FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

BLU Products, Inc.

10814 NW 33rd St # 100 Doral, FL 33172, United States

FCC ID: YHLBLUSTMEGALTE

Report Type:	Product Type:
Original Report	Mobile phone

Report Number: RSZ180528003-00D

Report Date: 2018-07-02

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *BLU Products, Inc.'s* product, model number: *STUDIO MEGA LTE (FCC ID: YHLBLUSTMEGALTE)* or the "EUT" in this report was a *Mobile phone*, which was measured approximately: 15.4 cm (L) * 7.3 cm (W) *0.7 cm (H), rated with input voltage: DC 3.8 V from battery or DC 5V from adapter.

Adapter Information:
Model: US-ZC-1000
Input: AC 100-240V, 50/60Hz, 0.4 A
Output: DC 5V, 1.0A

**All measurement and test data in this report was gathered from production sample serial number: 1800793. (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-05-28.*

Objective

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

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

Related Submittal(s)/Grant(s)

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

Test Methodology

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

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

Applicable Standards: TIA/EIA 603-D.

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

Measurement Uncertainty

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

Test Facility

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

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

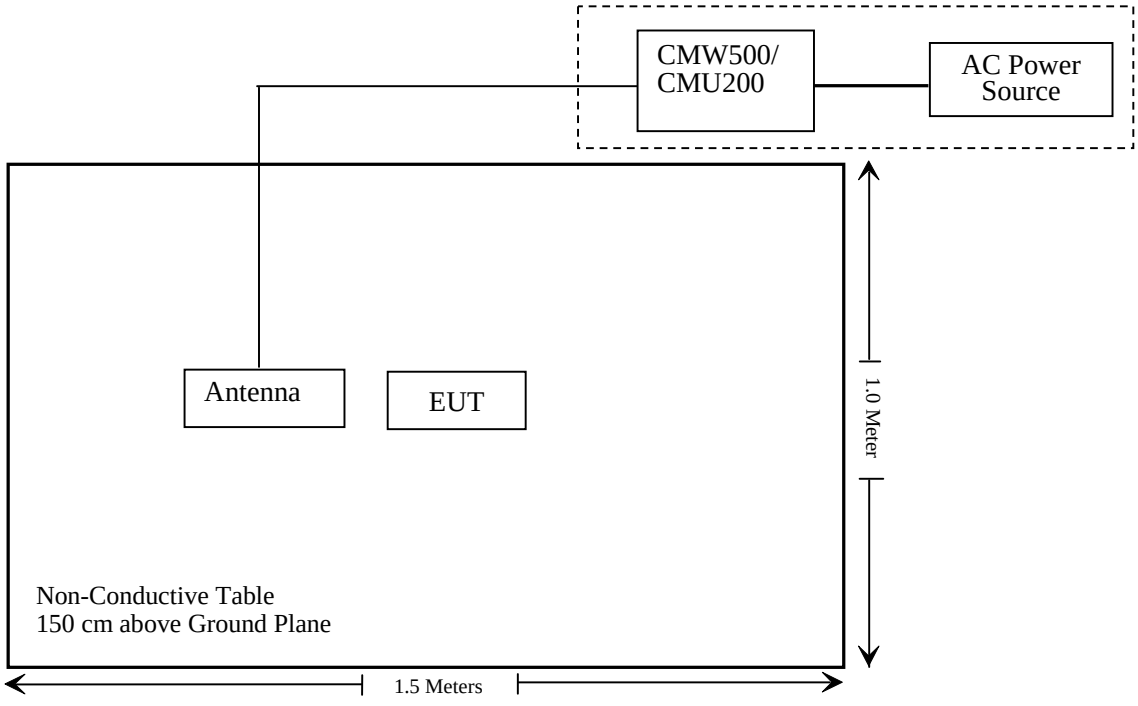
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

Note: * Please refer to SAR report released by BACL, report number: RSZ180528003-20

TEST EQUIPMENT LIST

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

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2017-12-24	2018-12-24
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2017-08-19	2018-08-19
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2017-12-21	2018-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Aglient	ESG Vector Signal Generator	E4438C	MY42080875	2018-05-09	2019-05-09
Rohde & Schwarz	Wideband Radio Communication Tester	CMU200	106891	2017-12-14	2018-12-14
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2018-04-24	2019-04-24
Ducommun technologies	RF Cable	RG-214	3	Each Time	
WEINSCHEL	10dB Attenuator	5324	AU 3842	Each Time	
N/A	Power Splitter	N/A	N/A	2018-05-21	2019-05-21

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

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

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ180528003-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

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

Applicable Standard

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

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

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

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

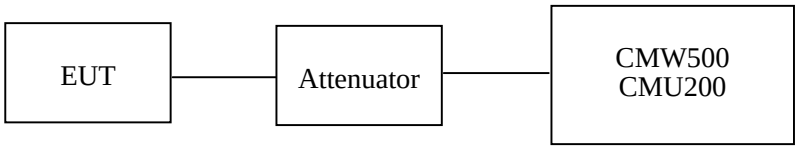
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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

Test Procedure

Conducted method:

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



Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

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

The testing was performed by Haiguo Li on 2018-06-01.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	31.50	38.45
	190	836.6	31.72	38.45
	251	848.8	31.90	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.46	30.16	28.43	27.28	38.45
	190	836.6	31.71	30.45	28.65	27.58	38.45
	251	848.8	31.92	30.62	28.86	27.80	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	24.91	23.29	21.60	20.22	38.45
	190	836.6	25.18	23.71	22.00	20.66	38.45
	251	848.8	25.63	23.90	22.27	20.87	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		21.85	21.86	21.91
		HSDPA	1	20.83	20.85	20.87
			2	20.72	20.72	20.75
			3	20.89	20.92	20.91
			4	20.73	20.78	20.78
		HSUPA	1	20.89	20.95	21.00
			2	20.83	20.85	20.97
			3	20.99	20.98	21.05
			4	20.81	20.87	20.93
			5	20.94	21.08	21.08
		HSPA+	1	21.02	20.96	21.11

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.40	33
	661	1880.0	28.20	33
	810	1909.8	28.00	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.42	27.70	25.98	24.85	33
	661	1880.0	28.22	27.51	25.84	24.77	33
	810	1909.8	28.01	27.33	25.65	24.61	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.27	24.39	22.26	21.10	33
	661	1880.0	25.24	24..35	22.34	21.07	33
	810	1909.8	25.17	24.29	22.26	21.04	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		20.70	20.74	20.91
		HSDPA	1	20.60	20.63	20.35
			2	20.53	20.59	20.36
			3	20.66	20.71	20.43
			4	20.54	20.57	20.31
		HSUPA	1	20.58	20.55	20.77
			2	20.49	20.45	20.67
			3	20.70	20.66	20.85
			4	20.50	20.48	20.73
			5	20.63	20.64	20.82
		HSPA+	1	20.72	20.75	20.89

AWS Band (Part 27)

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band IV)	Normal	RMC12.2k		21.48	21.43	21.30
		HSDPA	1	20.93	20.87	20.71
			2	20.81	20.80	20.62
			3	21.05	20.94	20.78
			4	20.82	20.80	20.65
		HSUPA	1	20.97	20.89	20.83
			2	20.87	20.77	20.76
			3	21.07	21.01	20.88
			4	20.92	20.81	20.75
			5	21.01	20.93	20.93
		HSPA+	1	20.97	20.98	21.02

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.52	13
	Middle	0.39	13
	High	0.56	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.62	13
	Middle	2.42	13
	High	2.64	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	5.32	13
	Middle	4.89	13
	High	5.42	13
HSDPA (16QAM)	Low	5.37	13
	Middle	4.81	13
	High	5.46	13
HSUPA (BPSK)	Low	5.39	13
	Middle	4.82	13
	High	5.46	13
HSPA+	Low	5.38	13
	Middle	4.83	13
	High	5.47	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.52	13
	Middle	0.32	13
	High	0.59	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.62	13
	Middle	2.42	13
	High	2.67	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.02	13
	Middle	2.81	13
	High	3.06	13
HSDPA (16QAM)	Low	3.09	13
	Middle	2.86	13
	High	3.05	13
HSUPA (BPSK)	Low	3.09	13
	Middle	2.86	13
	High	3.04	13
HSPA+	Low	3.05	13
	Middle	2.83	13
	High	3.07	13

AWS Band (Part 27)

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	4.32	13
	Middle	4.13	13
	High	4.35	13
HSDPA (16QAM)	Low	4.36	13
	Middle	4.15	13
	High	4.39	13
HSUPA (BPSK)	Low	4.38	13
	Middle	4.19	13
	High	4.33	13
HSPA+	Low	4.37	13
	Middle	4.16	13
	High	4.36	13

Radiated Power
GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.60	92.54	315	2.1	H	30.5	0.70	0.0	29.80	38.45	8.65
836.60	87.25	319	2.0	V	26.8	0.70	0.0	26.10	38.45	12.35
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	89.73	80	1.8	H	19.7	1.30	9.40	27.80	33	5.2
1880.00	87.25	332	2.2	V	17.0	1.30	9.40	25.10	33	7.9

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.60	85.51	126	2.2	H	23.5	0.70	0.0	22.80	38.45	15.65
836.60	80.15	124	1.8	V	19.7	0.70	0.0	19.00	38.45	19.45
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	84.42	73	1.1	H	14.4	1.30	9.40	22.50	33	10.5
1880.00	82.05	195	2.2	V	11.8	1.30	9.40	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/27	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.60	82.25	326	2.0	H	20.2	0.70	0.0	19.50	38.45	18.95
836.60	76.64	324	2.1	V	16.2	0.70	0.0	15.50	38.45	22.95
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	83.85	244	1.4	H	13.8	1.30	9.40	21.90	33	11.1
1880.00	79.34	306	1.3	V	9.1	1.30	9.40	17.20	33	15.8
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	84.56	220	2.4	H	11.4	1.30	8.90	19.00	30	11
1732.60	81.26	344	1.7	V	8.7	1.30	8.90	16.30	30	13.7

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

LTE Band 2:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.26	22.56	22.14
		RB Size=1, RB Offset=2	22.14	22.47	22.04
		RB Size=1, RB Offset=5	22.39	22.69	22.25
		RB Size=3, RB Offset=0	22.18	22.47	22.03
		RB Size=3, RB Offset=1	22.33	22.61	22.19
		RB Size=3, RB Offset=2	22.26	22.58	22.15
		RB Size=6, RB Offset=0	22.47	22.77	22.31
	16QAM	RB Size=1, RB Offset=0	22.38	22.67	22.22
		RB Size=1, RB Offset=2	22.14	22.48	22.03
		RB Size=1, RB Offset=5	22.37	22.65	22.18
		RB Size=3, RB Offset=0	22.25	22.57	22.11
		RB Size=3, RB Offset=1	22.47	22.74	22.30
		RB Size=3, RB Offset=2	22.26	22.56	22.14
		RB Size=6, RB Offset=0	22.44	22.68	22.25
3.0	QPSK	RB Size=1, RB Offset=0	22.25	22.64	22.13
		RB Size=1, RB Offset=7	22.43	22.85	22.36
		RB Size=1, RB Offset=14	22.25	22.69	22.20
		RB Size=8, RB Offset=0	22.45	22.85	22.35
		RB Size=8, RB Offset=4	22.36	22.69	22.18
		RB Size=8, RB Offset=7	22.51	22.94	22.43
		RB Size=15, RB Offset=0	22.31	22.77	22.29
	16QAM	RB Size=1, RB Offset=0	22.25	22.63	22.21
		RB Size=1, RB Offset=7	22.42	22.85	22.36
		RB Size=1, RB Offset=14	22.25	22.62	22.21
		RB Size=8, RB Offset=0	22.46	22.83	22.35
		RB Size=8, RB Offset=4	22.37	22.71	22.28
		RB Size=8, RB Offset=7	22.47	22.89	22.44
		RB Size=15, RB Offset=0	22.34	22.66	22.26

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	22.24	22.62	22.14
		RB Size=1, RB Offset=12	22.47	22.78	22.36
		RB Size=1, RB Offset=24	22.26	22.68	22.16
		RB Size=12, RB Offset=0	22.44	22.77	22.33
		RB Size=12, RB Offset=6	22.32	22.68	22.21
		RB Size=12, RB Offset=11	22.59	22.86	22.42
		RB Size=25, RB Offset=0	22.34	22.80	22.25
	16QAM	RB Size=1, RB Offset=0	22.41	22.79	22.29
		RB Size=1, RB Offset=12	22.24	22.69	22.14
		RB Size=1, RB Offset=24	22.41	22.77	22.31
		RB Size=12, RB Offset=0	22.41	22.70	22.28
		RB Size=12, RB Offset=6	22.48	22.91	22.33
		RB Size=12, RB Offset=11	22.36	22.76	22.26
		RB Size=25, RB Offset=0	22.49	22.84	22.44
10.0	QPSK	RB Size=1, RB Offset=0	22.39	22.85	22.33
		RB Size=1, RB Offset=24	22.30	22.69	22.17
		RB Size=1, RB Offset=49	22.40	22.83	22.33
		RB Size=25, RB Offset=0	22.32	22.77	22.21
		RB Size=25, RB Offset=12	22.50	22.92	22.40
		RB Size=25, RB Offset=24	22.34	22.79	22.26
		RB Size=50, RB Offset=0	22.50	22.86	22.44
	16QAM	RB Size=1, RB Offset=0	22.29	22.69	22.15
		RB Size=1, RB Offset=24	22.39	22.84	22.35
		RB Size=1, RB Offset=49	22.25	22.71	22.17
		RB Size=25, RB Offset=0	22.39	22.78	22.32
		RB Size=25, RB Offset=12	22.40	22.79	22.20
		RB Size=25, RB Offset=24	22.45	22.93	22.41
		RB Size=50, RB Offset=0	22.34	22.83	22.26

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	22.35	23.02	22.23
		RB Size=1, RB Offset=37	22.17	22.86	22.07
		RB Size=1, RB Offset=74	22.32	23.03	22.19
		RB Size=36, RB Offset=0	22.26	22.99	22.09
		RB Size=36, RB Offset=18	22.42	23.14	22.30
		RB Size=36, RB Offset=37	22.29	22.93	22.17
		RB Size=75, RB Offset=0	22.43	23.10	22.30
	16QAM	RB Size=1, RB Offset=0	22.28	23.05	22.20
		RB Size=1, RB Offset=37	22.12	22.85	22.03
		RB Size=1, RB Offset=74	22.33	23.05	22.25
		RB Size=36, RB Offset=0	22.27	22.93	22.22
		RB Size=36, RB Offset=18	22.41	23.13	22.24
		RB Size=36, RB Offset=37	22.24	22.98	22.07
		RB Size=75, RB Offset=0	22.38	23.18	22.38
20.0	QPSK	RB Size=1, RB Offset=0	22.35	22.99	22.25
		RB Size=1, RB Offset=49	22.13	22.89	22.04
		RB Size=1, RB Offset=99	22.33	23.07	22.24
		RB Size=50, RB Offset=0	22.26	22.95	22.12
		RB Size=50, RB Offset=24	22.40	23.05	22.29
		RB Size=50, RB Offset=49	22.19	22.98	22.15
		RB Size=100, RB Offset=0	22.45	23.18	22.29
	16QAM	RB Size=1, RB Offset=0	22.36	22.98	22.22
		RB Size=1, RB Offset=49	22.14	22.84	22.07
		RB Size=1, RB Offset=99	22.31	22.99	22.28
		RB Size=50, RB Offset=0	22.30	22.93	22.18
		RB Size=50, RB Offset=24	22.42	23.04	22.29
		RB Size=50, RB Offset=49	22.18	22.95	22.17
		RB Size=100, RB Offset=0	22.37	23.11	22.35

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.60	13	Pass
QPSK (100RB Size)	5.56	13	Pass
16QAM (1RB Size)	4.70	13	Pass
16QAM (100RB Size)	5.69	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	84.70	75	1.6	H	14.7	1.30	9.40	22.80	33
1880.00	81.63	134	1.5	V	11.4	1.30	9.40	19.50	33
3 MHz Bandwidth									
1880.00	84.33	358	1.1	H	14.3	1.30	9.40	22.40	33
1880.00	82.26	296	1.1	V	12.0	1.30	9.40	20.10	33
5 MHz Bandwidth									
1880.00	84.20	242	1.5	H	14.2	1.30	9.40	22.30	33
1880.00	82.11	77	2.2	V	11.8	1.30	9.40	19.90	33
10 MHz Bandwidth									
1880.00	84.63	207	2.3	H	14.6	1.30	9.40	22.70	33
1880.00	82.42	207	1.6	V	12.2	1.30	9.40	20.30	33
15 MHz Bandwidth									
1880.00	84.96	182	1.4	H	14.9	1.30	9.40	23.00	33
1880.00	82.26	309	1.7	V	12.0	1.30	9.40	20.10	33
20 MHz Bandwidth									
1880.00	84.78	279	2.1	H	14.7	1.30	9.40	22.80	33
1880.00	82.56	41	1.1	V	12.3	1.30	9.40	20.40	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	84.54	318	1.9	H	14.5	1.30	9.40	22.60	33
1880.00	81.13	114	1.8	V	10.9	1.30	9.40	19.00	33
3 MHz Bandwidth									
1880.00	84.79	204	1.7	H	14.7	1.30	9.40	22.80	33
1880.00	81.86	212	1.8	V	11.6	1.30	9.40	19.70	33
5 MHz Bandwidth									
1880.00	84.28	71	1.4	H	14.2	1.30	9.40	22.30	33
1880.00	81.63	234	2.2	V	11.4	1.30	9.40	19.50	33
10 MHz Bandwidth									
1880.00	84.96	60	1.5	H	14.9	1.30	9.40	23.00	33
1880.00	81.79	323	1.0	V	11.5	1.30	9.40	19.60	33
15 MHz Bandwidth									
1880.00	84.86	24	1.8	H	14.8	1.30	9.40	22.90	33
1880.00	81.65	316	2.4	V	11.4	1.30	9.40	19.50	33
20 MHz Bandwidth									
1880.00	84.79	25	2.1	H	14.7	1.30	9.40	22.80	33
1880.00	81.63	297	1.4	V	11.4	1.30	9.40	19.50	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.21	22.55	22.16
		RB Size=1, RB Offset=2	22.06	22.33	22.01
		RB Size=1, RB Offset=5	22.24	22.57	22.19
		RB Size=3, RB Offset=0	22.10	22.39	22.08
		RB Size=3, RB Offset=1	22.25	22.64	22.27
		RB Size=3, RB Offset=2	22.12	22.40	22.07
		RB Size=6, RB Offset=0	22.31	22.64	22.31
	16QAM	RB Size=1, RB Offset=0	22.23	22.49	22.13
		RB Size=1, RB Offset=2	22.02	22.39	22.05
		RB Size=1, RB Offset=5	22.19	22.50	22.15
		RB Size=3, RB Offset=0	22.21	22.52	22.06
		RB Size=3, RB Offset=1	22.27	22.60	22.22
		RB Size=3, RB Offset=2	22.11	22.51	22.08
		RB Size=6, RB Offset=0	22.31	22.62	22.19
3.0	QPSK	RB Size=1, RB Offset=0	22.22	22.57	22.18
		RB Size=1, RB Offset=7	22.01	22.36	22.00
		RB Size=1, RB Offset=14	22.20	22.52	22.12
		RB Size=8, RB Offset=0	22.15	22.46	22.00
		RB Size=8, RB Offset=4	22.27	22.68	22.25
		RB Size=8, RB Offset=7	22.14	22.46	22.09
		RB Size=15, RB Offset=0	22.27	22.59	22.25
	16QAM	RB Size=1, RB Offset=0	22.18	22.51	22.12
		RB Size=1, RB Offset=7	22.06	22.32	21.96
		RB Size=1, RB Offset=14	22.18	22.57	22.16
		RB Size=8, RB Offset=0	22.19	22.44	22.16
		RB Size=8, RB Offset=4	22.27	22.59	22.18
		RB Size=8, RB Offset=7	22.12	22.37	22.02
		RB Size=15, RB Offset=0	22.22	22.64	22.26

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	22.53	22.83	22.41
		RB Size=1, RB Offset=12	22.37	22.69	22.31
		RB Size=1, RB Offset=24	22.52	22.88	22.42
		RB Size=12, RB Offset=0	22.45	22.79	22.34
		RB Size=12, RB Offset=6	22.65	22.87	22.47
		RB Size=12, RB Offset=11	22.42	22.78	22.44
		RB Size=25, RB Offset=0	22.59	22.93	22.49
	16QAM	RB Size=1, RB Offset=0	22.54	22.82	22.42
		RB Size=1, RB Offset=12	22.35	22.73	22.32
		RB Size=1, RB Offset=24	22.52	22.84	22.49
		RB Size=12, RB Offset=0	22.48	22.78	22.42
		RB Size=12, RB Offset=6	22.62	22.94	22.50
		RB Size=12, RB Offset=11	22.42	22.80	22.35
		RB Size=25, RB Offset=0	22.56	22.89	22.52
10.0	QPSK	RB Size=1, RB Offset=0	22.53	22.87	22.49
		RB Size=1, RB Offset=24	22.35	22.71	22.28
		RB Size=1, RB Offset=49	22.55	22.90	22.41
		RB Size=25, RB Offset=0	22.50	22.77	22.43
		RB Size=25, RB Offset=12	22.57	22.97	22.61
		RB Size=25, RB Offset=24	22.47	22.80	22.40
		RB Size=50, RB Offset=0	22.60	23.02	22.51
	16QAM	RB Size=1, RB Offset=0	22.54	22.82	22.44
		RB Size=1, RB Offset=24	22.37	22.67	22.26
		RB Size=1, RB Offset=49	22.59	22.82	22.43
		RB Size=25, RB Offset=0	22.47	22.73	22.45
		RB Size=25, RB Offset=12	22.58	22.92	22.55
		RB Size=25, RB Offset=24	22.43	22.73	22.31
		RB Size=50, RB Offset=0	22.64	22.91	22.48

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	22.54	22.82	22.43
		RB Size=1, RB Offset=37	22.35	22.73	22.32
		RB Size=1, RB Offset=74	22.60	22.88	22.44
		RB Size=36, RB Offset=0	22.43	22.70	22.35
		RB Size=36, RB Offset=18	22.64	22.93	22.55
		RB Size=36, RB Offset=37	22.48	22.82	22.44
		RB Size=75, RB Offset=0	22.71	22.96	22.48
	16QAM	RB Size=1, RB Offset=0	22.29	22.90	22.27
		RB Size=1, RB Offset=37	22.11	22.78	22.06
		RB Size=1, RB Offset=74	22.33	22.92	22.27
		RB Size=36, RB Offset=0	22.24	22.85	22.19
		RB Size=36, RB Offset=18	22.34	23.02	22.35
		RB Size=36, RB Offset=37	22.24	22.82	22.11
		RB Size=75, RB Offset=0	22.40	22.96	22.32
20.0	QPSK	RB Size=1, RB Offset=0	22.32	22.87	22.27
		RB Size=1, RB Offset=49	22.10	22.77	22.11
		RB Size=1, RB Offset=99	22.28	22.89	22.31
		RB Size=50, RB Offset=0	22.23	22.85	22.13
		RB Size=50, RB Offset=24	22.36	22.98	22.31
		RB Size=50, RB Offset=49	22.17	22.86	22.22
		RB Size=100, RB Offset=0	22.31	23.00	22.42
	16QAM	RB Size=1, RB Offset=0	22.17	22.78	22.13
		RB Size=1, RB Offset=49	22.33	22.95	22.29
		RB Size=1, RB Offset=99	22.16	22.71	22.12
		RB Size=50, RB Offset=0	22.30	22.86	22.26
		RB Size=50, RB Offset=24	22.29	22.90	22.20
		RB Size=50, RB Offset=49	22.41	23.04	22.34
		RB Size=100, RB Offset=0	22.24	22.81	22.22

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.50	13	Pass
QPSK (100RB Size)	5.93	13	Pass
16QAM (1RB Size)	6.65	13	Pass
16QAM (100RB Size)	5.90	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	85.32	254	1.6	H	12.2	1.30	8.90	19.80	30
1732.50	82.63	351	1.3	V	10.1	1.30	8.90	17.70	30
3 MHz Bandwidth									
1732.50	85.69	4	2.0	H	12.5	1.30	8.90	20.10	30
1732.50	82.68	312	1.9	V	10.1	1.30	8.90	17.70	30
5 MHz Bandwidth									
1732.50	85.47	21	1.7	H	12.3	1.30	8.90	19.90	30
1732.50	82.93	208	1.0	V	10.4	1.30	8.90	18.00	30
10 MHz Bandwidth									
1732.50	85.96	284	1.1	H	12.8	1.30	8.90	20.40	30
1732.50	82.74	149	1.6	V	10.2	1.30	8.90	17.80	30
15 MHz Bandwidth									
1732.50	86.12	153	1.9	H	13.0	1.30	8.90	20.60	30
1732.50	83.42	249	1.8	V	10.9	1.30	8.90	18.50	30
20 MHz Bandwidth									
1732.50	85.31	200	2.1	H	12.1	1.30	8.90	19.70	30
1732.50	83.15	164	2.1	V	10.6	1.30	8.90	18.20	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	85.71	360	1.4	H	12.5	1.30	8.90	20.10	30
1732.50	83.45	50	2.3	V	10.9	1.30	8.90	18.50	30
3 MHz Bandwidth									
1732.50	85.96	52	1.6	H	12.8	1.30	8.90	20.40	30
1732.50	83.74	154	2.4	V	11.2	1.30	8.90	18.80	30
5 MHz Bandwidth									
1732.50	85.97	29	1.6	H	12.8	1.30	8.90	20.40	30
1732.50	82.46	276	1.2	V	9.9	1.30	8.90	17.50	30
10 MHz Bandwidth									
1732.50	85.33	181	2.4	H	12.2	1.30	8.90	19.80	30
1732.50	84.63	35	1.4	V	12.1	1.30	8.90	19.70	30
15 MHz Bandwidth									
1732.50	85.97	324	2.4	H	12.8	1.30	8.90	20.40	30
1732.50	83.66	74	1.3	V	11.1	1.30	8.90	18.70	30
20 MHz Bandwidth									
1732.50	85.63	11	2.1	H	12.5	1.30	8.90	20.10	30
1732.50	83.78	181	1.7	V	11.2	1.30	8.90	18.80	30

LTE Band 7:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	21.44	21.17	21.21
		RB Size=1, RB Offset=12	21.18	21.33	20.96
		RB Size=1, RB Offset=24	21.03	21.58	21.46
		RB Size=12, RB Offset=0	21.21	21.47	21.62
		RB Size=12, RB Offset=6	21.04	21.75	21.53
		RB Size=12, RB Offset=11	21.58	21.50	21.18
		RB Size=25, RB Offset=0	21.70	21.14	21.04
	16QAM	RB Size=1, RB Offset=0	21.43	21.61	21.49
		RB Size=1, RB Offset=12	21.18	21.65	21.22
		RB Size=1, RB Offset=24	20.89	21.82	21.39
		RB Size=12, RB Offset=0	21.74	21.05	21.07
		RB Size=12, RB Offset=6	21.50	21.00	21.70
		RB Size=12, RB Offset=11	21.80	21.30	21.39
		RB Size=25, RB Offset=0	21.33	21.01	21.61
10	QPSK	RB Size=1, RB Offset=0	21.24	21.16	21.29
		RB Size=1, RB Offset=24	21.20	21.32	21.81
		RB Size=1, RB Offset=49	21.77	21.37	21.08
		RB Size=25, RB Offset=0	21.24	21.43	21.39
		RB Size=25, RB Offset=12	21.79	21.75	21.11
		RB Size=25, RB Offset=24	21.47	21.26	21.09
		RB Size=50, RB Offset=0	21.53	21.55	20.90
	16QAM	RB Size=1, RB Offset=0	21.47	21.24	20.98
		RB Size=1, RB Offset=24	21.20	20.95	21.60
		RB Size=1, RB Offset=49	21.48	20.84	21.34
		RB Size=25, RB Offset=0	21.15	21.37	21.36
		RB Size=25, RB Offset=12	21.13	20.83	21.67
		RB Size=25, RB Offset=24	21.37	20.96	21.54
		RB Size=50, RB Offset=0	21.24	20.98	21.47

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	21.47	21.11	21.80
		RB Size=1, RB Offset=37	21.36	20.88	21.74
		RB Size=1, RB Offset=74	21.44	21.39	21.45
		RB Size=36, RB Offset=0	21.69	21.12	21.75
		RB Size=36, RB Offset=18	21.26	21.62	21.31
		RB Size=36, RB Offset=37	21.25	21.24	21.51
		RB Size=75, RB Offset=0	21.08	21.47	21.04
	16QAM	RB Size=1, RB Offset=0	20.94	21.81	21.59
		RB Size=1, RB Offset=37	21.13	21.13	21.08
		RB Size=1, RB Offset=74	21.28	21.14	20.96
		RB Size=36, RB Offset=0	21.28	21.77	21.04
		RB Size=36, RB Offset=18	20.96	21.66	21.72
		RB Size=36, RB Offset=37	21.52	21.15	21.24
		RB Size=75, RB Offset=0	21.21	21.34	21.19
20	QPSK	RB Size=1, RB Offset=0	20.92	20.92	21.52
		RB Size=1, RB Offset=49	21.05	21.57	21.39
		RB Size=1, RB Offset=99	21.43	21.44	21.29
		RB Size=50, RB Offset=0	21.32	21.74	21.31
		RB Size=50, RB Offset=24	21.03	21.55	21.05
		RB Size=50, RB Offset=49	21.04	21.28	20.87
		RB Size=100, RB Offset=0	21.14	20.95	20.94
	16QAM	RB Size=1, RB Offset=0	21.48	21.30	21.32
		RB Size=1, RB Offset=49	21.31	21.76	21.56
		RB Size=1, RB Offset=99	21.79	21.09	21.11
		RB Size=50, RB Offset=0	21.19	21.63	21.00
		RB Size=50, RB Offset=24	20.85	20.87	21.20
		RB Size=50, RB Offset=49	21.05	21.59	20.94
		RB Size=100, RB Offset=0	21.70	21.58	21.48

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.54	13	Pass
QPSK (100RB Size)	5.26	13	Pass
16QAM (1RB Size)	6.46	13	Pass
16QAM (100RB Size)	5.75	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 (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	84.73	329	1.7	H	15.2	2.60	10.20	22.80	33
2535.00	82.55	151	2.5	V	13.7	2.60	10.20	21.30	33
10 MHz Bandwidth									
2535.00	84.28	116	2.3	H	14.8	2.60	10.20	22.40	33
2535.00	82.67	106	1.7	V	13.8	2.60	10.20	21.40	33
15 MHz Bandwidth									
2535.00	84.10	174	2.4	H	14.6	2.60	10.20	22.20	33
2535.00	82.63	74	1.5	V	13.8	2.60	10.20	21.40	33
20 MHz Bandwidth									
2535.00	83.39	208	1.3	H	13.9	2.60	10.20	21.50	33
2535.00	82.96	230	1.9	V	14.1	2.60	10.20	21.70	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	84.63	202	1.5	H	15.1	2.60	10.20	22.70	33
2535.00	82.67	321	2.5	V	13.8	2.60	10.20	21.40	33
10 MHz Bandwidth									
2535.00	84.63	355	2.3	H	15.1	2.60	10.20	22.70	33
2535.00	82.94	174	1.8	V	14.1	2.60	10.20	21.70	33
15 MHz Bandwidth									
2535.00	84.77	229	1.8	H	15.3	2.60	10.20	22.90	33
2535.00	82.51	41	1.2	V	13.6	2.60	10.20	21.20	33
20 MHz Bandwidth									
2535.00	84.56	190	1.7	H	15.1	2.60	10.20	22.70	33
2535.00	82.61	51	2.3	V	13.7	2.60	10.20	21.30	33

LTE Band 12:

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	22.78	23.27	22.96
		RB Size=1, RB Offset=2	22.66	23.10	22.73
		RB Size=1, RB Offset=5	22.78	23.22	22.98
		RB Size=3, RB Offset=0	22.79	23.13	22.86
		RB Size=3, RB Offset=1	22.86	23.33	23.00
		RB Size=3, RB Offset=2	22.78	23.19	22.84
		RB Size=6, RB Offset=0	22.84	23.27	23.08
	16QAM	RB Size=1, RB Offset=0	22.78	23.25	22.89
		RB Size=1, RB Offset=2	22.69	23.04	22.81
		RB Size=1, RB Offset=5	22.81	23.26	22.96
		RB Size=3, RB Offset=0	22.83	23.12	22.88
		RB Size=3, RB Offset=1	22.86	23.37	22.97
		RB Size=3, RB Offset=2	22.75	23.14	22.90
		RB Size=6, RB Offset=0	22.90	23.34	23.02
3	QPSK	RB Size=1, RB Offset=0	22.80	23.27	22.90
		RB Size=1, RB Offset=7	22.70	23.08	22.73
		RB Size=1, RB Offset=14	22.83	23.26	22.88
		RB Size=8, RB Offset=0	22.74	23.19	22.81
		RB Size=8, RB Offset=4	22.93	23.36	22.95
		RB Size=8, RB Offset=7	22.83	23.18	22.77
		RB Size=15, RB Offset=0	22.90	23.30	22.99
	16QAM	RB Size=1, RB Offset=0	22.80	23.19	22.89
		RB Size=1, RB Offset=7	22.68	23.05	22.74
		RB Size=1, RB Offset=14	22.79	23.25	22.91
		RB Size=8, RB Offset=0	22.71	23.11	22.83
		RB Size=8, RB Offset=4	22.91	23.32	22.94
		RB Size=8, RB Offset=7	22.76	23.16	22.86
		RB Size=15, RB Offset=0	22.82	23.32	23.01

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	23.03	23.41	23.02
		RB Size=1, RB Offset=12	22.88	23.19	22.87
		RB Size=1, RB Offset=24	23.00	23.41	23.04
		RB Size=12, RB Offset=0	22.90	23.24	22.86
		RB Size=12, RB Offset=6	23.15	23.51	23.11
		RB Size=12, RB Offset=11	22.94	23.28	22.95
		RB Size=25, RB Offset=0	23.07	23.48	23.15
	16QAM	RB Size=1, RB Offset=0	23.07	23.39	23.03
		RB Size=1, RB Offset=12	22.88	23.19	22.82
		RB Size=1, RB Offset=24	23.06	23.44	23.02
		RB Size=12, RB Offset=0	22.97	23.36	22.91
		RB Size=12, RB Offset=6	23.15	23.44	23.10
		RB Size=12, RB Offset=11	22.96	23.30	22.93
		RB Size=25, RB Offset=0	23.10	23.52	23.15
10	QPSK	RB Size=1, RB Offset=0	23.03	23.40	23.01
		RB Size=1, RB Offset=24	22.90	23.22	22.83
		RB Size=1, RB Offset=49	22.99	23.43	23.03
		RB Size=25, RB Offset=0	22.99	23.33	22.90
		RB Size=25, RB Offset=12	23.09	23.51	23.10
		RB Size=25, RB Offset=24	22.96	23.25	22.92
		RB Size=50, RB Offset=0	23.05	23.49	23.09
	16QAM	RB Size=1, RB Offset=0	23.00	23.45	23.04
		RB Size=1, RB Offset=24	22.88	23.20	22.86
		RB Size=1, RB Offset=49	23.05	23.36	22.95
		RB Size=25, RB Offset=0	22.94	23.29	22.84
		RB Size=25, RB Offset=12	23.04	23.52	23.16
		RB Size=25, RB Offset=24	22.99	23.26	22.98
		RB Size=50, RB Offset=0	23.11	23.49	23.07

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.30	13	Pass
QPSK (50RB Size)	6.55	13	Pass
16QAM (1RB Size)	4.45	13	Pass
16QAM (50RB Size)	6.77	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
707.50	82.57	252	1.3	H	19.6	0.62	0.0	18.98	34.77
707.50	78.62	17	2.5	V	17.6	0.62	0.0	16.98	34.77
3 MHz Bandwidth									
707.50	82.42	239	1.1	H	19.4	0.62	0.0	18.78	34.77
707.50	78.19	326	2.1	V	17.2	0.62	0.0	16.58	34.77
5 MHz Bandwidth									
707.50	81.94	29	2.3	H	18.9	0.62	0.0	18.28	34.77
707.50	78.51	283	1.5	V	17.5	0.62	0.0	16.88	34.77
10 MHz Bandwidth									
707.5	81.82	102	1.7	H	18.8	0.62	0.0	18.18	34.77
707.5	78.91	330	1.1	V	17.9	0.62	0.0	17.28	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
707.50	82.84	65	1.8	H	19.8	0.62	0.0	19.18	34.77
707.50	78.16	103	2.1	V	17.2	0.62	0.0	16.58	34.77
3 MHz Bandwidth									
707.50	82.72	35	2.3	H	19.7	0.62	0.0	19.08	34.77
707.50	79.52	237	1.8	V	18.5	0.62	0.0	17.88	34.77
5 MHz Bandwidth									
707.50	81.92	179	2.2	H	18.9	0.62	0.0	18.28	34.77
707.50	79.36	154	1.7	V	18.4	0.62	0.0	17.78	34.77
10 MHz Bandwidth									
707.50	81.79	300	1.6	H	18.8	0.62	0.0	18.18	34.77
707.50	79.56	108	1.7	V	18.6	0.62	0.0	17.98	34.77

LTE Band 17:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.26	22.89	22.34
		RB Size=1, RB Offset=12	22.06	22.75	22.17
		RB Size=1, RB Offset=24	22.20	22.91	22.31
		RB Size=12, RB Offset=0	22.06	22.80	22.31
		RB Size=12, RB Offset=6	22.33	23.01	22.45
		RB Size=12, RB Offset=11	22.10	22.79	22.25
		RB Size=25, RB Offset=0	22.30	22.95	22.37
	16QAM	RB Size=1, RB Offset=0	22.24	22.94	22.36
		RB Size=1, RB Offset=12	22.08	22.80	22.21
		RB Size=1, RB Offset=24	22.19	22.89	22.38
		RB Size=12, RB Offset=0	22.16	22.82	22.28
		RB Size=12, RB Offset=6	22.32	23.01	22.44
		RB Size=12, RB Offset=11	22.12	22.88	22.33
		RB Size=25, RB Offset=0	22.30	23.00	22.44
10.0	QPSK	RB Size=1, RB Offset=0	22.06	22.71	22.18
		RB Size=1, RB Offset=24	22.24	22.96	22.35
		RB Size=1, RB Offset=49	22.02	22.73	22.21
		RB Size=25, RB Offset=0	22.26	22.92	22.33
		RB Size=25, RB Offset=12	22.10	22.79	22.31
		RB Size=25, RB Offset=24	22.33	23.03	22.47
		RB Size=50, RB Offset=0	22.13	22.81	22.34
	16QAM	RB Size=1, RB Offset=0	22.24	22.87	22.32
		RB Size=1, RB Offset=24	22.08	22.73	22.23
		RB Size=1, RB Offset=49	22.21	22.91	22.40
		RB Size=25, RB Offset=0	22.17	22.89	22.26
		RB Size=25, RB Offset=12	22.33	22.96	22.42
		RB Size=25, RB Offset=24	22.12	22.86	22.35
		RB Size=50, RB Offset=0	22.28	22.97	22.45

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.84	13	Pass
QPSK (50RB Size)	6.38	13	Pass
16QAM (1RB Size)	4.67	13	Pass
16QAM (50RB Size)	6.51	13	Pass

ERP:

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
710.00	83.52	68	1.3	H	20.5	0.62	0.0	19.88	34.77
710.00	79.26	346	1.9	V	18.3	0.62	0.0	17.68	34.77
10 MHz Bandwidth									
710.00	83.16	286	1.4	H	20.2	0.62	0.0	19.58	34.77
710.00	79.42	349	1.7	V	18.4	0.62	0.0	17.78	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
710.00	83.72	30	2.3	H	20.7	0.62	0.0	20.08	34.77
710.00	79.59	219	1.7	V	18.6	0.62	0.0	17.98	34.77
10 MHz Bandwidth									
710.00	83.06	91	1.0	H	20.1	0.62	0.0	19.48	34.77
710.00	79.13	300	1.5	V	18.1	0.62	0.0	17.48	34.77

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

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

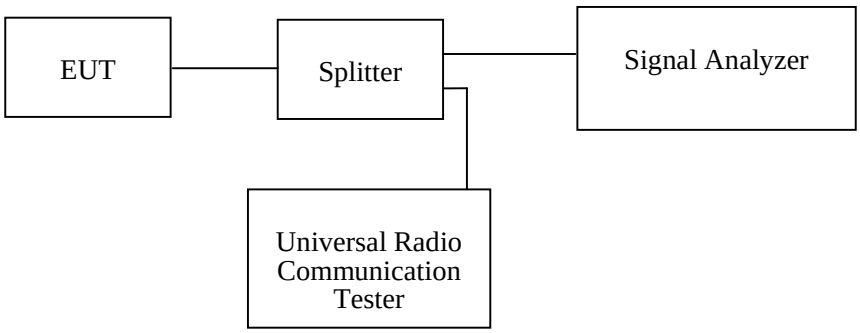
Applicable Standard

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

Test Procedure

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

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



Test Data

Environmental Conditions

Temperature:	23~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Haiguo Li from 2018-06-03 from to 2018-06-30.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	243.13	324.20
EGPRS(8PSK)	836.6	248.91	324.20

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.168	4.718
HSUPA (BPSK)	836.6	4.197	4.920
HSDPA (16QAM)	836.6	4.197	4.834

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	243.13	318.40
EGPRS(8PSK)	1880.0	254.70	327.10

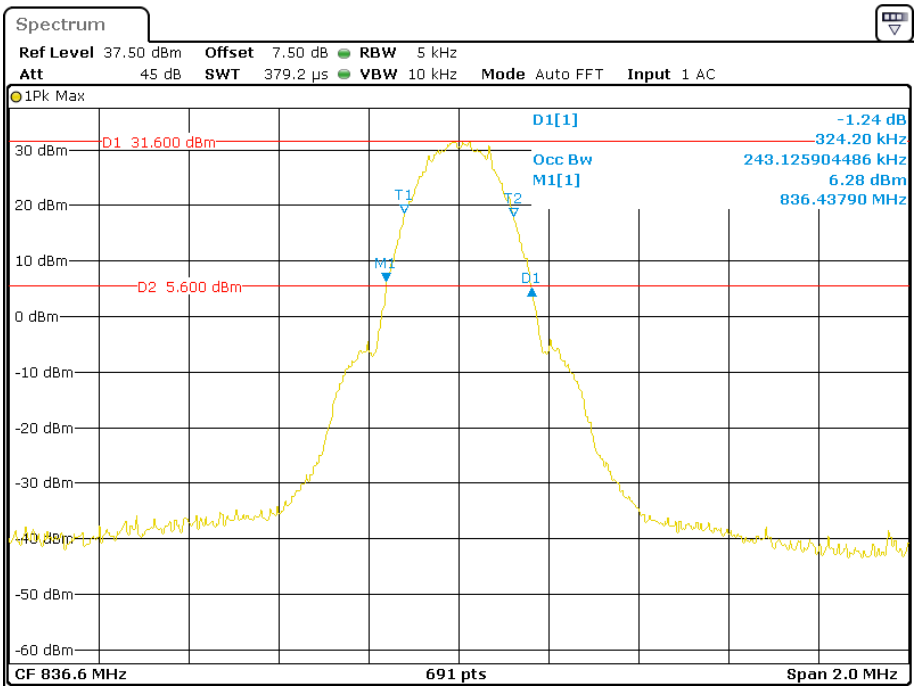
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.200	4.752
HSUPA (BPSK)	1880.0	4.182	4.761
HSDPA (16QAM)	1880.0	4.211	4.993

AWS Band (Part27)

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1732.6	4.168	4.732
HSUPA (BPSK)	1732.6	4.182	4.718
HSDPA (16QAM)	1732.6	4.197	4.790

Cellular Band (Part 22H)

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



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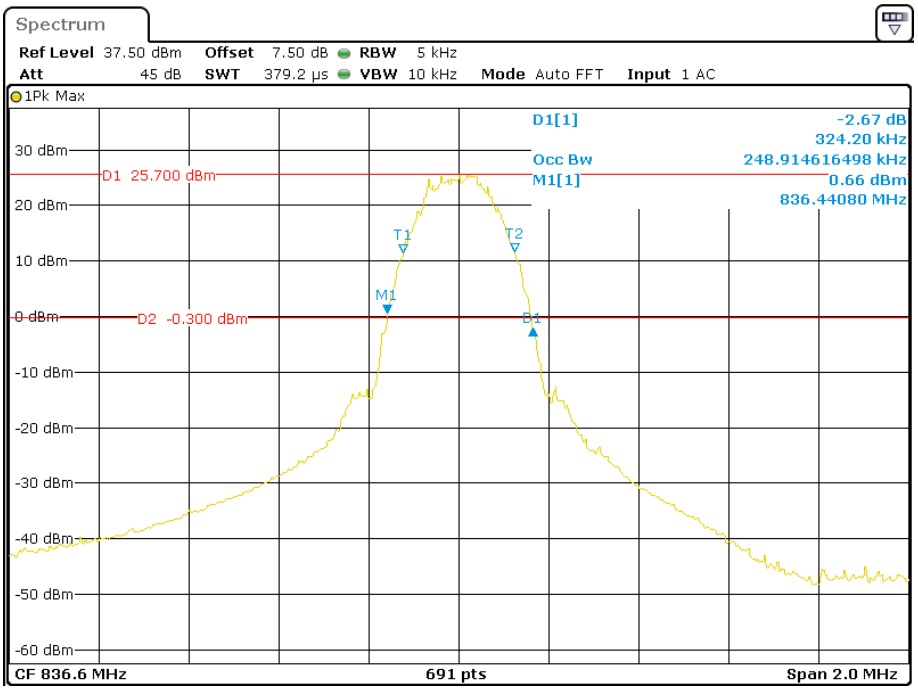
26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



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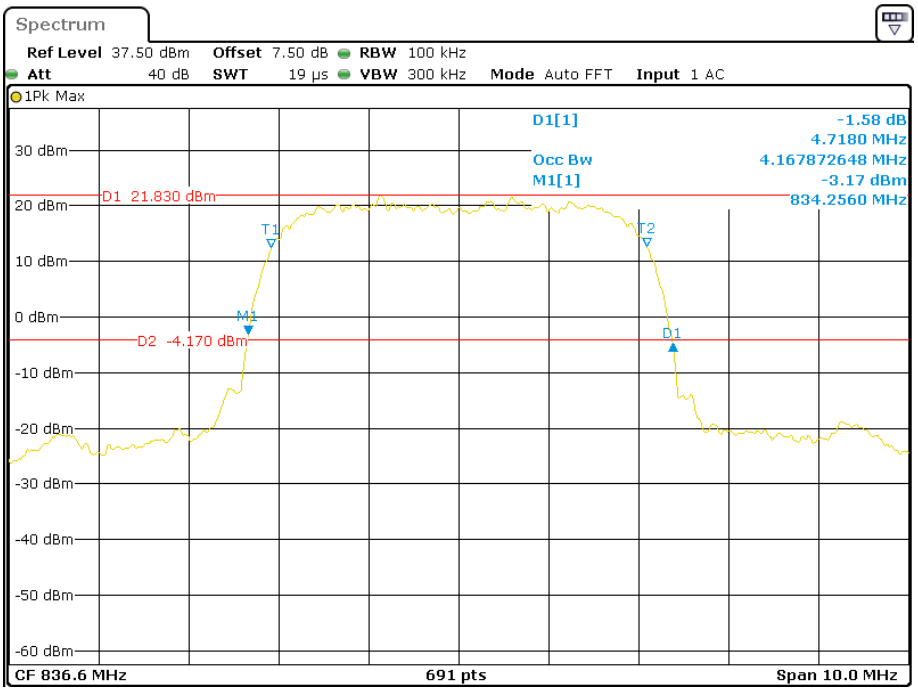
26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode



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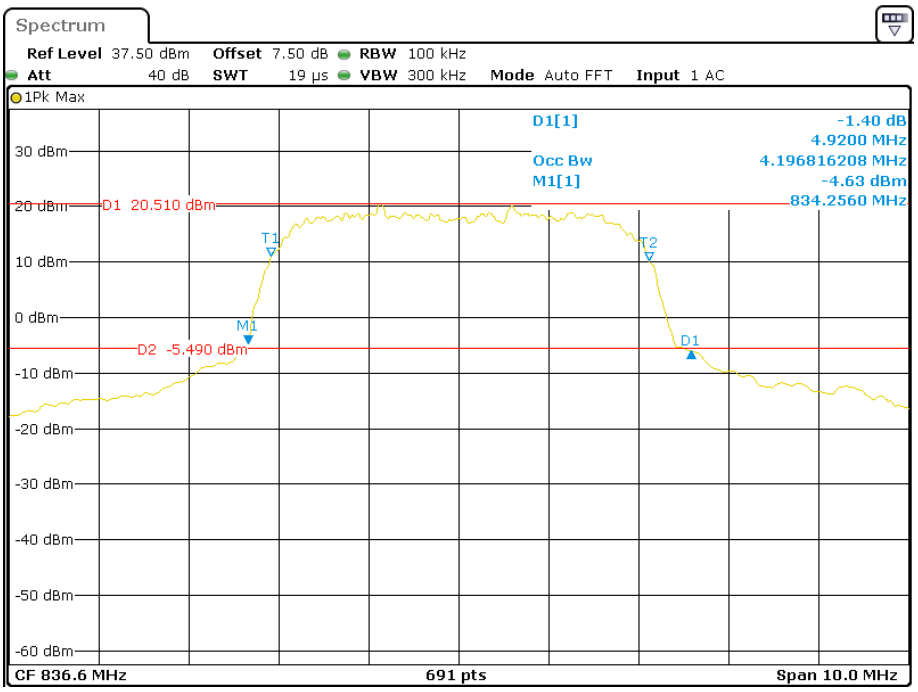
26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode



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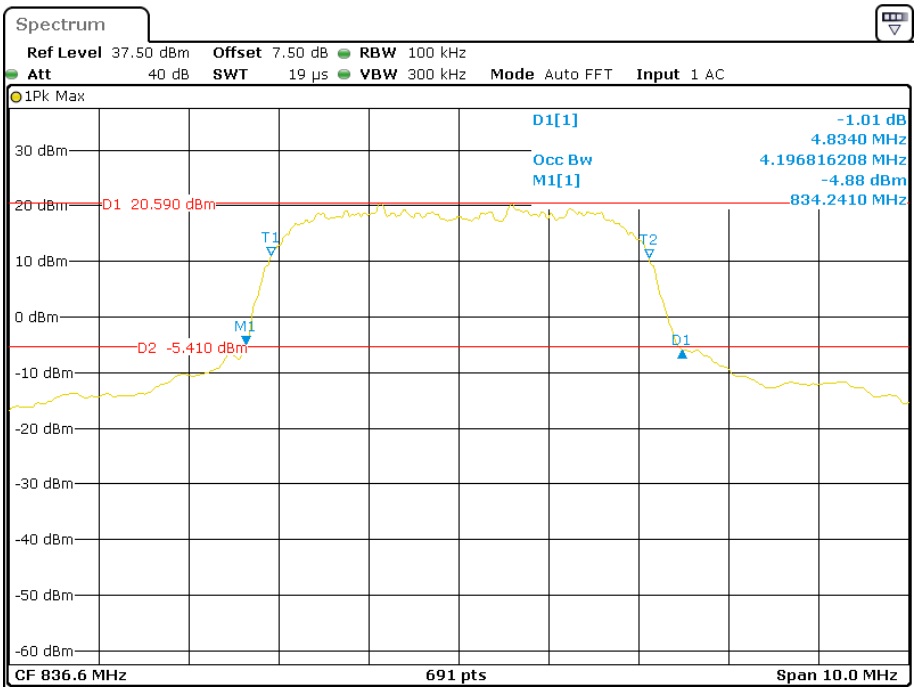
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



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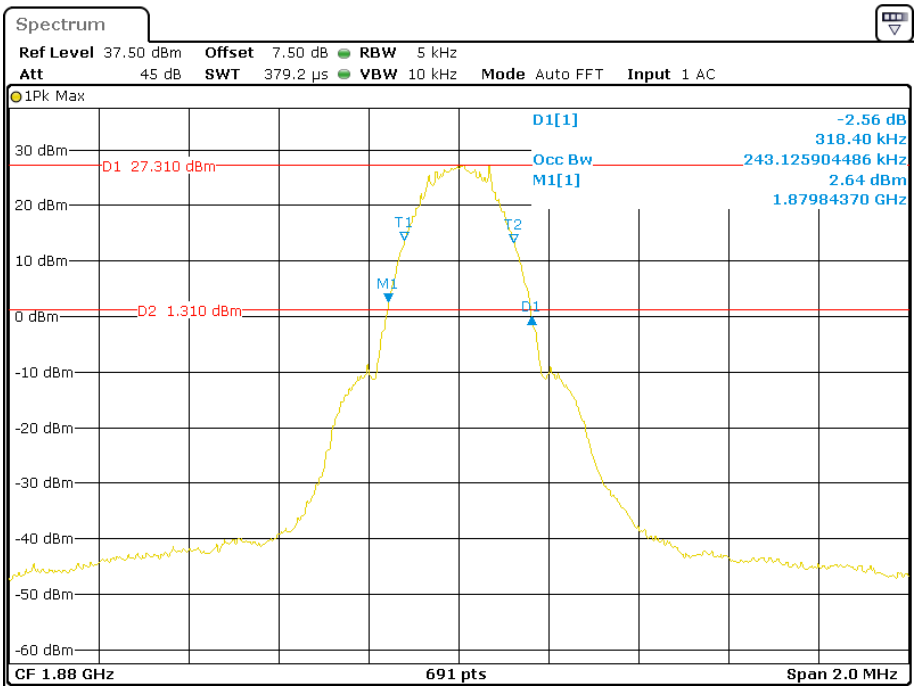
PCS Band (Part 24E)

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



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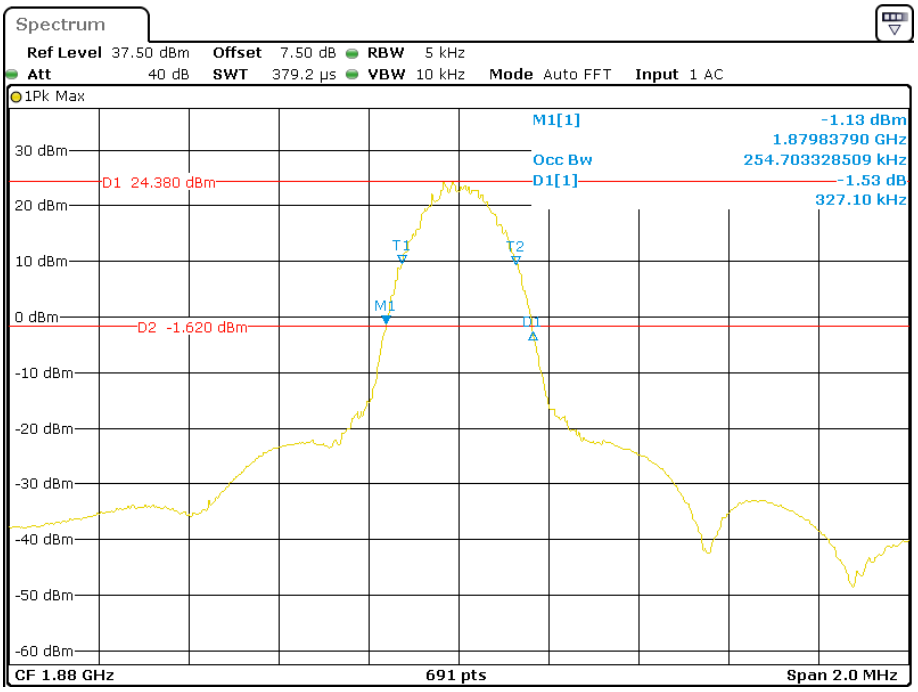
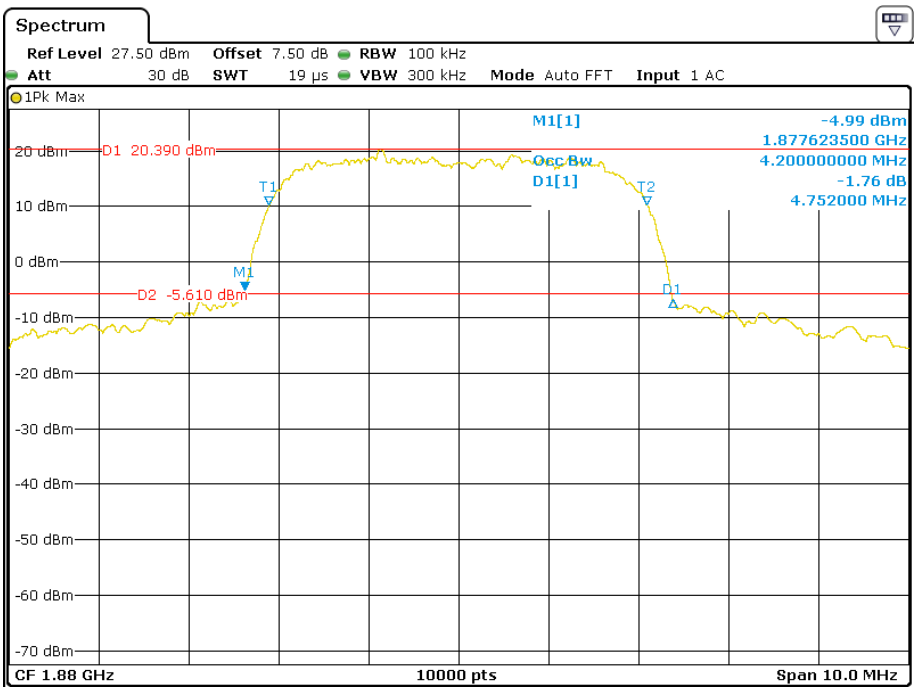
26 dB Emissions &99% Occupied Bandwidth for EDGE Mode



Date: 11.JUN.2018 14:27:53

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



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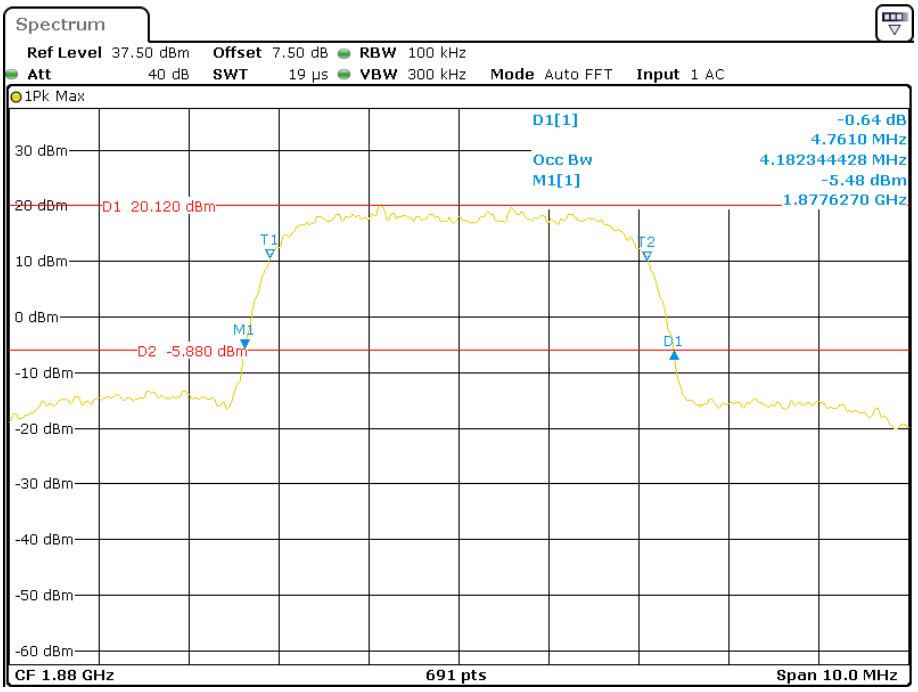
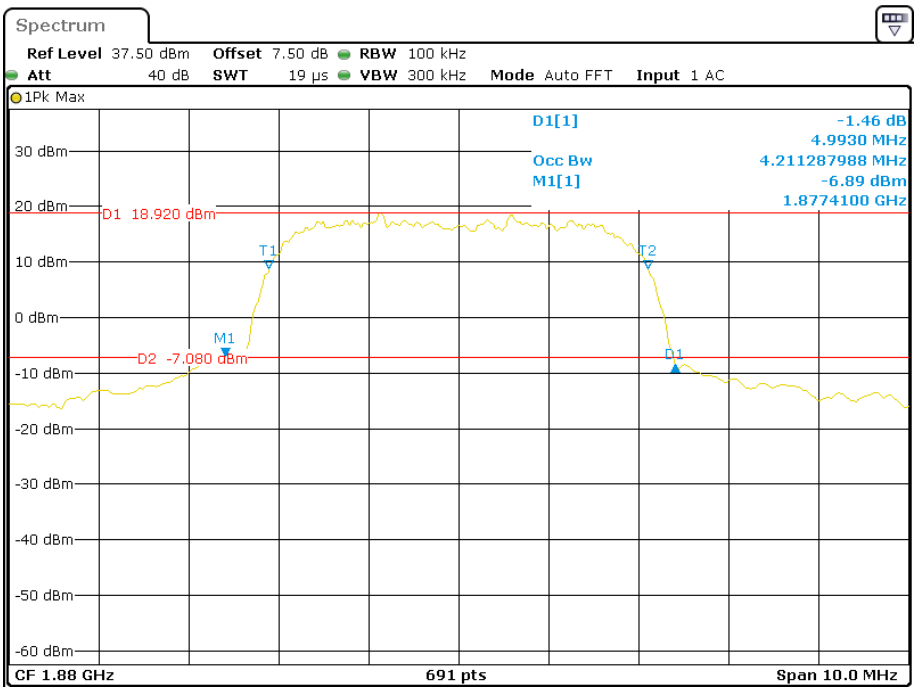
26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode



Date: 11.JUN.2018 14:41:25

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



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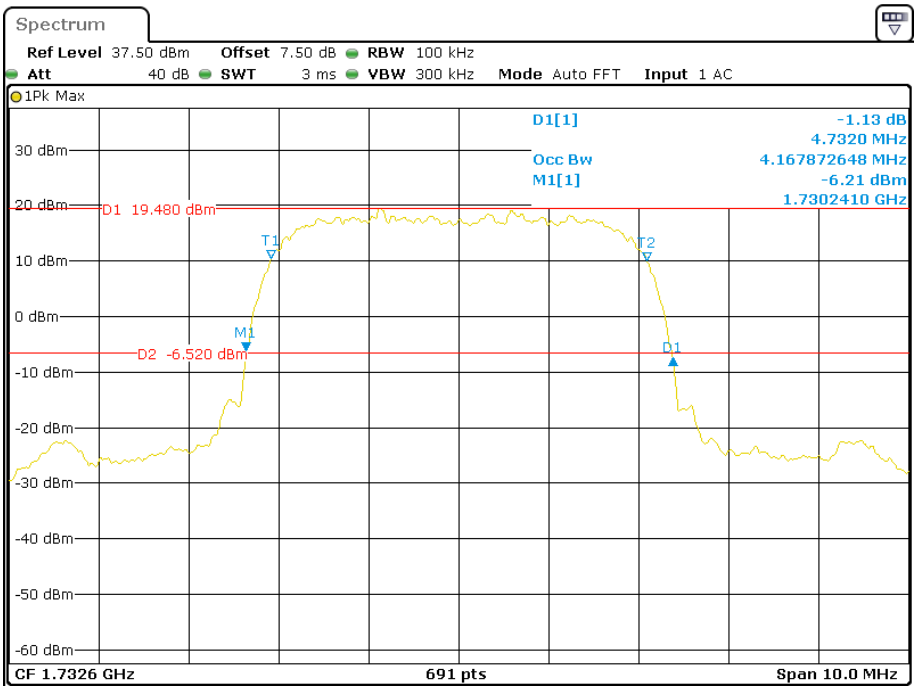
AWS Band (Part 27)

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



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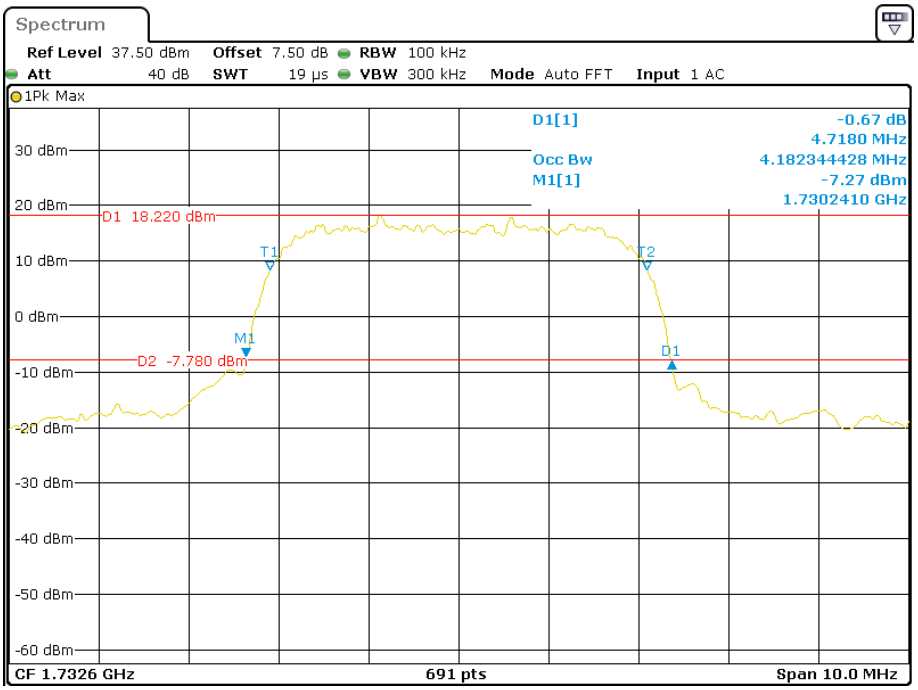
26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode



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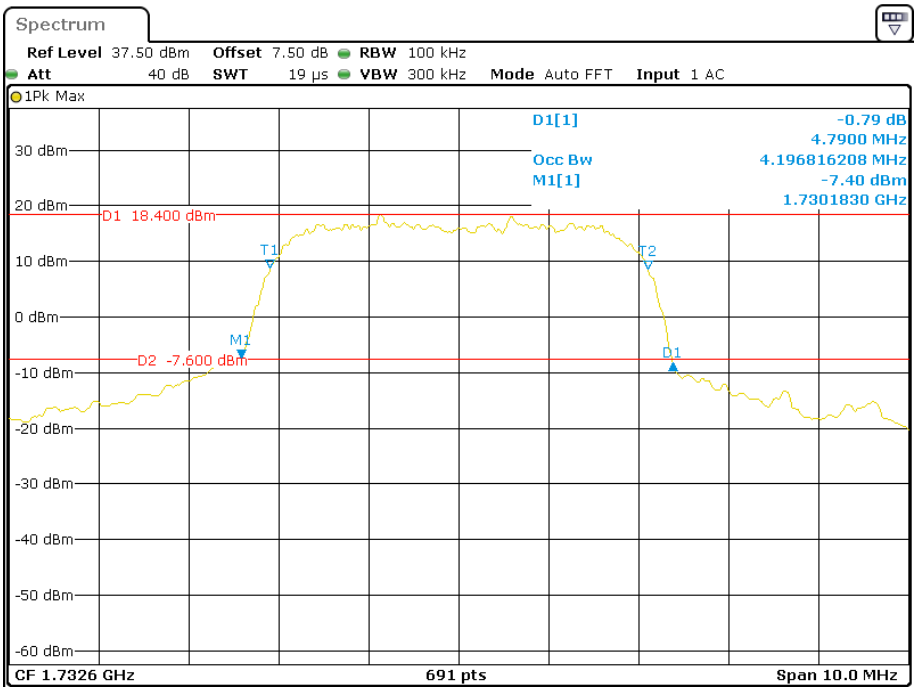
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



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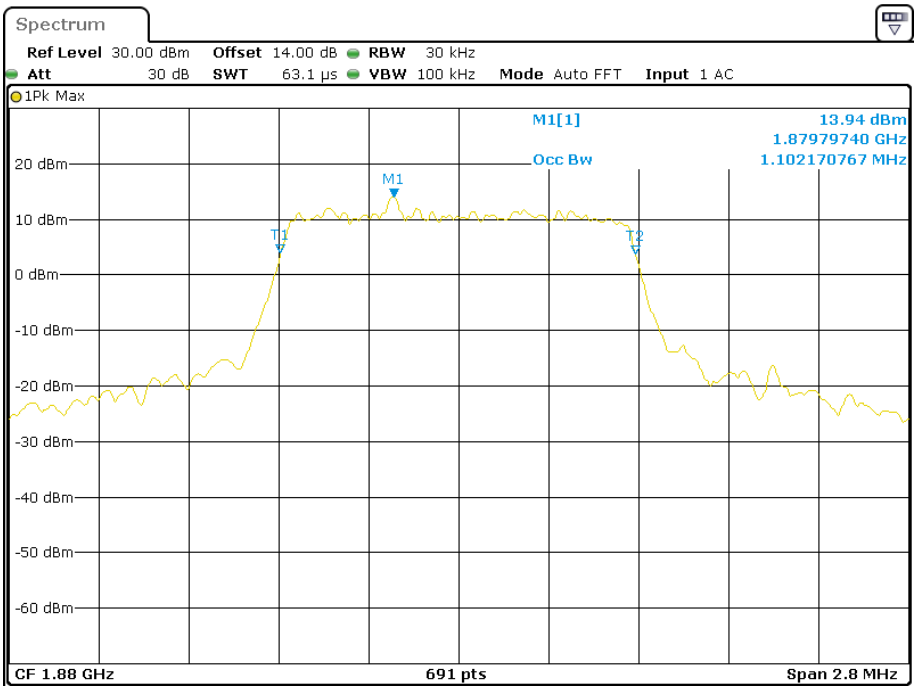
LTE Band 2: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.102	1.305
	16QAM	1.102	1.309
3.0	QPSK	2.674	2.874
	16QAM	2.674	2.874
5.0	QPSK	4.530	5.166
	16QAM	4.530	5.166
10.0	QPSK	8.973	9.725
	16QAM	8.973	9.725
15.0	QPSK	13.546	15.152
	16QAM	13.589	15.152
20.0	QPSK	18.061	19.797
	16QAM	18.003	19.508

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



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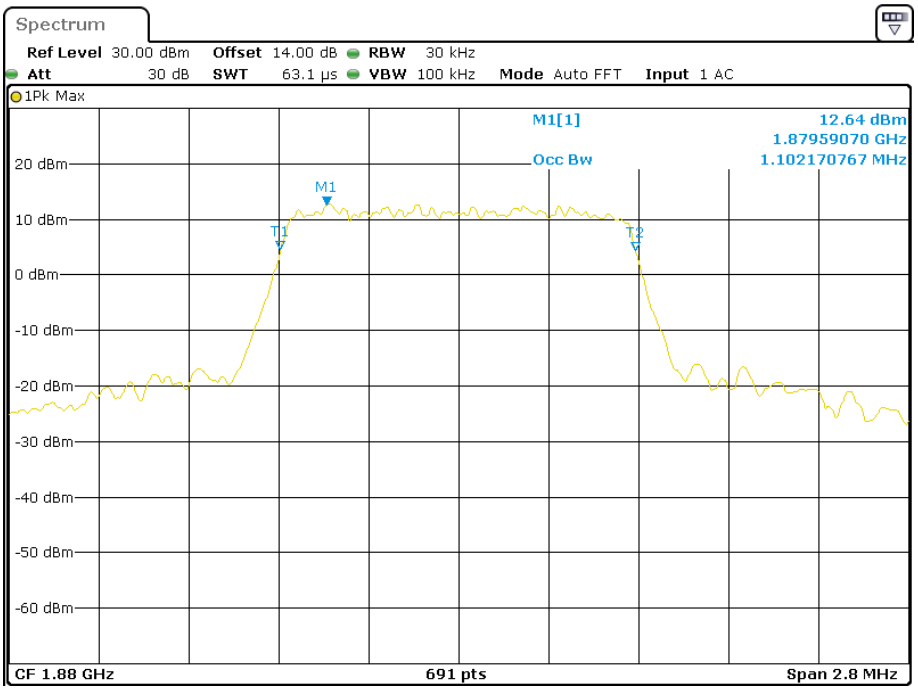
16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel



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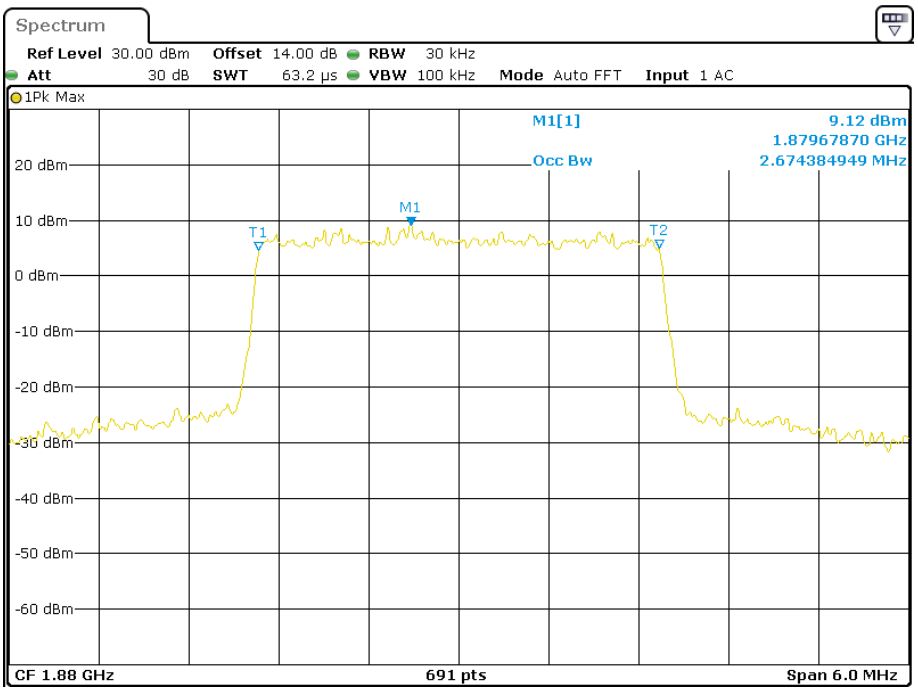
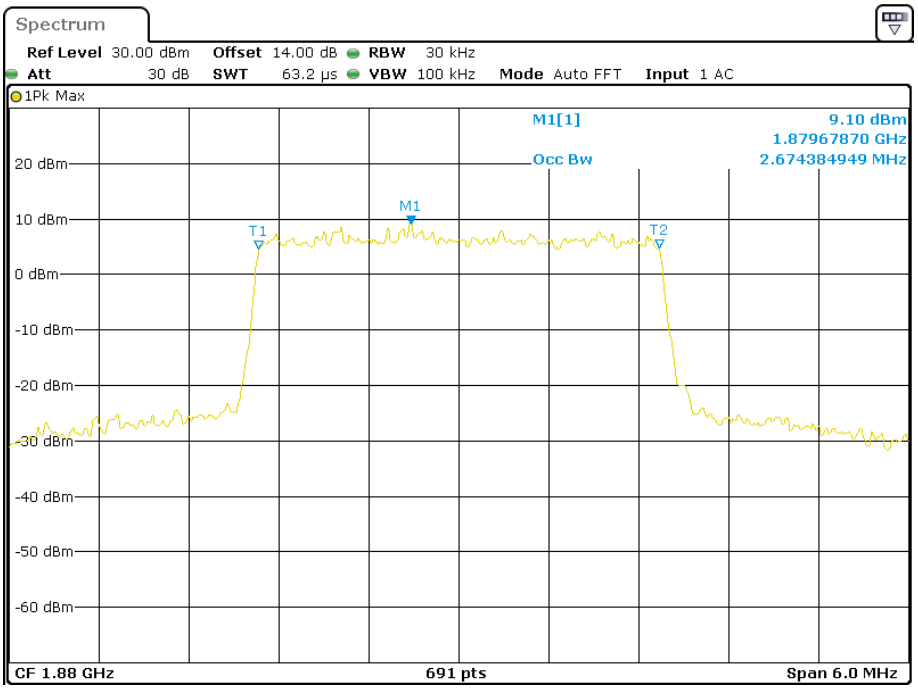
QPSK (3.0 MHz) - 99% Occupied Bandwidth, Middle channel



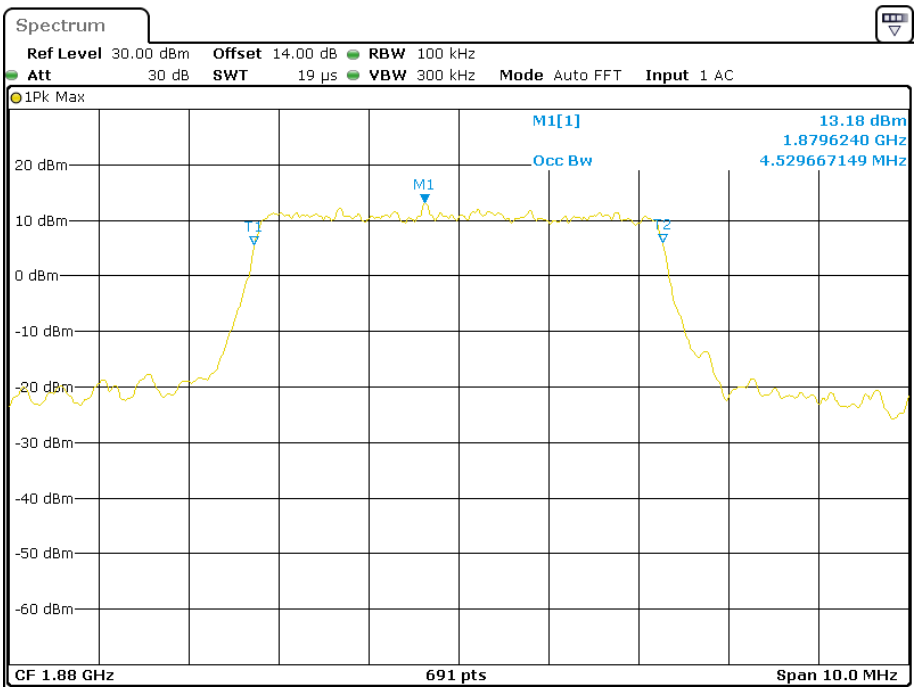
Date: 3.JUN.2018 08:29:04

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



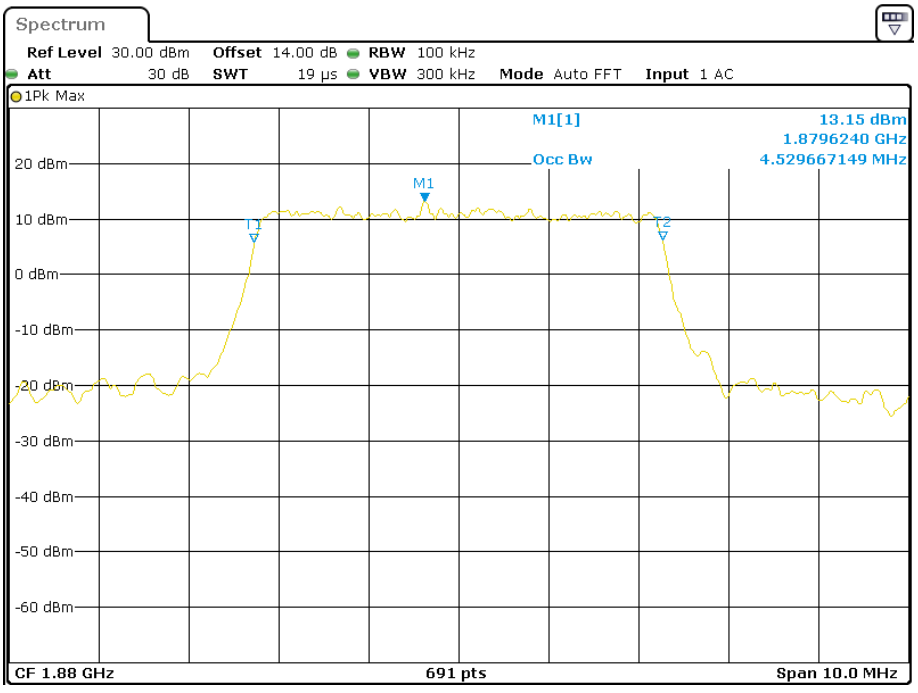
Date: 3.JUN.2018 08:29:56

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



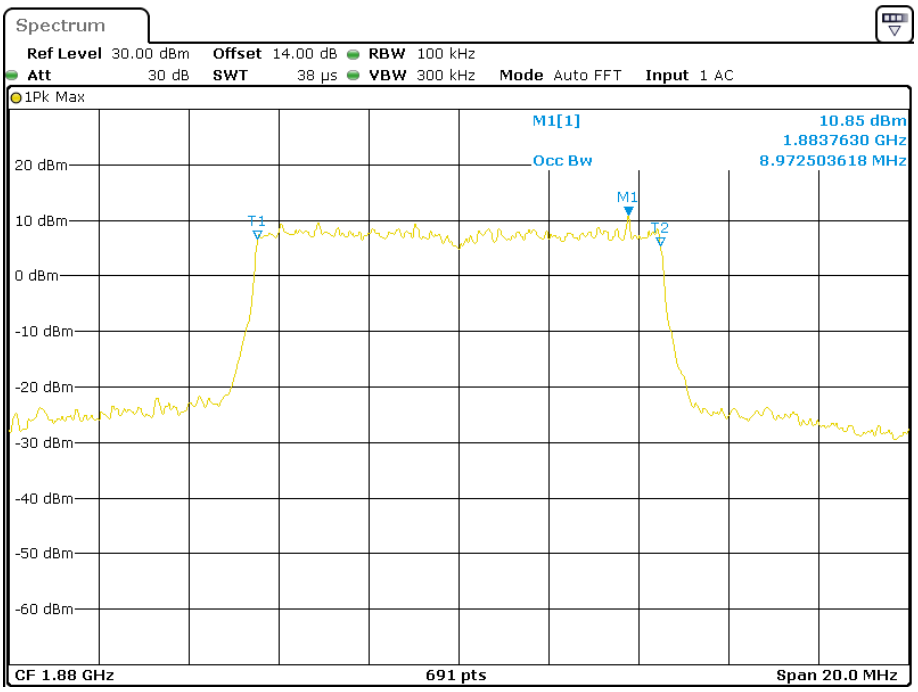
Date: 3.JUN.2018 08:35:21

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



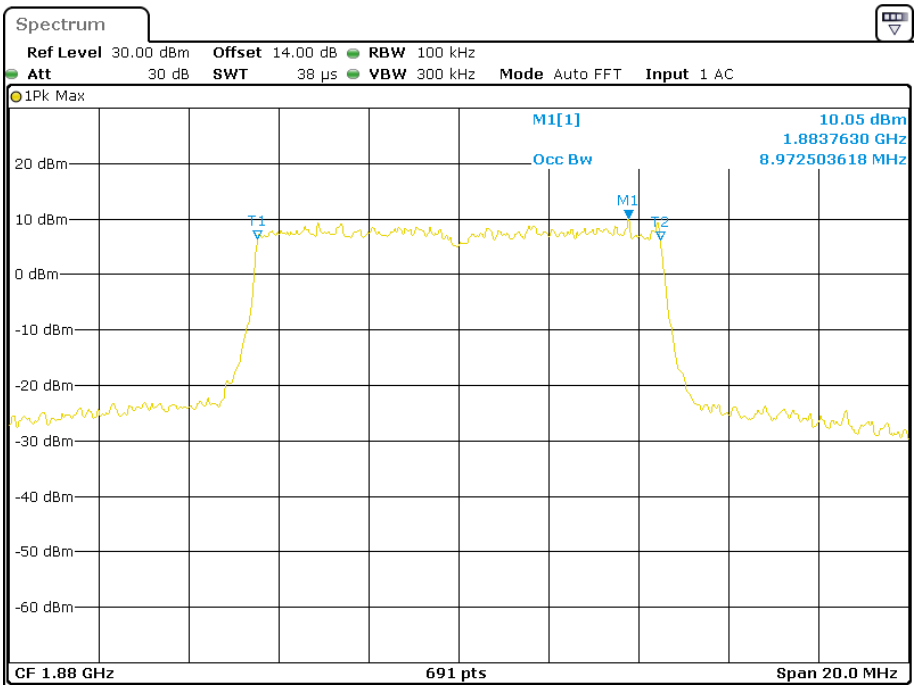
Date: 3.JUN.2018 08:33:13

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



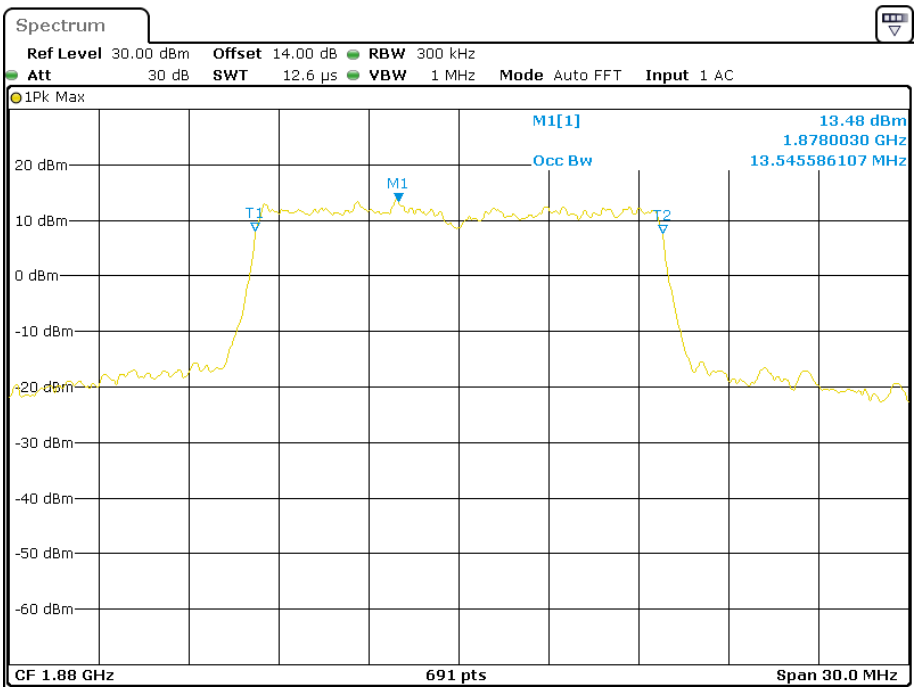
Date: 3.JUN.2018 08:34:50

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



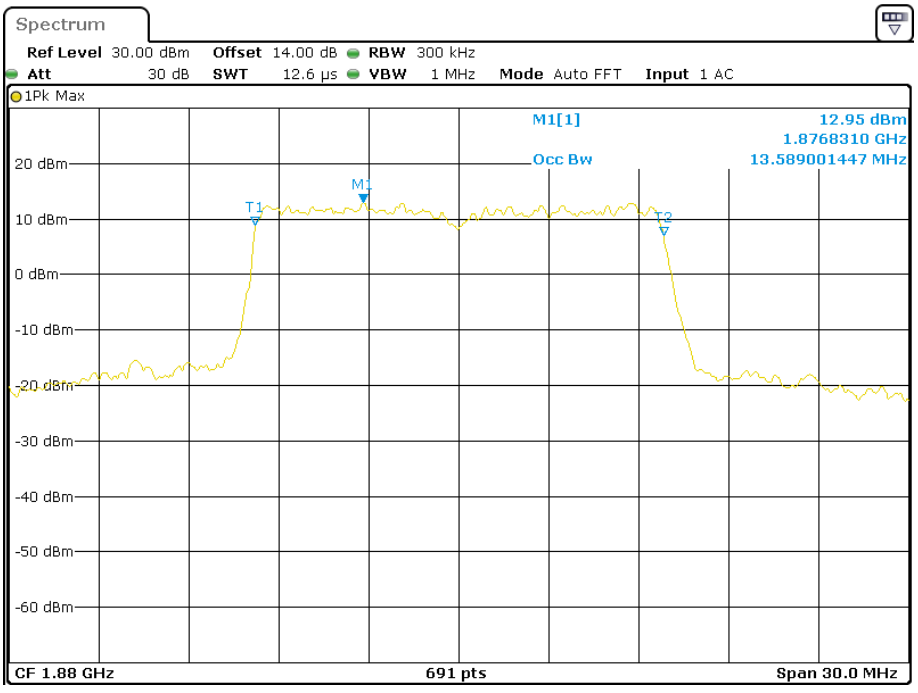
Date: 3.JUN.2018 08:34:00

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



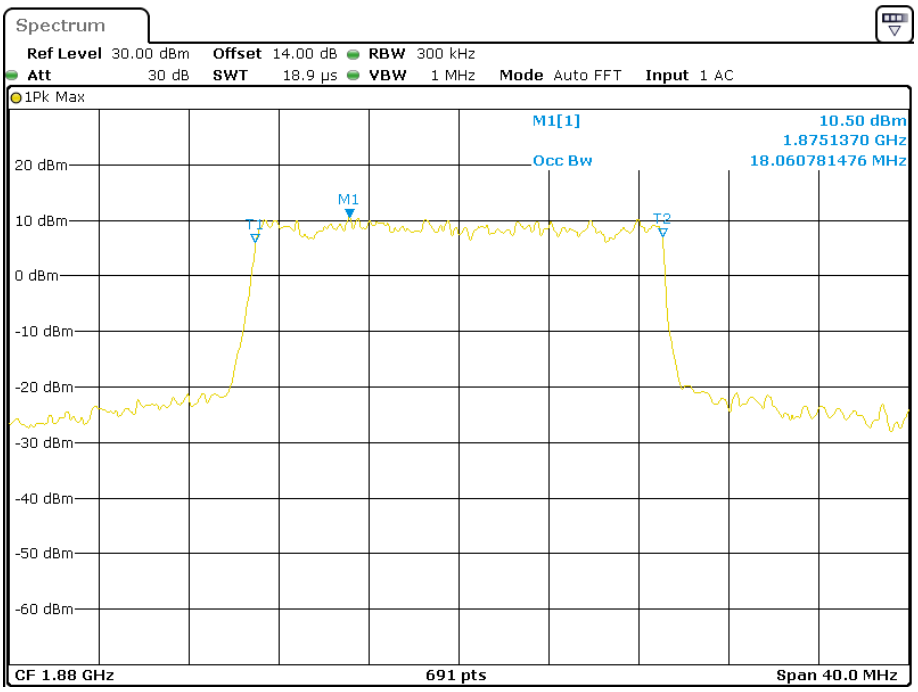
Date: 3.JUN.2018 08:36:08

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



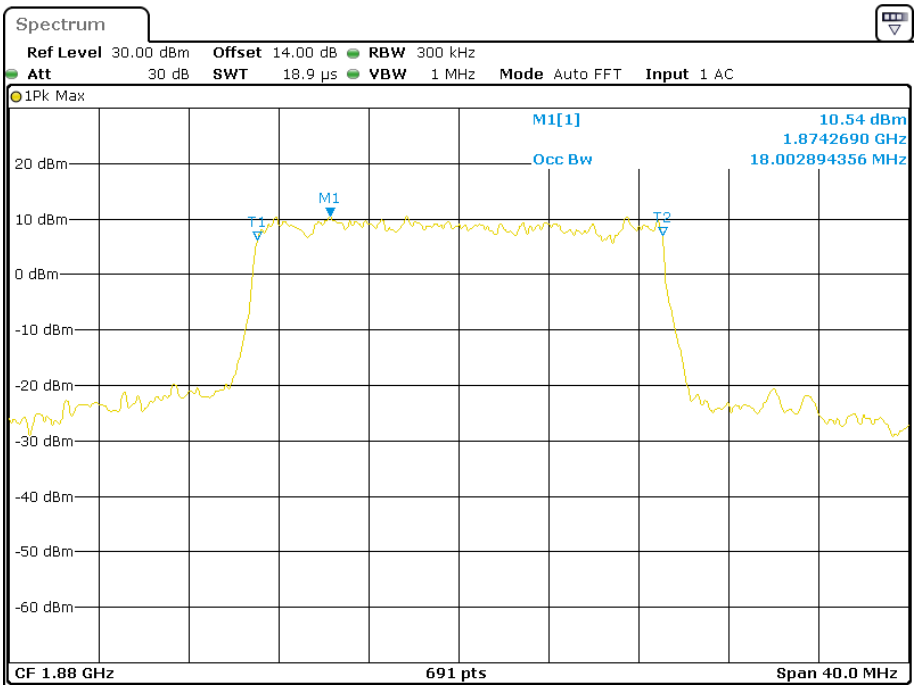
Date: 3.JUN.2018 08:37:54

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



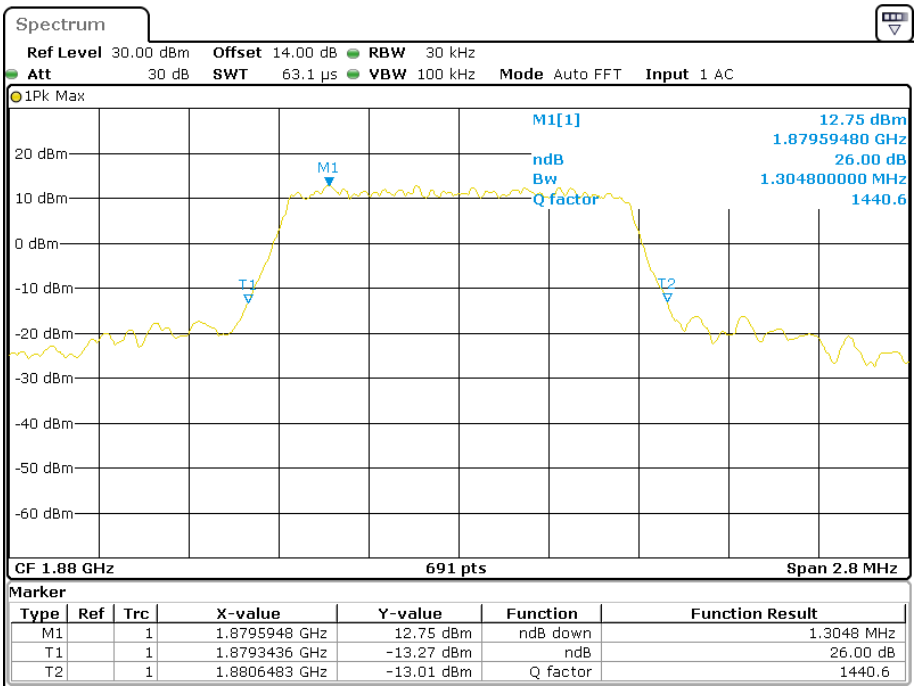
Date: 3.JUN.2018 08:36:42

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



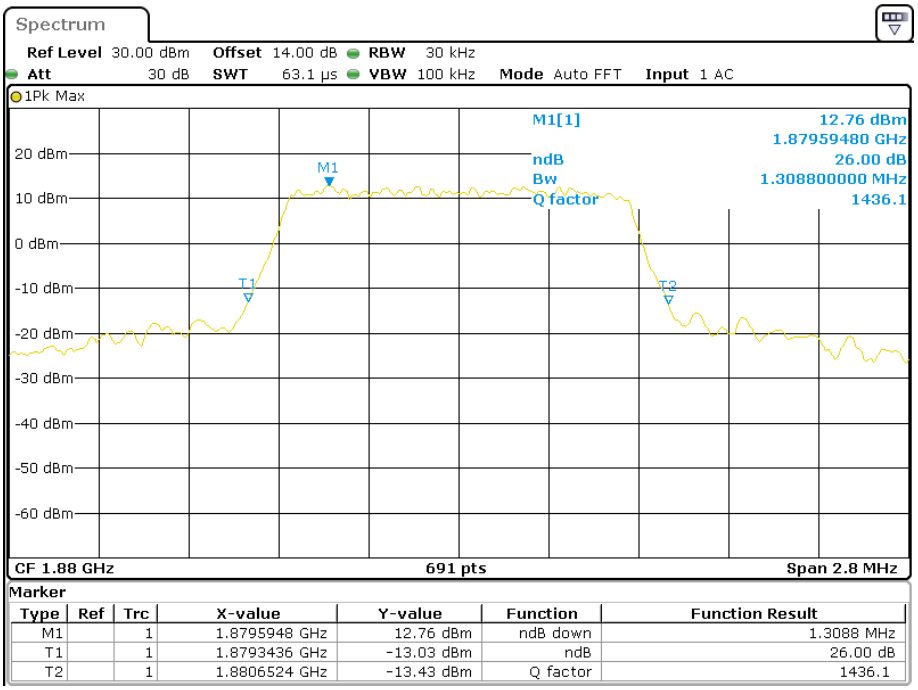
Date: 3.JUN.2018 08:37:22

QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel



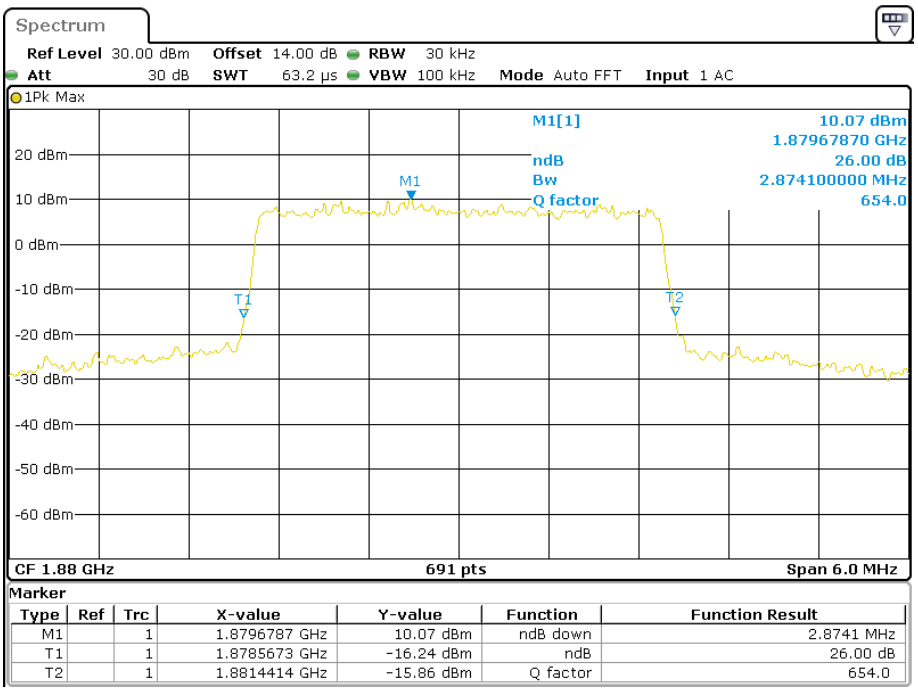
Date: 3.JUN.2018 09:35:41

16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel



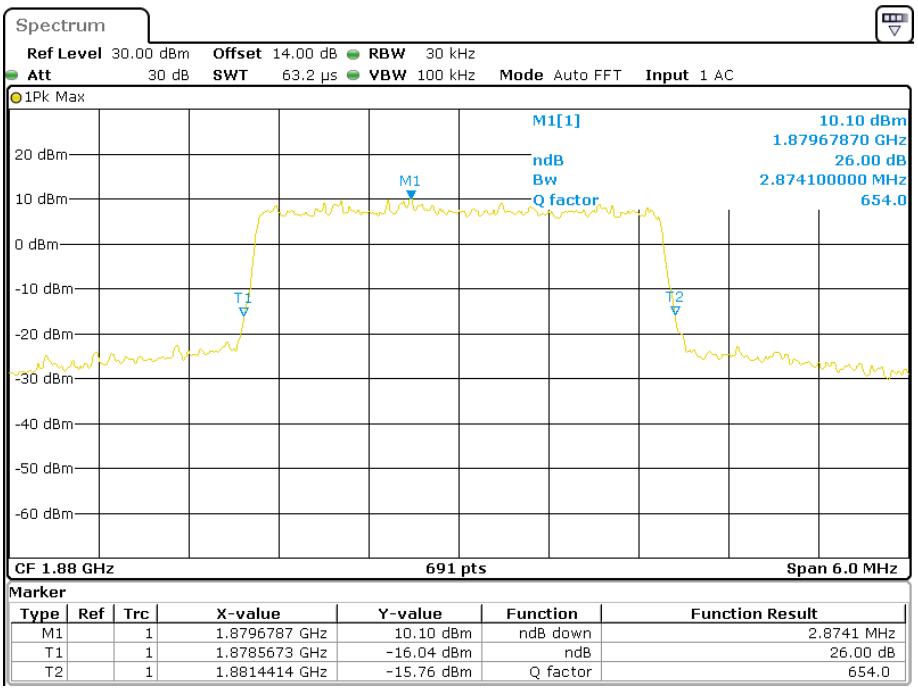
Date: 3.JUN.2018 09:37:23

QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel



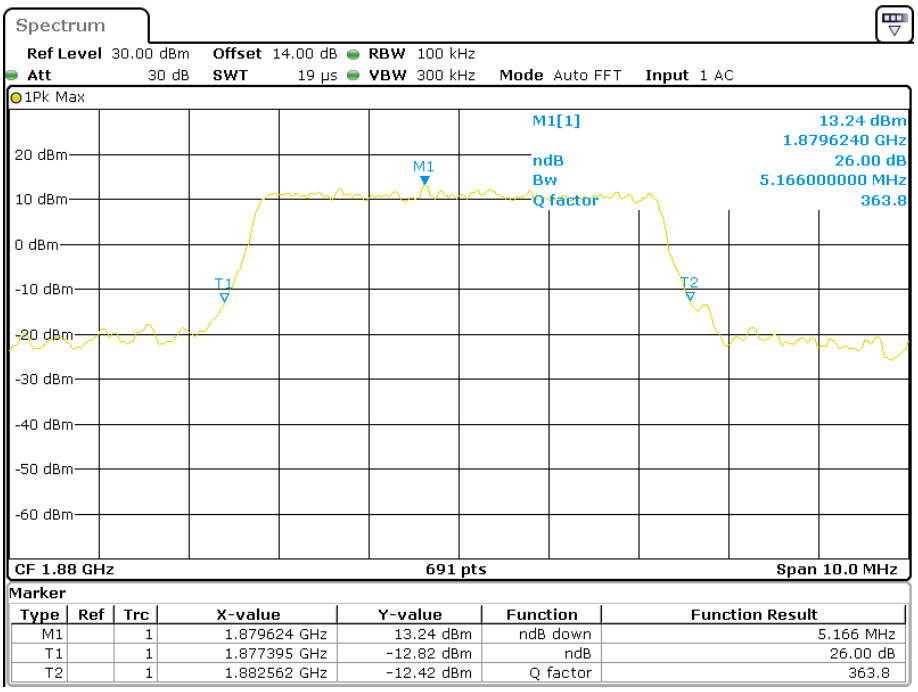
Date: 3.JUN.2018 09:36:15

16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel



Date: 3.JUN.2018 09:36:49

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

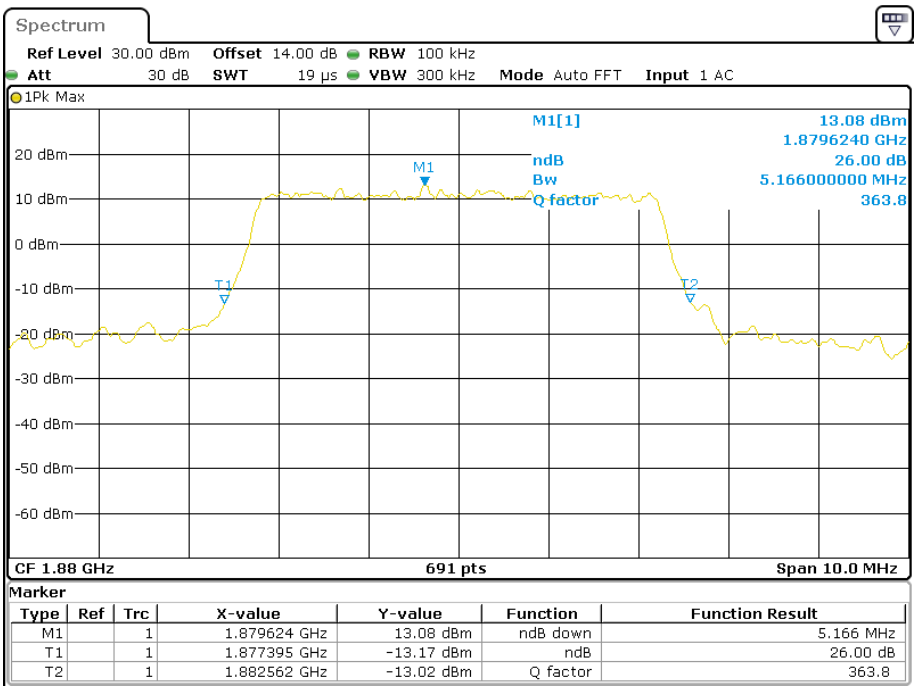


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.879624 GHz	13.24 dBm	ndB down	5.166 MHz
T1		1	1.877395 GHz	-12.82 dBm	ndB	26.00 dB
T2		1	1.882562 GHz	-12.42 dBm	Q factor	363.8

Date: 3.JUN.2018 09:40:01

16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel

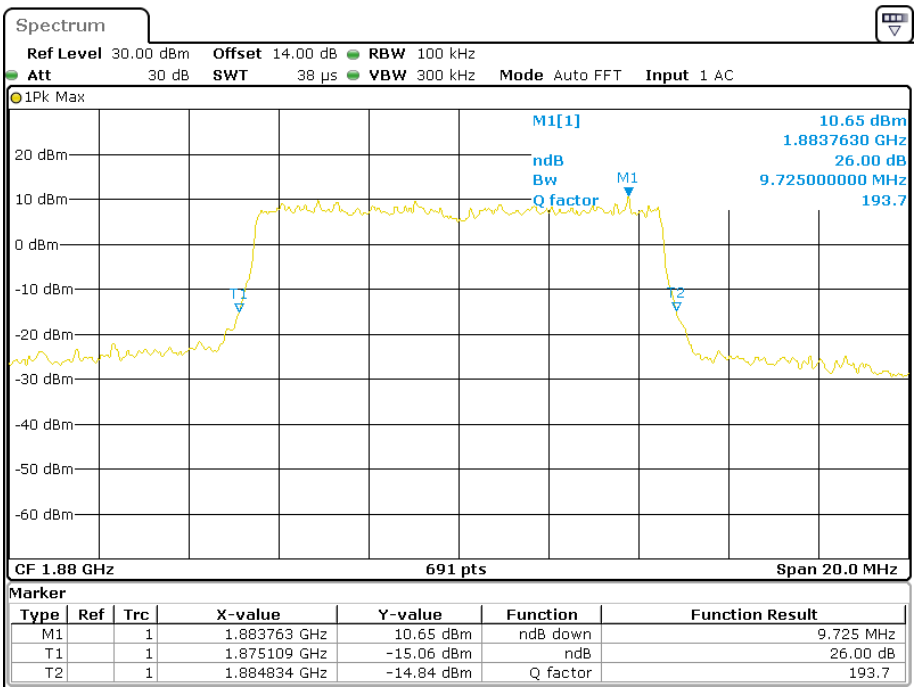


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.879624 GHz	13.08 dBm	ndB down	5.166 MHz
T1		1	1.877395 GHz	-13.17 dBm	ndB	26.00 dB
T2		1	1.882562 GHz	-13.02 dBm	Q factor	363.8

Date: 3.JUN.2018 09:38:11

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel

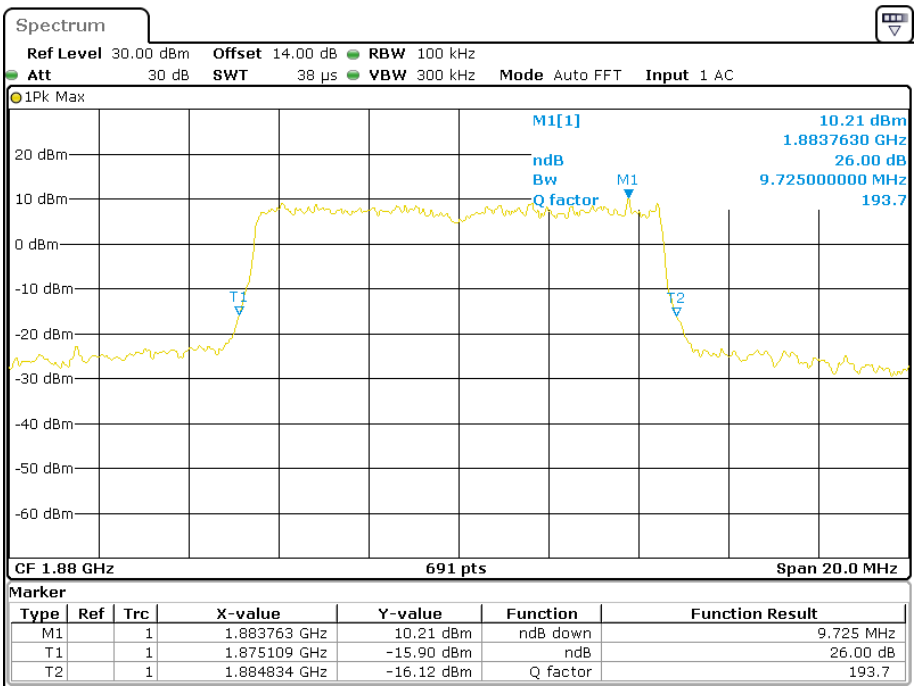


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.883763 GHz	10.65 dBm	ndB down	9.725 MHz
T1		1	1.875109 GHz	-15.06 dBm	ndB	26.00 dB
T2		1	1.884834 GHz	-14.84 dBm	Q factor	193.7

Date: 3.JUN.2018 09:39:26

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel

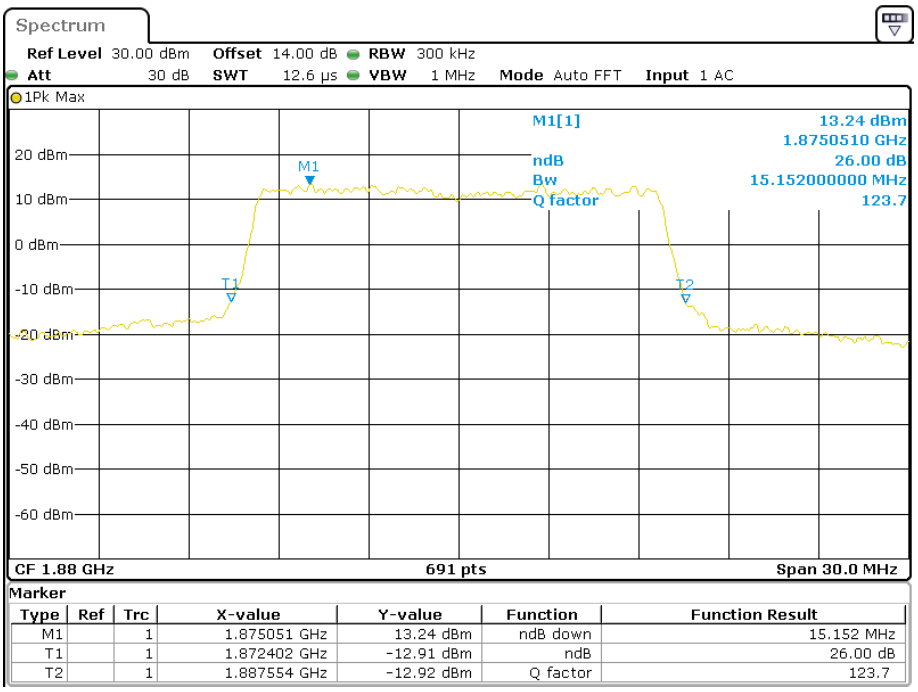


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.883763 GHz	10.21 dBm	ndB down	9.725 MHz
T1		1	1.875109 GHz	-15.90 dBm	ndB	26.00 dB
T2		1	1.884834 GHz	-16.12 dBm	Q factor	193.7

Date: 3.JUN.2018 09:38:45

QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel

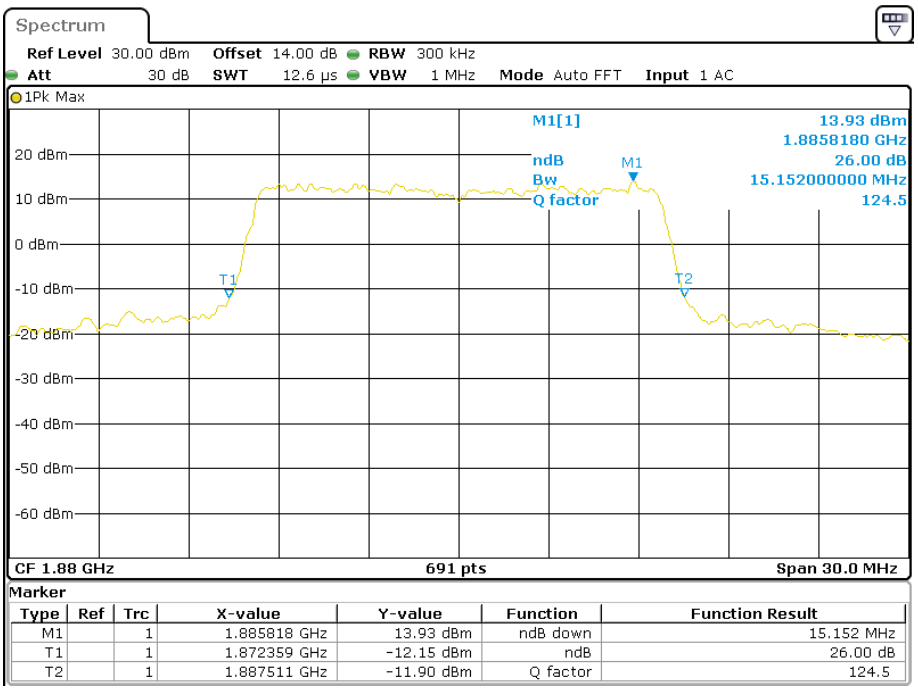


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.875051 GHz	13.24 dBm	ndB down	15.152 MHz
T1		1	1.872402 GHz	-12.91 dBm	ndB	26.00 dB
T2		1	1.887554 GHz	-12.92 dBm	Q factor	123.7

Date: 3.JUN.2018 09:41:11

16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel

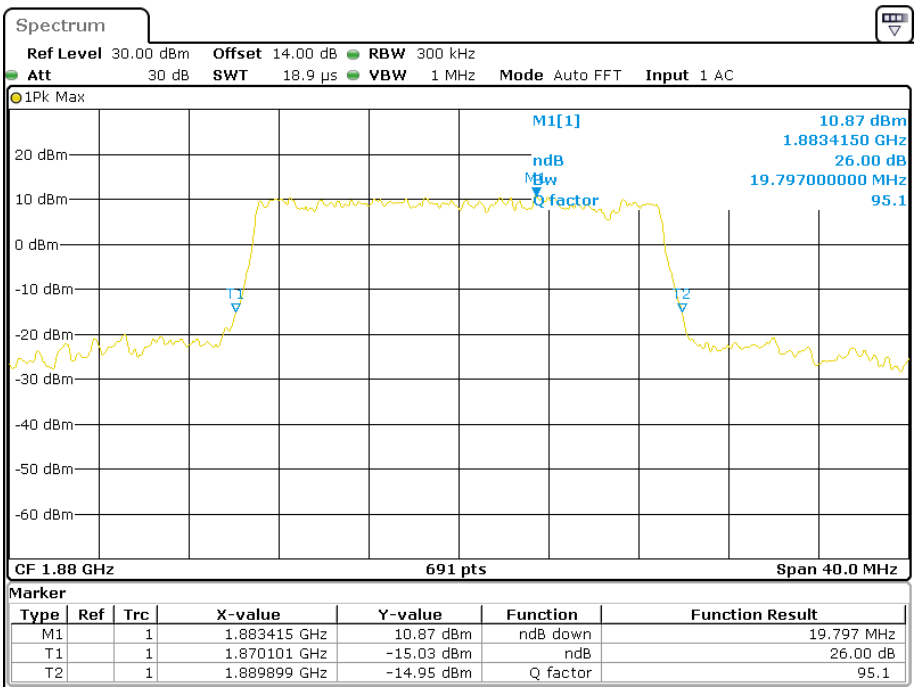


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.885818 GHz	13.93 dBm	ndB down	15.152 MHz
T1		1	1.872359 GHz	-12.15 dBm	ndB	26.00 dB
T2		1	1.887511 GHz	-11.90 dBm	Q factor	124.5

Date: 3.JUN.2018 09:43:05

QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel

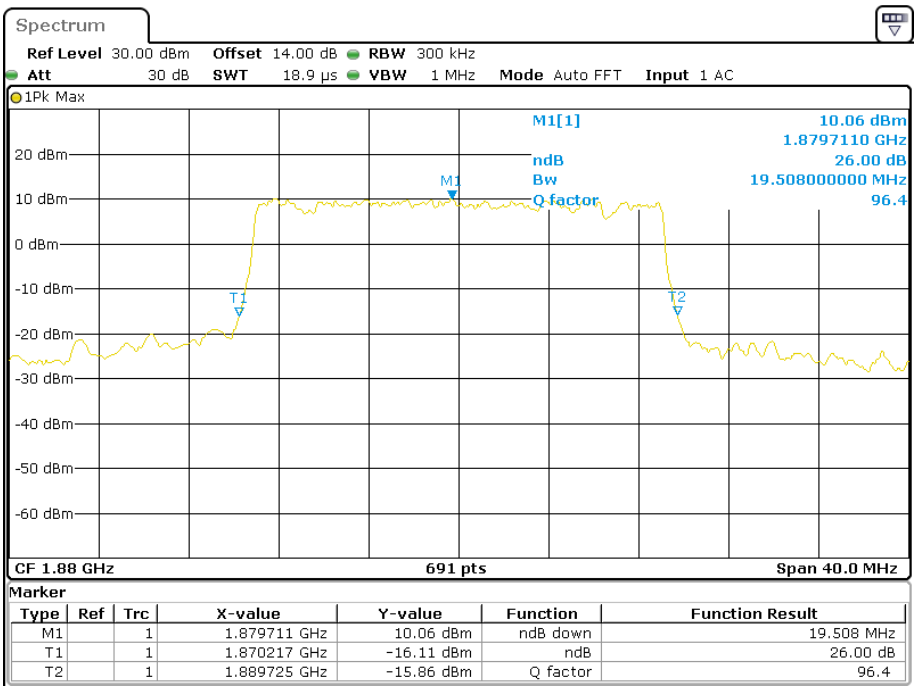


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.883415 GHz	10.87 dBm	ndB down	19.797 MHz
T1		1	1.870101 GHz	-15.03 dBm	ndB	26.00 dB
T2		1	1.889899 GHz	-14.95 dBm	Q factor	95.1

Date: 3.JUN.2018 09:41:41

16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel



Marker

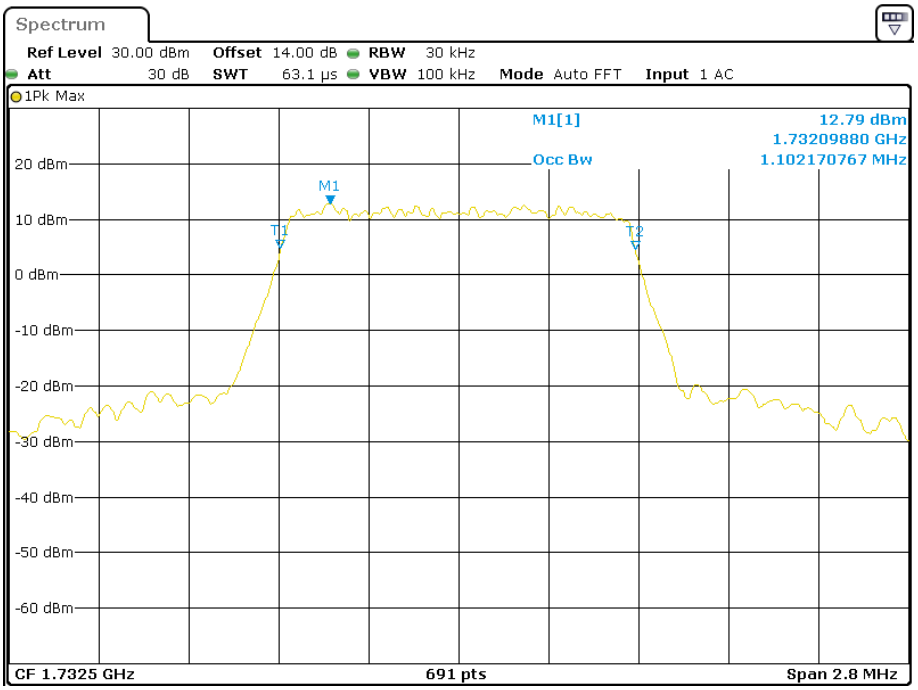
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.879711 GHz	10.06 dBm	ndB down	19.508 MHz
T1		1	1.870217 GHz	-16.11 dBm	ndB	26.00 dB
T2		1	1.889725 GHz	-15.86 dBm	Q factor	96.4

Date: 3.JUN.2018 09:42:11

LTE Band 4: (Middle Channel)

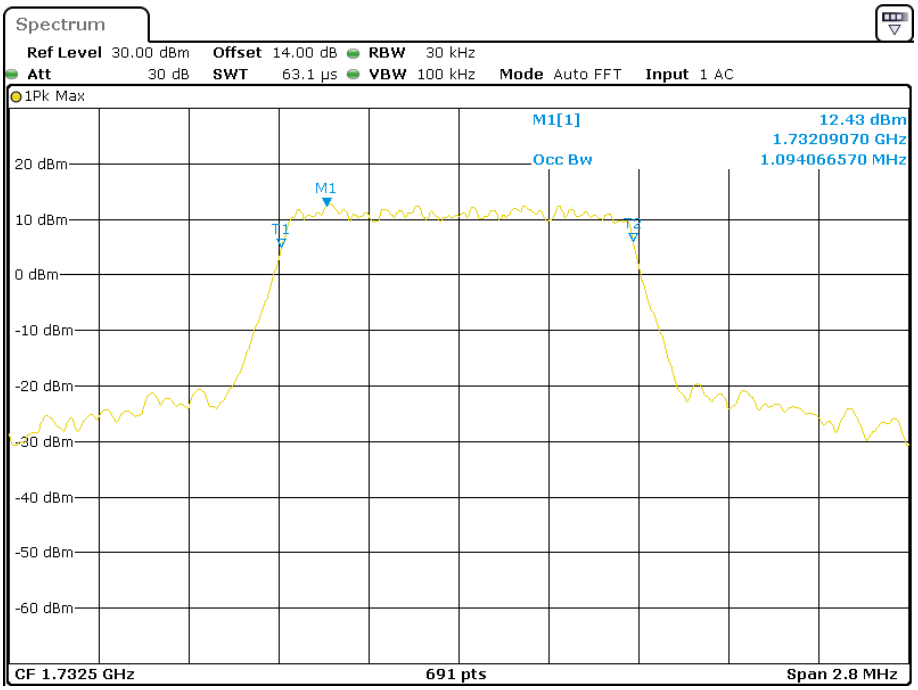
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.102	1.313
	16QAM	1.094	1.313
3.0	QPSK	2.674	2.874
	16QAM	2.674	2.874
5.0	QPSK	4.515	5.137
	16QAM	4.530	5.137
10.0	QPSK	8.944	9.638
	16QAM	8.944	9.899
15.0	QPSK	13.546	15.022
	16QAM	13.546	14.891
20.0	QPSK	17.945	19.392
	16QAM	17.945	19.508

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



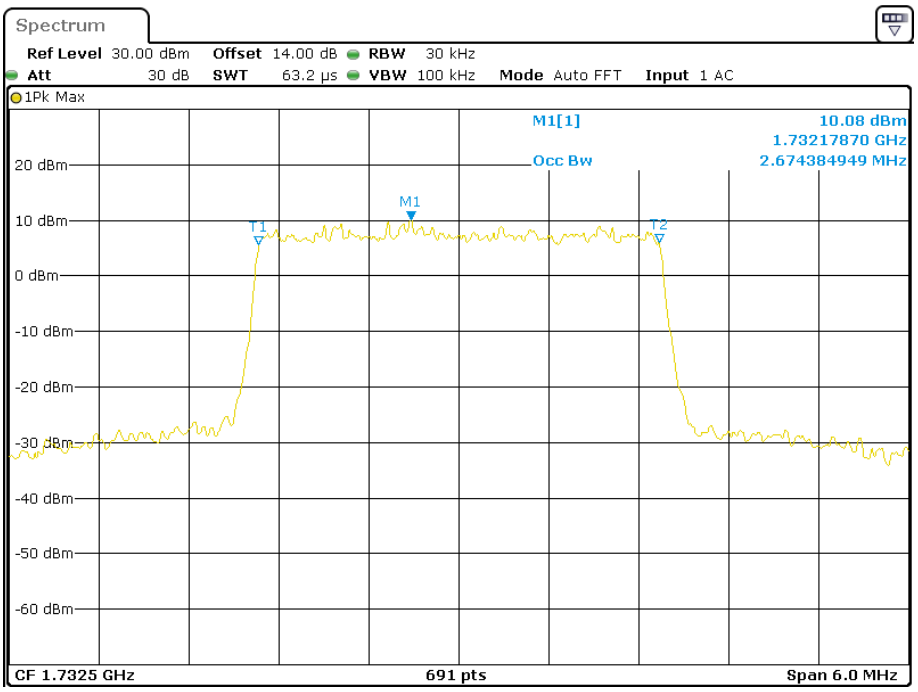
Date: 3.JUN.2018 08:52:56

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



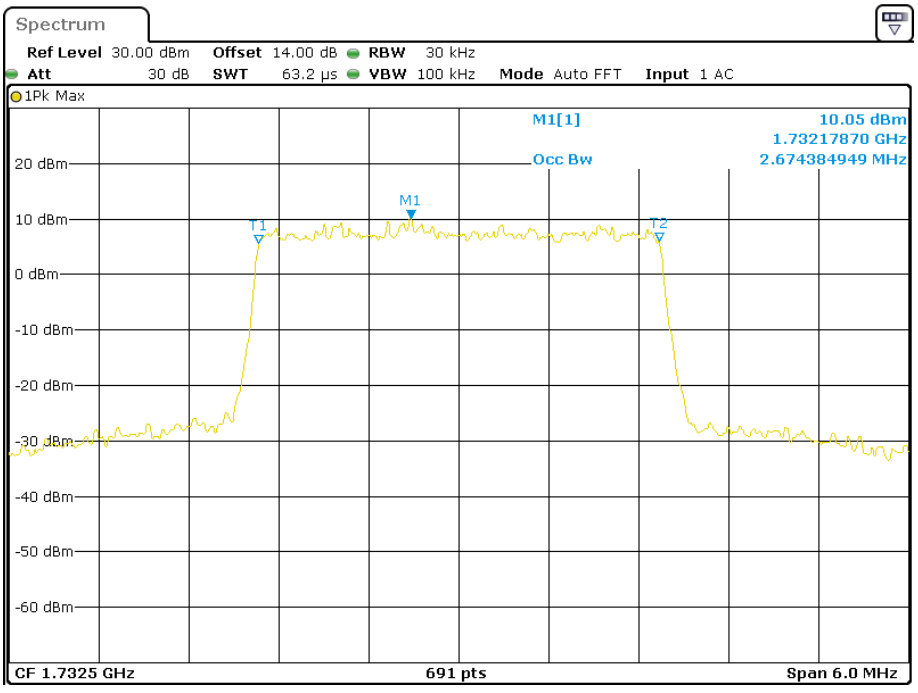
Date: 3.JUN.2018 08:50:55

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



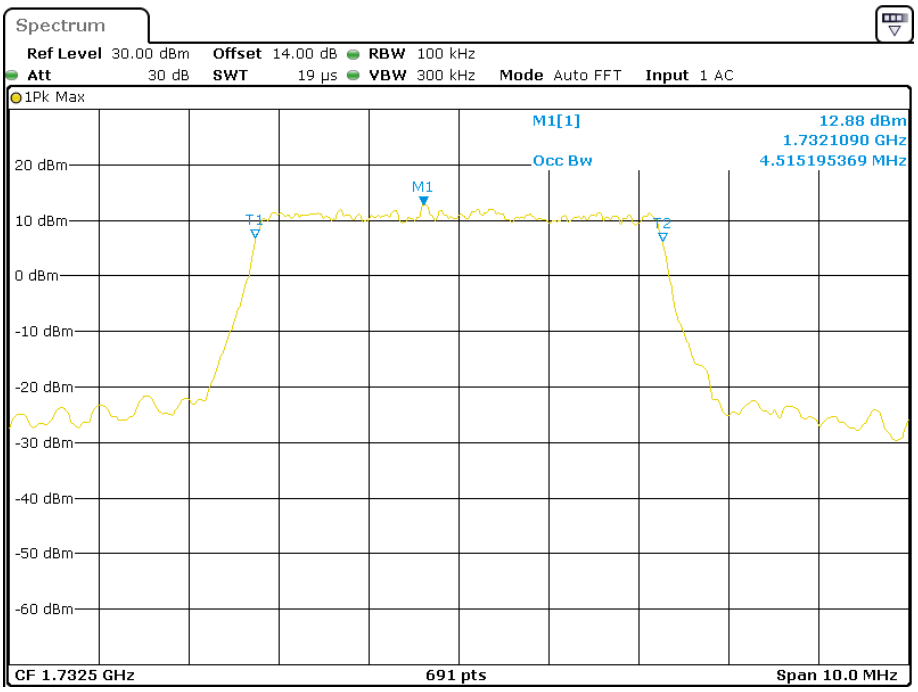
Date: 3.JUN.2018 08:52:19

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



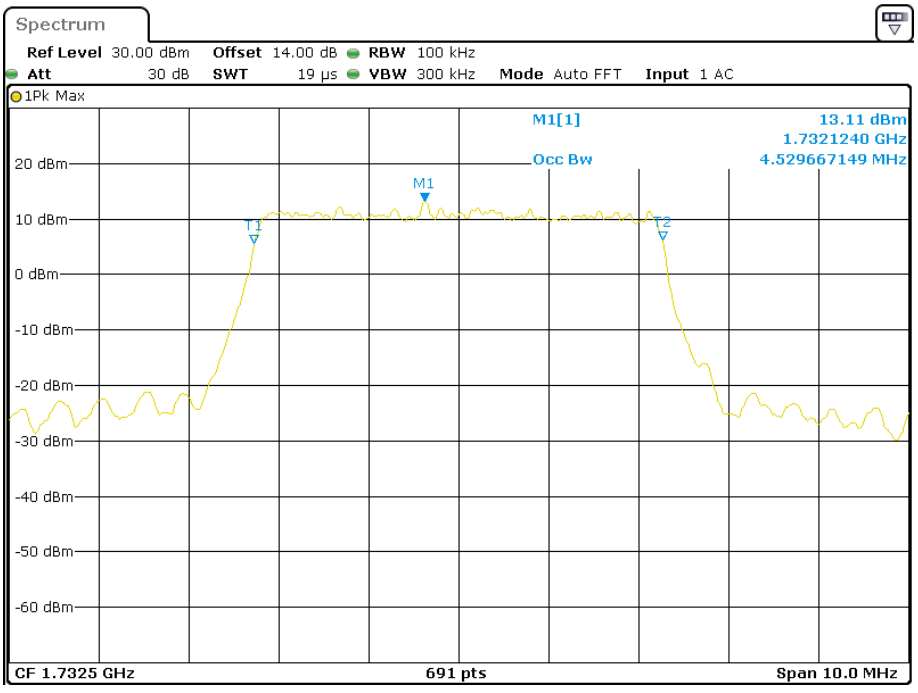
Date: 3.JUN.2018 08:51:48

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



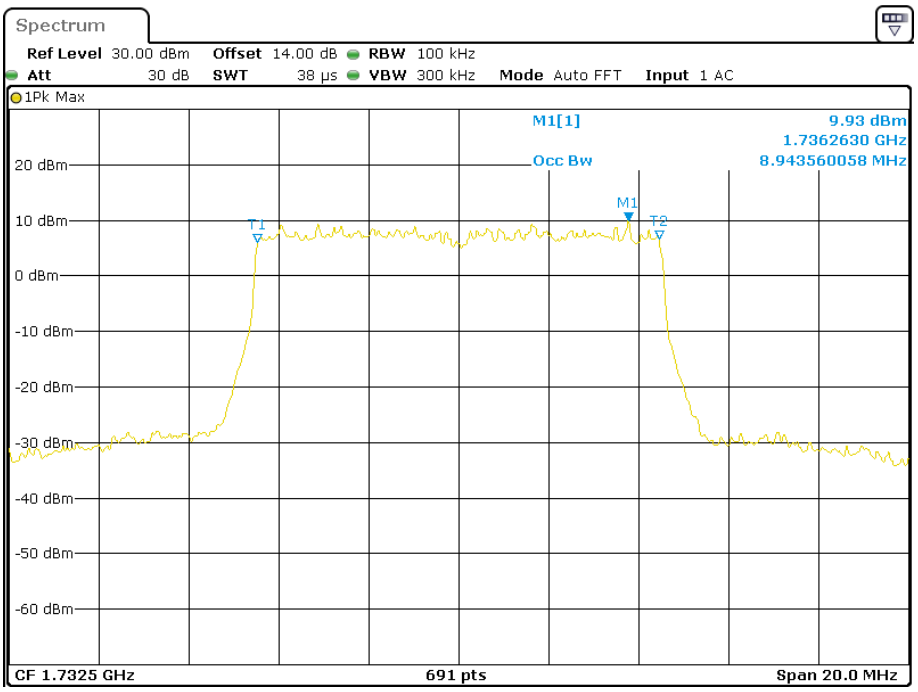
Date: 3.JUN.2018 08:59:52

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



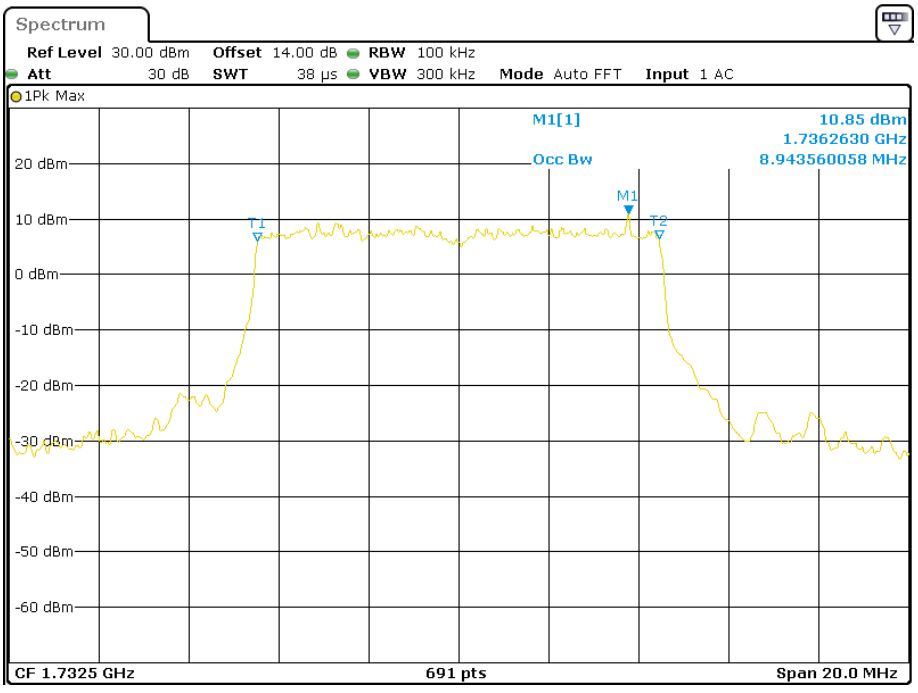
Date: 3.JUN.2018 09:02:02

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



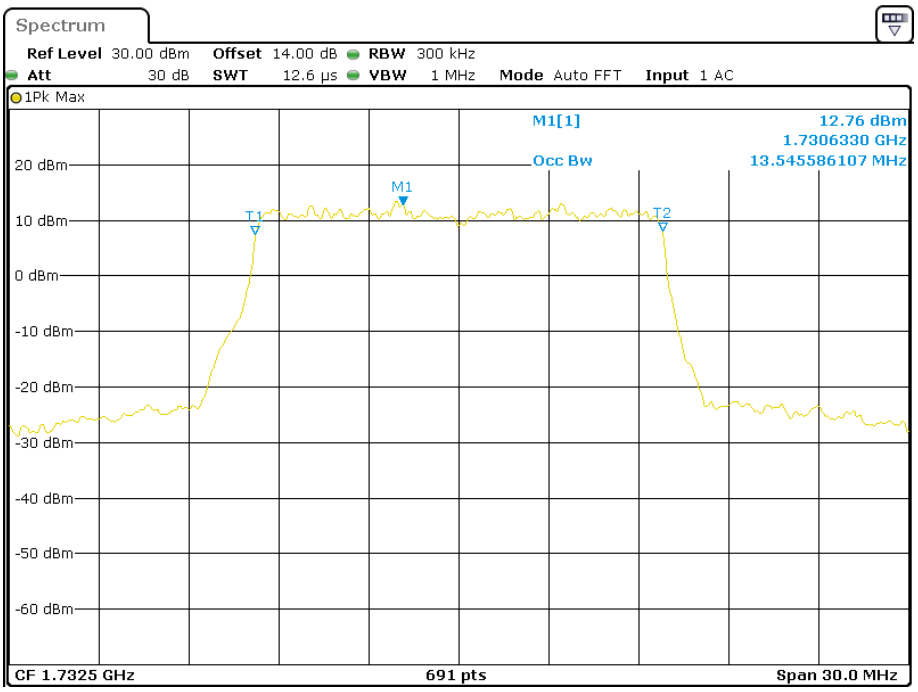
Date: 3.JUN.2018 09:00:33

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



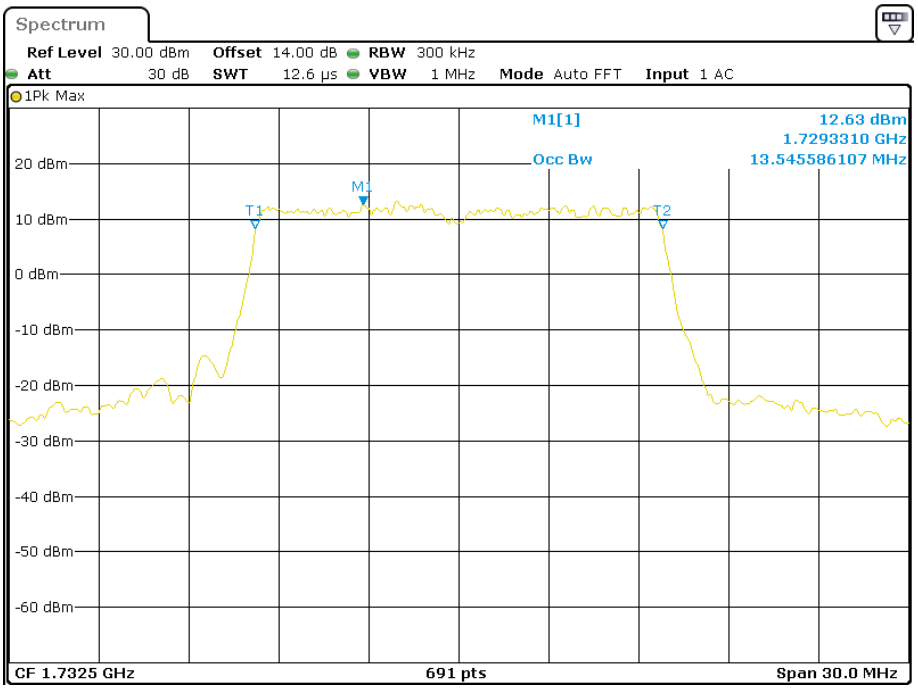
Date: 3.JUN.2018 09:01:20

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



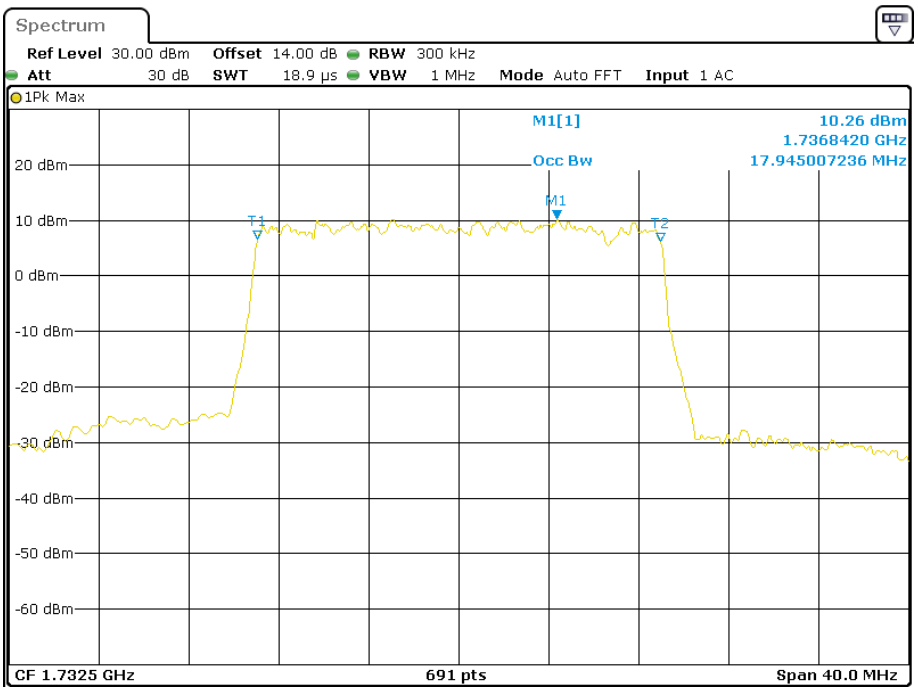
Date: 3.JUN.2018 09:04:52

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



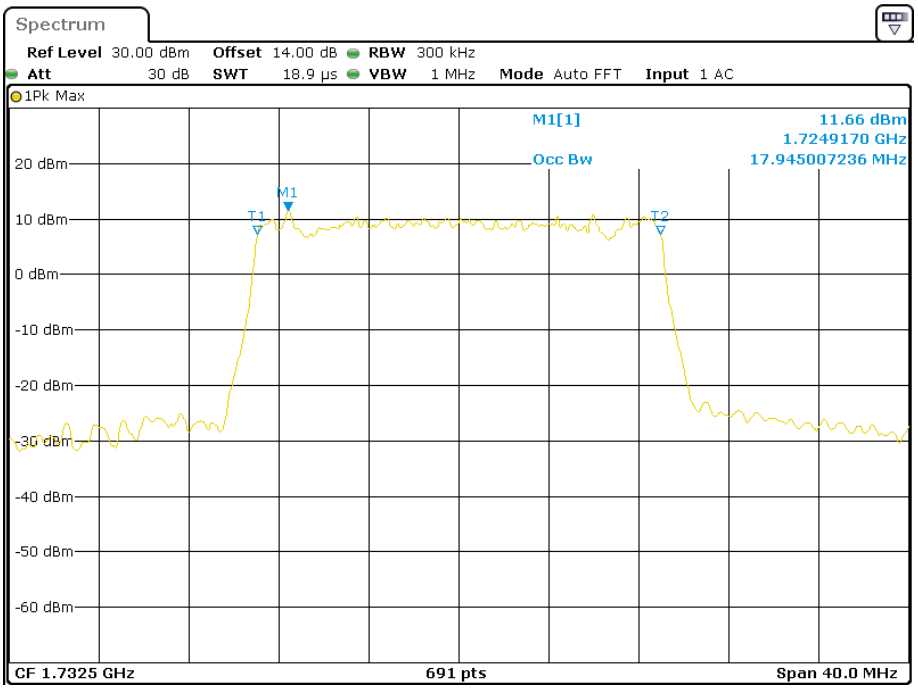
Date: 3.JUN.2018 09:03:01

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



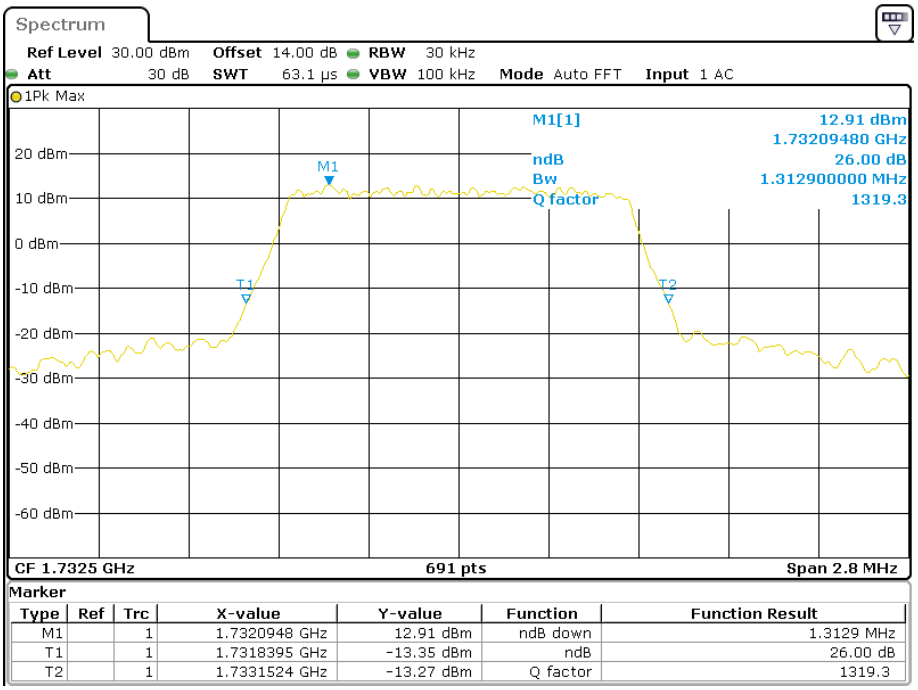
Date: 3.JUN.2018 09:04:18

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



Date: 3.JUN.2018 09:03:46

QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel

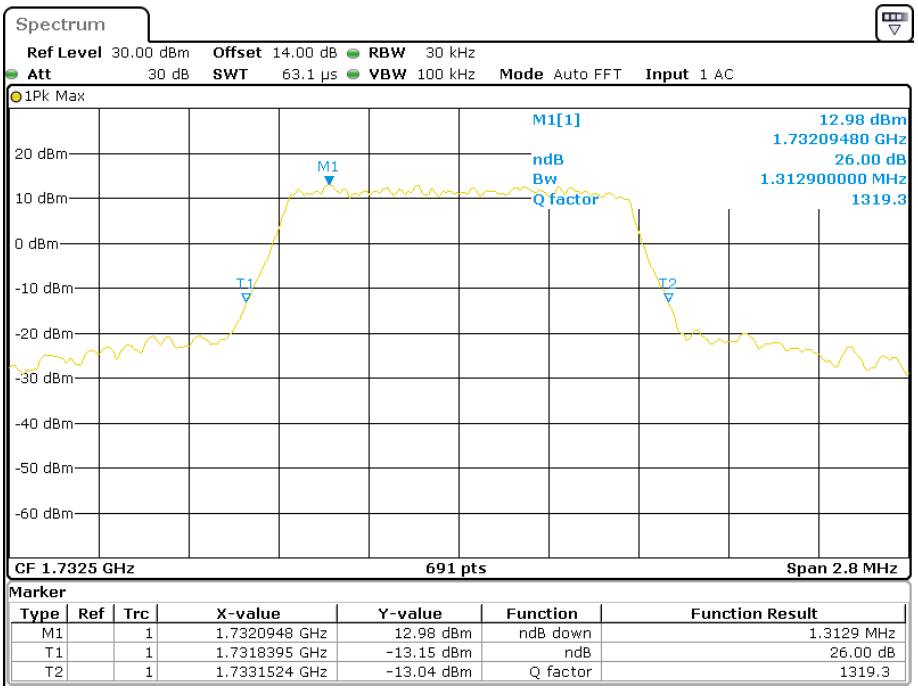


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7320948 GHz	12.91 dBm	ndB down	1.3129 MHz
T1		1	1.7318395 GHz	-13.35 dBm	ndB	26.00 dB
T2		1	1.7331524 GHz	-13.27 dBm	Q factor	1319.3

Date: 3.JUN.2018 10:03:29

16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel

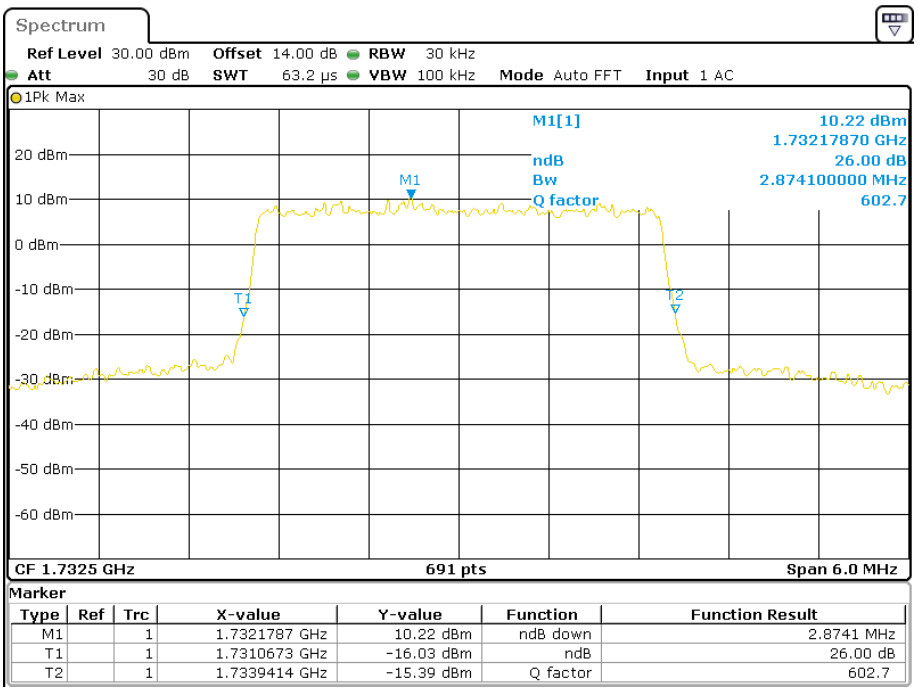


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7320948 GHz	12.98 dBm	ndB down	1.3129 MHz
T1		1	1.7318395 GHz	-13.15 dBm	ndB	26.00 dB
T2		1	1.7331524 GHz	-13.04 dBm	Q factor	1319.3

Date: 3.JUN.2018 10:00:40

QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel

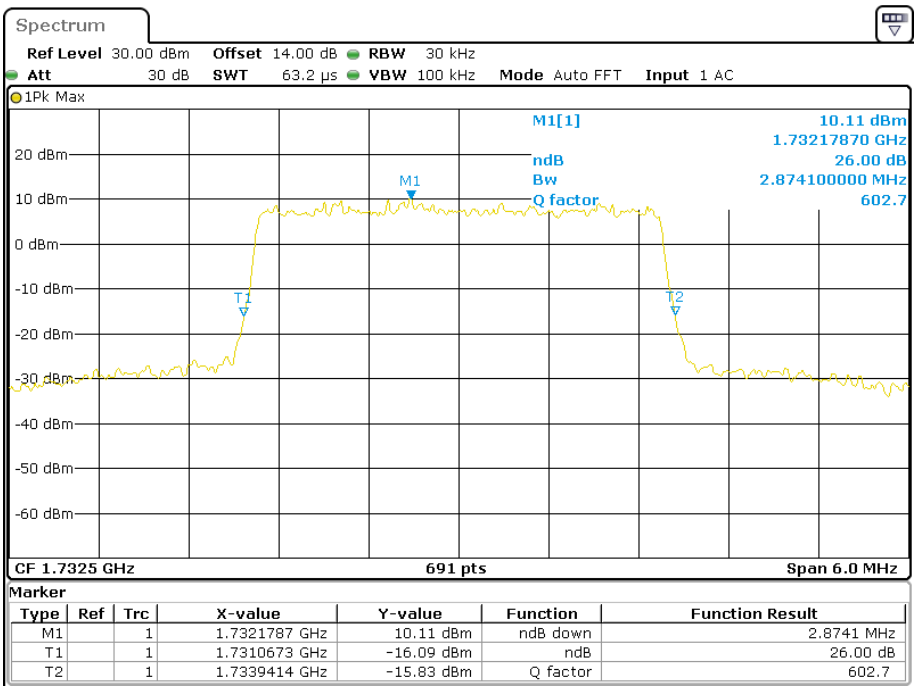


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7321787 GHz	10.22 dBm	ndB down	2.8741 MHz
T1		1	1.7310673 GHz	-16.03 dBm	ndB	26.00 dB
T2		1	1.7339414 GHz	-15.39 dBm	Q factor	602.7

Date: 3.JUN.2018 10:02:47

16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel

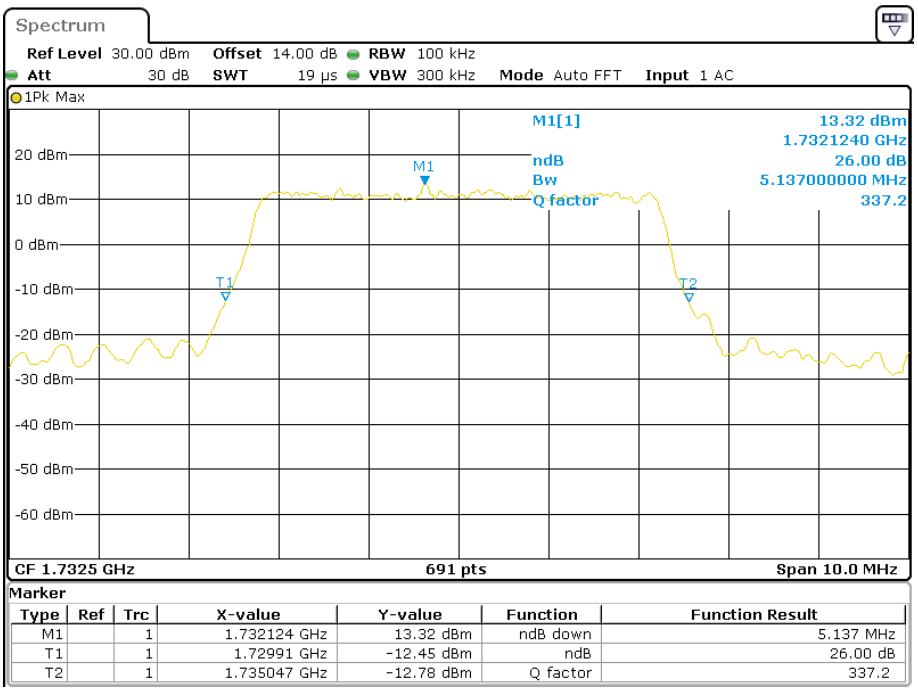


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7321787 GHz	10.11 dBm	ndB down	2.8741 MHz
T1		1	1.7310673 GHz	-16.09 dBm	ndB	26.00 dB
T2		1	1.7339414 GHz	-15.83 dBm	Q factor	602.7

Date: 3.JUN.2018 10:01:08

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

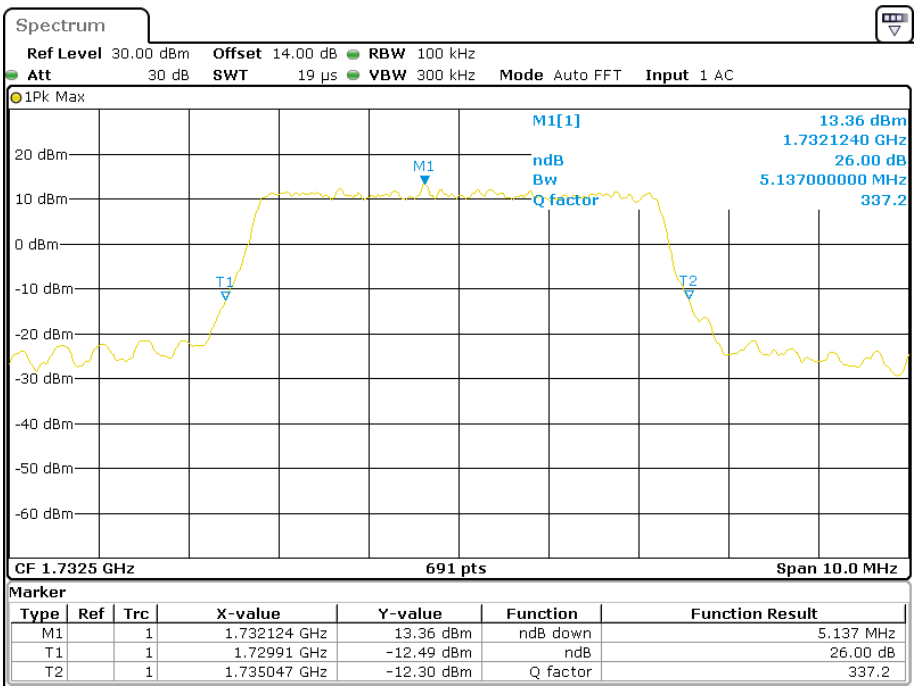


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.732124 GHz	13.32 dBm	ndB down	5.137 MHz
T1		1	1.72991 GHz	-12.45 dBm	ndB	26.00 dB
T2		1	1.735047 GHz	-12.78 dBm	Q factor	337.2

Date: 3.JUN.2018 10:04:14

16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel

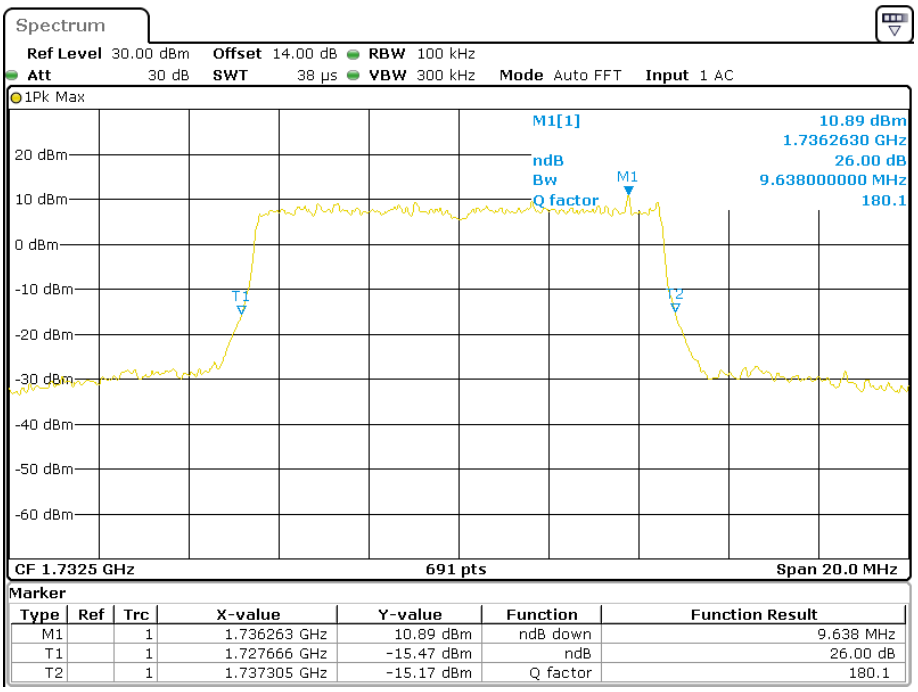


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.732124 GHz	13.36 dBm	ndB down	5.137 MHz
T1		1	1.72991 GHz	-12.49 dBm	ndB	26.00 dB
T2		1	1.735047 GHz	-12.30 dBm	Q factor	337.2

Date: 3.JUN.2018 10:06:19

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel

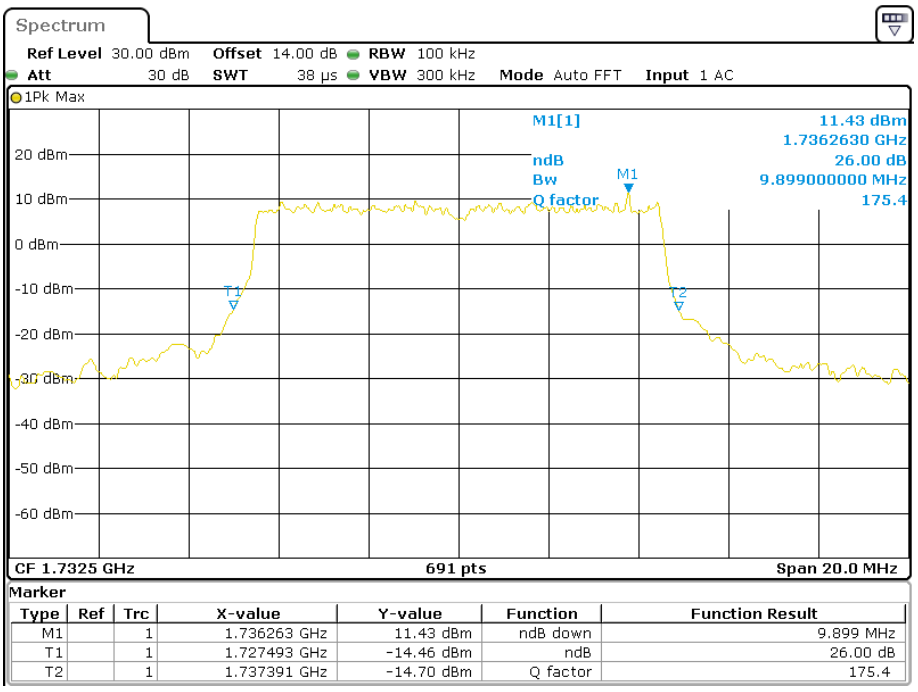


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.736263 GHz	10.89 dBm	ndB down	9.638 MHz
T1		1	1.727666 GHz	-15.47 dBm	ndB	26.00 dB
T2		1	1.737305 GHz	-15.17 dBm	Q factor	180.1

Date: 3.JUN.2018 10:04:53

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel

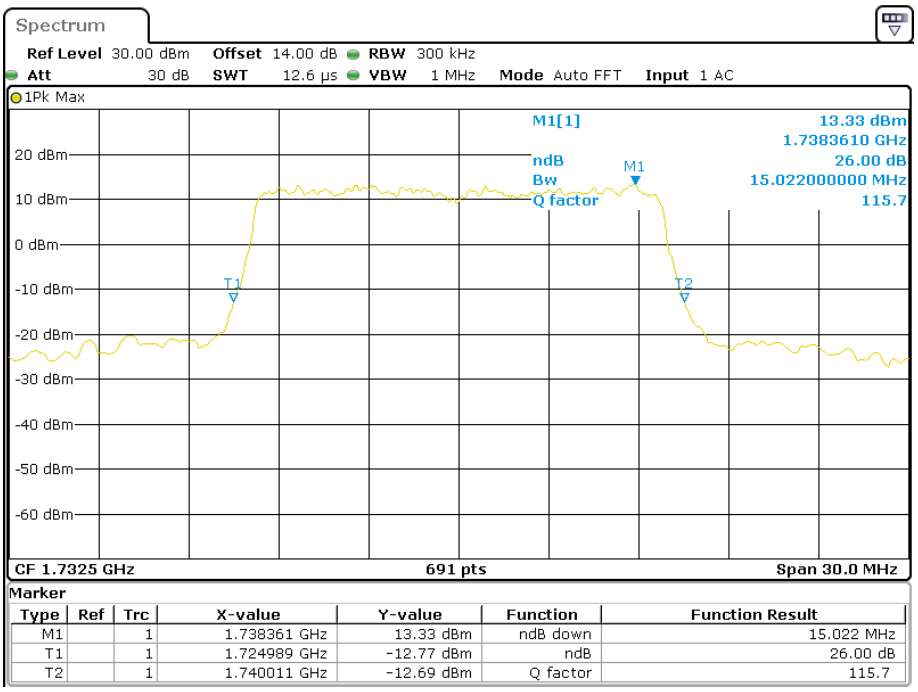


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.736263 GHz	11.43 dBm	ndB down	9.899 MHz
T1		1	1.727493 GHz	-14.46 dBm	ndB	26.00 dB
T2		1	1.737391 GHz	-14.70 dBm	Q factor	175.4

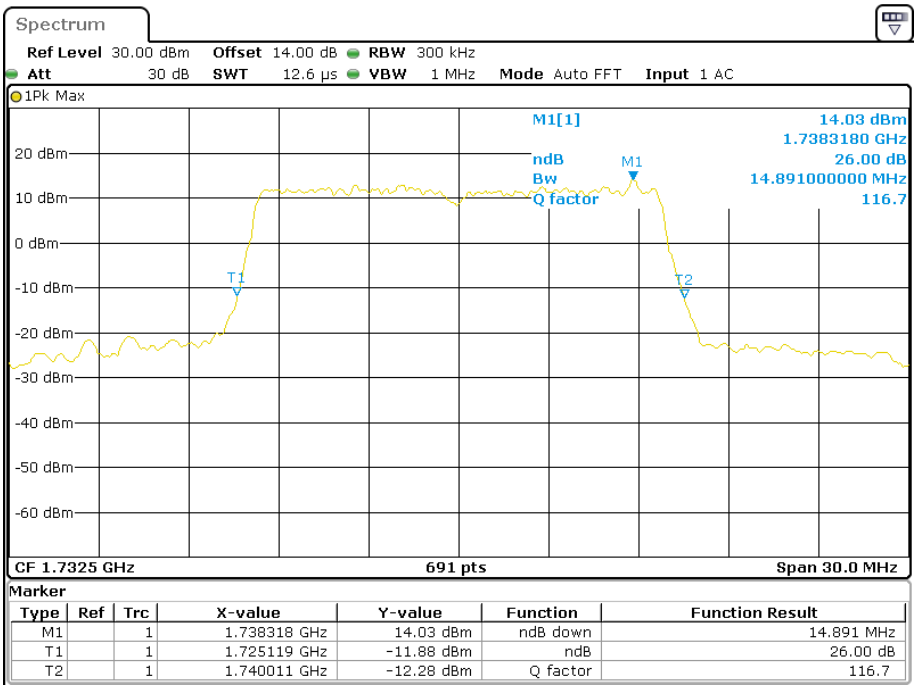
Date: 3.JUN.2018 10:05:42

QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel



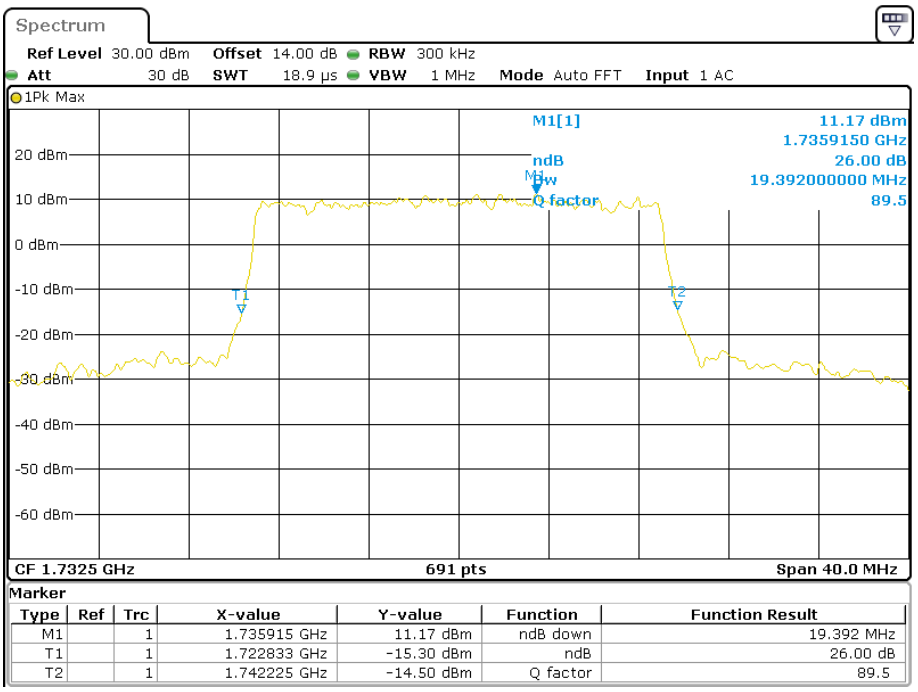
Date: 3.JUN.2018 10:09:00

16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel



Date: 3.JUN.2018 10:07:00

QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel

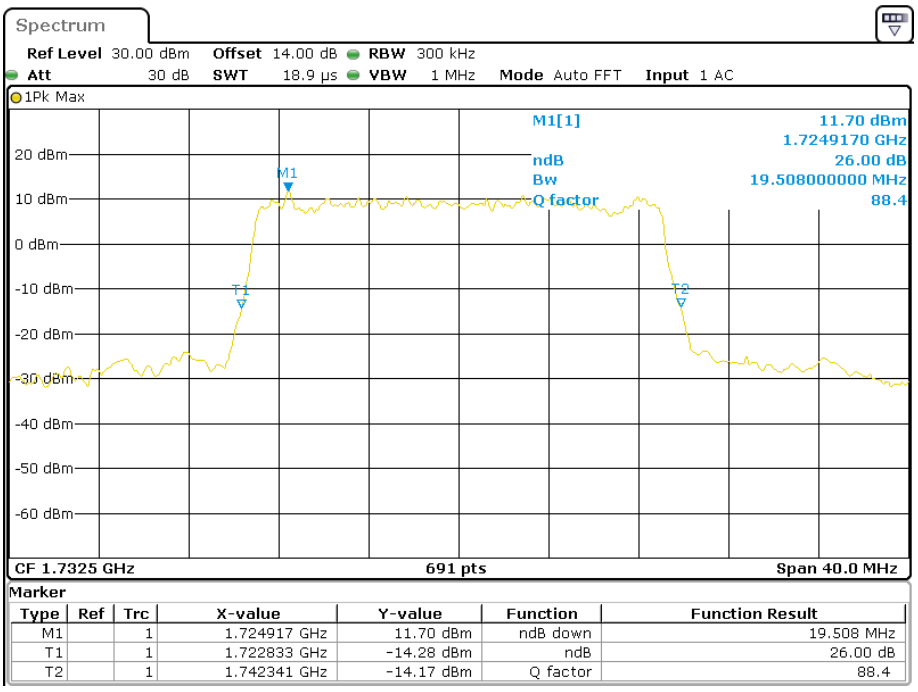


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.735915 GHz	11.17 dBm	ndB down	19.392 MHz
T1		1	1.722833 GHz	-15.30 dBm	ndB	26.00 dB
T2		1	1.742225 GHz	-14.50 dBm	Q factor	89.5

Date: 3.JUN.2018 10:08:12

16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel



Marker

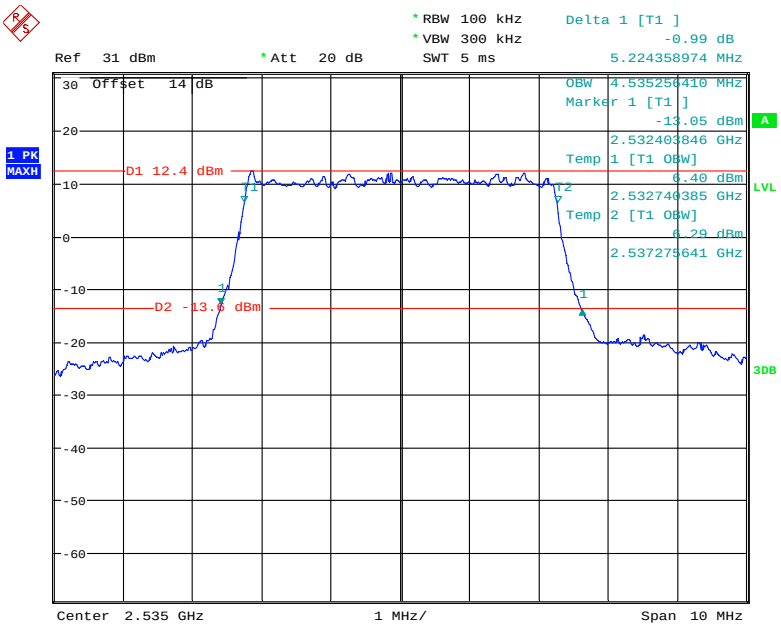
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.724917 GHz	11.70 dBm	ndB down	19.508 MHz
T1		1	1.722833 GHz	-14.28 dBm	ndB	26.00 dB
T2		1	1.742341 GHz	-14.17 dBm	Q factor	88.4

Date: 3.JUN.2018 10:07:32

LTE Band 7: (Middle Channel)

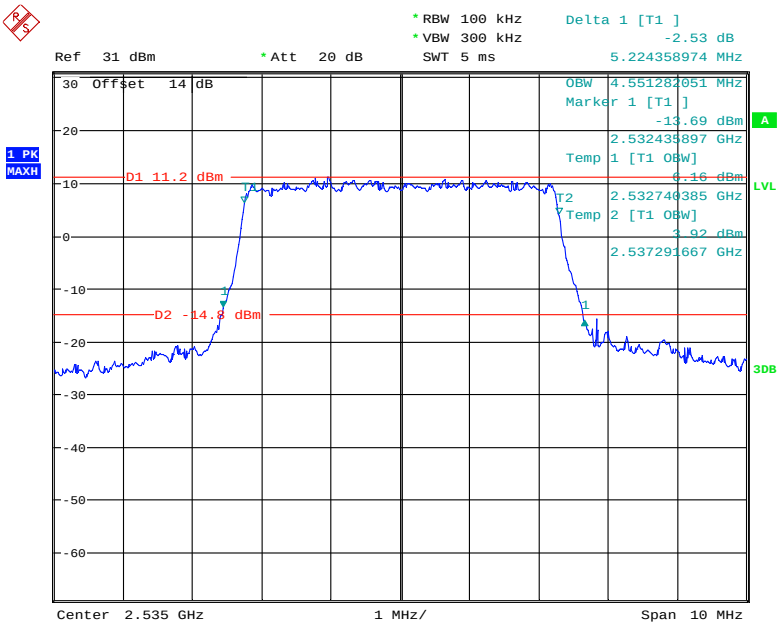
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.535	5.224
	16QAM	4.551	5.224
10.0	QPSK	8.974	9.936
	16QAM	8.974	9.776
15.0	QPSK	13.510	15.048
	16QAM	13.462	14.904
20.0	QPSK	17.949	19.407
	16QAM	17.949	19.535

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



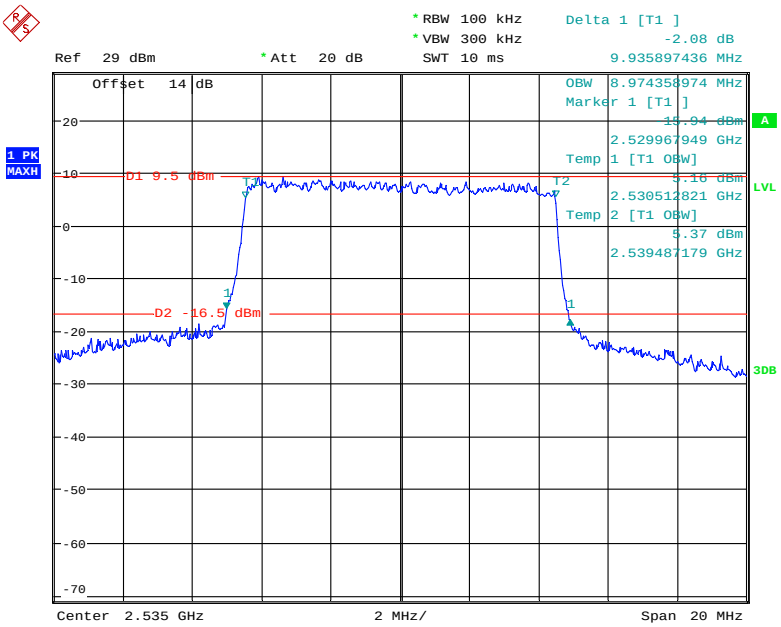
Date: 27.JUN.2018 09:25:34

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



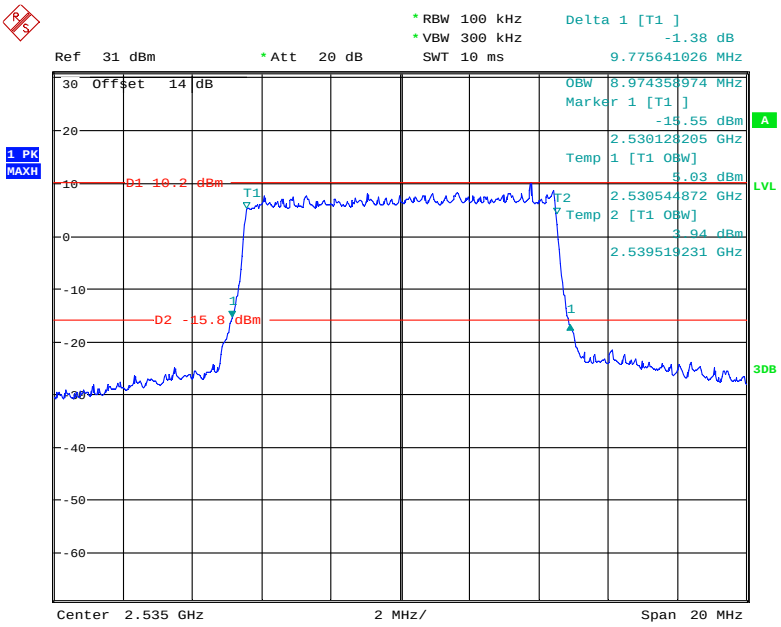
Date: 27.JUN.2018 09:27:28

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



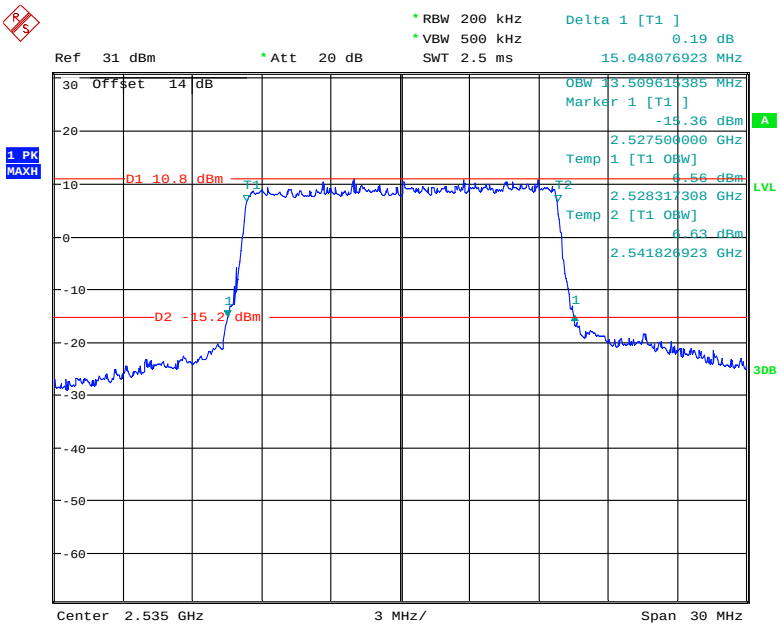
Date: 28.JUN.2018 09:12:32

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



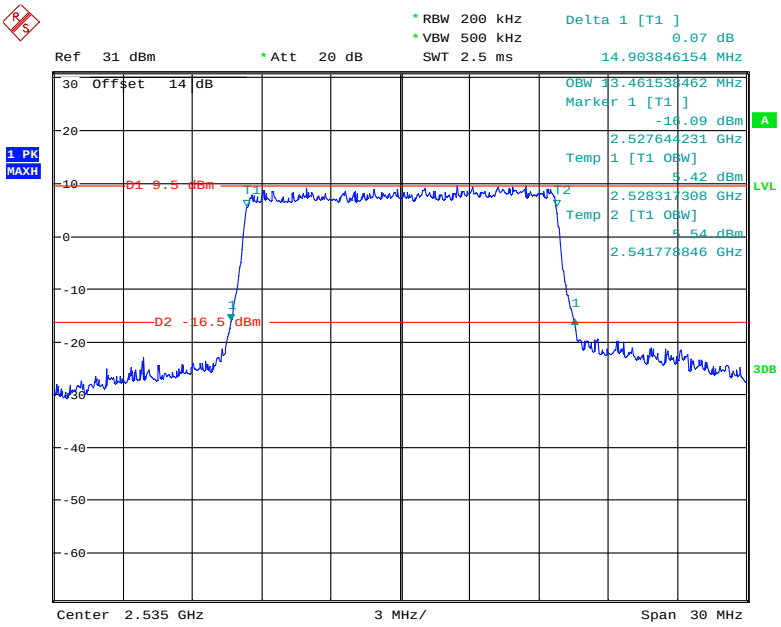
Date: 27.JUN.2018 09:31:09

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



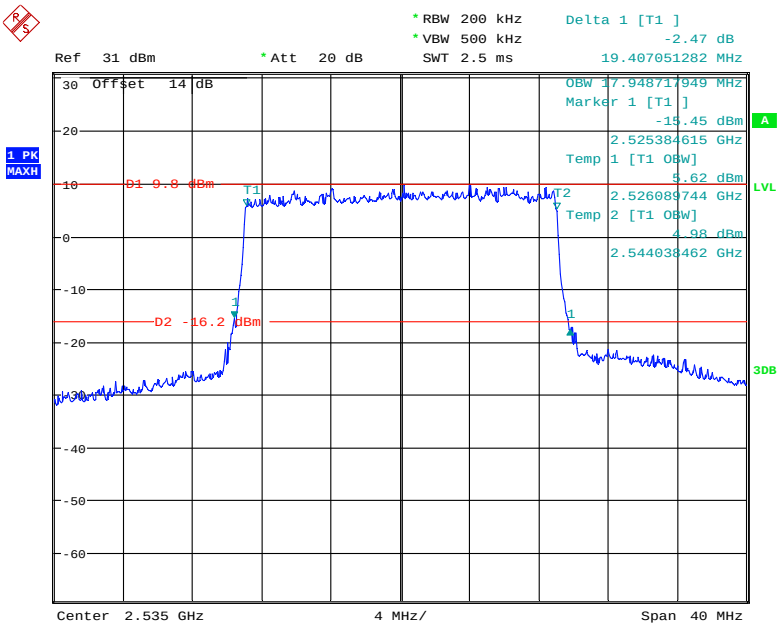
Date: 27.JUN.2018 09:32:37

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



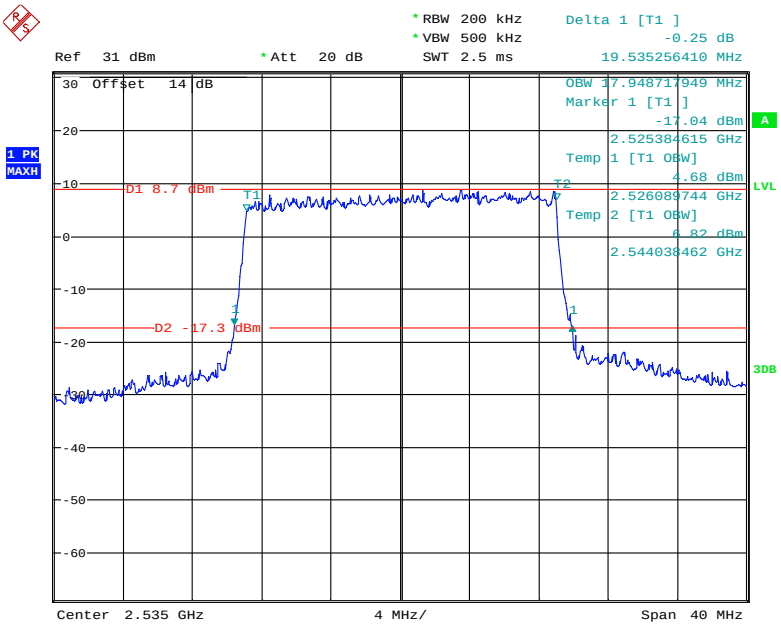
Date: 27.JUN.2018 09:33:43

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



Date: 27.JUN.2018 09:35:24

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

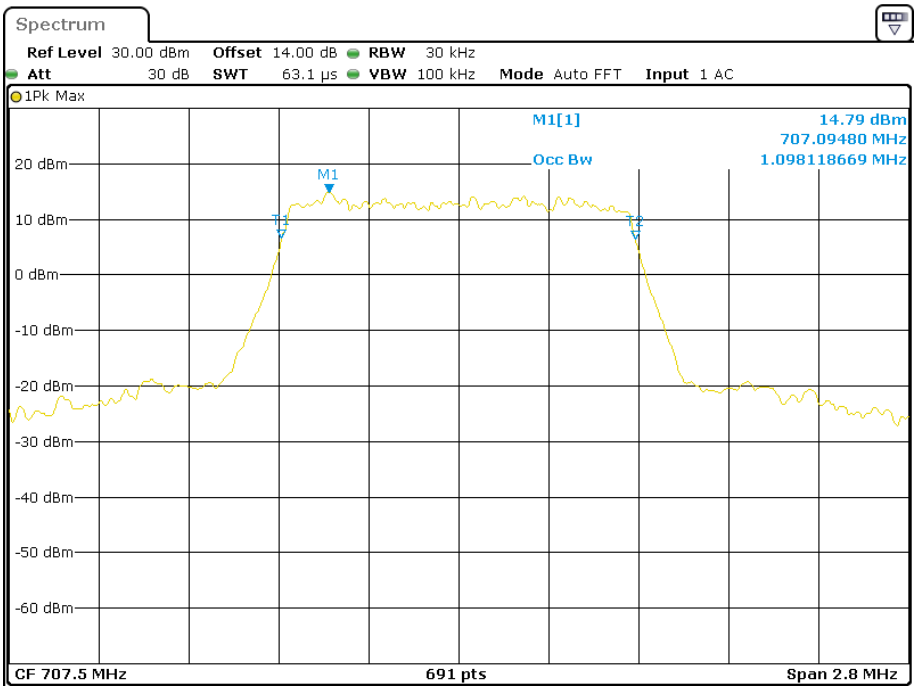


Date: 27.JUN.2018 09:38:23

LTE Band 12: (Middle Channel)

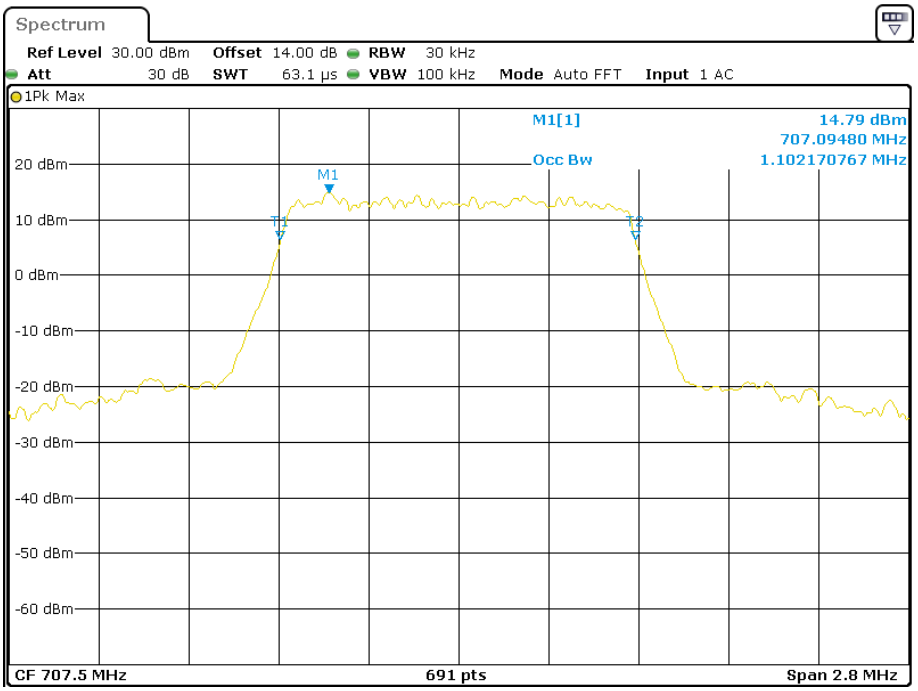
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.098	1.313
	16QAM	1.102	1.313
3.0	QPSK	2.674	2.874
	16QAM	2.674	2.874
5.0	QPSK	4.515	5.152
	16QAM	4.515	5.152
10.0	QPSK	8.944	9.696
	16QAM	8.973	9.812

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



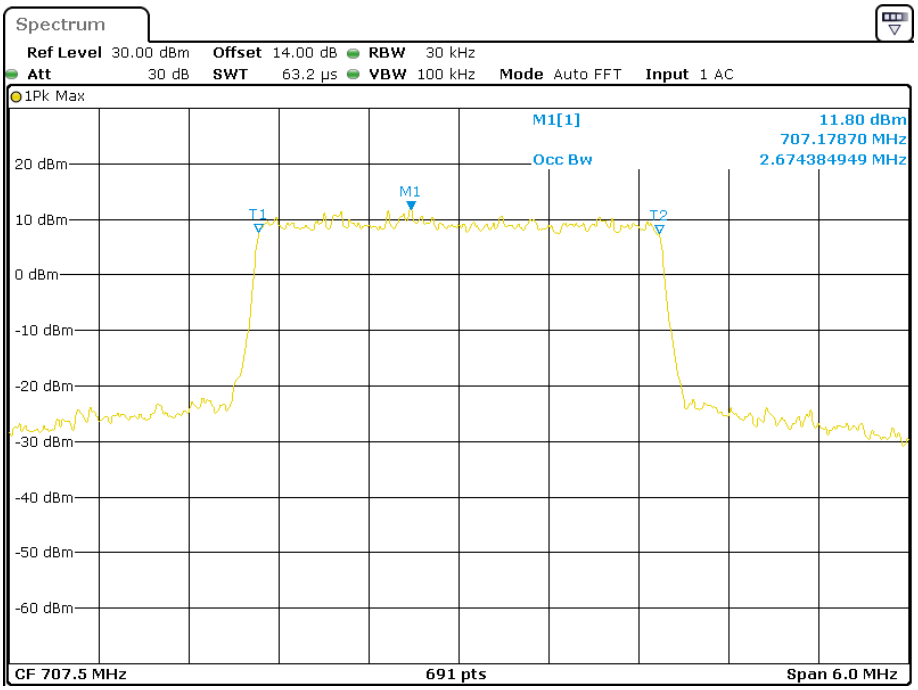
Date: 3.JUN.2018 09:07:33

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



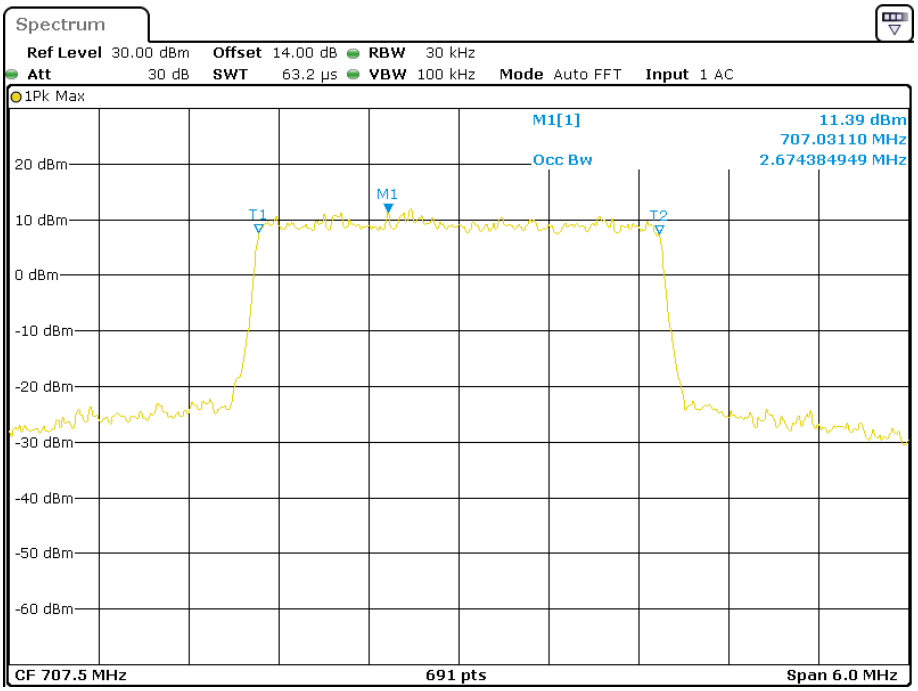
Date: 3.JUN.2018 09:09:28

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



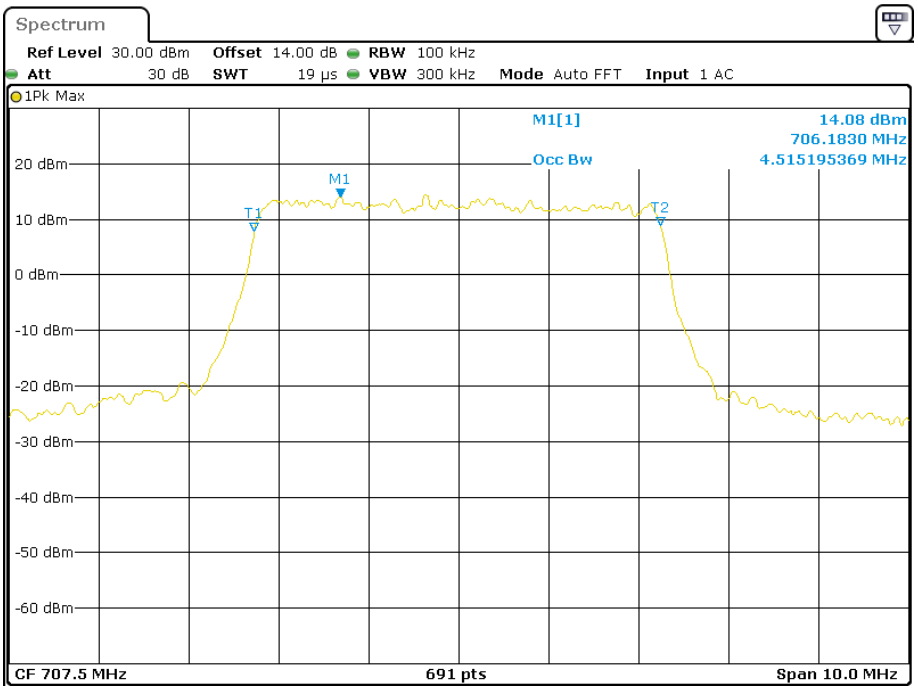
Date: 3.JUN.2018 09:08:28

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



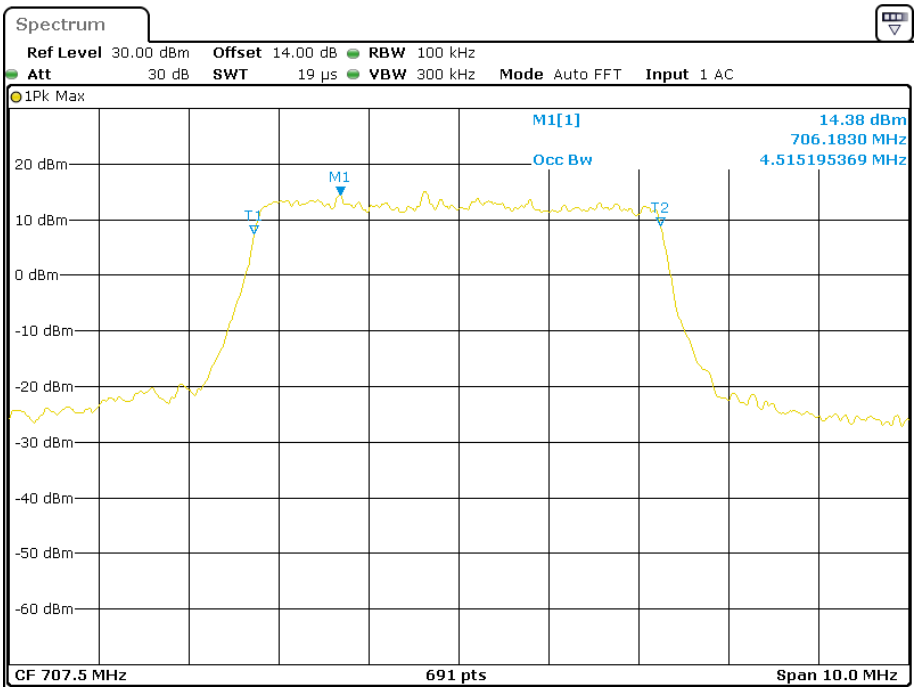
Date: 3.JUN.2018 09:09:01

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



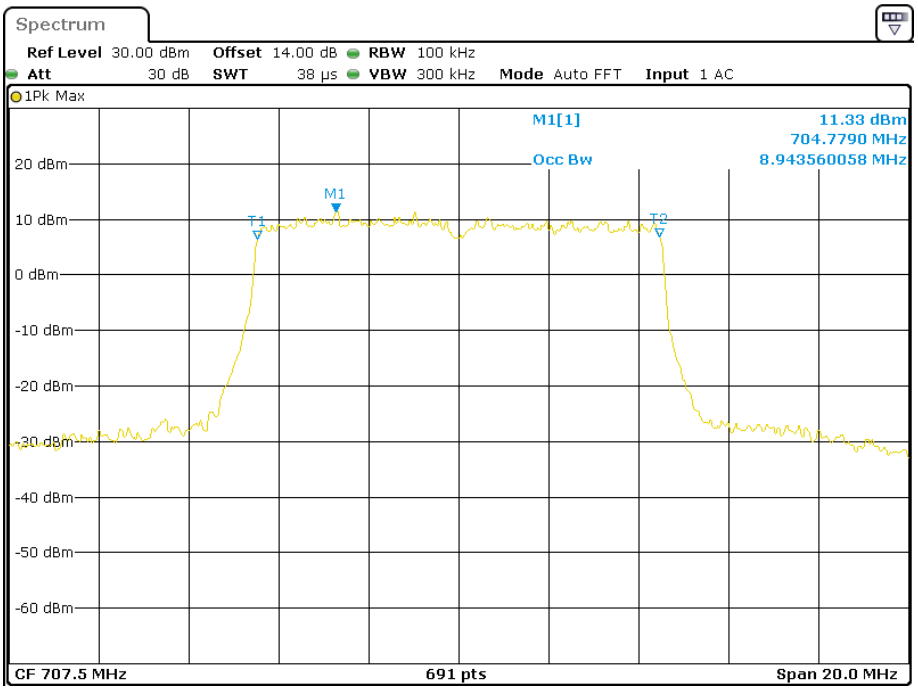
Date: 3.JUN.2018 09:11:47

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



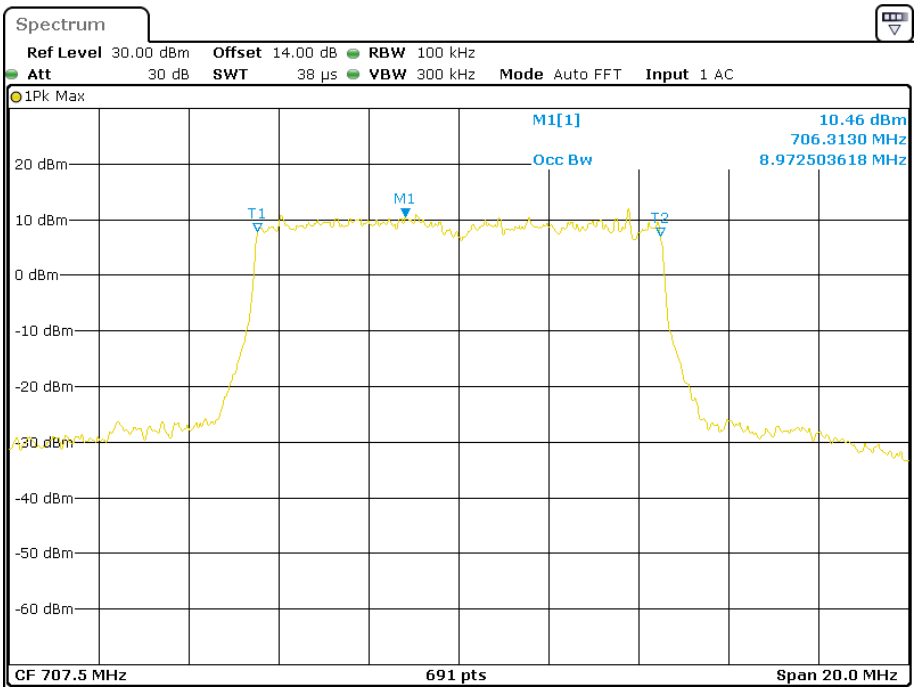
Date: 3.JUN.2018 09:10:00

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



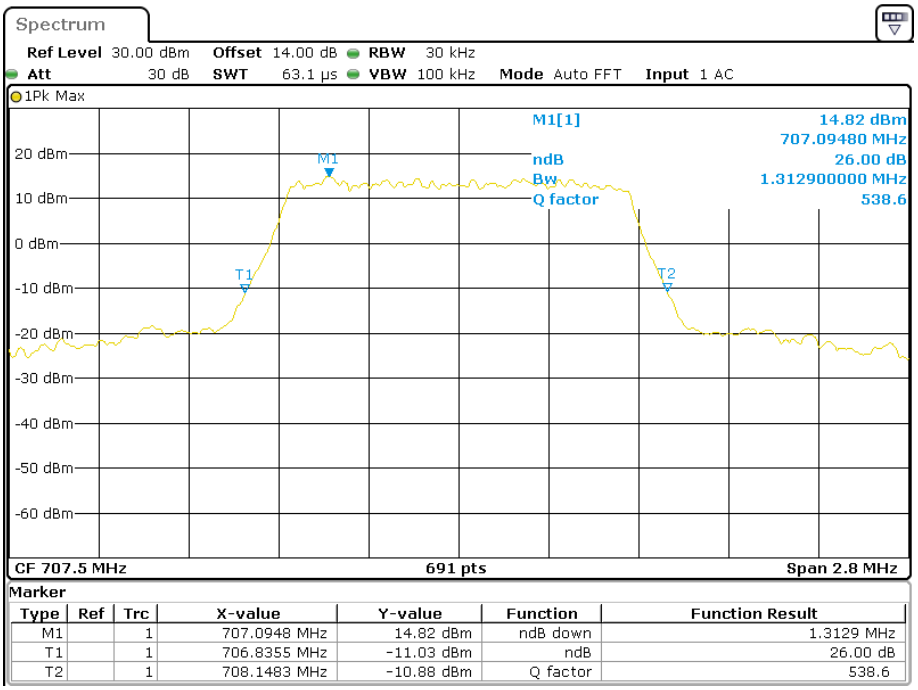
Date: 3.JUN.2018 09:11:10

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



Date: 3.JUN.2018 09:10:41

QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel

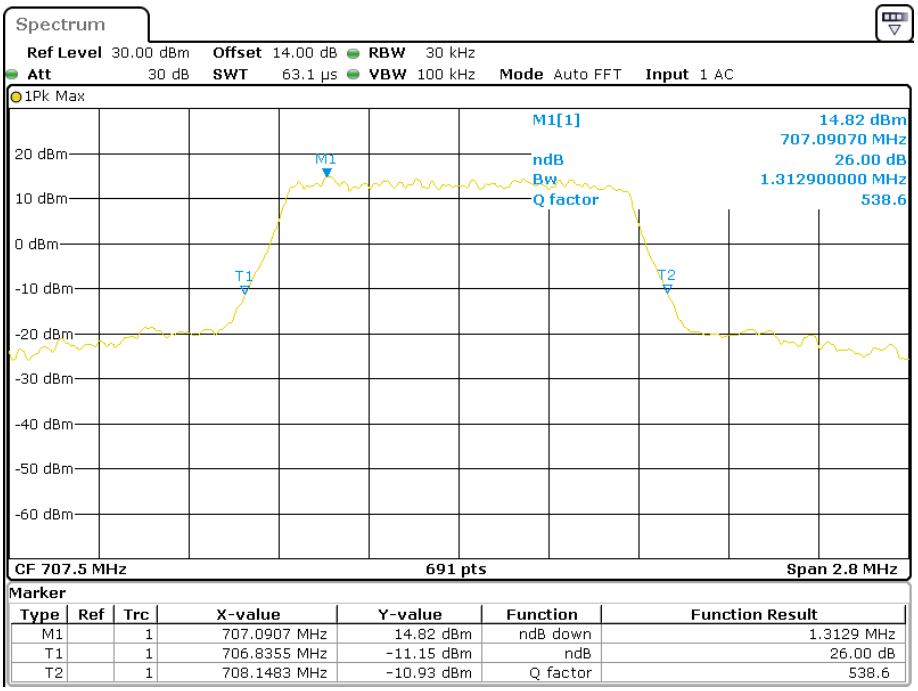


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.0948 MHz	14.82 dBm	ndB down	1.3129 MHz
T1		1	706.8355 MHz	-11.03 dBm	ndB	26.00 dB
T2		1	708.1483 MHz	-10.88 dBm	Q factor	538.6

Date: 3.JUN.2018 09:29:16

16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel

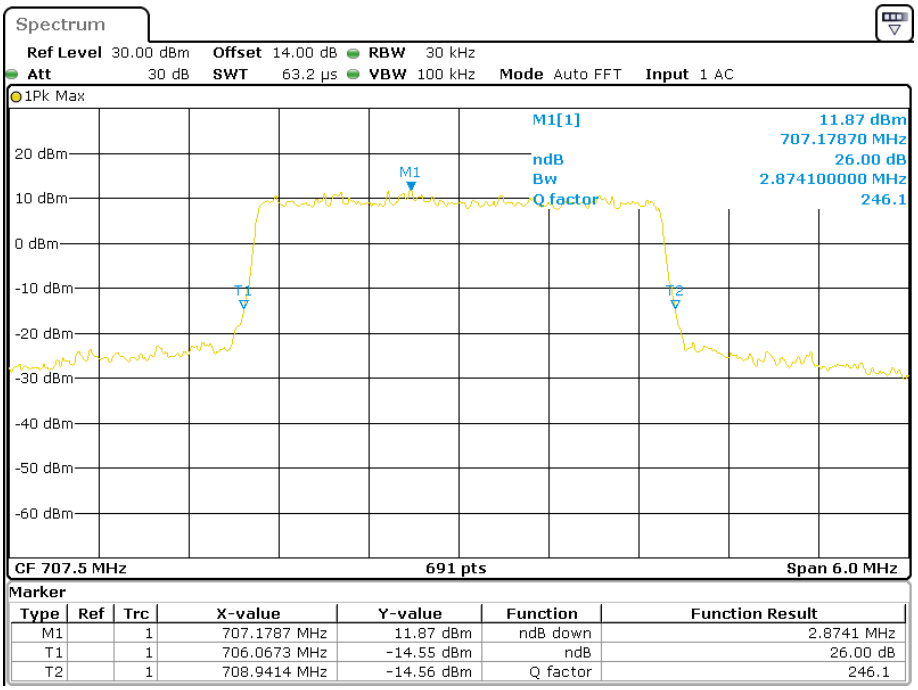


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.0907 MHz	14.82 dBm	ndB down	1.3129 MHz
T1		1	706.8355 MHz	-11.15 dBm	ndB	26.00 dB
T2		1	708.1483 MHz	-10.93 dBm	Q factor	538.6

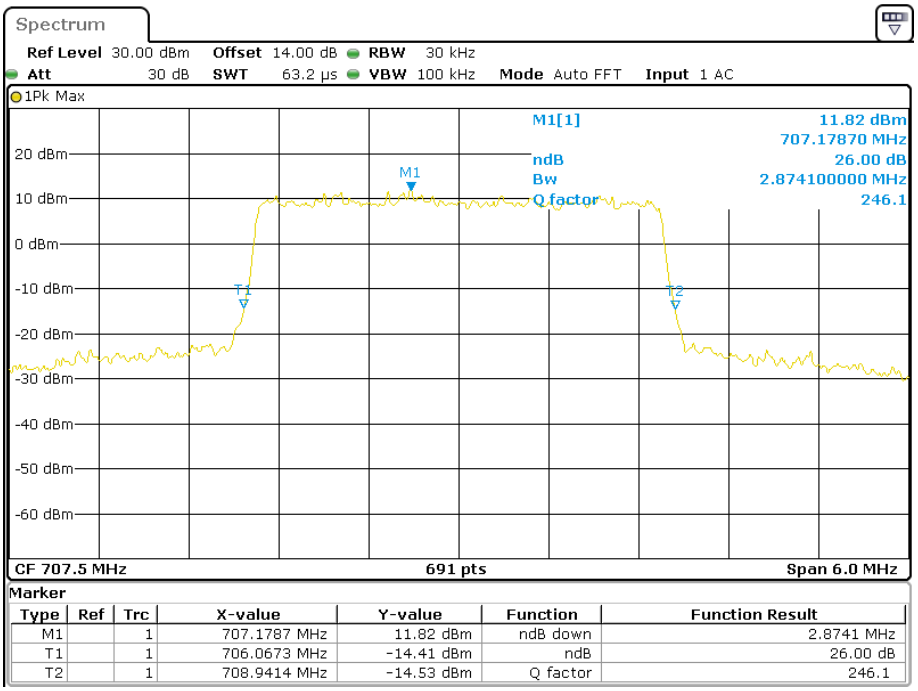
Date: 3.JUN.2018 09:31:30

QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel



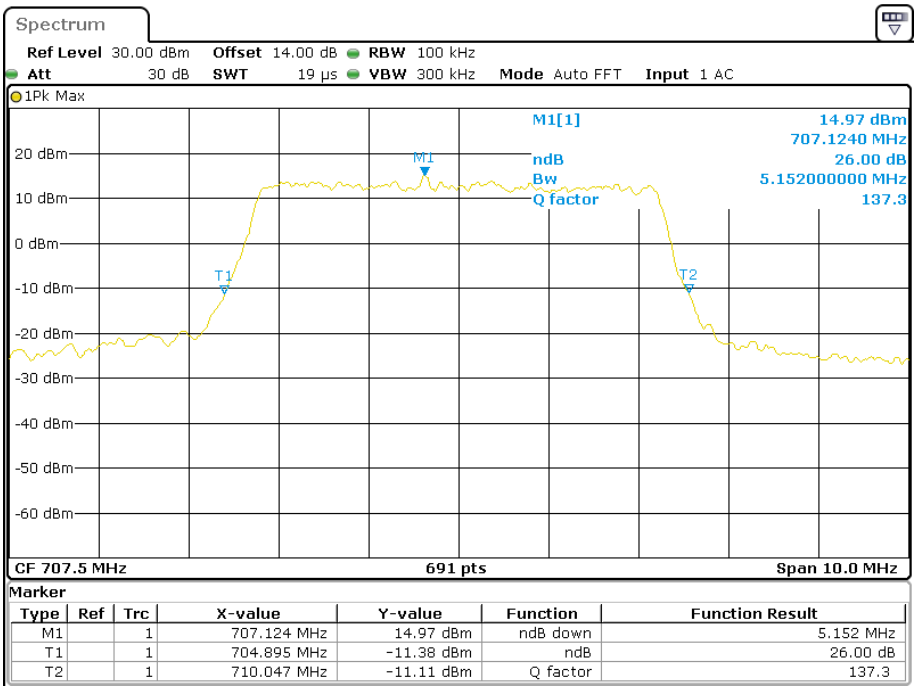
Date: 3.JUN.2018 09:30:03

16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel



Date: 3.JUN.2018 09:30:52

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

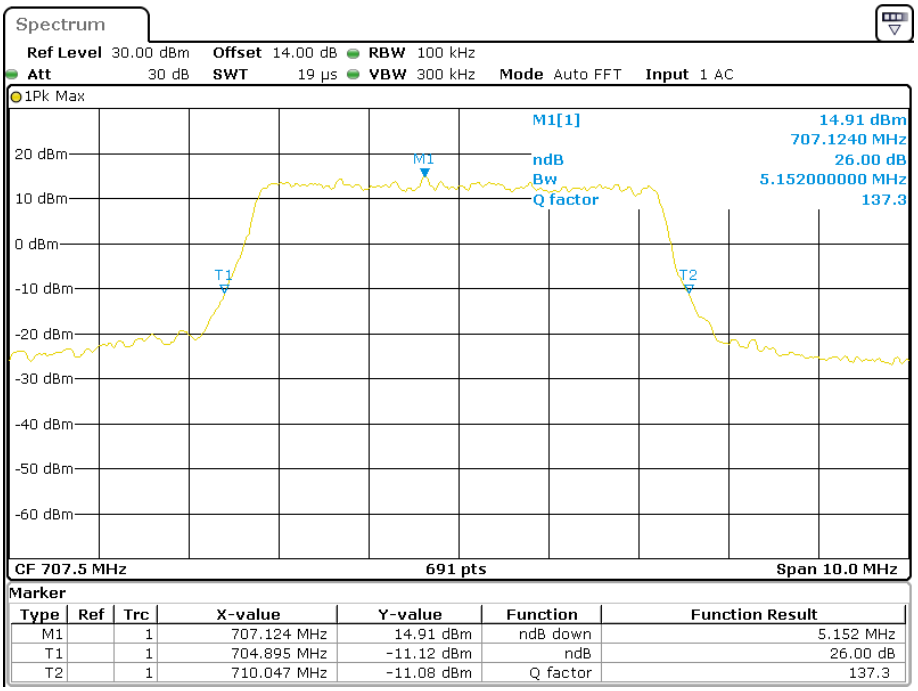


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.124 MHz	14.97 dBm	ndB down	5.152 MHz
T1		1	704.895 MHz	-11.38 dBm	ndB	26.00 dB
T2		1	710.047 MHz	-11.11 dBm	Q factor	137.3

Date: 3.JUN.2018 09:34:00

16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel

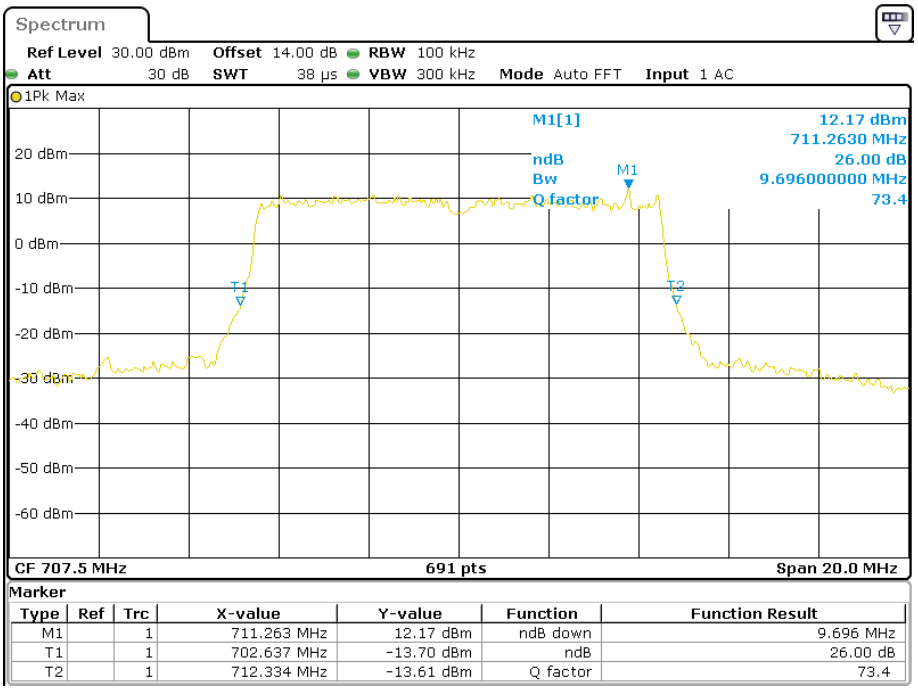


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.124 MHz	14.91 dBm	ndB down	5.152 MHz
T1		1	704.895 MHz	-11.12 dBm	ndB	26.00 dB
T2		1	710.047 MHz	-11.08 dBm	Q factor	137.3

Date: 3.JUN.2018 09:32:14

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel

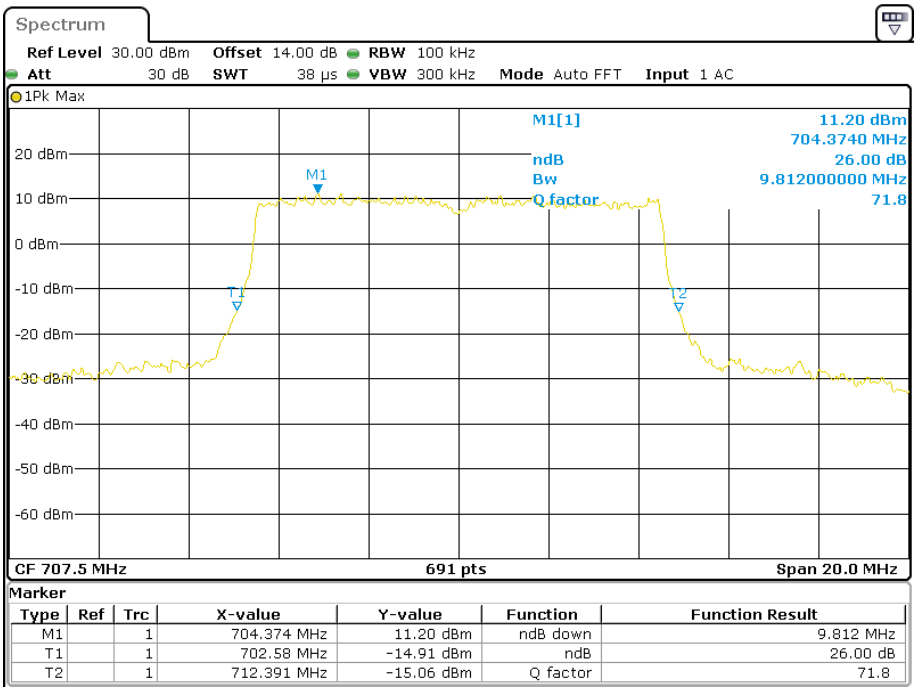


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	711.263 MHz	12.17 dBm	ndB down	9.696 MHz
T1		1	702.637 MHz	-13.70 dBm	ndB	26.00 dB
T2		1	712.334 MHz	-13.61 dBm	Q factor	73.4

Date: 3.JUN.2018 09:33:21

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel



Marker

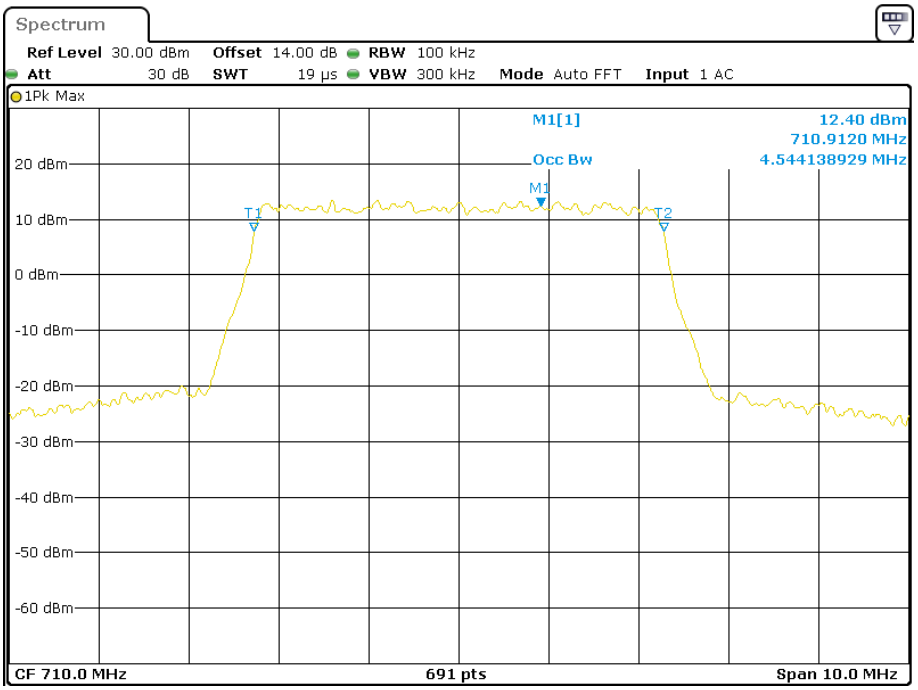
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	704.374 MHz	11.20 dBm	ndB down	9.812 MHz
T1		1	702.58 MHz	-14.91 dBm	ndB	26.00 dB
T2		1	712.391 MHz	-15.06 dBm	Q factor	71.8

Date: 3.JUN.2018 09:32:46

LTE Band 17: (Middle Channel)

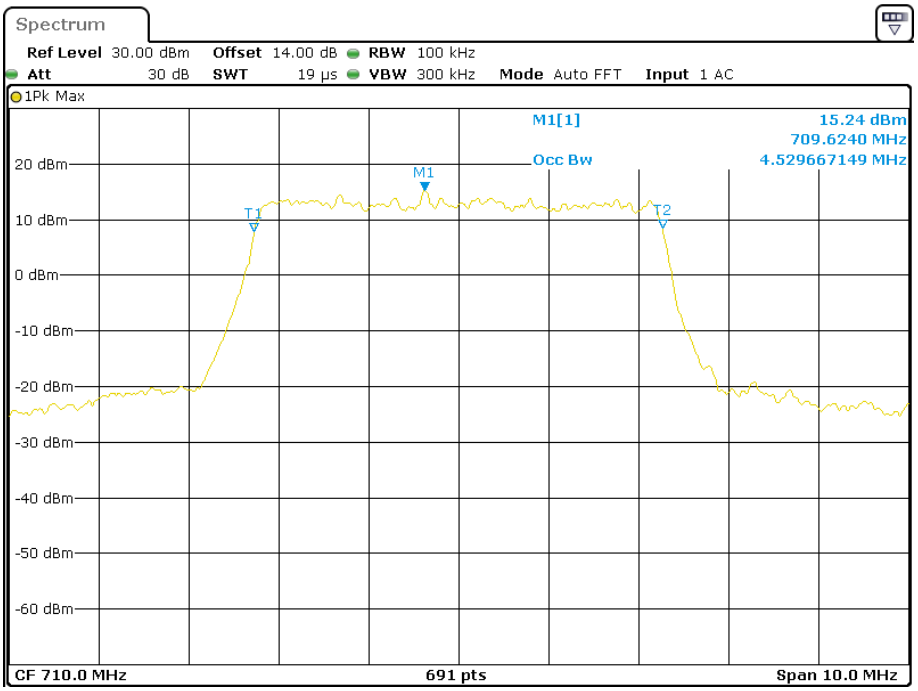
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.544	5.181
	16QAM	4.530	5.210
10.0	QPSK	8.973	9.783
	16QAM	8.973	9.754

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



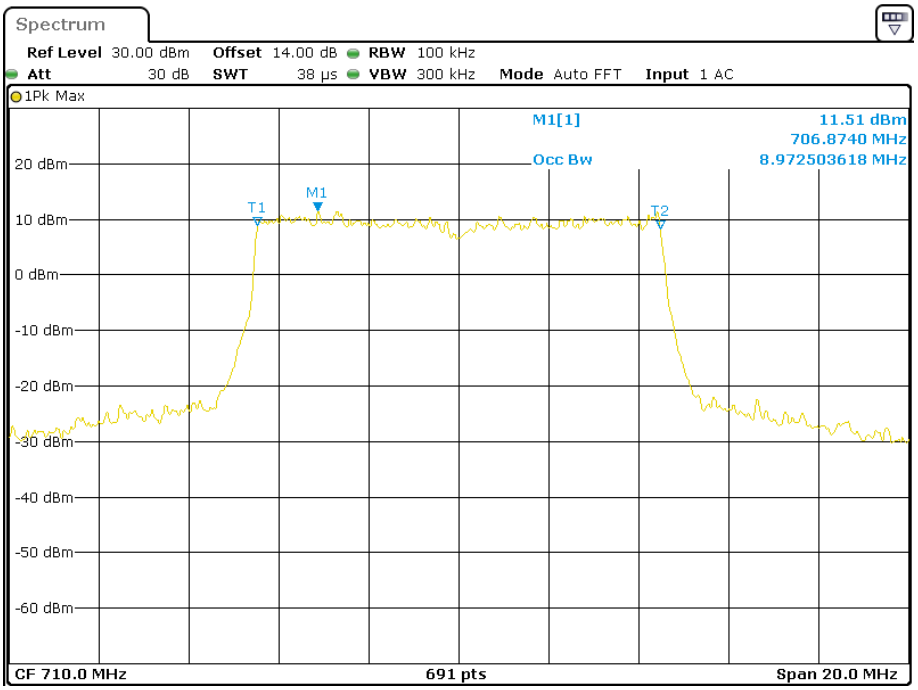
Date: 3.JUN.2018 09:13:05

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



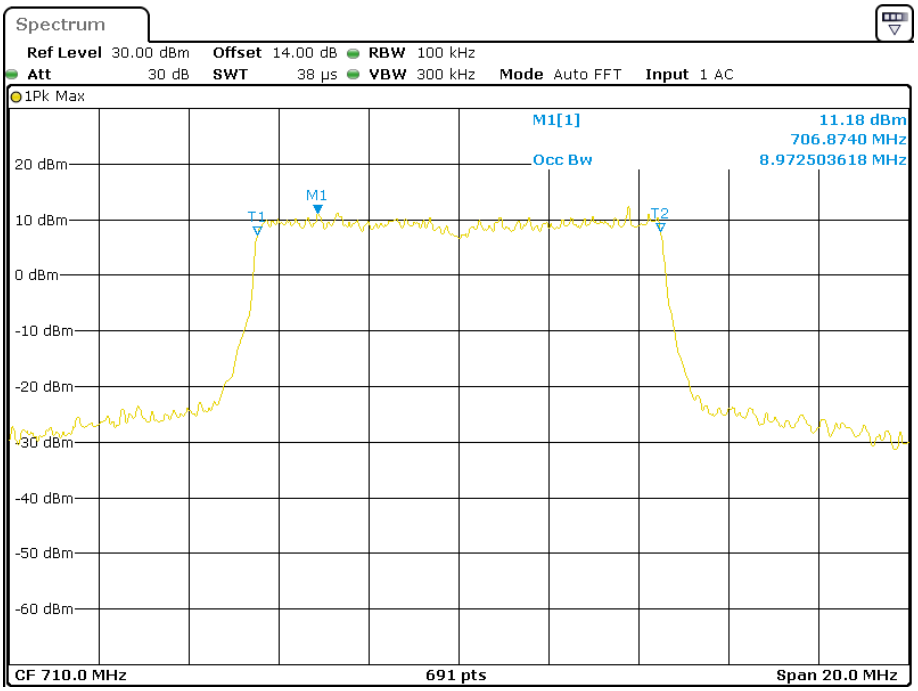
Date: 3.JUN.2018 09:19:07

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



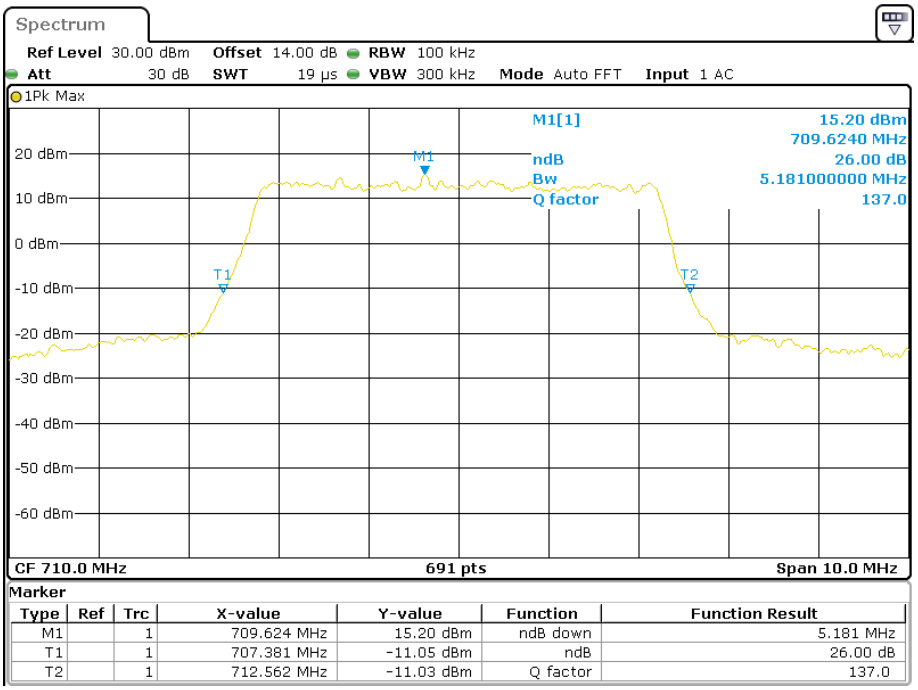
Date: 3.JUN.2018 09:17:54

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



Date: 3.JUN.2018 09:18:30

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

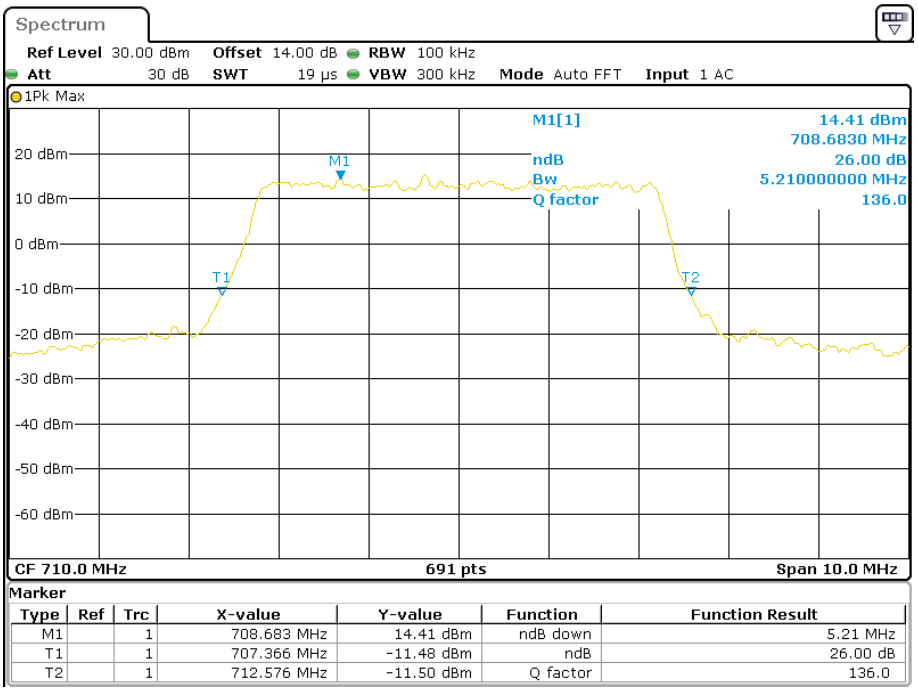


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	709.624 MHz	15.20 dBm	ndB down	5.181 MHz
T1		1	707.381 MHz	-11.05 dBm	ndB	26.00 dB
T2		1	712.562 MHz	-11.03 dBm	Q factor	137.0

Date: 3.JUN.2018 09:23:45

16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel

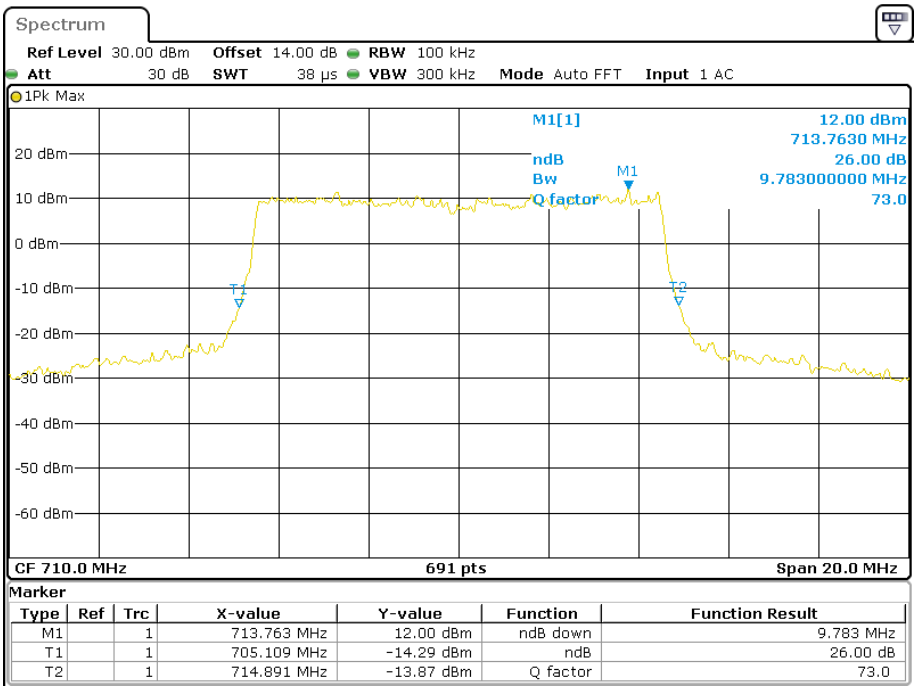


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	708.683 MHz	14.41 dBm	ndB down	5.21 MHz
T1		1	707.366 MHz	-11.48 dBm	ndB	26.00 dB
T2		1	712.576 MHz	-11.50 dBm	Q factor	136.0

Date: 3.JUN.2018 09:21:00

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel

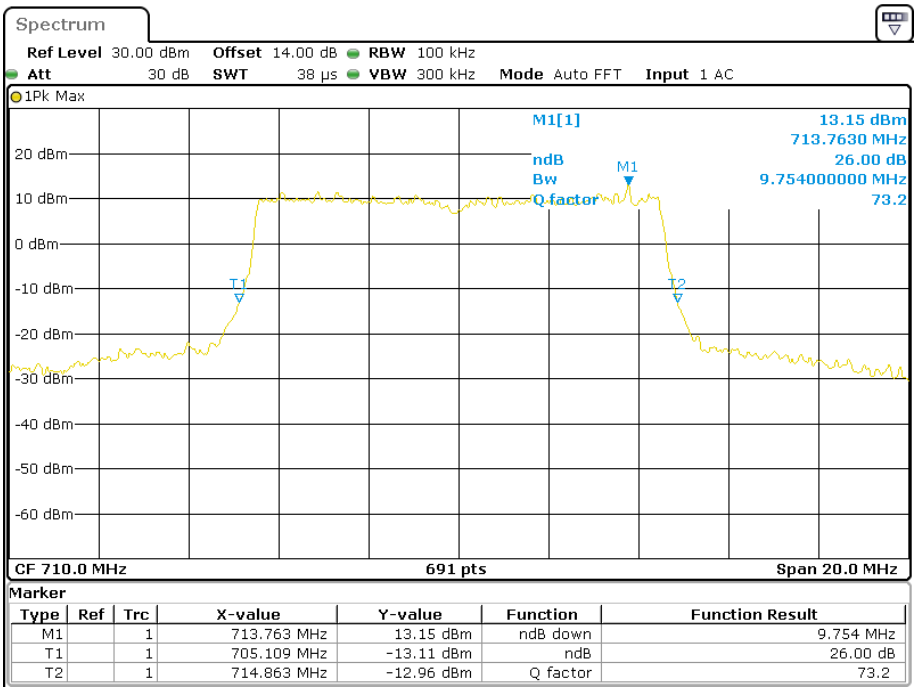


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	713.763 MHz	12.00 dBm	ndB down	9.783 MHz
T1		1	705.109 MHz	-14.29 dBm	ndB	26.00 dB
T2		1	714.891 MHz	-13.87 dBm	Q factor	73.0

Date: 3.JUN.2018 09:23:17

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	713.763 MHz	13.15 dBm	ndB down	9.754 MHz
T1		1	705.109 MHz	-13.11 dBm	ndB	26.00 dB
T2		1	714.863 MHz	-12.96 dBm	Q factor	73.2

Date: 3.JUN.2018 09:22:19

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

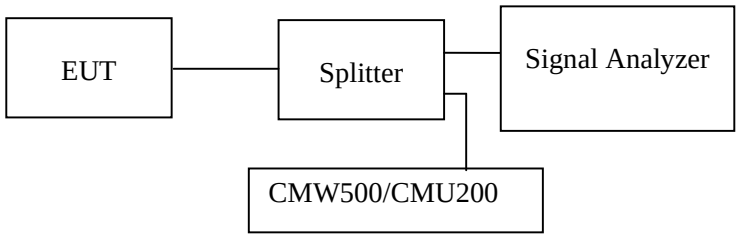
Applicable Standard

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

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

Test Procedure

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



Test Data

Environmental Conditions

Temperature:	23~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Haiguo Li from 2018-06-11 to 2018-06-27.

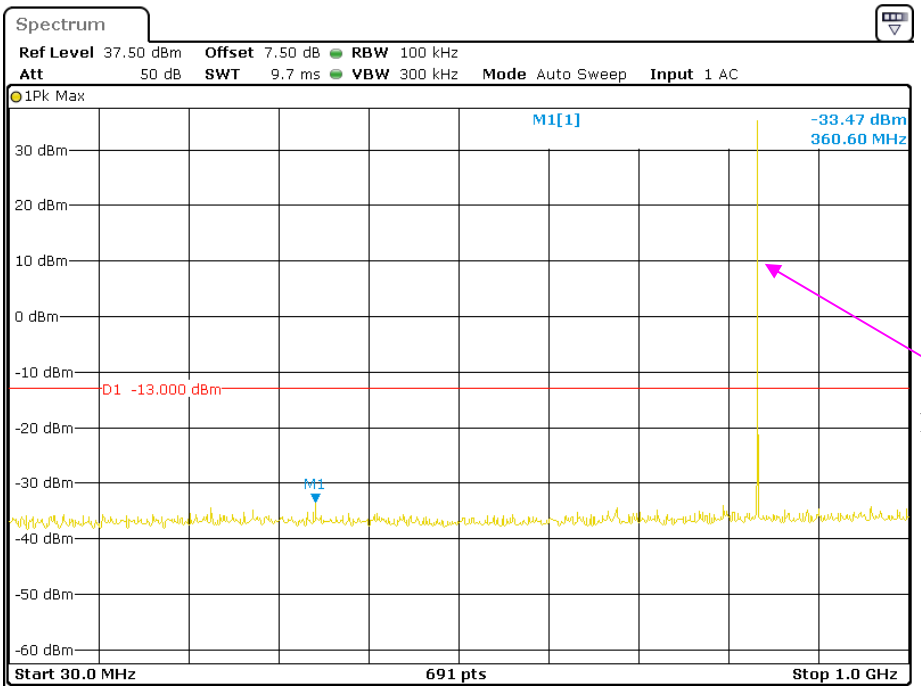
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

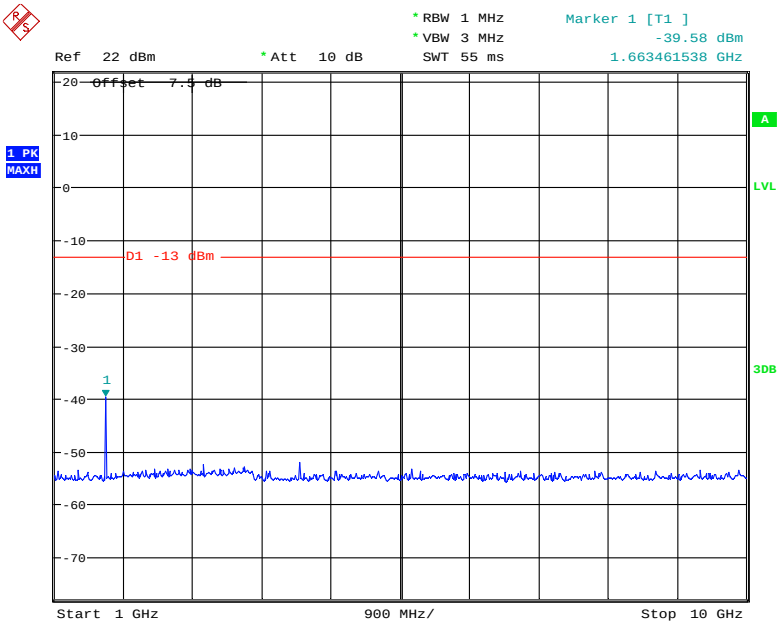
30 MHz – 1 GHz (GSM Mode)



Fundamental test

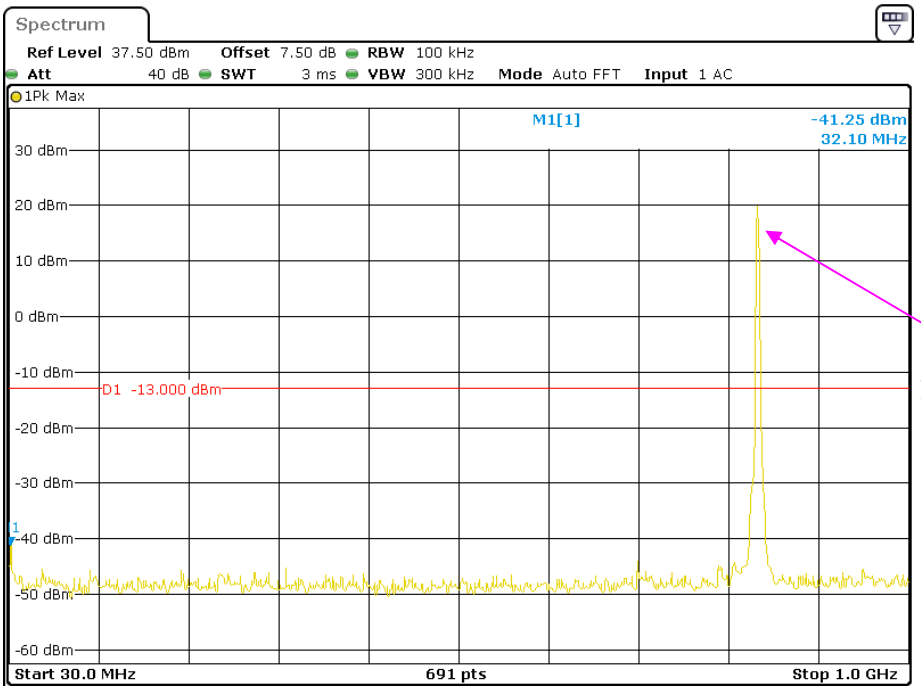
Date: 11.JUN.2018 13:27:32

1 GHz – 10 GHz (GSM Mode)



Date: 12.JUN.2018 08:22:44

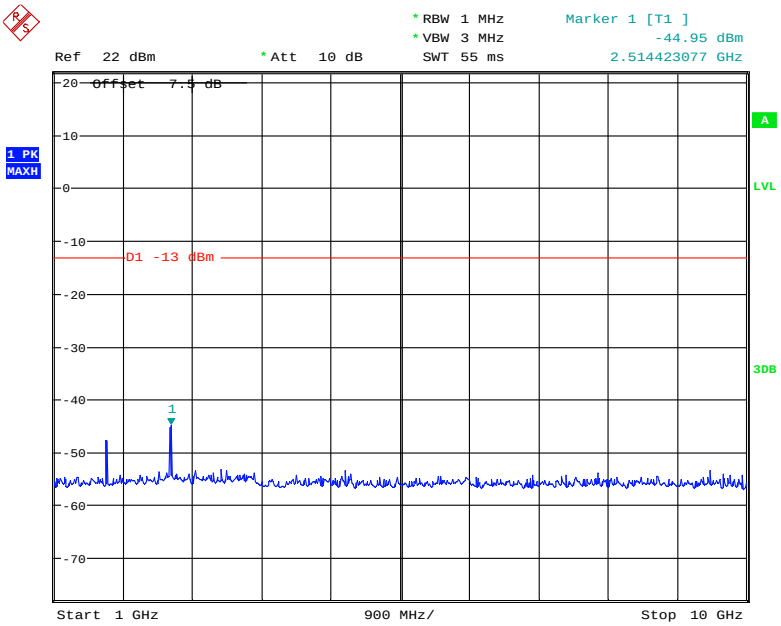
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 11.JUN.2018 14:56:50

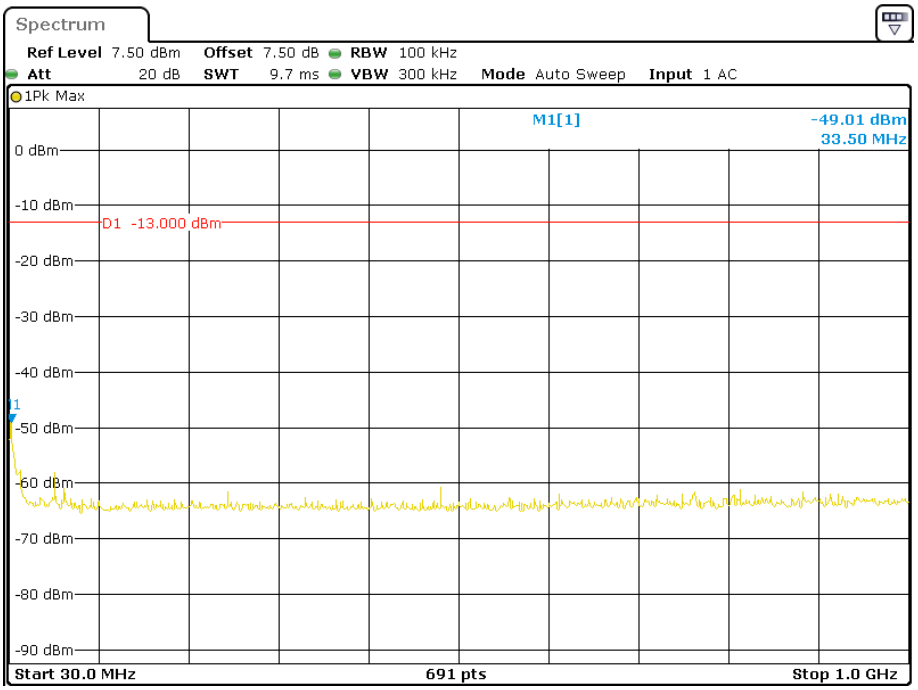
1 GHz – 10 GHz (WCDMA Mode)



Date: 12.JUN.2018 08:13:10

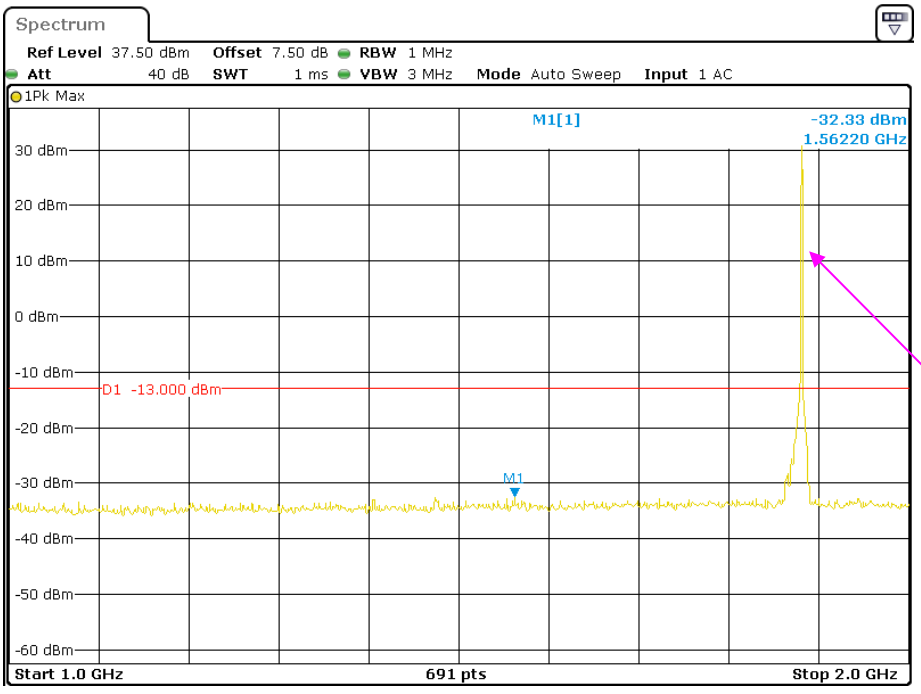
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 11.JUN.2018 14:13:36

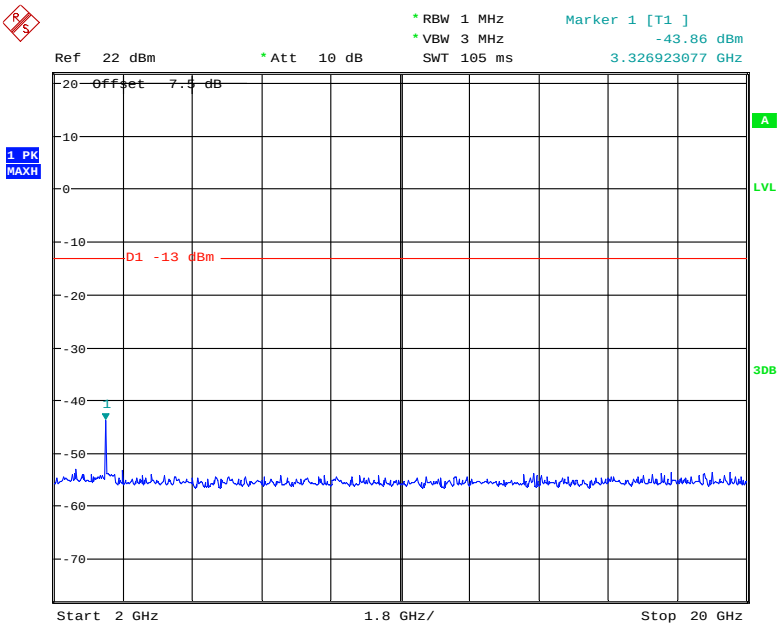
1 GHz – 2 GHz (GSM Mode)



Fundamental test

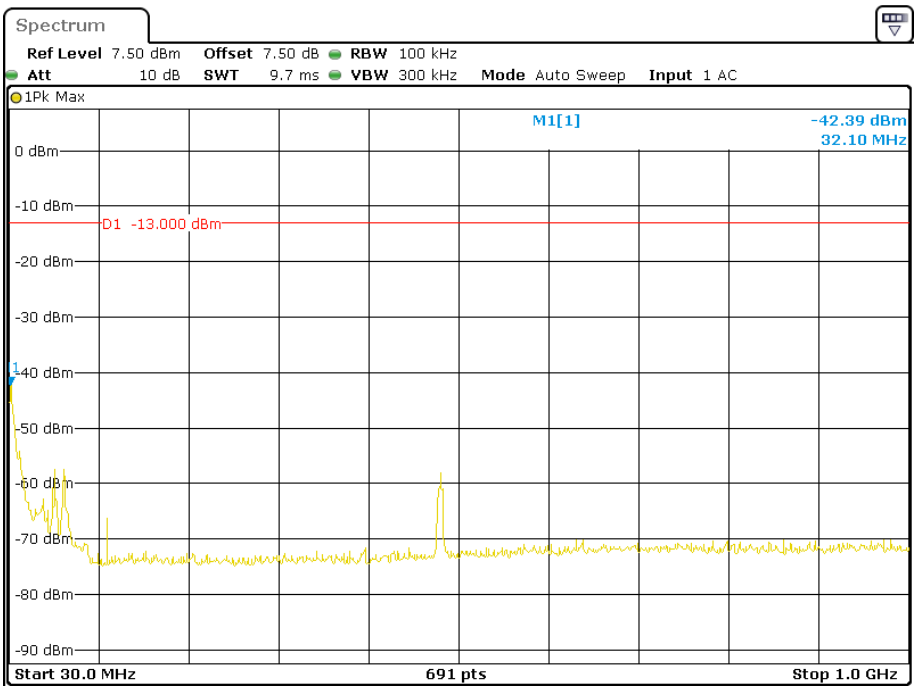
Date: 11.JUN.2018 14:15:31

2 GHz – 20 GHz (GSM Mode)



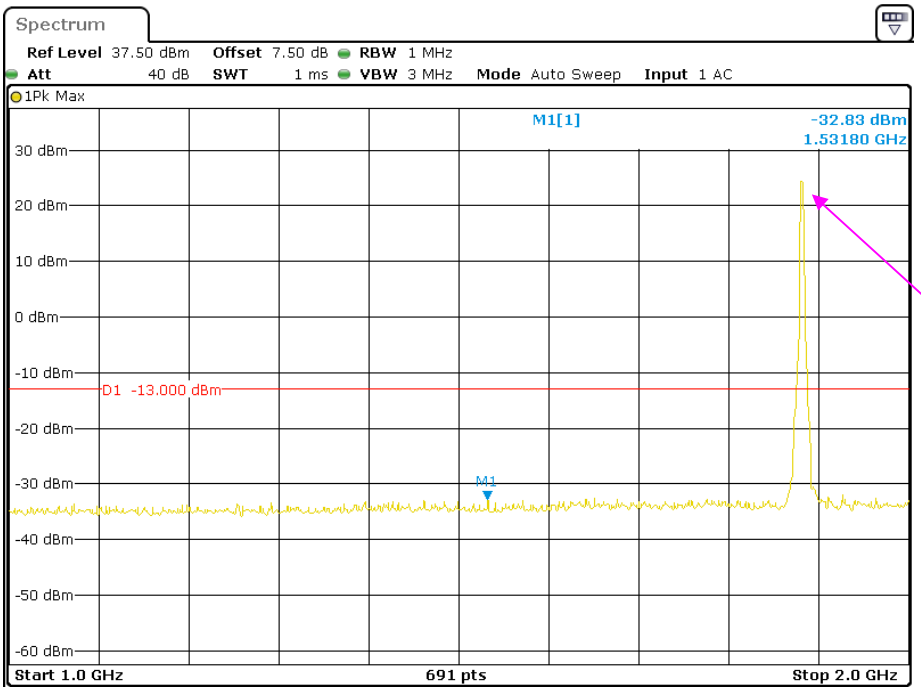
Date: 12.JUN.2018 08:24:27

30 MHz – 1 GHz (WCDMA Mode)



Date: 11.JUN.2018 14:42:33

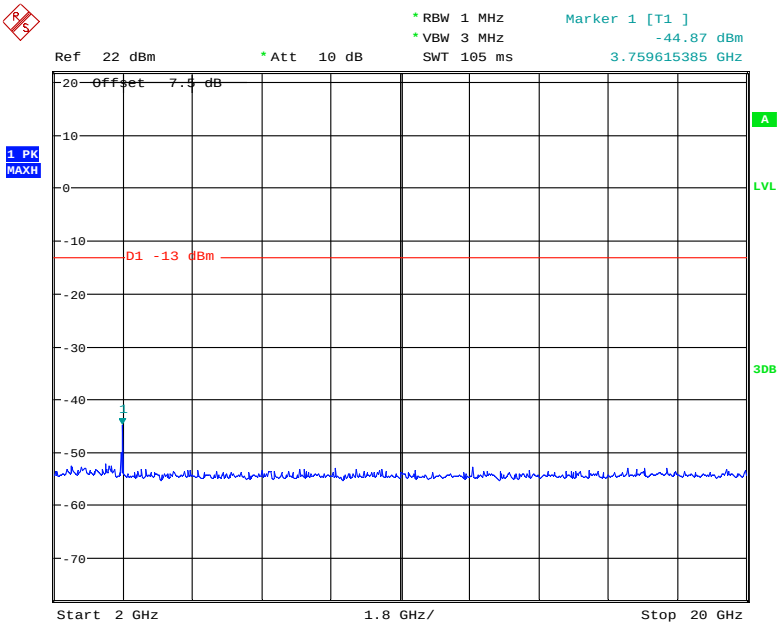
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 11.JUN.2018 14:44:05

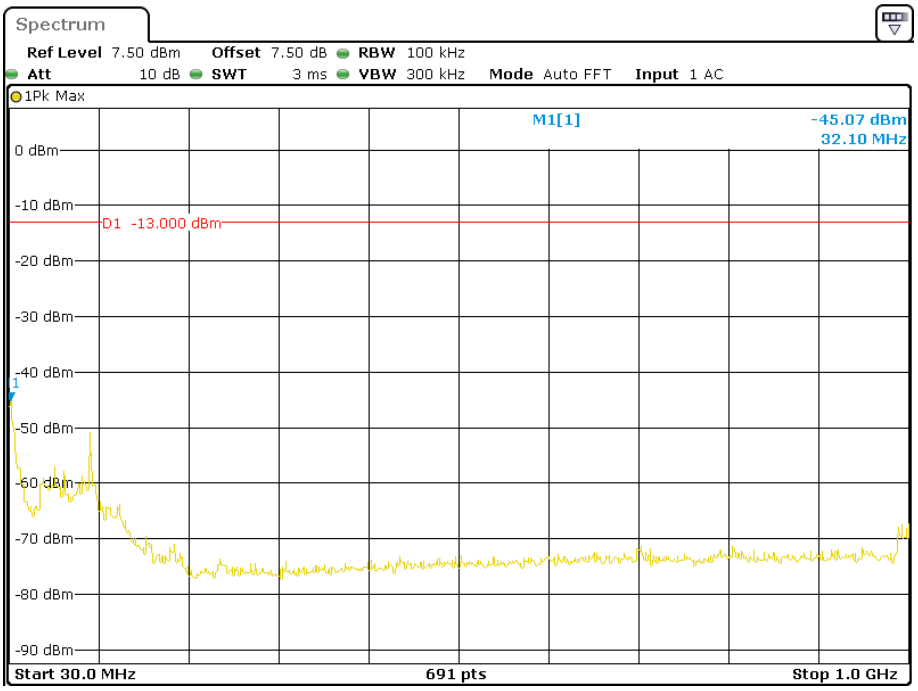
2 GHz – 20 GHz (WCDMA Mode)



Date: 12.JUN.2018 08:10:21

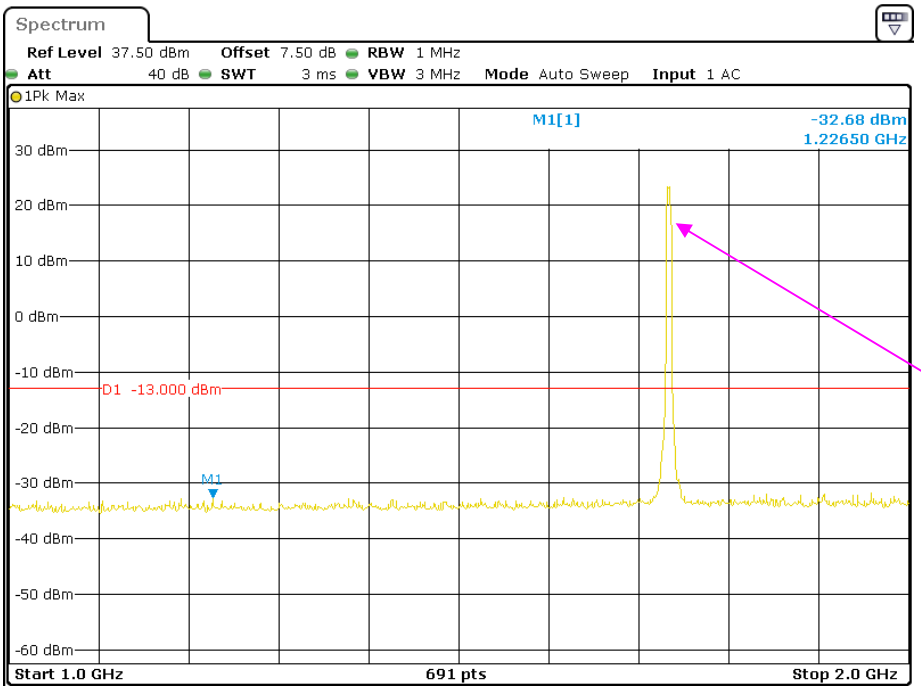
AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)



Date: 11.JUN.2018 14:54:25

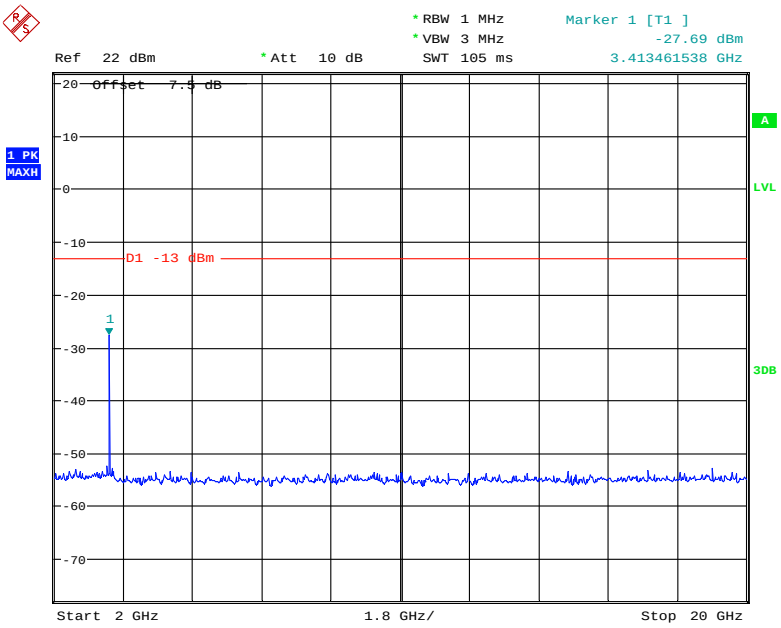
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 11.JUN.2018 14:55:38

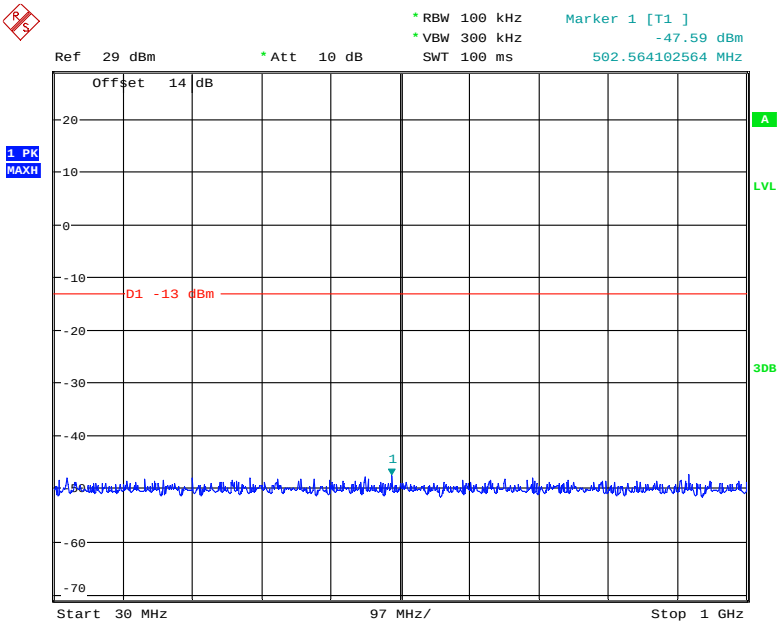
2 GHz – 20 GHz (WCDMA Mode)



Date: 12.JUN.2018 08:11:22

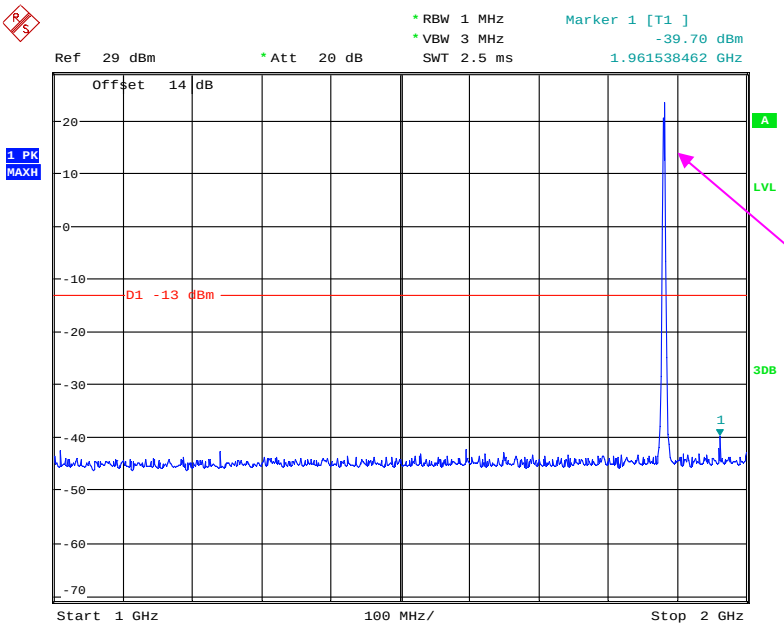
LTE Band 2:

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



Date: 27.JUN.2018 13:14:04

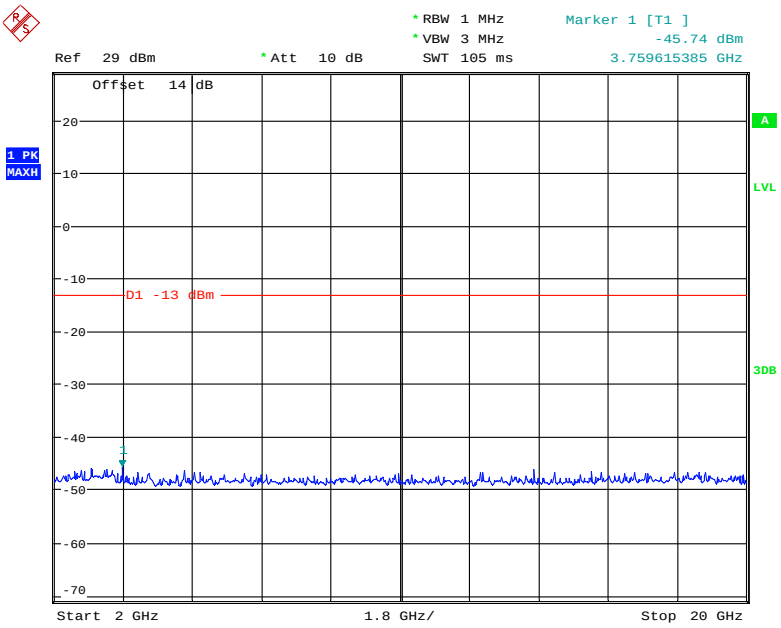
1 GHz – 2 GHz (1.4 MHz, Middle Channel)



Fundamental test

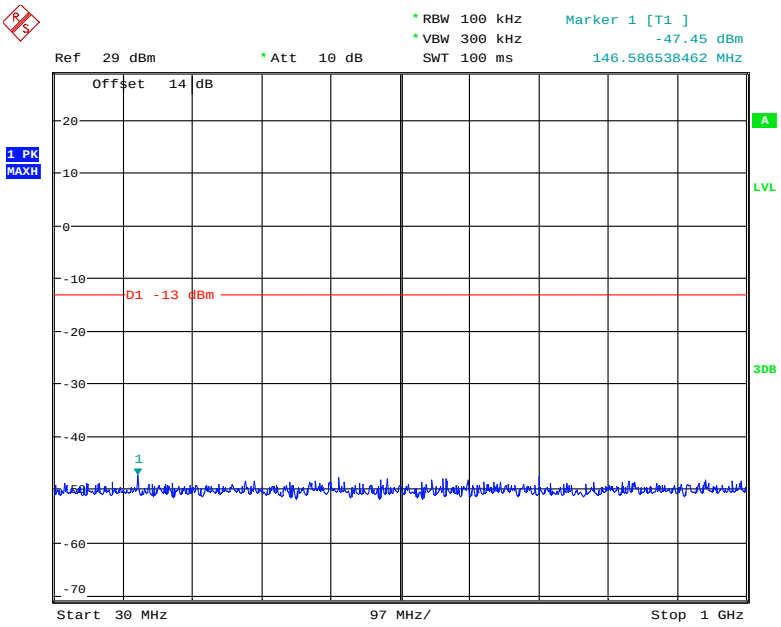
Date: 27.JUN.2018 13:14:46

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



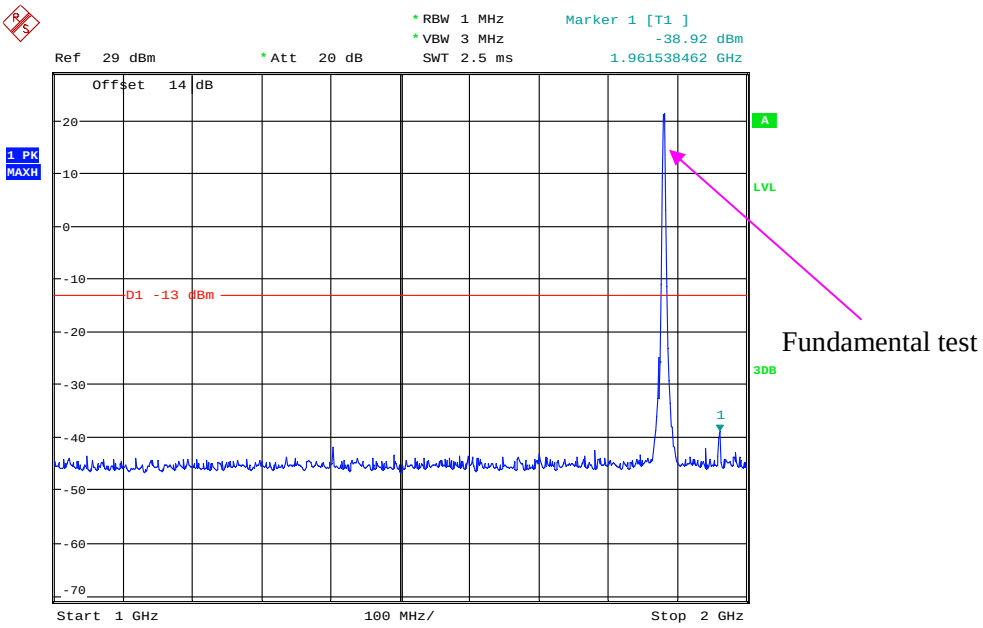
Date: 27.JUN.2018 13:15:20

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



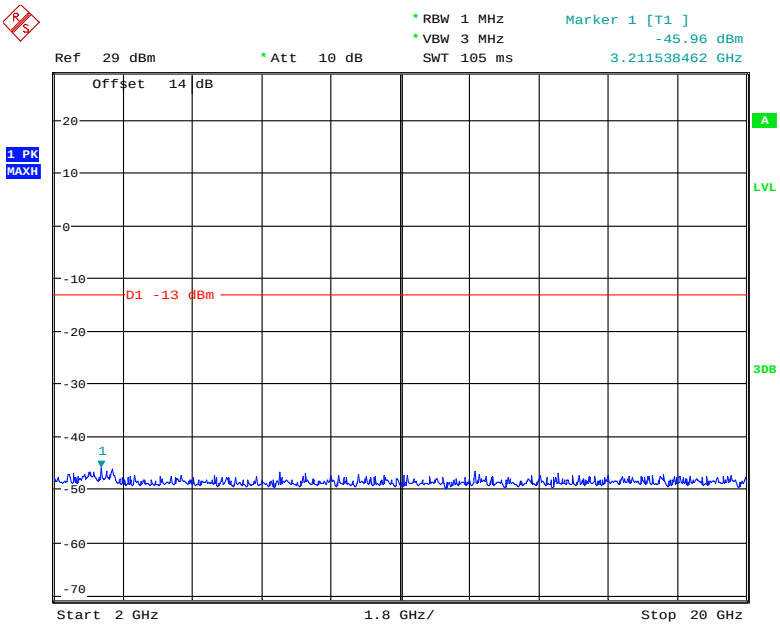
Date: 27.JUN.2018 13:17:39

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



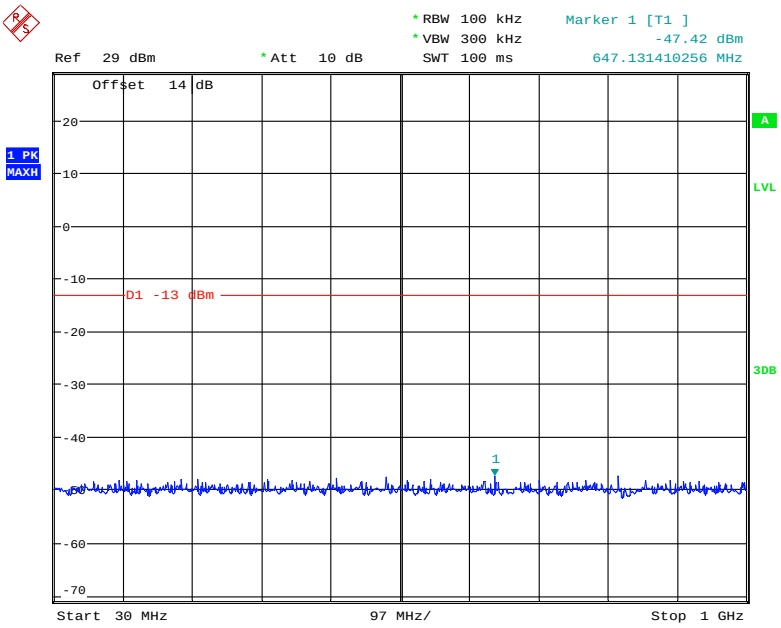
Date: 27.JUN.2018 13:17:06

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



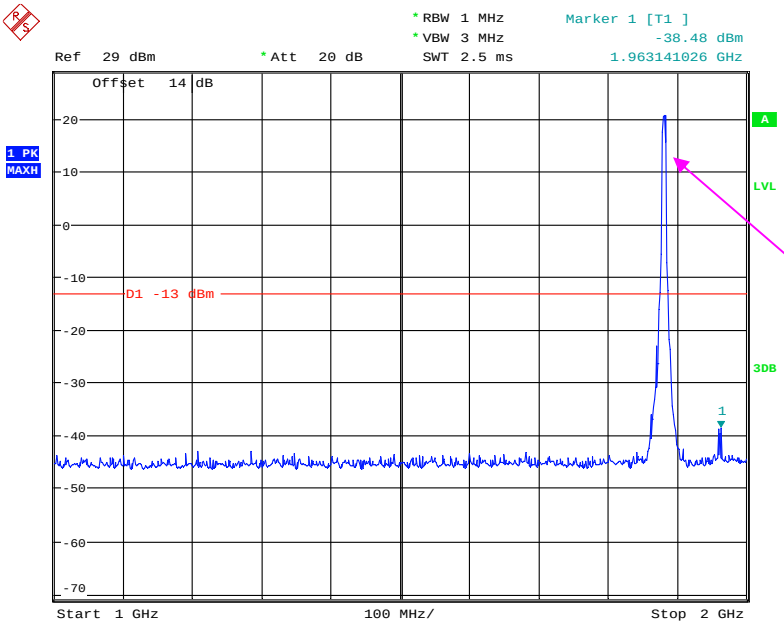
Date: 27.JUN.2018 13:16:25

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



Date: 27.JUN.2018 13:18:08

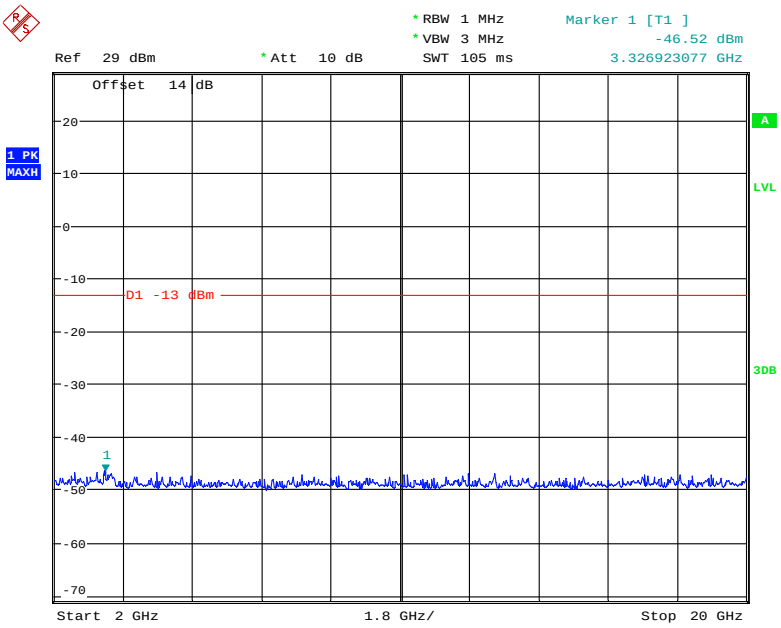
1 GHz – 2 GHz (5.0 MHz, Middle Channel)



Fundamental test

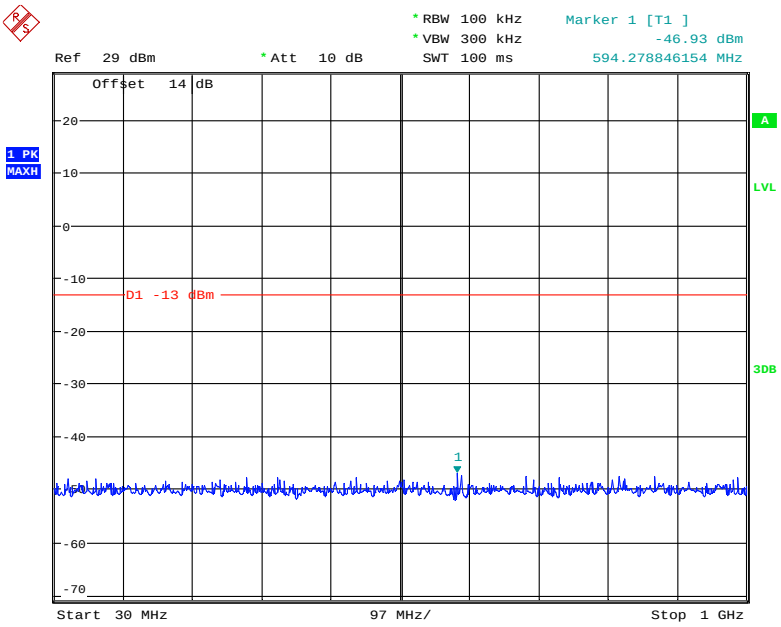
Date: 27.JUN.2018 13:18:44

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



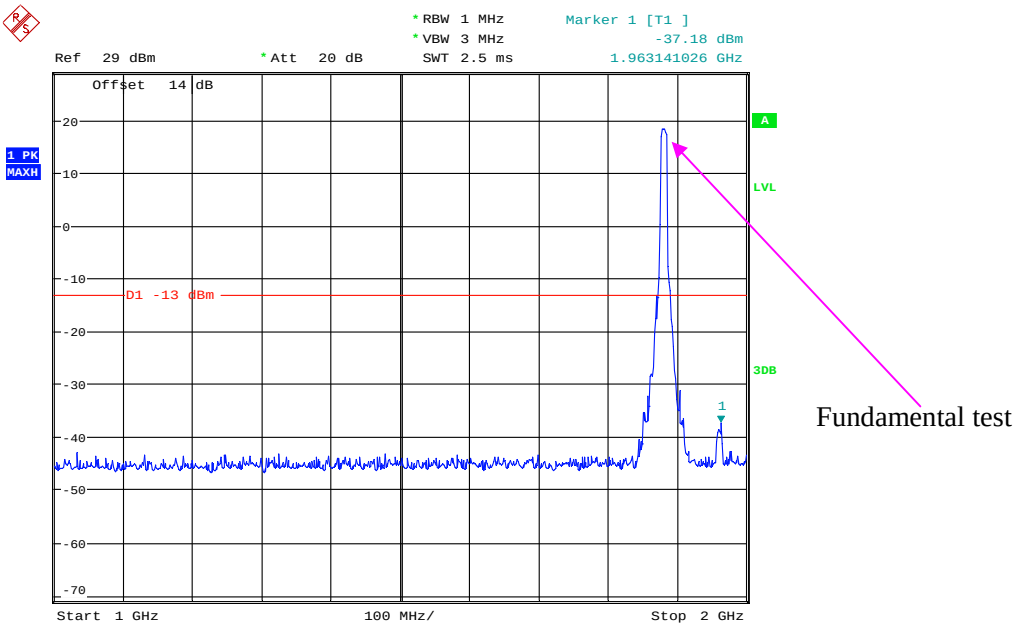
Date: 27.JUN.2018 13:19:32

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



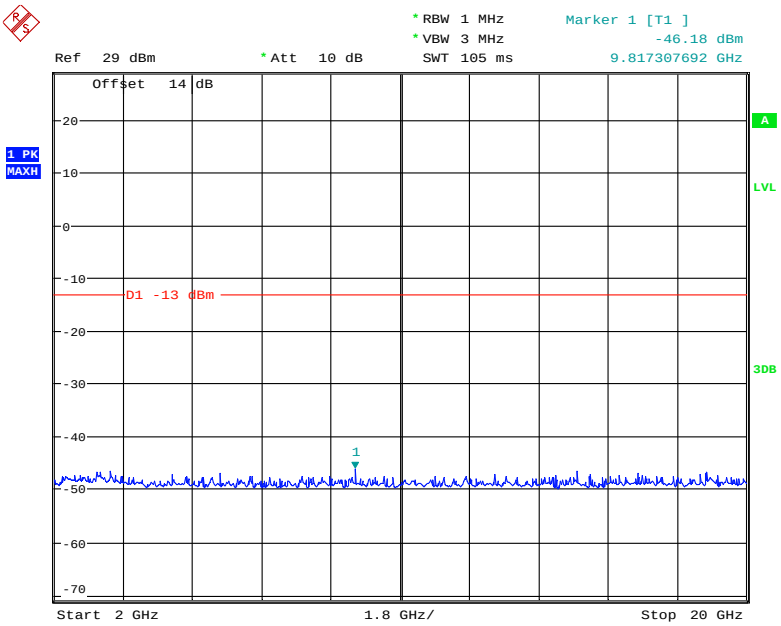
Date: 27.JUN.2018 13:20:35

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



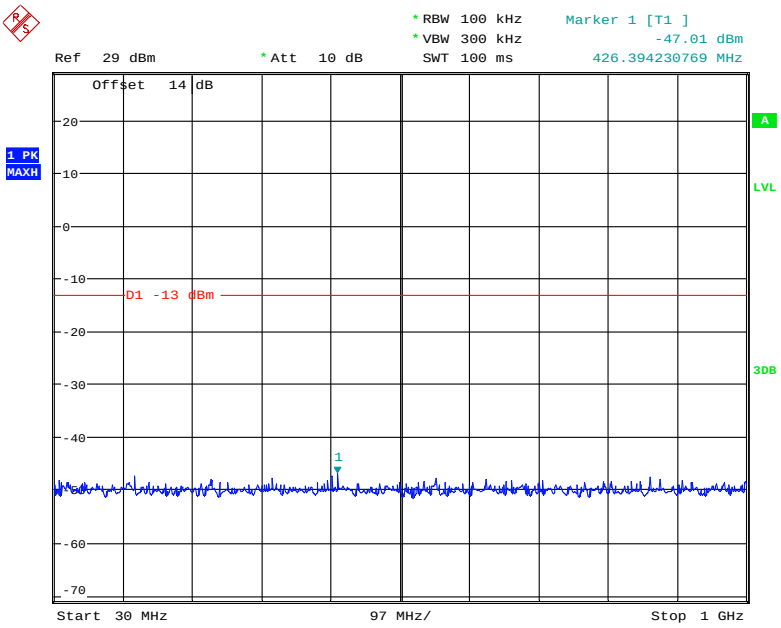
Date: 27.JUN.2018 13:20:12

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



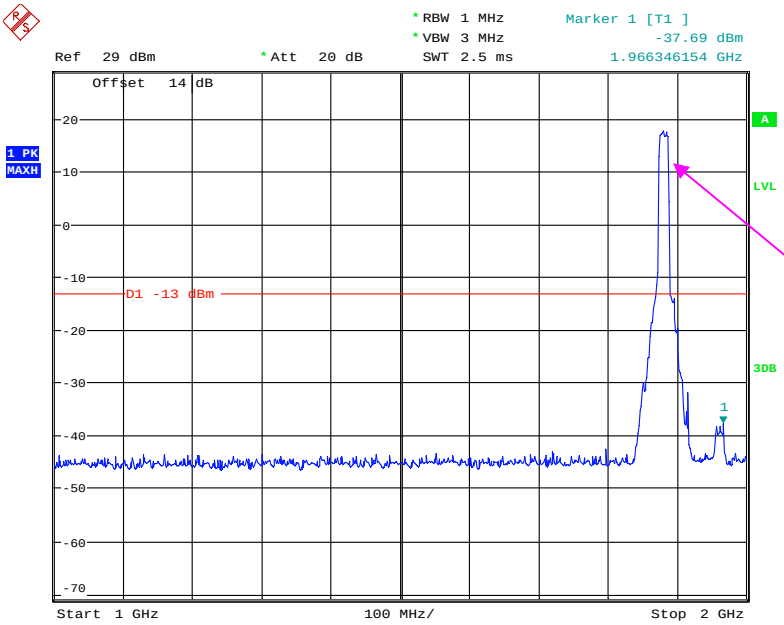
Date: 27.JUN.2018 13:19:48

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



Date: 27.JUN.2018 13:20:55

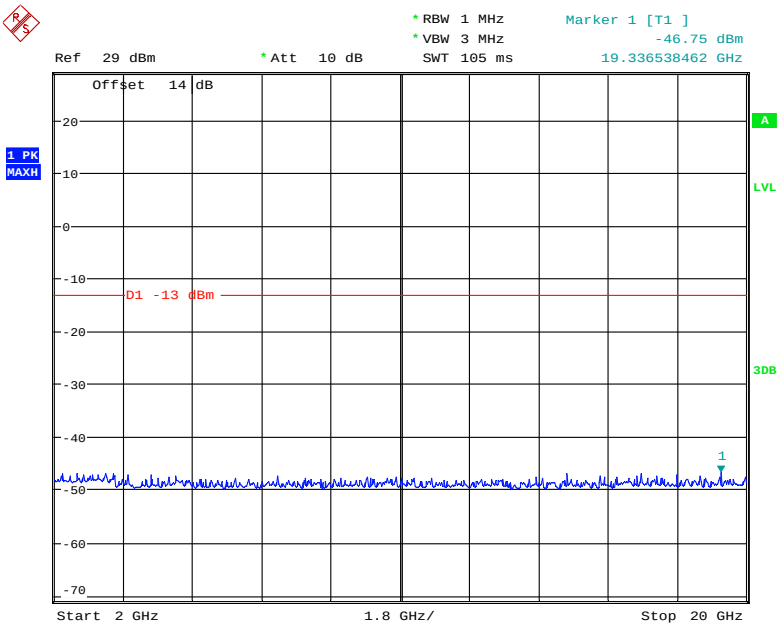
1 GHz – 2 GHz (15.0 MHz, Middle Channel)



Fundamental test

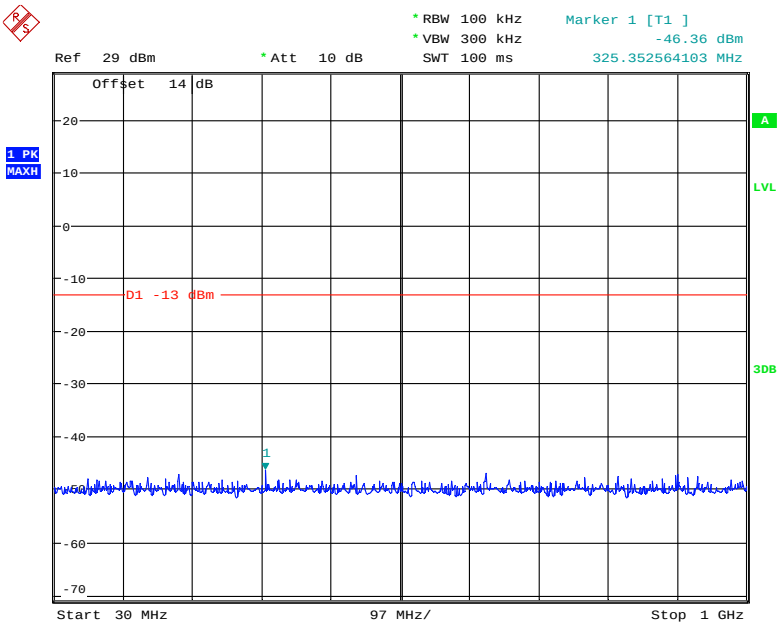
Date: 27.JUN.2018 13:21:32

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



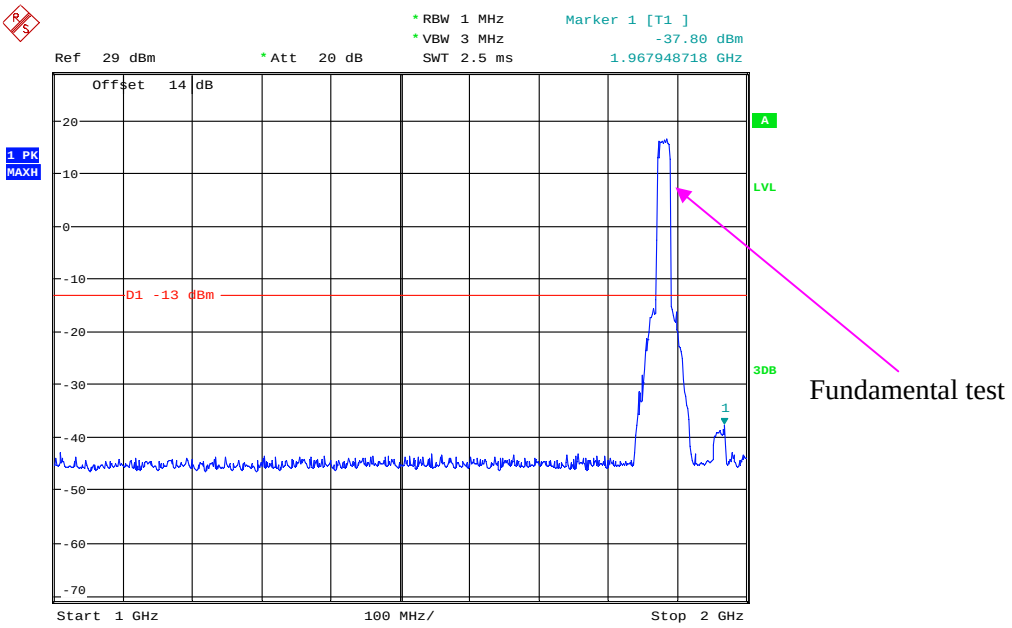
Date: 27.JUN.2018 13:22:26

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



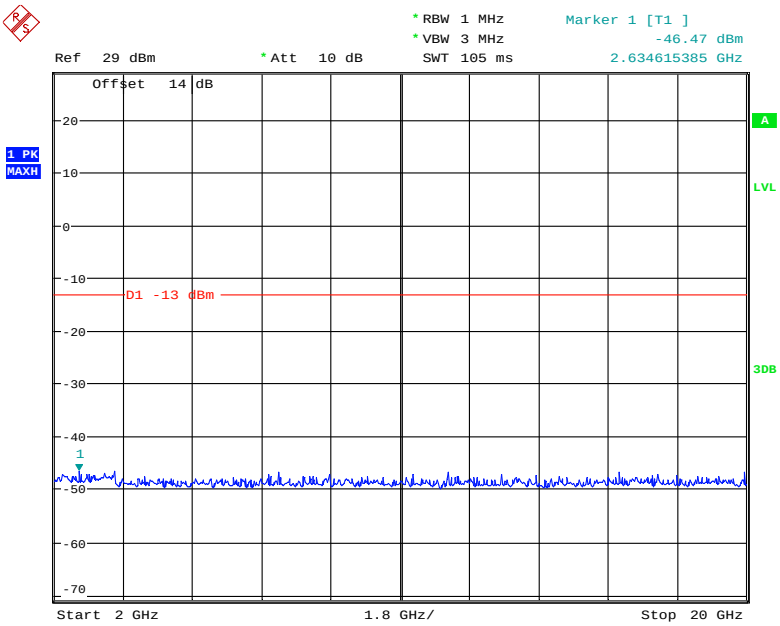
Date: 27.JUN.2018 13:23:36

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



Date: 27.JUN.2018 13:23:14

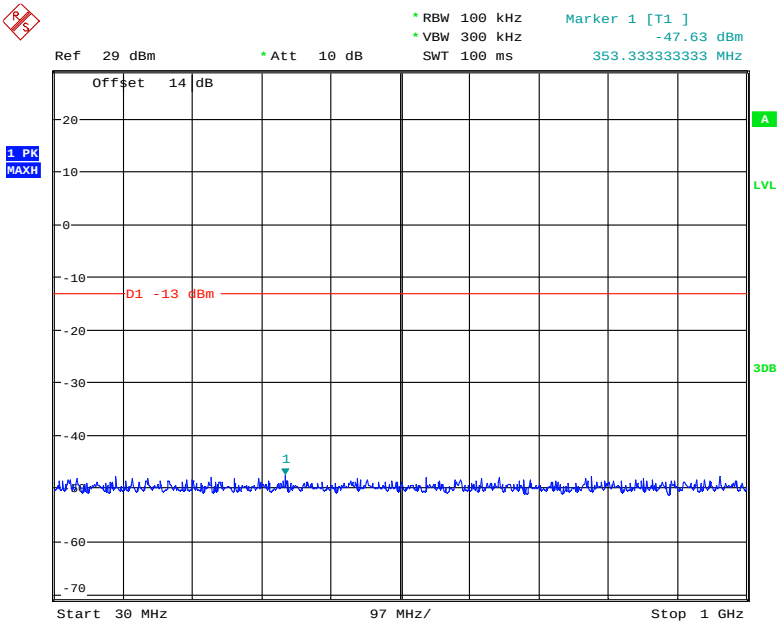
2 GHz –20 GHz (20.0 MHz, Middle Channel)



Date: 27.JUN.2018 13:22:46

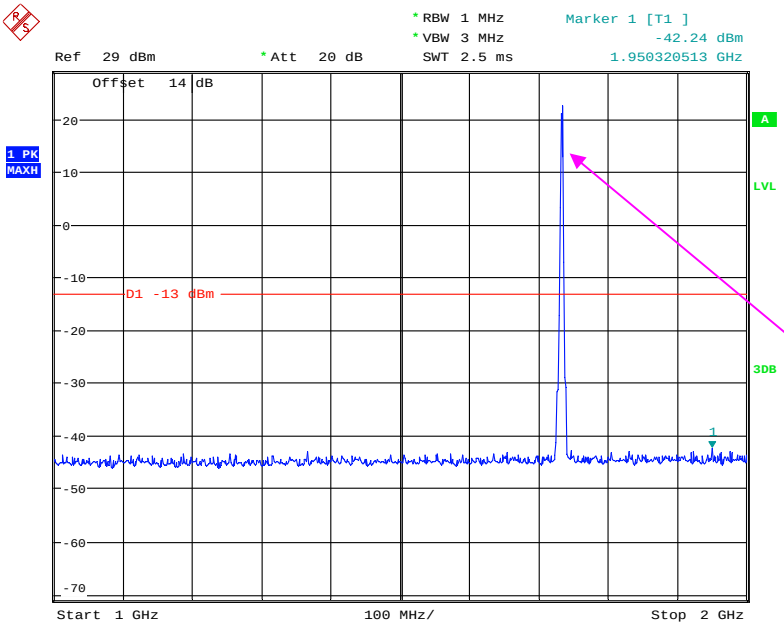
LTE Band 4:

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



Date: 27.JUN.2018 13:27:20

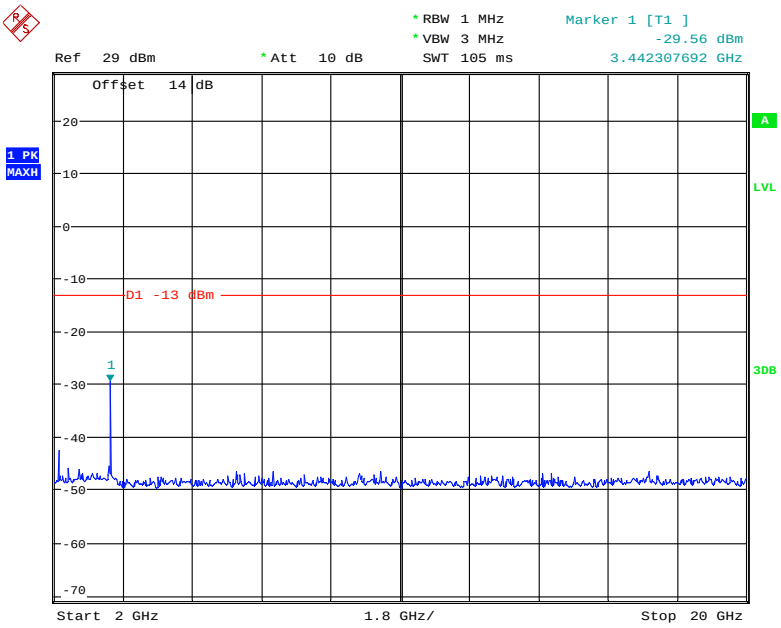
1 GHz – 2 GHz (1.4 MHz, Middle Channel)



Fundamental test

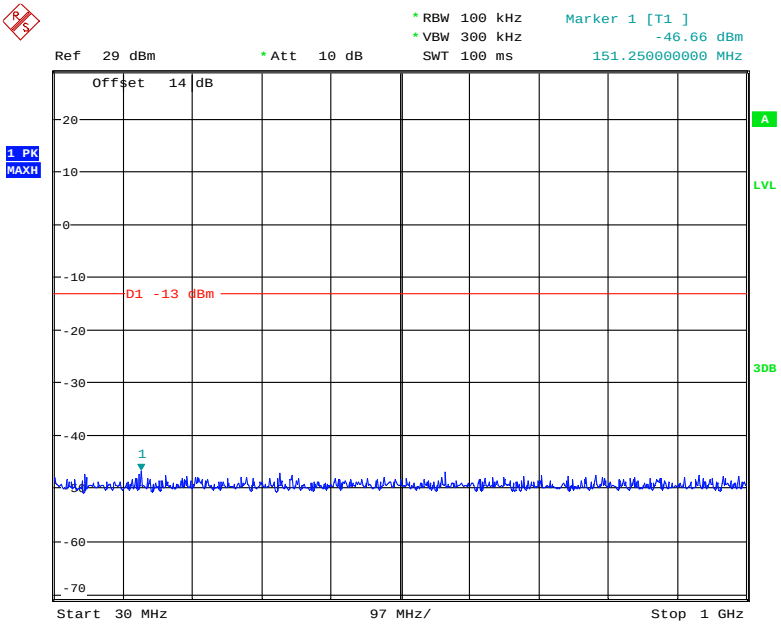
Date: 27.JUN.2018 13:28:22

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



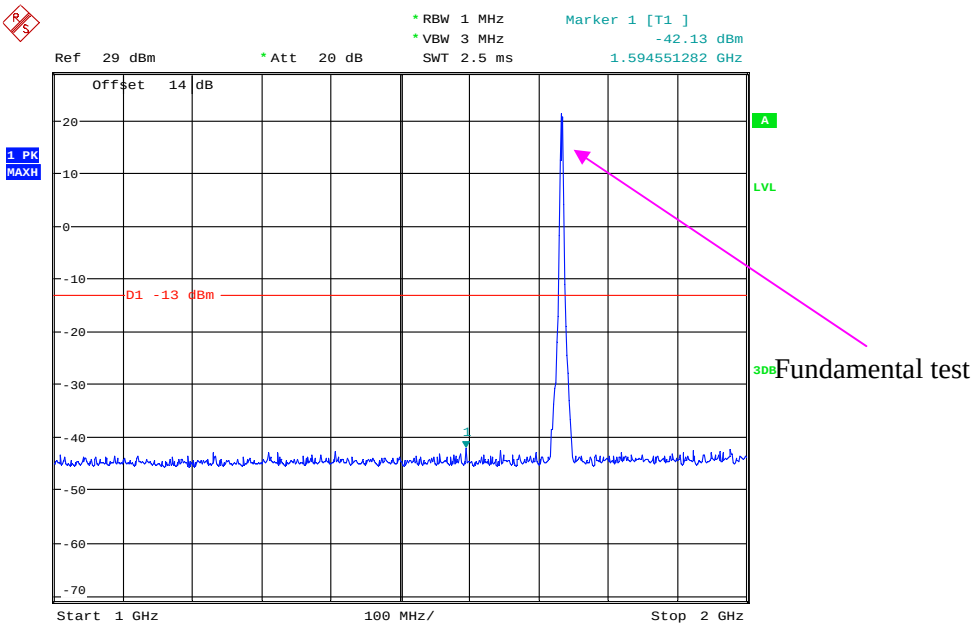
Date: 27.JUN.2018 13:29:35

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



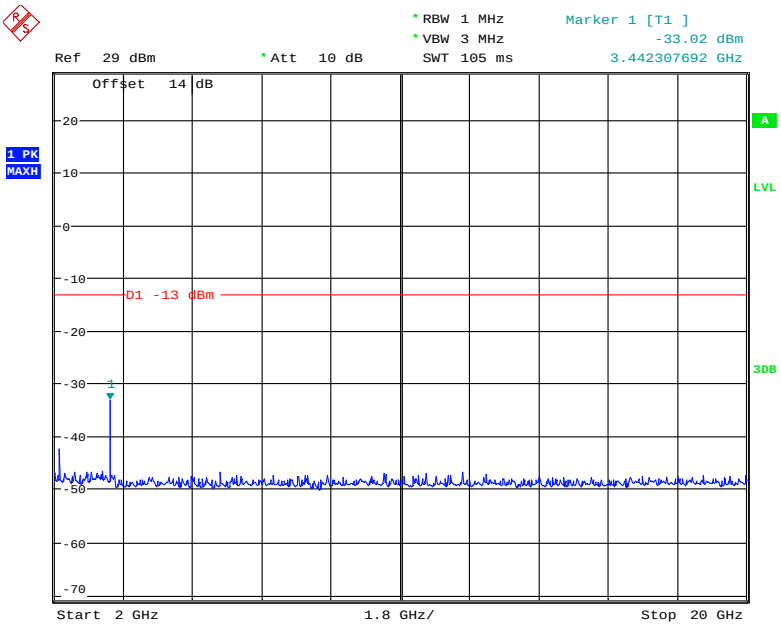
Date: 27.JUN.2018 13:31:24

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



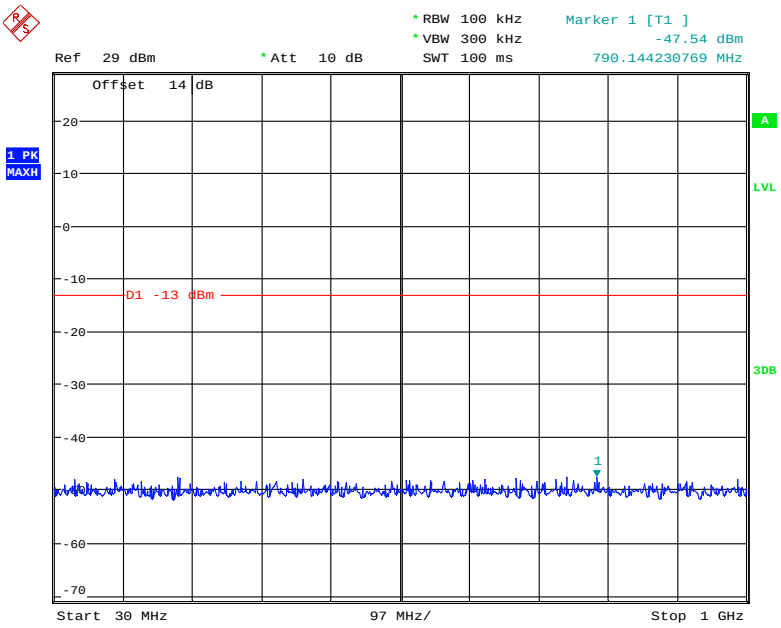
Date: 27.JUN.2018 13:30:52

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



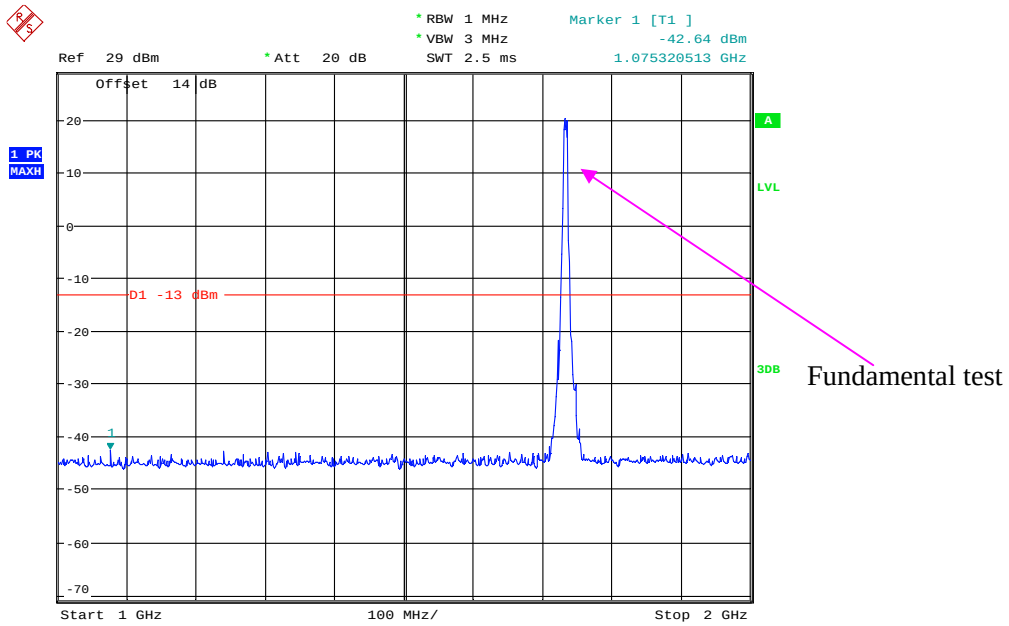
Date: 27.JUN.2018 13:30:00

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



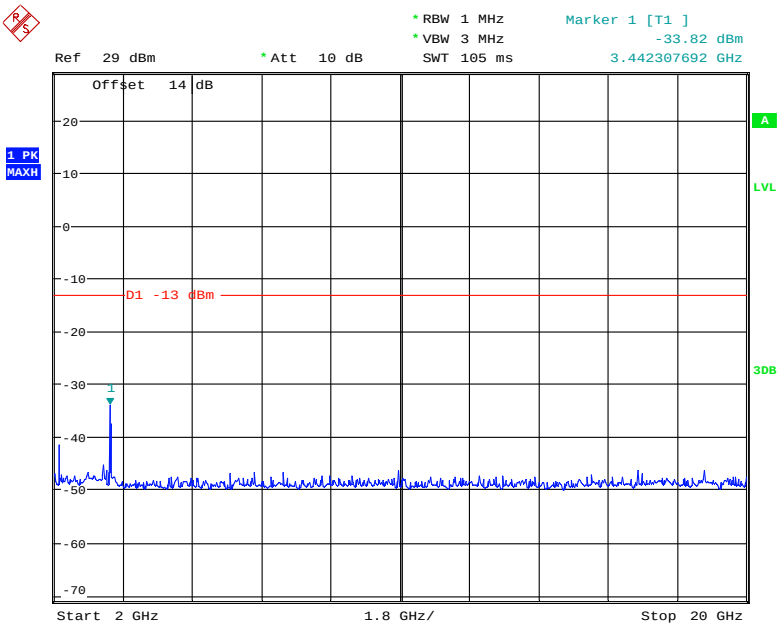
Date: 27.JUN.2018 13:31:46

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



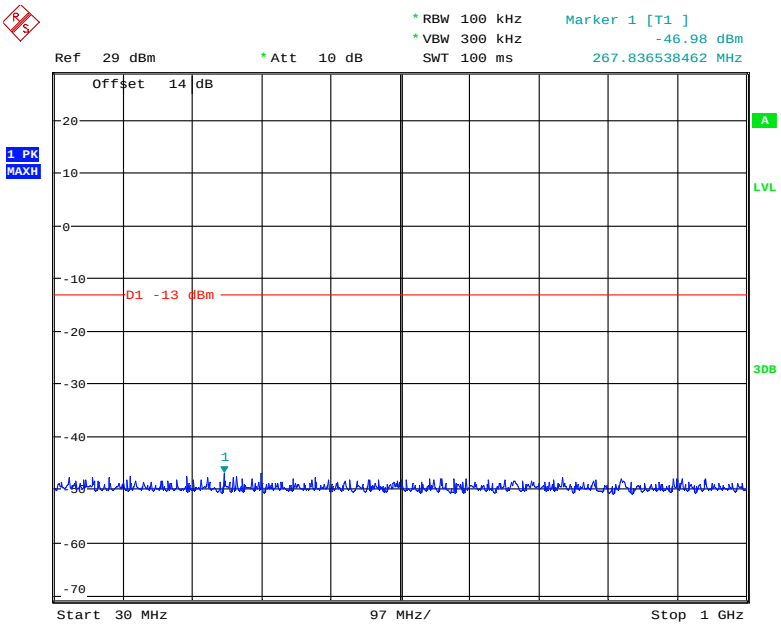
Date: 27.JUN.2018 13:32:30

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



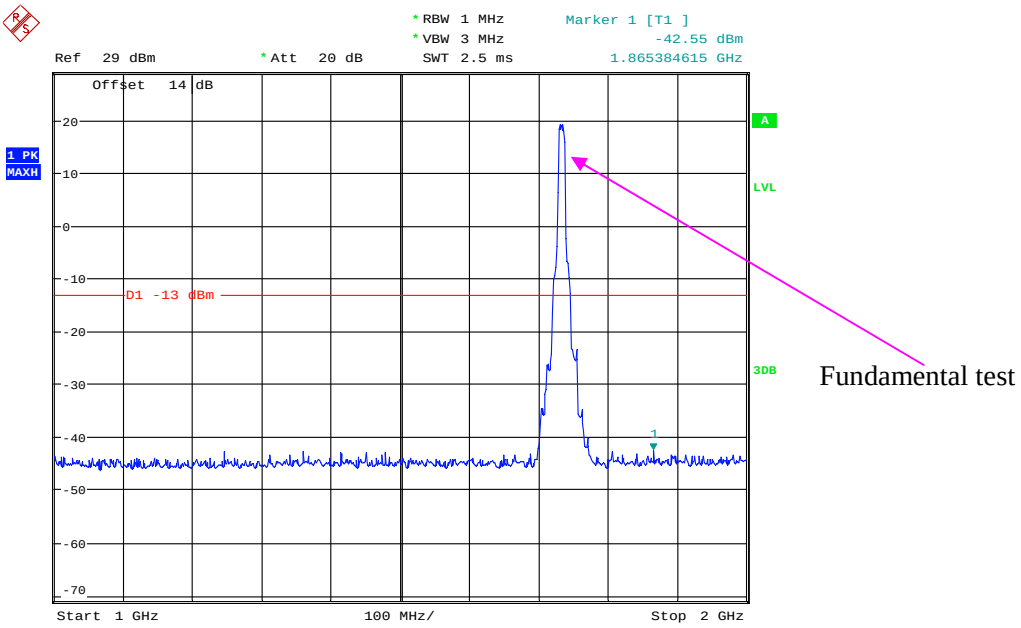
Date: 27.JUN.2018 13:32:59

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



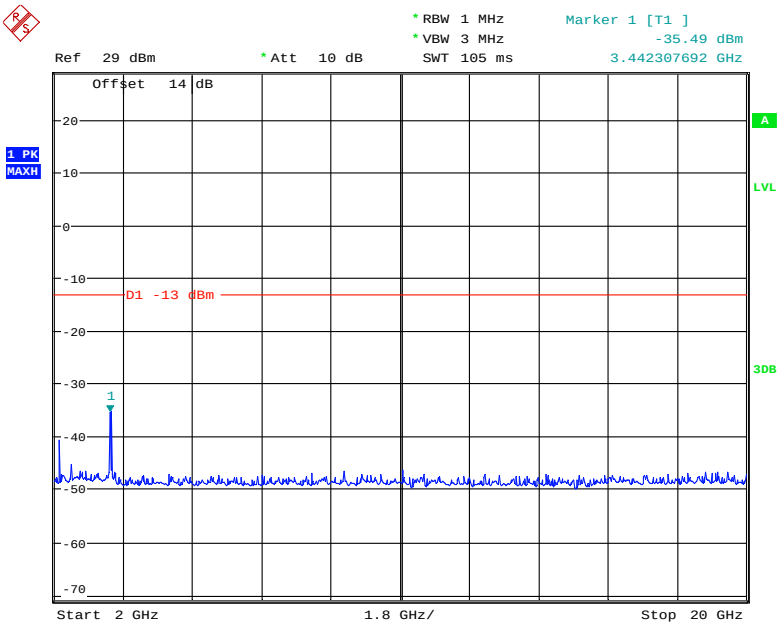
Date: 27.JUN.2018 13:34:42

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



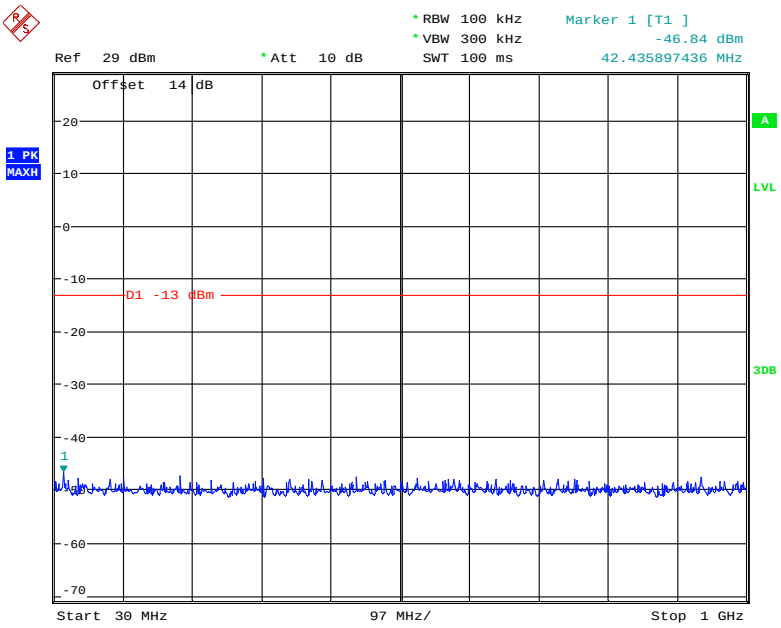
Date: 27.JUN.2018 13:34:16

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



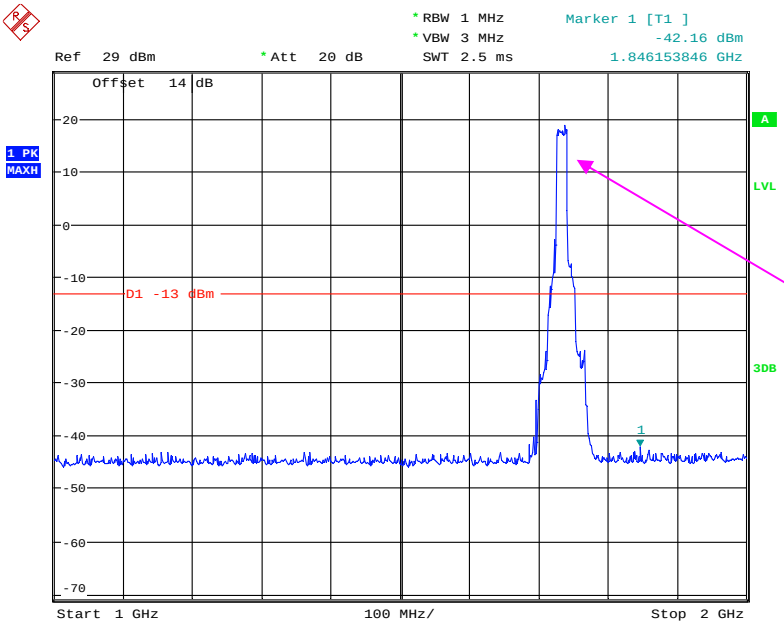
Date: 27.JUN.2018 13:33:36

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



Date: 27.JUN.2018 13:37:03

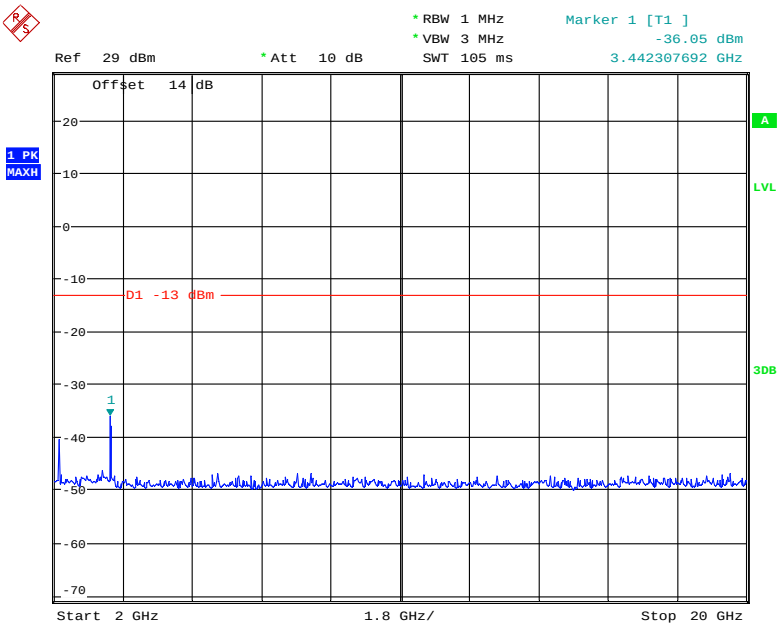
1 GHz – 2 GHz (15.0 MHz, Middle Channel)



Fundamental test

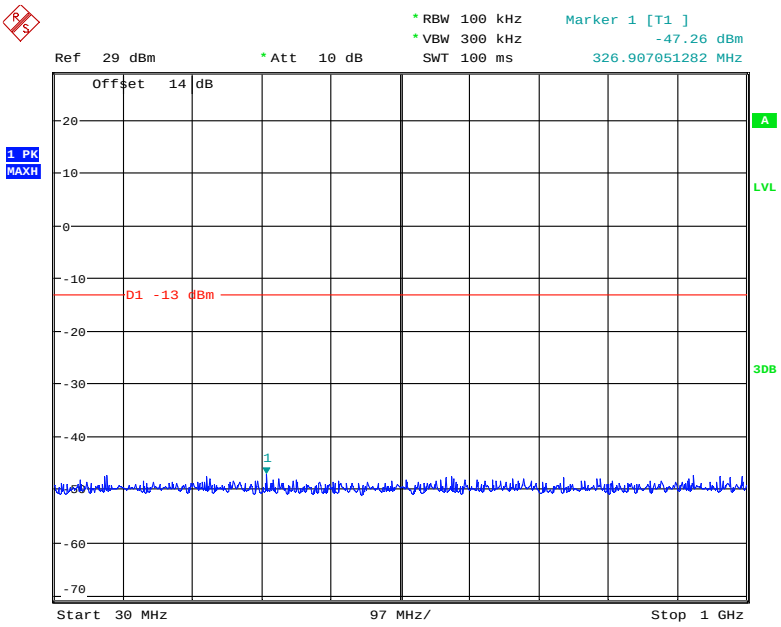
Date: 27.JUN.2018 13:38:01

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



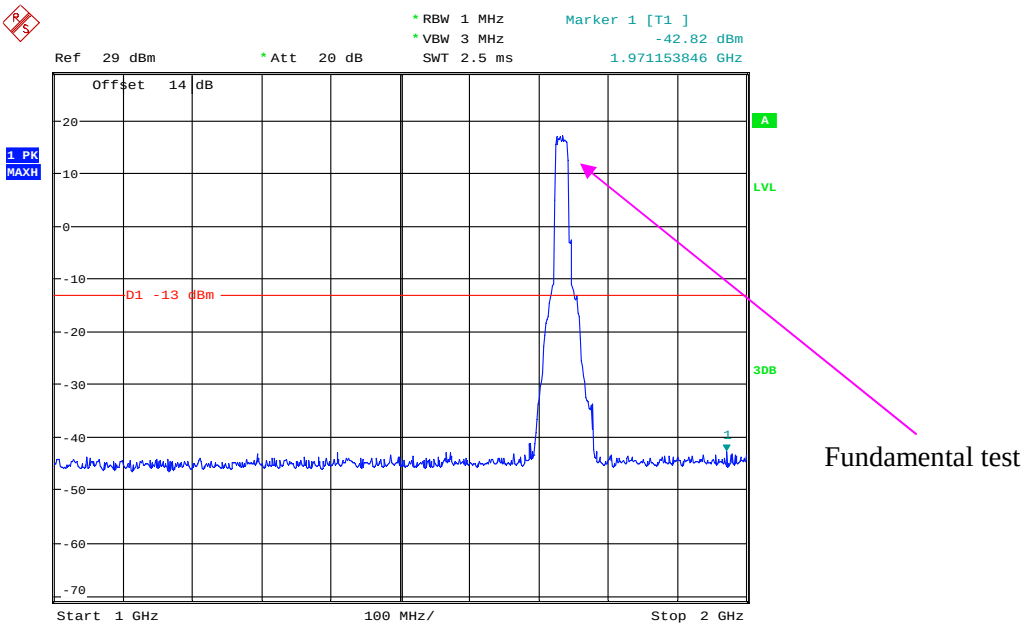
Date: 27.JUN.2018 13:38:21

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



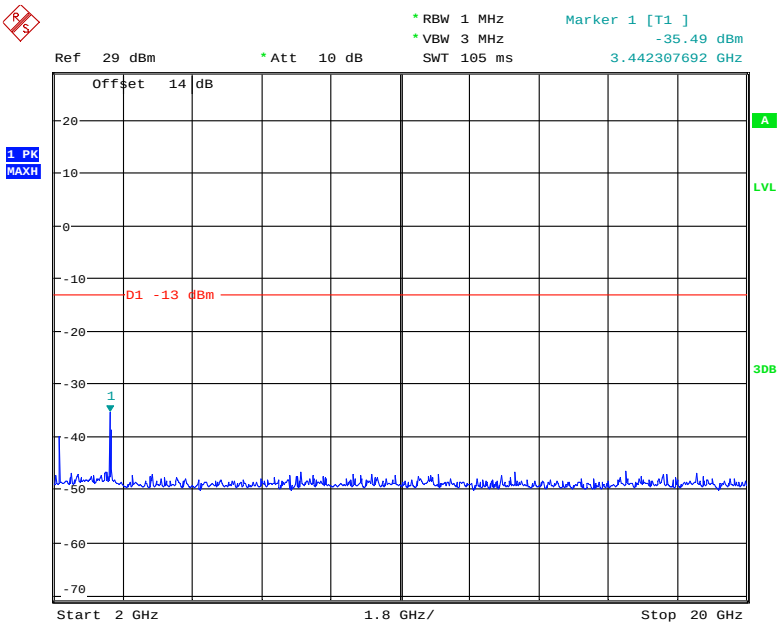
Date: 27.JUN.2018 13:39:56

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



Date: 27.JUN.2018 13:39:12

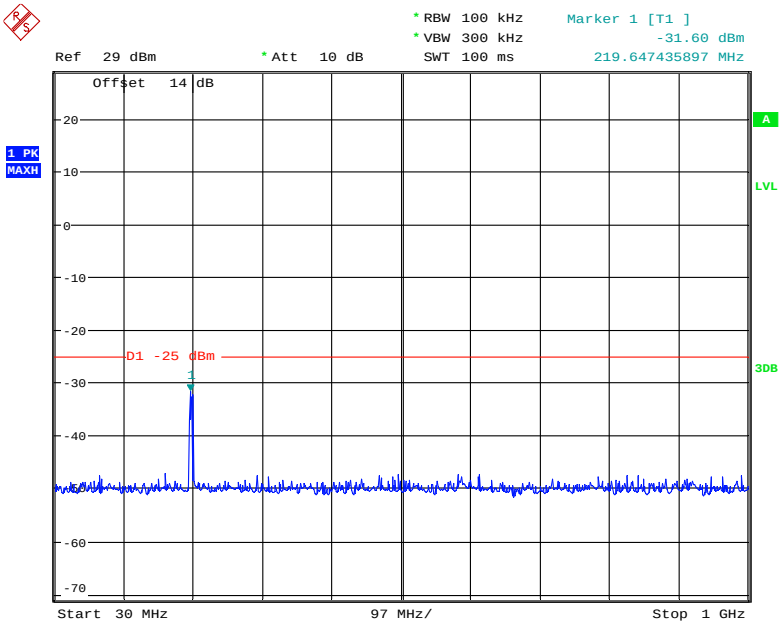
2 GHz – 20 GHz (20.0 MHz, Middle Channel)



Date: 27.JUN.2018 13:38:44

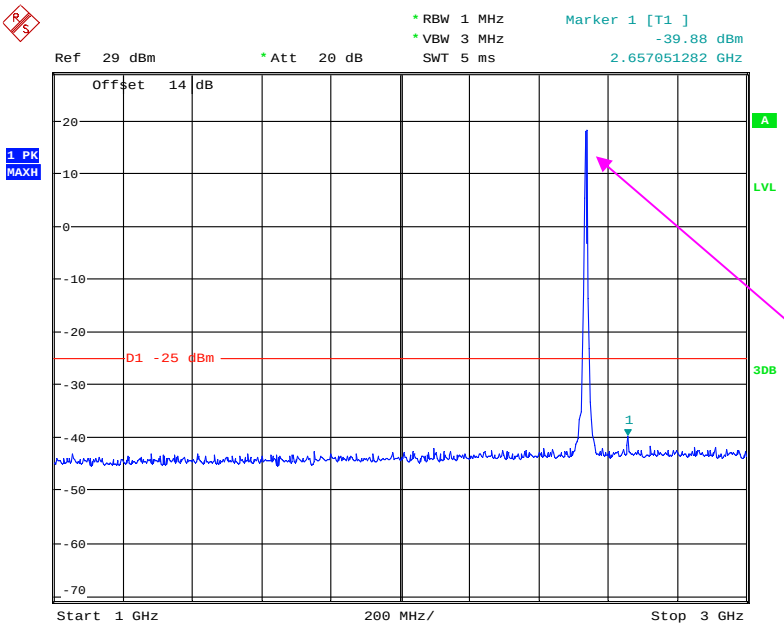
LTE Band 7:

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



Date: 27.JUN.2018 09:47:58

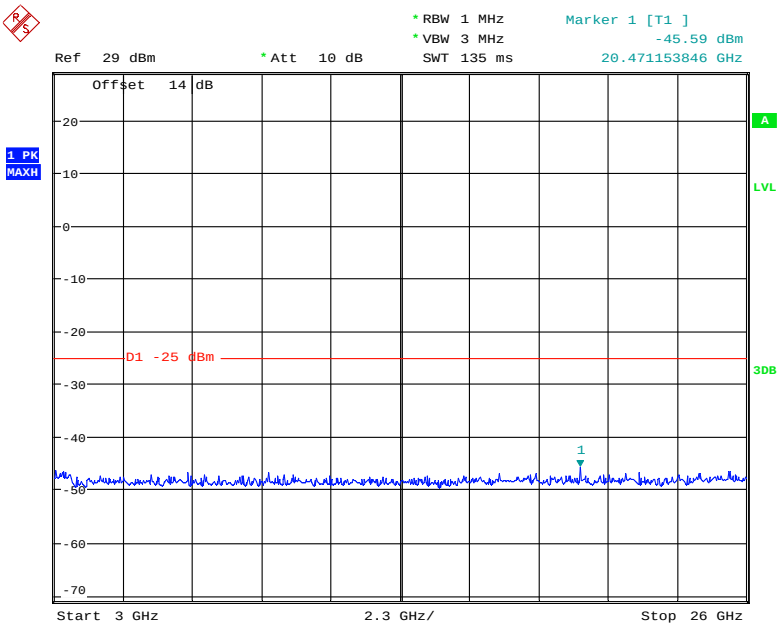
1 GHz – 3.0 GHz (5.0 MHz, Middle Channel)



Fundamental test

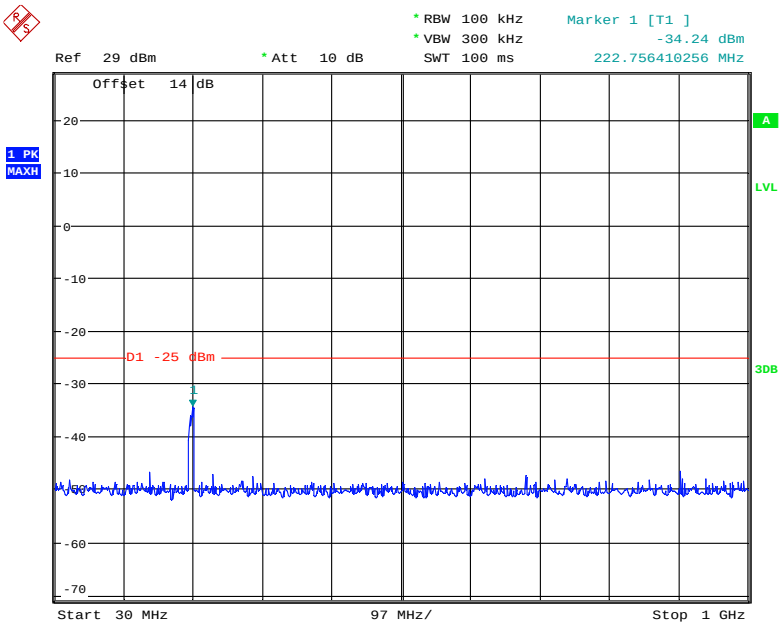
Date: 27.JUN.2018 09:50:14

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



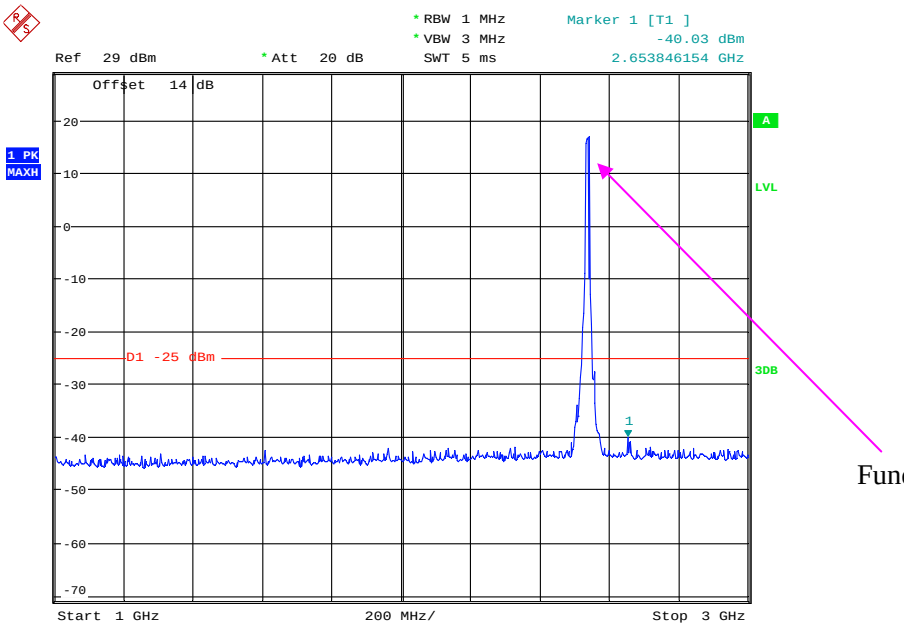
Date: 27.JUN.2018 09:50:51

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



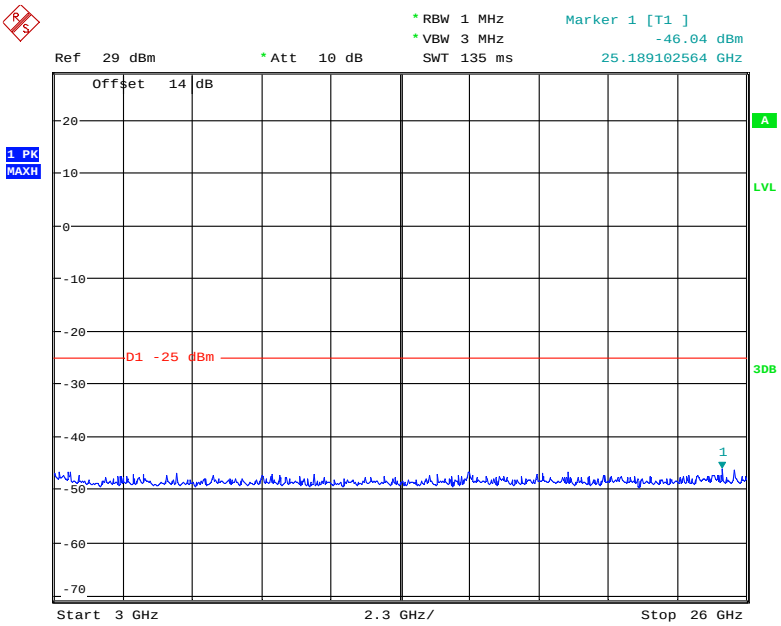
Date: 27.JUN.2018 09:53:42

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



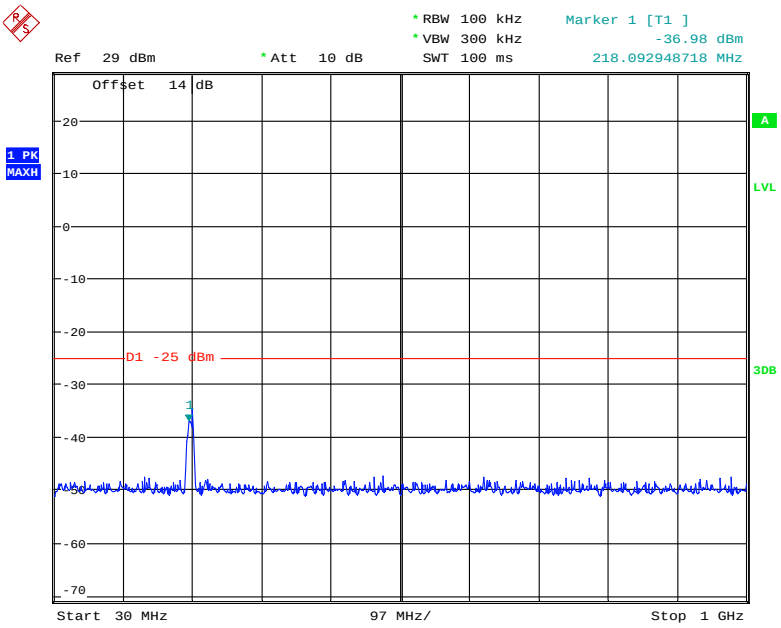
Date: 27.JUN.2018 09:52:59

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



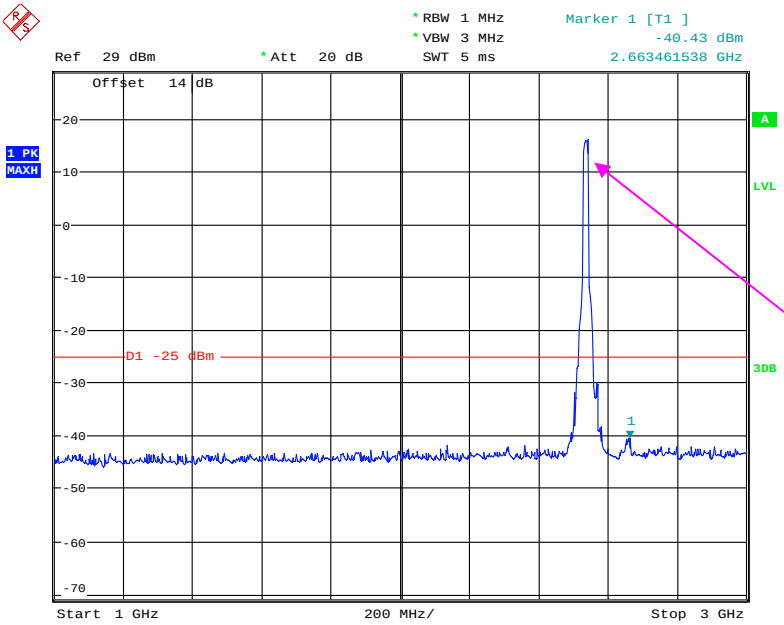
Date: 27.JUN.2018 09:52:09

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



Date: 27.JUN.2018 09:56:18

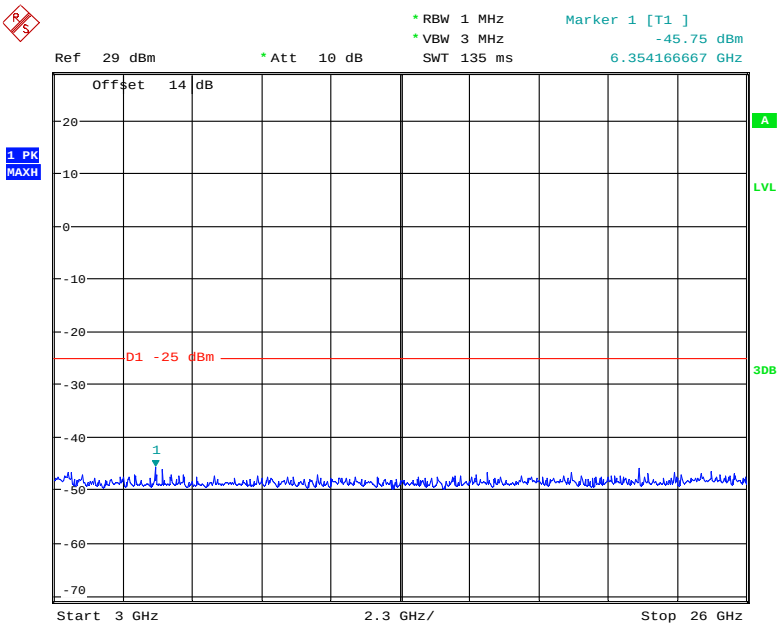
1 GHz – 3 GHz (15.0 MHz, Middle Channel)



Fundamental test

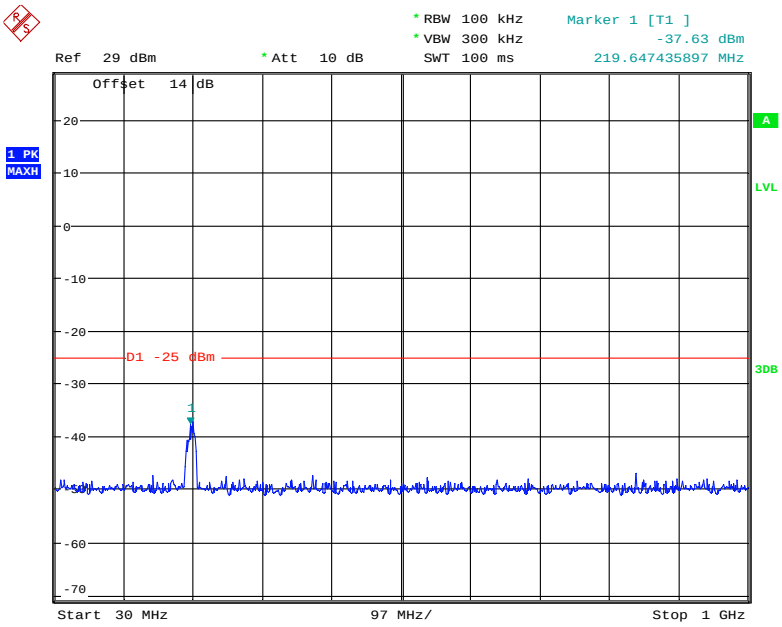
Date: 27.JUN.2018 09:57:09

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



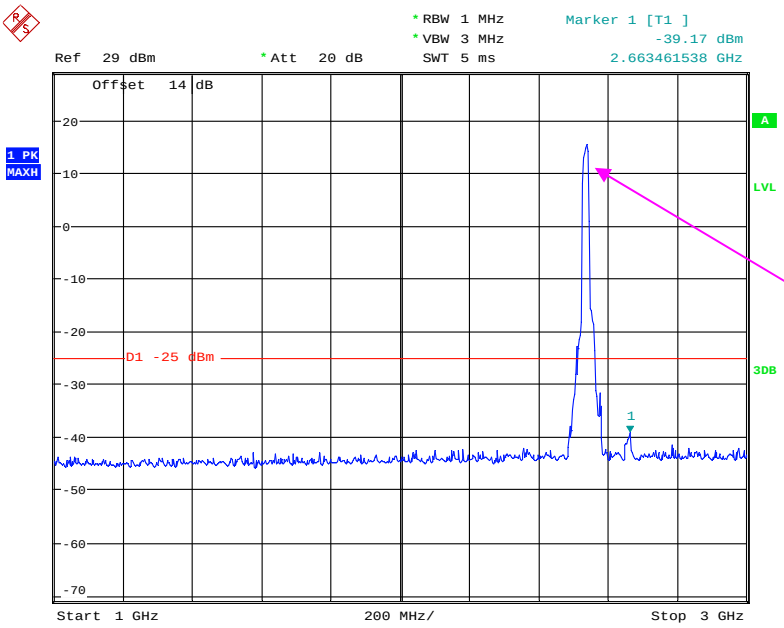
Date: 27.JUN.2018 09:57:50

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



Date: 27.JUN.2018 09:59:49

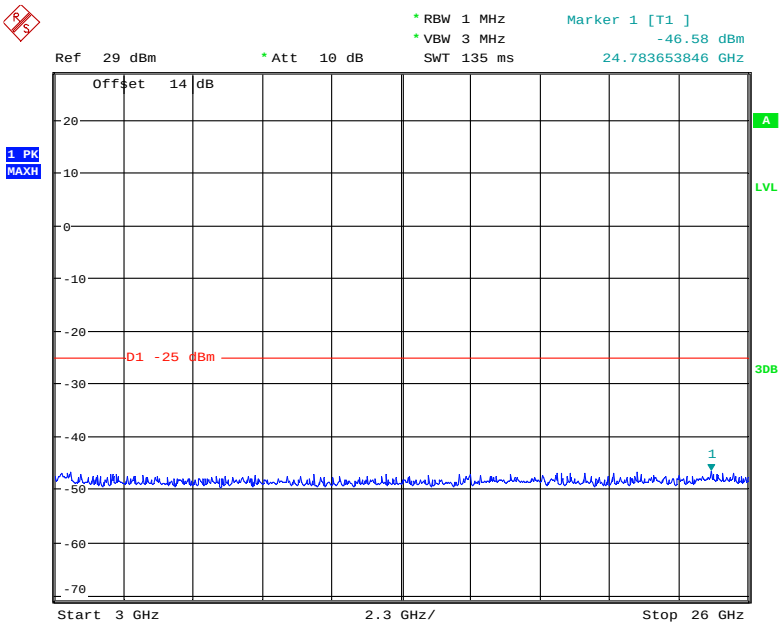
1 GHz – 3 GHz (20.0 MHz, Middle Channel)



Fundamental test

Date: 27.JUN.2018 09:59:09

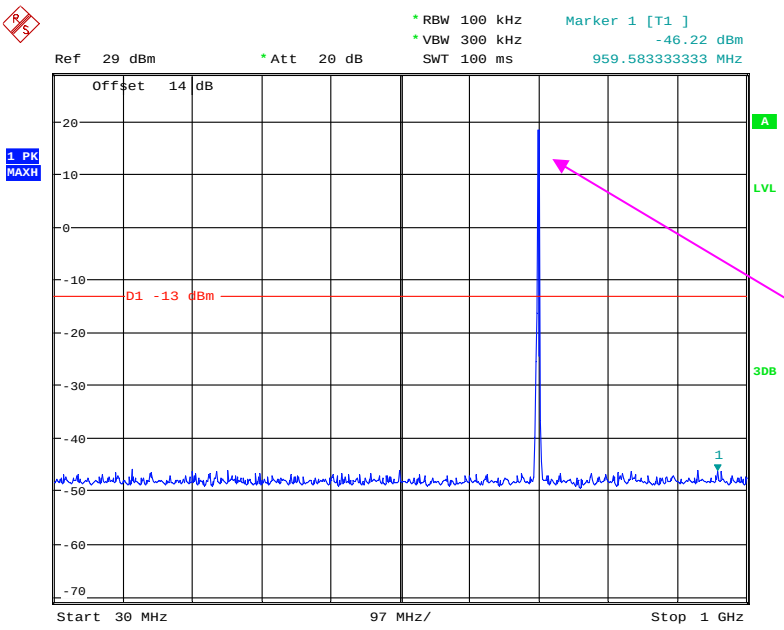
3 GHz – 26 GHz (20.0 MHz, Middle Channel)



Date: 27.JUN.2018 09:58:25

LTE Band 12:

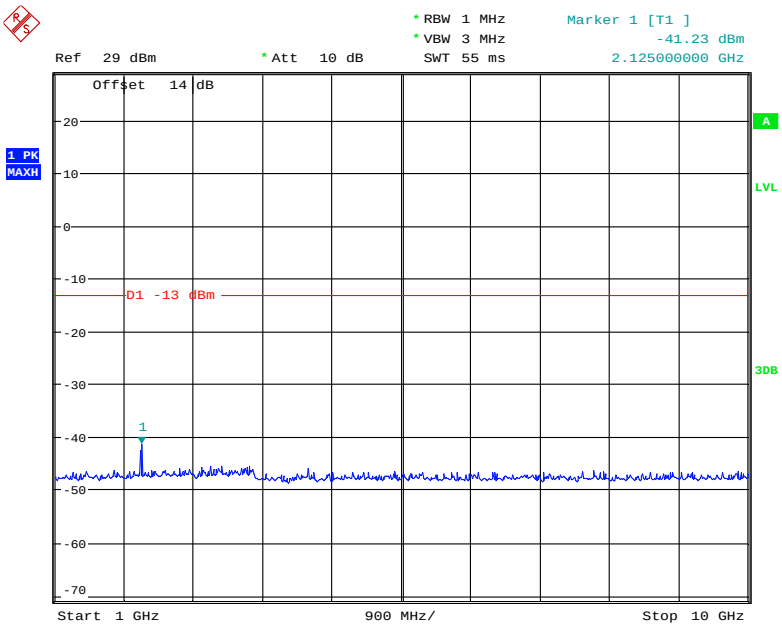
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Fundamental test

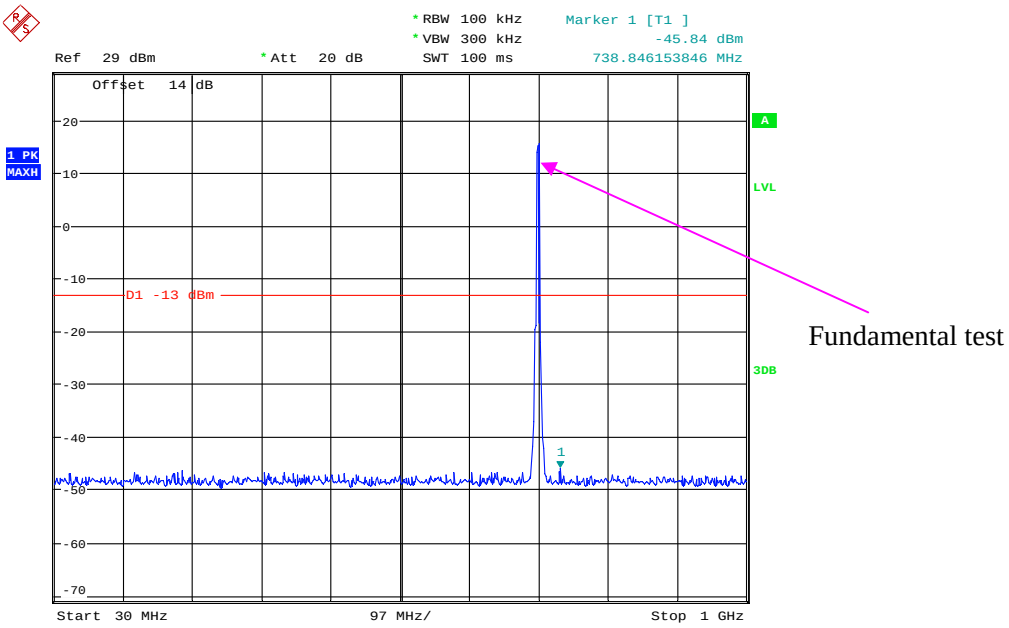
Date: 27.JUN.2018 13:46:30

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



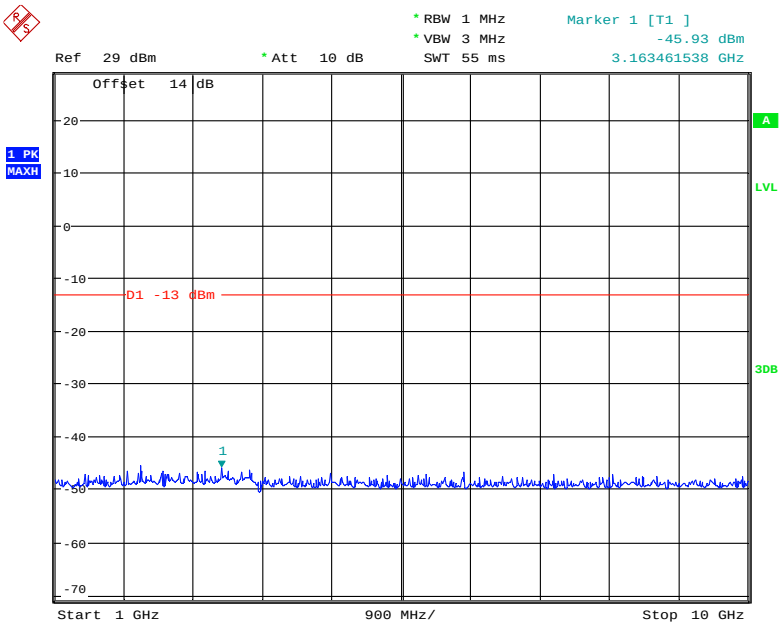
Date: 27.JUN.2018 13:48:50

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



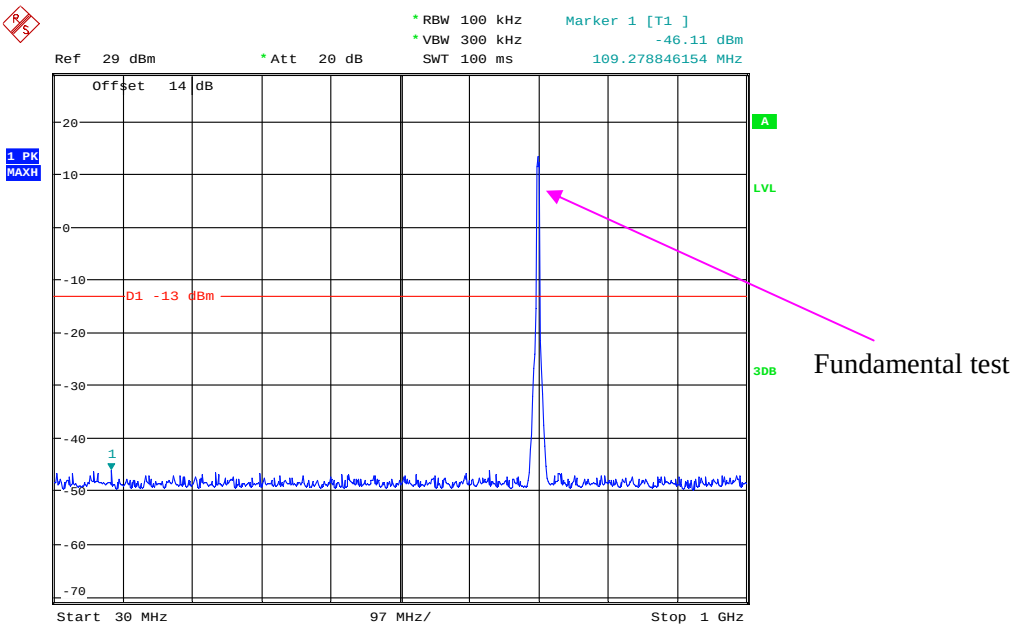
Date: 27.JUN.2018 13:50:15

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



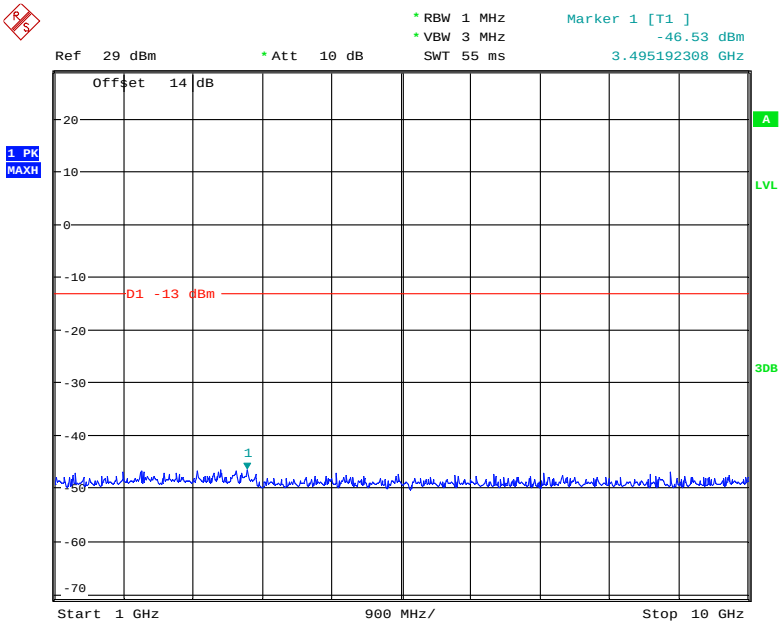
Date: 27.JUN.2018 13:49:24

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



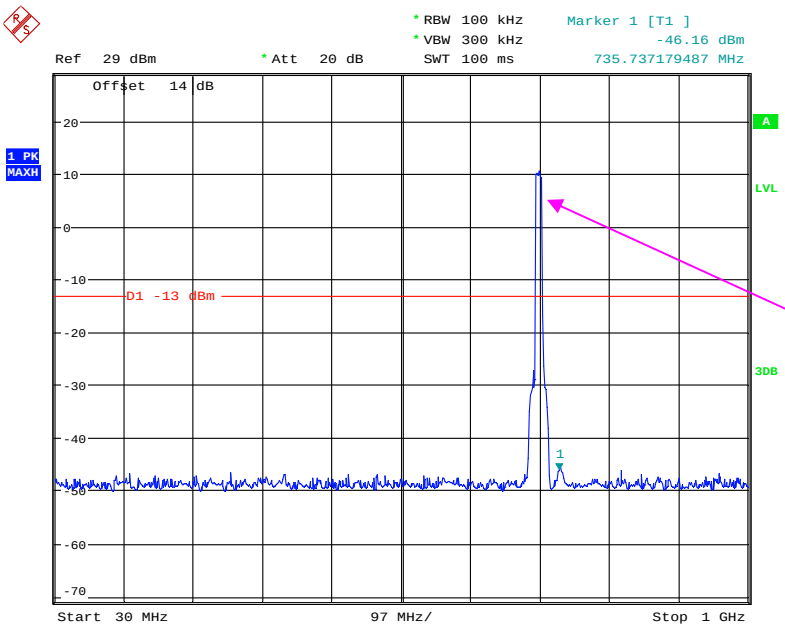
Date: 27.JUN.2018 13:50:58

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



Date: 27.JUN.2018 13:51:21

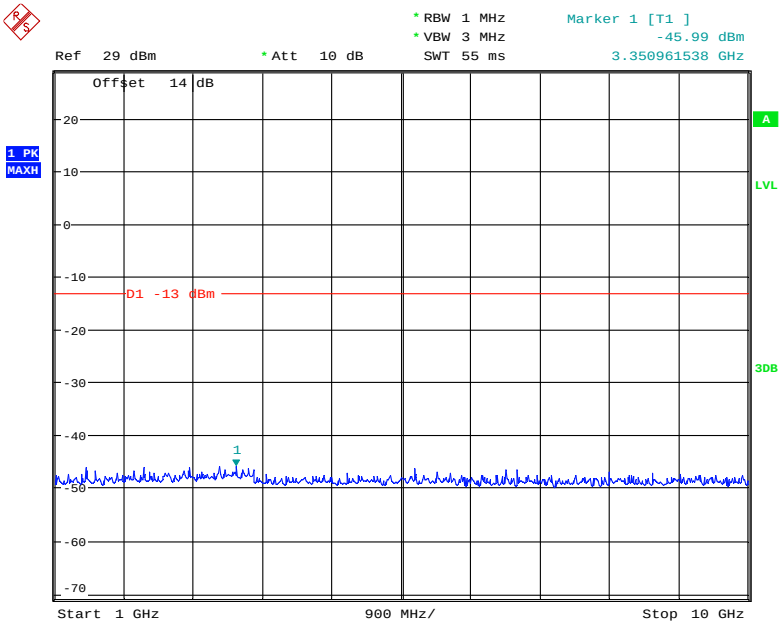
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



Fundamental test

Date: 27.JUN.2018 13:52:13

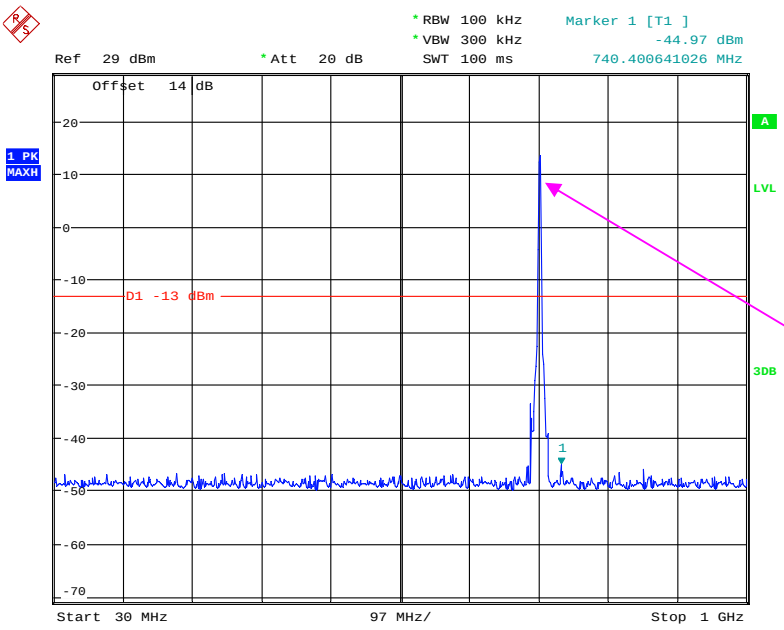
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



Date: 27.JUN.2018 13:51:39

LTE Band 17:

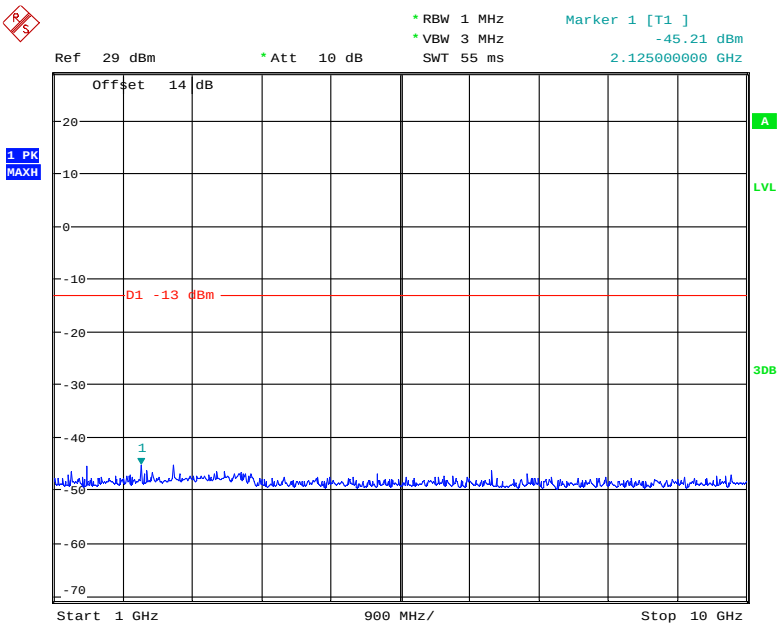
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



Fundamental test

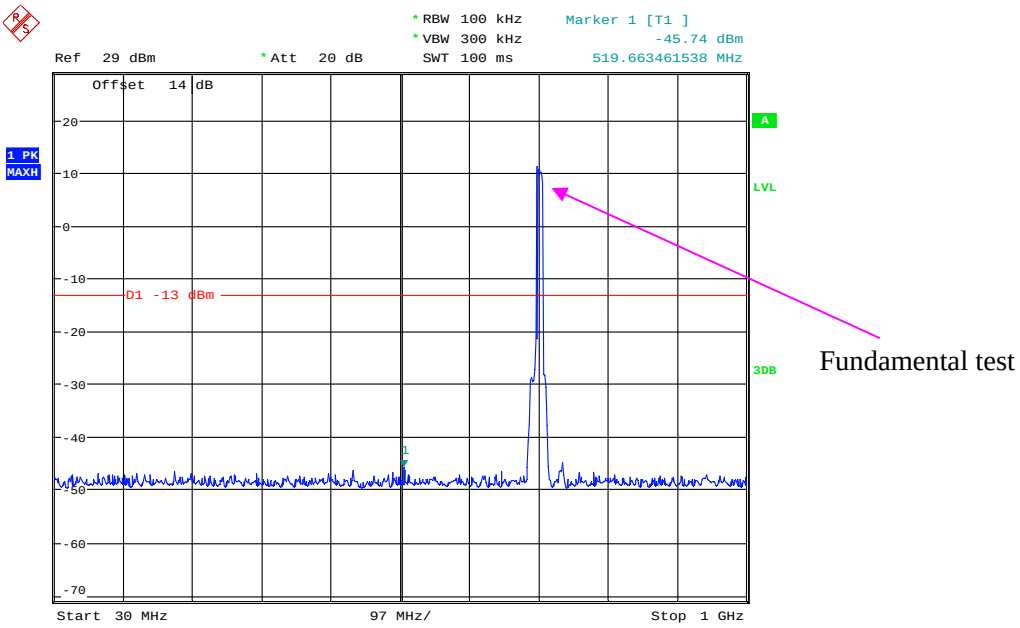
Date: 27.JUN.2018 13:53:48

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



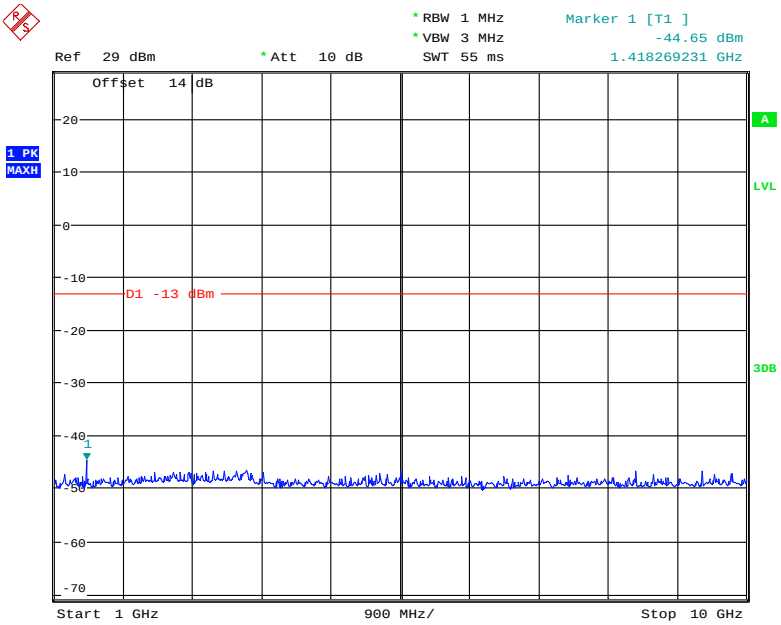
Date: 27.JUN.2018 13:54:24

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



Date: 27.JUN.2018 13:55:40

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



Date: 27.JUN.2018 13:54:42

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 Haiguo Li on 2018-06-07.

EUT operation mode: Transmitting

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

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
GSM Mode, Middle channel										
243.56	37.69	288	2.5	H	-59.3	0.31	0	-59.61	-13	46.61
243.56	36.42	135	2.0	V	-60.6	0.31	0	-60.91	-13	47.91
1673.2	70.65	308	1.5	H	-36.4	1.30	8.90	-28.80	-13	15.80
1673.2	63.83	29	2.2	V	-42.6	1.30	8.90	-35.00	-13	22.00
2509.8	61.51	185	2.0	H	-42.0	2.60	10.20	-34.40	-13	21.40
2509.8	58.81	288	1.4	V	-44.1	2.60	10.20	-36.50	-13	23.50
3346.4	55.29	54	1.5	H	-45.3	1.40	11.80	-34.90	-13	21.90
3346.4	53.99	229	1.8	V	-46.5	1.40	11.80	-36.10	-13	23.10
WCDMA Mode, Middle channel										
241.58	37.49	58	2.3	H	-59.5	0.31	0	-59.81	-13	46.81
241.58	36.28	70	1.6	V	-60.7	0.31	0	-61.01	-13	48.01
1673.2	47.91	54	2.2	H	-59.2	1.30	8.90	-51.60	-13	38.60
1673.2	53.84	141	1.6	V	-52.6	1.30	8.90	-45.00	-13	32.00
2509.8	56.72	183	1.5	H	-46.8	2.60	10.20	-39.20	-13	26.20
2509.8	57.75	99	2.0	V	-45.2	2.60	10.20	-37.60	-13	24.60
3346.4	53.33	43	1.9	H	-47.3	1.40	11.80	-36.90	-13	23.90
3346.4	51.51	39	1.5	V	-48.9	1.40	11.80	-38.50	-13	25.50

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
GSM Mode, Middle channel										
243.56	37.55	57	1.1	H	-59.5	0.31	0	-59.81	-13	46.81
243.56	36.84	352	1.3	V	-60.2	0.31	0	-60.51	-13	47.51
3760	55.21	220	2.4	H	-45.9	1.60	11.90	-35.60	-13	22.60
3760	55.66	263	2.2	V	-44.9	1.60	11.90	-34.60	-13	21.60
5640	59.56	217	1.7	H	-38.0	1.70	12.40	-27.30	-13	14.30
5640	59.04	232	2.3	V	-38.2	1.70	12.40	-27.50	-13	14.50
WCDMA Mode Band II, Middle channel										
241.58	37.15	300	1.8	H	-59.9	0.31	0	-60.21	-13	47.21
241.58	36.09	346	1.8	V	-60.9	0.31	0	-61.21	-13	48.21
3760	65.41	330	1.8	H	-35.8	1.50	11.80	-25.50	-13	12.50
3760	63.87	87	2.3	V	-36.9	1.50	11.80	-26.60	-13	13.60
5640	53.79	105	1.6	H	-44.2	1.60	12.10	-33.70	-13	20.70
5640	51.44	78	2.1	V	-45.9	1.60	12.10	-35.40	-13	22.40

30 MHz ~ 20 GHz:

AWS Band (Part 27)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
WCDMA Mode Band IV, Middle channel										
241.58	37.09	234	2.3	H	-59.9	0.31	0	-60.21	-13	47.21
241.58	36.26	354	1.2	V	-60.7	0.31	0	-61.01	-13	48.01
3465.2	64.25	4	1.4	H	-35.9	1.40	11.80	-25.50	-13	12.50
3465.2	63.15	104	1.5	V	-36.9	1.40	11.80	-26.50	-13	13.50
5197.8	53.06	342	1.7	H	-44.8	1.60	12.10	-34.30	-13	21.30
5197.8	51.12	293	1.7	V	-46.8	1.60	12.10	-36.30	-13	23.30

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
Band 2, Middle channel										
Test frequency range:30 MHz ~ 20 GHz										
226.52	37.26	61	1.9	H	-59.70	0.31	0	-60.01	-13	47.01
226.52	36.15	81	2.0	V	-60.80	0.31	0	-61.11	-13	48.11
3760.00	58.66	202	1.3	H	-42.6	1.50	11.80	-32.30	-13	19.30
3760.00	62.91	22	1.4	V	-37.8	1.50	11.80	-27.50	-13	14.50
5640.00	52.27	222	2.1	H	-45.3	1.70	12.40	-34.60	-13	21.60
5640.00	48.45	197	1.3	V	-48.8	1.70	12.40	-38.10	-13	25.10
Band 4, Middle channel										
Test frequency range:30 MHz ~ 18 GHz										
226.52	37.42	284	2.5	H	-59.60	0.31	0	-59.91	-13	46.91
226.52	36.26	39	2.3	V	-60.70	0.31	0	-61.01	-13	48.01
3465.00	59.27	235	2.3	H	-41.1	1.50	12.00	-30.60	-13	17.60
3465.00	62.69	83	1.2	V	-38.5	1.50	12.00	-28.00	-13	15.00
5197.50	46.43	334	1.6	H	-52.2	1.60	12.10	-41.70	-13	28.70
5197.50	44.45	244	1.2	V	-53.7	1.60	12.10	-43.20	-13	30.20
Band 7, Middle channel										
Test frequency range:30 MHz ~ 26 GHz										
226.52	37.59	221	1.9	H	-59.40	0.31	0	-59.71	-25	34.71
226.52	37.28	38	2.4	V	-59.70	0.31	0	-60.01	-25	35.01
5070.00	51.25	273	1.1	H	-46.6	1.60	12.10	-36.10	-25	11.10
5070.00	48.29	216	1.8	V	-49.6	1.60	12.10	-39.10	-25	14.10
7605.00	60.97	165	1.8	H	-34.2	2.10	10.50	-25.80	-25	0.80
7605.00	56.39	188	2.0	V	-38.6	2.10	10.50	-30.20	-25	5.20
Band 12, Middle channel										
Test frequency range: 30 MHz ~ 10GHz										
226.52	37.82	300	2.5	H	-59.20	0.31	0	-59.51	-13	46.51
226.52	37.46	43	1.7	V	-59.50	0.31	0	-59.81	-13	46.81
1415.00	54.45	78	1.3	H	-53.4	1.60	7.90	-47.10	-13	34.10
1415.00	52.85	48	1.1	V	-55.2	1.60	7.90	-48.90	-13	35.90
2122.50	50.54	7	1.3	H	-51.5	1.30	9.70	-43.10	-13	30.10
2122.50	53.06	278	2.4	V	-49.9	1.30	9.70	-41.50	-13	28.50

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
Band 17, Middle channel										
Test frequency range: 30 MHz ~ 10GHz										
226.52	37.96	295	2.1	H	-59.00	0.31	0	-59.31	-13	46.31
226.52	37.23	96	1.9	V	-59.80	0.31	0	-60.11	-13	47.11
1420.00	54.82	202	1.5	H	-53.0	1.60	7.90	-46.70	-13	33.70
1420.00	51.67	259	2.1	V	-56.4	1.60	7.90	-50.10	-13	37.10
2130.00	50.92	74	1.1	H	-51.2	1.30	9.70	-42.80	-13	29.80
2130.00	53.61	141	1.3	V	-49.3	1.30	9.70	-40.90	-13	27.90

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.

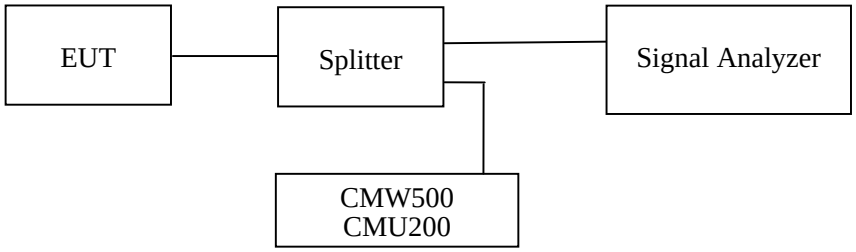
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

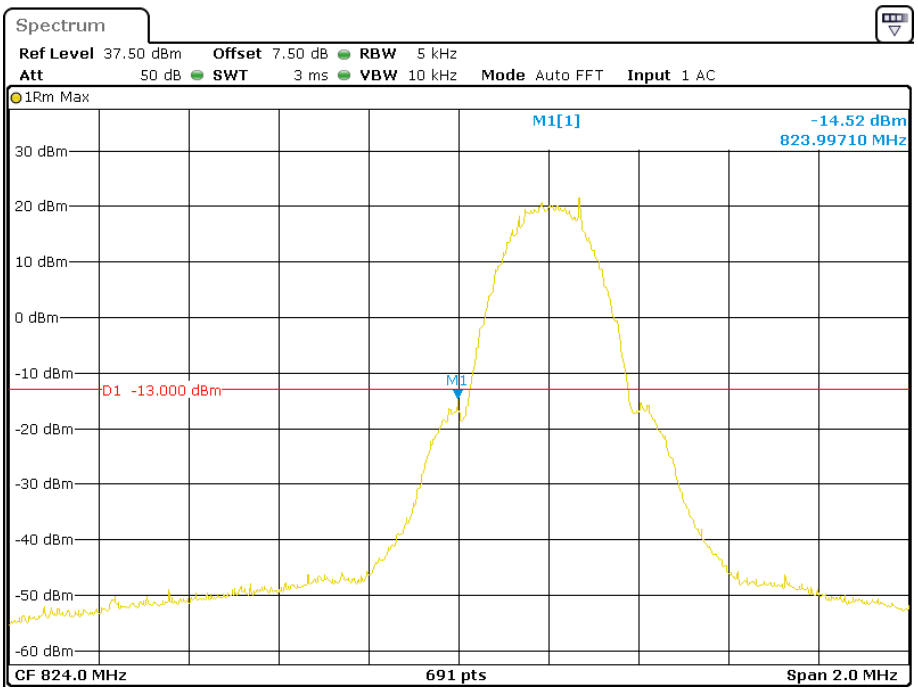
Temperature:	23~25 ℃
Relative Humidity:	50~52 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Haiguo Li from 2018-06-03 to 2018-06-27.

EUT operation mode: Transmitting

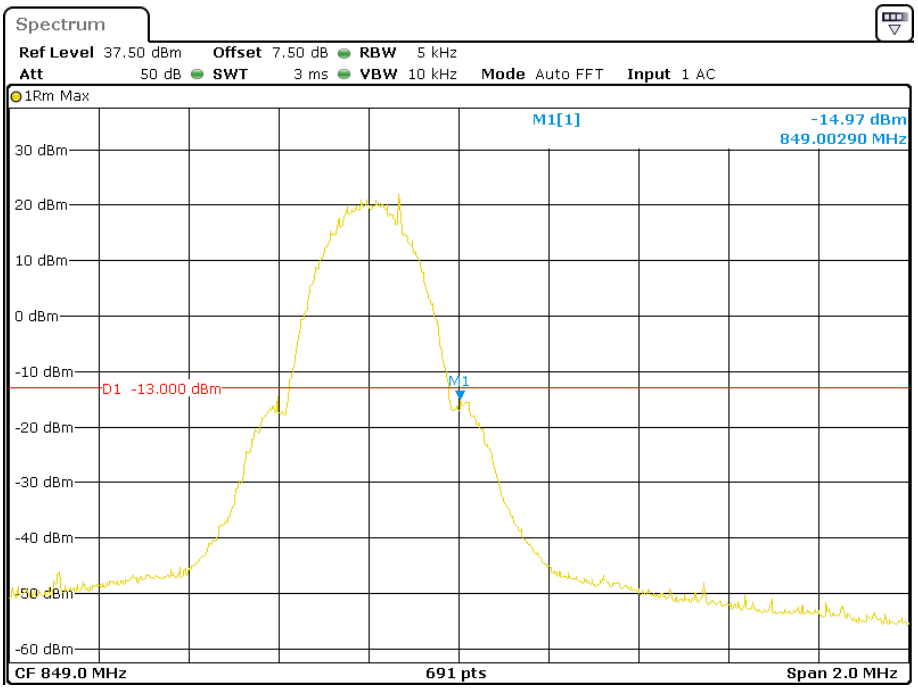
Test Result: Compliance. Please refer to the following plots.

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



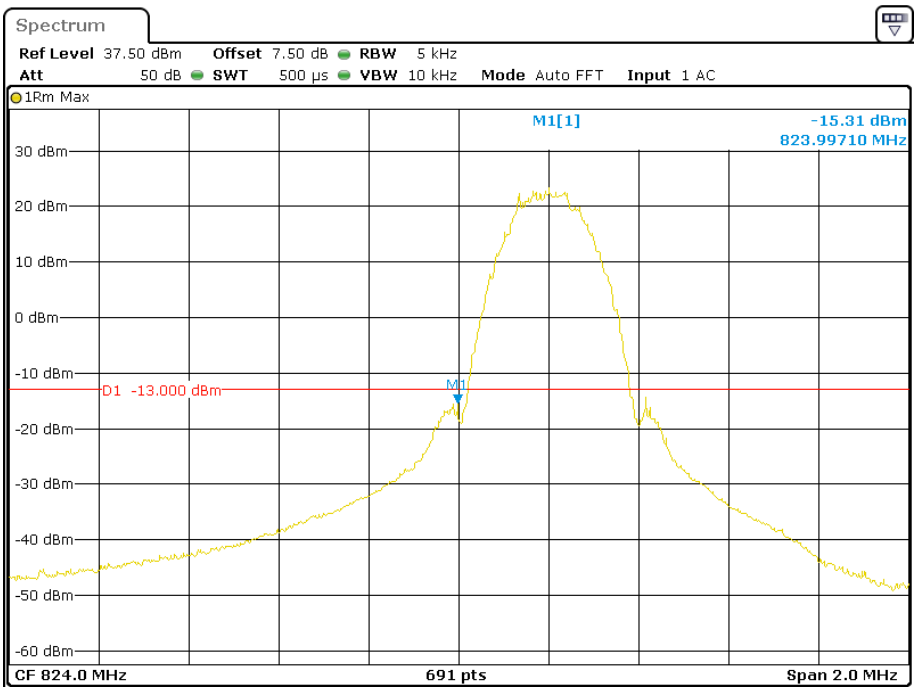
Date: 11.JUN.2018 13:30:02

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



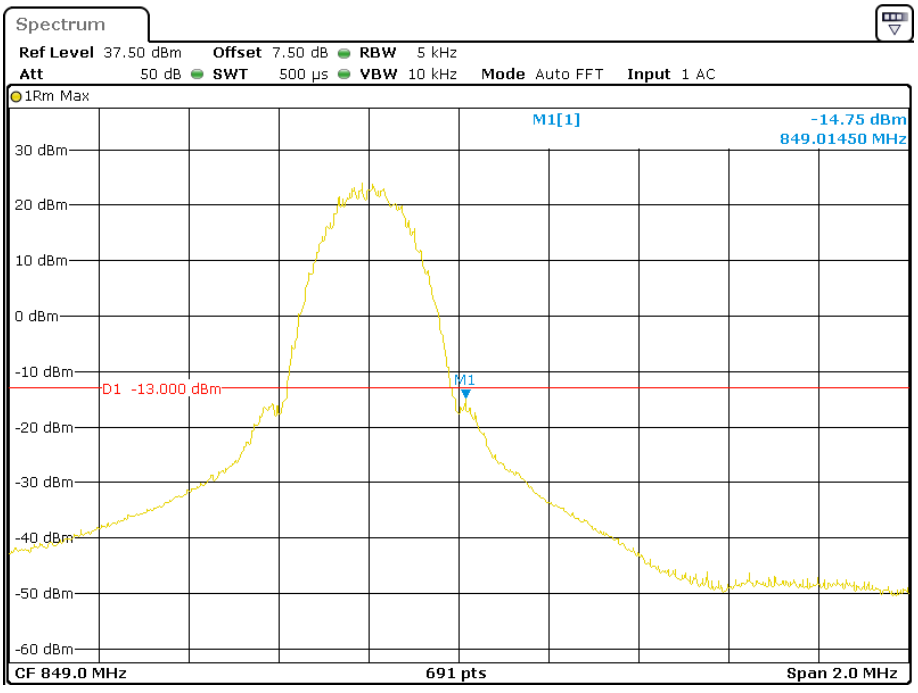
Date: 11.JUN.2018 13:31:37

Cellular Band, Left Band Edge for EDGE Mode



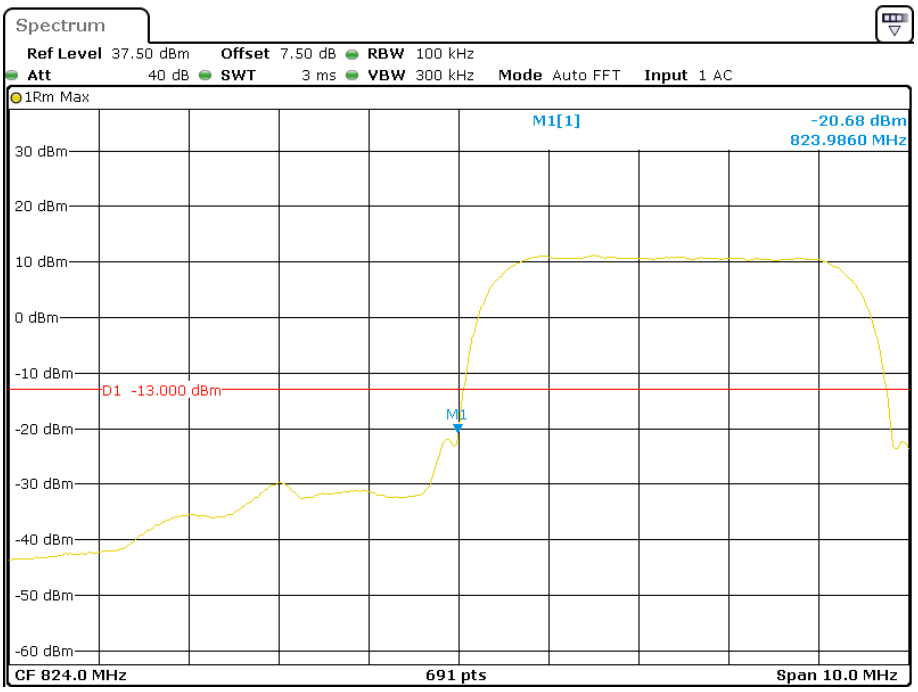
Date: 11.JUN.2018 13:56:19

Cellular Band, Right Band Edge for EDGE Mode



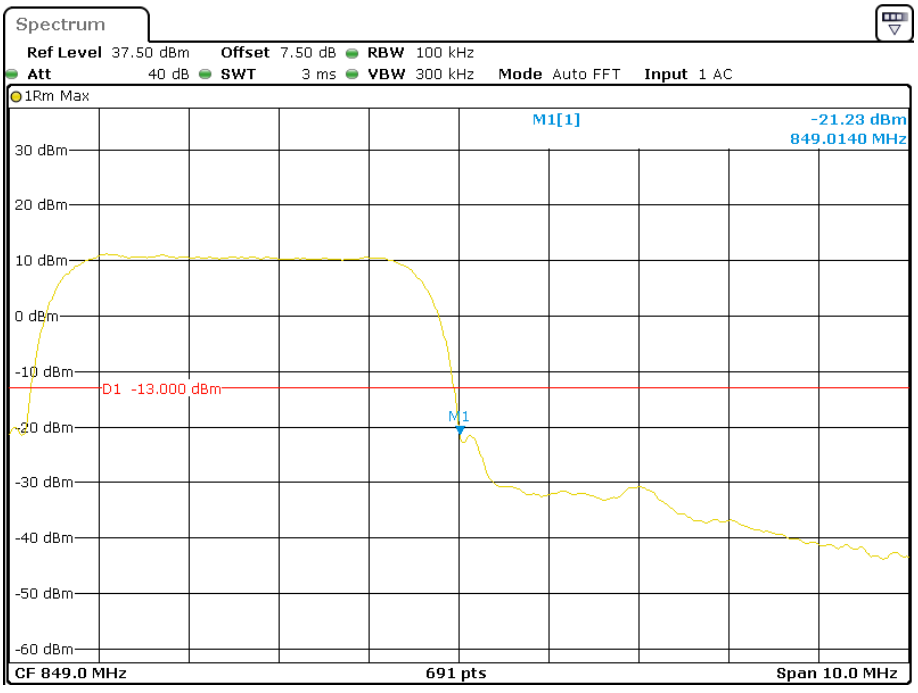
Date: 11.JUN.2018 13:57:48

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



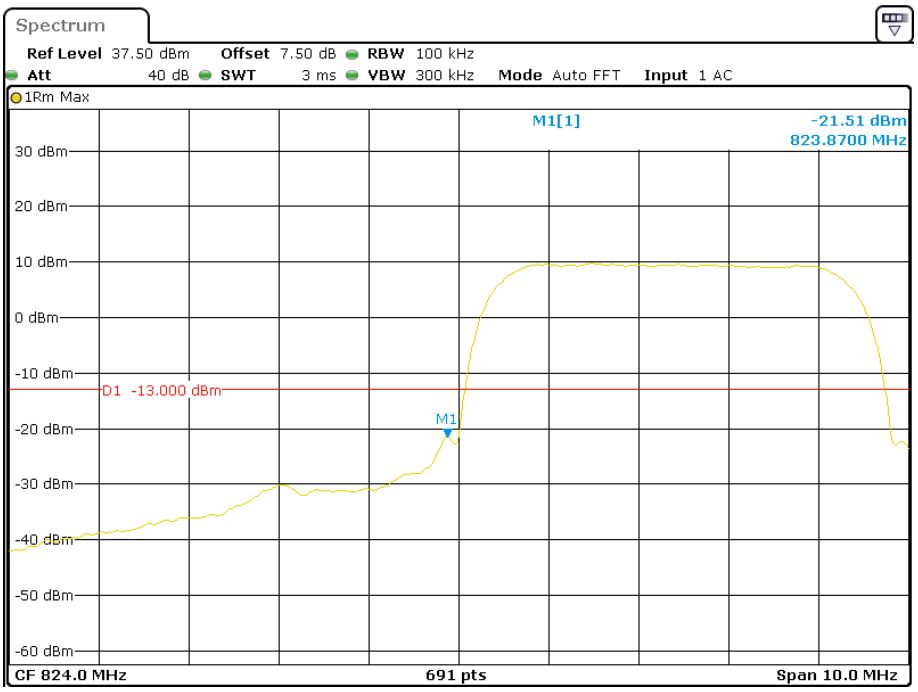
Date: 11.JUN.2018 15:01:35

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



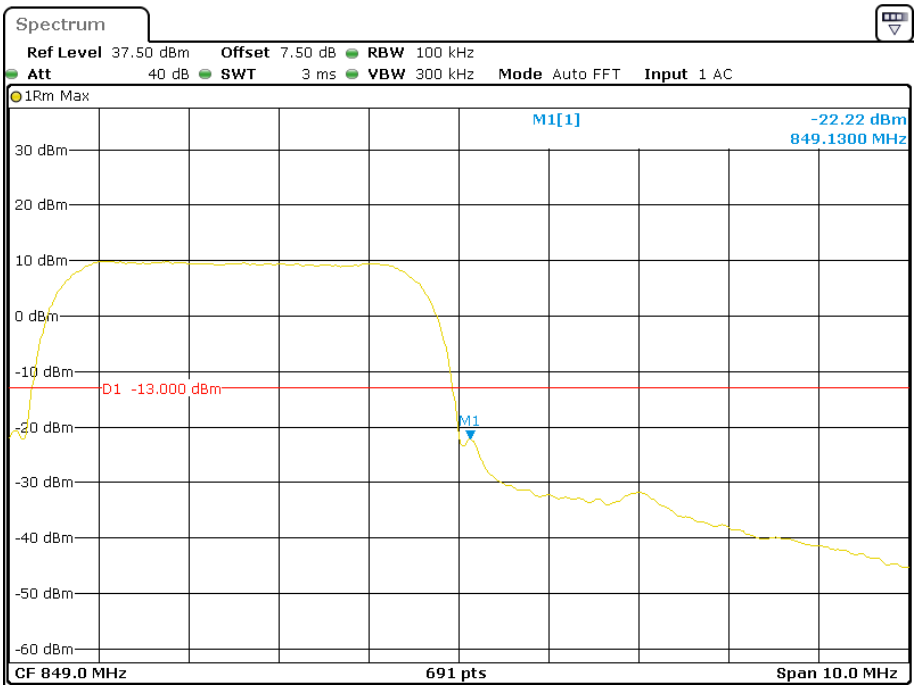
Date: 11.JUN.2018 15:02:21

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



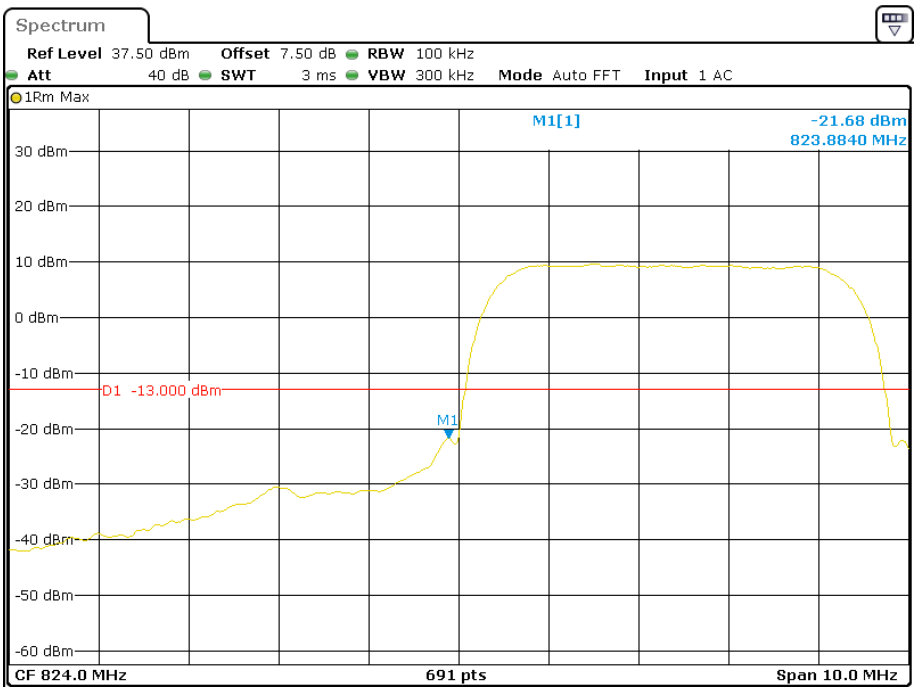
Date: 11.JUN.2018 15:42:10

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



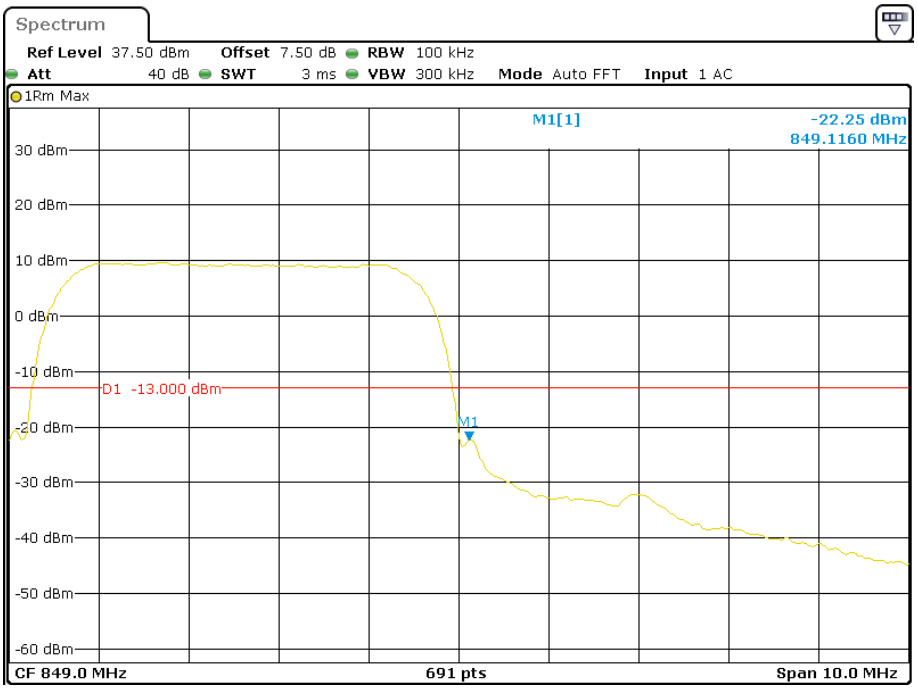
Date: 11.JUN.2018 15:44:15

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



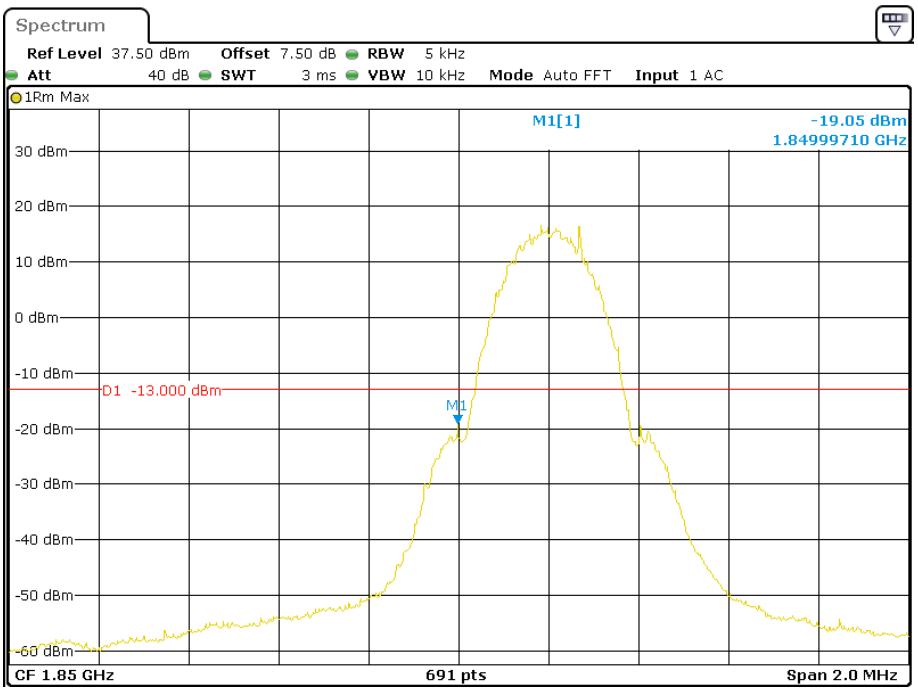
Date: 11.JUN.2018 15:20:24

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



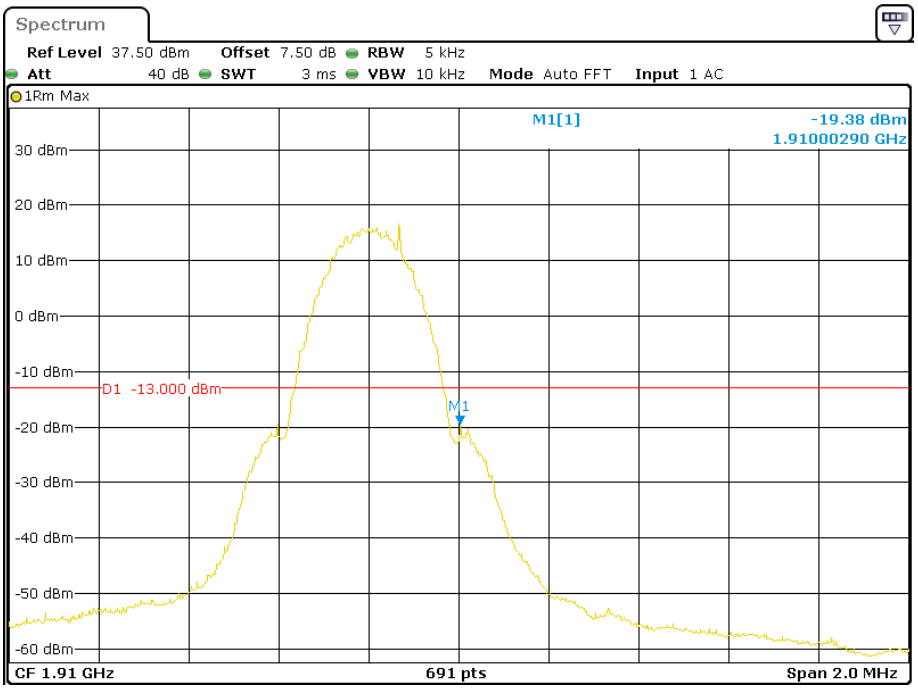
Date: 11.JUN.2018 15:18:50

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



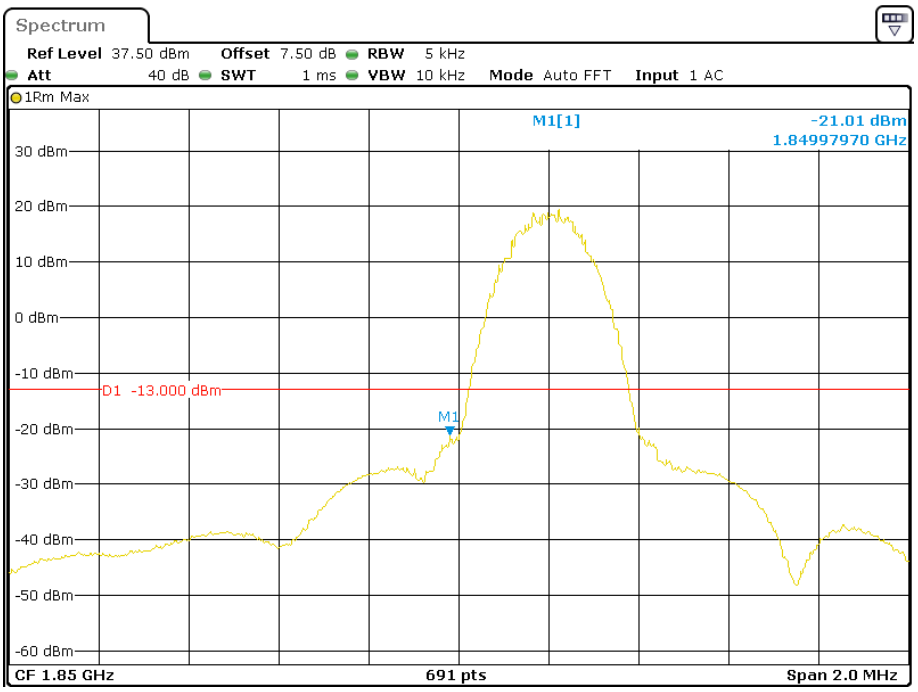
Date: 11.JUN.2018 14:19:53

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



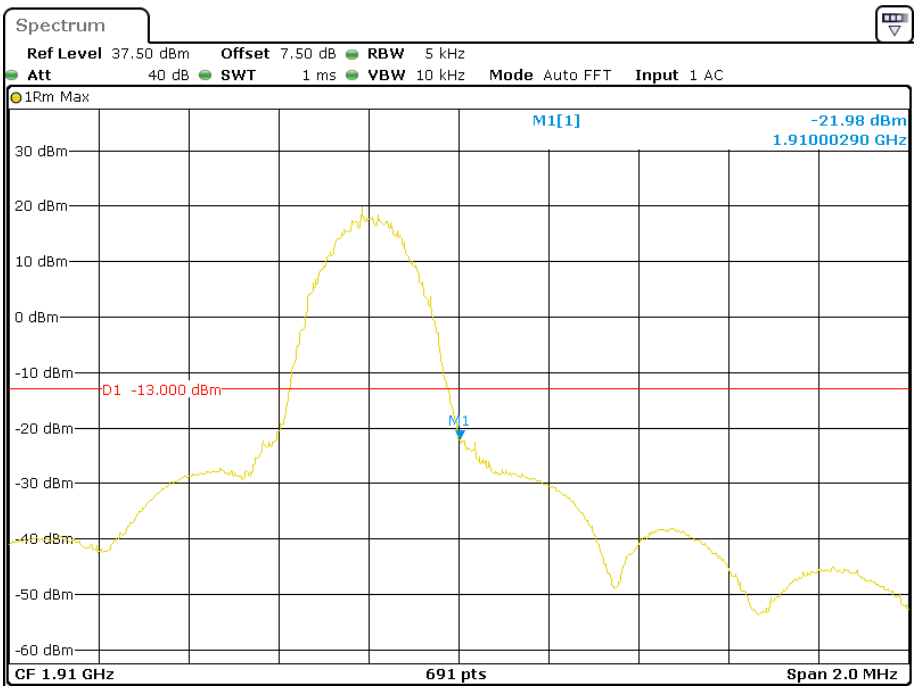
Date: 11.JUN.2018 14:21:16

PCS Band, Left Band Edge for EDGE Mode



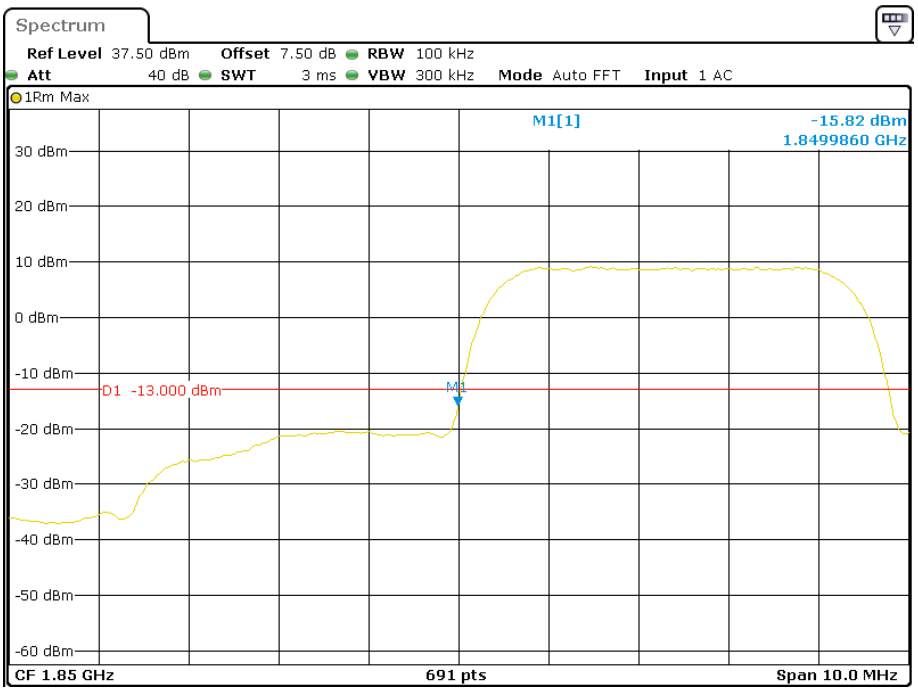
Date: 11.JUN.2018 14:29:25

PCS Band, Right Band Edge for EDGE Mode



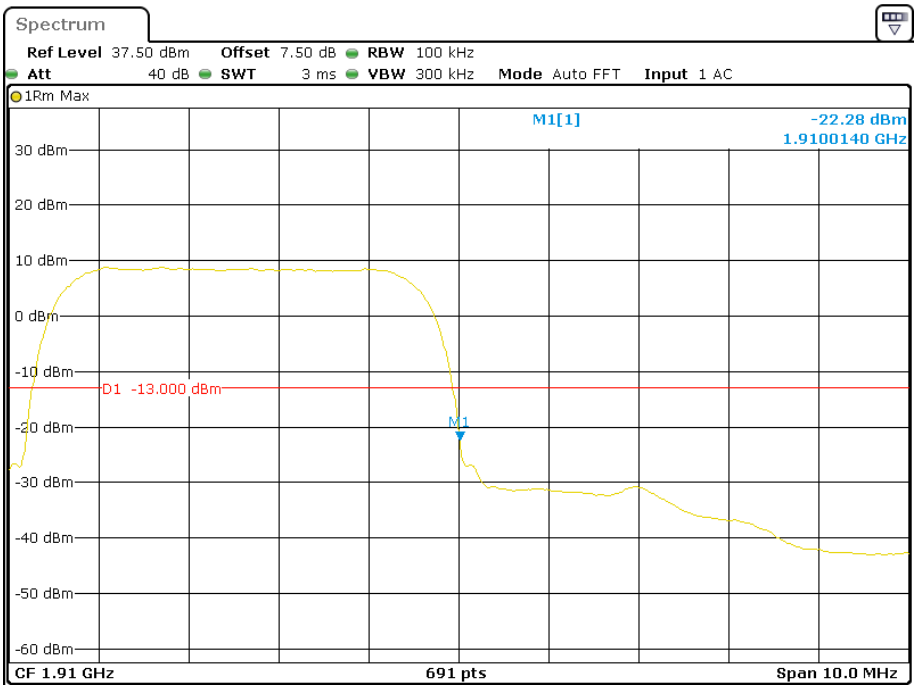
Date: 11.JUN.2018 14:30:48

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



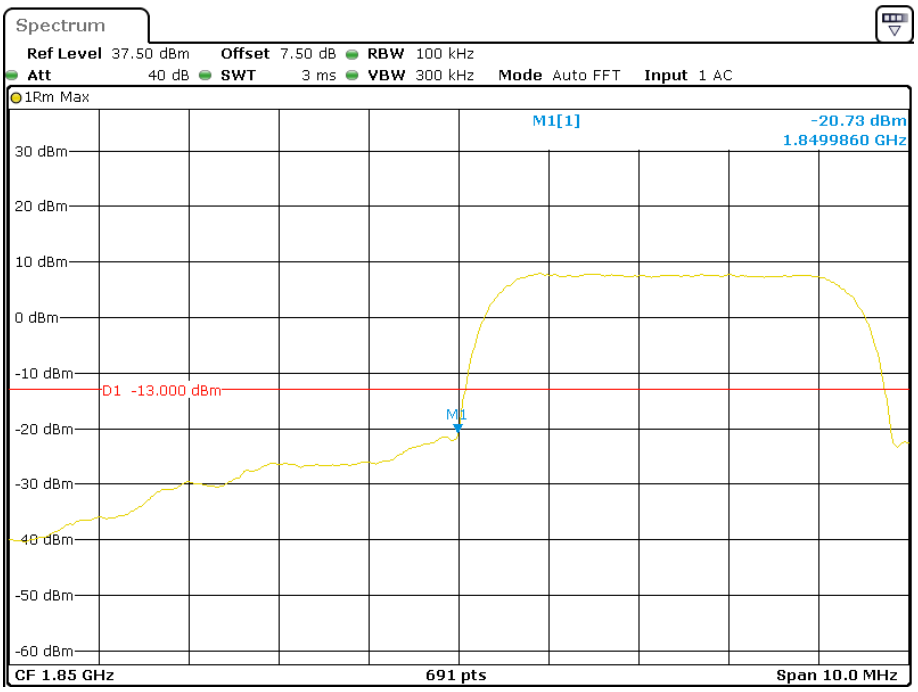
Date: 11.JUN.2018 14:45:45

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



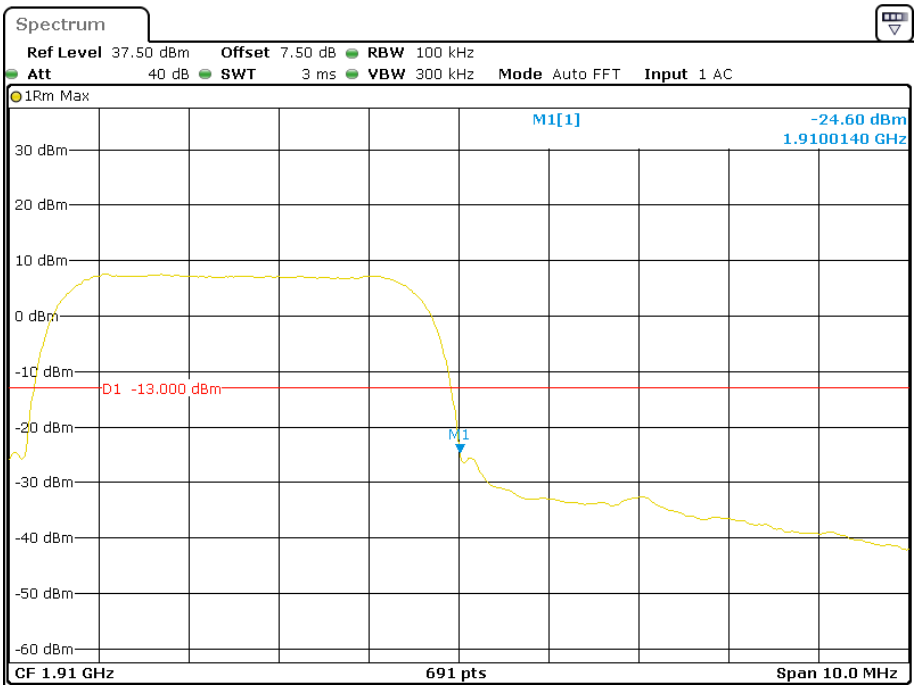
Date: 11.JUN.2018 14:47:01

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



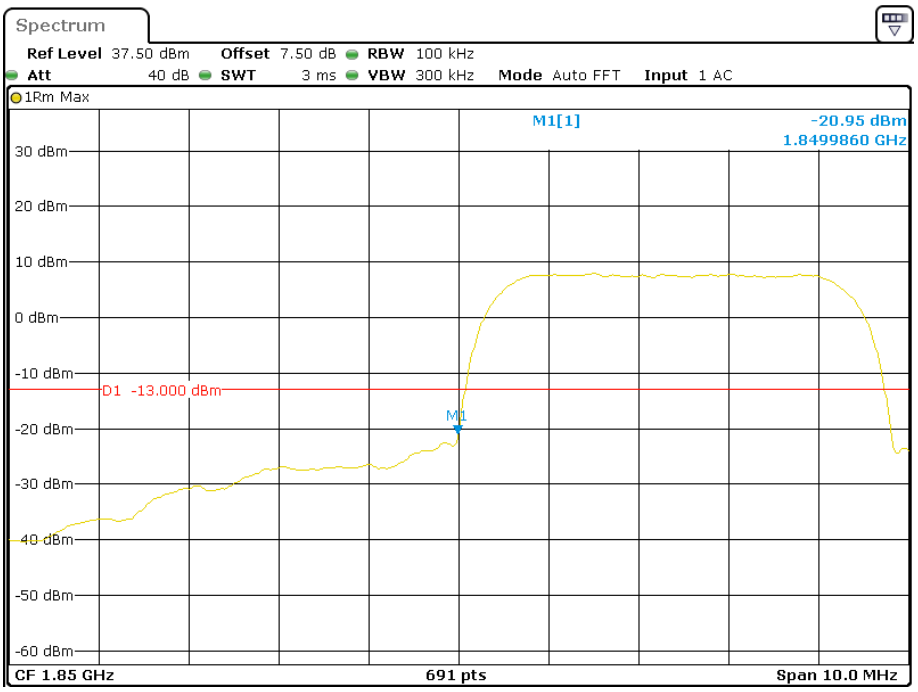
Date: 11.JUN.2018 15:30:30

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



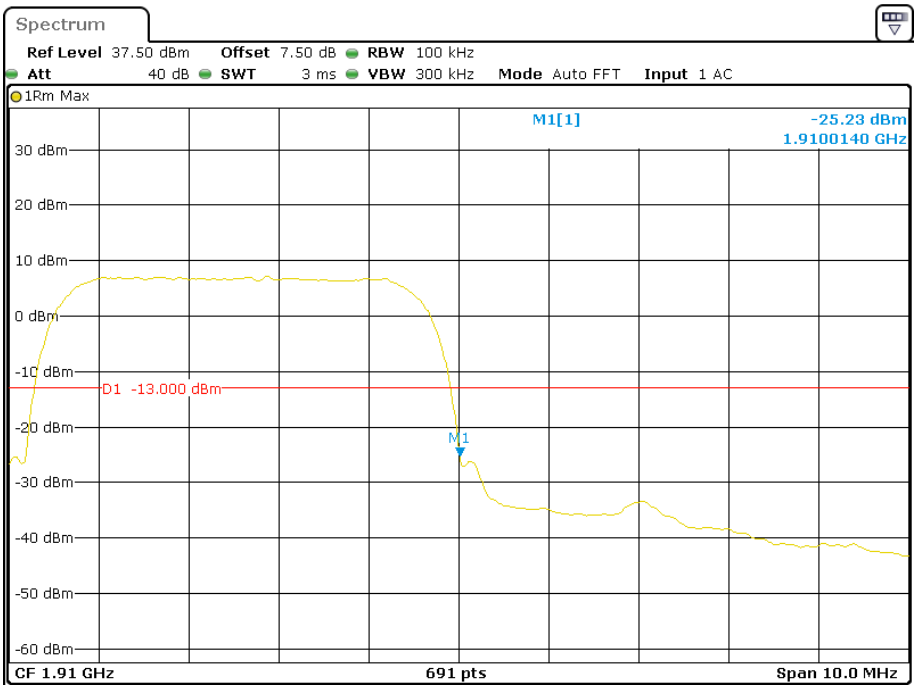
Date: 11.JUN.2018 15:31:46

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



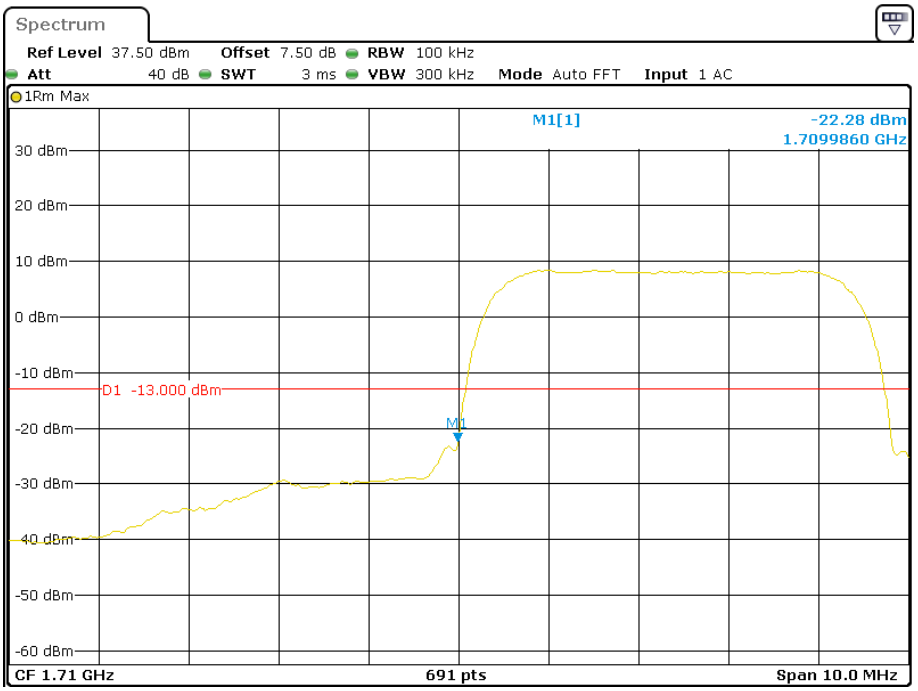
Date: 11.JUN.2018 15:06:47

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



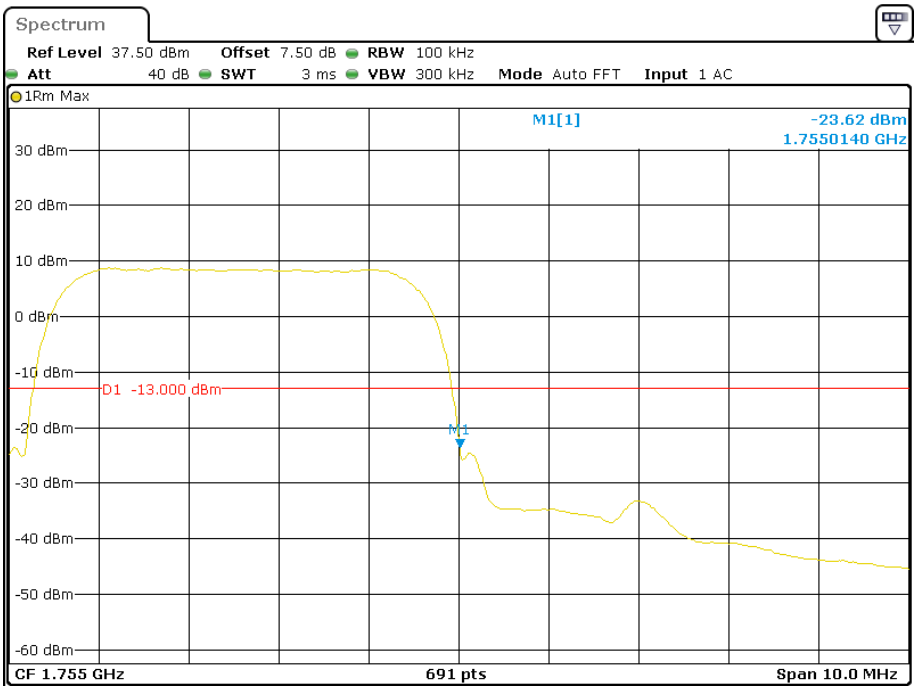
Date: 11.JUN.2018 15:05:36

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



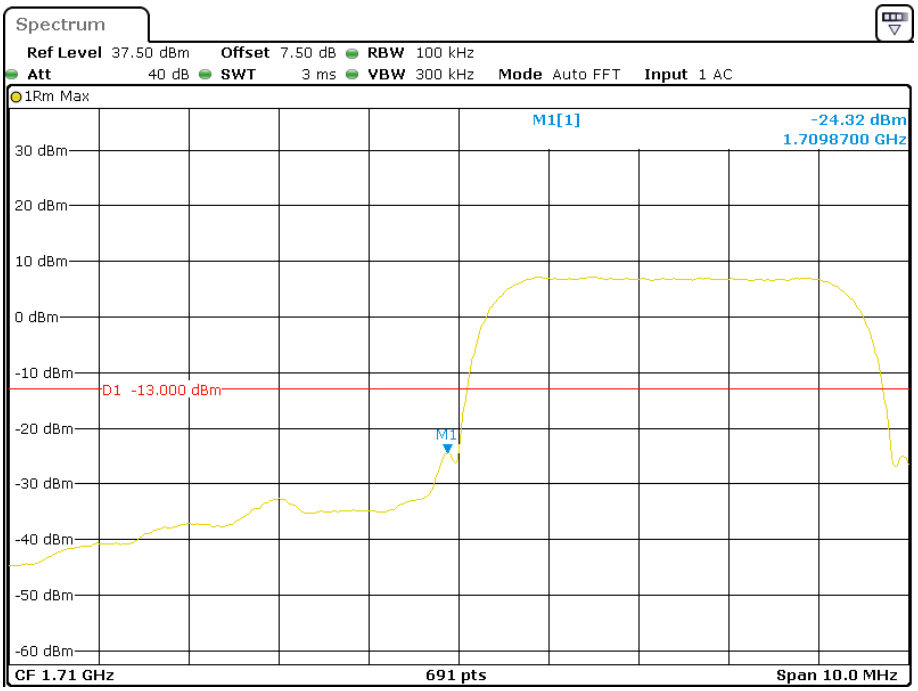
Date: 11.JUN.2018 14:51:01

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



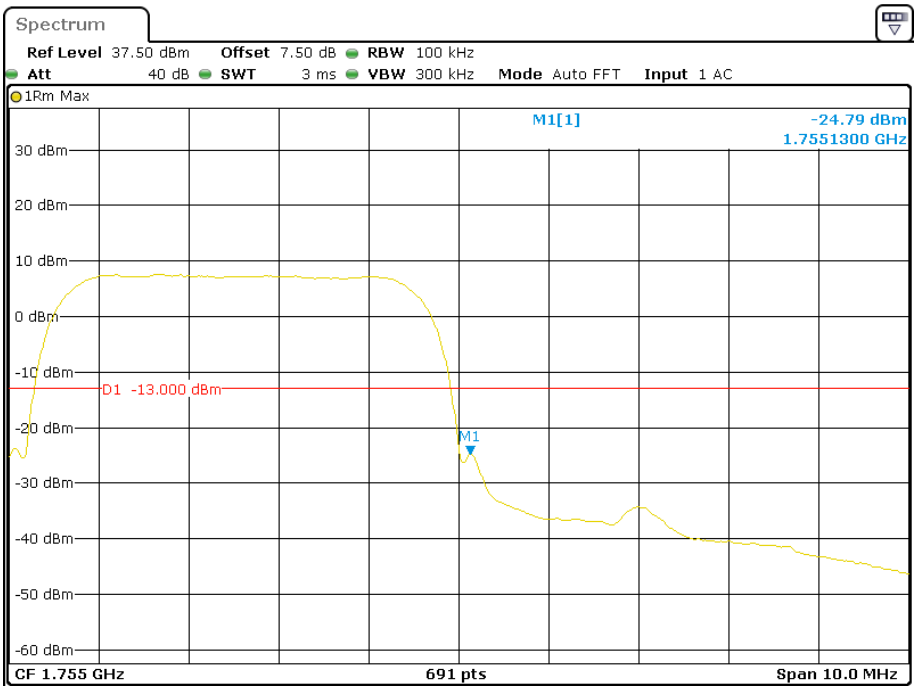
Date: 11.JUN.2018 14:49:54

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



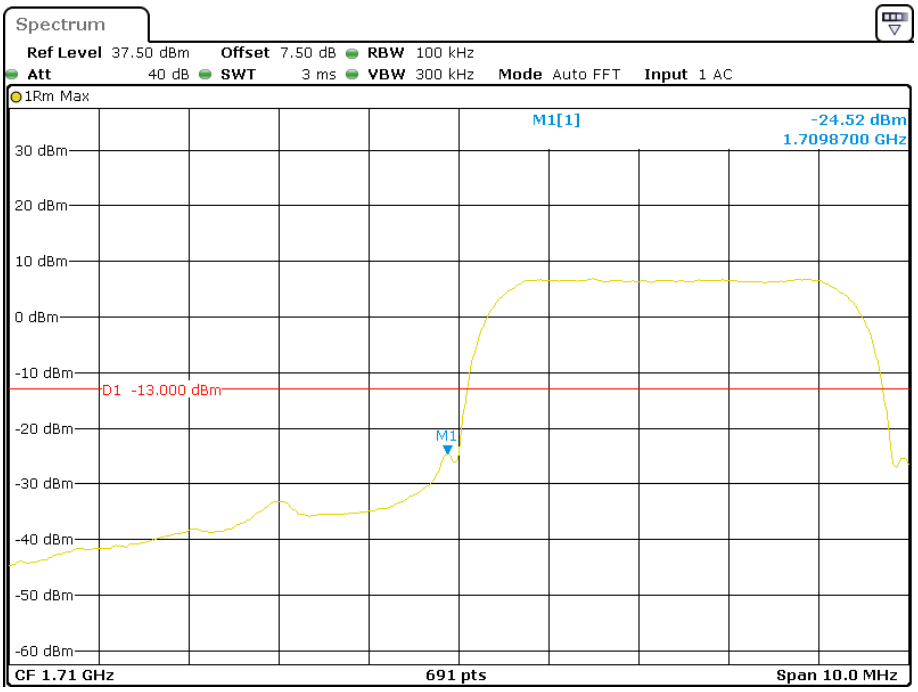
Date: 11.JUN.2018 15:35:11

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



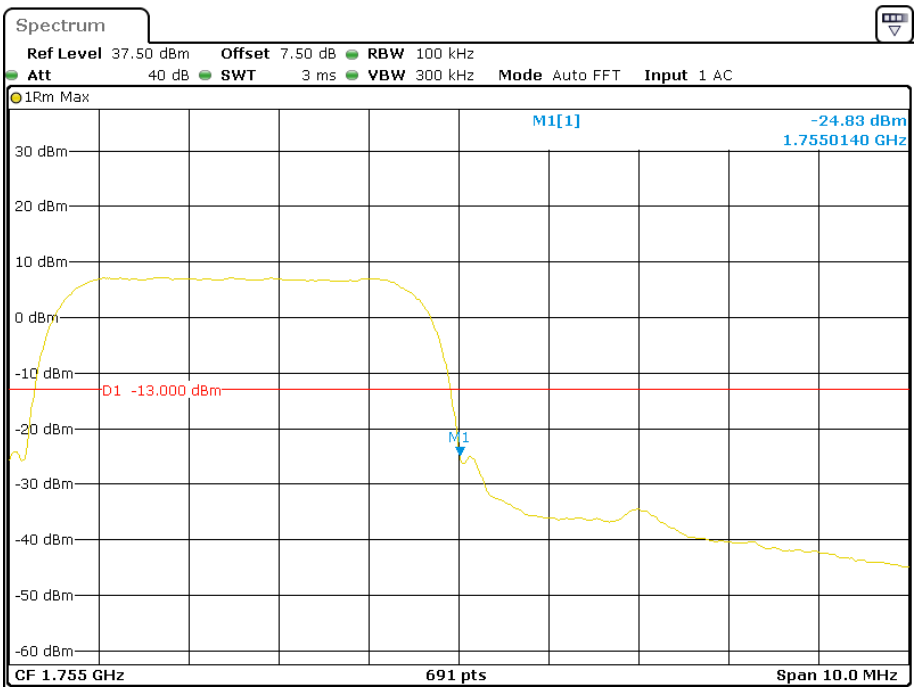
Date: 11.JUN.2018 15:33:32

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



Date: 11.JUN.2018 15:15:35

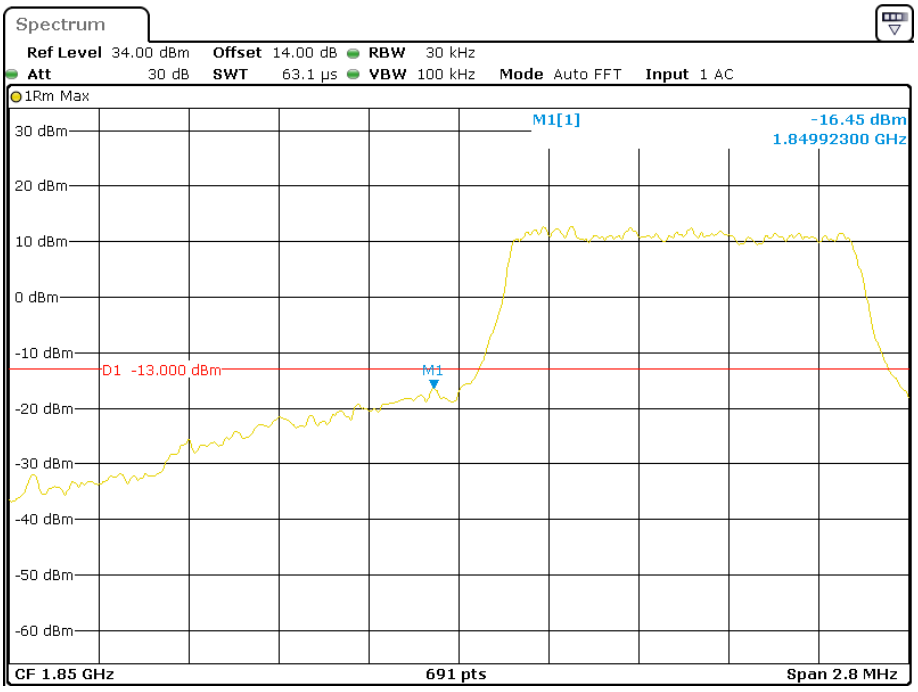
AWS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 11.JUN.2018 15:17:05

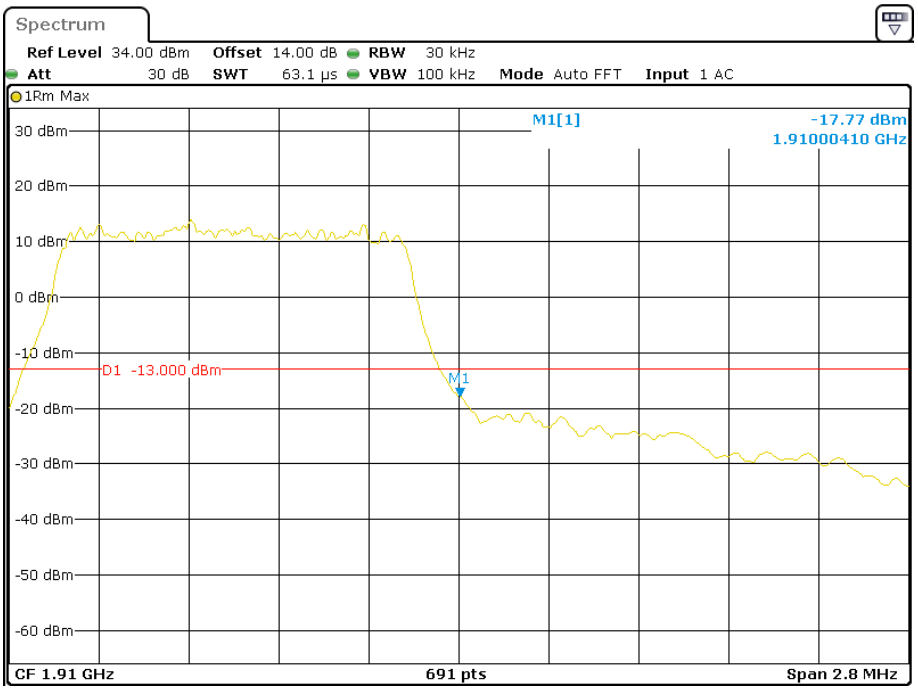
Band 2:

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



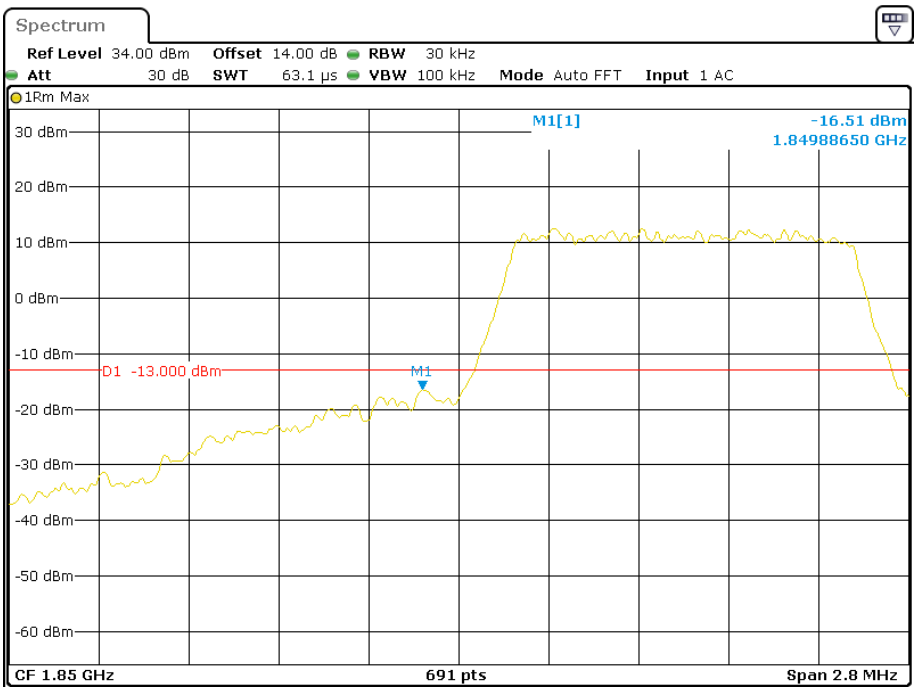
Date: 3.JUN.2018 13:15:05

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



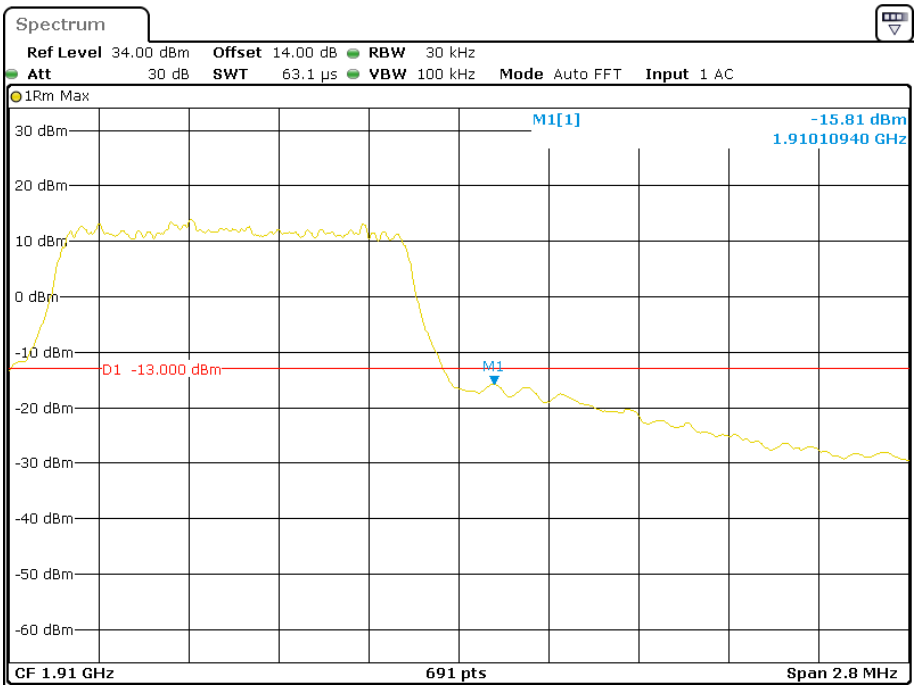
Date: 3.JUN.2018 13:16:07

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



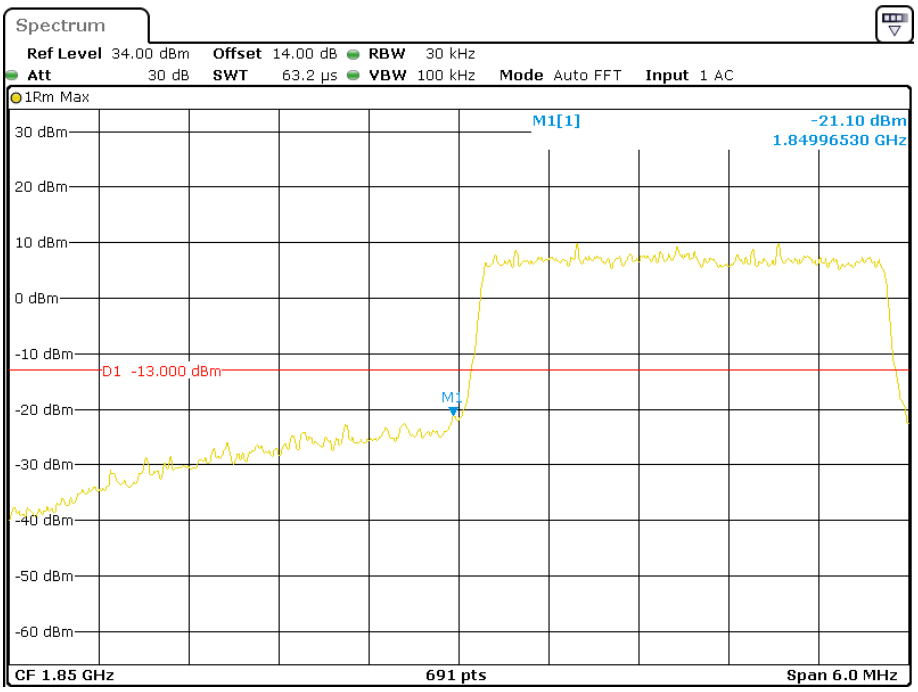
Date: 3.JUN.2018 13:19:10

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



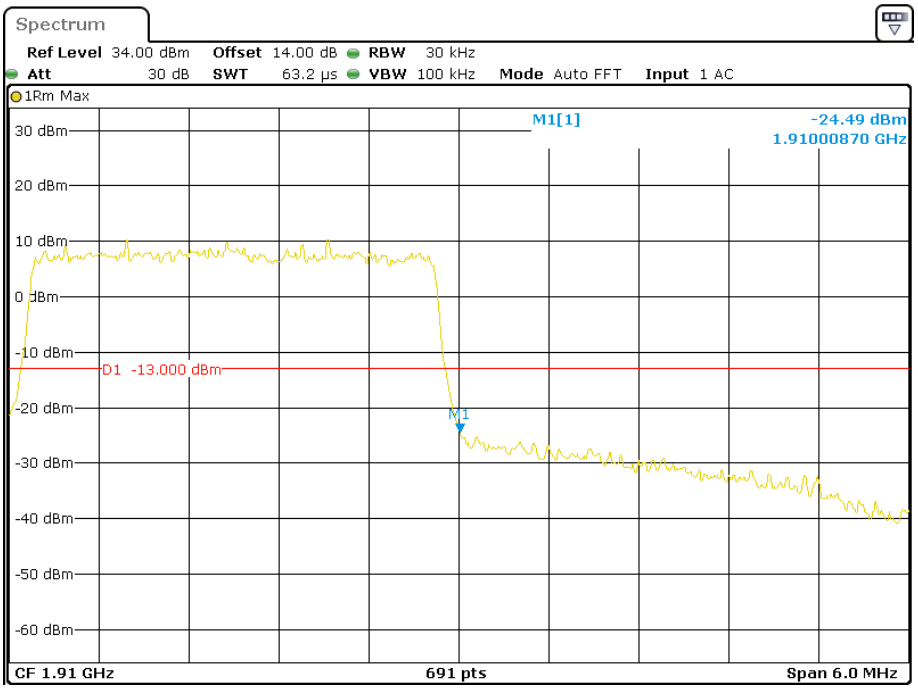
Date: 3.JUN.2018 13:17:35

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



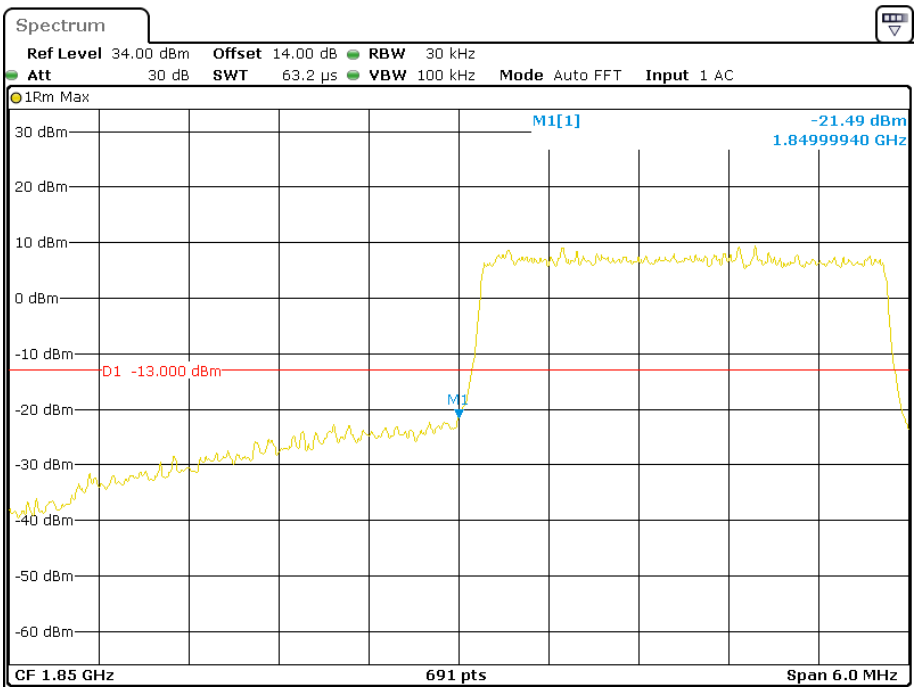
Date: 3.JUN.2018 13:25:07

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



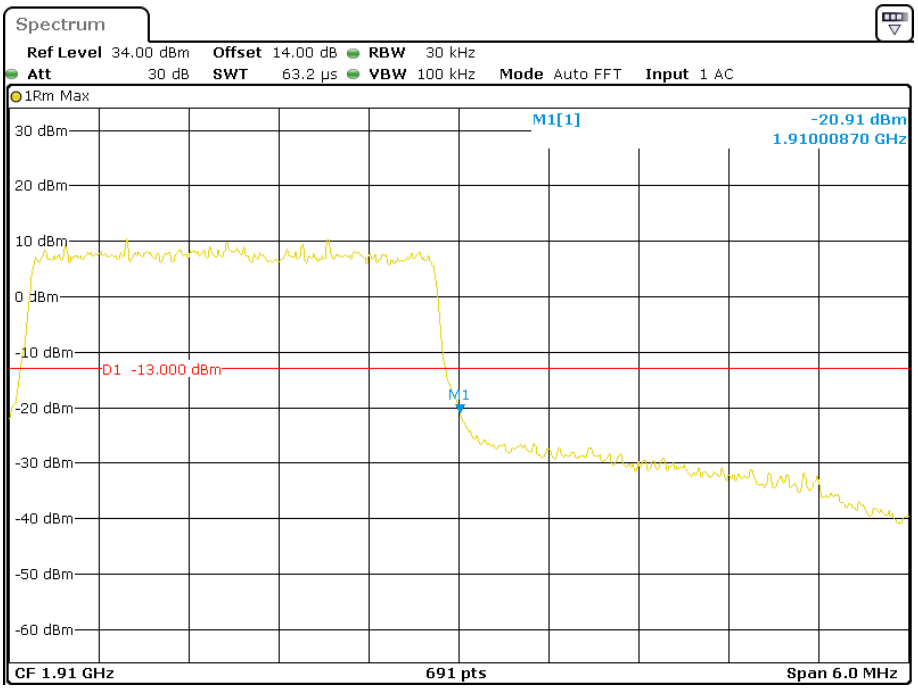
Date: 3.JUN.2018 13:23:16

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



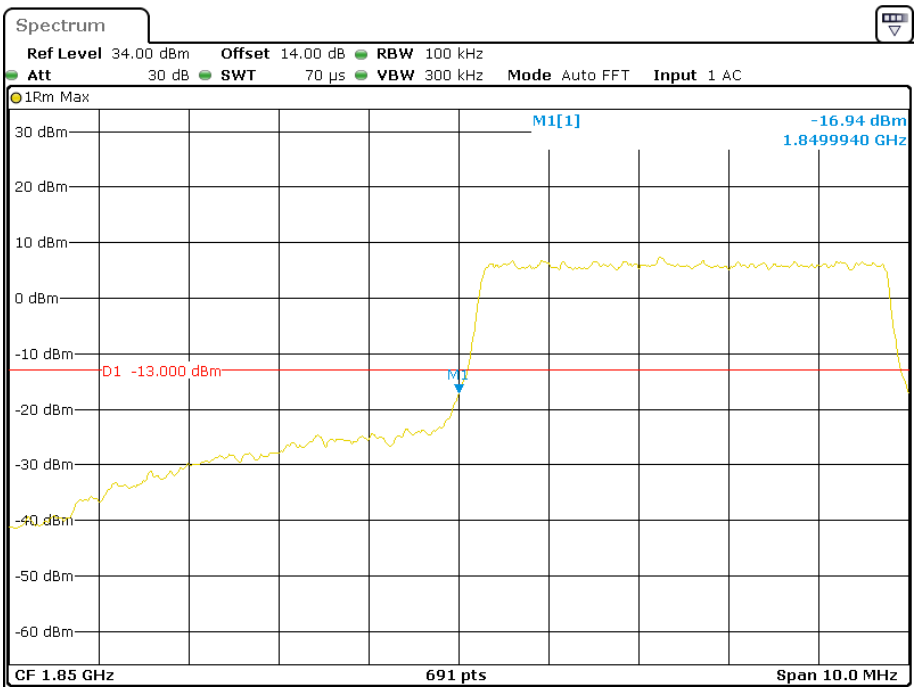
Date: 3.JUN.2018 13:20:41

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



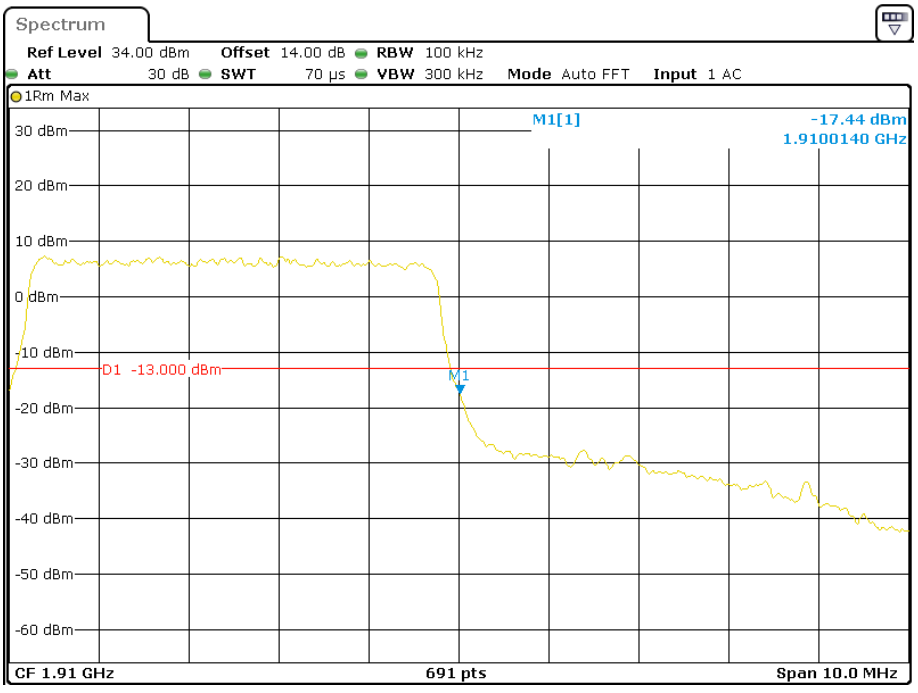
Date: 3.JUN.2018 13:22:19

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



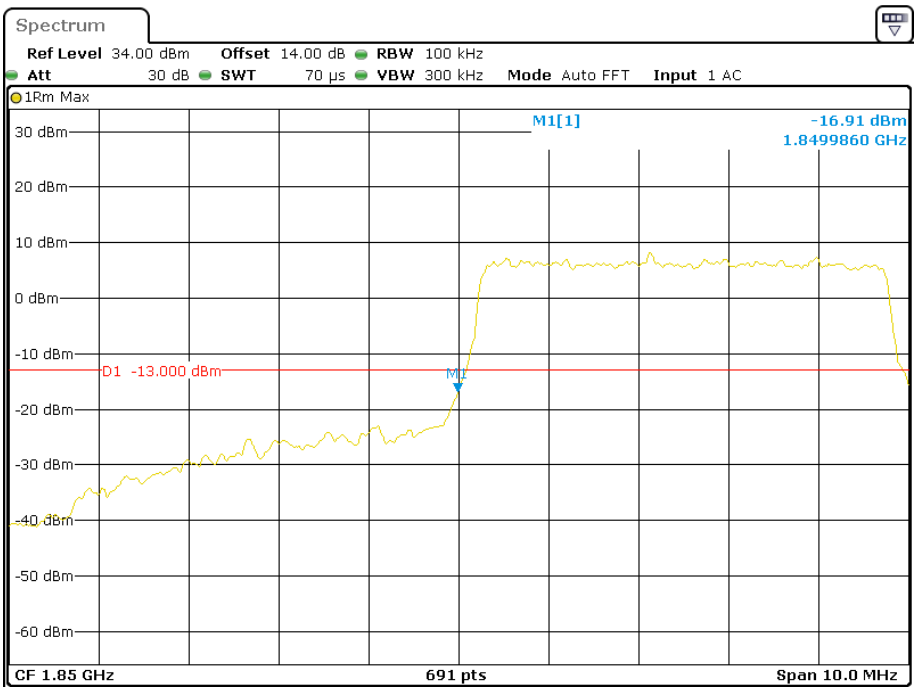
Date: 3.JUN.2018 13:26:55

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



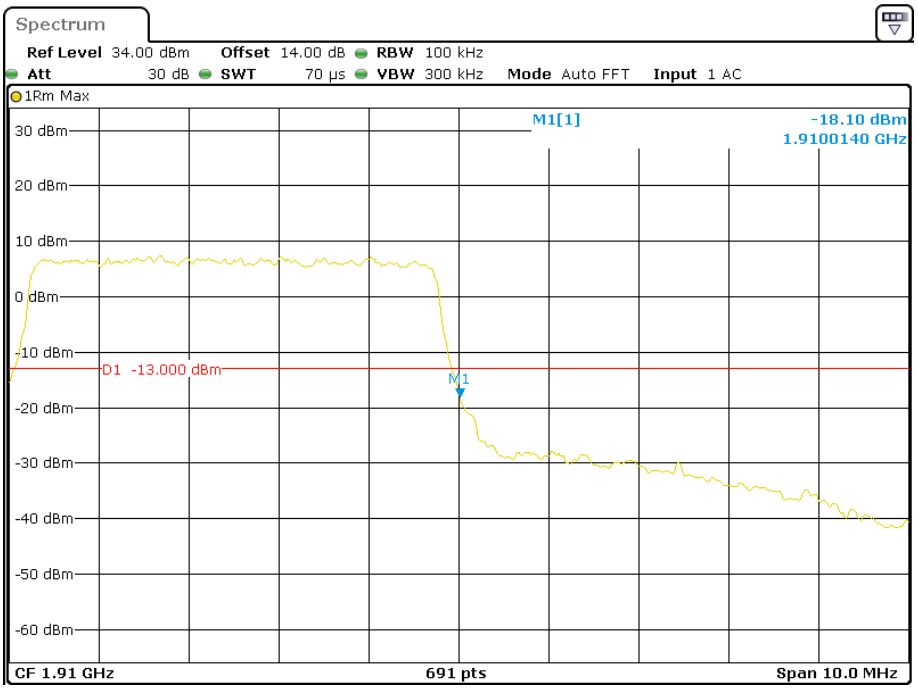
Date: 3.JUN.2018 13:27:50

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



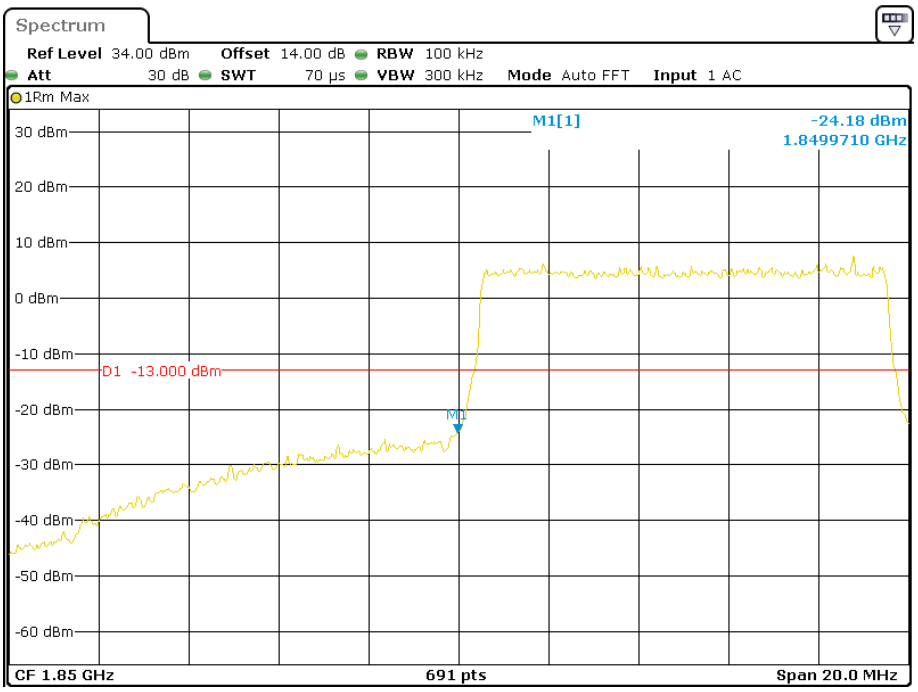
Date: 3.JUN.2018 13:30:01

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



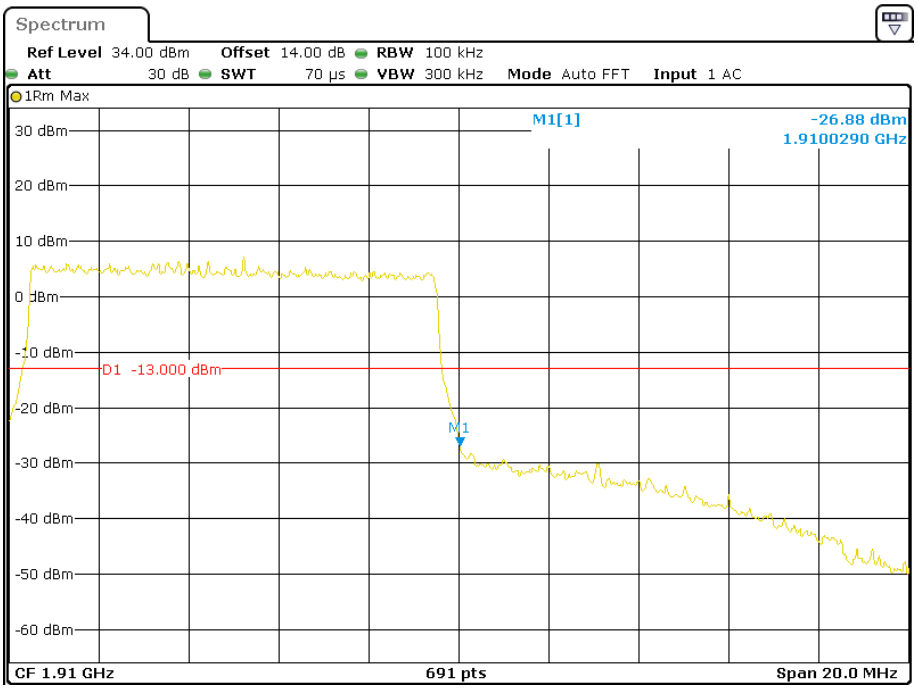
Date: 3.JUN.2018 13:28:38

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



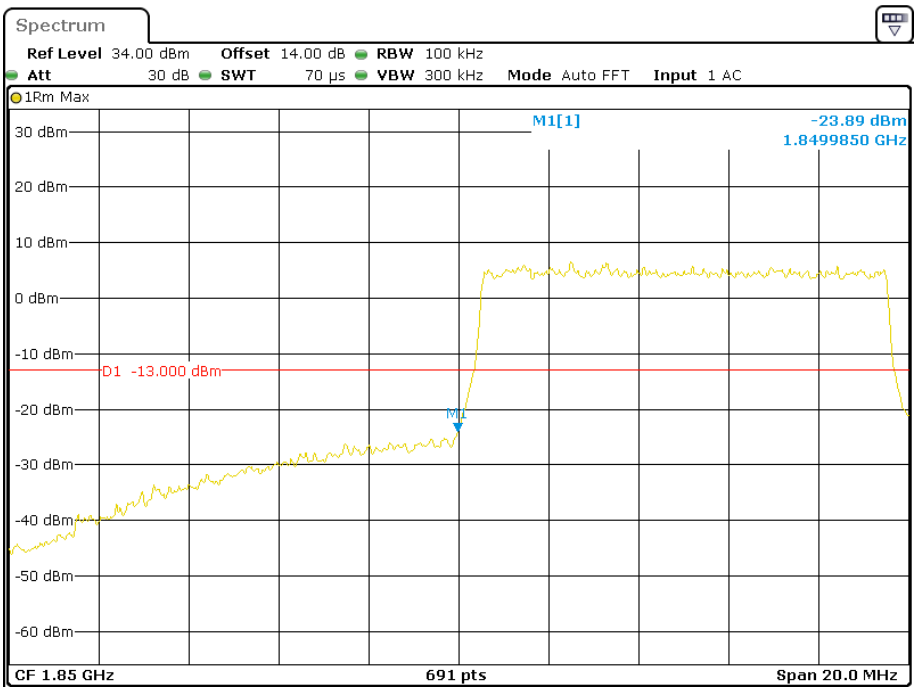
Date: 3.JUN.2018 13:34:50

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



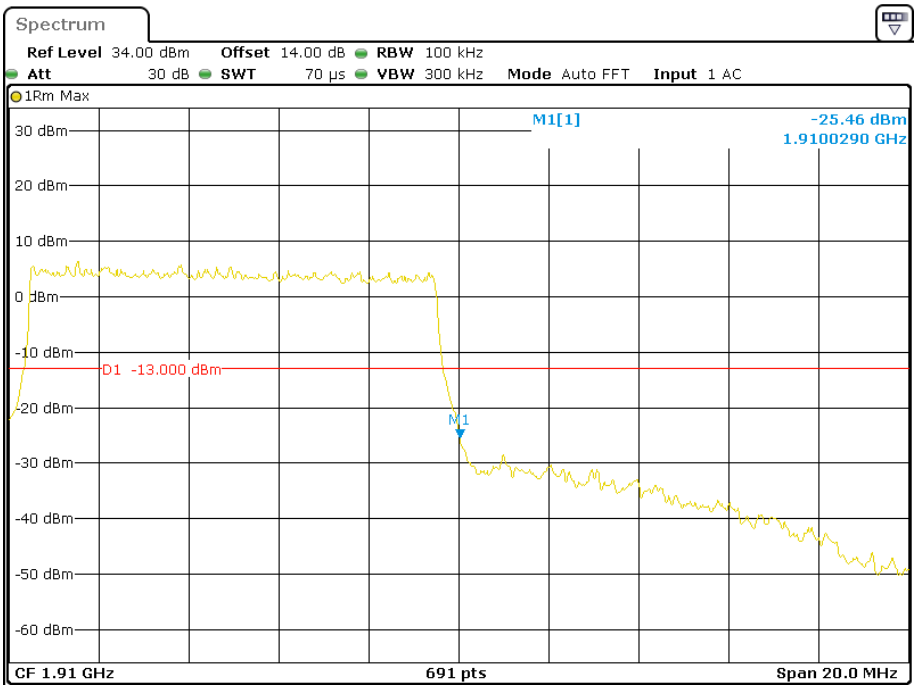
Date: 3.JUN.2018 13:33:16

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



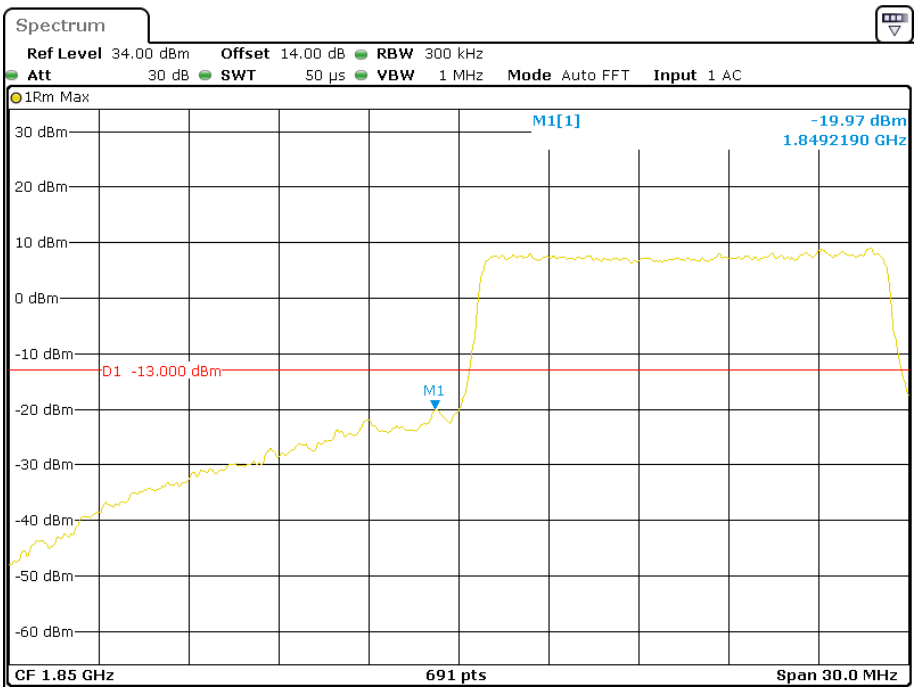
Date: 3.JUN.2018 13:31:30

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



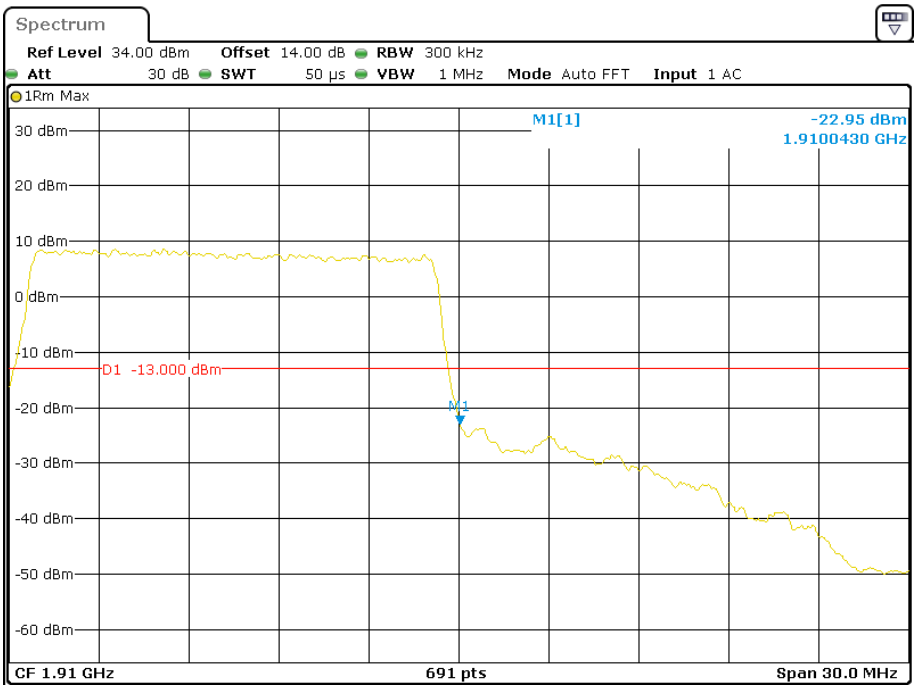
Date: 3.JUN.2018 13:32:29

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



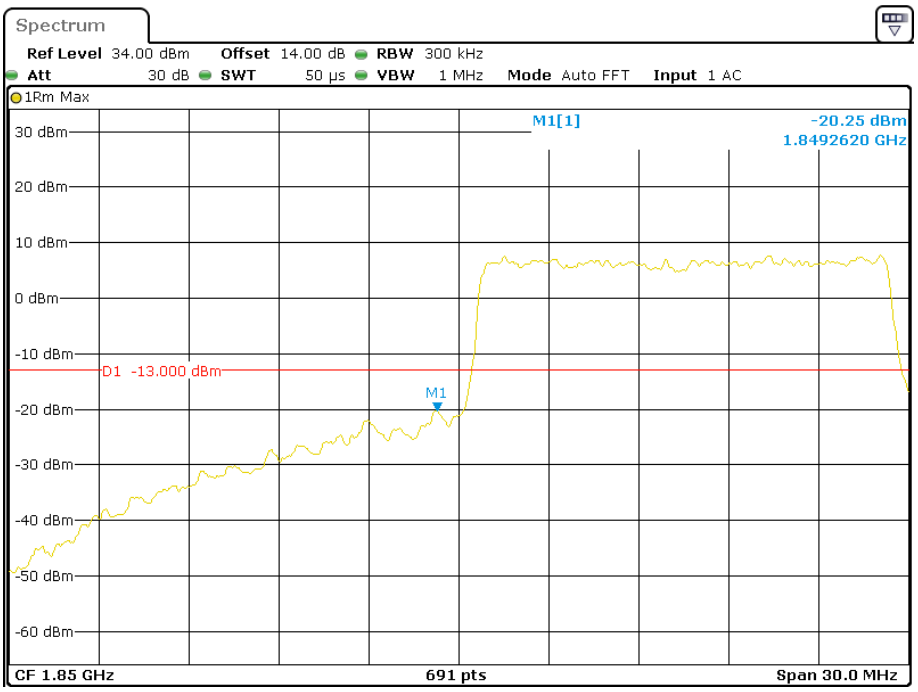
Date: 3.JUN.2018 14:20:03

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



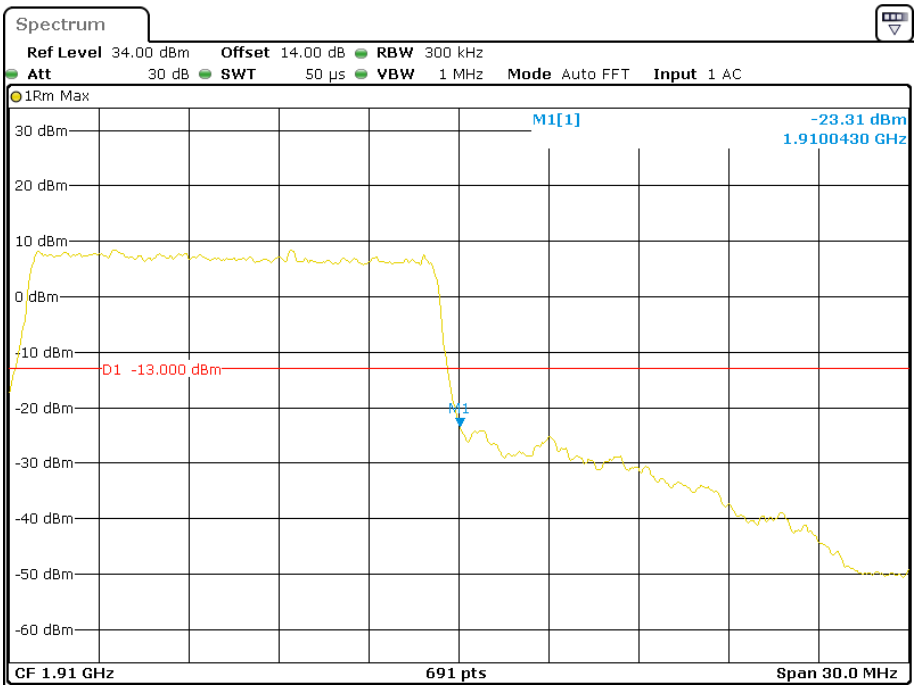
Date: 3.JUN.2018 14:21:26

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



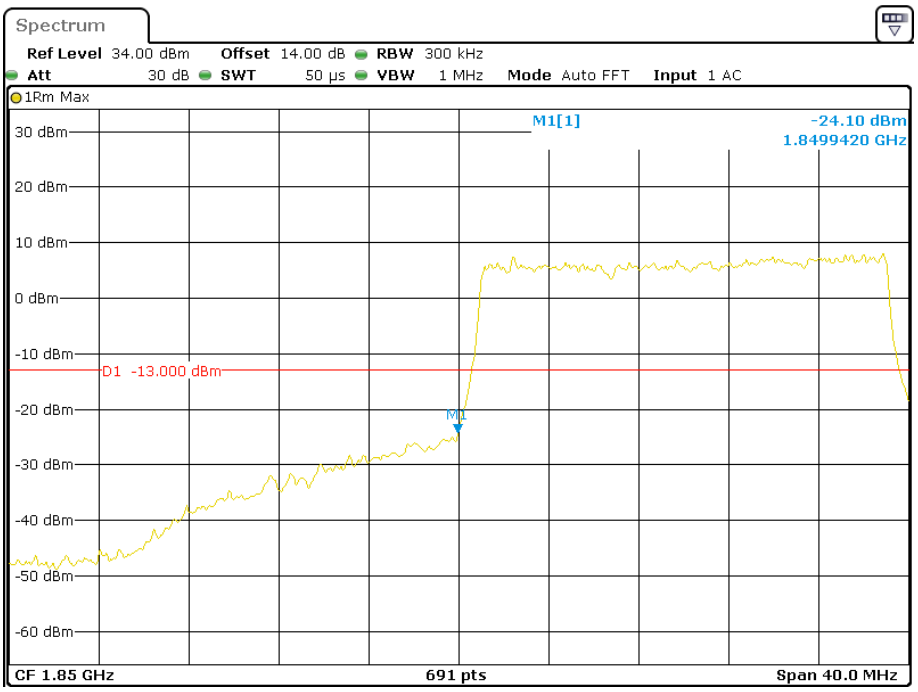
Date: 3.JUN.2018 14:23:19

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



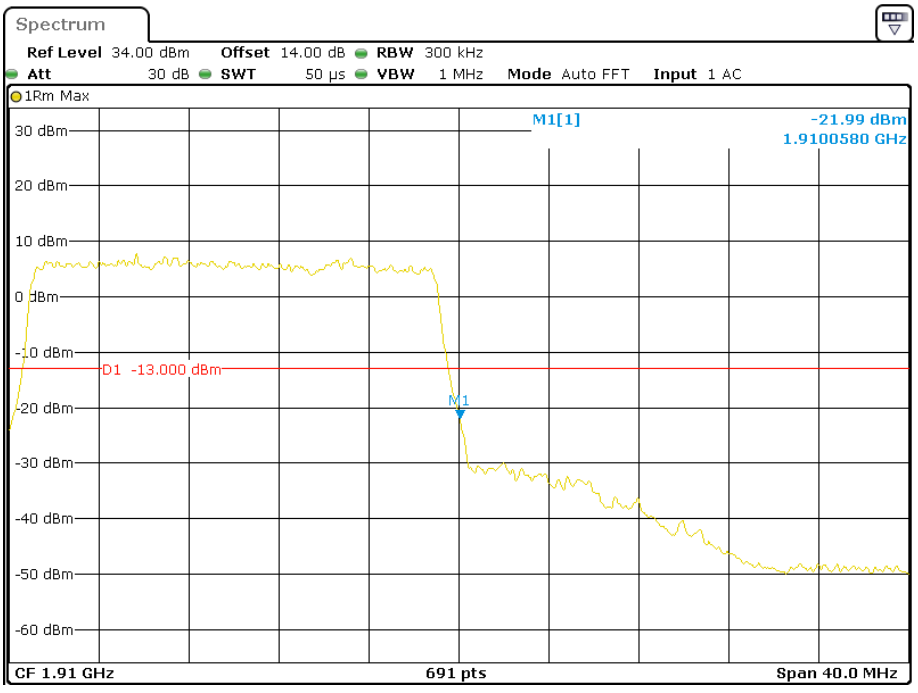
Date: 3.JUN.2018 14:22:18

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



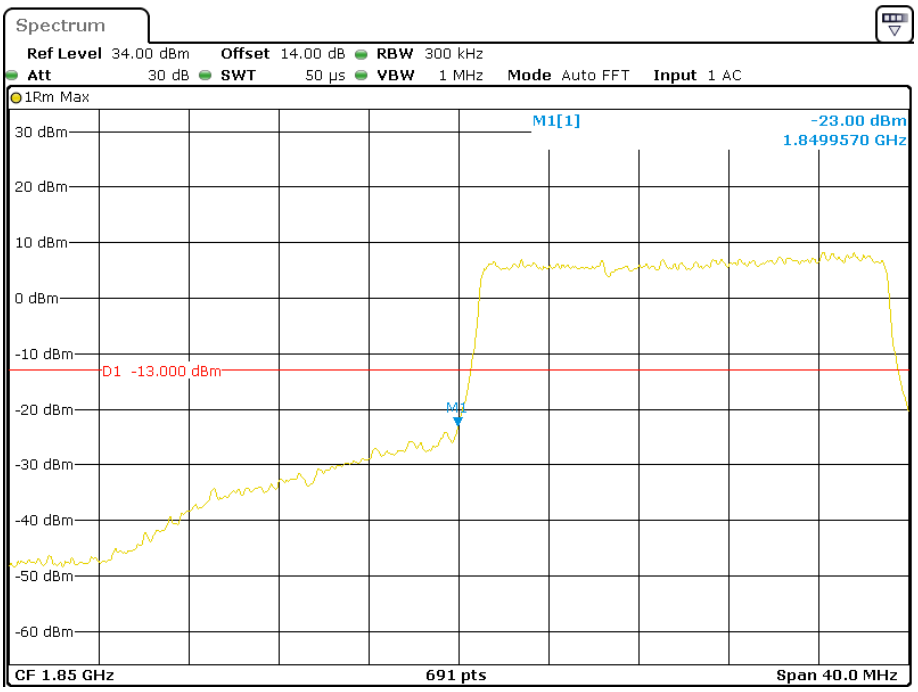
Date: 3.JUN.2018 14:28:31

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



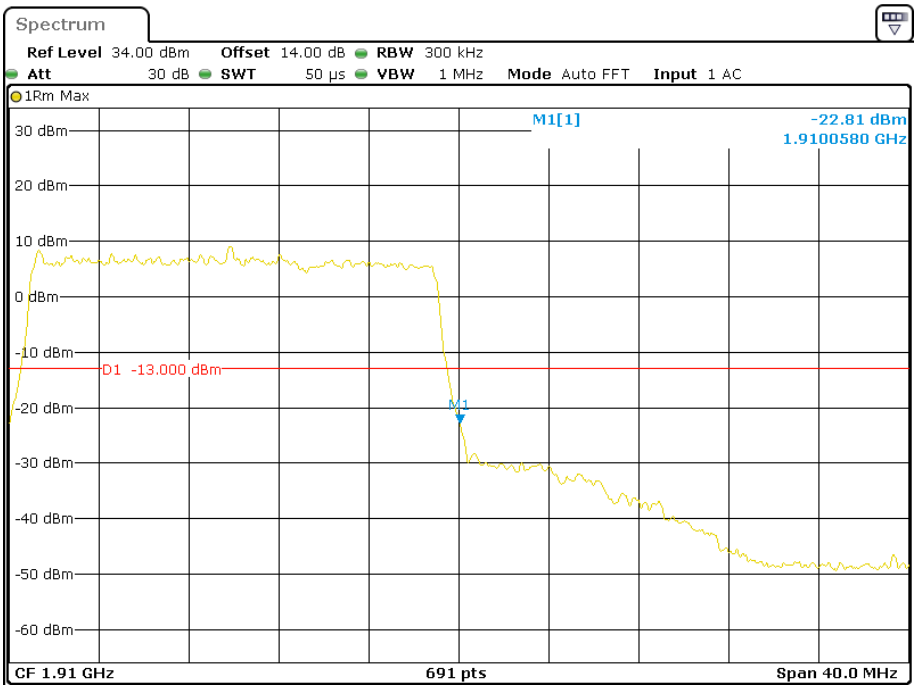
Date: 3.JUN.2018 14:27:06

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



Date: 3.JUN.2018 14:25:08

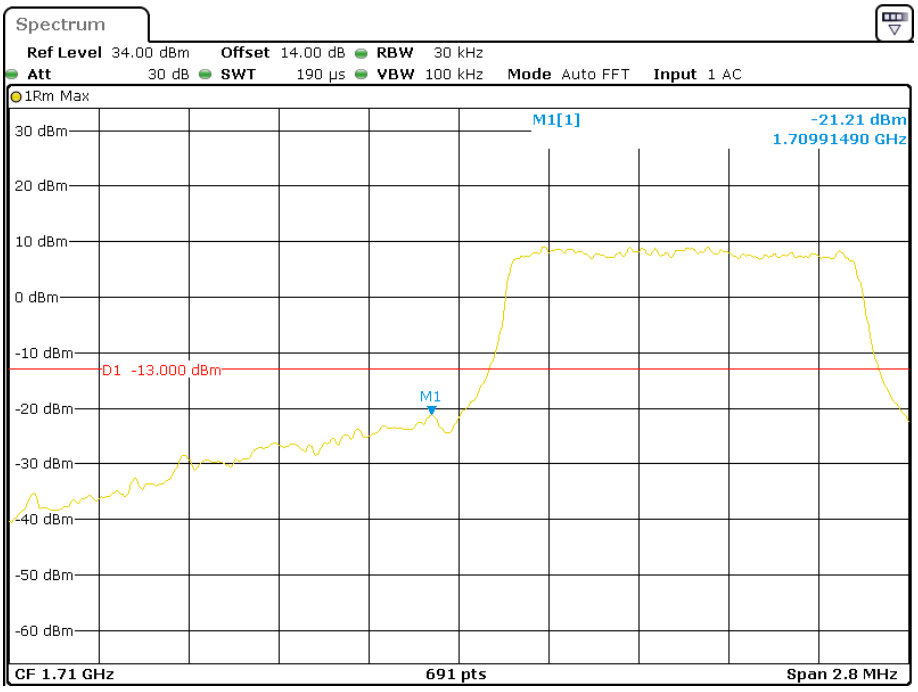
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 3.JUN.2018 14:26:28

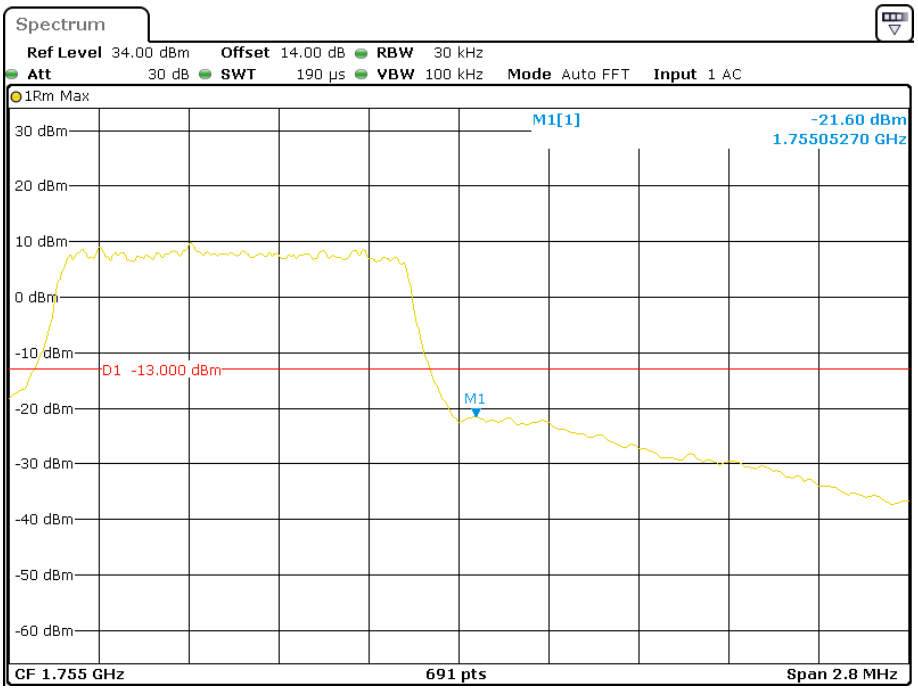
Band 4:

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



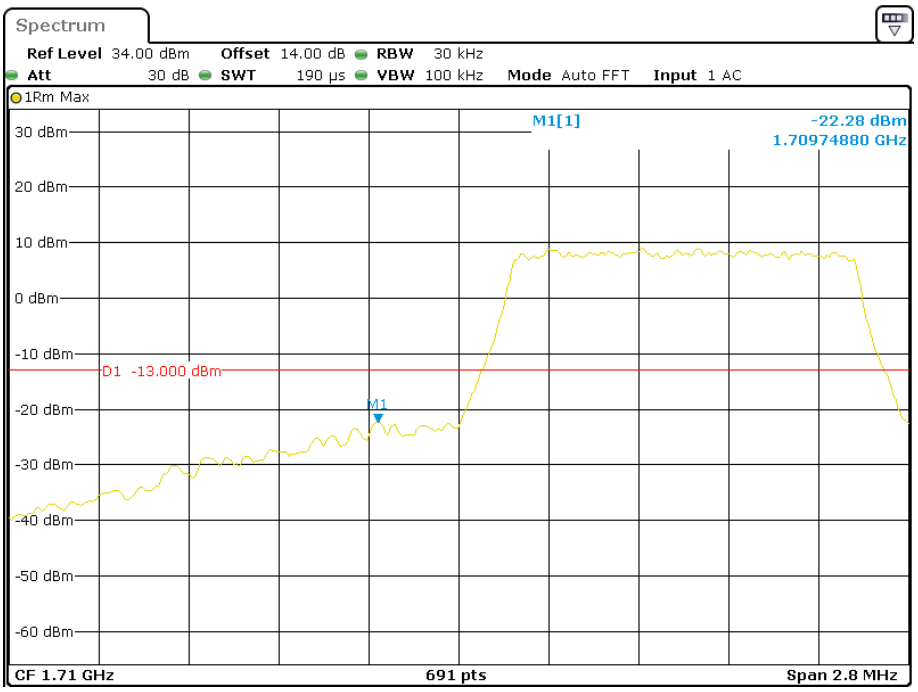
Date: 3.JUN.2018 14:31:38

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



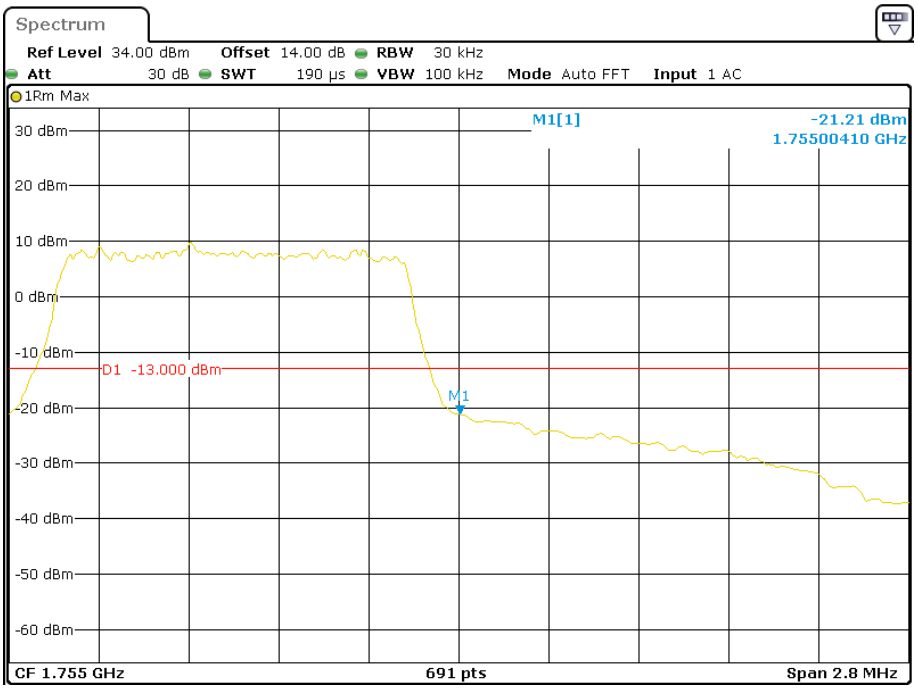
Date: 3.JUN.2018 14:33:03

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



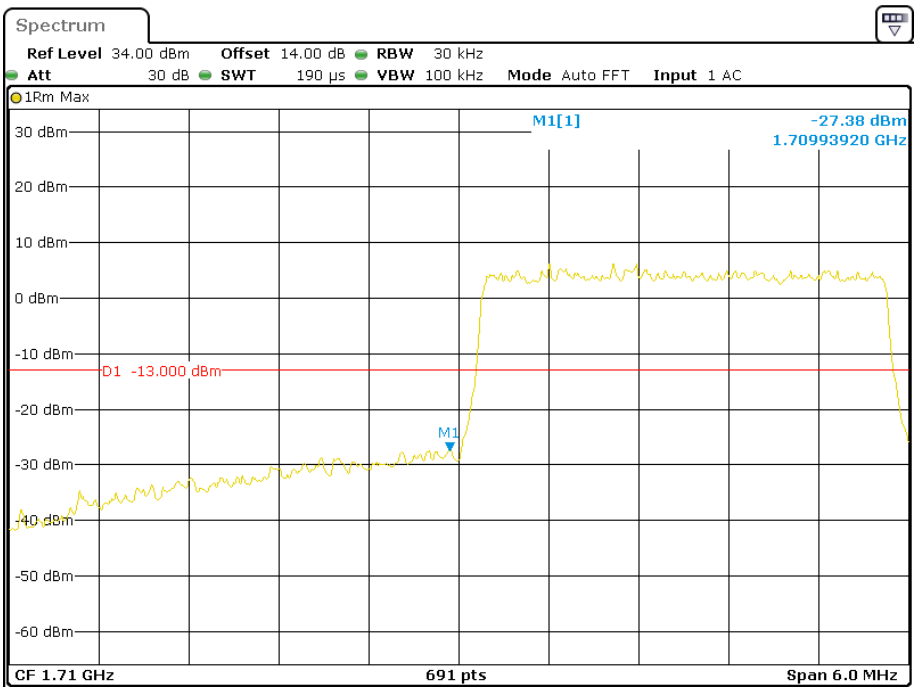
Date: 3.JUN.2018 14:36:06

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



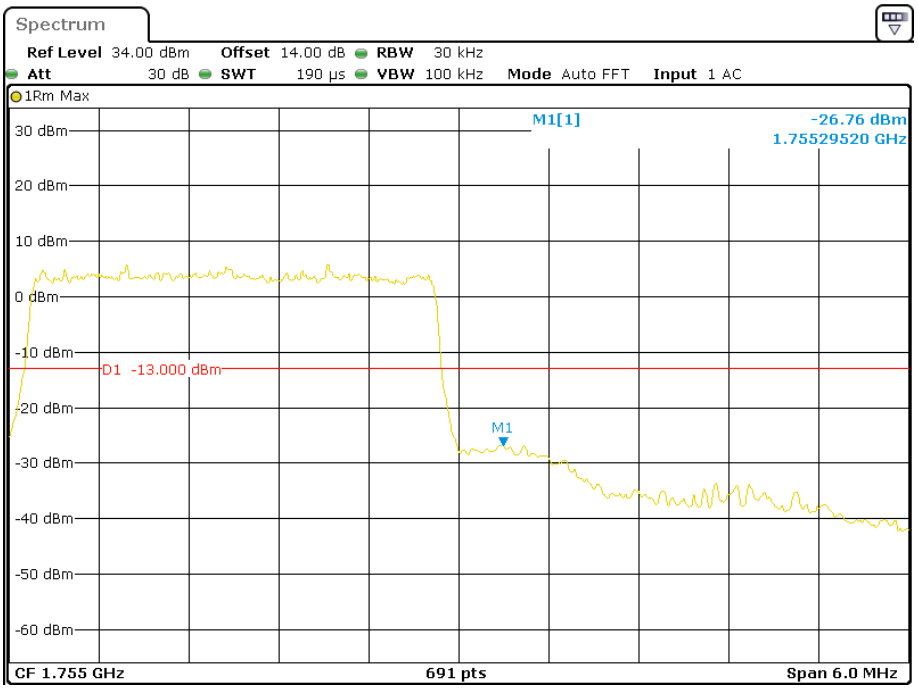
Date: 3.JUN.2018 14:34:15

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



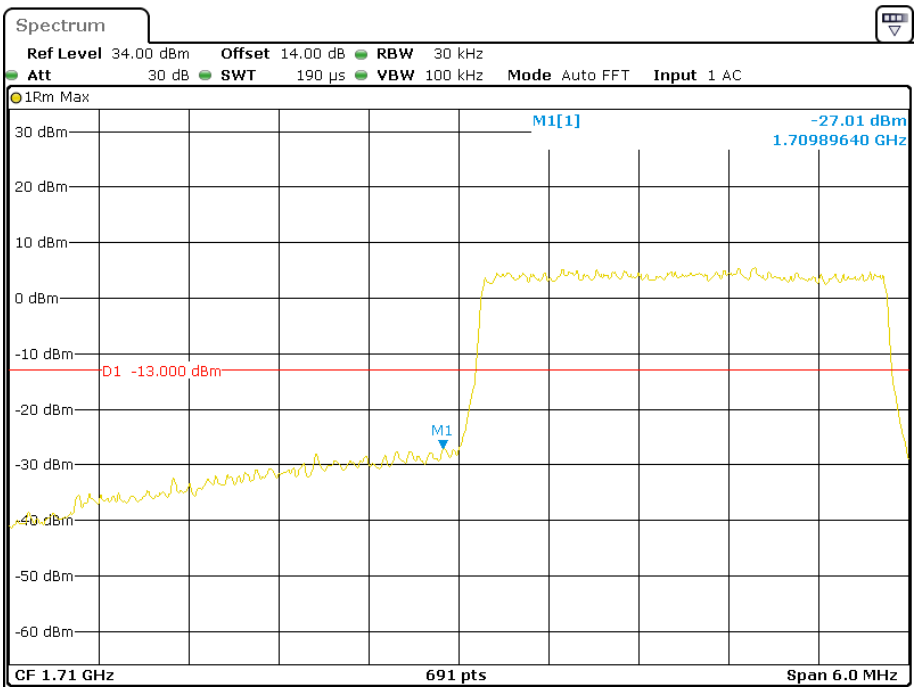
Date: 3.JUN.2018 14:42:28

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



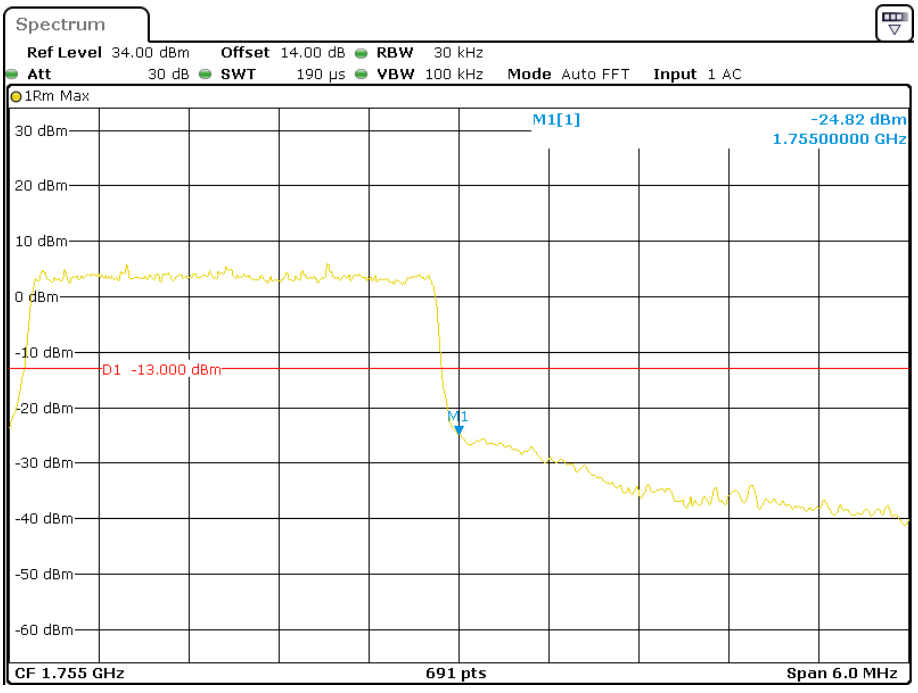
Date: 3.JUN.2018 14:40:55

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



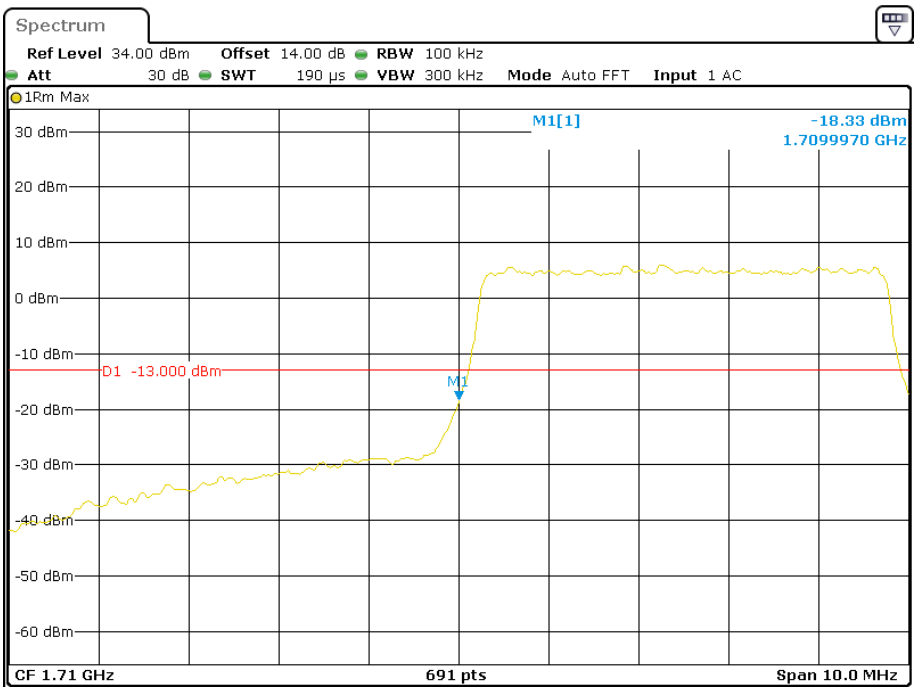
Date: 3.JUN.2018 14:37:54

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



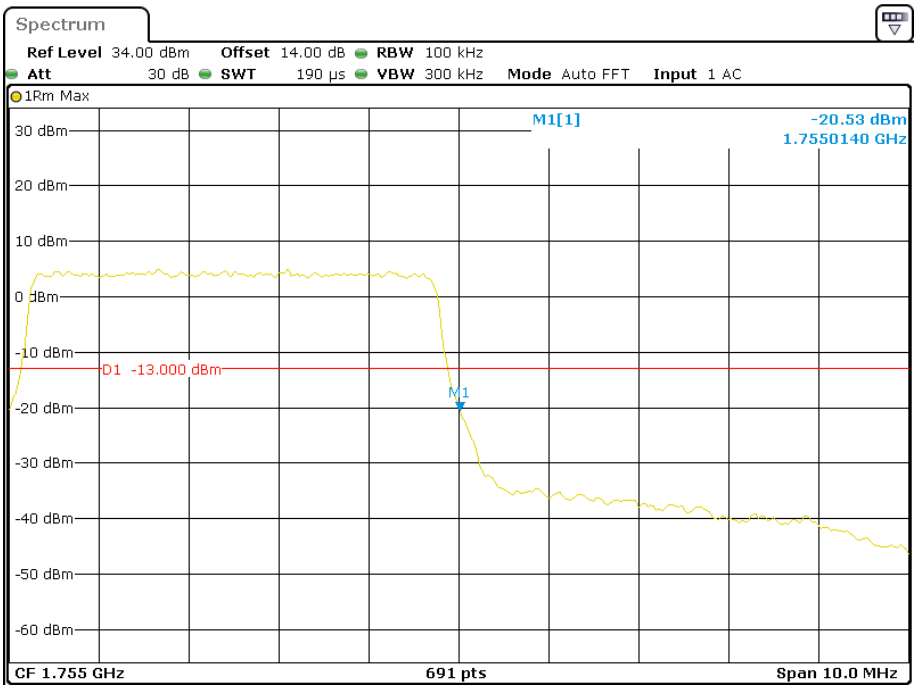
Date: 3.JUN.2018 14:39:32

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



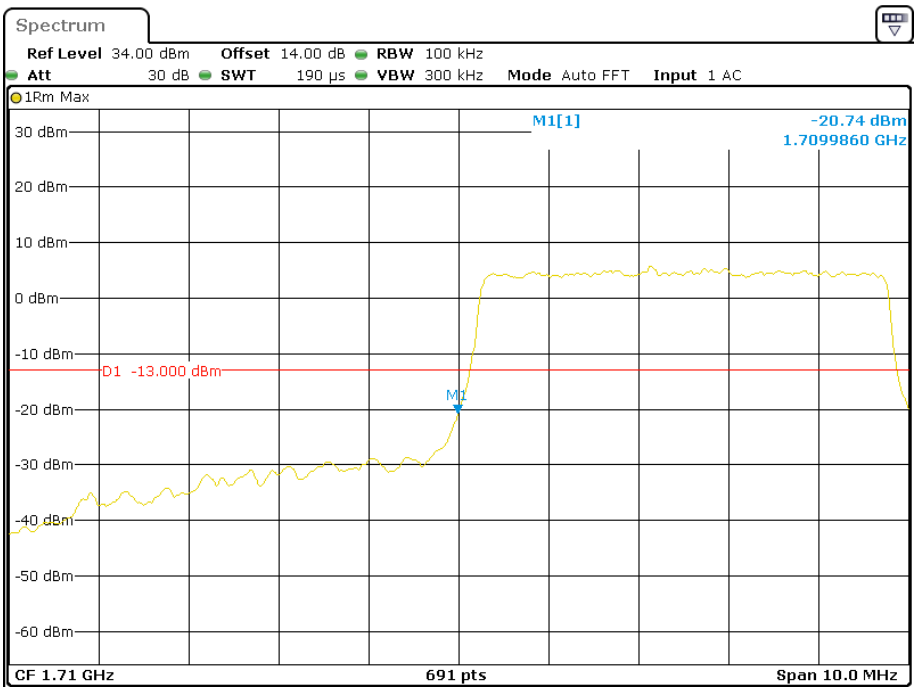
Date: 3.JUN.2018 14:43:44

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



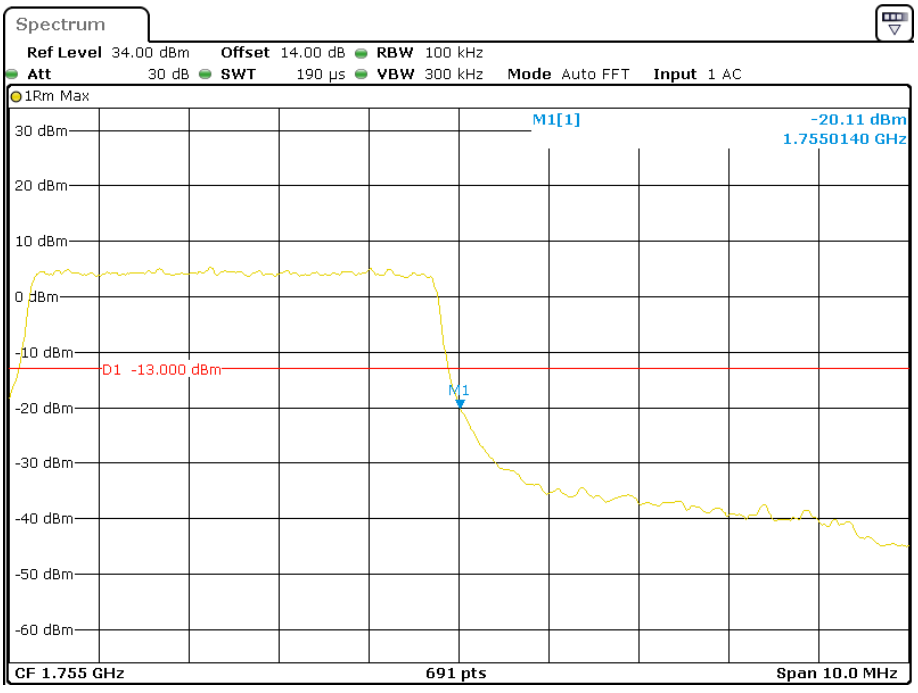
Date: 3.JUN.2018 14:44:56

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



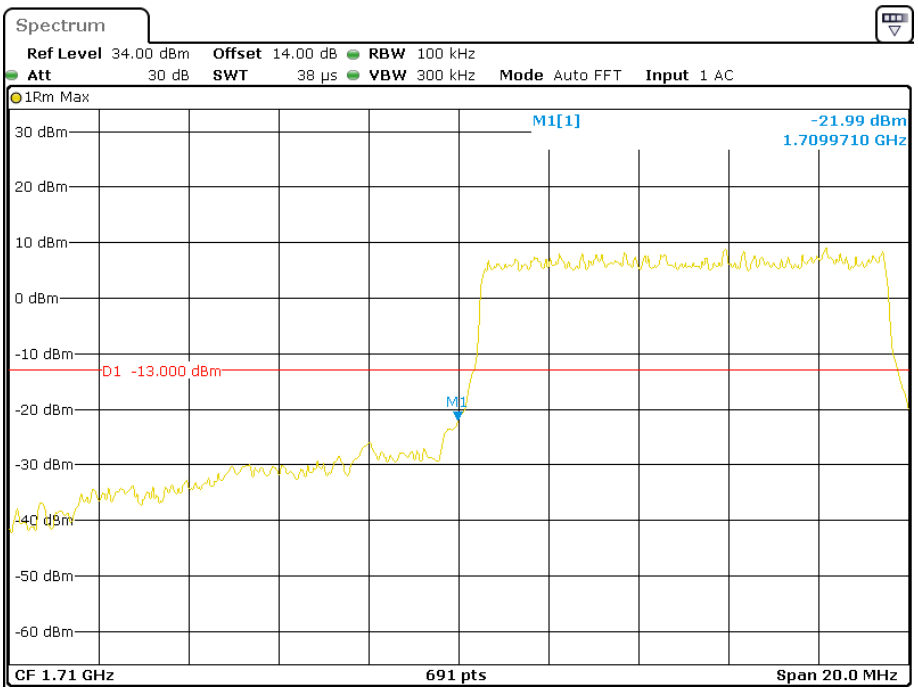
Date: 3.JUN.2018 14:46:35

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



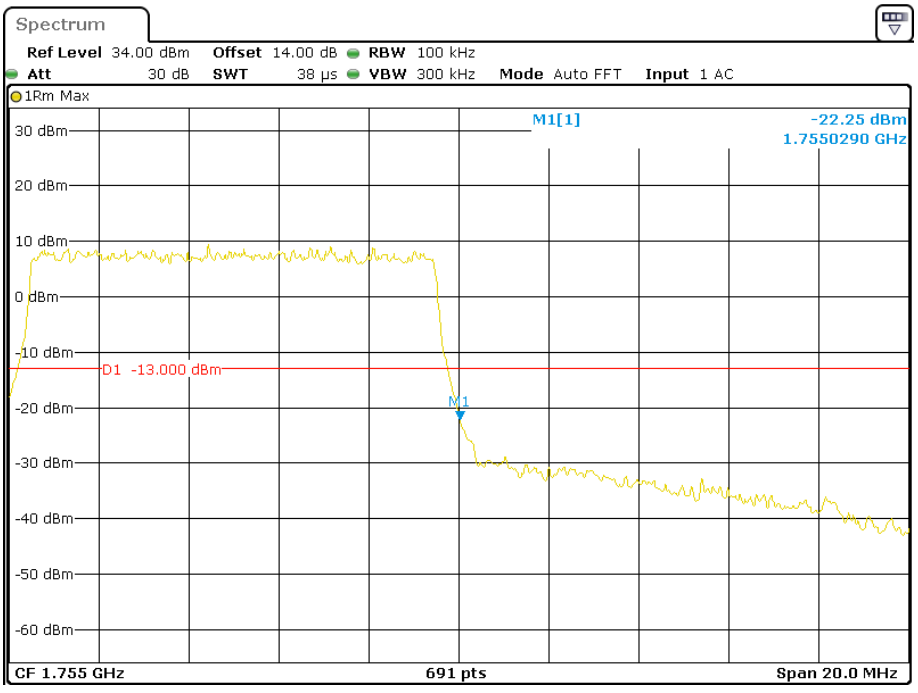
Date: 3.JUN.2018 14:45:40

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



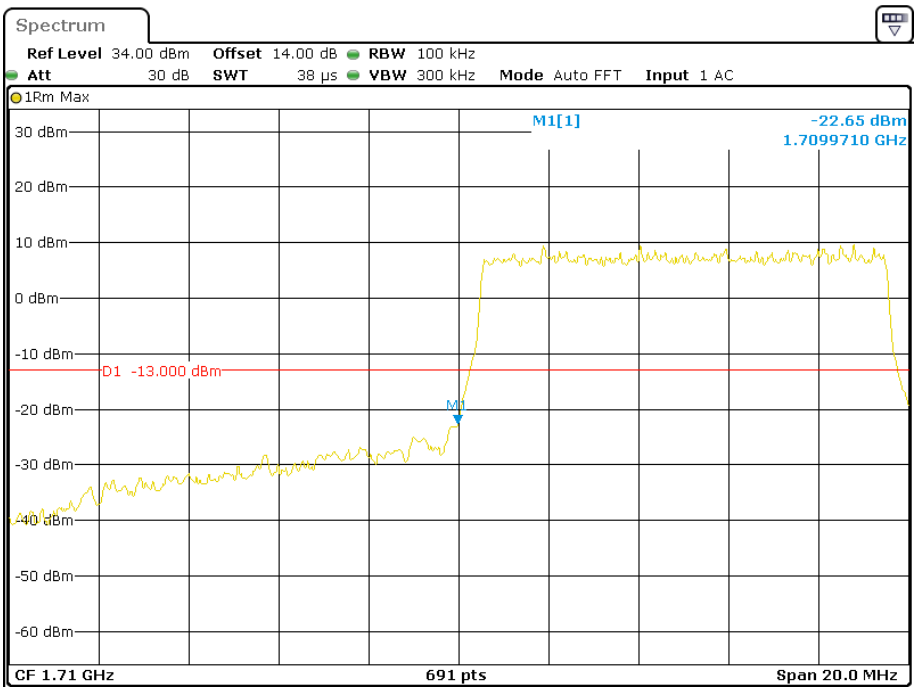
Date: 3.JUN.2018 14:50:40

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



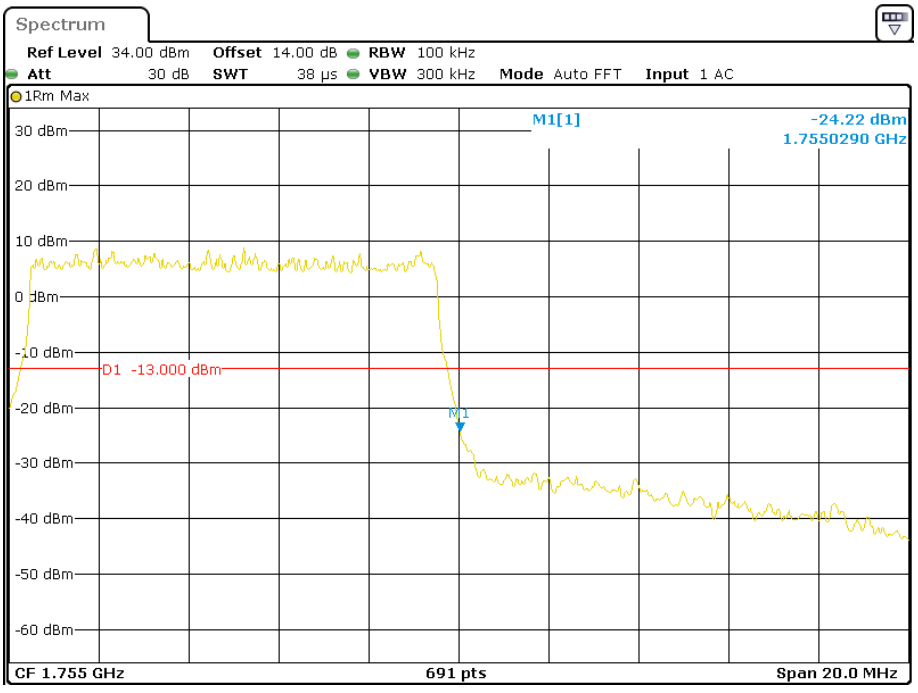
Date: 3.JUN.2018 14:49:48

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



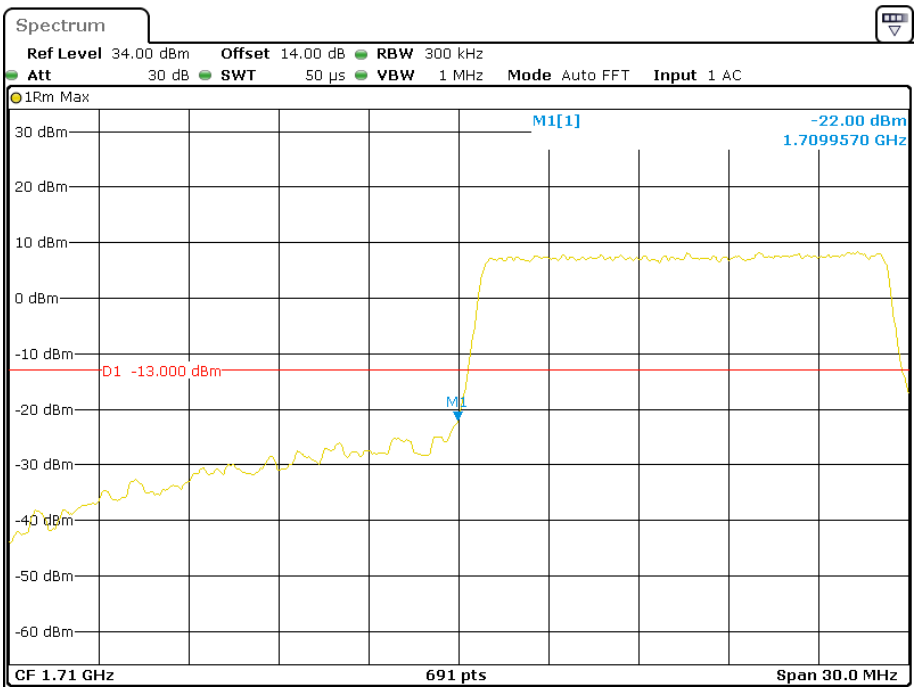
Date: 3.JUN.2018 14:51:24

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



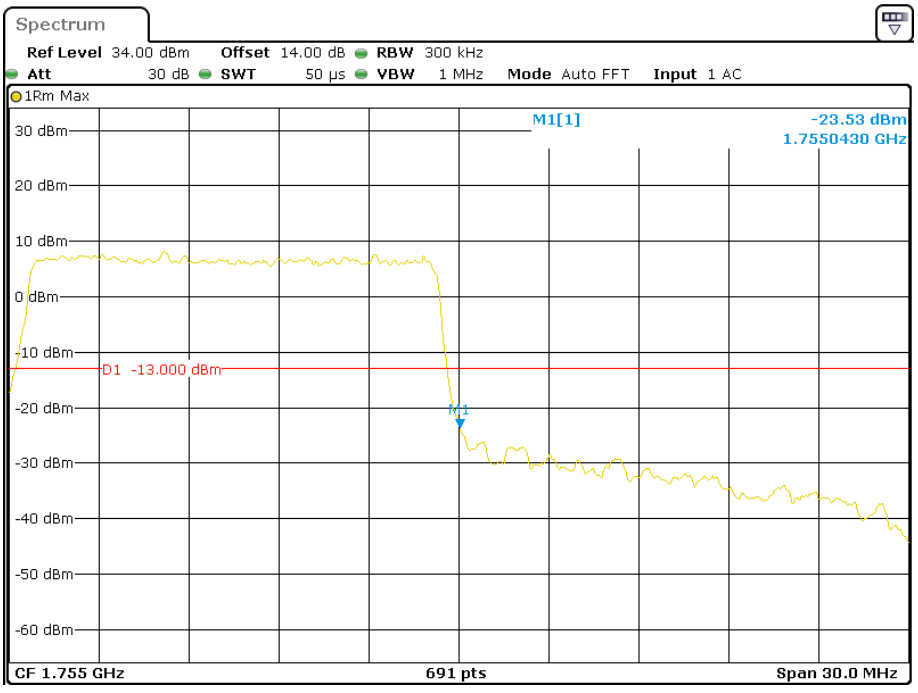
Date: 3.JUN.2018 14:48:57

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



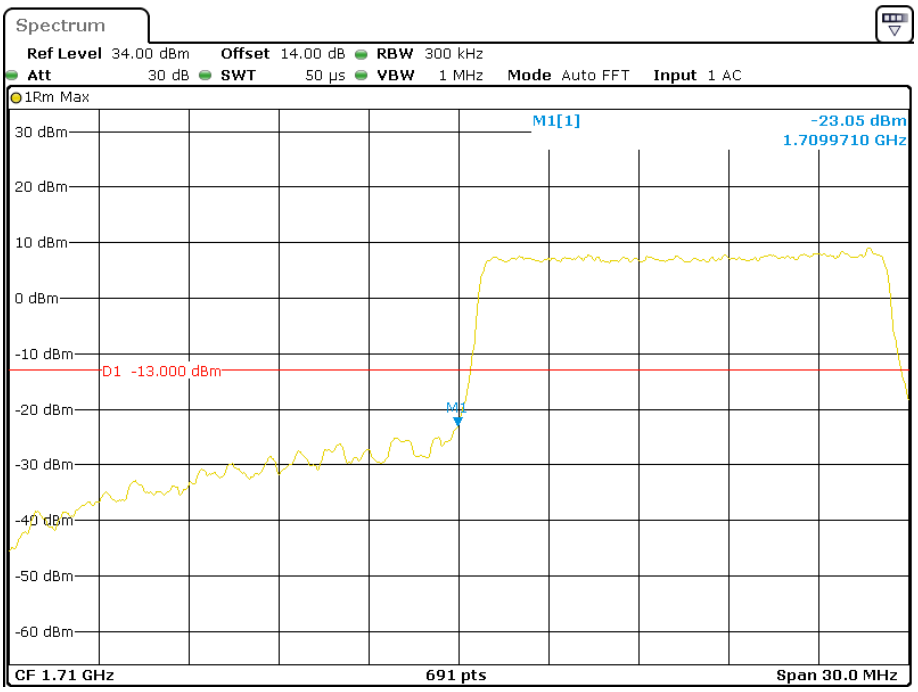
Date: 3.JUN.2018 14:56:25

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



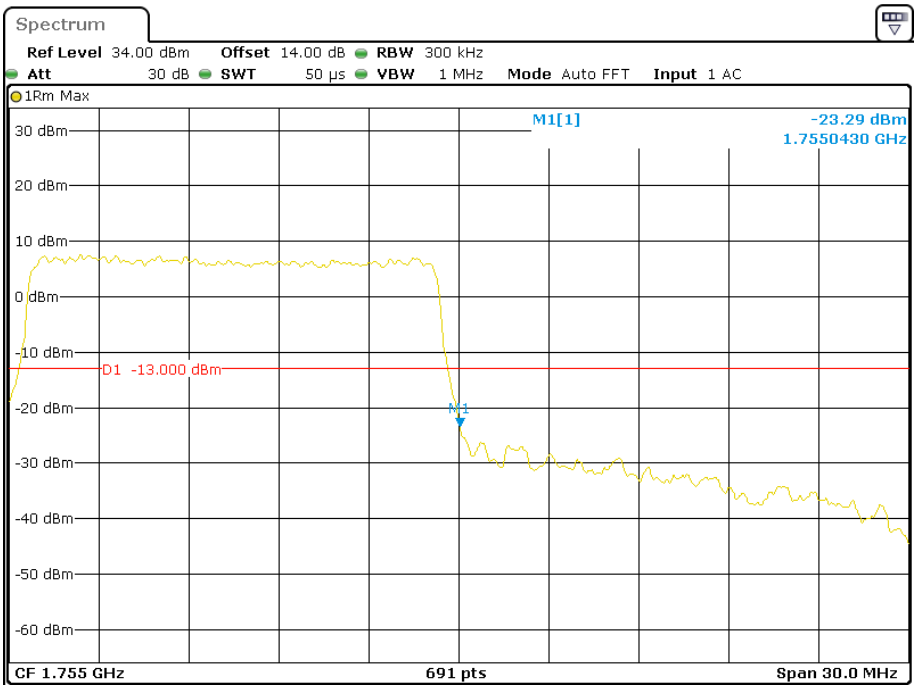
Date: 3.JUN.2018 14:54:59

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



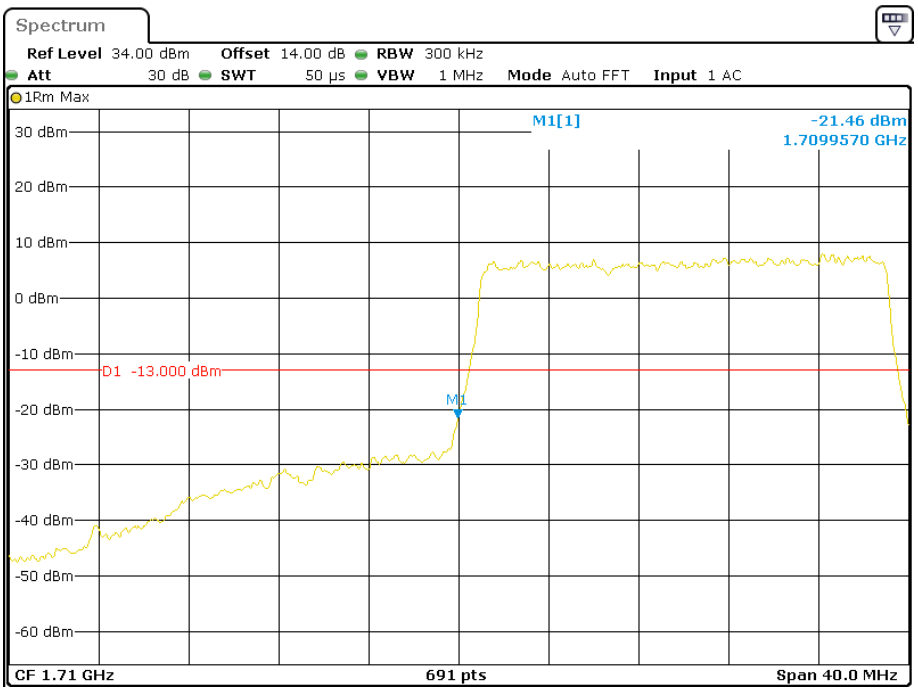
Date: 3.JUN.2018 14:53:27

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



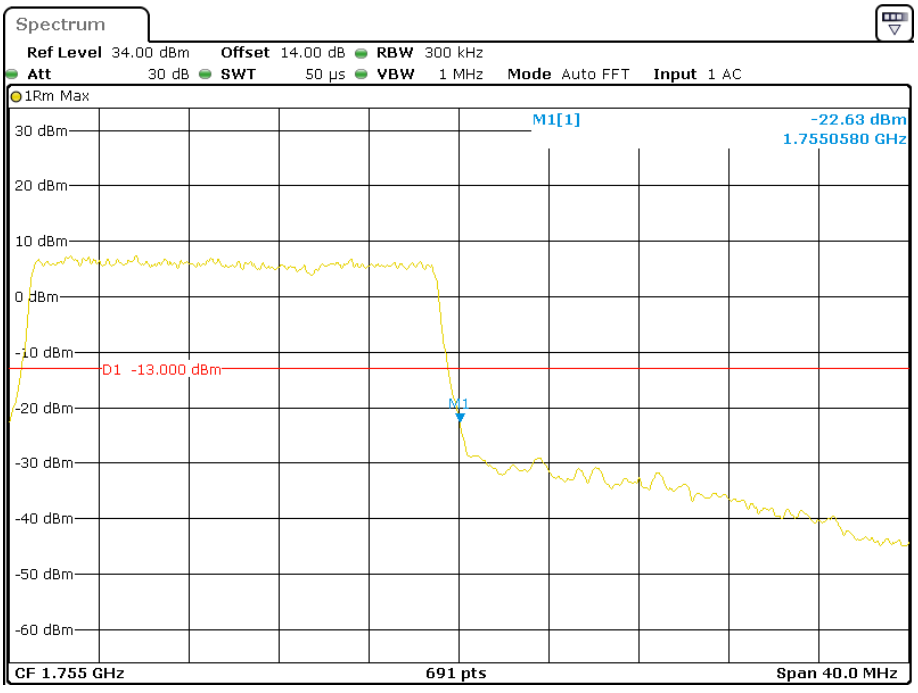
Date: 3.JUN.2018 14:54:16

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



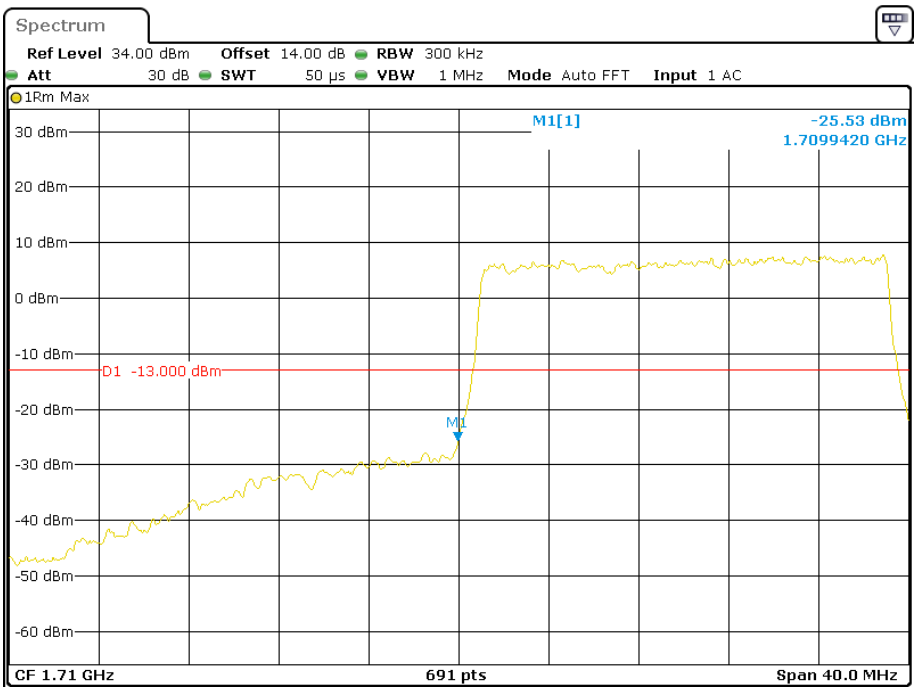
Date: 3.JUN.2018 14:57:56

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



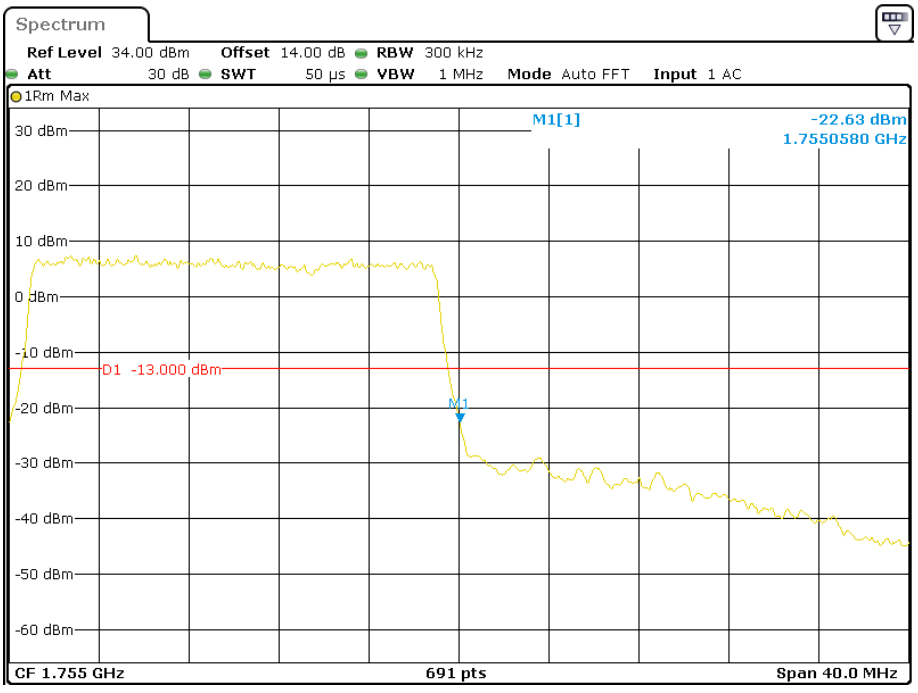
Date: 3.JUN.2018 14:59:09

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



Date: 3.JUN.2018 15:01:05

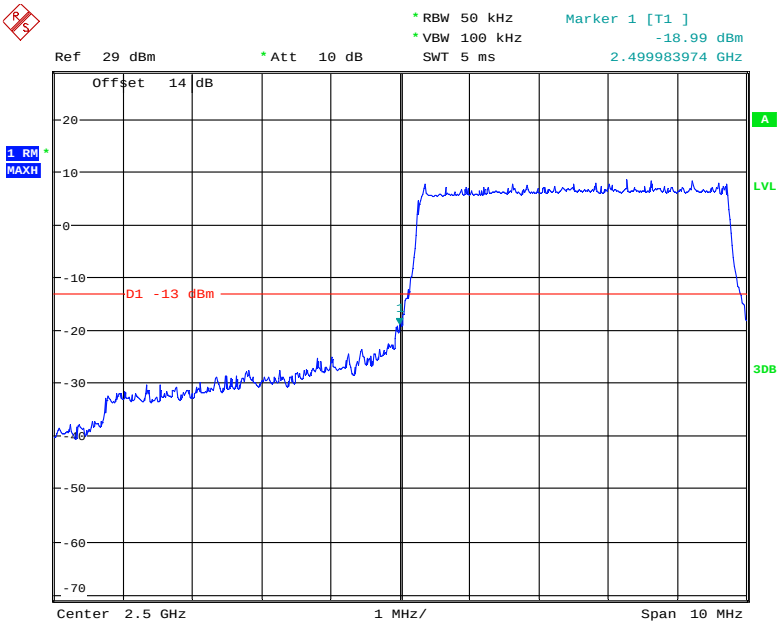
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 3.JUN.2018 14:59:09

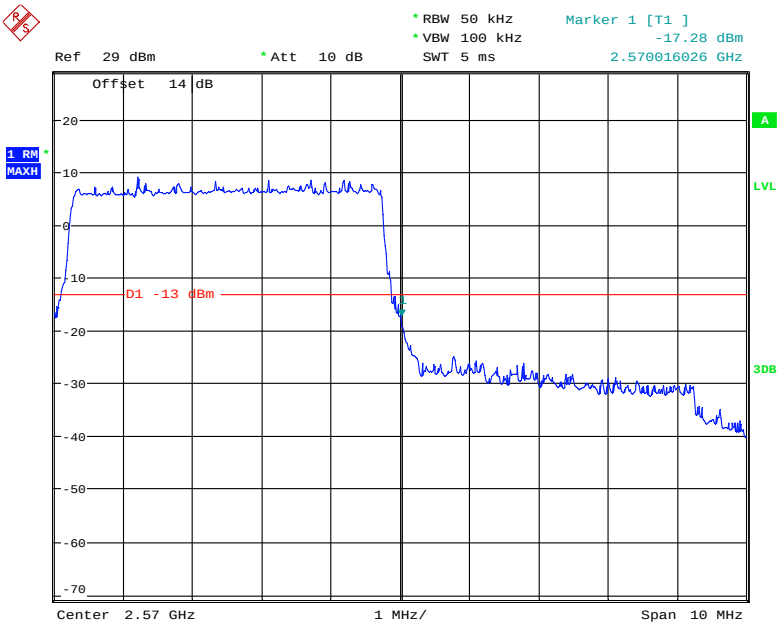
Band 7:

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



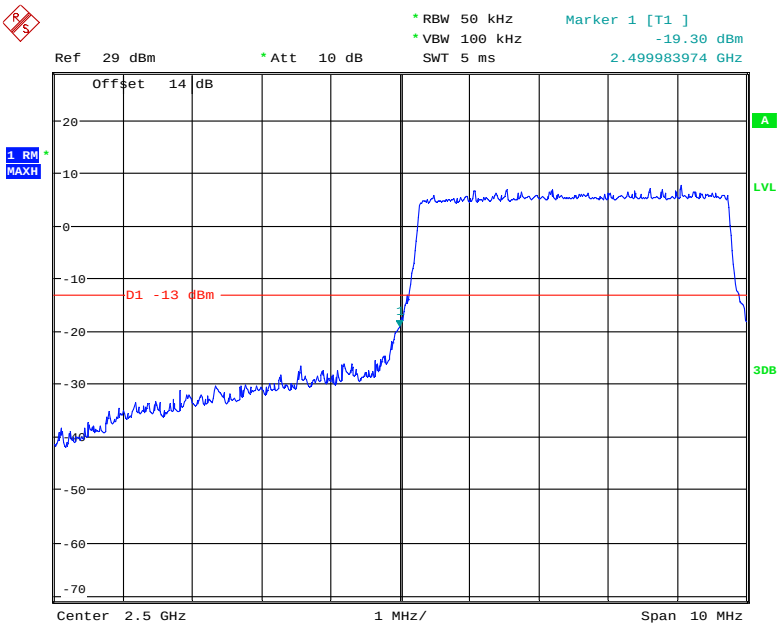
Date: 27.JUN.2018 10:25:31

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



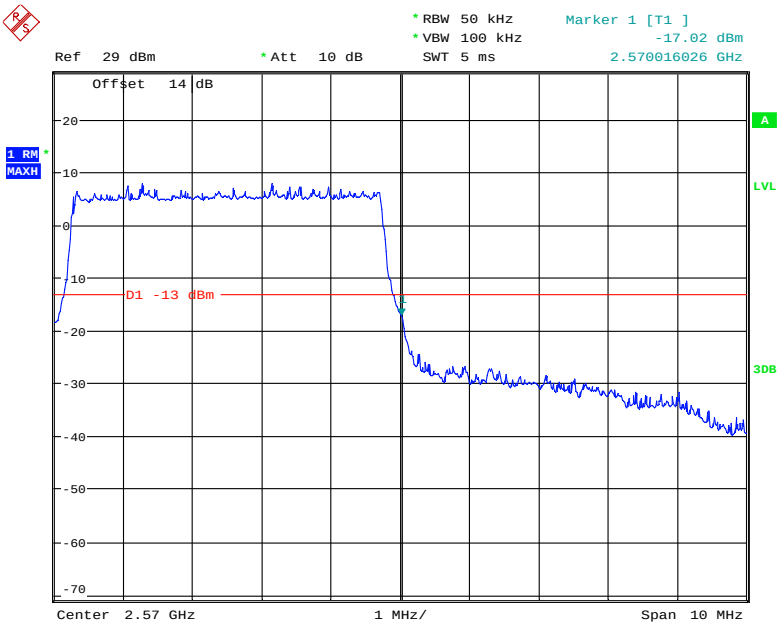
Date: 27.JUN.2018 10:30:03

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



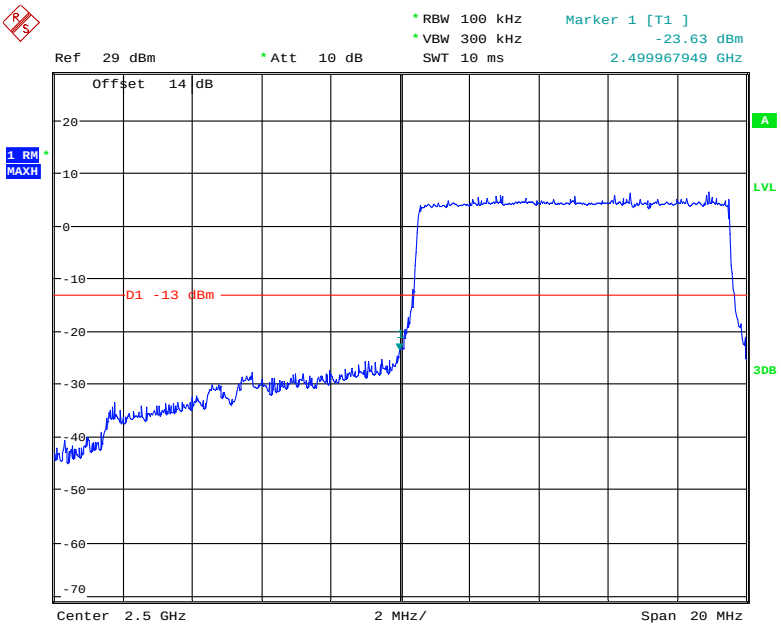
Date: 27.JUN.2018 10:27:30

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



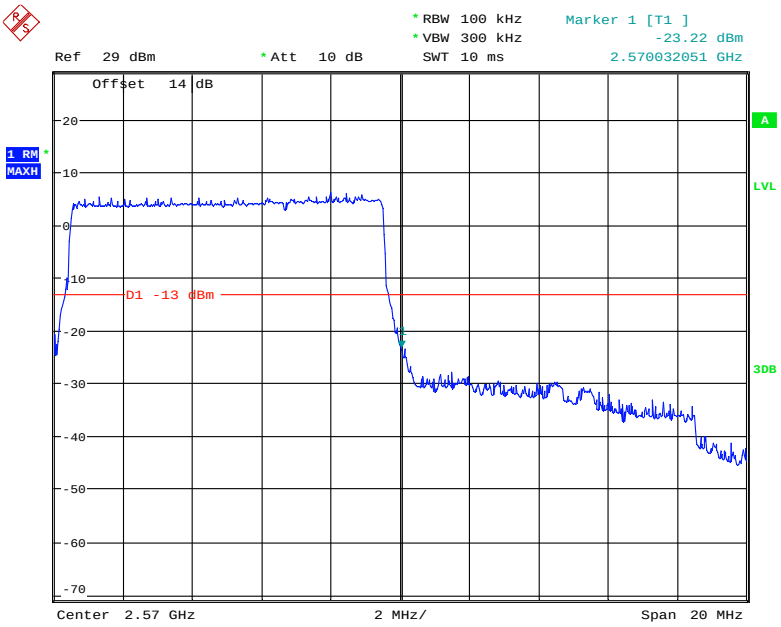
Date: 27.JUN.2018 10:28:59

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



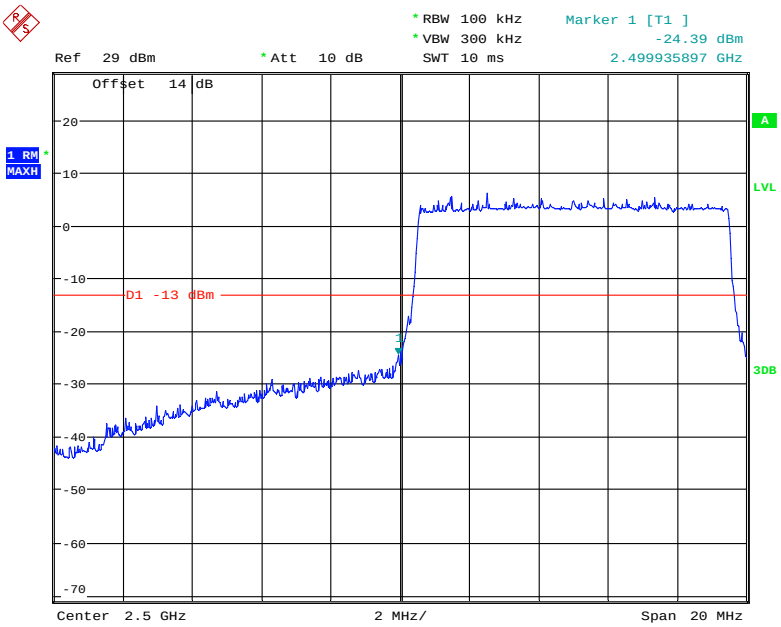
Date: 27.JUN.2018 10:33:55

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



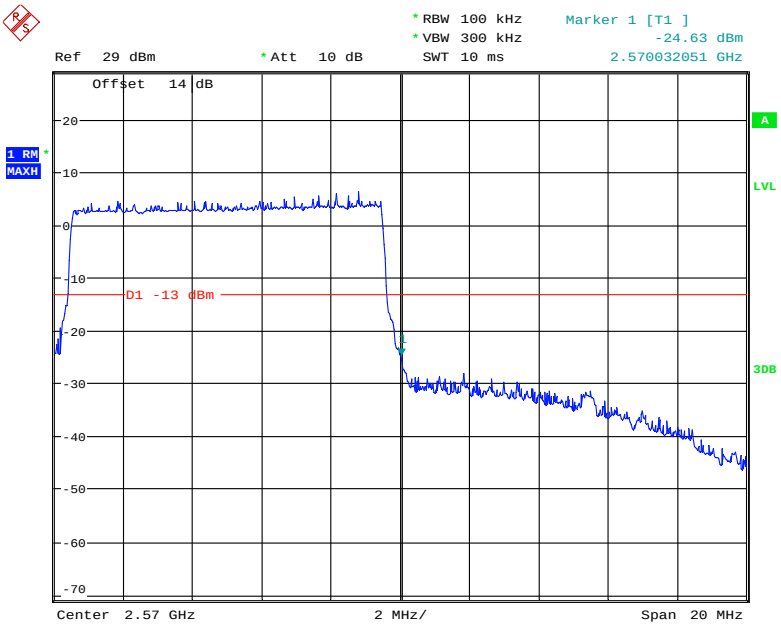
Date: 27.JUN.2018 10:31:25

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



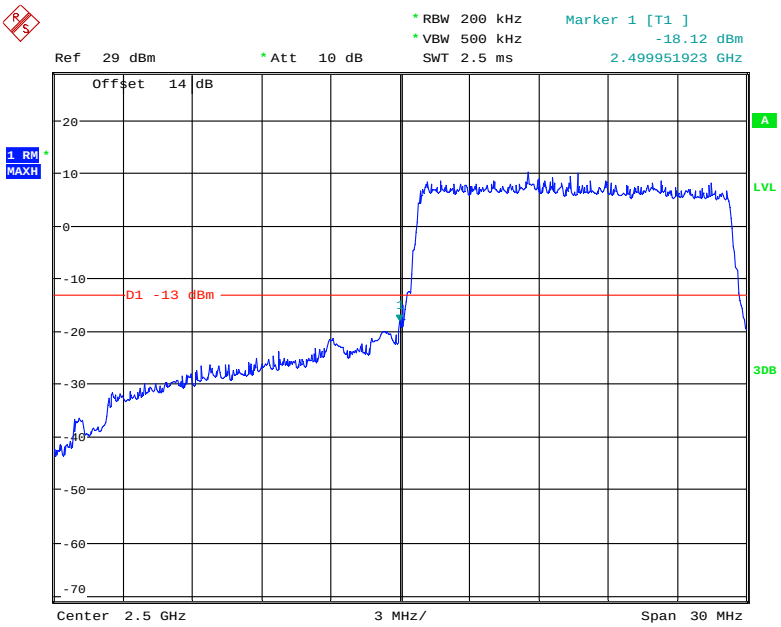
Date: 27.JUN.2018 10:33:17

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



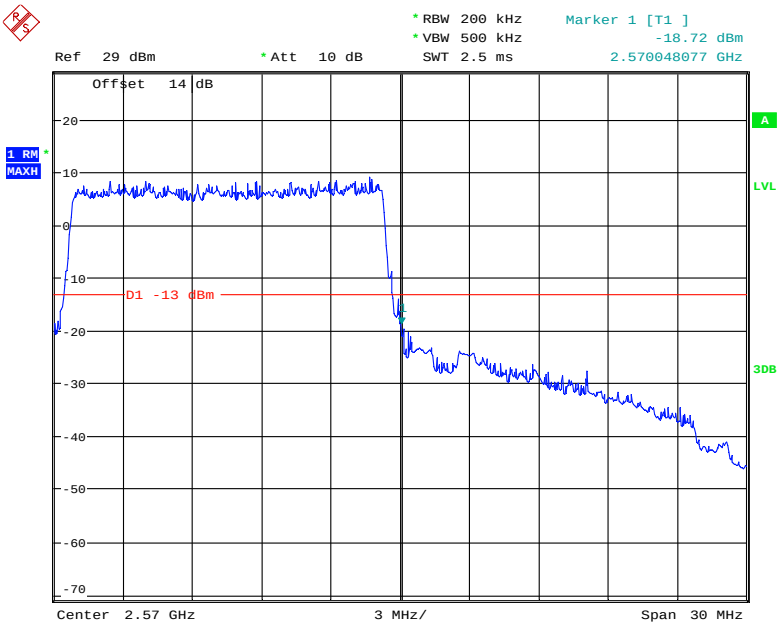
Date: 27.JUN.2018 10:32:01

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



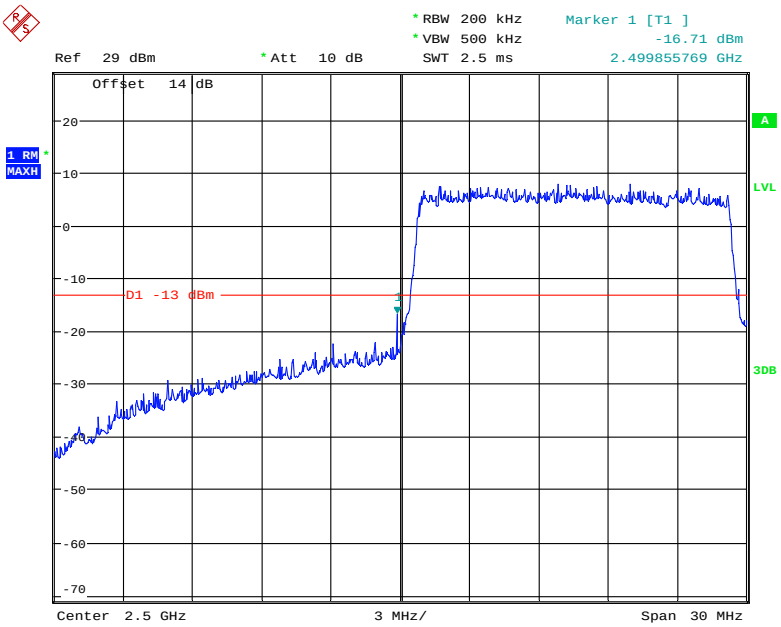
Date: 27.JUN.2018 10:35:03

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



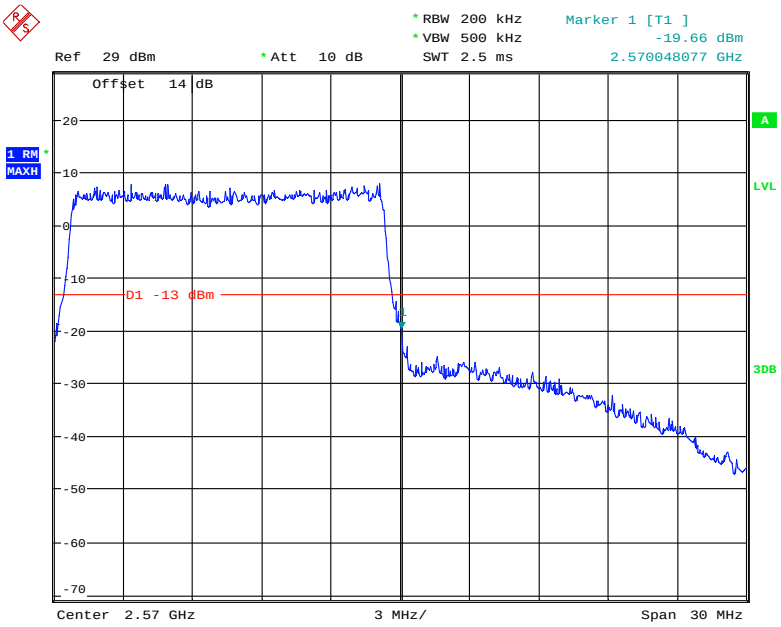
Date: 27.JUN.2018 10:37:13

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



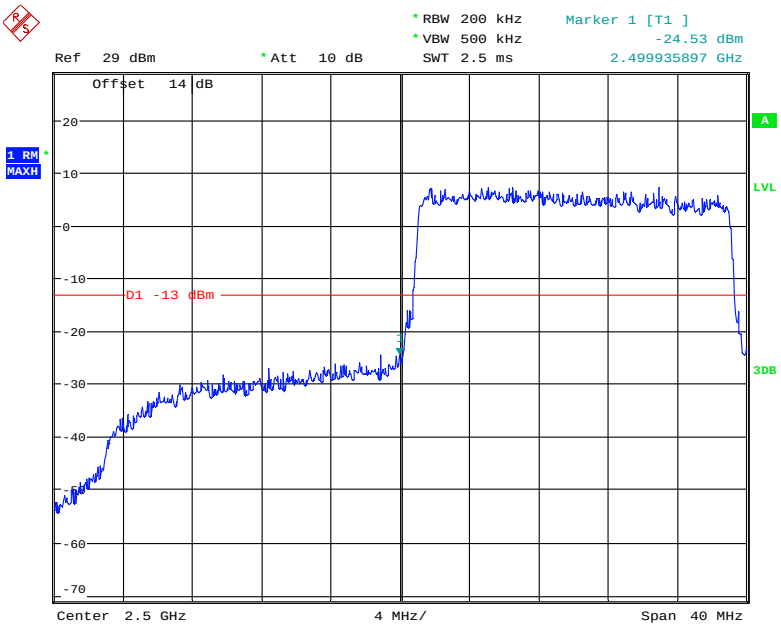
Date: 27.JUN.2018 10:35:38

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



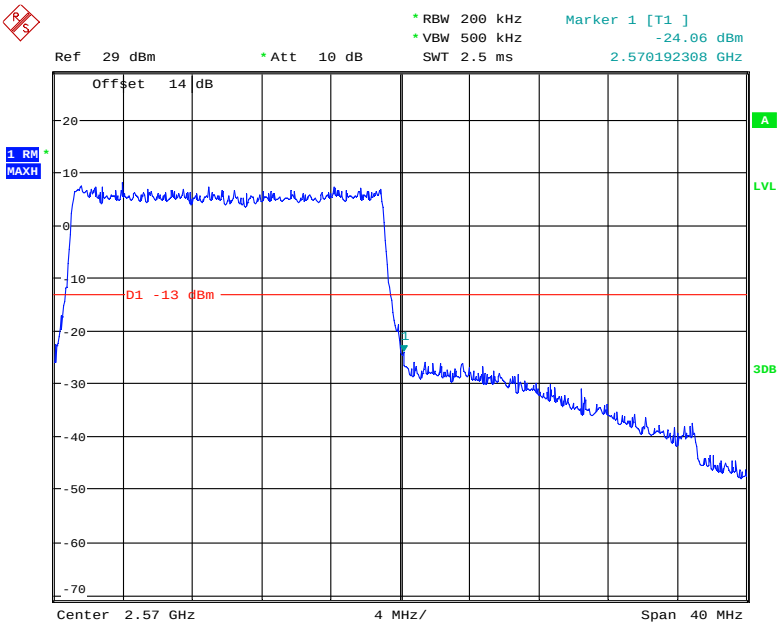
Date: 27.JUN.2018 10:36:32

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



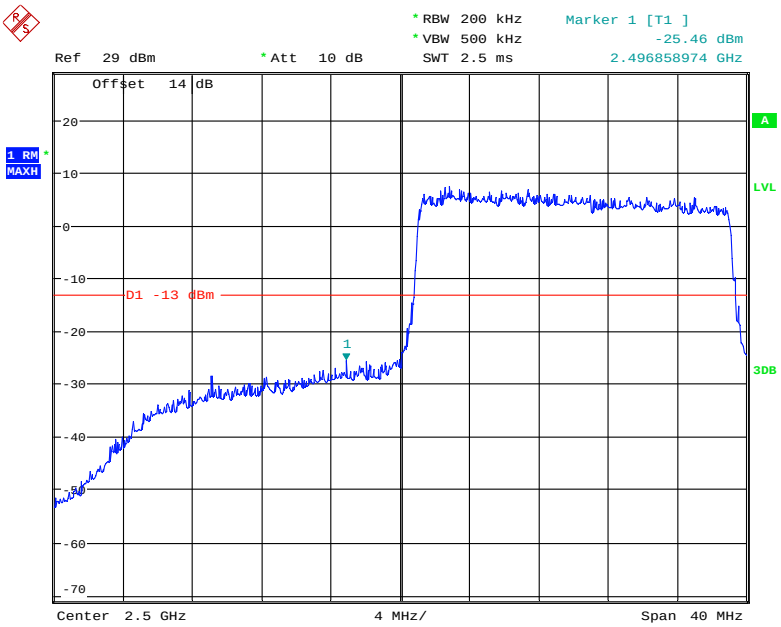
Date: 27.JUN.2018 10:43:20

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



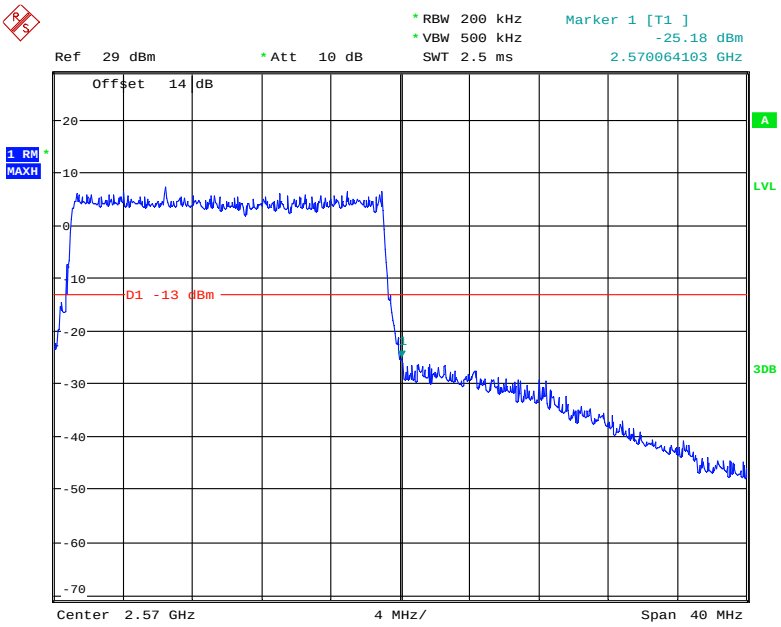
Date: 27.JUN.2018 10:40:42

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



Date: 27.JUN.2018 10:42:42

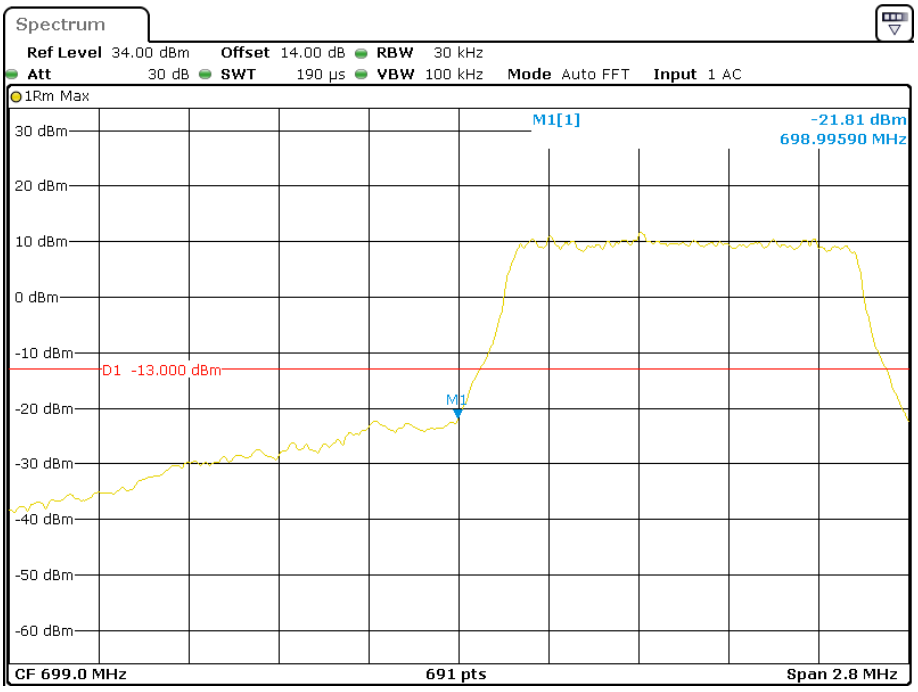
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 27.JUN.2018 10:41:42

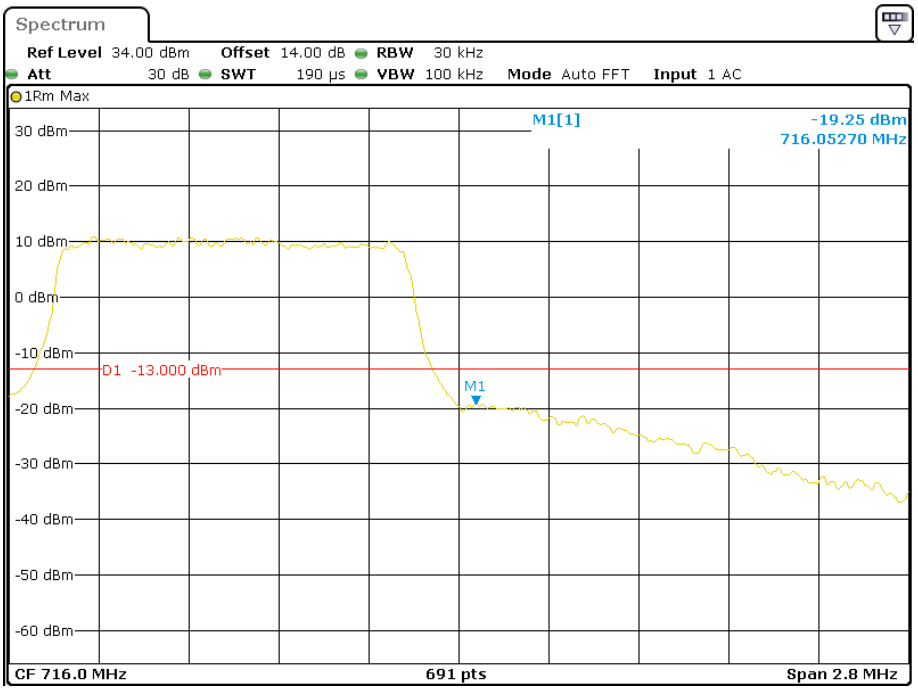
Band 12:

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



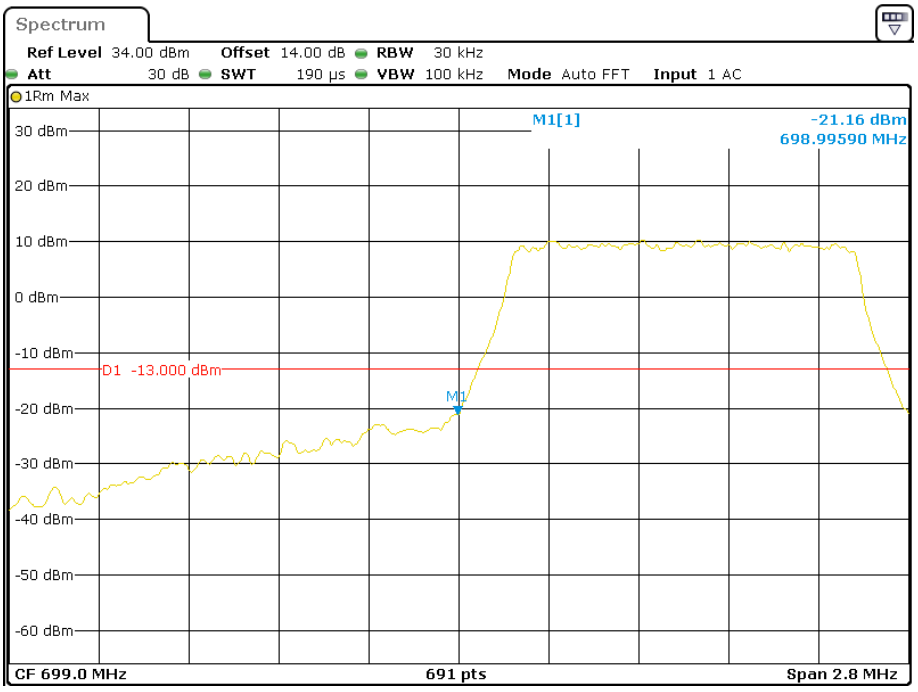
Date: 3.JUN.2018 15:10:42

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



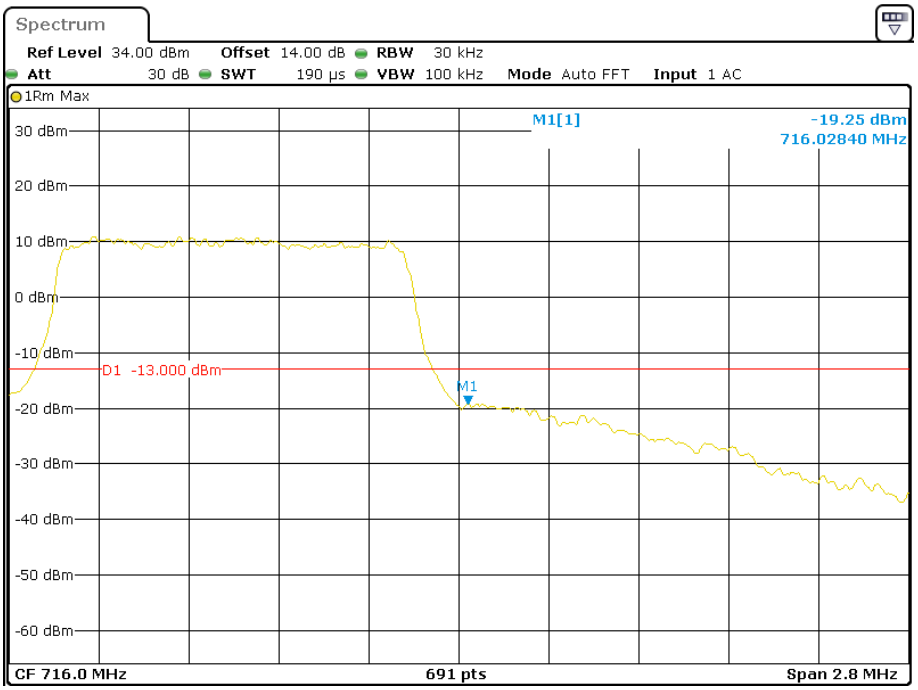
Date: 3.JUN.2018 15:08:58

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



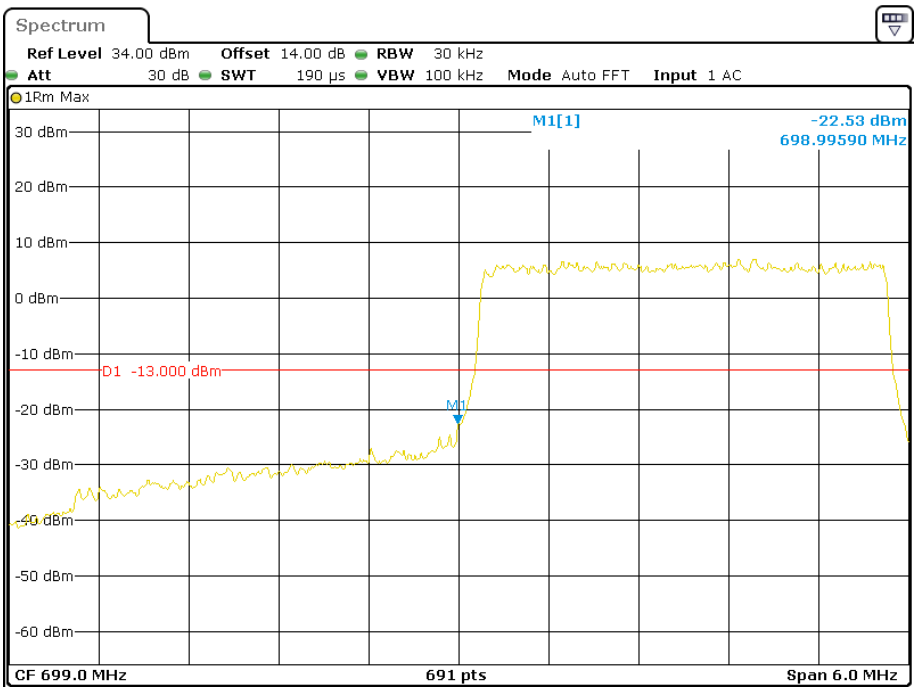
Date: 3.JUN.2018 15:04:55

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



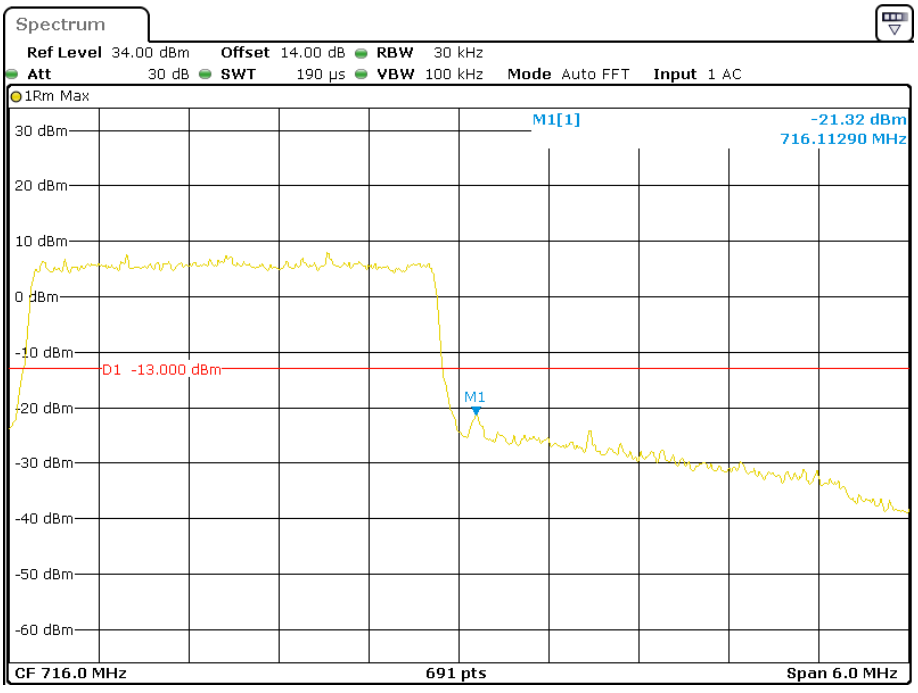
Date: 3.JUN.2018 15:07:19

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



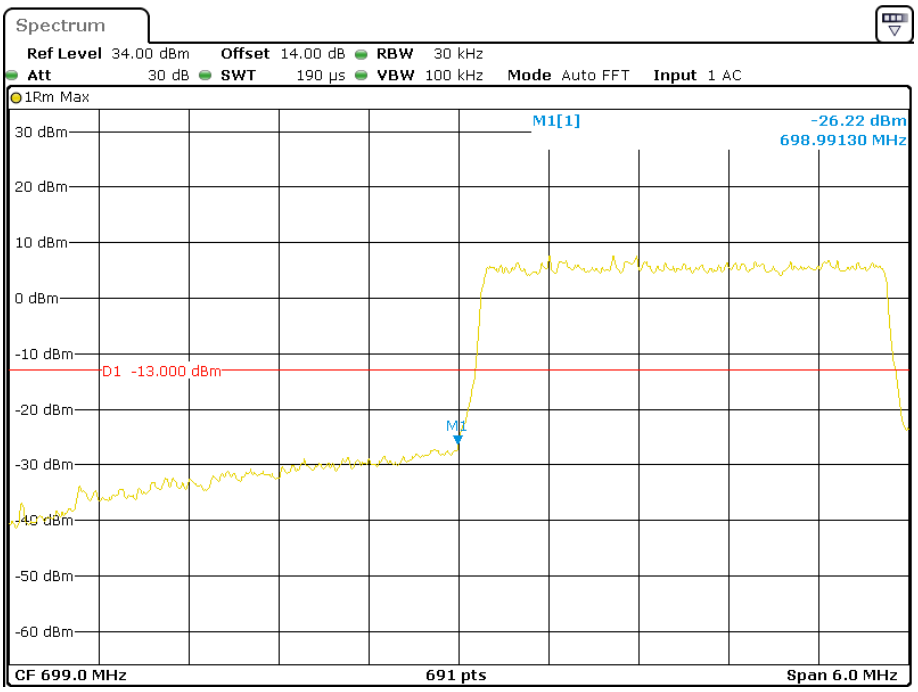
Date: 3.JUN.2018 15:12:48

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



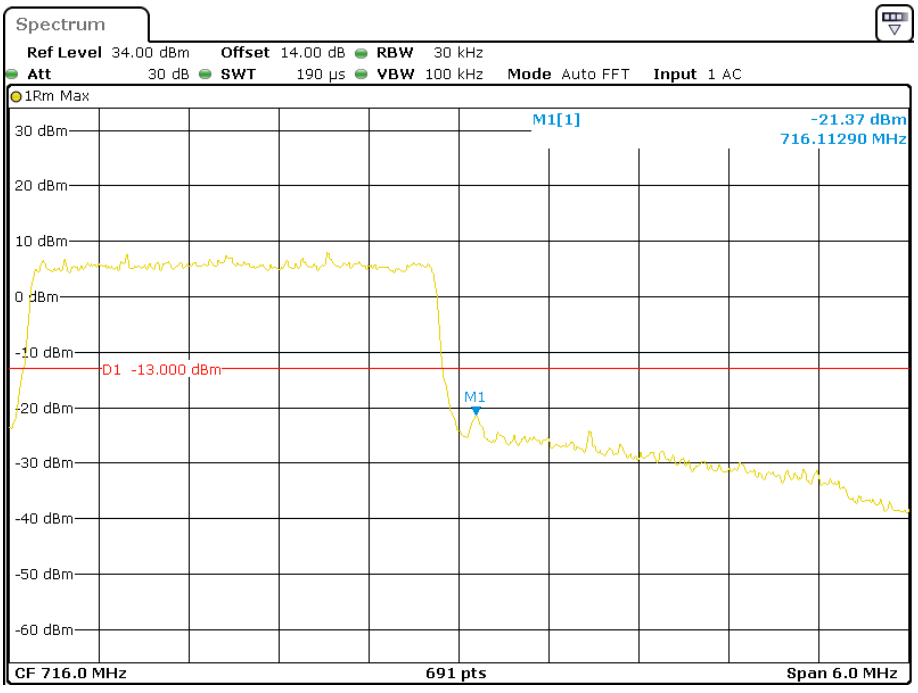
Date: 3.JUN.2018 15:14:42

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



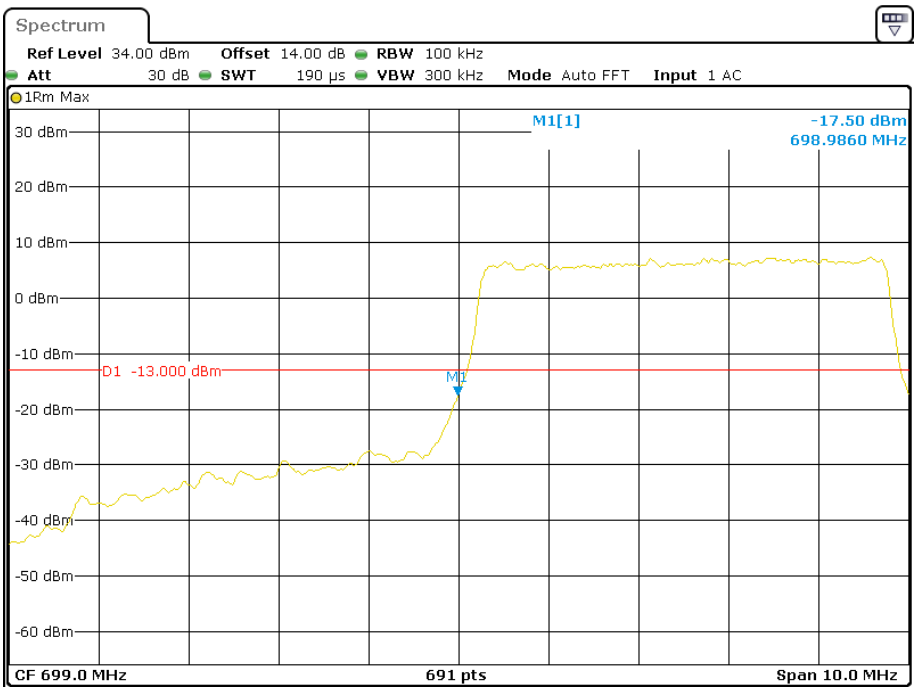
Date: 3.JUN.2018 15:17:08

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



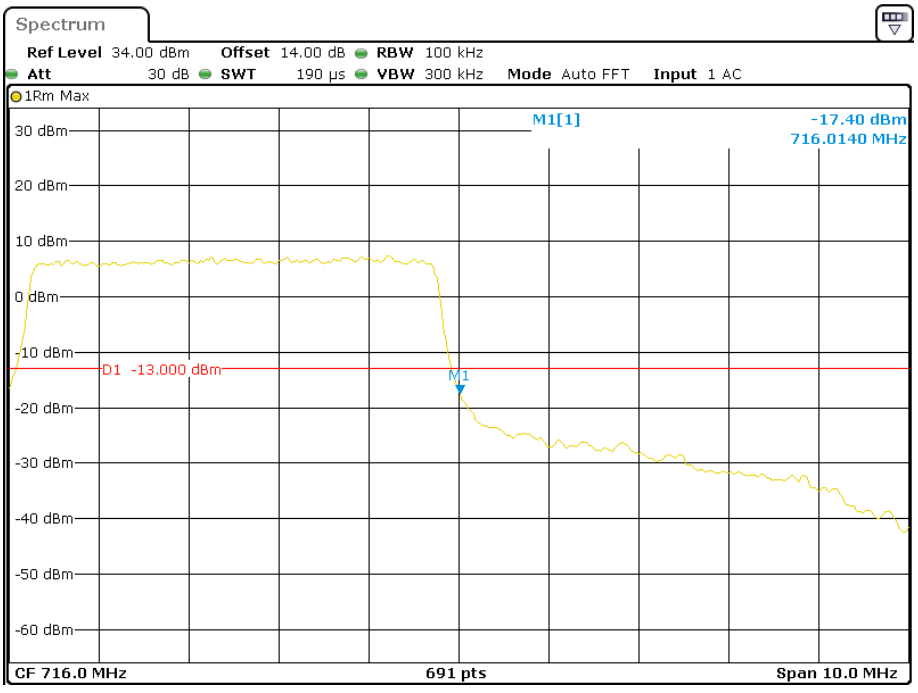
Date: 3.JUN.2018 15:15:54

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



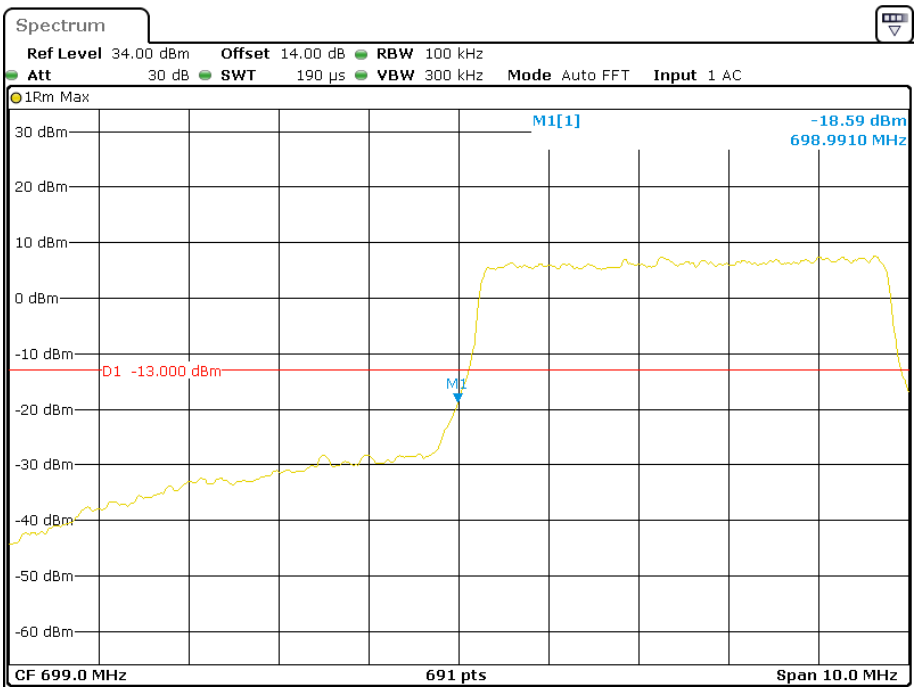
Date: 3.JUN.2018 15:21:24

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



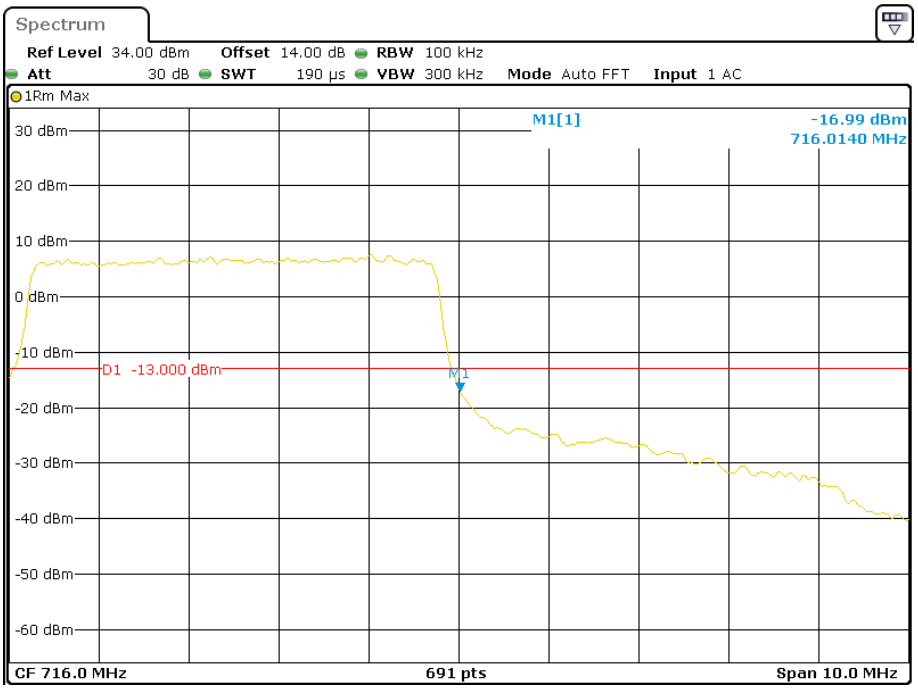
Date: 3.JUN.2018 15:20:02

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



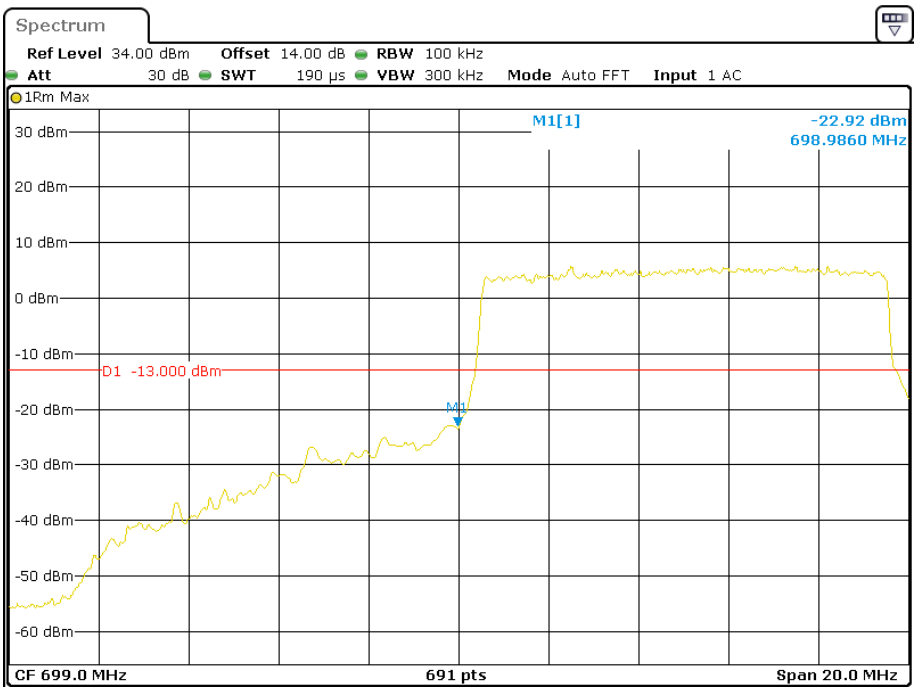
Date: 3.JUN.2018 15:18:12

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



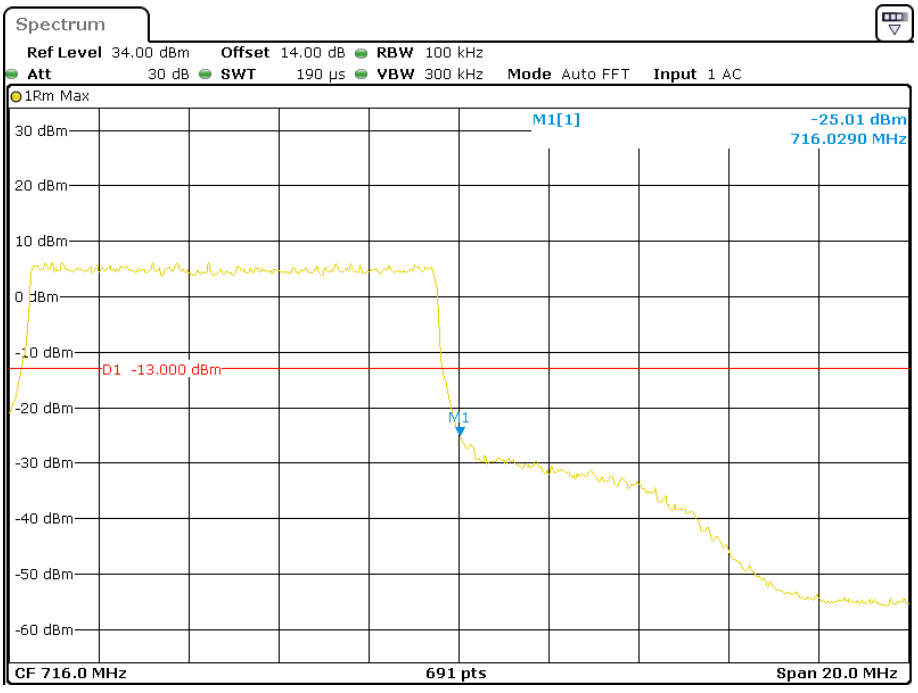
Date: 3.JUN.2018 15:19:24

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



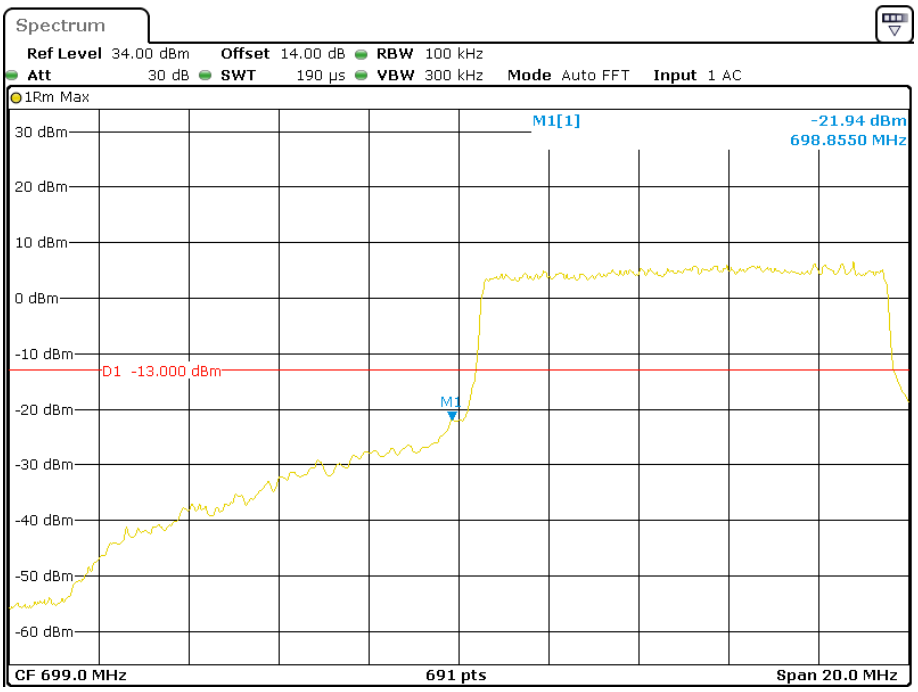
Date: 3.JUN.2018 15:22:44

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



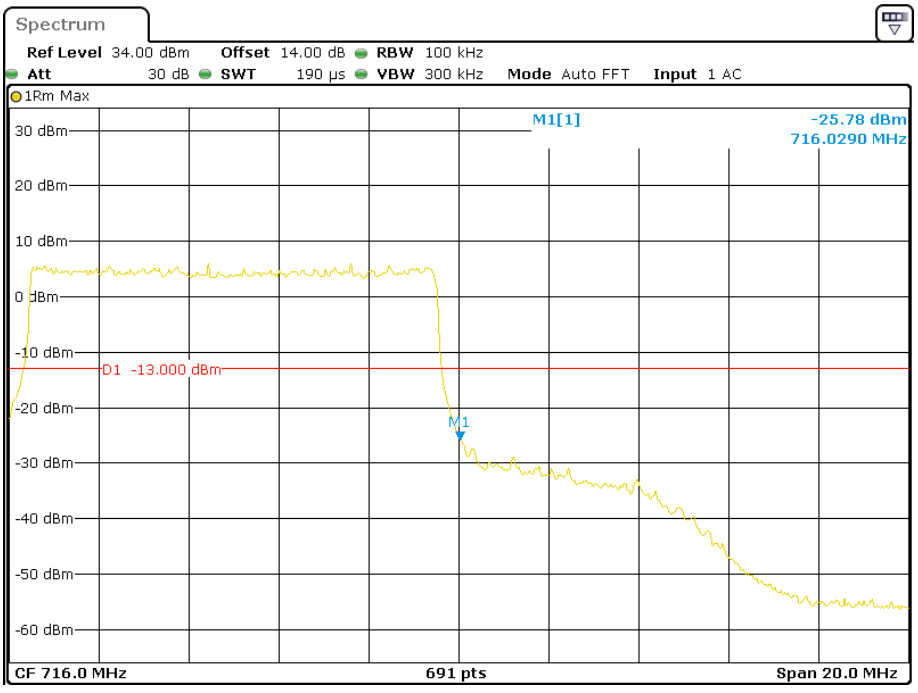
Date: 3.JUN.2018 15:24:25

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



Date: 3.JUN.2018 15:26:39

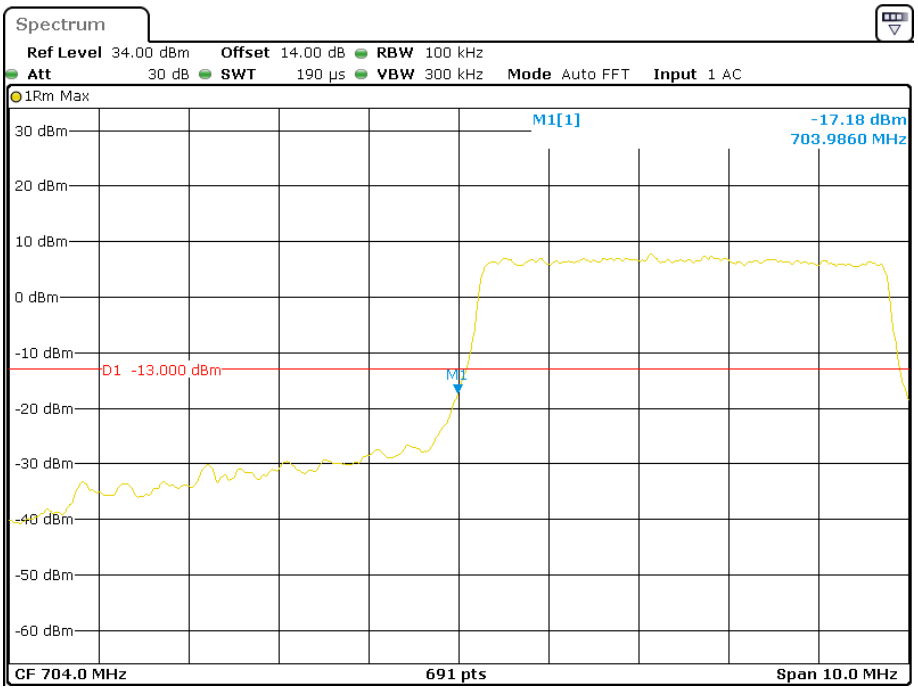
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 3.JUN.2018 15:25:06

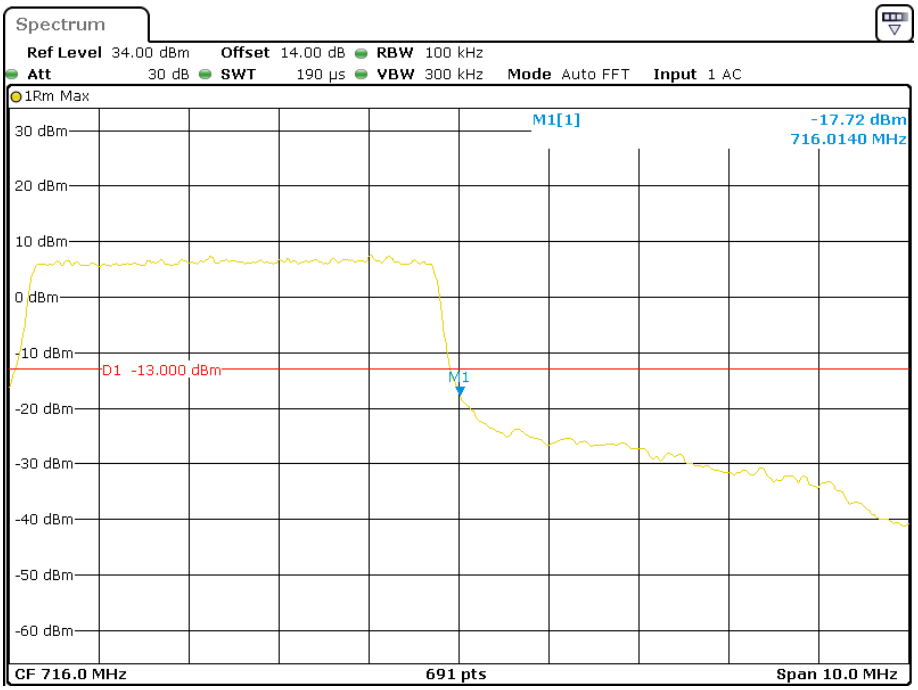
Band 17:

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



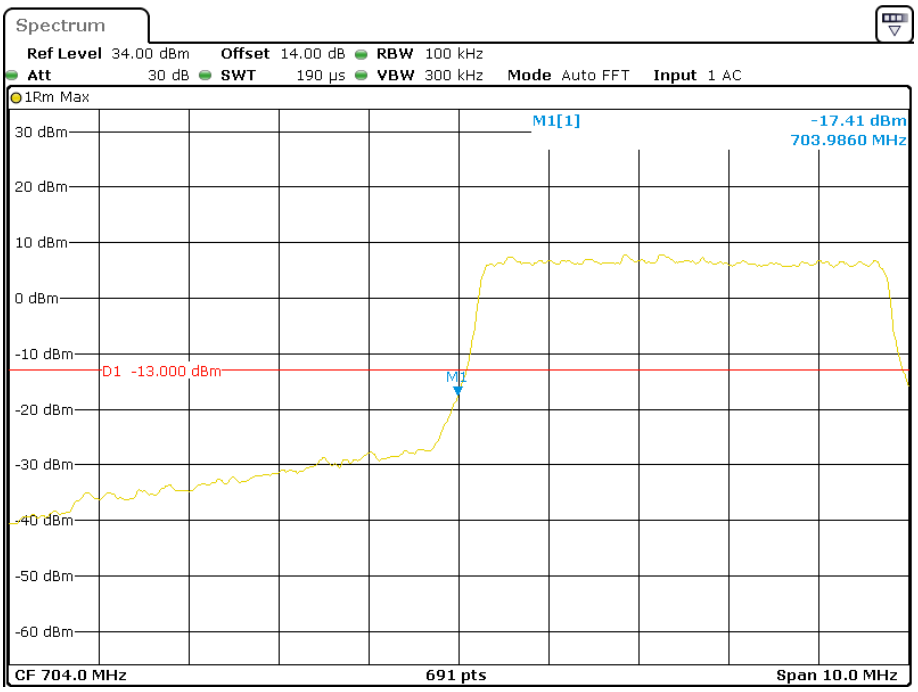
Date: 3.JUN.2018 15:31:49

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



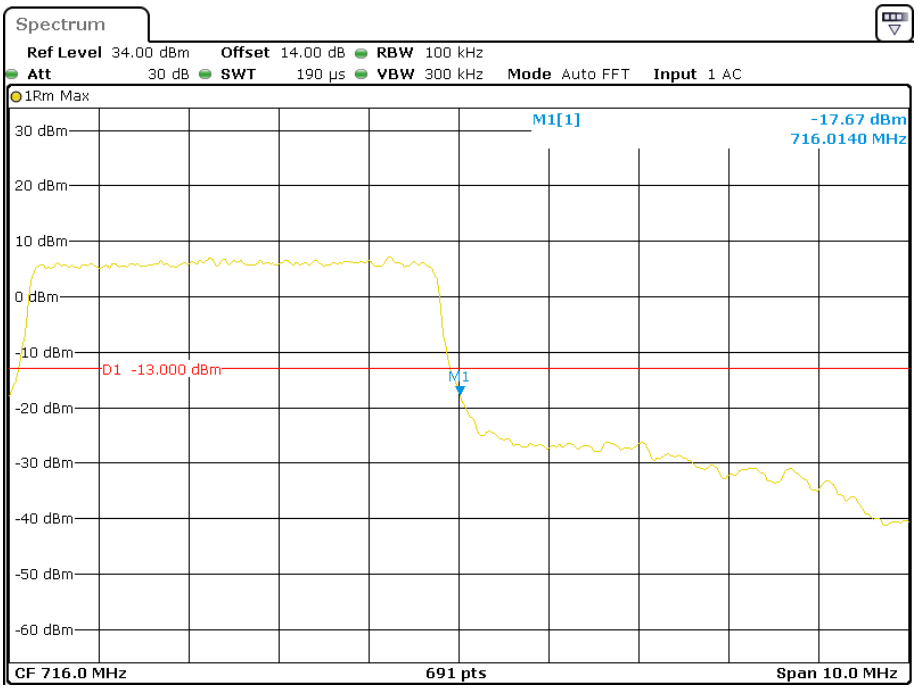
Date: 3.JUN.2018 15:30:30

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



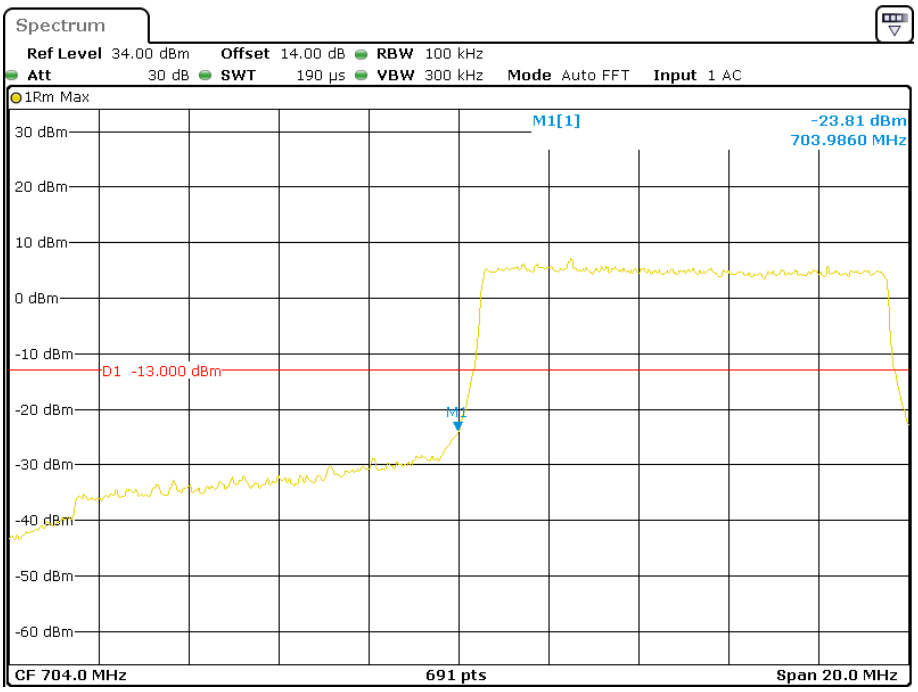
Date: 3.JUN.2018 15:29:13

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



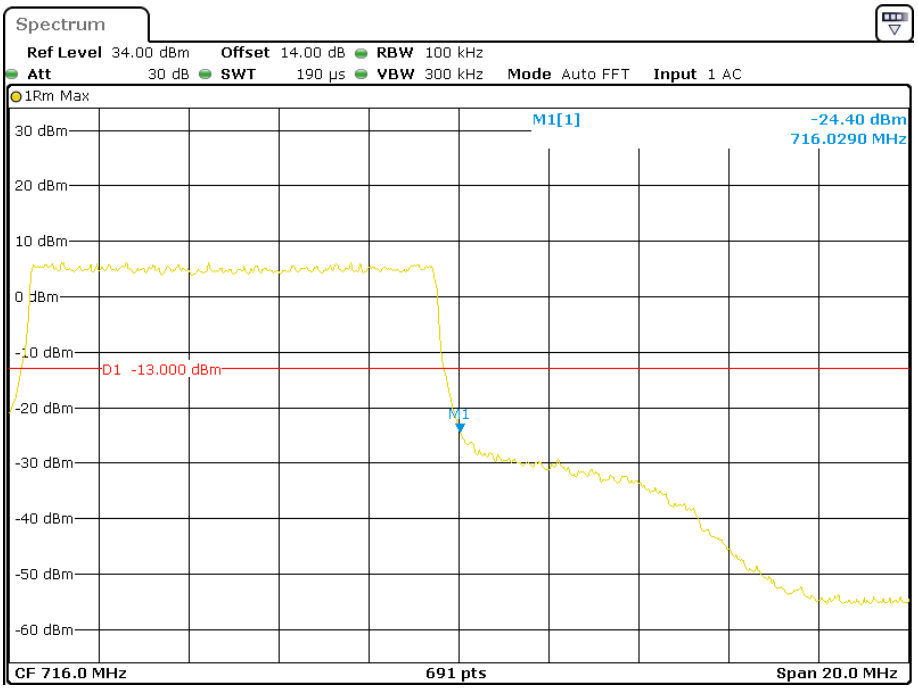
Date: 3.JUN.2018 15:29:46

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



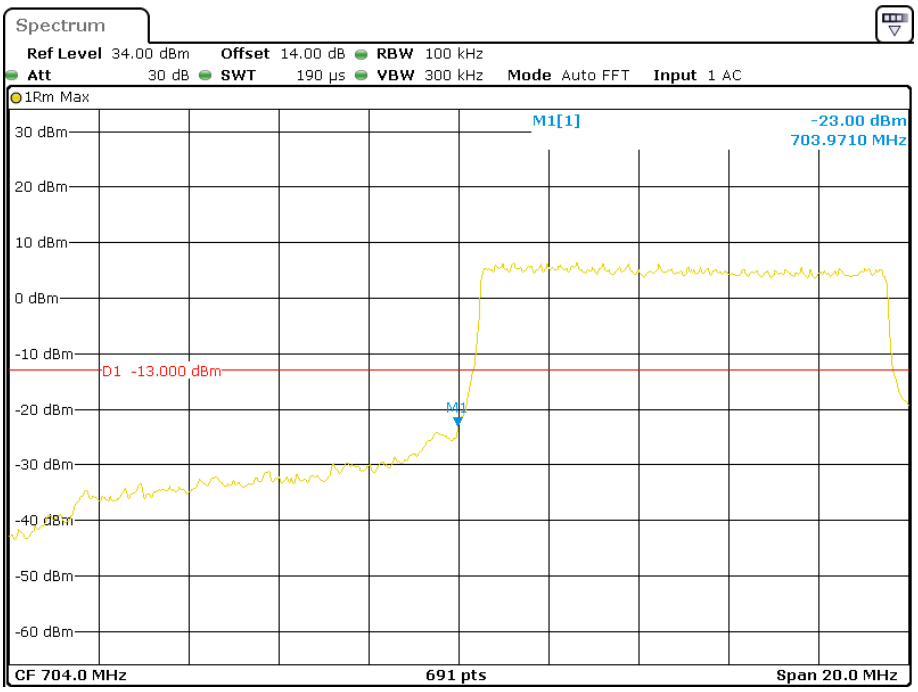
Date: 3.JUN.2018 15:33:03

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



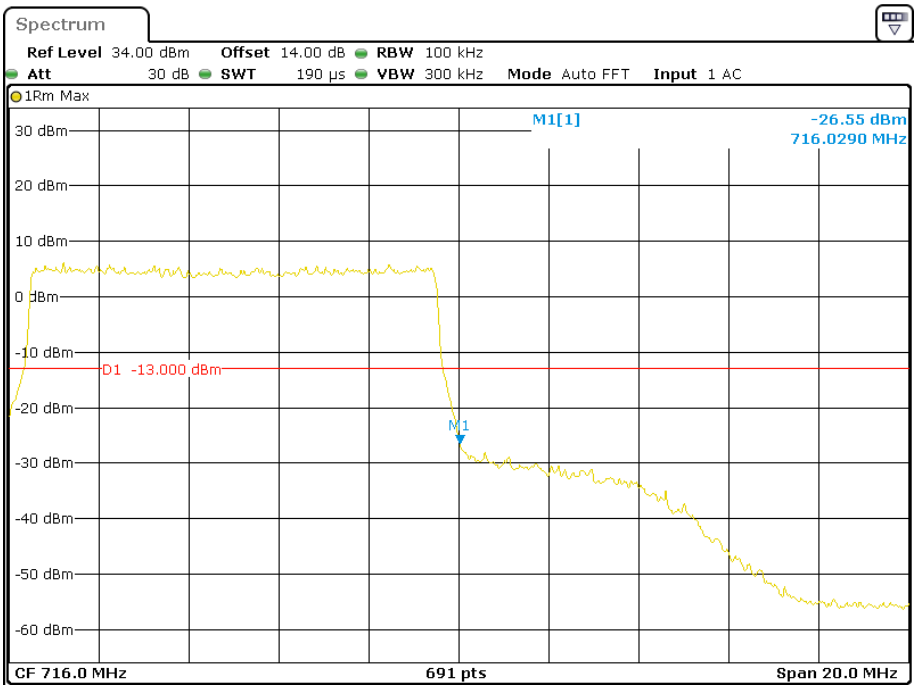
Date: 3.JUN.2018 15:34:03

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



Date: 3.JUN.2018 15:36:39

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



Date: 3.JUN.2018 15:34:30

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

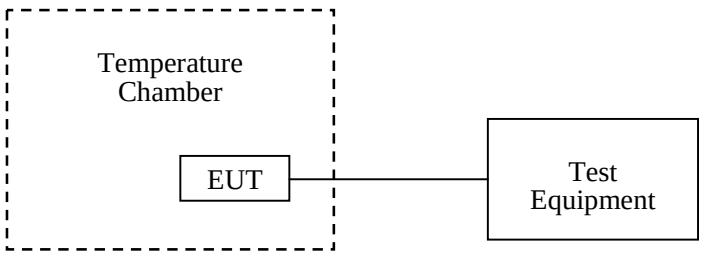
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 Haiguo Li on 2018-05-30.

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	15	0.01793	2.5
-20		15	0.01793	2.5
-10		14	0.01673	2.5
0		14	0.01673	2.5
10		14	0.01673	2.5
20		13	0.01554	2.5
30		15	0.01793	2.5
40		16	0.01913	2.5
50		17	0.02032	2.5
25	V min.= 3.6	18	0.02152	2.5
	V max.= 4.3	19	0.02271	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	10	0.01195	2.5
-20		10	0.01195	2.5
-10		8	0.00956	2.5
0		8	0.00956	2.5
10		8	0.00956	2.5
20		4	0.00478	2.5
30		8	0.00956	2.5
40		10	0.01195	2.5
50		13	0.01554	2.5
25	V min.= 3.6	15	0.01793	2.5
	V max.= 4.3	18	0.02152	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	-8	-0.00956	2.5
-20		-8	-0.00956	2.5
-10		-7	-0.00837	2.5
0		-7	-0.00837	2.5
10		-7	-0.00837	2.5
20		-6	-0.00717	2.5
30		-7	-0.00837	2.5
40		-8	-0.00956	2.5
50		-8	-0.00956	2.5
25	V min.= 3.6	-9	-0.01076	2.5
	V max.= 4.3	-9	-0.01076	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	30	0.01596	pass
-20		30	0.01596	pass
-10		28	0.01489	pass
0		28	0.01489	pass
10		28	0.01489	pass
20		25	0.01330	pass
30		28	0.01489	pass
40		30	0.01596	pass
50		32	0.01702	pass
25	V min.= 3.6	35	0.01862	pass
	V max.= 4.3	37	0.01968	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	30	0.01596	pass
-20		30	0.01596	pass
-10		28	0.01489	pass
0		28	0.01489	pass
10		28	0.01489	pass
20		24	0.01277	pass
30		28	0.01489	pass
40		30	0.01596	pass
50		30	0.01596	pass
25	V min.= 3.6	32	0.01702	pass
	V max.= 4.3	34	0.01809	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	-6	-0.00319	pass
-20		-6	-0.00319	pass
-10		-6	-0.00319	pass
0		-5	-0.00266	pass
10		-5	-0.00266	pass
20		-4	-0.00213	pass
30		-5	-0.00266	pass
40		-6	-0.00319	pass
50		-8	-0.00426	pass
25	V min.= 3.6	-8	-0.00426	pass
	V max.= 4.3	-9	-0.00479	pass

AWS Band (Part 27)

WCDMA Mode

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.8	1710.309895	1754.68953	1710	1755
-20		1710.30801	1754.683972	1710	1755
-10		1710.307501	1754.684285	1710	1755
0		1710.309075	1754.691604	1710	1755
10		1710.309797	1754.686562	1710	1755
20		1710.307744	1754.683928	1710	1755
30		1710.314014	1754.688179	1710	1755
40		1710.307448	1754.688675	1710	1755
50		1710.313512	1754.689213	1710	1755
25	V min.= 3.6	1710.309789	1754.686495	1710	1755
	V max.= 4.3	1710.310861	1754.68534	1710	1755

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-12	-0.00638	pass
-20		-12	-0.00638	pass
-10		-10	-0.00532	pass
0		-10	-0.00532	pass
10		-10	-0.00532	pass
20		-7	-0.00372	pass
30		-10	-0.00532	pass
40		-12	-0.00638	pass
50		-14	-0.00745	pass
20	V min.= 3.6	-16	-0.00851	pass
	V max.= 4.3	-21	-0.01117	pass

Band 4:

Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.8	1710.310094	1754.68659	1710	1755
-20		1710.310502	1754.683953	1710	1755
-10		1710.309411	1754.691476	1710	1755
0		1710.306942	1754.686312	1710	1755
10		1710.309678	1754.686606	1710	1755
20		1710.308619	1754.687428	1710	1755
30		1710.313804	1754.684509	1710	1755
40		1710.307901	1754.688324	1710	1755
50		1710.312342	1754.686082	1710	1755
25	V min.= 3.6	1710.307026	1754.686232	1710	1755
	V max.= 4.3	1710.307909	1754.688402	1710	1755

Band 7:

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.8	2500.312137	2569.786195	2500	2570
-20		2500.311015	2569.784297	2500	2570
-10		2500.318914	2569.787568	2500	2570
0		2500.312217	2569.787944	2500	2570
10		2500.314221	2569.787064	2500	2570
20		2500.312406	2569.788814	2500	2570
30		2500.31783	2569.785152	2500	2570
40		2500.317585	2569.791053	2500	2570
50		2500.317325	2569.789091	2500	2570
25	V min.= 3.6	2500.311378	2569.784263	2500	2570
	V max.= 4.3	2500.316573	2569.790304	2500	2570

Band 12:

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.8	699.3245124	715.7910984	699	716
-20		699.3266807	715.7857237	699	716
-10		699.3245874	715.7880097	699	716
0		699.3235045	715.7850609	699	716
10		699.325057	715.7865816	699	716
20		699.3272995	715.7879135	699	716
30		699.3278893	715.7846624	699	716
40		699.3256479	715.7862569	699	716
50		699.3250648	715.787879	699	716
25	V min.= 3.6	699.3279919	715.7850926	699	716
	V max.= 4.3	699.3300126	715.7908728	699	716

Band 17:

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.8	704.3250687	715.7896778	704	716
-20		704.3232065	715.7833062	704	716
-10		704.3257897	715.7842804	704	716
0		704.3264262	715.7850284	704	716
10		704.3244501	715.7862633	704	716
20		704.3236612	715.7839341	704	716
30		704.3247787	715.7899739	704	716
40		704.3223472	715.7902355	704	716
50		704.3273765	715.7884764	704	716
25	V min.= 3.6	704.3246746	715.7898759	704	716
	V max.= 4.35	704.3287893	715.7853298	704	716

16QAM:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	-15	-0.00798	pass
-20		-10	-0.00532	pass
-10		-10	-0.00532	pass
0		-10	-0.00532	pass
10		-10	-0.00532	pass
20		-5	-0.00266	pass
30		-10	-0.00532	pass
40		-15	-0.00798	pass
50		-20	-0.01064	pass
20	V min.= 3.6	-25	-0.01330	pass
	V max.= 4.3	-30	-0.01596	pass

Band 4:

Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.8	1710.309975	1754.686155	1710	1755
-20		1710.310288	1754.684207	1710	1755
-10		1710.309093	1754.691685	1710	1755
0		1710.306789	1754.685883	1710	1755
10		1710.30992	1754.68675	1710	1755
20		1710.308902	1754.687361	1710	1755
30		1710.314055	1754.684518	1710	1755
40		1710.308136	1754.688506	1710	1755
50		1710.312601	1754.685726	1710	1755
25	V min.= 3.6	1710.307032	1754.686284	1710	1755
	V max.= 4.3	1710.307578	1754.688079	1710	1755

Band 7:

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.8	2500.312444	2569.786329	2500	2570
-20		2500.311185	2569.784257	2500	2570
-10		2500.319118	2569.787524	2500	2570
0		2500.312076	2569.787396	2500	2570
10		2500.314379	2569.787203	2500	2570
20		2500.311877	2569.788473	2500	2570
30		2500.317679	2569.784628	2500	2570
40		2500.317695	2569.791446	2500	2570
50		2500.317559	2569.789284	2500	2570
25	V min.= 3.6	2500.31101	2569.784515	2500	2570
	V max.= 4.3	2500.316605	2569.790474	2500	2570

Band 12:

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.8	699.3241235	715.7910669	699	716
-20		699.3263522	715.7859557	699	716
-10		699.3247145	715.7882583	699	716
0		699.3235827	715.7848356	699	716
10		699.3250821	715.7867776	699	716
20		699.3274366	715.7881198	699	716
30		699.3278401	715.7849046	699	716
40		699.3256663	715.7860314	699	716
50		699.3249935	715.7881623	699	716
25	V min.= 3.6	699.3279318	715.784874	699	716
	V max.= 4.3	699.3297245	715.7905487	699	716

Band 17:

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.8	704.3250091	715.7896413	704	716
-20		704.3233274	715.7832528	704	716
-10		704.3258395	715.7841546	704	716
0		704.3265628	715.7851119	704	716
10		704.3244482	715.7858476	704	716
20		704.3235889	715.7840273	704	716
30		704.3246516	715.789656	704	716
40		704.3224698	715.7900916	704	716
50		704.3272054	715.7884969	704	716
25	V min.= 3.6	704.3250505	715.7898559	704	716
	V max.= 4.3	704.3288452	715.7853861	704	716

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