FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

i.safe MOBILE GmbH

i_Park Tauberfranken 10 97922 Lauda-Koenigshofen, Germany

FCC ID: 2AACZ-IS5201

Report Type:	**Product Type:**
Original Report	TD-LTE Digital Mobile Phone

Report Number:	RSZ180411007-00D
Report Date:	2018-05-21
Reviewed By:	Rocky Kang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *i.safe MOBILE GmbH's* product, model number: IS520.1 *(FCC ID: 2AACZ-IS5201)* or the "EUT" in this report was a *TD-LTE Digital Mobile Phone*, which was measured approximately: 15.4 cm (L) × 7.8 cm (W) × 2.4 cm (H), rated with input voltage: DC 3.8V battery or DC5.0V from Adapter.

Adapter Information:
Model: ICP12-050-2000B
Input: AC 100-240V, 50/60Hz, 0.3 A
Output: DC 5.0V, 2000mA

**All measurement and test data in this report was gathered from production sample serial number: 1800508. (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-04-11.*

Objective

This test report is prepared on behalf of *i.safe MOBILE GmbH* 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 15B JBP, Part 15.247 DSS & DTS, Part 15.225 DXX and Part 15.407 NII submissions with FCC ID: 2AACZ-IS5201.

Test Methodology

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

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

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

Measurement Uncertainty

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

Test Facility

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

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

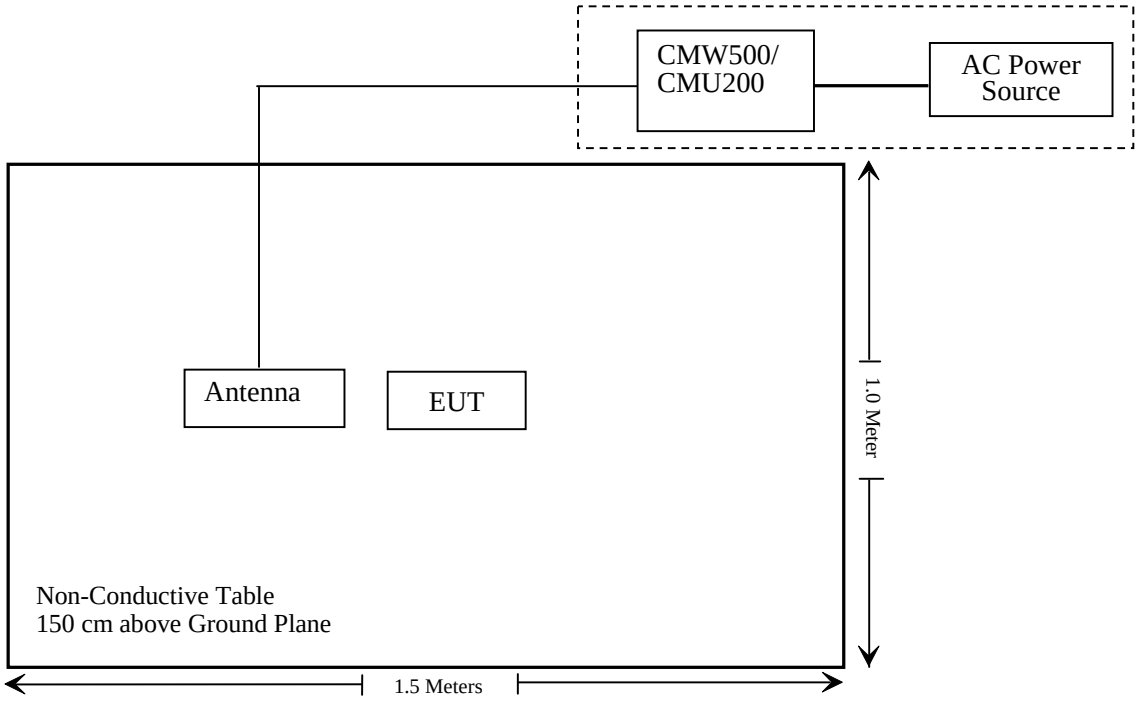
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (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: RSZ180411007-20A.

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	2017-04-24	2018-04-24
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2018-04-24	2019-04-24
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2017-12-17	2020-12-16
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-05-21	2018-05-21
HP	Amplifier	HP8447E	1937A01046	2017-11-19	2018-05-17
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	2017-11-19	2018-05-17
Ducommun technologies	RF Cable	104PEA	218124002	2017-11-19	2018-05-17
Ducommun technologies	RF Cable	RG-214	1	2017-11-19	2018-05-17
Ducommun technologies	RF Cable	RG-214	2	2017-11-22	2018-05-22
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2017-12-29	2020-12-28
Ducommun technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2017-12-24	2018-12-24
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2017-12-21	2018-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Rohde & Schwarz	Wideband Radio Communication Tester	CMU200	106891	2017-12-14	2018-12-14
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2017-04-24	2018-04-24
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2018-04-24	2019-04-24
Ducommun technologies	RF Cable	RG-214	3	2017-11-22	2018-05-22
WEINSCHEL	10dB Attenuator	5324	AU 3842	2017-11-22	2018-05-23
WEINSCHEL	3dB Attenuator	N/A	N/A	2017-11-22	2018-05-23
N/A	Power Splitter	N/A	N/A	2017-05-21	2018-05-21

* 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: RSZ180411007-20A.

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(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.

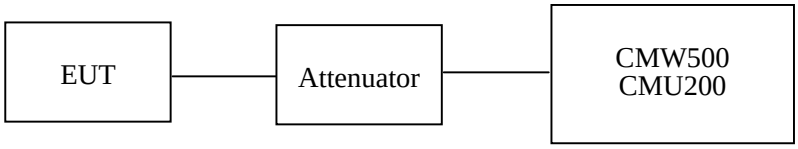
The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

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

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

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

The testing was performed by Simon Wang on 2018-04-14.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	31.54	38.45
	190	836.6	31.43	38.45
	251	848.8	31.36	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.30	30.55	29.00	27.58	38.45
	190	836.6	31.20	30.21	29.01	27.40	38.45
	251	848.8	31.26	30.22	28.95	27.42	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	25.94	24.83	22.89	21.24	38.45
	190	836.6	25.81	24.77	22.70	21.08	38.45
	251	848.8	24.84	24.65	23.11	21.03	38.45

2G:

RC1+SO55:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC0)	1013	824.70	22.28	38.45
	384	836.52	22.24	38.45
	777	848.31	22.27	38.45

RC3+SO55:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC0)	1013	824.70	22.29	38.45
	384	836.52	22.23	38.45
	777	848.31	22.25	38.45

RC3+SO32(FCH):

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC0)	1013	824.70	22.21	38.45
	384	836.52	22.33	38.45
	777	848.31	22.31	38.45

RC3+SO32(SCH):

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC0)	1013	824.70	22.31	38.45
	384	836.52	22.18	38.45
	777	848.31	22.24	38.45

3G:

RTAP 153.6kbps Subtype 0:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA EV-DO (BC0)	1013	824.70	22.18	38.45
	384	836.52	22.17	38.45
	777	848.31	22.13	38.45

RETAP 4096pbs Subtype 2:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA EV-DO (BC0)	1013	824.70	22.12	38.45
	384	836.52	22.19	38.45
	777	848.31	22.16	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		22.45	22.37	22.63
		HSDPA	1	21.29	21.14	21.47
			2	21.23	21.08	21.41
			3	21.18	21.01	21.35
			4	21.12	20.99	21.29
		HSUPA	1	20.79	20.76	21.03
			2	20.76	20.71	20.97
			3	20.69	20.64	20.92
			4	20.65	20.59	20.89
			5	20.61	20.54	20.83
		HSPA+	1	21.32	21.41	21.33

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.23	33
	661	1880.0	28.40	33
	810	1909.8	28.25	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.13	28.04	26.59	24.81	33
	661	1880.0	28.62	27.29	25.82	23.99	33
	810	1909.8	28.23	26.57	25.03	23.26	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.07	23.89	22.29	20.85	33
	661	1880.0	24.37	23.21	21.48	19.97	33
	810	1909.8	23.66	22.49	20.72	19.36	33

2G:

RC1+SO55:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC1)	25	1851.25	22.25	38.45
	600	1880.00	22.36	38.45
	1175	1908.75	22.27	38.45

RC3+SO55:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC1)	25	1851.25	22.24	38.45
	600	1880.00	22.21	38.45
	1175	1908.75	22.31	38.45

RC3+SO32(FCH):

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC1)	25	1851.25	22.26	38.45
	600	1880.00	22.33	38.45
	1175	1908.75	22.36	38.45

RC3+SO32(SCH):

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC1)	25	1851.25	22.37	38.45
	600	1880.00	22.40	38.45
	1175	1908.75	22.39	38.45

3G:

RTAP 153.6kbps Subtype 0:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC1)	25	1851.25	22.36	38.45
	600	1880.00	22.32	38.45
	1175	1908.75	22.25	38.45

RETAP 4096pbs Subtype:

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA 1*RTT (BC1)	25	1851.25	22.32	38.45
	600	1880.00	22.34	38.45
	1175	1908.75	22.28	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
CDMA EV-DO (BC1)	25	1851.25	22.27	38.45
	600	1880.00	22.19	38.45
	1175	1908.75	22.30	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		22.19	22.13	22.86
		HSDPA	1	21.96	21.80	21.72
			2	21.91	21.77	21.65
			3	21.85	21.71	21.61
			4	21.82	21.68	21.56
		HSUPA	1	21.38	21.49	21.33
			2	21.32	21.45	21.30
			3	21.29	21.38	21.26
			4	21.25	21.36	21.21
			5	21.23	21.32	21.16
		HSPA+	1	21.24	21.38	21.17

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.53	13
	Middle	1.62	13
	High	1.47	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.88	13
	Middle	1.64	13
	High	1.60	13

Mode	Channel	PAR (dB)	Limit (dB)
CDMA 1*RTT (BC0)	Low	1.38	13
	Middle	1.36	13
	High	1.40	13

Mode	Channel	PAR (dB)	Limit (dB)
CDMA EV-DO (BC0)	Low	2.17	13
	Middle	2.25	13
	High	2.40	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.24	13
	Middle	3.85	13
	High	3.73	13
HSDPA (16QAM)	Low	4.62	13
	Middle	4.25	13
	High	4.43	13
HSUPA (BPSK)	Low	6.23	13
	Middle	4.41	13
	High	6.21	13
HSPA+	Low	3.55	13
	Middle	3.75	13
	High	3.14	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.77	13
	Middle	1.82	13
	High	1.56	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.47	13
	Middle	1.38	13
	High	1.52	13

Mode	Channel	PAR (dB)	Limit (dB)
CDMA 1*RTT (BC1)	Low	1.50	13
	Middle	1.48	13
	High	1.47	13

Mode	Channel	PAR (dB)	Limit (dB)
CDMA EV-DO (BC1)	Low	2.24	13
	Middle	2.30	13
	High	2.36	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.43	13
	Middle	3.52	13
	High	3.46	13
HSDPA (16QAM)	Low	3.79	13
	Middle	3.89	13
	High	3.82	13
HSUPA (BPSK)	Low	5.76	13
	Middle	4.14	13
	High	5.86	13
HSPA+	Low	4.36	13
	Middle	4.08	13
	High	4.11	13

Radiated Power

GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	101.20	210	1.2	H	31.2	0.67	0	30.53	38.45	7.92
836.6	100.87	104	2.0	V	30.9	0.67	0	30.23	38.45	8.22
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	89.46	75	1.1	H	19.4	1.30	9.40	27.50	33	5.5
1880.00	87.79	235	1.8	V	17.5	1.30	9.40	25.60	33	7.4

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	95.37	38	1.3	H	25.4	0.67	0	24.73	38.45	13.72
836.6	94.87	201	1.2	V	24.9	0.67	0	24.23	38.45	14.22
EIRP, PCS Band (Part 24E), Middle Channel										
1880	85.87	318	2.4	H	15.8	1.30	9.40	23.90	33	9.1
1880	86.2	326	1.6	V	15.9	1.30	9.40	24.00	33	9.0

CDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
ERP for CDMA (1*RTT , BC0)										
836.52	89.86	34	1.9	H	19.9	0.67	0	19.23	38.45	19.22
836.52	88.77	120	1.3	V	18.8	0.67	0	18.13	38.45	20.32
ERP for CDMA (1*RTT , BC1)										
836.52	90.03	34	1.9	H	20.0	0.67	0	19.33	38.45	19.12
836.52	89.6	120	1.3	V	19.6	0.67	0	18.93	38.45	19.52
EIRP for CDMA (EV-DO, BC0)										
1880.00	81.08	307	2.5	H	11.0	1.30	9.40	19.10	33	13.9
1880.00	81.51	174	1.0	V	11.2	1.30	9.40	19.30	33	13.7
EIRP for CDMA (EV-DO, BC1)										
1880.00	82.16	91	1.7	H	12.1	1.30	8.50	19.30	33	13.7
1880.00	82.99	152	2.0	V	12.7	1.30	8.50	19.90	33	13.1

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	93.60	282	1	H	23.6	0.67	0	22.93	38.45	15.52
836.6	95.37	128	2.4	V	25.4	0.67	0	24.73	38.45	13.72
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	83.26	145	1.4	H	13.2	1.30	9.40	21.30	33.00	11.7
1880.00	84.11	289	1.8	V	13.8	1.30	9.40	21.90	33.00	11.1

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

LTE Band 5:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.43	22.42	22.52
		RB Size=1, RB Offset=2	22.49	22.28	22.58
		RB Size=1, RB Offset=5	22.45	22.01	22.60
		RB Size=3, RB Offset=0	22.65	22.71	22.67
		RB Size=3, RB Offset=1	22.57	22.61	22.65
		RB Size=3, RB Offset=2	22.51	22.50	22.46
		RB Size=6, RB Offset=0	21.48	21.44	21.44
	16QAM	RB Size=1, RB Offset=0	21.88	21.90	21.96
		RB Size=1, RB Offset=2	21.78	21.86	21.78
		RB Size=1, RB Offset=5	21.74	21.89	21.86
		RB Size=3, RB Offset=0	22.81	21.86	21.80
		RB Size=3, RB Offset=1	22.81	21.69	21.84
		RB Size=3, RB Offset=2	22.62	21.74	21.62
		RB Size=6, RB Offset=0	20.70	20.69	20.72
3.0	QPSK	RB Size=1, RB Offset=0	22.51	22.50	22.46
		RB Size=1, RB Offset=7	22.32	22.44	22.26
		RB Size=1, RB Offset=14	22.37	22.23	22.23
		RB Size=8, RB Offset=0	21.58	21.60	21.65
		RB Size=8, RB Offset=4	21.47	21.46	21.68
		RB Size=8, RB Offset=7	21.36	21.33	21.67
		RB Size=15, RB Offset=0	21.60	21.61	21.69
	16QAM	RB Size=1, RB Offset=0	21.72	21.64	21.61
		RB Size=1, RB Offset=7	21.72	21.60	21.47
		RB Size=1, RB Offset=14	21.72	21.48	21.32
		RB Size=8, RB Offset=0	20.69	20.68	20.74
		RB Size=8, RB Offset=4	20.61	20.61	20.76
		RB Size=8, RB Offset=7	20.63	20.76	20.54
		RB Size=15, RB Offset=0	20.73	20.74	20.73

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	22.71	22.64	22.75
		RB Size=1, RB Offset=12	22.62	22.52	22.62
		RB Size=1, RB Offset=24	22.56	22.53	22.66
		RB Size=12, RB Offset=0	21.77	21.62	21.68
		RB Size=12, RB Offset=6	21.76	21.68	21.69
		RB Size=12, RB Offset=11	21.52	21.75	21.63
		RB Size=25, RB Offset=0	21.75	21.68	21.72
	16QAM	RB Size=1, RB Offset=0	21.93	21.90	21.91
		RB Size=1, RB Offset=12	21.83	21.77	21.70
		RB Size=1, RB Offset=24	21.69	21.70	21.68
		RB Size=12, RB Offset=0	20.89	20.97	21.00
		RB Size=12, RB Offset=6	20.82	20.96	20.92
		RB Size=12, RB Offset=11	20.73	20.74	20.80
		RB Size=25, RB Offset=0	20.88	20.63	20.65
10.0	QPSK	RB Size=1, RB Offset=0	22.73	22.75	22.76
		RB Size=1, RB Offset=24	22.71	22.66	22.74
		RB Size=1, RB Offset=49	22.58	22.69	22.73
		RB Size=25, RB Offset=0	21.76	21.79	21.73
		RB Size=25, RB Offset=12	21.62	21.84	21.74
		RB Size=25, RB Offset=24	21.64	21.54	21.65
		RB Size=50, RB Offset=0	21.81	21.83	21.79
	16QAM	RB Size=1, RB Offset=0	22.19	22.20	22.30
		RB Size=1, RB Offset=24	22.13	22.14	22.30
		RB Size=1, RB Offset=49	22.20	22.12	22.09
		RB Size=25, RB Offset=0	20.84	20.86	20.87
		RB Size=25, RB Offset=12	20.67	20.65	20.91
		RB Size=25, RB Offset=24	20.60	20.71	20.67
		RB Size=50, RB Offset=0	20.94	20.87	20.92

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.58	13	Pass
QPSK (50RB Size)	4.49	13	Pass
16QAM (1RB Size)	4.67	13	Pass
16QAM (50RB Size)	4.73	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	90.20	127	1.7	H	20.2	0.67	0	19.53	38.45
836.5	89.71	338	1.8	V	19.7	0.67	0	19.03	38.45
3 MHz Bandwidth									
836.5	90.09	272	2.2	H	20.1	0.67	0	19.43	38.45
836.5	89.62	19	1.3	V	19.6	0.67	0	18.93	38.45
5 MHz Bandwidth									
836.5	89.87	267	1.9	H	19.9	0.67	0	19.23	38.45
836.5	89.57	96	1.4	V	19.6	0.67	0	18.93	38.45
10 MHz Bandwidth									
836.5	89.76	45	1.1	H	19.8	0.67	0	19.13	38.45
836.5	89.69	32	1.5	V	19.7	0.67	0	19.03	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	90.40	338	1.5	H	20.4	0.67	0	19.73	38.45
836.5	90.21	312	2.4	V	20.2	0.67	0	19.53	38.45
3 MHz Bandwidth									
836.5	90.18	338	1.5	H	20.2	0.67	0	19.53	38.45
836.5	90.10	312	2.4	V	20.1	0.67	0	19.43	38.45
5 MHz Bandwidth									
836.5	90.07	338	1.5	H	20.1	0.67	0	19.43	38.45
836.5	90.01	312	2.4	V	20	0.67	0	19.33	38.45
10 MHz Bandwidth									
836.5	89.93	338	1.5	H	19.9	0.67	0	19.23	38.45
836.5	88.76	312	2.4	V	18.8	0.67	0	18.13	38.45

LTE Band 7:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	23.24	23.00	22.53
		RB Size=1, RB Offset=12	22.76	22.46	22.27
		RB Size=1, RB Offset=24	23.37	22.98	22.82
		RB Size=12, RB Offset=0	22.02	21.58	21.31
		RB Size=12, RB Offset=6	22.04	21.58	21.35
		RB Size=12, RB Offset=11	22.08	21.55	21.48
		RB Size=25, RB Offset=0	22.01	21.57	22.36
	16QAM	RB Size=1, RB Offset=0	22.58	21.92	22.10
		RB Size=1, RB Offset=12	22.52	21.78	22.12
		RB Size=1, RB Offset=24	22.64	21.99	22.24
		RB Size=12, RB Offset=0	21.83	20.95	21.34
		RB Size=12, RB Offset=6	21.67	21.09	21.30
		RB Size=12, RB Offset=11	21.64	20.99	21.39
		RB Size=25, RB Offset=0	21.05	20.76	20.58
10.0	QPSK	RB Size=1, RB Offset=0	22.64	22.42	22.83
		RB Size=1, RB Offset=24	22.77	22.33	22.63
		RB Size=1, RB Offset=49	22.63	22.26	22.76
		RB Size=25, RB Offset=0	21.84	21.65	22.11
		RB Size=25, RB Offset=12	21.88	21.82	21.98
		RB Size=25, RB Offset=24	21.82	21.79	22.04
		RB Size=50, RB Offset=0	22.05	21.50	21.54
	16QAM	RB Size=1, RB Offset=0	21.88	22.05	21.97
		RB Size=1, RB Offset=24	21.72	22.17	21.99
		RB Size=1, RB Offset=49	21.78	22.26	22.01
		RB Size=25, RB Offset=0	21.03	21.23	21.22
		RB Size=25, RB Offset=12	21.15	21.15	21.05
		RB Size=25, RB Offset=24	21.07	21.30	21.22
		RB Size=50, RB Offset=0	21.14	20.56	20.67

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.74	22.65	23.85
		RB Size=1, RB Offset=37	22.66	22.70	23.58
		RB Size=1, RB Offset=74	22.79	22.69	23.84
		RB Size=36, RB Offset=0	21.98	21.94	22.90
		RB Size=36, RB Offset=18	21.98	21.68	23.11
		RB Size=36, RB Offset=37	22.08	21.88	23.07
		RB Size=75, RB Offset=0	22.12	21.35	22.18
	16QAM	RB Size=1, RB Offset=0	22.01	21.77	22.62
		RB Size=1, RB Offset=37	21.90	21.48	22.67
		RB Size=1, RB Offset=74	22.05	21.68	22.82
		RB Size=36, RB Offset=0	21.11	20.94	21.91
		RB Size=36, RB Offset=18	21.30	20.96	21.79
		RB Size=36, RB Offset=37	21.12	21.03	21.82
		RB Size=75, RB Offset=0	20.66	20.50	21.29
20.0	QPSK	RB Size=1, RB Offset=0	22.79	22.99	23.58
		RB Size=1, RB Offset=49	22.68	22.88	23.40
		RB Size=1, RB Offset=99	22.99	23.09	23.72
		RB Size=50, RB Offset=0	22.04	22.23	22.82
		RB Size=50, RB Offset=24	22.07	22.20	22.78
		RB Size=50, RB Offset=49	22.03	22.14	22.83
		RB Size=100, RB Offset=0	22.24	21.66	22.47
	16QAM	RB Size=1, RB Offset=0	22.11	22.27	22.87
		RB Size=1, RB Offset=49	21.97	22.29	22.62
		RB Size=1, RB Offset=99	22.10	22.28	22.92
		RB Size=50, RB Offset=0	21.35	21.35	22.04
		RB Size=50, RB Offset=24	21.35	21.55	22.10
		RB Size=50, RB Offset=49	21.20	21.44	22.04
		RB Size=100, RB Offset=0	21.28	20.74	21.51

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.85	13	Pass
QPSK (100RB Size)	4.74	13	Pass
16QAM (1RB Size)	4.77	13	Pass
16QAM (100RB Size)	4.34	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	83.48	232	1.9	H	14.0	2.60	10.20	21.60	33
2535.00	83.96	347	1.1	V	15.1	2.60	10.20	22.70	33
10 MHz Bandwidth									
2535.00	83.68	89	1.8	H	14.2	2.60	10.20	21.80	33
2535.00	83.81	163	2.1	V	14.9	2.60	10.20	22.50	33
15 MHz Bandwidth									
2535.00	83.69	173	1.7	H	14.2	2.60	10.20	21.80	33
2535.00	83.72	235	2.1	V	14.8	2.60	10.20	22.40	33
20 MHz Bandwidth									
2535.00	83.76	145	1.5	H	14.3	2.60	10.20	21.90	33
2535.00	83.15	198	2.5	V	14.3	2.60	10.20	21.90	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	87.79	49	2.0	H	11.4	1.70	8.60	18.30	33
2535.00	76.89	240	1.0	V	10.2	1.70	8.60	17.10	33
10 MHz Bandwidth									
2535.00	82.46	24	2.0	H	12.9	2.20	10.20	20.90	33
2535.00	82.78	65	2.4	V	13.6	2.20	10.20	21.60	33
15 MHz Bandwidth									
2535.00	83.23	148	1.1	H	13.7	2.60	10.20	21.30	33
2535.00	82.95	264	1.4	V	14.1	2.60	10.20	21.70	33
20 MHz Bandwidth									
2535.00	82.41	15	1.6	H	12.9	2.60	10.20	20.50	33
2535.00	83.15	223	1.1	V	14.3	2.60	10.20	21.90	33

LTE Band 38:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	23.24	22.94	22.57
		RB Size=1, RB Offset=12	22.79	22.49	22.33
		RB Size=1, RB Offset=24	23.34	22.95	22.85
		RB Size=12, RB Offset=0	22.03	21.55	21.31
		RB Size=12, RB Offset=6	22.03	21.59	21.40
		RB Size=12, RB Offset=11	22.07	21.55	21.54
		RB Size=25, RB Offset=0	22.02	21.60	22.32
	16QAM	RB Size=1, RB Offset=0	22.53	21.92	22.15
		RB Size=1, RB Offset=12	22.55	21.83	22.12
		RB Size=1, RB Offset=24	22.65	22.00	22.24
		RB Size=12, RB Offset=0	21.82	20.95	21.35
		RB Size=12, RB Offset=6	21.69	21.07	21.31
		RB Size=12, RB Offset=11	21.60	21.01	21.41
		RB Size=25, RB Offset=0	21.05	20.75	20.55
10.0	QPSK	RB Size=1, RB Offset=0	22.64	22.41	22.84
		RB Size=1, RB Offset=24	22.75	22.38	22.66
		RB Size=1, RB Offset=49	22.61	22.29	22.79
		RB Size=25, RB Offset=0	21.87	21.64	22.10
		RB Size=25, RB Offset=12	21.91	21.82	22.01
		RB Size=25, RB Offset=24	21.80	21.74	22.07
		RB Size=50, RB Offset=0	22.01	21.48	21.56
	16QAM	RB Size=1, RB Offset=0	21.87	22.06	21.99
		RB Size=1, RB Offset=24	21.73	22.19	22.01
		RB Size=1, RB Offset=49	21.80	22.22	22.02
		RB Size=25, RB Offset=0	21.02	21.21	21.26
		RB Size=25, RB Offset=12	21.19	21.17	21.06
		RB Size=25, RB Offset=24	21.07	21.28	21.24
		RB Size=50, RB Offset=0	21.10	20.56	20.68

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.71	22.61	23.85
		RB Size=1, RB Offset=37	22.61	22.68	23.60
		RB Size=1, RB Offset=74	22.78	22.66	23.86
		RB Size=36, RB Offset=0	21.97	21.97	22.93
		RB Size=36, RB Offset=18	21.96	21.67	23.08
		RB Size=36, RB Offset=37	22.09	21.92	23.06
		RB Size=75, RB Offset=0	22.15	21.32	22.21
	16QAM	RB Size=1, RB Offset=0	22.03	21.76	22.67
		RB Size=1, RB Offset=37	21.93	21.52	22.69
		RB Size=1, RB Offset=74	22.03	21.68	22.80
		RB Size=36, RB Offset=0	21.16	20.96	21.94
		RB Size=36, RB Offset=18	21.30	20.96	21.78
		RB Size=36, RB Offset=37	21.13	21.01	21.79
		RB Size=75, RB Offset=0	20.68	20.53	21.30
20.0	QPSK	RB Size=1, RB Offset=0	22.80	22.99	23.58
		RB Size=1, RB Offset=49	22.70	22.91	23.37
		RB Size=1, RB Offset=99	22.94	23.11	23.71
		RB Size=50, RB Offset=0	22.00	22.23	22.80
		RB Size=50, RB Offset=24	22.05	22.18	22.81
		RB Size=50, RB Offset=49	22.01	22.10	22.83
		RB Size=100, RB Offset=0	22.23	21.67	22.48
	16QAM	RB Size=1, RB Offset=0	22.12	22.29	22.86
		RB Size=1, RB Offset=49	21.97	22.35	22.67
		RB Size=1, RB Offset=99	22.12	22.28	22.94
		RB Size=50, RB Offset=0	21.33	21.34	22.09
		RB Size=50, RB Offset=24	21.35	21.54	22.14
		RB Size=50, RB Offset=49	21.19	21.44	22.00
		RB Size=100, RB Offset=0	21.24	20.75	21.48

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.31	13	Pass
QPSK (100RB Size)	4.43	13	Pass
16QAM (1RB Size)	4.29	13	Pass
16QAM (100RB Size)	4.45	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2595.00	83.62	46	1.1	H	14.1	2.20	10.20	22.10	33
2595.00	83.51	36	1.7	V	14.3	2.20	10.20	22.30	33
10 MHz Bandwidth									
2595.00	83.69	229	1.7	H	14.1	2.20	10.20	22.10	33
2595.00	83.94	40	1.6	V	14.7	2.20	10.20	22.70	33
15 MHz Bandwidth									
2595.00	83.74	329	2.4	H	14.2	2.20	10.20	22.20	33
2595.00	83.68	13	1.6	V	14.5	2.20	10.20	22.50	33
20 MHz Bandwidth									
2595.00	83.62	204	1.8	H	14.1	2.20	10.20	22.10	33
2595.00	83.79	300	1.0	V	14.6	2.20	10.20	22.60	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2595.00	83.74	358	1.2	H	14.2	2.20	10.20	22.20	33
2595.00	84.02	22	2.5	V	14.8	2.20	10.20	22.80	33
10 MHz Bandwidth									
2595.00	83.66	83	2.1	H	14.1	2.20	10.20	22.10	33
2595.00	83.51	310	1.1	V	14.3	2.20	10.20	22.30	33
15 MHz Bandwidth									
2595.00	83.45	259	1.9	H	13.9	2.20	10.20	21.90	33
2595.00	83.67	280	1.9	V	14.5	2.20	10.20	22.50	33
20 MHz Bandwidth									
2595.00	83.56	133	1.2	H	14.0	2.20	10.20	22.00	33
2595.00	83.67	278	1.8	V	14.5	2.20	10.20	22.50	33

LTE Band 41:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	23.23	22.99	22.55
		RB Size=1, RB Offset=12	22.75	22.50	22.30
		RB Size=1, RB Offset=24	23.37	22.94	22.82
		RB Size=12, RB Offset=0	22.01	21.54	21.27
		RB Size=12, RB Offset=6	22.02	21.60	21.40
		RB Size=12, RB Offset=11	22.08	21.58	21.52
		RB Size=25, RB Offset=0	21.99	21.57	22.32
	16QAM	RB Size=1, RB Offset=0	22.54	21.91	22.16
		RB Size=1, RB Offset=12	22.53	21.83	22.14
		RB Size=1, RB Offset=24	22.66	21.94	22.28
		RB Size=12, RB Offset=0	21.82	20.97	21.34
		RB Size=12, RB Offset=6	21.66	21.10	21.34
		RB Size=12, RB Offset=11	21.60	20.96	21.44
		RB Size=25, RB Offset=0	21.04	20.74	20.54
10.0	QPSK	RB Size=1, RB Offset=0	22.64	22.39	22.84
		RB Size=1, RB Offset=24	22.75	22.33	22.62
		RB Size=1, RB Offset=49	22.57	22.31	22.80
		RB Size=25, RB Offset=0	21.87	21.65	22.08
		RB Size=25, RB Offset=12	21.91	21.82	22.01
		RB Size=25, RB Offset=24	21.84	21.78	22.04
		RB Size=50, RB Offset=0	22.05	21.47	21.55
	16QAM	RB Size=1, RB Offset=0	21.86	22.05	21.93
		RB Size=1, RB Offset=24	21.74	22.20	21.97
		RB Size=1, RB Offset=49	21.77	22.23	21.99
		RB Size=25, RB Offset=0	21.04	21.23	21.23
		RB Size=25, RB Offset=12	21.18	21.11	21.07
		RB Size=25, RB Offset=24	21.06	21.30	21.24
		RB Size=50, RB Offset=0	21.11	20.57	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	22.77	22.63	23.86
		RB Size=1, RB Offset=37	22.66	22.72	23.61
		RB Size=1, RB Offset=74	22.78	22.65	23.84
		RB Size=36, RB Offset=0	22.00	21.93	22.90
		RB Size=36, RB Offset=18	21.94	21.68	23.09
		RB Size=36, RB Offset=37	22.07	21.92	23.03
		RB Size=75, RB Offset=0	22.11	21.35	22.17
	16QAM	RB Size=1, RB Offset=0	22.02	21.78	22.66
		RB Size=1, RB Offset=37	21.93	21.53	22.67
		RB Size=1, RB Offset=74	22.02	21.69	22.76
		RB Size=36, RB Offset=0	21.15	20.98	21.91
		RB Size=36, RB Offset=18	21.30	20.98	21.73
		RB Size=36, RB Offset=37	21.11	21.05	21.79
		RB Size=75, RB Offset=0	20.71	20.48	21.29
20.0	QPSK	RB Size=1, RB Offset=0	22.78	22.98	23.58
		RB Size=1, RB Offset=49	22.72	22.89	23.38
		RB Size=1, RB Offset=99	22.99	23.13	23.70
		RB Size=50, RB Offset=0	22.02	22.20	22.77
		RB Size=50, RB Offset=24	22.08	22.17	22.76
		RB Size=50, RB Offset=49	22.02	22.13	22.80
		RB Size=100, RB Offset=0	22.25	21.65	22.44
	16QAM	RB Size=1, RB Offset=0	22.12	22.26	22.85
		RB Size=1, RB Offset=49	21.98	22.30	22.62
		RB Size=1, RB Offset=99	22.09	22.25	22.97
		RB Size=50, RB Offset=0	21.35	21.34	22.06
		RB Size=50, RB Offset=24	21.35	21.59	22.09
		RB Size=50, RB Offset=49	21.19	21.44	22.05
		RB Size=100, RB Offset=0	21.29	20.75	21.53

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.67	13	Pass
QPSK (100RB Size)	4.72	13	Pass
16QAM (1RB Size)	4.52	13	Pass
16QAM (100RB Size)	4.31	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2593.00	83.94	203	1.9	H	14.4	2.20	10.20	22.40	33
2593.00	82.31	261	1.1	V	13.1	2.20	10.20	21.10	33
10 MHz Bandwidth									
2593.00	83.67	92	1.0	H	14.1	2.20	10.20	22.10	33
2593.00	83.11	14	1.6	V	13.9	2.20	10.20	21.90	33
15 MHz Bandwidth									
2593.00	83.48	269	1.1	H	13.9	2.20	10.20	21.90	33
2593.00	83.61	23	1.1	V	14.4	2.20	10.20	22.40	33
20 MHz Bandwidth									
2593.00	83.77	115	1.4	H	14.2	2.20	10.20	22.20	33
2593.00	83.16	326	1.5	V	14.0	2.20	10.20	22.00	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2593.00	83.69	189	2.0	H	14.1	2.20	10.20	22.10	33
2593.00	83.42	78	1.4	V	14.2	2.20	10.20	22.20	33
10 MHz Bandwidth									
2593.00	83.64	92	2.1	H	14.1	2.20	10.20	22.10	33
2593.00	83.59	26	2.2	V	14.4	2.20	10.20	22.40	33
15 MHz Bandwidth									
2593.00	84.11	81	2.1	H	14.5	2.20	10.20	22.50	33
2593.00	83.60	97	2.3	V	14.4	2.20	10.20	22.40	33
20 MHz Bandwidth									
2593.00	83.49	31	1.8	H	13.9	2.20	10.20	21.90	33
2593.00	83.84	355	2.4	V	14.6	2.20	10.20	22.60	33

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

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

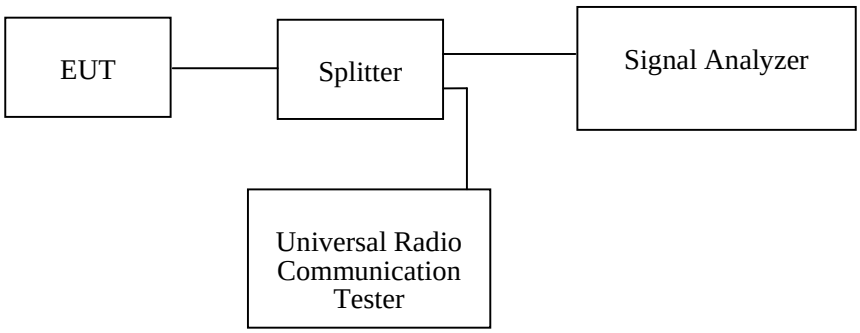
Applicable Standard

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

Test Procedure

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

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



Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	52~53 %
ATM Pressure:	101.0~101.2 kPa

The testing was performed by Simon Wang from 2018-04-16 to 2018-05-21.

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	245.19	314.10
EGPRS(8PSK)	836.6	245.19	309.29

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
CDMA (1*RTT) BC0	836.52	1.279	1.438
CDMA (EV-DO) BC0	836.52	1.279	1.442

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.12	4.71
HSUPA (BPSK)	836.6	4.13	4.71
HSDPA (16QAM)	836.6	4.12	4.73

PCS Band (Part 24E)

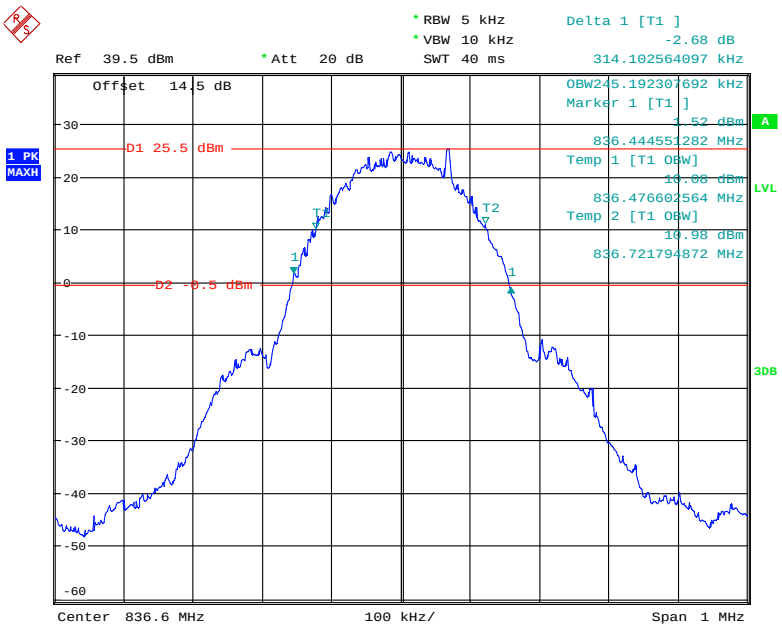
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	245.19	314.10
EGPRS(8PSK)	1880.0	245.19	310.90

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
CDMA (1*RTT) BC0	1880.00	1.269	1.418
CDMA (EV-DO) BC0	1880.00	1.274	1.423

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.12	4.71
HSUPA (BPSK)	1880.0	4.13	4.71
HSDPA (16QAM)	1880.0	4.13	4.71

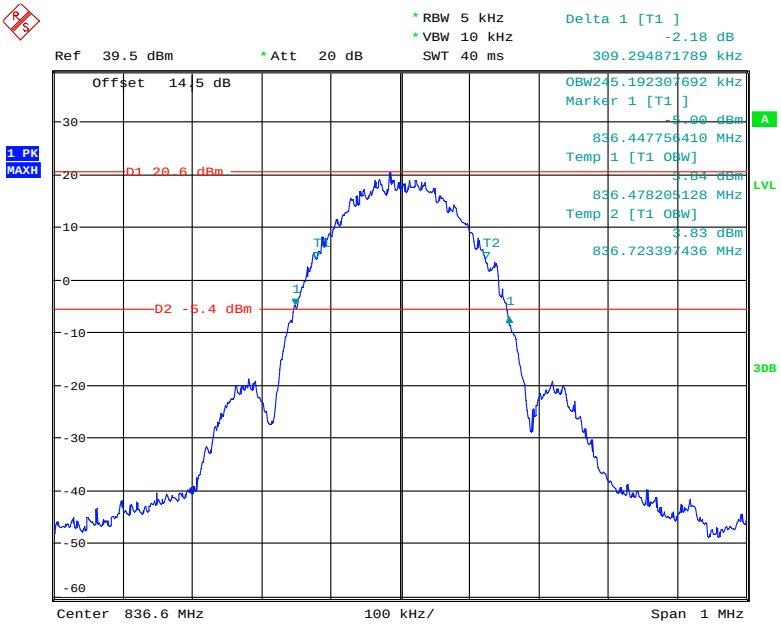
Cellular Band (Part 22H)

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



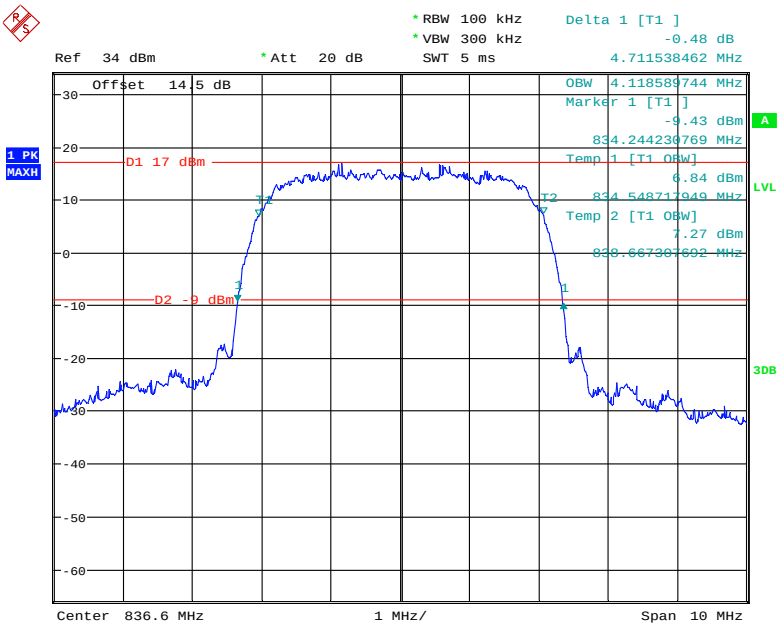
Date: 16.APR.2018 09:21:24

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



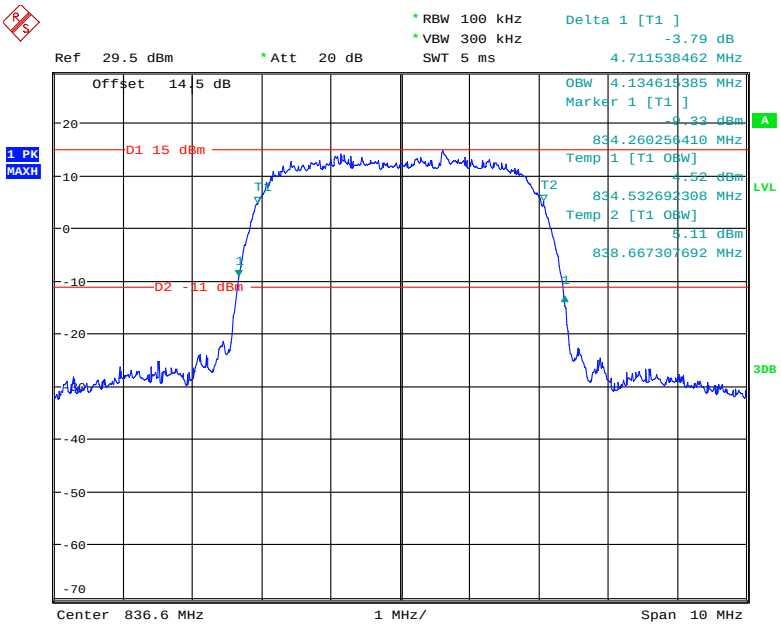
Date: 16.APR.2018 10:11:46

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



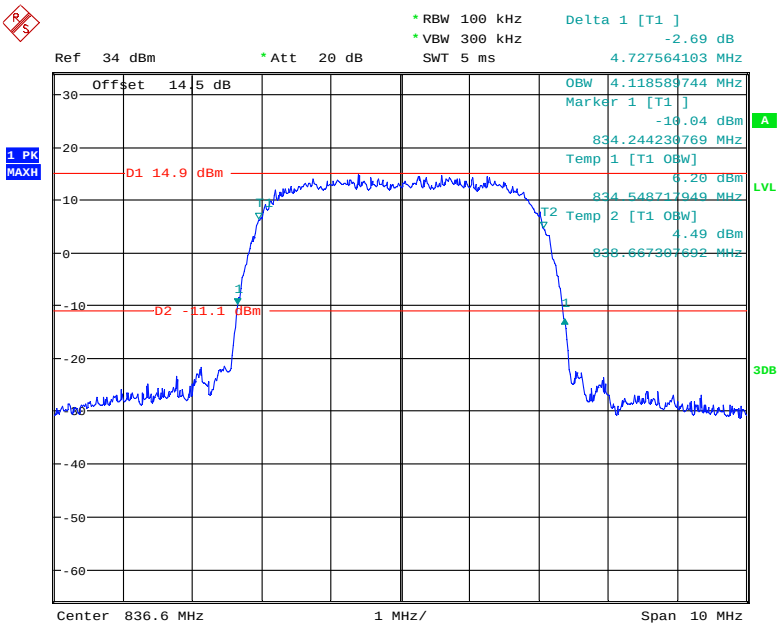
Date: 19.APR.2018 13:52:02

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



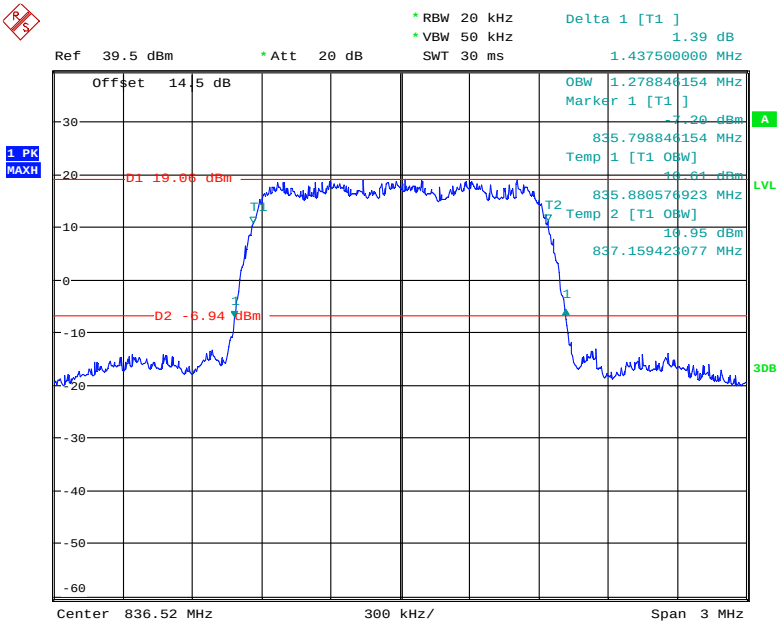
Date: 16.APR.2018 13:54:14

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



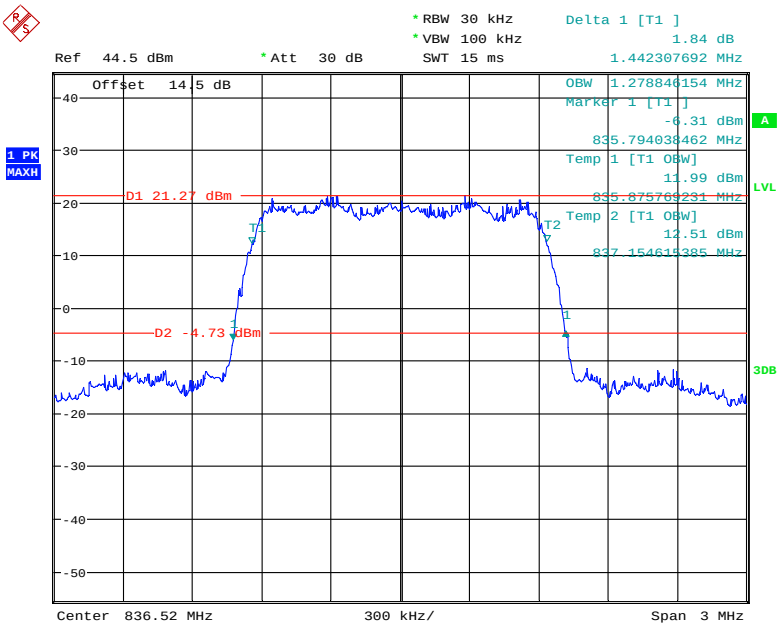
Date: 19.APR.2018 13:50:02

26 dB Emissions &99% Occupied Bandwidth for CDMA (1*RTT, BC0) Mode, Middle Channel



Date: 17.MAY.2018 16:14:54

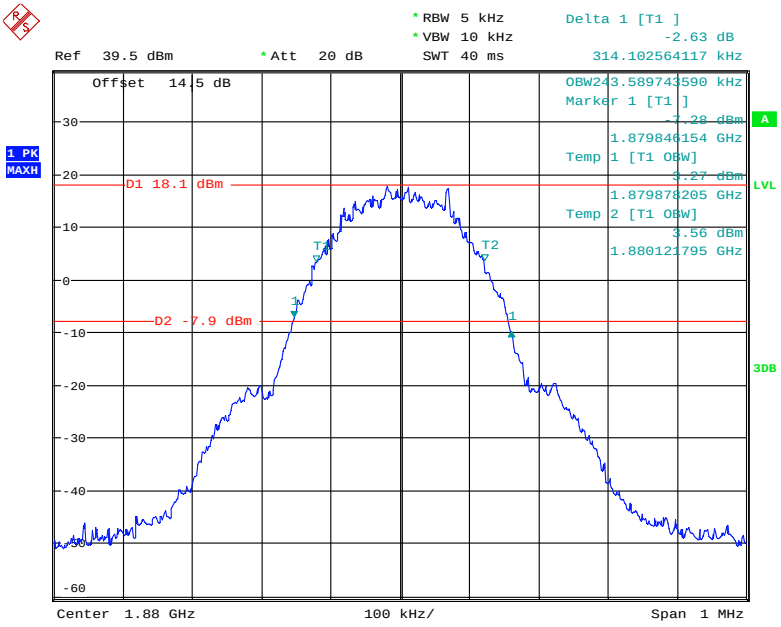
26 dB Emissions &99% Occupied Bandwidth for CDMA (EV-DO, BC0) Mode, Middle Channel



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

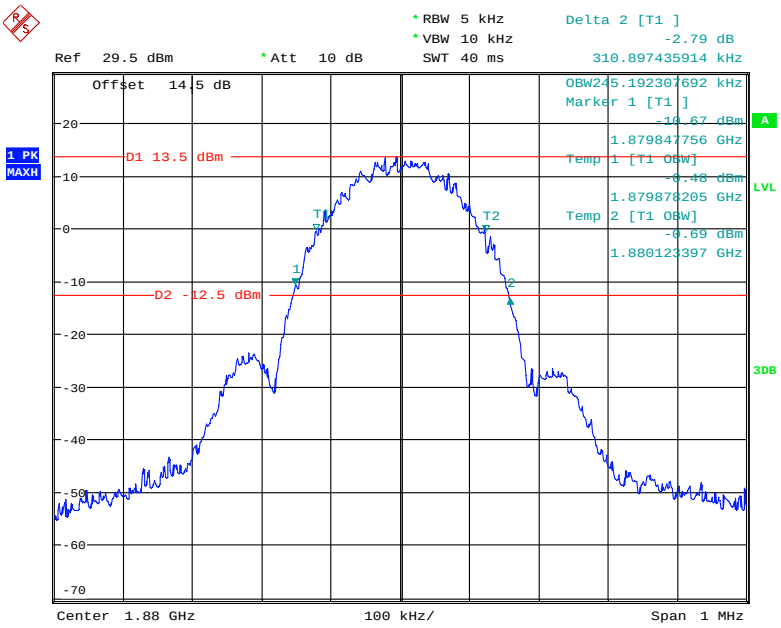
PCS Band (Part 24E)

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



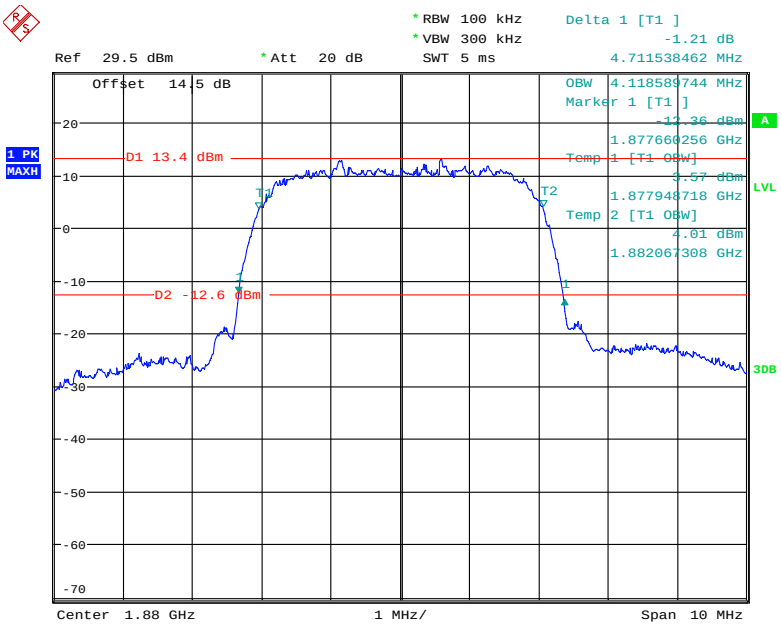
Date: 16.APR.2018 10:37:01

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



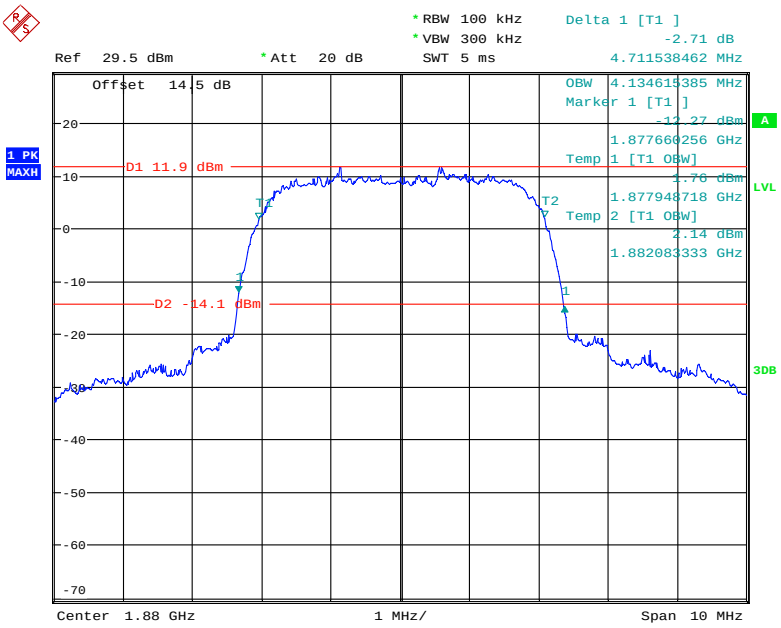
Date: 16.APR.2018 11:09:57

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



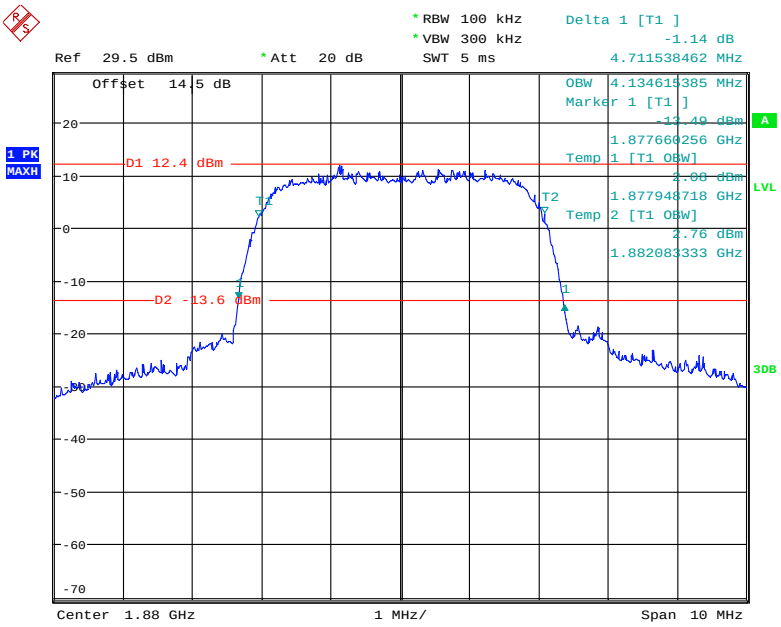
Date: 16.APR.2018 14:43:13

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



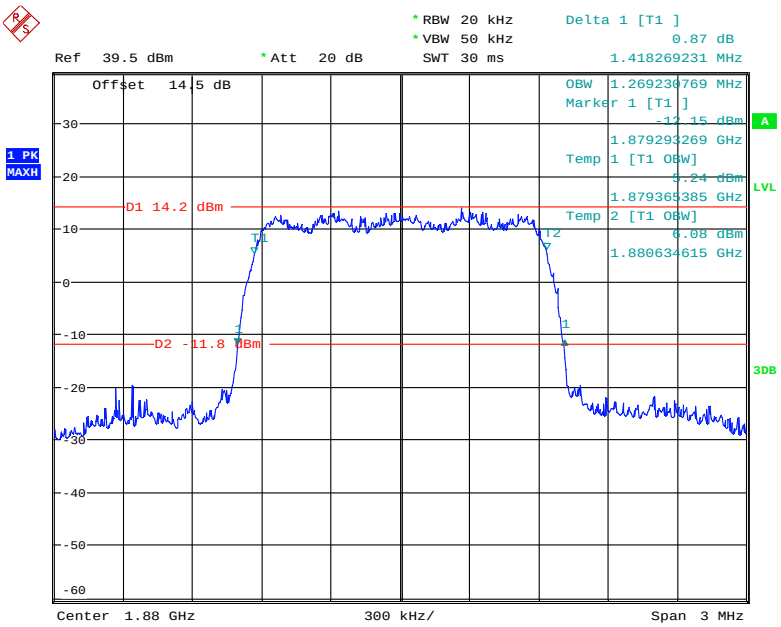
Date: 16.APR.2018 14:40:39

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



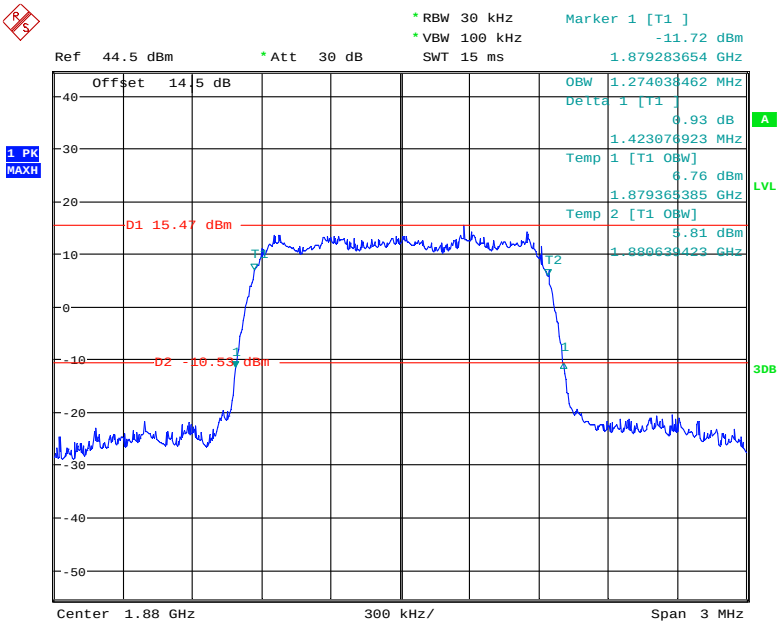
Date: 16.APR.2018 14:42:00

26 dB Emissions &99% Occupied Bandwidth for CDMA (1*RTT, BC1) Mode, Middle Channel



Date: 17.MAY.2018 16:19:43

26 dB Emissions &99% Occupied Bandwidth for CDMA (EV-DO, BC1) Mode, Middle Channel

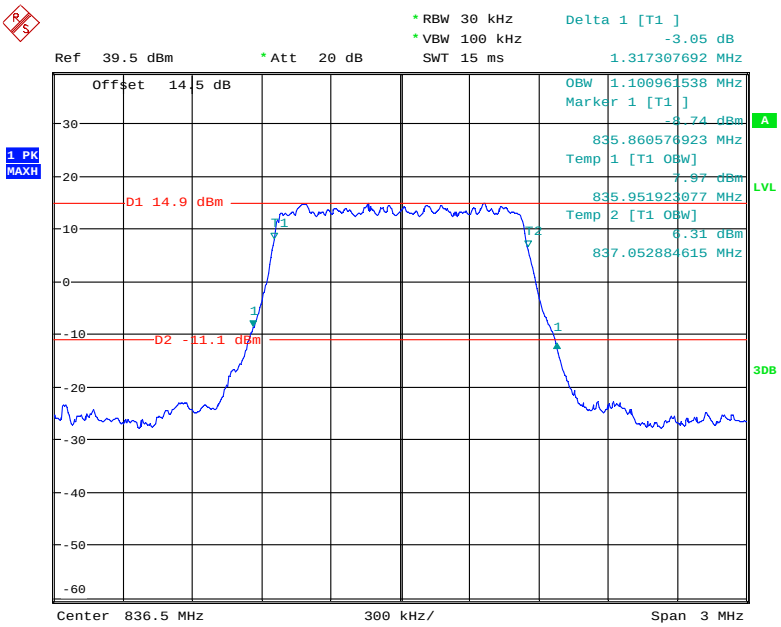


Date: 17.MAY.2018 17:07:23

LTE Band 5: (Middle Channel)

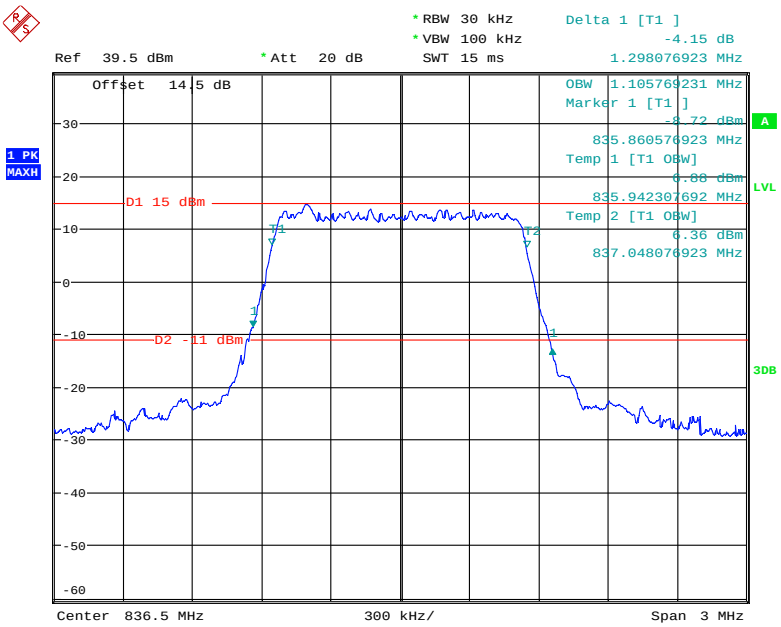
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.317
	16QAM	1.106	1.298
3.0	QPSK	2.692	2.923
	16QAM	2.692	2.942
5.0	QPSK	4.519	4.997
	16QAM	4.503	4.997
10.0	QPSK	8.942	9.644
	16QAM	8.942	9.644

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



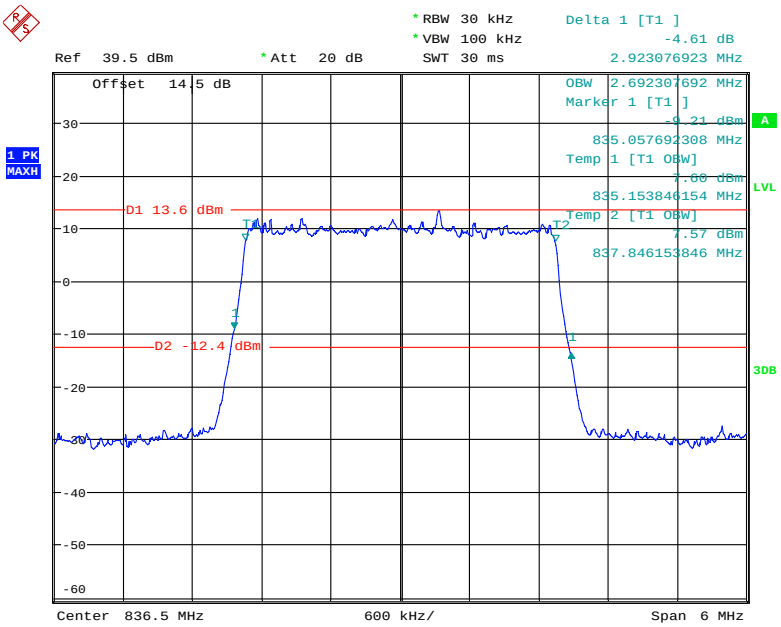
Date: 16.APR.2018 15:41:04

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



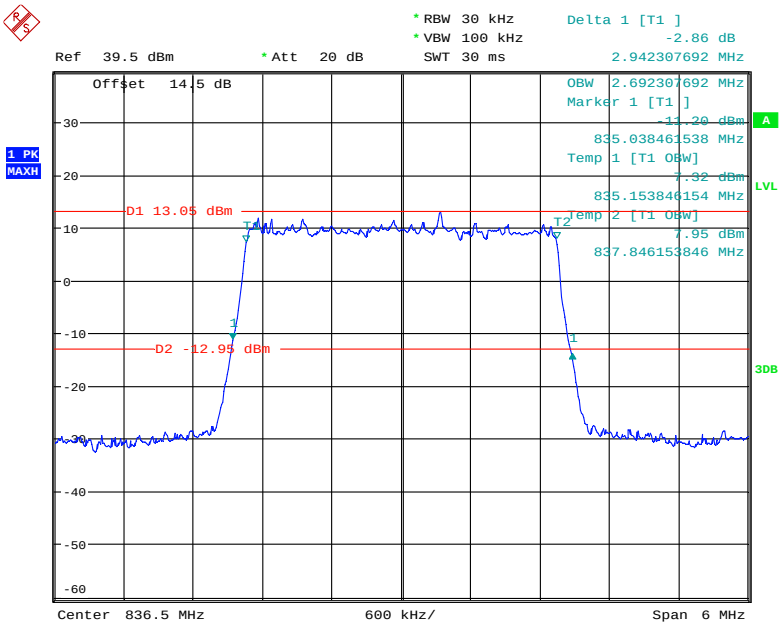
Date: 16.APR.2018 15:43:27

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



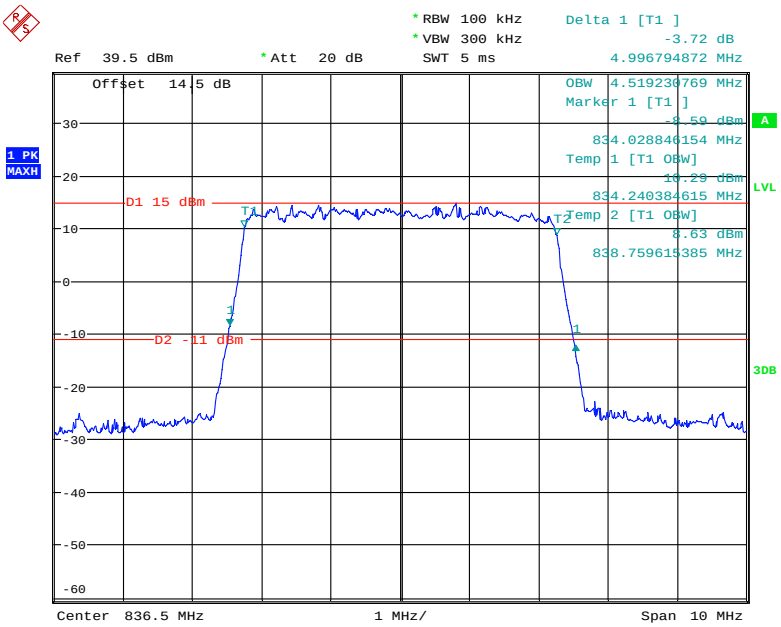
Date: 16.APR.2018 15:47:49

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



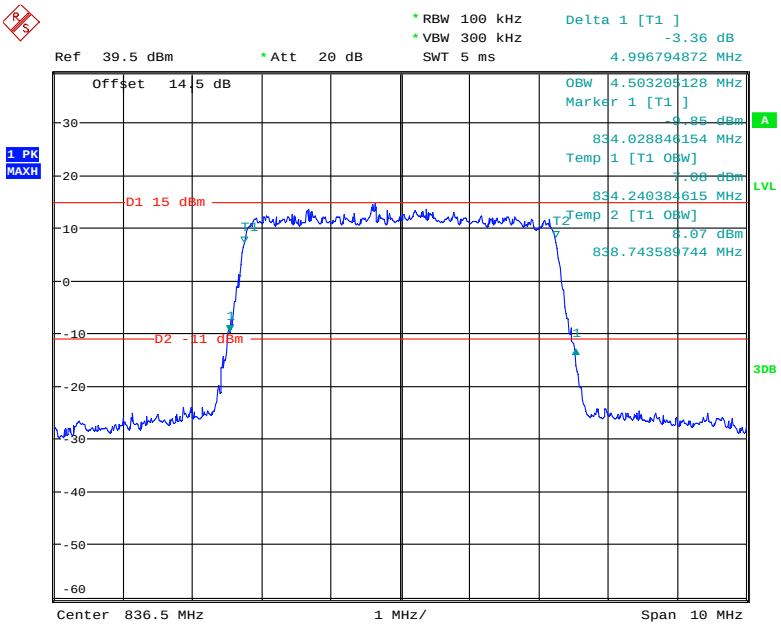
Date: 21.MAY.2018 17:38:20

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



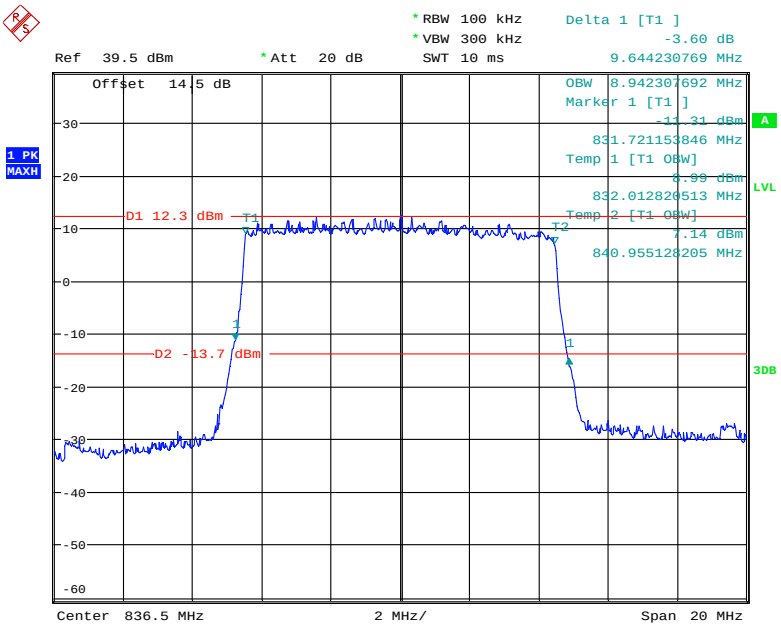
Date: 16.APR.2018 15:52:44

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



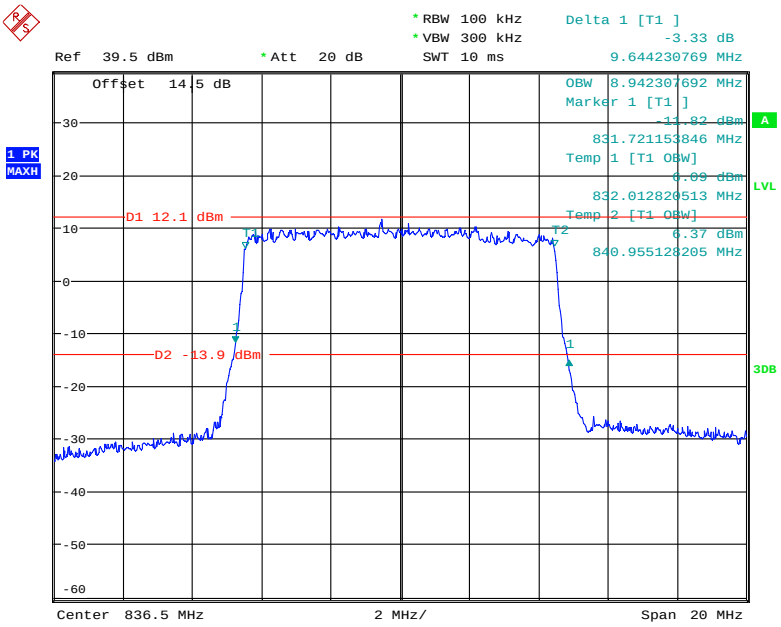
Date: 16.APR.2018 15:55:34

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



Date: 16.APR.2018 15:58:37

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

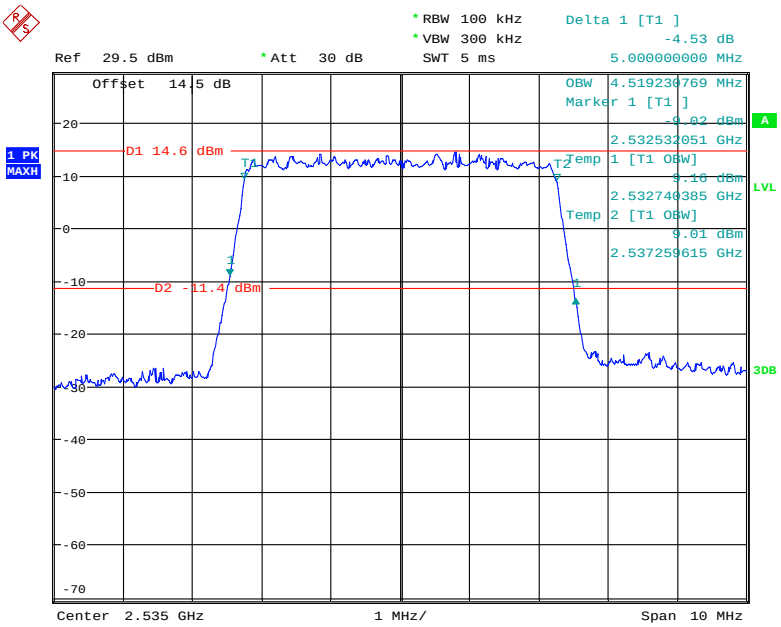


Date: 16.APR.2018 15:57:21

LTE Band 7: (Middle Channel)

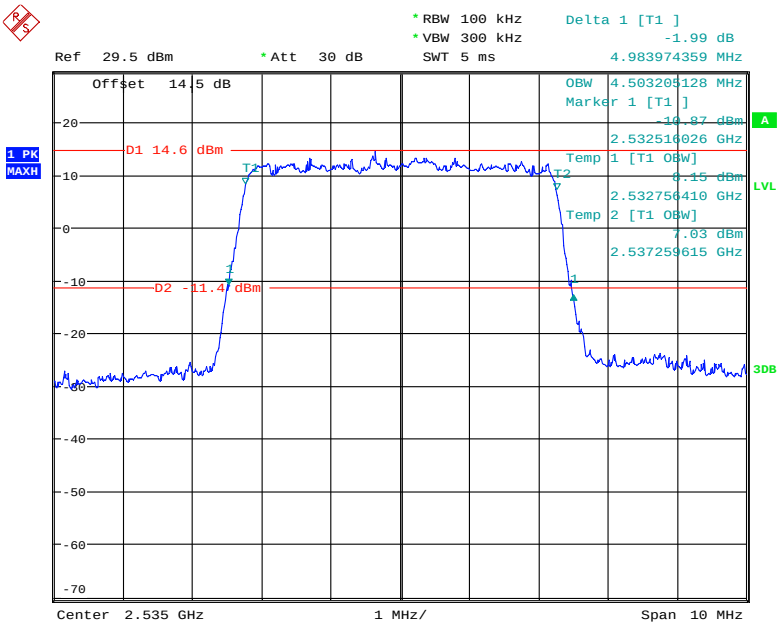
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.519	5.000
	16QAM	4.503	4.984
10.0	QPSK	8.974	9.760
	16QAM	8.942	9.631
15.0	QPSK	13.462	14.631
	16QAM	13.413	14.631
20.0	QPSK	17.885	19.423
	16QAM	17.885	19.103

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



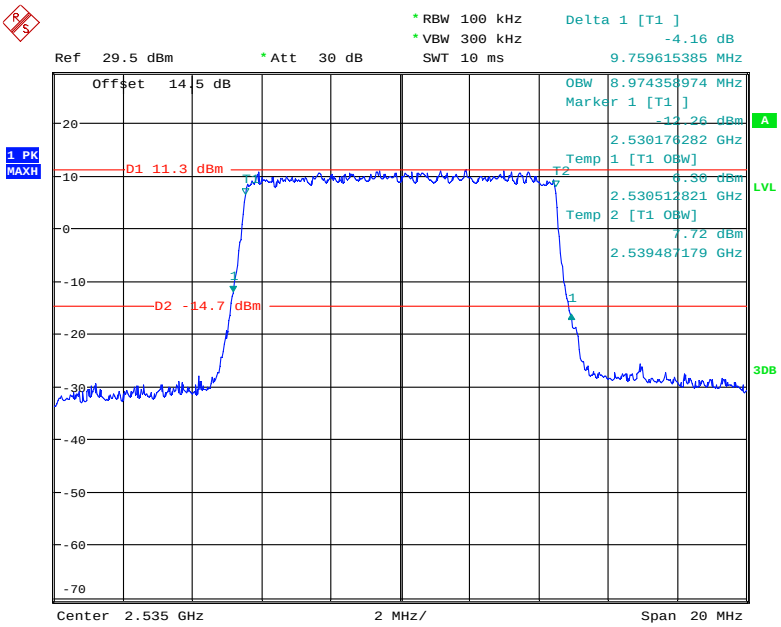
Date: 17.APR.2018 10:45:37

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



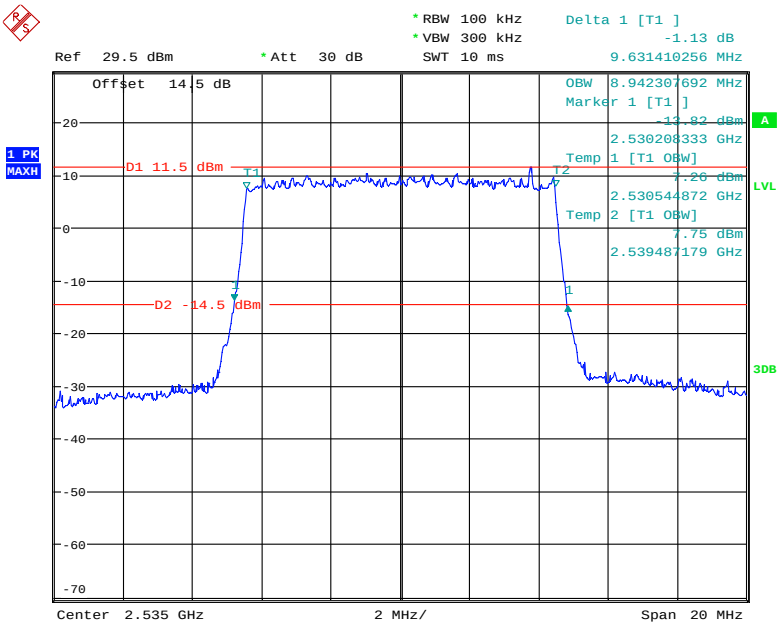
Date: 17.APR.2018 10:46:59

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



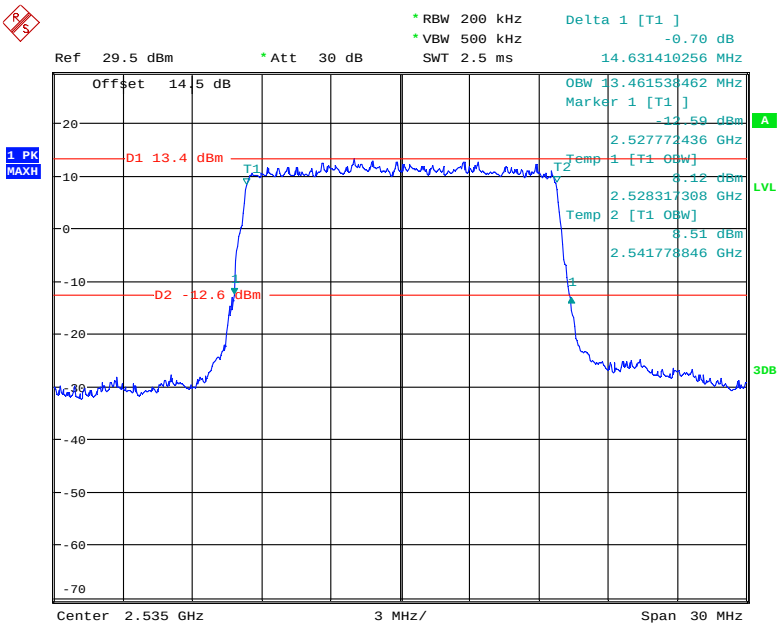
Date: 17.APR.2018 10:42:35

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



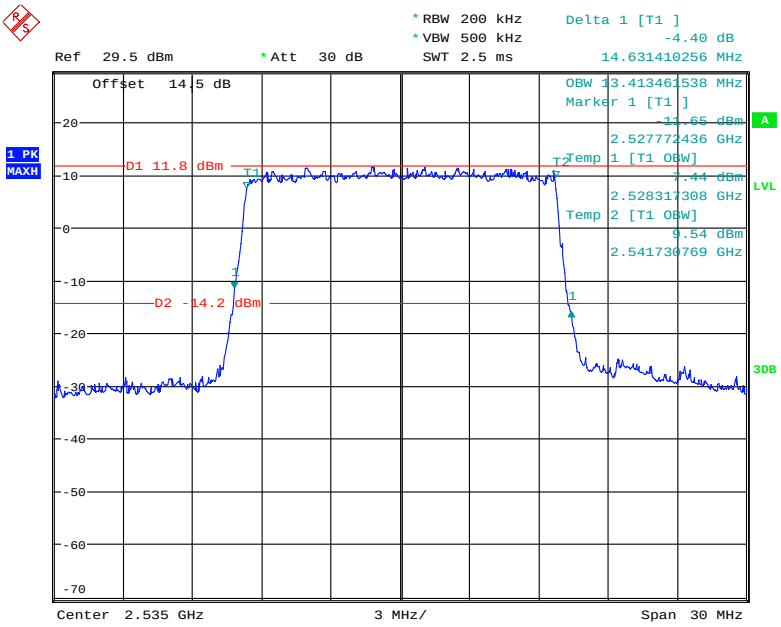
Date: 17.APR.2018 10:43:56

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



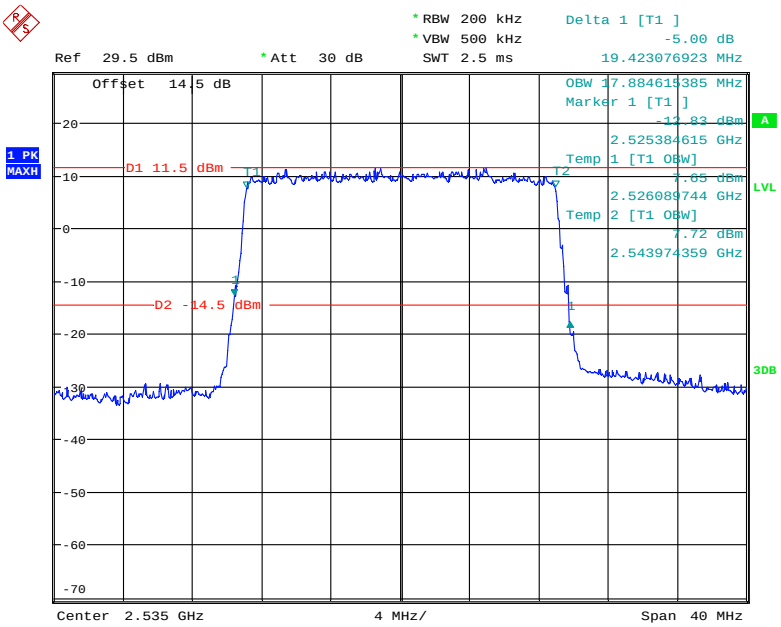
Date: 17.APR.2018 10:39:19

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



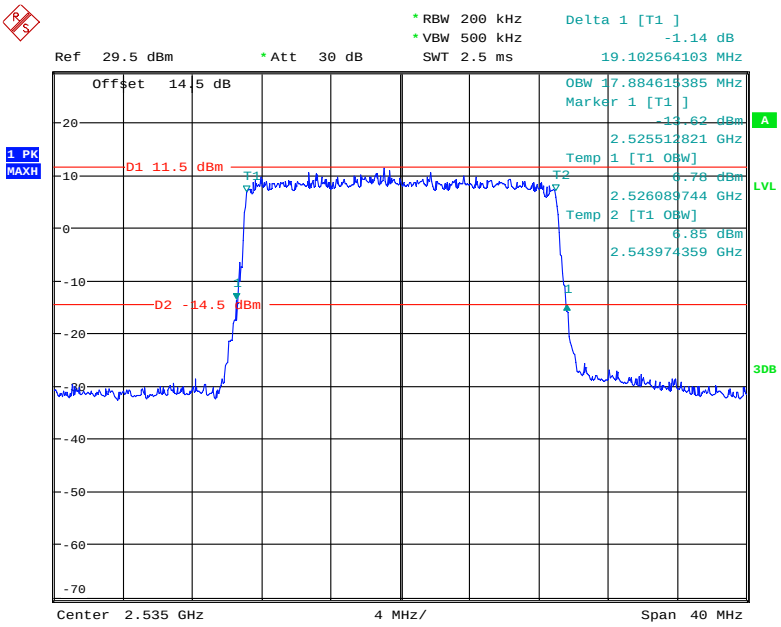
Date: 17.APR.2018 10:41:13

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



Date: 17.APR.2018 10:35:02

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

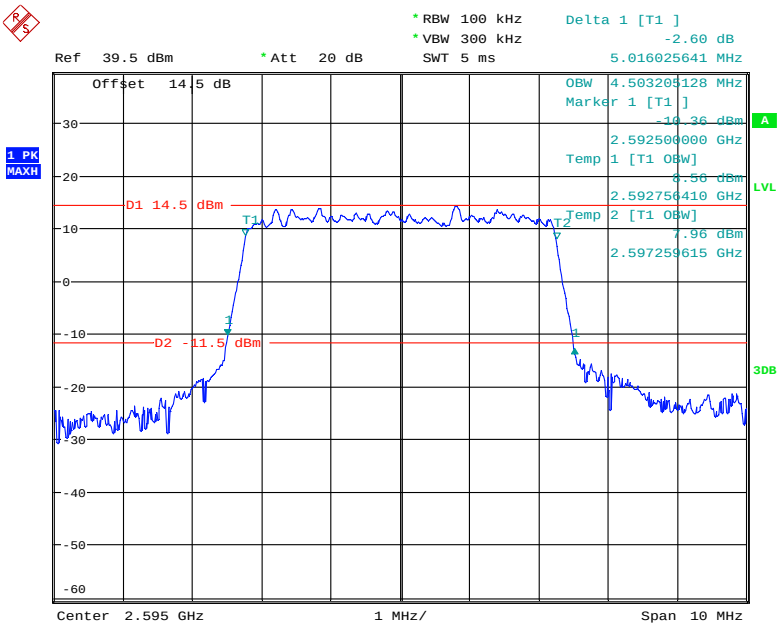


Date: 17.APR.2018 10:36:50

LTE Band 38: (Middle Channel)

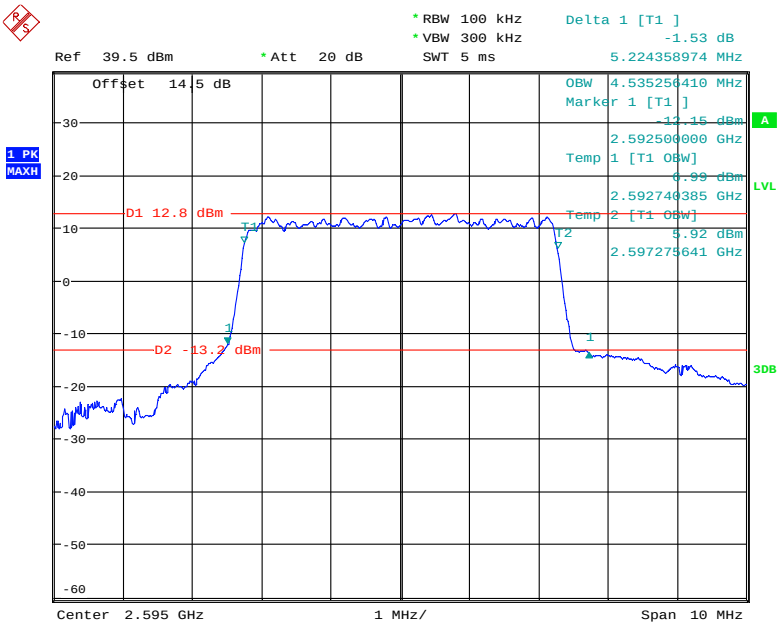
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.503	5.016
	16QAM	4.535	5.224
10.0	QPSK	8.974	10.096
	16QAM	8.974	9.679
15.0	QPSK	13.510	15.344
	16QAM	13.462	15.344
20.0	QPSK	17.949	18.998
	16QAM	17.821	19.126

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



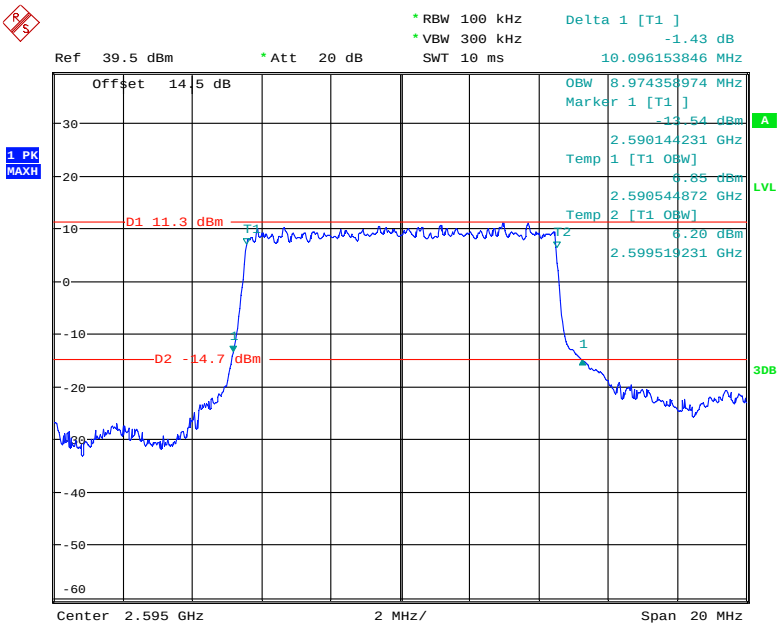
Date: 17.APR.2018 11:41:57

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



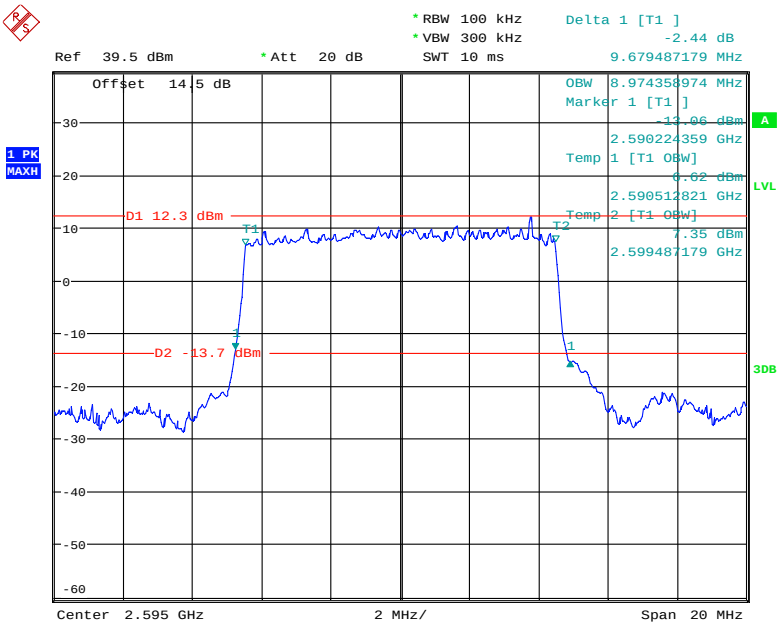
Date: 17.APR.2018 11:49:33

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



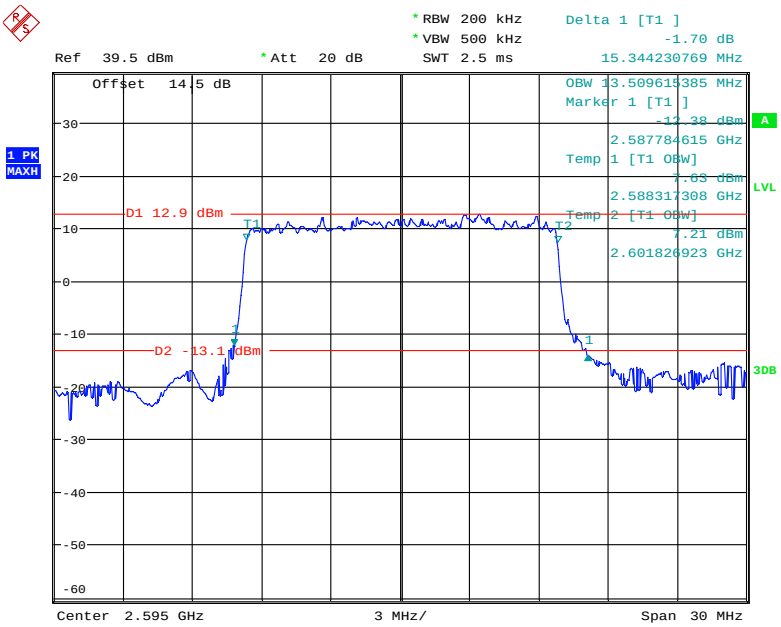
Date: 17.APR.2018 13:16:45

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



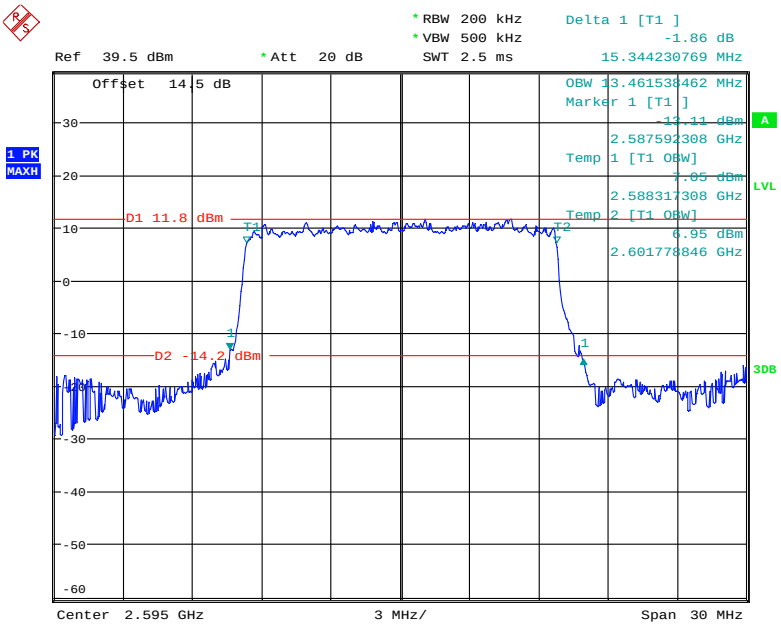
Date: 17.APR.2018 11:57:18

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



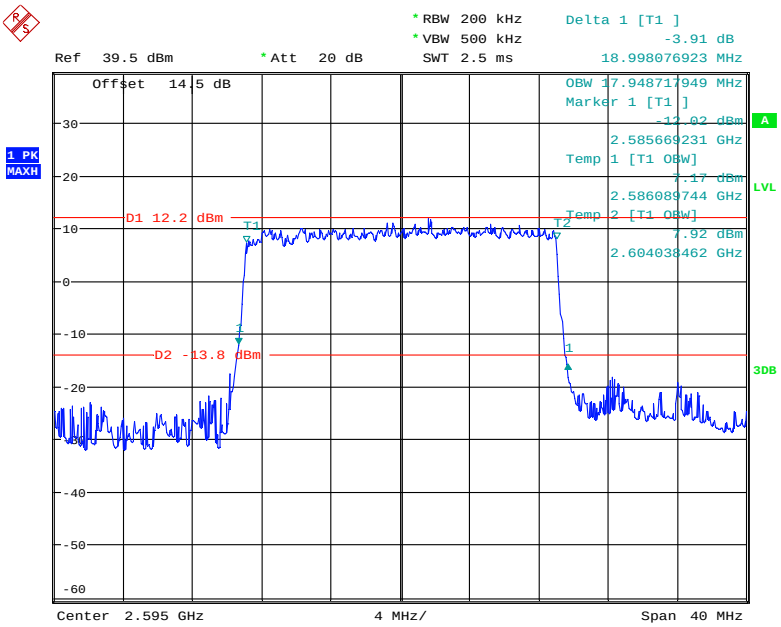
Date: 17.APR.2018 13:23:46

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



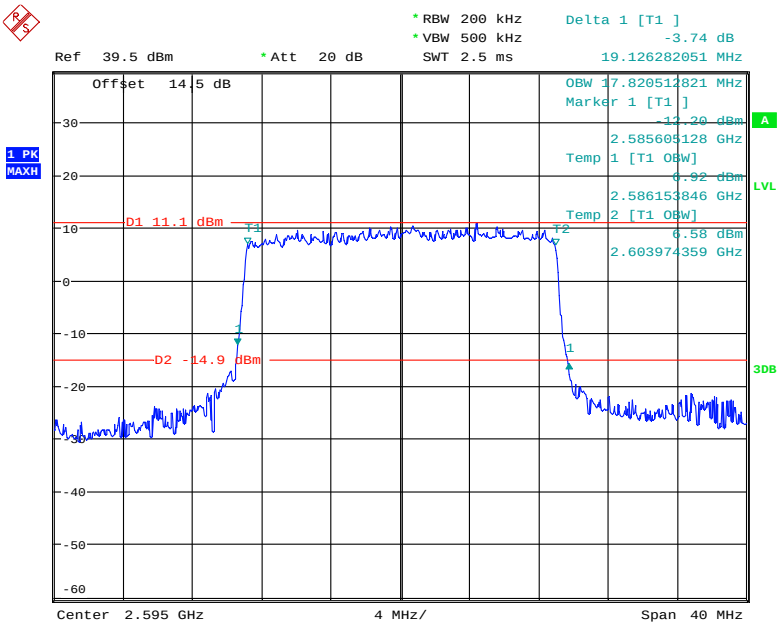
Date: 17.APR.2018 13:27:44

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



Date: 17.APR.2018 13:28:56

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

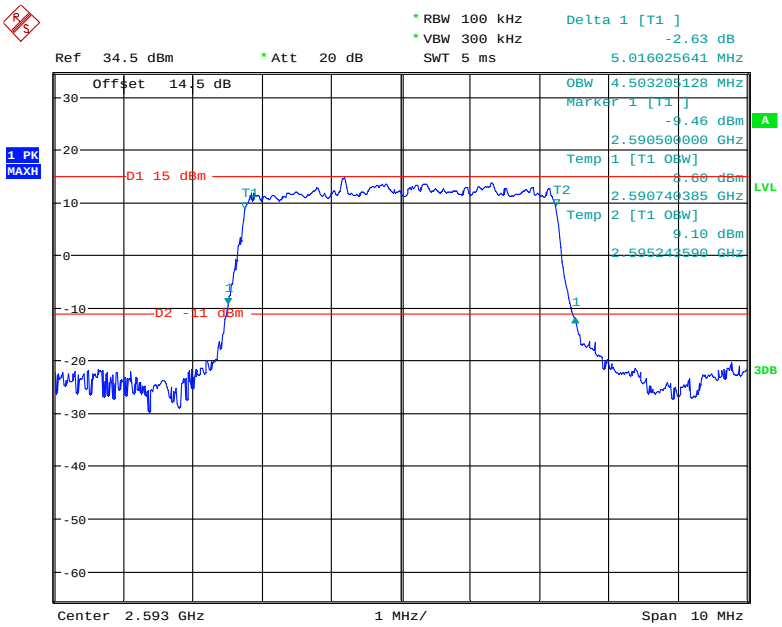


Date: 17.APR.2018 13:30:54

LTE Band 41: (Middle Channel)

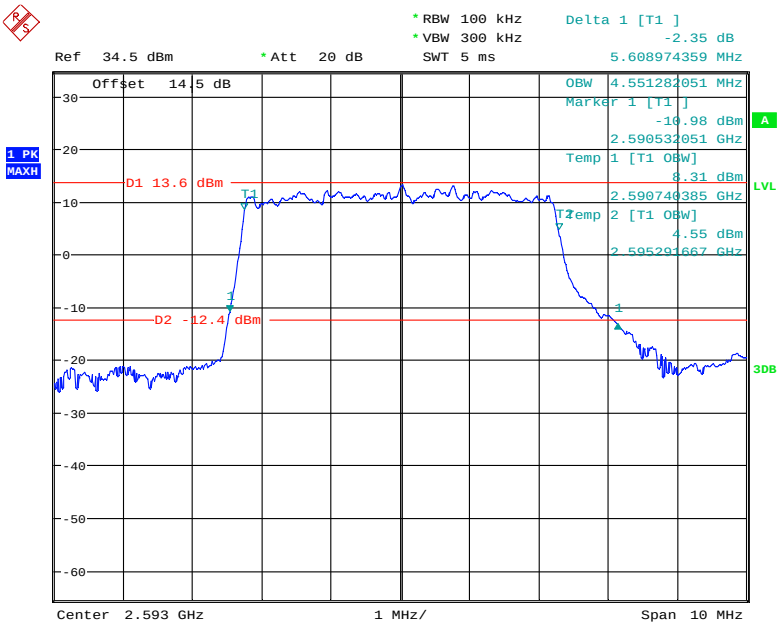
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.503	5.016
	16QAM	4.551	5.609
10.0	QPSK	8.974	10.160
	16QAM	8.942	9.583
15.0	QPSK	13.510	15.353
	16QAM	13.462	15.064
20.0	QPSK	17.949	19.135
	16QAM	17.885	19.135

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



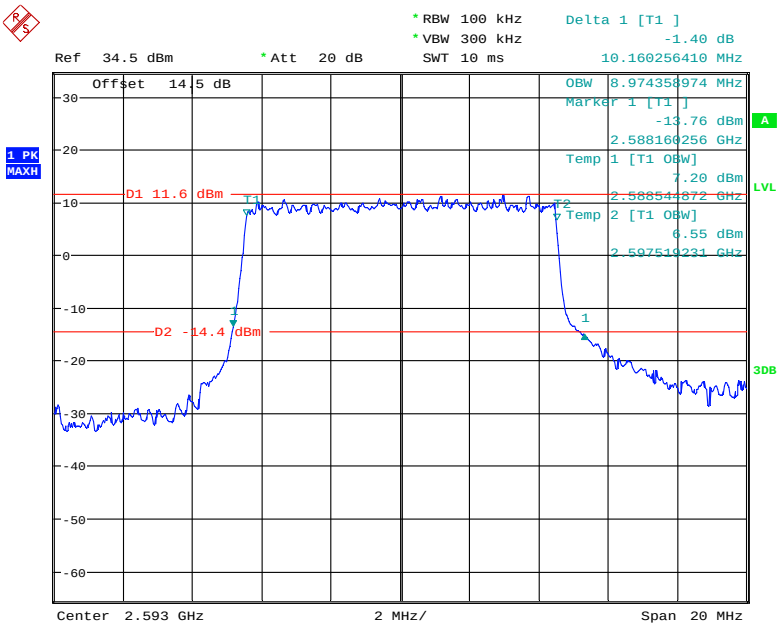
Date: 18.APR.2018 09:11:23

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



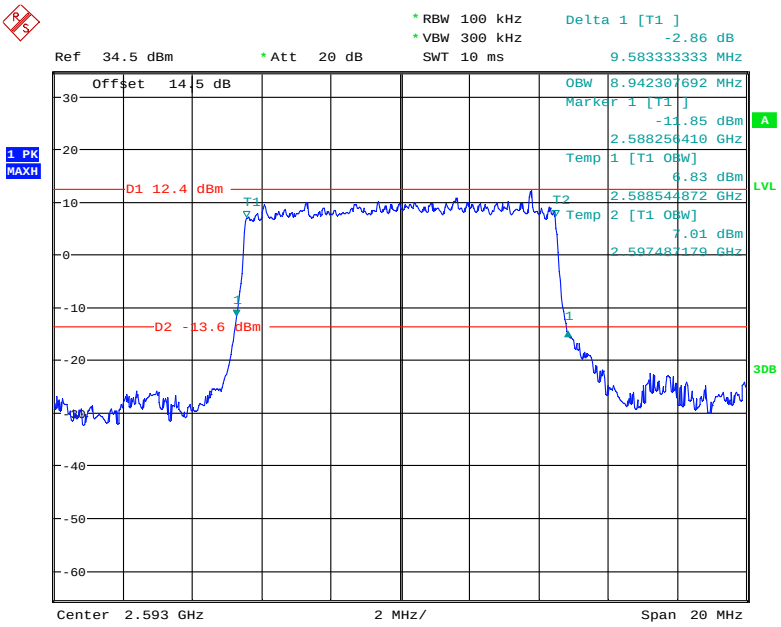
Date: 18.APR.2018 09:17:40

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



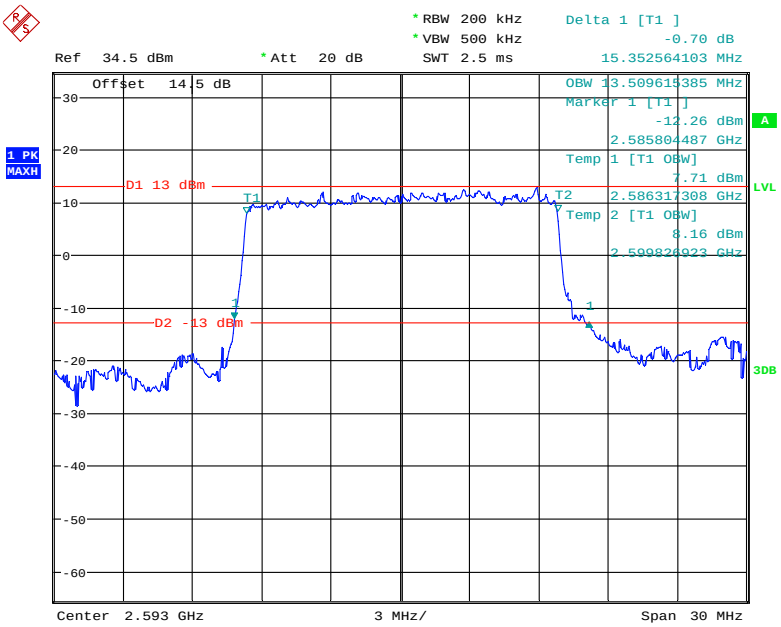
Date: 18.APR.2018 09:23:00

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



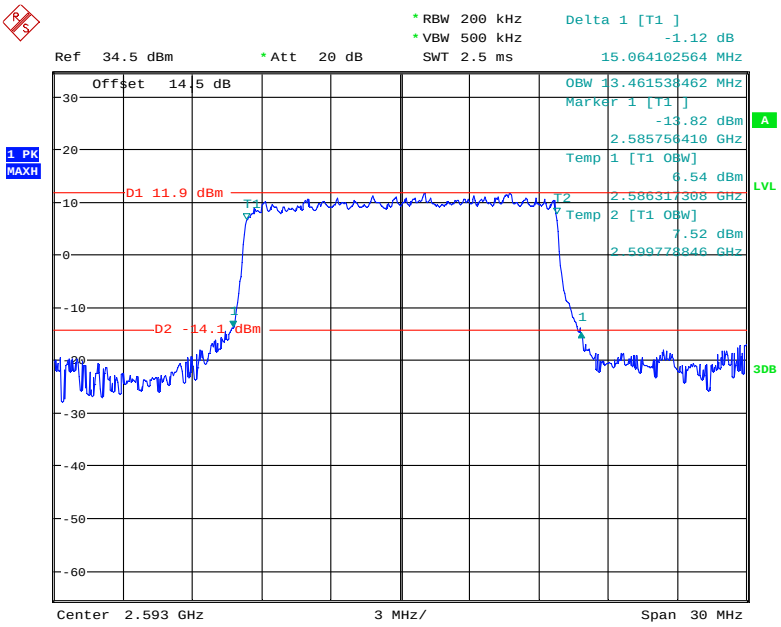
Date: 18.APR.2018 09:19:38

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



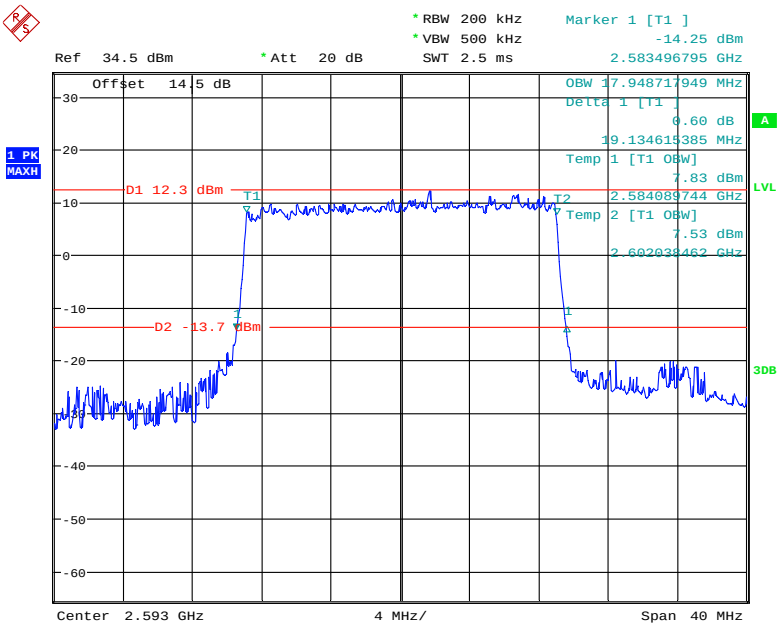
Date: 18.APR.2018 09:30:56

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



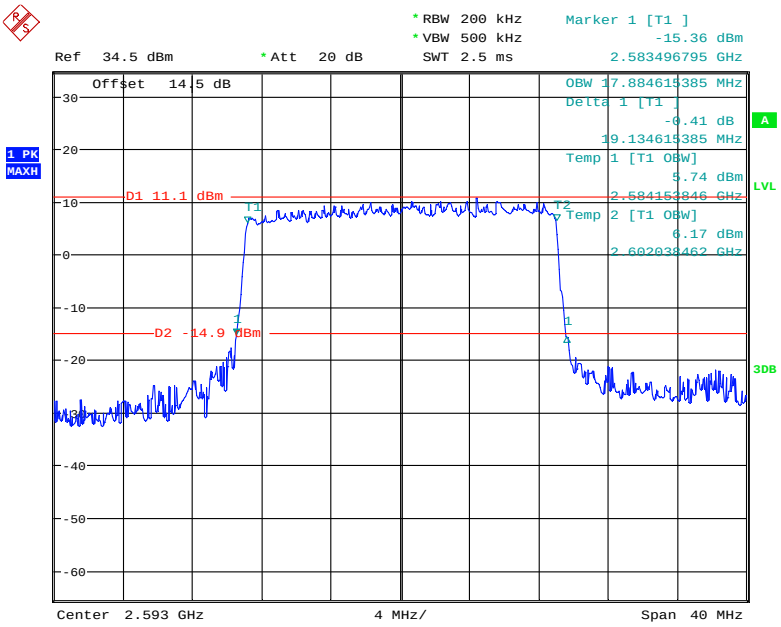
Date: 18.APR.2018 09:27:02

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



Date: 18.APR.2018 09:32:34

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



Date: 18.APR.2018 09:33:52

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

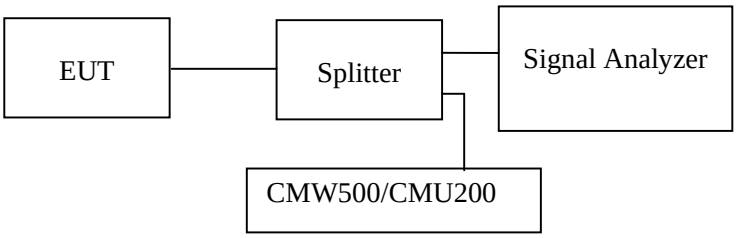
Applicable Standard

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 10^{th} harmonic.



Test Data

Environmental Conditions

Temperature:	25~26 ℃
Relative Humidity:	52~54 %
ATM Pressure:	101.0~101.5 kPa

The testing was performed by Simon Wang from 2018-04-16 to 2018-05-19.

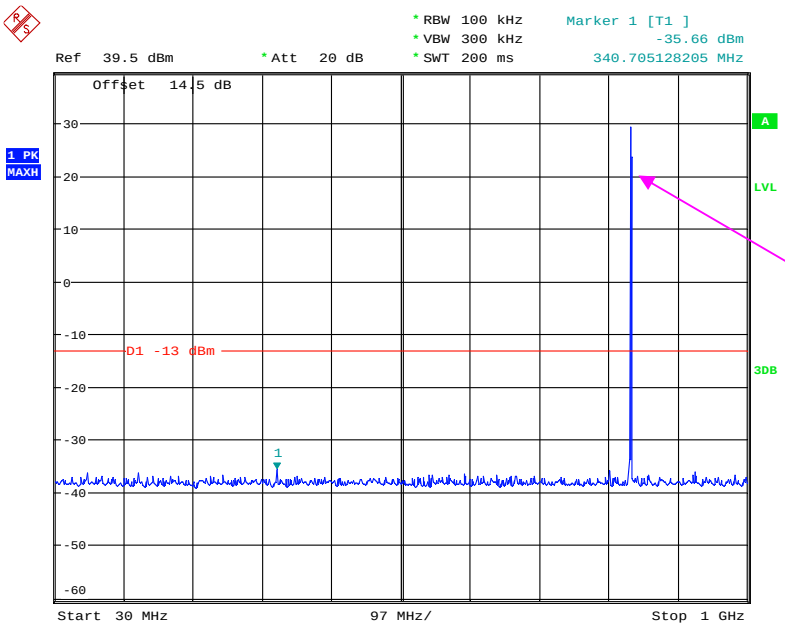
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

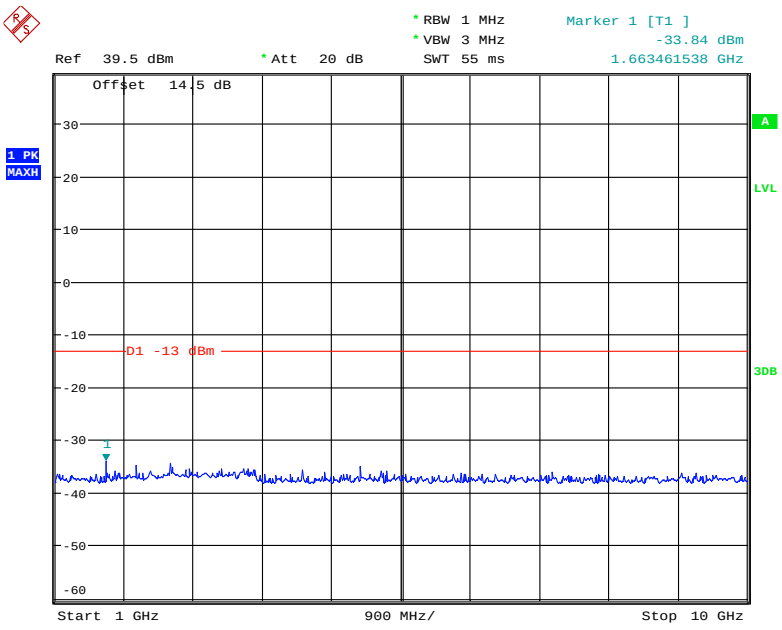
30 MHz – 1 GHz (GSM Mode)



Fundamental test

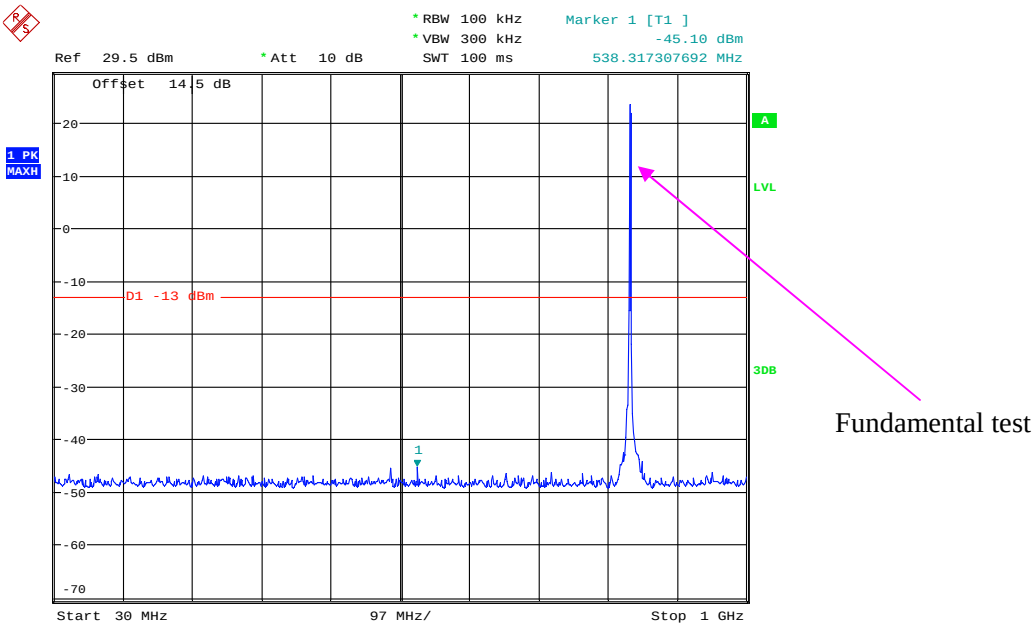
Date: 16.APR.2018 09:37:44

1 GHz – 10 GHz (GSM Mode)



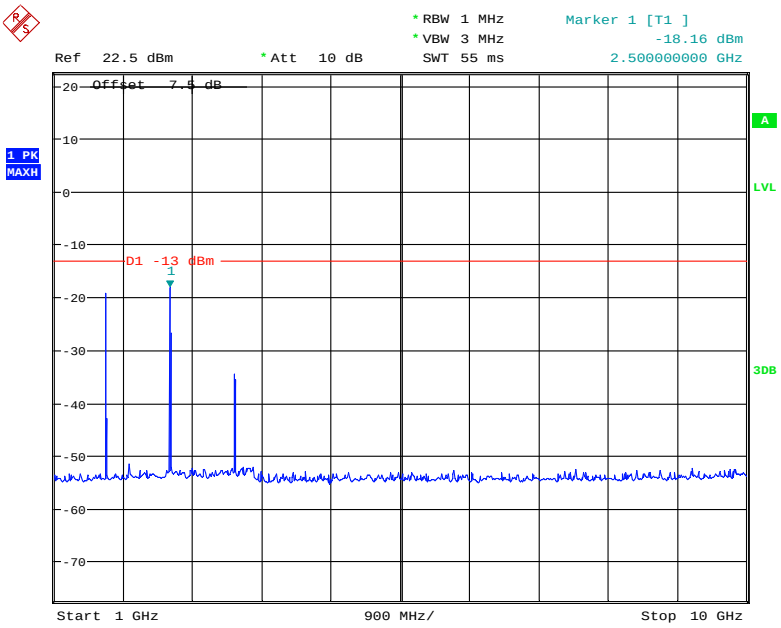
Date: 16.APR.2018 09:39:54

30 MHz – 1 GHz CDMA (1*RTT BC 0) Mode, Middle channel



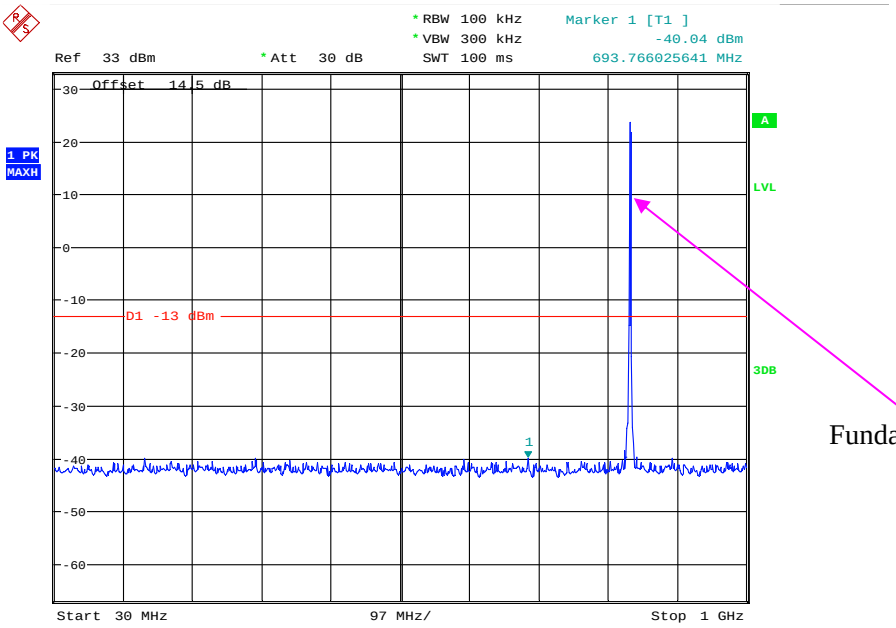
Date: 17.MAY.2018 16:28:37

1 GHz – 10 GHz CDMA (1*RTT BC 0) Mode, Middle channel



Date: 19.MAY.2018 15:38:12

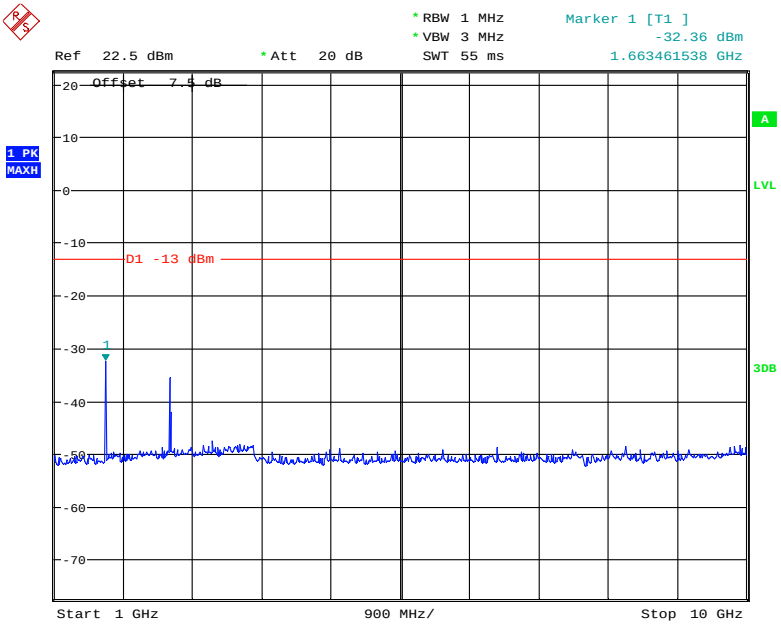
30 MHz – 1 GHz CDMA (EV-DO, BC0) Mode, Middle channel



Fundamental test

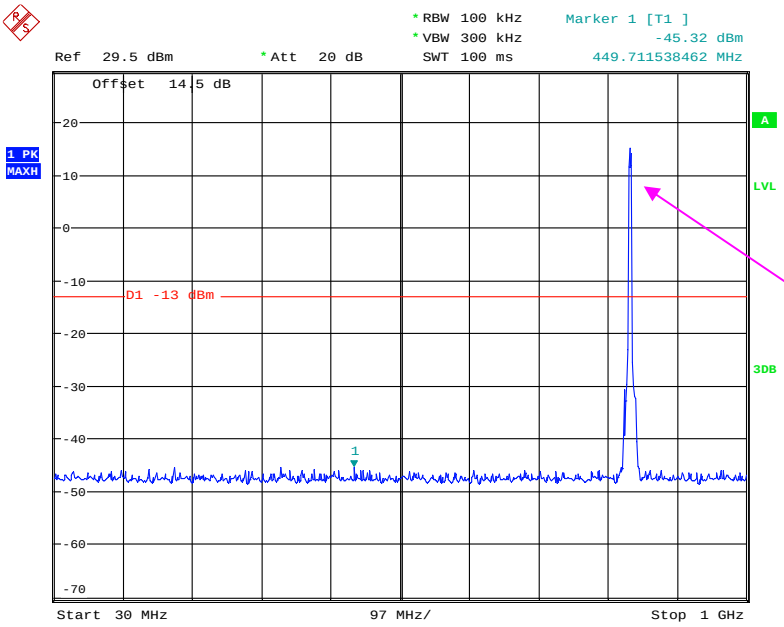
Date: 17.MAY.2018 16:58:11

1 GHz – 10 GHz CDMA (EV-DO, BC0) Mode, Middle channel



Date: 19.MAY.2018 15:41:32

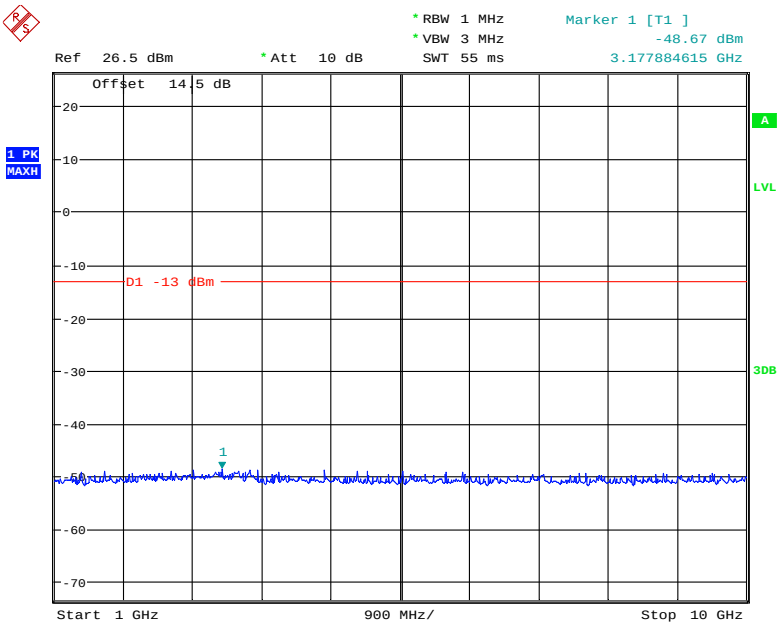
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 16.APR.2018 14:07:26

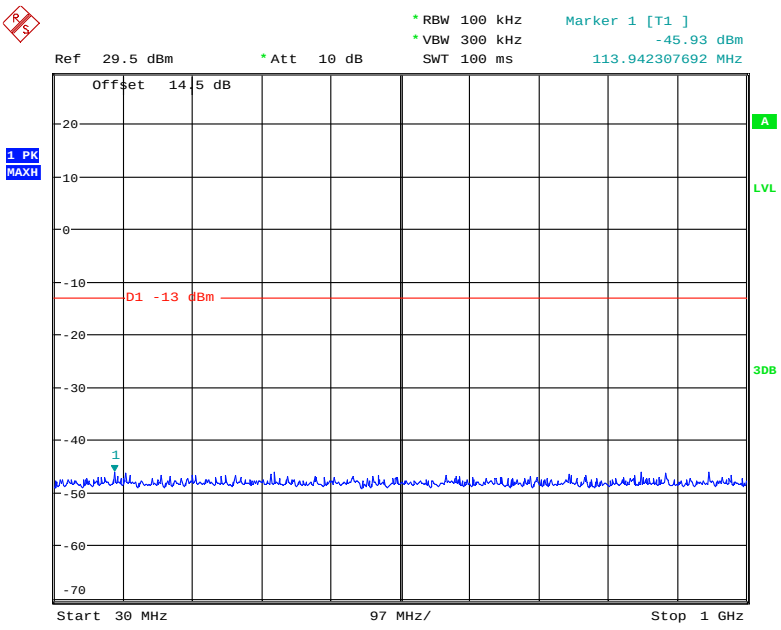
1 GHz – 10 GHz (WCDMA Mode)



Date: 19.APR.2018 13:36:28

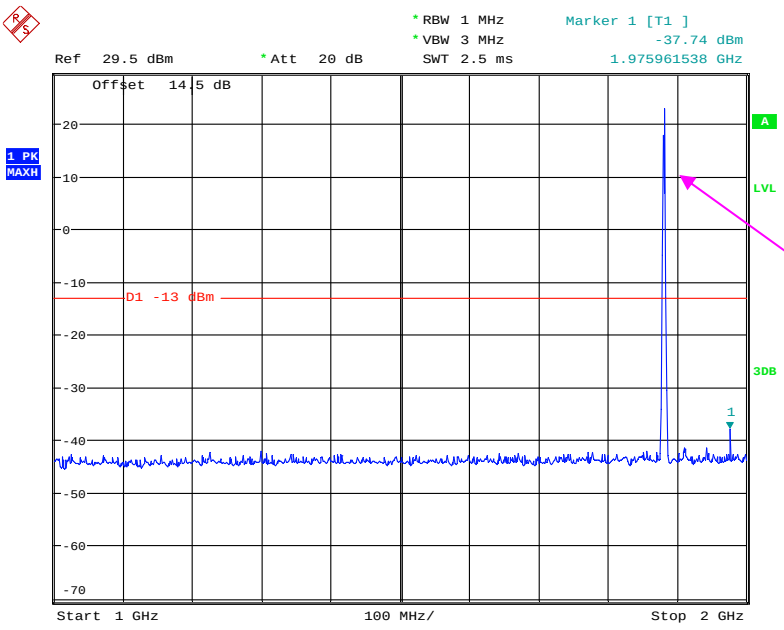
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 16.APR.2018 10:46:31

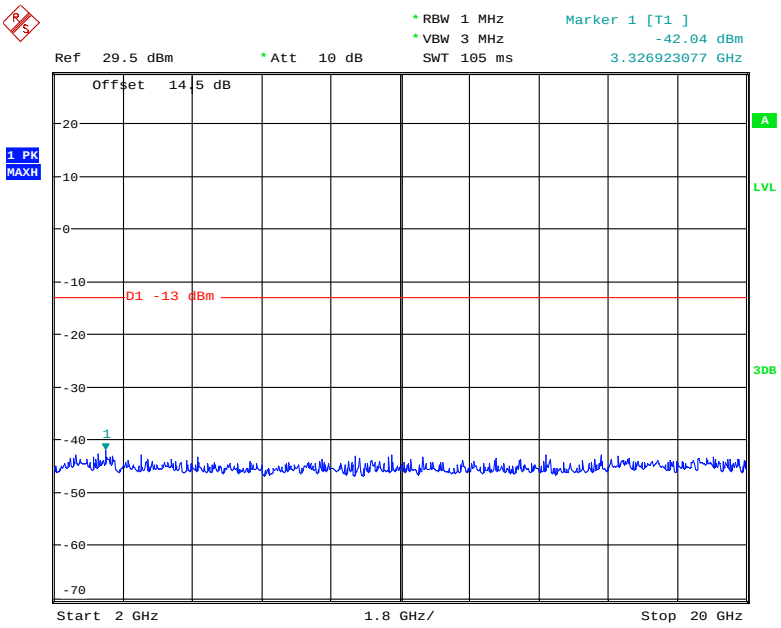
1 GHz – 2 GHz (GSM Mode)



Fundamental test

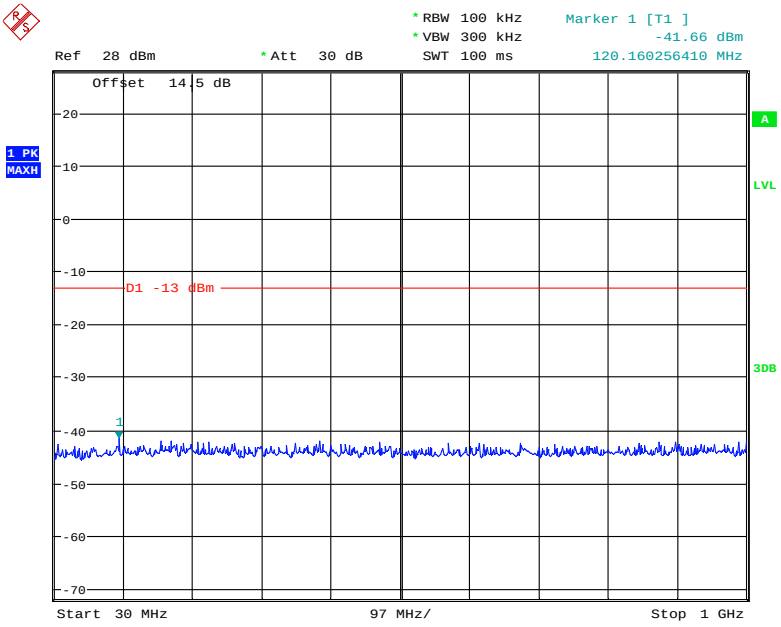
Date: 16.APR.2018 10:48:27

2 GHz – 20 GHz (GSM Mode)



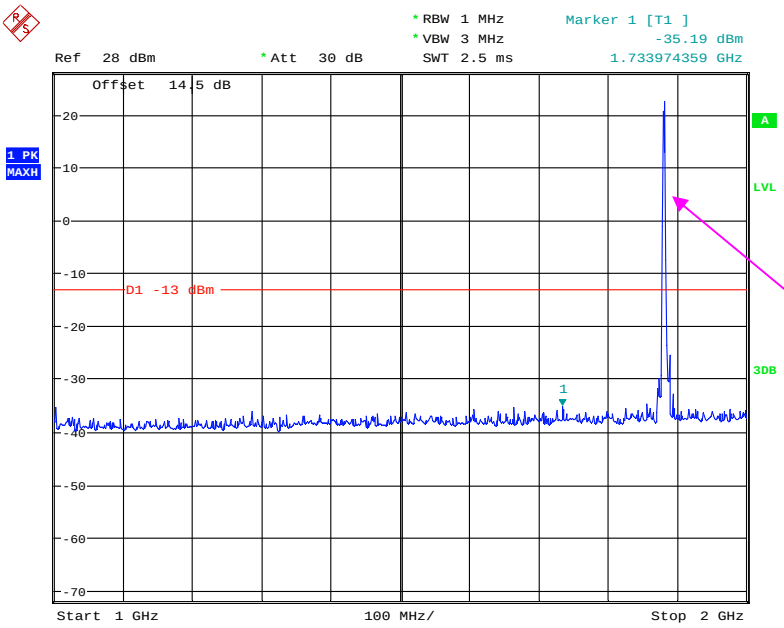
Date: 16.APR.2018 10:49:27

30 MHz – 1 GHz CDMA (1*RTT BC 1) Mode, Middle channel



Date: 17.MAY.2018 16:42:28

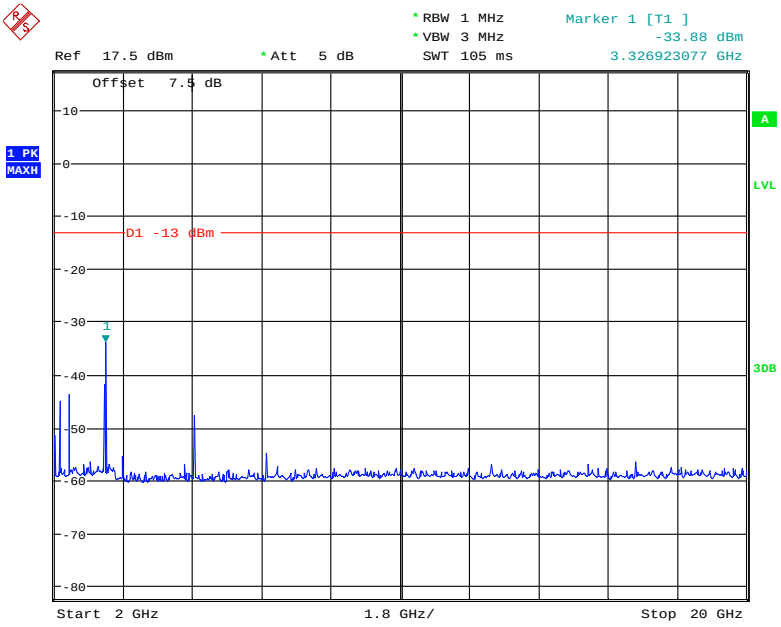
1 GHz – 2 GHz CDMA (1*RTT BC 1) Mode, Middle channel



Fundamental test

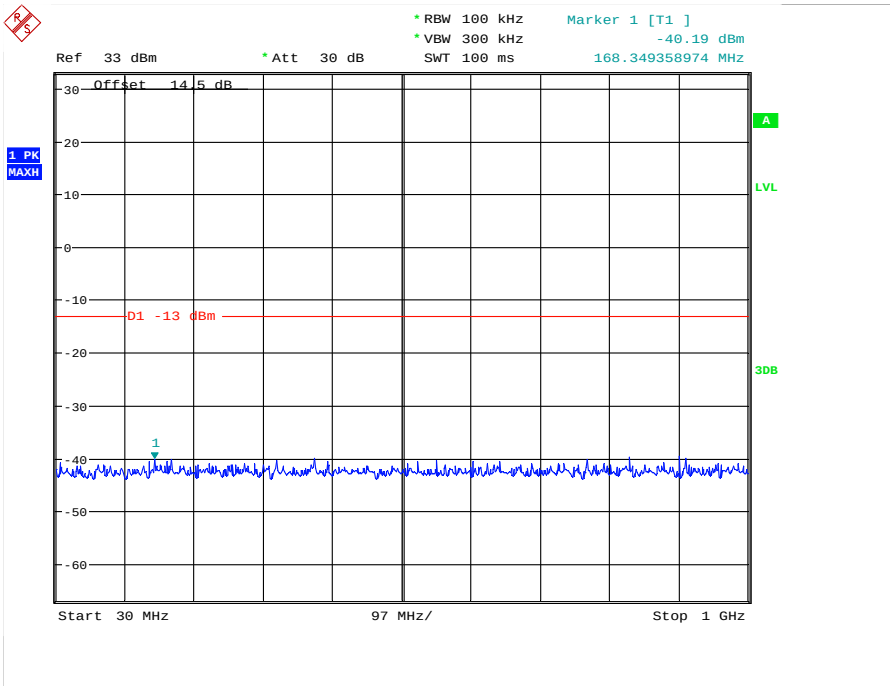
Date: 17.MAY.2018 16:41:49

2 GHz – 20 GHz CDMA (1*RTT BC 1) Mode, Middle channel



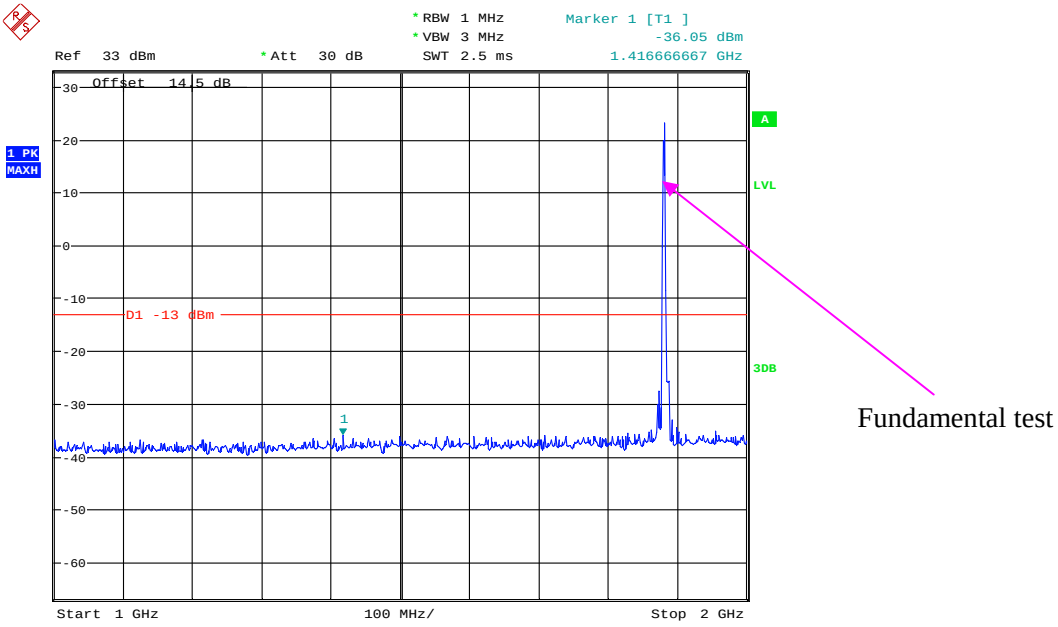
Date: 19.MAY.2018 15:43:36

30 MHz – 1 GHz CDMA (EV-DO, BC1) Mode, Middle channel



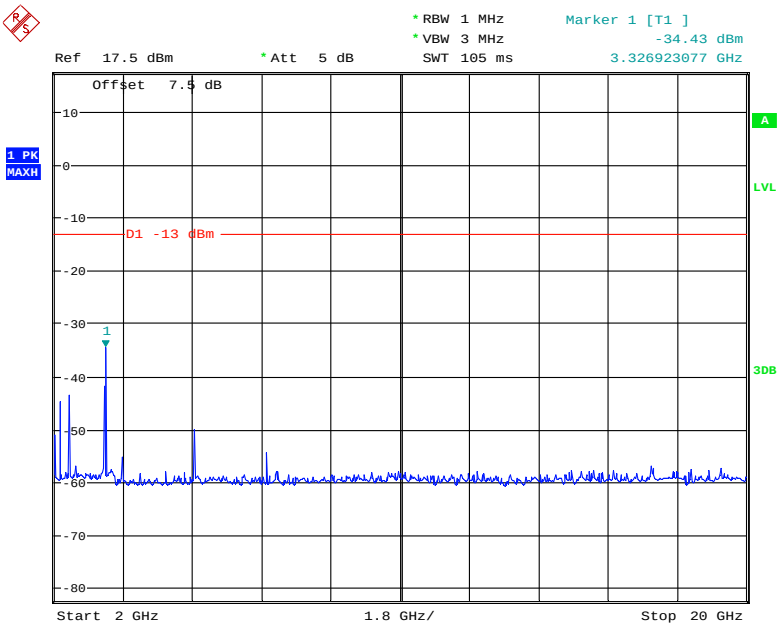
Date: 17.MAY.2018 16:49:25

1 GHz – 2 GHz CDMA (EV-DO, BC1) Mode, Middle channel



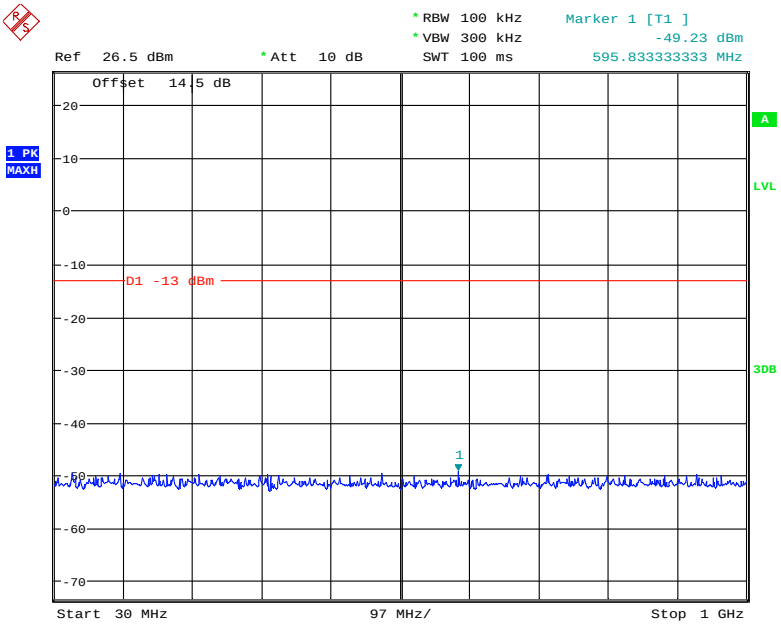
Date: 17.MAY.2018 16:50:07

2 GHz – 20 GHz CDMA (EV-DO, BC1) Mode, Middle channel



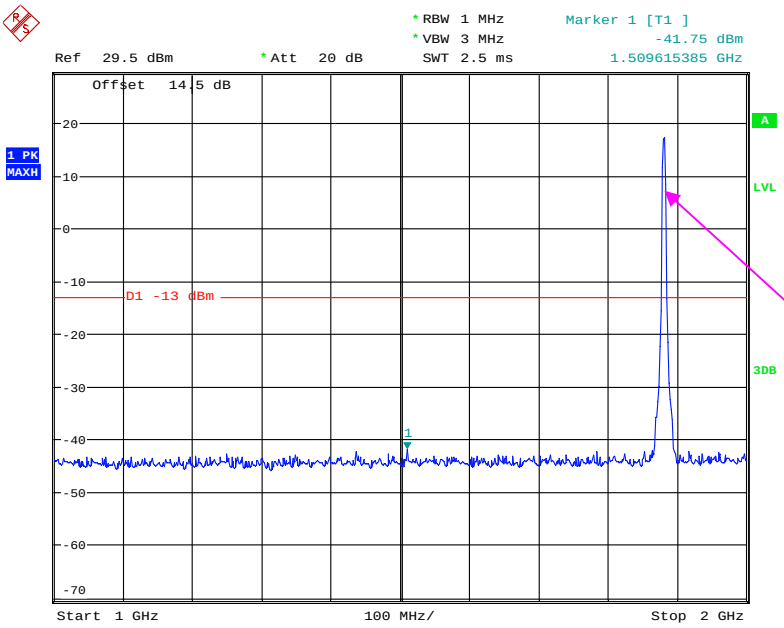
Date: 19.MAY.2018 15:45:18

30 MHz – 1 GHz (WCDMA Mode)



Date: 19.APR.2018 13:37:27

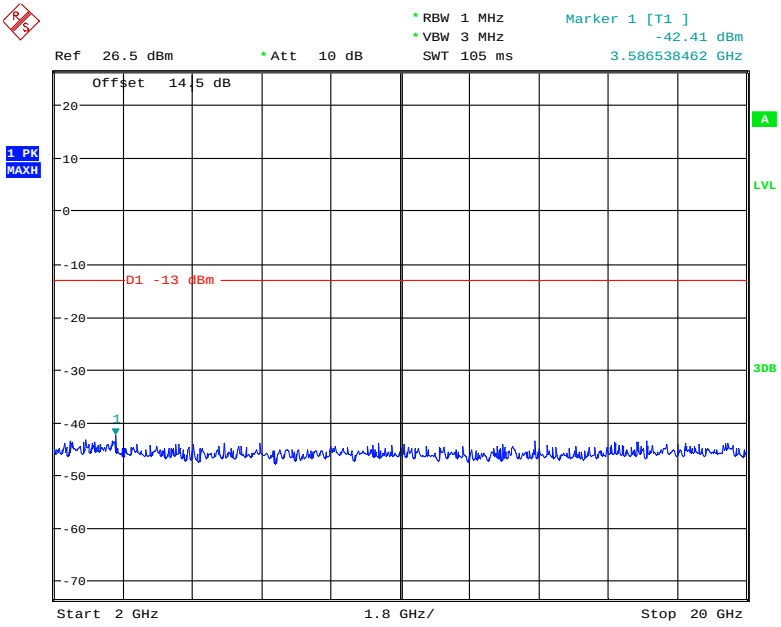
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 16.APR.2018 14:46:46

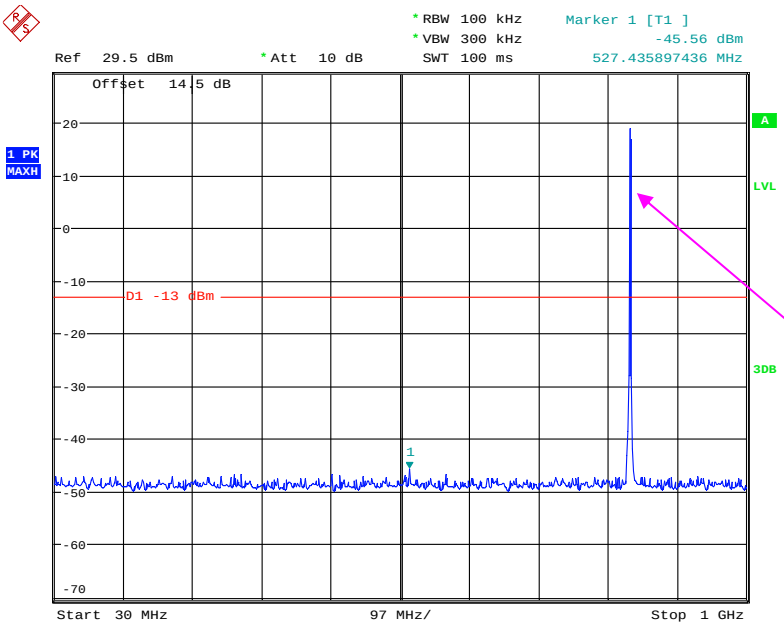
2 GHz – 20 GHz (WCDMA Mode)



Date: 19.APR.2018 13:35:23

LTE Band 5:

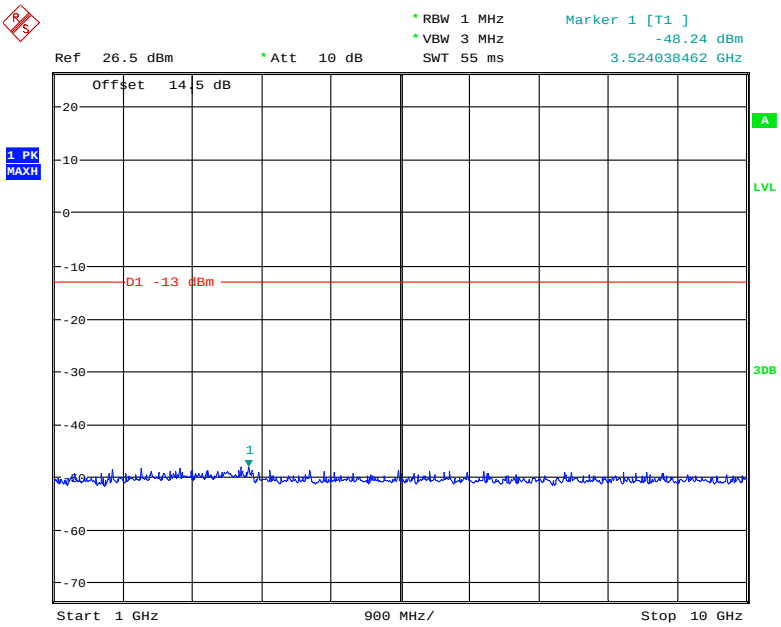
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

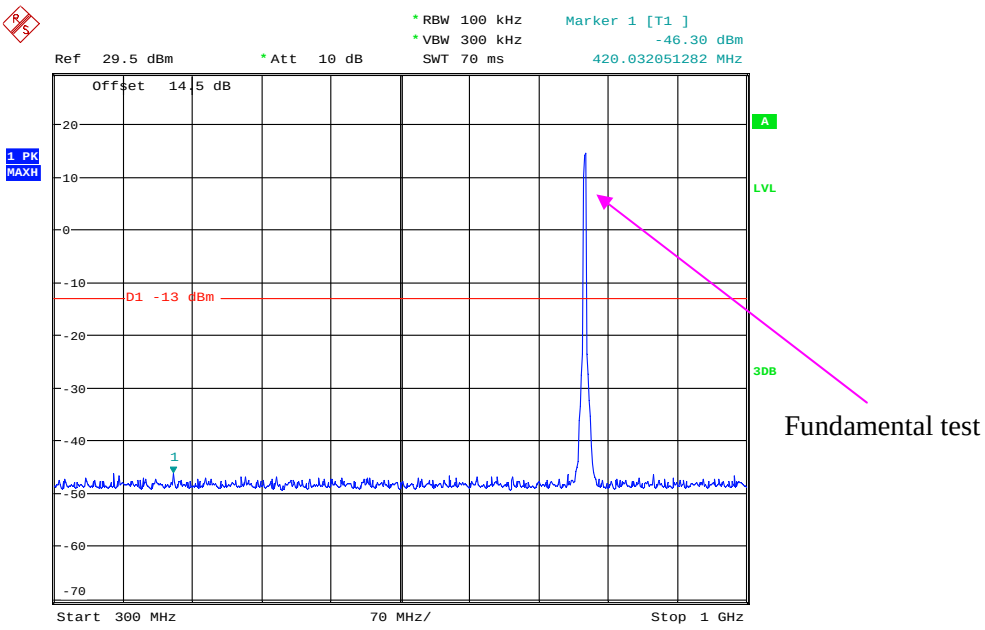
Date: 16.APR.2018 16:13:24

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



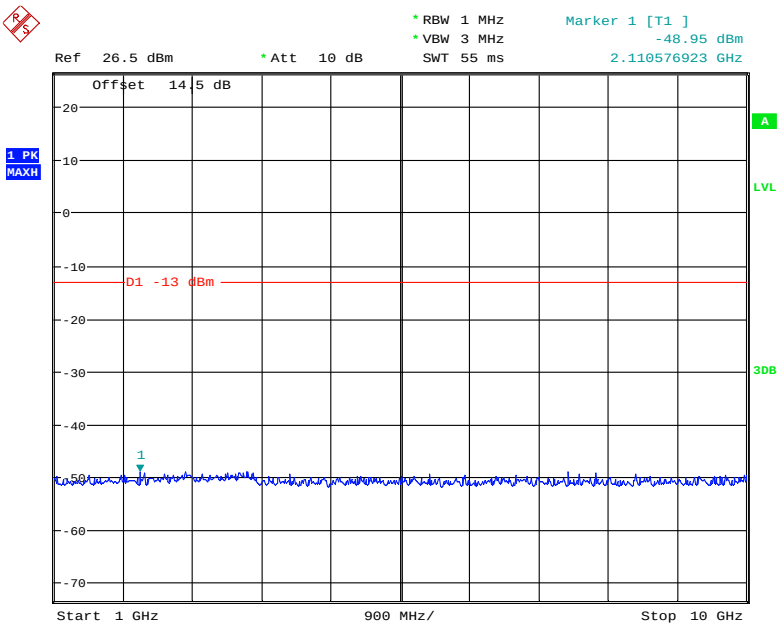
Date: 19.APR.2018 13:39:11

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



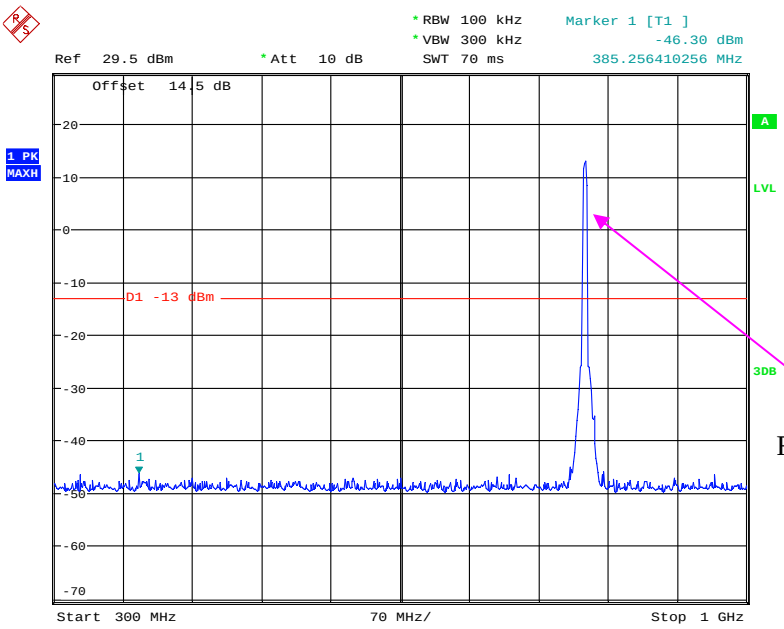
Date: 16.APR.2018 16:11:56

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



Date: 19.APR.2018 13:39:46

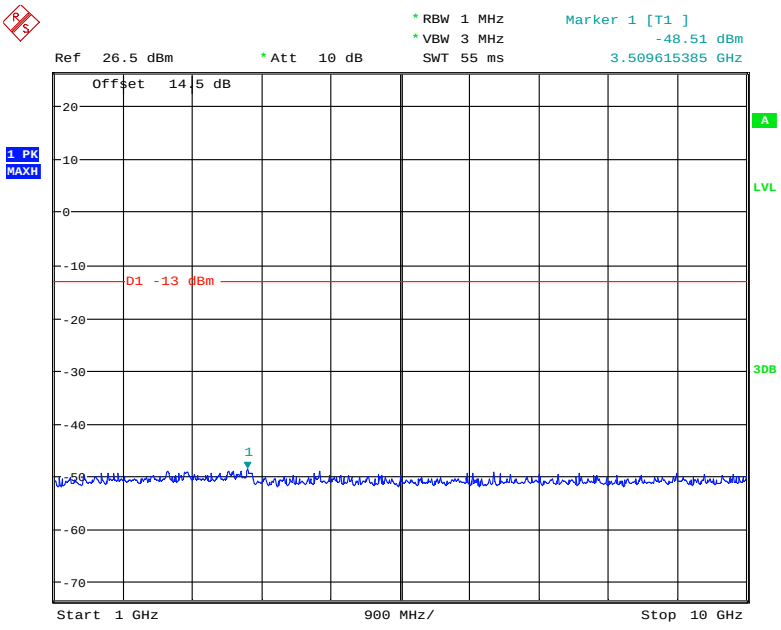
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

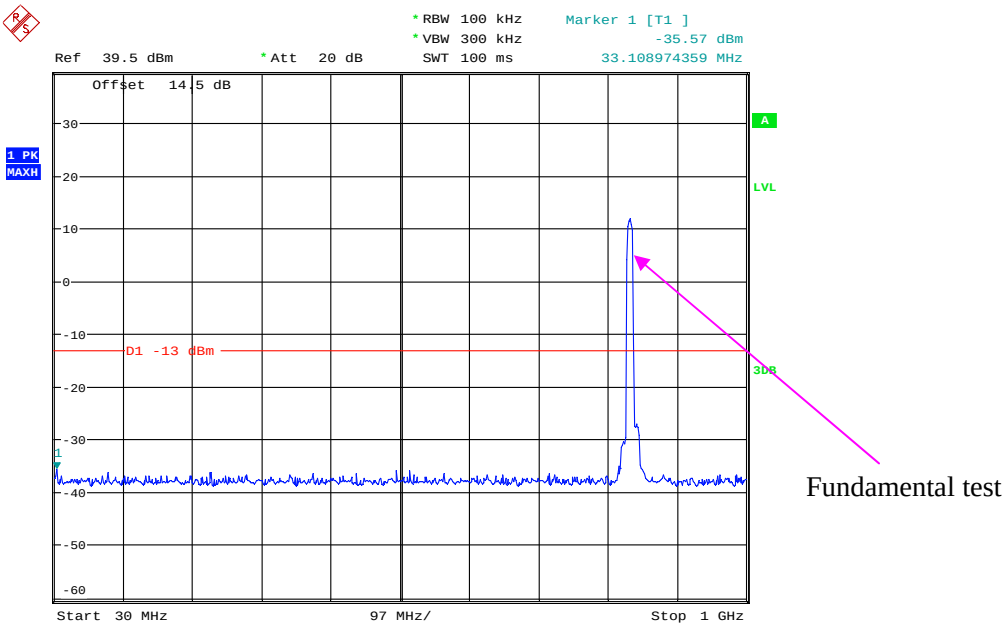
Date: 16.APR.2018 16:08:58

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



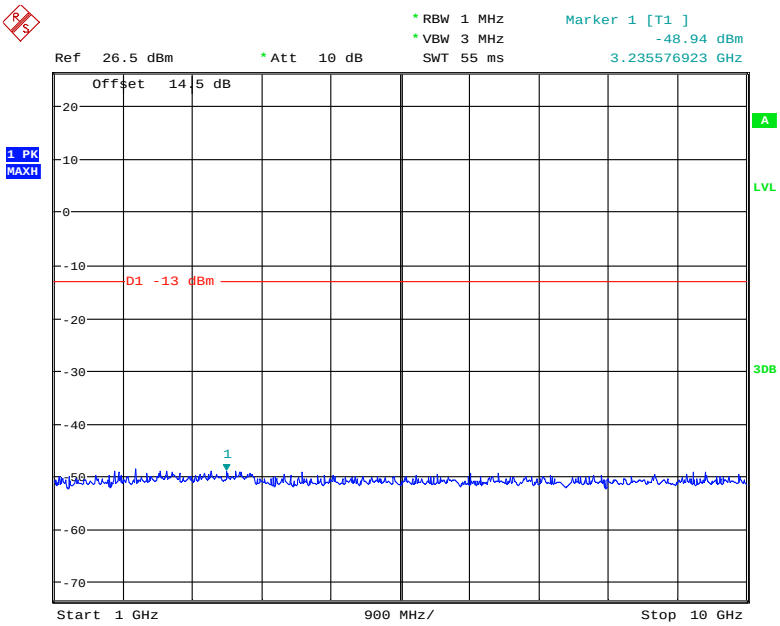
Date: 19.APR.2018 13:40:05

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



Date: 16.APR.2018 16:04:19

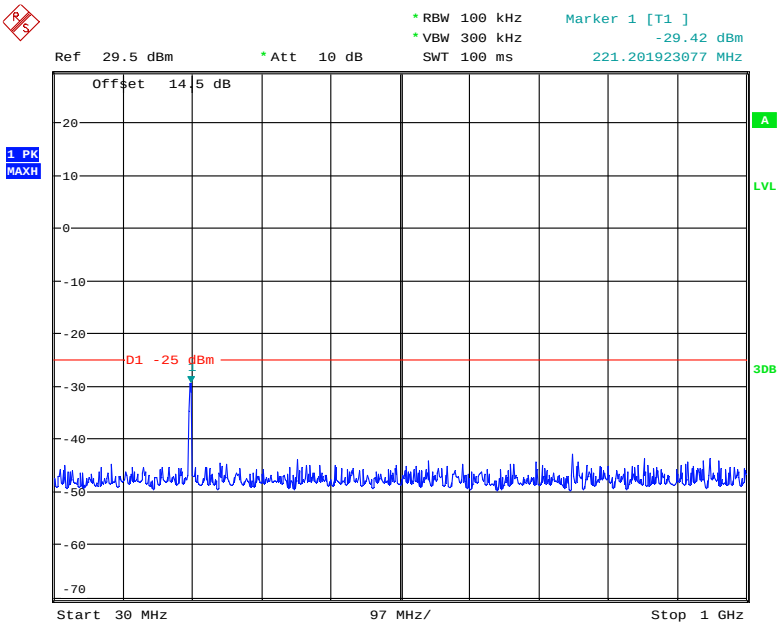
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 19.APR.2018 13:40:21

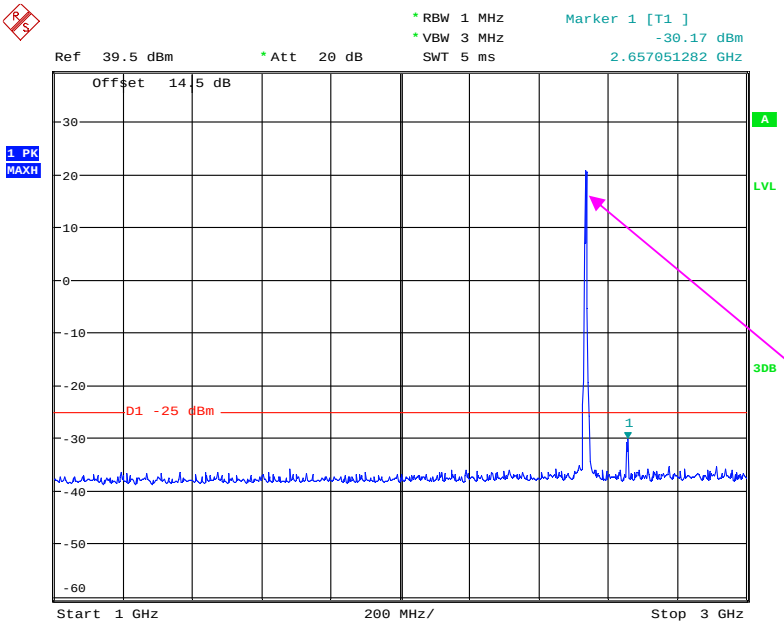
LTE Band 7:

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



Date: 17.APR.2018 10:53:51

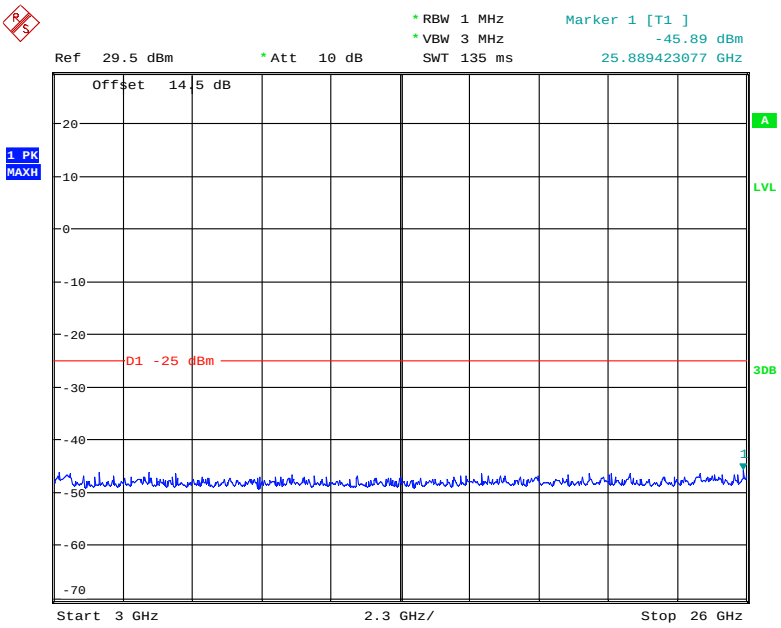
1 GHz – 3 GHz (5.0 MHz, Middle Channel)



Fundamental test

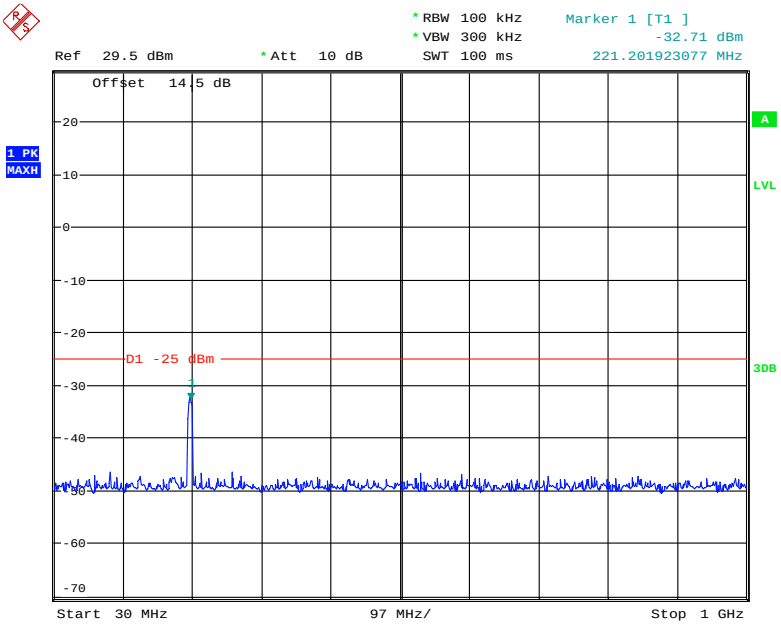
Date: 17.APR.2018 11:00:58

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



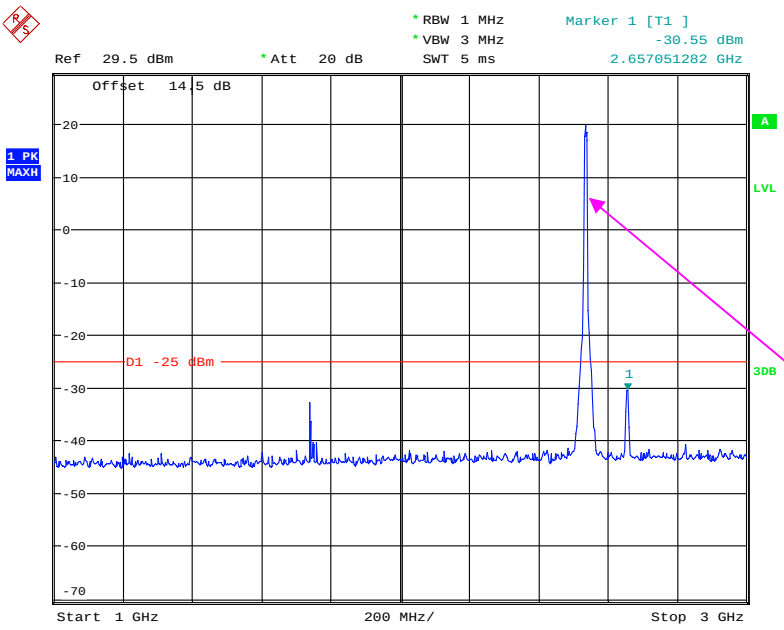
Date: 17.APR.2018 11:02:27

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



Date: 17.APR.2018 11:06:11

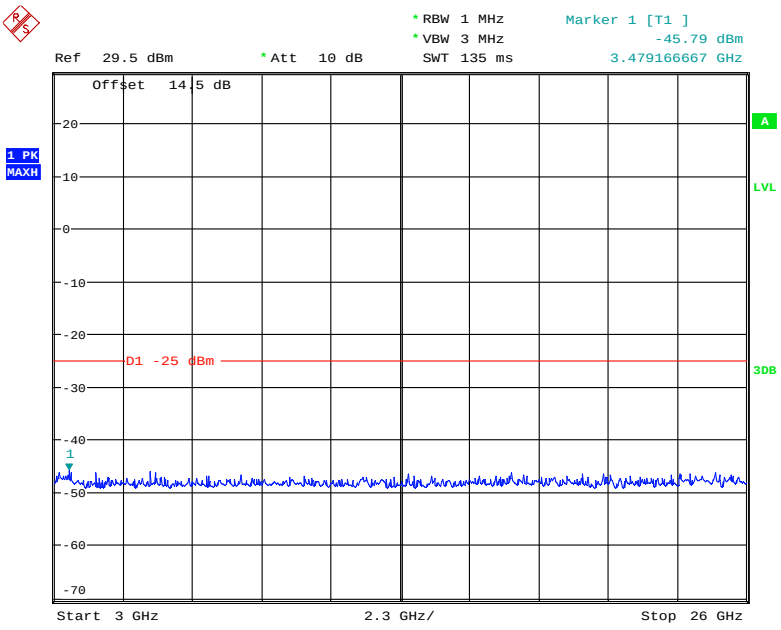
1 GHz – 3 GHz (10.0 MHz, Middle Channel)



Fundamental test

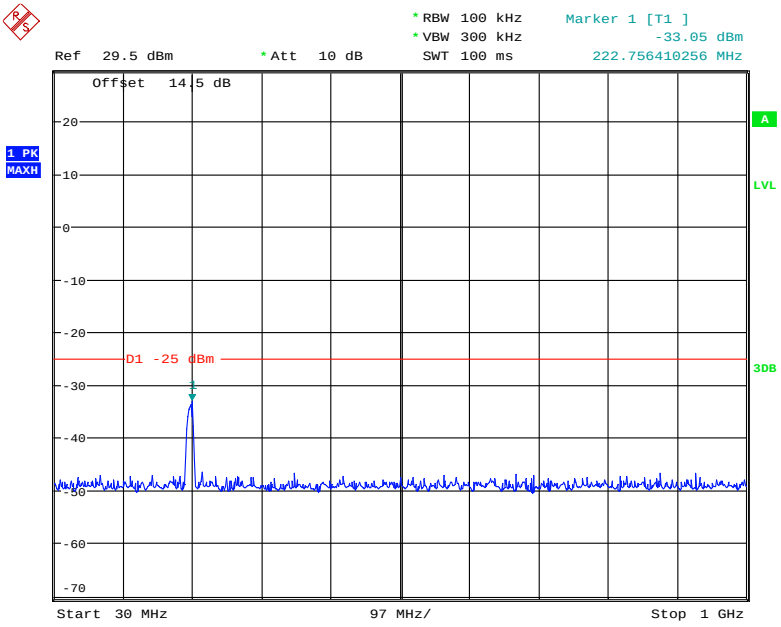
Date: 17.APR.2018 11:05:21

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



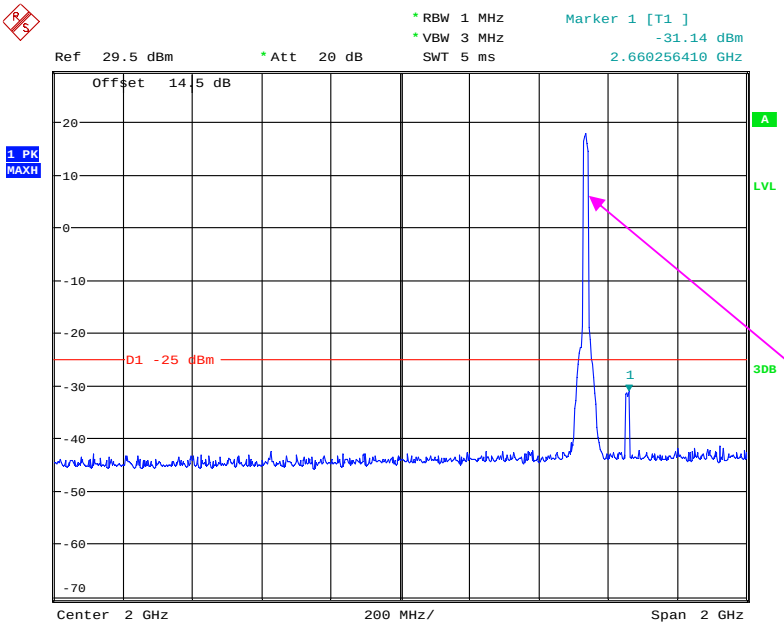
Date: 17.APR.2018 11:03:13

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



Date: 17.APR.2018 11:06:55

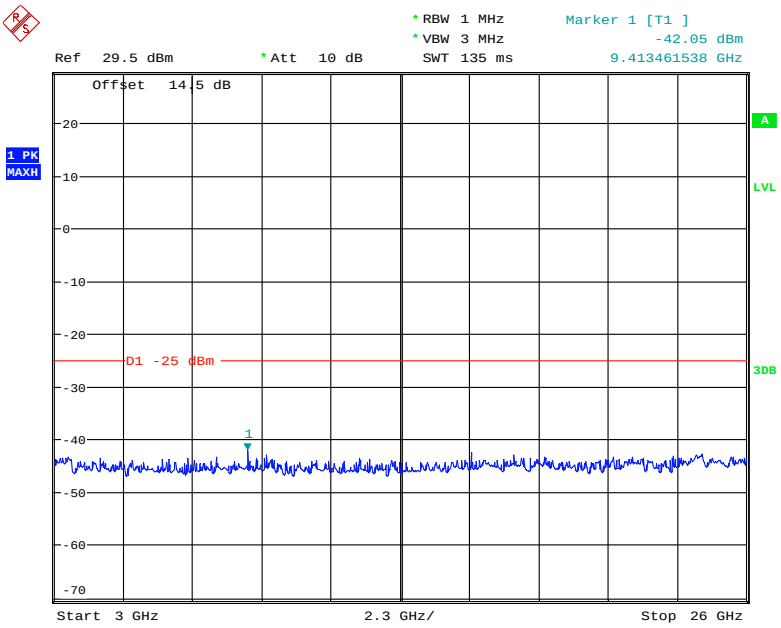
1 GHz – 3 GHz (15.0 MHz, Middle Channel)



Fundamental test

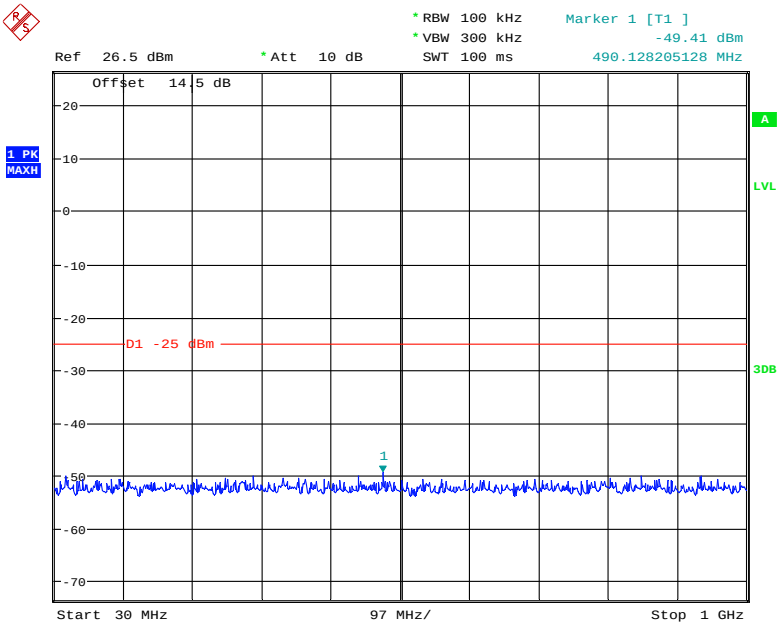
Date: 17.APR.2018 11:09:03

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



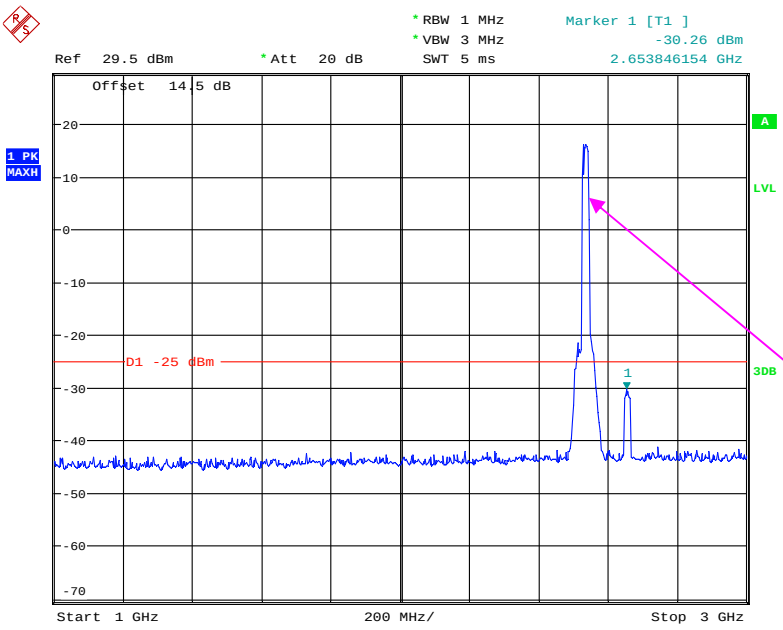
Date: 17.APR.2018 11:09:30

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



Date: 19.APR.2018 13:41:20

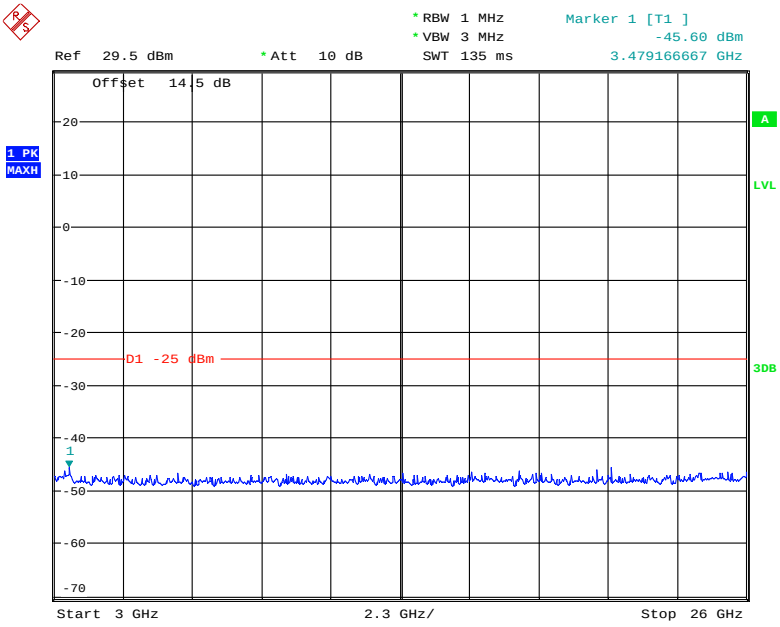
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 17.APR.2018 11:10:36

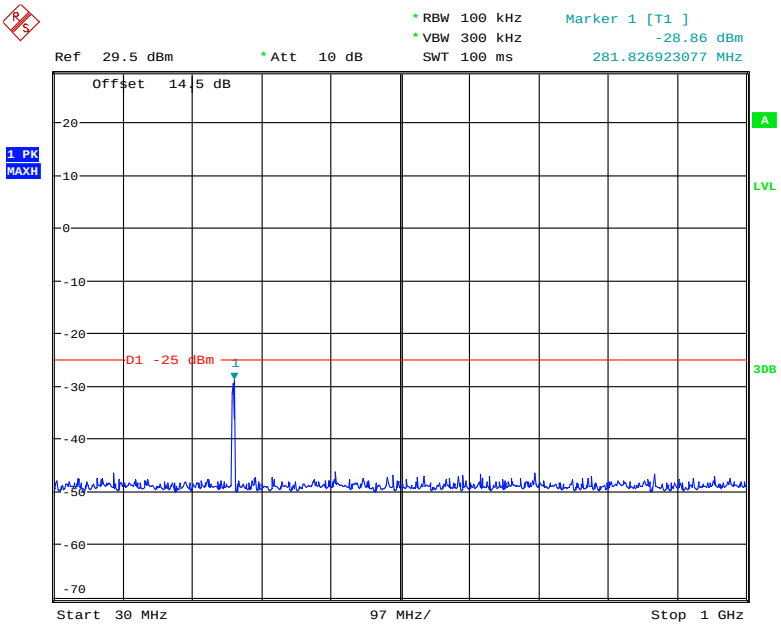
3 GHz – 26 GHz (20.0 MHz, Middle Channel)



Date: 17.APR.2018 11:09:57

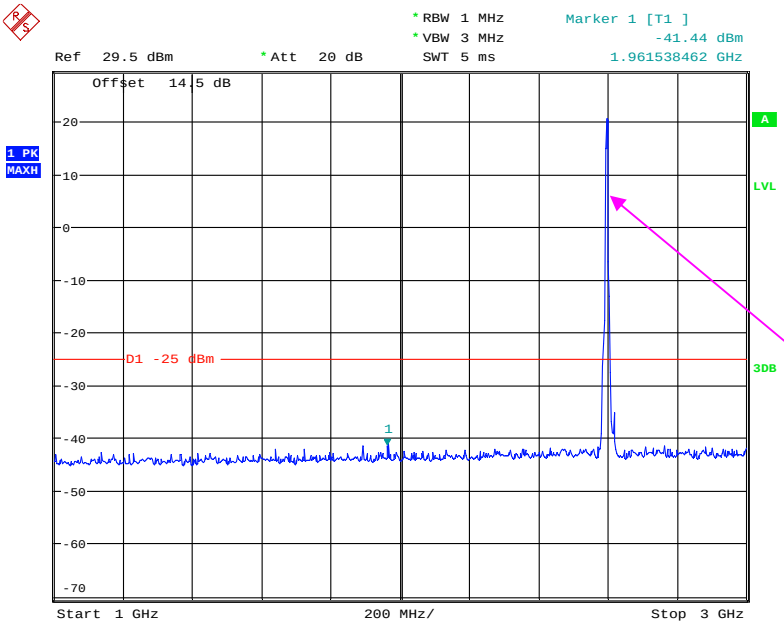
LTE Band 38:

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



Date: 17.APR.2018 13:51:28

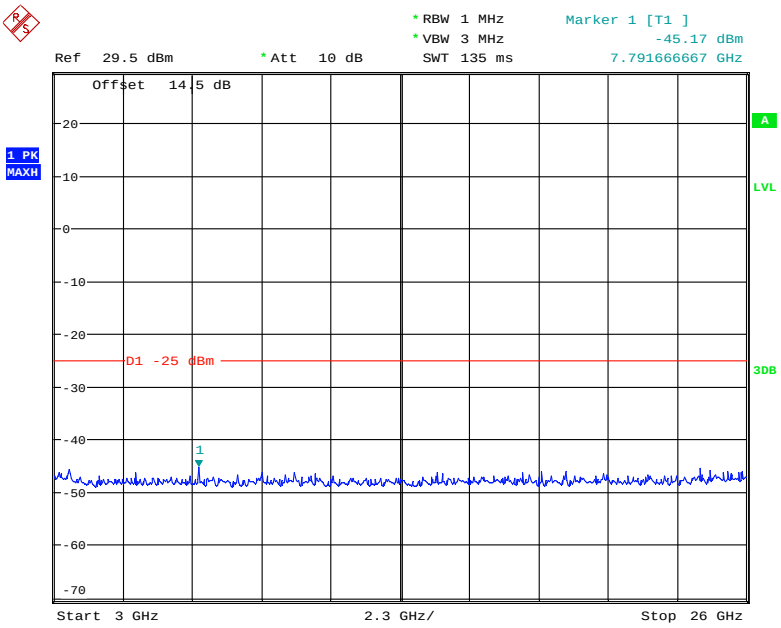
1 GHz – 3 GHz (5.0 MHz, Middle Channel)



Fundamental test

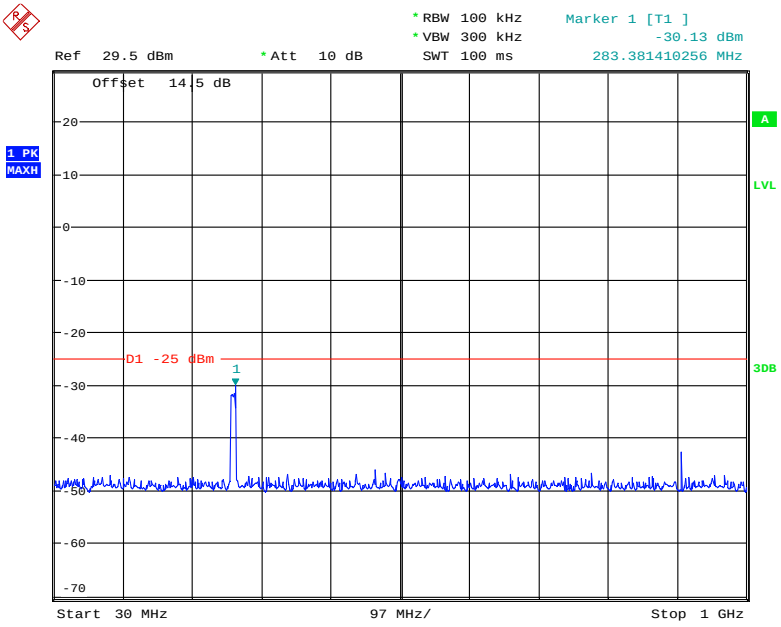
Date: 17.APR.2018 13:50:20

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



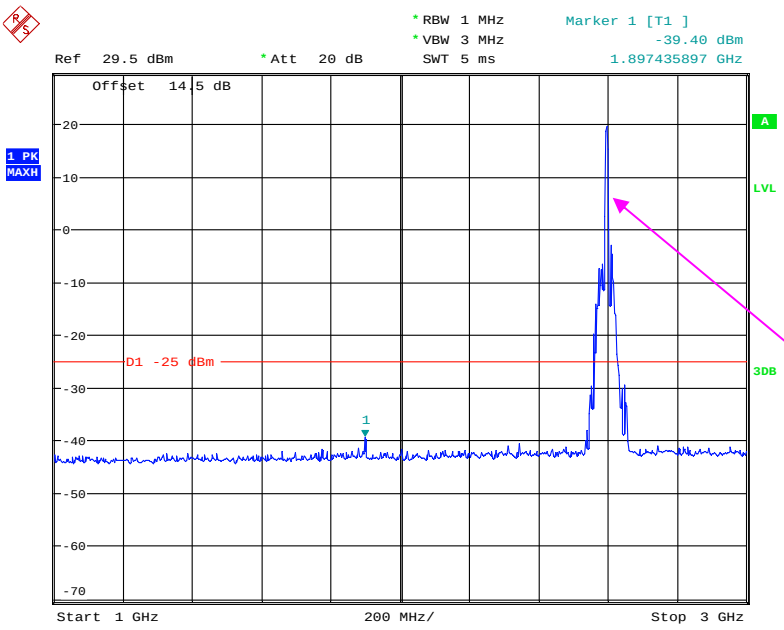
Date: 17.APR.2018 13:49:32

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



Date: 17.APR.2018 13:45:52

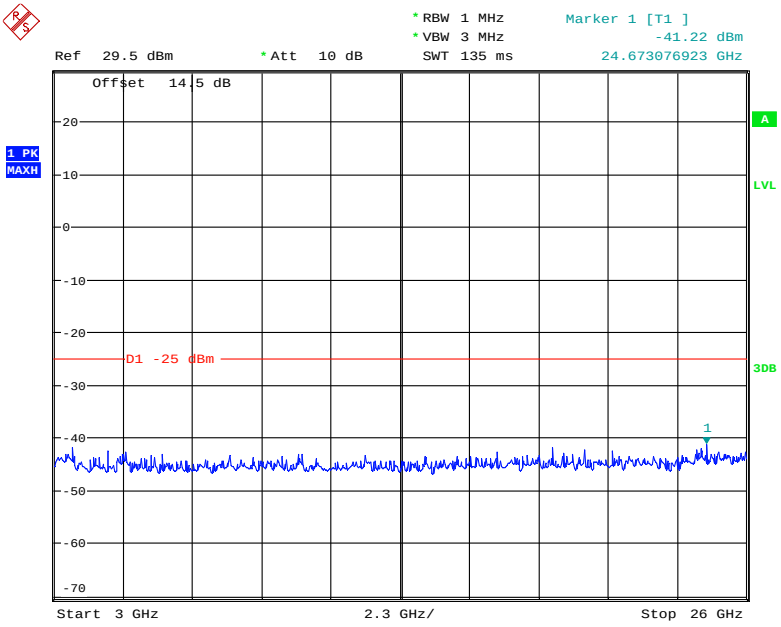
1 GHz – 3 GHz (10.0 MHz, Middle Channel)



Fundamental test

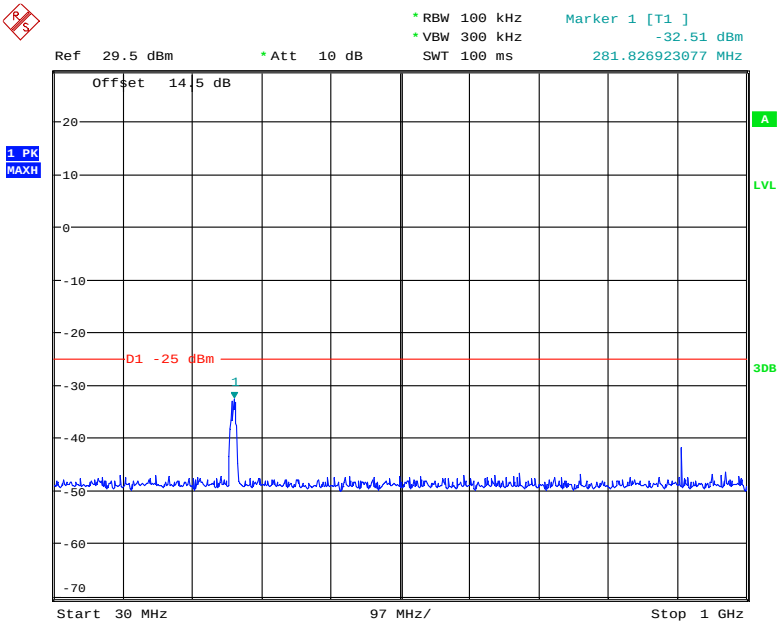
Date: 17.APR.2018 13:48:05

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



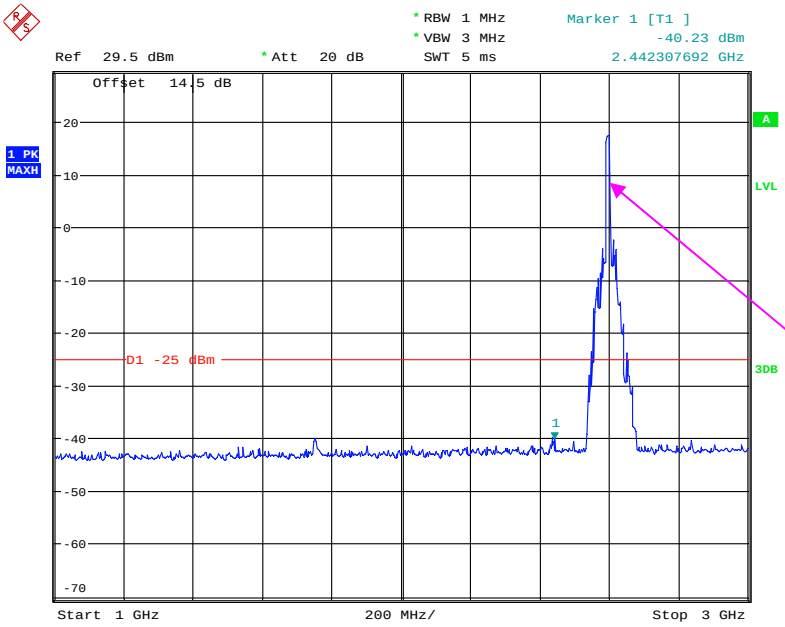
Date: 17.APR.2018 13:49:02

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



Date: 17.APR.2018 13:45:13

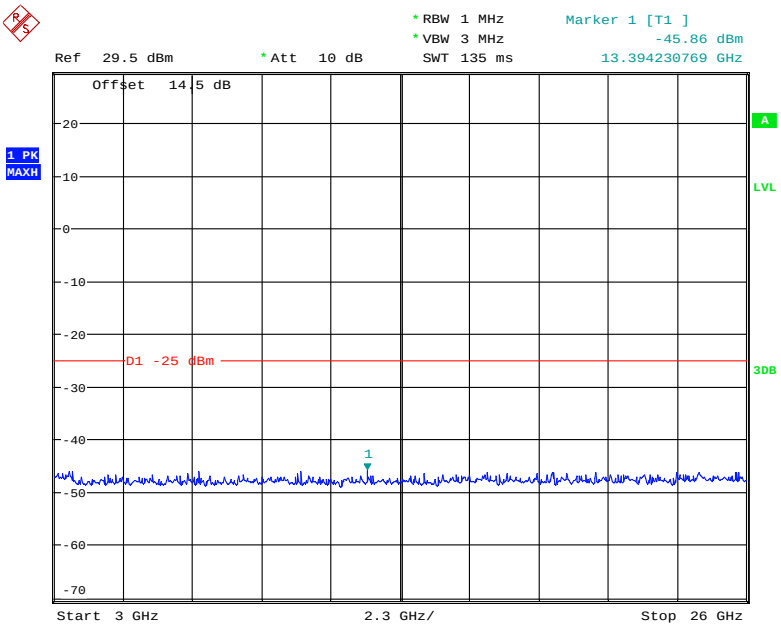
1 GHz – 3 GHz (15.0 MHz, Middle Channel)



Fundamental test

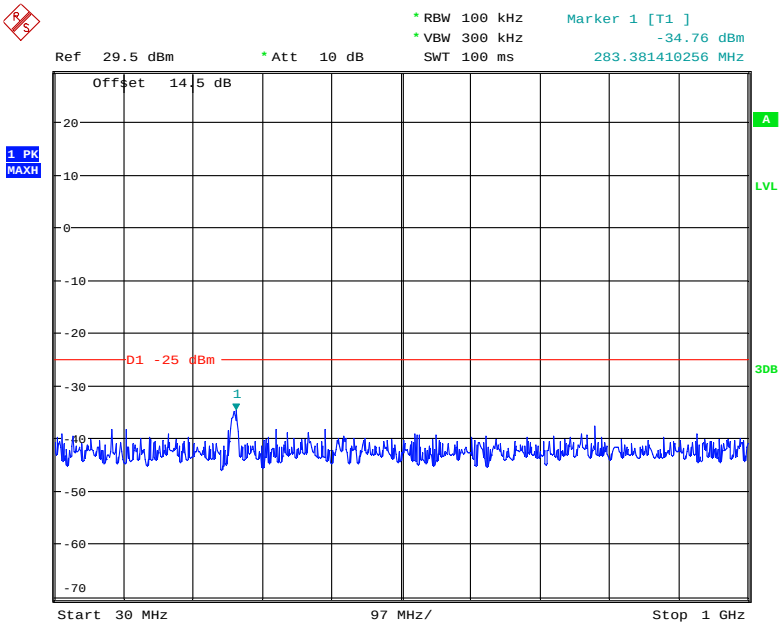
Date: 17.APR.2018 13:43:07

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



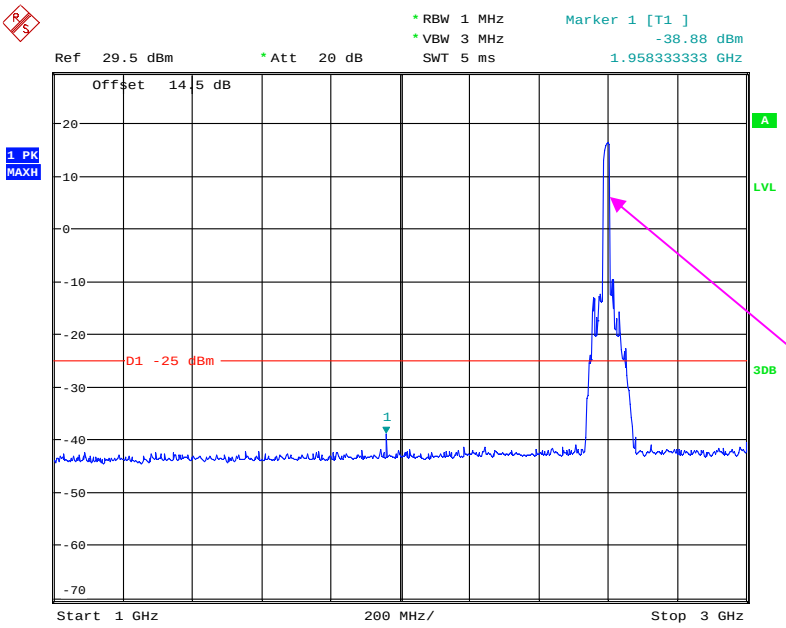
Date: 17.APR.2018 13:38:46

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



Date: 17.APR.2018 13:34:56

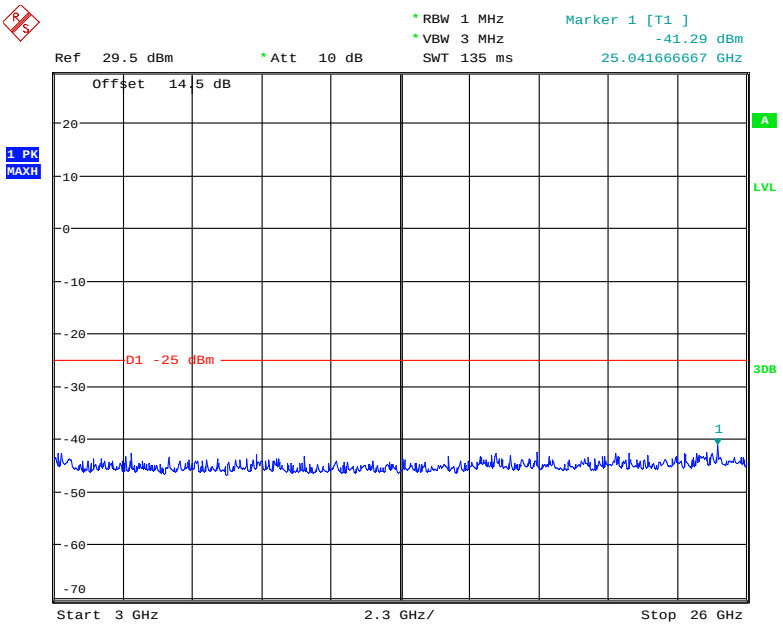
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 17.APR.2018 13:37:29

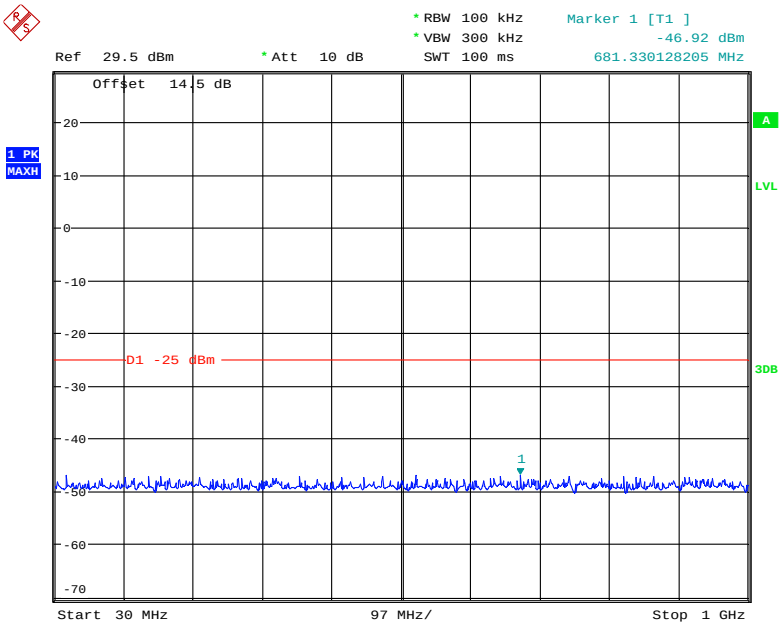
3 GHz – 26 GHz (20.0 MHz, Middle Channel)



Date: 17.APR.2018 13:38:05

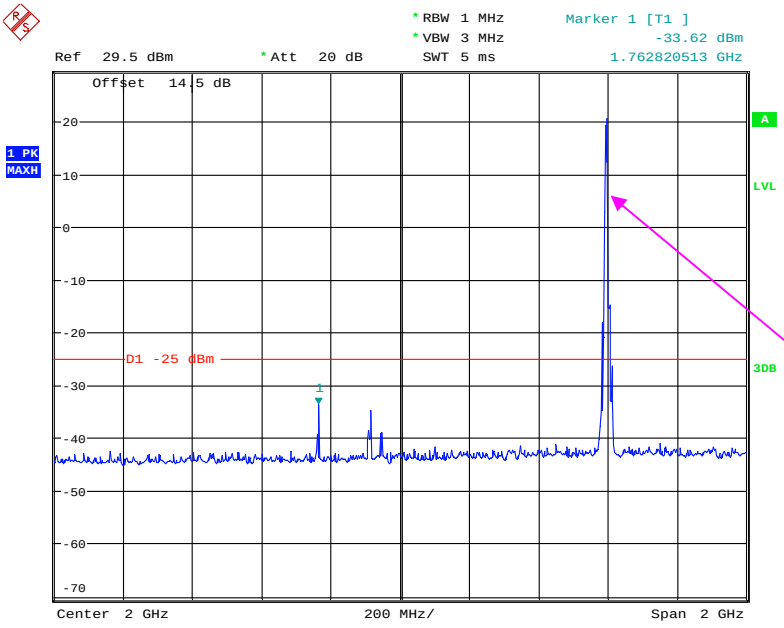
LTE Band 41:

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



Date: 18.APR.2018 09:45:06

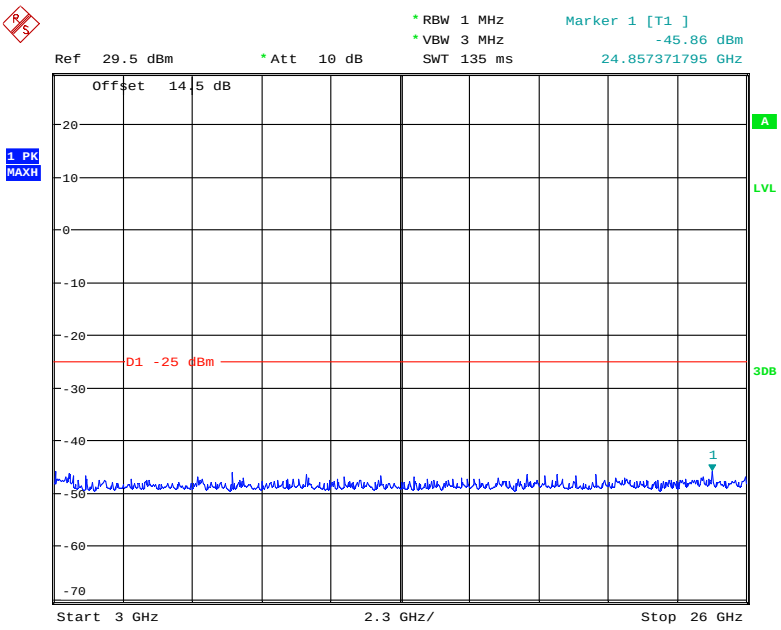
1 GHz – 3 GHz (5.0 MHz, Middle Channel)



Fundamental test

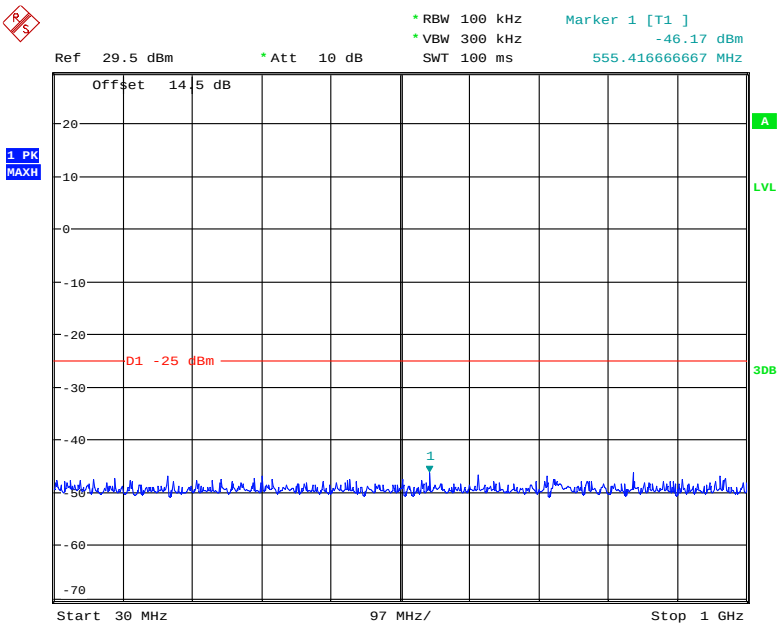
Date: 18.APR.2018 09:50:20

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



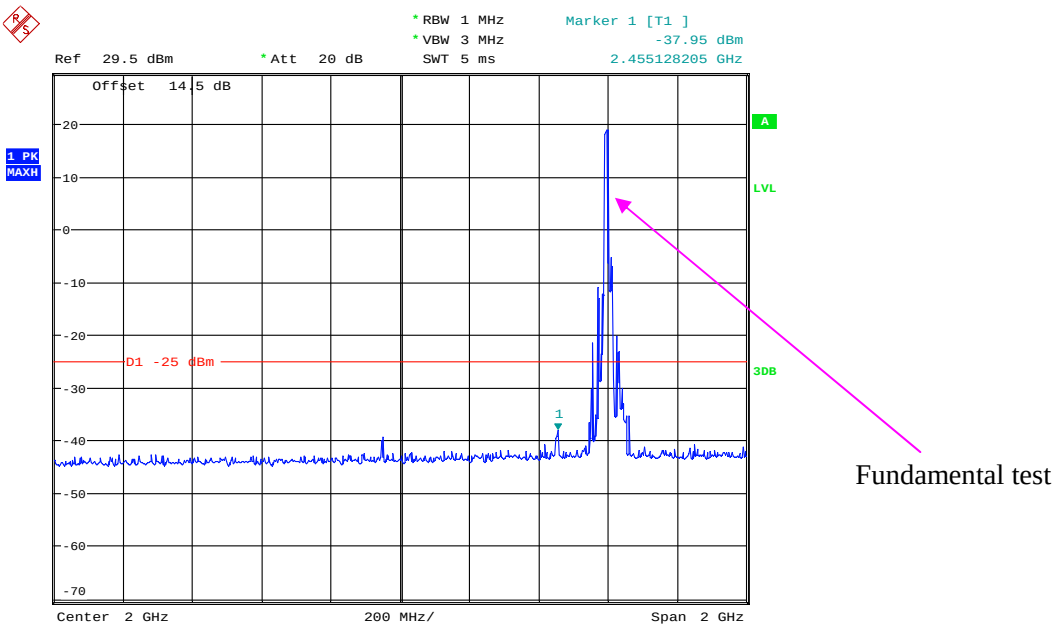
Date: 18.APR.2018 09:47:01

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



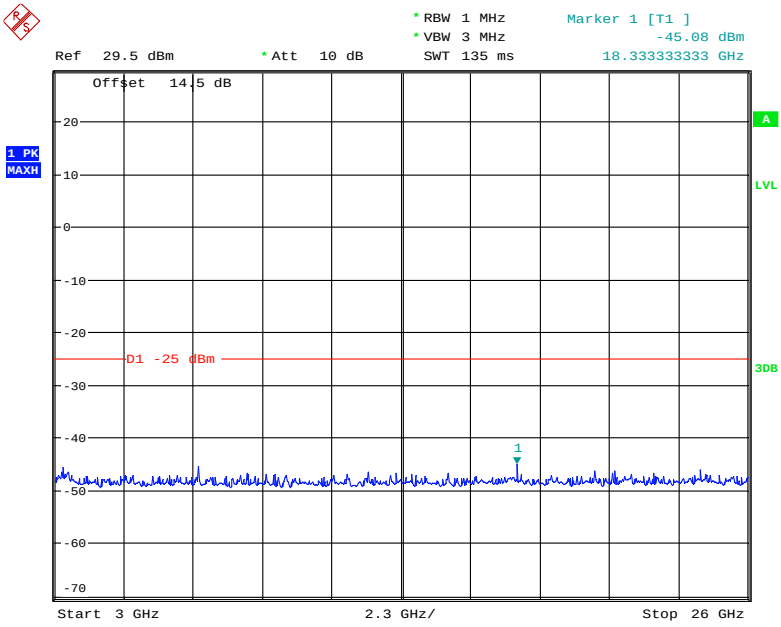
Date: 18.APR.2018 09:44:41

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



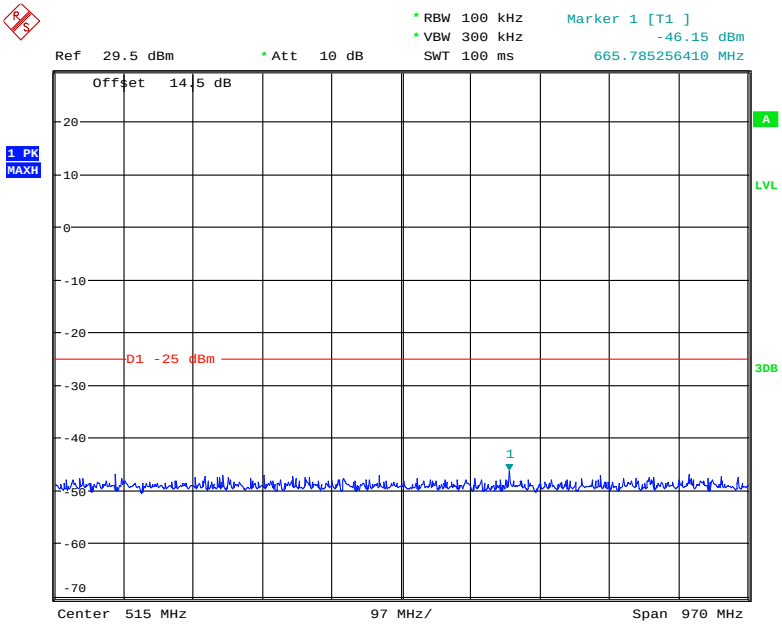
Date: 18.APR.2018 09:49:39

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



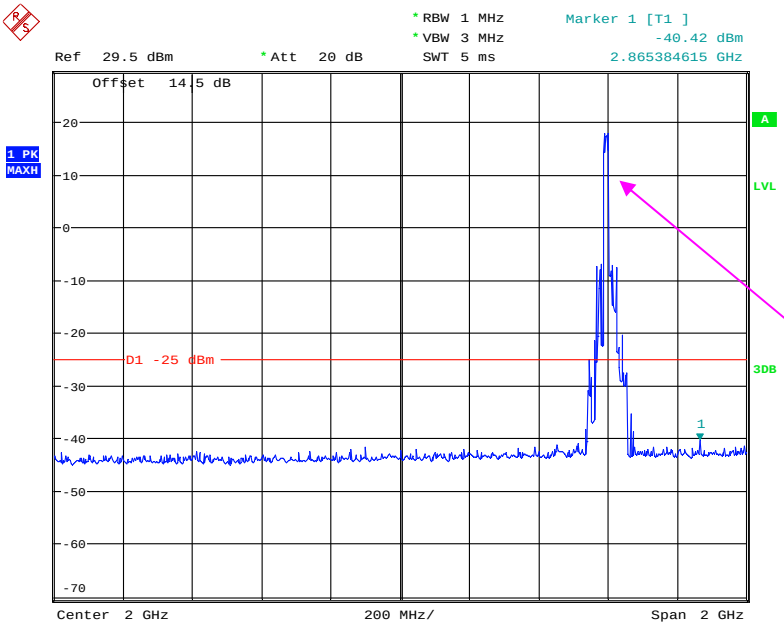
Date: 18.APR.2018 09:46:45

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



Date: 18.APR.2018 09:42:55

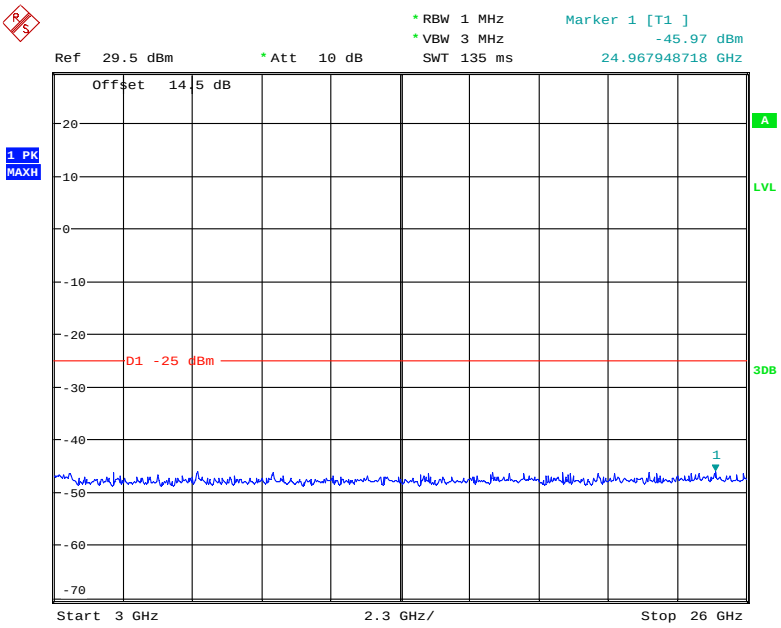
1 GHz – 3 GHz (15.0 MHz, Middle Channel)



Fundamental test

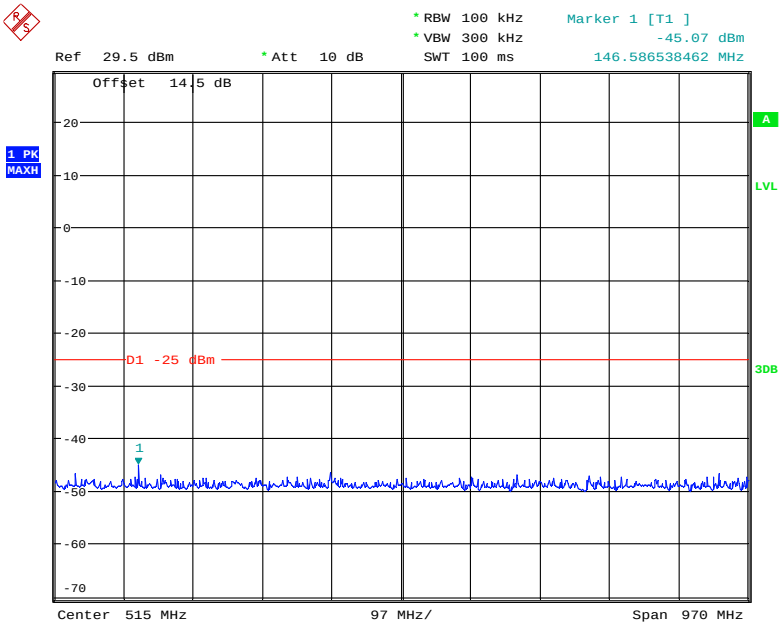
Date: 18.APR.2018 09:48:09

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



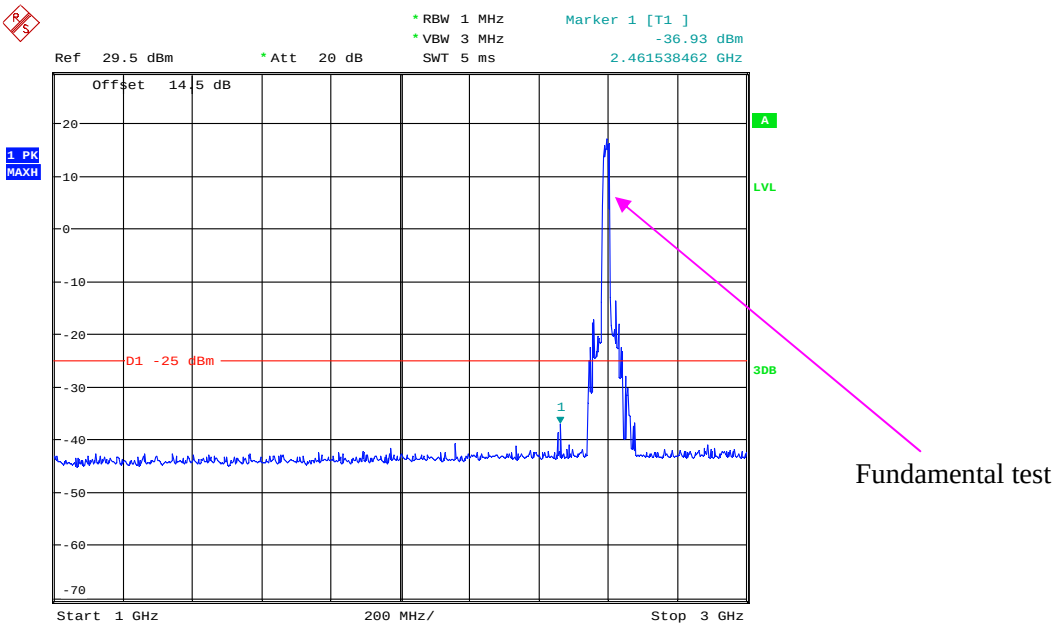
Date: 18.APR.2018 09:40:16

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



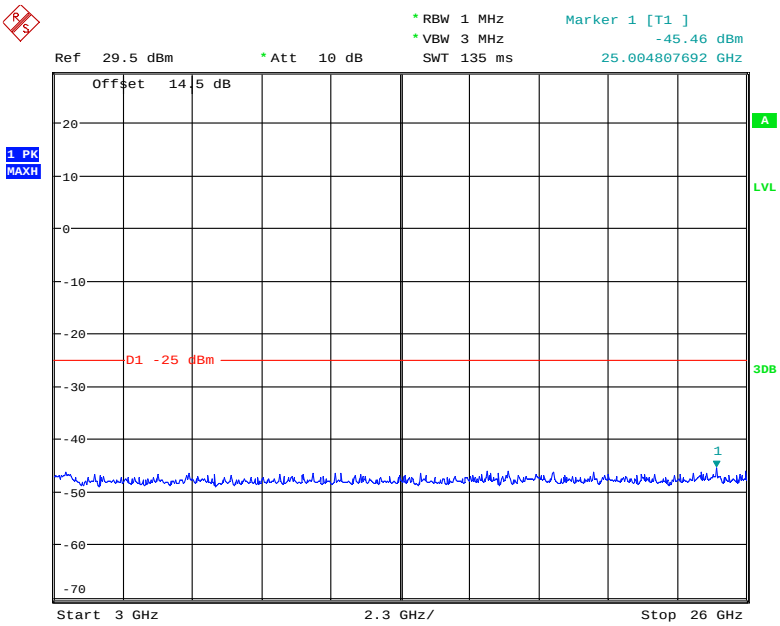
Date: 18.APR.2018 09:43:59

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



Date: 18.APR.2018 09:37:49

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



Date: 18.APR.2018 09:39:29

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 ℃
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Simon Wang on 2018-04-17.

EUT operation mode: Transmitting

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

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
952.3	36.93	23	1.1	H	-60.1	0.74	0	-60.84	-13	47.84
952.3	37.01	34	1.9	V	-60.0	0.74	0	-60.74	-13	47.74
1673.20	69.64	86	1.9	H	-37.4	1.30	8.90	-29.80	-13	16.80
1673.20	70.89	293	2.3	V	-35.6	1.30	8.90	-28.00	-13	15.00
2509.80	62.22	35	2.2	H	-41.3	2.60	10.20	-33.70	-13	20.70
2509.80	63.89	294	2.4	V	-39.0	2.60	10.20	-31.40	-13	18.40
3346.40	56.65	82	1.9	H	-43.7	1.50	11.70	-33.50	-13	20.50
3346.40	53.56	347	1.8	V	-46.8	1.50	11.70	-36.60	-13	23.60
WCDMA Mode, Middle channel										
942.1	36.8	244	1.6	H	-60.2	0.70	0	-60.90	-13	47.90
942.1	36.52	239	1.6	V	-60.5	0.70	0	-61.20	-13	48.20
1673.20	62.44	172	2.2	H	-44.6	1.30	8.90	-37.00	-13	24.00
1673.20	63.01	214	1.9	V	-43.5	1.30	8.90	-35.90	-13	22.90
2509.80	45.96	87	2.3	H	-57.6	2.60	10.20	-50.00	-13	37.00
2509.80	49.75	45	1.8	V	-53.2	2.60	10.20	-45.60	-13	32.60
3346.40	42.66	317	1.4	H	-57.7	1.50	11.70	-47.50	-13	34.50
3346.40	42.6	30	1.7	V	-57.8	1.50	11.70	-47.60	-13	34.60
CDMA (1*RTT , BC0), Middle channel										
956.6	32.82	51	2.4	H	-64.2	0.74	0	-64.94	-13	51.94
956.6	33.06	65	1.1	V	-63.9	0.74	0	-64.64	-13	51.64
1673.04	52.43	119	2.3	H	-55.0	1.30	8.90	-47.40	-13	34.40
1673.04	51.99	343	2.1	V	-54.9	1.30	8.90	-47.30	-13	34.30
2509.56	50.78	279	1.4	H	-53.4	2.60	10.20	-45.80	-13	32.80
2509.56	50.69	148	2.2	V	-52.9	2.60	10.20	-45.30	-13	32.30
CDMA(EV-DO, BC0), Middle channel										
956.6	32.98	97	1.4	H	-64.0	0.74	0	-64.74	-13	51.74
956.6	33.17	113	1.8	V	-63.8	0.74	0	-64.54	-13	51.54
1673.04	50.82	325	2.2	H	-56.7	1.30	8.90	-49.10	-13	36.10
1673.04	51.07	145	1.8	V	-55.8	1.30	8.90	-48.20	-13	35.20
2509.56	49.92	242	2.1	H	-54.3	2.60	10.20	-46.70	-13	33.70
2509.56	50.05	268	1.1	V	-53.5	2.60	10.20	-45.90	-13	32.90

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
952.3	37.5	287	2.0	H	-59.5	0.74	0	-60.24	-13	47.24
952.3	37.21	70	1.6	V	-59.8	0.74	0	-60.54	-13	47.54
3760.00	54.58	171	1.6	H	-47.0	1.50	11.80	-36.70	-13	23.70
3760.00	59.64	294	2.1	V	-41.5	1.50	11.80	-31.20	-13	18.20
5640.00	46.36	314	2.2	H	-47.3	1.70	12.40	-36.60	-13	23.60
5640.00	49.8	350	2.4	V	-43.5	1.70	12.40	-32.80	-13	19.80
WCDMA Mode Band II, Middle channel										
942.1	36.68	4	2.4	H	-60.3	0.70	0	-61.00	-13	48.00
942.1	36.31	60	1.7	V	-60.7	0.70	0	-61.40	-13	48.40
3760.00	44.66	154	1.6	H	-56.6	1.50	11.80	-46.30	-13	33.30
3760.00	43.51	103	1.6	V	-57.2	1.50	11.80	-46.90	-13	33.90
CDMA (1*RTT , BC1), Middle channel										
939.2	33.6	295	2.0	H	-63.4	0.70	0	-64.10	-13	51.10
939.2	33.25	147	1.3	V	-63.7	0.70	0	-64.40	-13	51.40
3760	53.57	66	1.5	H	-48.7	1.50	11.80	-38.40	-13	25.40
3760	52.08	178	2.1	V	-49.7	1.50	11.80	-39.40	-13	26.40
5640	49.3	168	1.5	H	-49.0	1.70	12.40	-38.30	-13	25.30
5640	50.11	10	2.3	V	-47.9	1.70	12.40	-37.20	-13	24.20
CDMA(EV-DO, BC1), Middle channel										
939.2	33.72	250	2.1	H	-63.3	0.70	0	-64.00	-13	51.00
939.2	33.38	276	1.9	V	-63.6	0.70	0	-64.30	-13	51.30
3760	52.27	158	2.0	H	-50.0	1.50	11.80	-39.70	-13	26.70
3760	52.14	201	1.8	V	-49.7	1.50	11.80	-39.40	-13	26.40
5640	50.38	210	1.0	H	-47.9	1.70	12.40	-37.20	-13	24.20
5640	50.29	234	1.5	V	-47.7	1.70	12.40	-37.00	-13	24.00

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)			
Band 5										
Test frequency range:30 MHz ~ 10 GHz										
954.1	36.20	256	1.2	H	-60.8	0.74	0	-61.54	-13	48.54
954.1	35.99	88	2.1	V	-61.0	0.74	0	-61.74	-13	48.74
1673.00	59.12	27	1.0	H	-48.0	1.30	8.90	-40.40	-13	27.40
1673.00	58.39	6	1.0	V	-48.1	1.30	8.90	-40.50	-13	27.50
2509.50	51.39	251	1.1	H	-52.1	2.60	10.20	-44.50	-13	31.50
2509.50	47.33	110	1.6	V	-55.6	2.60	10.20	-48.00	-13	35.00
3346.00	43.51	246	1.1	H	-56.8	1.50	11.70	-46.60	-13	33.60
3346.00	42.32	60	1.8	V	-58.1	1.50	11.70	-47.90	-13	34.90
Band 7										
Test frequency range:30 MHz ~ 26 GHz										
954.1	36.36	355	1.2	H	-60.6	0.74	0	-61.34	-25	36.34
954.1	36.1	290	1.1	V	-60.9	0.74	0	-61.64	-25	36.64
5070.00	42.21	60	1.6	H	-53.3	1.60	12.10	-42.80	-25	17.80
5070.00	41.9	25	1.4	V	-53.6	1.60	12.10	-43.10	-25	18.10
Band 38										
Test frequency range: 30 MHz ~ 26GHz										
954.1	36.51	195	2.0	H	-60.5	0.74	0	-61.24	-25	36.24
954.1	36.39	13	1.7	V	-60.6	0.74	0	-61.34	-25	36.34
5190.00	41.39	222	2.0	H	-53.9	1.60	12.10	-43.40	-25	18.4
5190.00	41.68	278	1.7	V	-53.2	1.60	12.10	-42.70	-25	17.7
Band 41										
Test frequency range: 30 MHz ~ 26GHz										
954.1	36.09	183	1.7	H	-60.9	0.74	0	-61.64	-25	36.64
954.1	36.78	170	2.1	V	-60.2	0.74	0	-60.94	-25	35.94
5186.00	43.74	341	1.3	H	-51.6	1.60	12.10	-41.10	-25	16.1
5186.00	41.58	303	2.2	V	-53.3	1.60	12.10	-42.80	-25	17.8

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.

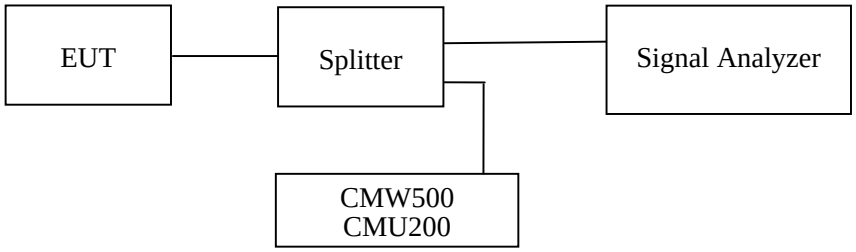
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

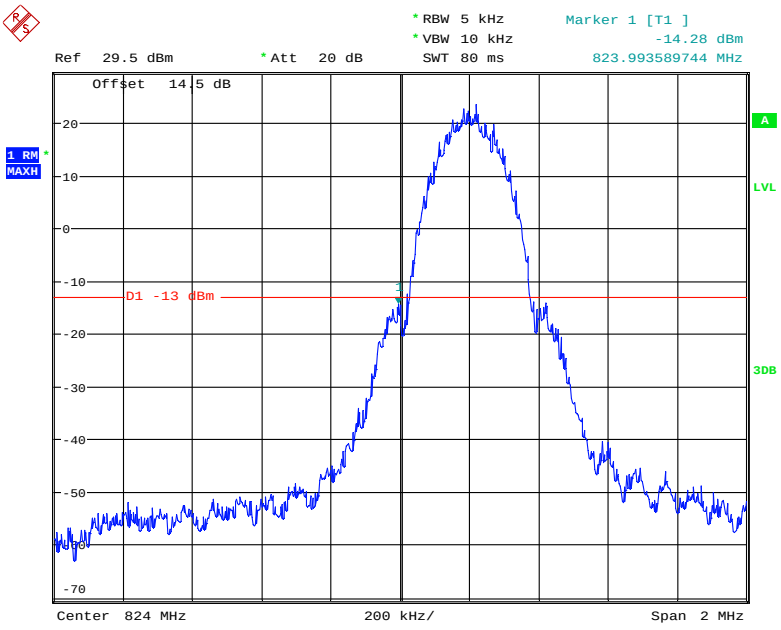
Temperature:	21~25 ℃
Relative Humidity:	51~52 %
ATM Pressure:	100.5~101.0 kPa

The testing was performed by Simon Wang from 2018-04-16 to 2018-05-19.

EUT operation mode: Transmitting

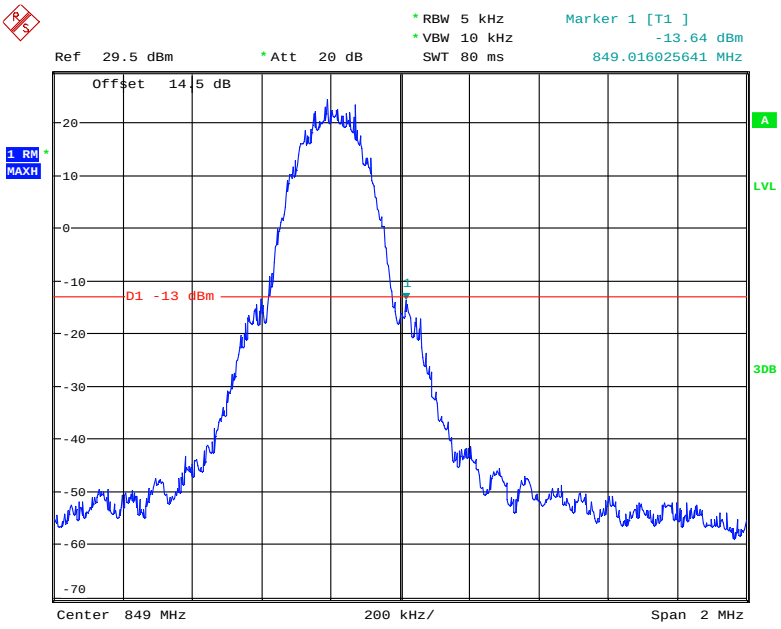
Test Result: Compliance. Please refer to the following plots.

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



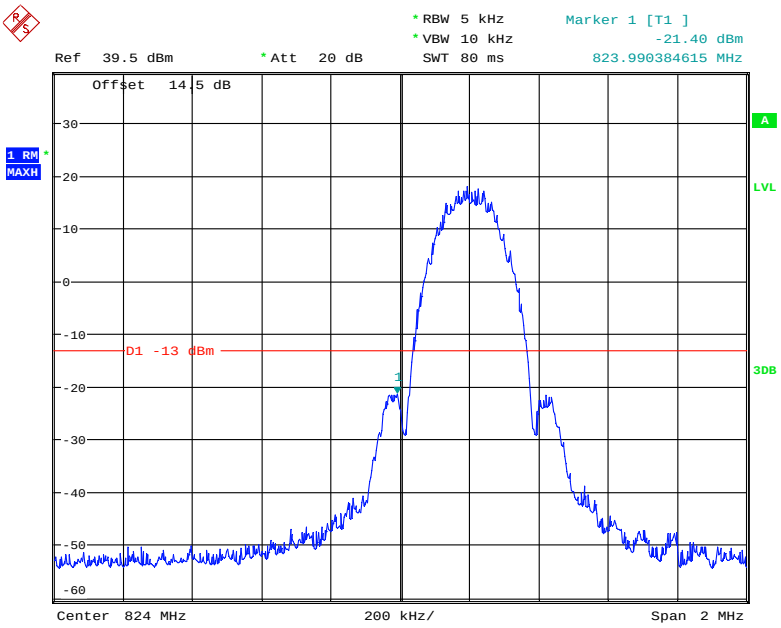
Date: 16.APR.2018 11:37:51

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



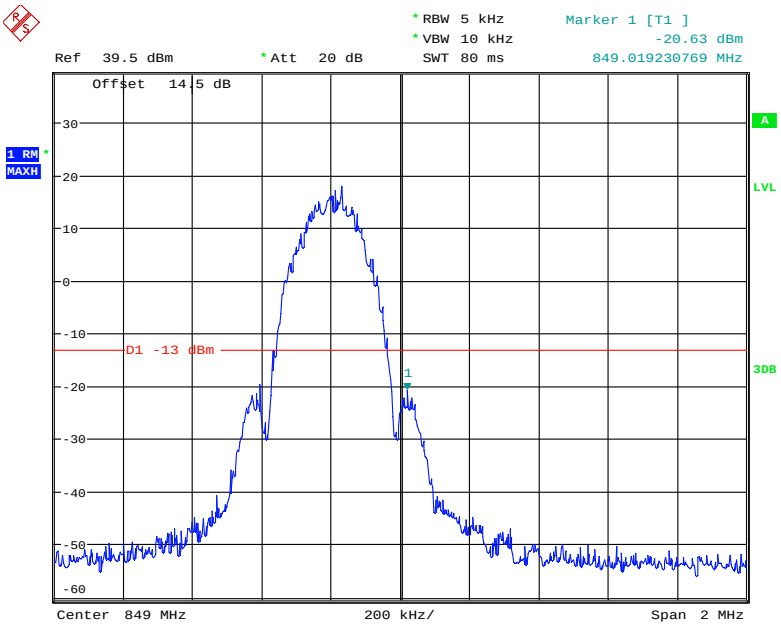
Date: 16.APR.2018 11:38:59

Cellular Band, Left Band Edge for EDGE Mode



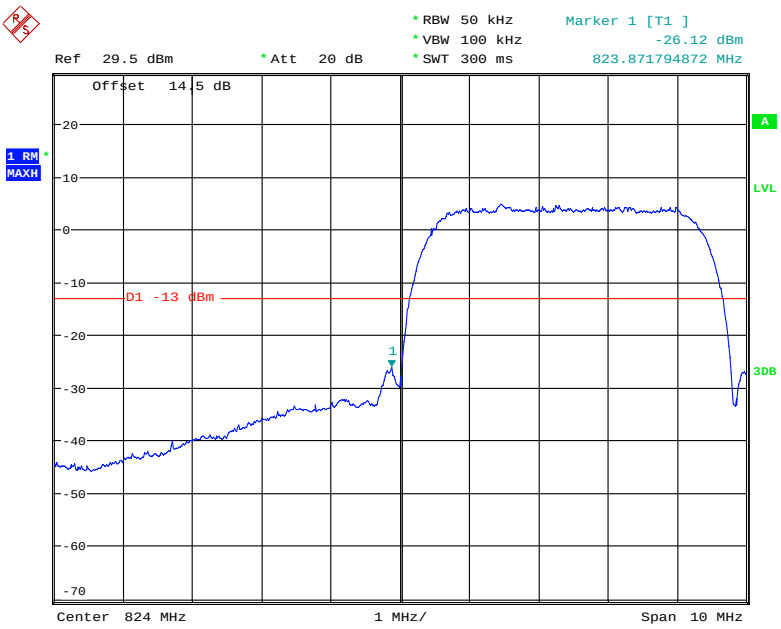
Date: 16.APR.2018 10:16:20

Cellular Band, Right Band Edge for EDGE Mode



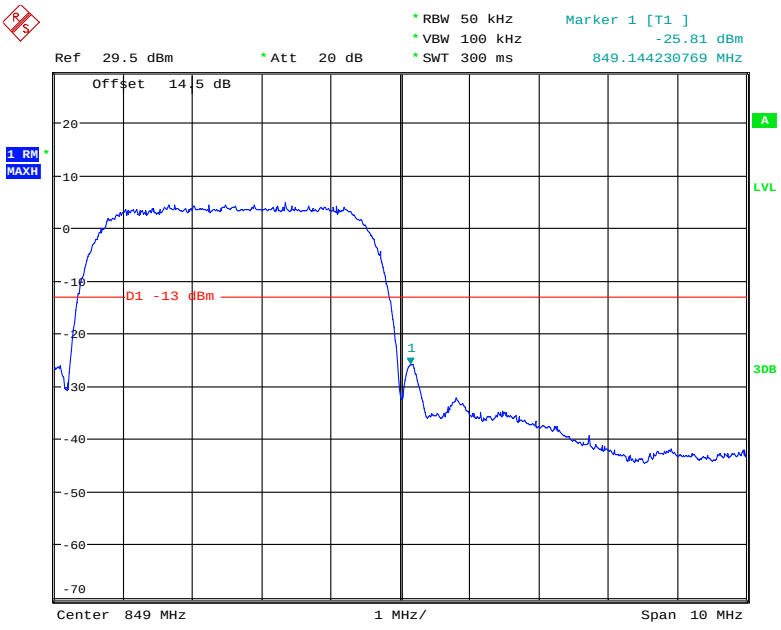
Date: 16.APR.2018 10:17:19

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



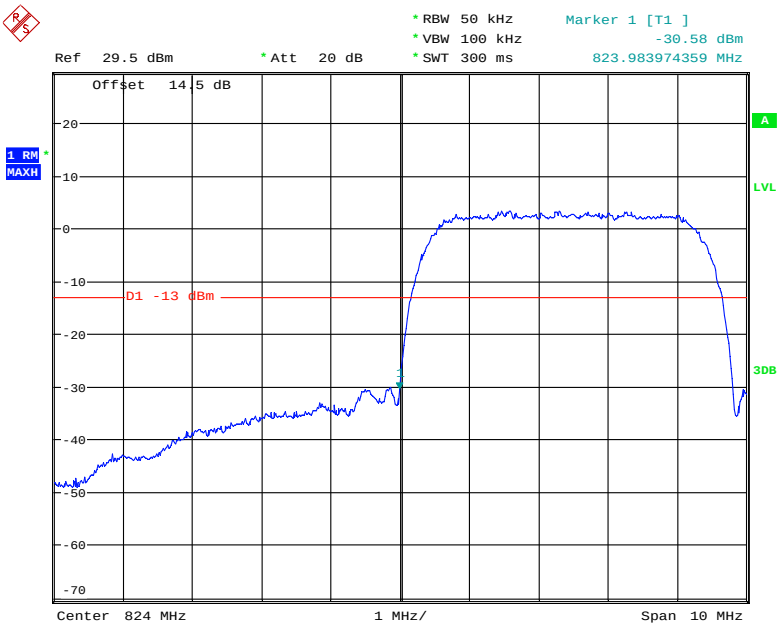
Date: 16.APR.2018 13:42:35

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



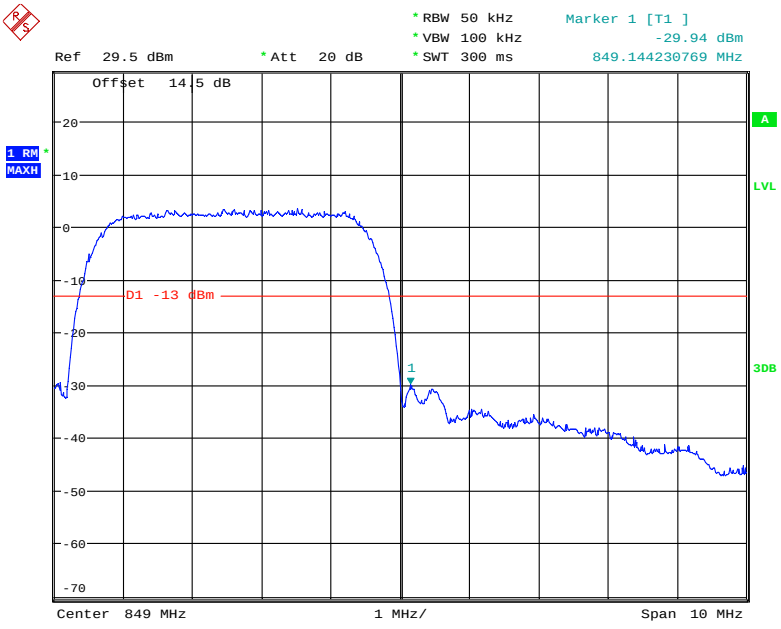
Date: 16.APR.2018 13:44:48

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



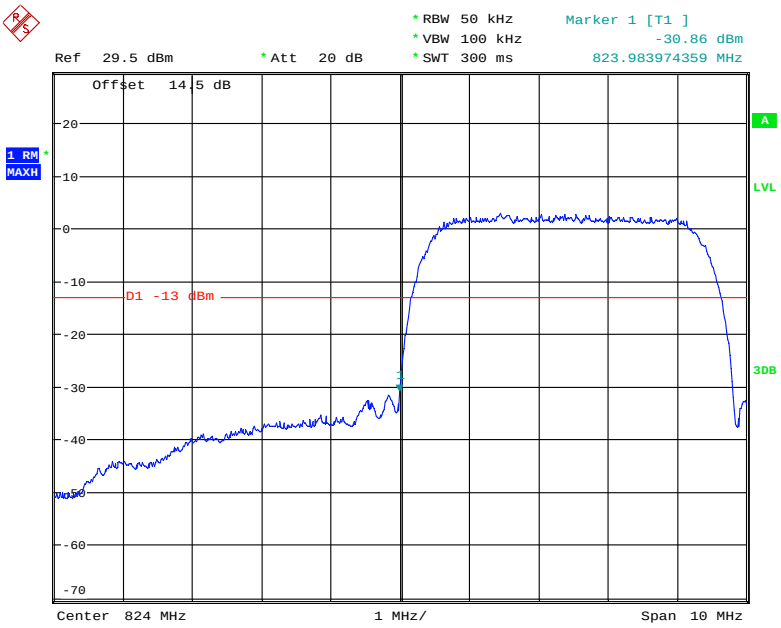
Date: 16.APR.2018 13:47:36

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



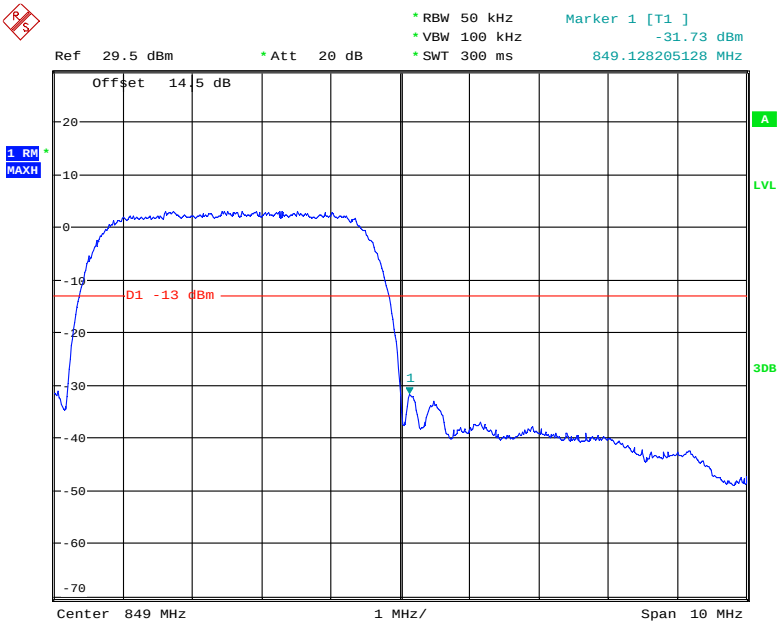
Date: 16.APR.2018 13:46:10

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



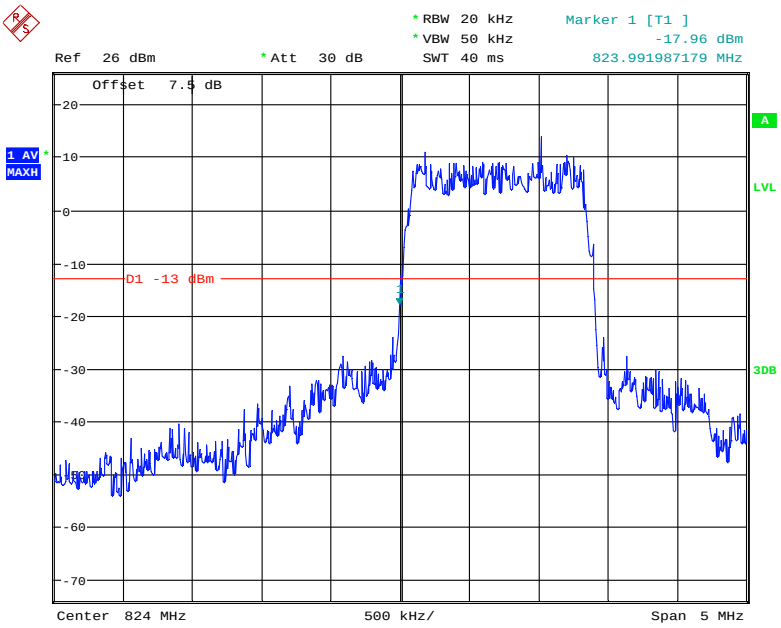
Date: 16.APR.2018 13:48:57

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



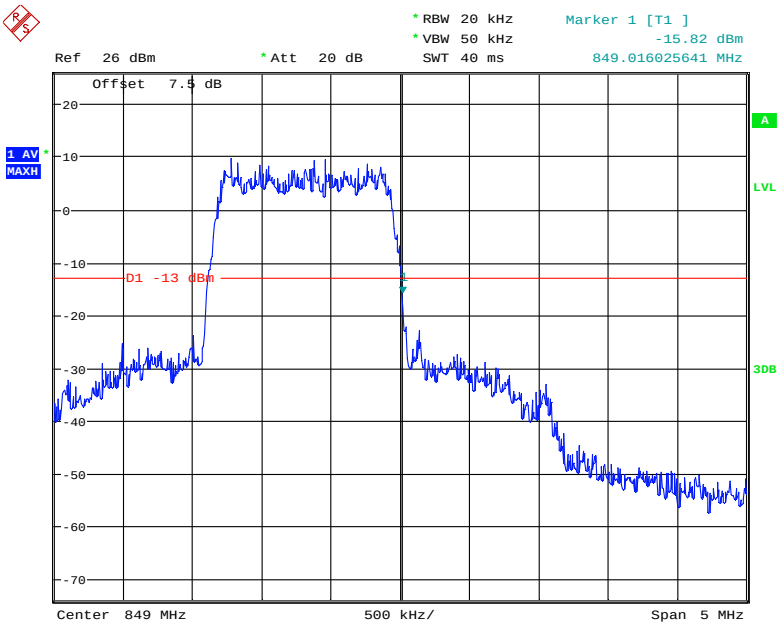
Date: 16.APR.2018 13:50:53

Cellular Band, Left Band Edge for CDMA (1*RTT, BC0) Mode



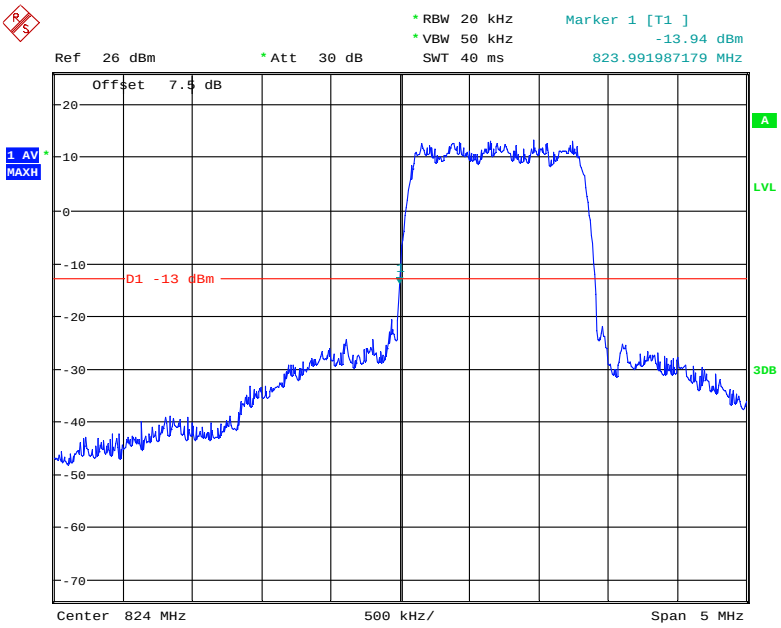
Date: 19.MAY.2018 15:08:19

Cellular Band, Right Band Edge for CDMA (1*RTT, BC0) Mode



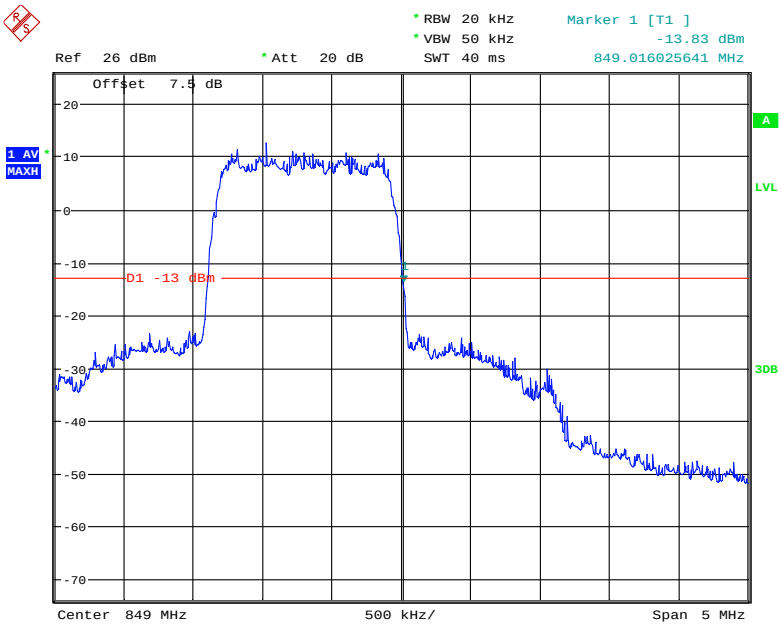
Date: 19.MAY.2018 15:33:14

Cellular Band, Left Band Edge for CDMA (EV-DO, BC0) Mode



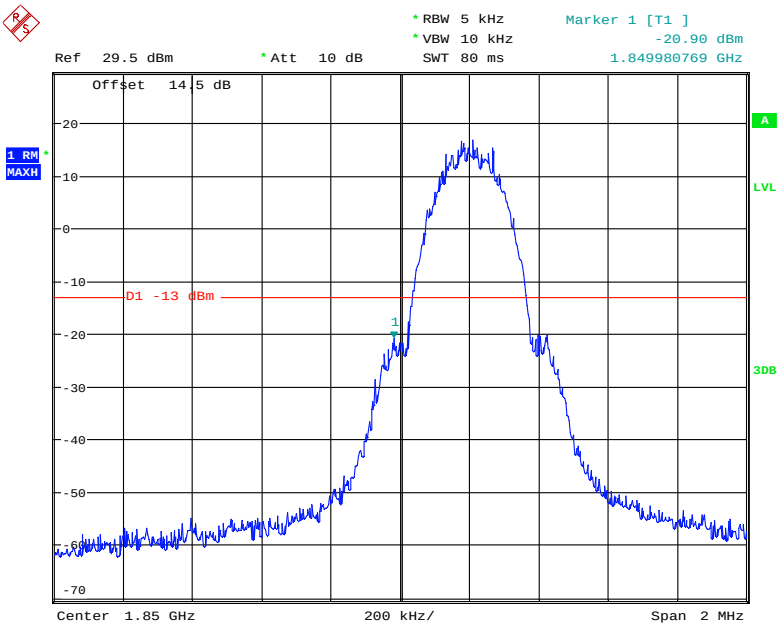
Date: 19.MAY.2018 15:09:37

Cellular Band, Right Band Edge for CDMA (EV-DO, BC0) Mode



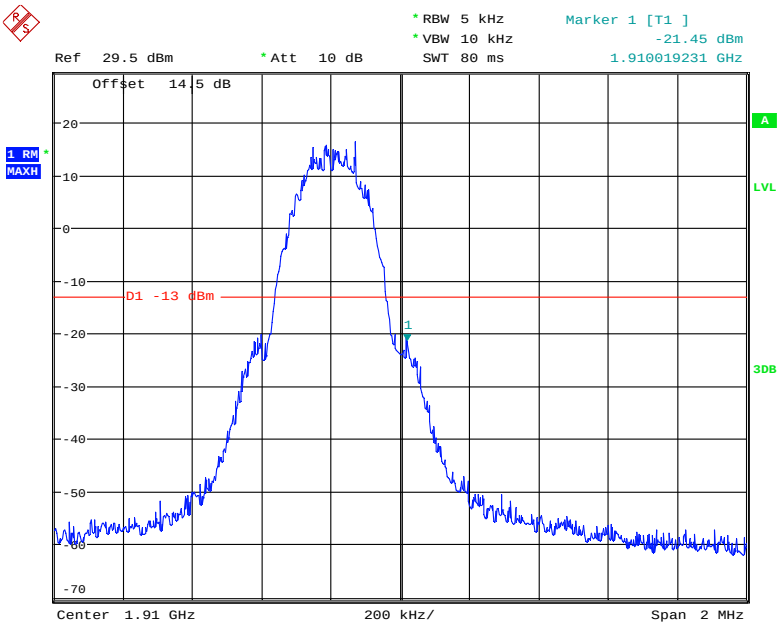
Date: 19.MAY.2018 15:32:41

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



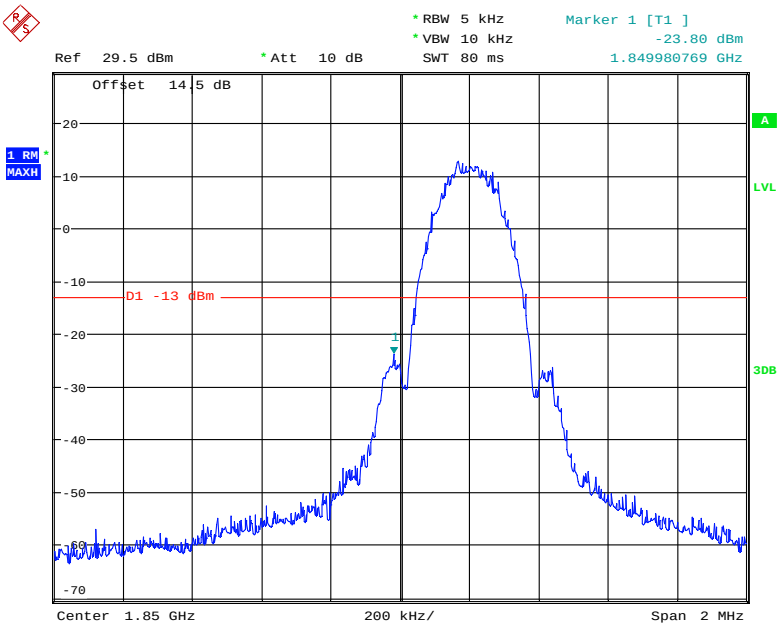
Date: 16.APR.2018 11:32:45

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



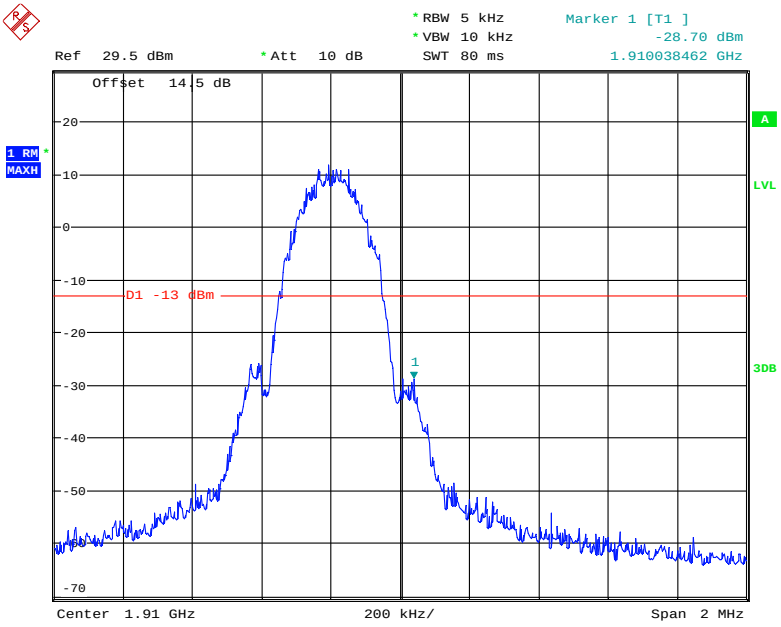
Date: 16.APR.2018 11:31:41

PCS Band, Left Band Edge for EDGE Mode



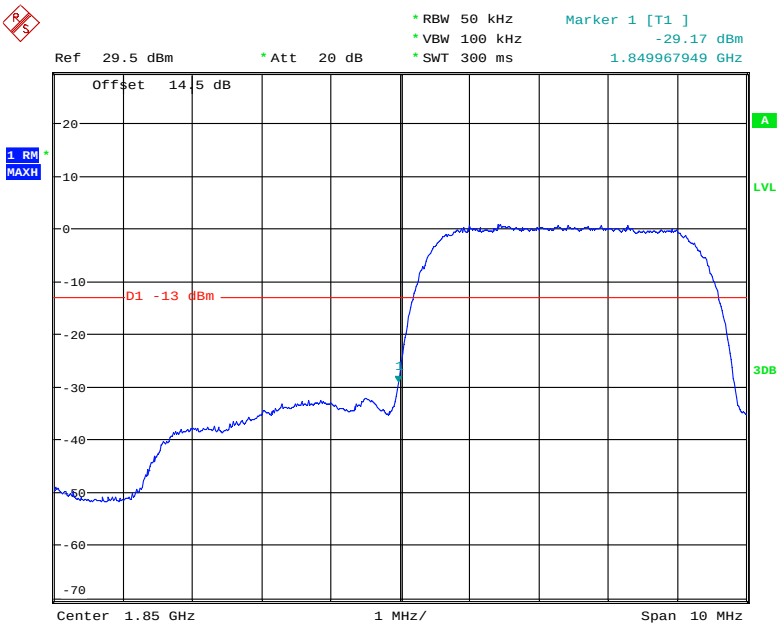
Date: 16.APR.2018 11:26:39

PCS Band, Right Band Edge for EDGE Mode



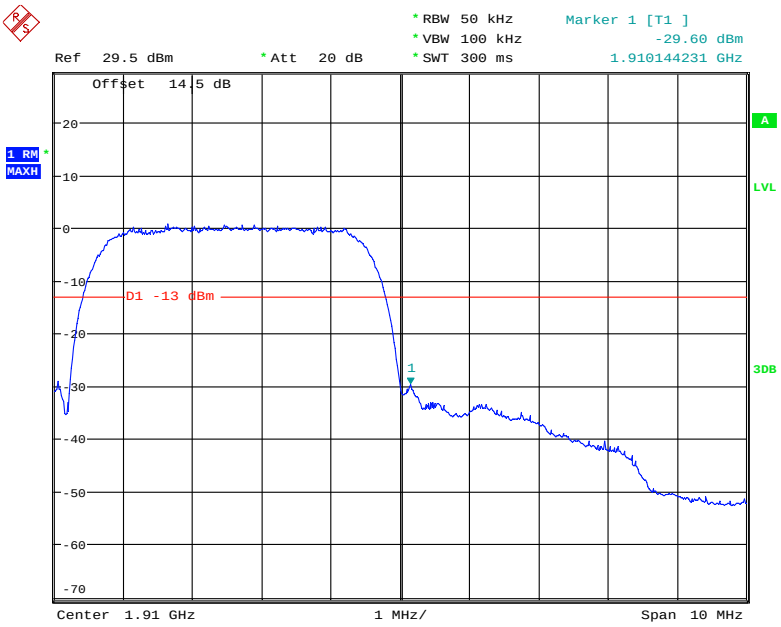
Date: 16.APR.2018 11:27:48

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



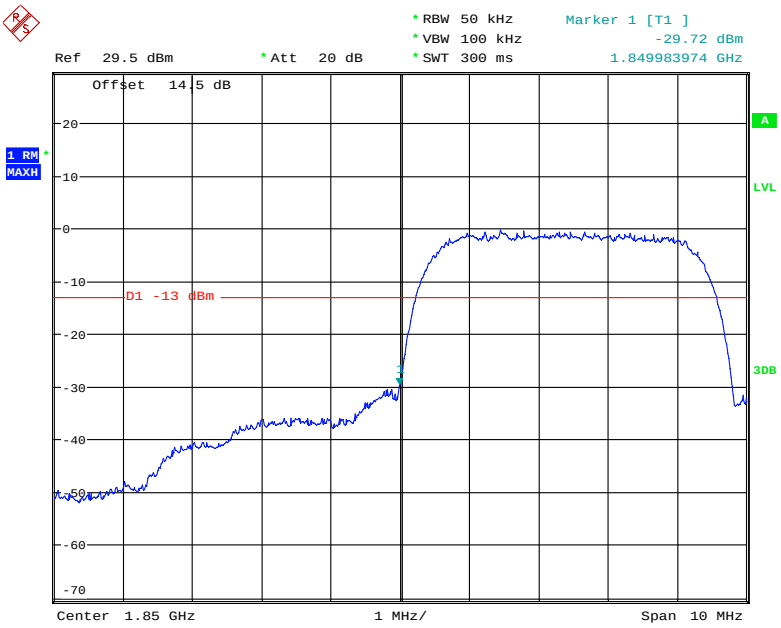
Date: 16.APR.2018 14:30:19

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



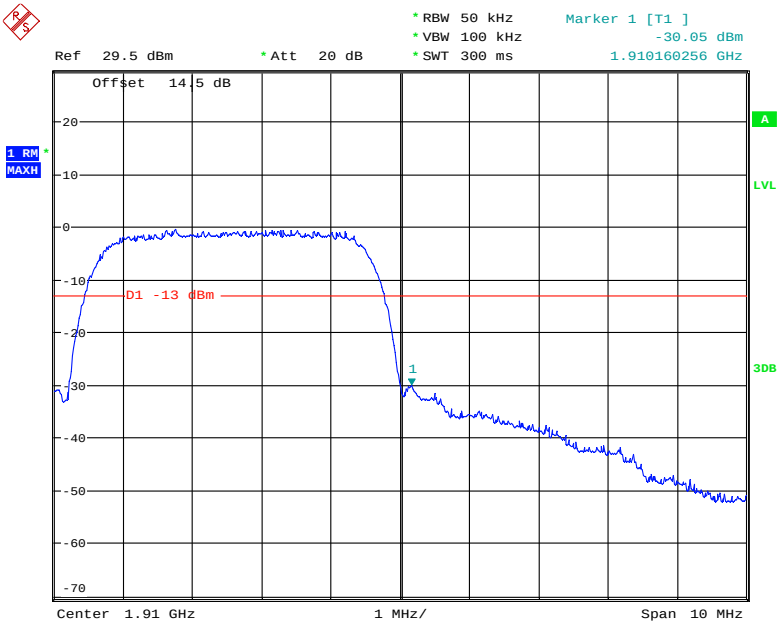
Date: 16.APR.2018 14:32:29

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



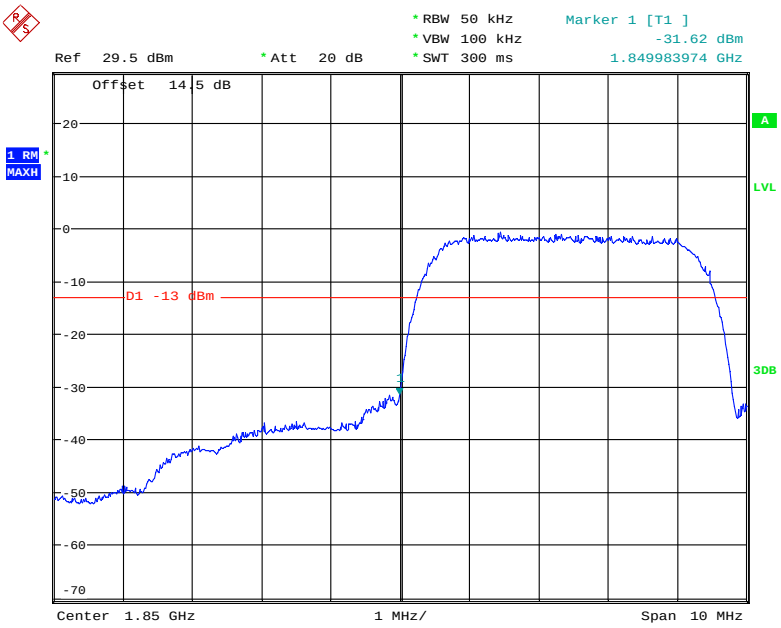
Date: 16.APR.2018 14:34:44

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



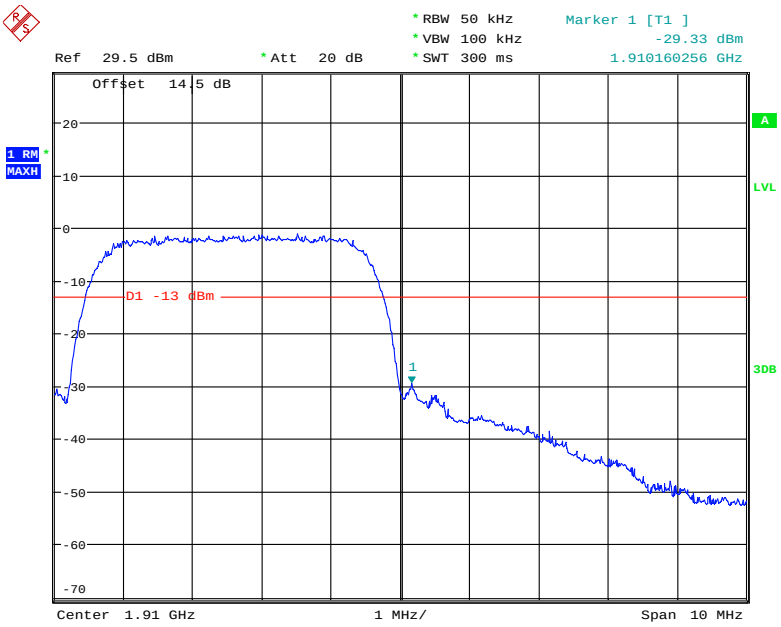
Date: 16.APR.2018 14:33:53

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



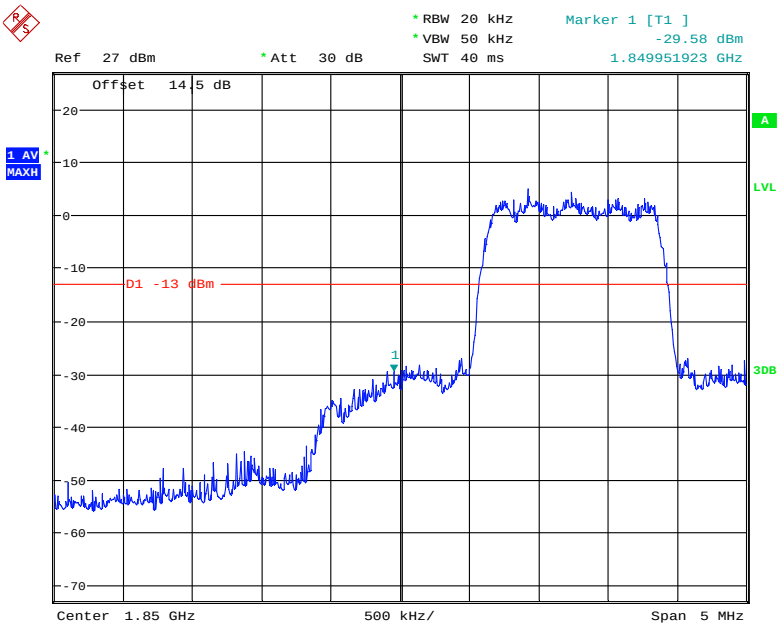
Date: 16.APR.2018 14:36:14

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



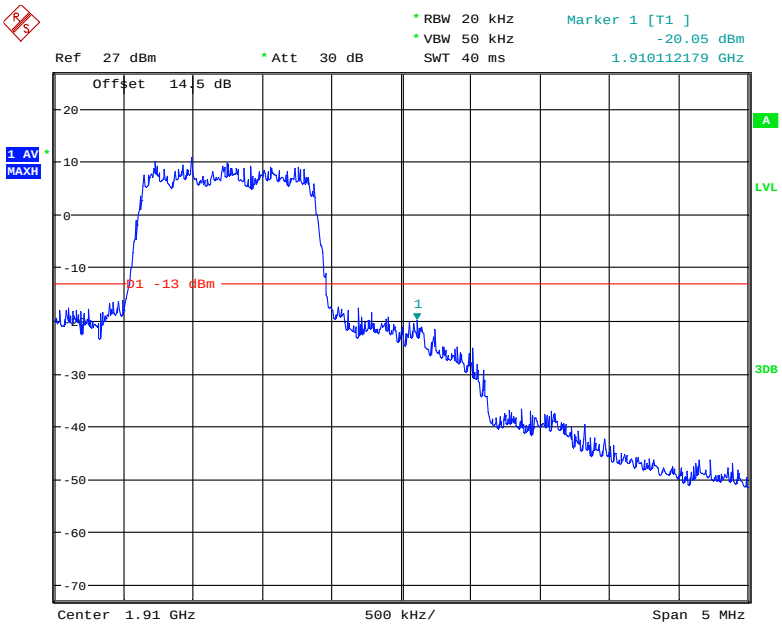
Date: 16.APR.2018 14:37:05

Left Band Edge for CDMA (1*RTT, BC1) Mode



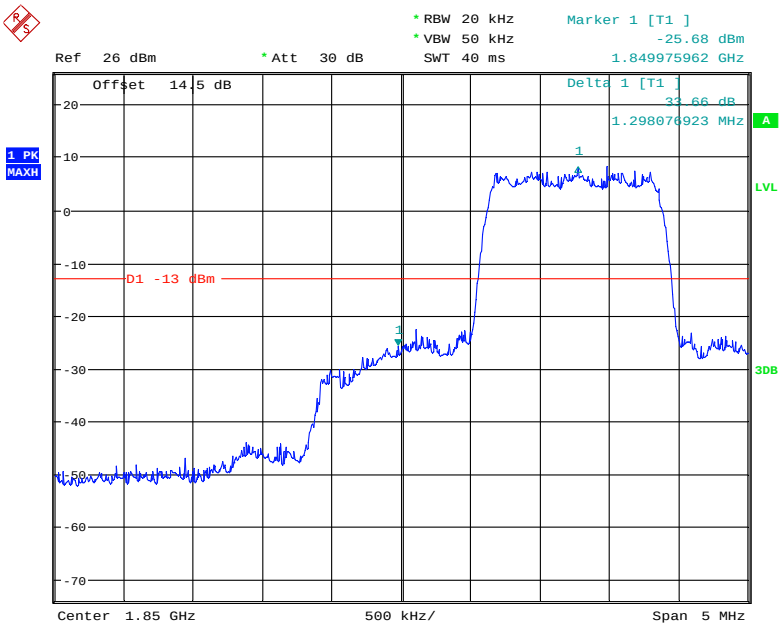
Date: 17.MAY.2018 16:09:17

Right Band Edge for CDMA (1*RTT, BC1) Mode



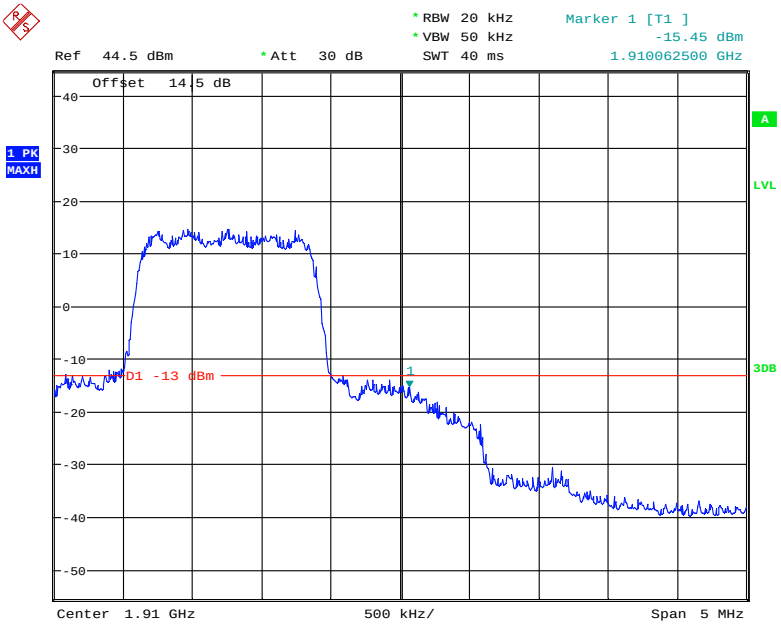
Date: 17.MAY.2018 16:10:02

Left Band Edge for CDMA (EV-DO, BC1) Mode



Date: 17.MAY.2018 17:12:08

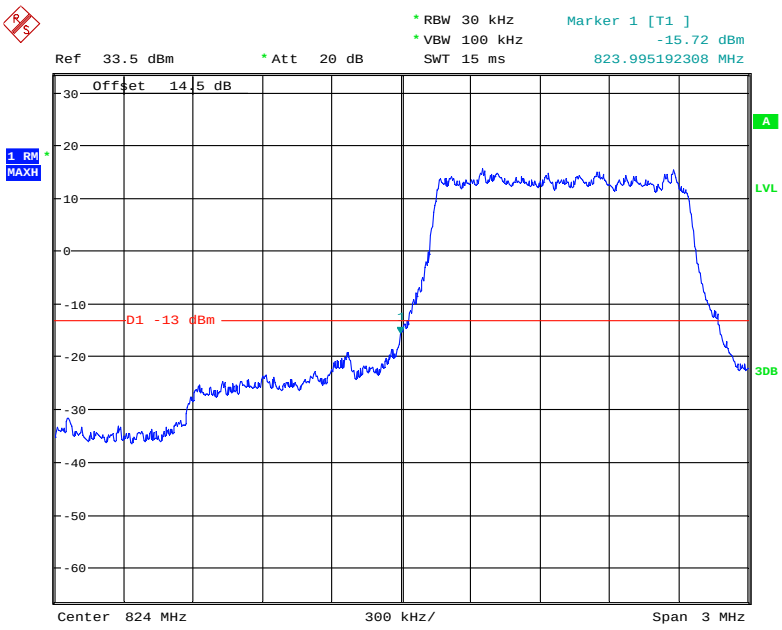
Right Band Edge for CDMA (EV-DO, BC1) Mode



Date: 17.MAY.2018 17:10:49

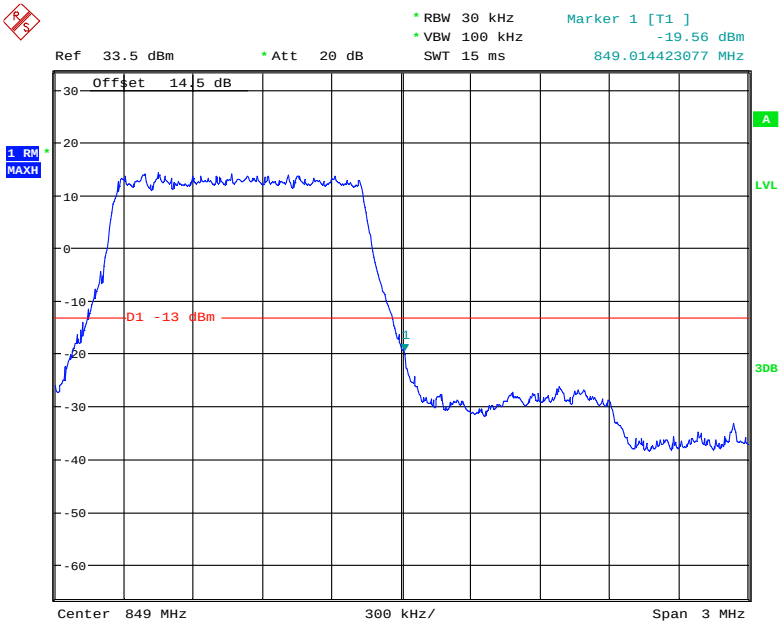
Band 5:

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



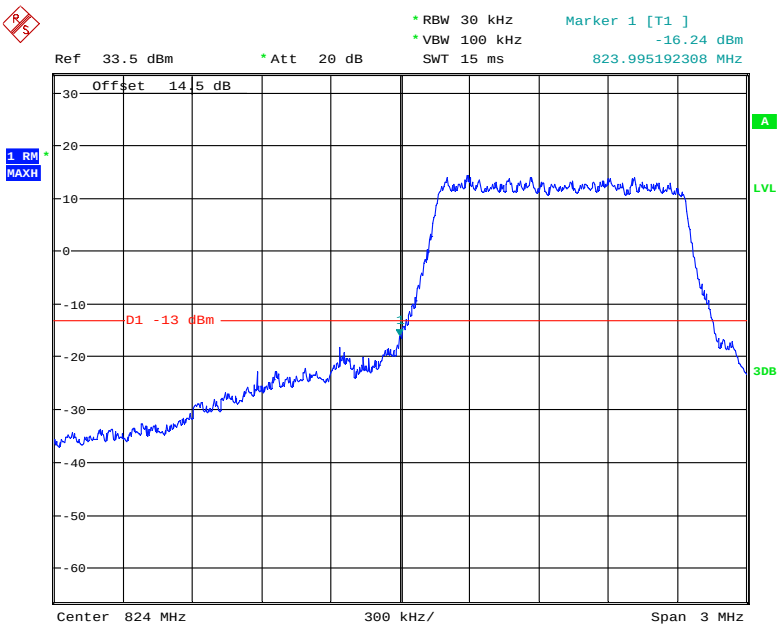
Date: 17.APR.2018 08:57:46

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



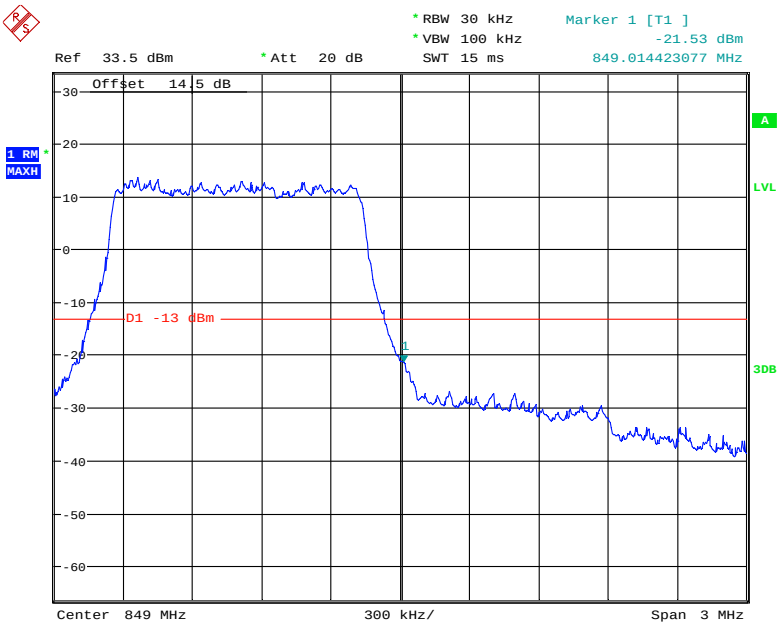
Date: 17.APR.2018 08:55:54

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



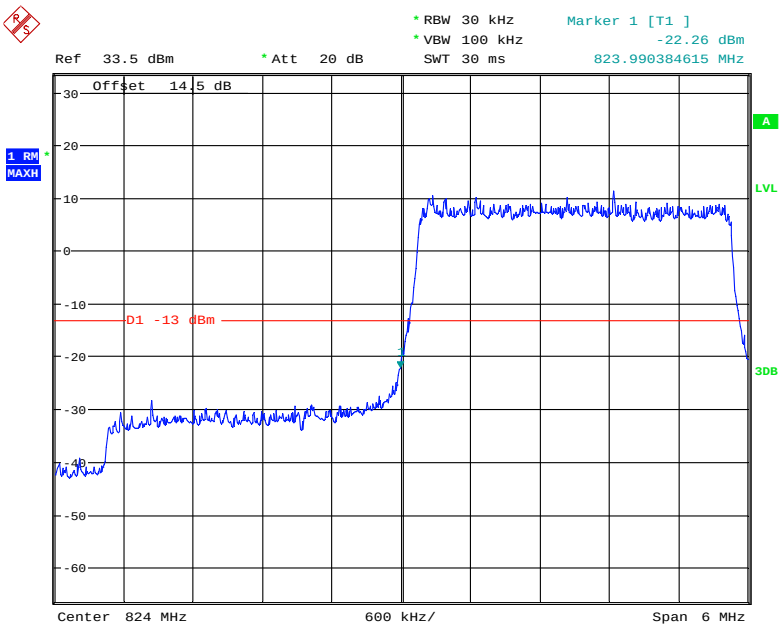
Date: 17.APR.2018 08:50:29

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



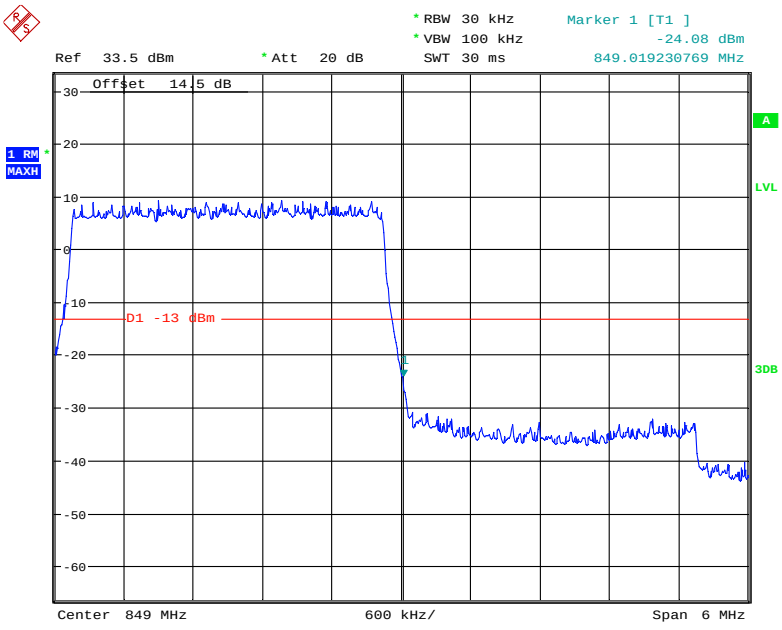
Date: 17.APR.2018 08:52:47

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



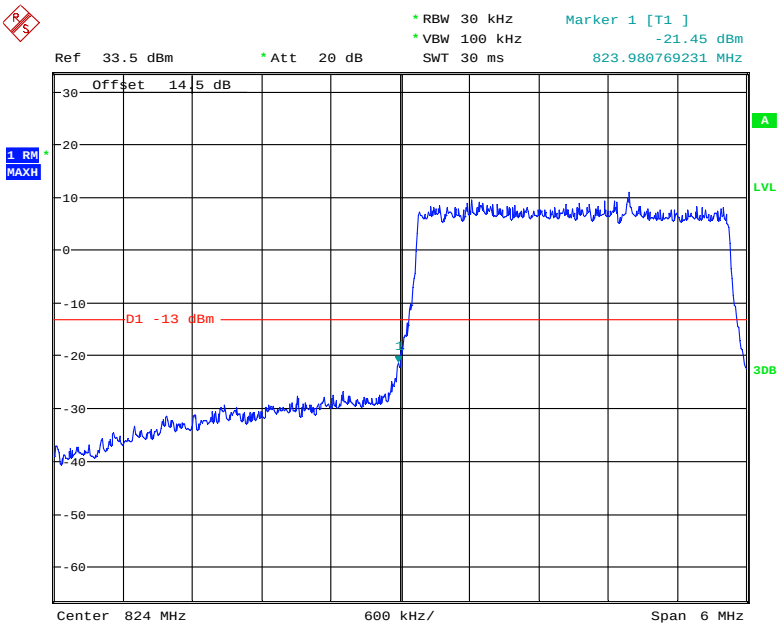
Date: 17.APR.2018 09:10:56

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



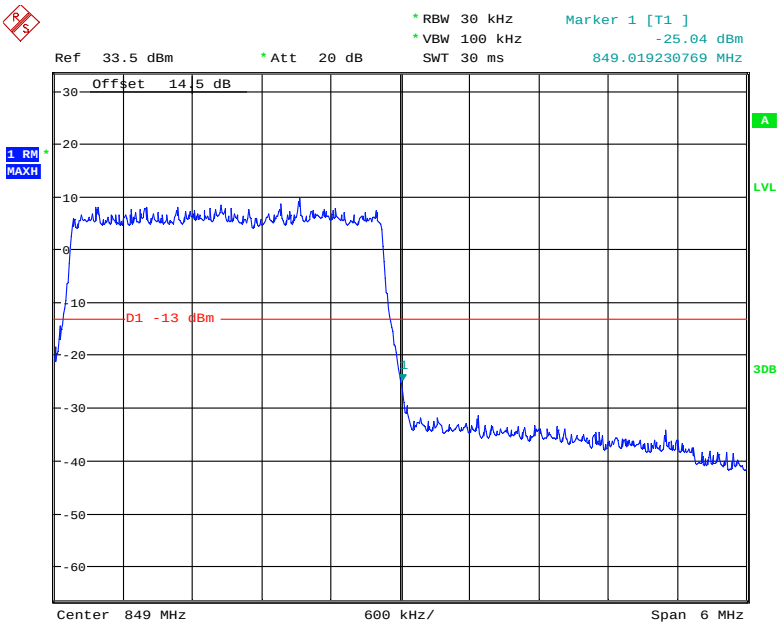
Date: 17.APR.2018 09:10:05

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



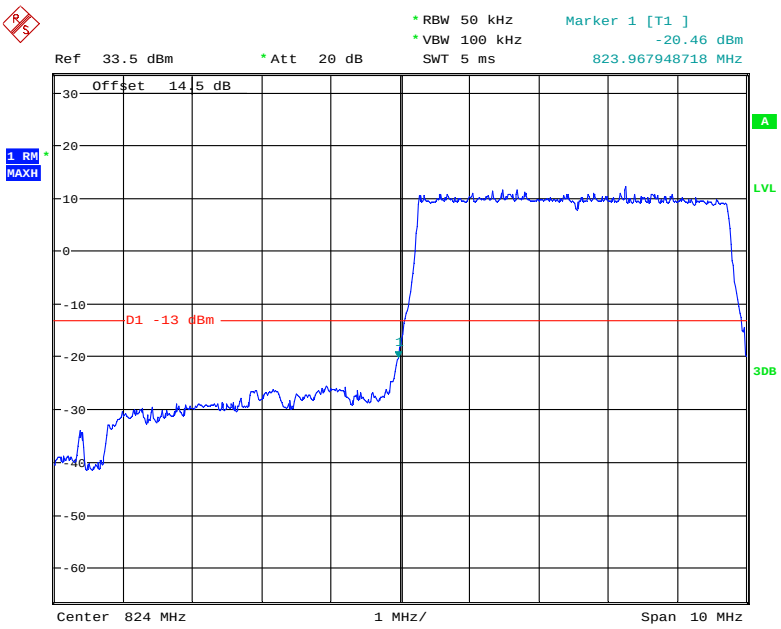
Date: 17.APR.2018 09:08:19

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



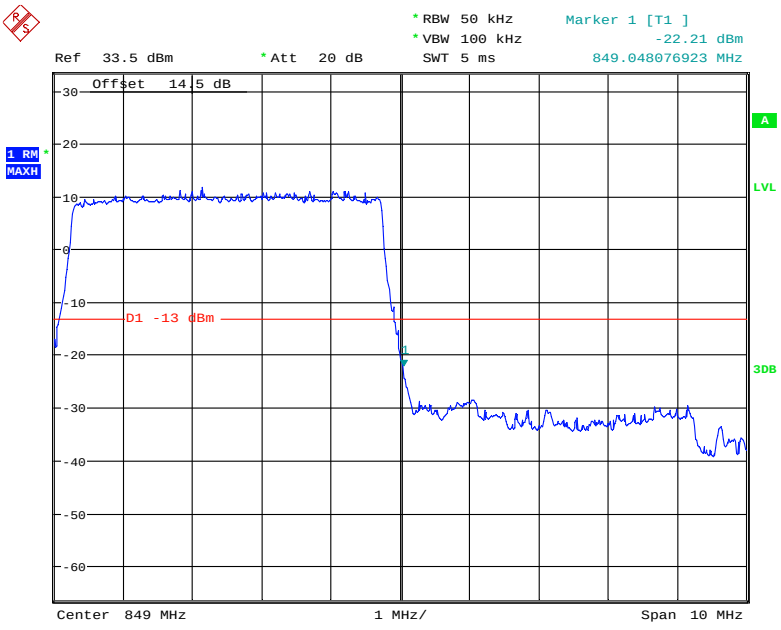
Date: 17.APR.2018 09:09:15

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



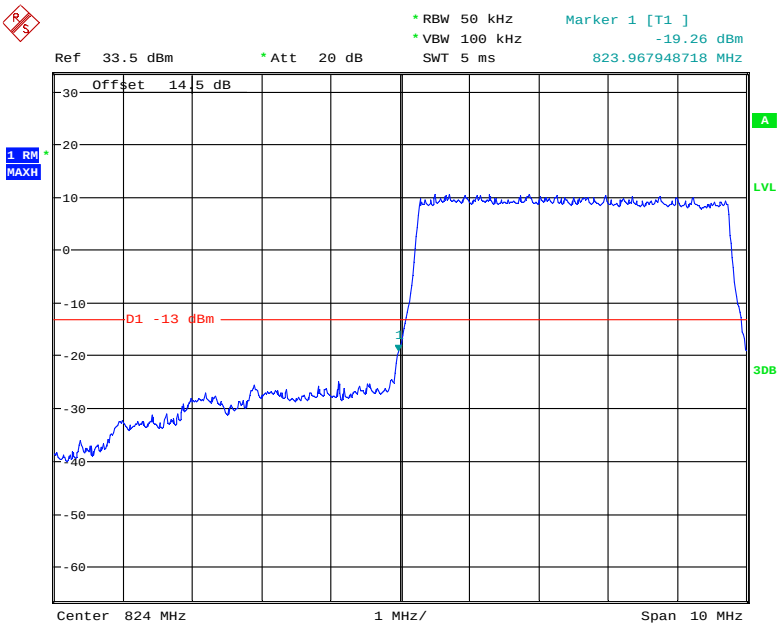
Date: 17.APR.2018 09:29:30

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



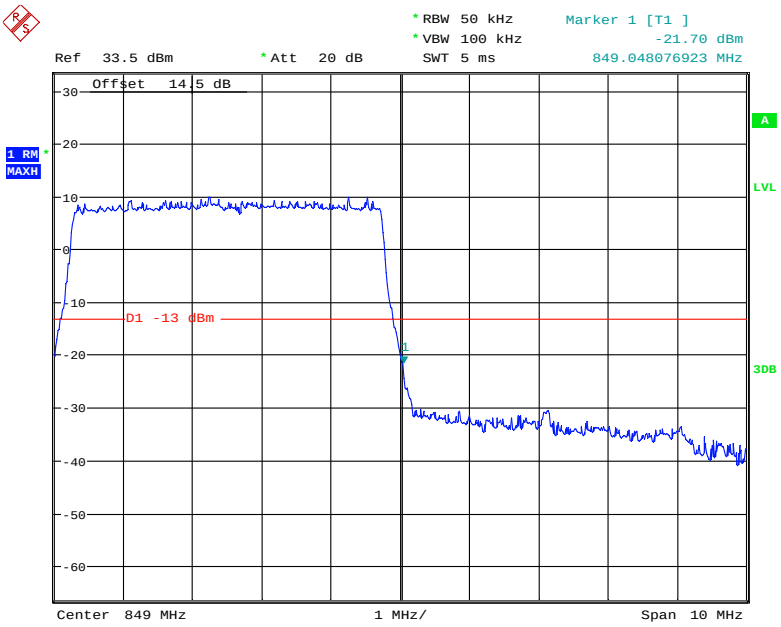
Date: 17.APR.2018 09:26:22

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



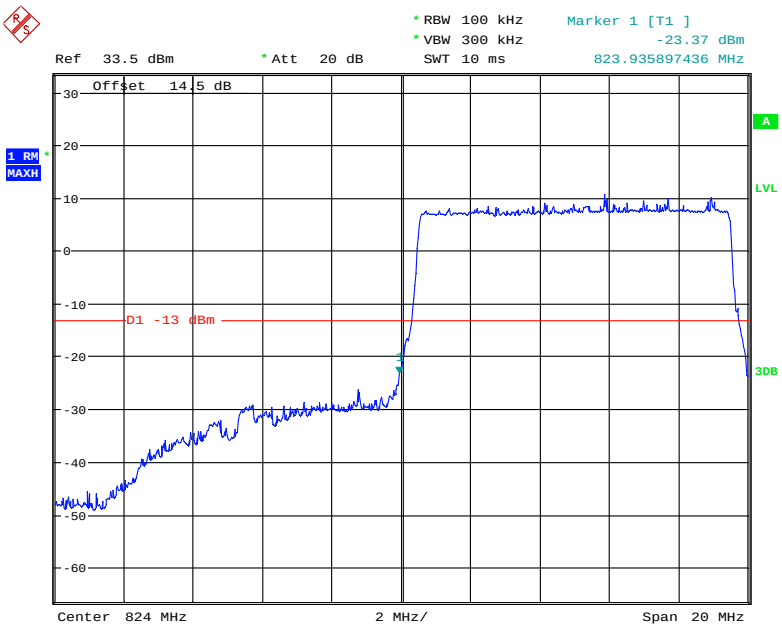
Date: 17.APR.2018 09:23:17

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



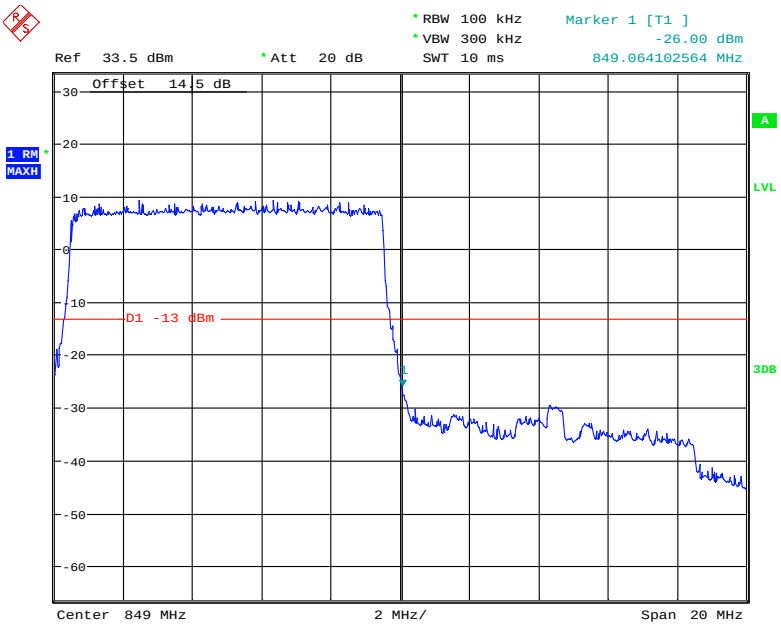
Date: 17.APR.2018 09:24:49

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



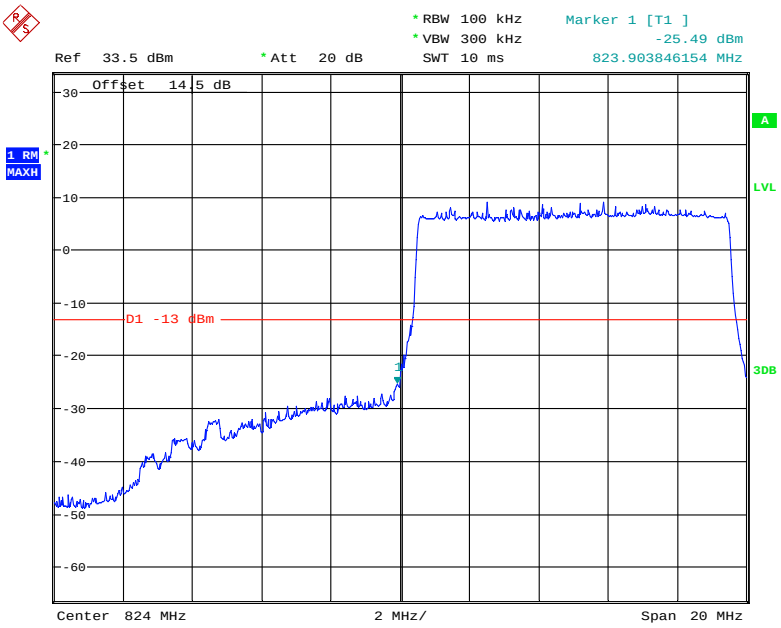
Date: 17.APR.2018 09:33:31

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



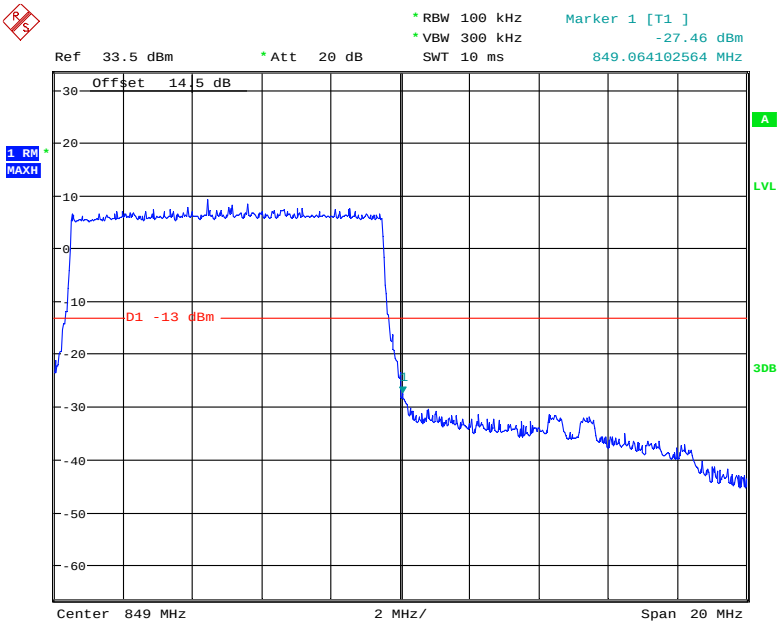
Date: 17.APR.2018 09:34:21

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



Date: 17.APR.2018 09:32:23

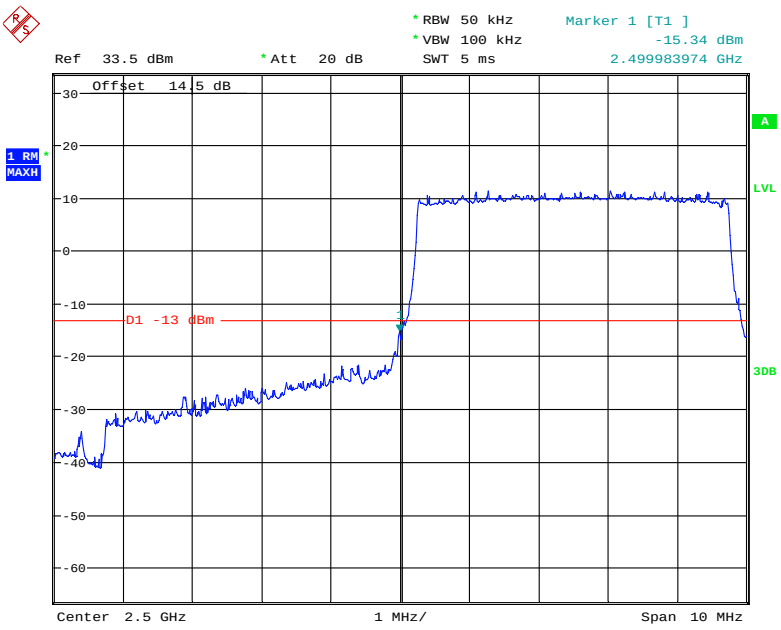
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2018 09:35:07

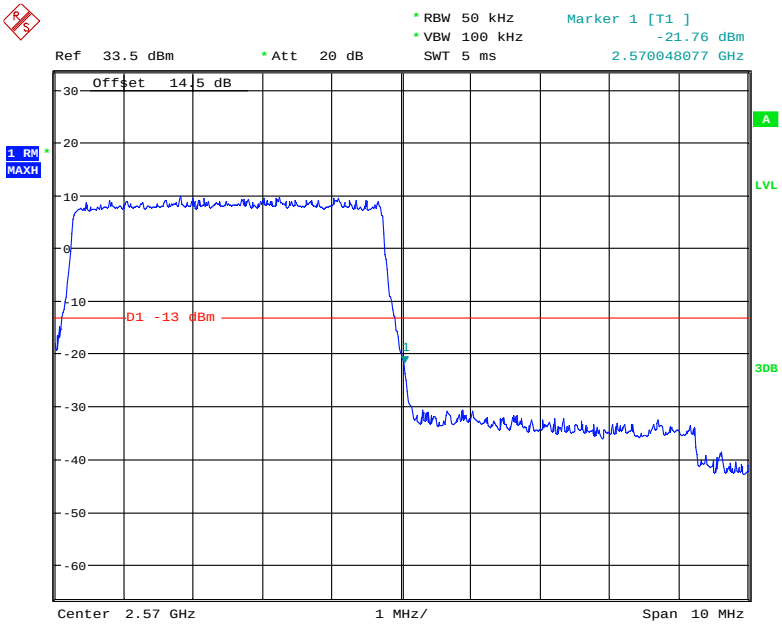
Band 7:

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



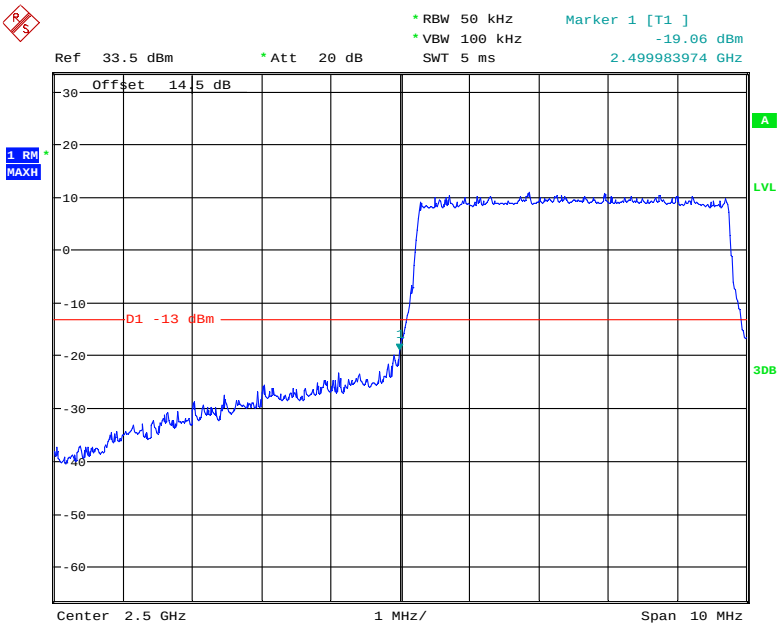
Date: 17.APR.2018 10:02:11

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



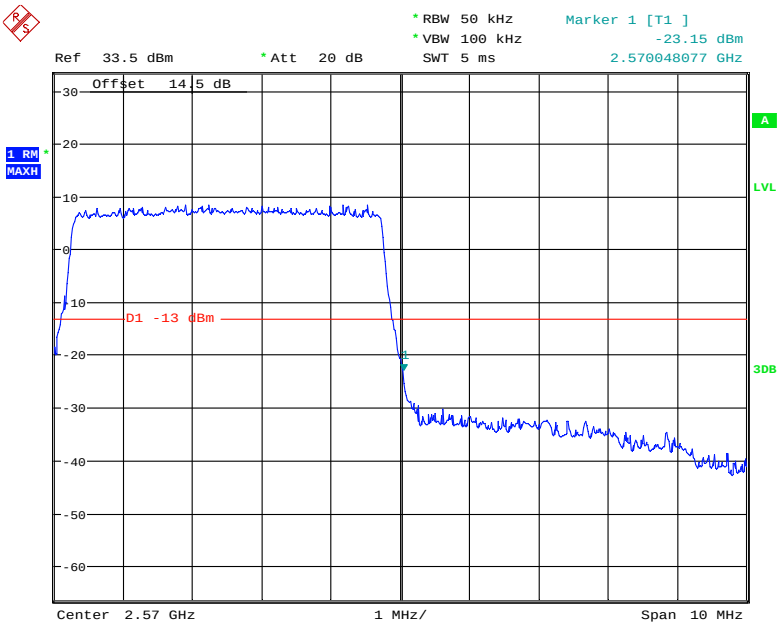
Date: 17.APR.2018 10:06:53

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



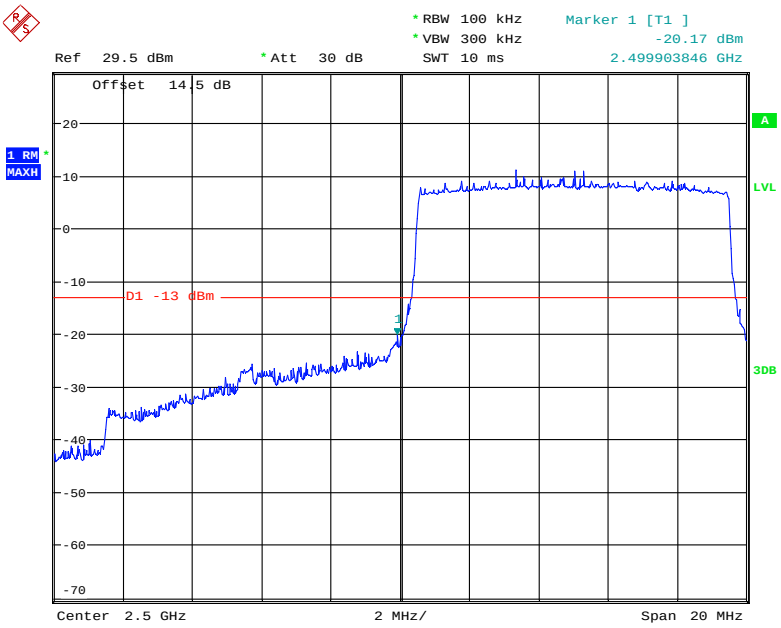
Date: 17.APR.2018 10:03:53

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



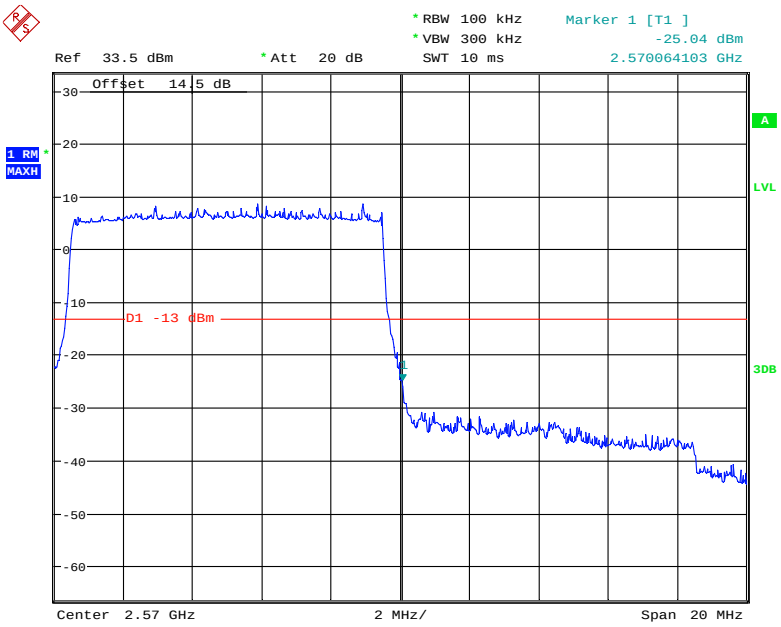
Date: 17.APR.2018 10:05:42

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



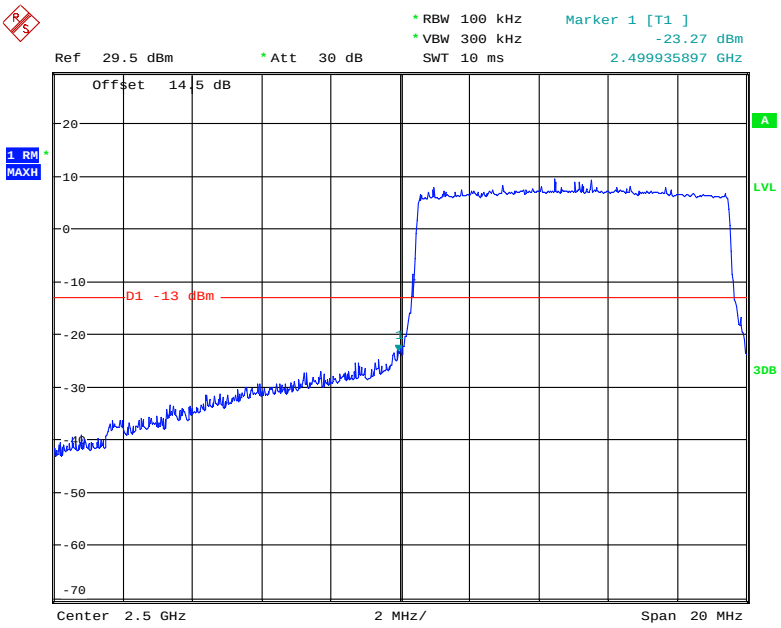
Date: 17.APR.2018 10:21:29

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



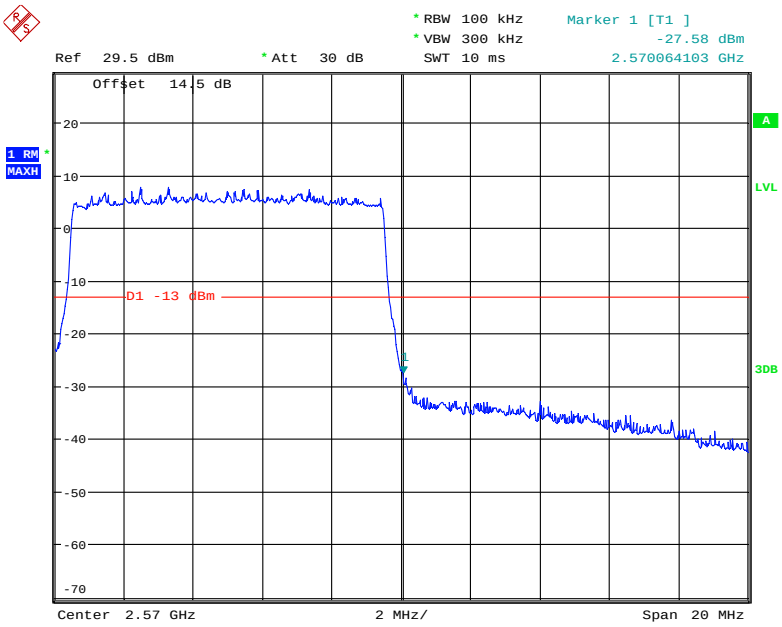
Date: 17.APR.2018 10:09:57

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



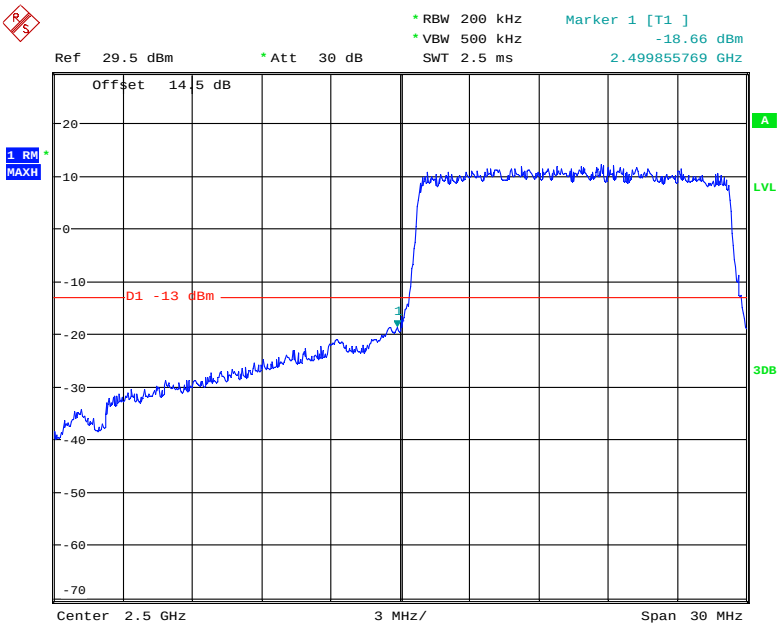
Date: 17.APR.2018 10:20:54

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



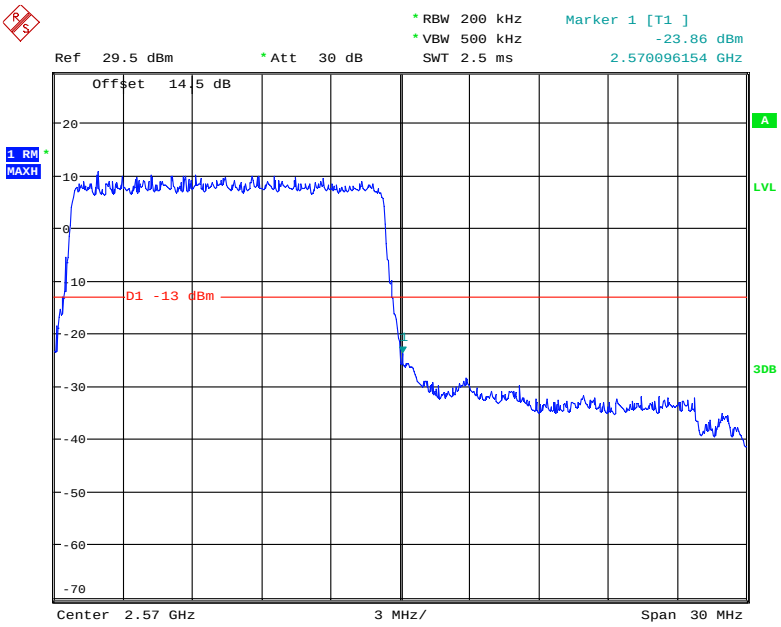
Date: 17.APR.2018 10:19:33

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



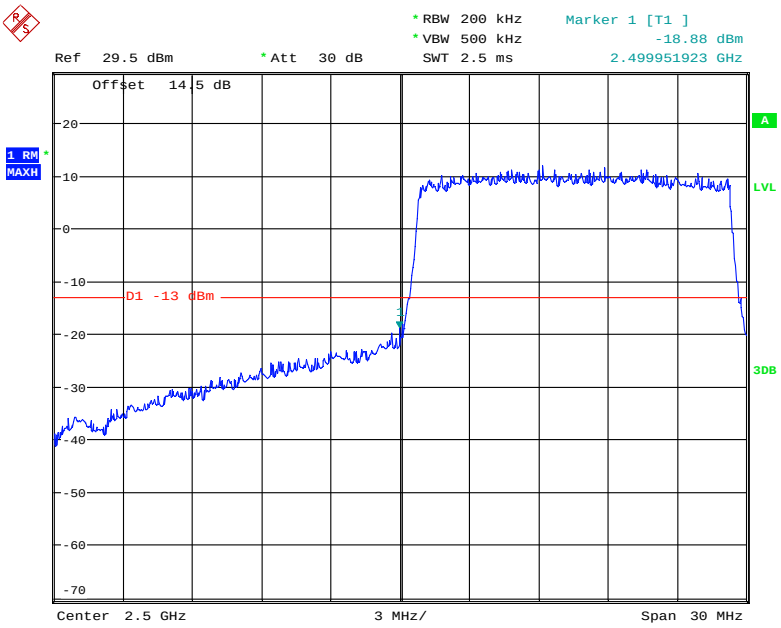
Date: 17.APR.2018 10:23:15

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



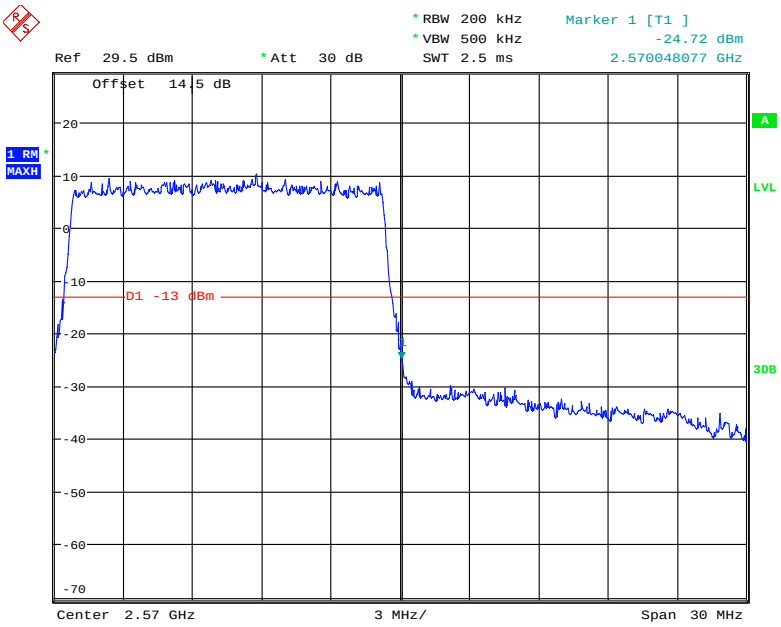
Date: 17.APR.2018 10:26:23

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



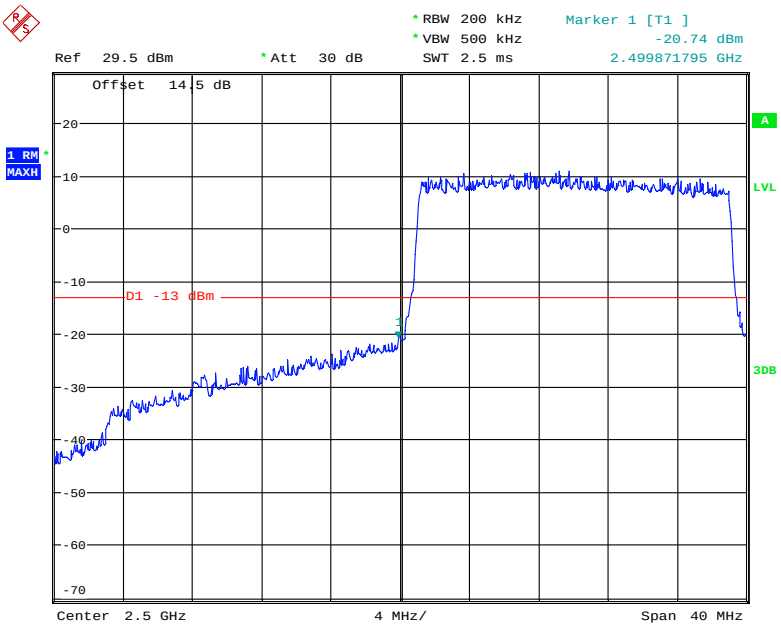
Date: 17.APR.2018 10:24:16

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



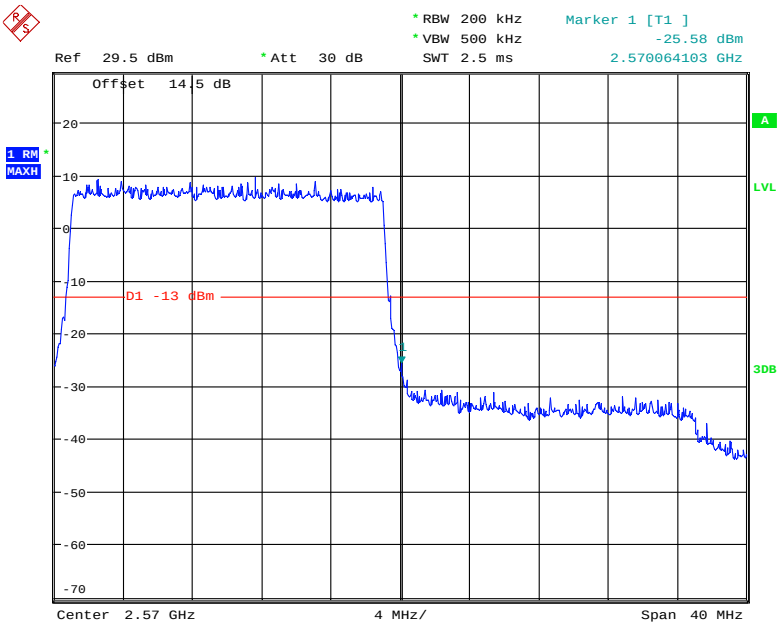
Date: 17.APR.2018 10:25:21

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



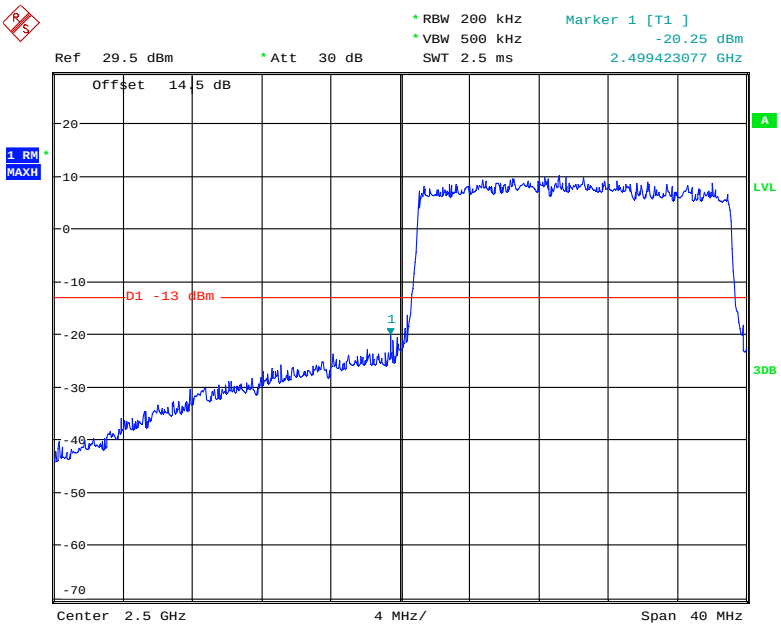
Date: 17.APR.2018 10:31:11

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



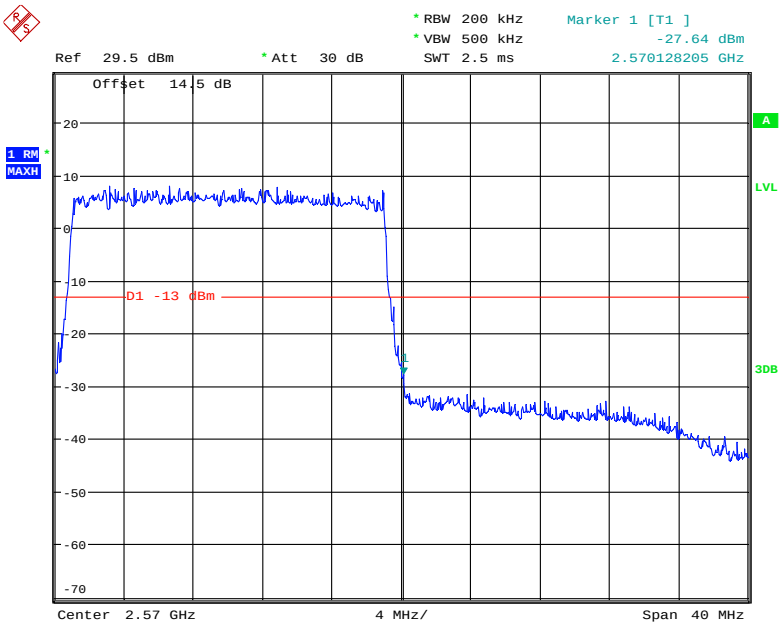
Date: 17.APR.2018 10:28:45

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



Date: 17.APR.2018 10:30:32

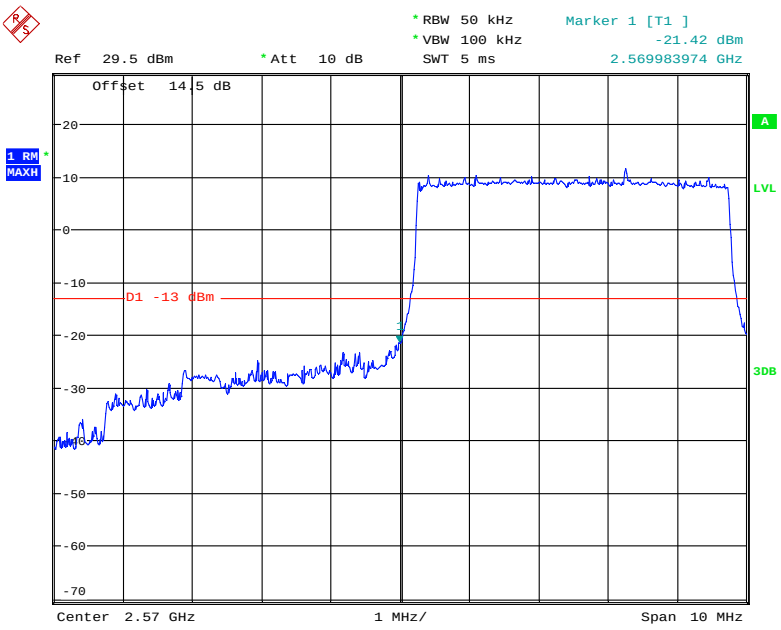
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2018 10:29:35

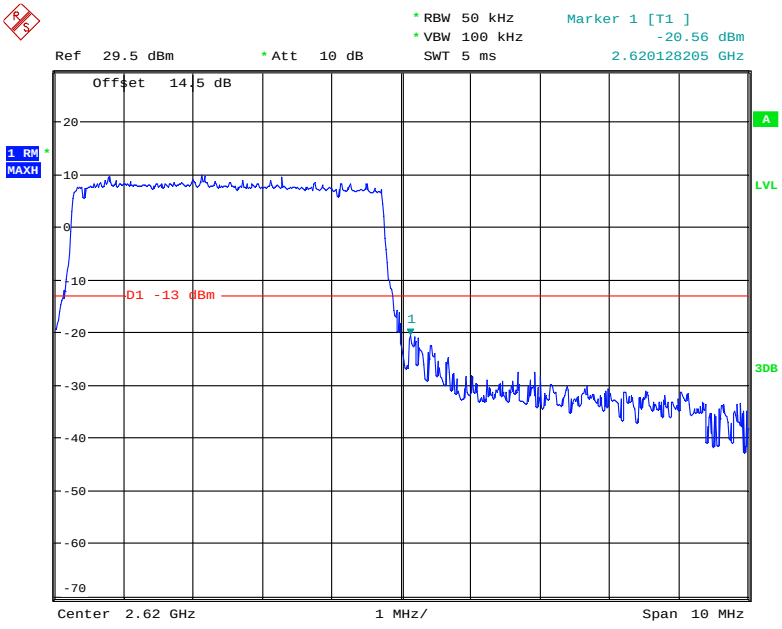
Band 38:

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



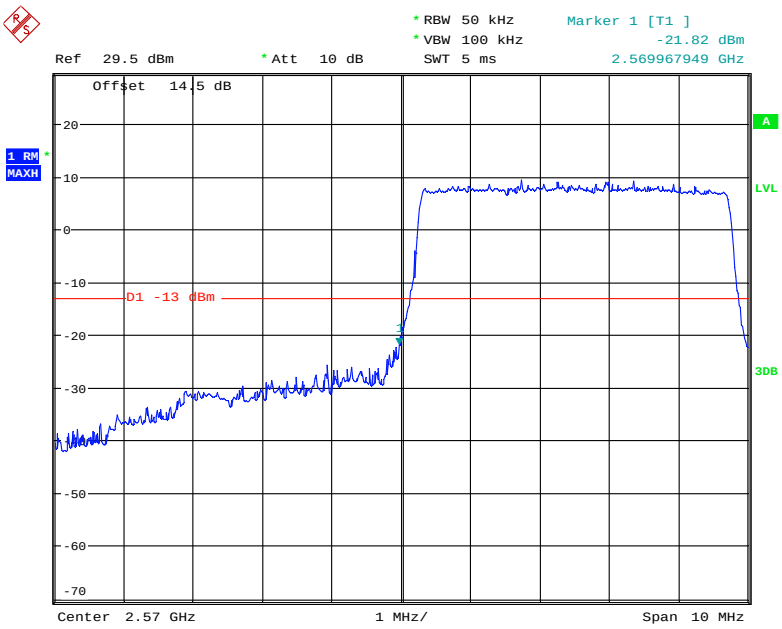
Date: 17.APR.2018 13:55:53

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



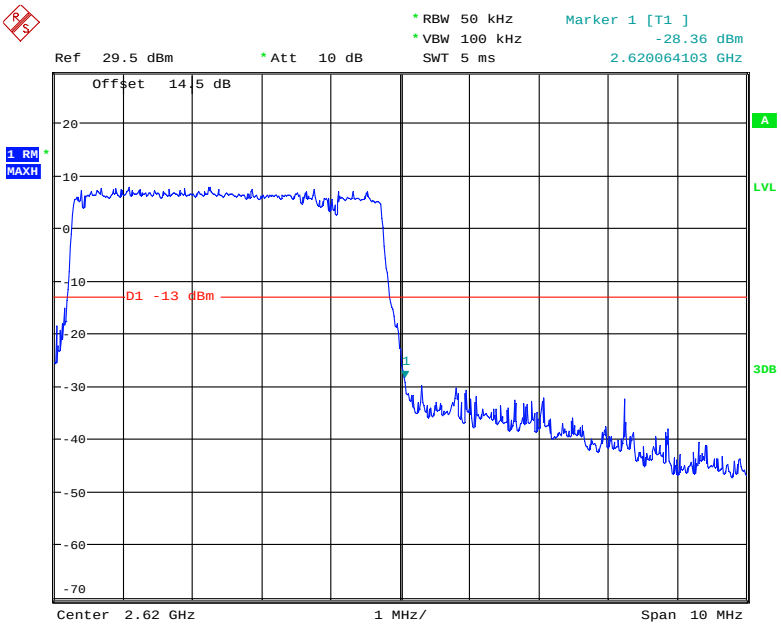
Date: 17.APR.2018 13:58:42

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



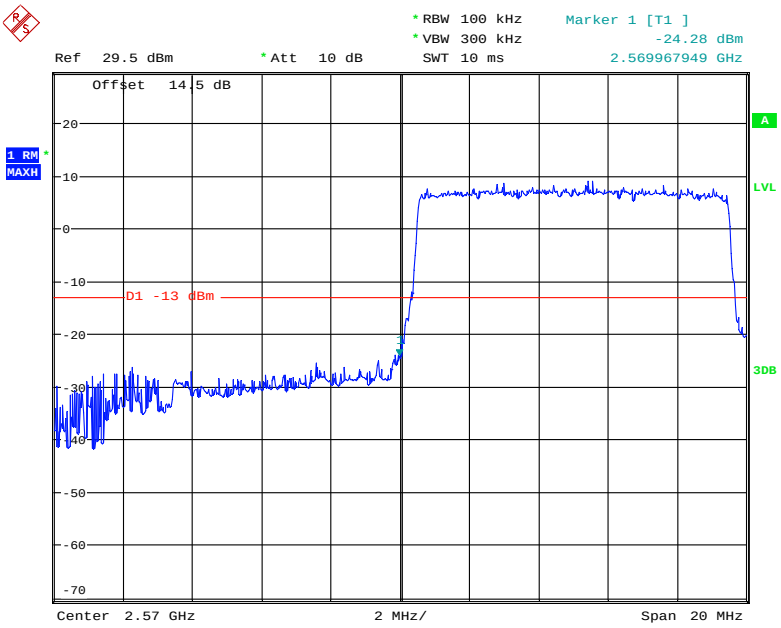
Date: 17.APR.2018 13:54:25

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



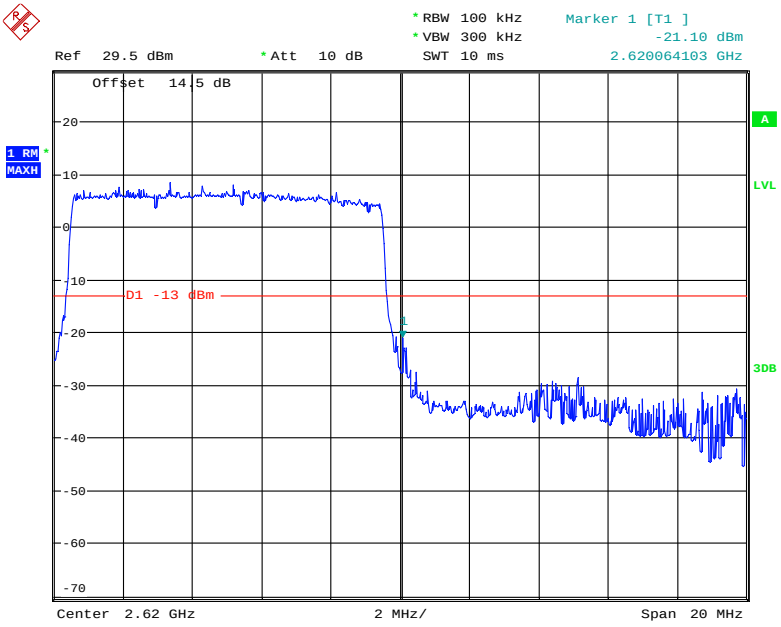
Date: 17.APR.2018 14:11:25

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



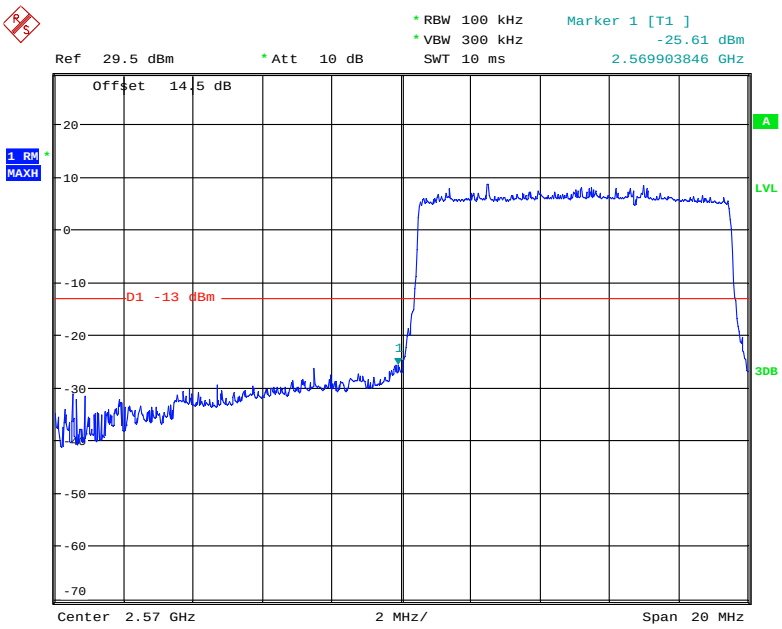
Date: 17.APR.2018 14:16:16

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



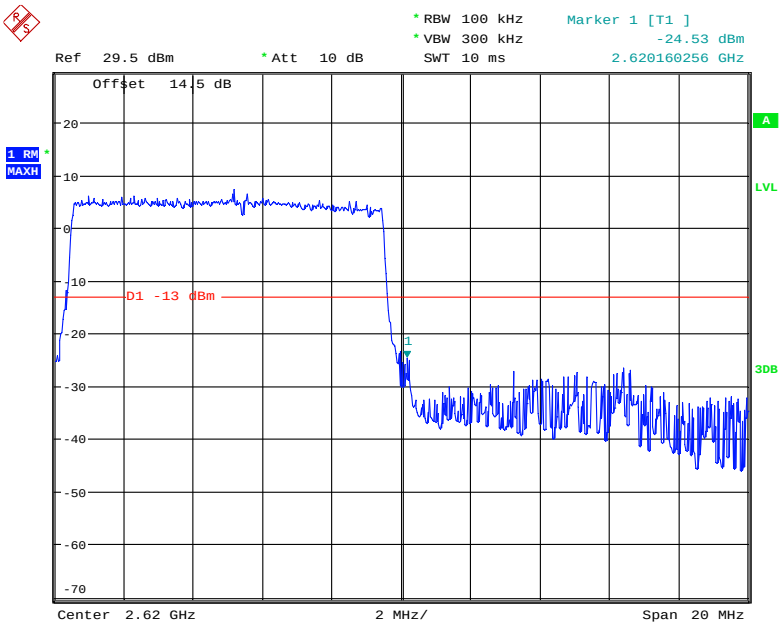
Date: 17.APR.2018 14:20:45

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



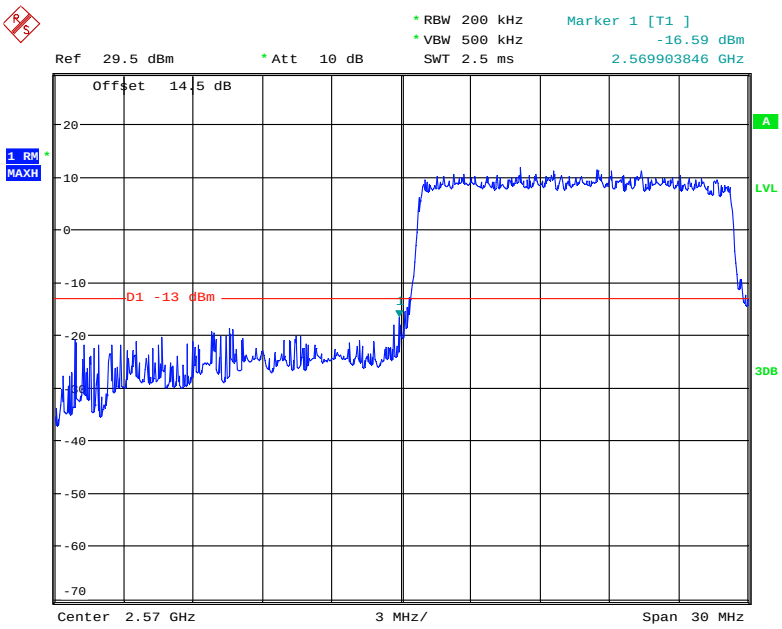
Date: 17.APR.2018 14:18:23

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



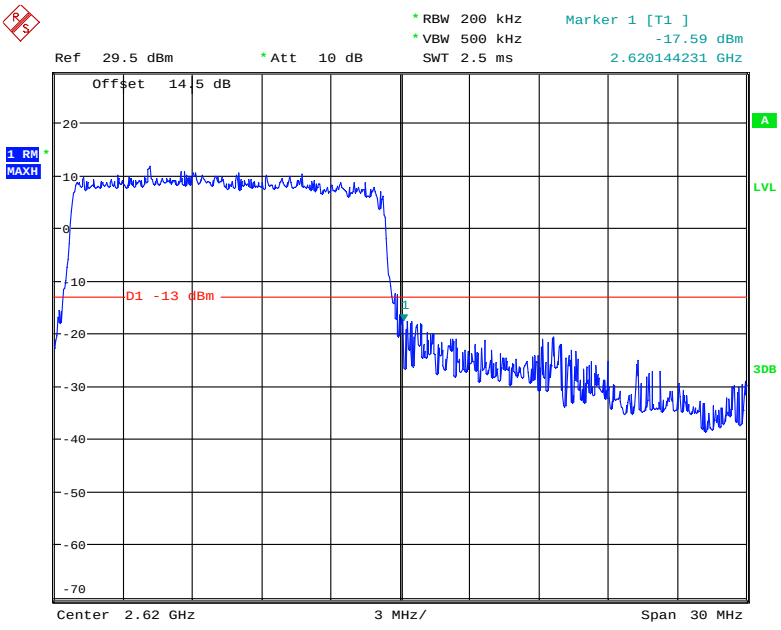
Date: 17.APR.2018 14:19:38

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



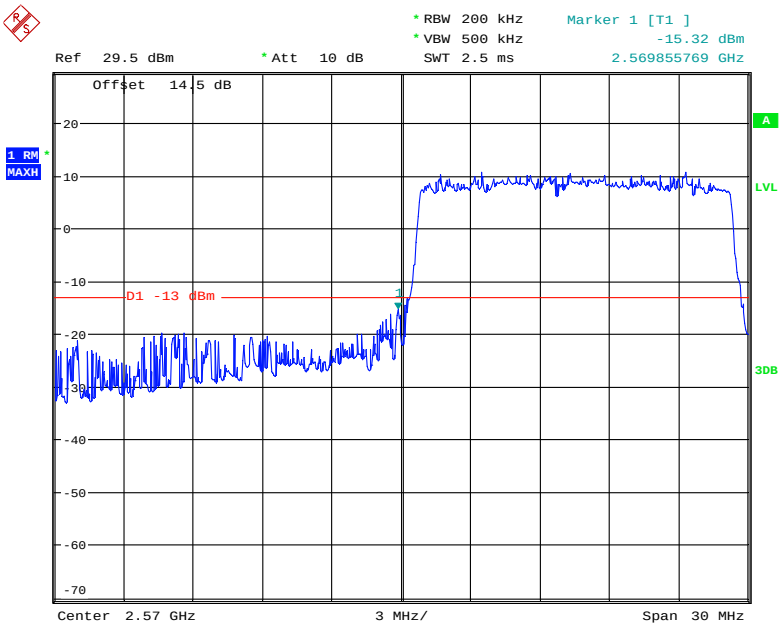
Date: 17.APR.2018 14:27:25

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



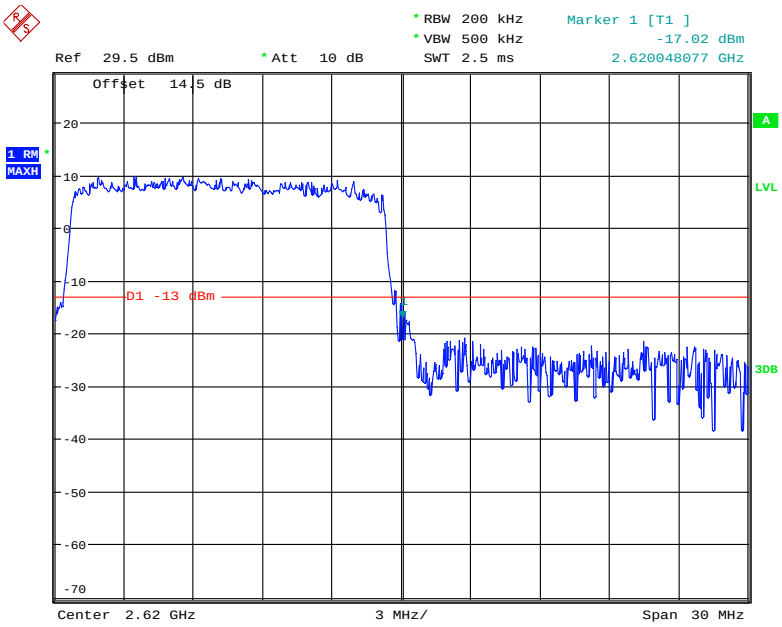
Date: 17.APR.2018 14:29:10

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



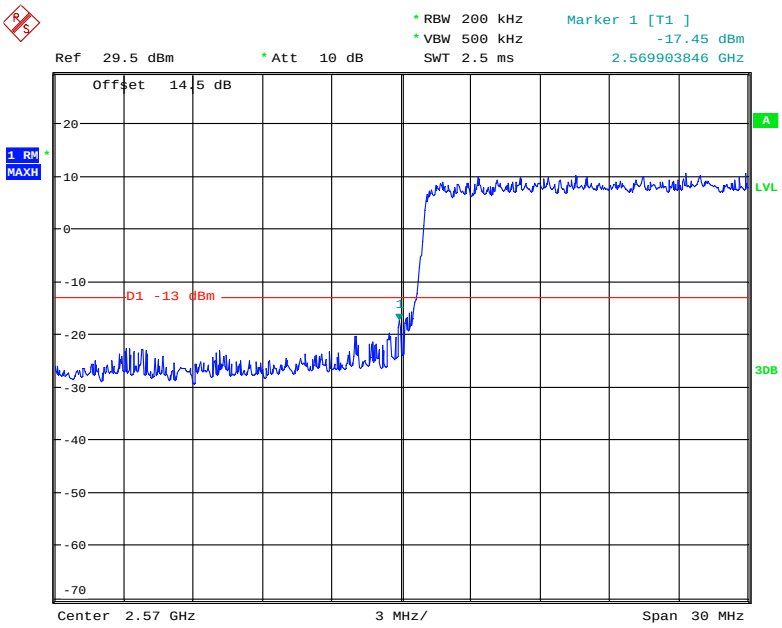
Date: 17.APR.2018 14:23:44

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



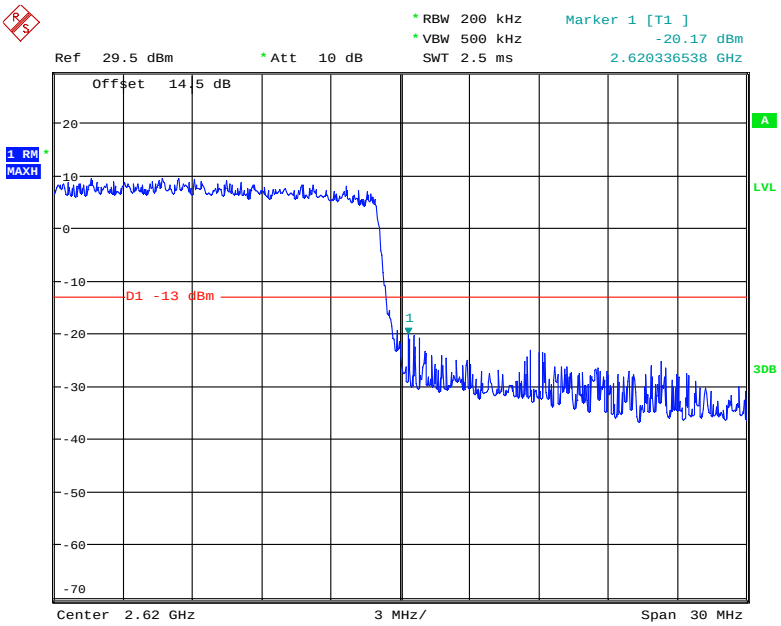
Date: 17.APR.2018 14:32:39

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



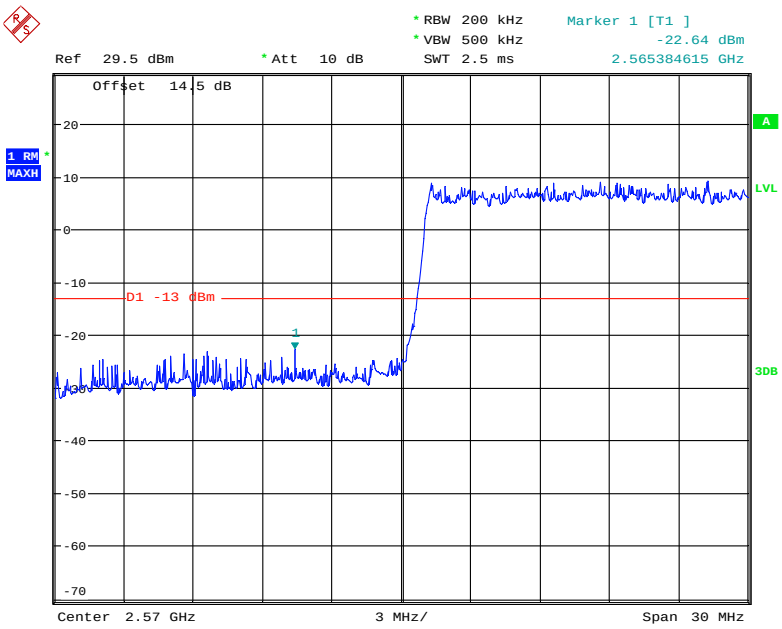
Date: 17.APR.2018 14:37:59

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



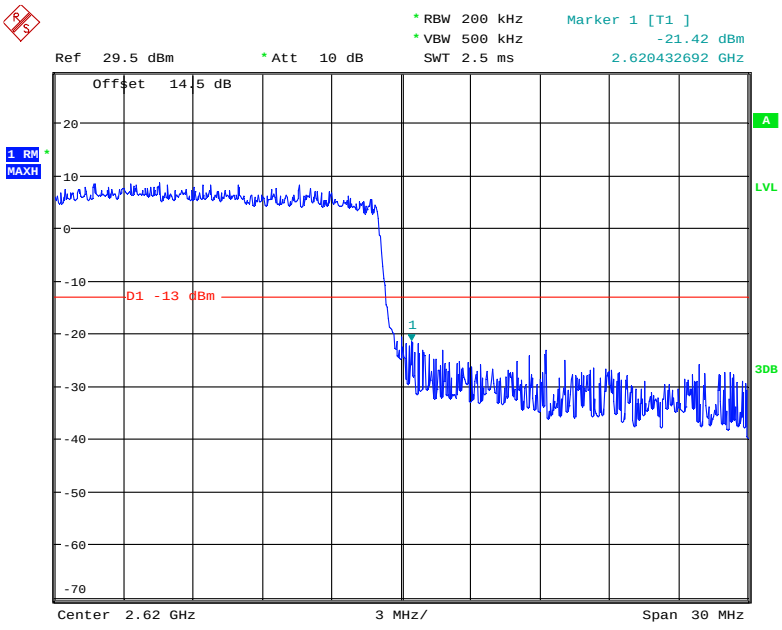
Date: 17.APR.2018 14:35:56

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



Date: 17.APR.2018 14:39:01

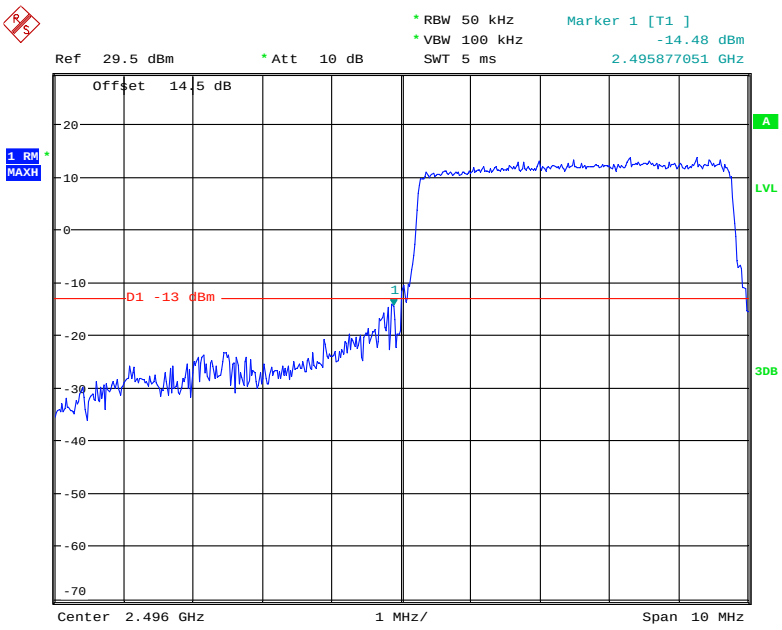
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 17.APR.2018 14:34:10

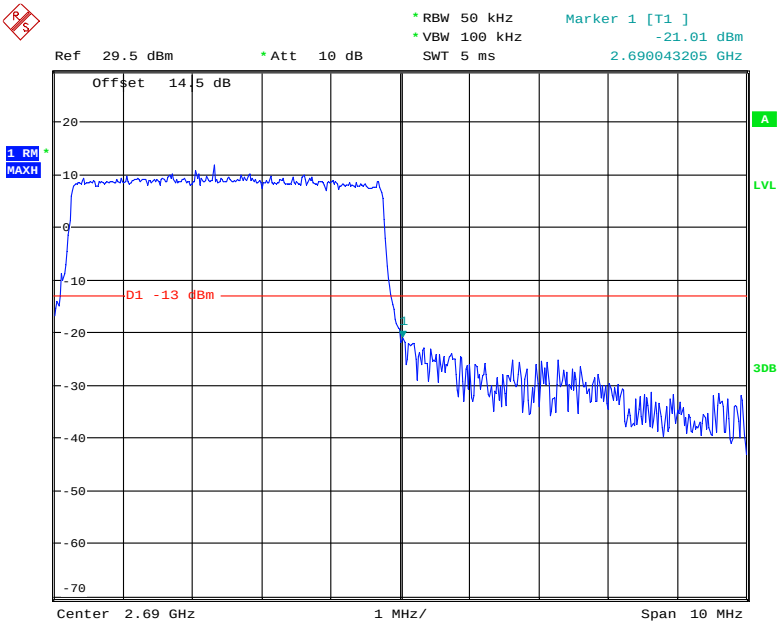
Band 41:

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



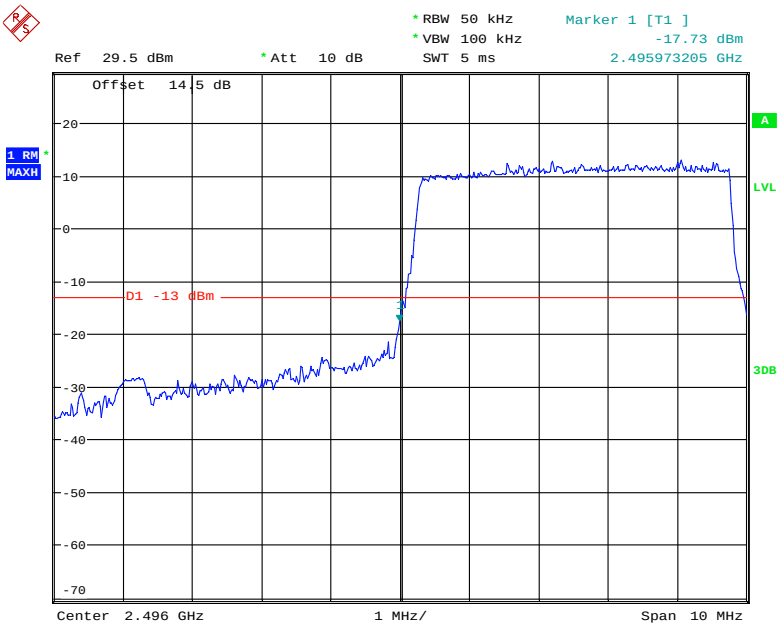
Date: 27.APR.2018 14:30:44

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



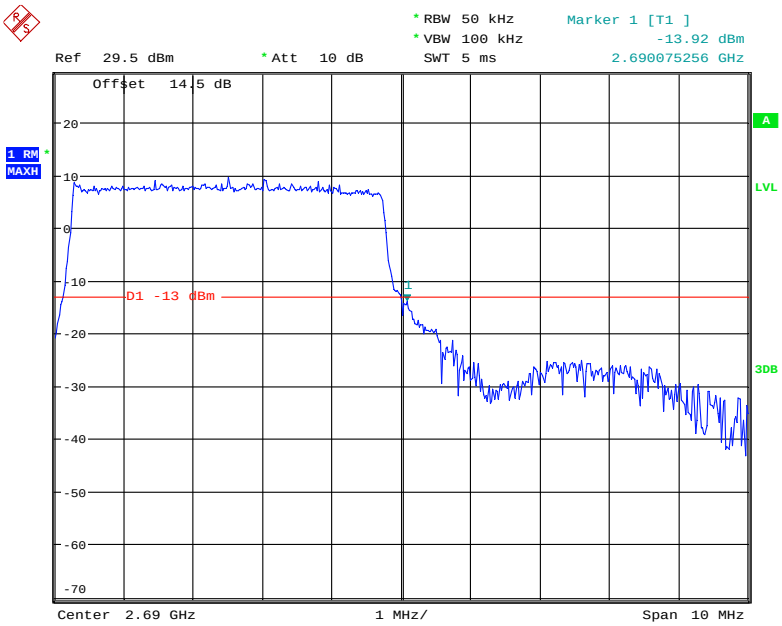
Date: 27.APR.2018 14:35:36

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



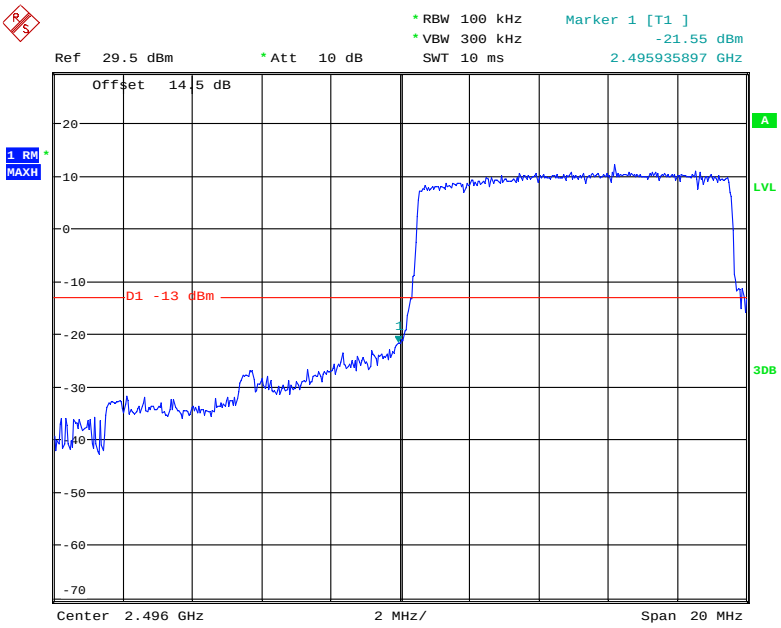
Date: 27.APR.2018 14:32:23

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



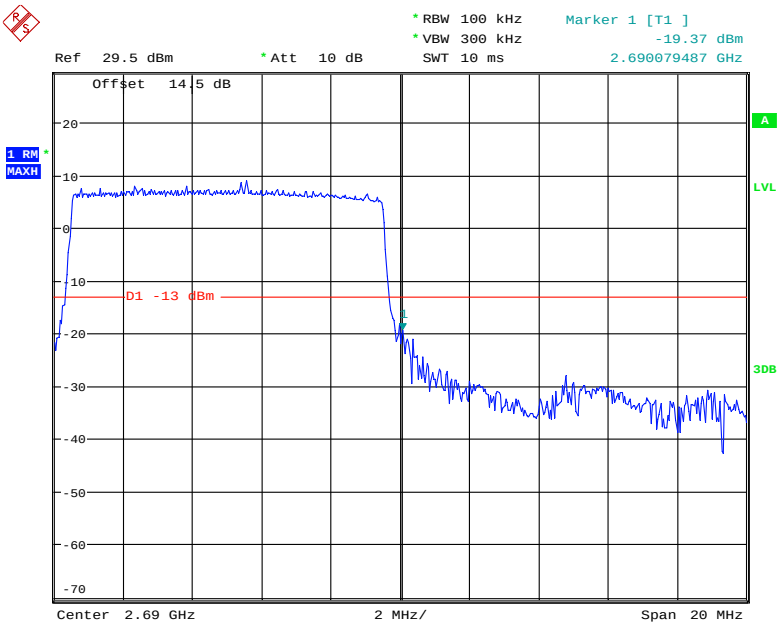
Date: 27.APR.2018 14:34:54

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



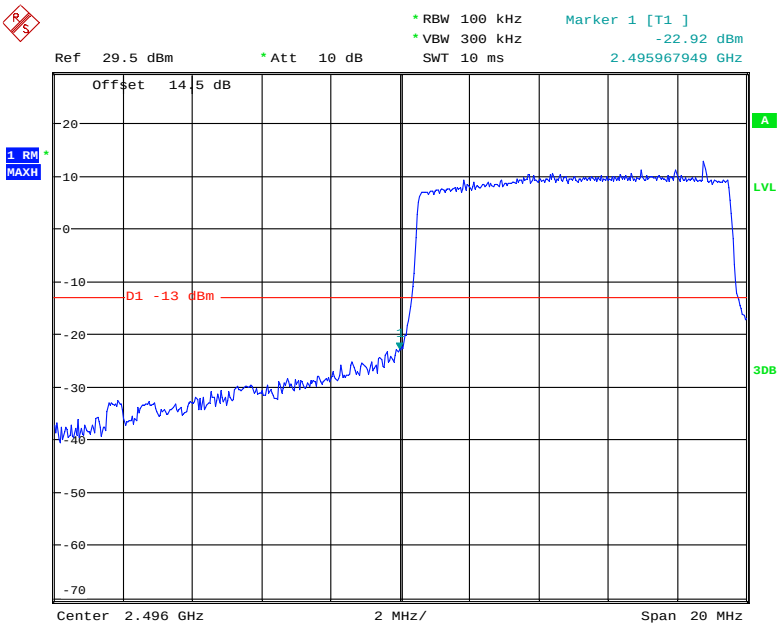
Date: 27.APR.2018 14:46:27

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



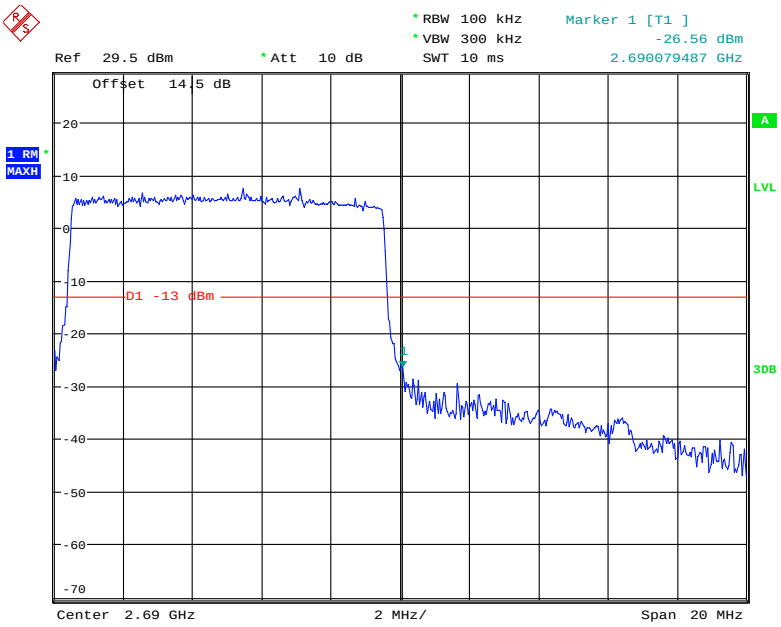
Date: 27.APR.2018 14:47:43

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



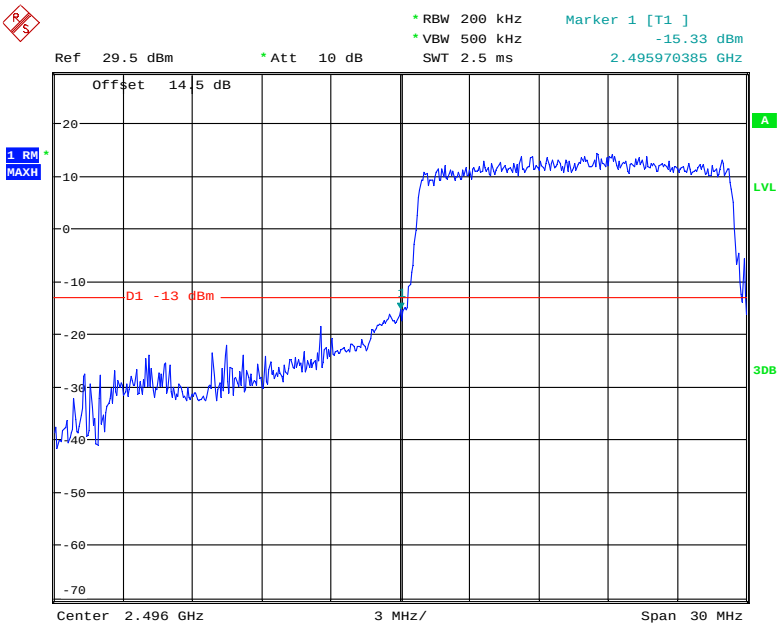
Date: 27.APR.2018 14:46:03

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



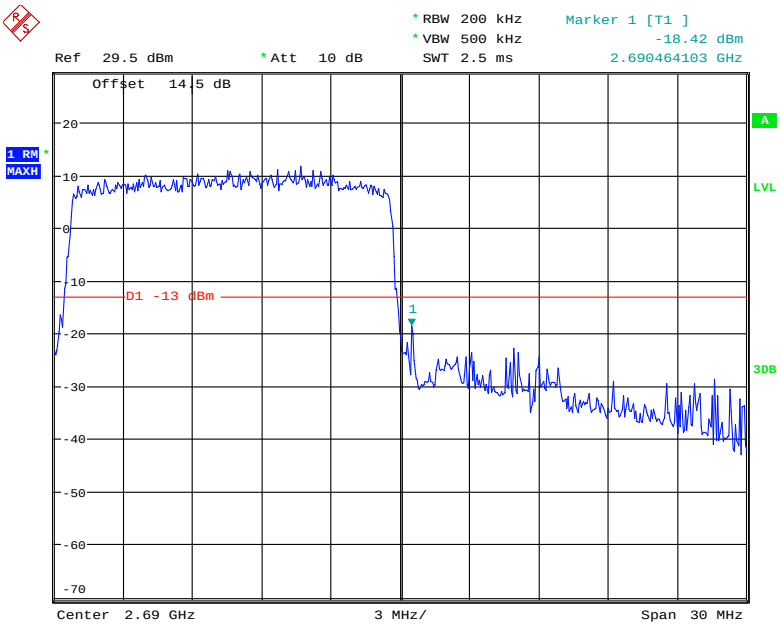
Date: 27.APR.2018 14:48:25

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



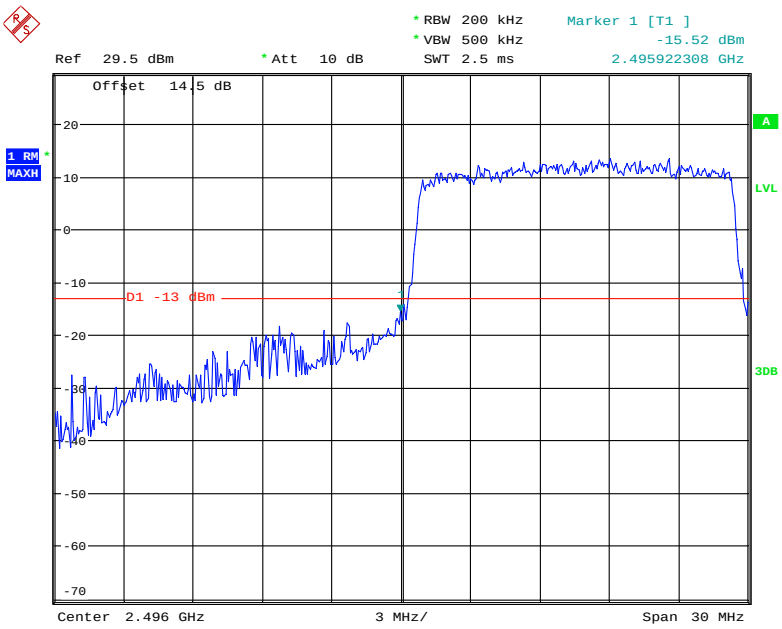
Date: 27.APR.2018 14:57:40

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



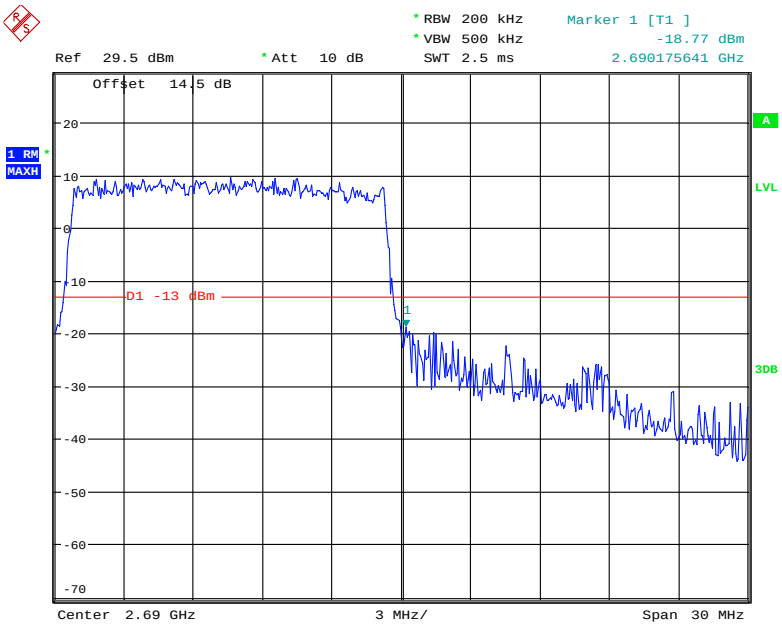
Date: 27.APR.2018 14:52:47

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



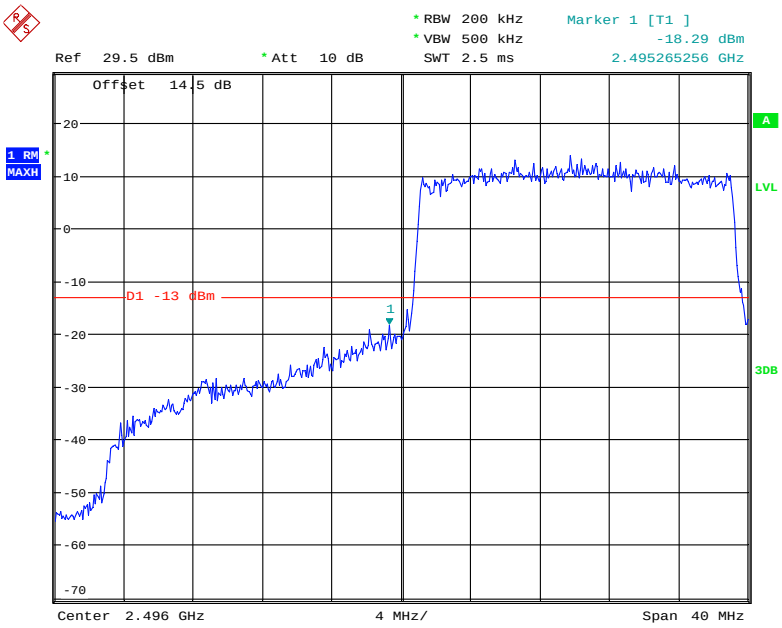
Date: 27.APR.2018 14:57:00

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



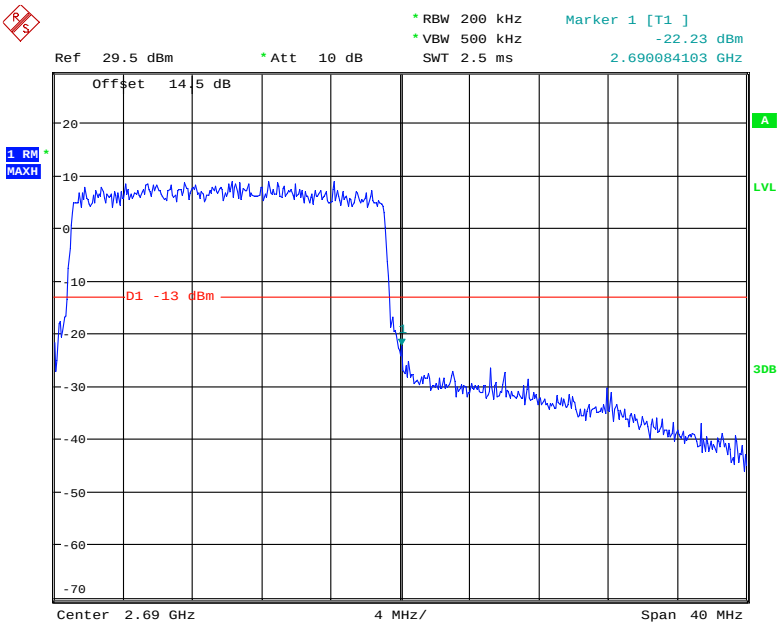
Date: 27.APR.2018 14:55:16

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



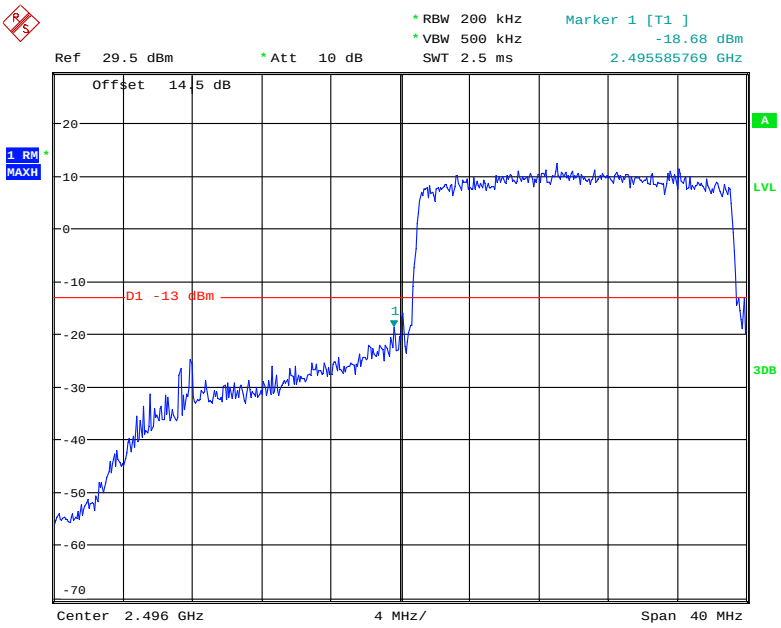
Date: 27.APR.2018 14:59:18

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



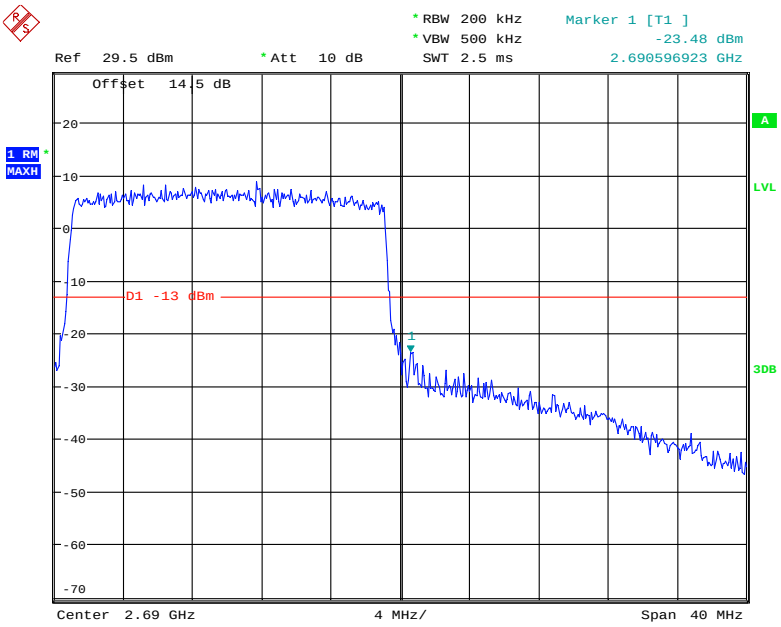
Date: 27.APR.2018 15:01:57

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



Date: 27.APR.2018 15:00:04

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



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

Applicable Standard

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

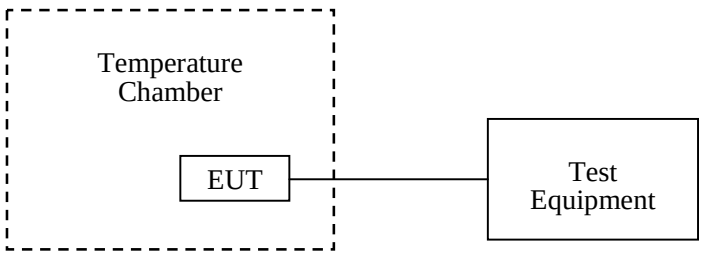
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data

Environmental Conditions

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

The testing was performed by Simon Wang on 2018-04-09.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	8	0.0096	2.5
-20		7	0.0084	2.5
-10		4	0.0048	2.5
0		5	0.0060	2.5
10		2	0.0024	2.5
20		3	0.0036	2.5
30		-1	-0.0012	2.5
40		1	0.0012	2.5
50		-2	-0.0024	2.5
25	V min.= 3.6	-4	-0.0048	2.5
	V max.= 4.35	-7	-0.0084	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	7	0.0084	2.5
-20		6	0.0072	2.5
-10		9	0.0108	2.5
0		12	0.0143	2.5
10		13	0.0155	2.5
20		15	0.0179	2.5
30		11	0.0131	2.5
40		10	0.0120	2.5
50		7	0.0084	2.5
25	V min.= 3.6	5	0.0060	2.5
	V max.= 4.35	2	0.0024	2.5

CDMA (1*RTT, BC0) Mode

Middle Channel, f_o=836.52MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-7	-0.0084	2.5
-20		-5	-0.0060	2.5
-10		-2	-0.0024	2.5
0		-3	-0.0036	2.5
10		-8	-0.0096	2.5
20		-7	-0.0084	2.5
30		-5	-0.0060	2.5
40		2	0.0024	2.5
50		-4	-0.0048	2.5
25	V min.=3.6	-6	-0.0072	2.5
	V max.= 4.35	-7	-0.0084	2.5

CDMA (EV-DO, BC0） Mode

Middle Channel, f_o=836.52MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-5	-0.0060	2.5
-20		-3	-0.0036	2.5
-10		-3	-0.0036	2.5
0		-3	-0.0036	2.5
10		-4	-0.0048	2.5
20		-6	-0.0072	2.5
30		-8	-0.0096	2.5
40		-7	-0.0084	2.5
25	V min.=3.6	-9	-0.0108	2.5
	V max.= 4.35	-8	-0.0096	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	5	0.0060	2.5
-20		6	0.0072	2.5
-10		4	0.0048	2.5
0		3	0.0036	2.5
10		1	0.0012	2.5
20		-1	-0.0012	2.5
30		2	0.0024	2.5
40		-3	-0.0036	2.5
50		-7	-0.0084	2.5
25	V min.= 3.6	-4	-0.0048	2.5
	V max.= 4.35	-6	-0.0072	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-14	-0.0074	pass
-20		-12	-0.0064	pass
-10		-8	-0.0043	pass
0		-10	-0.0053	pass
10		-11	-0.0059	pass
20		-13	-0.0069	pass
30		-9	-0.0048	pass
40		-7	-0.0037	pass
50		-6	-0.0032	pass
25	V min.= 3.6	-3	-0.0016	pass
	V max.= 4.35	1	0.0005	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	9	0.0048	pass
-20		4	0.0021	pass
-10		8	0.0043	pass
0		5	0.0027	pass
10		1	0.0005	pass
20		-2	-0.0011	pass
30		-1	-0.0005	pass
40		2	0.0011	pass
50		-3	-0.0016	pass
25	V min.= 3.6	-5	-0.0027	pass
	V max.= 4.35	-8	-0.0043	pass

CDMA (1*RTT, BC1) Mode

Middle Channel, f_o =1880.0MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-9	-0.0048	pass
-20		-5	-0.0027	pass
-10		-4	-0.0021	pass
0		-10	-0.0053	pass
10		-2	-0.0011	pass
20		-14	-0.0074	pass
30		-5	-0.0027	pass
40		-7	-0.0037	pass
50		-14	-0.0074	pass
25	V min.=3.6	-10	-0.0053	pass
	V max.= 4.35	-5	-0.0027	pass

CDMA (EV-DO, BC1) Mode

Middle Channel, f_o=1880.0MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-6	-0.0032	pass
-20		-3	-0.0016	pass
-10		-1	-0.0005	pass
0		-7	-0.0037	pass
10		-8	-0.0043	pass
20		-9	-0.0048	pass
30		-2	-0.0011	pass
40		-10	-0.0053	pass
50		-9	-0.0048	pass
25	V min.=3.6	-4	-0.0021	pass
	V max.= 4.35	-2	-0.0011	pass

WCDMA Mode

Middle Channel, f_o=1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	4	0.0021	pass
-20		7	0.0037	pass
-10		5	0.0027	pass
0		3	0.0016	pass
10		2	0.0011	pass
20		-1	-0.0005	pass
30		1	0.0005	pass
40		-3	-0.0016	pass
50		-2	-0.0011	pass
25	V min.= 3.6	-5	-0.0027	pass
	V max.= 4.35	-4	-0.0021	pass

LTE:
QPSK:

Band 5:

10.0 MHz Middle Channel, f_o = 836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-7	-0.00837	2.5
-20		-5	-0.00598	2.5
-10		-3	-0.00359	2.5
0		1	0.001195	2.5
10		-2	-0.00239	2.5
20		4	0.004782	2.5
30		2	0.002391	2.5
40		4	0.004782	2.5
50		7	0.008368	2.5
20	V min.= 3.6	3	0.003586	2.5
	V max.= 4.35	6	0.007173	2.5

Band 7:

10.0 MHz Middle Channel, f_o =2535 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-6	-0.00237	pass
-20		-4	-0.00158	pass
-10		-7	-0.00276	pass
0		-3	-0.00118	pass
10		-1	-0.00039	pass
20		-4	-0.00158	pass
30		2	0.000789	pass
40		1	0.000394	pass
50		4	0.001578	pass
20	V min.= 3.6	3	0.001183	pass
	V max.= 4.35	6	0.002367	pass

Band 38:

10.0 MHz Middle Channel, f_o=2595 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	5	0.001927	pass
-20		3	0.001156	pass
-10		6	0.002312	pass
0		4	0.001541	pass
10		2	0.000771	pass
20		-5	-0.00193	pass
30		-1	-0.00039	pass
40		-3	-0.00116	pass
50		-5	-0.00193	pass
20	V min.= 3.6	-4	-0.00154	pass
	V max.= 4.35	-2	-0.00077	pass

Band41:

10.0 MHz Middle Channel, f_o=2593 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.85	-6	-0.00231	pass
-20		-4	-0.00154	pass
-10		-7	-0.0027	pass
0		-5	-0.00193	pass
10		-2	-0.00077	pass
20		1	0.000386	pass
30		-3	-0.00116	pass
40		1	0.000386	pass
50		5	0.001928	pass
20	V min.= 3.6	3	0.001157	pass
	V max.= 4.3	7	0.0027	pass

16QAM:

Band 5:

10.0 MHz Middle Channel, f_o=836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-8	-0.00956	2.5
-20		-5	-0.00598	2.5
-10		-4	-0.00478	2.5
0		2	0.002391	2.5
10		-3	-0.00359	2.5
20		8	0.009564	2.5
30		1	0.001195	2.5
40		4	0.004782	2.5
50		5	0.005977	2.5
20	V min.= 3.6	7	0.008368	2.5
	V max.= 4.35	8	0.009564	2.5

Band 7:

10.0 MHz Middle Channel, f_o=2535 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-5	-0.00197	pass
-20		-1	-0.00039	pass
-10		-4	-0.00158	pass
0		-2	-0.00079	pass
10		1	0.000394	pass
20		3	0.001183	pass
30		2	0.000789	pass
40		-1	-0.00039	pass
50		3	0.001183	pass
20	V min.= 3.6	9	0.00355	pass
	V max.= 4.35	6	0.002367	pass

Band 38:

10.0 MHz Middle Channel, f_o=2595 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	6	0.002312	pass
-20		7	0.002697	pass
-10		4	0.001541	pass
0		2	0.000771	pass
10		3	0.001156	pass
20		3	0.001156	pass
30		-1	-0.00039	pass
40		-5	-0.00193	pass
50		-7	-0.0027	pass
20	V min.= 3.6	-3	-0.00116	pass
	V max.= 4.35	-6	-0.00231	pass

Band 41:

10.0 MHz Middle Channel, f_o=2593 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	-6	-0.00231	pass
-20		-1	-0.00039	pass
-10		-4	-0.00154	pass
0		-7	-0.0027	pass
10		-3	-0.00116	pass
20		-7	-0.0027	pass
30		2	0.000771	pass
40		4	0.001543	pass
50		5	0.001928	pass
20	V min.= 3.6	7	0.0027	pass
	V max.= 4.35	8	0.003085	pass

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