



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

For

**Reliance Communications LLC**

555 Wireless Blvd, Hauppauge New York United States 11788

**FCC ID: 2ABGH-RC506LT**

<b>Report Type:</b> Original Report	<b>Product Type:</b> 4G mobile phone
<b>Report Number:</b> <u>RSZ171115012-00D</u>	
<b>Report Date:</b> <u>2017-12-13</u>	
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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

The *Reliance Communications LLC*'s product, model number: RC506LT (*FCC ID: 2ABGH-RC506LT*) or the "EUT" in this report was a *4G mobile phone*, which was measured approximately:  
14.2 cm (L) × 7.1 cm (W) × 1.0 cm (H), rated with input voltage: DC 3.7V battery or DC 5V from adapter.

Adapter Information:

Model:RC506LT

Input: AC 100-240V, 50/60Hz, 0.2A

Output: DC 5V, 1000 mA

*\*All measurement and test data in this report was gathered from production sample serial number: 1702520.  
(Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2017-11-15.*

### Objective

This test report is prepared on behalf of *Reliance Communications 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 15.247 DTS & DSS and Part 15B JBP submissions with FCC ID: 2ABGH-RC506LT.

### Test Methodology

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

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D.

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

**Measurement Uncertainty**

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

**Test Facility**

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

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 382179, the FCC Designation No. : CN5001.

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.

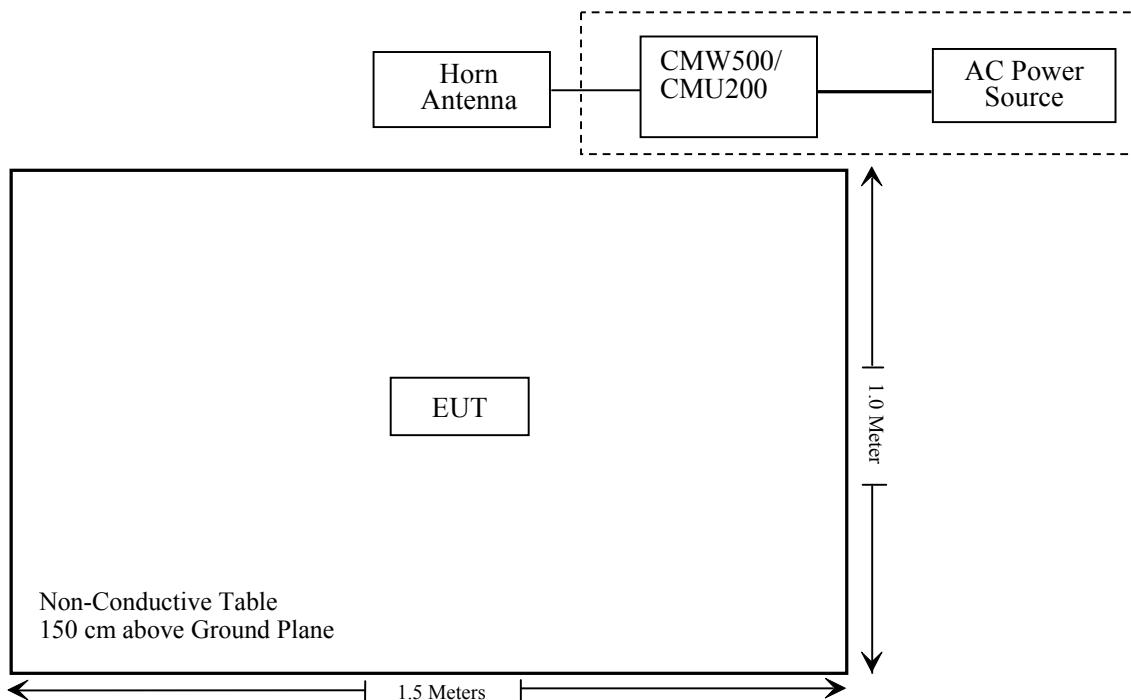
### Equipment Modifications

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 (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: RSZ171115012-20A.

## TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test</b>					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Rohde & Schwarz	Signal ANALYZER	FSIQ26	8386001028	2017-04-24	2018-04-24
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-17	2017-12-16
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-02-14	2018-02-14
HP	Amplifier	HP8447E	1937A01046	2017-11-19	2018-05-21
Anritsu	Signal Generator	68369B	004114	2016-12-05	2017-12-05
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2016-12-07	2017-12-07
COM POWER	Dipole Antenna	AD-100	041000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2017-11-19	2018-05-21
Ducommun technologies	RF Cable	104PEA	218124002	2017-11-19	2018-05-21
Ducommun technologies	RF Cable	RG-214	1	2017-11-19	2018-05-21
Ducommun technologies	RF Cable	RG-214	2	2017-11-22	2018-05-22
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2014-12-29	2017-12-28
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2014-12-29	2017-12-28
Ducommun technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>RF Conducted Test</b>					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2016-12-05	2017-12-05
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2017-11-22	2018-05-22
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Aglient	ESG Vector Signal Generator	E4438C	MY42080875	2017-05-09	2018-05-09
Rohde & Schwarz	Wideband Radio Communication Tester	CMU200	106891	2017-10-18	2018-10-18
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2017-04-24	2018-04-24
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2017-08-17	2018-08-17
Ducommun technologies	RF Cable	RG-214	3	2017-11-22	2018-05-22
WEINSCHEL	10dB Attenuator	5324	AU 3842	2017-11-22	2018-05-22
WEINSCHEL	3dB Attenuator	N/A	N/A	2017-11-22	2018-05-22
N/A	Power Splitter	N/A	N/A	2017-05-21	2018-05-21

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

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

### **Applicable Standard**

FCC§1.1310 and §2.1093.

### **Test Result**

Compliance, please refer to the SAR report: RSZ171115012-20A.

## **FCC §2.1047 - MODULATION CHARACTERISTIC**

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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 (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.

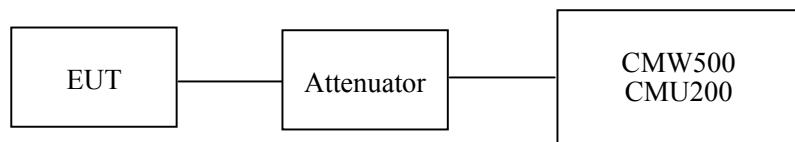
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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

### Test Procedure

#### *Conducted method:*

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



#### *Radiated method:*

TIA 603-D section 2.2.17

### Test Data

#### Environmental Conditions

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

*The testing was performed by Hill He on 2017-11-25.*

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

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	31.78	38.45
	190	836.6	31.96	38.45
	251	848.8	32.10	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.77	29.96	28.29	26.65	38.45
	190	836.6	31.95	30.17	28.49	26.89	38.45
	251	848.8	32.15	30.35	28.66	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	25.62	24.44	23.24	21.58	38.45
	190	836.6	25.62	24.47	23.27	21.80	38.45
	251	848.8	25.34	24.21	22.97	21.48	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	HSDPA	RMC12.2k	22.34	22.29	22.25
			1	21.30	20.88	21.21
			2	21.24	20.83	21.12
			3	21.36	20.94	21.28
			4	21.23	20.76	21.09
		HSUPA	1	21.57	21.06	21.41
			2	21.46	21.02	21.28
			3	21.65	21.10	21.47
			4	21.45	20.94	21.32
			5	21.69	21.10	21.48
		HSPA+	1	21.54	21.06	21.45

**PCS Band (Part 24E)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	29.24	33
	661	1880.0	28.77	33
	810	1909.8	28.21	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	29.25	26.94	25.43	23.88	33
	661	1880.0	28.77	26.65	25.13	23.58	33
	810	1909.8	28.26	26.15	24.60	23.11	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	24.02	23.13	21.21	19.54	33
	661	1880.0	24.83	23.86	21.80	20.25	33
	810	1909.8	24.68	23.69	21.60	19.93	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	HSDPA	RMC12.2k	22.18	22.16	22.08
			1	21.75	21.16	20.81
			2	21.62	21.04	20.77
			3	21.88	21.29	20.87
			4	21.71	21.03	20.68
		HSUPA	1	21.45	20.83	20.64
			2	21.32	20.72	20.53
			3	21.51	20.95	20.73
			4	21.36	20.74	20.57
			5	21.52	20.94	20.77
		HSPA+	1	20.73	21.01	20.99

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

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.45	13
	Middle	0.36	13
	High	0.48	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.45	13
	Middle	0.36	13
	High	0.48	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.58	13
	Middle	3.33	13
	High	3.52	13
HSDPA (16QAM)	Low	3.51	13
	Middle	3.39	13
	High	3.54	13
HSUPA (BPSK)	Low	3.52	13
	Middle	3.39	13
	High	3.57	13
HSPA+	Low	3.36	13
	Middle	3.31	13
	High	3.55	13

**PCS Band**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.45	13
	Middle	0.31	13
	High	0.49	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.59	13
	Middle	2.42	13
	High	2.57	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.56	13
	Middle	3.32	13
	High	3.48	13
HSDPA (16QAM)	Low	3.57	13
	Middle	3.34	13
	High	3.42	13
HSUPA (BPSK)	Low	3.59	13
	Middle	3.35	13
	High	3.45	13
HSPA+	Low	3.77	13
	Middle	3.53	13
	High	3.24	13

**Radiated Power****GSM Mode:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	79.75	189	1.0	H	18.8	0.7	0.0	18.10	38.45	20.35
836.6	90.27	87	1.0	V	29.3	0.7	0.0	28.60	38.45	9.85
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	90.68	228	2.2	H	20.6	1.30	8.50	27.80	33	5.20
1880.00	89.98	301	1.3	V	19.7	1.30	8.50	26.90	33	6.10

**EDGE Mode:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	79.25	189	1.0	H	18.3	0.7	0.0	17.60	38.45	20.85
836.6	85.37	87	1.0	V	24.4	0.7	0.0	23.70	38.45	14.75
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	86.38	228	2.2	H	16.3	1.30	8.50	23.50	33	9.50
1880.00	84.58	301	1.3	V	14.3	1.30	8.50	21.50	33	11.50

**WCDMA Mode:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	73.78	32	2.3	H	12.8	0.7	0.0	12.10	38.45	26.35
836.6	80.94	310	1.7	V	19.9	0.7	0.0	19.20	38.45	19.25
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	85.55	265	1.7	H	15.5	1.30	8.50	22.70	33	10.30
1880.00	84.23	78	1.6	V	14.0	1.30	8.50	21.20	33	11.80

**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	23.18	23.37	22.24
		RB Size=1, RB Offset=2	23.11	23.32	22.20
		RB Size=1, RB Offset=5	23.30	23.48	22.31
		RB Size=3, RB Offset=0	22.93	23.1	22.82
		RB Size=3, RB Offset=1	22.90	22.99	22.72
		RB Size=3, RB Offset=2	23.05	23.20	22.95
		RB Size=6, RB Offset=0	22.54	22.87	22.42
	16QAM	RB Size=1, RB Offset=0	22.91	23.09	22.84
		RB Size=1, RB Offset=2	22.86	22.96	22.73
		RB Size=1, RB Offset=5	22.98	23.15	22.96
		RB Size=3, RB Offset=0	22.73	22.93	22.79
		RB Size=3, RB Offset=1	22.63	22.85	22.70
		RB Size=3, RB Offset=2	22.82	23.05	22.86
		RB Size=6, RB Offset=0	22.47	22.81	22.54
3.0	QPSK	RB Size=1, RB Offset=0	22.95	23.13	22.87
		RB Size=1, RB Offset=7	22.86	23.08	22.79
		RB Size=1, RB Offset=14	23.07	23.23	22.92
		RB Size=8, RB Offset=0	22.62	22.86	22.72
		RB Size=8, RB Offset=4	22.56	22.76	22.60
		RB Size=8, RB Offset=7	22.68	22.90	22.77
		RB Size=15, RB Offset=0	22.31	22.63	22.41
	16QAM	RB Size=1, RB Offset=0	22.97	23.2	22.92
		RB Size=1, RB Offset=7	22.89	23.13	22.84
		RB Size=1, RB Offset=14	23.05	23.31	23.00
		RB Size=8, RB Offset=0	22.78	23.04	22.82
		RB Size=8, RB Offset=4	22.73	22.95	22.79
		RB Size=8, RB Offset=7	22.87	23.12	22.94
		RB Size=15, RB Offset=0	22.45	22.83	22.56

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
5.0	QPSK	RB Size=1, RB Offset=0	22.42	22.61	22.48
		RB Size=1, RB Offset=12	22.34	22.51	22.42
		RB Size=1, RB Offset=24	22.48	22.72	22.57
		RB Size=12, RB Offset=0	22.43	22.53	22.49
		RB Size=12, RB Offset=6	22.40	22.42	22.37
		RB Size=12, RB Offset=11	22.46	22.56	22.56
		RB Size=25, RB Offset=0	22.26	22.45	22.37
	16QAM	RB Size=1, RB Offset=0	22.46	22.57	22.44
		RB Size=1, RB Offset=12	22.41	22.46	22.38
		RB Size=1, RB Offset=24	22.50	22.69	22.55
		RB Size=12, RB Offset=0	22.32	22.49	22.36
		RB Size=12, RB Offset=6	22.23	22.44	22.31
		RB Size=12, RB Offset=11	22.37	22.57	22.46
		RB Size=25, RB Offset=0	22.15	22.38	22.26
10.0	QPSK	RB Size=1, RB Offset=0	22.26	22.38	22.21
		RB Size=1, RB Offset=24	22.17	22.33	22.16
		RB Size=1, RB Offset=49	22.38	22.46	22.30
		RB Size=25, RB Offset=0	22.21	22.26	22.15
		RB Size=25, RB Offset=12	22.34	22.48	22.26
		RB Size=25, RB Offset=24	22.29	22.44	22.25
		RB Size=50, RB Offset=0	22.27	22.53	22.39
	16QAM	RB Size=1, RB Offset=0	22.26	22.38	22.21
		RB Size=1, RB Offset=24	22.17	22.25	22.16
		RB Size=1, RB Offset=49	22.37	22.47	22.26
		RB Size=25, RB Offset=0	22.18	22.29	22.09
		RB Size=25, RB Offset=12	22.32	22.48	22.30
		RB Size=25, RB Offset=24	22.27	22.37	22.26
		RB Size=50, RB Offset=0	22.41	22.56	22.37

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
15.0	QPSK	RB Size=1, RB Offset=0	21.86	22.02	21.87
		RB Size=1, RB Offset=37	21.73	21.93	21.75
		RB Size=1, RB Offset=74	21.94	22.12	22.00
		RB Size=36, RB Offset=0	22.26	22.38	22.21
		RB Size=36, RB Offset=18	22.15	22.33	22.08
		RB Size=36, RB Offset=37	22.38	22.45	22.32
		RB Size=75, RB Offset=0	22.12	22.42	22.27
	16QAM	RB Size=1, RB Offset=0	21.81	22.04	21.82
		RB Size=1, RB Offset=37	21.71	22.01	21.70
		RB Size=1, RB Offset=74	21.84	22.14	21.85
		RB Size=36, RB Offset=0	22.01	22.21	22.06
		RB Size=36, RB Offset=18	21.95	22.12	21.94
		RB Size=36, RB Offset=37	22.06	22.34	22.17
		RB Size=75, RB Offset=0	22.17	22.35	22.29
20.0	QPSK	RB Size=1, RB Offset=0	22.52	22.73	22.48
		RB Size=1, RB Offset=49	22.47	22.69	22.38
		RB Size=1, RB Offset=99	22.65	22.79	22.53
		RB Size=50, RB Offset=0	21.75	22.03	21.79
		RB Size=50, RB Offset=24	21.65	21.96	21.71
		RB Size=50, RB Offset=49	21.84	22.08	21.88
		RB Size=100, RB Offset=0	22.47	22.64	22.38
	16QAM	RB Size=1, RB Offset=0	22.58	22.72	22.43
		RB Size=1, RB Offset=49	22.50	22.65	22.35
		RB Size=1, RB Offset=99	22.66	22.81	22.48
		RB Size=50, RB Offset=0	22.50	22.60	22.32
		RB Size=50, RB Offset=24	22.71	22.81	22.53
		RB Size=50, RB Offset=49	22.55	22.67	22.50
		RB Size=100, RB Offset=0	22.25	22.64	22.35

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

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.61	13	Pass
QPSK (100RB Size)	5.64	13	Pass
16QAM (1RB Size)	5.00	13	Pass
16QAM (100%RB Size)	5.43	13	Pass

**QPSK:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)				
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
Middle Channel													
1.4 MHz Bandwidth													
1880.00	88.12	76	1.0	H	18.1	1.30	8.50	25.30	33				
1880.00	88.94	297	1.9	V	18.7	1.30	8.50	25.90	33				
3 MHz Bandwidth													
1880.00	88.34	338	2.3	H	18.3	1.30	8.50	25.50	33				
1880.00	88.62	140	1.0	V	18.4	1.30	8.50	25.60	33				
5 MHz Bandwidth													
1880.00	88.46	189	1.6	H	18.4	1.30	8.50	25.60	33				
1880.00	88.79	204	1.2	V	18.5	1.30	8.50	25.70	33				
10 MHz Bandwidth													
1880.00	87.93	25	1.6	H	17.9	1.30	8.50	25.10	33				
1880.00	88.64	207	1.5	V	18.4	1.30	8.50	25.60	33				
15 MHz Bandwidth													
1880.00	88.70	221	1.2	H	18.7	1.30	8.50	25.90	33				
1880.00	88.86	175	2.0	V	18.6	1.30	8.50	25.80	33				
20 MHz Bandwidth													
1880.00	88.46	31	2.1	H	18.4	1.30	8.50	25.60	33				
1880.00	88.33	245	1.3	V	18.1	1.30	8.50	25.30	33				

**16QAM:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)				
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
Middle Channel													
1.4 MHz Bandwidth													
1880.00	89.11	17	1.7	H	19.1	1.30	8.50	26.30	33				
1880.00	88.69	340	1.7	V	18.4	1.30	8.50	25.60	33				
3 MHz Bandwidth													
1880.00	89.81	12	1.3	H	19.8	1.30	8.50	27.00	33				
1880.00	89.61	237	1.9	V	19.3	1.30	8.50	26.50	33				
5 MHz Bandwidth													
1880.00	87.64	158	1.5	H	17.6	1.30	8.50	24.80	33				
1880.00	88.21	328	1.7	V	17.9	1.30	8.50	25.10	33				
10 MHz Bandwidth													
1880.00	87.83	325	1.9	H	17.8	1.30	8.50	25.00	33				
1880.00	88.80	83	1.6	V	18.5	1.30	8.50	25.70	33				
15 MHz Bandwidth													
1880.00	89.00	51	2.0	H	18.9	1.30	8.50	26.10	33				
1880.00	87.79	14	2.3	V	17.5	1.30	8.50	24.70	33				
20 MHz Bandwidth													
1880.00	88.27	200	1.0	H	18.2	1.30	8.50	25.40	33				
1880.00	88.13	151	1.2	V	17.9	1.30	8.50	25.10	33				

**LTE Band 4:****Maximum Output Power**

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
1.4	QPSK	RB Size=1, RB Offset=0	23.36	23.53	23.39
		RB Size=1, RB Offset=2	23.23	23.47	23.31
		RB Size=1, RB Offset=5	23.48	23.63	23.43
		RB Size=3, RB Offset=0	23.15	23.35	23.18
		RB Size=3, RB Offset=1	23.06	23.24	23.09
		RB Size=3, RB Offset=2	23.28	23.47	23.28
		RB Size=6, RB Offset=0	22.78	23.15	22.84
	16QAM	RB Size=1, RB Offset=0	23.38	23.56	23.35
		RB Size=1, RB Offset=2	23.27	23.51	23.22
		RB Size=1, RB Offset=5	23.51	23.64	23.39
		RB Size=3, RB Offset=0	23.12	23.39	23.13
		RB Size=3, RB Offset=1	22.99	23.32	23.04
		RB Size=3, RB Offset=2	23.23	23.50	23.17
		RB Size=6, RB Offset=0	22.89	23.16	22.79
3.0	QPSK	RB Size=1, RB Offset=0	23.62	23.8	23.54
		RB Size=1, RB Offset=7	23.53	23.75	23.46
		RB Size=1, RB Offset=14	23.68	23.89	23.59
		RB Size=8, RB Offset=0	23.42	23.62	23.49
		RB Size=8, RB Offset=4	23.39	23.55	23.36
		RB Size=8, RB Offset=7	23.53	23.72	23.57
		RB Size=15, RB Offset=0	23.15	23.44	23.17
	16QAM	RB Size=1, RB Offset=0	23.67	23.83	23.58
		RB Size=1, RB Offset=7	23.63	23.71	23.49
		RB Size=1, RB Offset=14	23.76	23.89	23.63
		RB Size=8, RB Offset=0	23.49	23.68	23.42
		RB Size=8, RB Offset=4	23.46	23.61	23.39
		RB Size=8, RB Offset=7	23.53	23.75	23.54
		RB Size=15, RB Offset=0	23.15	23.42	23.24

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
5.0	QPSK	RB Size=1, RB Offset=0	23.15	23.36	23.12
		RB Size=1, RB Offset=12	23.11	23.25	23.04
		RB Size=1, RB Offset=24	23.22	23.45	23.25
		RB Size=12, RB Offset=0	23.11	23.24	23.03
		RB Size=12, RB Offset=6	23.23	23.40	23.24
		RB Size=12, RB Offset=11	23.23	23.30	23.16
		RB Size=25, RB Offset=0	23.07	23.27	23.01
	16QAM	RB Size=1, RB Offset=0	23.26	23.44	23.24
		RB Size=1, RB Offset=12	23.16	23.40	23.18
		RB Size=1, RB Offset=24	23.31	23.54	23.30
		RB Size=12, RB Offset=0	23.15	23.36	23.19
		RB Size=12, RB Offset=6	23.30	23.52	23.36
		RB Size=12, RB Offset=11	23.23	23.47	23.25
		RB Size=25, RB Offset=0	23.06	23.27	23.09
10.0	QPSK	RB Size=1, RB Offset=0	22.92	23.1	22.94
		RB Size=1, RB Offset=24	22.84	23.02	22.84
		RB Size=1, RB Offset=49	23.02	23.14	22.98
		RB Size=25, RB Offset=0	22.84	23.04	22.83
		RB Size=25, RB Offset=12	23.01	23.15	22.99
		RB Size=25, RB Offset=24	22.97	23.07	22.93
		RB Size=50, RB Offset=0	23.15	23.32	23.19
	16QAM	RB Size=1, RB Offset=0	22.98	23.11	22.97
		RB Size=1, RB Offset=24	22.86	23.08	22.92
		RB Size=1, RB Offset=49	23.07	23.19	23.05
		RB Size=25, RB Offset=0	22.89	23.03	22.93
		RB Size=25, RB Offset=12	23.04	23.24	23.05
		RB Size=25, RB Offset=24	22.90	23.14	23.01
		RB Size=50, RB Offset=0	23.15	23.37	23.18

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
15.0	QPSK	RB Size=1, RB Offset=0	22.32	22.59	22.37
		RB Size=1, RB Offset=37	22.25	22.53	22.24
		RB Size=1, RB Offset=74	22.45	22.66	22.41
		RB Size=36, RB Offset=0	22.83	23.00	22.73
		RB Size=36, RB Offset=18	22.77	22.93	22.62
		RB Size=36, RB Offset=37	22.96	23.03	22.85
		RB Size=75, RB Offset=0	23.24	23.47	23.18
	16QAM	RB Size=1, RB Offset=0	22.39	22.57	22.34
		RB Size=1, RB Offset=37	22.35	22.49	22.27
		RB Size=1, RB Offset=74	22.51	22.69	22.45
		RB Size=36, RB Offset=0	22.26	22.45	22.28
		RB Size=36, RB Offset=18	22.50	22.68	22.46
		RB Size=36, RB Offset=37	22.42	22.58	22.32
		RB Size=75, RB Offset=0	22.74	22.92	22.63
20.0	QPSK	RB Size=1, RB Offset=0	22.46	22.7	22.42
		RB Size=1, RB Offset=49	22.37	22.61	22.29
		RB Size=1, RB Offset=99	22.55	22.78	22.54
		RB Size=50, RB Offset=0	22.36	22.59	22.38
		RB Size=50, RB Offset=24	22.55	22.74	22.47
		RB Size=50, RB Offset=49	22.44	22.74	22.39
		RB Size=100, RB Offset=0	22.65	22.90	22.72
	16QAM	RB Size=1, RB Offset=0	22.43	22.78	22.46
		RB Size=1, RB Offset=49	22.32	22.67	22.39
		RB Size=1, RB Offset=99	22.54	22.86	22.51
		RB Size=50, RB Offset=0	22.56	22.83	22.58
		RB Size=50, RB Offset=24	22.42	22.79	22.43
		RB Size=50, RB Offset=49	22.62	22.98	22.55
		RB Size=100, RB Offset=0	22.86	23.07	22.79

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

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.01	13	Pass
QPSK (100RB Size)	5.33	13	Pass
16QAM (1RB Size)	5.19	13	Pass
16QAM (100%RB Size)	5.42	13	Pass

**QPSK:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)				
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
Middle Channel													
1.4 MHz Bandwidth													
1732.50	90.17	40	2.4	H	17.0	1.30	9.10	24.80	30				
1732.50	88.92	158	1.4	V	16.4	1.30	9.10	24.20	30				
3 MHz Bandwidth													
1732.50	90.10	36	1.5	H	16.9	1.30	9.10	24.70	30				
1732.50	88.52	204	1.9	V	16.0	1.30	9.10	23.80	30				
5 MHz Bandwidth													
1732.50	90.91	85	1.6	H	17.7	1.30	9.10	25.50	30				
1732.50	88.92	79	2.4	V	16.4	1.30	9.10	24.20	30				
10 MHz Bandwidth													
1732.50	90.24	132	1.2	H	17.1	1.30	9.10	24.90	30				
1732.50	88.25	281	1.7	V	15.7	1.30	9.10	23.50	30				
15 MHz Bandwidth													
1732.50	90.15	87	2.2	H	17.0	1.30	9.10	24.80	30				
1732.50	88.79	339	2.3	V	16.2	1.30	9.10	24.00	30				
20 MHz Bandwidth													
1732.50	90.21	197	2.2	H	17.0	1.30	9.10	24.80	30				
1732.50	88.64	121	2.0	V	16.1	1.30	9.10	23.90	30				

**16QAM:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)				
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
Middle Channel													
1.4 MHz Bandwidth													
1732.50	89.37	266	1.5	H	16.2	1.30	9.10	24.00	30				
1732.50	89.32	353	2.1	V	16.8	1.30	9.10	24.60	30				
3 MHz Bandwidth													
1732.50	88.74	9	1.8	H	15.6	1.30	9.10	23.40	30				
1732.50	88.56	181	2.3	V	16.0	1.30	9.10	23.80	30				
5 MHz Bandwidth													
1732.50	89.43	126	1.7	H	16.3	1.30	9.10	24.10	30				
1732.50	88.51	288	1.8	V	15.9	1.30	9.10	23.70	30				
10 MHz Bandwidth													
1732.50	88.01	255	2.3	H	14.8	1.30	9.10	22.60	30				
1732.50	89.76	88	1.6	V	17.2	1.30	9.10	25.00	30				
15 MHz Bandwidth													
1732.50	88.84	140	1.7	H	15.7	1.30	9.10	23.50	30				
1732.50	88.76	140	2.4	V	16.2	1.30	9.10	24.00	30				
20 MHz Bandwidth													
1732.50	88.27	27	1.1	H	15.1	1.30	9.10	22.90	30				
1732.50	88.97	293	1.7	V	16.4	1.30	9.10	24.20	30				

**LTE Band 5:****Maximum Output Power**

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
1.4	QPSK	RB Size=1, RB Offset=0	22.94	23.18	22.96
		RB Size=1, RB Offset=2	22.89	23.10	22.87
		RB Size=1, RB Offset=5	23.01	23.24	23.08
		RB Size=3, RB Offset=0	22.82	23.14	22.90
		RB Size=3, RB Offset=1	23.05	23.21	23.02
		RB Size=3, RB Offset=2	22.92	23.21	22.93
		RB Size=6, RB Offset=0	22.41	22.64	22.36
	16QAM	RB Size=1, RB Offset=0	22.91	23.13	22.92
		RB Size=1, RB Offset=2	22.83	23.02	22.81
		RB Size=1, RB Offset=5	23.03	23.24	22.96
		RB Size=3, RB Offset=0	22.87	23.06	22.83
		RB Size=3, RB Offset=1	23.04	23.24	23.05
		RB Size=3, RB Offset=2	22.92	23.10	22.91
		RB Size=6, RB Offset=0	22.35	22.59	22.47
3.0	QPSK	RB Size=1, RB Offset=0	23.15	23.41	23.28
		RB Size=1, RB Offset=7	23.09	23.36	23.21
		RB Size=1, RB Offset=14	23.19	23.52	23.39
		RB Size=8, RB Offset=0	22.84	23.04	22.86
		RB Size=8, RB Offset=4	22.76	22.99	22.81
		RB Size=8, RB Offset=7	22.95	23.15	22.96
		RB Size=15, RB Offset=0	22.45	22.64	22.48
	16QAM	RB Size=1, RB Offset=0	23.17	23.45	23.23
		RB Size=1, RB Offset=7	23.05	23.36	23.15
		RB Size=1, RB Offset=14	23.23	23.53	23.34
		RB Size=8, RB Offset=0	22.89	23.08	22.82
		RB Size=8, RB Offset=4	22.84	23.01	22.76
		RB Size=8, RB Offset=7	23.02	23.20	22.86
		RB Size=15, RB Offset=0	22.26	22.54	22.34

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
5.0	QPSK	RB Size=1, RB Offset=0	23.03	23.27	23.07
		RB Size=1, RB Offset=12	22.96	23.23	23.03
		RB Size=1, RB Offset=24	23.12	23.39	23.13
		RB Size=12, RB Offset=0	22.62	22.86	22.52
		RB Size=12, RB Offset=6	22.50	22.74	22.47
		RB Size=12, RB Offset=11	22.72	22.98	22.58
		RB Size=25, RB Offset=0	22.47	22.68	22.42
	16QAM	RB Size=1, RB Offset=0	23.09	23.27	23.05
		RB Size=1, RB Offset=12	22.98	23.16	22.98
		RB Size=1, RB Offset=24	23.13	23.32	23.10
		RB Size=12, RB Offset=0	22.67	22.85	22.56
		RB Size=12, RB Offset=6	22.62	22.77	22.46
		RB Size=12, RB Offset=11	22.78	22.93	22.65
		RB Size=25, RB Offset=0	22.48	22.67	22.38
10.0	QPSK	RB Size=1, RB Offset=0	23.16	23.37	23.12
		RB Size=1, RB Offset=24	23.11	23.24	23.04
		RB Size=1, RB Offset=49	23.25	23.46	23.15
		RB Size=25, RB Offset=0	22.62	22.89	22.54
		RB Size=25, RB Offset=12	22.56	22.83	22.50
		RB Size=25, RB Offset=24	22.71	22.93	22.62
		RB Size=50, RB Offset=0	22.36	22.62	22.38
	16QAM	RB Size=1, RB Offset=0	23.12	23.4	23.15
		RB Size=1, RB Offset=24	23.00	23.30	23.09
		RB Size=1, RB Offset=49	23.21	23.46	23.27
		RB Size=25, RB Offset=0	22.65	22.94	22.72
		RB Size=25, RB Offset=12	22.54	22.87	22.66
		RB Size=25, RB Offset=24	22.77	23.02	22.82
		RB Size=50, RB Offset=0	22.48	22.69	22.42

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

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK(1RB Size)	5.43	13	Pass
QPSK(50RB Size)	6.88	13	Pass
16QAM (1RB Size)	5.35	13	Pass
16QAM (100%RB Size)	6.88	13	Pass

**QPSK:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)				
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
Middle Channel													
1.4 MHz Bandwidth													
836.6	75.24	201	1.8	H	14.2	0.7	0.0	13.60	38.45				
836.6	82.49	75	1.2	V	21.5	0.7	0.0	20.80	38.45				
3 MHz Bandwidth													
836.6	74.35	63	1.4	H	13.4	0.7	0.0	12.70	38.45				
836.6	83.58	314	2.0	V	22.6	0.7	0.0	21.90	38.45				
5 MHz Bandwidth													
836.6	75.09	308	1.3	H	14.1	0.7	0.0	13.40	38.45				
836.6	83.13	54	2.0	V	22.1	0.7	0.0	21.50	38.45				
10 MHz Bandwidth													
836.6	74.68	10	1.2	H	13.7	0.7	0.0	13.00	38.45				
836.6	83.95	32	1.9	V	23.0	0.7	0.0	22.30	38.45				

**16QAM:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)				
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
Middle Channel													
1.4 MHz Bandwidth													
836.6	75.19	194	1.4	H	14.2	0.7	0.0	13.50	38.45				
836.6	82.11	160	1.5	V	21.1	0.7	0.0	20.50	38.45				
3 MHz Bandwidth													
836.6	74.96	229	1.9	H	14.0	0.7	0.0	13.30	38.45				
836.6	83.59	168	1.4	V	22.6	0.7	0.0	21.90	38.45				
5 MHz Bandwidth													
836.6	75.01	340	1.6	H	14.0	0.7	0.0	13.40	38.45				
836.6	83.70	243	1.8	V	22.7	0.7	0.0	22.00	38.45				
10 MHz Bandwidth													
836.6	75.35	23	1.3	H	14.4	0.7	0.0	13.70	38.45				
836.6	84.17	287	1.1	V	23.2	0.7	0.0	22.50	38.45				

**LTE Band 7:**

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
5	QPSK	RB Size=1, RB Offset=0	21.13	21.35	21.06
		RB Size=1, RB Offset=12	21.03	21.28	20.96
		RB Size=1, RB Offset=24	21.22	21.42	21.13
		RB Size=12, RB Offset=0	21.01	21.30	20.99
		RB Size=12, RB Offset=6	21.20	21.46	21.14
		RB Size=12, RB Offset=11	21.08	21.38	21.05
		RB Size=25, RB Offset=0	20.46	20.89	20.52
	16QAM	RB Size=1, RB Offset=0	21.02	21.18	21.01
		RB Size=1, RB Offset=12	20.95	21.09	20.92
		RB Size=1, RB Offset=24	21.13	21.27	21.12
		RB Size=12, RB Offset=0	20.99	21.11	20.96
		RB Size=12, RB Offset=6	21.09	21.27	21.08
		RB Size=12, RB Offset=11	21.01	21.17	21.03
		RB Size=25, RB Offset=0	20.34	20.89	20.52
10	QPSK	RB Size=1, RB Offset=0	21.07	21.39	21.16
		RB Size=1, RB Offset=24	20.98	21.27	21.10
		RB Size=1, RB Offset=49	21.11	21.52	21.29
		RB Size=25, RB Offset=0	21.00	21.29	21.12
		RB Size=25, RB Offset=12	21.12	21.42	21.27
		RB Size=25, RB Offset=24	21.06	21.31	21.15
		RB Size=50, RB Offset=0	20.84	21.02	20.79
	16QAM	RB Size=1, RB Offset=0	21.17	21.46	21.14
		RB Size=1, RB Offset=24	21.14	21.33	21.02
		RB Size=1, RB Offset=49	21.28	21.57	21.22
		RB Size=25, RB Offset=0	21.08	21.35	21.03
		RB Size=25, RB Offset=12	21.21	21.55	21.18
		RB Size=25, RB Offset=24	21.18	21.43	21.08
		RB Size=50, RB Offset=0	20.79	21.13	20.83

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
15	QPSK	RB Size=1, RB Offset=0	20.72	20.89	20.68
		RB Size=1, RB Offset=37	20.59	20.76	20.56
		RB Size=1, RB Offset=74	20.84	20.95	20.80
		RB Size=36, RB Offset=0	20.61	20.76	20.58
		RB Size=36, RB Offset=18	20.81	20.94	20.76
		RB Size=36, RB Offset=37	20.67	20.82	20.67
		RB Size=75, RB Offset=0	20.75	21.01	20.76
	16QAM	RB Size=1, RB Offset=0	20.62	20.88	20.64
		RB Size=1, RB Offset=37	20.57	20.80	20.58
		RB Size=1, RB Offset=74	20.66	20.94	20.68
		RB Size=36, RB Offset=0	20.54	20.79	20.60
		RB Size=36, RB Offset=18	20.75	21.01	20.71
		RB Size=36, RB Offset=37	20.61	20.90	20.61
		RB Size=75, RB Offset=0	20.72	20.96	20.79
20	QPSK	RB Size=1, RB Offset=0	21.23	21.53	21.28
		RB Size=1, RB Offset=49	21.19	21.43	21.20
		RB Size=1, RB Offset=99	21.30	21.64	21.32
		RB Size=50, RB Offset=0	21.19	21.47	21.25
		RB Size=50, RB Offset=24	21.28	21.57	21.35
		RB Size=50, RB Offset=49	21.23	21.50	21.26
		RB Size=100, RB Offset=0	20.93	21.14	20.82
	16QAM	RB Size=1, RB Offset=0	21.24	21.46	21.27
		RB Size=1, RB Offset=49	21.13	21.36	21.20
		RB Size=1, RB Offset=99	21.29	21.52	21.33
		RB Size=50, RB Offset=0	21.12	21.38	21.21
		RB Size=50, RB Offset=24	21.28	21.52	21.35
		RB Size=50, RB Offset=49	21.20	21.48	21.26
		RB Size=100, RB Offset=0	20.92	21.02	20.89

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

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.03	13	Pass
QPSK (100RB Size)	3.98	13	Pass
16QAM (1RB Size)	3.81	13	Pass
16QAM (100%RB Size)	3.92	13	Pass

**EIRP:****QPSK:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)				
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
Middle Channel													
5 MHz Bandwidth													
2535.00	80.25	293	1.3	H	10.8	2.60	9.30	17.50	33				
2535.00	78.07	110	2.2	V	9.2	2.60	9.30	15.90	33				
10 MHz Bandwidth													
2535.00	80.34	179	1.6	H	10.9	2.60	9.30	17.60	33				
2535.00	78.94	228	2.3	V	10.1	2.60	9.30	16.80	33				
15 MHz Bandwidth													
2535.00	80.59	244	2.1	H	11.1	2.60	9.30	17.80	33				
2535.00	78.85	131	1.5	V	10.0	2.60	9.30	16.70	33				
20 MHz Bandwidth													
2535.00	80.45	156	1.0	H	11.0	2.60	9.30	17.70	33				
2535.00	78.98	17	2.1	V	10.1	2.60	9.30	16.80	33				

**16QAM:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)				
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
Middle Channel													
5 MHz Bandwidth													
2535.00	79.63	91	1.8	H	10.1	2.60	9.30	16.80	33				
2535.00	79.77	282	2.2	V	10.9	2.60	9.30	17.60	33				
10 MHz Bandwidth													
2535.00	79.59	165	1.8	H	10.1	2.60	9.30	16.80	33				
2535.00	79.93	4	1.1	V	11.1	2.60	9.30	17.80	33				
15 MHz Bandwidth													
2535.00	79.92	197	2.1	H	10.4	2.60	9.30	17.10	33				
2535.00	81.10	177	2.1	V	12.2	2.60	9.30	18.90	33				
20 MHz Bandwidth													
2535.00	79.59	178	1.3	H	10.1	2.60	9.30	16.80	33				
2535.00	80.62	337	1.2	V	11.7	2.60	9.30	18.40	33				

**Note:**

All above data were tested with no amplifier

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

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

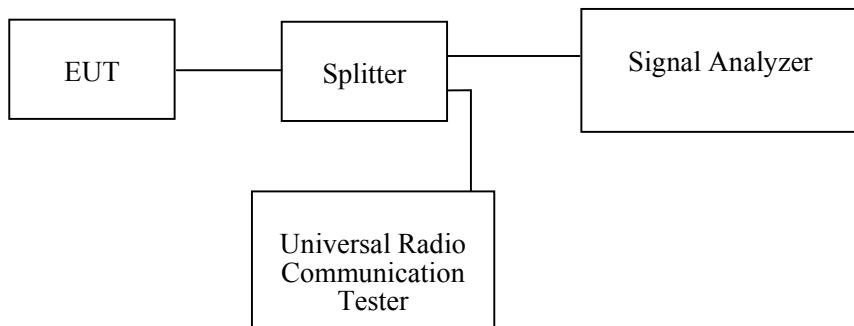
### Applicable Standard

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

### Test Procedure

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

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



### Test Data

#### Environmental Conditions

Temperature:	24~25 °C
Relative Humidity:	48~50 %
ATM Pressure:	100.0~101.0 kPa

*The testing was performed by Hill He from 2017-11-17 to 2017-11-20.*

*EUT operation mode: Transmitting*

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

#### Cellular Band (Part 22H)

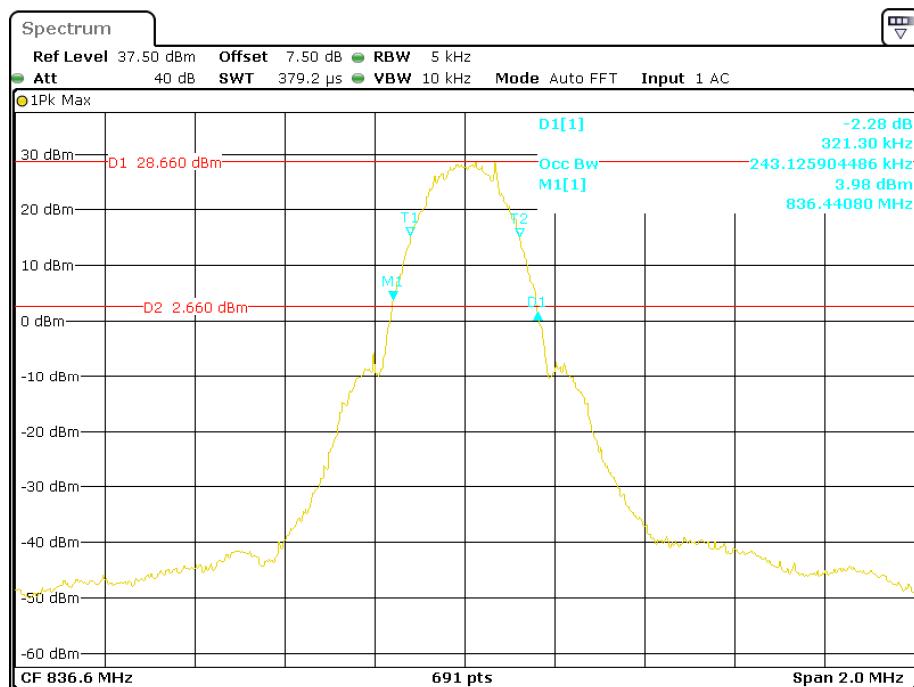
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	243.13	321.30
EGPRS(8PSK)	836.6	248.91	318.40

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.110	4.689
HSUPA (BPSK)	836.6	4.096	4.674
HSDPA (16QAM)	836.6	4.110	4.689

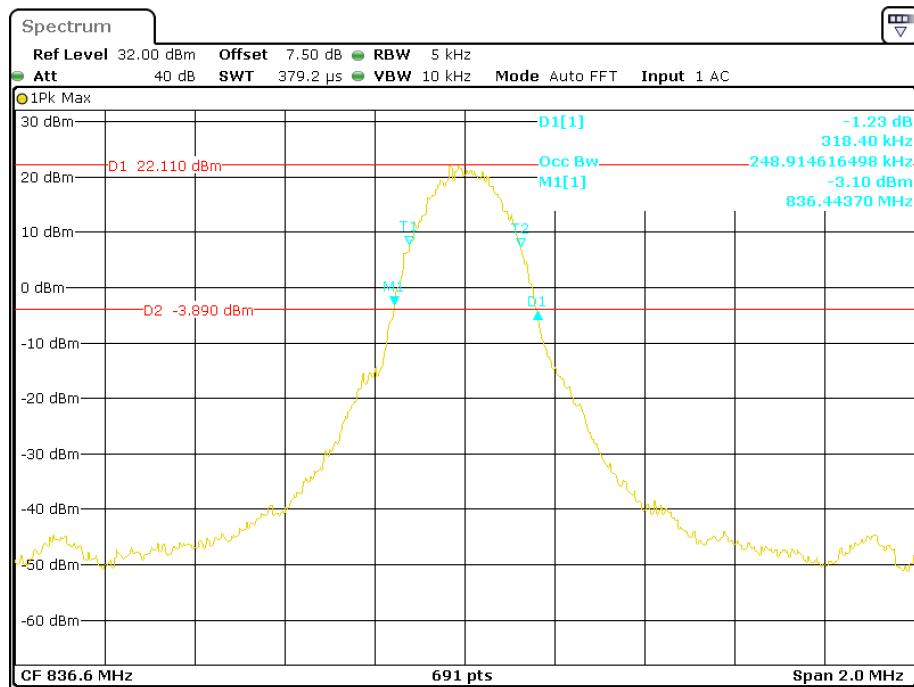
#### PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	246.02	321.30
EGPRS(8PSK)	1880.0	246.02	315.50

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.096	4.674
HSUPA (BPSK)	1880.0	4.096	4.689
HSDPA (16QAM)	1880.0	4.096	4.689

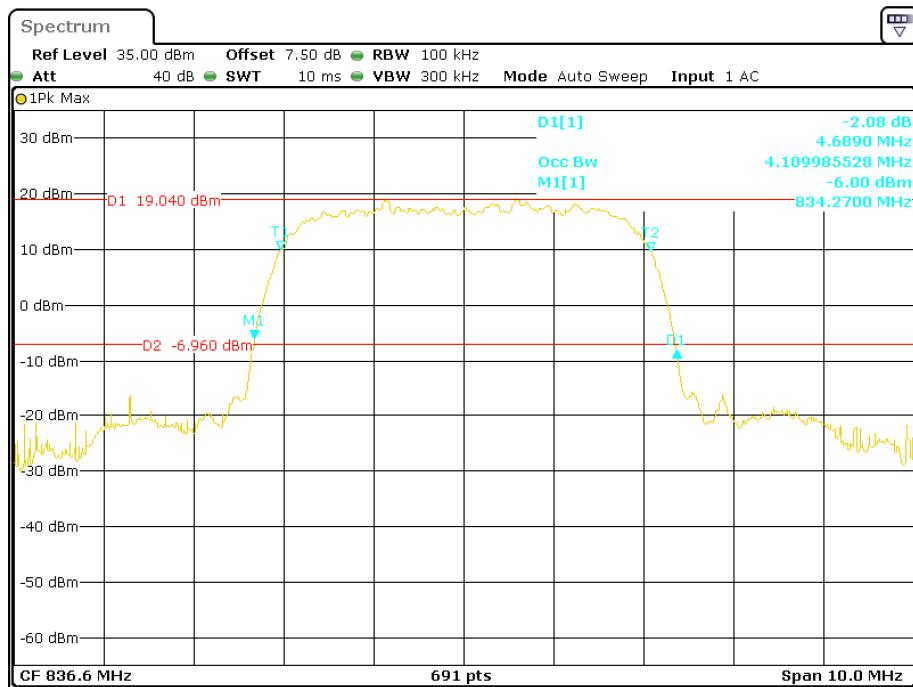
**Cellular Band (Part 22H)****26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode**

Date: 20.NOV.2017 08:58:48

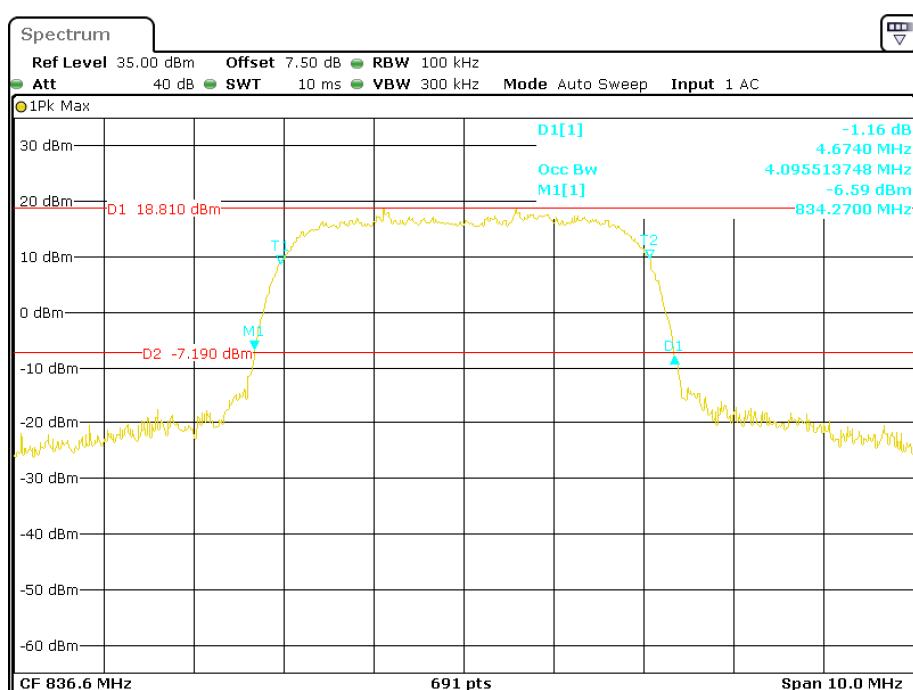
**26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode**

Date: 20.NOV.2017 09:12:06

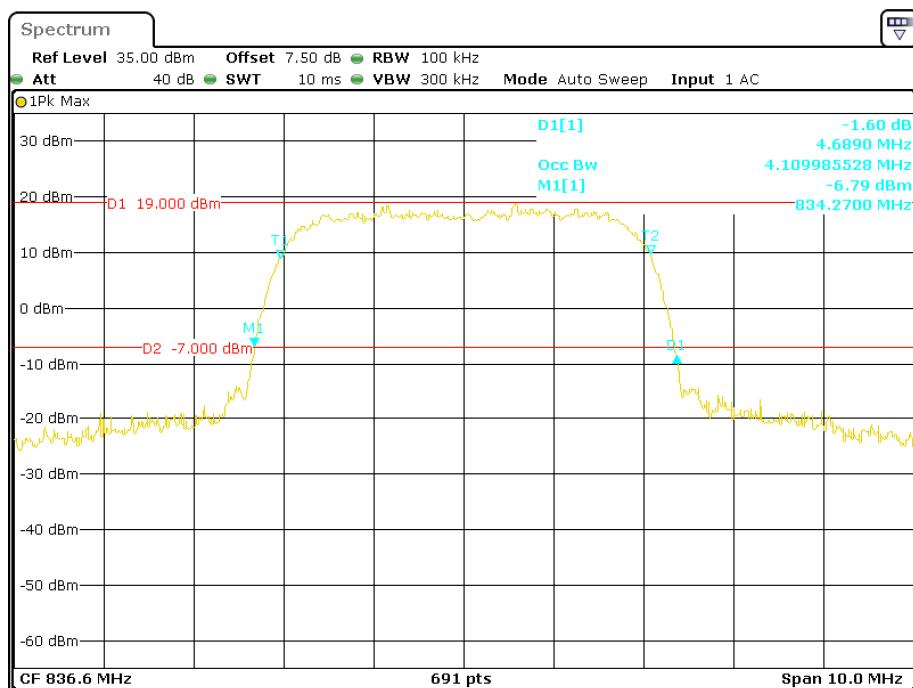
### 26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode



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



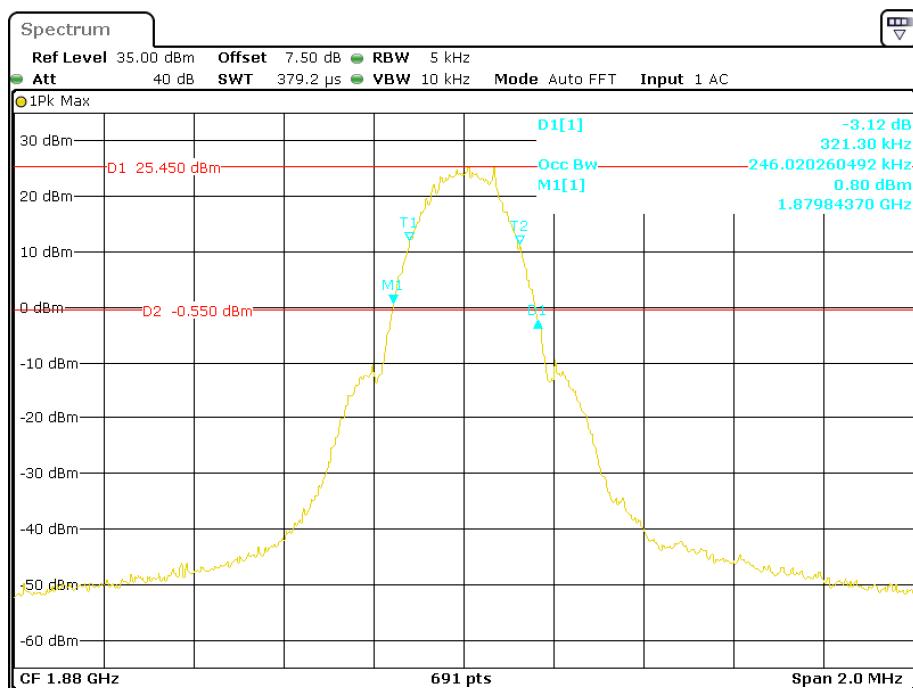
### 26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode



Date: 20.NOV.2017 10:19:14

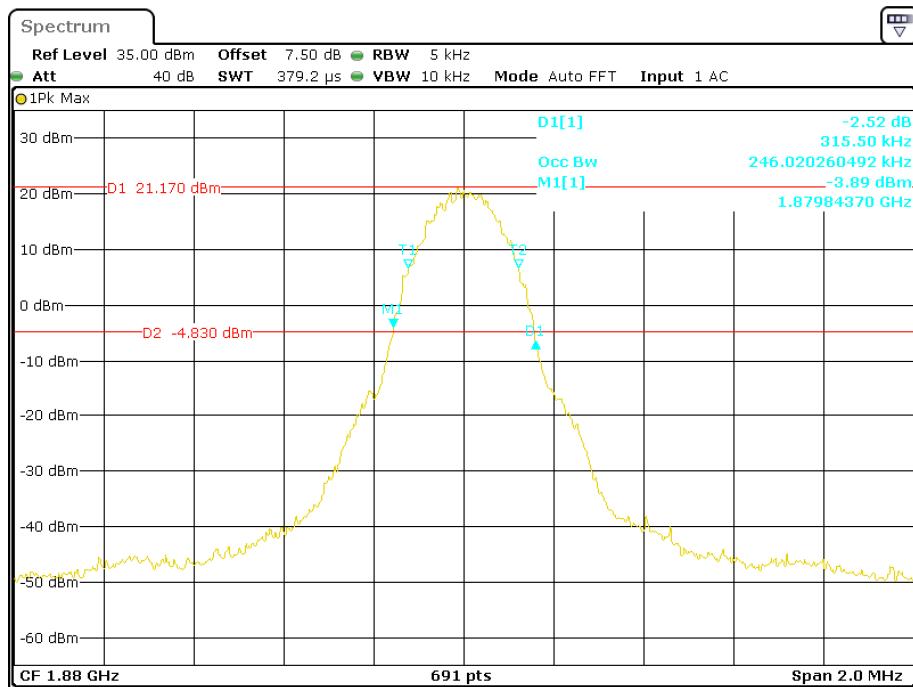
### PCS Band (Part 24E)

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



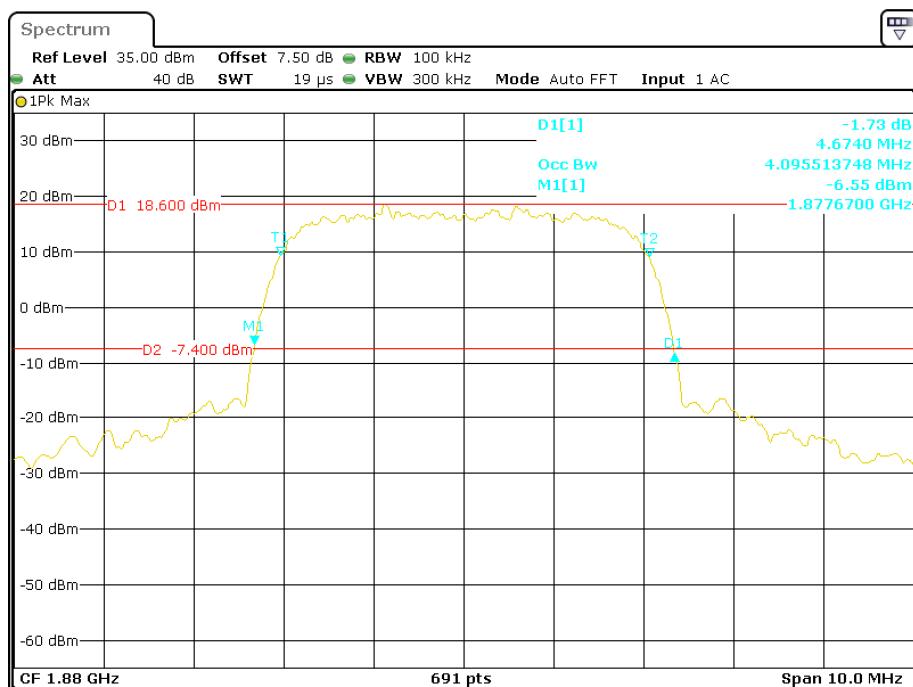
Date: 20.NOV.2017 09:29:32

## 26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



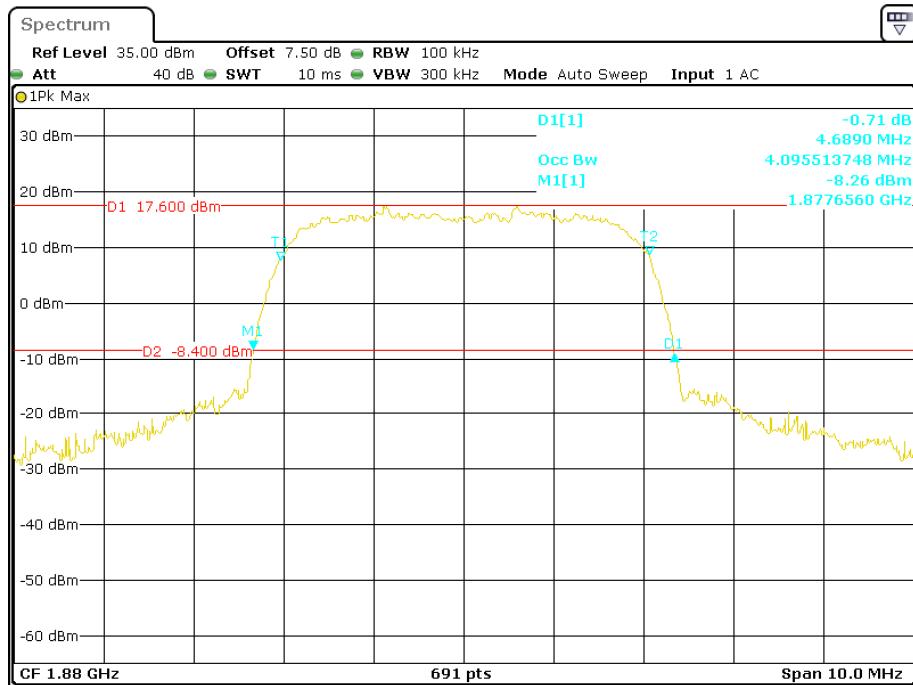
Date: 20.NOV.2017 09:38:34

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



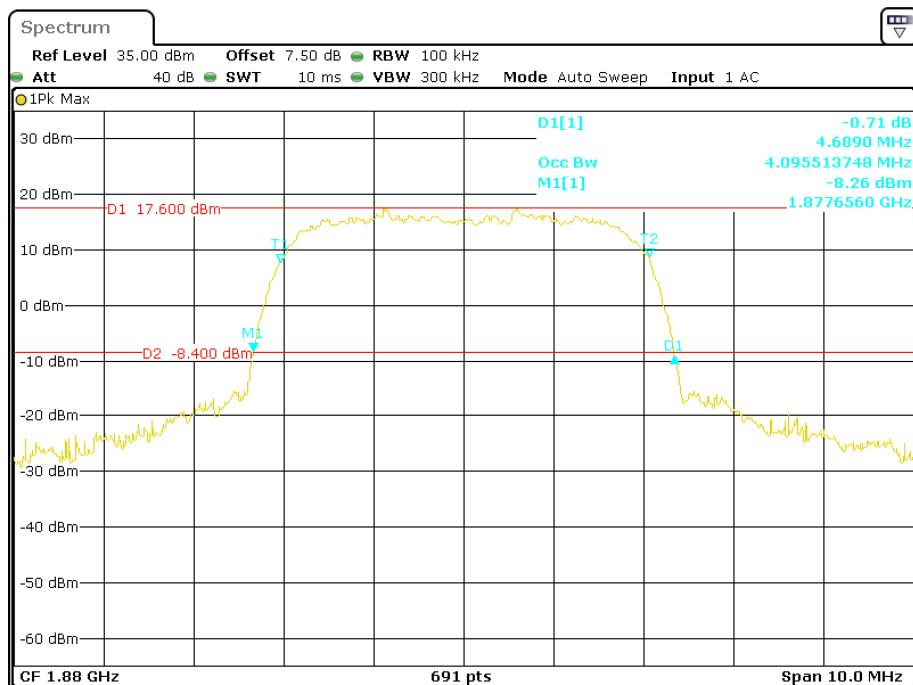
Date: 20.NOV.2017 09:48:05

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



Date: 20.NOV.2017 10:10:22

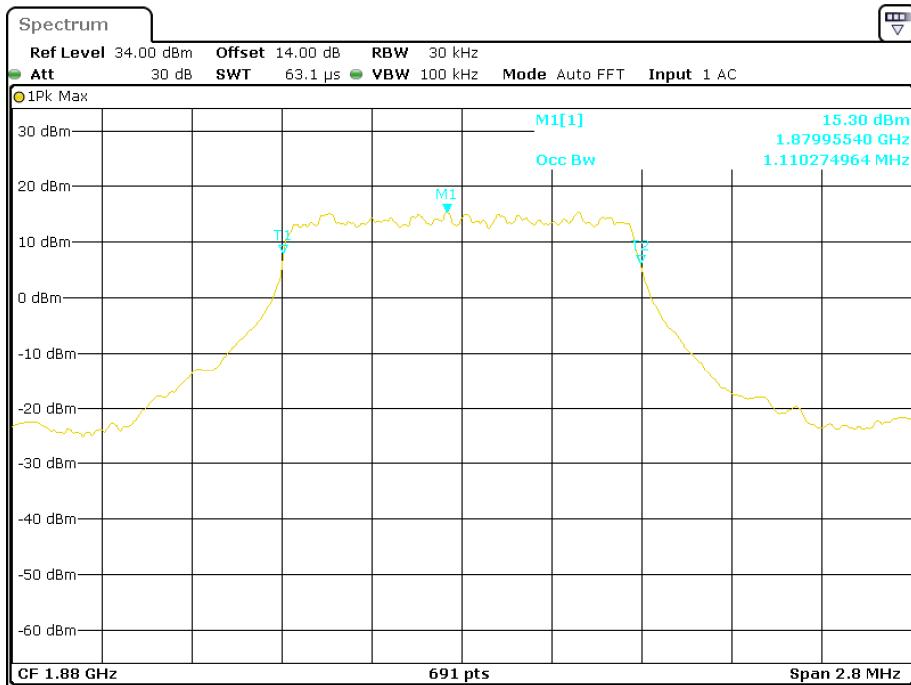
### 26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode



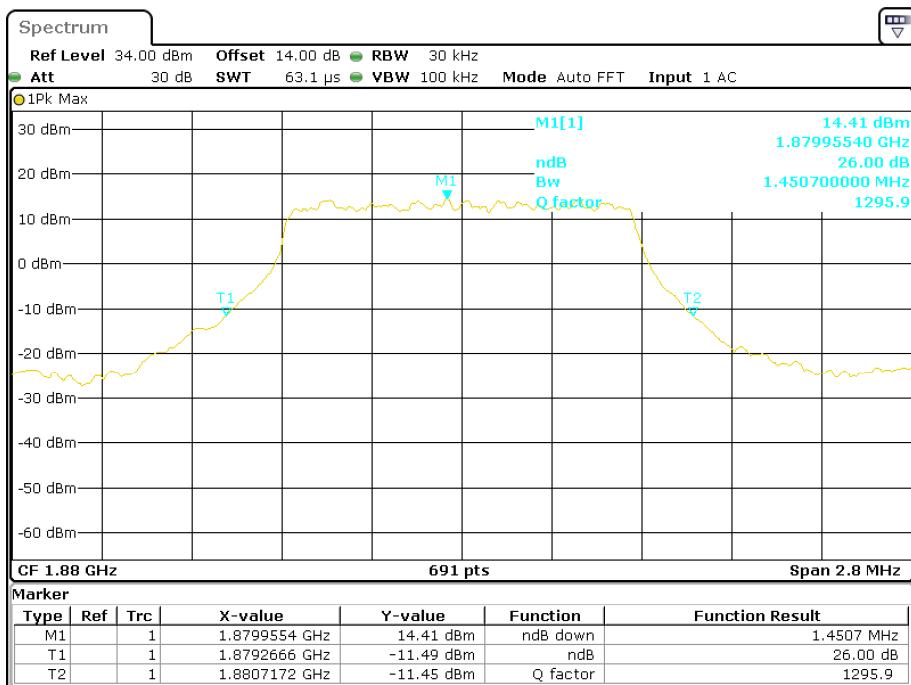
Date: 20.NOV.2017 10:10:22

**LTE Band 2: (Middle Channel)**

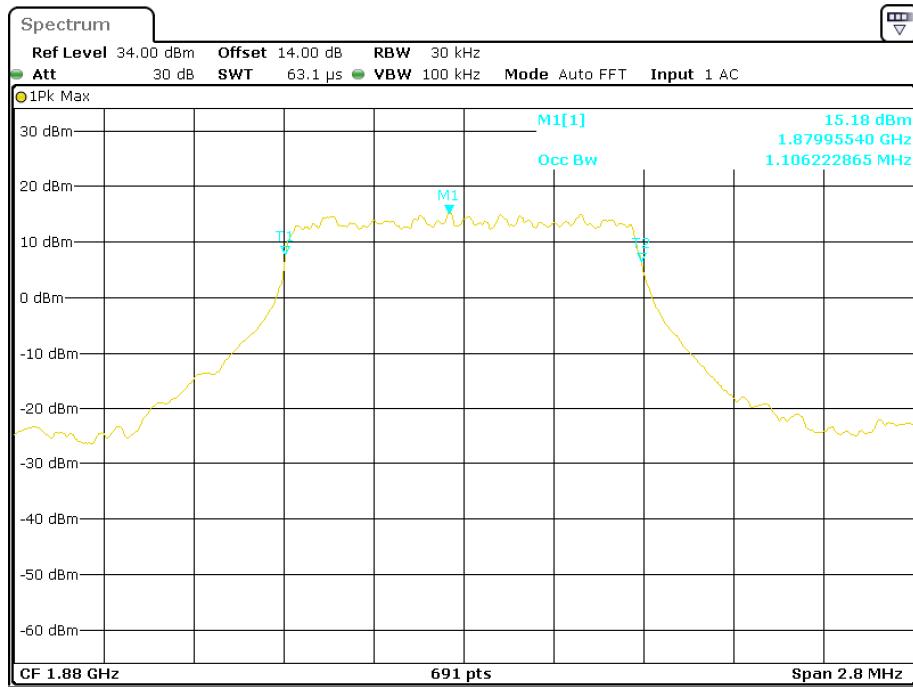
<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>26 dB Emission Bandwidth (MHz)</b>
1.4	QPSK	1.110	1.451
	16QAM	1.106	1.455
3.0	QPSK	2.683	3.013
	16QAM	2.683	3.004
5.0	QPSK	4.559	5.398
	16QAM	4.544	5.398
10.0	QPSK	8.973	9.812
	16QAM	8.973	9.841
15.0	QPSK	13.546	15.152
	16QAM	13.502	15.326
20.0	QPSK	18.003	19.913
	16QAM	18.003	20.318

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

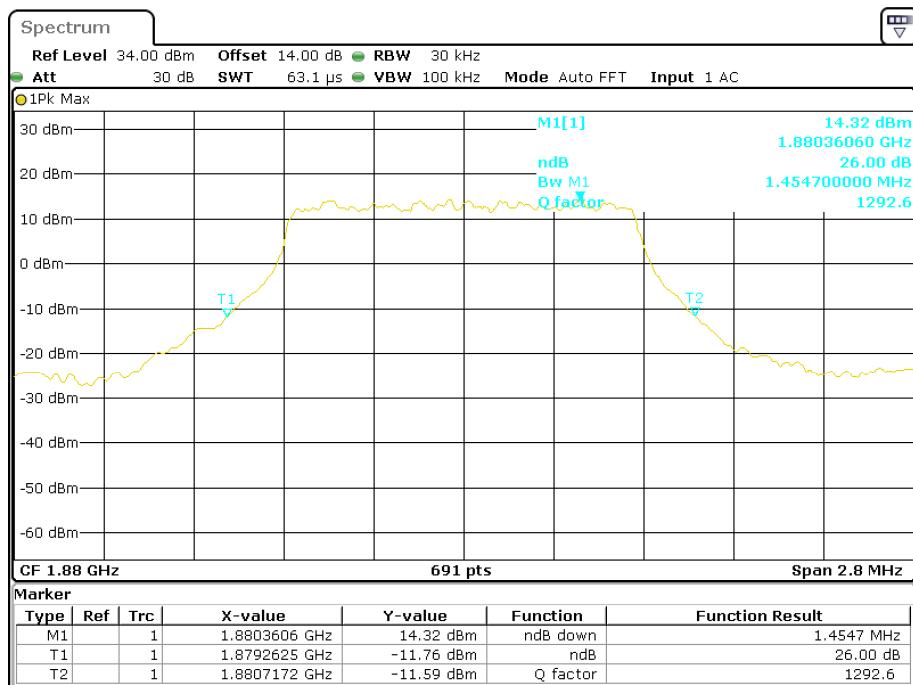
Date: 17.NOV.2017 13:40:38

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

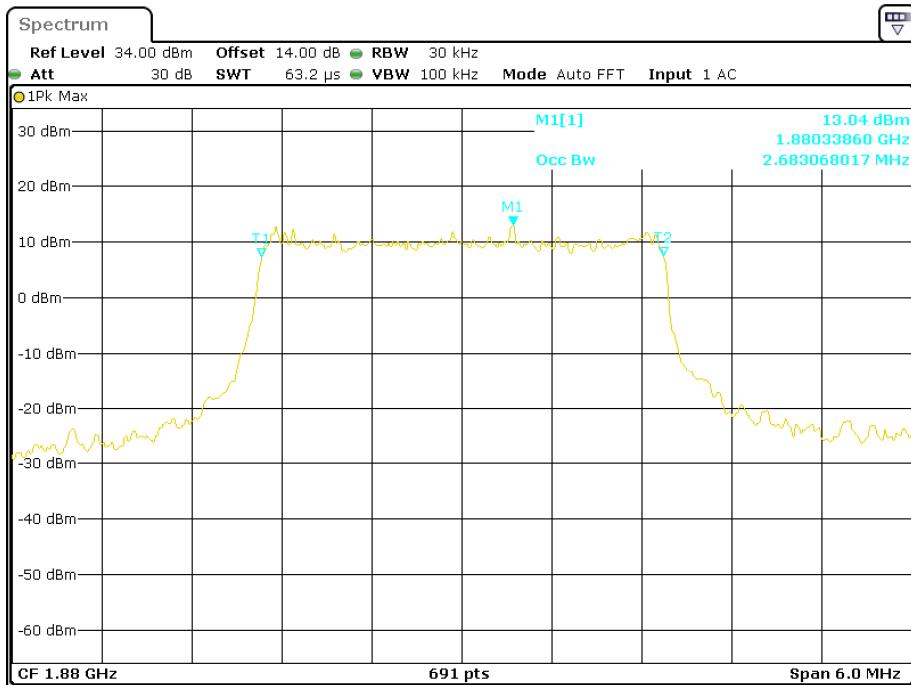
Date: 17.NOV.2017 14:34:04

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

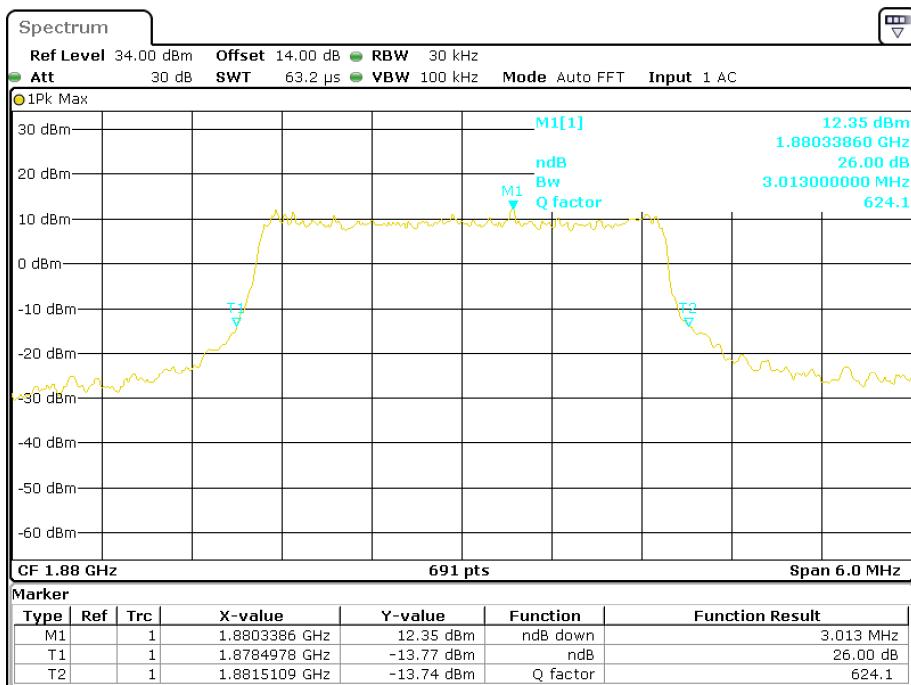
Date: 17.NOV.2017 13:41:40

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

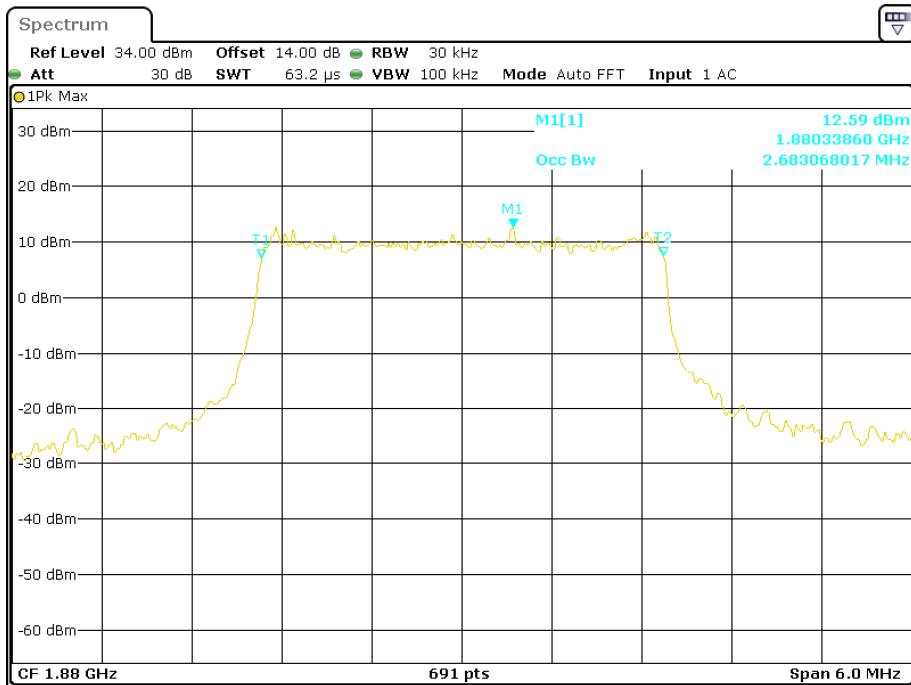
Date: 17.NOV.2017 14:34:57

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

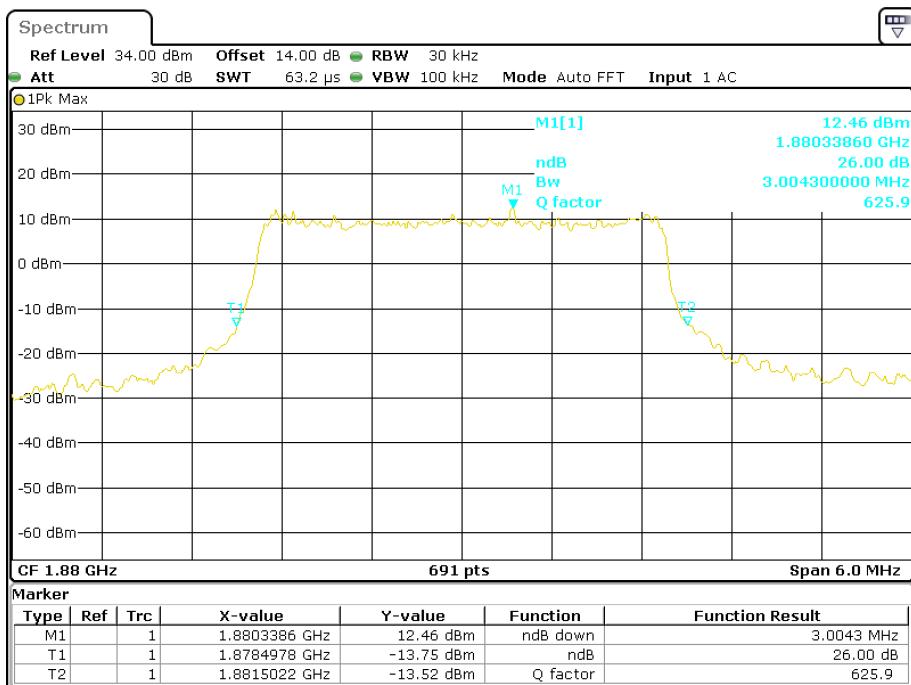
Date: 17.NOV.2017 13:44:38

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

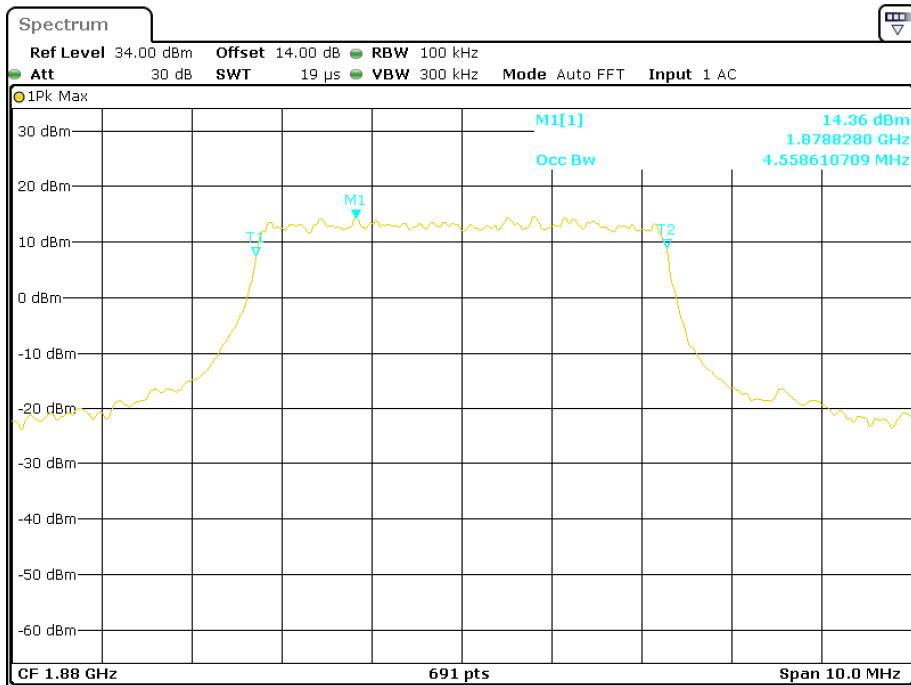
Date: 17.NOV.2017 14:39:03

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

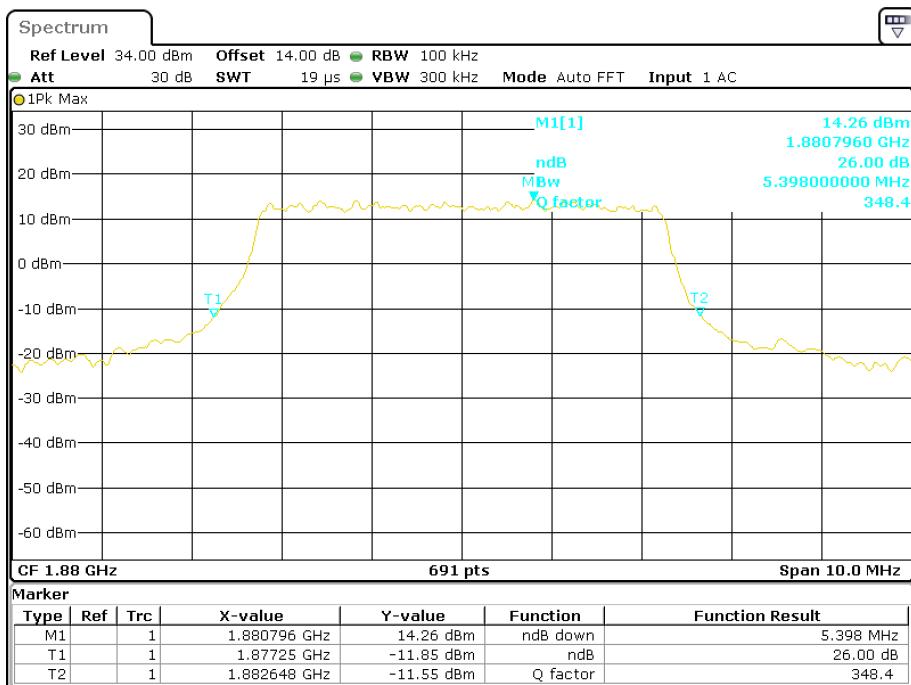
Date: 17.NOV.2017 13:45:02

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

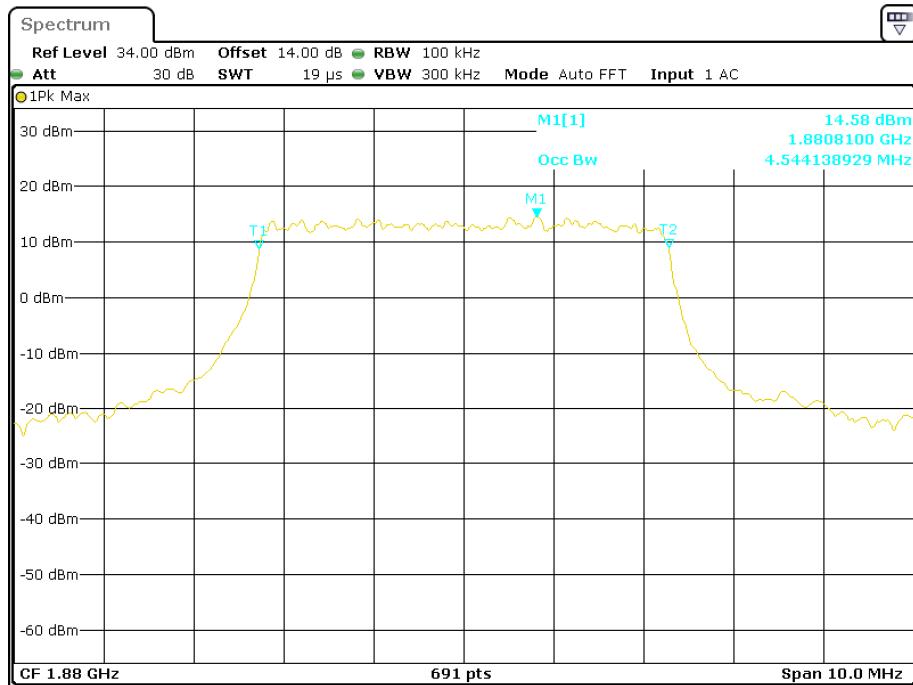
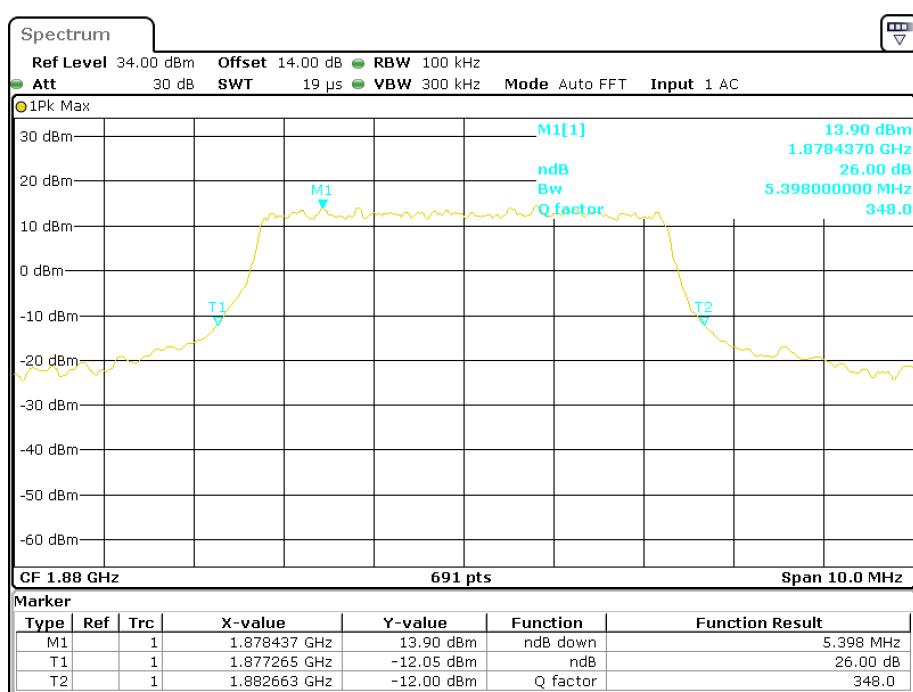
Date: 17.NOV.2017 14:37:50

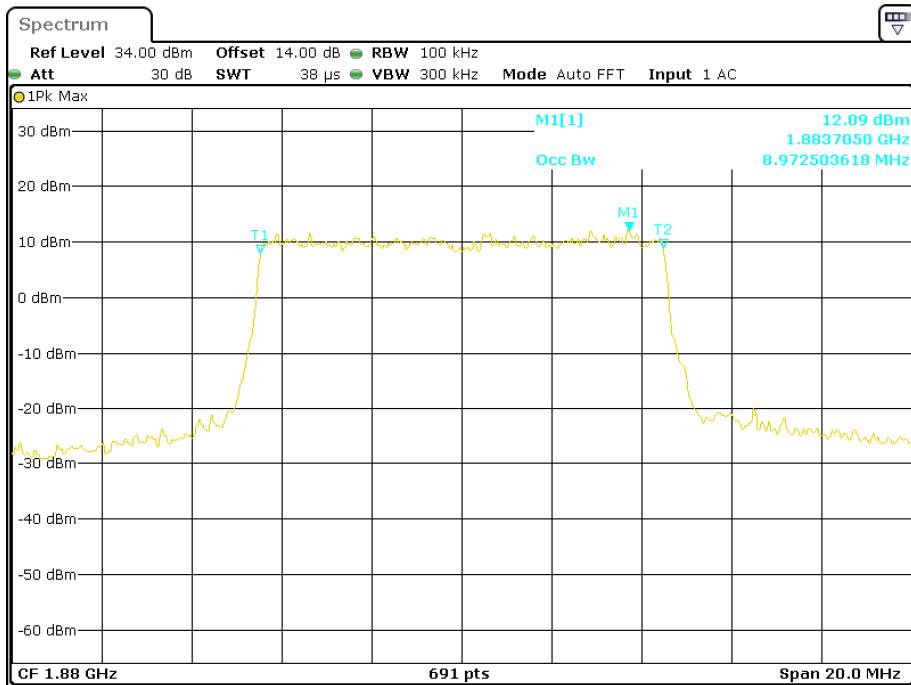
**QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel**

Date: 17.NOV.2017 13:46:17

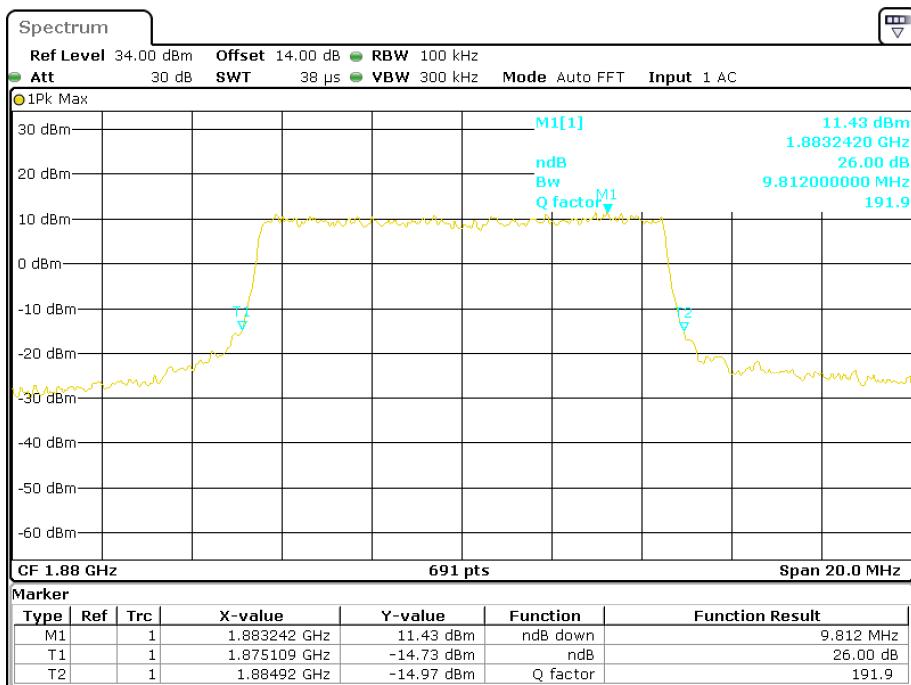
**QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel**

Date: 17.NOV.2017 14:43:17

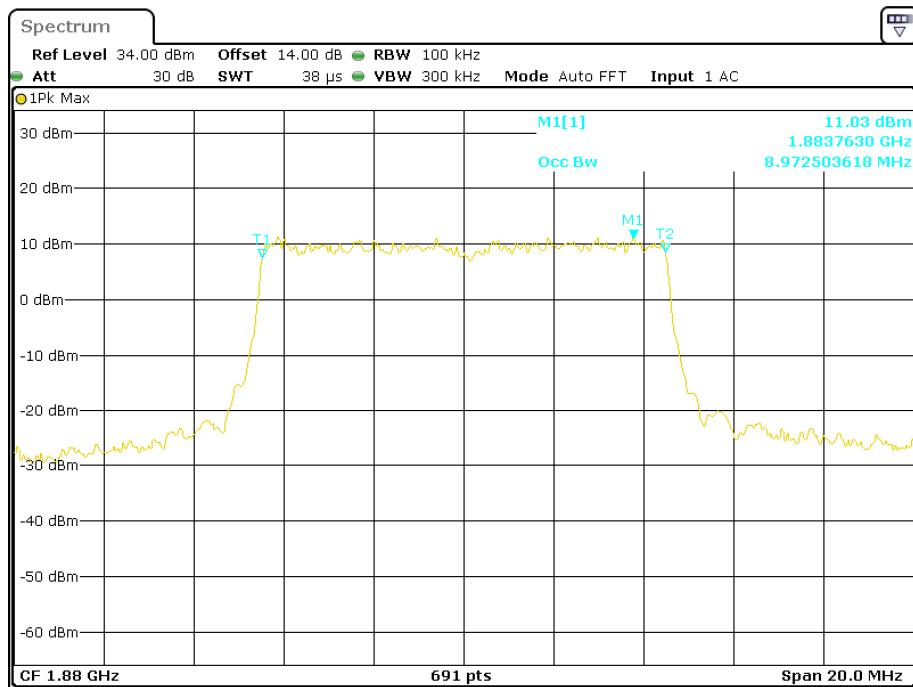
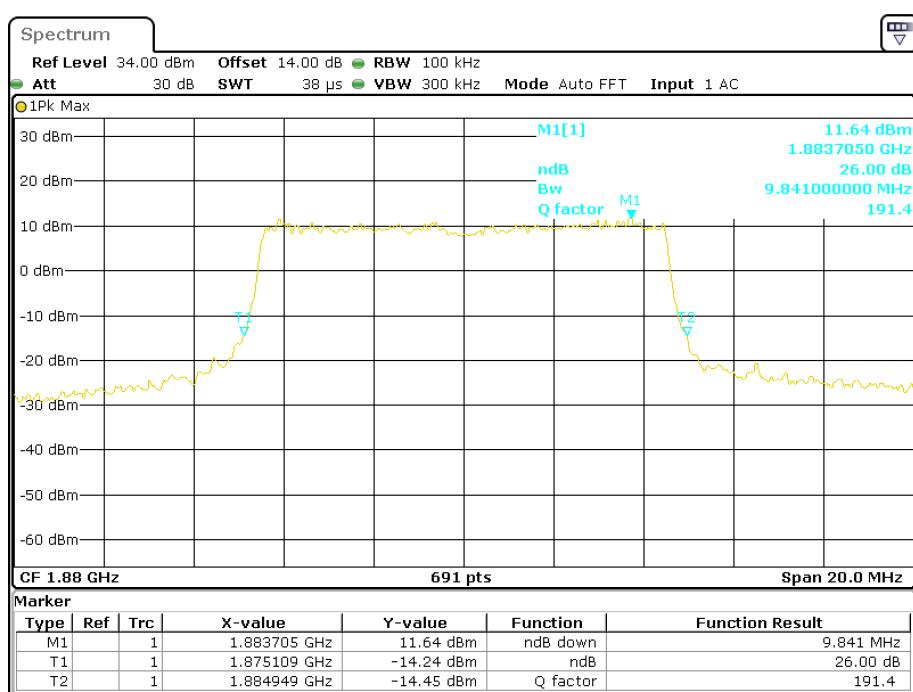
**16-QAM (5.0 MHz) - 99% Occupied Bandwidth, Middle channel****16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel**

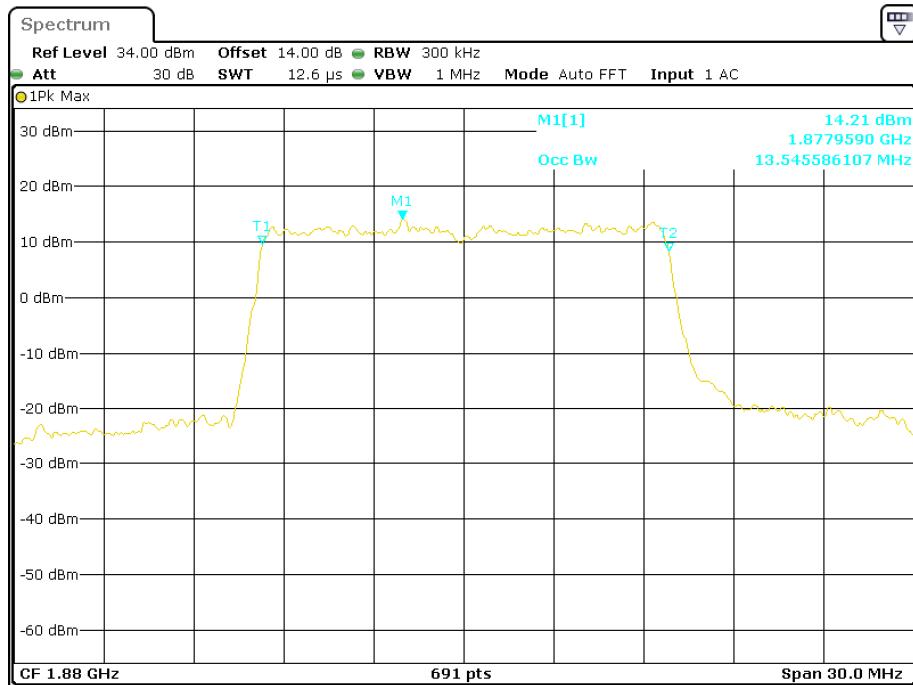
**QPSK (10.0 MHz) - 99% Occupied Bandwidth, Middle channel**

Date: 17.NOV.2017 13:46:56

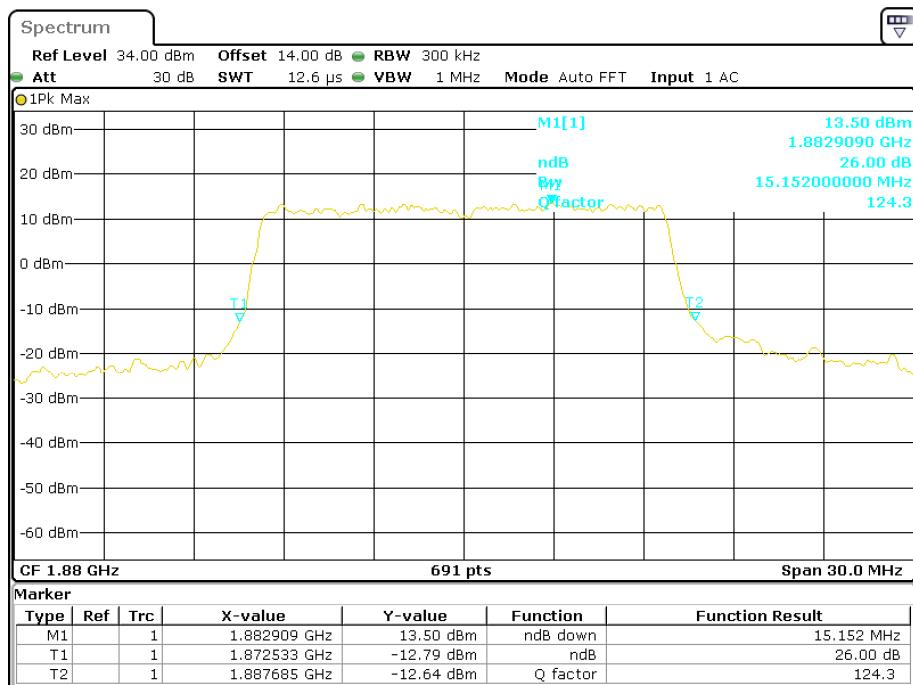
**QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel**

Date: 17.NOV.2017 14:44:48

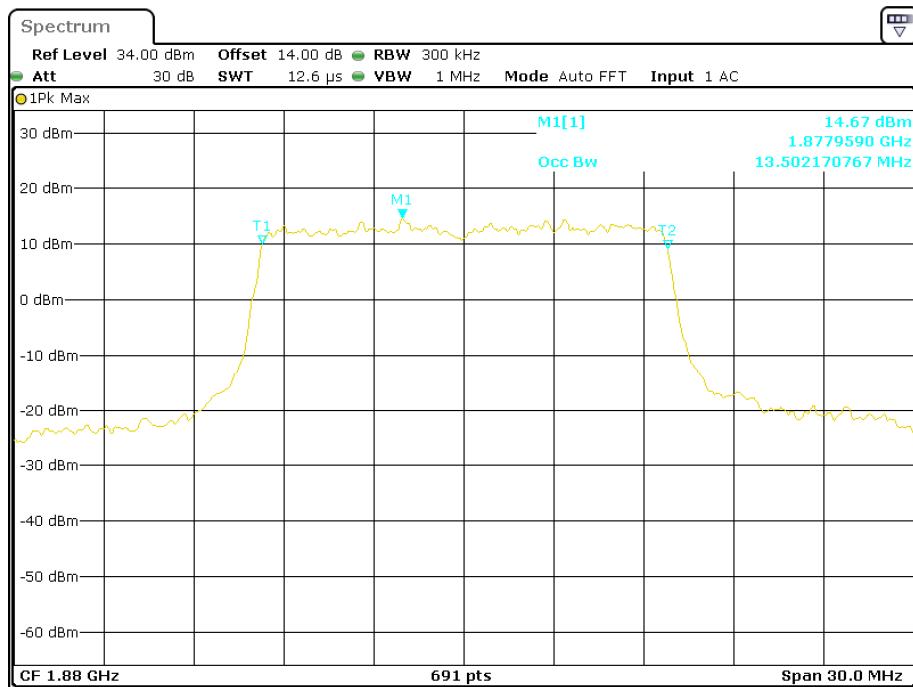
**16-QAM (10.0 MHz) - 99% Occupied Bandwidth, Middle channel****16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel**

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

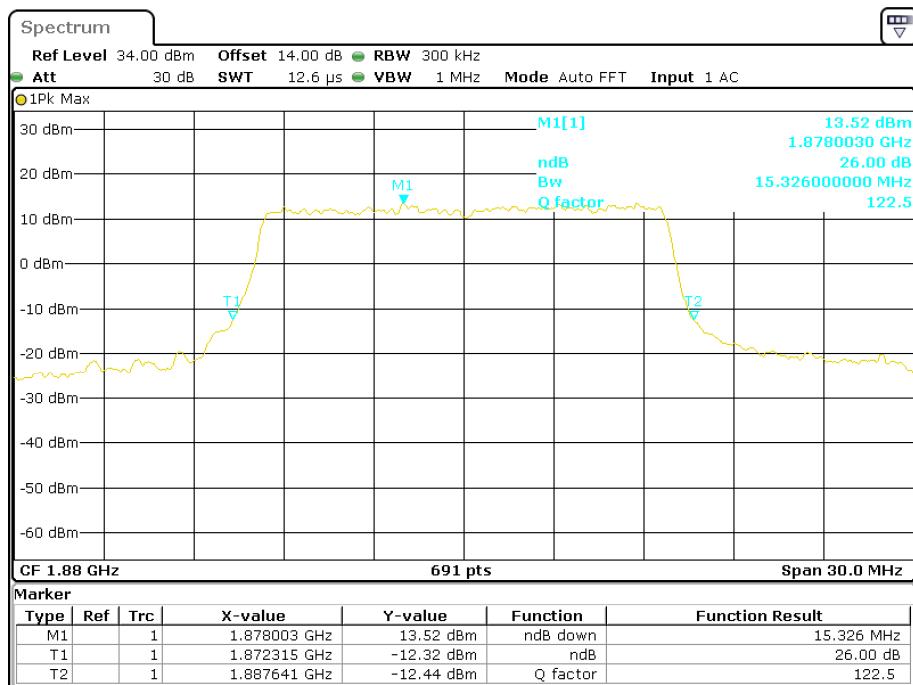
Date: 17.NOV.2017 13:48:34

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

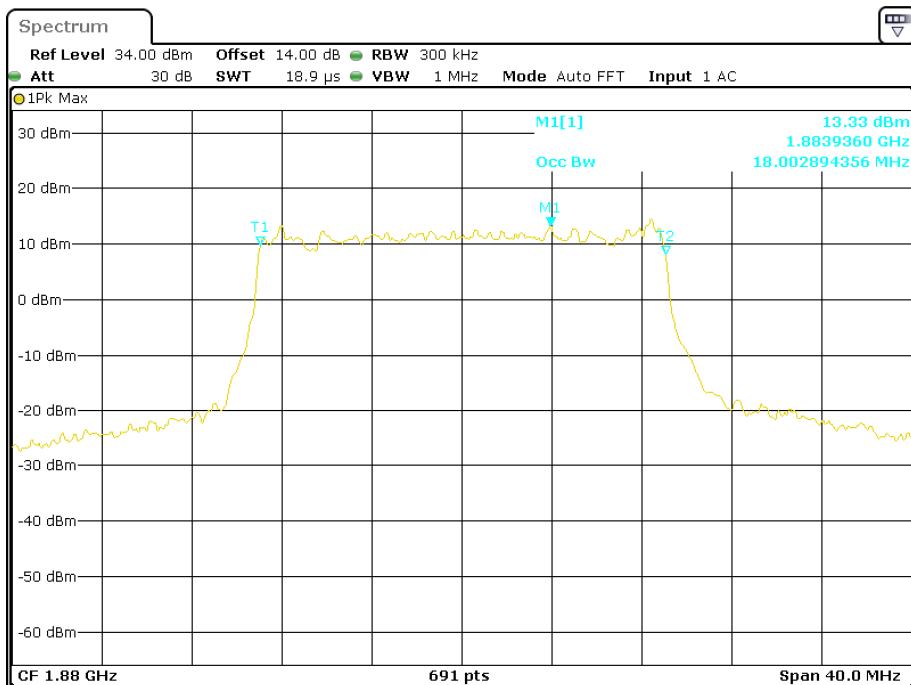
Date: 17.NOV.2017 14:45:22

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

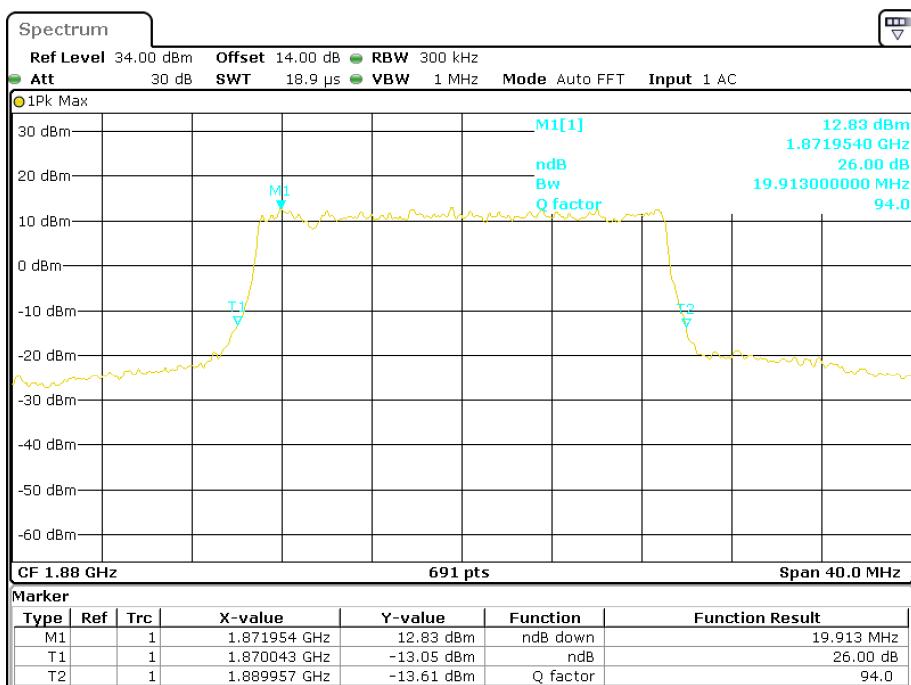
Date: 17.NOV.2017 13:48:06

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

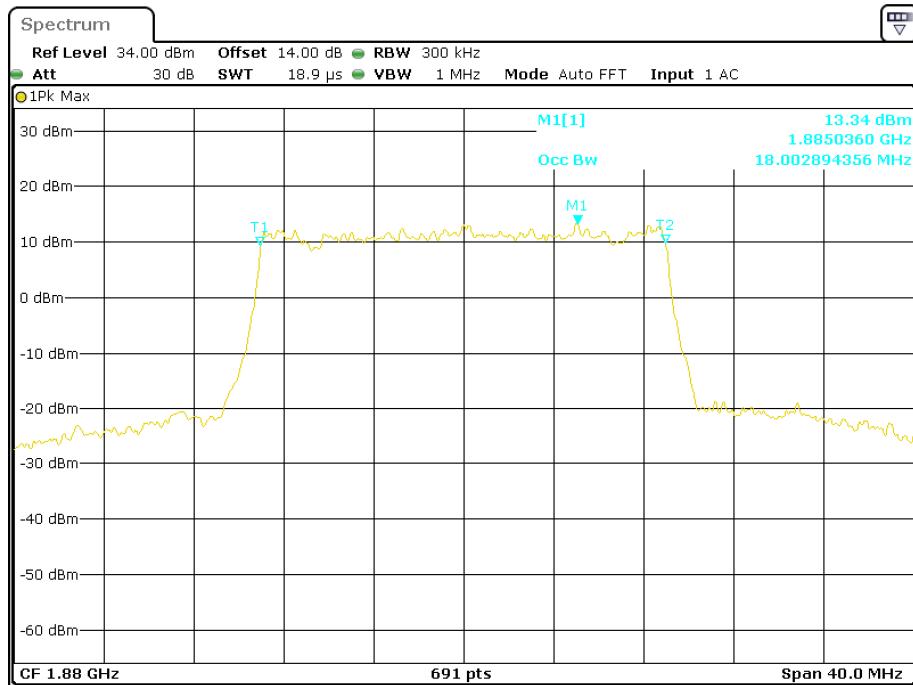
Date: 17.NOV.2017 14:46:01

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

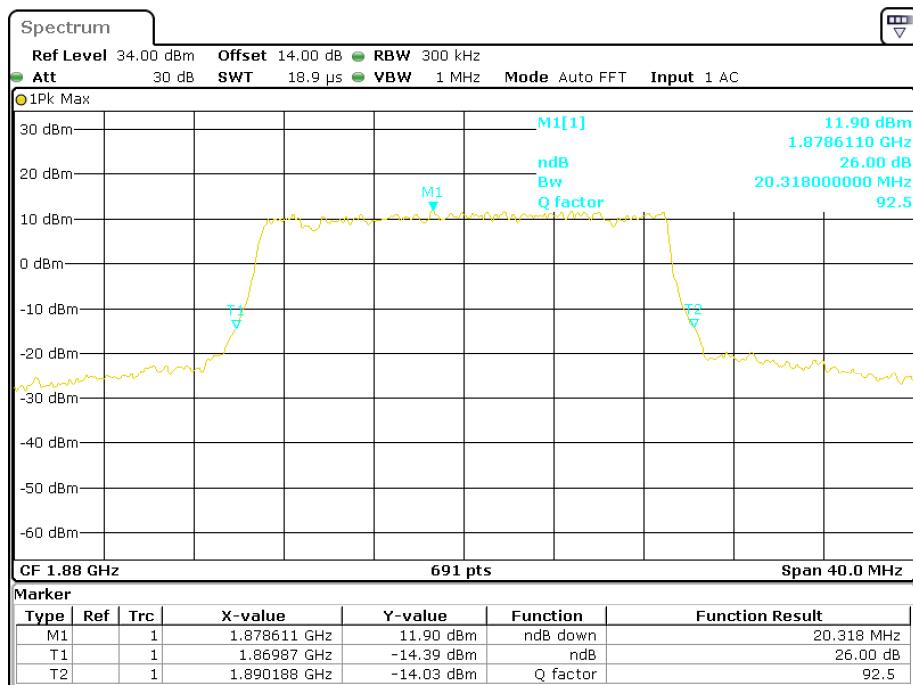
Date: 17.NOV.2017 13:49:10

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

Date: 17.NOV.2017 14:47:08

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

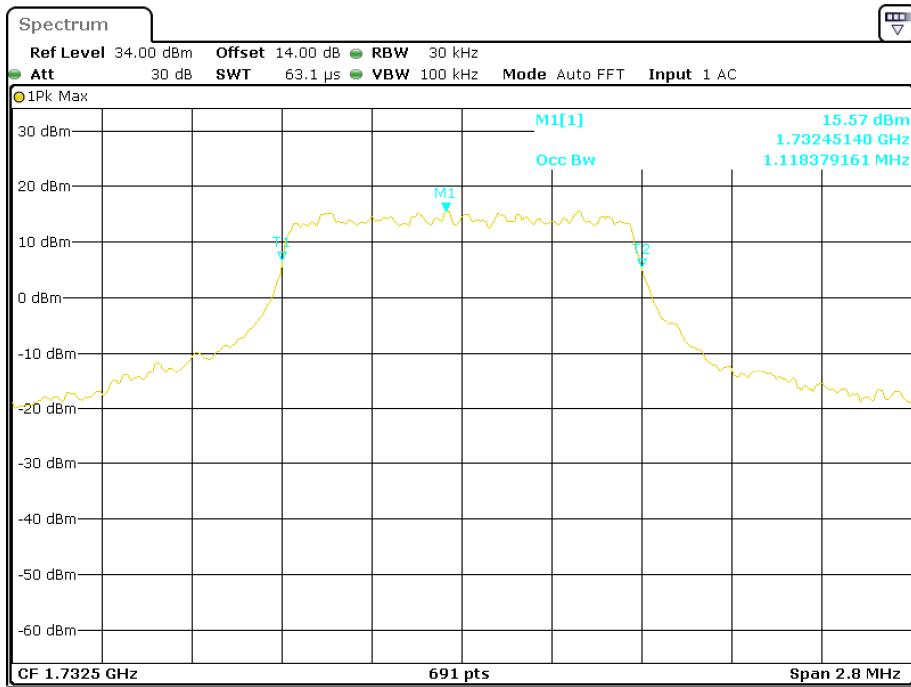
Date: 17.NOV.2017 13:49:37

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

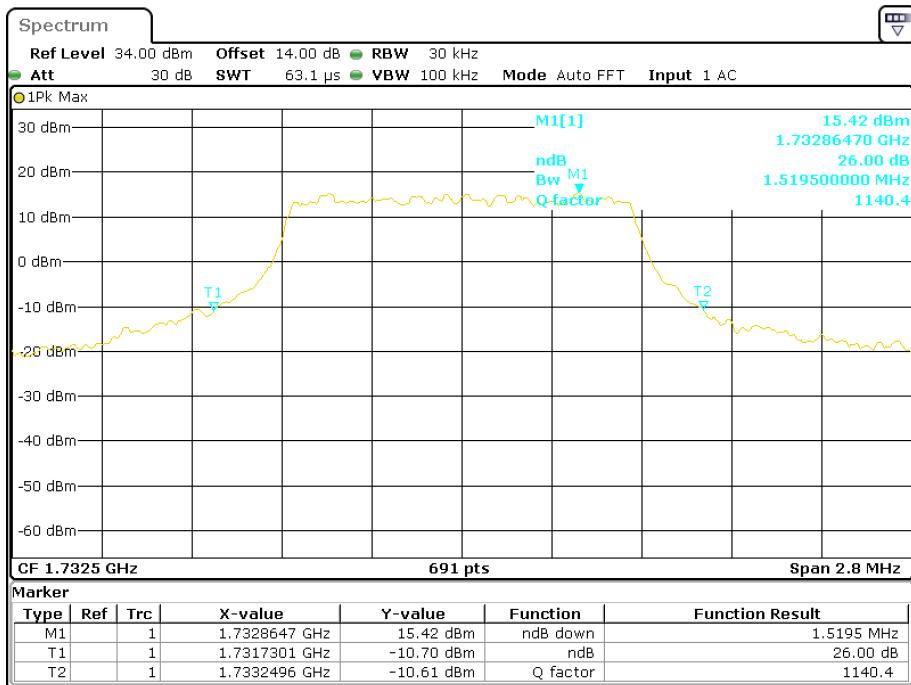
Date: 17.NOV.2017 14:46:26

**LTE Band 4: (Middle Channel)**

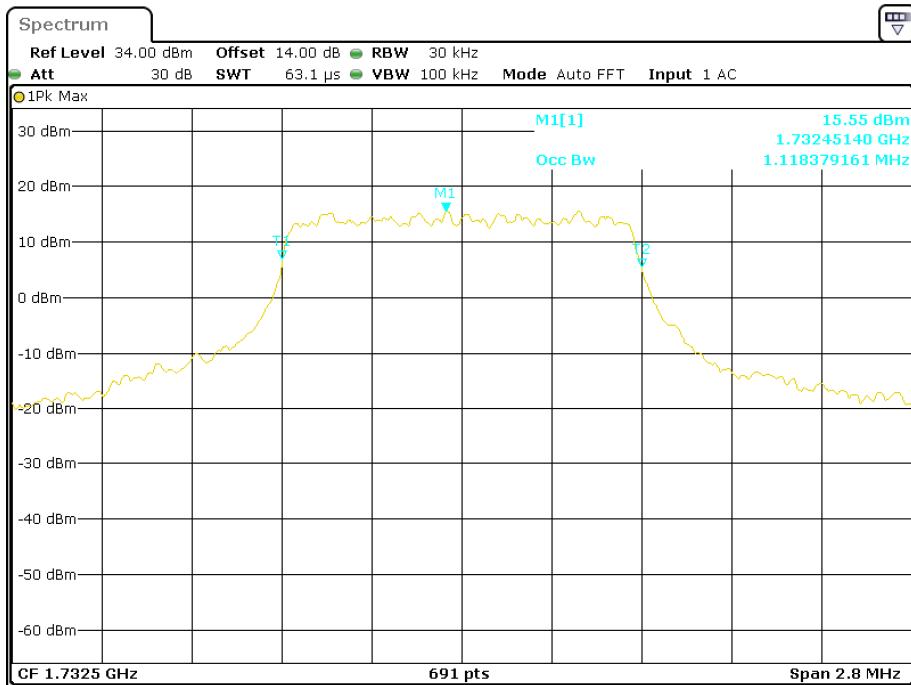
<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>26 dB Emission Bandwidth (MHz)</b>
1.4	QPSK	1.118	1.520
	16QAM	1.118	1.524
3.0	QPSK	2.692	3.048
	16QAM	2.692	3.048
5.0	QPSK	4.559	5.441
	16QAM	4.559	5.441
10.0	QPSK	8.973	9.957
	16QAM	8.973	9.899
15.0	QPSK	13.546	14.848
	16QAM	13.502	15.239
20.0	QPSK	17.945	19.450
	16QAM	17.887	19.566

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

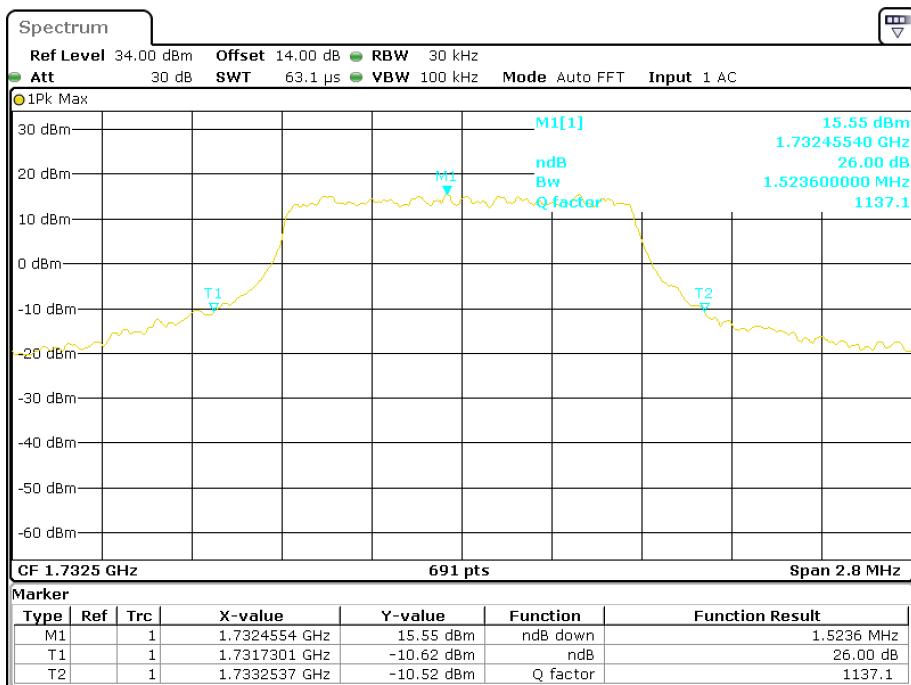
Date: 17.NOV.2017 14:02:19

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

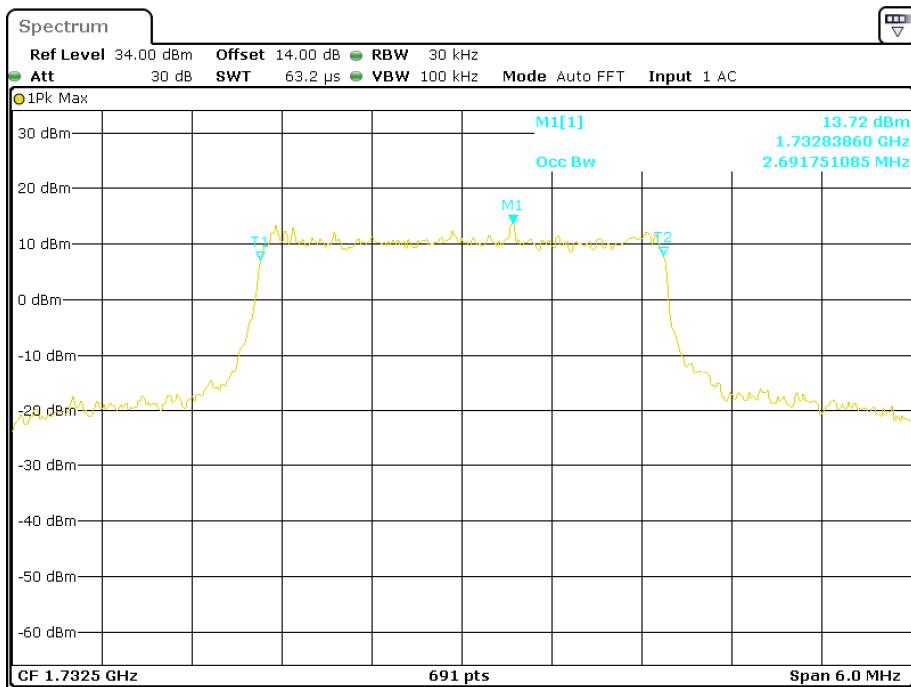
Date: 17.NOV.2017 15:09:29

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

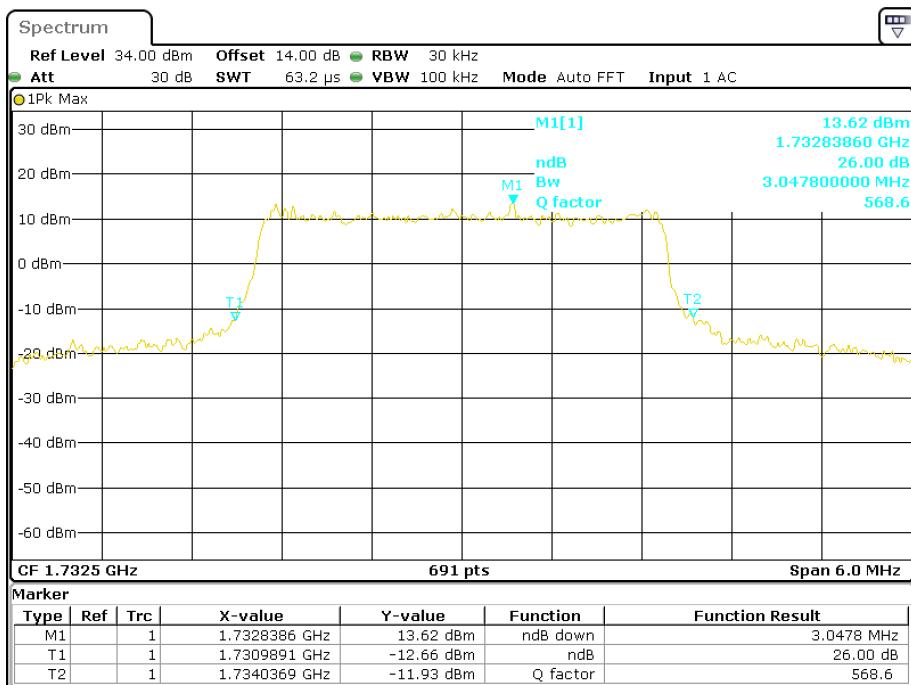
Date: 17.NOV.2017 14:01:48

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

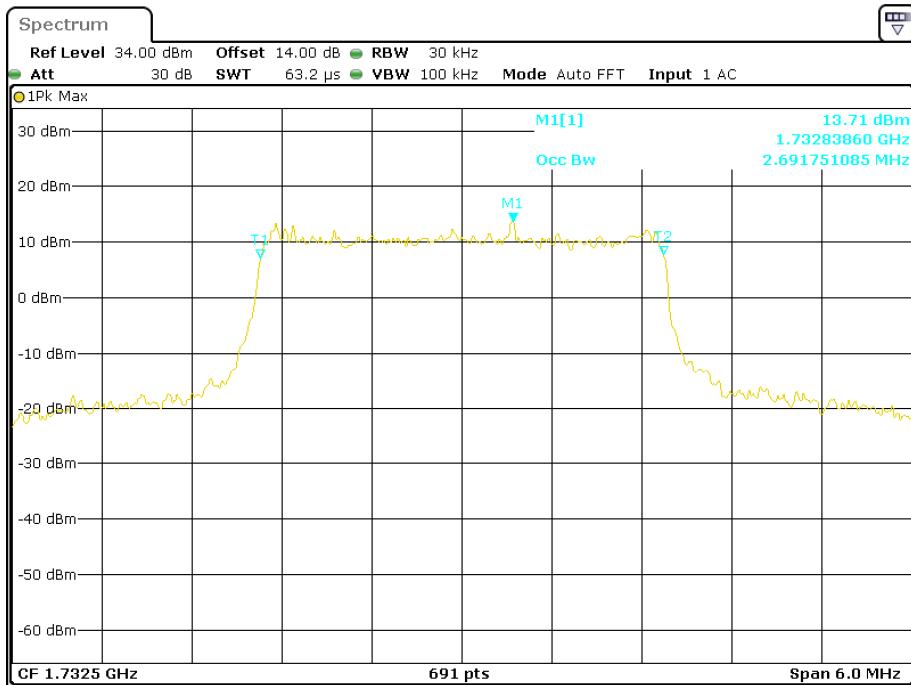
Date: 17.NOV.2017 15:09:55

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

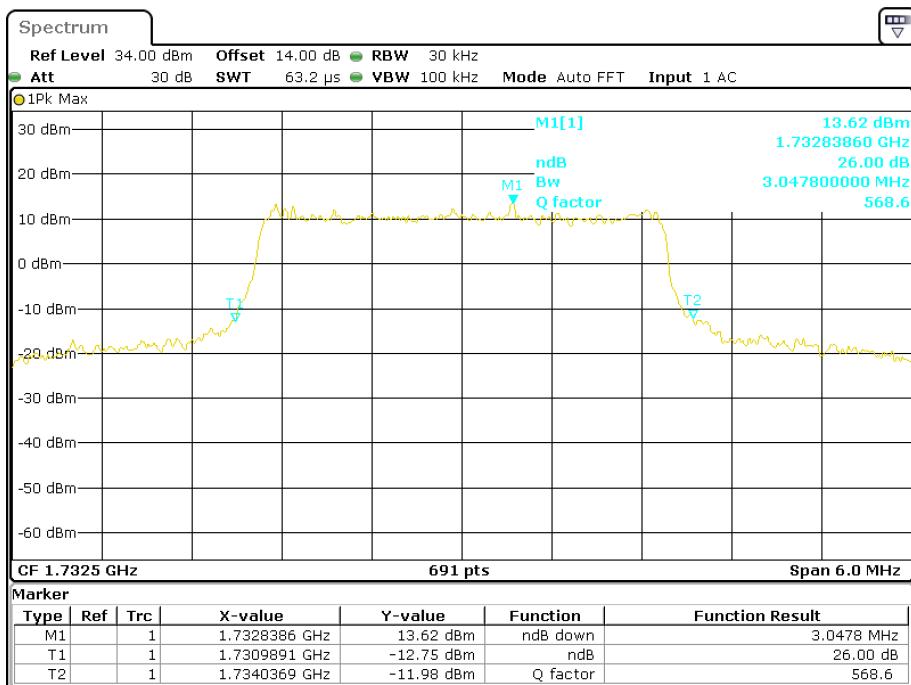
Date: 17.NOV.2017 14:03:32

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

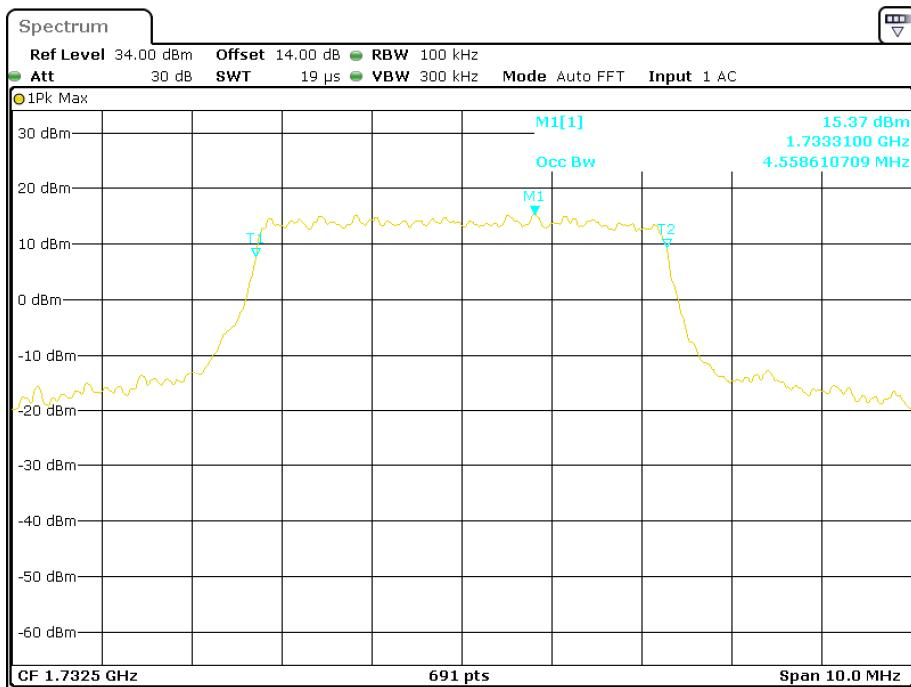
Date: 17.NOV.2017 15:10:58

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

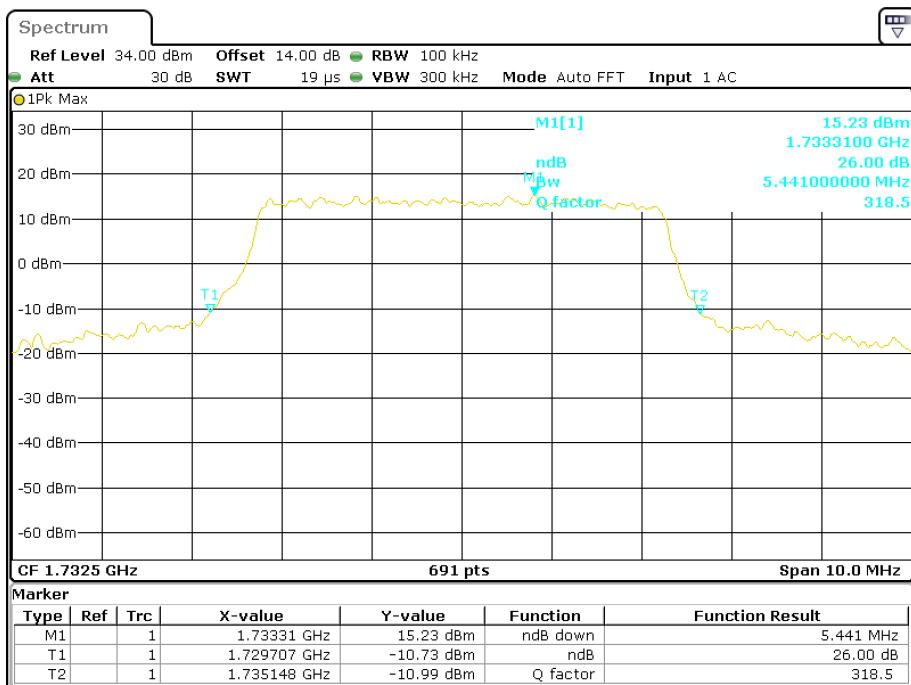
Date: 17.NOV.2017 14:03:59

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

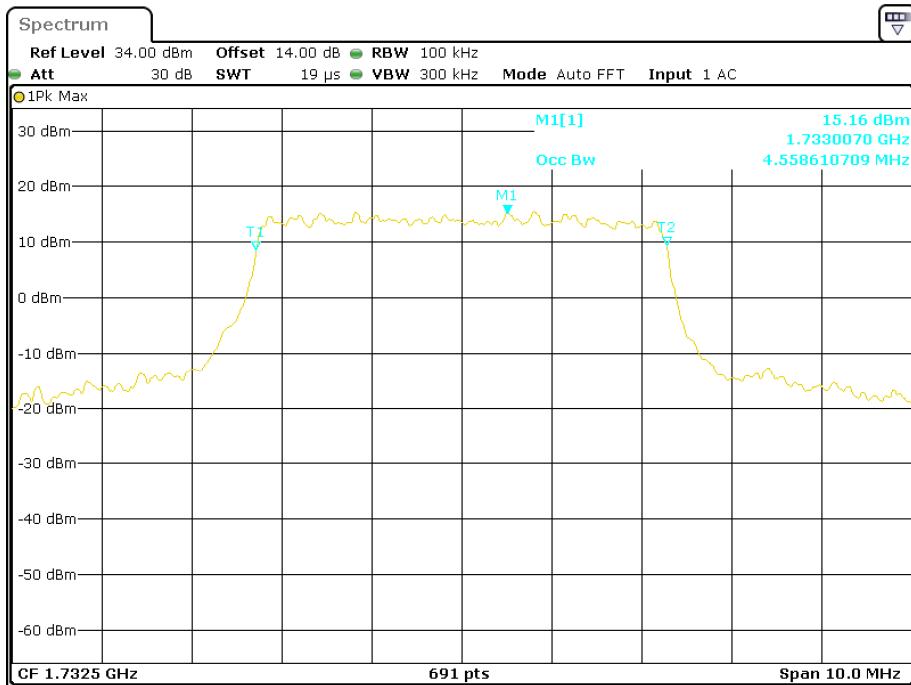
Date: 17.NOV.2017 15:10:26

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

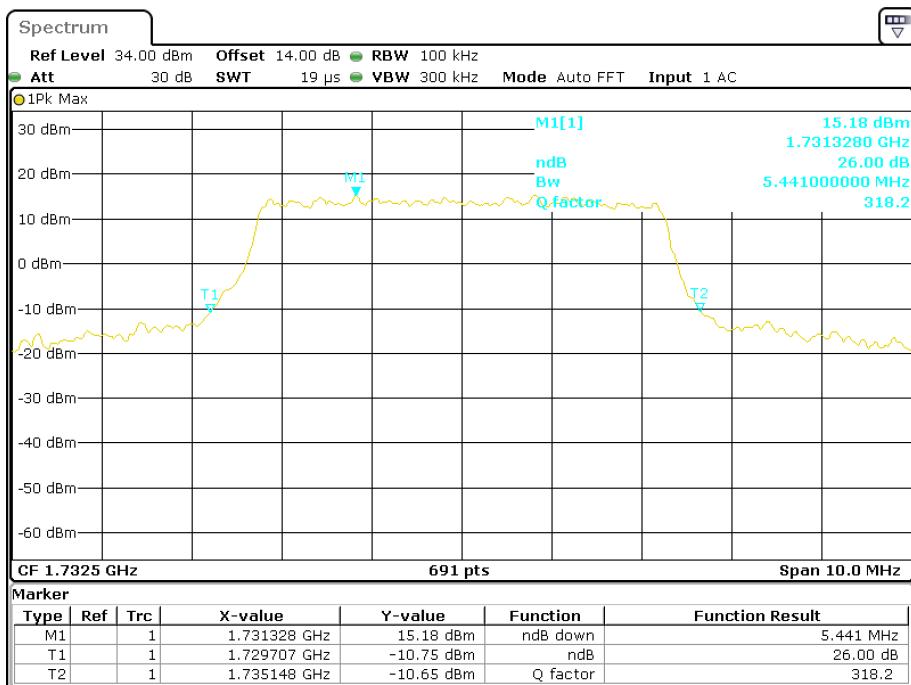
Date: 17.NOV.2017 14:05:58

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

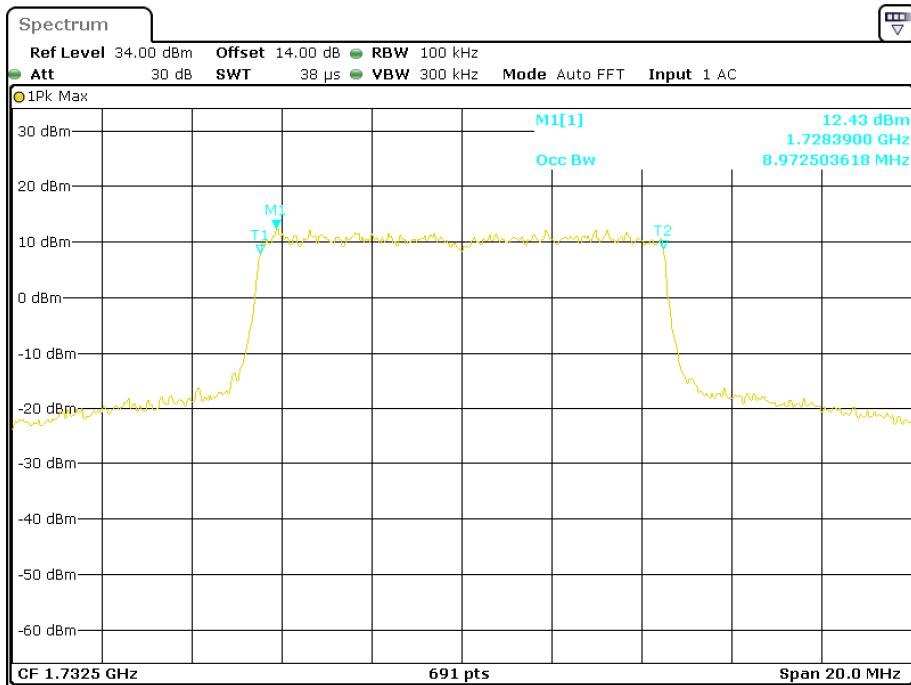
Date: 17.NOV.2017 15:11:46

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

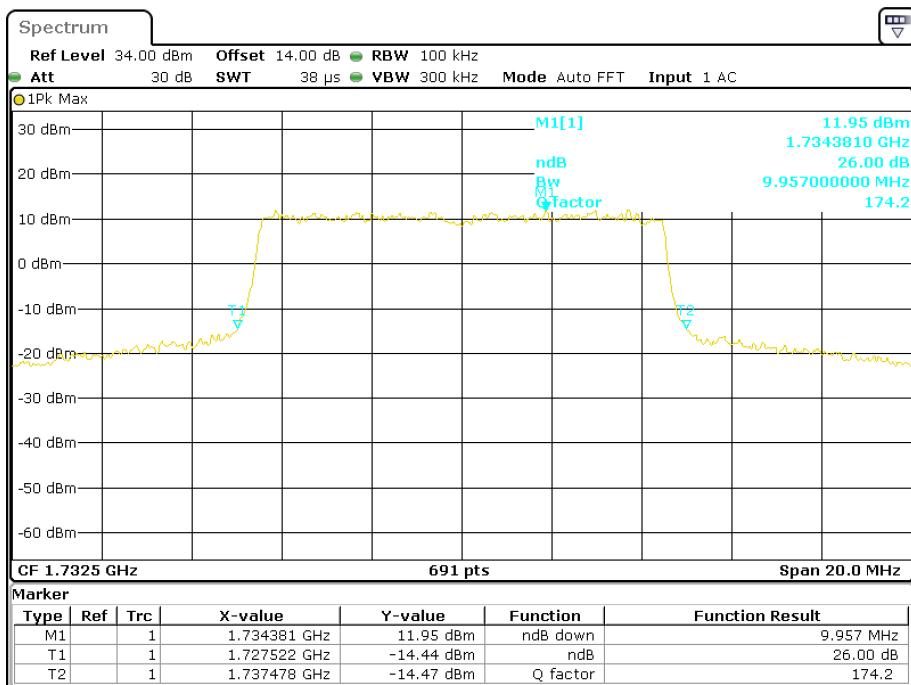
Date: 17.NOV.2017 14:05:30

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

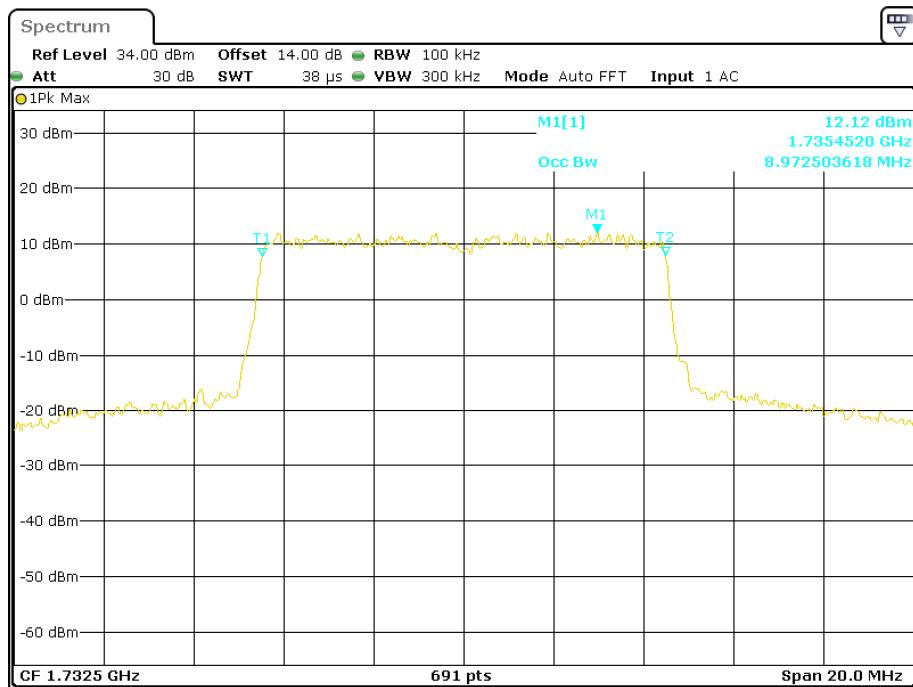
Date: 17.NOV.2017 15:12:14

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

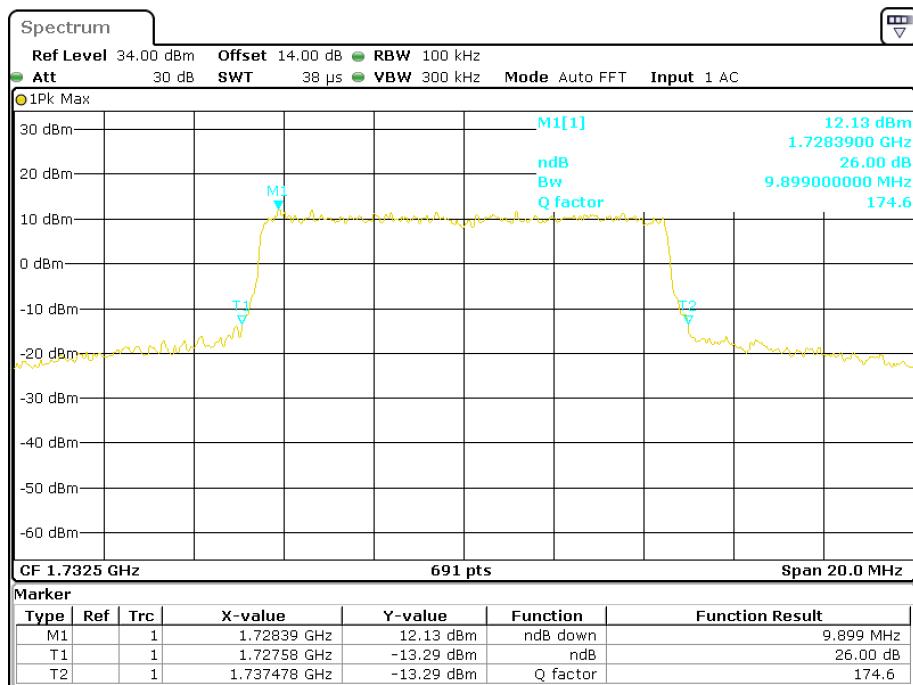
Date: 17.NOV.2017 14:07:56

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

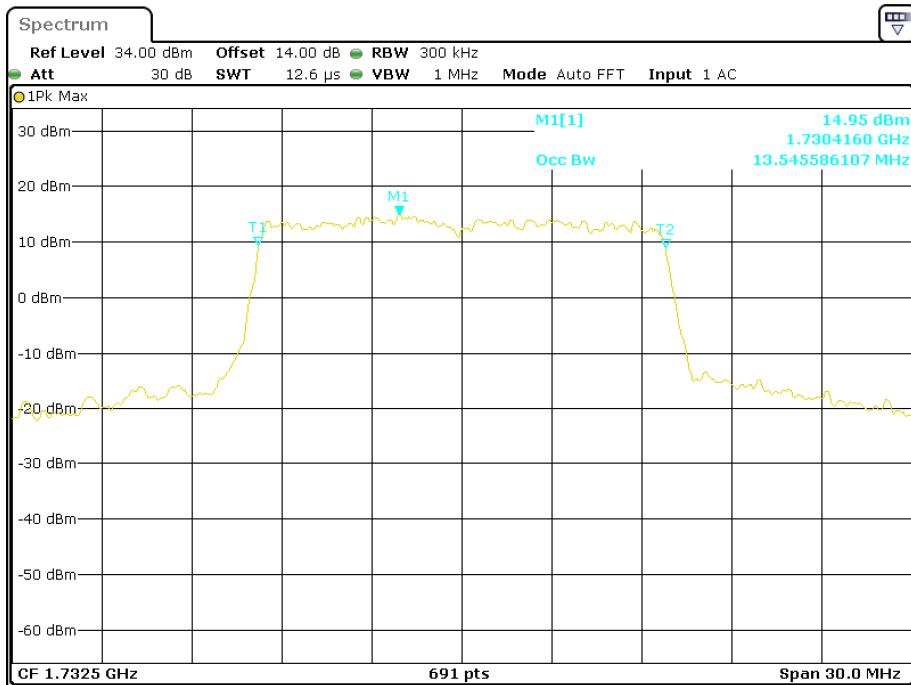
Date: 17.NOV.2017 15:13:25

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

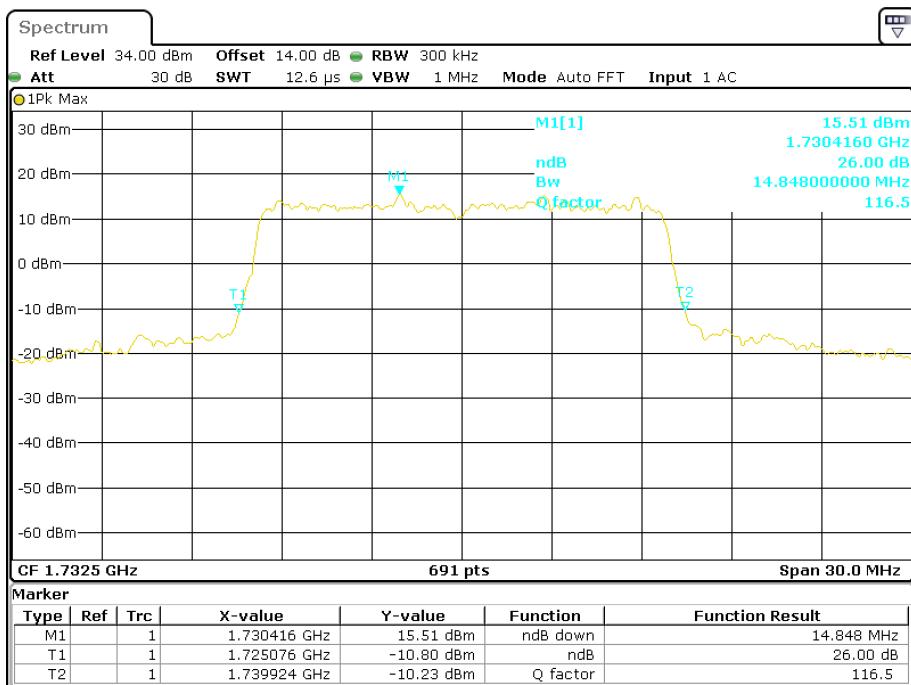
Date: 17.NOV.2017 14:07:03

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

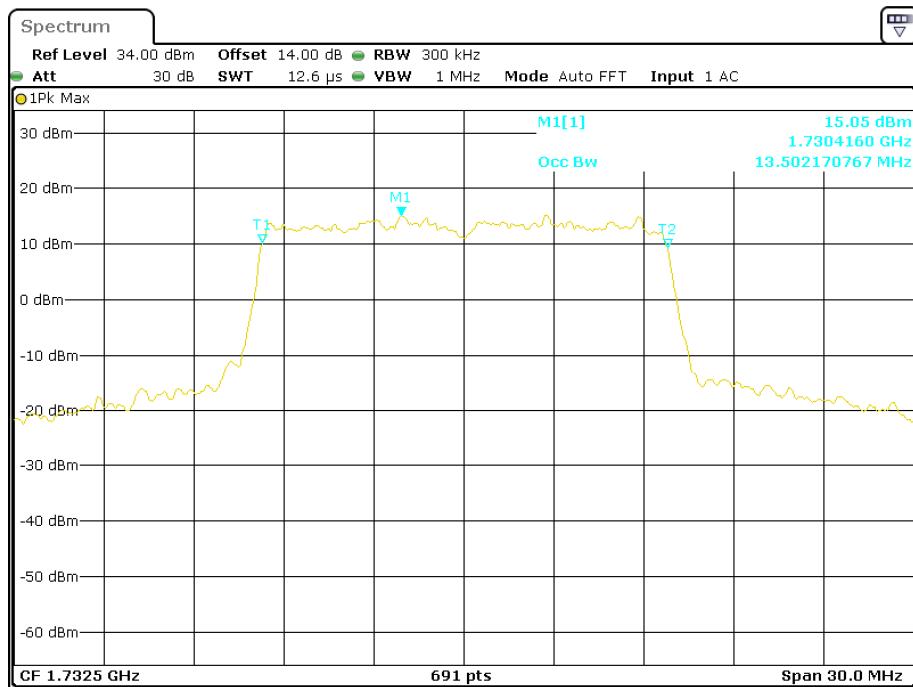
Date: 17.NOV.2017 15:12:51

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

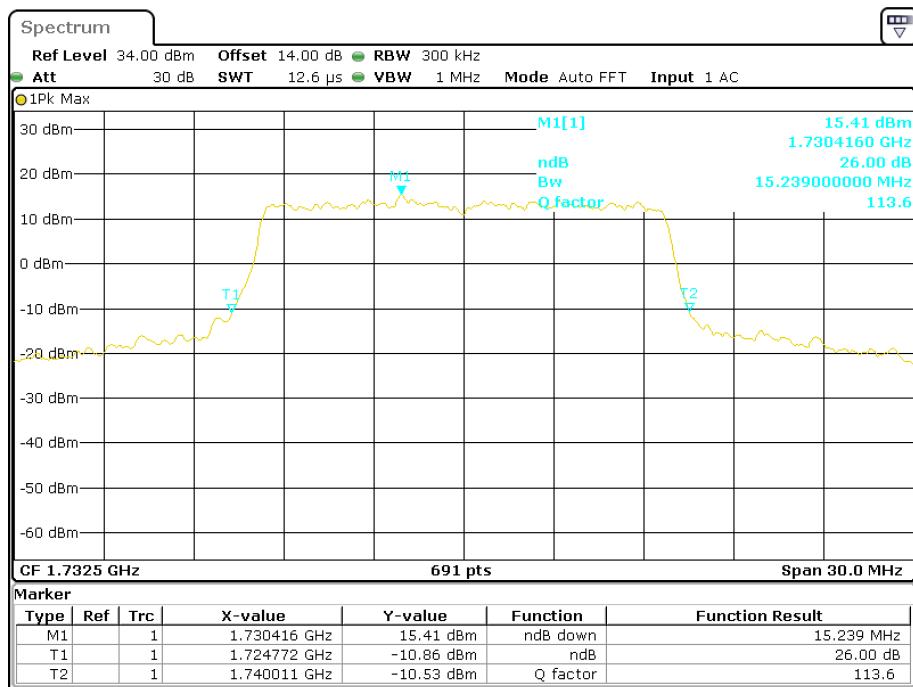
Date: 17.NOV.2017 14:09:39

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

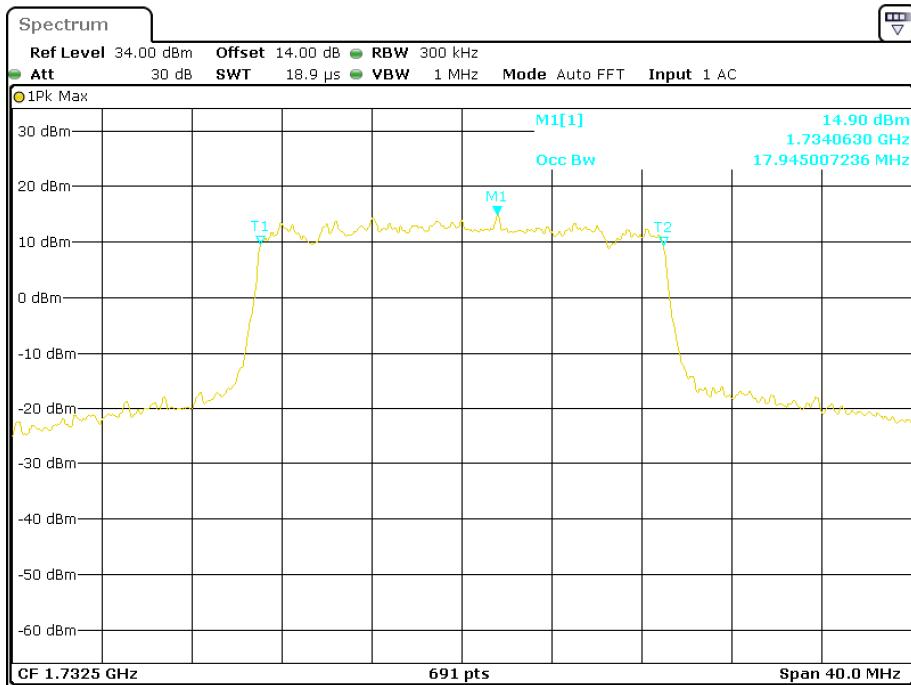
Date: 17.NOV.2017 15:13:56

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

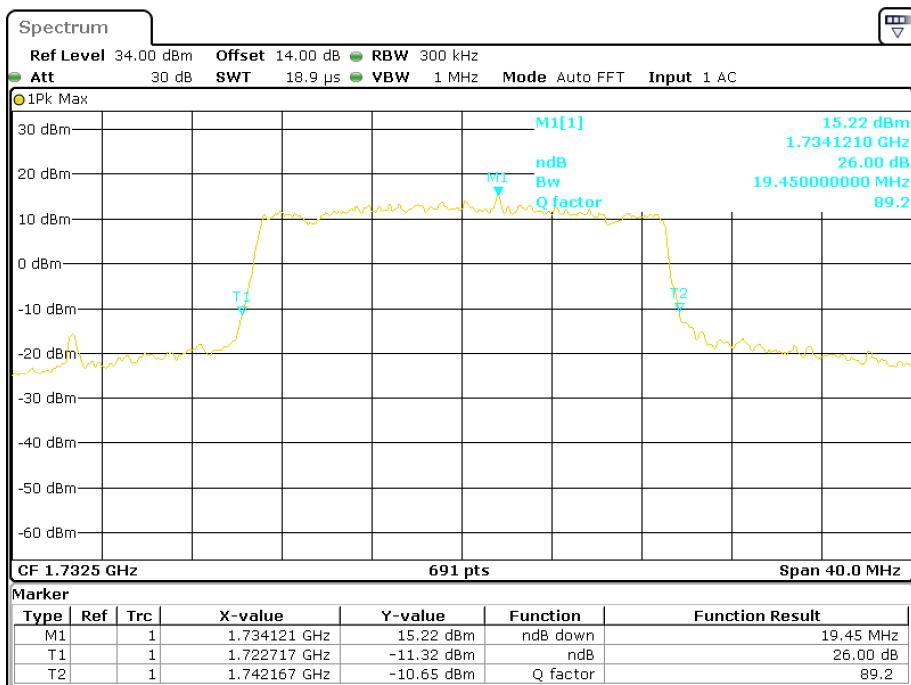
Date: 17.NOV.2017 14:10:13

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

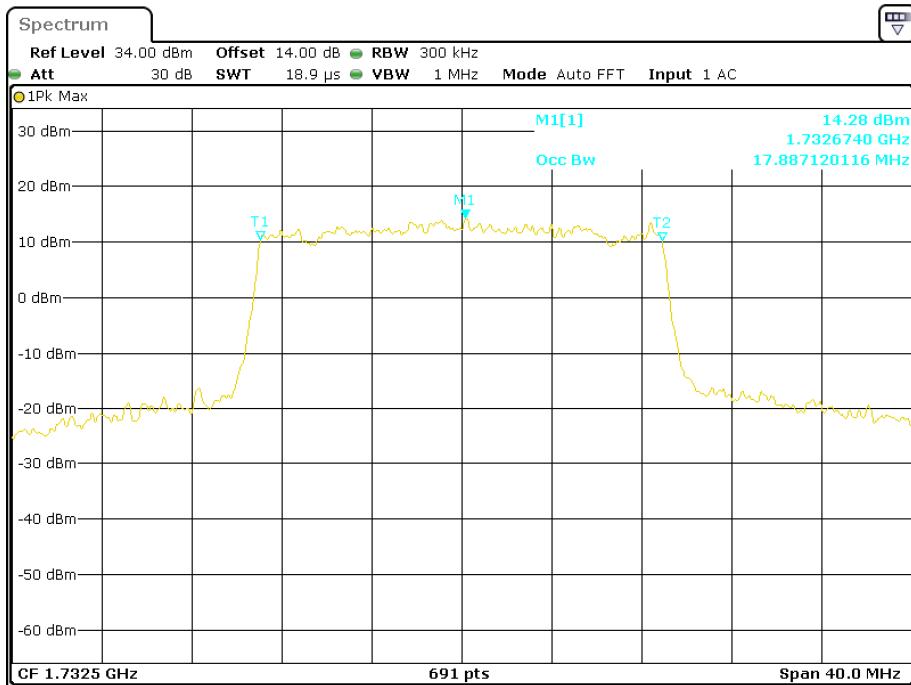
Date: 17.NOV.2017 15:14:30

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

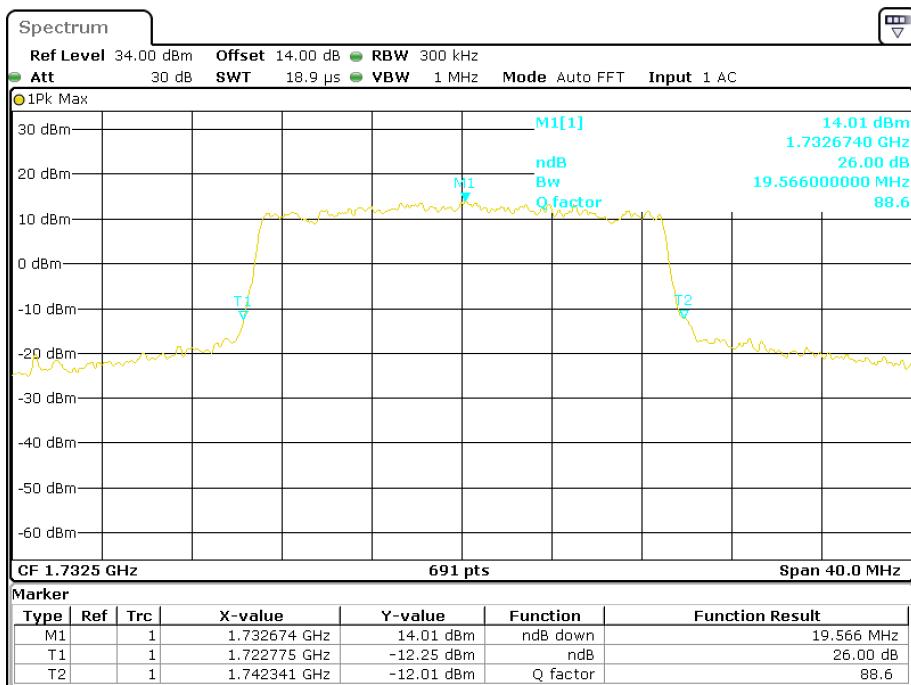
Date: 17.NOV.2017 14:17:55

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

Date: 17.NOV.2017 15:15:39

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

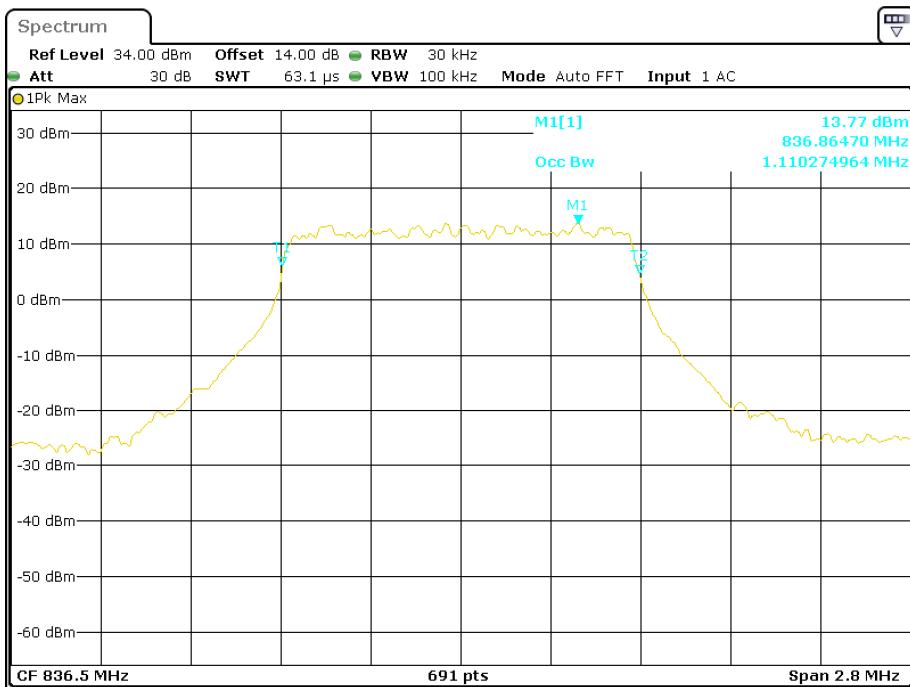
Date: 17.NOV.2017 14:17:14

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

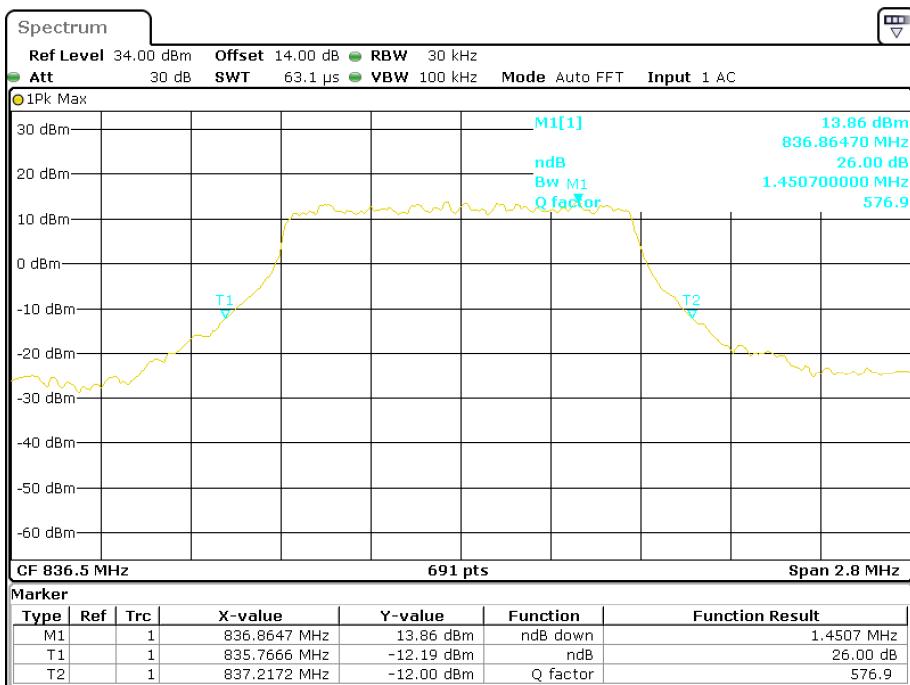
Date: 17.NOV.2017 15:15:06

**LTE Band 5: (Middle Channel)**

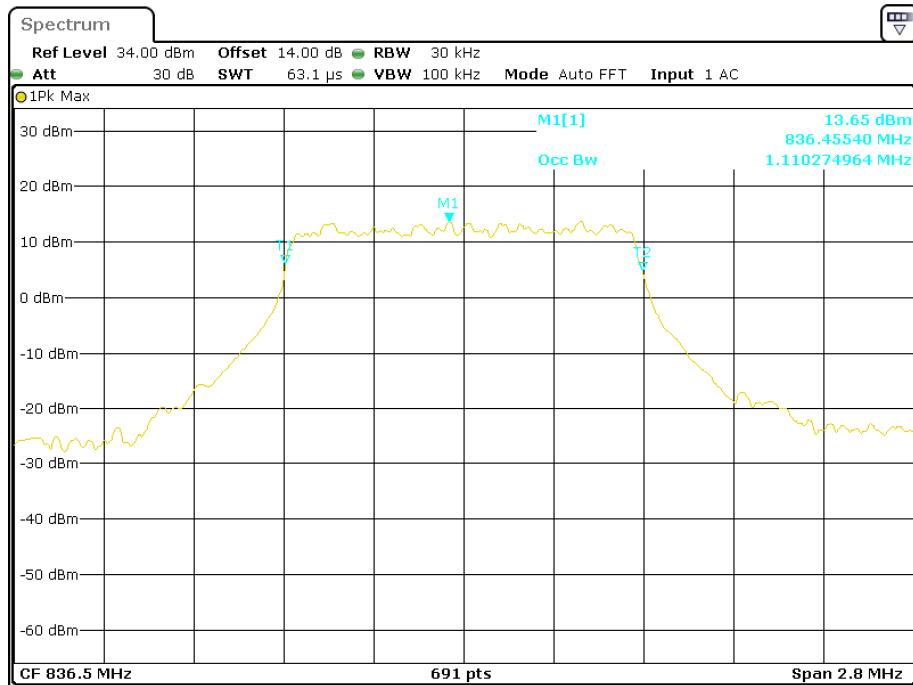
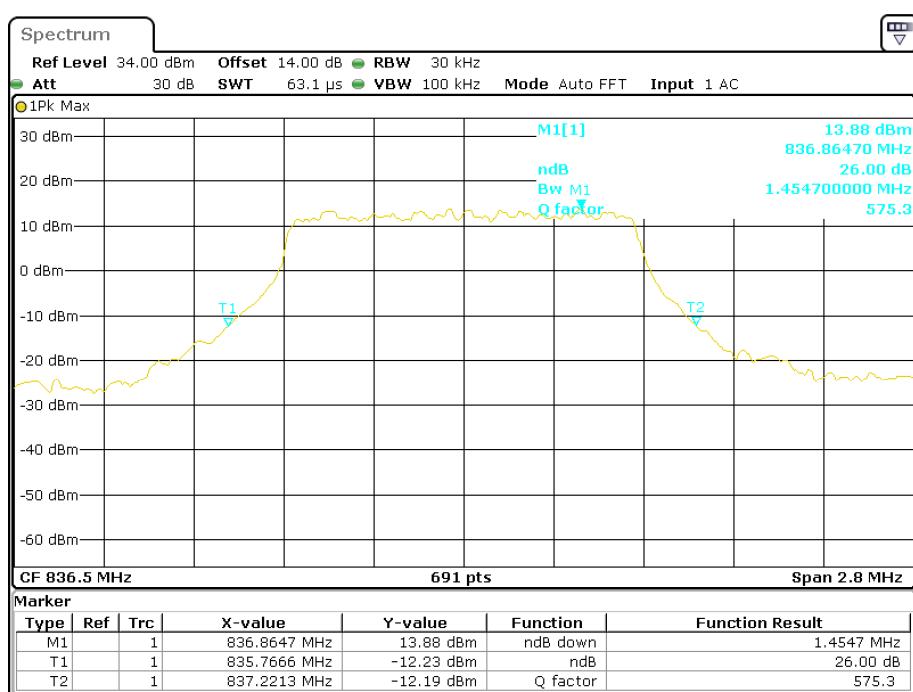
<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>26 dB Emission Bandwidth (MHz)</b>
1.4	QPSK	1.110	1.451
	16QAM	1.110	1.455
3.0	QPSK	2.683	3.013
	16QAM	2.683	3.013
5.0	QPSK	4.559	5.427
	16QAM	4.544	5.427
10.0	QPSK	8.973	9.841
	16QAM	8.973	9.841

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

Date: 17.NOV.2017 14:19:27

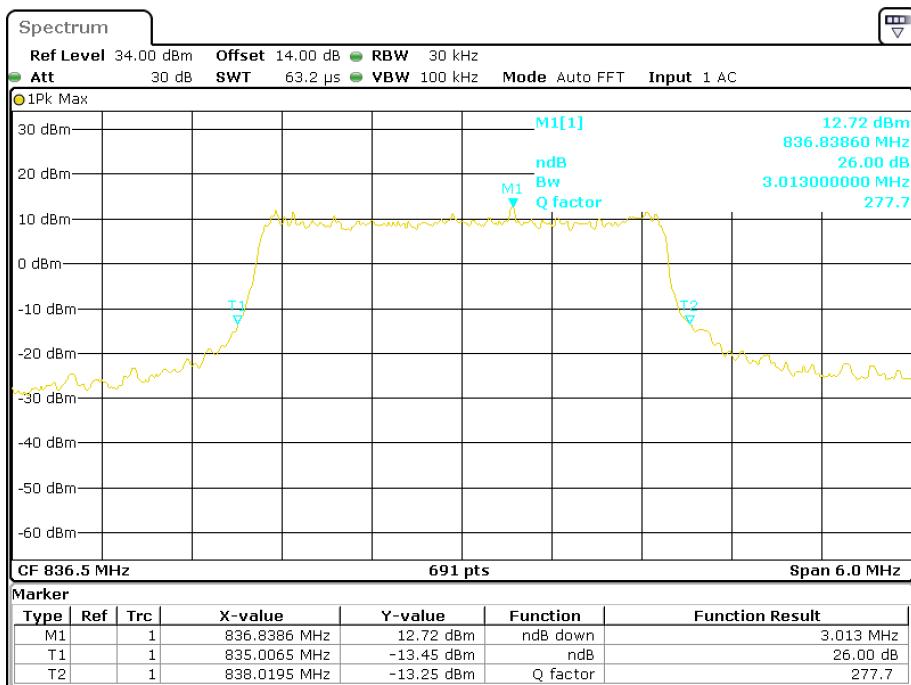
**QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel**

Date: 17.NOV.2017 15:17:28

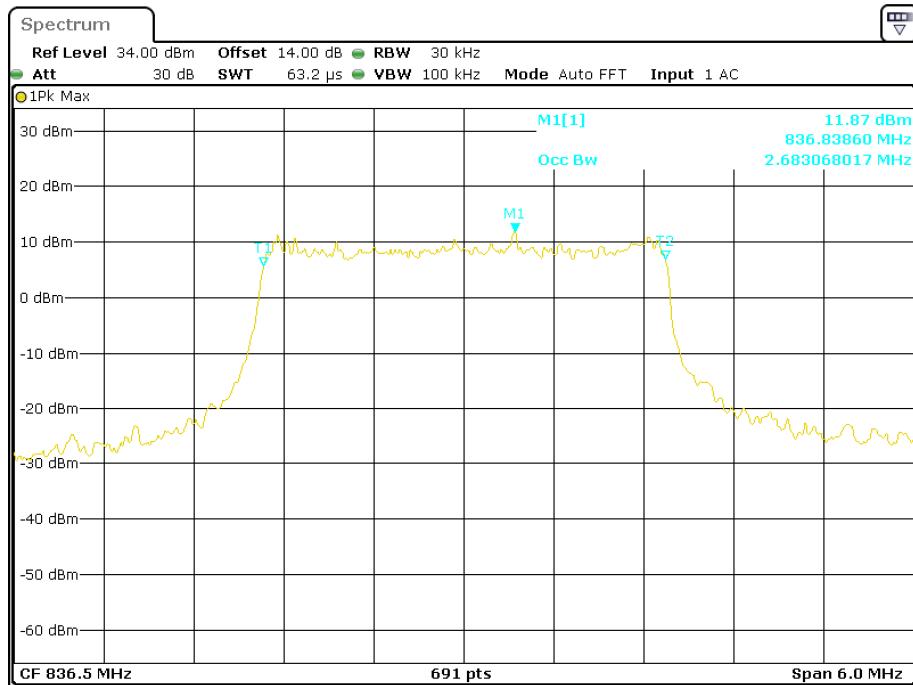
**16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel****16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel**

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

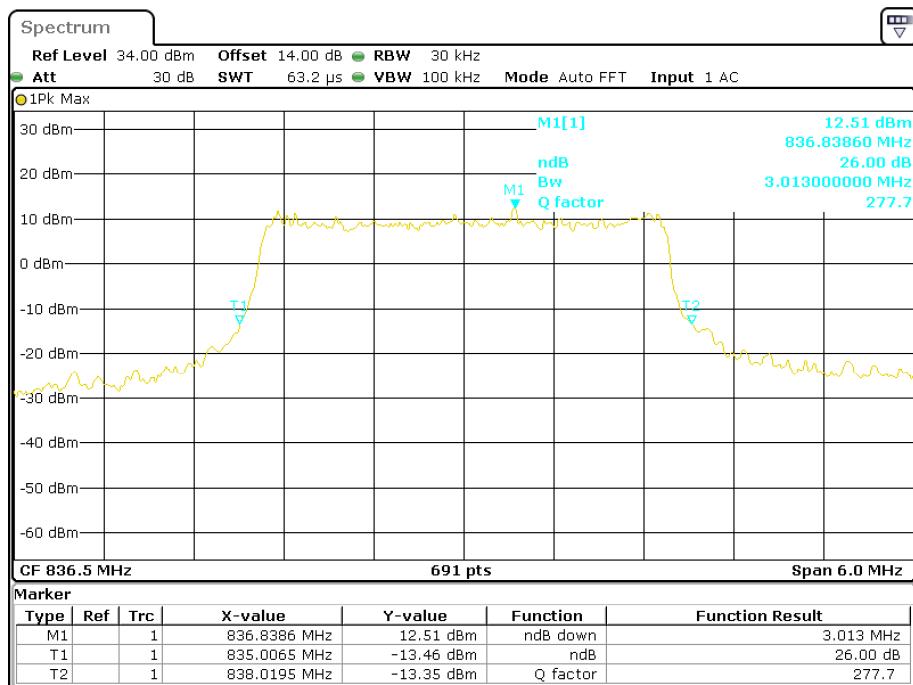
Date: 17.NOV.2017 14:22:11

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

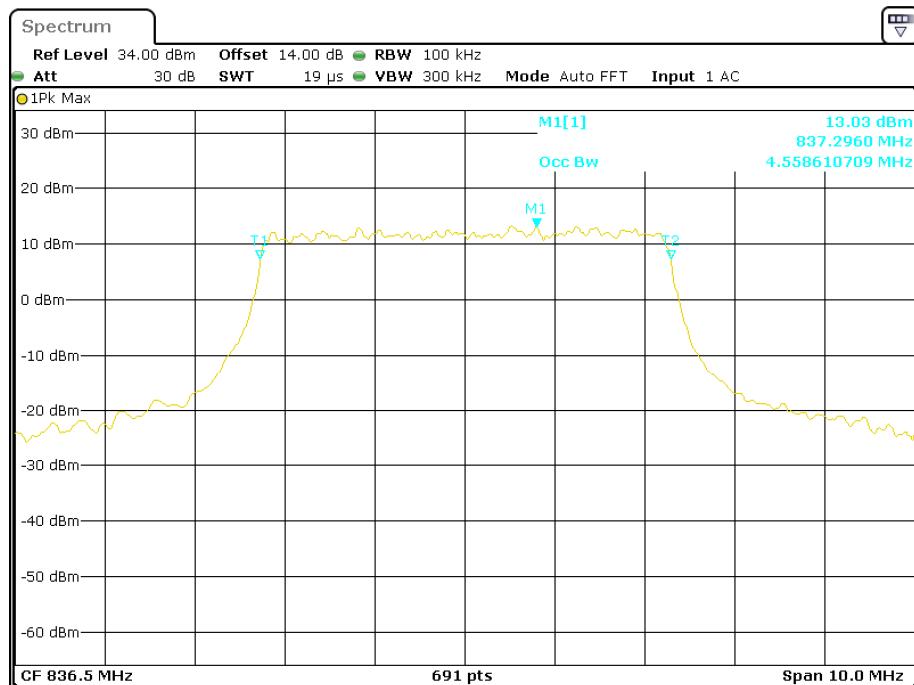
Date: 17.NOV.2017 15:22:04

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

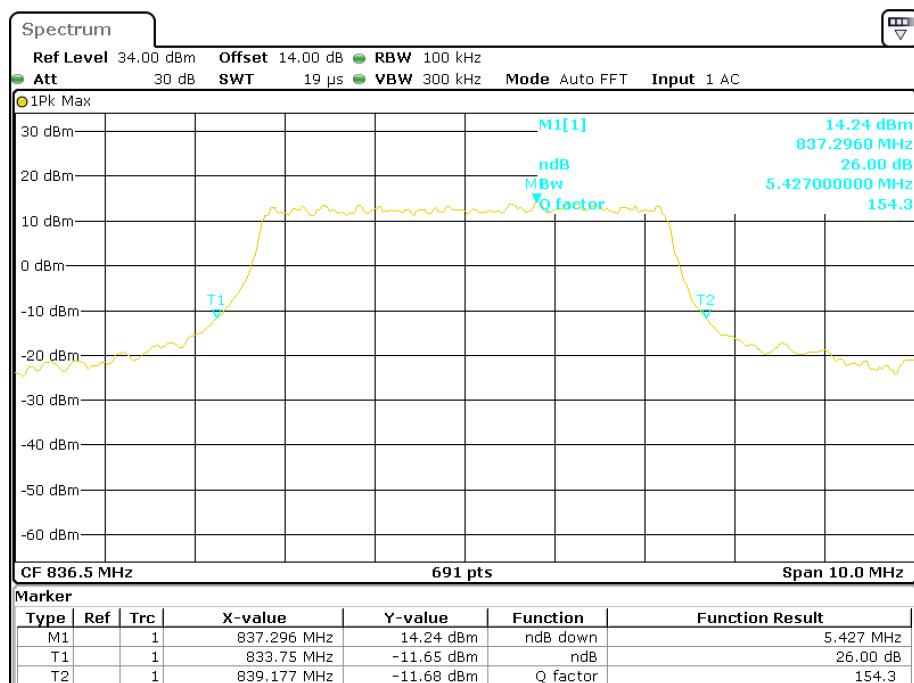
Date: 17.NOV.2017 14:21:46

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

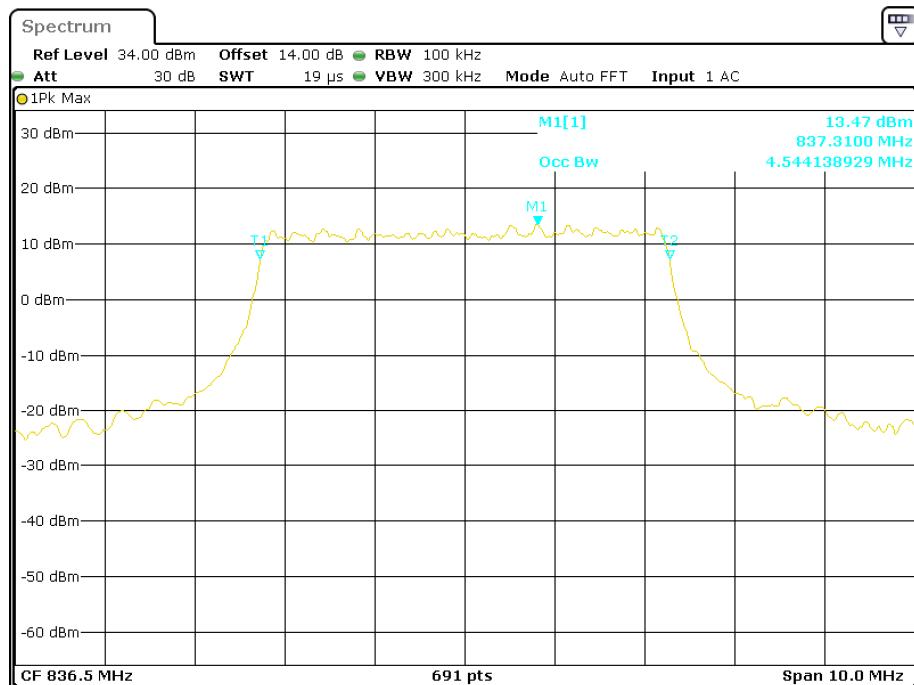
Date: 17.NOV.2017 15:21:35

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

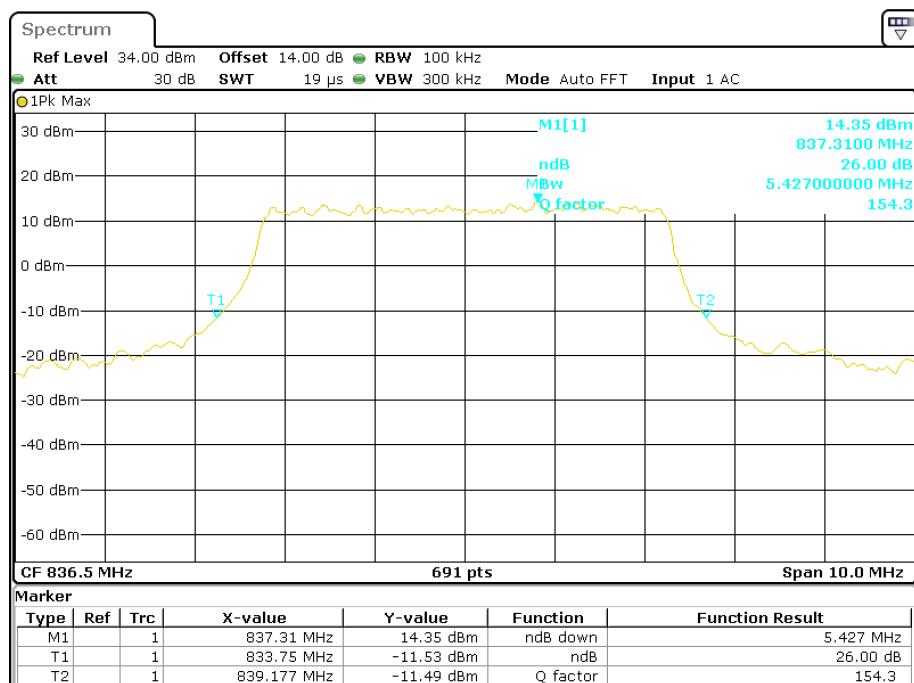
Date: 17.NOV.2017 14:22:43

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

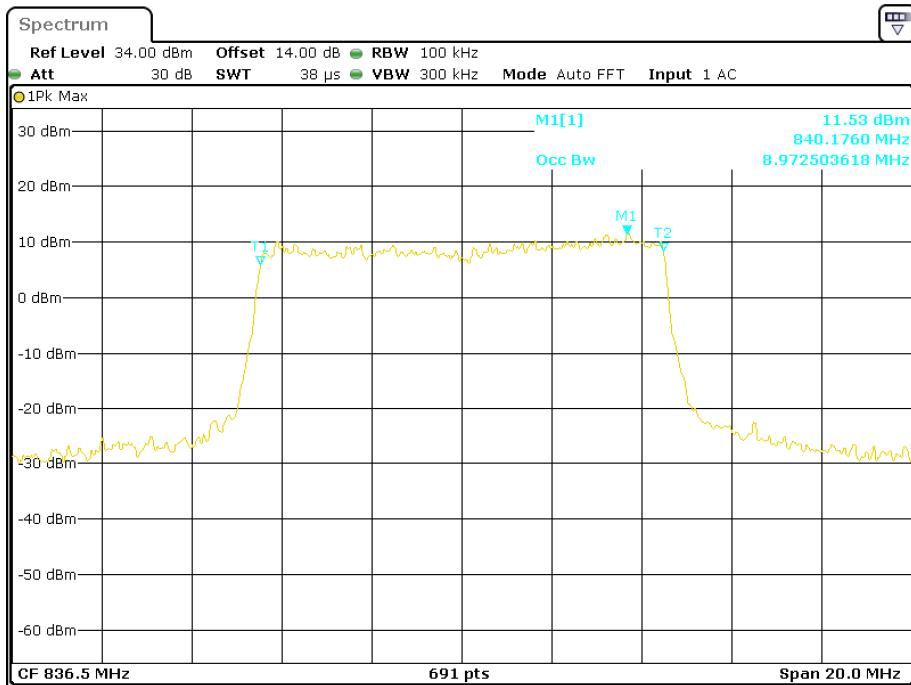
Date: 17.NOV.2017 15:22:38

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

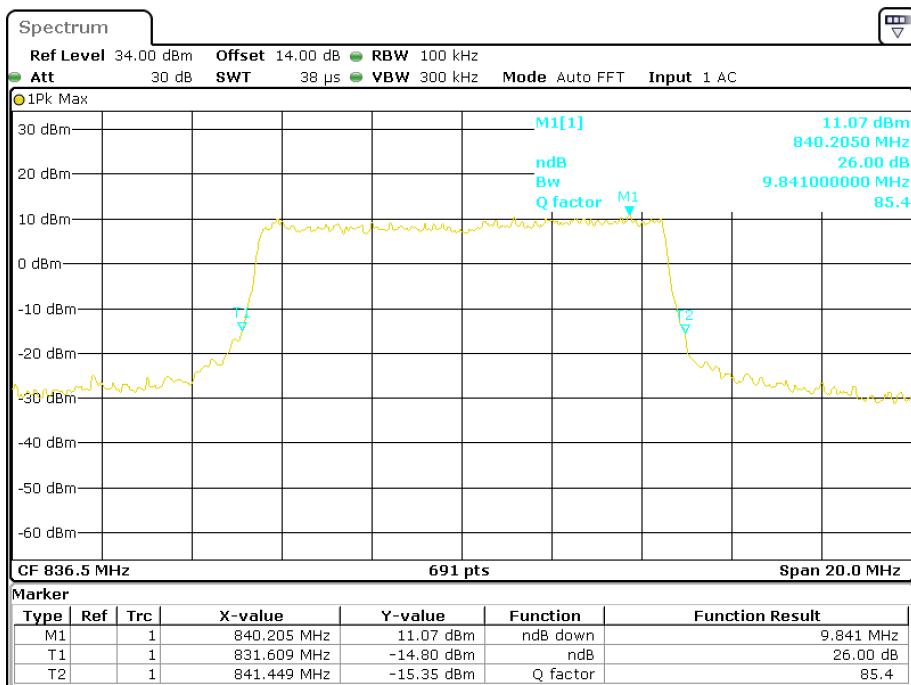
Date: 17.NOV.2017 14:23:07

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

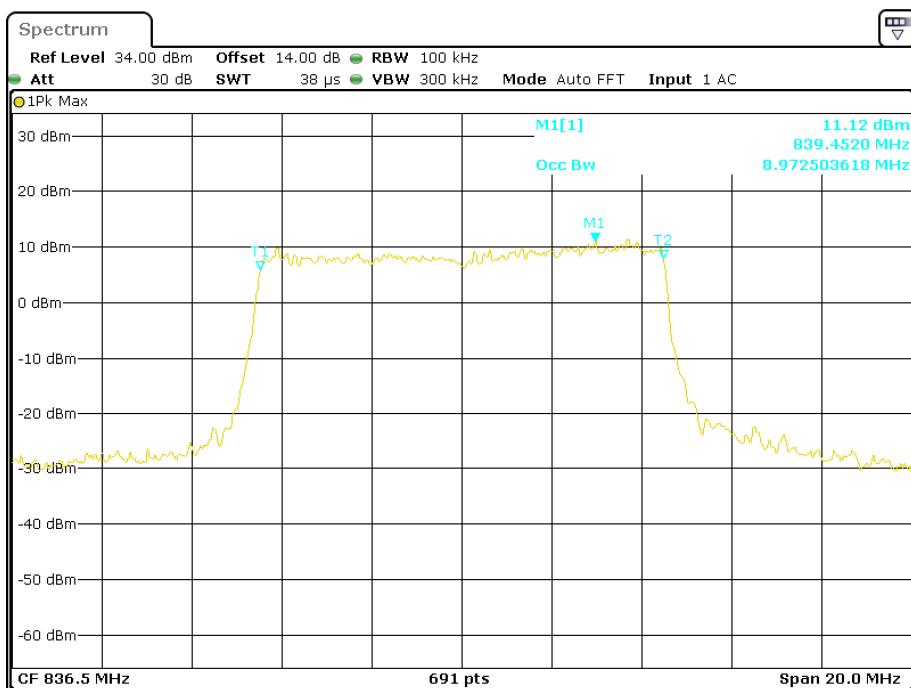
Date: 17.NOV.2017 15:23:02

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

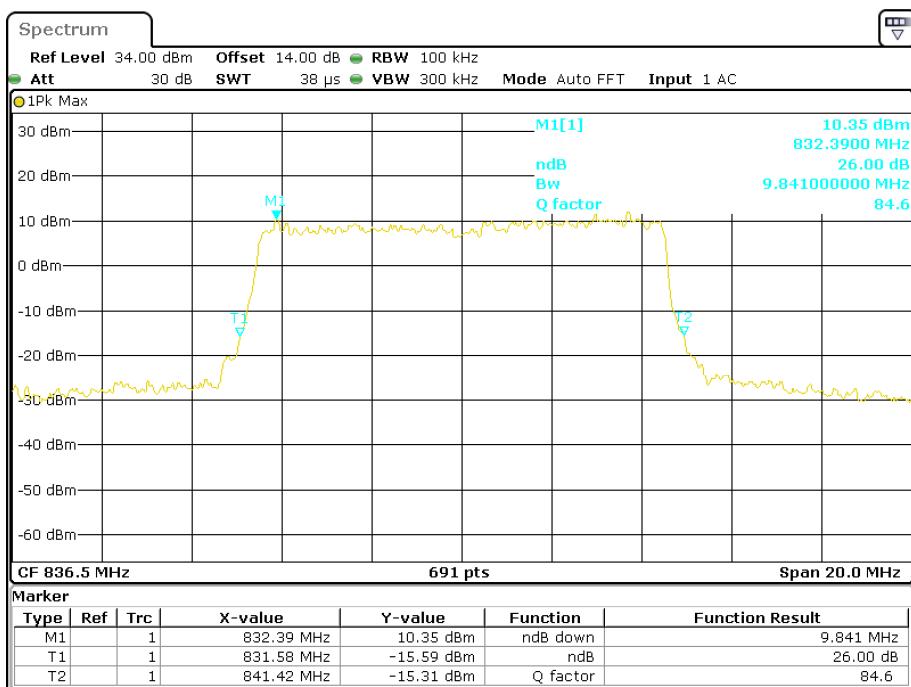
Date: 17.NOV.2017 14:24:19

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

Date: 17.NOV.2017 15:23:59

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

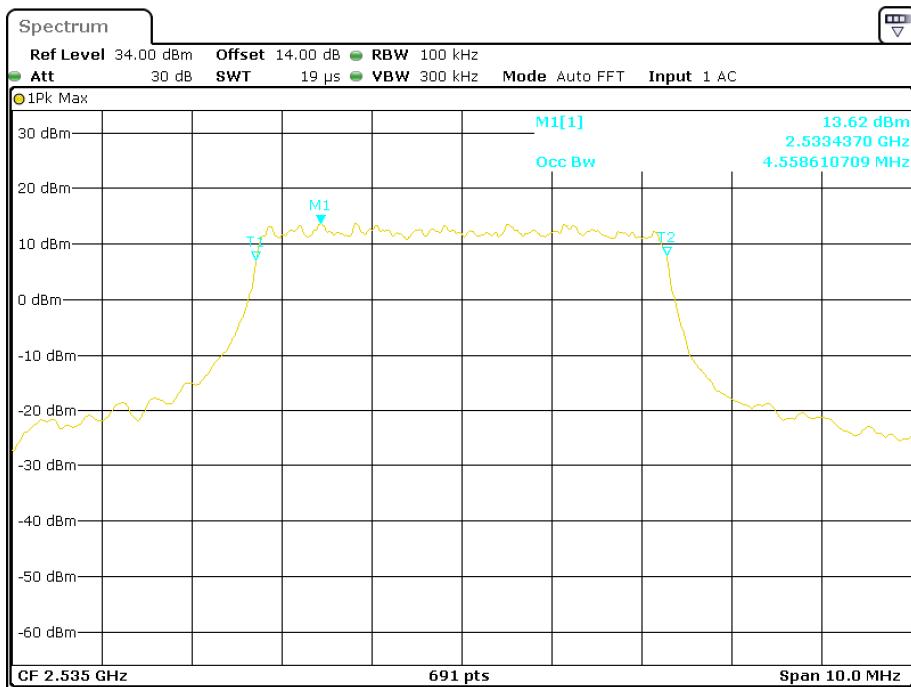
Date: 17.NOV.2017 14:23:42

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

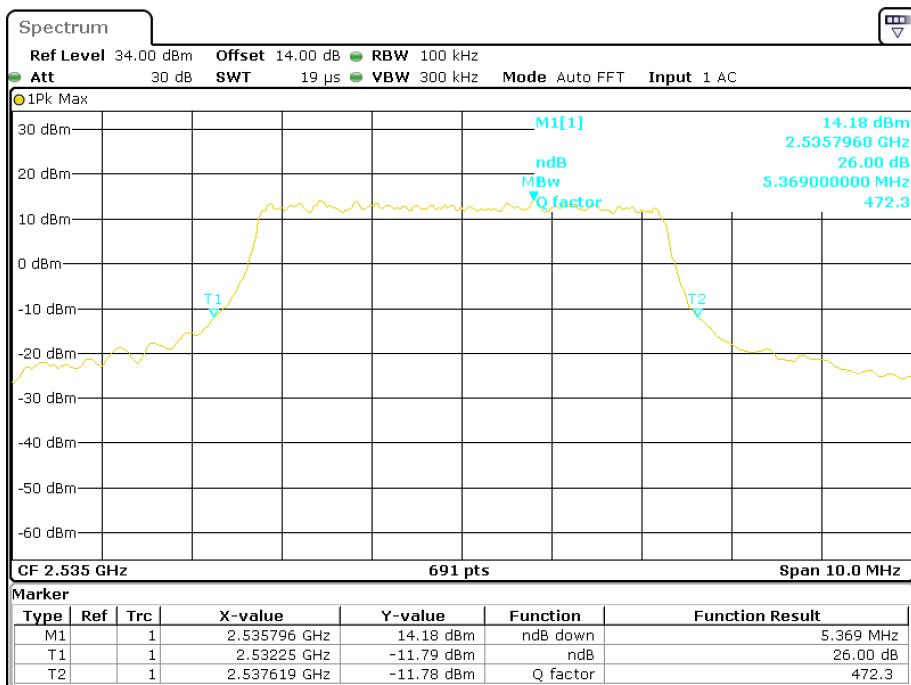
Date: 17.NOV.2017 15:23:31

**LTE Band 7: (Middle Channel)**

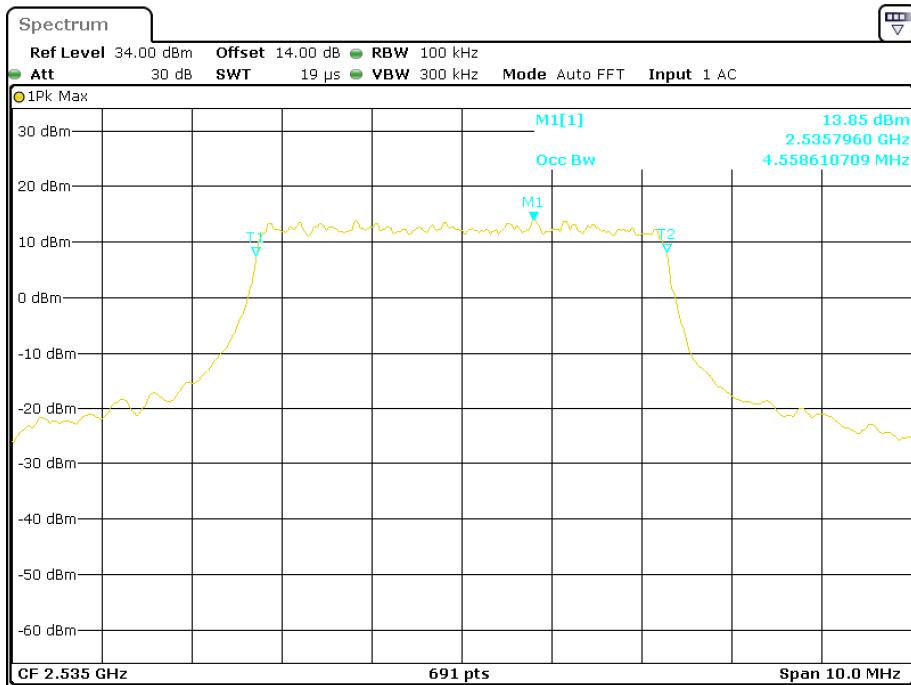
<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>26 dB Emission Bandwidth (MHz)</b>
5.0	QPSK	4.559	5.369
	16QAM	4.559	5.412
10.0	QPSK	8.973	9.812
	16QAM	8.973	9.754
15.0	QPSK	13.502	15.369
	16QAM	13.546	14.631
20.0	QPSK	17.945	19.855
	16QAM	17.945	19.624

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

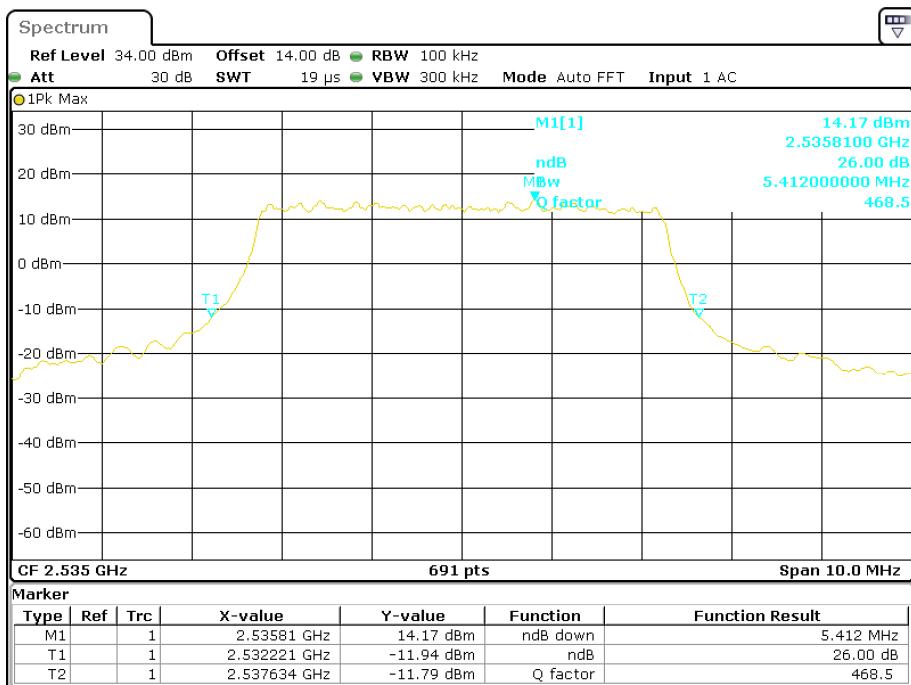
Date: 17.NOV.2017 14:25:20

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

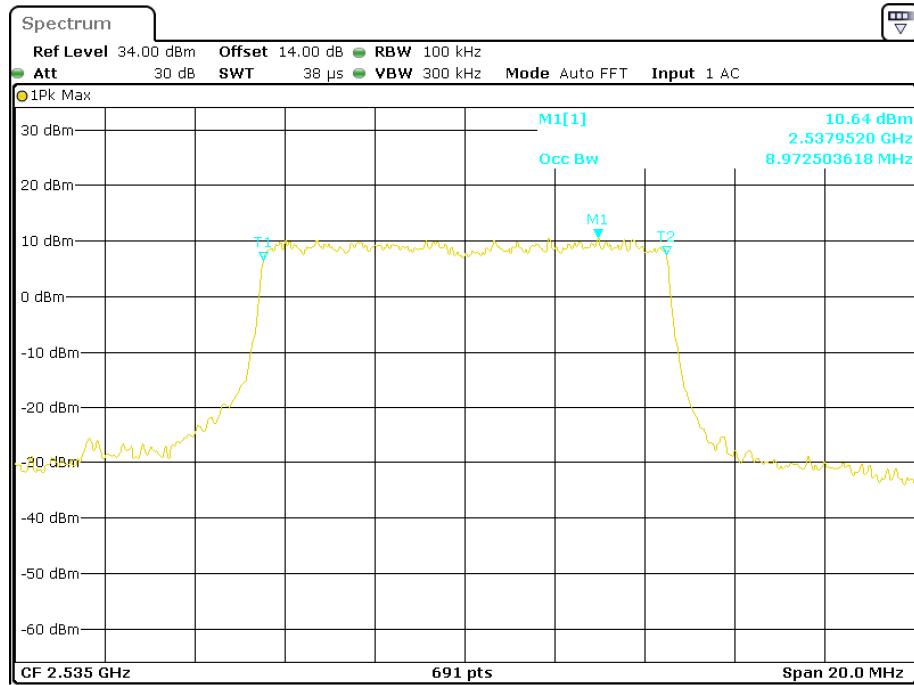
Date: 17.NOV.2017 15:25:04

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

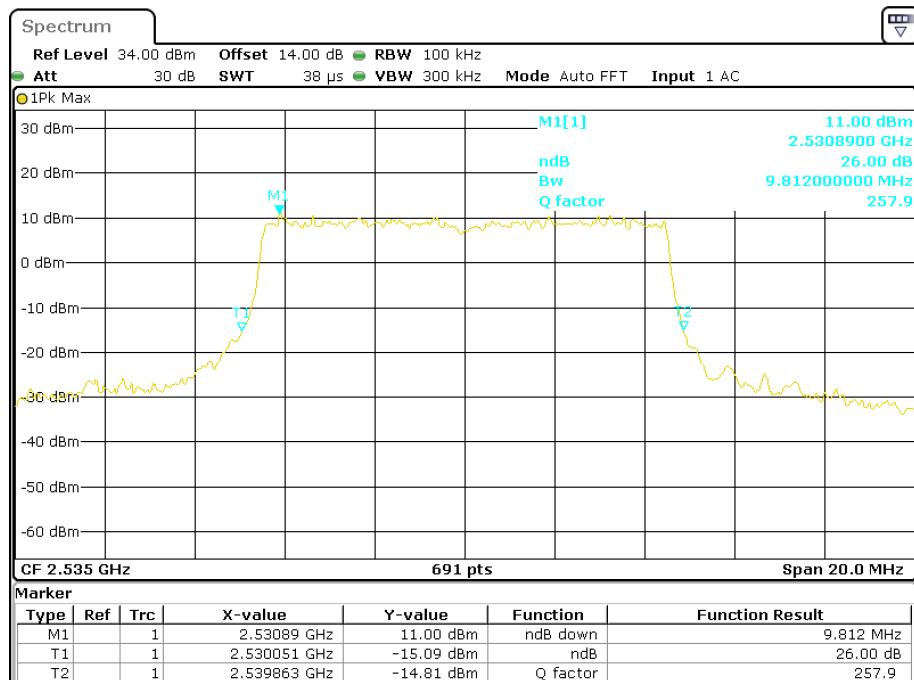
Date: 17.NOV.2017 14:25:56

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

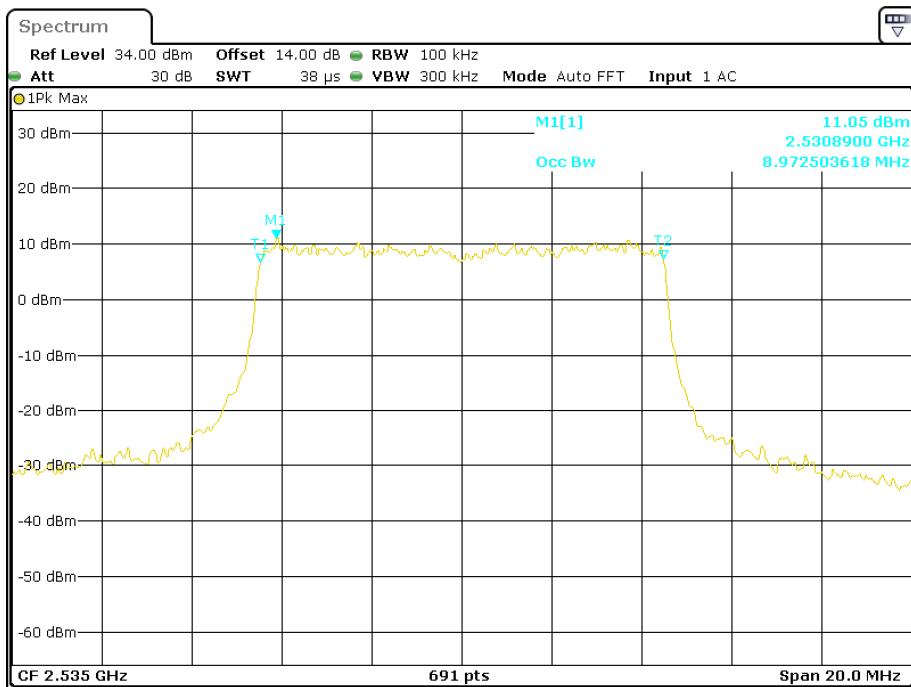
Date: 17.NOV.2017 15:25:43

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

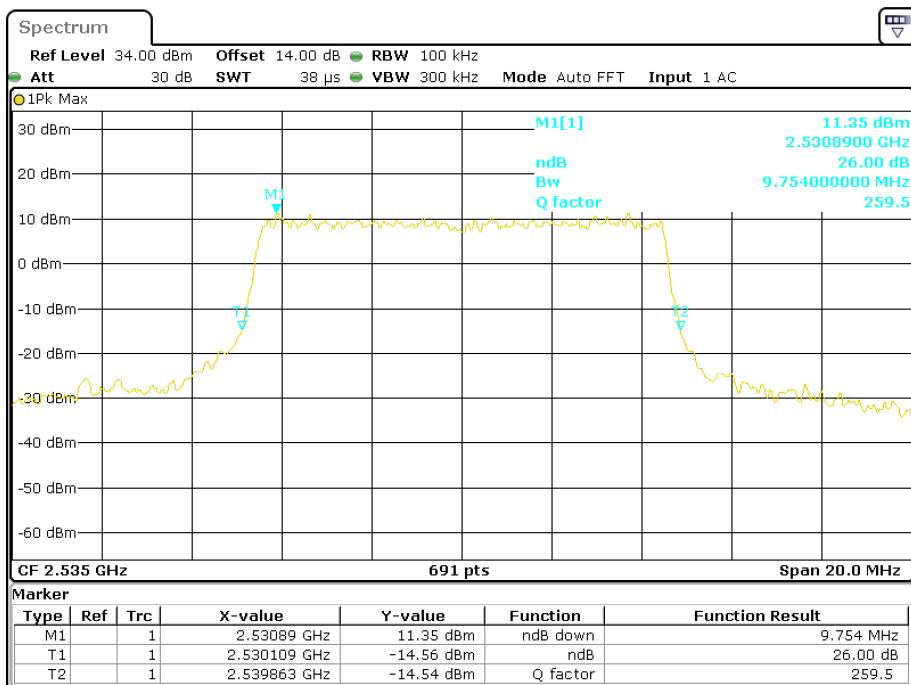
Date: 17.NOV.2017 14:26:59

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

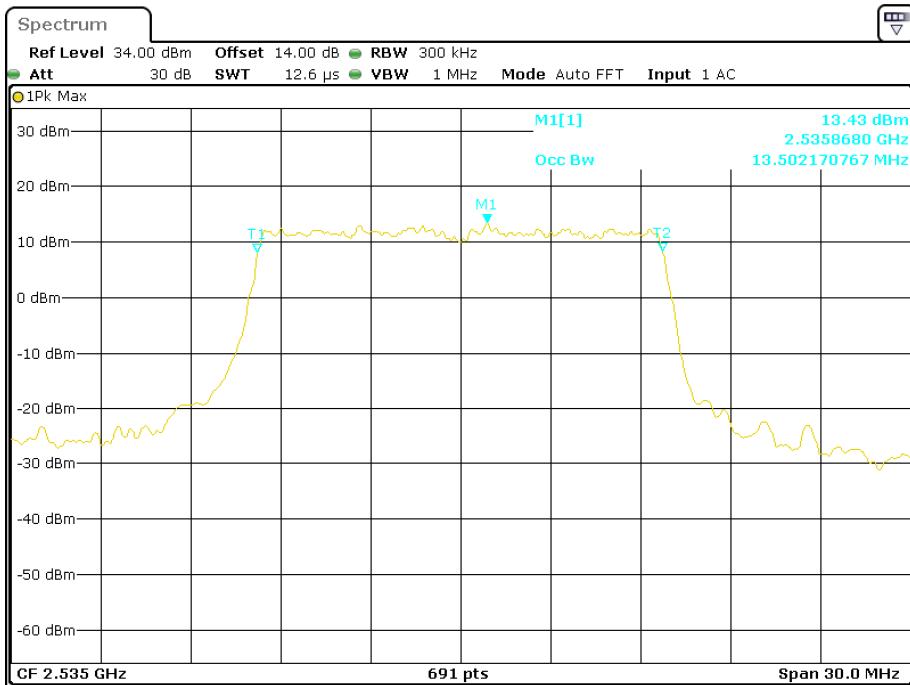
Date: 17.NOV.2017 15:31:09

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

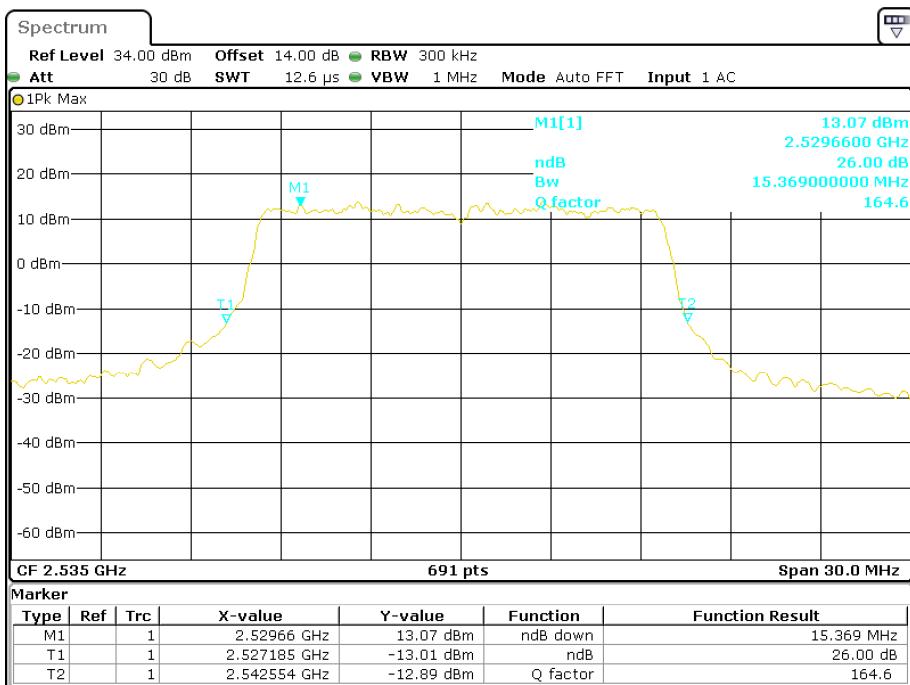
Date: 17.NOV.2017 14:26:25

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

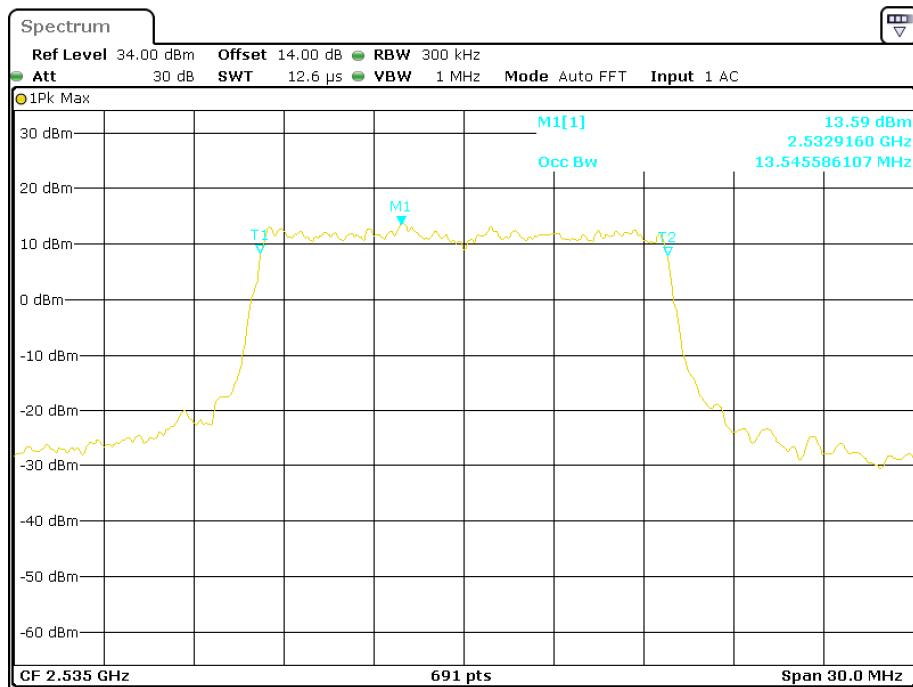
Date: 17.NOV.2017 15:30:30

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

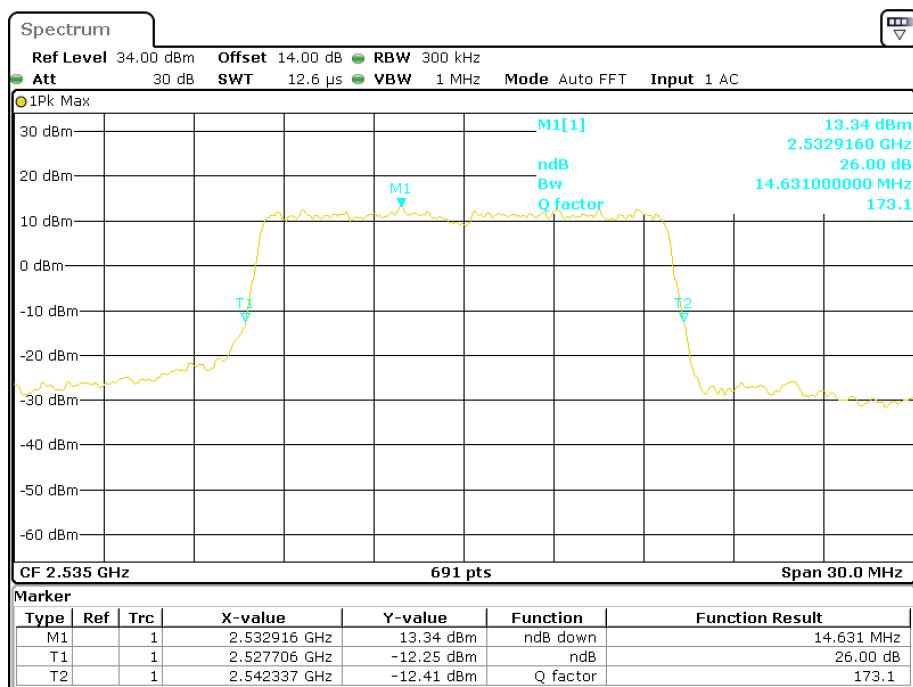
Date: 17.NOV.2017 14:27:37

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

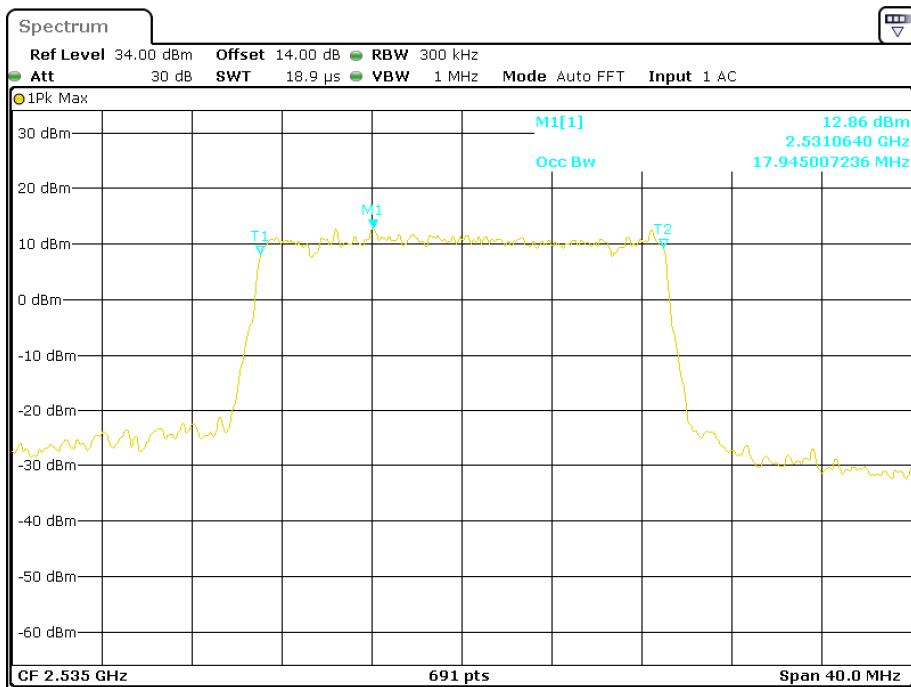
Date: 17.NOV.2017 15:31:48

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

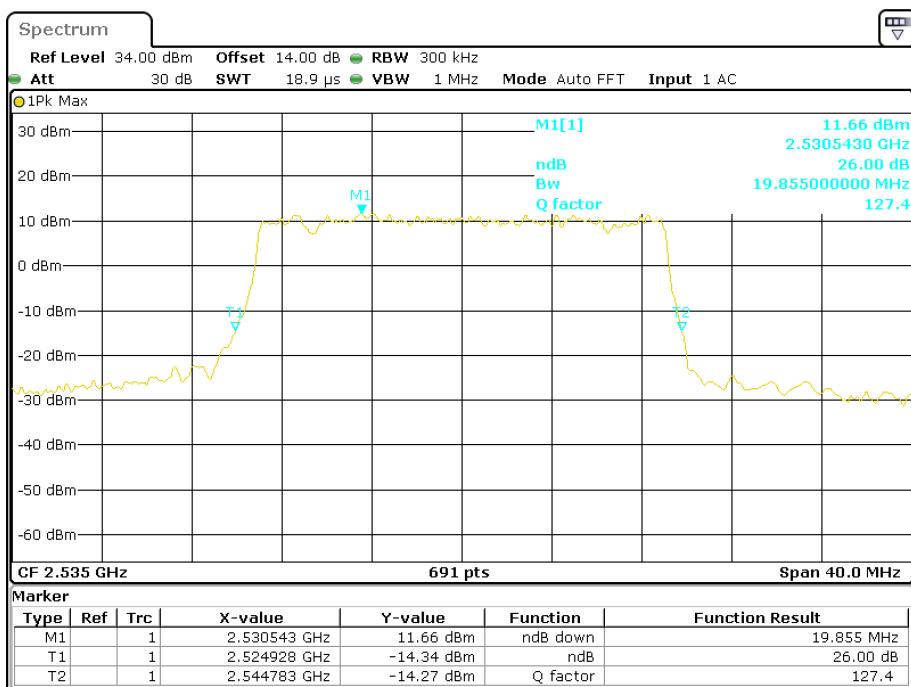
Date: 17.NOV.2017 14:28:02

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

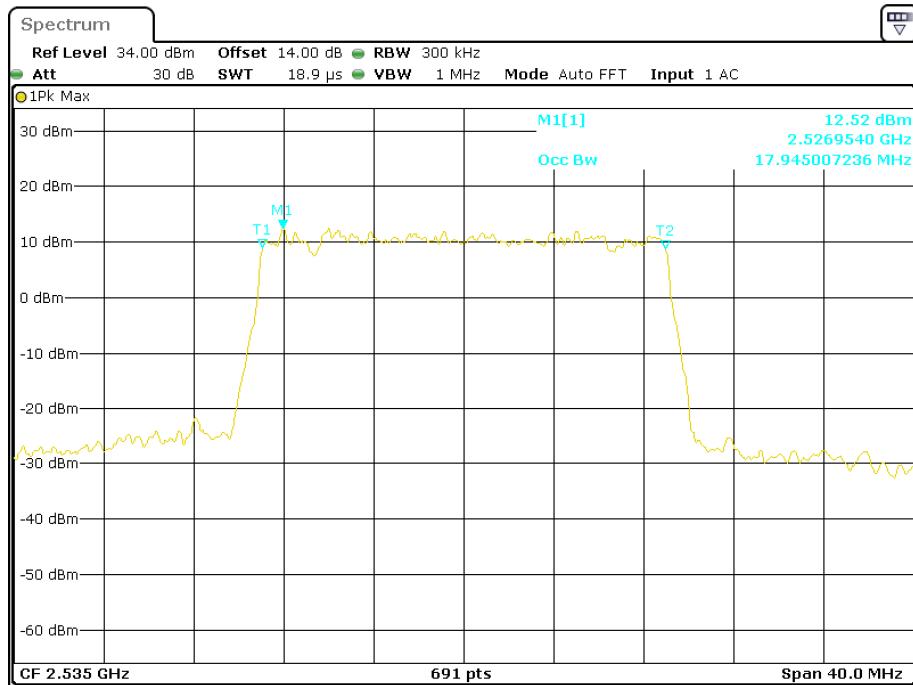
Date: 17.NOV.2017 15:32:14

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

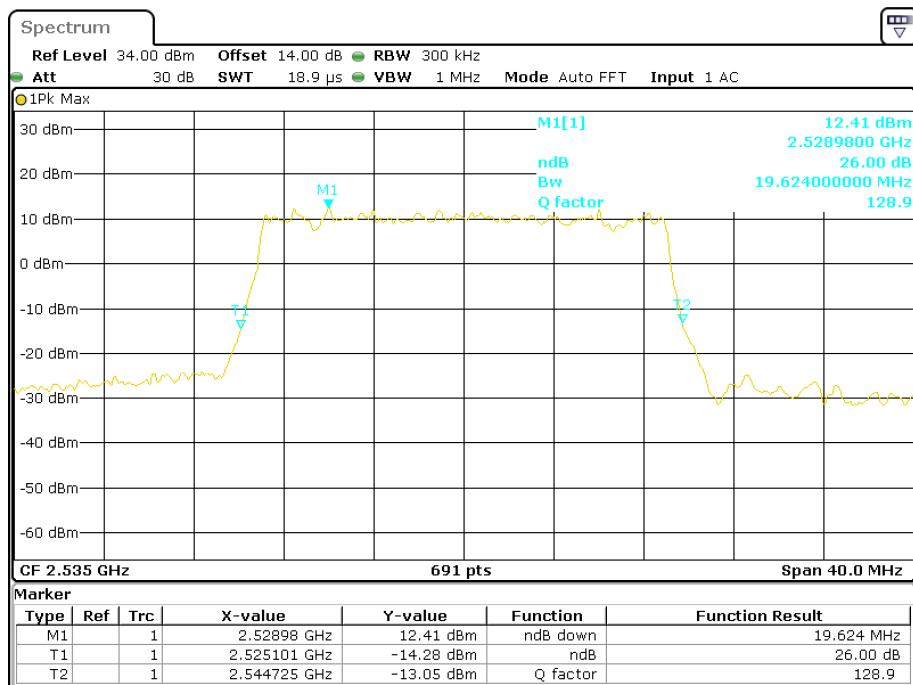
Date: 17.NOV.2017 14:29:05

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

Date: 17.NOV.2017 15:33:16

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

Date: 17.NOV.2017 14:28:33

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

Date: 17.NOV.2017 15:32:41

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

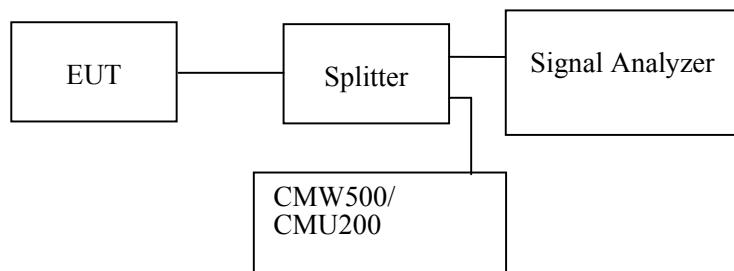
### Applicable Standard

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

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

### Test Procedure

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



### Test Data

#### Environmental Conditions

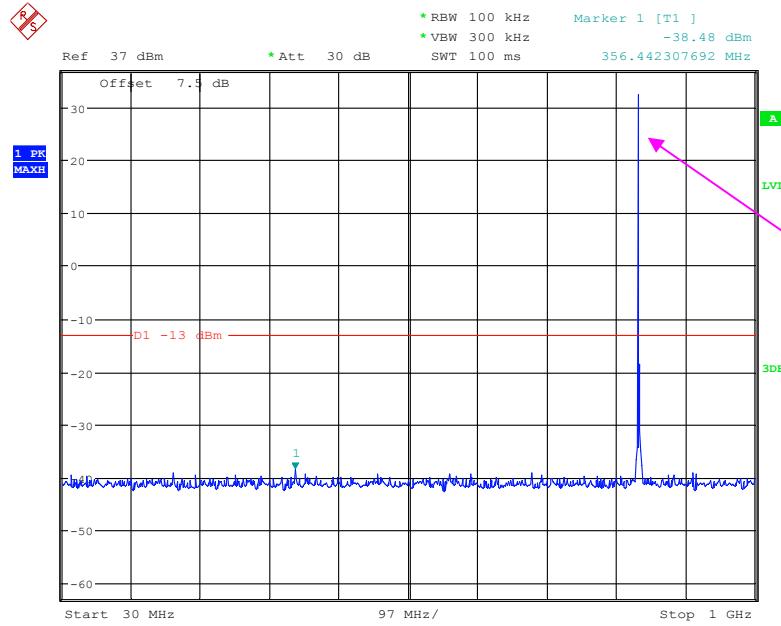
Temperature:	21~24 °C
Relative Humidity:	49~50 %
ATM Pressure:	100.0~101.0 kPa

*The testing was performed by Hill He from 2017-11-18 to 2017-11-27.*

*Test result: Compliance,*

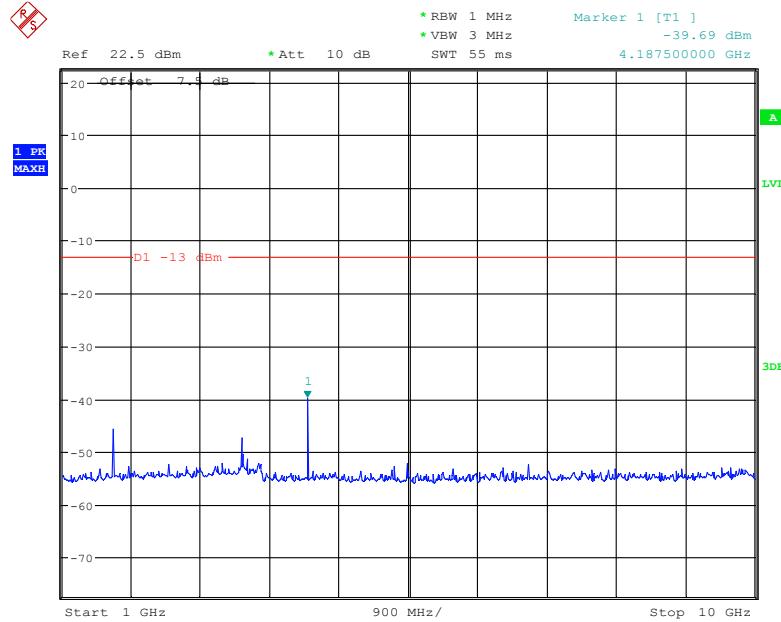
*EUT operation mode: transmitting*

*Please refer to the following plots.*

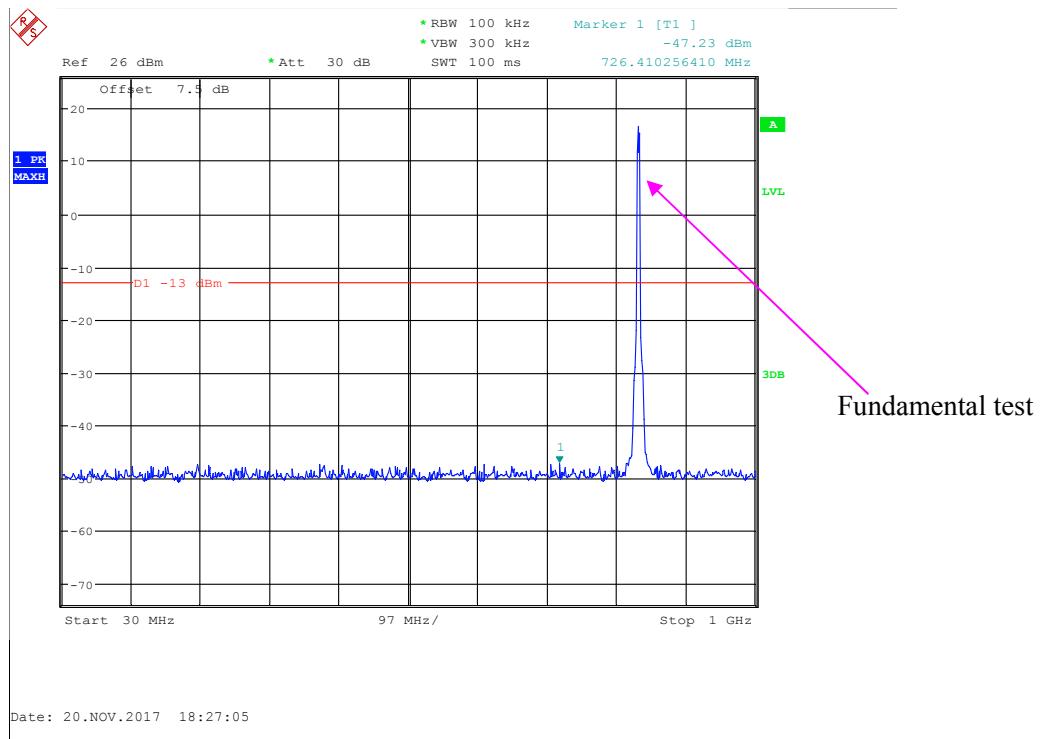
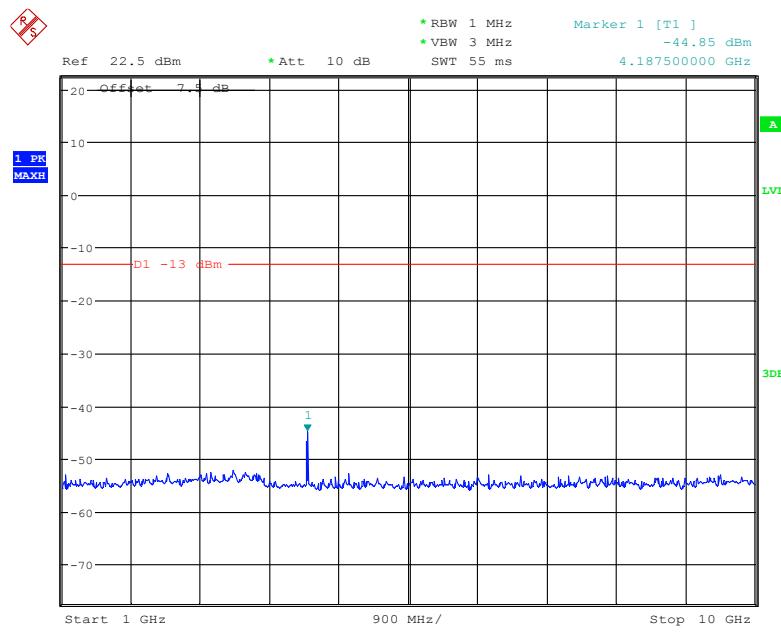
**Cellular Band (Part 22H)****30 MHz – 1 GHz (GSM Mode)**

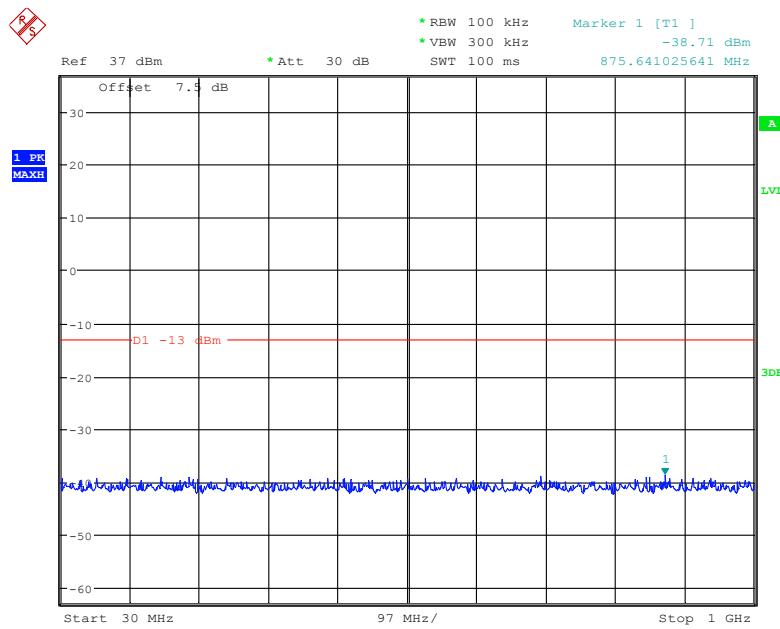
Fundamental test

Date: 20.NOV.2017 18:19:04

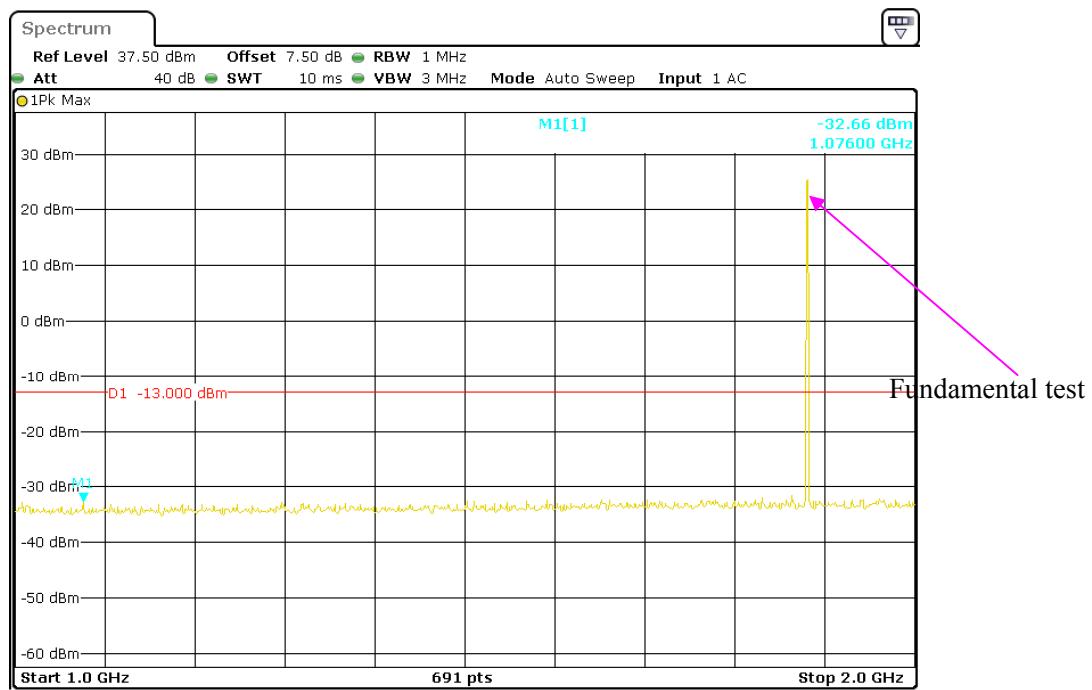
**1 GHz – 10 GHz (GSM Mode)**

Date: 20.NOV.2017 18:17:47

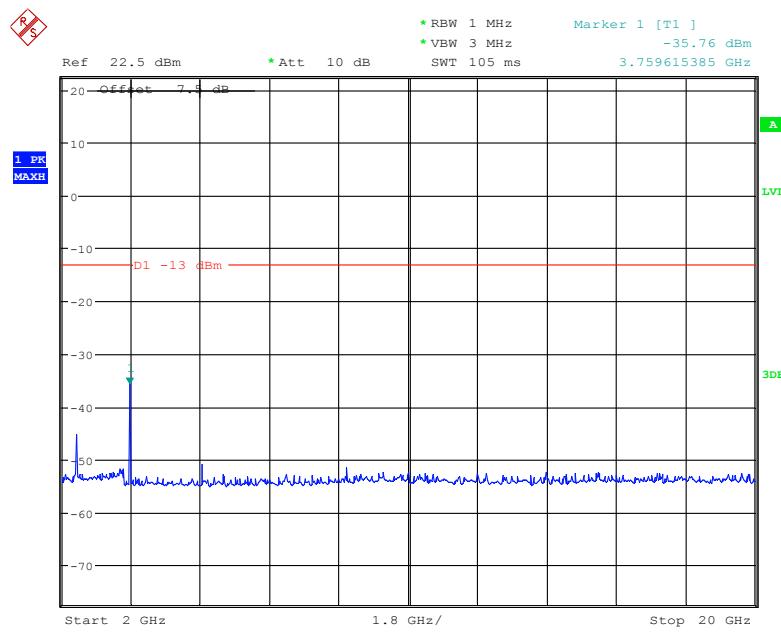
**30 MHz – 1 GHz (WCDMA Mode)****1 GHz – 10 GHz (WCDMA Mode)**

**PCS Band (Part 24E)****30 MHz – 1 GHz (GSM Mode)**

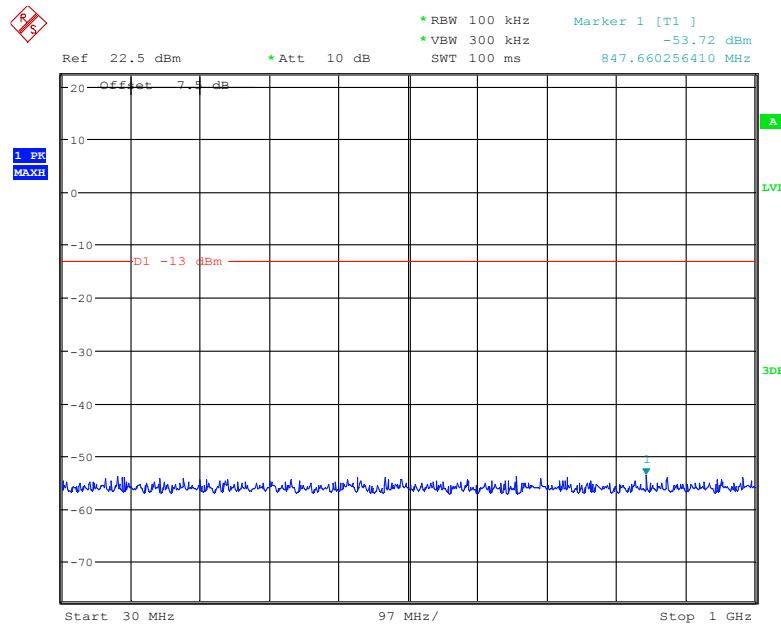
Date: 20.NOV.2017 18:20:42

**1 GHz – 2 GHz (GSM Mode)**

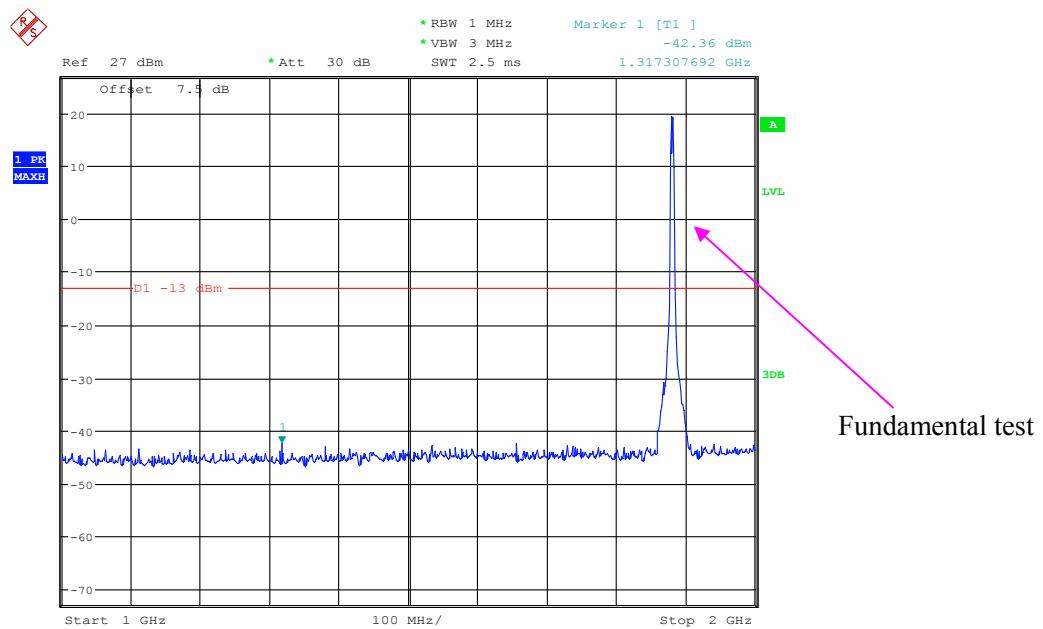
Date: 27.NOV.2017 13:27:36

**2 GHz – 20 GHz (GSM Mode)**

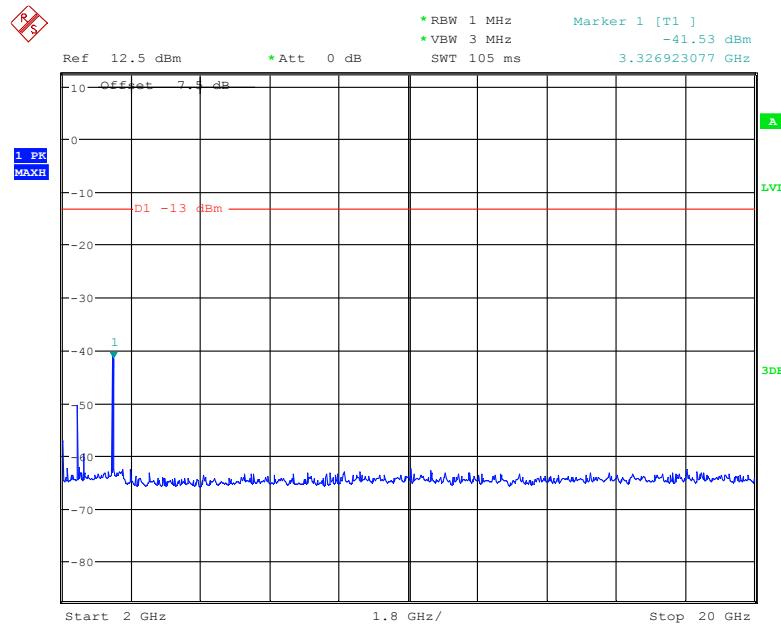
Date: 20.NOV.2017 18:22:01

**30 MHz – 1 GHz (WCDMA Mode)**

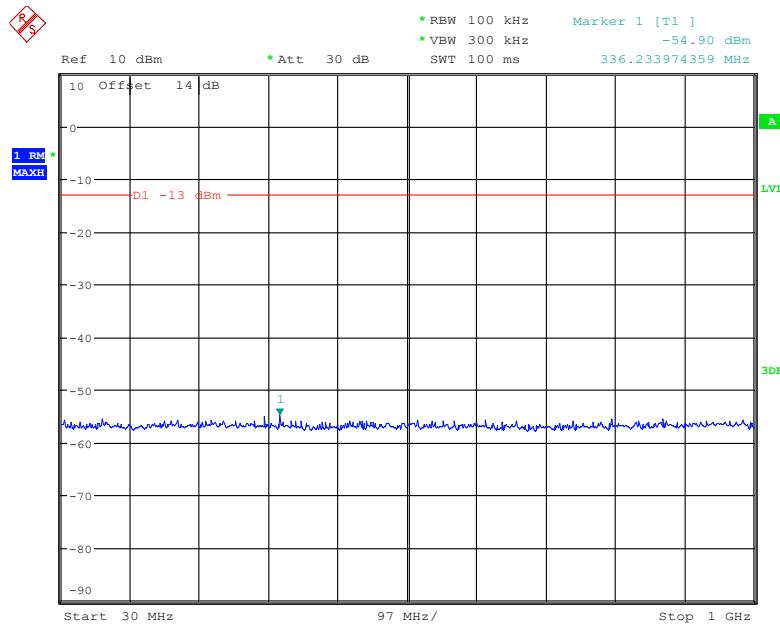
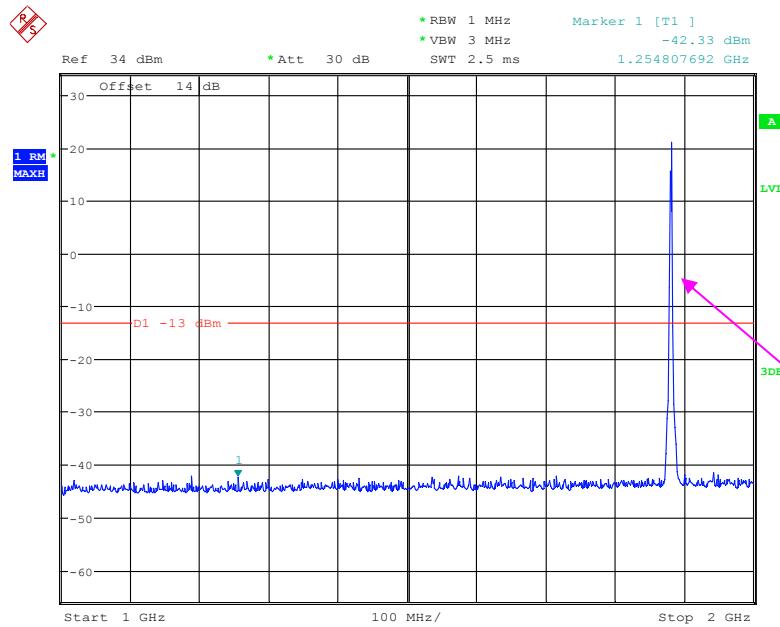
Date: 20.NOV.2017 18:25:53

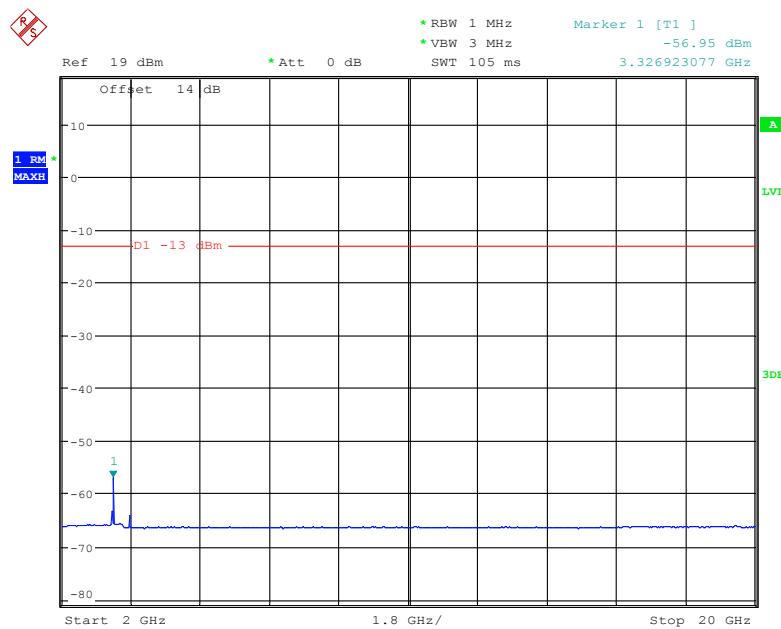
**1 GHz – 2 GHz (WCDMA Mode)**

Date: 20.NOV.2017 18:25:07

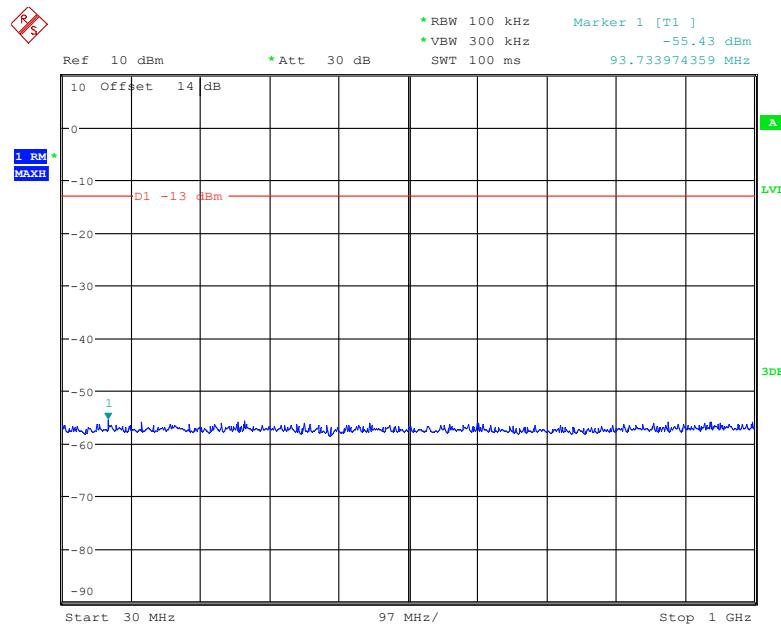
**2 GHz – 20 GHz (WCDMA Mode)**

Date: 20.NOV.2017 18:24:22

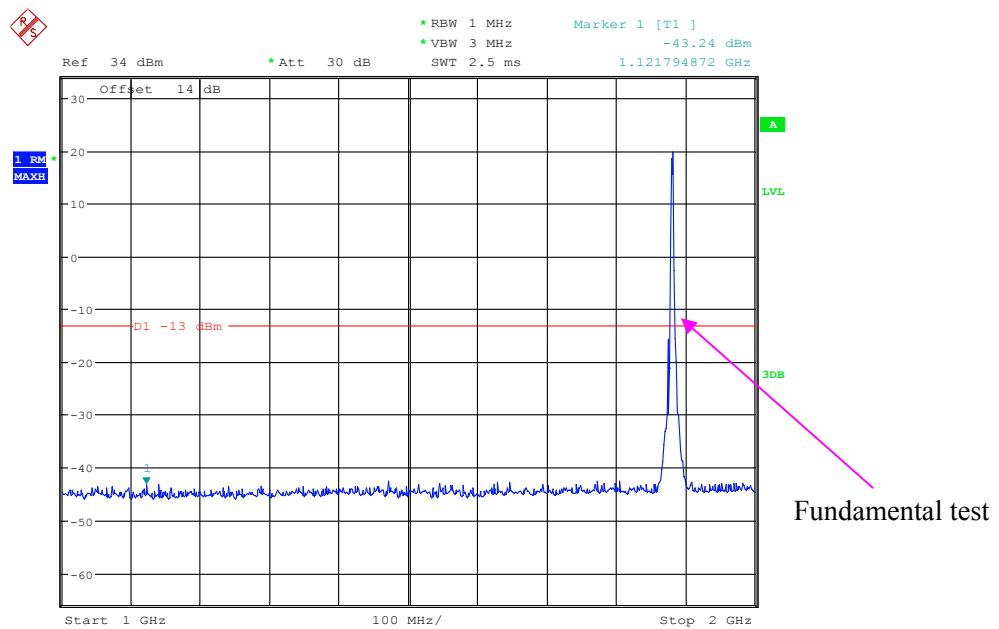
**LTE Band 2:****30 MHz - 1 GHz (1.4 MHz, Middle Channel)****1 GHz – 2 GHz (1.4 MHz, Middle Channel)**

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

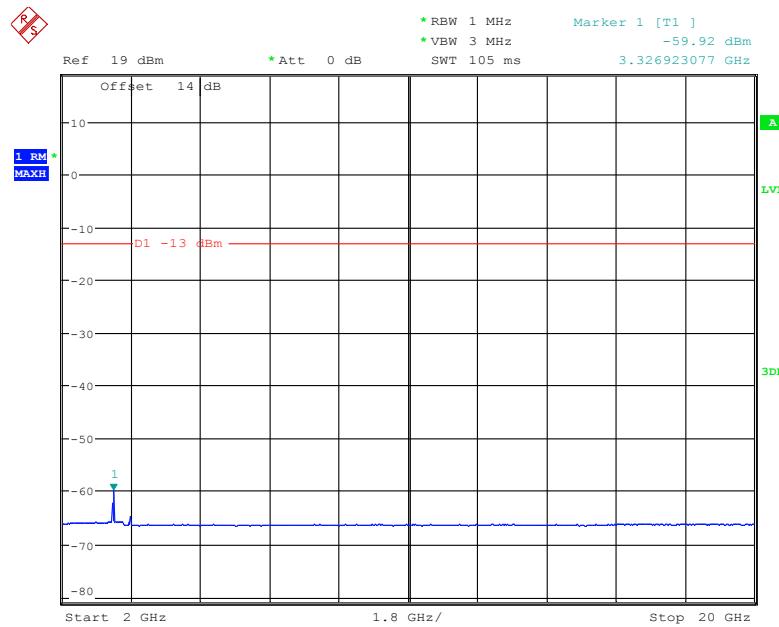
Date: 18.NOV.2017 08:40:00

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

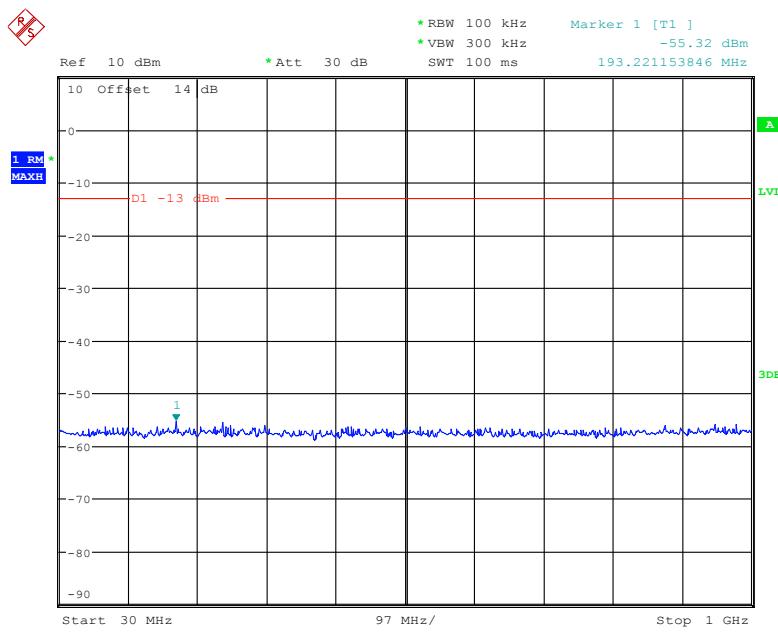
Date: 18.NOV.2017 08:35:02

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

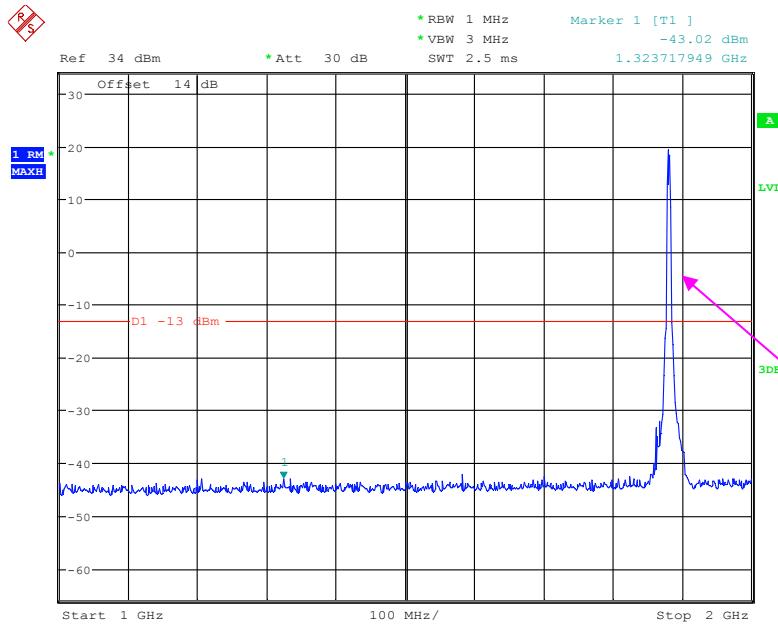
Date: 18.NOV.2017 08:38:07

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

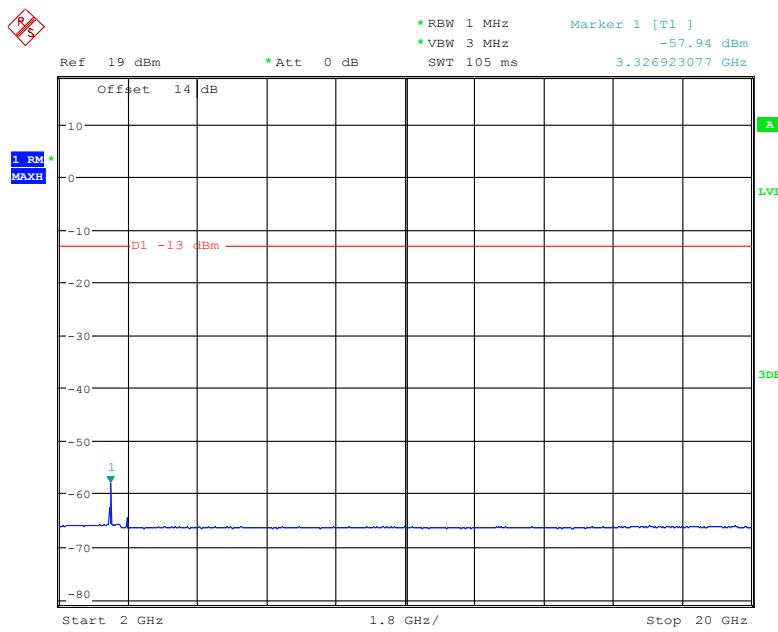
Date: 18.NOV.2017 08:40:47

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

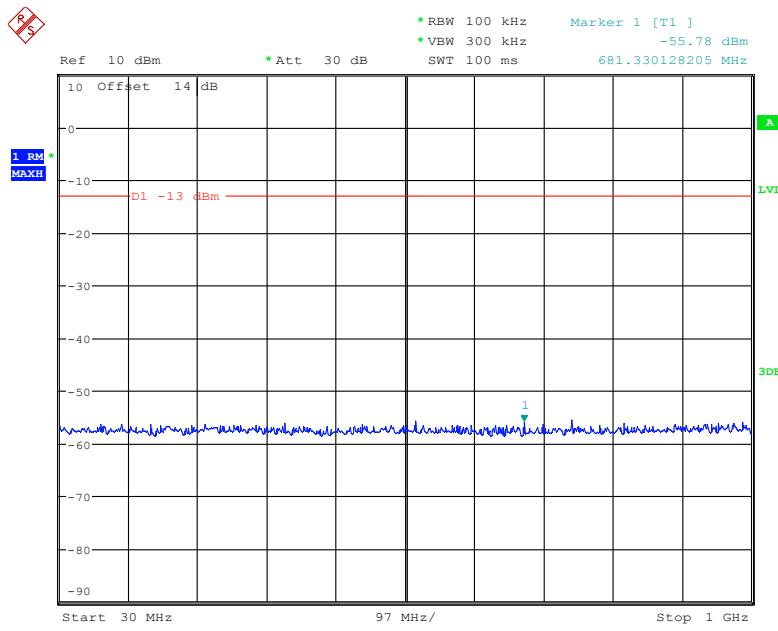
Date: 18.NOV.2017 08:35:32

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

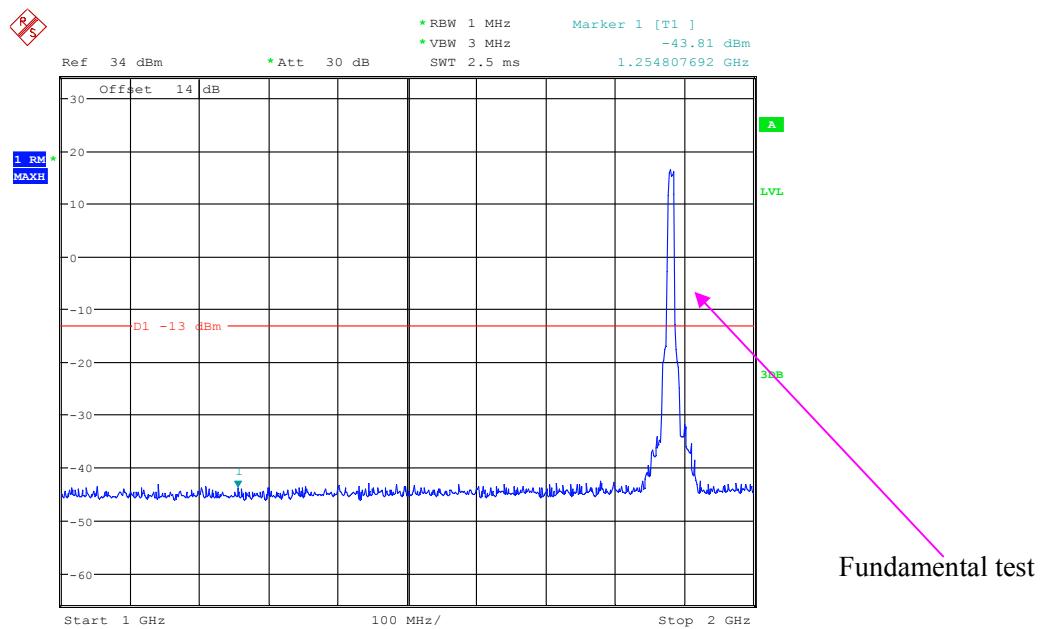
Date: 18.NOV.2017 08:38:31

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

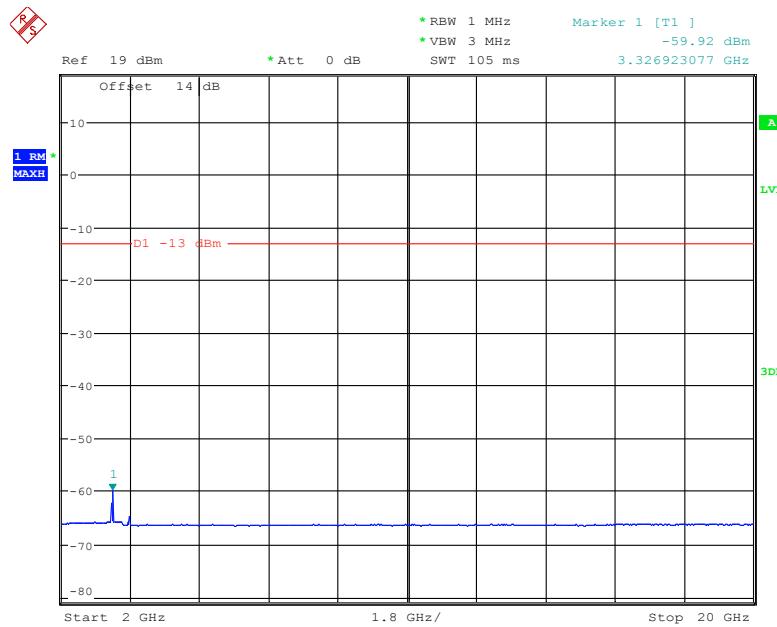
Date: 18.NOV.2017 08:40:33

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

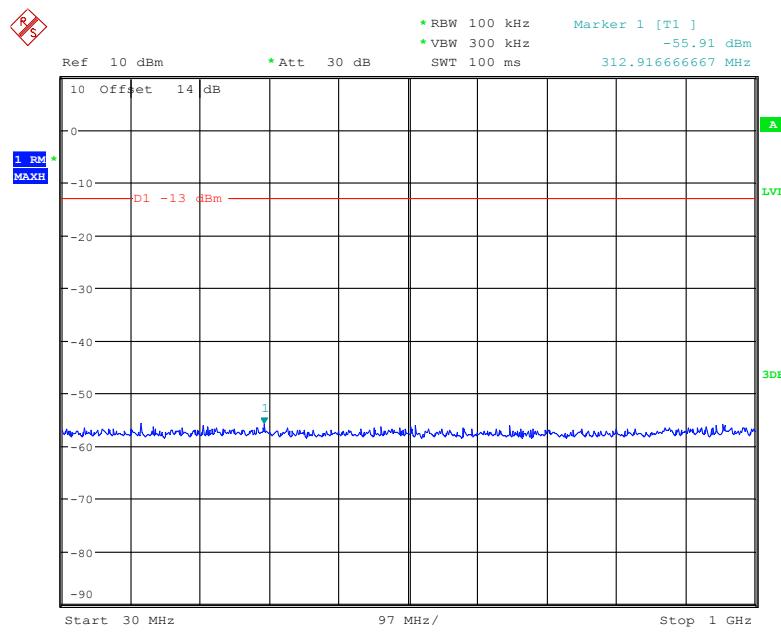
Date: 18.NOV.2017 08:35:46

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

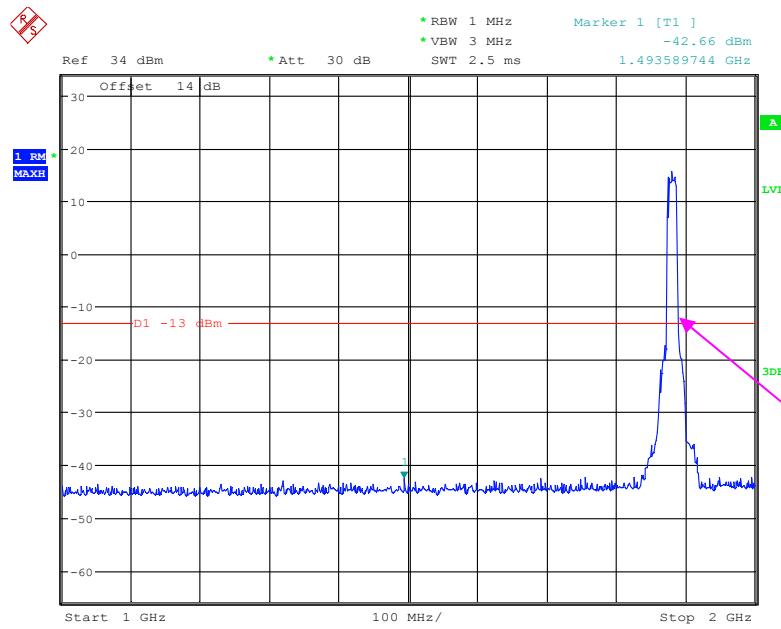
Date: 18.NOV.2017 08:38:54

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

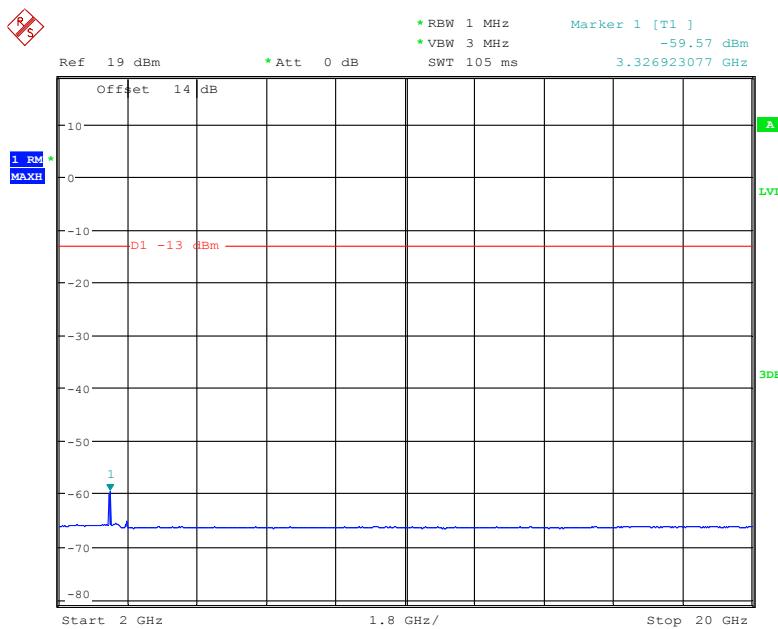
Date: 18.NOV.2017 08:40:47

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

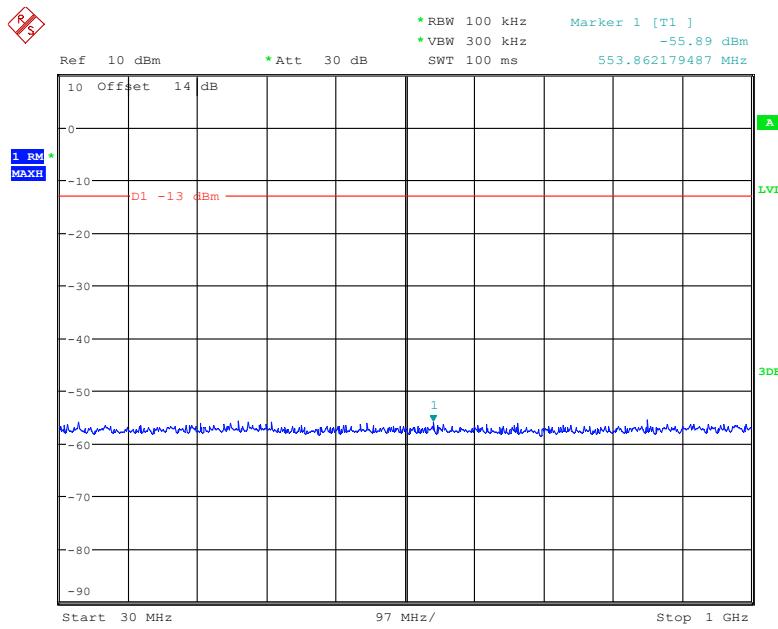
Date: 18.NOV.2017 08:36:00

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

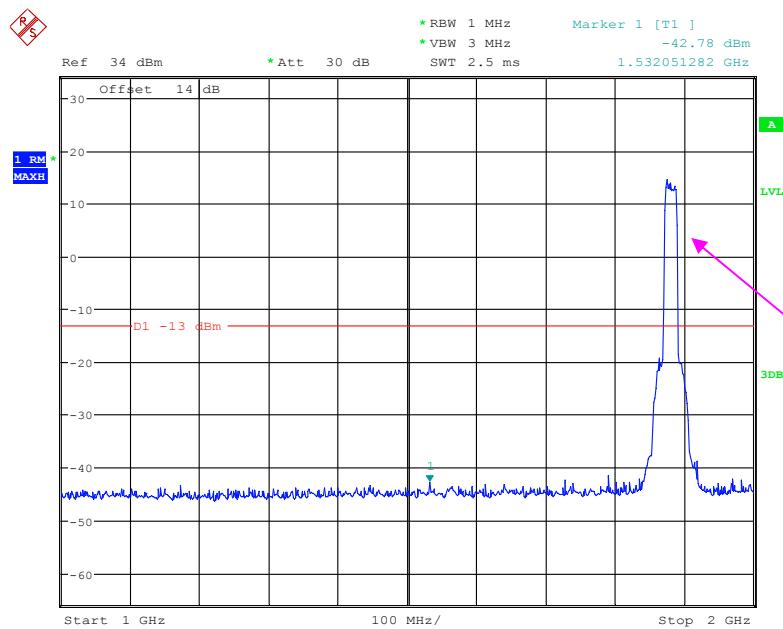
Date: 18.NOV.2017 08:39:19

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

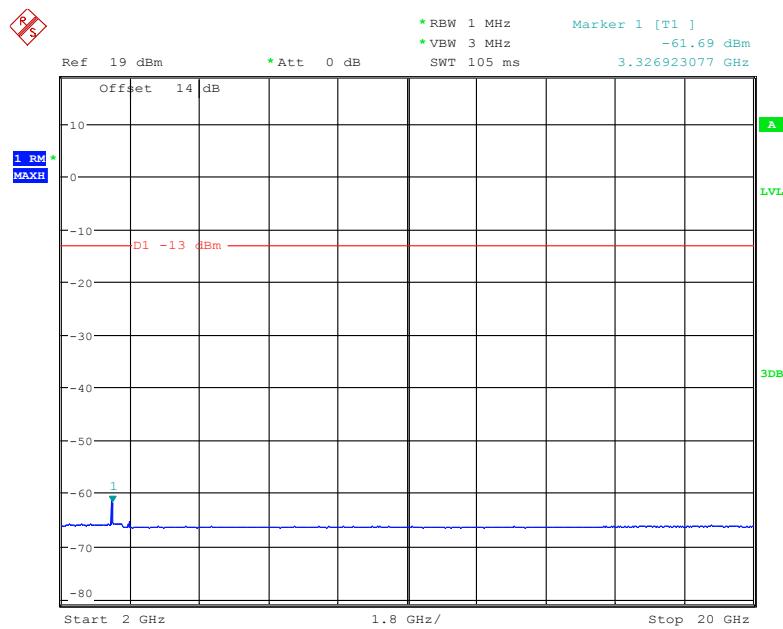
Date: 18.NOV.2017 08:41:00

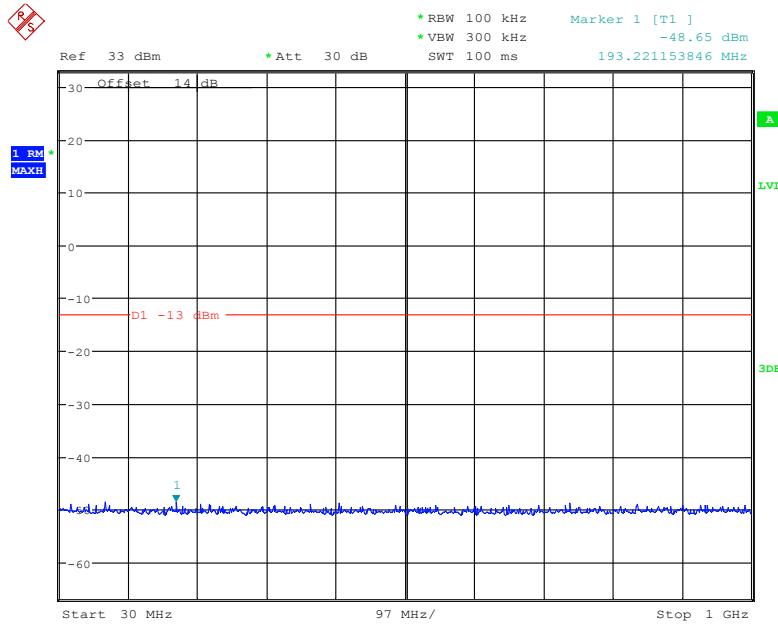
**30 MHz - 1 GHz (20.0 MHz, Middle Channel)**

Date: 18.NOV.2017 08:36:15

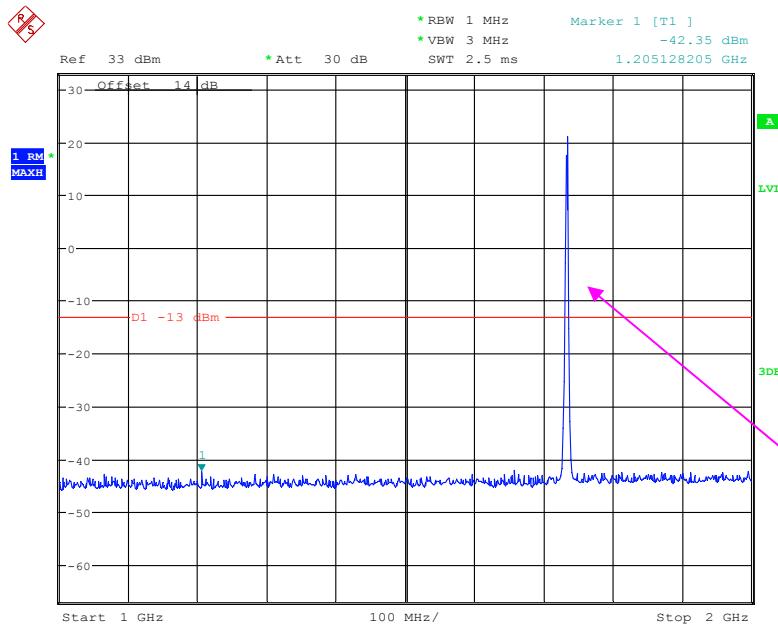
**1 GHz – 2 GHz (20.0 MHz, Middle Channel)**

Fundamental test

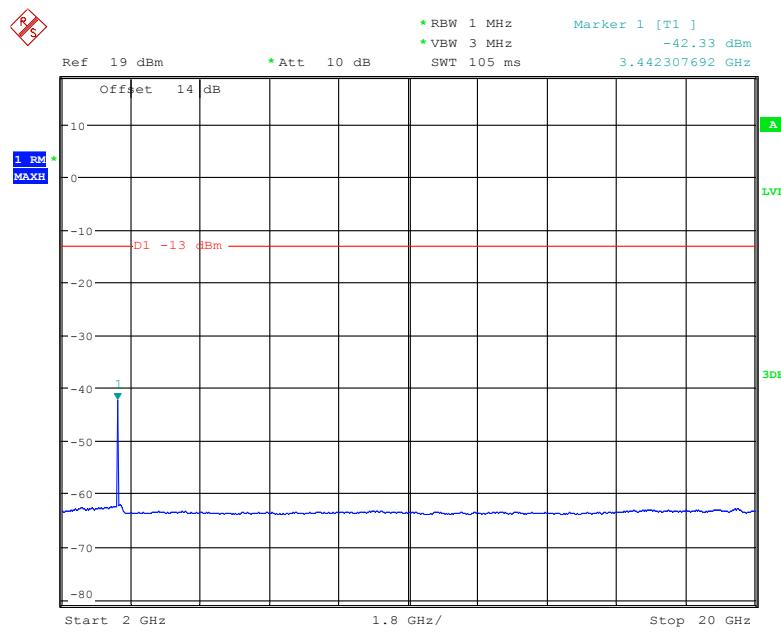
**2 GHz –20 GHz (20.0 MHz, Middle Channel)**

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

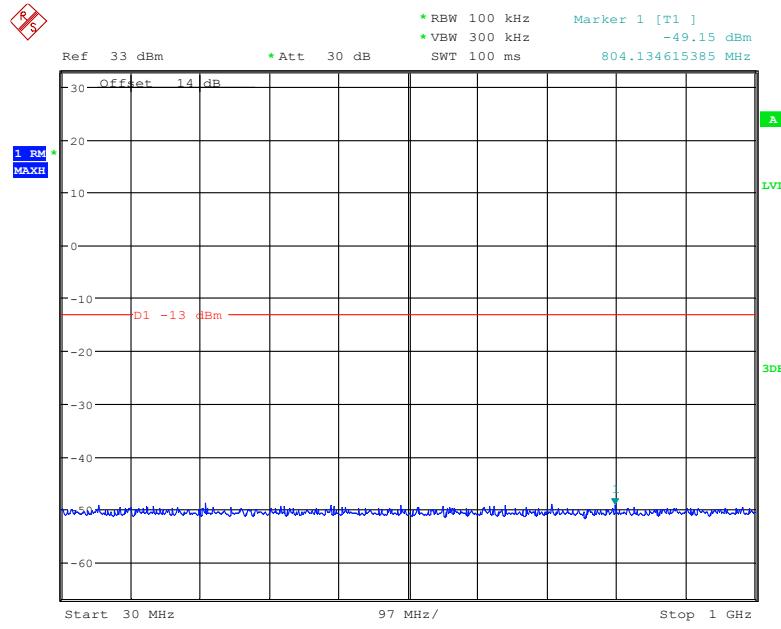
Date: 18.NOV.2017 08:48:19

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

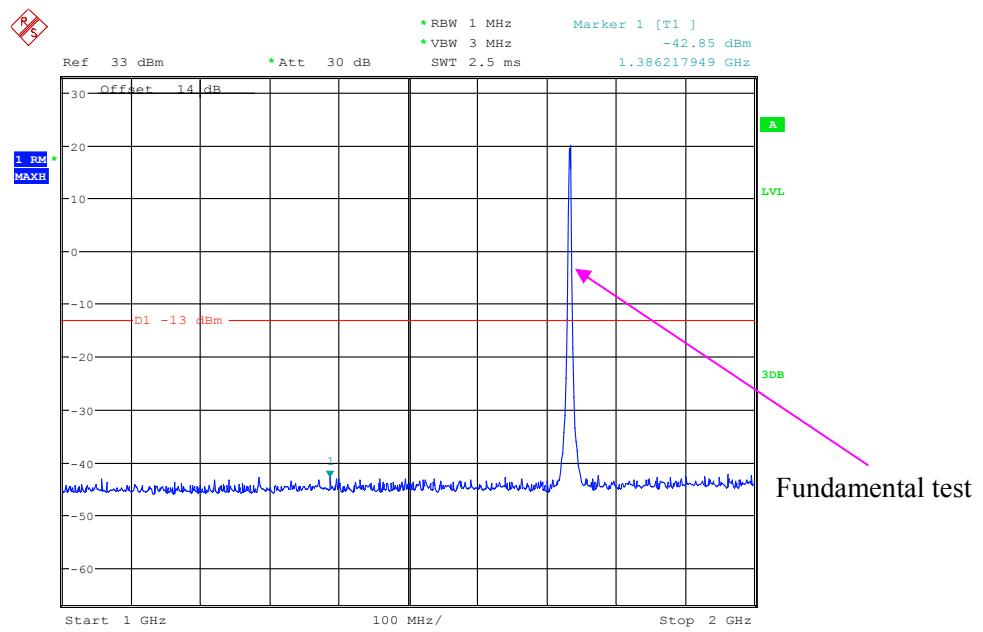
Date: 18.NOV.2017 08:44:43

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

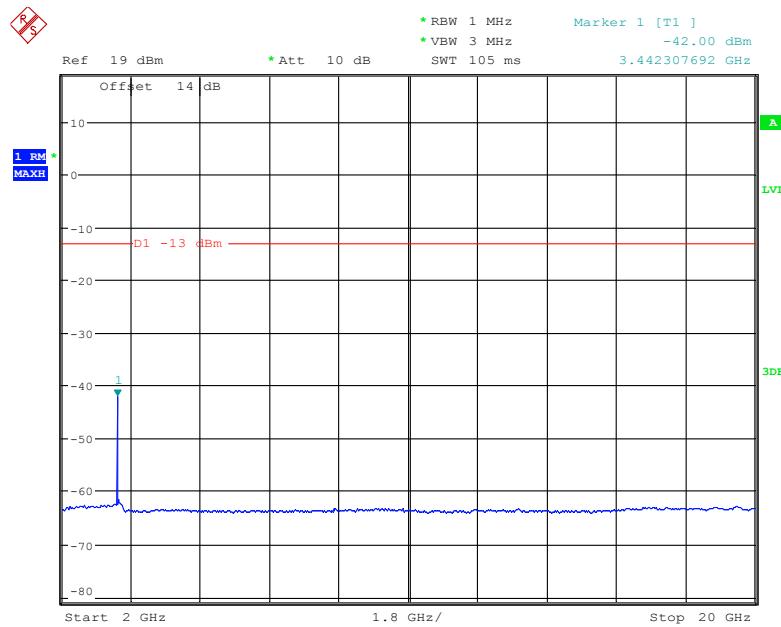
Date: 18.NOV.2017 08:42:45

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

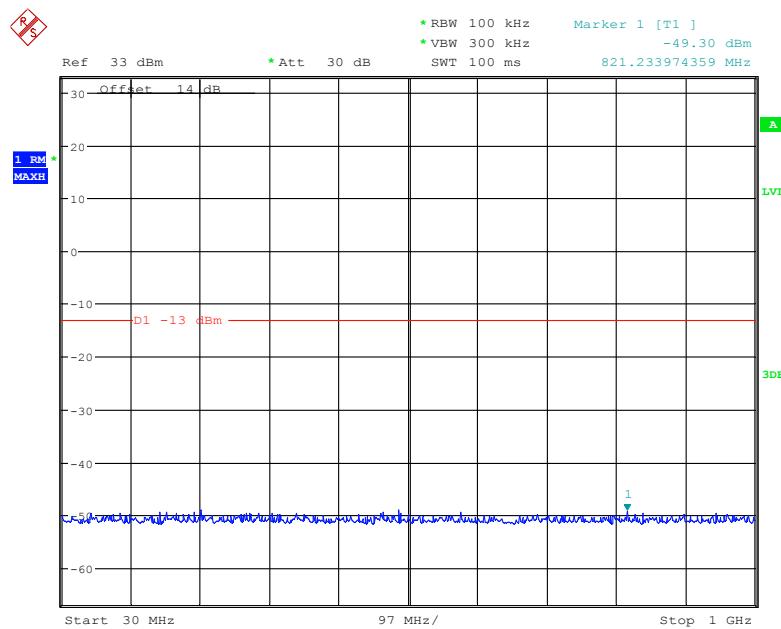
Date: 18.NOV.2017 08:49:38

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

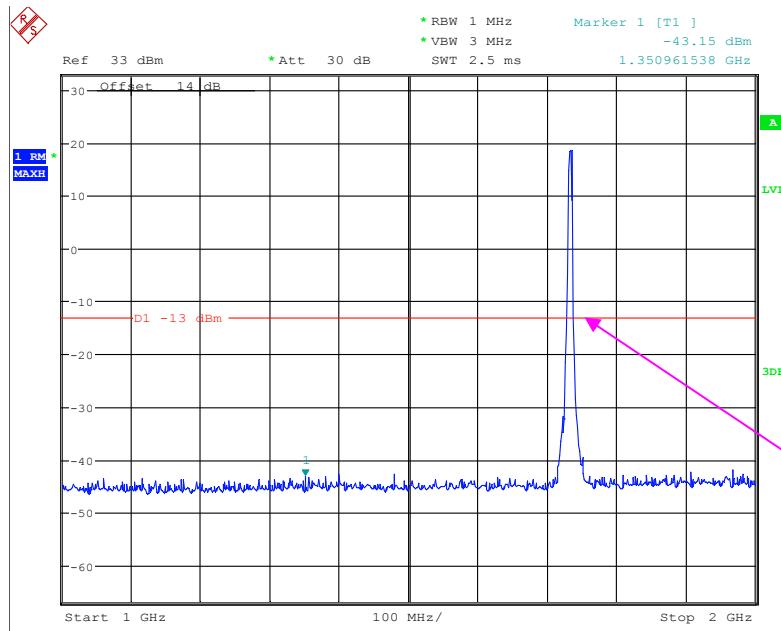
Date: 18.NOV.2017 08:45:38

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

Date: 18.NOV.2017 08:43:05

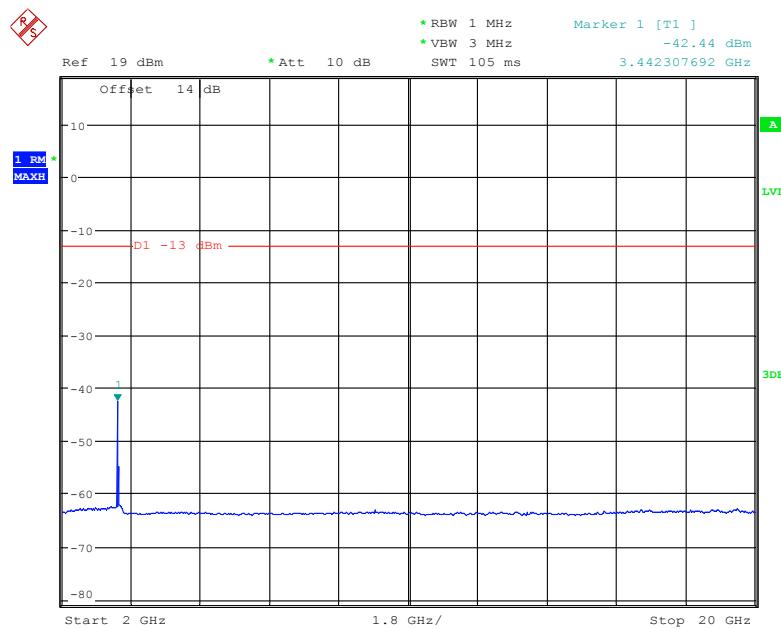
**30 MHz - 1 GHz (5.0 MHz, Middle Channel)**

Date: 18.NOV.2017 08:49:53

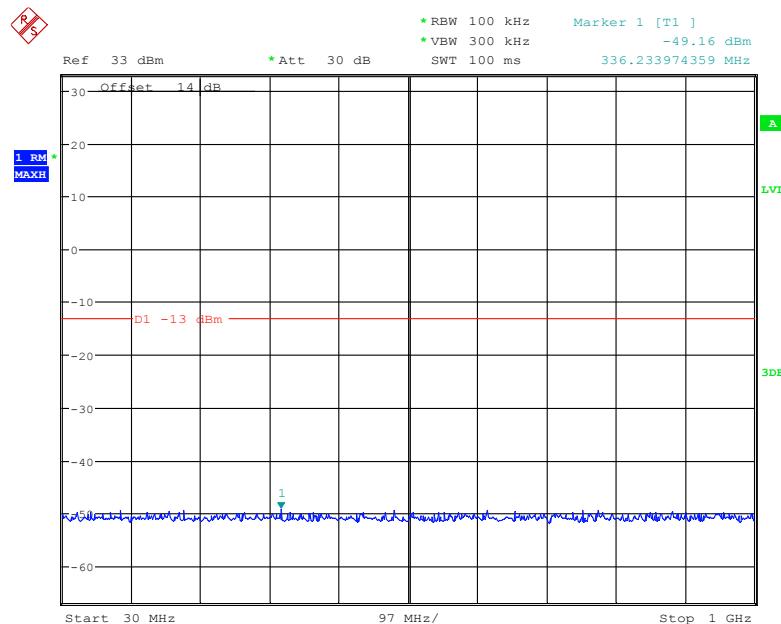
**1 GHz - 2 GHz (5.0 MHz, Middle Channel)**

Fundamental test

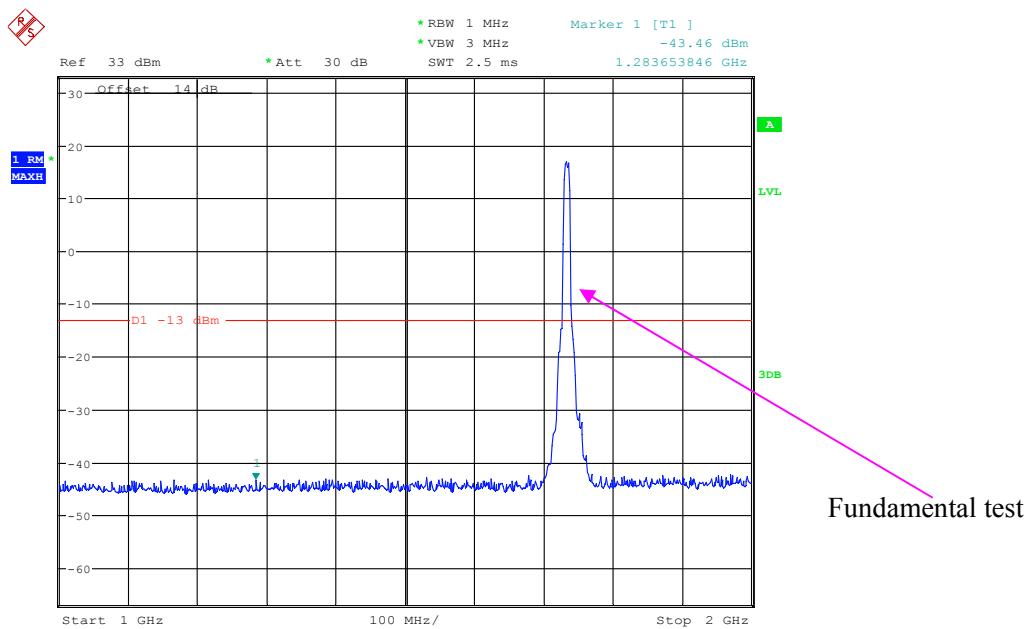
Date: 18.NOV.2017 08:46:03

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

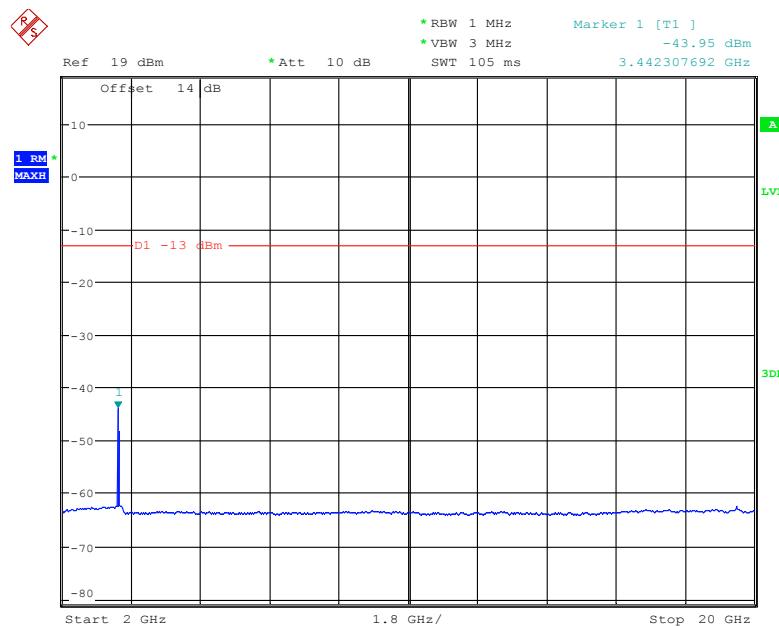
Date: 18.NOV.2017 08:43:18

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

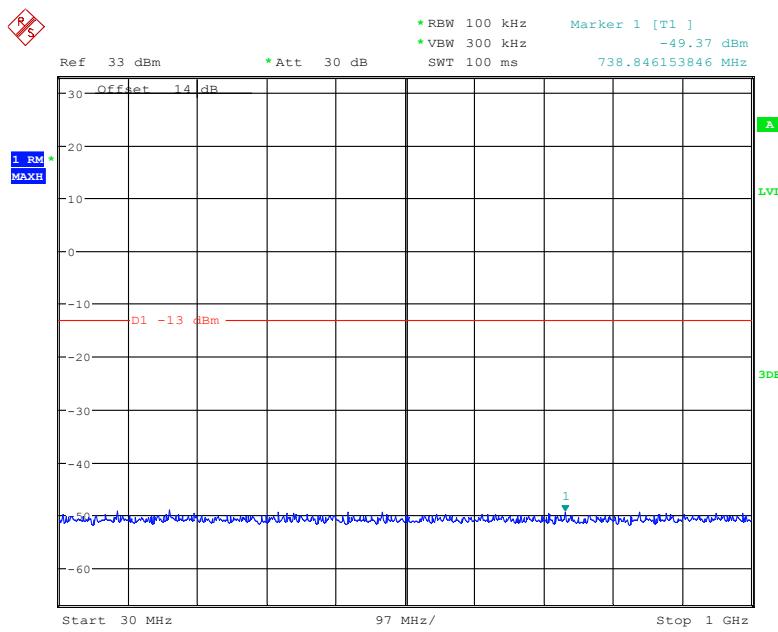
Date: 18.NOV.2017 08:50:06

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

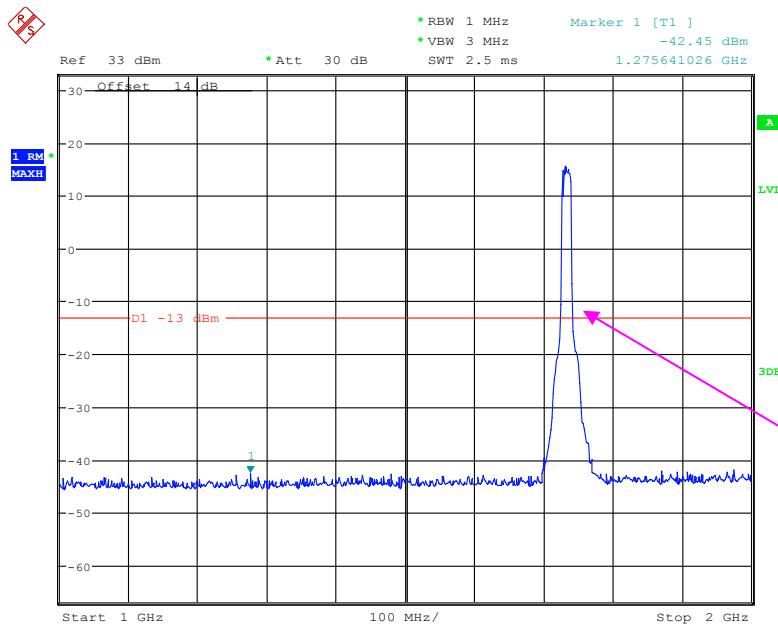
Date: 18.NOV.2017 08:46:30

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

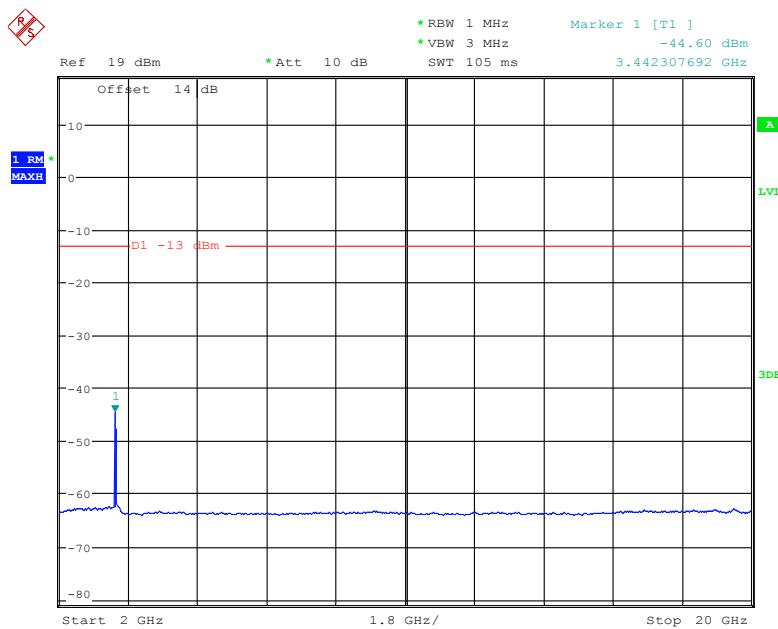
Date: 18.NOV.2017 08:43:30

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

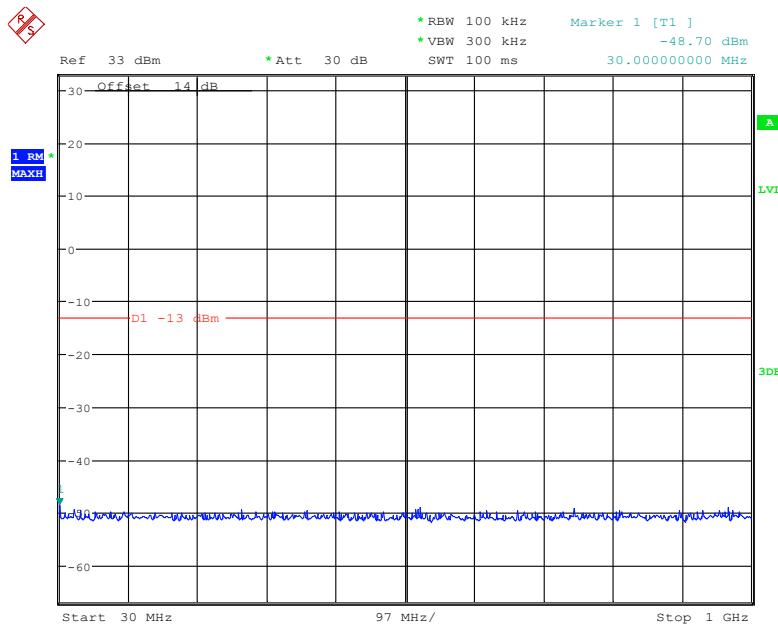
Date: 18.NOV.2017 08:50:19

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

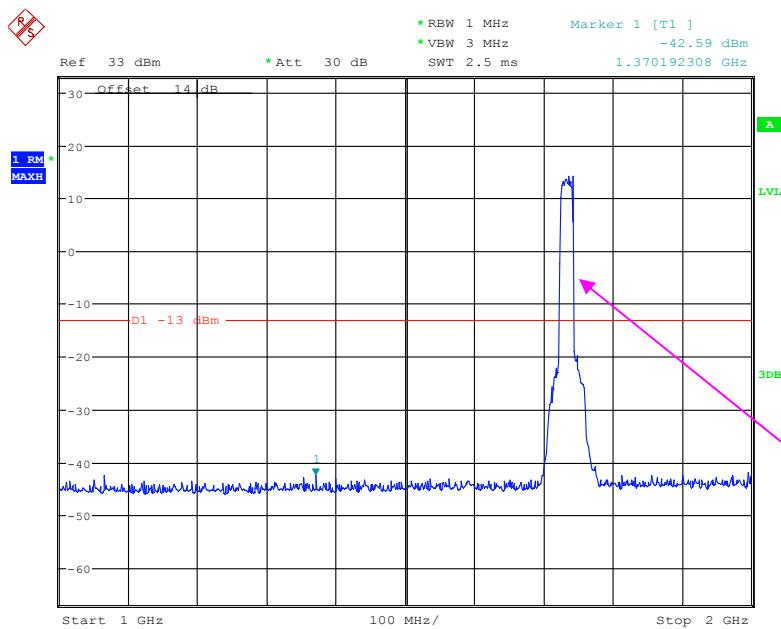
Date: 18.NOV.2017 08:47:12

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

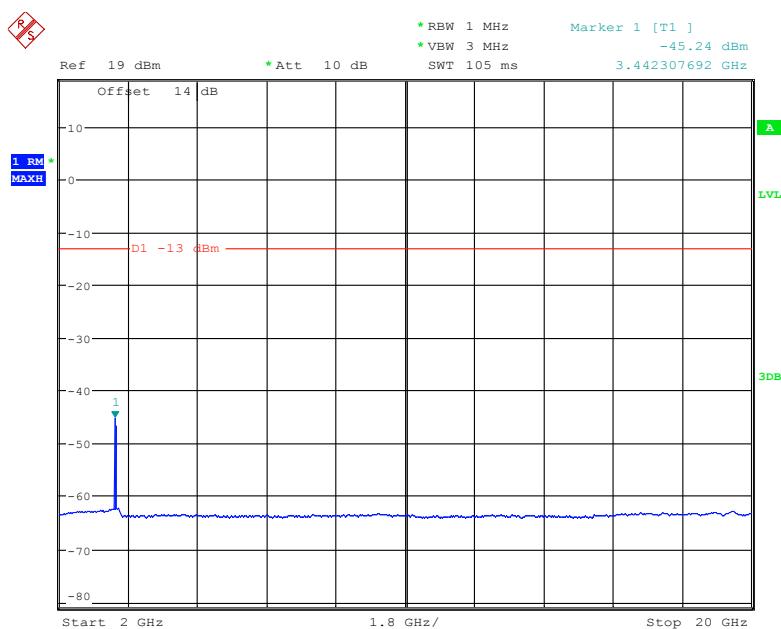
Date: 18.NOV.2017 08:43:42

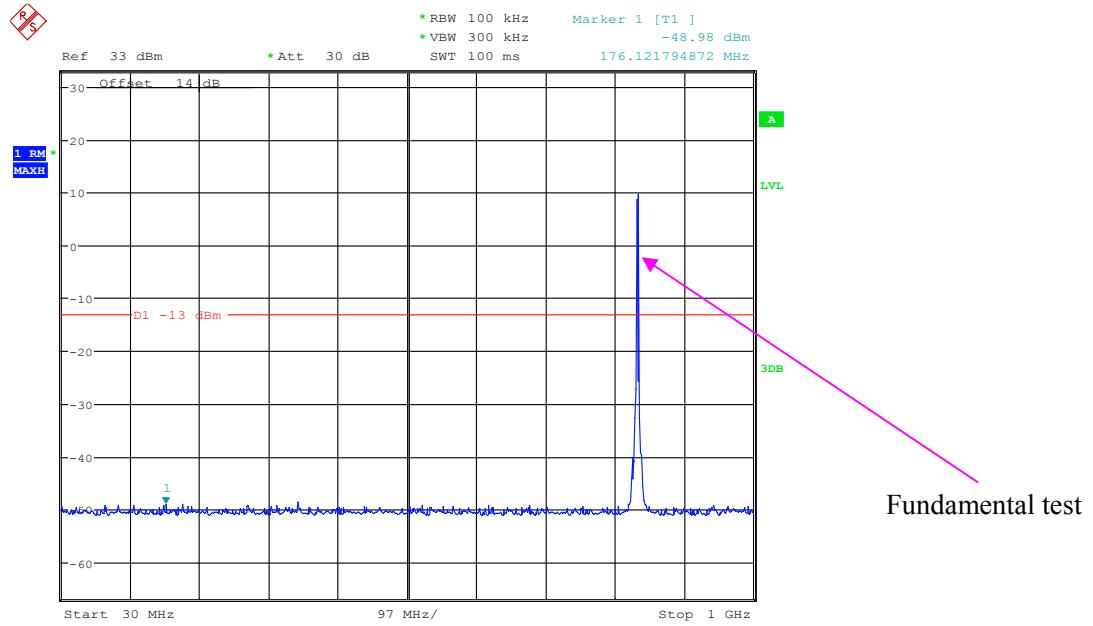
**30 MHz - 1 GHz (20.0 MHz, Middle Channel)**

Date: 18.NOV.2017 08:50:32

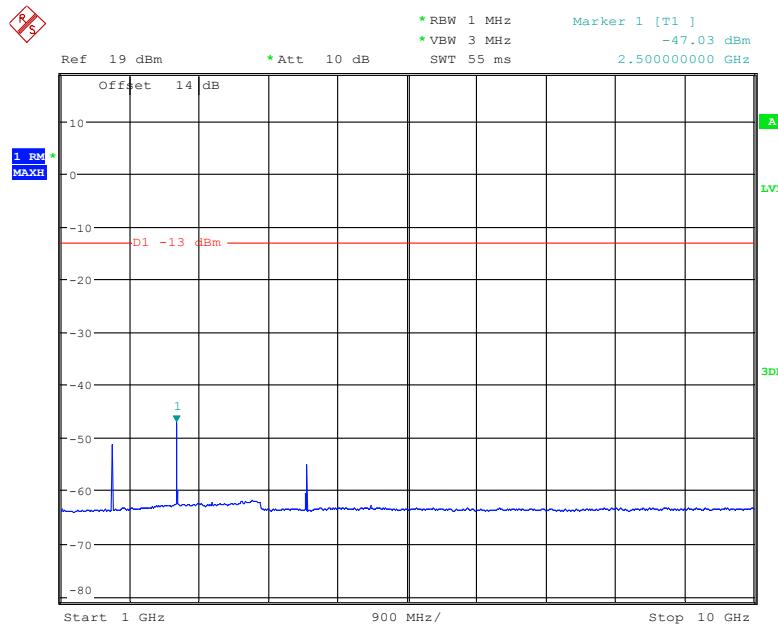
**1 GHz – 2 GHz (20.0 MHz, Middle Channel)**

Fundamental test

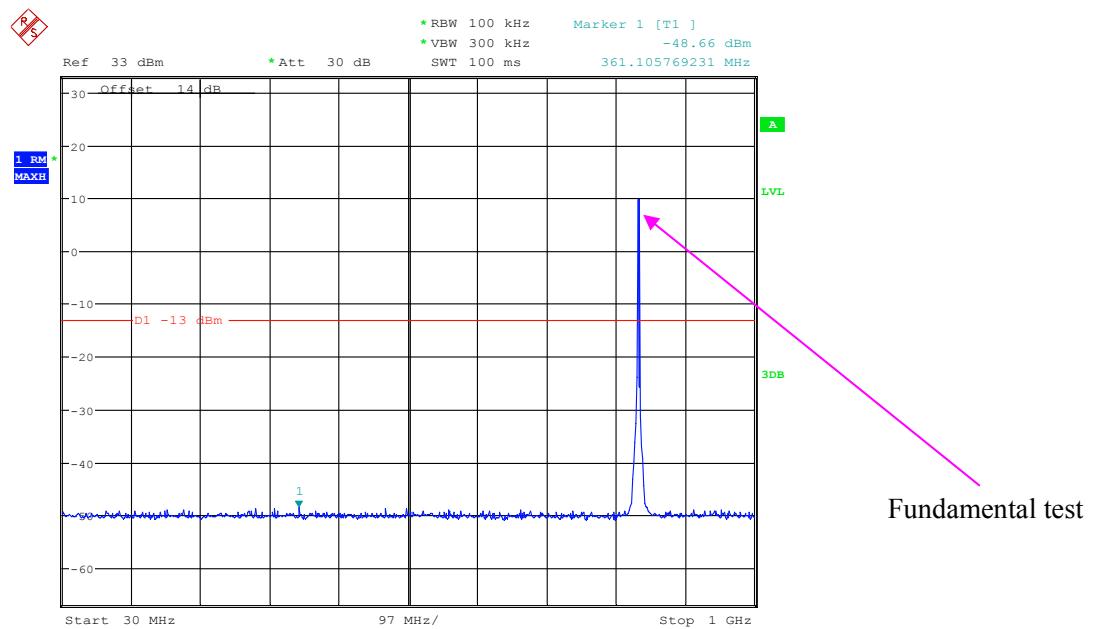
**2 GHz – 20 GHz (20.0 MHz, Middle Channel)**

**LTE Band 5:****30 MHz - 1 GHz (1.4 MHz, Middle Channel)**

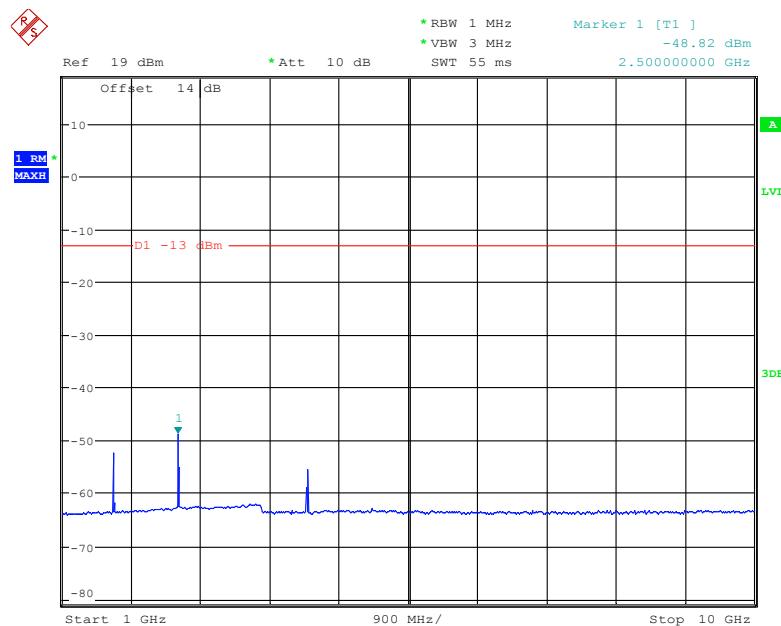
Date: 18.NOV.2017 08:52:42

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

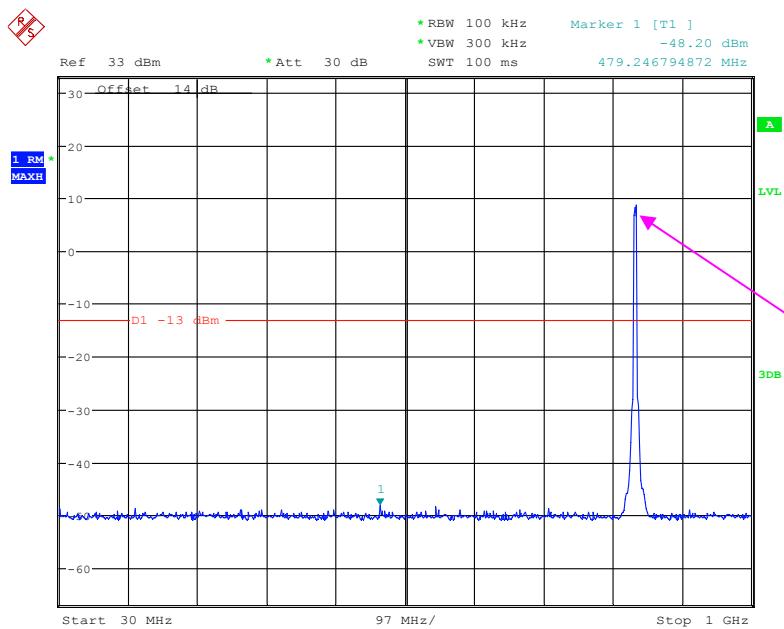
Date: 18.NOV.2017 08:54:17

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

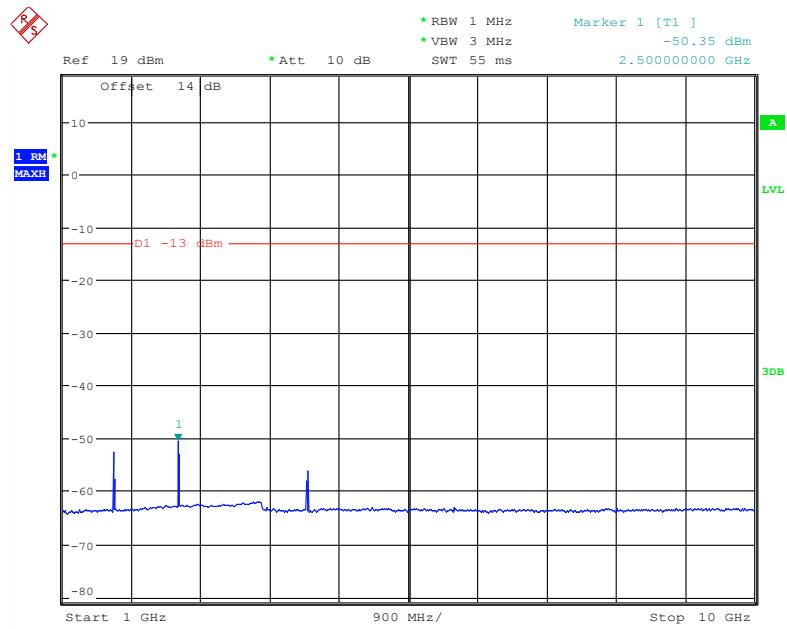
Date: 18.NOV.2017 08:52:57

**1 GHz - 10 GHz (3.0 MHz, Middle Channel)**

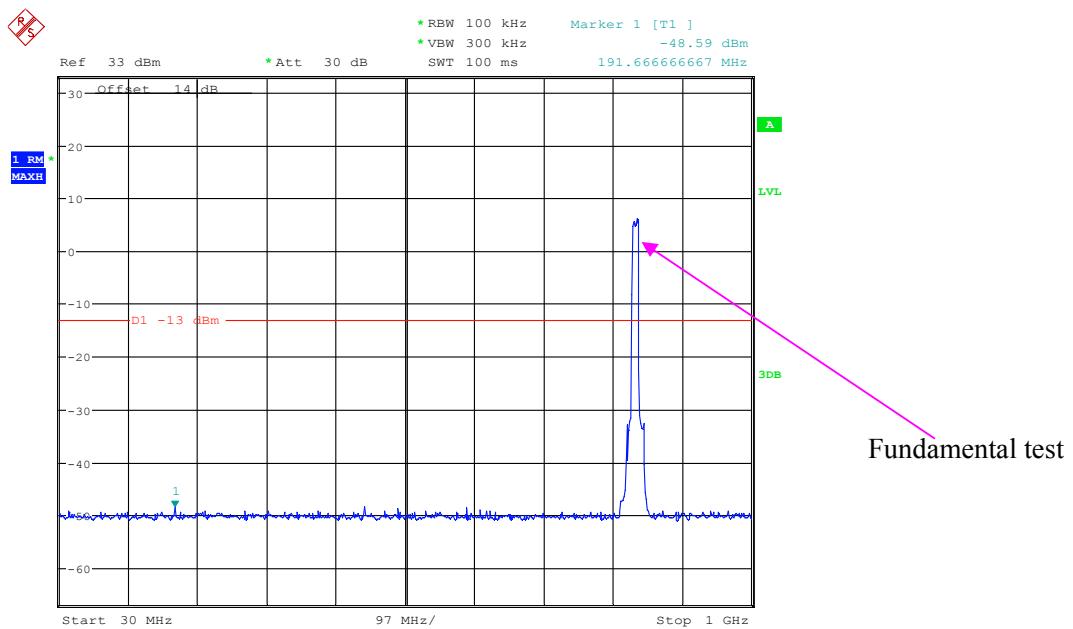
Date: 18.NOV.2017 08:54:39

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

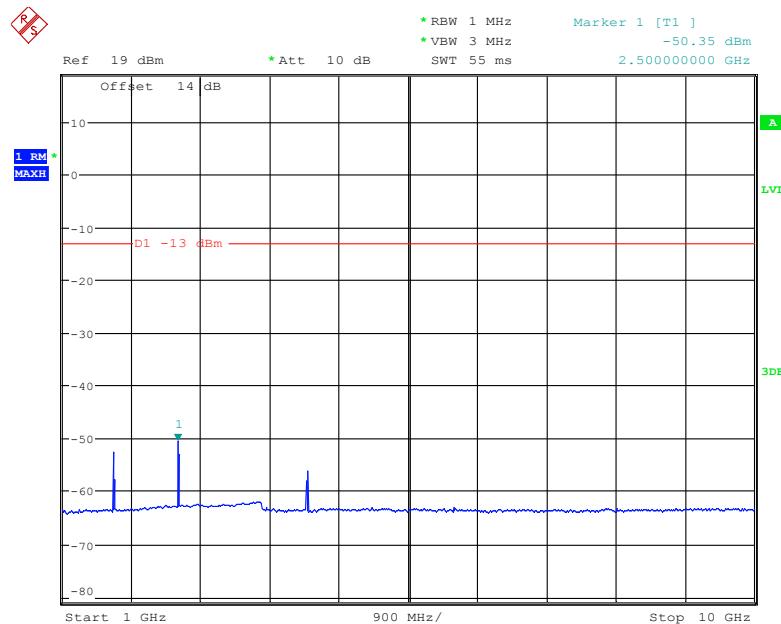
Date: 18.NOV.2017 08:53:22

**1 GHz - 10 GHz (5.0 MHz, Middle Channel)**

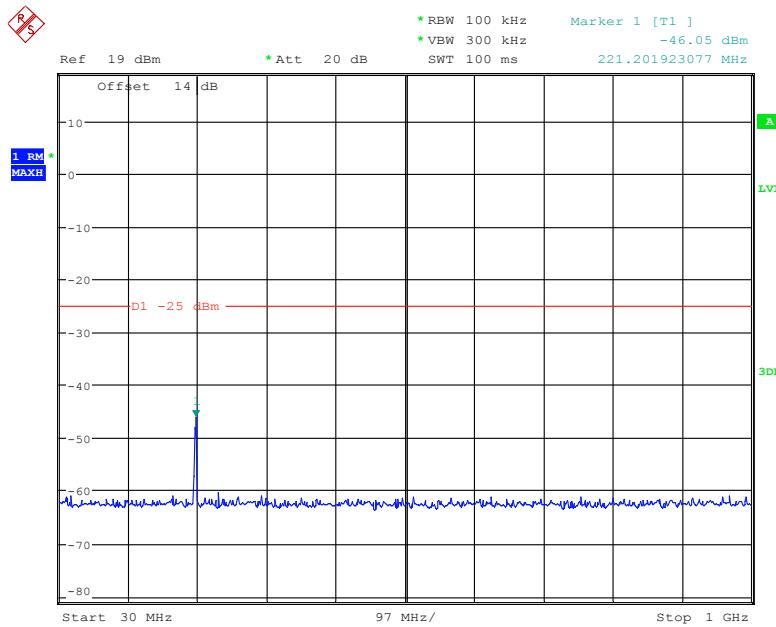
Date: 18.NOV.2017 08:54:53

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

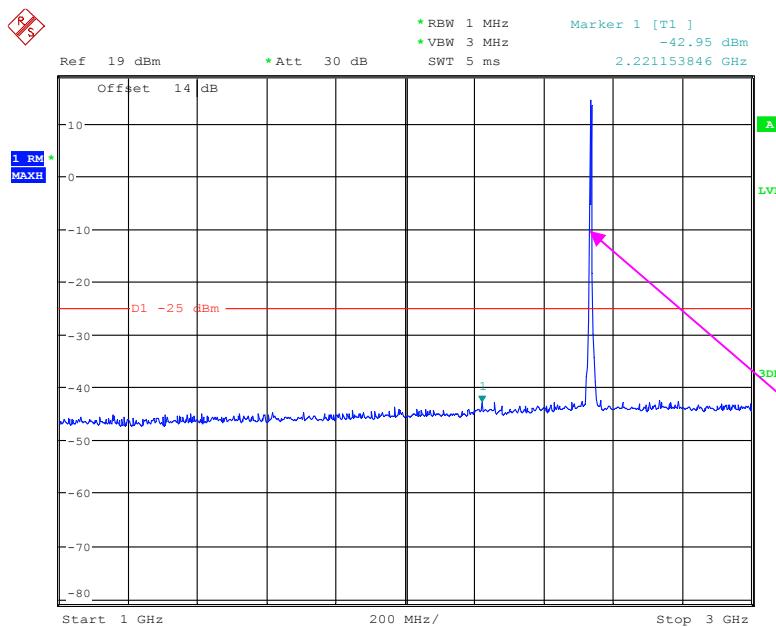
Date: 18.NOV.2017 08:53:46

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

Date: 18.NOV.2017 08:54:53

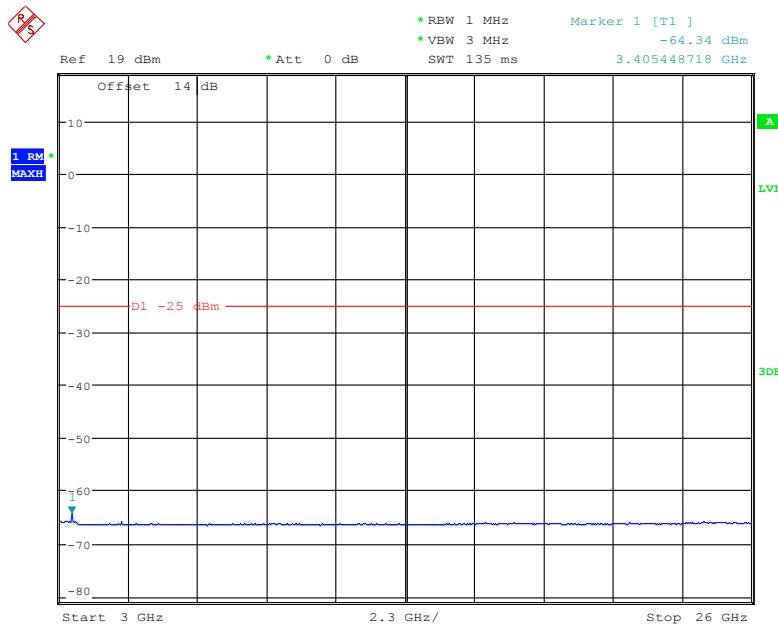
**LTE Band 7:****30 MHz – 1 GHz (5.0 MHz, Middle Channel)**

Date: 18.NOV.2017 09:01:39

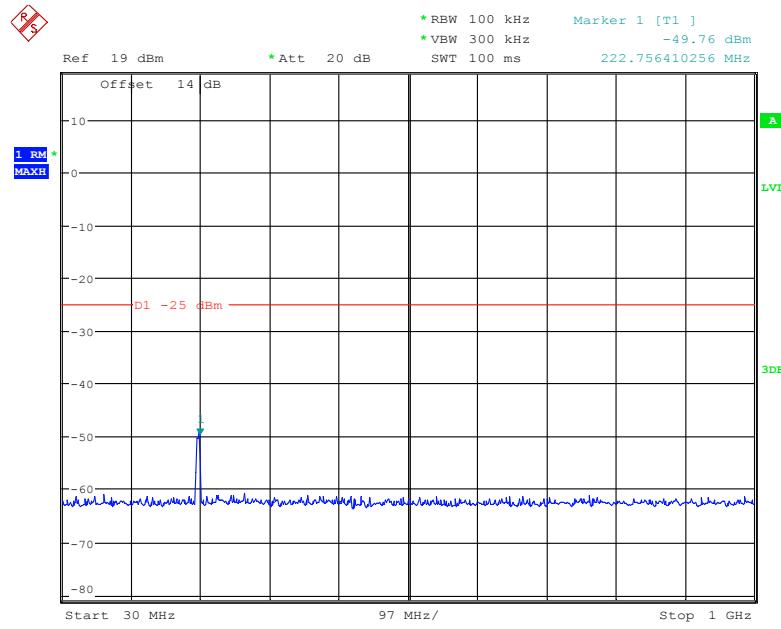
**1 GHz – 3.0 GHz (5.0 MHz, Middle Channel)**

Fundamental test

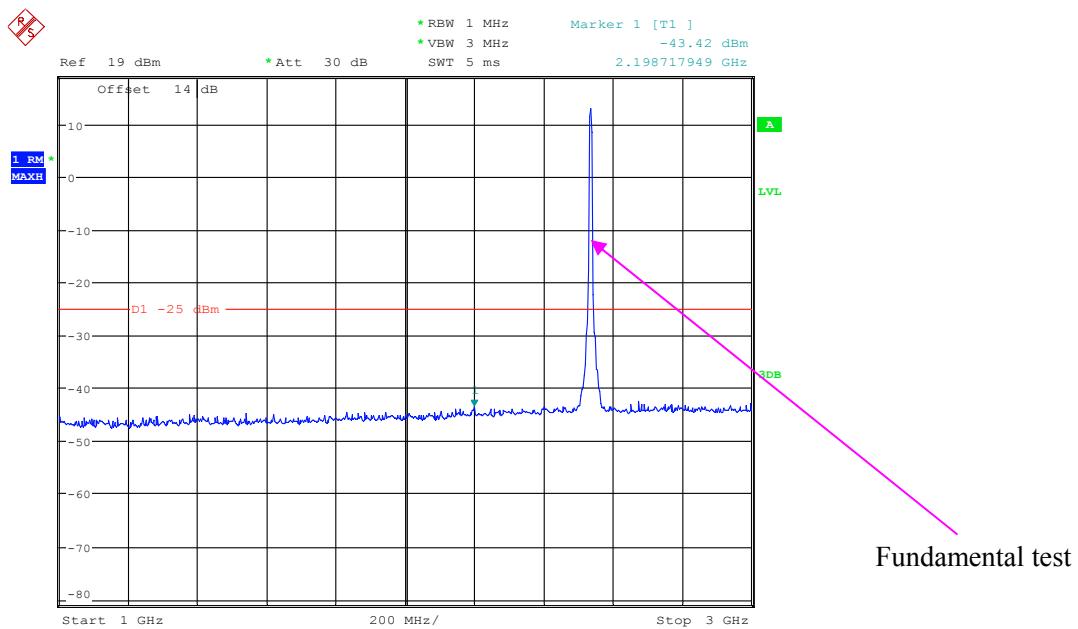
Date: 18.NOV.2017 08:56:50

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

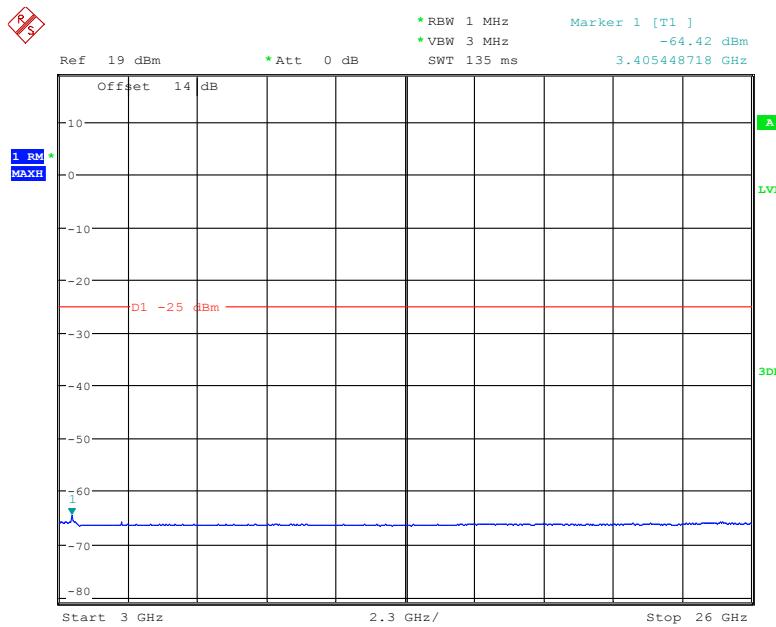
Date: 18.NOV.2017 09:00:35

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

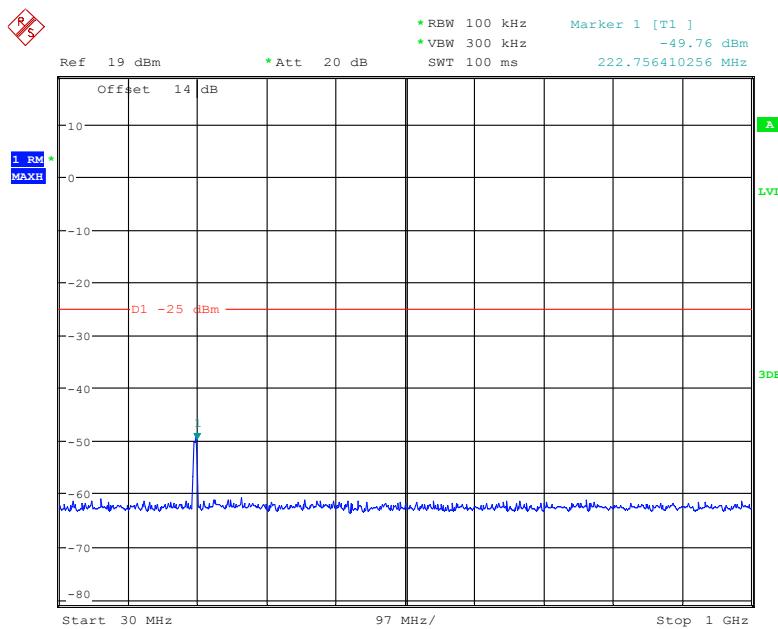
Date: 18.NOV.2017 09:02:02

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

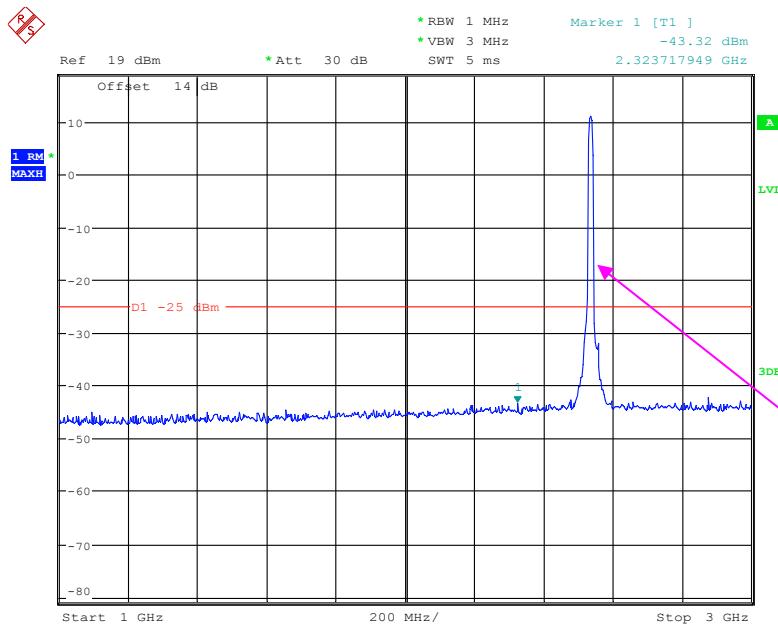
Date: 18.NOV.2017 08:57:26

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

Date: 18.NOV.2017 09:00:48

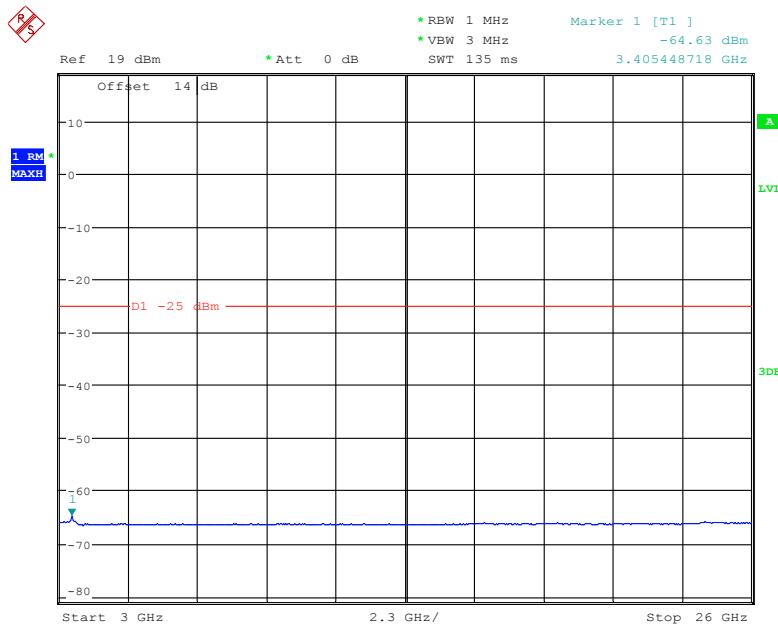
**30 MHz – 1 GHz (15.0 MHz, Middle Channel)**

Date: 18.NOV.2017 09:02:02

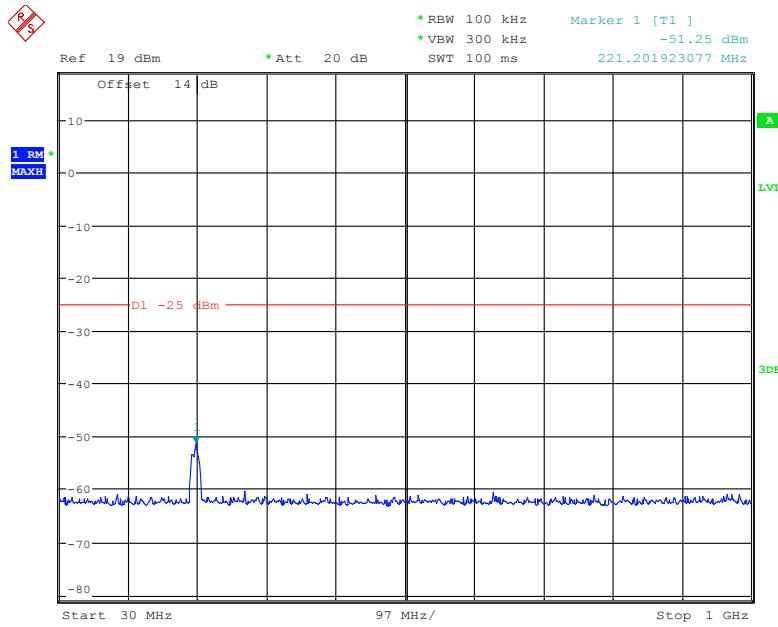
**1 GHz – 3 GHz (15.0 MHz, Middle Channel)**

Fundamental test

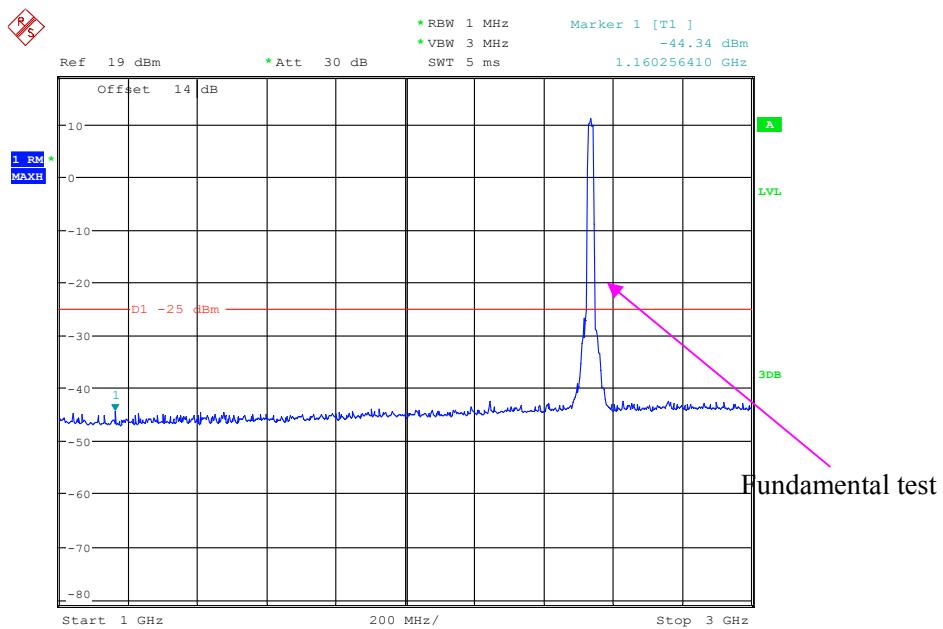
Date: 18.NOV.2017 08:57:48

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

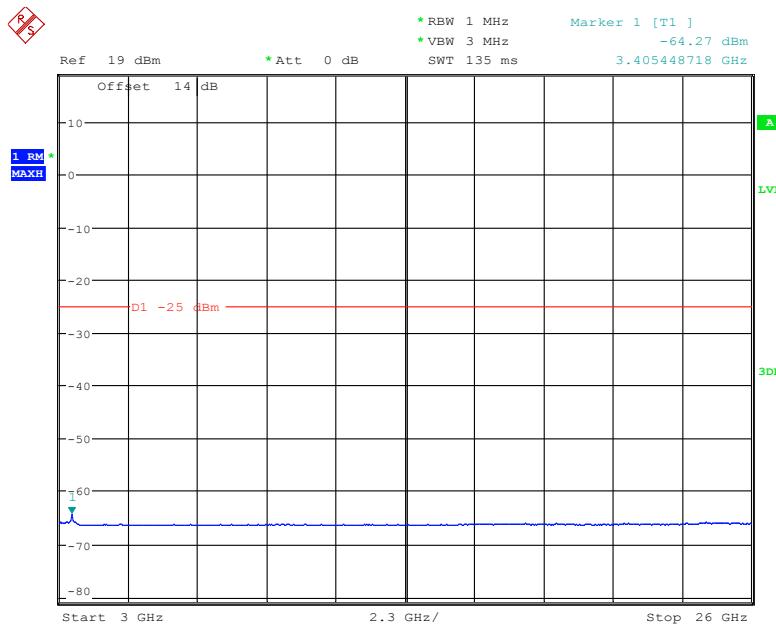
Date: 18.NOV.2017 09:00:21

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

Date: 18.NOV.2017 09:02:36

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

Date: 18.NOV.2017 08:58:33

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

Date: 18.NOV.2017 09:00:07

**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**

<b>Temperature:</b>	22 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Hill He on 2017-11-25.*

*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 (dB $\mu$ V)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
GSM Mode, Middle channel										
163.79	34.89	322	1.3	H	-62.1	0.27	0	-62.37	-13	49.37
163.79	34.55	248	1.4	V	-62.5	0.27	0	-62.77	-13	49.77
1673.20	73.49	173	2.0	H	-33.6	1.30	9.10	-25.80	-13	12.80
1673.20	67.56	143	1.3	V	-38.9	1.30	9.10	-31.10	-13	18.10
2509.80	70.19	275	1.4	H	-33.3	2.60	9.30	-26.60	-13	13.60
2509.80	67.35	63	1.9	V	-35.6	2.60	9.30	-28.90	-13	15.90
3346.40	62.57	305	1.9	H	-37.8	1.50	9.60	-29.70	-13	16.70
3346.40	57.6	224	2.4	V	-42.8	1.50	9.60	-34.70	-13	21.70
WCDMA Mode, Middle channel										
253.56	34.38	125	2.3	H	-62.6	0.32	0	-62.92	-13	49.92
253.56	33.55	356	1.1	V	-63.4	0.32	0	-63.72	-13	50.72
1673.20	46.23	339	1.2	H	-60.8	1.30	9.10	-53.00	-13	40.00
1673.20	43.85	143	1.6	V	-62.6	1.30	9.10	-54.80	-13	41.80
2509.80	45.24	169	1.6	H	-58.3	2.60	9.30	-51.60	-13	38.60
2509.80	45.94	139	1.2	V	-57.0	2.60	9.30	-50.30	-13	37.30

**30 MHz ~ 20 GHz:**

**PCS Band (Part 24E)**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
GSM Mode, Middle channel										
163.79	34.94	222	1.1	H	-62.1	0.27	0	-62.37	-13	49.37
163.79	33.97	30	2.0	V	-63.0	0.27	0	-63.27	-13	50.27
3760.00	64.36	308	1.7	H	-36.9	1.50	9.70	-28.70	-13	15.70
3760.00	63.88	327	2.1	V	-36.9	1.50	9.70	-28.70	-13	15.70
WCDMA Mode Band II, Middle channel										
253.56	34.51	140	1.3	H	-62.5	0.32	0	-62.82	-13	49.82
253.56	34.63	7	1.3	V	-62.4	0.32	0	-62.72	-13	49.72
3760.00	52.11	334	1.1	H	-49.1	1.50	9.70	-40.90	-13	27.90
3760.00	50.58	45	1.5	V	-50.2	1.50	9.70	-42.00	-13	29.00

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)			
(MHz)	Reading (dB $\mu$ V)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)						
<b>Band 2</b>													
<b>Test frequency range:30 MHz ~ 20 GHz</b>													
351.36	34.75	186	1.1	H	-62.3	0.40	0	-62.70	-13	49.70			
351.36	33.23	247	1.5	V	-63.8	0.40	0	-64.20	-13	51.20			
3760.00	54.47	90	2.2	H	-46.8	1.50	9.70	-38.60	-13	25.60			
3760.00	56.13	124	2.2	V	-44.6	1.50	9.70	-36.40	-13	23.40			
5640.00	57.4	230	1.2	H	-40.2	1.70	11.20	-30.70	-13	17.70			
5640.00	58.75	25	1.1	V	-38.5	1.70	11.20	-29.00	-13	16.00			
<b>Band 4</b>													
<b>Test frequency range:30 MHz ~ 18 GHz</b>													
351.36	33.78	196	2.5	H	-63.2	0.40	0	-63.60	-13	50.60			
351.36	34.62	282	2.2	V	-62.4	0.40	0	-62.80	-13	49.80			
3465.00	57.73	246	1.6	H	-42.7	1.50	9.70	-34.50	-13	21.50			
3465.00	53.19	164	1.9	V	-48.0	1.50	9.70	-39.80	-13	26.80			
5197.50	64.35	159	1.4	H	-34.3	1.60	11.20	-24.70	-13	11.70			
5197.50	68.05	302	2.2	V	-30.1	1.60	11.20	-20.50	-13	7.50			
<b>Band 5</b>													
<b>Test frequency range:30 MHz ~ 10 GHz</b>													
351.36	34.47	86	1.8	H	-62.5	0.40	0	-62.90	-13	49.90			
351.36	33.85	325	2.1	V	-63.1	0.40	0	-63.50	-13	50.50			
1673.00	43.45	117	2.1	H	-63.6	1.30	9.10	-55.80	-13	42.80			
1673.00	45.85	169	2.4	V	-60.6	1.30	9.10	-52.80	-13	39.80			
2509.50	43.85	272	1.9	H	-59.7	2.60	9.30	-53.00	-13	40.00			
2509.50	44.94	353	1.6	V	-58.0	2.60	9.30	-51.30	-13	38.30			
<b>Band 7</b>													
<b>Test frequency range:30 MHz ~ 26 GHz</b>													
351.36	33.02	205	2.5	H	-64.0	0.40	0	-64.40	-25	39.40			
351.36	33.55	277	1.4	V	-63.5	0.40	0	-63.90	-25	38.90			
5070.00	43.77	328	2.2	H	-54.1	1.60	11.20	-44.50	-25	19.50			
5070.00	43.23	86	1.2	V	-54.6	1.60	11.20	-45.00	-25	20.00			

**Note:**

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

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

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

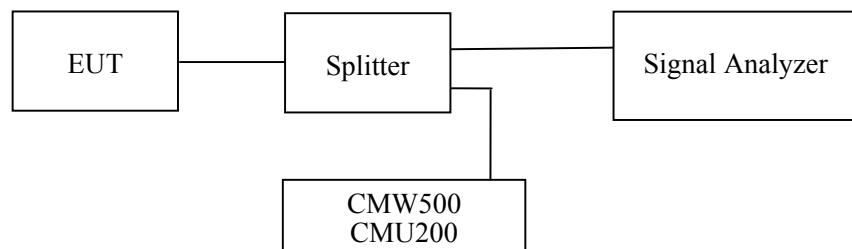
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

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

**Test Procedure**

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

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

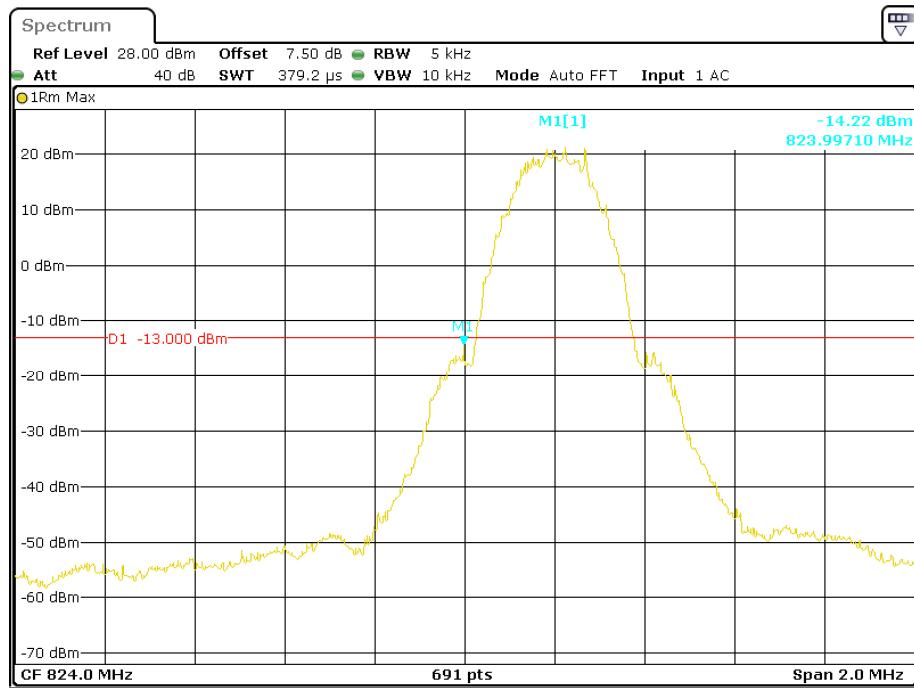
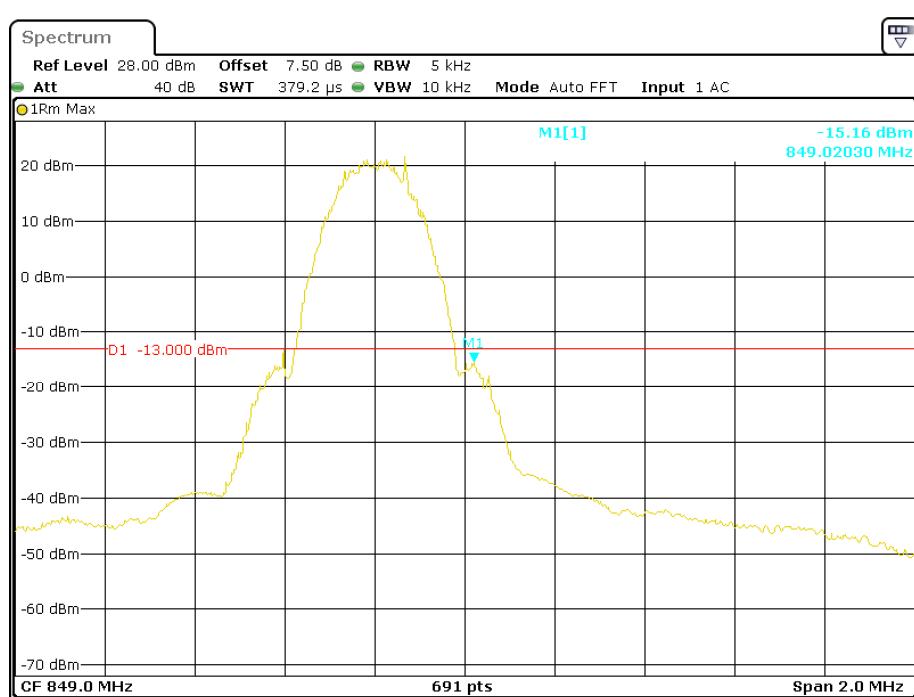
**Test Data****Environmental Conditions**

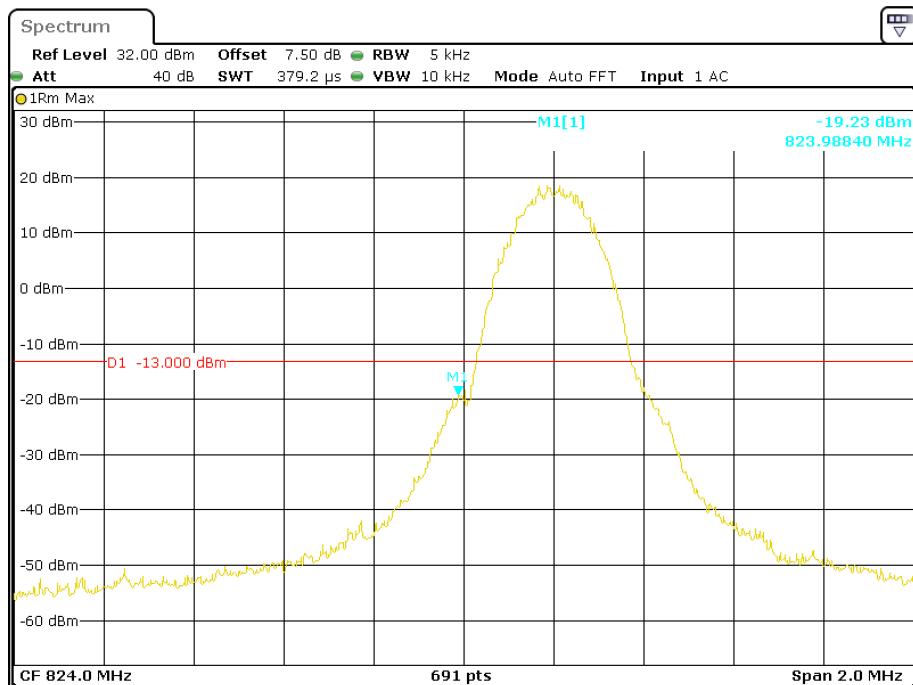
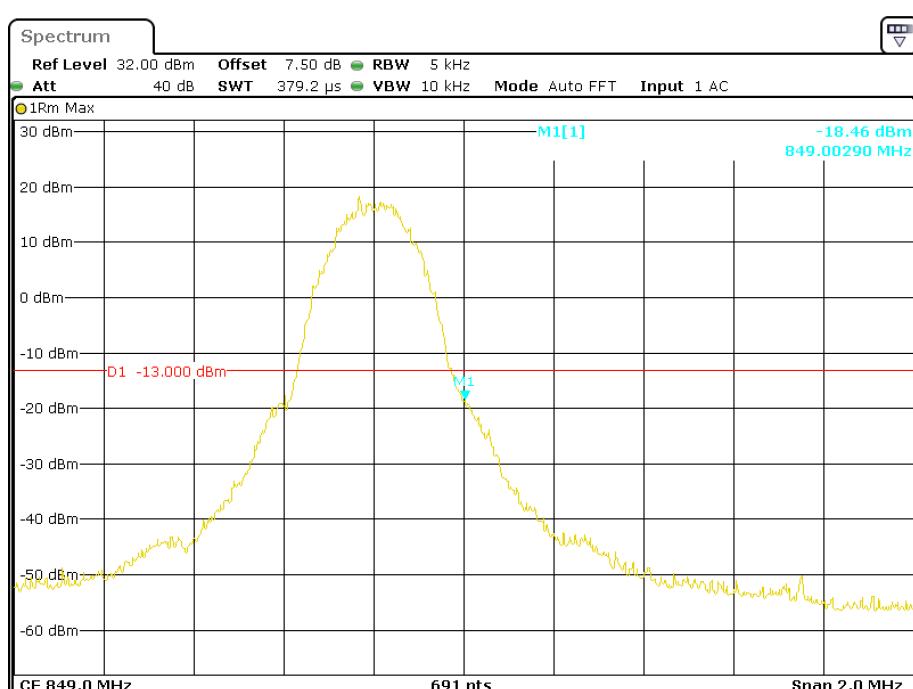
<b>Temperature:</b>	24~25°C
<b>Relative Humidity:</b>	47~50 %
<b>ATM Pressure:</b>	100.0~101.0 kPa

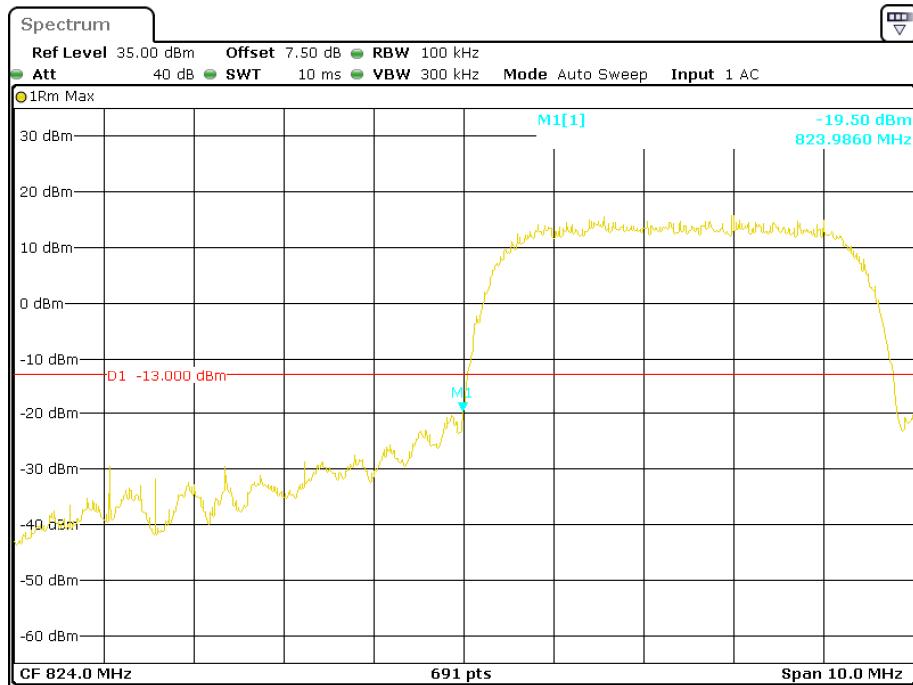
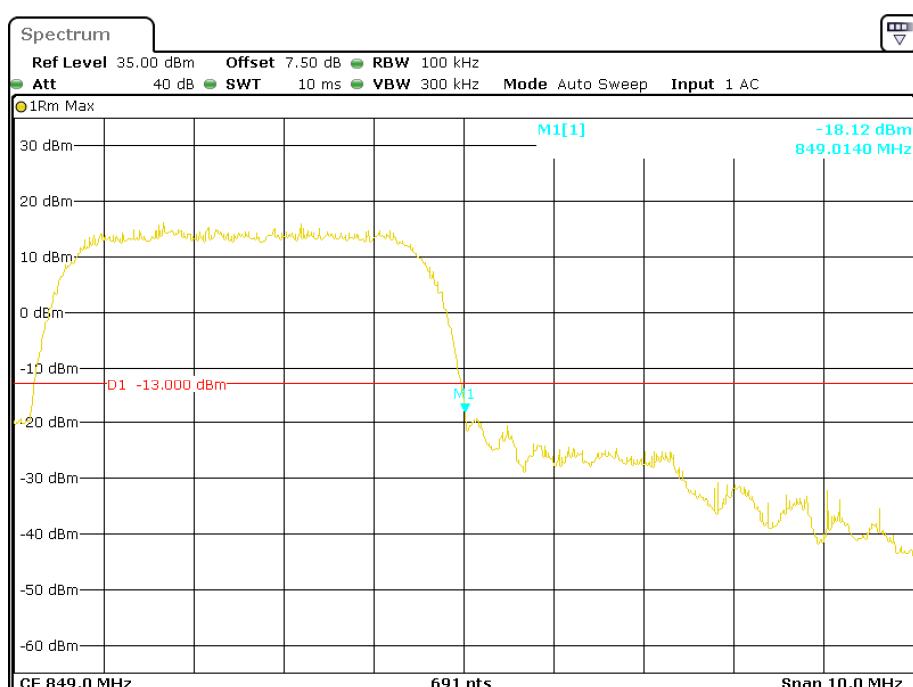
*The testing was performed by Hill He from 2017-11-18 to 2017-11-27.*

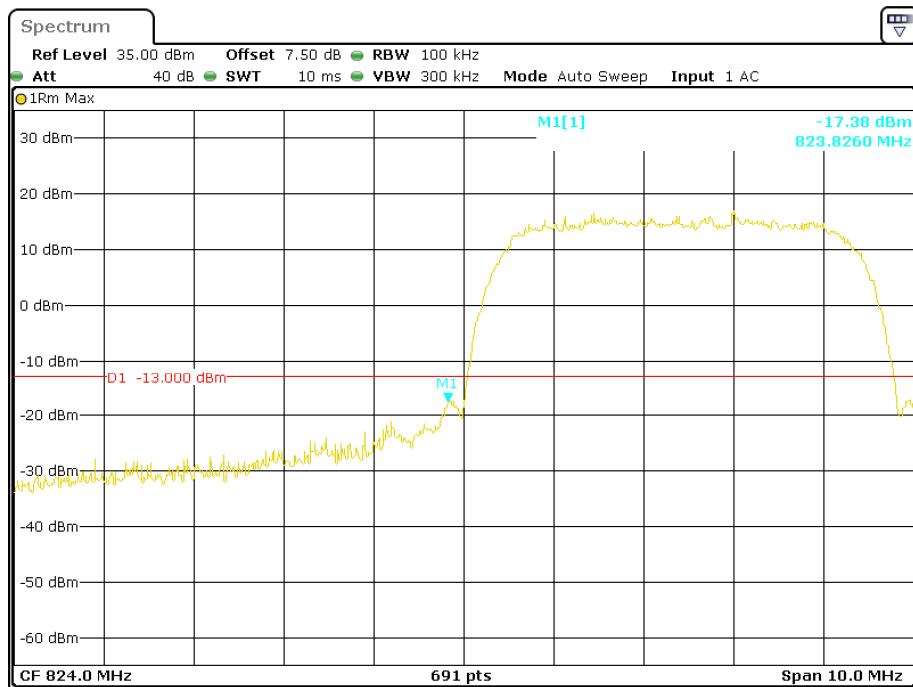
*EUT operation mode: Transmitting-*

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

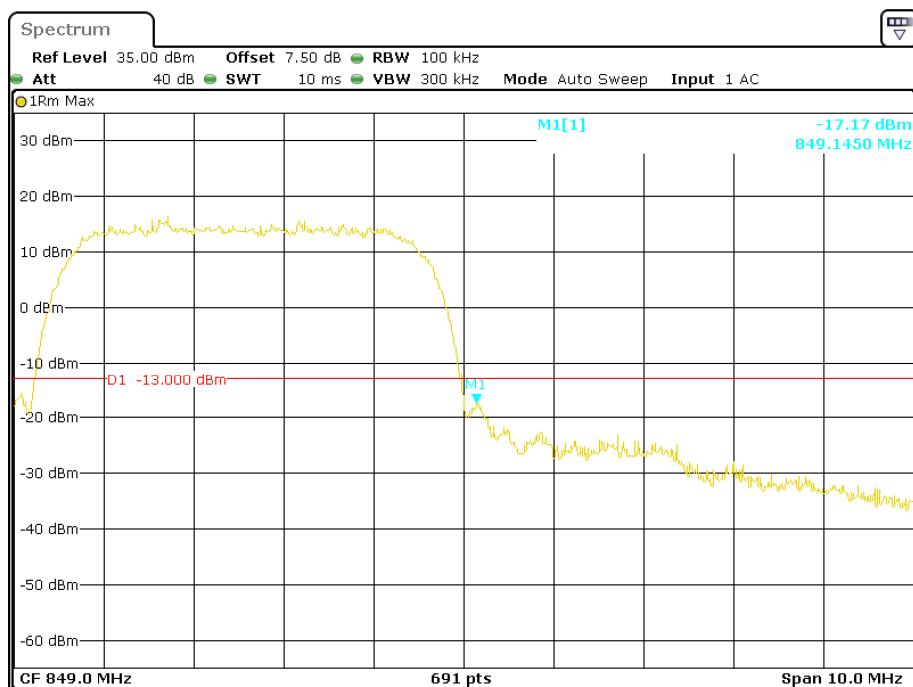
**Cellular Band, Left Band Edge for GSM (GMSK) Mode****Cellular Band, Right Band Edge for GSM (GMSK) Mode**

**Cellular Band, Left Band Edge for EDGE Mode****Cellular Band, Right Band Edge for EDGE Mode**

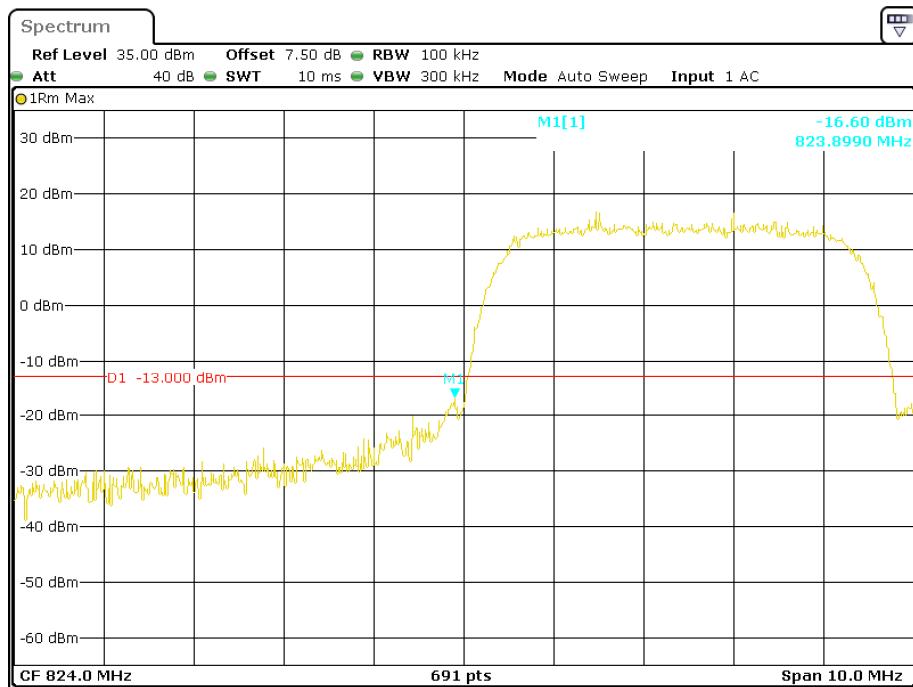
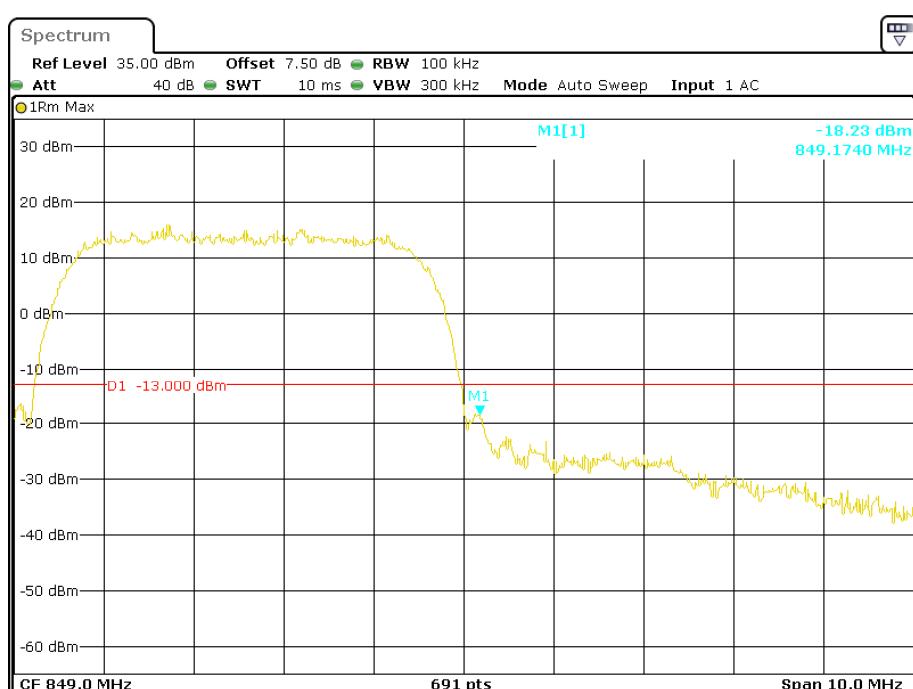
**Cellular Band, Left Band Edge for WCDMA (BPSK) Mode****Cellular Band, Right Band Edge for WCDMA (BPSK) Mode**

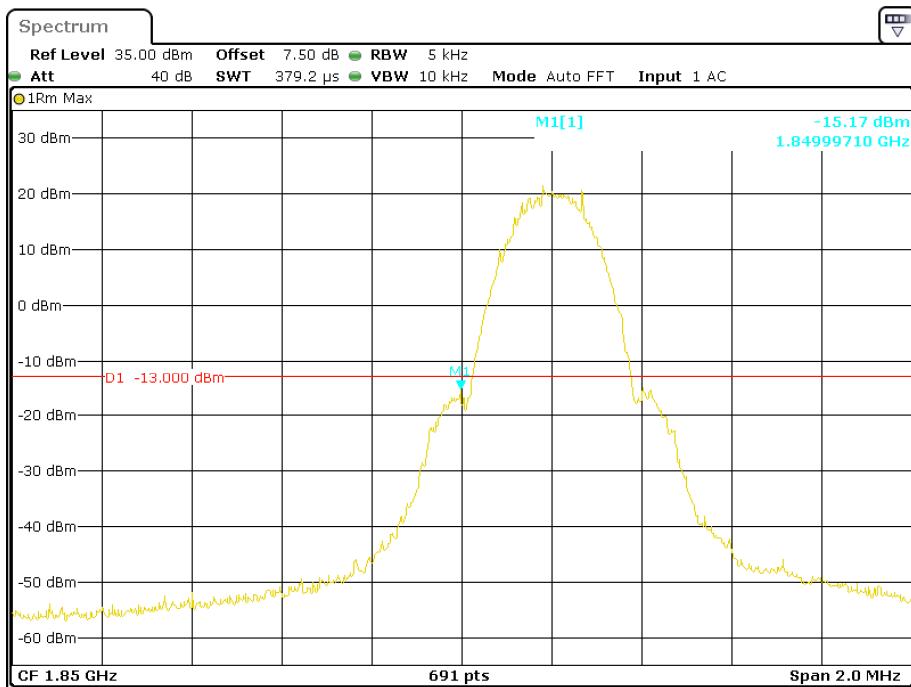
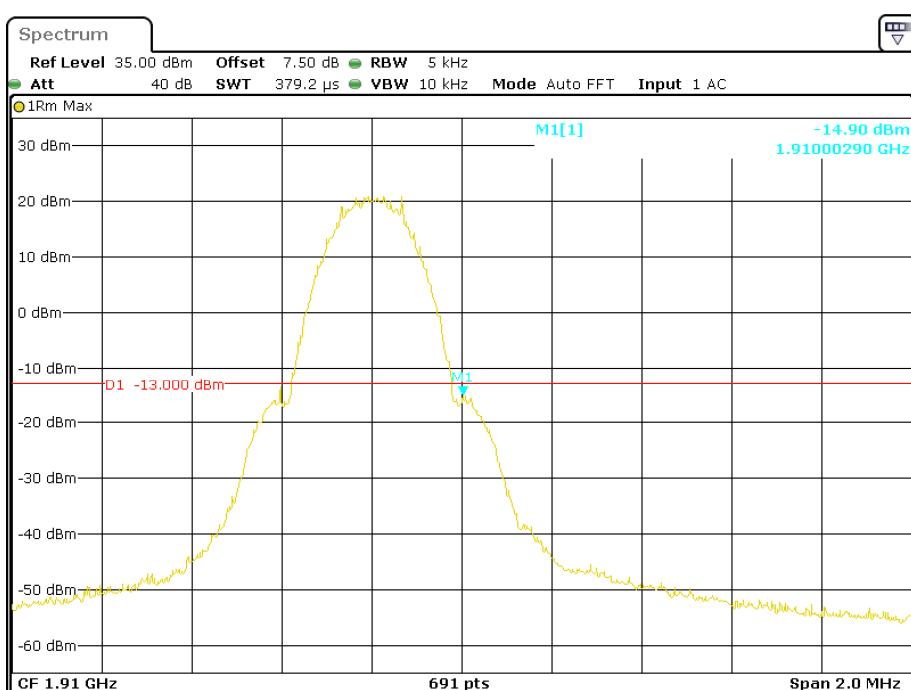
**Cellular Band, Left Band Edge for HSDPA (16QAM) Mode**

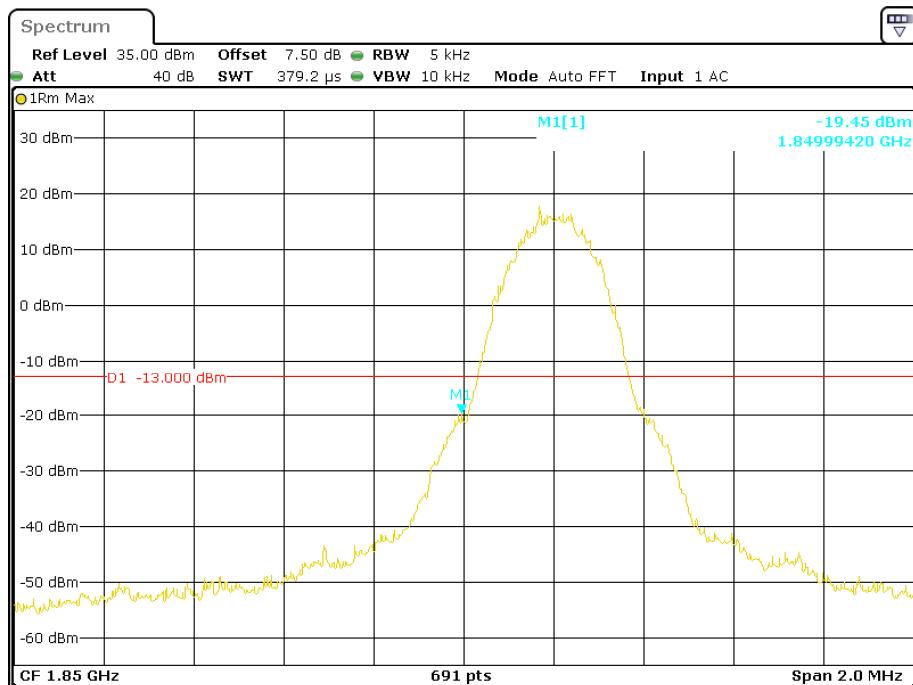
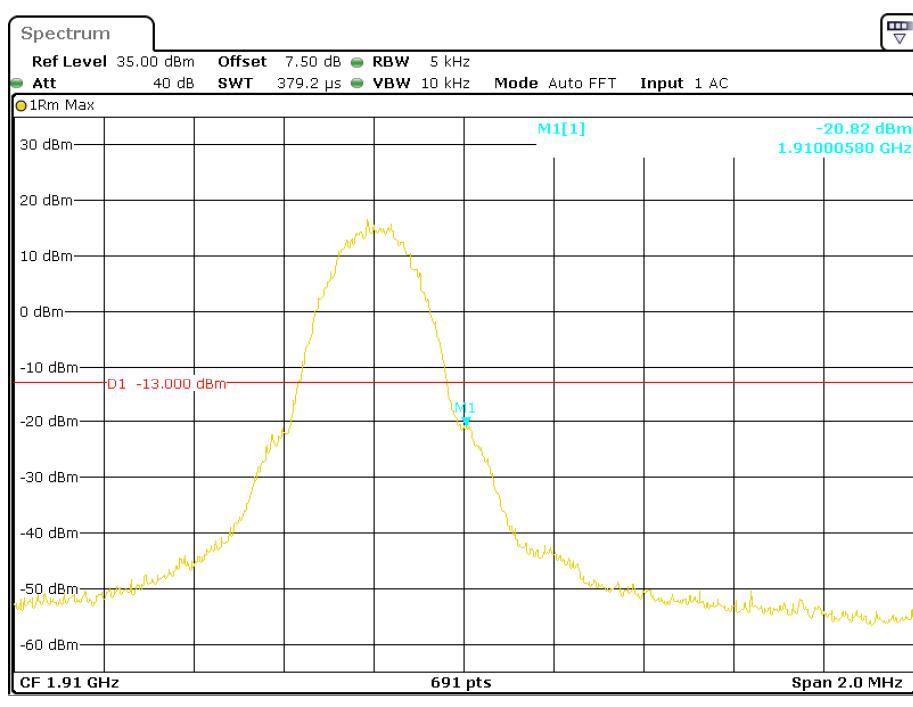
Date: 20.NOV.2017 10:21:02

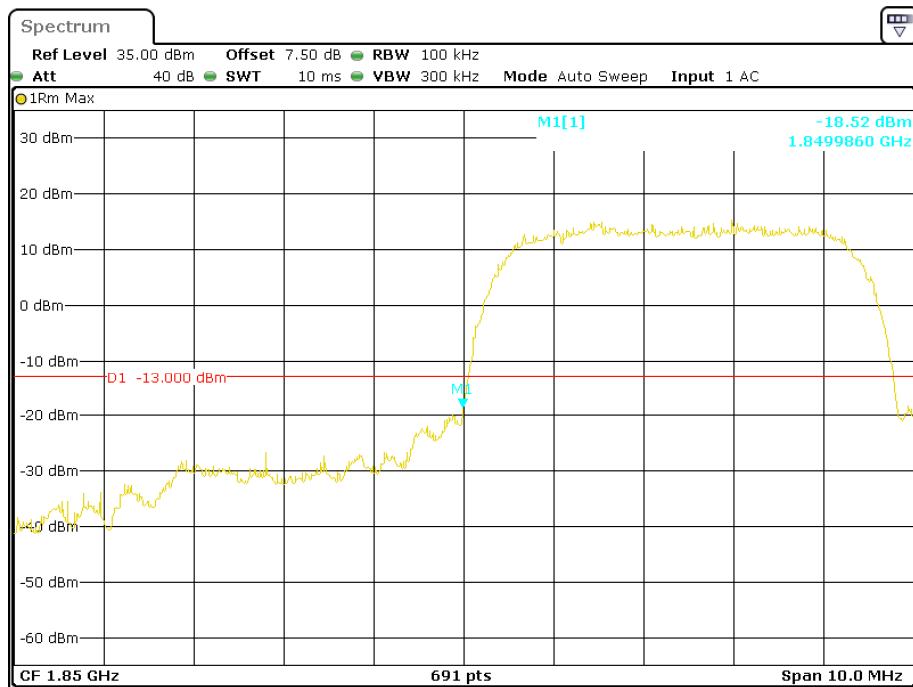
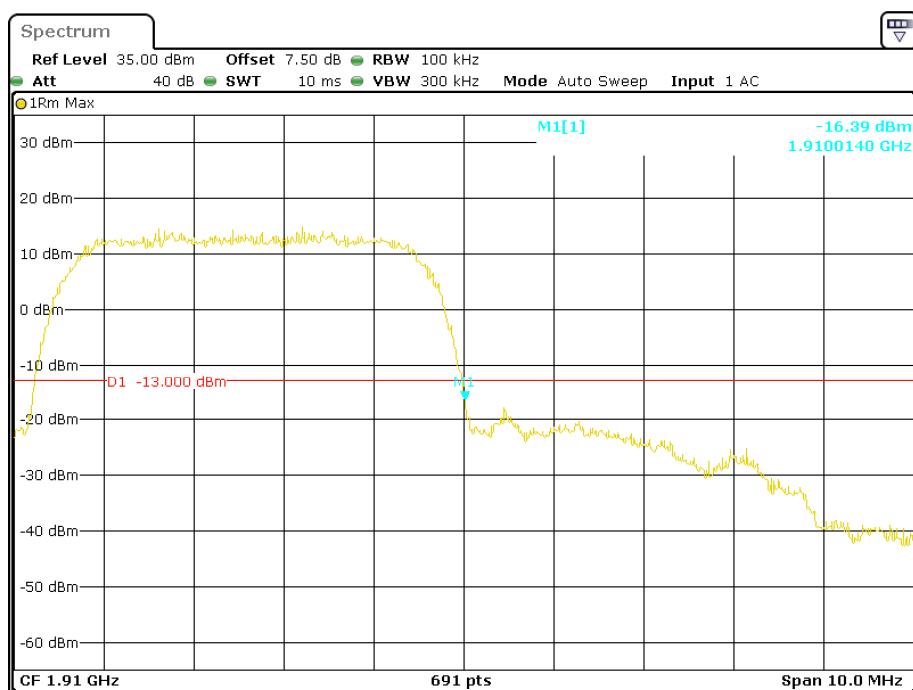
**Cellular Band, Right Band Edge for HSDPA (16QAM) Mode**

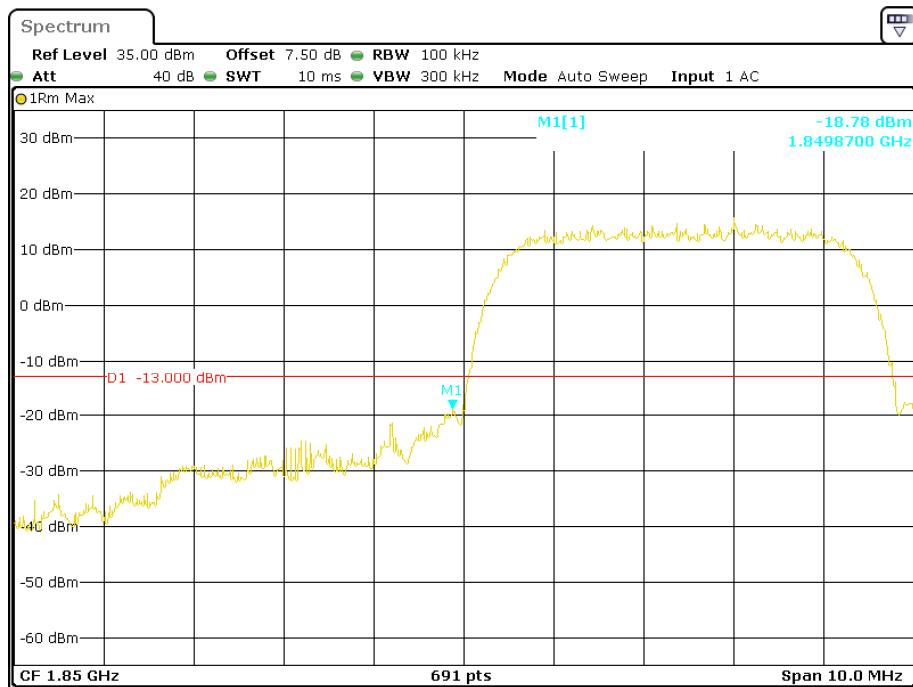
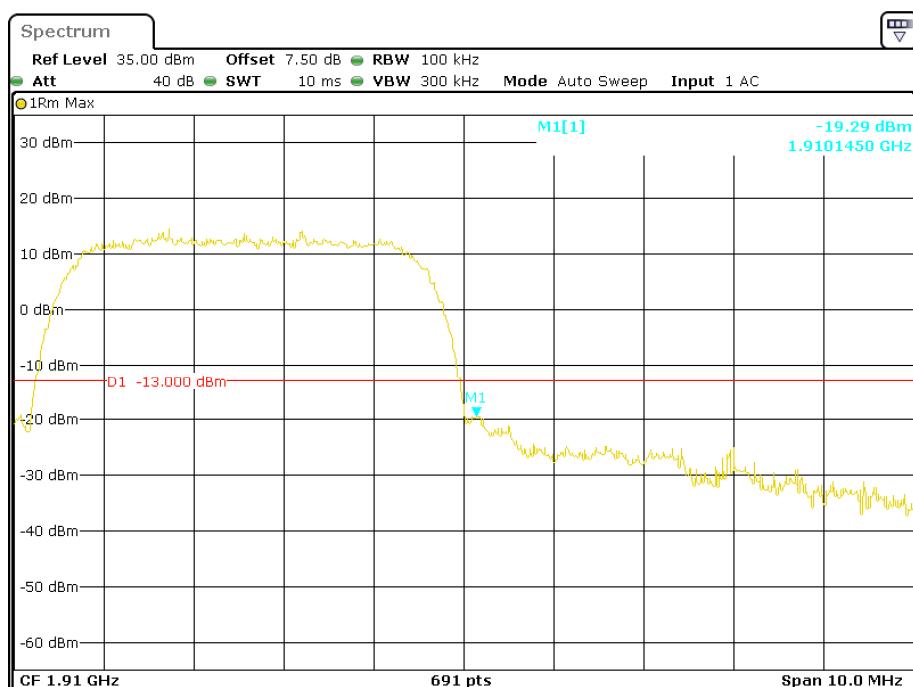
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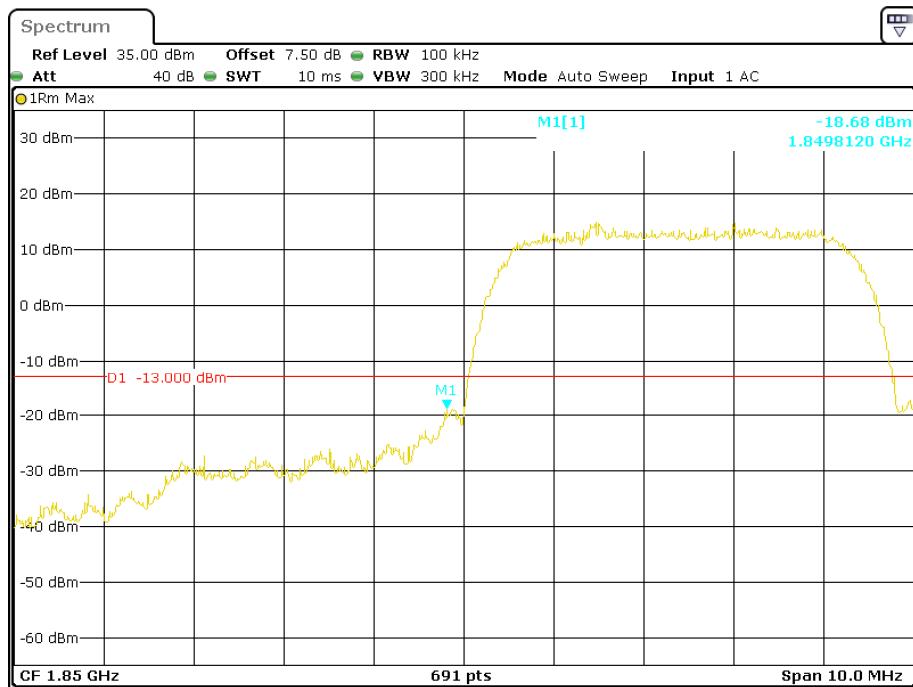
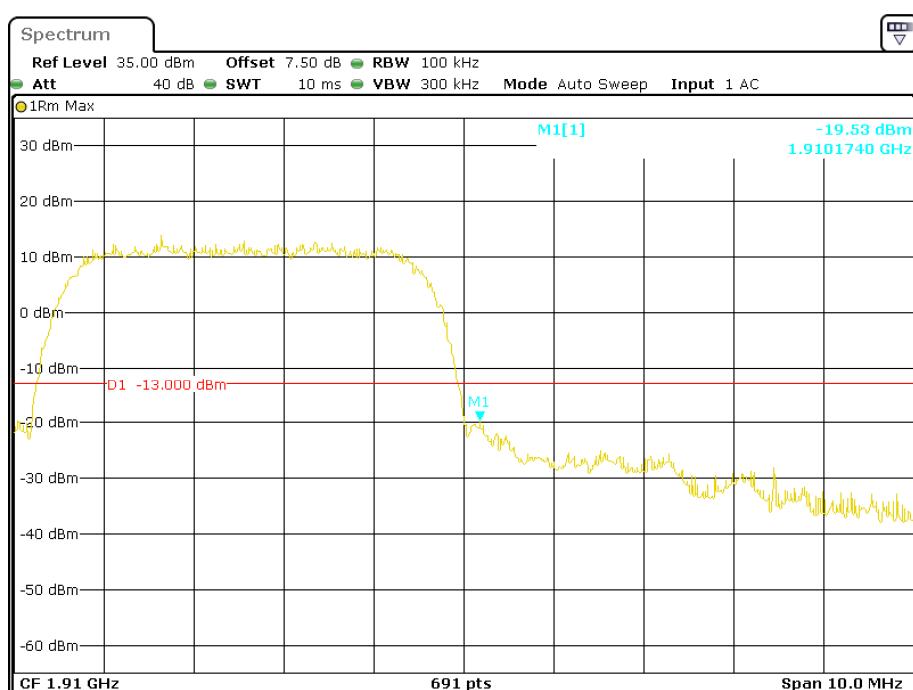
**Cellular Band, Left Band Edge for HSUPA (BPSK) Mode****Cellular Band, Right Band Edge for HSUPA (BPSK) Mode**

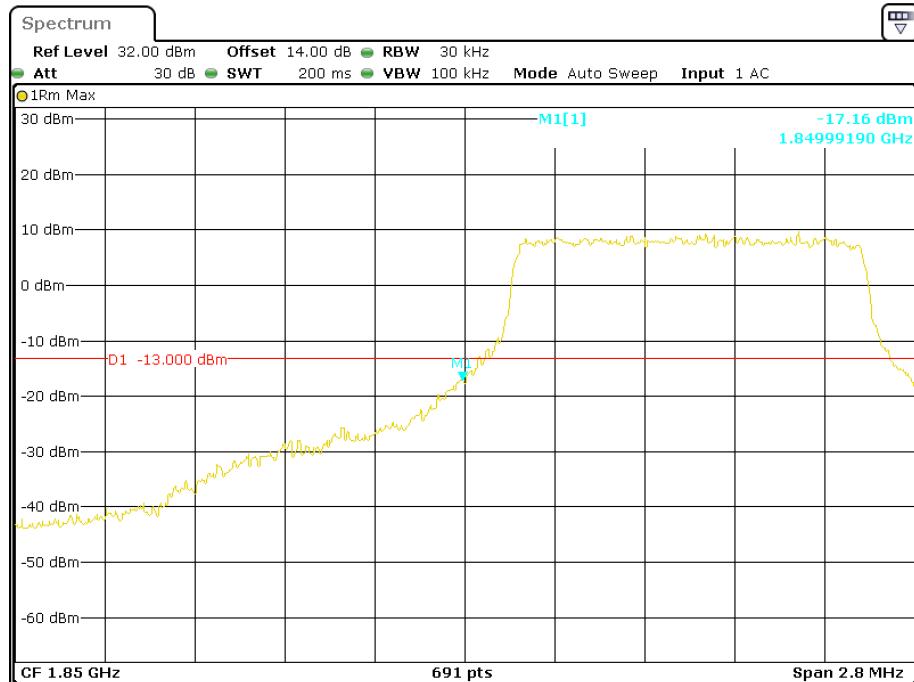
**PCS Band, Left Band Edge for GSM (GMSK) Mode****PCS Band, Right Band Edge for GSM (GMSK) Mode**

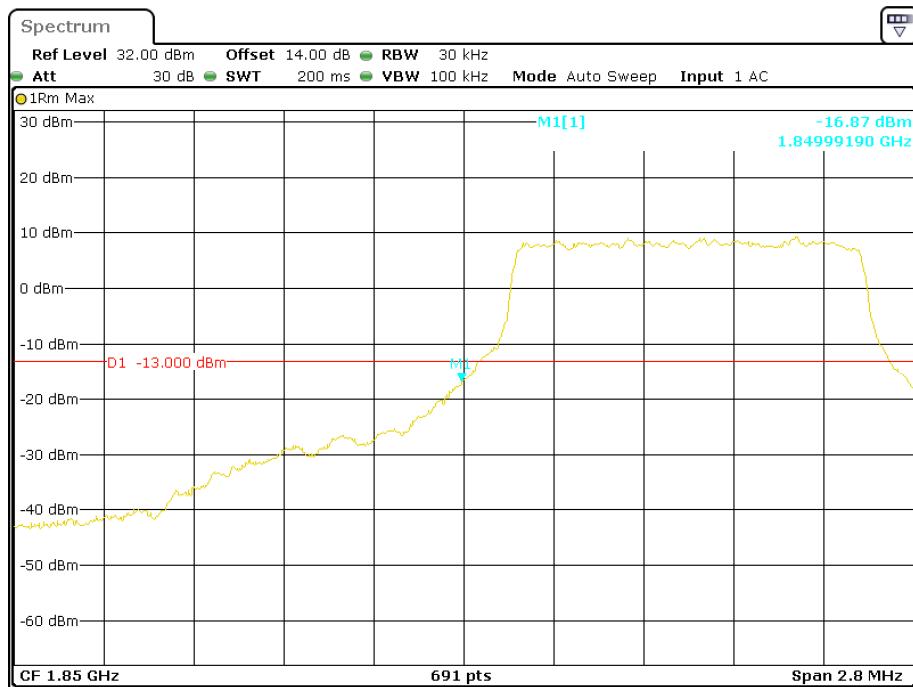
**PCS Band, Left Band Edge for EDGE Mode****PCS Band, Right Band Edge for EDGE Mode**

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

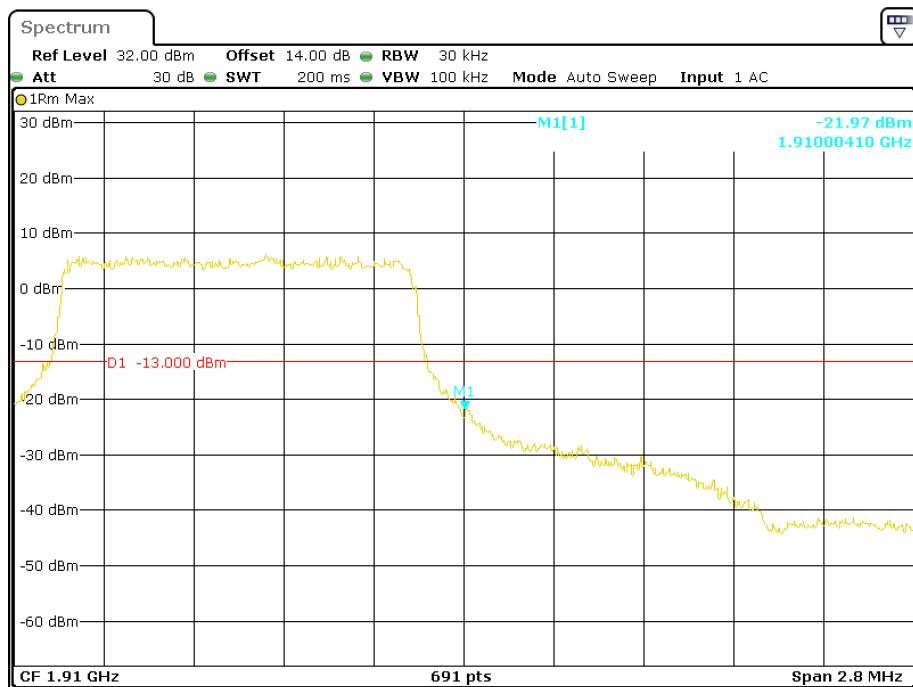
**PCS Band, Left Band Edge for HSDPA (16QAM) Mode****PCS Band, Right Band Edge for HSDPA (16QAM) Mode**

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

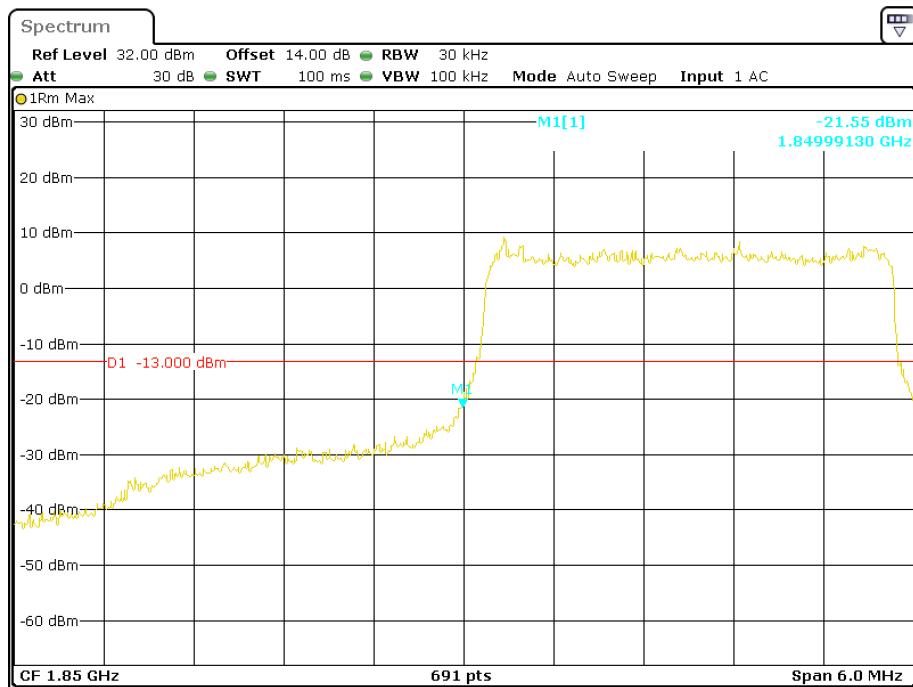
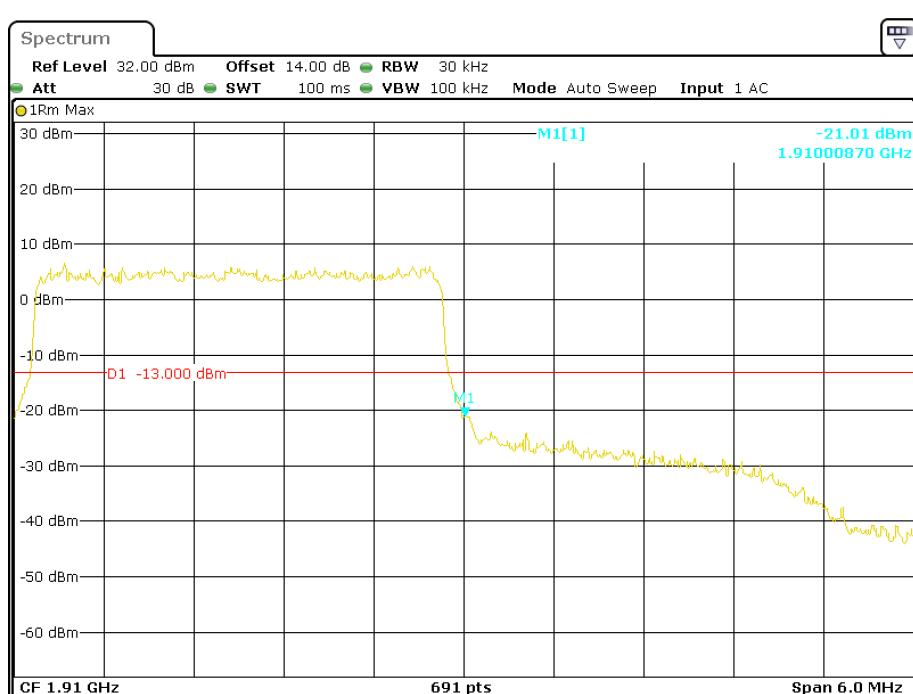
**Band 2:****QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

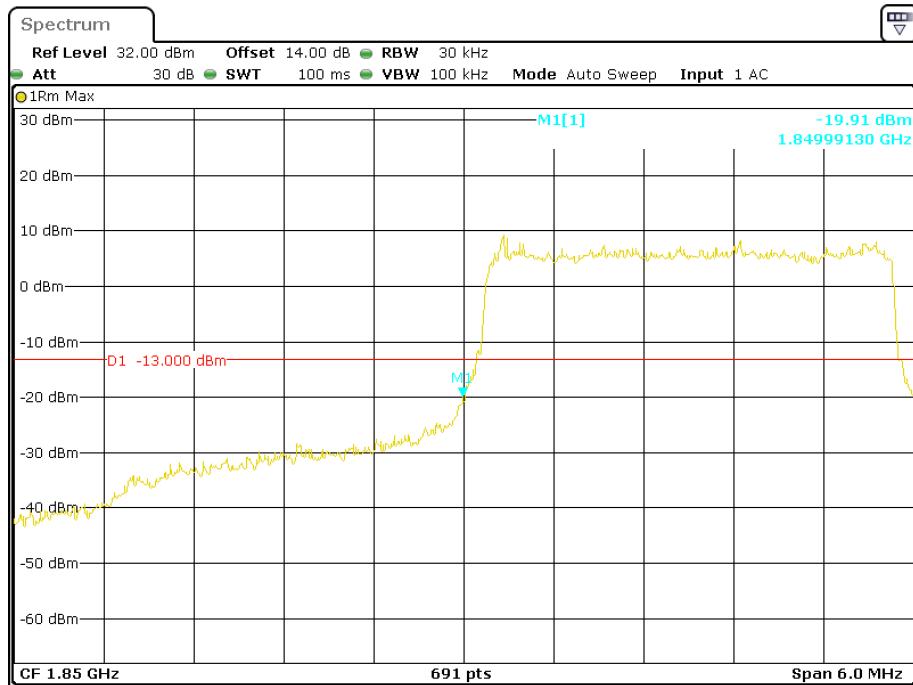
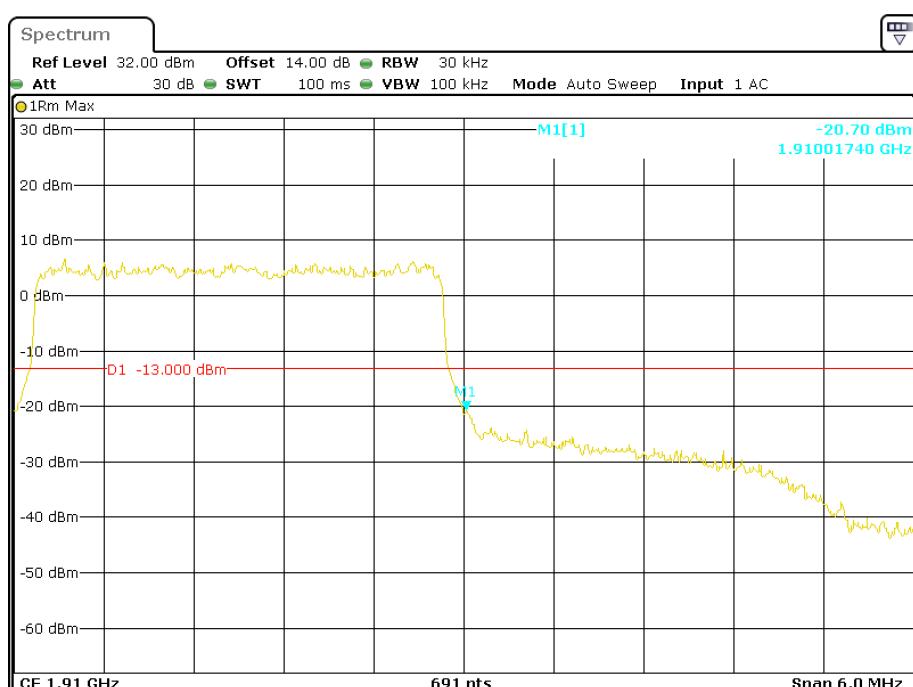
**16-QAM (1.4 MHz, FULL RB) - Left Band Edge**

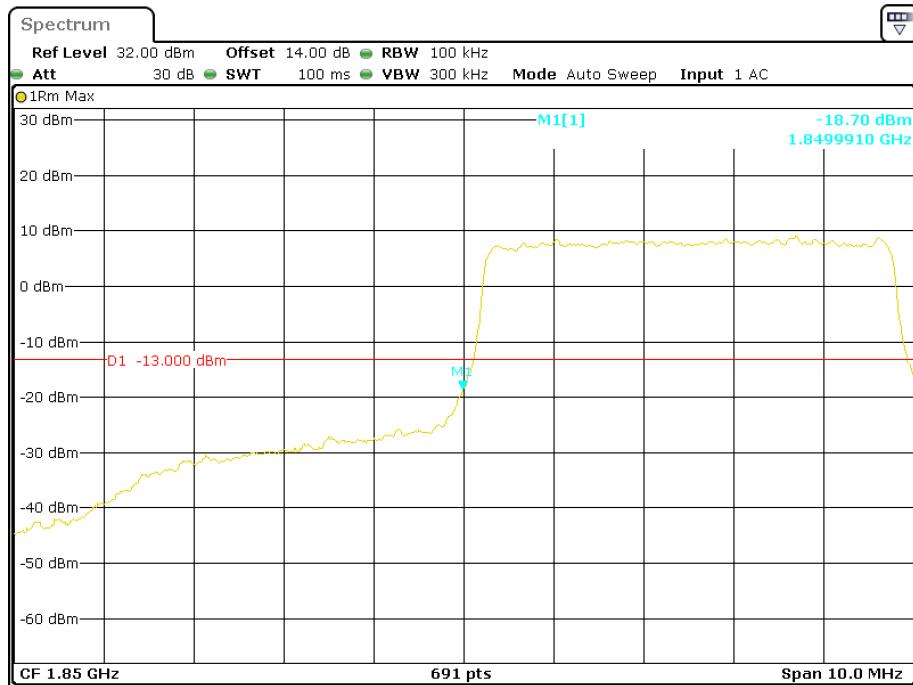
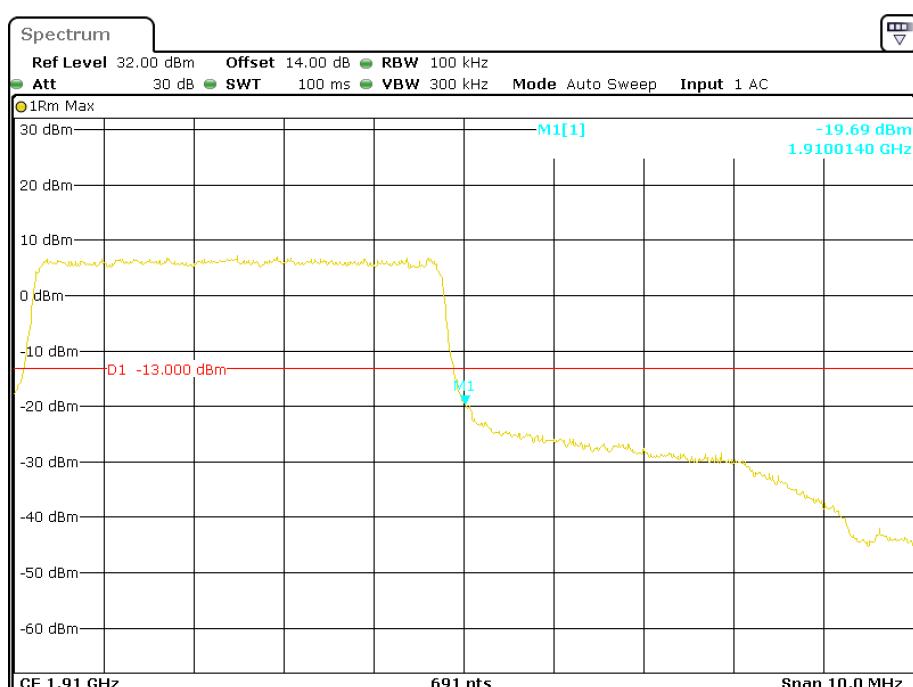
Date: 18.NOV.2017 08:43:08

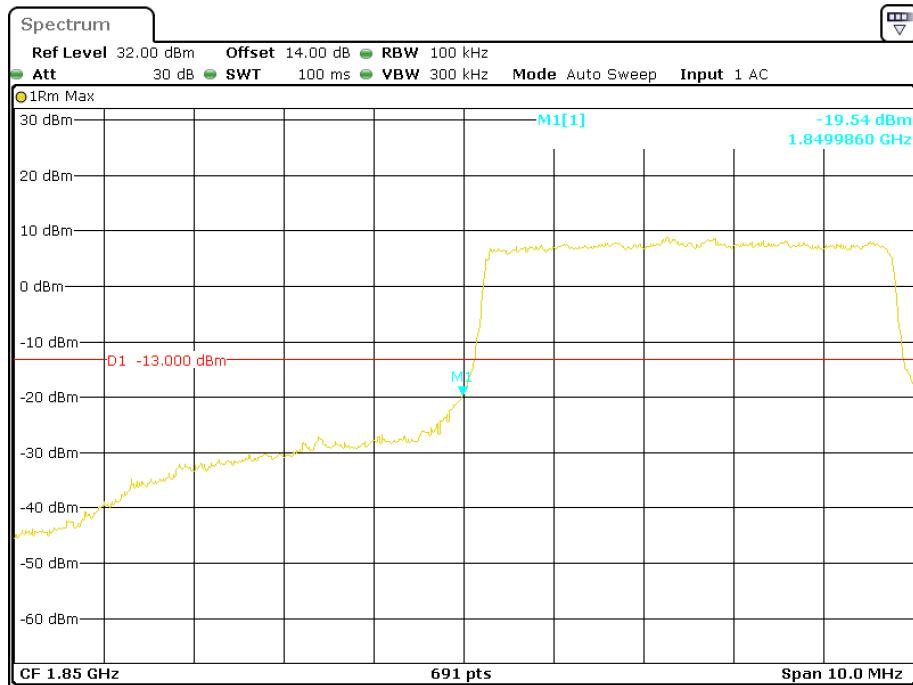
**16-QAM (1.4 MHz, FULL RB) - Right Band Edge**

Date: 18.NOV.2017 08:44:31

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

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

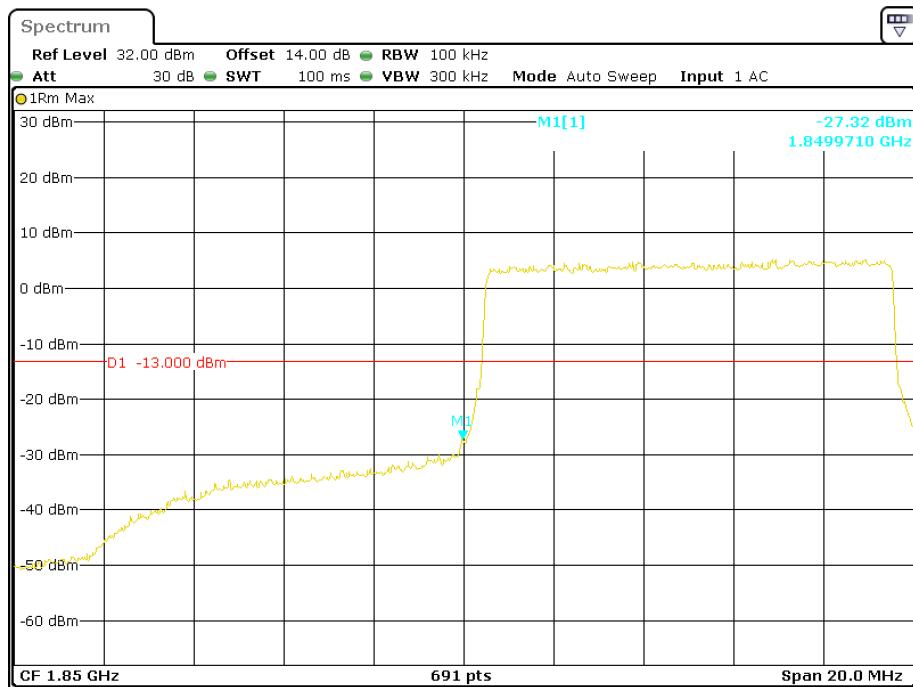
**QPSK (5.0 MHz, FULL RB) - Left Band Edge****QPSK (5.0 MHz, FULL RB) - Right Band Edge**

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

Date: 18.NOV.2017 09:06:44

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

Date: 18.NOV.2017 09:05:38

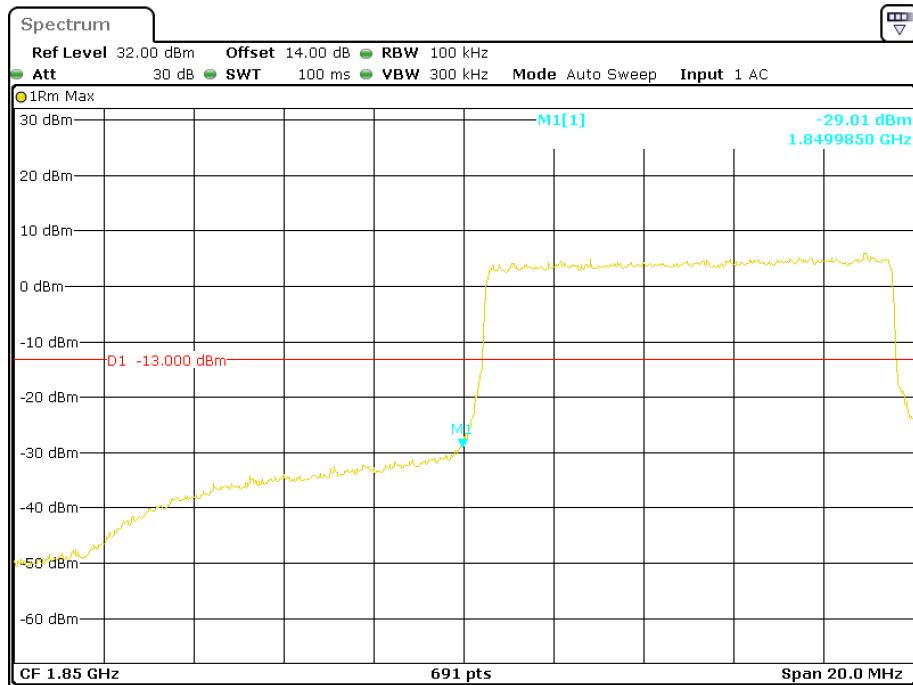
**QPSK (10.0 MHz, FULL RB) - Left Band Edge**

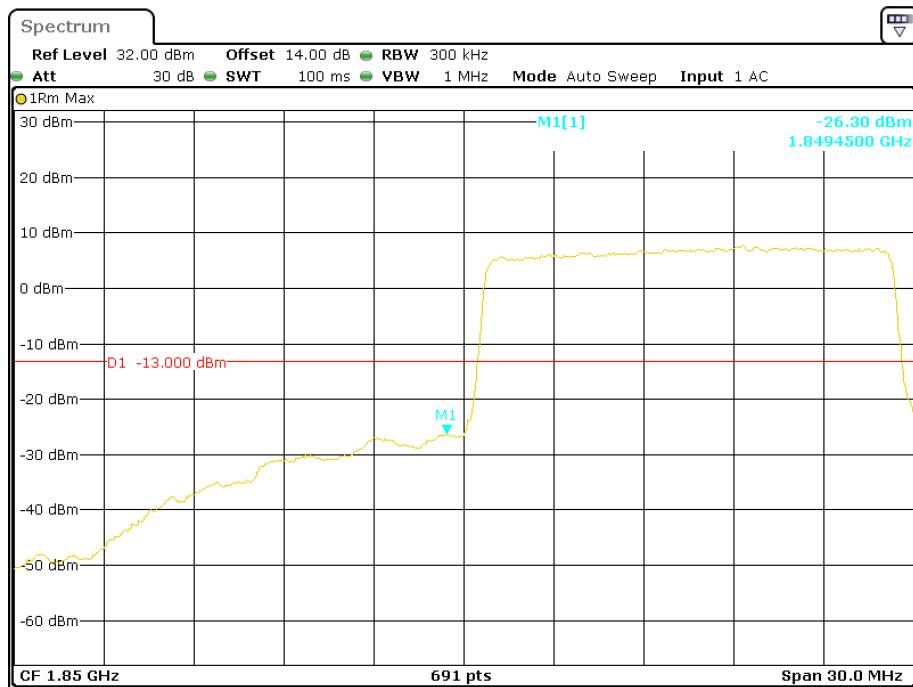
Date: 18.NOV.2017 09:13:30

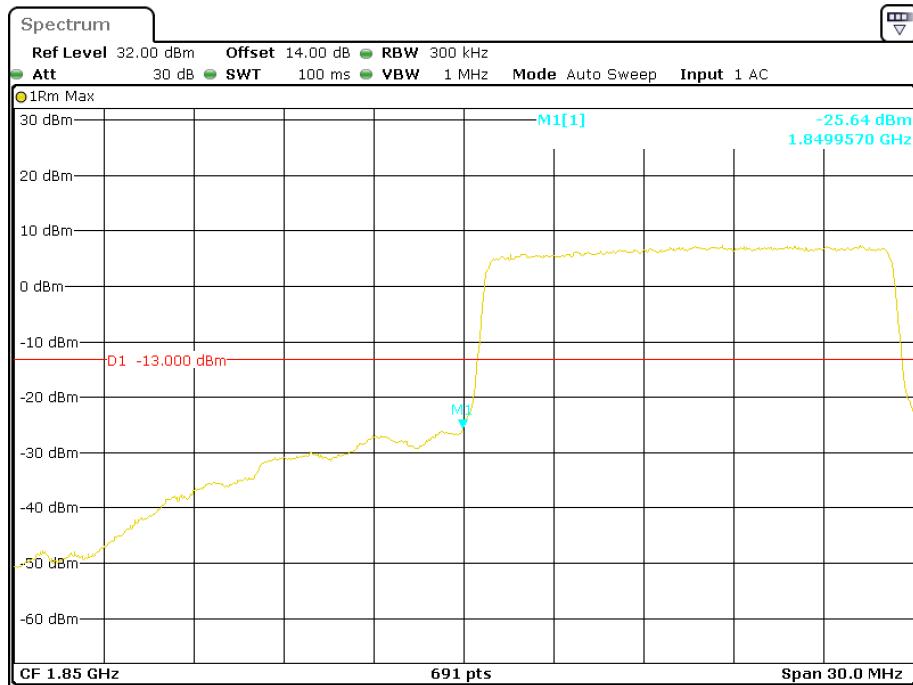
**QPSK (10.0 MHz, FULL RB) - Right Band Edge**

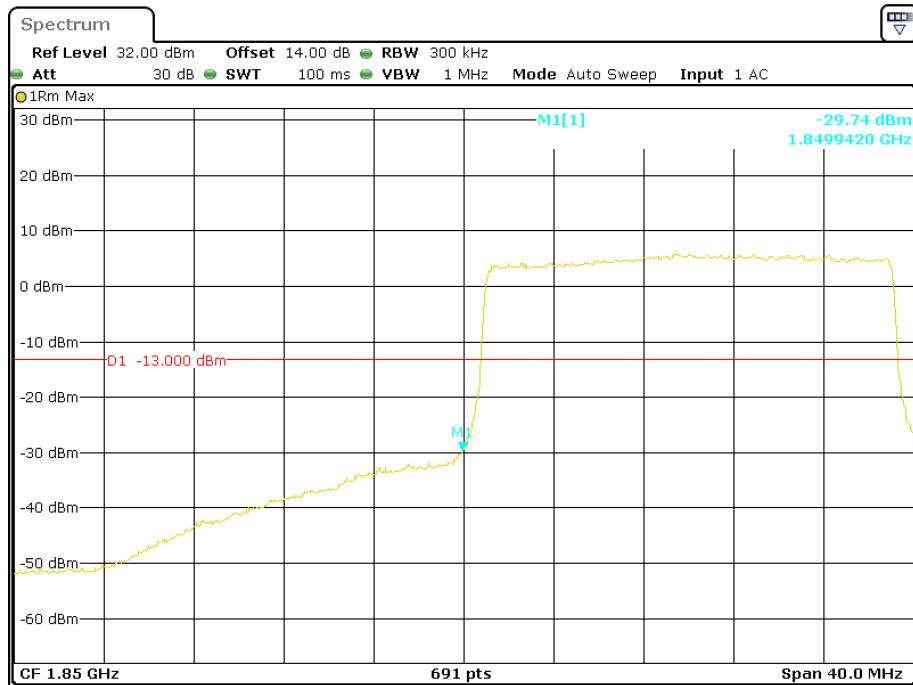
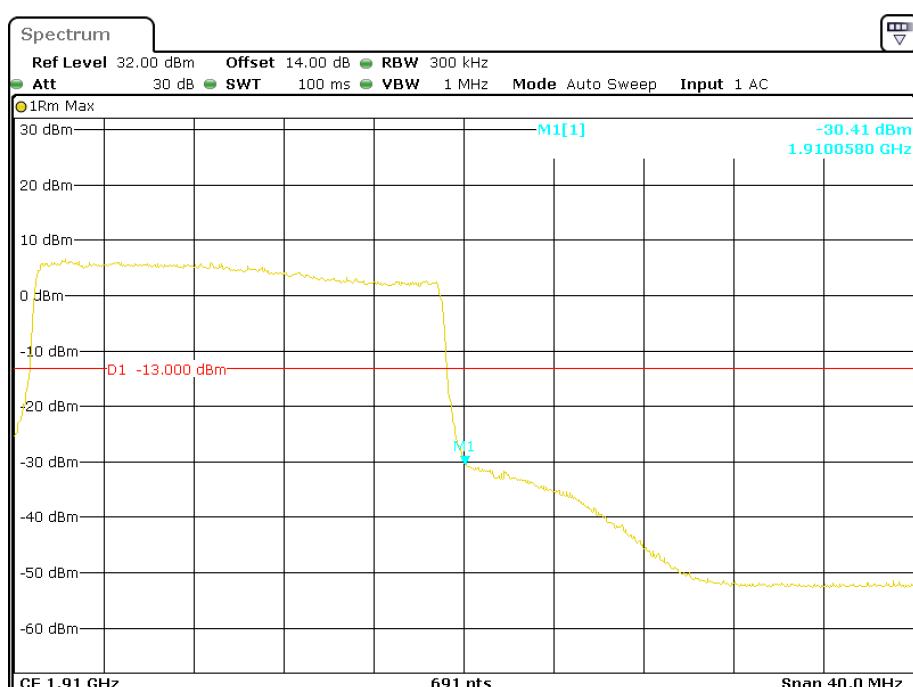
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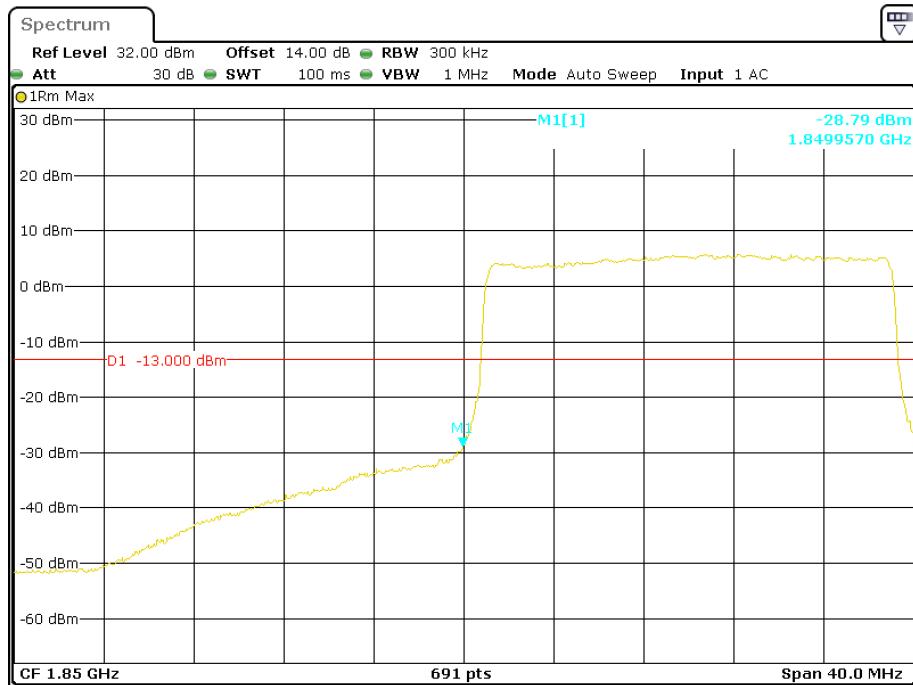
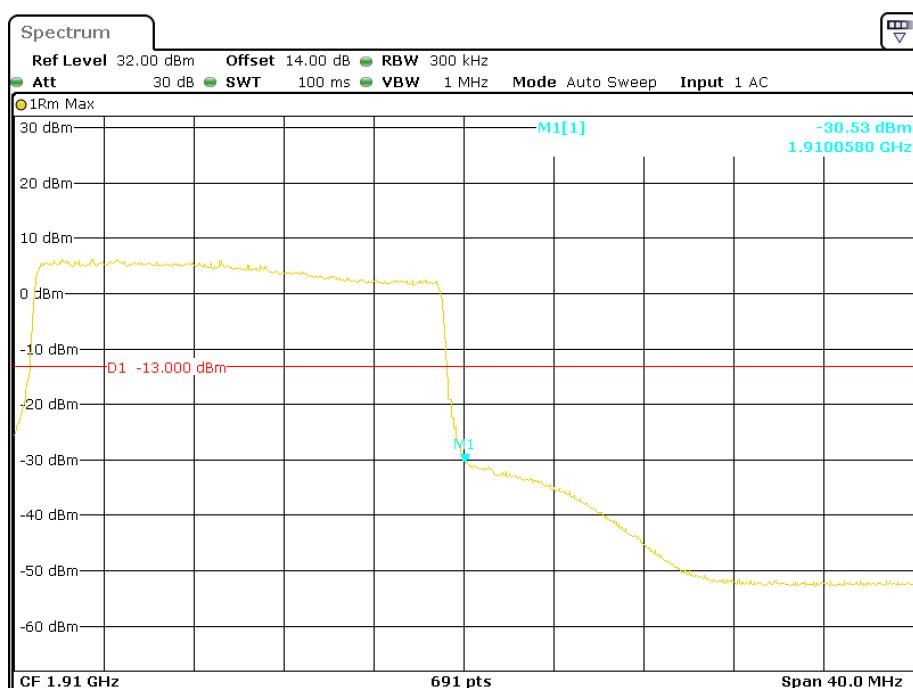
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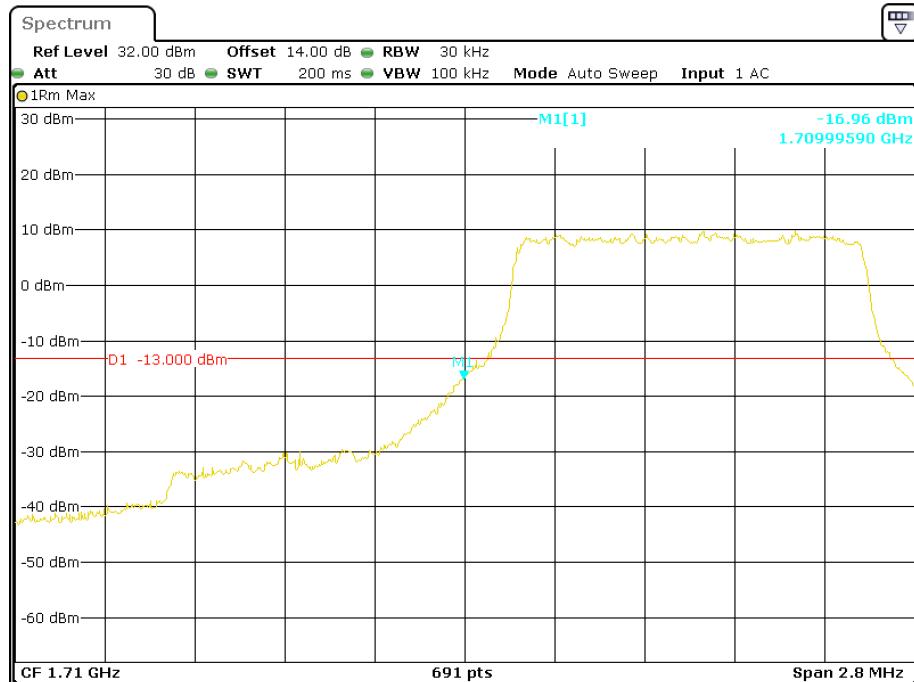
**16-QAM (10.0 MHz, FULL RB) - Left Band Edge****16-QAM (10.0 MHz, FULL RB) - Right Band Edge**

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

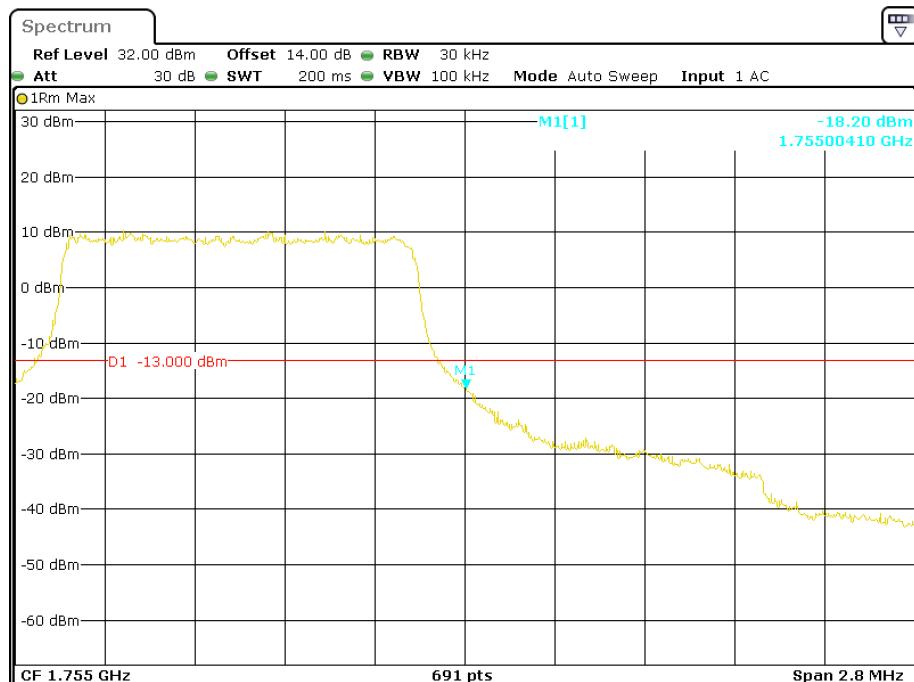
**16-QAM (15.0 MHz, FULL RB) - Left Band Edge****16-QAM (15.0 MHz, FULL RB) - Right Band Edge**

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

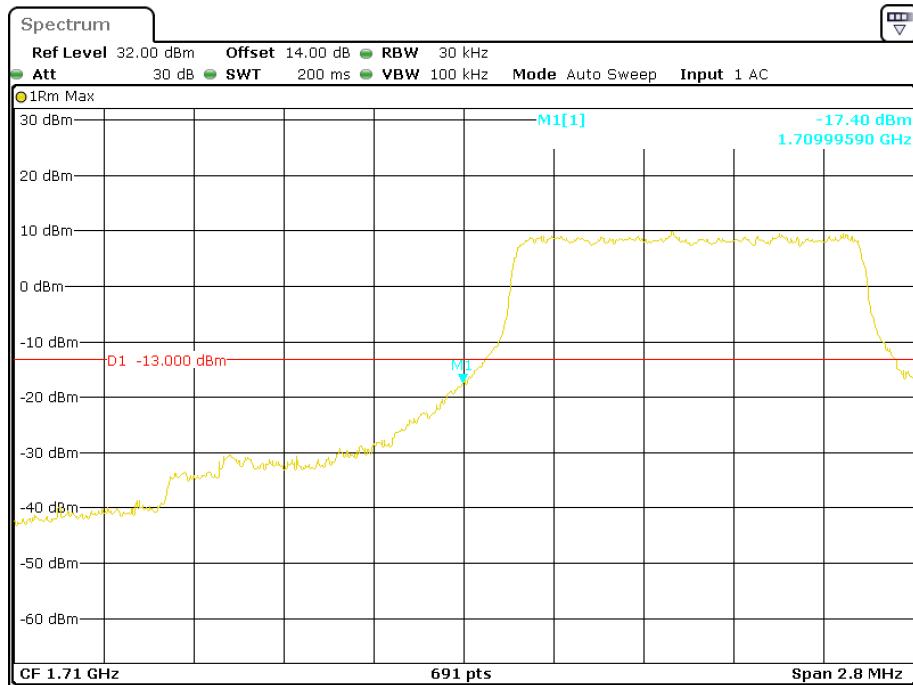
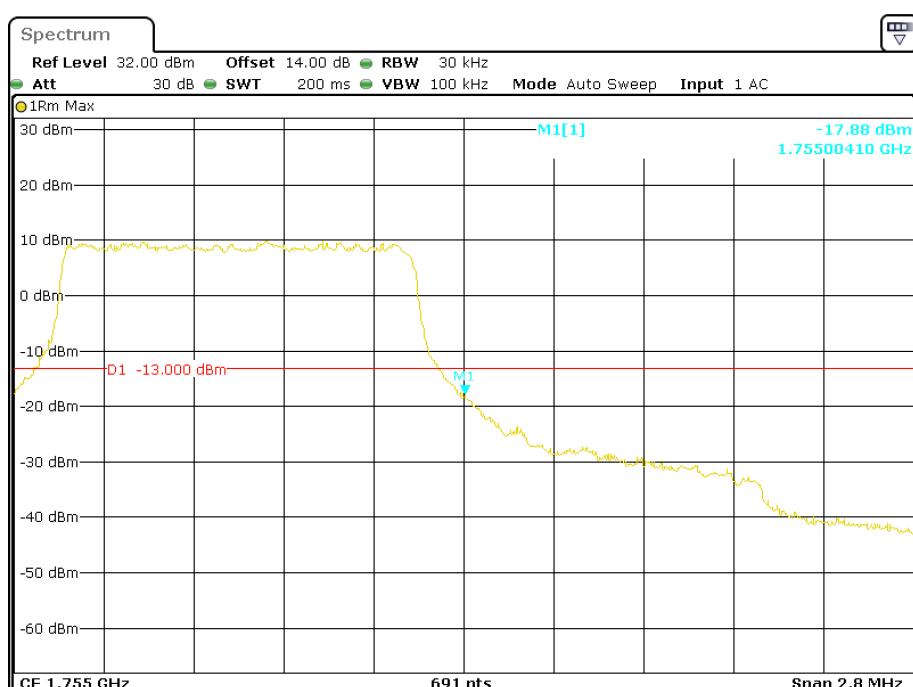
**16-QAM (20.0 MHz, FULL RB) - Left Band Edge****16-QAM (20.0 MHz, FULL RB) - Right Band Edge**

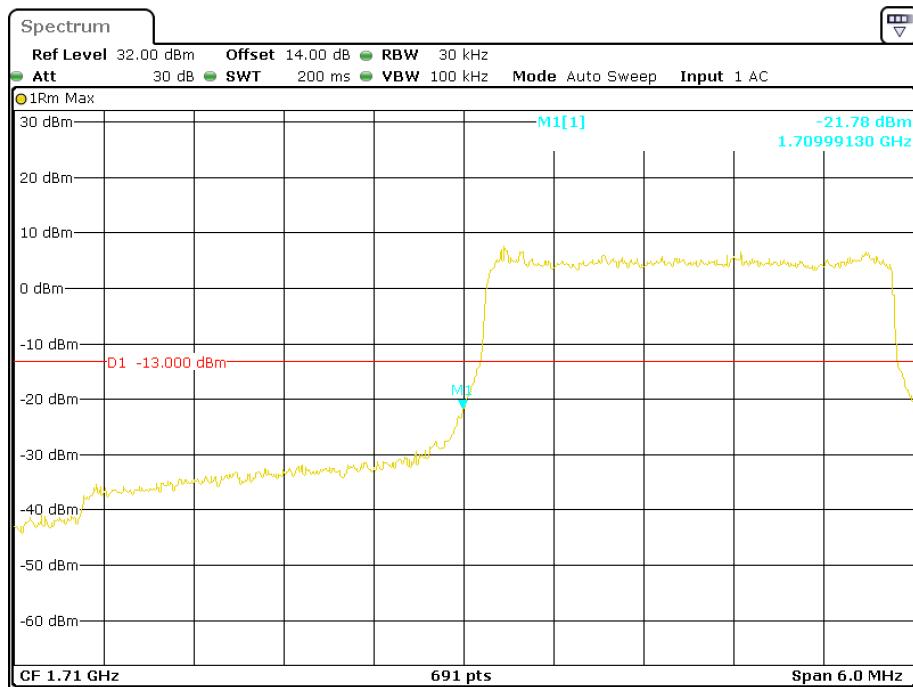
**Band 4:****QPSK (1.4 MHz, FULL RB) - Left Band Edge**

Date: 18.NOV.2017 09:30:41

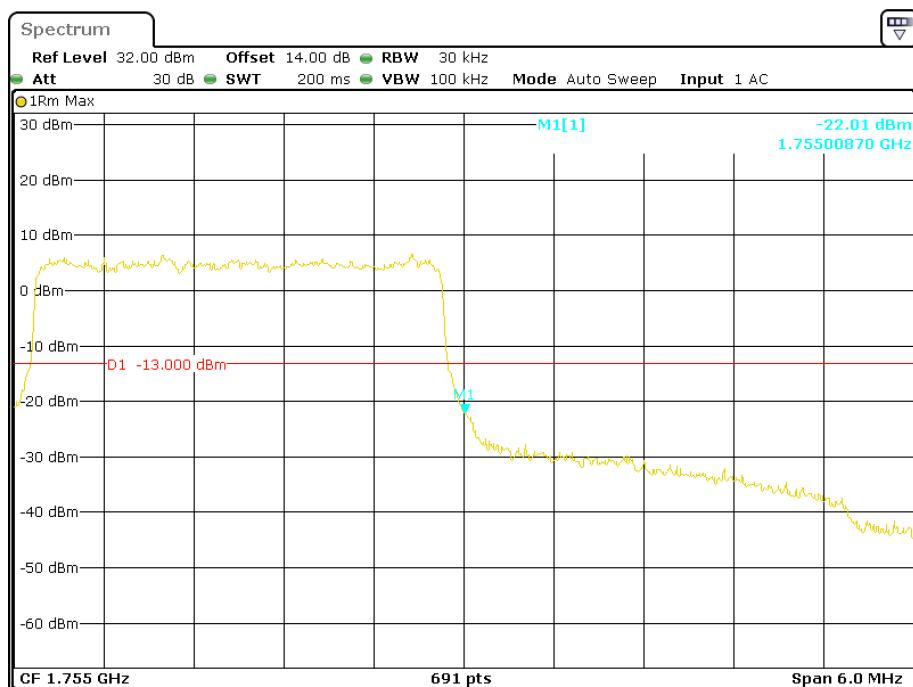
**QPSK (1.4 MHz, FULL RB) - Right Band Edge**

Date: 18.NOV.2017 09:32:34

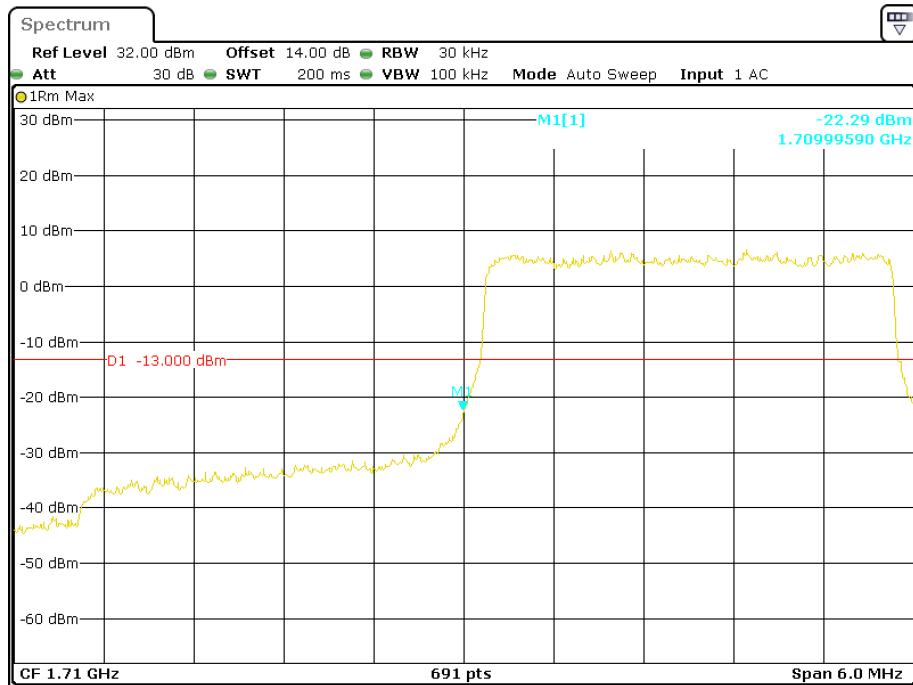
**16-QAM (1.4 MHz, FULL RB) - Left Band Edge****16-QAM (1.4 MHz, FULL RB) - Right Band Edge**

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

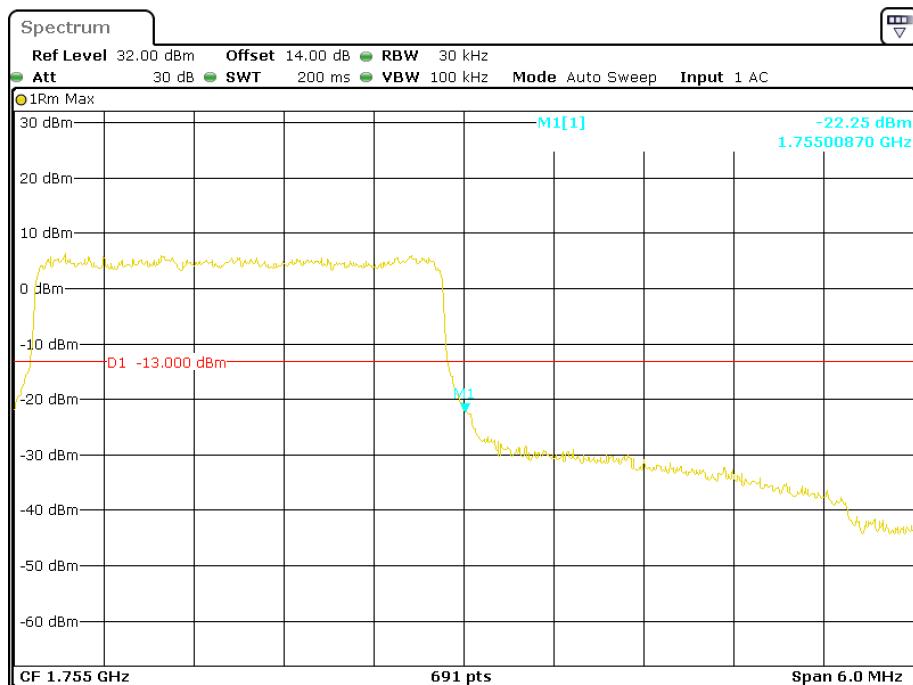
Date: 18.NOV.2017 09:40:43

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

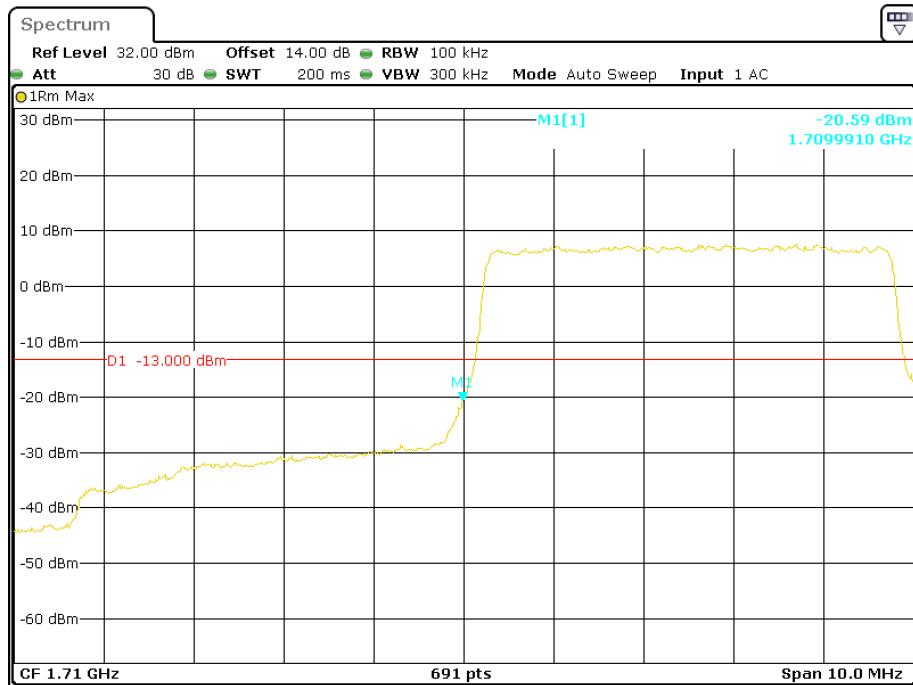
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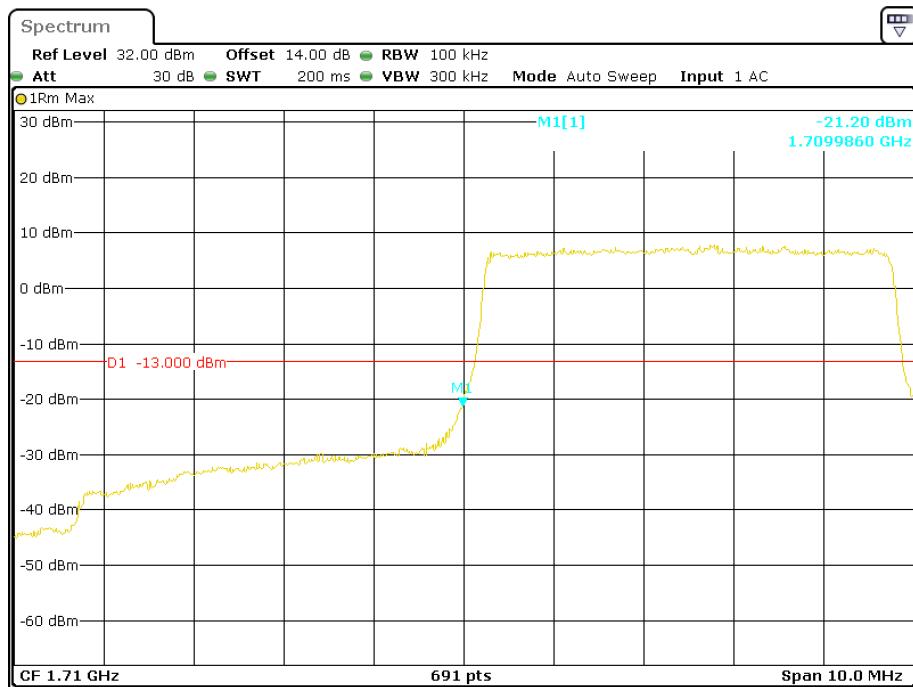
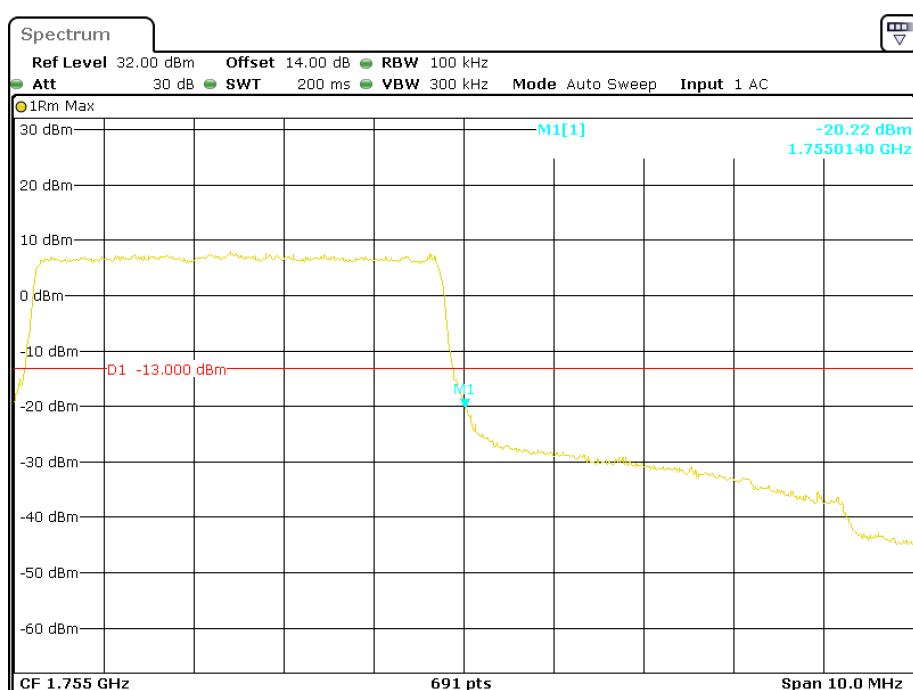
**16-QAM (3.0 MHz, FULL RB) - Left Band Edge**

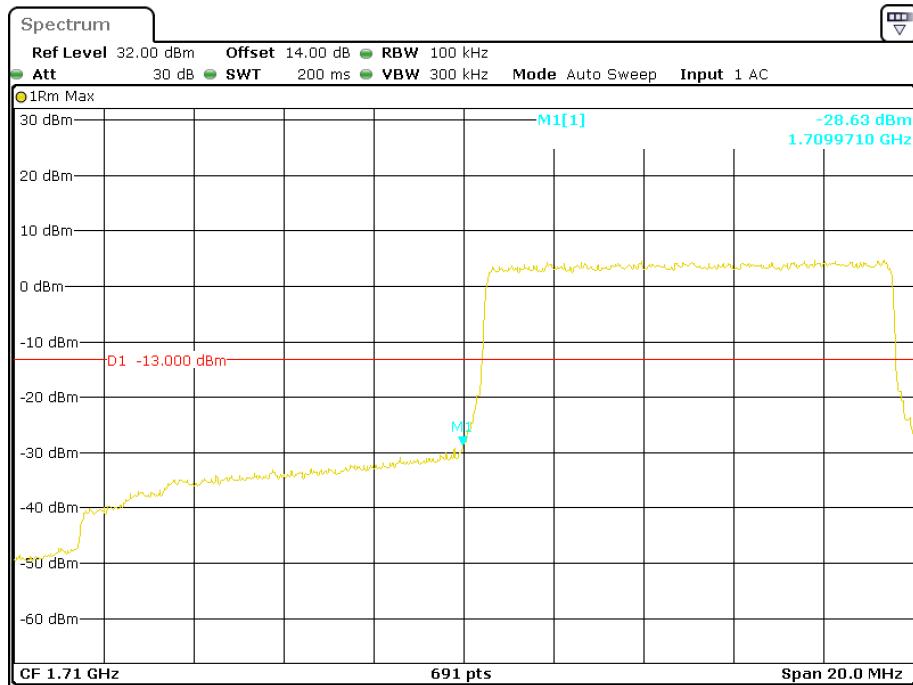
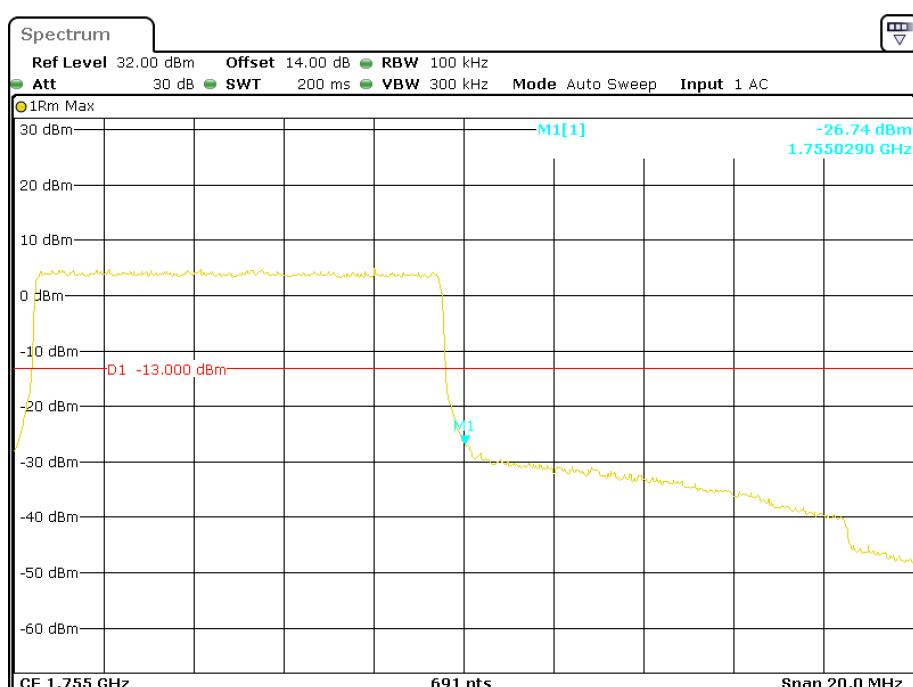
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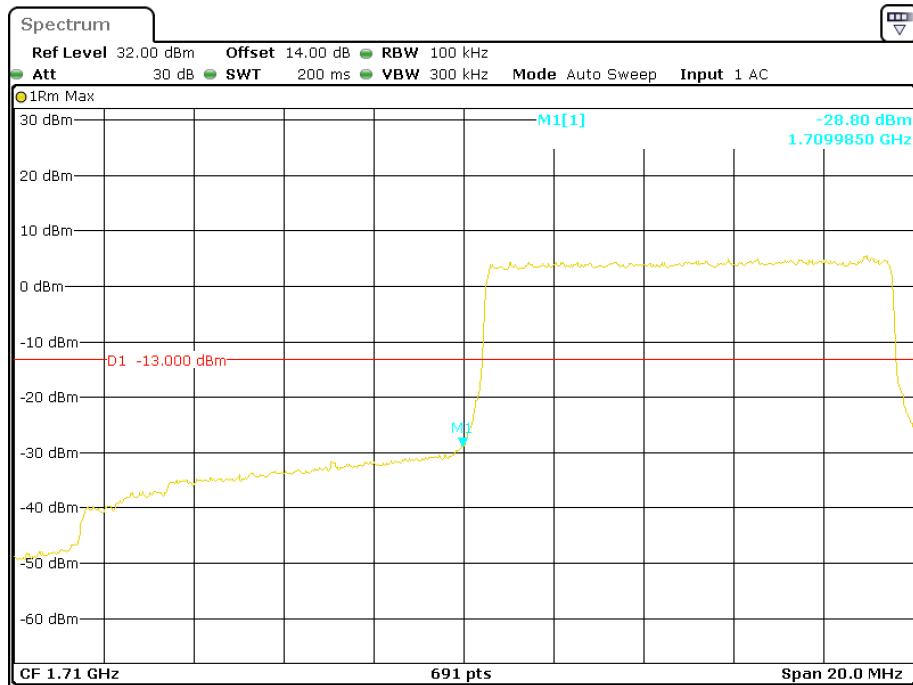
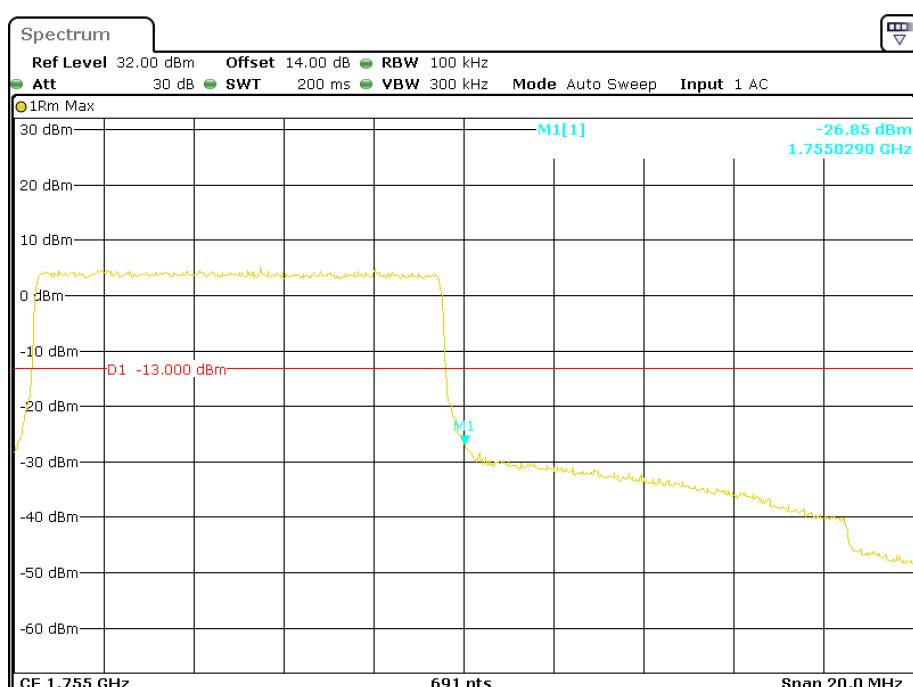
**16-QAM (3.0 MHz, FULL RB) - Right Band Edge**

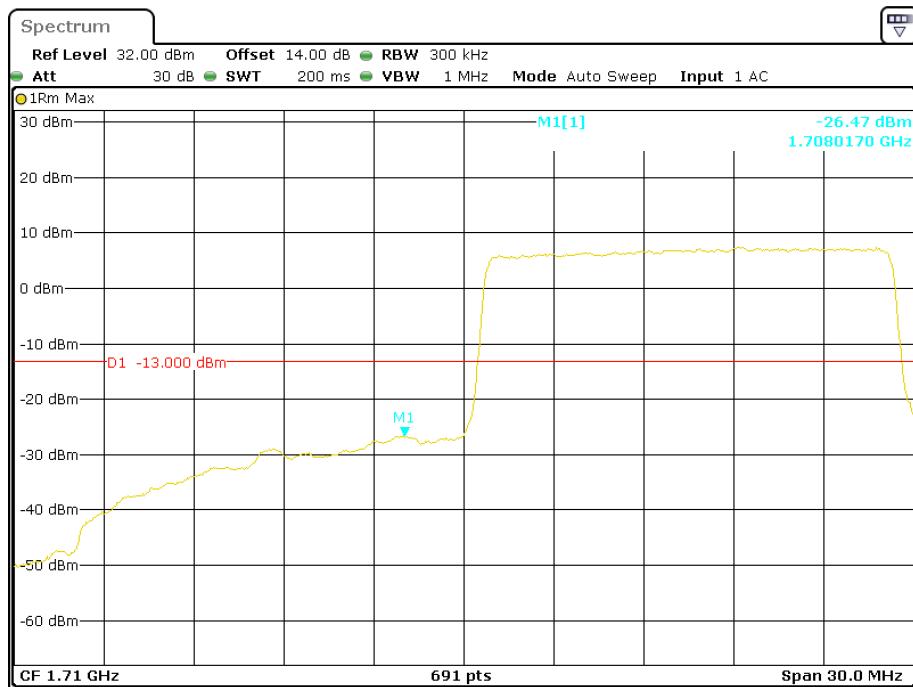
Date: 18.NOV.2017 09:39:30

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

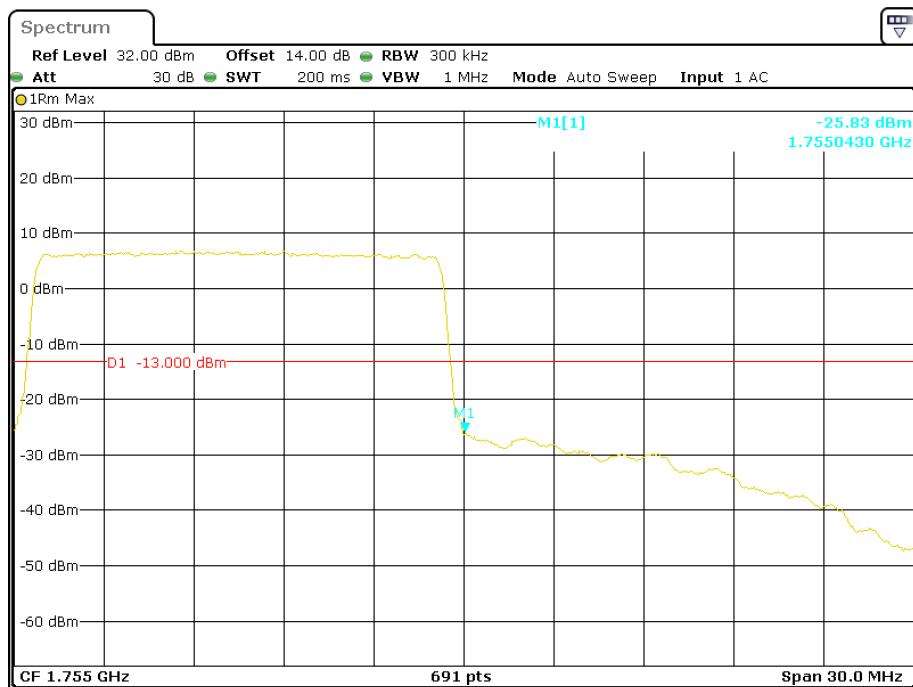
**16-QAM (5.0 MHz, FULL RB) - Left Band Edge****16-QAM (5.0 MHz, FULL RB) - Right Band Edge**

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

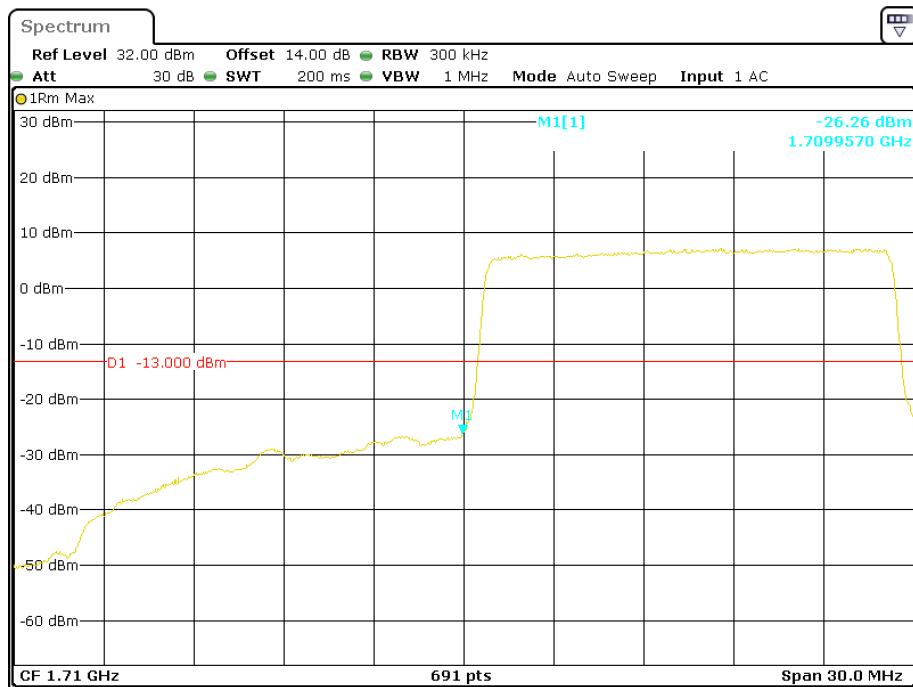
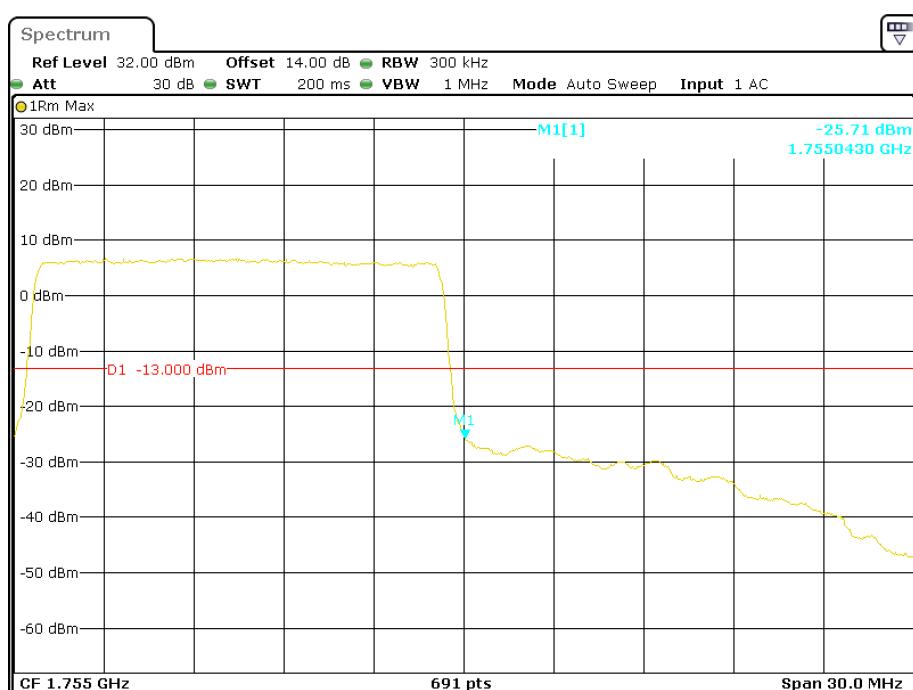
**16-QAM (10.0 MHz, FULL RB) - Left Band Edge****16-QAM (10.0 MHz, FULL RB) - Right Band Edge**

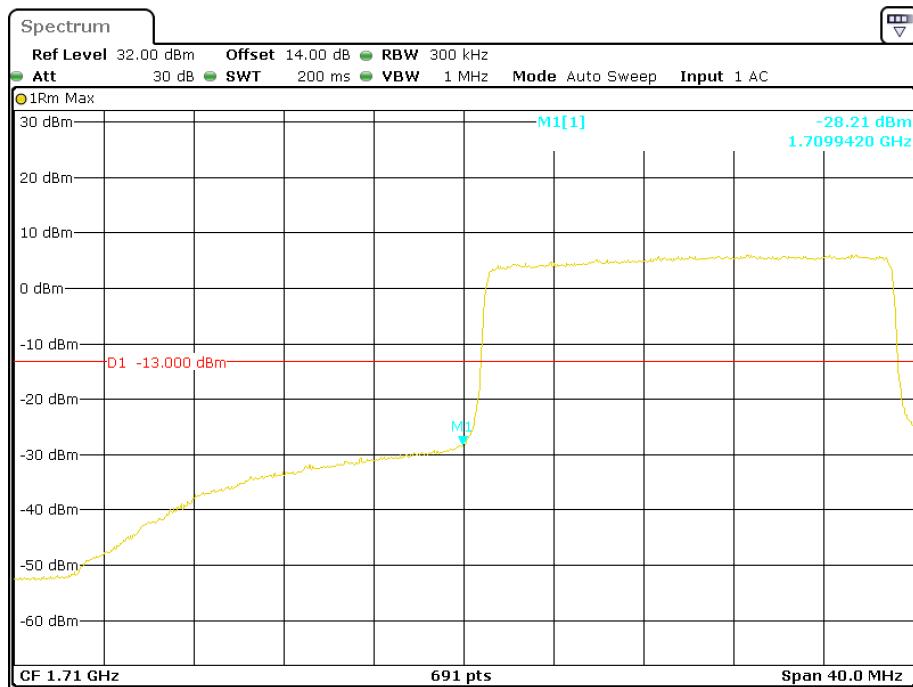
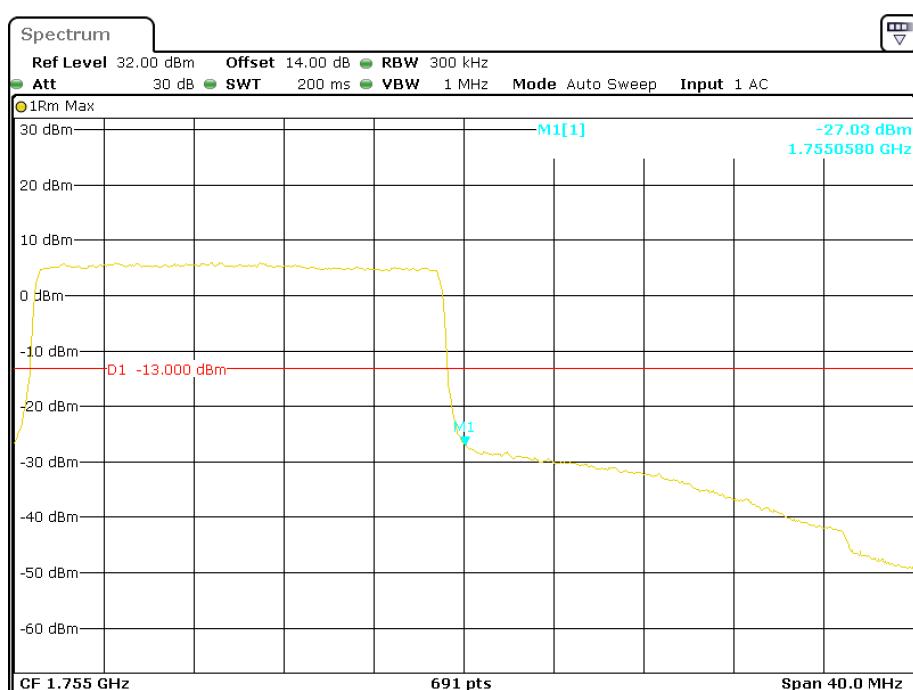
**QPSK (15.0 MHz, FULL RB) - Left Band Edge**

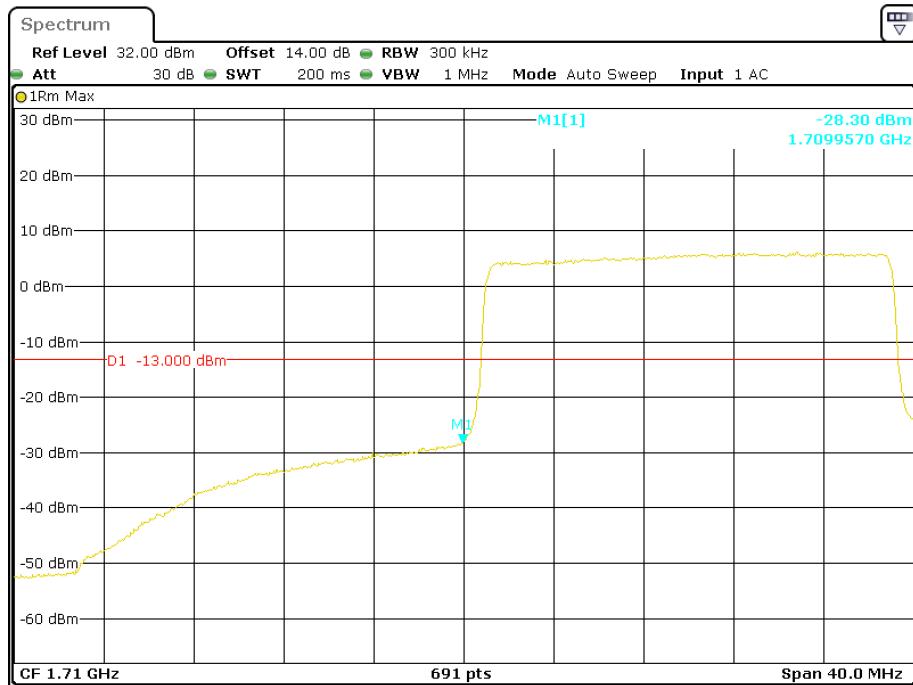
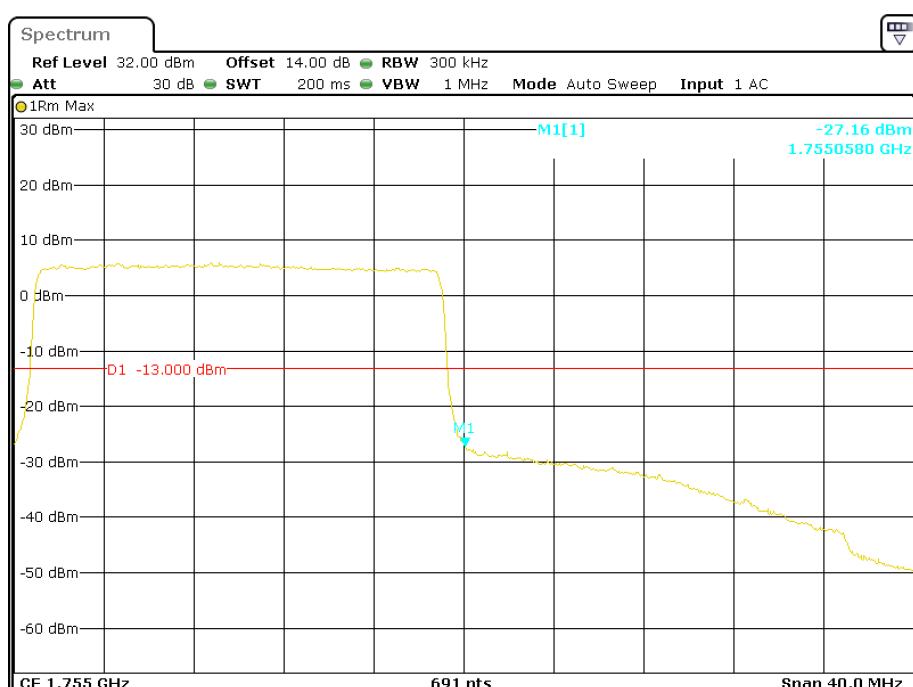
Date: 18.NOV.2017 09:57:03

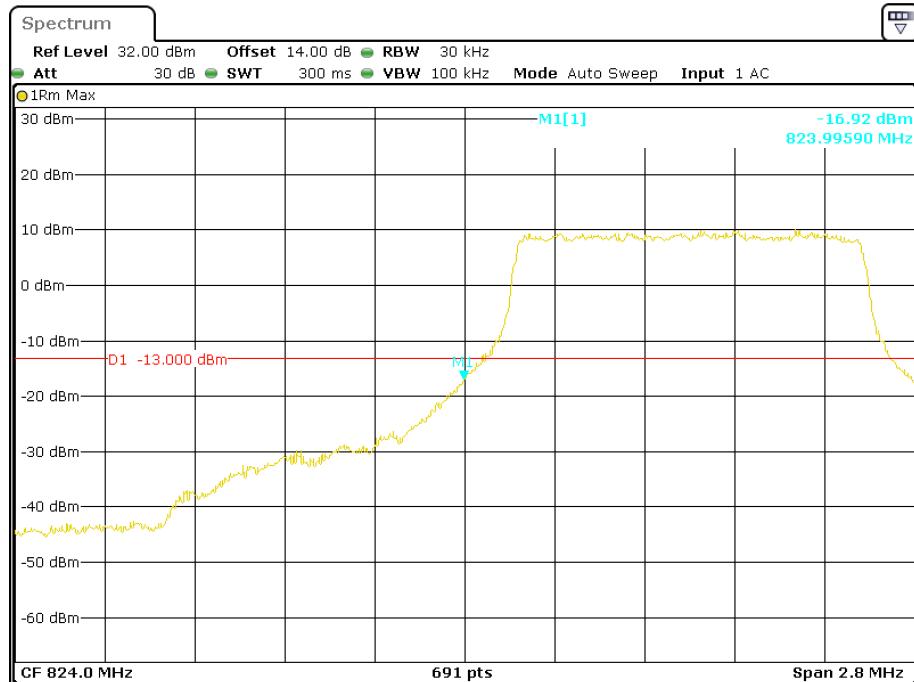
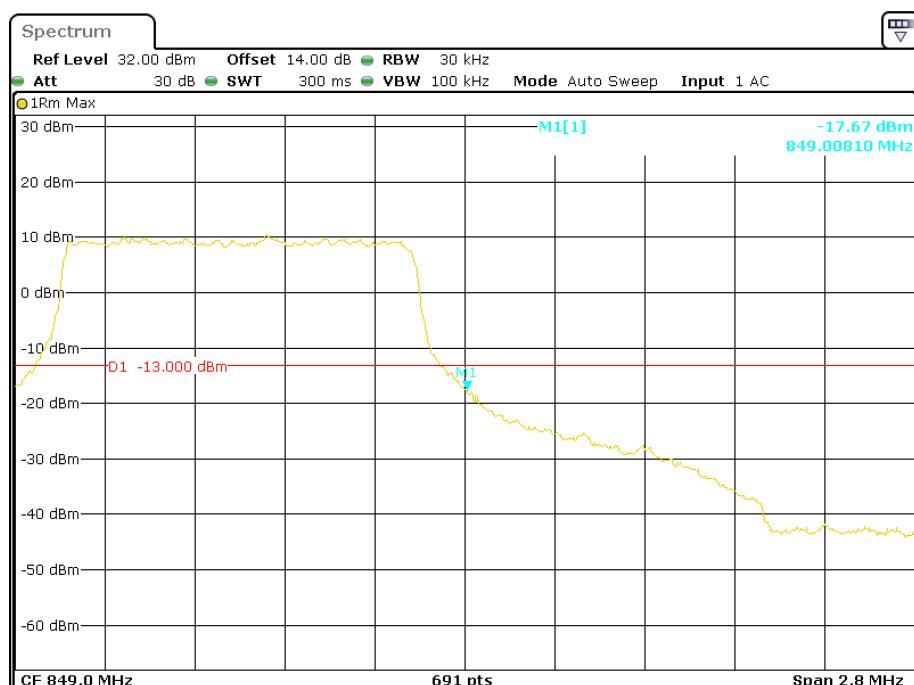
**QPSK (15.0 MHz, FULL RB) - Right Band Edge**

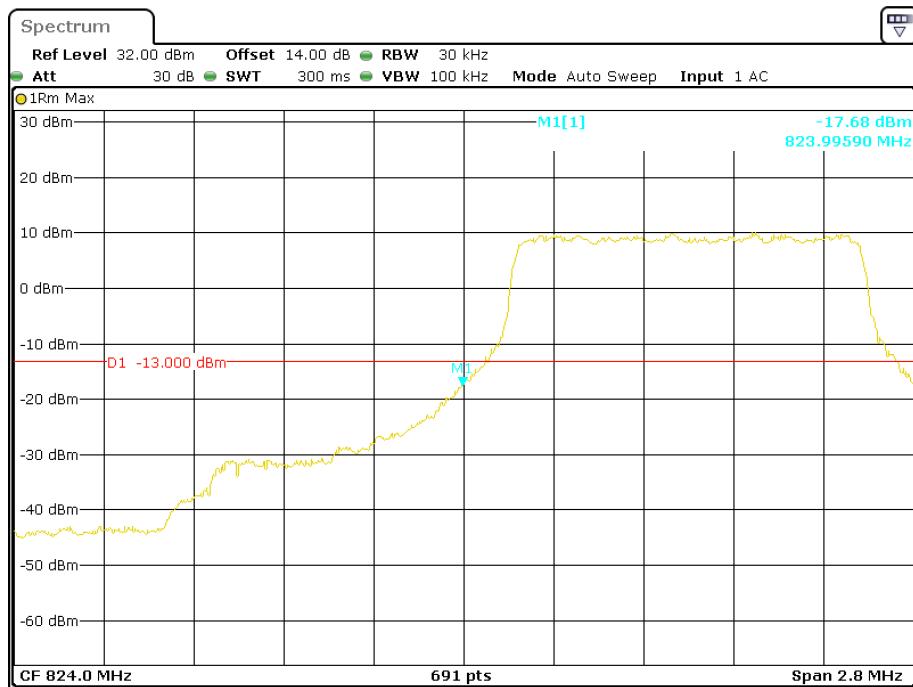
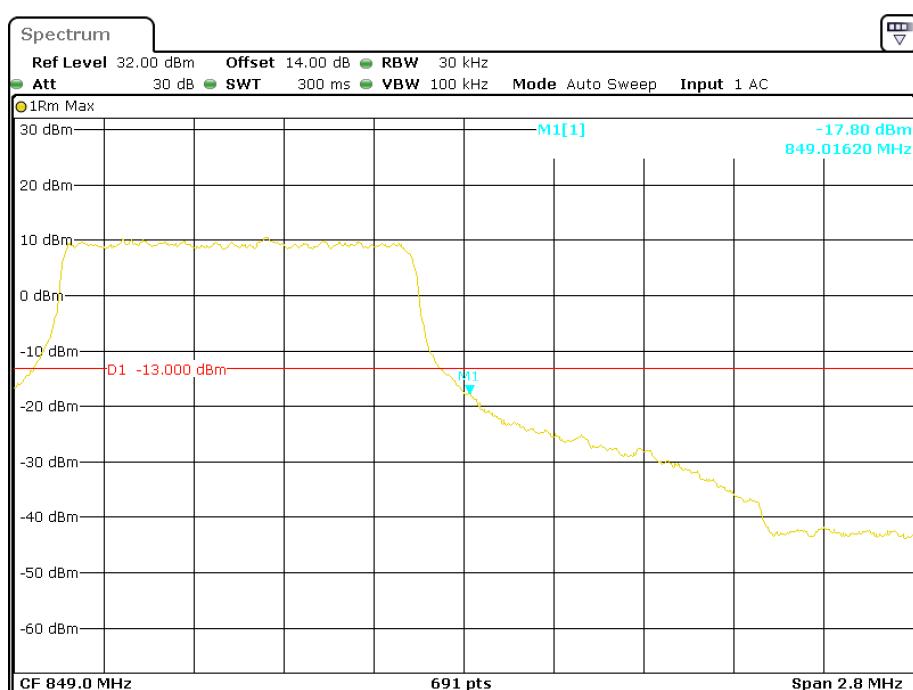
Date: 18.NOV.2017 09:57:53

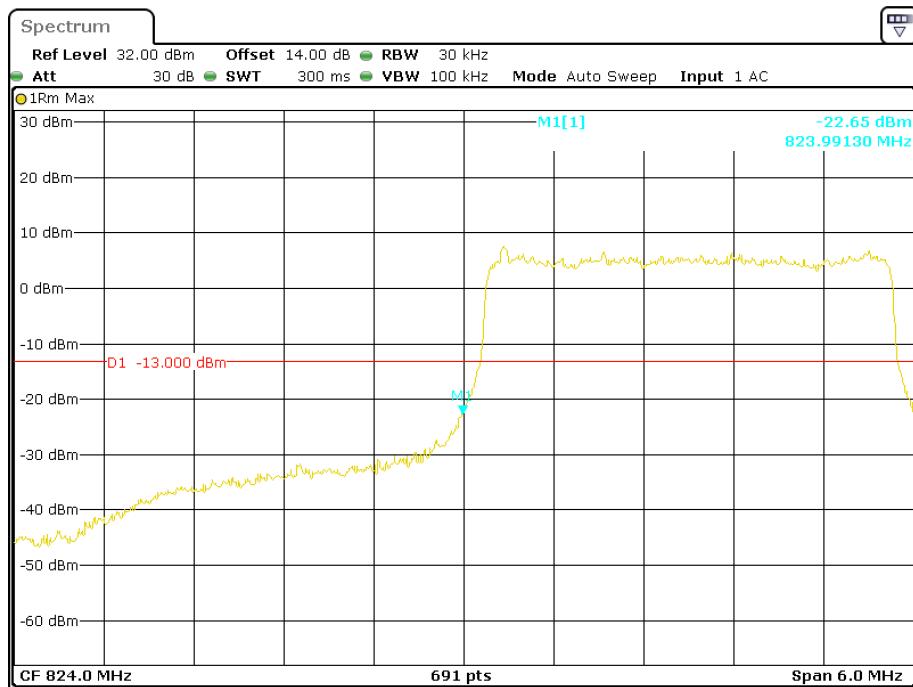
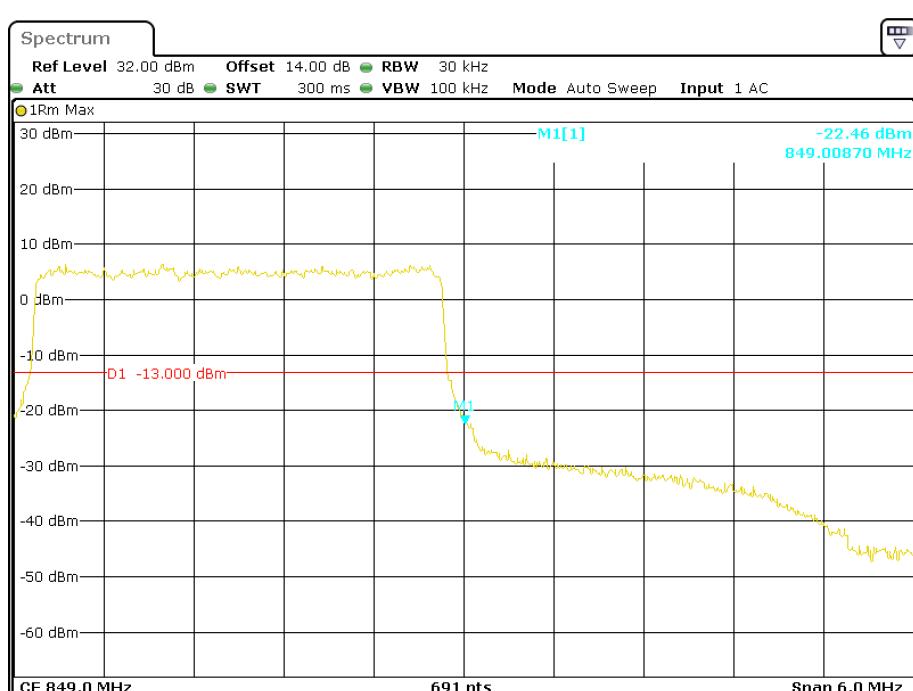
**16-QAM (15.0 MHz, FULL RB) - Left Band Edge****16-QAM (15.0 MHz, FULL RB) - Right Band Edge**

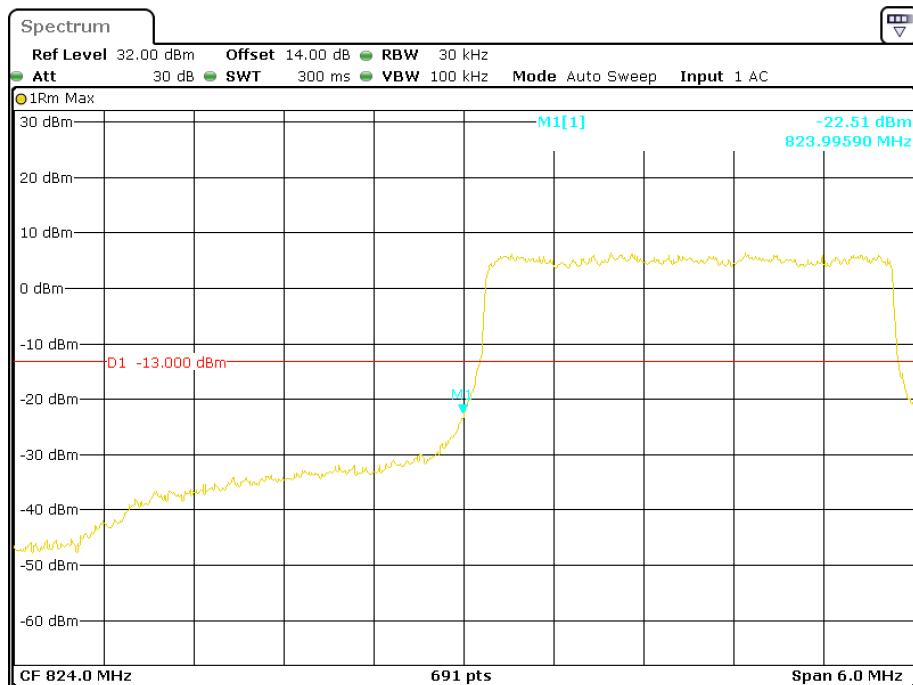
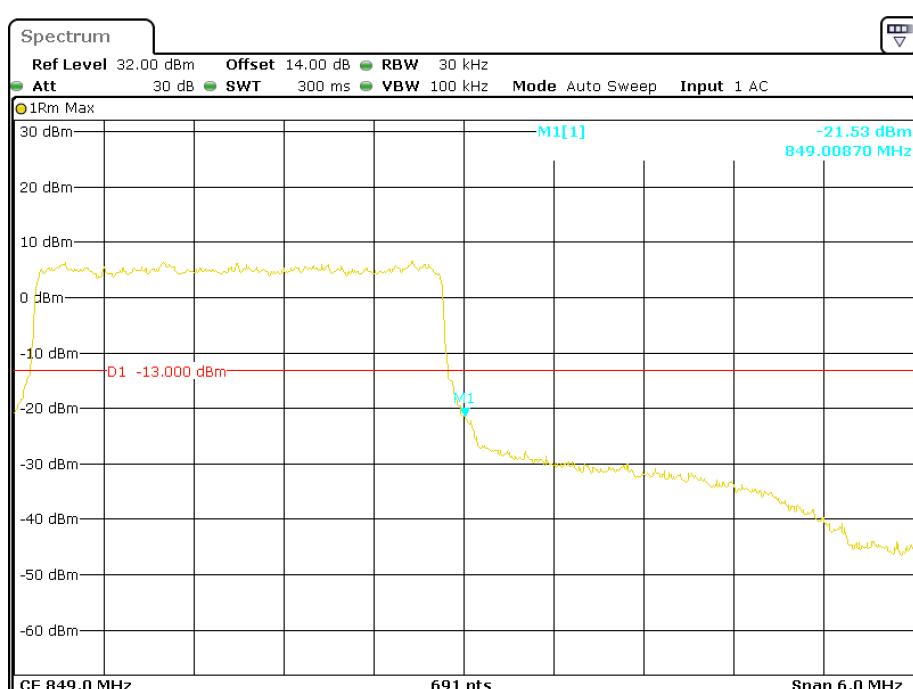
**QPSK (20.0 MHz, FULL RB) - Left Band Edge****QPSK (20.0 MHz, FULL RB) - Right Band Edge**

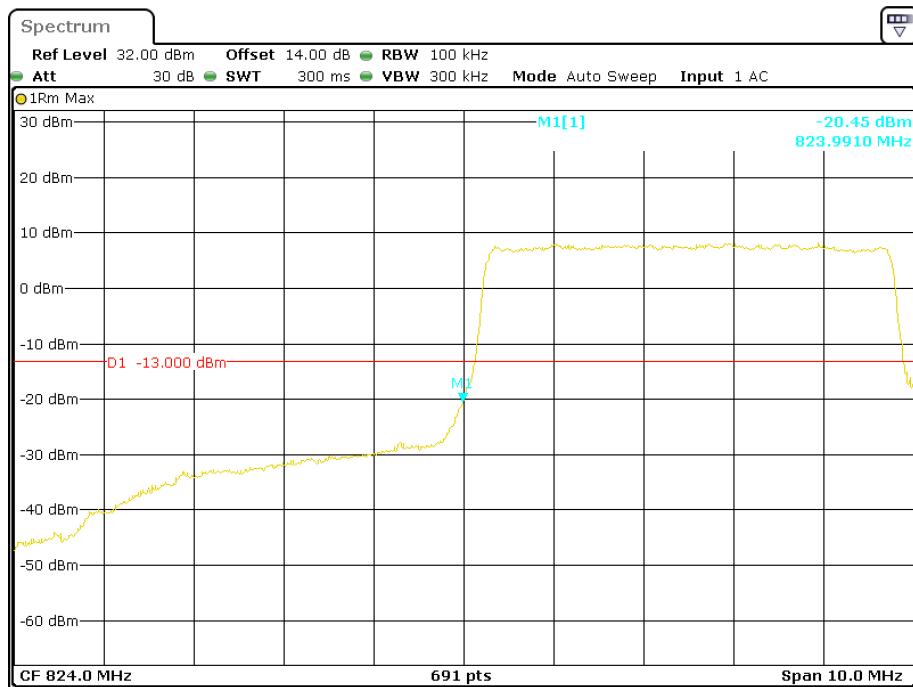
**16-QAM (20.0 MHz, FULL RB) - Left Band Edge****16-QAM (20.0 MHz, FULL RB) - Right Band Edge**

**Band 5:****QPSK (1.4 MHz, FULL RB) - Left Band Edge****QPSK (1.4 MHz, FULL RB) - Right Band Edge**

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

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

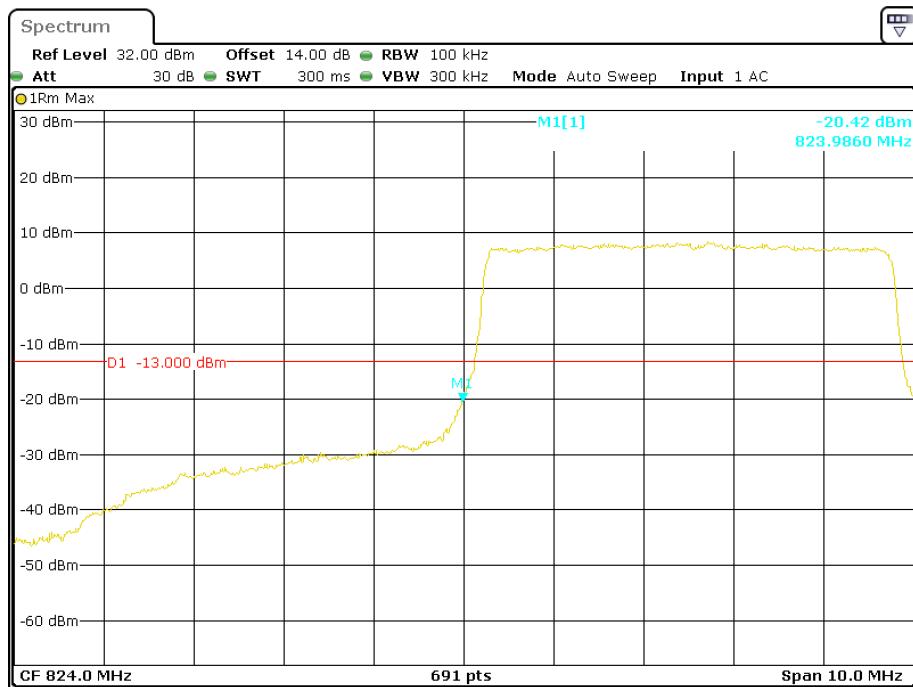
**16-QAM (3.0 MHz, FULL RB) - Left Band Edge****16-QAM (3.0 MHz, FULL RB) - Right Band Edge**

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

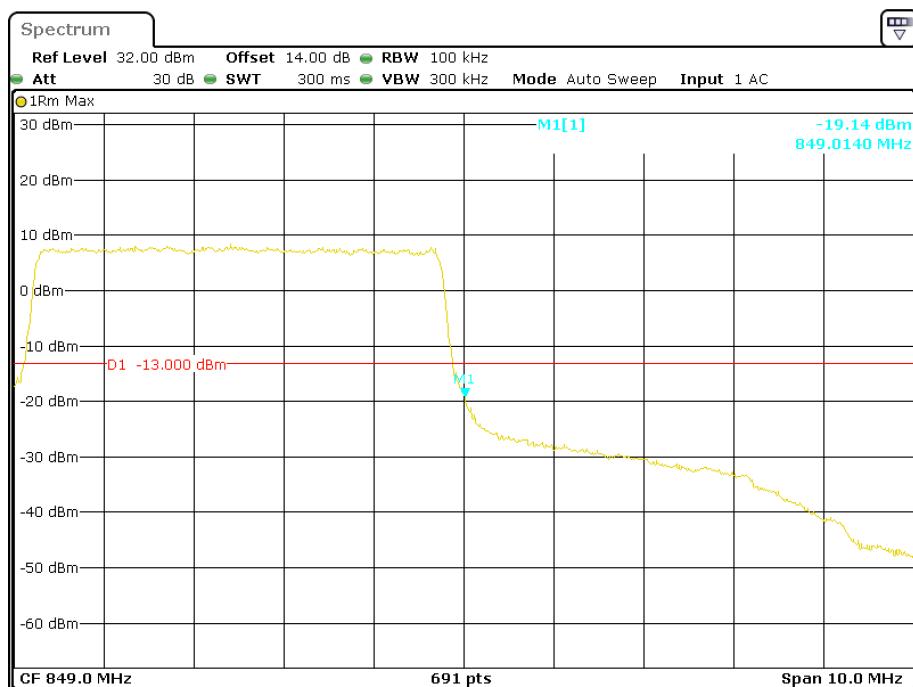
Date: 18.NOV.2017 10:44:26

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

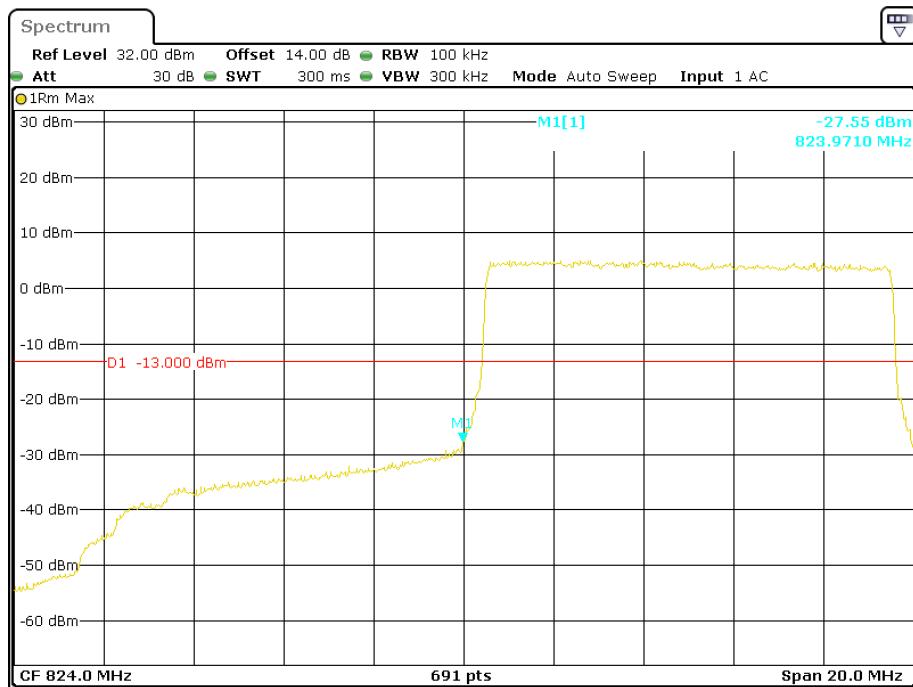
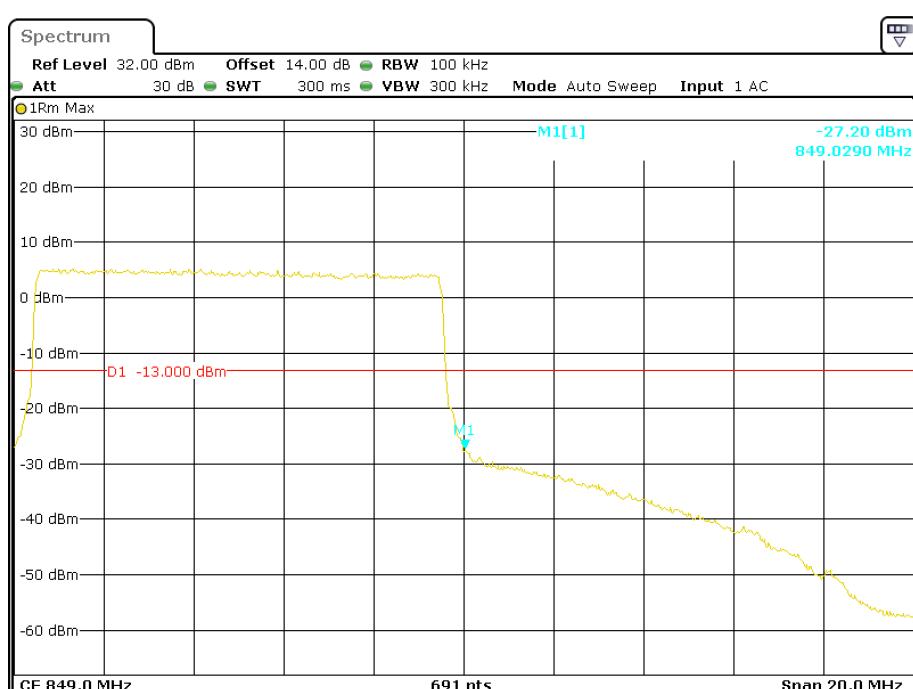
Date: 18.NOV.2017 10:45:05

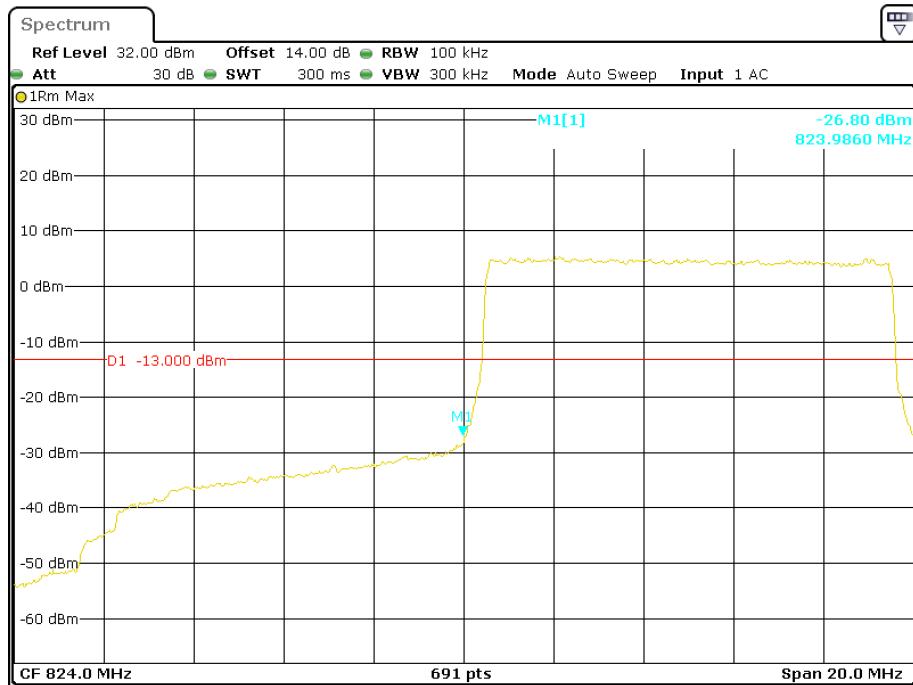
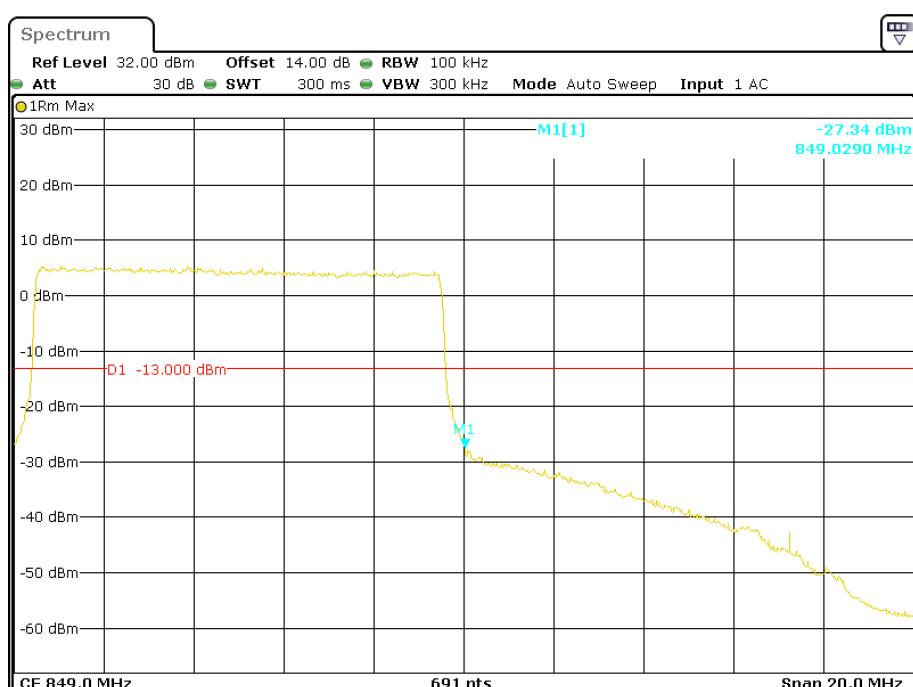
**16-QAM (5.0 MHz, FULL RB) - Left Band Edge**

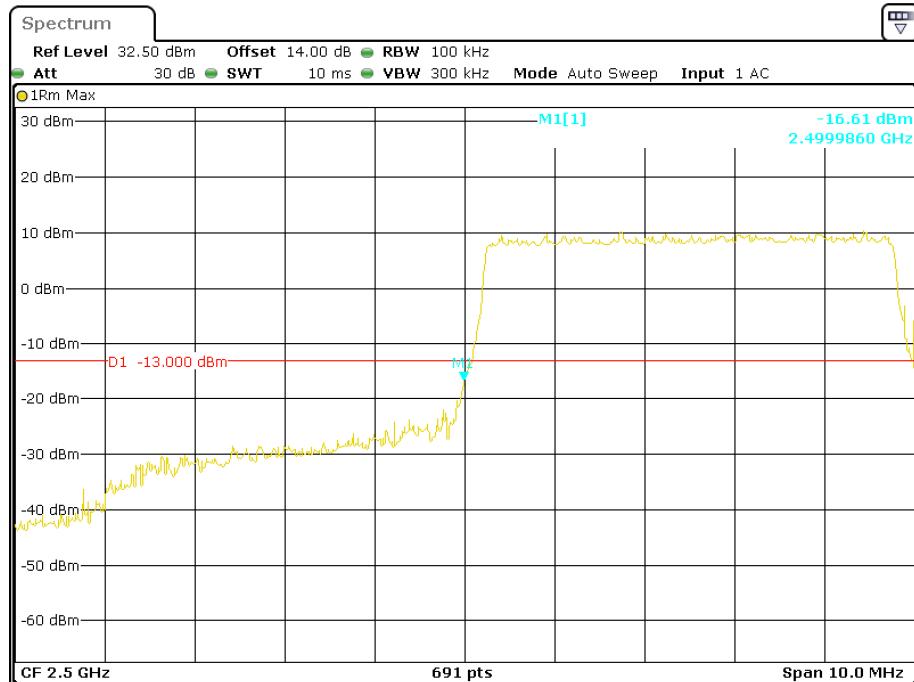
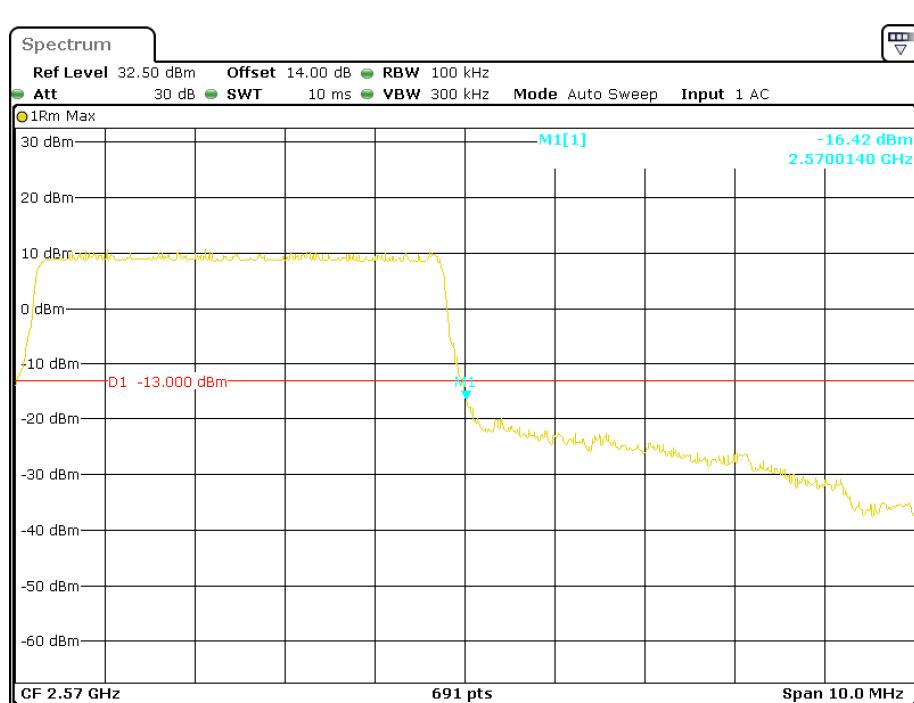
Date: 18.NOV.2017 10:46:30

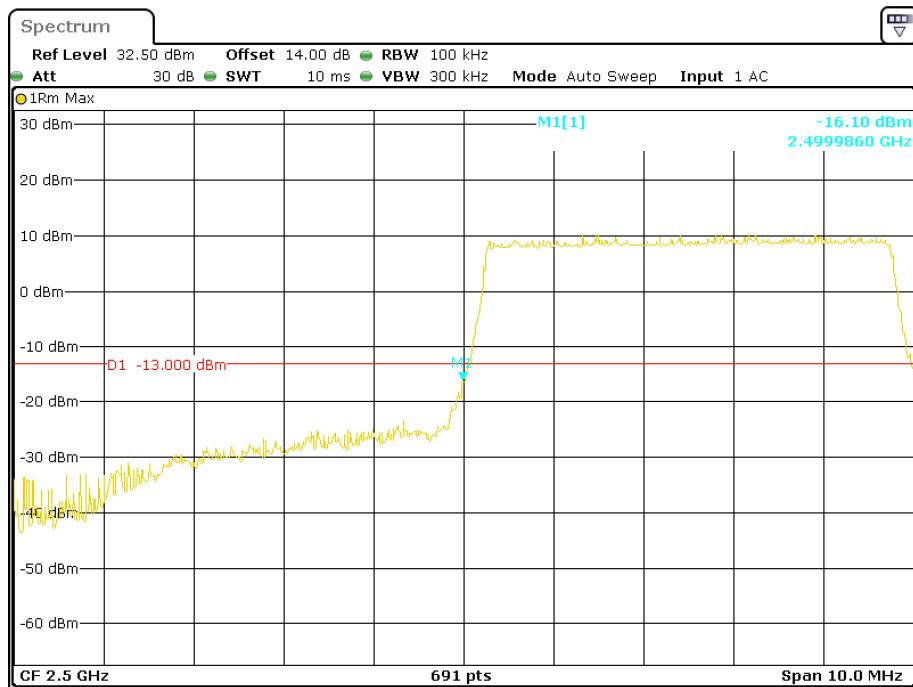
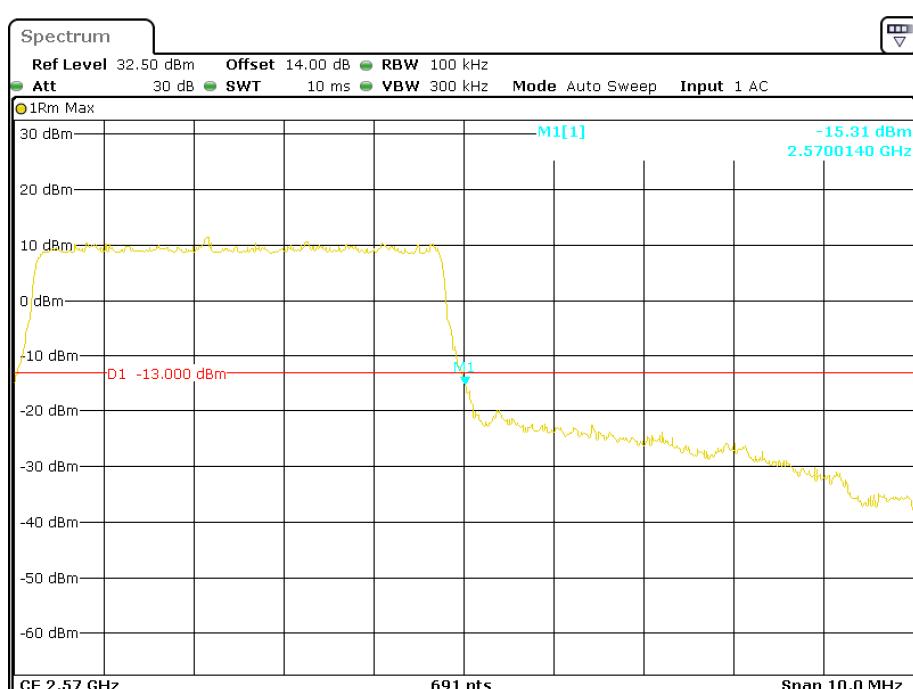
**16-QAM (5.0 MHz, FULL RB) - Right Band Edge**

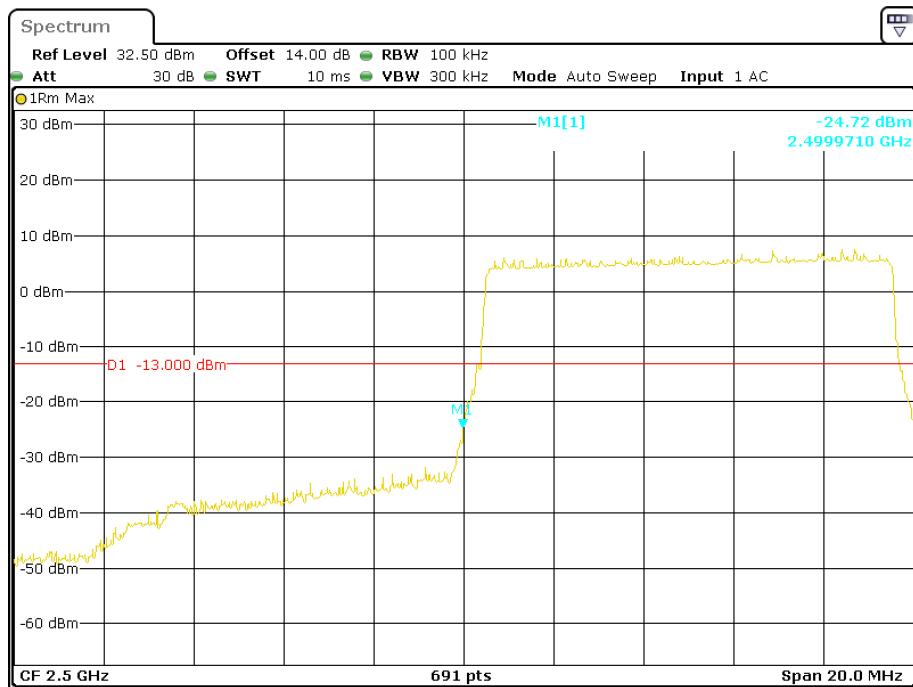
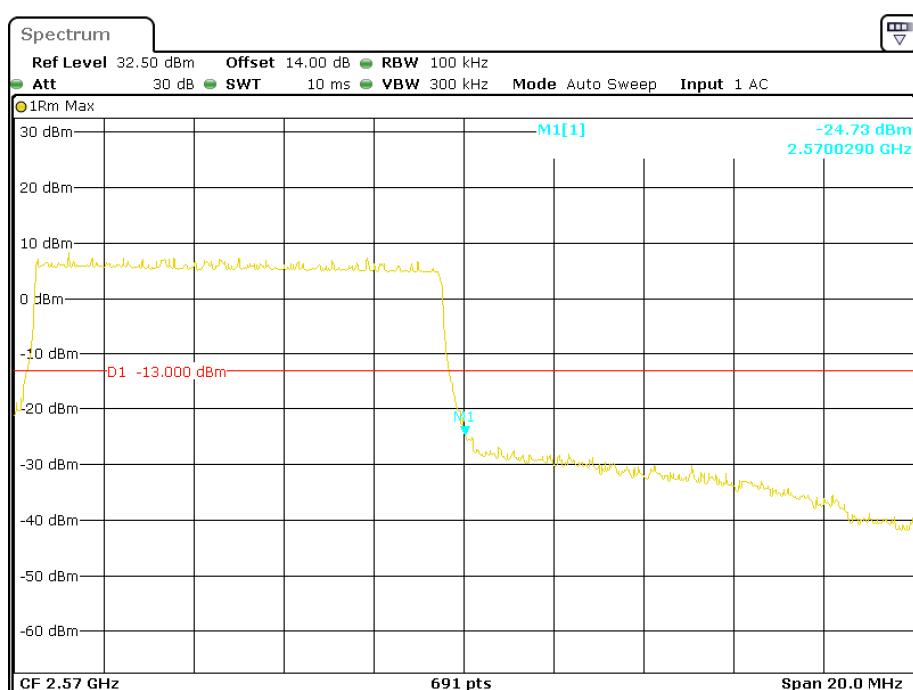
Date: 18.NOV.2017 10:45:31

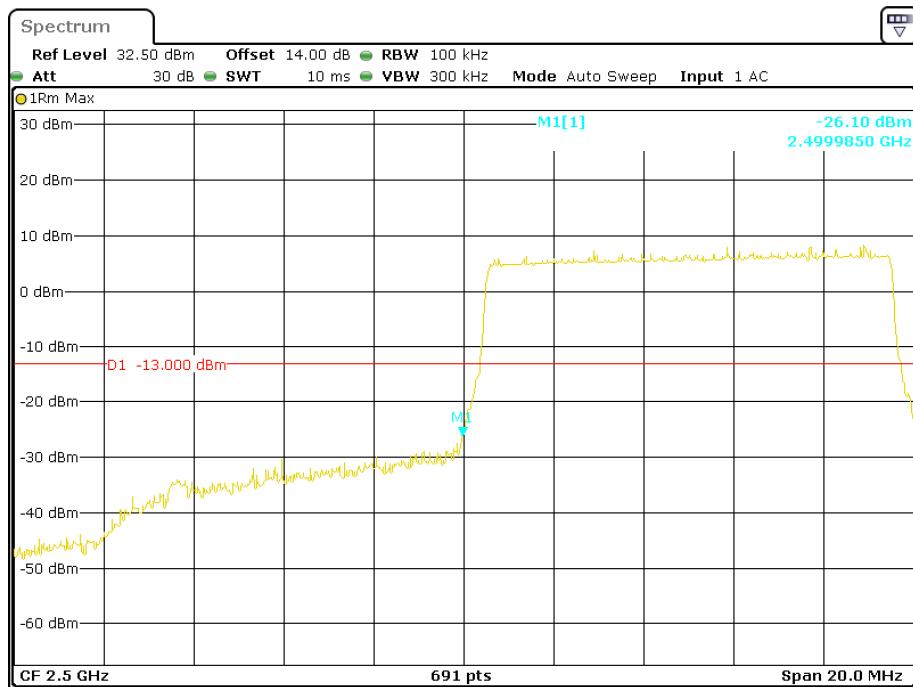
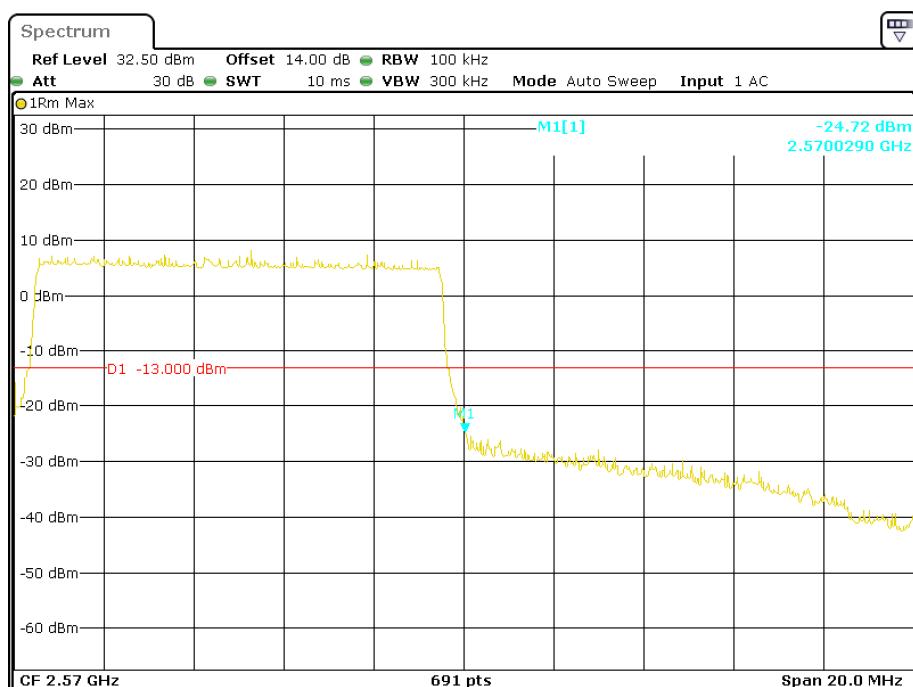
**QPSK (10.0 MHz, FULL RB) - Left Band Edge****QPSK (10.0 MHz, FULL RB) - Right Band Edge**

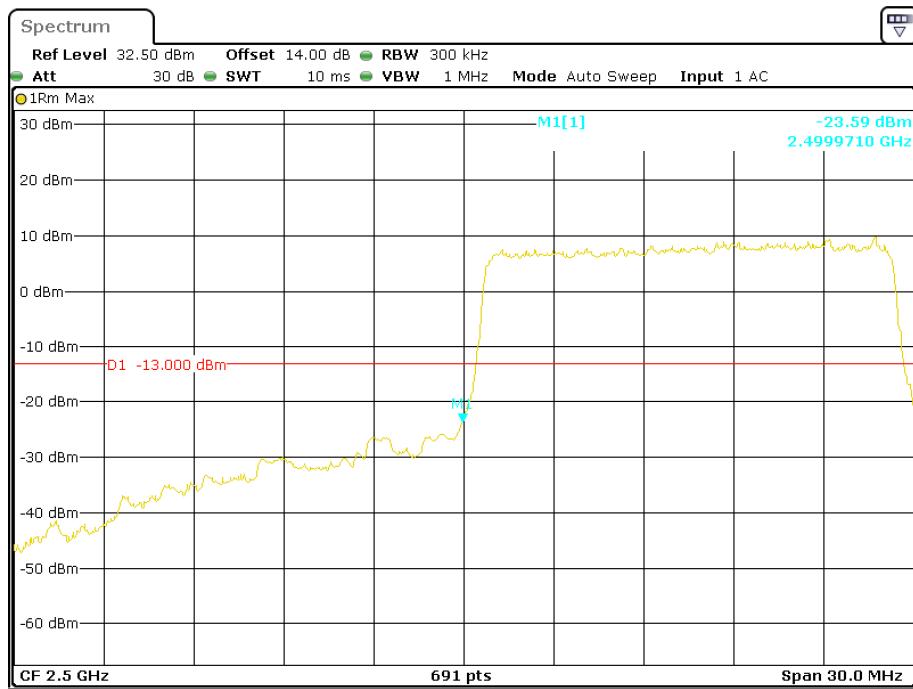
**16-QAM (10.0 MHz, FULL RB) - Left Band Edge****16-QAM (10.0 MHz, FULL RB) - Right Band Edge**

**Band 7:****QPSK (5.0 MHz, FULL RB) - Left Band Edge****QPSK (5.0 MHz, FULL RB) - Right Band Edge**

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

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

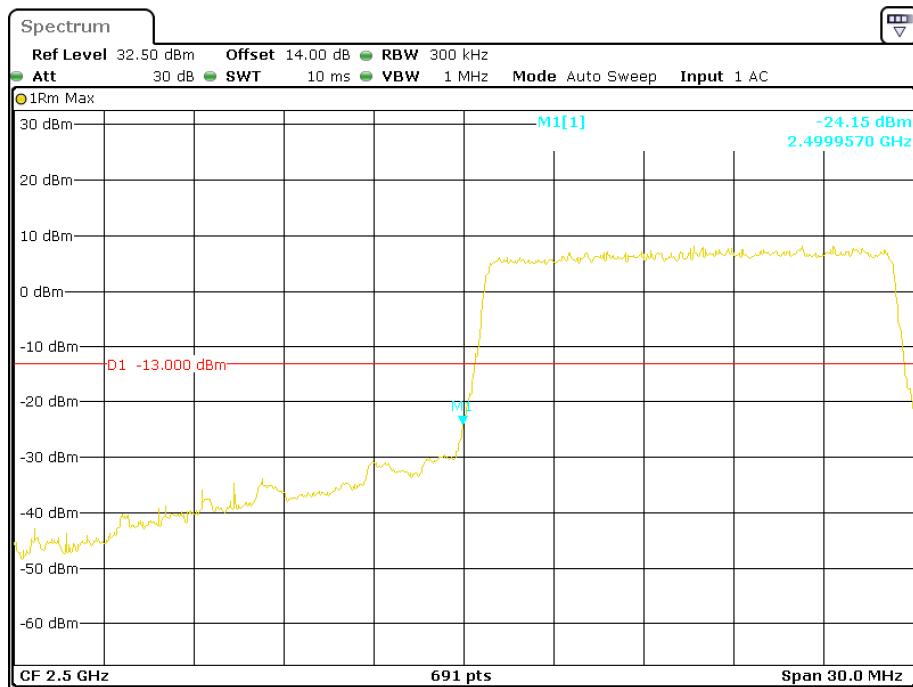
**16-QAM (10.0 MHz, FULL RB) - Left Band Edge****16-QAM (10.0 MHz, FULL RB) - Right Band Edge**

**QPSK (15 MHz, FULL RB) - Left Band Edge**

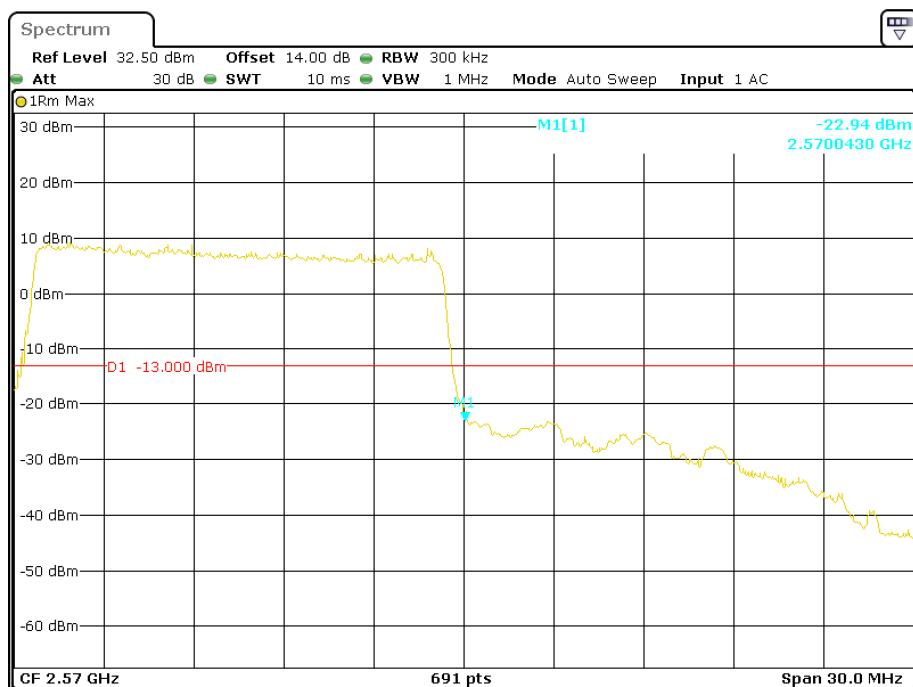
Date: 27.NOV.2017 13:00:56

**QPSK (15 MHz, FULL RB) - Right Band Edge**

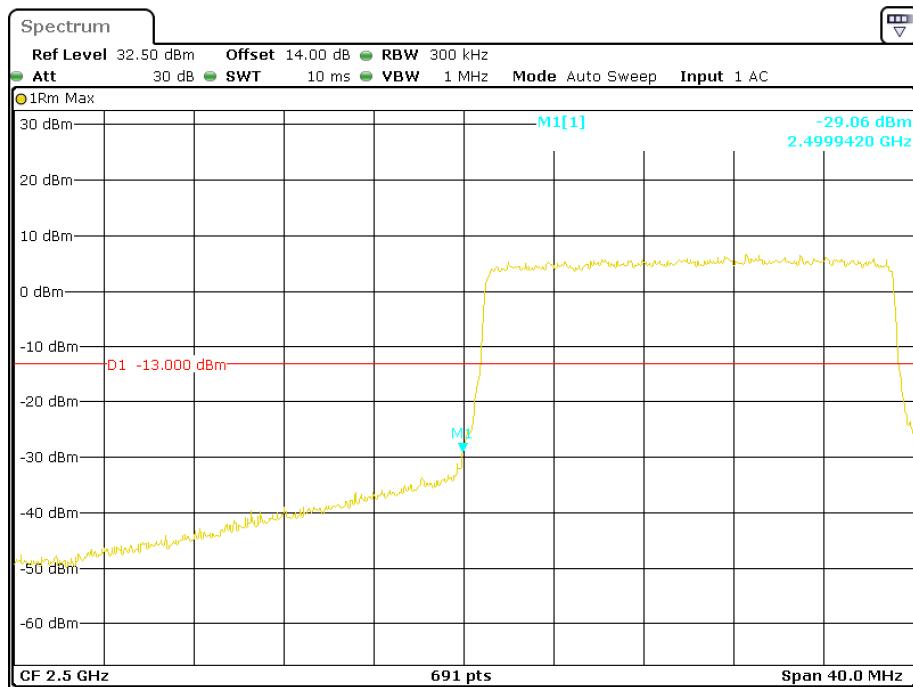
Date: 27.NOV.2017 13:01:43

**16-QAM (15 MHz, FULL RB) - Left Band Edge**

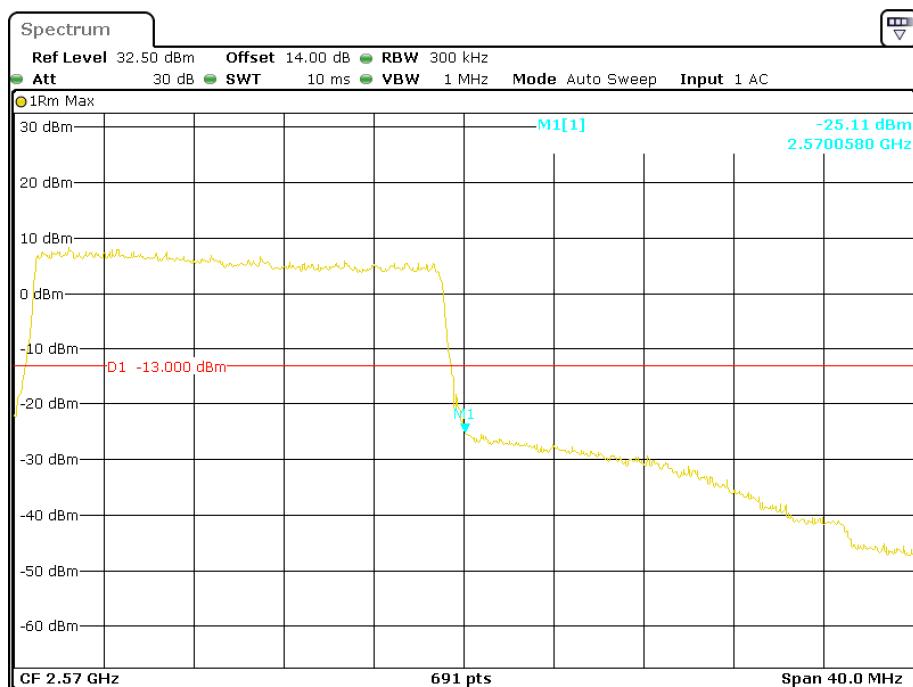
Date: 27.NOV.2017 13:03:10

**16-QAM (15 MHz, FULL RB) - Right Band Edge**

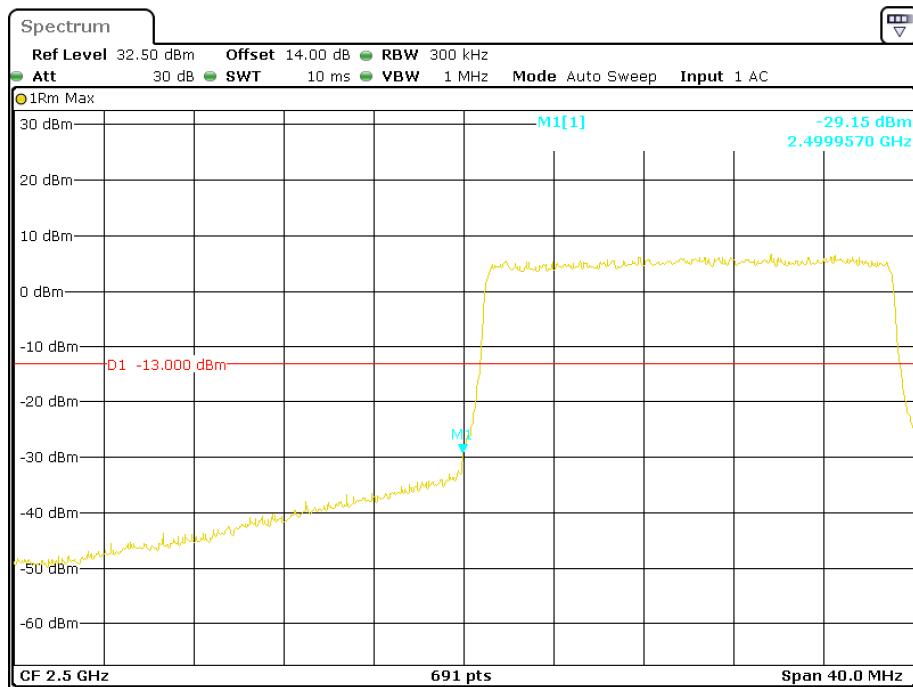
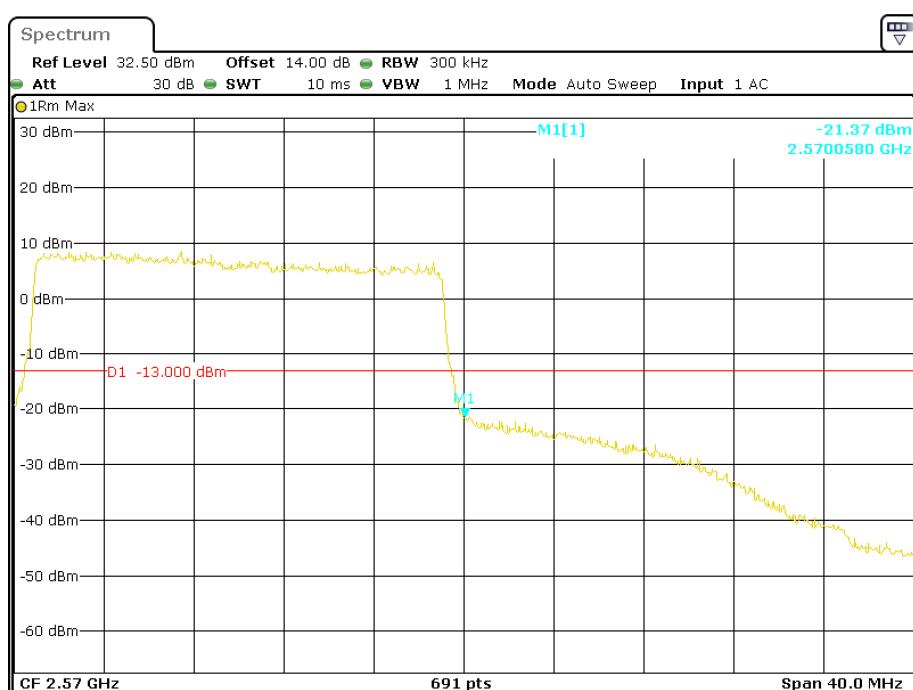
Date: 27.NOV.2017 13:02:15

**QPSK (20 MHz, FULL RB) - Left Band Edge**

Date: 27.NOV.2017 13:06:21

**QPSK (20 MHz, FULL RB) - Right Band Edge**

Date: 27.NOV.2017 13:05:33

**16-QAM (20 MHz, FULL RB) - Left Band Edge****16-QAM (20 MHz, FULL RB) - Right Band Edge**

## 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

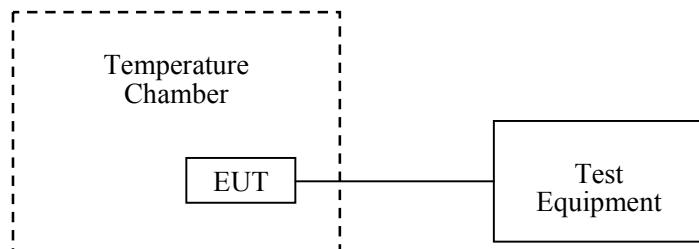
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

### 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

<b>Temperature:</b>	22 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Hill He on 2017-11-25.*

*EUT operation mode: Transmitting*

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

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

Middle Channel, $f_o=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	5	0.00598	2.5
-20		5	0.00598	2.5
-10		3	0.00359	2.5
0		3	0.00359	2.5
10		3	0.00359	2.5
20		0	0.00000	2.5
30		5	0.00598	2.5
40		7	0.00837	2.5
50		10	0.01195	2.5
25		V min.= 3.5	12	0.01434
		V max.= 4.2	14	0.01673

**EDGE Mode**

Middle Channel, $f_o=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	-3	-0.00359	2.5
-20		-3	-0.00359	2.5
-10		-2	-0.00239	2.5
0		-2	-0.00239	2.5
10		-2	-0.00239	2.5
20		-1	-0.00120	2.5
30		-5	-0.00598	2.5
40		-10	-0.01195	2.5
50		-12	-0.01434	2.5
25		V min.= 3.5	-14	-0.01673
		V max.= 4.2	-16	-0.01913

**WCDMA Mode**

Middle Channel, $f_o=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	8	0.00956	2.5
-20		8	0.00956	2.5
-10		7	0.00837	2.5
0		7	0.00837	2.5
10		7	0.00837	2.5
20		5	0.00598	2.5
30		7	0.00837	2.5
40		8	0.00956	2.5
50		10	0.01195	2.5
25		V min.= 3.5	11	0.01315
		V max.= 4.2	13	0.01554

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

Middle Channel, $f_o=1880.0\text{ MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	7	0.00372	pass
-20		7	0.00372	pass
-10		5	0.00266	pass
0		5	0.00266	pass
10		5	0.00266	pass
20		-4	-0.00213	pass
30		9	0.00479	pass
40		16	0.00851	pass
50		20	0.01064	pass
25		V min.= 3.5	22	0.01170
		V max.= 4.2	26	0.01383

**EDGE Mode**

Middle Channel, $f_o=1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-22	-0.01170	pass
-20		-22	-0.01170	pass
-10		-20	-0.01064	pass
0		-20	-0.01064	pass
10		-20	-0.01064	pass
20		-18	-0.00957	pass
30		-26	-0.01383	pass
40		-30	-0.01596	pass
50		-36	-0.01915	pass
25	V min.= 3.5	-40	-0.02128	pass
	V max.= 4.2	-45	-0.02394	pass

**WCDMA Mode**

Middle Channel, $f_o=1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-7	-0.00372	pass
-20		-7	-0.00372	pass
-10		-5	-0.00266	pass
0		-5	-0.00266	pass
10		-5	-0.00266	pass
20		4	0.00213	pass
30		-10	-0.00532	pass
40		-13	-0.00692	pass
50		-15	-0.00798	pass
25	V min.= 3.5	-20	-0.01064	pass
	V max.= 4.2	-23	-0.01223	pass

LTE:  
QPSK:

**Band 2:**

10.0 MHz Middle Channel, $f_0 = 1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	14	0.00745	pass
-20		14	0.00745	pass
-10		12	0.00638	pass
0		12	0.00638	pass
10		12	0.00638	pass
20		11	0.00585	pass
30		12	0.00638	pass
40		14	0.00745	pass
50		16	0.00851	pass
20	V min.= 3.5	18	0.00957	pass
	V max.= 4.2	20	0.01064	pass

**Band 4:**

10.0 MHz Middle Channel, $f_0 = 1732.5\text{ MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-14	-0.00808	pass
-20		-14	-0.00808	pass
-10		-12	-0.00693	pass
0		-12	-0.00693	pass
10		-12	-0.00693	pass
20		-11	-0.00635	pass
30		-12	-0.00693	pass
40		-14	-0.00808	pass
50		-16	-0.00924	pass
20	V min.= 3.5	-18	-0.01039	pass
	V max.= 4.2	-20	-0.01154	pass

**Band 5:**

10.0 MHz Middle Channel, $f_o=836.5$ MHz				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	3	0.00359	2.5
-20		3	0.00359	2.5
-10		2	0.00239	2.5
0		2	0.00239	2.5
10		2	0.00239	2.5
20		1	0.00120	2.5
30		2	0.00239	2.5
40		2	0.00239	2.5
50		3	0.00359	2.5
20	V min.= 3.5	4	0.00478	2.5
	V max.= 4.2	5	0.00598	2.5

**Band 7:**

10.0 MHz Middle Channel, $f_o=2535$ MHz				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-10	-0.00394	pass
-20		-7	-0.00276	pass
-10		-7	-0.00276	pass
0		-6	-0.00237	pass
10		-6	-0.00237	pass
20		-4	-0.00158	pass
30		-6	-0.00237	pass
40		-10	-0.00394	pass
50		-16	-0.00631	pass
20	V min.= 3.5	-22	-0.00868	pass
	V max.= 4.2	-24	-0.00947	pass

**16QAM:****Band 2:**

10.0 MHz Middle Channel, $f_0=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	7	0.00372	pass
-20		7	0.00372	pass
-10		5	0.00266	pass
0		5	0.00266	pass
10		5	0.00266	pass
20		3	0.00160	pass
30		5	0.00266	pass
40		9	0.00479	pass
50		16	0.00851	pass
20	V min.= 3.5	24	0.01277	pass
	V max.= 4.2	26	0.01383	pass

**Band 4:**

10.0 MHz Middle Channel, $f_0=1732.5\text{ MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-12	-0.00693	pass
-20		11	-0.00635	pass
-10		-11	-0.00635	pass
0		-9	-0.00520	pass
10		-9	-0.00520	pass
20		-7	-0.00404	pass
30		-9	-0.00520	pass
40		-16	-0.00924	pass
50		-20	-0.01154	pass
20	V min.= 3.5	-26	-0.01501	pass
	V max.= 4.2	-29	-0.01674	pass

**Band 5:**

10.0 MHz Middle Channel, $f_0=836.5$ MHz				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	4	0.00478	2.5
-20		4	0.00478	2.5
-10		2	0.00239	2.5
0		2	0.00239	2.5
10		2	0.00239	2.5
20		1	0.00120	2.5
30		2	0.00239	2.5
40		3	0.00359	2.5
50		4	0.00478	2.5
20	V min.= 3.5	6	0.00717	2.5
	V max.= 4.2	7	0.00837	2.5

**Band 7:**

10.0 MHz Middle Channel, $f_0=2535$ MHz				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	-7	-0.00276	pass
-20		-7	-0.00276	pass
-10		-6	-0.00237	pass
0		-6	-0.00237	pass
10		-6	-0.00237	pass
20		-4	-0.00158	pass
30		-6	-0.00237	pass
40		-10	-0.00394	pass
50		-16	-0.00631	pass
20	V min.= 3.5	-18	-0.00710	pass
	V max.= 4.2	-20	-0.00789	pass

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