BACL
Bay Area Compliance Labs Corp.

FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

Xwireless LLC

11565 Old Georgetown Road, Rockville, MD 20852, USA

FCC ID: 2ADLJSYNQ

Report Type:	Product Type:
Original Report	4G smart phone

Report Number:	RSZ180917004-00D
Report Date:	2018-10-15
Reviewed By:	Simon Wang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Xwireless LLC's* product, model number: *SYNQ (FCC ID: 2ADLJSYNQ)* or the "EUT" in this report was a *4G smart phone,* which was measured approximately: 141 mm (L) × 71 mm (W) × 9 mm (H), rated with input voltage: DC 3.7 V battery or DC 5.0V from adapter.

Adapter Information:
Model: SYNQ
Input: AC 100-240V, 50/60Hz, 0.15 A
Output: DC 5.0 V, 1.0A

All measurement and test data in this report was gathered from production sample serial number: 180917004. (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-09-17.

Objective

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

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

Related Submittal(s)/Grant(s)

FCC Part 15B JBP and FCC Part 15.247 DSS & DTS submissions with FCC ID: 2ADLJSYNQ.

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
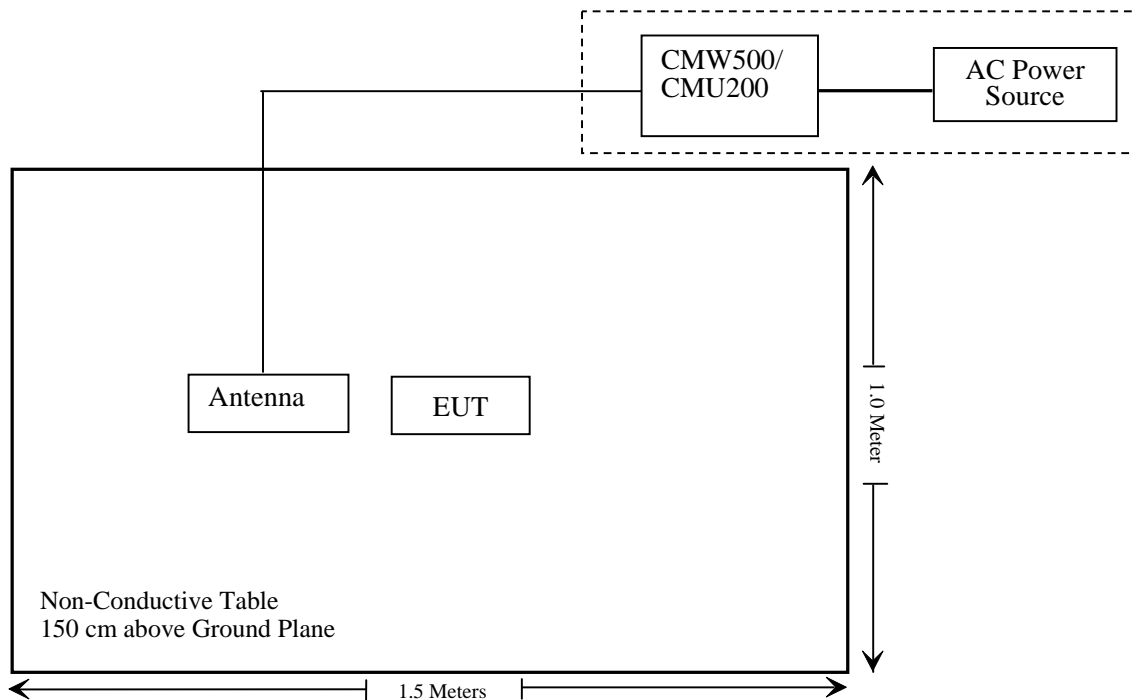
SUMMARY OF TEST RESULTS

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: RSZ180917004-20.

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	2018-06-23	2019-06-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-05-22	2018-11-22
Sonoma instrument	Amplifier	310N	186238	2018-05-12	2018-11-12
Anritsu	Signal Generator	68369B	004114	2017-12-24	2018-12-24
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2018-08-01	2019-02-01
COM POWER	Dipole Antenna	AD-100	041000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2018-08-18	2021-08-17
Ducommun technologies	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-08-01	2019-02-01
Ducommun technologies	RF Cable	104PEA	218124002	2018-05-21	2018-11-21
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
Heatsink Required	Amplifier	QLW-18405536-J0	15964001002	2018-08-01	2019-02-01
MICRO-TRONICS	High Pass filter	1.3GHz	101120	2018-08-01	2019-02-01
MICRO-TRONICS	High pass filter	3.5GHz	N/A	2018-08-01	2019-02-01

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	2018-07-11	2019-07-11
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2017-12-21	2018-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Agilent	Vector signal source	N5182B	MY53051503	2018-06-23	2019-06-23
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	2018-06-23	2019-06-23
Ducommun technologies	RF Cable	RG-214	3	Each Time	
WEINSCHEL	3dB Attenuator	N/A	N/A	Each Time	
N/A	Power Splitter	N/A	N/A	Each Time	

* 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: RSZ180917004-20.

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.
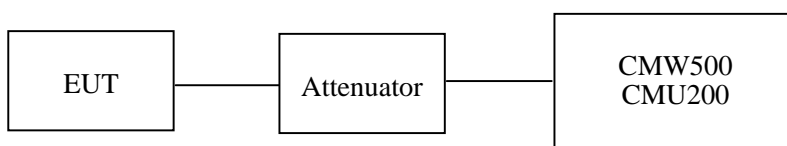
Radiated method:

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 2018-09-28.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.47	38.45
	190	836.6	32.43	38.45
	251	848.8	32.39	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.45	30.49	28.30	27.20	38.45
	190	836.6	32.44	30.42	28.29	27.07	38.45
	251	848.8	32.37	30.36	28.21	27.06	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	26.43	24.11	22.56	21.02	38.45
	190	836.6	26.63	24.26	22.64	21.24	38.45
	251	848.8	26.72	24.34	22.73	21.06	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		21.40	21.22	21.32
		HSDPA	1	20.83	20.72	20.66
			2	20.79	20.62	20.56
			3	20.90	20.77	20.75
			4	20.75	20.65	20.59
		HSUPA	1	20.99	20.84	20.76
			2	20.95	20.81	20.67
			3	20.97	20.96	20.80
			4	20.94	20.74	20.71
			5	20.96	20.89	20.87
		HSPA+	1	21.08	21.04	21.12

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.27	33
	661	1880.0	29.73	33
	810	1909.8	29.60	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.05	27.18	24.86	23.77	33
	661	1880.0	29.52	27.61	25.35	24.29	33
	810	1909.8	29.80	27.96	25.88	24.70	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	24.57	22.41	20.52	19.23	33
	661	1880.0	24.90	22.61	20.71	19.48	33
	810	1909.8	25.25	22.93	21.01	19.76	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		21.54	21.64	21.87
		HSDPA	1	20.57	20.71	20.74
			2	20.62	20.65	20.63
			3	20.66	20.80	20.86
			4	20.61	20.69	20.68
		HSUPA	1	20.84	20.92	20.65
			2	20.76	20.81	20.55
			3	20.78	20.97	20.73
			4	20.71	20.82	20.52
			5	20.92	20.90	20.76
		HSPA+	1	20.86	20.84	20.89

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	10.52	13
	Middle	10.32	13
	High	10.15	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	11.54	13
	Middle	11.36	13
	High	11.62	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.78	13
	Middle	3.53	13
	High	3.73	13
HSDPA (16QAM)	Low	3.72	13
	Middle	3.57	13
	High	3.76	13
HSUPA (BPSK)	Low	3.76	13
	Middle	3.51	13
	High	3.74	13
HSPA+	Low	3.94	13
	Middle	3.81	13
	High	3.91	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	10.62	13
	Middle	10.42	13
	High	10.26	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	11.72	13
	Middle	11.52	13
	High	11.67	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.18	13
	Middle	2.92	13
	High	3.17	13
HSDPA (16QAM)	Low	3.14	13
	Middle	2.92	13
	High	3.16	13
HSUPA (BPSK)	Low	3.18	13
	Middle	2.96	13
	High	3.15	13
HSPA+	Low	3.54	13
	Middle	3.21	13
	High	3.51	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 (dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	91.79	80	1.6	H	29.8	0.70	0.0	29.10	38.45	9.35
836.6	85.42	304	2.5	V	25.4	0.70	0.0	24.70	38.45	13.75
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	88.30	293	1.7	H	18.3	1.30	9.40	26.40	33	6.6
1880.00	85.30	321	2.1	V	15.0	1.30	9.40	23.10	33	9.9

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 (dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.60	87.35	188	2.3	H	25.4	0.70	0.0	24.70	38.45	13.75
836.60	84.32	267	2.1	V	24.3	0.70	0.0	23.60	38.45	14.85
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	86.24	178	1.8	H	16.2	1.30	9.40	24.30	33	8.7
1880.00	84.15	232	1.2	V	13.9	1.30	9.40	22.00	33	11.0

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.60	85.34	293	1.9	H	23.3	0.70	0.0	22.60	38.45	15.85
836.60	82.18	69	2.2	V	22.2	0.70	0.0	21.50	38.45	16.95
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	83.96	9	1.8	H	13.9	1.30	9.40	22.00	33	11.0
1880.00	79.48	13	1.9	V	9.2	1.30	9.40	17.30	33	15.7

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	22.81	22.51	22.26
		RB Size=1, RB Offset=2	22.52	23.16	22.84
		RB Size=1, RB Offset=5	22.36	22.71	22.87
		RB Size=3, RB Offset=0	22.58	22.81	23.29
		RB Size=3, RB Offset=1	22.70	23.34	22.94
		RB Size=3, RB Offset=2	22.33	22.92	23.52
		RB Size=6, RB Offset=0	21.44	22.15	22.27
	16QAM	RB Size=1, RB Offset=0	21.86	21.58	21.75
		RB Size=1, RB Offset=2	21.87	22.09	22.22
		RB Size=1, RB Offset=5	21.91	22.12	21.85
		RB Size=3, RB Offset=0	22.92	22.21	21.45
		RB Size=3, RB Offset=1	22.98	21.42	21.85
		RB Size=3, RB Offset=2	21.73	22.21	21.91
		RB Size=6, RB Offset=0	20.69	21.00	20.91
3.0	QPSK	RB Size=1, RB Offset=0	22.20	21.77	21.54
		RB Size=1, RB Offset=7	22.77	22.84	22.46
		RB Size=1, RB Offset=14	22.87	22.93	22.53
		RB Size=8, RB Offset=0	21.60	22.02	22.01
		RB Size=8, RB Offset=4	21.79	22.03	21.78
		RB Size=8, RB Offset=7	21.75	22.23	21.26
		RB Size=15, RB Offset=0	21.99	22.10	21.75
	16QAM	RB Size=1, RB Offset=0	21.67	21.63	21.84
		RB Size=1, RB Offset=7	21.93	21.77	21.86
		RB Size=1, RB Offset=14	21.95	21.47	22.01
		RB Size=8, RB Offset=0	21.03	21.37	21.16
		RB Size=8, RB Offset=4	20.93	21.20	21.15
		RB Size=8, RB Offset=7	21.09	20.83	21.23
		RB Size=15, RB Offset=0	21.42	20.66	20.81

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	22.49	22.44	22.81
		RB Size=1, RB Offset=12	23.28	22.73	23.50
		RB Size=1, RB Offset=24	22.95	22.74	22.83
		RB Size=12, RB Offset=0	21.71	21.95	22.29
		RB Size=12, RB Offset=6	22.09	21.86	21.73
		RB Size=12, RB Offset=11	22.17	21.70	21.66
		RB Size=25, RB Offset=0	21.88	21.89	22.18
	16QAM	RB Size=1, RB Offset=0	21.59	21.86	21.82
		RB Size=1, RB Offset=12	21.74	22.06	21.89
		RB Size=1, RB Offset=24	21.66	22.02	22.26
		RB Size=12, RB Offset=0	21.03	20.99	20.98
		RB Size=12, RB Offset=6	20.99	21.08	21.17
		RB Size=12, RB Offset=11	21.25	20.83	21.11
		RB Size=25, RB Offset=0	20.97	21.07	20.77
10.0	QPSK	RB Size=1, RB Offset=0	22.37	22.63	22.59
		RB Size=1, RB Offset=24	23.09	23.13	22.82
		RB Size=1, RB Offset=49	22.93	22.90	22.61
		RB Size=25, RB Offset=0	21.91	21.83	22.22
		RB Size=25, RB Offset=12	21.76	22.02	21.54
		RB Size=25, RB Offset=24	21.51	22.07	21.72
		RB Size=50, RB Offset=0	21.64	21.84	21.98
	16QAM	RB Size=1, RB Offset=0	21.94	21.67	21.85
		RB Size=1, RB Offset=24	22.90	22.69	22.79
		RB Size=1, RB Offset=49	22.54	22.62	22.71
		RB Size=25, RB Offset=0	21.00	21.07	21.10
		RB Size=25, RB Offset=12	21.08	20.95	20.97
		RB Size=25, RB Offset=24	20.81	21.16	21.00
		RB Size=50, RB Offset=0	21.07	21.18	20.99

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	22.55	22.45	22.75
		RB Size=1, RB Offset=37	22.62	22.81	23.21
		RB Size=1, RB Offset=74	22.89	23.00	22.73
		RB Size=36, RB Offset=0	21.93	22.08	21.26
		RB Size=36, RB Offset=18	22.09	22.07	22.26
		RB Size=36, RB Offset=37	22.35	21.97	21.89
		RB Size=75, RB Offset=0	21.76	22.19	21.35
	16QAM	RB Size=1, RB Offset=0	21.55	21.91	21.74
		RB Size=1, RB Offset=37	21.91	22.20	21.96
		RB Size=1, RB Offset=74	22.19	21.94	21.98
		RB Size=36, RB Offset=0	21.03	20.80	21.38
		RB Size=36, RB Offset=18	20.91	20.84	21.25
		RB Size=36, RB Offset=37	20.98	21.03	20.93
		RB Size=75, RB Offset=0	20.93	20.94	23.20
20.0	QPSK	RB Size=1, RB Offset=0	22.75	22.51	22.45
		RB Size=1, RB Offset=49	22.53	22.69	23.22
		RB Size=1, RB Offset=99	23.25	22.70	22.94
		RB Size=50, RB Offset=0	22.50	21.84	21.87
		RB Size=50, RB Offset=24	21.57	21.94	22.05
		RB Size=50, RB Offset=49	21.87	22.19	21.59
		RB Size=100, RB Offset=0	21.61	22.15	21.84
	16QAM	RB Size=1, RB Offset=0	21.85	21.49	21.66
		RB Size=1, RB Offset=49	22.80	22.44	23.29
		RB Size=1, RB Offset=99	21.99	22.78	22.66
		RB Size=50, RB Offset=0	21.54	21.11	21.94
		RB Size=50, RB Offset=24	21.43	21.06	20.87
		RB Size=50, RB Offset=49	21.31	21.60	20.87
		RB Size=100, RB Offset=0	21.10	21.05	21.14

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.14	13	Pass
QPSK (100RB Size)	6.43	13	Pass
16QAM (1RB Size)	6.95	13	Pass
16QAM (100RB Size)	6.84	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	84.52	157	1.1	H	14.5	1.30	9.40	22.60	33
1880.00	83.17	133	1.9	V	12.9	1.30	9.40	21.00	33
3 MHz Bandwidth									
1880.00	84.21	91	2.2	H	14.2	1.30	9.40	22.30	33
1880.00	82.54	106	1.8	V	12.3	1.30	9.40	20.40	33
5 MHz Bandwidth									
1880.00	83.52	91	2.3	H	13.5	1.30	9.40	21.60	33
1880.00	82.23	37	1.9	V	12.0	1.30	9.40	20.10	33
10 MHz Bandwidth									
1880.00	83.14	34	1.5	H	13.1	1.30	9.40	21.20	33
1880.00	81.72	65	1.7	V	11.5	1.30	9.40	19.60	33
15 MHz Bandwidth									
1880.00	82.51	204	1.8	H	12.5	1.30	9.40	20.60	33
1880.00	81.42	14	2.4	V	11.2	1.30	9.40	19.30	33
20 MHz Bandwidth									
1880.00	82.12	140	1.7	H	12.1	1.30	9.40	20.20	33
1880.00	81.26	4	1.3	V	11.0	1.30	9.40	19.10	33

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	84.32	143	1.5	H	14.3	1.30	9.40	22.40	33
1880.00	83.24	339	1.1	V	13.0	1.30	9.40	21.10	33
3 MHz Bandwidth									
1880.00	84.12	201	2.3	H	14.1	1.30	9.40	22.20	33
1880.00	83.02	129	1.8	V	12.8	1.30	9.40	20.90	33
5 MHz Bandwidth									
1880.00	83.65	326	1.9	H	13.6	1.30	9.40	21.70	33
1880.00	82.84	53	2.0	V	12.6	1.30	9.40	20.70	33
10 MHz Bandwidth									
1880.00	83.42	198	1.5	H	13.4	1.30	9.40	21.50	33
1880.00	82.53	32	1.9	V	12.3	1.30	9.40	20.40	33
15 MHz Bandwidth									
1880.00	83.26	280	2.0	H	13.2	1.30	9.40	21.30	33
1880.00	82.27	10	1.4	V	12.0	1.30	9.40	20.10	33
20 MHz Bandwidth									
1880.00	83.15	99	1.5	H	13.1	1.30	9.40	21.20	33
1880.00	82.06	314	1.6	V	11.8	1.30	9.40	19.90	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.00	22.24	22.20
		RB Size=1, RB Offset=2	22.59	22.66	22.80
		RB Size=1, RB Offset=5	22.63	22.80	23.05
		RB Size=3, RB Offset=0	22.65	22.89	23.52
		RB Size=3, RB Offset=1	22.84	23.01	23.00
		RB Size=3, RB Offset=2	22.61	23.06	23.29
		RB Size=6, RB Offset=0	21.37	21.95	22.23
	16QAM	RB Size=1, RB Offset=0	21.22	21.05	21.16
		RB Size=1, RB Offset=2	22.03	22.09	21.98
		RB Size=1, RB Offset=5	21.71	22.16	22.37
		RB Size=3, RB Offset=0	22.70	22.33	21.23
		RB Size=3, RB Offset=1	23.16	21.57	21.80
		RB Size=3, RB Offset=2	22.08	21.97	21.73
		RB Size=6, RB Offset=0	21.01	20.85	21.18
3.0	QPSK	RB Size=1, RB Offset=0	21.97	21.98	22.12
		RB Size=1, RB Offset=7	22.68	23.00	22.66
		RB Size=1, RB Offset=14	23.27	22.74	22.76
		RB Size=8, RB Offset=0	21.45	21.79	22.02
		RB Size=8, RB Offset=4	22.05	21.97	21.83
		RB Size=8, RB Offset=7	21.71	22.14	21.59
		RB Size=15, RB Offset=0	21.64	21.65	21.85
	16QAM	RB Size=1, RB Offset=0	21.20	20.97	21.23
		RB Size=1, RB Offset=7	22.16	21.73	22.10
		RB Size=1, RB Offset=14	22.10	21.85	21.72
		RB Size=8, RB Offset=0	21.03	21.08	21.18
		RB Size=8, RB Offset=4	20.75	21.03	20.88
		RB Size=8, RB Offset=7	21.00	20.82	21.42
		RB Size=15, RB Offset=0	21.13	21.23	20.93

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	21.97	22.08	21.92
		RB Size=1, RB Offset=12	22.96	22.80	23.61
		RB Size=1, RB Offset=24	23.02	22.82	22.85
		RB Size=12, RB Offset=0	21.56	22.16	21.79
		RB Size=12, RB Offset=6	21.78	21.76	22.02
		RB Size=12, RB Offset=11	21.89	21.81	21.85
		RB Size=25, RB Offset=0	22.06	21.84	22.08
	16QAM	RB Size=1, RB Offset=0	21.29	21.73	20.95
		RB Size=1, RB Offset=12	21.54	22.00	21.84
		RB Size=1, RB Offset=24	21.39	22.22	22.24
		RB Size=12, RB Offset=0	20.80	20.89	21.16
		RB Size=12, RB Offset=6	21.18	20.94	21.14
		RB Size=12, RB Offset=11	20.97	20.91	20.73
		RB Size=25, RB Offset=0	20.81	20.94	20.95
10.0	QPSK	RB Size=1, RB Offset=0	21.81	22.20	22.21
		RB Size=1, RB Offset=24	23.00	23.14	22.88
		RB Size=1, RB Offset=49	22.88	22.96	22.44
		RB Size=25, RB Offset=0	21.76	21.75	21.68
		RB Size=25, RB Offset=12	21.86	21.95	21.56
		RB Size=25, RB Offset=24	21.56	21.80	21.79
		RB Size=50, RB Offset=0	21.94	21.44	22.08
	16QAM	RB Size=1, RB Offset=0	20.75	38.84	21.18
		RB Size=1, RB Offset=24	22.68	22.66	22.82
		RB Size=1, RB Offset=49	22.54	22.55	23.00
		RB Size=25, RB Offset=0	21.03	21.32	20.62
		RB Size=25, RB Offset=12	21.19	20.98	20.85
		RB Size=25, RB Offset=24	20.91	20.87	21.10
		RB Size=50, RB Offset=0	21.35	21.27	21.00

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	21.57	21.68	21.85
		RB Size=1, RB Offset=37	22.40	22.77	23.26
		RB Size=1, RB Offset=74	23.26	22.98	22.94
		RB Size=36, RB Offset=0	21.51	21.75	21.48
		RB Size=36, RB Offset=18	21.99	21.99	22.19
		RB Size=36, RB Offset=37	22.43	22.23	21.61
		RB Size=75, RB Offset=0	21.81	22.27	21.65
	16QAM	RB Size=1, RB Offset=0	20.87	21.08	21.47
		RB Size=1, RB Offset=37	21.88	21.81	21.52
		RB Size=1, RB Offset=74	22.24	21.50	22.20
		RB Size=36, RB Offset=0	21.23	21.11	21.20
		RB Size=36, RB Offset=18	21.13	20.80	21.40
		RB Size=36, RB Offset=37	20.73	20.85	20.85
		RB Size=75, RB Offset=0	20.82	21.05	22.98
20.0	QPSK	RB Size=1, RB Offset=0	22.00	22.05	22.05
		RB Size=1, RB Offset=49	22.75	22.65	22.90
		RB Size=1, RB Offset=99	22.80	22.75	22.96
		RB Size=50, RB Offset=0	22.38	21.57	21.68
		RB Size=50, RB Offset=24	21.66	21.70	22.29
		RB Size=50, RB Offset=49	22.18	22.19	21.62
		RB Size=100, RB Offset=0	21.39	22.35	21.87
	16QAM	RB Size=1, RB Offset=0	21.08	26.56	21.30
		RB Size=1, RB Offset=49	22.74	22.23	23.22
		RB Size=1, RB Offset=99	21.86	23.08	23.03
		RB Size=50, RB Offset=0	21.24	21.23	22.27
		RB Size=50, RB Offset=24	20.96	20.74	20.96
		RB Size=50, RB Offset=49	21.32	21.47	21.23
		RB Size=100, RB Offset=0	21.14	20.83	20.93

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.23	13	Pass
QPSK (100RB Size)	6.43	13	Pass
16QAM (1RB Size)	5.24	13	Pass
16QAM (100RB Size)	5.75	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.51	155	1.7	H	14.3	1.30	8.90	21.90	30
1732.50	85.34	12	1.6	V	12.8	1.30	8.90	20.40	30
3 MHz Bandwidth									
1732.50	87.15	250	2.2	H	14.0	1.30	8.90	21.60	30
1732.50	85.21	205	1.2	V	12.6	1.30	8.90	20.20	30
5 MHz Bandwidth									
1732.50	86.78	257	2.3	H	13.6	1.30	8.90	21.20	30
1732.50	85.07	196	1.2	V	12.5	1.30	8.90	20.10	30
10 MHz Bandwidth									
1732.50	85.48	159	1.3	H	12.3	1.30	8.90	19.90	30
1732.50	84.68	228	1.5	V	12.1	1.30	8.90	19.70	30
15 MHz Bandwidth									
1732.50	85.21	244	2.4	H	12.0	1.30	8.90	19.60	30
1732.50	84.42	212	2.0	V	11.9	1.30	8.90	19.50	30
20 MHz Bandwidth									
1732.50	85.07	273	1.1	H	11.9	1.30	8.90	19.50	30
1732.50	84.13	158	2.0	V	11.6	1.30	8.90	19.20	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 (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	86.71	15	2.1	H	13.5	1.30	8.90	21.10	30
1732.50	85.86	186	2.1	V	13.3	1.30	8.90	20.90	30
3 MHz Bandwidth									
1732.50	86.42	245	1.5	H	13.3	1.30	8.90	20.90	30
1732.50	85.52	1	1.8	V	13.0	1.30	8.90	20.60	30
5 MHz Bandwidth									
1732.50	86.21	181	1.3	H	13.0	1.30	8.90	20.60	30
1732.50	85.27	7	1.3	V	12.7	1.30	8.90	20.30	30
10 MHz Bandwidth									
1732.50	86.04	317	1.3	H	12.9	1.30	8.90	20.50	30
1732.50	85.03	159	2.2	V	12.5	1.30	8.90	20.10	30
15 MHz Bandwidth									
1732.50	85.83	198	1.9	H	12.7	1.30	8.90	20.30	30
1732.50	84.76	285	1.2	V	12.2	1.30	8.90	19.80	30
20 MHz Bandwidth									
1732.50	85.42	166	2.4	H	12.3	1.30	8.90	19.90	30
1732.50	84.31	96	2.1	V	11.7	1.30	8.90	19.30	30

LTE Band 5:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.28	22.44	22.42
		RB Size=1, RB Offset=2	22.90	22.69	23.08
		RB Size=1, RB Offset=5	22.87	23.31	23.24
		RB Size=3, RB Offset=0	21.88	22.15	22.34
		RB Size=3, RB Offset=1	22.07	22.09	21.88
		RB Size=3, RB Offset=2	22.09	22.13	21.52
		RB Size=6, RB Offset=0	22.00	21.95	22.00
	16QAM	RB Size=1, RB Offset=0	21.45	27.36	21.51
		RB Size=1, RB Offset=2	22.96	21.92	23.25
		RB Size=1, RB Offset=5	23.36	21.96	23.15
		RB Size=3, RB Offset=0	21.90	20.94	22.14
		RB Size=3, RB Offset=1	22.17	22.27	22.11
		RB Size=3, RB Offset=2	22.04	21.14	21.85
		RB Size=6, RB Offset=0	21.25	20.88	21.18
3.0	QPSK	RB Size=1, RB Offset=0	22.19	22.41	22.69
		RB Size=1, RB Offset=7	23.20	22.65	22.86
		RB Size=1, RB Offset=14	23.21	22.66	23.15
		RB Size=8, RB Offset=0	22.15	22.06	22.46
		RB Size=8, RB Offset=4	22.30	21.93	22.43
		RB Size=8, RB Offset=7	22.21	22.18	22.60
		RB Size=15, RB Offset=0	22.71	21.86	21.89
	16QAM	RB Size=1, RB Offset=0	21.40	40.70	21.54
		RB Size=1, RB Offset=7	22.40	22.51	22.40
		RB Size=1, RB Offset=14	21.82	22.74	22.35
		RB Size=8, RB Offset=0	21.45	21.73	21.78
		RB Size=8, RB Offset=4	21.90	21.32	21.35
		RB Size=8, RB Offset=7	21.25	21.59	21.71
		RB Size=15, RB Offset=0	21.74	21.00	21.26

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	22.51	22.10	22.27
		RB Size=1, RB Offset=12	22.47	22.63	22.61
		RB Size=1, RB Offset=24	22.38	23.14	22.74
		RB Size=12, RB Offset=0	22.18	22.15	22.06
		RB Size=12, RB Offset=6	22.37	22.42	22.49
		RB Size=12, RB Offset=11	22.56	22.77	22.63
		RB Size=25, RB Offset=0	22.62	22.76	23.00
	16QAM	RB Size=1, RB Offset=0	21.56	23.07	21.87
		RB Size=1, RB Offset=12	22.24	22.28	22.29
		RB Size=1, RB Offset=24	21.63	21.84	21.27
		RB Size=12, RB Offset=0	21.69	22.04	22.32
		RB Size=12, RB Offset=6	21.43	21.68	21.83
		RB Size=12, RB Offset=11	22.41	21.70	22.11
		RB Size=25, RB Offset=0	20.77	21.29	22.07
10.0	QPSK	RB Size=1, RB Offset=0	22.66	22.33	22.50
		RB Size=1, RB Offset=24	22.99	23.10	23.16
		RB Size=1, RB Offset=49	22.62	22.82	22.82
		RB Size=25, RB Offset=0	21.38	22.71	23.22
		RB Size=25, RB Offset=12	22.55	22.93	22.79
		RB Size=25, RB Offset=24	21.64	22.68	22.76
		RB Size=50, RB Offset=0	22.80	22.23	22.87
	16QAM	RB Size=1, RB Offset=0	21.75	23.29	21.66
		RB Size=1, RB Offset=24	22.63	23.02	22.88
		RB Size=1, RB Offset=49	22.86	23.31	23.23
		RB Size=25, RB Offset=0	21.80	21.78	23.20
		RB Size=25, RB Offset=12	21.89	22.01	22.92
		RB Size=25, RB Offset=24	21.62	22.02	22.30
		RB Size=50, RB Offset=0	22.19	21.10	22.12

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.35	13	Pass
QPSK (100RB Size)	6.37	13	Pass
16QAM (1RB Size)	7.64	13	Pass
16QAM (100RB Size)	7.45	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.60	84.58	157	2.2	H	22.6	0.70	0.0	21.90	38.45
836.60	81.87	270	1.6	V	21.9	0.70	0.0	21.20	38.45
3 MHz Bandwidth									
836.60	84.21	151	2.0	H	22.2	0.70	0.0	21.50	38.45
836.60	81.45	319	1.5	V	21.5	0.70	0.0	20.80	38.45
5 MHz Bandwidth									
836.60	84.03	243	2.3	H	22.0	0.70	0.0	21.30	38.45
836.60	81.02	344	1.0	V	21.0	0.70	0.0	20.30	38.45
10 MHz Bandwidth									
836.60	83.54	11	2.1	H	21.5	0.70	0.0	20.80	38.45
836.60	80.84	36	2.5	V	20.8	0.70	0.0	20.10	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dBi)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.60	84.42	347	2.2	H	22.4	0.70	0.0	21.70	38.45
836.60	82.21	78	2.0	V	22.2	0.70	0.0	21.50	38.45
3 MHz Bandwidth									
836.60	84.21	347	1.5	H	22.2	0.70	0.0	21.50	38.45
836.60	81.52	351	2.1	V	21.5	0.70	0.0	20.80	38.45
5 MHz Bandwidth									
836.60	84.03	236	2.1	H	22.0	0.70	0.0	21.30	38.45
836.60	81.25	29	1.3	V	21.3	0.70	0.0	20.60	38.45
10 MHz Bandwidth									
836.60	83.65	356	2.3	H	21.7	0.70	0.0	21.00	38.45
836.60	81.12	3	1.4	V	21.1	0.70	0.0	20.40	38.45

LTE Band 12:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.72	22.69	22.82
		RB Size=1, RB Offset=2	22.81	22.75	23.02
		RB Size=1, RB Offset=5	23.48	22.85	23.20
		RB Size=3, RB Offset=0	21.97	21.80	22.25
		RB Size=3, RB Offset=1	22.14	22.48	22.06
		RB Size=3, RB Offset=2	21.69	22.33	21.52
		RB Size=6, RB Offset=0	21.76	22.08	22.07
	16QAM	RB Size=1, RB Offset=0	21.86	21.99	21.94
		RB Size=1, RB Offset=2	22.03	22.19	21.85
		RB Size=1, RB Offset=5	22.26	21.85	22.03
		RB Size=3, RB Offset=0	20.81	21.22	21.47
		RB Size=3, RB Offset=1	20.96	21.35	21.08
		RB Size=3, RB Offset=2	21.17	20.81	21.72
		RB Size=6, RB Offset=0	21.42	20.87	21.32
3.0	QPSK	RB Size=1, RB Offset=0	22.83	22.88	22.71
		RB Size=1, RB Offset=7	23.19	22.80	23.67
		RB Size=1, RB Offset=14	23.25	22.85	22.86
		RB Size=8, RB Offset=0	21.97	22.35	22.21
		RB Size=8, RB Offset=4	21.73	21.93	21.97
		RB Size=8, RB Offset=7	22.04	22.10	21.82
		RB Size=15, RB Offset=0	21.66	21.69	22.30
	16QAM	RB Size=1, RB Offset=0	21.81	21.58	21.76
		RB Size=1, RB Offset=7	21.75	22.38	22.08
		RB Size=1, RB Offset=14	21.59	22.29	22.48
		RB Size=8, RB Offset=0	20.93	21.05	21.39
		RB Size=8, RB Offset=4	21.11	20.89	21.15
		RB Size=8, RB Offset=7	21.36	21.23	21.26
		RB Size=15, RB Offset=0	20.96	21.15	20.91

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	22.94	22.66	22.56
		RB Size=1, RB Offset=12	23.41	23.25	23.15
		RB Size=1, RB Offset=24	22.80	22.98	22.57
		RB Size=12, RB Offset=0	21.90	22.28	21.87
		RB Size=12, RB Offset=6	22.02	21.96	21.61
		RB Size=12, RB Offset=11	21.66	22.04	21.75
		RB Size=25, RB Offset=0	21.95	21.95	22.03
	16QAM	RB Size=1, RB Offset=0	22.01	21.57	21.87
		RB Size=1, RB Offset=12	23.28	22.95	23.16
		RB Size=1, RB Offset=24	22.93	22.76	23.26
		RB Size=12, RB Offset=0	20.98	21.47	20.68
		RB Size=12, RB Offset=6	21.22	20.83	20.87
		RB Size=12, RB Offset=11	21.14	20.97	21.14
		RB Size=25, RB Offset=0	21.17	21.58	21.23
10.0	QPSK	RB Size=1, RB Offset=0	22.85	22.79	22.62
		RB Size=1, RB Offset=24	23.42	23.39	22.89
		RB Size=1, RB Offset=49	23.00	23.30	22.47
		RB Size=25, RB Offset=0	22.15	22.31	22.05
		RB Size=25, RB Offset=12	22.07	22.25	21.53
		RB Size=25, RB Offset=24	21.60	21.93	21.85
		RB Size=50, RB Offset=0	21.90	21.82	22.17
	16QAM	RB Size=1, RB Offset=0	21.91	21.77	21.61
		RB Size=1, RB Offset=24	23.24	22.60	23.21
		RB Size=1, RB Offset=49	22.97	22.82	23.43
		RB Size=25, RB Offset=0	20.91	21.54	20.92
		RB Size=25, RB Offset=12	20.93	20.86	20.93
		RB Size=25, RB Offset=24	21.16	20.86	21.35
		RB Size=50, RB Offset=0	21.35	21.30	21.29

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.34	13	Pass
QPSK (100RB Size)	6.38	13	Pass
16QAM (1RB Size)	7.56	13	Pass
16QAM (100RB Size)	7.42	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
707.50	88.52	199	1.9	H	22.5	0.62	0.0	21.88	30
707.50	87.62	78	2.4	V	21.6	0.62	0.0	20.98	30
3 MHz Bandwidth									
707.50	88.24	61	2.0	H	22.2	0.62	0.0	21.58	30
707.50	87.32	188	2.3	V	21.3	0.62	0.0	20.68	30
5 MHz Bandwidth									
707.50	87.52	69	2.4	H	21.5	0.62	0.0	20.88	30
707.50	86.54	224	1.9	V	20.5	0.62	0.0	19.88	30
10 MHz Bandwidth									
707.50	87.24	312	2.0	H	21.2	0.62	0.0	20.58	30
707.50	86.16	346	1.3	V	20.2	0.62	0.0	19.58	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 (dBi)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
707.50	88.48	194	2.4	H	22.5	0.62	0.0	21.88	30
707.50	87.26	319	1.7	V	21.3	0.62	0.0	20.68	30
3 MHz Bandwidth									
707.50	88.21	301	1.7	H	22.2	0.62	0.0	21.58	30
707.50	86.86	333	1.7	V	20.9	0.62	0.0	20.28	30
5 MHz Bandwidth									
707.50	87.75	91	1.4	H	21.8	0.62	0.0	21.18	30
707.50	86.57	327	2.0	V	20.6	0.62	0.0	19.98	30
10 MHz Bandwidth									
707.50	87.27	229	2.0	H	21.3	0.62	0.0	20.68	30
707.50	86.13	244	2.4	V	20.1	0.62	0.0	19.48	30

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.

```
┌─────────┐      ┌──────────┐        ┌──────────────────┐
│   EUT   │──────│ Splitter │────────│  Signal Analyzer │
└─────────┘      └──────────┘        └──────────────────┘
                      │
                 ┌──────────────┐
                 │ Universal Radio │
                 │ Communication   │
                 │    Tester       │
                 └──────────────┘
```
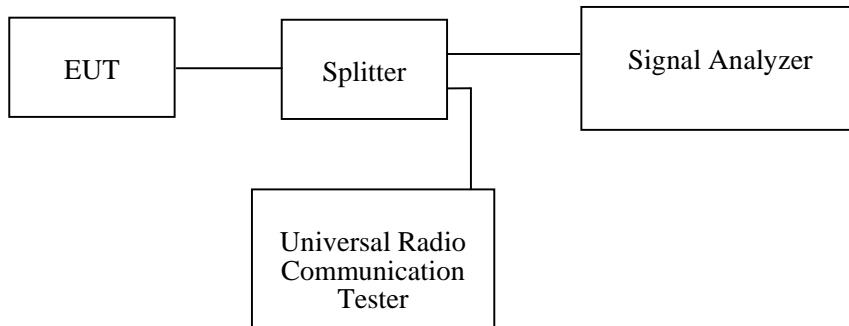
Test Data

Environmental Conditions

Temperature:	25~26 ℃
Relative Humidity:	52~53 %
ATM Pressure:	101.0~101.2 kPa

The testing was performed by Haiguo Li from 2018-09-19 to 2018-10-15.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	245.19	312.50
EGPRS(8PSK)	836.6	244.57	318.40

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.171	4.711
HSUPA (BPSK)	836.6	4.215	5.657
HSDPA (16QAM)	836.6	4.231	5.545

PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	245.71	317.31
EGPRS(8PSK)	1880.0	244.29	310.05

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.167	4.728
HSUPA (BPSK)	1880.0	4.153	4.689
HSDPA (16QAM)	1880.0	4.186	4.725

Cellular Band (Part 22H)
26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode
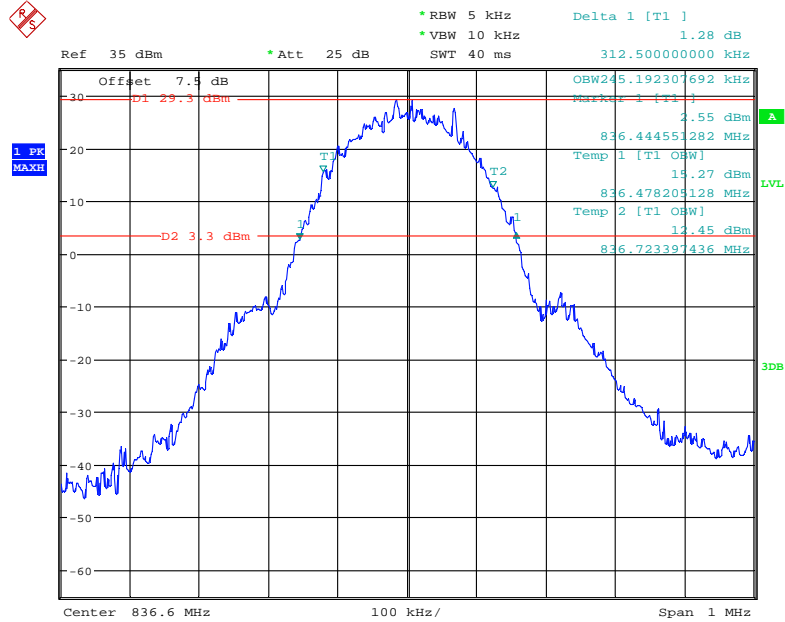
Date: 28.SEP.2018 15:01:20

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode
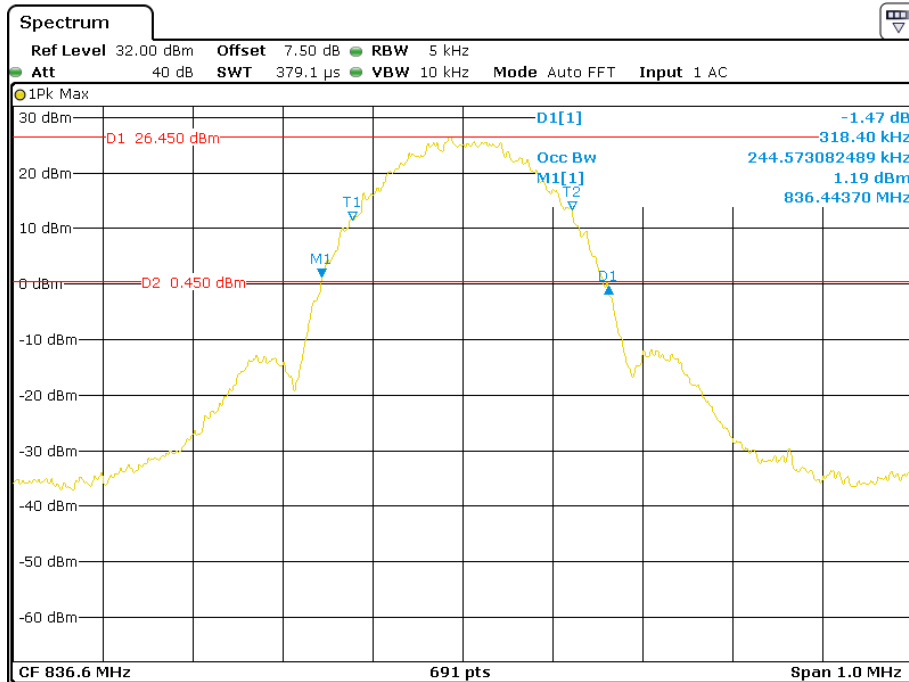
Date: 30.SEP.2018 16:17:22

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode
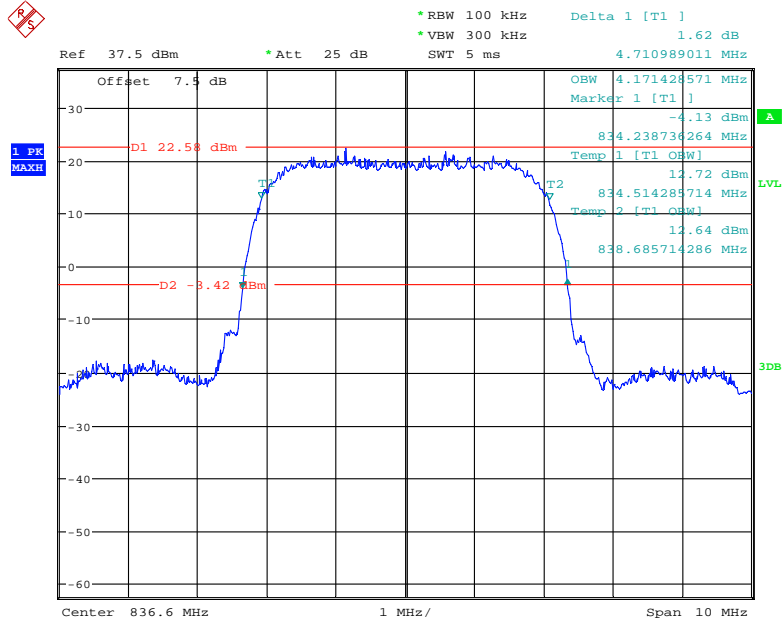
Date: 20.SEP.2018 16:24:09

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode
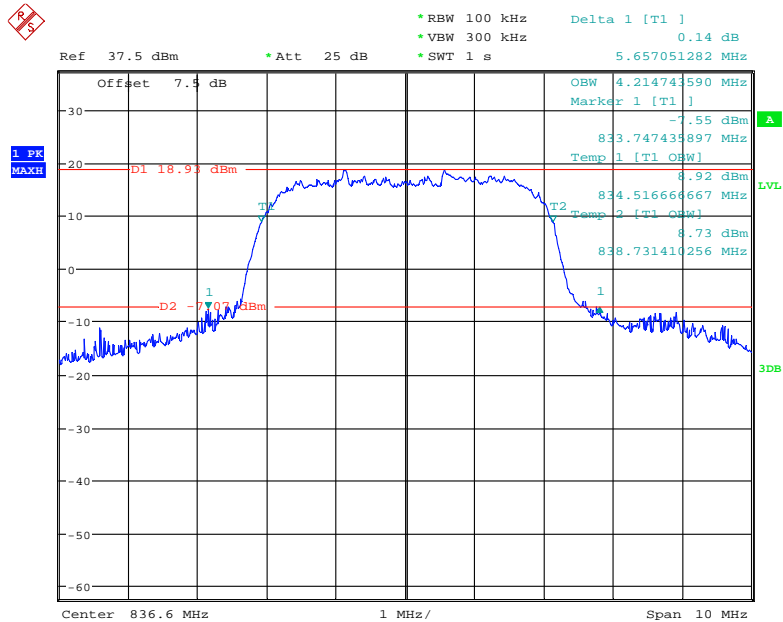
Date: 28.SEP.2018 15:20:18

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode
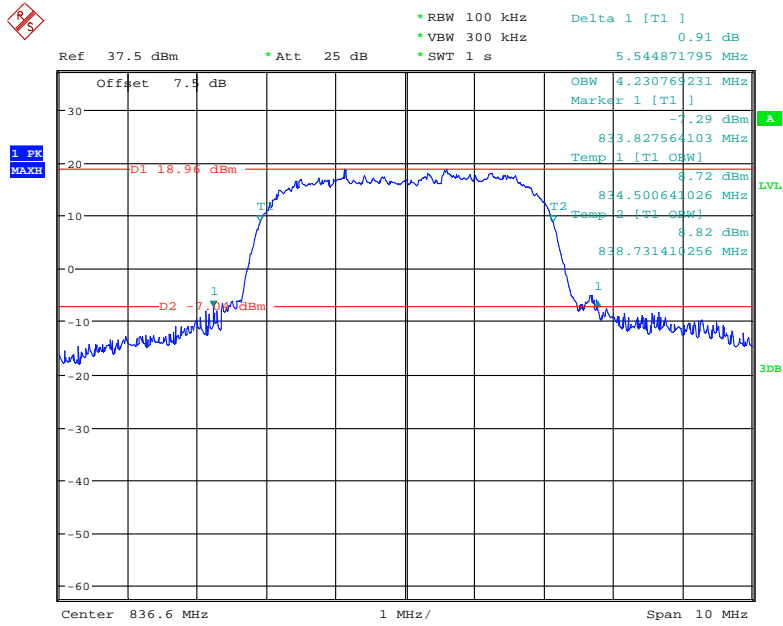
Date: 28.SEP.2018 15:21:57

PCS Band (Part 24E)
26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode
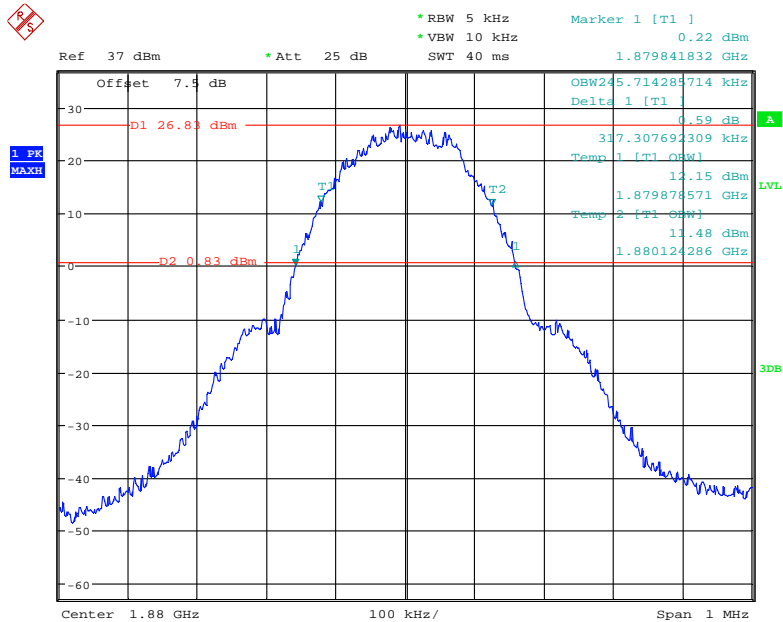
Date: 20.SEP.2018 14:46:01

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode
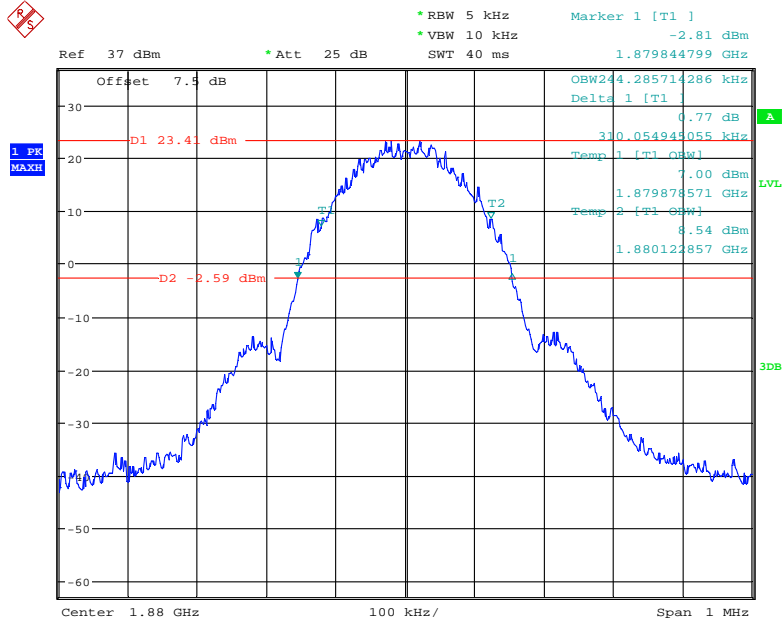
Date: 20.SEP.2018 14:52:11

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode
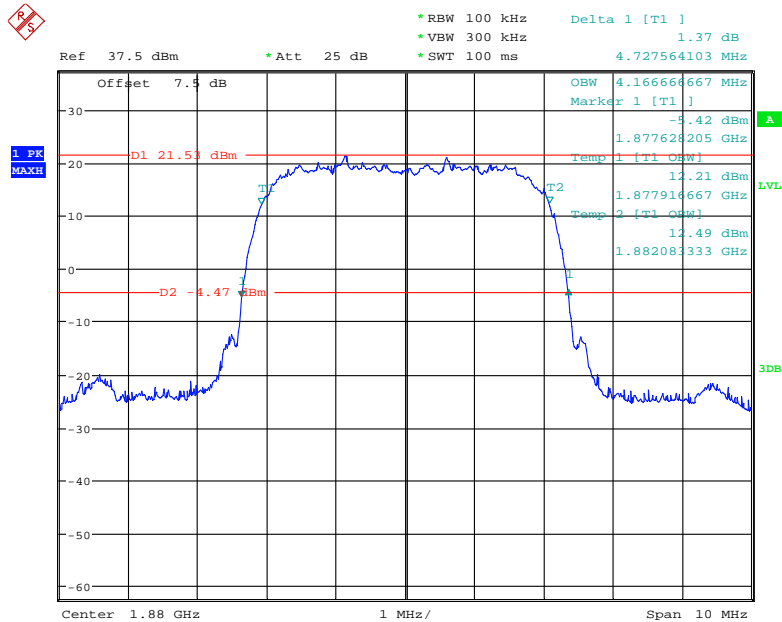
Date: 28.SEP.2018 15:10:21

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode
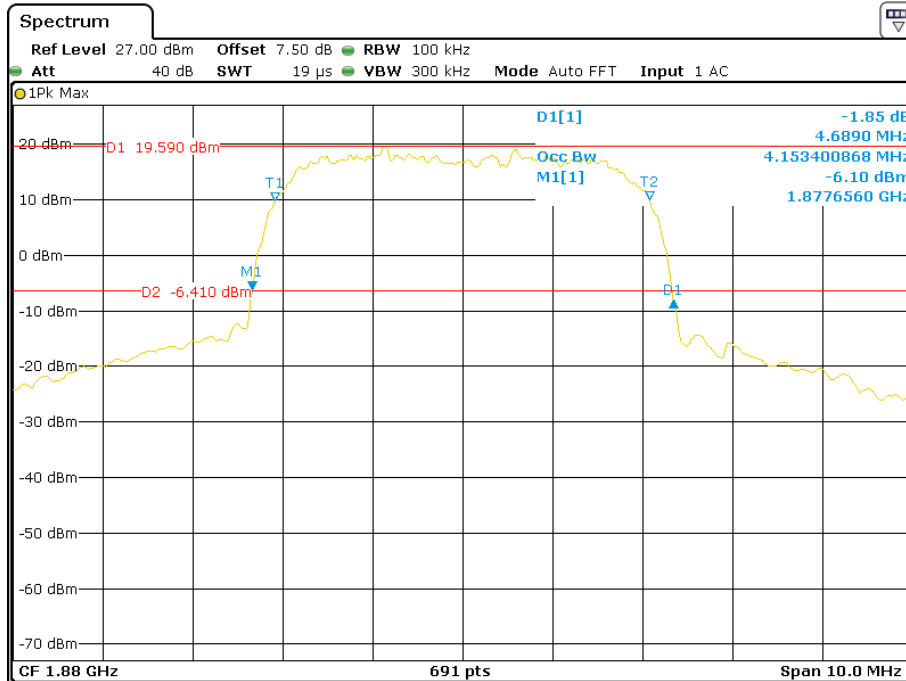
Date: 15.OCT.2018 16:11:10

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode
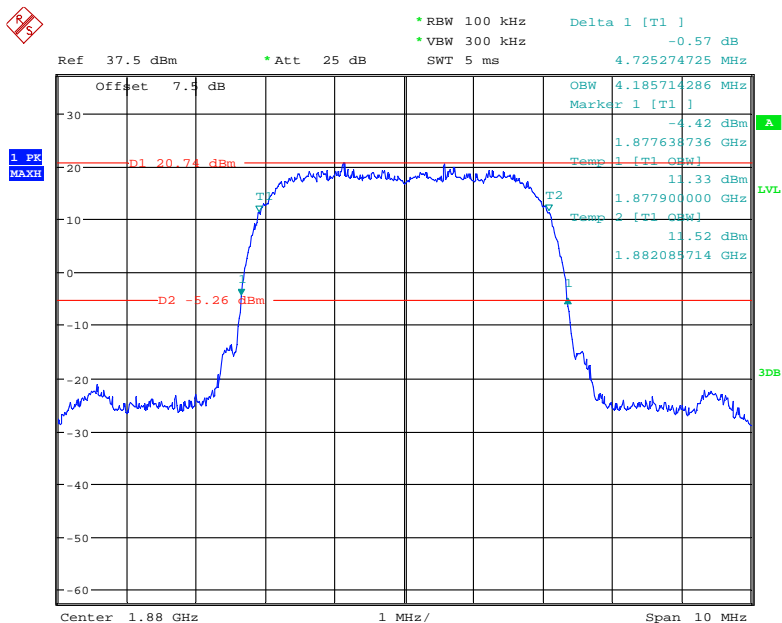
Date: 20.SEP.2018 16:17:10

LTE Band 2: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.308
	16QAM	1.106	1.322
3.0	QPSK	2.683	2.875
	16QAM	2.683	2.894
5.0	QPSK	4.503	5.032
	16QAM	4.503	5.064
10.0	QPSK	9.006	10.096
	16QAM	8.974	9.872
15.0	QPSK	13.558	15.000
	16QAM	13.510	14.952
20.0	QPSK	17.949	19.615
	16QAM	17.949	19.615

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

Date: 19.SEP.2018 08:52:48

16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
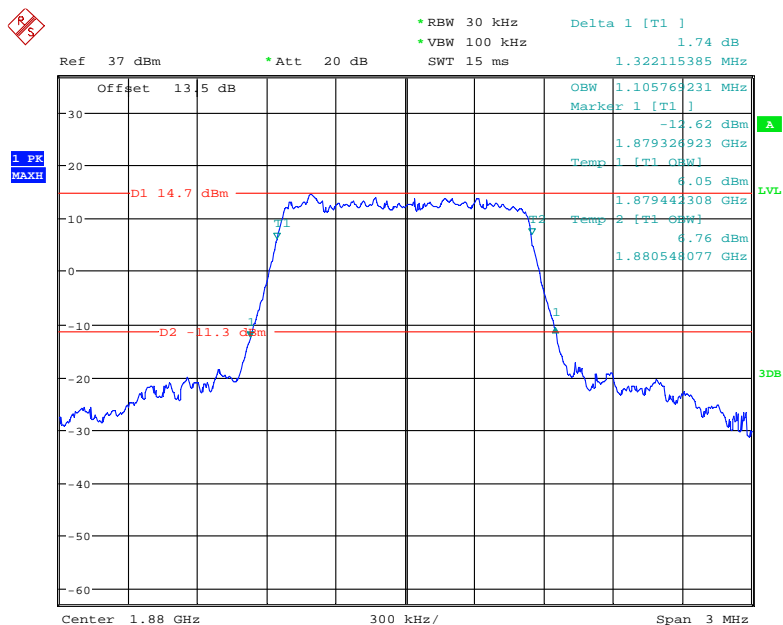
Date: 19.SEP.2018 08:55:34

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

```
                                    *RBW 30 kHz      Delta 1 [T1 ]
                                    *VBW 100 kHz             1.34 dB
     Ref  37 dBm        *Att  20 dB  SWT 30 ms        2.875000000 MHz
       Offset  13.5 dB                          OBW  2.682692308 MHz
                                                Marker 1 [T1 ]
    30                                                  -13.17 dBm     A
                                                   1.878557692 GHz
                                                Temp 1 [T1 OBW]
    20                                                    7.27 dBm     LVL
                                                   1.878663462 GHz
   D1 13.21 dBm                            T2 Temp 2 [T1 OBW]
    10                                                    8.36 dBm
                                                   1.881346154 GHz
     0

   -10   -D2 -12.79 dBm
                                                                       3DB
   -20

   -30

   -40

   -50

   -60
    Center  1.88 GHz              600 kHz/              Span  6 MHz
```

    Date: 19.SEP.2018 08:57:57

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

```
                                    *RBW 30 kHz      Delta 1 [T1 ]
                                    *VBW 100 kHz             0.67 dB
     Ref  37 dBm        *Att  20 dB  SWT 30 ms        2.894230769 MHz
       Offset  13.5 dB                          OBW  2.682692308 MHz
                                                Marker 1 [T1 ]
    30                                                  -15.02 dBm     A
                                                   1.878557692 GHz
                                                Temp 1 [T1 OBW]
    20                                                    6.80 dBm     LVL
                                                   1.878663462 GHz
   D1 11.64 dBm                            T2 Temp 2 [T1 OBW]
    10                                                    7.07 dBm
                                                   1.881346154 GHz
     0

   -10
         -D2 -14.36 dBm
                                                                       3DB
   -20

   -40

   -50

   -60
    Center  1.88 GHz              600 kHz/              Span  6 MHz
```

    Date: 19.SEP.2018 08:59:04

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

Date: 19.SEP.2018 09:03:49

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

Date: 19.SEP.2018 09:01:07

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

Date: 19.SEP.2018 09:11:38

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

Date: 19.SEP.2018 09:13:36

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

Date: 19.SEP.2018 09:17:00

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

Date: 19.SEP.2018 09:15:59

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

Date: 19.SEP.2018 09:20:38

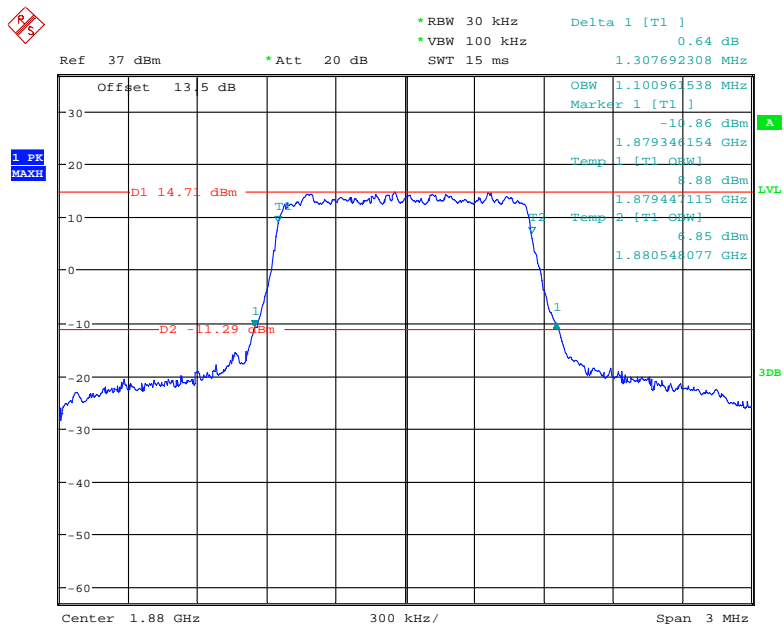## 16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 19.SEP.2018 09:28:23

LTE Band 4: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.322
	16QAM	1.106	1.317
3.0	QPSK	2.683	2.885
	16QAM	2.683	2.894
5.0	QPSK	4.487	4.968
	16QAM	4.487	5.016
10.0	QPSK	8.974	9.968
	16QAM	8.974	9.776
15.0	QPSK	13.510	14.760
	16QAM	13.462	14.952
20.0	QPSK	17.949	19.551
	16QAM	18.013	19.551

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

```
                                    * RBW 30 kHz      Delta 1 [T1 ]
                                    * VBW 100 kHz                2.35 dB
     Ref   37 dBm        * Att  20 dB   SWT 15 ms     1.322115385 MHz
        Offset  13.5 dB                           OBW 1.100961538 MHz
                                                  Marker 1 [T1 ]
   -30                                                     -12.85 dBm    A
                                                     1.731836538 GHz
                                                  Temp 1 [T1 OBW]
   -20                                                       9.06 dBm    LVL
                                                     1.731947115 GHz
   D1 14.94 dBm                                   Temp 2 [T1 OBW]
   -10                                                       7.48 dBm
                                                     1.733048077 GHz
     0

   -10
   D2 -11.06 dBm
   -20                                                                   3DB

   -30

   -40

   -50

   -60
     Center  1.7325 GHz            300 kHz/                Span  3 MHz
```

Date: 19.SEP.2018 09:31:22

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

```
                                    * RBW 30 kHz      Delta 1 [T1 ]
                                    * VBW 100 kHz                1.34 dB
     Ref   37 dBm        * Att  20 dB   SWT 15 ms     1.317307692 MHz
        Offset  13.5 dB                           OBW 1.105769231 MHz
                                                  Marker 1 [T1 ]
   -30                                                     -11.87 dBm    A
                                                     1.731831731 GHz
                                                  Temp 1 [T1 OBW]
   -20                                                       5.96 dBm    LVL
                                                     1.731942308 GHz
   D1 14.75 dBm                                   Temp 2 [T1 OBW]
   -10                                                       6.92 dBm
                                                     1.733048077 GHz
     0

   -10
   D2 -11.25 dBm
   -20                                                                   3DB

   -30

   -40

   -50

   -60
     Center  1.7325 GHz            300 kHz/                Span  3 MHz
```
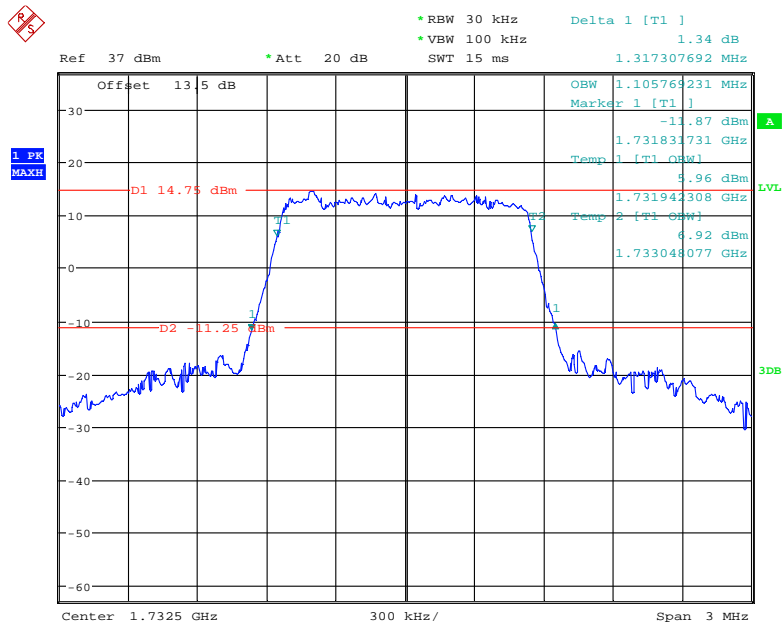
Date: 19.SEP.2018 09:30:20

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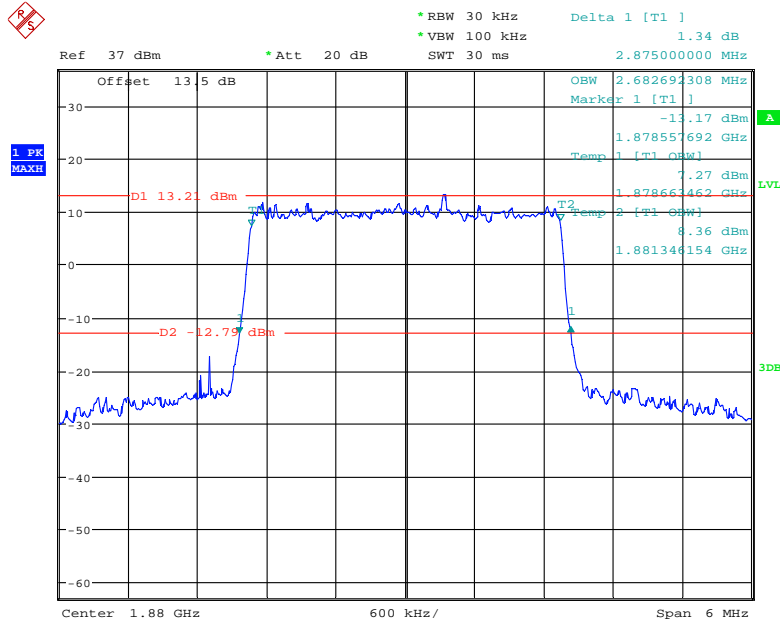

Date: 19.SEP.2018 09:34:48

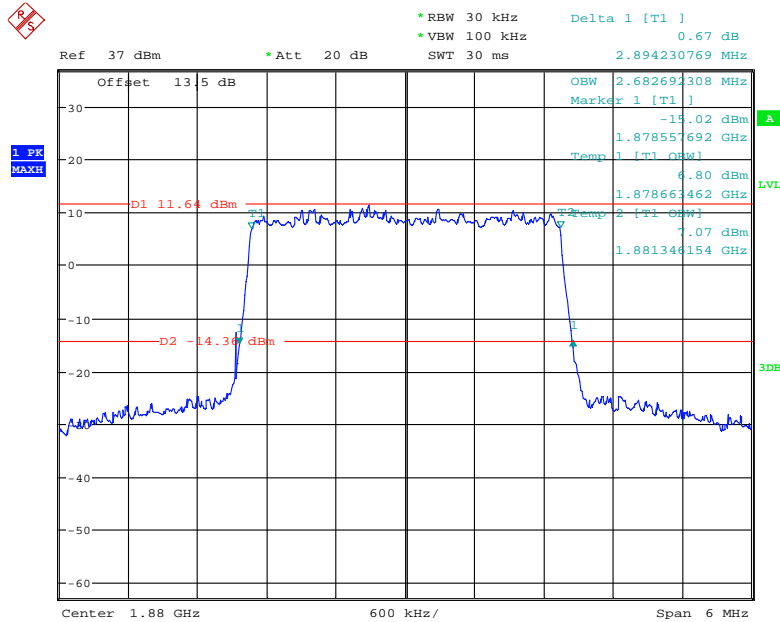## 16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 19.SEP.2018 09:32:16

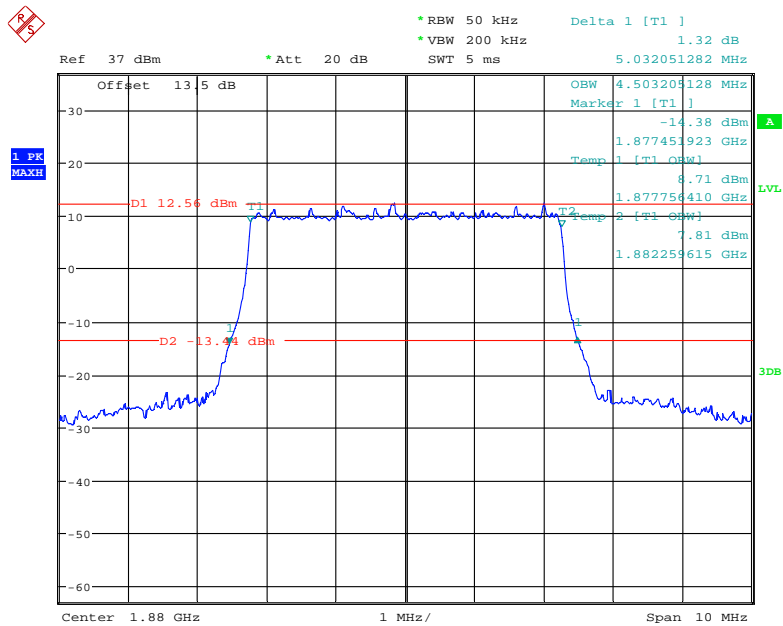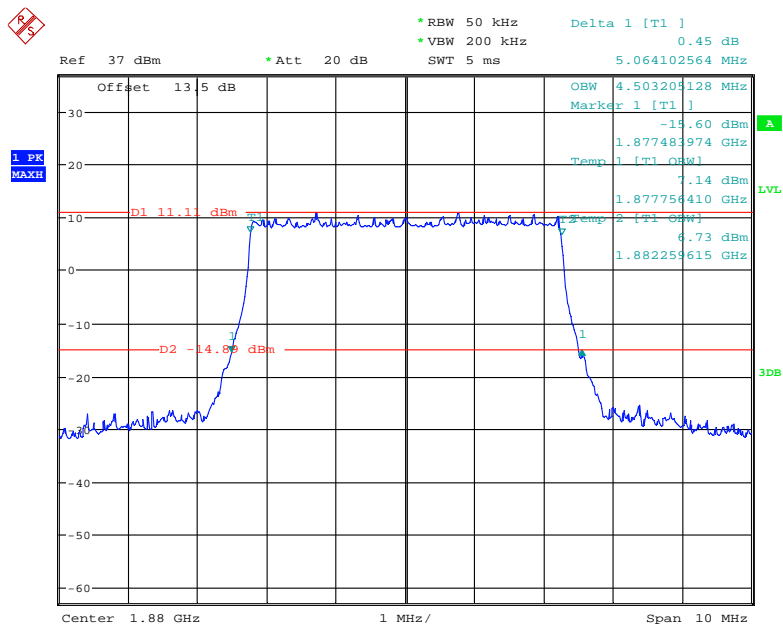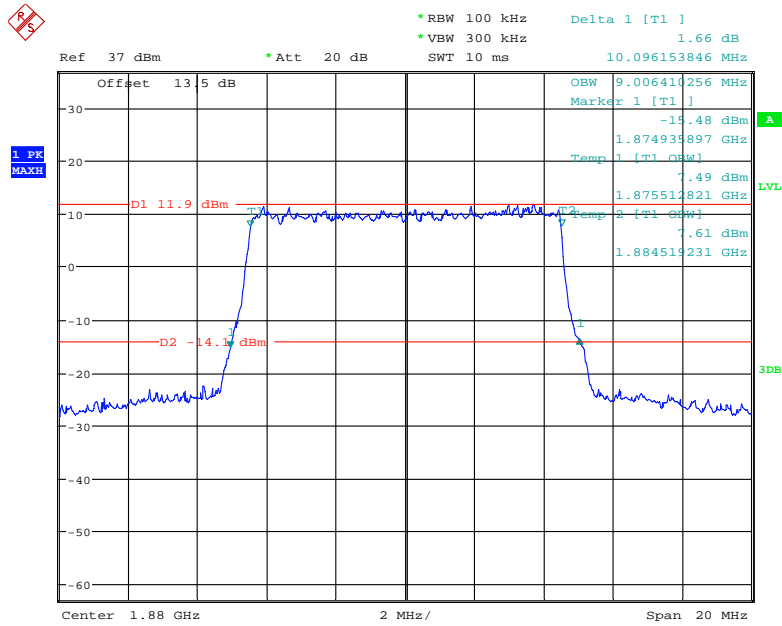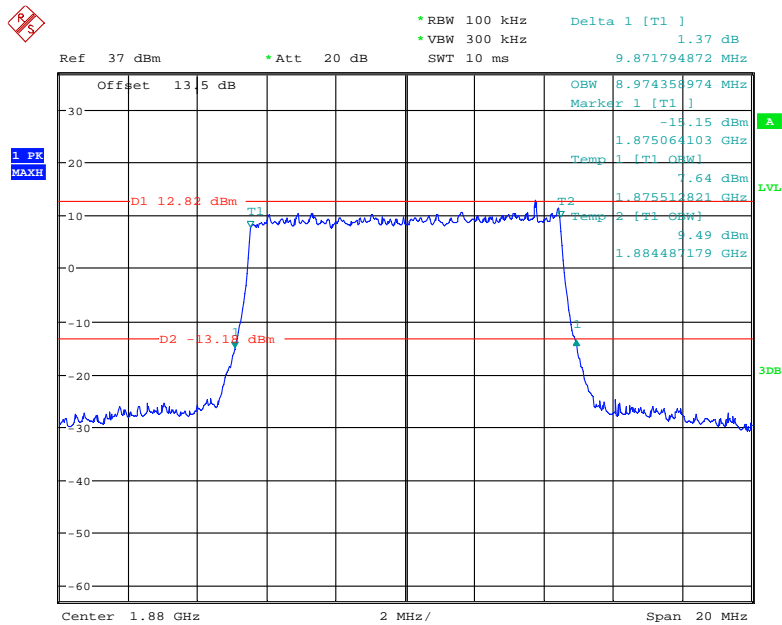## QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
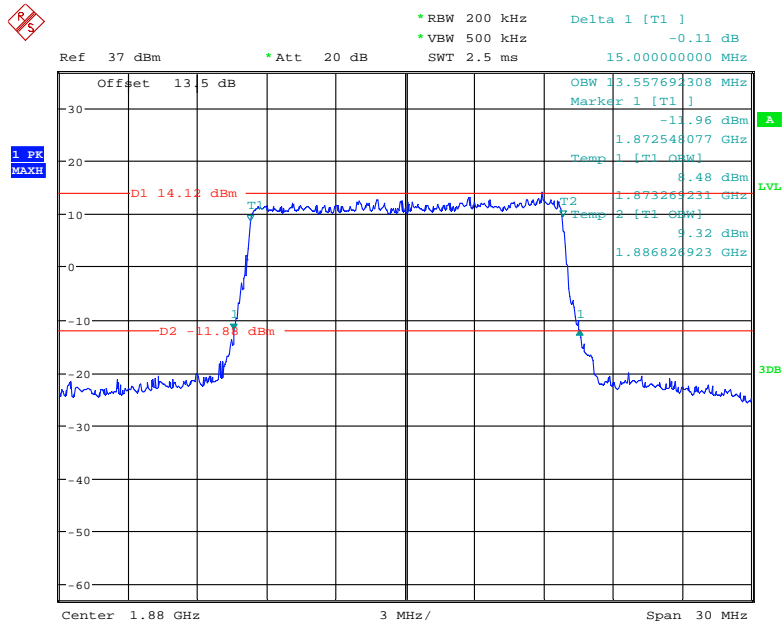

Date: 19.SEP.2018 09:36:04

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

Date: 19.SEP.2018 09:37:42

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

Date: 19.SEP.2018 09:51:55

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

Date: 19.SEP.2018 09:44:50

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

Date: 19.SEP.2018 09:52:52

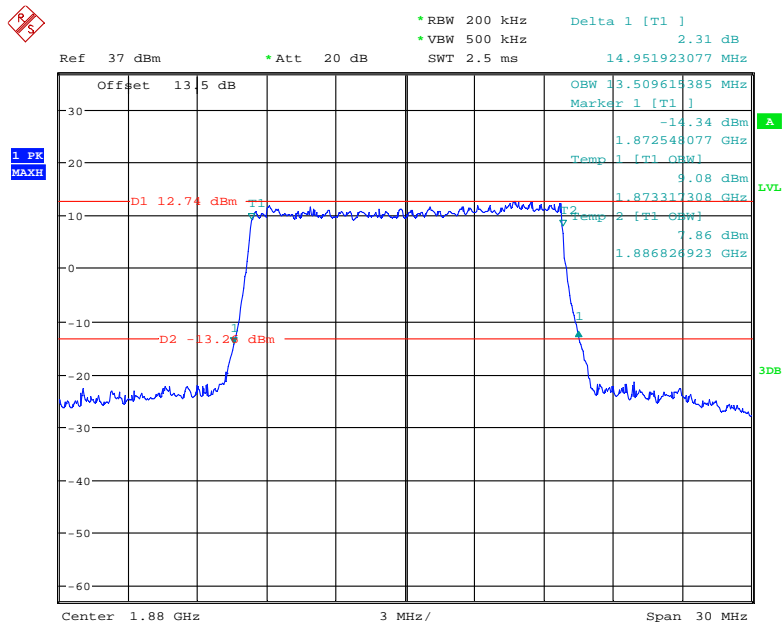## 16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 19.SEP.2018 09:54:30

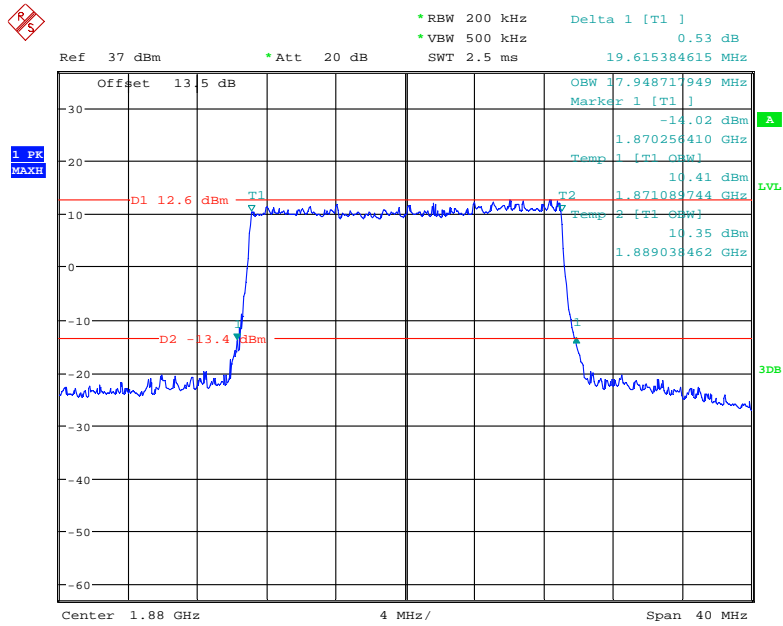## QPSK (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 19.SEP.2018 09:57:10

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

Date: 19.SEP.2018 09:56:13

LTE Band 5: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.317
	16QAM	1.111	1.337
3.0	QPSK	2.683	2.875
	16QAM	2.683	2.894
5.0	QPSK	4.503	4.968
	16QAM	4.486	5.007
10.0	QPSK	8.974	9.904
	16QAM	8.942	9.776

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

Date: 19.SEP.2018 09:58:50

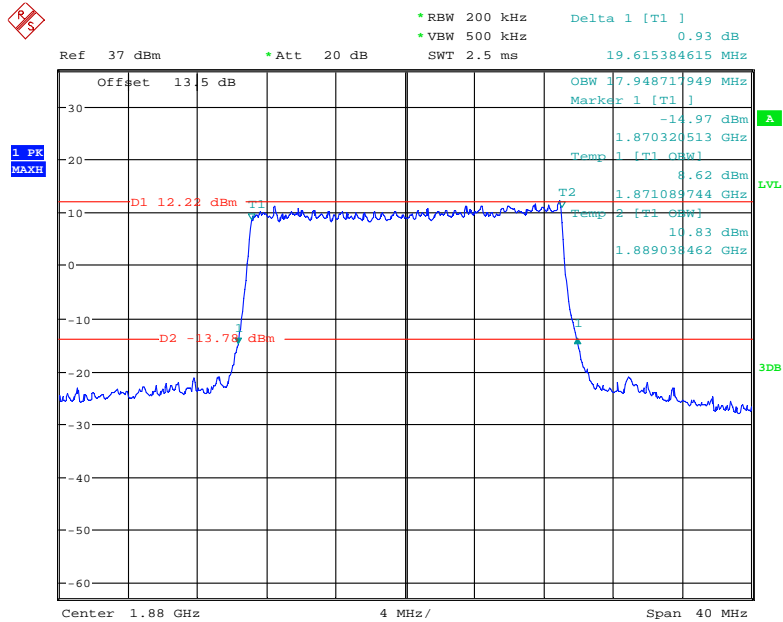## 16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
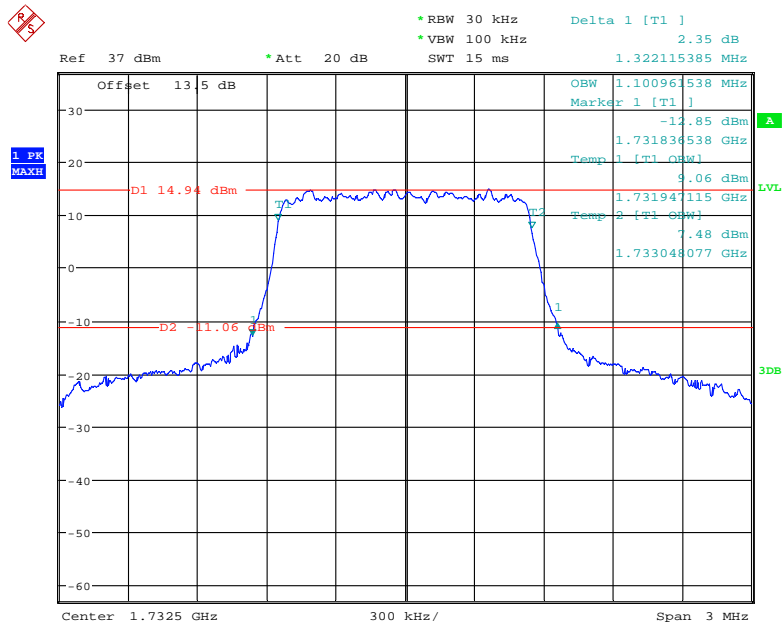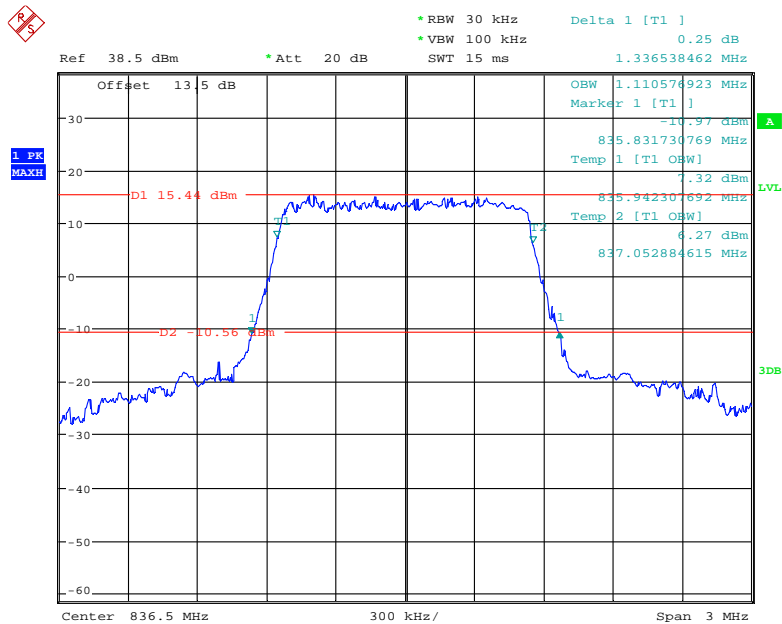

Date: 19.SEP.2018 09:59:47

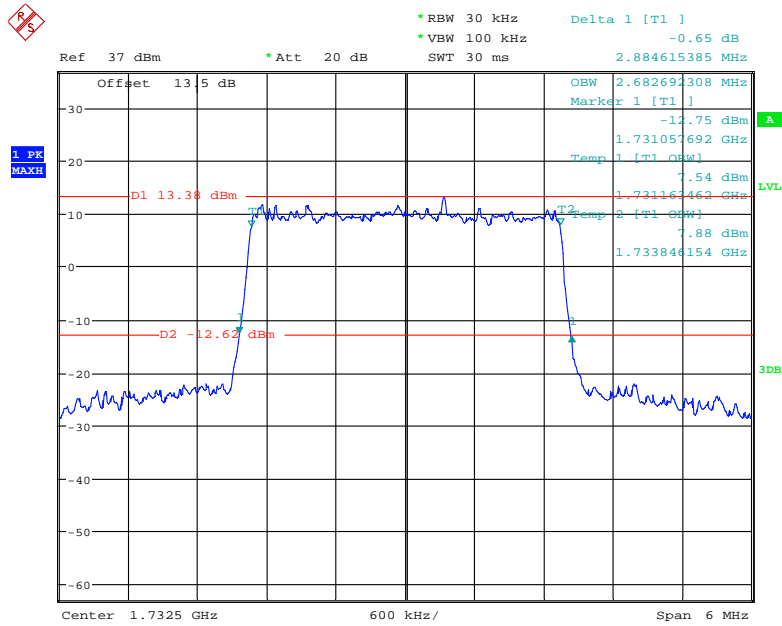## QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

```
                                    *RBW 30 kHz      Delta 1 [T1 ]
                                    *VBW 100 kHz              2.47 dB
      Ref  38.5 dBm      *Att  20 dB  SWT 30 ms       2.875000000 MHz
         Offset  13.5 dB                         OBW  2.682692308 MHz
                                                 Marker 1 [T1 ]
    30                                                   -13.17 dBm       A
                                                 835.057692308 MHz
 1 PK                                            Temp 1 [T1 OBW]
 MAXH 20                                                    8.04 dBm      LVL
      D1 14.51 dBm                               835.163461538 MHz
    10         T1                        T2 Temp 2 [T1 OBW]
                                                           9.28 dBm
                                                 837.846153846 MHz
     0
   -10                                                                    3DB
      D2 -11.49 dBm
   -20
   -30
   -40
   -50
   -60
      Center  836.5 MHz          600 kHz/               Span  6 MHz
```

Date: 19.SEP.2018 10:00:58

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

```
                                    *RBW 30 kHz      Delta 1 [T1 ]
                                    *VBW 100 kHz              0.86 dB
      Ref  38.5 dBm      *Att  20 dB  SWT 30 ms       2.894230769 MHz
         Offset  13.5 dB                         OBW  2.682692308 MHz
                                                 Marker 1 [T1 ]
    30                                                   -14.35 dBm       A
                                                 835.057692308 MHz
 1 PK                                            Temp 1 [T1 OBW]
 MAXH 20                                                    7.66 dBm      LVL
      D1 12.44 dBm                               835.163461538 MHz
    10         T1                        T2 Temp 2 [T1 OBW]
                                                           8.24 dBm
                                                 837.846153846 MHz
     0
   -10
      D2 -13.56 dBm                                                       3DB
   -20
   -30
   -40
   -50
   -60
      Center  836.5 MHz          600 kHz/               Span  6 MHz
```

Date: 19.SEP.2018 10:02:01

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

Date: 19.SEP.2018 10:08:37

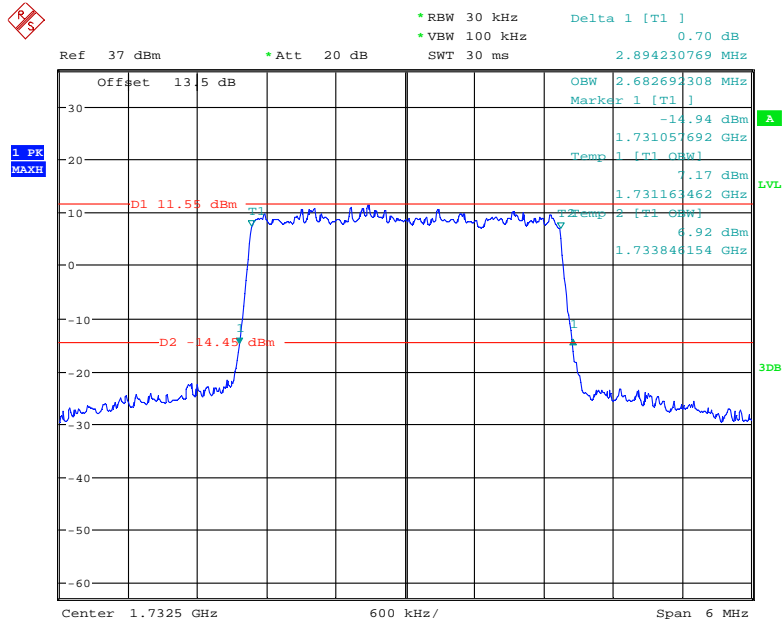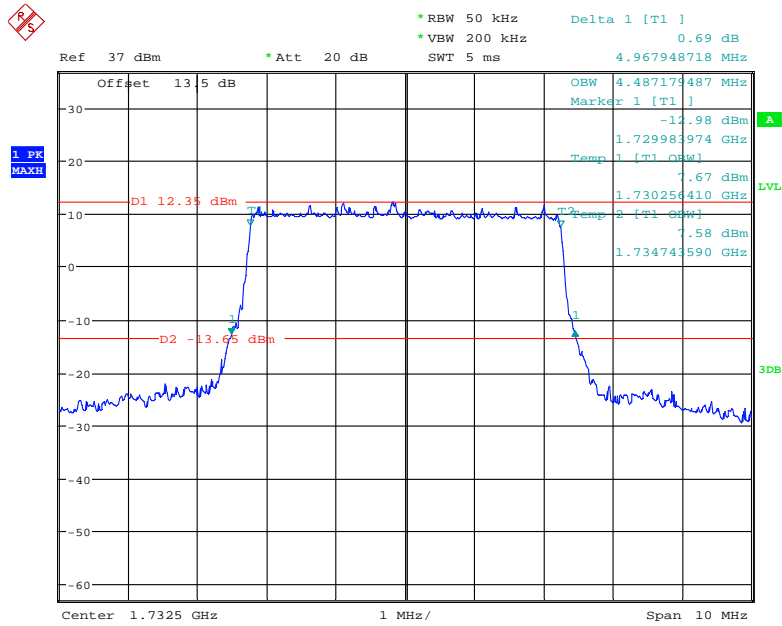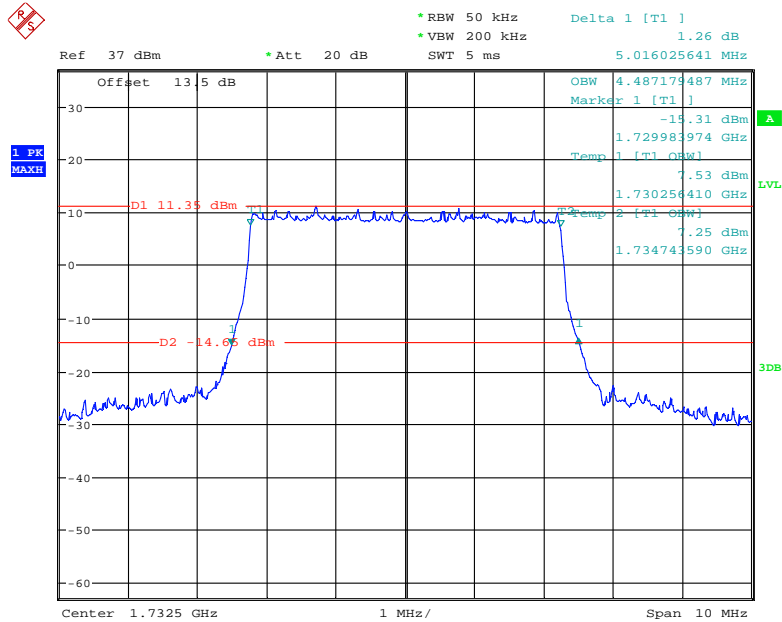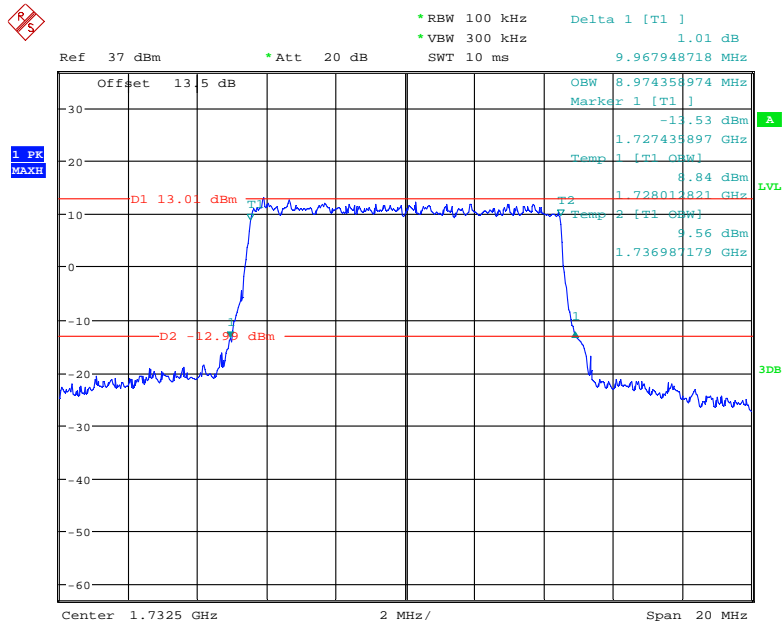**16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel**
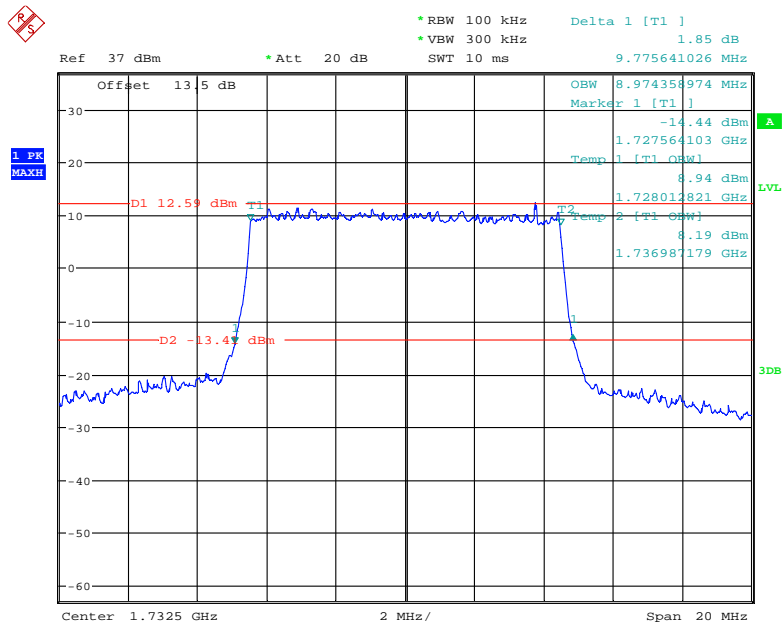

Date: 9.OCT.2018 15:01:46

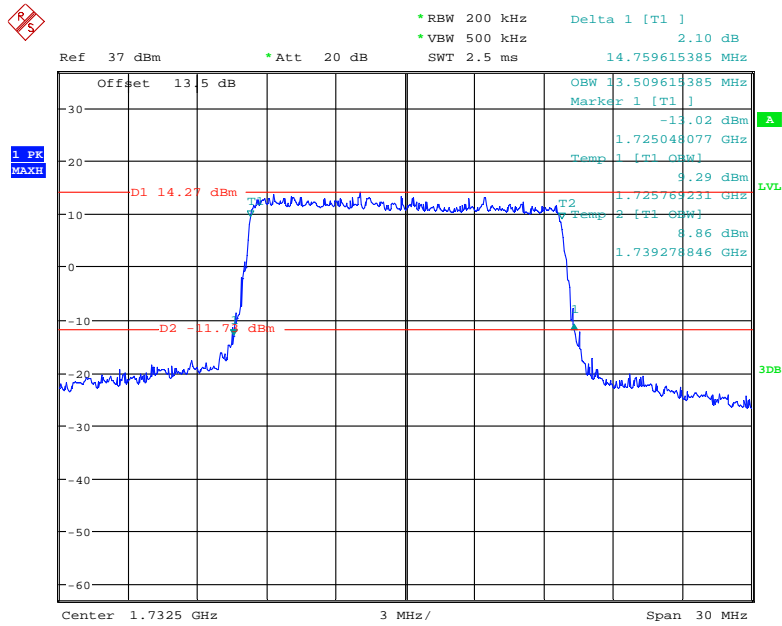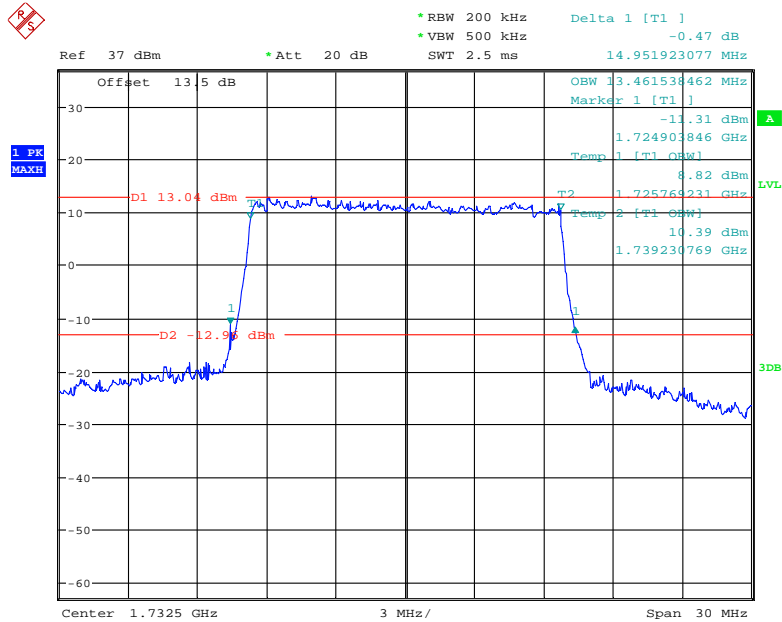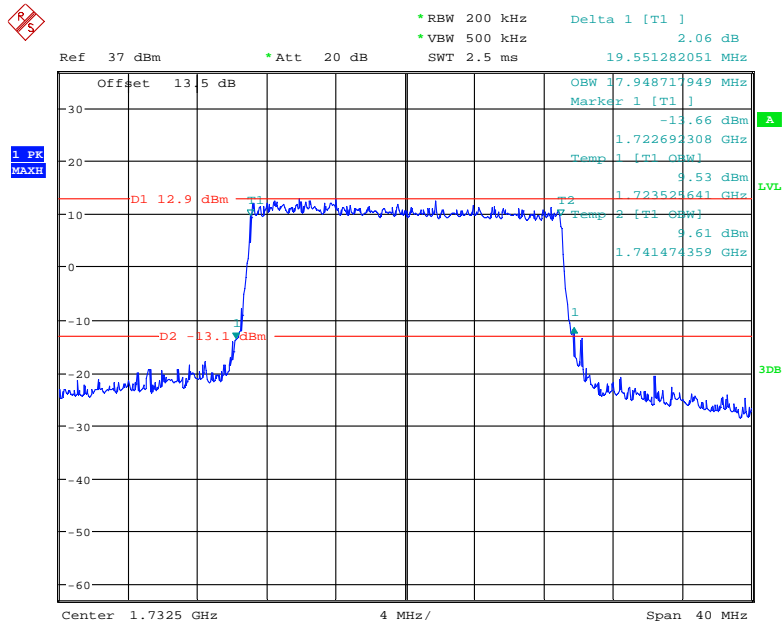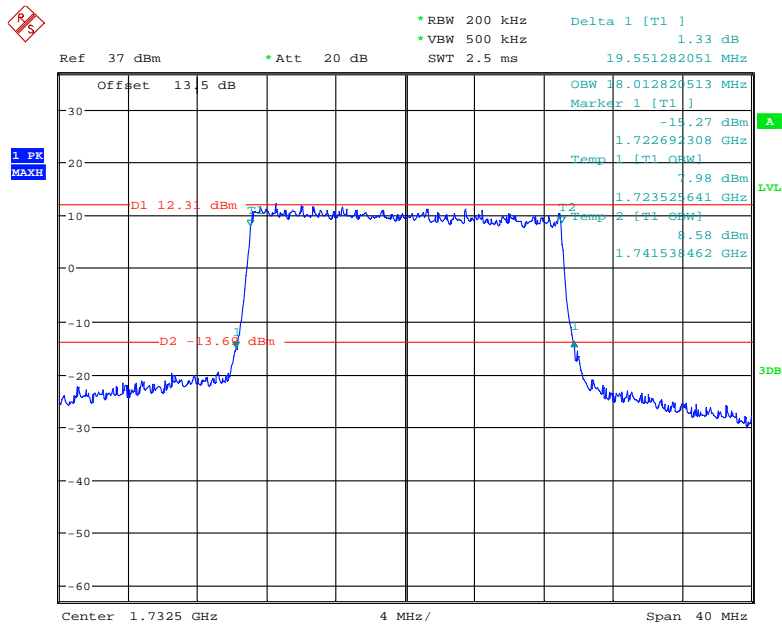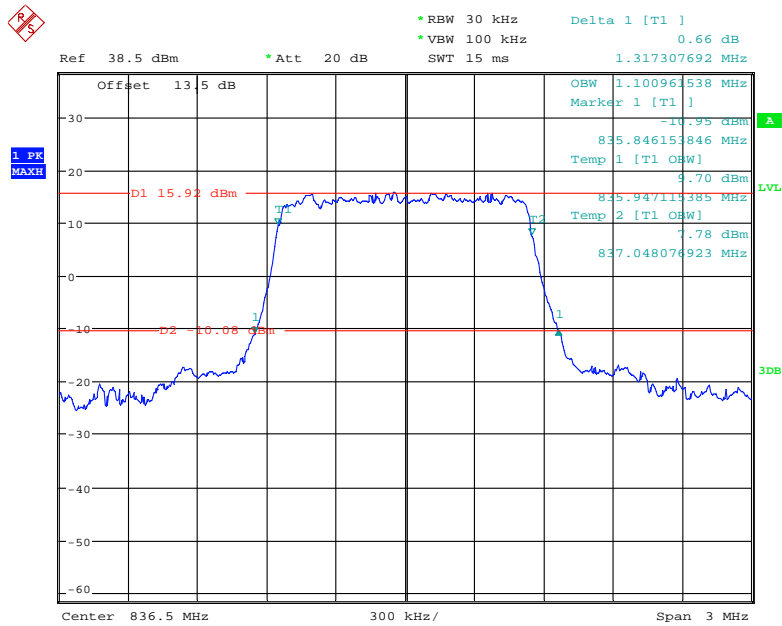## QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

```
                                    *RBW  100 kHz    Delta 1 [T1 ]
                                    *VBW  300 kHz             2.11 dB
       Ref  38.5 dBm      *Att  20 dB    SWT 10 ms    9.903846154 MHz
          Offset  13.5 dB                      OBW  8.974358974 MHz
                                               Marker 1 [T1 ]
      30                                             -14.58 dBm      A
                                               831.564102564 MHz
1 PK                                           Temp 1 [T1 OBW]
MAXH  20                                              7.73 dBm      LVL
     D1 13.12 dBm                              832.012820513 MHz
      10                                       Temp 2 [T1 OBW]
                                                     9.85 dBm
       0                                       840.987179487 MHz
     -10
     D2 -12.88 dBm                                               3DB
     -20
     -30
     -40
     -50
     -60
      Center  836.5 MHz         2 MHz/              Span  20 MHz
```

Date: 19.SEP.2018 10:17:29

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

```
                                    *RBW  100 kHz    Delta 1 [T1 ]
                                    *VBW  300 kHz             0.98 dB
       Ref  38.5 dBm      *Att  20 dB    SWT 10 ms    9.775641026 MHz
          Offset  13.5 dB                      OBW  8.942307692 MHz
                                               Marker 1 [T1 ]
      30                                             -13.08 dBm      A
                                               831.596153846 MHz
1 PK                                           Temp 1 [T1 OBW]
MAXH  20                                              8.50 dBm      LVL
     D1 14.11 dBm                              832.044871795 MHz
      10                                       Temp 2 [T1 OBW]
                                                     8.83 dBm
       0                                       840.987179487 MHz
     -10
     D2 -11.89 dBm                                               3DB
     -20
     -30
     -40
     -50
     -60
      Center  836.5 MHz         2 MHz/              Span  20 MHz
```

Date: 19.SEP.2018 10:15:42

LTE Band 12: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.308
	16QAM	1.106	1.322
3.0	QPSK	2.683	2.875
	16QAM	2.683	2.885
5.0	QPSK	4.471	4.968
	16QAM	4.487	5.016
10.0	QPSK	8.974	9.936
	16QAM	8.942	9.808

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

```
                              *RBW 30 kHz        Delta 1 [T1 ]
                              *VBW 100 kHz                  2.43 dB
  Ref  38.5 dBm    *Att  20 dB   SWT 15 ms       1.307692308 MHz
     Offset  13.5 dB                            OBW 1.100961538 MHz
                                               Marker 1 [T1 ]
   30                                                    -11.91 dBm      A
                                                706.841346154 MHz
                                               Temp 1 [T1 OBW]
   20                                                     9.54 dBm      LVL
  D1 15.59 dBm                                  706.947115385 MHz
   10                                          Temp 2 [T1 OBW]
                                                          7.63 dBm
                                                708.048076923 MHz
    0
  -10  D2 -10.41 dBm
  -20                                                                   3DB
  -30
  -40
  -50
  -60
  Center 707.5 MHz        300 kHz/              Span 3 MHz
```

Date: 19.SEP.2018 10:41:57

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

```
                              *RBW 30 kHz        Delta 1 [T1 ]
                              *VBW 100 kHz                  2.21 dB
  Ref  38.5 dBm    *Att  20 dB   SWT 15 ms       1.322115385 MHz
     Offset  13.5 dB                            OBW 1.105769231 MHz
                                               Marker 1 [T1 ]
   30                                                    -12.21 dBm     A
                                                706.826923077 MHz
                                               Temp 1 [T1 OBW]
   20                                                     6.76 dBm      LVL
  D1 15.23 dBm                                  706.942307692 MHz
   10                                          Temp 2 [T1 OBW]
                                                          7.25 dBm
                                                708.048076923 MHz
    0
  -10  D2 -10.77 dBm
  -20                                                                   3DB
  -30
  -40
  -50
  -60
  Center 707.5 MHz        300 kHz/              Span 3 MHz
```

Date: 19.SEP.2018 10:40:47

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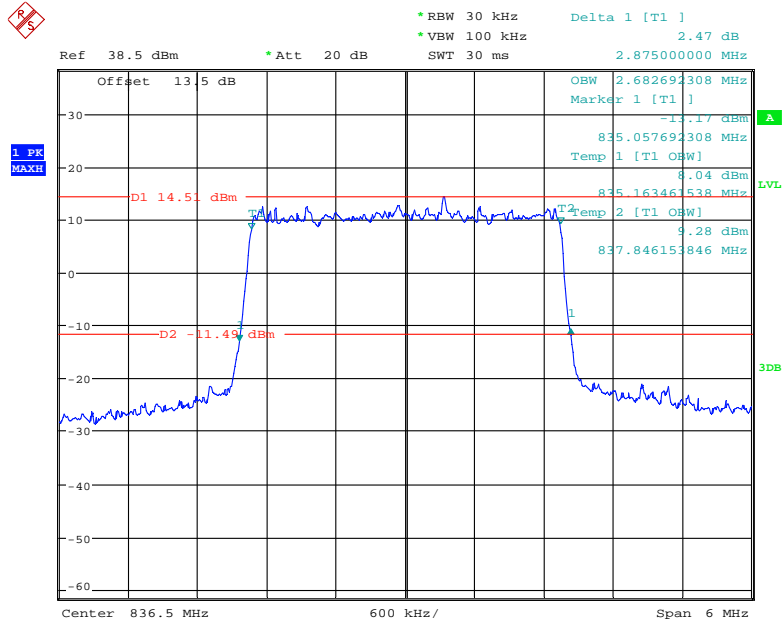

Date: 19.SEP.2018 10:44:35

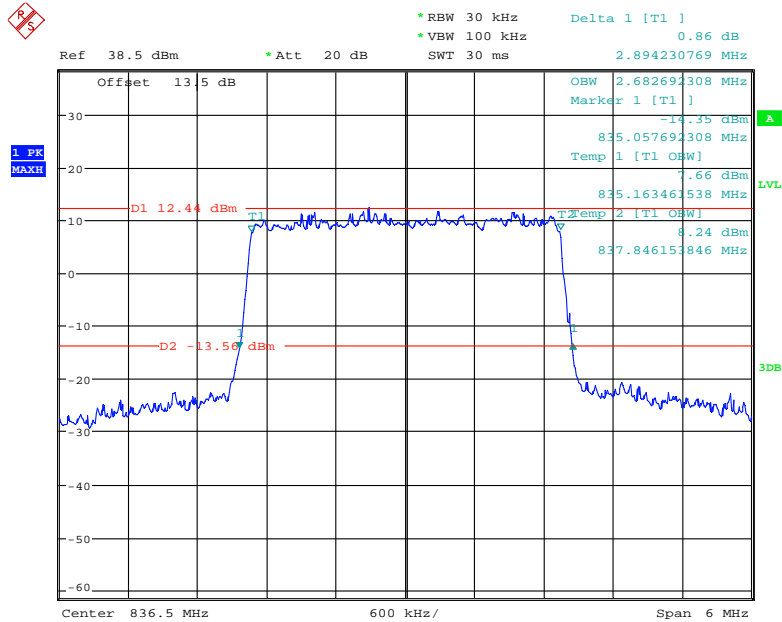### 16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 19.SEP.2018 10:43:48

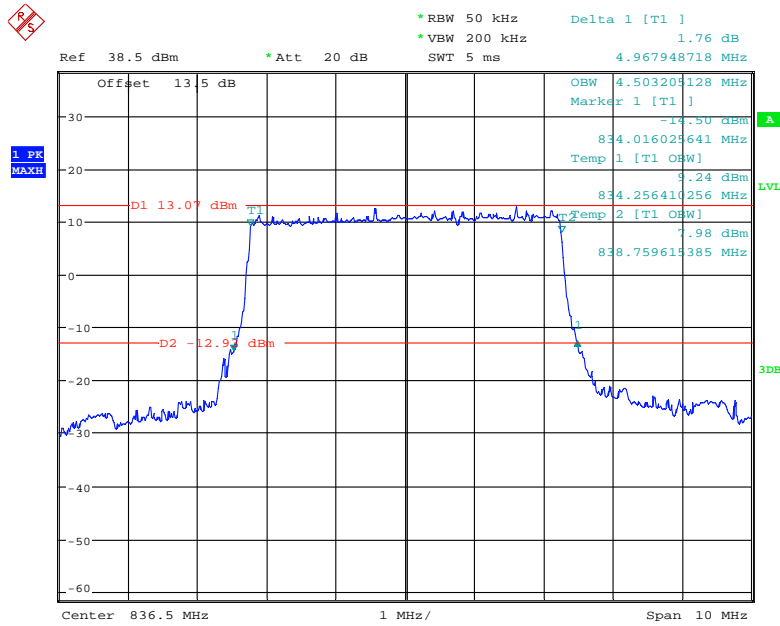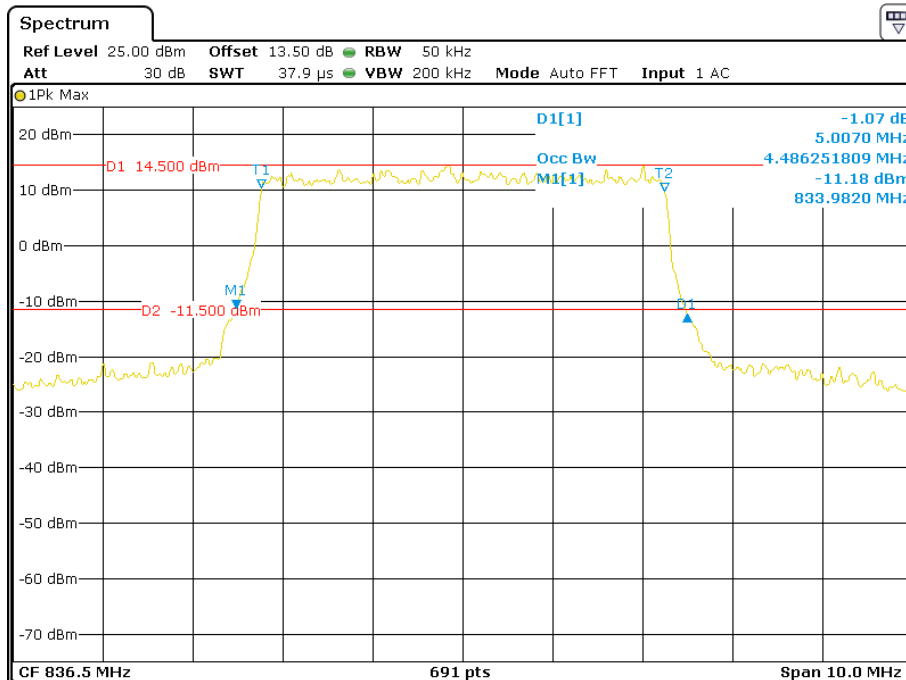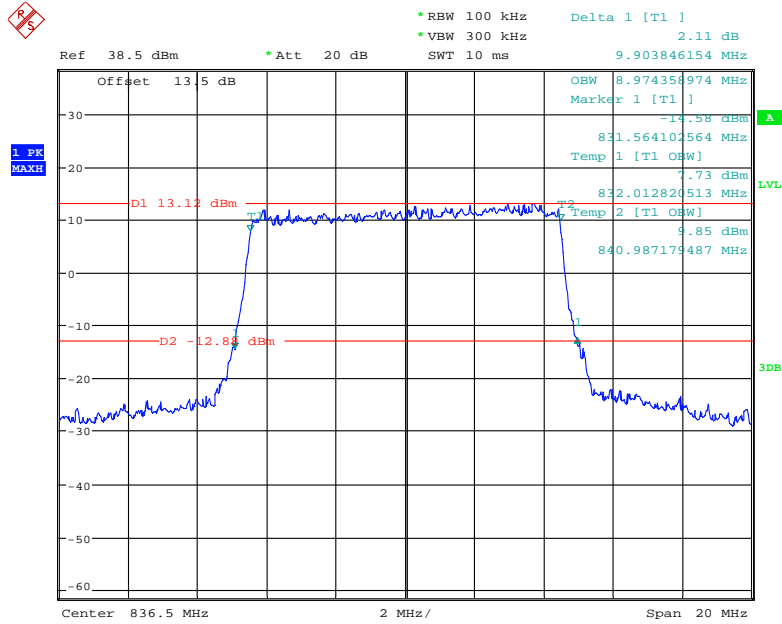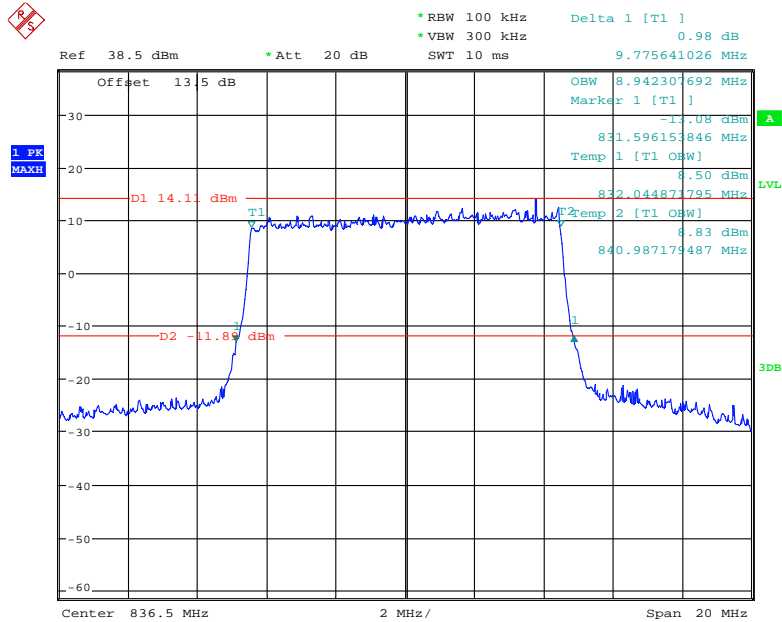## QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
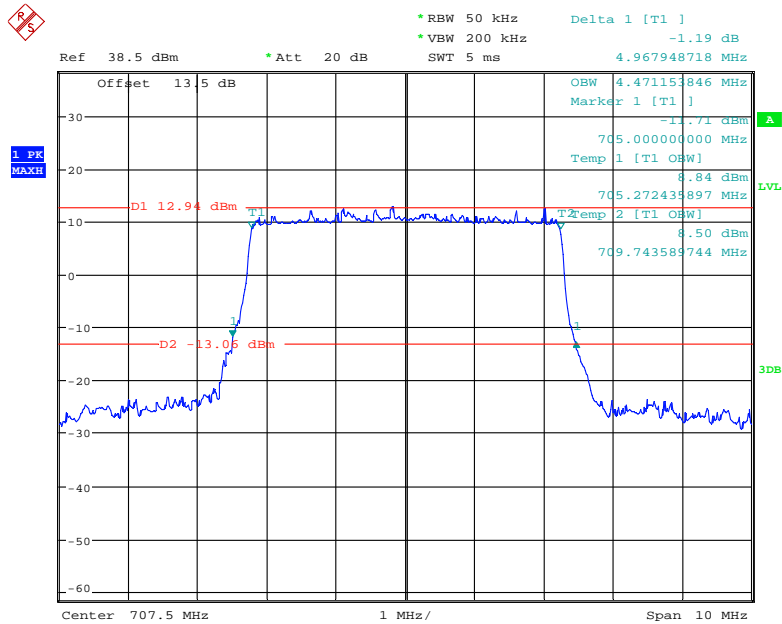
Date: 19.SEP.2018 10:46:15

16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
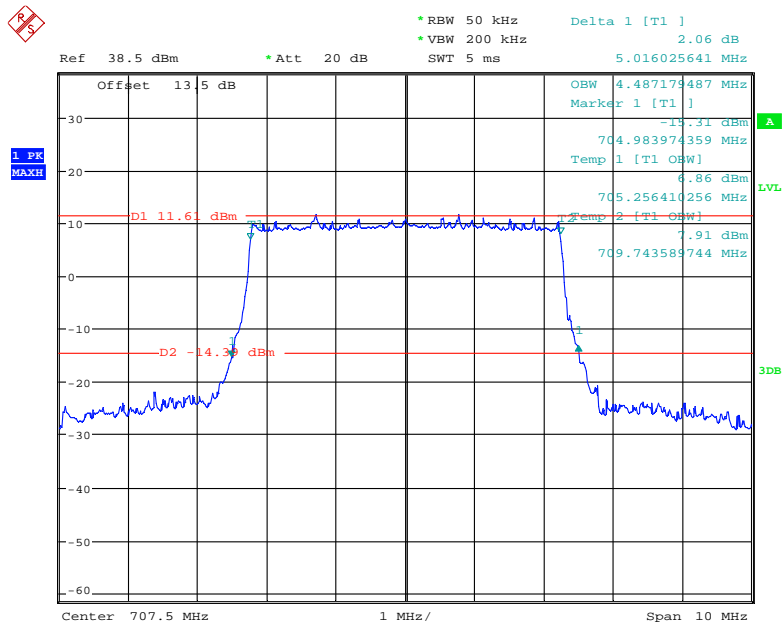
Date: 19.SEP.2018 10:47:51

QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
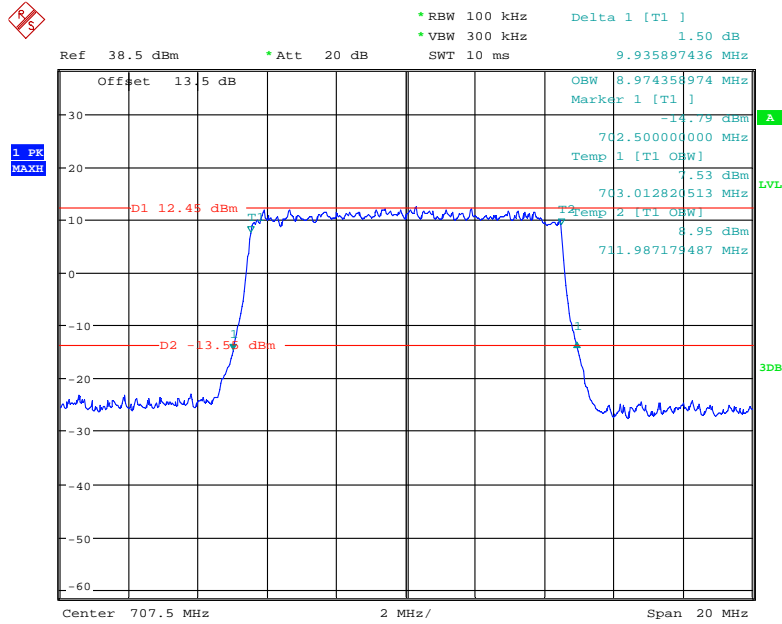
Date: 19.SEP.2018 10:51:49

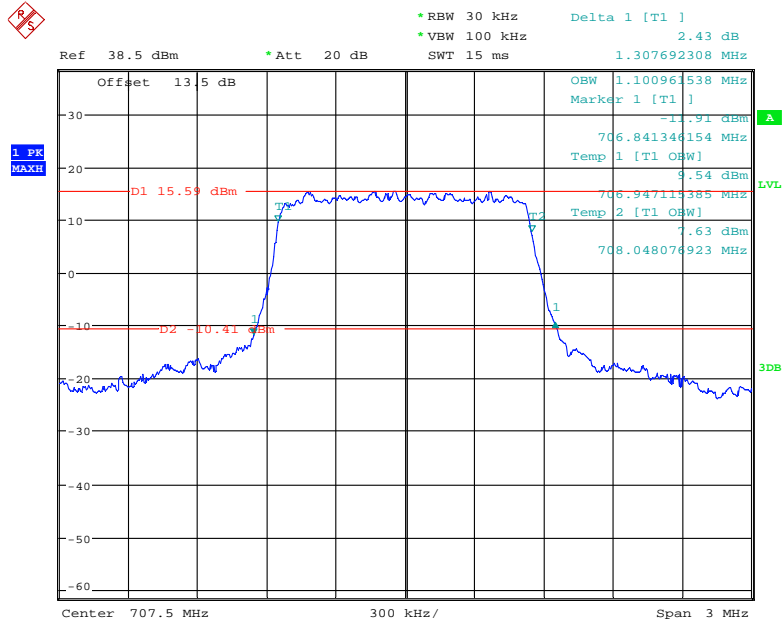## 16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
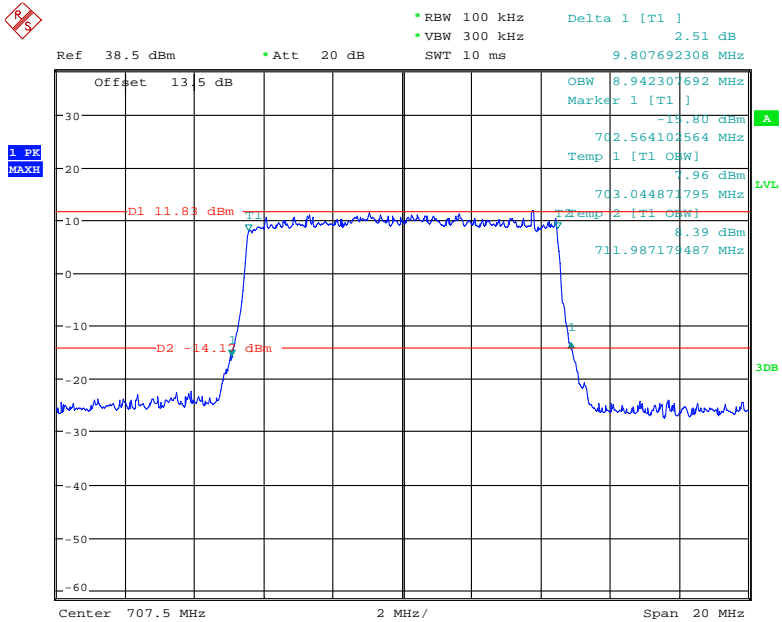
Date: 19.SEP.2018 10:53:28

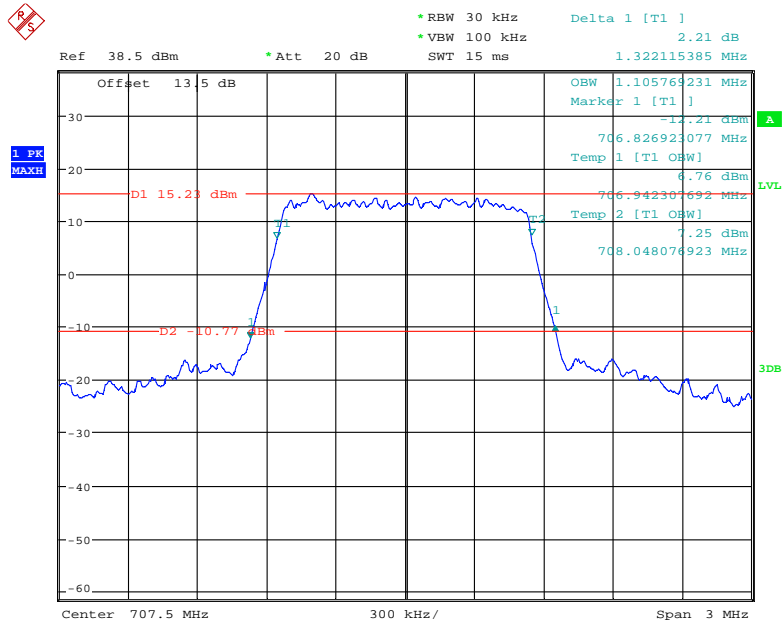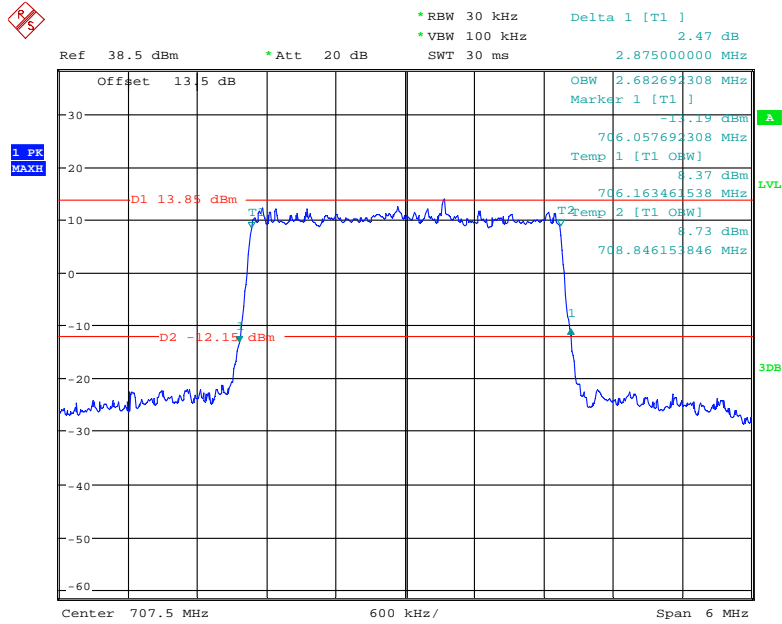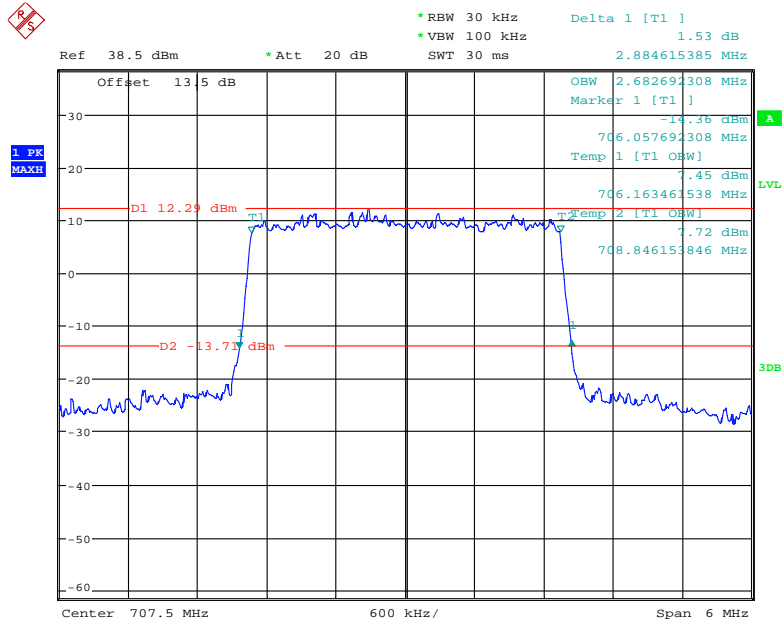## FCC §2.1051, §22.917(a) & §24.238(a); §27.53 (h) (m) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

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 100KHz to below 1GHz and 1MHz to above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

```
  ┌─────────┐      ┌──────────┐      ┌──────────────────┐
  │   EUT   │──────│ Splitter │──────│  Signal Analyzer │
  └─────────┘      └────┬─────┘      └──────────────────┘
                        │
                ┌───────────────┐
                │ CMW500/CMU200 │
                └───────────────┘
```
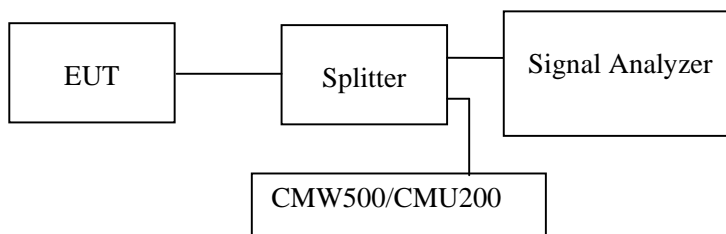
Test Data

Environmental Conditions

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

The testing was performed by Haiguo Li from 2018-09-20 to 2018-09-28.

Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz              -36.97 dBm
        Ref  37.5 dBm    *Att  25 dB  SWT 100 ms    478.513461538 MHz
```
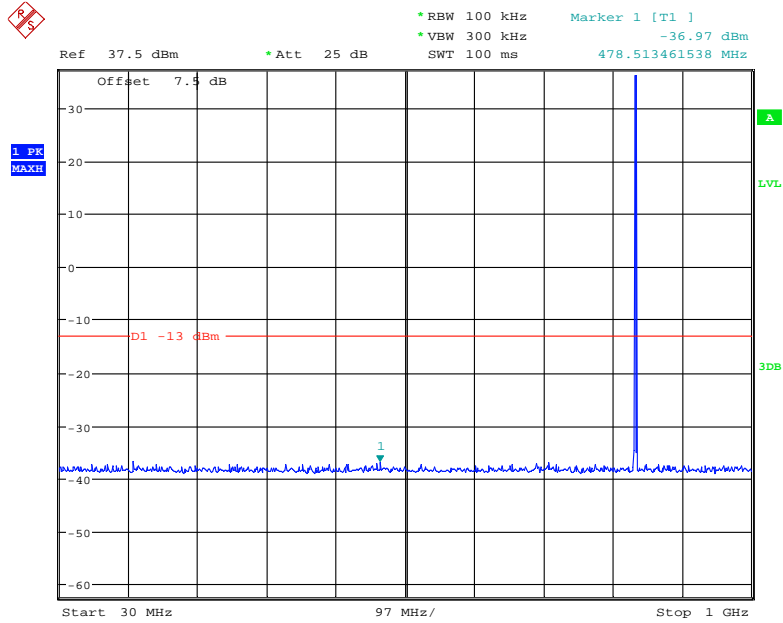

Date: 20.SEP.2018 16:10:13

1 GHz – 10 GHz (GSM Mode)

```
                                    *RBW 1 MHz     Marker 1 [T1 ]
                                    *VBW 3 MHz                -33.91 dBm
        Ref  35 dBm     *Att  25 dB  SWT 55 ms     1.663461538 GHz
```
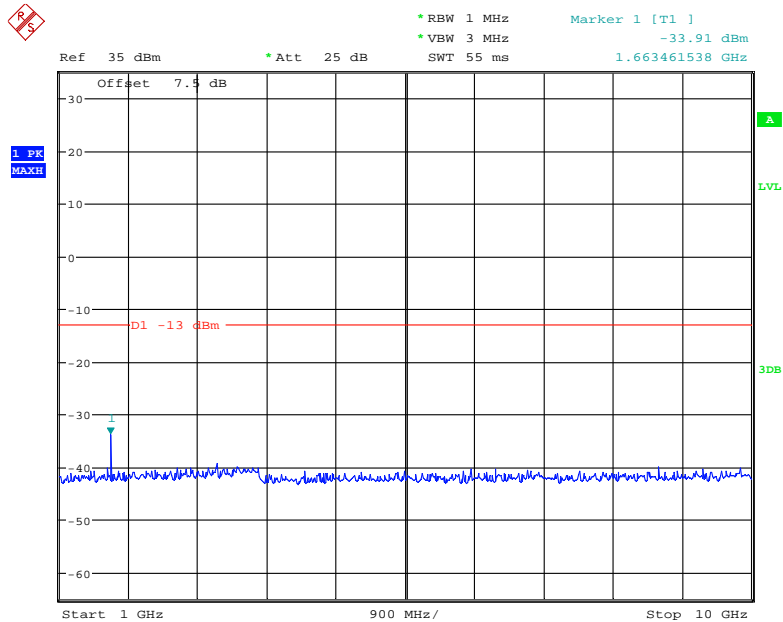

Date: 28.SEP.2018 15:03:18

30 MHz – 1 GHz (WCDMA Mode)

```
                                  *RBW 100 kHz    Marker 1 [T1 ]
                                  *VBW 300 kHz              -43.29 dBm
        Ref  32 dBm    *Att  20 dB   SWT 100 ms      191.666666667 MHz
        -30  Offset   7.5 dB                                              A
 1 PK
 MAXH   -20
        -10                                                             LVL

         -0

        --10
           D1 -13 dBm
        --20                                                            3DB
        --30

        --40     1

        --50

        --60

        Start 30 MHz            97 MHz/            Stop 1 GHz
```

Fundamental test
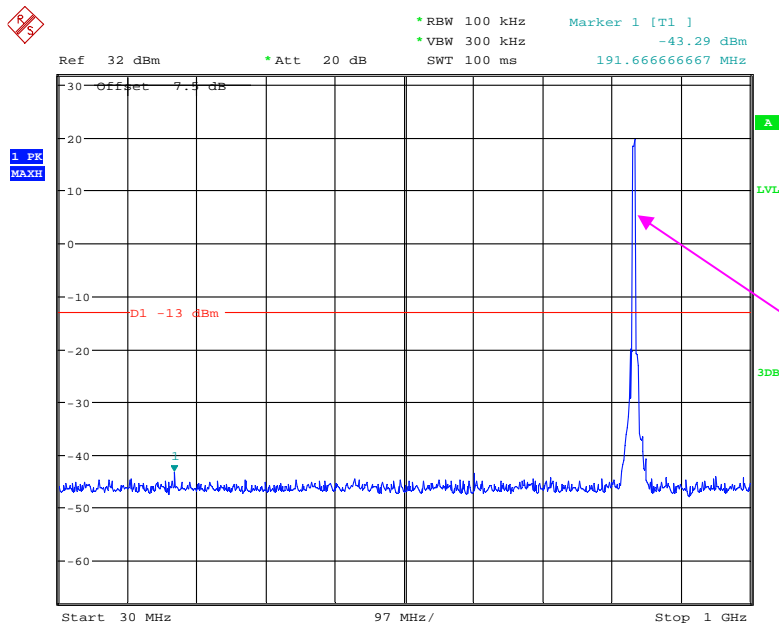
Date: 20.SEP.2018 16:59:34

1 GHz – 10 GHz (WCDMA Mode)

```
                                  *RBW 1 MHz      Marker 1 [T1 ]
                                  *VBW 3 MHz               -23.04 dBm
        Ref  27.5 dBm   *Att  15 dB   SWT 55 ms       2.504285714 GHz
          Offset   7.5 dB                                               A
 1 PK
 MAXH   -20
        --10                                                           LVL

         -0

        --10
           D1 -13 dBm
        --20     1                                                     3DB
        --30

        --40

        --60

        --70

        Start 1 GHz            900 MHz/           Stop 10 GHz
```
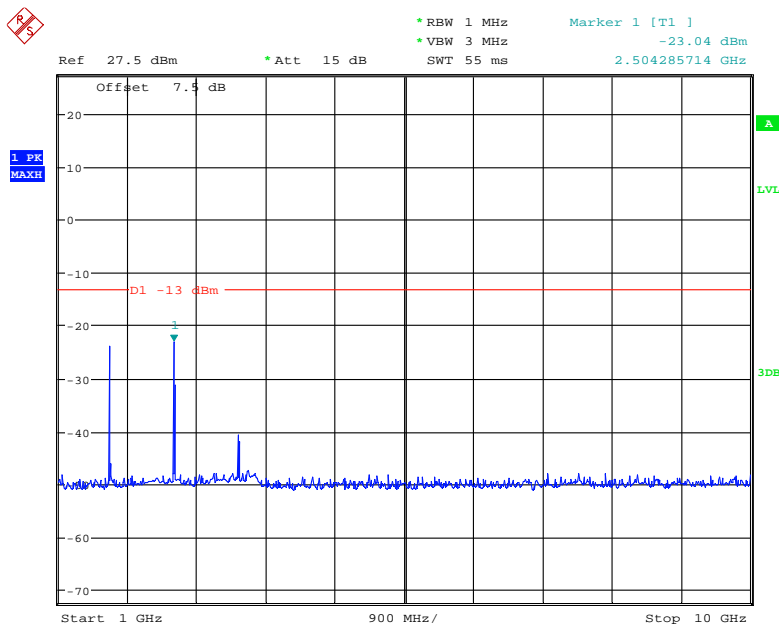
Date: 20.SEP.2018 16:58:52

PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)

```
                                        *RBW  100 kHz      Marker 1 [T1 ]
                                        *VBW  300 kHz              -45.86 dBm
        Ref   27.5 dBm     *Att  25 dB   SWT  100 ms       505.300000000 MHz
```
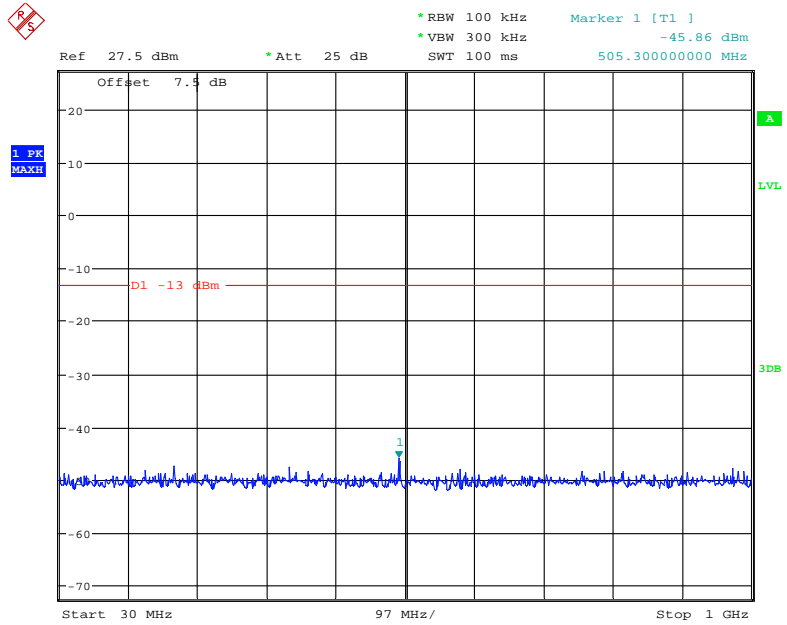
Date: 20.SEP.2018 16:13:09

1 GHz – 2 GHz (GSM Mode)

```
                                        *RBW  1 MHz       Marker 1 [T1 ]
                                        *VBW  3 MHz               -40.79 dBm
        Ref   35 dBm      *Att  20 dB    SWT  5 ms         1.720000000 GHz
```

Fundamental test
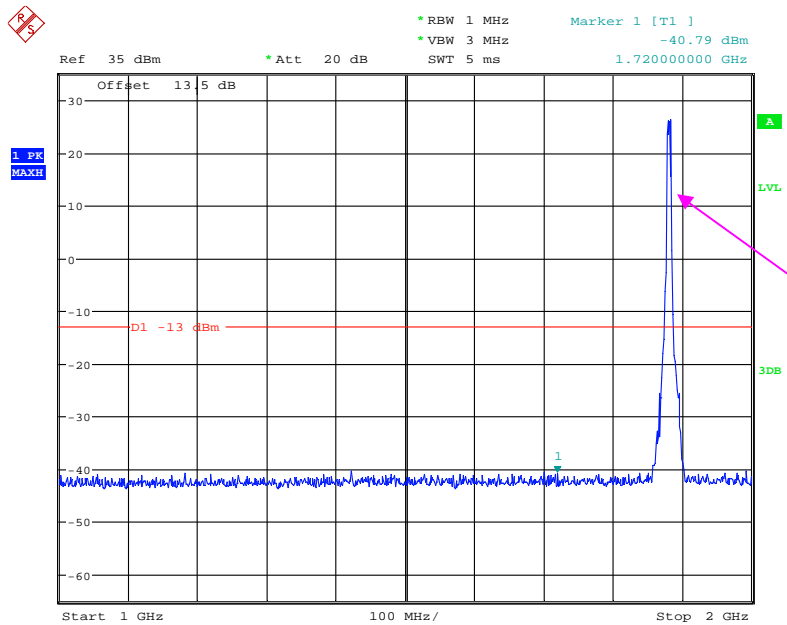
Date: 21.SEP.2018 10:22:01

2 GHz – 20 GHz (GSM Mode)

```
                                    *RBW  1 MHz        Marker 1 [T1 ]
                                    *VBW  3 MHz                 -36.88 dBm
     Ref   27.5 dBm      *Att  15 dB  SWT 105 ms        2.385714286 GHz
        Offset  7.5 dB
```

```
Start  2 GHz                   1.8 GHz/                   Stop  20 GHz
```
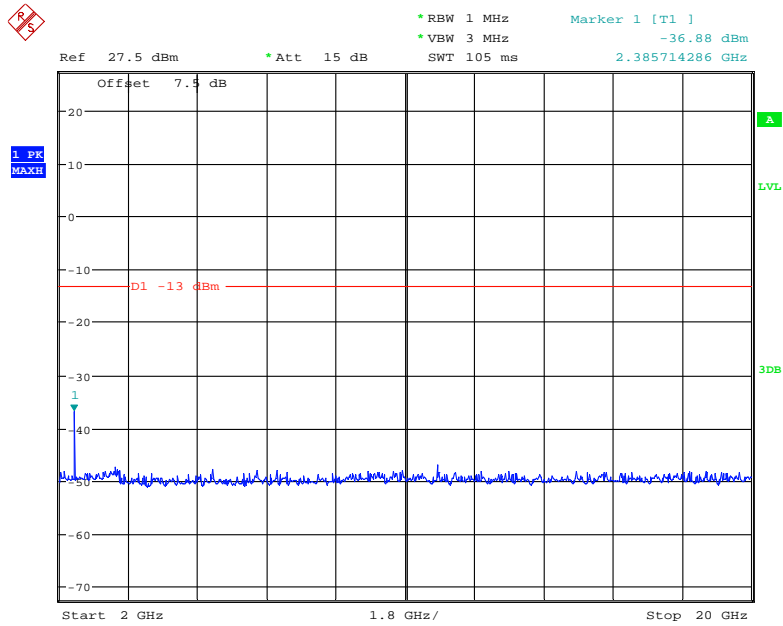
Date: 20.SEP.2018 16:12:45

30 MHz – 1 GHz (WCDMA Mode)

```
                                    *RBW 100 kHz        Marker 1 [T1 ]
                                    *VBW 300 kHz                -48.33 dBm
     Ref   27.5 dBm      *Att  15 dB  SWT 100 ms        503.914285714 MHz
        Offset  7.5 dB
```

```
Start  30 MHz                   97 MHz/                   Stop  1 GHz
```
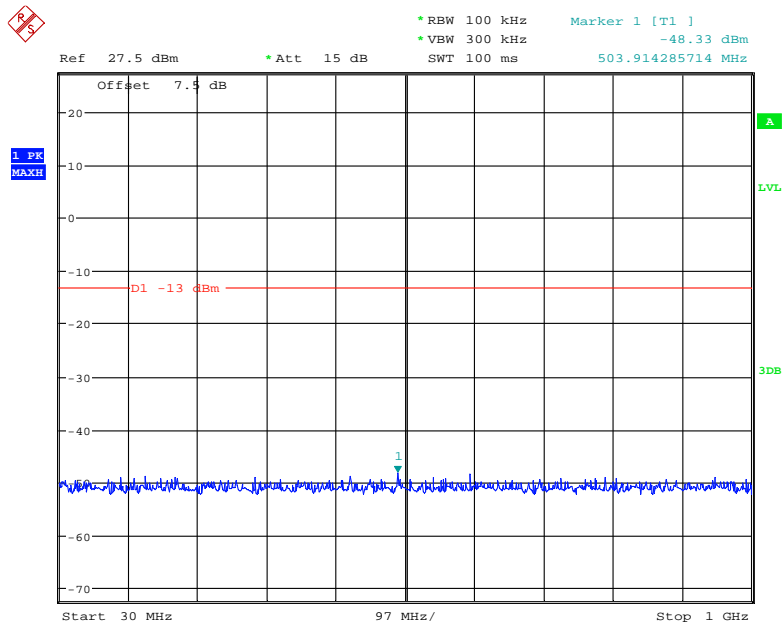
Date: 20.SEP.2018 16:54:27

1 GHz – 2 GHz (WCDMA Mode)
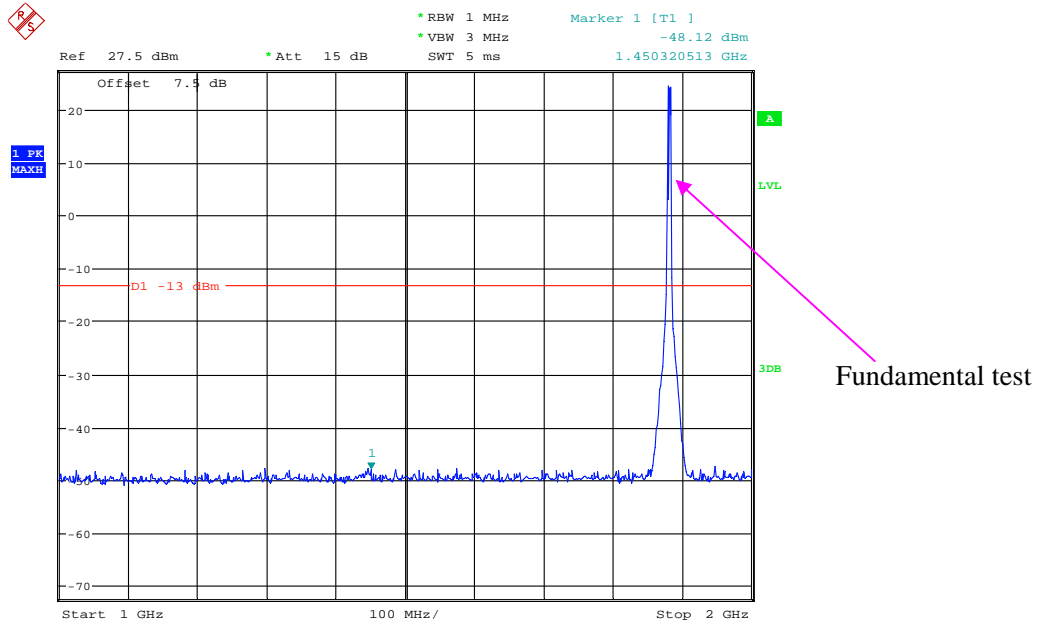
Fundamental test

Date: 20.SEP.2018 16:55:17

2 GHz – 20 GHz (WCDMA Mode)
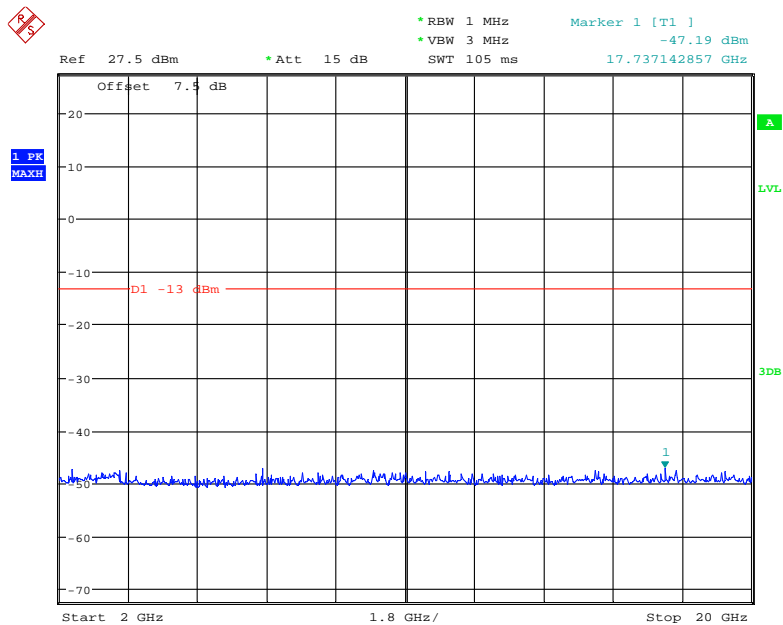
Date: 20.SEP.2018 16:55:35

LTE Band 2:

30 MHz - 1 GHz (1.4 MHz, Middle Channel)
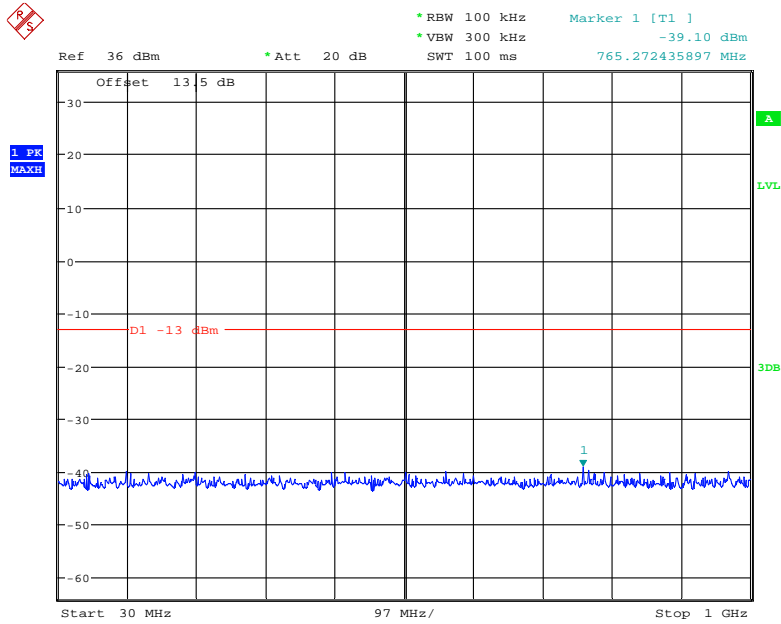
Date: 19.SEP.2018 16:27:07

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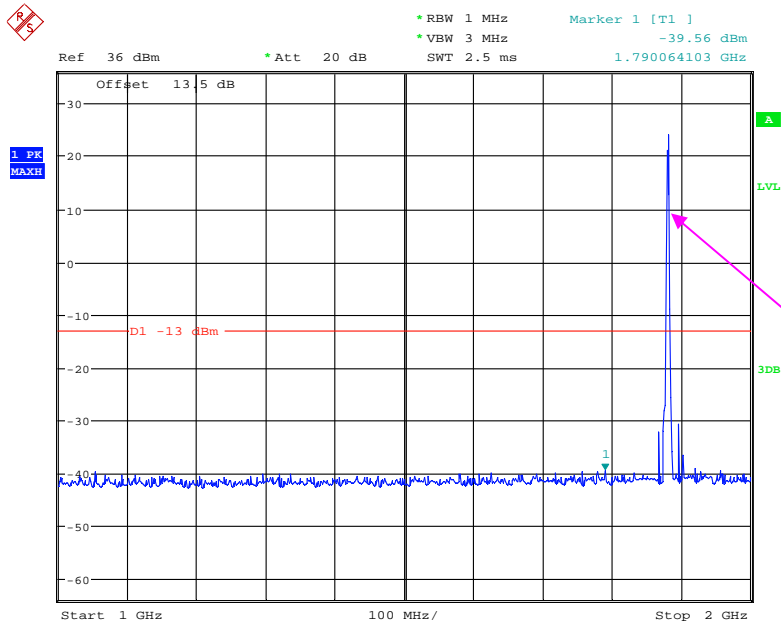
Fundamental test

Date: 19.SEP.2018 16:28:49

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

```
                                    * RBW  1 MHz      Marker 1 [T1 ]
                                    * VBW  3 MHz                 -53.08 dBm
    Ref   18.5 dBm      * Att   0 dB    SWT 105 ms        2.378000000 GHz
        Offset  13.5 dB                                                    A
  -10
                                                                          LVL
   0
 1 PK
 MAXH
  -10
         D1 -13 dBm
  -20

  -30
                                                                          3DB
  -40

  -50

  -60

  -70

  -80
    Start  2 GHz            1.8 GHz/            Stop  20 GHz
```

Date: 21.SEP.2018 09:58:33

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

```
                                    * RBW 100 kHz      Marker 1 [T1 ]
                                    * VBW 300 kHz                -42.95 dBm
    Ref   33.5 dBm      * Att  15 dB    SWT 100 ms       187.003205128 MHz
        Offset  13.5 dB                                                    A
   30
   20
 1 PK
 MAXH
   10
   0
                                                                          LVL
  -10
         D1 -13 dBm
  -20

  -30
                                                                          3DB
  -40    1

  -50

  -60
    Start  30 MHz            97 MHz/            Stop  1 GHz
```
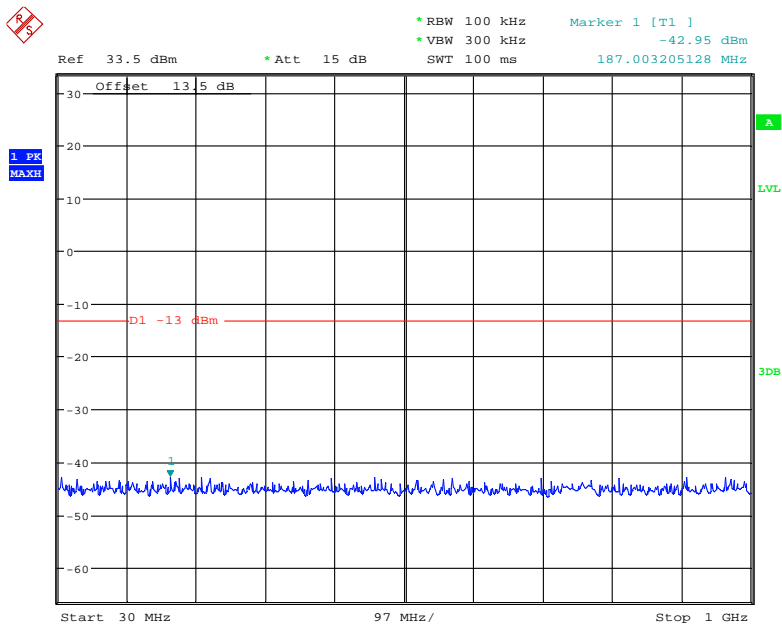
Date: 19.SEP.2018 16:32:20

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

```
                                        * RBW 1 MHz        Marker 1 [T1 ]
                                        * VBW 3 MHz               -41.87 dBm
        Ref  33.5 dBm      * Att  15 dB  SWT 2.5 ms        1.431089744 GHz
```

Fundamental test

Date: 19.SEP.2018 16:31:58

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

```
                                        * RBW 1 MHz        Marker 1 [T1 ]
                                        * VBW 3 MHz               -41.56 dBm
        Ref  33.5 dBm      * Att  15 dB  SWT 105 ms        17.576923077 GHz
```

Date: 19.SEP.2018 16:31:05

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

```
                                    *RBW 100 kHz      Marker 1 [T1 ]
                                    *VBW 300 kHz              -41.24 dBm
        Ref  33.5 dBm     *Att  15 dB   SWT 100 ms     783.926282051 MHz
```
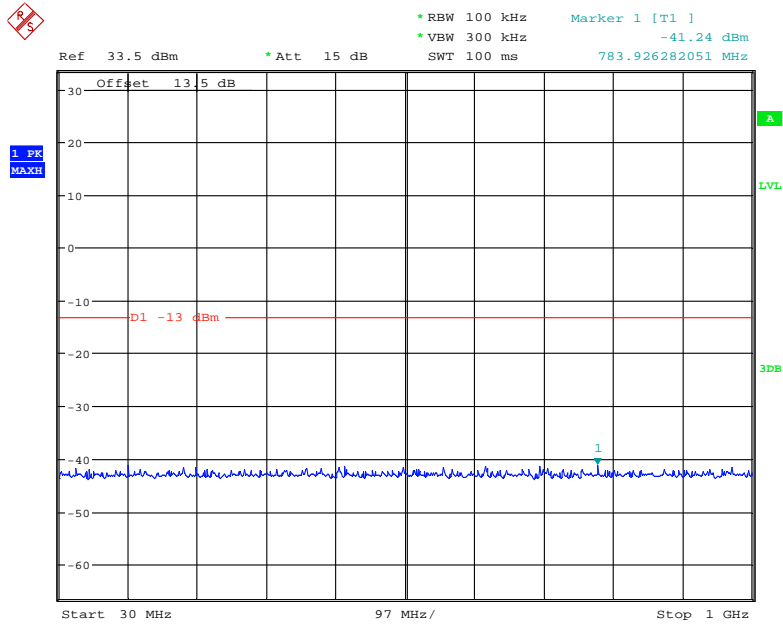
Date: 19.SEP.2018 16:39:25

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

```
                                    *RBW 1 MHz        Marker 1 [T1 ]
                                    *VBW 3 MHz                -42.16 dBm
        Ref  33.5 dBm     *Att  15 dB   SWT 2.5 ms      1.429487179 GHz
```

Fundamental test
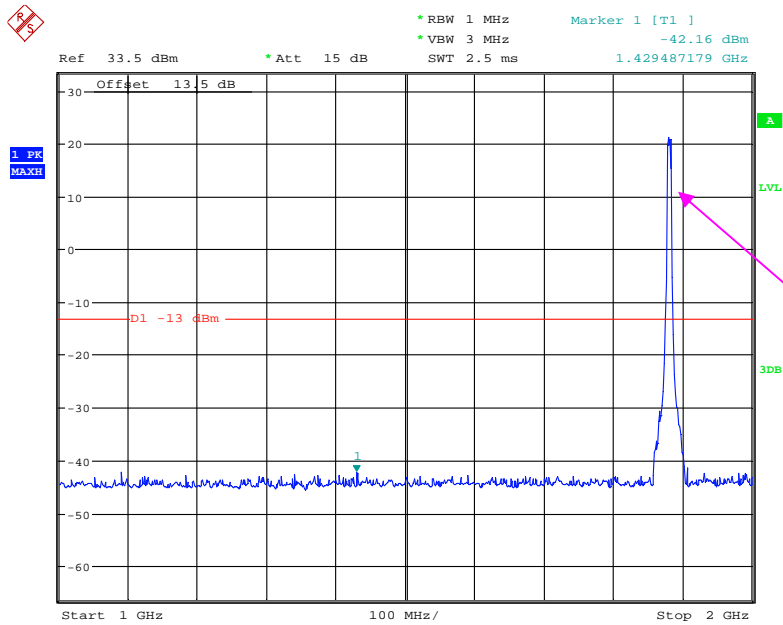
Date: 19.SEP.2018 16:39:54

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

```
                                    *RBW  1 MHz        Marker 1 [T1 ]
                                    *VBW  3 MHz               -41.66 dBm
      Ref  33.5 dBm      *Att  15 dB   SWT 105 ms        6.644230769 GHz
         Offset   13.5 dB
      -30
                                                                        A
      -20
 1 PK
 MAXH
      -10                                                               LVL

       0

      -10
          D1 -13 dBm
      -20                                                               3DB

      -30

      -40      1

      -50

      -60

      Start  2 GHz           1.8 GHz/              Stop  20 GHz
```
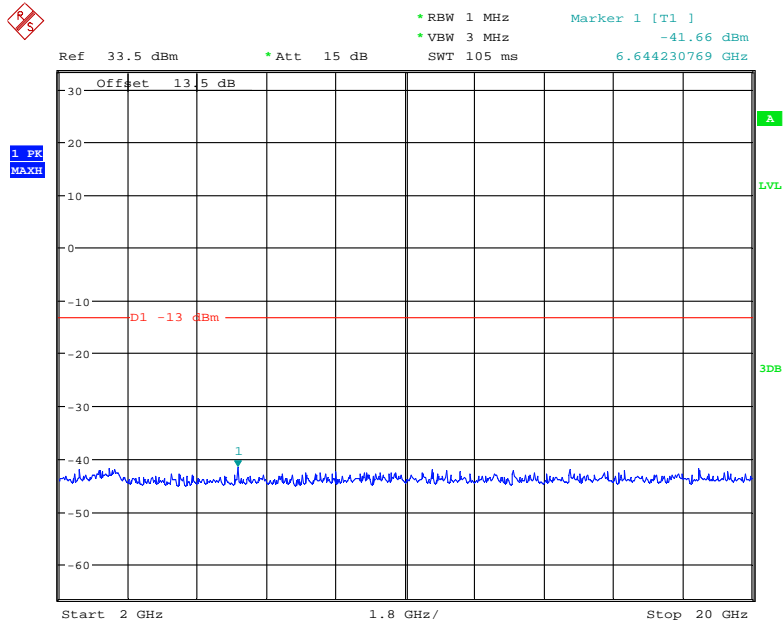
Date: 19.SEP.2018 16:40:12

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

```
                                    *RBW  100 kHz      Marker 1 [T1 ]
                                    *VBW  300 kHz             -42.55 dBm
      Ref  33.5 dBm      *Att  15 dB   SWT 100 ms        134.150641026 MHz
         Offset   13.5 dB
      -30
                                                                        A
      -20
 1 PK
 MAXH
      -10                                                               LVL

       0

      -10
          D1 -13 dBm
      -20                                                               3DB

      -30

      -40    1

      -50

      -60

      Start  30 MHz           97 MHz/              Stop  1 GHz
```

Date: 19.SEP.2018 16:46:30

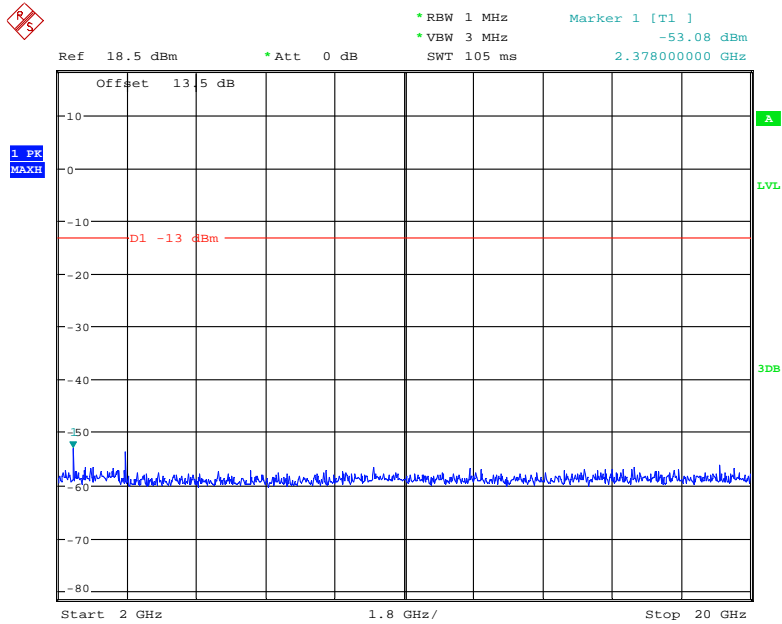## 1 GHz – 2 GHz (10.0 MHz, Middle Channel)

Fundamental test
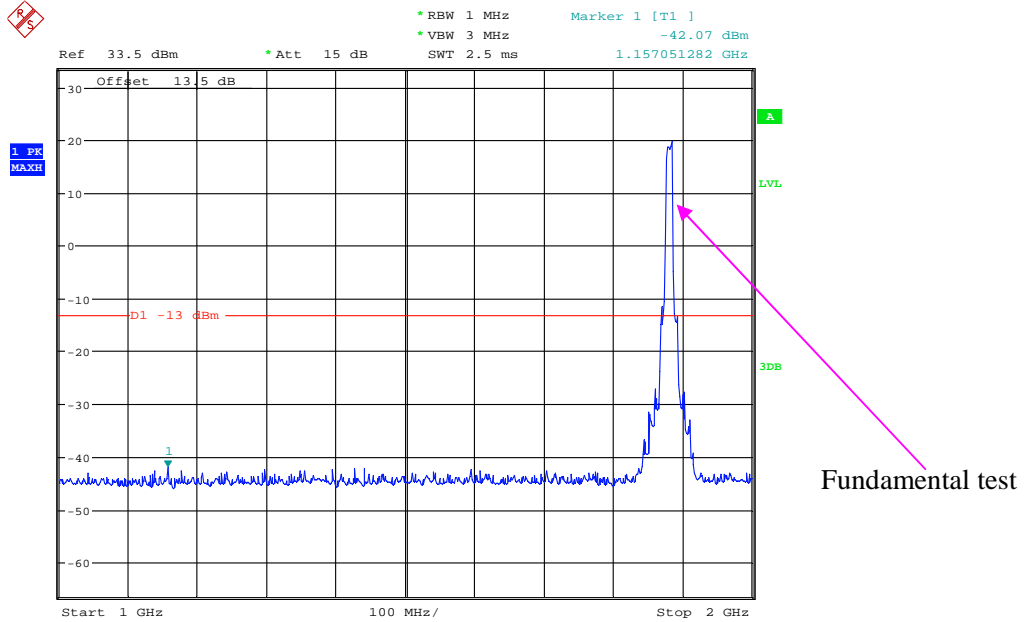
Date: 19.SEP.2018 16:46:08

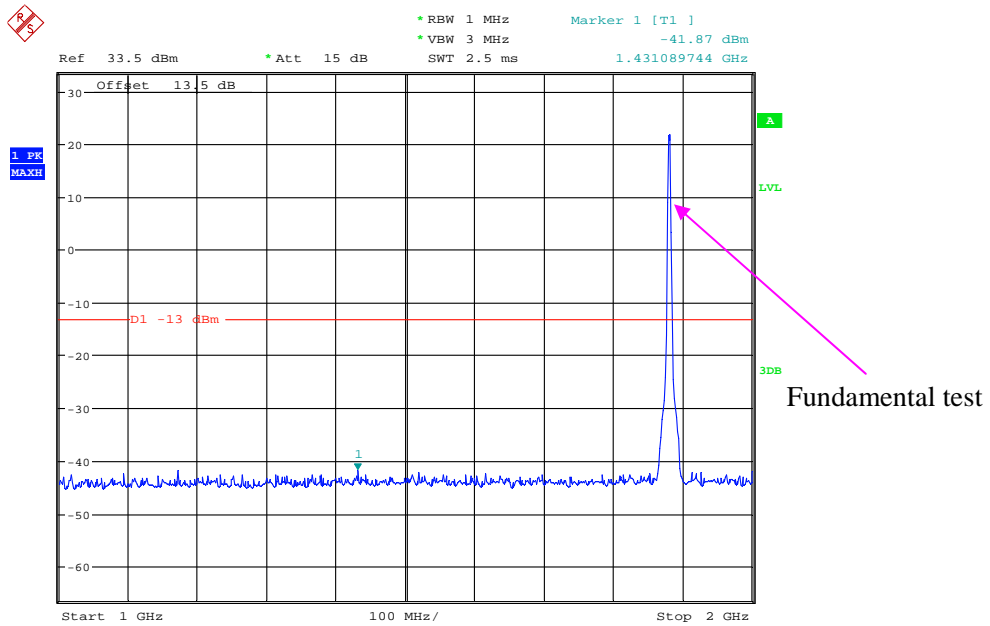## 2 GHz – 20 GHz (10.0 MHz, Middle Channel)
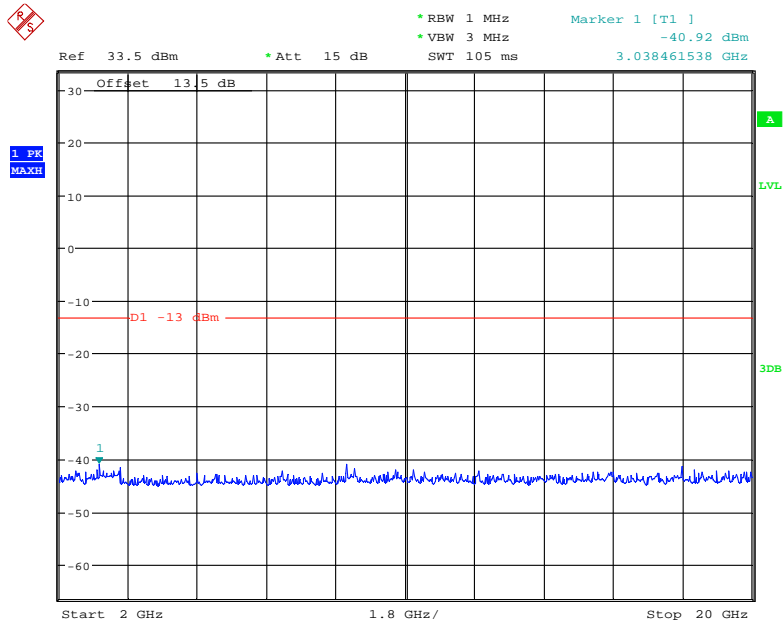
Date: 19.SEP.2018 16:45:47

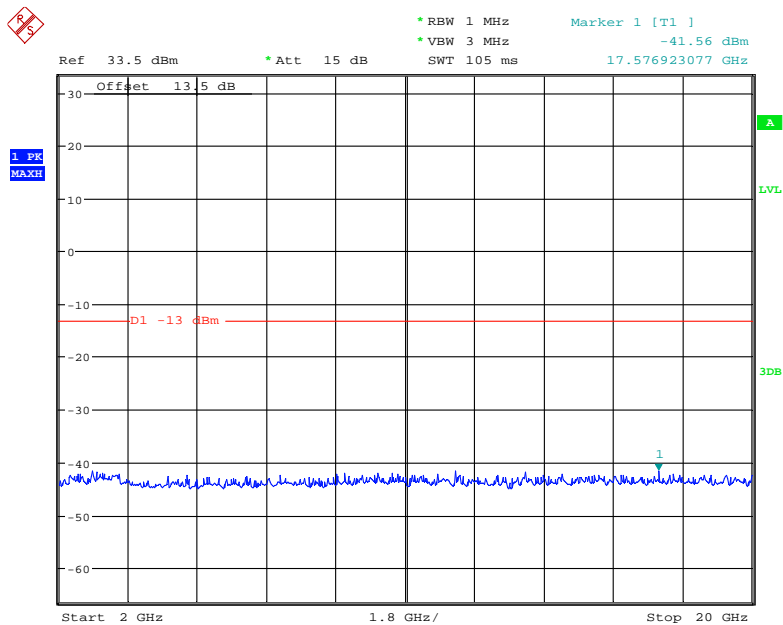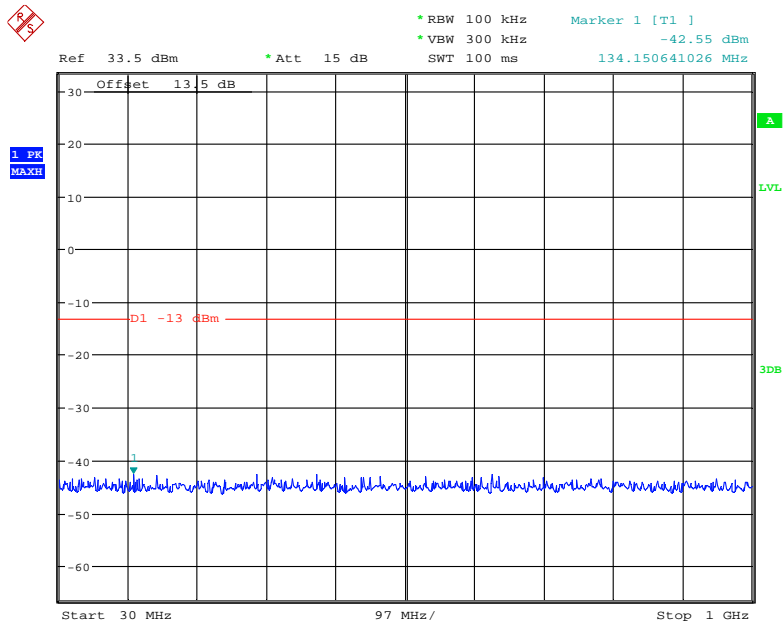### 30 MHz - 1 GHz (15.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz              -40.84 dBm
        Ref  33.5 dBm   *Att  15 dB  SWT 100 ms     376.650641026 MHz
           Offset  13.5 dB                                              A
   -30
1 PK
MAXH                                                                   LVL
   -20

   -10

    0

   -10
        D1 -13 dBm                                                     3DB
   -20

   -30

           1
   -40

   -50

   -60

   Start 30 MHz              97 MHz/              Stop  1 GHz
```
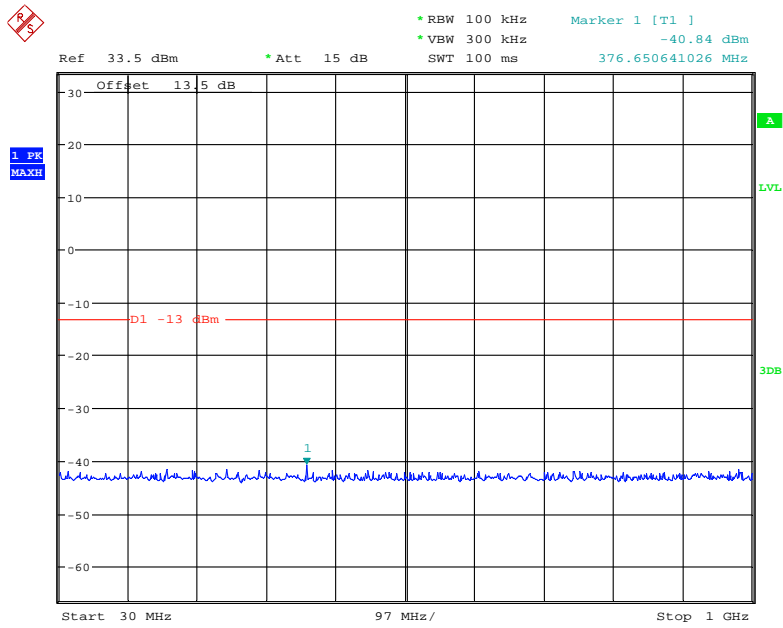
Date: 19.SEP.2018 16:50:46

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

```
                                    *RBW 1 MHz     Marker 1 [T1 ]
                                    *VBW 3 MHz                -41.98 dBm
        Ref  33.5 dBm   *Att  15 dB  SWT 2.5 ms     1.203525641 GHz
           Offset  13.5 dB                                              A
   -30
1 PK
MAXH                                                                   LVL
   -20

   -10

    0

   -10
        D1 -13 dBm                                                     3DB
   -20

   -30

           1                                                   Fundamental test
   -40

   -50

   -60

   Start 1 GHz              100 MHz/              Stop  2 GHz
```
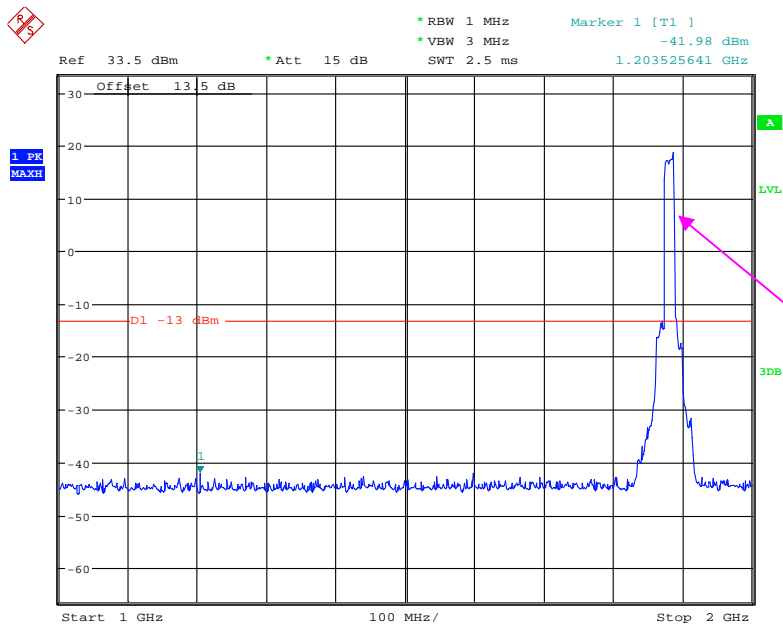
Date: 19.SEP.2018 16:51:11

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

```
                                        *RBW 1 MHz        Marker 1 [T1 ]
                                        *VBW 3 MHz              -41.78 dBm
         Ref  33.5 dBm      *Att  15 dB  SWT 105 ms       10.365384615 GHz
            Offset   13.5 dB                                                    A
         -30

         -20
                                                                              LVL
         -10

          0

         -10
           D1 -13 dBm
         -20                                                                  3DB

         -30

         -40                            1

         -50

         -60

         Start  2 GHz              1.8 GHz/              Stop  20 GHz
```
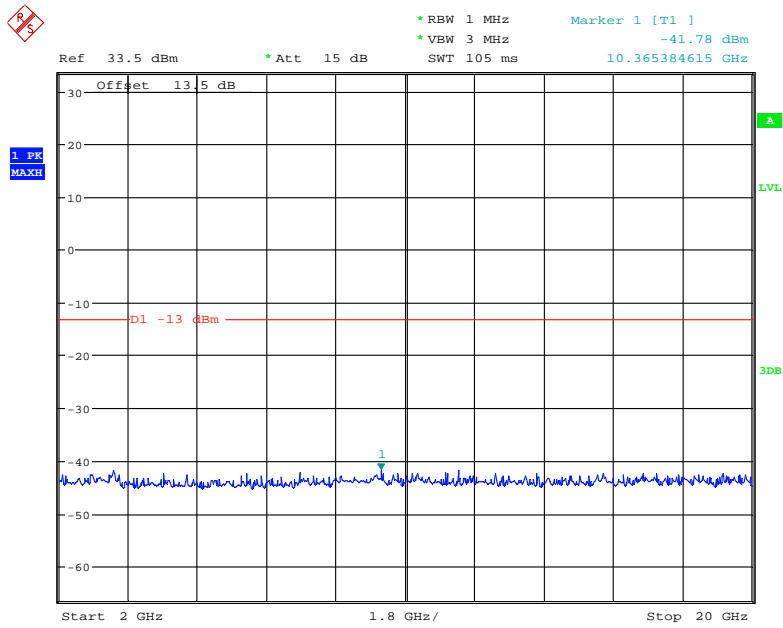
Date: 19.SEP.2018 16:51:26

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

```
                                        *RBW 100 kHz       Marker 1 [T1 ]
                                        *VBW 300 kHz             -42.36 dBm
         Ref  33.5 dBm      *Att  15 dB  SWT 100 ms       162.131410256 MHz
            Offset   13.5 dB                                                    A
         -30

         -20
                                                                              LVL
         -10

          0

         -10
           D1 -13 dBm
         -20                                                                  3DB

         -30

         -40      1

         -50

         -60

         Start  30 MHz             97 MHz/               Stop  1 GHz
```
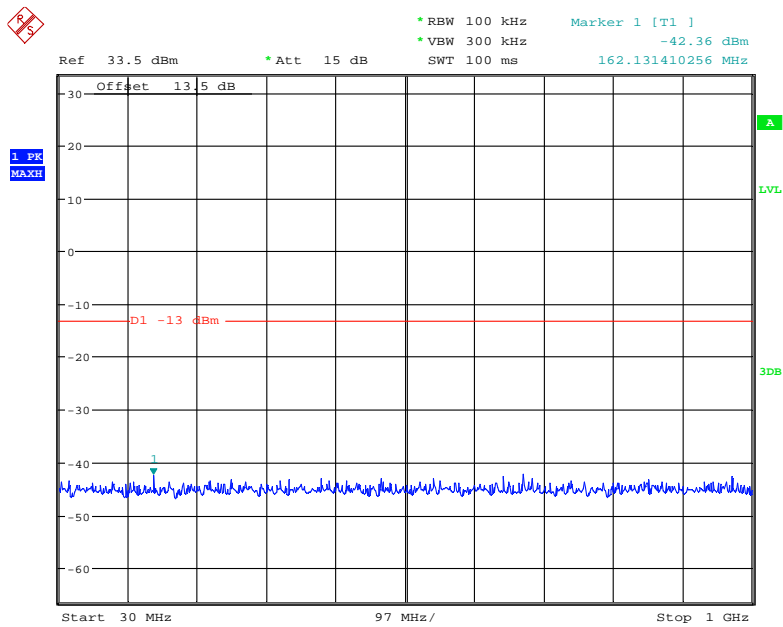
Date: 19.SEP.2018 16:56:38

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

```
                              * RBW  1 MHz        Marker 1 [T1 ]
                              * VBW  3 MHz                    -41.94 dBm
   Ref   33.5 dBm    * Att  15 dB    SWT  2.5 ms        1.785256410 GHz
      Offset   13.5 dB                                               A
   -30
   -20
1 PK
MAXH                                                              LVL
   -10
   -0
   --10
   D1 -13 dBm                                                    3DB
   --20
   --30
   --40                                        1
   --50
   --60
   Start  1 GHz           100 MHz/              Stop  2 GHz
```

Fundamental test
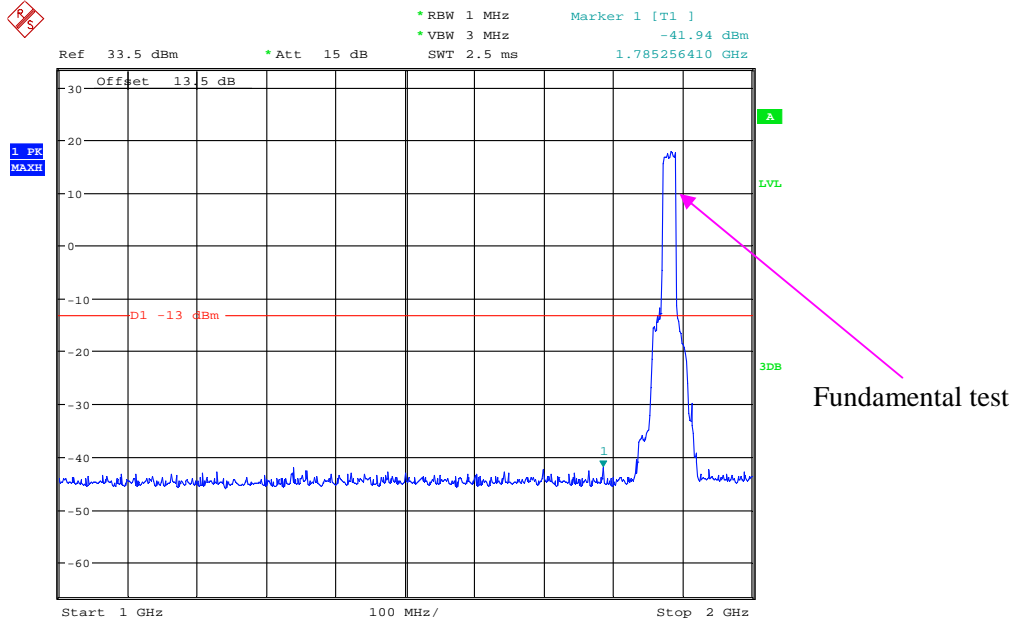
Date: 19.SEP.2018 16:56:18

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

```
                              * RBW  1 MHz        Marker 1 [T1 ]
                              * VBW  3 MHz                    -41.85 dBm
   Ref   33.5 dBm    * Att  15 dB    SWT  105 ms        3.355769231 GHz
      Offset   13.5 dB                                               A
   -30
   -20
1 PK
MAXH                                                              LVL
   -10
   -0
   --10
   D1 -13 dBm                                                    3DB
   --20
   --30
   --40  1
   --50
   --60
   Start  2 GHz           1.8 GHz/              Stop  20 GHz
```
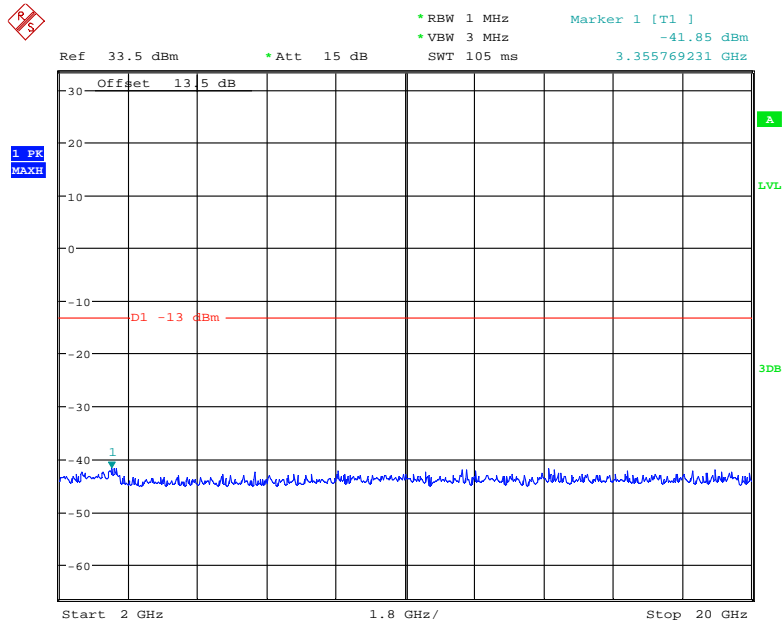
Date: 19.SEP.2018 16:55:56

LTE Band 4:

30 MHz - 1 GHz (1.4 MHz, Middle Channel)
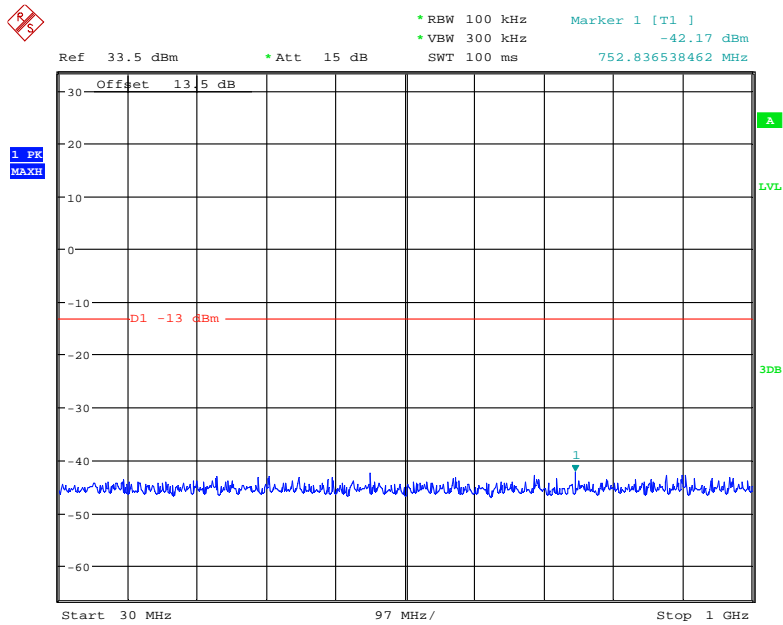
Date: 19.SEP.2018 17:14:13

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

Fundamental test

Date: 19.SEP.2018 17:14:43

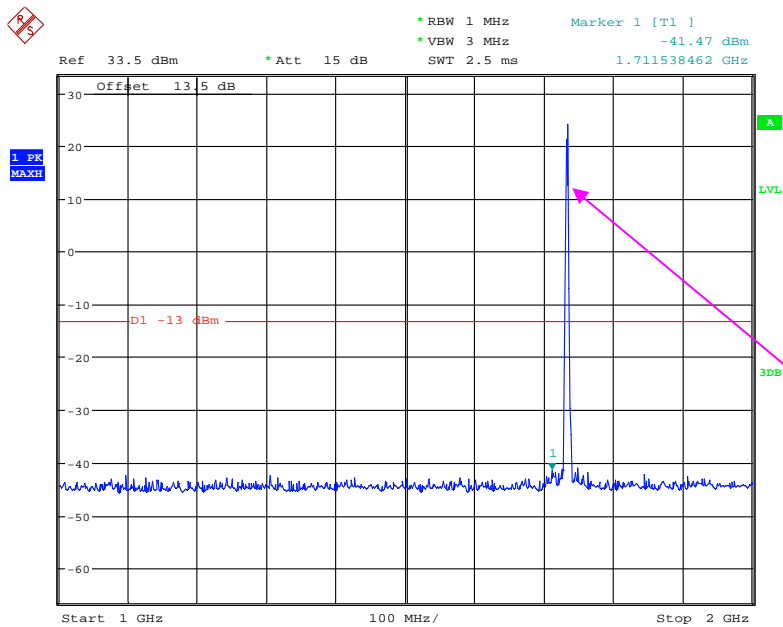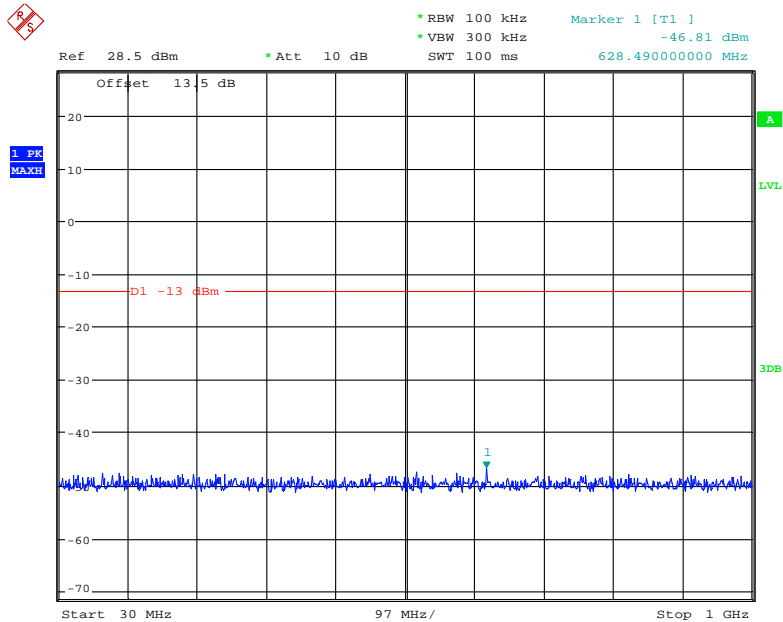## 2 GHz – 20 GHz (1.4 MHz, Middle Channel)

```
                                          * RBW 1 MHz        Marker 1 [T1 ]
                                          * VBW 3 MHz              -24.86 dBm
        Ref  33.5 dBm      * Att  15 dB    SWT 105 ms       3.442307692 GHz
            Offset  13.5 dB
          -30                                                                    A
          -20
  1 PK
  MAXH    -10
                                                                                LVL
            0

          -10
              D1 -13 dBm
          -20                                                                   3DB
              1
          -30
          -40
          -50
          -60
        Start  2 GHz              1.8 GHz/                    Stop  20 GHz
```
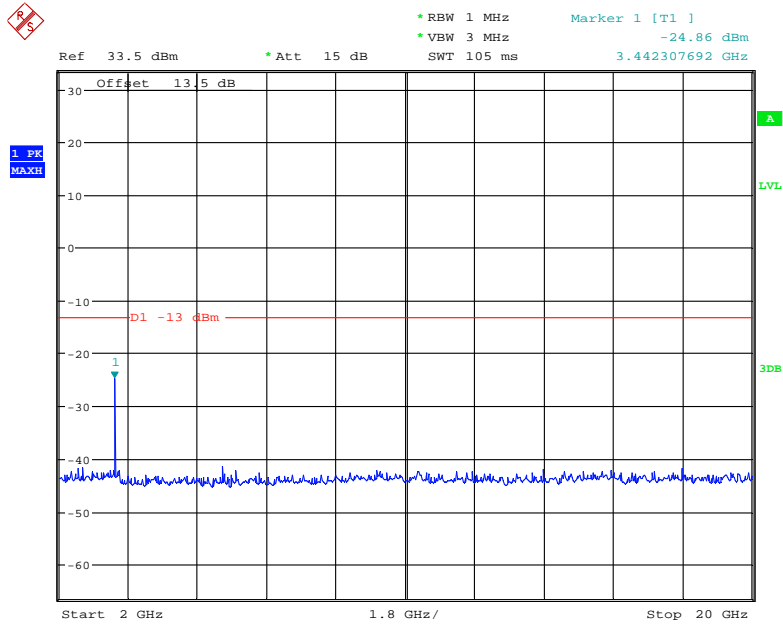
Date: 19.SEP.2018 17:15:02

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

```
                                          * RBW 100 kHz      Marker 1 [T1 ]
                                          * VBW 300 kHz            -46.81 dBm
        Ref  28.5 dBm      * Att  10 dB    SWT 100 ms       628.490000000 MHz
            Offset  13.5 dB
          -20                                                                    A
  1 PK    -10
  MAXH
                                                                                LVL
            0

          -10
              D1 -13 dBm
          -20
          -30                                                                   3DB
          -40
                                                1
          -60
          -70
        Start  30 MHz             97 MHz/                     Stop  1 GHz
```

Date: 21.SEP.2018 10:02:08

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

```
                          * RBW 1 MHz      Marker 1 [T1 ]
                          * VBW 3 MHz                   -41.57 dBm
 Ref   33.5 dBm    * Att  15 dB   SWT 5 ms       1.574897436 GHz
      Offset  13.5 dB
```

Fundamental test

```
 Start  1 GHz            100 MHz/              Stop  2 GHz
```
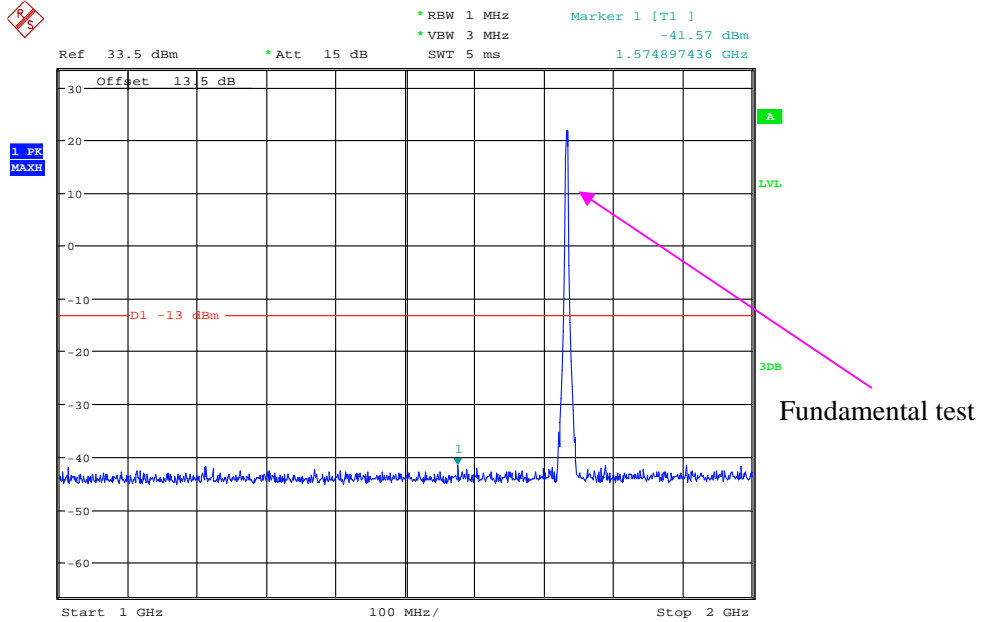
Date: 21.SEP.2018 10:01:30

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

```
                          * RBW 1 MHz      Marker 1 [T1 ]
                          * VBW 3 MHz                   -21.69 dBm
 Ref   18.5 dBm    * Att   5 dB   SWT 105 ms      3.458000000 GHz
      Offset  13.5 dB
```

```
 Start  2 GHz            1.8 GHz/              Stop  20 GHz
```
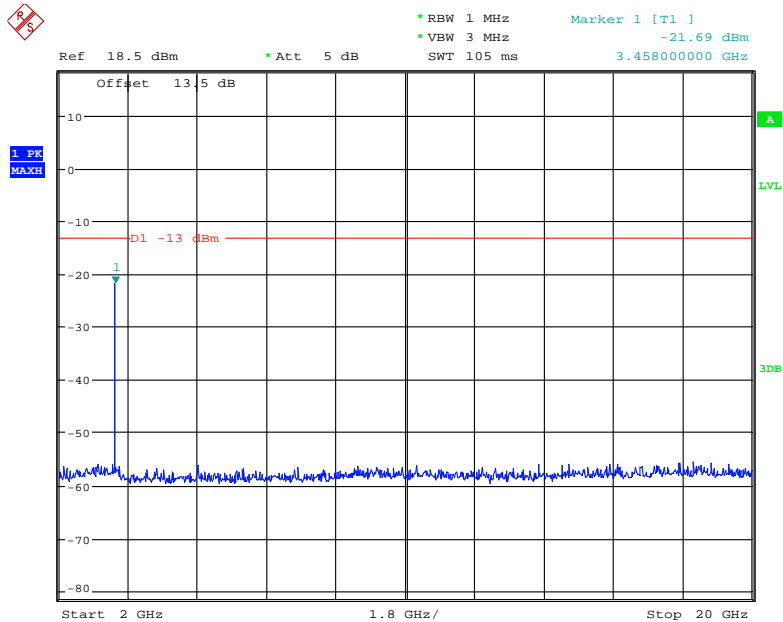
Date: 21.SEP.2018 10:00:21

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

```
                                    * RBW 100 kHz    Marker 1 [T1 ]
                                    * VBW 300 kHz             -46.78 dBm
        Ref   28.5 dBm      * Att  10 dB    SWT 100 ms    714.820000000 MHz
           Offset  13.5 dB                                               A
   -20
1 PK
MAXH  -10                                                               LVL
    -0
   --10
        D1 -13 dBm                                                      3DB
   --20
   --30
   --40
                                              1
   --50
   --60
   --70
        Start 30 MHz              97 MHz/              Stop 1 GHz
```
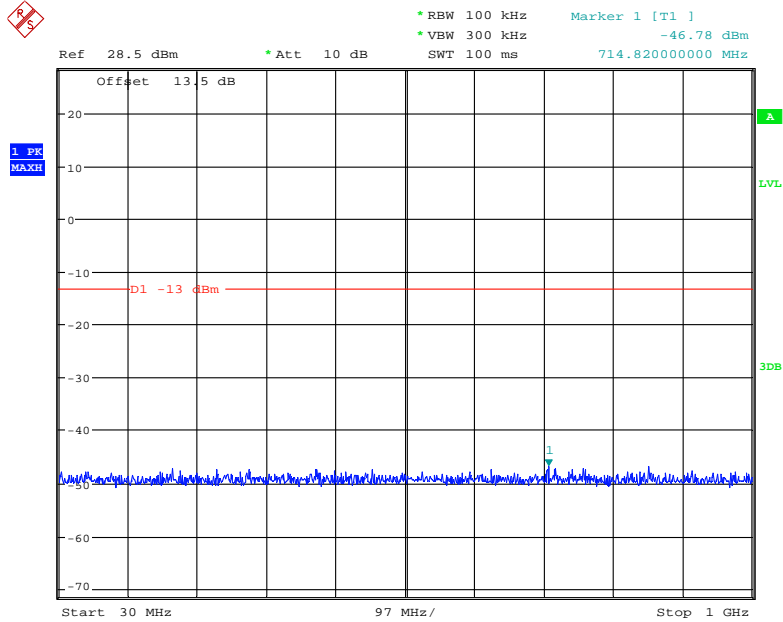
Date: 21.SEP.2018 10:02:58

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

```
                                    * RBW 1 MHz     Marker 1 [T1 ]
                                    * VBW 3 MHz              -46.70 dBm
        Ref   28.5 dBm      * Att  10 dB    SWT 5 ms    1.647435897 GHz
           Offset  13.5 dB                                               A
   -20
1 PK
MAXH  -10                                                               LVL
    -0
   --10
        D1 -13 dBm                                                      3DB
   --20
   --30                                                    Fundamental test
   --40
                                        1
   --50
   --60
   --70
        Start 1 GHz              100 MHz/              Stop 2 GHz
```
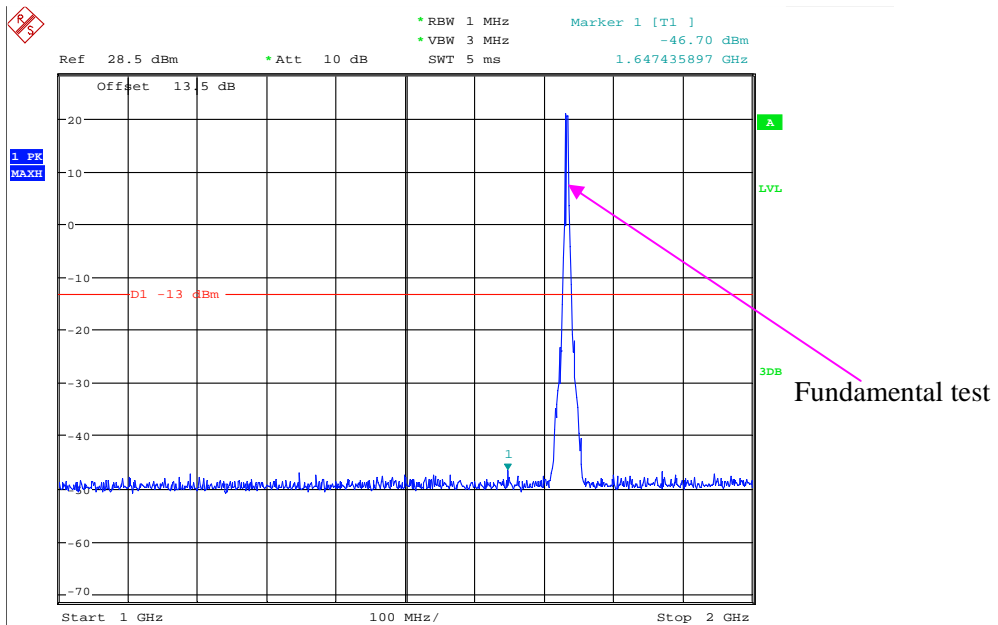
Date: 21.SEP.2018 10:03:24

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

```
                                    *RBW  1 MHz      Marker 1 [T1 ]
                                    *VBW  3 MHz              -28.31 dBm
     Ref   28.5 dBm      *Att  10 dB    SWT 105 ms       3.458000000 GHz
        Offset   13.5 dB                                              A

   -20

   -10

    0

   -10
        D1 -13 dBm                                                  LVL
   -20

   -30                                                              3DB
 1

   -40

   -50

   -60

   -70
     Start  2 GHz              1.8 GHz/              Stop  20 GHz
```

1 PK MAXH
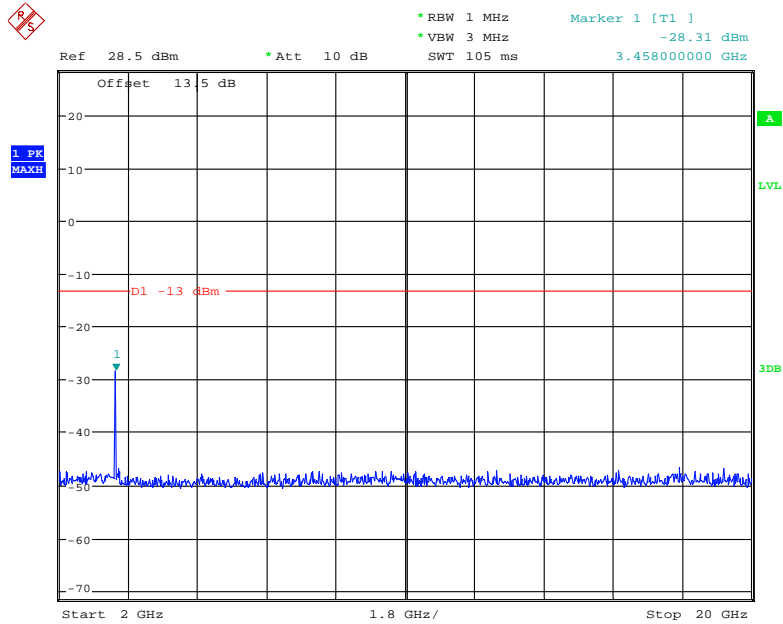
Date: 21.SEP.2018 10:03:40

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

```
                                    *RBW  100 kHz    Marker 1 [T1 ]
                                    *VBW  300 kHz            -46.99 dBm
     Ref   28.5 dBm      *Att  10 dB    SWT 100 ms     159.980000000 MHz
        Offset   13.5 dB                                              A

   -20

   -10

    0

   -10
        D1 -13 dBm                                                  LVL
   -20

   -30

   -40                                                              3DB
      1

   -60

   -70
     Start  30 MHz             97 MHz/               Stop  1 GHz
```

1 PK MAXH
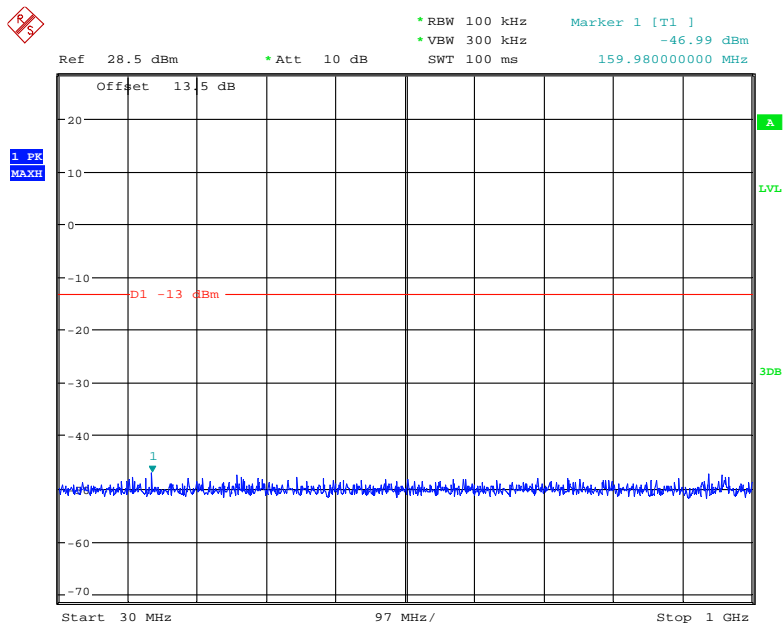
Date: 21.SEP.2018 10:04:46

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

```
                          * RBW 1 MHz      Marker 1 [T1 ]
                          * VBW 3 MHz               -46.97 dBm
      Ref  28.5 dBm    * Att  10 dB   SWT 5 ms     1.121794872 GHz
        Offset  13.5 dB
```

Fundamental test
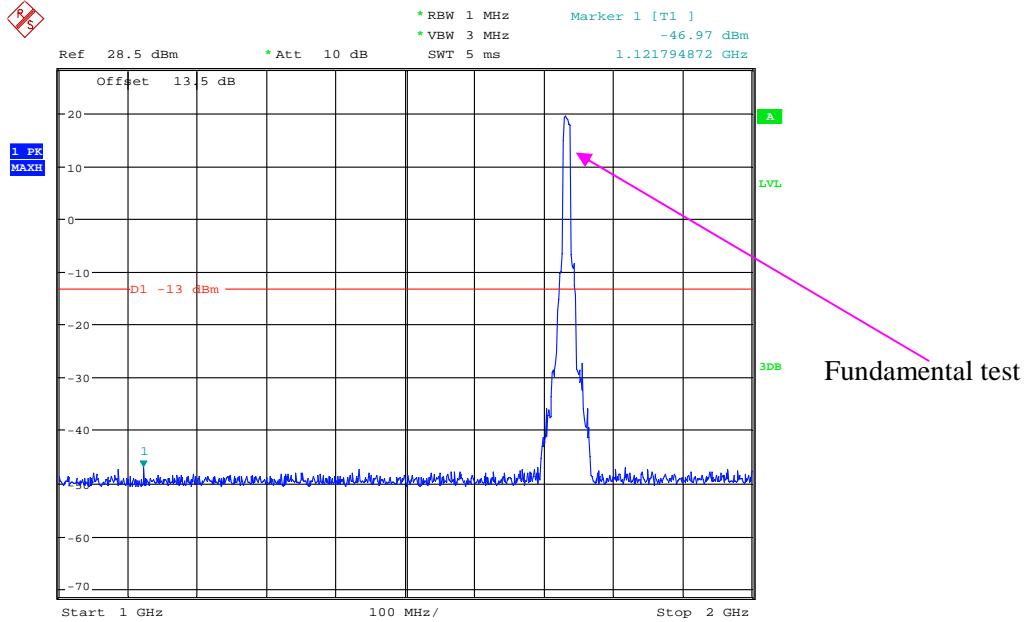
```
Date: 21.SEP.2018  10:04:23
```

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

```
                          * RBW 1 MHz      Marker 1 [T1 ]
                          * VBW 3 MHz               -29.12 dBm
      Ref  28.5 dBm    * Att  10 dB   SWT 105 ms    3.458000000 GHz
        Offset  13.5 dB
```
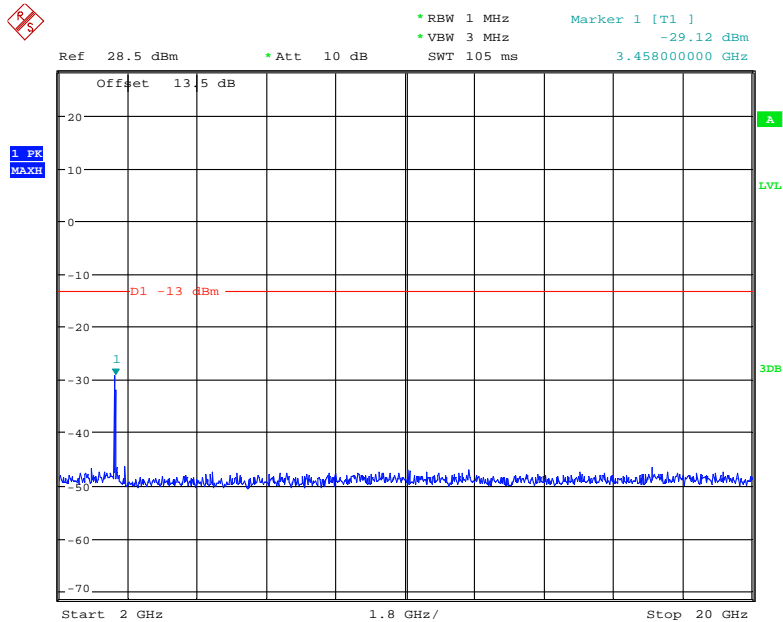
```
Date: 21.SEP.2018  10:04:01
```

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

```
                                    *RBW  100 kHz    Marker 1 [T1 ]
                                    *VBW  300 kHz              -47.54 dBm
        Ref   28.5 dBm   *Att  10 dB   SWT  100 ms     475.230000000 MHz
```
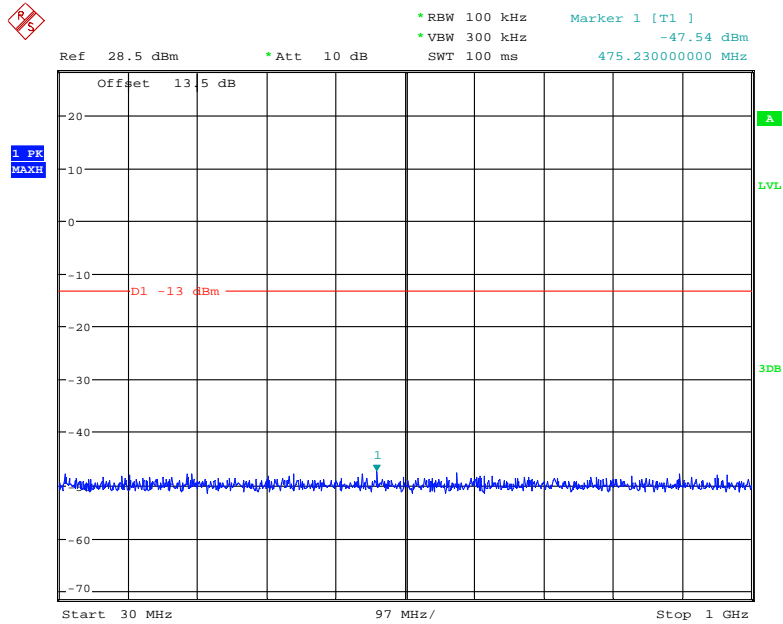
Date: 21.SEP.2018 10:05:07

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

```
                                    *RBW  1 MHz      Marker 1 [T1 ]
                                    *VBW  3 MHz                -46.68 dBm
        Ref   28.5 dBm   *Att  10 dB   SWT  5 ms       1.530448718 GHz
```
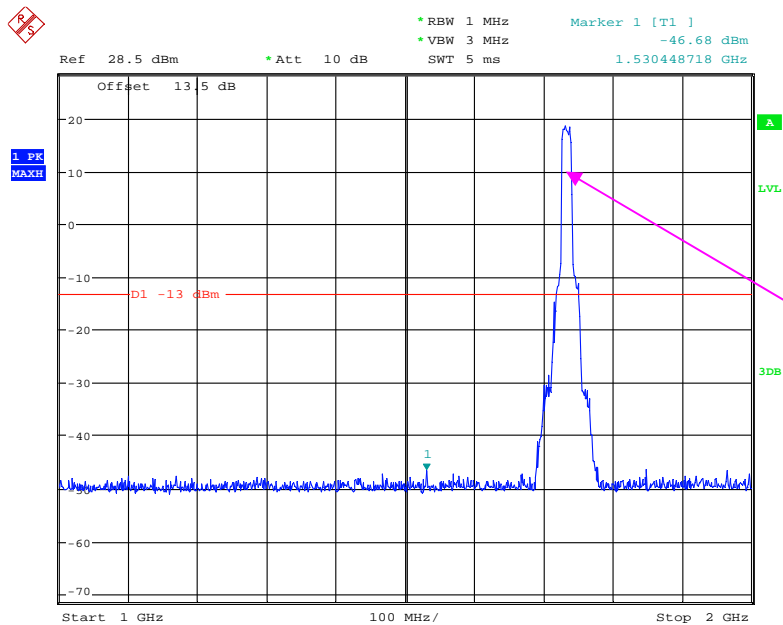
Fundamental test

Date: 21.SEP.2018 10:05:32

2 GHz – 20 GHz (15.0 MHz, Middle Channel)
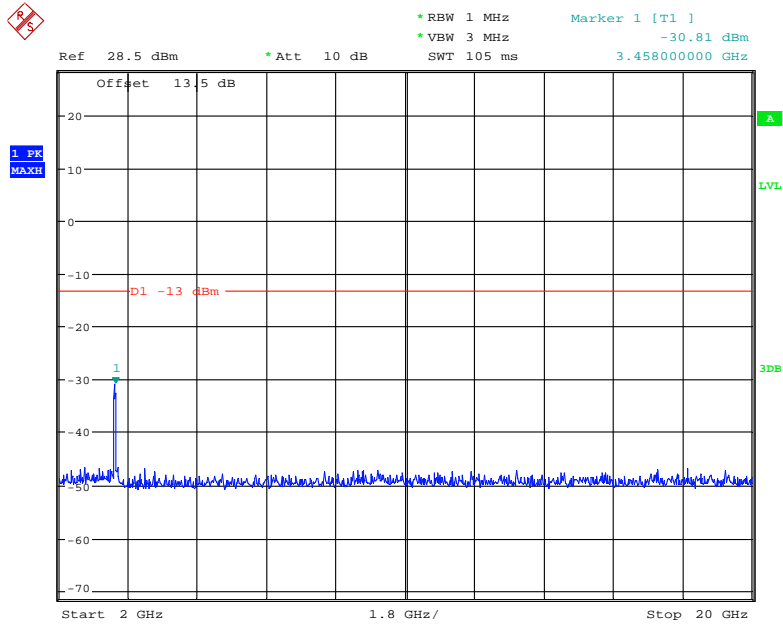
Date: 21.SEP.2018 10:05:47

LTE Band 5:

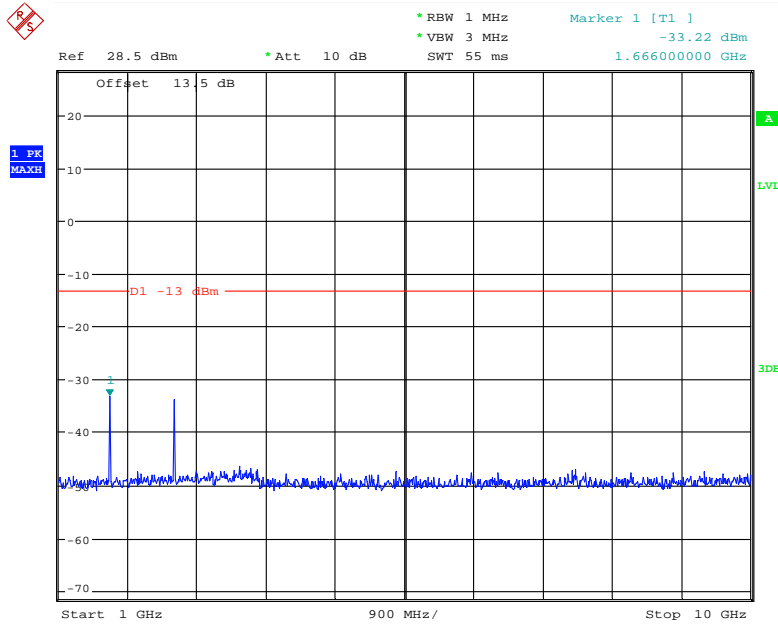## 30 MHz - 1 GHz (1.4 MHz, Middle Channel)
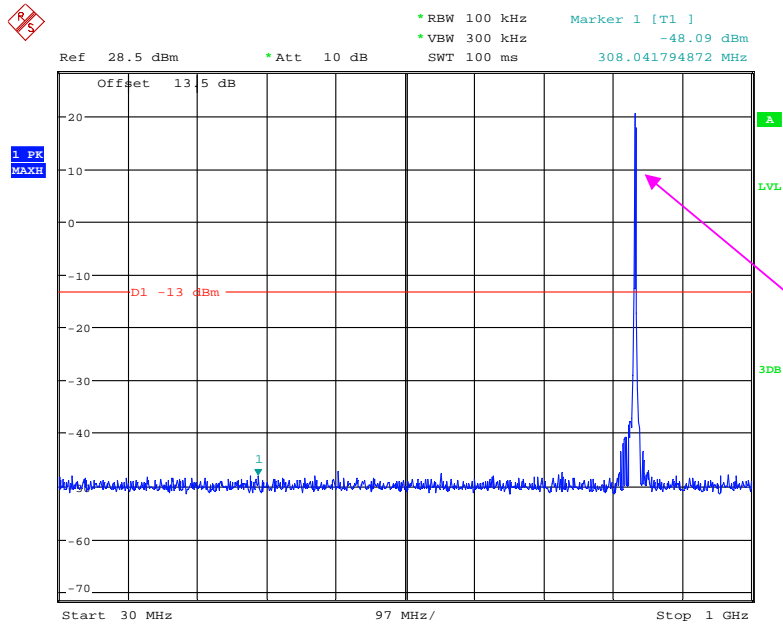
Fundamental test

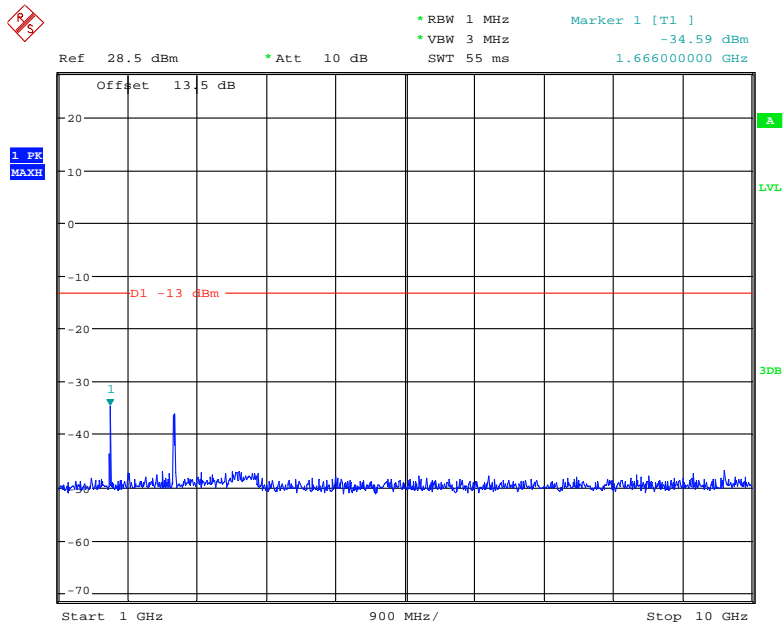Date: 21.SEP.2018 10:09:08

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

```
                              * RBW 1 MHz        Marker 1 [T1 ]
                              * VBW 3 MHz                -24.96 dBm
        Ref  28.5 dBm    * Att  10 dB    SWT 55 ms     2.503000000 GHz
          Offset  13.5 dB                                              A

  1 PK
  MAXH                                                                 LVL

                                                                       3DB
```
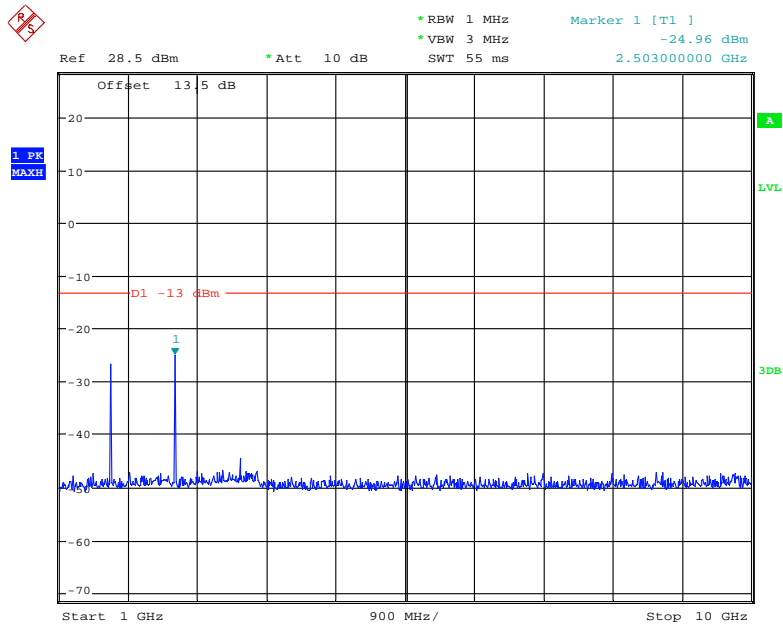
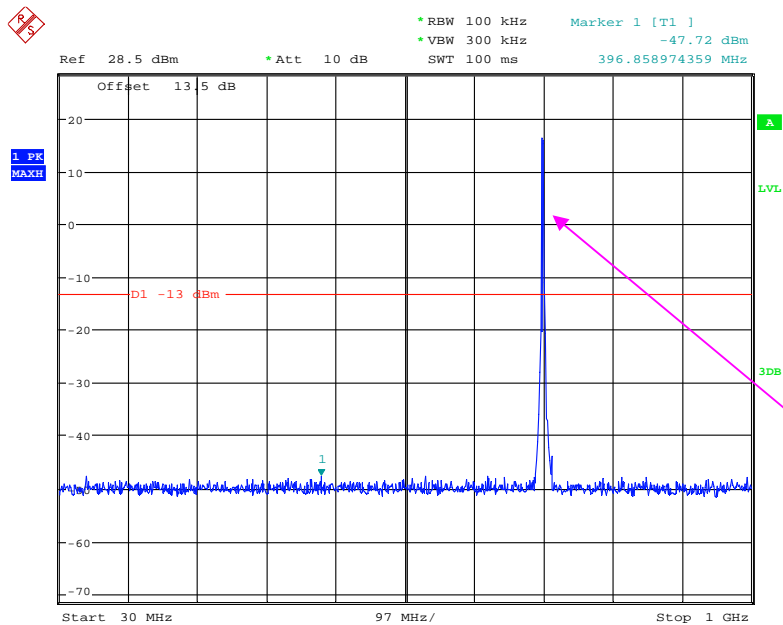Date: 21.SEP.2018 10:09:33

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

```
                              * RBW 100 kHz       Marker 1 [T1 ]
                              * VBW 300 kHz               -47.54 dBm
        Ref  28.5 dBm    * Att  10 dB    SWT 100 ms    371.987179487 MHz
          Offset  13.5 dB                                              A

  1 PK
  MAXH                                                                 LVL

                                                                       3DB
```
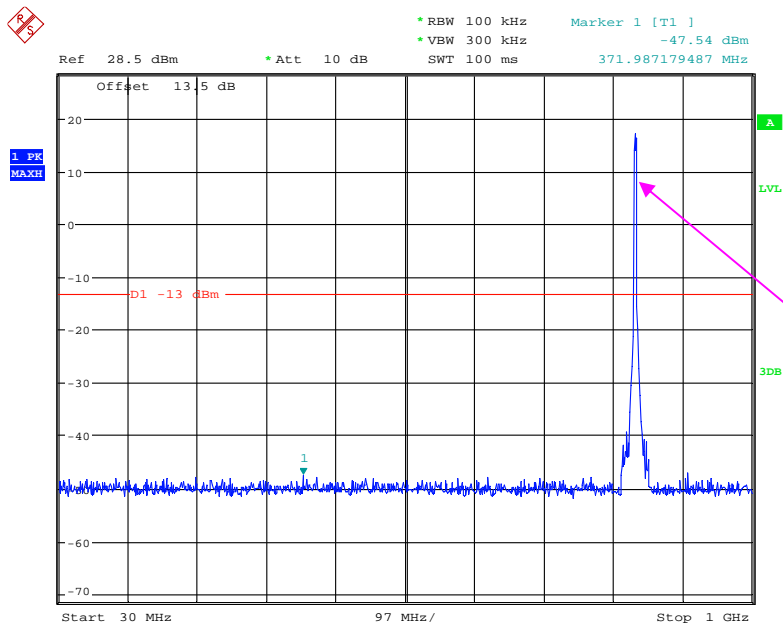
Fundamental test

Date: 21.SEP.2018 10:10:27

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

```
                                    * RBW 1 MHz      Marker 1 [T1 ]
                                    * VBW 3 MHz              -29.86 dBm
        Ref  28.5 dBm    * Att  10 dB    SWT 55 ms    1.666000000 GHz
          Offset  13.5 dB                                           A
     -20
1 PK
MAXH -10
      0
     -10
          D1 -13 dBm
     -20                                                            3DB
     -30  1
     -40
     -50
     -60
     -70
        Start 1 GHz           900 MHz/           Stop 10 GHz
```
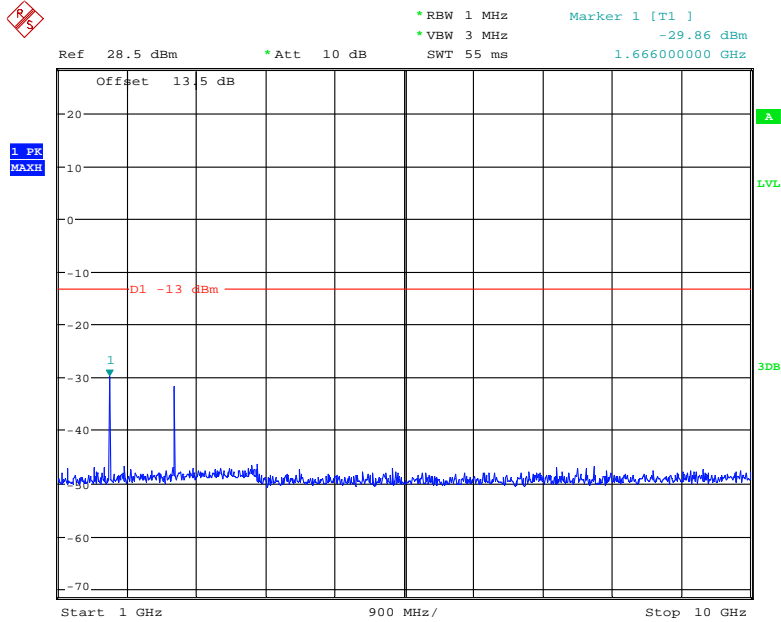
Date: 21.SEP.2018 10:10:00

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

```
                                    * RBW 100 kHz    Marker 1 [T1 ]
                                    * VBW 300 kHz            -47.60 dBm
        Ref  28.5 dBm    * Att  10 dB    SWT 100 ms   482.355769231 MHz
          Offset  13.5 dB                                           A
     -20
1 PK
MAXH -10
      0
     -10
          D1 -13 dBm
     -20                                                            3DB
     -30
     -40
           1
     -50
     -60
     -70
        Start 30 MHz          97 MHz/            Stop 1 GHz
```
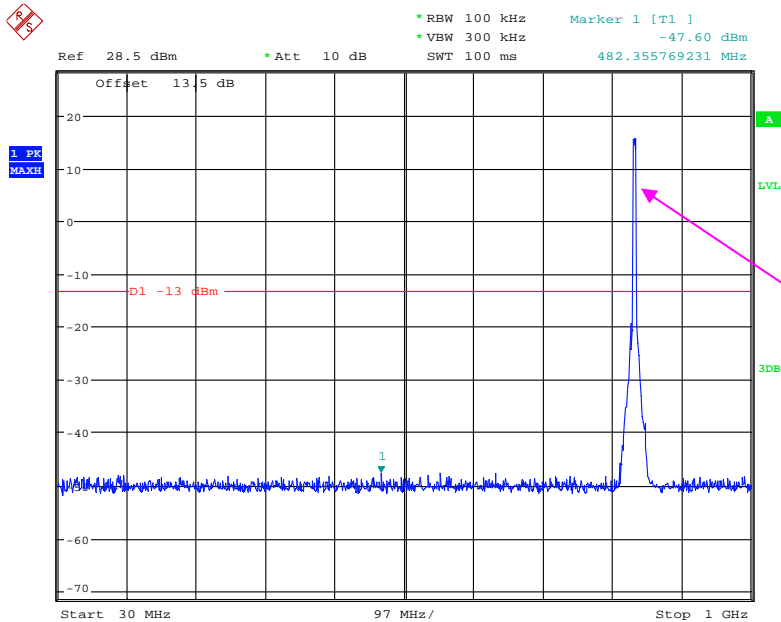
Fundamental test

Date: 21.SEP.2018 10:10:47

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

Date: 21.SEP.2018 10:11:16
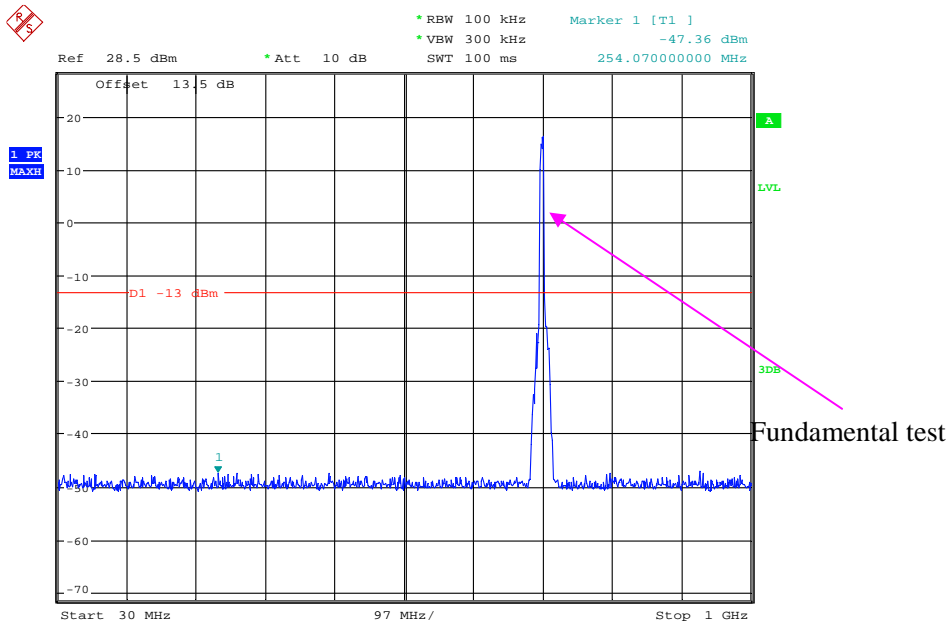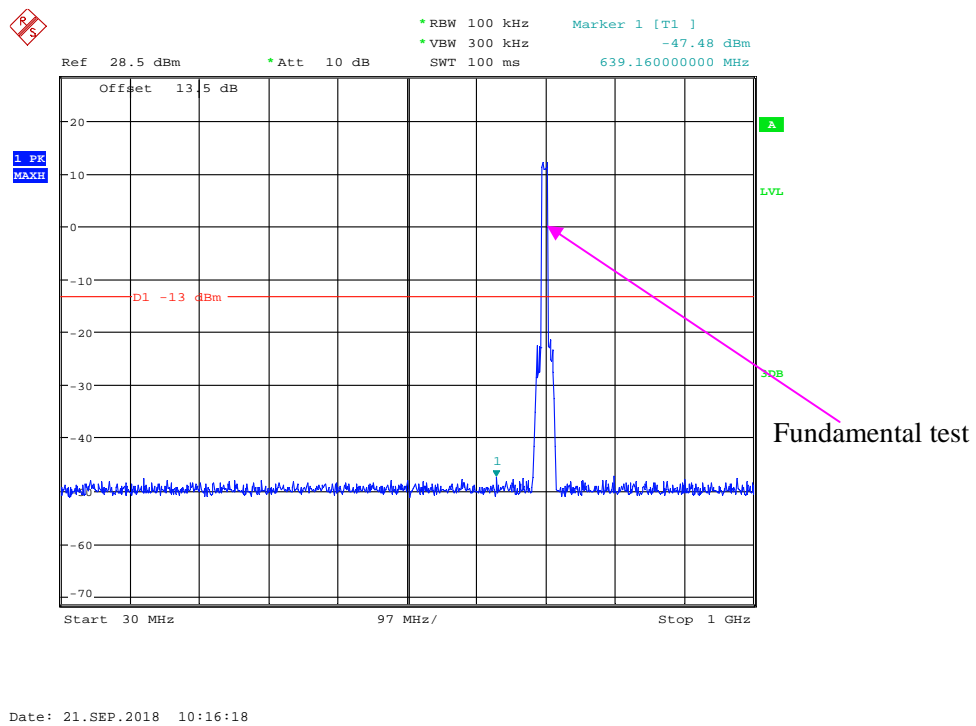
30 MHz - 1 GHz (10.0 MHz, Middle Channel)

Fundamental test
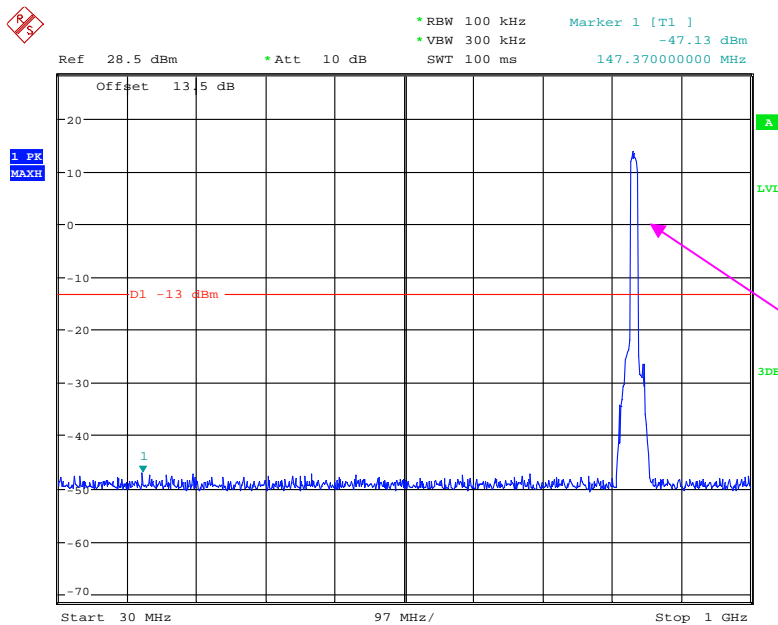
Date: 21.SEP.2018 10:12:17

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

Date: 21.SEP.2018 10:11:34

LTE Band 12:

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

Fundamental test
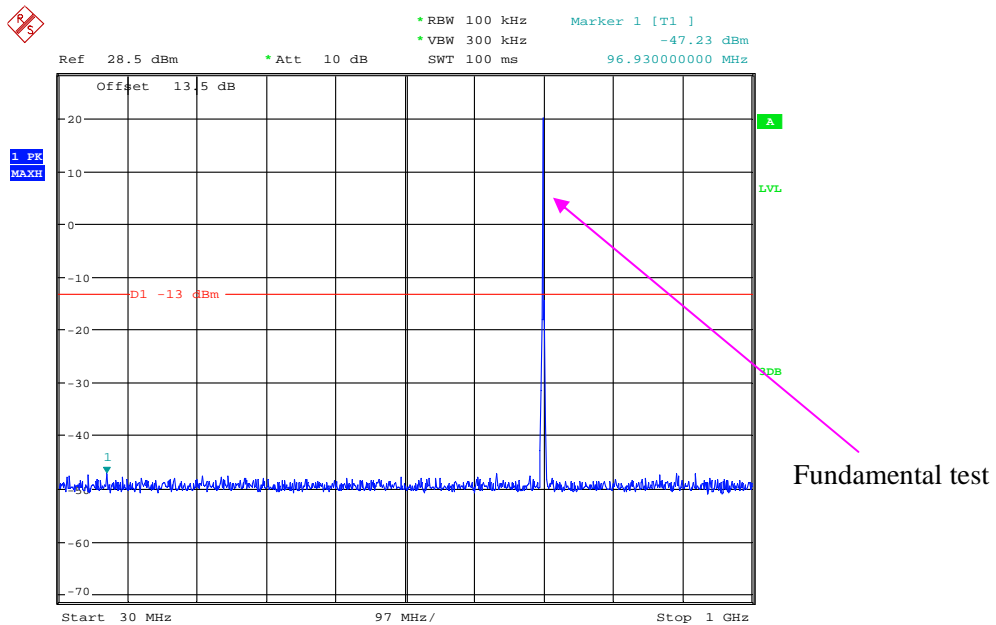
Date: 21.SEP.2018 10:13:31

1 GHz – 8 GHz (1.4 MHz, Middle Channel)

	*RBW 1 MHz	Marker 1 [T1]	
	*VBW 3 MHz	-29.27 dBm	
Ref 28.5 dBm	*Att 10 dB	SWT 45 ms	1.413000000 GHz

Offset 13.5 dB
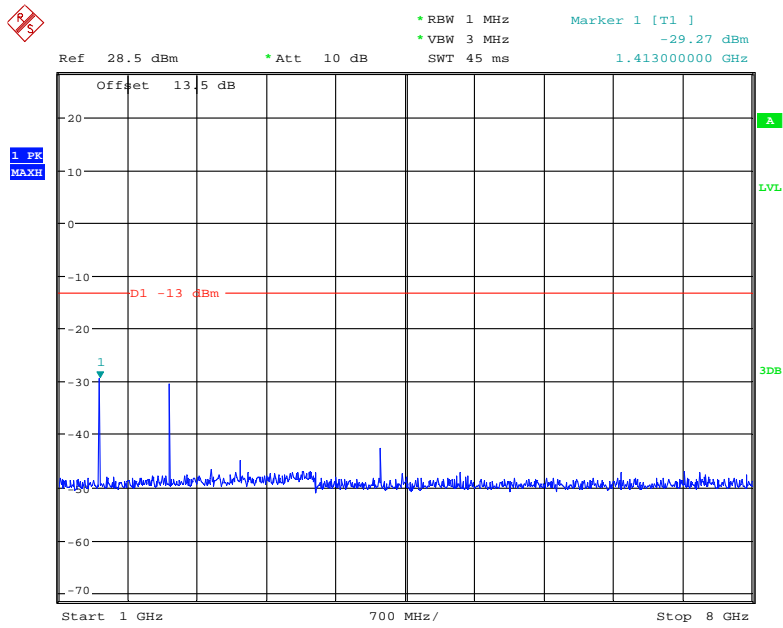
Date: 21.SEP.2018 10:13:57

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

	*RBW 100 kHz	Marker 1 [T1]	
	*VBW 300 kHz	-47.72 dBm	
Ref 28.5 dBm	*Att 10 dB	SWT 100 ms	396.858974359 MHz

Offset 13.5 dB

Fundamental test

Date: 21.SEP.2018 10:14:42

1 GHz – 8 GHz (3.0 MHz, Middle Channel)

```
                              * RBW 1 MHz        Marker 1 [T1 ]
                              * VBW 3 MHz              -32.31 dBm
      Ref  28.5 dBm    * Att  10 dB    SWT 45 ms    1.413000000 GHz
         Offset  13.5 dB                                              A
  -20
1 PK
MAXH -10                                                             LVL
  -0
  -10
        D1 -13 dBm
  -20
                                                                    3DB
  -30  1
  -40
  -60
  -70
      Start  1 GHz          700 MHz/              Stop  8 GHz
```
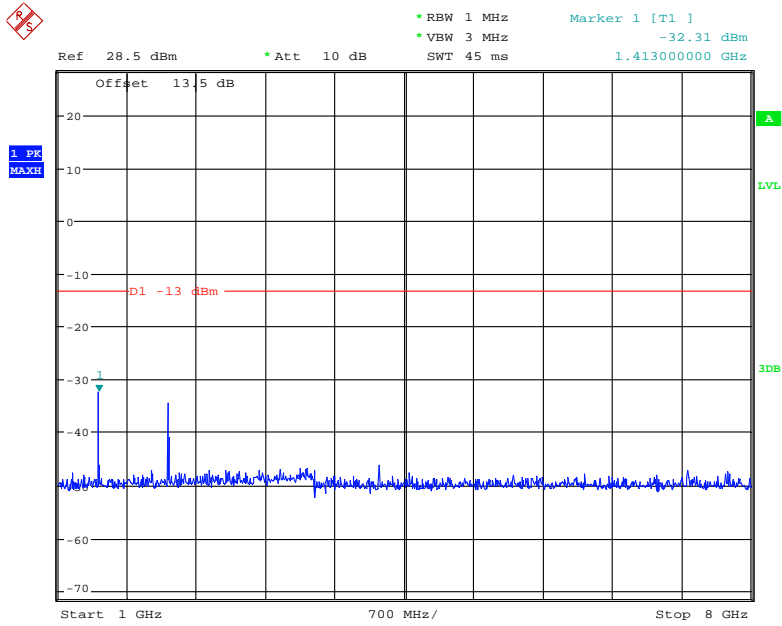
Date: 21.SEP.2018 10:14:18

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

```
                              * RBW 100 kHz      Marker 1 [T1 ]
                              * VBW 300 kHz            -47.36 dBm
      Ref  28.5 dBm    * Att  10 dB    SWT 100 ms   254.070000000 MHz
         Offset  13.5 dB                                              A
  -20
1 PK
MAXH -10                                                             LVL
  -0
  -10
        D1 -13 dBm
  -20
                                                                    3DB
  -30
  -40                                               Fundamental test
  -60
  -70
      Start  30 MHz          97 MHz/              Stop  1 GHz
```

Date: 21.SEP.2018 10:15:13

1 GHz – 8 GHz (5.0 MHz, Middle Channel)

```
                                    * RBW 1 MHz        Marker 1 [T1 ]
                                    * VBW 3 MHz              -34.78 dBm
        Ref  28.5 dBm    * Att  10 dB    SWT 45 ms      1.413000000 GHz
          Offset  13.5 dB                                              A
1 PK
MAXH                                                                  LVL
                                                                     3DB
```

Date: 21.SEP.2018 10:15:35

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

```
                                    * RBW 100 kHz      Marker 1 [T1 ]
                                    * VBW 300 kHz            -47.48 dBm
        Ref  28.5 dBm    * Att  10 dB    SWT 100 ms     639.160000000 MHz
          Offset  13.5 dB                                              A
1 PK
MAXH                                                                  LVL
                                                                     3DB
```

Fundamental test

Date: 21.SEP.2018 10:16:18

1 GHz – 8 GHz (10.0 MHz, Middle Channel)


```
                                    * RBW  1 MHz        Marker 1 [T1 ]
                                    * VBW  3 MHz               -36.35 dBm
        Ref   28.5 dBm     * Att  10 dB   SWT  45 ms    1.420000000 GHz
           Offset   13.5 dB
```
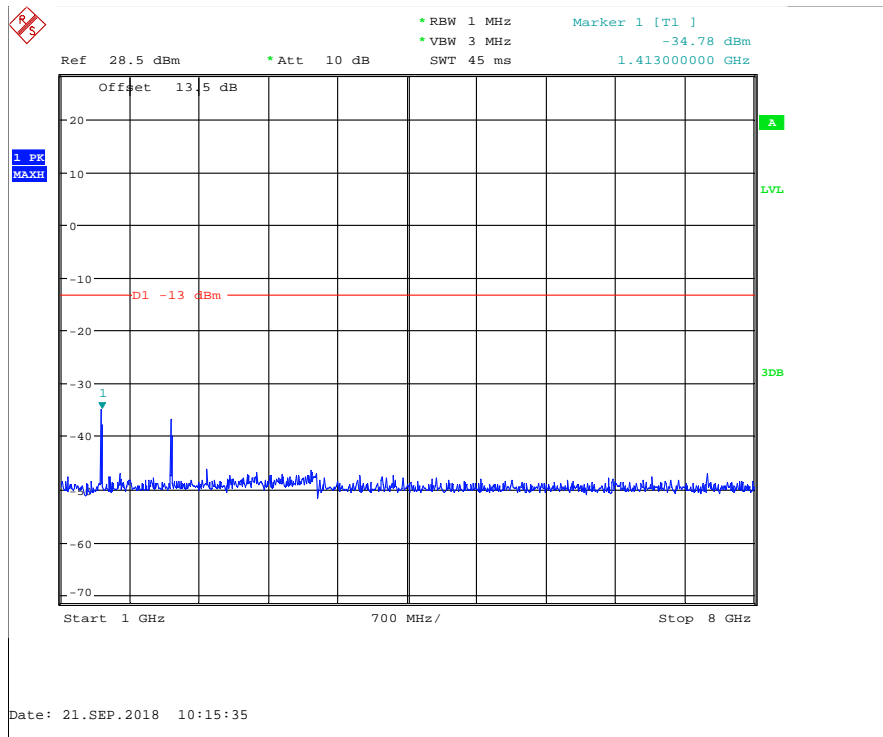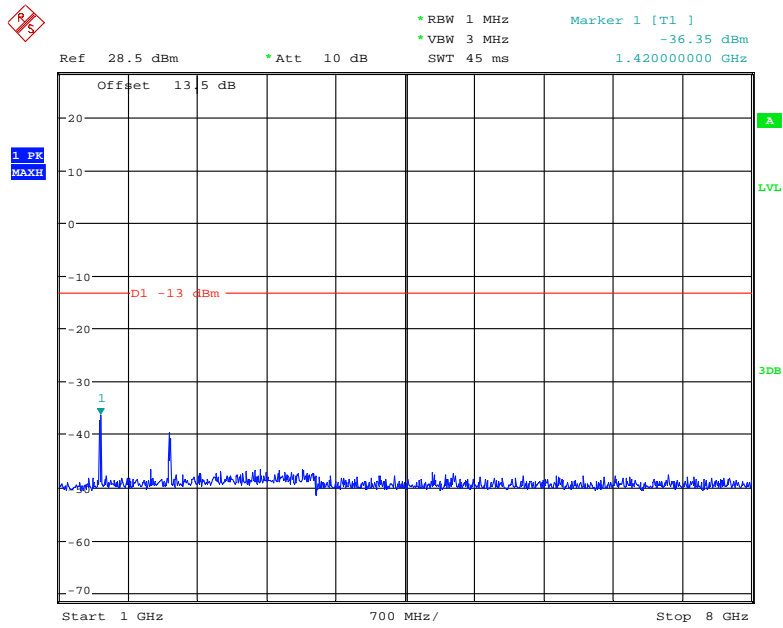
Date: 21.SEP.2018 10:15:50

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 2018-09-21.

EUT operation mode: Transmitting

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

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
967.25	38.24	44	1.5	H	-58.8	0.74	0	-59.54	-13	46.54
967.25	36.52	12	2.5	V	-60.5	0.74	0	-61.24	-13	48.24
1673.20	66.67	192	1.7	H	-40.4	1.30	8.90	-32.80	-13	19.80
1673.20	66.89	46	1.9	V	-39.6	1.30	8.90	-32.00	-13	19.00
2509.80	71.25	226	1.5	H	-32.3	2.60	10.20	-24.70	-13	11.70
2509.80	72.21	213	1.5	V	-30.7	2.60	10.20	-23.10	-13	10.10
3346.40	47.95	172	1.6	H	-52.4	1.50	11.70	-42.20	-13	29.20
3346.40	45.65	345	1.0	V	-54.7	1.50	11.70	-44.50	-13	31.50
WCDMA Mode, Middle channel										
963.14	38.52	217	1.0	H	-58.5	0.74	0	-59.24	-13	46.24
963.14	37.46	320	2.4	V	-59.5	0.74	0	-60.24	-13	47.24
1673.20	50.02	73	1.7	H	-57.1	1.30	8.90	-49.50	-13	36.50
1673.20	49.77	131	1.3	V	-56.7	1.30	8.90	-49.10	-13	36.10
2509.80	47.72	28	1.5	H	-55.8	2.60	10.20	-48.20	-13	35.20
2509.80	49.78	26	1.4	V	-53.1	2.60	10.20	-45.50	-13	32.50
3346.40	43.19	261	2.5	H	-57.2	1.50	11.70	-47.00	-13	34.00
3346.40	43.3	355	1.6	V	-57.1	1.50	11.70	-46.90	-13	33.90

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, Middle channel										
967.25	38.74	264	1.1	H	-58.3	0.74	0	-59.04	-13	46.04
967.25	36.18	356	1.3	V	-60.8	0.74	0	-61.54	-13	48.54
3760.00	46.02	358	1.8	H	-55.2	1.50	11.80	-44.90	-13	31.90
3760.00	46.59	234	2.4	V	-54.2	1.50	11.80	-43.90	-13	30.90
WCDMA Mode Band II, Middle channel										
963.14	38.17	7	1.3	H	-58.8	0.74	0	-59.54	-13	46.54
963.14	37.29	181	2.5	V	-59.7	0.74	0	-60.44	-13	47.44
3760.00	43.07	285	1.6	H	-58.2	1.50	11.80	-47.90	-13	34.90
3760.00	43.59	80	2.0	V	-57.2	1.50	11.80	-46.90	-13	33.90

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level	Limit	Margin
(MHz)	Reading (dBµV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	(dBm)	(dBm)	(dB)
Band 2										
Test frequency range:30 MHz ~ 20 GHz										
961.29	38.41	228	2.4	H	-58.6	0.74	0	-59.34	-13	46.34
961.29	37.51	217	1.6	V	-59.5	0.74	0	-60.24	-13	47.24
3760.00	43.66	114	1.2	H	-57.6	1.50	11.80	-47.30	-13	34.30
3760.00	43.32	333	2.3	V	-57.4	1.50	11.80	-47.10	-13	34.10
Band 4										
Test frequency range: 30 MHz ~ 20 GHz										
961.29	38.57	158	1.2	H	-58.4	0.74	0	-59.14	-13	46.14
961.29	37.06	51	1.0	V	-59.9	0.74	0	-60.64	-13	47.64
3465.00	44.32	22	1.7	H	-56.1	1.50	12.00	-45.60	-13	32.60
3465.00	44.30	54	1.5	V	-56.8	1.50	12.00	-46.30	-13	33.30
Band 5										
Test frequency range:30 MHz ~ 10 GHz										
961.29	38.62	9	1.6	H	-58.4	0.74	0	-59.14	-13	46.14
961.29	37.21	23	1.1	V	-59.8	0.74	0	-60.54	-13	47.54
1673.00	51.67	53	1.3	H	-55.4	1.30	8.90	-47.80	-13	34.80
1673.00	54.65	58	1.2	V	-51.8	1.30	8.90	-44.20	-13	31.20
2509.50	47.44	326	1.5	H	-56.1	2.60	10.20	-48.50	-13	35.50
2509.50	49.51	355	2.2	V	-53.4	2.60	10.20	-45.80	-13	32.80
3346.00	43.38	97	1.9	H	-57.0	1.50	11.70	-46.80	-13	33.80
3346.00	42.42	314	1.5	V	-58.0	1.50	11.70	-47.80	-13	34.80
Band 12										
Test frequency range: 30 MHz ~ 8 GHz										
961.29	38.92	324	1.1	H	-58.1	0.74	0	-58.84	-13	45.84
961.29	37.07	289	1.3	V	-59.9	0.74	0	-60.64	-13	47.64
1415.00	43.18	31	1.7	H	-64.7	1.60	7.90	-58.40	-13	45.40
1415.00	43.9	165	1.4	V	-64.2	1.60	7.90	-57.90	-13	44.90
2122.50	40.58	238	2.3	H	-61.5	1.30	9.70	-53.10	-13	40.10
2122.50	39.27	312	1.3	V	-63.6	1.30	9.70	-55.20	-13	42.20
2830.00	43.5	281	2.3	H	-60.3	1.80	10.50	-51.60	-13	38.60
2830.00	42.89	222	1.5	V	-60.5	1.80	10.50	-51.80	-13	38.80
3537.50	43.17	342	2.4	H	-57.3	1.50	12.00	-46.80	-13	33.80
3537.50	43.3	122	1.6	V	-58.0	1.50	12.00	-47.50	-13	34.50

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

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

Applicable Standard

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.
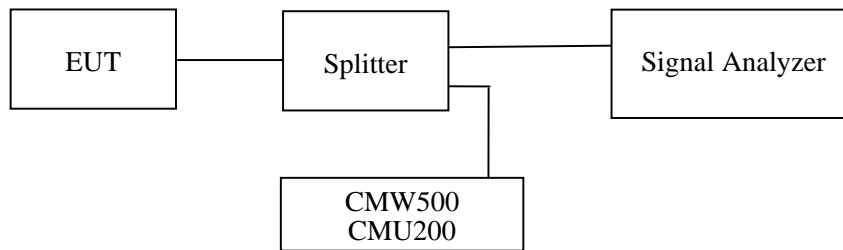
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

Test Procedure

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

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

```
┌──────────┐      ┌──────────┐      ┌──────────────────┐
│   EUT    │──────│ Splitter │──────│  Signal Analyzer │
└──────────┘      └──────────┘      └──────────────────┘
                       │
                  ┌─────────────┐
                  │   CMW500    │
                  │   CMU200    │
                  └─────────────┘
```

Test Data

Environmental Conditions

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

The testing was performed by Haiguo Li on 2018-09-19 to 2018-09-30.

EUT operation mode: Transmitting

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

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

```
                                          *RBW  5 kHz        Marker 1 [T1 ]
                                          *VBW 10 kHz                -15.61 dBm
        Ref  33 dBm          *Att  25 dB  *SWT  1 s         823.990384615 MHz
         -30  Offset  7.5 dB
```
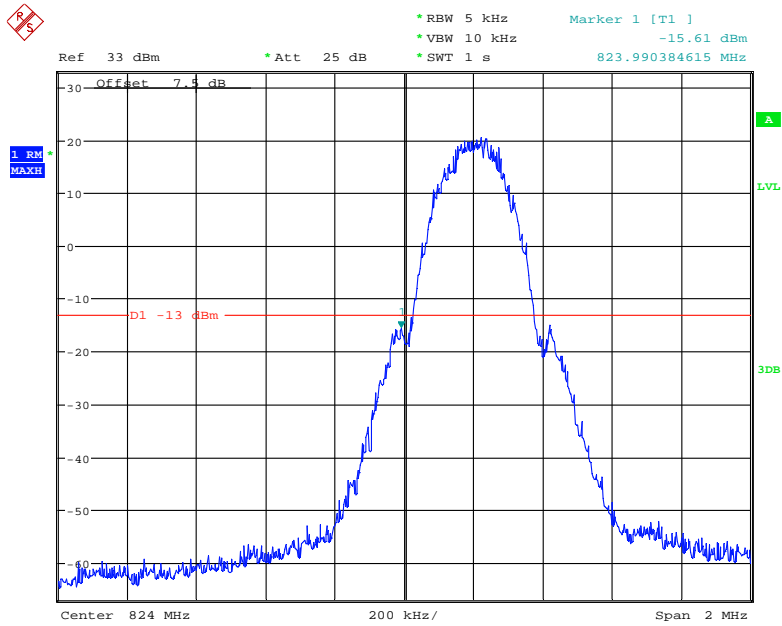
Date: 20.SEP.2018 15:23:21

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

```
                                          *RBW  5 kHz        Marker 1 [T1 ]
                                          *VBW 10 kHz                -16.14 dBm
        Ref  33 dBm          *Att  25 dB  *SWT  1 s         849.019230769 MHz
         -30  Offset  7.5 dB
```
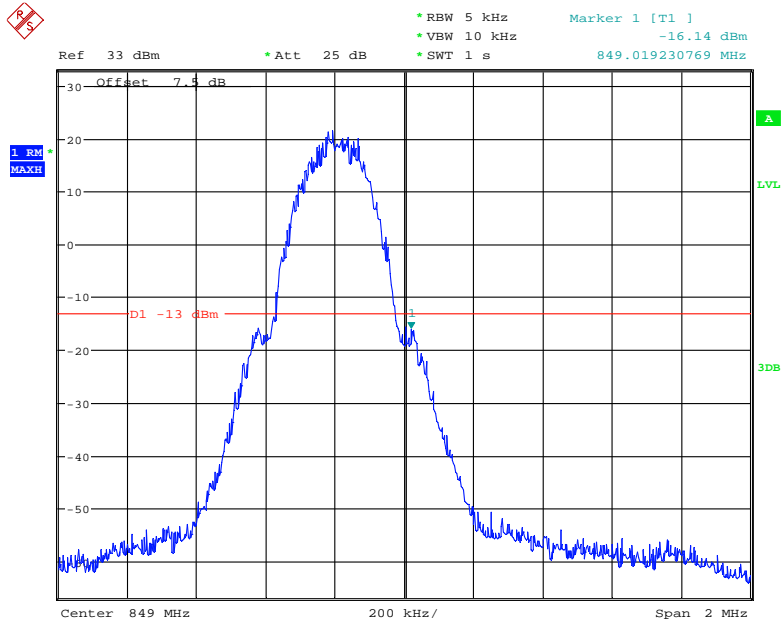
Date: 20.SEP.2018 15:24:08

Cellular Band, Left Band Edge for EDGE Mode

```
                                    *RBW  5 kHz      Marker 1 [T1 ]
                                    *VBW 10 kHz             -15.65 dBm
      Ref  37 dBm       *Att  25 dB  SWT 80 ms      823.993589744 MHz
        Offset   7.5 dB
```
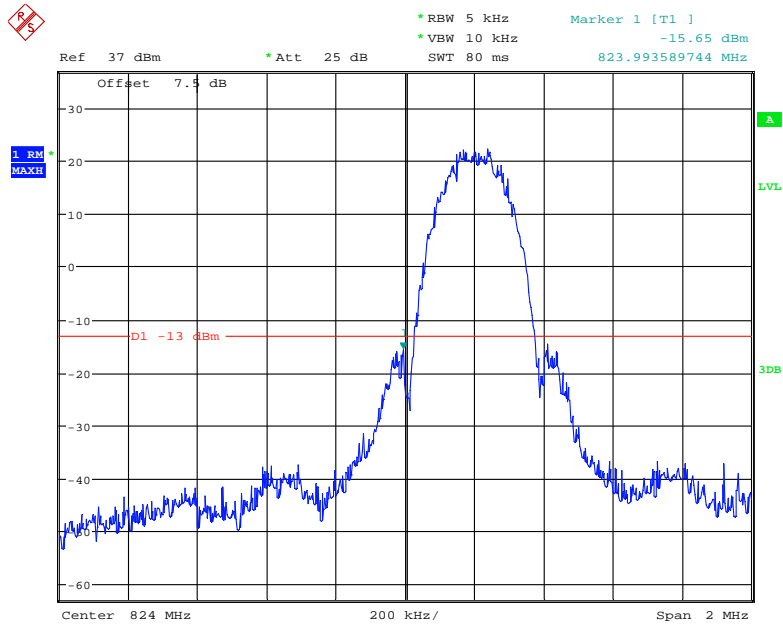
Date: 20.SEP.2018 14:58:31

Cellular Band, Right Band Edge for EDGE Mode

```
                                    *RBW  5 kHz      Marker 1 [T1 ]
                                    *VBW 10 kHz             -15.20 dBm
      Ref  37 dBm       *Att  25 dB *SWT 100 ms     849.025641026 MHz
        Offset   7.5 dB
```
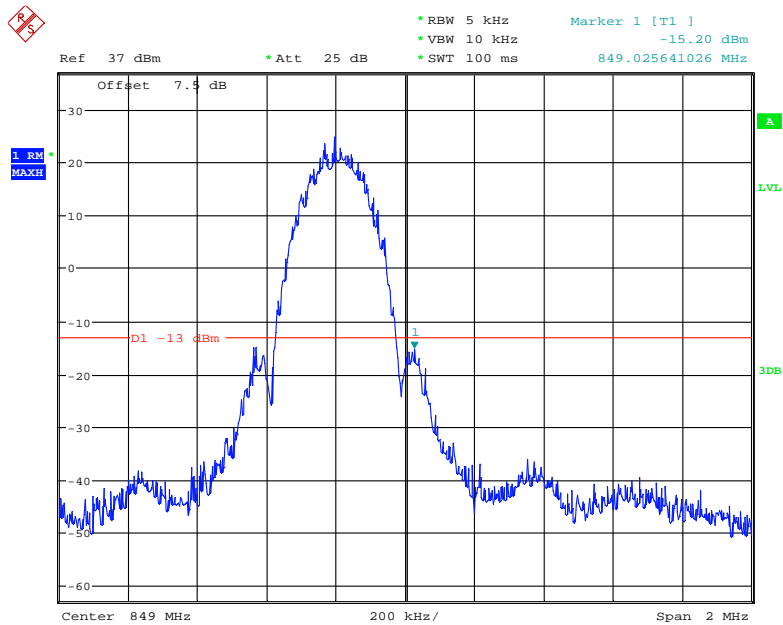
Date: 20.SEP.2018 15:02:35

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

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -17.62 dBm
        Ref  37.5 dBm    *Att  25 dB  *SWT 150 ms   823.983974359 MHz
           Offset  7.5 dB
```
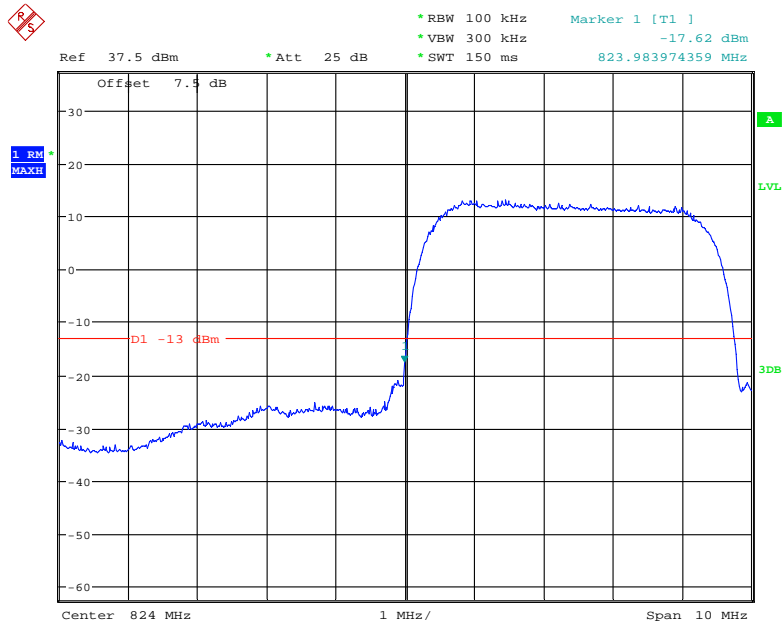
Date: 28.SEP.2018 15:13:06

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

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -17.09 dBm
        Ref  37.5 dBm    *Att  25 dB  *SWT 20 ms    849.160256410 MHz
           Offset  7.5 dB
```
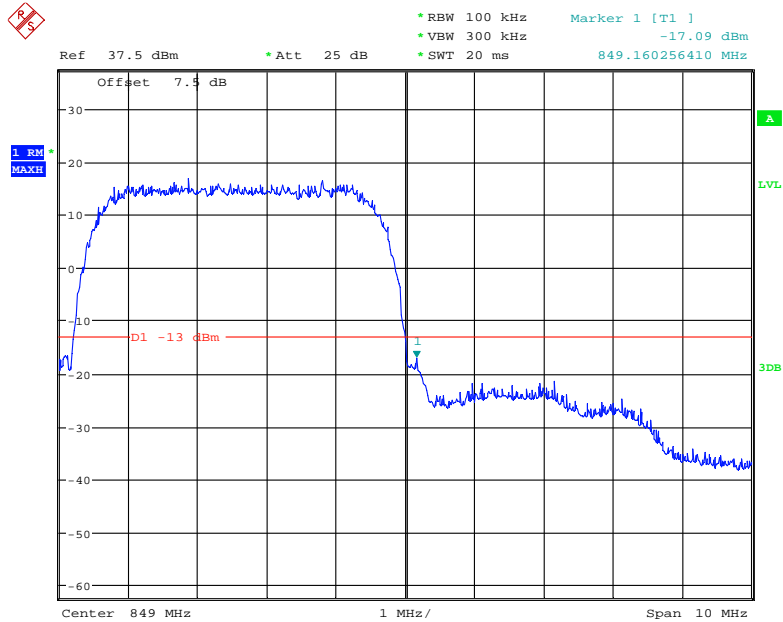
Date: 20.SEP.2018 16:34:39

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

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz           -14.69 dBm
      Ref  37.5 dBm      *Att  25 dB *SWT 20 ms     823.599358974 MHz
        Offset  7.5 dB
```
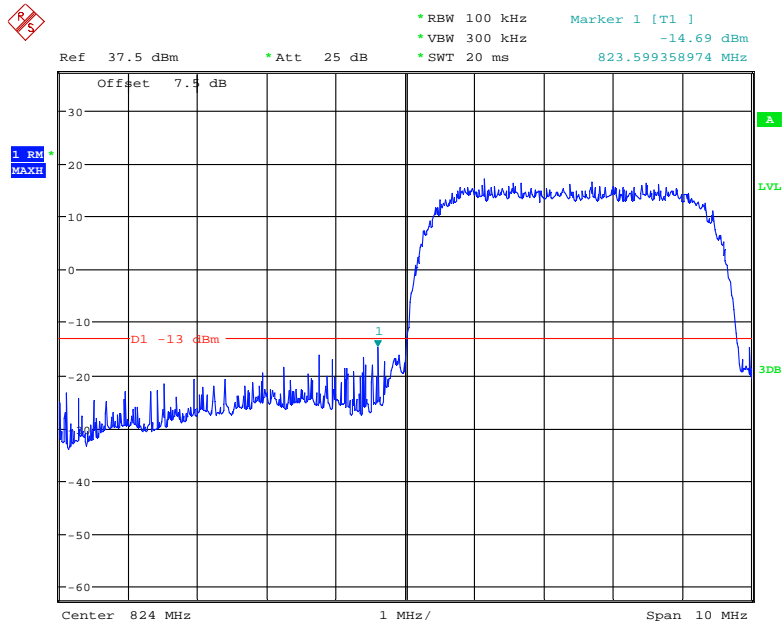
Date: 20.SEP.2018 16:39:18

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

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz           -15.11 dBm
      Ref  37.5 dBm      *Att  25 dB *SWT 20 ms     849.160256410 MHz
        Offset  7.5 dB
```
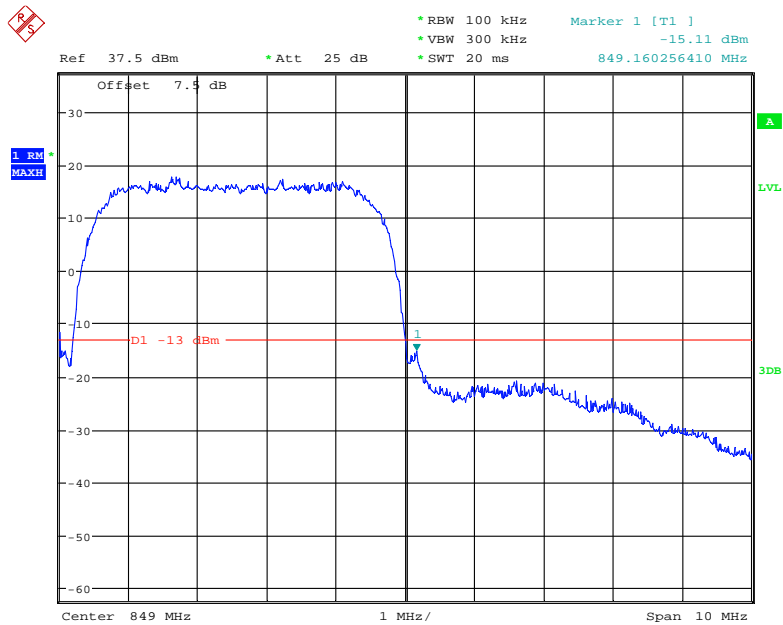
Date: 20.SEP.2018 16:38:43

Cellular Band, Left Band Edge for HSUPA (BPSK) Mode
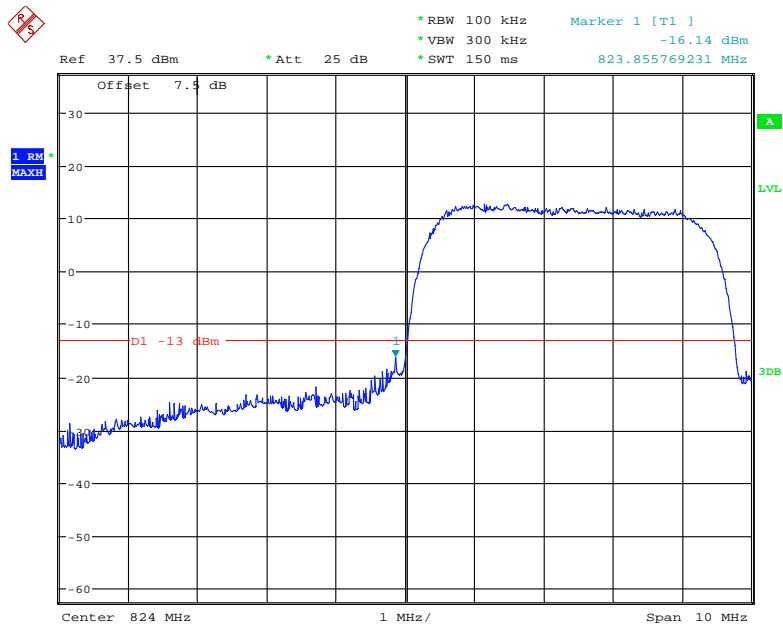
Date: 28.SEP.2018 15:12:02

Cellular Band, Right Band Edge for HSUPA (BPSK) Mode
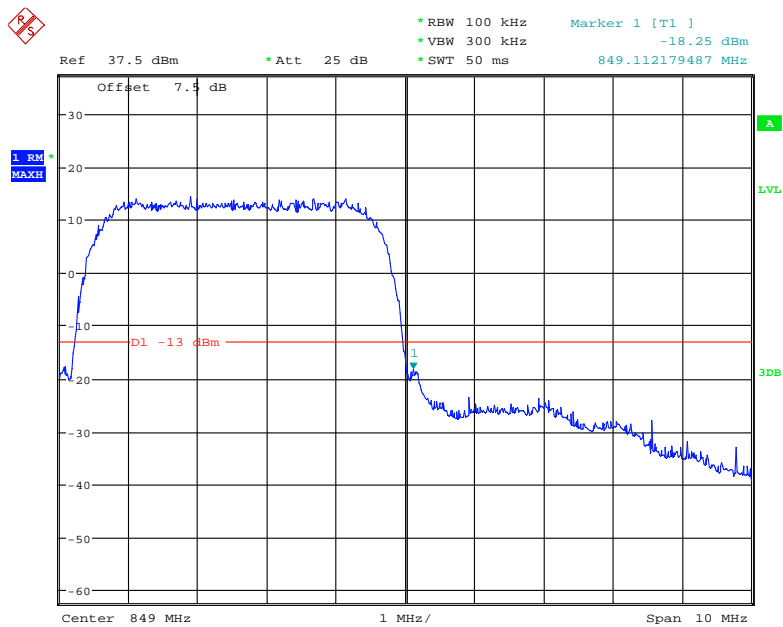
Date: 20.SEP.2018 16:42:13

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

```
                                    *RBW 5 kHz       Marker 1 [T1 ]
                                    *VBW 10 kHz              -14.25 dBm
        Ref  31 dBm      *Att  25 dB  *SWT 300 ms      1.849996795 GHz
```
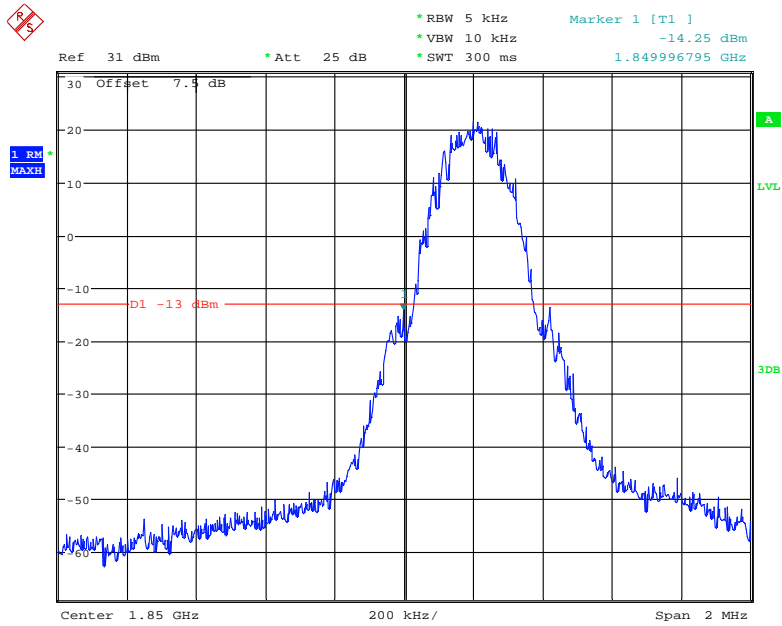
Date: 28.SEP.2018 15:05:10

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

```
                                    *RBW 5 kHz       Marker 1 [T1 ]
                                    *VBW 10 kHz              -14.55 dBm
        Ref  32 dBm      *Att  25 dB  *SWT 120 ms      1.910025641 GHz
```
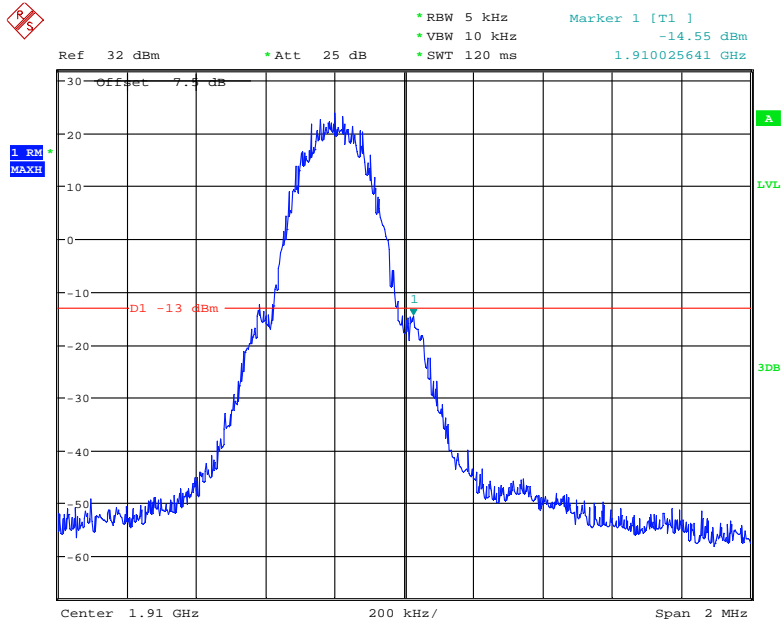
Date: 20.SEP.2018 15:16:00

PCS Band, Left Band Edge for EDGE Mode

```
                                    *RBW  5 kHz      Marker 1 [T1 ]
                                    *VBW  10 kHz              -15.17 dBm
         Ref  32 dBm      *Att  25 dB   SWT  80 ms      1.849993590 GHz
```
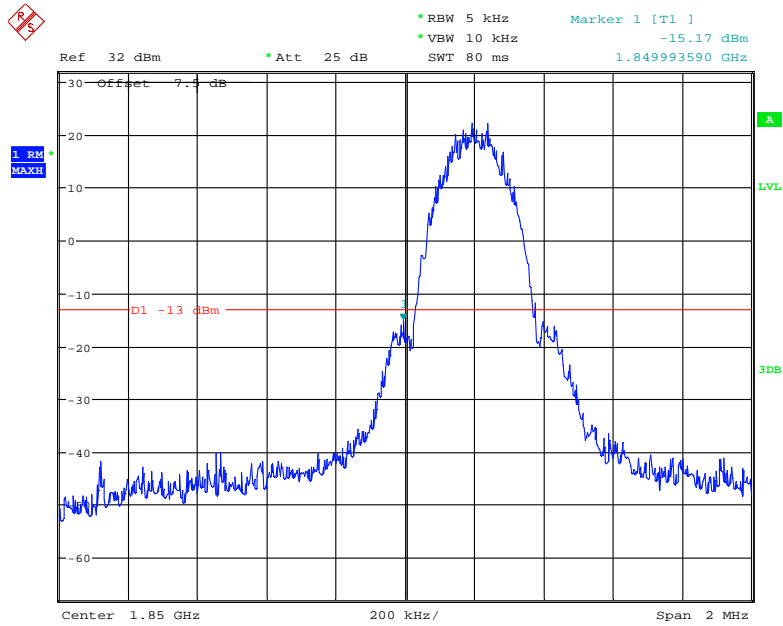


```
Date: 20.SEP.2018  15:05:24
```

PCS Band, Right Band Edge for EDGE Mode

```
                                    *RBW  5 kHz      Marker 1 [T1 ]
                                    *VBW  10 kHz              -16.19 dBm
         Ref  32 dBm      *Att  25 dB   SWT  80 ms      1.910016026 GHz
```
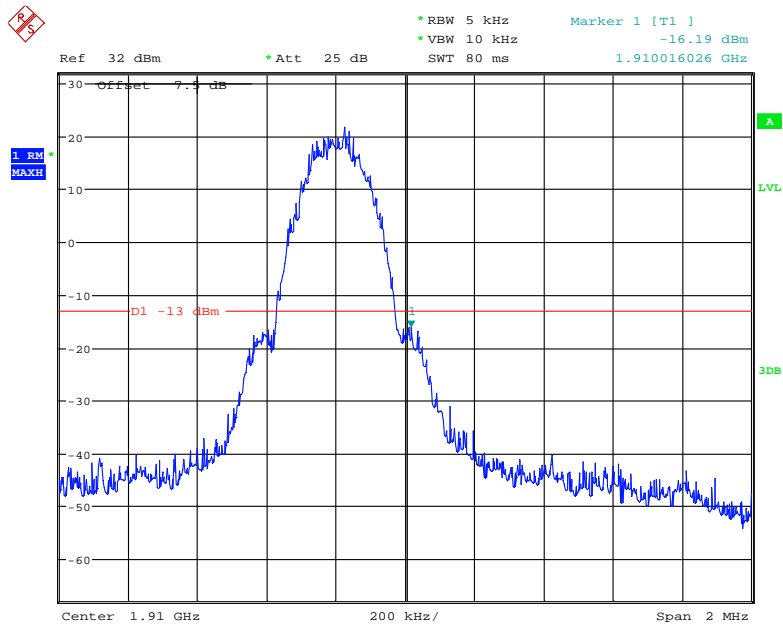


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Date: 20.SEP.2018  15:06:37
```

PCS Band, Left Band Edge for WCDMA (BPSK) Mode
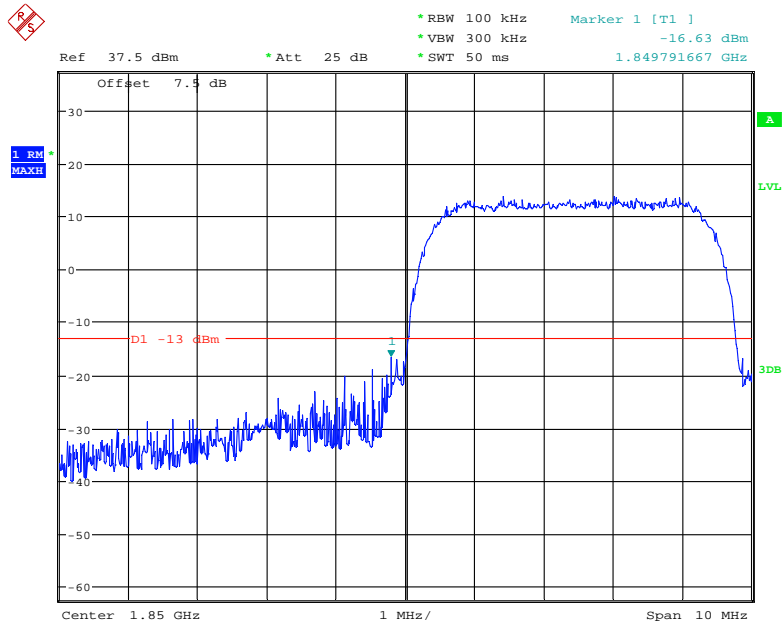
Date: 20.SEP.2018 16:44:13

## PCS Band, Right Band Edge for WCDMA (BPSK) Mode
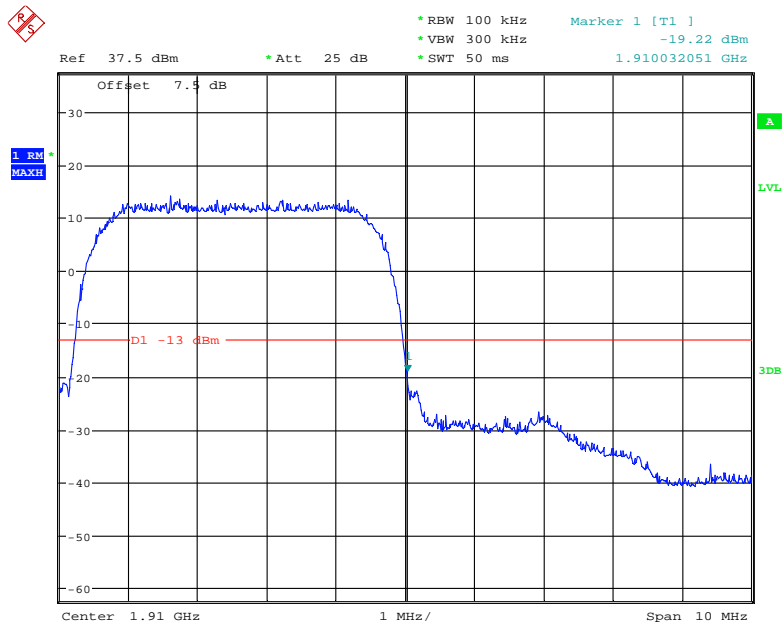
Date: 20.SEP.2018 16:44:43

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

```
                                    *RBW 100 kHz     Marker 1 [T1 ]
                                    *VBW 300 kHz              -15.66 dBm
   Ref   37.5 dBm        *Att  25 dB  *SWT 50 ms           1.849855769 GHz
        Offset   7.5 dB
                                                                          A
   30
1 RM *
MAXH 20                                                                  LVL
   10
    0
  -10
     D1 -13 dBm                                    1
  -20                                                                   3DB
  -30
  -40
  -50
  -60
   Center  1.85 GHz              1 MHz/              Span  10 MHz
```
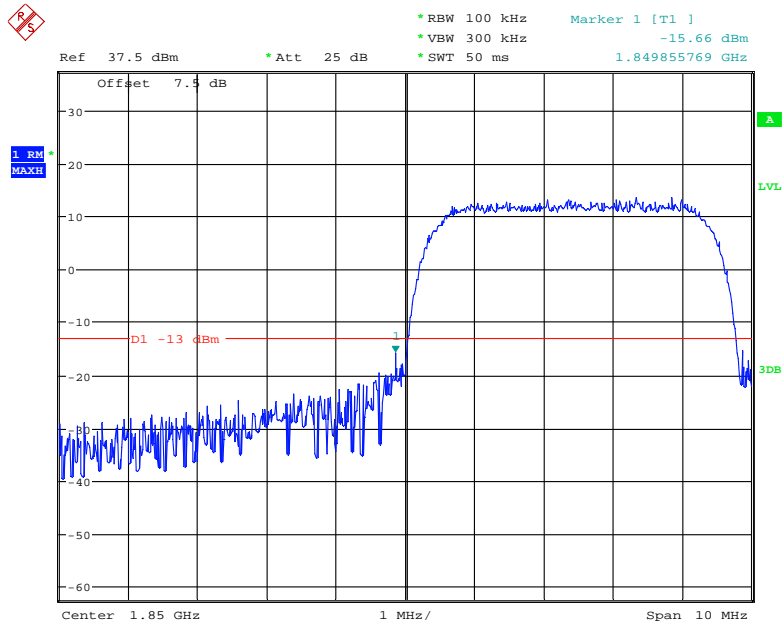
Date: 20.SEP.2018 16:52:19

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

```
                                    *RBW 100 kHz     Marker 1 [T1 ]
                                    *VBW 300 kHz              -18.38 dBm
   Ref   37.5 dBm        *Att  25 dB  *SWT 50 ms           1.910032051 GHz
        Offset   7.5 dB
                                                                          A
   30
1 RM *
MAXH 20                                                                  LVL
   10
    0
  -10
     D1 -13 dBm                                    1
  -20                                                                   3DB
  -30
  -40
  -50
  -60
   Center  1.91 GHz              1 MHz/              Span  10 MHz
```
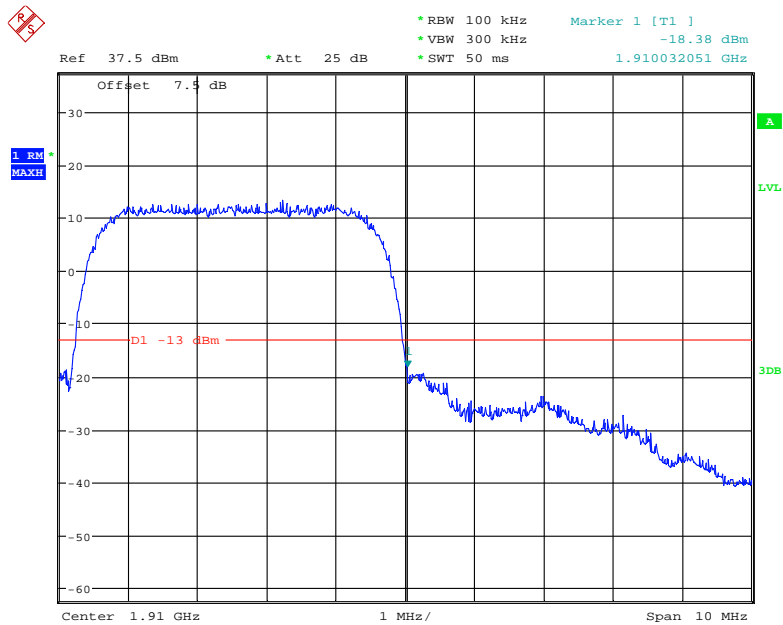
Date: 20.SEP.2018 16:52:36

PCS Band, Left Band Edge for HSUPA (BPSK) Mode
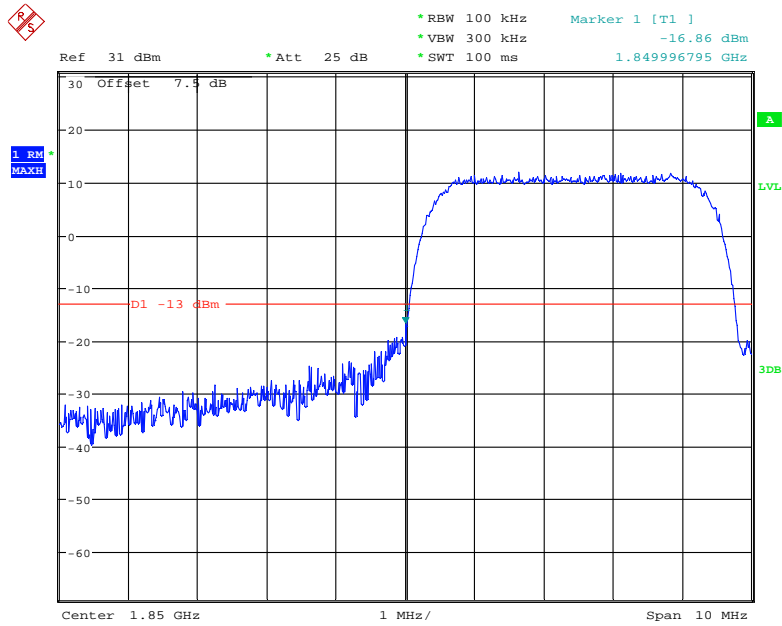
Date: 28.SEP.2018 15:07:32

PCS Band, Right Band Edge for HSUPA (BPSK) Mode
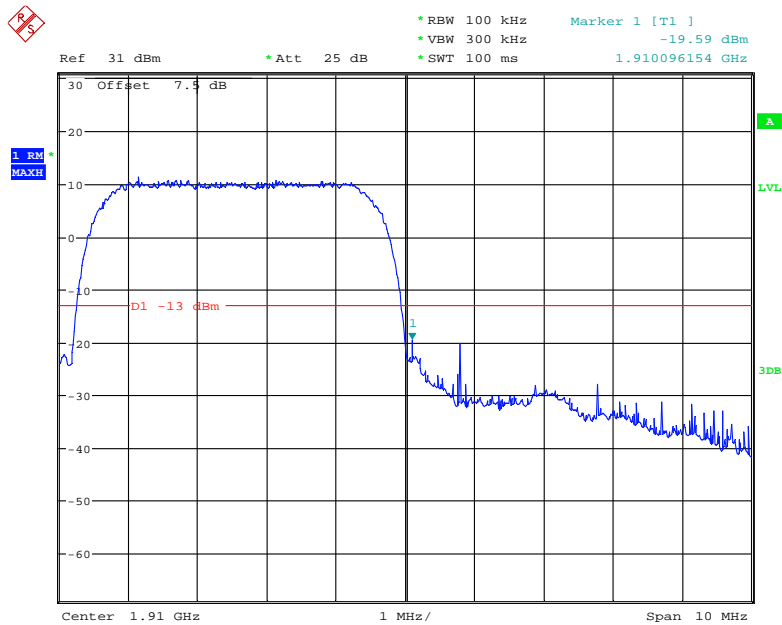
Date: 28.SEP.2018 15:08:11

Band 2:

QPSK (1.4 MHz, FULL RB) - Left Band Edge
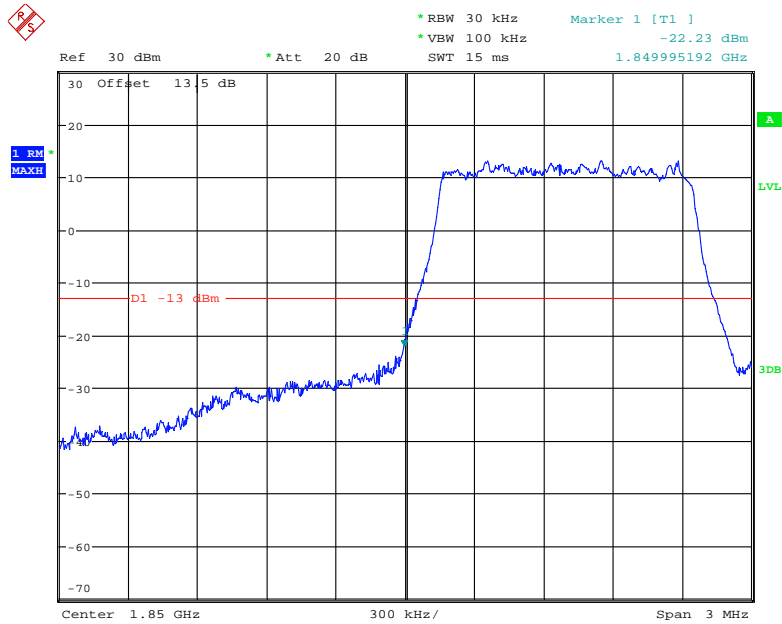
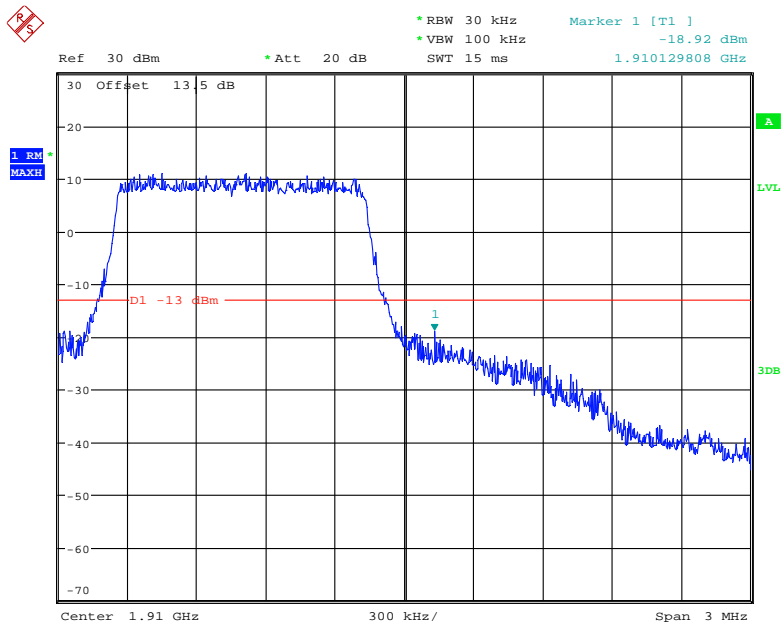Date: 21.SEP.2018 09:10:49

QPSK (1.4 MHz, FULL RB) - Right Band Edge
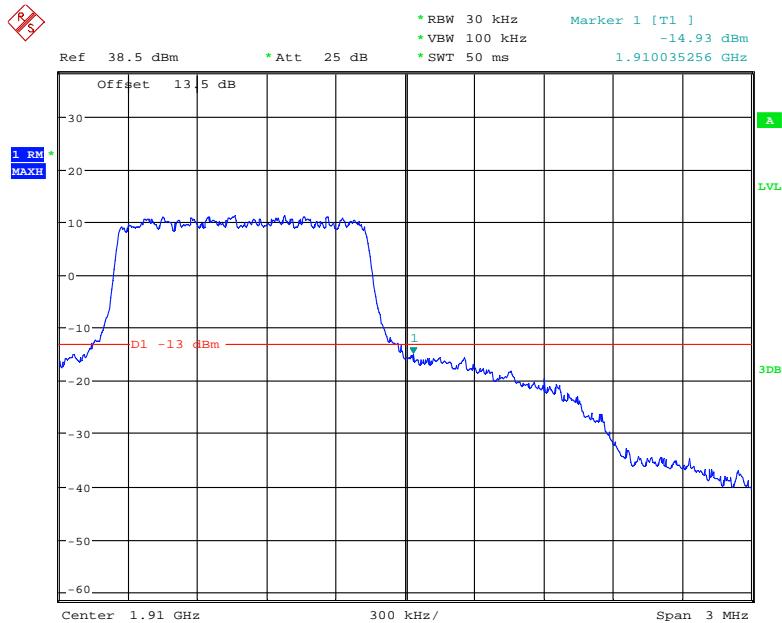
Date: 19.SEP.2018 13:25:41
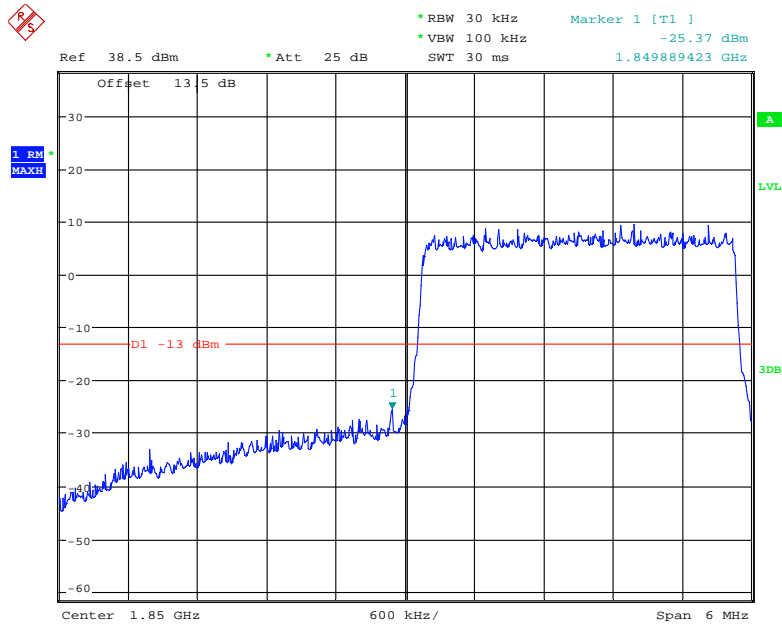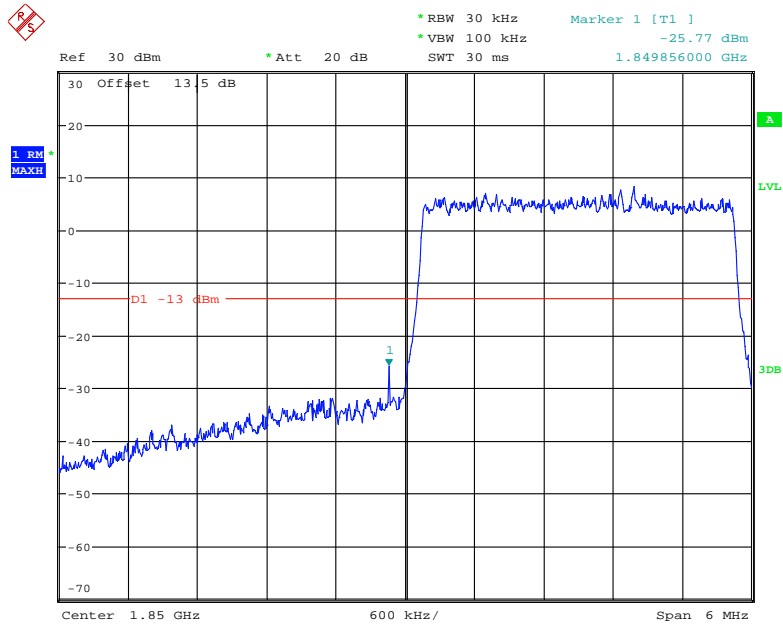
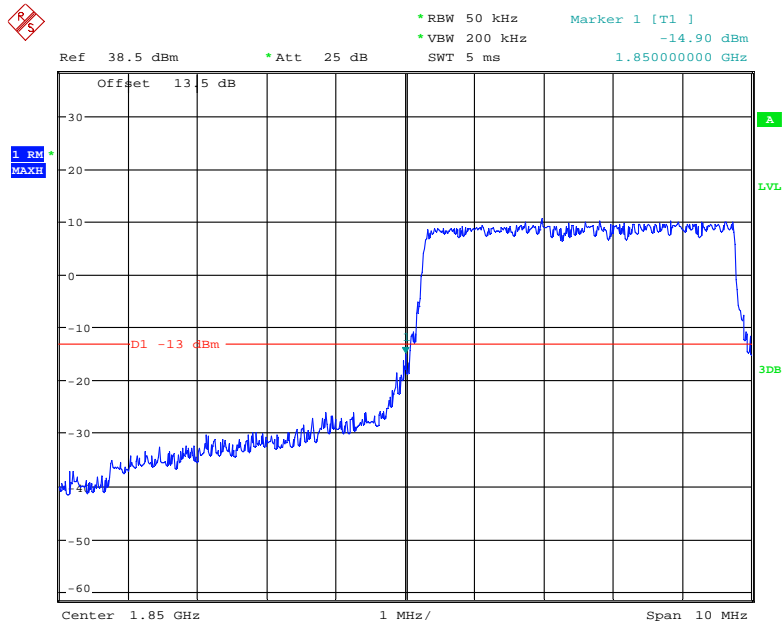## 16-QAM (1.4 MHz, FULL RB) - Left Band Edge

```
                                        *RBW  30 kHz      Marker 1 [T1 ]
                                        *VBW  100 kHz              -22.12 dBm
        Ref  30 dBm         *Att  20 dB  SWT  15 ms        1.849995192 GHz
```

```
      30 Offset  13.5 dB
```
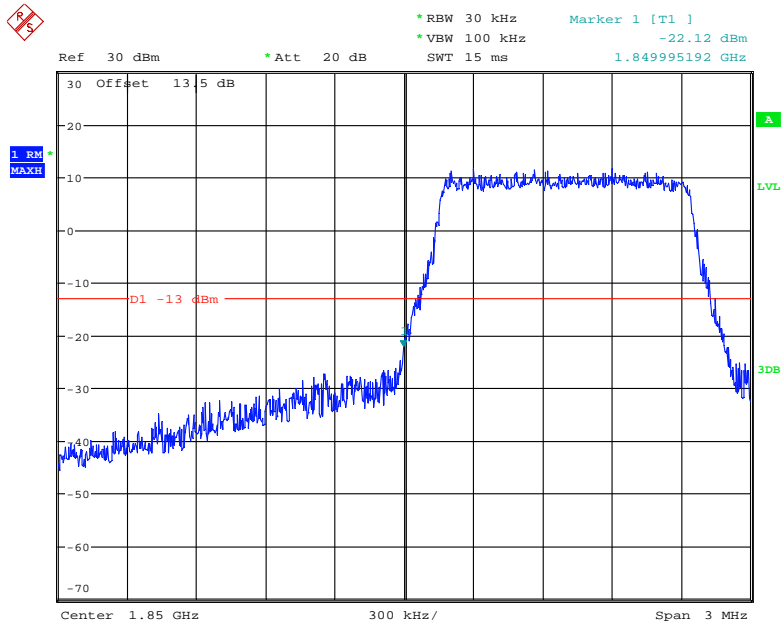
Date: 21.SEP.2018 09:07:37

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

```
                                        *RBW  30 kHz      Marker 1 [T1 ]
                                        *VBW  100 kHz              -18.92 dBm
        Ref  30 dBm         *Att  20 dB  SWT  15 ms        1.910129808 GHz
```

```
      30 Offset  13.5 dB
```

Date: 21.SEP.2018 09:08:44

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

		*RBW 30 kHz	Marker 1 [T1]
		*VBW 100 kHz	-25.37 dBm
Ref 38.5 dBm	*Att 25 dB	SWT 30 ms	1.849889423 GHz

Offset 13.5 dB

A

1 RM *
MAXH

LVL

D1 -13 dBm

3DB

Center 1.85 GHz   600 kHz/   Span 6 MHz

Date: 19.SEP.2018 13:28:23

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

		*RBW 30 kHz	Marker 1 [T1]
		*VBW 100 kHz	-19.55 dBm
Ref 38.5 dBm	*Att 25 dB	SWT 30 ms	1.910067308 GHz

Offset 13.5 dB

A

1 RM *
MAXH

LVL

D1 -13 dBm

3DB

Center 1.91 GHz   600 kHz/   Span 6 MHz
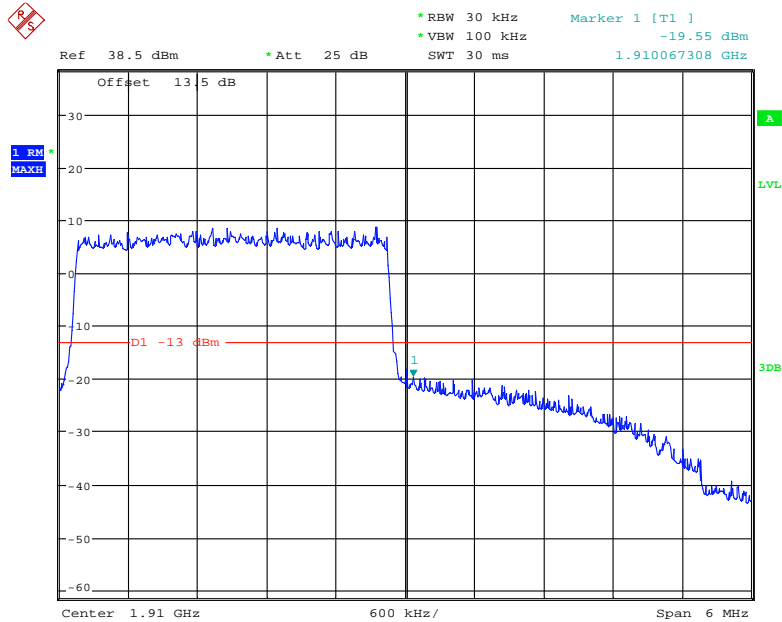
Date: 19.SEP.2018 13:32:01

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

```
                                   *RBW 30 kHz      Marker 1 [T1 ]
                                   *VBW 100 kHz           -25.77 dBm
       Ref  30 dBm      *Att  20 dB   SWT 30 ms     1.849856000 GHz
       30  Offset  13.5 dB                                          A

    -20

1 RM *
MAXH -10                                                            LVL

    -0

    -10
       D1 -13 dBm
    -20                                      1

    -30                                                             3DB

    -40

    -50

    -60

    -70
       Center  1.85 GHz          600 kHz/              Span  6 MHz
```

Date: 21.SEP.2018 09:26:31

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

```
                                   *RBW 30 kHz      Marker 1 [T1 ]
                                   *VBW 100 kHz           -20.91 dBm
       Ref  38.5 dBm    *Att  25 dB   SWT 30 ms     1.910105769 GHz
          Offset  13.5 dB                                           A

    -30

1 RM *
MAXH -20                                                            LVL

    -10

    -0

    -10
       D1 -13 dBm
    -20                                      1                      3DB

    -30

    -40

    -50

    -60
       Center  1.91 GHz          600 kHz/              Span  6 MHz
```
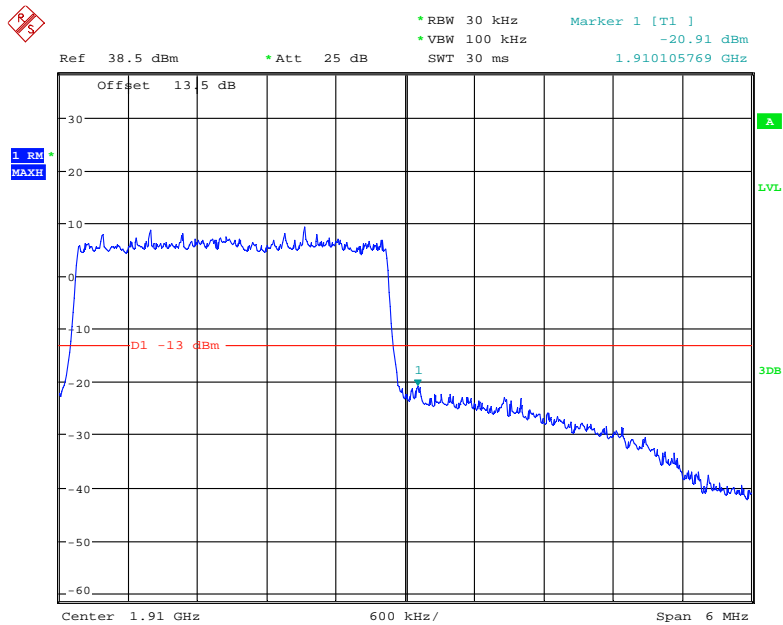
Date: 19.SEP.2018 13:31:10

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

```
                                          *RBW 50 kHz      Marker 1 [T1 ]
                                          *VBW 200 kHz              -14.90 dBm
        Ref  38.5 dBm          *Att  25 dB   SWT 5 ms         1.850000000 GHz
          Offset  13.5 dB
```

Date: 19.SEP.2018 13:34:46

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

```
                                          *RBW 50 kHz      Marker 1 [T1 ]
                                          *VBW 200 kHz              -19.46 dBm
        Ref  30 dBm            *Att  20 dB   SWT 5 ms         1.910016026 GHz
       30  Offset  13.5 dB
```
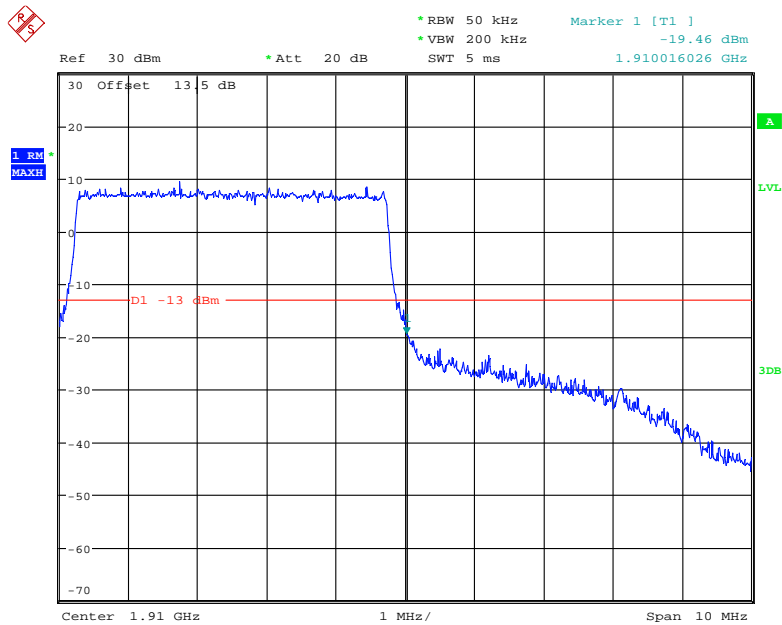
Date: 21.SEP.2018 09:29:46

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

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 200 kHz              -16.60 dBm
         Ref  38.5 dBm      *Att  25 dB    SWT 5 ms        1.850000000 GHz
```
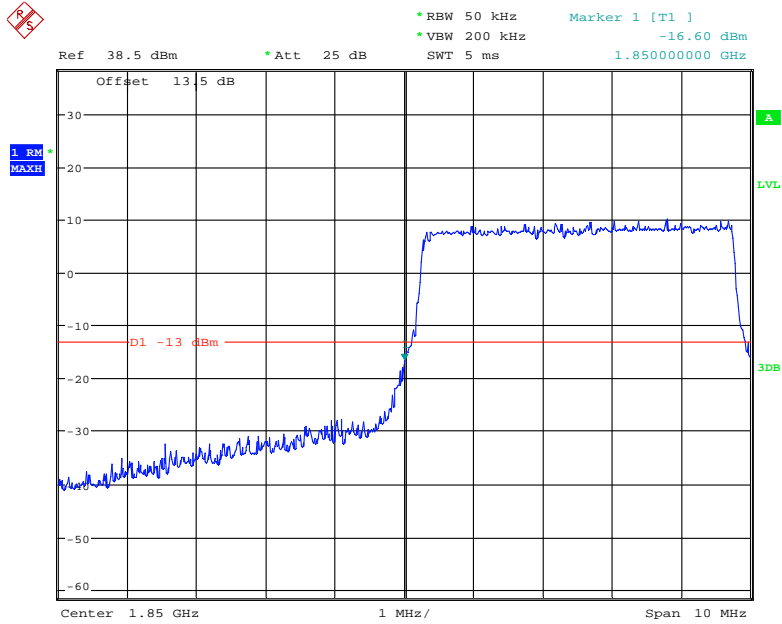
Date: 19.SEP.2018 13:34:14

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

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 200 kHz              -17.37 dBm
         Ref  38.5 dBm      *Att  25 dB    SWT 5 ms        1.910064103 GHz
```
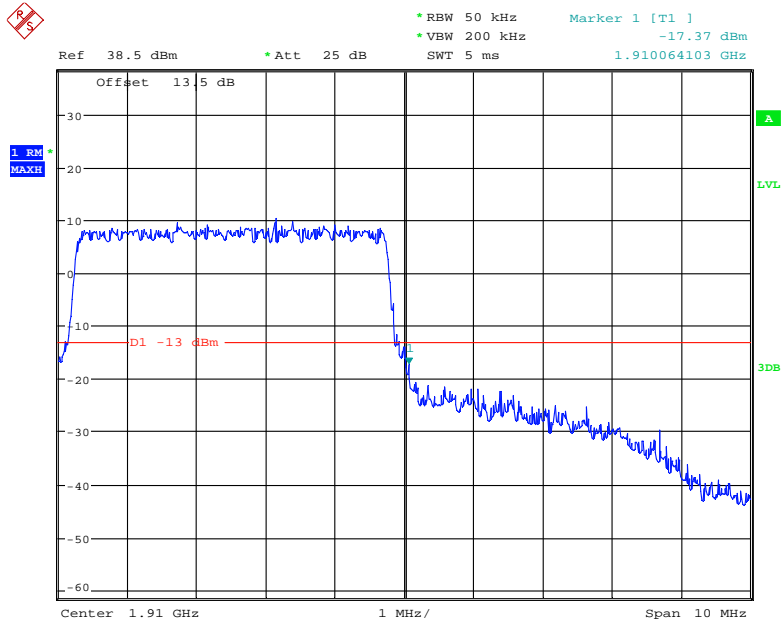
Date: 19.SEP.2018 13:36:55

QPSK (10.0 MHz, FULL RB) - Left Band Edge
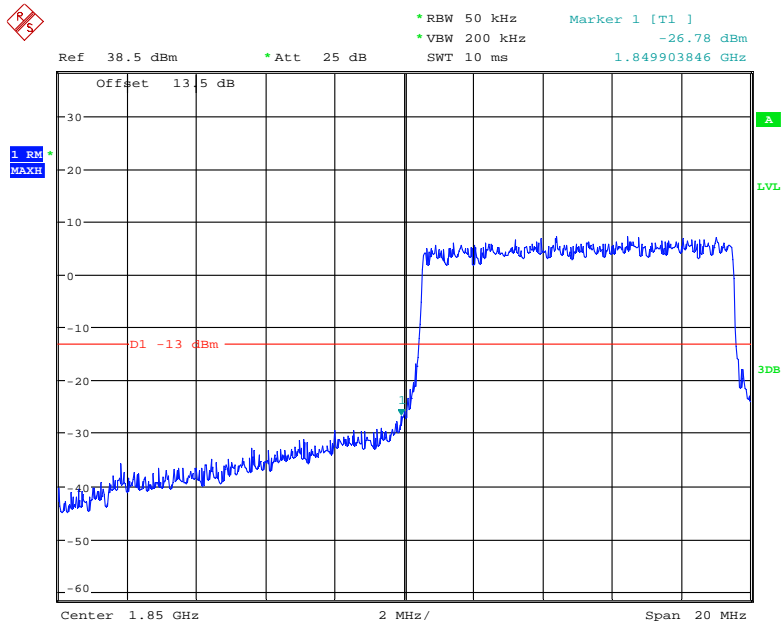
Date: 19.SEP.2018 13:39:46
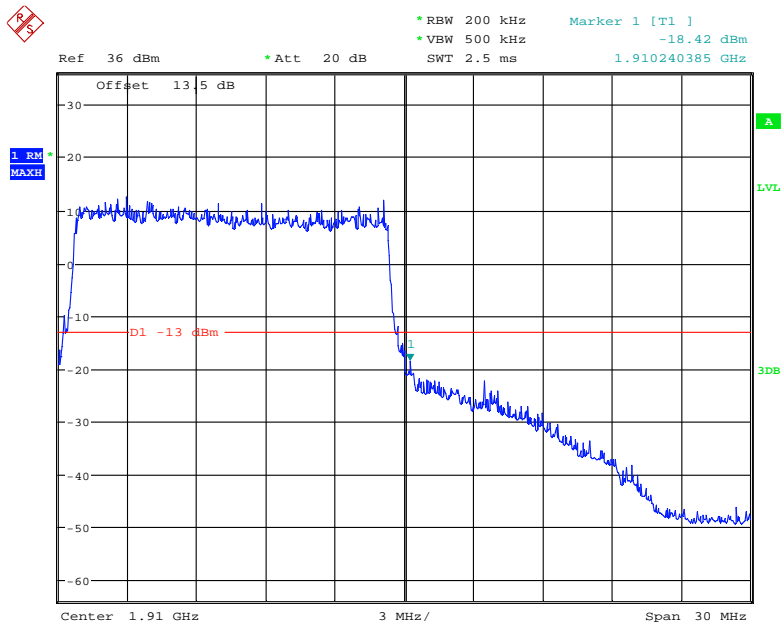
QPSK (10.0 MHz, FULL RB) - Right Band Edge
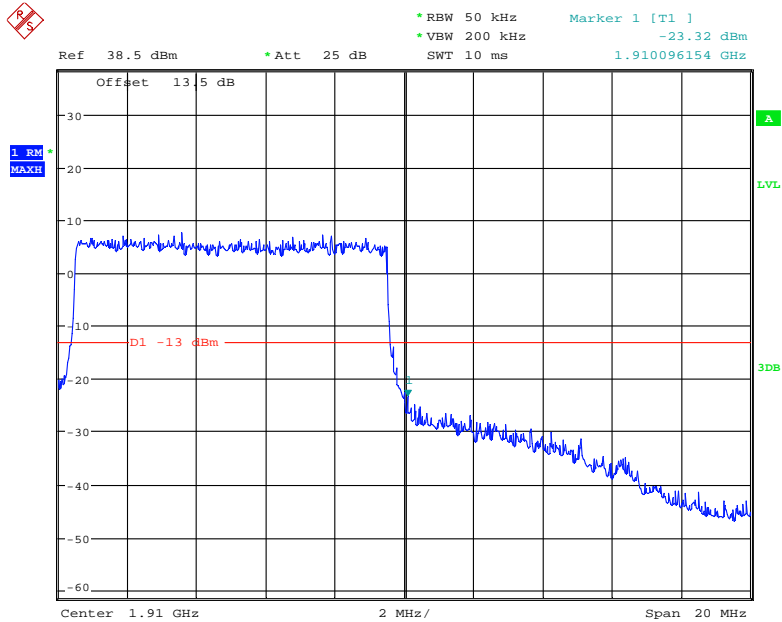
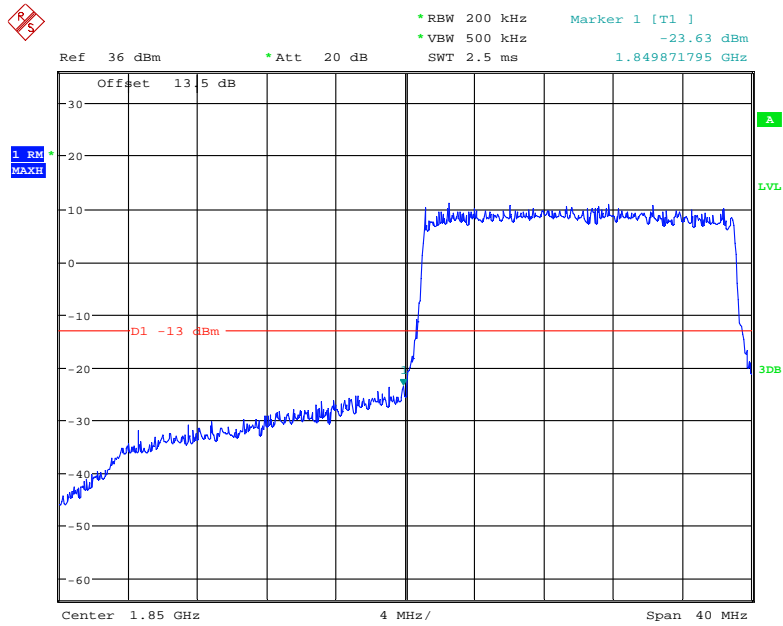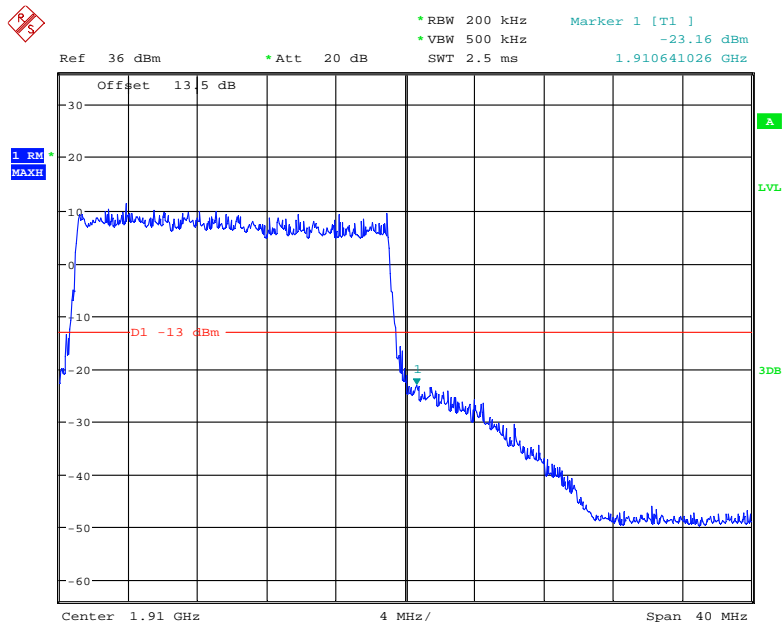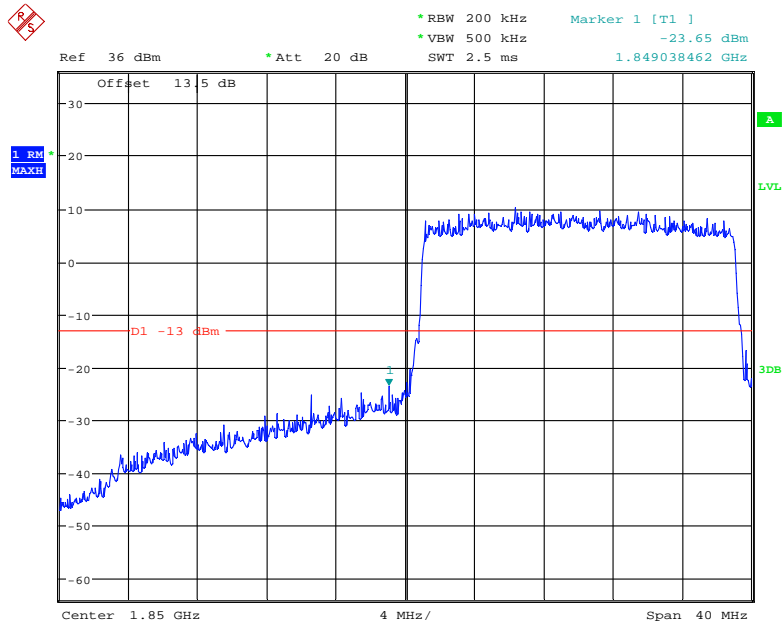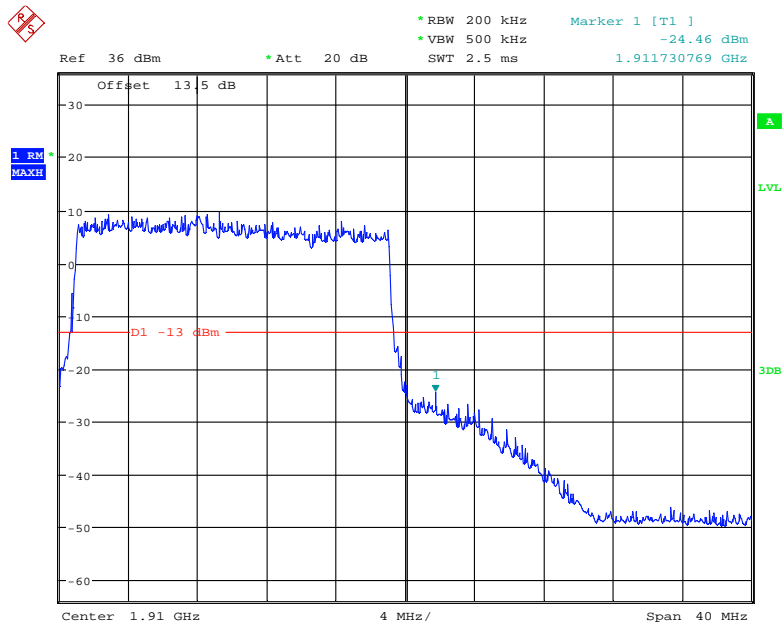Date: 19.SEP.2018 13:40:28

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

```
                                  *RBW 50 kHz        Marker 1 [T1 ]
                                  *VBW 200 kHz                  -24.34 dBm
          Ref  38.5 dBm     *Att  25 dB    SWT 10 ms   1.849967949 GHz
             Offset  13.5 dB
```
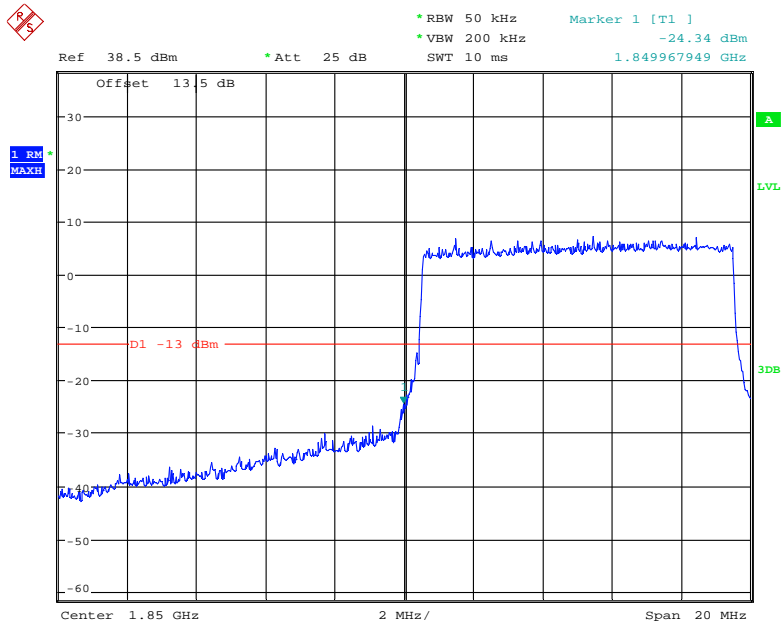
Date: 19.SEP.2018 13:39:13

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

```
                                  *RBW 50 kHz        Marker 1 [T1 ]
                                  *VBW 200 kHz                  -26.16 dBm
          Ref  38.5 dBm     *Att  25 dB    SWT 10 ms   1.910288462 GHz
             Offset  13.5 dB
```
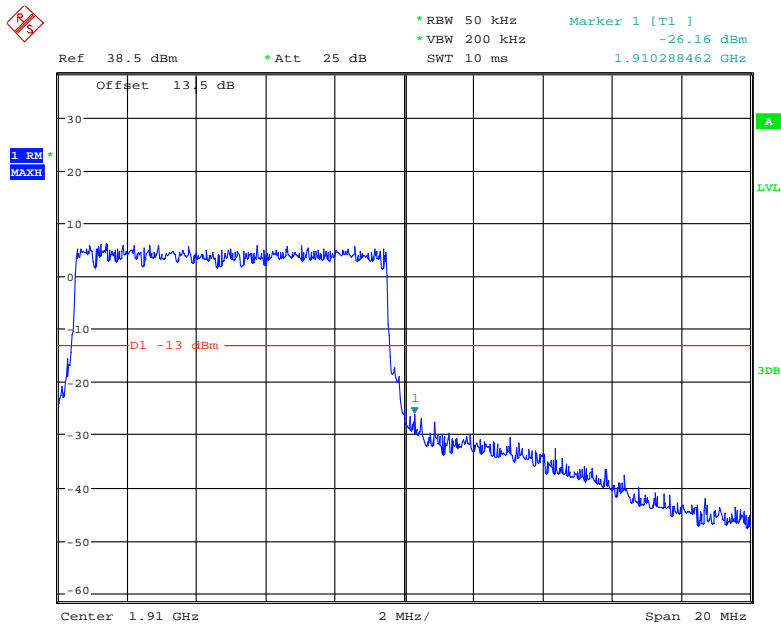
Date: 19.SEP.2018 13:41:01

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

```
                                    *RBW  200 kHz      Marker 1 [T1 ]
                                    *VBW  500 kHz                -17.37 dBm
        Ref  36 dBm      *Att  20 dB   SWT  2.5 ms       1.849855769 GHz
           Offset  13.5 dB                                              A
        30
1 RM *
MAXH    20                                                              LVL
        10
         0                                                              3DB
       -10  D1 -13 dBm
       -20
       -30
       -40
       -50
       -60
        Center  1.85 GHz            3 MHz/              Span  30 MHz
```
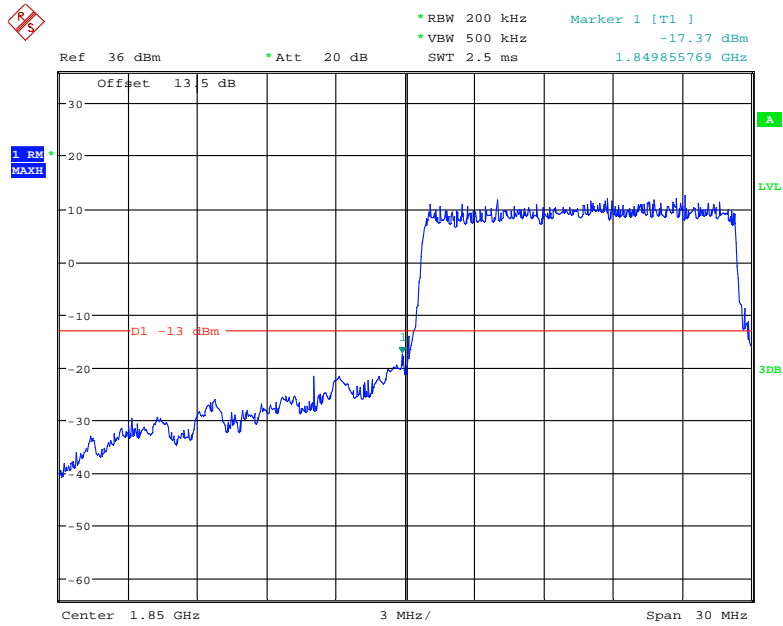
Date: 19.SEP.2018 14:49:36

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

```
                                    *RBW  200 kHz      Marker 1 [T1 ]
                                    *VBW  500 kHz                -21.08 dBm
        Ref  30 dBm      *Att  20 dB   SWT  5 ms         1.910016026 GHz
        30  Offset  13.5 dB                                             A
        20
1 RM *
MAXH    10                                                              LVL
         0
       -10  D1 -13 dBm
       -20
       -30                                                             3DB
       -40
       -50
       -60
       -70
        Center  1.91 GHz            3 MHz/              Span  30 MHz
```
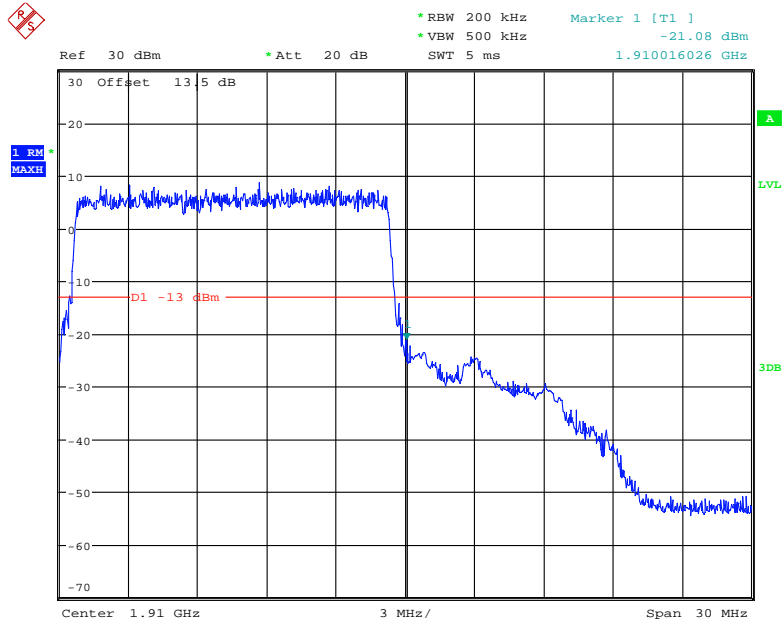
Date: 21.SEP.2018 09:31:22

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

```
                              * RBW  200 kHz      Marker 1 [T1 ]
                              * VBW  500 kHz              -20.82 dBm
   Ref   36 dBm    * Att  20 dB   SWT  2.5 ms      1.849855769 GHz
         Offset   13.5 dB
```
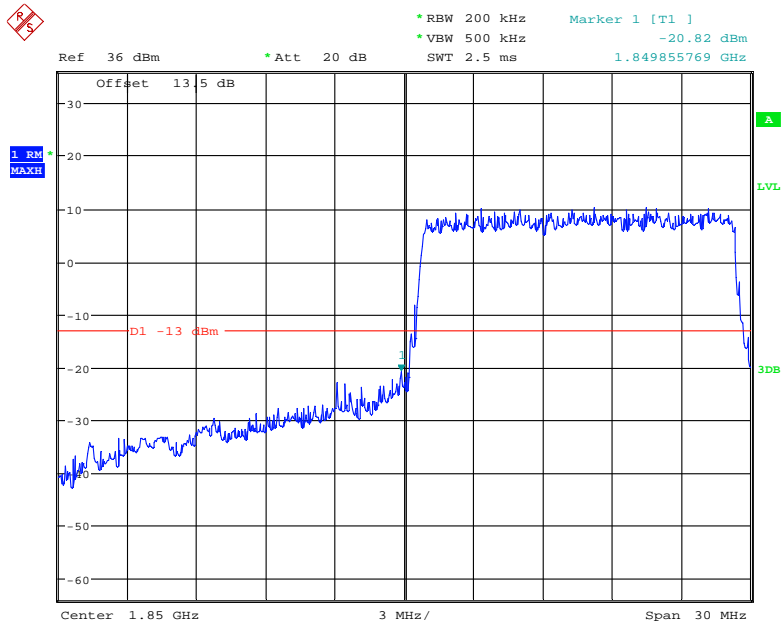
Date: 19.SEP.2018 14:50:24

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

```
                              * RBW  200 kHz      Marker 1 [T1 ]
                              * VBW  500 kHz              -18.42 dBm
   Ref   36 dBm    * Att  20 dB   SWT  2.5 ms      1.910240385 GHz
         Offset   13.5 dB
```

Date: 19.SEP.2018 14:51:12

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

Date: 19.SEP.2018 14:54:08

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

Date: 19.SEP.2018 14:58:38
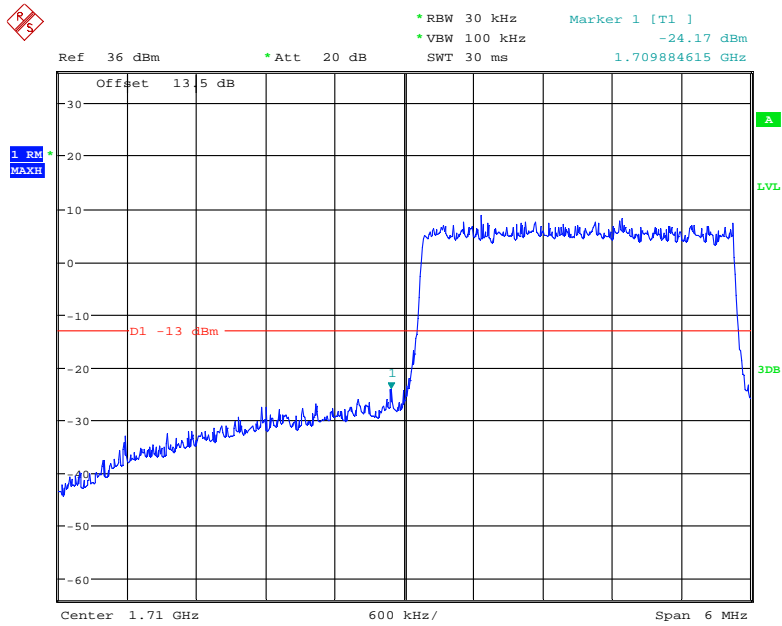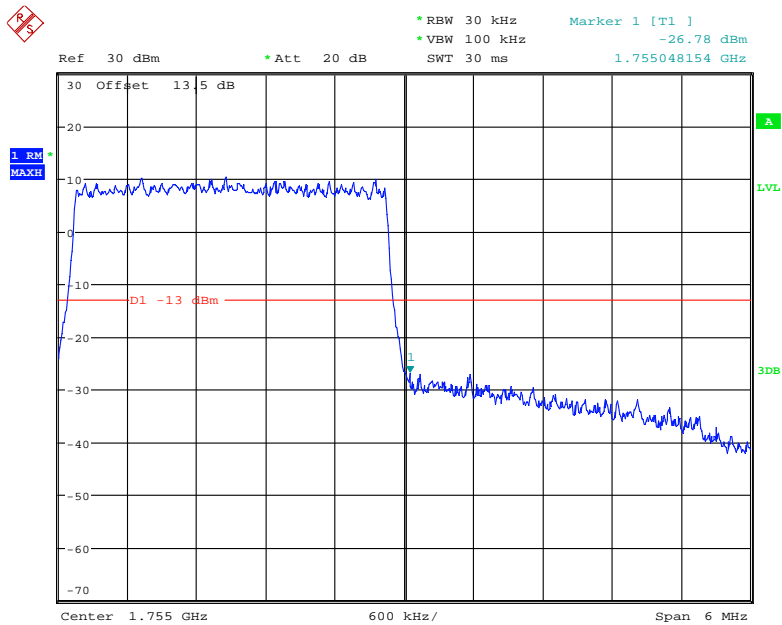
16-QAM (20.0 MHz, FULL RB) - Left Band Edge

Date: 19.SEP.2018 14:54:43

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

Date: 19.SEP.2018 14:58:05

Band 4:

QPSK (1.4 MHz, FULL RB) - Left Band Edge
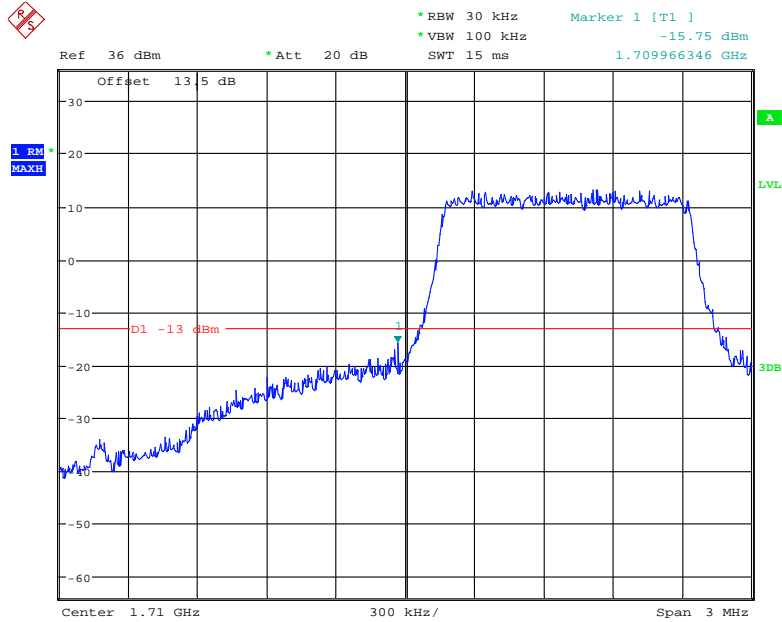
Date: 19.SEP.2018 15:02:28

QPSK (1.4 MHz, FULL RB) - Right Band Edge
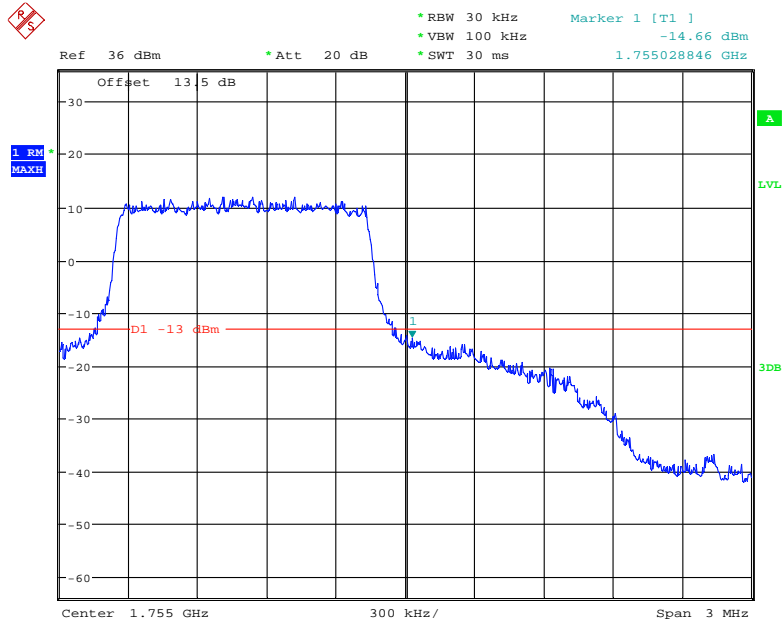
Date: 19.SEP.2018 15:04:28
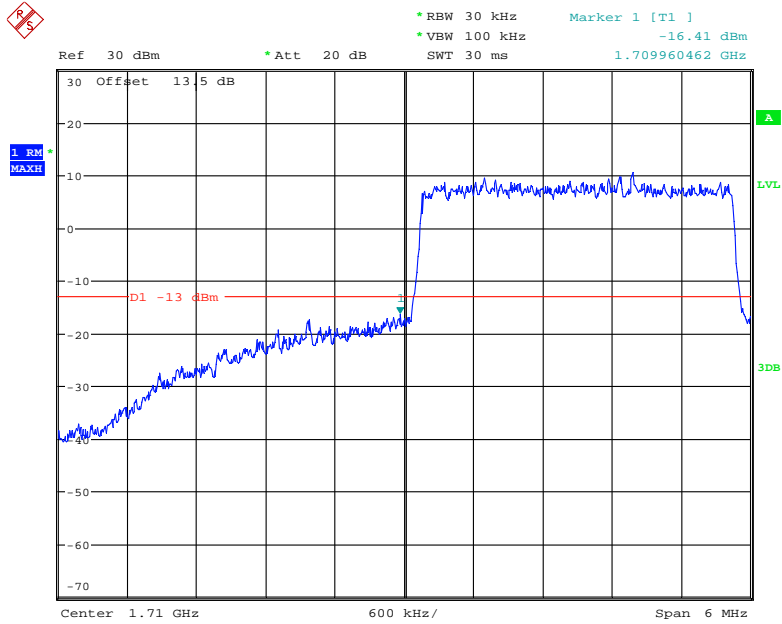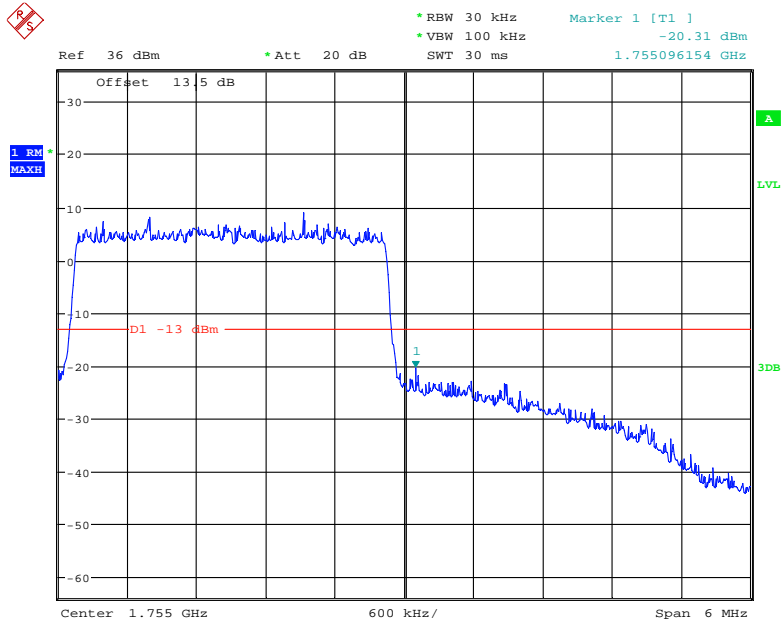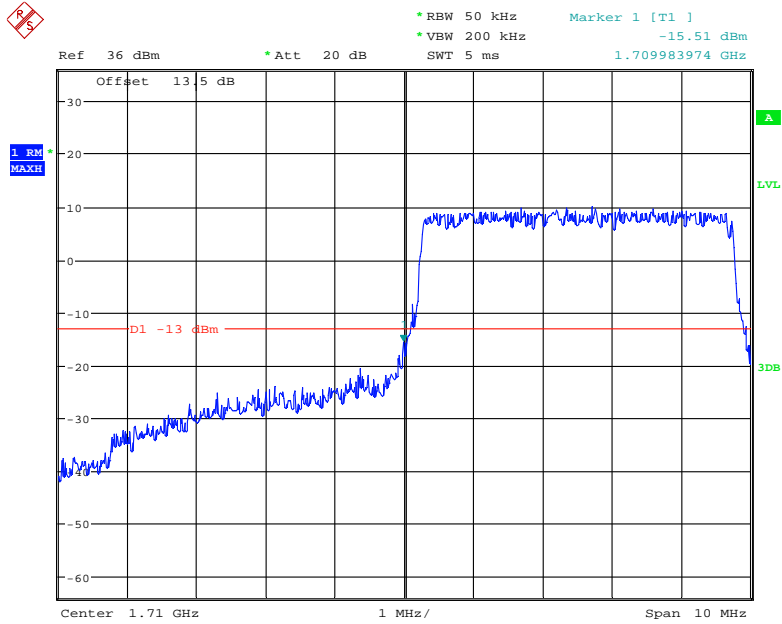
16-QAM (1.4 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 30 kHz       Marker 1 [T1 ]
                                    *VBW 100 kHz              -18.13 dBm
        Ref  36 dBm      *Att  20 dB   SWT 15 ms       1.709942308 GHz
```
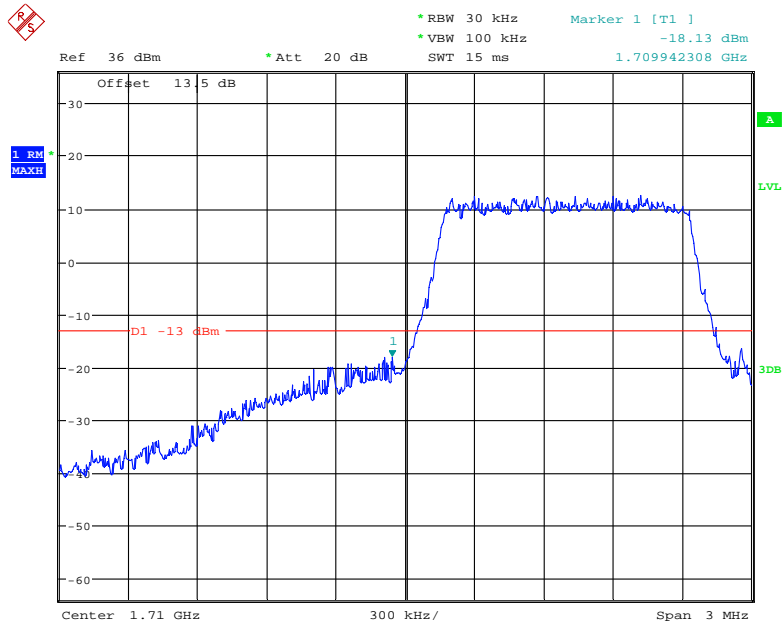


```
Date: 19.SEP.2018  15:03:10
```

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

```
                                    *RBW 30 kHz       Marker 1 [T1 ]
                                    *VBW 100 kHz              -17.55 dBm
        Ref  36 dBm      *Att  20 dB   *SWT 30 ms       1.755115385 GHz
```
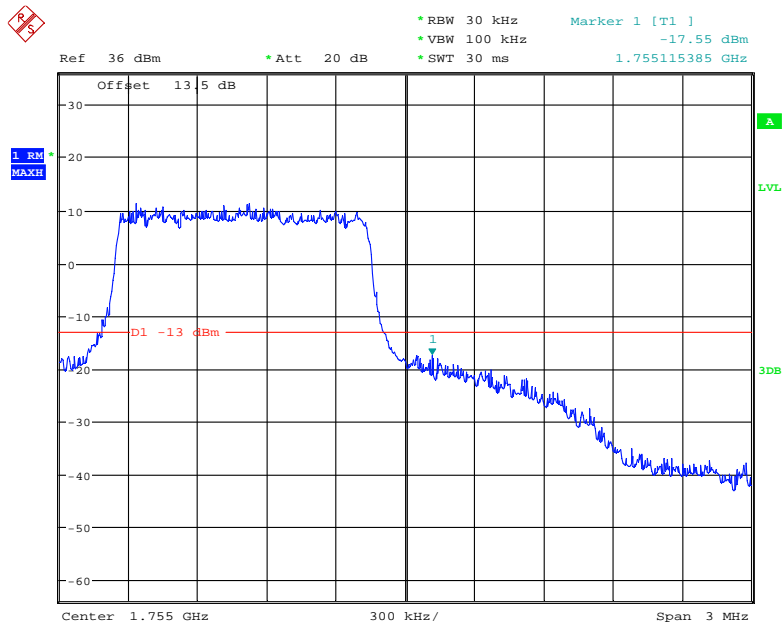


```
Date: 19.SEP.2018  15:04:00
```

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

```
                                    *RBW  30 kHz      Marker 1 [T1 ]
                                    *VBW  100 kHz              -24.17 dBm
        Ref   36 dBm      *Att  20 dB    SWT  30 ms     1.709884615 GHz
            Offset  13.5 dB
                                                                        A

 1 RM *
 MAXH                                                                   LVL

                                                                        3DB

        Center  1.71 GHz          600 kHz/              Span  6 MHz
```

Date: 19.SEP.2018 15:05:35

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

```
                                    *RBW  30 kHz      Marker 1 [T1 ]
                                    *VBW  100 kHz              -26.78 dBm
        Ref   30 dBm      *Att  20 dB    SWT  30 ms     1.755048154 GHz
         30 Offset  13.5 dB
                                                                        A

 1 RM *
 MAXH                                                                   LVL

                                                                        3DB

        Center  1.755 GHz         600 kHz/              Span  6 MHz
```

Date: 21.SEP.2018 09:43:56

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

```
                                    *RBW 30 kHz        Marker 1 [T1 ]
                                    *VBW 100 kHz              -16.41 dBm
        Ref  30 dBm      *Att  20 dB   SWT 30 ms         1.709960462 GHz
    30  Offset  13.5 dB                                              A
  -20
1 RM *
MAXH
  -10                                                              LVL

   0

  -10
      D1 -13 dBm
  -20                                                              3DB
  -30

  -40

  -50

  -60

  -70
      Center  1.71 GHz        600 kHz/            Span  6 MHz
```

Date: 21.SEP.2018 09:37:24

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

```
                                    *RBW 30 kHz        Marker 1 [T1 ]
                                    *VBW 100 kHz              -20.31 dBm
        Ref  36 dBm      *Att  20 dB   SWT 30 ms         1.755096154 GHz
       Offset  13.5 dB                                              A
  -30
1 RM *
MAXH -20
  -10                                                              LVL

   0

  -10
      D1 -13 dBm
  -20                                                              3DB
  -30

  -40

  -50

  -60
      Center  1.755 GHz       600 kHz/            Span  6 MHz
```
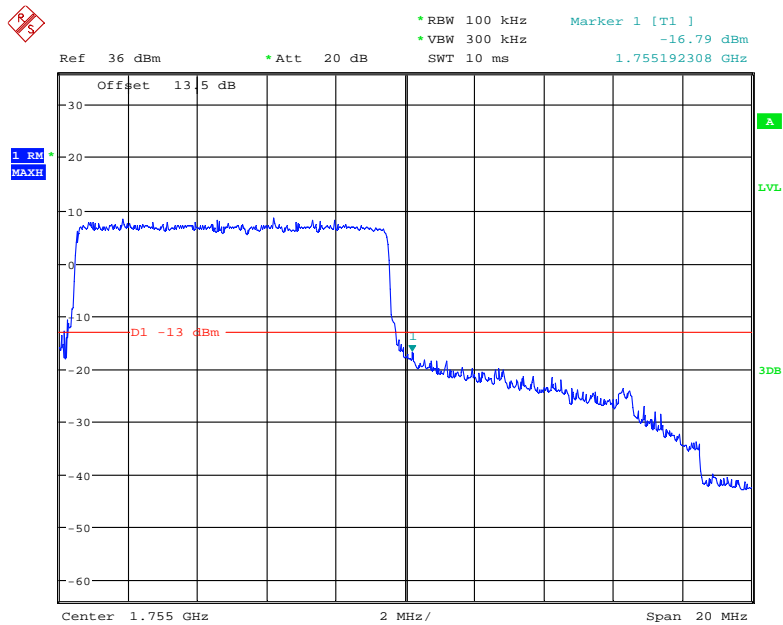
Date: 19.SEP.2018 15:06:51
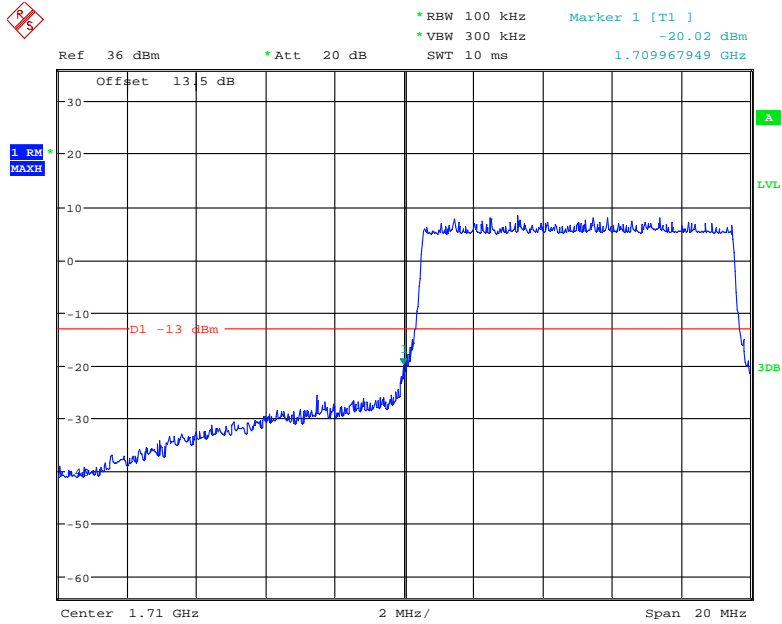
QPSK (5.0 MHz, FULL RB) - Left Band Edge

Date: 19.SEP.2018 15:10:06

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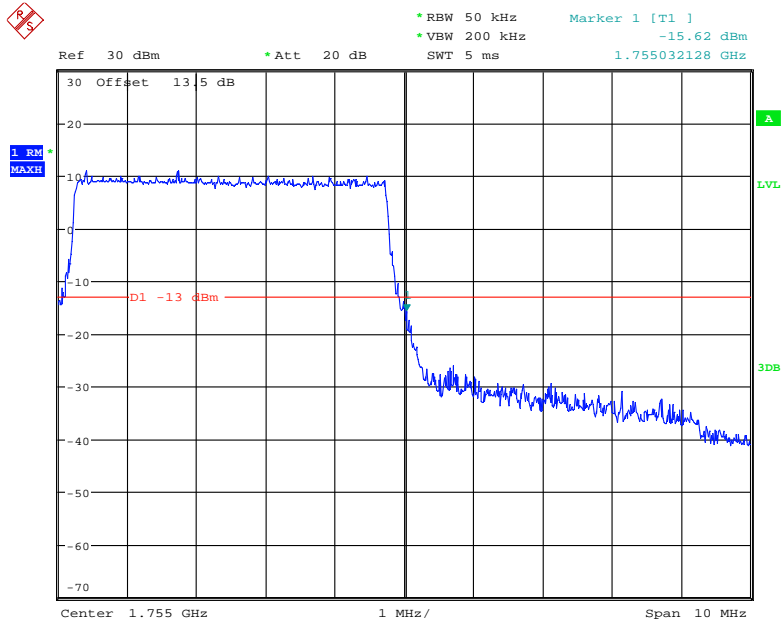

Date: 21.SEP.2018 09:45:16
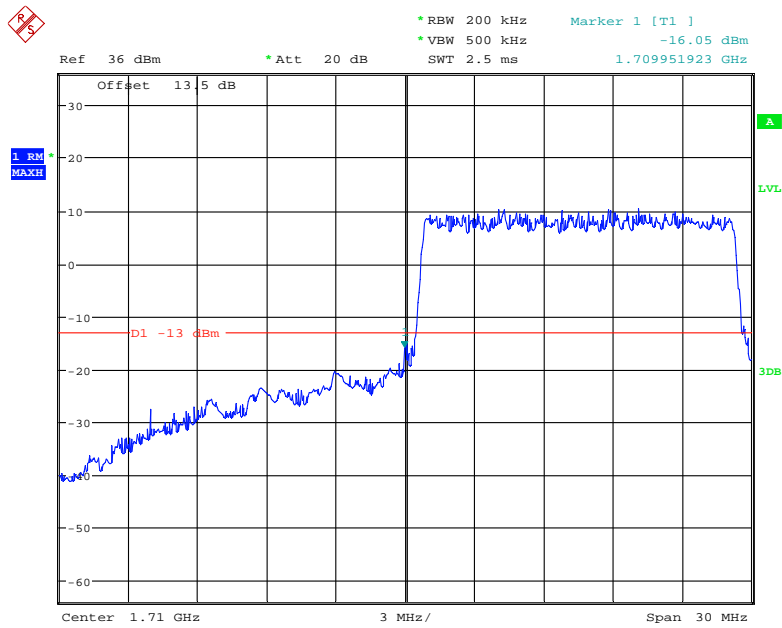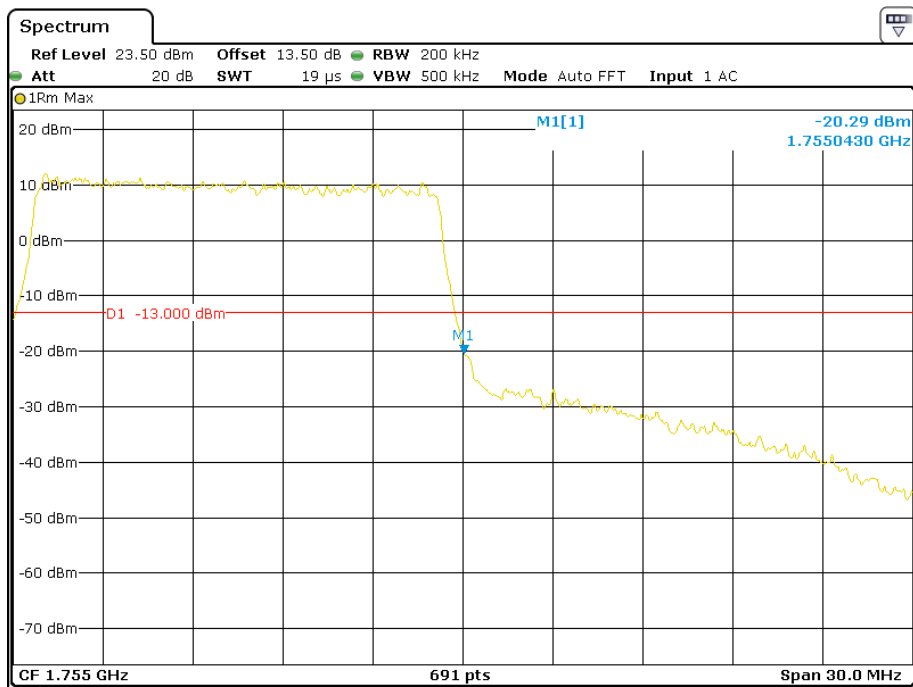
16-QAM (5.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 200 kHz            -17.33 dBm
     Ref  36 dBm        *Att  20 dB  SWT 5 ms        1.709967949 GHz
          Offset  13.5 dB
```
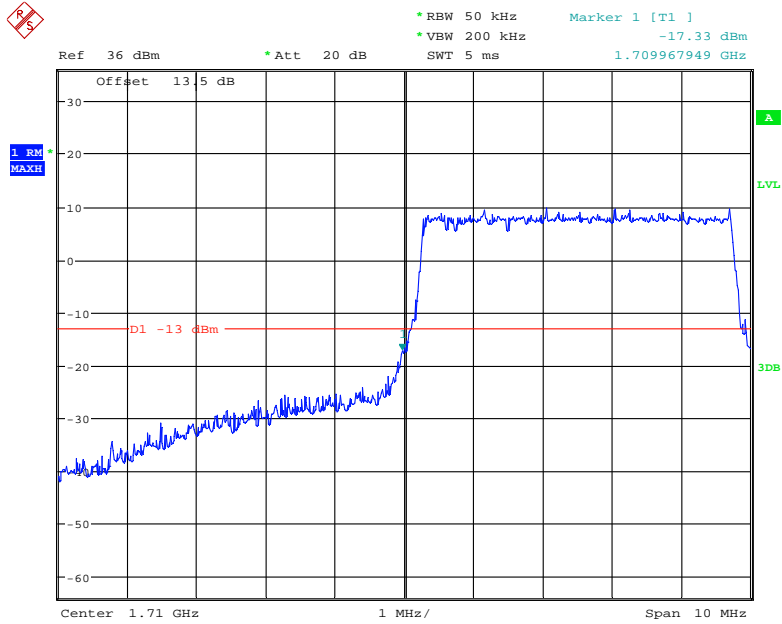
Date: 19.SEP.2018 15:09:25

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

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 200 kHz            -16.63 dBm
     Ref  36 dBm        *Att  20 dB  SWT 5 ms        1.755016026 GHz
          Offset  13.5 dB
```
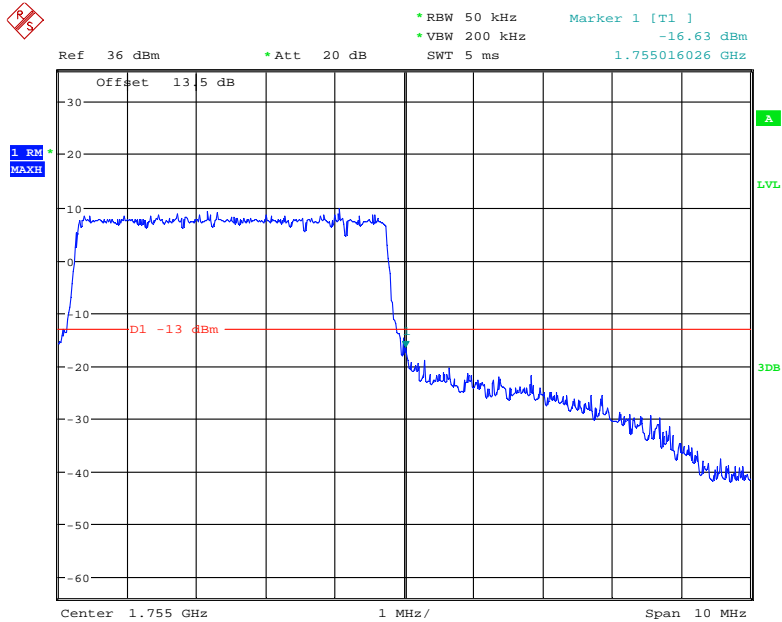
Date: 19.SEP.2018 15:11:14

QPSK (10.0 MHz, FULL RB) - Left Band Edge
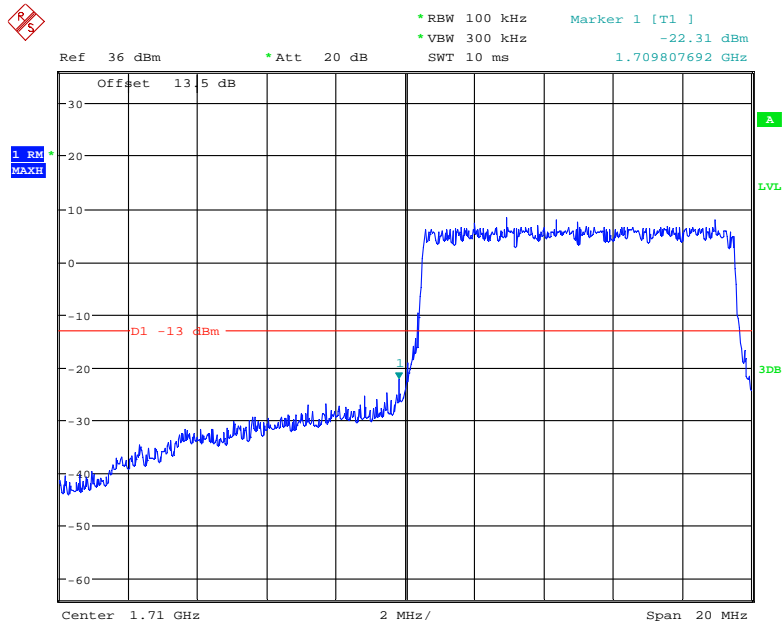
Date: 19.SEP.2018 15:17:32

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

Date: 19.SEP.2018 15:18:51

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

Date: 19.SEP.2018 15:17:09

16-QAM (10.0 MHz, FULL RB) - Right Band Edge
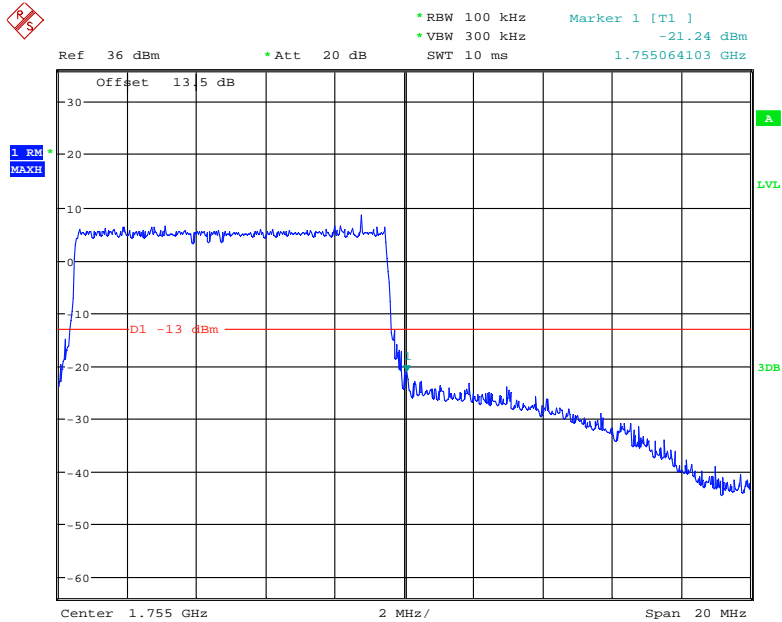
Date: 19.SEP.2018 15:19:21
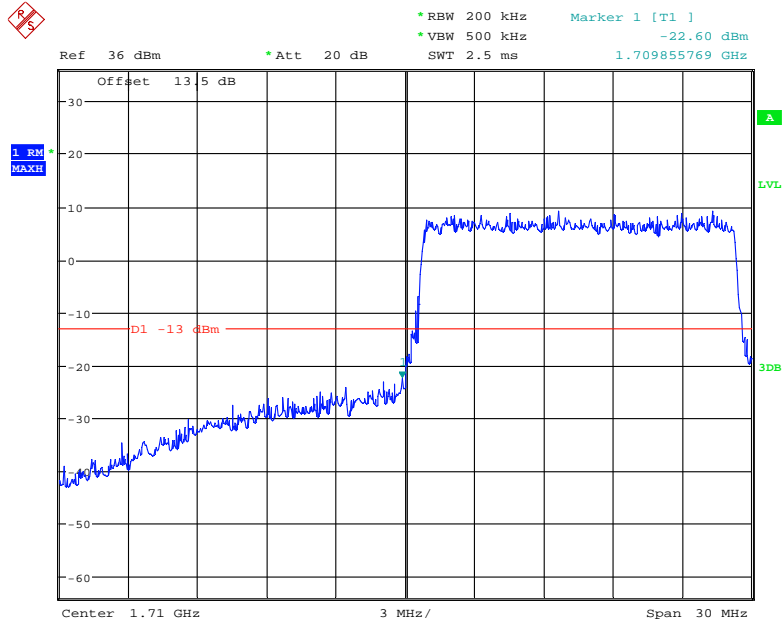
QPSK (15.0 MHz, FULL RB) - Left Band Edge

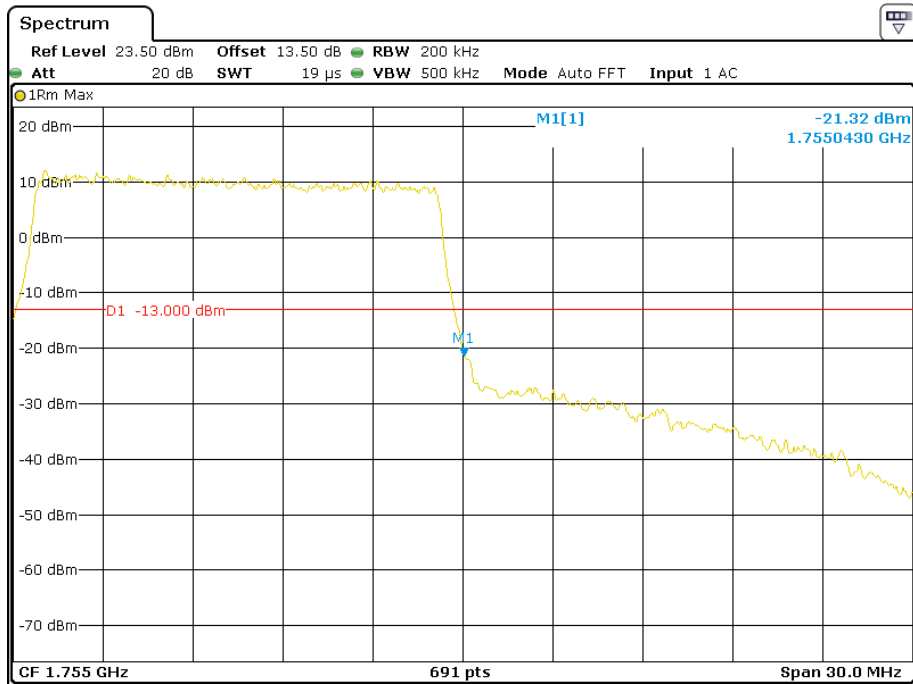Date: 19.SEP.2018 15:20:34

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

Date: 30.SEP.2018 16:48:53

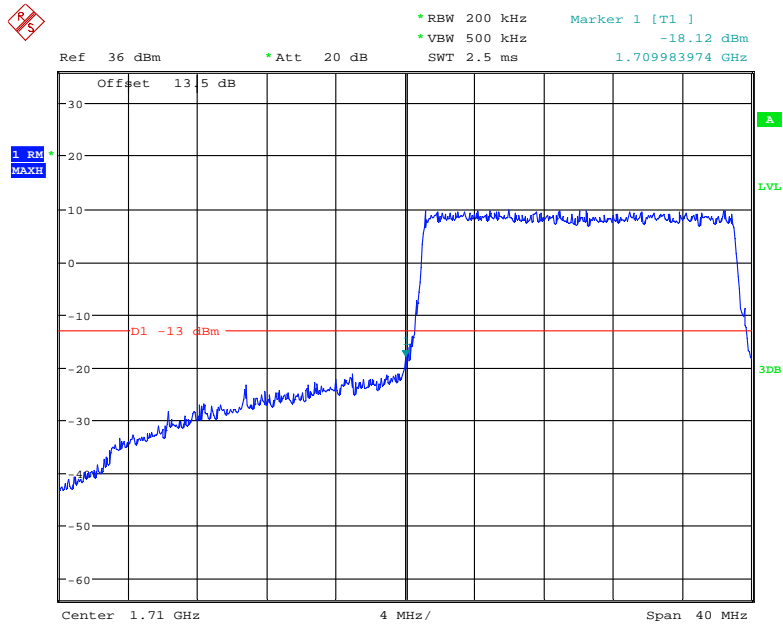## 16-QAM (15.0 MHz, FULL RB) - Left Band Edge

Date: 19.SEP.2018 15:21:14

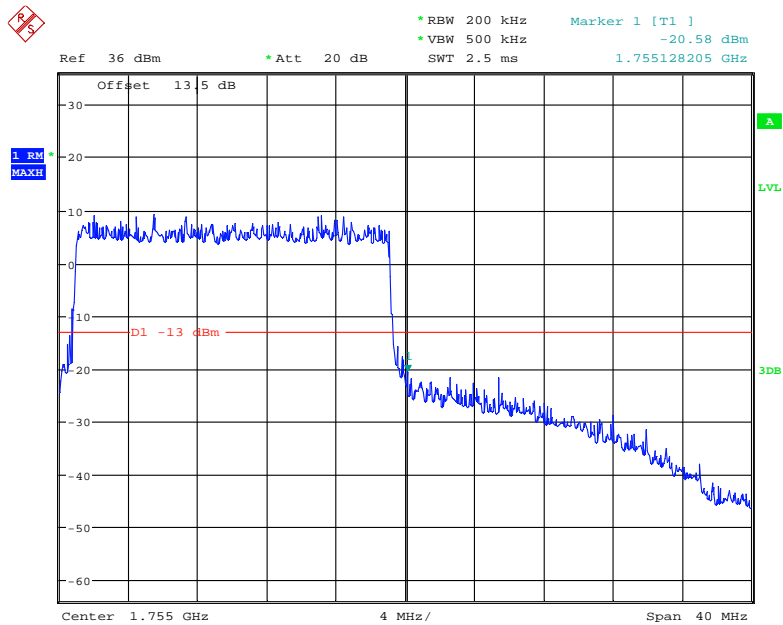## 16-QAM (15.0 MHz, FULL RB) - Right Band Edge

Date: 30.SEP.2018 16:45:35
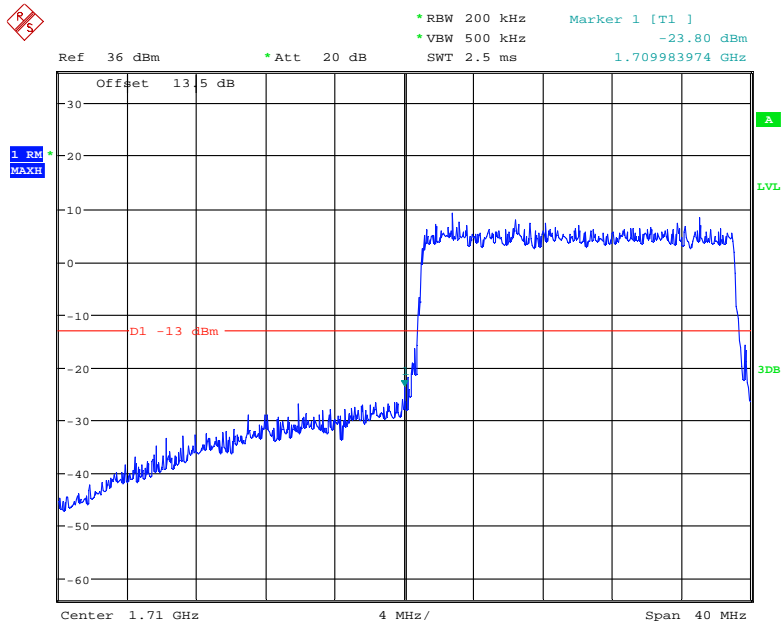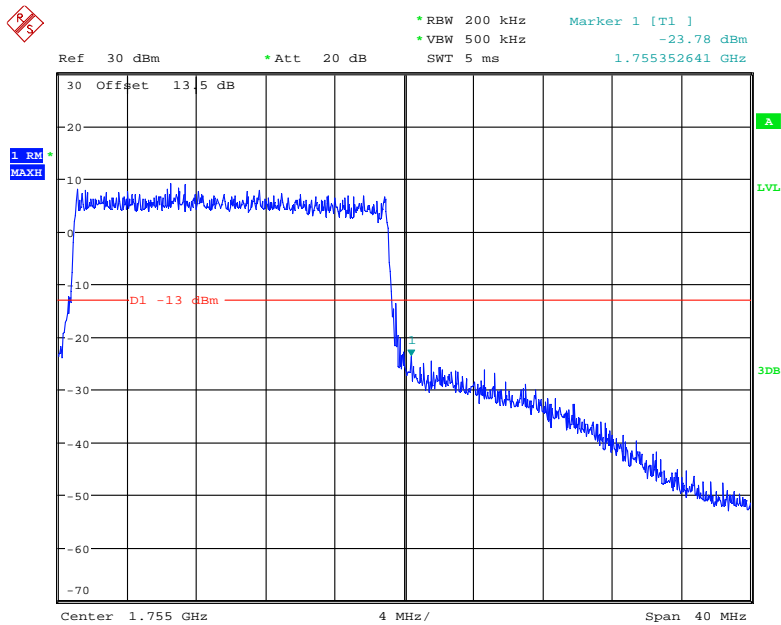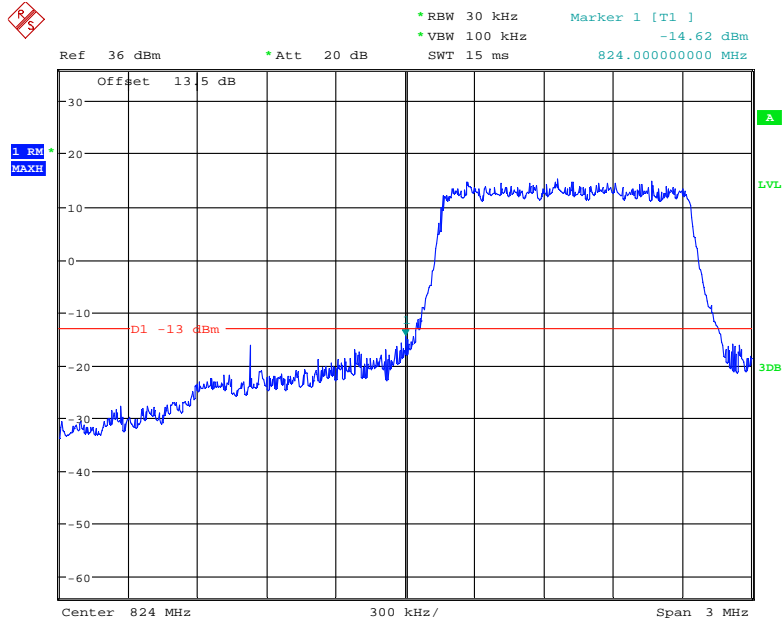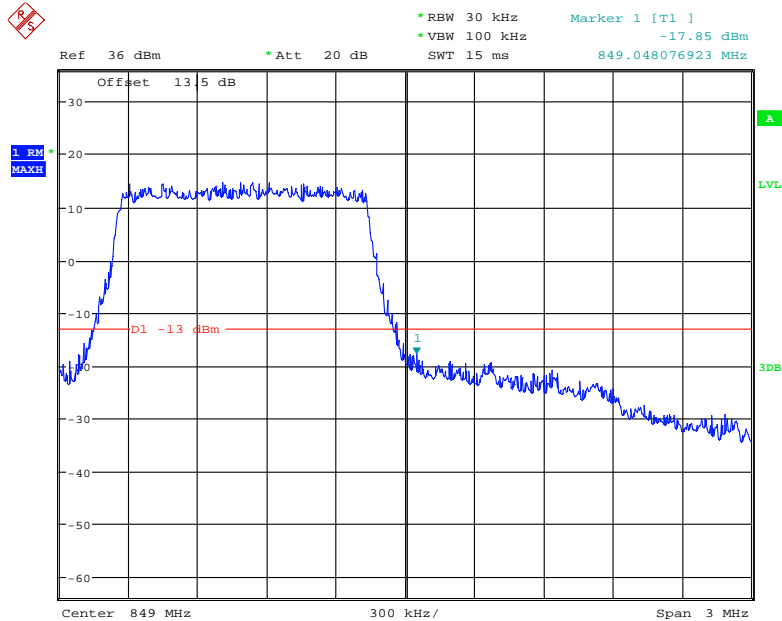
QPSK (20.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 200 kHz      Marker 1 [T1 ]
                                    *VBW 500 kHz              -18.12 dBm
   Ref  36 dBm         *Att  20 dB  SWT 2.5 ms        1.709983974 GHz
       Offset  13.5 dB                                                    A
  -30
1 RM *
MAXH                                                                      LVL
  -20

  -10

   0

 -10
      D1 -13 dBm
 -20                                                                     3DB

 -30

 -40

 -50

 -60

  Center  1.71 GHz              4 MHz/                    Span 40 MHz
```

Date: 19.SEP.2018 15:27:01

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

```
                                    *RBW 200 kHz      Marker 1 [T1 ]
                                    *VBW 500 kHz              -20.58 dBm
   Ref  36 dBm         *Att  20 dB  SWT 2.5 ms        1.755128205 GHz
       Offset  13.5 dB                                                    A
  -30
1 RM *
MAXH                                                                      LVL
  -20

  -10

   0

 -10
      D1 -13 dBm
 -20                                                                     3DB

 -30

 -40

 -50

 -60

  Center  1.755 GHz             4 MHz/                    Span 40 MHz
```

Date: 19.SEP.2018 15:28:23

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

```
                                    *RBW  200 kHz      Marker 1 [T1 ]
                                    *VBW  500 kHz              -23.80 dBm
        Ref  36 dBm      *Att  20 dB   SWT  2.5 ms      1.709983974 GHz
           Offset  13.5 dB                                              A
      -30

1 RM *
MAXH  -20                                                              LVL

      -10

        0

      -10  D1 -13 dBm                                                  3DB
      -20

      -30

      -40

      -50

      -60

      Center  1.71 GHz          4 MHz/              Span  40 MHz
```

Date: 19.SEP.2018 15:27:31

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

```
                                    *RBW  200 kHz      Marker 1 [T1 ]
                                    *VBW  500 kHz              -23.78 dBm
        Ref  30 dBm      *Att  20 dB   SWT  5 ms       1.755352641 GHz
       30 Offset  13.5 dB                                               A
      -20

1 RM *
MAXH  -10                                                              LVL

        0

      -10  D1 -13 dBm                                                  
      -20                                                              3DB

      -30

      -40

      -50

      -60

      -70

      Center  1.755 GHz         4 MHz/              Span  40 MHz
```

Date: 21.SEP.2018 09:46:57

Band 5:

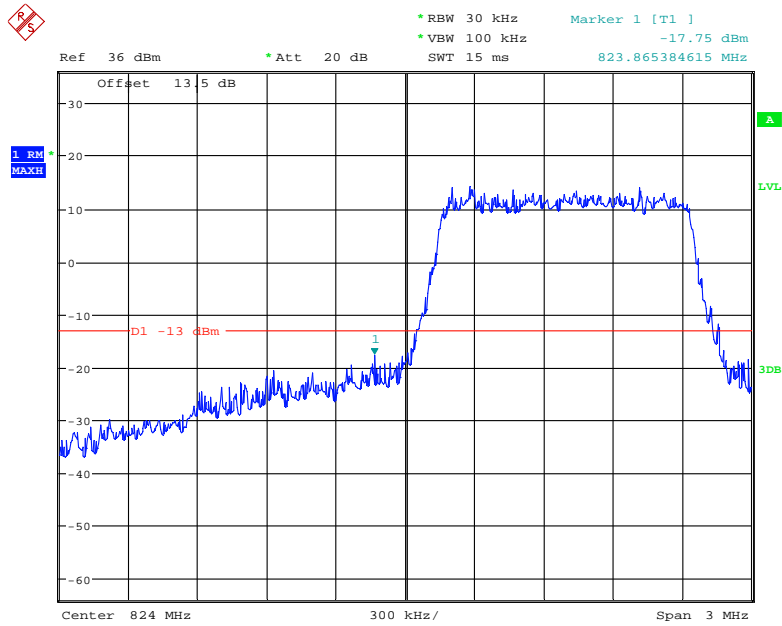## QPSK (1.4 MHz, FULL RB) - Left Band Edge

Date: 19.SEP.2018 15:31:13

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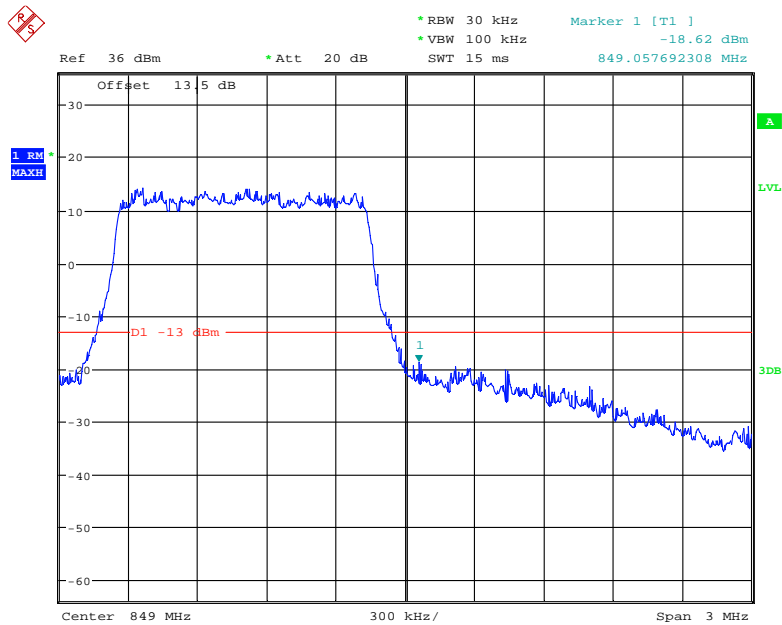

Date: 19.SEP.2018 15:32:45

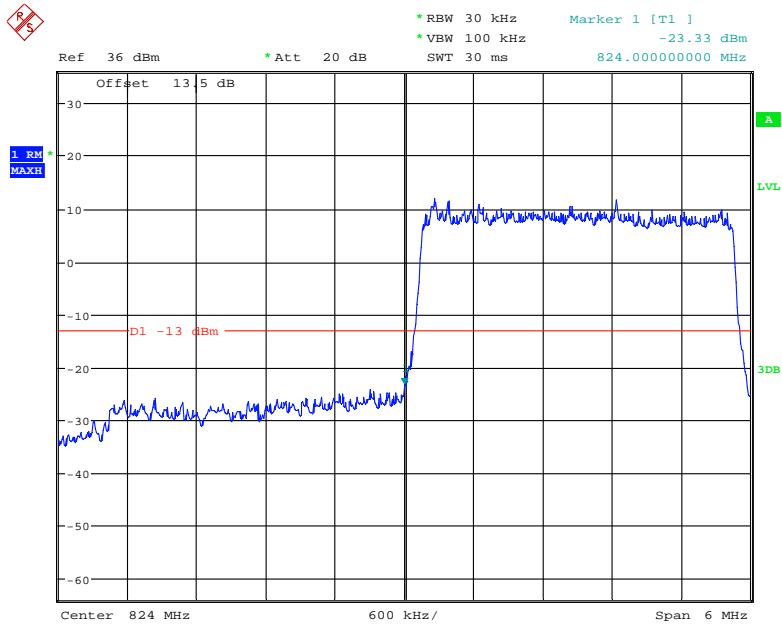## 16-QAM (1.4 MHz, FULL RB) - Left Band Edge

Date: 19.SEP.2018 15:31:42

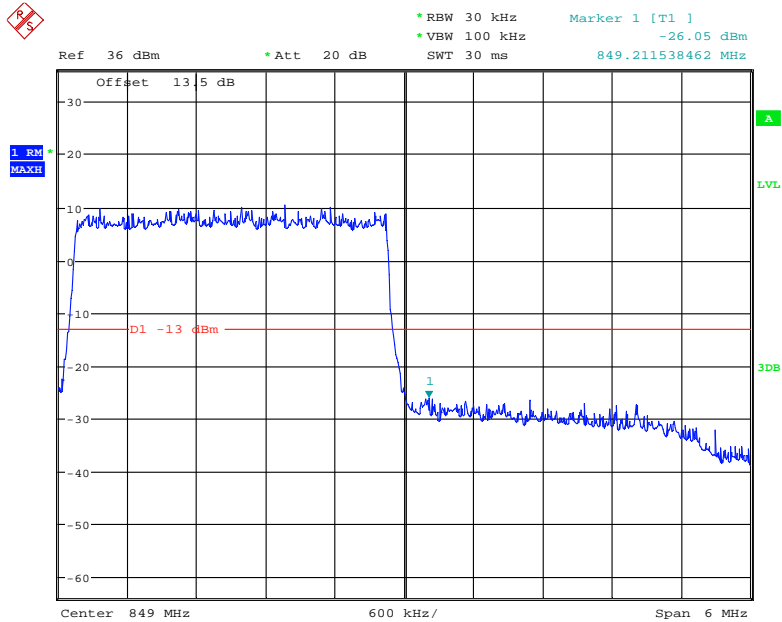## 16-QAM (1.4 MHz, FULL RB) - Right Band Edge

Date: 19.SEP.2018 15:32:20
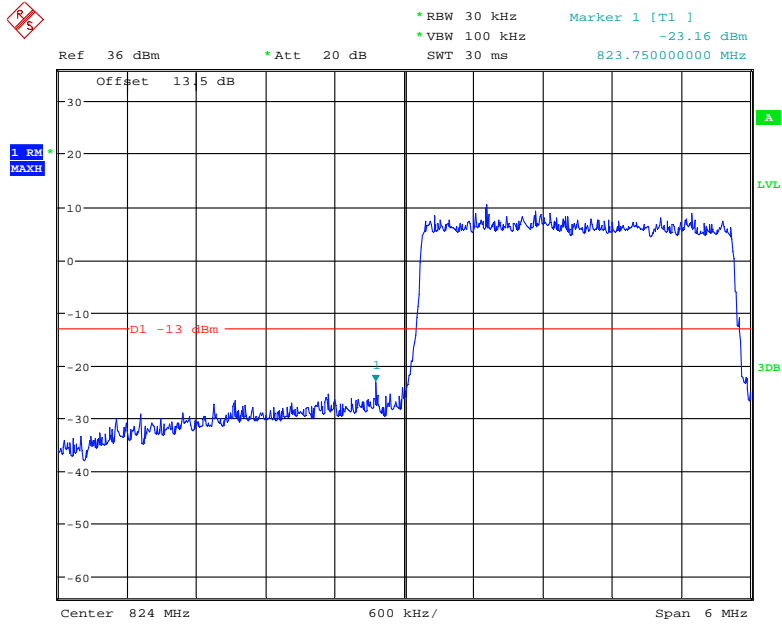
QPSK (3.0 MHz, FULL RB) - Left Band Edge

Date: 19.SEP.2018 15:35:13

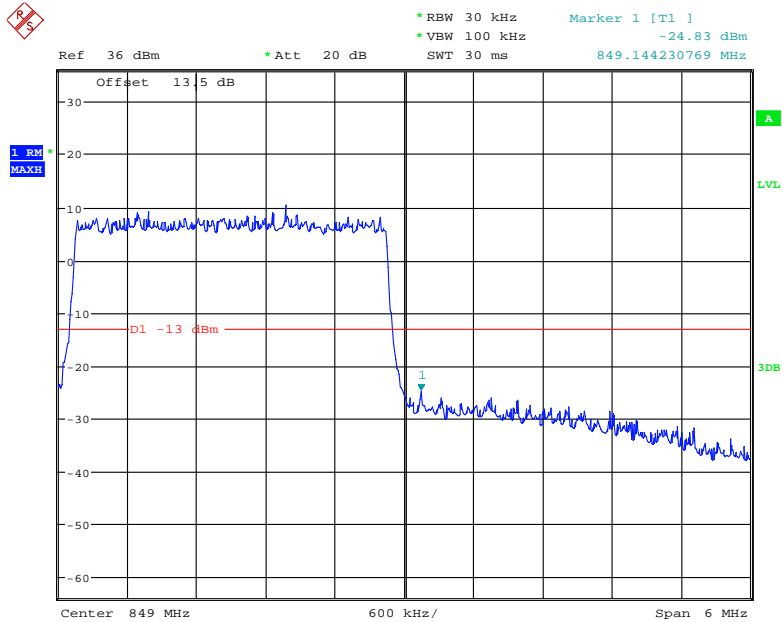## QPSK (3.0 MHz, FULL RB) - Right Band Edge

Date: 19.SEP.2018 15:36:55
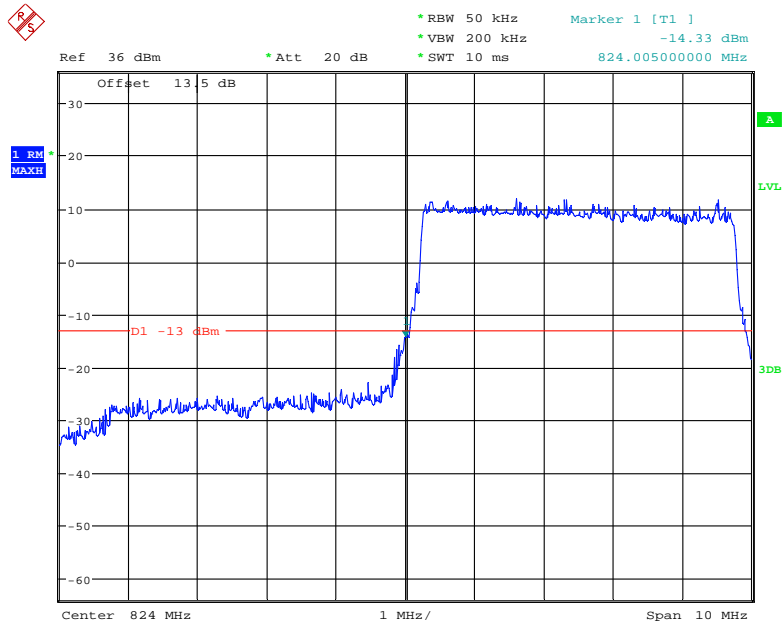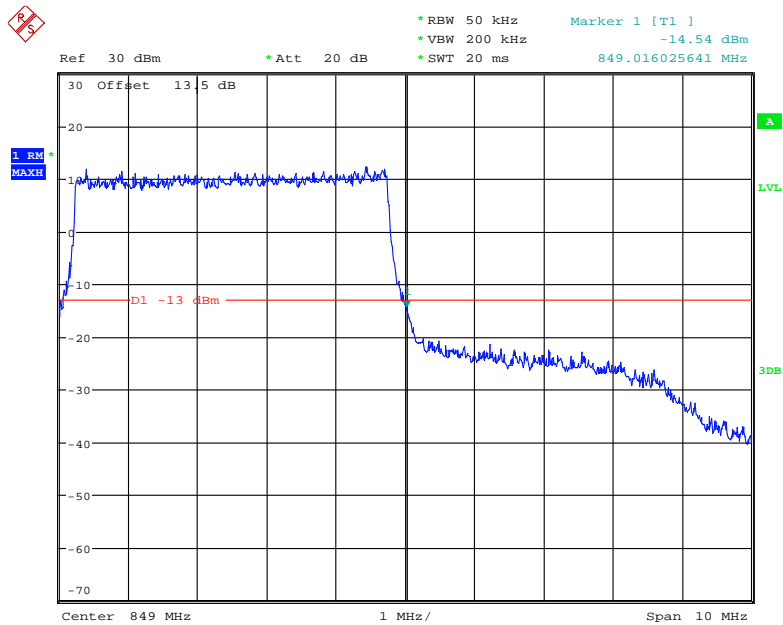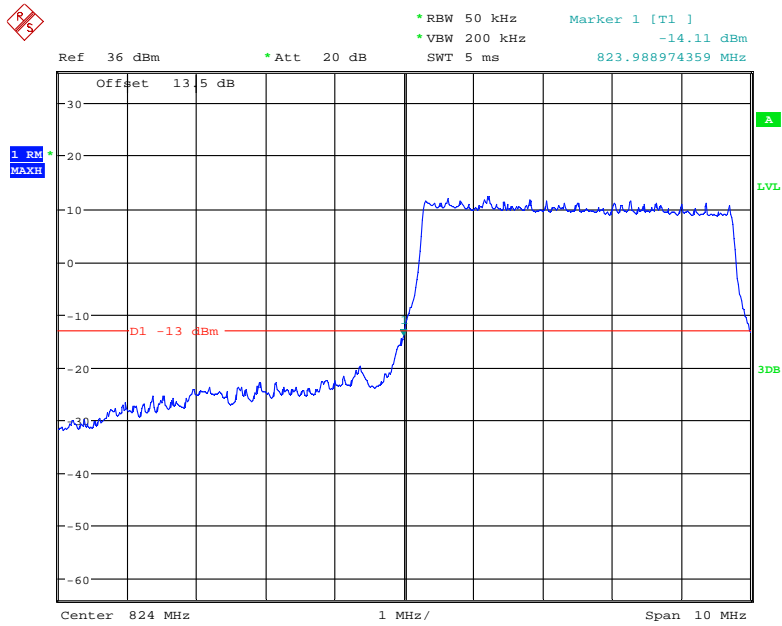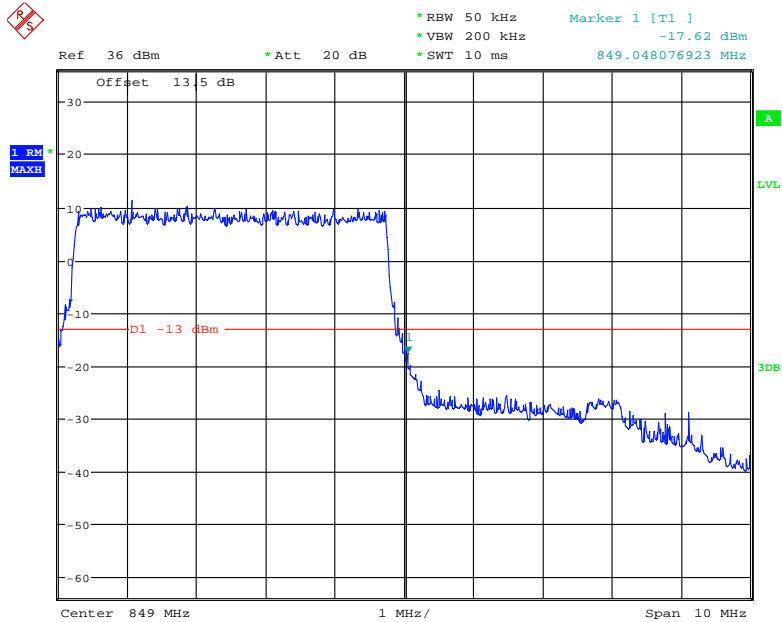
16-QAM (3.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 30 kHz      Marker 1 [T1 ]
                                    *VBW 100 kHz              -23.16 dBm
       Ref  36 dBm      *Att  20 dB  SWT 30 ms       823.750000000 MHz
          Offset  13.5 dB                                              A
  -30
1 RM *
MAXH                                                                  LVL
  -20

  -10

    0

  -10
       D1 -13 dBm                                                     3DB
  -20
                               1
  -30

  -40

  -50

  -60

       Center  824 MHz      600 kHz/              Span  6 MHz
```

Date: 19.SEP.2018 15:35:44

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

```
                                    *RBW 30 kHz      Marker 1 [T1 ]
                                    *VBW 100 kHz              -24.83 dBm
       Ref  36 dBm      *Att  20 dB  SWT 30 ms       849.144230769 MHz
          Offset  13.5 dB                                              A
  -30
1 RM *
MAXH                                                                  LVL
  -20

  -10

    0

  -10
       D1 -13 dBm                                                     3DB
  -20
                               1
  -30

  -40

  -50

  -60

       Center  849 MHz      600 kHz/              Span  6 MHz
```

Date: 19.SEP.2018 15:36:30

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

```
                                    *RBW 50 kHz        Marker 1 [T1 ]
                                    *VBW 200 kHz           -14.33 dBm
         Ref  36 dBm      *Att  20 dB  *SWT 10 ms    824.005000000 MHz
         Offset  13.5 dB                                              A
   30
1 RM *
MAXH
-20                                                                 LVL
-10
  0
-10  D1 -13 dBm
-20                                                                 3DB
-30
-40
-50
-60
         Center  824 MHz            1 MHz/            Span  10 MHz
```

Date: 19.SEP.2018 15:46:10

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

```
                                    *RBW 50 kHz        Marker 1 [T1 ]
                                    *VBW 200 kHz           -14.54 dBm
         Ref  30 dBm      *Att  20 dB  *SWT 20 ms    849.016025641 MHz
   30   Offset  13.5 dB                                              A
-20
1 RM *
MAXH
-10                                                                 LVL
  0
-10  D1 -13 dBm
-20                                                                 3DB
-30
-40
-50
-60
-70
         Center  849 MHz            1 MHz/            Span  10 MHz
```

Date: 21.SEP.2018 09:56:04

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

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 200 kHz            -14.11 dBm
     Ref  36 dBm        *Att  20 dB  SWT 5 ms         823.988974359 MHz
        Offset   13.5 dB                                              A
   -30
1 RM *
MAXH -20                                                            LVL
   -10
    0
  -10
       D1 -13 dBm
  -20                                                               3DB
  -40
  -50
  -60
     Center  824 MHz            1 MHz/              Span  10 MHz
```

Date: 19.SEP.2018 15:45:05

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

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 200 kHz            -17.62 dBm
     Ref  36 dBm        *Att  20 dB  *SWT 10 ms       849.048076923 MHz
        Offset   13.5 dB                                              A
   -30
1 RM *
MAXH -20                                                            LVL
   -10
    0
  -10
       D1 -13 dBm
  -20                                                               3DB
  -30
  -40
  -50
  -60
     Center  849 MHz            1 MHz/              Span  10 MHz
```

Date: 19.SEP.2018 15:49:33

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

```
                                        *RBW 100 kHz    Marker 1 [T1 ]
                                        *VBW 300 kHz              -19.26 dBm
      Ref  36 dBm        *Att  20 dB    *SWT 10 ms       823.977948718 MHz
          Offset   13.5 dB
        -30                                                               A

1 RM  *  -20                                                              LVL
MAXH
         10

          0

        -10
          D1 -13 dBm
        -20                                                               3DB

        -30

        -40

        -50

        -60

      Center  824 MHz              2 MHz/              Span  20 MHz
```
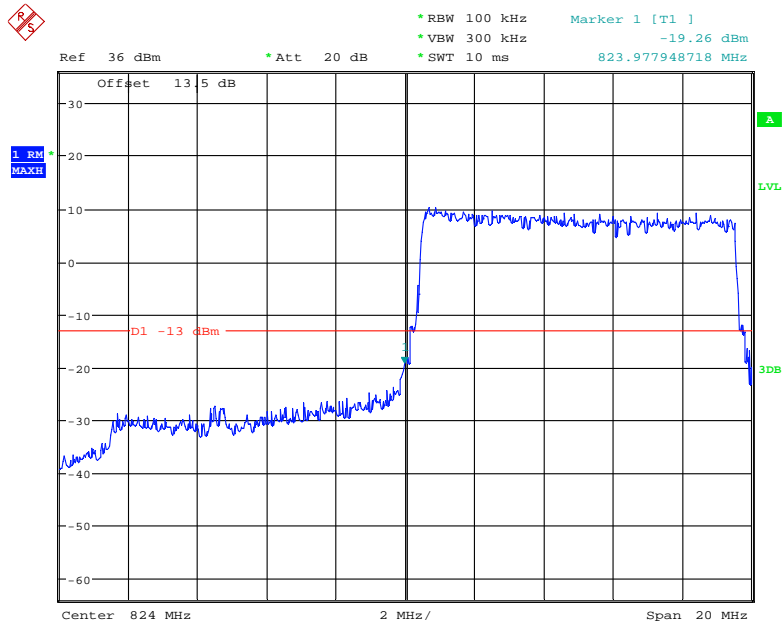
Date: 19.SEP.2018 15:52:08

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

```
                                        *RBW 100 kHz    Marker 1 [T1 ]
                                        *VBW 300 kHz              -22.29 dBm
      Ref  36 dBm        *Att  20 dB     SWT 10 ms       849.096153846 MHz
          Offset   13.5 dB
        -30                                                               A

1 RM  *  -20                                                              LVL
MAXH
         10

          0

        -10
          D1 -13 dBm
        -20                                                               3DB

        -30

        -40

        -50

        -60

      Center  849 MHz              2 MHz/              Span  20 MHz
```
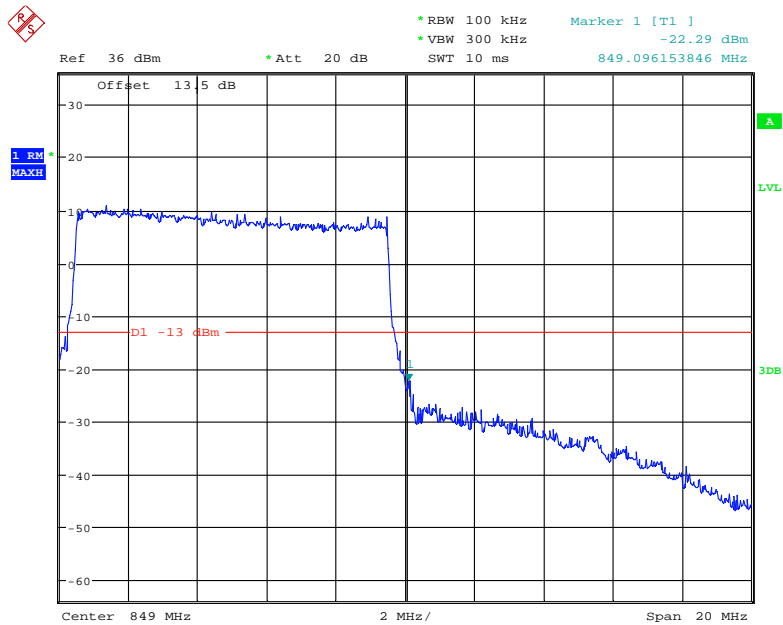
Date: 19.SEP.2018 15:53:02

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

```
                                    * RBW 100 kHz      Marker 1 [T1 ]
                                    * VBW 300 kHz              -21.06 dBm
  Ref  36 dBm        * Att  20 dB   * SWT 10 ms         823.977948718 MHz
     Offset  13.5 dB
```
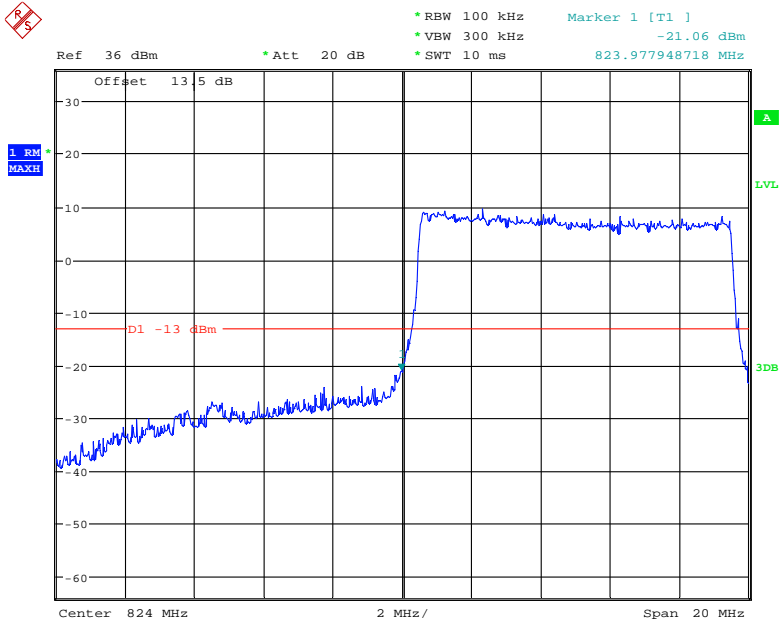
Date: 19.SEP.2018 15:51:24

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

```
                                    * RBW 100 kHz      Marker 1 [T1 ]
                                    * VBW 300 kHz              -23.93 dBm
  Ref  36 dBm        * Att  20 dB     SWT 10 ms         849.064102564 MHz
     Offset  13.5 dB
```
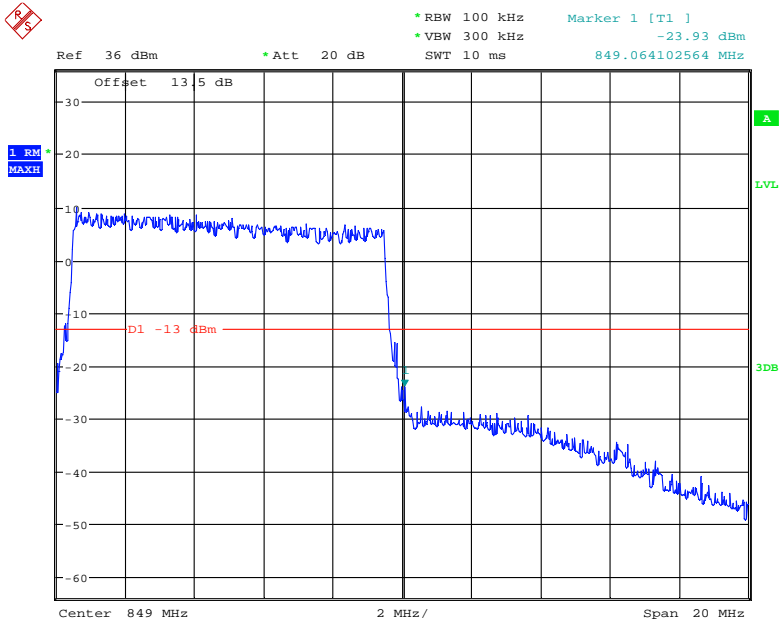
Date: 19.SEP.2018 15:53:28

Band 12:

QPSK (1.4 MHz, FULL RB) - Left Band Edge
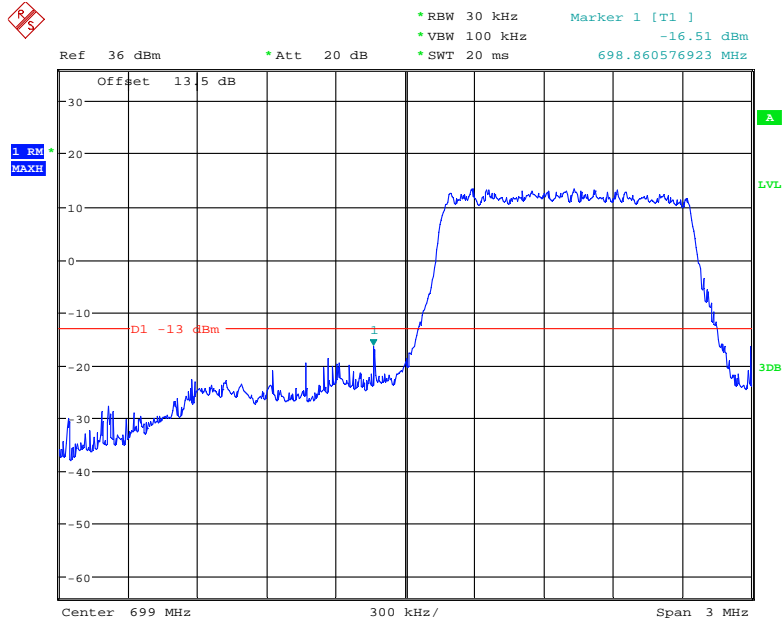
Date: 19.SEP.2018 15:56:21

QPSK (1.4 MHz, FULL RB) - Right Band Edge
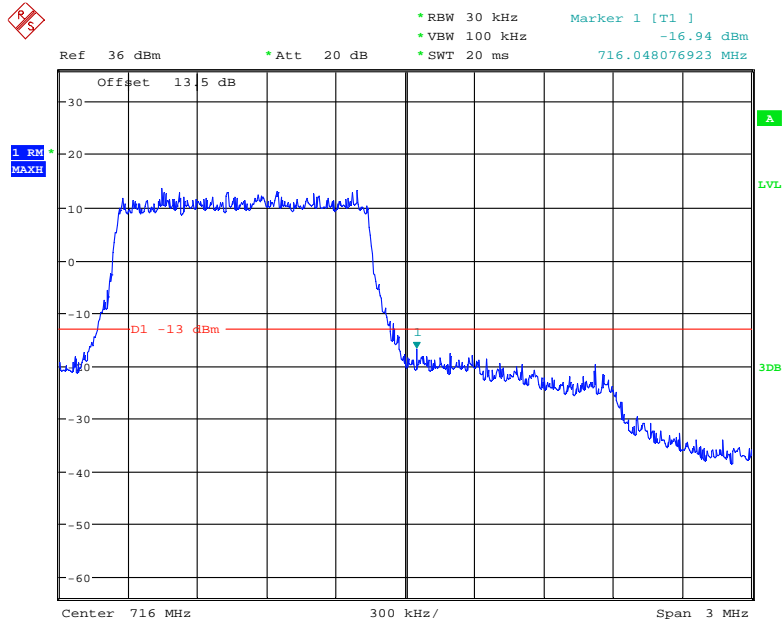
Date: 19.SEP.2018 15:58:09

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

```
* RBW  30 kHz        Marker 1 [T1 ]
* VBW  100 kHz              -15.56 dBm
Ref  36 dBm      * Att  20 dB    * SWT  20 ms    698.711538462 MHz
Offset  13.5 dB
```
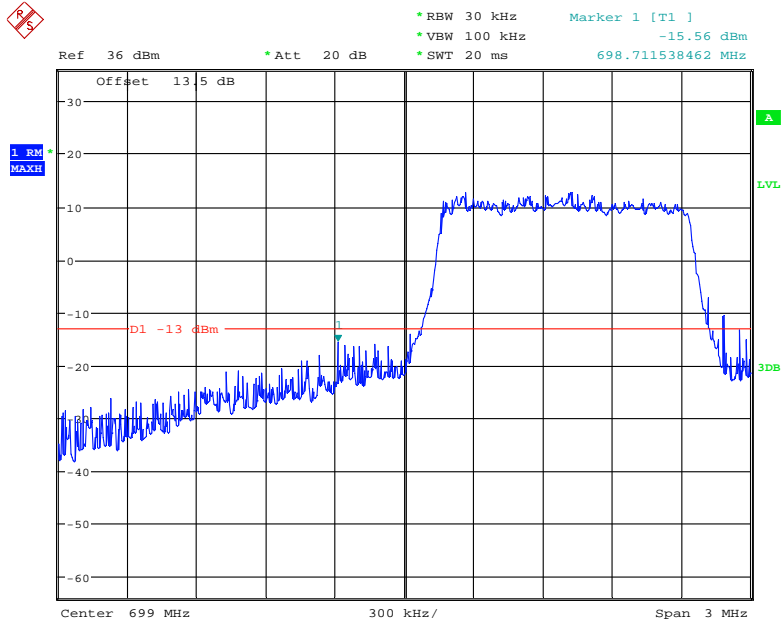
Date: 19.SEP.2018 15:56:55

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

```
* RBW  30 kHz        Marker 1 [T1 ]
* VBW  100 kHz              -16.94 dBm
Ref  36 dBm      * Att  20 dB    * SWT  20 ms    716.009615385 MHz
Offset  13.5 dB
```
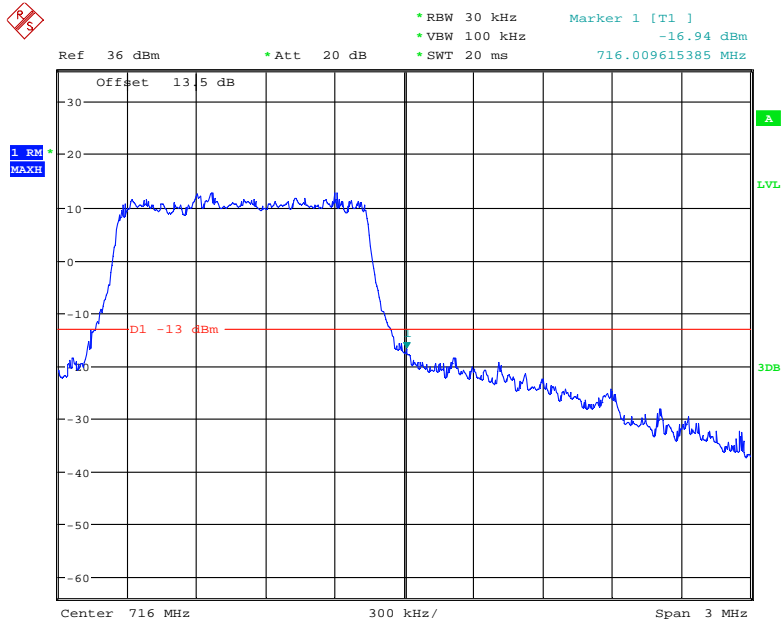
Date: 19.SEP.2018 15:57:46

QPSK (3.0 MHz, FULL RB) - Left Band Edge
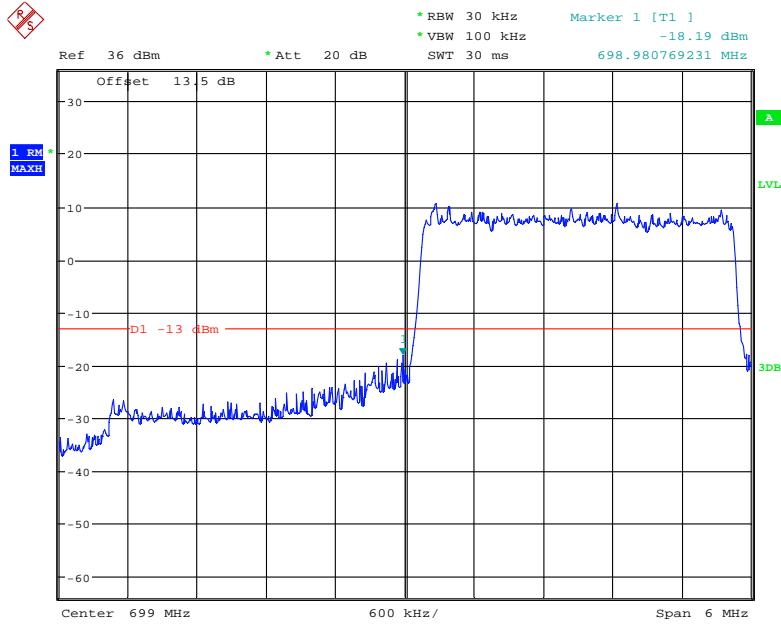
Date: 19.SEP.2018 16:05:15

QPSK (3.0 MHz, FULL RB) - Right Band Edge
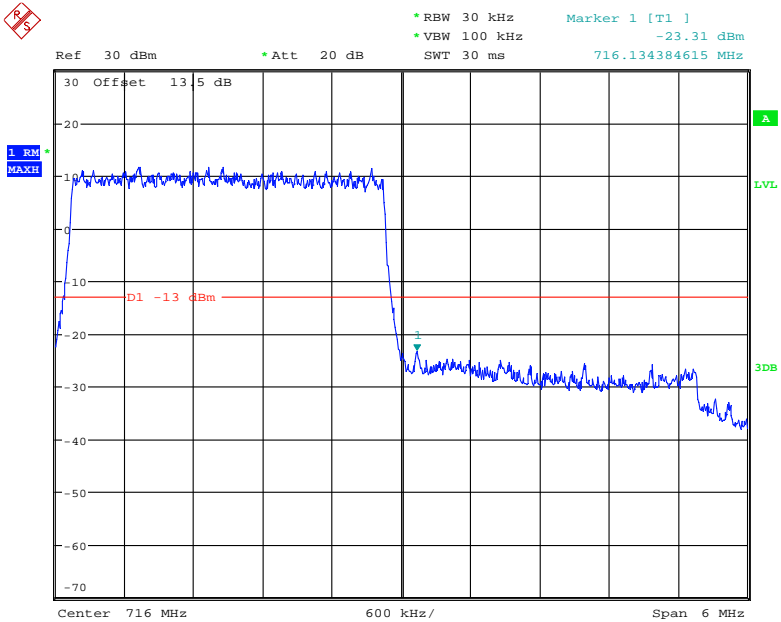
Date: 21.SEP.2018 09:52:04

16-QAM (3.0 MHz, FULL RB) - Left Band Edge
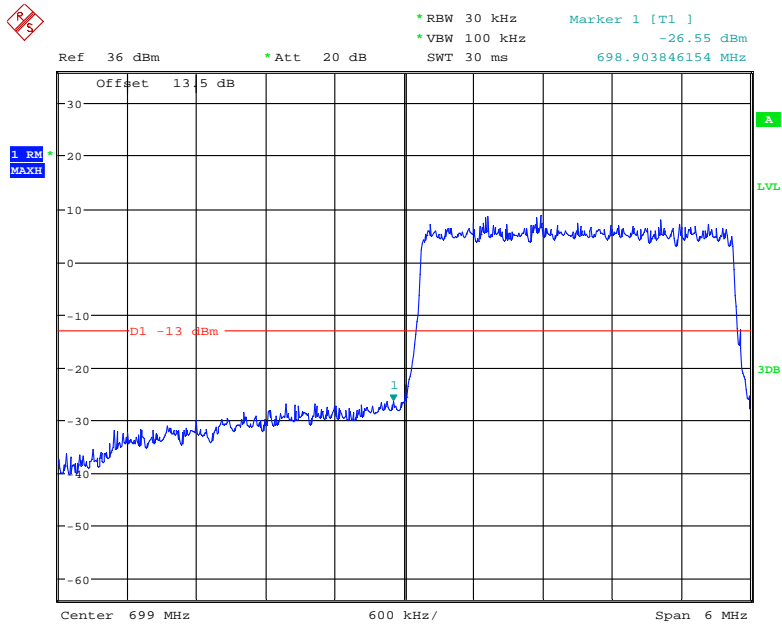
Date: 19.SEP.2018　16:05:48

16-QAM (3.0 MHz, FULL RB) - Right Band Edge
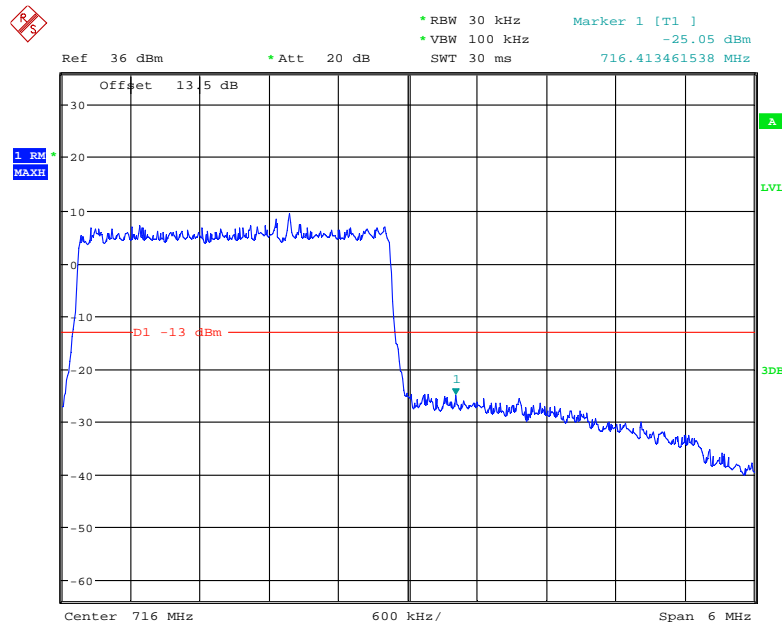
Date: 19.SEP.2018　16:09:22

QPSK (5.0 MHz, FULL RB) - Left Band Edge
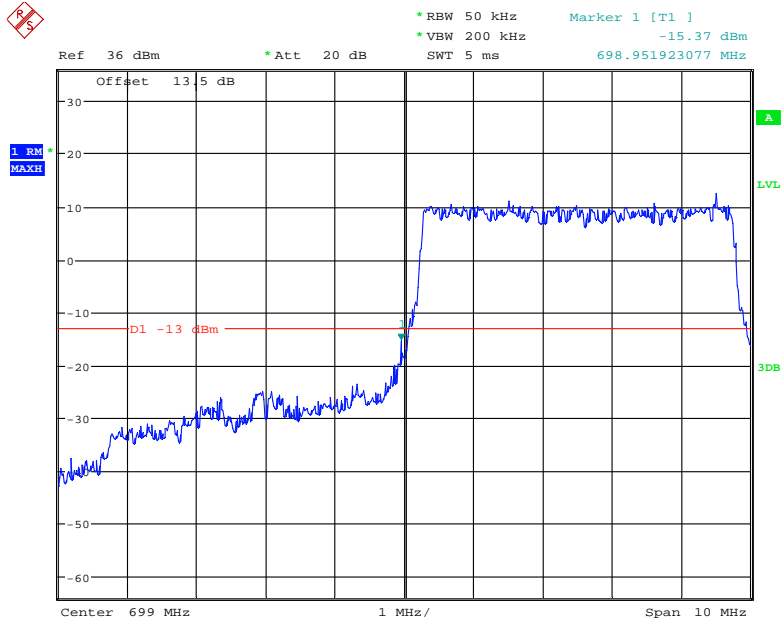
Date: 19.SEP.2018 16:14:20
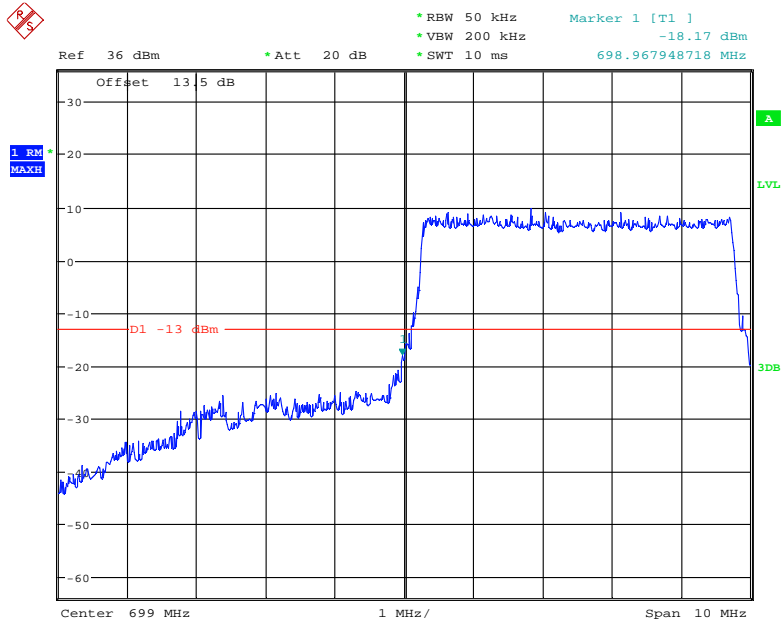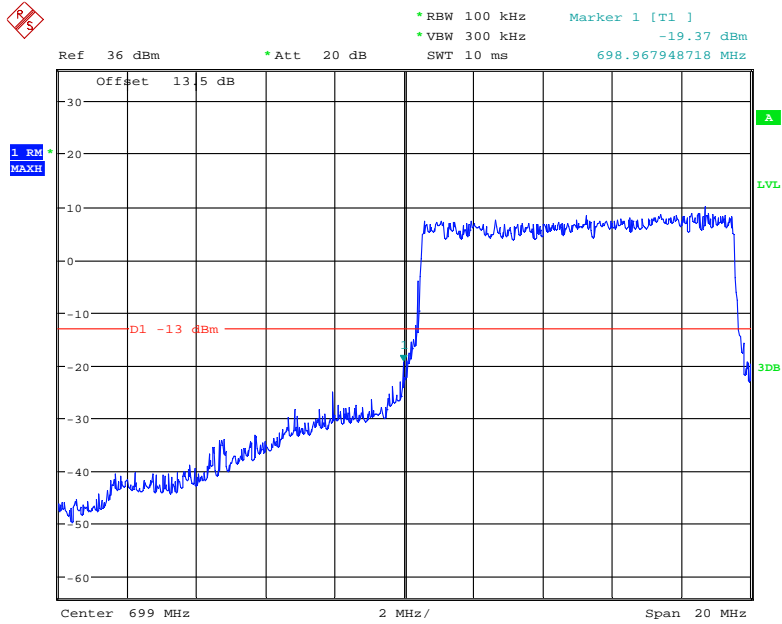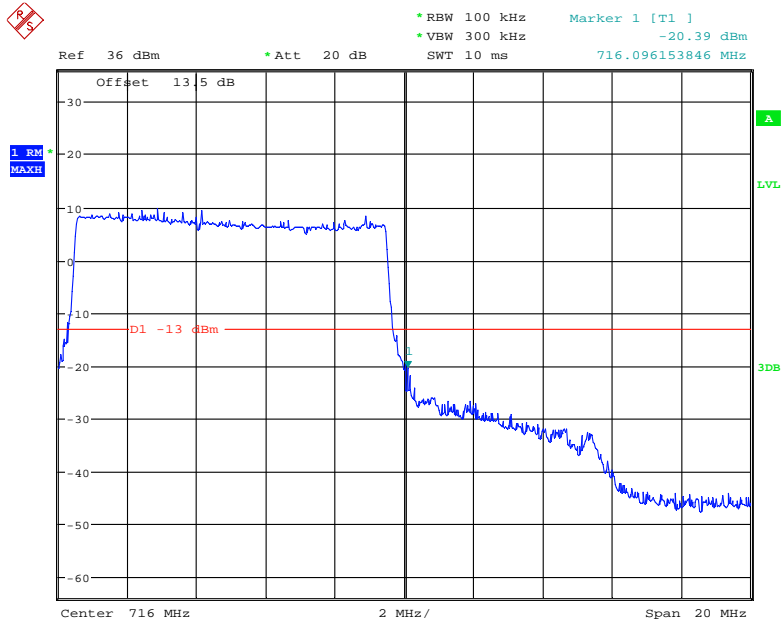
QPSK (5.0 MHz, FULL RB) - Right Band Edge
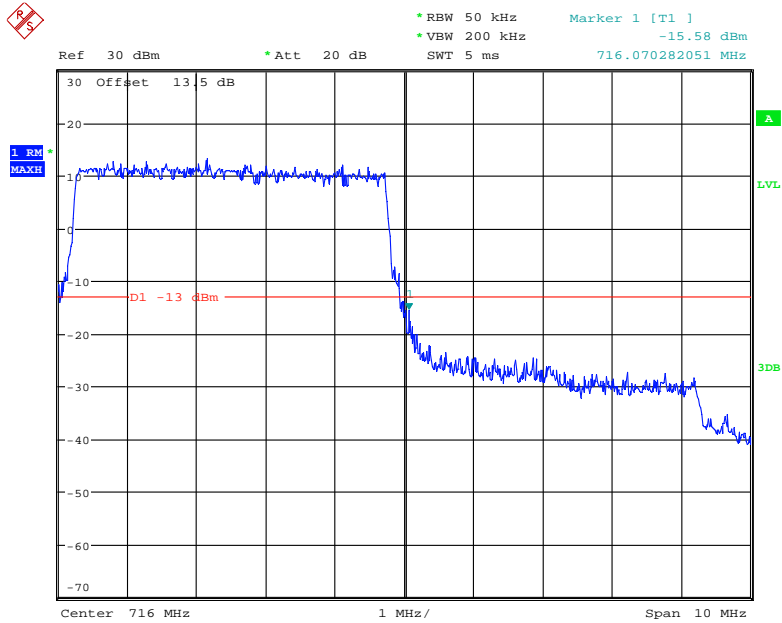
Date: 21.SEP.2018 09:53:35

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

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 200 kHz              -18.17 dBm
        Ref  36 dBm      *Att  20 dB  *SWT 10 ms      698.967948718 MHz
```
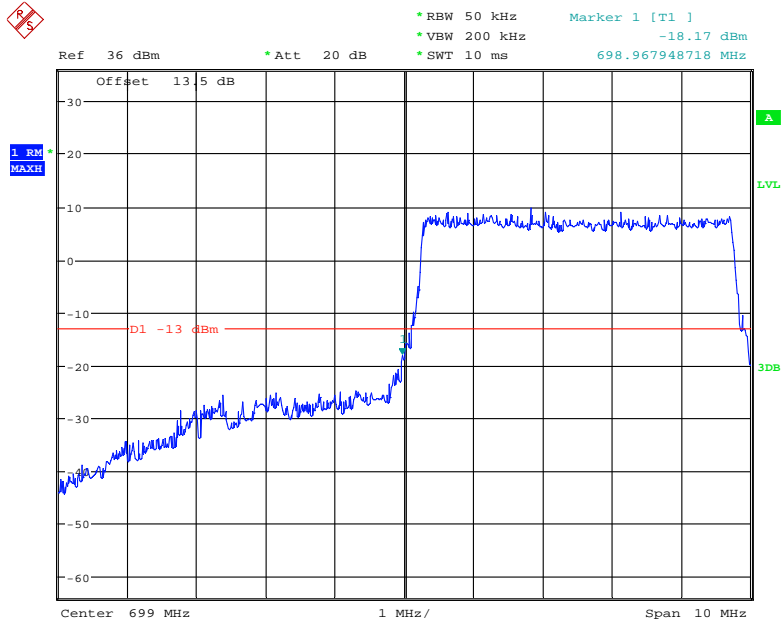
Date: 19.SEP.2018 16:11:54

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

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 200 kHz              -18.17 dBm
        Ref  36 dBm      *Att  20 dB  *SWT 10 ms      698.967948718 MHz
```

Date: 19.SEP.2018 16:11:54

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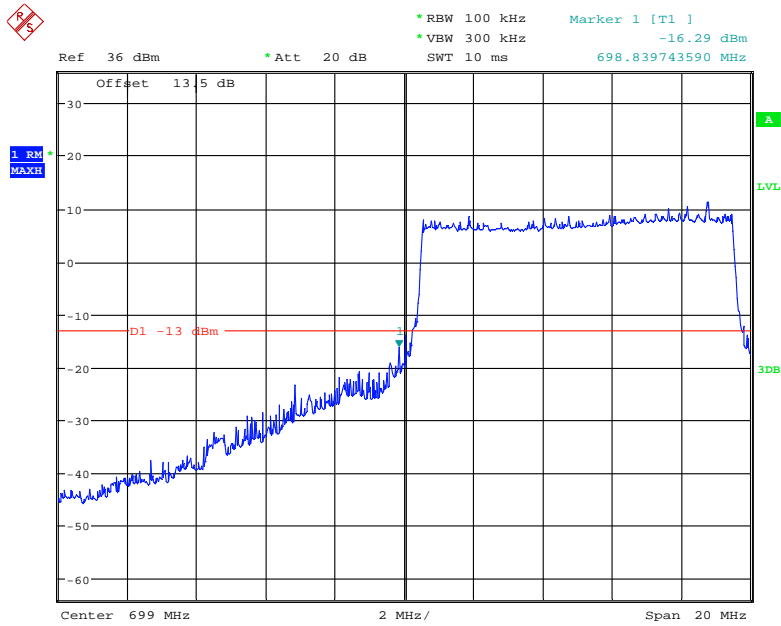

Date: 19.SEP.2018 16:23:27

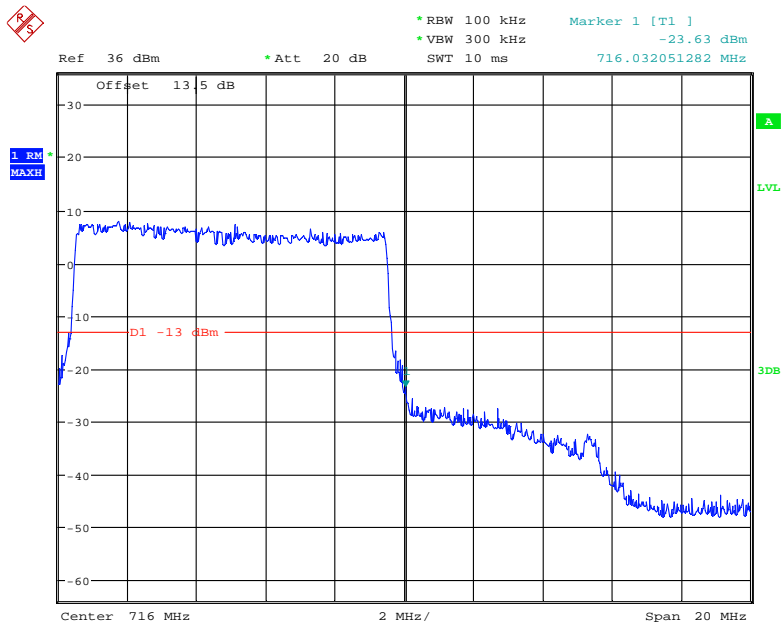## QPSK (10.0 MHz, FULL RB) - Right Band Edge

Date: 19.SEP.2018 16:24:02

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

Date: 19.SEP.2018 16:23:04

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

Date: 19.SEP.2018 16:24:25

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.
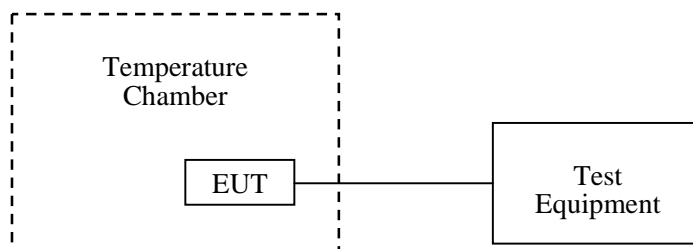
Test Data

Environmental Conditions

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

The testing was performed by Haiguo Li on 2018-09-28.

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		12	0.0143	2.5
-20		7	0.0084	2.5
-10		9	0.0108	2.5
0		6	0.0072	2.5
10	3.7	5	0.0060	2.5
20		4	0.0048	2.5
30		5	0.0060	2.5
40		7	0.0084	2.5
50		10	0.0120	2.5
25	V min.= 3.5	12	0.0143	2.5
	V max.= 4.2	13	0.0155	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30		10	0.0120	2.5
-20		11	0.0131	2.5
-10		9	0.0108	2.5
0		4	0.0048	2.5
10	3.7	4	0.0048	2.5
20		2	0.0024	2.5
30		4	0.0048	2.5
40		6	0.0072	2.5
50		8	0.0096	2.5
25	V min.= 3.5	11	0.0131	2.5
	V max.= 4.2	17	0.0203	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30		-11	-0.0131	2.5
-20		-15	-0.0179	2.5
-10		-17	-0.0203	2.5
0		-15	-0.0179	2.5
10	3.7	-15	-0.0179	2.5
20		-14	-0.0167	2.5
30		-15	-0.0179	2.5
40		-18	-0.0215	2.5
50		-19	-0.0227	2.5
25	V min.= 3.5	-20	-0.0239	2.5
	V max.= 4.2	-21	-0.0251	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		7	0.0037	pass
-20		6	0.0032	pass
-10		6	0.0032	pass
0		6	0.0032	pass
10	3.7	5	0.0027	pass
20		5	0.0027	pass
30		6	0.0032	pass
40		7	0.0037	pass
50		10	0.0053	pass
25	V min.= 3.5	15	0.0080	pass
	V max.= 4.2	20	0.0106	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30		5	0.0027	pass
-20		5	0.0027	pass
-10		4	0.0021	pass
0		4	0.0021	pass
10	3.7	3	0.0016	pass
20		3	0.0016	pass
30		4	0.0021	pass
40		7	0.0037	pass
50		17	0.0090	pass
25	V min.= 3.5	20	0.0106	pass
	V max.= 4.2	23	0.0122	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30		-12	-0.0064	pass
-20		-13	-0.0069	pass
-10		-19	-0.0101	pass
0		-14	-0.0074	pass
10	3.7	-18	-0.0096	pass
20		-17	-0.0090	pass
30		-18	-0.0096	pass
40		-19	-0.0101	pass
50		-20	-0.0106	pass
25	V min.= 3.5	-23	-0.0122	pass
	V max.= 4.2	-25	-0.0133	pass

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	3.7	-9	-0.00479	pass
-20		-10	-0.00532	pass
-10		-15	-0.00798	pass
0		-8	-0.00426	pass
10		-10	-0.00532	pass
20		-7	-0.00372	pass
30		-10	-0.00532	pass
40		-12	-0.00638	pass
50		-13	-0.00691	pass
20	V min.= 3.5	-16	-0.00851	pass
	V max.= 4.2	-17	-0.00904	pass

Band 4:

20 MHz Bandwidth					
Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.7	1710.3228	1754.3169	1710.0000	1755.0000
-20		1710.3237	1754.3158	1710.0000	1755.0000
-10		1710.3242	1754.3191	1710.0000	1755.0000
0		1710.3245	1754.3189	1710.0000	1755.0000
10		1710.3245	1754.3160	1710.0000	1755.0000
20		1710.3229	1754.3132	1710.0000	1755.0000
30		1710.3290	1754.3137	1710.0000	1755.0000
40		1710.3239	1754.3172	1710.0000	1755.0000
50		1710.3282	1754.3135	1710.0000	1755.0000
25	V min.= 3.5	1710.3253	1754.3178	1710.0000	1755.0000
	V max.= 4.2	1710.3216	1754.3157	1710.0000	1755.0000

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	14	0.016736	2.5
-20		10	0.011955	2.5
-10		12	0.014345	2.5
0		7	0.008368	2.5
10		8	0.009564	2.5
20		9	0.010759	2.5
30		4	0.004782	2.5
40		10	0.011955	2.5
50		15	0.017932	2.5
20	V min.= 3.5	20	0.023909	2.5
	V max.= 4.2	27	0.032277	2.5

Band 12:

10 MHz Bandwidth					
Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.7	699.2104	715.2366	699.0000	716.0000
-20		699.2207	715.3214	699.0000	716.0000
-10		699.2215	715.3356	699.0000	716.0000
0		699.2312	715.4523	699.0000	716.0000
10		699.2356	715.5623	699.0000	716.0000
20		699.3205	715.6474	699.0000	716.0000
30		699.3425	715.6574	699.0000	716.0000
40		699.3456	715.6658	699.0000	716.0000
50		699.3785	715.6752	699.0000	716.0000
25	V min.= 3.5	699.4211	715.6895	699.0000	716.0000
	V max.= 4.2	699.4266	715.6955	699.0000	716.0000

16QAM:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-14	-0.0074	pass
-20		-10	-0.0053	pass
-10		-8	-0.0043	pass
0		-9	-0.0048	pass
10		-7	-0.0037	pass
20		-5	-0.0027	pass
30		-7	-0.0037	pass
40		-11	-0.0059	pass
50		-15	-0.0080	pass
20	V min.= 3.5	-18	-0.0096	pass
	V max.= 4.2	-20	-0.0106	pass

Band 4:

20 MHz Bandwidth					
Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.7	1710.5788	1754.3556	1710.0000	1755.0000
-20		1710.5728	1754.3570	1710.0000	1755.0000
-10		1710.5767	1754.3597	1710.0000	1755.0000
0		1710.5747	1754.3558	1710.0000	1755.0000
10		1710.574	1754.3562	1710.0000	1755.0000
20		1710.5718	1754.3575	1710.0000	1755.0000
30		1710.5772	1754.3550	1710.0000	1755.0000
40		1710.5785	1754.3559	1710.0000	1755.0000
50		1710.5778	1754.3558	1710.0000	1755.0000
25	V min.= 3.5	1710.5757	1754.3542	1710.0000	1755.0000
	V max.= 4.2	1710.5751	1754.3584	1710.0000	1755.0000

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	9	0.010759	2.5
-20		8	0.009564	2.5
-10		14	0.016736	2.5
0		8	0.009564	2.5
10		4	0.004782	2.5
20		2	0.002391	2.5
30		4	0.004782	2.5
40		8	0.009564	2.5
50		10	0.011955	2.5
20	V min.= 3.5	20	0.023909	2.5
	V max.= 4.2	25	0.029886	2.5

Band 12:

10 MHz Bandwidth					
Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.7	699.2021	715.2305	699.0000	716.0000
-20		699.2102	715.3204	699.0000	716.0000
-10		699.2206	715.3312	699.0000	716.0000
0		699.2304	715.4230	699.0000	716.0000
10		699.2321	715.5012	699.0000	716.0000
20		699.3212	715.6462	699.0000	716.0000
30		699.3362	715.6555	699.0000	716.0000
40		699.3425	715.6623	699.0000	716.0000
50		699.3635	715.6731	699.0000	716.0000
25	V min.= 3.5	699.4012	715.6804	699.0000	716.0000
	V max.= 4.2	699.4125	715.6941	699.0000	716.0000

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