

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

For

KRIPTO MOBILE CORPORATION

7236 NW 31ST ST., MIAMI Florida United States

FCC ID: 2APX7K550A

Report Type: Original Report	Product Type: Mobile phone
Report Number: <u>RSZ180620007-00D</u>	
Report Date: <u>2018-07-24</u>	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *KRIPTO MOBILE CORPORATION*'s product, model number: *K55 (FCC ID: 2APX7K550A)* or the "EUT" in this report was a *Mobile phone*, which was measured approximately: 14.7cm (L) * 7.0 cm (W) * 0.8 cm (H), rated with input voltage: DC 3.8V from battery or DC 5.0 V from adapter.

Adapter Information:

Model: C550

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

Output: 5.0 V, 1.0 A

**All measurement and test data in this report was gathered from production sample serial number: 180620007. (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-06-20.*

Objective

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

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS, Part 15.247 DTS and Part 15B JBP submissions with FCC ID: 2APX7K550A.

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.

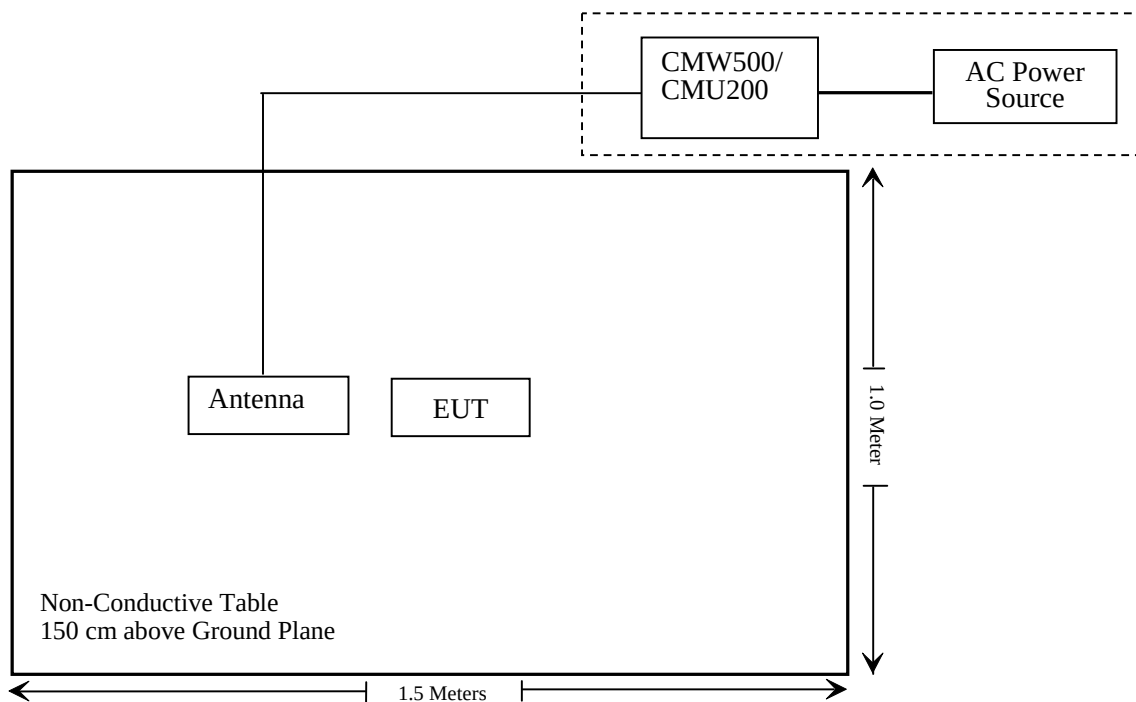
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (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

Note: * Please refer to SAR report released by BACL, report number: RSZ180620007-20A

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017-12-22	2020-12-21
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2018-04-24	2019-04-24
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2018-05-21	2019-05-21
HP	Amplifier	HP8447E	1937A01046	2018-05-21	2018-11-19
Anritsu	Signal Generator	68369B	004114	2017-12-24	2018-12-24
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2018-01-11	2019-01-11
COM POWER	Dipole Antenna	AD-100	041000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2018-05-21	2018-11-19
Ducommun technologies	RF Cable	104PEA	218124002	2018-05-21	2018-11-19
Ducommun technologies	RF Cable	RG-214	1	2018-05-21	2018-11-19
Ducommun technologies	RF Cable	RG-214	2	2018-05-22	2018-11-22
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2017-12-29	2020-12-28
Ducommun technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2017-12-24	2018-12-24
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2017-12-21	2018-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
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	
Ducommun technologies	RF Cable	RG-214	4	Each Time	
WEINSCHTEL	10dB Attenuator	5324	AU 3842	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).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ180620007-20A.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50(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.

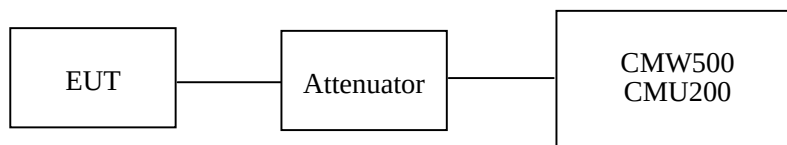
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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 Tracy Hu on 2018-07-08.

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

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.02	38.45
	190	836.6	31.71	38.45
	251	848.8	31.11	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.00	30.83	28.78	27.55	38.45
	190	836.6	31.72	30.63	28.53	27.32	38.45
	251	848.8	31.08	30.06	28.02	26.86	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	25.25	23.93	21.61	19.87	38.45
	190	836.6	25.28	23.76	21.59	20.09	38.45
	251	848.8	25.27	24.08	21.46	20.18	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		22.61	22.50	22.54
		HSDPA	1	21.44	21.31	21.37
			2	21.52	21.35	21.40
			3	21.57	21.38	21.42
			4	21.60	21.42	21.48
		HSUPA	1	21.05	20.91	20.98
			2	21.11	20.95	21.01
			3	21.16	20.99	21.08
			4	21.21	21.01	21.13
			5	21.23	21.08	21.16
		HSPA+	1	21.31	21.11	21.19

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.2	33
	661	1880.0	28.9	33
	810	1909.8	28.4	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.83	27.06	25.37	24.17	33
	661	1880.0	28.56	26.82	25.13	23.98	33
	810	1909.8	28.02	26.50	24.85	23.72	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	24.45	22.86	20.60	18.55	33
	661	1880.0	24.34	22.77	20.42	18.58	33
	810	1909.8	23.66	22.05	19.54	18.02	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		22.16	21.54	20.84
		HSDPA	1	22.35	21.82	20.93
			2	22.39	21.90	21.00
			3	22.43	21.93	21.07
			4	22.48	21.95	21.14
		HSUPA	1	21.99	21.68	21.00
			2	21.05	21.41	21.06
			3	21.12	21.39	21.10
			4	21.17	21.27	21.15
			5	21.23	21.24	21.17
		HSPA+	1	21.31	21.02	21.20

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

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.31	13
	Middle	0.34	13
	High	0.29	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.31	13
	Middle	0.34	13
	High	0.29	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.34	13
	Middle	3.26	13
	High	3.44	13
HSDPA (16QAM)	Low	3.68	13
	Middle	3.63	13
	High	3.62	13
HSUPA (BPSK)	Low	3.57	13
	Middle	3.50	13
	High	3.49	13
HSPA+	Low	3.52	13
	Middle	3.44	13
	High	3.72	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.41	13
	Middle	0.35	13
	High	0.33	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.44	13
	Middle	0.42	13
	High	0.38	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.37	13
	Middle	3.40	13
	High	3.42	13
HSDPA (16QAM)	Low	3.44	13
	Middle	3.39	13
	High	3.38	13
HSUPA (BPSK)	Low	3.68	13
	Middle	3.62	13
	High	3.77	13
HSPA+	Low	3.24	13
	Middle	3.61	13
	High	3.38	13

**Radiated Power
GSM Mode:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	93.07	332	1.1	H	31.0	0.7	0.0	30.30	38.45	8.15
836.6	86.01	48	1.2	V	25.6	0.7	0.0	24.90	38.45	13.55
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	91.44	157	2.0	H	21.4	1.30	9.40	29.50	33	3.5
1880.00	86.54	7	1.3	V	16.3	1.30	9.40	24.40	33	8.6

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	85.98	220	1.9	H	23.9	0.7	0.0	23.20	38.45	15.25
836.6	78.02	130	1.3	V	17.6	0.7	0.0	16.90	38.45	21.55
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	83.93	126	1.4	H	13.9	1.30	9.40	22.00	33	11.0
1880.00	81.25	333	1.6	V	11.0	1.30	9.40	19.10	33	13.9

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	83.36	313	2.2	H	21.3	0.70	0.0	20.60	38.45	17.85
836.6	78.11	24	2.4	V	17.7	0.70	0.0	17.00	38.45	21.45
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	81.83	144	1.5	H	11.8	1.30	9.40	19.90	33	13.1
1880.00	80.35	95	1.9	V	10.1	1.30	9.40	18.20	33	14.8

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	22.45	22.42	22.34
		RB Size=1, RB Offset=2	22.41	22.39	22.36
		RB Size=1, RB Offset=5	22.41	22.35	22.27
		RB Size=3, RB Offset=0	22.77	22.74	22.70
		RB Size=3, RB Offset=1	22.86	22.87	22.78
		RB Size=3, RB Offset=2	21.98	22.01	21.89
		RB Size=6, RB Offset=0	22.84	22.85	22.73
	16QAM	RB Size=1, RB Offset=0	22.22	22.18	22.07
		RB Size=1, RB Offset=2	22.24	22.13	22.03
		RB Size=1, RB Offset=5	22.23	22.12	21.99
		RB Size=3, RB Offset=0	22.63	22.55	22.48
		RB Size=3, RB Offset=1	22.75	22.62	22.54
		RB Size=3, RB Offset=2	21.78	21.71	21.63
		RB Size=6, RB Offset=0	22.69	22.60	22.48
3.0	QPSK	RB Size=1, RB Offset=0	22.83	22.83	22.78
		RB Size=1, RB Offset=7	22.76	22.74	22.69
		RB Size=1, RB Offset=14	23.13	23.13	23.08
		RB Size=8, RB Offset=0	22.57	22.51	22.45
		RB Size=8, RB Offset=4	22.58	22.57	22.53
		RB Size=8, RB Offset=7	21.72	21.65	21.57
		RB Size=15, RB Offset=0	22.29	22.22	22.18
	16QAM	RB Size=1, RB Offset=0	22.67	22.64	22.59
		RB Size=1, RB Offset=7	22.65	22.58	22.53
		RB Size=1, RB Offset=14	23.01	22.89	22.78
		RB Size=8, RB Offset=0	22.33	22.21	22.16
		RB Size=8, RB Offset=4	22.45	22.41	22.37
		RB Size=8, RB Offset=7	21.53	21.42	21.35
		RB Size=15, RB Offset=0	22.06	22.00	21.93

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.12	22.05	22.01
		RB Size=1, RB Offset=12	21.15	21.11	21.08
		RB Size=1, RB Offset=24	21.88	21.90	21.86
		RB Size=12, RB Offset=0	22.51	22.48	22.40
		RB Size=12, RB Offset=6	22.59	22.55	22.49
		RB Size=12, RB Offset=11	21.50	21.49	21.40
		RB Size=25, RB Offset=0	22.34	22.36	22.30
	16QAM	RB Size=1, RB Offset=0	21.90	21.78	21.74
		RB Size=1, RB Offset=12	20.99	20.90	20.86
		RB Size=1, RB Offset=24	21.75	21.66	21.60
		RB Size=12, RB Offset=0	22.36	22.28	22.20
		RB Size=12, RB Offset=6	22.43	22.38	22.26
		RB Size=12, RB Offset=11	21.37	21.27	21.16
		RB Size=25, RB Offset=0	22.20	22.16	22.05
10.0	QPSK	RB Size=1, RB Offset=0	22.04	21.99	21.90
		RB Size=1, RB Offset=24	22.13	22.11	22.06
		RB Size=1, RB Offset=49	22.56	22.50	22.44
		RB Size=25, RB Offset=0	22.05	22.03	21.96
		RB Size=25, RB Offset=12	21.69	21.64	21.55
		RB Size=25, RB Offset=24	21.66	21.68	21.57
		RB Size=50, RB Offset=0	20.97	20.98	20.89
	16QAM	RB Size=1, RB Offset=0	21.86	21.73	21.65
		RB Size=1, RB Offset=24	22.03	21.96	21.84
		RB Size=1, RB Offset=49	22.33	22.30	22.25
		RB Size=25, RB Offset=0	21.87	21.80	21.75
		RB Size=25, RB Offset=12	21.51	21.39	21.31
		RB Size=25, RB Offset=24	21.50	21.40	21.33
		RB Size=50, RB Offset=0	20.79	20.70	20.64

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	21.94	21.88	21.79
		RB Size=1, RB Offset=37	21.90	21.93	21.82
		RB Size=1, RB Offset=74	21.13	21.15	21.09
		RB Size=36, RB Offset=0	22.38	22.35	22.25
		RB Size=36, RB Offset=18	22.24	22.27	22.15
		RB Size=36, RB Offset=37	21.59	21.54	21.44
		RB Size=75, RB Offset=0	22.00	21.96	21.87
	16QAM	RB Size=1, RB Offset=0	21.74	21.68	21.58
		RB Size=1, RB Offset=37	21.70	21.62	21.50
		RB Size=1, RB Offset=74	21.03	20.96	20.93
		RB Size=36, RB Offset=0	22.14	22.04	21.91
		RB Size=36, RB Offset=18	22.07	22.01	21.89
		RB Size=36, RB Offset=37	21.33	21.22	21.15
		RB Size=75, RB Offset=0	21.80	21.70	21.60
20.0	QPSK	RB Size=1, RB Offset=0	21.70	21.68	21.55
		RB Size=1, RB Offset=49	21.76	21.72	21.59
		RB Size=1, RB Offset=99	22.26	22.20	22.15
		RB Size=50, RB Offset=0	21.44	21.44	21.39
		RB Size=50, RB Offset=24	21.49	21.52	21.43
		RB Size=50, RB Offset=49	21.07	21.09	20.97
		RB Size=100, RB Offset=0	22.00	21.97	21.87
	16QAM	RB Size=1, RB Offset=0	21.44	21.37	21.27
		RB Size=1, RB Offset=49	21.50	21.39	21.35
		RB Size=1, RB Offset=99	22.02	21.93	21.87
		RB Size=50, RB Offset=0	21.35	21.28	21.24
		RB Size=50, RB Offset=24	21.34	21.25	21.17
		RB Size=50, RB Offset=49	20.93	20.80	20.75
		RB Size=100, RB Offset=0	21.78	21.68	21.59

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.23	13	Pass
QPSK (100RB Size)	7.39	13	Pass
16QAM (1RB Size)	6.56	13	Pass
16QAM (100RB Size)	7.35	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	88.24	153	2.0	H	15.1	1.30	8.90	22.70	30
1732.50	83.92	143	2.4	V	11.4	1.30	8.90	19.00	30
3 MHz Bandwidth									
1732.50	87.65	284	1.7	H	14.5	1.30	8.90	22.10	30
1732.50	83.76	331	1.3	V	11.2	1.30	8.90	18.80	30
5 MHz Bandwidth									
1732.50	87.92	282	1.7	H	14.8	1.30	8.90	22.40	30
1732.50	83.41	51	2.0	V	10.8	1.30	8.90	18.40	30
10 MHz Bandwidth									
1732.50	87.54	175	1.9	H	14.4	1.30	8.90	22.00	30
1732.50	83.62	159	2.5	V	11.1	1.30	8.90	18.70	30
15 MHz Bandwidth									
1732.50	88.05	287	1.7	H	14.9	1.30	8.90	22.50	30
1732.50	83.79	283	1.5	V	11.2	1.30	8.90	18.80	30
20 MHz Bandwidth									
1732.50	87.44	325	1.5	H	14.3	1.30	8.90	21.90	30
1732.50	83.25	130	2.4	V	10.7	1.30	8.90	18.30	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	88.76	217	2.0	H	15.6	1.30	8.90	23.20	30
1732.50	83.94	15	2.4	V	11.4	1.30	8.90	19.00	30
3 MHz Bandwidth									
1732.50	88.28	300	1.3	H	15.1	1.30	8.90	22.70	30
1732.50	83.22	173	1.6	V	10.7	1.30	8.90	18.30	30
5 MHz Bandwidth									
1732.50	87.95	250	2.4	H	14.8	1.30	8.90	22.40	30
1732.50	83.64	43	1.6	V	11.1	1.30	8.90	18.70	30
10 MHz Bandwidth									
1732.50	88.24	347	2.2	H	15.1	1.30	8.90	22.70	30
1732.50	83.55	46	1.2	V	11.0	1.30	8.90	18.60	30
15 MHz Bandwidth									
1732.50	88.51	253	2.2	H	15.3	1.30	8.90	22.90	30
1732.50	83.73	4	1.4	V	11.2	1.30	8.90	18.80	30
20 MHz Bandwidth									
1732.50	89.02	333	1.1	H	15.9	1.30	8.90	23.50	30
1732.50	83.27	77	1.9	V	10.7	1.30	8.90	18.30	30

LTE Band 7:

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	22.15	22.09	21.98
		RB Size=1, RB Offset=12	21.95	21.96	21.87
		RB Size=1, RB Offset=24	21.27	21.23	21.19
		RB Size=12, RB Offset=0	22.57	22.50	22.43
		RB Size=12, RB Offset=6	22.69	22.69	22.66
		RB Size=12, RB Offset=11	22.08	22.03	21.92
		RB Size=25, RB Offset=0	22.42	22.36	22.25
	16QAM	RB Size=1, RB Offset=0	21.94	21.82	21.79
		RB Size=1, RB Offset=12	21.80	21.75	21.64
		RB Size=1, RB Offset=24	21.07	20.95	20.90
		RB Size=12, RB Offset=0	22.33	22.23	22.11
		RB Size=12, RB Offset=6	22.60	22.52	22.39
		RB Size=12, RB Offset=11	21.85	21.77	21.74
		RB Size=25, RB Offset=0	22.21	22.13	22.07
10.0	QPSK	RB Size=1, RB Offset=0	22.27	22.22	22.15
		RB Size=1, RB Offset=24	21.89	21.91	21.85
		RB Size=1, RB Offset=49	22.53	22.53	22.41
		RB Size=25, RB Offset=0	22.14	22.15	22.06
		RB Size=25, RB Offset=12	21.84	21.83	21.73
		RB Size=25, RB Offset=24	21.72	21.74	21.70
		RB Size=50, RB Offset=0	22.36	22.38	22.33
	16QAM	RB Size=1, RB Offset=0	22.05	22.00	21.92
		RB Size=1, RB Offset=24	21.75	21.62	21.58
		RB Size=1, RB Offset=49	22.33	22.24	22.14
		RB Size=25, RB Offset=0	21.99	21.95	21.90
		RB Size=25, RB Offset=12	21.63	21.53	21.42
		RB Size=25, RB Offset=24	21.59	21.47	21.42
		RB Size=50, RB Offset=0	22.29	22.25	22.20

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	21.85	21.82	21.76
		RB Size=1, RB Offset=37	21.40	21.39	21.29
		RB Size=1, RB Offset=74	21.65	21.66	21.62
		RB Size=36, RB Offset=0	21.95	21.92	21.86
		RB Size=36, RB Offset=18	22.21	22.15	22.07
		RB Size=36, RB Offset=37	21.30	21.32	21.23
		RB Size=75, RB Offset=0	22.02	21.98	21.85
	16QAM	RB Size=1, RB Offset=0	21.64	21.53	21.42
		RB Size=1, RB Offset=37	21.21	21.13	21.06
		RB Size=1, RB Offset=74	21.52	21.43	21.31
		RB Size=36, RB Offset=0	21.76	21.66	21.63
		RB Size=36, RB Offset=18	21.96	21.88	21.79
		RB Size=36, RB Offset=37	21.11	21.01	20.90
		RB Size=75, RB Offset=0	21.79	21.69	21.61
20.0	QPSK	RB Size=1, RB Offset=0	21.87	21.84	21.80
		RB Size=1, RB Offset=49	21.94	21.93	21.88
		RB Size=1, RB Offset=99	22.05	22.07	21.95
		RB Size=50, RB Offset=0	21.72	21.71	21.61
		RB Size=50, RB Offset=24	21.93	21.91	21.85
		RB Size=50, RB Offset=49	21.41	21.36	21.32
		RB Size=100, RB Offset=0	21.97	21.96	21.86
	16QAM	RB Size=1, RB Offset=0	21.74	21.64	21.54
		RB Size=1, RB Offset=49	21.80	21.73	21.61
		RB Size=1, RB Offset=99	21.86	21.82	21.72
		RB Size=50, RB Offset=0	21.58	21.51	21.38
		RB Size=50, RB Offset=24	21.73	21.64	21.57
		RB Size=50, RB Offset=49	21.24	21.20	21.09
		RB Size=100, RB Offset=0	21.73	21.66	21.60

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.33	13	Pass
QPSK (100RB Size)	6.21	13	Pass
16QAM (1RB Size)	5.26	13	Pass
16QAM (100RB Size)	6.11	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	78.32	138	2.3	H	8.8	2.60	10.20	16.40	33
2535.00	81.51	232	1.1	V	12.6	2.60	10.20	20.20	33
10 MHz Bandwidth									
2535.00	78.91	169	2.5	H	9.4	2.60	10.20	17.00	33
2535.00	81.84	180	1.3	V	13.0	2.60	10.20	20.60	33
15 MHz Bandwidth									
2535.00	80.74	152	1.1	H	11.3	2.60	10.20	18.90	33
2535.00	82.19	339	1.3	V	13.3	2.60	10.20	20.90	33
20 MHz Bandwidth									
2535.00	80.61	322	2.4	H	11.1	2.60	10.20	18.70	33
2535.00	81.56	93	1.7	V	12.7	2.60	10.20	20.30	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	80.69	98	1.4	H	11.2	2.60	10.20	18.80	33
2535.00	81.72	275	2.0	V	12.8	2.60	10.20	20.40	33
10 MHz Bandwidth									
2535.00	80.79	313	2.0	H	11.3	2.60	10.20	18.90	33
2535.00	81.33	329	2.1	V	12.5	2.60	10.20	20.10	33
15 MHz Bandwidth									
2535.00	80.82	131	1.1	H	11.3	2.60	10.20	18.90	33
2535.00	81.95	155	2.3	V	13.1	2.60	10.20	20.70	33
20 MHz Bandwidth									
2535.00	79.31	359	2.5	H	9.8	2.60	10.20	17.40	33
2535.00	81.33	40	2.4	V	12.5	2.60	10.20	20.10	33

LTE Band 12:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.56	22.51	22.42
		RB Size=1, RB Offset=2	21.86	21.83	21.78
		RB Size=1, RB Offset=5	21.58	21.53	21.43
		RB Size=3, RB Offset=0	22.78	22.73	22.63
		RB Size=3, RB Offset=1	22.79	22.77	22.66
		RB Size=3, RB Offset=2	22.20	22.16	22.12
		RB Size=6, RB Offset=0	22.99	22.97	22.85
	16QAM	RB Size=1, RB Offset=0	22.33	22.29	22.21
		RB Size=1, RB Offset=2	21.67	21.60	21.51
		RB Size=1, RB Offset=5	21.39	21.35	21.22
		RB Size=3, RB Offset=0	22.54	22.49	22.36
		RB Size=3, RB Offset=1	22.55	22.46	22.33
		RB Size=3, RB Offset=2	21.99	21.91	21.85
		RB Size=6, RB Offset=0	22.76	22.71	22.58
3.0	QPSK	RB Size=1, RB Offset=0	22.76	22.71	22.65
		RB Size=1, RB Offset=7	22.52	22.54	22.50
		RB Size=1, RB Offset=14	23.03	22.97	22.84
		RB Size=8, RB Offset=0	22.50	22.44	22.38
		RB Size=8, RB Offset=4	22.86	22.80	22.69
		RB Size=8, RB Offset=7	22.35	22.34	22.30
		RB Size=15, RB Offset=0	22.33	22.28	22.20
	16QAM	RB Size=1, RB Offset=0	22.52	22.46	22.37
		RB Size=1, RB Offset=7	22.39	22.29	22.16
		RB Size=1, RB Offset=14	22.80	22.76	22.70
		RB Size=8, RB Offset=0	22.30	22.27	22.21
		RB Size=8, RB Offset=4	22.64	22.60	22.53
		RB Size=8, RB Offset=7	22.17	22.07	21.97
		RB Size=15, RB Offset=0	22.08	22.04	21.93

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.11	21.14	21.10
		RB Size=1, RB Offset=12	20.20	20.19	20.12
		RB Size=1, RB Offset=24	21.06	21.06	21.02
		RB Size=12, RB Offset=0	21.58	21.57	21.46
		RB Size=12, RB Offset=6	21.26	21.25	21.17
		RB Size=12, RB Offset=11	20.52	20.51	20.45
		RB Size=25, RB Offset=0	21.37	21.37	21.27
	16QAM	RB Size=1, RB Offset=0	21.04	20.95	20.88
		RB Size=1, RB Offset=12	20.05	19.97	19.85
		RB Size=1, RB Offset=24	20.94	20.86	20.81
		RB Size=12, RB Offset=0	21.39	21.27	21.20
		RB Size=12, RB Offset=6	21.06	20.98	20.90
		RB Size=12, RB Offset=11	20.42	20.36	20.32
		RB Size=25, RB Offset=0	21.19	21.10	21.06
10.0	QPSK	RB Size=1, RB Offset=0	21.17	21.13	21.01
		RB Size=1, RB Offset=24	21.04	21.06	21.00
		RB Size=1, RB Offset=49	21.63	21.64	21.60
		RB Size=25, RB Offset=0	20.90	20.93	20.82
		RB Size=25, RB Offset=12	20.99	20.93	20.84
		RB Size=25, RB Offset=24	20.49	20.49	20.36
		RB Size=50, RB Offset=0	20.96	20.99	20.88
	16QAM	RB Size=1, RB Offset=0	20.89	20.77	20.69
		RB Size=1, RB Offset=24	20.93	20.89	20.77
		RB Size=1, RB Offset=49	21.54	21.49	21.38
		RB Size=25, RB Offset=0	20.72	20.66	20.56
		RB Size=25, RB Offset=12	20.78	20.71	20.67
		RB Size=25, RB Offset=24	20.29	20.25	20.20
		RB Size=50, RB Offset=0	20.78	20.68	20.57

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.41	13	Pass
QPSK (100RB Size)	6.29	13	Pass
16QAM (1RB Size)	5.17	13	Pass
16QAM(50RB Size)	6.54	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	78.05	28	1.1	H	15.1	0.62	0.0	14.48	34.77
707.5	82.36	103	2.4	V	21.4	0.62	0.0	20.78	34.77
3 MHz Bandwidth									
707.5	78.07	340	2.2	H	15.1	0.62	0.0	14.48	34.77
707.5	82.16	322	1.0	V	21.2	0.62	0.0	20.58	34.77
5 MHz Bandwidth									
707.5	78.26	314	1.9	H	15.3	0.62	0.0	14.68	34.77
707.5	82.06	132	2.0	V	21.1	0.62	0.0	20.48	34.77
10 MHz Bandwidth									
707.5	78.17	178	2.4	H	15.2	0.62	0.0	14.58	34.77
707.5	82.31	295	2.3	V	21.3	0.62	0.0	20.68	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	78.31	114	1.1	H	15.3	0.62	0.0	14.68	34.77
707.5	82.33	114	2.1	V	21.3	0.62	0.0	20.68	34.77
3 MHz Bandwidth									
707.5	77.69	344	1.1	H	14.7	0.62	0.0	14.08	34.77
707.5	82.46	51	1.9	V	21.5	0.62	0.0	20.88	34.77
5 MHz Bandwidth									
707.5	78.26	130	1.6	H	15.3	0.62	0.0	14.68	34.77
707.5	82.09	316	1.4	V	21.1	0.62	0.0	20.48	34.77
10 MHz Bandwidth									
707.5	78.45	205	2.1	H	15.5	0.62	0.0	14.88	34.77
707.5	82.38	113	2.4	V	21.4	0.62	0.0	20.78	34.77

LTE Band 17:

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	22.04	22.03	22.03
		RB Size=1, RB Offset=12	22.02	21.92	21.88
		RB Size=1, RB Offset=24	21.94	21.85	21.78
		RB Size=12, RB Offset=0	21.20	21.17	21.18
		RB Size=12, RB Offset=6	20.99	21.19	21.09
		RB Size=12, RB Offset=11	20.73	21.17	20.99
		RB Size=25, RB Offset=0	22.09	22.03	22.02
	16QAM	RB Size=1, RB Offset=0	22.01	22.01	21.99
		RB Size=1, RB Offset=12	21.89	21.81	21.95
		RB Size=1, RB Offset=24	21.99	21.66	21.96
		RB Size=12, RB Offset=0	21.24	21.16	21.22
		RB Size=12, RB Offset=6	21.01	21.10	21.13
		RB Size=12, RB Offset=11	20.95	21.01	20.94
		RB Size=25, RB Offset=0	21.09	21.09	21.11
10.0	QPSK	RB Size=1, RB Offset=0	23.08	23.06	23.07
		RB Size=1, RB Offset=24	23.08	23.00	22.93
		RB Size=1, RB Offset=49	23.00	23.04	22.87
		RB Size=25, RB Offset=0	22.06	22.02	21.97
		RB Size=25, RB Offset=12	21.99	22.01	22.07
		RB Size=25, RB Offset=24	21.78	21.92	21.89
		RB Size=50, RB Offset=0	22.07	22.08	22.11
	16QAM	RB Size=1, RB Offset=0	22.66	22.64	22.61
		RB Size=1, RB Offset=24	22.59	22.44	22.53
		RB Size=1, RB Offset=49	22.49	22.23	22.26
		RB Size=25, RB Offset=0	21.16	21.16	21.15
		RB Size=25, RB Offset=12	21.04	21.20	21.01
		RB Size=25, RB Offset=24	21.04	21.24	20.98
		RB Size=50, RB Offset=0	21.12	21.08	21.13

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.24	13	Pass
QPSK (50RB Size)	7.17	13	Pass
16QAM (1RB Size)	5.49	13	Pass
16QAM (50RB Size)	7.28	13	Pass

ERP:**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									
710	78.79	90	2.2	H	15.8	0.62	0.0	15.18	34.77
710	82.36	136	1.1	V	21.4	0.62	0.0	20.78	34.77
10 MHz Bandwidth									
710	78.10	324	2.0	H	15.1	0.62	0.0	14.48	34.77
710	81.98	98	1.6	V	21.0	0.62	0.0	20.38	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
710	79.03	297	1.0	H	16.0	0.62	0.0	15.38	34.77
710	82.13	96	1.5	V	21.1	0.62	0.0	20.48	34.77
10 MHz Bandwidth									
710	78.32	20	1.9	H	15.3	0.62	0.0	14.68	34.77
710	81.89	72	1.8	V	20.9	0.62	0.0	20.28	34.77

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

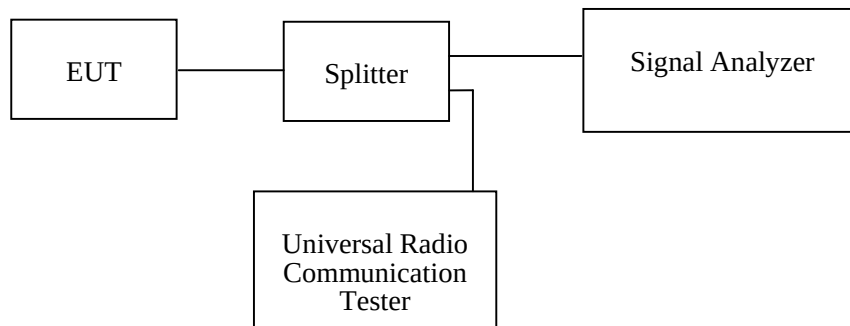
Applicable Standard

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:	23~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	100.5~101.0 kPa

The testing was performed by Tracy Hu from 2018-06-27 to 2018-07-14.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

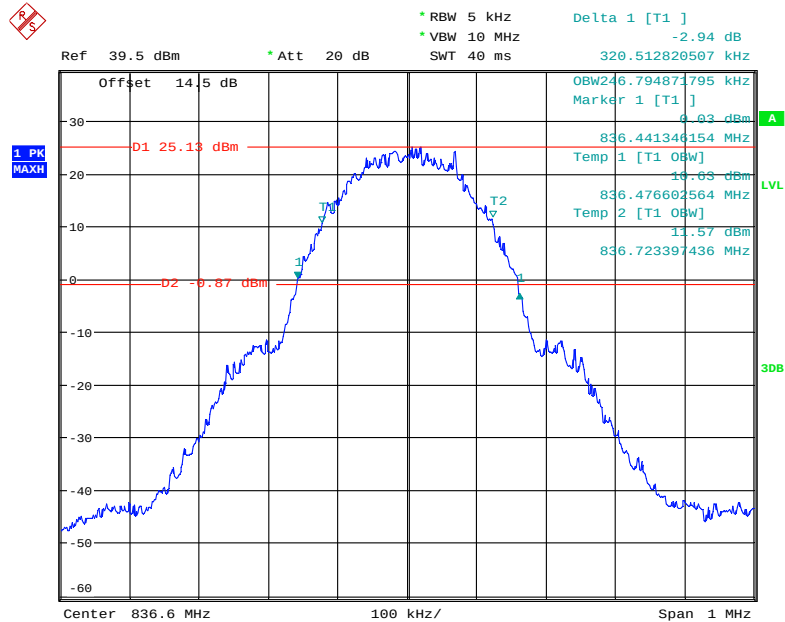
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	246.79	320.51
EGPRS(8PSK)	836.6	248.40	315.71

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.183	4.712
HSUPA (BPSK)	836.6	4.167	4.712
HSDPA (16QAM)	836.6	4.183	4.728

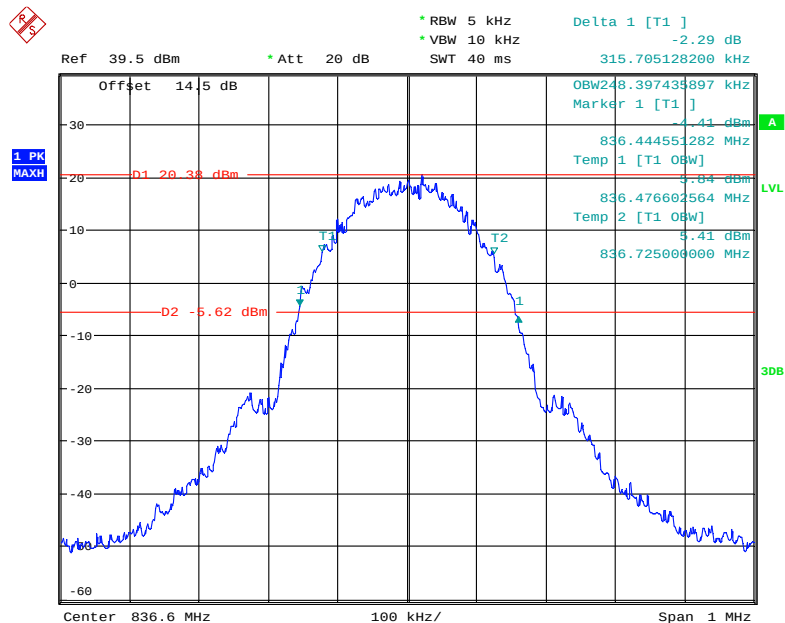
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	248.40	320.51
EGPRS(8PSK)	1880.0	248.40	322.12

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.167	4.744
HSUPA (BPSK)	1880.0	4.183	4.744
HSDPA (16QAM)	1880.0	4.183	4.744

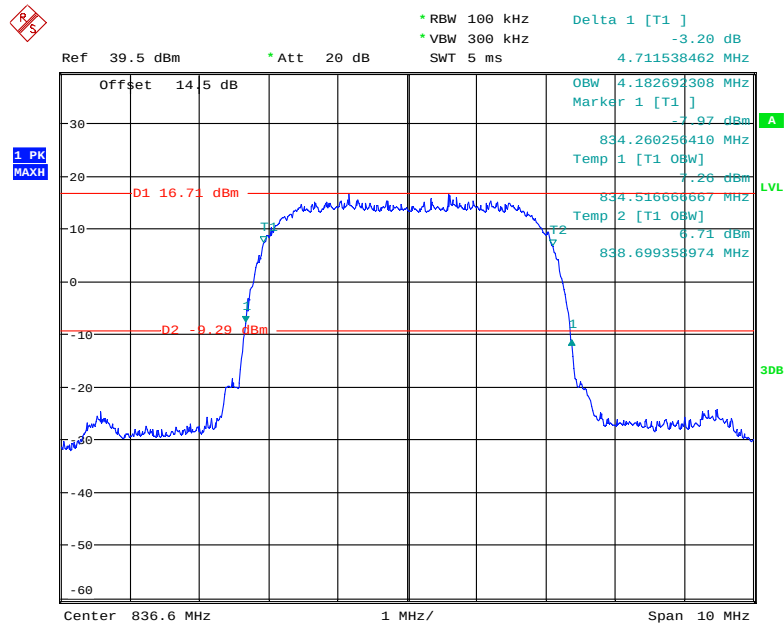
Cellular Band (Part 22H)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode**

Date: 27.JUN.2018 21:24:14

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode

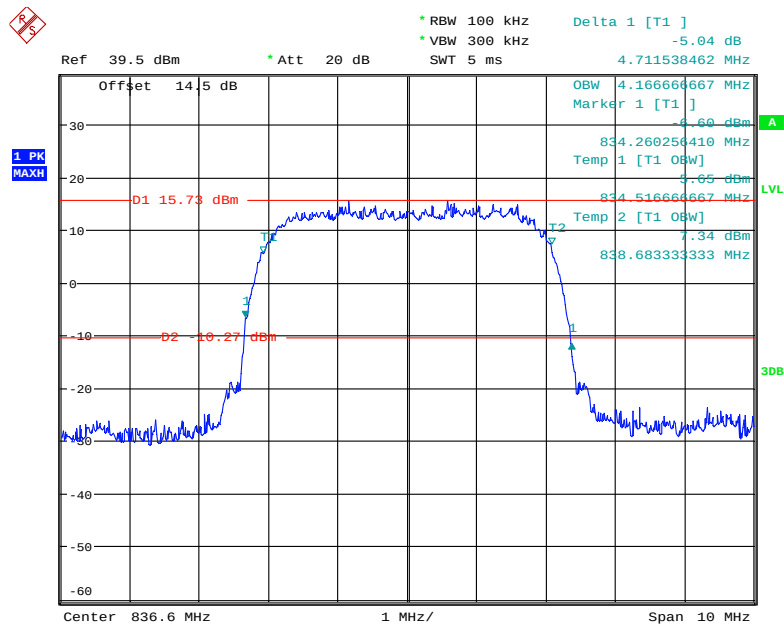
Date: 27.JUN.2018 23:13:07

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

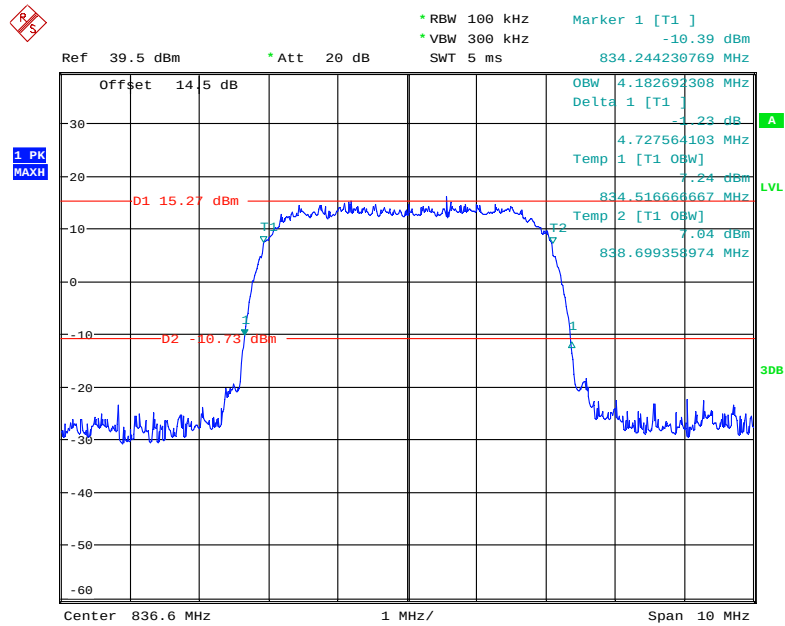


Date: 27.JUN.2018 22:28:34

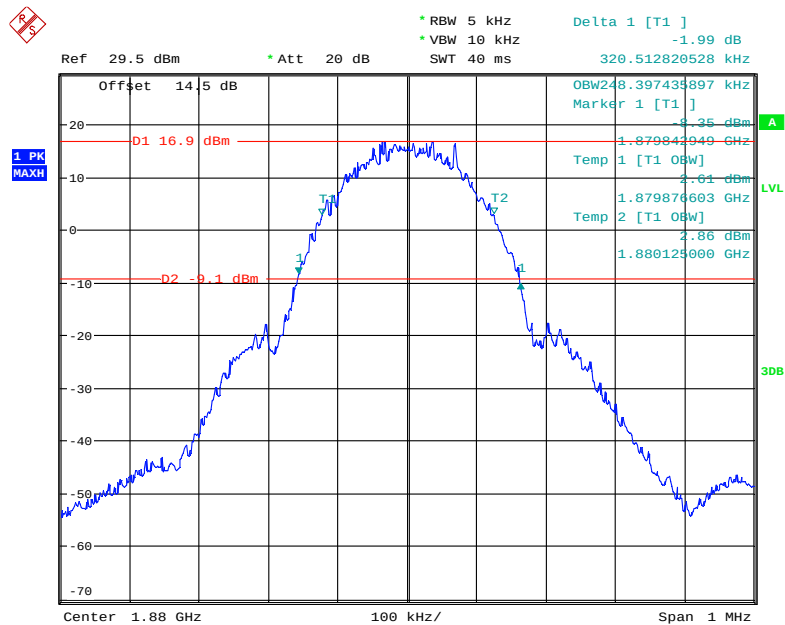
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode



Date: 27.JUN.2018 22:31:25

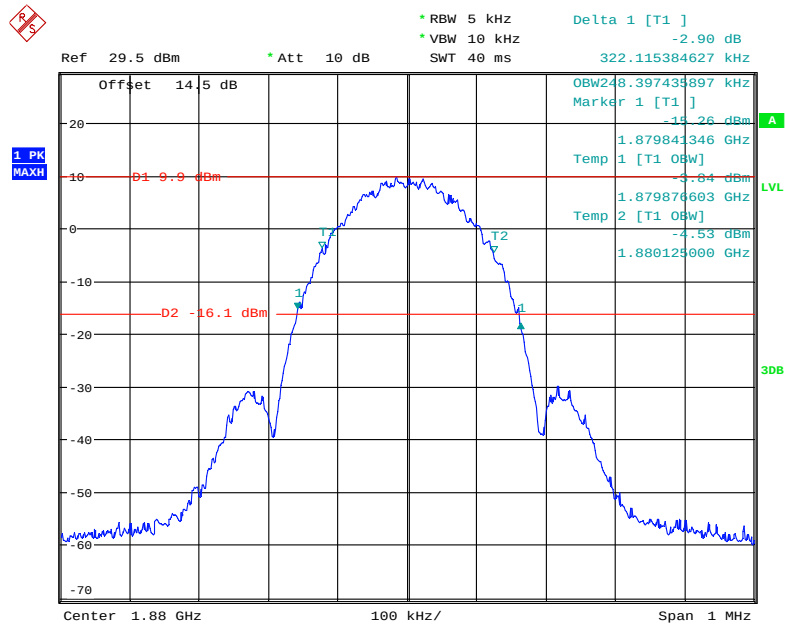
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

Date: 27.JUN.2018 22:34:01

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

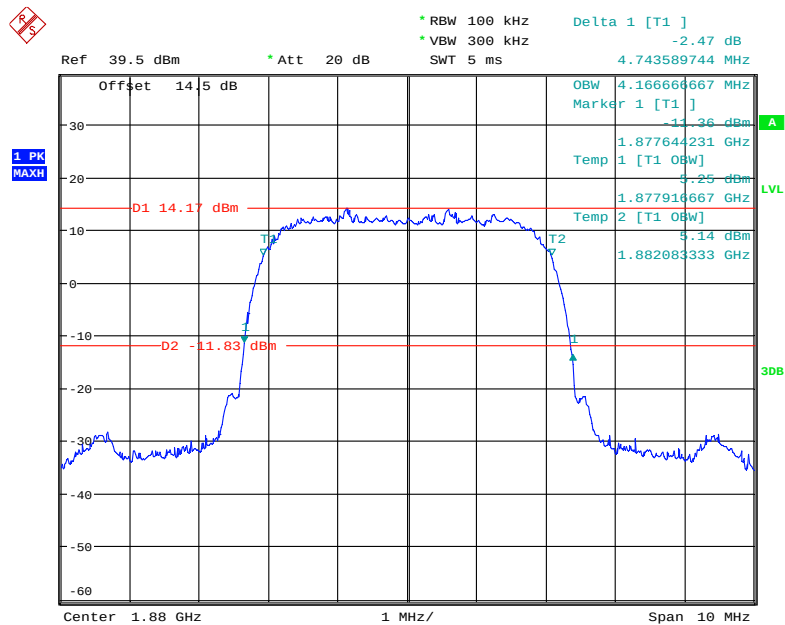
Date: 27.JUN.2018 20:57:02

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



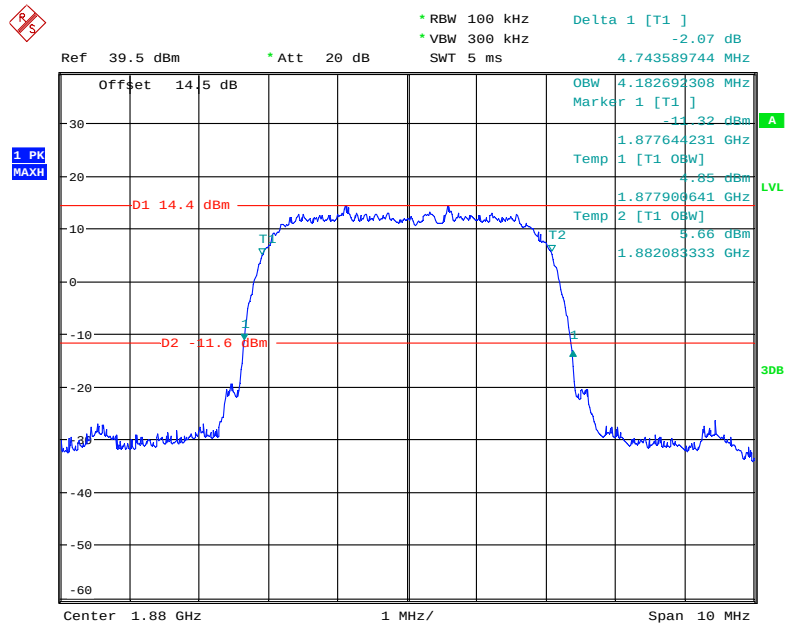
Date: 27.JUN.2018 21:17:11

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



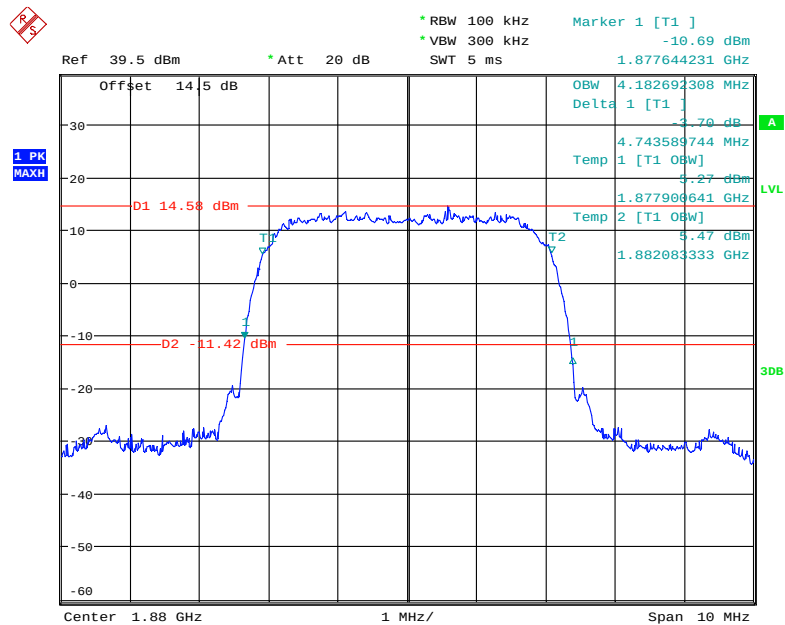
Date: 27.JUN.2018 22:57:24

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



Date: 27.JUN.2018 22:59:45

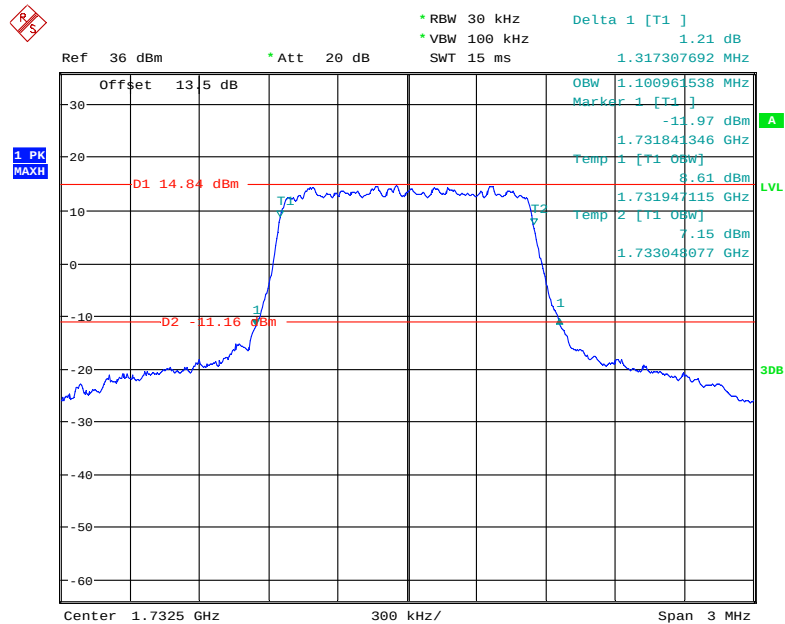
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode



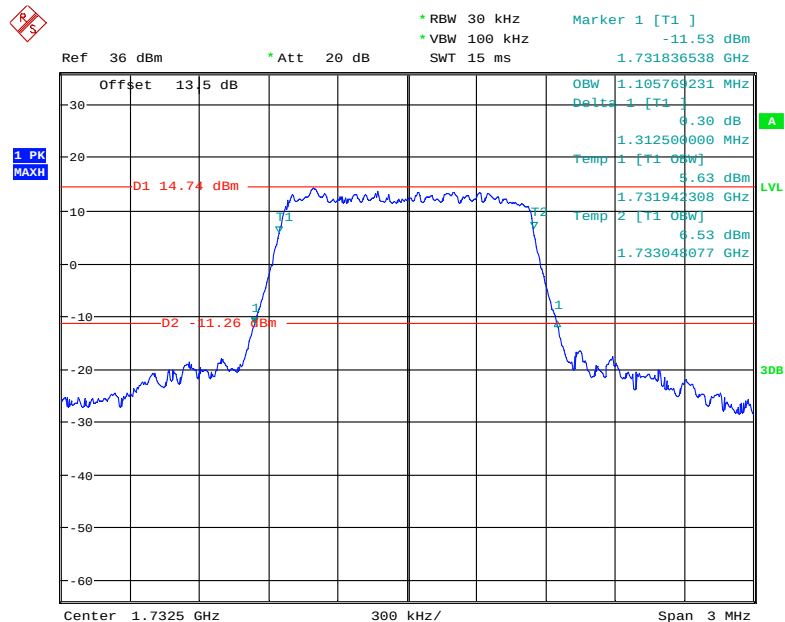
Date: 27.JUN.2018 23:03:20

LTE Band 4: (Middle Channel)

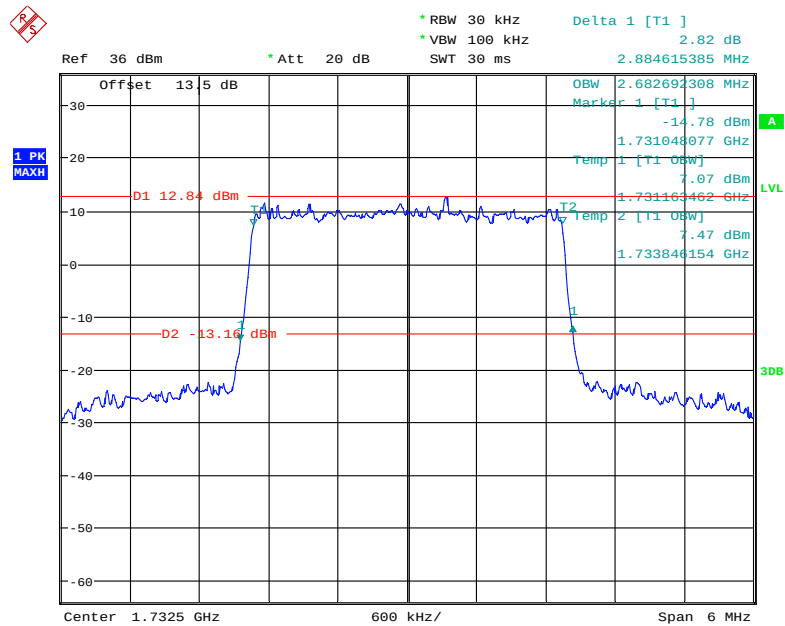
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.317
	16QAM	1.106	1.313
3.0	QPSK	2.683	2.885
	16QAM	2.683	2.885
5.0	QPSK	4.535	5.192
	16QAM	4.535	5.240
10.0	QPSK	8.974	10.00
	16QAM	8.974	9.744
15.0	QPSK	13.510	14.904
	16QAM	13.510	14.952
20.0	QPSK	17.949	19.231
	16QAM	17.949	19.423

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

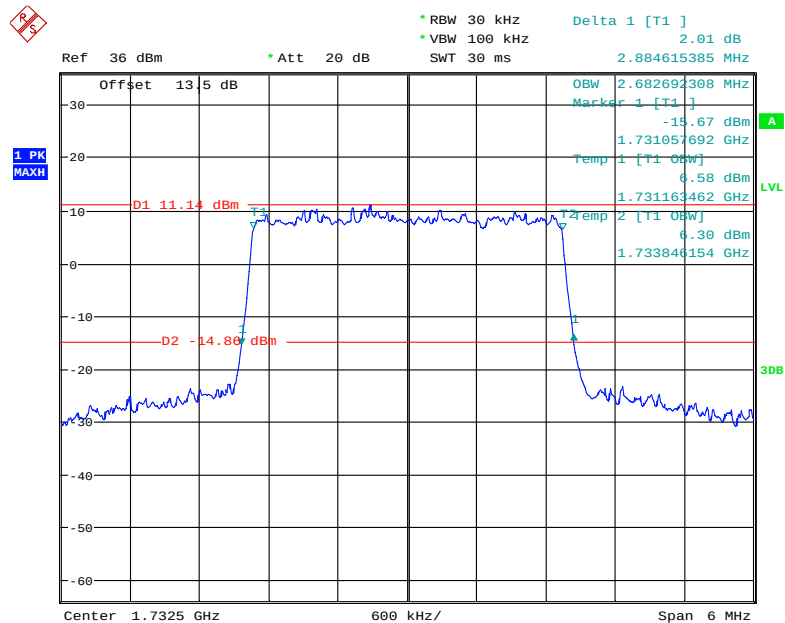
Date: 14.JUL.2018 09:45:43

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

Date: 14.JUL.2018 09:47:02

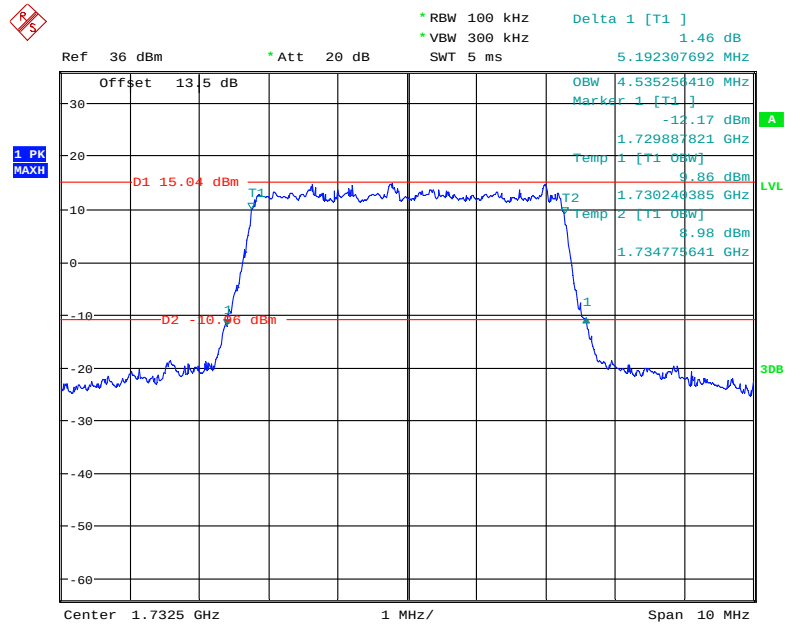
QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 14.JUL.2018 09:53:30

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

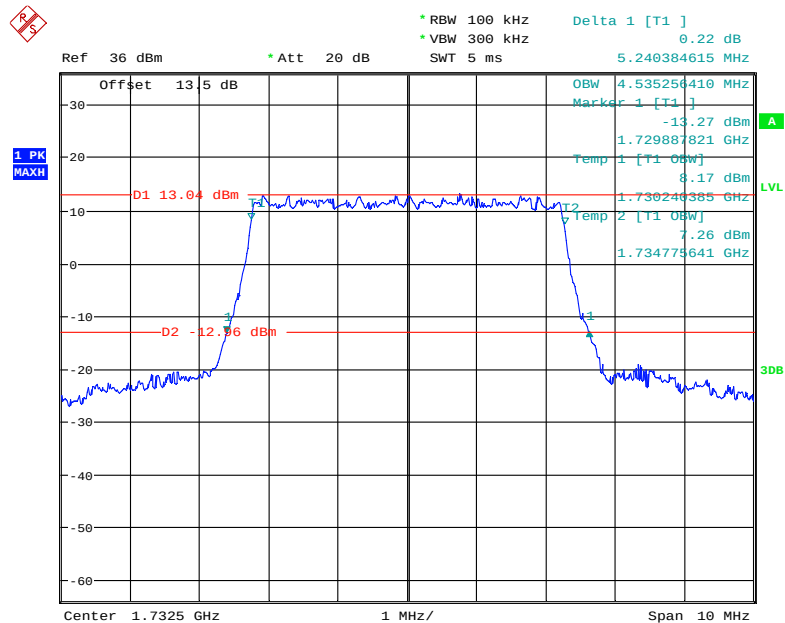
Date: 14.JUL.2018 09:49:54

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



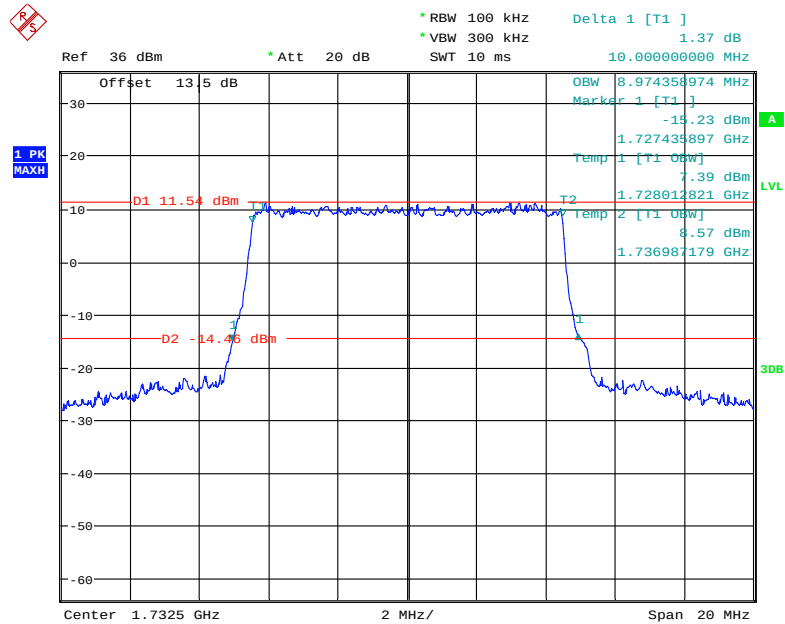
Date: 14.JUL.2018 09:55:18

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



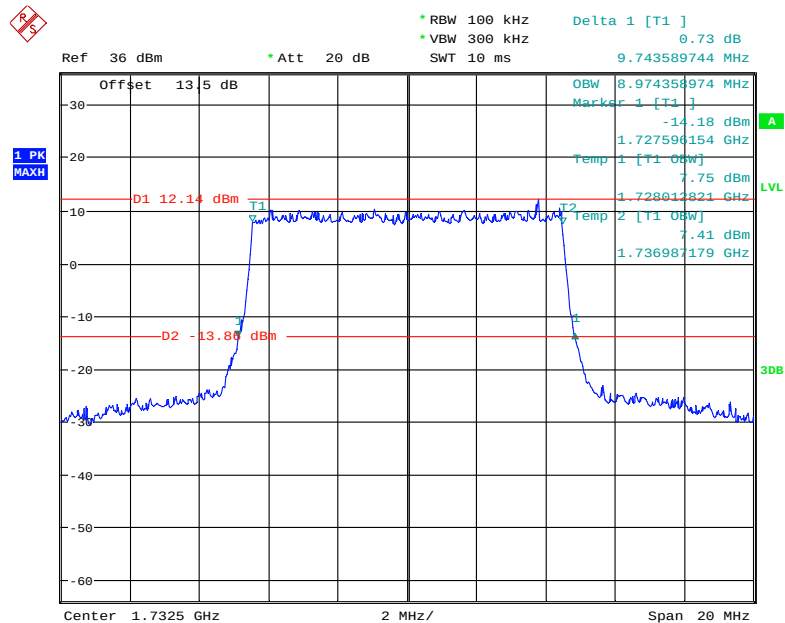
Date: 14.JUL.2018 09:54:21

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



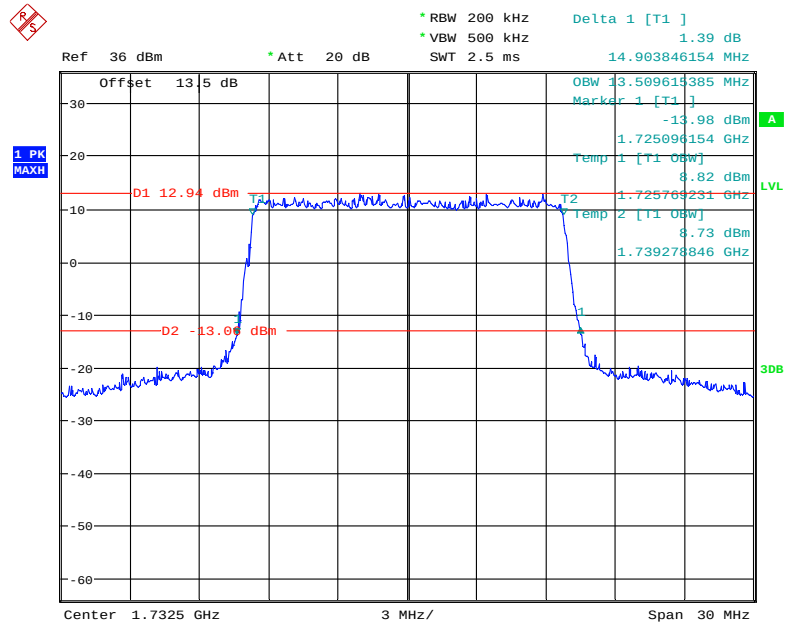
Date: 14.JUL.2018 09:58:19

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



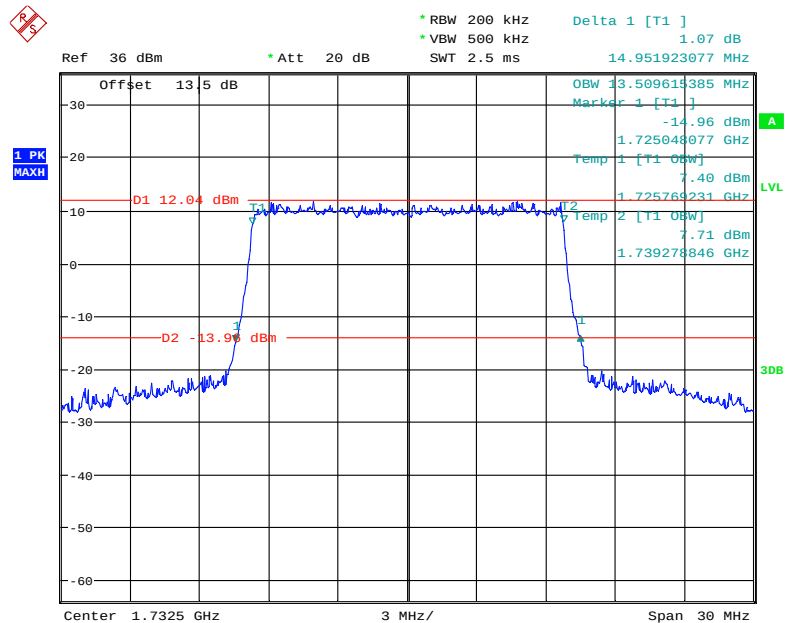
Date: 14.JUL.2018 09:57:06

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



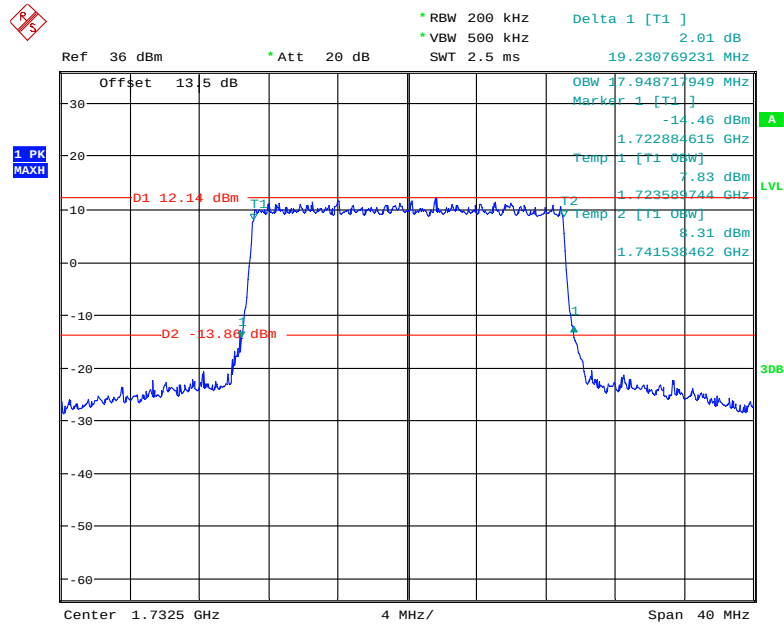
Date: 14.JUL.2018 09:59:36

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



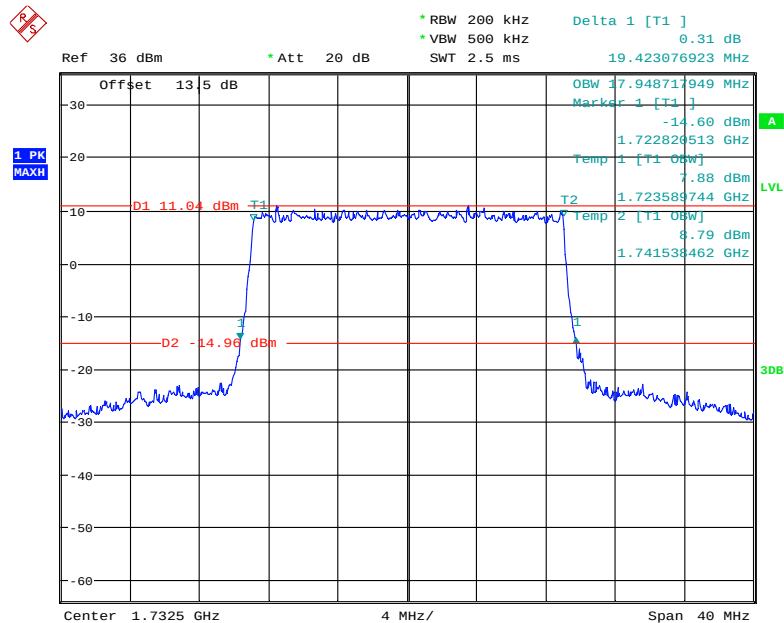
Date: 14.JUL.2018 10:00:34

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



Date: 14.JUL.2018 10:02:19

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

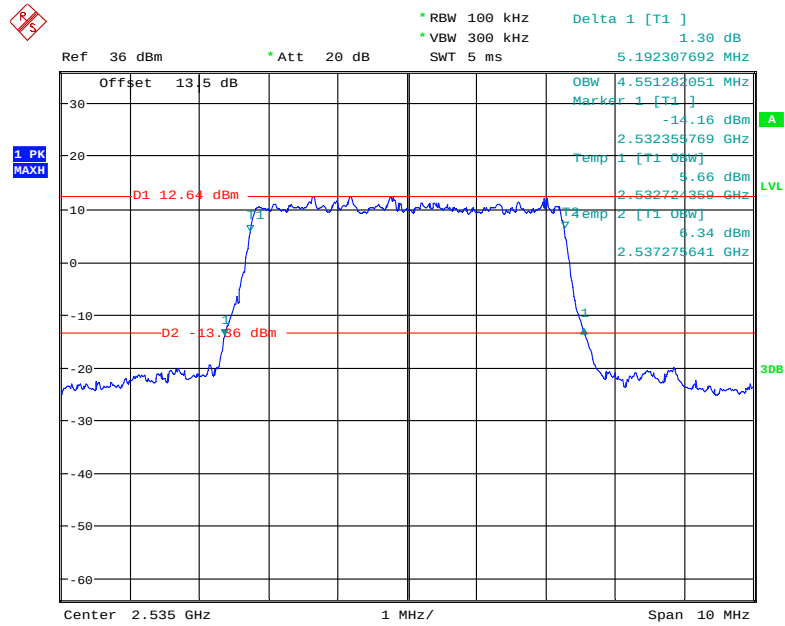


Date: 14.JUL.2018 10:04:03

LTE Band 7: (Middle Channel)

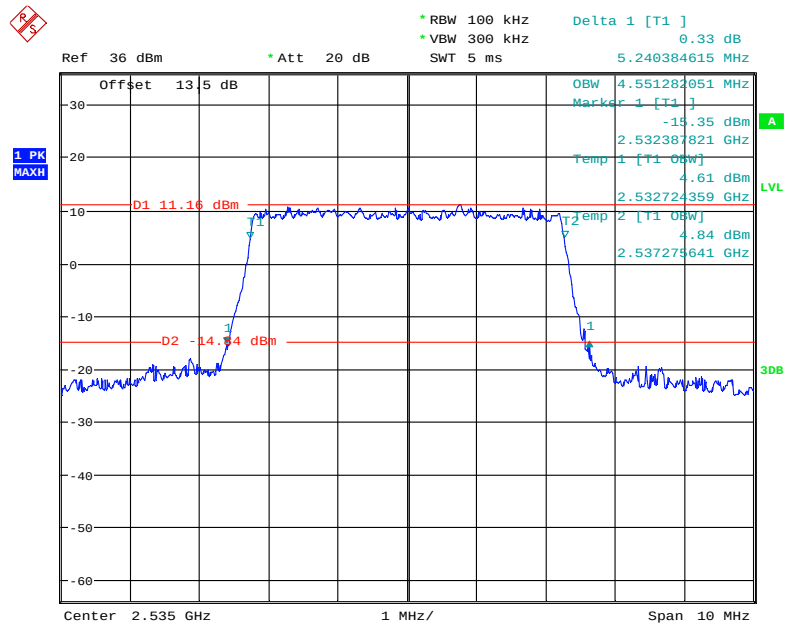
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.551	5.192
	16QAM	4.551	5.240
10.0	QPSK	8.974	9.936
	16QAM	8.974	9.936
15.0	QPSK	13.462	14.904
	16QAM	13.510	15.000
20.0	QPSK	17.885	19.359
	16QAM	17.949	19.487

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

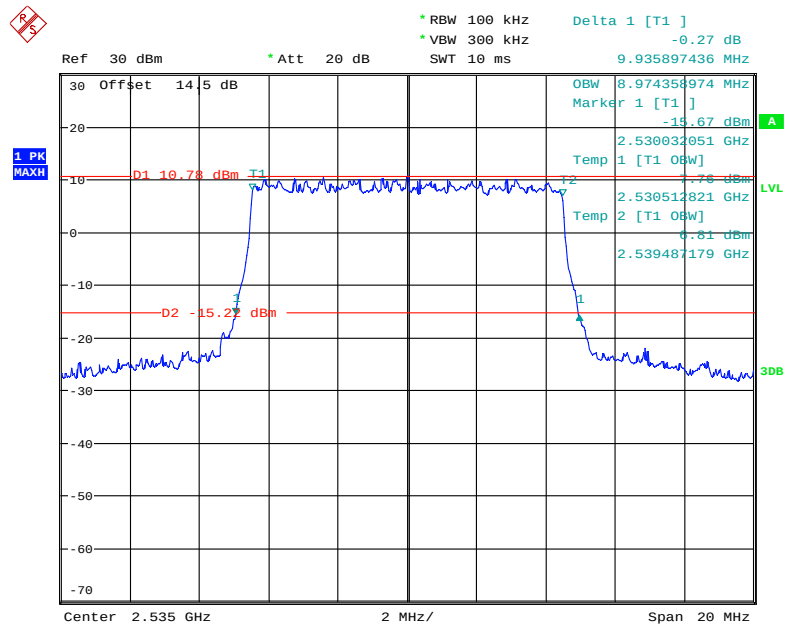


Date: 14.JUL.2018 10:12:35

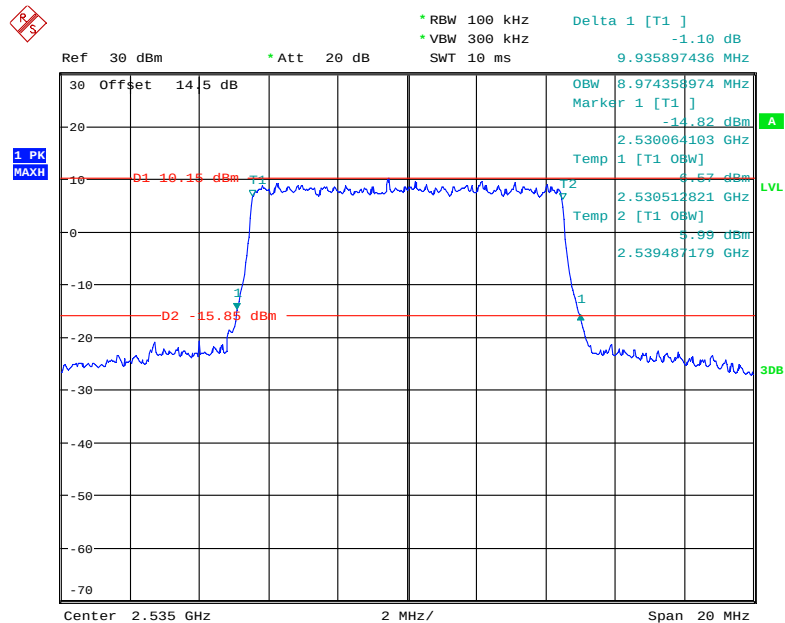
16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 14.JUL.2018 10:13:45

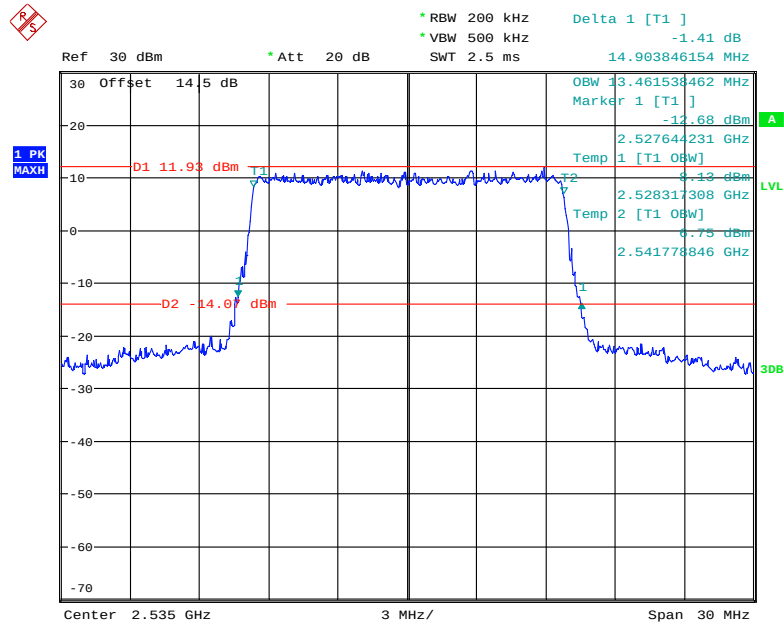
QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 15.JUL.2018 18:38:19

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

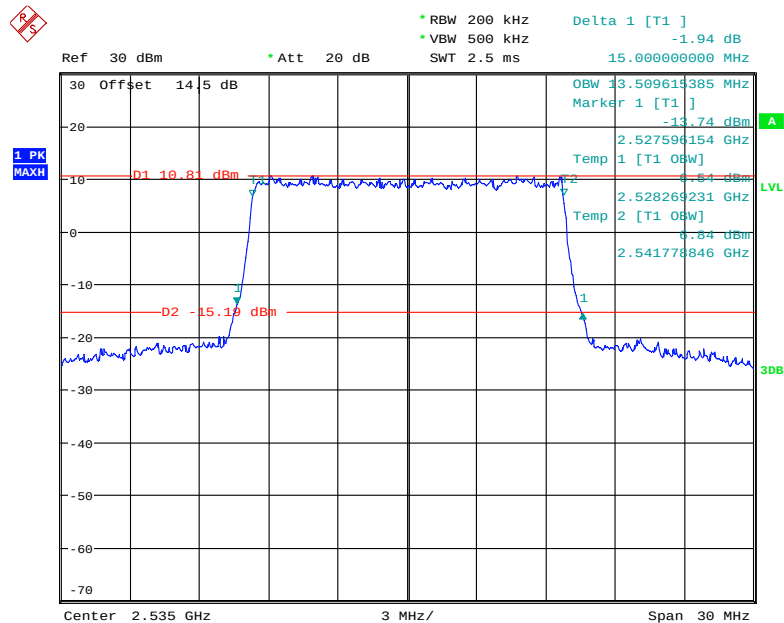
Date: 15.JUL.2018 18:42:17

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

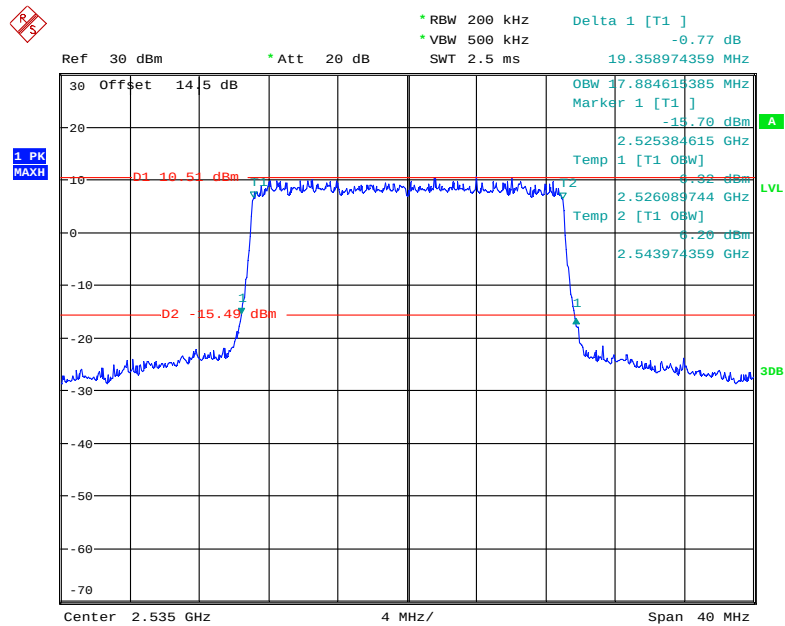


Date: 15.JUL.2018 18:44:14

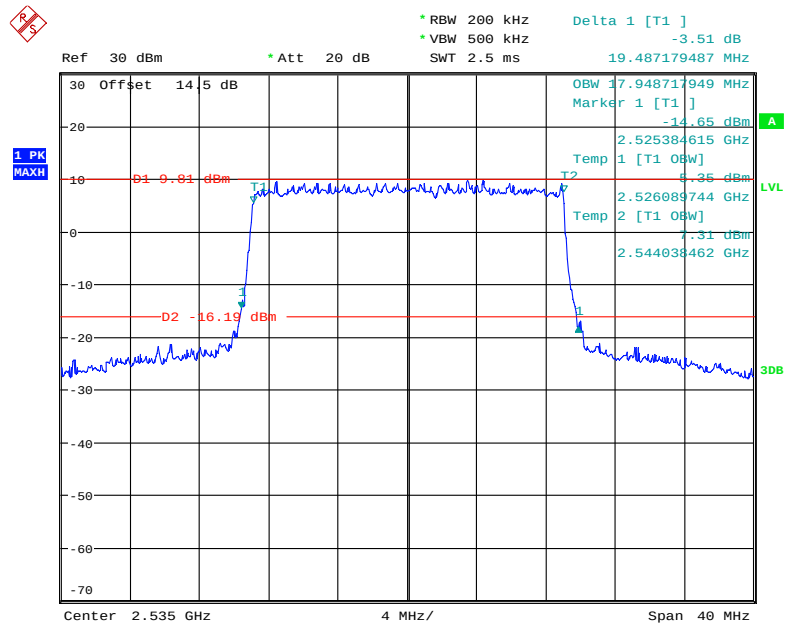
16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 15.JUL.2018 18:47:24

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

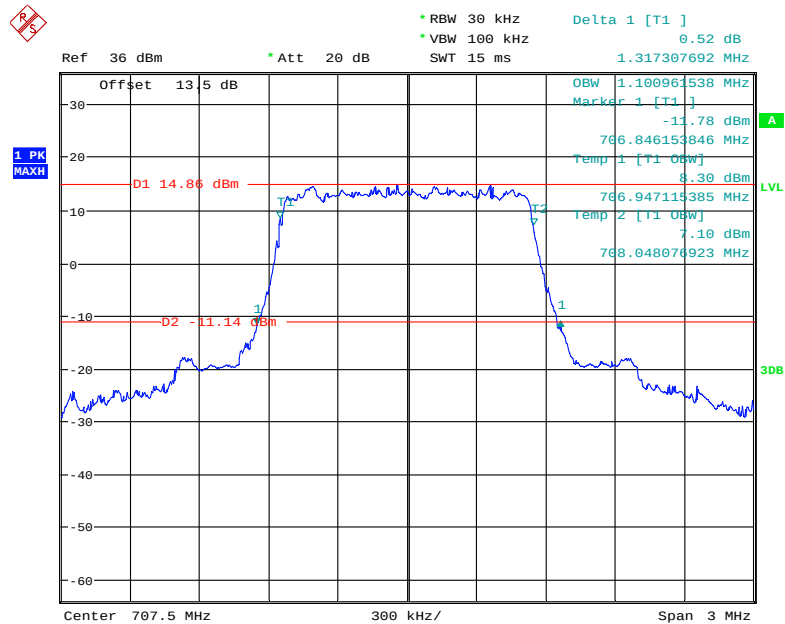
Date: 15.JUL.2018 18:52:50

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

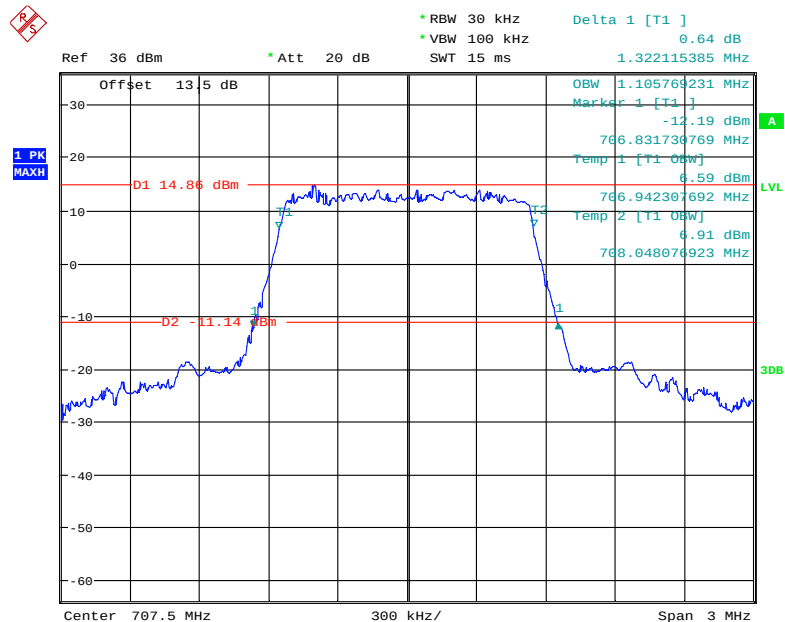
Date: 15.JUL.2018 18:51:14

LTE Band 12: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.317
	16QAM	1.106	1.322
3.0	QPSK	2.683	2.875
	16QAM	2.683	2.885
5.0	QPSK	4.551	5.240
	16QAM	4.535	5.192
10.0	QPSK	9.006	9.968
	16QAM	9.006	9.968

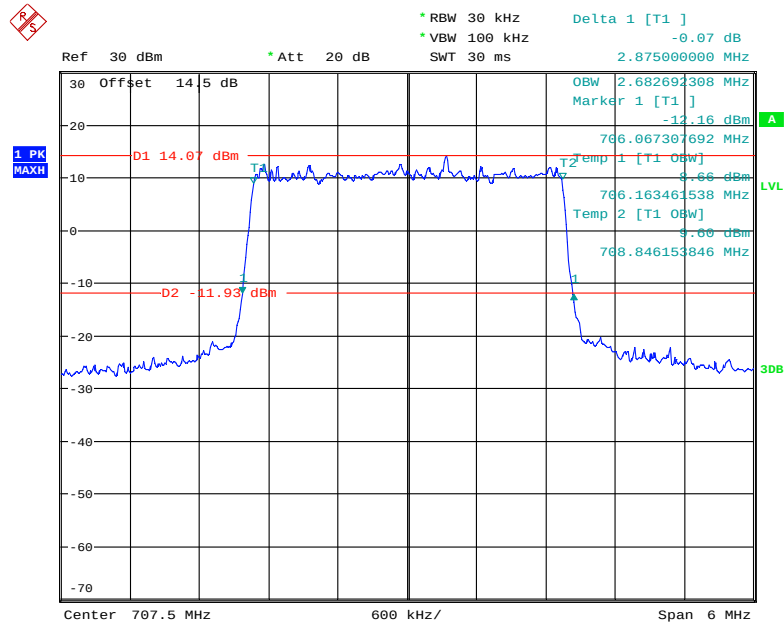
QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 14.JUL.2018 10:31:07

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

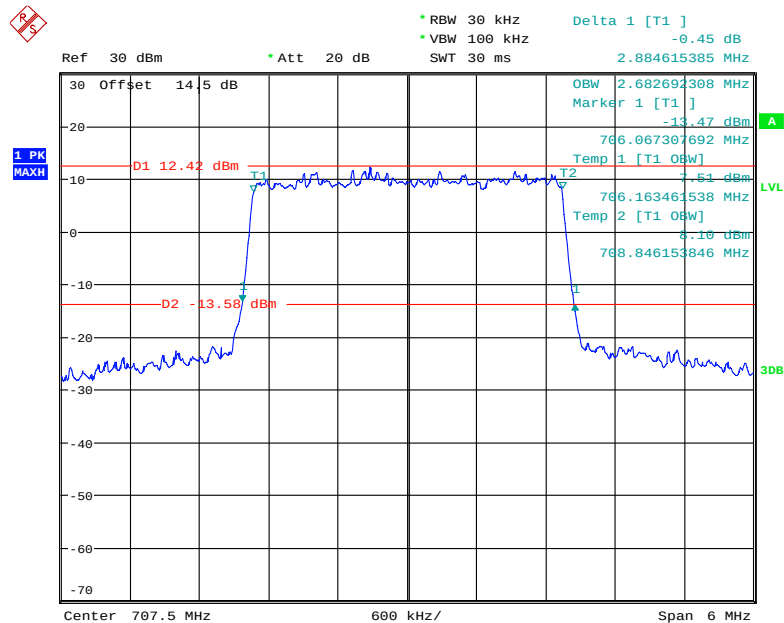
Date: 14.JUL.2018 10:30:29

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

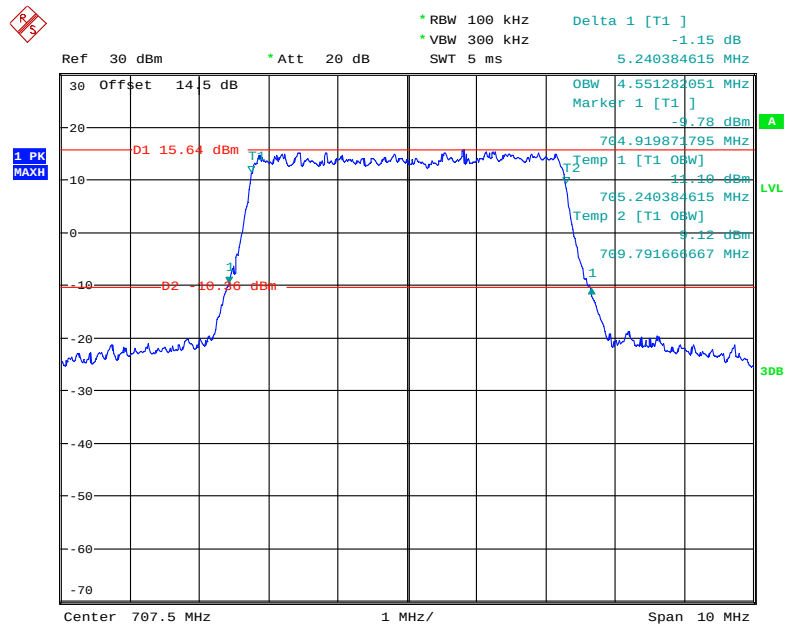


Date: 15.JUL.2018 18:55:20

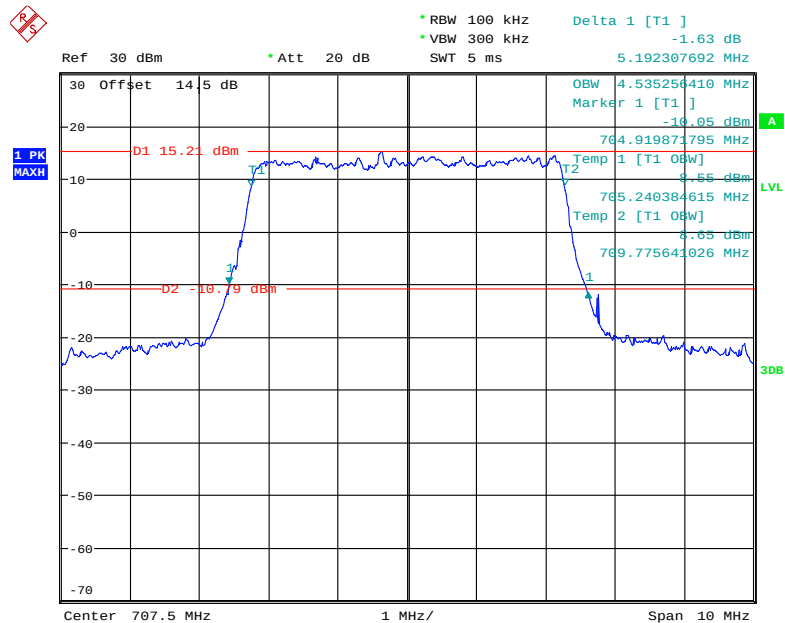
16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 15.JUL.2018 18:57:13

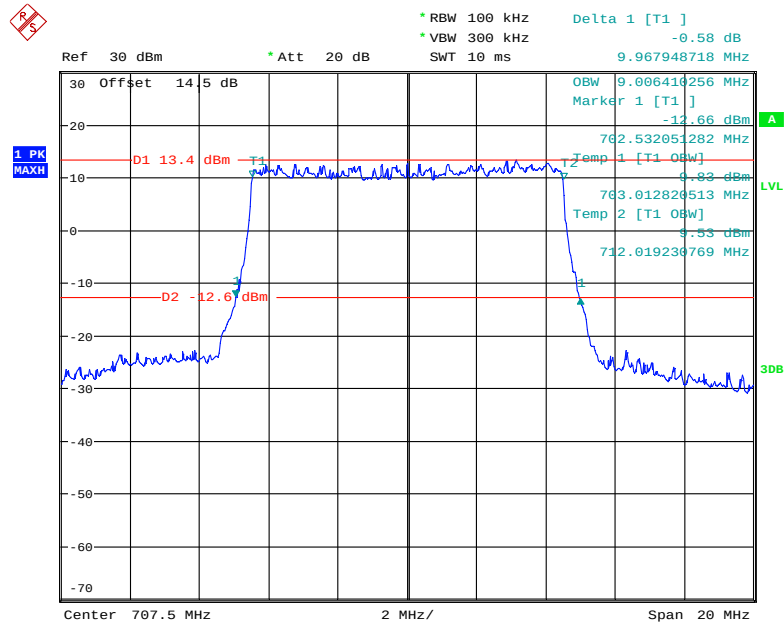
QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 15.JUL.2018 18:24:34

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

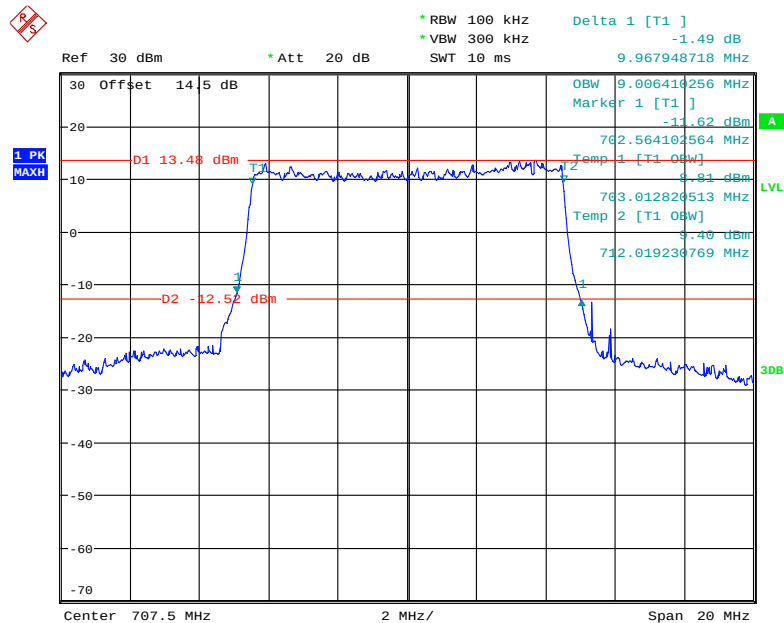
Date: 15.JUL.2018 18:22:59

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



Date: 15.JUL.2018 18:15:37

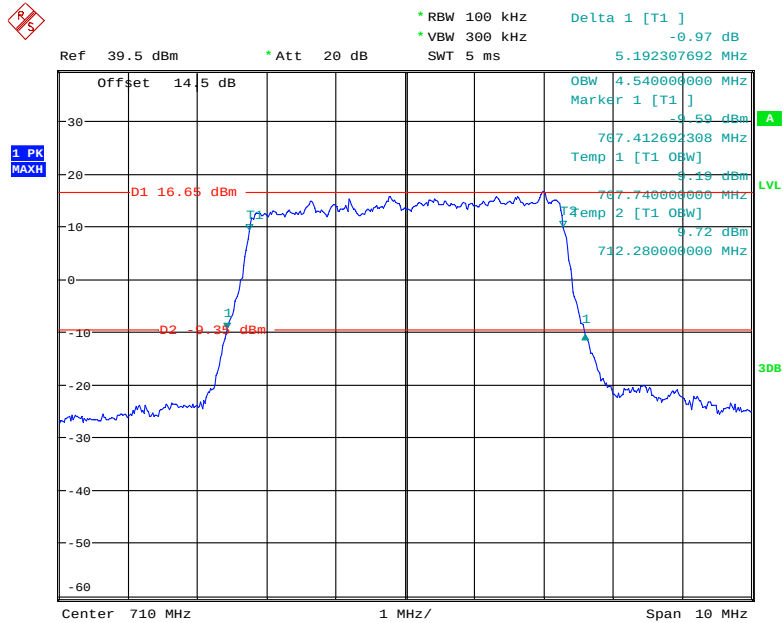
16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



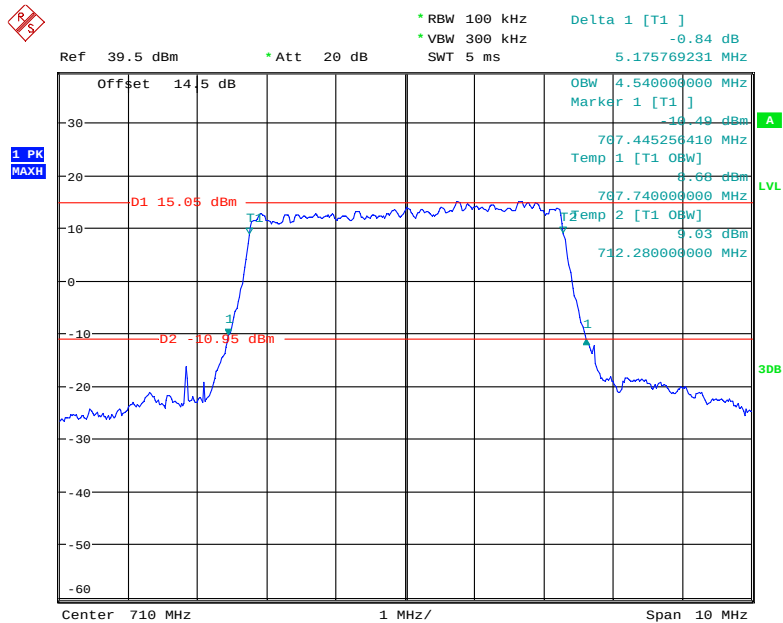
Date: 15.JUL.2018 18:30:00

LTE Band 17: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.540	5.192
	16QAM	4.540	5.176
10.0	QPSK	8.960	9.891
	16QAM	8.920	9.758

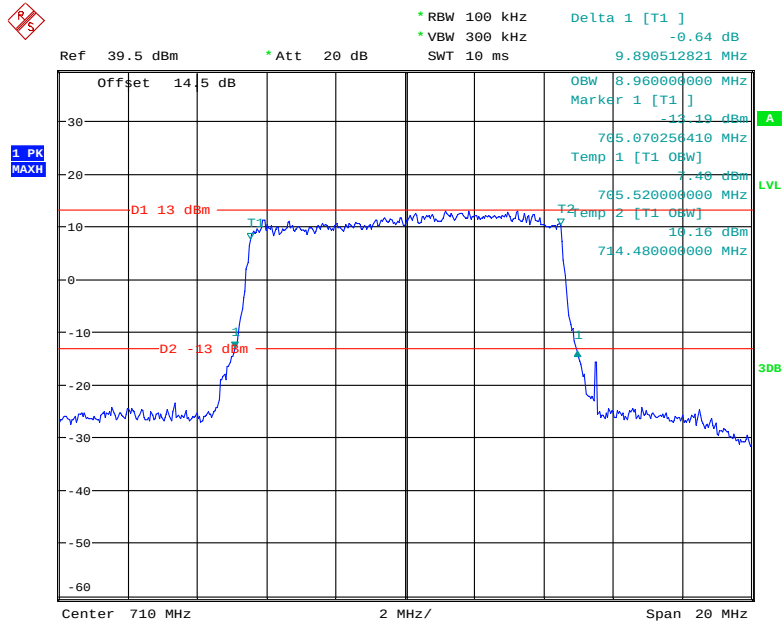
QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 16.JUL.2018 21:32:46

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

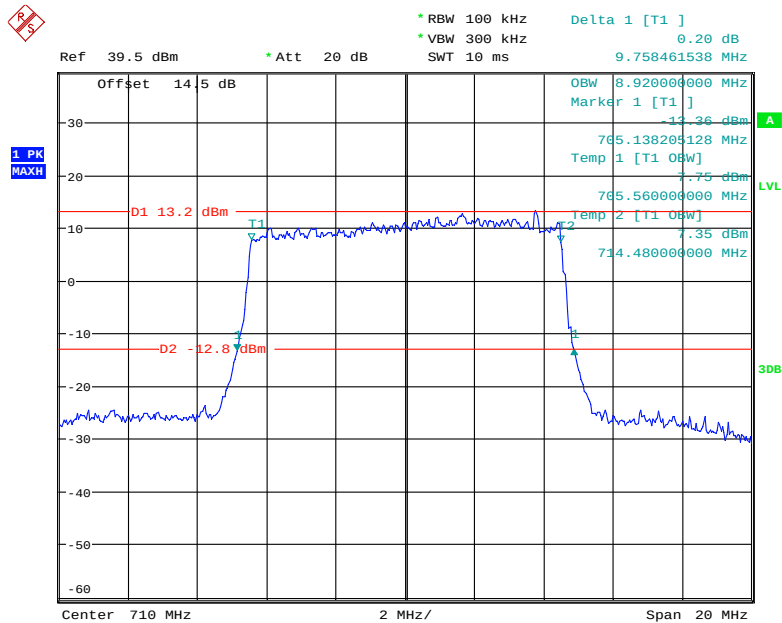
Date: 16.JUL.2018 21:37:01

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



Date: 16.JUL.2018 21:39:26

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



Date: 16.JUL.2018 21:40:58

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

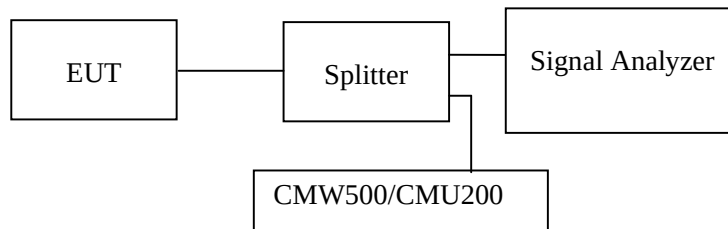
Applicable Standard

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 Tracy Hu from 2018-06-27 to 2018-07-15.

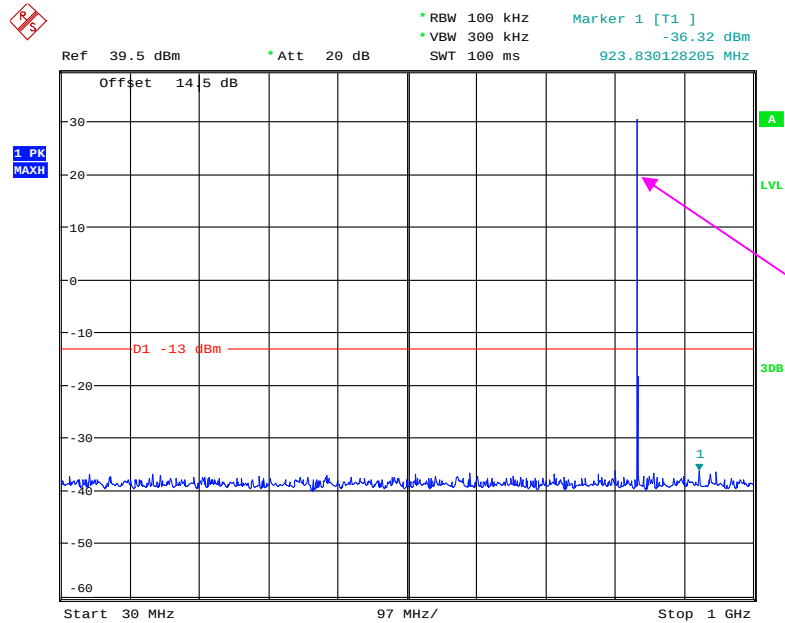
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

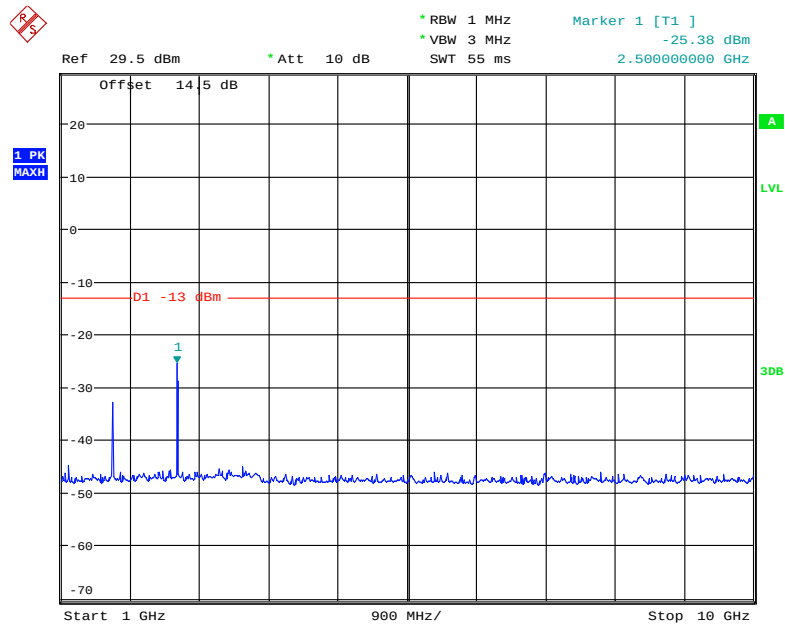
Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode)



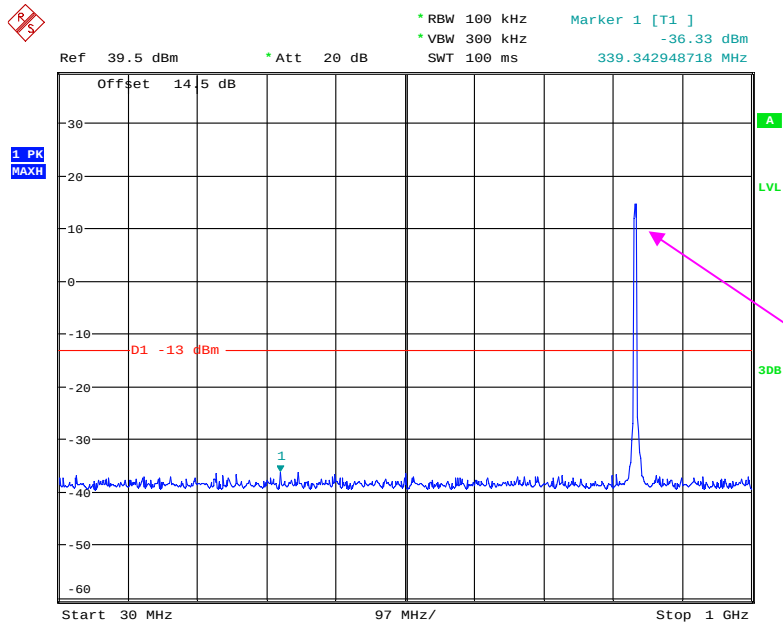
Date: 27.JUN.2018 21:25:29

1 GHz – 10 GHz (GSM Mode)



Date: 27.JUN.2018 23:45:48

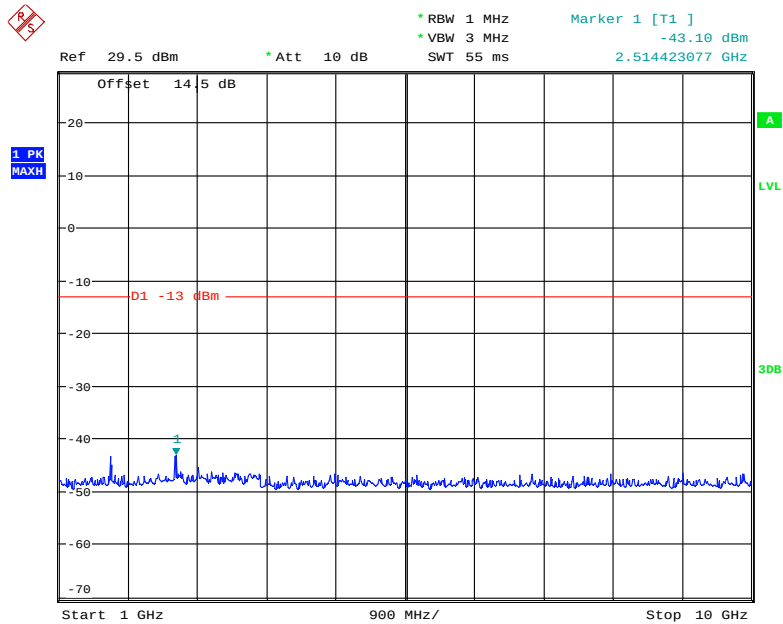
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 27.JUN.2018 22:37:56

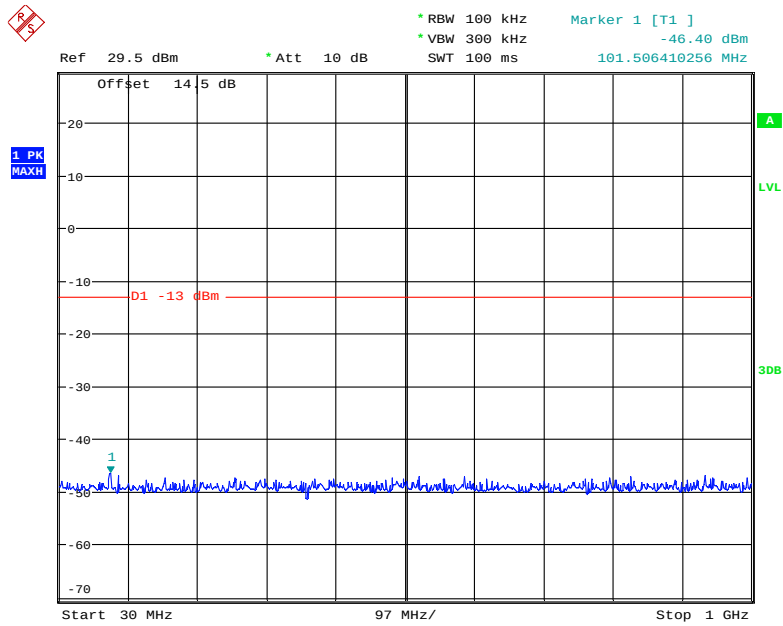
1 GHz – 10 GHz (WCDMA Mode)



Date: 27.JUN.2018 22:38:22

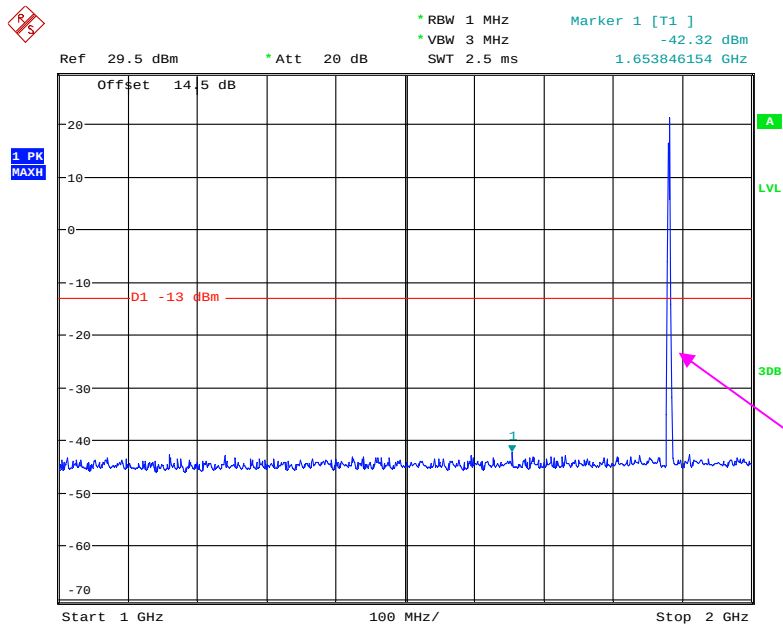
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



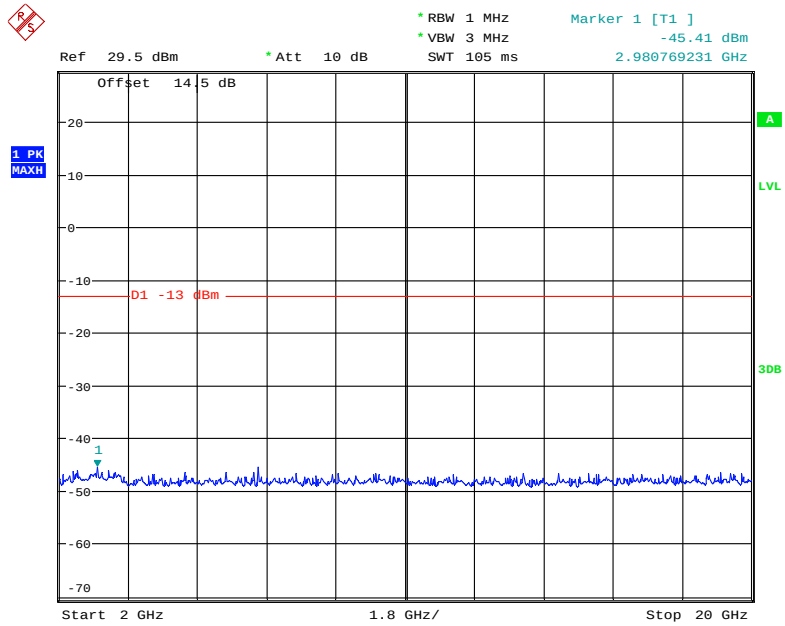
Date: 27.JUN.2018 20:59:08

1 GHz – 2 GHz (GSM Mode)



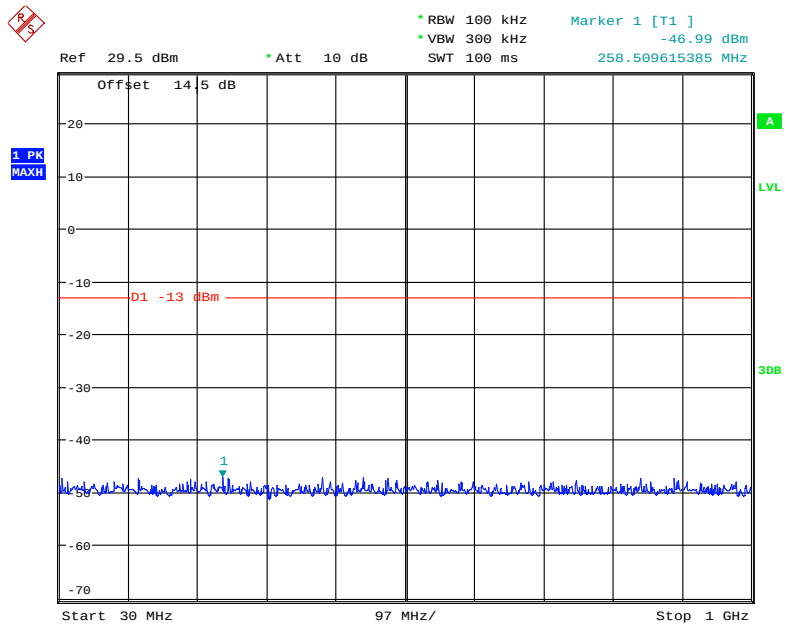
Date: 27.JUN.2018 21:00:09

2 GHz – 20 GHz (GSM Mode)



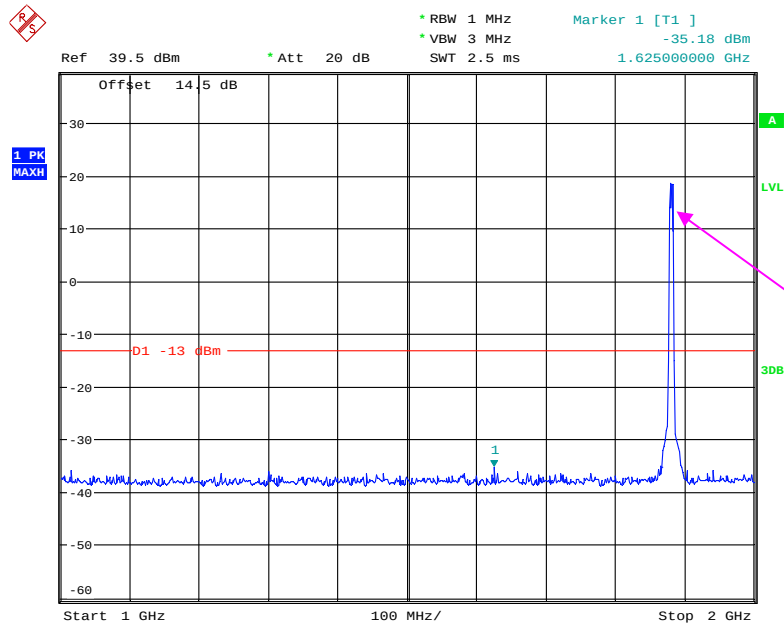
Date: 27.JUN.2018 21:00:41

30 MHz – 1 GHz (WCDMA Mode)



Date: 27.JUN.2018 23:05:35

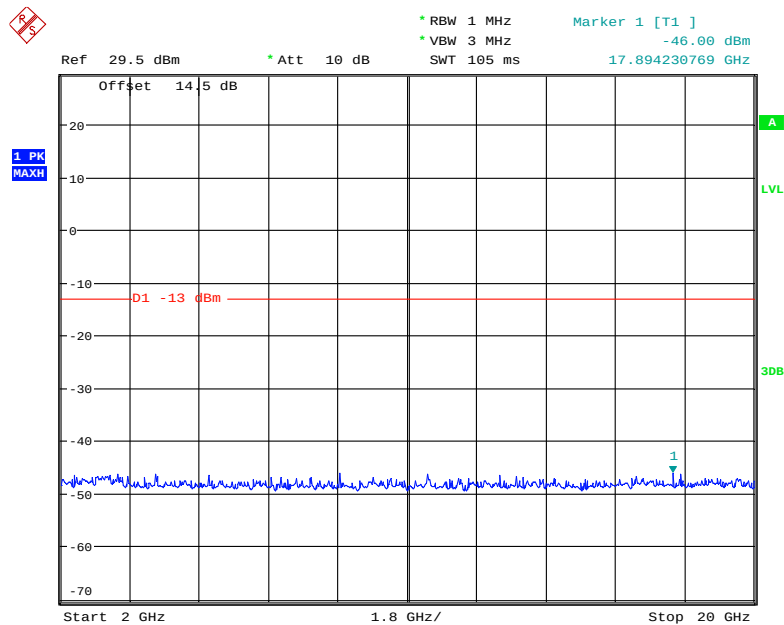
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 27.JUN.2018 23:06:58

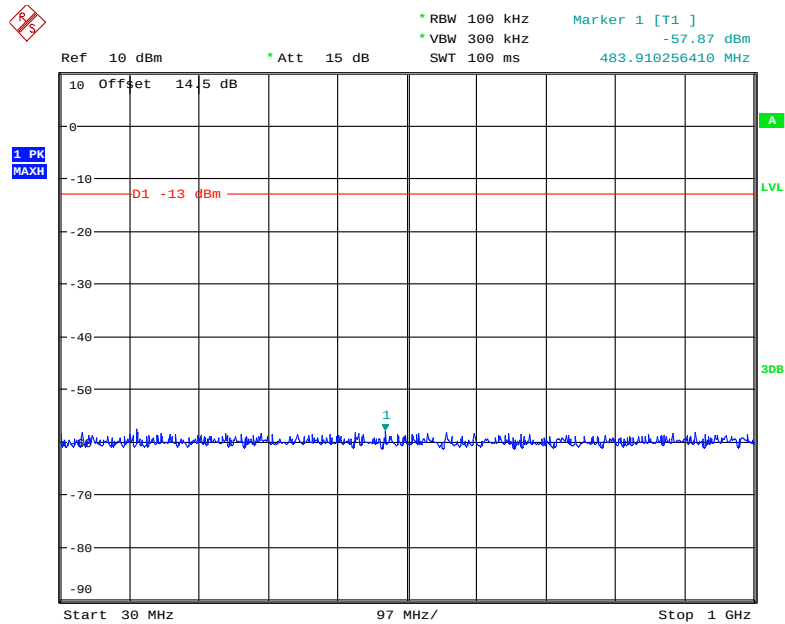
2 GHz – 20 GHz (WCDMA Mode)



Date: 27.JUN.2018 23:07:27

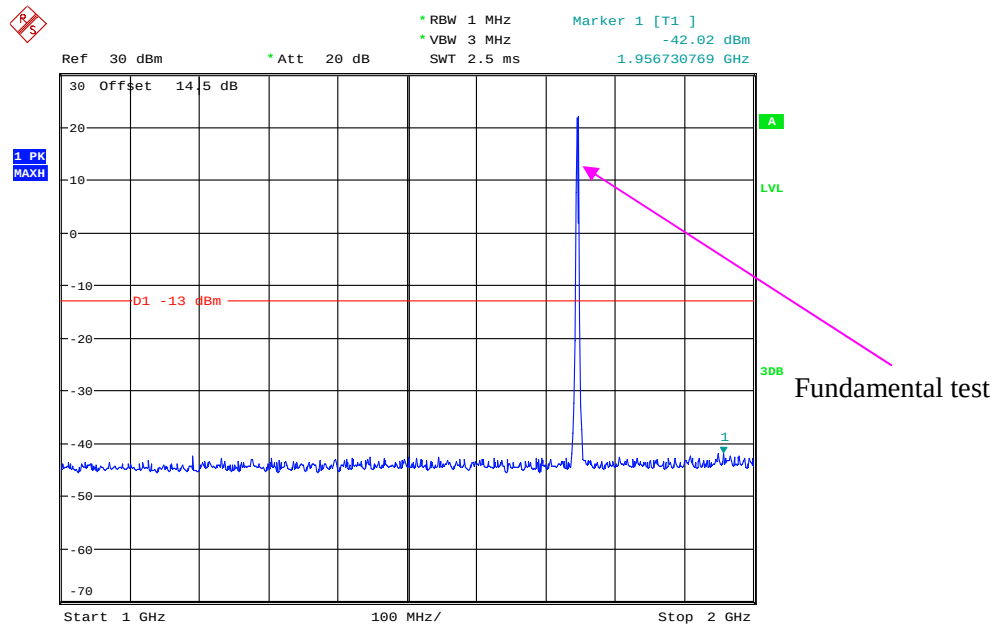
LTE Band 4:

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



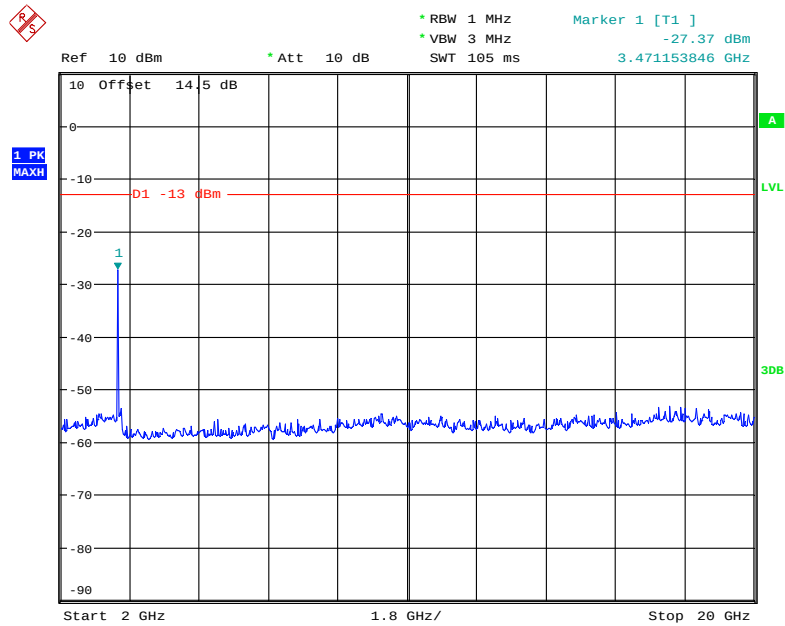
Date: 15.JUL.2018 16:36:38

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



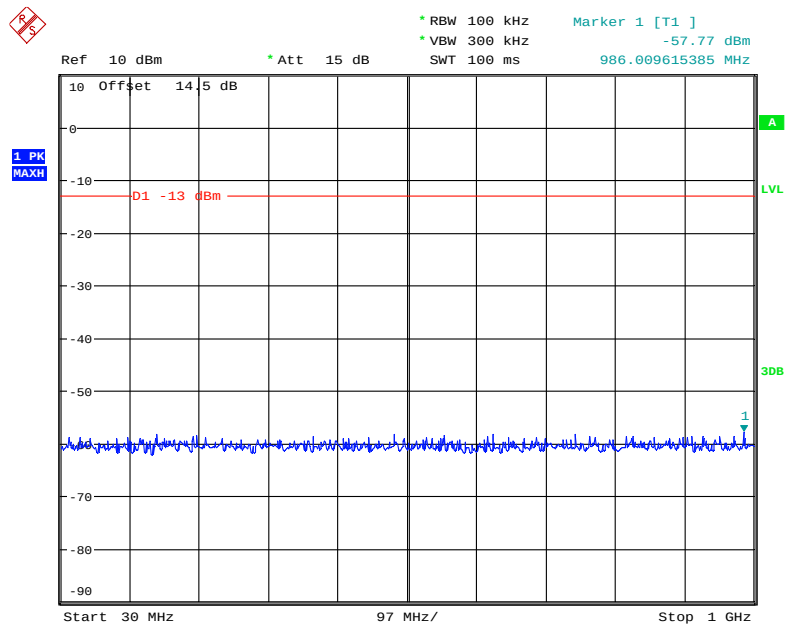
Date: 15.JUL.2018 16:43:04

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



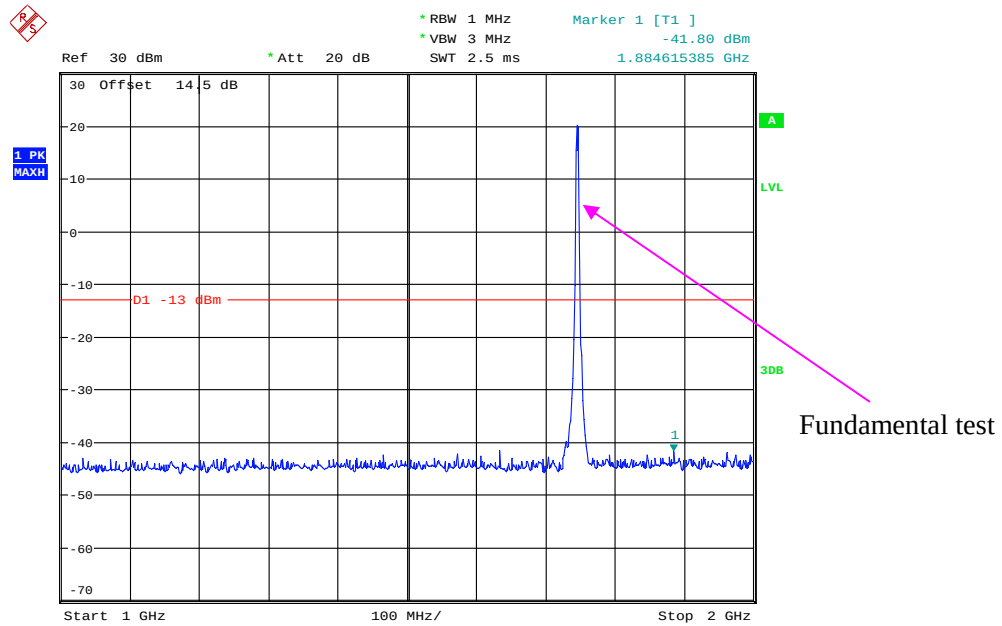
Date: 15.JUL.2018 16:41:44

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



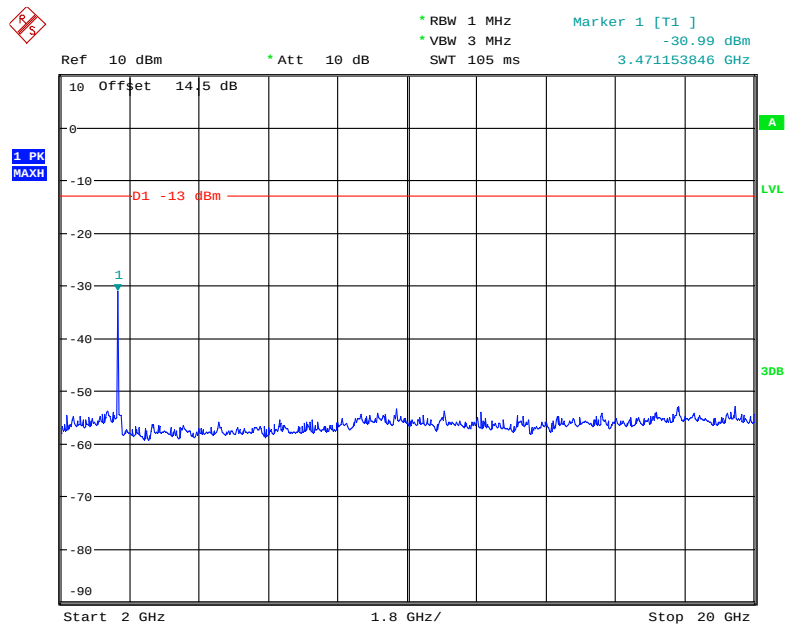
Date: 15.JUL.2018 16:37:17

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



Date: 15.JUL.2018 16:43:45

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



Date: 15.JUL.2018 16:41:31

Ref 10 dBm * Att 15 dB * RBW 100 kHz * VBW 300 kHz SWT 100 ms Marker 1 [T1] -58.40 dBm 584.951923077 MHz

10 Offset 14 5 dB

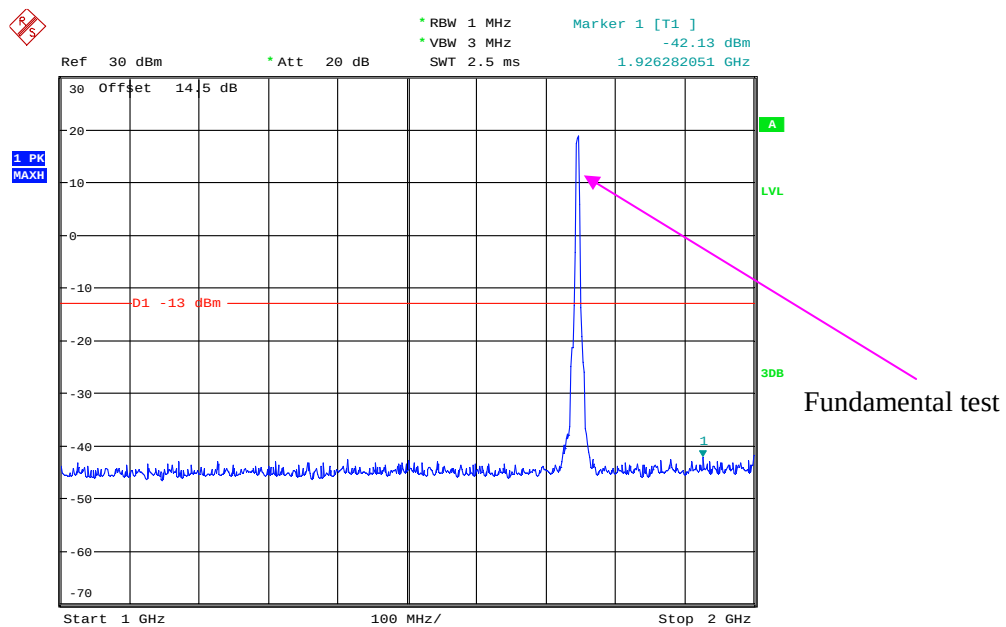
1 PK MAXH

D1 -13 dBm

1

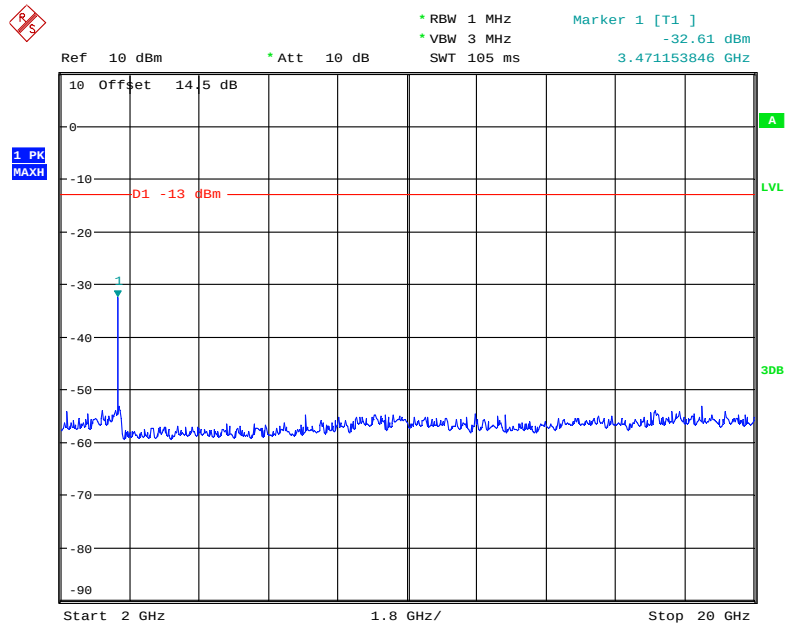
Start 30 MHz 97 MHz/ Stop 1 GHz

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



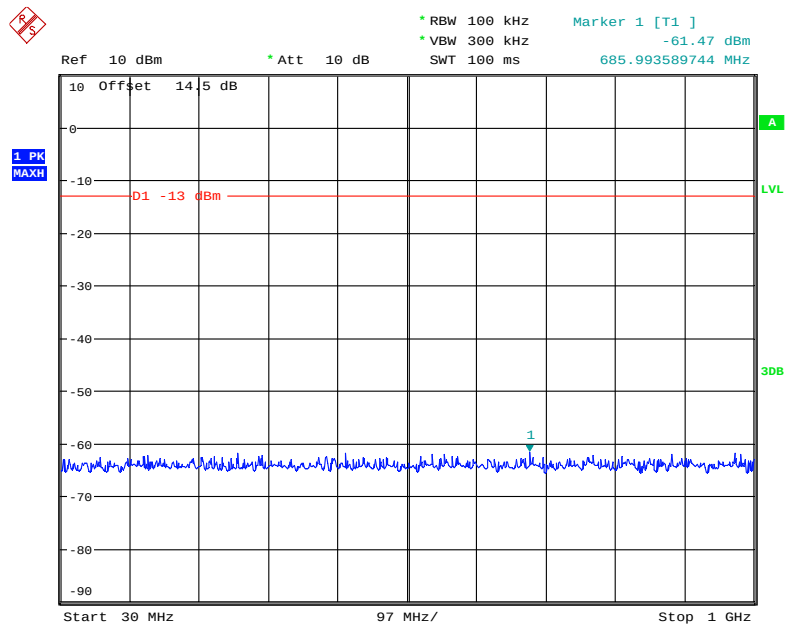
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2 GHz – 20 GHz (5.0 MHz, Middle Channel)



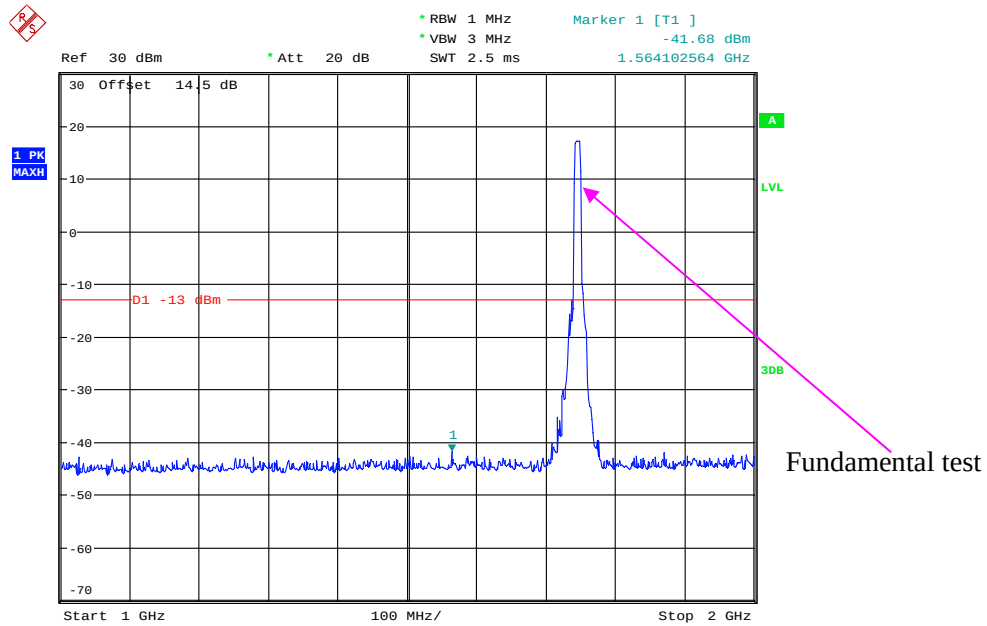
Date: 15.JUL.2018 16:41:15

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



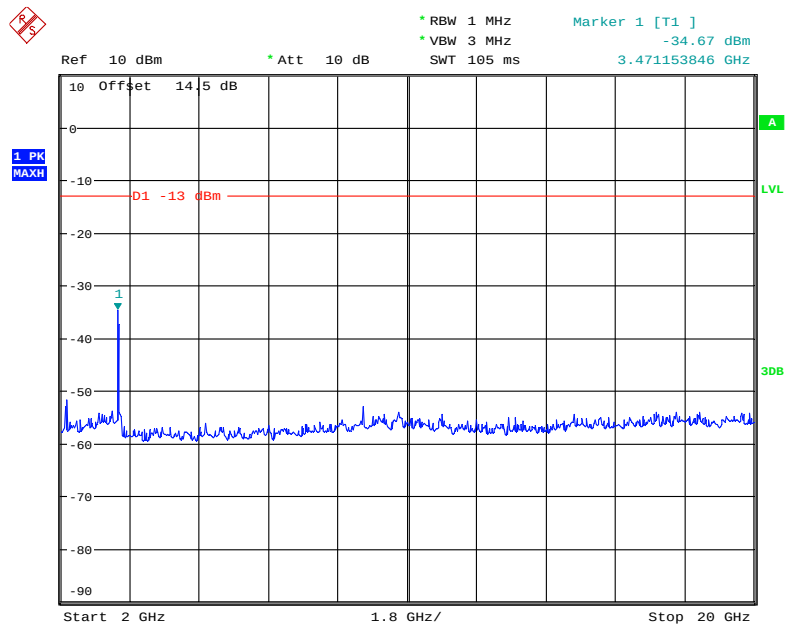
Date: 15.JUL.2018 16:38:02

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



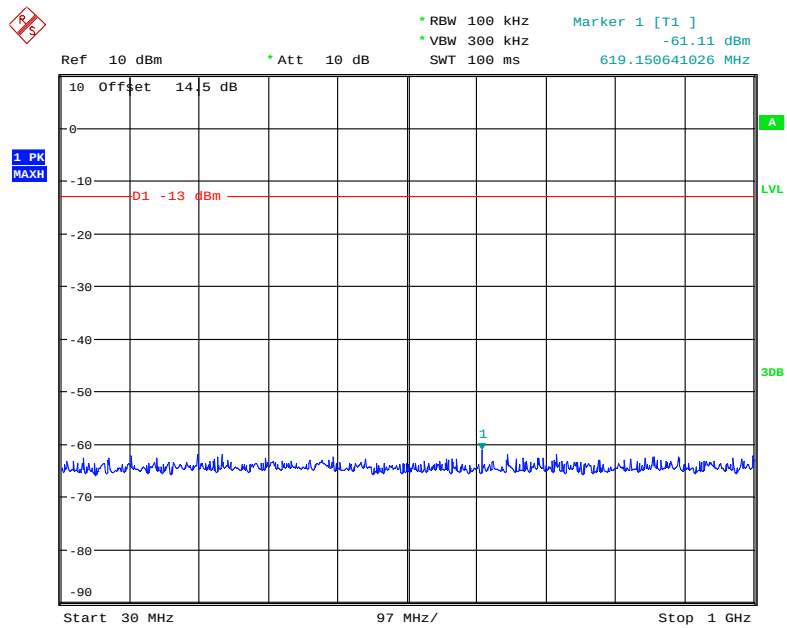
Date: 15.JUL.2018 16:44:29

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



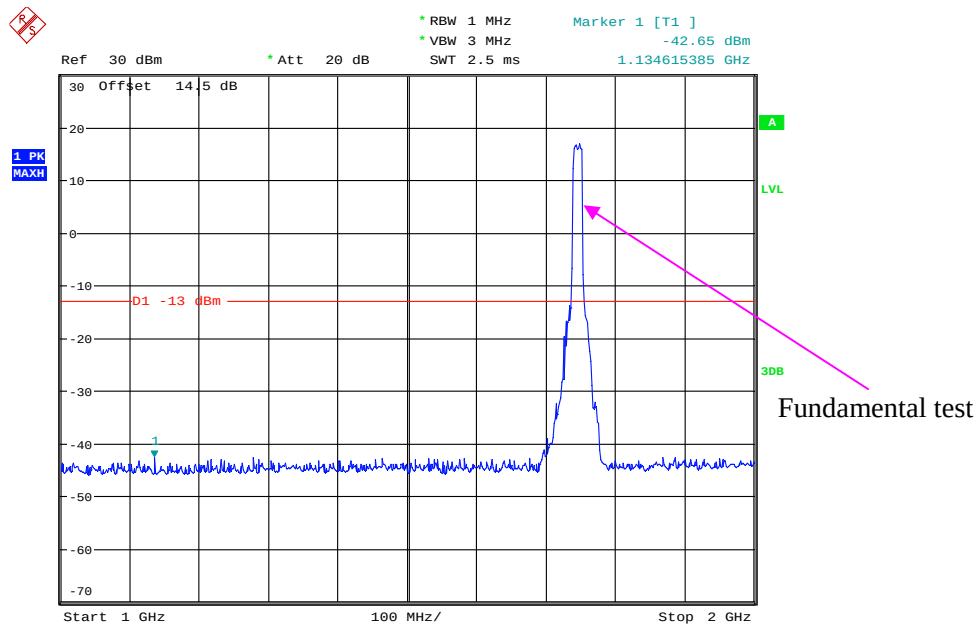
Date: 15.JUL.2018 16:41:00

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



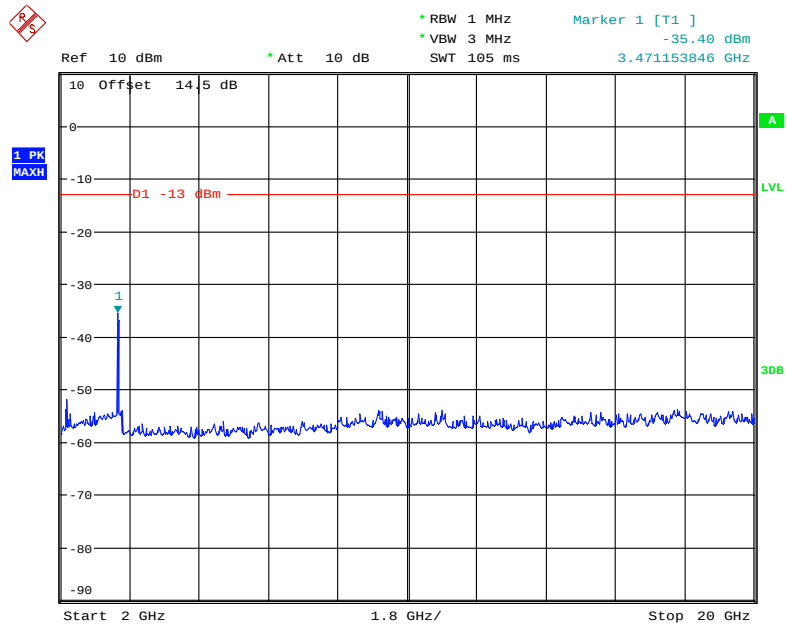
Date: 15.JUL.2018 16:38:23

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



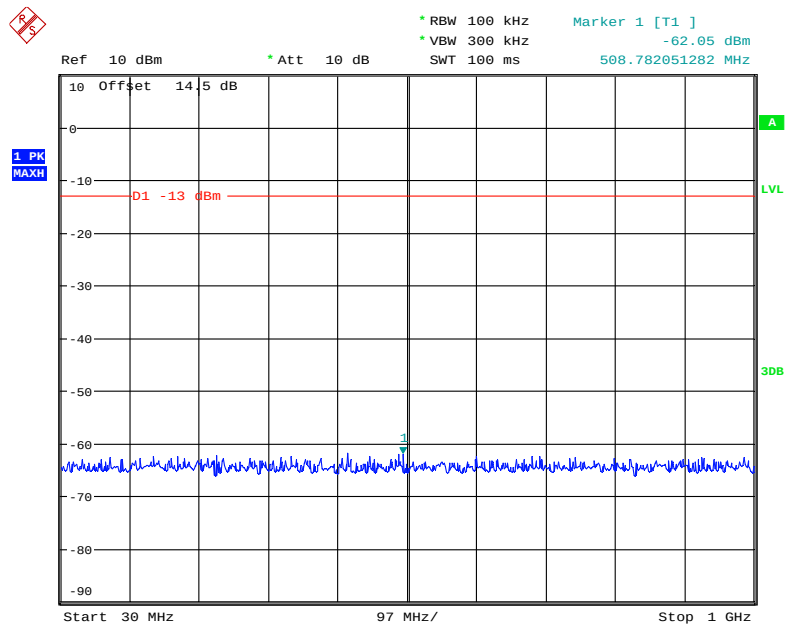
Date: 15.JUL.2018 16:44:53

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



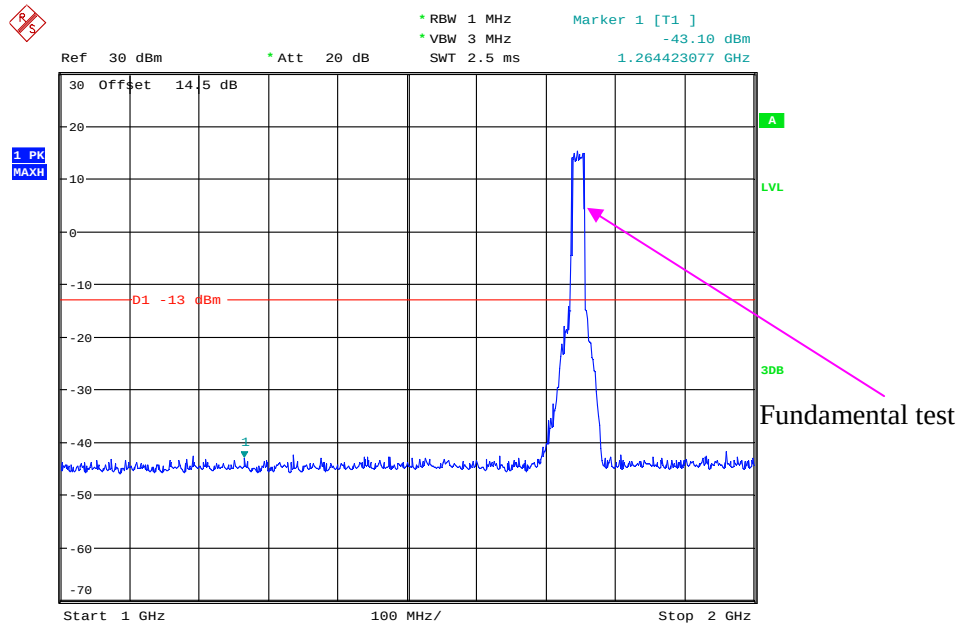
Date: 15.JUL.2018 16:40:46

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



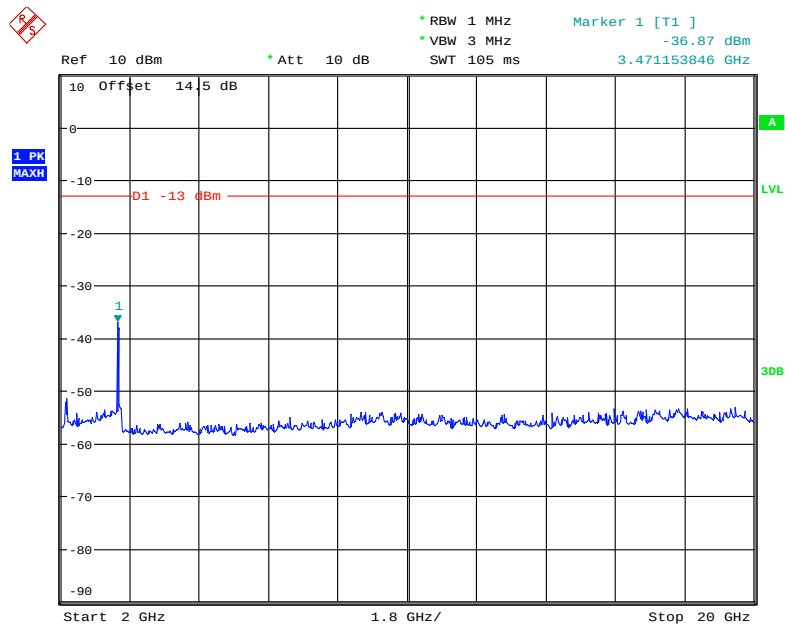
Date: 15.JUL.2018 16:38:52

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

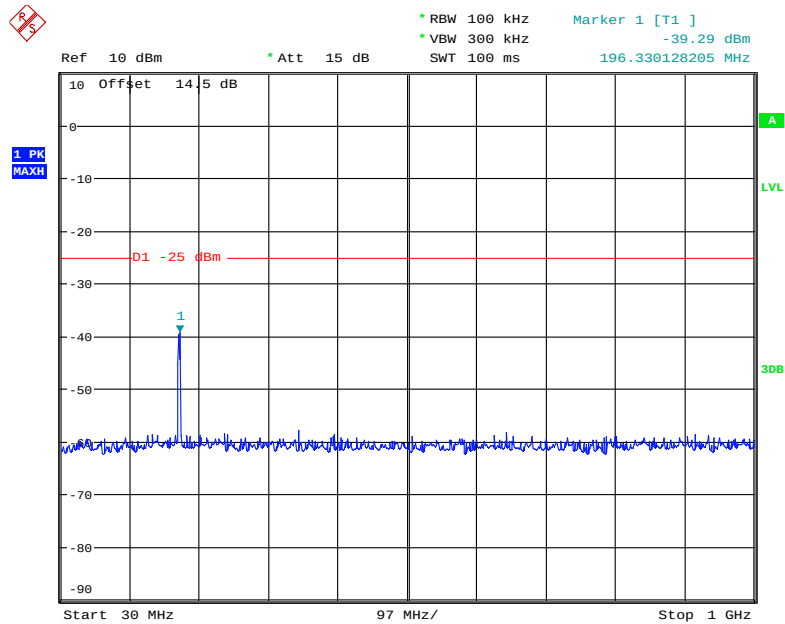


Date: 15.JUL.2018 16:45:23

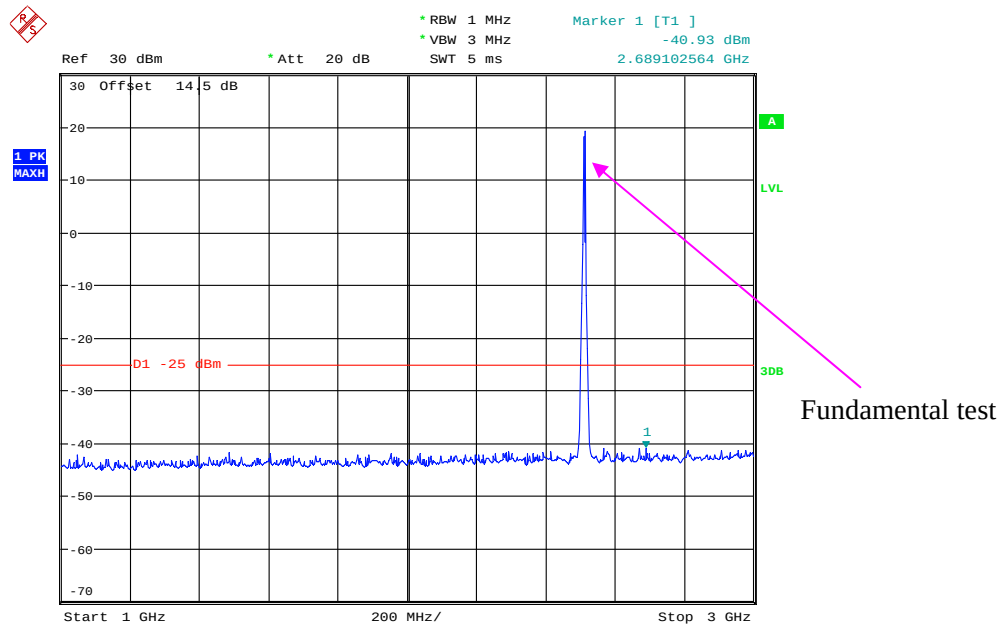
2 GHz –20 GHz (20.0 MHz, Middle Channel)



Date: 15.JUL.2018 16:39:33

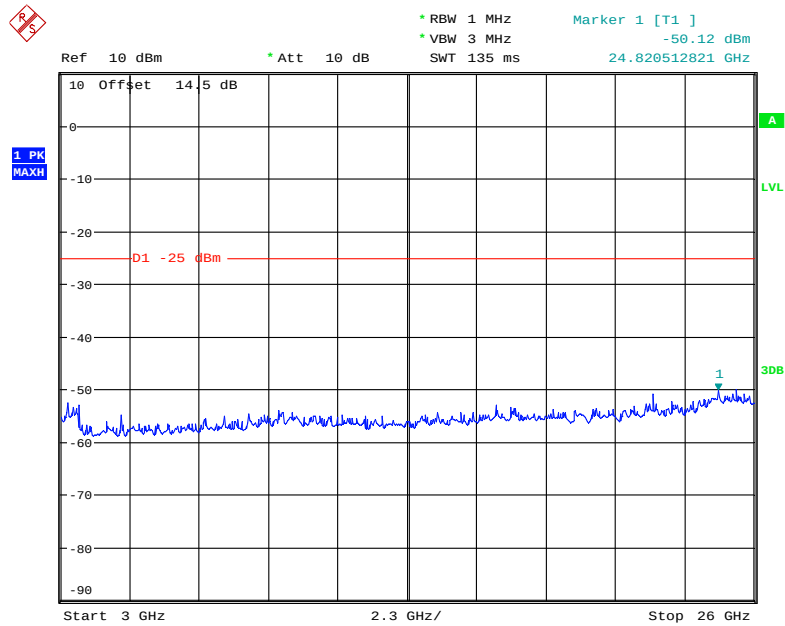
LTE Band 7:**30 MHz – 1 GHz (5.0 MHz, Middle Channel)**

Date: 15.JUL.2018 16:35:09

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

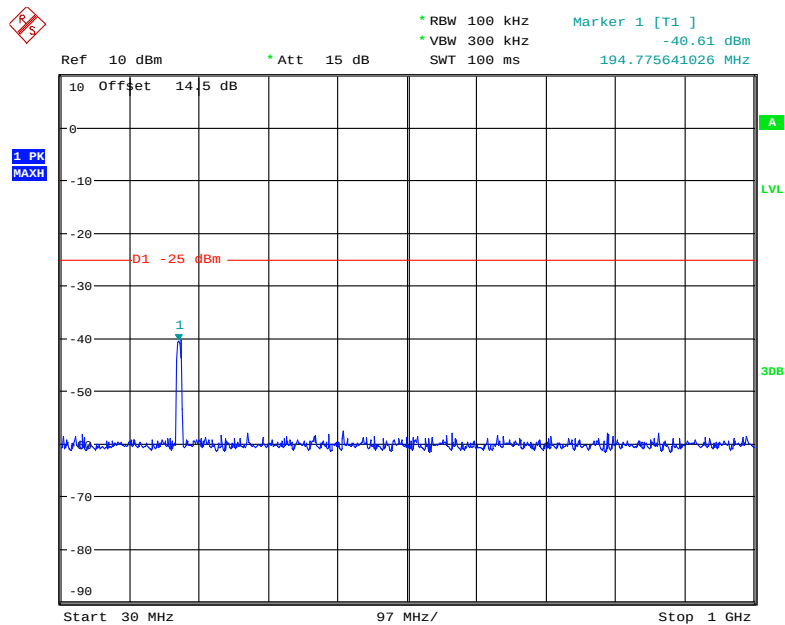
Date: 15.JUL.2018 16:29:52

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



Date: 15.JUL.2018 16:30:42

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



Date: 15.JUL.2018 16:34:51

Ref 30 dBm * Att 20 dB * RBW 1 MHz * VBW 3 MHz SWT 5 ms Marker 1 [T1] -40.91 dBm 2.884615385 GHz

30 Offset 14.5 dB

1 PK MAXH

D1 -25 dBm

30dB

1

Start 1 GHz 200 MHz/ Stop 3 GHz

Fundamental test

Ref 10 dBm * Att 10 dB

* RBW 1 MHz * VBW 3 MHz * SWT 135 ms

Marker 1 [T1] -50.65 dBm 25.041666667 GHz

10 Offset 14 5 dB

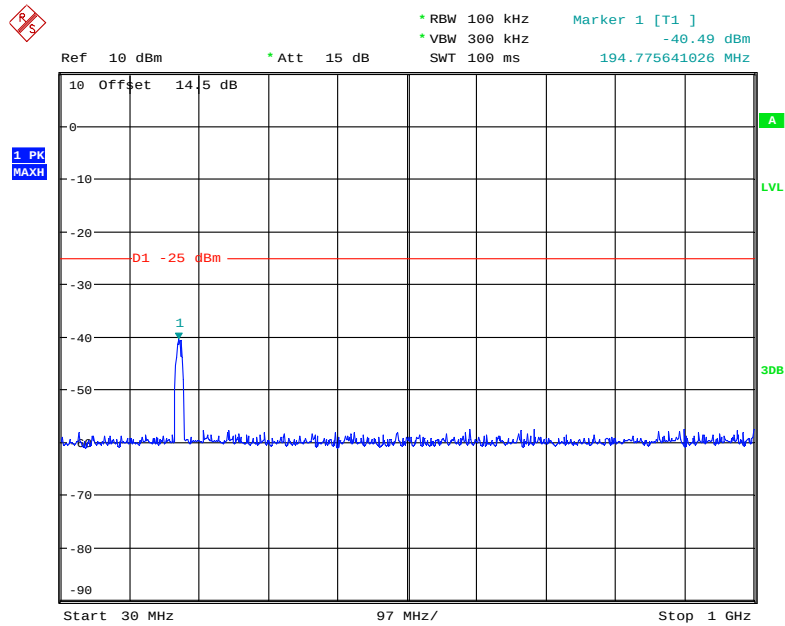
1 PK MAXH

D1 -25 dBm

Start 3 GHz 2.3 GHz/ Stop 26 GHz

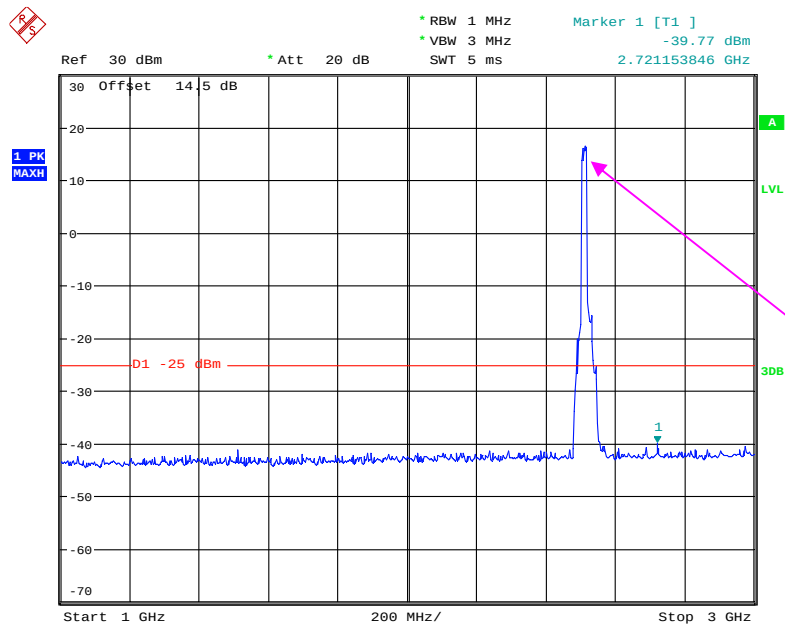
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30 MHz – 1 GHz (15.0 MHz, Middle Channel)



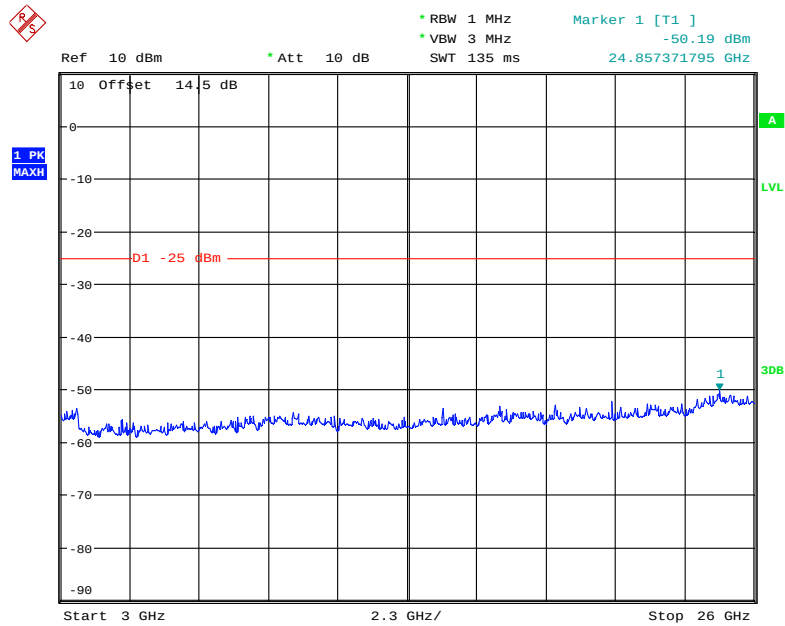
Date: 15.JUL.2018 16:34:31

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



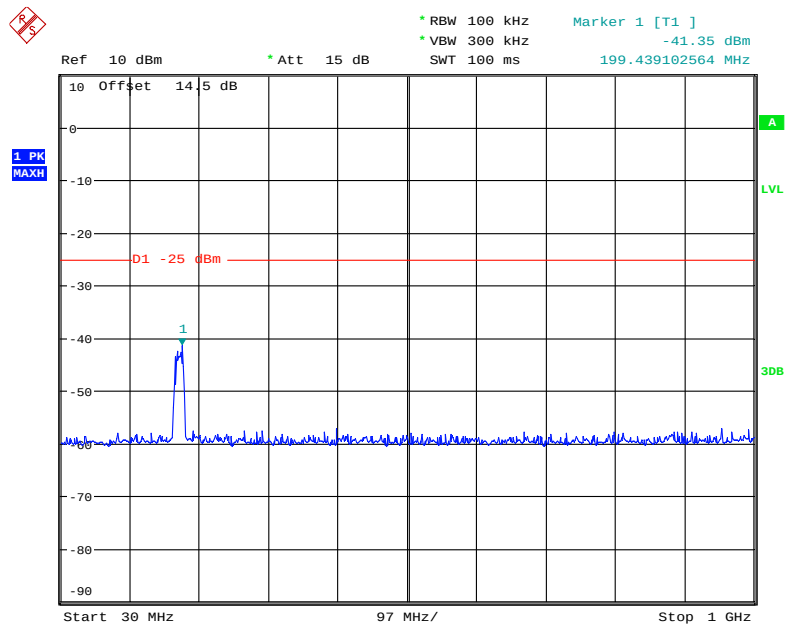
Date: 15.JUL.2018 16:28:14

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



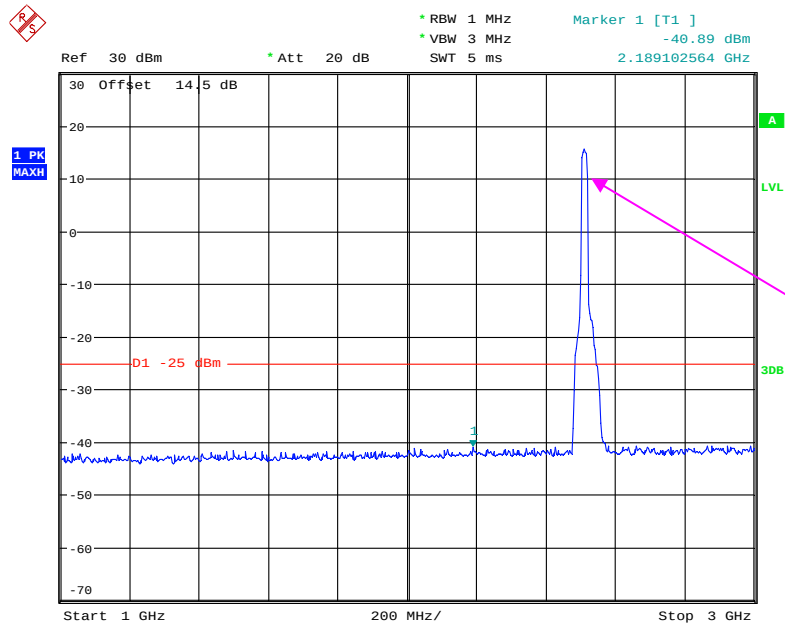
Date: 15.JUL.2018 16:31:56

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



Date: 15.JUL.2018 16:33:53

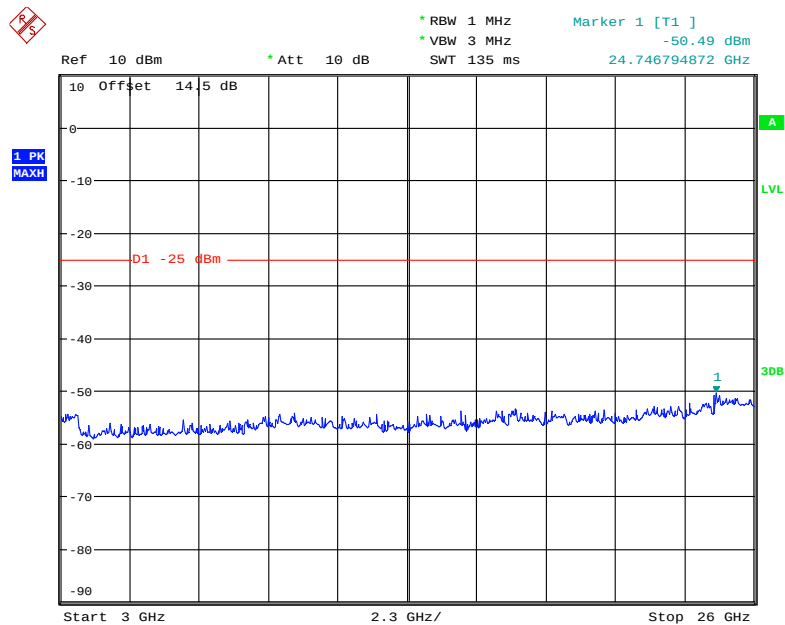
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 15.JUL.2018 16:26:52

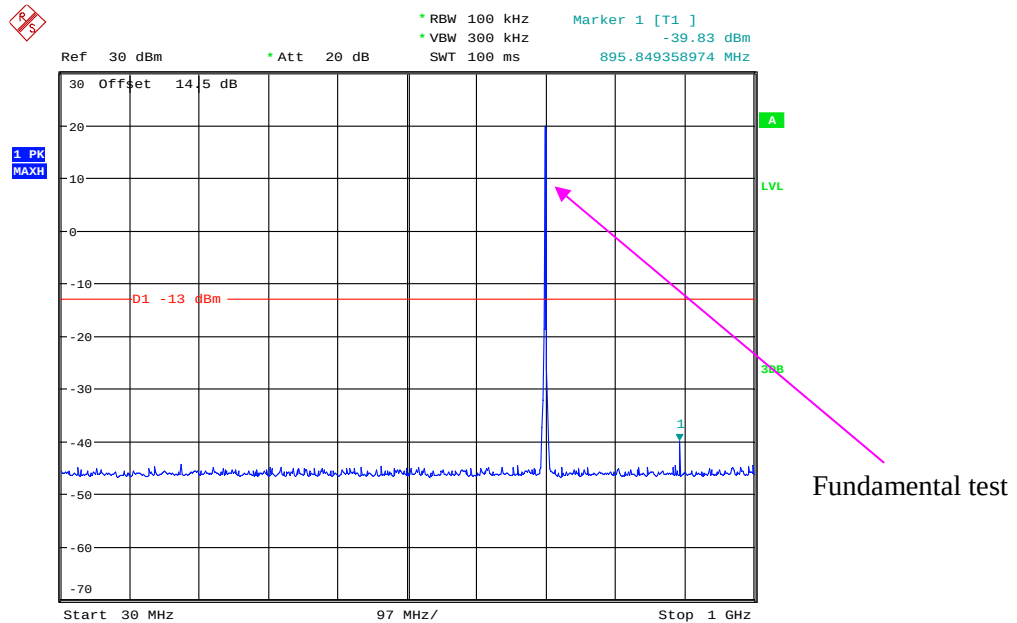
3 GHz – 26 GHz (20.0 MHz, Middle Channel)



Date: 15.JUL.2018 16:32:17

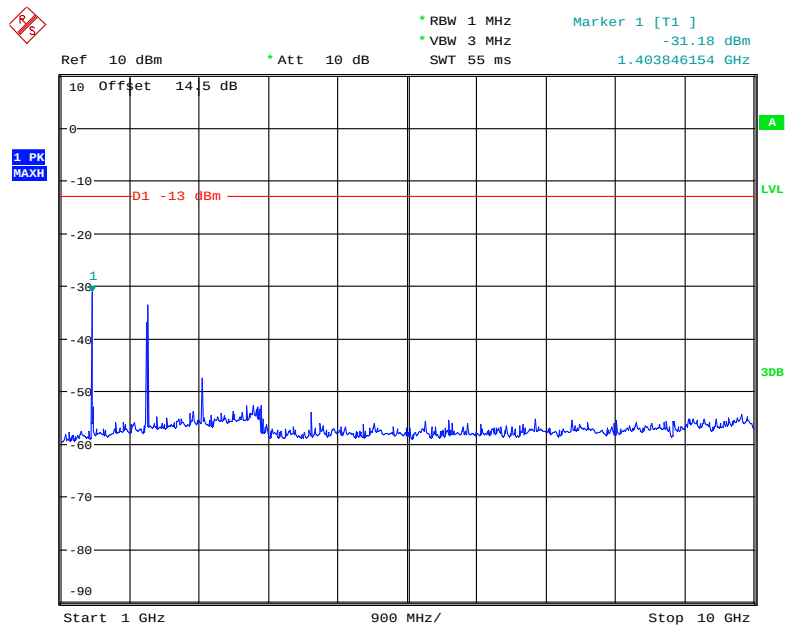
LTE Band 12:

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



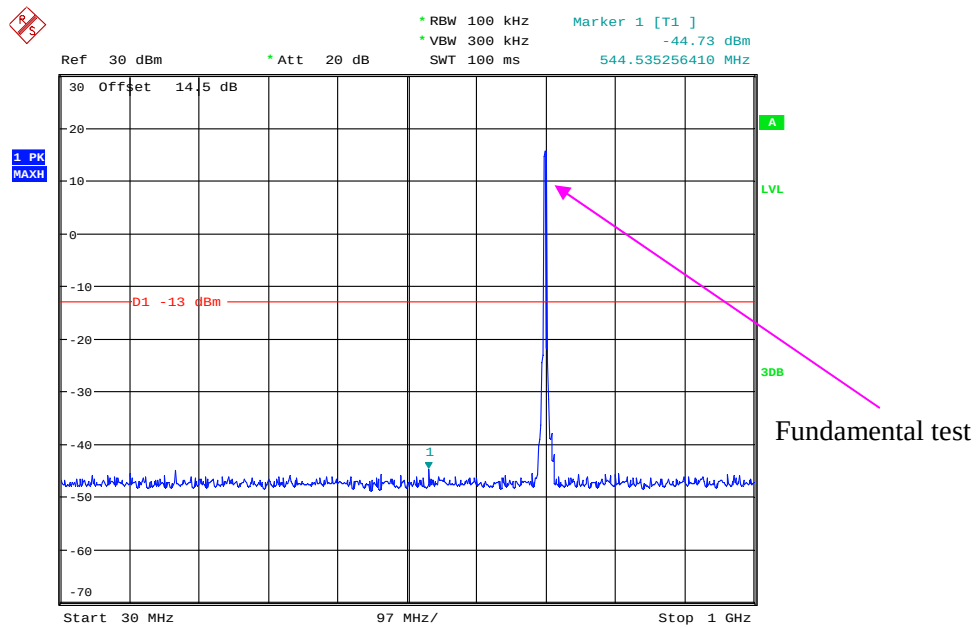
Date: 15.JUL.2018 16:14:45

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



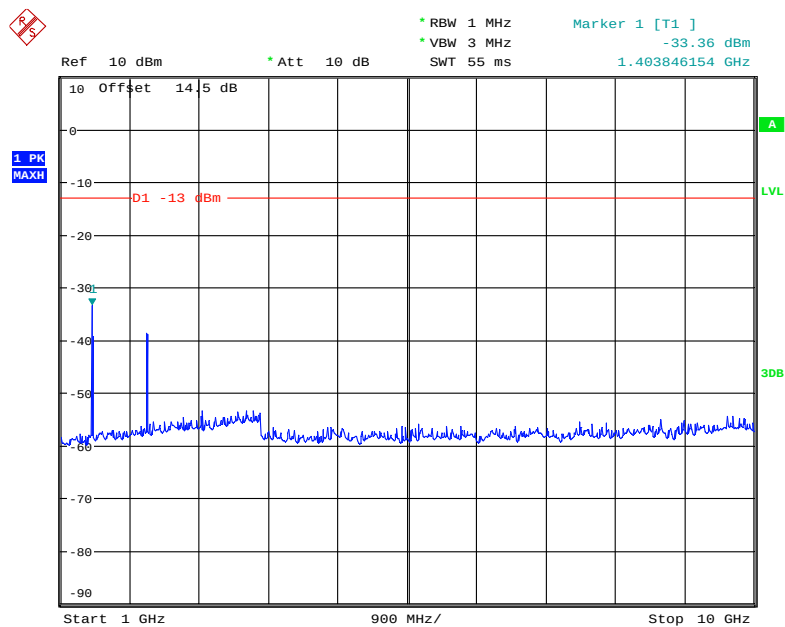
Date: 15.JUL.2018 16:20:06

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

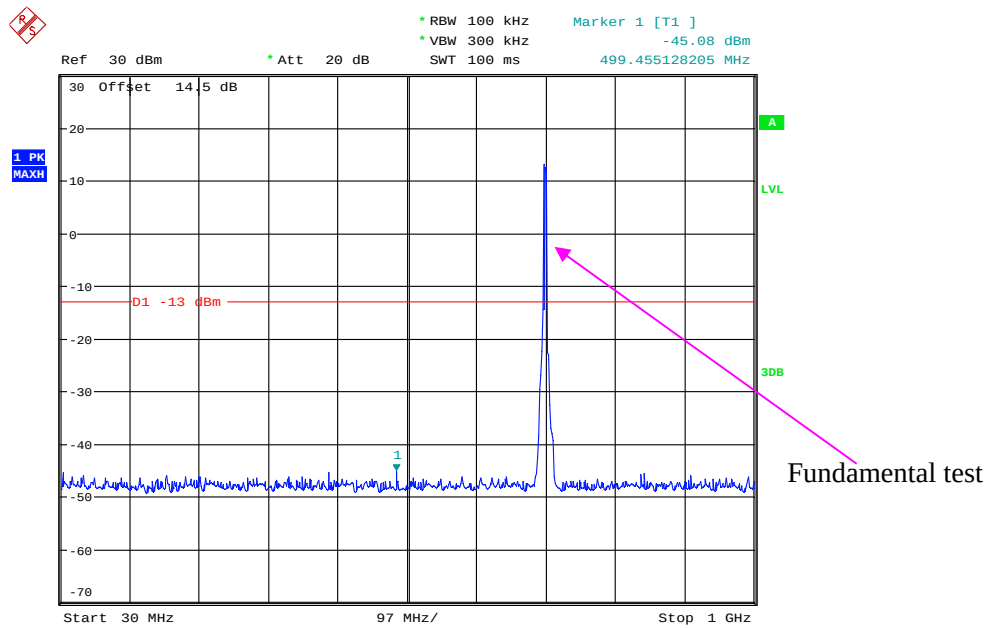


Date: 15.JUL.2018 16:15:59

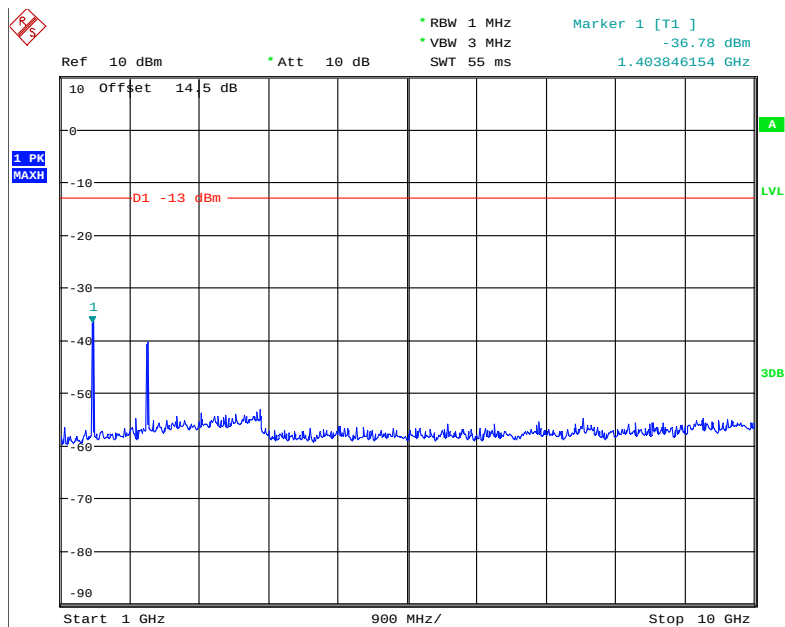
1 GHz – 10 GHz (3.0 MHz, Middle Channel)



Date: 15.JUL.2018 16:19:39

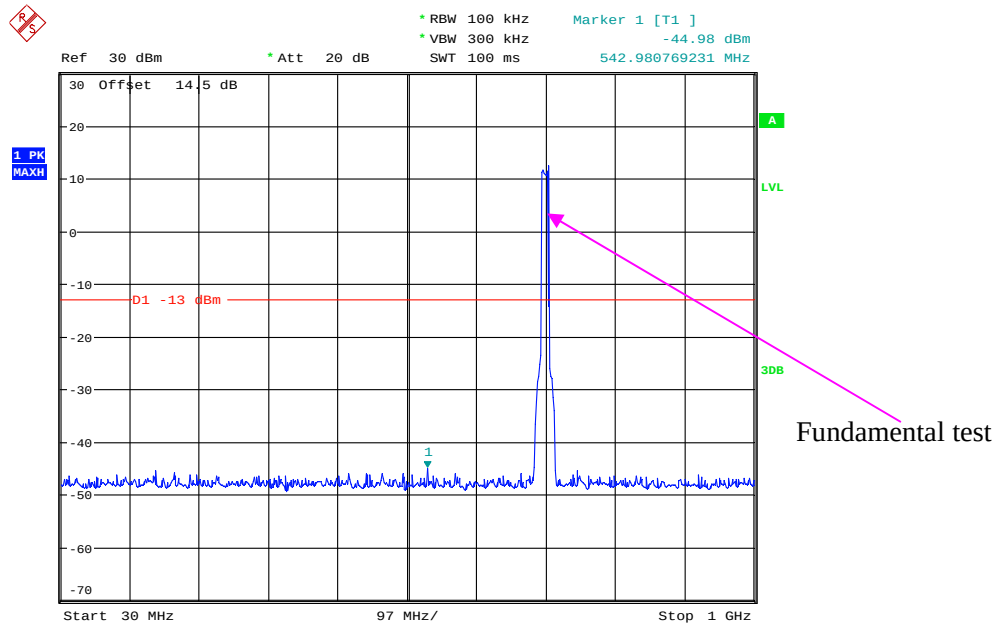
30 MHz - 1 GHz (5.0 MHz, Middle Channel)

Date: 15.JUL.2018 16:16:26

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

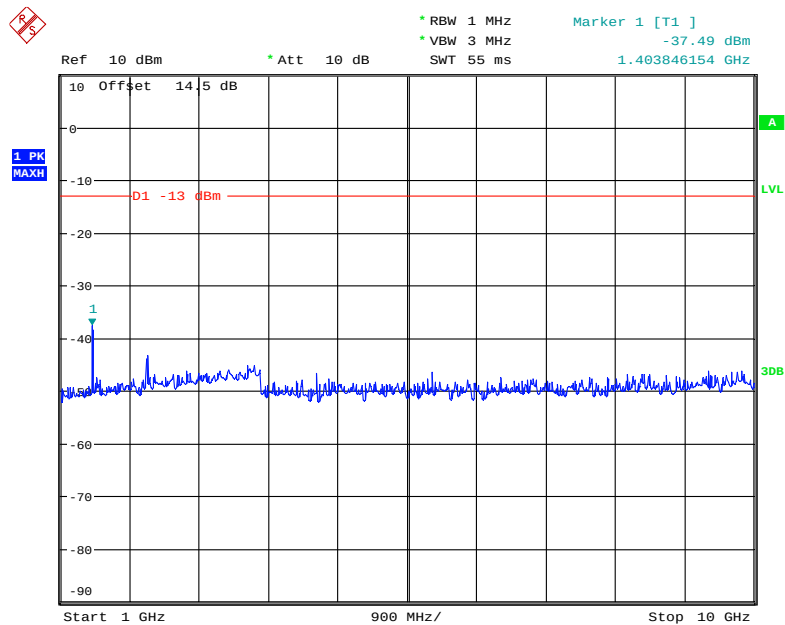
Date: 15.JUL.2018 16:19:19

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



Date: 15.JUL.2018 16:17:08

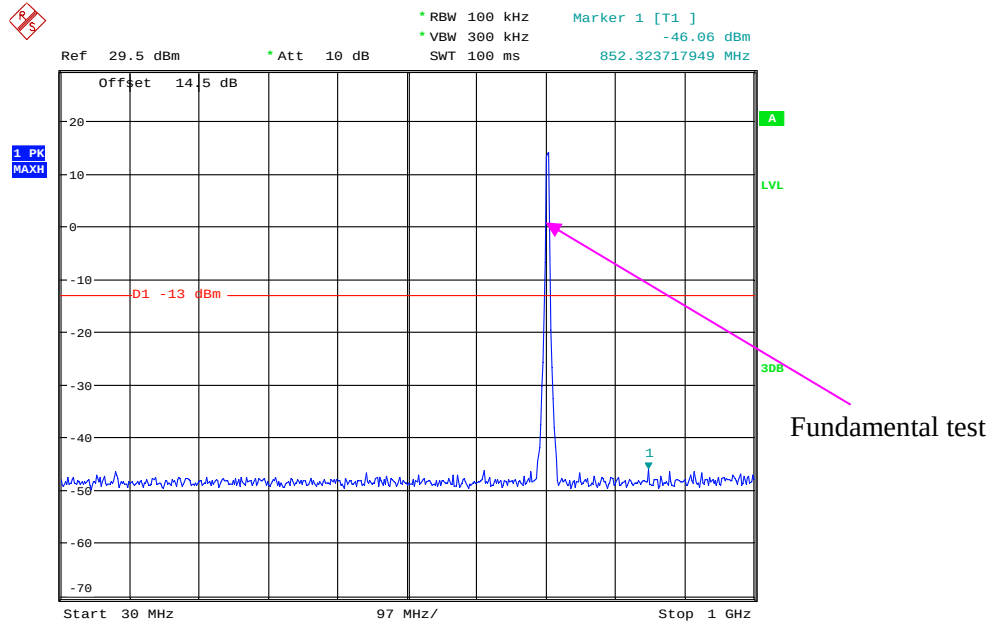
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 15.JUL.2018 16:18:14

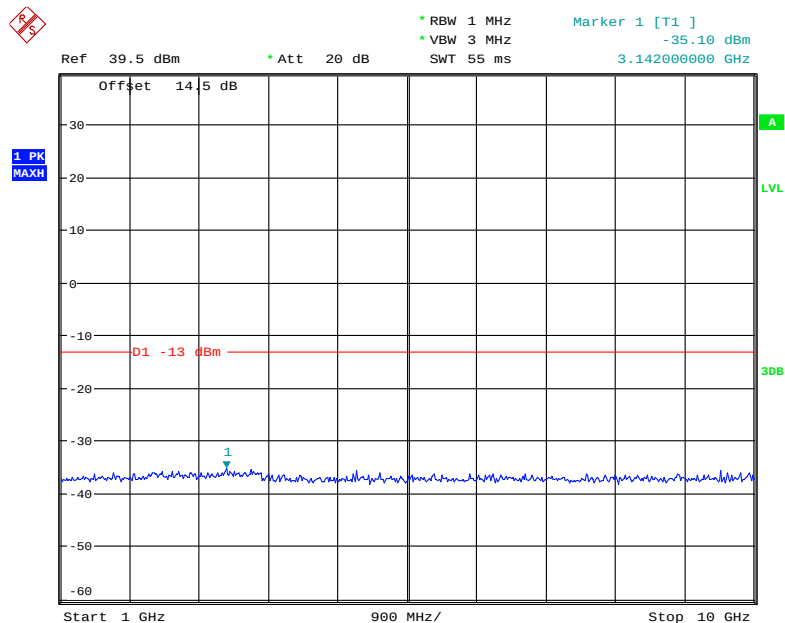
LTE Band 17:

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



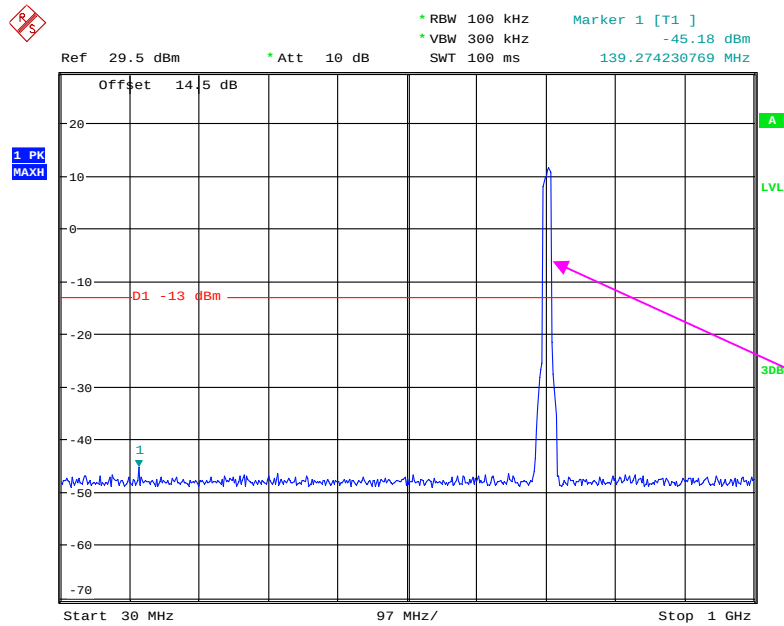
Date: 16.JUL.2018 21:46:27

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



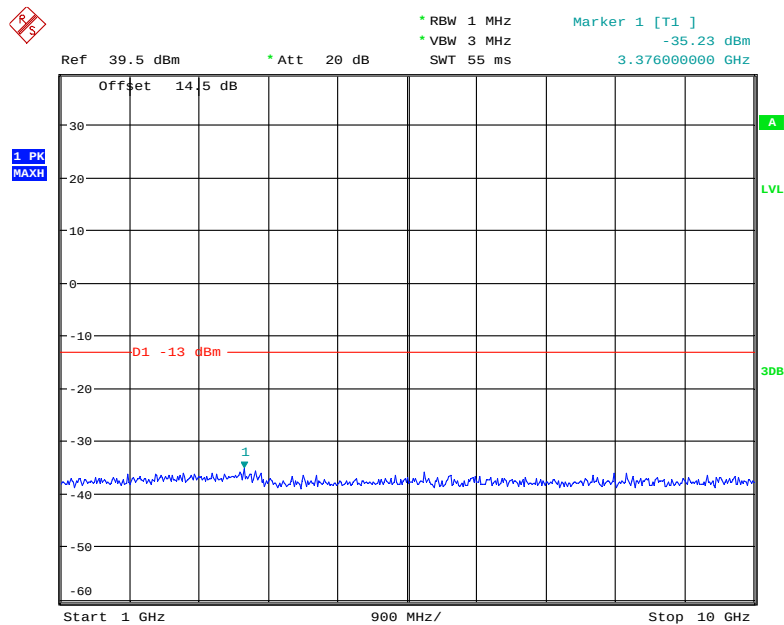
Date: 16.JUL.2018 21:45:45

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



Date: 16.JUL.2018 21:43:31

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



Date: 16.JUL.2018 21:44:25

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 Tracy Hu on 2018-06-27.

EUT operation mode: Transmitting

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

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
202.65	34.09	43	1.8	H	-62.90	0.30	0	-63.20	-13	50.20
202.65	32.93	359	2.3	V	-64.10	0.30	0	-64.40	-13	51.40
1673.20	71.25	73	2.2	H	-35.8	1.30	8.90	-28.20	-13	15.20
1673.20	70.11	126	2.2	V	-36.4	1.30	8.90	-28.80	-13	15.80
2509.80	62.69	224	2.3	H	-40.8	2.60	10.20	-33.20	-13	20.20
2509.80	56.96	118	1.4	V	-46.0	2.60	10.20	-38.40	-13	25.40
4183.00	67.73	208	1.3	H	-33.7	1.50	11.80	-23.40	-13	10.40
4183.00	70.45	54	1.9	V	-30.1	1.50	11.80	-19.80	-13	6.80
WCDMA Mode, Middle channel										
202.65	34.14	94	2.1	H	-62.90	0.30	0	-63.20	-13	50.20
202.65	33.01	258	1.4	V	-64.00	0.30	0	-64.30	-13	51.30
1673.20	52.68	143	2.4	H	-54.4	1.30	8.90	-46.80	-13	33.80
1673.20	52.03	58	2.4	V	-54.4	1.30	8.90	-46.80	-13	33.80

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										
202.65	34.08	88	1.4	H	-62.90	0.30	0	-63.20	-13	50.20
202.65	33.42	279	2.1	V	-63.60	0.30	0	-63.90	-13	50.90
3760.00	68.69	341	1.7	H	-32.5	1.50	11.80	-22.20	-13	9.20
3760.00	60.07	15	1.3	V	-40.7	1.50	11.80	-30.40	-13	17.40
5640.00	64.24	199	1.2	H	-33.4	1.70	12.40	-22.70	-13	9.70
5640.00	62.21	285	1.6	V	-35.0	1.70	12.40	-24.30	-13	11.30
WCDMA Mode Band II, Middle channel										
202.65	34.05	232	1.5	H	-62.90	0.30	0	-63.20	-13	50.20
202.65	32.34	43	2.5	V	-64.70	0.30	0	-65.00	-13	52.00
3760.00	66.96	229	1.1	H	-34.3	1.50	11.80	-24.00	-13	11.00
3760.00	63.16	92	1.5	V	-37.6	1.50	11.80	-27.30	-13	14.30
5640.00	58.51	39	1.1	H	-39.1	1.70	12.40	-28.40	-13	15.40
5640.00	57.27	5	2.0	V	-40.0	1.70	12.40	-29.30	-13	16.30

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
Band 4										
Test frequency range:30 MHz ~ 18 GHz										
186.37	34.97	314	1.9	H	-62.00	0.29	0	-62.29	-13	49.29
186.37	32.52	110	2.3	V	-64.50	0.29	0	-64.79	-13	51.79
3465.00	51.79	338	1.7	H	-48.6	1.50	12.00	-38.10	-13	25.10
3465.00	51.32	153	1.7	V	-49.8	1.50	12.00	-39.30	-13	26.30
Band 7										
Test frequency range:30 MHz ~ 26 GHz										
186.37	33.25	295	2.0	H	-63.70	0.29	0	-63.99	-25	38.99
186.37	32.88	170	1.1	V	-64.10	0.29	0	-64.39	-25	39.39
5070.00	64.21	101	1.1	H	-33.7	1.60	12.10	-23.20	-25	0.80
5070.00	61.17	211	1.8	V	-36.7	1.60	12.10	-26.20	-25	1.20
Band 12										
Test frequency range:30 MHz ~ 10GHz										
186.37	33.25	138	2.4	H	-63.70	0.29	0	-63.99	-13	50.99
186.37	33.06	289	2.0	V	-63.90	0.29	0	-64.19	-13	51.19
1415.00	56.48	154	2.4	H	-51.4	1.60	7.90	-45.10	-13	32.10
1415.00	54.78	327	1.3	V	-53.3	1.60	7.90	-47.00	-13	34.00
Band 17										
Test frequency range: 30 MHz ~ 10GHz										
186.37	34.57	167	1.2	H	-62.40	0.29	0	-62.69	-13	49.69
186.37	33.32	231	2.2	V	-63.70	0.29	0	-63.99	-13	50.99
1420.00	55.26	154	1.8	H	-52.6	1.60	7.90	-46.30	-13	33.30
1420.00	54.31	118	1.1	V	-53.8	1.60	7.90	-47.50	-13	34.50

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.

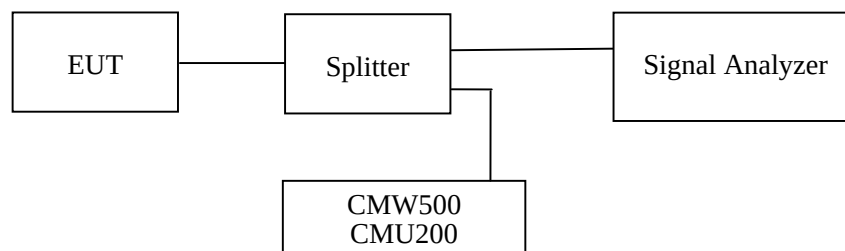
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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**

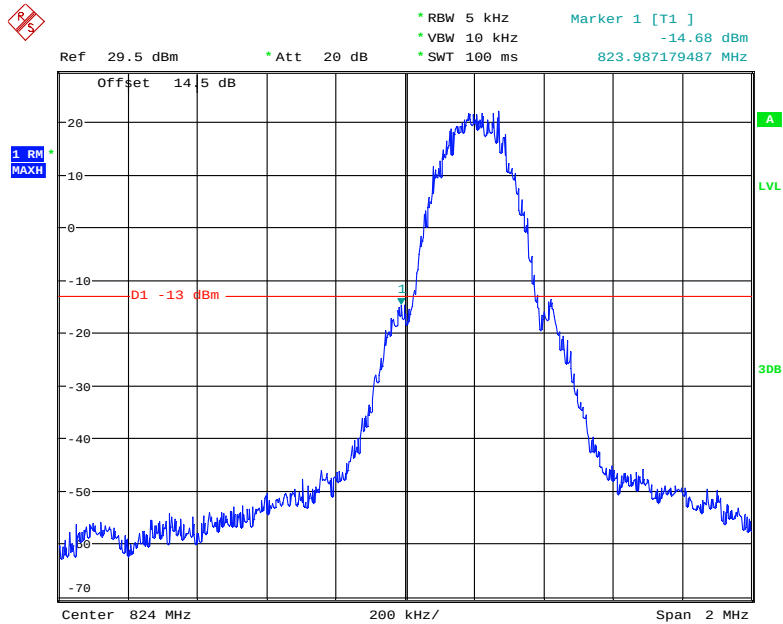
Temperature:	21~25 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Tracy Hu from 2018-06-27 to 2018-07-23.

EUT operation mode: Transmitting

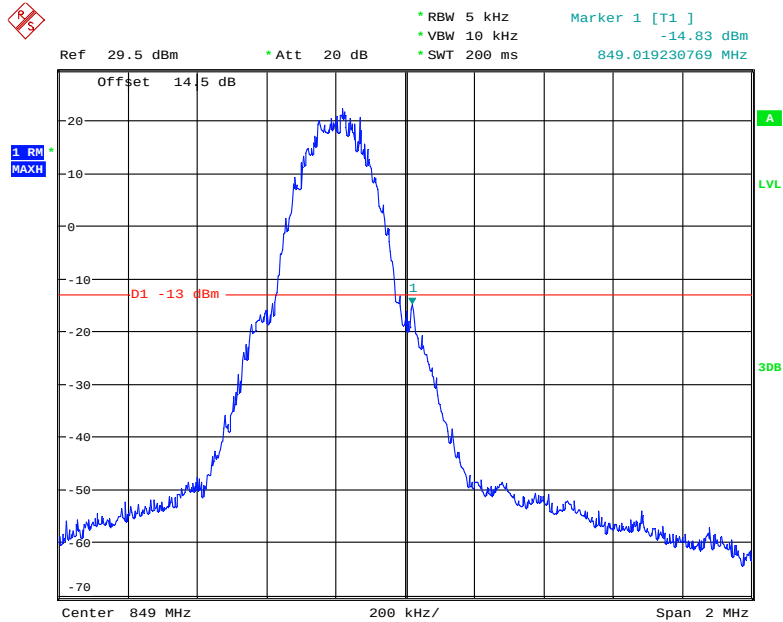
Test Result: Compliance. Please refer to the following plots.

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



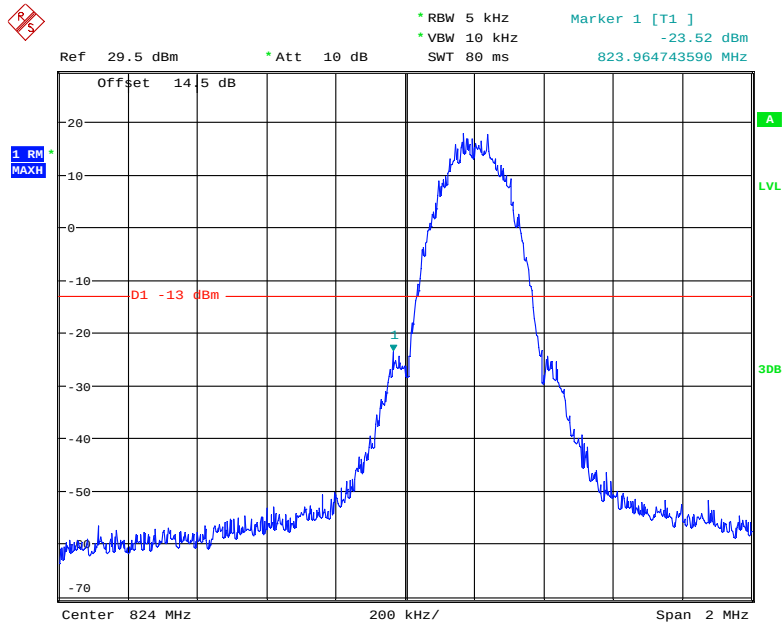
Date: 27.JUN.2018 21:20:05

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



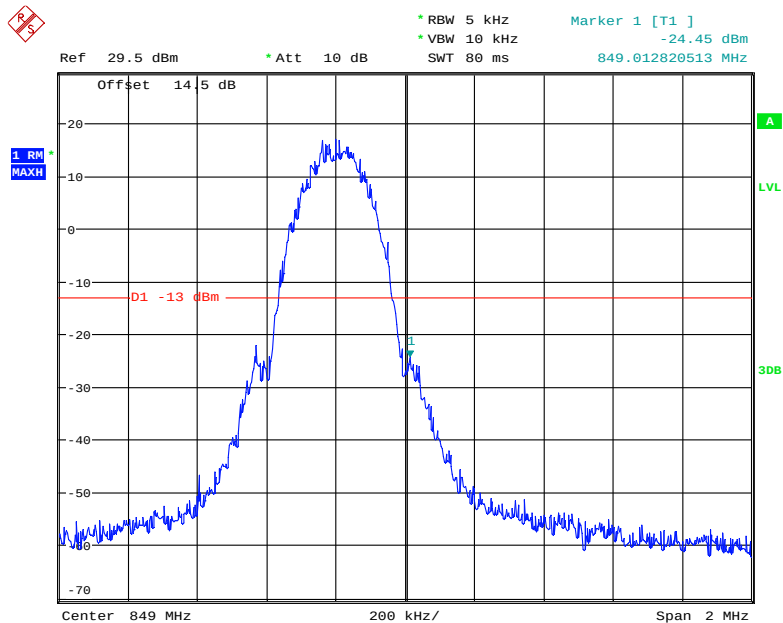
Date: 27.JUN.2018 21:21:57

Cellular Band, Left Band Edge for EDGE Mode



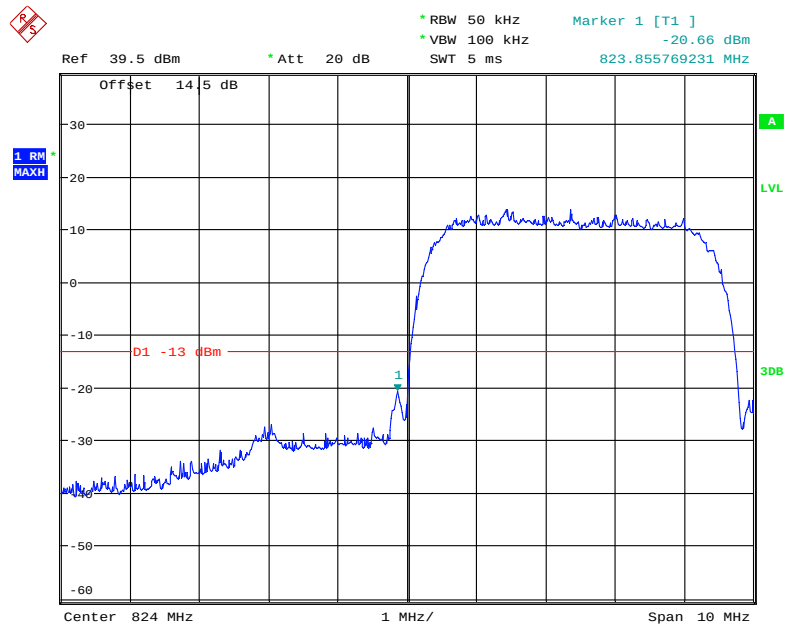
Date: 27.JUN.2018 21:29:43

Cellular Band, Right Band Edge for EDGE Mode



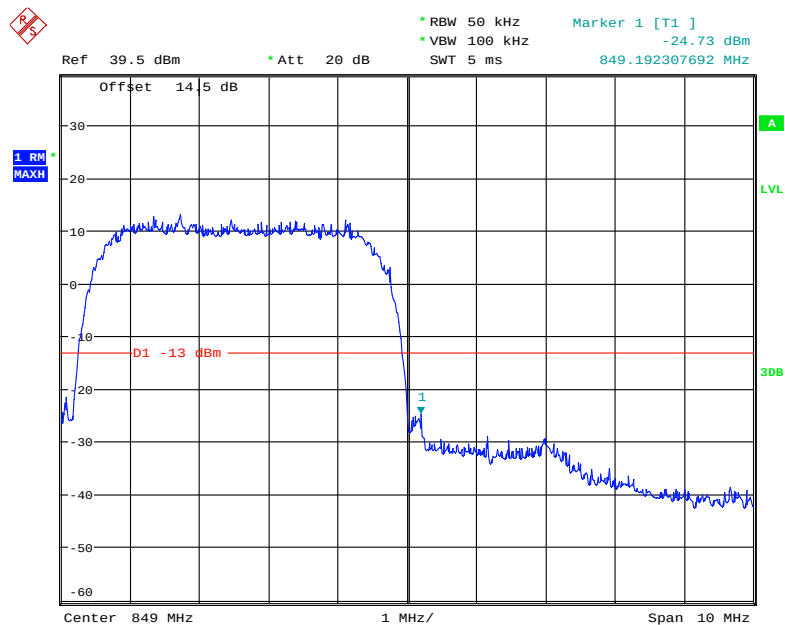
Date: 27.JUN.2018 21:30:48

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



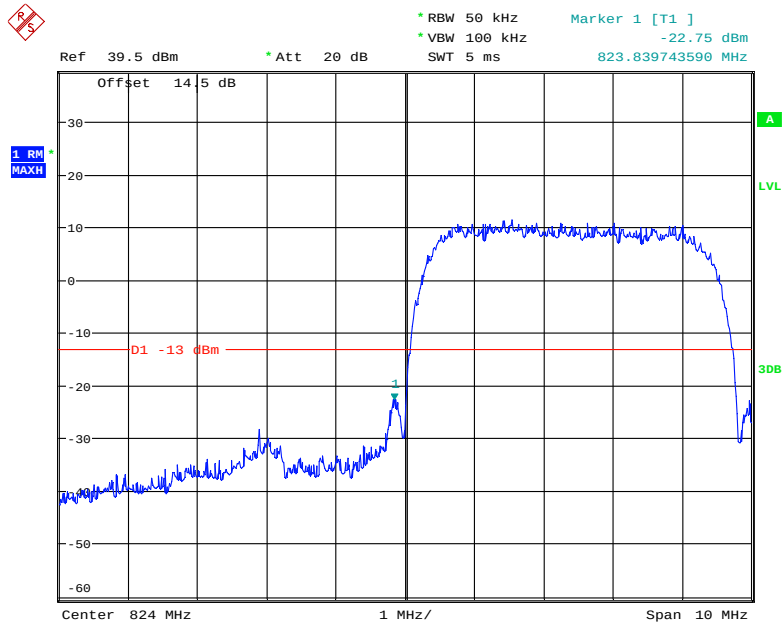
Date: 27.JUN.2018 22:06:32

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



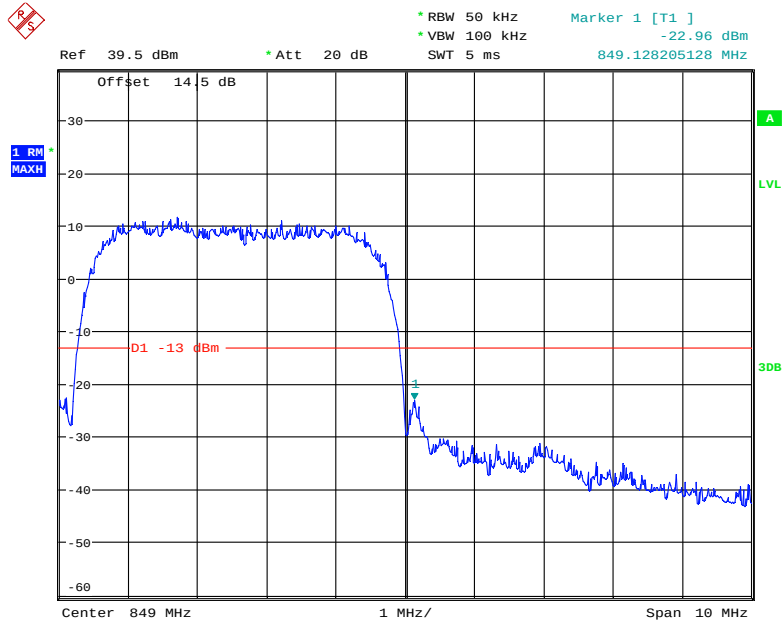
Date: 27.JUN.2018 22:07:26

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



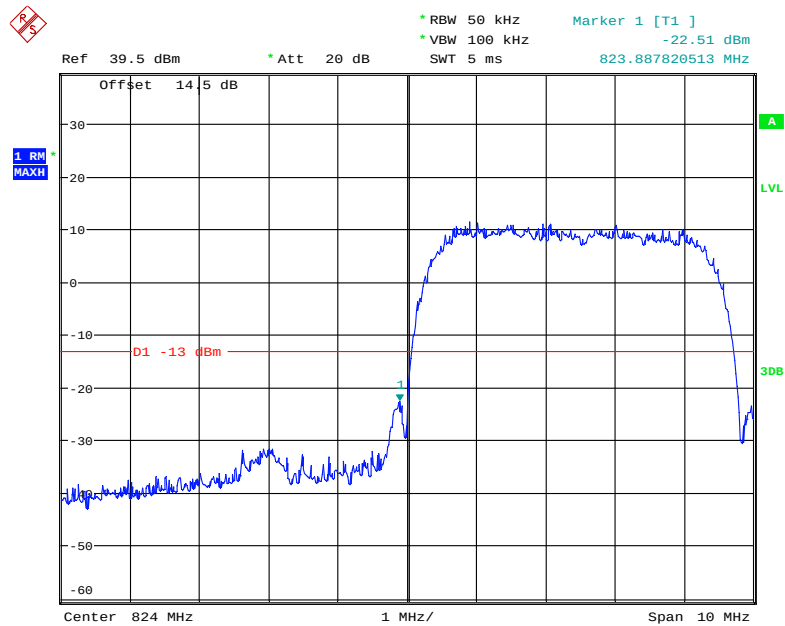
Date: 27.JUN.2018 22:10:47

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



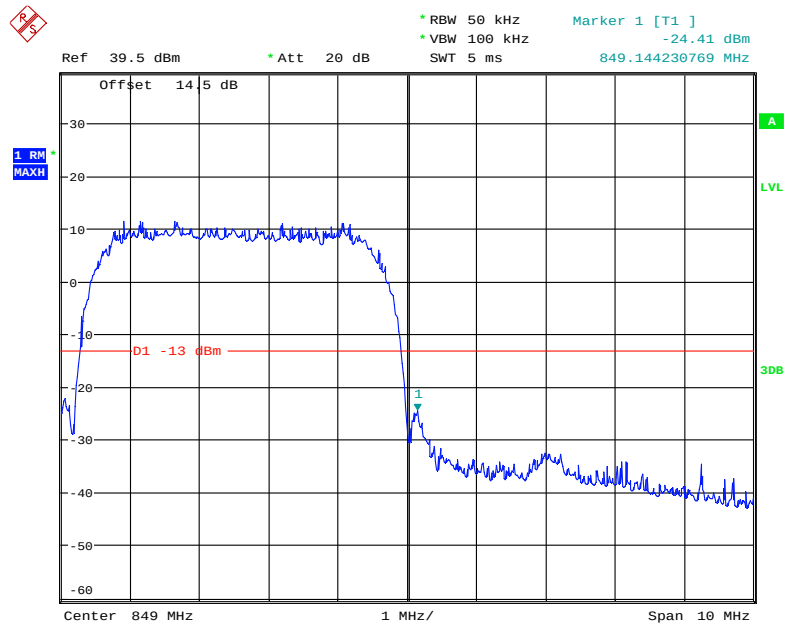
Date: 27.JUN.2018 22:09:27

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



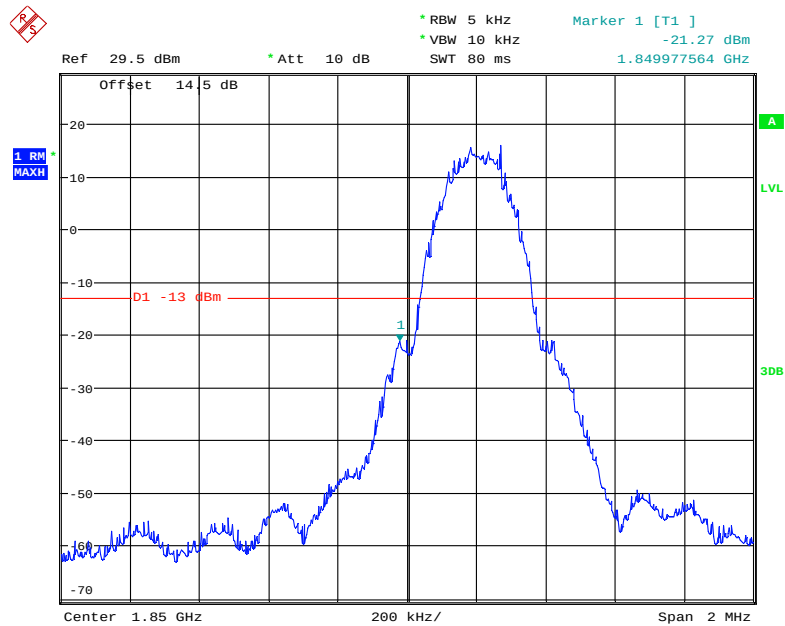
Date: 27.JUN.2018 22:11:56

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



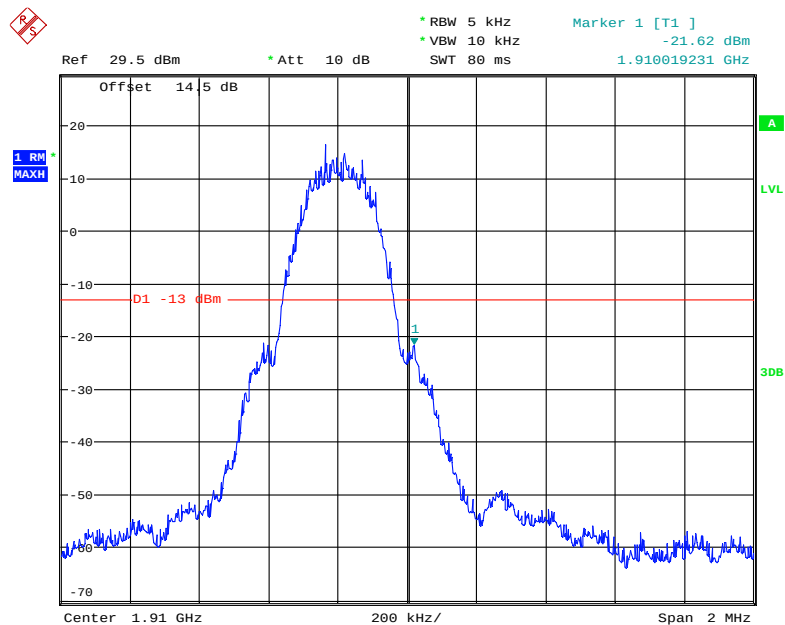
Date: 27.JUN.2018 22:12:56

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



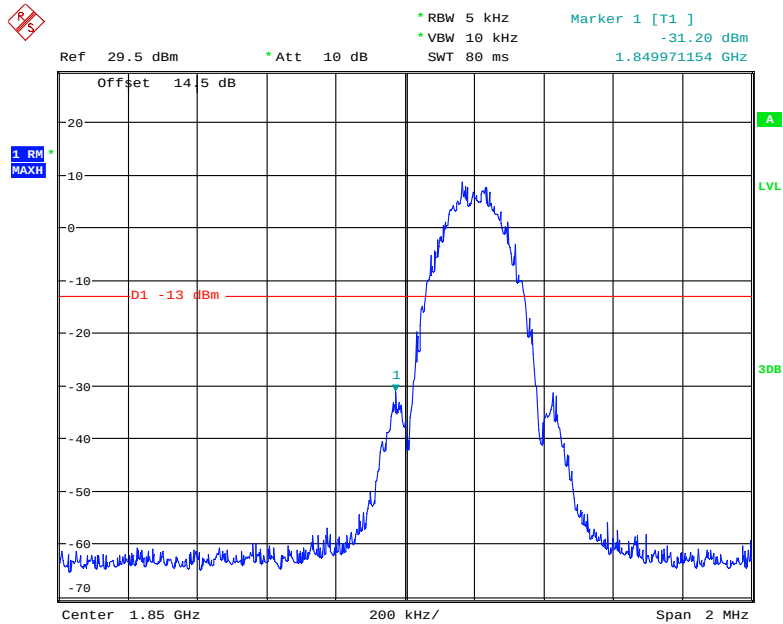
Date: 27.JUN.2018 20:53:16

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



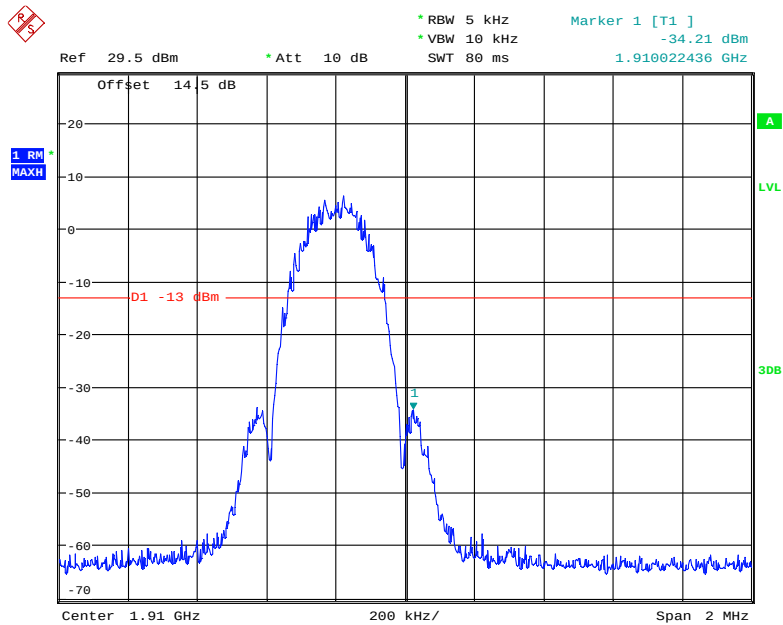
Date: 27.JUN.2018 20:54:22

PCS Band, Left Band Edge for EDGE Mode



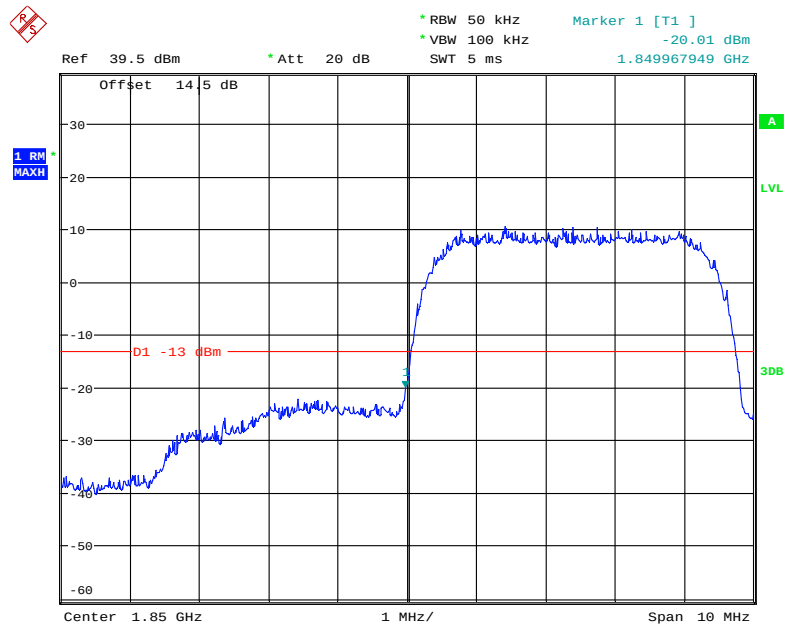
Date: 27.JUN.2018 21:06:24

PCS Band, Right Band Edge for EDGE Mode



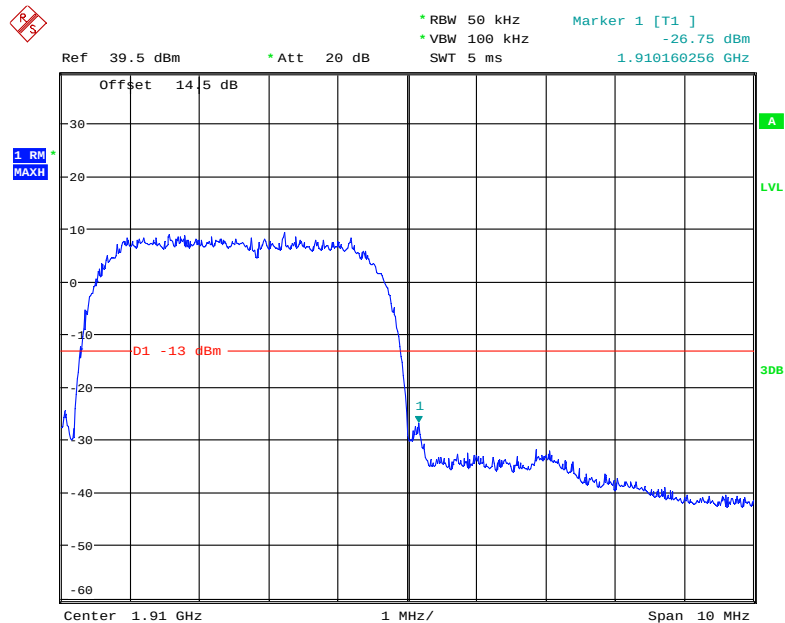
Date: 27.JUN.2018 21:08:04

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

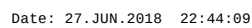
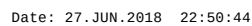


Date: 27.JUN.2018 22:44:09

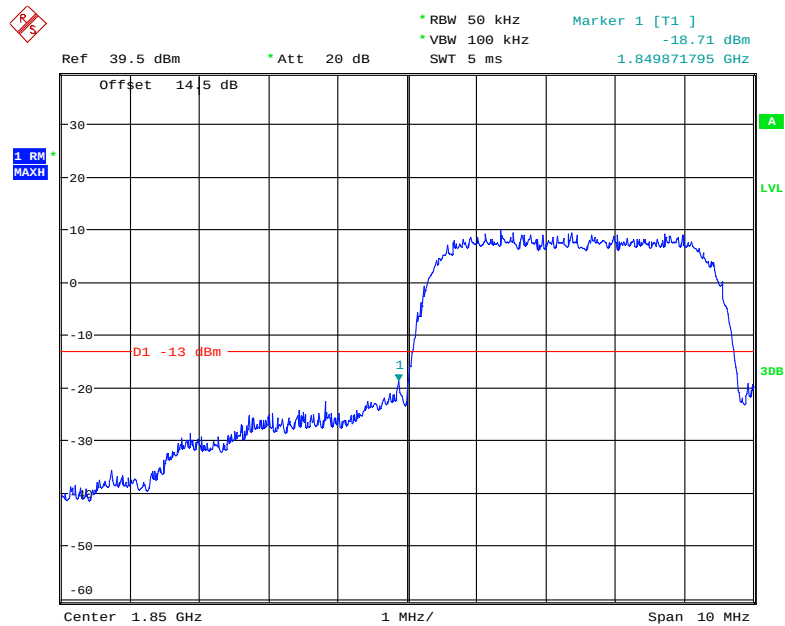
PCS Band, Right Band Edge for WCDMA (BPSK) Mode



Date: 27.JUN.2018 22:46:06

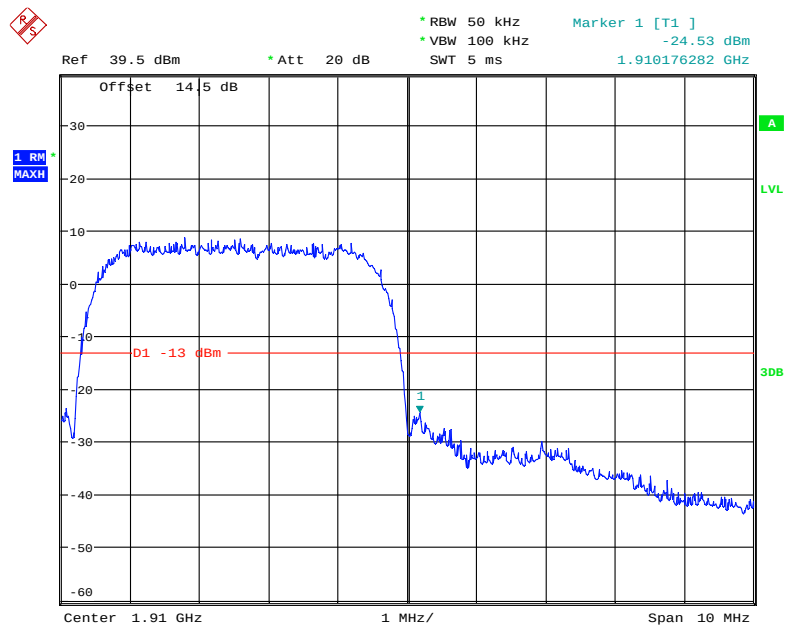


PCS Band, Left Band Edge for HSUPA (BPSK) Mode



Date: 27.JUN.2018 22:49:20

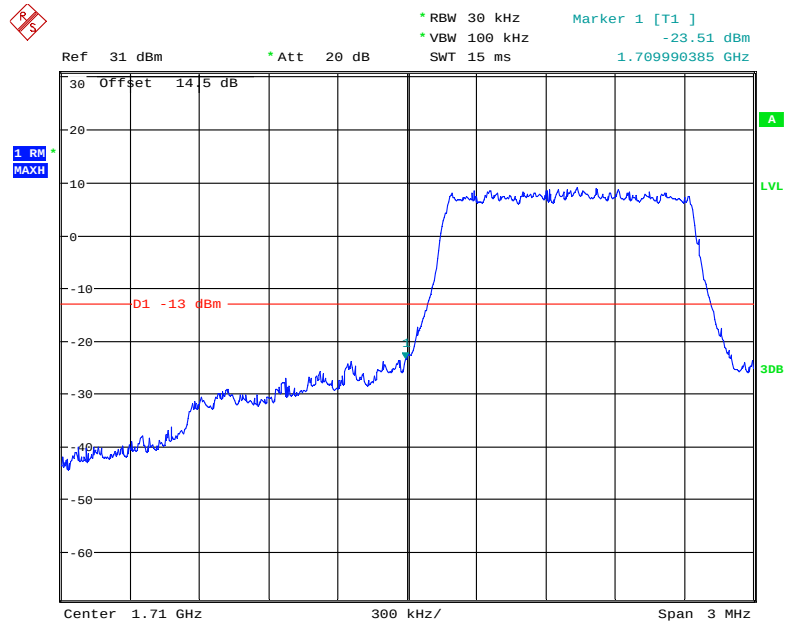
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 27.JUN.2018 22:48:28

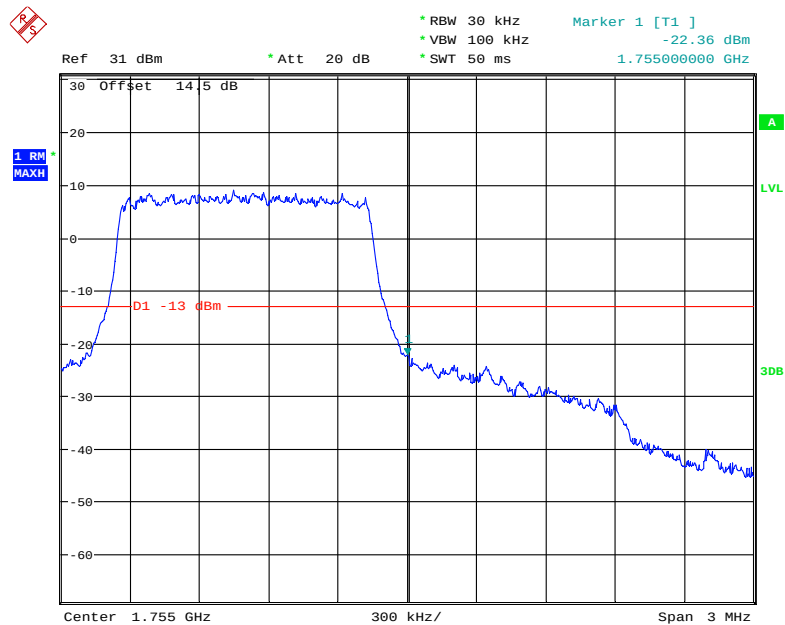
Band 4:

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



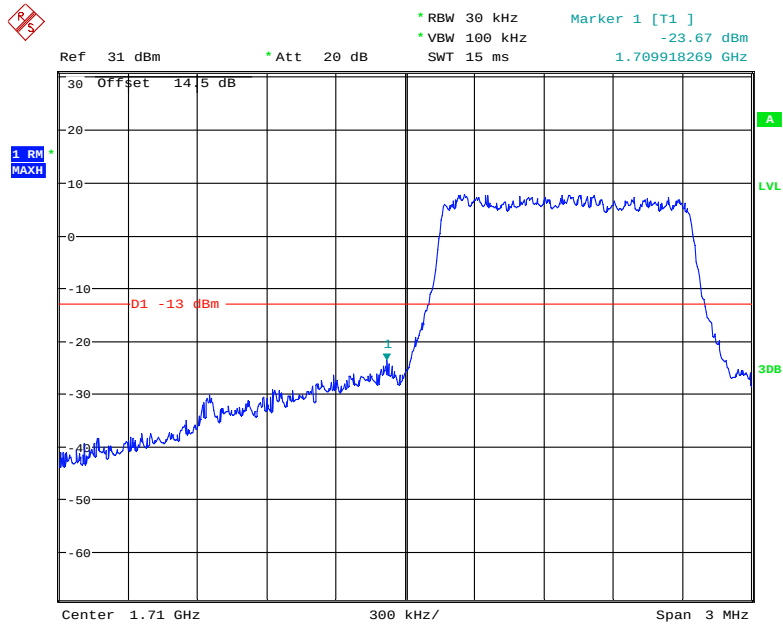
Date: 23.JUL.2018 18:53:42

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



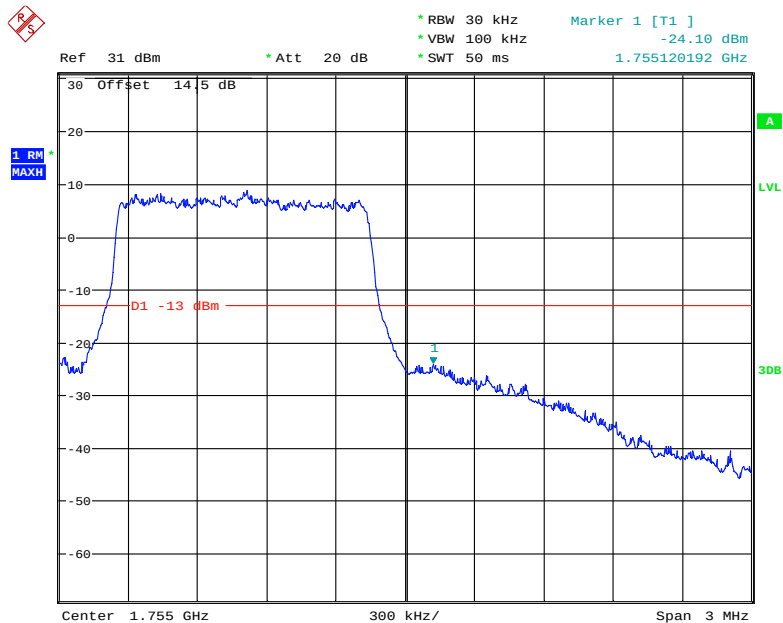
Date: 15.JUL.2018 14:56:12

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

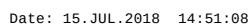
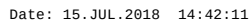


Date: 23.JUL.2018 18:55:38

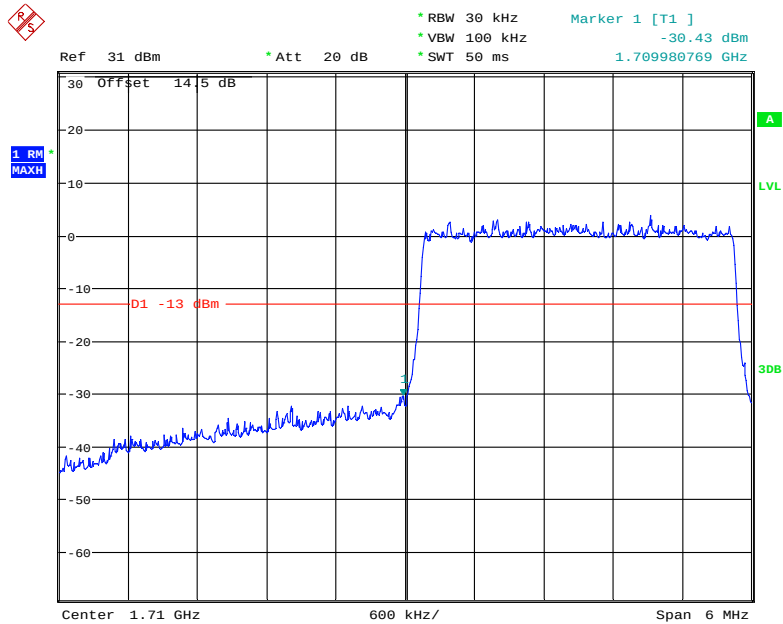
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



Date: 15.JUL.2018 14:55:10

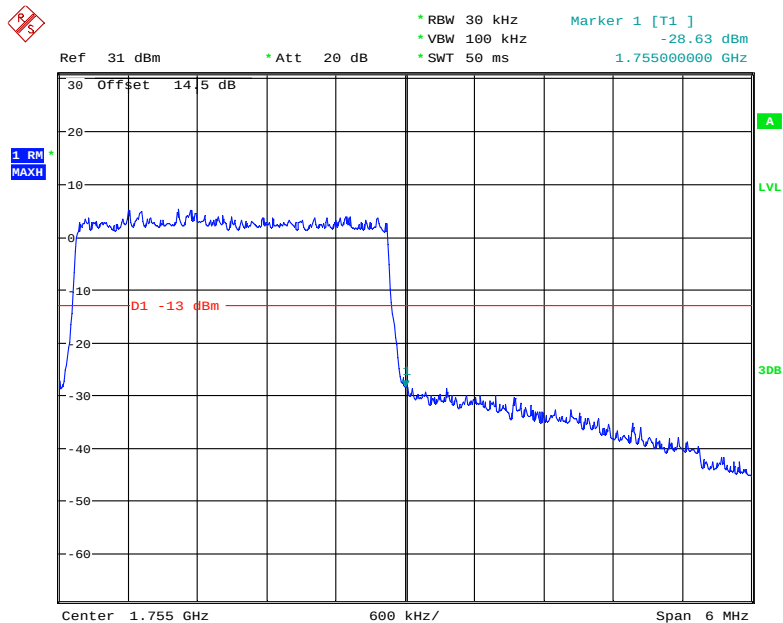


16-QAM (3.0 MHz, FULL RB) - Left Band Edge



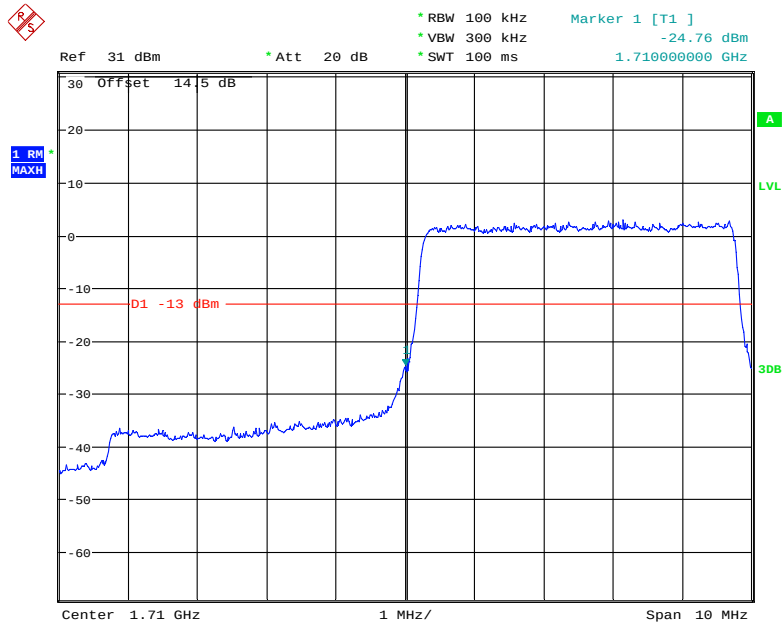
Date: 15.JUL.2018 14:43:19

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



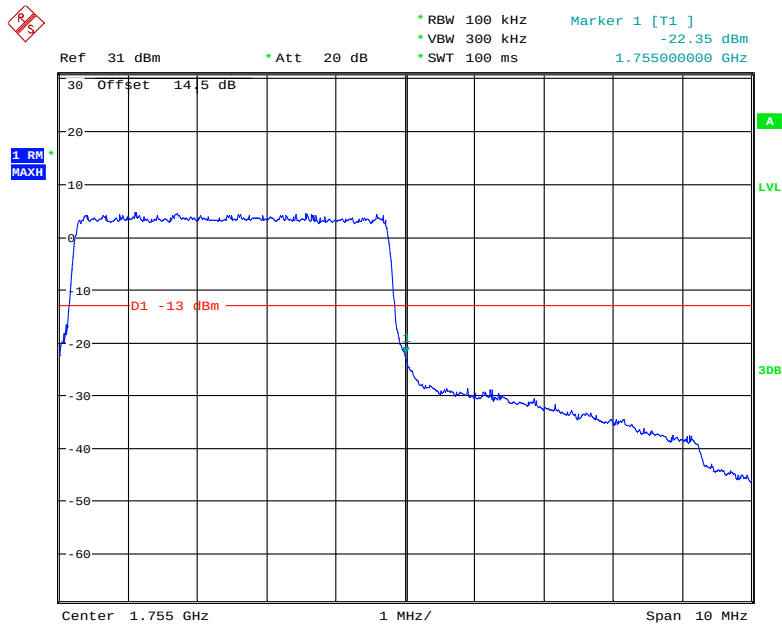
Date: 15.JUL.2018 14:44:59

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



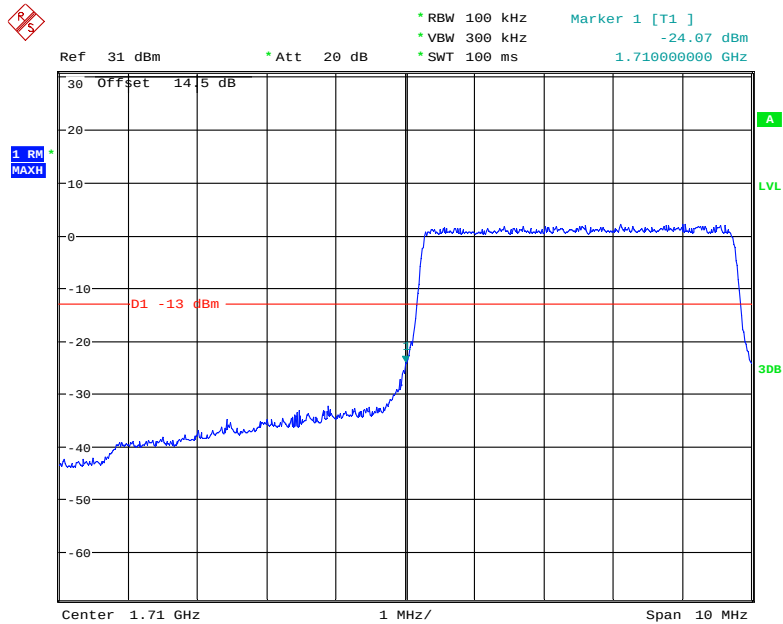
Date: 15.JUL.2018 14:38:48

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



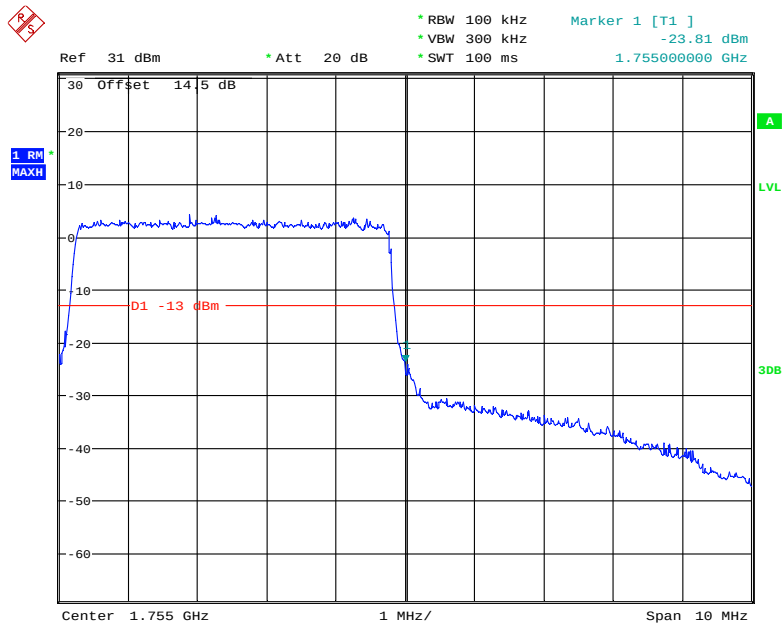
Date: 15.JUL.2018 14:37:40

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



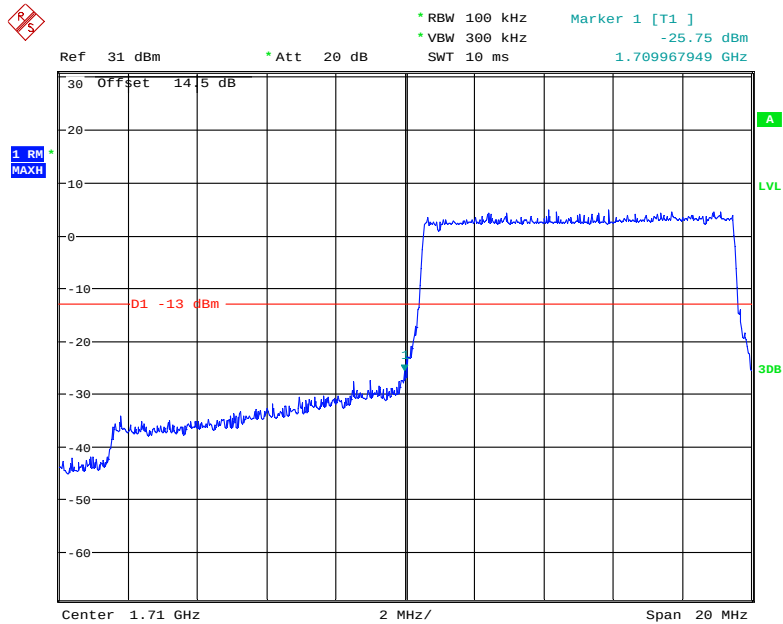
Date: 15.JUL.2018 14:39:23

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



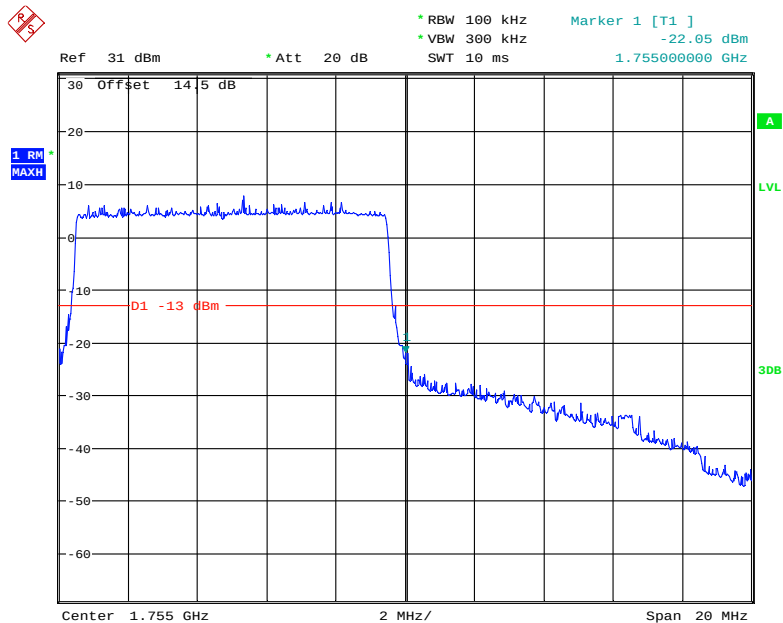
Date: 15.JUL.2018 14:37:10

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



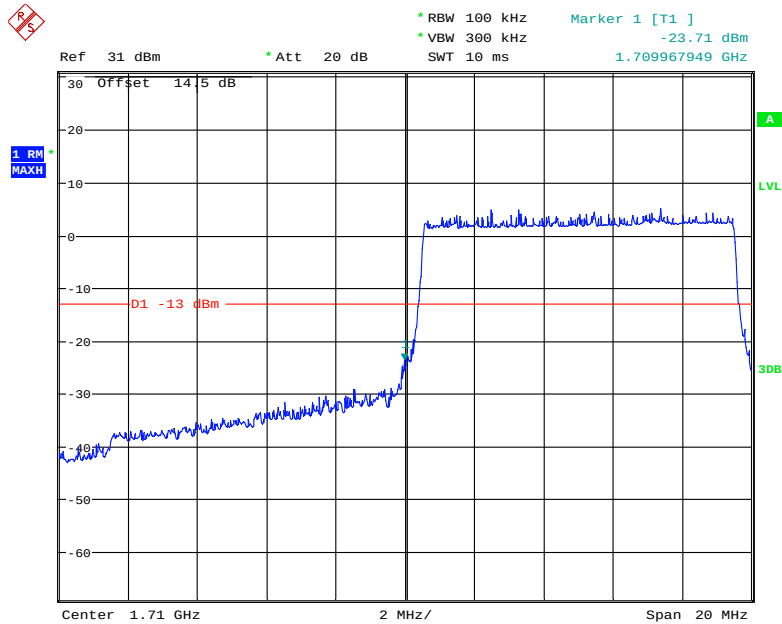
Date: 15.JUL.2018 14:22:10

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



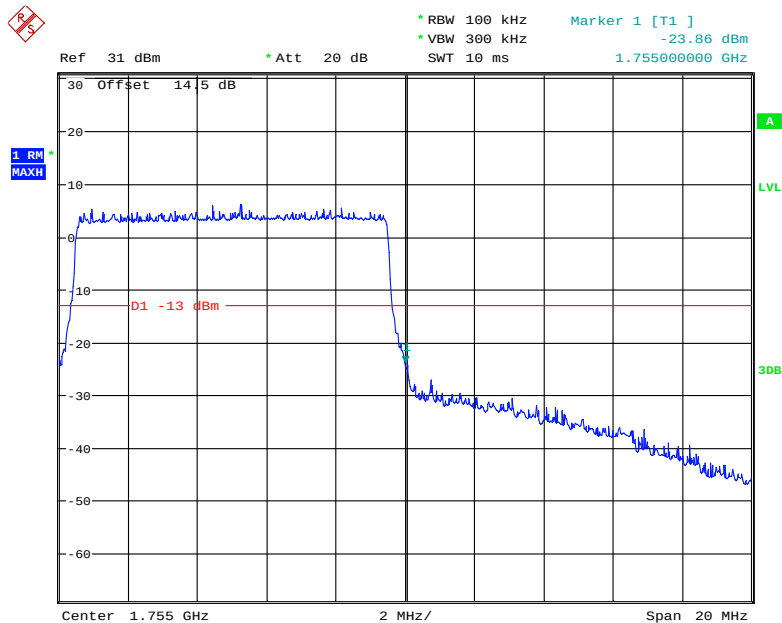
Date: 15.JUL.2018 14:24:13

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



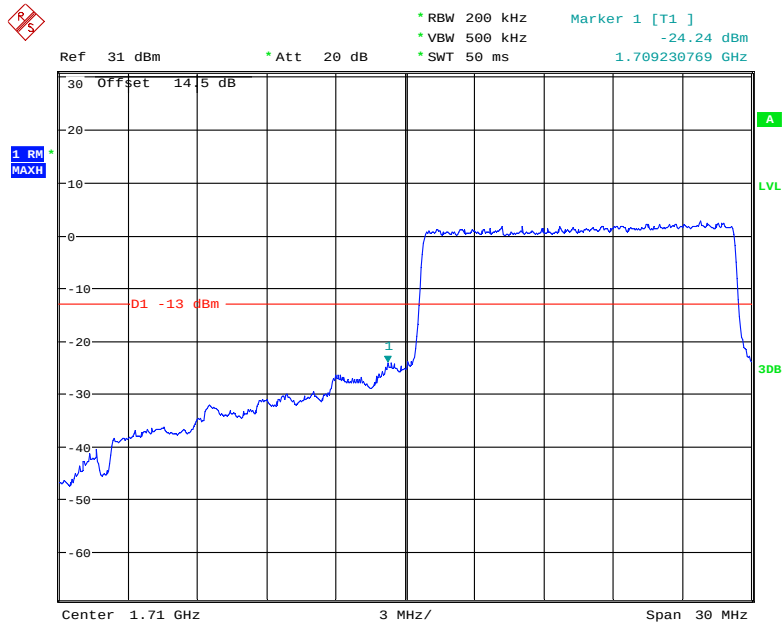
Date: 15.JUL.2018 14:20:21

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



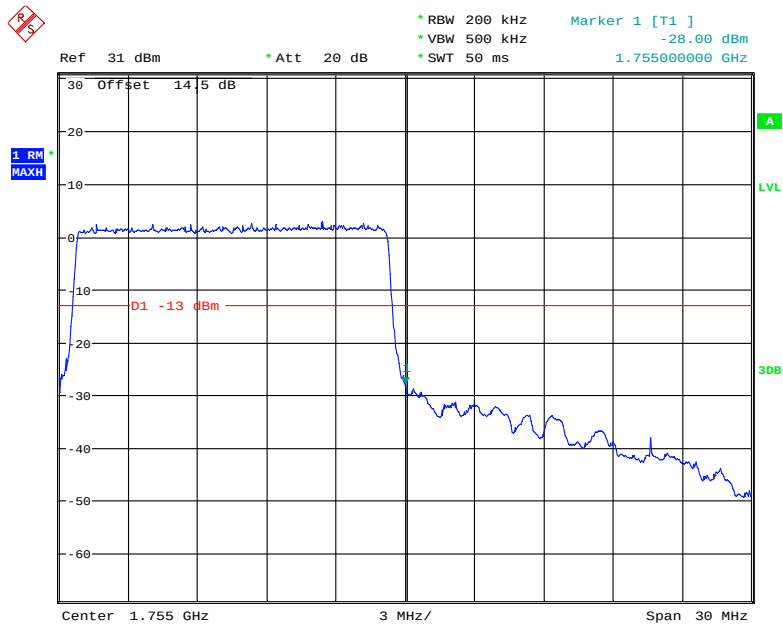
Date: 15.JUL.2018 14:25:21

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



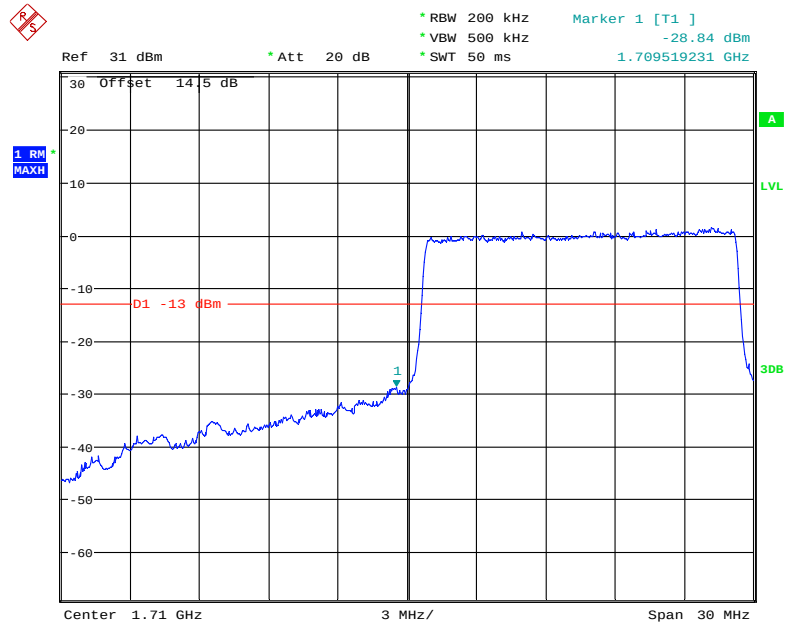
Date: 15.JUL.2018 15:06:17

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



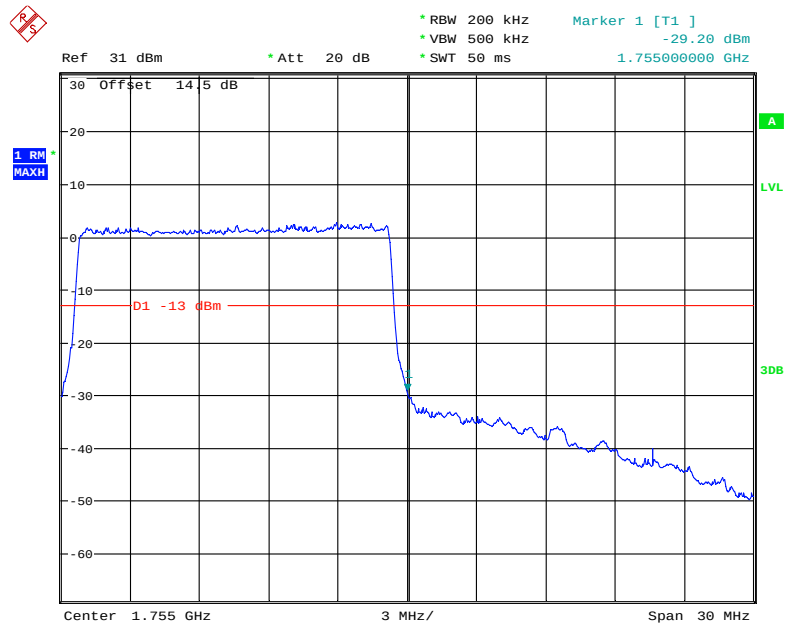
Date: 15.JUL.2018 14:58:53

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



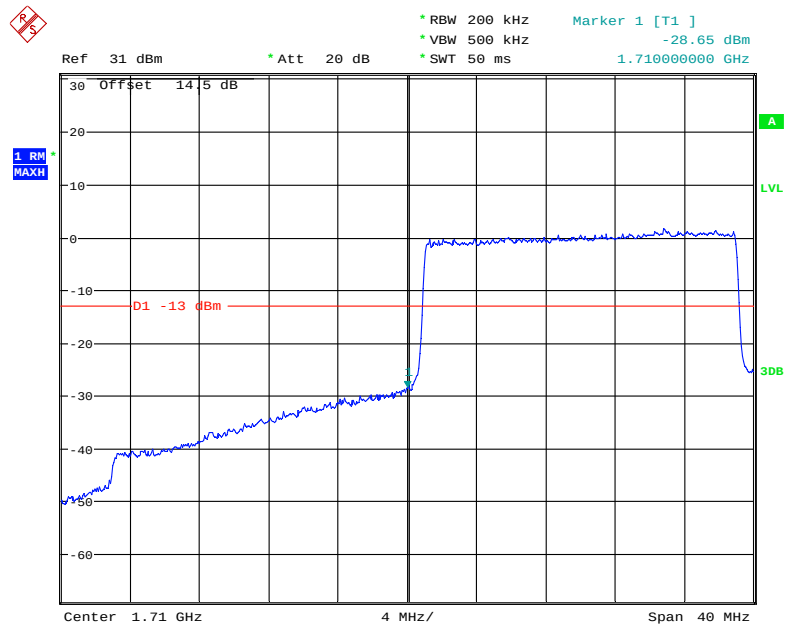
Date: 15.JUL.2018 15:04:33

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



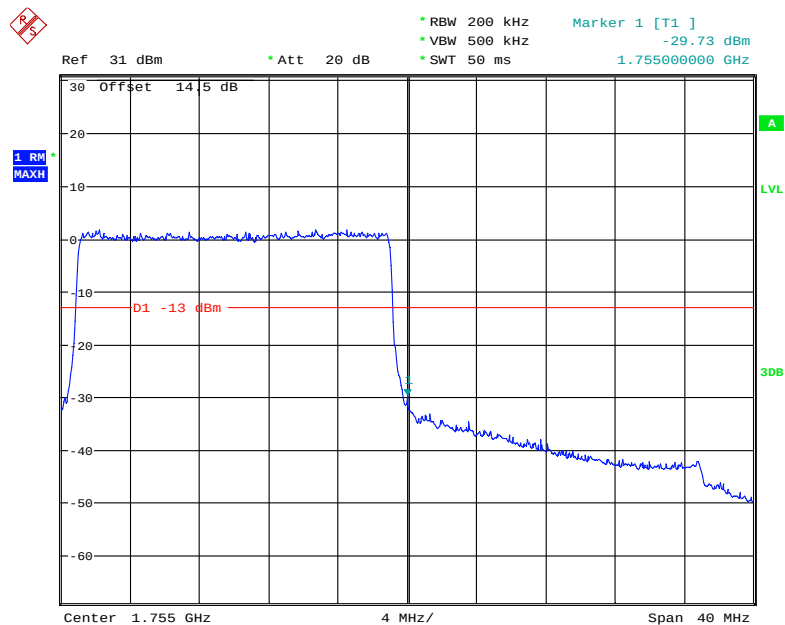
Date: 15.JUL.2018 15:02:50

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



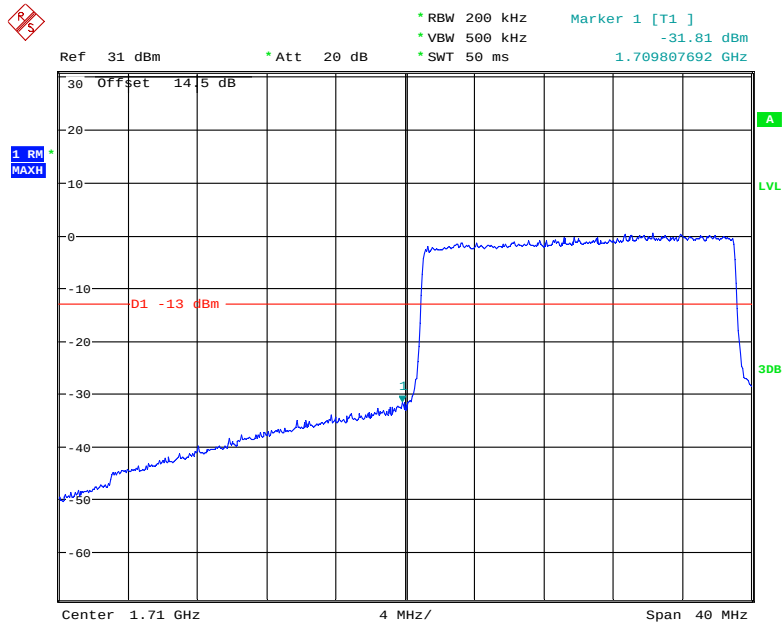
Date: 15.JUL.2018 15:10:17

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



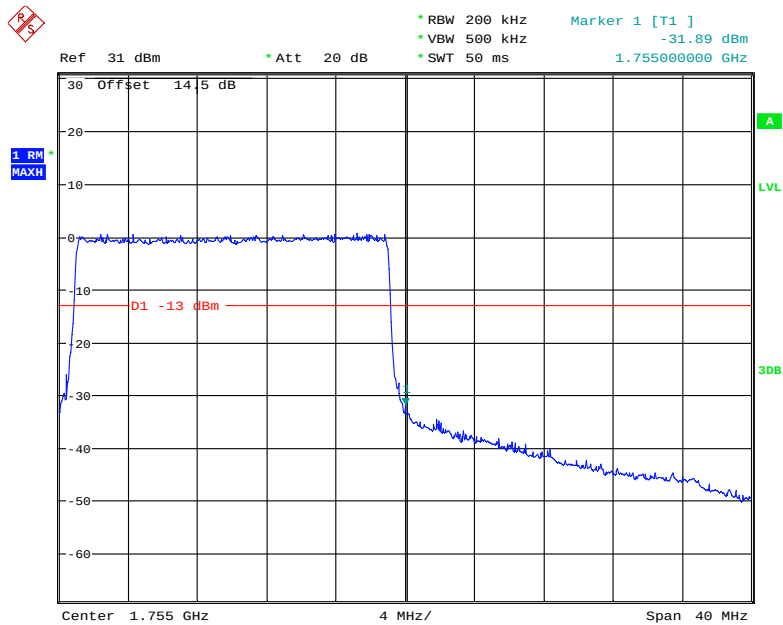
Date: 15.JUL.2018 15:11:06

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



Date: 15.JUL.2018 15:08:15

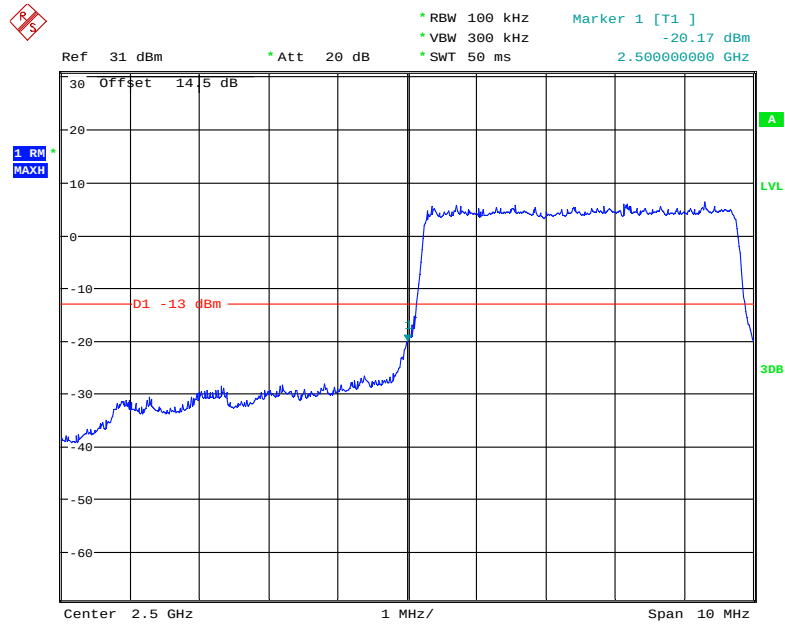
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 15.JUL.2018 15:11:38

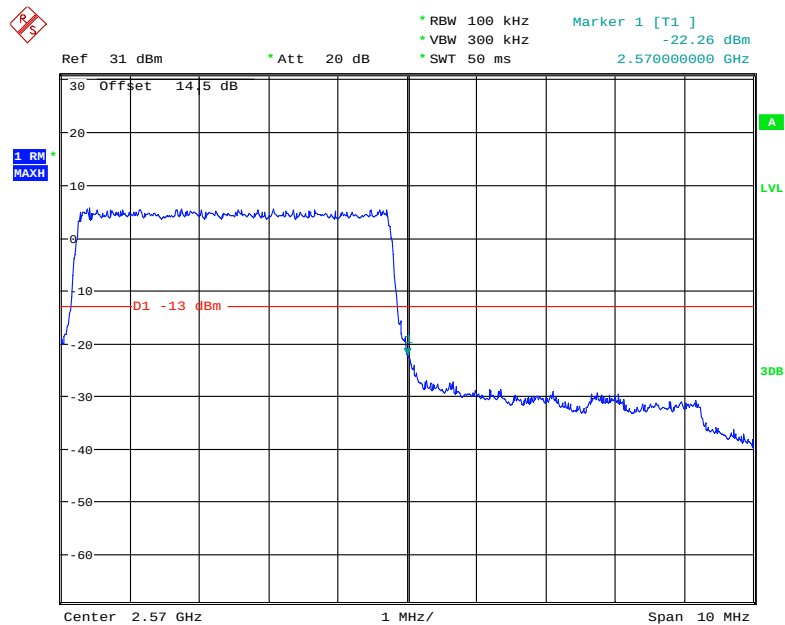
Band 7:

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



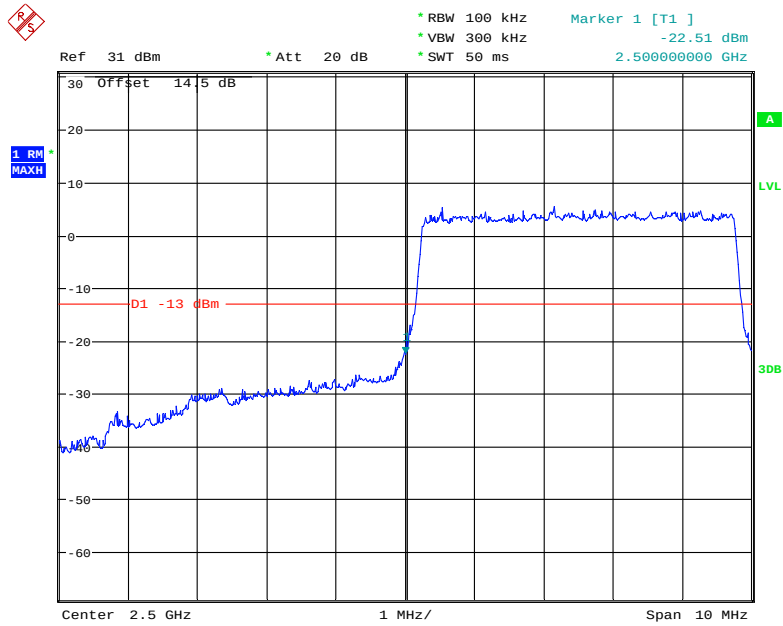
Date: 15.JUL.2018 15:15:39

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



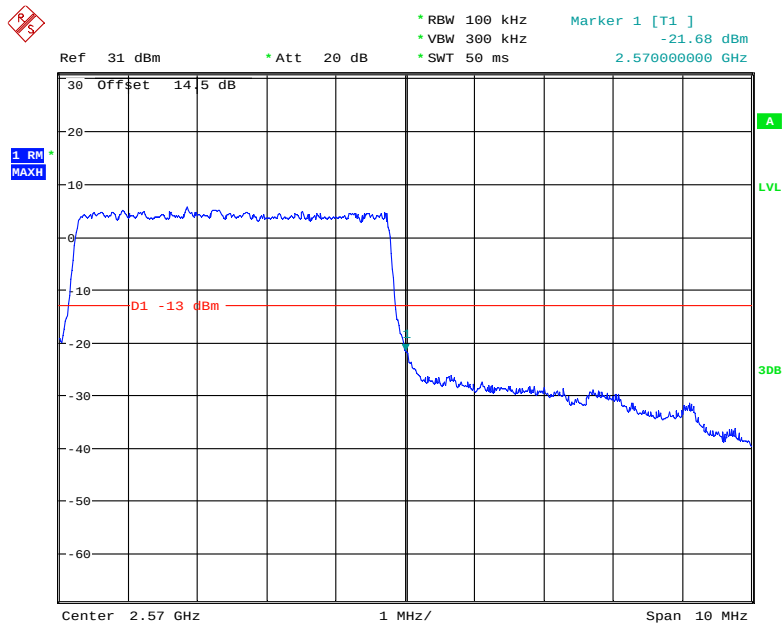
Date: 15.JUL.2018 15:16:51

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



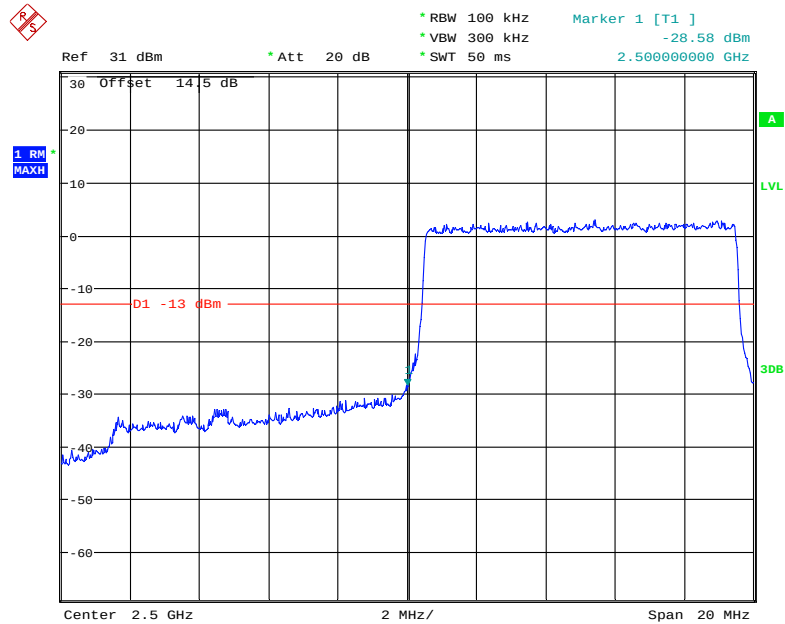
Date: 15.JUL.2018 15:14:38

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



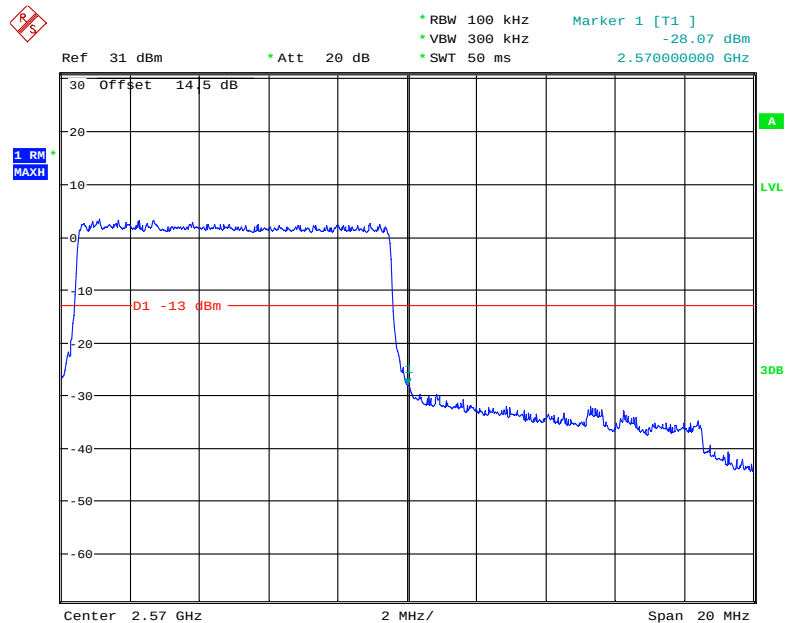
Date: 15.JUL.2018 15:17:55

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



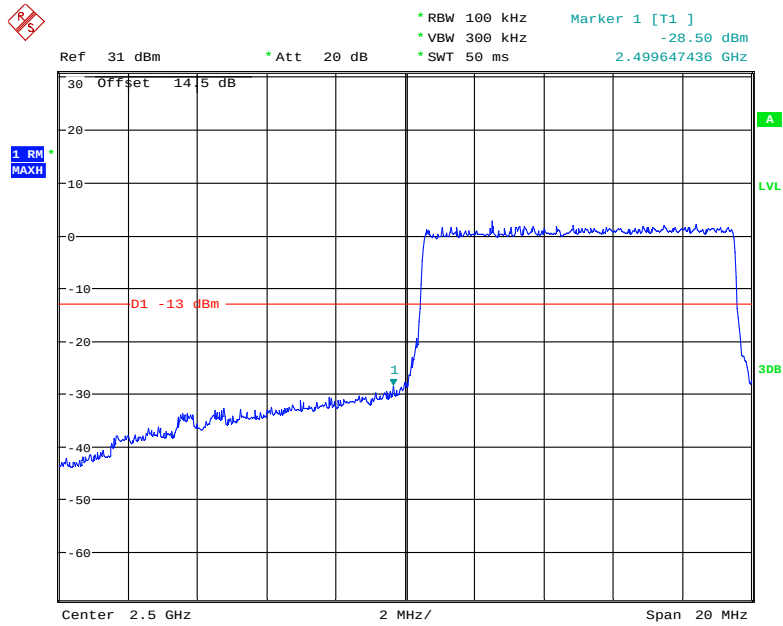
Date: 15.JUL.2018 15:21:34

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



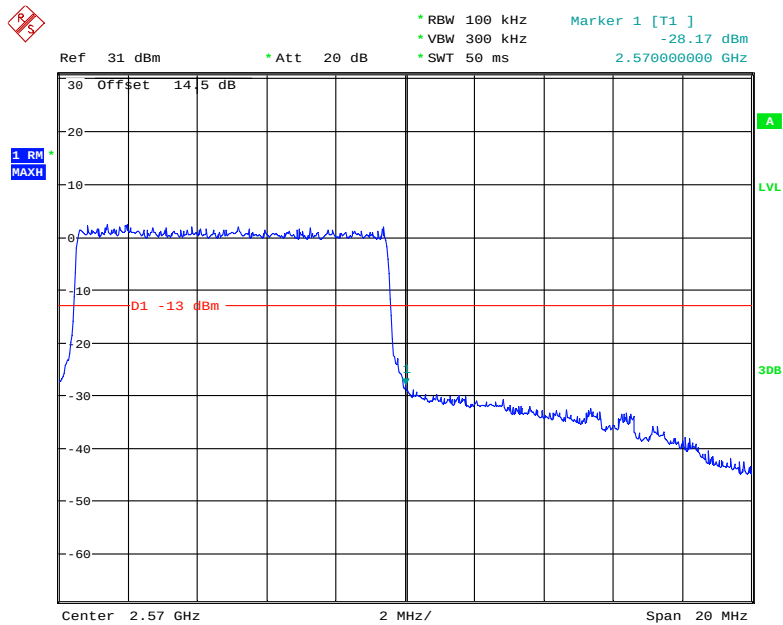
Date: 15.JUL.2018 15:20:14

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



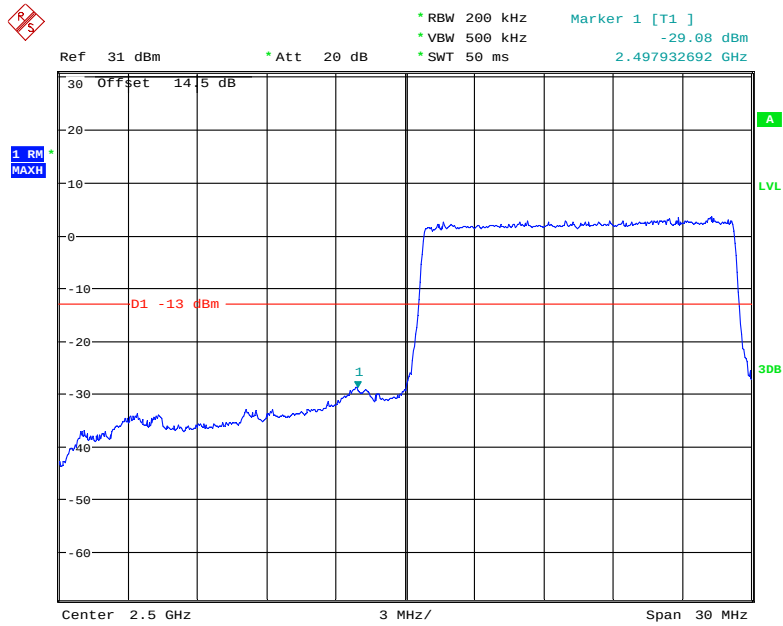
Date: 15.JUL.2018 15:22:23

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



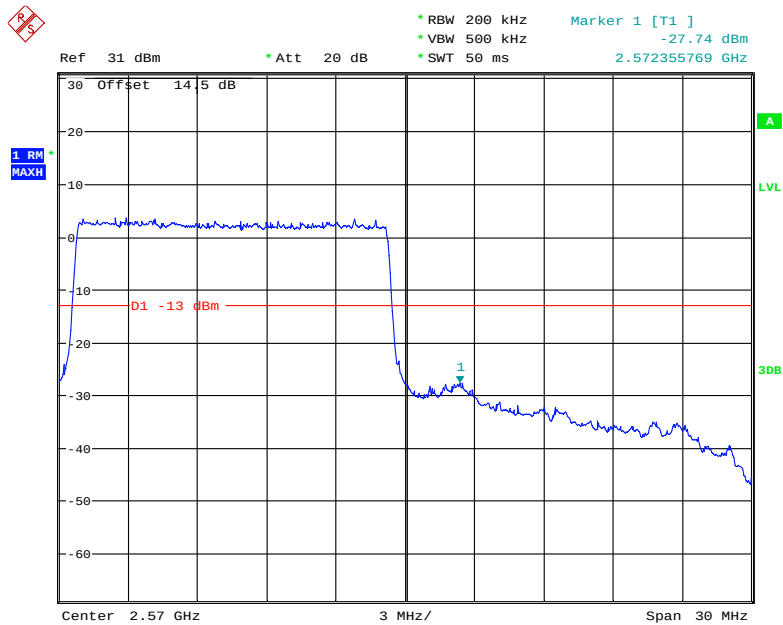
Date: 15.JUL.2018 15:19:30

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



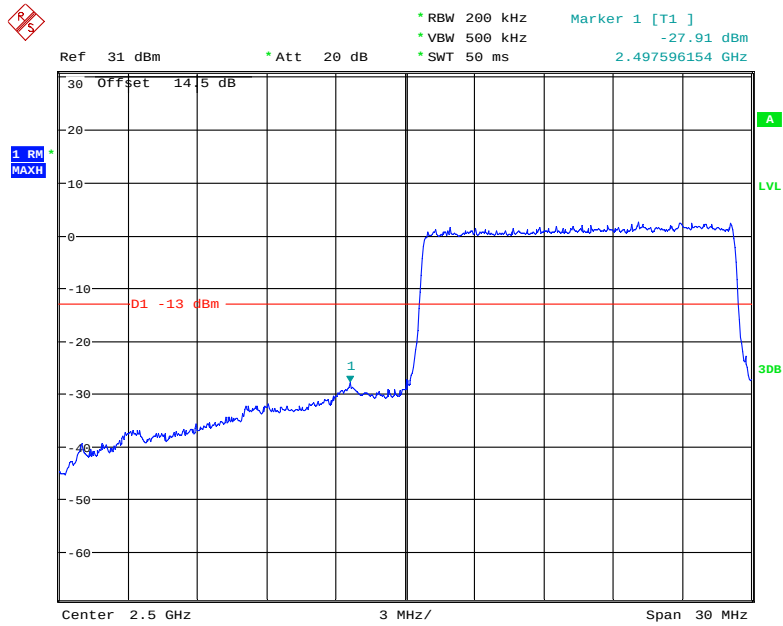
Date: 15.JUL.2018 15:23:37

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



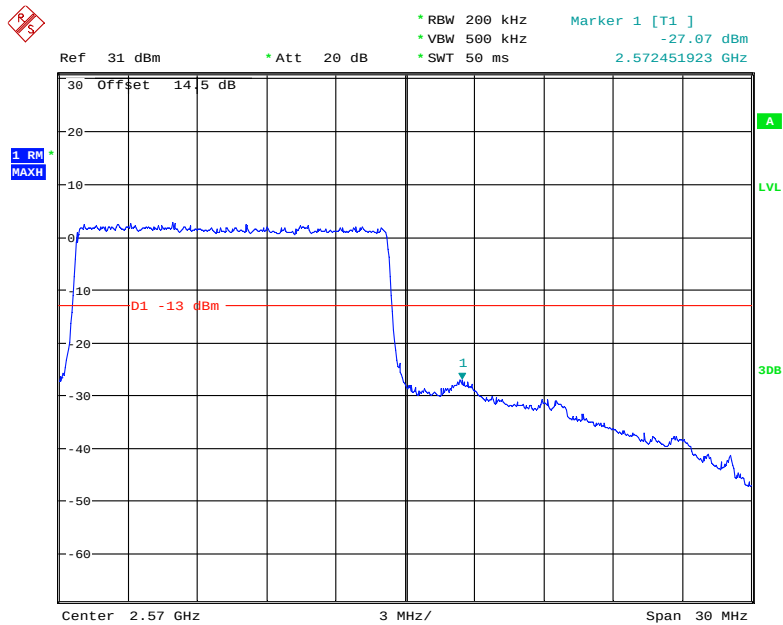
Date: 15.JUL.2018 15:25:49

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



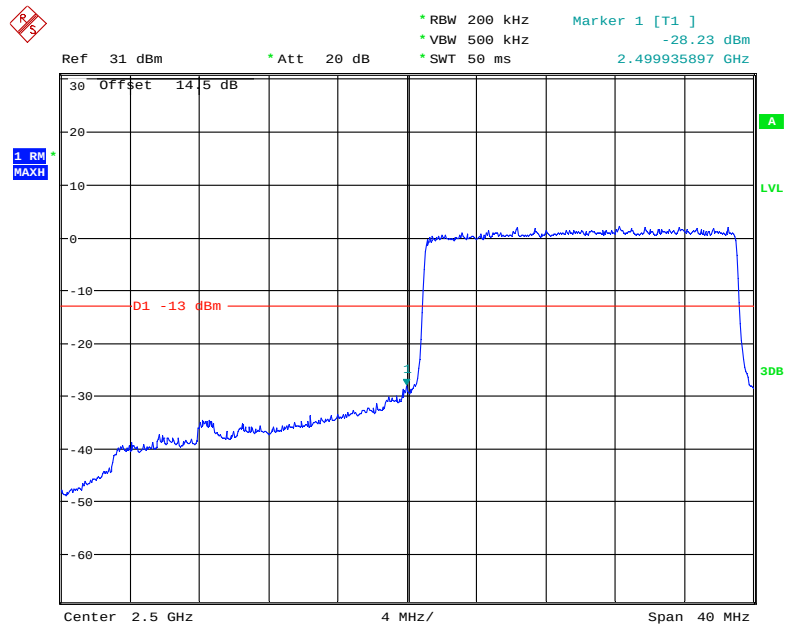
Date: 15.JUL.2018 15:24:27

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



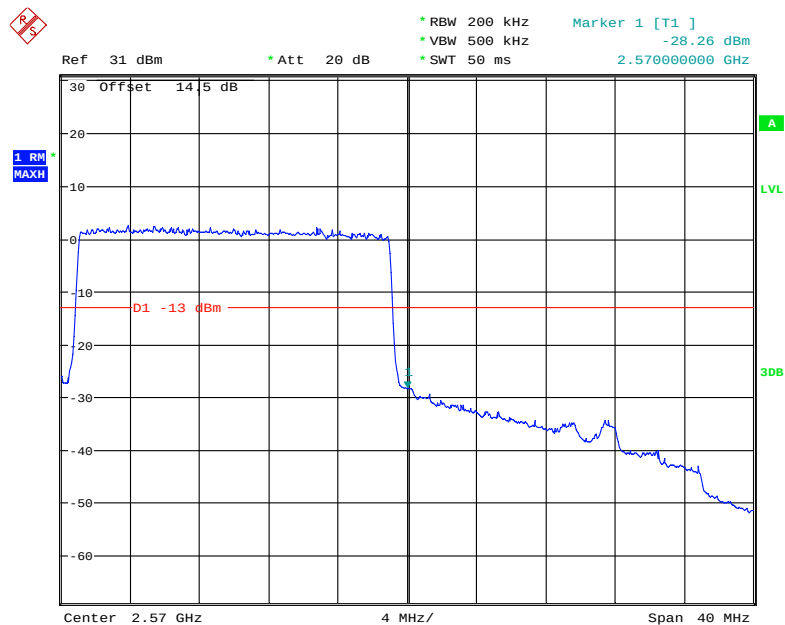
Date: 15.JUL.2018 15:25:23

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



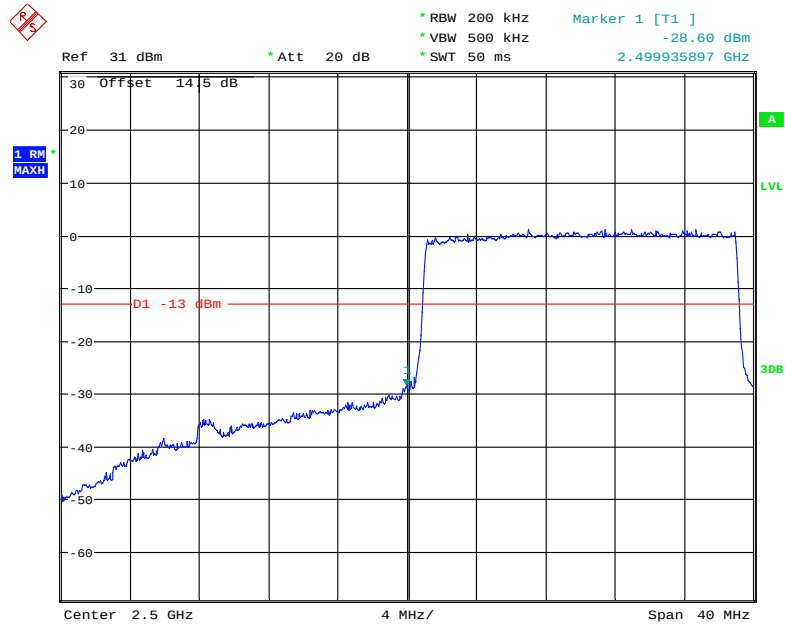
Date: 15.JUL.2018 15:29:26

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



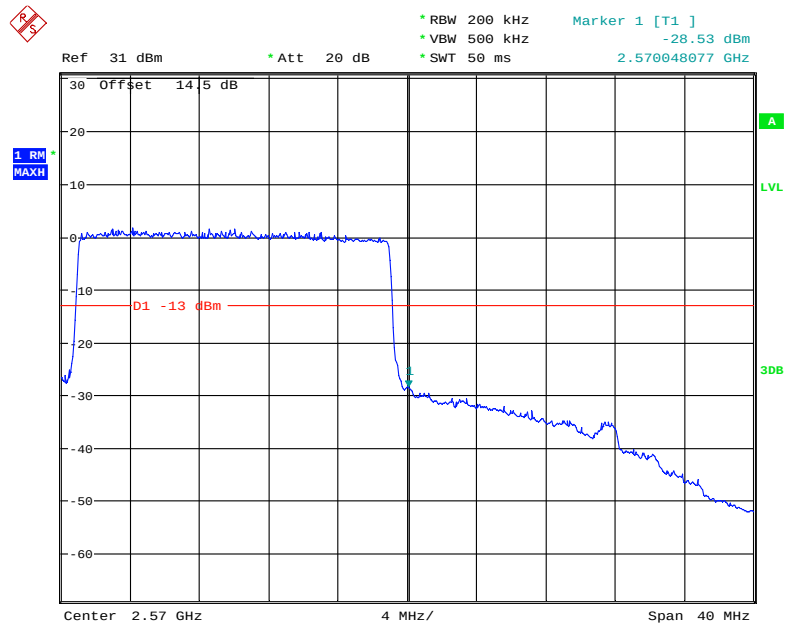
Date: 15.JUL.2018 15:28:19

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



Date: 15.JUL.2018 15:30:02

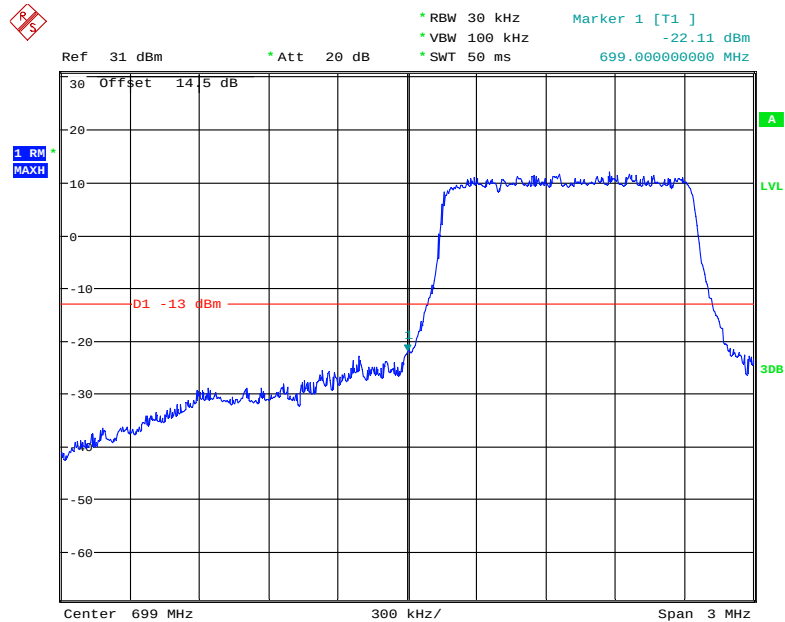
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 15.JUL.2018 15:27:09

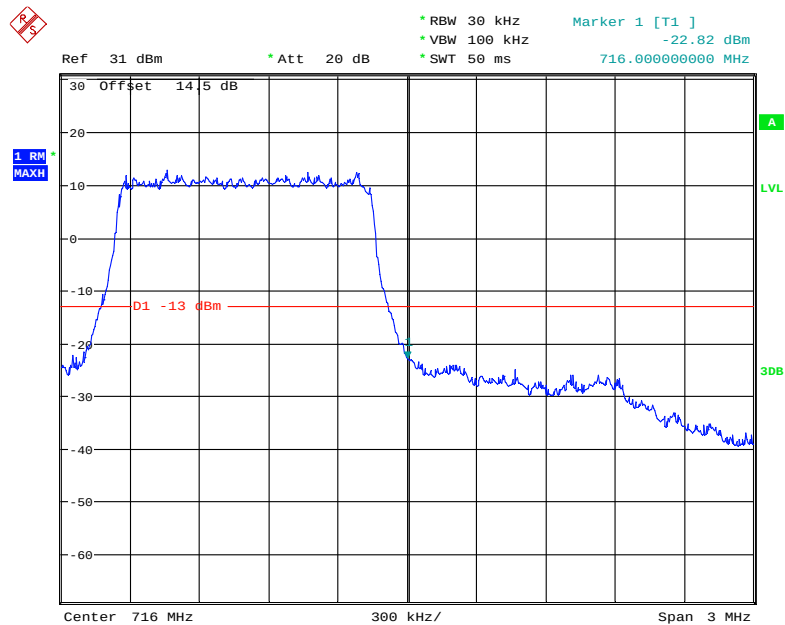
Band 12:

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



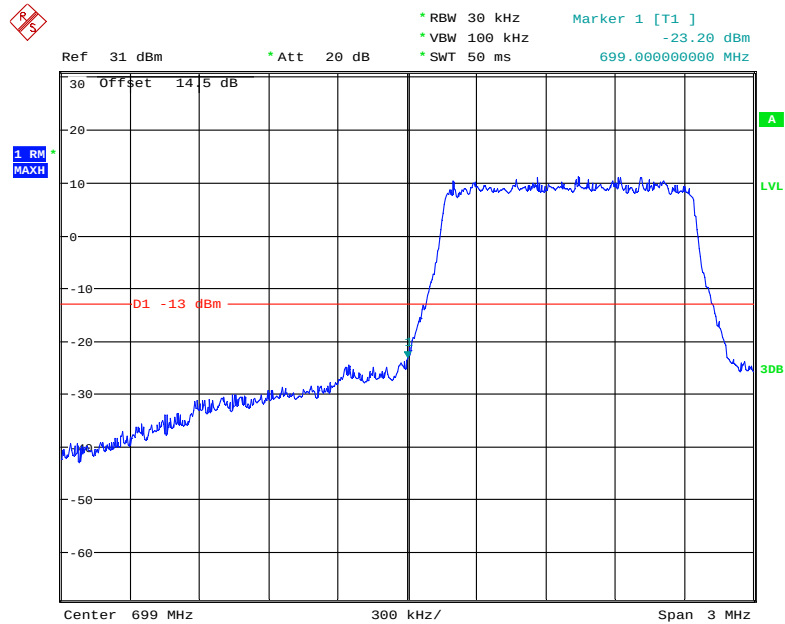
Date: 15.JUL.2018 15:56:06

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



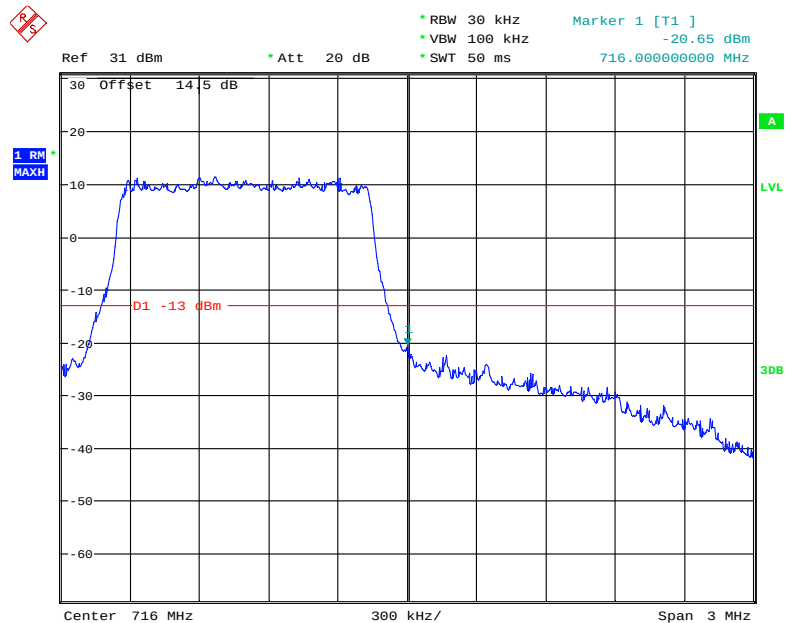
Date: 15.JUL.2018 15:53:41

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

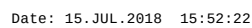
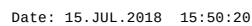


Date: 15.JUL.2018 15:55:32

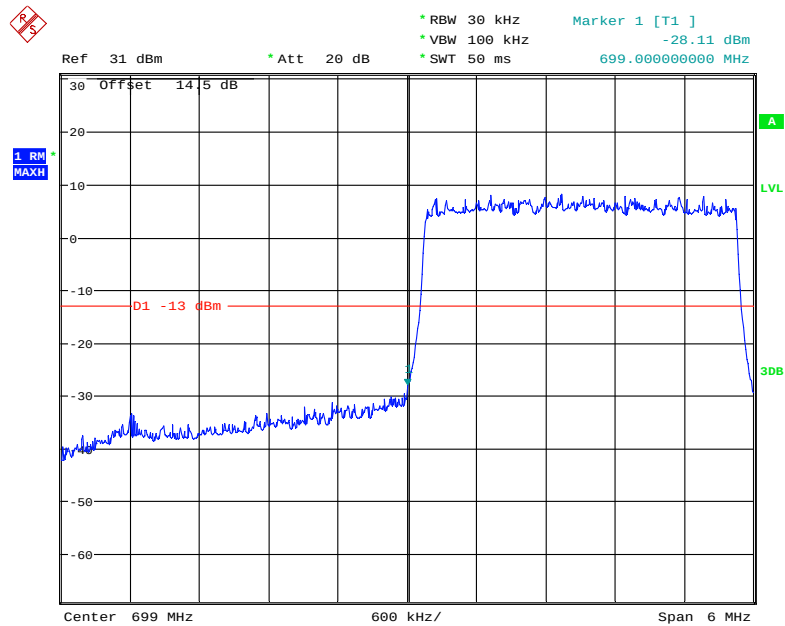
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



Date: 15.JUL.2018 15:54:43

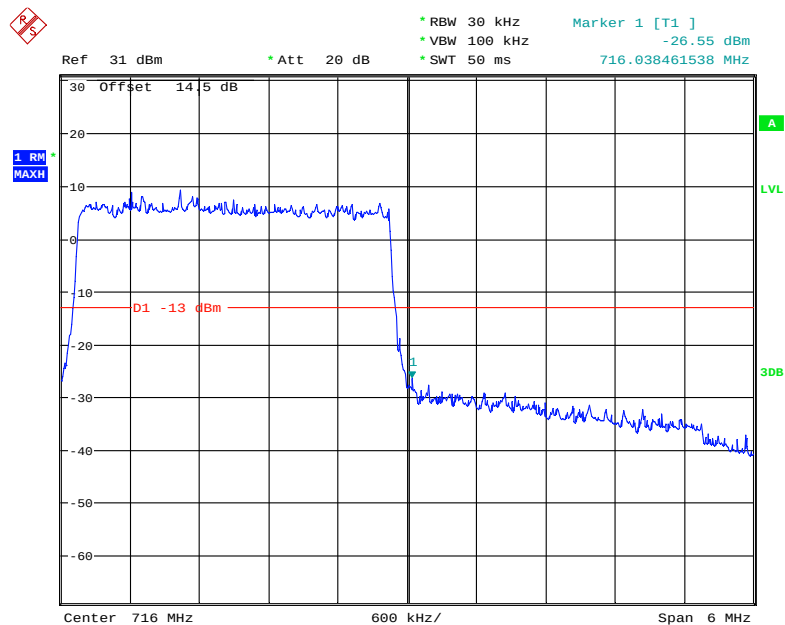


16-QAM (3.0 MHz, FULL RB) - Left Band Edge



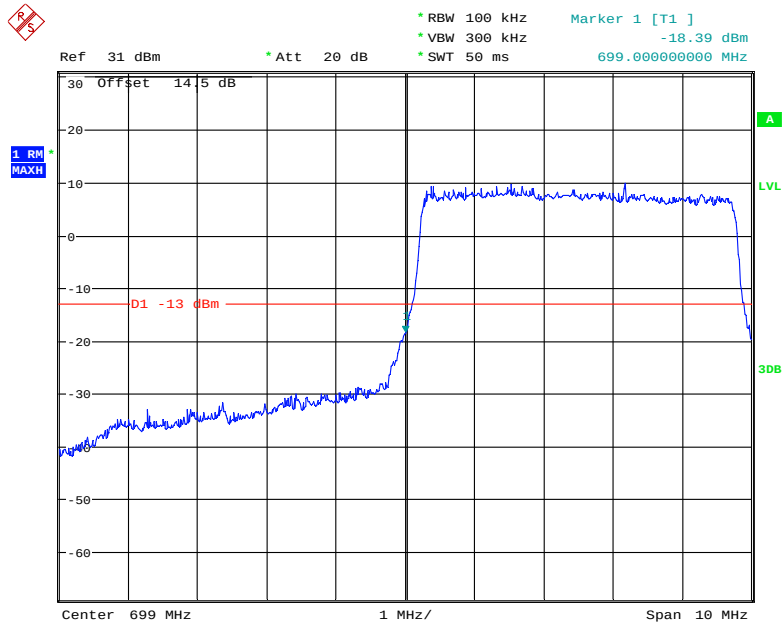
Date: 15.JUL.2018 15:49:48

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



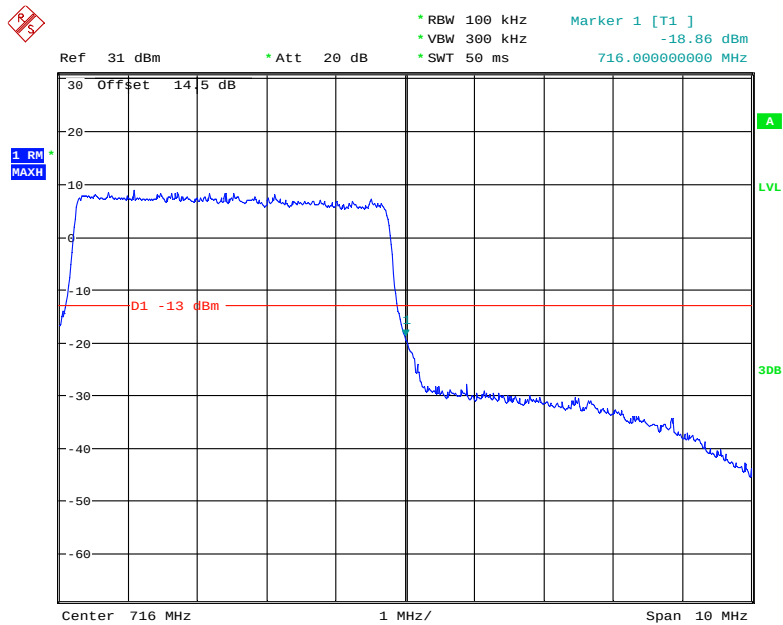
Date: 15.JUL.2018 15:51:18

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



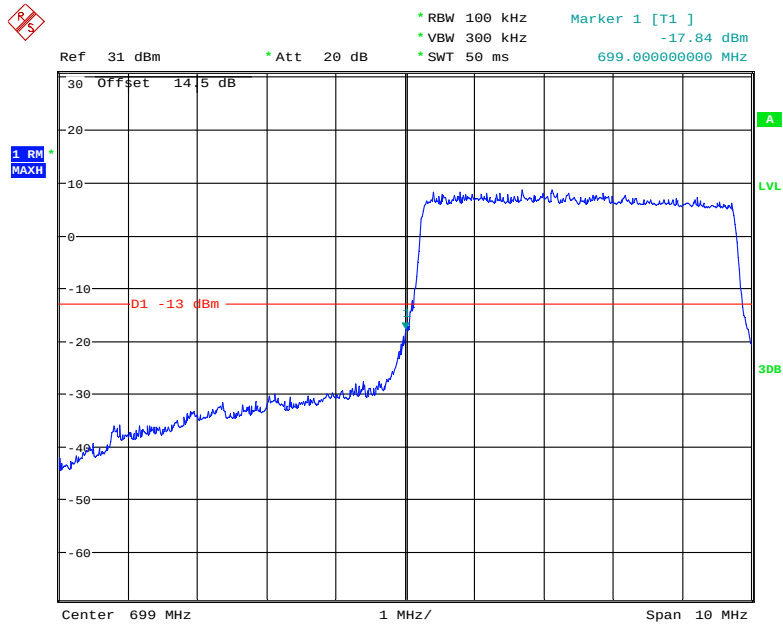
Date: 15.JUL.2018 15:47:16

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



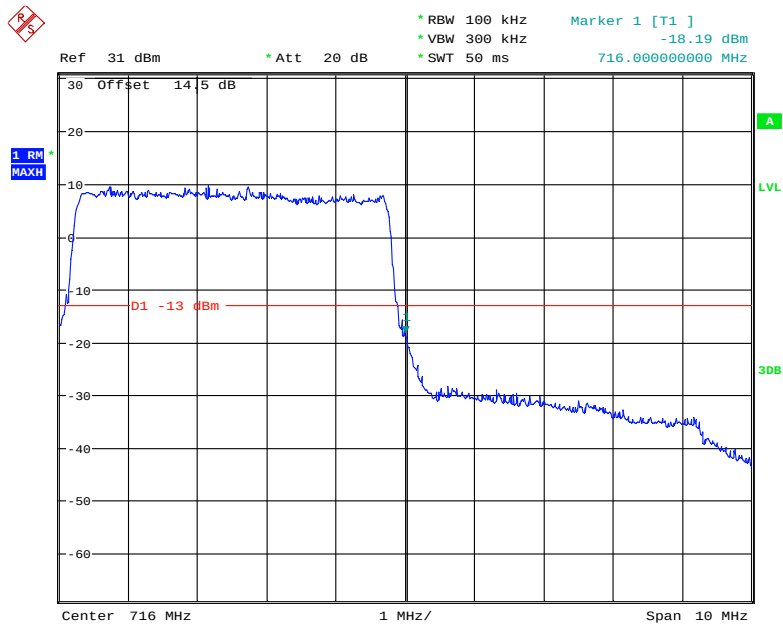
Date: 15.JUL.2018 15:45:44

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



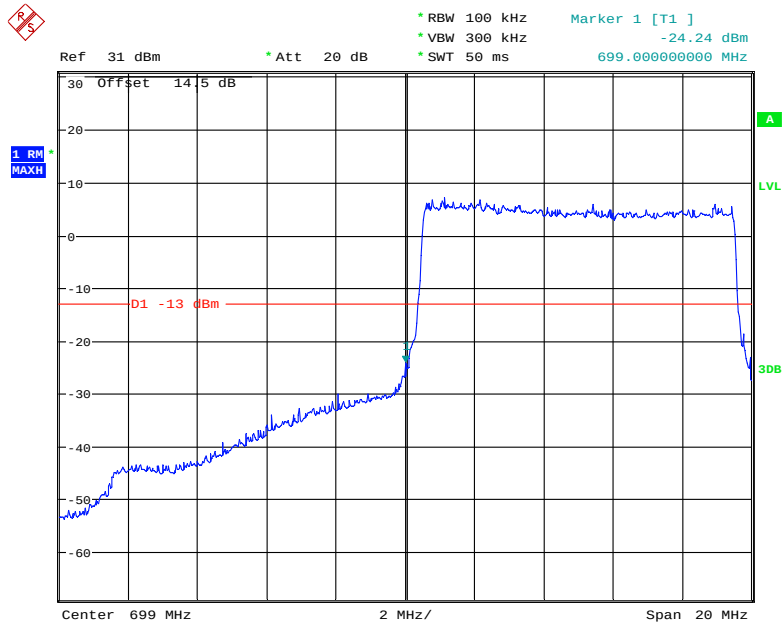
Date: 15.JUL.2018 15:48:16

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



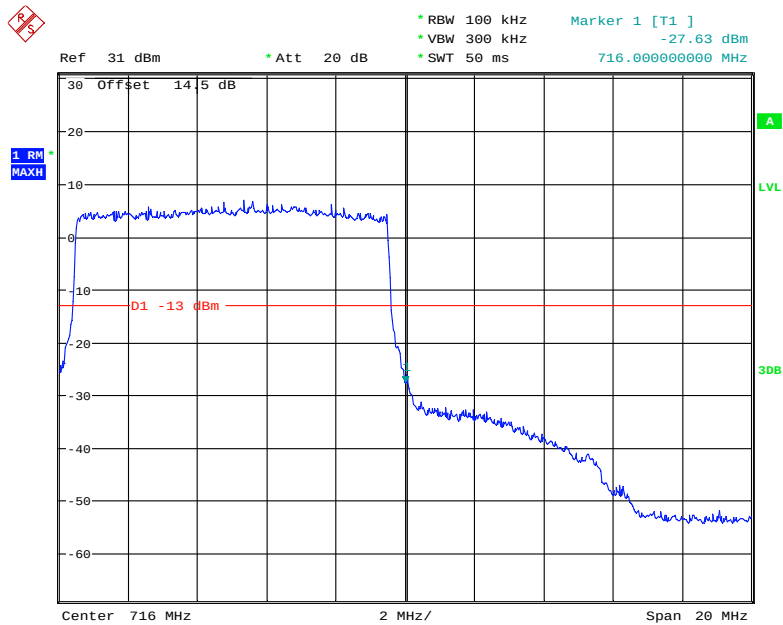
Date: 15.JUL.2018 15:46:19

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



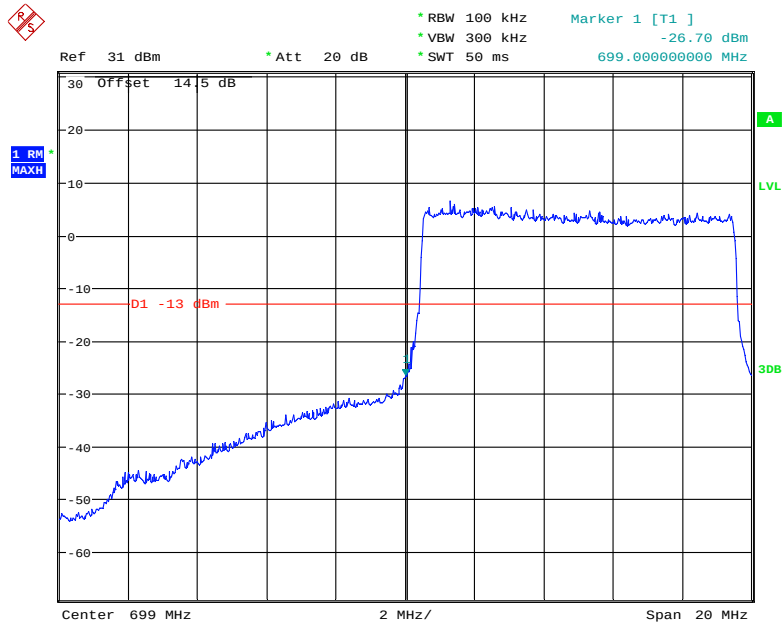
Date: 15.JUL.2018 15:40:17

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



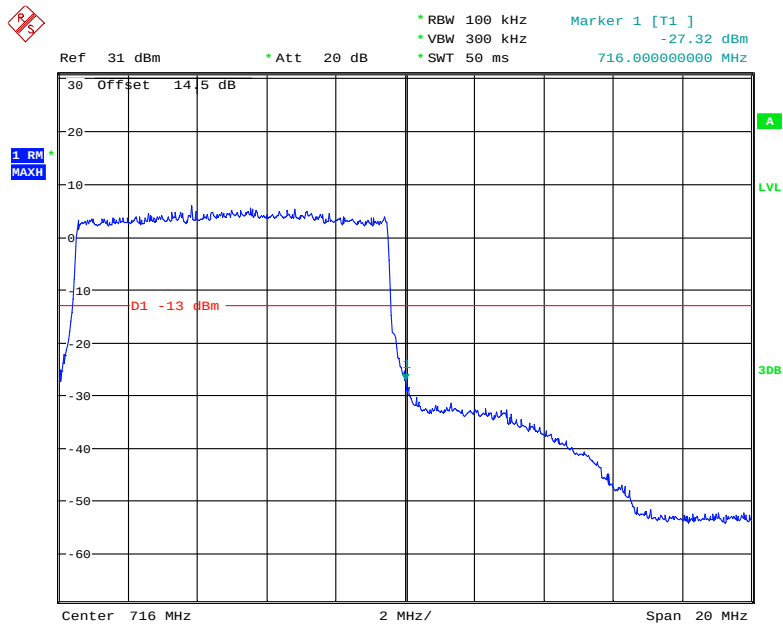
Date: 15.JUL.2018 15:42:26

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



Date: 15.JUL.2018 15:40:42

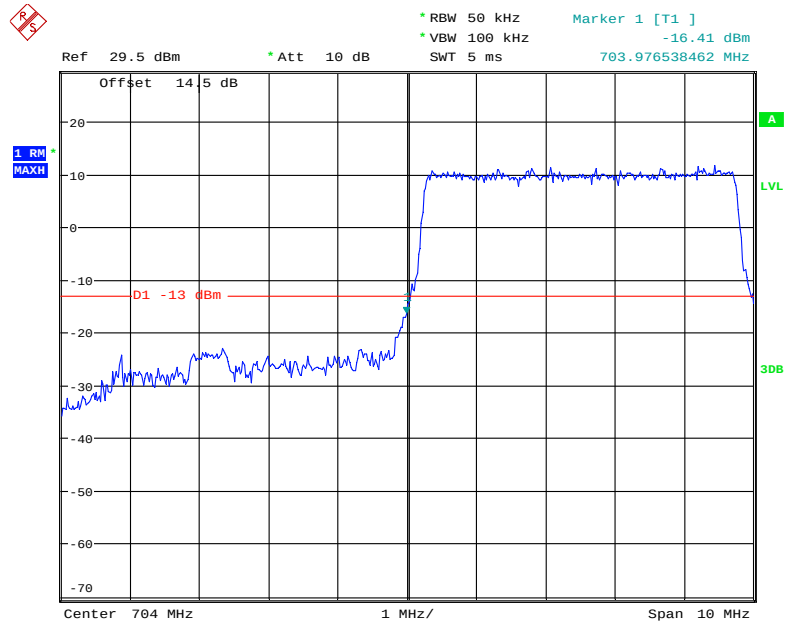
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 15.JUL.2018 15:42:00

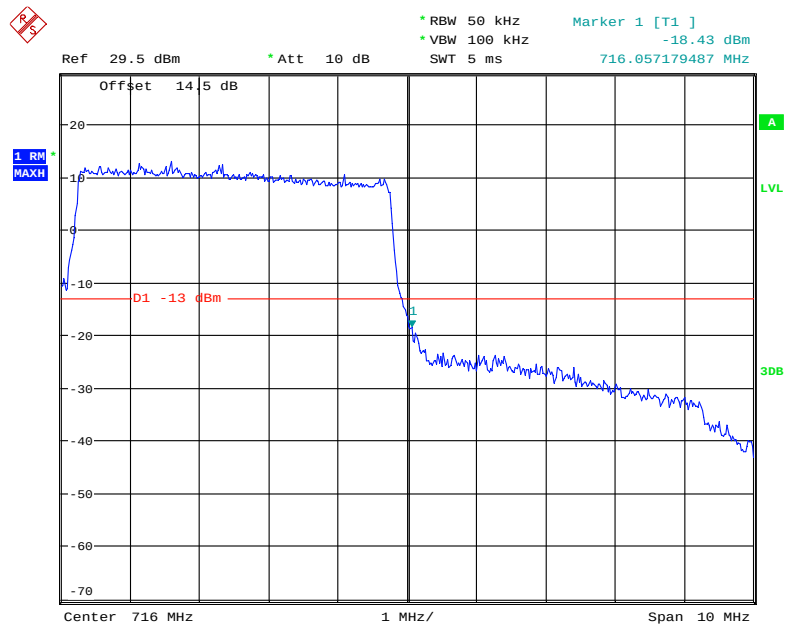
Band 17:

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

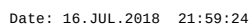
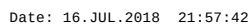


Date: 16.JUL.2018 22:01:31

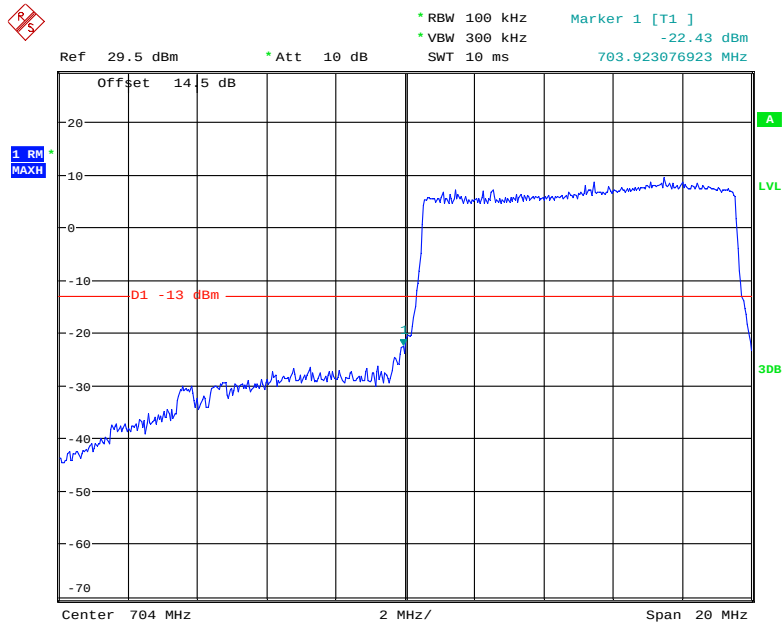
QPSK (5.0 MHz, FULL RB) - Right Band Edge



Date: 16.JUL.2018 22:00:10

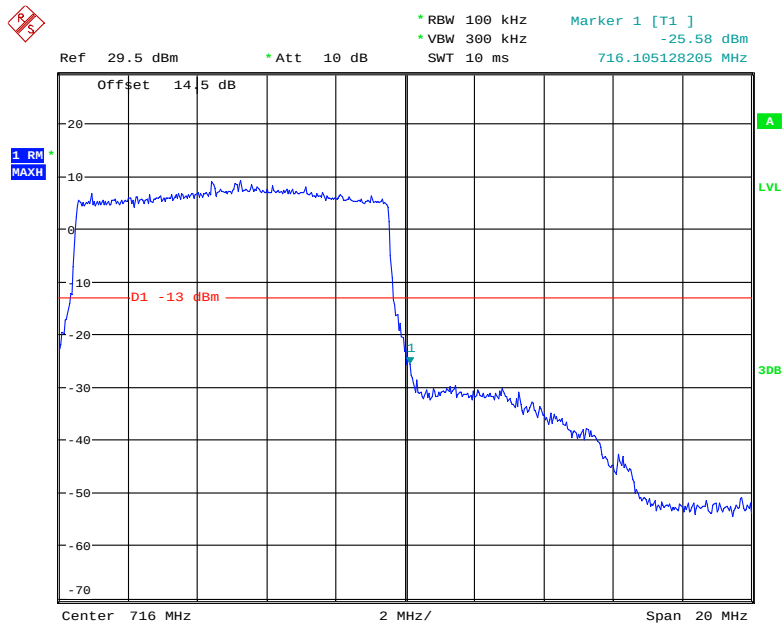


QPSK (10.0 MHz, FULL RB) - Left Band Edge



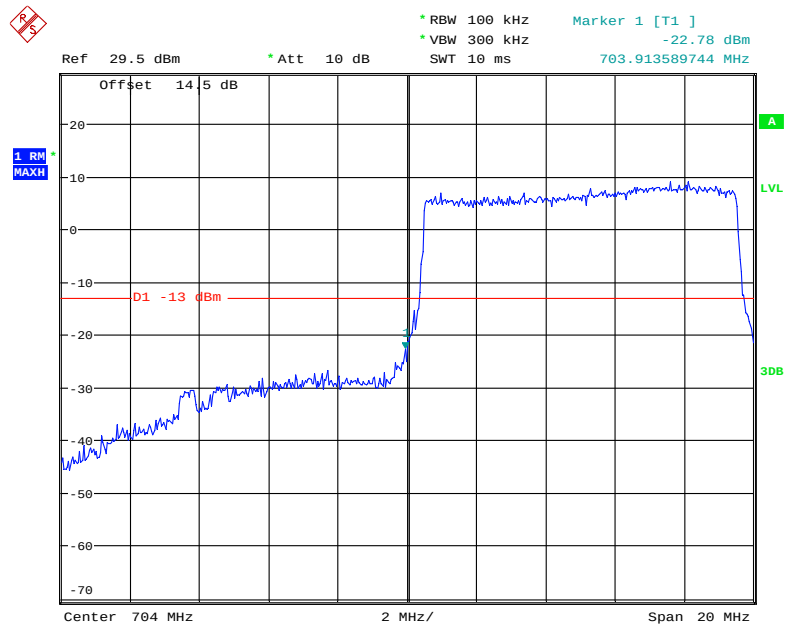
Date: 16.JUL.2018 22:03:20

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



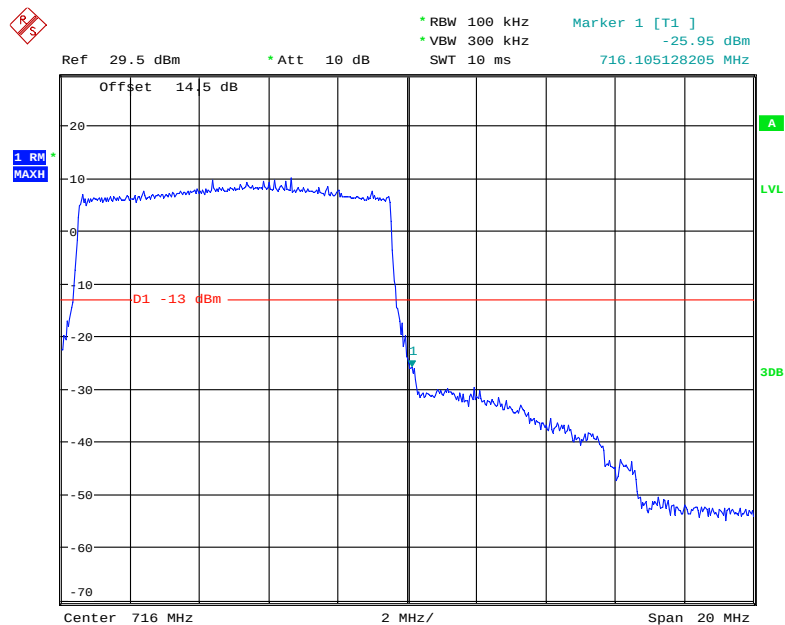
Date: 16.JUL.2018 22:04:29

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



Date: 16.JUL.2018 22:06:24

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



Date: 16.JUL.2018 22:05:38

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

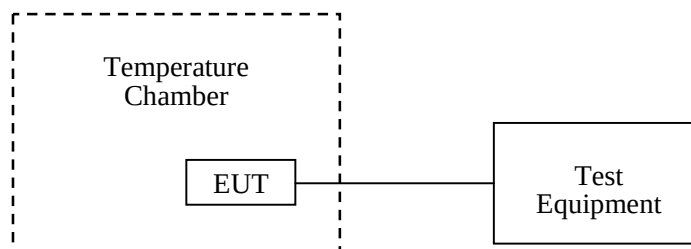
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 Tracy Hu on 2018-06-27.

EUT operation mode: Transmitting

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

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

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	3	0.0036	2.5
-20		5	0.0060	2.5
-10		9	0.0108	2.5
0		8	0.0096	2.5
10		10	0.0120	2.5
20		12	0.0143	2.5
30		11	0.0131	2.5
40		13	0.0155	2.5
50		15	0.0179	2.5
25	V min.= 3.4	19	0.0227	2.5
	V max.= 4.2	16	0.0191	2.5

EDGE Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	11	0.0131	2.5
-20		9	0.0108	2.5
-10		5	0.0060	2.5
0		7	0.0084	2.5
10		10	0.0120	2.5
20		15	0.0179	2.5
30		14	0.0167	2.5
40		17	0.0203	2.5
50		19	0.0227	2.5
25	V min.= 3.4	20	0.0239	2.5
	V max.= 4.2	18	0.0215	2.5

WCDMA Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	-8	-0.0096	2.5
-20		-6	-0.0072	2.5
-10		-9	-0.0108	2.5
0		-7	-0.0084	2.5
10		-4	-0.0048	2.5
20		-2	-0.0024	2.5
30		1	0.0012	2.5
40		-1	-0.0012	2.5
50		3	0.0036	2.5
25	V min.= 3.4	7	0.0084	2.5
	V max.= 4.2	4	0.0048	2.5

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

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	7	0.0037	pass
-20		9	0.0048	pass
-10		10	0.0053	pass
0		11	0.0059	pass
10		15	0.0080	pass
20		17	0.0090	pass
30		14	0.0074	pass
40		16	0.0085	pass
50		19	0.0101	pass
25	V min.= 3.4	21	0.0112	pass
	V max.= 4.2	22	0.0117	pass

EDGE Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.8	5	0.0027	pass
-20		9	0.0048	pass
-10		11	0.0059	pass
0		15	0.0080	pass
10		16	0.0085	pass
20		18	0.0096	pass
30		17	0.0090	pass
40		14	0.0074	pass
50		19	0.0101	pass
25	V min.= 3.4	23	0.0122	pass
	V max.= 4.2	21	0.0112	pass

WCDMA Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.8	-9	-0.0048	pass
-20		-7	-0.0037	pass
-10		-4	-0.0021	pass
0		-8	-0.0043	pass
10		-5	-0.0027	pass
20		-3	-0.0016	pass
30		-1	-0.0005	pass
40		2	0.0011	pass
50		4	0.0021	pass
25	V min.= 3.4	7	0.0037	pass
	V max.= 4.2	6	0.0032	pass

LTE:
QPSK:

Band 4:

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.8	1710.313823	1754.688916	1710	1755
-20		1710.310361	1754.691687	1710	1755
-10		1710.310751	1754.685035	1710	1755
0		1710.316312	1754.685875	1710	1755
10		1710.312124	1754.687229	1710	1755
20		1710.313001	1754.689106	1710	1755
30		1710.315660	1754.692211	1710	1755
40		1710.317016	1754.691199	1710	1755
50		1710.315592	1754.686359	1710	1755
25	V min.= 3.4	1710.315495	1754.690462	1710	1755
	V max.= 4.2	1710.313823	1754.688916	1710	1755

Band 7:

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.8	2500.318745	2569.785531	2500	2570
-20		2500.316494	2569.784845	2500	2570
-10		2500.320860	2569.790215	2500	2570
0		2500.317161	2569.785090	2500	2570
10		2500.316651	2569.786833	2500	2570
20		2500.317373	2569.784220	2500	2570
30		2500.316558	2569.790039	2500	2570
40		2500.314635	2569.784251	2500	2570
50		2500.318937	2569.786076	2500	2570
25	V min.= 3.4	2500.317432	2569.784316	2500	2570
	V max.= 4.2	2500.318745	2569.785531	2500	2570

Band 12:

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.8	699.321110	715.785263	699	716
-20		699.315041	715.786102	699	716
-10		699.317750	715.780962	699	716
0		699.314722	715.784096	699	716
10		699.317425	715.781325	699	716
20		699.317835	715.784650	699	716
30		699.316613	715.778783	699	716
40		699.321892	715.781534	699	716
50		699.315336	715.783893	699	716
25	V min.= 3.4	699.316582	715.784712	699	716
	V max.= 4.2	699.321110	715.785263	699	716

Band 17:

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.8	704.318332	715.792401	704	716
-20		704.324741	715.793244	704	716
-10		704.318362	715.794260	704	716
0		704.320345	715.795407	704	716
10		704.320419	715.793423	704	716
20		704.323715	715.792682	704	716
30		704.318366	715.794481	704	716
40		704.318892	715.794845	704	716
50		704.321619	715.797844	704	716
25	V min.= 3.4	704.319208	715.796254	704	716
	V max.= 4.2	704.318332	715.792401	704	716

**16QAM:
Band 4:**

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.8	1710.312365	1754.686034	1710	1755
-20		1710.312705	1754.685973	1710	1755
-10		1710.316986	1754.690761	1710	1755
0		1710.312001	1754.691093	1710	1755
10		1710.312136	1754.687231	1710	1755
20		1710.316784	1754.687362	1710	1755
30		1710.315506	1754.689003	1710	1755
40		1710.309211	1754.689103	1710	1755
50		1710.313696	1754.687837	1710	1755
25	V min.= 3.4	1710.316596	1754.687019	1710	1755
	V max.= 4.2	1710.312365	1754.686034	1710	1755

Band 7:

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.8	2500.318176	2569.785681	2500	2570
-20		2500.320039	2569.786079	2500	2570
-10		2500.316855	2569.788594	2500	2570
0		2500.319841	2569.784099	2500	2570
10		2500.316626	2569.786828	2500	2570
20		2500.315024	2569.790011	2500	2570
30		2500.320663	2569.790508	2500	2570
40		2500.317898	2569.788721	2500	2570
50		2500.319196	2569.789871	2500	2570
25	V min.= 3.4	2500.317068	2569.787564	2500	2570
	V max.= 4.2	2500.318176	2569.785681	2500	2570

Band 12:

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.8	699.316618	715.780334	699	716
-20		699.319369	715.786175	699	716
-10		699.321958	715.784924	699	716
0		699.314810	715.784349	699	716
10		699.317422	715.781328	699	716
20		699.319953	715.782142	699	716
30		699.322017	715.785695	699	716
40		699.321736	715.784527	699	716
50		699.316035	715.784040	699	716
25	V min.= 3.4	699.315269	715.782156	699	716
	V max.= 4.2	699.316618	715.780334	699	716

Band 17:

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	3.8	704.323164	715.783829	704	716
-20		704.321917	715.791285	704	716
-10		704.321258	715.787224	704	716
0		704.318615	715.787216	704	716
10		704.320135	715.786536	704	716
20		704.319464	715.786807	704	716
30		704.322649	715.788955	704	716
40		704.320288	715.783969	704	716
50		704.322173	715.784603	704	716
25	V min.= 3.4	704.322231	715.784712	704	716
	V max.= 4.2	704.323164	715.783829	704	716

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