

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,
DELEGACION CUAJIMALPA DE MORELOS CIUDAD DE MEXICO, Mexico

FCC ID: 2AAA6-LS5718

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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: LS5718 (FCC ID: 2AAA6-LS5718) or the "EUT" in this report was a *Mobile Phone*, which was measured approximately: 15.7 cm (L) * 7.3 cm (W) * 0.9 cm (H), rated with input voltage: DC 3.8 V from rechargeable li-ion battery or DC 5.0V from adapter.

Adapter Information:

Model: SENWAC1A

Input: AC 100-240V, 50/60Hz, 0.15 A

Output: DC 5V, 1 A

**All measurement and test data in this report was gathered from production sample serial number: 180504009 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-05-04.*

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 DTS & DSS submissions with FCC ID: 2AAA6-LS5718.

Test Methodology

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

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D and KDB 971168 D01 v03.

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		$\pm 5\%$
RF output power, conducted		$\pm 1.5\text{dB}$
Unwanted Emission, conducted		$\pm 1.5\text{dB}$
Emissions, radiated	Below 1GHz	$\pm 4.70\text{dB}$
	Above 1GHz	$\pm 4.80\text{dB}$
Temperature		$\pm 1^\circ\text{C}$
Supply voltages		$\pm 0.4\%$

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.

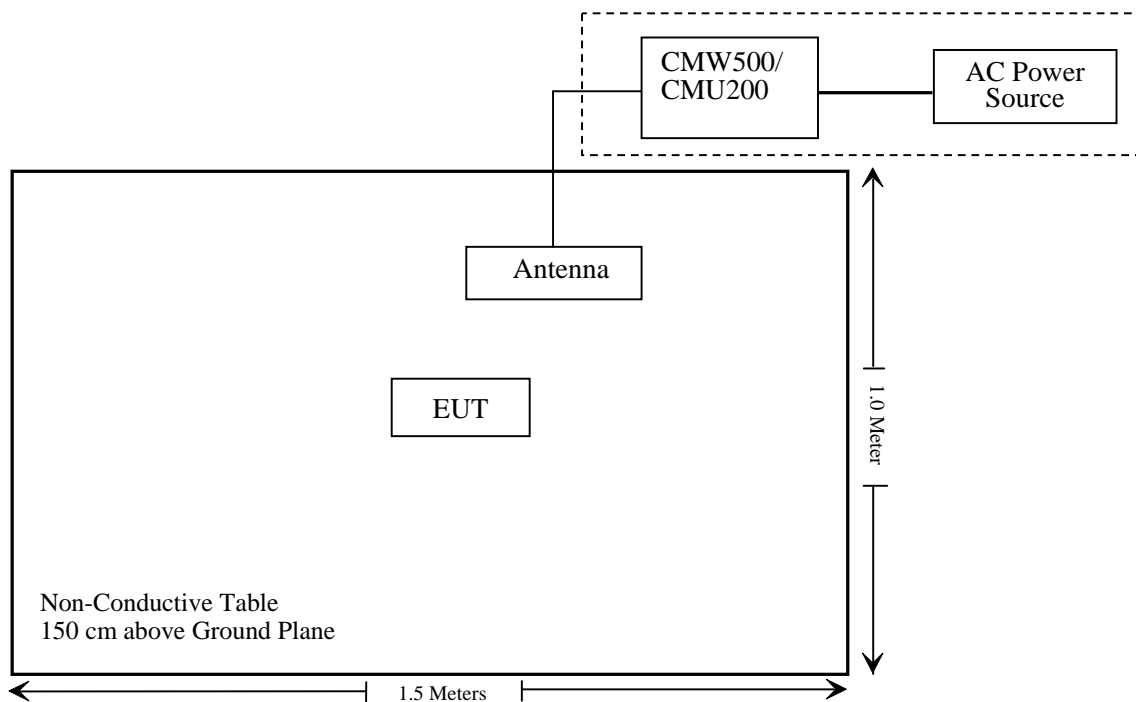
Equipment Modifications

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: RSZ180504009-20A.

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	2018-04-24	2019-04-24
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2018-05-21	2019-05-21
HP	Amplifier	HP8447E	1937A01046	2018-05-21	2018-11-19
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	041000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2018-05-21	2018-11-19
Ducommun technologies	RF Cable	104PEA	218124002	2018-05-21	2018-11-19
Ducommun technologies	RF Cable	RG-214	1	2018-05-21	2018-11-19
Ducommun technologies	RF Cable	RG-214	2	2018-05-22	2018-11-22
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
Ducommun technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03

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
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2017-12-21	2018-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Rohde & Schwarz	Wideband Radio Communication Tester	CMU200	106891	2017-12-14	2018-12-14
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2018-04-24	2019-04-24
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2017-08-19	2018-08-19
Ducommun technologies	RF Cable	RG-214	3	Each Time	
WEINSCHTEL	10dB Attenuator	5324	AU 3842	Each Time	
N/A	Power Splitter	N/A	N/A	2017-05-21	2018-05-21
N/A	Power Splitter	N/A	N/A	2018-05-21	2019-05-21

* 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: RSZ180504009-20A.

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.

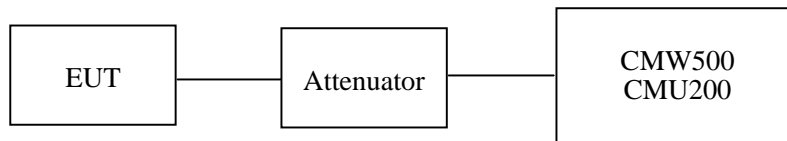
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Nancy Wang on 2018-06-02.

Conducted Power**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	31.31	38.45
	190	836.6	31.26	38.45
	251	848.8	31.32	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.42	29.72	27.82	25.85	38.45
	190	836.6	31.33	29.68	27.77	25.84	38.45
	251	848.8	31.34	29.58	27.66	25.75	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		21.71	21.64	21.64
		HSDPA	1	21.19	21.22	21.06
			2	21.13	21.10	20.98
			3	21.27	21.31	21.10
			4	21.14	21.12	20.99
		HSUPA	1	21.33	21.31	21.29
			2	21.27	21.19	21.23
			3	21.44	21.41	21.35
			4	21.23	21.23	21.24
			5	21.39	21.42	21.39
		HSPA+	1	21.03	20.84	20.81

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.58	33
	661	1880.0	28.47	33
	810	1909.8	28.35	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.56	26.35	24.86	22.74	33
	661	1880.0	28.49	26.48	24.94	22.85	33
	810	1909.8	28.43	26.32	24.73	22.58	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		21.81	21.85	21.86
		HSDPA	1	21.38	20.87	20.86
			2	21.26	20.75	20.81
			3	21.44	20.90	20.99
			4	21.30	20.79	20.76
		HSUPA	1	21.36	20.92	20.88
			2	21.27	20.83	20.80
			3	21.46	21.02	20.93
			4	21.32	20.84	20.76
			5	21.45	21.02	20.97
		HSPA+	1	21.17	20.73	20.64

Peak-to-average ratio (PAR)**Cellular Band**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.23	13
	Middle	0.18	13
	High	0.22	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.09	13
	Middle	3.20	13
	High	3.83	13
HSDPA (16QAM)	Low	3.35	13
	Middle	3.57	13
	High	3.82	13
HSUPA (BPSK)	Low	3.51	13
	Middle	3.02	13
	High	3.24	13
HSPA+	Low	3.26	13
	Middle	3.13	13
	High	3.17	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.21	13
	Middle	0.09	13
	High	0.14	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.82	13
	Middle	3.18	13
	High	3.50	13
HSDPA (16QAM)	Low	3.22	13
	Middle	3.66	13
	High	3.28	13
HSUPA (BPSK)	Low	3.29	13
	Middle	3.23	13
	High	3.04	13
HSPA+	Low	3.28	13
	Middle	3.14	13
	High	3.04	13

Radiated Power**GSM Mode:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	93.54	42	2.3	H	31.1	0.7	0.0	30.40	38.45	8.05
836.6	88.31	10	2.0	V	27.9	0.7	0.0	27.20	38.45	11.25
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	90.11	24	2.0	H	20.1	1.30	9.40	28.20	33	4.8
1880.00	87.46	27	1.3	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)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	81.62	332	2.3	H	19.2	0.7	0.0	18.50	38.45	19.95
836.6	76.31	22	2.1	V	15.9	0.7	0.0	15.20	38.45	23.25
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	81.02	2	1.7	H	11.0	1.30	9.40	19.10	33	13.9
1880.00	77.47	323	1.5	V	7.2	1.30	9.40	15.30	33	17.7

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit - Absolute Level

LTE Band 2:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.62	22.24	22.25
		RB Size=1, RB Offset=2	22.45	22.93	22.64
		RB Size=1, RB Offset=5	22.30	22.43	22.58
		RB Size=3, RB Offset=0	22.43	22.61	23.14
		RB Size=3, RB Offset=1	22.65	23.10	22.70
		RB Size=3, RB Offset=2	22.32	22.74	23.24
		RB Size=6, RB Offset=0	21.35	22.00	22.01
	16QAM	RB Size=1, RB Offset=0	21.61	21.48	21.74
		RB Size=1, RB Offset=2	21.83	22.01	22.14
		RB Size=1, RB Offset=5	21.69	22.06	21.76
		RB Size=3, RB Offset=0	22.69	22.00	21.34
		RB Size=3, RB Offset=1	22.76	21.31	21.66
		RB Size=3, RB Offset=2	21.60	22.10	21.90
		RB Size=6, RB Offset=0	20.57	20.88	20.78
3.0	QPSK	RB Size=1, RB Offset=0	22.15	21.54	21.51
		RB Size=1, RB Offset=7	22.64	22.72	22.43
		RB Size=1, RB Offset=14	22.77	22.73	22.49
		RB Size=8, RB Offset=0	21.37	21.79	21.95
		RB Size=8, RB Offset=4	21.73	21.95	21.66
		RB Size=8, RB Offset=7	21.73	22.07	21.24
		RB Size=15, RB Offset=0	21.87	21.93	21.50
	16QAM	RB Size=1, RB Offset=0	21.45	21.49	21.69
		RB Size=1, RB Offset=7	21.89	21.54	21.61
		RB Size=1, RB Offset=14	21.70	21.44	21.94
		RB Size=8, RB Offset=0	20.87	21.17	20.94
		RB Size=8, RB Offset=4	20.68	21.14	21.19
		RB Size=8, RB Offset=7	20.94	20.73	21.07
		RB Size=15, RB Offset=0	21.22	20.57	20.68

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	22.32	22.37	22.73
		RB Size=1, RB Offset=12	22.99	22.66	23.26
		RB Size=1, RB Offset=24	22.67	22.69	22.58
		RB Size=12, RB Offset=0	21.62	21.86	22.07
		RB Size=12, RB Offset=6	21.83	21.59	21.52
		RB Size=12, RB Offset=11	22.05	21.68	21.39
		RB Size=25, RB Offset=0	21.66	21.61	22.02
	16QAM	RB Size=1, RB Offset=0	21.49	21.66	21.71
		RB Size=1, RB Offset=12	21.49	21.82	21.68
		RB Size=1, RB Offset=24	21.40	22.01	22.00
		RB Size=12, RB Offset=0	20.76	20.97	20.92
		RB Size=12, RB Offset=6	20.70	20.90	21.06
		RB Size=12, RB Offset=11	21.07	20.74	20.99
		RB Size=25, RB Offset=0	20.75	20.82	20.75
10.0	QPSK	RB Size=1, RB Offset=0	22.33	22.45	22.46
		RB Size=1, RB Offset=24	22.80	23.09	22.61
		RB Size=1, RB Offset=49	22.79	22.71	22.44
		RB Size=25, RB Offset=0	21.83	21.61	21.98
		RB Size=25, RB Offset=12	21.55	21.81	21.37
		RB Size=25, RB Offset=24	21.49	21.82	21.43
		RB Size=50, RB Offset=0	21.47	21.59	21.78
	16QAM	RB Size=1, RB Offset=0	21.72	21.41	21.82
		RB Size=1, RB Offset=24	22.85	22.51	22.62
		RB Size=1, RB Offset=49	22.35	22.55	22.55
		RB Size=25, RB Offset=0	20.74	20.94	20.32
		RB Size=25, RB Offset=12	20.96	20.69	20.70
		RB Size=25, RB Offset=24	20.67	21.00	20.95
		RB Size=50, RB Offset=0	20.92	21.08	20.54

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	22.29	22.41	22.60
		RB Size=1, RB Offset=37	22.49	22.56	23.05
		RB Size=1, RB Offset=74	22.81	22.98	22.51
		RB Size=36, RB Offset=0	21.77	21.91	21.25
		RB Size=36, RB Offset=18	22.07	21.85	22.10
		RB Size=36, RB Offset=37	22.09	21.81	21.84
		RB Size=75, RB Offset=0	21.52	22.06	21.27
	16QAM	RB Size=1, RB Offset=0	21.48	21.68	21.71
		RB Size=1, RB Offset=37	21.90	21.94	21.84
		RB Size=1, RB Offset=74	22.08	21.91	21.95
		RB Size=36, RB Offset=0	20.91	20.68	21.23
		RB Size=36, RB Offset=18	20.91	20.79	21.05
		RB Size=36, RB Offset=37	20.87	20.94	20.71
		RB Size=75, RB Offset=0	20.67	20.72	22.93
20.0	QPSK	RB Size=1, RB Offset=0	22.64	22.33	22.33
		RB Size=1, RB Offset=49	22.49	22.65	23.05
		RB Size=1, RB Offset=99	23.03	22.64	22.69
		RB Size=50, RB Offset=0	22.26	21.57	21.61
		RB Size=50, RB Offset=24	21.55	21.79	22.03
		RB Size=50, RB Offset=49	21.85	22.17	21.58
		RB Size=100, RB Offset=0	21.51	21.89	21.78
	16QAM	RB Size=1, RB Offset=0	21.64	21.33	21.57
		RB Size=1, RB Offset=49	22.72	22.25	23.10
		RB Size=1, RB Offset=99	21.87	22.73	22.60
		RB Size=50, RB Offset=0	21.42	20.93	21.78
		RB Size=50, RB Offset=24	21.21	21.00	20.79
		RB Size=50, RB Offset=49	21.13	21.36	20.81
		RB Size=100, RB Offset=0	20.91	20.78	20.67

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.12	13	Pass
QPSK (100RB Size)	6.43	13	Pass
16QAM (1RB Size)	6.95	13	Pass
16QAM (100RB Size)	6.87	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	82.36	356	2.3	H	12.3	1.30	9.40	20.40	33
1880.00	83.18	203	1.1	V	12.9	1.30	9.40	21.00	33
3 MHz Bandwidth									
1880.00	83.42	237	1.4	H	13.4	1.30	9.40	21.50	33
1880.00	83.74	107	2.3	V	13.5	1.30	9.40	21.60	33
5 MHz Bandwidth									
1880.00	82.98	259	1.1	H	12.9	1.30	9.40	21.00	33
1880.00	83.69	136	2.1	V	13.4	1.30	9.40	21.50	33
10 MHz Bandwidth									
1880.00	82.97	267	2.1	H	12.9	1.30	9.40	21.00	33
1880.00	82.75	317	1.4	V	12.5	1.30	9.40	20.60	33
15 MHz Bandwidth									
1880.00	83.08	287	1.2	H	13.0	1.30	9.40	21.10	33
1880.00	83.57	307	1.4	V	13.3	1.30	9.40	21.40	33
20 MHz Bandwidth									
1880.00	83.42	279	1.6	H	13.4	1.30	9.40	21.50	33
1880.00	82.99	1	1.9	V	12.7	1.30	9.40	20.80	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	83.56	255	1.0	H	13.5	1.30	9.40	21.60	33
1880.00	82.49	263	1.6	V	12.2	1.30	9.40	20.30	33
3 MHz Bandwidth									
1880.00	83.86	222	1.8	H	13.8	1.30	9.40	21.90	33
1880.00	82.76	322	1.4	V	12.5	1.30	9.40	20.60	33
5 MHz Bandwidth									
1880.00	83.96	197	1.6	H	13.9	1.30	9.40	22.00	33
1880.00	83.21	92	2.1	V	12.9	1.30	9.40	21.00	33
10 MHz Bandwidth									
1880.00	83.12	55	1.2	H	13.1	1.30	9.40	21.20	33
1880.00	82.09	269	1.6	V	11.8	1.30	9.40	19.90	33
15 MHz Bandwidth									
1880.00	83.62	334	1.3	H	13.6	1.30	9.40	21.70	33
1880.00	82.54	195	1.5	V	12.3	1.30	9.40	20.40	33
20 MHz Bandwidth									
1880.00	83.51	131	1.9	H	13.5	1.30	9.40	21.60	33
1880.00	82.11	30	2.0	V	11.8	1.30	9.40	19.90	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	21.71	22.01	21.92
		RB Size=1, RB Offset=2	22.55	22.59	22.73
		RB Size=1, RB Offset=5	22.50	22.73	22.78
		RB Size=3, RB Offset=0	22.35	22.79	23.25
		RB Size=3, RB Offset=1	22.70	23.00	22.72
		RB Size=3, RB Offset=2	22.59	22.89	23.03
		RB Size=6, RB Offset=0	21.36	21.90	21.96
	16QAM	RB Size=1, RB Offset=0	21.00	20.69	21.09
		RB Size=1, RB Offset=2	21.74	21.96	21.86
		RB Size=1, RB Offset=5	21.61	22.08	22.09
		RB Size=3, RB Offset=0	22.59	22.03	21.17
		RB Size=3, RB Offset=1	23.02	21.53	21.59
		RB Size=3, RB Offset=2	21.83	21.95	21.61
		RB Size=6, RB Offset=0	21.01	20.68	20.91
3.0	QPSK	RB Size=1, RB Offset=0	21.76	21.89	22.00
		RB Size=1, RB Offset=7	22.66	22.71	22.61
		RB Size=1, RB Offset=14	23.14	22.72	22.67
		RB Size=8, RB Offset=0	21.39	21.75	21.80
		RB Size=8, RB Offset=4	22.04	21.93	21.81
		RB Size=8, RB Offset=7	21.65	21.95	21.34
		RB Size=15, RB Offset=0	21.50	21.62	21.59
	16QAM	RB Size=1, RB Offset=0	21.10	20.78	21.00
		RB Size=1, RB Offset=7	21.96	21.65	21.84
		RB Size=1, RB Offset=14	21.98	21.66	21.59
		RB Size=8, RB Offset=0	20.75	20.96	21.13
		RB Size=8, RB Offset=4	20.63	20.75	20.70
		RB Size=8, RB Offset=7	20.82	20.64	21.33
		RB Size=15, RB Offset=0	21.13	21.00	20.93

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	21.70	21.90	21.68
		RB Size=1, RB Offset=12	22.67	22.77	23.32
		RB Size=1, RB Offset=24	22.74	22.53	22.68
		RB Size=12, RB Offset=0	21.39	22.06	21.72
		RB Size=12, RB Offset=6	21.68	21.61	21.81
		RB Size=12, RB Offset=11	21.83	21.57	21.63
		RB Size=25, RB Offset=0	21.79	21.63	21.89
	16QAM	RB Size=1, RB Offset=0	21.07	21.52	20.92
		RB Size=1, RB Offset=12	21.35	21.84	21.76
		RB Size=1, RB Offset=24	21.12	21.96	22.16
		RB Size=12, RB Offset=0	20.59	20.85	21.13
		RB Size=12, RB Offset=6	20.94	20.80	21.12
		RB Size=12, RB Offset=11	20.78	20.81	20.63
		RB Size=25, RB Offset=0	20.63	20.81	20.74
10.0	QPSK	RB Size=1, RB Offset=0	21.66	21.90	22.05
		RB Size=1, RB Offset=24	22.90	23.05	22.59
		RB Size=1, RB Offset=49	22.70	22.88	22.37
		RB Size=25, RB Offset=0	21.76	21.71	21.68
		RB Size=25, RB Offset=12	21.73	21.68	21.45
		RB Size=25, RB Offset=24	21.38	21.78	21.72
		RB Size=50, RB Offset=0	21.76	21.44	21.97
	16QAM	RB Size=1, RB Offset=0	20.58	20.62	20.93
		RB Size=1, RB Offset=24	22.67	22.52	22.72
		RB Size=1, RB Offset=49	22.42	22.50	22.89
		RB Size=25, RB Offset=0	20.87	21.11	20.58
		RB Size=25, RB Offset=12	20.92	20.73	20.56
		RB Size=25, RB Offset=24	20.84	20.84	20.83
		RB Size=50, RB Offset=0	21.10	21.01	20.80

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	21.48	21.48	21.83
		RB Size=1, RB Offset=37	22.33	22.58	22.99
		RB Size=1, RB Offset=74	23.08	22.92	22.80
		RB Size=36, RB Offset=0	21.48	21.60	21.35
		RB Size=36, RB Offset=18	21.94	21.93	21.97
		RB Size=36, RB Offset=37	22.18	21.97	21.43
		RB Size=75, RB Offset=0	21.61	22.18	21.39
	16QAM	RB Size=1, RB Offset=0	20.58	20.87	21.30
		RB Size=1, RB Offset=37	21.82	21.66	21.51
		RB Size=1, RB Offset=74	22.02	21.44	22.00
		RB Size=36, RB Offset=0	21.04	20.96	20.98
		RB Size=36, RB Offset=18	21.01	20.66	21.32
		RB Size=36, RB Offset=37	20.71	20.73	20.66
		RB Size=75, RB Offset=0	20.62	20.88	22.85
20.0	QPSK	RB Size=1, RB Offset=0	21.94	22.00	21.95
		RB Size=1, RB Offset=49	22.65	22.54	22.77
		RB Size=1, RB Offset=99	22.56	22.74	22.76
		RB Size=50, RB Offset=0	22.16	21.38	21.48
		RB Size=50, RB Offset=24	21.36	21.57	22.12
		RB Size=50, RB Offset=49	21.98	22.07	21.57
		RB Size=100, RB Offset=0	21.30	22.08	21.68
	16QAM	RB Size=1, RB Offset=0	20.83	26.27	21.03
		RB Size=1, RB Offset=49	22.51	22.15	23.05
		RB Size=1, RB Offset=99	21.67	22.88	22.79
		RB Size=50, RB Offset=0	21.05	21.13	22.04
		RB Size=50, RB Offset=24	20.91	20.57	20.78
		RB Size=50, RB Offset=49	21.10	21.47	21.07
		RB Size=100, RB Offset=0	20.90	20.58	20.74

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.23	13	Pass
QPSK (100RB Size)	6.43	13	Pass
16QAM (1RB Size)	5.20	13	Pass
16QAM (100RB Size)	5.73	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	85.96	75	2.1	H	12.8	1.30	8.90	20.40	30
1732.50	86.17	33	2.4	V	13.6	1.30	8.90	21.20	30
3 MHz Bandwidth									
1732.50	85.23	236	2.5	H	12.1	1.30	8.90	19.70	30
1732.50	85.65	336	2.2	V	13.1	1.30	8.90	20.70	30
5 MHz Bandwidth									
1732.50	86.10	264	1.2	H	12.9	1.30	8.90	20.50	30
1732.50	85.23	109	1.0	V	12.7	1.30	8.90	20.30	30
10 MHz Bandwidth									
1732.50	86.94	286	1.5	H	13.8	1.30	8.90	21.40	30
1732.50	85.12	220	1.8	V	12.6	1.30	8.90	20.20	30
15 MHz Bandwidth									
1732.50	86.87	338	1.2	H	13.7	1.30	8.90	21.30	30
1732.50	85.08	220	1.2	V	12.5	1.30	8.90	20.10	30
20 MHz Bandwidth									
1732.50	86.62	273	2.4	H	13.5	1.30	8.90	21.10	30
1732.50	85.67	183	2.1	V	13.1	1.30	8.90	20.70	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	85.69	143	1.1	H	12.5	1.30	8.90	20.10	30
1732.50	85.44	350	1.1	V	12.9	1.30	8.90	20.50	30
3 MHz Bandwidth									
1732.50	86.27	229	1.2	H	13.1	1.30	8.90	20.70	30
1732.50	85.47	244	1.3	V	12.9	1.30	8.90	20.50	30
5 MHz Bandwidth									
1732.50	86.12	319	1.1	H	13.0	1.30	8.90	20.60	30
1732.50	85.69	24	1.8	V	13.1	1.30	8.90	20.70	30
10 MHz Bandwidth									
1732.50	86.54	351	2.1	H	13.4	1.30	8.90	21.00	30
1732.50	84.97	325	1.1	V	12.4	1.30	8.90	20.00	30
15 MHz Bandwidth									
1732.50	85.76	240	2.2	H	12.6	1.30	8.90	20.20	30
1732.50	84.65	239	1.3	V	12.1	1.30	8.90	19.70	30
20 MHz Bandwidth									
1732.50	85.73	4	1.1	H	12.6	1.30	8.90	20.20	30
1732.50	84.96	140	1.3	V	12.4	1.30	8.90	20.00	30

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	22.11	22.15	22.31
		RB Size=1, RB Offset=12	22.86	22.63	22.92
		RB Size=1, RB Offset=24	22.78	23.27	23.19
		RB Size=12, RB Offset=0	21.88	21.94	22.24
		RB Size=12, RB Offset=6	22.06	22.09	21.73
		RB Size=12, RB Offset=11	22.08	22.09	21.45
		RB Size=25, RB Offset=0	21.76	21.77	21.86
	16QAM	RB Size=1, RB Offset=0	21.16	21.08	21.36
		RB Size=1, RB Offset=12	22.83	21.89	22.98
		RB Size=1, RB Offset=24	23.23	21.84	23.05
		RB Size=12, RB Offset=0	21.83	20.71	21.91
		RB Size=12, RB Offset=6	21.87	22.18	22.01
		RB Size=12, RB Offset=11	21.81	21.05	21.71
		RB Size=25, RB Offset=0	21.18	20.83	20.99
10.0	QPSK	RB Size=1, RB Offset=0	22.15	22.12	22.48
		RB Size=1, RB Offset=24	22.98	22.41	22.84
		RB Size=1, RB Offset=49	23.08	22.61	23.13
		RB Size=25, RB Offset=0	22.10	21.93	22.40
		RB Size=25, RB Offset=12	22.05	21.89	22.38
		RB Size=25, RB Offset=24	21.97	22.09	22.33
		RB Size=50, RB Offset=0	22.52	21.80	21.82
	16QAM	RB Size=1, RB Offset=0	21.27	21.31	21.47
		RB Size=1, RB Offset=24	22.12	22.38	22.34
		RB Size=1, RB Offset=49	21.80	22.65	22.29
		RB Size=25, RB Offset=0	21.16	21.56	21.64
		RB Size=25, RB Offset=12	21.63	21.14	21.28
		RB Size=25, RB Offset=24	21.23	21.39	21.50
		RB Size=50, RB Offset=0	21.53	20.90	21.11

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.24	22.08	22.20
		RB Size=1, RB Offset=37	22.46	22.54	22.59
		RB Size=1, RB Offset=74	22.37	22.87	22.61
		RB Size=36, RB Offset=0	22.08	21.86	21.86
		RB Size=36, RB Offset=18	22.19	22.42	22.19
		RB Size=36, RB Offset=37	22.65	22.61	22.43
		RB Size=75, RB Offset=0	22.42	22.51	22.81
	16QAM	RB Size=1, RB Offset=0	21.44	21.48	21.58
		RB Size=1, RB Offset=37	22.10	22.04	22.09
		RB Size=1, RB Offset=74	21.53	21.58	21.23
		RB Size=36, RB Offset=0	21.39	21.81	22.12
		RB Size=36, RB Offset=18	21.29	21.63	21.82
		RB Size=36, RB Offset=37	22.16	21.41	21.88
		RB Size=75, RB Offset=0	20.70	21.27	21.84
20.0	QPSK	RB Size=1, RB Offset=0	22.38	22.26	22.34
		RB Size=1, RB Offset=49	22.77	23.02	23.06
		RB Size=1, RB Offset=99	22.61	22.69	22.61
		RB Size=50, RB Offset=0	21.33	22.64	23.05
		RB Size=50, RB Offset=24	22.35	22.75	22.60
		RB Size=50, RB Offset=49	21.61	22.53	22.60
		RB Size=100, RB Offset=0	22.62	22.15	22.65
	16QAM	RB Size=1, RB Offset=0	21.57	23.20	21.59
		RB Size=1, RB Offset=49	22.34	22.91	22.59
		RB Size=1, RB Offset=99	22.83	23.18	23.04
		RB Size=50, RB Offset=0	21.57	21.73	22.91
		RB Size=50, RB Offset=24	21.73	21.76	22.73
		RB Size=50, RB Offset=49	21.42	21.86	22.17
		RB Size=100, RB Offset=0	22.01	20.88	22.05

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.35	13	Pass
QPSK (100RB Size)	6.37	13	Pass
16QAM (1RB Size)	7.60	13	Pass
16QAM (100RB Size)	7.44	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	83.21	109	1.2	H	13.7	2.60	10.20	21.30	33
2535.00	82.09	292	1.4	V	13.2	2.60	10.20	20.80	33
10 MHz Bandwidth									
2535.00	82.96	351	1.2	H	13.5	2.60	10.20	21.10	33
2535.00	82.13	163	2.5	V	13.3	2.60	10.20	20.90	33
15 MHz Bandwidth									
2535.00	83.02	60	1.0	H	13.5	2.60	10.20	21.10	33
2535.00	82.78	2	1.8	V	13.9	2.60	10.20	21.50	33
20 MHz Bandwidth									
2535.00	83.15	192	1.5	H	13.7	2.60	10.20	21.30	33
2535.00	82.34	81	2.0	V	13.5	2.60	10.20	21.10	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	83.12	300	1.6	H	13.6	2.60	10.20	21.20	33
2535.00	82.84	172	1.3	V	14.0	2.60	10.20	21.60	33
10 MHz Bandwidth									
2535.00	83.52	343	1.7	H	14.0	2.60	10.20	21.60	33
2535.00	82.97	225	1.5	V	14.1	2.60	10.20	21.70	33
15 MHz Bandwidth									
2535.00	83.10	290	1.1	H	13.6	2.60	10.20	21.20	33
2535.00	82.97	328	2.5	V	14.1	2.60	10.20	21.70	33
20 MHz Bandwidth									
2535.00	83.22	266	1.4	H	13.7	2.60	10.20	21.30	33
2535.00	82.63	304	1.6	V	13.8	2.60	10.20	21.40	33

Note:

All above data were tested with no amplifier

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

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

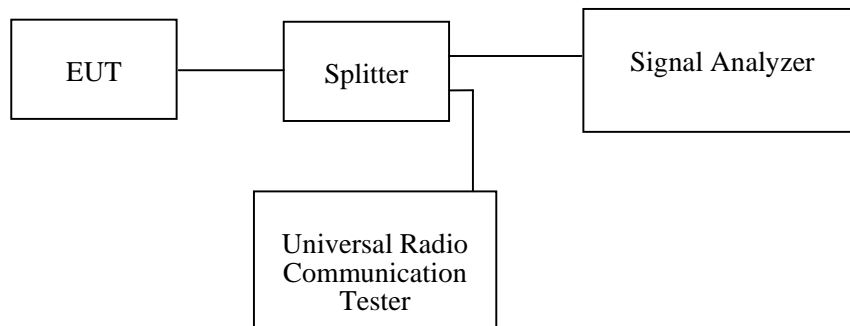
Applicable Standard

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

Test Procedure

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

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



Test Data

Environmental Conditions

Temperature:	25~26 °C
Relative Humidity:	52~55 %
ATM Pressure:	100.5~101.0 kPa

The testing was performed by Nancy Wang from 2018-05-10 to 2018-06-06.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

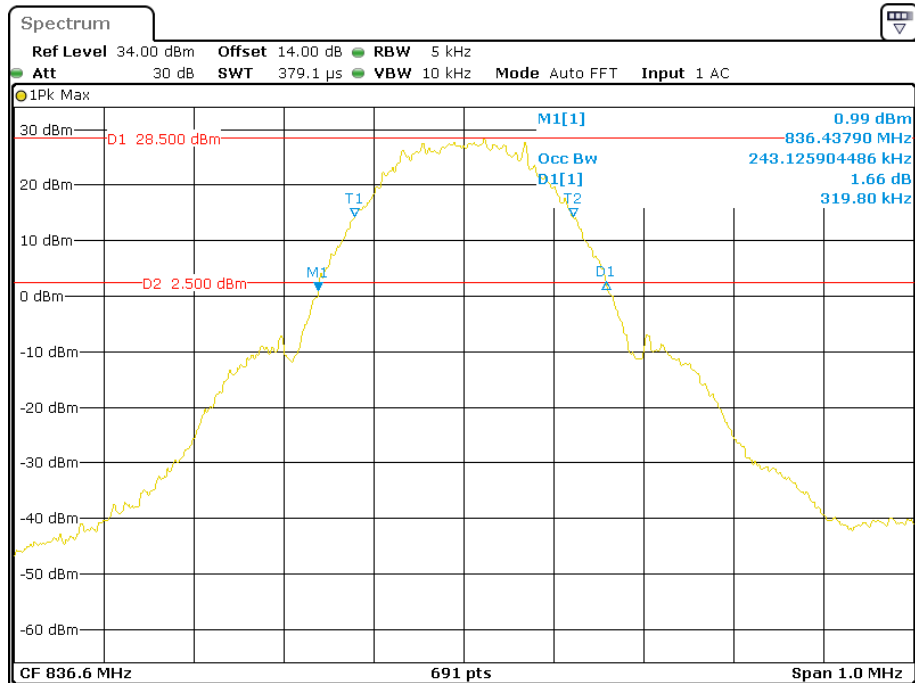
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	243.1	319.8

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.139	4.703
HSUPA (BPSK)	836.6	4.153	4.703
HSDPA (16QAM)	836.6	4.153	4.703

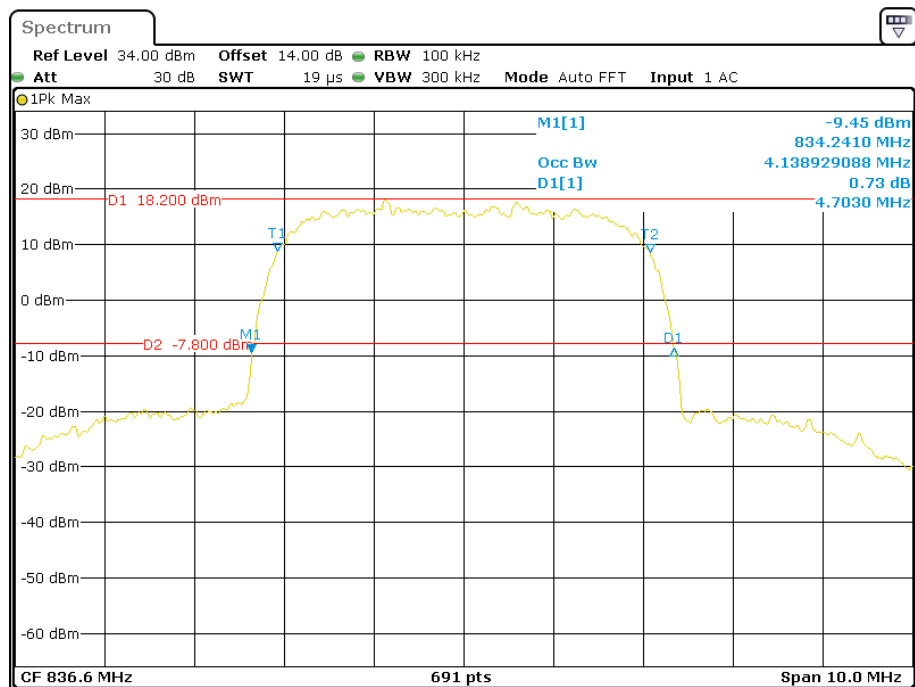
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	244.6	321.3

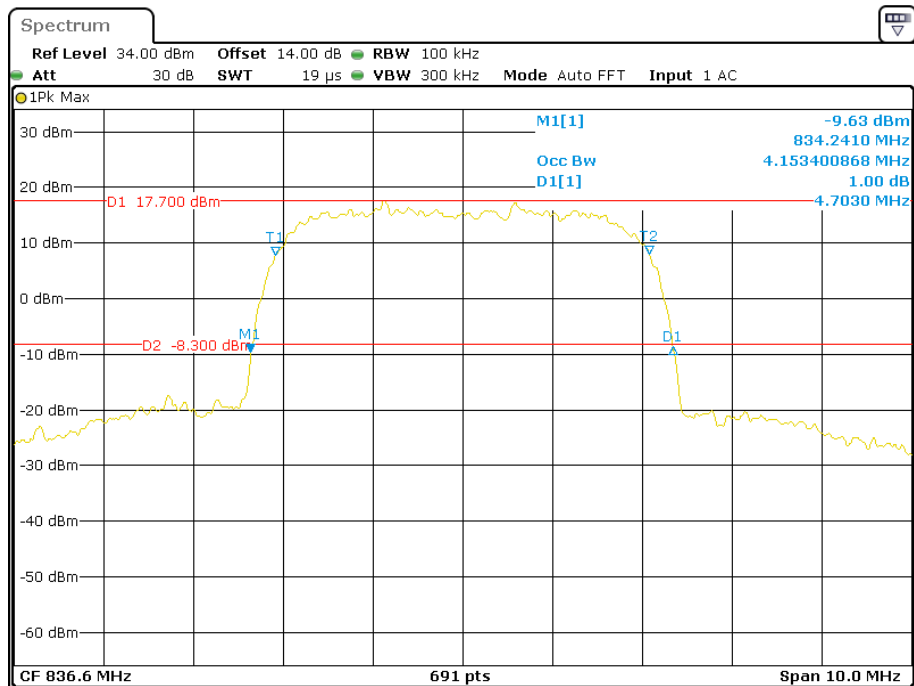
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.153	4.689
HSUPA (BPSK)	1880.0	4.153	4.689
HSDPA (16QAM)	1880.0	4.153	4.689

Cellular Band (Part 22H)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode**

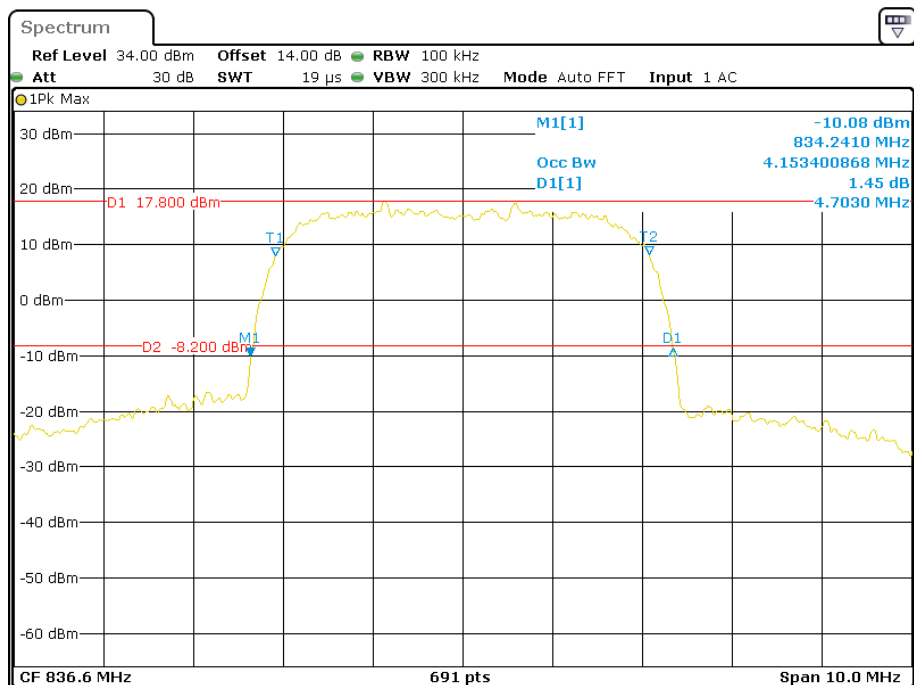
Date: 5.JUN.2018 19:43:50

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

Date: 5.JUN.2018 20:24:33

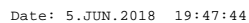
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode

Date: 5.JUN.2018 20:34:11

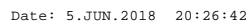
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

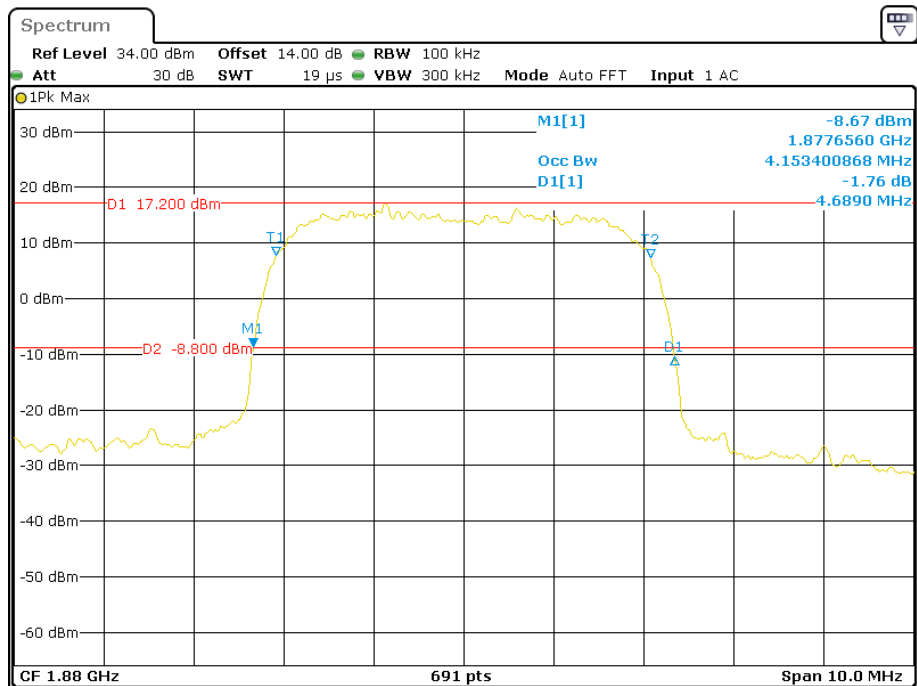
Date: 5.JUN.2018 20:32:09

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

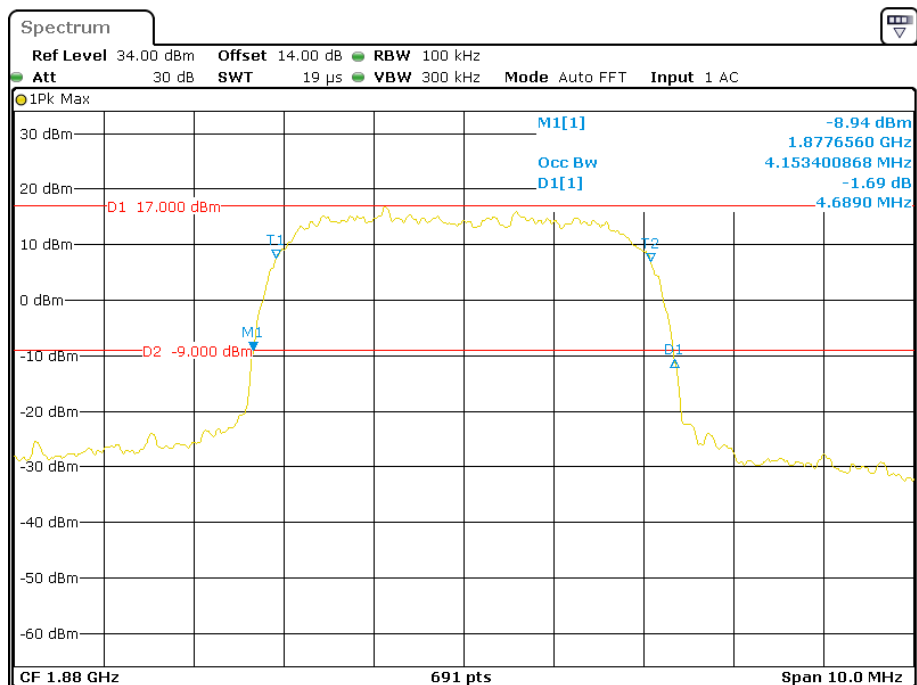


26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode



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

Date: 5.JUN.2018 20:36:23

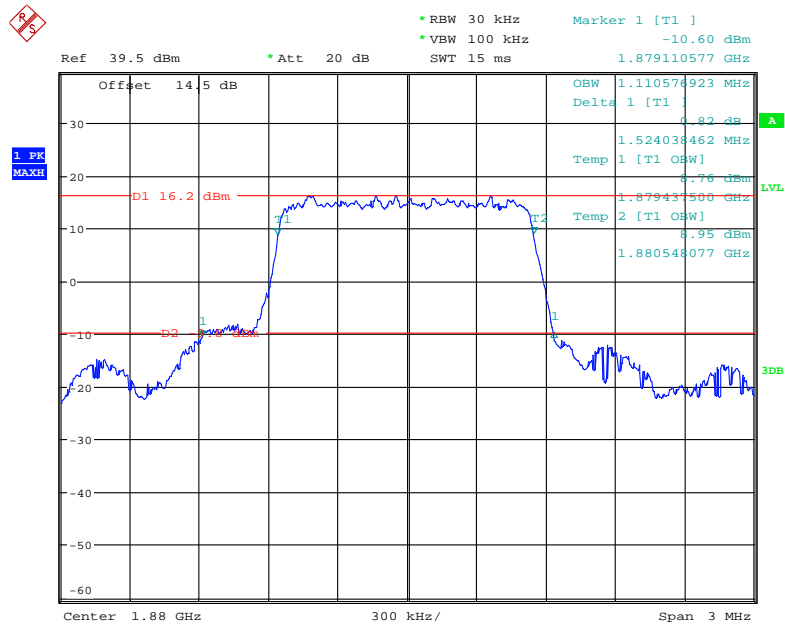
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

Date: 5.JUN.2018 20:29:09

LTE Band 2: (Middle Channel)

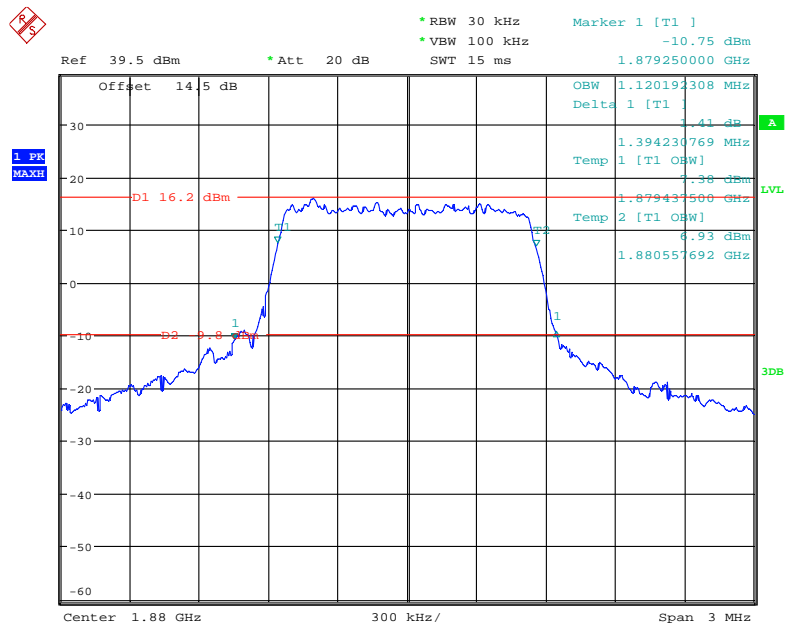
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.111	1.524
	16QAM	1.120	1.394
3.0	QPSK	2.721	3.106
	16QAM	2.692	3.029
5.0	QPSK	4.535	5.128
	16QAM	4.535	5.337
10.0	QPSK	8.974	9.921
	16QAM	8.974	9.889
15.0	QPSK	13.510	15.130
	16QAM	13.510	14.938
20.0	QPSK	18.077	20.064
	16QAM	18.077	19.872

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



Date: 10.MAY.2018 15:49:30

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



Date: 10.MAY.2018 15:48:01

Ref 32.5 dBm * Att 20 dB
 * RBW 50 kHz Delta 1 [T1]
 * VBW 100 kHz 1.63 dB
 SWT 2.5 ms 3.105769231 MHz

Offset 7.4 dB
 OBW 2.721151846 MHz
 Marker 1 [T1]
 -11.38 dBm
 1.878432692 GHz
 Temp 1 [T1 OBW]
 7.79 dBm
 1.878634615 GHz
 Temp 2 [T1 OBW]
 8.50 dBm
 1.881359769 GHz

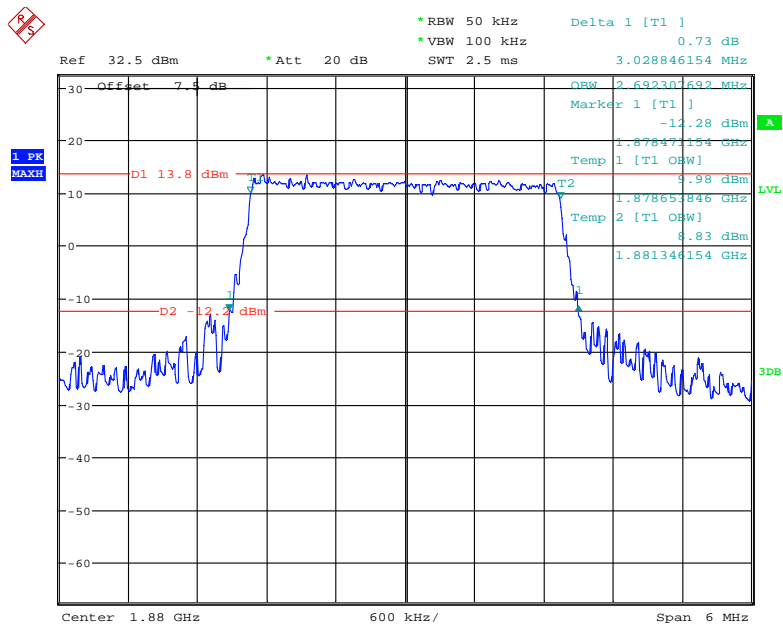
1 PK
 MAXH

D1 15.5 dBm
 D2 -10.3 dBm

1
 2
 1
 1
 3DB

Center 1.88 GHz
 600 kHz/
 Span 6 MHz

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



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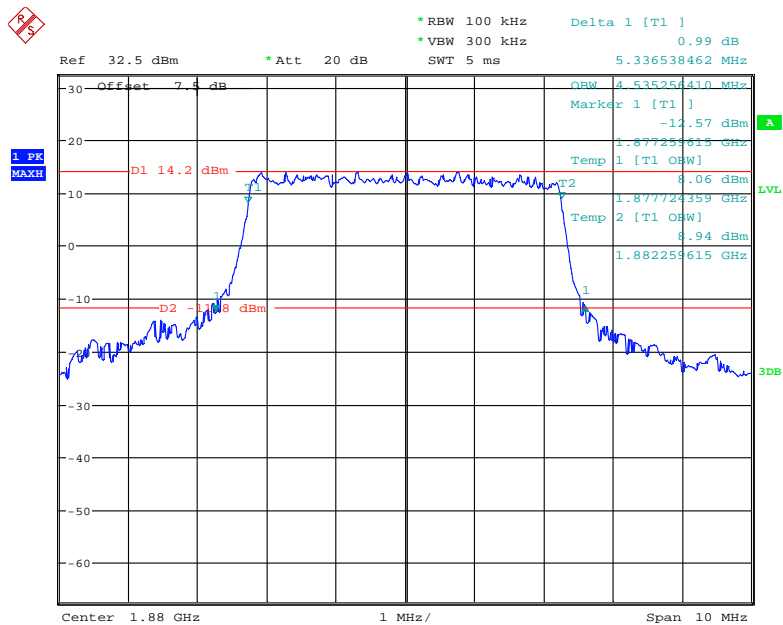
Ref 32.5 dBm * Att 20 dB * RBW 100 kHz Delta 1 [T1] 2.55 dB
 * VBW 300 kHz 5.128205128 MHz
 SWT 5 ms

Offset 7.4 dB
 D1 15.8 dBm
 D2 -10.1 dBm
 T1
 T2
 Temp 1 [T1 BW] 1.877354769 GHz -11.83 dBm
 Temp 2 [T1 BW] 1.877724359 GHz 8.96 dBm
 Temp 1 [T1 BW] 1.882259615 GHz 10.33 dBm

1 PK
 MAXH
 3DB
 LVL

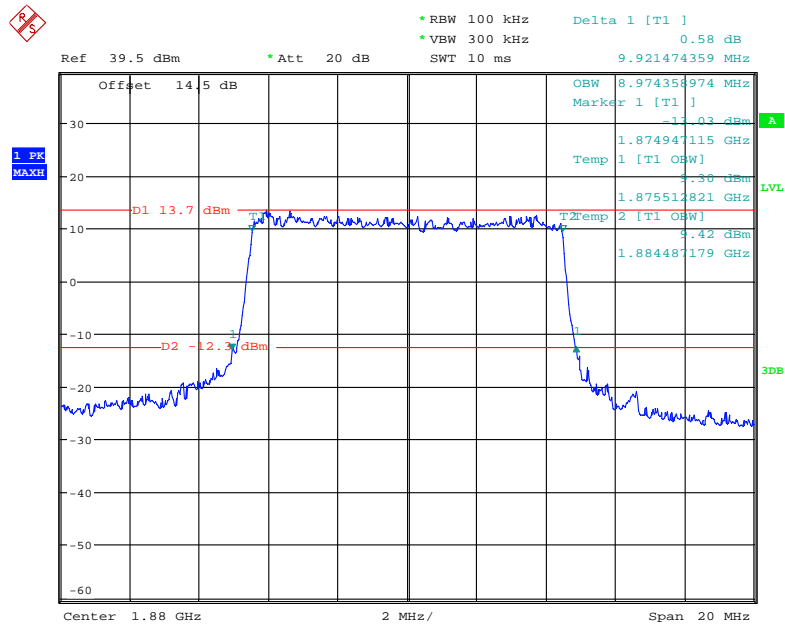
Center 1.88 GHz 1 MHz/
 Span 10 MHz

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



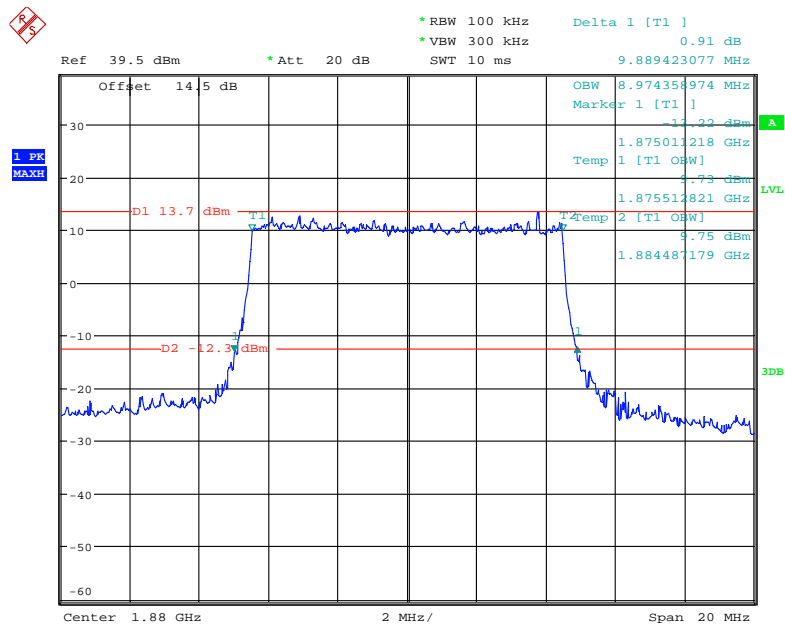
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QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

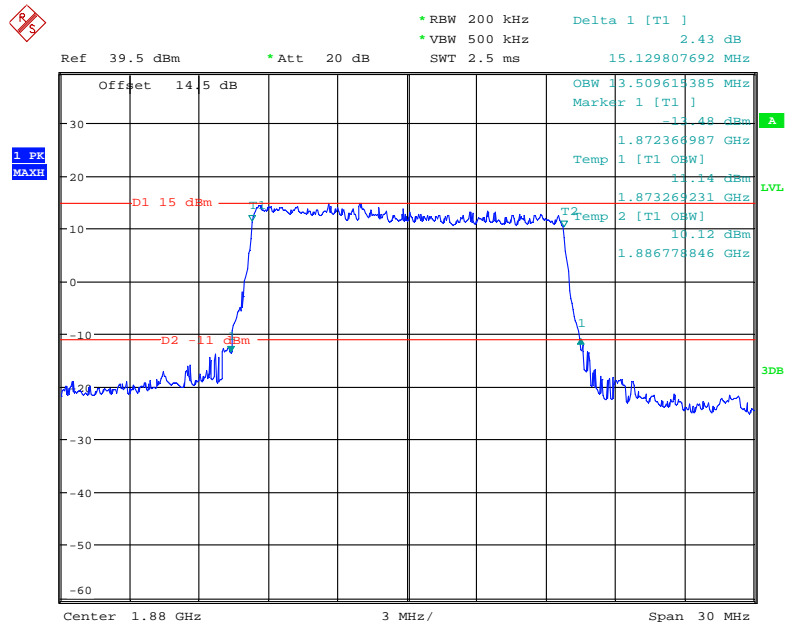


Date: 10.MAY.2018 15:54:03

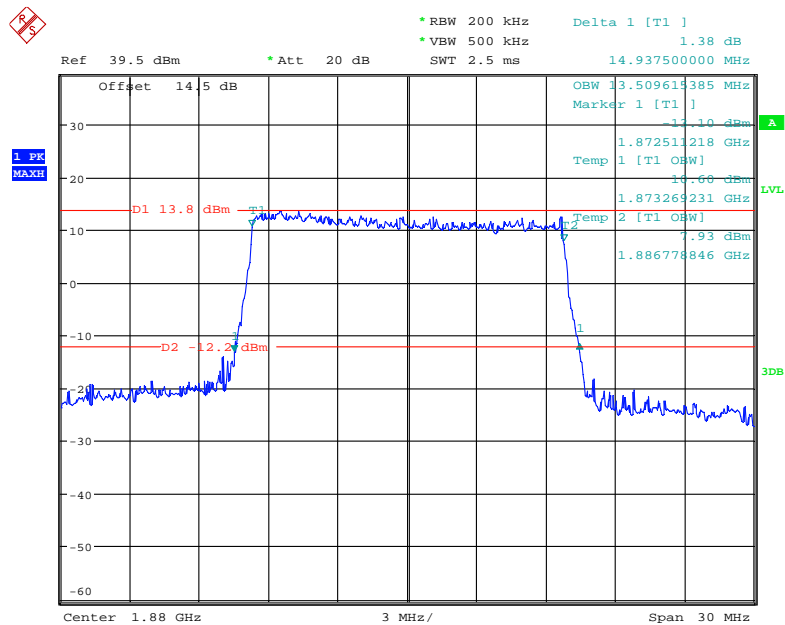
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 10.MAY.2018 15:55:03

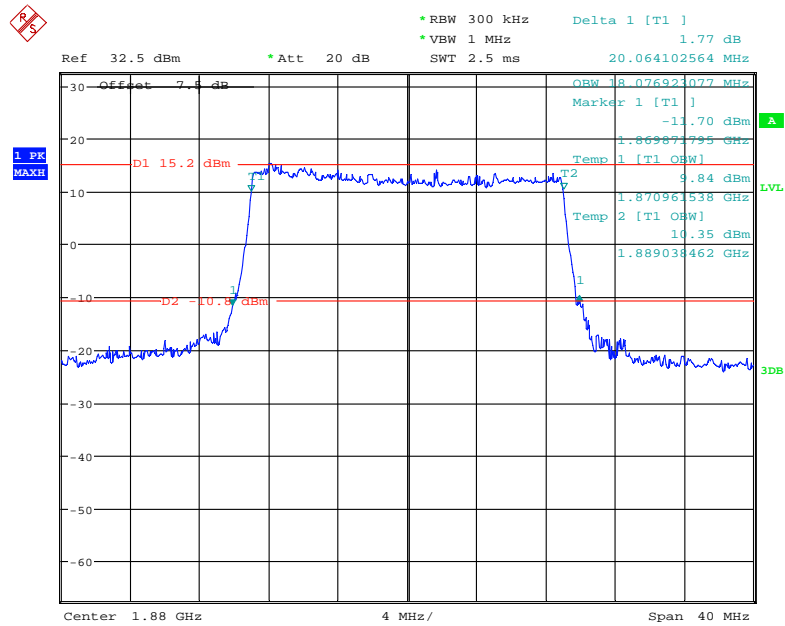
QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 10.MAY.2018 15:56:34

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

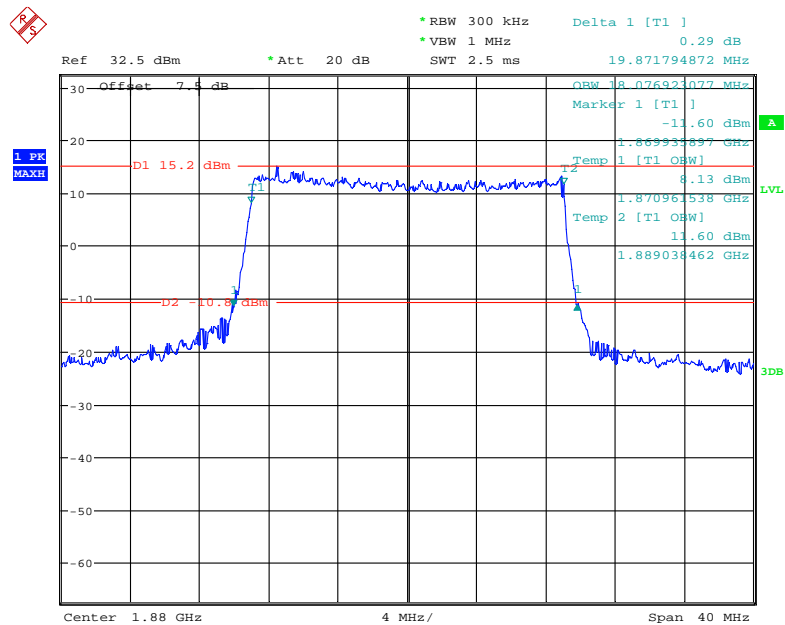
Date: 10.MAY.2018 15:55:44

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



Date: 6.JUN.2018 12:52:18

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



Date: 6.JUN.2018 12:53:29

LTE Band 4: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.115	1.423
	16QAM	1.120	1.389
3.0	QPSK	2.712	3.067
	16QAM	2.712	3.106
5.0	QPSK	4.535	5.032
	16QAM	4.519	5.337
10.0	QPSK	9.006	10.160
	16QAM	9.006	10.224
15.0	QPSK	13.462	14.918
	16QAM	13.462	14.870
20.0	QPSK	17.949	19.357
	16QAM	17.949	19.486

Ref 34 dBm * Att 20 dB * RBW 30 kHz * VBW 100 kHz Delta 1 [T1] 0.15 dB
SWT 15 ms 1.423076923 MHz

Offset 14.5 dB

OBW 1.115384615 MHz
Marker 1 [T1] -10.24 dBm
1.731721154 GHz
Temp 1 [T1 OBW] 7.96 dBm
1.731937500 GHz
Temp 2 [T1 OBW] 7.62 dBm
1.733054885 GHz

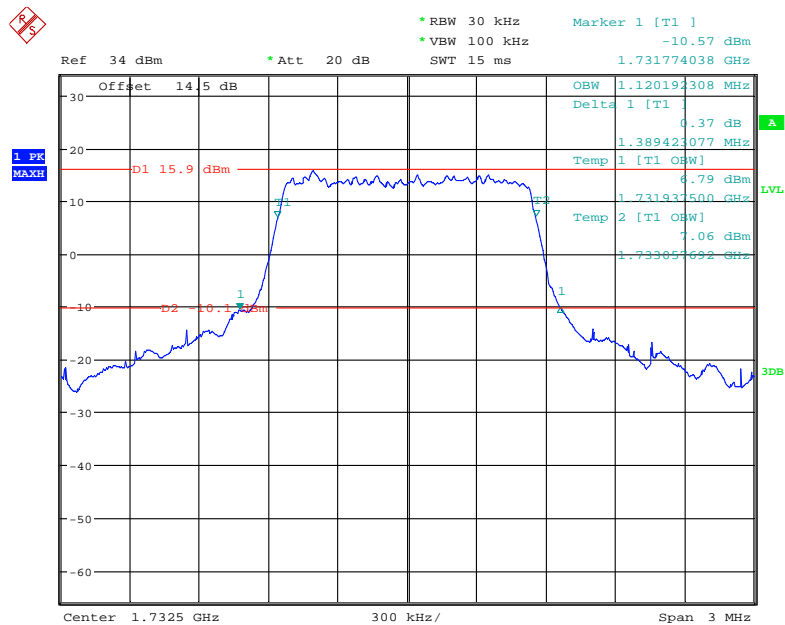
D1 15.8 dBm
D2 -10.24 dBm
1
2
1

1 PK
MAXH

A
LVL
3DB

Center 1.7325 GHz 300 kHz/ Span 3 MHz

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



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The screenshot displays a spectrum analyzer interface with a blue trace on a grid. Two horizontal red lines represent reference levels: D1 at 15.5 dBm and D2 at -10.5 dBm. The signal trace rises from the noise floor at -30 dBm to a plateau around 12 dBm between 1.731 GHz and 1.733 GHz, then falls back to the noise floor. Two markers are present: Marker 1 (T1) at 1.73088769 GHz, -10.53 dBm, and Marker 2 (T2) at 1.73114231 GHz, 7.97 dBm. The interface includes a top status bar with parameters like RBW, VBW, and Delta 1, and a bottom bar showing Center frequency (1.7325 GHz), Span (6 MHz), and Att (20 dB).

Ref 32.5 dBm * Att 20 dB Delta 1 [T1] 0.83 dB
 * RBW 50 kHz * VBW 100 kHz 3.067307692 MHz
 SWT 2.5 ms

Offset 7.4 dB

OBW 2.711538462 MHz
 Marker 1 [T1]
 -10.53 dBm
 1.73088769 GHz
 Temp 1 [T1 OBW]
 T2 7.97 dBm
 1.73114231 GHz
 Temp 2 [T1 OBW]
 8.94 dBm
 1.733854769 GHz

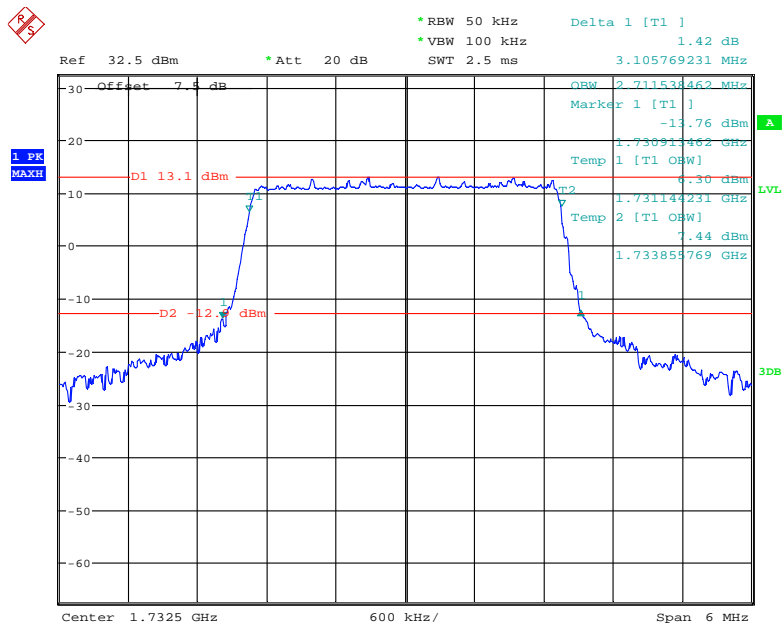
D1 15.5 dBm
 D2 -10.5 dBm

1 PK
 MAXH

1
 3DB

Center 1.7325 GHz 600 kHz/
 Span 6 MHz

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



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* RBW 100 kHz
 * VBW 300 kHz
 SWT 5 ms

Delta 1 [T1] 2.20 dB
 5.032051282 MHz

Ref 32.5 dBm
 * Att 20 dB

Offset 7.4 dB

OBW 4.536256410 MHz
 Marker 1 [T1]
 -11.44 dBm
 1.729367949 GHz
 Temp 1 [T1 OBW]
 10.15 dBm
 1.730240385 GHz
 Temp 2 [T1 OBW]
 7.59 dBm
 1.734779641 GHz

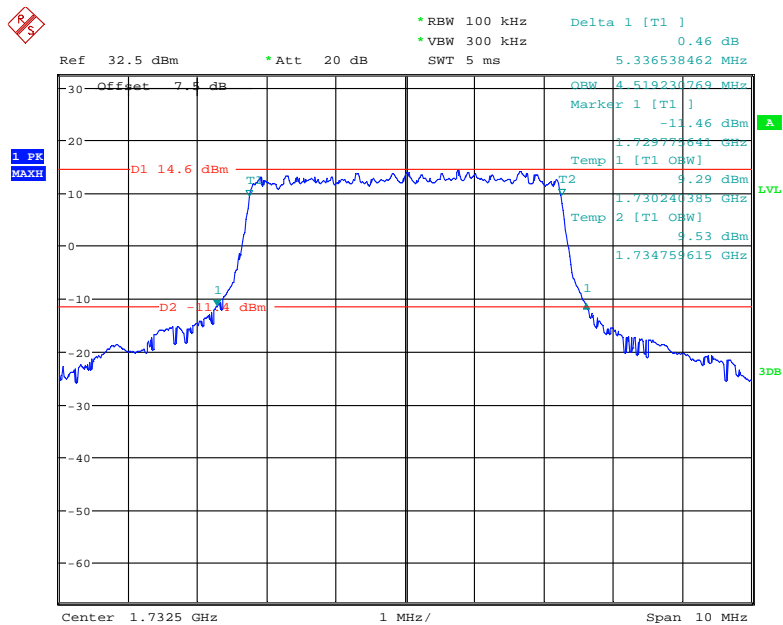
1 PK
 MAXH

D1 15.5 dBm
 D2 -10.3 dBm

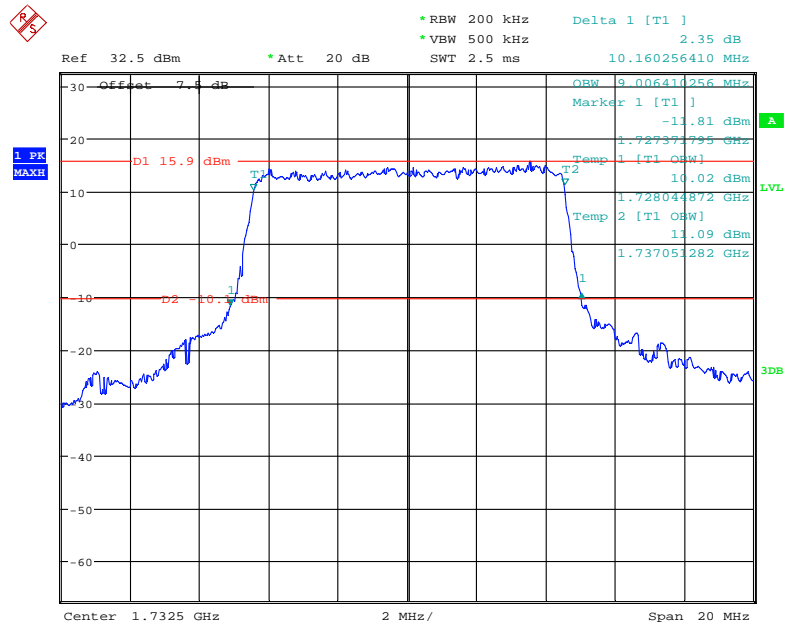
LVL
 3DB

Center 1.7325 GHz
 1 MHz/
 Span 10 MHz

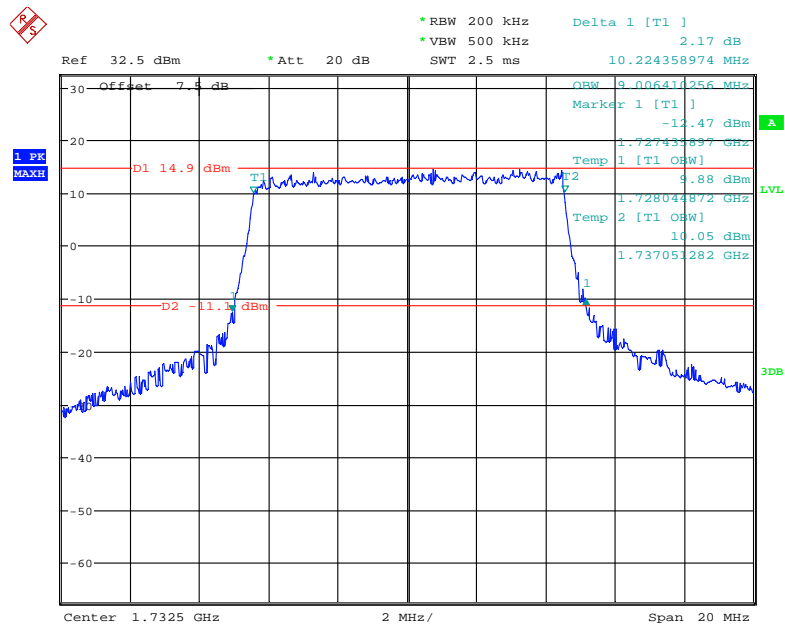
16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



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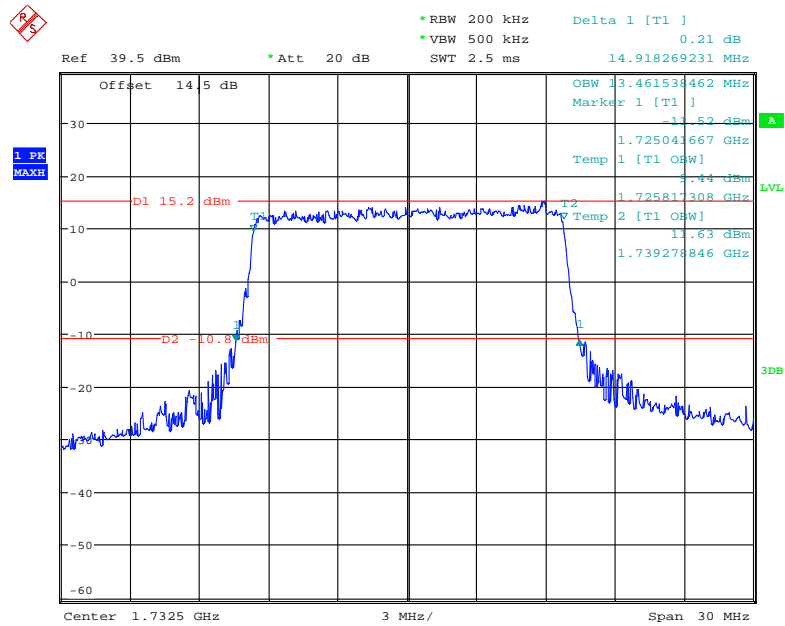
QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 6.JUN.2018 13:09:17

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

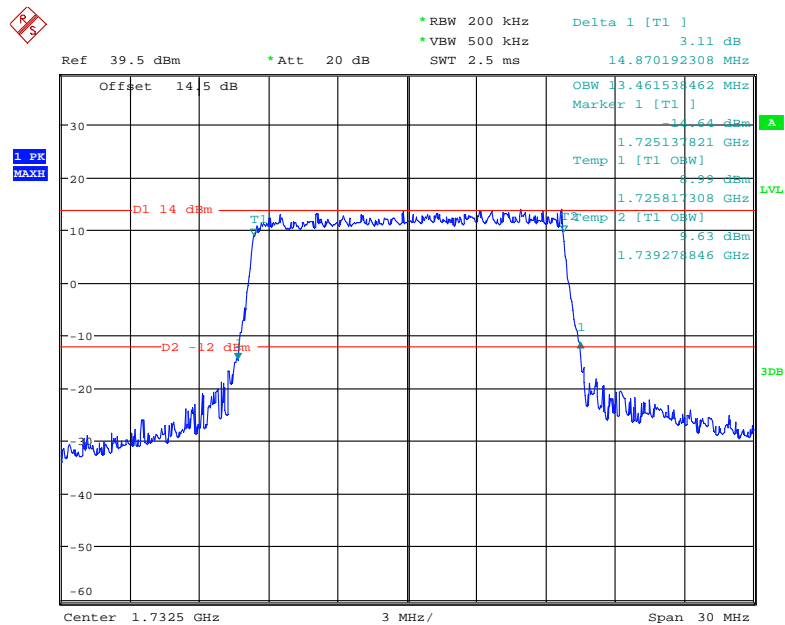
Date: 6.JUN.2018 13:10:12

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



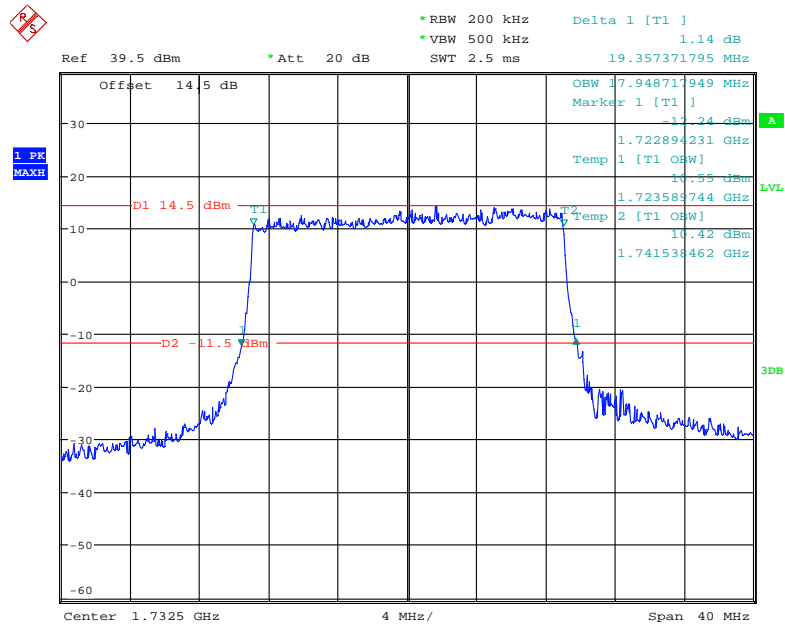
Date: 10.MAY.2018 15:43:29

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



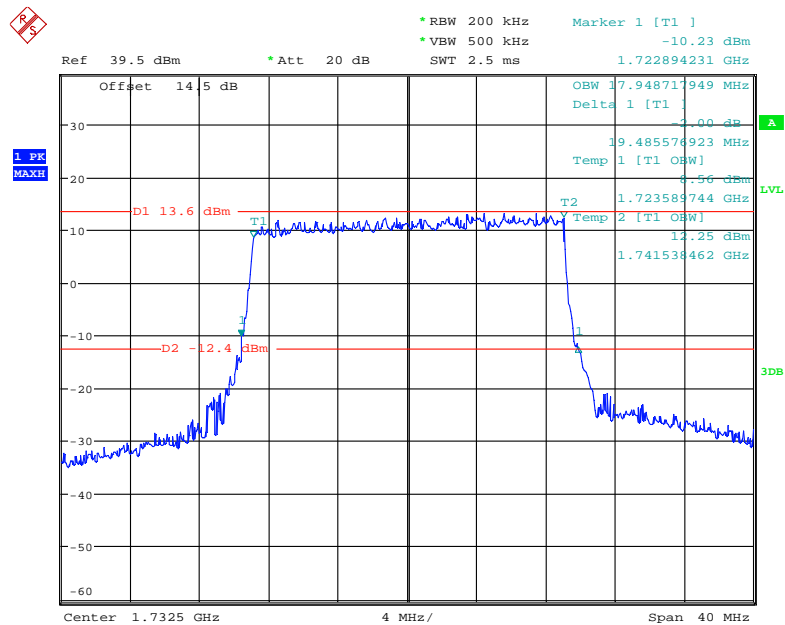
Date: 10.MAY.2018 15:44:05

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



Date: 10.MAY.2018 15:46:18

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

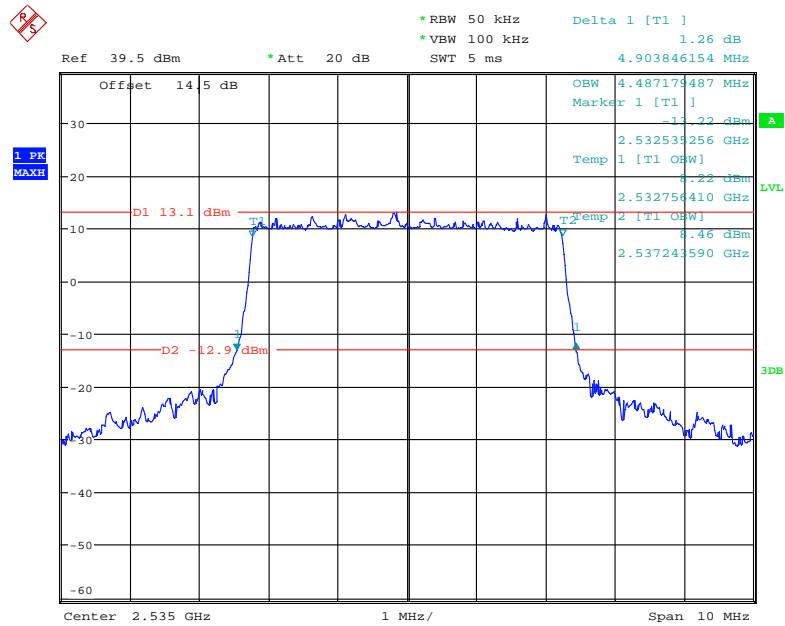


Date: 10.MAY.2018 15:45:23

LTE Band 7: (Middle Channel)

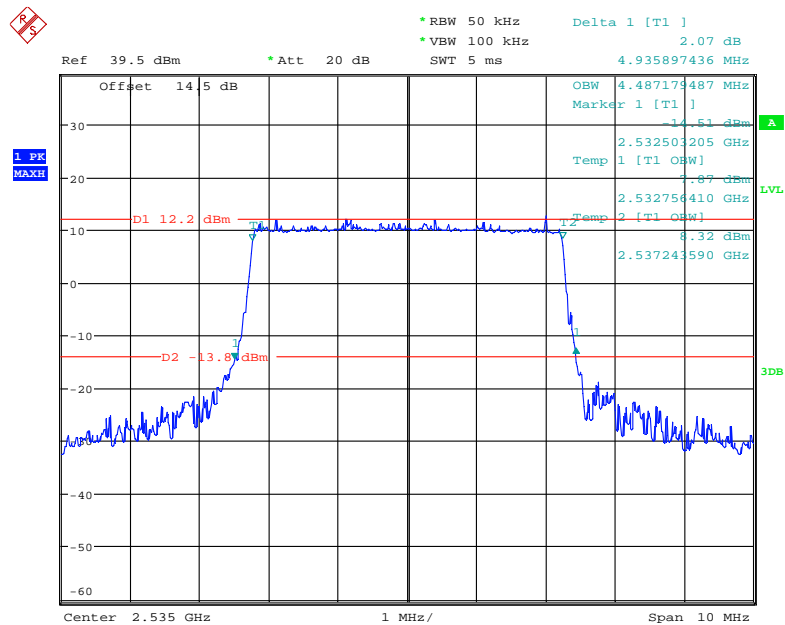
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.487	4.904
	16QAM	4.487	4.936
10.0	QPSK	8.974	9.936
	16QAM	8.974	9.872
15.0	QPSK	13.510	15.401
	16QAM	13.510	15.016
20.0	QPSK	17.949	19.631
	16QAM	18.013	19.567

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



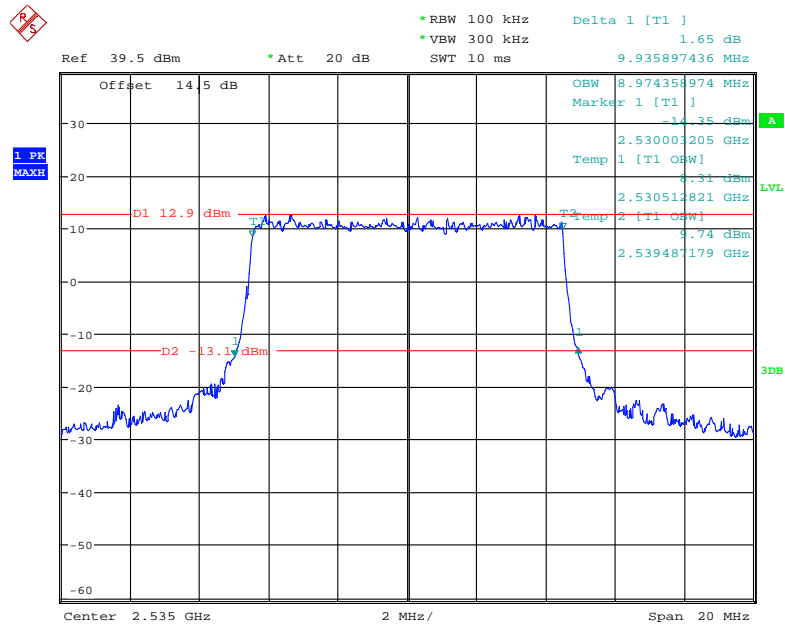
Date: 10.MAY.2018 15:24:11

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



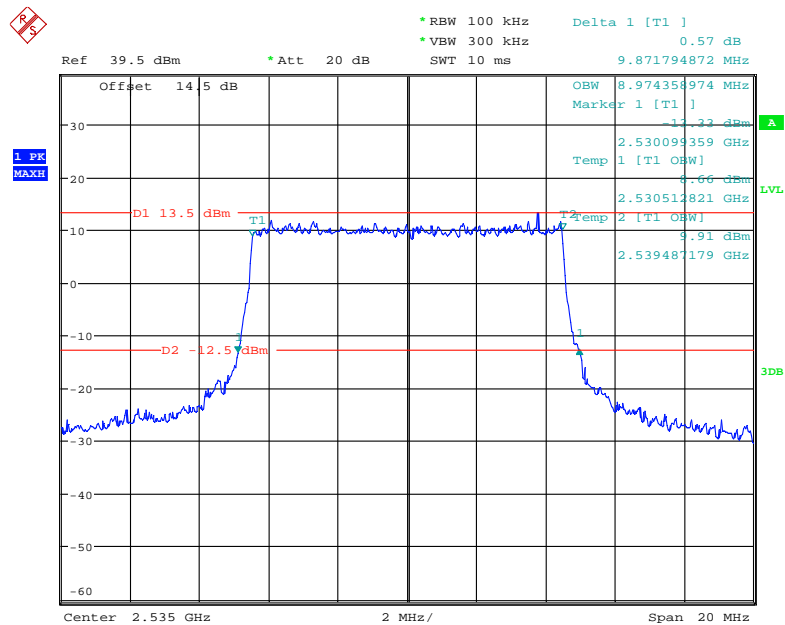
Date: 10.MAY.2018 15:23:06

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



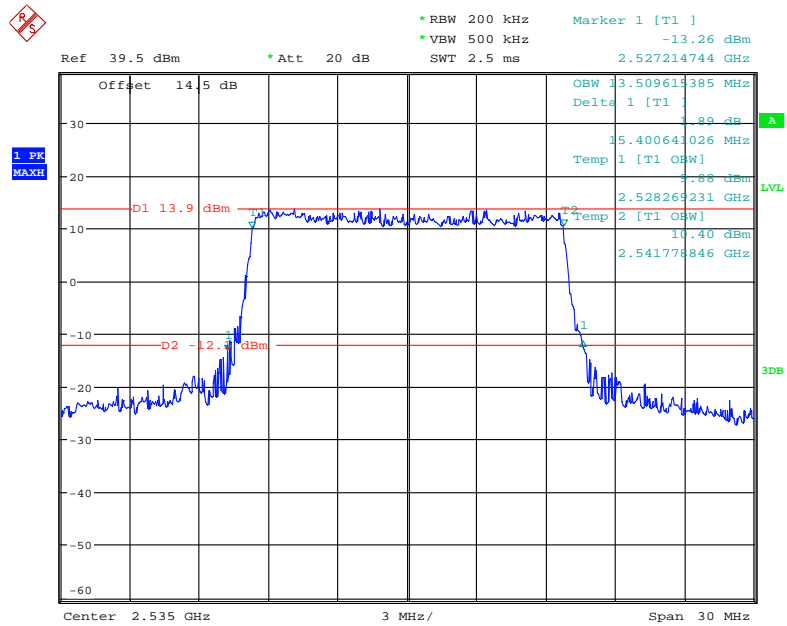
Date: 10.MAY.2018 15:26:05

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



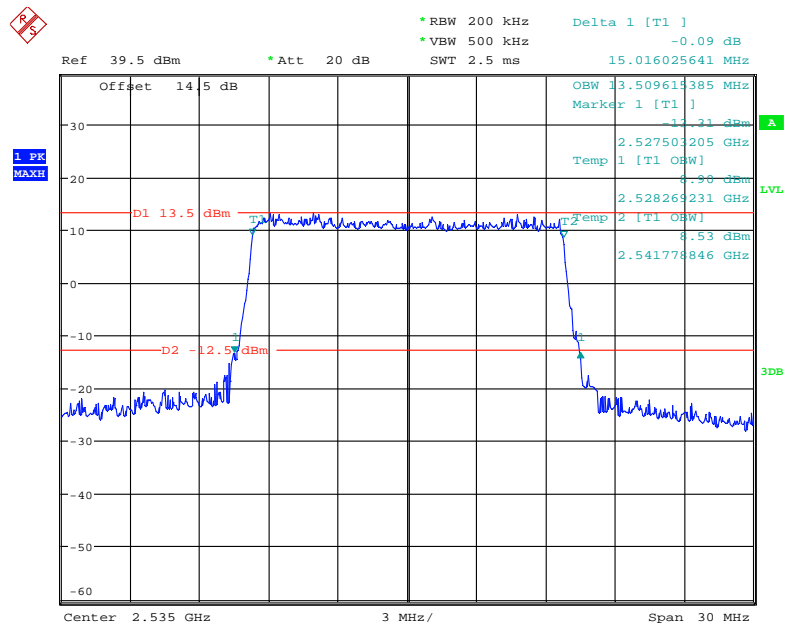
Date: 10.MAY.2018 15:27:17

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

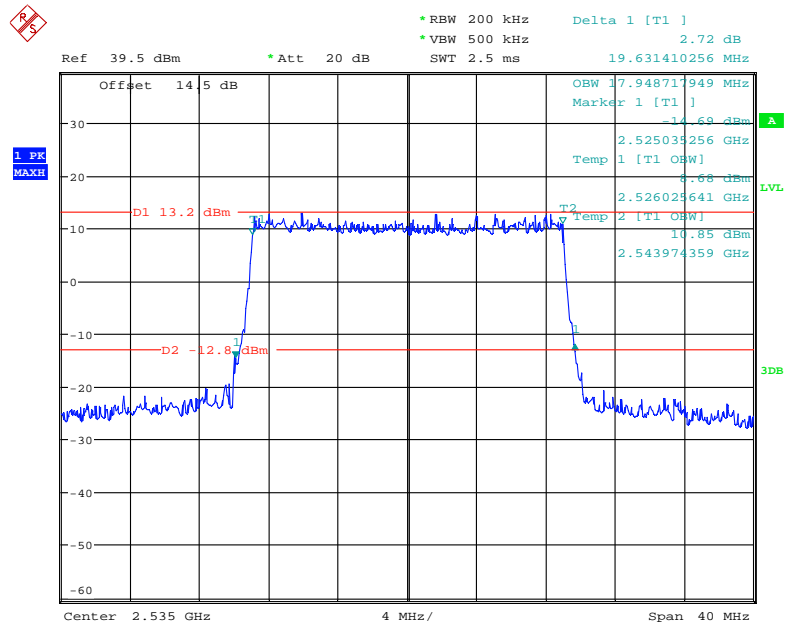


Date: 10.MAY.2018 15:29:33

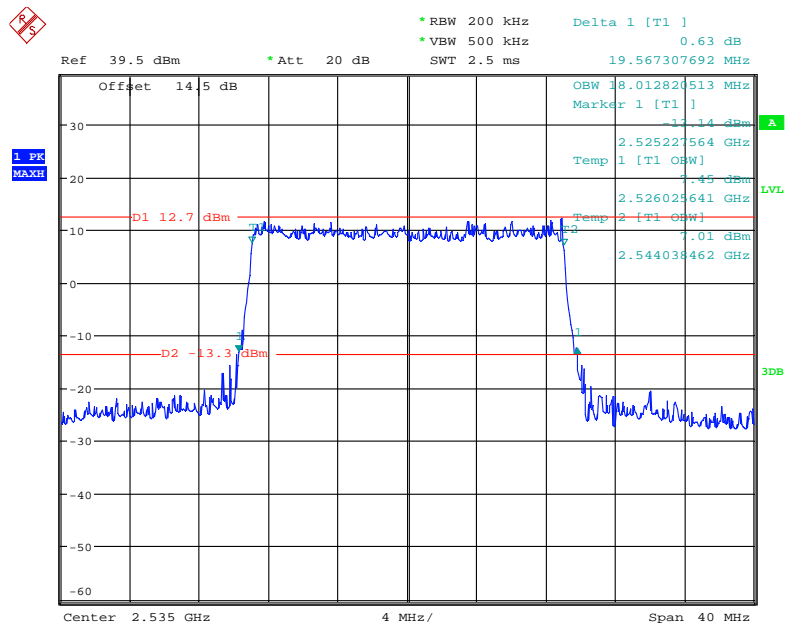
16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 10.MAY.2018 15:28:33

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

Date: 10.MAY.2018 15:30:20

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

Date: 10.MAY.2018 15:31:04

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

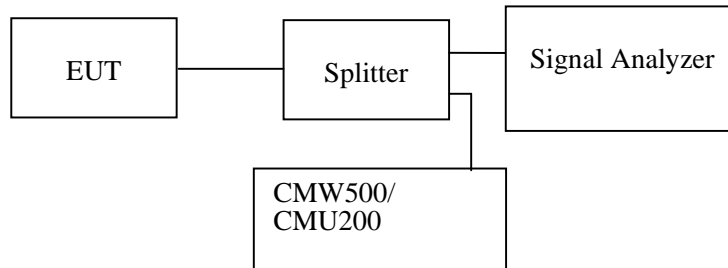
Applicable Standard

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

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

Test Procedure

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



Test Data

Environmental Conditions

Temperature:	24~25 °C
Relative Humidity:	50~55 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Nancy Wang from 2018-05-10 to 2018-06-05.

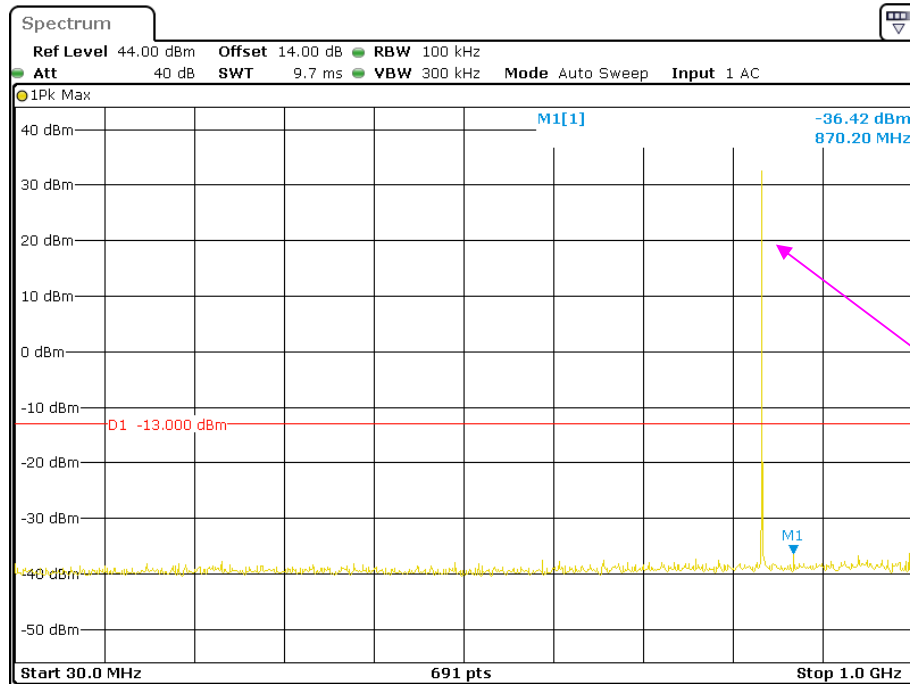
Test result: Compliance

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

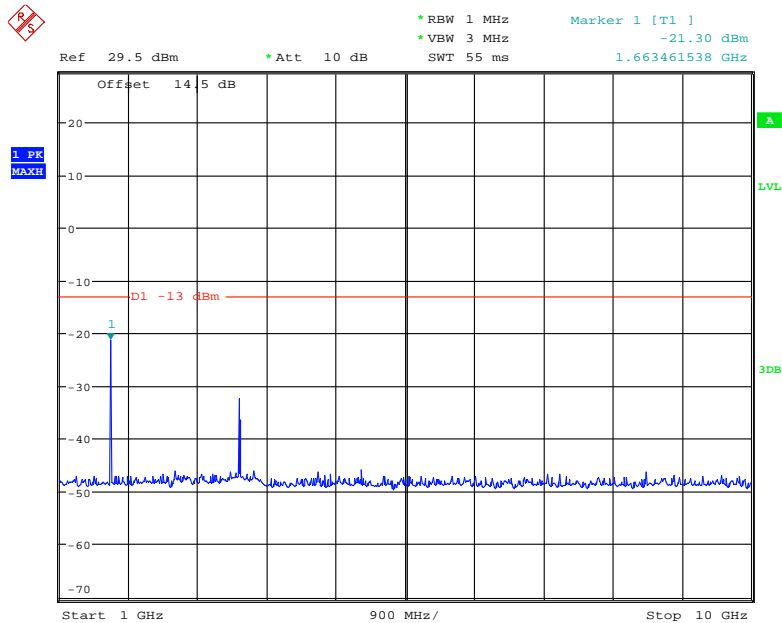
30 MHz – 1 GHz (GSM Mode)



Date: 5.JUN.2018 20:03:40

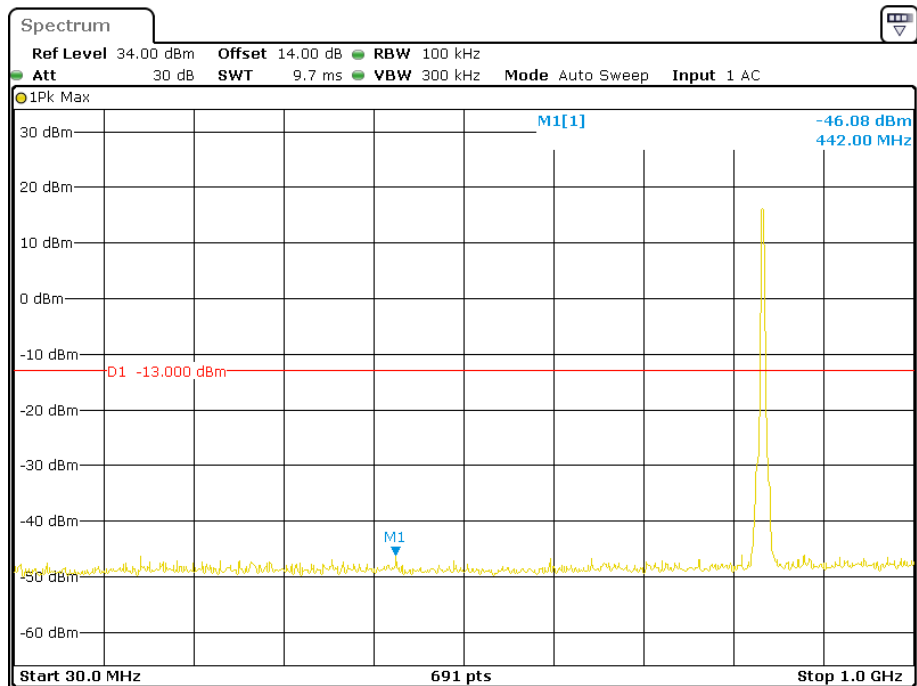
Fundamental test

1 GHz – 10 GHz (GSM Mode)



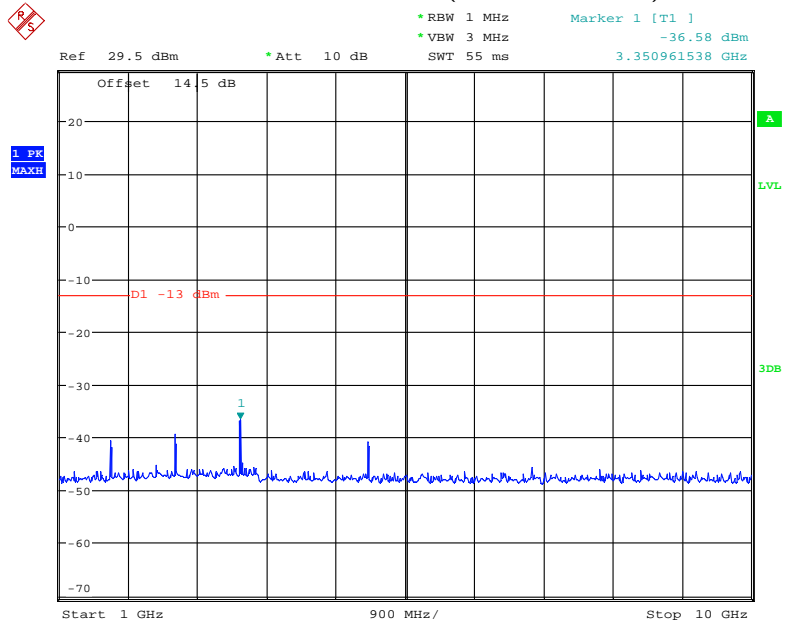
Date: 30.MAY.2018 20:03:54

30 MHz – 1 GHz (WCDMA Mode)



Date: 5.JUN.2018 20:21:31

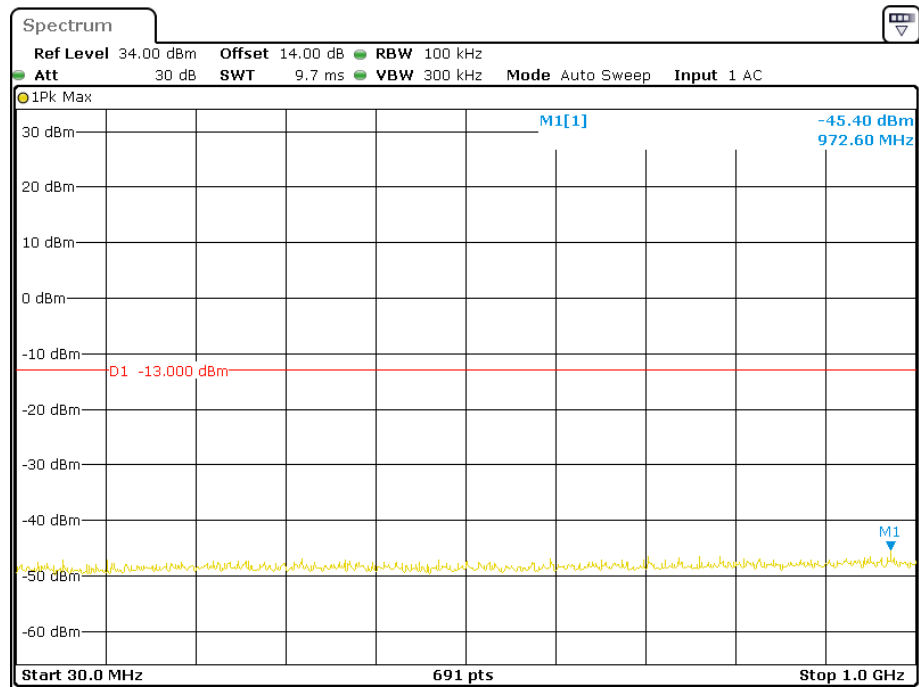
1 GHz – 10 GHz (WCDMA Mode)



Date: 30.MAY.2018 19:54:42

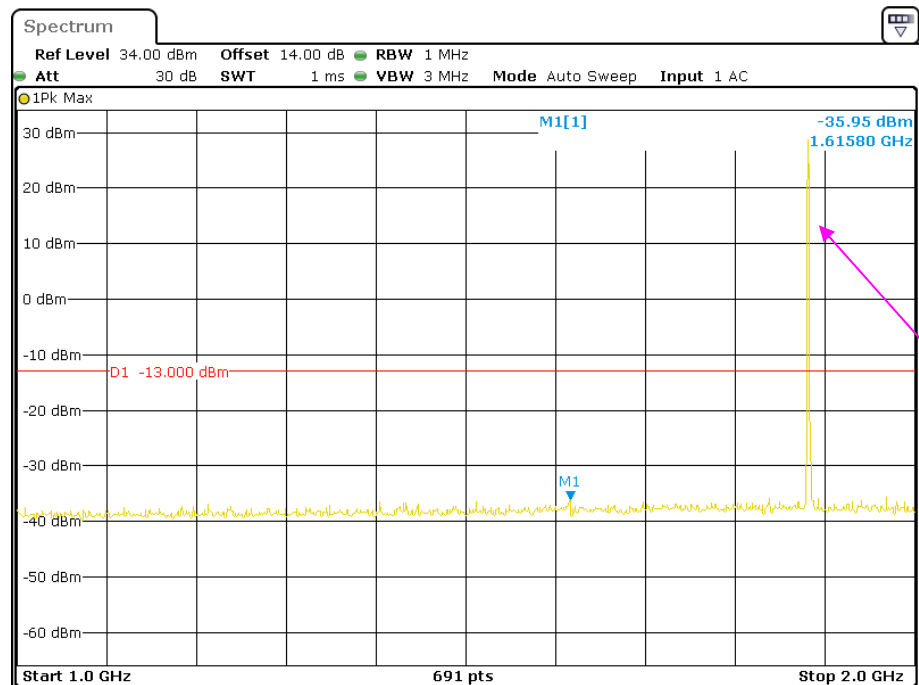
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



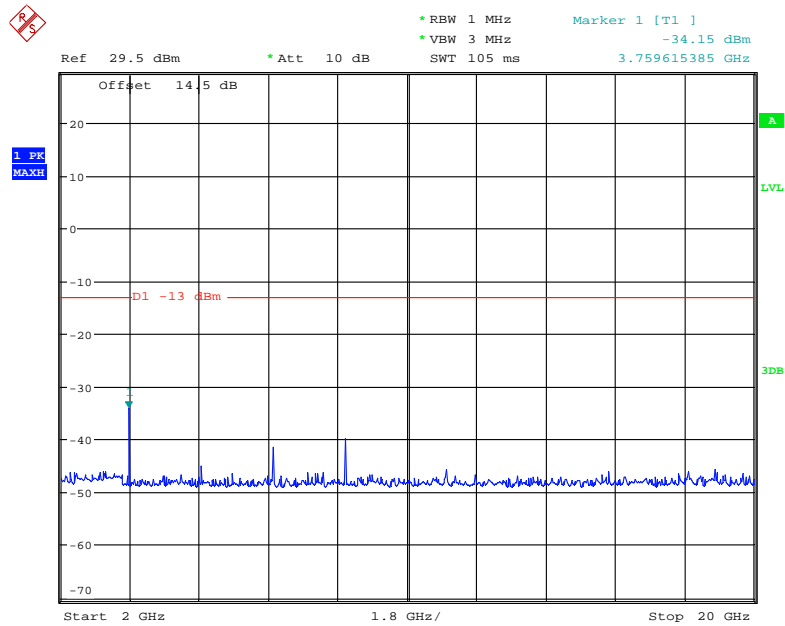
Date: 5.JUN.2018 20:05:49

1 GHz – 2 GHz (GSM Mode)



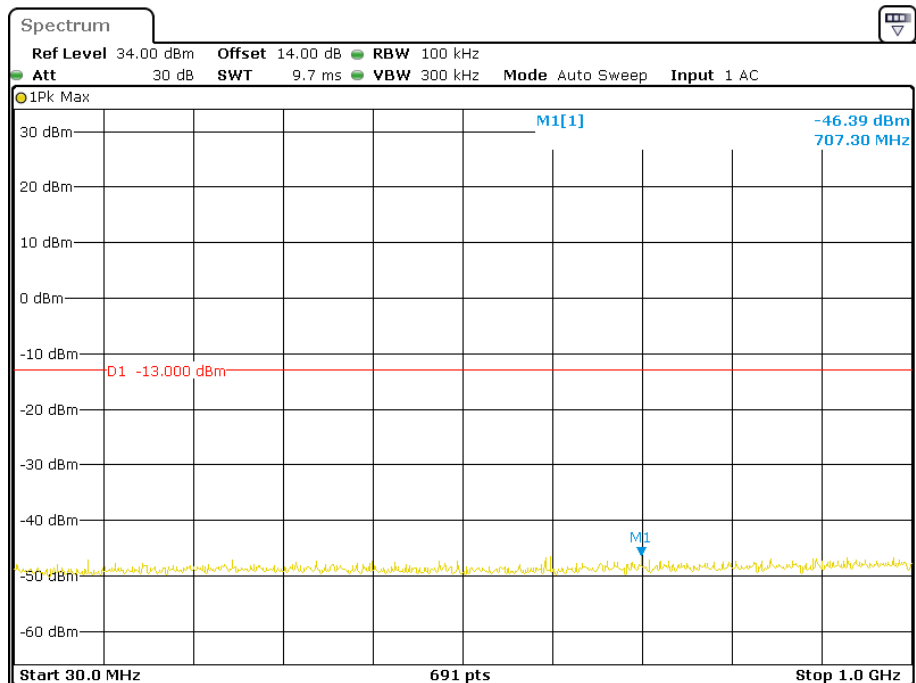
Date: 5.JUN.2018 20:08:17

2 GHz – 20 GHz (GSM Mode)



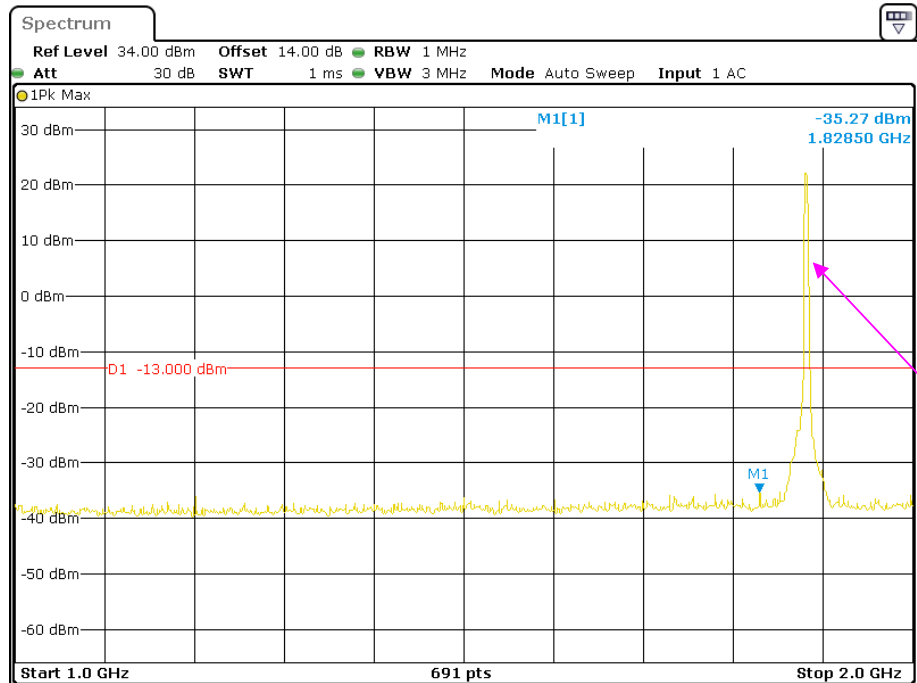
Date: 30.MAY.2018 20:02:45

30 MHz – 1 GHz (WCDMA Mode)



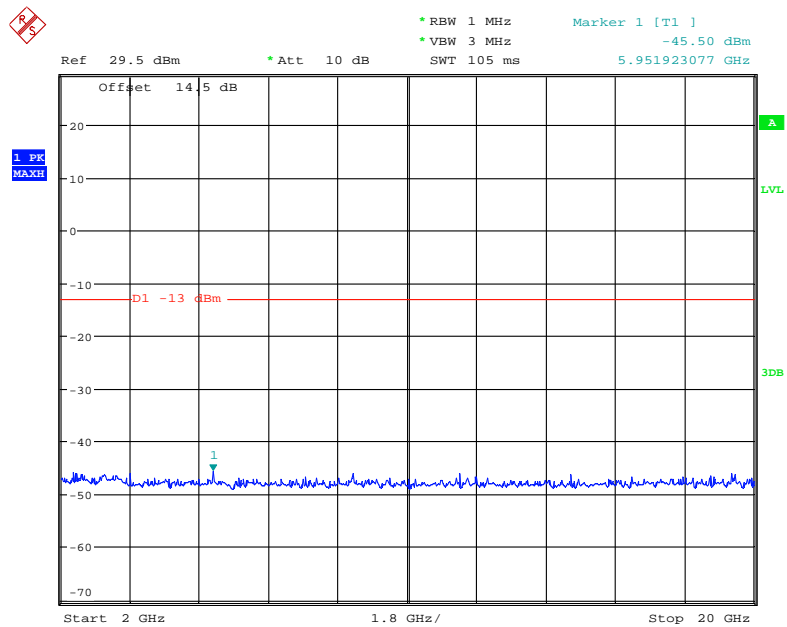
Date: 5.JUN.2018 20:19:14

1 GHz – 2 GHz (WCDMA Mode)



Date: 5.JUN.2018 20:17:16

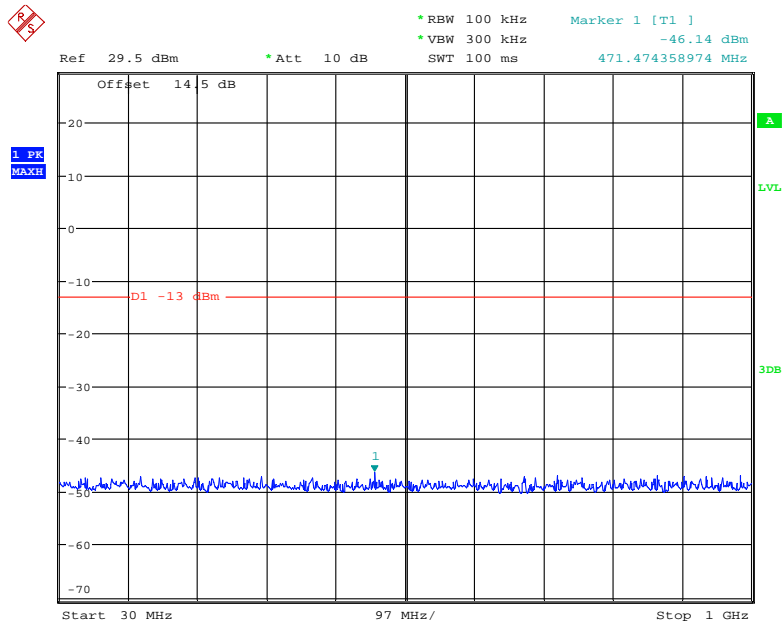
2 GHz – 20 GHz (WCDMA Mode)



Date: 30.MAY.2018 19:51:13

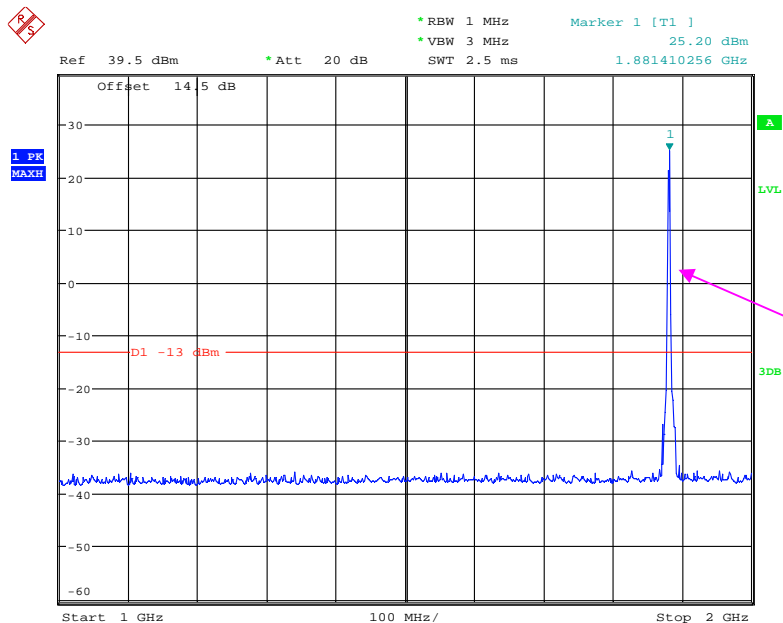
LTE Band 2: (QPSK)

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



Date: 10.MAY.2018 16:06:40

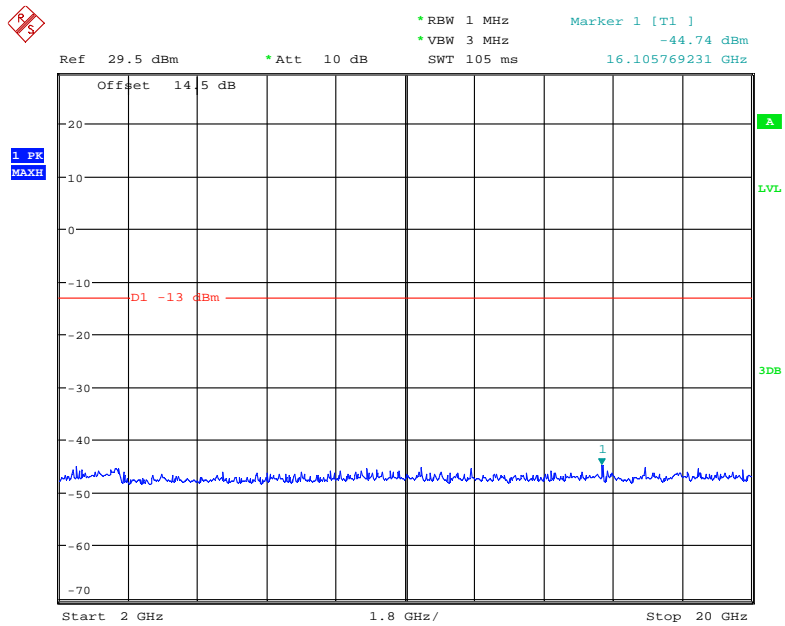
1 GHz - 2 GHz (1.4 MHz, Middle Channel)



Fundamental test

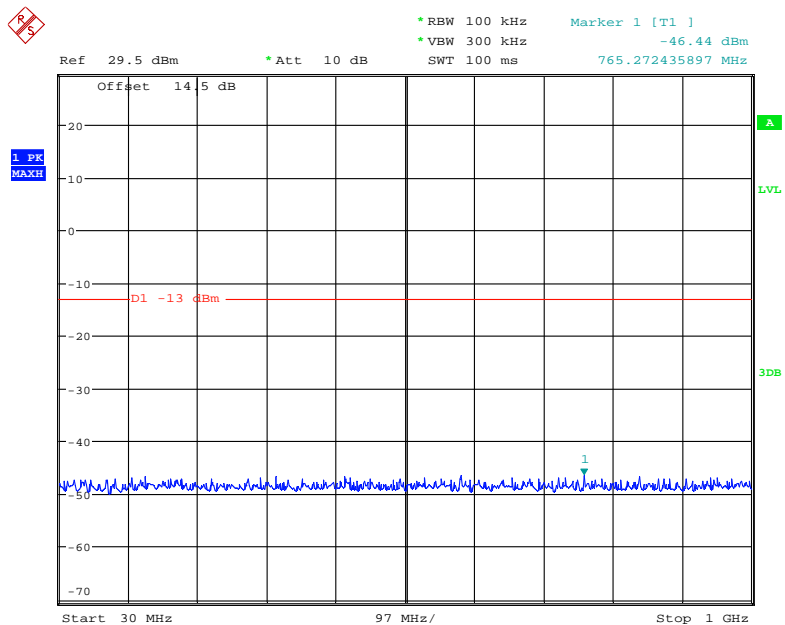
Date: 10.MAY.2018 16:05:24

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



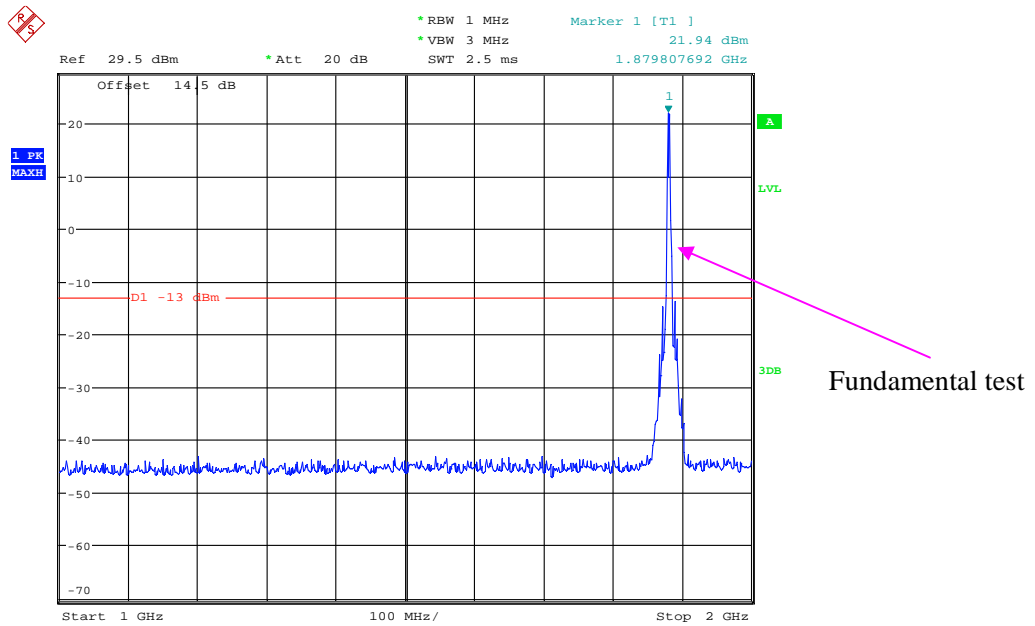
Date: 10.MAY.2018 16:08:55

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



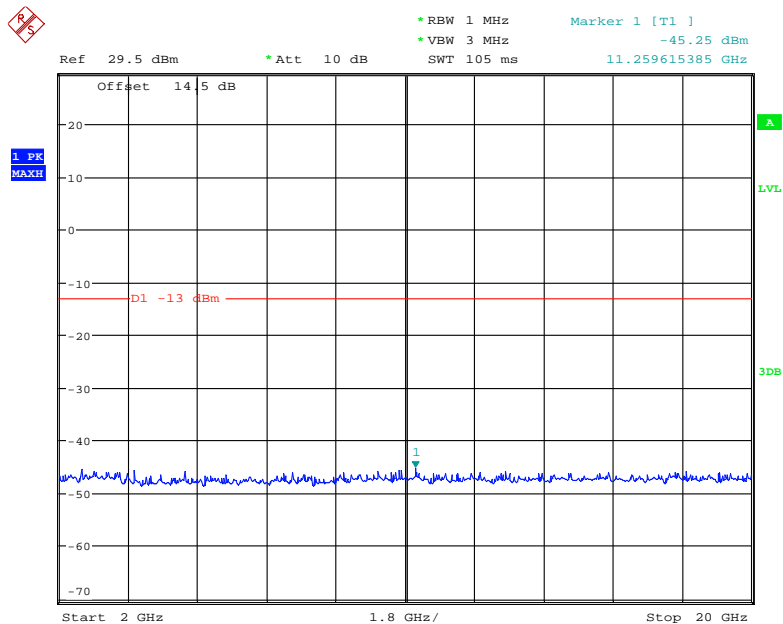
Date: 10.MAY.2018 16:10:01

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



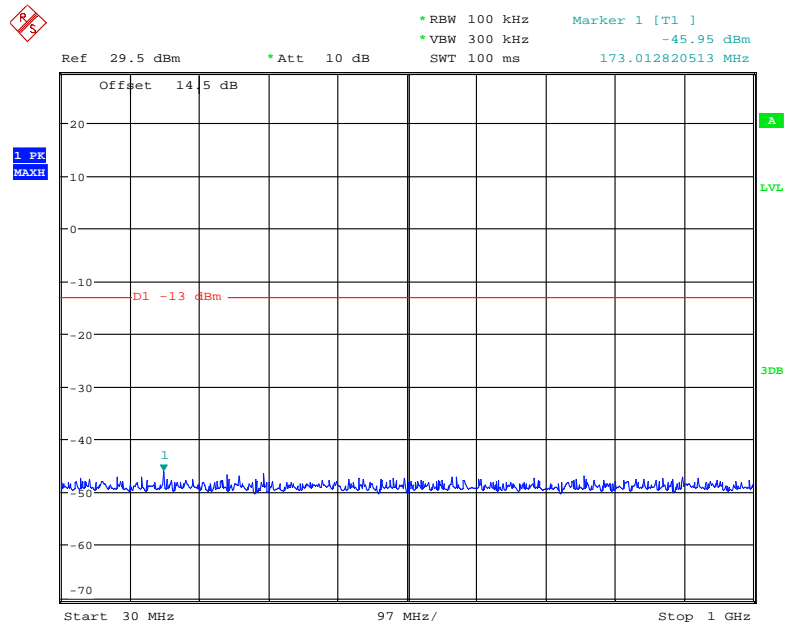
Date: 10.MAY.2018 16:11:11

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



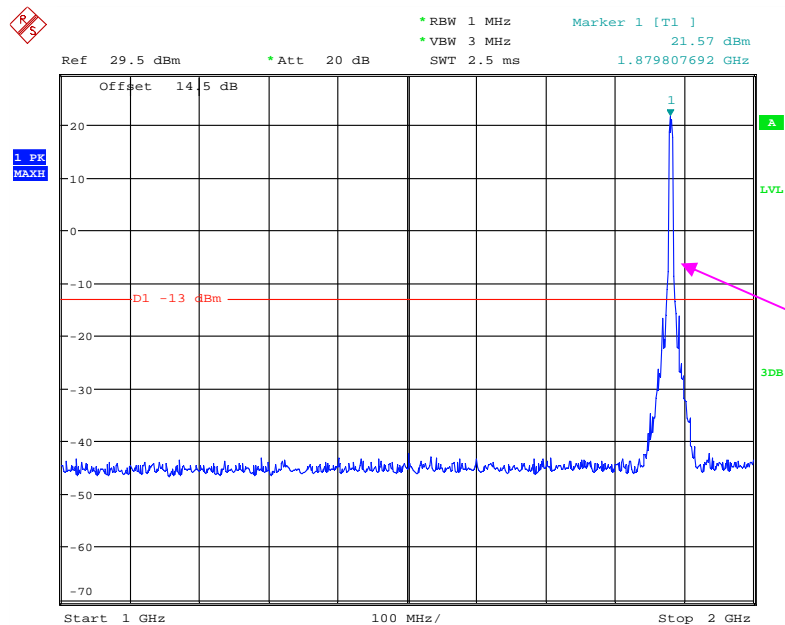
Date: 10.MAY.2018 16:11:55

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



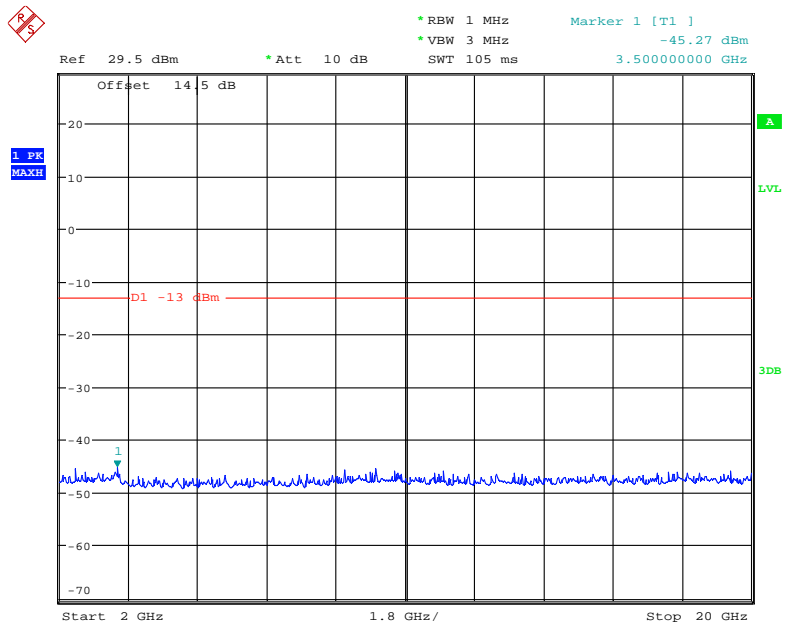
Date: 10.MAY.2018 16:16:13

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



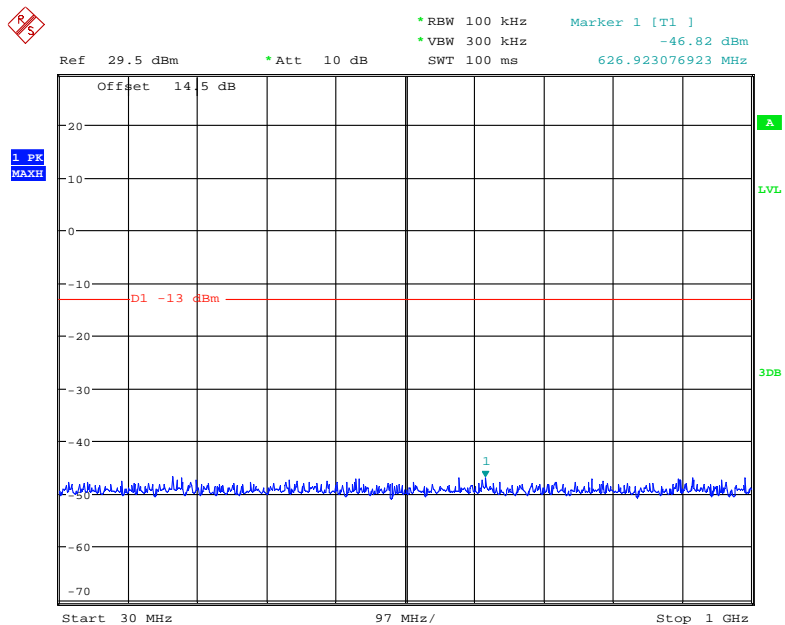
Date: 10.MAY.2018 16:15:35

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



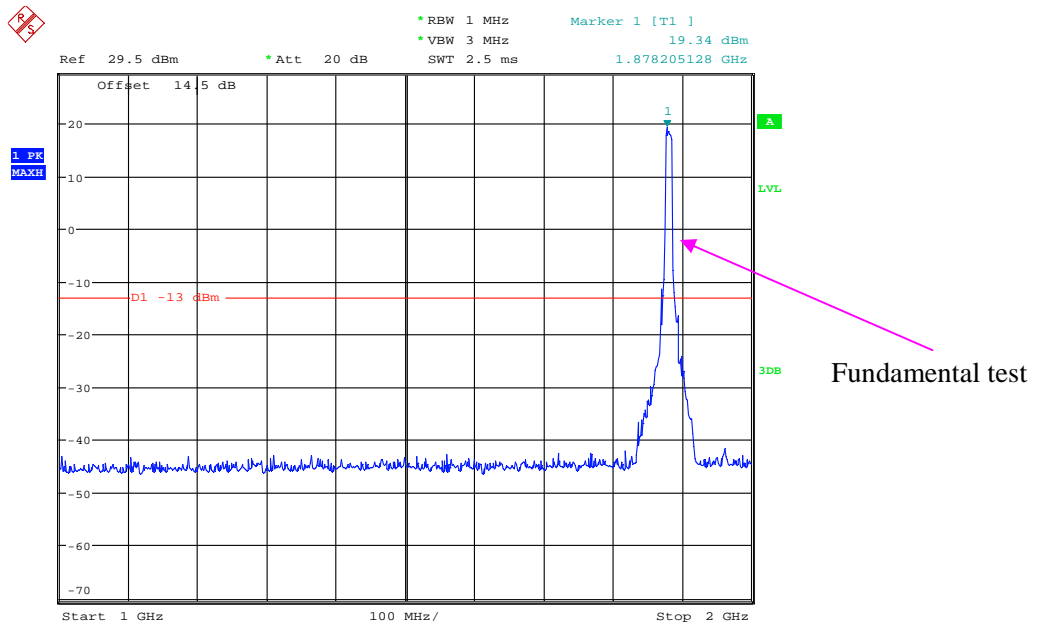
Date: 10.MAY.2018 16:15:07

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



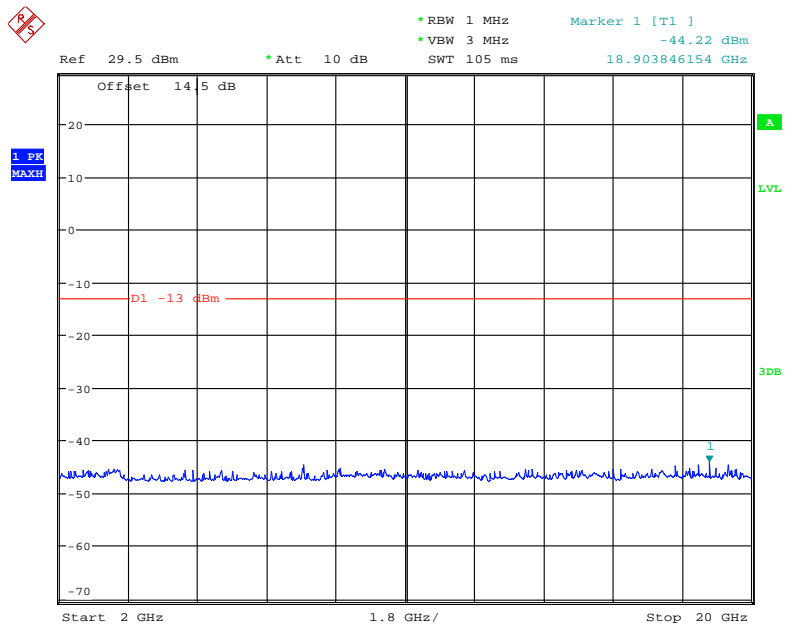
Date: 10.MAY.2018 16:16:39

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



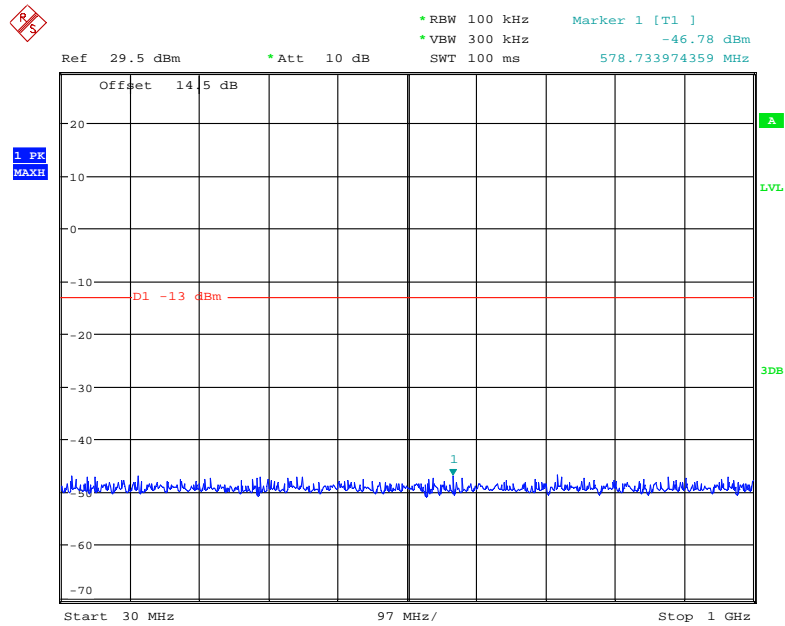
Date: 10.MAY.2018 16:18:10

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



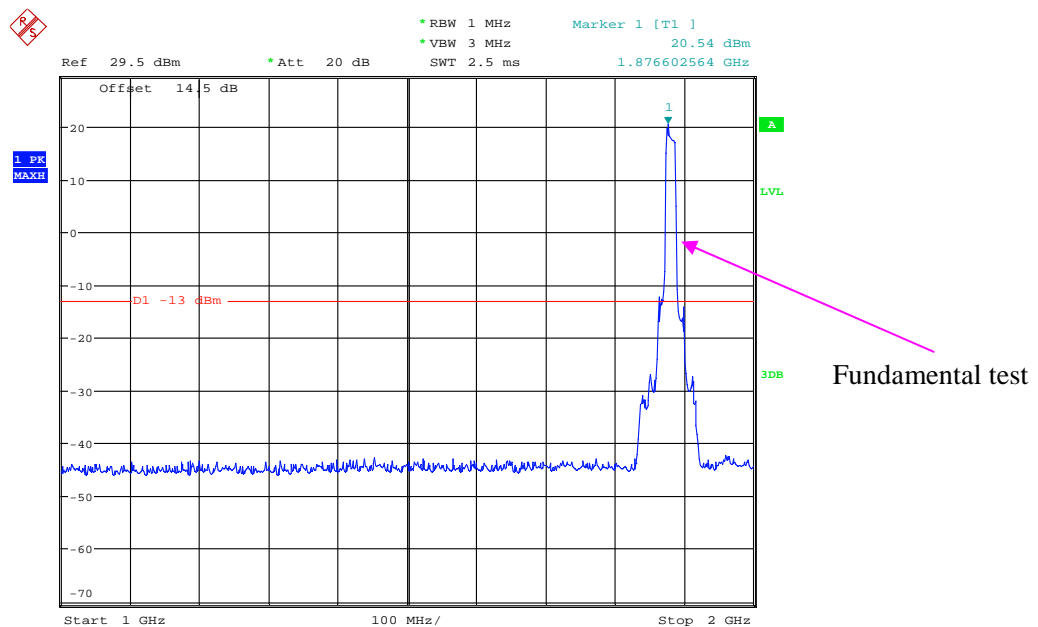
Date: 10.MAY.2018 16:19:13

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



Date: 10.MAY.2018 16:22:30

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



Date: 10.MAY.2018 16:21:40

* RBW 1 MHz
 * VBW 3 MHz
 SWT 105 ms

Marker 1 [T1]
 -45.70 dBm
 18.038461538 GHz

Ref 29.5 dBm
 * Att 10 dB

Offset 14.5 dB

1 PK
 MAXH

D1 -13 dBm

1

Start 2 GHz
 1.8 GHz/
 Stop 20 GHz

Date: 10.MAY.2018 16:21:00

Ref 29.5 dBm * Att 10 dB * RBW 100 kHz Marker 1 [T1] -46.29 dBm
 SWT 100 ms 407.740384615 MHz

Offset 14.5 dB

1 PK MAXII

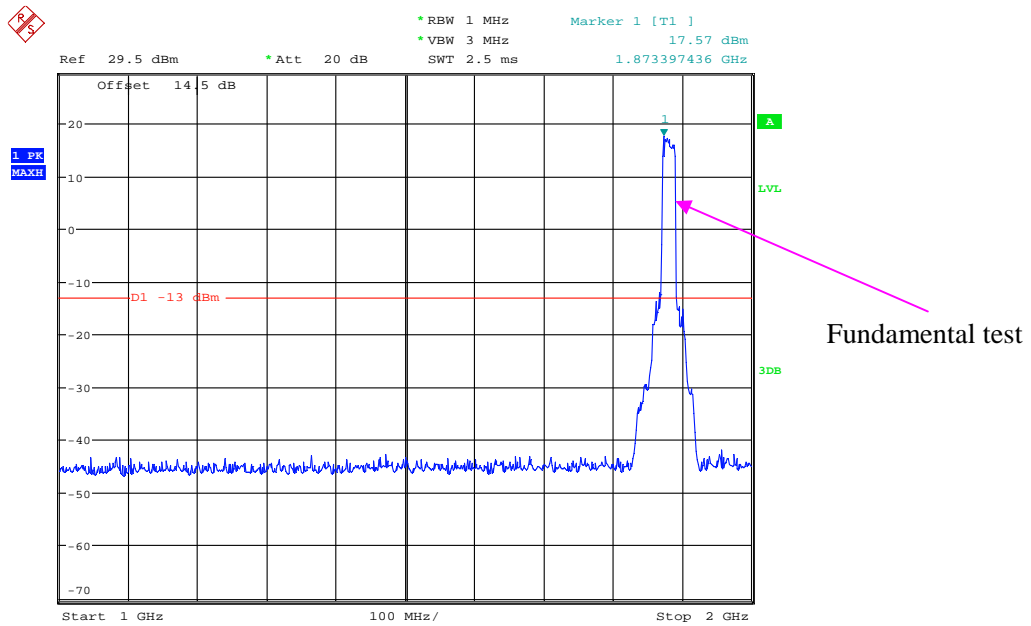
D1 -13 dBm

1

Start 30 MHz 97 MHz/ Stop 1 GHz

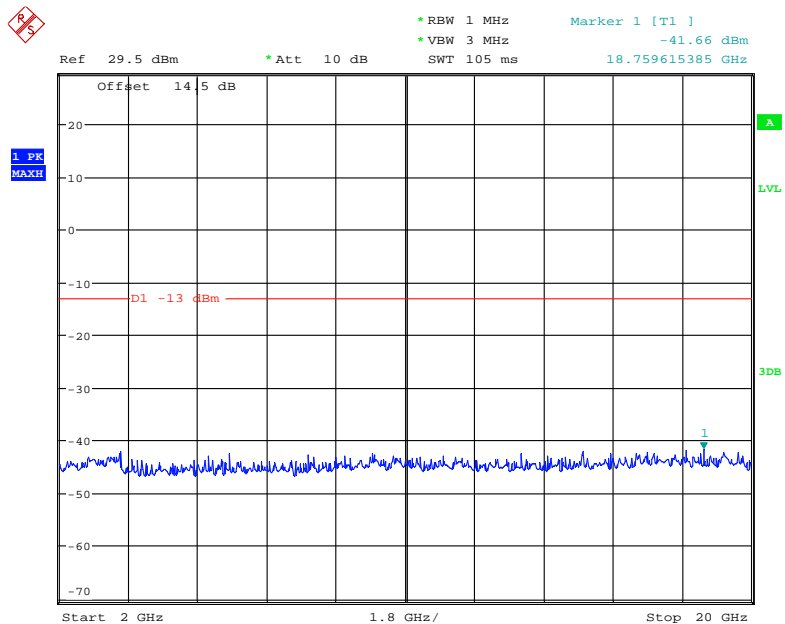
Date: 10.MAY.2018 16:23:05

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



Date: 10.MAY.2018 16:23:43

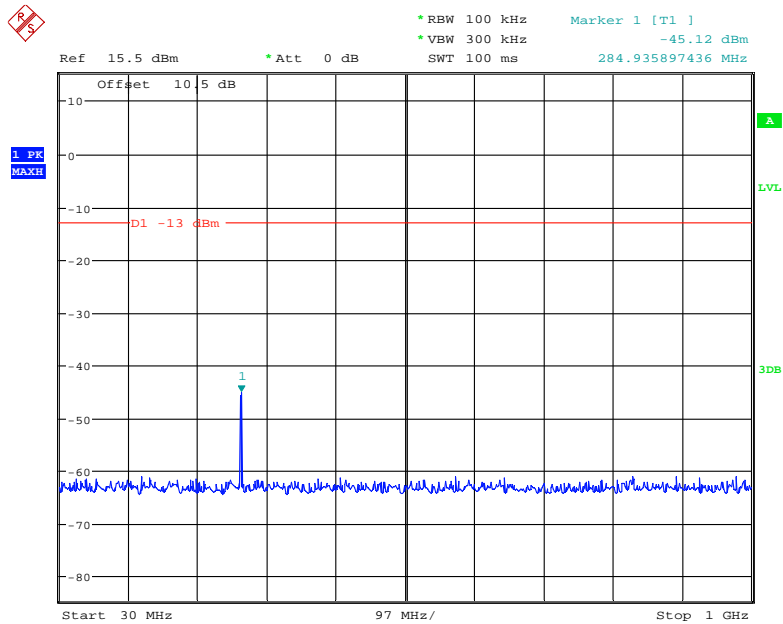
2 GHz - 20 GHz (20.0 MHz, Middle Channel)



Date: 10.MAY.2018 16:24:15

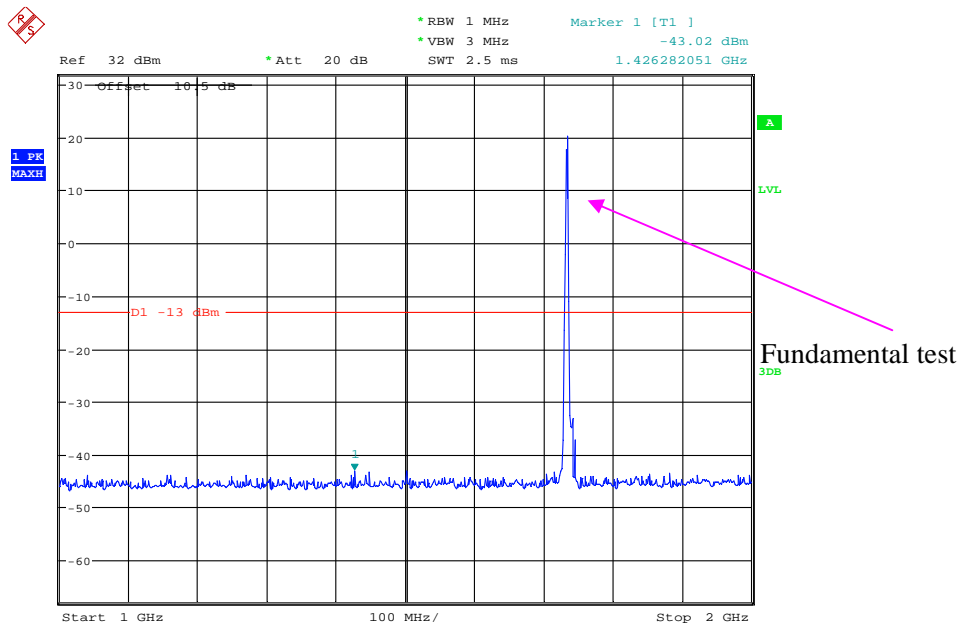
LTE Band 4: (QPSK)

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



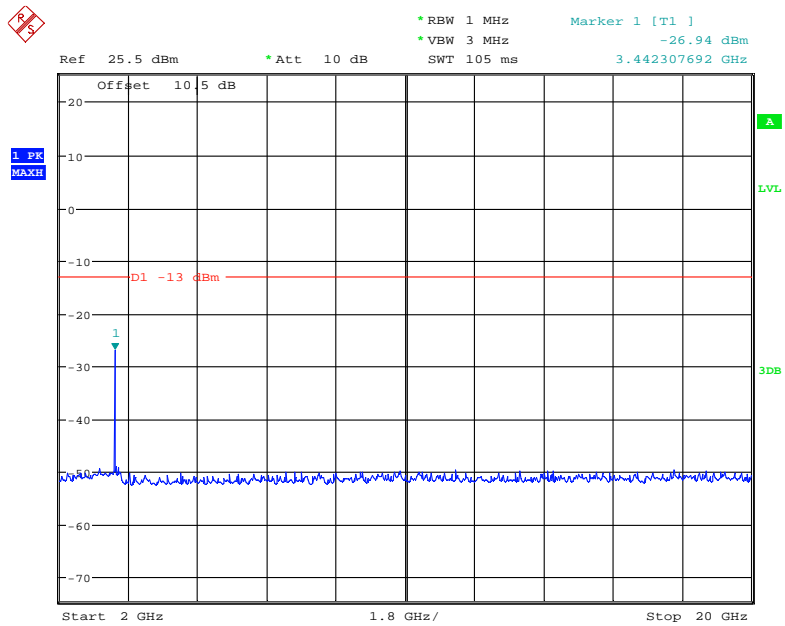
Date: 29.MAY.2018 18:10:41

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



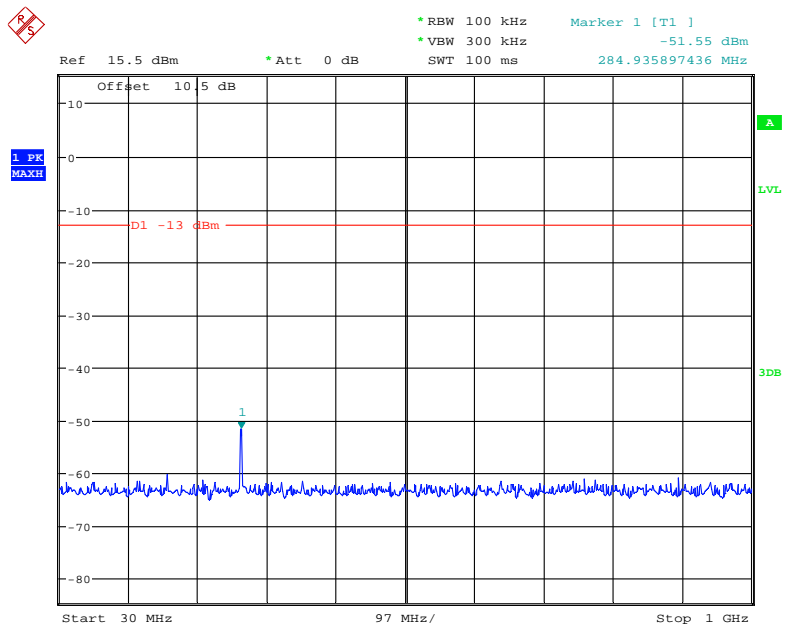
Date: 29.MAY.2018 18:12:01

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



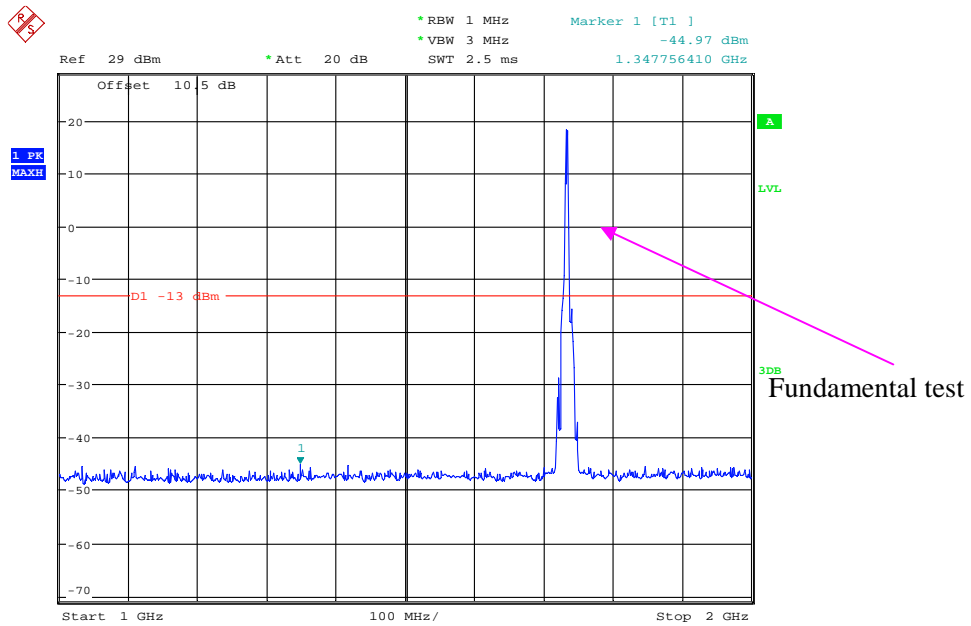
Date: 29.MAY.2018 18:12:32

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



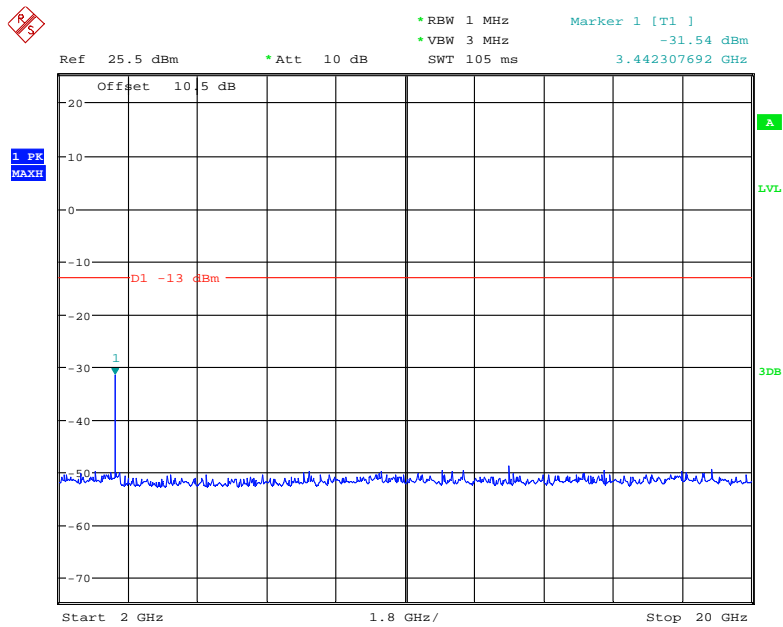
Date: 29.MAY.2018 18:14:01

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



Date: 29.MAY.2018 18:14:47

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



Date: 29.MAY.2018 18:13:07

Ref 15.5 dBm * Att 0 dB

* RBW 100 kHz * VBW 300 kHz * SWT 100 ms

Marker 1 [T1] -52.49 dBm 284.935897436 MHz

Offset 10.5 dB

1 PK MAXH

D1 -13 dBm

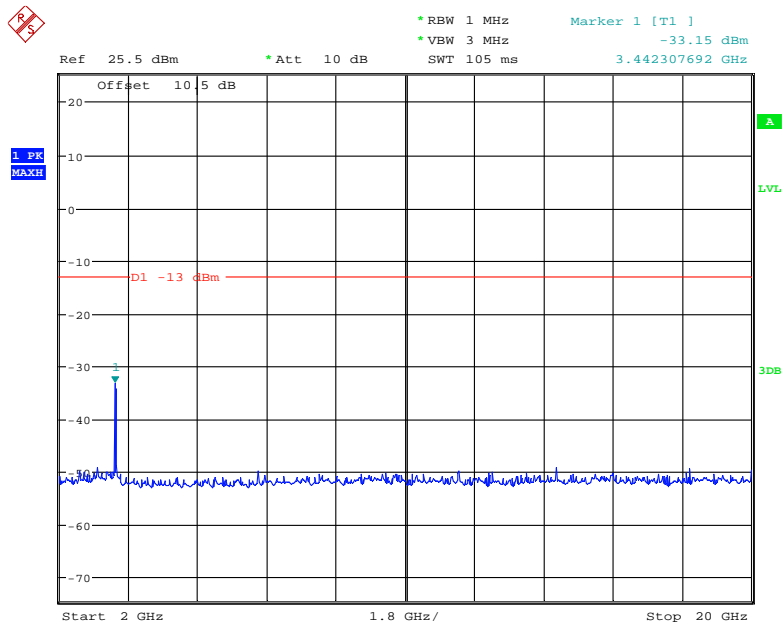
1

Start 30 MHz 97 MHz/ Stop 1 GHz

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

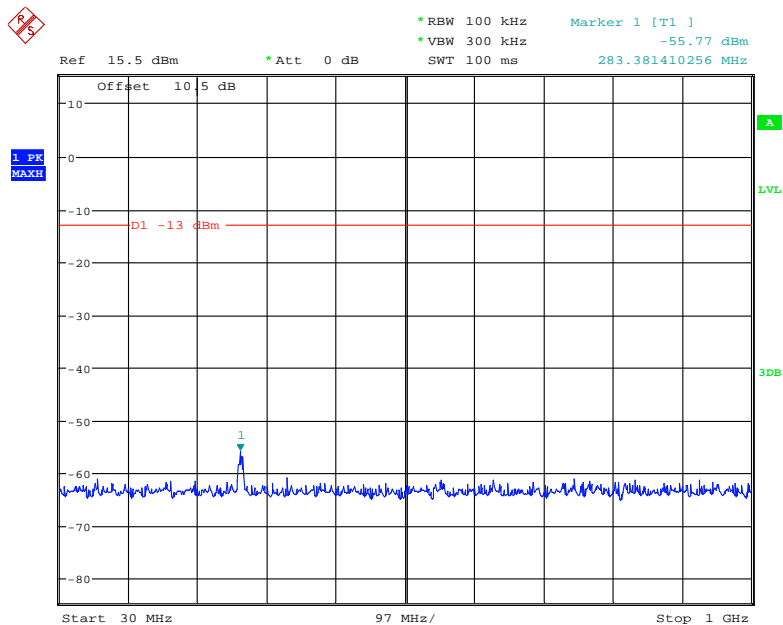


2 GHz - 20 GHz (5.0 MHz, Middle Channel)



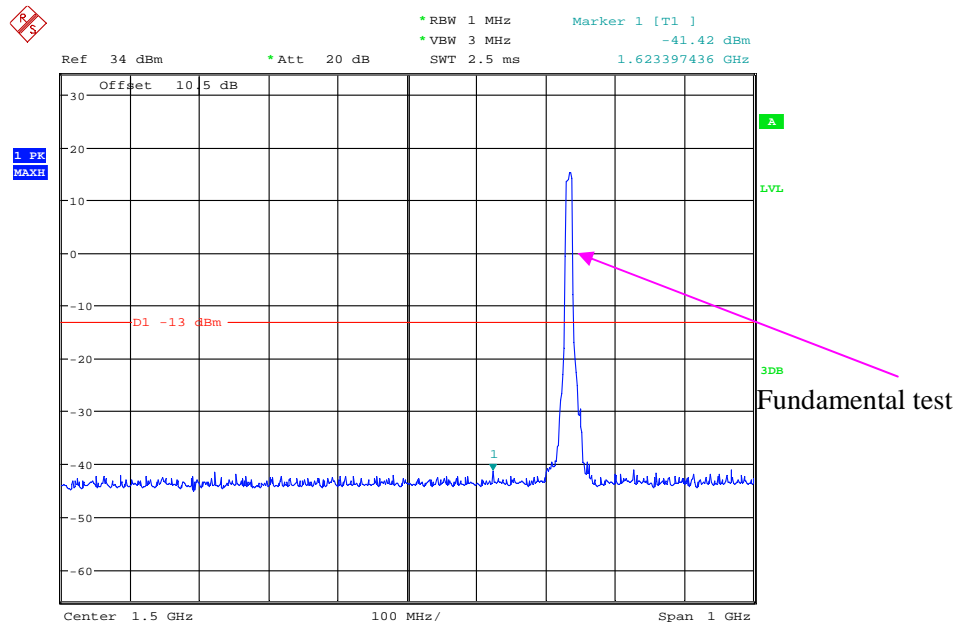
Date: 29.MAY.2018 18:15:40

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



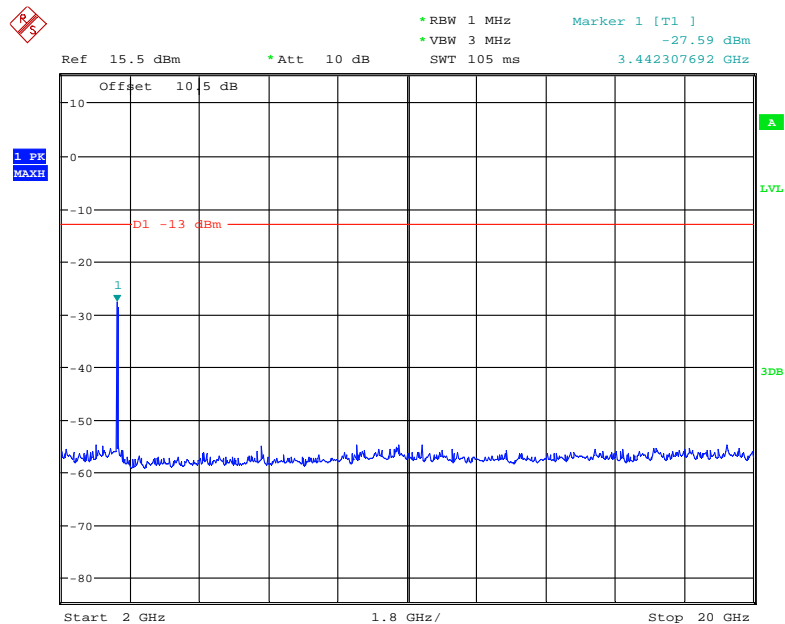
Date: 29.MAY.2018 18:29:34

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



Date: 29.MAY.2018 18:30:21

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



Date: 29.MAY.2018 18:30:57

Ref 15.5 dBm * Att 0 dB * RBW 100 kHz Marker 1 [T1] -54.03 dBm
 * VBW 300 kHz SWT 100 ms 286.490384615 MHz

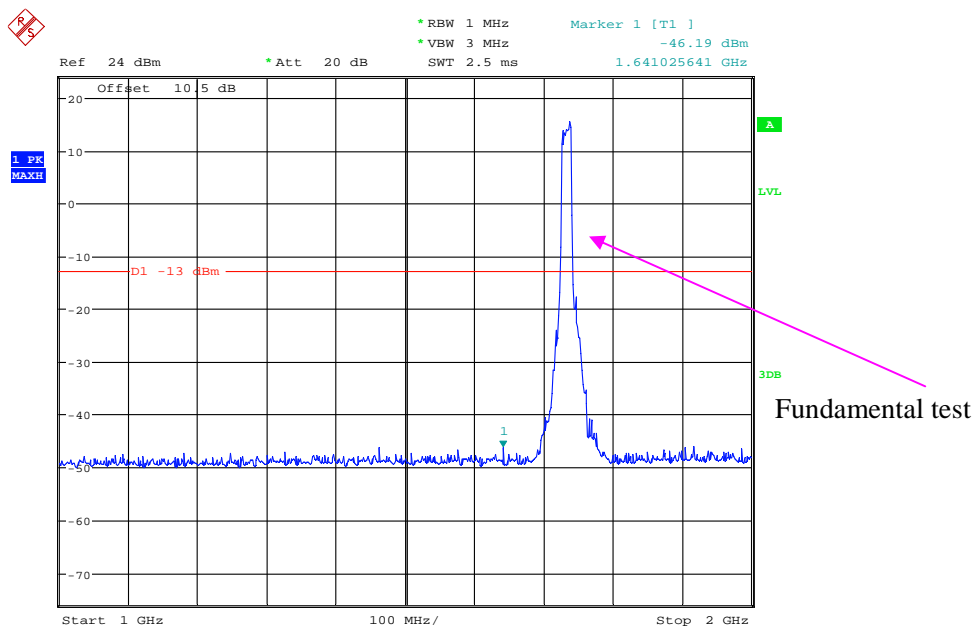
Offset 10.5 dB

1 PK
MAXH

D1 -13 dBm

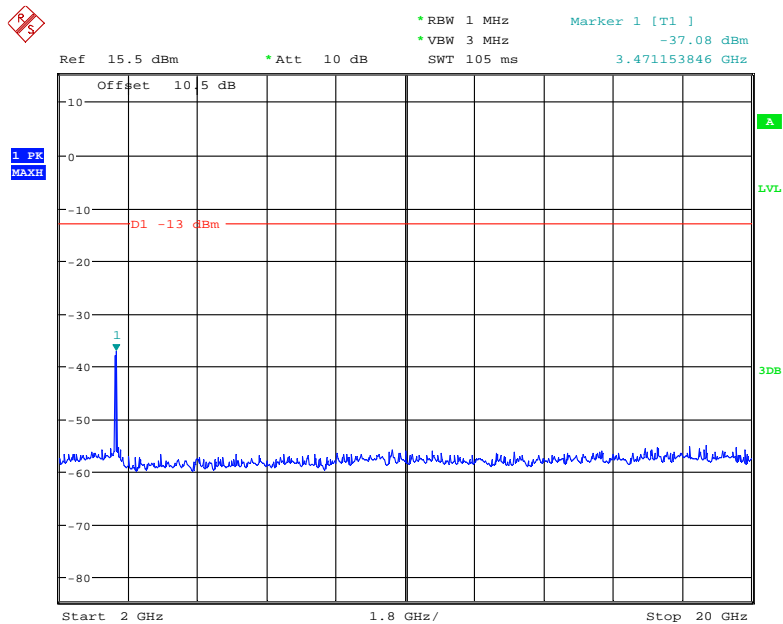
Start 30 MHz 97 MHz/ Stop 1 GHz

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



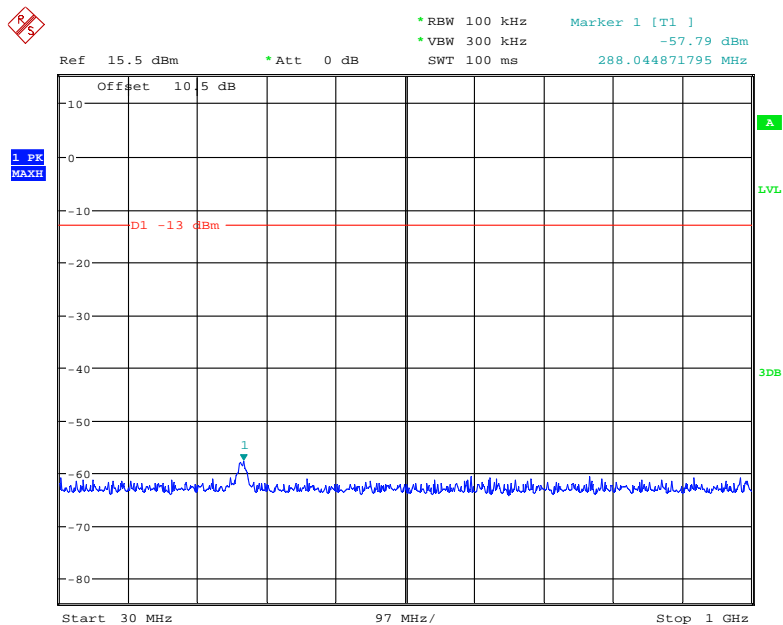
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2 GHz - 20 GHz (15.0 MHz, Middle Channel)



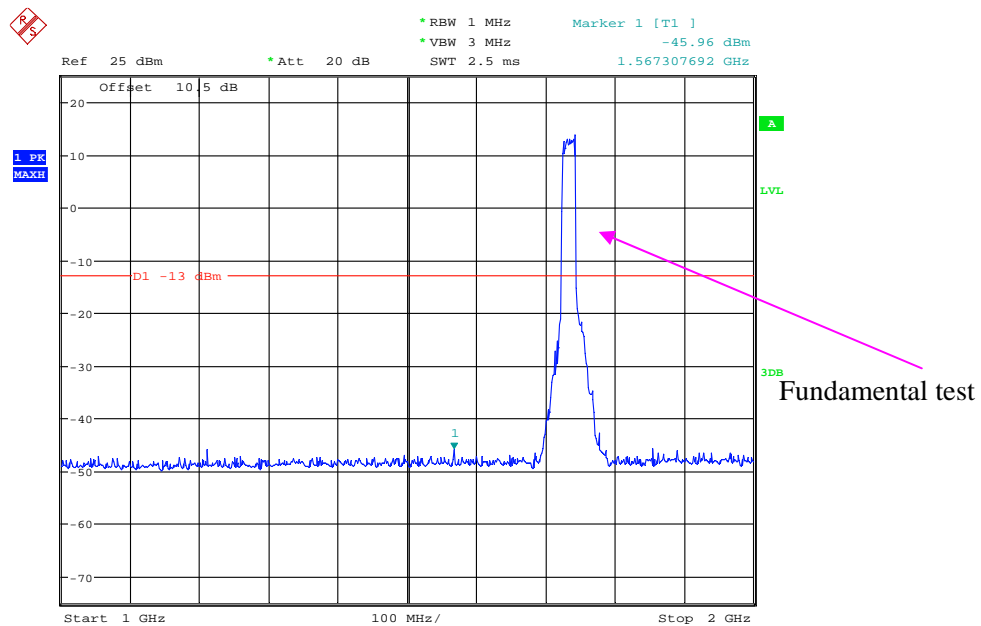
Date: 29.MAY.2018 18:31:14

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



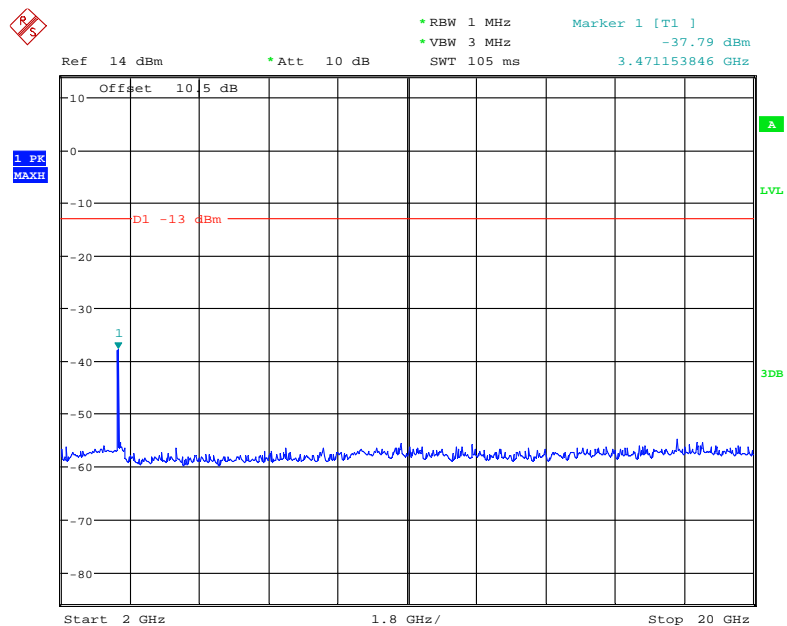
Date: 29.MAY.2018 18:32:42

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



Date: 29.MAY.2018 18:33:24

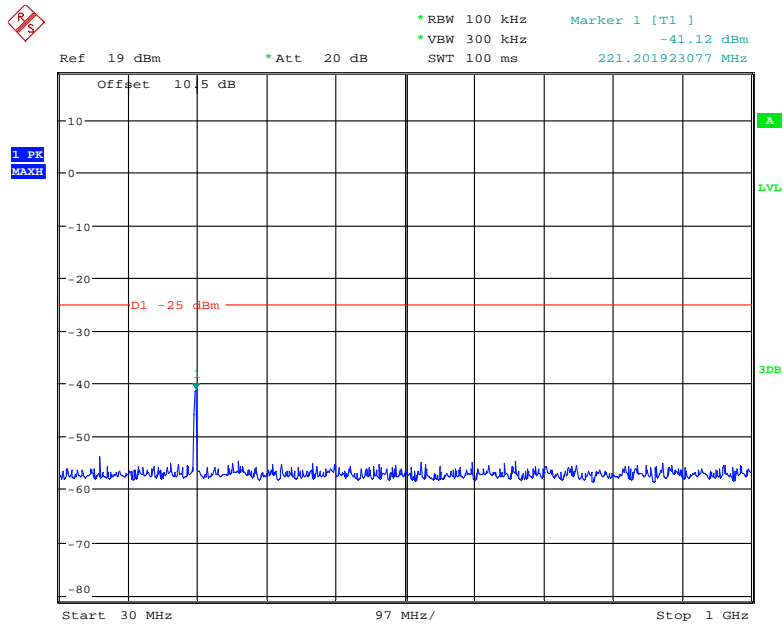
2 GHz - 20 GHz (20.0 MHz, Middle Channel)



Date: 29.MAY.2018 18:34:04

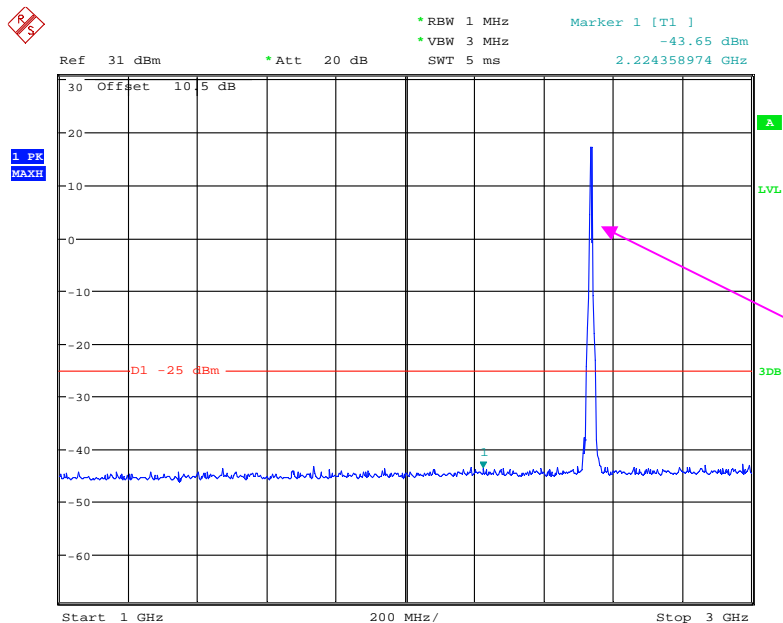
LTE Band 7: (QPSK)

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



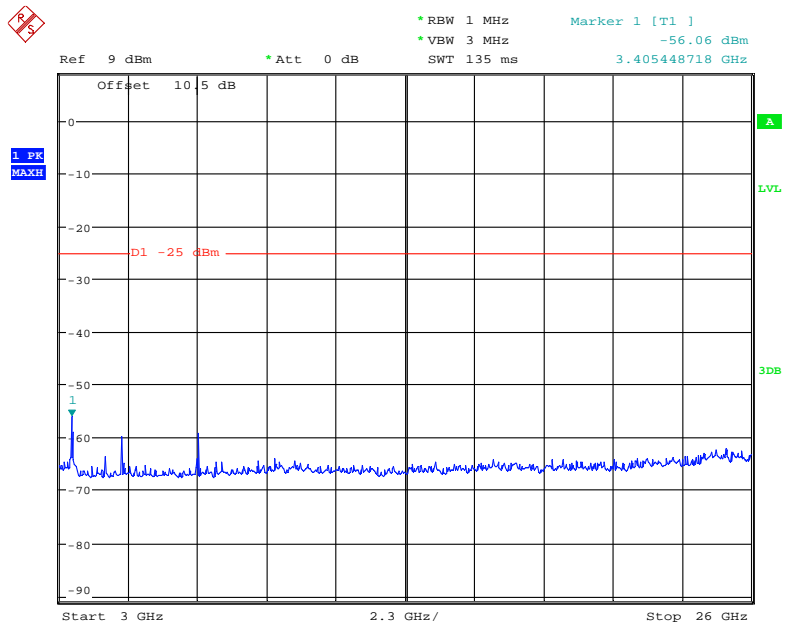
Date: 29.MAY.2018 17:43:56

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



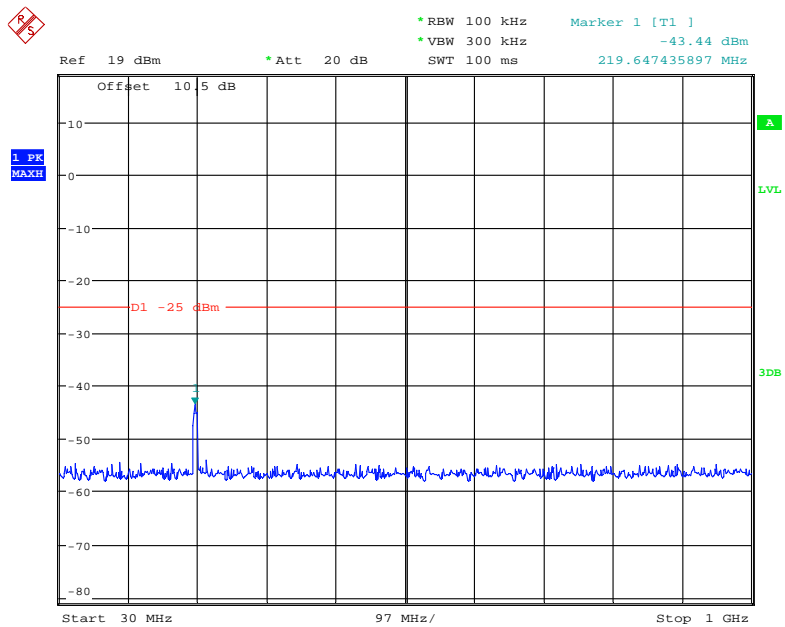
Date: 29.MAY.2018 16:53:01

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



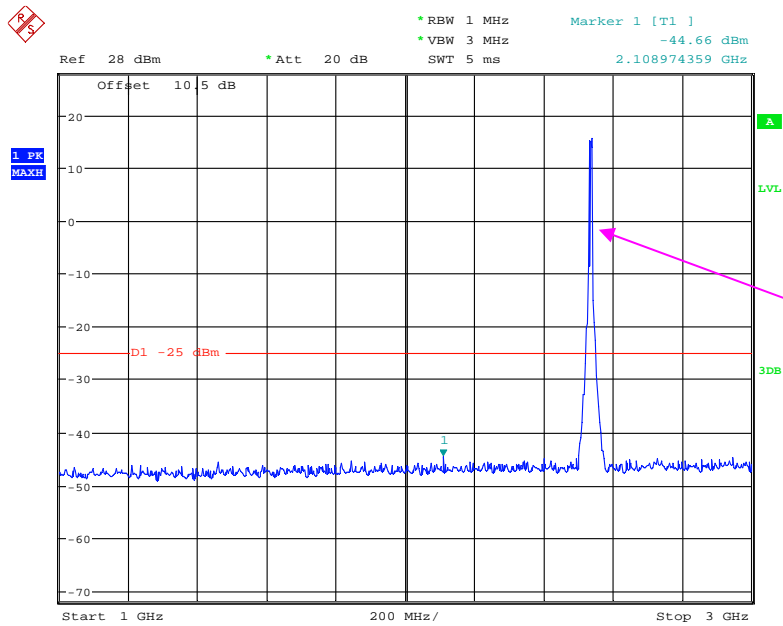
Date: 29.MAY.2018 17:42:14

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



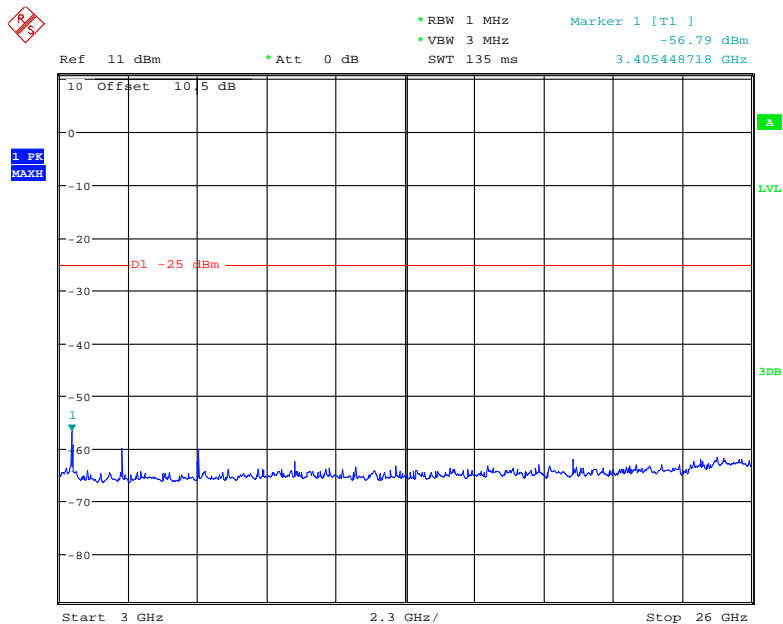
Date: 29.MAY.2018 17:44:40

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



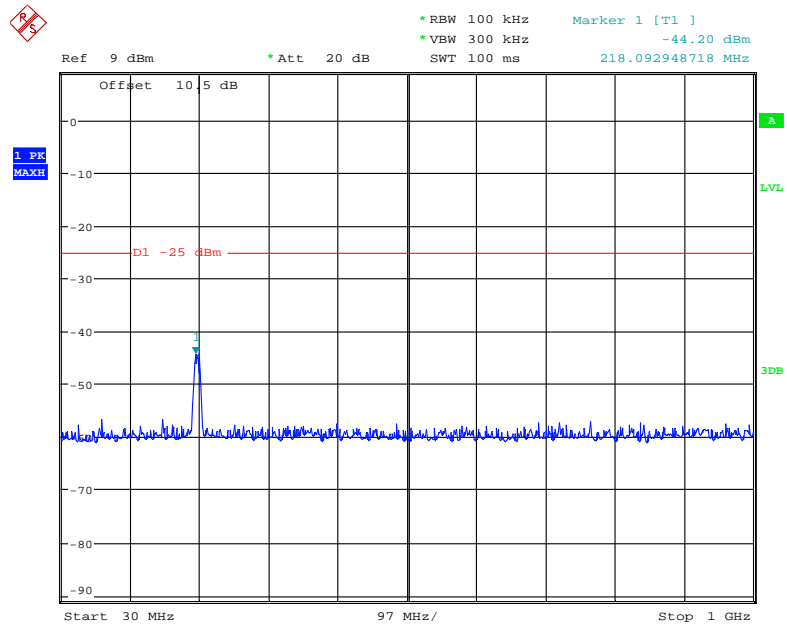
Date: 29.MAY.2018 17:45:19

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



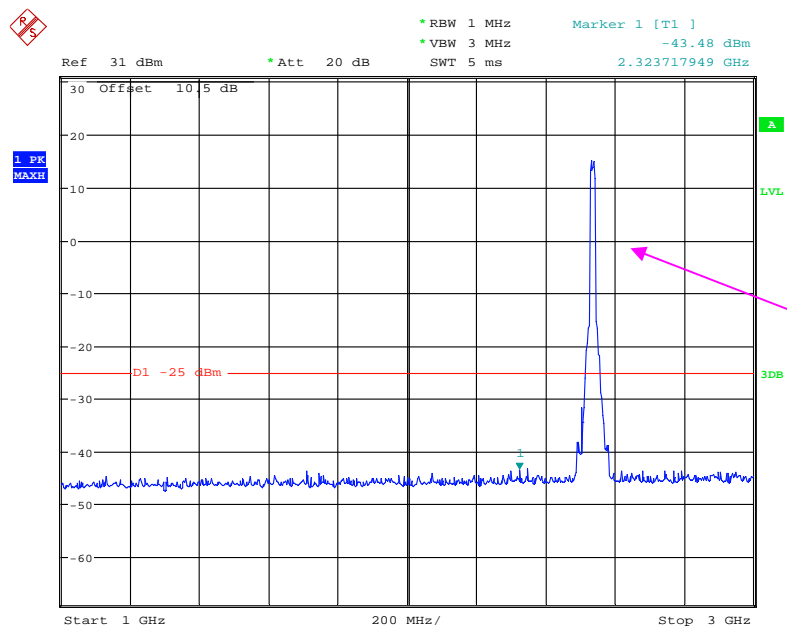
Date: 29.MAY.2018 17:46:07

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



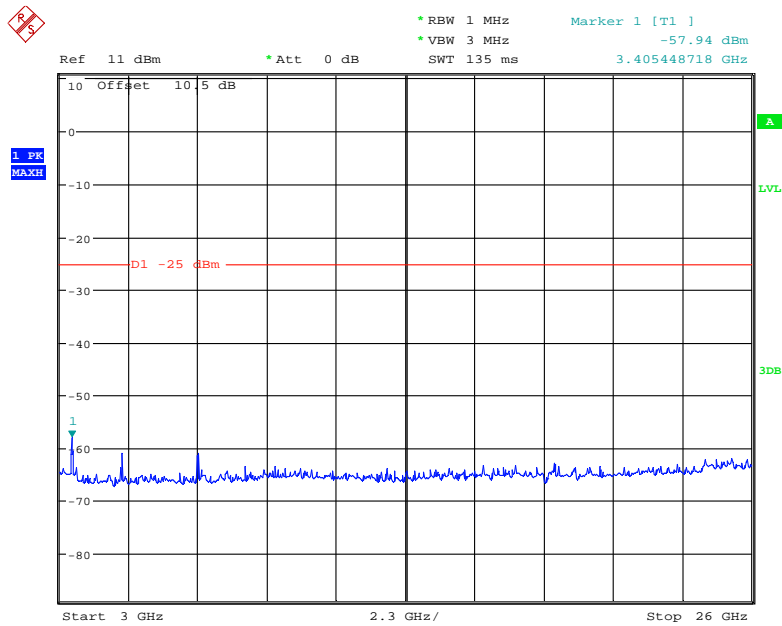
Date: 29.MAY.2018 17:48:16

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



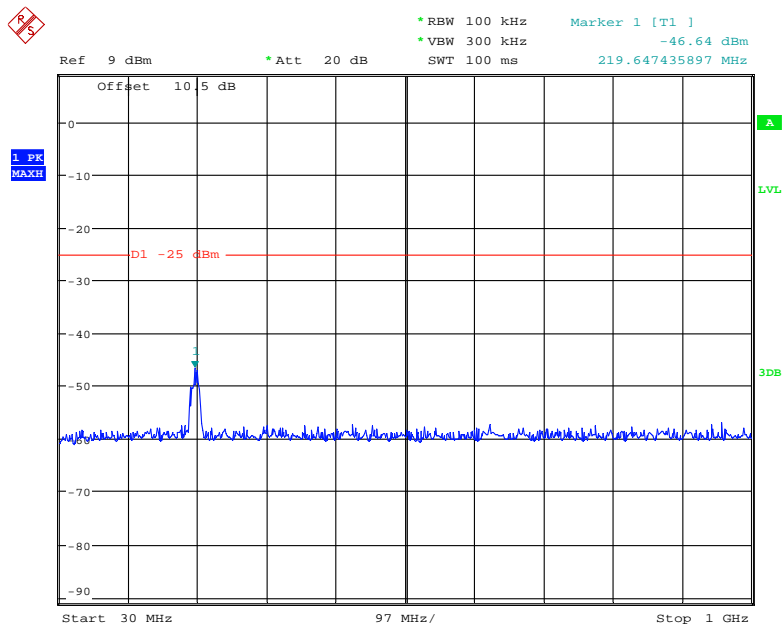
Date: 29.MAY.2018 17:47:44

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



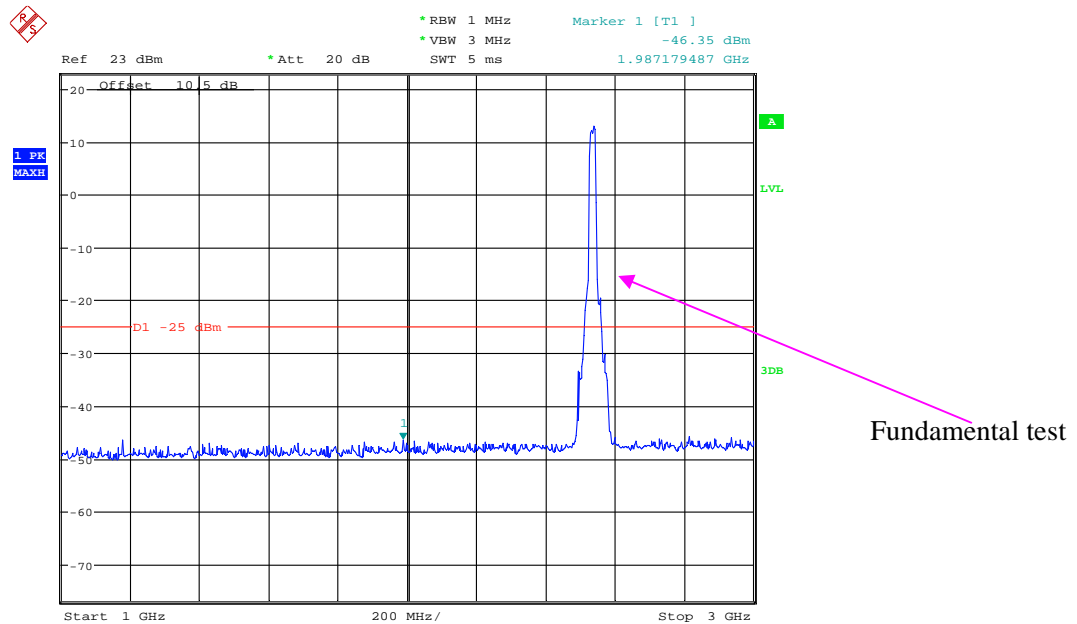
Date: 29.MAY.2018 17:46:55

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



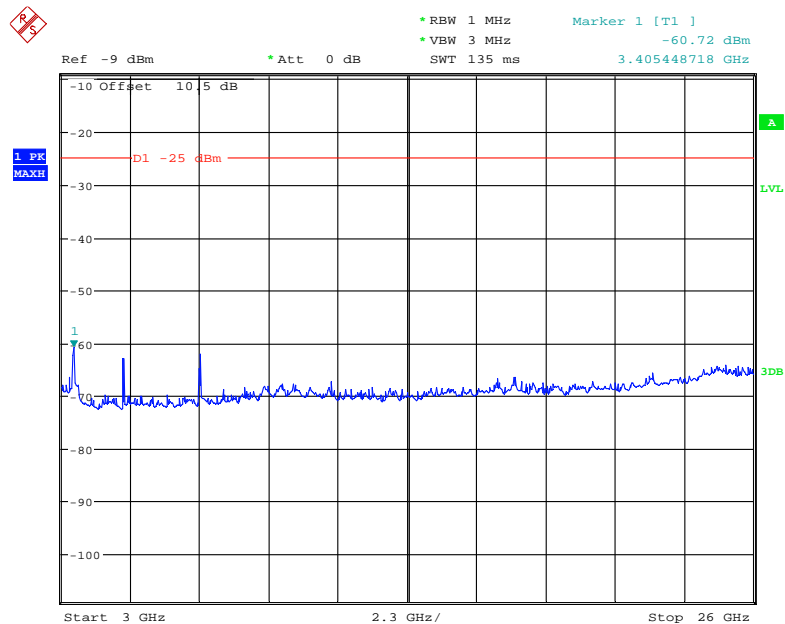
Date: 29.MAY.2018 17:48:40

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



Date: 29.MAY.2018 17:49:16

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



Date: 29.MAY.2018 17:49:52

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:	26 °C
Relative Humidity:	48 %
ATM Pressure:	110.0 kPa

The testing was performed by Nancy Wang on 2018-06-02.

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 (dB)		Limit (dBm)	Margin (dB)
GSM Mode, Middle channel										
251.83	33.24	69	1.1	H	-63.8	0.32	0	-64.12	-13	51.12
251.83	33.97	208	1.5	V	-63.0	0.32	0	-63.32	-13	50.32
1673.20	55.68	273	1.8	H	-51.4	1.30	8.90	-43.80	-13	30.80
1673.20	58.09	96	1.9	V	-48.4	1.30	8.90	-40.80	-13	27.80
2509.80	55.53	48	1.3	H	-48.0	2.60	10.20	-40.40	-13	27.40
2509.80	59.25	350	1.8	V	-43.7	2.60	10.20	-36.10	-13	23.10
WCDMA Mode, Middle channel										
235.18	34.18	281	1.7	H	-62.8	0.31	0	-63.11	-13	50.11
235.18	33.62	121	1.5	V	-63.4	0.31	0	-63.71	-13	50.71
1673.20	45.04	303	1.4	H	-62.0	1.30	8.90	-54.40	-13	41.40
1673.20	44.87	96	2.0	V	-61.6	1.30	8.90	-54.00	-13	41.00

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 (dB)		Limit (dBm)	Margin (dB)
GSM Mode, Middle channel										
251.83	33.62	358	2.5	H	-63.4	0.32	0	-63.72	-13	50.72
251.83	34.51	254	2.1	V	-62.5	0.32	0	-62.82	-13	49.82
3760.00	51.79	199	1.2	H	-49.4	1.50	11.80	-39.10	-13	26.10
3760.00	57.85	66	1.2	V	-42.9	1.50	11.80	-32.60	-13	19.60
WCDMA Mode, Middle channel										
235.18	33.29	130	1.1	H	-63.7	0.31	0	-64.01	-13	51.01
235.18	34.63	269	1.7	V	-62.4	0.31	0	-62.71	-13	49.71
3760.00	43.55	318	1.2	H	-57.7	1.50	11.80	-47.40	-13	34.40
3760.00	47.17	211	1.5	V	-53.6	1.50	11.80	-43.30	-13	30.30

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 (dB)			
Band 2, Middle channel										
Test frequency range: 30 MHz ~ 20 GHz										
183.27	33.29	243	1.9	H	-63.7	0.28	0	-63.98	-13	50.98
183.27	33.96	177	1.1	V	-63.0	0.28	0	-63.28	-13	50.28
3760.00	46.55	213	1.9	H	-64.7	1.50	11.80	-44.40	-13	31.40
3760.00	49.50	32	1.3	V	-61.3	1.50	11.80	-41.00	-13	28.00
5640.00	42.80	315	1.5	H	-64.8	1.70	12.40	-44.10	-13	31.10
5640.00	43.65	251	2.3	V	-63.6	1.70	12.40	-42.90	-13	39.90
Band 4, Middle channel,										
Test frequency range: 30 MHz ~ 18 GHz										
183.27	33.51	262	2.2	H	-63.5	0.28	0	-63.78	-13	50.78
183.27	33.67	337	1.6	V	-63.3	0.28	0	-63.58	-13	50.58
3465.00	47.14	54	1.5	H	-63.2	1.50	12.00	-42.70	-13	29.70
3465.00	47.83	166	1.5	V	-63.3	1.50	12.00	-42.80	-13	29.80
5197.50	44.10	157	2.1	H	-64.5	1.60	12.10	-44.00	-13	31.00
5197.50	45.62	280	2.4	V	-62.5	1.60	12.10	-42.00	-13	29.00
Band 7, Middle channel										
Test frequency range: 30 MHz ~26 GHz										
183.27	34.21	117	2.2	H	-62.8	0.28	0	-63.08	-13	50.08
183.27	34.63	213	1.3	V	-62.4	0.28	0	-62.68	-13	49.68
5070.00	47.95	309	1.3	H	-49.9	1.60	12.10	-39.40	-25	14.40
5070.00	47.25	189	1.8	V	-50.6	1.60	12.10	-40.10	-25	15.10
7605.00	51.64	223	2.0	H	-43.6	2.10	10.50	-35.20	-25	10.20
7605.00	48.82	290	1.9	V	-46.2	2.10	10.50	-37.80	-25	12.80

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.

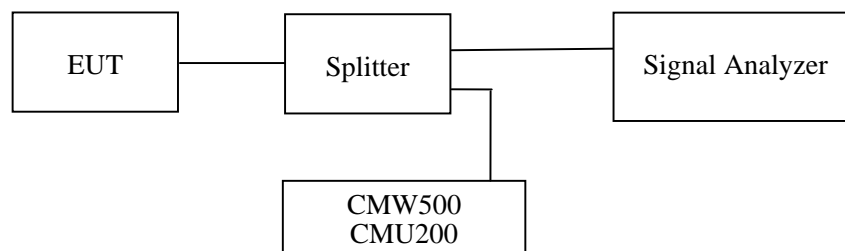
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

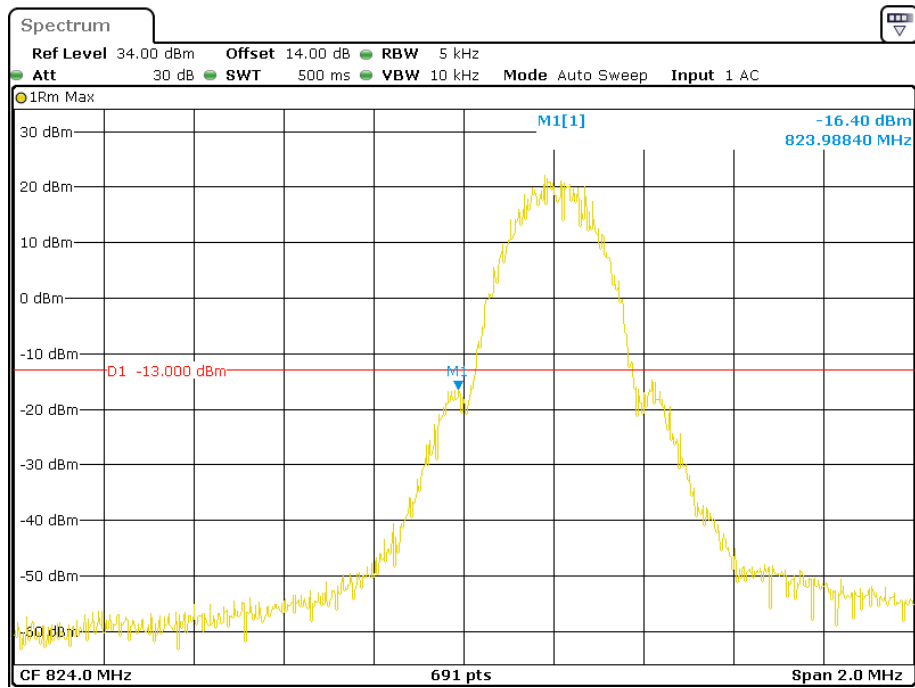
Temperature:	24~25 °C
Relative Humidity:	48~50 %
ATM Pressure:	100.5~101.0 kPa

The testing was performed by Nancy Wang from 2018-05-09 to 2018-06-05.

EUT operation mode: Transmitting

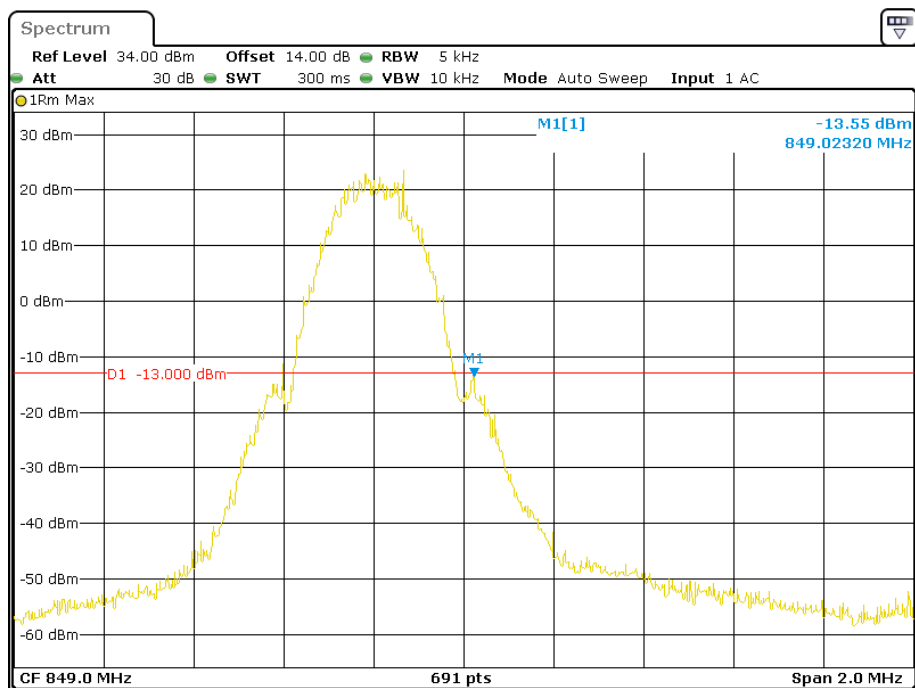
Test Result: Compliance. Please refer to the following plots.

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



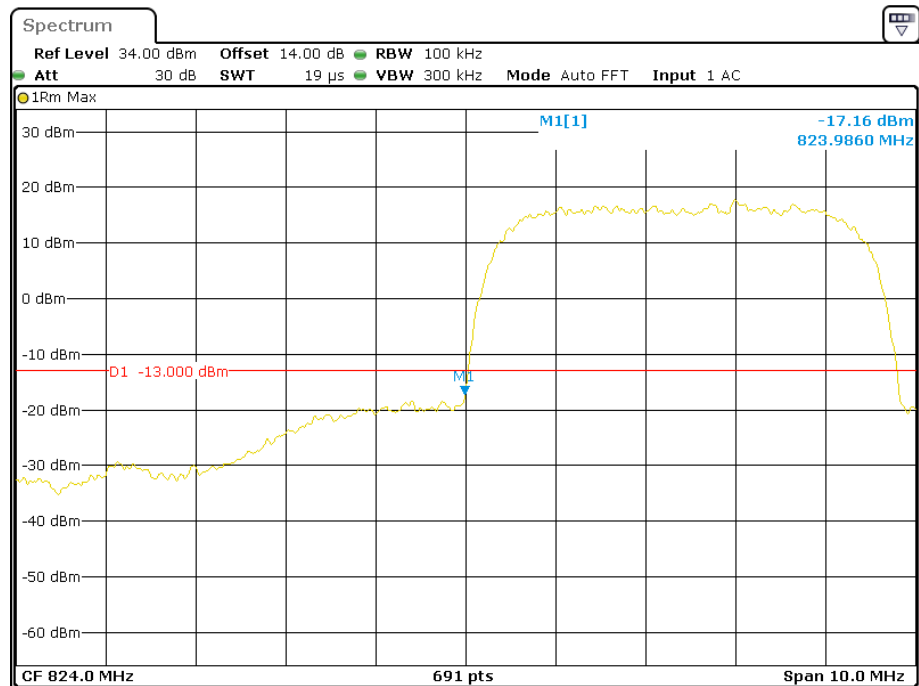
Date: 5.JUN.2018 19:59:44

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



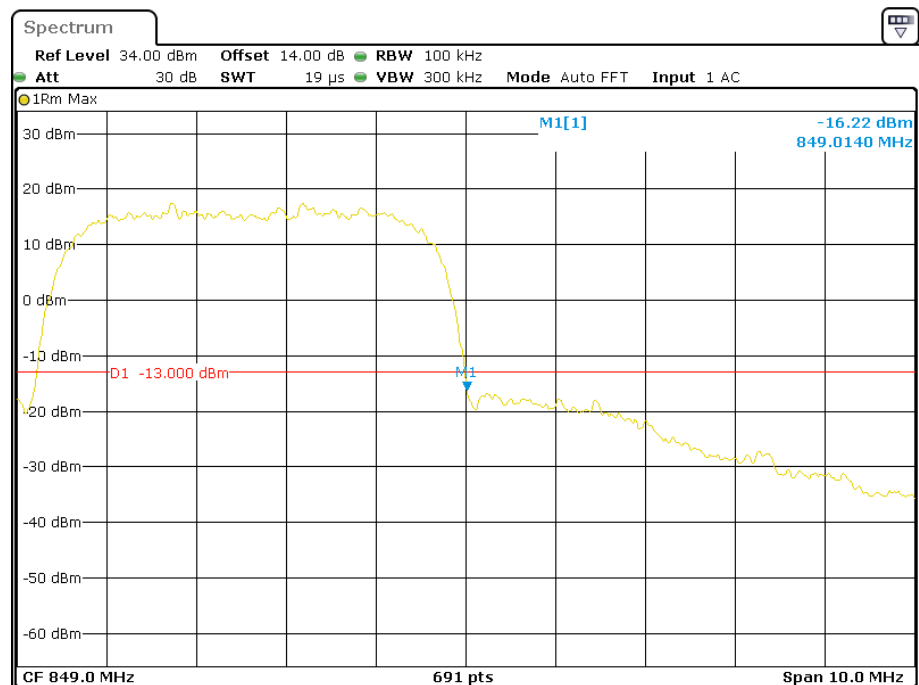
Date: 5.JUN.2018 19:54:55

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



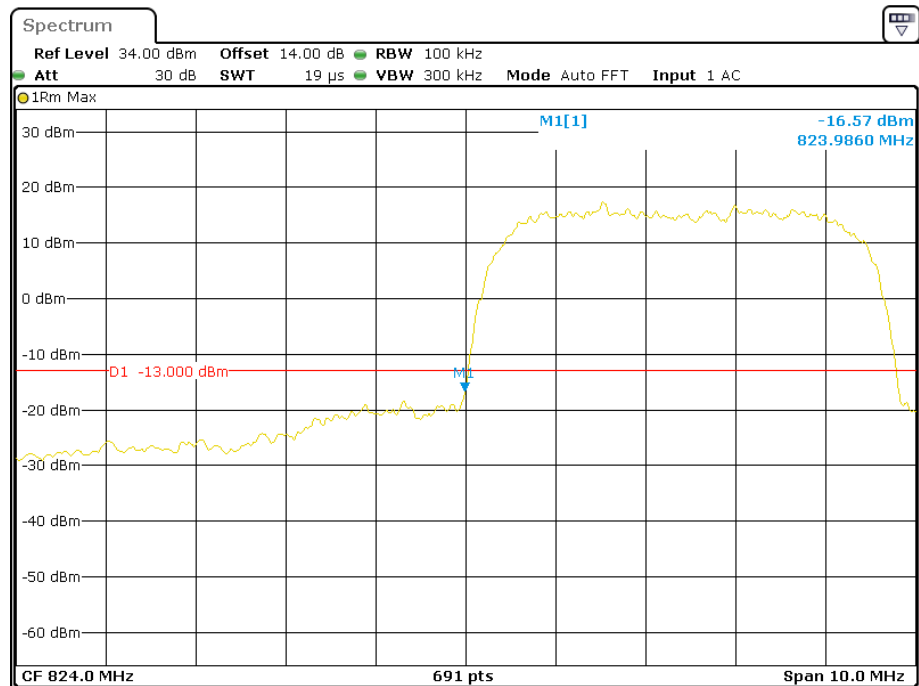
Date: 5.JUN.2018 20:45:58

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



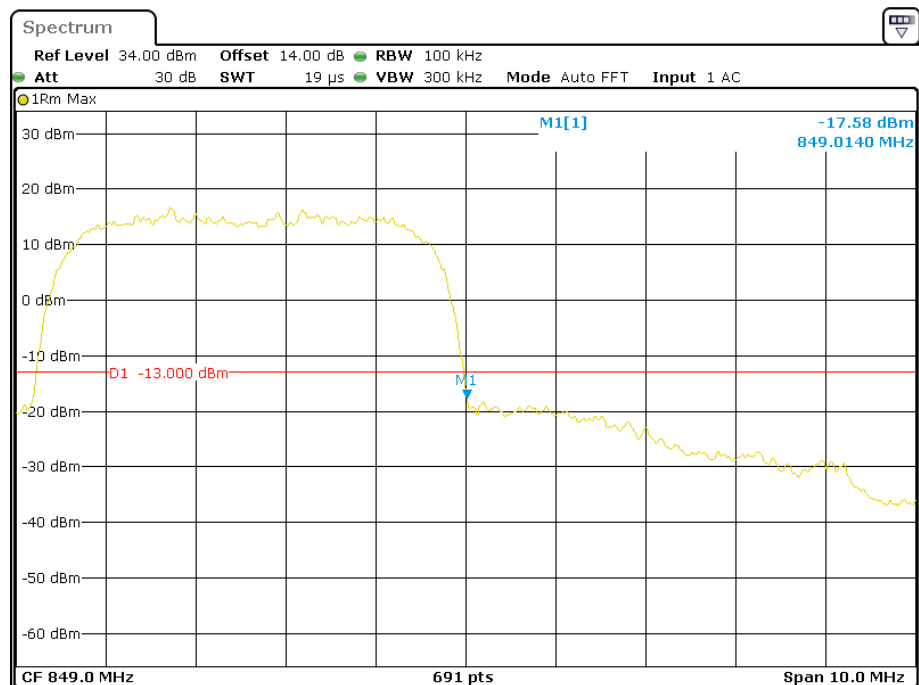
Date: 5.JUN.2018 20:44:17

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



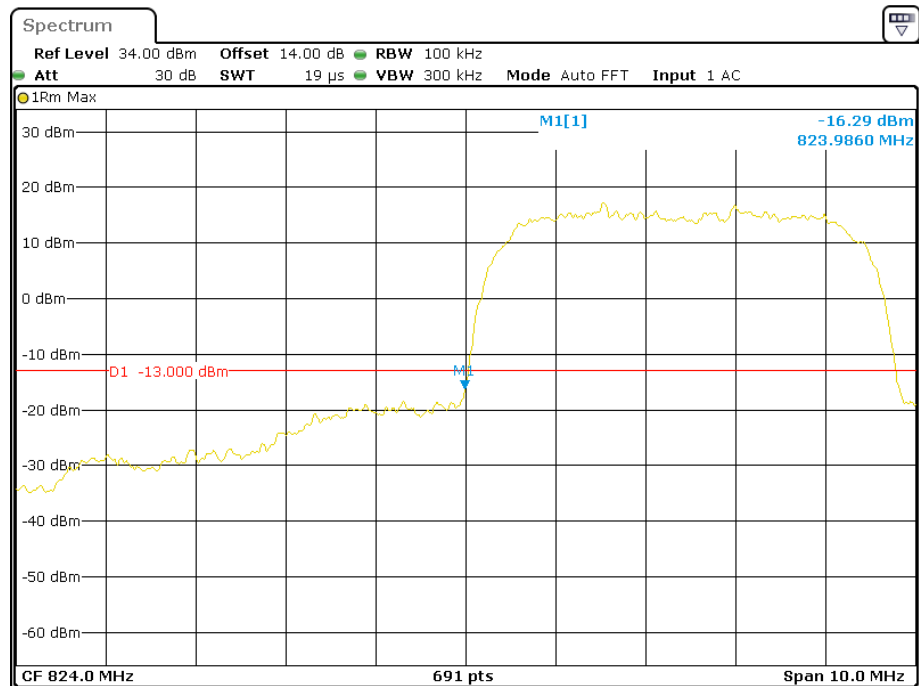
Date: 5.JUN.2018 21:00:29

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



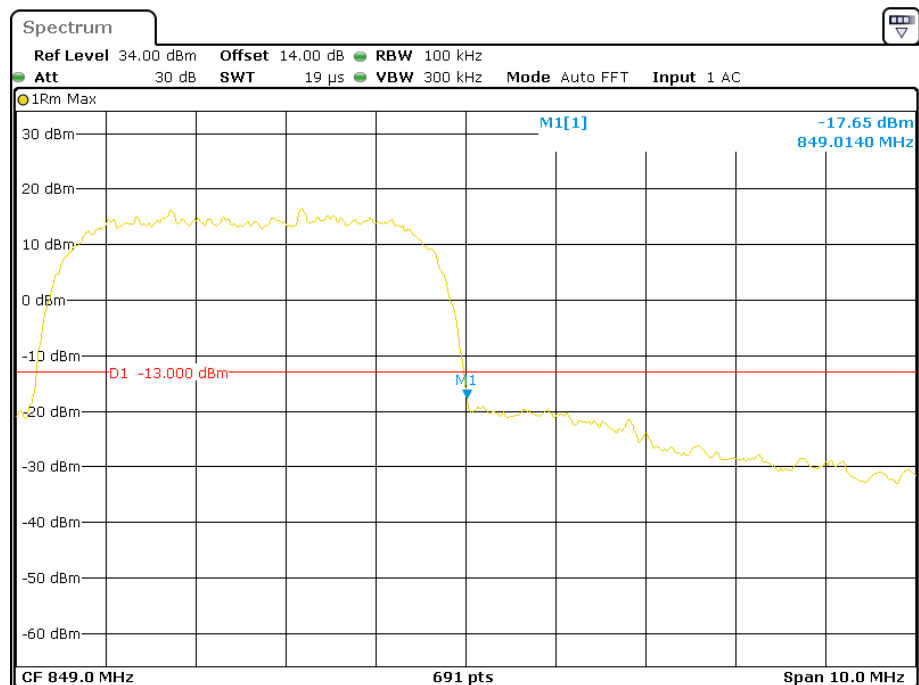
Date: 5.JUN.2018 20:57:49

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



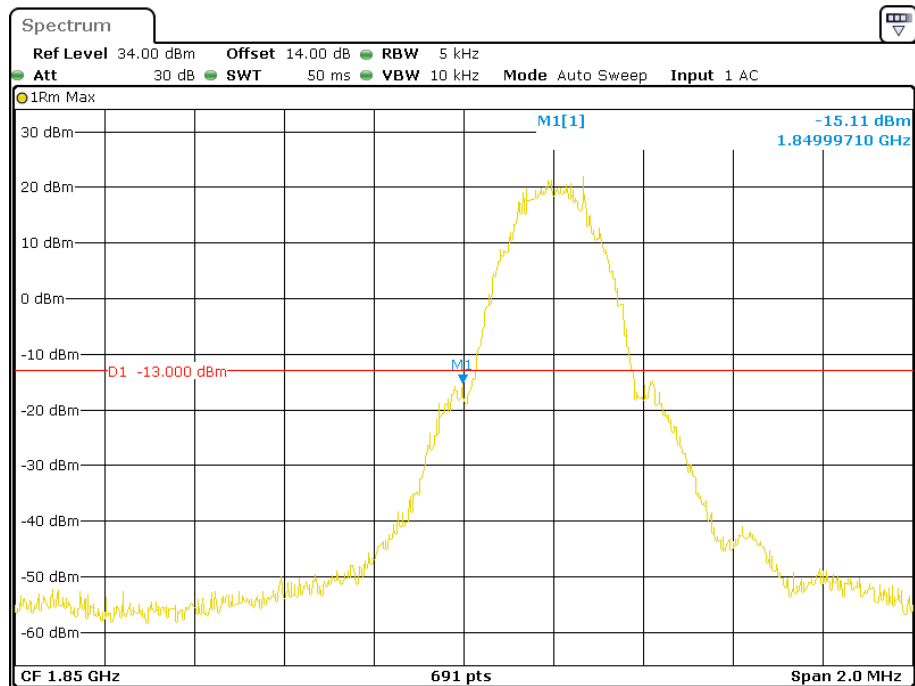
Date: 5.JUN.2018 20:49:14

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



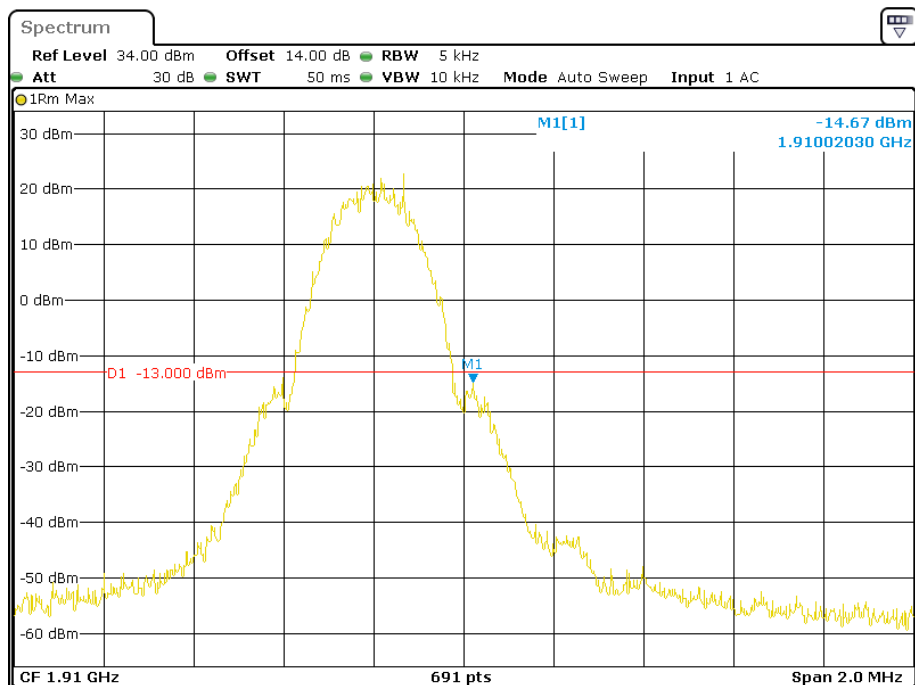
Date: 5.JUN.2018 20:50:42

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



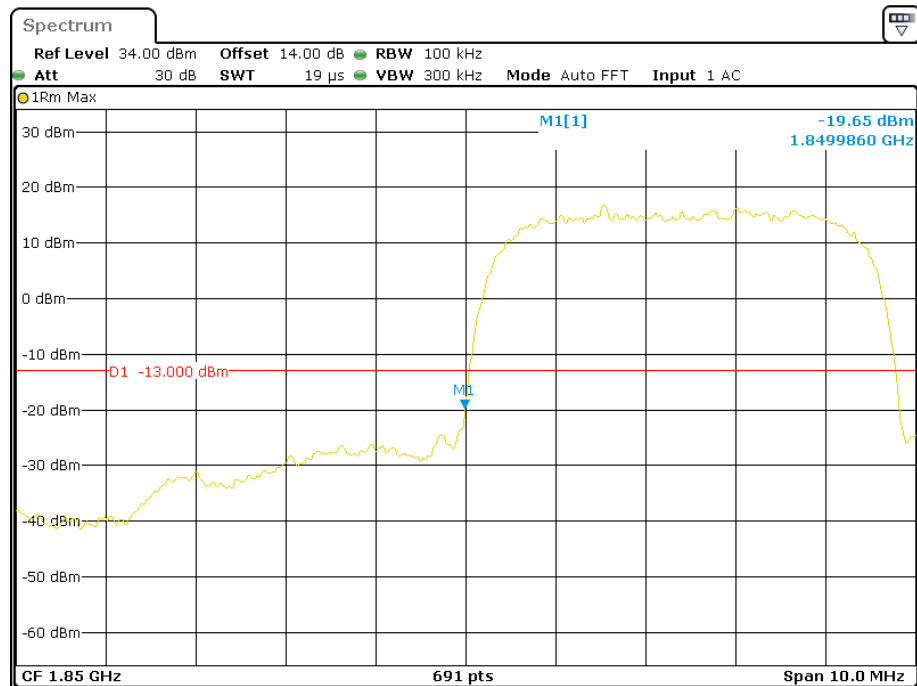
Date: 5.JUN.2018 19:50:37

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



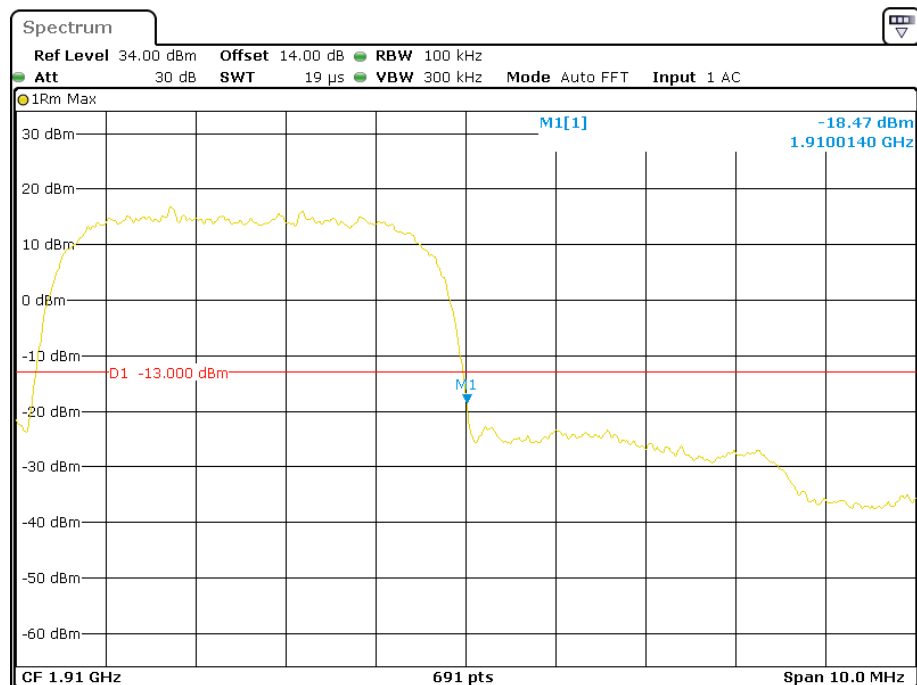
Date: 5.JUN.2018 19:52:29

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



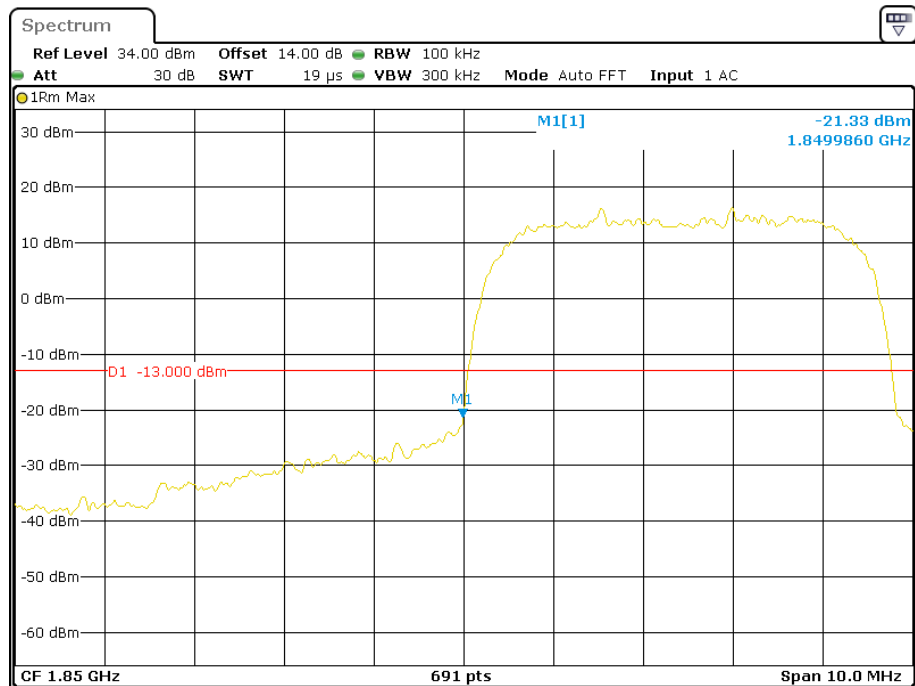
Date: 5.JUN.2018 20:39:13

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



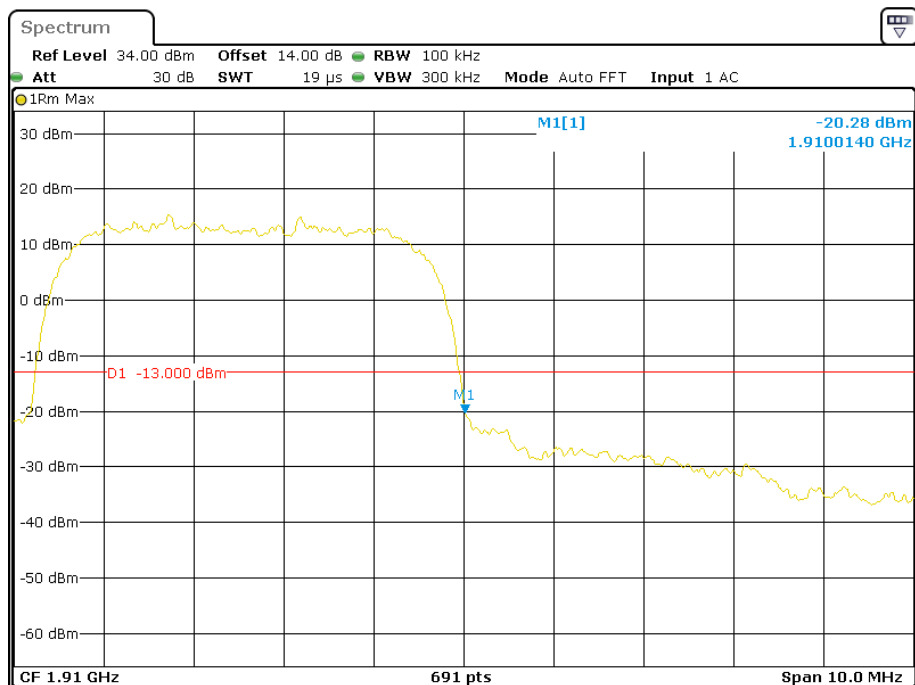
Date: 5.JUN.2018 20:41:08

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



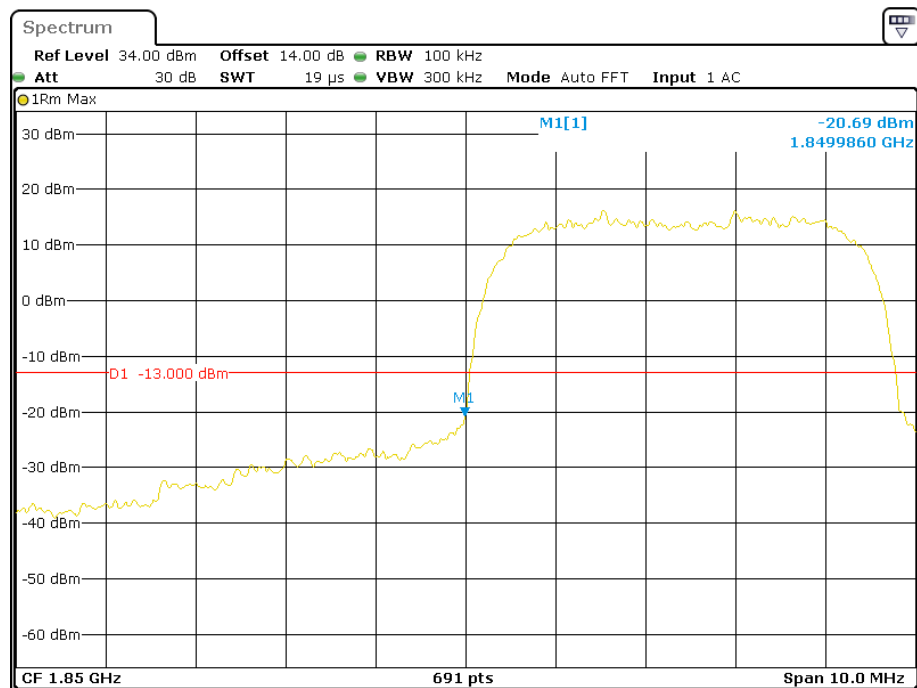
Date: 5.JUN.2018 20:54:54

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



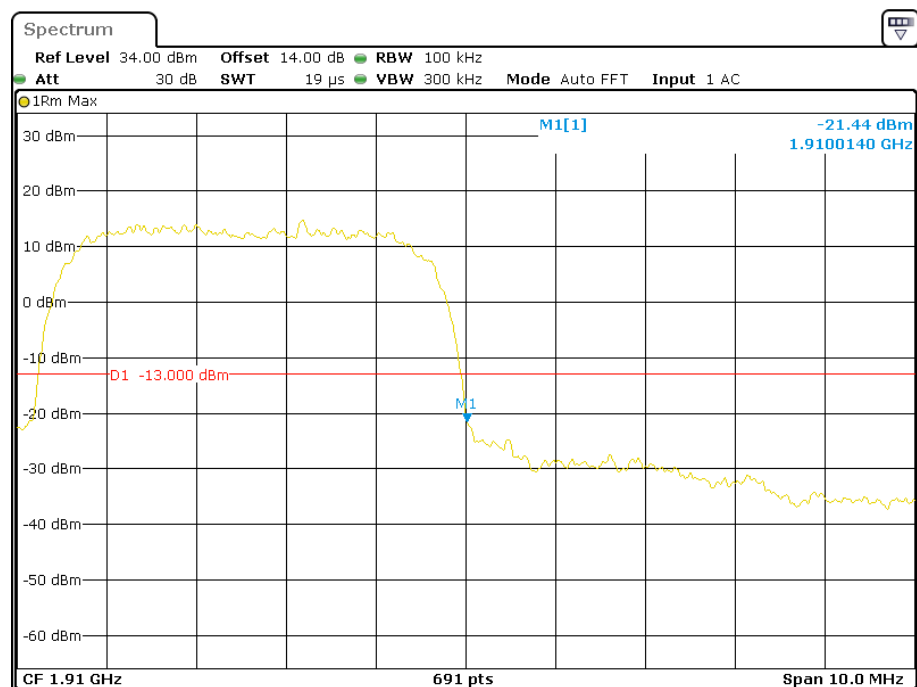
Date: 5.JUN.2018 20:56:20

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



Date: 5.JUN.2018 20:54:04

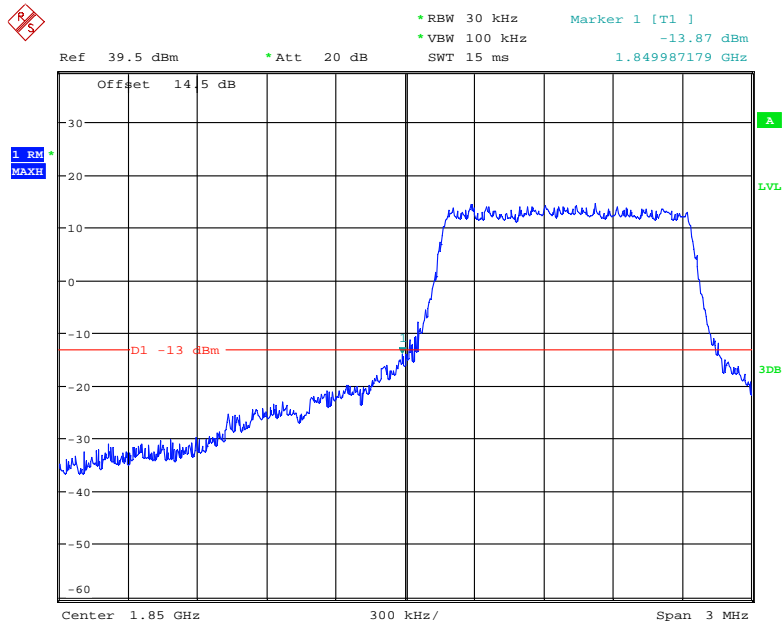
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 5.JUN.2018 20:52:40

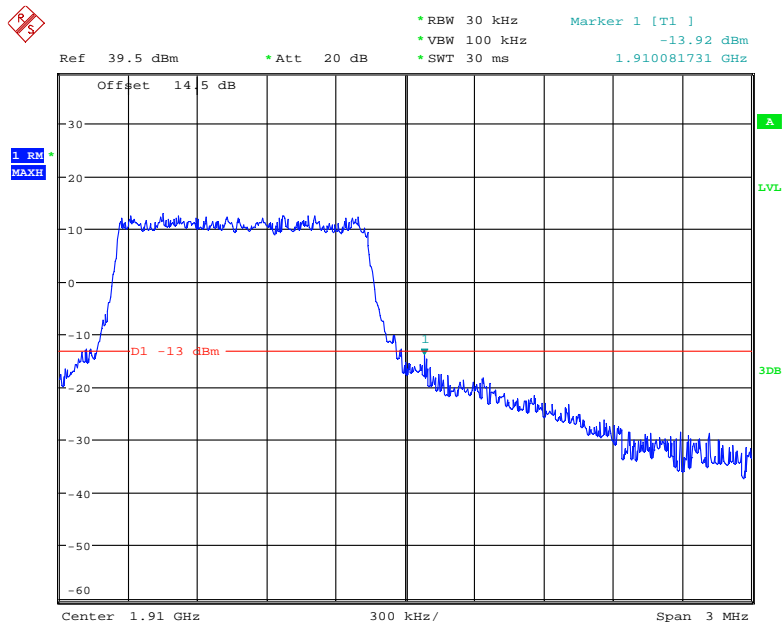
LTE Band 2:

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



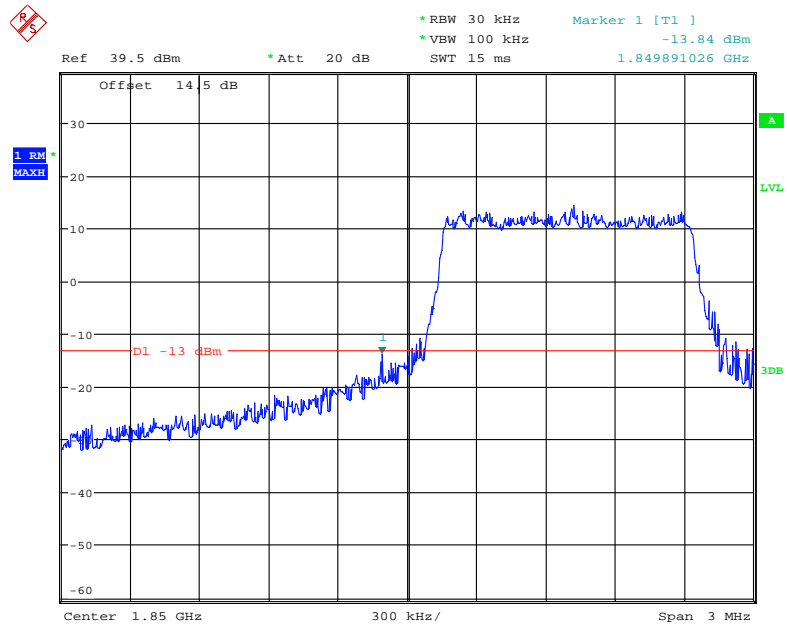
Date: 9.MAY.2018 16:22:29

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



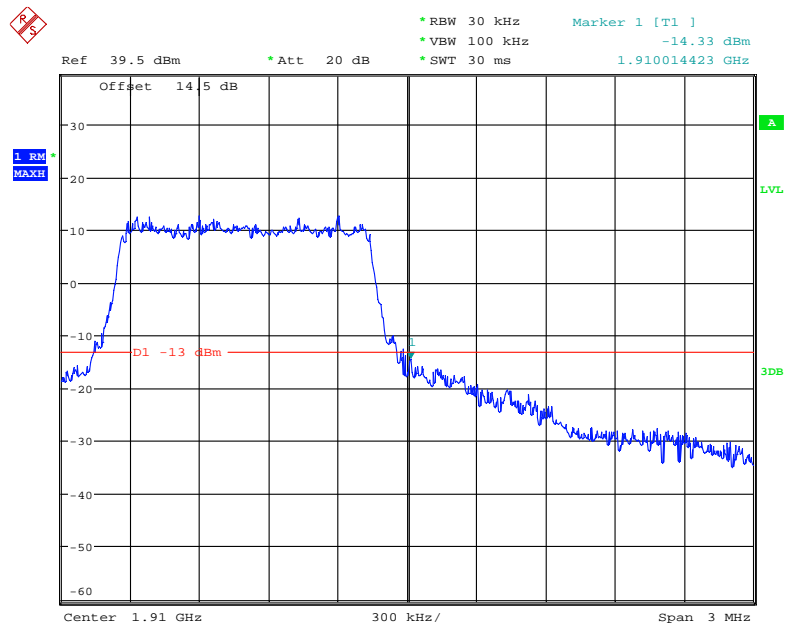
Date: 9.MAY.2018 16:24:52

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



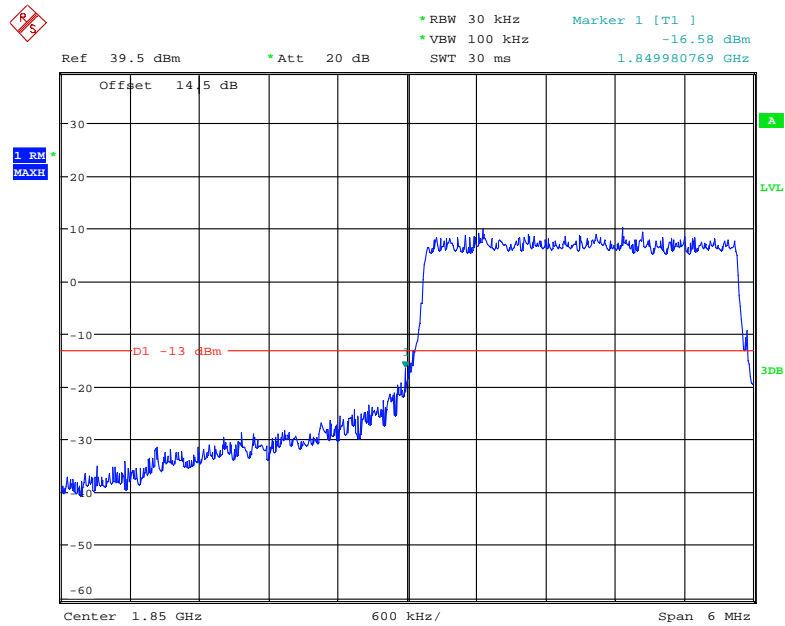
Date: 9.MAY.2018 16:23:08

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



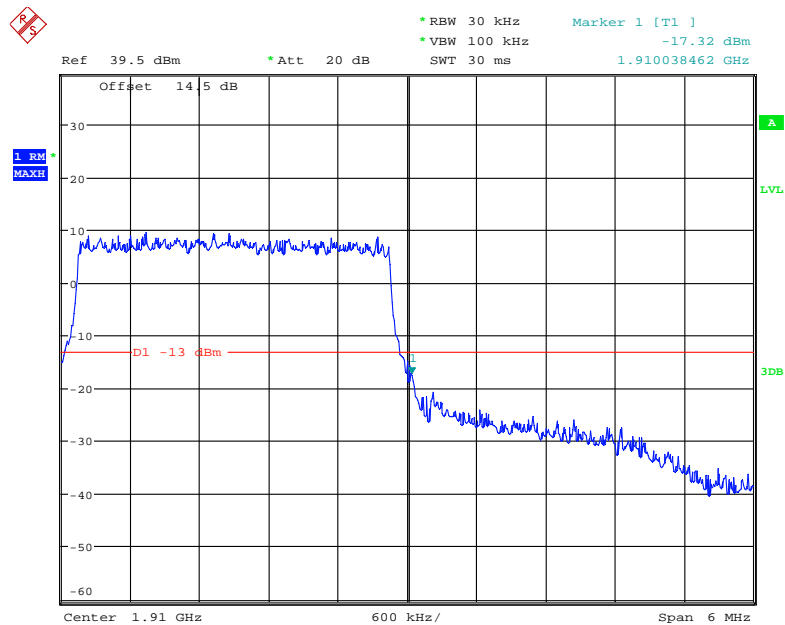
Date: 9.MAY.2018 16:24:24

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



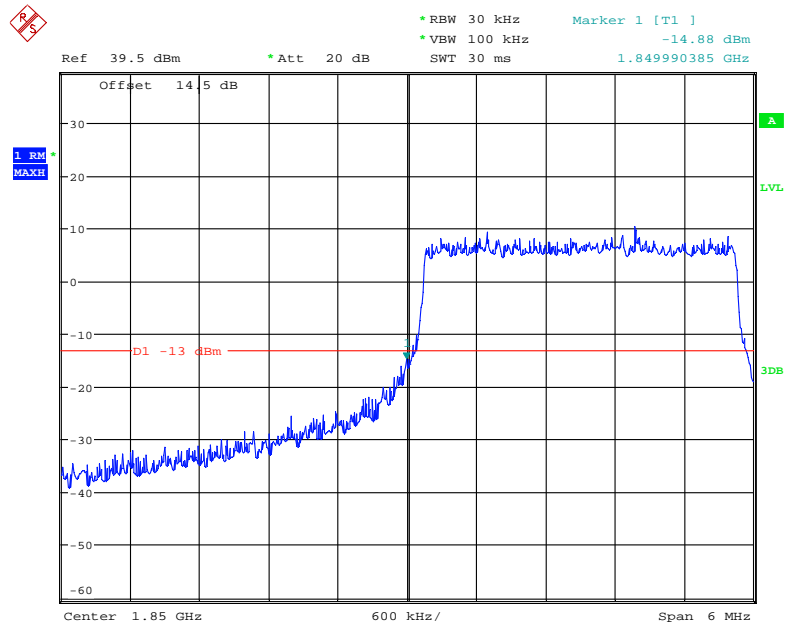
Date: 9.MAY.2018 16:06:47

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



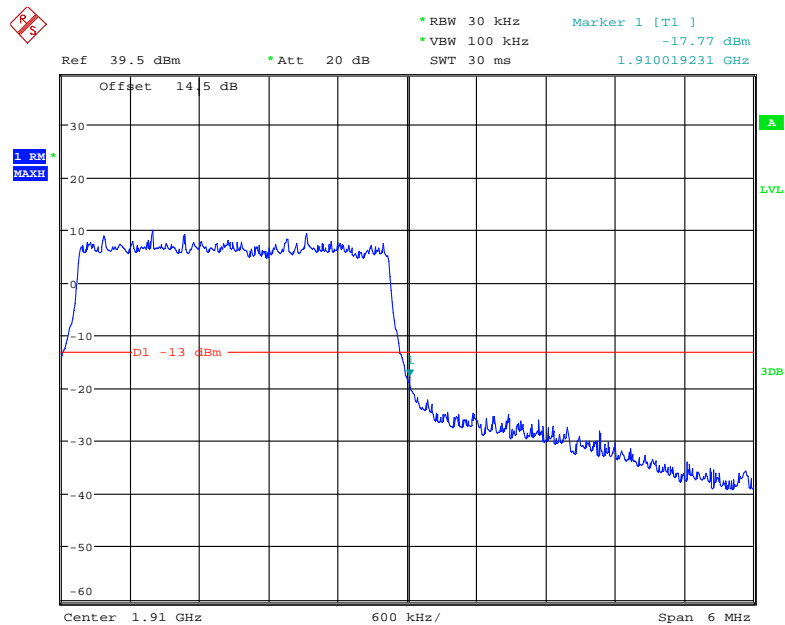
Date: 9.MAY.2018 16:08:02

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



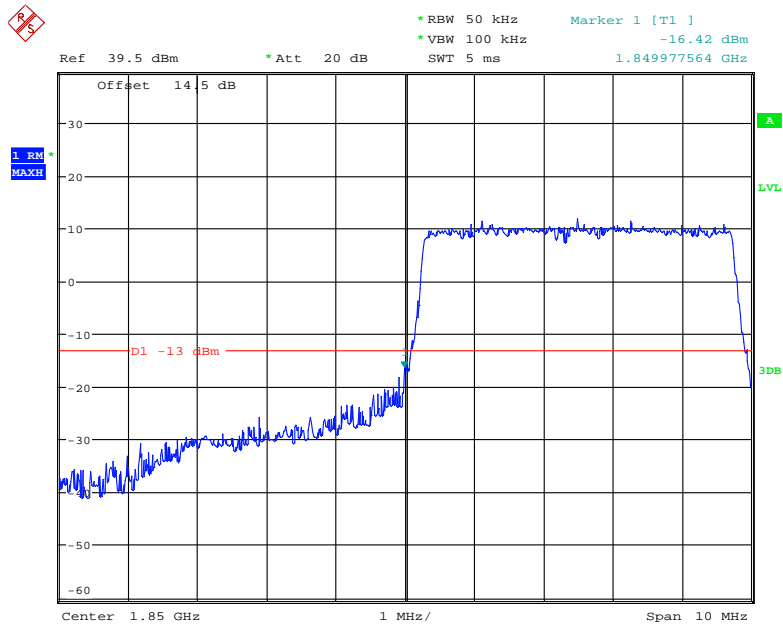
Date: 9.MAY.2018 16:05:54

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



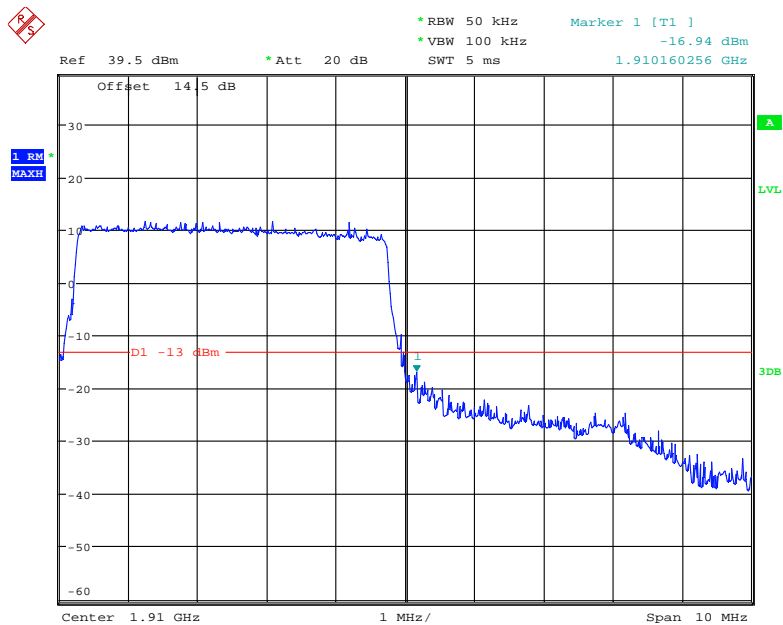
Date: 9.MAY.2018 16:09:14

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



Date: 9.MAY.2018 16:27:33

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



Date: 9.MAY.2018 16:28:32

Ref 39.5 dBm * Att 20 dB * RBW 50 kHz VBW 100 kHz SWT 5 ms Marker 1 [T1] -17.33 dBm
1.849977564 GHz

Offset 14.5 dB

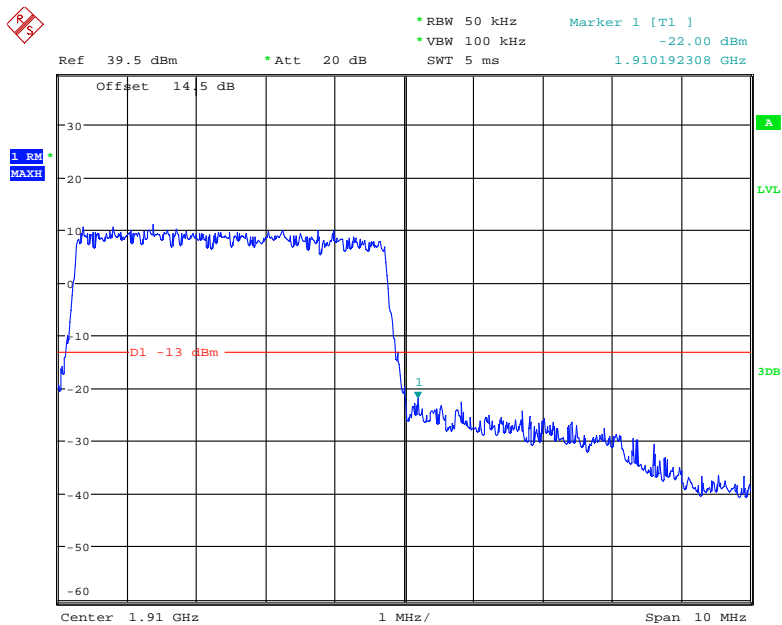
1.8 MHz MAXH

D1 -13 dBm

3dB

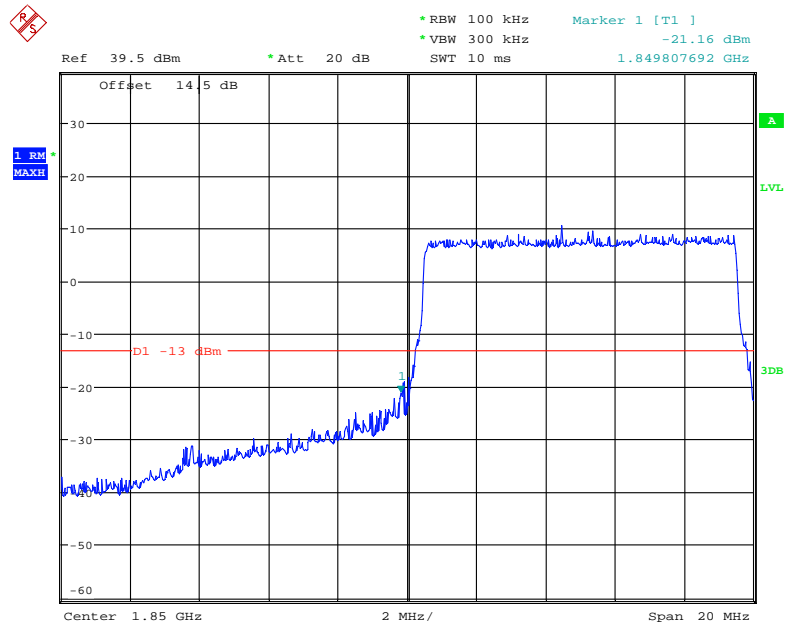
Center 1.85 GHz 1 MHz/ Span 10 MHz

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



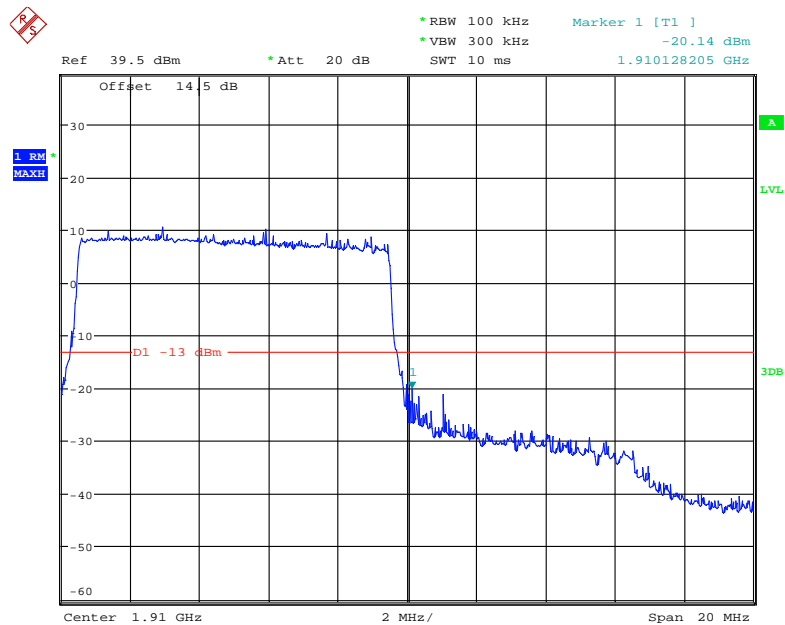
Page 104 of 137

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



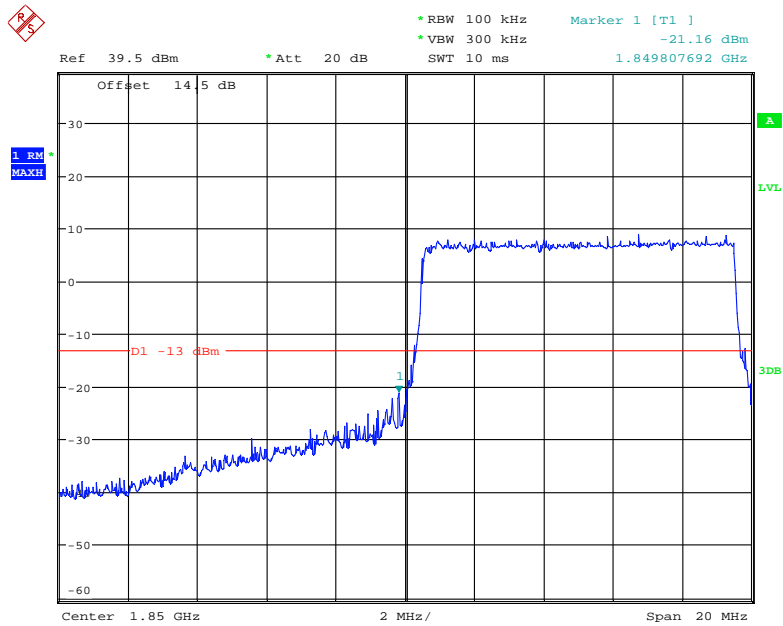
Date: 9.MAY.2018 16:33:31

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



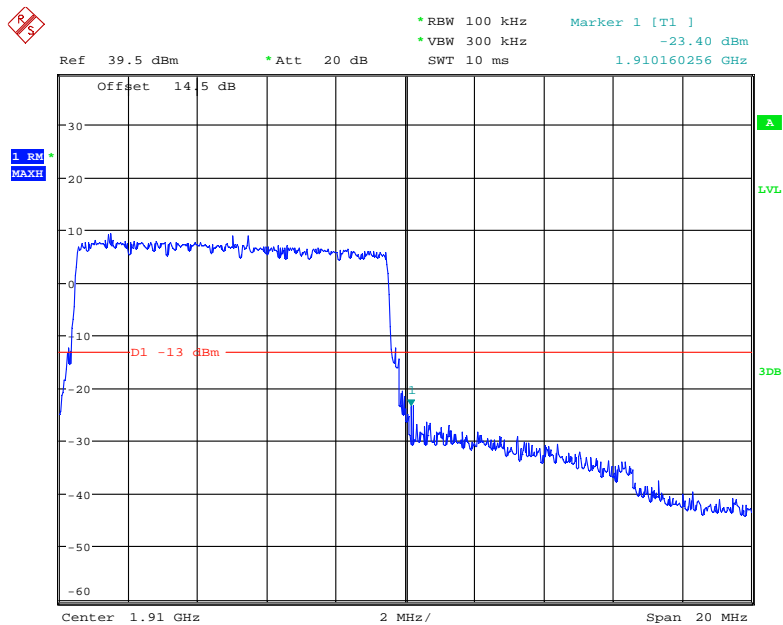
Date: 9.MAY.2018 16:31:41

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



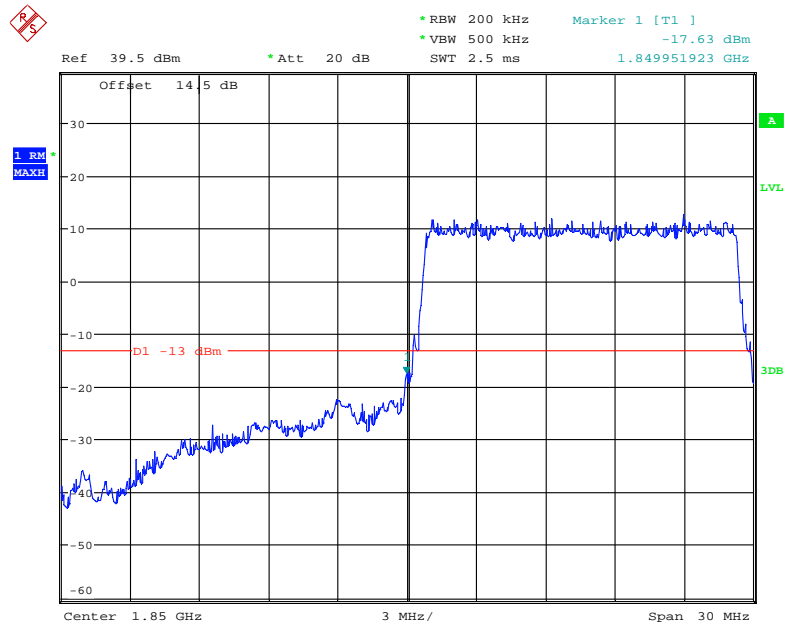
Date: 9.MAY.2018 16:33:13

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



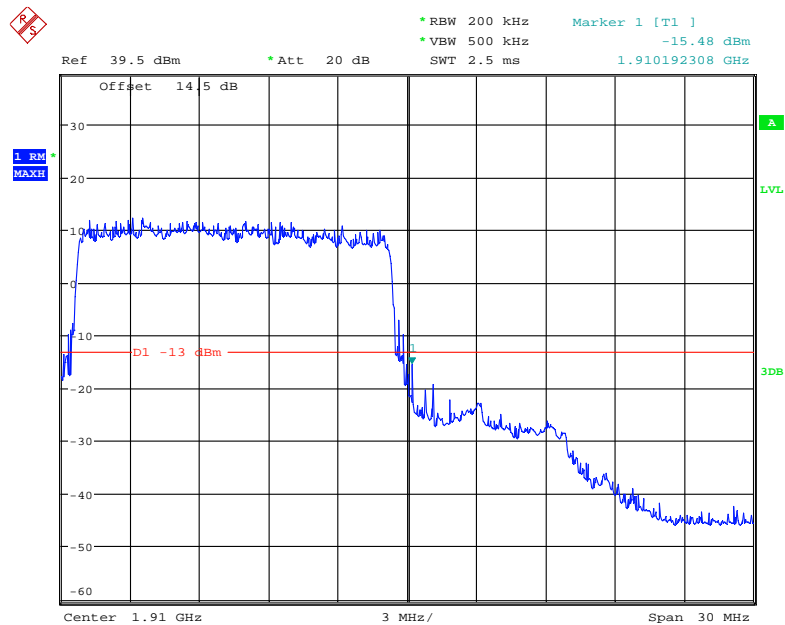
Date: 9.MAY.2018 16:32:09

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



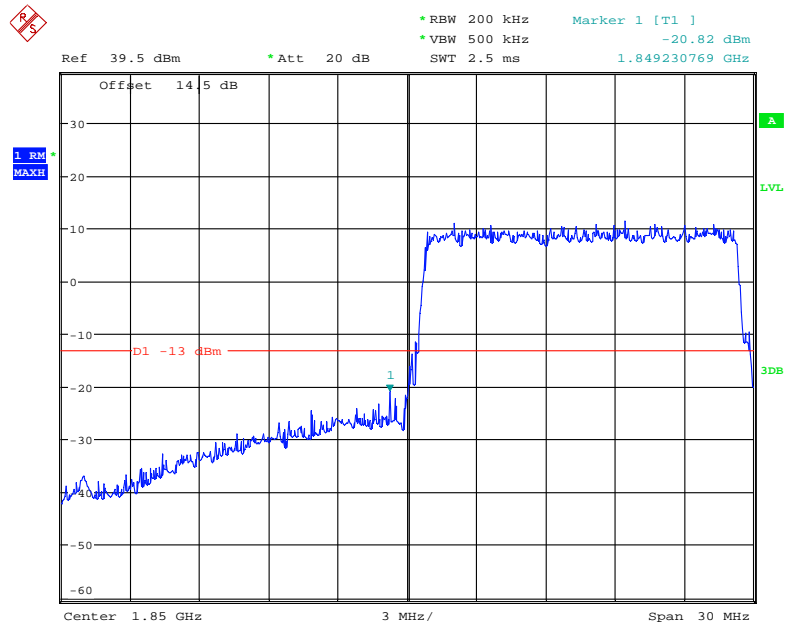
Date: 9.MAY.2018 16:34:56

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



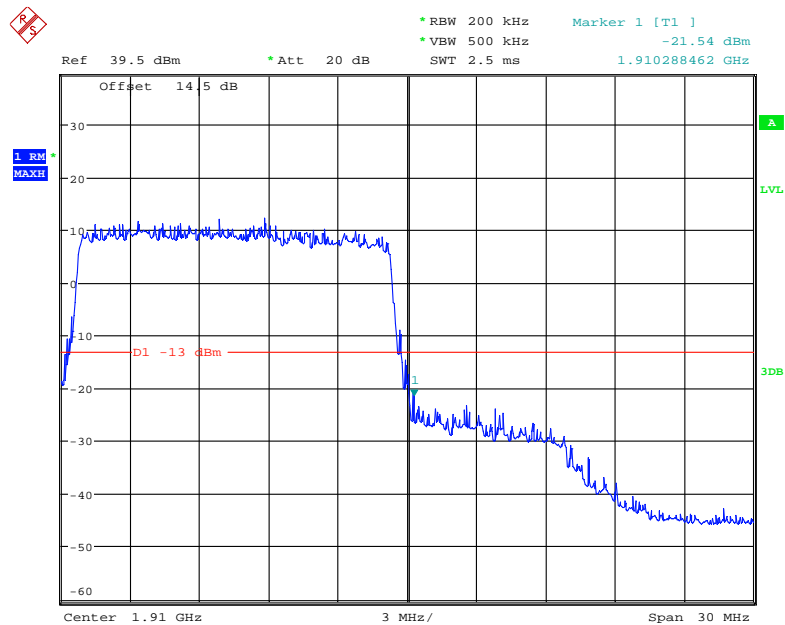
Date: 9.MAY.2018 16:37:15

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



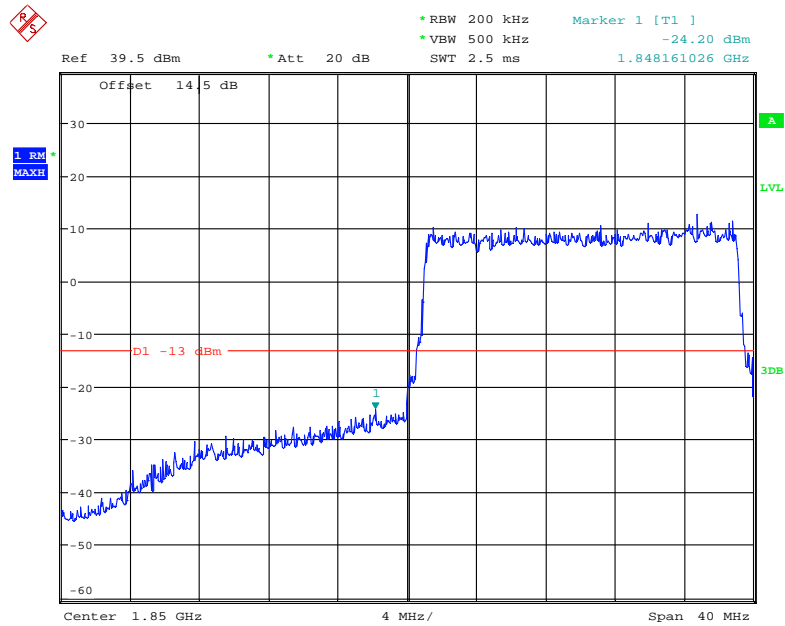
Date: 9.MAY.2018 16:35:40

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



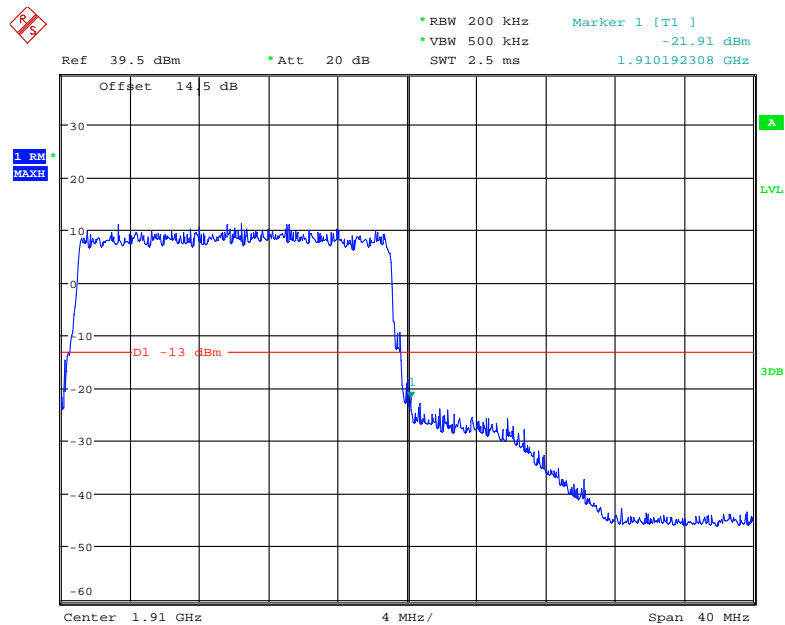
Date: 9.MAY.2018 16:36:45

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



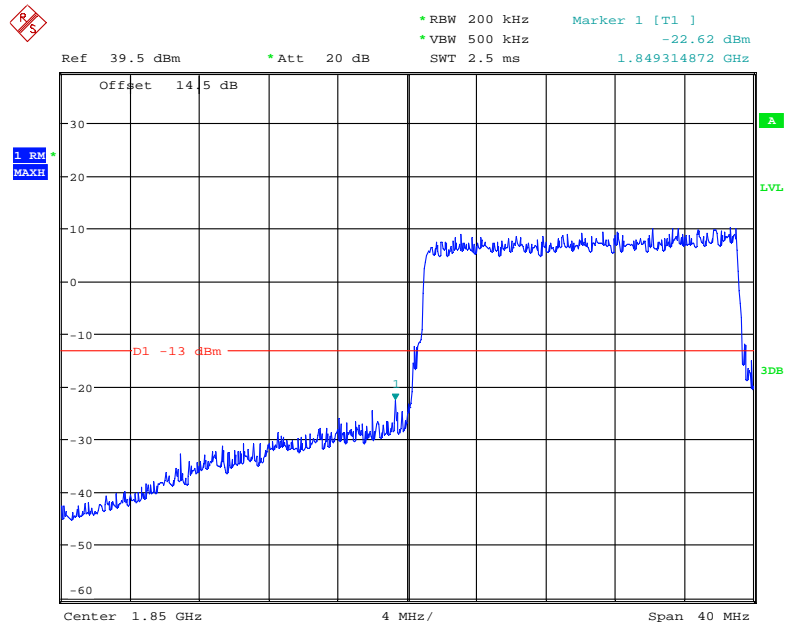
Date: 9.MAY.2018 16:38:17

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



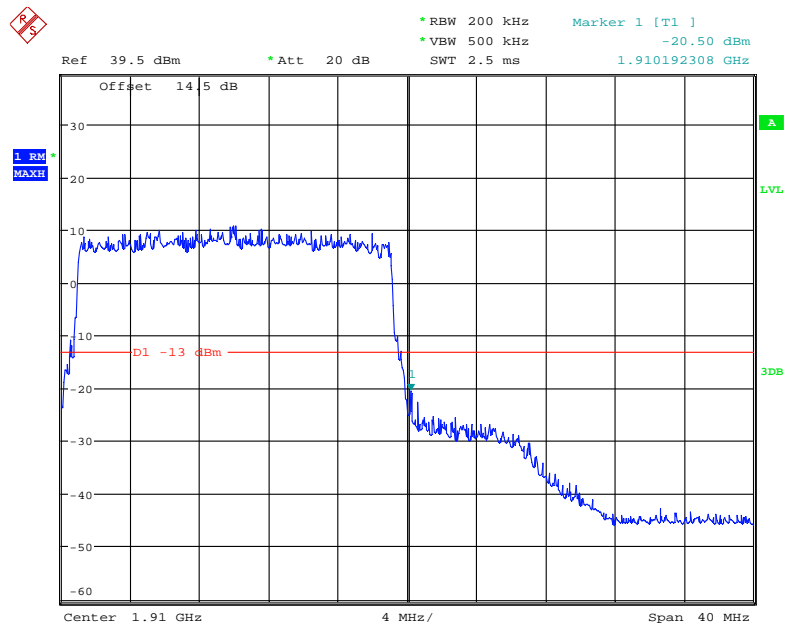
Date: 9.MAY.2018 16:40:25

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



Date: 9.MAY.2018 16:38:51

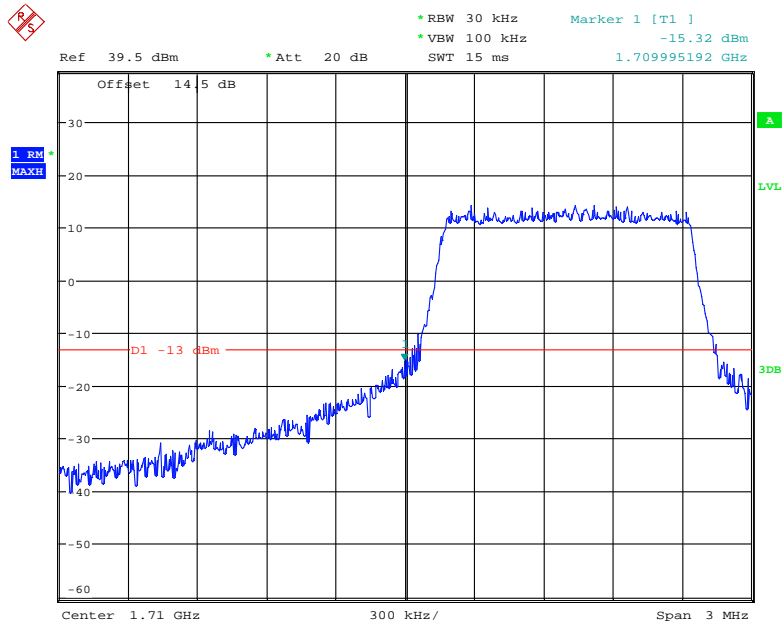
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 9.MAY.2018 16:39:54

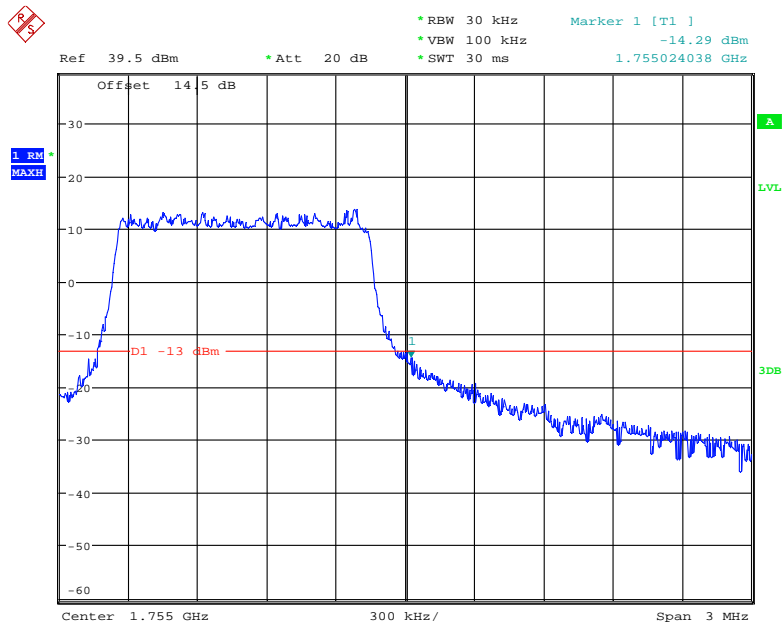
LTE Band 4:

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



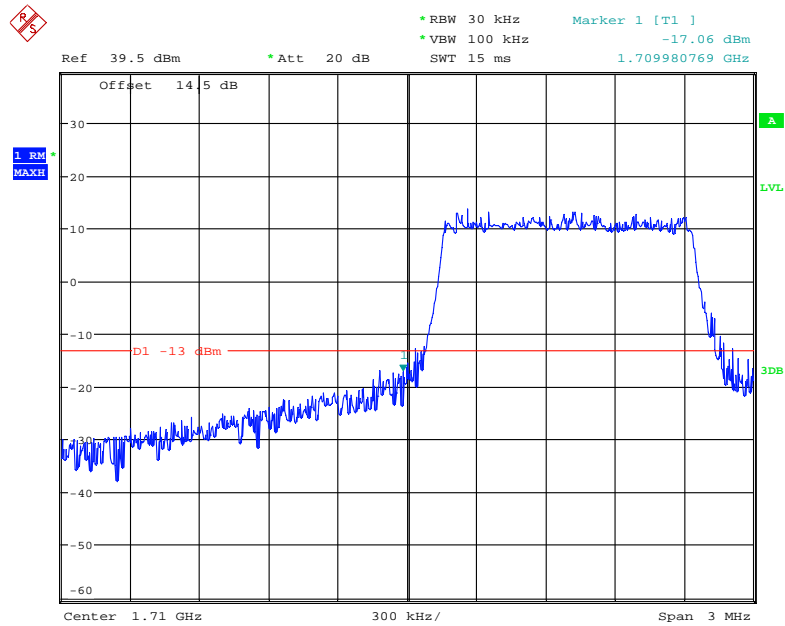
Date: 9.MAY.2018 16:48:34

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



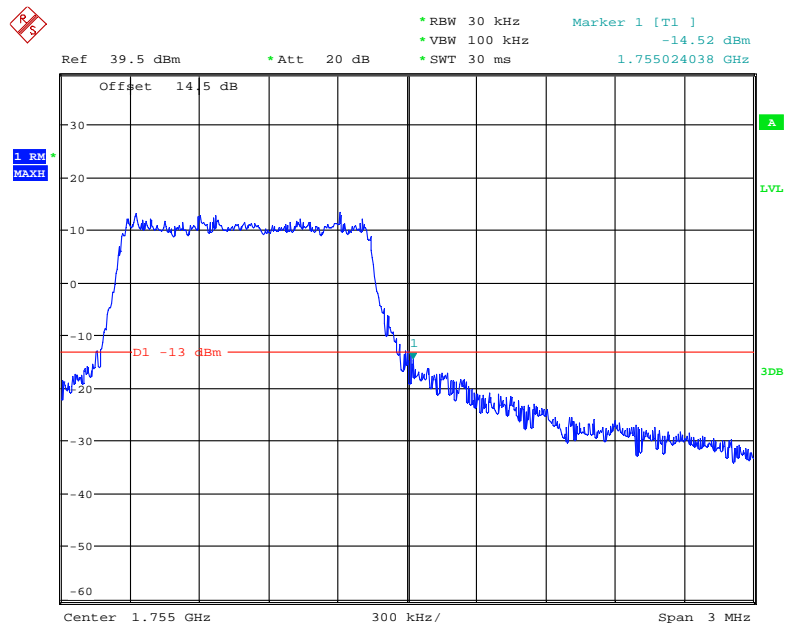
Date: 9.MAY.2018 16:50:55

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



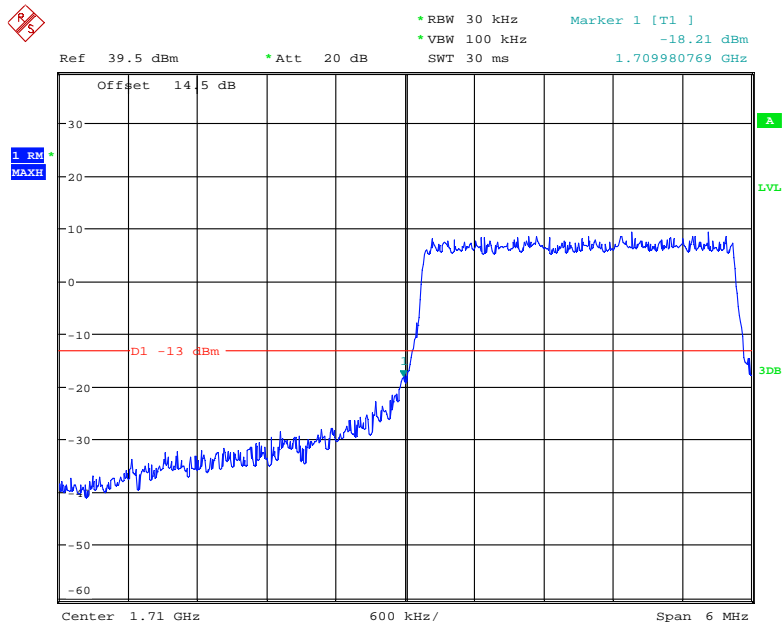
Date: 9.MAY.2018 16:49:15

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



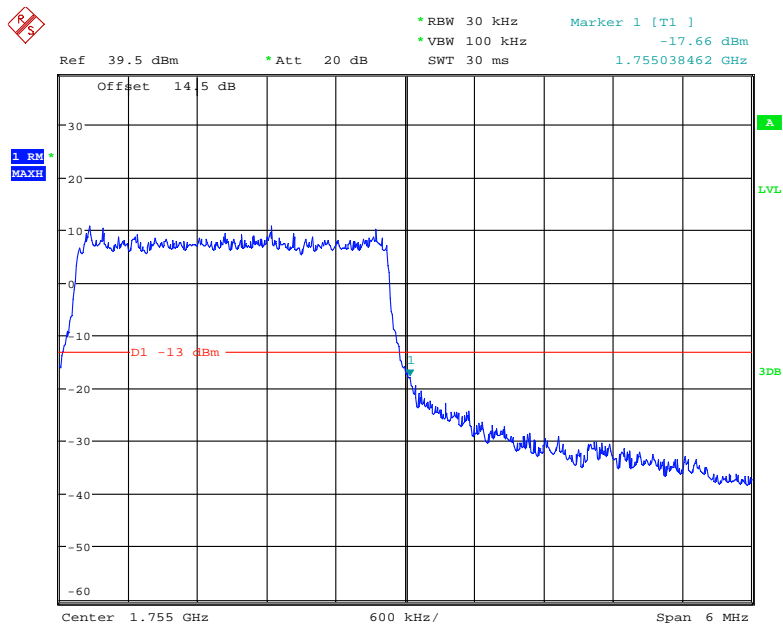
Date: 9.MAY.2018 16:50:16

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



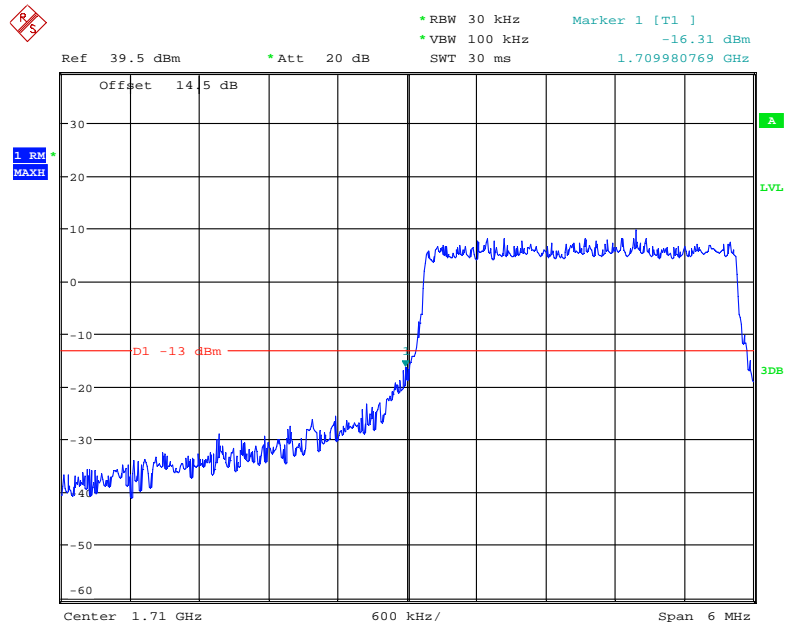
Date: 9.MAY.2018 16:54:12

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



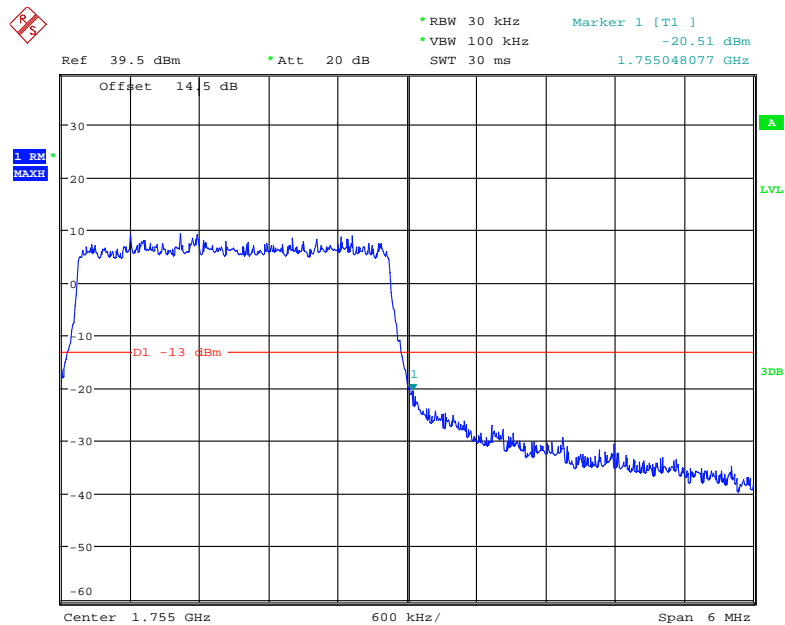
Date: 9.MAY.2018 16:55:19

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



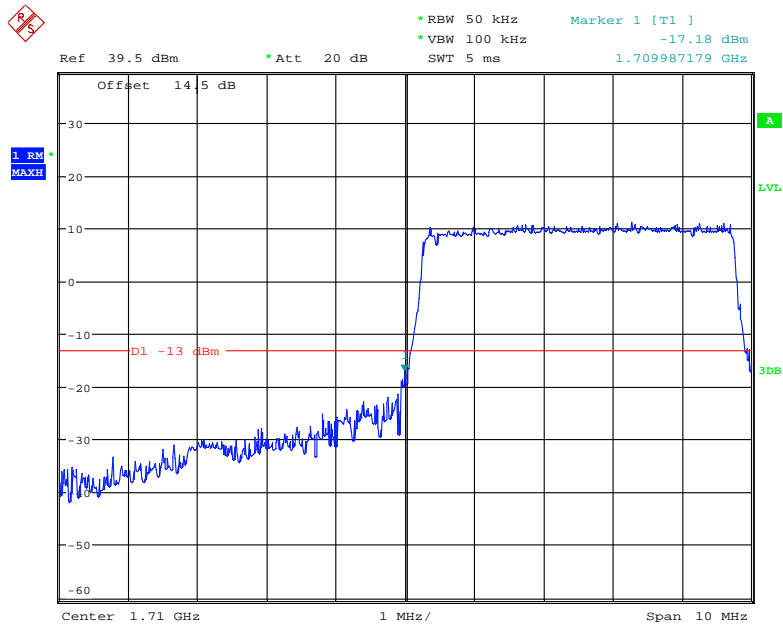
Date: 9.MAY.2018 16:53:32

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



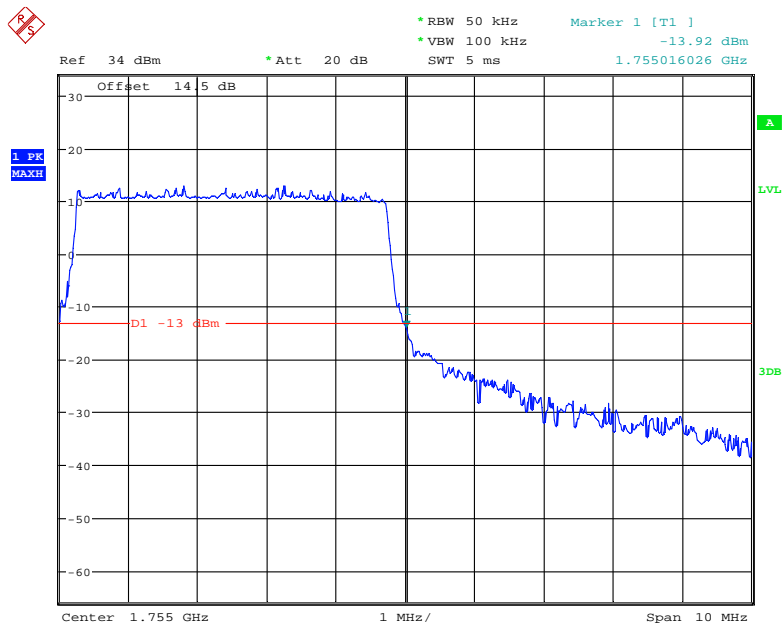
Date: 9.MAY.2018 16:55:47

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



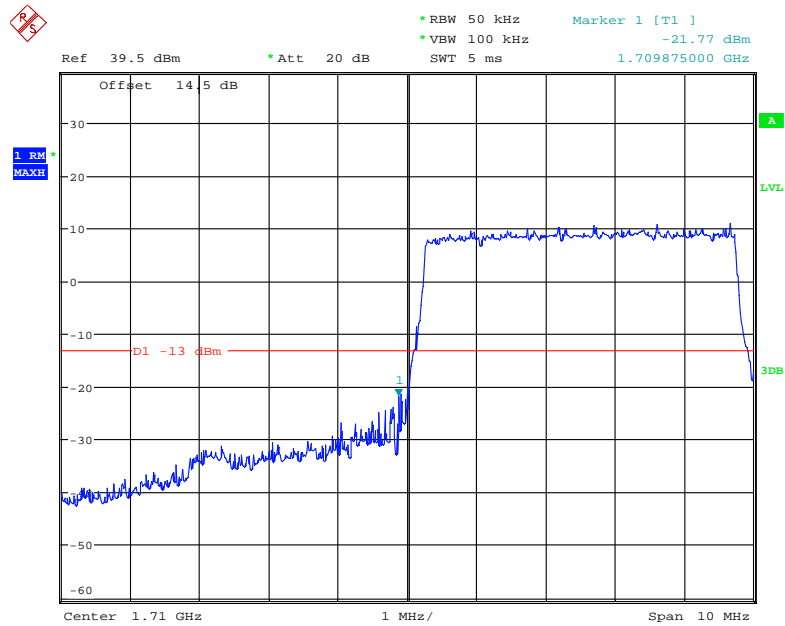
Date: 9.MAY.2018 17:02:52

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



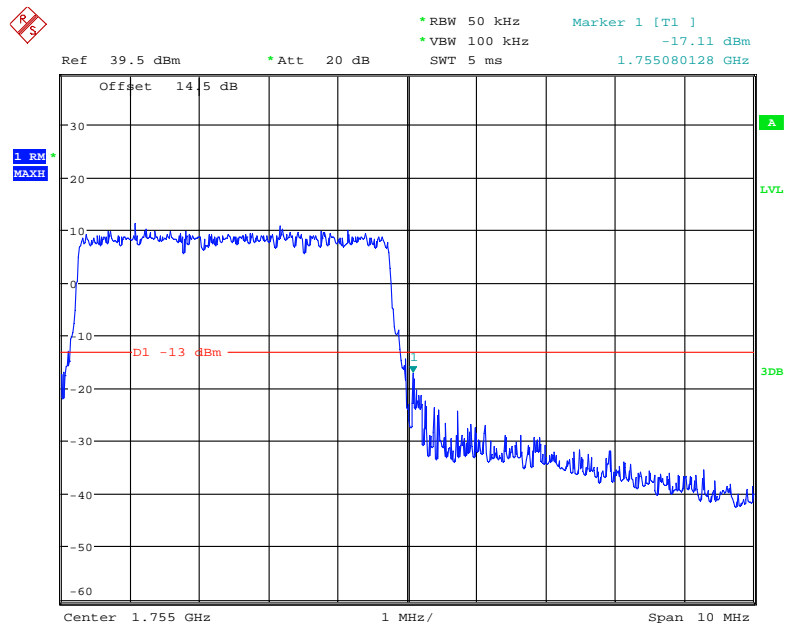
Date: 2.JUN.2018 20:51:30

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



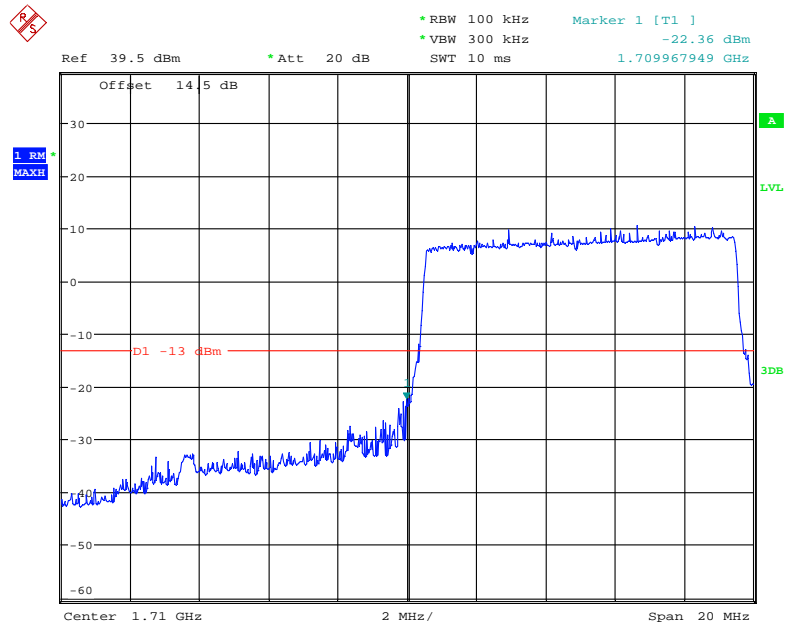
Date: 9.MAY.2018 17:01:59

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



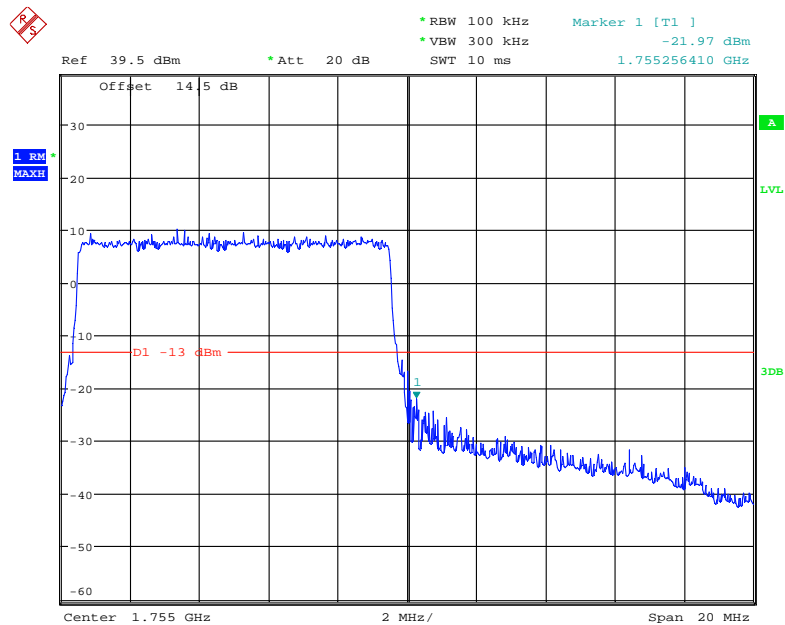
Date: 9.MAY.2018 17:04:31

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



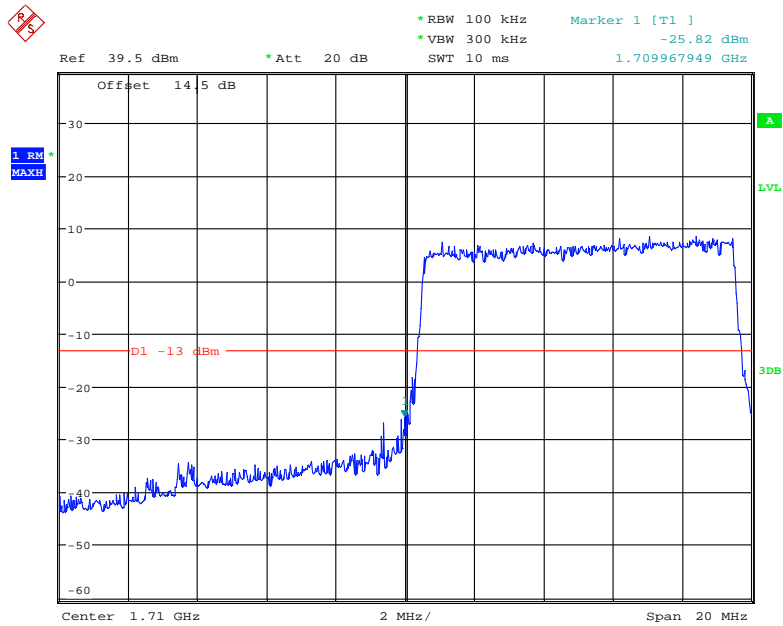
Date: 9.MAY.2018 17:06:15

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



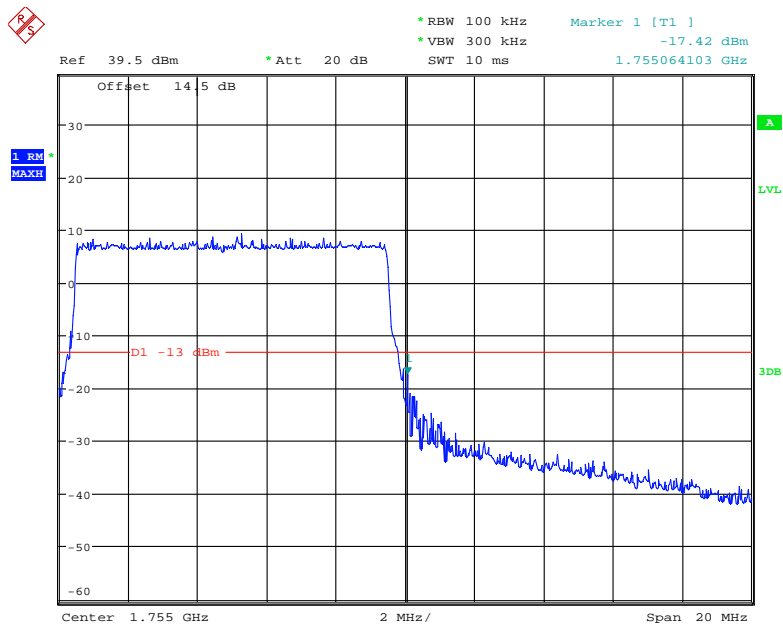
Date: 9.MAY.2018 17:08:39

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



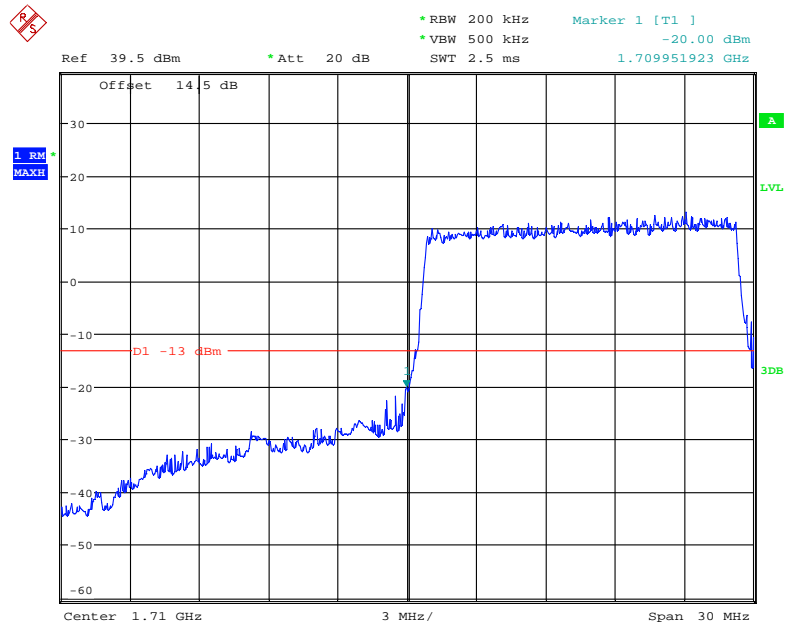
Date: 9.MAY.2018 17:06:47

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



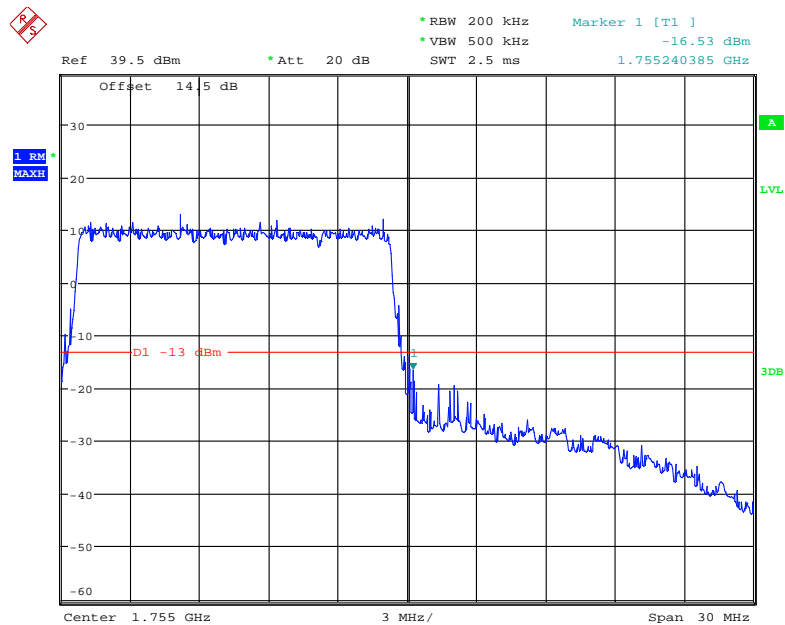
Date: 9.MAY.2018 17:08:00

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



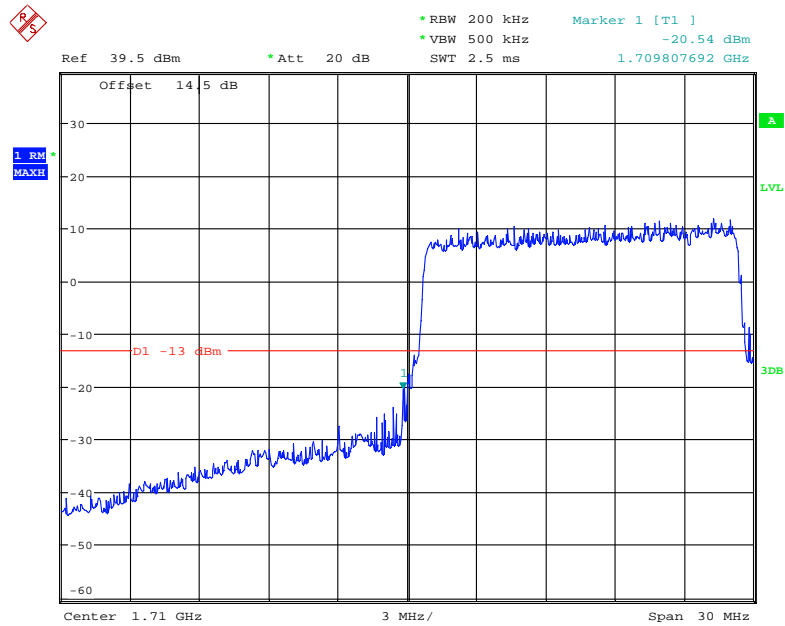
Date: 9.MAY.2018 17:10:10

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



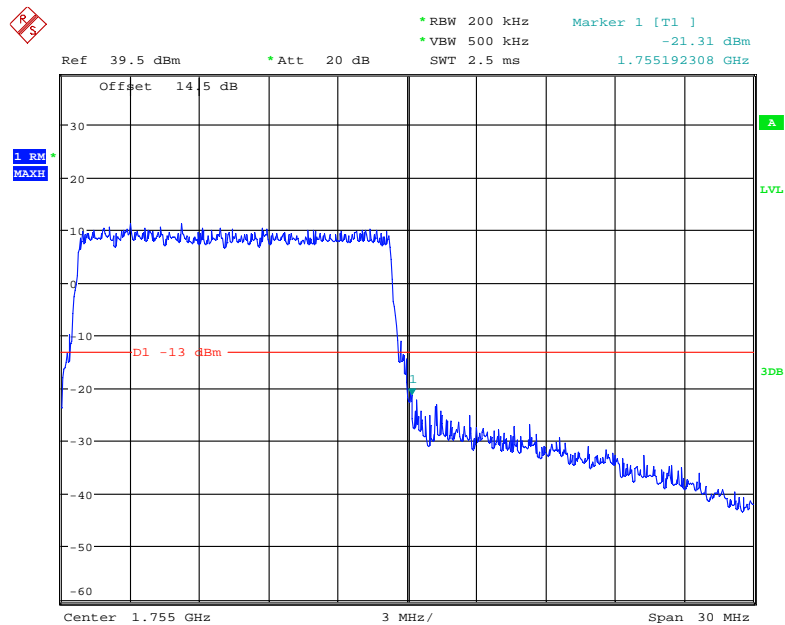
Date: 9.MAY.2018 17:12:13

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



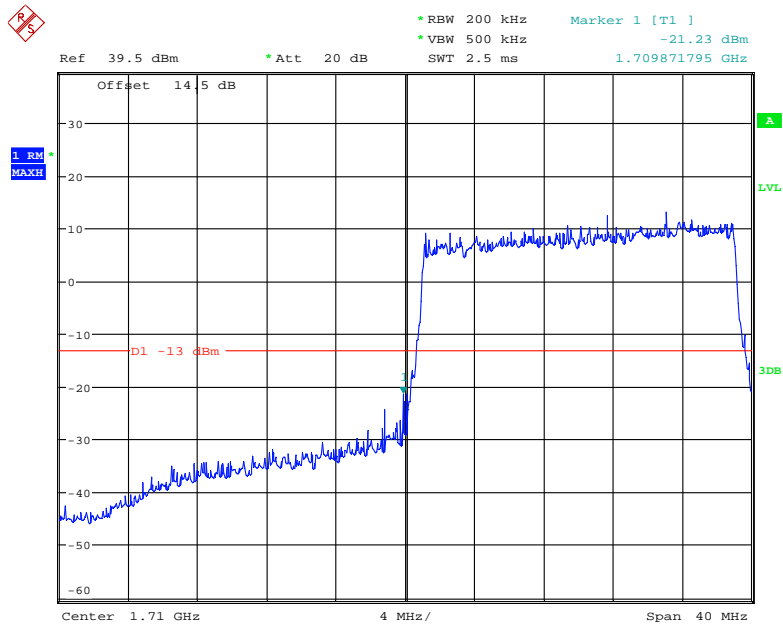
Date: 9.MAY.2018 17:10:44

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



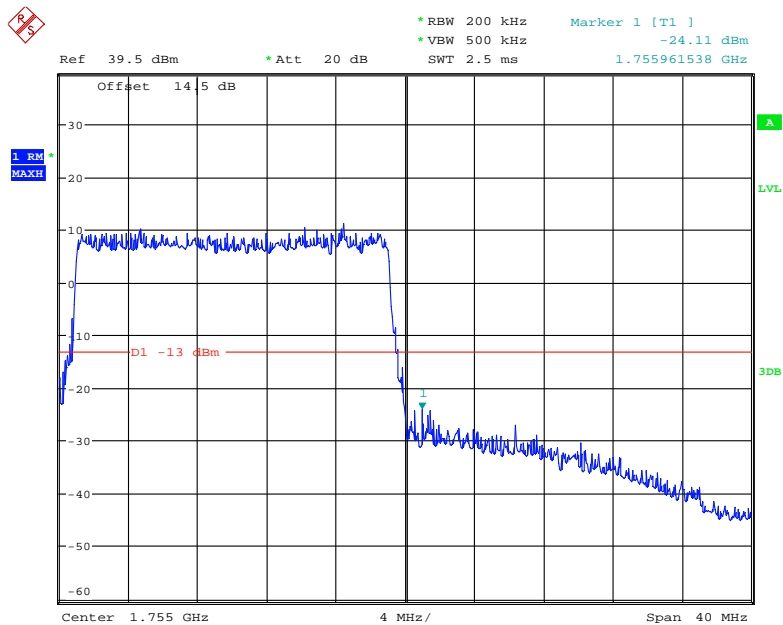
Date: 9.MAY.2018 17:11:43

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



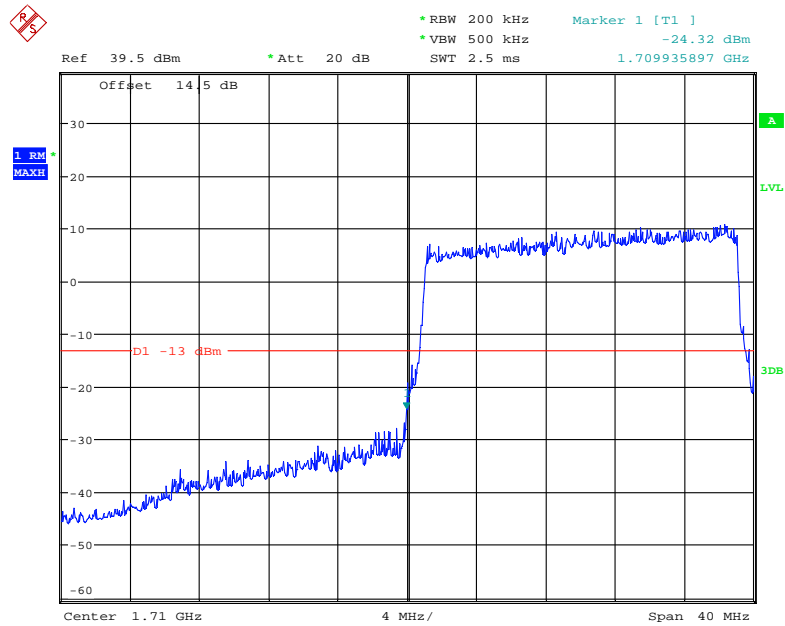
Date: 9.MAY.2018 18:33:31

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



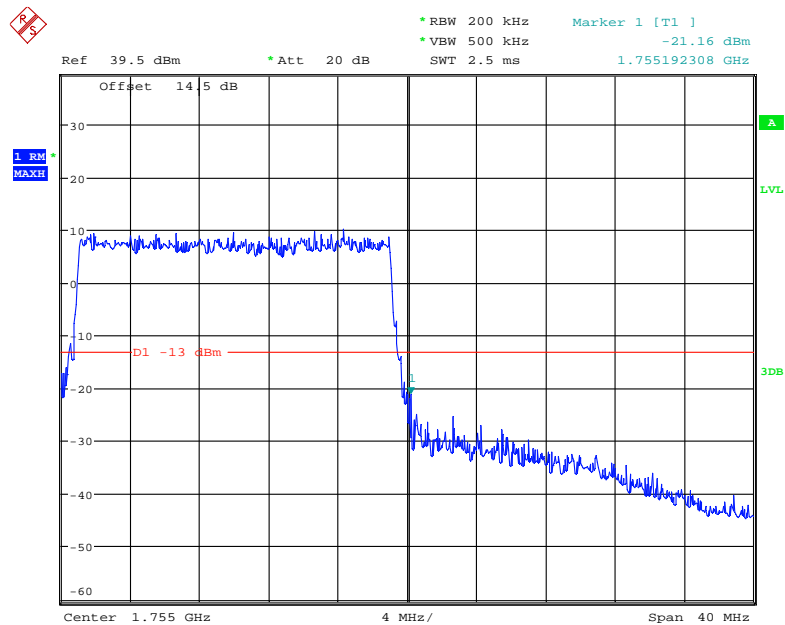
Date: 9.MAY.2018 18:35:46

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



Date: 9.MAY.2018 18:34:20

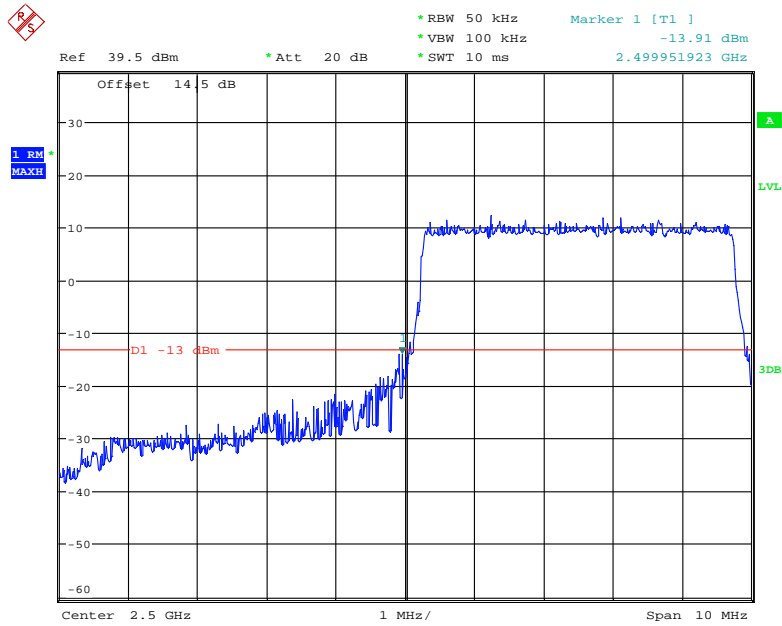
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 9.MAY.2018 18:35:21

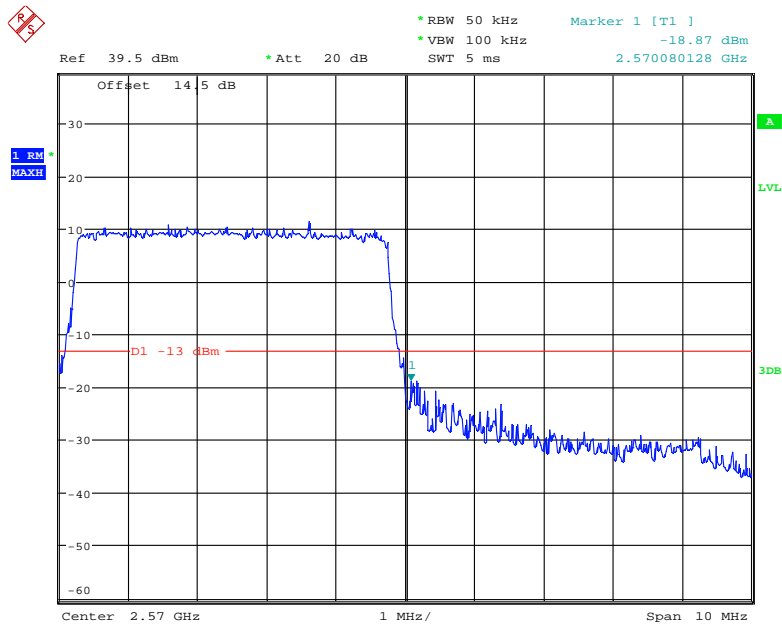
LTE Band 7:

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



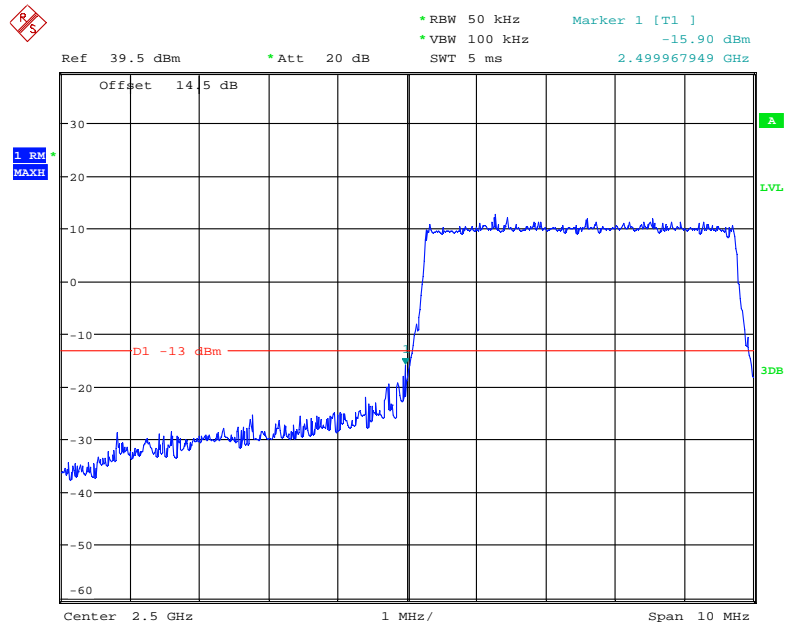
Date: 10.MAY.2018 13:32:51

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



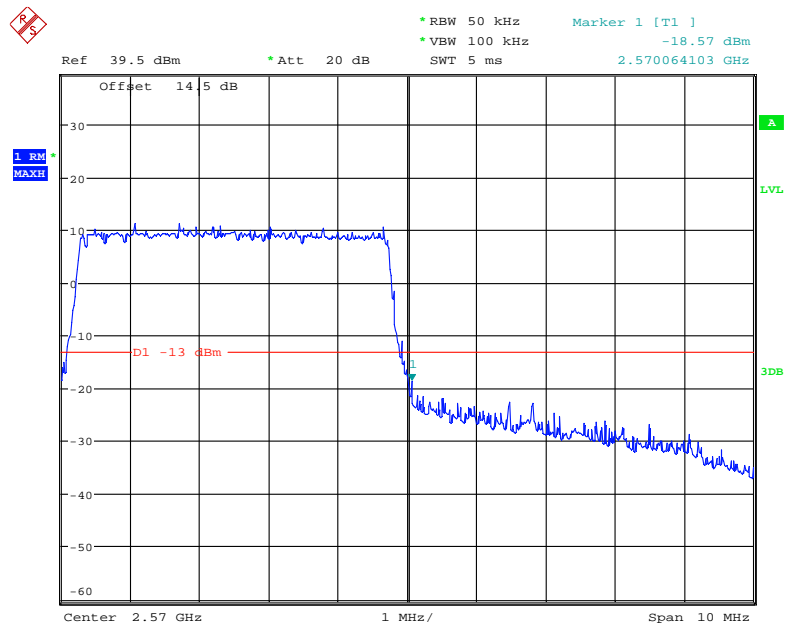
Date: 10.MAY.2018 13:28:47

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



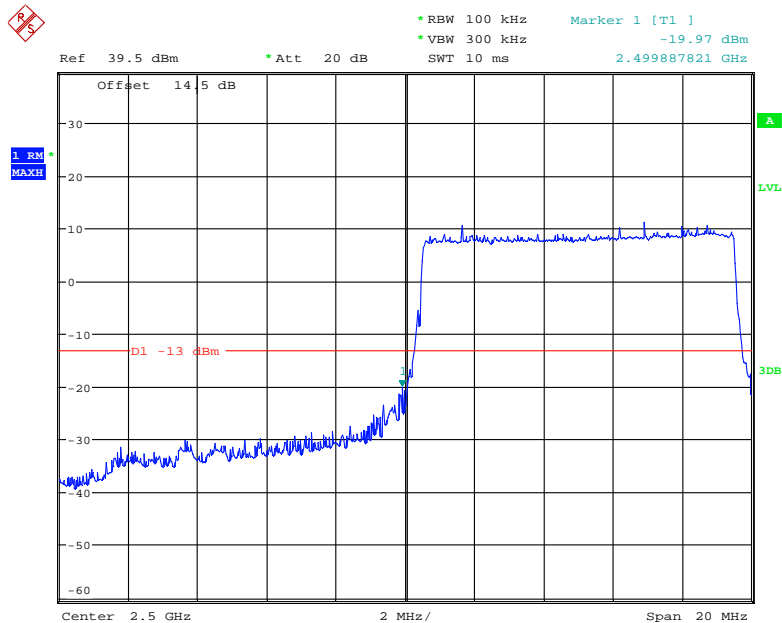
Date: 10.MAY.2018 13:30:21

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



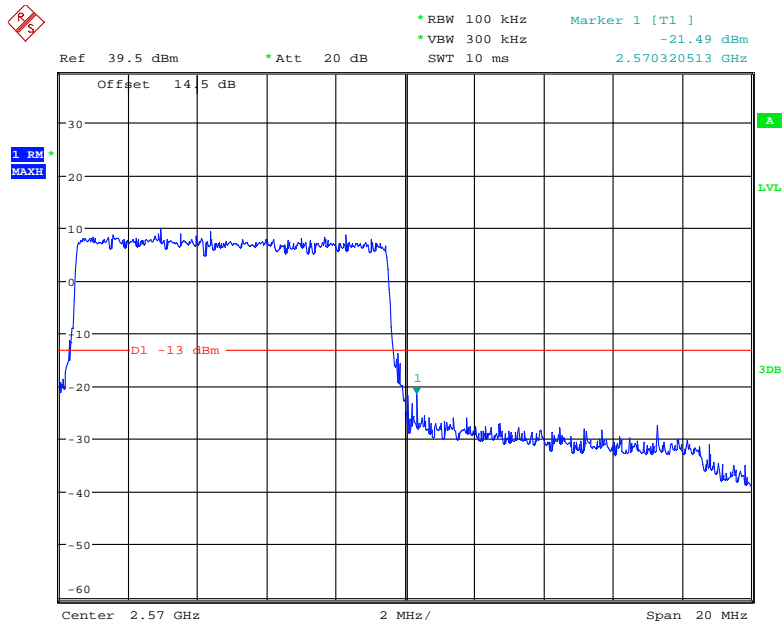
Date: 10.MAY.2018 13:29:36

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



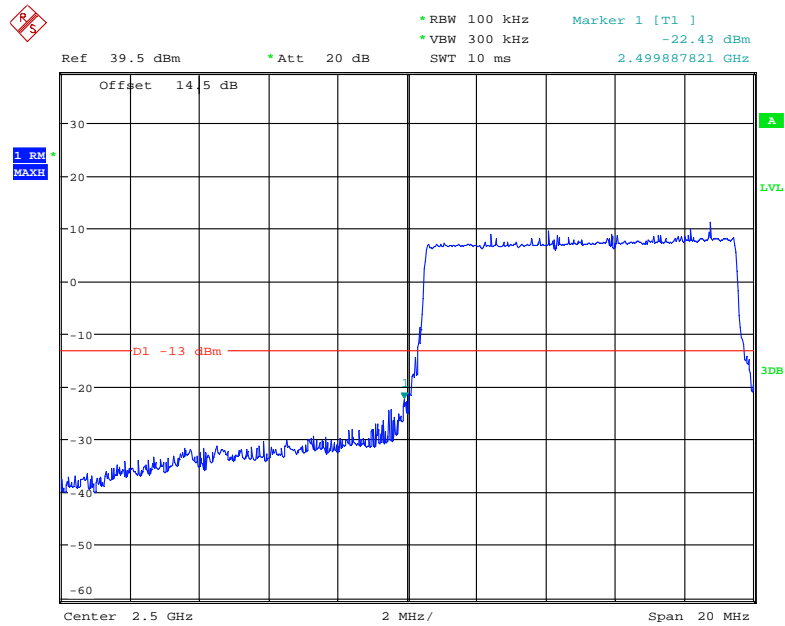
Date: 10.MAY.2018 13:36:08

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



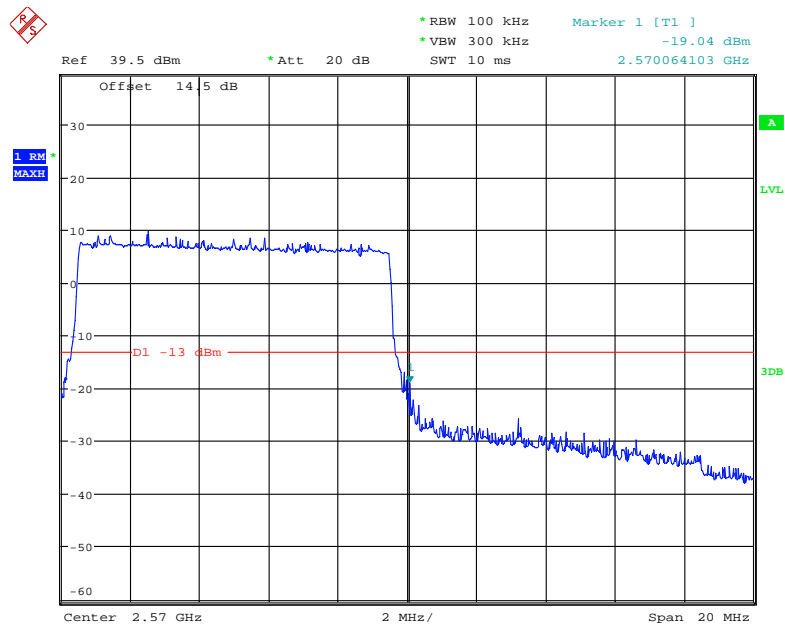
Date: 10.MAY.2018 13:38:36

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



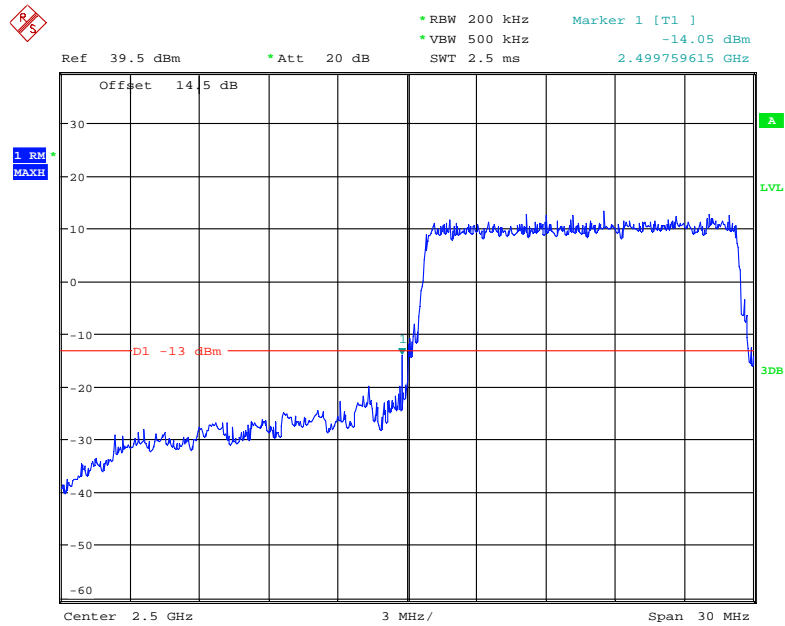
Date: 10.MAY.2018 13:36:54

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



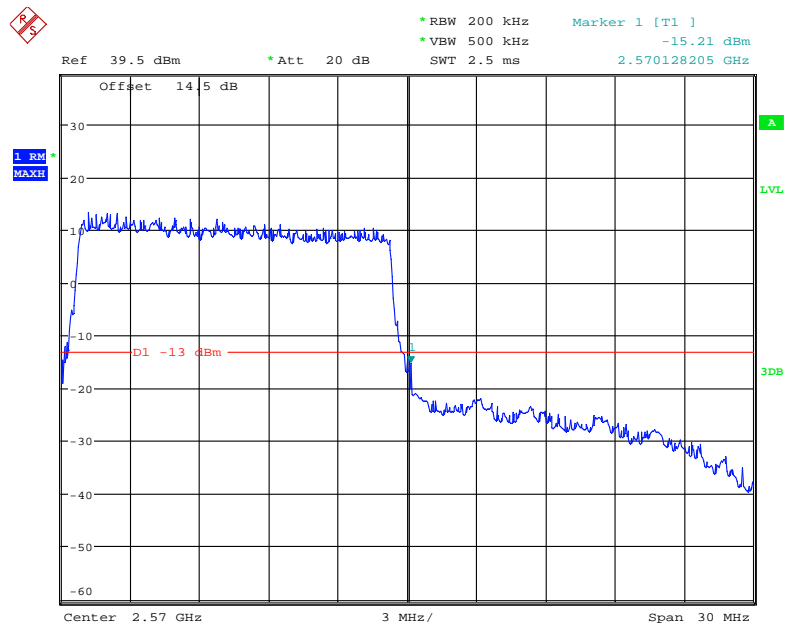
Date: 10.MAY.2018 13:38:11

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



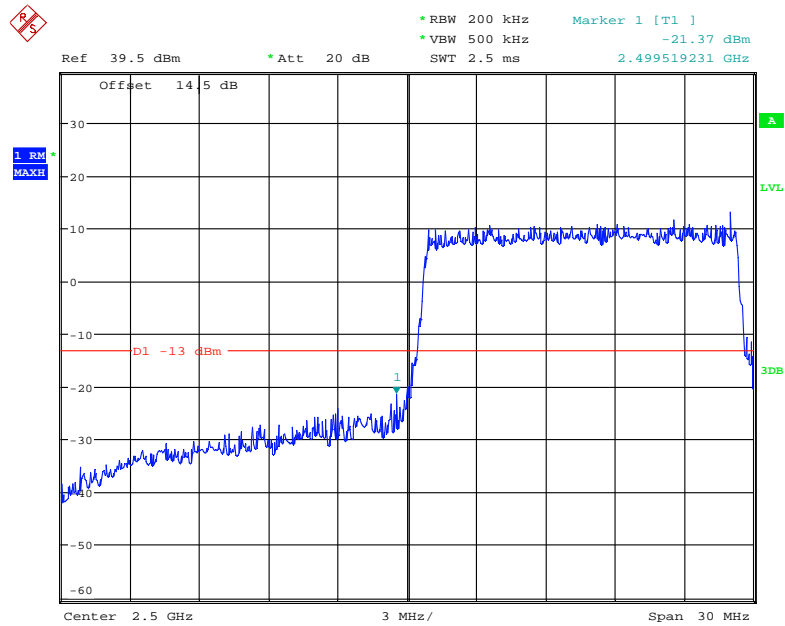
Date: 10.MAY.2018 13:41:34

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



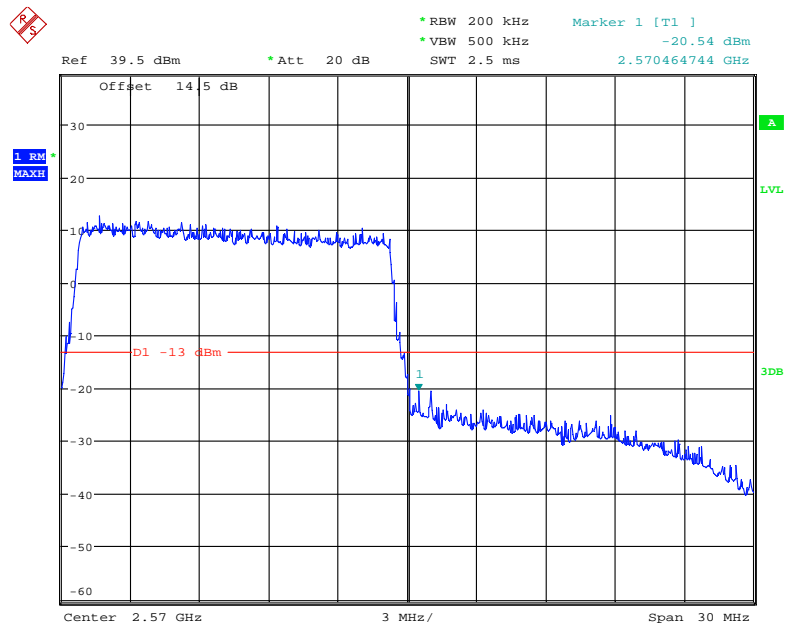
Date: 10.MAY.2018 13:40:37

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



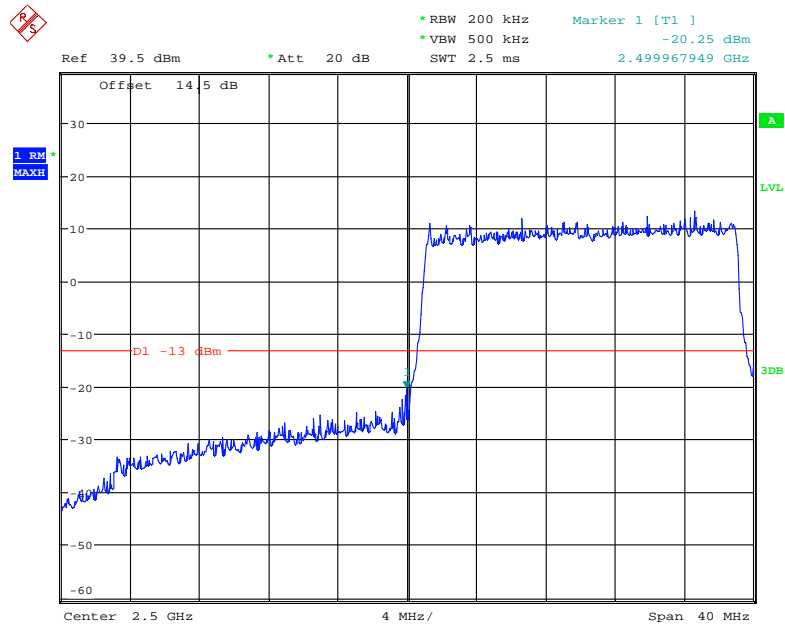
Date: 10.MAY.2018 13:41:51

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



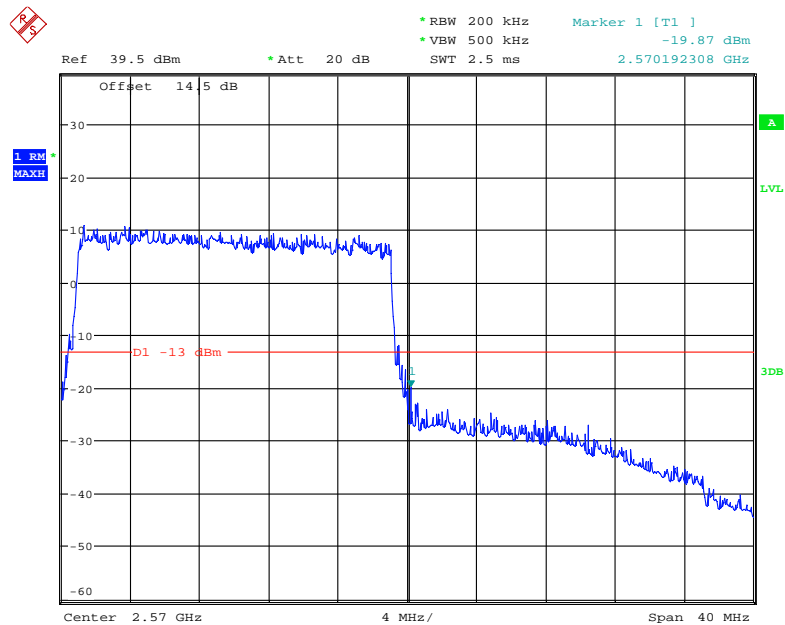
Date: 10.MAY.2018 13:39:40

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



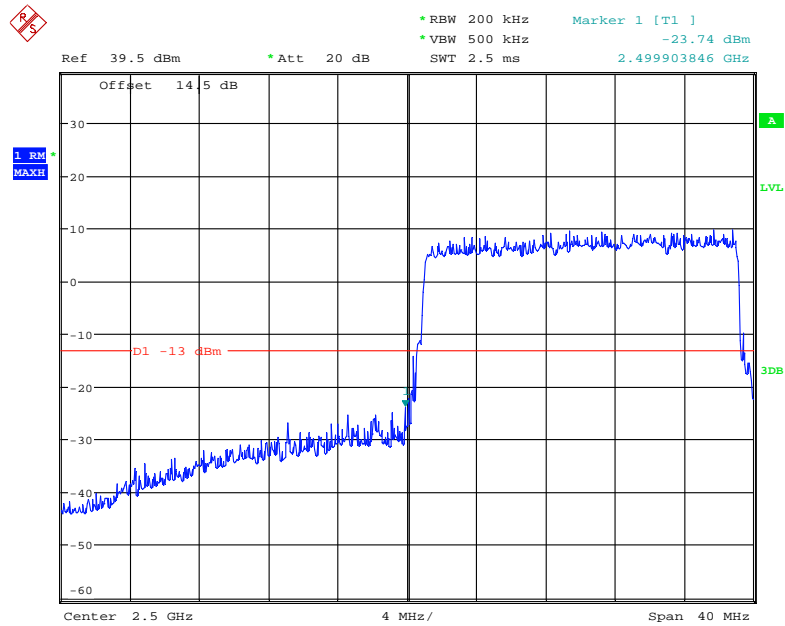
Date: 10.MAY.2018 13:42:44

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



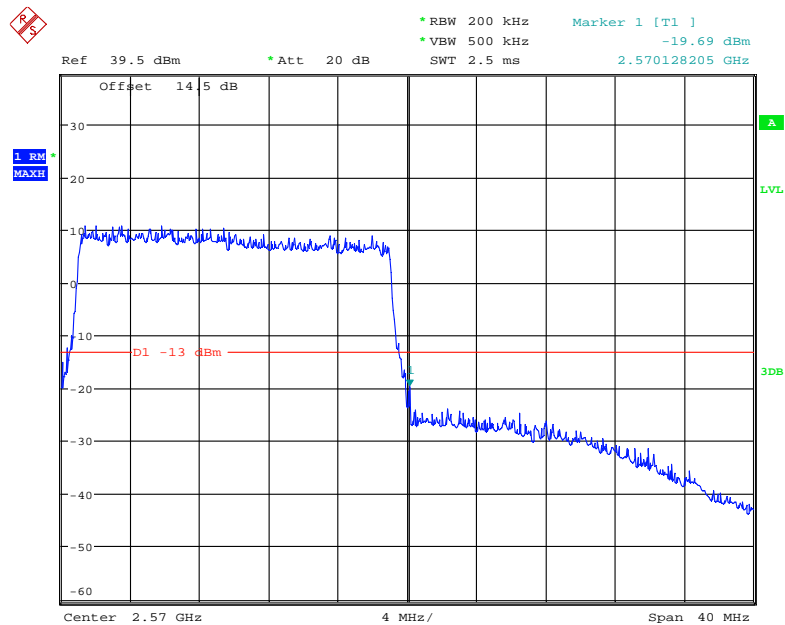
Date: 10.MAY.2018 13:44:42

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



Date: 10.MAY.2018 13:43:12

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



Date: 10.MAY.2018 13:44:17

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

Applicable Standard

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

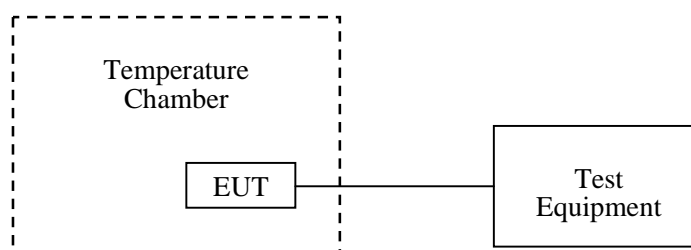
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data**Environmental Conditions**

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Nancy Wang on 2018-05-08.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)**GSM Mode**

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	-3	-0.0036	2.5
-20		-4	-0.0048	2.5
-10		-4	-0.0048	2.5
0		-2	-0.0024	2.5
10		-8	-0.0096	2.5
20		-3	-0.0036	2.5
30		-4	-0.0048	2.5
40		-4	-0.0048	2.5
50		5	0.0060	2.5
25	V min.= 3.6	-4	-0.0048	2.5
	V max.= 4.3	-2	-0.0024	2.5

WCDMA Mode

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	8	0.0096	2.5
-20		4	0.0048	2.5
-10		5	0.0060	2.5
0		1	0.0012	2.5
10		3	0.0036	2.5
20		-1	-0.0012	2.5
30		-3	-0.0036	2.5
40		-2	-0.0024	2.5
50		-5	-0.0060	2.5
25	V min.= 3.6	-2	-0.0024	2.5
	V max.= 4.3	1	0.0012	2.5

PCS Band (Part 24E)**GSM Mode**

Middle Channel, $f_0 = 1880.0\text{ MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	14	0.0074	pass
-20		8	0.0043	pass
-10		17	0.0090	pass
0		10	0.0053	pass
10		9	0.0048	pass
20		-4	-0.0021	pass
30		8	0.0043	pass
40		9	0.0048	pass
50		6	0.0032	pass
25	V min.= 3.6	5	0.0027	pass
	V max.= 4.3	5	0.0027	pass

WCDMA Mode

Middle Channel, $f_o=1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	4	0.0048	pass
-20		7	0.0084	pass
-10		6	0.0072	pass
0		3	0.0036	pass
10		2	0.0024	pass
20		0	0.0000	pass
30		-1	-0.0012	pass
40		-4	-0.0048	pass
50		-2	-0.0024	pass
25	V min.= 3.6	2	0.0024	pass
	V max.= 4.3	24	0.0128	pass

LTE:
QPSK:

Band 2:

20.0 MHz Middle Channel, $f_o=1880$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	3.36	0.0018	pass
-20		3.60	0.0019	pass
-10		2.02	0.0011	pass
0		-1.59	-0.0008	pass
10		-0.59	-0.0003	pass
20		0.35	0.0002	pass
30		-0.73	-0.0004	pass
40		-1.16	-0.0006	pass
50		-0.65	-0.0003	pass
20	V min.= 3.6	2.81	0.0015	pass
	V max.= 4.3	1.94	0.0010	pass

Band 4:

20.0 MHz Middle Channel, $f_0 = 1732.5$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	1.46	0.0008	pass
-20		1.81	0.0010	pass
-10		-0.40	-0.0002	pass
0		-3.57	-0.0021	pass
10		-2.55	-0.0015	pass
20		-1.61	-0.0009	pass
30		-2.70	-0.0016	pass
40		-3.13	-0.0018	pass
50		-2.83	-0.0016	pass
20	V min.= 3.6	0.26	0.0002	pass
	V max.= 4.3	0.82	0.0005	pass

Band 7:

20.0 MHz Middle Channel, $f_0 = 2535$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	5.91	0.0023	pass
-20		5.34	0.0021	pass
-10		4.71	0.0019	pass
0		0.92	0.0004	pass
10		1.91	0.0008	pass
20		2.83	0.0011	pass
30		1.78	0.0007	pass
40		1.26	0.0005	pass
50		1.43	0.0006	pass
20	V min.= 3.6	5.20	0.0021	pass
	V max.= 4.3	5.76	0.0023	pass

LTE:
16QAM:

Band 2:

20.0 MHz Middle Channel, $f_0=1880$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	0.73	0.0004	pass
-20		1.64	0.0009	pass
-10		-1.30	-0.0007	pass
0		-4.24	-0.0023	pass
10		-3.29	-0.0017	pass
20		-2.33	-0.0012	pass
30		-3.42	-0.0018	pass
40		-3.86	-0.0021	pass
50		-3.42	-0.0018	pass
20	V min.= 3.6	0.29	0.0002	pass
	V max.= 4.3	0.63	0.0003	pass

Band 4:

20.0 MHz Middle Channel, $f_0=1732.5$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	3.70	0.0021	pass
-20		5.06	0.0029	pass
-10		1.86	0.0011	pass
0		-1.30	-0.0008	pass
10		-0.34	-0.0002	pass
20		0.64	0.0004	pass
30		-0.45	-0.0003	pass
40		-0.90	-0.0005	pass
50		-1.20	-0.0007	pass
20	V min.= 3.6	3.57	0.0021	pass
	V max.= 4.3	2.86	0.0017	pass

Band 7:

20.0 MHz Middle Channel, $f_o=2535$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	5.41	0.0021	pass
-20		5.89	0.0023	pass
-10		3.61	0.0014	pass
0		0.32	0.0001	pass
10		1.33	0.0005	pass
20		2.32	0.0009	pass
30		1.25	0.0005	pass
40		0.79	0.0003	pass
50		0.69	0.0003	pass
20	V min.= 3.6	3.82	0.0015	pass
	V max.= 4.3	4.82	0.0019	pass

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