



FCC PART 27
FCC PART 22H, PART 24E
TEST REPORT

For

MFOURTEL MEXICO S.A. DE C.V.

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Mexico

FCC ID: CLNM4WILINK1

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TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION	5
DESCRIPTION OF TEST CONFIGURATION	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL I/O CABLE.....	5
LISN.....	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
TEST EQUIPMENT LIST	8
§2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	10
FCC §2.1047 - MODULATION CHARACTERISTIC	12
FCC § 2.1046, § 22.913 (A) & § 24.232 (C); §27.50(C) (D) (H) - RF OUTPUT POWER.....	13
APPLICABLE STANDARD	13
TEST PROCEDURE	13
TEST DATA	13
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53 - OCCUPIED BANDWIDTH	36
APPLICABLE STANDARD	36
TEST PROCEDURE	36
TEST DATA	36
FCC §2.1051, §22.917(A) & §24.238(A); §27.53 (H) (M) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	60
APPLICABLE STANDARD	60
TEST PROCEDURE	60
TEST DATA	60
FCC § 2.1053; § 22.917 (A);§ 24.238 (A); §27.53 (H)(M) SPURIOUS RADIATED EMISSIONS.....	85
APPLICABLE STANDARD	85
TEST PROCEDURE	85
TEST DATA	85
FCC § 22.917 (A);§ 24.238 (A); §27.53 (H)(M) - BAND EDGES	90
APPLICABLE STANDARD	90
TEST PROCEDURE	90
TEST DATA	90
FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY	129
APPLICABLE STANDARD	129
TEST PROCEDURE	129
TEST DATA	130

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The MFOURTEL MEXICO S.A. DE C.V.'s product, model number: M4 WiLink1 (FCC ID: CLNM4WILINK1) or the "EUT" in this report was a M4 WiLink1, which was measured approximately: 175 mm (L) × 168 mm (W) × 52 mm (H), rated with input voltage: DC 12.0 V from adapter.

Adapter Information:

Model: ZL-A012W1201000

Input: AC 100-240V, 50/60Hz, 0.5A

Output: DC 12V, 1A

**All measurement and test data in this report was gathered from production sample serial number: 180614004. (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-06-14.*

Objective

This test report is prepared on behalf of *MFOURTEL 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, and Part 15B JBP submissions with FCC ID: CLNM4WILINK1.

Test Methodology

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

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D.

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

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		±1.5dB
Unwanted Emission, conducted		±1.5dB
Emissions, radiated	Below 1GHz	±4.70dB
	Above 1GHz	±4.80dB
Temperature		±1 °C
Supply voltages		±0.4%

Test Facility

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

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

The device can use External or internal Antenna, but only external antenna can transmission when external antenna was installed.

Equipment Modifications

No modification was made to the EUT.

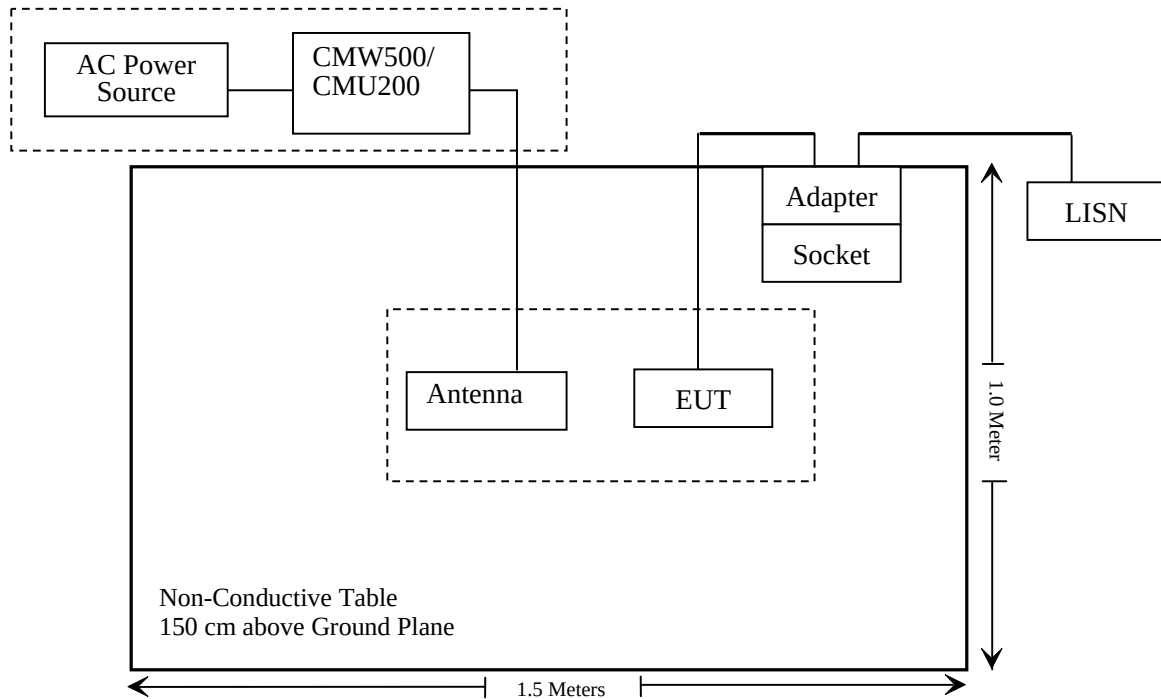
Support Equipment List and Details

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

External I/O Cable

Manufacturer	Description	Model	Serial Number
Un-shielding Un-detachable DC Power Cable	1.0	EUT	Adapter
Un-shielded Un-detachable AC cable	1.0	Socket	LISN

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§2.1091	Maximum Permissible Exposure (MPE)	Compliance
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (c) (d) (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53 (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

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
Aglient	ESG Vector Signal Generator	E4438C	MY42080875	2018-05-09	2019-05-09
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
Ducommun technologies	RF Cable	RG-214	3	Each Time	
WEINSCHEL	3dB Attenuator	N/A	N/A	Each Time	
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).

§2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (Minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Result

Mode/Band	Frequency range (MHz)	Antenna Gain		Tune up Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
GPRS850	824-849	3.00	2.00	33.00	1995.26	30.00	0.35	0.55
GPRS1900	1850-1910	3.00	2.00	30.50	1122.02	30.00	0.20	1.00
WCDMA 850	824-849	3.00	2.00	23.00	2.00	30.00	0.35	0.55
WCDMA 1900	1850-1910	3.00	2.00	22.00	2.00	30.00	0.35	1.00
LTE Band 4	1710-1755	2.50	1.78	23.50	223.87	30.00	0.04	1.00
LTE Band 5	824-849	3.00	2.00	23.00	199.53	30.00	0.04	0.55
LTE Band 7	2500-2570	2.50	1.78	23.00	199.53	30.00	0.03	1.00
WLAN	2412-2462	4.00	2.51	20.50	112.20	30.00	0.02	1.00

Note: the maximum gain is external antenna used for MPE calculation.

The WLAN and WWAN can transmit simultaneously:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$= S_{WLAN}/S_{limit-WLAN} + S_{WWAN}/S_{limit-WWAN}$$

$$= 0.02/1 + 0.35/0.55$$

$$= 0.66$$

$$< 1.0$$

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 30cm from nearby persons.

Result: Compliance

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(c) (d) (h) - RF OUTPUT POWER

Applicable Standard

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

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

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

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

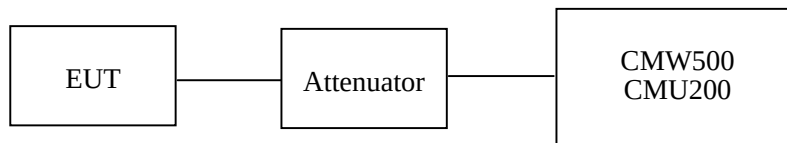
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Bibo Zhang on 2018-07-10.

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

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.68	32.53	32.43	32.20	38.45
	190	836.6	32.73	32.56	32.49	32.22	38.45
	251	848.8	32.67	32.49	32.37	32.20	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	27.09	27.08	27.02	27.01	38.45
	190	836.6	27.04	27.02	26.99	26.95	38.45
	251	848.8	26.96	26.94	26.94	26.82	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		22.59	22.56	22.08
		HSDPA	1	20.92	20.97	20.90
			2	20.83	20.85	20.79
			3	21.02	21.02	20.95
			4	20.79	20.91	20.78
		HSUPA	1	21.63	21.68	21.55
			2	21.59	21.55	21.44
			3	21.73	21.79	21.59
			4	21.56	21.56	21.49
			5	21.69	21.80	21.66

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	30.11	30.03	29.08	28.86	33
	661	1880.0	30.15	30.01	29.14	29.97	33
	810	1909.8	29.57	29.46	29.23	28.98	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.11	24.95	24.92	24.78	33
	661	1880.0	25.11	24.99	24.90	24.76	33
	810	1909.8	25.00	24.85	24.74	24.56	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		21.99	21.91	21.88
		HSDPA	1	20.93	20.76	20.80
			2	20.84	20.73	20.72
			3	20.98	20.85	20.91
			4	20.81	20.70	20.73
		HSUPA	1	21.61	21.31	21.57
			2	21.49	21.18	21.49
			3	21.70	21.38	21.62
			4	21.55	21.23	21.54
			5	21.69	21.35	21.60

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

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	0.25	13
	Middle	0.19	13
	High	0.25	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.36	13
	Middle	0.34	13
	High	0.28	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.84	13
	Middle	2.63	13
	High	2.85	13
HSDPA (16QAM)	Low	2.87	13
	Middle	2.66	13
	High	2.82	13
HSUPA (BPSK)	Low	2.88	13
	Middle	2.68	13
	High	2.81	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	0.23	13
	Middle	0.08	13
	High	0.14	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.32	13
	Middle	0.28	13
	High	0.44	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.85	13
	Middle	3.64	13
	High	3.87	13
HSDPA (16QAM)	Low	3.84	13
	Middle	3.66	13
	High	3.85	13
HSUPA (BPSK)	Low	3.85	13
	Middle	3.63	13
	High	3.82	13

Radiated Power**Internal Antenna****GPRS Mode:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	84.21	236	1.0	H	22.2	0.7	0.0	21.50	38.45	16.95
836.6	90.93	0	1.9	V	30.5	0.7	0.0	29.80	38.45	8.65
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	86.90	10	1.8	H	16.9	1.30	9.40	25.00	33.00	8.0
1880.00	86.13	260	1.2	V	15.9	1.30	9.40	24.00	33.00	9.0

EGPRS Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	80.23	236	1.0	H	18.2	0.7	0.0	17.50	38.45	20.95
836.6	86.94	0	1.9	V	26.5	0.7	0.0	25.80	38.45	12.65
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	82.86	10	1.8	H	12.9	1.30	9.40	21.00	33.00	12.0
1880.00	82.11	260	1.2	V	11.9	1.30	9.40	20.00	33.00	13.0

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	72.20	219	2.4	H	10.4	0.7	0.0	9.70	38.45	28.75
836.6	78.18	333	1.8	V	17.7	0.7	0.0	17.00	38.45	21.45
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	78.37	20	1.8	H	8.3	1.30	9.40	16.40	33.00	16.6
1880.00	78.68	335	1.9	V	8.4	1.30	9.40	16.50	33.00	16.5

External Antenna**GPRS Mode:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	86.23	236	1.0	H	24.2	0.7	0.0	23.50	38.45	14.95
836.6	92.92	0	1.9	V	32.5	0.7	0.0	31.80	38.45	6.65
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	88.83	97	1.7	H	18.8	1.30	9.40	26.90	33.00	6.1
1880.00	91.83	134	2.1	V	21.6	1.30	9.40	29.70	33.00	3.3

EGPRS Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	82.24	236	1.0	H	20.2	0.7	0.0	19.50	38.45	18.95
836.6	88.91	0	1.9	V	28.5	0.7	0.0	27.80	38.45	10.65
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	84.81	97	1.7	H	14.8	1.30	9.40	22.90	33.00	10.1
1880.00	87.82	134	2.1	V	17.6	1.30	9.40	25.70	33.00	7.3

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	76.2	219	2.4	H	14.4	0.7	0.0	13.70	38.45	24.75
836.6	82.19	333	1.8	V	21.7	0.7	0.0	21.00	38.45	17.45
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	81.53	307	1.5	H	11.5	1.30	9.40	19.60	33.00	13.4
1880.00	85.59	15	1.4	V	15.3	1.30	9.40	23.40	33.00	9.6

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

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	21.45	21.52	21.48
		RB Size=1, RB Offset=2	21.75	21.83	21.75
		RB Size=1, RB Offset=5	21.99	22.00	21.21
		RB Size=3, RB Offset=0	21.86	21.88	21.98
		RB Size=3, RB Offset=1	21.96	21.22	21.92
		RB Size=3, RB Offset=2	21.89	21.92	21.86
		RB Size=6, RB Offset=0	21.97	21.58	22.02
	16QAM	RB Size=1, RB Offset=0	21.71	21.56	21.24
		RB Size=1, RB Offset=2	20.42	20.41	20.38
		RB Size=1, RB Offset=5	20.51	20.41	20.65
		RB Size=3, RB Offset=0	20.46	20.56	20.42
		RB Size=3, RB Offset=1	20.47	20.46	20.54
		RB Size=3, RB Offset=2	20.42	20.48	20.54
		RB Size=6, RB Offset=0	20.44	20.52	20.52
3.0	QPSK	RB Size=1, RB Offset=0	22.33	22.46	22.25
		RB Size=1, RB Offset=7	22.83	22.41	22.32
		RB Size=1, RB Offset=14	22.40	22.00	22.49
		RB Size=8, RB Offset=0	22.60	22.20	22.27
		RB Size=8, RB Offset=4	22.55	22.01	22.55
		RB Size=8, RB Offset=7	22.84	22.20	22.85
		RB Size=15, RB Offset=0	22.70	22.01	22.53
	16QAM	RB Size=1, RB Offset=0	22.38	22.32	22.43
		RB Size=1, RB Offset=7	22.93	22.25	22.56
		RB Size=1, RB Offset=14	22.89	22.11	22.73
		RB Size=8, RB Offset=0	22.91	21.84	22.61
		RB Size=8, RB Offset=4	22.78	21.94	22.62
		RB Size=8, RB Offset=7	22.51	22.21	23.02
		RB Size=15, RB Offset=0	22.49	22.31	22.86

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	22.21	22.32	22.36
		RB Size=1, RB Offset=12	22.30	21.99	22.49
		RB Size=1, RB Offset=24	22.56	22.26	22.46
		RB Size=12, RB Offset=0	22.77	21.84	22.62
		RB Size=12, RB Offset=6	22.49	21.97	22.75
		RB Size=12, RB Offset=11	22.67	21.91	23.08
		RB Size=25, RB Offset=0	22.60	21.86	22.80
	16QAM	RB Size=1, RB Offset=0	22.25	22.18	22.33
		RB Size=1, RB Offset=12	22.55	21.95	22.68
		RB Size=1, RB Offset=24	22.79	21.72	22.33
		RB Size=12, RB Offset=0	22.45	22.17	22.46
		RB Size=12, RB Offset=6	22.28	21.95	22.69
		RB Size=12, RB Offset=11	22.36	22.05	22.72
		RB Size=25, RB Offset=0	22.77	21.72	22.50
10.0	QPSK	RB Size=1, RB Offset=0	22.15	22.13	22.28
		RB Size=1, RB Offset=24	22.52	21.87	22.76
		RB Size=1, RB Offset=49	22.38	21.86	22.49
		RB Size=25, RB Offset=0	22.31	21.94	22.58
		RB Size=25, RB Offset=12	22.23	21.83	22.46
		RB Size=25, RB Offset=24	22.63	22.10	22.87
		RB Size=50, RB Offset=0	22.38	21.78	22.77
	16QAM	RB Size=1, RB Offset=0	22.24	22.17	22.24
		RB Size=1, RB Offset=24	21.93	21.98	21.92
		RB Size=1, RB Offset=49	21.92	22.01	21.90
		RB Size=25, RB Offset=0	21.89	21.82	22.03
		RB Size=25, RB Offset=12	22.09	21.75	21.93
		RB Size=25, RB Offset=24	21.90	22.05	21.62
		RB Size=50, RB Offset=0	21.83	21.71	21.78

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	22.11	22.13	22.21
		RB Size=1, RB Offset=37	21.78	21.84	22.13
		RB Size=1, RB Offset=74	21.86	21.77	21.89
		RB Size=36, RB Offset=0	21.84	21.76	22.17
		RB Size=36, RB Offset=18	21.71	21.82	21.94
		RB Size=36, RB Offset=37	21.78	21.69	21.85
		RB Size=75, RB Offset=0	22.06	21.82	22.07
	16QAM	RB Size=1, RB Offset=0	21.89	22.05	22.13
		RB Size=1, RB Offset=37	21.41	21.71	21.68
		RB Size=1, RB Offset=74	21.50	21.57	21.92
		RB Size=36, RB Offset=0	21.73	22.00	22.09
		RB Size=36, RB Offset=18	21.73	21.57	21.71
		RB Size=36, RB Offset=37	21.60	21.62	21.23
		RB Size=75, RB Offset=0	21.71	21.82	21.78
20.0	QPSK	RB Size=1, RB Offset=0	21.85	21.85	22.07
		RB Size=1, RB Offset=49	21.42	21.81	21.92
		RB Size=1, RB Offset=99	21.69	21.73	21.86
		RB Size=50, RB Offset=0	21.43	21.77	21.70
		RB Size=50, RB Offset=24	21.38	21.39	21.94
		RB Size=50, RB Offset=49	21.56	21.35	21.93
		RB Size=100, RB Offset=0	21.70	21.44	21.60
	16QAM	RB Size=1, RB Offset=0	21.89	21.93	22.01
		RB Size=1, RB Offset=49	21.84	21.87	21.63
		RB Size=1, RB Offset=99	21.63	21.59	21.79
		RB Size=50, RB Offset=0	21.84	21.46	21.86
		RB Size=50, RB Offset=24	21.80	21.68	21.55
		RB Size=50, RB Offset=49	21.56	21.47	21.23
		RB Size=100, RB Offset=0	21.80	21.63	21.97

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.24	13	Pass
QPSK (100RB Size)	4.63	13	Pass
16QAM (1RB Size)	5.32	13	Pass
16QAM (100RB Size)	5.42	13	Pass

External Antenna:**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	90.84	334	1.5	H	17.7	1.30	8.90	25.30	30
1732.50	90.51	274	2.3	V	17.9	1.30	8.90	25.50	30
3 MHz Bandwidth									
1732.50	90.92	274	1.9	H	17.8	1.30	8.90	25.40	30
1732.50	90.45	224	1.6	V	17.9	1.30	8.90	25.50	30
5 MHz Bandwidth									
1732.50	90.78	196	1.8	H	17.6	1.30	8.90	25.20	30
1732.50	90.05	228	2.5	V	17.5	1.30	8.90	25.10	30
10 MHz Bandwidth									
1732.50	90.58	344	2.5	H	17.4	1.30	8.90	25.00	30
1732.50	90.21	70	1.8	V	17.6	1.30	8.90	25.20	30
15 MHz Bandwidth									
1732.50	90.69	97	2.4	H	17.5	1.30	8.90	25.10	30
1732.50	90.11	101	1.5	V	17.5	1.30	8.90	25.10	30
20 MHz Bandwidth									
1732.50	90.45	41	1.4	H	17.3	1.30	8.90	24.90	30
1732.50	89.96	29	2.4	V	17.4	1.30	8.90	25.00	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	91.62	326	2.1	H	18.5	1.30	8.90	26.10	30
1732.50	90.84	251	2.5	V	18.3	1.30	8.90	25.90	30
3 MHz Bandwidth									
1732.50	91.08	322	1.3	H	17.9	1.30	8.90	25.50	30
1732.50	90.38	234	1.6	V	17.8	1.30	8.90	25.40	30
5 MHz Bandwidth									
1732.50	91.69	3	1.1	H	18.5	1.30	8.90	26.10	30
1732.50	90.45	215	1.0	V	17.9	1.30	8.90	25.50	30
10 MHz Bandwidth									
1732.50	91.11	47	1.1	H	17.9	1.30	8.90	25.50	30
1732.50	90.16	34	1.4	V	17.6	1.30	8.90	25.20	30
15 MHz Bandwidth									
1732.50	91.51	301	1.3	H	18.3	1.30	8.90	25.90	30
1732.50	90.87	257	2.3	V	18.3	1.30	8.90	25.90	30
20 MHz Bandwidth									
1732.50	91.21	356	1.3	H	18.0	1.30	8.90	25.60	30
1732.50	90.51	351	1.5	V	17.9	1.30	8.90	25.50	30

Internal Antenna:**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	88.72	113	1.6	H	15.6	1.30	8.90	23.20	30
1732.50	86.47	137	2.5	V	13.9	1.30	8.90	21.50	30
3 MHz Bandwidth									
1732.50	88.72	113	1.6	H	15.6	1.30	8.90	23.20	30
1732.50	86.47	137	2.5	V	13.9	1.30	8.90	21.50	30
5 MHz Bandwidth									
1732.50	88.36	344	1.1	H	15.2	1.30	8.90	22.80	30
1732.50	86.21	127	1.3	V	13.6	1.30	8.90	21.20	30
10 MHz Bandwidth									
1732.50	88.75	30	2.2	H	15.6	1.30	8.90	23.20	30
1732.50	86.05	297	1.3	V	13.5	1.30	8.90	21.10	30
15 MHz Bandwidth									
1732.50	88.17	35	1.2	H	15.0	1.30	8.90	22.60	30
1732.50	85.74	63	1.5	V	13.2	1.30	8.90	20.80	30
20 MHz Bandwidth									
1732.50	88.35	294	1.7	H	15.2	1.30	8.90	22.80	30
1732.50	85.92	320	1.7	V	13.4	1.30	8.90	21.00	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	87.52	303	1.5	H	14.4	1.30	8.90	22.00	33
1732.50	85.34	270	1.3	V	12.8	1.30	8.90	20.40	33
3 MHz Bandwidth									
1732.50	88.35	97	2.1	H	15.2	1.30	8.90	22.80	33
1732.50	85.87	292	1.5	V	13.3	1.30	8.90	20.90	33
5 MHz Bandwidth									
1732.50	88.52	96	1.5	H	15.4	1.30	8.90	23.00	33
1732.50	86.02	195	1.3	V	13.5	1.30	8.90	21.10	33
10 MHz Bandwidth									
1732.50	89.02	241	1.2	H	15.9	1.30	8.90	23.50	33
1732.50	85.43	359	1.6	V	12.9	1.30	8.90	20.50	33
15 MHz Bandwidth									
1732.50	88.26	336	1.7	H	15.1	1.30	8.90	22.70	33
1732.50	85.97	269	2.3	V	13.4	1.30	8.90	21.00	33
20 MHz Bandwidth									
1732.50	88.72	52	1.4	H	15.6	1.30	8.90	23.20	33
1732.50	84.91	45	1.3	V	12.3	1.30	8.90	19.90	33

LTE Band 5:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.31	22.27	22.17
		RB Size=1, RB Offset=2	21.36	21.31	21.25
		RB Size=1, RB Offset=5	22.30	22.23	22.12
		RB Size=3, RB Offset=0	22.80	22.78	22.70
		RB Size=3, RB Offset=1	22.60	22.58	22.55
		RB Size=3, RB Offset=2	21.78	21.73	21.60
		RB Size=6, RB Offset=0	22.48	22.45	22.40
	16QAM	RB Size=1, RB Offset=0	22.10	22.06	21.94
		RB Size=1, RB Offset=2	21.13	21.04	20.95
		RB Size=1, RB Offset=5	22.00	21.94	21.91
		RB Size=3, RB Offset=0	22.57	22.48	22.35
		RB Size=3, RB Offset=1	22.45	22.34	22.29
		RB Size=3, RB Offset=2	21.49	21.43	21.38
		RB Size=6, RB Offset=0	22.33	22.29	22.23
3.0	QPSK	RB Size=1, RB Offset=0	22.16	22.19	22.06
		RB Size=1, RB Offset=7	22.05	22.07	21.97
		RB Size=1, RB Offset=14	22.50	22.44	22.34
		RB Size=8, RB Offset=0	22.06	22.09	22.04
		RB Size=8, RB Offset=4	21.72	21.74	21.67
		RB Size=8, RB Offset=7	21.49	21.47	21.35
		RB Size=15, RB Offset=0	21.73	21.73	21.70
	16QAM	RB Size=1, RB Offset=0	21.96	21.87	21.83
		RB Size=1, RB Offset=7	21.93	21.86	21.78
		RB Size=1, RB Offset=14	22.29	22.18	22.08
		RB Size=8, RB Offset=0	21.97	21.84	21.73
		RB Size=8, RB Offset=4	21.61	21.49	21.40
		RB Size=8, RB Offset=7	21.24	21.20	21.15
		RB Size=15, RB Offset=0	21.58	21.52	21.45

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	22.34	22.55	22.22
		RB Size=1, RB Offset=12	22.46	22.48	22.59
		RB Size=1, RB Offset=24	22.42	22.41	22.36
		RB Size=12, RB Offset=0	21.59	21.58	21.55
		RB Size=12, RB Offset=6	21.15	21.54	21.28
		RB Size=12, RB Offset=11	21.46	21.63	21.44
		RB Size=25, RB Offset=0	21.31	21.17	21.27
	16QAM	RB Size=1, RB Offset=0	21.21	21.03	21.29
		RB Size=1, RB Offset=12	21.23	21.31	21.67
		RB Size=1, RB Offset=24	21.33	21.28	21.31
		RB Size=12, RB Offset=0	20.25	20.24	20.21
		RB Size=12, RB Offset=6	20.37	20.45	20.43
		RB Size=12, RB Offset=11	20.28	20.37	20.33
		RB Size=25, RB Offset=0	20.18	20.23	20.14
10.0	QPSK	RB Size=1, RB Offset=0	21.89	21.83	21.79
		RB Size=1, RB Offset=24	21.66	21.66	21.61
		RB Size=1, RB Offset=49	21.28	21.24	21.11
		RB Size=25, RB Offset=0	22.24	22.23	22.16
		RB Size=25, RB Offset=12	22.19	22.19	22.10
		RB Size=25, RB Offset=24	21.37	21.40	21.36
		RB Size=50, RB Offset=0	22.24	22.24	22.11
	16QAM	RB Size=1, RB Offset=0	21.73	21.67	21.60
		RB Size=1, RB Offset=24	21.55	21.44	21.36
		RB Size=1, RB Offset=49	21.02	20.97	20.85
		RB Size=25, RB Offset=0	22.04	21.92	21.85
		RB Size=25, RB Offset=12	22.06	22.00	21.87
		RB Size=25, RB Offset=24	21.33	21.24	21.16
		RB Size=50, RB Offset=0	22.00	21.96	21.84

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.48	13	Pass
QPSK (100RB Size)	4.35	13	Pass
16QAM (1RB Size)	5.01	13	Pass
16QAM (100RB Size)	4.93	13	Pass

Internal Antenna:**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									
836.5	83.33	54	1.9	H	21.3	0.7	0	20.6	38.45
836.5	83.05	273	1.7	V	22.6	0.7	0	21.9	38.45
3 MHz Bandwidth									
836.5	83.28	305	2.3	H	21.3	0.7	0	20.6	38.45
836.5	83.51	93	1.6	V	23.1	0.7	0	22.4	38.45
5 MHz Bandwidth									
836.5	83.13	186	2.2	H	21.1	0.7	0	20.4	38.45
836.5	83.26	151	1.5	V	22.9	0.7	0	22.2	38.45
10 MHz Bandwidth									
836.5	83.02	266	1.4	H	21.0	0.7	0	20.3	38.45
836.5	83.22	218	2.3	V	22.8	0.7	0	22.1	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	81.97	67	1.0	H	20.0	0.7	0	19.3	38.45
836.5	81.89	137	2.4	V	21.5	0.7	0	20.8	38.45
3 MHz Bandwidth									
836.5	81.53	17	1.7	H	19.5	0.7	0	18.8	38.45
836.5	81.81	251	2.2	V	21.4	0.7	0	20.7	38.45
5 MHz Bandwidth									
836.5	81.04	259	1.5	H	19.0	0.7	0	18.3	38.45
836.5	81.33	54	2.2	V	20.9	0.7	0	20.2	38.45
10 MHz Bandwidth									
836.5	81.07	329	1.5	H	19.1	0.7	0	18.4	38.45
836.5	81.34	273	2.4	V	20.9	0.7	0	20.2	38.45

External Antenna:**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									
836.5	86.29	30	1.0	H	24.3	0.7	0	23.6	38.45
836.5	86.67	230	2.3	V	26.3	0.7	0	25.6	38.45
3 MHz Bandwidth									
836.5	86.18	270	2.3	H	24.2	0.7	0	23.5	38.45
836.5	86.18	339	1.2	V	25.8	0.7	0	25.1	38.45
5 MHz Bandwidth									
836.5	86.26	230	1.3	H	24.3	0.7	0	23.6	38.45
836.5	86.49	169	1.3	V	26.1	0.7	0	25.4	38.45
10 MHz Bandwidth									
836.5	86.04	7	1.6	H	24.0	0.7	0	23.3	38.45
836.5	86.29	359	1.9	V	25.9	0.7	0	25.2	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	85.23	91	1.9	H	23.2	0.7	0	22.5	38.45
836.5	85.28	353	1.8	V	24.9	0.7	0	24.2	38.45
3 MHz Bandwidth									
836.5	85.78	9	1.0	H	23.8	0.7	0	23.1	38.45
836.5	85.91	102	1.0	V	25.5	0.7	0	24.8	38.45
5 MHz Bandwidth									
836.5	85.67	3	1.7	H	23.7	0.7	0	23.0	38.45
836.5	85.82	178	2.0	V	25.4	0.7	0	24.7	38.45
10 MHz Bandwidth									
836.5	85.25	54	2.1	H	23.2	0.7	0	22.5	38.45
836.5	85.23	133	2	V	24.8	0.7	0	24.1	38.45

LTE Band 7:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	22.29	22.22	22.11
		RB Size=1, RB Offset=12	21.35	21.33	21.25
		RB Size=1, RB Offset=24	21.39	21.37	21.26
		RB Size=12, RB Offset=0	22.51	22.48	22.43
		RB Size=12, RB Offset=6	22.36	22.32	22.29
		RB Size=12, RB Offset=11	22.12	22.14	22.01
		RB Size=25, RB Offset=0	22.72	22.73	22.60
	16QAM	RB Size=1, RB Offset=0	22.02	21.96	21.86
		RB Size=1, RB Offset=12	21.14	21.04	20.97
		RB Size=1, RB Offset=24	21.19	21.14	21.04
		RB Size=12, RB Offset=0	22.38	22.27	22.15
		RB Size=12, RB Offset=6	22.17	22.04	21.98
		RB Size=12, RB Offset=11	21.96	21.89	21.84
		RB Size=25, RB Offset=0	22.53	22.47	22.35
10	QPSK	RB Size=1, RB Offset=0	22.54	22.48	22.39
		RB Size=1, RB Offset=24	22.13	22.10	22.05
		RB Size=1, RB Offset=49	22.93	22.95	22.90
		RB Size=25, RB Offset=0	22.44	22.40	22.34
		RB Size=25, RB Offset=12	22.41	22.36	22.28
		RB Size=25, RB Offset=24	21.81	21.80	21.75
		RB Size=50, RB Offset=0	22.57	22.55	22.46
	16QAM	RB Size=1, RB Offset=0	22.29	22.17	22.08
		RB Size=1, RB Offset=24	21.94	21.86	21.78
		RB Size=1, RB Offset=49	22.82	22.76	22.70
		RB Size=25, RB Offset=0	22.24	22.11	22.01
		RB Size=25, RB Offset=12	22.15	22.07	22.01
		RB Size=25, RB Offset=24	21.63	21.52	21.47
		RB Size=50, RB Offset=0	22.41	22.33	22.23

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	21.76	21.74	21.61
		RB Size=1, RB Offset=37	21.41	21.38	21.32
		RB Size=1, RB Offset=74	21.26	21.27	21.20
		RB Size=36, RB Offset=0	22.02	21.98	21.92
		RB Size=36, RB Offset=18	22.16	22.10	22.02
		RB Size=36, RB Offset=37	21.61	21.57	21.54
		RB Size=75, RB Offset=0	22.14	22.13	22.05
	16QAM	RB Size=1, RB Offset=0	21.52	21.45	21.33
		RB Size=1, RB Offset=37	21.27	21.18	21.10
		RB Size=1, RB Offset=74	21.11	21.05	21.00
		RB Size=36, RB Offset=0	21.87	21.81	21.77
		RB Size=36, RB Offset=18	21.92	21.86	21.82
		RB Size=36, RB Offset=37	21.49	21.42	21.31
		RB Size=75, RB Offset=0	21.94	21.90	21.86
20	QPSK	RB Size=1, RB Offset=0	22.13	22.13	22.05
		RB Size=1, RB Offset=49	22.07	22.07	21.97
		RB Size=1, RB Offset=99	22.40	22.34	22.26
		RB Size=50, RB Offset=0	21.76	21.78	21.68
		RB Size=50, RB Offset=24	21.47	21.42	21.33
		RB Size=50, RB Offset=49	21.26	21.23	21.16
		RB Size=100, RB Offset=0	21.28	21.26	21.15
	16QAM	RB Size=1, RB Offset=0	22.00	21.97	21.92
		RB Size=1, RB Offset=49	21.88	21.83	21.78
		RB Size=1, RB Offset=99	22.15	22.06	21.99
		RB Size=50, RB Offset=0	21.64	21.54	21.45
		RB Size=50, RB Offset=24	21.25	21.16	21.04
		RB Size=50, RB Offset=49	21.13	21.06	21.02
		RB Size=100, RB Offset=0	21.04	20.97	20.93

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.54	13	Pass
QPSK (100RB Size)	4.46	13	Pass
16QAM (1RB Size)	5.63	13	Pass
16QAM (100RB Size)	5.64	13	Pass

EIRP:**Internal Antenna****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									
2535.50	84.19	56	1.2	H	14.7	2.60	10.20	22.30	33
2535.50	84.08	78	1.3	V	15.2	2.60	10.20	22.80	33
10 MHz Bandwidth									
2535.50	83.95	179	1.7	H	14.5	2.60	10.20	22.10	33
2535.50	84.06	328	2.1	V	15.2	2.60	10.20	22.80	33
15 MHz Bandwidth									
2535.50	84.13	86	1.3	H	14.6	2.60	10.20	22.20	33
2535.50	83.86	60	1.8	V	15.0	2.60	10.20	22.60	33
20 MHz Bandwidth									
2535.50	84.21	186	1.1	H	14.7	2.60	10.20	22.30	33
2535.50	83.92	116	1.1	V	15.0	2.60	10.20	22.60	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									
2535.50	84.51	179	2.3	H	15.0	2.60	10.20	22.60	33
2535.50	84.23	73	2.2	V	15.4	2.60	10.20	23.00	33
10 MHz Bandwidth									
2535.50	84.95	272	2.5	H	15.5	2.60	10.20	23.10	33
2535.50	84.73	65	2.2	V	15.9	2.60	10.20	23.50	33
15 MHz Bandwidth									
2535.50	85.22	51	1.7	H	15.7	2.60	10.20	23.30	33
2535.50	84.61	334	2.0	V	15.7	2.60	10.20	23.30	33
20 MHz Bandwidth									
2535.50	85.19	83	1.8	H	15.7	2.60	10.20	23.30	33
2535.50	85.07	291	1.3	V	16.2	2.60	10.20	23.80	33

External Antenna**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	75.92	245	1.5	H	6.4	2.60	10.20	14.00	33
2535.00	87.24	122	2.1	V	18.4	2.60	10.20	26.00	33
10 MHz Bandwidth									
2535.00	74.55	339	2.5	H	5.1	2.60	10.20	12.70	33
2535.00	86.63	34	2.0	V	17.8	2.60	10.20	25.40	33
15 MHz Bandwidth									
2535.00	75.23	30	2.1	H	5.7	2.60	10.20	13.30	33
2535.00	86.97	87	1.7	V	18.1	2.60	10.20	25.70	33
20 MHz Bandwidth									
2535.00	74.72	234	2.1	H	5.2	2.60	10.20	12.80	33
2535.00	86.71	51	2.3	V	17.8	2.60	10.20	25.40	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	74.32	28	2.2	H	4.8	2.60	10.20	12.40	33
2535.00	87.12	35	1.2	V	18.2	2.60	10.20	25.80	33
10 MHz Bandwidth									
2535.00	76.25	219	1.6	H	6.8	2.60	10.20	14.40	33
2535.00	87.43	242	1.3	V	18.6	2.60	10.20	26.20	33
15 MHz Bandwidth									
2535.00	75.74	322	1.9	H	6.3	2.60	10.20	13.90	33
2535.00	87.52	118	1.3	V	18.6	2.60	10.20	26.20	33
20 MHz Bandwidth									
2535.00	76.19	9	1.4	H	6.7	2.60	10.20	14.30	33
2535.00	87.23	89	1.7	V	18.4	2.60	10.20	26.00	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

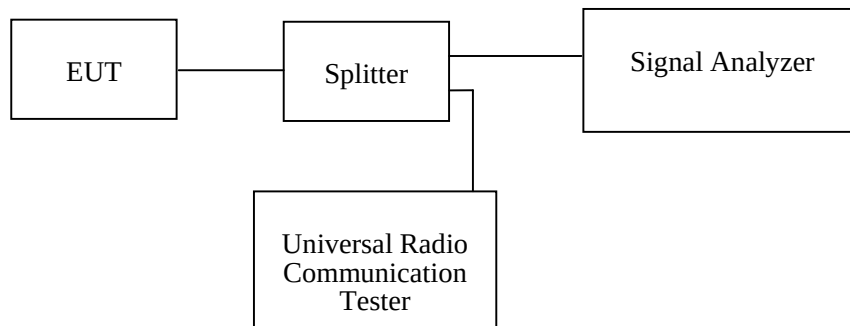
Applicable Standard

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 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Bibo Zhang on 2018-06-21 and 2018-06-22.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

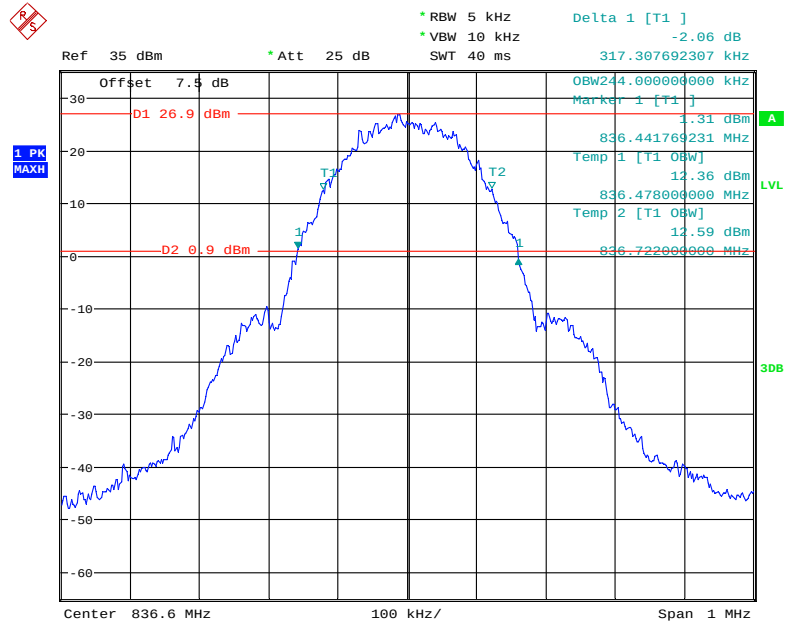
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GPRS (GMSK)	836.6	244.00	317.31
EGPRS(8PSK)	836.6	244.00	310.90

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.120	4.719
HSUPA (BPSK)	836.6	4.140	4.744
HSDPA (16QAM)	836.6	4.140	4.744

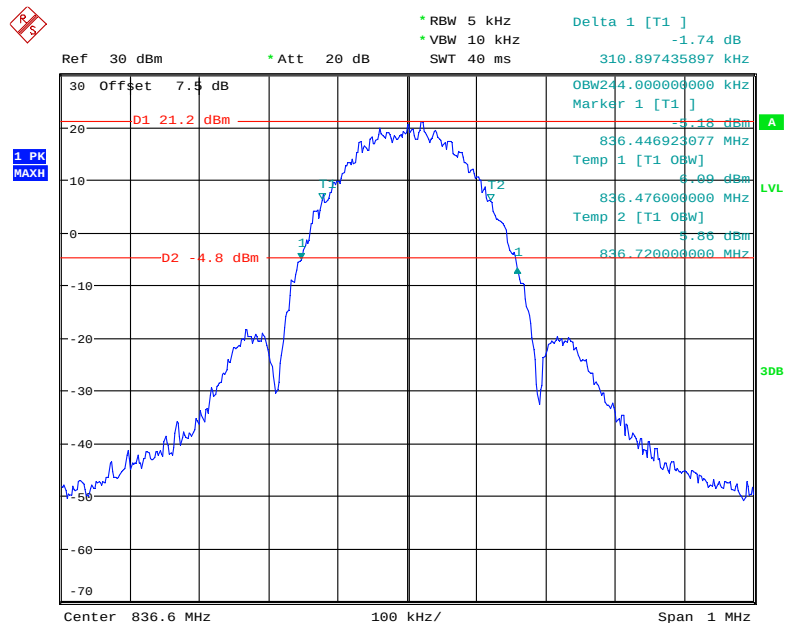
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GPRS (GMSK)	1880.0	248.00	320.51
EGPRS(8PSK)	1880.0	244.00	310.90

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.12	4.713
HSUPA (BPSK)	1880.0	4.140	4.713
HSDPA (16QAM)	1880.0	4.140	4.720

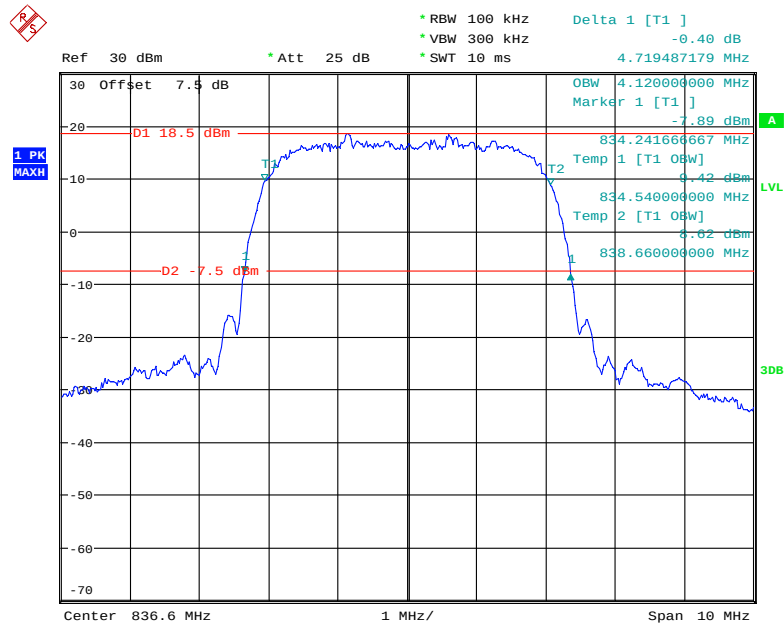
Cellular Band (Part 22H)**26 dB Emissions & 99% Occupied Bandwidth for GPRS(GMSK) Mode**

Date: 22.JUN.2018 00:52:49

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode

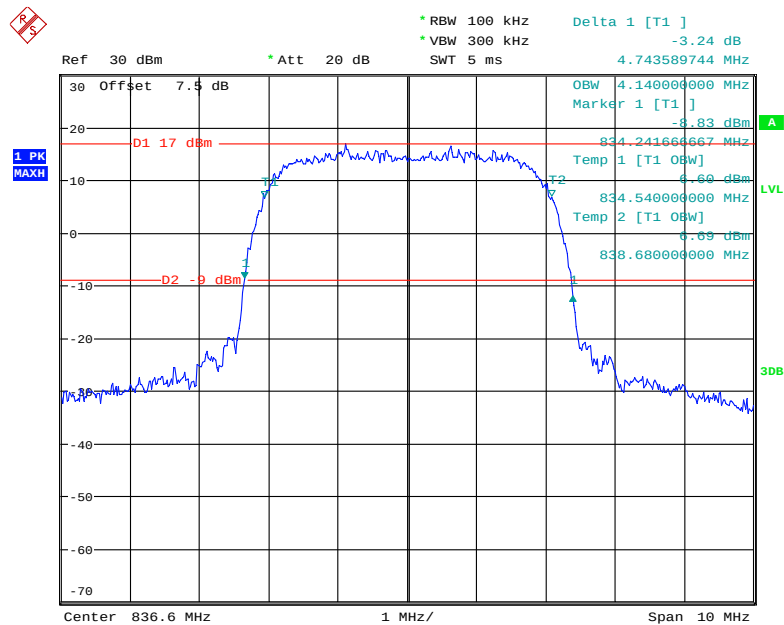
Date: 22.JUN.2018 00:04:36

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

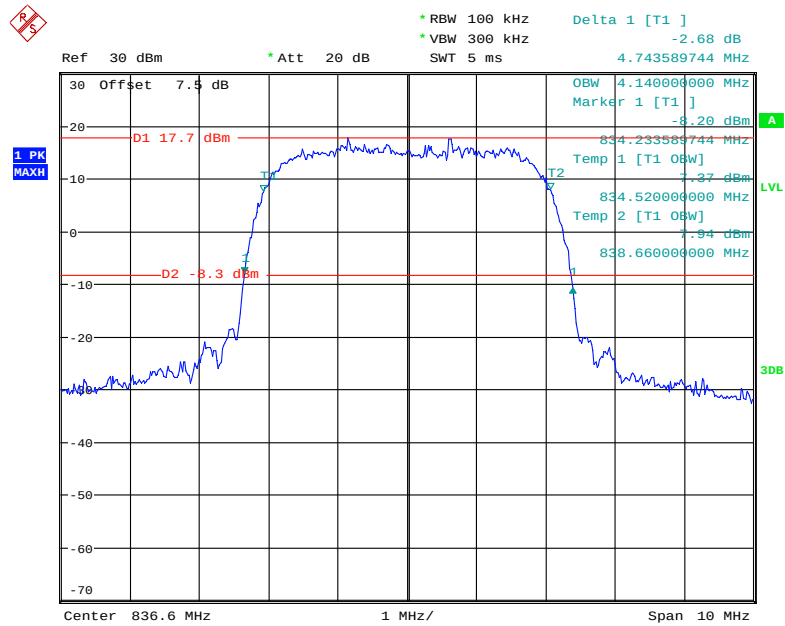


Date: 21.JUN.2018 23:07:54

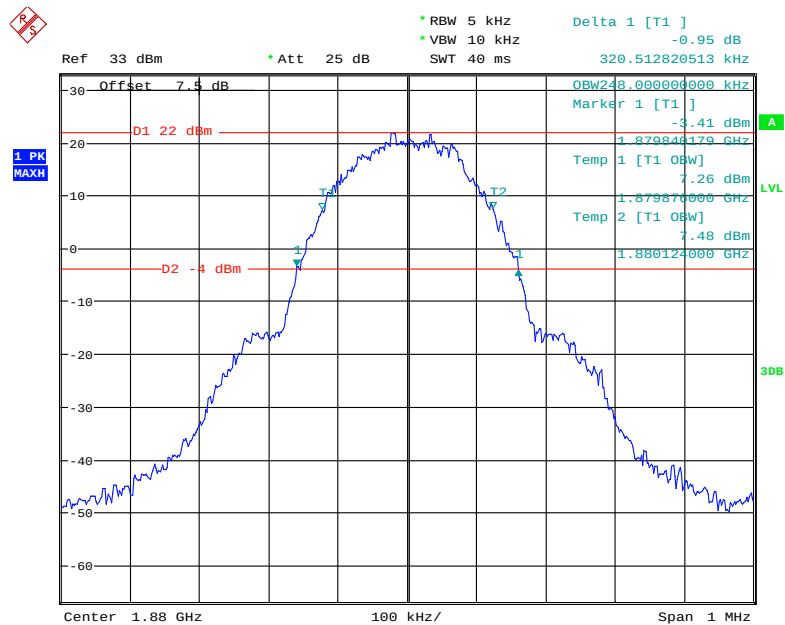
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode



Date: 21.JUN.2018 23:35:32

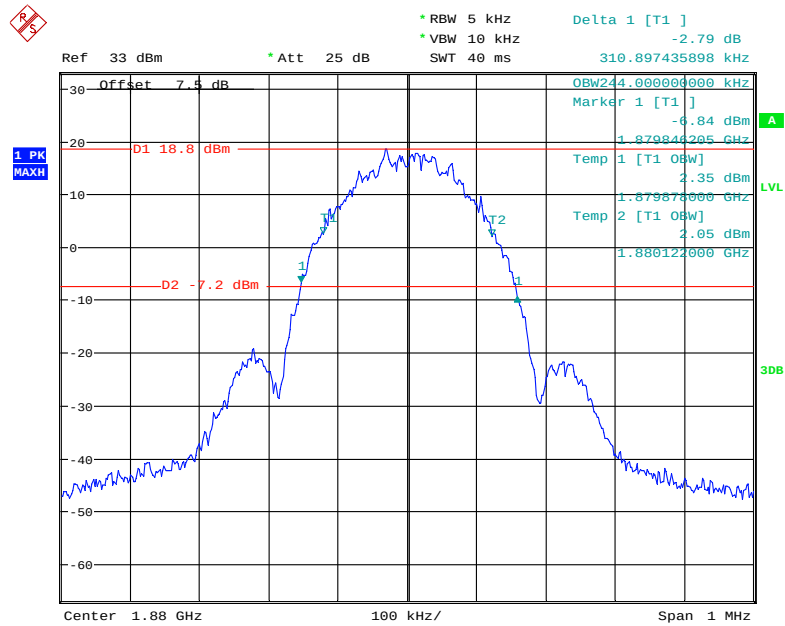
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

Date: 21.JUN.2018 23:52:13

PCS Band (Part 24E)**26 dB Emissions & 99% Occupied Bandwidth for GPRS(GMSK) Mode**

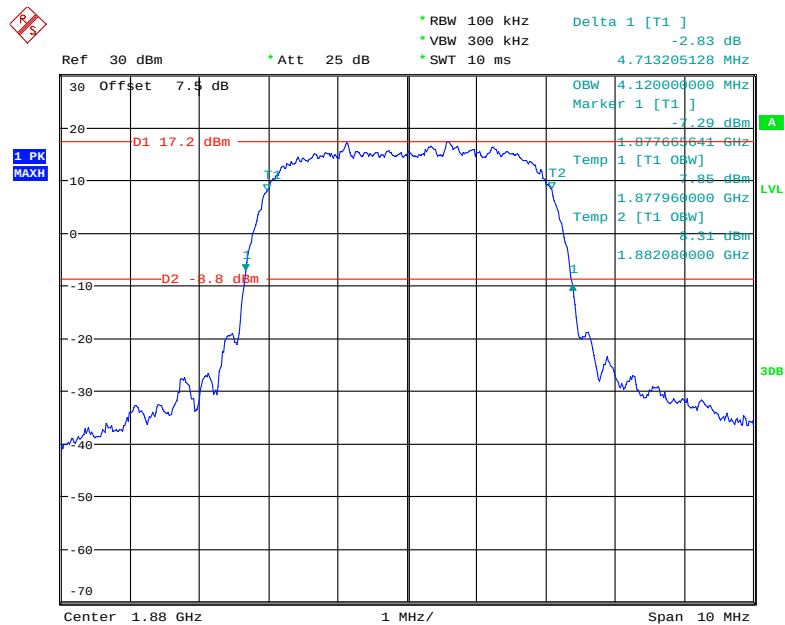
Date: 22.JUN.2018 00:39:46

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



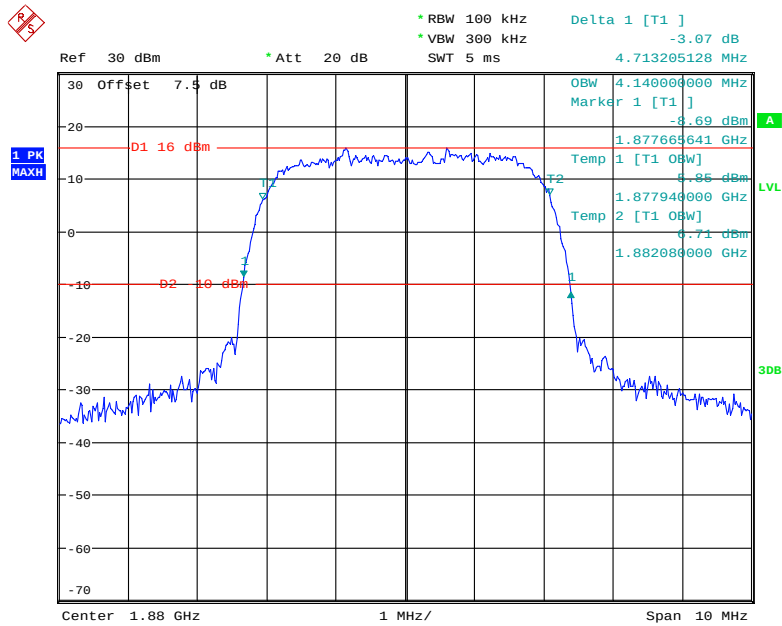
Date: 22.JUN.2018 00:43:45

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



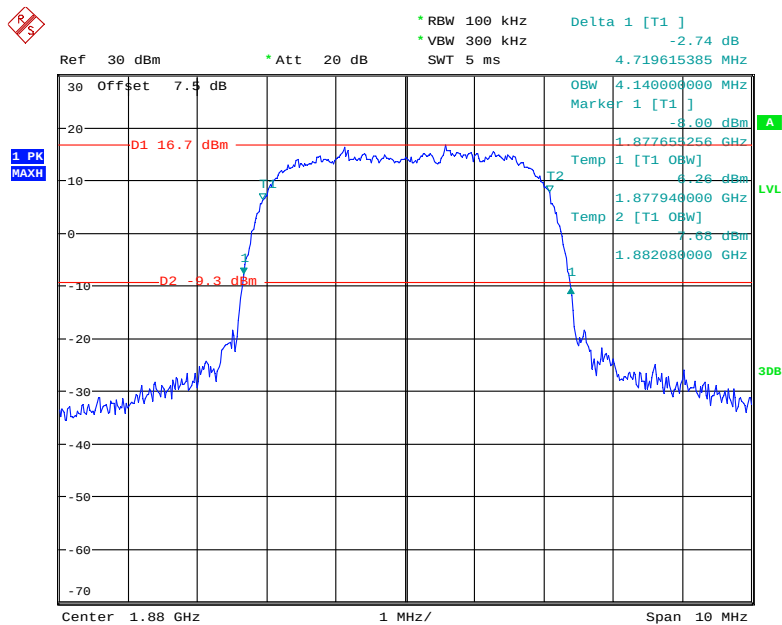
Date: 21.JUN.2018 23:11:52

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



Date: 21.JUN.2018 23:38:48

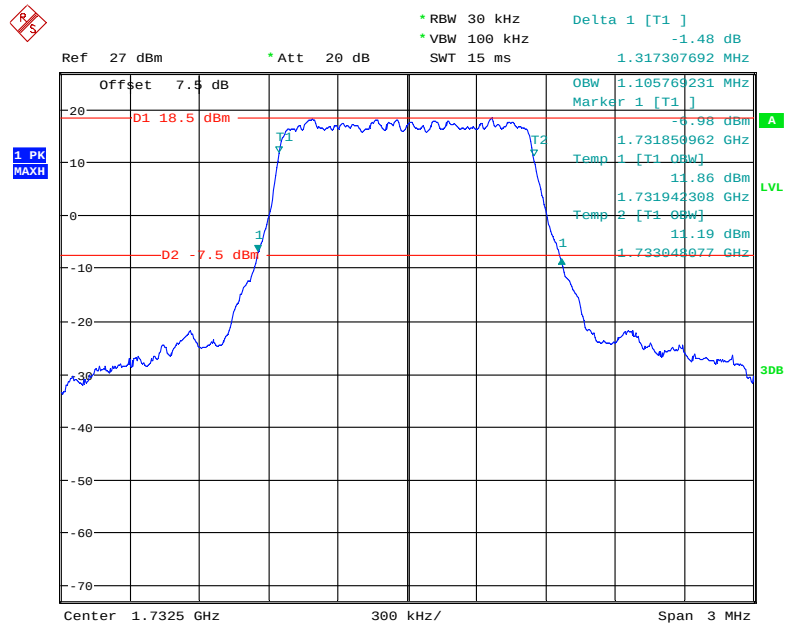
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode



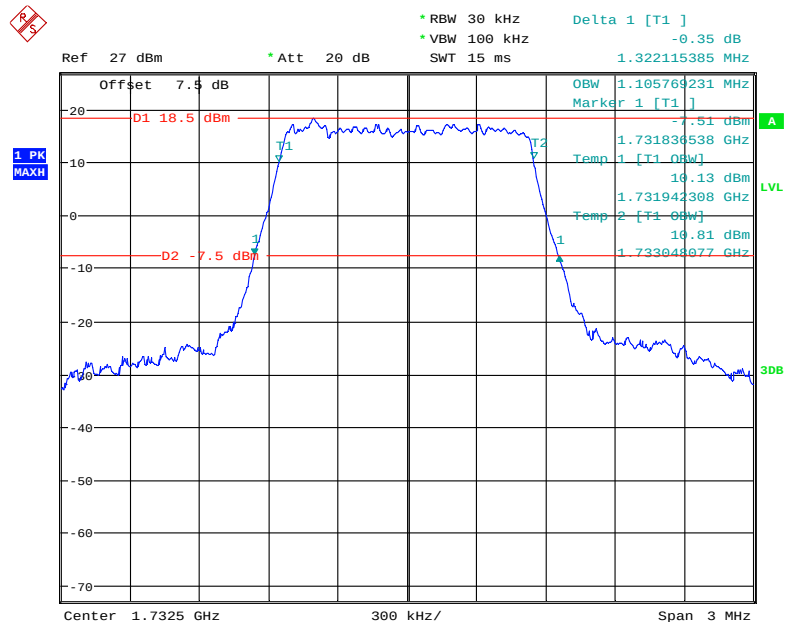
Date: 21.JUN.2018 23:55:29

LTE Band 4: (Middle Channel)

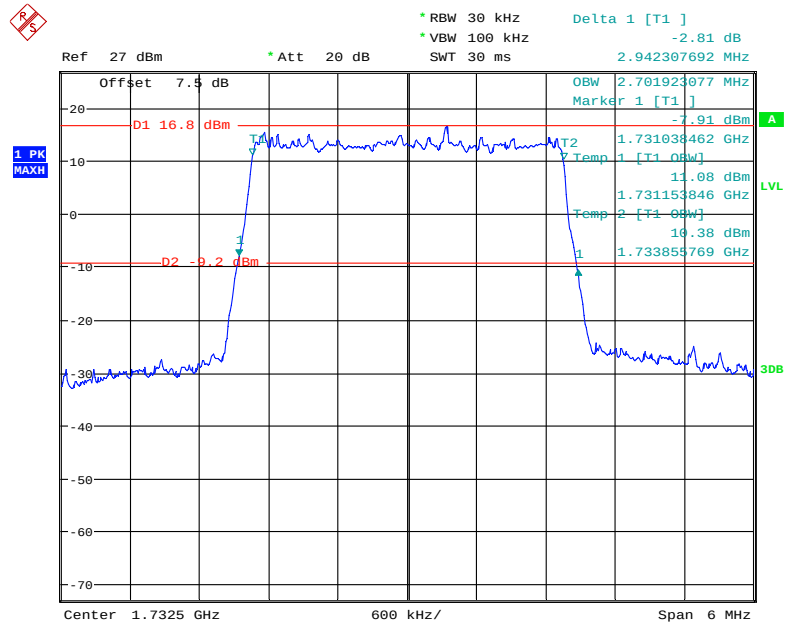
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.106	1.317
	16QAM	1.106	1.322
3.0	QPSK	2.702	2.942
	16QAM	2.692	2.962
5.0	QPSK	4.487	4.904
	16QAM	4.487	4.952
10.0	QPSK	8.974	9.808
	16QAM	8.974	9.647
15.0	QPSK	13.462	14.712
	16QAM	13.413	14.663
20.0	QPSK	17.885	19.103
	16QAM	17.949	19.231

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

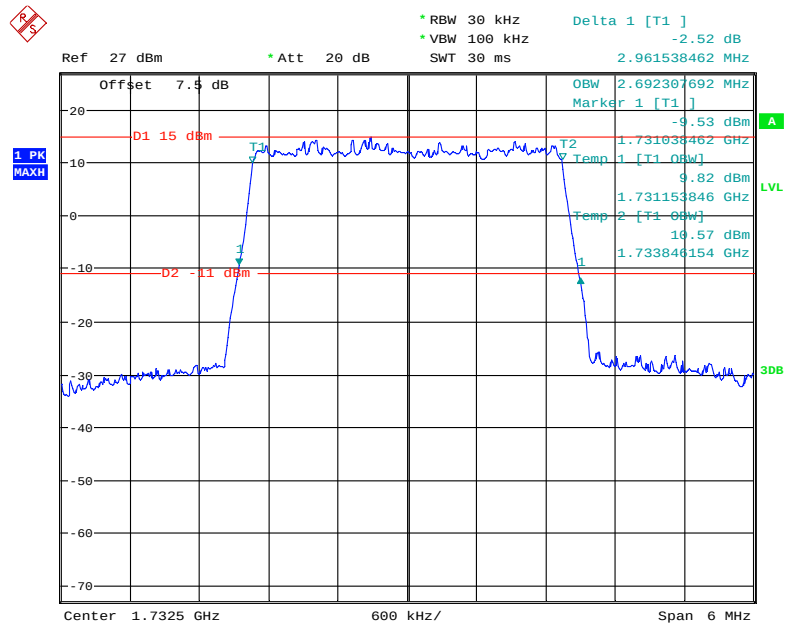
Date: 22.JUN.2018 22:40:20

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

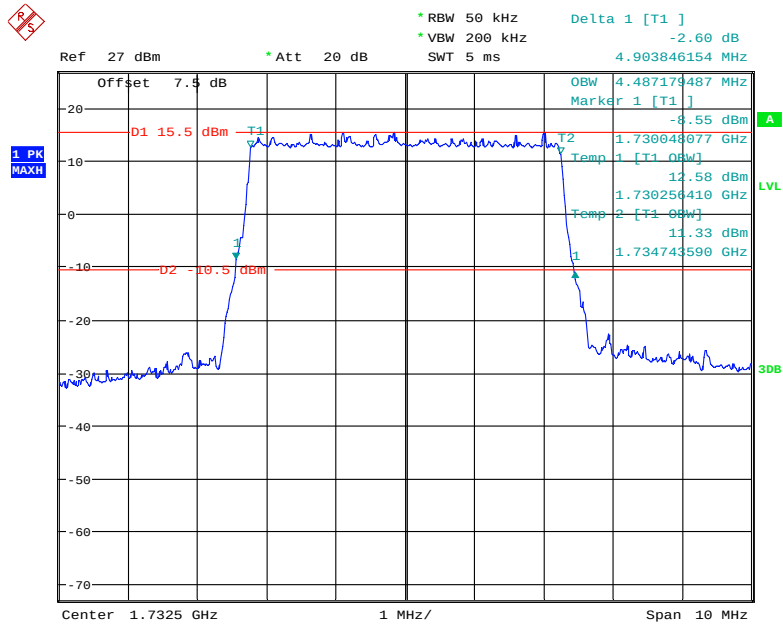
Date: 22.JUN.2018 22:42:14

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

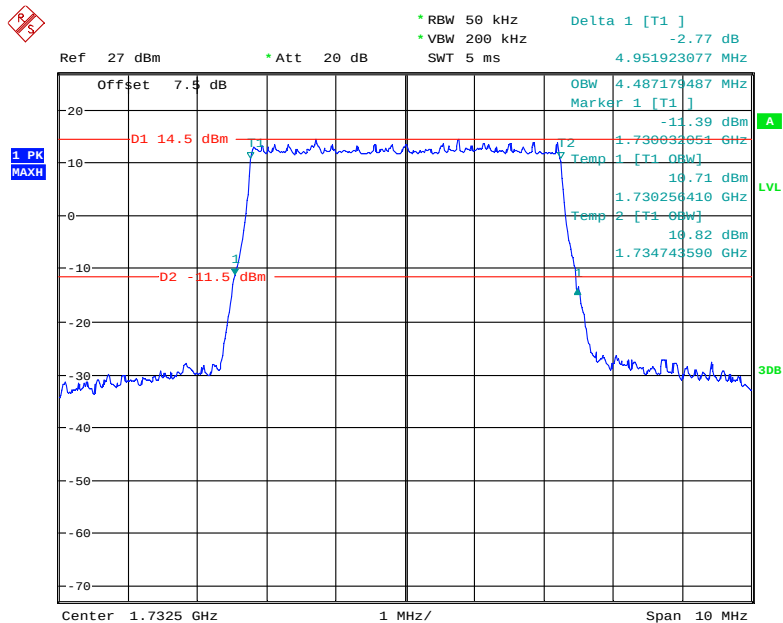
Date: 22.JUN.2018 22:36:32

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

Date: 22.JUN.2018 22:38:10

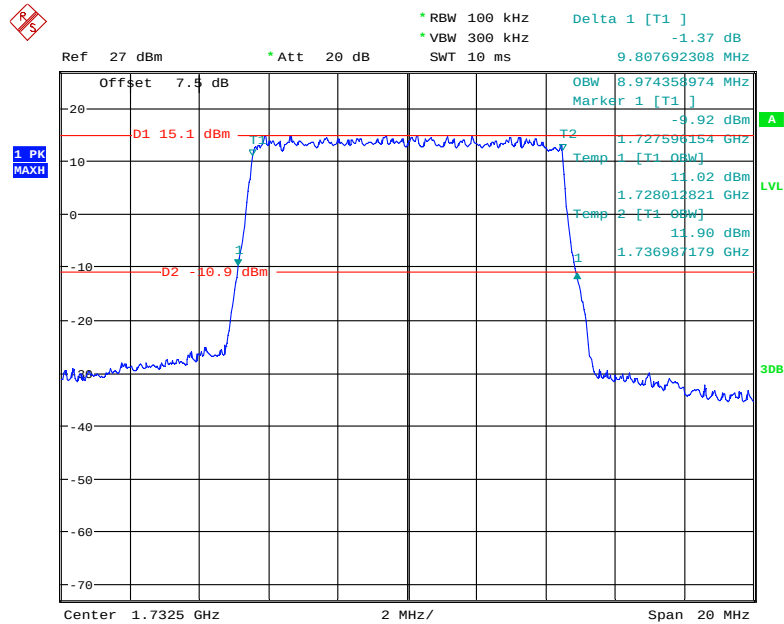
QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 22.JUN.2018 22:31:40

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

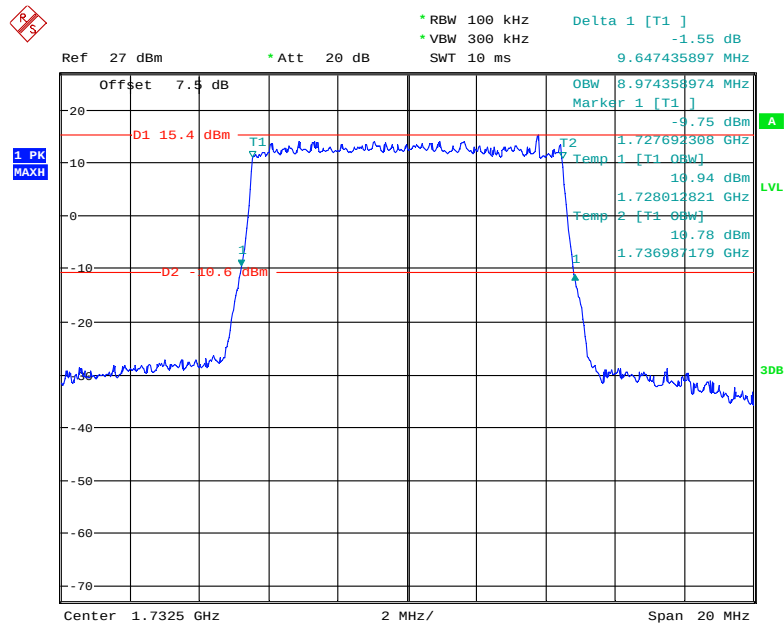
Date: 22.JUN.2018 22:33:38

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

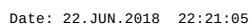
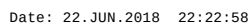


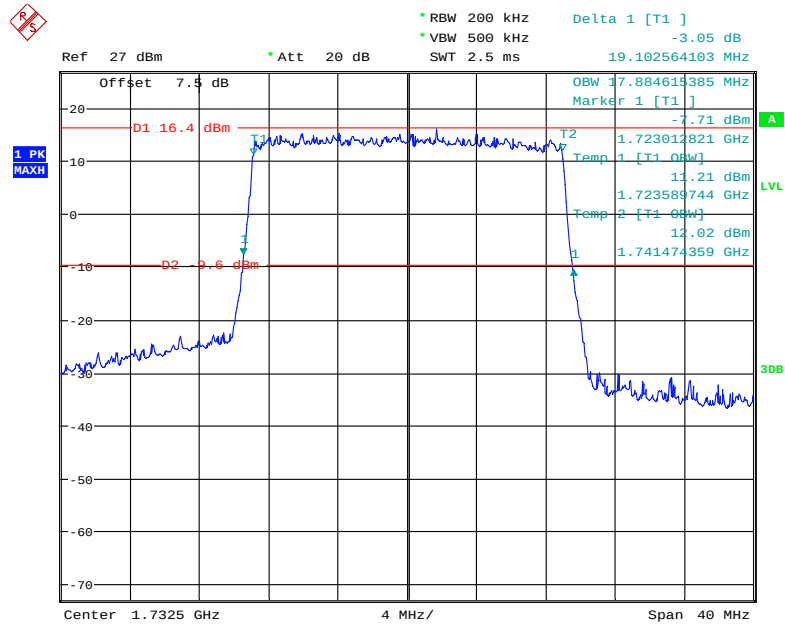
Date: 22.JUN.2018 22:28:03

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

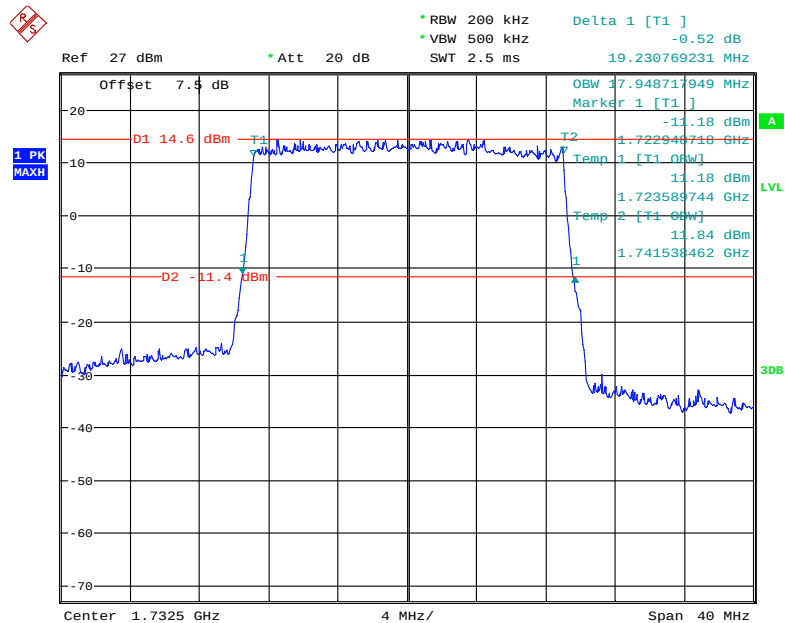


Date: 22.JUN.2018 22:25:30



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

Date: 22.JUN.2018 22:19:14

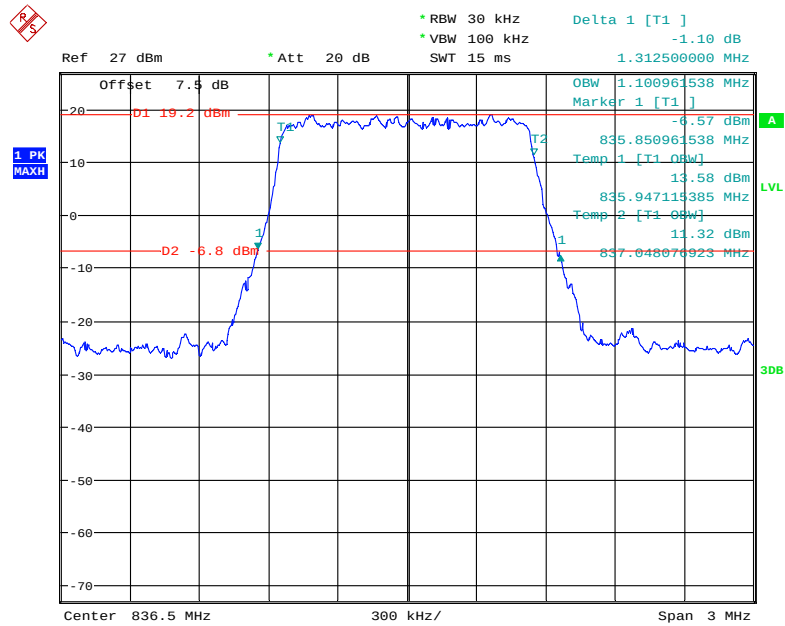
16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 22.JUN.2018 22:17:30

LTE Band 5: (Middle Channel)

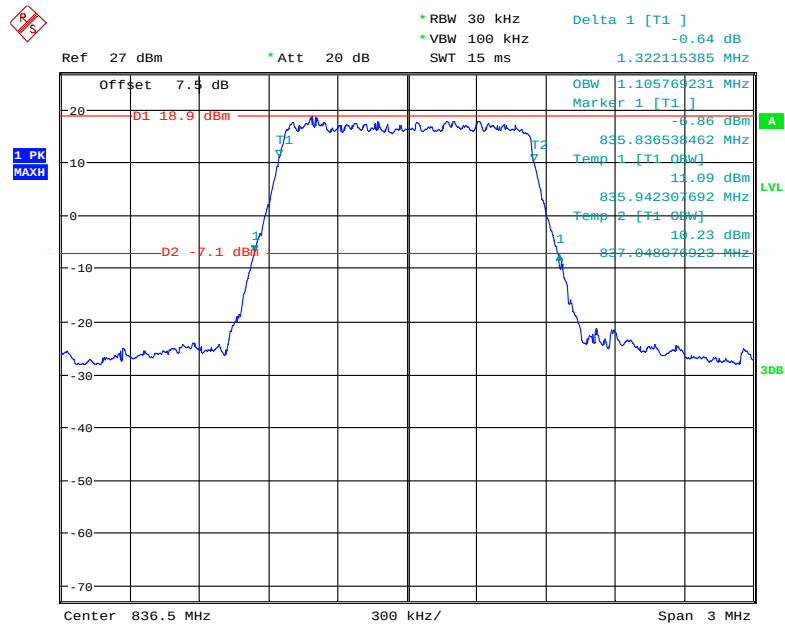
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.313
	16QAM	1.106	1.322
3.0	QPSK	2.692	2.952
	16QAM	2.692	2.971
5.0	QPSK	4.487	4.904
	16QAM	4.487	4.920
10.0	QPSK	8.974	9.808
	16QAM	8.910	9.647

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

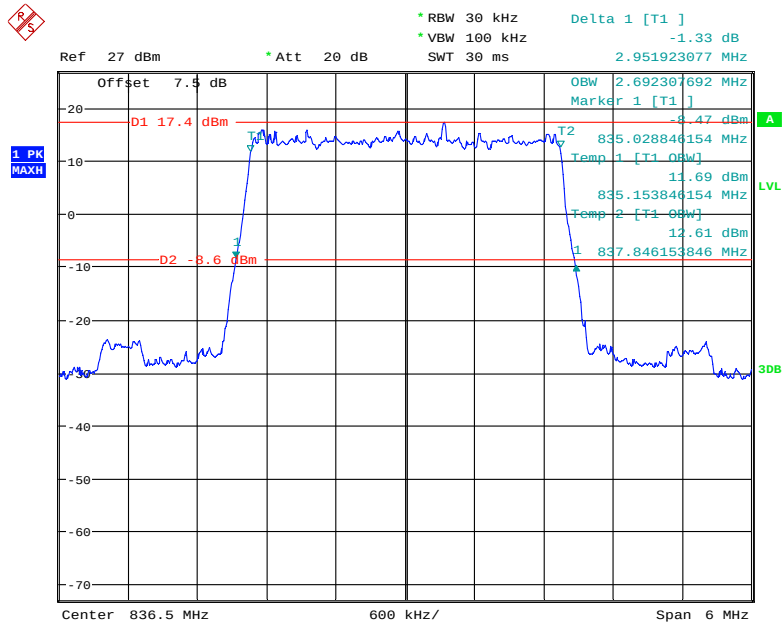


Date: 22.JUN.2018 22:51:33

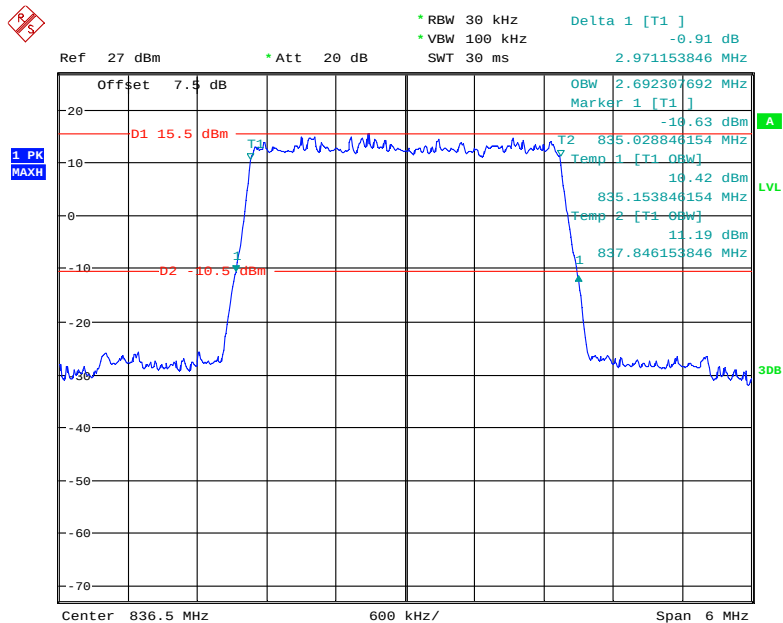
16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



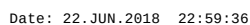
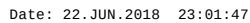
Date: 22.JUN.2018 22:49:35

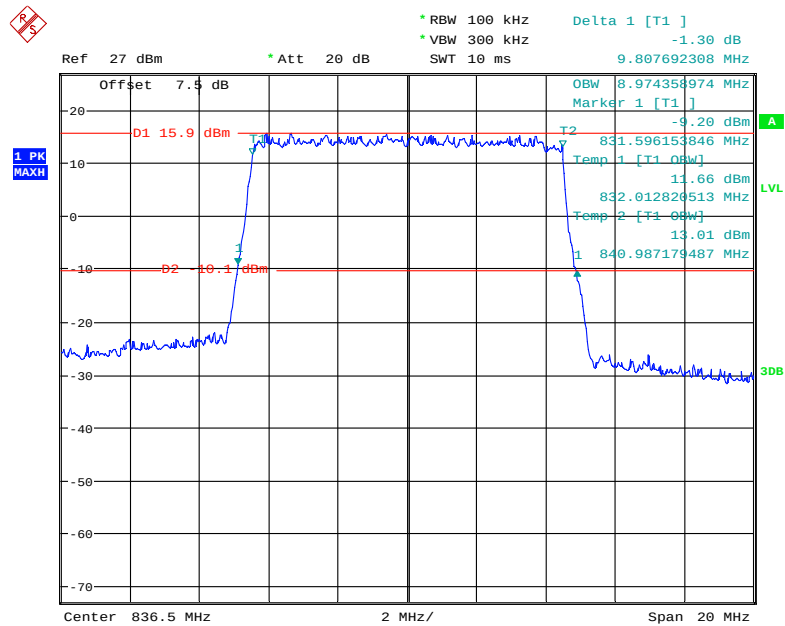
QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 22.JUN.2018 22:55:51

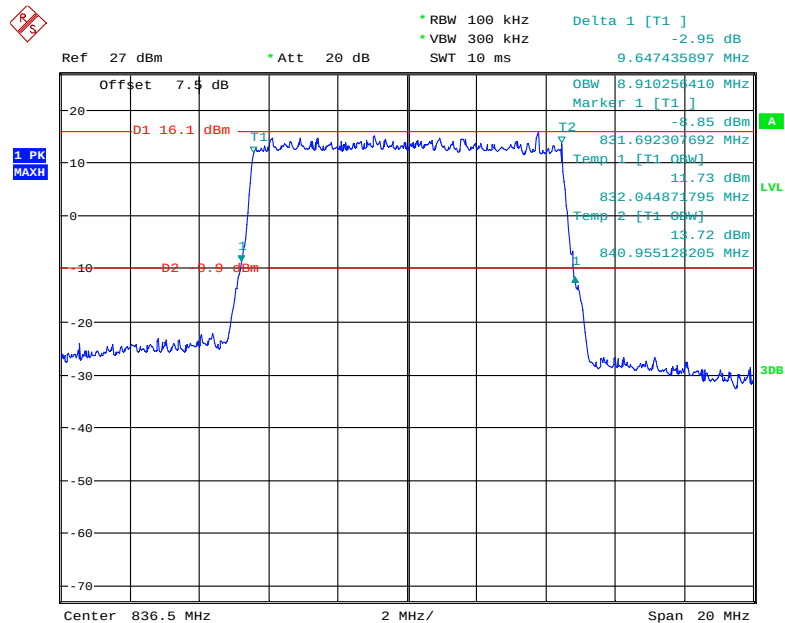
16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 22.JUN.2018 22:53:36



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

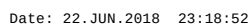
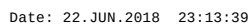
Date: 22.JUN.2018 23:04:08

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

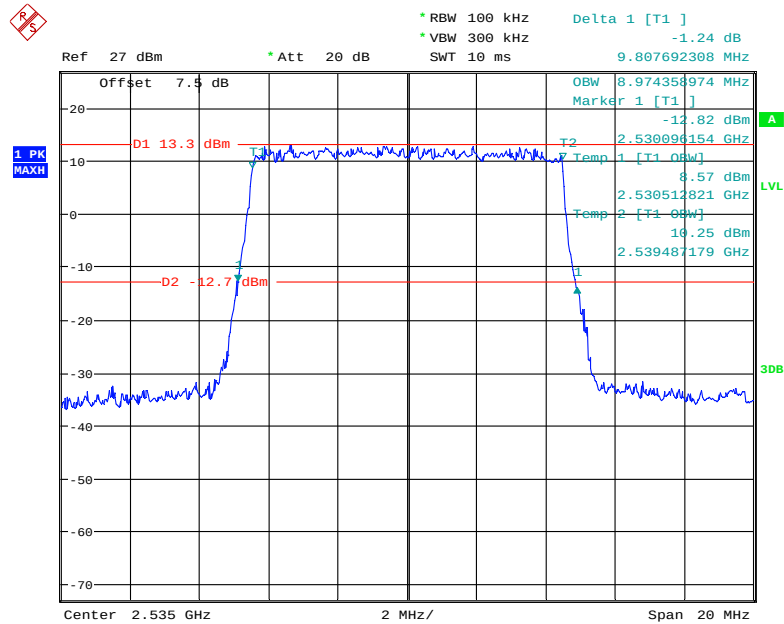
Date: 22.JUN.2018 23:06:30

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	4.471	4.936
10.0	QPSK	8.974	9.808
	16QAM	8.974	9.674
15.0	QPSK	13.462	14.712
	16QAM	13.462	14.615
20.0	QPSK	17.885	19.167
	16QAM	17.949	19.231

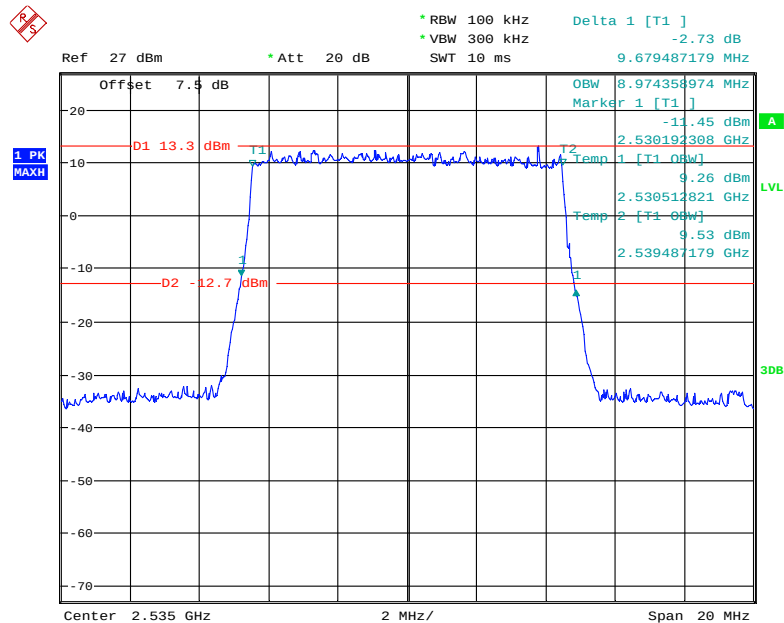


QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



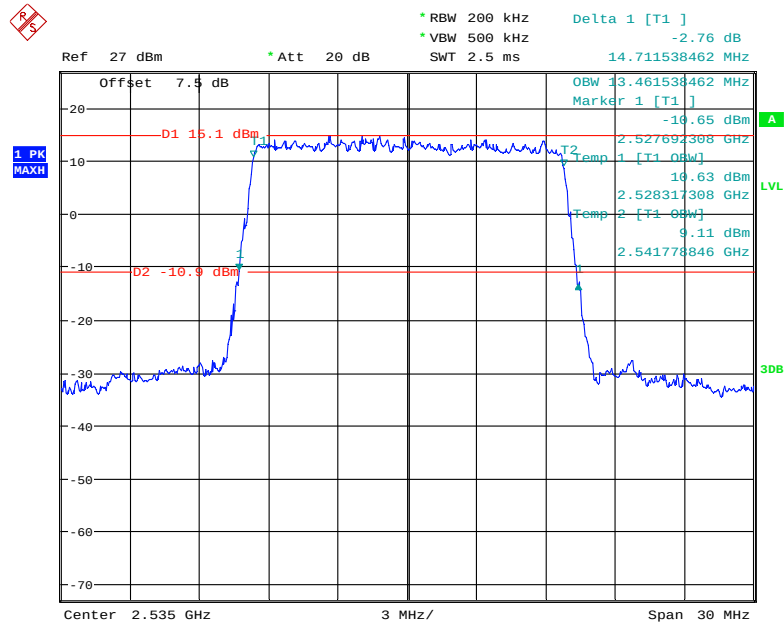
Date: 22.JUN.2018 23:10:38

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



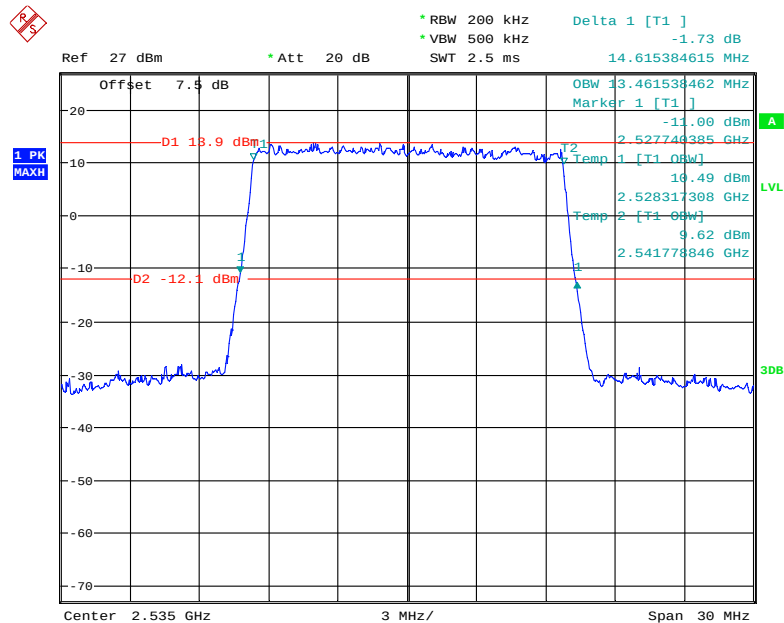
Date: 22.JUN.2018 23:09:16

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

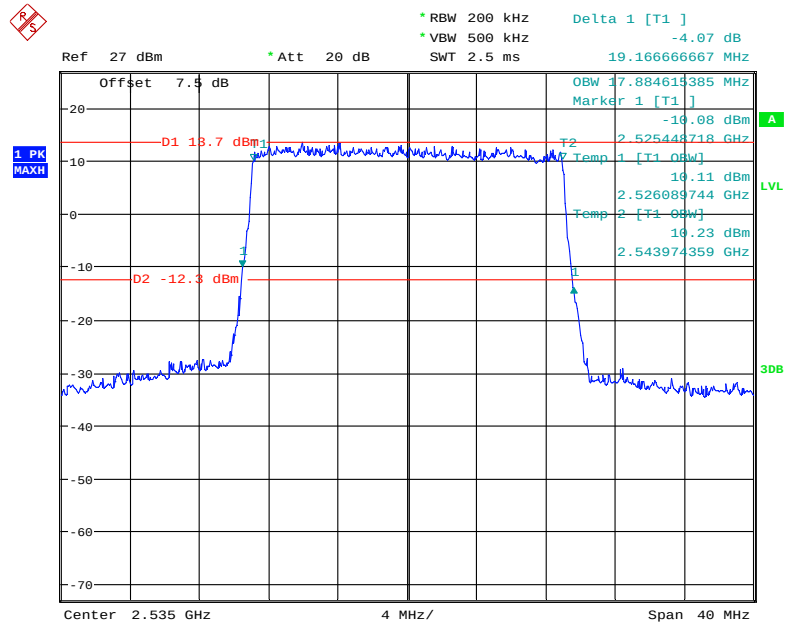


Date: 22.JUN.2018 23:21:31

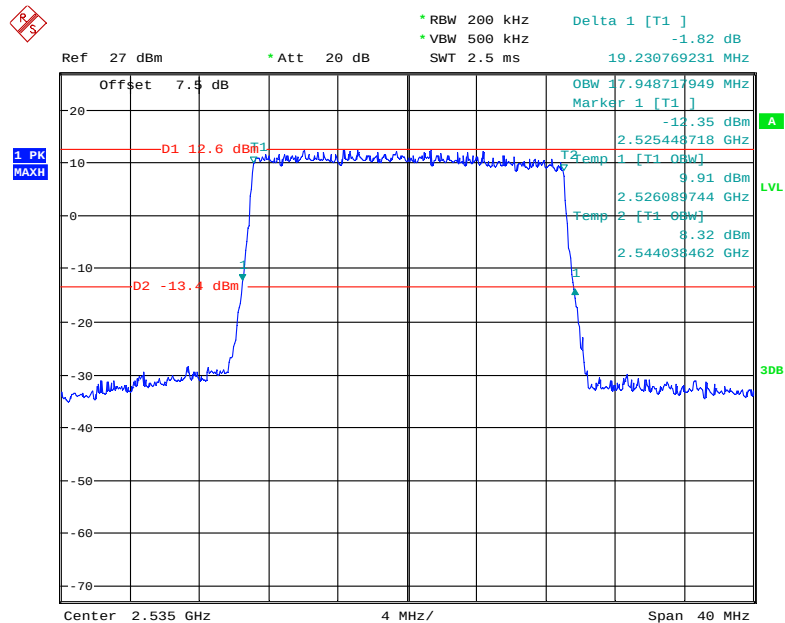
16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 22.JUN.2018 23:25:05

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

Date: 22.JUN.2018 23:27:22

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

Date: 22.JUN.2018 23:31:17

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

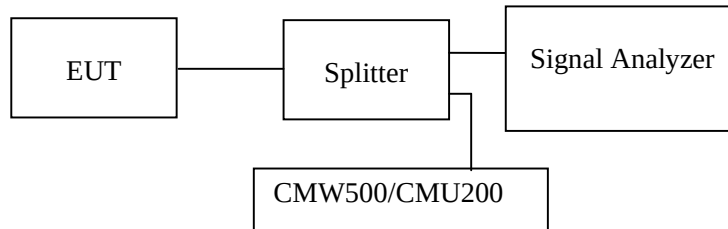
Applicable Standard

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:	25~26 °C
Relative Humidity:	52~54 %
ATM Pressure:	101.0 kPa

The testing was performed by Bibo Zhang from 2018-06-21 to 2018-06-23.

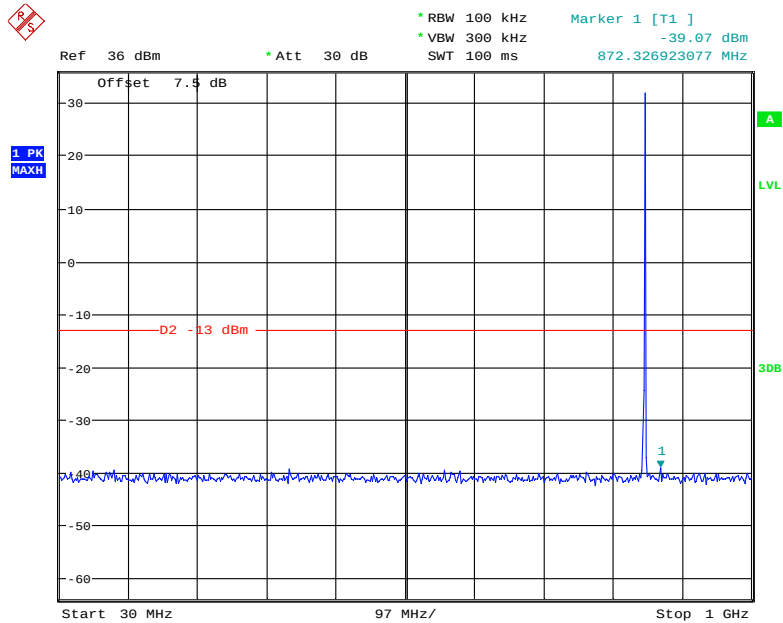
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

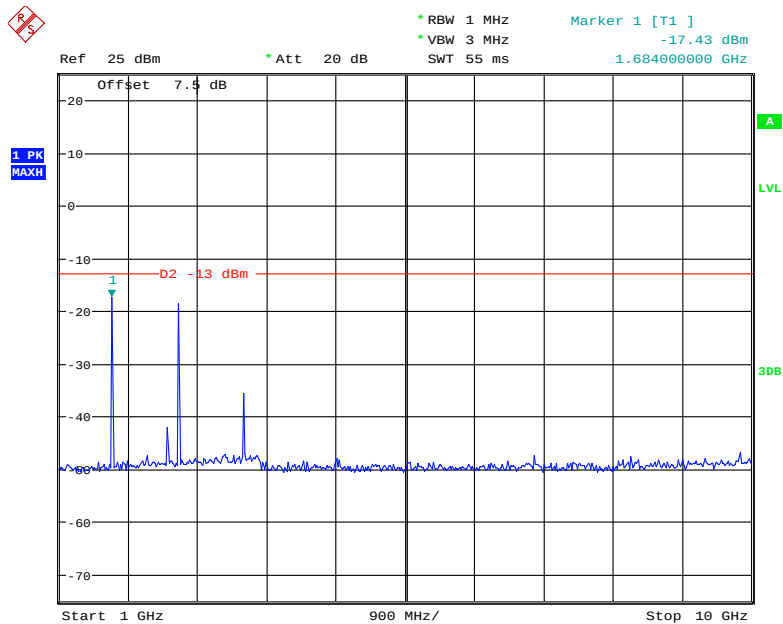
Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode)



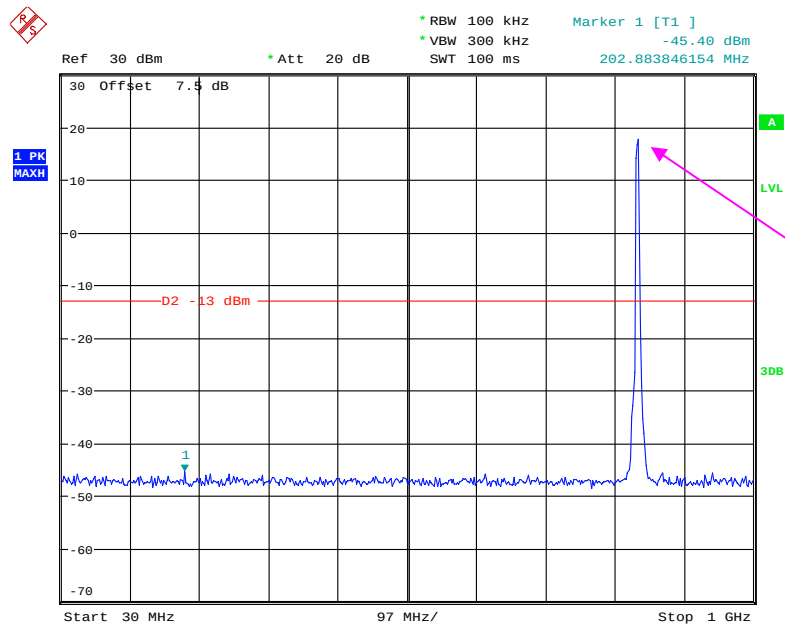
Date: 22.JUN.2018 00:20:40

1 GHz – 10 GHz (GSM Mode)



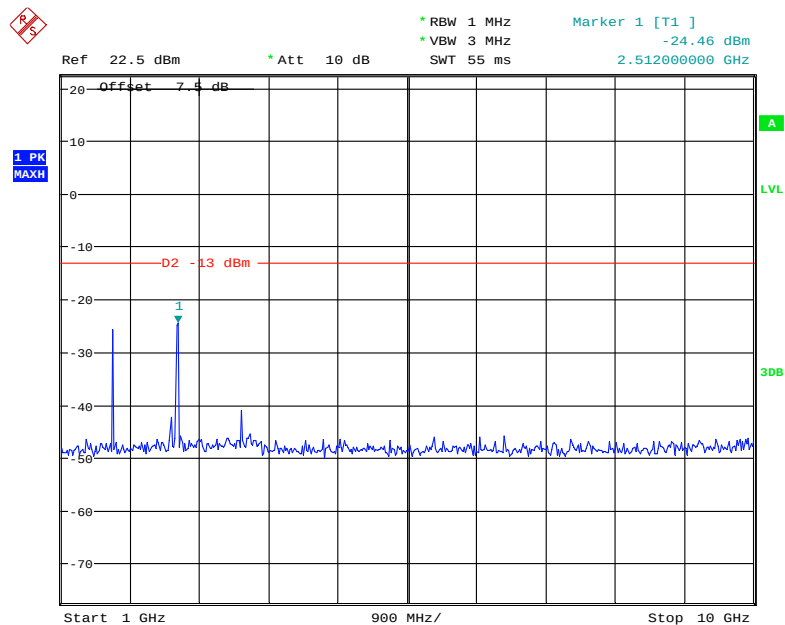
Date: 22.JUN.2018 00:24:00

30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

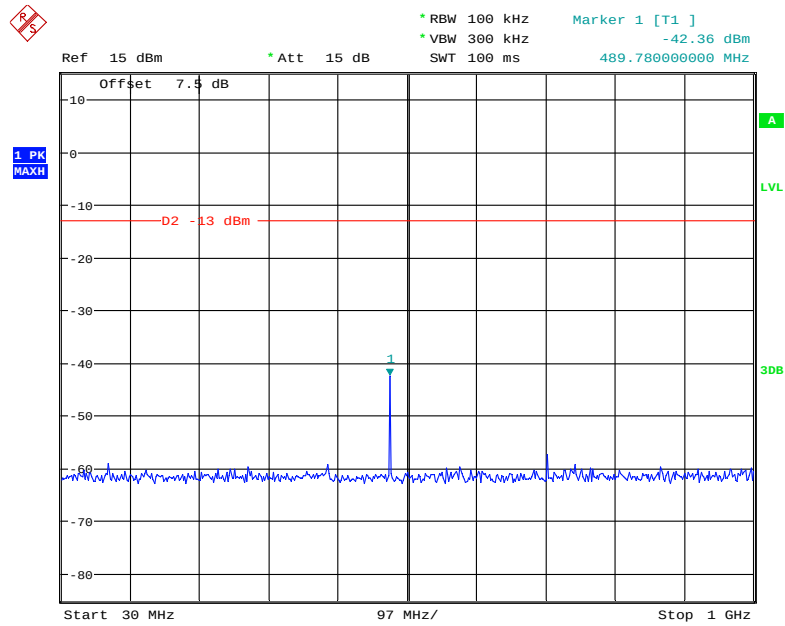
1 GHz – 10 GHz (WCDMA Mode)



Date: 21.JUN.2018 23:23:44

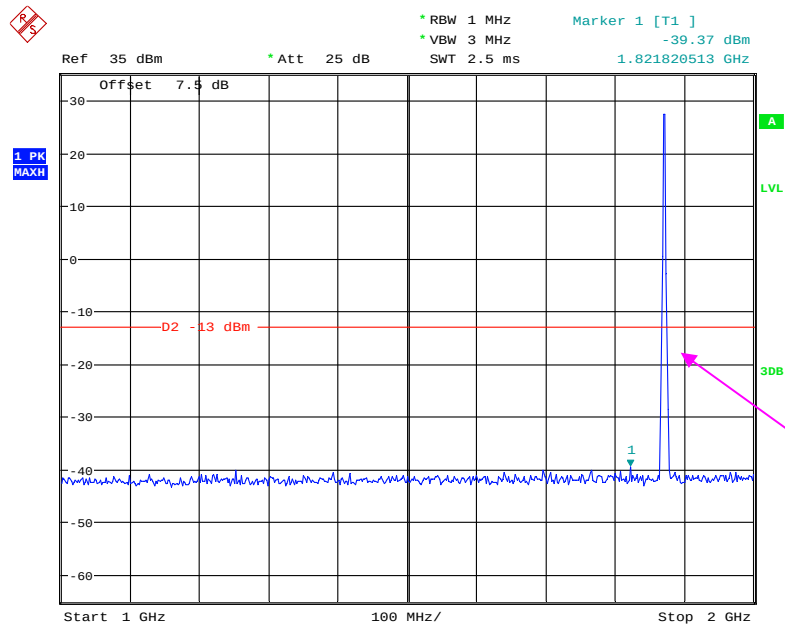
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 22.JUN.2018 00:31:29

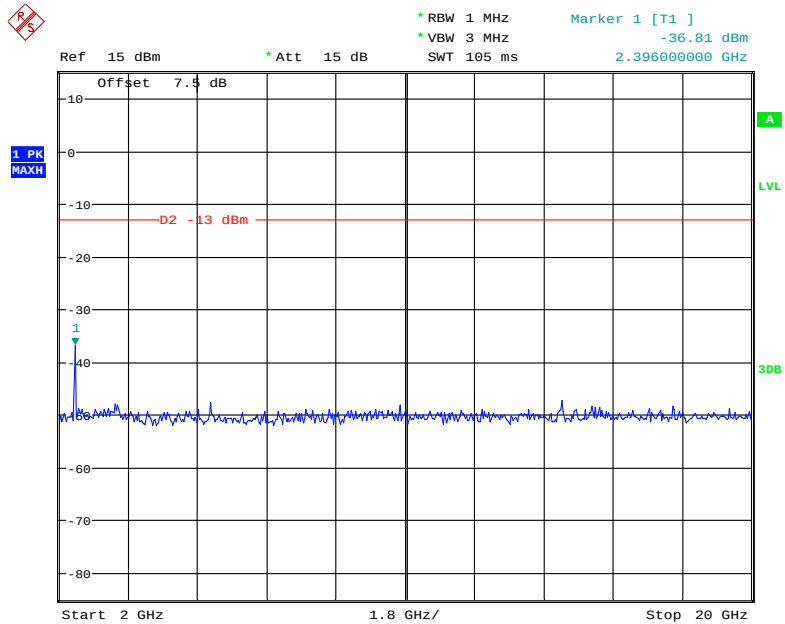
1 GHz – 2 GHz (GSM Mode)



Fundamental test

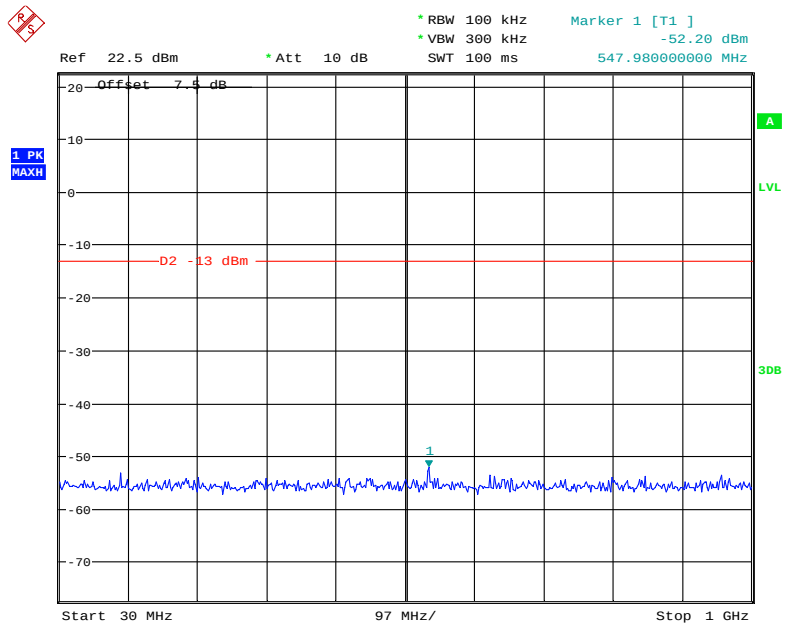
Date: 22.JUN.2018 00:28:58

2 GHz – 20 GHz (GSM Mode)



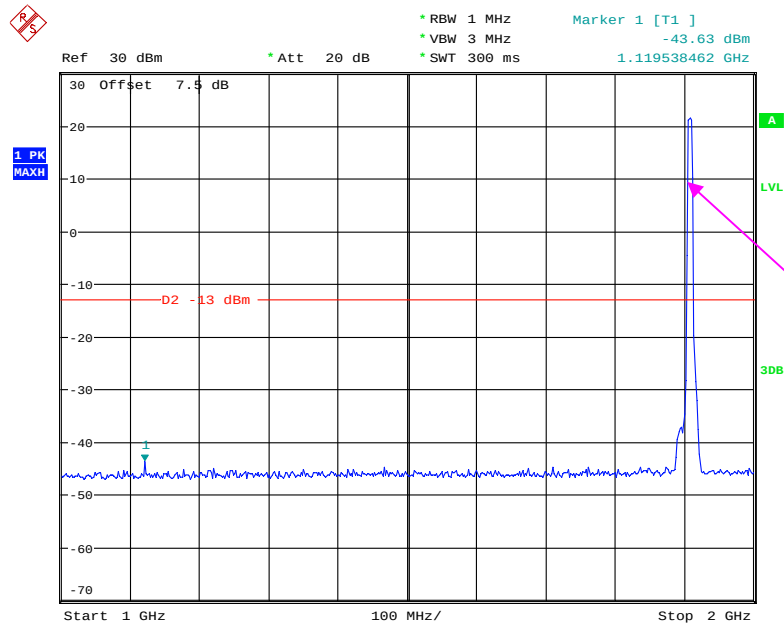
Date: 22.JUN.2018 00:30:34

30 MHz – 1 GHz (WCDMA Mode)



Date: 21.JUN.2018 23:21:32

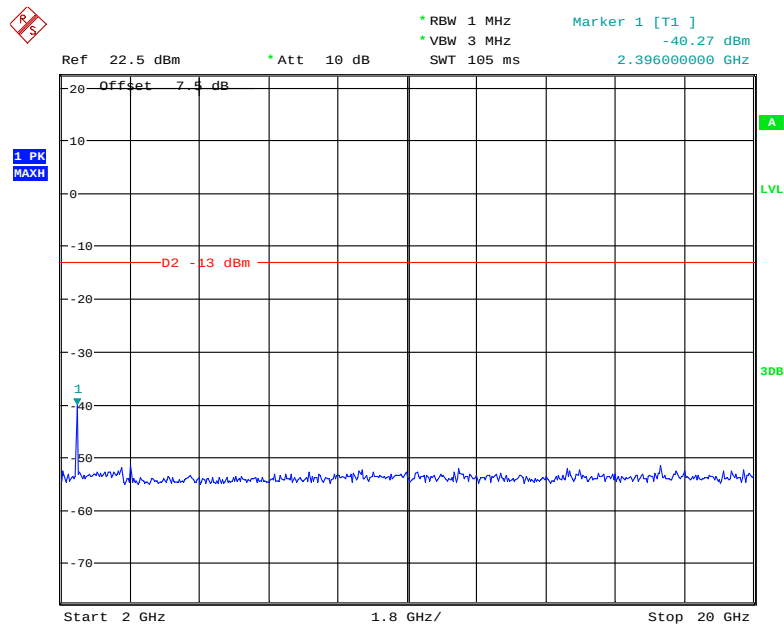
1 GHz – 2 GHz (WCDMA Mode)



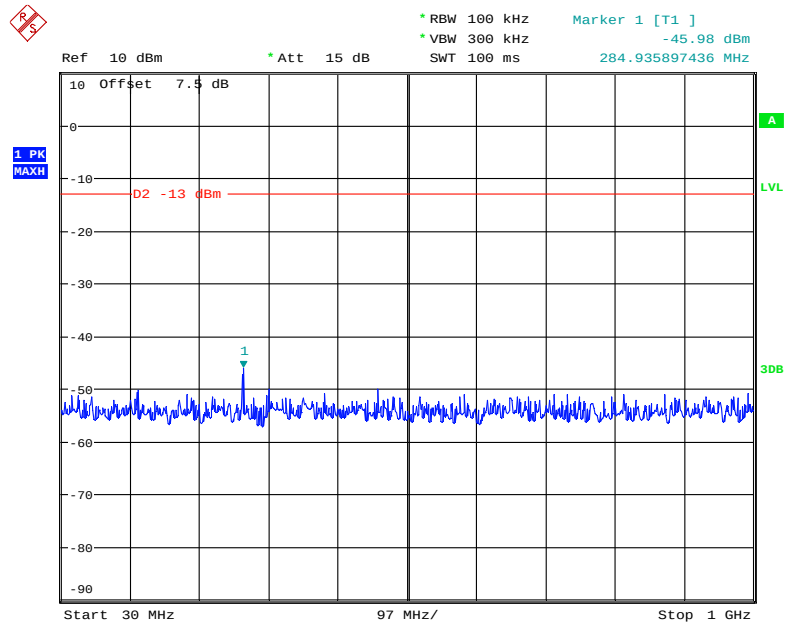
Fundamental test

Date: 21.JUN.2018 23:19:47

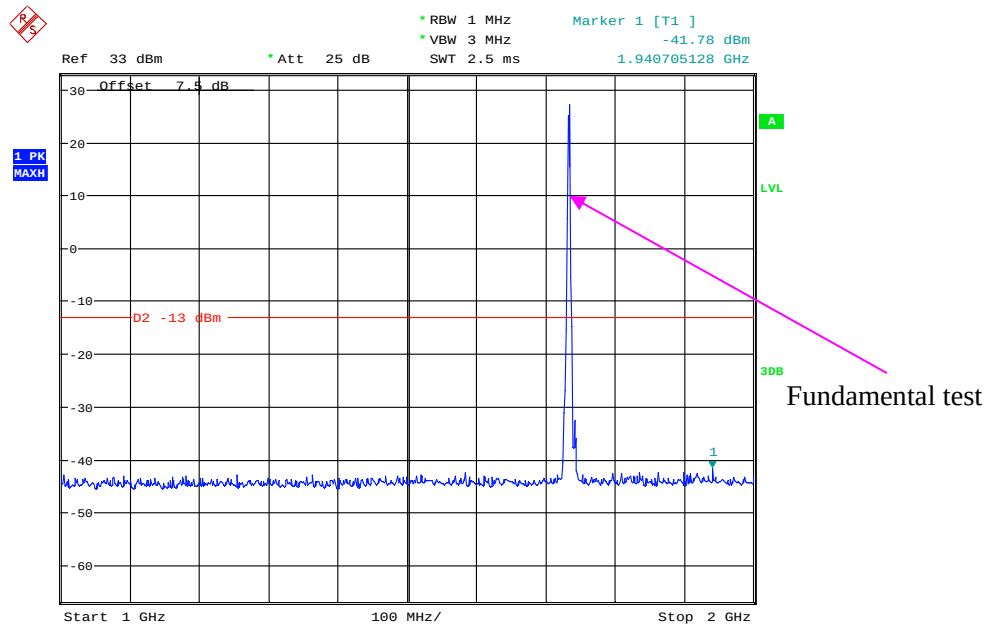
2 GHz – 20 GHz (WCDMA Mode)



Date: 21.JUN.2018 23:20:36

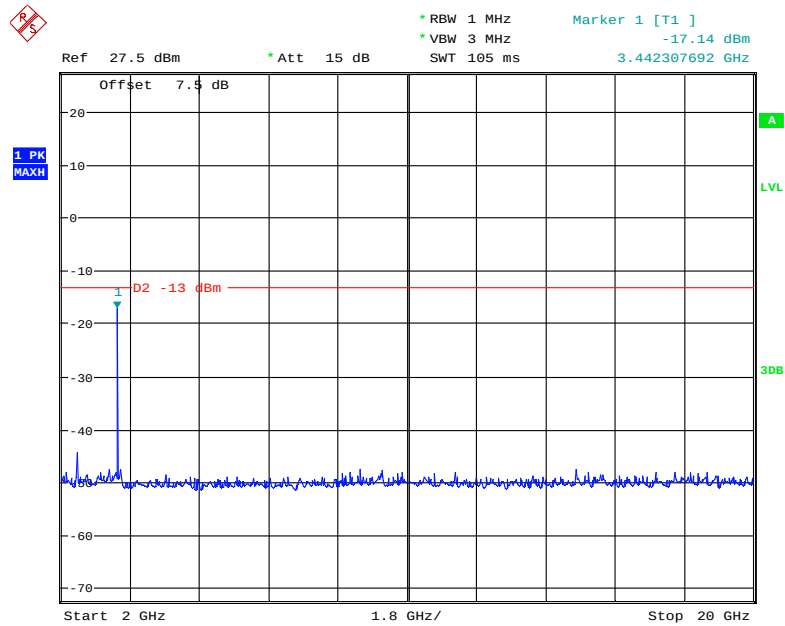
LTE Band 4:**30 MHz - 1 GHz (1.4 MHz, Middle Channel)**

Date: 23.JUN.2018 00:36:03

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

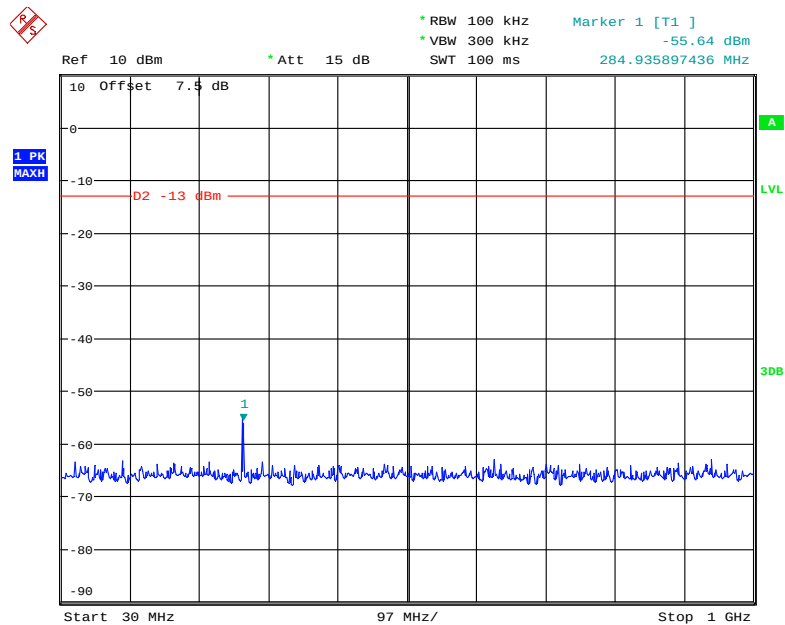
Date: 23.JUN.2018 00:24:21

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



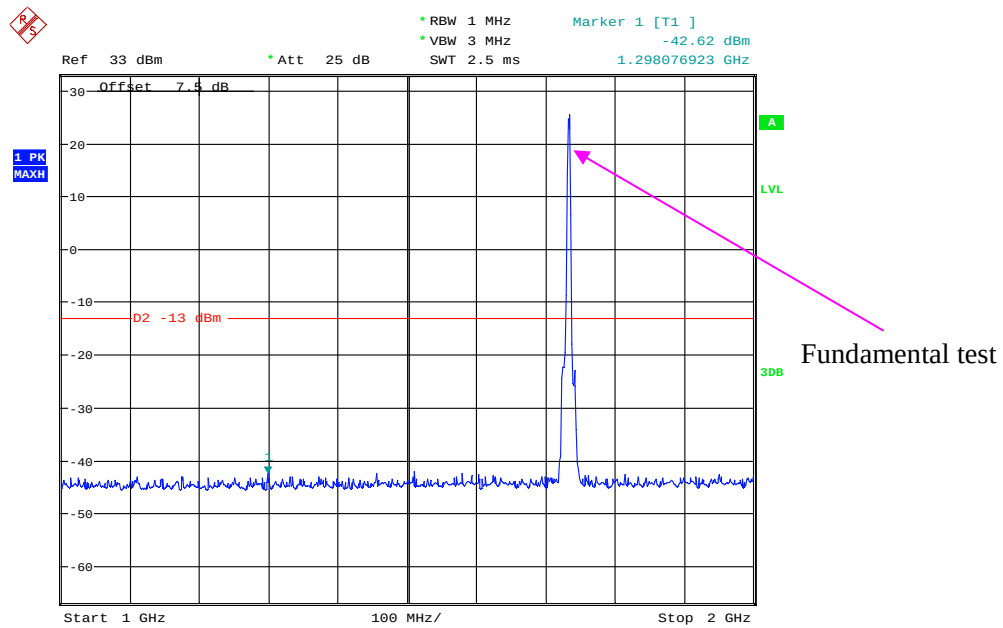
Date: 23.JUN.2018 00:34:37

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



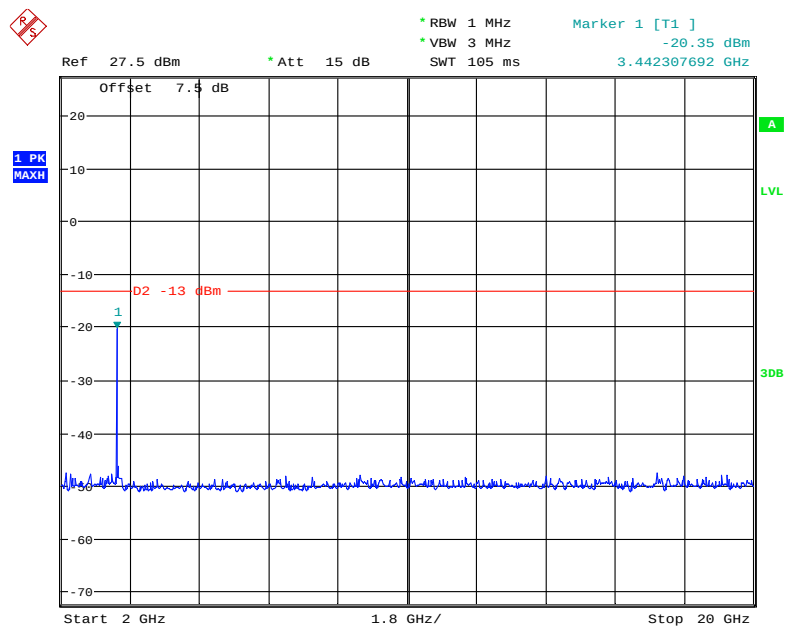
Date: 23.JUN.2018 00:36:37

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



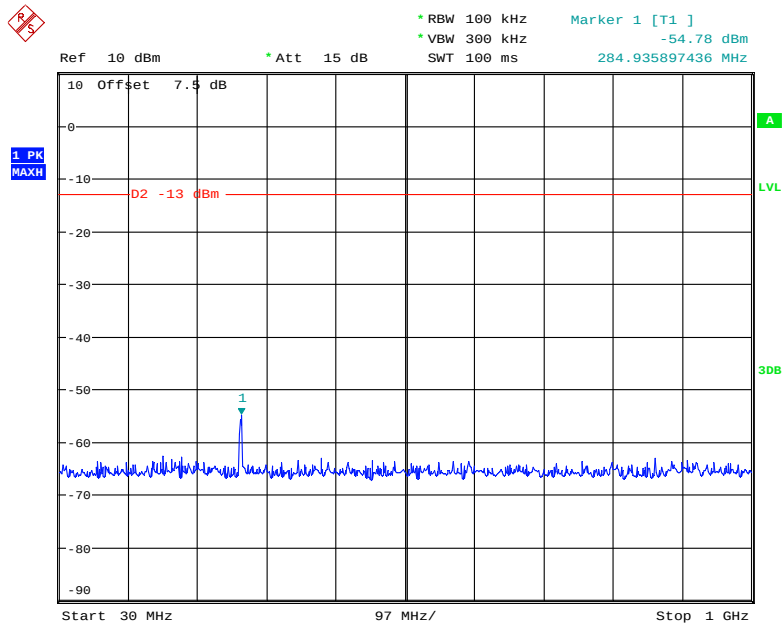
Date: 23.JUN.2018 00:25:51

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



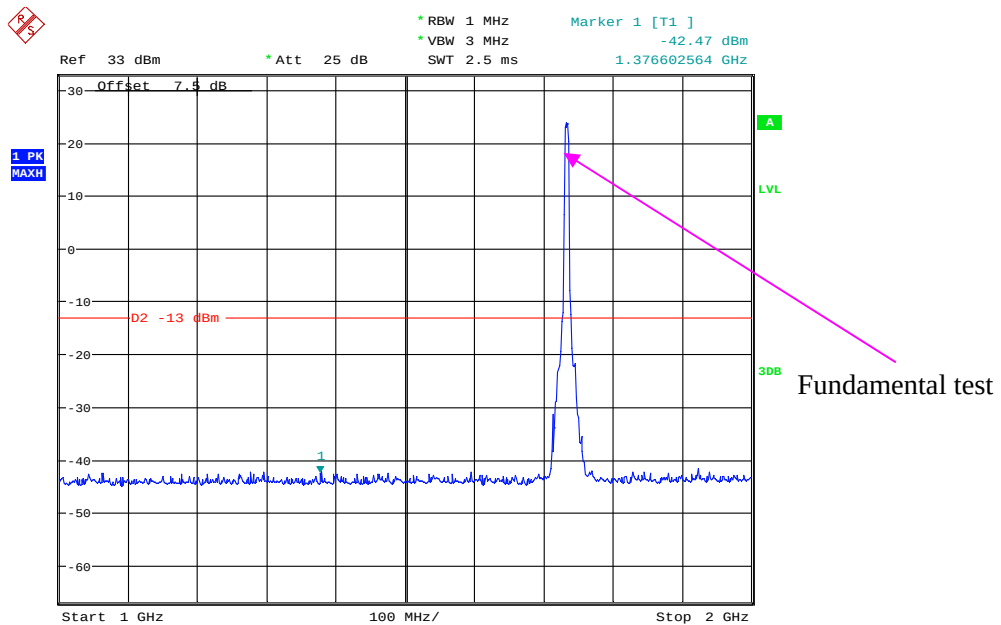
Date: 23.JUN.2018 00:34:14

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



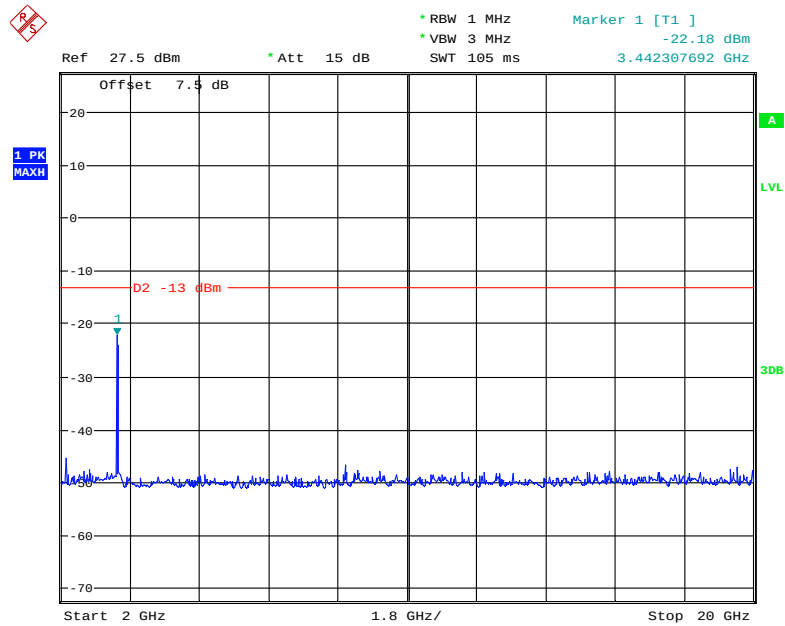
Date: 23.JUN.2018 00:37:03

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



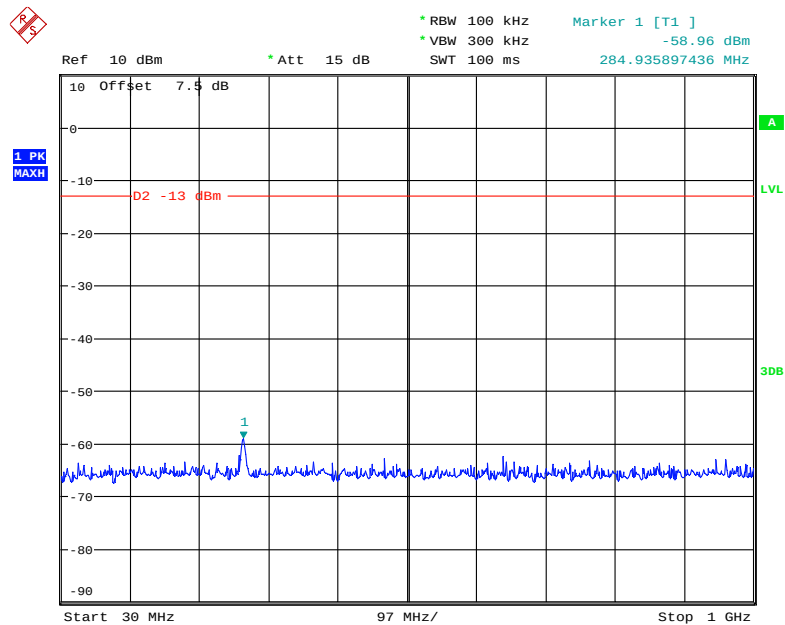
Date: 23.JUN.2018 00:27:18

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



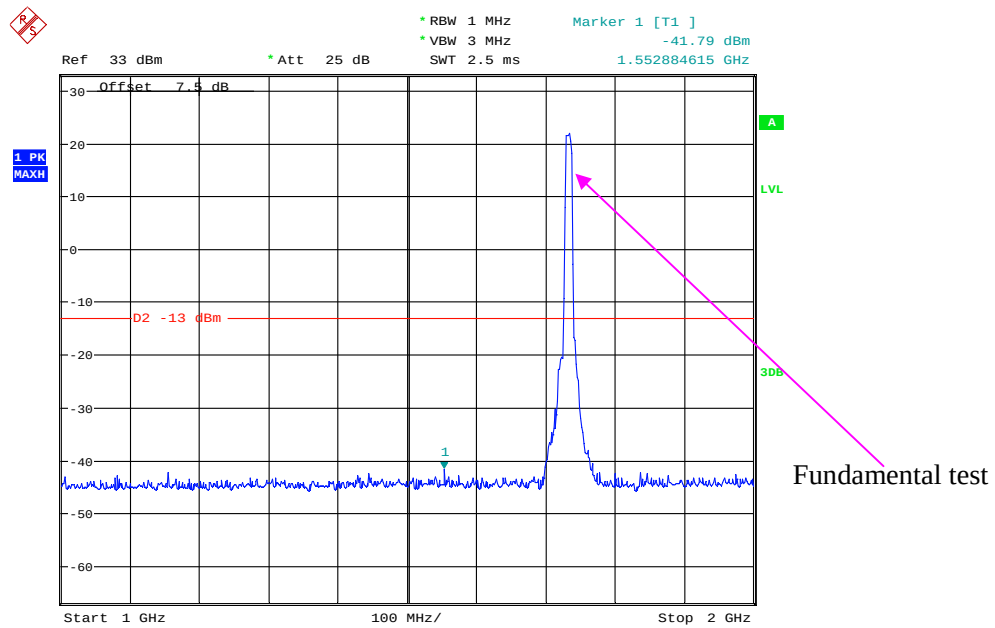
Date: 23.JUN.2018 00:33:54

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



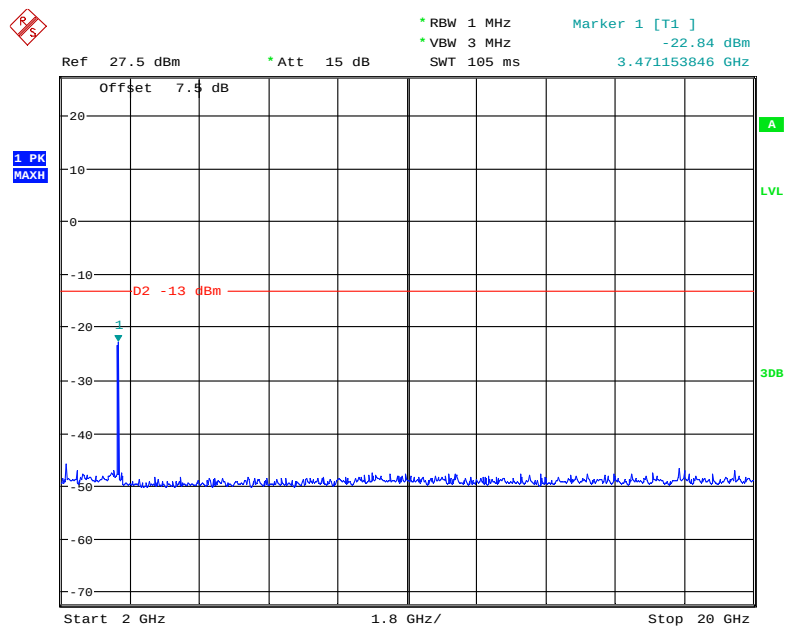
Date: 23.JUN.2018 00:37:25

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



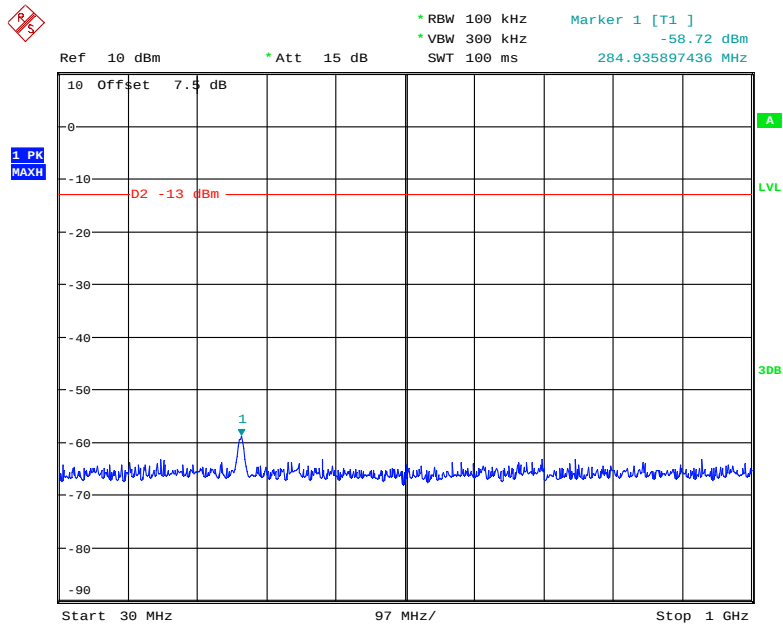
Date: 23.JUN.2018 00:28:27

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



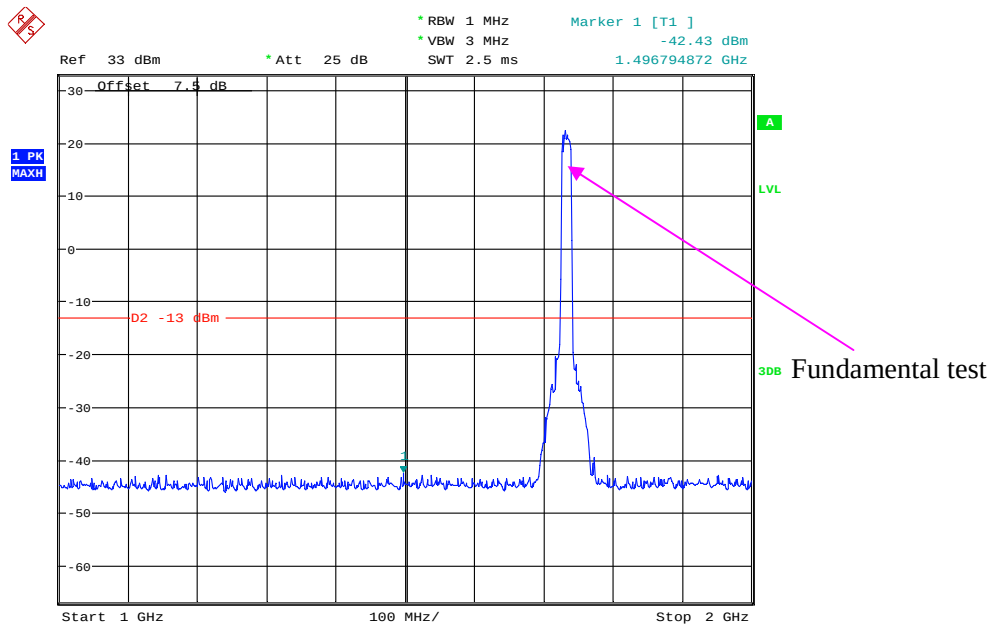
Date: 23.JUN.2018 00:32:59

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



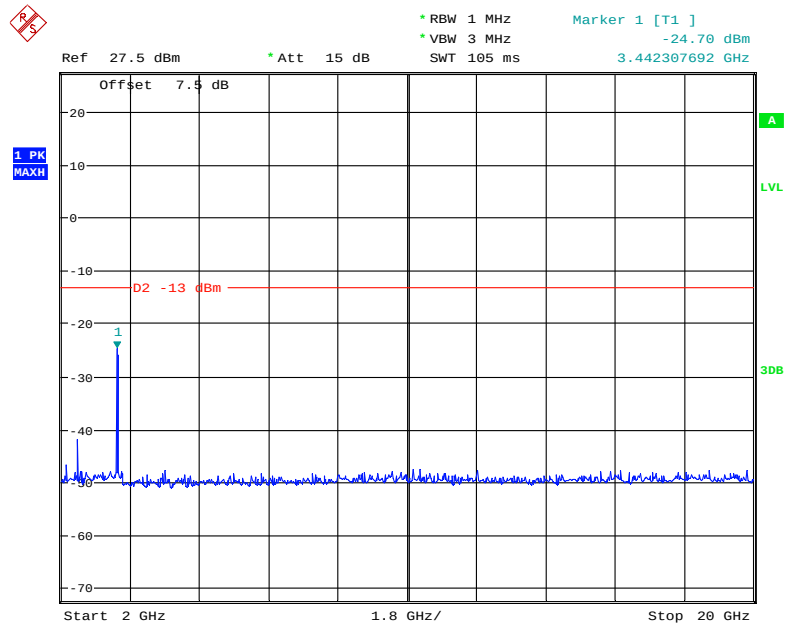
Date: 23.JUN.2018 00:37:45

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



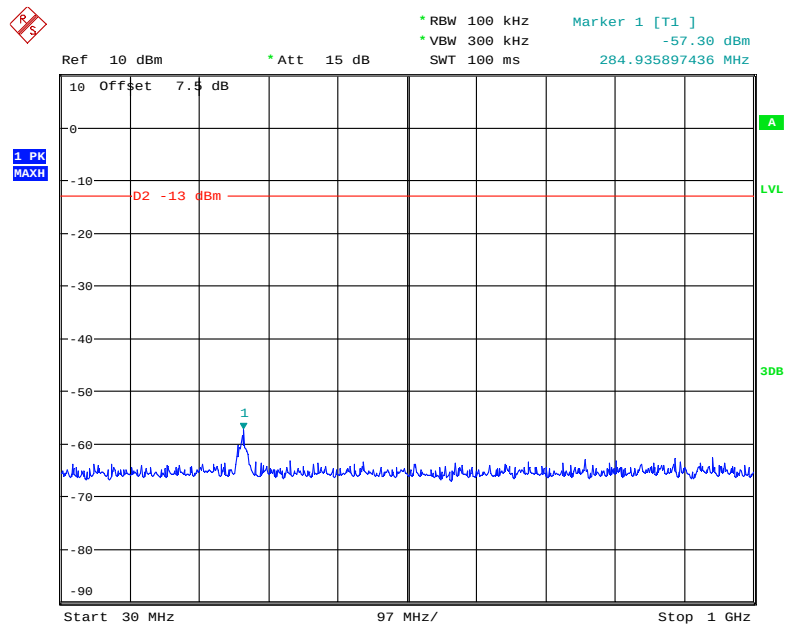
Date: 23.JUN.2018 00:30:01

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



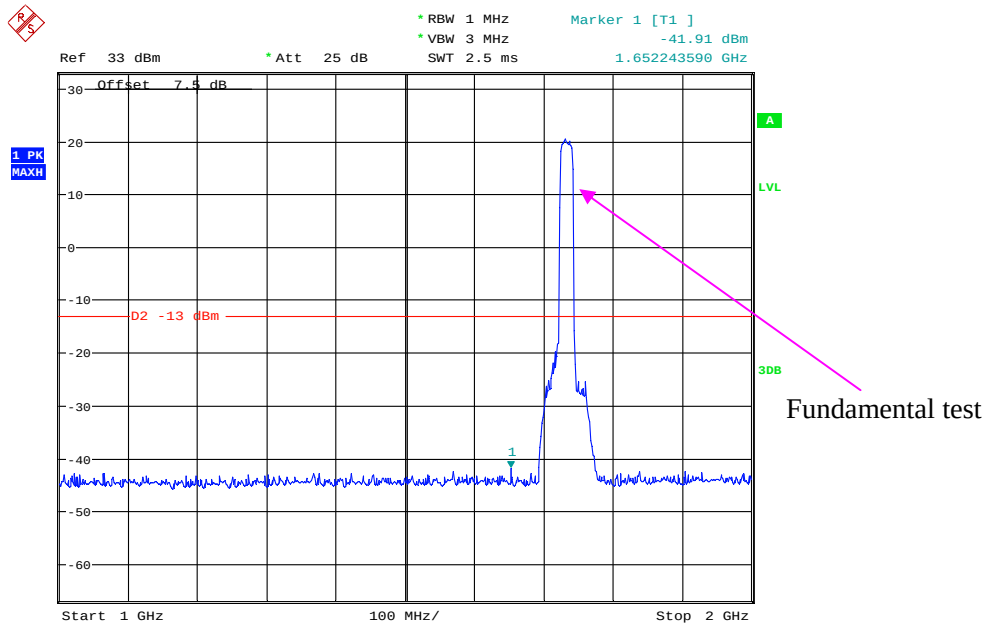
Date: 23.JUN.2018 00:32:17

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



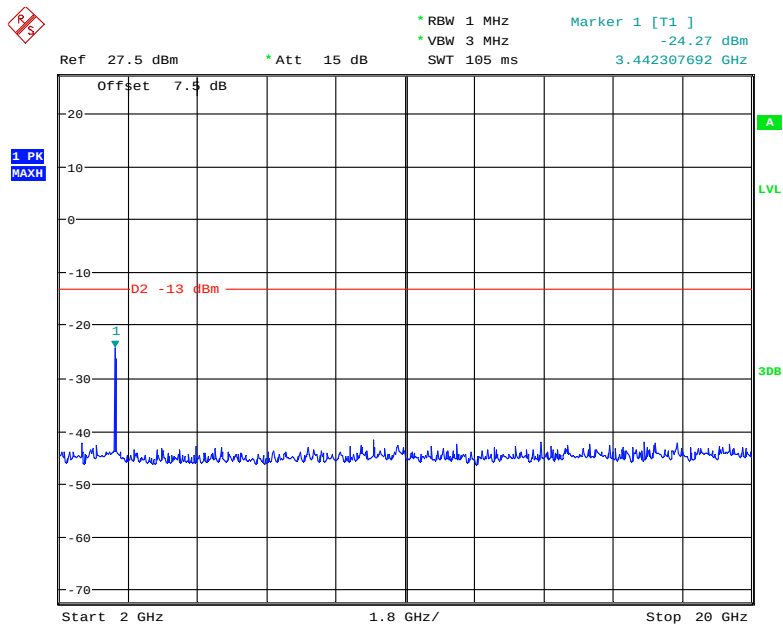
Date: 23.JUN.2018 00:38:13

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



Date: 23.JUN.2018 00:30:40

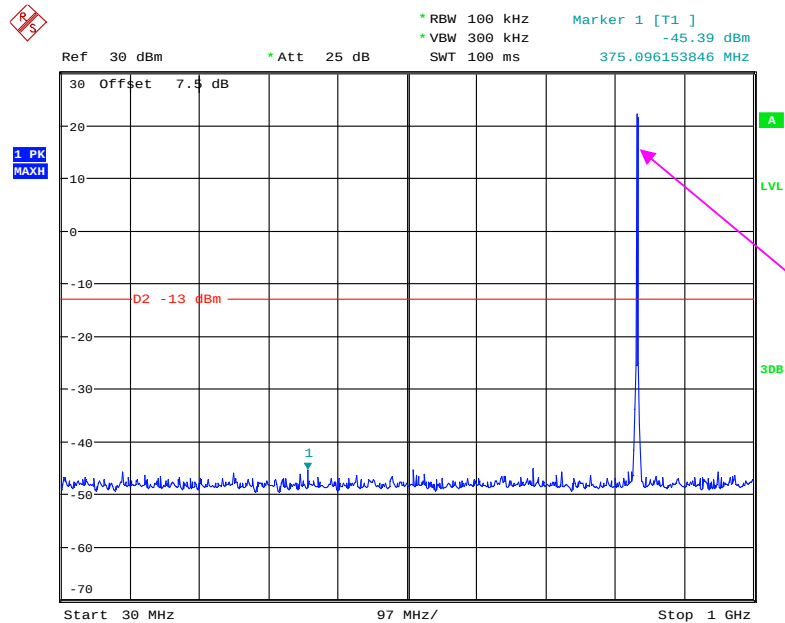
2 GHz –20 GHz (20.0 MHz, Middle Channel)



Date: 23.JUN.2018 00:31:45

LTE Band 5:

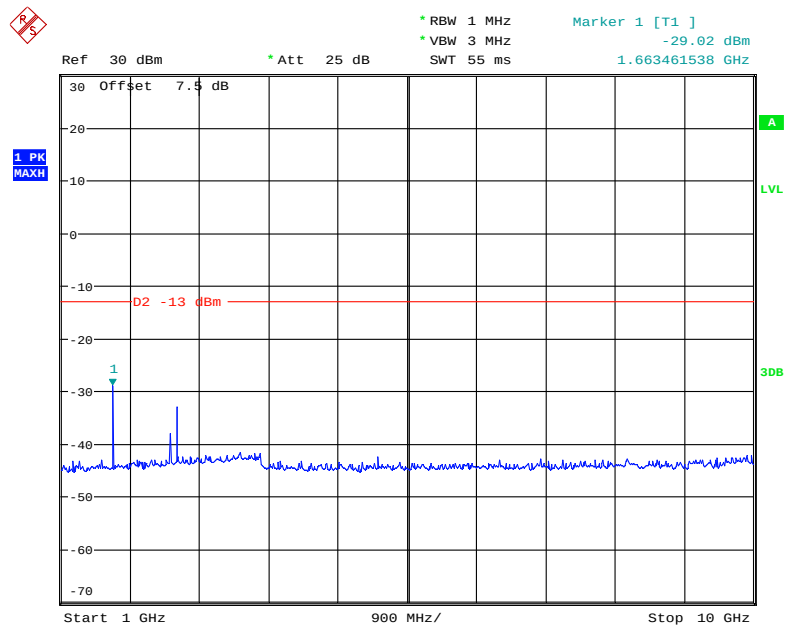
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

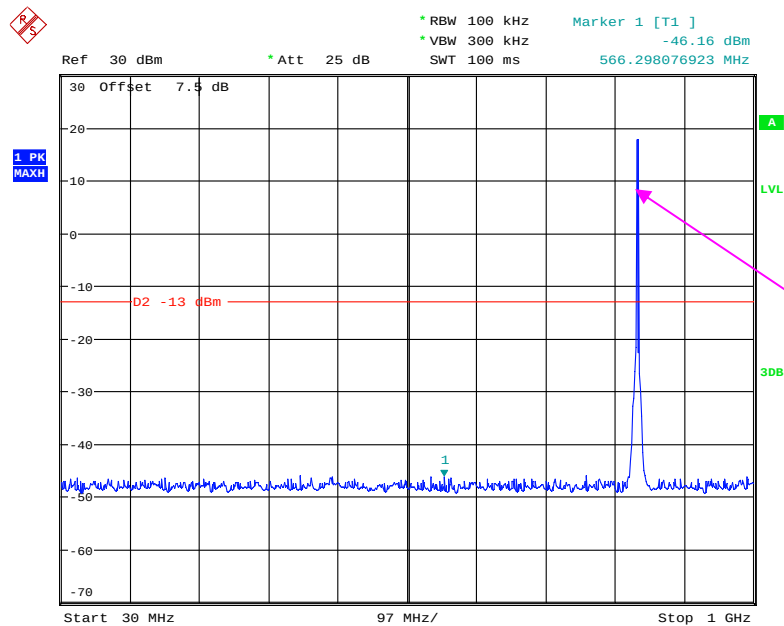
Date: 23.JUN.2018 00:41:40

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



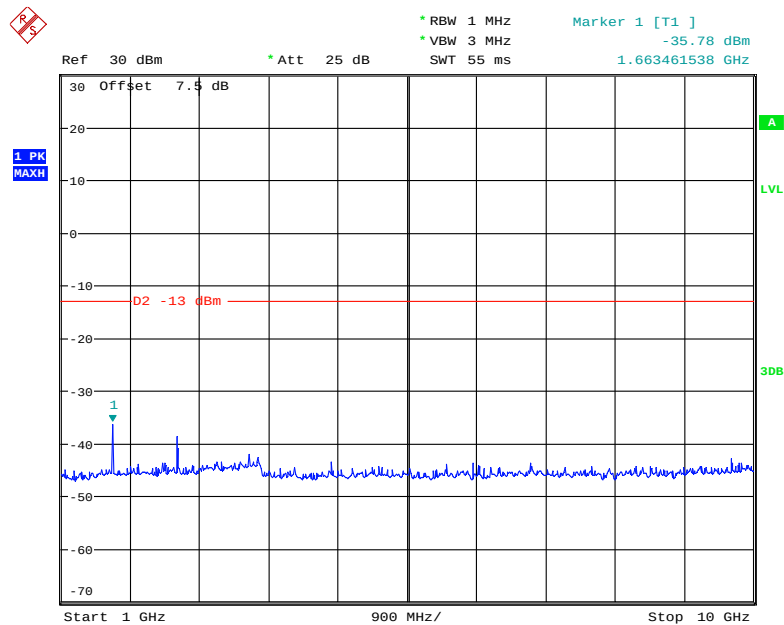
Date: 23.JUN.2018 00:44:10

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



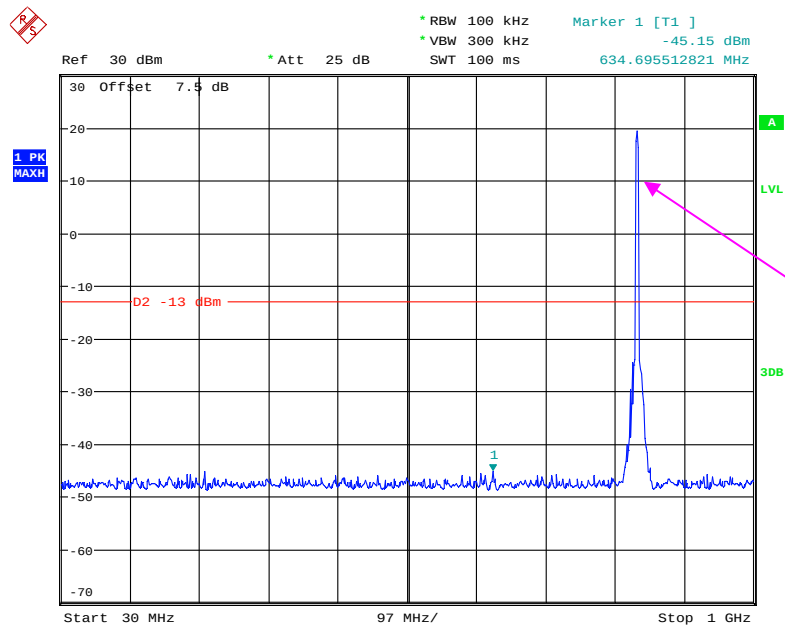
Date: 23.JUN.2018 00:41:07

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



Date: 23.JUN.2018 00:44:43

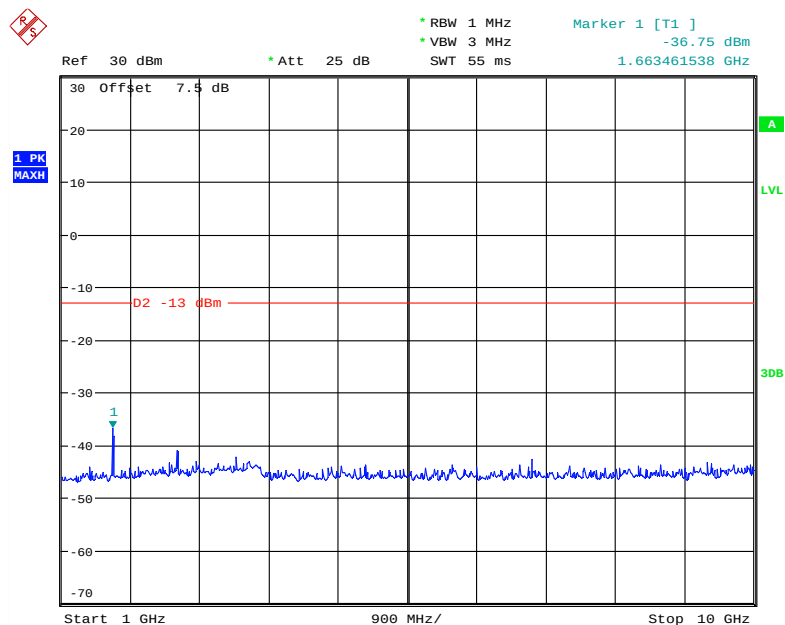
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

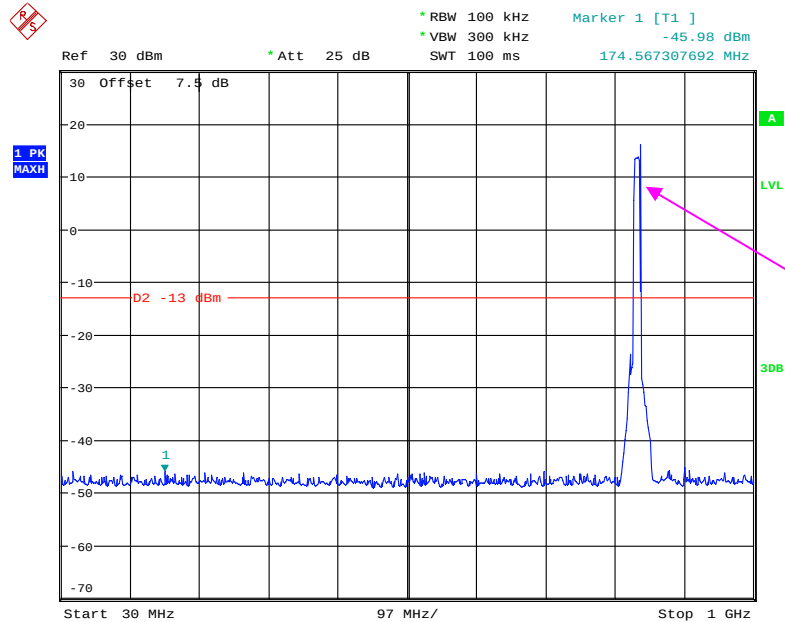
Date: 23.JUN.2018 00:40:01

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



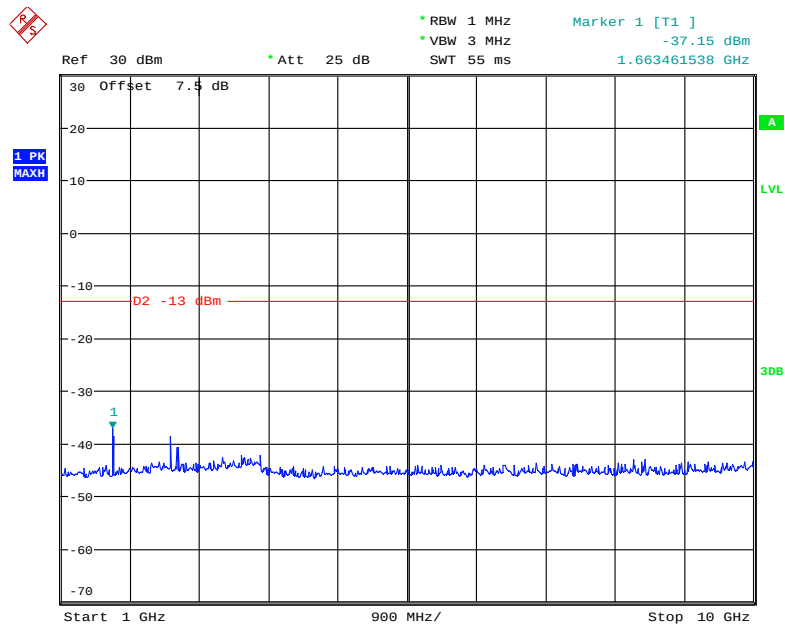
Date: 23.JUN.2018 00:45:01

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



Date: 23.JUN.2018 00:40:38

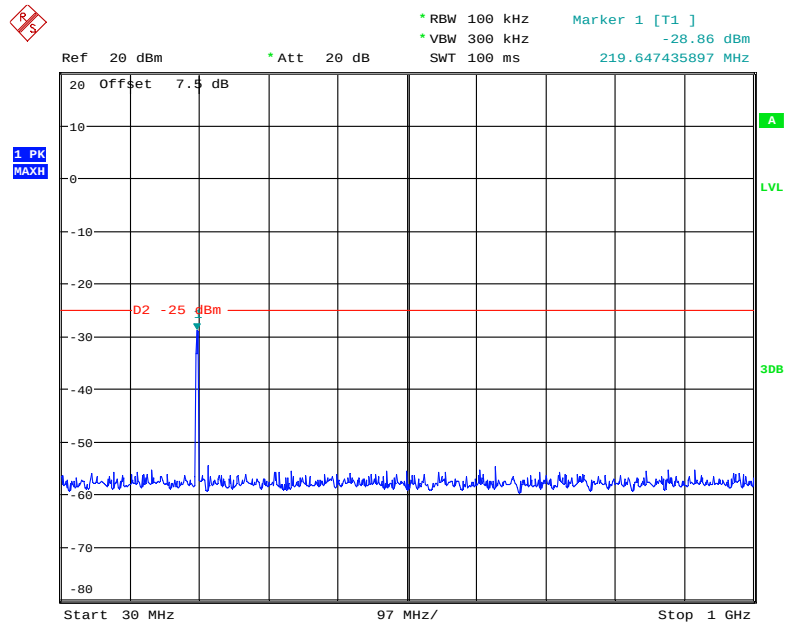
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 23.JUN.2018 00:45:28

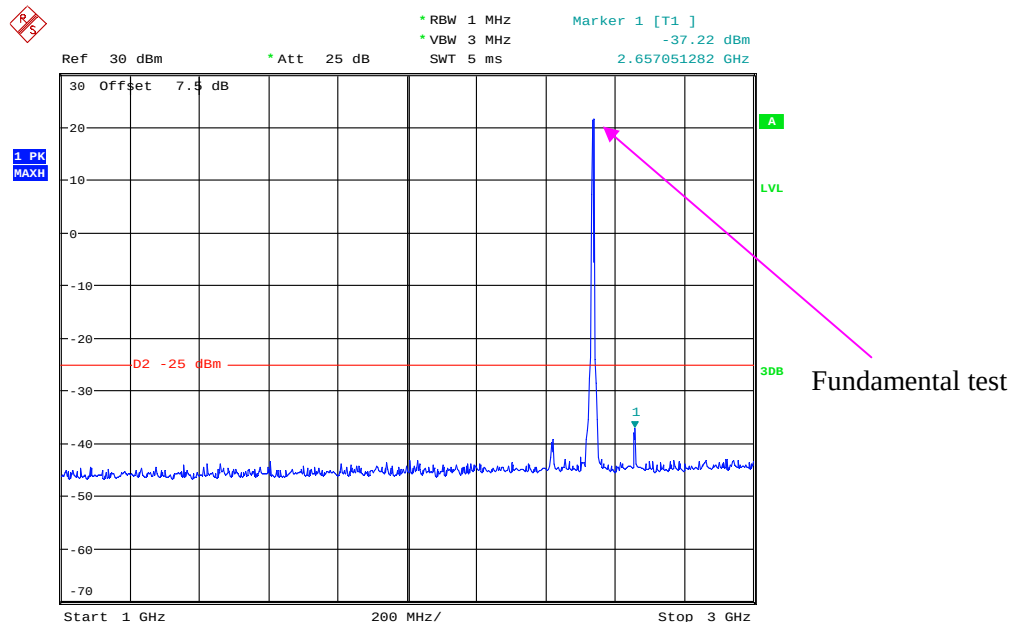
LTE Band 7:

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



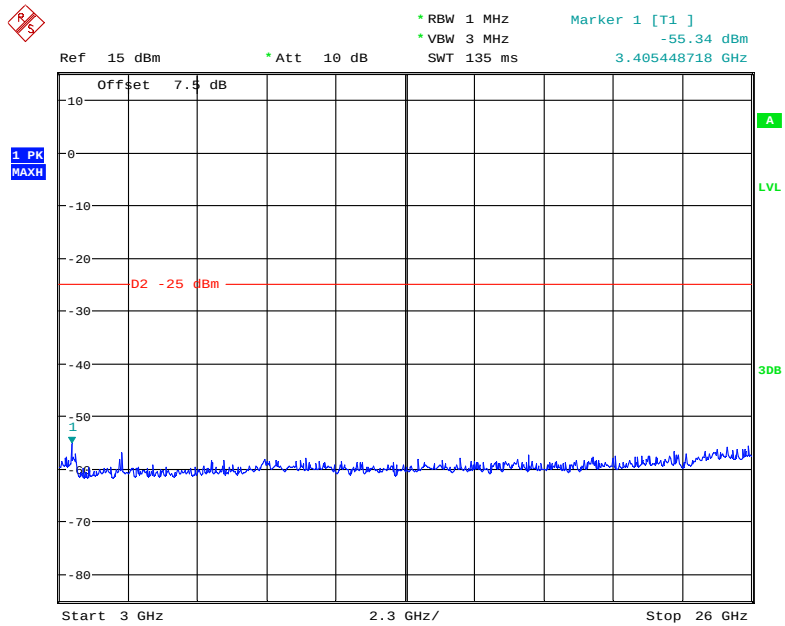
Date: 23.JUN.2018 01:06:28

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



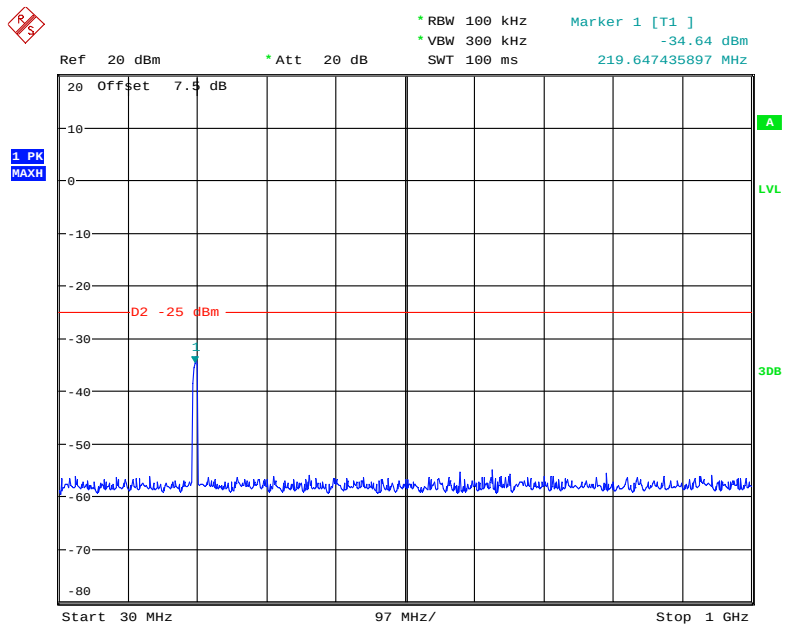
Date: 23.JUN.2018 00:55:11

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



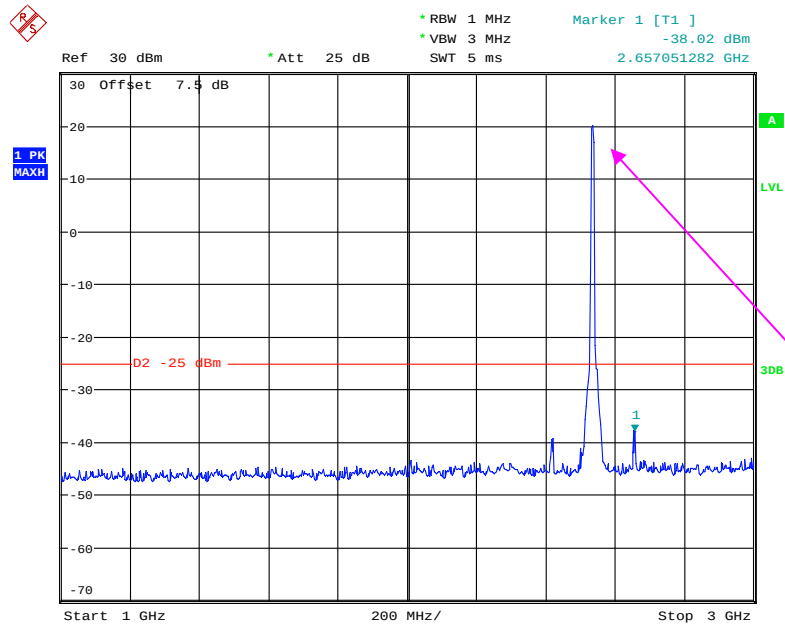
Date: 23.JUN.2018 01:00:17

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



Date: 23.JUN.2018 01:06:02

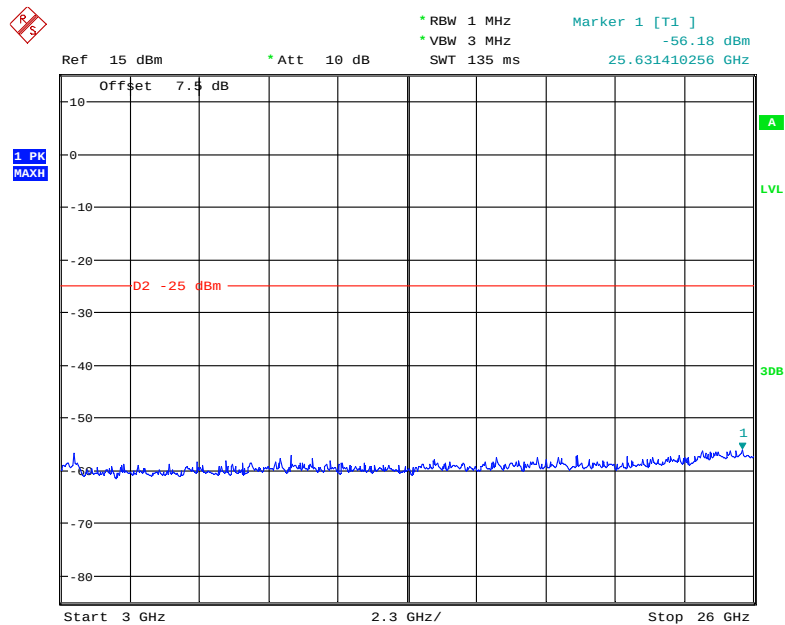
1 GHz – 3 GHz (10.0 MHz, Middle Channel)



Fundamental test

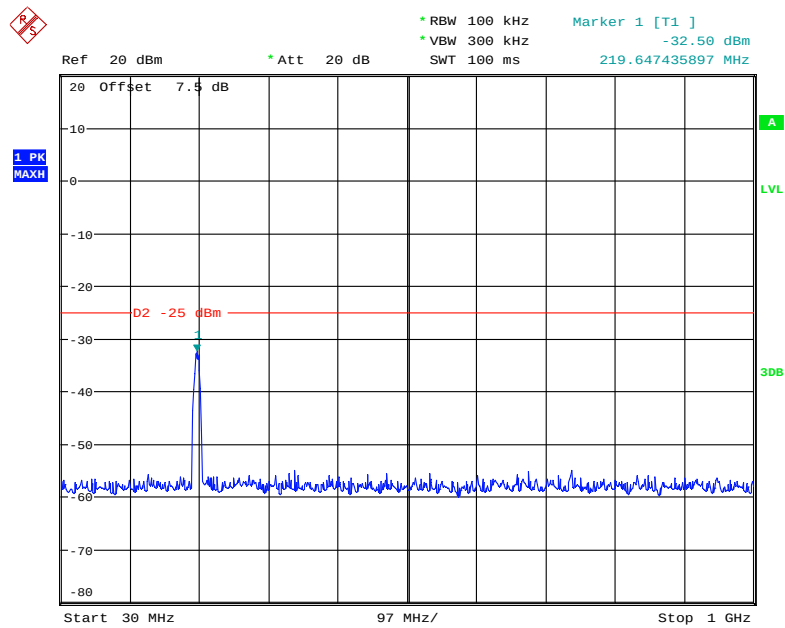
Date: 23.JUN.2018 00:56:00

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



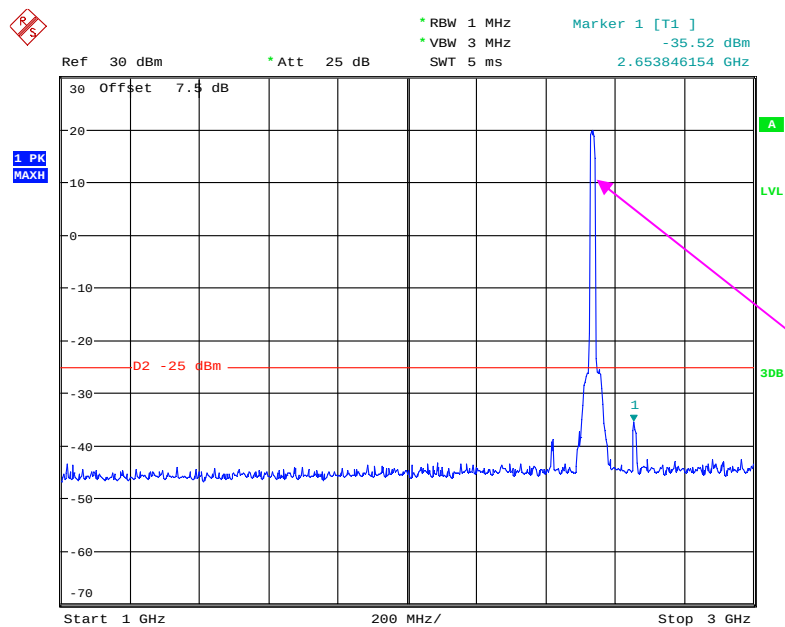
Date: 23.JUN.2018 00:59:56

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



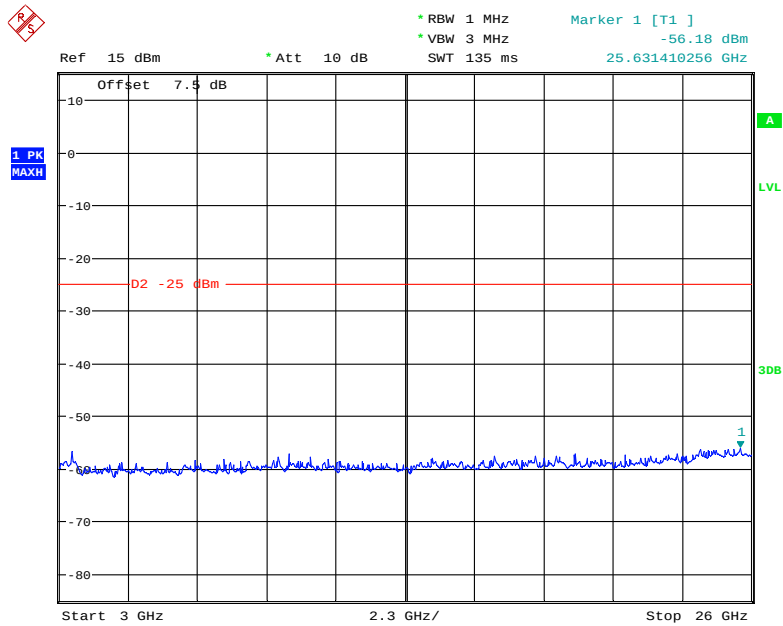
Date: 23.JUN.2018 01:05:45

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



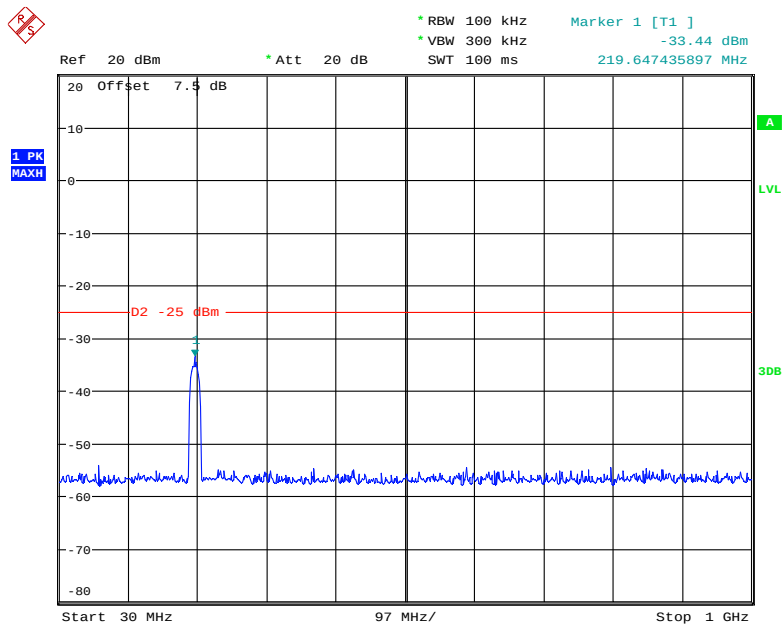
Date: 23.JUN.2018 00:57:17

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



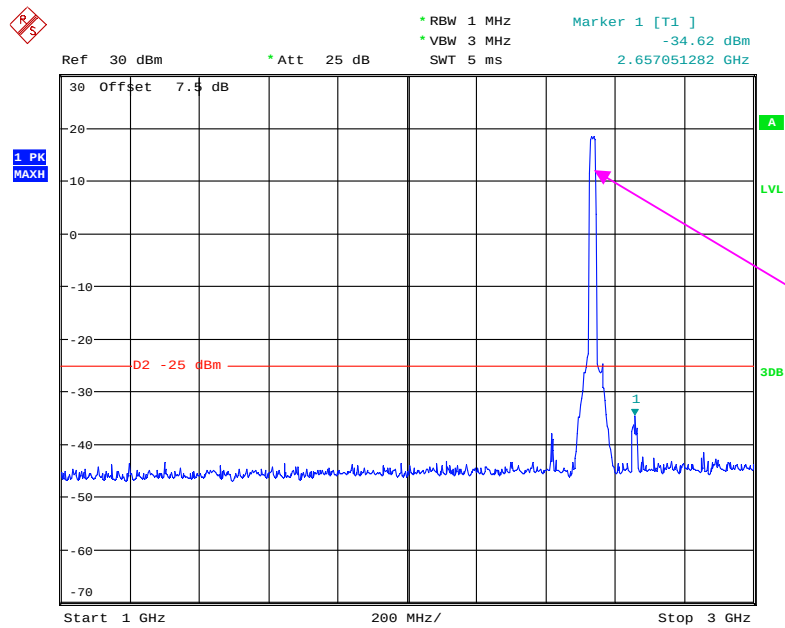
Date: 23.JUN.2018 00:59:56

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



Date: 23.JUN.2018 01:05:31

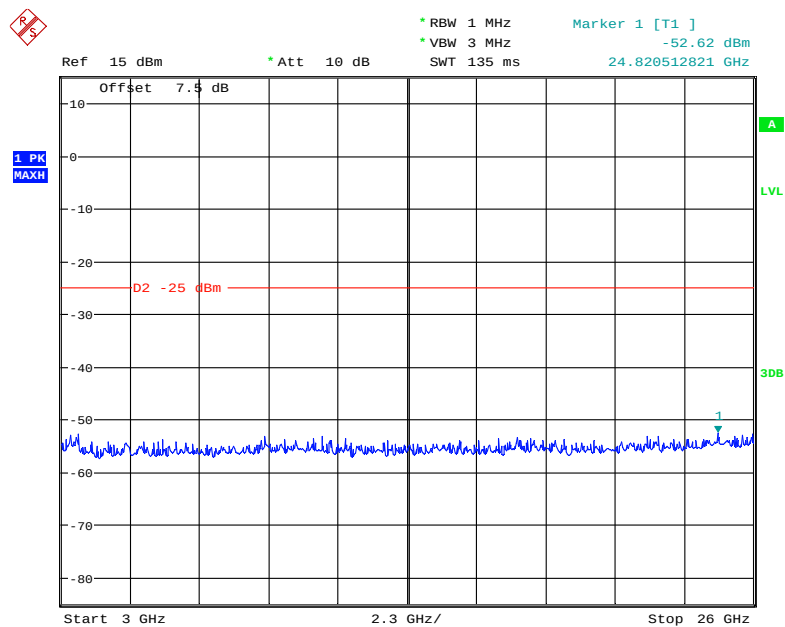
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 23.JUN.2018 00:57:47

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



Date: 23.JUN.2018 00:59:09

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

Applicable Standard

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

Test Procedure

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

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

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

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Bibo Zhang on 2018-06-24.

EUT operation mode: Transmitting

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

Internal Antenna

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										
1673.20	59.69	4	1.3	H	-47.4	1.30	8.90	-39.80	-13	26.80
1673.20	59.62	149	1.8	V	-46.9	1.30	8.90	-39.30	-13	26.30
2509.80	49.84	356	2.1	H	-53.7	2.60	10.20	-46.10	-13	33.10
2509.80	50.87	14	2.2	V	-52.0	2.60	10.20	-44.40	-13	31.40
WCDMA Mode, Middle channel										
913.83	32.17	221	1.7	H	-64.8	0.70	0	-65.50	-13	52.50
913.83	32.35	147	2.3	V	-64.6	0.70	0	-65.30	-13	52.30
1673.20	42.36	79	2.4	H	-64.7	1.30	8.90	-57.10	-13	44.10
1673.20	42.57	13	2.1	V	-63.9	1.30	8.90	-56.30	-13	43.30

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										
913.83	33.05	72	1.2	H	-63.9	0.70	0	-64.60	-13	51.60
913.83	32.94	154	2.1	V	-64.1	0.70	0	-64.80	-13	51.80
3760.00	44.65	281	1.3	H	-56.6	1.50	11.80	-46.30	-13	33.30
3760.00	44.38	290	1.6	V	-56.4	1.50	11.80	-46.10	-13	33.10
WCDMA Mode Band II, Middle channel										
913.83	32.29	275	1.2	H	-64.7	0.70	0	-65.40	-13	52.40
913.83	32.78	31	2.3	V	-64.2	0.70	0	-64.90	-13	51.90
3760.00	42.58	16	1.6	H	-58.6	1.50	11.80	-48.30	-13	35.30
3760.00	42.79	26	2.2	V	-58.0	1.50	11.80	-47.70	-13	34.70

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
Band 4										
Test frequency range:30 MHz ~ 18 GHz										
913.83	33.10	53	1.1	H	-63.9	0.70	0	-64.60	-13	51.60
913.83	32.86	95	1.8	V	-64.1	0.70	0	-64.80	-13	51.80
3465.00	43.83	191	1.1	H	-56.7	1.50	12.00	-46.20	-13	33.20
3465.00	43.52	298	1.4	V	-57.8	1.50	12.00	-47.30	-13	34.30
Band 5										
Test frequency range:30 MHz ~ 10GHz										
913.83	33.32	117	1.1	H	-63.7	0.70	0	-64.40	-13	51.40
913.83	33.67	234	1.7	V	-63.3	0.70	0	-64.00	-13	51.00
1673.00	43.98	138	1.6	H	-63.1	1.30	8.90	-55.50	-13	42.50
1673.00	44.51	226	1.3	V	-62.0	1.30	8.90	-54.40	-13	41.40
Band 7										
Test frequency range: 30 MHz ~ 26GHz										
913.83	33.32	117	1.1	H	-63.7	0.70	0	-64.40	-25	39.40
913.83	33.67	234	1.7	V	-63.3	0.70	0	-64.00	-25	39.00
5070	43.98	88	1.1	H	-54.8	1.60	12.10	-44.30	-25	19.30
5070	44.51	211	1.9	V	-54.3	1.60	12.10	-43.80	-25	18.80

External Antenna**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										
913.83	33.66	285	2.3	H	-63.3	0.70	0	-64.00	-13	51.00
913.83	32.06	245	1.2	V	-64.9	0.70	0	-65.60	-13	52.60
1673.20	51.91	218	1.8	H	-55.2	1.30	8.90	-47.60	-13	34.60
1673.20	49.65	179	2.4	V	-56.8	1.30	8.90	-49.20	-13	36.20
2509.80	65.84	61	2.3	H	-37.7	2.60	10.20	-30.10	-13	17.10
2509.80	60.27	289	1.7	V	-42.6	2.60	10.20	-35.00	-13	22.00
WCDMA Mode, Middle channel										
913.83	33.27	90	1.9	H	-63.7	0.70	0	-64.40	-13	51.40
913.83	32.96	220	2.3	V	-64.0	0.70	0	-64.70	-13	51.70
1673.20	43.53	105	1.2	H	-63.5	1.30	8.90	-55.90	-13	42.90
1673.20	43.48	162	1.8	V	-63.0	1.30	8.90	-55.40	-13	42.40

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										
913.83	33.60	105	1.9	H	-63.4	0.70	0	-64.10	-13	51.10
913.83	33.06	270	1.7	V	-63.9	0.70	0	-64.60	-13	51.60
3760.00	42.59	81	1.3	H	-58.6	1.50	11.80	-48.30	-13	35.30
3760.00	43.17	154	2.4	V	-57.6	1.50	11.80	-47.30	-13	34.30
WCDMA Mode Band II, Middle channel										
913.83	33.98	69	1.5	H	-63.0	0.70	0	-63.70	-13	50.70
913.83	32.63	227	1.0	V	-64.4	0.70	0	-65.10	-13	52.10
3760.00	42.67	24	2.2	H	-58.6	1.50	11.80	-48.30	-13	35.30
3760.00	43.52	270	1.8	V	-57.2	1.50	11.80	-46.90	-13	33.90

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 4										
Test frequency range:30 MHz ~ 18 GHz										
913.83	32.04	265	1.3	H	-65.0	0.70	0	-65.70	-13	52.70
913.83	32.94	175	2.3	V	-64.1	0.70	0	-64.80	-13	51.80
3465.00	44.15	202	2.1	H	-56.2	1.50	12.00	-45.70	-13	32.70
3465.00	44.71	357	2.3	V	-56.4	1.50	12.00	-45.90	-13	32.90
Band 5										
Test frequency range:30 MHz ~ 10GHz										
913.83	32.20	107	1.8	H	-64.8	0.70	0	-65.50	-13	52.50
913.83	32.54	184	1.2	V	-64.5	0.70	0	-65.20	-13	52.20
1673.00	47.36	311	1.3	H	-59.7	1.30	8.90	-52.10	-13	39.10
1673.00	46.62	189	1.7	V	-59.9	1.30	8.90	-52.30	-13	39.30
Band 7										
Test frequency range: 30 MHz ~ 26GHz										
913.83	33.18	239	2.4	H	-63.8	0.70	0	-64.50	-25	39.50
913.83	32.40	104	1.1	V	-64.6	0.70	0	-65.30	-25	40.30
5070	42.68	18	1.5	H	-56.1	1.60	12.10	-45.60	-25	20.60
5070	43.27	159	1.1	V	-55.5	1.60	12.10	-45.00	-25	20.00

Note:

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

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

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

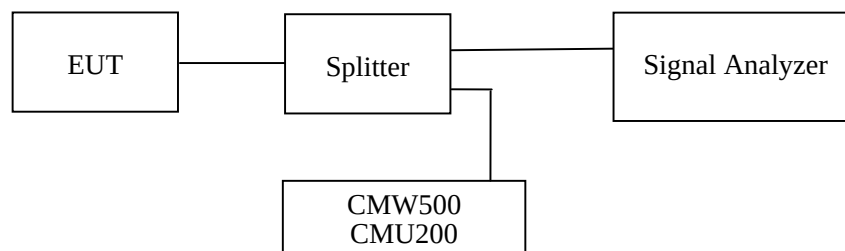
According to § 24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

Test Procedure

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

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

**Test Data****Environmental Conditions**

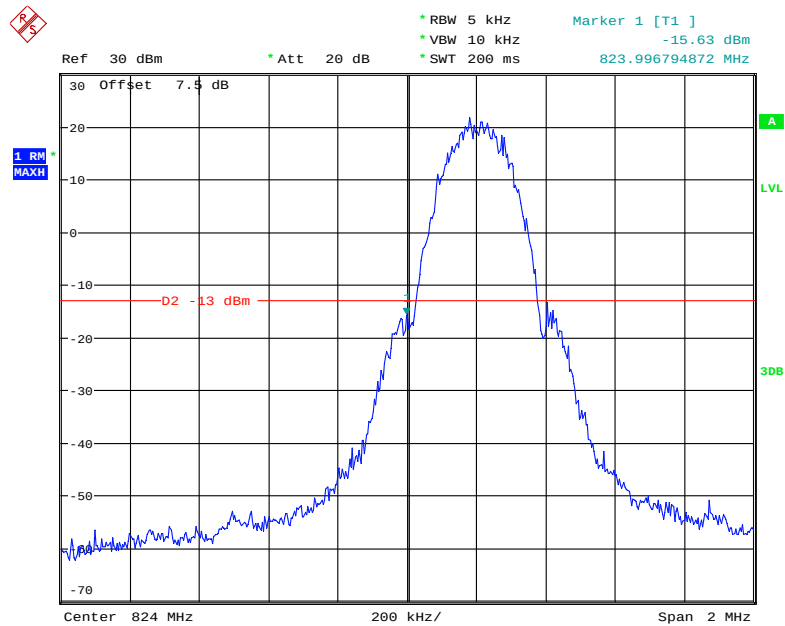
Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Bibo Zhang from 2018-06-21 to 2018-06-23.

EUT operation mode: Transmitting

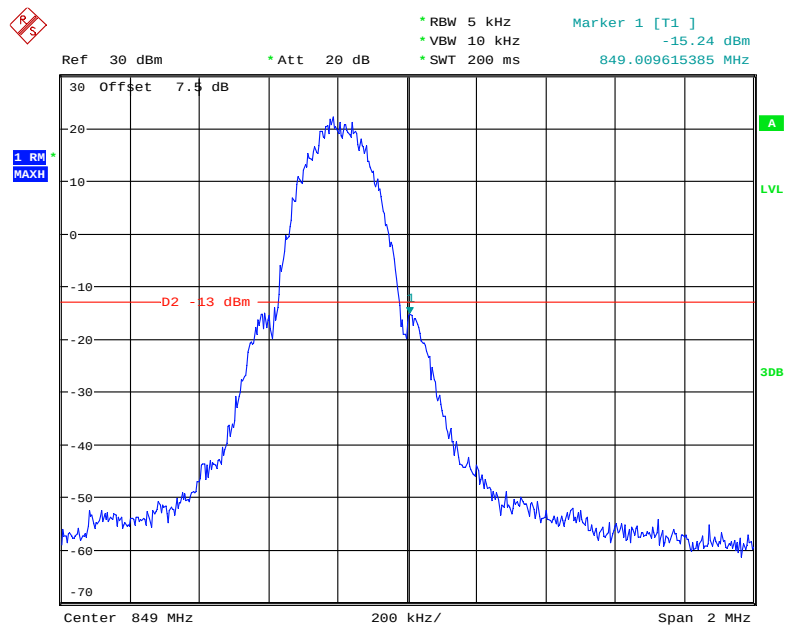
Test Result: Compliance. Please refer to the following plots.

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



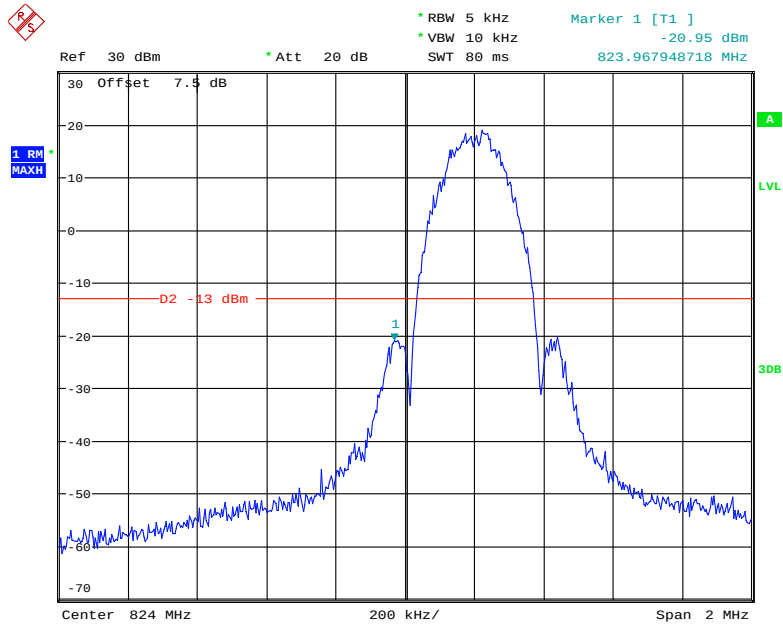
Date: 22.JUN.2018 00:16:27

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



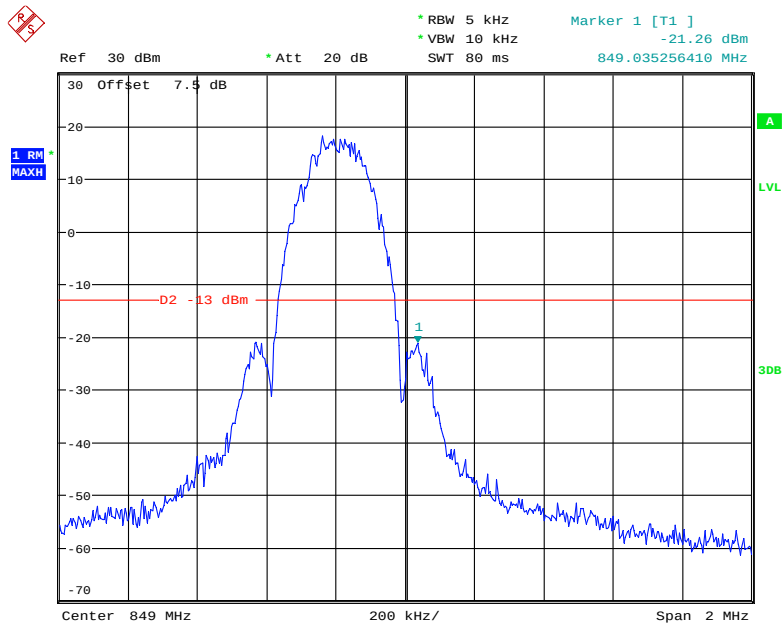
Date: 22.JUN.2018 00:17:47

Cellular Band, Left Band Edge for EDGE Mode



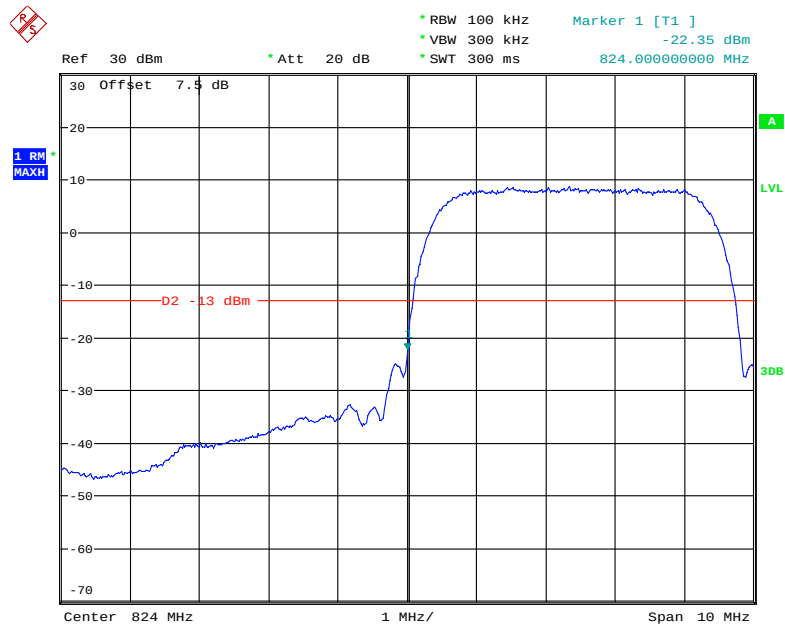
Date: 22.JUN.2018 00:08:29

Cellular Band, Right Band Edge for EDGE Mode



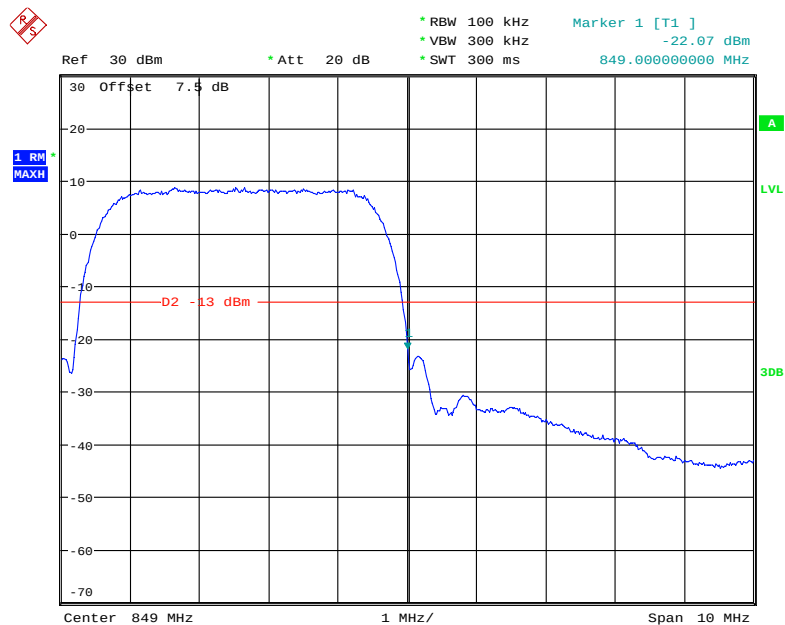
Date: 22.JUN.2018 00:10:36

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



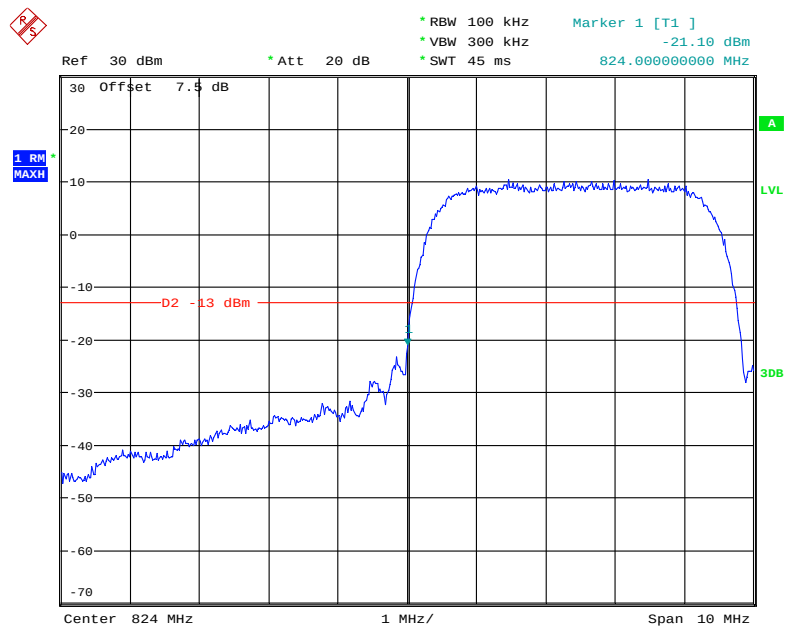
Date: 21.JUN.2018 23:25:58

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



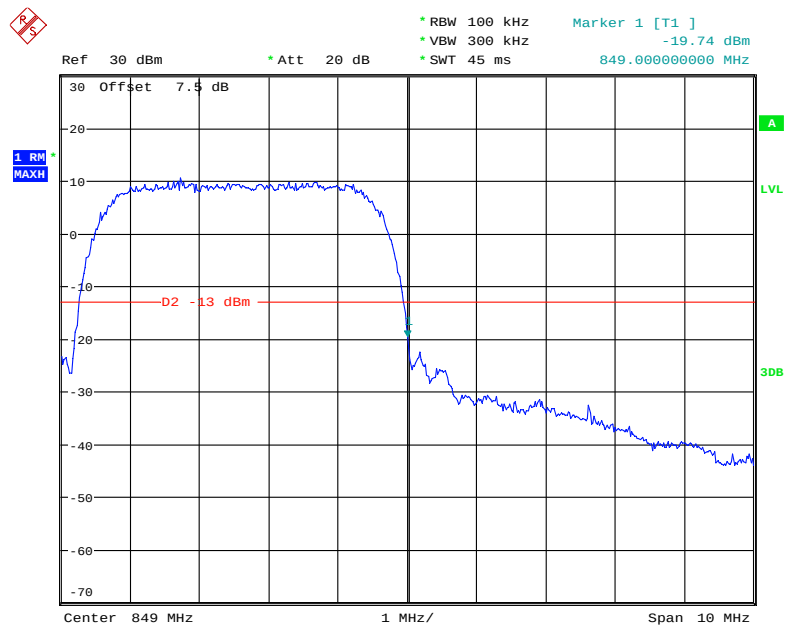
Date: 21.JUN.2018 23:26:56

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



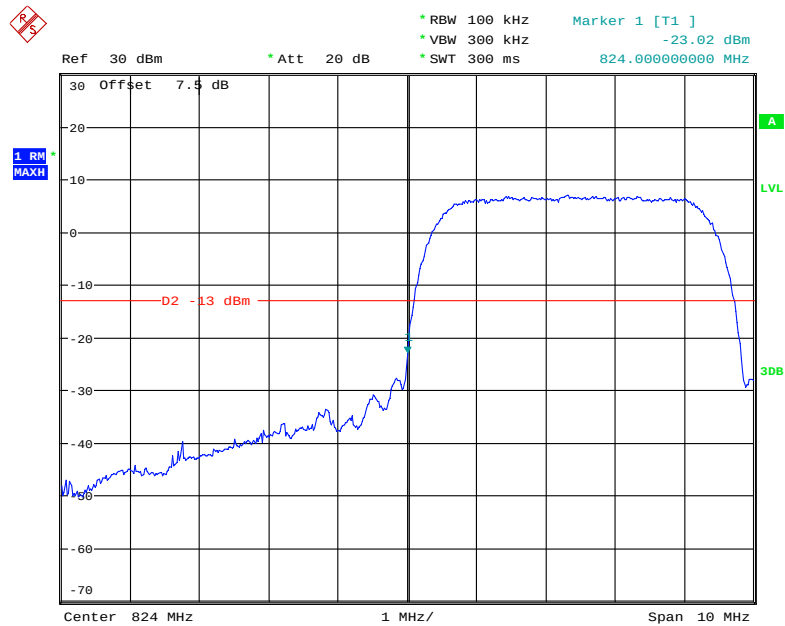
Date: 21.JUN.2018 23:48:36

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



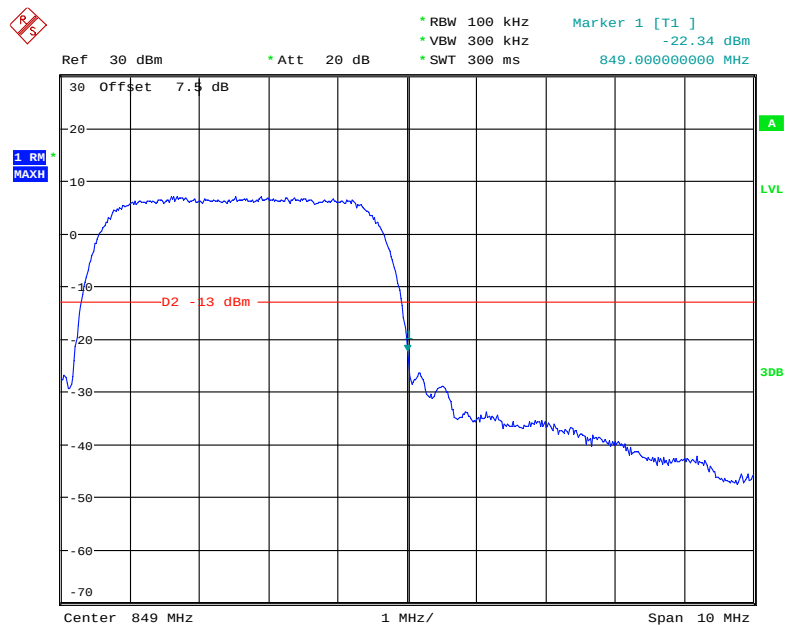
Date: 21.JUN.2018 23:49:28

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



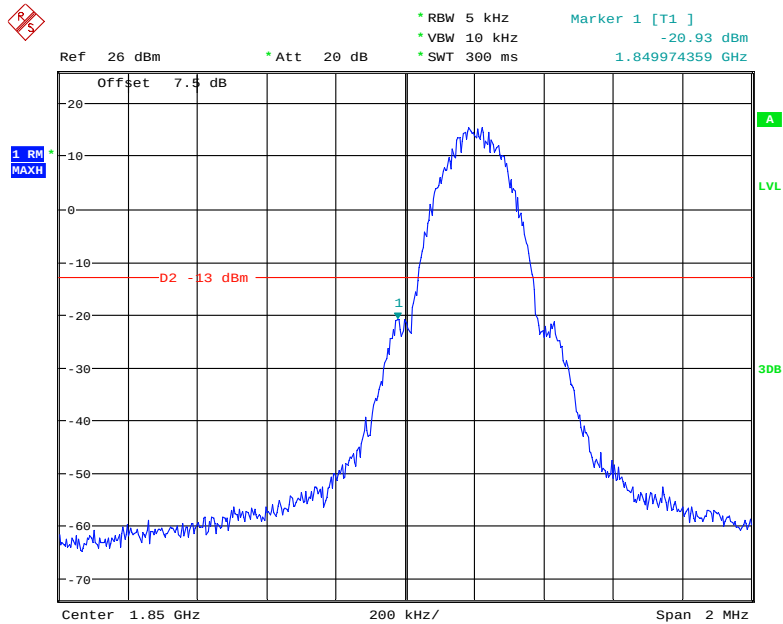
Date: 21.JUN.2018 23:32:06

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



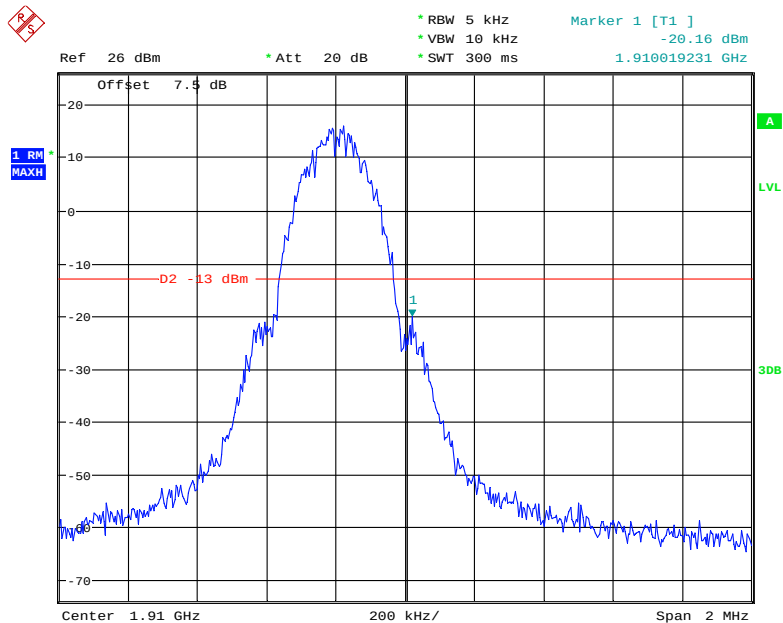
Date: 21.JUN.2018 23:30:33

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



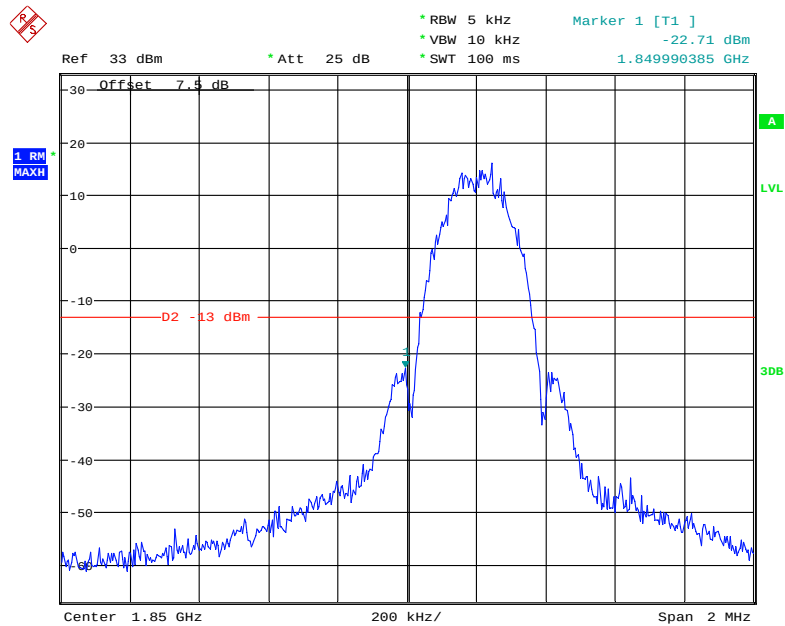
Date: 22.JUN.2018 00:36:49

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



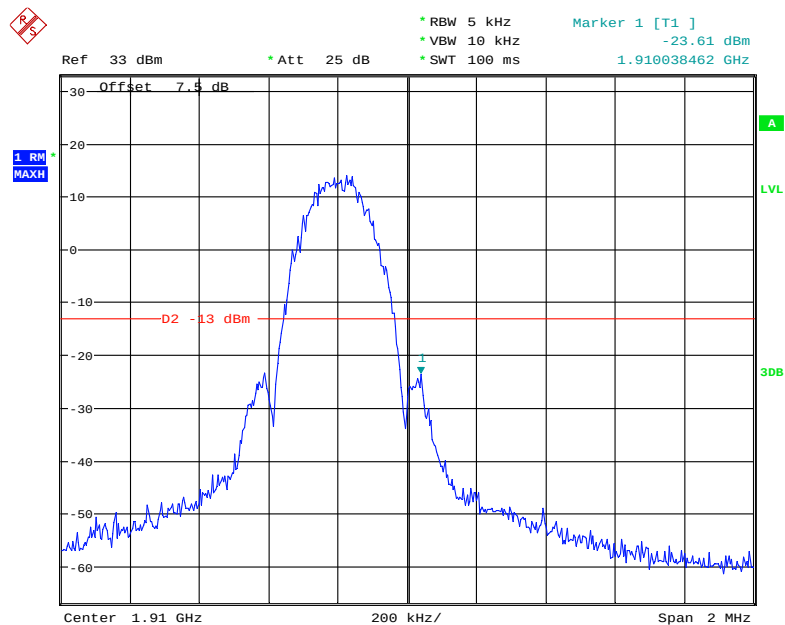
Date: 22.JUN.2018 00:35:46

PCS Band, Left Band Edge for EDGE Mode



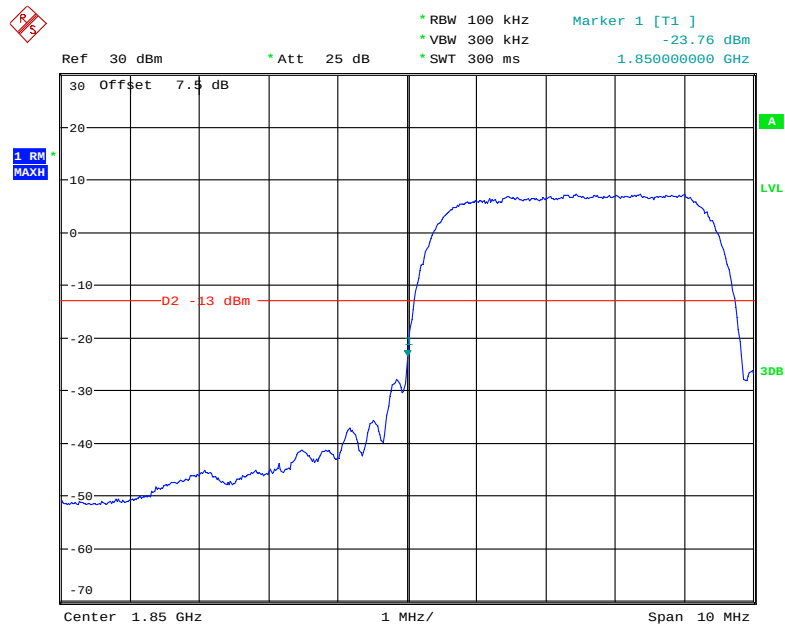
Date: 22.JUN.2018 00:46:07

PCS Band, Right Band Edge for EDGE Mode



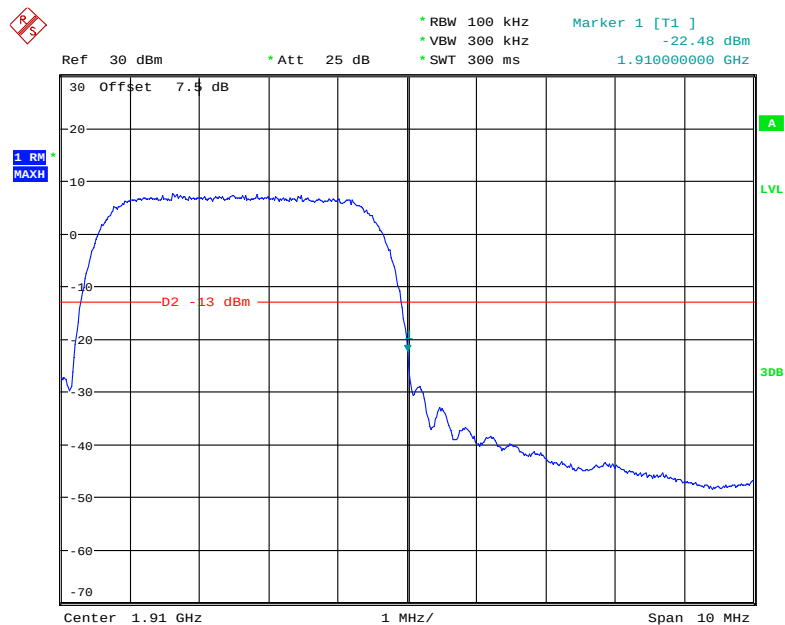
Date: 22.JUN.2018 00:47:09

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



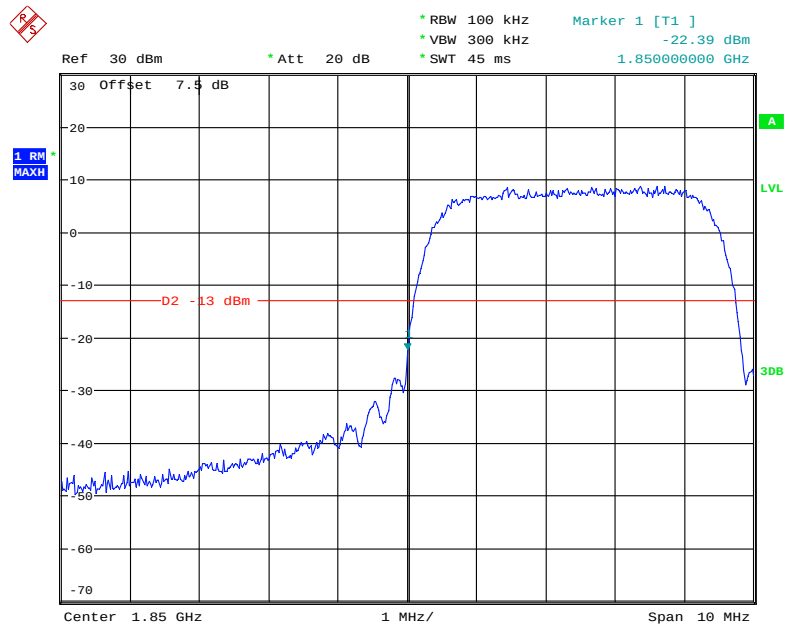
Date: 21.JUN.2018 23:15:12

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



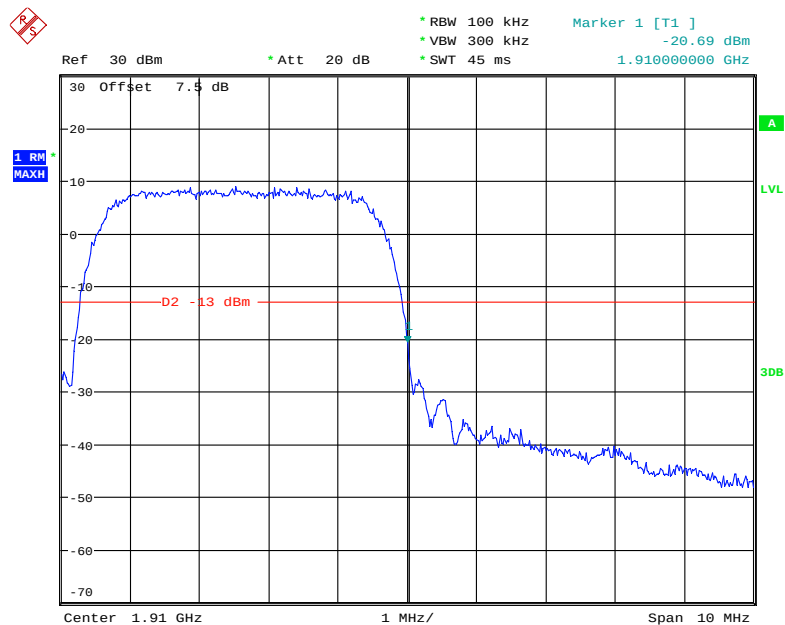
Date: 21.JUN.2018 23:16:48

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



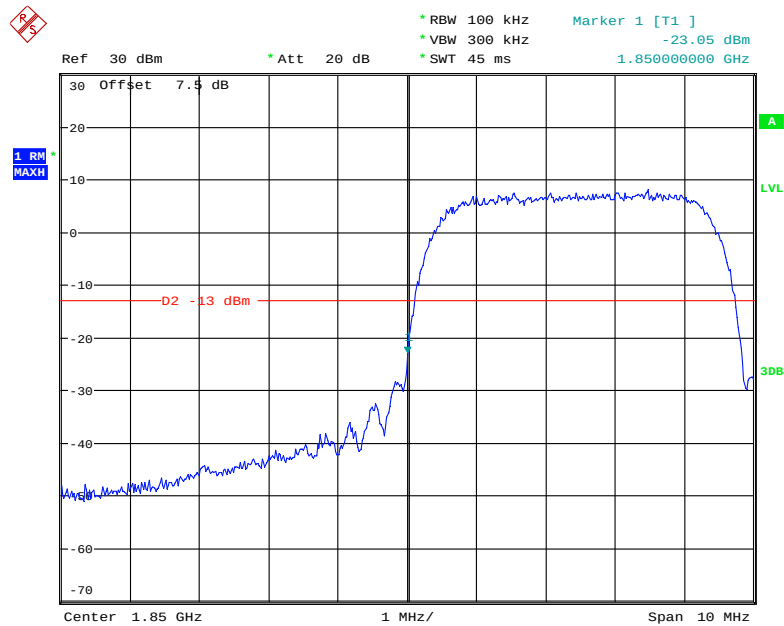
Date: 21.JUN.2018 23:47:16

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



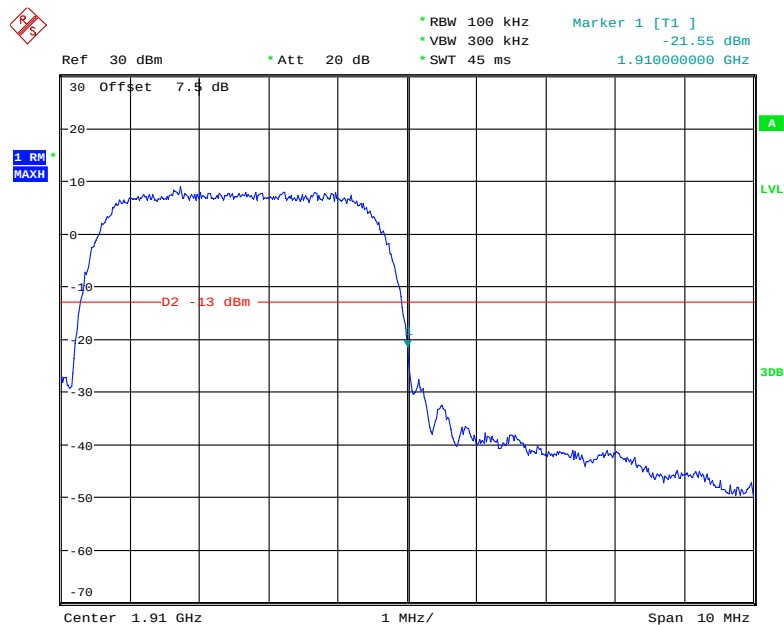
Date: 21.JUN.2018 23:46:25

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



Date: 21.JUN.2018 23:41:54

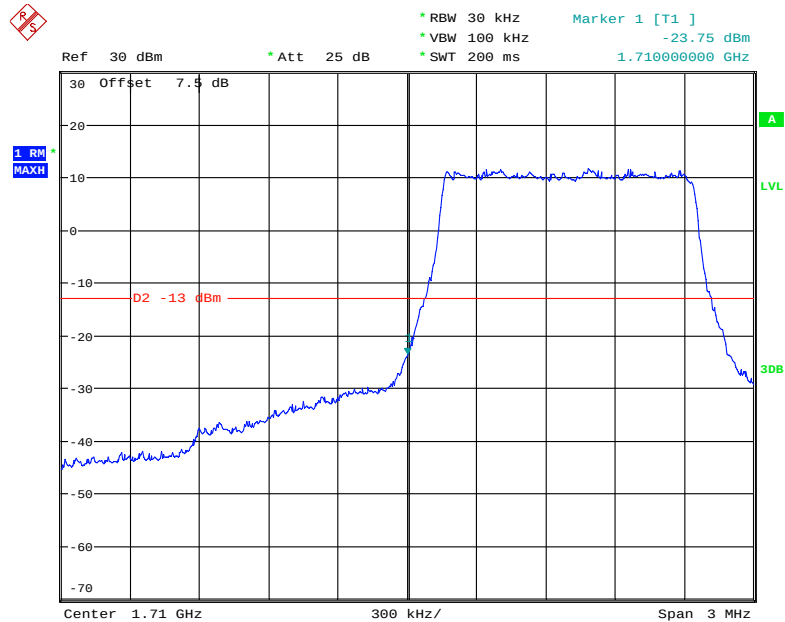
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 21.JUN.2018 23:43:06

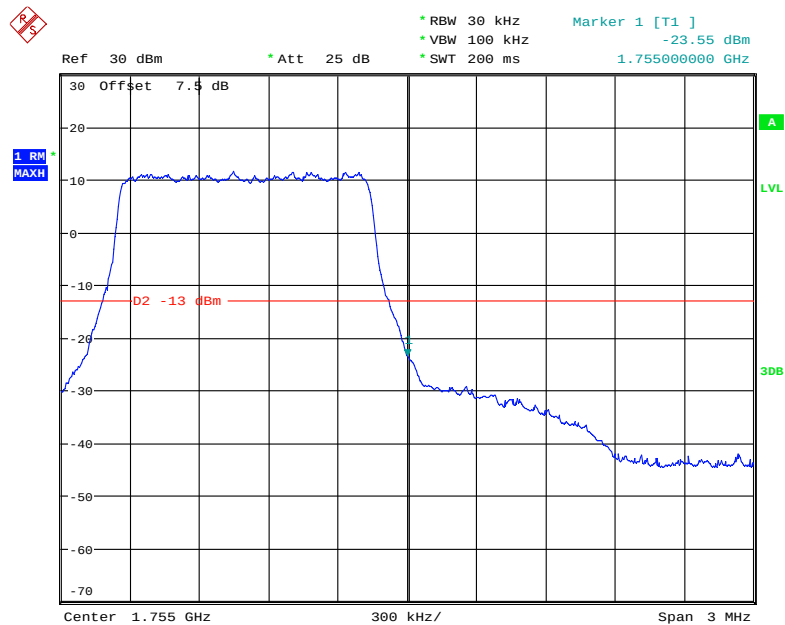
Band 4:

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



Date: 23.JUN.2018 01:29:41

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



Date: 23.JUN.2018 01:33:33

Ref 30 dBm * Att 25 dB

* RBW 30 kHz * VBW 100 kHz * SWT 200 ms

Marker 1 [T1] -24.11 dBm 1.71000000 GHz

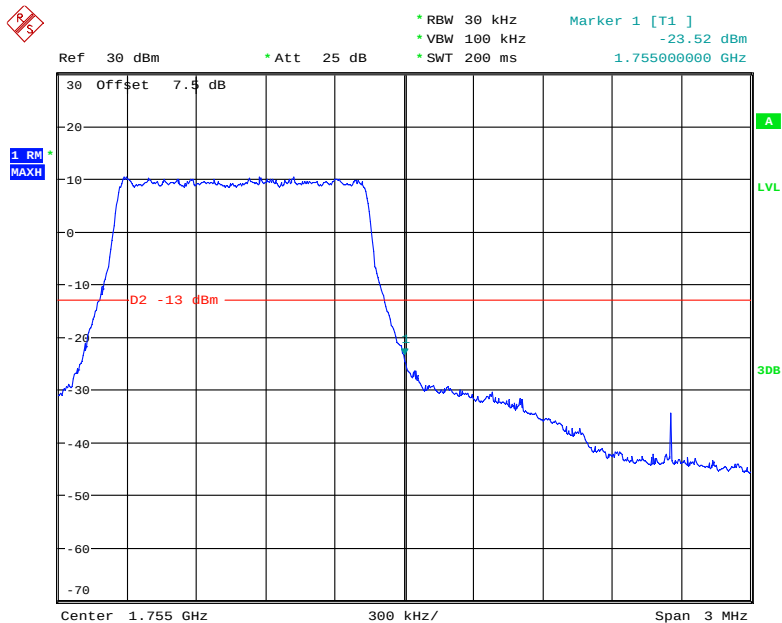
30 Offset 7.5 dB

1 RM MAXH

D2 -13 dBm

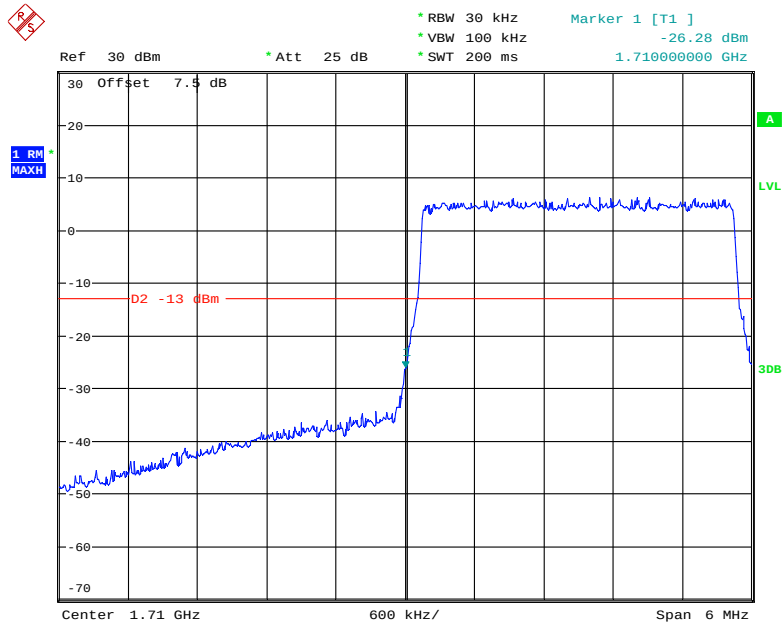
Center 1.71 GHz 300 kHz/ Span 3 MHz

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



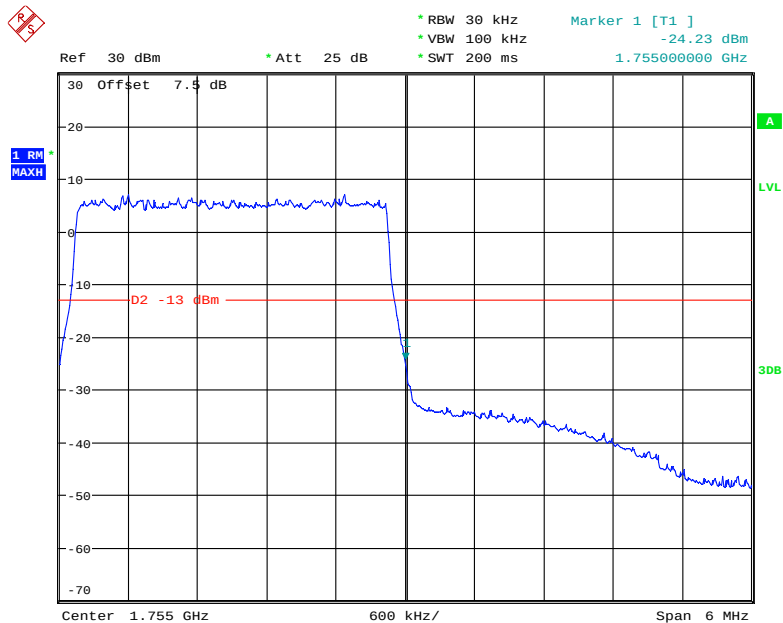
Page 102 of 136

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



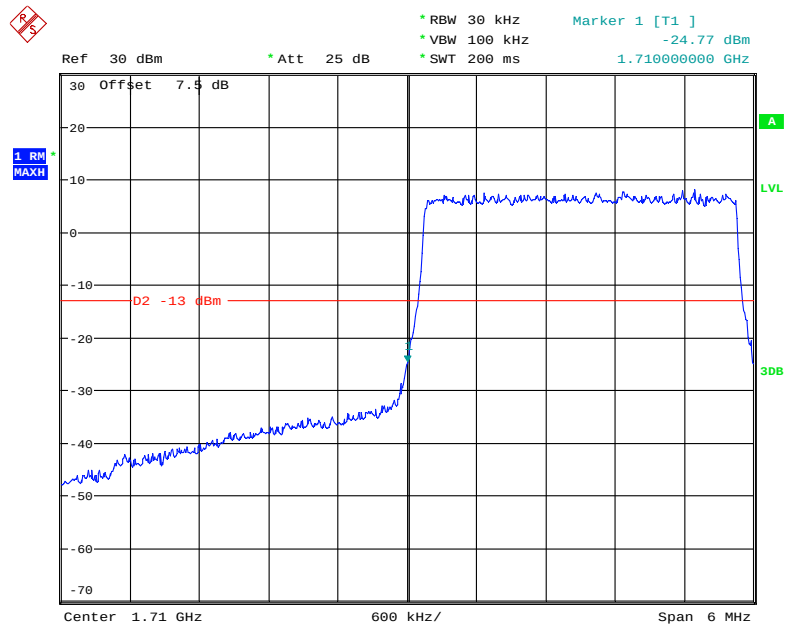
Date: 23.JUN.2018 01:37:34

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



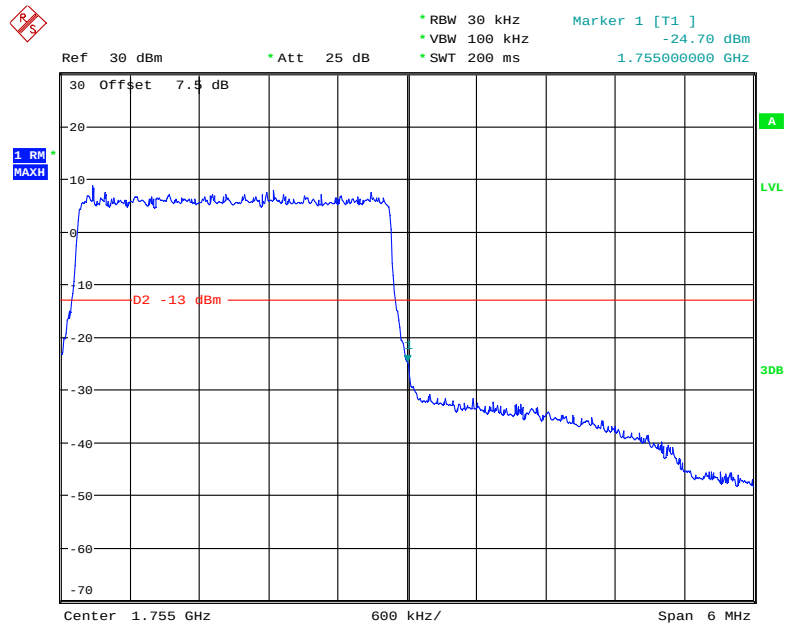
Date: 23.JUN.2018 01:35:59

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



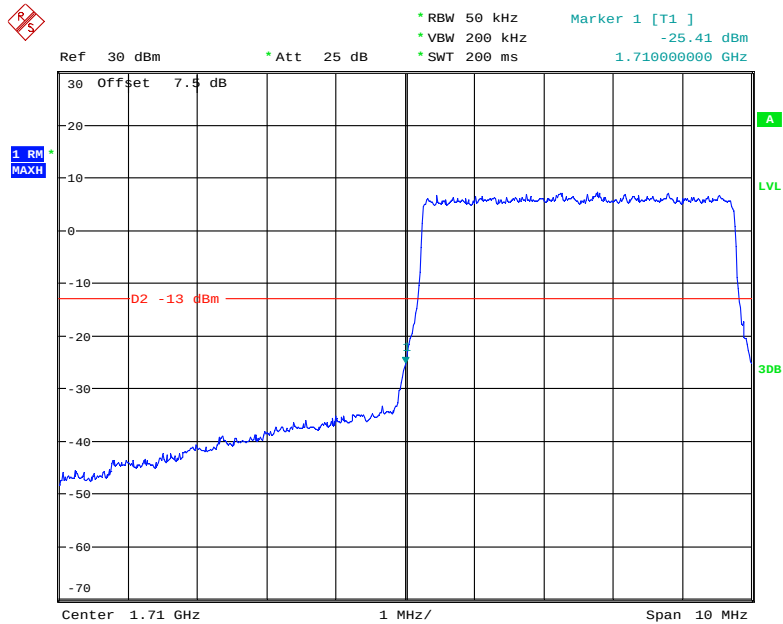
Date: 23.JUN.2018 01:37:14

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



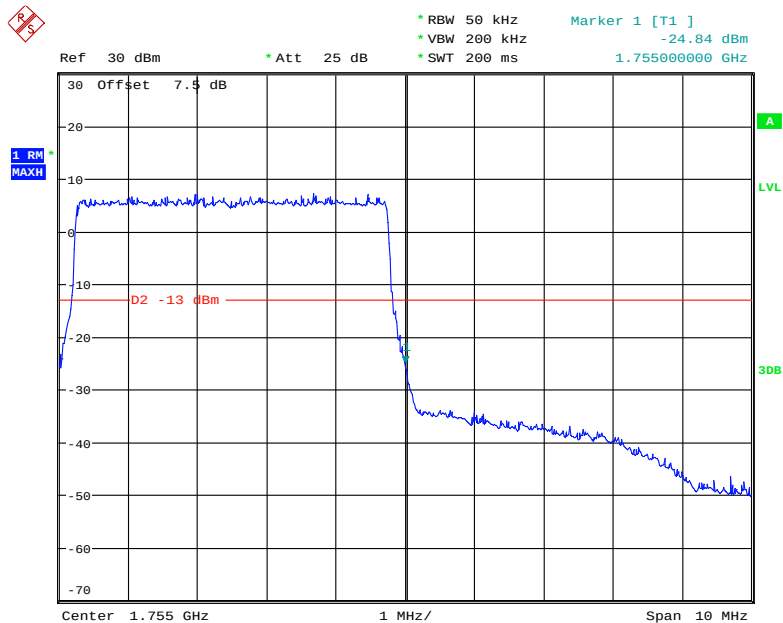
Date: 23.JUN.2018 01:36:24

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



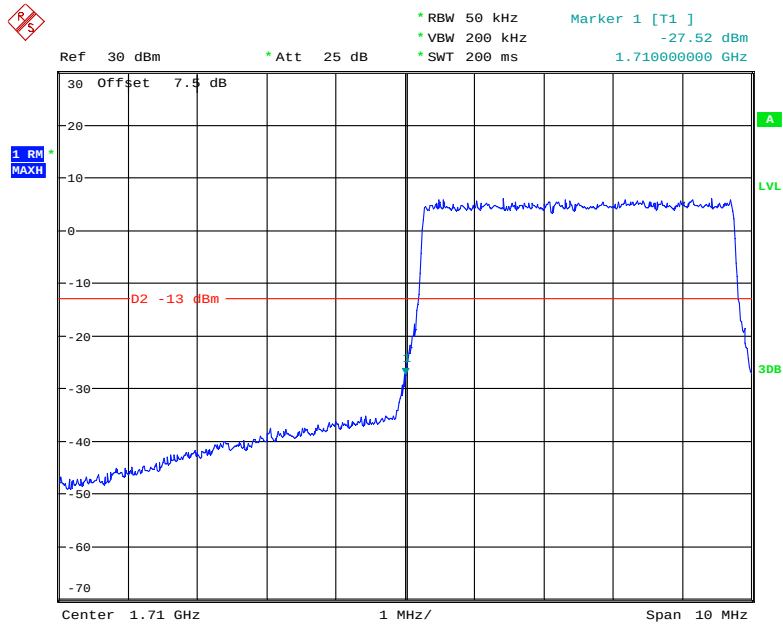
Date: 23.JUN.2018 01:39:26

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



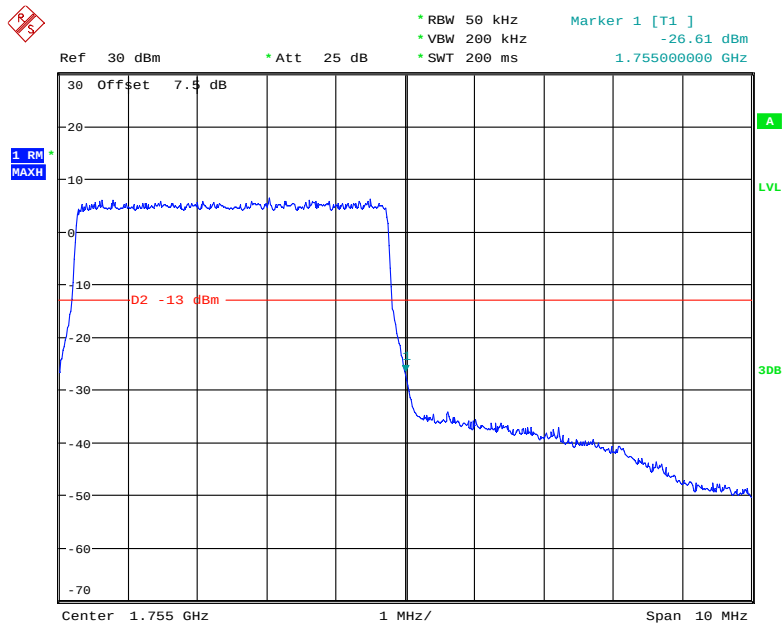
Date: 23.JUN.2018 01:40:59

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



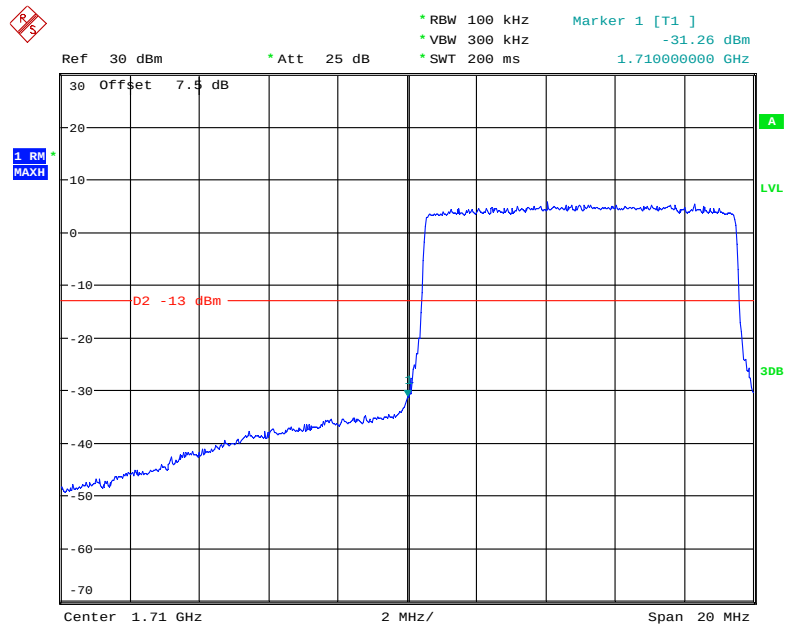
Date: 23.JUN.2018 01:39:52

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



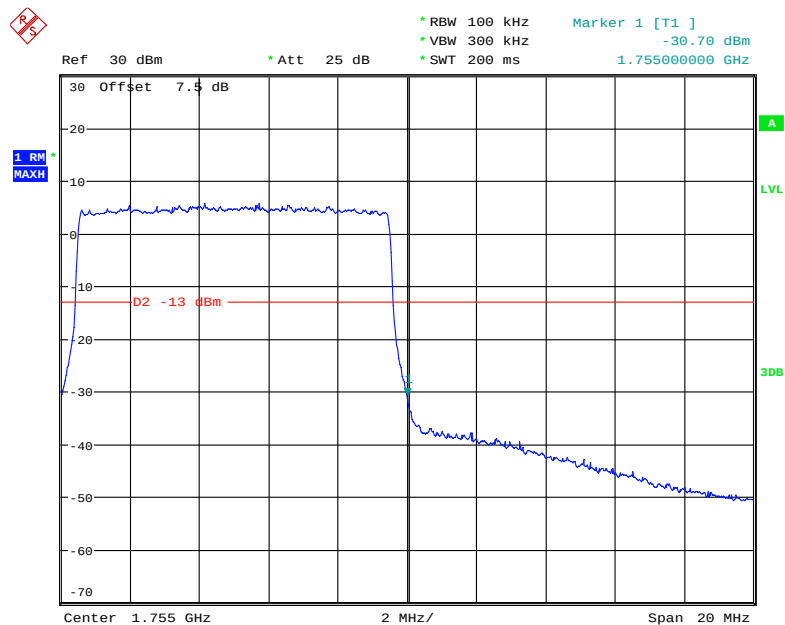
Date: 23.JUN.2018 01:40:35

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



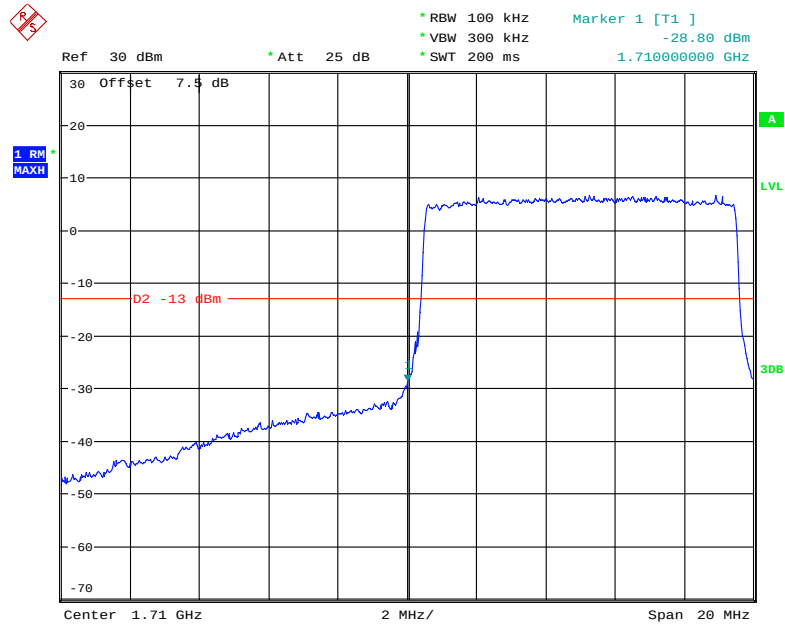
Date: 23.JUN.2018 01:45:02

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



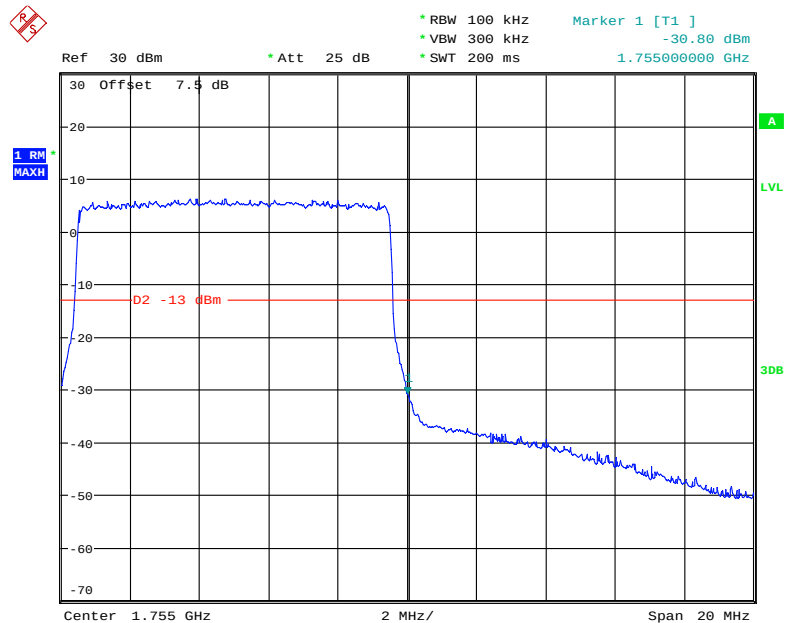
Date: 23.JUN.2018 01:43:28

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



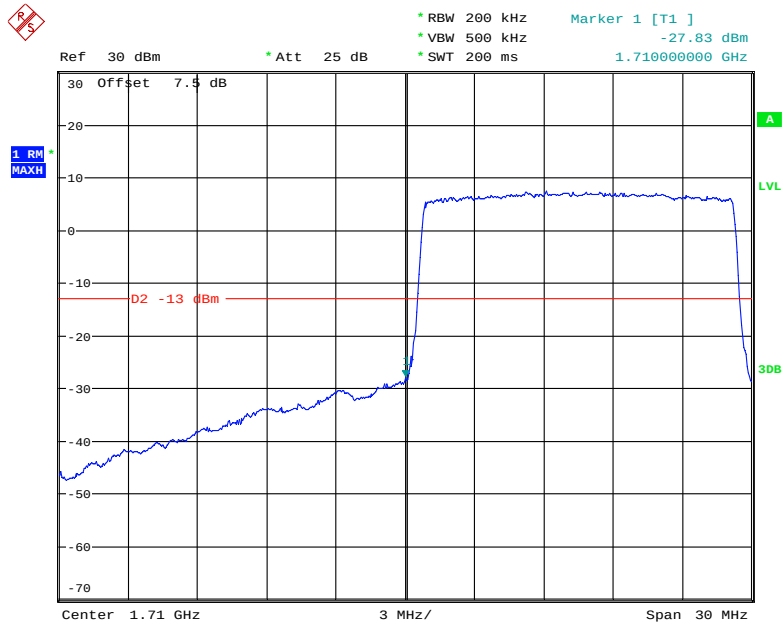
Date: 23.JUN.2018 01:44:42

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



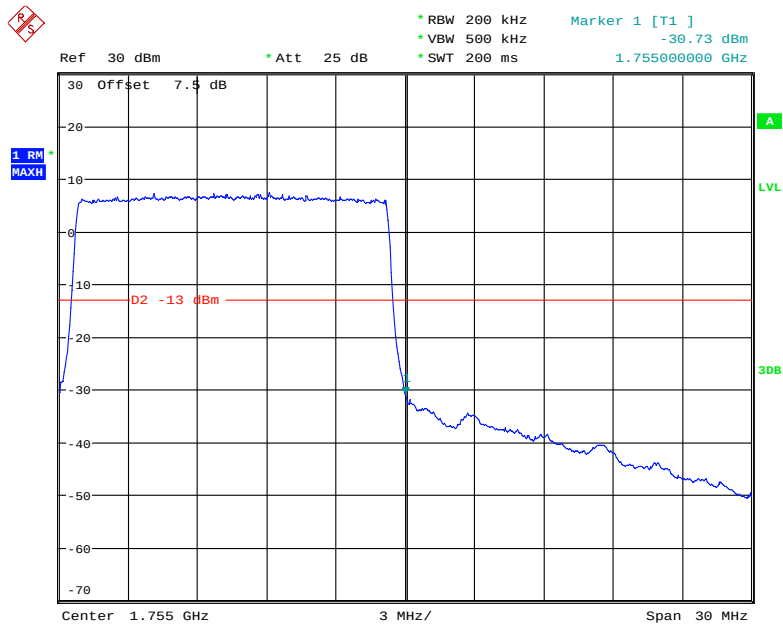
Date: 23.JUN.2018 01:44:07

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



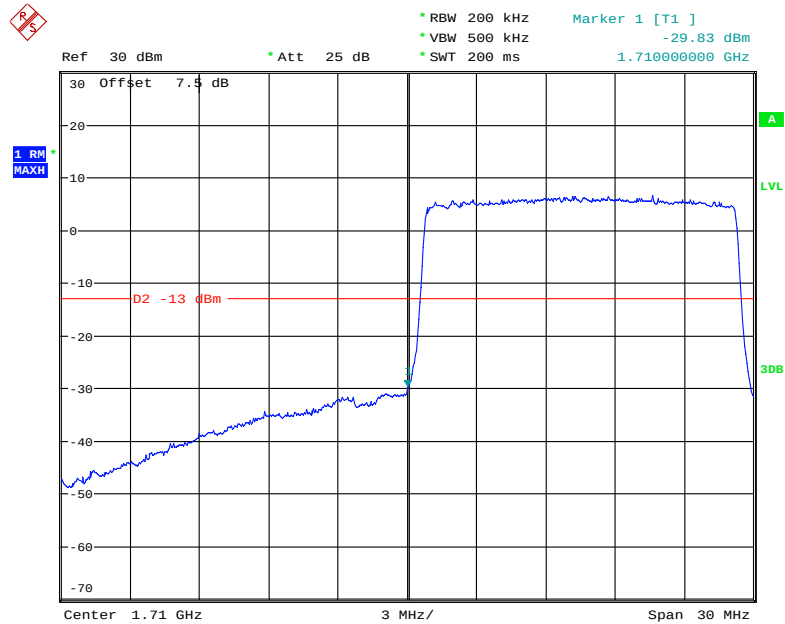
Date: 23.JUN.2018 01:47:12

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



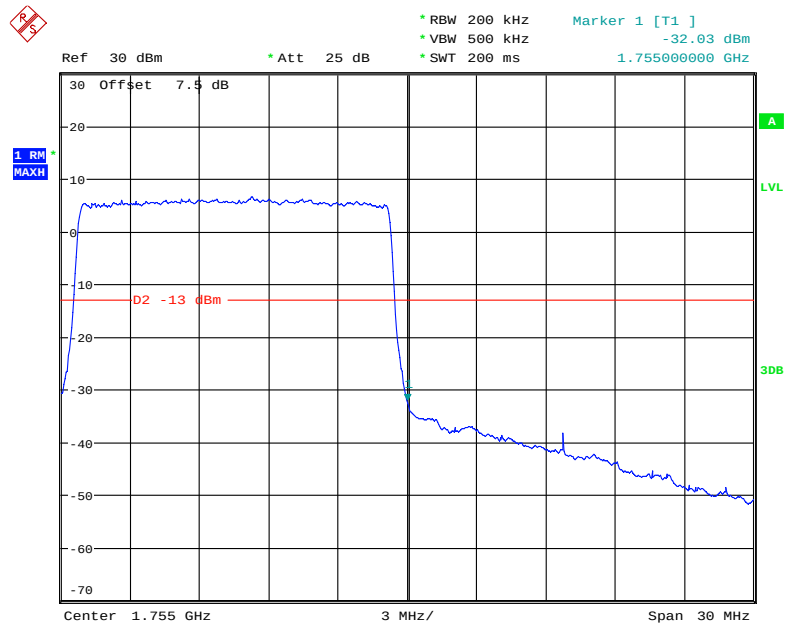
Date: 23.JUN.2018 01:49:45

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



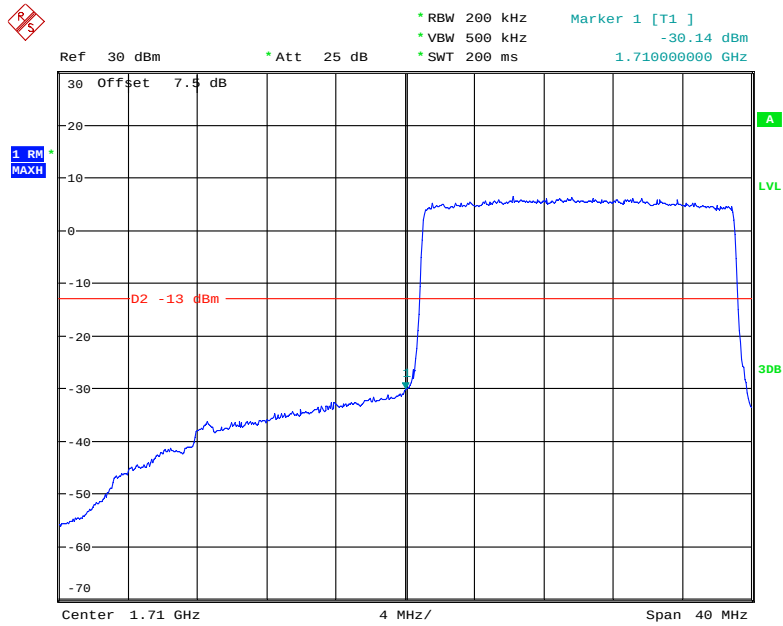
Date: 23.JUN.2018 01:48:24

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



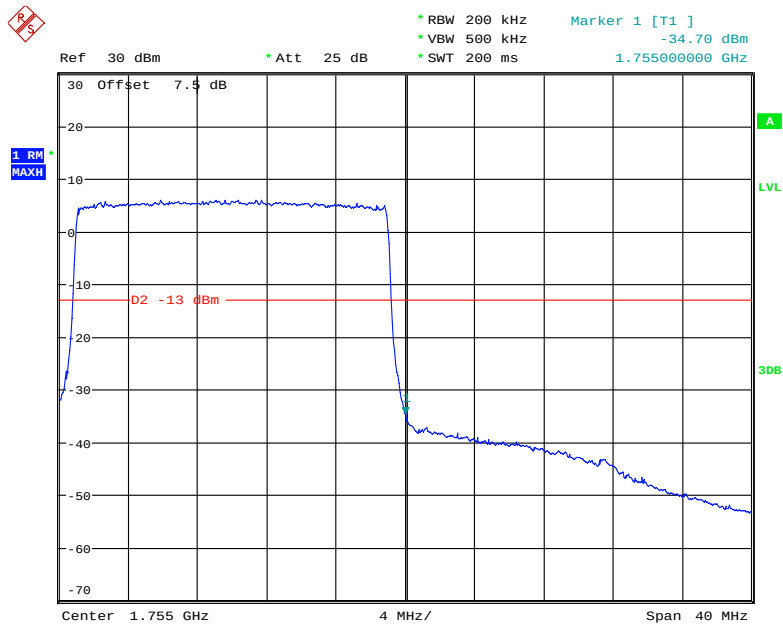
Date: 23.JUN.2018 01:49:21

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



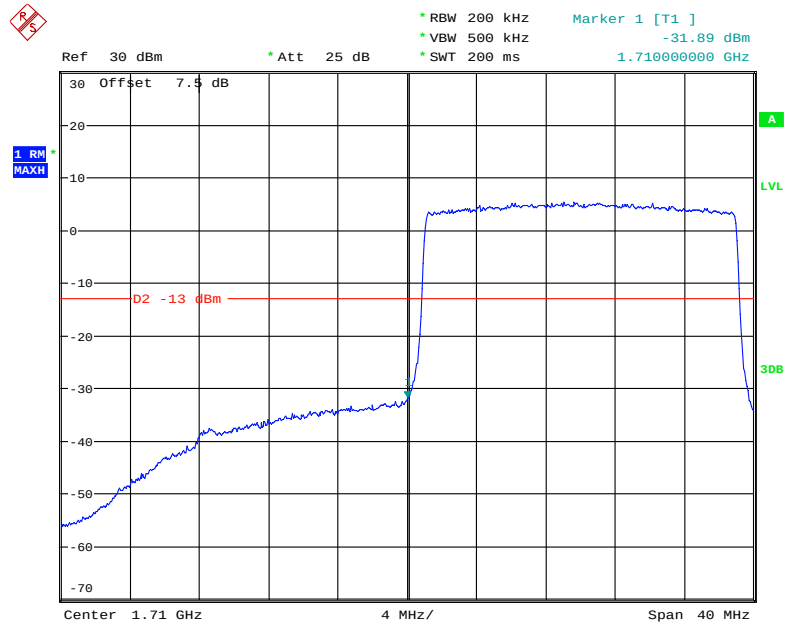
Date: 23.JUN.2018 01:54:32

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



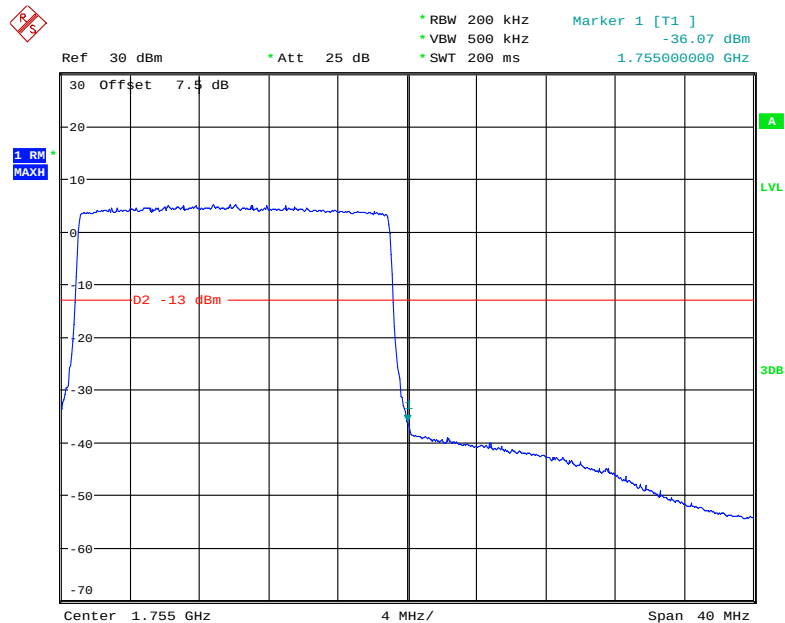
Date: 23.JUN.2018 01:52:55

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



Date: 23.JUN.2018 01:54:11

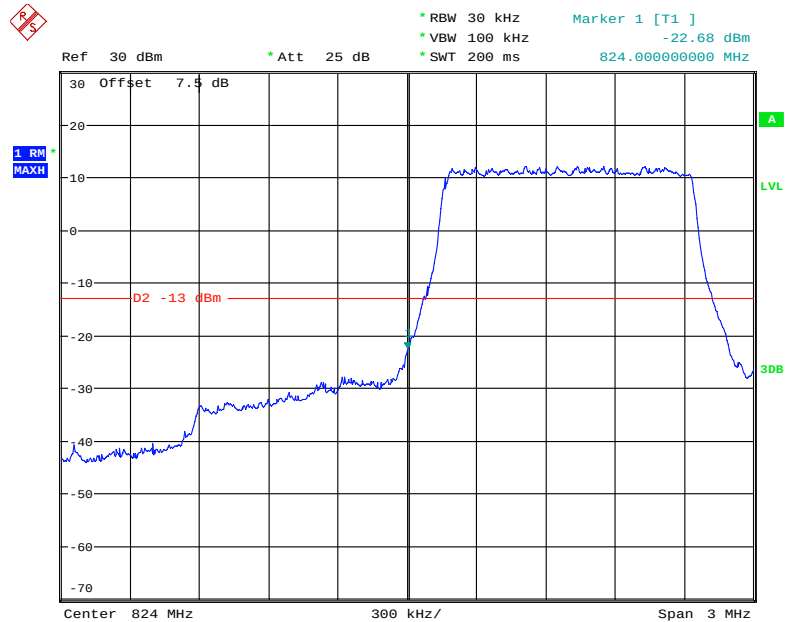
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 23.JUN.2018 01:53:23

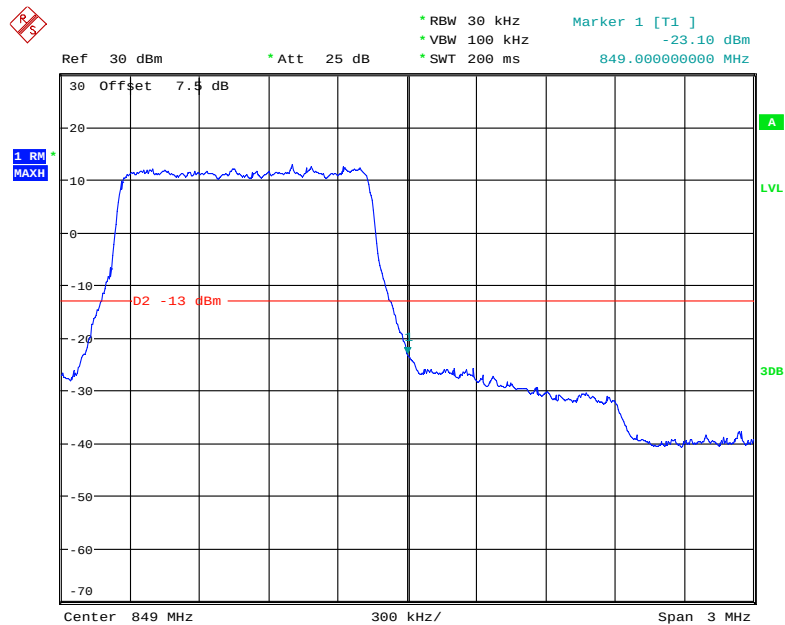
Band 5:

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



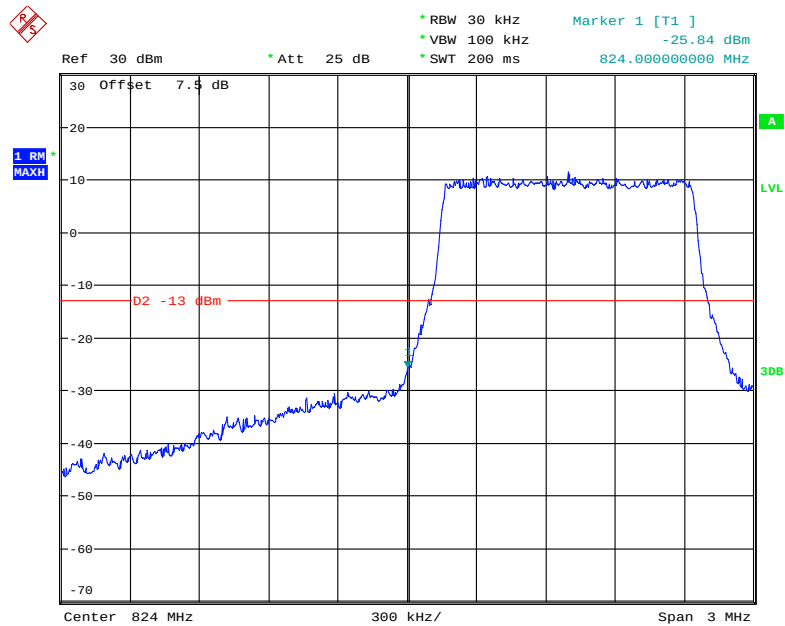
Date: 23.JUN.2018 02:04:08

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



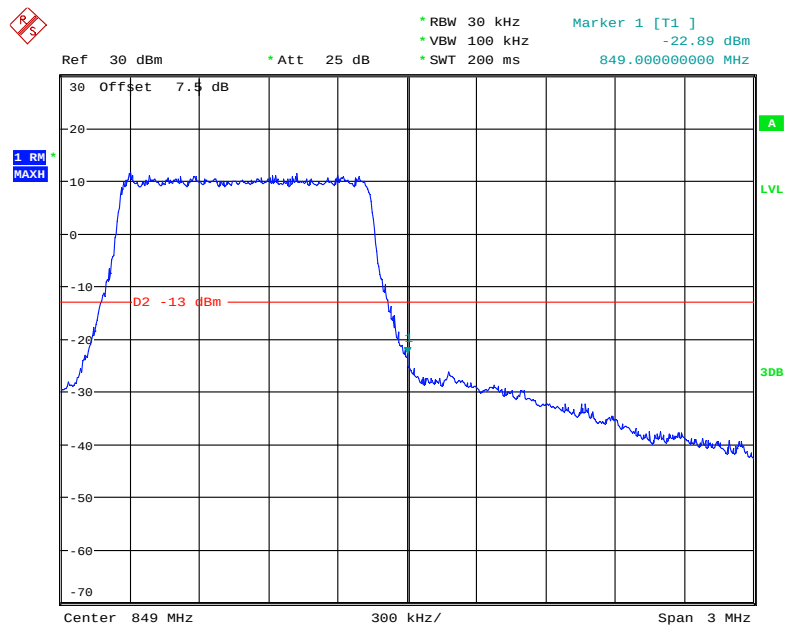
Date: 23.JUN.2018 02:09:06

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



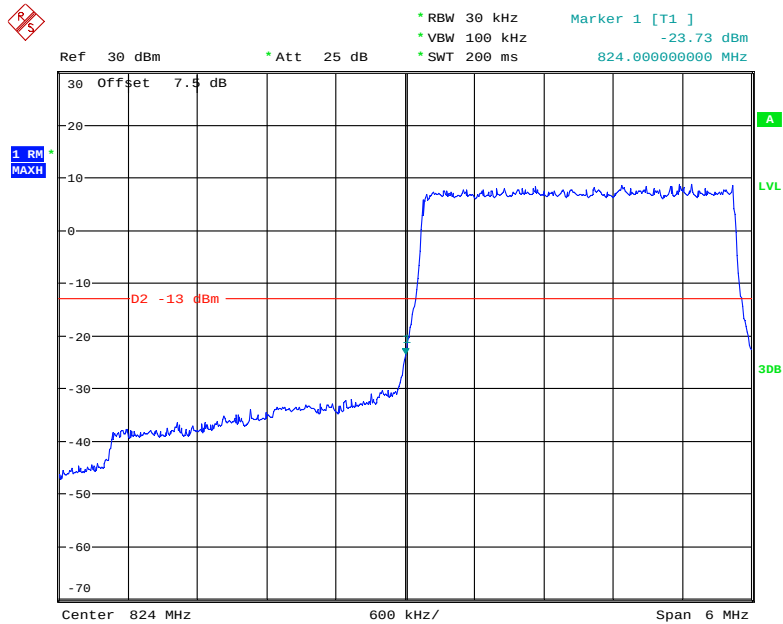
Date: 23.JUN.2018 02:04:44

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



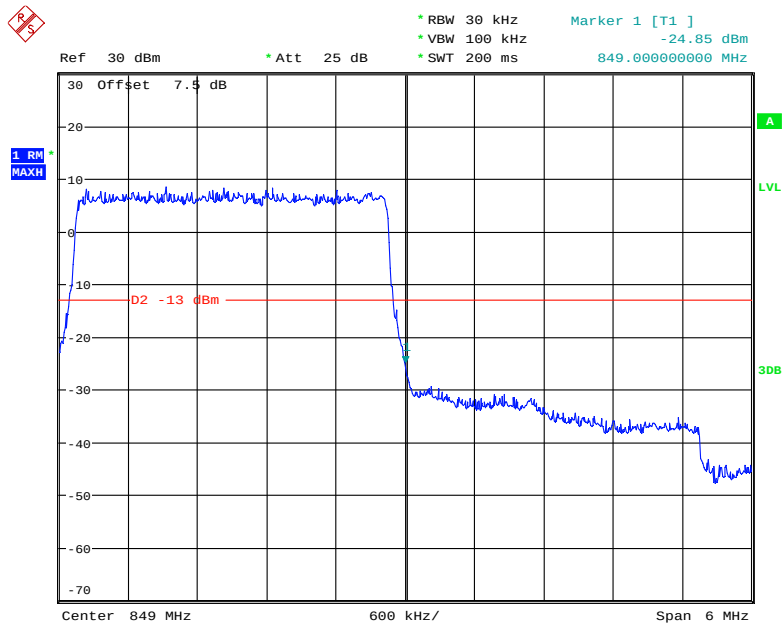
Date: 23.JUN.2018 02:09:37

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



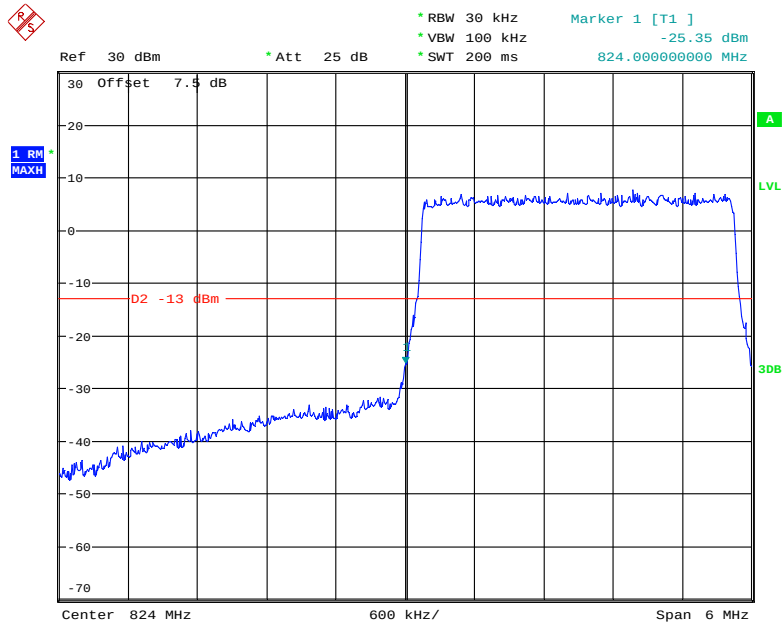
Date: 23.JUN.2018 02:12:21

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



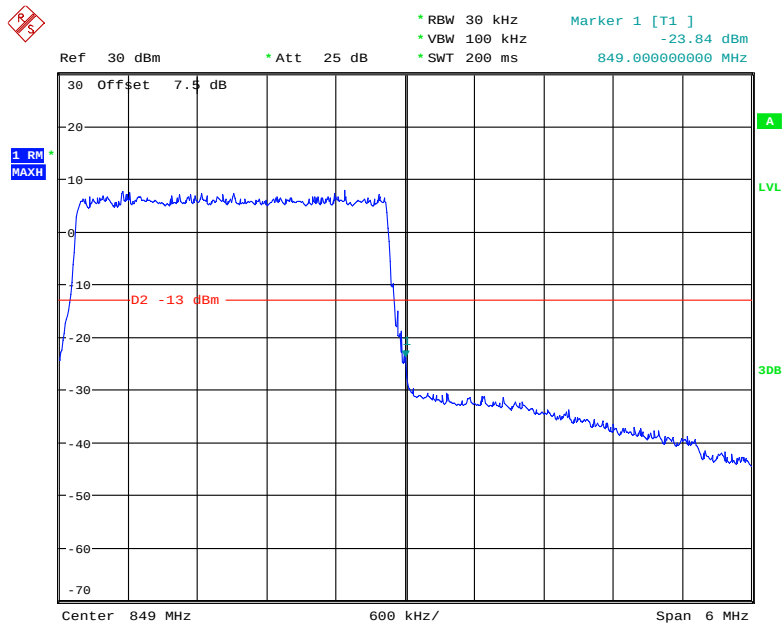
Date: 23.JUN.2018 02:11:35

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



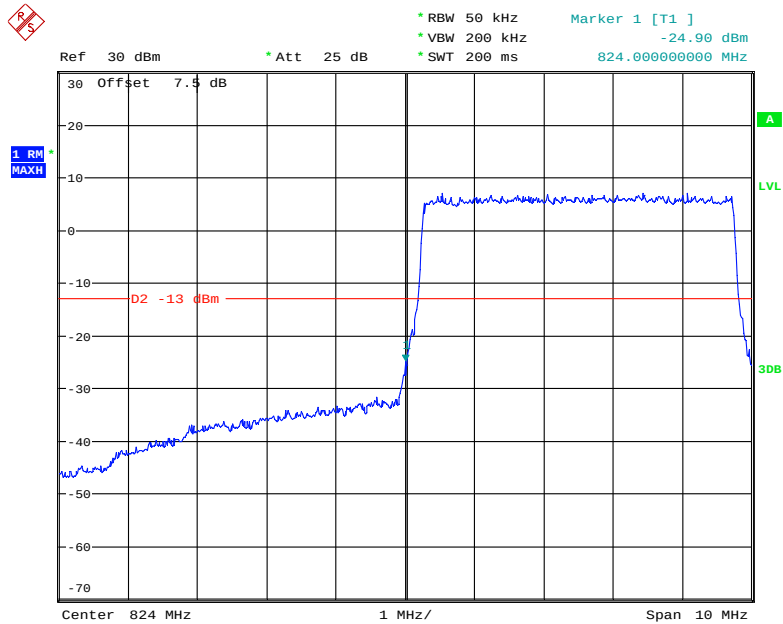
Date: 23.JUN.2018 02:12:43

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



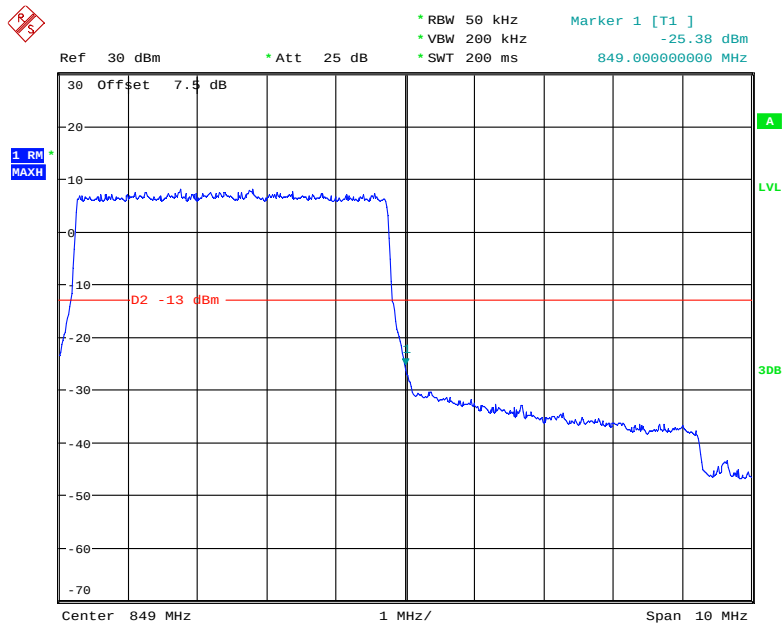
Date: 23.JUN.2018 02:11:12

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



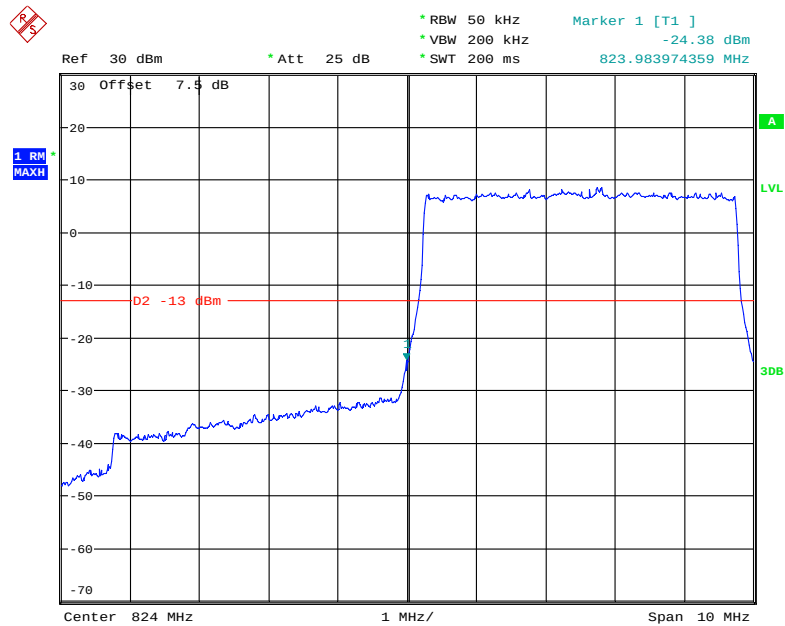
Date: 23.JUN.2018 02:14:45

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



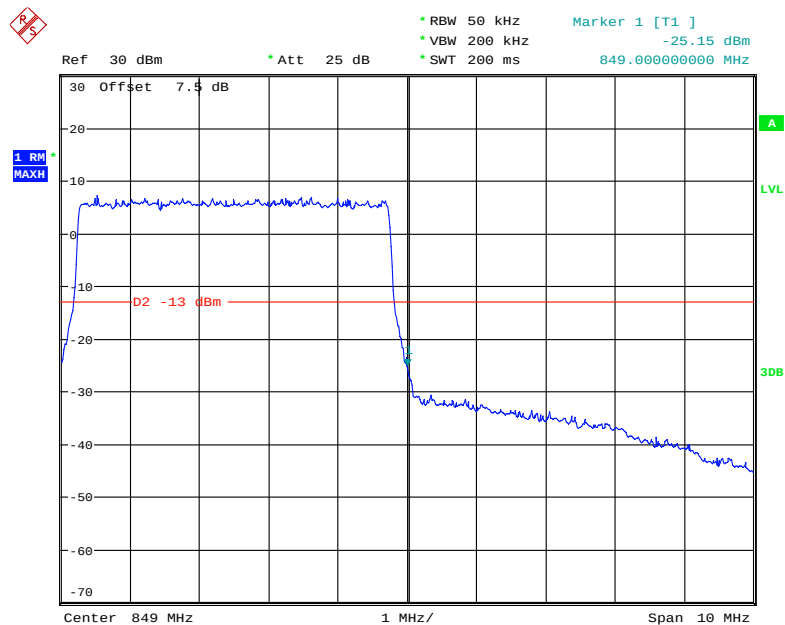
Date: 23.JUN.2018 02:17:51

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



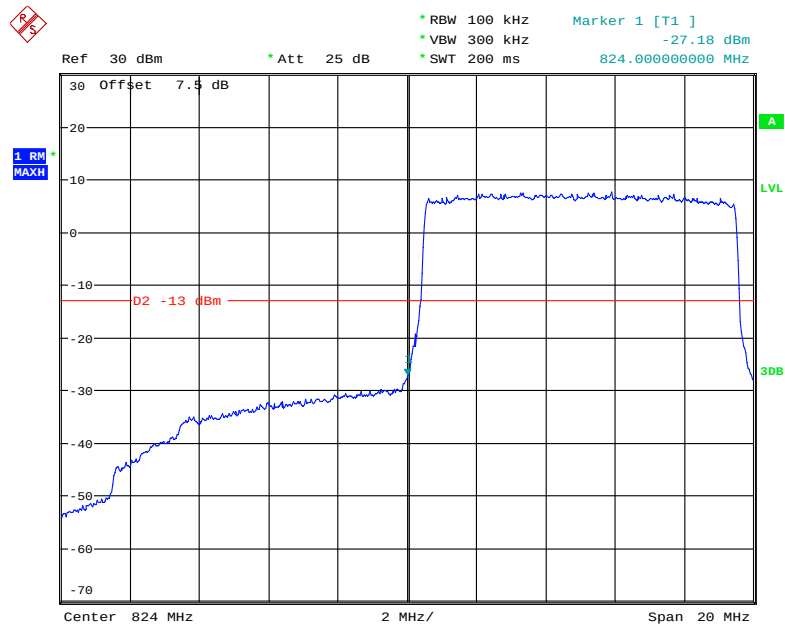
Date: 23.JUN.2018 02:14:18

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



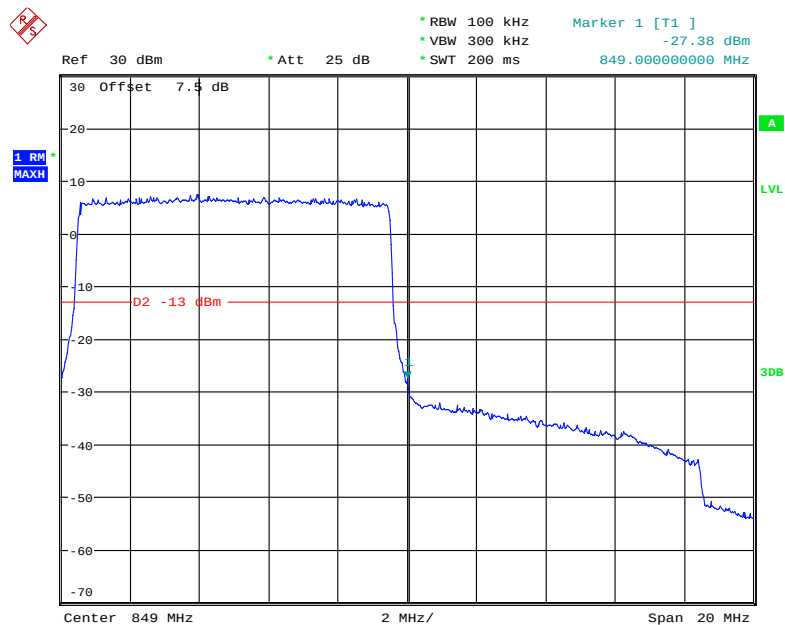
Date: 23.JUN.2018 02:17:22

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



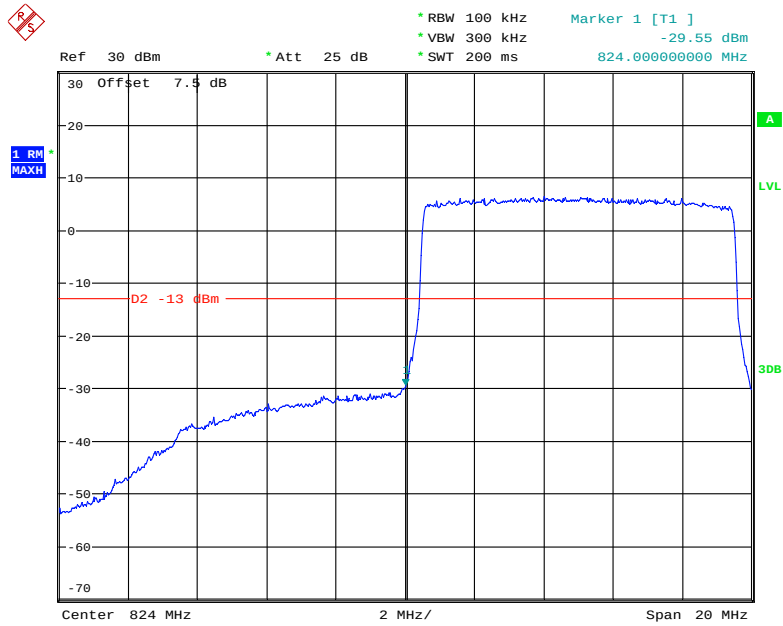
Date: 23.JUN.2018 02:20:17

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



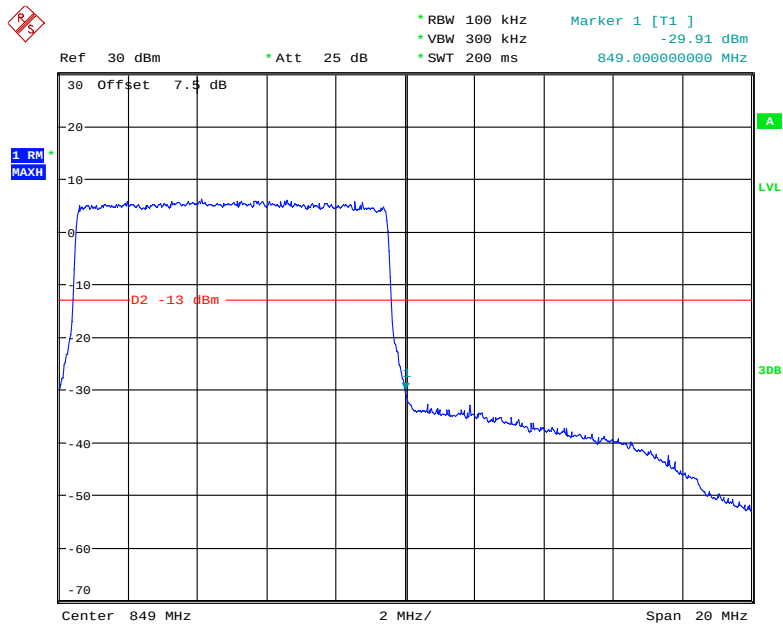
Date: 23.JUN.2018 02:19:29

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



Date: 23.JUN.2018 02:20:49

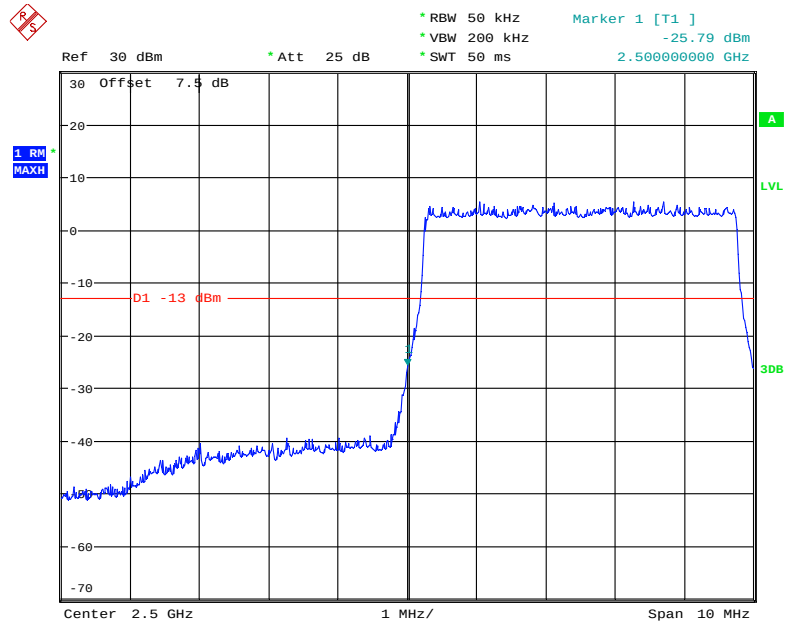
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 23.JUN.2018 02:18:55

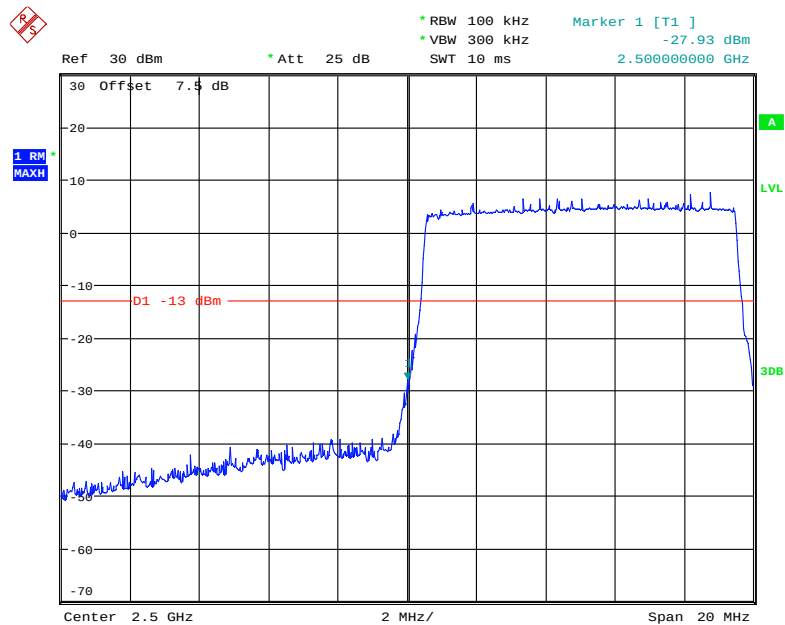
Band 7:

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



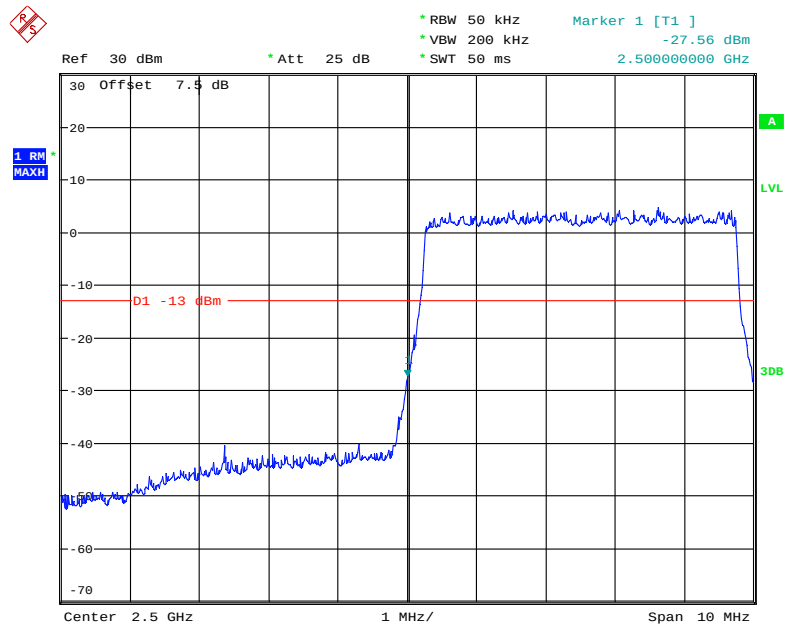
Date: 28.JUN.2018 20:06:03

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



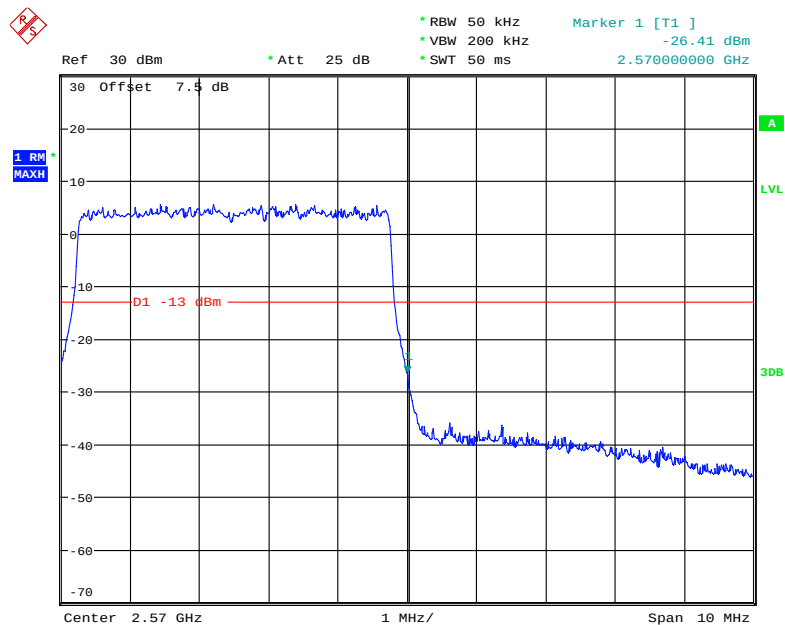
Date: 28.JUN.2018 19:49:38

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



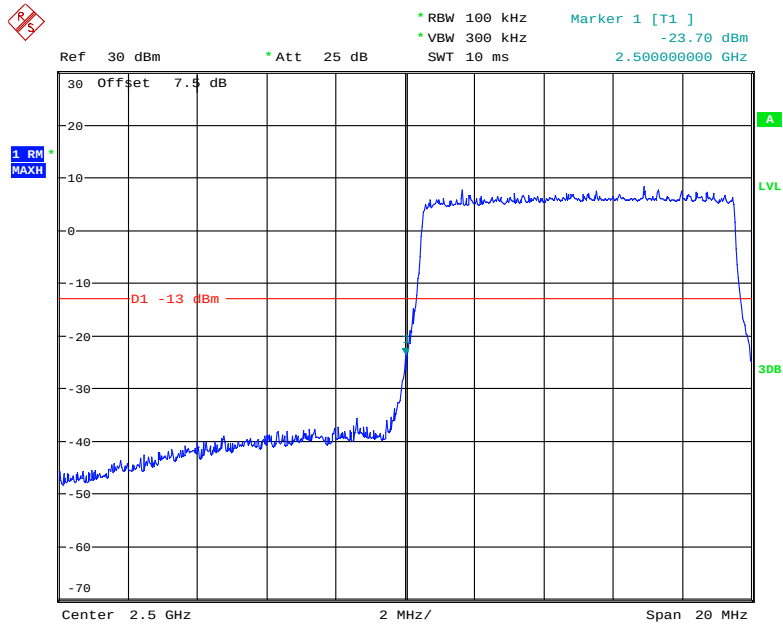
Date: 28.JUN.2018 20:04:48

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



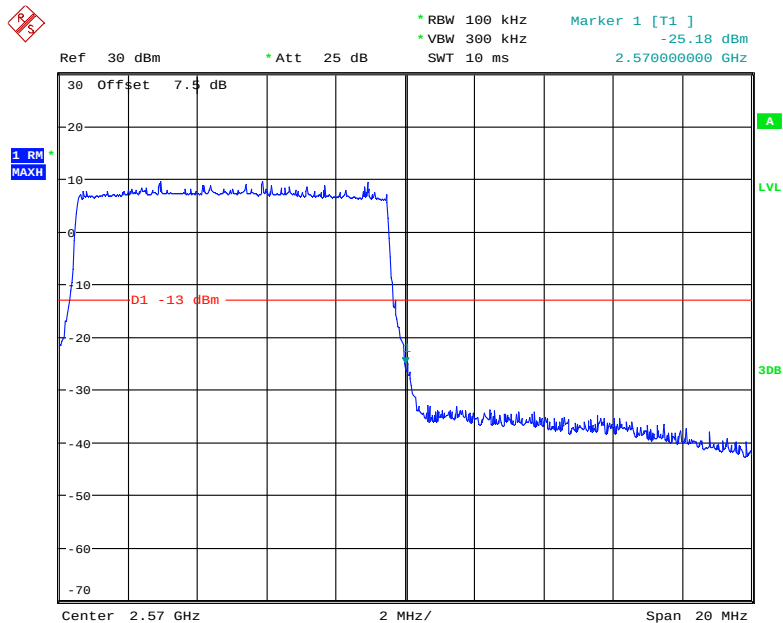
Date: 28.JUN.2018 20:02:27

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



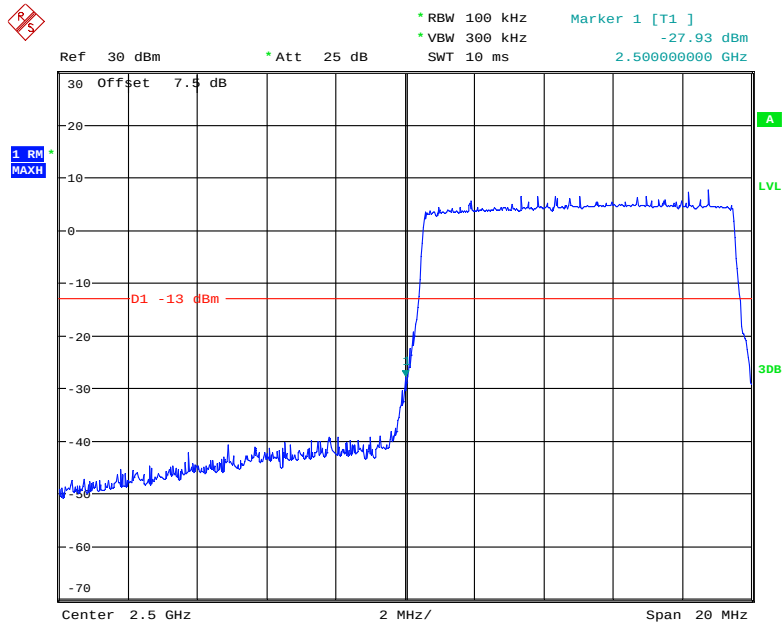
Date: 28.JUN.2018 19:47:48

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



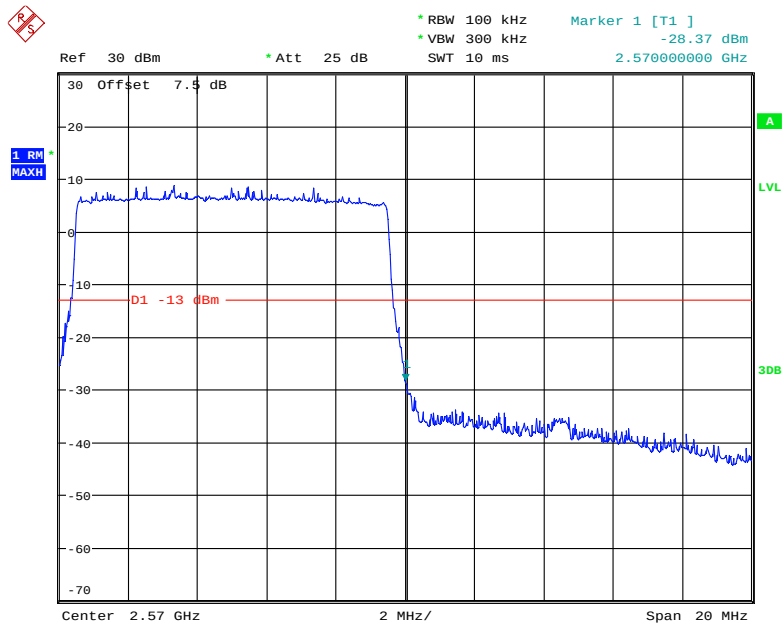
Date: 28.JUN.2018 19:55:40

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



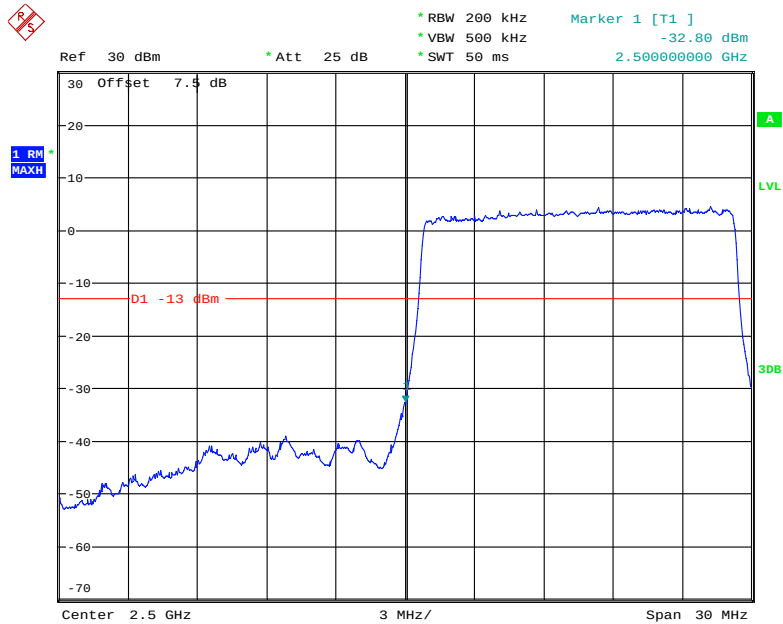
Date: 28.JUN.2018 19:49:38

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



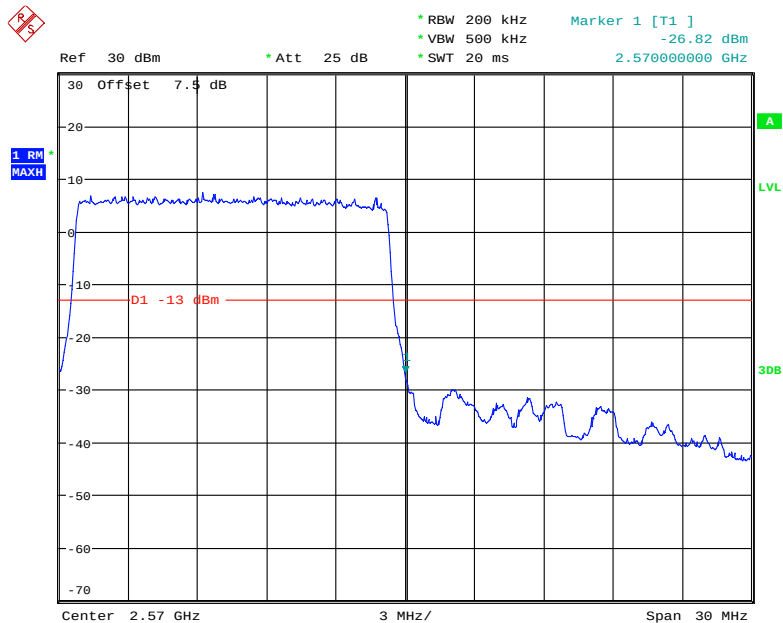
Date: 28.JUN.2018 19:54:15

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



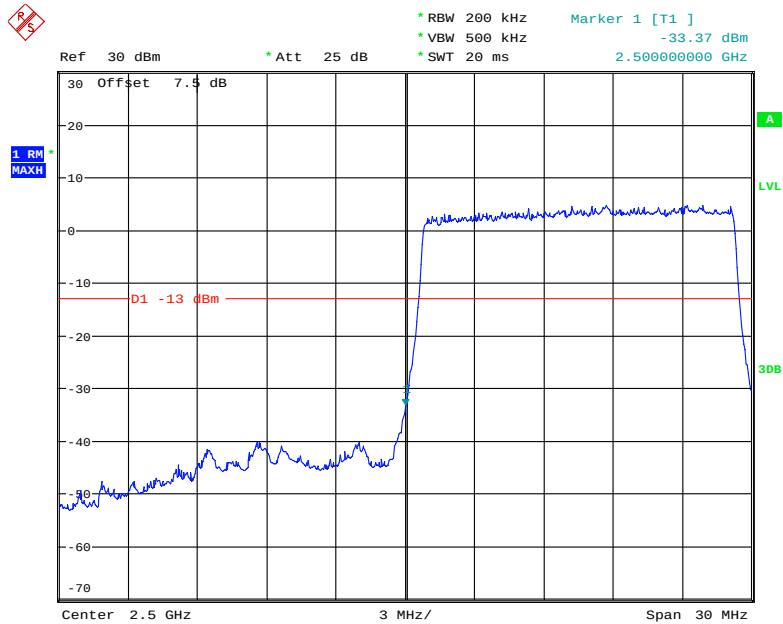
Date: 28.JUN.2018 20:08:30

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



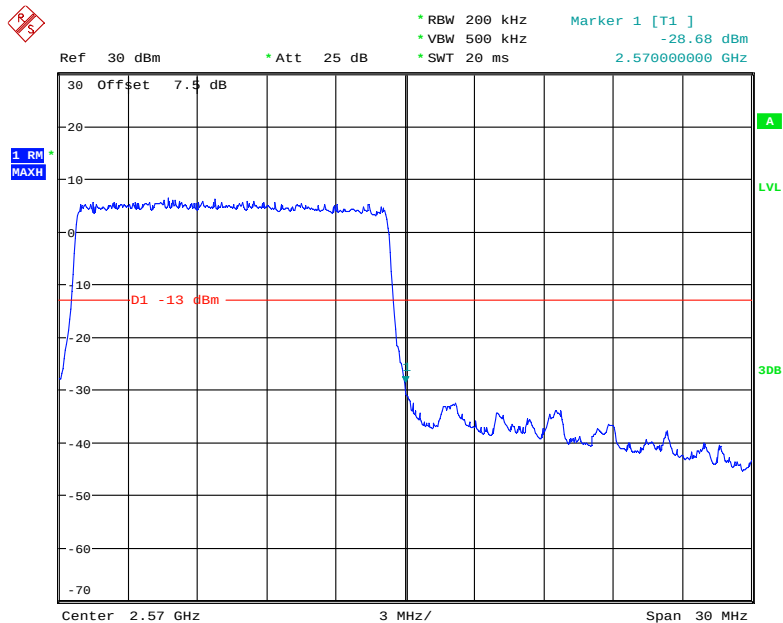
Date: 28.JUN.2018 20:12:20

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



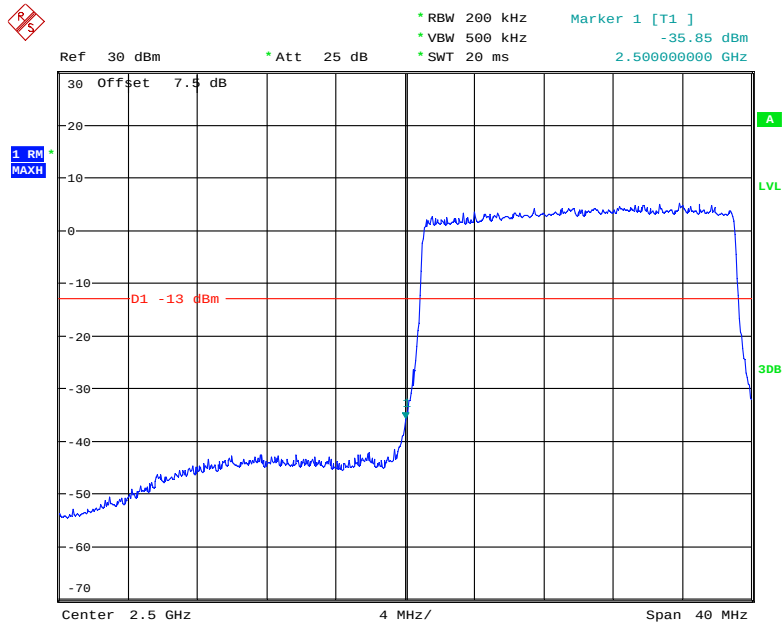
Date: 28.JUN.2018 20:09:54

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



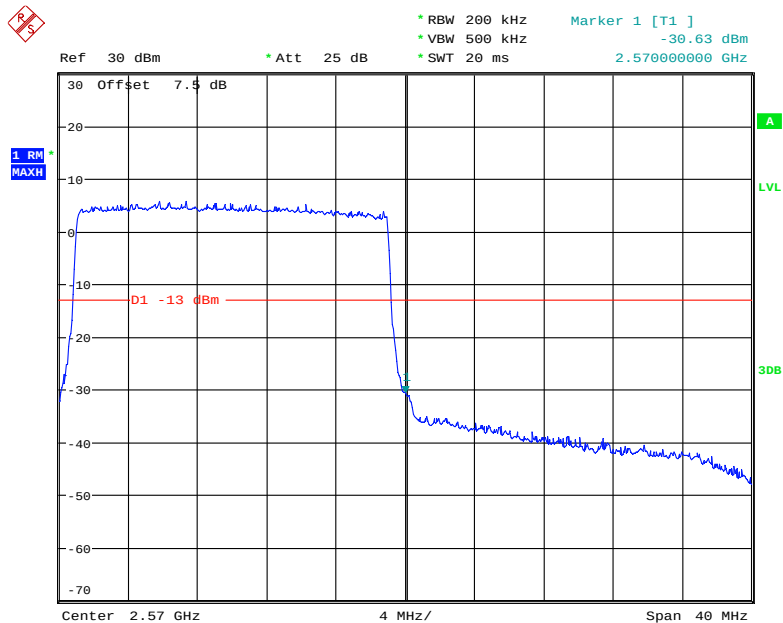
Date: 28.JUN.2018 20:11:06

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



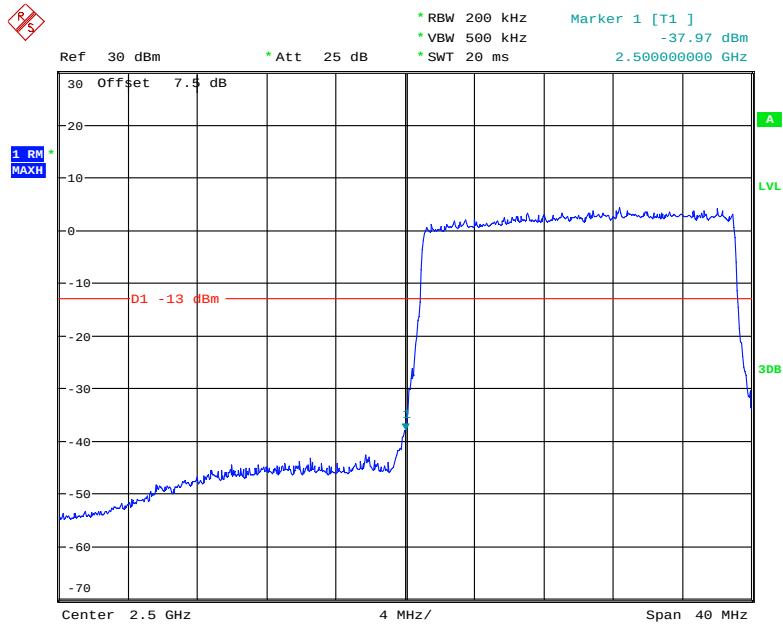
Date: 28.JUN.2018 20:19:33

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



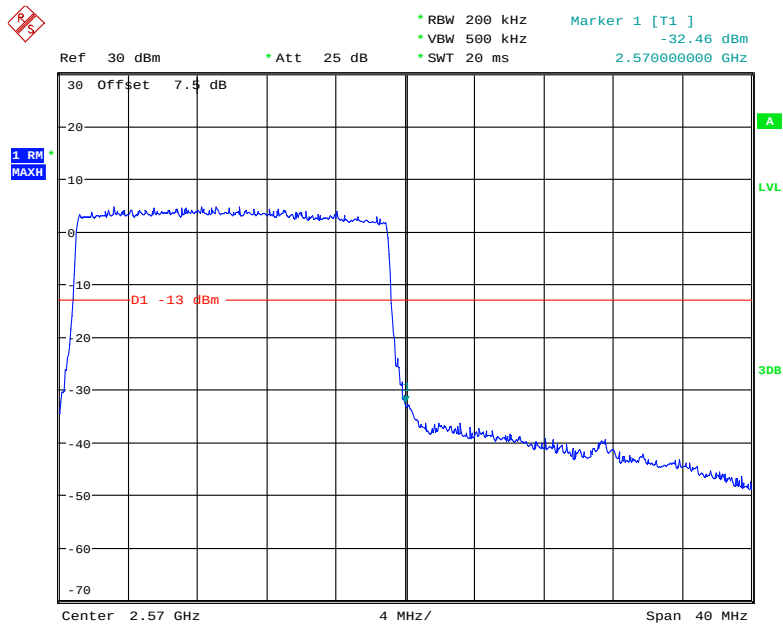
Date: 28.JUN.2018 20:16:40

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



Date: 28.JUN.2018 20:18:37

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



Date: 28.JUN.2018 20:17:29

FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY**Applicable Standard**

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

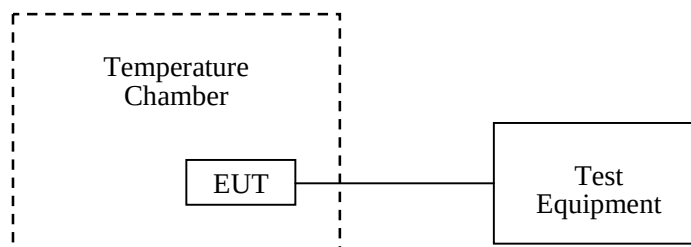
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Bibo Zhang on 2018-06-21.

EUT operation mode: Transmitting

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

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

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V_{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	120	16	0.019125	2.5
-20		15	0.017930	2.5
-10		17	0.020320	2.5
0		14	0.016734	2.5
10		16	0.019125	2.5
20		20	0.023906	2.5
30		16	0.019125	2.5
40		15	0.017930	2.5
50		19	0.022711	2.5
25	V min.= 102	16	0.019125	2.5
	V max.= 138	17	0.020320	2.5

EDGE Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	120	13	0.015539	2.5
-20		14	0.016734	2.5
-10		11	0.013148	2.5
0		13	0.015539	2.5
10		16	0.019125	2.5
20		20	0.023906	2.5
30		16	0.019125	2.5
40		14	0.016734	2.5
50		15	0.020311	2.5
25	V min.= 102	17	0.020320	2.5
	V max.= 138	16	0.019125	2.5

WCDMA Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	120	-1	-0.001195	2.5
-20		-2	-0.002391	2.5
-10		2	0.002391	2.5
0		1	0.001195	2.5
10		2	0.002391	2.5
20		0	0.000000	2.5
30		-1	-0.001195	2.5
40		-2	-0.002391	2.5
50		1	0.001195	2.5
25	V min.= 102	2	0.002391	2.5
	V max.= 138	1	0.001195	2.5

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

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V_{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	2	0.001064	pass
-20		3	0.001596	pass
-10		2	0.001064	pass
0		1	0.000532	pass
10		3	0.001596	pass
20		5	0.002660	pass
30		-2	-0.001064	pass
40		3	0.001596	pass
50		4	0.002128	pass
25	V min.= 102	2	0.001064	pass
	V max.= 138	3	0.001596	pass

EDGE Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V_{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	120	-3	-0.001596	pass
-20		1	0.000532	pass
-10		2	0.001064	pass
0		2	0.001064	pass
10		-2	-0.001064	pass
20		-5	-0.002660	pass
30		-2	-0.001064	pass
40		2	0.001064	pass
50		-2	-0.001064	pass
25	V min.= 102	2	0.001064	pass
	V max.= 138	-3	-0.001596	pass

WCDMA Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V_{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	-1	-0.000532	pass
-20		1	0.000532	pass
-10		2	0.001064	pass
0		1	0.000532	pass
10		-1	-0.000532	pass
20		2	0.001064	pass
30		1	0.000532	pass
40		2	0.001064	pass
50		1	0.000532	pass
25	V min.= 102	2	0.001064	pass
	V max.= 138	-1	-0.000532	pass

LTE:
QPSK:

Band 4:

Temperature (°C)	Power Supplied (V_{AC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	120	1710.3179	1754.6822	1710	1755
-20		1710.3140	1754.6837	1710	1755
-10		1710.3135	1754.6840	1710	1755
0		1710.3142	1754.6838	1710	1755
10		1710.3151	1754.6840	1710	1755
20		1710.3139	1754.6836	1710	1755
30		1710.3130	1754.6855	1710	1755
40		1710.3160	1754.6836	1710	1755
50		1710.3126	1754.6873	1710	1755
25	V min.= 102	1710.3149	1754.6860	1710	1755
	V max.= 138	1710.3150	1754.6867	1710	1755

Band 5:

10.0 MHz Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	-5.39	-0.0064	2.5
-20		-0.93	-0.0011	2.5
-10		-1.79	-0.0021	2.5
0		-3.98	-0.0048	2.5
10		-3.71	-0.0044	2.5
20		-1.80	-0.0022	2.5
30		-6.43	-0.0077	2.5
40		-2.82	-0.0034	2.5
50		-5.06	-0.0060	2.5
20	V min.= 102	-0.60	-0.0007	2.5
	V max.= 138	1.30	0.0016	2.5

Band 7

Temperature (°C)	Power Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	2500.3444	2569.7633	2500	2570
-20		2500.3523	2569.7635	2500	2570
-10		2500.3553	2569.7653	2500	2570
0		2500.3565	2569.7626	2500	2570
10		2500.354	2569.7634	2500	2570
20		2500.3471	2569.7643	2500	2570
30		2500.3434	2569.7643	2500	2570
40		2500.3543	2569.7632	2500	2570
50		2500.3465	2569.7955	2500	2570
25	V min.= 102	2500.3431	2569.7623	2500	2570
	V max.= 138	2500.3466	2569.7642	2500	2570

16QAM:**Band 4:**

Temperature (°C)	Power Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	1710.3187	1754.6880	1710	1755
-20		1710.3125	1754.6865	1710	1755
-10		1710.3143	1754.6875	1710	1755
0		1710.3140	1754.6860	1710	1755
10		1710.3169	1754.6834	1710	1755
20		1710.3171	1754.6856	1710	1755
30		1710.3139	1754.6847	1710	1755
40		1710.3126	1754.6868	1710	1755
50		1710.3128	1754.6869	1710	1755
25	V min.= 102	1710.3164	1754.6881	1710	1755
	V max.= 138	1710.3172	1754.6883	1710	1755

Band 5:

10.0 MHz Middle Channel, f ₀ = 836.6MHz				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	2.24	0.0027	2.5
-20		2.02	0.0024	2.5
-10		4.15	0.0050	2.5
0		-0.90	-0.0011	2.5
10		1.21	0.0014	2.5
20		2.41	0.0029	2.5
30		-1.87	-0.0022	2.5
40		1.90	0.0023	2.5
50		1.92	0.0023	2.5
20	V min.= 102	1.64	0.0020	2.5
	V max.= 138	-0.51	-0.0006	2.5

Band 7:

Temperature (°C)	Power Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	2500.3489	2569.7639	2500	2570
-20		2500.3504	2569.7634	2500	2570
-10		2500.3527	2569.7636	2500	2570
0		2500.3541	2569.7666	2500	2570
10		2500.348	2569.7630	2500	2570
20		2500.3474	2569.7655	2500	2570
30		2500.3462	2569.7643	2500	2570
40		2500.3508	2569.7614	2500	2570
50		2500.3489	2569.7959	2500	2570
25	V min.= 102	2500.3484	2569.7659	2500	2570
	V max.= 138	2500.3477	2569.7648	2500	2570

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