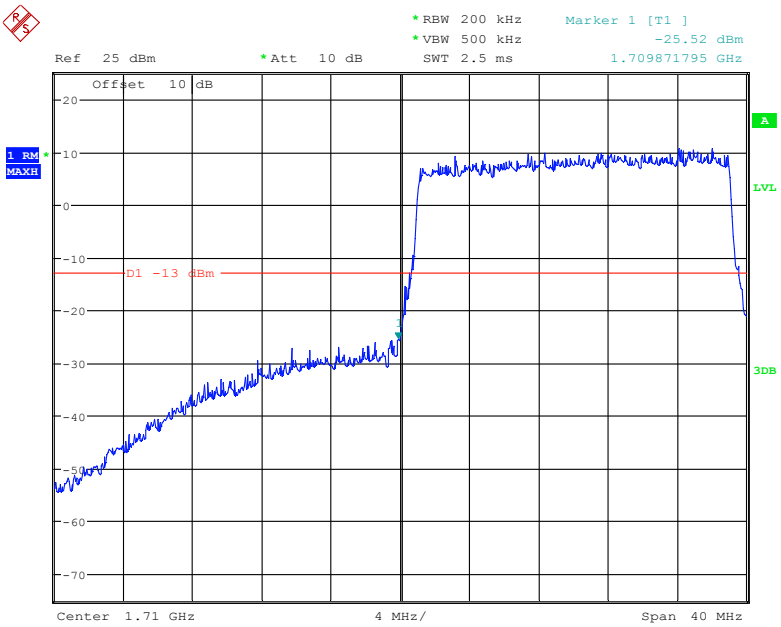
Date: 23.JUN.2019 10:37:06

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



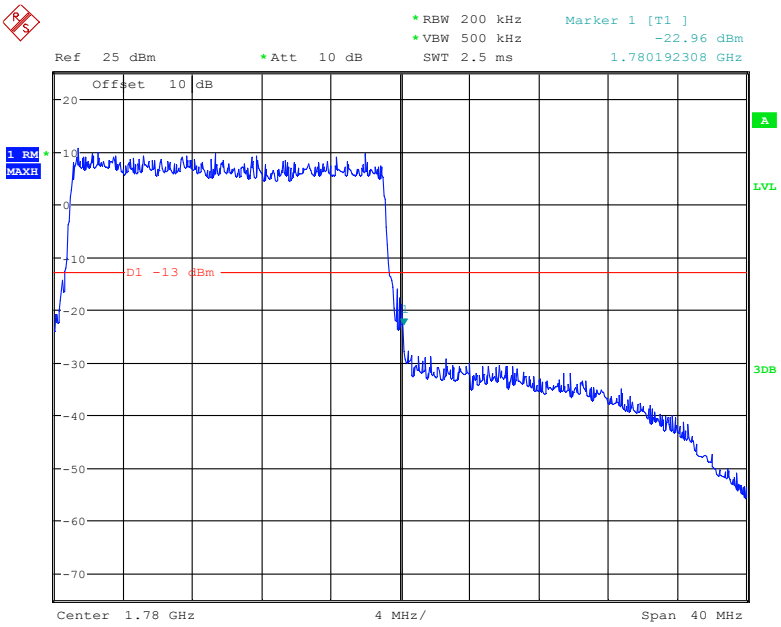
Date: 23.JUN.2019 10:42:12

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



Date: 23.JUN.2019 10:37:58

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



Date: 23.JUN.2019 10:38:34

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

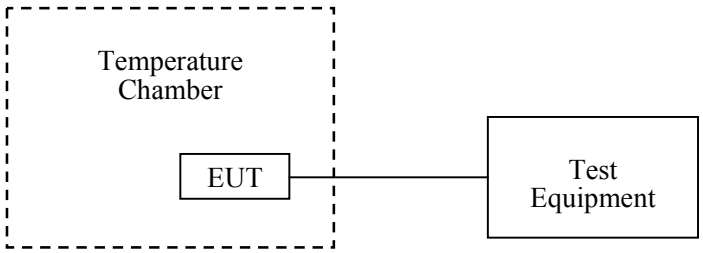
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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:	24~25 ℃
Relative Humidity:	50~56 %
ATM Pressure:	101.0 kPa

The testing was performed by James Fu from 2019-06-21 to 2019-08-07.

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	2	0.0024	2.5
-20		1	0.0012	2.5
-10		4	0.0048	2.5
0		5	0.0060	2.5
10		7	0.0084	2.5
20		9	0.0108	2.5
30		11	0.0131	2.5
40		12	0.0143	2.5
50		14	0.0167	2.5
20	V min.= 3.4	18	0.0215	2.5
	V max.= 4.2	21	0.0251	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	9	0.0108	2.5
-20		12	0.0143	2.5
-10		13	0.0155	2.5
0		15	0.0179	2.5
10		14	0.0167	2.5
20		18	0.0215	2.5
30		20	0.0239	2.5
40		19	0.0227	2.5
50		22	0.0263	2.5
20	V min.= 3.4	23	0.0275	2.5
	V max.= 4.2	28	0.0335	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	-26	-0.0311	2.5
-20		-22	-0.0263	2.5
-10		-19	-0.0227	2.5
0		-17	-0.0203	2.5
10		-14	-0.0167	2.5
20		-12	-0.0143	2.5
30		-11	-0.0131	2.5
40		-8	-0.0096	2.5
50		-7	-0.0084	2.5
20	V min.= 3.4	-4	-0.0048	2.5
	V max.= 4.2	-2	-0.0024	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	22	0.0117	pass
-20		25	0.0133	pass
-10		28	0.0149	pass
0		32	0.0170	pass
10		33	0.0176	pass
20		37	0.0197	pass
30		38	0.0202	pass
40		39	0.0207	pass
50		41	0.0218	pass
20	V min.= 3.4	44	0.0234	pass
	V max.= 4.2	46	0.0245	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	21	0.0112	pass
-20		24	0.0128	pass
-10		25	0.0133	pass
0		27	0.0144	pass
10		31	0.0165	pass
20		33	0.0176	pass
30		35	0.0186	pass
40		37	0.0197	pass
50		39	0.0207	pass
20	V min.= 3.4	38	0.0202	pass
	V max.= 4.2	45	0.0239	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	-24	-0.0128	pass
-20		-19	-0.0101	pass
-10		-17	-0.0090	pass
0		-15	-0.0080	pass
10		-12	-0.0064	pass
20		-11	-0.0059	pass
30		-8	-0.0043	pass
40		-9	-0.0048	pass
50		-6	-0.0032	pass
20	V min.= 3.4	-4	-0.0021	pass
	V max.= 4.2	-2	-0.0011	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	1710.4669	1754.4922	1710	1755
-20		1710.4640	1754.4880	1710	1755
-10		1710.4694	1754.4853	1710	1755
0		1710.4690	1754.4907	1710	1755
10		1710.4668	1754.4878	1710	1755
20		1710.4705	1754.4924	1710	1755
30		1710.4658	1754.4885	1710	1755
40		1710.4679	1754.4883	1710	1755
50		1710.4692	1754.4903	1710	1755
20	V min.= 3.4	1710.4682	1754.4921	1710	1755
	V max.= 4.2	1710.4648	1754.4847	1710	1755

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-8	-0.0043	pass
-20		-7	-0.0037	pass
-10		-4	-0.0021	pass
0		-5	-0.0027	pass
10		-1	-0.0005	pass
20		-2.52	-0.0013	pass
30		1	0.0005	pass
40		4	0.0021	pass
50		5	0.0027	pass
20	V min.= 3.4	6	0.0032	pass
	V max.= 4.2	9	0.0048	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	1710.4665	1754.4963	1710	1755
-20		1710.4518	1754.4874	1710	1755
-10		1710.4442	1754.4947	1710	1755
0		1710.4538	1754.4965	1710	1755
10		1710.4609	1754.4814	1710	1755
20		1710.4571	1754.4982	1710	1755
30		1710.4486	1754.4899	1710	1755
40		1710.4593	1754.5071	1710	1755
50		1710.4558	1754.4961	1710	1755
20	V min.= 3.4	1710.4625	1754.4838	1710	1755
	V max.= 4.2	1710.4516	1754.4931	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	-11	-0.0132	2.5
-20		-8	-0.0096	2.5
-10		-7	-0.0084	2.5
0		-5	-0.0060	2.5
10		-2	-0.0024	2.5
20		-3.46	-0.0041	2.5
30		-1	-0.0012	2.5
40		1	0.0012	2.5
50		3	0.0036	2.5
20	V min.= 3.4	4	0.0048	2.5
	V max.= 4.2	7	0.0084	2.5

Band 12:

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	699.6385	715.8751	699	716
-20		699.6275	715.8754	699	716
-10		699.6360	715.8605	699	716
0		699.6464	715.8646	699	716
10		699.6295	715.8799	699	716
20		699.6337	715.8688	699	716
30		699.6412	715.8696	699	716
40		699.6368	715.8549	699	716
50		699.6508	715.8652	699	716
20	V min.= 3.4	699.6433	715.8766	699	716
	V max.= 4.2	699.6359	715.8635	699	716

Band 13:

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	777.6424	786.8322	777	787
-20		777.6205	786.8225	777	787
-10		777.6239	786.8347	777	787
0		777.6284	786.8319	777	787
10		777.6262	786.8231	777	787
20		777.6253	786.8224	777	787
30		777.6372	786.8325	777	787
40		777.6419	786.8271	777	787
50		777.6377	786.8358	777	787
20	V min.= 3.4	777.6302	786.8220	777	787
	V max.= 4.2	777.6311	786.8324	777	787

Band 17:

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	704.4481	715.4890	704	716
-20		704.4464	715.4880	704	716
-10		704.4492	715.4891	704	716
0		704.4469	715.4900	704	716
10		704.4487	715.4872	704	716
20		704.4484	715.4893	704	716
30		704.4494	715.4868	704	716
40		704.4489	715.4902	704	716
50		704.4485	715.4866	704	716
20	V min.= 3.4	704.4502	715.4866	704	716
	V max.= 4.2	704.4496	715.4869	704	716

Band 66:

5 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.8	1710.5670	1779.5639	1710	1780
-20		1710.5669	1779.5573	1710	1780
-10		1710.5617	1779.5649	1710	1780
0		1710.5557	1779.5600	1710	1780
10		1710.5570	1779.5626	1710	1780
20		1710.5643	1779.5473	1710	1780
30		1710.5716	1779.5665	1710	1780
40		1710.5534	1779.5661	1710	1780
50		1710.5537	1779.5521	1710	1780
20	V min.= 3.4	1710.5563	1779.5670	1710	1780
	V max.= 4.2	1710.5598	1779.5480	1710	1780

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	-9	-0.0048	pass
-20		-11	-0.0059	pass
-10		-7	-0.0037	pass
0		-6	-0.0032	pass
10		-4	-0.0021	pass
20		-4.38	-0.0023	pass
30		-2	-0.0011	pass
40		-1	-0.0005	pass
50		1	0.0005	pass
20	V min.= 3.4	4	0.0021	pass
	V max.= 4.2	5	0.0027	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.8	1710.4644	1754.4931	1710	1755
-20		1710.4648	1754.4869	1710	1755
-10		1710.4437	1754.4956	1710	1755
0		1710.4694	1754.5063	1710	1755
10		1710.4683	1754.4894	1710	1755
20		1710.4565	1754.4946	1710	1755
30		1710.4611	1754.4911	1710	1755
40		1710.4604	1754.5220	1710	1755
50		1710.4651	1754.5078	1710	1755
20	V min.= 3.4	1710.4656	1754.4921	1710	1755
	V max.= 4.2	1710.4610	1754.4959	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	-10	-0.0120	2.5
-20		-8	-0.0096	2.5
-10		-5	-0.0060	2.5
0		-4	-0.0048	2.5
10		-2	-0.0024	2.5
20		-2.42	-0.0029	2.5
30		-1	-0.0012	2.5
40		2	0.0024	2.5
50		5	0.0060	2.5
20	V min.= 3.4	4	0.0048	2.5
	V max.= 4.2	7	0.0084	2.5

Band 12:

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	699.6410	715.8771	699	716
-20		699.6194	715.8842	699	716
-10		699.6486	715.8592	699	716
0		699.6532	715.8763	699	716
10		699.6375	715.8919	699	716
20		699.6343	715.8827	699	716
30		699.6376	715.8680	699	716
40		699.6386	715.8637	699	716
50		699.6547	715.8682	699	716
20	V min.= 3.4	699.6405	715.8874	699	716
	V max.= 4.2	699.6364	715.8781	699	716

Band 13:

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	777.6368	786.8322	777	787
-20		777.6333	786.8208	777	787
-10		777.6290	786.8458	777	787
0		777.6437	786.8345	777	787
10		777.6271	786.8425	777	787
20		777.6213	786.8267	777	787
30		777.6350	786.8308	777	787
40		777.6464	786.8318	777	787
50		777.6340	786.8480	777	787
20	V min.= 3.4	777.6325	786.8207	777	787
	V max.= 4.2	777.6316	786.8395	777	787

Band 17:

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	704.4450	715.4874	704	716
-20		704.4449	715.4894	704	716
-10		704.4495	715.4901	704	716
0		704.4470	715.4891	704	716
10		704.4464	715.4882	704	716
20		704.4446	715.4877	704	716
30		704.4461	715.4887	704	716
40		704.4454	715.4874	704	716
50		704.4481	715.4892	704	716
20	V min.= 3.4	704.4486	715.4879	704	716
	V max.= 4.2	704.4460	715.4916	704	716

Band 66:

5 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.8	1710.5761	1779.5712	1710	1780
-20		1710.5732	1779.5589	1710	1780
-10		1710.5667	1779.5655	1710	1780
0		1710.5742	1779.5575	1710	1780
10		1710.5672	1779.5685	1710	1780
20		1710.5695	1779.5523	1710	1780
30		1710.5753	1779.5703	1710	1780
40		1710.5511	1779.5644	1710	1780
50		1710.5631	1779.5531	1710	1780
20	V min.= 3.4	1710.5714	1779.5783	1710	1780
	V max.= 4.2	1710.5677	1779.5515	1710	1780

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