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TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

SENWA MEXICO,S.A.DE C.V

CARRETERA MEXICO-TOLUCA No. 5324, INT. PLANTA BAJA COL. EL YAQUI,
CUAJIMALPA DE MORELOS, CIUDAD DE MEXICO, C.P. 05320

FCC ID: 2AAA6-LSQ380

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

Report Number:	RSZ181128002-00D
Report Date:	2019-01-03
Reviewed By:	Rocky Kang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*".

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *SENWA MEXICO,S.A.DE C.V's* product, model number: *LSQ380 (FCC ID: 2AAA6-LSQ380)* or the "EUT" in this report was a *Mobile Phone*, which was measured approximately: 12.5 cm (L) * 5.6 cm (W) * 1.4 cm (H), rated with input voltage: DC 3.7 V from rechargeable li-ion battery or DC 5.0V from adapter.

Adapter Information:
Model: SENWAC05MA
Input: AC 100-240Vca, 50/60Hz, 0.2 A
Output: DC 5.0Vcc, 500mA

**All measurement and test data in this report was gathered from production sample serial number: 181128002. (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-11-28.*

Objective

This test report is prepared on behalf of *SENWA MEXICO,S.A.DE C.V* 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: 2AAA6-LSQ380.

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

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		±1.5dB
Unwanted Emission, conducted		±1.5dB
Emissions, radiated	Below 1GHz	±4.70dB
	Above 1GHz	±4.80dB
Temperature		±1℃
Supply voltages		±0.4%

Test Facility

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

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

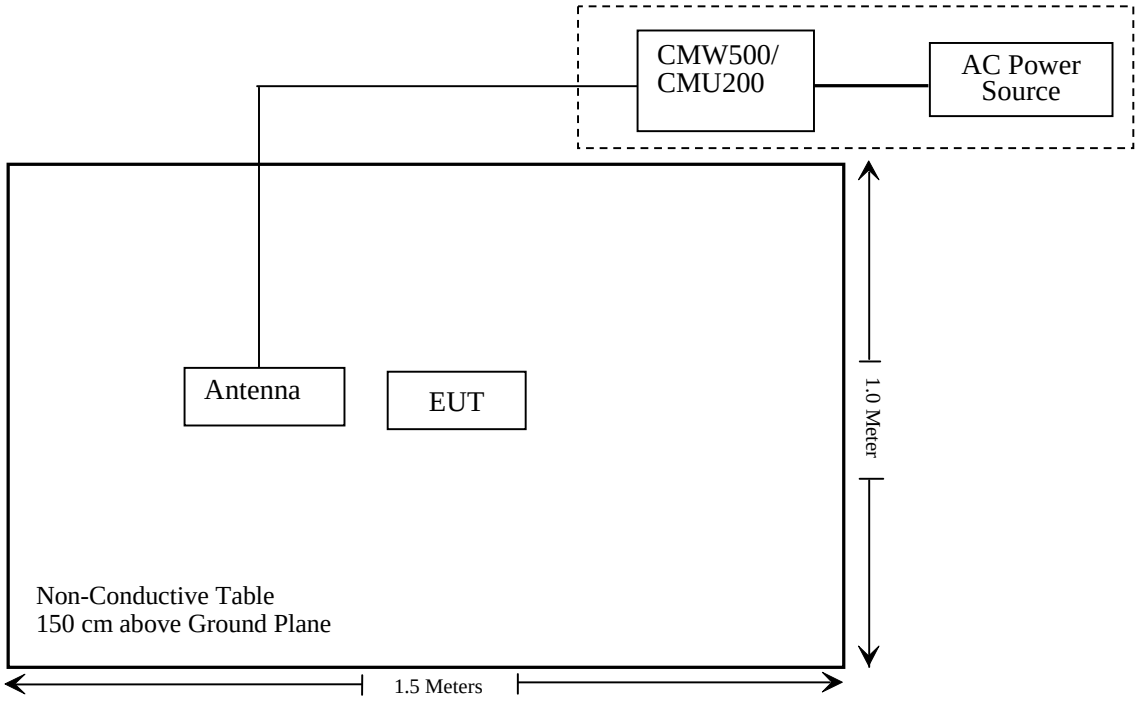
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307, §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50(d) (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliance

Note: * Please refer to SAR report released by BACL, report number: RSZ181128002-20A.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017-12-22	2020-12-21
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2018-06-23	2019-06-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-08-01	2019-02-01
Sonoma instrument	Amplifier	310 N	186238	2018-11-12	2019-05-12
Anritsu	Signal Generator	68369B	004114	2017-12-24	2018-12-24
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2018-01-11	2019-01-11
COM POWER	Dipole Antenna	AD-100	41000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
UTiFLEX MICRO-C0AX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-08-01	2019-02-01
Ducommun technologies	RF Cable	104PEA	218124002	2018-11-21	2019-05-21
Ducommun technologies	RF Cable	RG-214	1	2018-11-21	2019-05-21
Ducommun technologies	RF Cable	RG-214	2	2018-11-21	2019-05-21
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-03	2017-12-29	2020-12-28
Heatsink Required	Amplifier	QLW-18405536-J0	15964001002	2018-08-01	2019-02-01

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2017-12-24	2018-12-24
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2018-12-24	2019-12-24
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2017-12-21	2018-12-21
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2018-12-21	2019-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2017-12-14	2018-12-14
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2018-12-14	2019-12-14
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2018-06-23	2019-06-23
Ducommun technologies	RF Cable	RG-214	3	Each Time	
WEINSCHEL	10dB Attenuator	5324	AU 3842	Each Time	
Un-known	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: RSZ181128002-20A.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

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

Applicable Standard

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

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

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

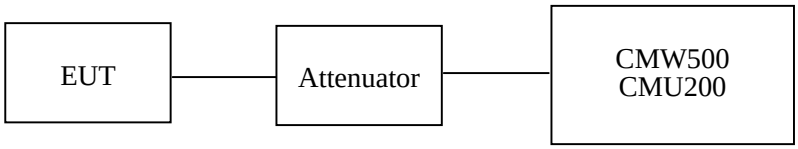
According to §27.50(d), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §27.50(h), Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

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

The testing was performed by Hill He on 2018-12-05.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	31.64	38.45
	190	836.6	31.62	38.45
	251	848.8	31.56	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.15	30.40	28.59	27.35	38.45
	190	836.6	31.23	30.49	28.65	27.40	38.45
	251	848.8	31.33	30.64	28.79	27.52	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		22.54	22.53	22.45
		HSDPA	1	21.60	21.77	21.80
			2	21.68	21.19	21.74
			3	21.63	21.06	21.83
			4	21.75	21.17	21.75
		HSUPA	1	21.65	21.73	21.65
			2	21.72	21.72	21.66
			3	21.76	21.68	21.73
			4	21.66	21.72	21.62
			5	21.64	21.68	21.72
		HSPA+	1	21.53	21.27	21.36

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.54	33
	661	1880.0	28.92	33
	810	1909.8	29.10	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.11	26.83	25.56	23.21	33
	661	1880.0	29.08	27.04	25.43	23.36	33
	810	1909.8	29.22	27.13	25.50	23.35	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		22.53	22.60	22.72
		HSDPA	1	21.60	21.78	21.71
			2	21.67	21.18	21.74
			3	21.66	21.06	21.83
			4	21.79	21.16	21.75
		HSUPA	1	21.66	21.63	21.66
			2	21.72	21.72	21.67
			3	21.76	21.68	21.73
			4	21.66	21.72	21.62
			5	21.64	21.68	21.73
		HSPA+	1	21.23	21.05	21.17

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.29	13
	Middle	1.13	13
	High	1.21	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.56	13
	Middle	3.65	13
	High	3.85	13
HSDPA (16QAM)	Low	3.87	13
	Middle	3.66	13
	High	3.86	13
HSUPA (BPSK)	Low	3.6	13
	Middle	3.64	13
	High	3.64	13
HSPA+	Low	3.62	13
	Middle	3.44	13
	High	3.58	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.21	13
	Middle	1.12	13
	High	1.08	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.63	13
	Middle	3.61	13
	High	3.87	13
HSDPA (16QAM)	Low	3.84	13
	Middle	3.66	13
	High	3.65	13
HSUPA (BPSK)	Low	3.89	13
	Middle	3.63	13
	High	3.85	13
HSPA+	Low	3.12	13
	Middle	3.54	13
	High	3.51	13

Radiated Power

GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	87.07	107	1.2	H	30.5	0.3	0.0	30.20	38.45	8.25
836.6	82.63	282	2.2	V	27.4	0.3	0.0	27.10	38.45	11.35
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	89.53	254	2.3	H	19.5	1.30	9.40	27.60	33	5.4
1880.00	87.45	235	1.9	V	17.2	1.30	9.40	25.30	33	7.7

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.50	83.55	356	3.2	H	24.17	1.9	0	22.27	38.35	16.08
836.50	82.83	40	2.8	V	22.83	1.9	0	20.93	38.35	17.42
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	82.78	164	1.6	H	12.7	1.30	9.40	20.80	33	12.20
1880.00	82.47	159	1.7	V	12.2	1.30	9.40	20.30	33	12.70

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

LTE Band 2:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	21.67	20.40	21.17
		RB Size=1, RB Offset=2	21.41	21.42	21.81
		RB Size=1, RB Offset=5	21.76	20.44	21.46
		RB Size=3, RB Offset=0	21.64	21.11	21.14
		RB Size=3, RB Offset=1	20.94	21.27	20.89
		RB Size=3, RB Offset=2	21.46	20.86	21.42
		RB Size=6, RB Offset=0	21.23	21.57	20.56
	16QAM	RB Size=1, RB Offset=0	21.42	21.40	21.51
		RB Size=1, RB Offset=2	21.41	21.36	21.58
		RB Size=1, RB Offset=5	20.68	20.97	20.84
		RB Size=3, RB Offset=0	20.83	20.60	21.07
		RB Size=3, RB Offset=1	20.74	21.18	21.03
		RB Size=3, RB Offset=2	20.66	21.50	21.37
		RB Size=6, RB Offset=0	20.96	21.27	20.67
3.0	QPSK	RB Size=1, RB Offset=0	21.97	20.78	21.13
		RB Size=1, RB Offset=7	21.50	21.23	21.00
		RB Size=1, RB Offset=14	21.68	20.69	22.08
		RB Size=8, RB Offset=0	21.47	21.68	20.95
		RB Size=8, RB Offset=4	21.87	20.92	20.33
		RB Size=8, RB Offset=7	21.30	21.34	22.00
		RB Size=15, RB Offset=0	21.39	21.48	20.25
	16QAM	RB Size=1, RB Offset=0	20.82	21.21	21.08
		RB Size=1, RB Offset=7	21.43	20.84	21.09
		RB Size=1, RB Offset=14	20.68	20.69	20.95
		RB Size=8, RB Offset=0	21.52	20.85	21.43
		RB Size=8, RB Offset=4	21.50	21.20	21.58
		RB Size=8, RB Offset=7	20.43	21.22	21.20
		RB Size=15, RB Offset=0	20.44	20.53	20.48

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.92	21.11	21.79
		RB Size=1, RB Offset=12	22.00	21.61	20.69
		RB Size=1, RB Offset=24	21.18	20.62	21.33
		RB Size=12, RB Offset=0	21.89	21.81	20.82
		RB Size=12, RB Offset=6	20.87	20.44	21.23
		RB Size=12, RB Offset=11	21.08	21.11	20.73
		RB Size=25, RB Offset=0	21.62	21.89	20.92
	16QAM	RB Size=1, RB Offset=0	20.90	21.50	21.42
		RB Size=1, RB Offset=12	20.91	20.90	21.38
		RB Size=1, RB Offset=24	21.23	20.76	22.00
		RB Size=12, RB Offset=0	20.61	21.61	22.14
		RB Size=12, RB Offset=6	21.13	21.65	21.53
		RB Size=12, RB Offset=11	20.71	20.90	21.14
		RB Size=25, RB Offset=0	20.64	20.52	20.74
10.0	QPSK	RB Size=1, RB Offset=0	22.10	21.51	21.30
		RB Size=1, RB Offset=24	21.85	20.82	21.21
		RB Size=1, RB Offset=49	21.77	20.64	20.96
		RB Size=25, RB Offset=0	21.65	21.90	21.64
		RB Size=25, RB Offset=12	21.63	21.62	21.16
		RB Size=25, RB Offset=24	21.69	21.05	21.59
		RB Size=50, RB Offset=0	21.50	21.47	20.50
	16QAM	RB Size=1, RB Offset=0	21.58	21.03	21.33
		RB Size=1, RB Offset=24	21.12	20.89	21.78
		RB Size=1, RB Offset=49	21.34	21.01	20.46
		RB Size=25, RB Offset=0	21.30	21.36	21.20
		RB Size=25, RB Offset=12	20.98	21.33	21.87
		RB Size=25, RB Offset=24	21.01	21.29	20.81
		RB Size=50, RB Offset=0	20.78	21.06	20.76

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	21.98	21.56	20.92
		RB Size=1, RB Offset=37	22.02	20.85	21.59
		RB Size=1, RB Offset=74	21.65	21.01	21.14
		RB Size=36, RB Offset=0	21.25	21.27	20.95
		RB Size=36, RB Offset=18	21.49	21.14	21.80
		RB Size=36, RB Offset=37	21.30	20.84	20.97
		RB Size=75, RB Offset=0	20.90	21.02	21.36
	16QAM	RB Size=1, RB Offset=0	21.17	21.03	21.45
		RB Size=1, RB Offset=37	21.45	21.12	20.88
		RB Size=1, RB Offset=74	21.30	20.82	22.10
		RB Size=36, RB Offset=0	21.21	21.02	21.35
		RB Size=36, RB Offset=18	21.39	21.26	21.14
		RB Size=36, RB Offset=37	20.48	20.84	21.86
		RB Size=75, RB Offset=0	20.87	20.33	20.50
20.0	QPSK	RB Size=1, RB Offset=0	21.85	21.90	21.94
		RB Size=1, RB Offset=49	21.66	20.69	20.97
		RB Size=1, RB Offset=99	21.51	21.43	20.87
		RB Size=50, RB Offset=0	20.87	21.16	20.55
		RB Size=50, RB Offset=24	21.26	21.11	21.44
		RB Size=50, RB Offset=49	21.73	20.87	21.27
		RB Size=100, RB Offset=0	21.53	21.70	21.11
	16QAM	RB Size=1, RB Offset=0	20.80	21.09	20.95
		RB Size=1, RB Offset=49	20.95	22.00	20.41
		RB Size=1, RB Offset=99	21.18	21.52	21.42
		RB Size=50, RB Offset=0	20.70	21.61	21.61
		RB Size=50, RB Offset=24	20.87	21.41	20.89
		RB Size=50, RB Offset=49	21.23	21.26	20.83
		RB Size=100, RB Offset=0	20.91	20.71	20.86

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.72	13	Pass
QPSK (100RB Size)	6.79	13	Pass
16QAM (1RB Size)	6.32	13	Pass
16QAM (100RB Size)	6.27	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	87.99	276	2.4	H	17.9	1.30	9.40	26.00	33
1880.00	87.24	301	1.5	V	17.0	1.30	9.40	25.10	33
3 MHz Bandwidth									
1880.00	87.85	235	1.2	H	17.8	1.30	9.40	25.90	33
1880.00	87.16	246	2.1	V	16.9	1.30	9.40	25.00	33
5 MHz Bandwidth									
1880.00	87.91	329	1.4	H	17.9	1.30	9.40	26.00	33
1880.00	87.06	74	1.8	V	16.8	1.30	9.40	24.90	33
10 MHz Bandwidth									
1880.00	87.74	348	1.4	H	17.7	1.30	9.40	25.80	33
1880.00	87.20	81	2.0	V	16.9	1.30	9.40	25.00	33
12 MHz Bandwidth									
1880.00	87.85	33	1.1	H	17.8	1.30	9.40	25.90	33
1880.00	87.11	121	2.4	V	16.8	1.30	9.40	24.90	33
20 MHz Bandwidth									
1880.00	87.86	271	2.4	H	17.8	1.30	9.40	25.90	33
1880.00	87.01	72	1.2	V	16.7	1.30	9.40	24.80	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	87.91	321	1.2	H	17.9	1.30	9.40	26.00	33
1880.00	87.52	80	2.1	V	17.3	1.30	9.40	25.40	33
3 MHz Bandwidth									
1880.00	87.60	317	1.8	H	17.6	1.30	9.40	25.70	33
1880.00	87.29	31	2.0	V	17.0	1.30	9.40	25.10	33
5 MHz Bandwidth									
1880.00	87.36	104	1.5	H	17.3	1.30	9.40	25.40	33
1880.00	87.24	275	2.2	V	17.0	1.30	9.40	25.10	33
10 MHz Bandwidth									
1880.00	87.55	320	1.8	H	17.5	1.30	9.40	25.60	33
1880.00	87.24	356	1.5	V	17.0	1.30	9.40	25.10	33
15 MHz Bandwidth									
1880.00	87.02	23	1.2	H	17.0	1.30	9.40	25.10	33
1880.00	86.52	34	1.9	V	16.3	1.30	9.40	24.40	33
20 MHz Bandwidth									
1880.00	87.36	192	1.9	H	17.3	1.30	9.40	25.40	33
1880.00	87.49	37	1.7	V	17.2	1.30	9.40	25.30	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	21.51	21.07	21.47
		RB Size=1, RB Offset=2	21.17	20.66	21.07
		RB Size=1, RB Offset=5	21.74	21.29	21.64
		RB Size=3, RB Offset=0	21.79	20.68	20.91
		RB Size=3, RB Offset=1	21.77	20.58	20.64
		RB Size=3, RB Offset=2	20.90	21.33	21.07
		RB Size=6, RB Offset=0	21.18	21.88	20.40
	16QAM	RB Size=1, RB Offset=0	21.10	21.67	21.69
		RB Size=1, RB Offset=2	21.25	21.66	21.17
		RB Size=1, RB Offset=5	20.68	21.19	20.78
		RB Size=3, RB Offset=0	21.05	21.35	21.25
		RB Size=3, RB Offset=1	21.28	21.11	21.11
		RB Size=3, RB Offset=2	20.99	21.14	20.52
		RB Size=6, RB Offset=0	20.70	20.71	20.96
3.0	QPSK	RB Size=1, RB Offset=0	21.65	21.81	21.64
		RB Size=1, RB Offset=7	21.68	21.44	20.48
		RB Size=1, RB Offset=14	21.80	21.06	21.75
		RB Size=8, RB Offset=0	21.59	22.01	20.88
		RB Size=8, RB Offset=4	21.25	20.79	20.96
		RB Size=8, RB Offset=7	21.31	21.41	20.69
		RB Size=15, RB Offset=0	21.10	21.95	21.95
	16QAM	RB Size=1, RB Offset=0	21.55	21.52	21.94
		RB Size=1, RB Offset=7	21.10	20.68	21.38
		RB Size=1, RB Offset=14	21.20	22.02	21.44
		RB Size=8, RB Offset=0	20.95	20.90	21.37
		RB Size=8, RB Offset=4	20.50	21.21	20.50
		RB Size=8, RB Offset=7	21.30	21.49	21.93
		RB Size=15, RB Offset=0	20.40	20.78	21.10

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.08	21.06	20.65
		RB Size=1, RB Offset=12	21.42	20.89	20.89
		RB Size=1, RB Offset=24	21.56	21.00	20.59
		RB Size=12, RB Offset=0	21.05	21.33	20.94
		RB Size=12, RB Offset=6	21.37	20.52	21.56
		RB Size=12, RB Offset=11	21.74	21.24	20.78
		RB Size=25, RB Offset=0	21.36	21.70	21.49
	16QAM	RB Size=1, RB Offset=0	20.84	20.54	20.63
		RB Size=1, RB Offset=12	21.54	21.06	21.11
		RB Size=1, RB Offset=24	20.67	20.37	21.60
		RB Size=12, RB Offset=0	21.26	21.30	21.39
		RB Size=12, RB Offset=6	20.29	21.88	21.44
		RB Size=12, RB Offset=11	20.73	21.48	21.64
		RB Size=25, RB Offset=0	20.39	20.59	20.86
10.0	QPSK	RB Size=1, RB Offset=0	22.15	20.95	21.98
		RB Size=1, RB Offset=24	22.05	21.69	21.17
		RB Size=1, RB Offset=49	21.29	20.53	21.32
		RB Size=25, RB Offset=0	21.34	21.54	21.95
		RB Size=25, RB Offset=12	21.46	21.33	20.94
		RB Size=25, RB Offset=24	21.45	21.48	20.62
		RB Size=50, RB Offset=0	21.30	21.91	21.88
	16QAM	RB Size=1, RB Offset=0	21.36	20.68	21.27
		RB Size=1, RB Offset=24	21.68	21.79	21.92
		RB Size=1, RB Offset=49	21.46	20.65	21.36
		RB Size=25, RB Offset=0	21.19	20.82	20.87
		RB Size=25, RB Offset=12	20.97	21.20	20.89
		RB Size=25, RB Offset=24	21.29	21.68	20.94
		RB Size=50, RB Offset=0	20.67	20.77	21.18

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	21.32	21.48	20.75
		RB Size=1, RB Offset=37	22.02	21.33	21.17
		RB Size=1, RB Offset=74	21.77	21.06	20.94
		RB Size=36, RB Offset=0	20.99	21.71	20.28
		RB Size=36, RB Offset=18	21.87	21.27	21.57
		RB Size=36, RB Offset=37	21.61	21.60	21.41
		RB Size=75, RB Offset=0	21.38	20.76	20.99
	16QAM	RB Size=1, RB Offset=0	21.52	21.52	21.56
		RB Size=1, RB Offset=37	20.79	21.01	21.84
		RB Size=1, RB Offset=74	21.19	21.10	20.87
		RB Size=36, RB Offset=0	20.73	21.94	21.49
		RB Size=36, RB Offset=18	20.96	20.73	21.67
		RB Size=36, RB Offset=37	21.45	20.55	20.87
		RB Size=75, RB Offset=0	21.21	21.75	20.89
20.0	QPSK	RB Size=1, RB Offset=0	21.34	22.10	21.03
		RB Size=1, RB Offset=49	21.42	20.76	20.78
		RB Size=1, RB Offset=99	21.47	20.94	21.09
		RB Size=50, RB Offset=0	21.88	20.97	20.82
		RB Size=50, RB Offset=24	21.60	21.31	21.76
		RB Size=50, RB Offset=49	21.87	21.95	20.99
		RB Size=100, RB Offset=0	21.73	20.91	21.36
	16QAM	RB Size=1, RB Offset=0	21.40	21.31	21.48
		RB Size=1, RB Offset=49	20.69	21.30	21.75
		RB Size=1, RB Offset=99	21.27	20.67	20.66
		RB Size=50, RB Offset=0	21.10	21.87	20.81
		RB Size=50, RB Offset=24	20.94	20.93	20.90
		RB Size=50, RB Offset=49	20.68	21.55	21.13
		RB Size=100, RB Offset=0	20.73	20.89	20.46

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.63	13	Pass
QPSK (100RB Size)	6.57	13	Pass
16QAM (1RB Size)	7.05	13	Pass
16QAM (100RB Size)	6.65	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	87.54	346	2.1	H	14.4	1.30	8.90	22.00	30
1732.50	86.71	160	2.2	V	14.1	1.30	8.90	21.70	30
3 MHz Bandwidth									
1732.50	87.40	50	1.8	H	14.2	1.30	8.90	21.80	30
1732.50	86.65	173	1.4	V	14.1	1.30	8.90	21.70	30
5 MHz Bandwidth									
1732.50	87.42	278	1.8	H	14.3	1.30	8.90	21.90	30
1732.50	86.39	251	2.4	V	13.8	1.30	8.90	21.40	30
10 MHz Bandwidth									
1732.50	87.29	272	1.9	H	14.1	1.30	8.90	21.70	30
1732.50	86.11	132	1.4	V	13.5	1.30	8.90	21.10	30
15 MHz Bandwidth									
1732.50	87.30	203	1.7	H	14.1	1.30	8.90	21.70	30
1732.50	86.10	182	1.6	V	13.5	1.30	8.90	21.10	30
20 MHz Bandwidth									
1732.50	87.21	7	2.0	H	14.0	1.30	8.90	21.60	30
1732.50	86.04	78	2.0	V	13.5	1.30	8.90	21.10	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.90	14	1.8	H	14.7	1.30	8.90	22.30	30
1732.50	86.20	206	1.9	V	13.6	1.30	8.90	21.20	30
3 MHz Bandwidth									
1732.50	87.59	100	1.4	H	14.4	1.30	8.90	22.00	30
1732.50	86.10	335	1.1	V	13.5	1.30	8.90	21.10	30
5 MHz Bandwidth									
1732.50	87.44	305	1.3	H	14.3	1.30	8.90	21.90	30
1732.50	86.29	115	1.9	V	13.7	1.30	8.90	21.30	30
10 MHz Bandwidth									
1732.50	87.50	20	1.9	H	14.3	1.30	8.90	21.90	30
1732.50	86.02	100	1.3	V	13.5	1.30	8.90	21.10	30
15 MHz Bandwidth									
1732.50	87.30	29	1.7	H	14.1	1.30	8.90	21.70	30
1732.50	85.03	152	1.3	V	12.5	1.30	8.90	20.10	30
20 MHz Bandwidth									
1732.50	87.22	227	1.4	H	14.1	1.30	8.90	21.70	30
1732.50	85.01	312	1.9	V	12.4	1.30	8.90	20.00	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	22.23	21.15	21.46
		RB Size=1, RB Offset=2	22.54	21.77	21.40
		RB Size=1, RB Offset=5	22.58	21.38	21.17
		RB Size=3, RB Offset=0	22.35	22.01	21.92
		RB Size=3, RB Offset=1	21.92	21.97	22.06
		RB Size=3, RB Offset=2	22.29	21.76	21.90
		RB Size=6, RB Offset=0	22.20	21.92	22.25
	16QAM	RB Size=1, RB Offset=0	21.74	21.35	21.55
		RB Size=1, RB Offset=2	22.40	21.43	22.15
		RB Size=1, RB Offset=5	21.53	21.49	21.62
		RB Size=3, RB Offset=0	21.73	21.40	21.49
		RB Size=3, RB Offset=1	21.44	21.79	21.88
		RB Size=3, RB Offset=2	21.59	21.28	21.57
		RB Size=6, RB Offset=0	20.79	20.75	20.99
3.0	QPSK	RB Size=1, RB Offset=0	21.93	21.58	22.21
		RB Size=1, RB Offset=7	21.93	20.83	21.95
		RB Size=1, RB Offset=14	21.83	22.48	21.92
		RB Size=8, RB Offset=0	21.98	22.28	21.34
		RB Size=8, RB Offset=4	21.52	22.14	21.66
		RB Size=8, RB Offset=7	21.38	22.21	21.38
		RB Size=15, RB Offset=0	21.74	21.90	21.45
	16QAM	RB Size=1, RB Offset=0	21.80	21.47	21.40
		RB Size=1, RB Offset=7	21.91	22.27	21.54
		RB Size=1, RB Offset=14	21.20	21.25	21.05
		RB Size=8, RB Offset=0	21.00	22.49	21.19
		RB Size=8, RB Offset=4	20.89	21.65	22.24
		RB Size=8, RB Offset=7	21.60	21.49	21.61
		RB Size=15, RB Offset=0	20.98	20.75	20.53

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.26	21.77	21.76
		RB Size=1, RB Offset=12	22.12	22.13	22.09
		RB Size=1, RB Offset=24	21.78	21.88	21.64
		RB Size=12, RB Offset=0	21.71	20.91	21.15
		RB Size=12, RB Offset=6	21.75	22.18	22.45
		RB Size=12, RB Offset=11	22.14	22.08	21.74
		RB Size=25, RB Offset=0	21.87	21.59	21.68
	16QAM	RB Size=1, RB Offset=0	21.97	21.53	21.94
		RB Size=1, RB Offset=12	21.60	21.17	21.79
		RB Size=1, RB Offset=24	22.01	22.61	22.10
		RB Size=12, RB Offset=0	21.87	22.47	21.54
		RB Size=12, RB Offset=6	21.31	21.59	22.20
		RB Size=12, RB Offset=11	20.95	21.78	21.33
		RB Size=25, RB Offset=0	20.74	21.59	20.99
10.0	QPSK	RB Size=1, RB Offset=0	22.04	21.02	21.03
		RB Size=1, RB Offset=24	21.95	22.30	22.05
		RB Size=1, RB Offset=49	22.13	21.58	21.19
		RB Size=25, RB Offset=0	21.45	22.15	21.62
		RB Size=25, RB Offset=12	21.66	22.13	21.25
		RB Size=25, RB Offset=24	21.38	21.12	21.47
		RB Size=50, RB Offset=0	22.01	22.04	21.42
	16QAM	RB Size=1, RB Offset=0	21.38	21.52	22.11
		RB Size=1, RB Offset=24	21.36	21.86	21.18
		RB Size=1, RB Offset=49	21.55	21.15	22.09
		RB Size=25, RB Offset=0	21.12	22.25	22.14
		RB Size=25, RB Offset=12	21.22	22.17	21.93
		RB Size=25, RB Offset=24	21.33	21.66	21.77
		RB Size=50, RB Offset=0	20.99	20.90	21.23

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.63	13	Pass
QPSK (50RB Size)	6.34	13	Pass
16QAM (1RB Size)	6.75	13	Pass
16QAM (50RB Size)	7.04	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									
836.50	83.34	268	3.3	H	23.96	1.9	0	22.06	38.45
836.50	82.87	132	3.0	V	22.87	1.9	0	20.97	38.45
3 MHz Bandwidth									
836.50	83.49	154	1.5	H	24.11	1.9	0	22.21	38.45
836.50	82.80	210	2.0	V	22.80	1.9	0	20.90	38.45
5 MHz Bandwidth									
836.50	83.65	273	3.4	H	24.27	1.9	0	22.37	38.45
836.50	82.42	287	3.5	V	22.42	1.9	0	20.52	38.45
10 MHz Bandwidth									
836.50	83.42	326	3.3	H	24.04	1.9	0	22.14	38.45
836.50	82.11	160	0.5	V	22.11	1.9	0	20.21	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									
836.50	83.71	282	1.0	H	24.33	1.9	0	22.43	38.45
836.50	82.26	249	0.5	V	22.26	1.9	0	20.36	38.45
3 MHz Bandwidth									
836.50	83.30	154	2.6	H	23.92	1.9	0	22.02	38.45
836.50	82.91	337	1.5	V	22.91	1.9	0	21.01	38.45
5 MHz Bandwidth									
836.50	83.37	302	1.3	H	23.99	1.9	0	22.09	38.45
836.50	82.17	56	1.9	V	22.17	1.9	0	20.27	38.45
10 MHz Bandwidth									
836.50	83.42	253	3.8	H	24.04	1.9	0	22.14	38.45
836.50	82.69	256	3.8	V	22.69	1.9	0	20.79	38.45

LTE Band 7:

Maximum Output Power

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	22.88	22.45	22.16
		RB Size=1, RB Offset=12	22.64	21.96	21.94
		RB Size=1, RB Offset=24	22.89	22.75	22.58
		RB Size=12, RB Offset=0	22.36	21.17	20.99
		RB Size=12, RB Offset=6	22.09	21.63	21.55
		RB Size=12, RB Offset=11	21.83	21.94	21.18
		RB Size=25, RB Offset=0	21.55	21.42	22.01
	16QAM	RB Size=1, RB Offset=0	22.19	21.57	22.52
		RB Size=1, RB Offset=12	22.73	21.69	21.93
		RB Size=1, RB Offset=24	22.22	22.09	22.08
		RB Size=12, RB Offset=0	21.84	20.82	20.93
		RB Size=12, RB Offset=6	21.38	21.14	21.65
		RB Size=12, RB Offset=11	21.45	20.68	21.25
		RB Size=25, RB Offset=0	21.14	20.38	20.76
10.0	QPSK	RB Size=1, RB Offset=0	22.67	22.14	23.10
		RB Size=1, RB Offset=24	23.12	22.38	22.89
		RB Size=1, RB Offset=49	22.55	22.70	22.50
		RB Size=25, RB Offset=0	21.55	21.21	22.33
		RB Size=25, RB Offset=12	22.22	21.76	22.17
		RB Size=25, RB Offset=24	22.20	21.26	21.69
		RB Size=50, RB Offset=0	22.40	21.87	21.01
	16QAM	RB Size=1, RB Offset=0	21.93	21.65	21.82
		RB Size=1, RB Offset=24	21.92	21.90	22.29
		RB Size=1, RB Offset=49	21.67	21.86	21.97
		RB Size=25, RB Offset=0	20.49	20.77	20.86
		RB Size=25, RB Offset=12	20.73	21.06	20.77
		RB Size=25, RB Offset=24	21.11	21.17	21.29
		RB Size=50, RB Offset=0	20.93	20.84	20.52

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	22.94	22.23	23.83
		RB Size=1, RB Offset=37	22.58	22.66	23.80
		RB Size=1, RB Offset=74	23.00	22.88	24.20
		RB Size=36, RB Offset=0	22.37	22.01	23.13
		RB Size=36, RB Offset=18	22.06	21.24	22.68
		RB Size=36, RB Offset=37	21.70	22.03	22.63
		RB Size=75, RB Offset=0	21.01	21.65	21.24
	16QAM	RB Size=1, RB Offset=0	22.19	22.21	22.95
		RB Size=1, RB Offset=37	22.33	21.49	22.42
		RB Size=1, RB Offset=74	21.82	21.18	22.25
		RB Size=36, RB Offset=0	20.97	20.92	21.53
		RB Size=36, RB Offset=18	21.32	20.78	22.07
		RB Size=36, RB Offset=37	21.07	20.92	21.98
		RB Size=75, RB Offset=0	20.77	20.72	21.56
20.0	QPSK	RB Size=1, RB Offset=0	22.78	22.79	23.70
		RB Size=1, RB Offset=49	22.85	22.63	23.26
		RB Size=1, RB Offset=99	22.81	23.23	24.12
		RB Size=50, RB Offset=0	21.58	22.01	22.44
		RB Size=50, RB Offset=24	21.79	22.18	22.59
		RB Size=50, RB Offset=49	22.24	21.84	22.42
		RB Size=100, RB Offset=0	22.28	22.01	22.57
	16QAM	RB Size=1, RB Offset=0	21.67	21.80	22.63
		RB Size=1, RB Offset=49	21.48	21.84	22.99
		RB Size=1, RB Offset=99	22.08	22.66	23.38
		RB Size=50, RB Offset=0	21.47	21.65	22.30
		RB Size=50, RB Offset=24	21.05	21.90	22.20
		RB Size=50, RB Offset=49	20.89	20.99	22.09
		RB Size=100, RB Offset=0	20.88	20.67	21.38

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	7.15	13	Pass
QPSK (100RB Size)	6.62	13	Pass
16QAM (1RB Size)	7.08	13	Pass
16QAM (100RB Size)	6.58	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									
5 MHz Bandwidth									
2535.00	81.90	78	1.4	H	12.4	2.60	10.20	20.00	33
2535.00	78.65	128	2.3	V	9.8	2.60	10.20	17.40	33
10 MHz Bandwidth									
2535.00	81.49	345	1.9	H	12.0	2.60	10.20	19.60	33
2535.00	78.50	209	2.0	V	9.6	2.60	10.20	17.20	33
15 MHz Bandwidth									
2535.00	81.03	237	2.0	H	11.5	2.60	10.20	19.10	33
2535.00	78.25	147	2.5	V	9.4	2.60	10.20	17.00	33
20 MHz Bandwidth									
2535.00	81.14	218	2.3	H	11.7	2.60	10.20	19.30	33
2535.00	78.20	78	1.9	V	9.3	2.60	10.20	16.90	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									
5 MHz Bandwidth									
2535.00	81.21	40	2.1	H	11.7	2.60	10.20	19.30	33
2535.00	77.97	315	1.2	V	9.1	2.60	10.20	16.70	33
10 MHz Bandwidth									
2535.00	81.95	323	1.2	H	12.5	2.60	10.20	20.10	33
2535.00	78.02	307	1.7	V	9.1	2.60	10.20	16.70	33
15 MHz Bandwidth									
2535.00	81.04	318	1.5	H	11.6	2.60	10.20	19.20	33
2535.00	77.60	183	2.0	V	8.7	2.60	10.20	16.30	33
20 MHz Bandwidth									
2535.00	81.02	356	1.2	H	11.5	2.60	10.20	19.10	33
2535.00	77.12	170	2.0	V	8.2	2.60	10.20	15.80	33

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

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

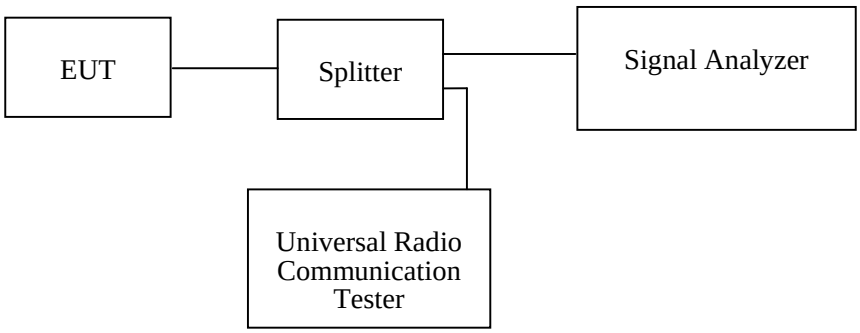
Applicable Standard

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

Test Procedure

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

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



Test Data

Environmental Conditions

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

The testing was performed by Hill He from 2018-12-03 to 2018-12-05.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	248.4	318.9

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.151	4.679
HSUPA (BPSK)	836.6	4.167	4.679
HSDPA (16QAM)	836.6	4.167	4.679

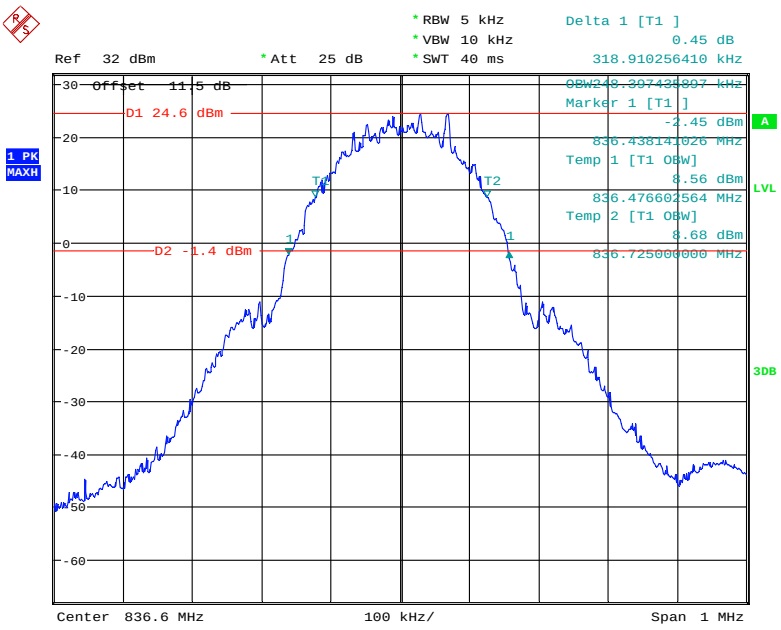
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	245.2	304.5

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.151	4.679
HSUPA (BPSK)	1880.0	4.167	4.679
HSDPA (16QAM)	1880.0	4.167	4.663

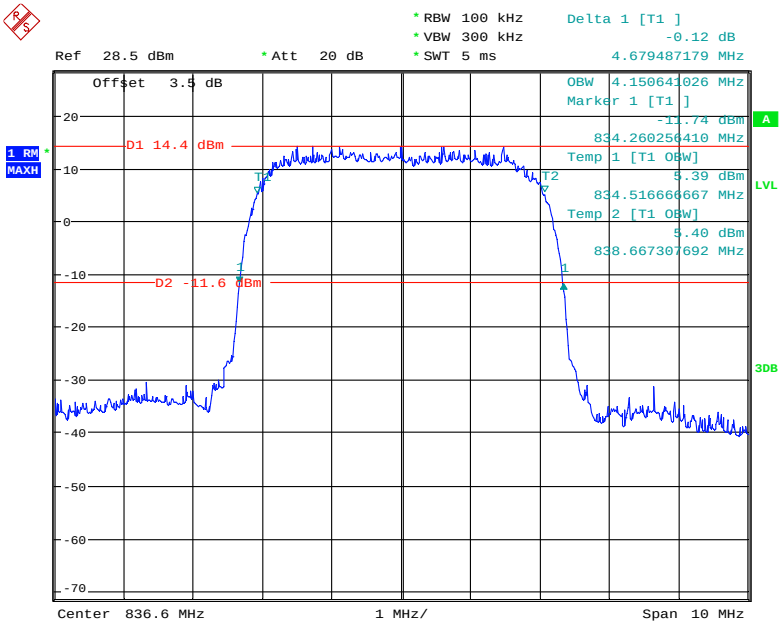
Cellular Band (Part 22H)

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



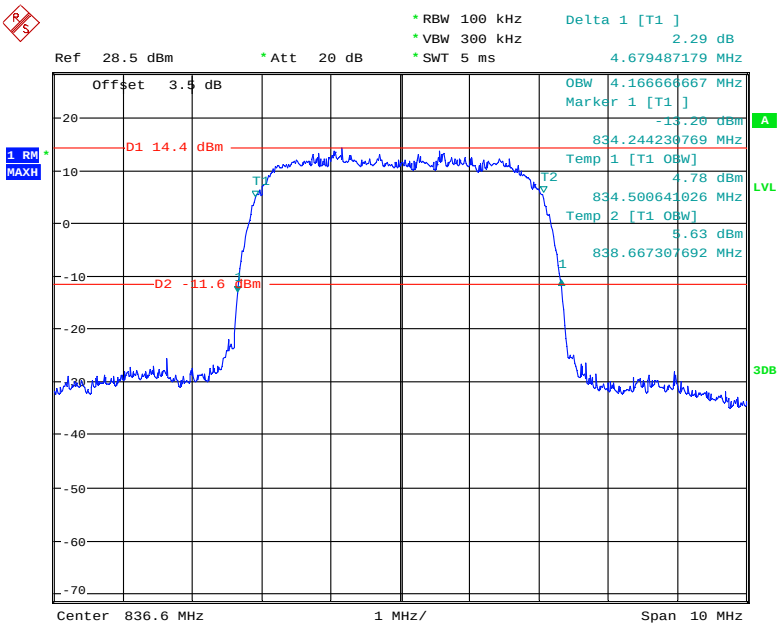
Date: 3.DEC.2018 15:32:04

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



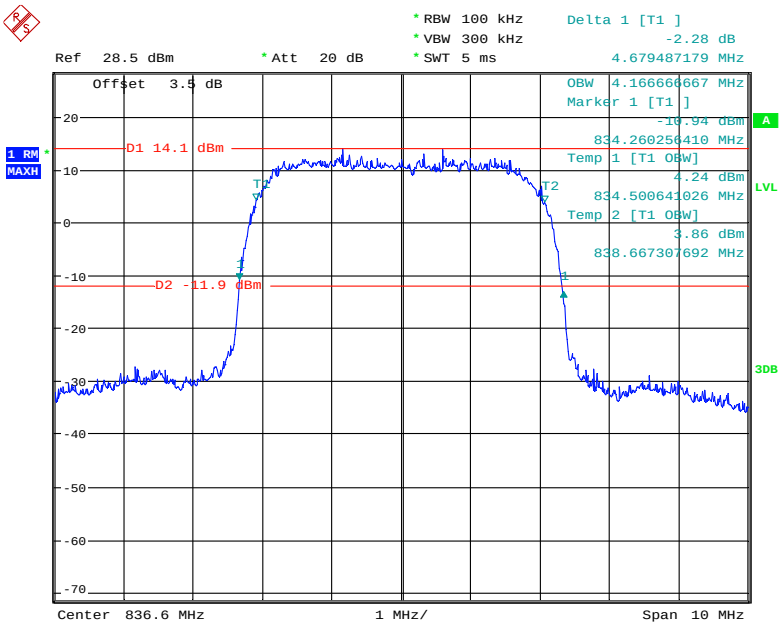
Date: 5.DEC.2018 08:56:25

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



Date: 5.DEC.2018 08:52:16

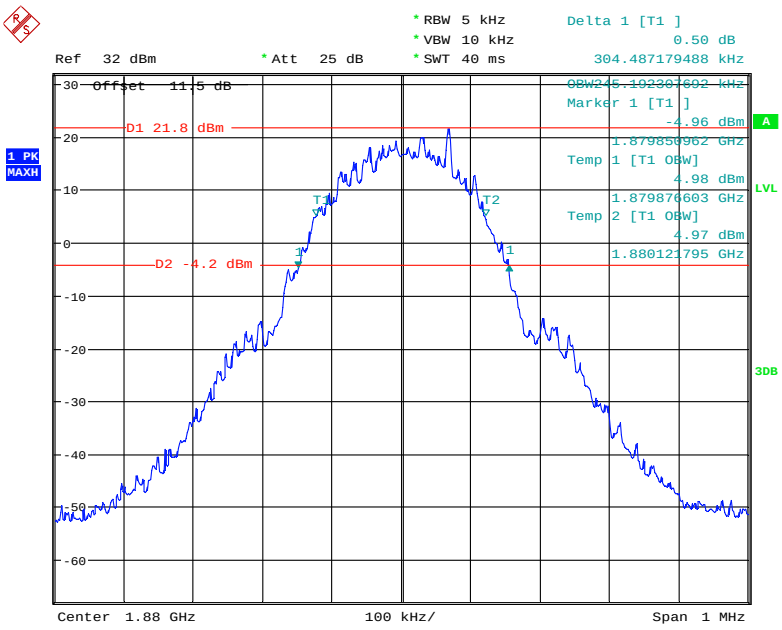
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 5.DEC.2018 08:58:43

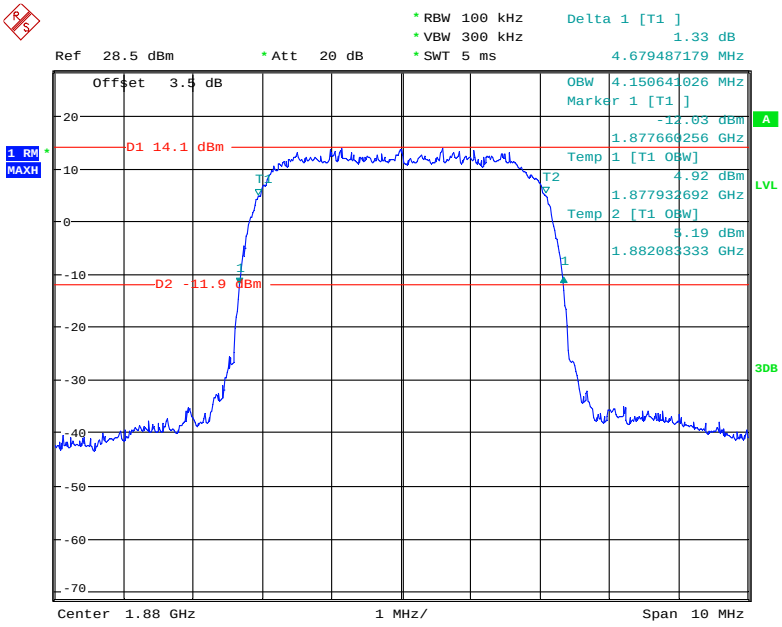
PCS Band (Part 24E)

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



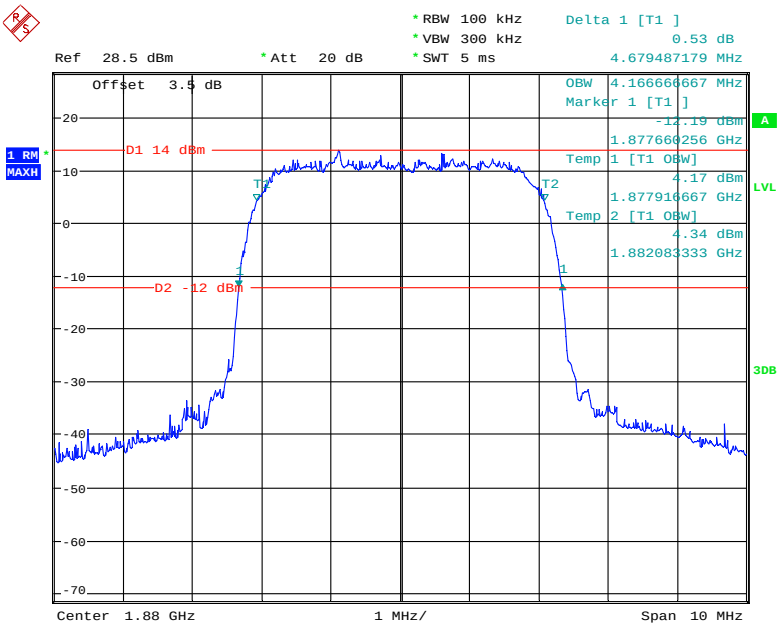
Date: 3.DEC.2018 15:29:07

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



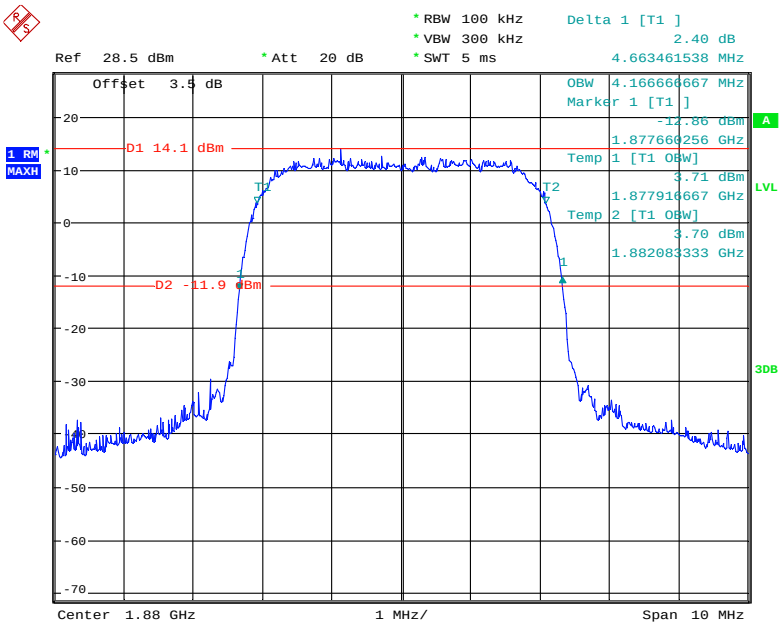
Date: 5.DEC.2018 09:02:41

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



Date: 5.DEC.2018 09:07:45

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

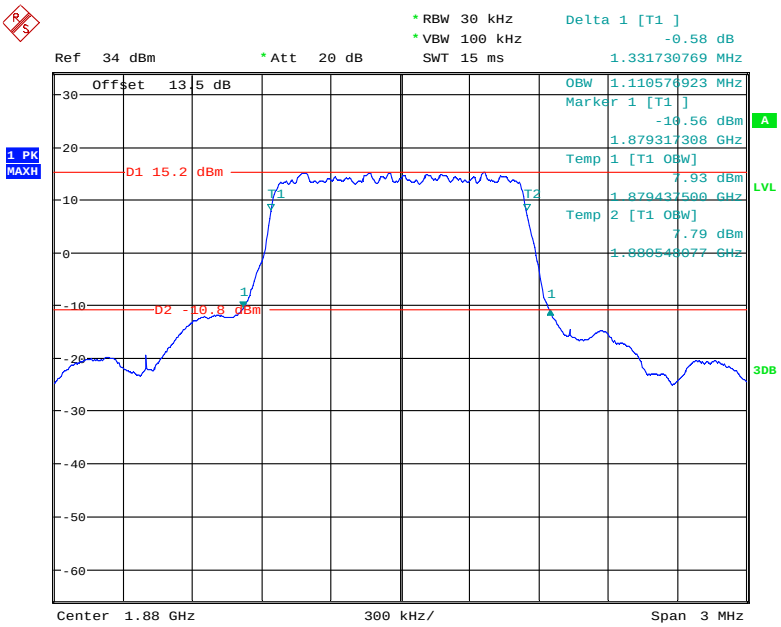


Date: 5.DEC.2018 09:05:38

LTE Band 2: (Middle Channel)

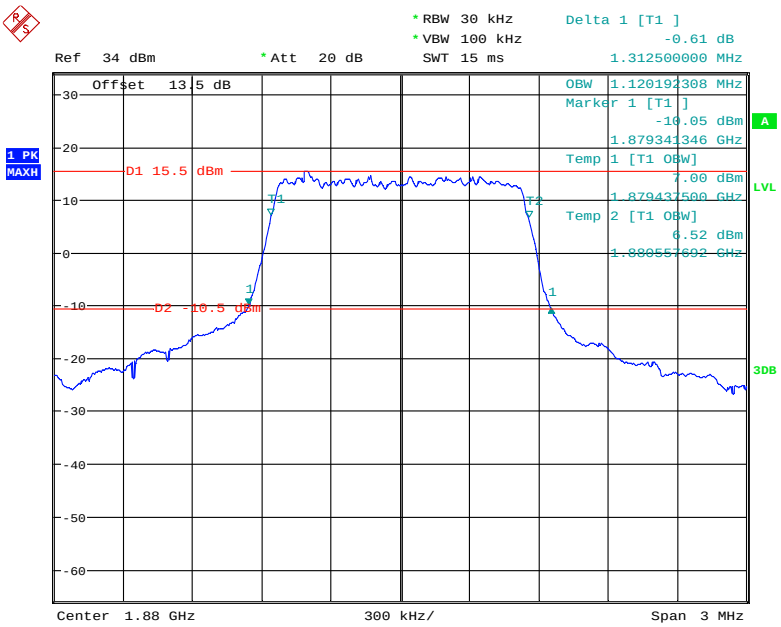
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.33
	16QAM	1.12	1.31
3.0	QPSK	2.70	3.02
	16QAM	2.70	3.04
5.0	QPSK	4.55	5.32
	16QAM	4.54	5.27
10.0	QPSK	8.97	9.88
	16QAM	8.94	9.79
15.0	QPSK	13.46	15.00
	16QAM	13.46	14.90
20.0	QPSK	17.95	19.42
	16QAM	17.95	19.61

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



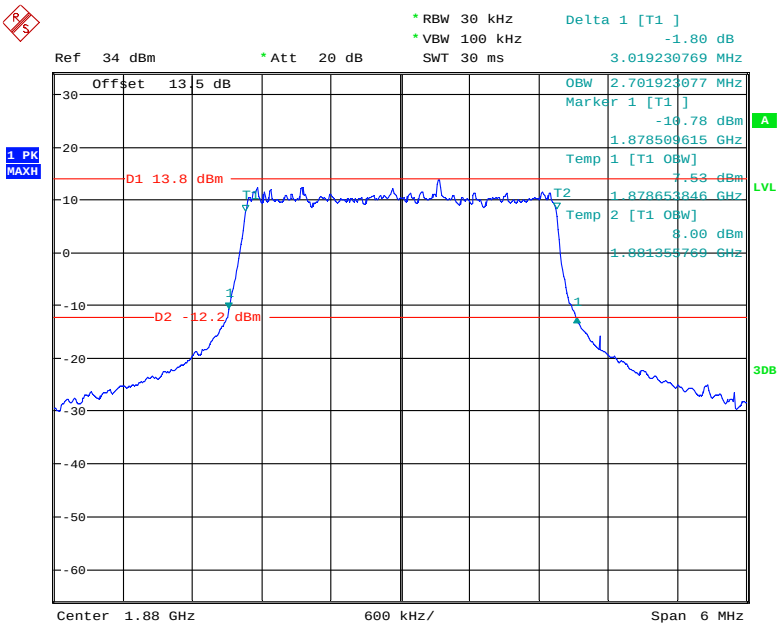
Date: 4.DEC.2018 13:58:10

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



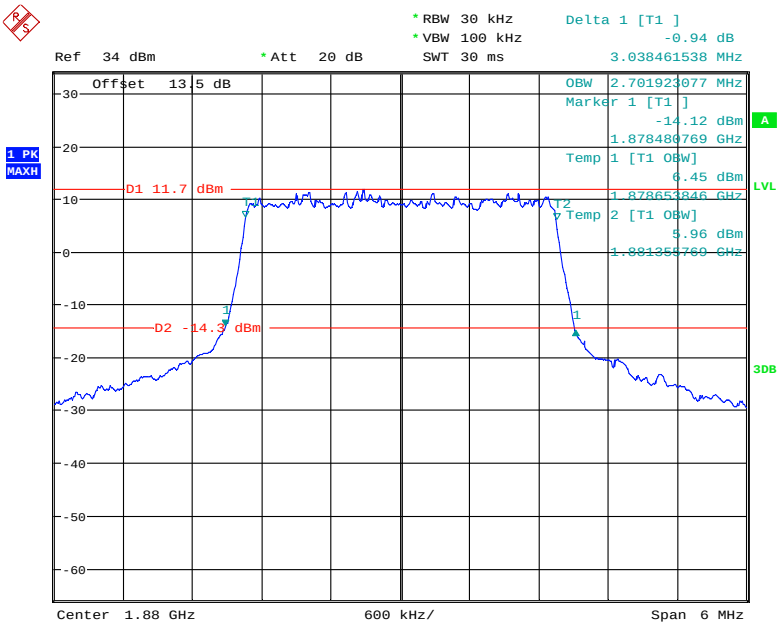
Date: 4.DEC.2018 13:59:50

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



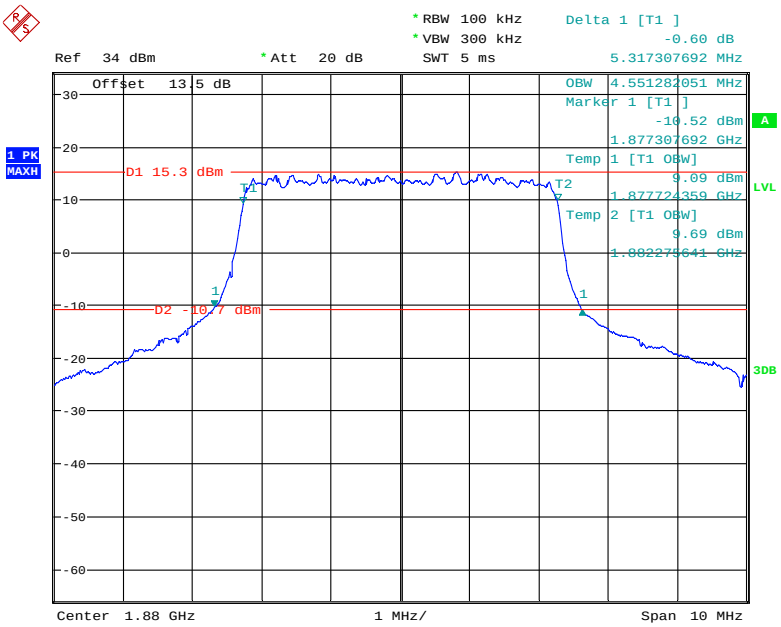
Date: 4.DEC.2018 14:02:41

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



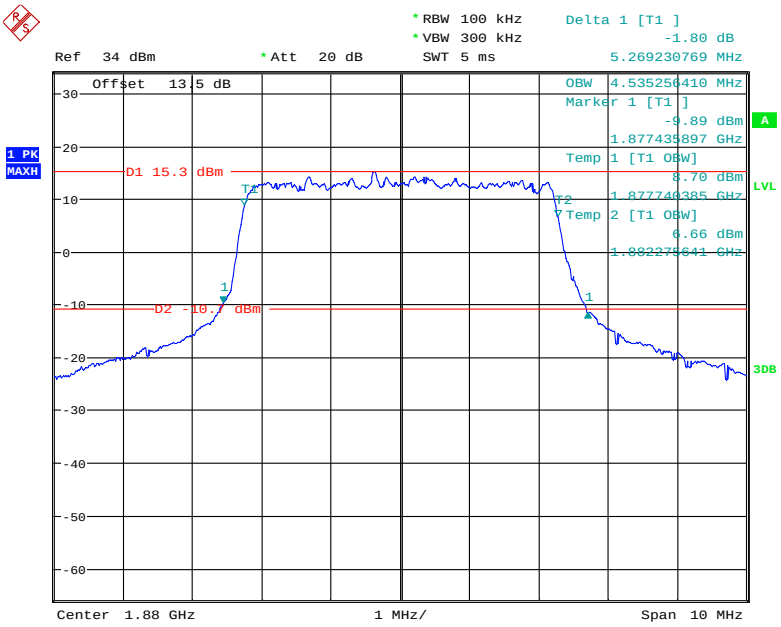
Date: 4.DEC.2018 14:03:49

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



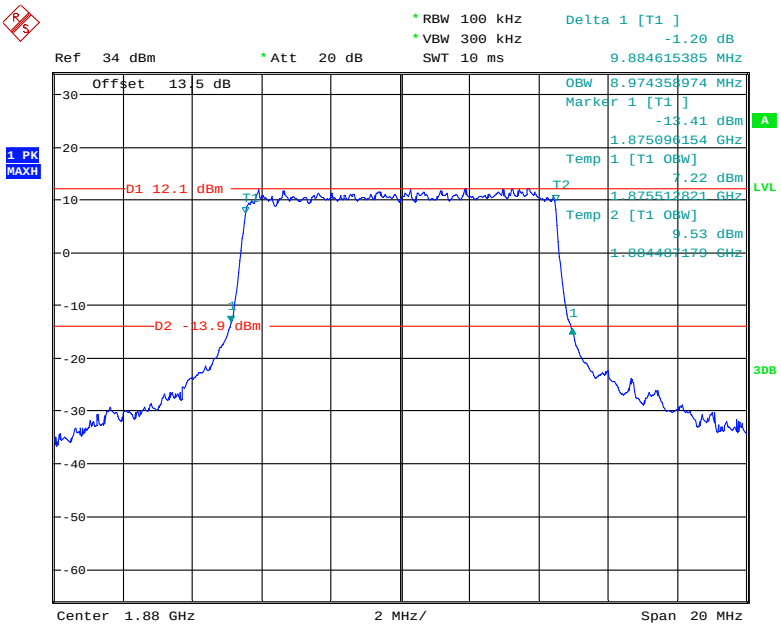
Date: 4.DEC.2018 14:06:44

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



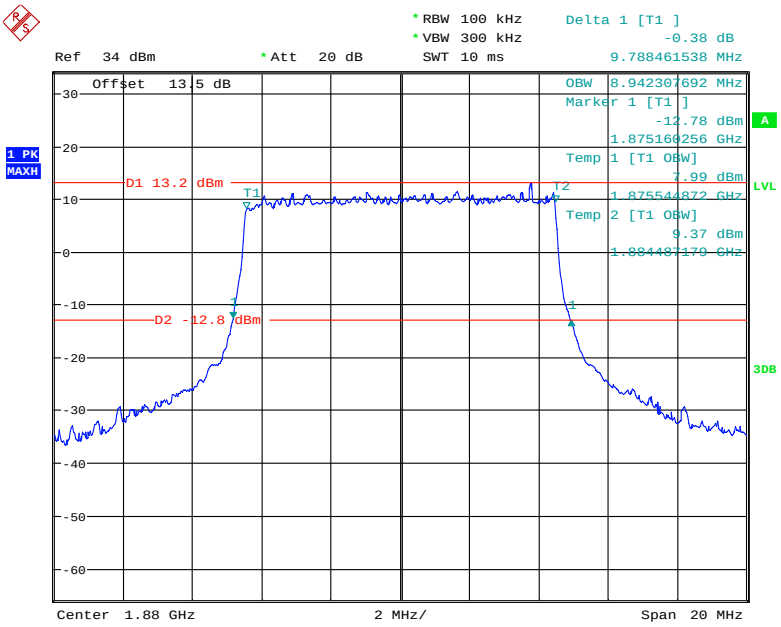
Date: 4.DEC.2018 14:07:56

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



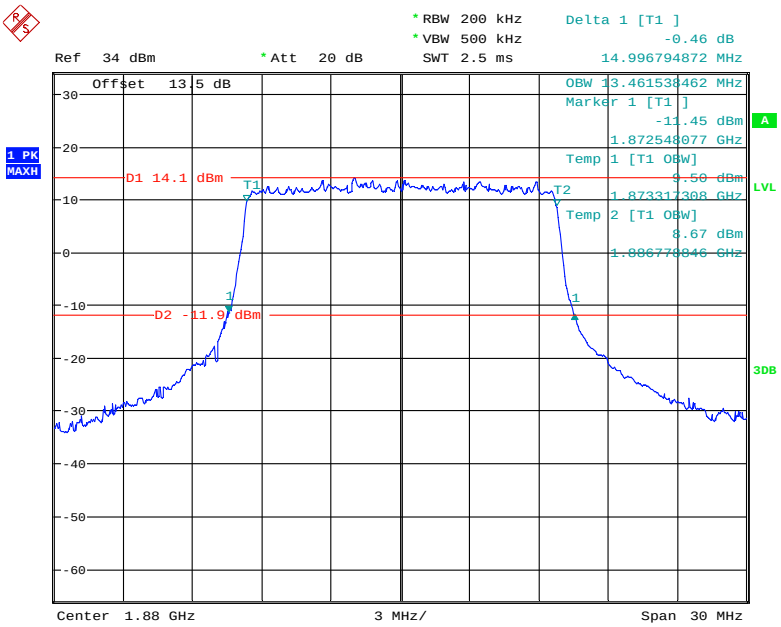
Date: 4.DEC.2018 14:09:35

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



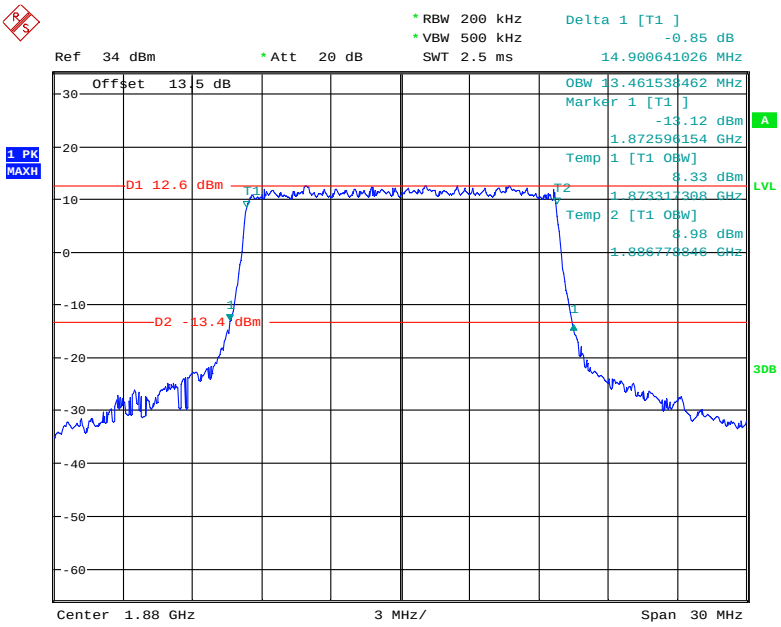
Date: 4.DEC.2018 14:11:25

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



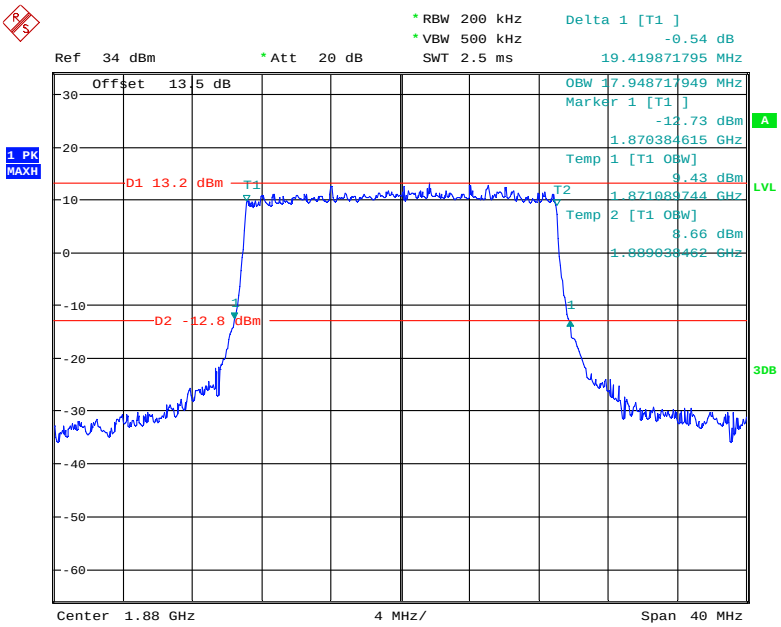
Date: 4.DEC.2018 14:13:50

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



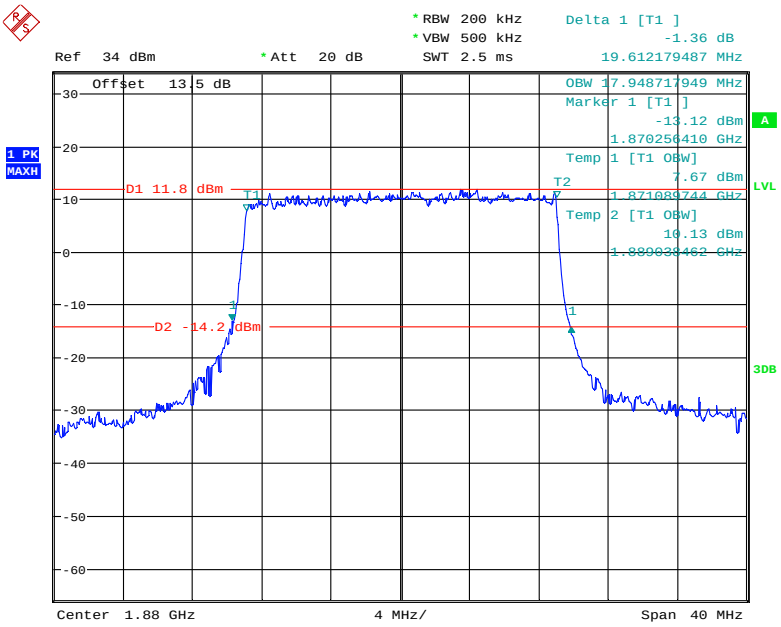
Date: 4.DEC.2018 14:15:26

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



Date: 4.DEC.2018 14:17:16

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

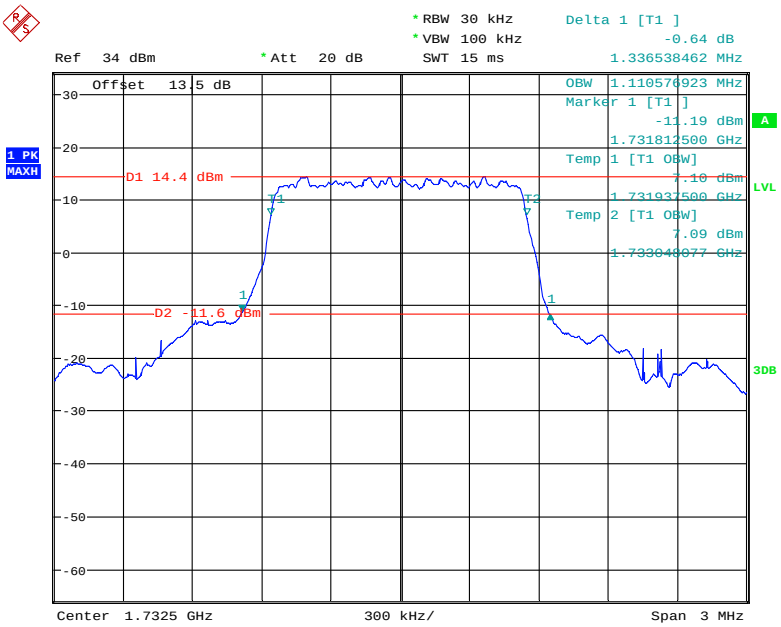


Date: 4.DEC.2018 14:19:32

LTE Band 4: (Middle Channel)

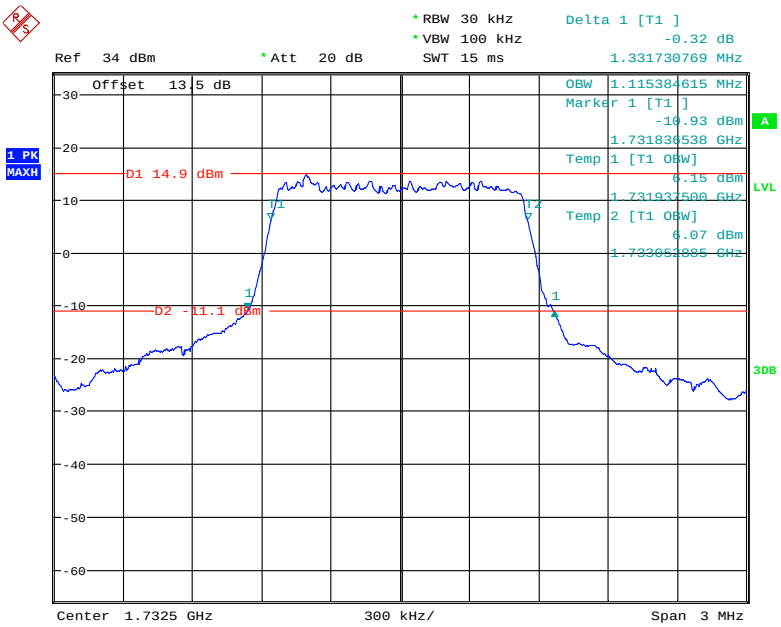
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.34
	16QAM	1.12	1.33
3.0	QPSK	2.71	3.02
	16QAM	2.71	3.04
5.0	QPSK	4.57	5.42
	16QAM	4.54	5.31
10.0	QPSK	8.97	9.80
	16QAM	8.97	9.83
15.0	QPSK	13.51	15.06
	16QAM	13.46	14.86
20.0	QPSK	17.88	19.50
	16QAM	17.95	19.62

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



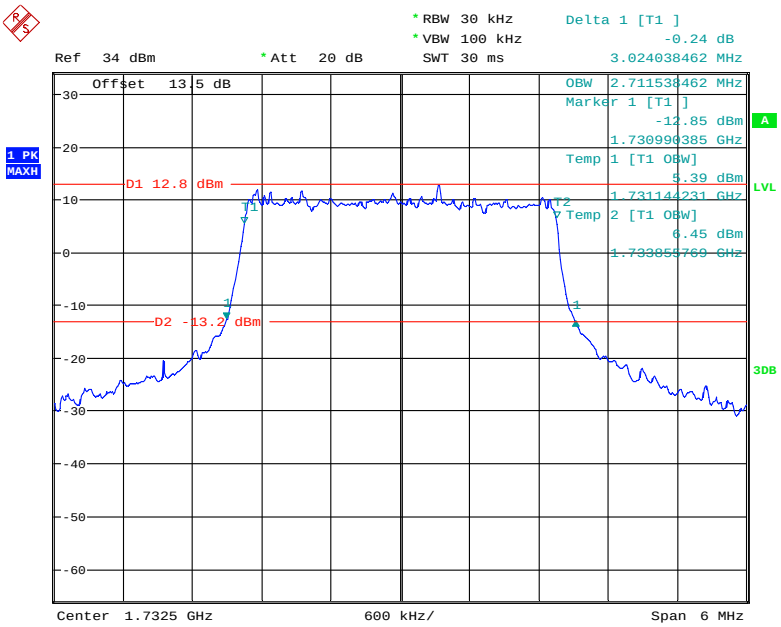
Date: 4.DEC.2018 14:31:12

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



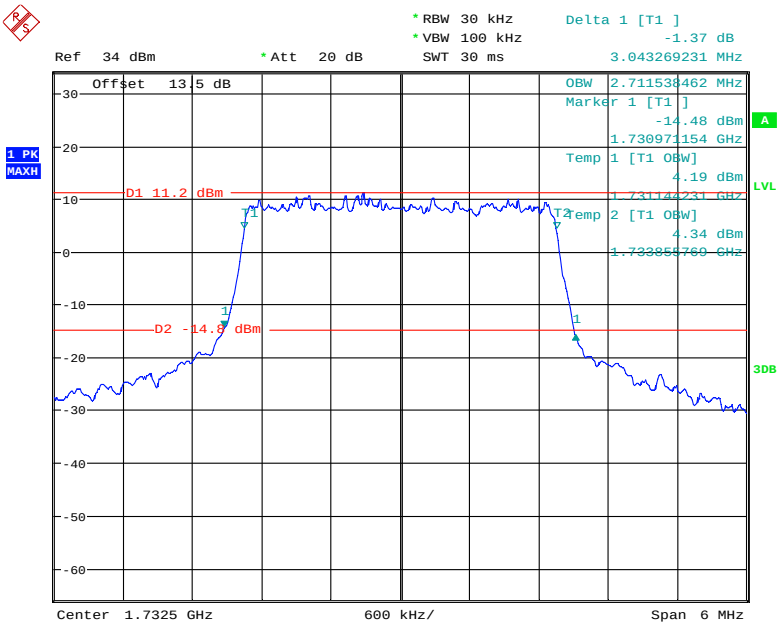
Date: 4.DEC.2018 14:32:44

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



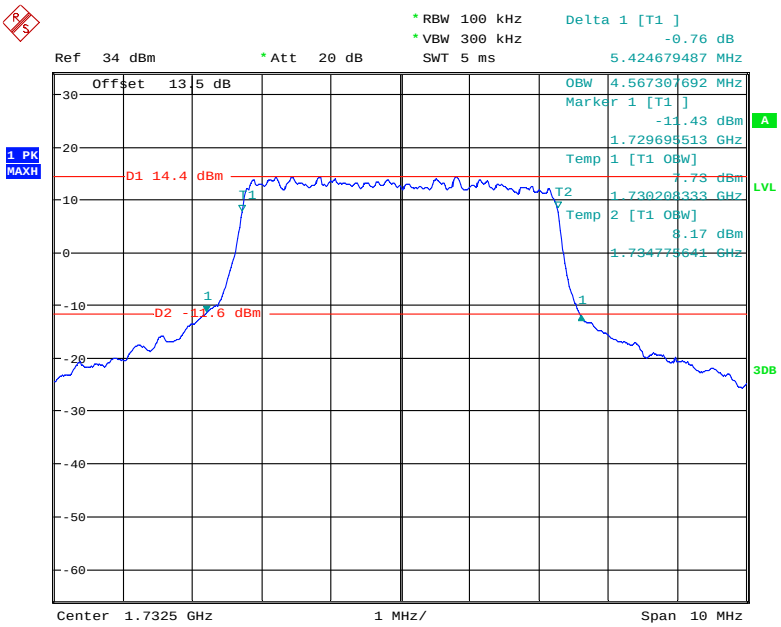
Date: 4.DEC.2018 14:35:09

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



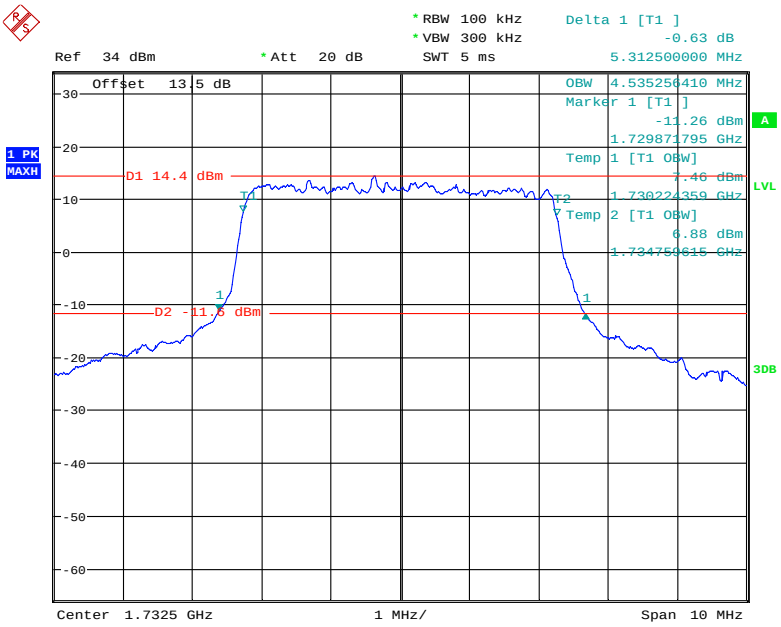
Date: 4.DEC.2018 14:33:56

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



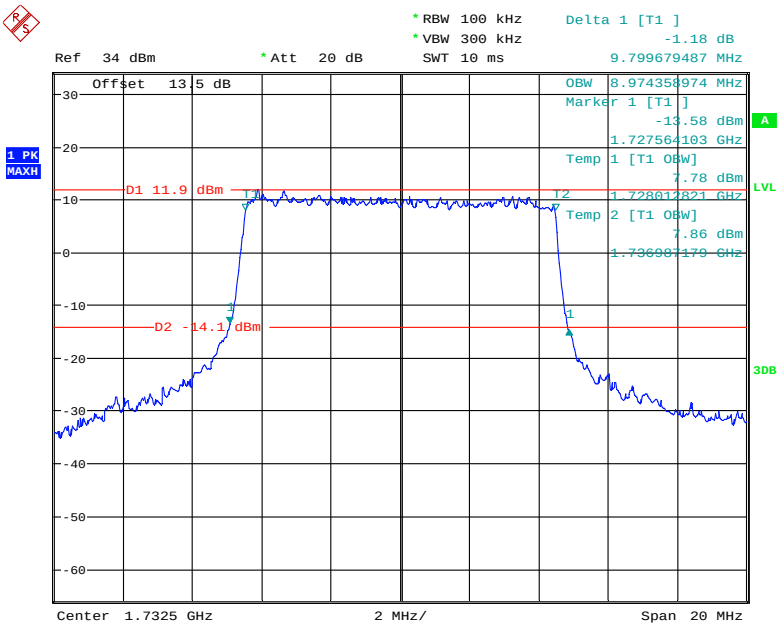
Date: 4.DEC.2018 14:41:24

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



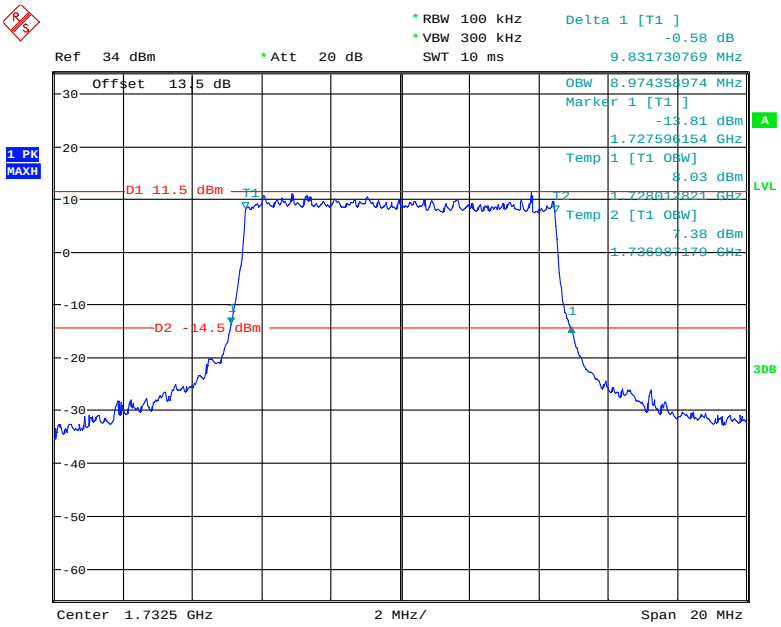
Date: 4.DEC.2018 14:38:32

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



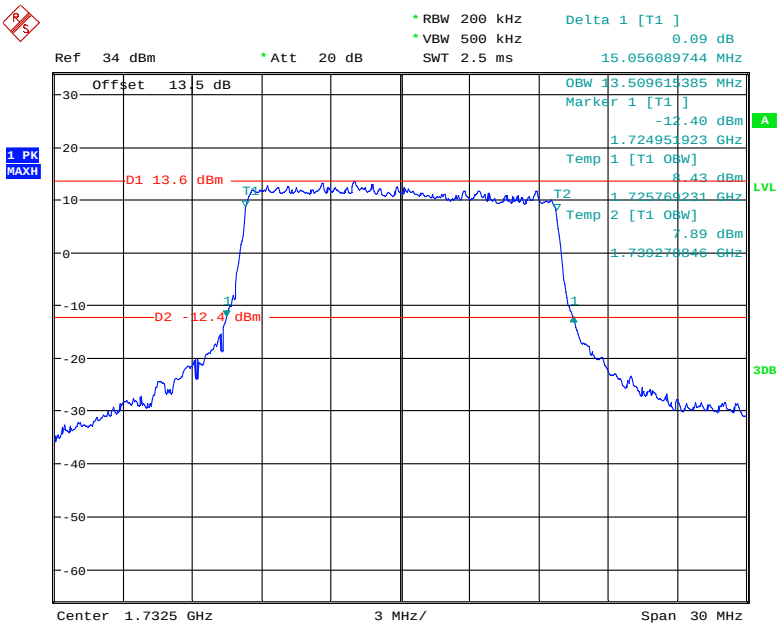
Date: 4.DEC.2018 14:44:01

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



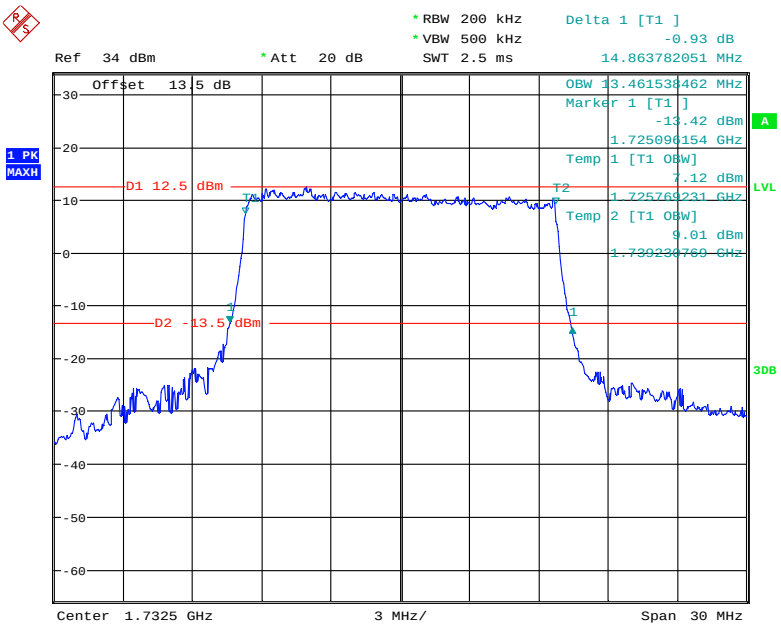
Date: 4.DEC.2018 14:42:45

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



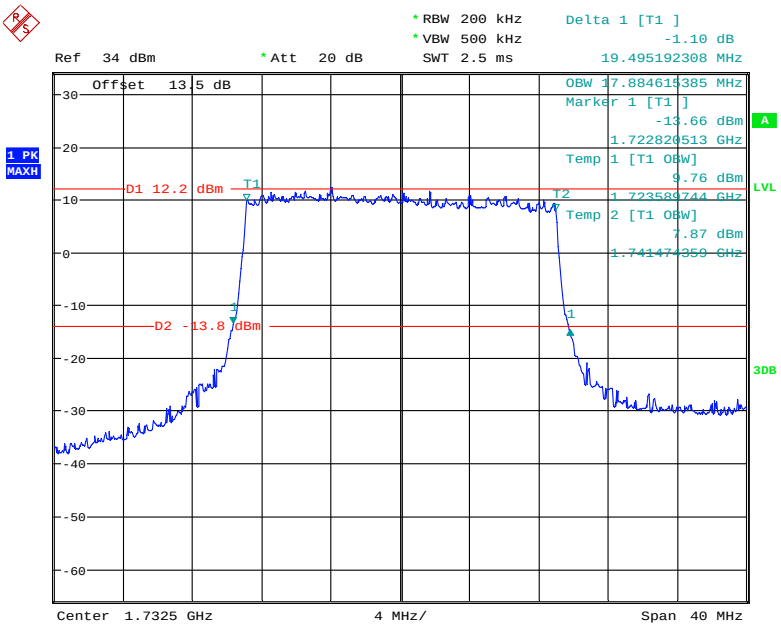
Date: 4.DEC.2018 14:49:33

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



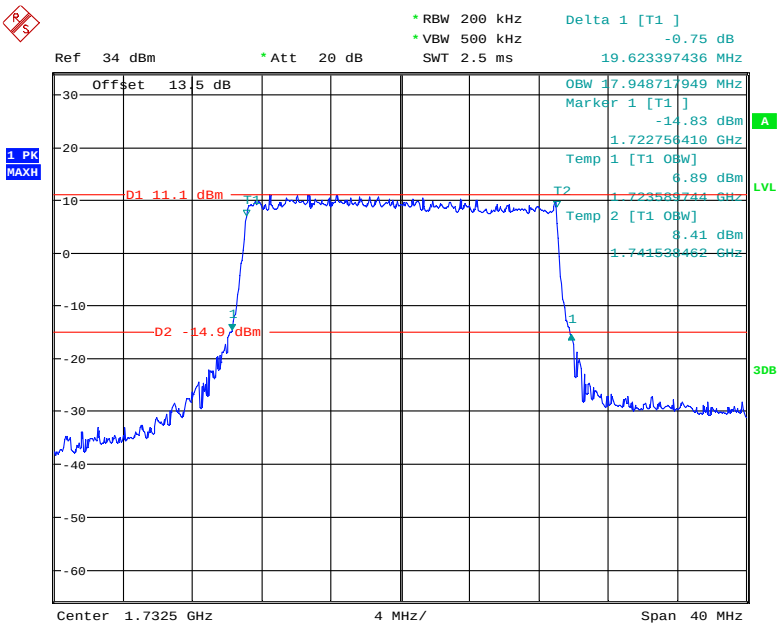
Date: 4.DEC.2018 14:47:00

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



Date: 4.DEC.2018 14:52:43

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

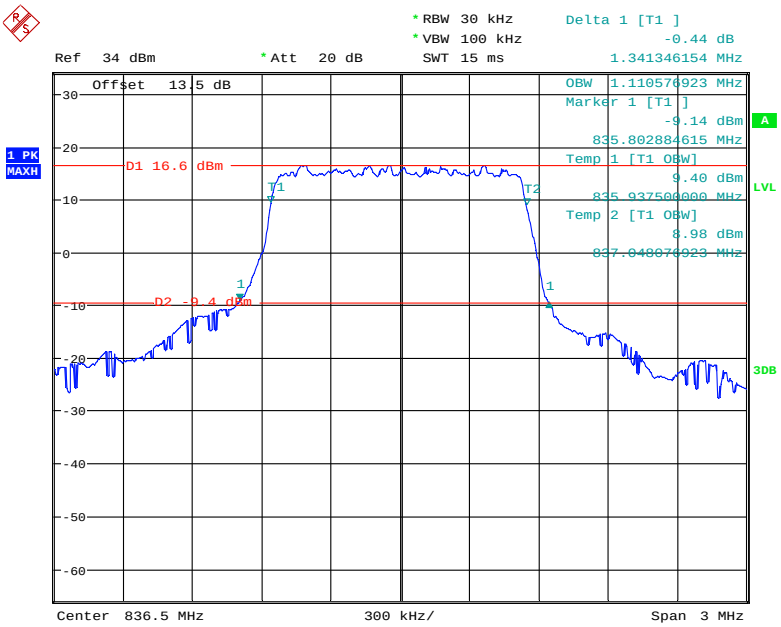


Date: 4.DEC.2018 14:51:06

LTE Band 5: (Middle Channel)

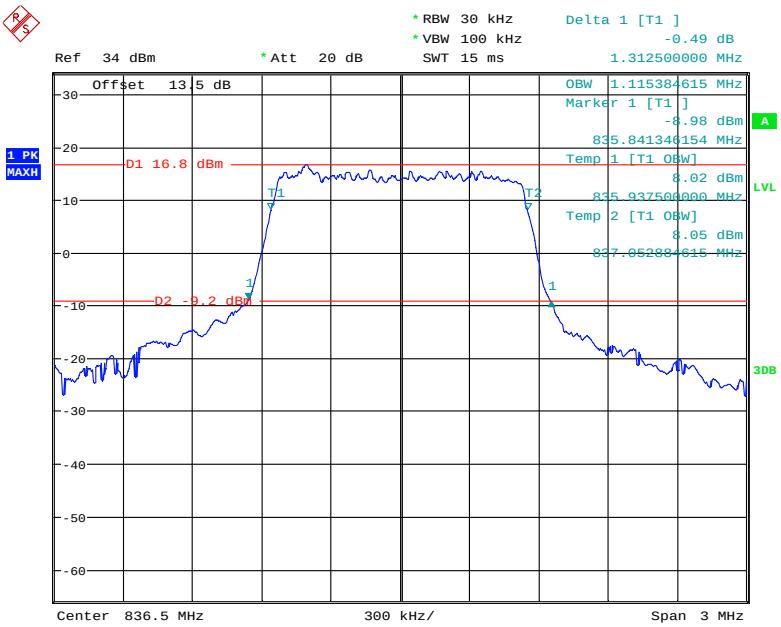
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.34
	16QAM	1.12	1.31
3.0	QPSK	2.71	3.03
	16QAM	2.71	3.04
5.0	QPSK	4.55	5.38
	16QAM	4.54	5.28
10.0	QPSK	8.97	9.79
	16QAM	8.94	9.91

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



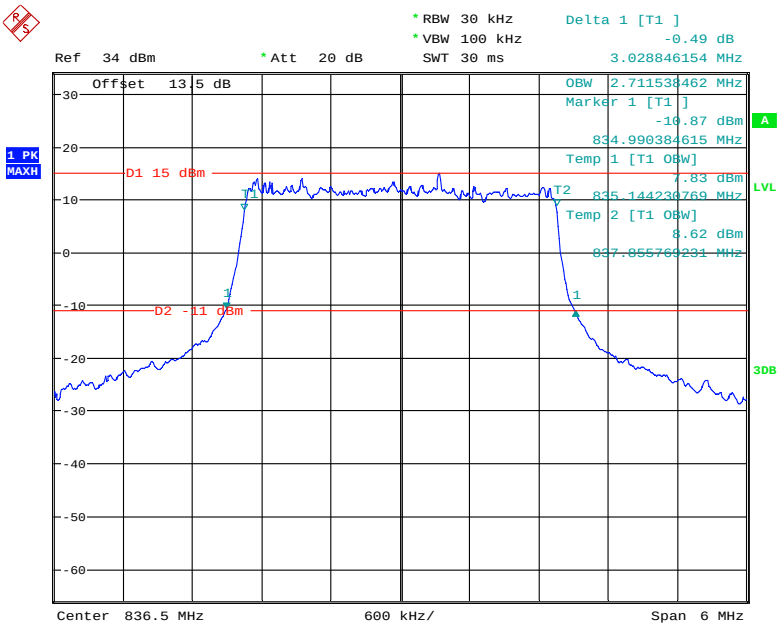
Date: 4.DEC.2018 14:58:02

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



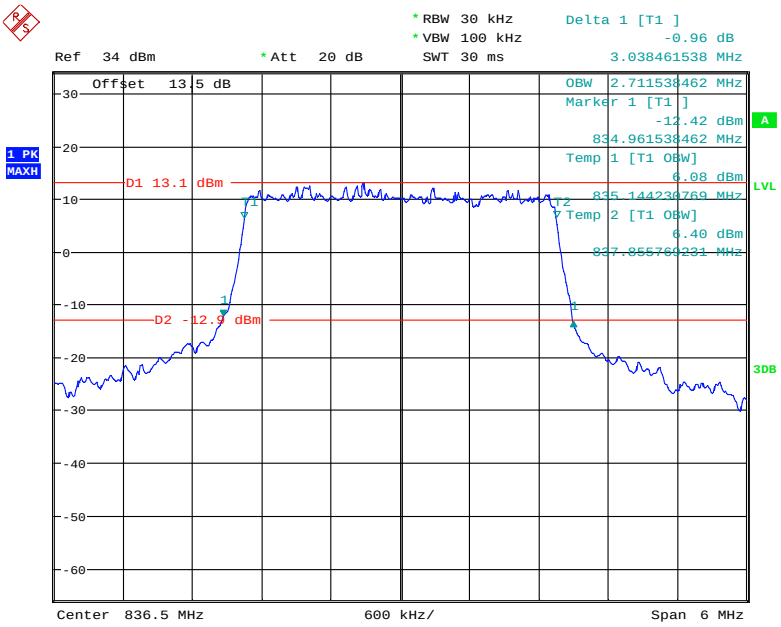
Date: 4.DEC.2018 14:56:36

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



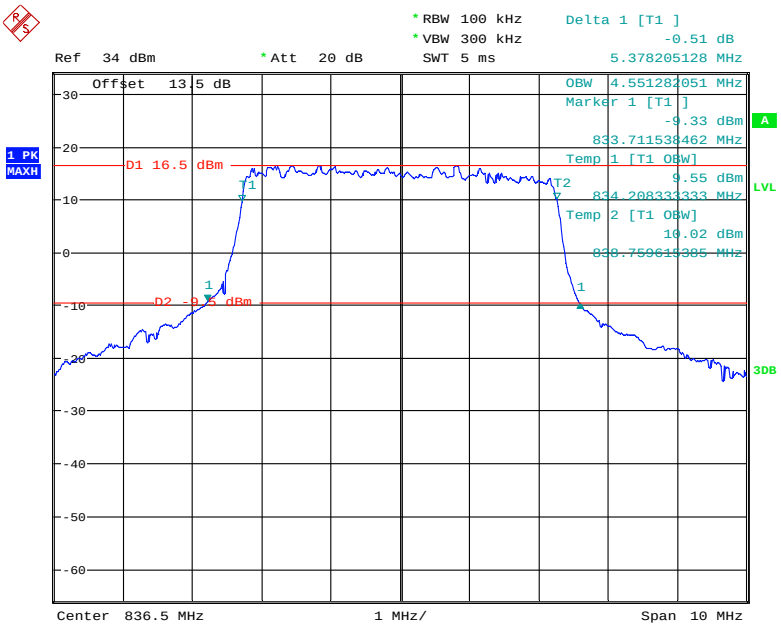
Date: 4.DEC.2018 14:59:36

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



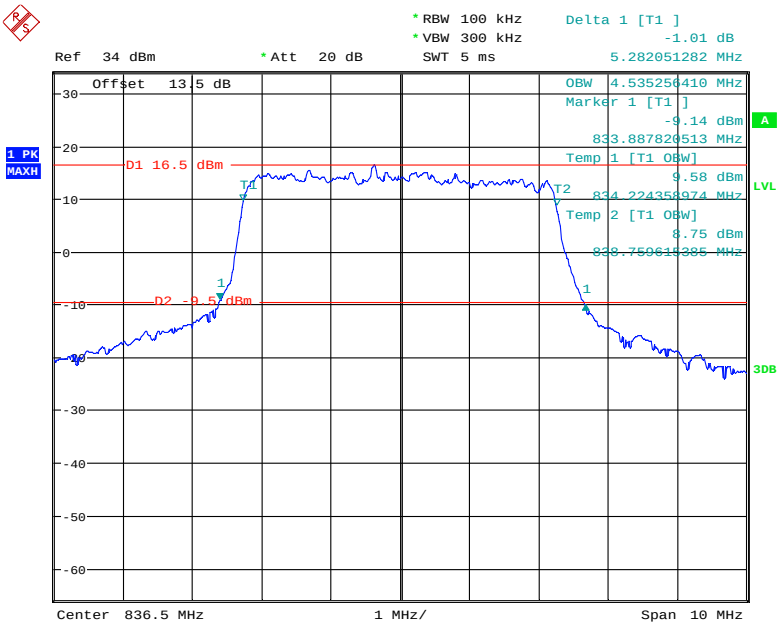
Date: 4.DEC.2018 15:00:37

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



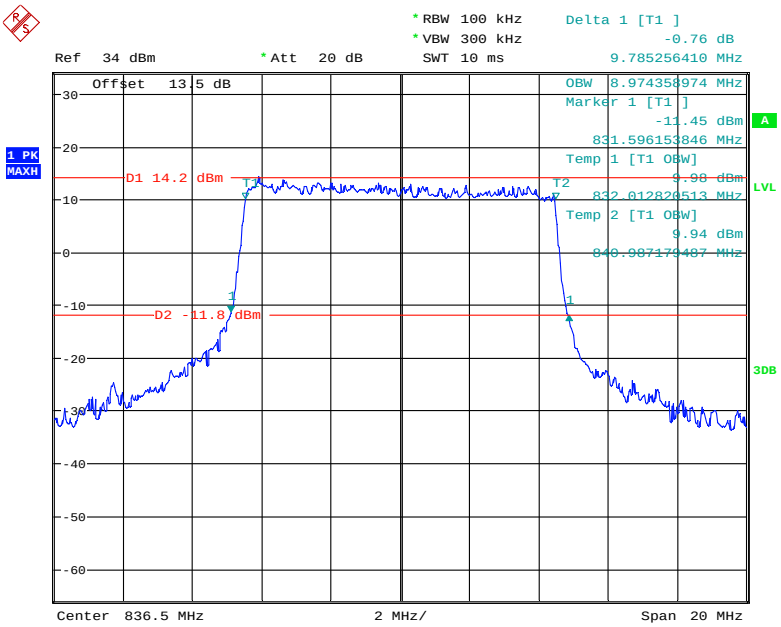
Date: 4.DEC.2018 15:03:52

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



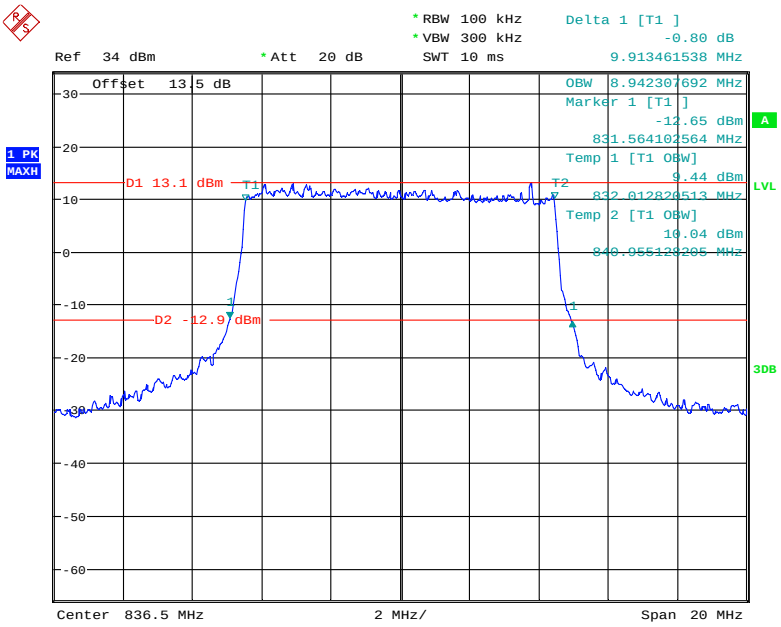
Date: 4.DEC.2018 15:06:33

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



Date: 4.DEC.2018 15:08:03

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

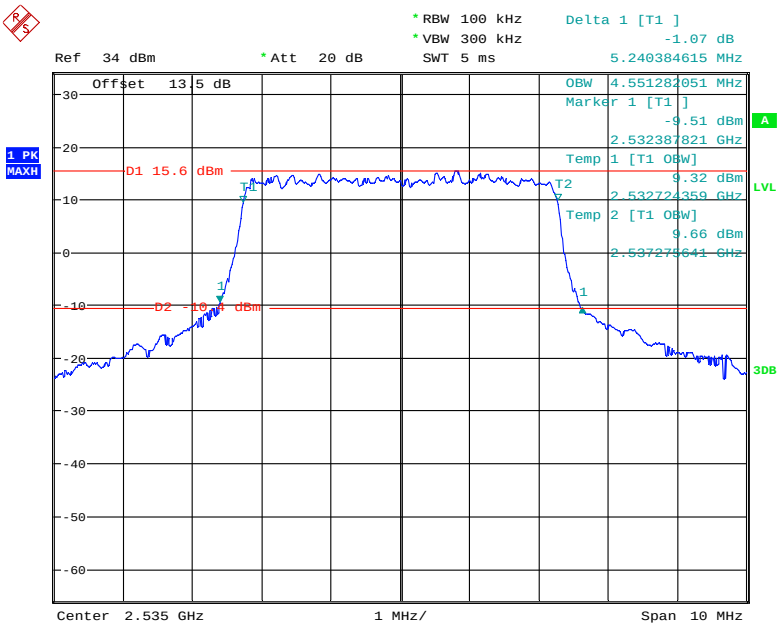


Date: 4.DEC.2018 15:10:54

LTE Band 7: (Middle Channel)

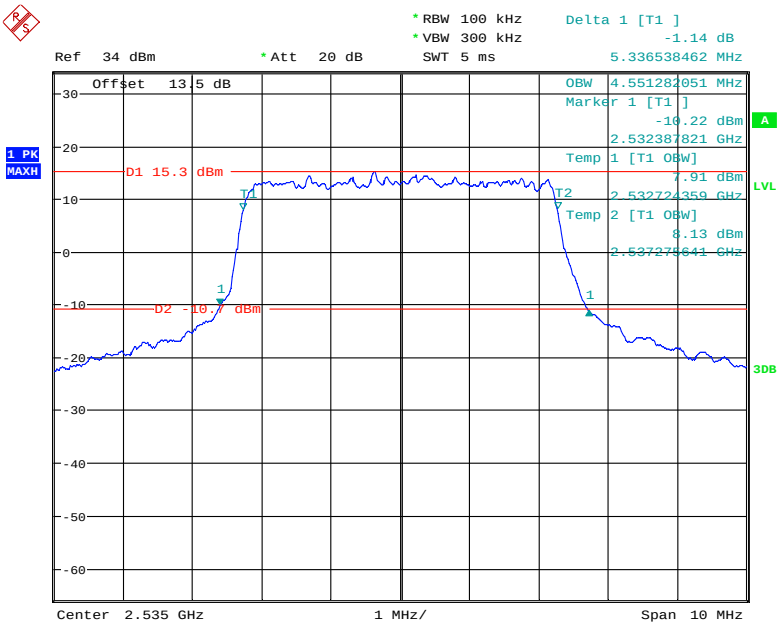
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.55	5.24
	16QAM	4.55	5.34
10.0	QPSK	9.01	9.90
	16QAM	8.97	9.87
15.0	QPSK	13.51	15.21
	16QAM	13.46	14.92
20.0	QPSK	17.95	19.49
	16QAM	18.01	19.87

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



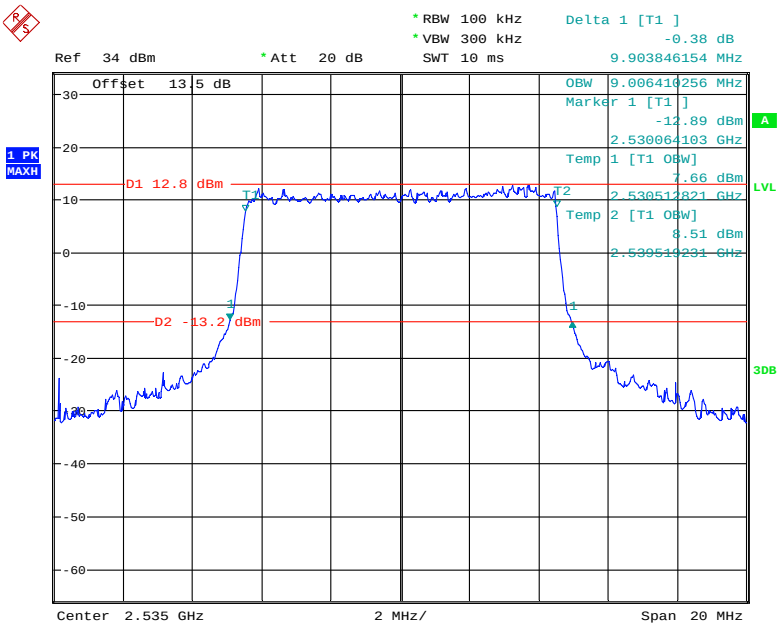
Date: 4.DEC.2018 15:20:16

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



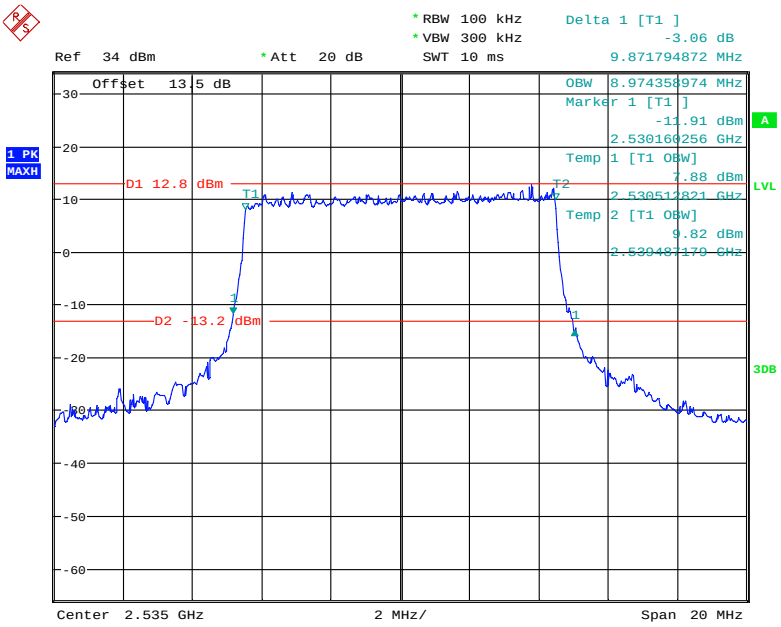
Date: 4.DEC.2018 15:18:23

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



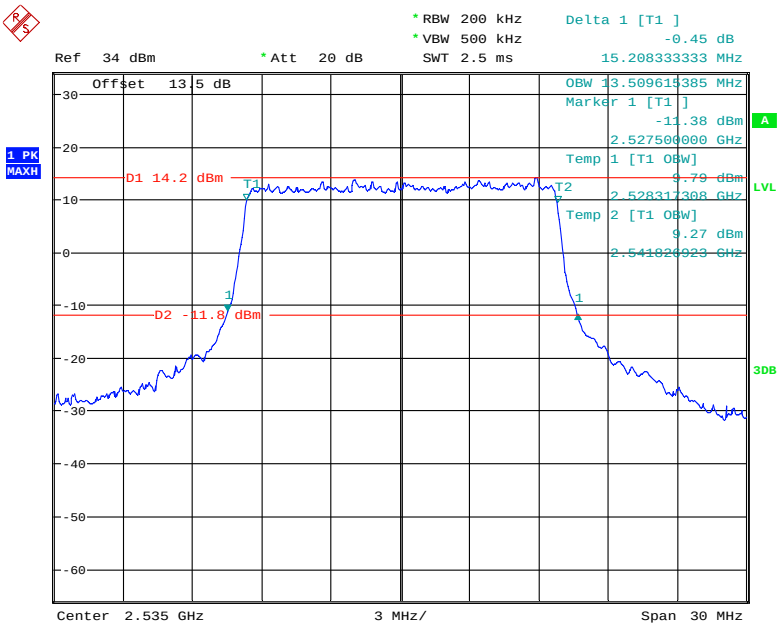
Date: 4.DEC.2018 15:24:04

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



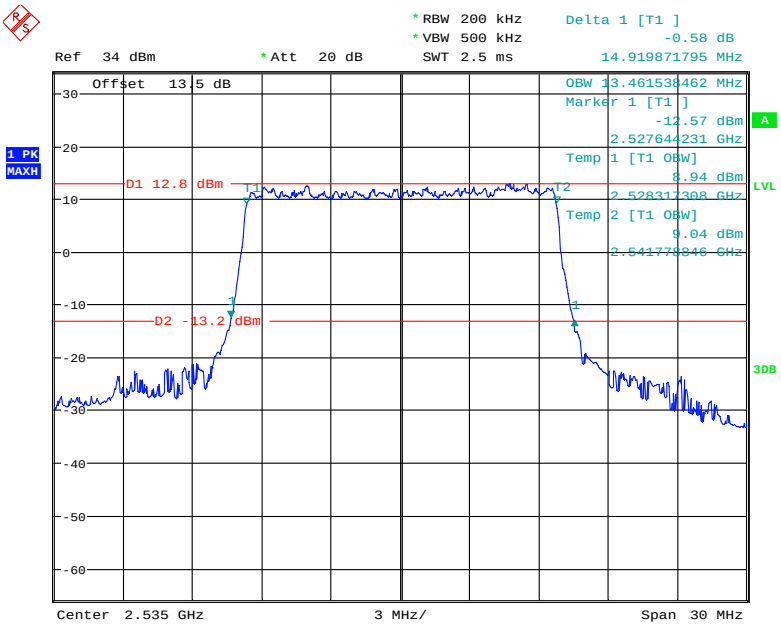
Date: 4.DEC.2018 15:21:53

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



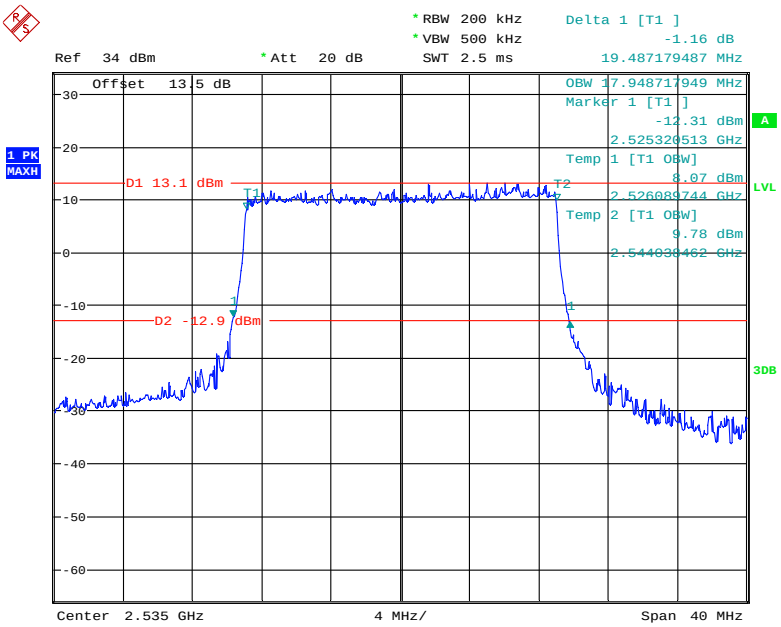
Date: 4.DEC.2018 15:37:33

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



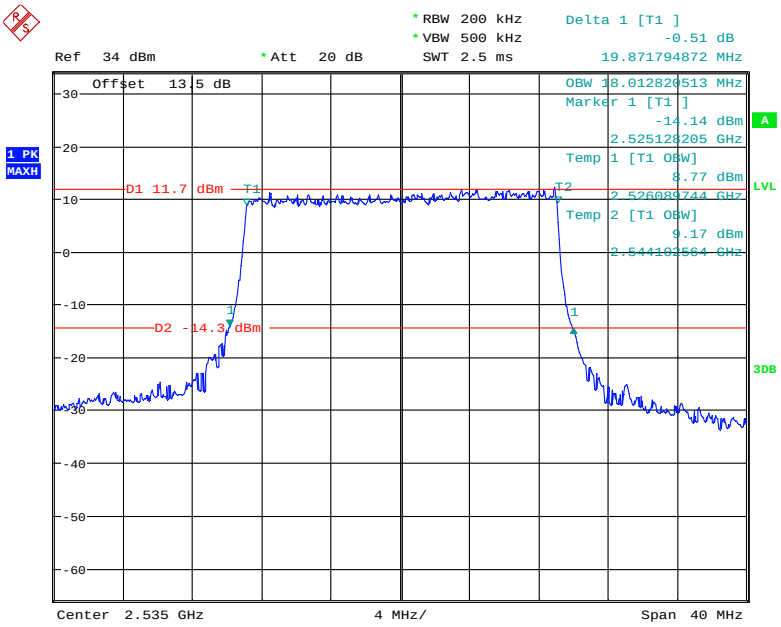
Date: 4.DEC.2018 15:40:10

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



Date: 4.DEC.2018 15:41:44

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



Date: 4.DEC.2018 15:45:20

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

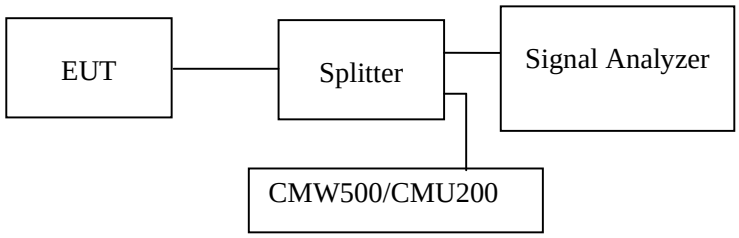
Applicable Standard

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

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

Test Procedure

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



Test Data

Environmental Conditions

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

The testing was performed by Hill He from 2018-12-03 to 2019-01-02.

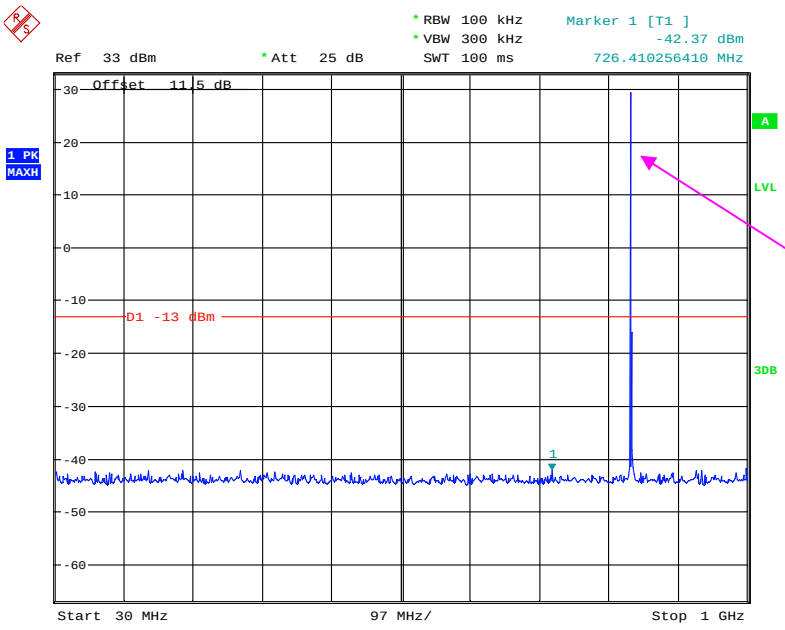
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

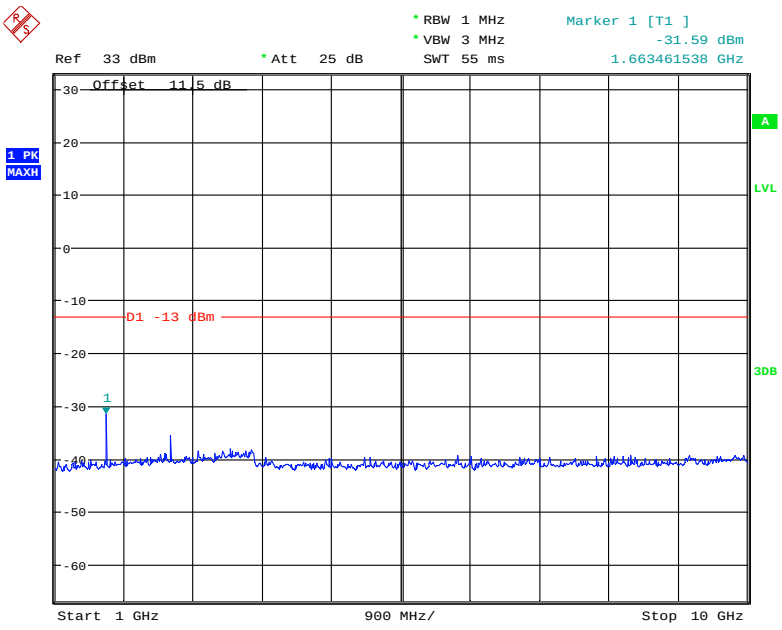
30 MHz – 1 GHz (GSM Mode)



Fundamental test

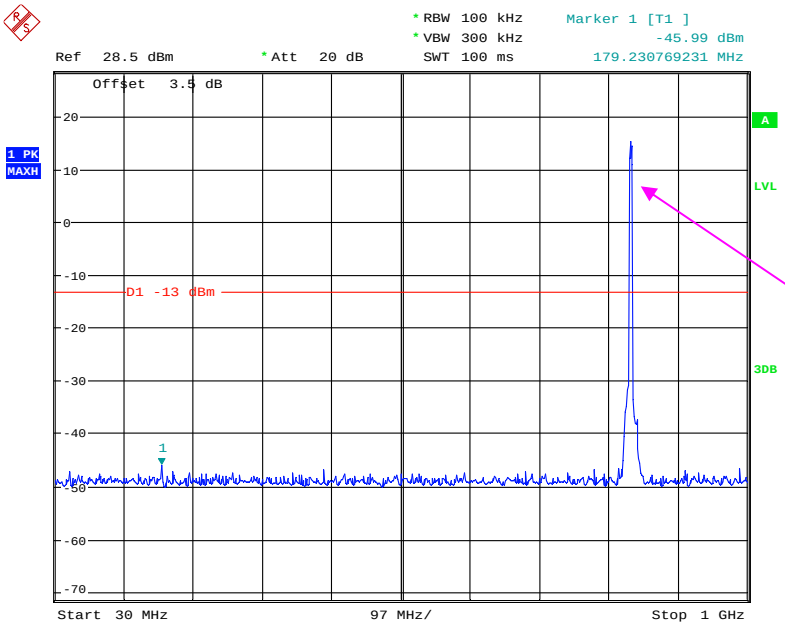
Date: 3.DEC.2018 15:38:19

1 GHz – 10 GHz (GSM Mode)



Date: 3.DEC.2018 15:36:58

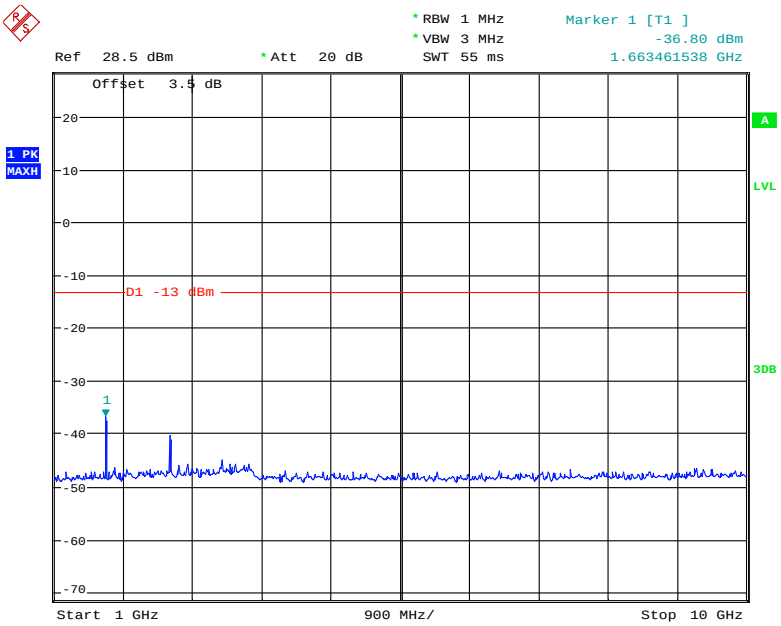
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 5.DEC.2018 09:23:40

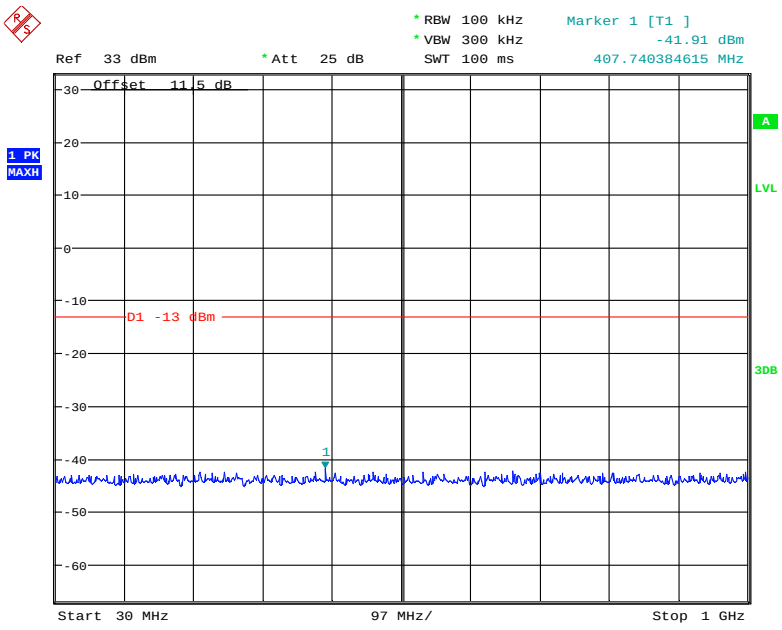
1 GHz – 10 GHz (WCDMA Mode)



Date: 5.DEC.2018 09:22:19

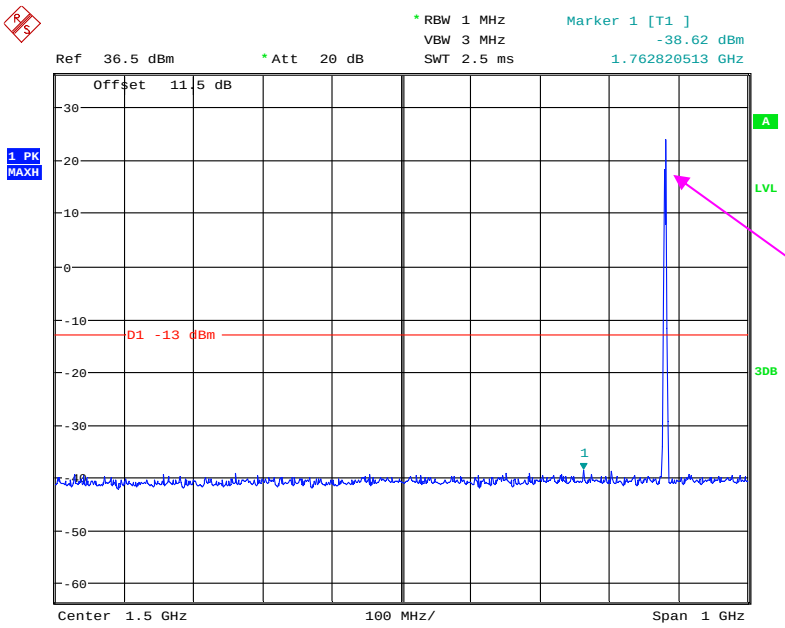
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 3.DEC.2018 15:40:59

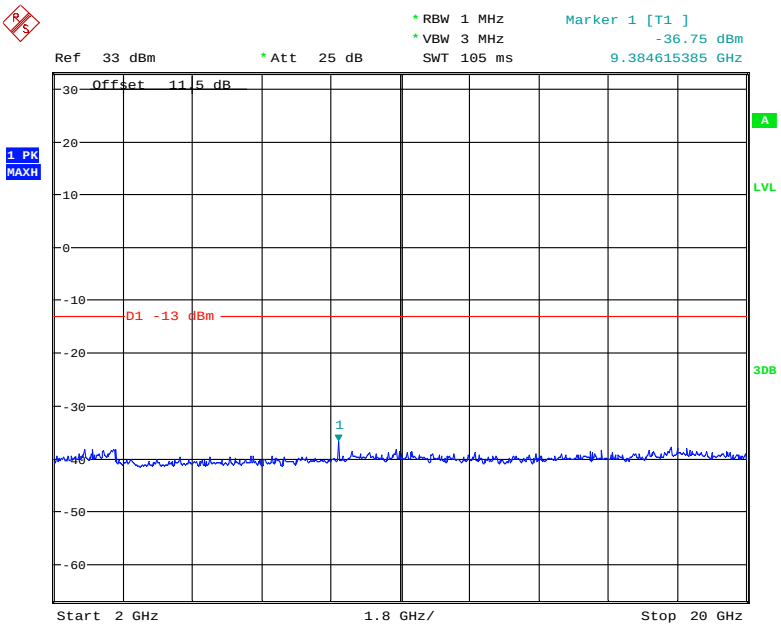
1 GHz – 2 GHz (GSM Mode)



Fundamental test

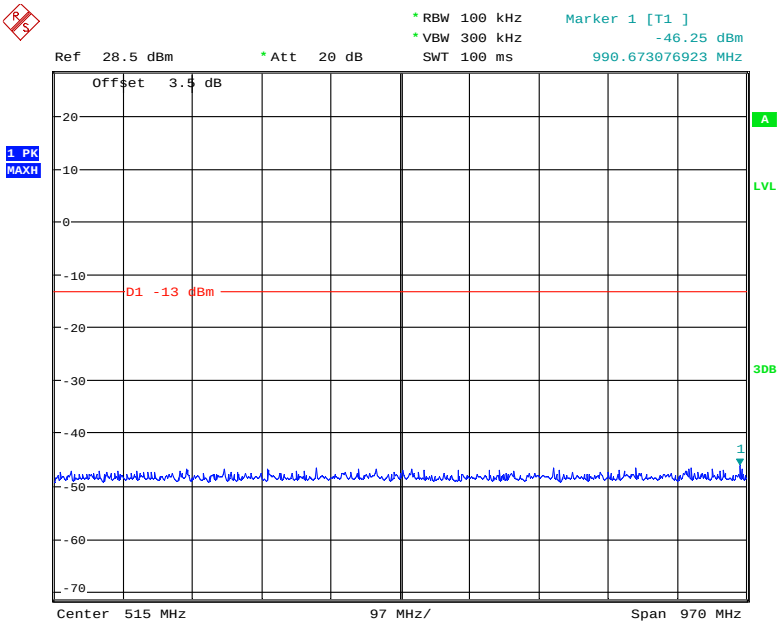
Date: 2.JAN.2019 17:06:08

2 GHz – 20 GHz (GSM Mode)



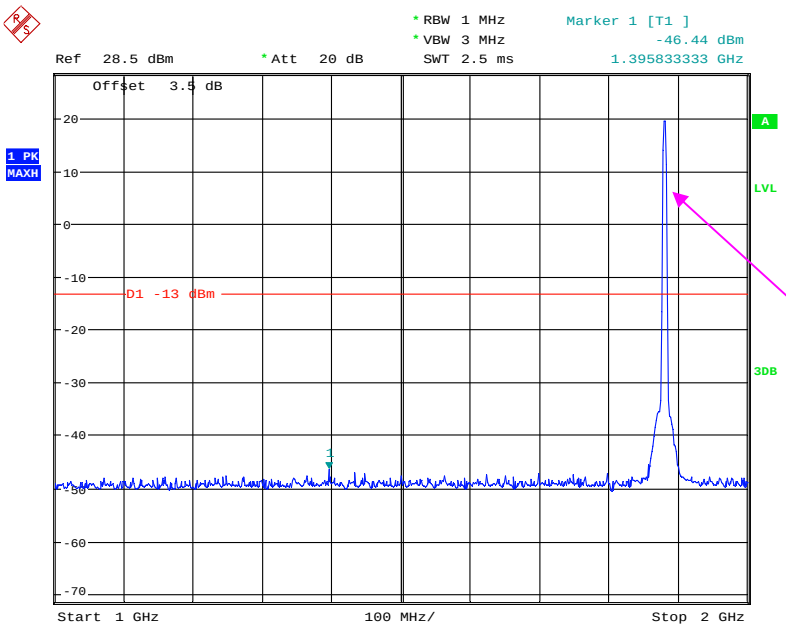
Date: 3.DEC.2018 15:46:22

30 MHz – 1 GHz (WCDMA Mode)



Date: 5.DEC.2018 09:17:21

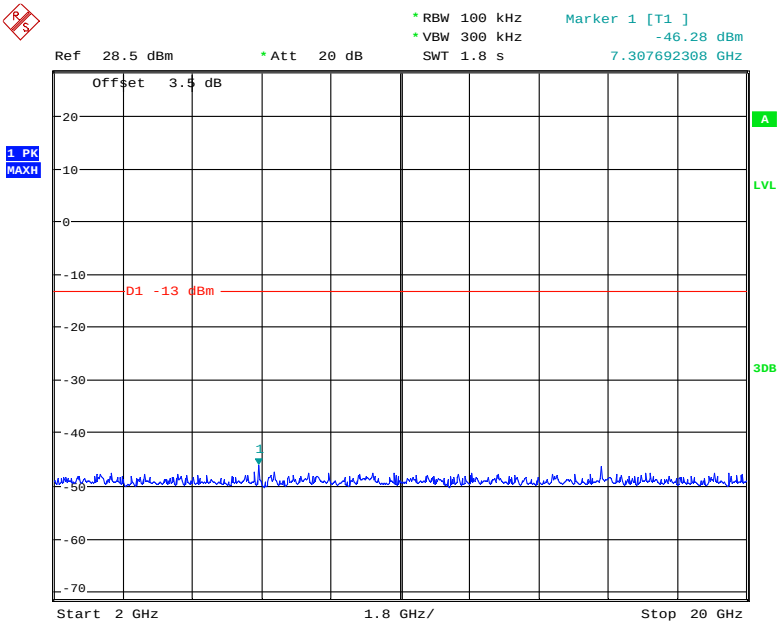
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 5.DEC.2018 09:18:17

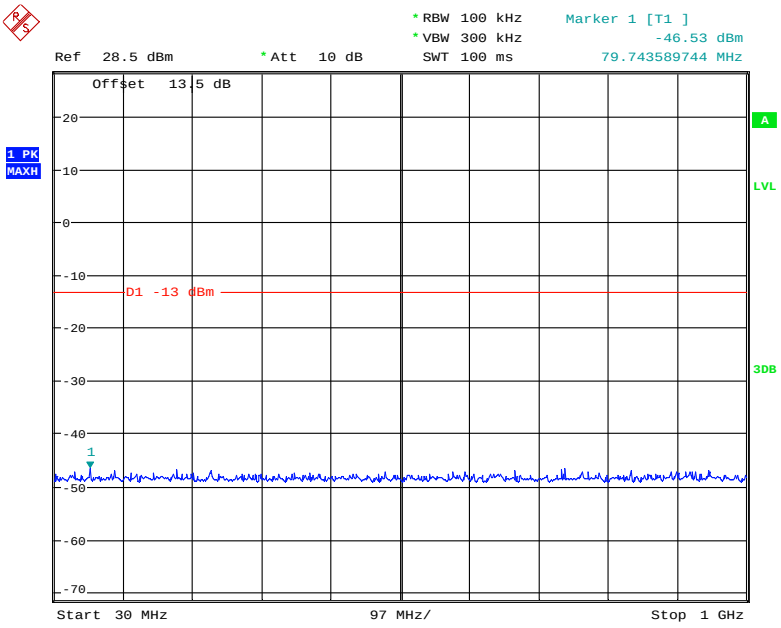
2 GHz – 20 GHz (WCDMA Mode)



Date: 5.DEC.2018 09:14:40

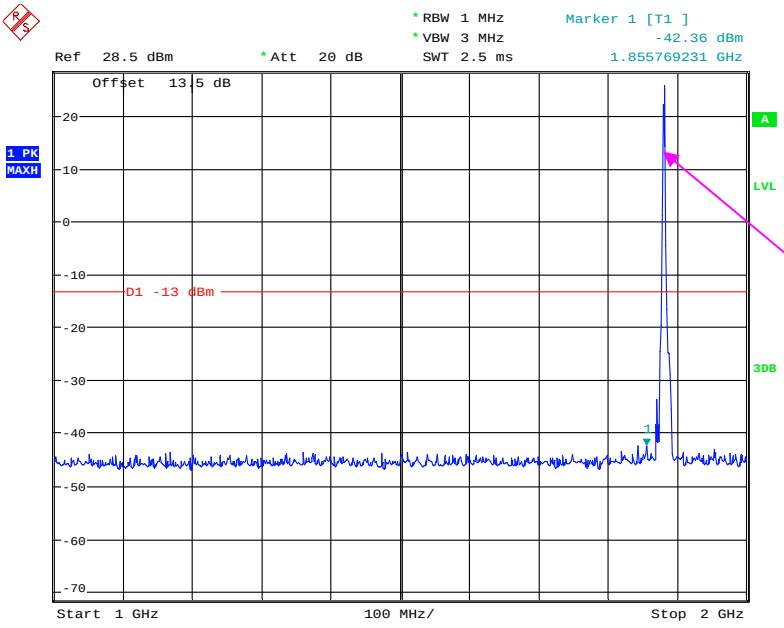
LTE Band 2:

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



Date: 5.DEC.2018 11:17:57

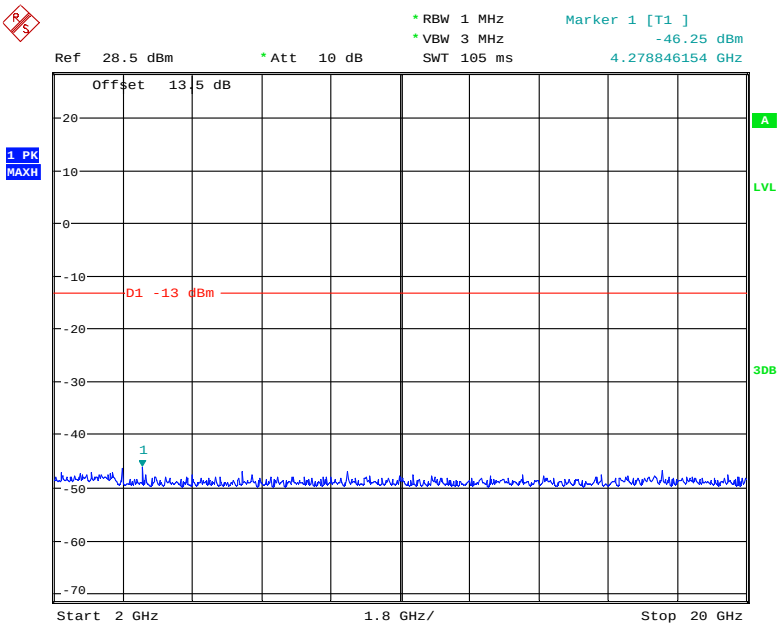
1 GHz – 2 GHz (1.4 MHz, Middle Channel)



Fundamental test

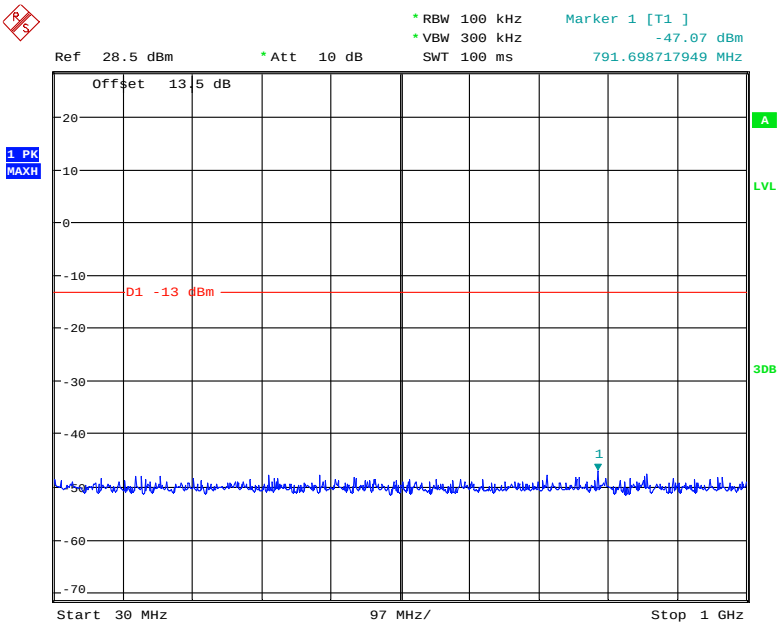
Date: 5.DEC.2018 11:27:36

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



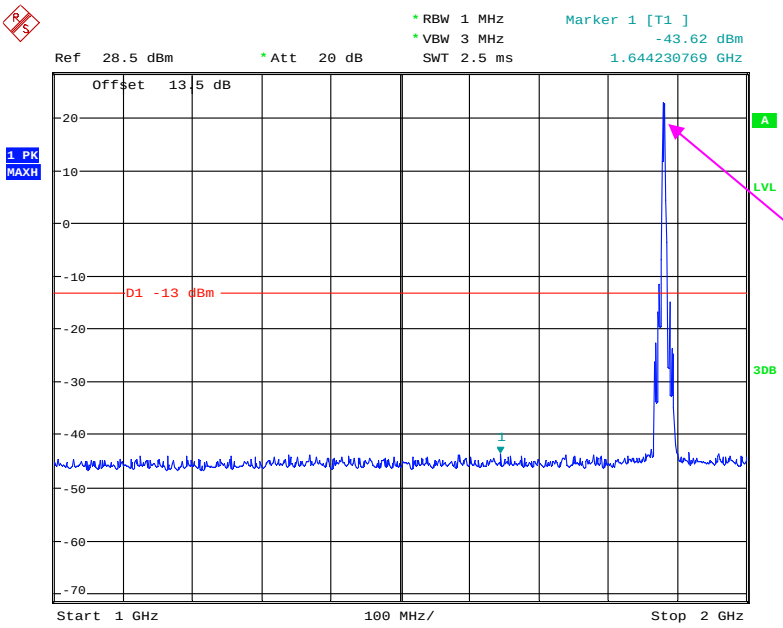
Date: 5.DEC.2018 11:28:13

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



Date: 5.DEC.2018 11:19:05

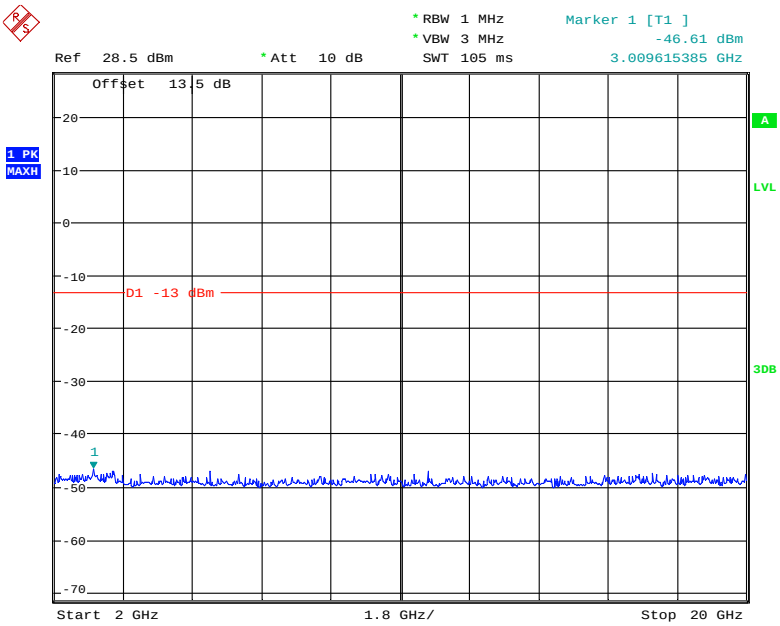
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



Fundamental test

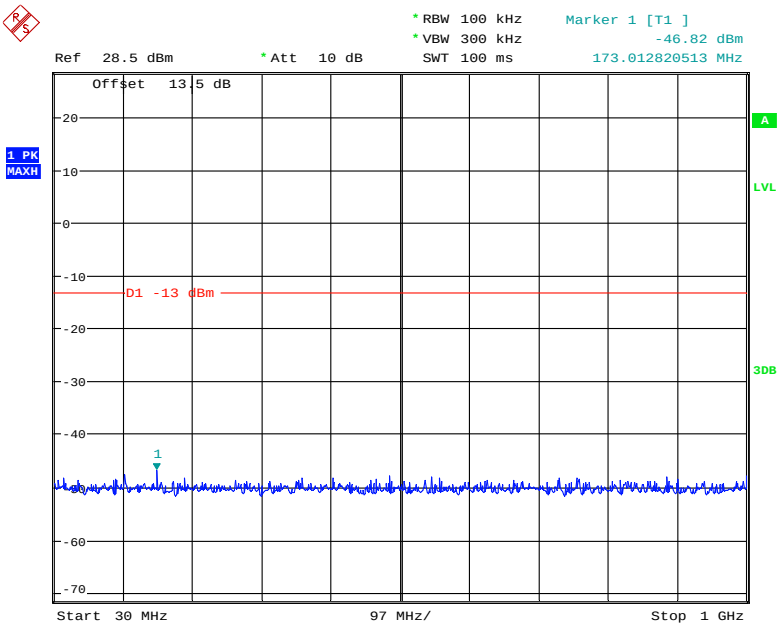
Date: 5.DEC.2018 11:27:09

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



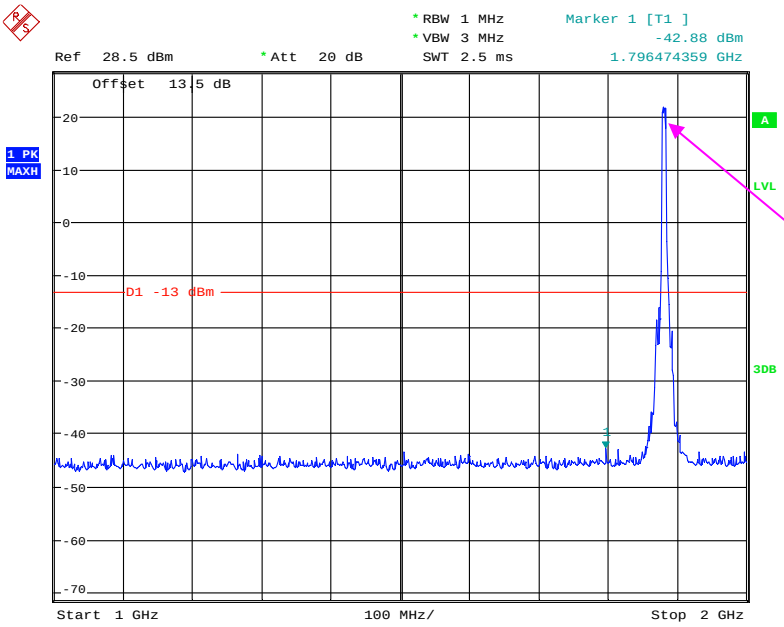
Date: 5.DEC.2018 11:28:31

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



Date: 5.DEC.2018 11:19:23

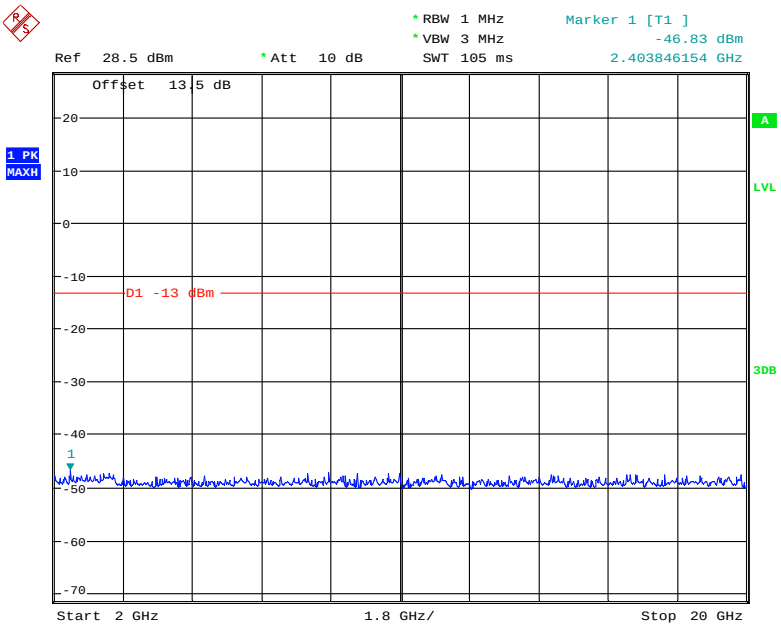
1 GHz – 2 GHz (5.0 MHz, Middle Channel)



Fundamental test

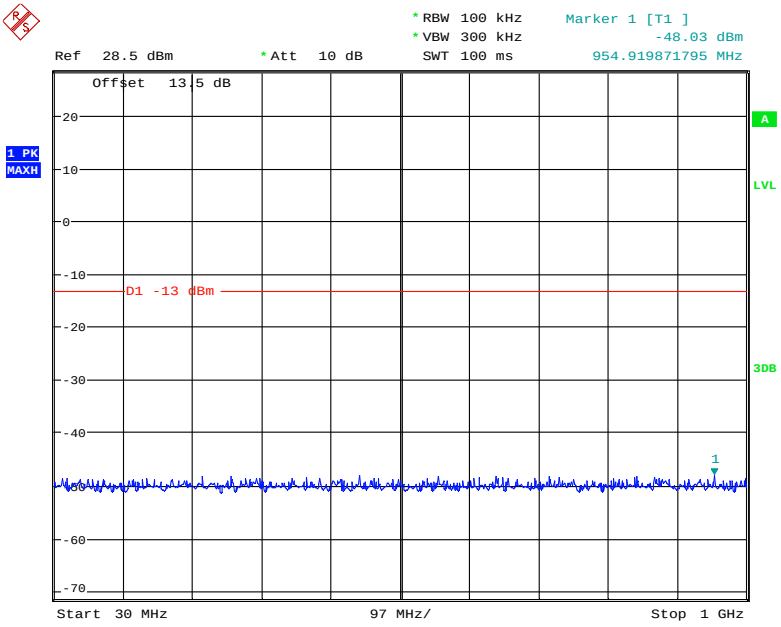
Date: 5.DEC.2018 11:26:39

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



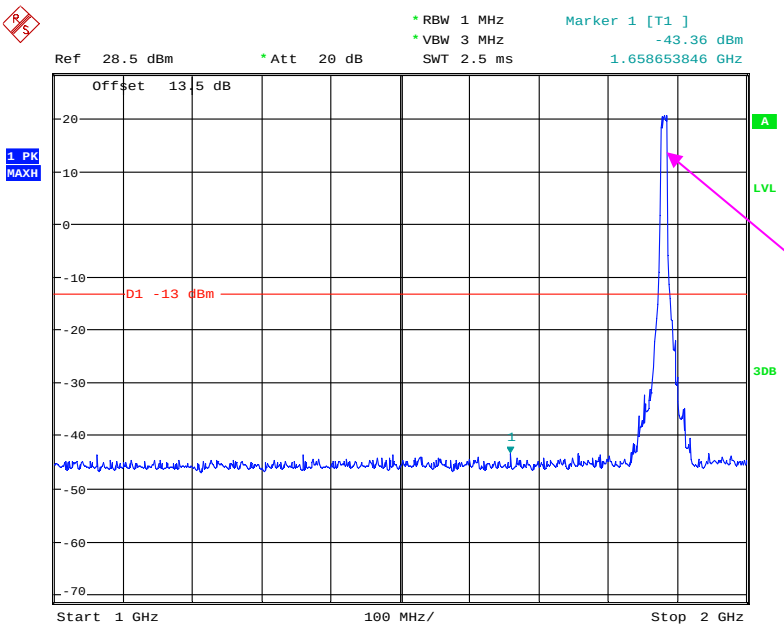
Date: 5.DEC.2018 11:28:48

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



Date: 5.DEC.2018 11:19:44

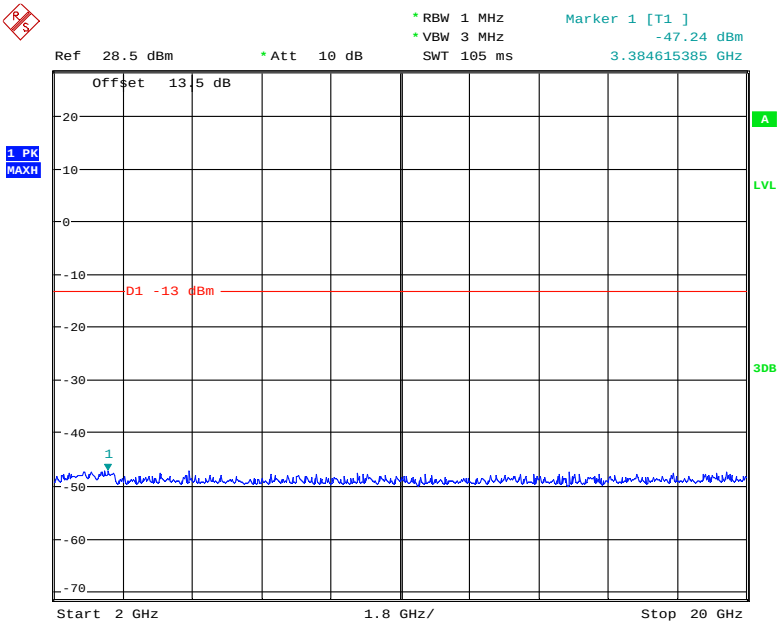
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



Fundamental test

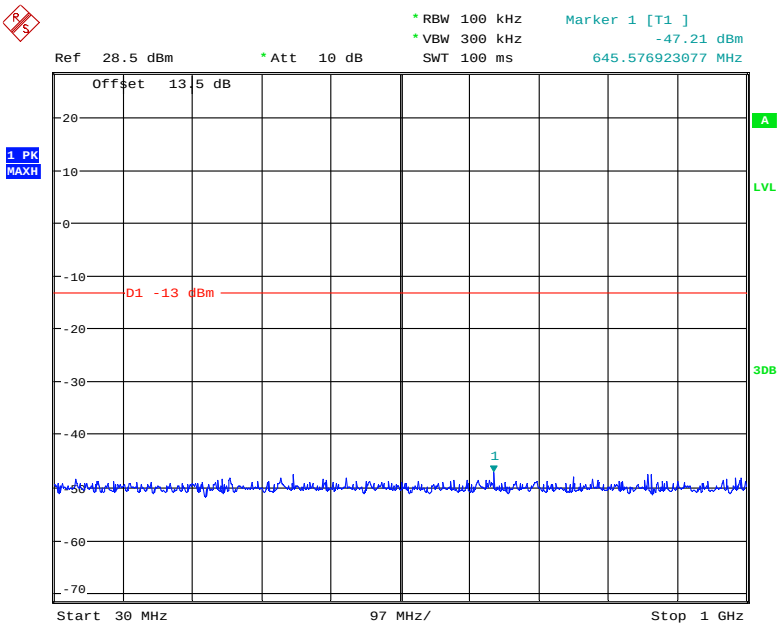
Date: 5.DEC.2018 11:26:18

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



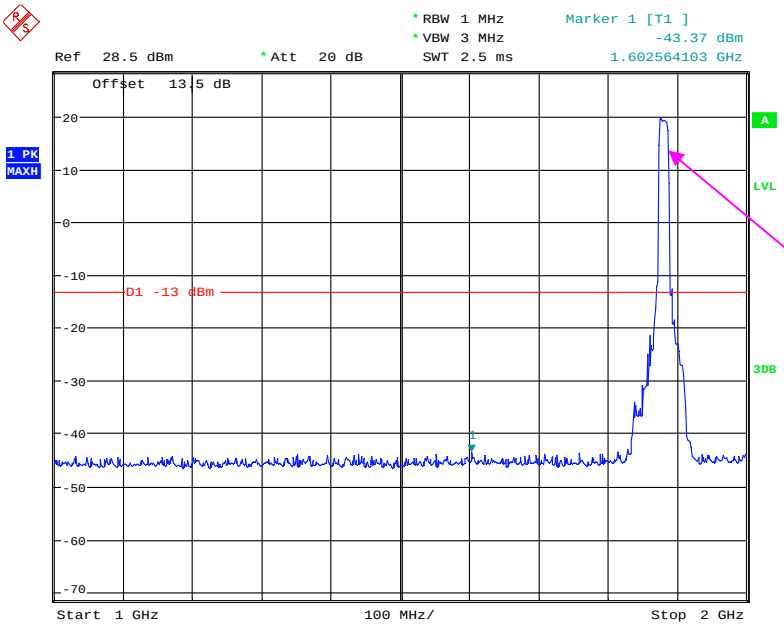
Date: 5.DEC.2018 11:29:05

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



Date: 5.DEC.2018 11:20:04

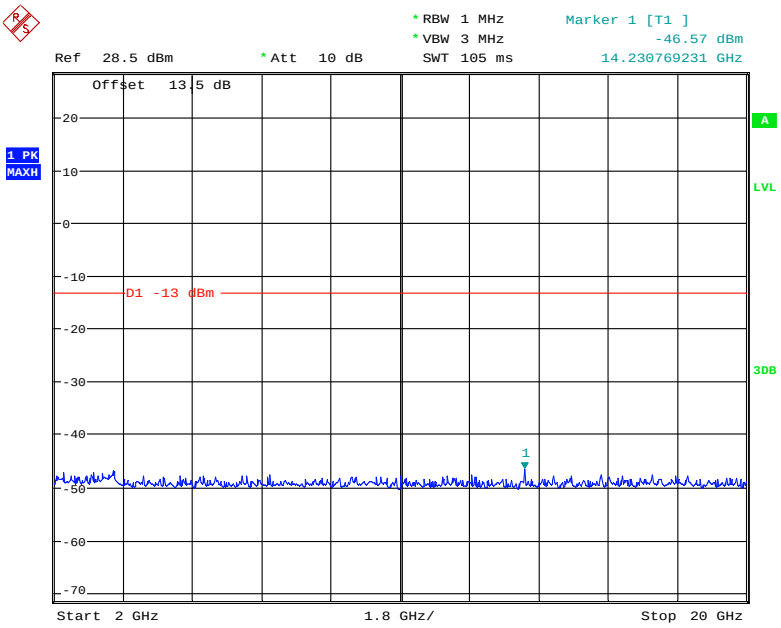
1 GHz – 2 GHz (15.0 MHz, Middle Channel)



Fundamental test

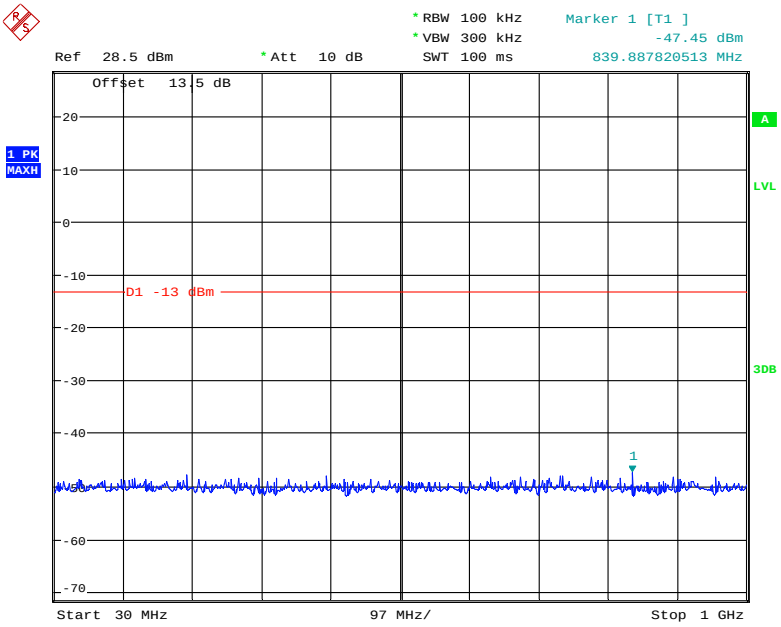
Date: 5.DEC.2018 11:25:53

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



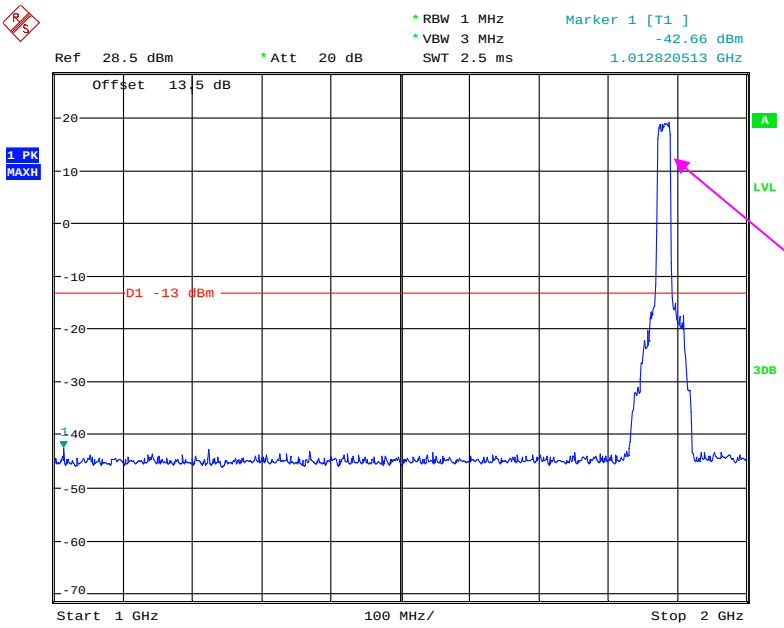
Date: 5.DEC.2018 11:29:21

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



Date: 5.DEC.2018 11:20:23

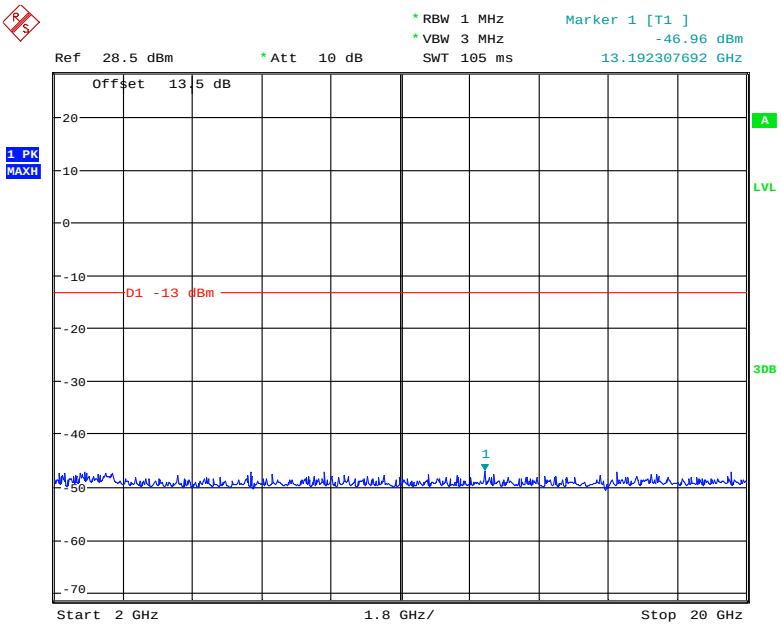
1 GHz – 2 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 5.DEC.2018 11:21:27

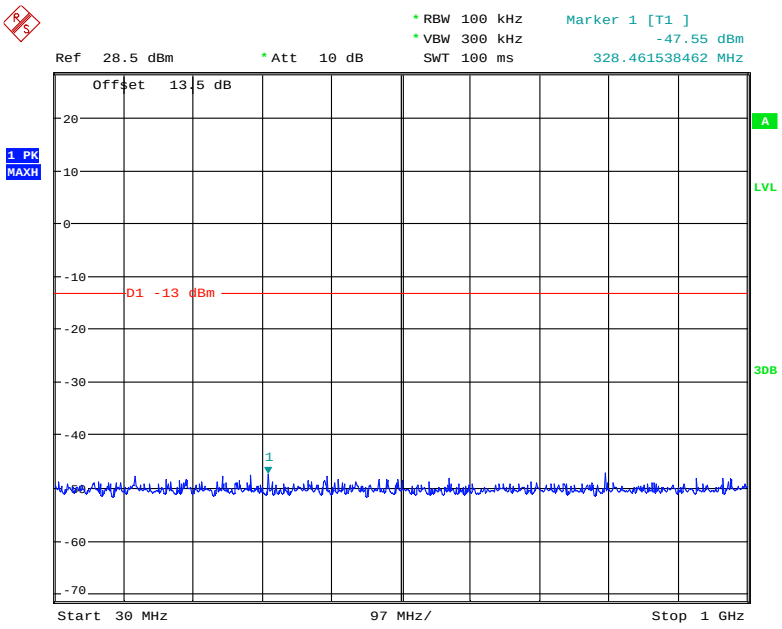
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 5.DEC.2018 11:29:36

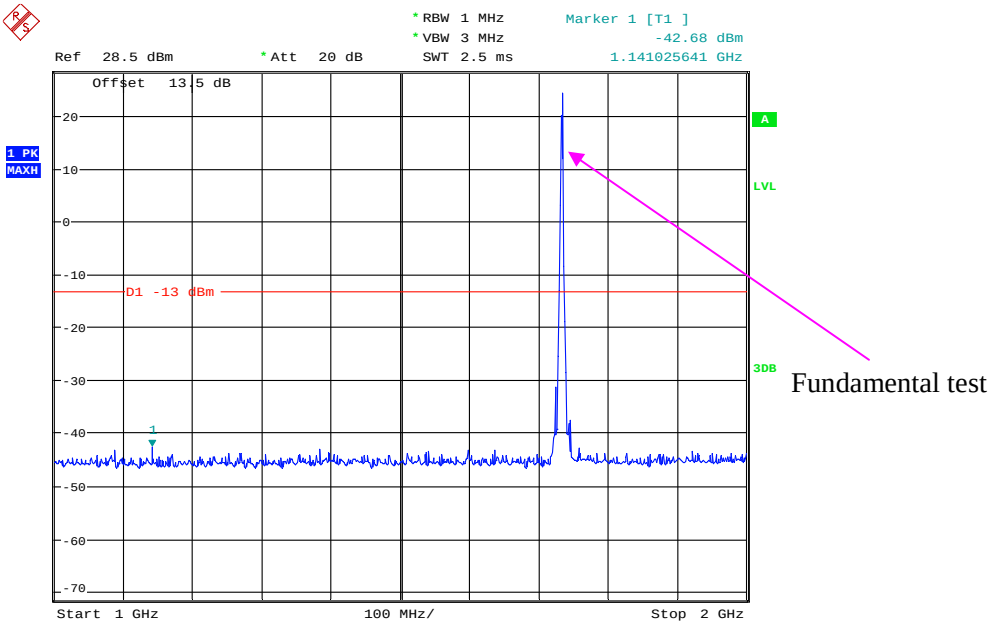
LTE Band 4:

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



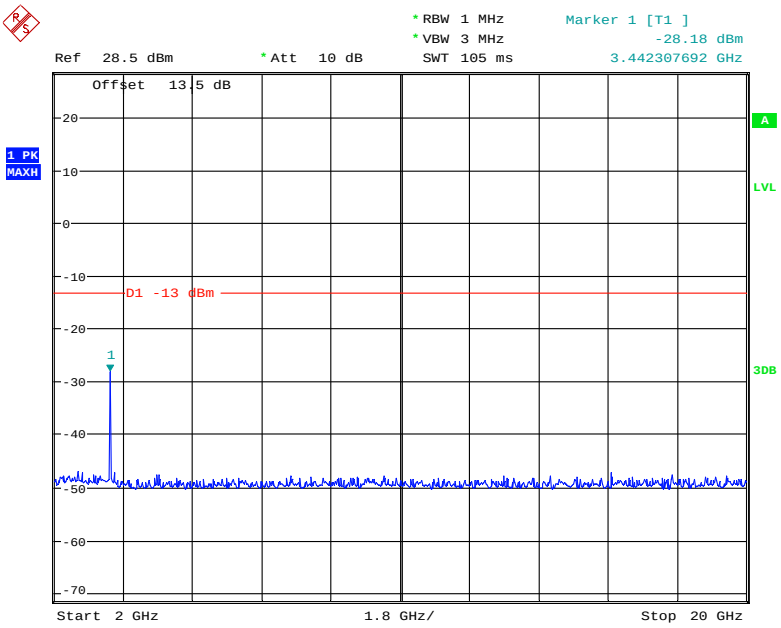
Date: 5.DEC.2018 11:45:58

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



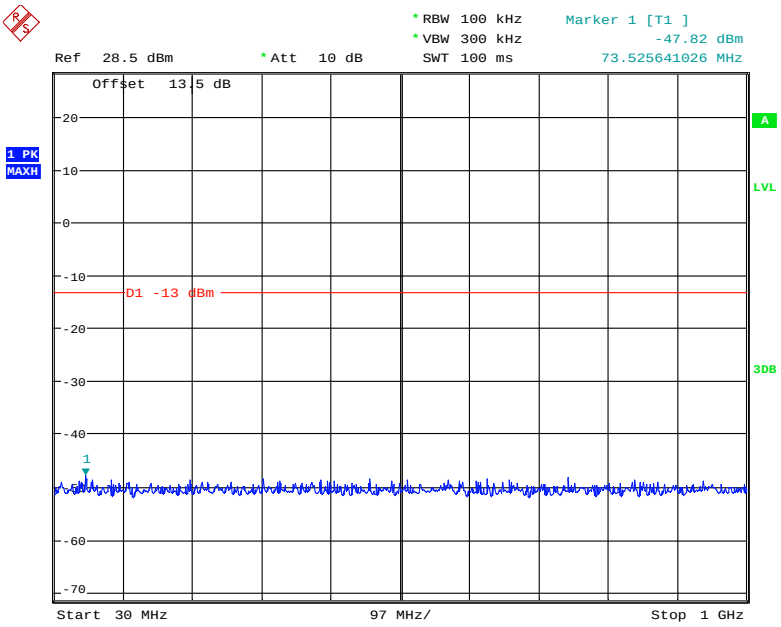
Date: 5.DEC.2018 11:40:40

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



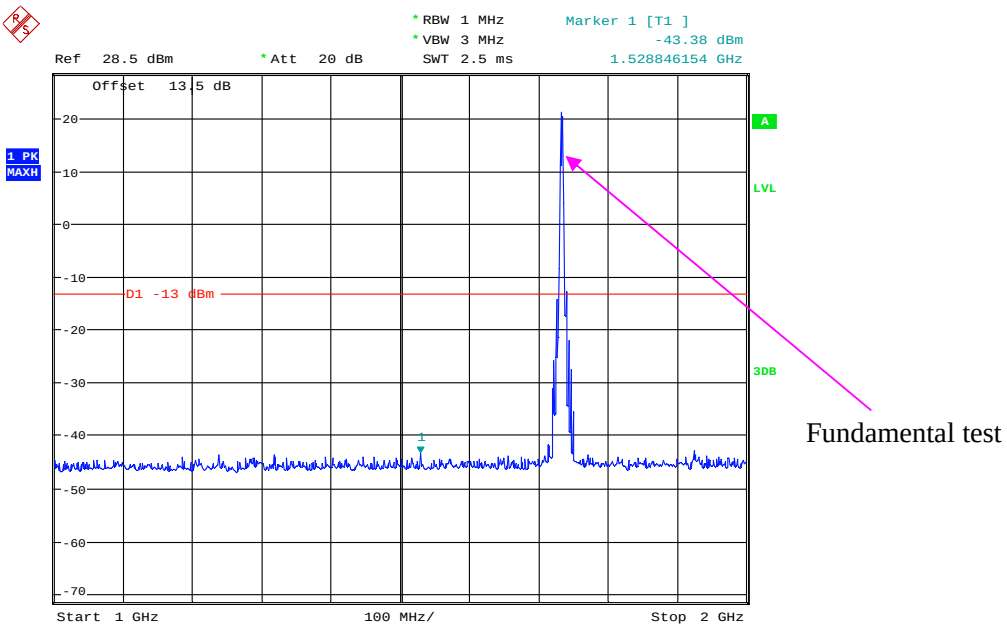
Date: 5.DEC.2018 11:37:27

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



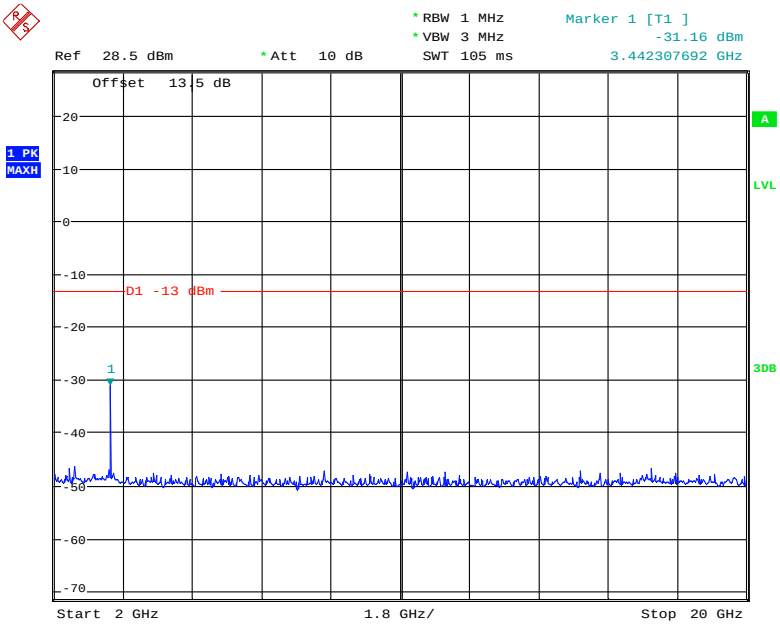
Date: 5.DEC.2018 11:45:44

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



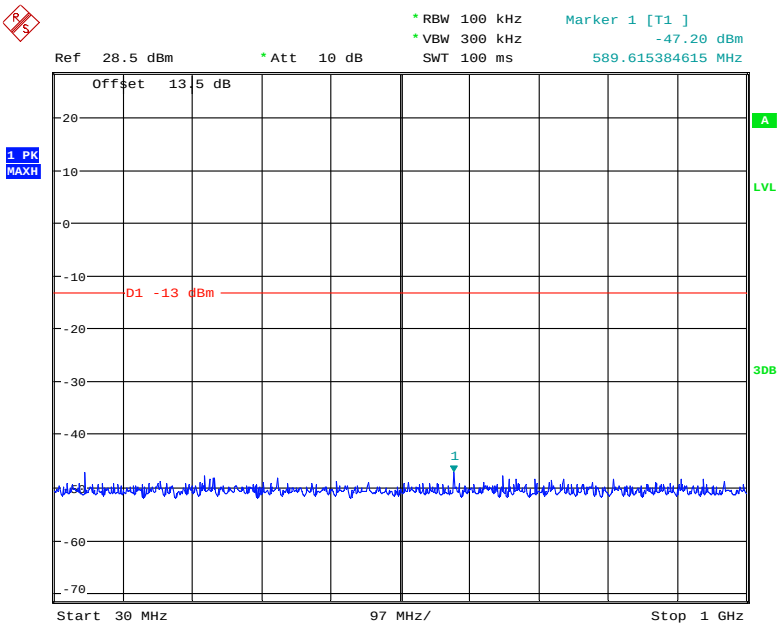
Date: 5.DEC.2018 11:41:01

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



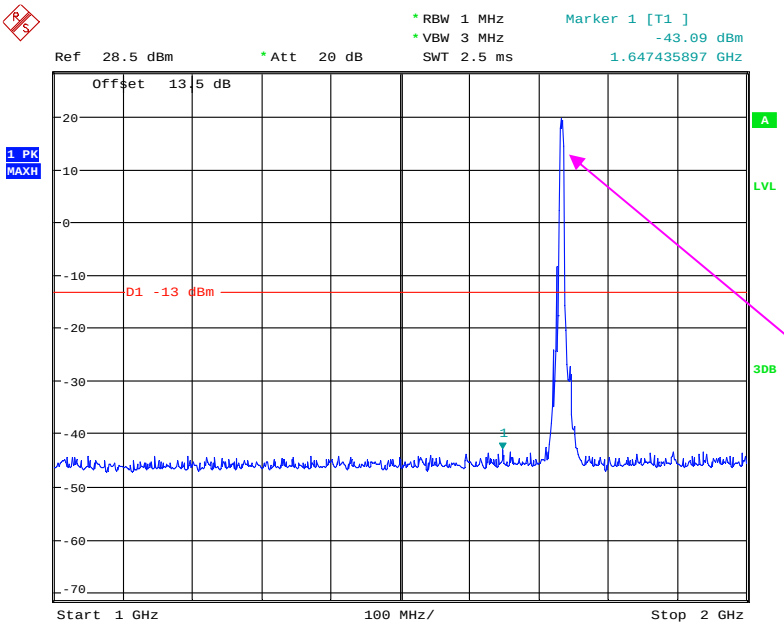
Date: 5.DEC.2018 11:37:11

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



Date: 5.DEC.2018 11:45:28

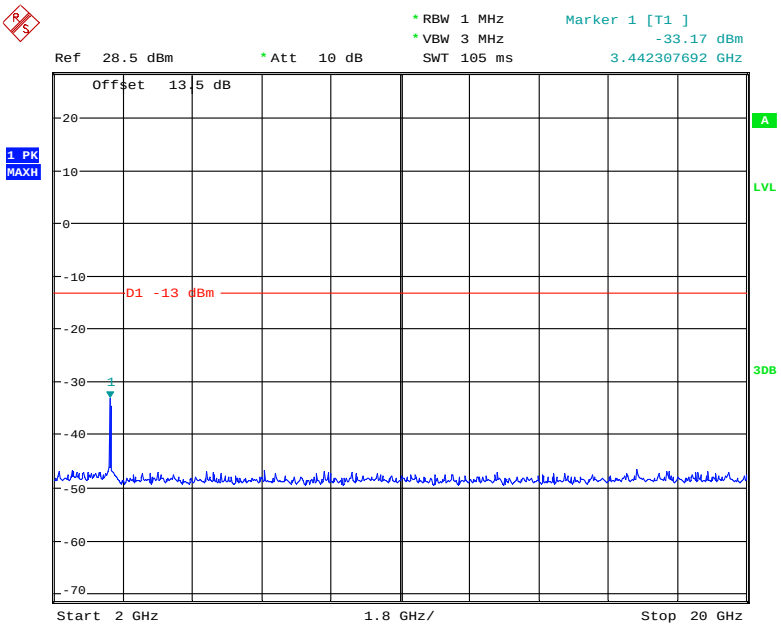
1 GHz – 2 GHz (5.0 MHz, Middle Channel)



Fundamental test

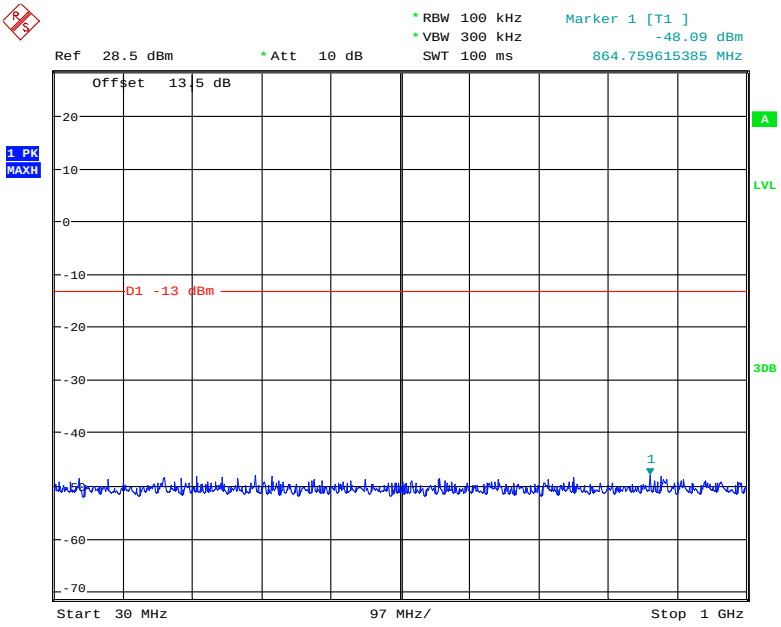
Date: 5.DEC.2018 11:41:21

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



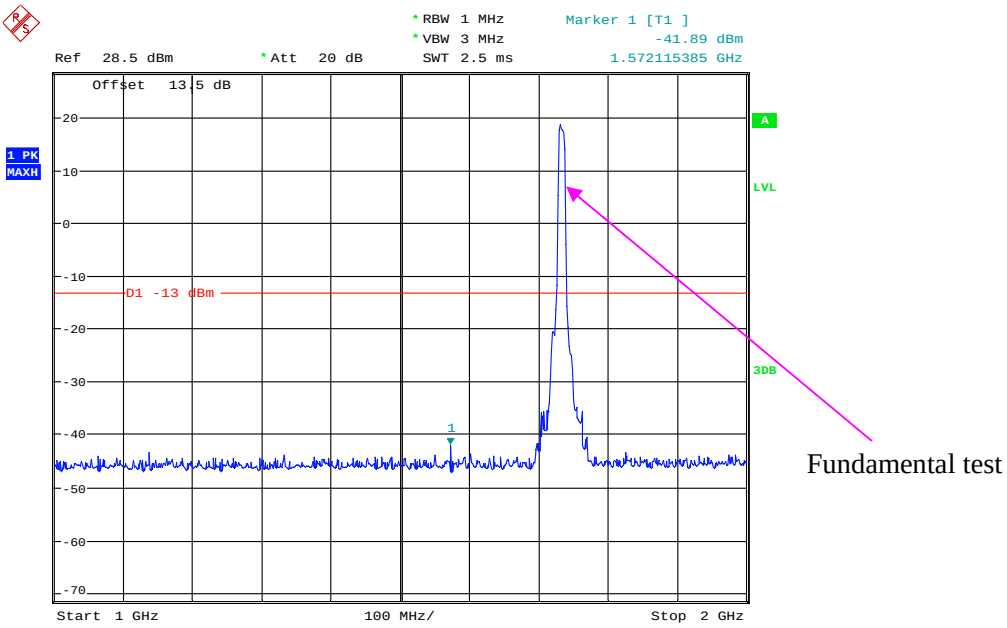
Date: 5.DEC.2018 11:35:33

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



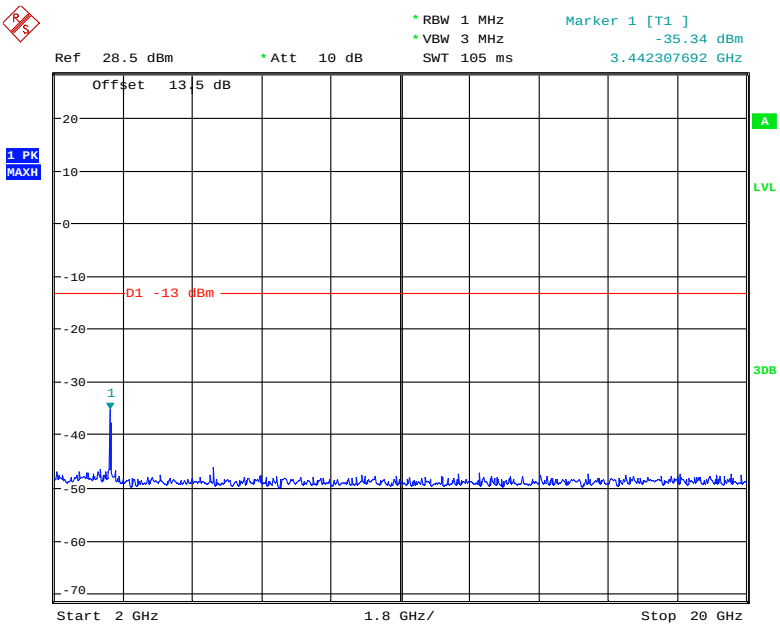
Date: 5.DEC.2018 11:45:12

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



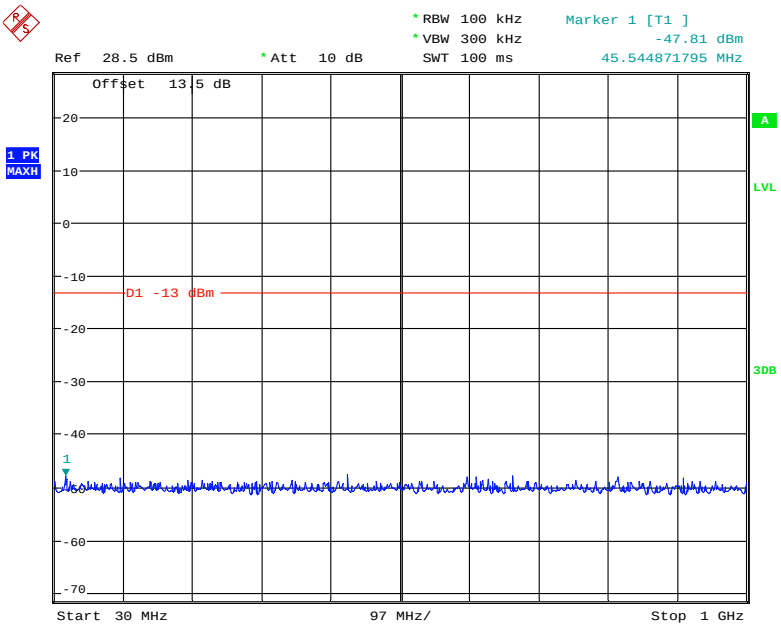
Date: 5.DEC.2018 11:42:36

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



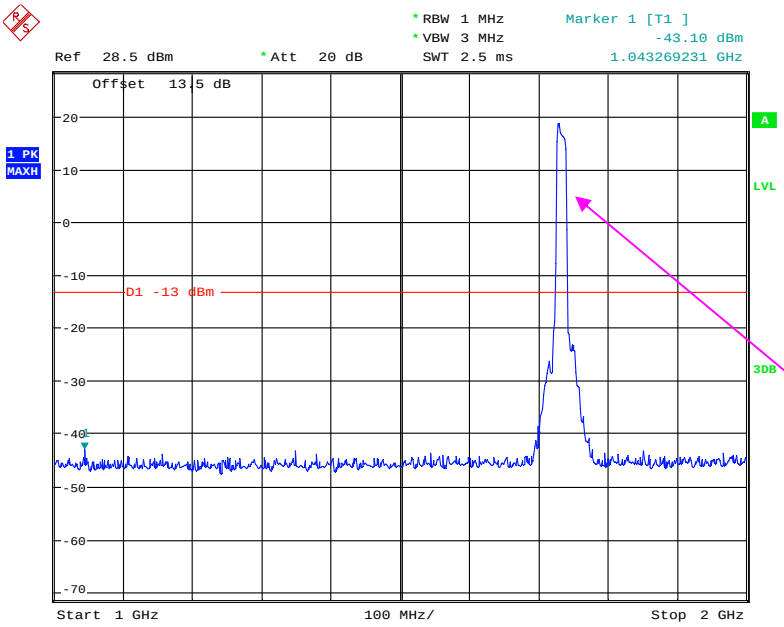
Date: 5.DEC.2018 11:35:07

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



Date: 5.DEC.2018 11:44:44

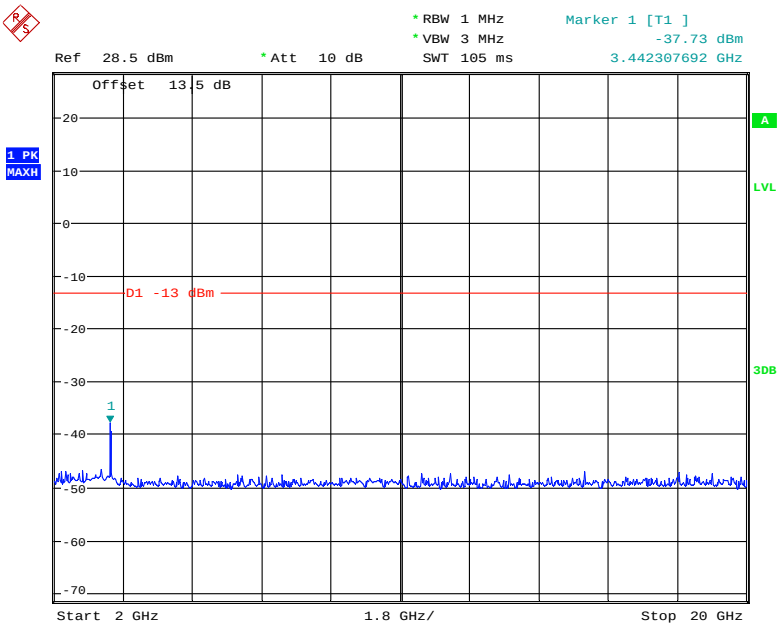
1 GHz – 2 GHz (15.0 MHz, Middle Channel)



Fundamental test

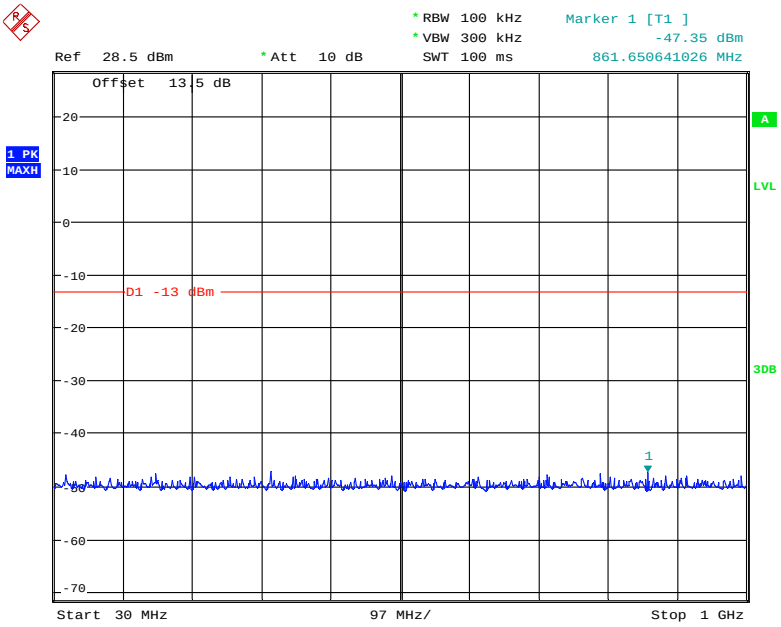
Date: 5.DEC.2018 11:42:54

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



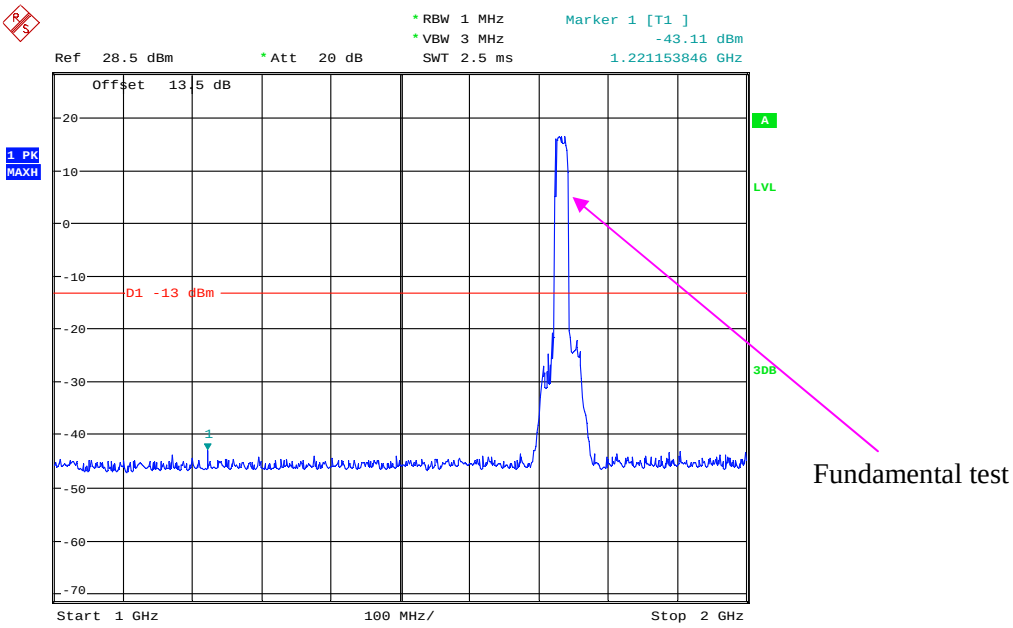
Date: 5.DEC.2018 11:34:49

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



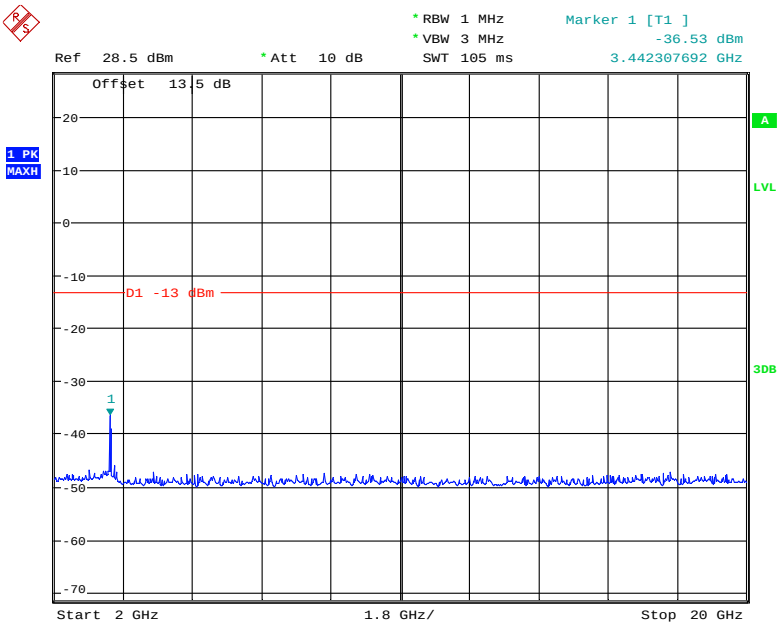
Date: 5.DEC.2018 11:44:28

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



Date: 5.DEC.2018 11:43:18

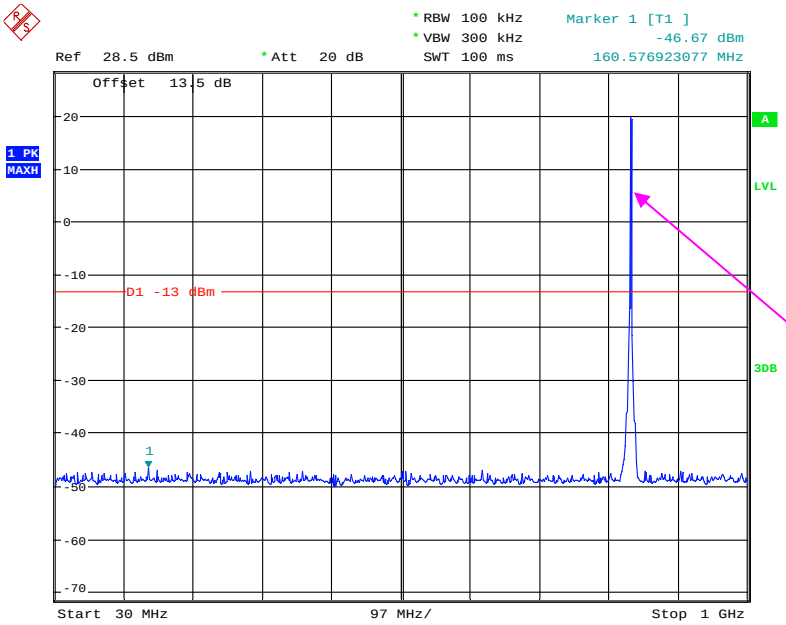
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 5.DEC.2018 11:34:29

LTE Band 5:

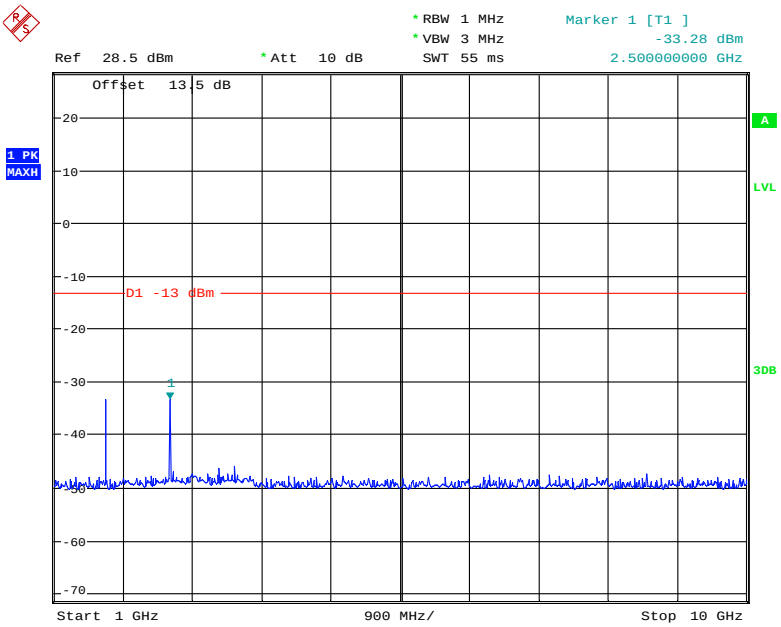
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

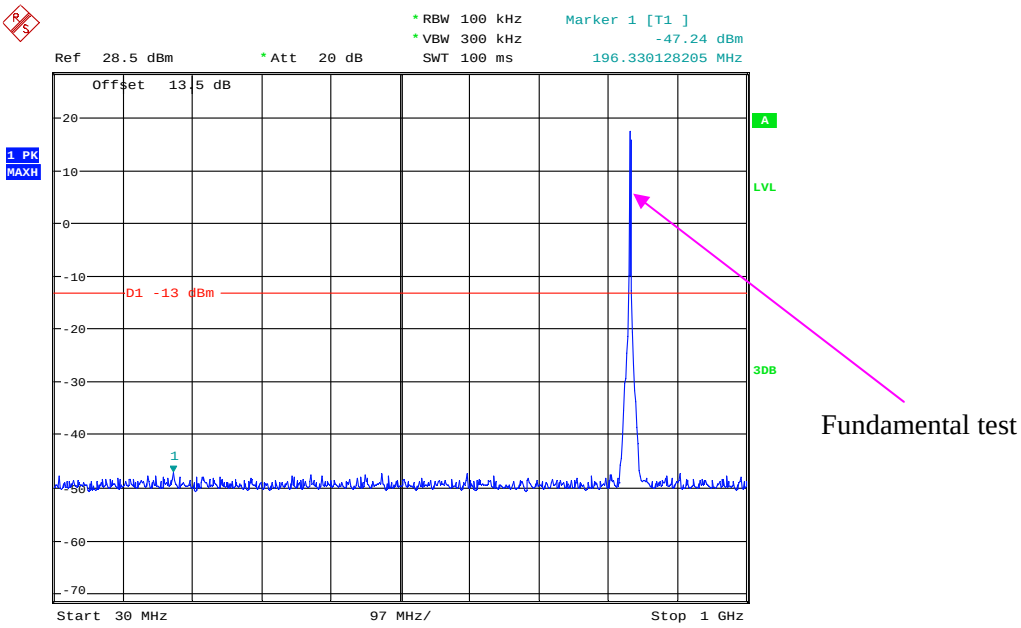
Date: 5.DEC.2018 11:47:55

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



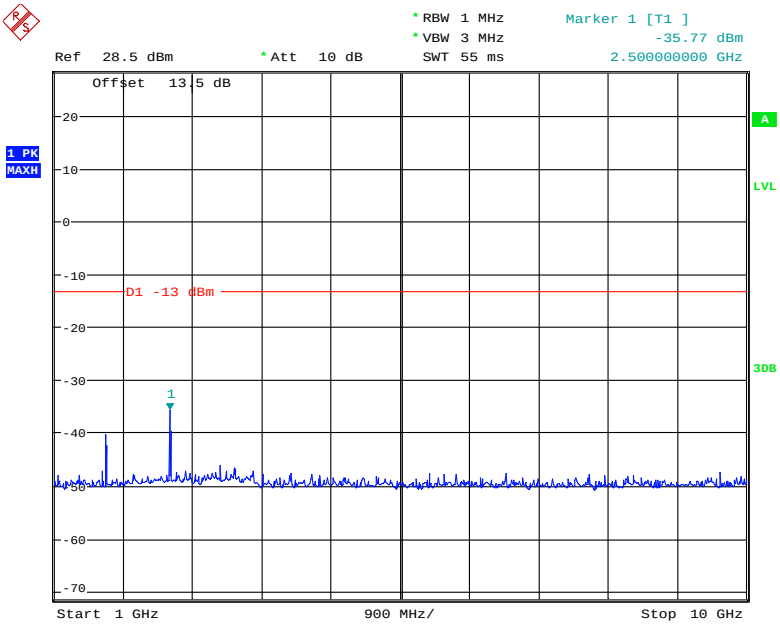
Date: 5.DEC.2018 11:50:24

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



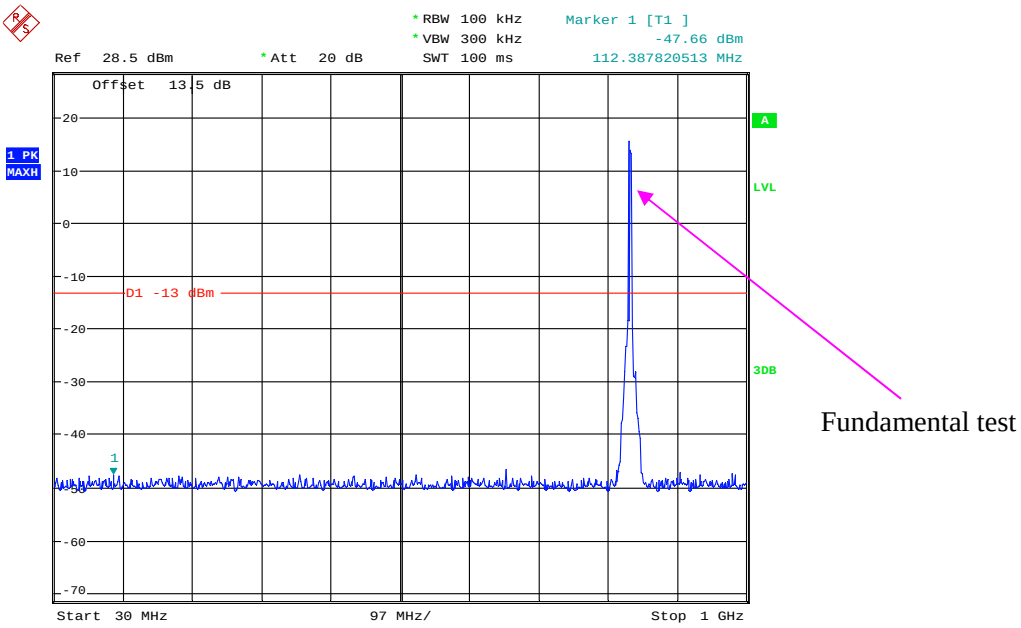
Date: 5.DEC.2018 11:48:17

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



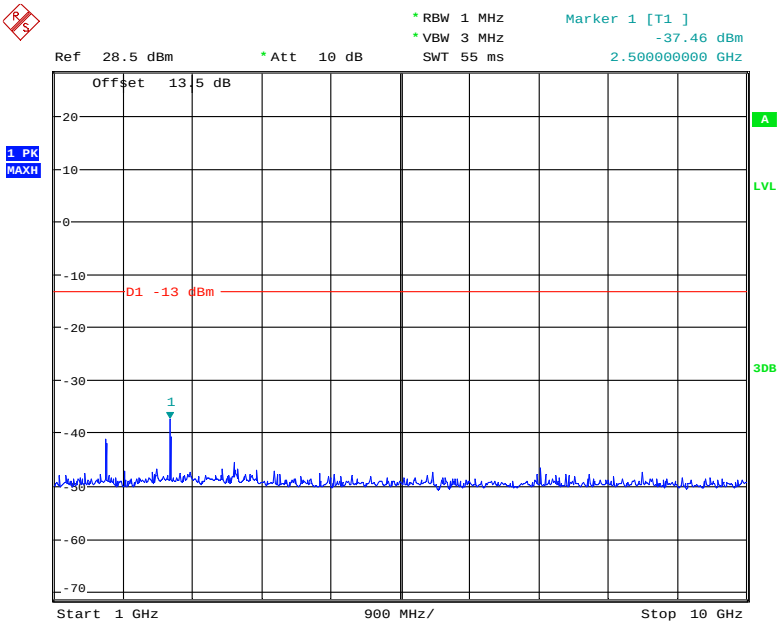
Date: 5.DEC.2018 11:50:12

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



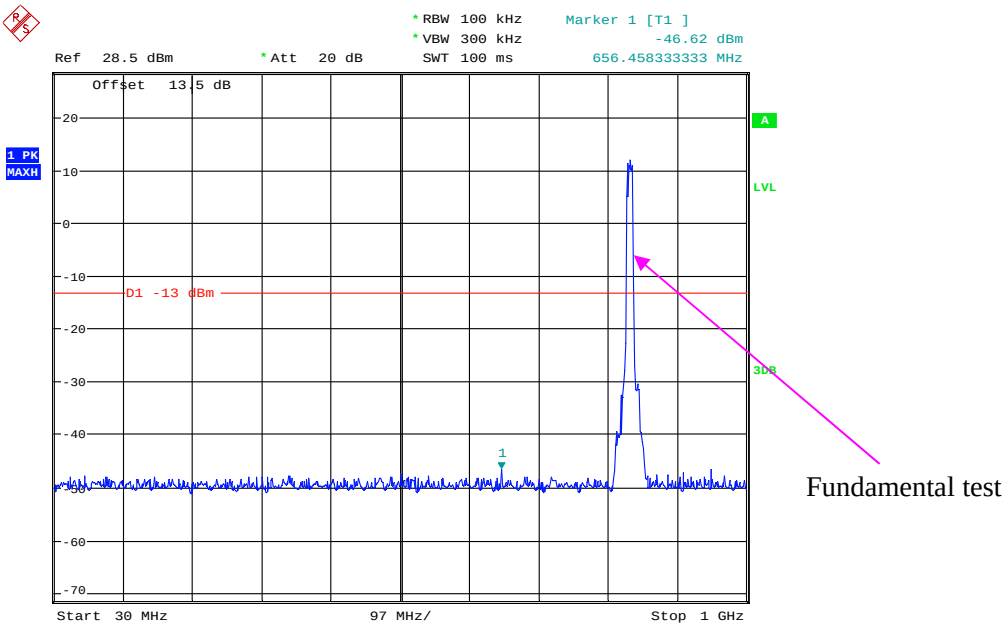
Date: 5.DEC.2018 11:48:34

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



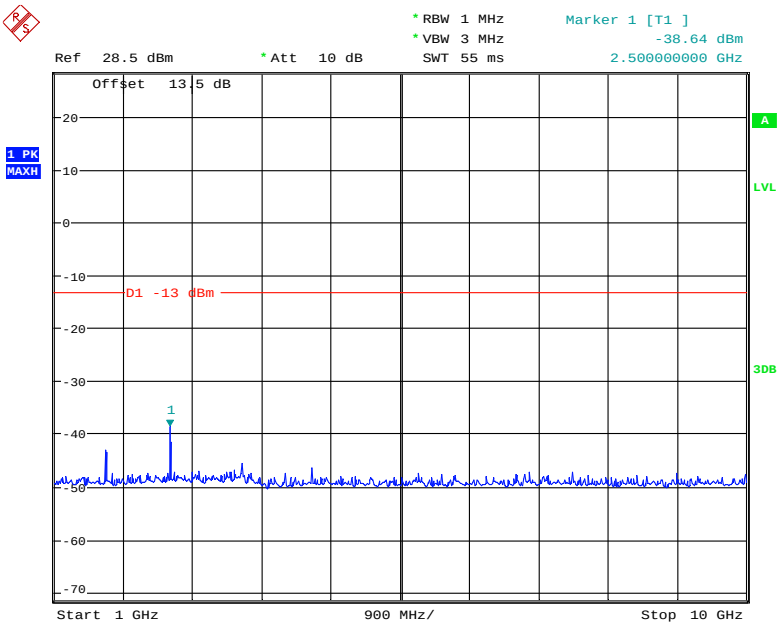
Date: 5.DEC.2018 11:49:59

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



Date: 5.DEC.2018 11:48:57

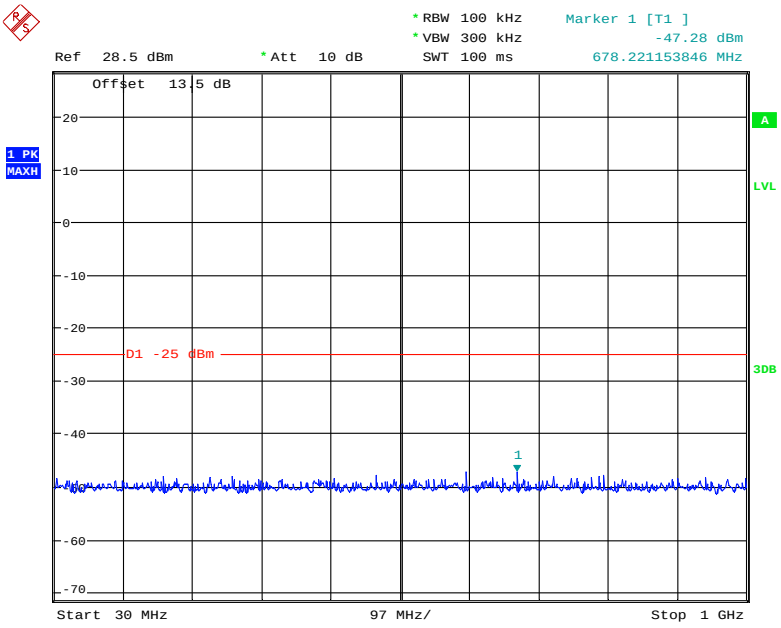
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 5.DEC.2018 11:49:38

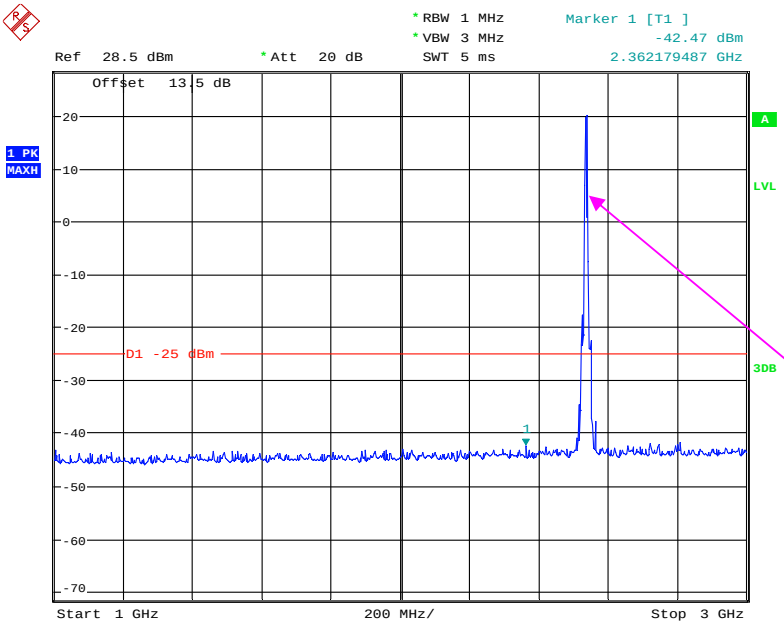
LTE Band 7:

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



Date: 5.DEC.2018 13:14:24

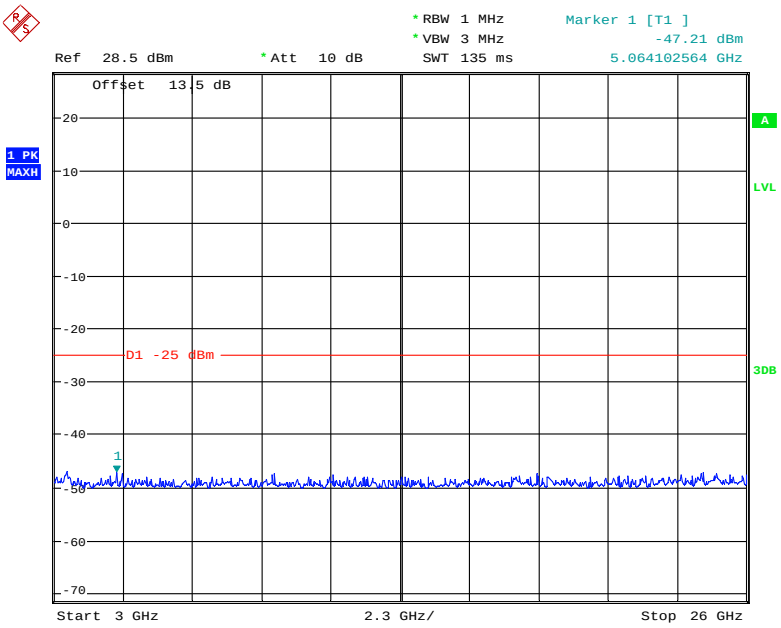
1 GHz – 3 GHz (5.0 MHz, Middle Channel)



Fundamental test

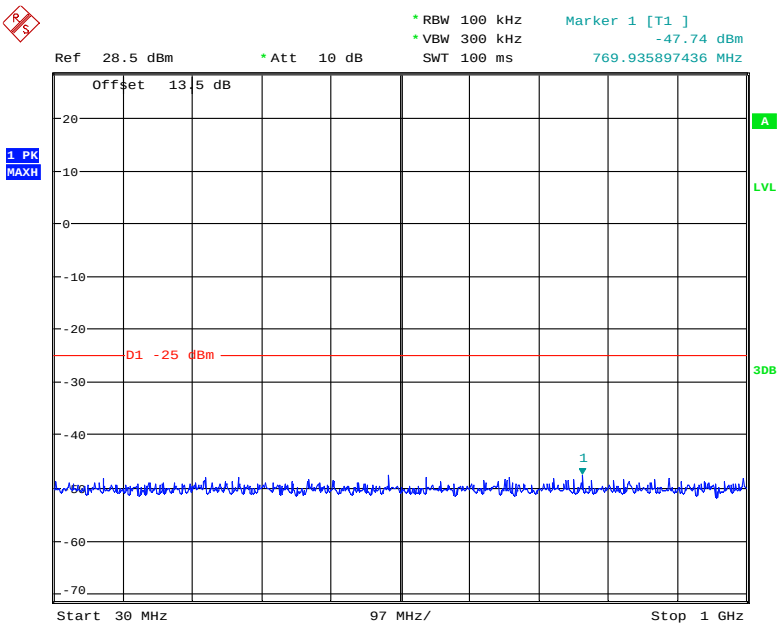
Date: 5.DEC.2018 13:10:47

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



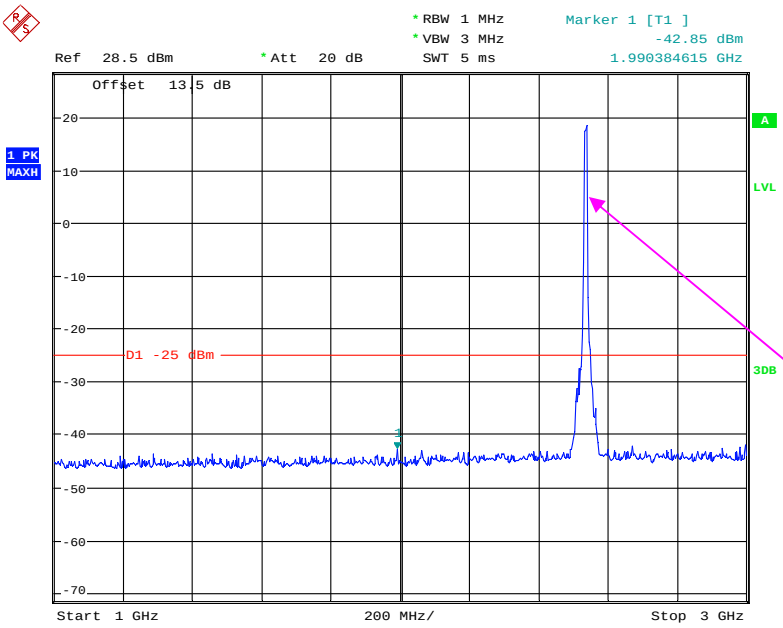
Date: 5.DEC.2018 13:13:50

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



Date: 5.DEC.2018 13:14:37

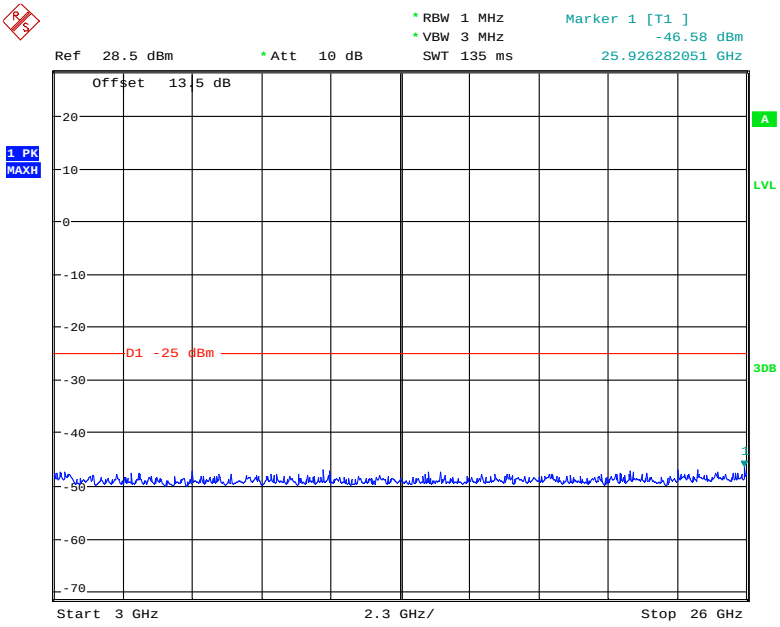
1 GHz – 3 GHz (10.0 MHz, Middle Channel)



Fundamental test

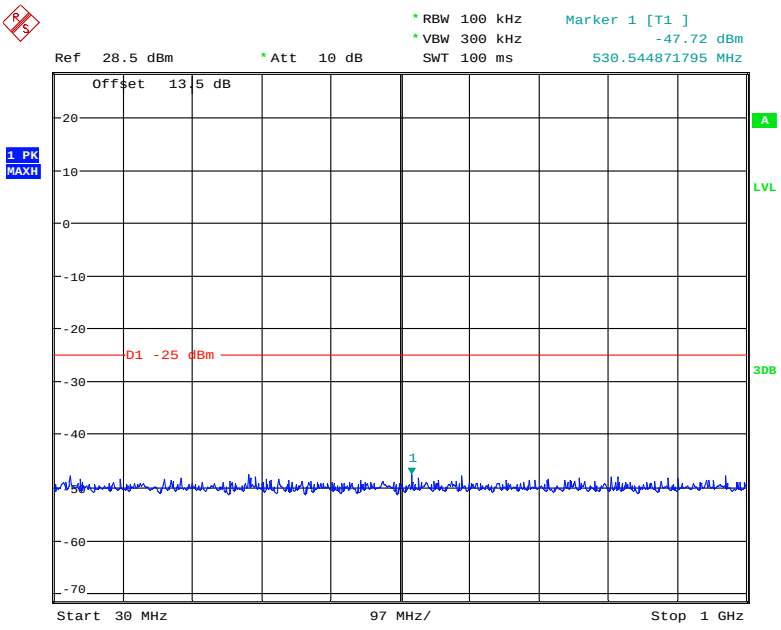
Date: 5.DEC.2018 13:11:40

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



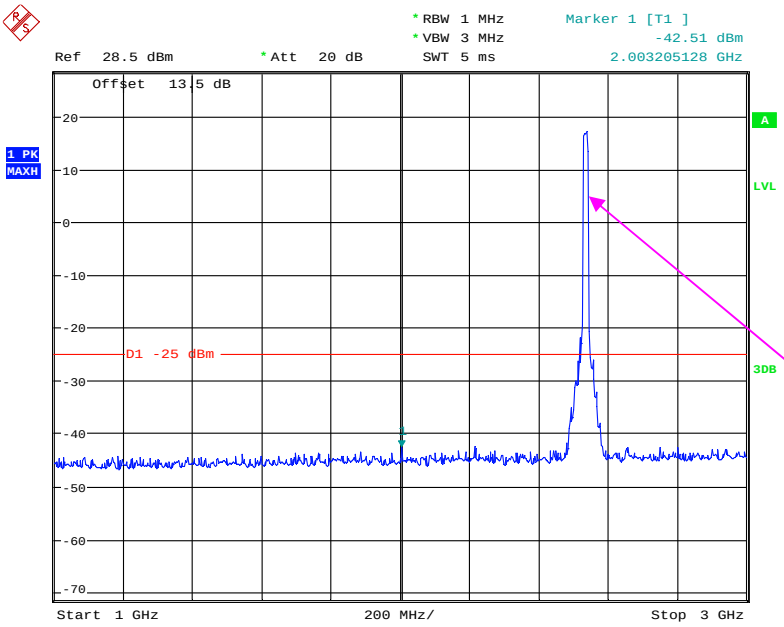
Date: 5.DEC.2018 13:13:34

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



Date: 5.DEC.2018 13:14:53

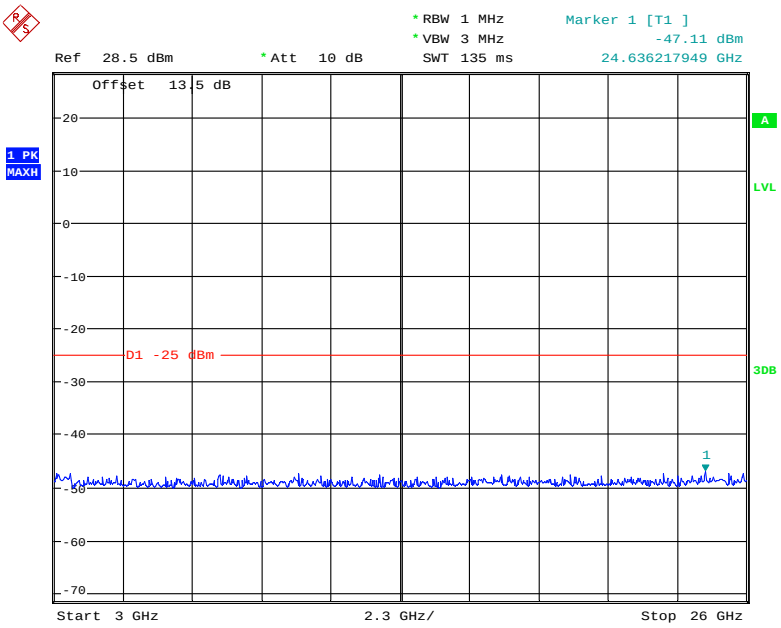
1 GHz – 3 GHz (15.0 MHz, Middle Channel)



Fundamental test

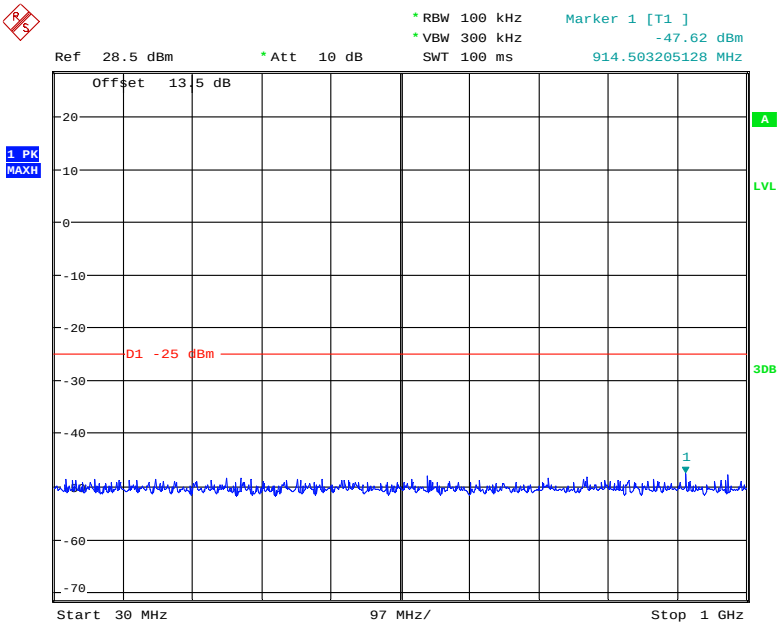
Date: 5.DEC.2018 13:12:03

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



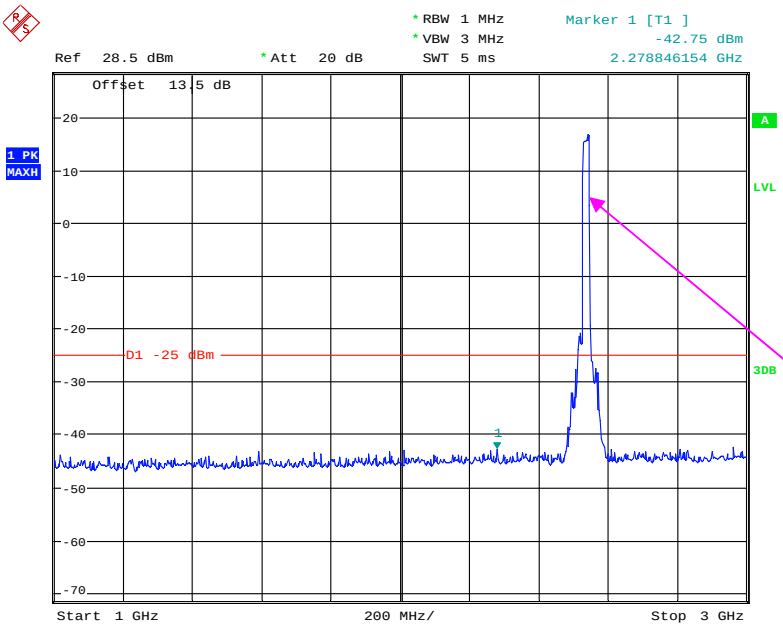
Date: 5.DEC.2018 13:13:16

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



Date: 5.DEC.2018 13:15:05

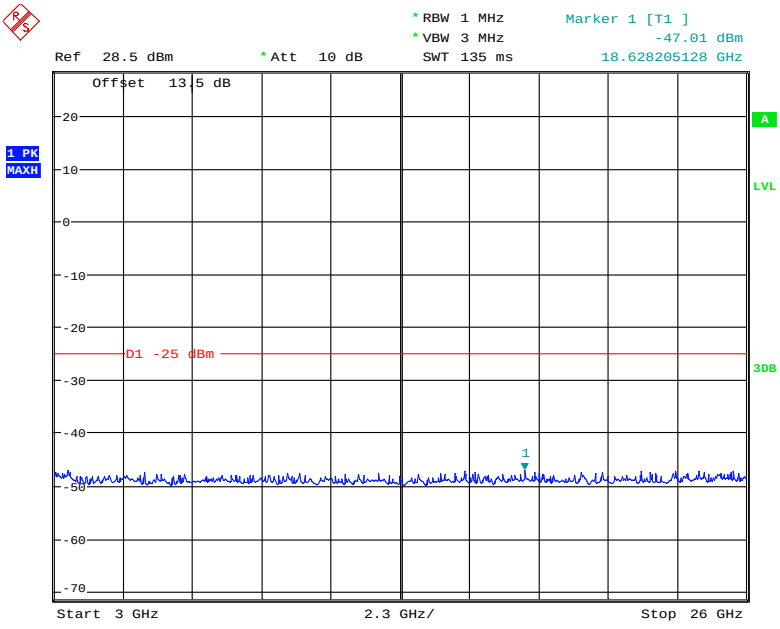
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 5.DEC.2018 13:12:23

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



Date: 5.DEC.2018 13:12:49

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

Applicable Standard

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

Test Procedure

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

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

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

Test Data

Environmental Conditions

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

The testing was performed by Yecar Lu on 2018-12-02.

EUT operation mode: Transmitting

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

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
271.37	29.02	175	2.2	H	-68.0	0.32	0	-68.32	-13	55.32
271.37	28.76	33	1.1	V	-68.2	0.32	0	-68.52	-13	55.52
1673.20	60.45	32	2.1	H	-46.6	1.30	8.90	-39.00	-13	26.00
1673.20	58.95	153	2.1	V	-47.5	1.30	8.90	-39.90	-13	26.90
2509.80	46.90	119	2.4	H	-56.6	2.60	10.20	-49.00	-13	36.00
2509.80	45.70	75	1.8	V	-57.2	2.60	10.20	-49.60	-13	36.60
WCDMA Mode, Middle channel										
271.37	29.09	81	1.8	H	-67.9	0.32	0	-68.22	-13	55.22
271.37	29.60	355	2.2	V	-67.4	0.32	0	-67.72	-13	54.72
1673.20	44.28	247	1.9	H	-62.8	1.30	8.90	-55.20	-13	42.20
1673.20	44.16	24	2.0	V	-62.3	1.30	8.90	-54.70	-13	41.70

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
271.37	28.14	194	1.9	H	-68.9	0.32	0	-69.22	-13	56.22
271.37	29.22	136	2.1	V	-67.8	0.32	0	-68.12	-13	55.12
3760.00	51.67	279	1.2	H	-49.6	1.50	11.80	-39.30	-13	26.30
3760.00	51.90	217	1.5	V	-48.9	1.50	11.80	-38.60	-13	25.60
WCDMA Mode Band II, Middle channel										
271.37	28.94	147	1.3	H	-68.1	0.32	0	-68.42	-13	55.42
271.37	29.80	249	1.5	V	-67.2	0.32	0	-67.52	-13	54.52
3760.00	44.26	144	2.0	H	-57.0	1.50	11.80	-46.70	-13	33.70
3760.00	44.02	293	1.2	V	-56.7	1.50	11.80	-46.40	-13	33.40

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)			
Band 2 QPSK 20MHz										
Test frequency range:30 MHz ~ 20 GHz										
271.37	28.90	255	1.4	H	-68.1	0.32	0	-68.42	-13	55.42
271.37	29.33	264	2.3	V	-67.7	0.32	0	-68.02	-13	55.02
3760.00	44.55	317	1.3	H	-56.7	1.50	11.80	-46.40	-13	33.40
3760.00	43.67	267	2.0	V	-57.1	1.50	11.80	-46.80	-13	33.80
Band 4 QPSK 20MHz										
Test frequency range:30 MHz ~ 20 GHz										
271.37	28.27	273	1.4	H	-68.7	0.32	0	-69.02	-13	56.02
271.37	28.23	71	2.0	V	-68.8	0.32	0	-69.12	-13	56.12
3465.00	44.36	153	1.8	H	-56.0	1.50	12.00	-45.50	-13	32.50
3465.00	43.80	57	1.4	V	-57.3	1.50	12.00	-46.80	-13	33.80
Band 5 QPSK 10MHz										
Test frequency range:30 MHz ~ 10 GHz										
271.37	29.15	249	1.1	H	-67.8	0.32	0	-68.12	-13	55.12
271.37	28.12	170	1.0	V	-68.9	0.32	0	-69.22	-13	56.22
1673.00	44.31	278	1.7	H	-62.8	1.30	8.90	-55.20	-13	42.20
1673.00	43.90	84	1.3	V	-62.6	1.30	8.90	-55.00	-13	42.00
Band 7 QPSK 20MHz										
Test frequency range:30 MHz ~ 26 GHz										
271.37	29.22	126	2.3	H	-67.8	0.32	0	-68.12	-25	43.12
271.37	28.19	97	2.2	V	-68.8	0.32	0	-69.12	-25	44.12
5070.00	44.87	224	1.8	H	-53.0	1.60	12.10	-42.50	-25	17.50
5070.00	43.96	322	1.1	V	-53.9	1.60	12.10	-43.40	-25	18.40

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

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

Applicable Standard

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

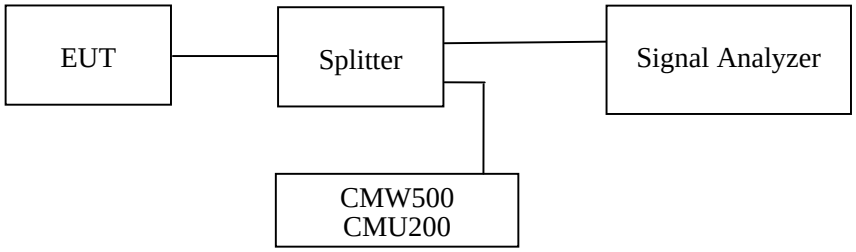
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

Test Procedure

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

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



Test Data

Environmental Conditions

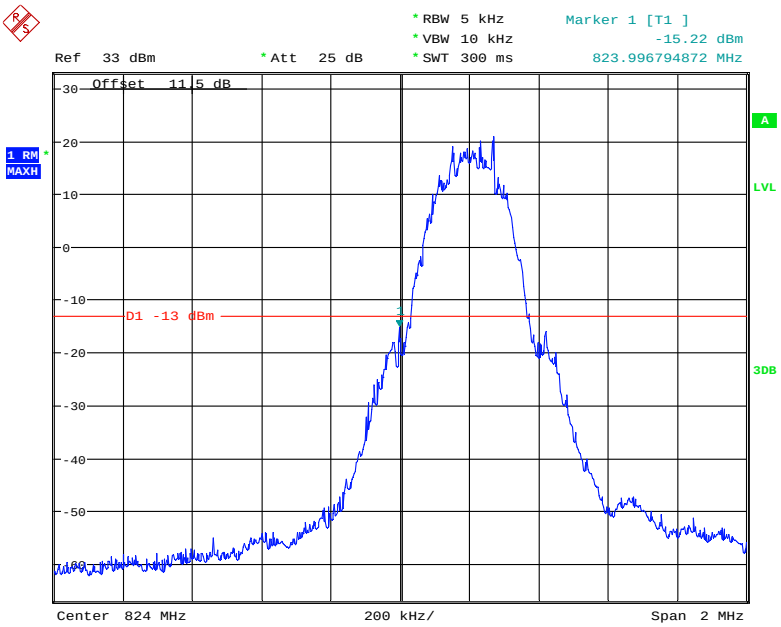
Temperature:	24~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Hill He from 2018-12-03 to 2018-12-05.

EUT operation mode: Transmitting

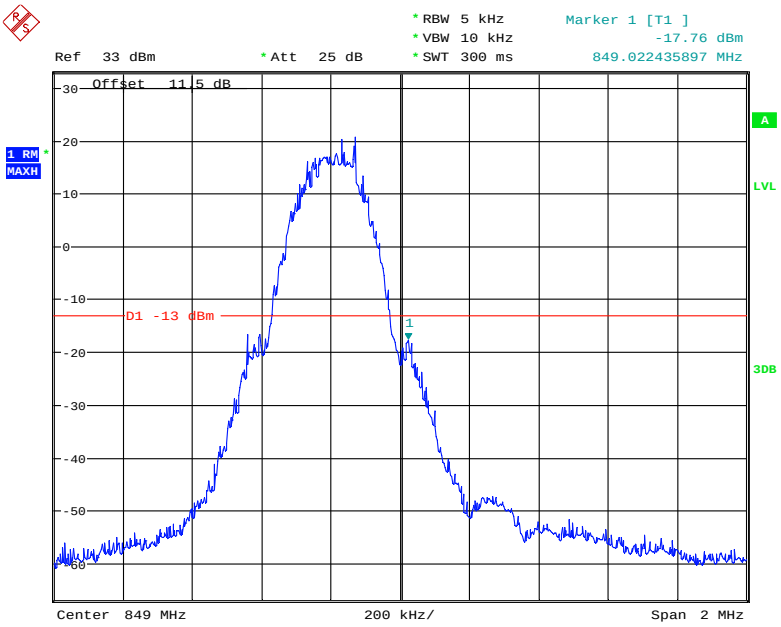
Test Result: Compliance. Please refer to the following plots.

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



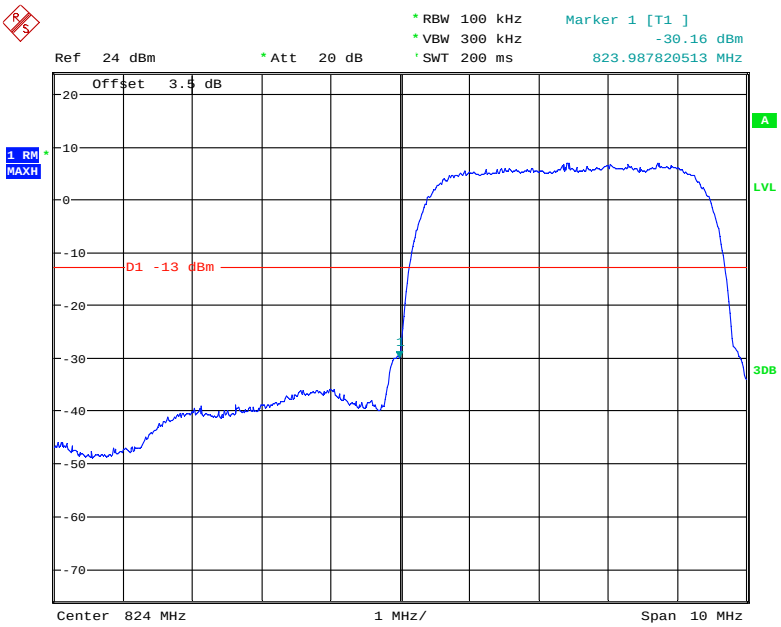
Date: 3.DEC.2018 16:15:20

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



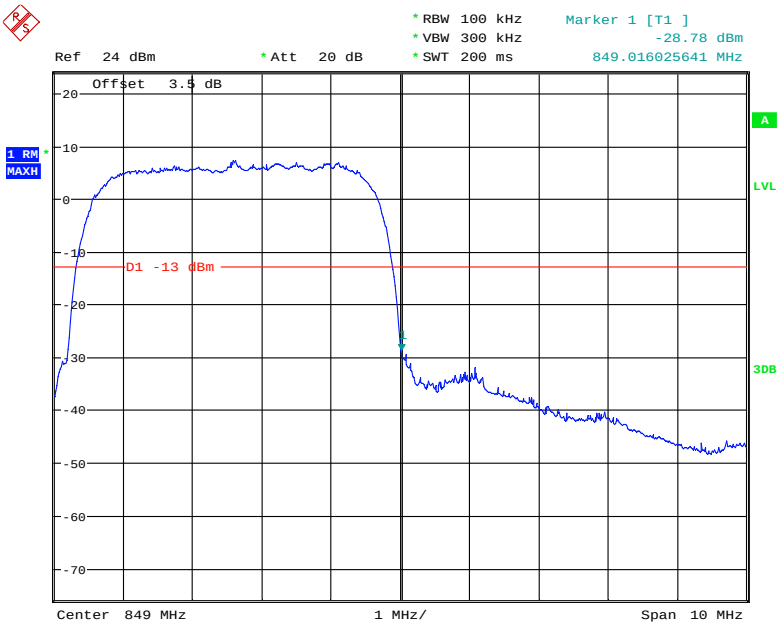
Date: 3.DEC.2018 16:17:23

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



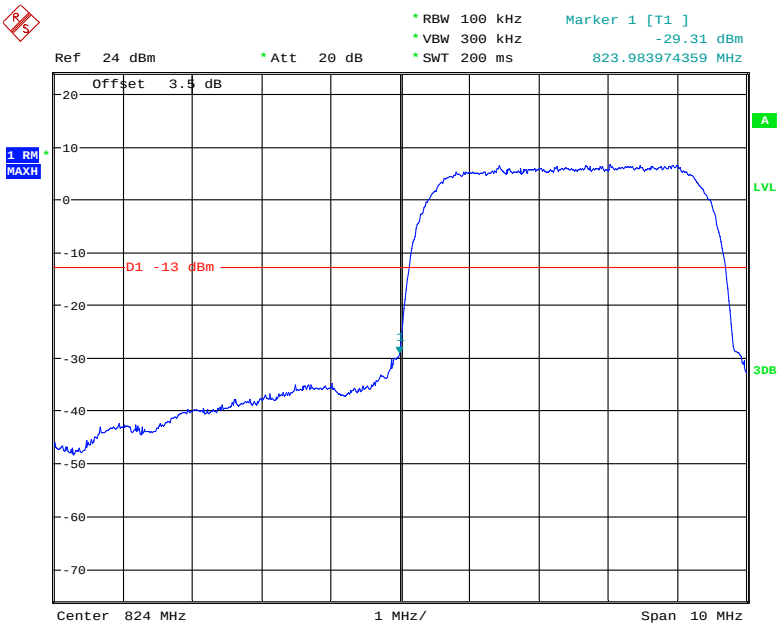
Date: 5.DEC.2018 08:39:05

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



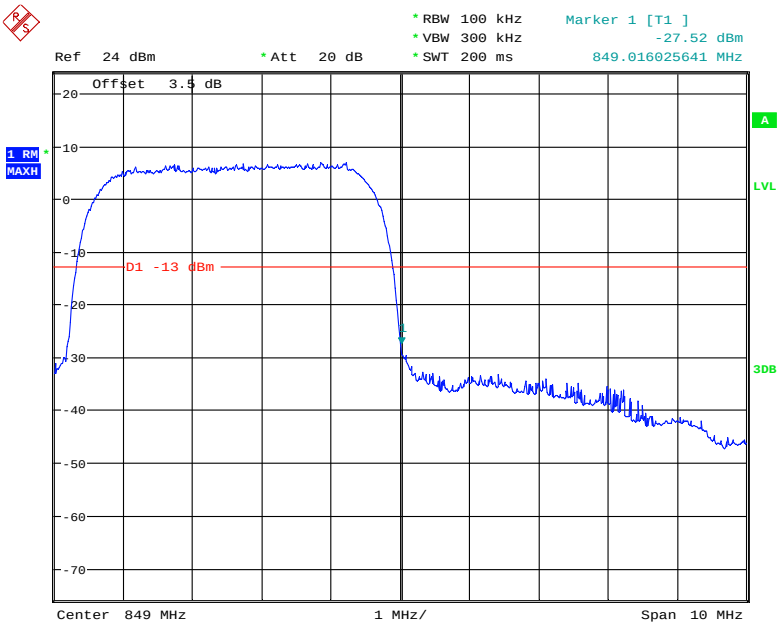
Date: 5.DEC.2018 08:40:26

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



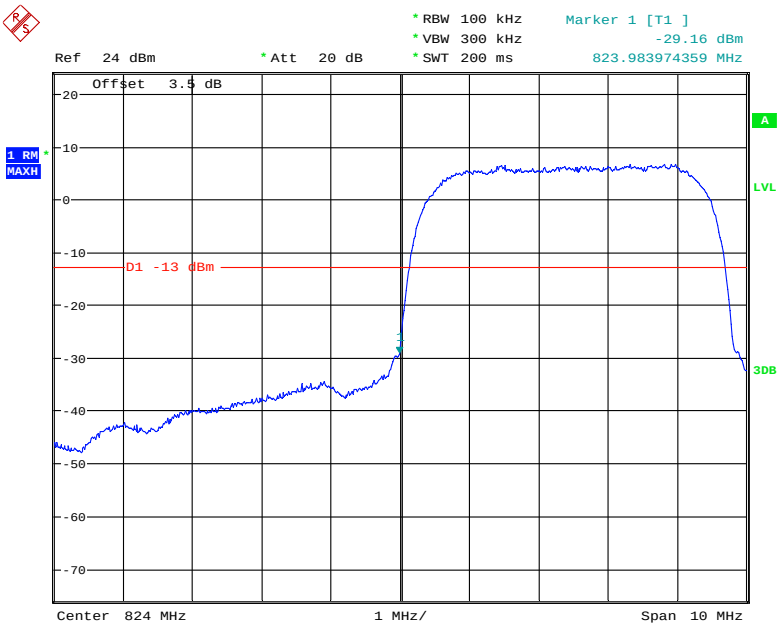
Date: 5.DEC.2018 08:42:56

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



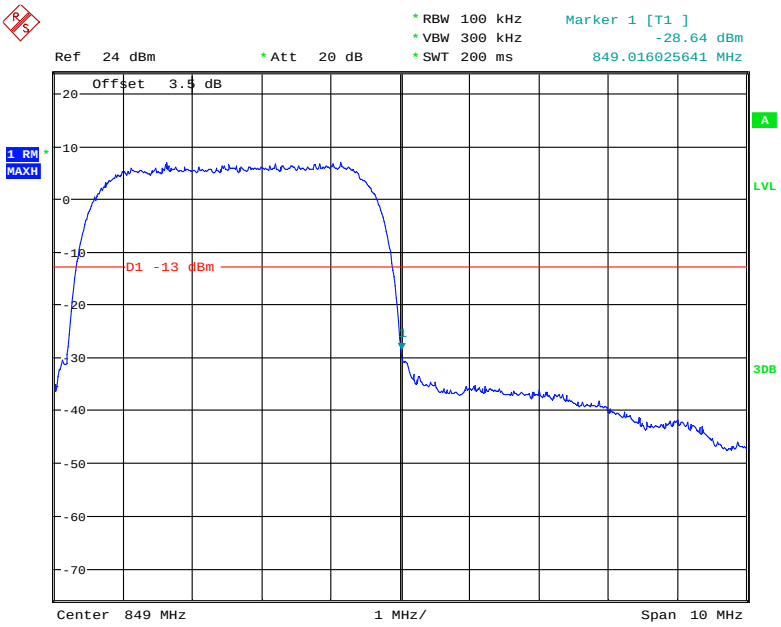
Date: 5.DEC.2018 08:42:03

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



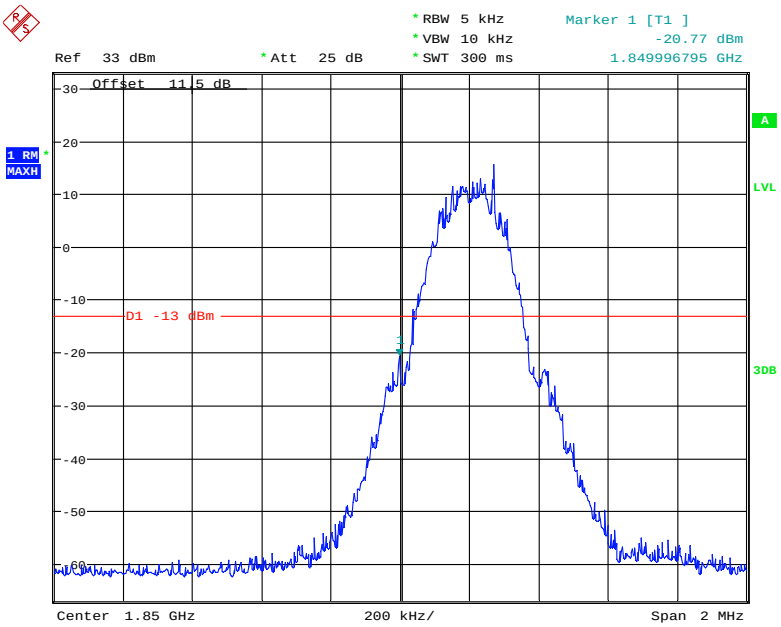
Date: 5.DEC.2018 08:43:54

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



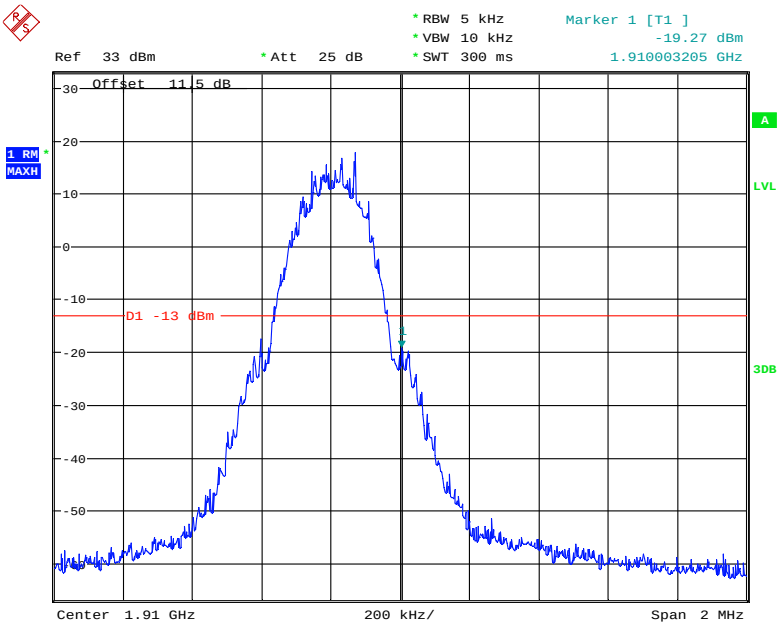
Date: 5.DEC.2018 08:44:29

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



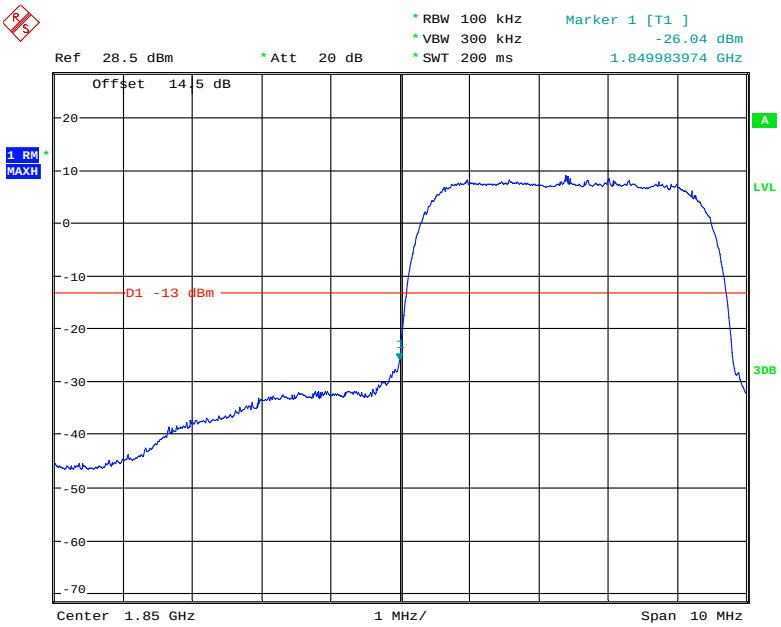
Date: 3.DEC.2018 16:22:24

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



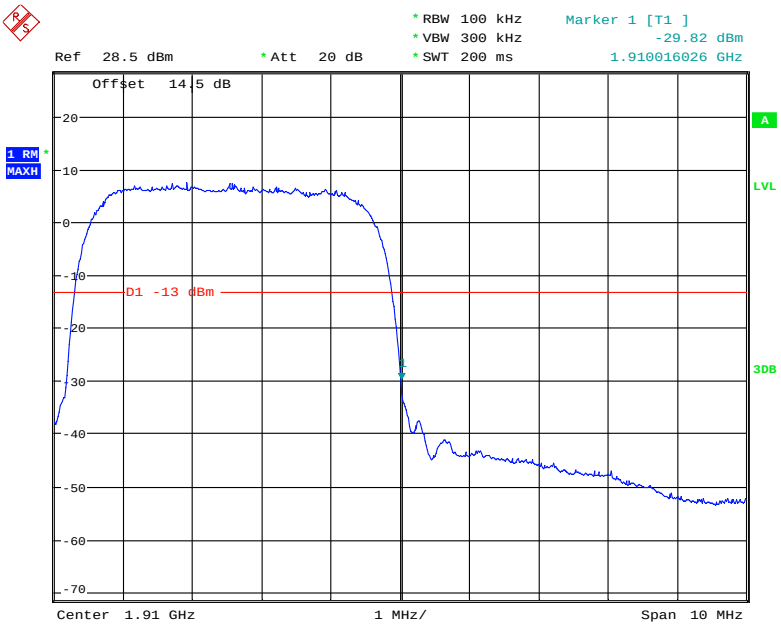
Date: 3.DEC.2018 16:23:31

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



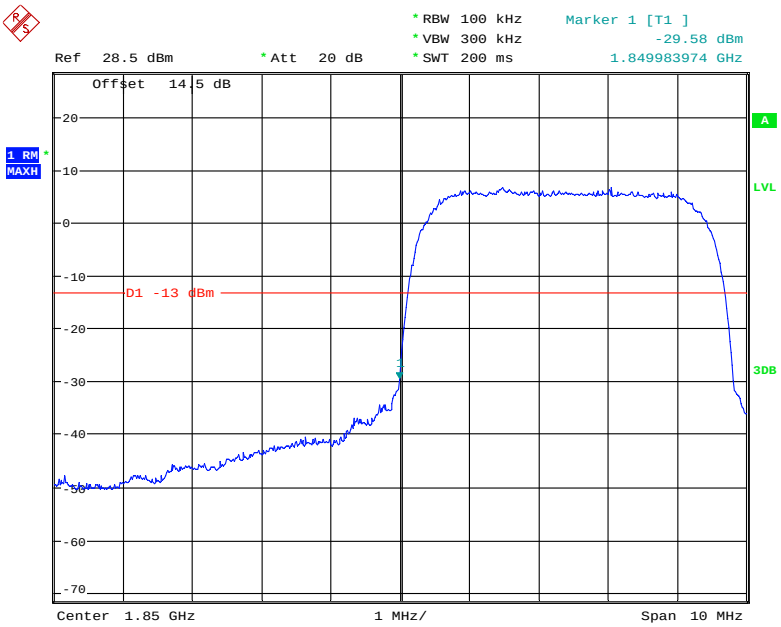
Date: 4.DEC.2018 10:03:19

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



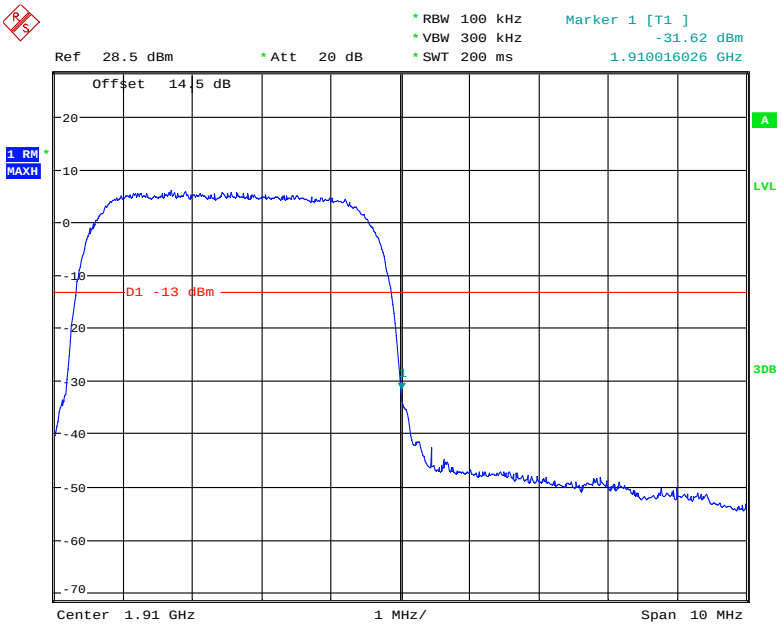
Date: 4.DEC.2018 10:04:24

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



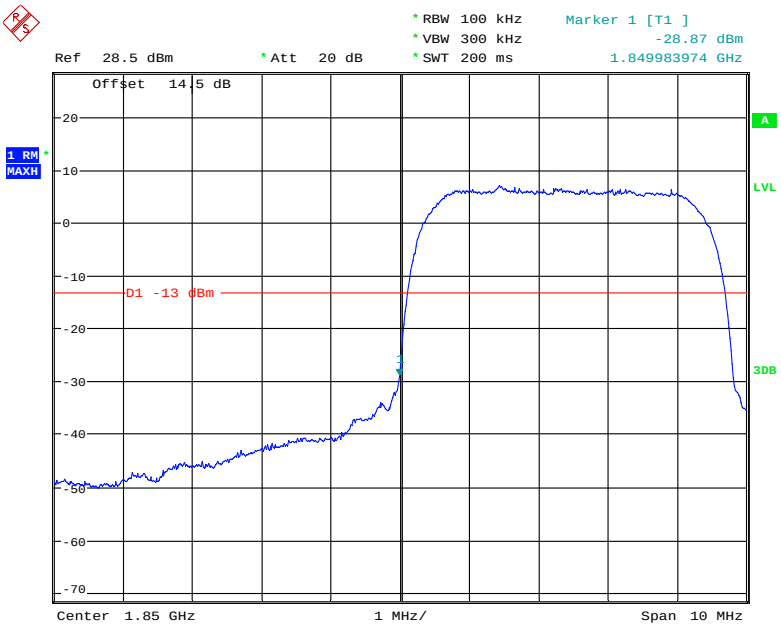
Date: 4.DEC.2018 10:02:11

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



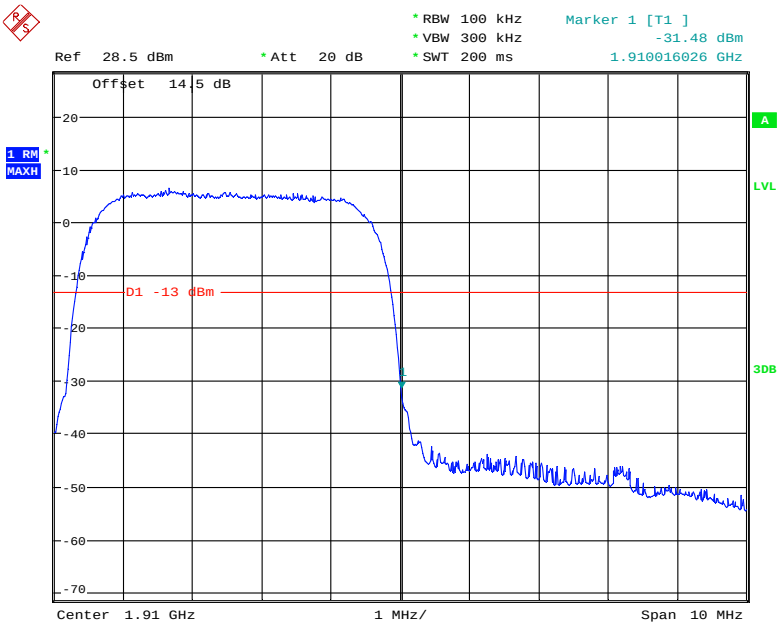
Date: 4.DEC.2018 10:01:15

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



Date: 4.DEC.2018 09:59:58

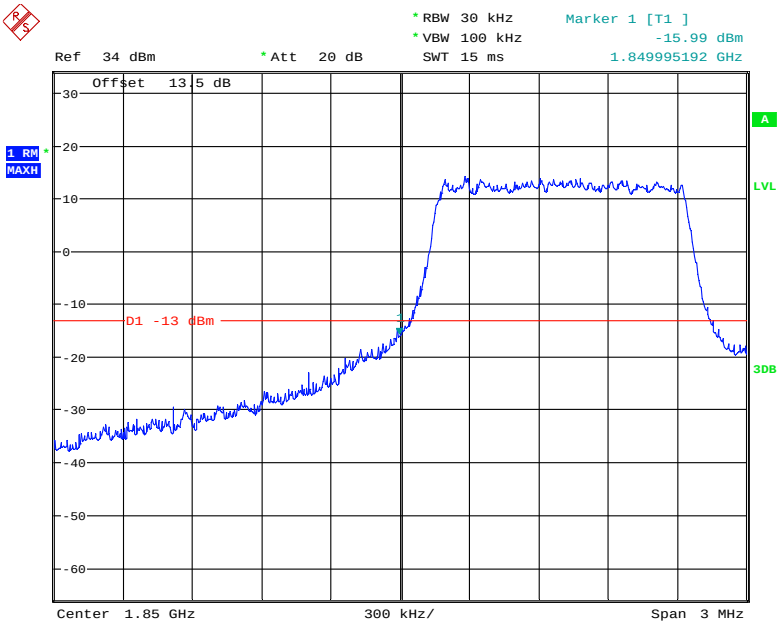
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 4.DEC.2018 10:00:34

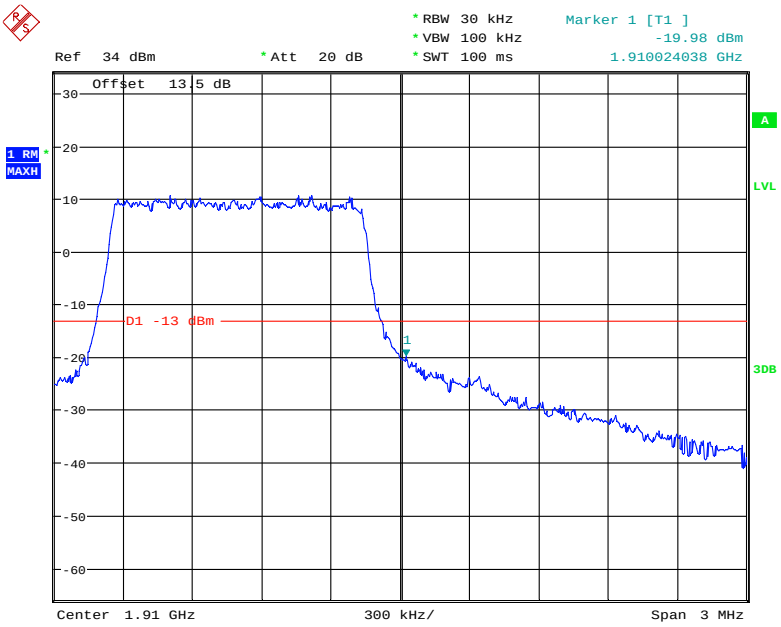
Band 2:

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



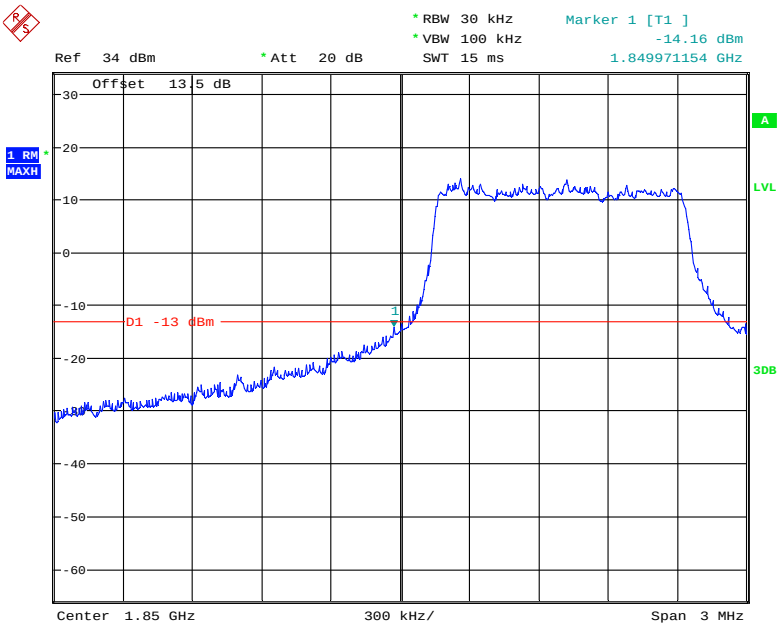
Date: 4.DEC.2018 16:25:05

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



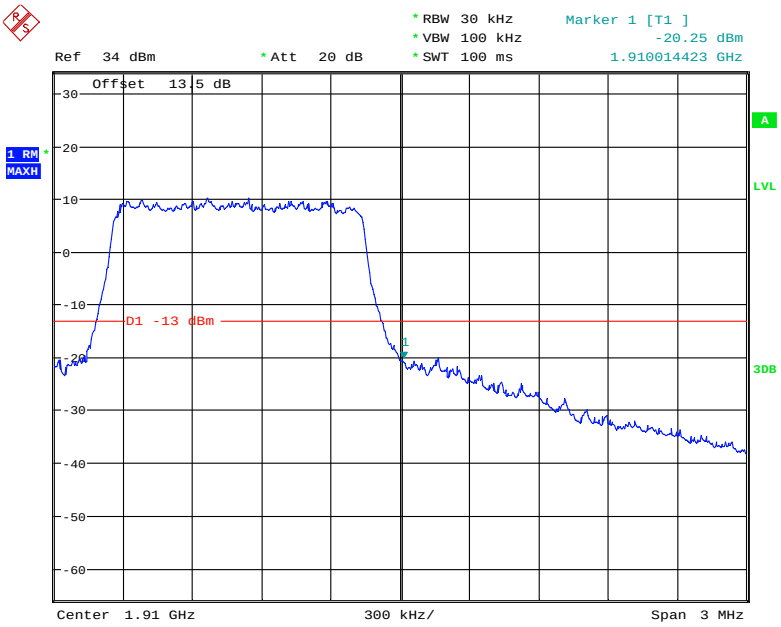
Date: 4.DEC.2018 16:29:52

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



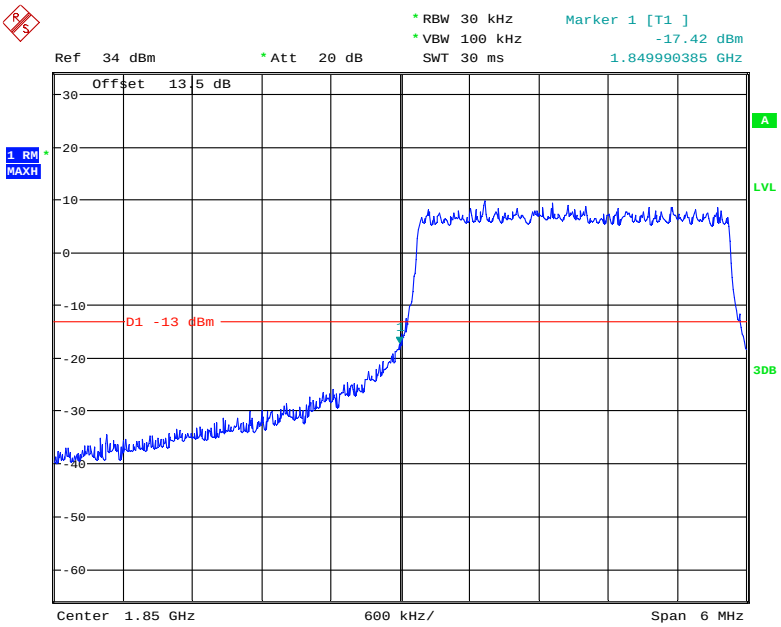
Date: 4.DEC.2018 16:27:12

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



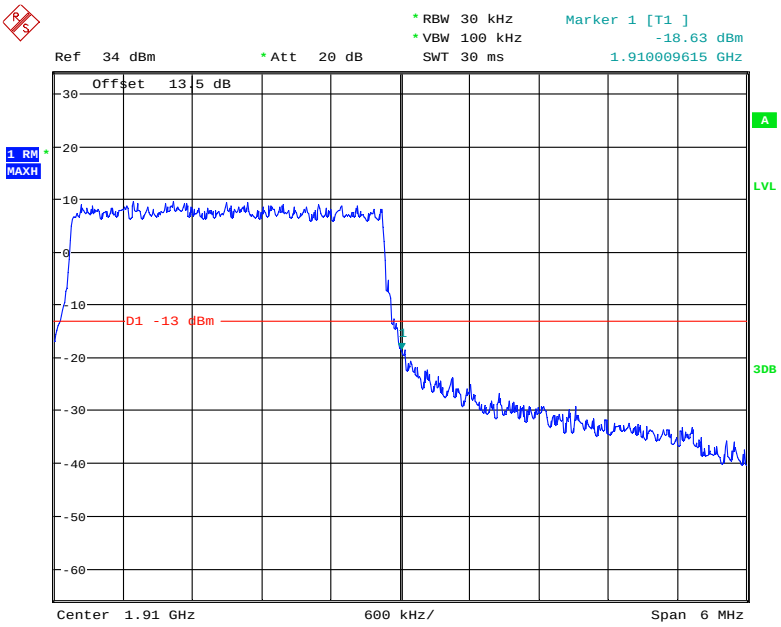
Date: 4.DEC.2018 16:29:10

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



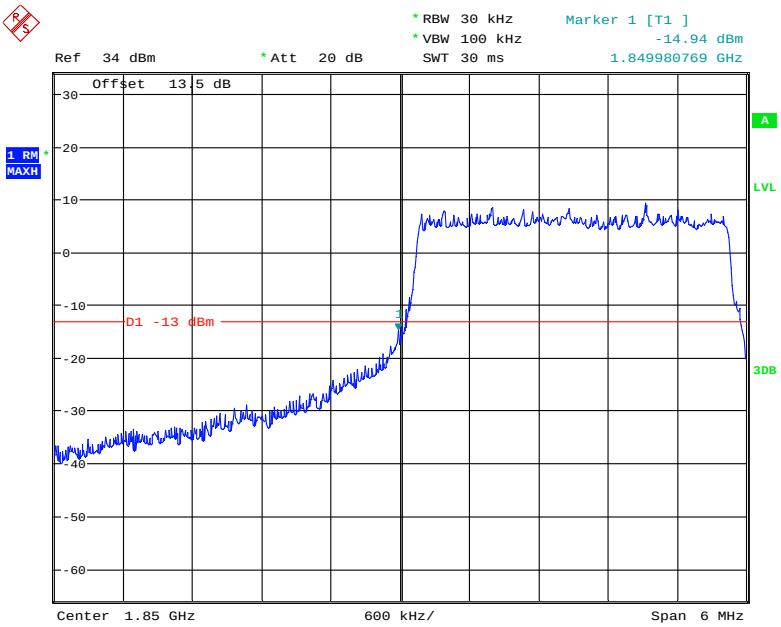
Date: 4.DEC.2018 16:33:11

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



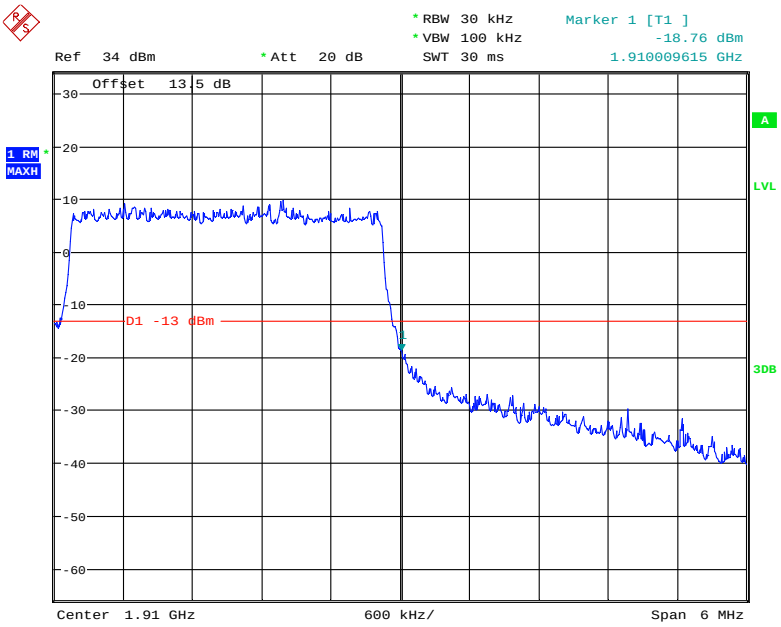
Date: 4.DEC.2018 16:32:27

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



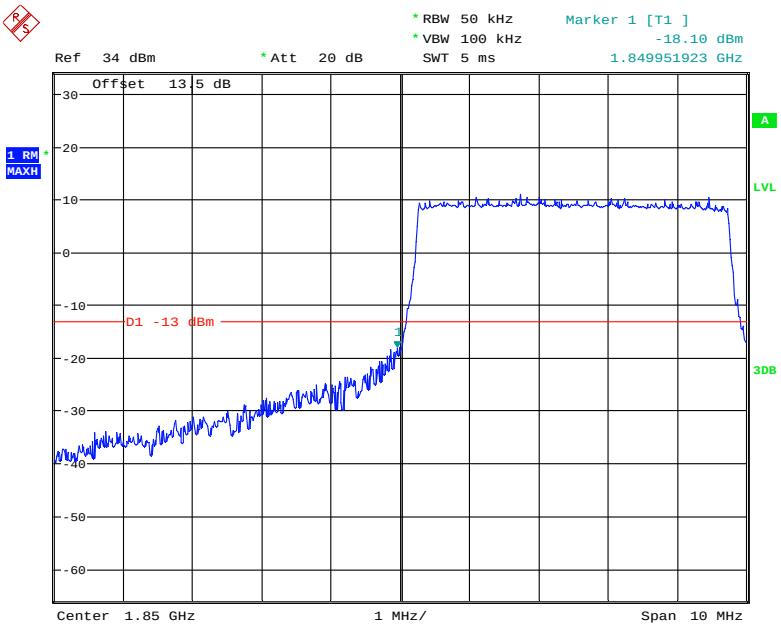
Date: 4.DEC.2018 16:33:56

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



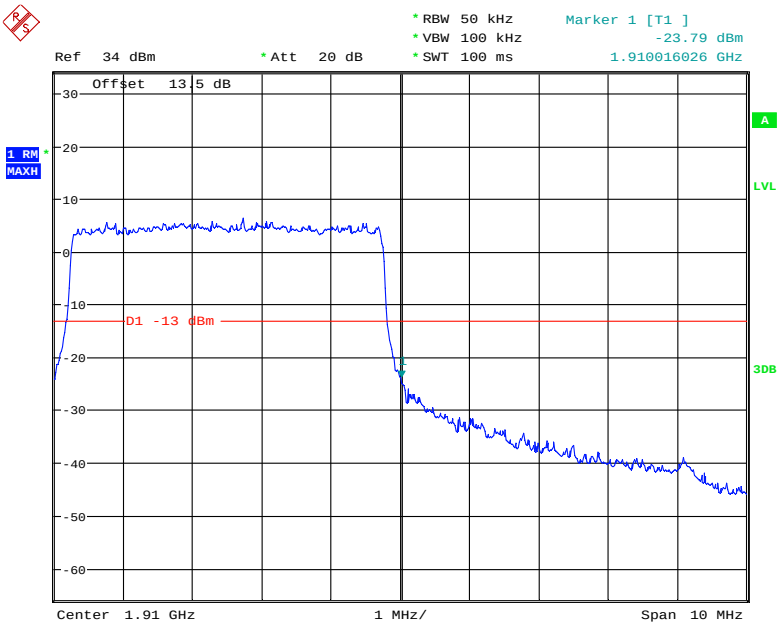
Date: 4.DEC.2018 16:31:48

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



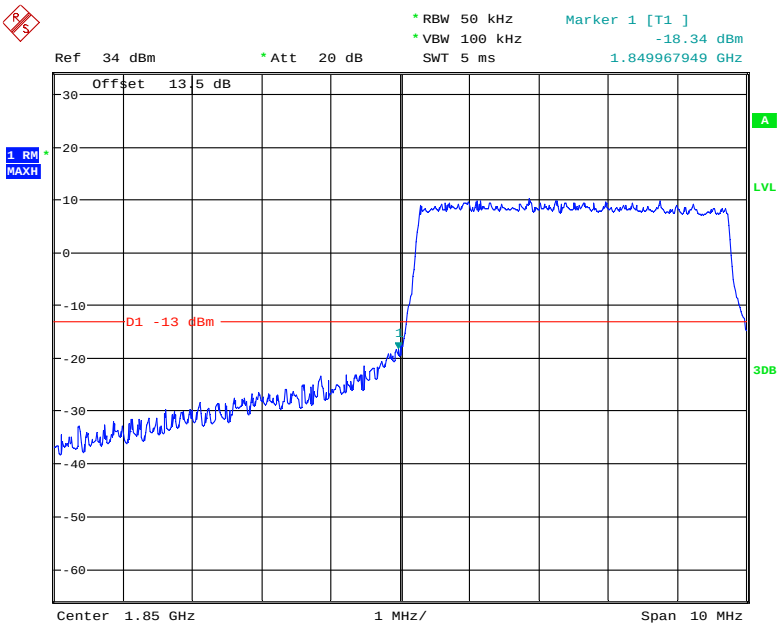
Date: 4.DEC.2018 16:38:22

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



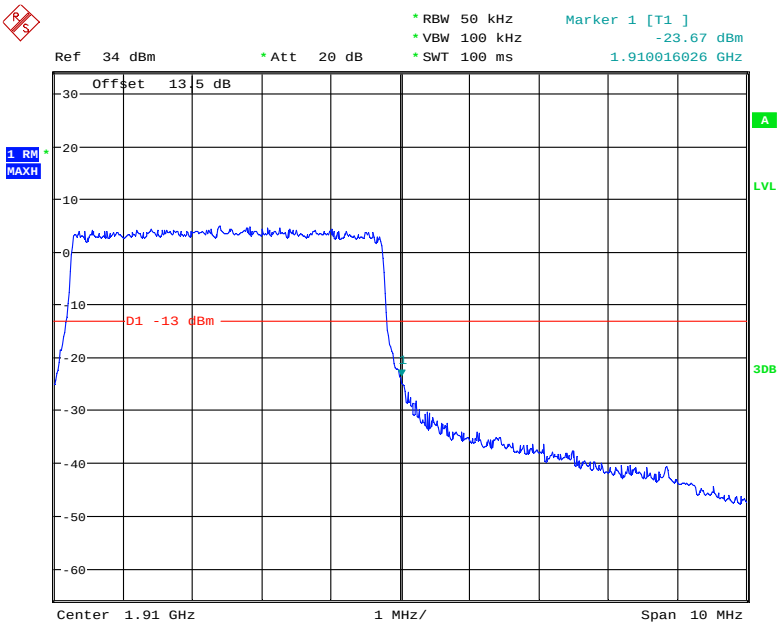
Date: 4.DEC.2018 16:40:05

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



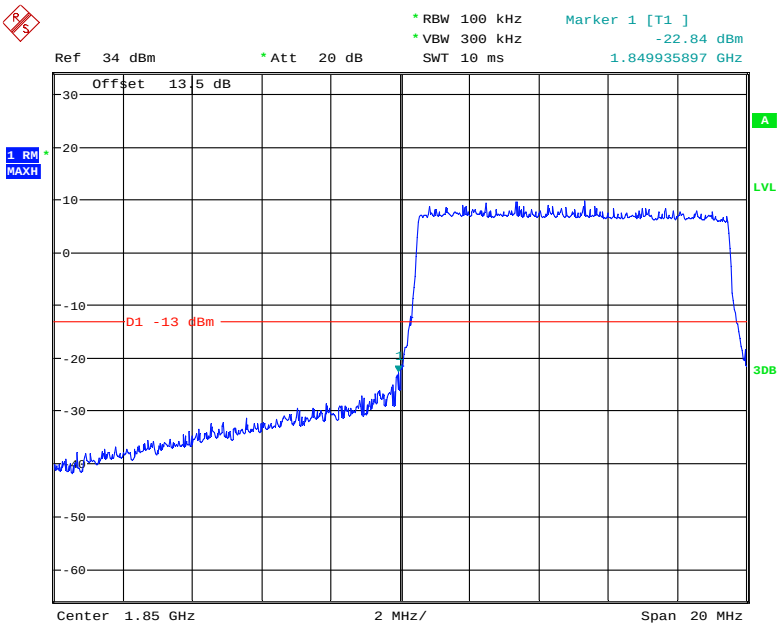
Date: 4.DEC.2018 16:37:29

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



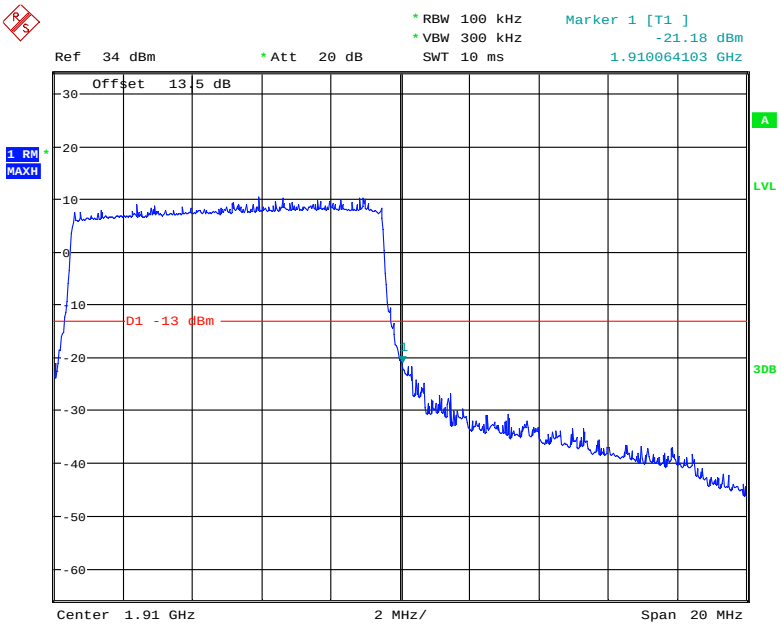
Date: 4.DEC.2018 16:40:48

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



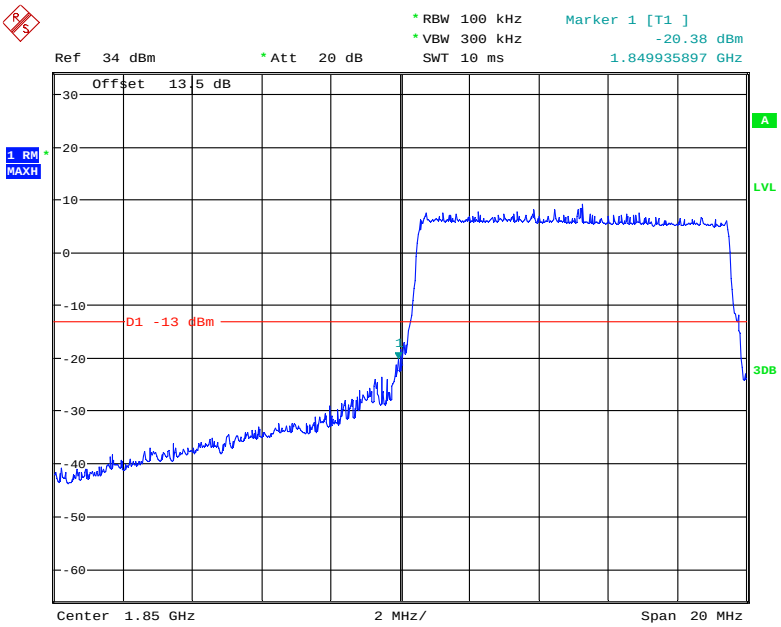
Date: 4.DEC.2018 16:47:10

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



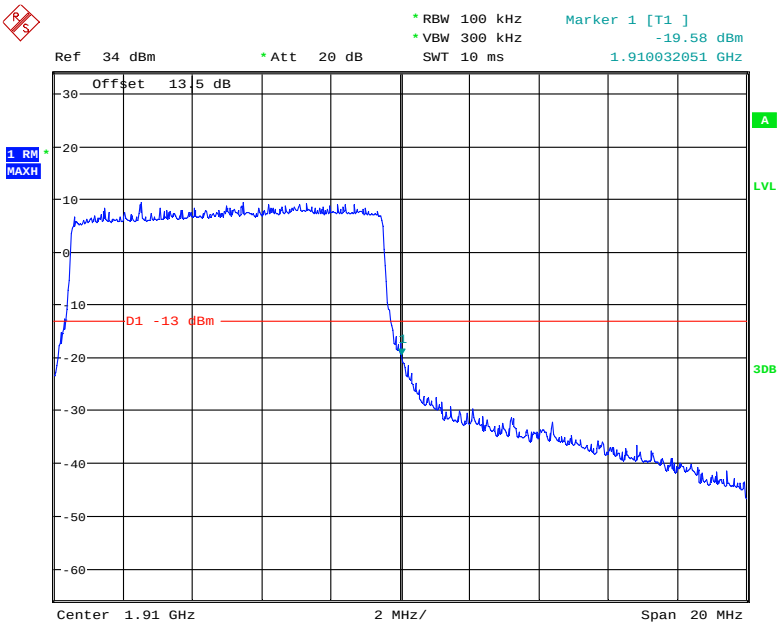
Date: 4.DEC.2018 16:45:41

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



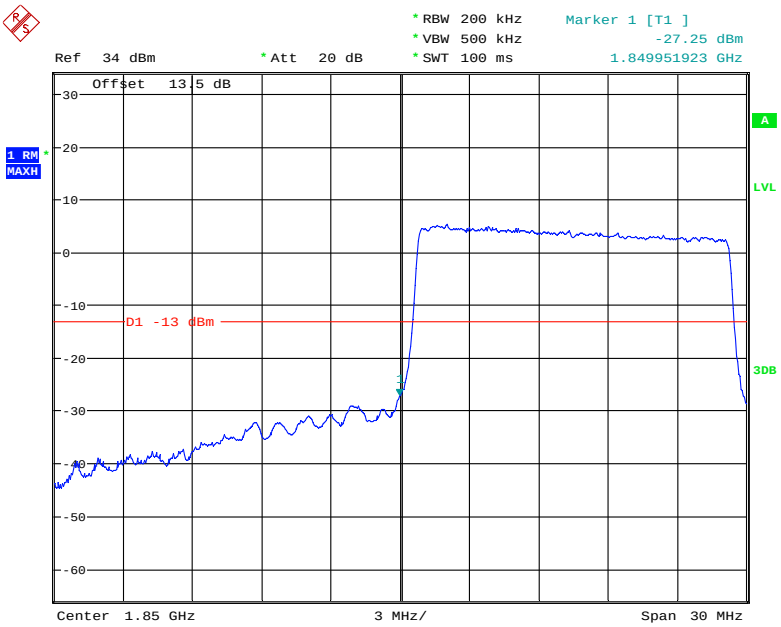
Date: 4.DEC.2018 16:47:55

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



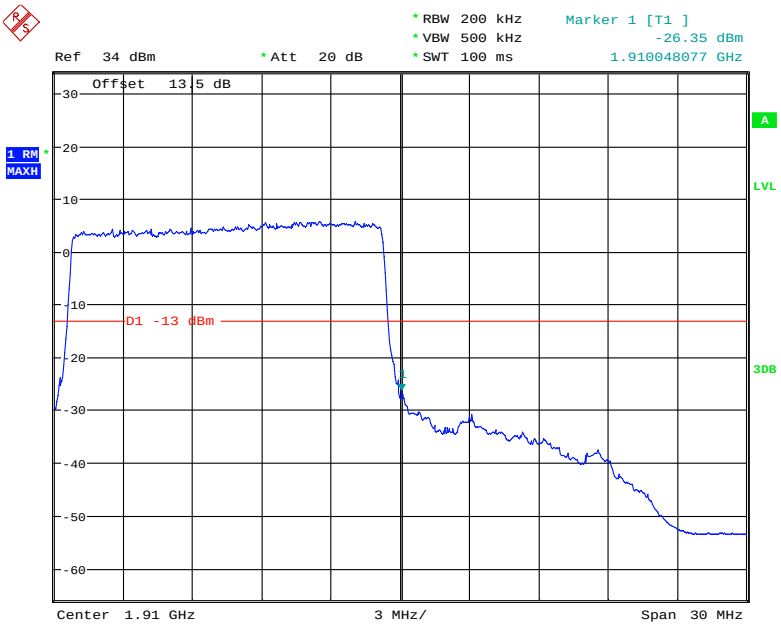
Date: 4.DEC.2018 16:44:56

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



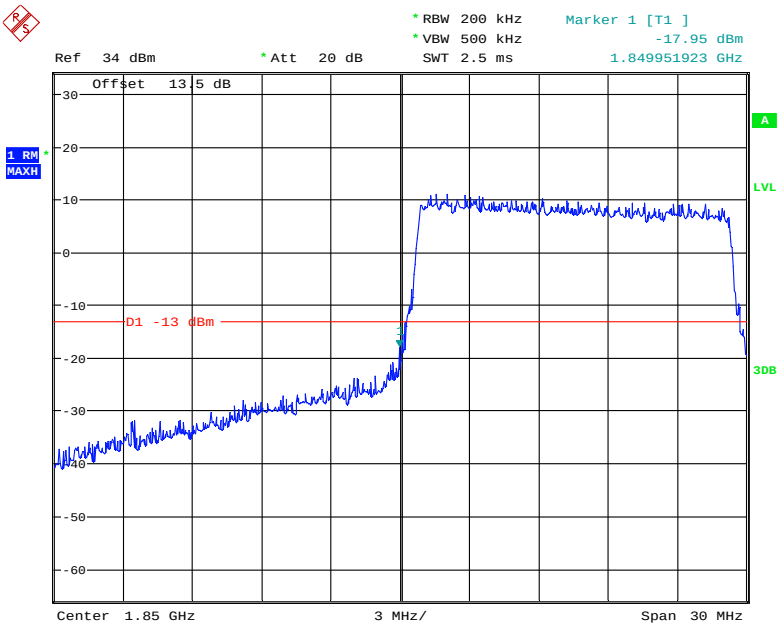
Date: 4.DEC.2018 16:50:38

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



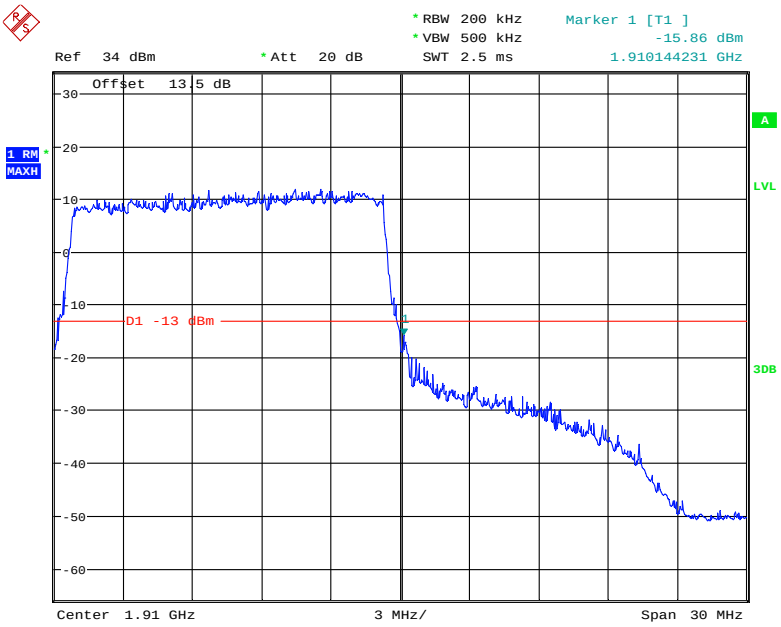
Date: 4.DEC.2018 16:54:46

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



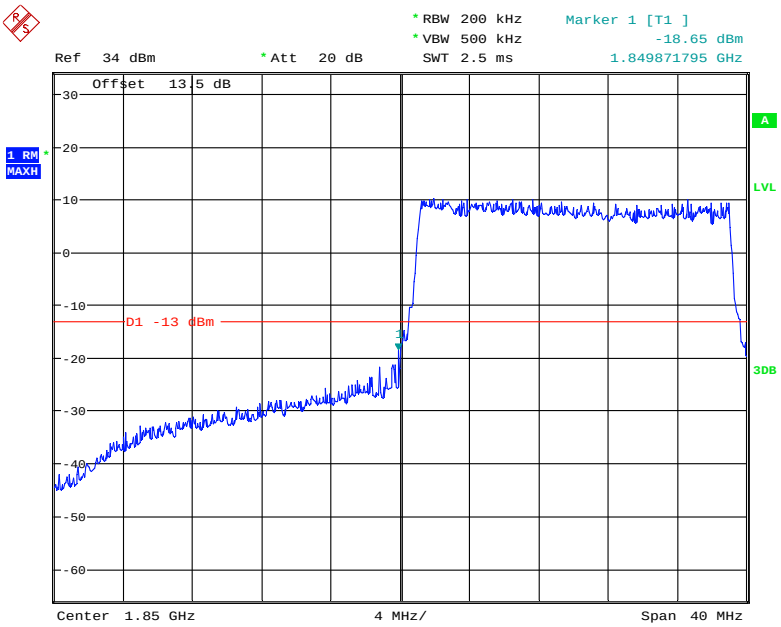
Date: 4.DEC.2018 16:51:31

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



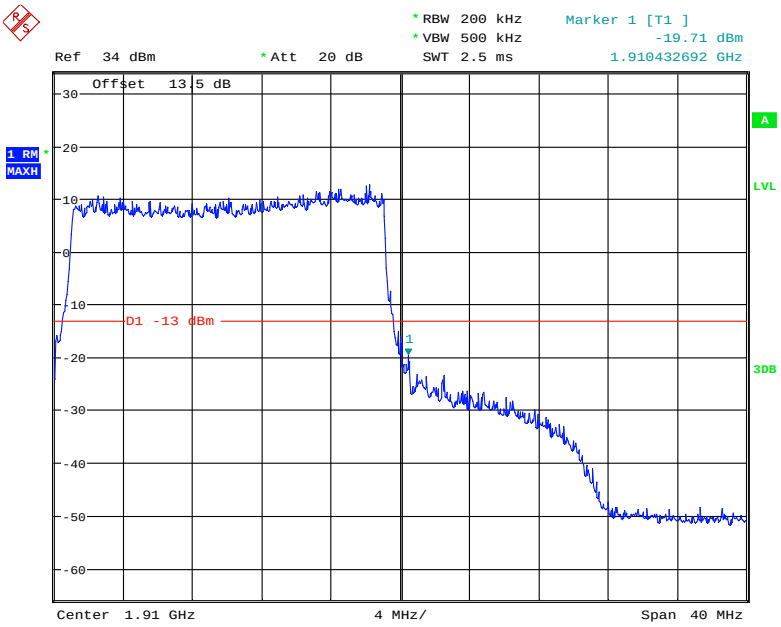
Date: 4.DEC.2018 16:53:15

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



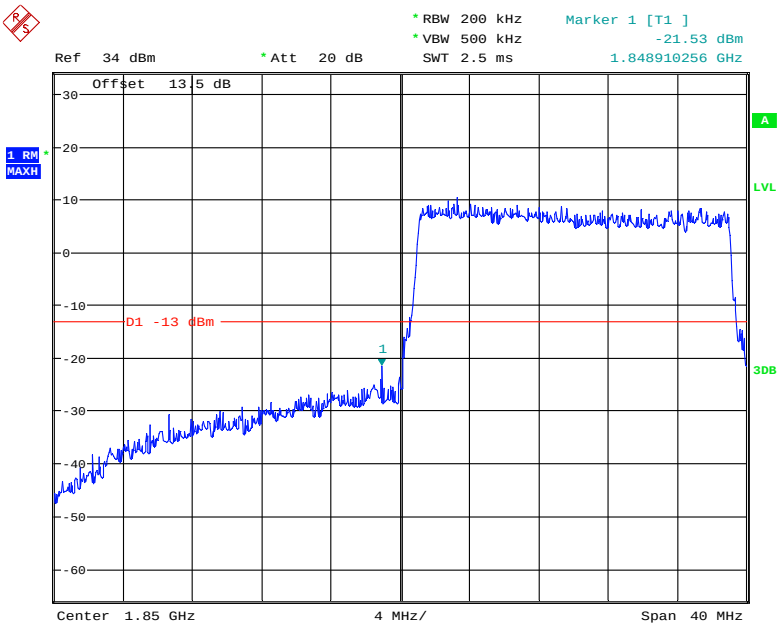
Date: 4.DEC.2018 16:58:37

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



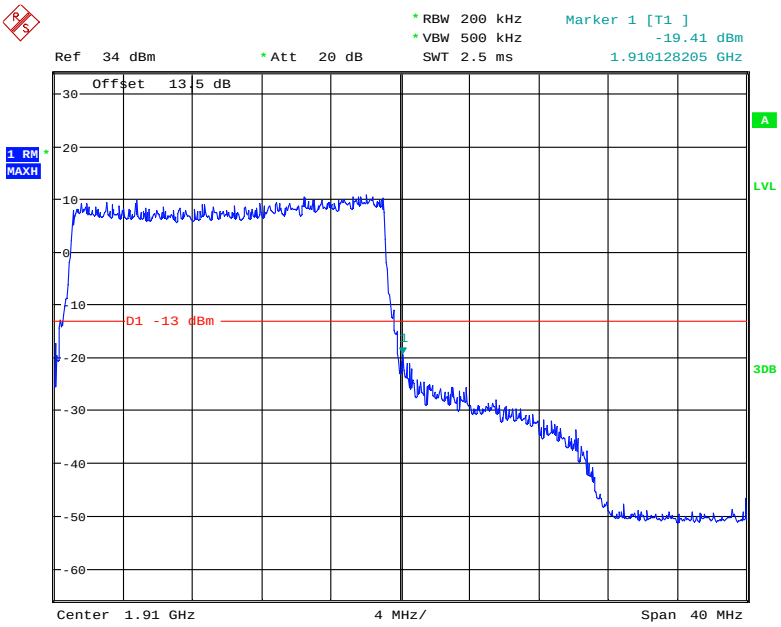
Date: 4.DEC.2018 16:56:14

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



Date: 4.DEC.2018 16:57:45

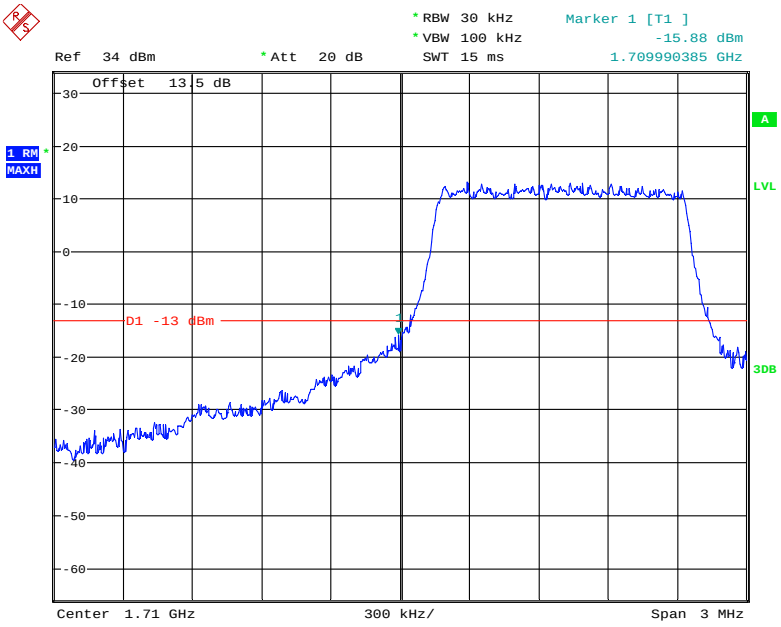
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 4.DEC.2018 16:57:03

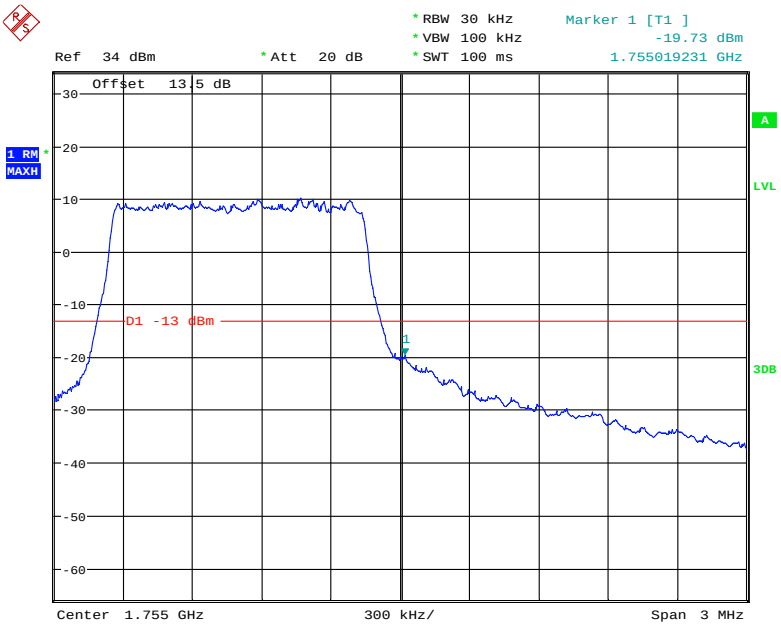
Band 4:

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



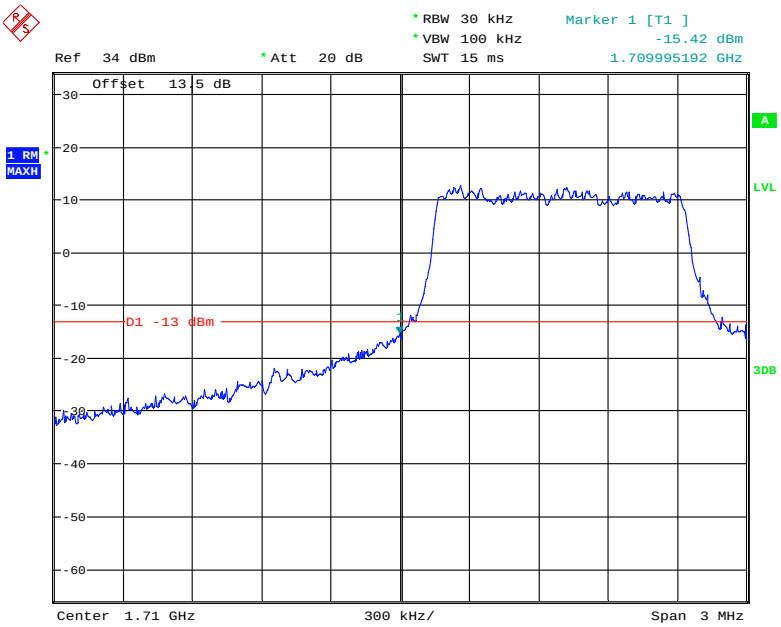
Date: 4.DEC.2018 17:25:47

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



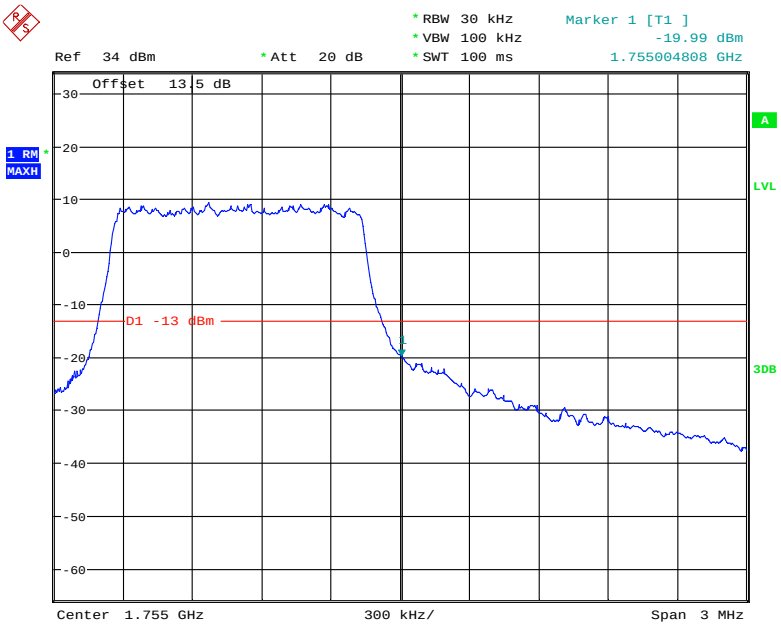
Date: 4.DEC.2018 17:31:25

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



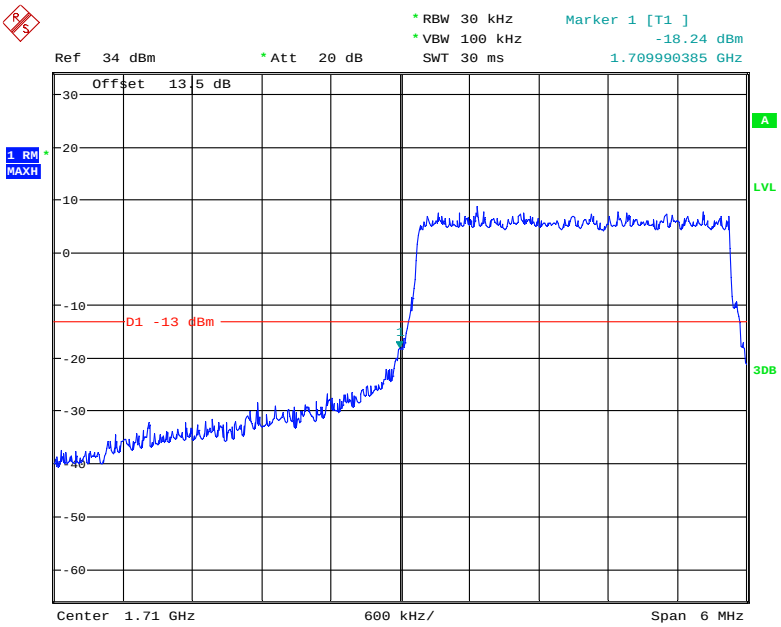
Date: 4.DEC.2018 17:27:29

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



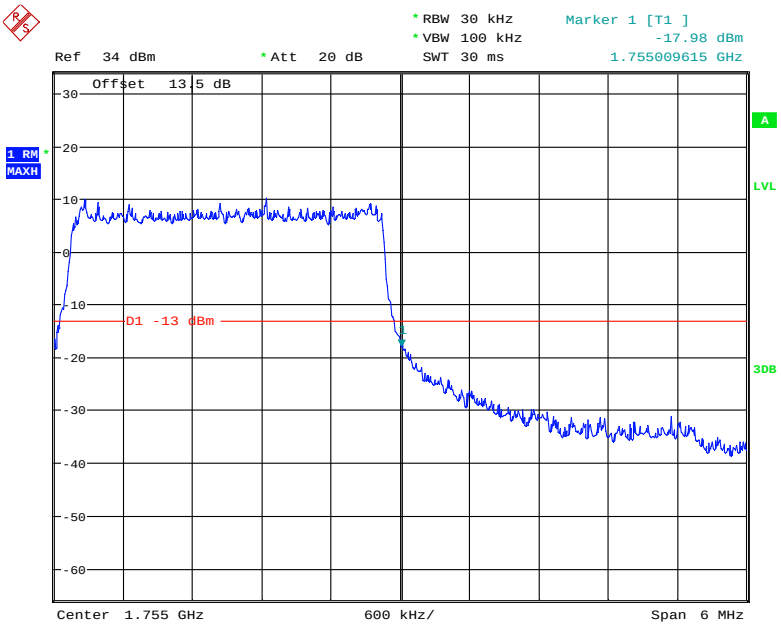
Date: 4.DEC.2018 17:30:21

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



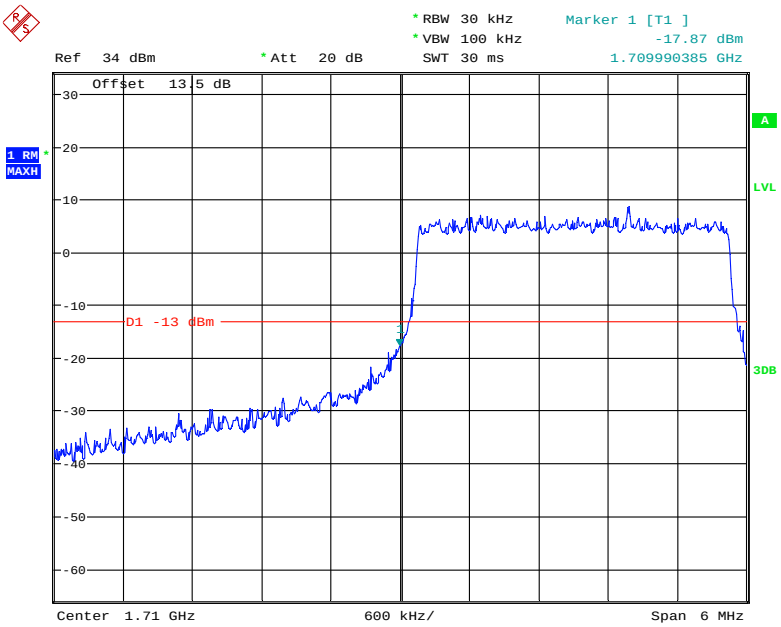
Date: 4.DEC.2018 17:34:09

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



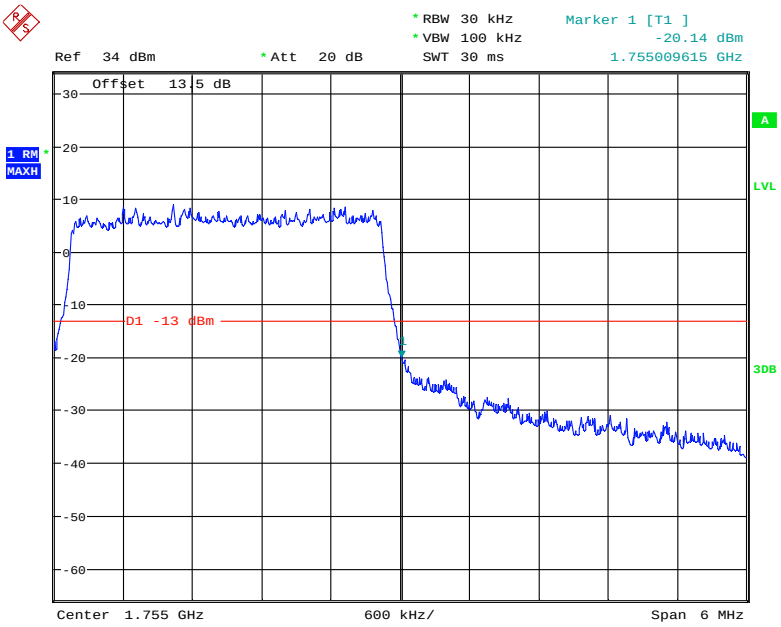
Date: 4.DEC.2018 17:33:23

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



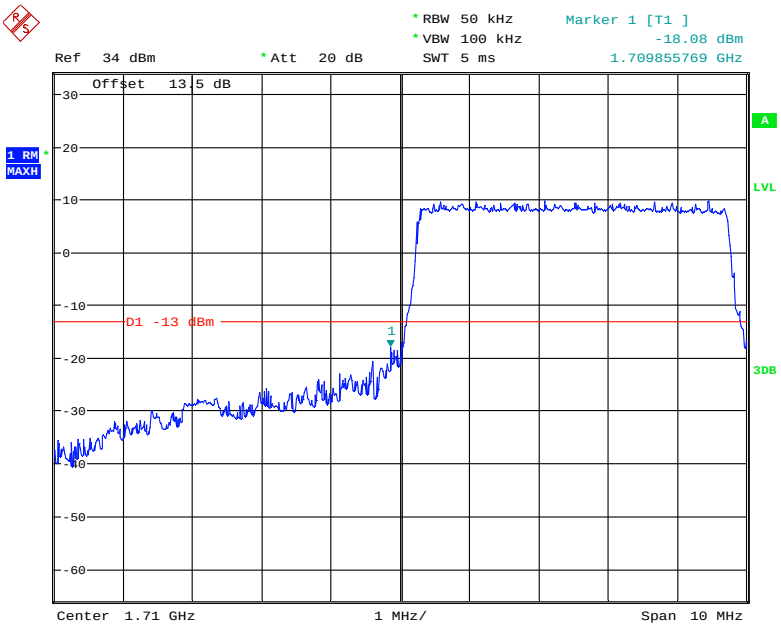
Date: 4.DEC.2018 17:34:47

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



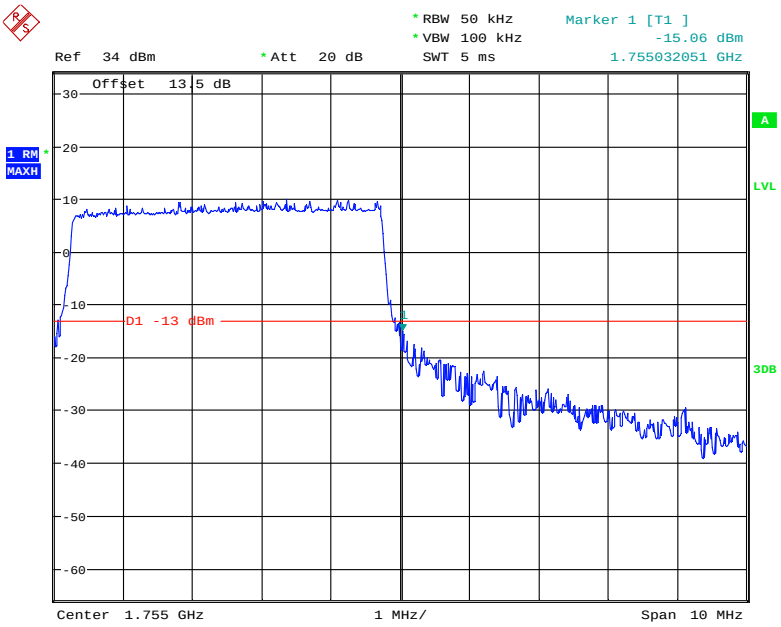
Date: 4.DEC.2018 17:32:58

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



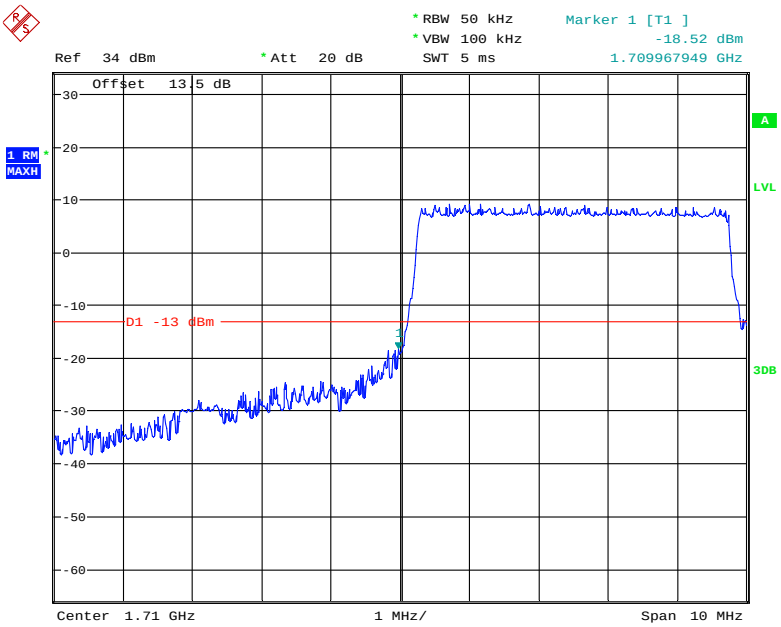
Date: 5.DEC.2018 09:32:21

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



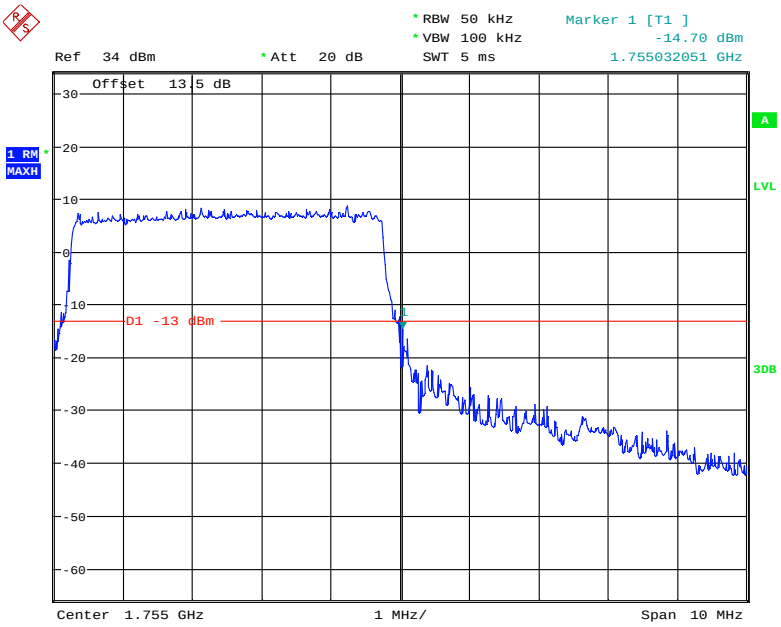
Date: 5.DEC.2018 09:37:46

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



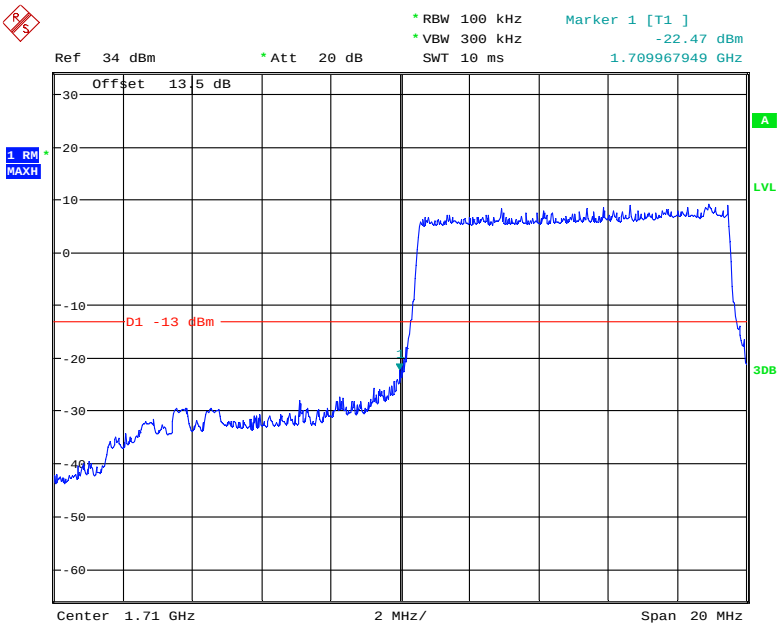
Date: 5.DEC.2018 09:34:59

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



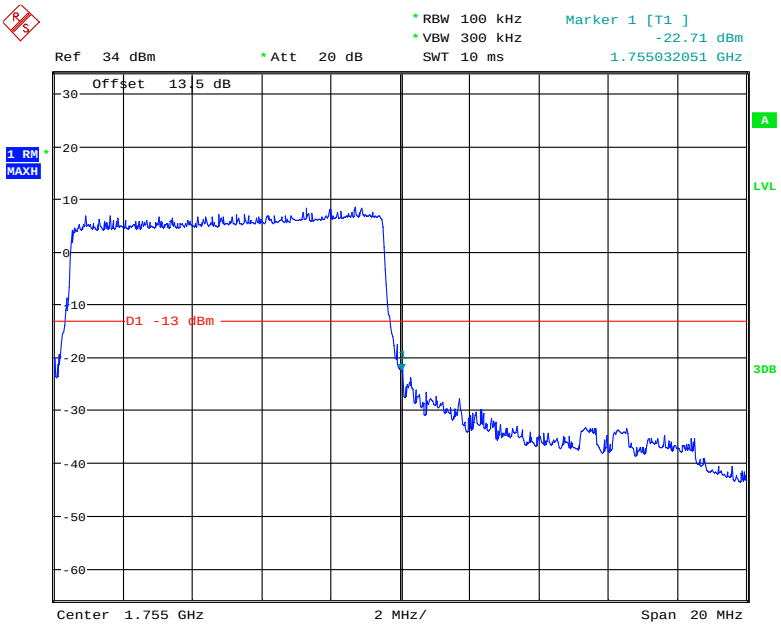
Date: 5.DEC.2018 09:36:52

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



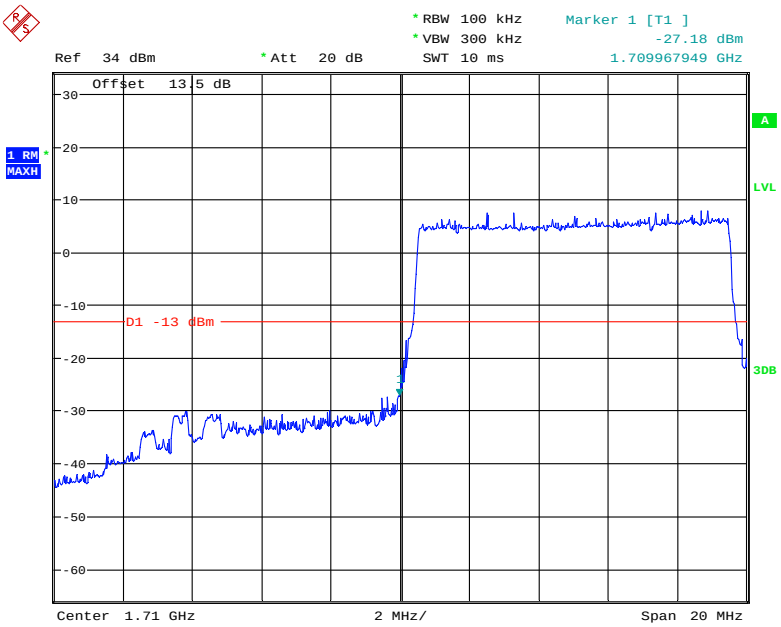
Date: 5.DEC.2018 09:43:17

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



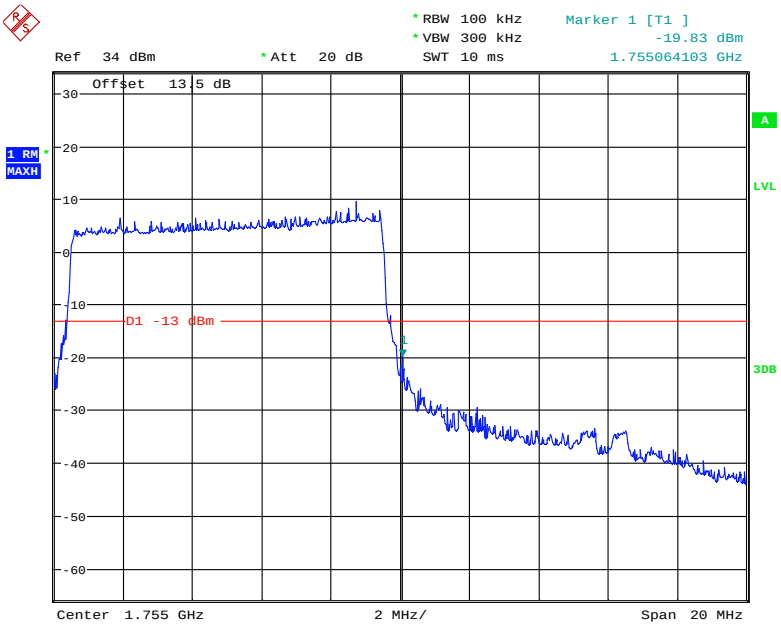
Date: 5.DEC.2018 09:39:08

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



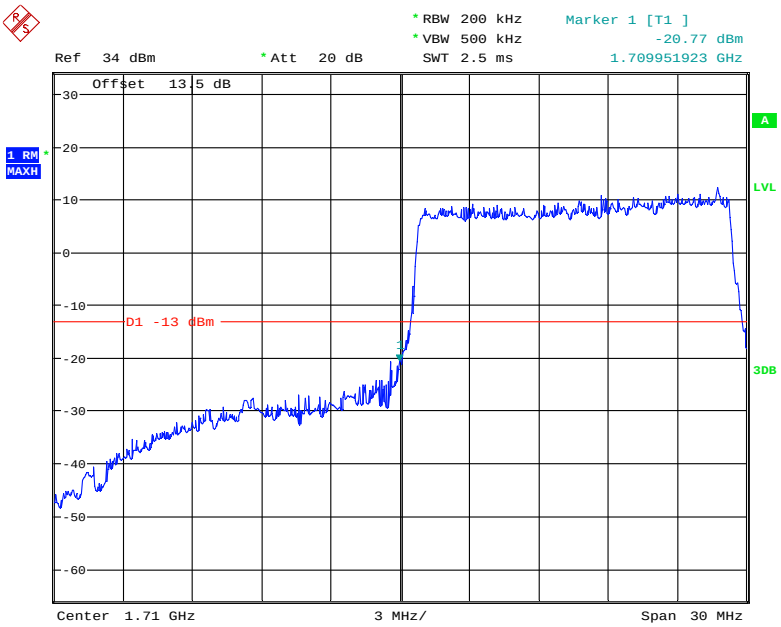
Date: 5.DEC.2018 09:40:56

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



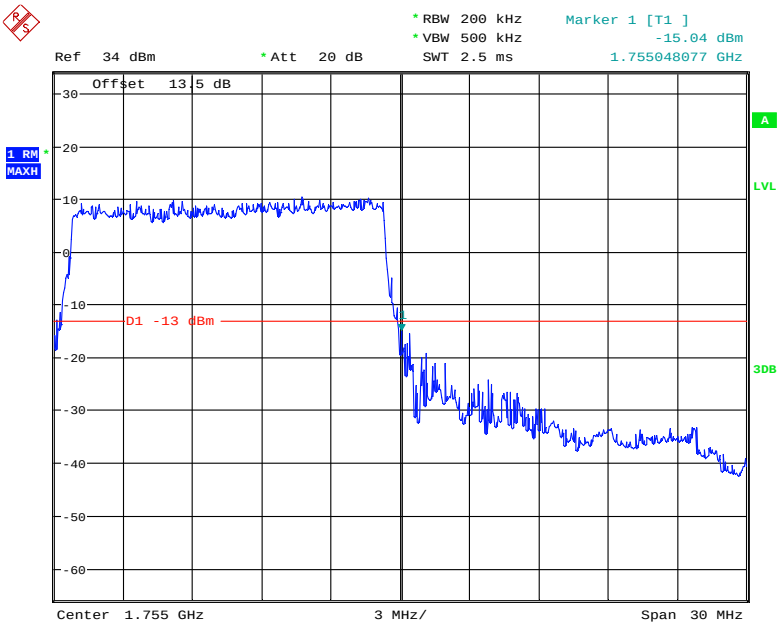
Date: 5.DEC.2018 09:39:43

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



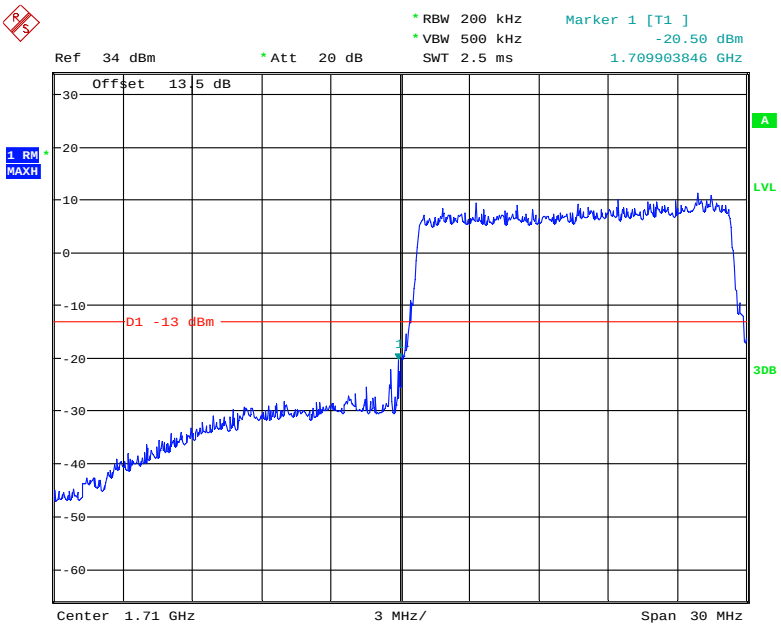
Date: 5.DEC.2018 09:46:02

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



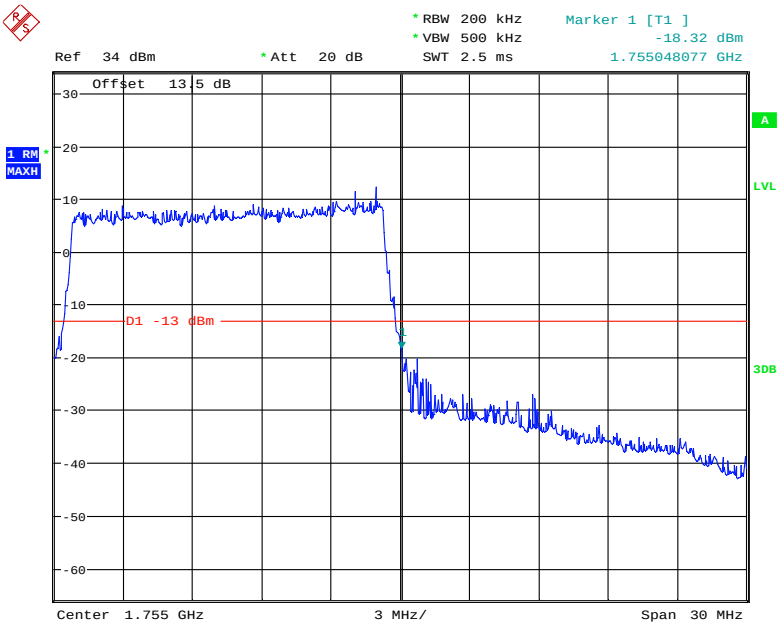
Date: 5.DEC.2018 09:49:36

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



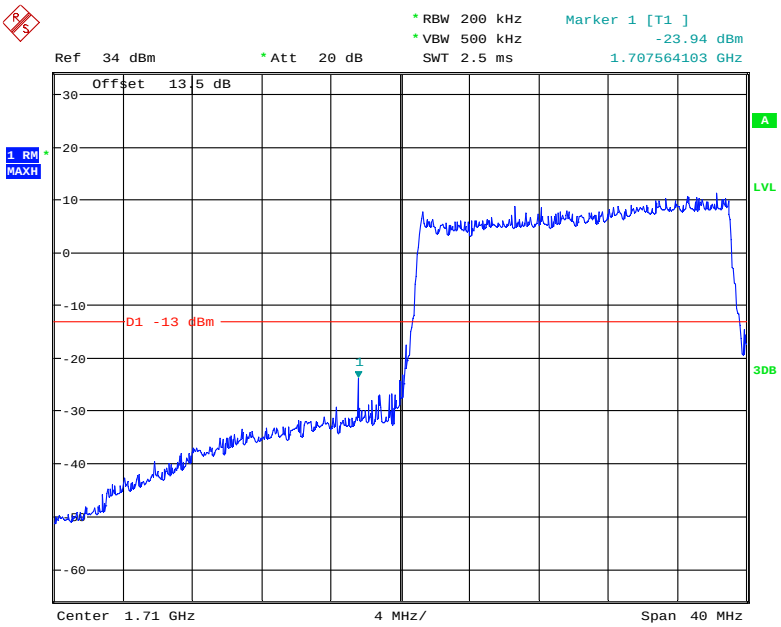
Date: 5.DEC.2018 09:46:46

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



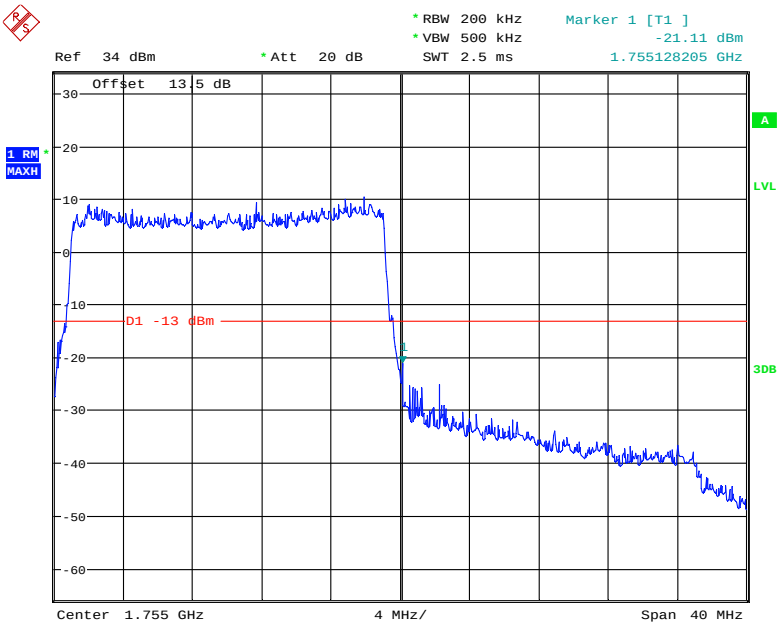
Date: 5.DEC.2018 09:47:37

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



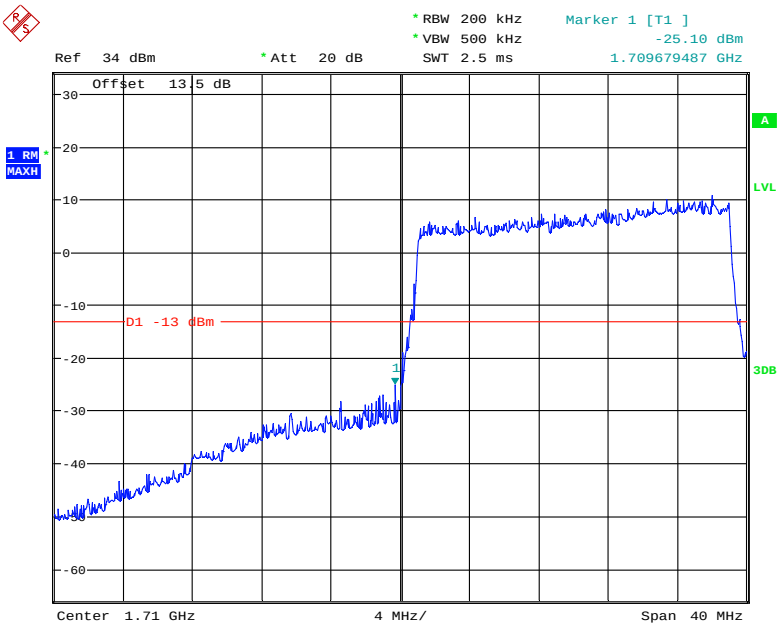
Date: 5.DEC.2018 09:54:50

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



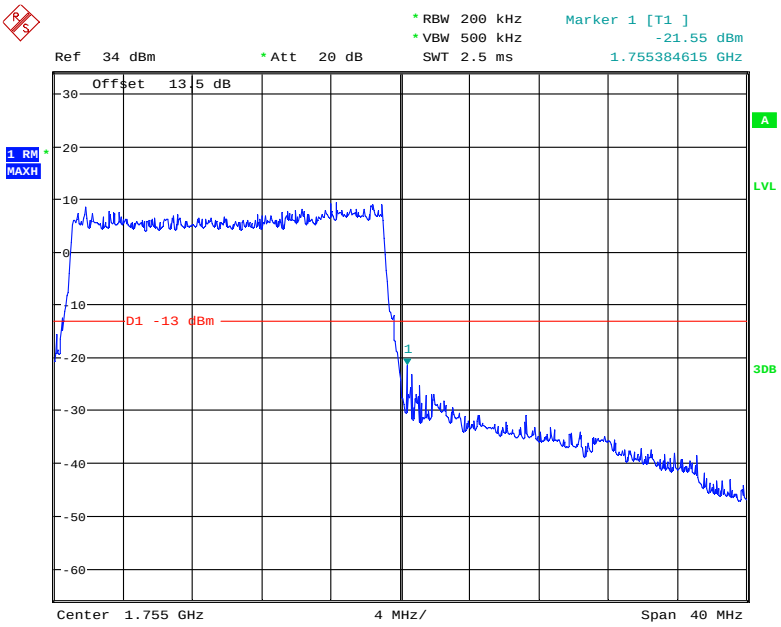
Date: 5.DEC.2018 09:52:17

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



Date: 5.DEC.2018 09:54:14

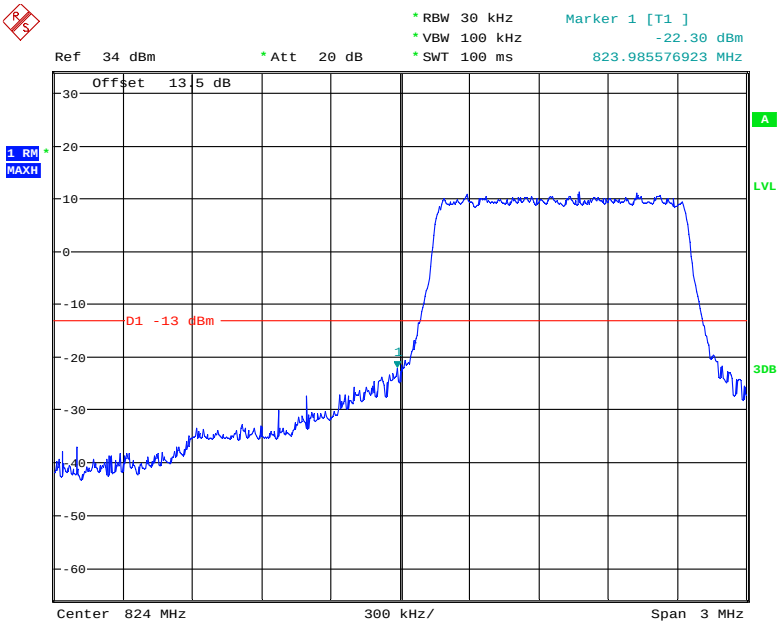
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 5.DEC.2018 09:53:12

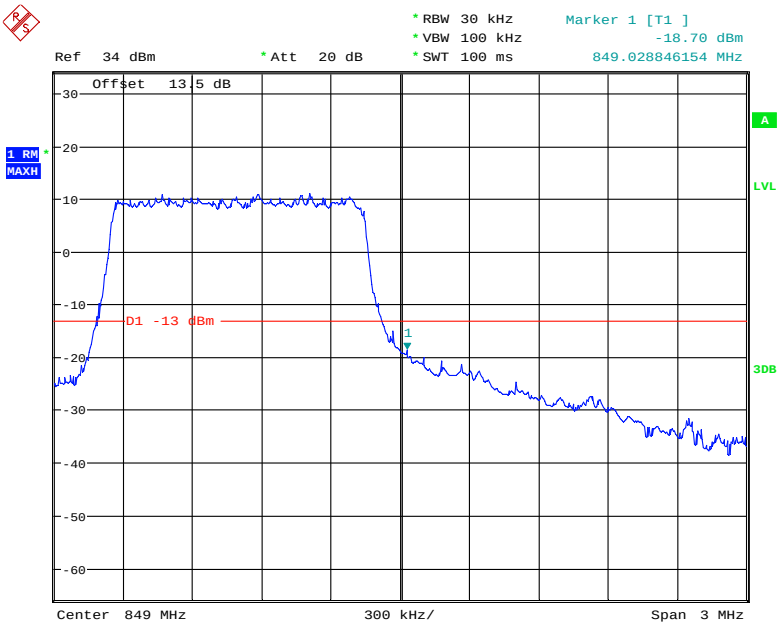
Band 5:

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



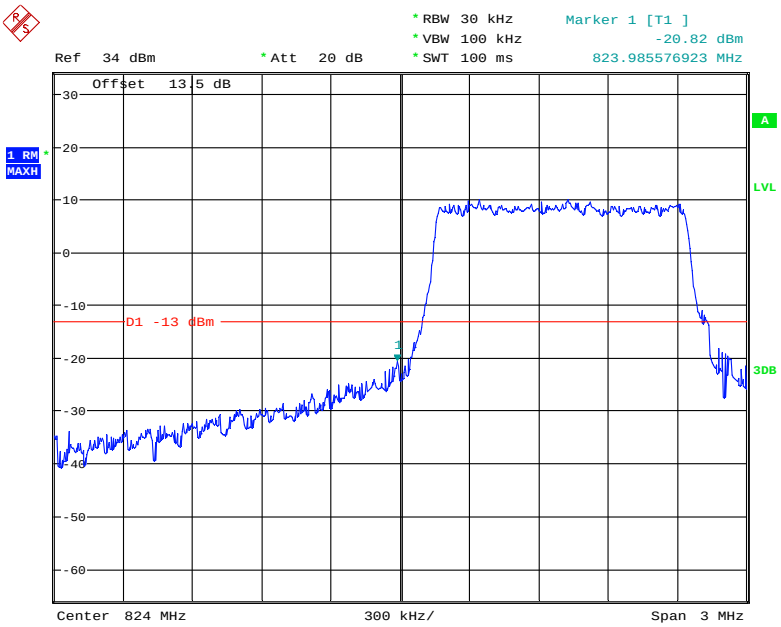
Date: 5.DEC.2018 10:02:21

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



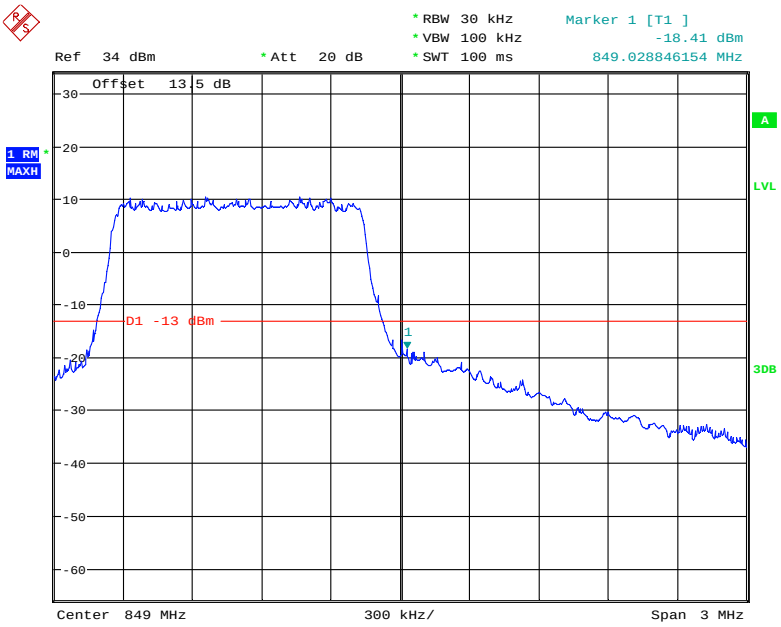
Date: 5.DEC.2018 10:03:06

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



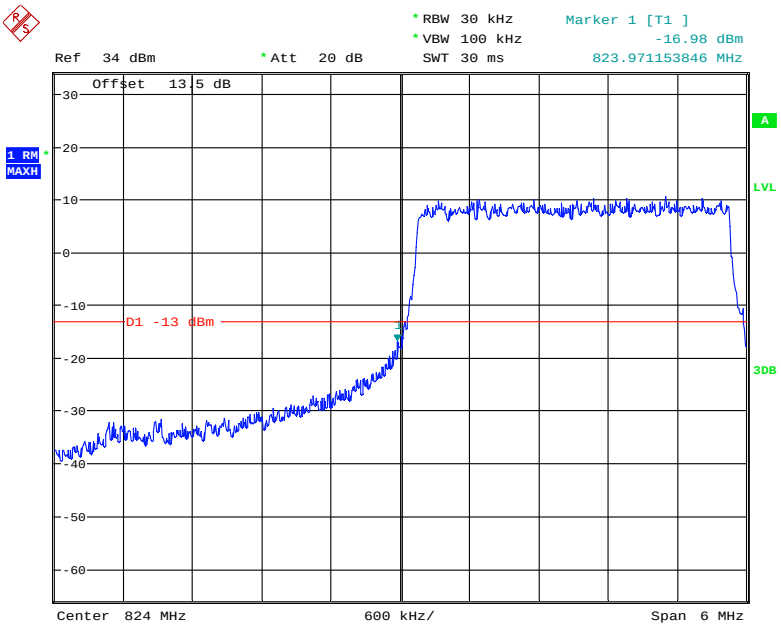
Date: 5.DEC.2018 10:01:41

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



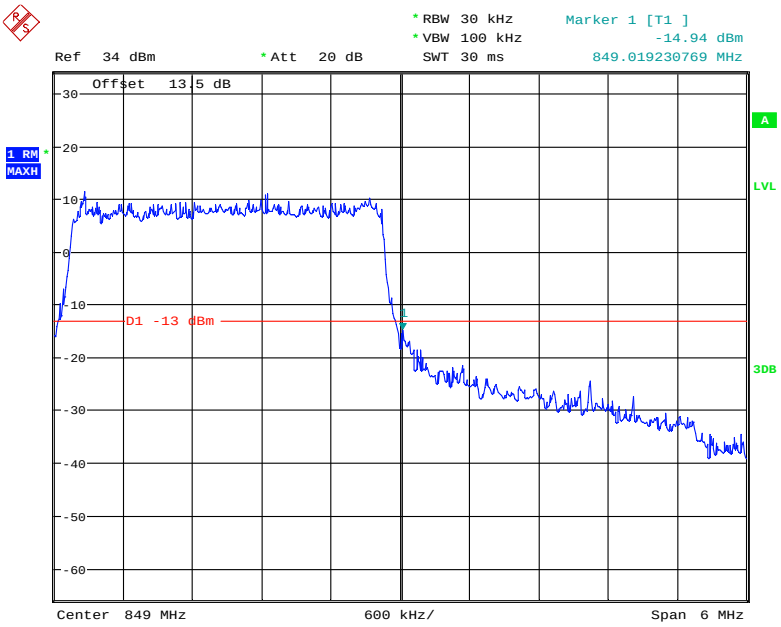
Date: 5.DEC.2018 10:03:40

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



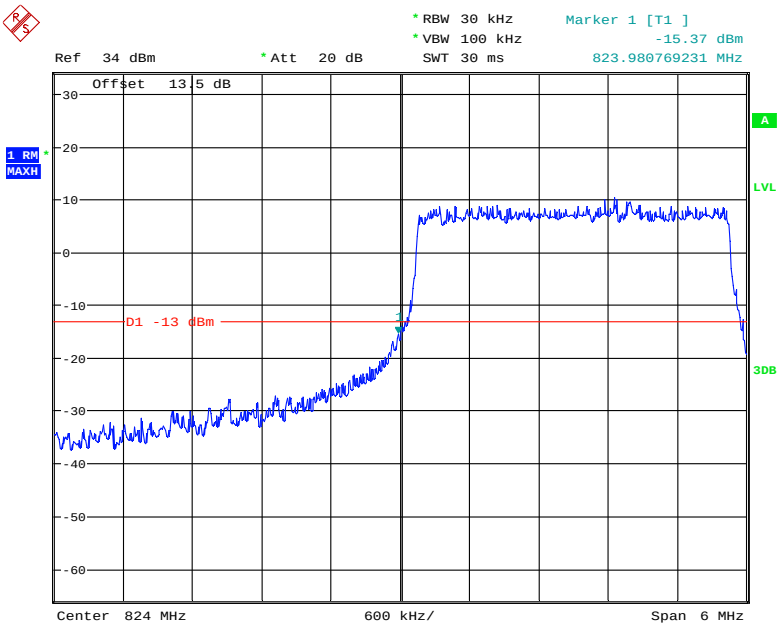
Date: 5.DEC.2018 10:06:59

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



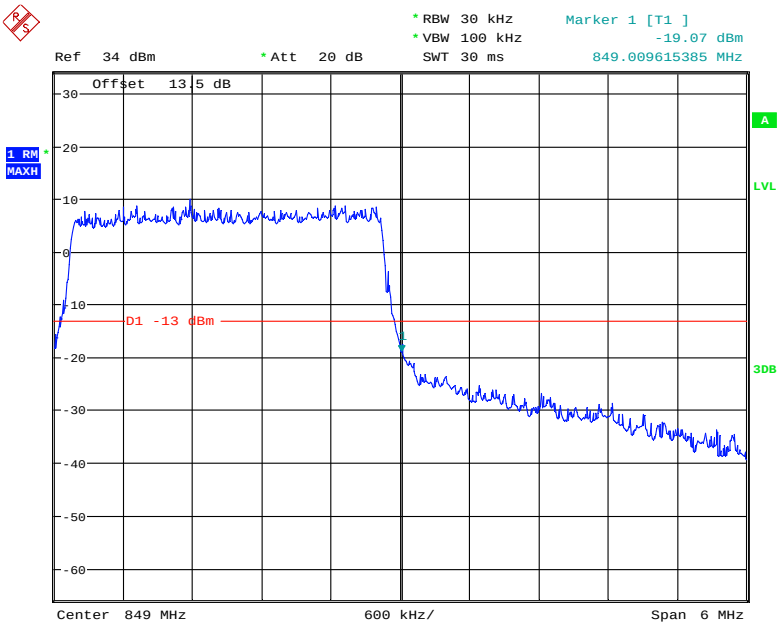
Date: 5.DEC.2018 10:05:15

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



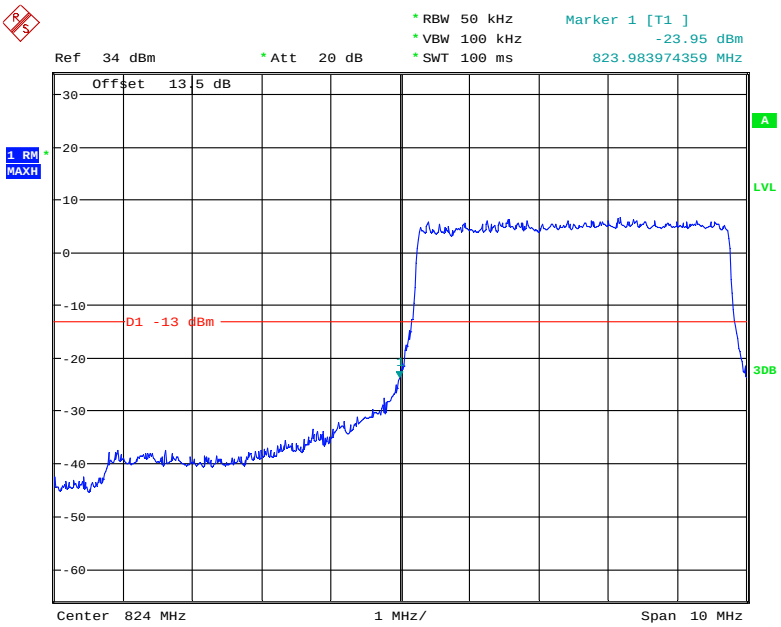
Date: 5.DEC.2018 10:06:30

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



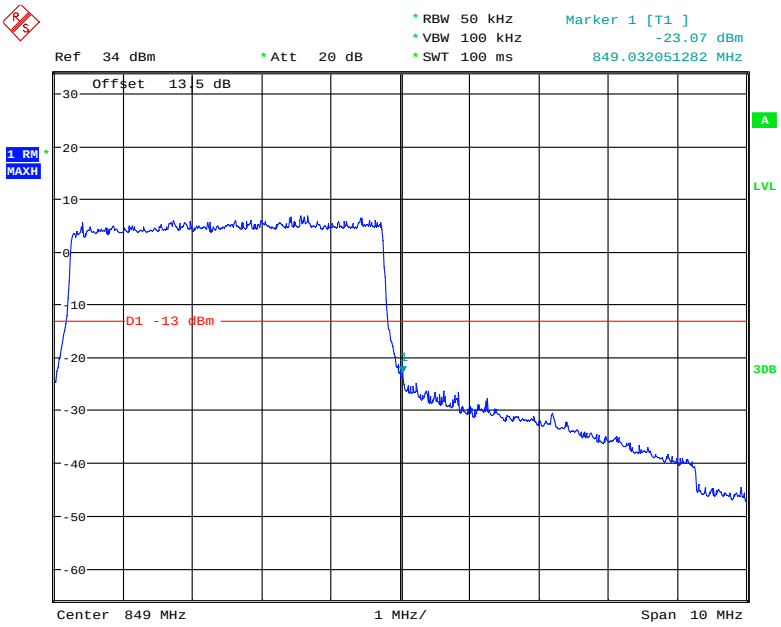
Date: 5.DEC.2018 10:05:51

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



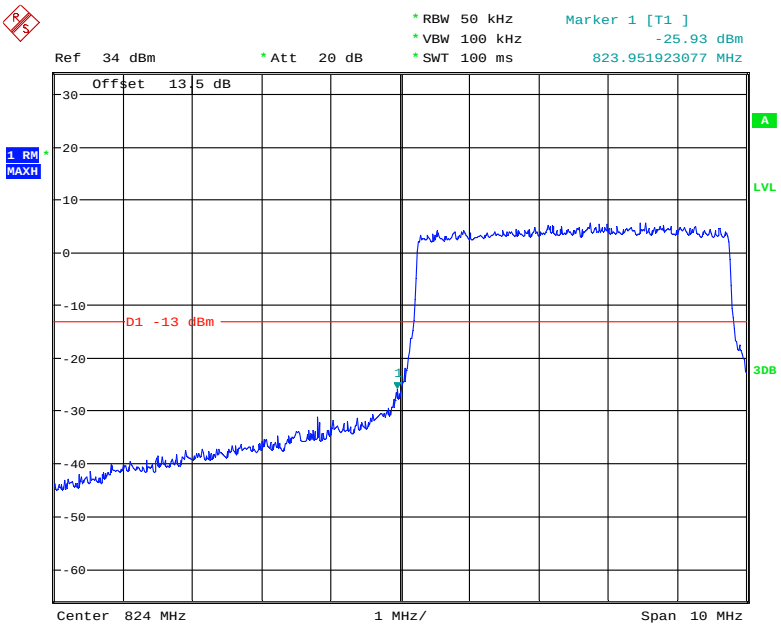
Date: 5.DEC.2018 10:08:32

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



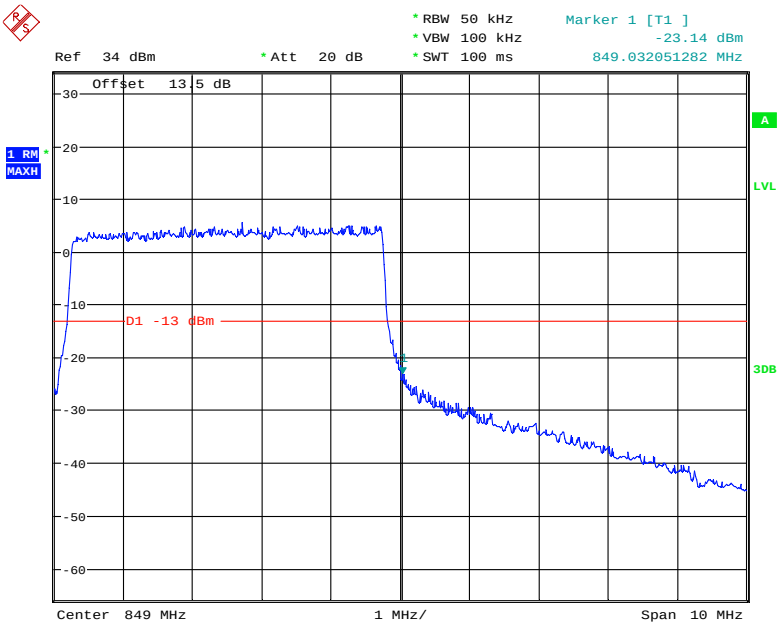
Date: 5.DEC.2018 10:10:23

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



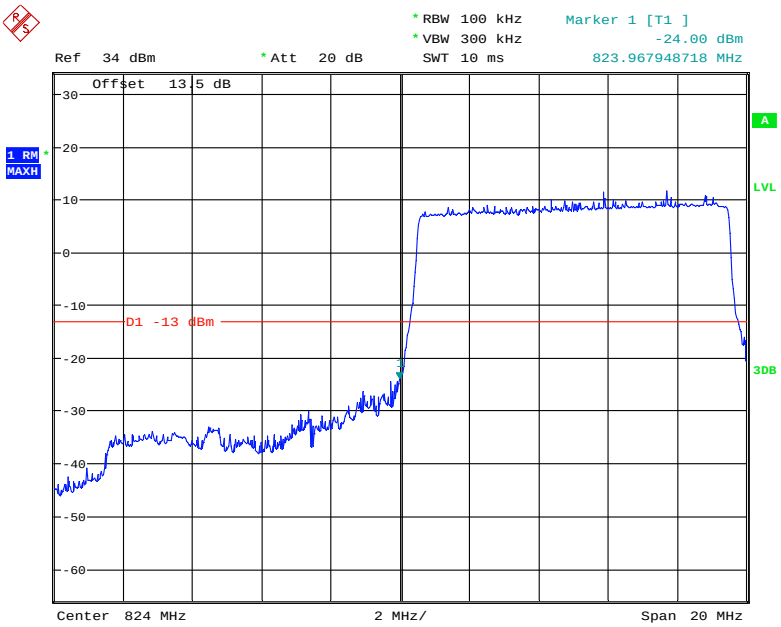
Date: 5.DEC.2018 10:08:55

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



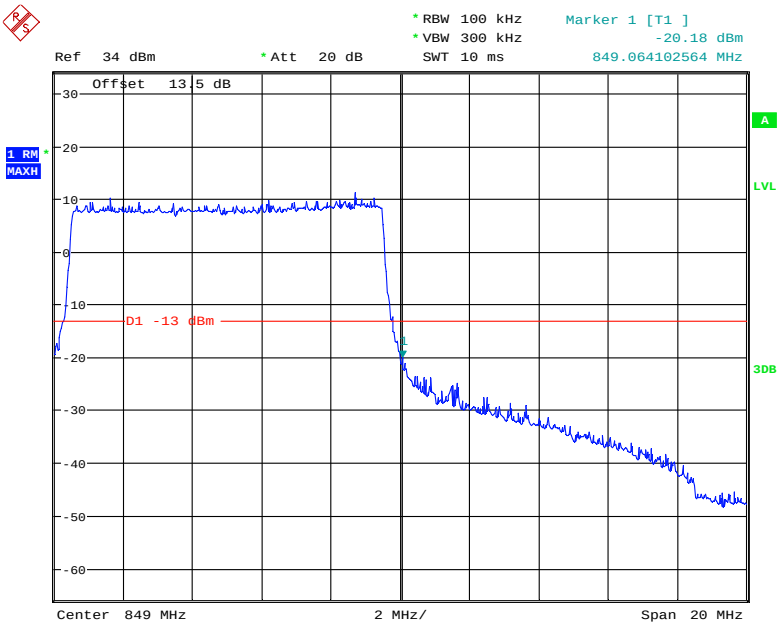
Date: 5.DEC.2018 10:09:49

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



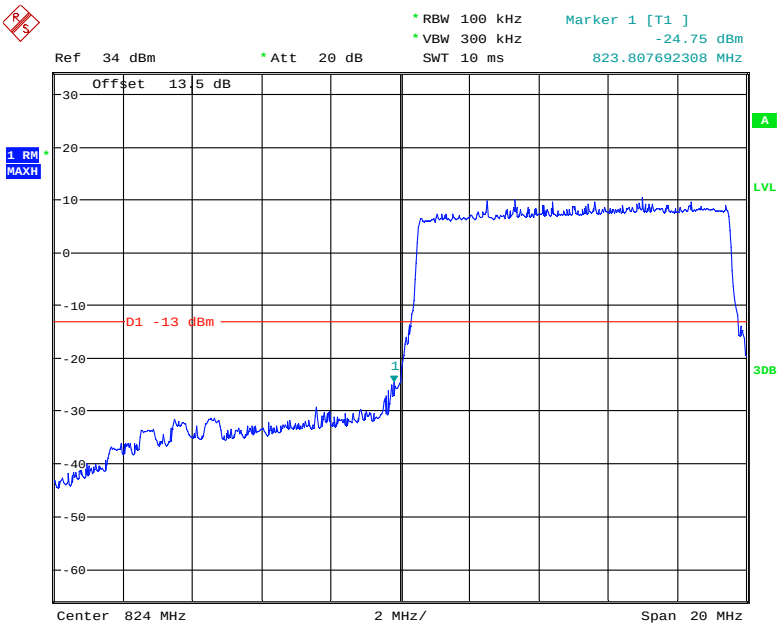
Date: 5.DEC.2018 10:14:06

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



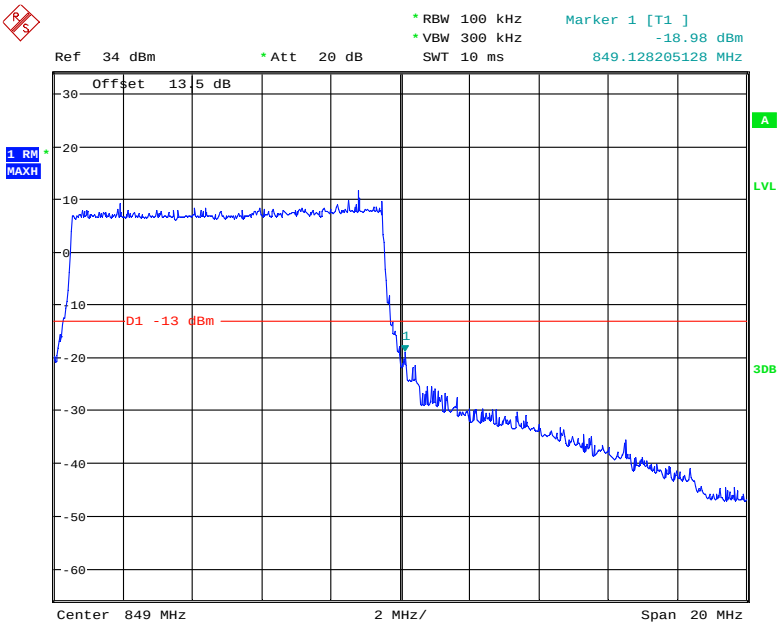
Date: 5.DEC.2018 10:11:42

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



Date: 5.DEC.2018 10:13:24

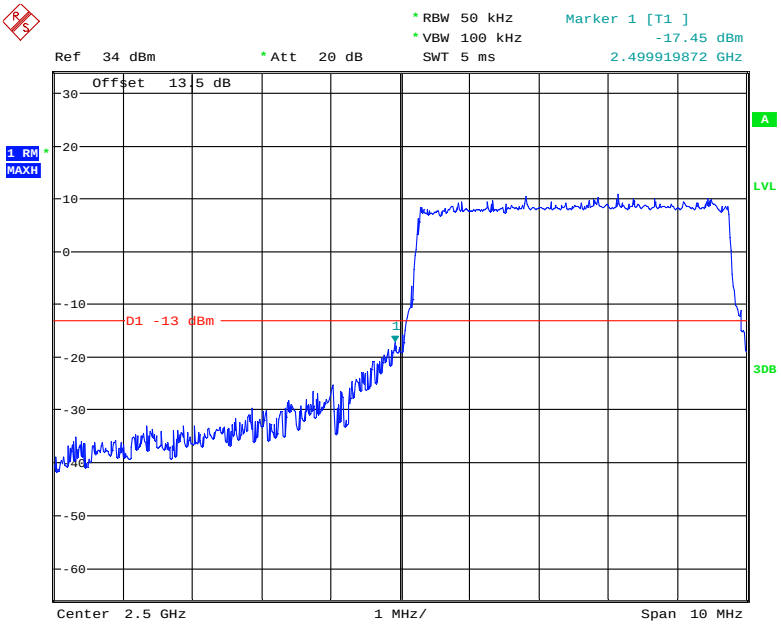
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 5.DEC.2018 10:12:22

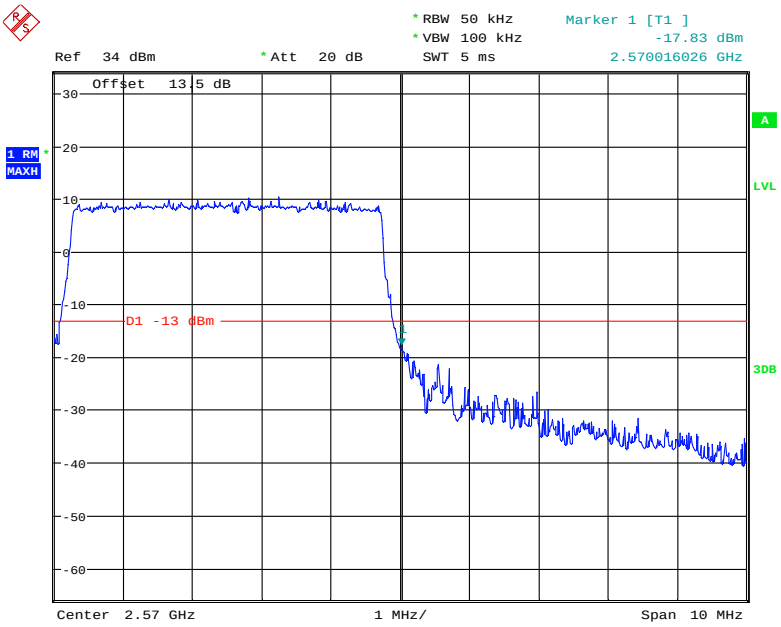
Band 7:

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



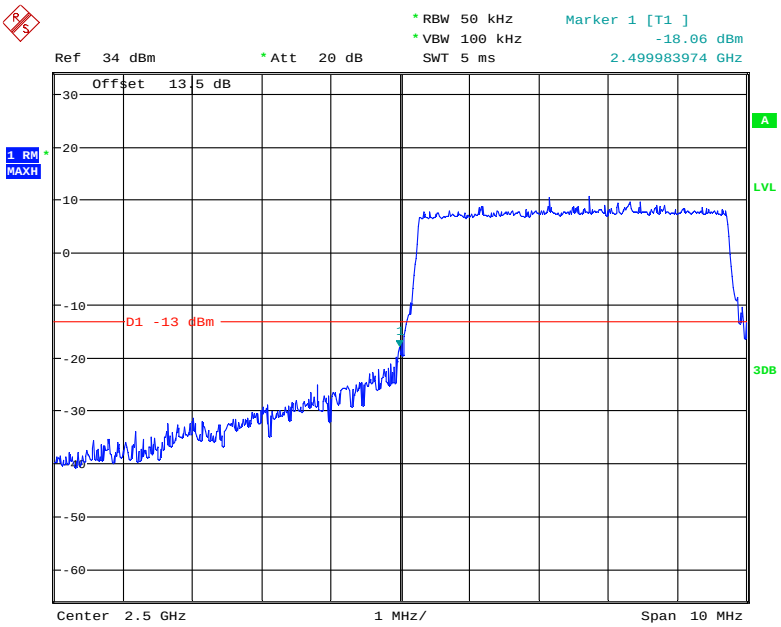
Date: 5.DEC.2018 10:18:25

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



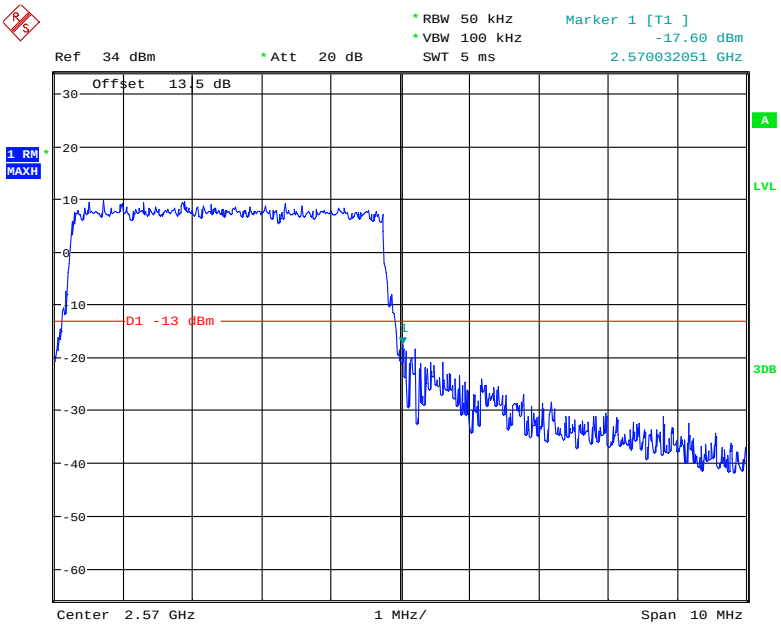
Date: 5.DEC.2018 10:21:33

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



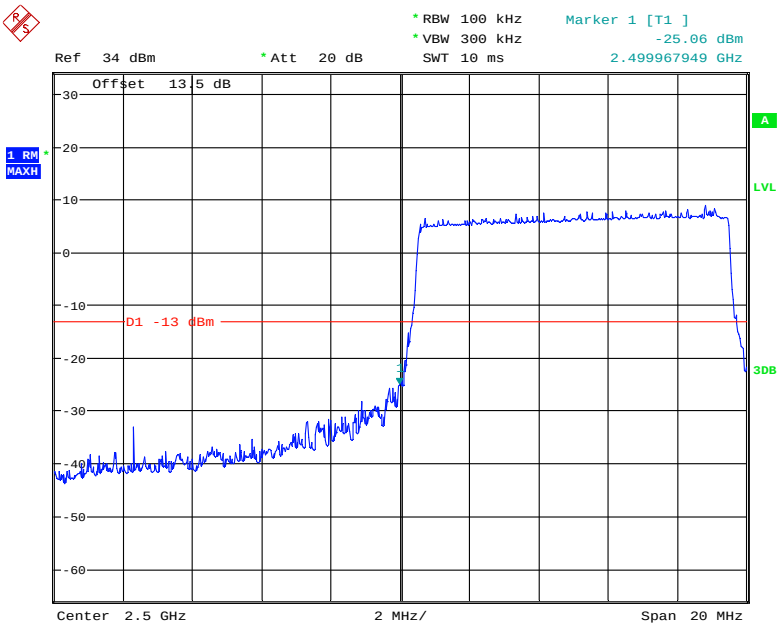
Date: 5.DEC.2018 10:19:07

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



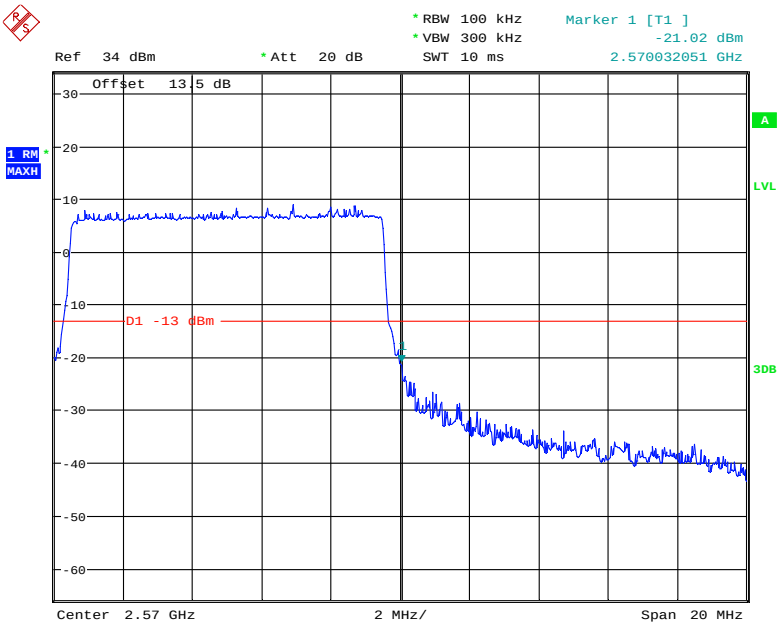
Date: 5.DEC.2018 10:20:27

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



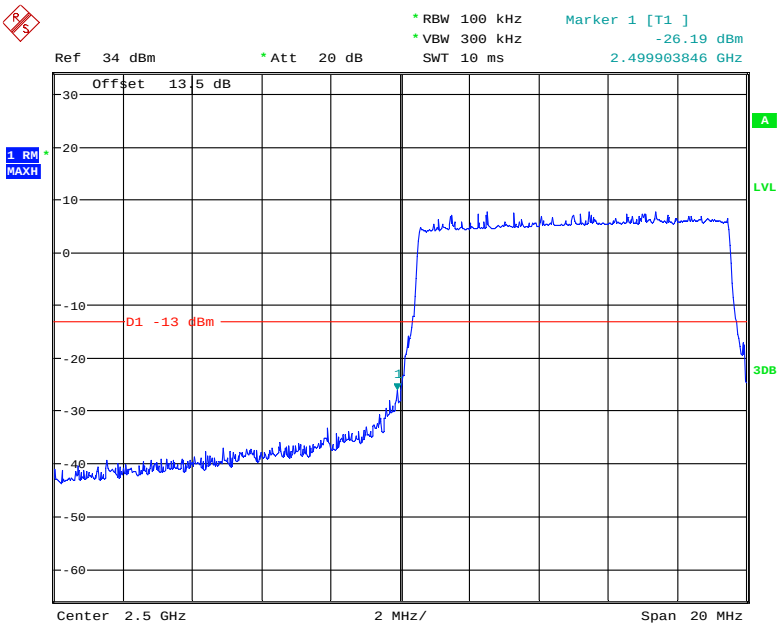
Date: 5.DEC.2018 10:25:28

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



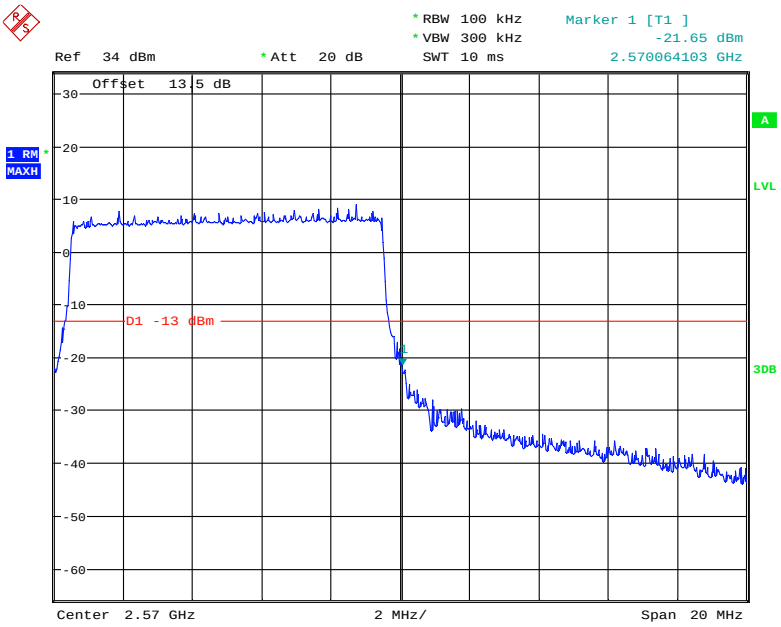
Date: 5.DEC.2018 10:22:46

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



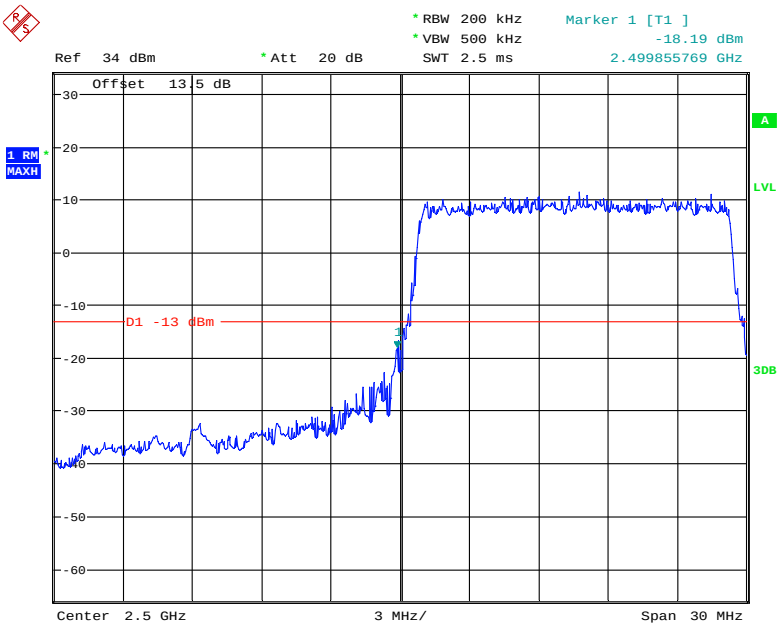
Date: 5.DEC.2018 10:24:42

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



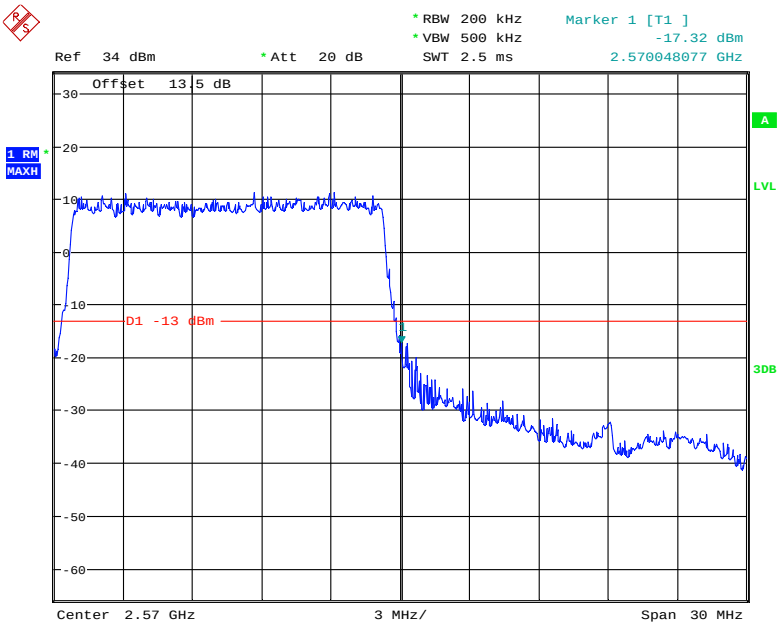
Date: 5.DEC.2018 10:23:27

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



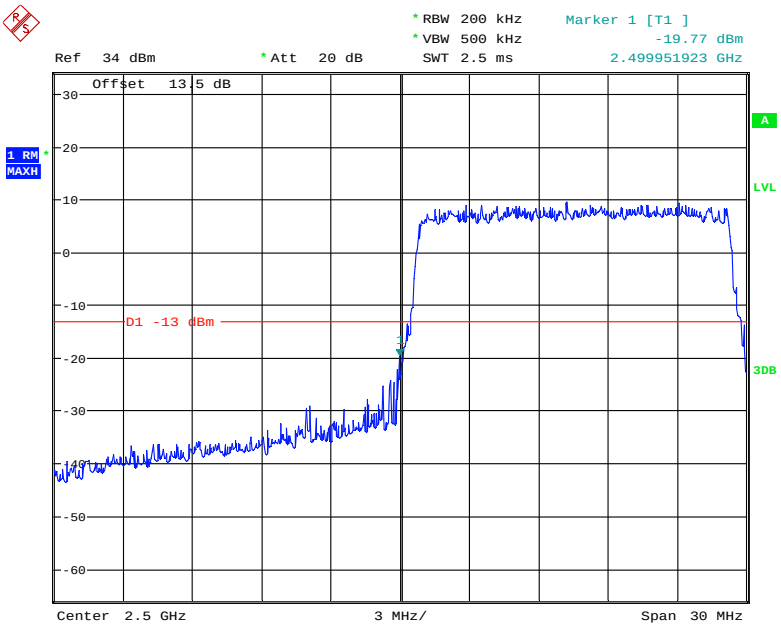
Date: 5.DEC.2018 10:28:31

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



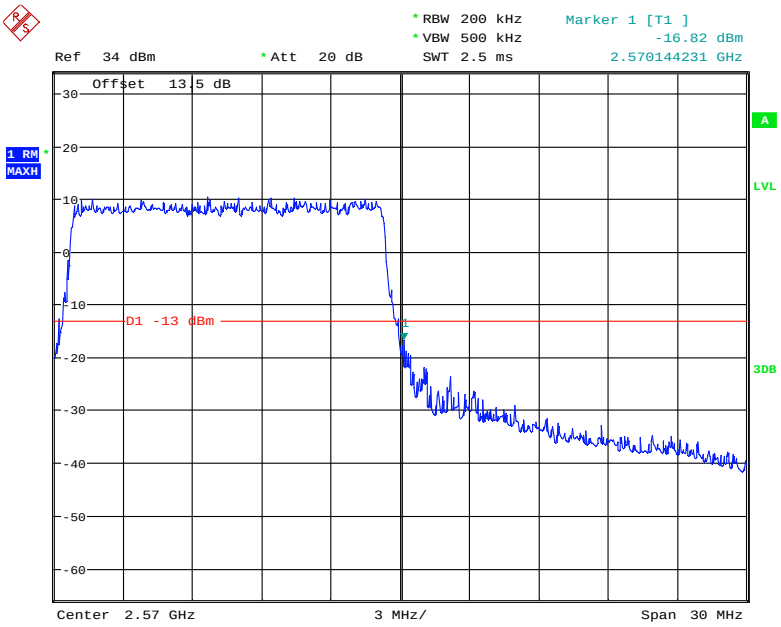
Date: 5.DEC.2018 10:42:24

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



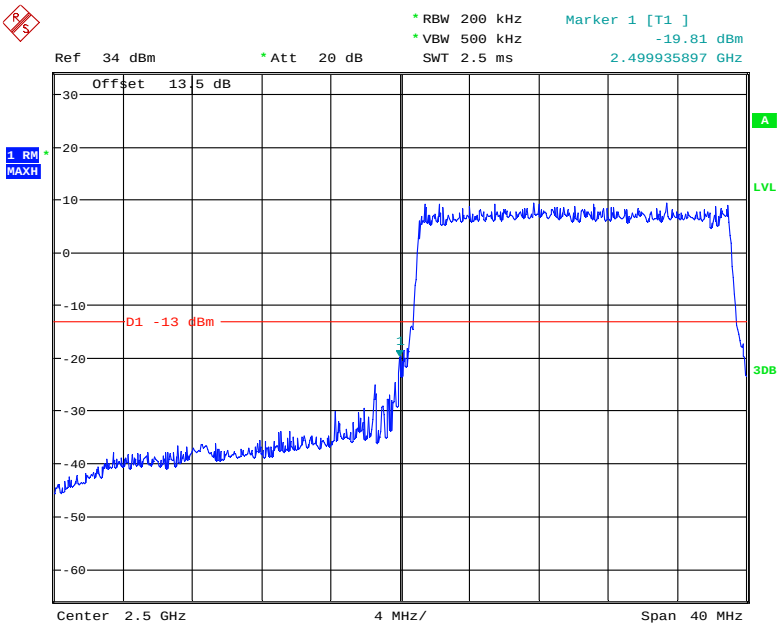
Date: 5.DEC.2018 10:29:18

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



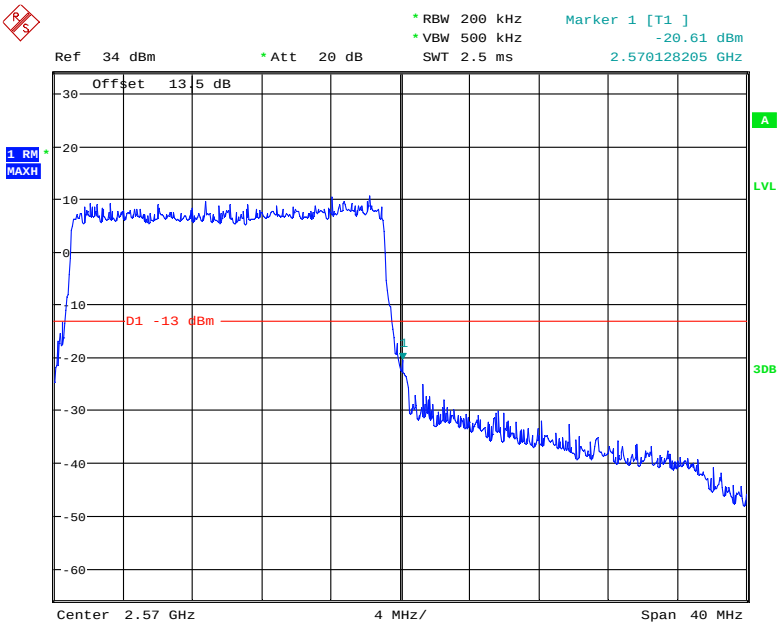
Date: 5.DEC.2018 10:41:52

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



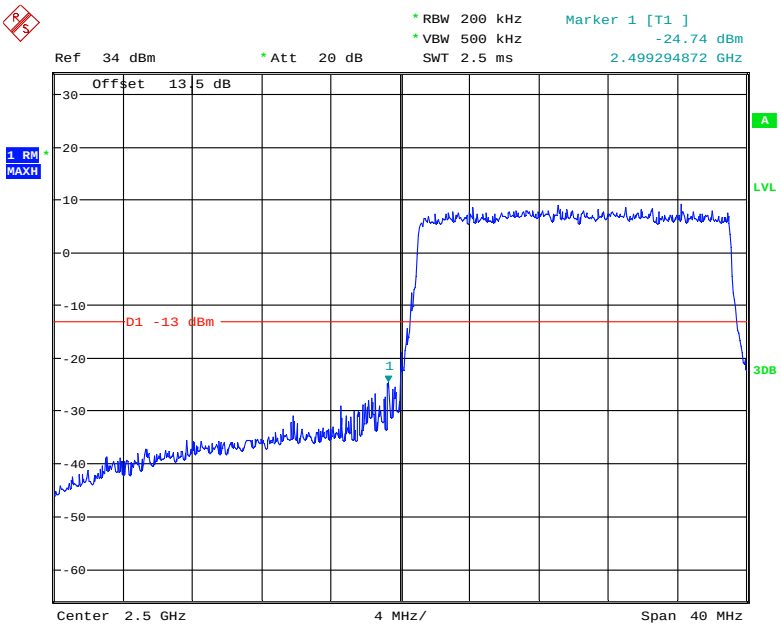
Date: 5.DEC.2018 10:46:08

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



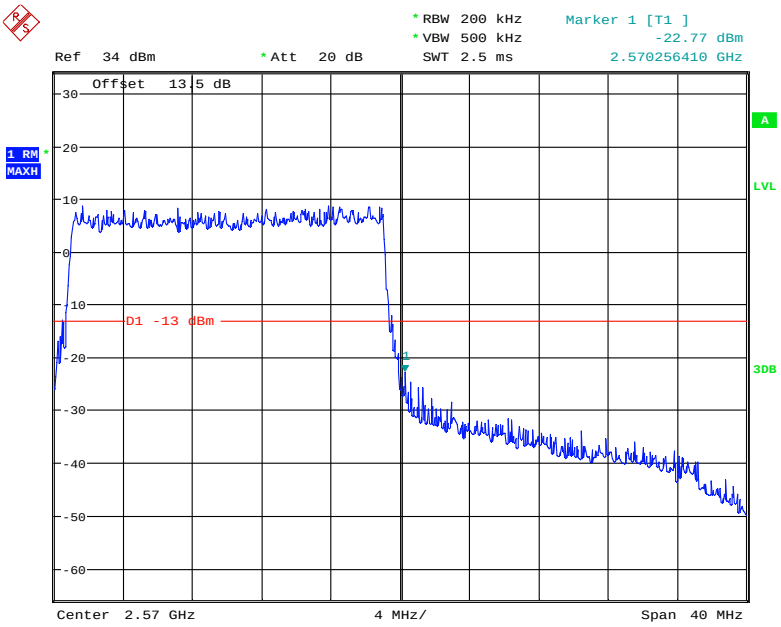
Date: 5.DEC.2018 10:43:19

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



Date: 5.DEC.2018 10:45:35

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



Date: 5.DEC.2018 10:43:46

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

Applicable Standard

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

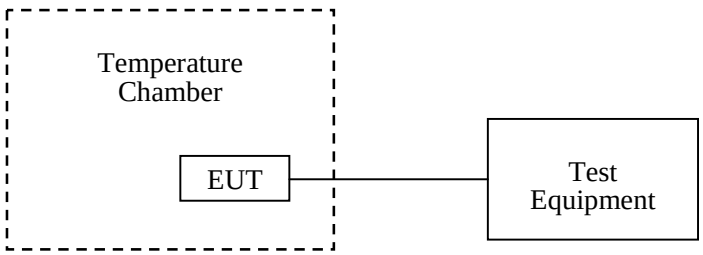
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data

Environmental Conditions

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

The testing was performed by Hill He on 2018-12-05.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	6	0.0072	2.5
-20		7	0.0084	2.5
-10		-5	-0.0060	2.5
0		6	0.0072	2.5
10		7	0.0084	2.5
20		-6	-0.0072	2.5
30		7	0.0084	2.5
40		6	0.0072	2.5
50		8	0.0096	2.5
20	V min.= 3.5	6	0.0072	2.5
	V max.= 4.2	-8	-0.0096	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	3	0.0036	2.5
-20		2	0.0024	2.5
-10		3	0.0036	2.5
0		-3	-0.0036	2.5
10		1	0.0012	2.5
20		1	0.0012	2.5
30		2	0.0024	2.5
40		3	0.0036	2.5
50		3	0.0036	2.5
20	V min.= 3.5	4	0.0048	2.5
	V max.= 4.2	3	0.0036	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.7	5	0.0027	pass
-20		3	0.0016	pass
-10		4	0.0021	pass
0		-4	-0.0021	pass
10		3	0.0016	pass
20		-4	-0.0021	pass
30		6	0.0032	pass
40		5	0.0027	pass
50		4	0.0021	pass
20	V min.= 3.5	-6	-0.0032	pass
	V max.= 4.2	5	0.0027	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.7	-1	-0.0005	pass
-20		-3	-0.0016	pass
-10		-2	-0.0011	pass
0		-3	-0.0016	pass
10		-1	-0.0005	pass
20		-1	-0.0005	pass
30		2	0.0011	pass
40		1	0.0005	pass
50		-1	-0.0005	pass
20	V min.= 3.5	-1	-0.0005	pass
	V max.= 4.2	-2	-0.0011	pass

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.7	-16	-0.008511	pass
-20		-17	-0.009043	pass
-10		-24	-0.012766	pass
0		-23	-0.012234	pass
10		-22	-0.011702	pass
20		-23	-0.012234	pass
30		-25	-0.013298	pass
40		-20	-0.010638	pass
50		-25	-0.013298	pass
20	V min.= 3.5	-26	-0.013830	pass
	V max.= 4.2	-23	-0.012234	pass

Band 4 (5MHz Band width):

Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.7	1710.6928	1754.3598	1710.0000	1755.0000
-20		1710.6918	1754.3168	1710.0000	1755.0000
-10		1710.6974	1754.3931	1710.0000	1755.0000
0		1710.6918	1754.3314	1710.0000	1755.0000
10		1710.7200	1754.3396	1710.0000	1755.0000
20		1710.6410	1754.3154	1710.0000	1755.0000
30		1710.6786	1754.2323	1710.0000	1755.0000
40		1710.6089	1754.2770	1710.0000	1755.0000
50		1710.6322	1754.2576	1710.0000	1755.0000
20	V min.= 3.5	1710.7217	1754.3246	1710.0000	1755.0000
	V max.= 4.2	1710.6990	1754.3044	1710.0000	1755.0000

Band 5:

10.0 MHz Middle Channel, f_o = 836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.7	-18	-0.021518	2.5
-20		-26	-0.031082	2.5
-10		-23	-0.027496	2.5
0		-21	-0.025105	2.5
10		-16	-0.019127	2.5
20		-18	-0.021518	2.5
30		-17	-0.020323	2.5
40		-19	-0.022714	2.5
50		-16	-0.019127	2.5
20	V min.= 3.5	-14	-0.016736	2.5
	V max.= 4.2	-14	-0.016736	2.5

Band 7:

5 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.7	2500.6910	2569.2646	2500	2570
-20		2500.6125	2569.2787	2500	2570
-10		2500.6766	2569.2868	2500	2570
0		2500.6479	2569.2283	2500	2570
10		2500.7389	2569.2270	2500	2570
20		2500.6128	2569.2154	2500	2570
30		2500.6278	2569.2344	2500	2570
40		2500.5716	2569.3035	2500	2570
50		2500.6008	2569.3631	2500	2570
20	V min.= 3.5	2500.6267	2569.2347	2500	2570
	V max.= 4.2	2500.6479	2569.2682	2500	2570

16QAM:

Band 2:

10.0 MHz Middle Channel				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.7	-26	-0.013830	pass
-20		-22	-0.011702	pass
-10		-27	-0.014362	pass
0		-27	-0.014362	pass
10		-25	-0.013298	pass
20		-24	-0.012766	pass
30		-23	-0.012234	pass
40		-20	-0.010638	pass
50		-23	-0.012234	pass
20	V min.= 3.5	-22	-0.011702	pass
	V max.= 4.2	-28	-0.014894	pass

Band 4 (5MHz Band width):

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.7	1710.4537	1754.6261	1710.0000	1755.0000
-20		1710.1602	1754.6483	1710.0000	1755.0000
-10		1710.5010	1754.5570	1710.0000	1755.0000
0		1710.4712	1754.4448	1710.0000	1755.0000
10		1710.8883	1754.5634	1710.0000	1755.0000
20		1710.6310	1754.6258	1710.0000	1755.0000
30		1710.5400	1754.5846	1710.0000	1755.0000
40		1710.6412	1754.3273	1710.0000	1755.0000
50		1710.1317	1754.1339	1710.0000	1755.0000
20	V min.= 3.5	1710.7806	1754.3525	1710.0000	1755.0000
	V max.= 4.2	1710.6047	1754.7342	1710.0000	1755.0000

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	-22	-0.026300	2.5
-20		-23	-0.027496	2.5
-10		-19	-0.022714	2.5
0		-23	-0.027496	2.5
10		-24	-0.028691	2.5
20		-19	-0.022714	2.5
30		-16	-0.019127	2.5
40		-17	-0.020323	2.5
50		-23	-0.027496	2.5
20	V min.= 3.5	-16	-0.019127	2.5
	V max.= 4.2	-26	-0.031082	2.5

Band 7:

5 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.7	2500.6681	2569.2293	2500	2570
-20		2500.6348	2569.2072	2500	2570
-10		2500.8250	2569.9376	2500	2570
0		2500.7404	2569.2108	2500	2570
10		2500.8467	2569.1585	2500	2570
20		2500.6148	2569.1744	2500	2570
30		2500.6091	2569.2216	2500	2570
40		2500.7614	2569.2865	2500	2570
50		2500.6793	2569.1741	2500	2570
20	V min.= 3.5	2500.5426	2569.2285	2500	2570
	V max.= 4.2	2500.7221	2569.1541	2500	2570

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