



RF TEST REPORT

Report No.: SET2014-13270

Product: LTE Mobile Phone

FCC ID: CLNSS4445

Model No.: M4 SS4445

Applicant: MFOURTEL MEXICO S.A. DE C.V.

Address: Av. Ejército Nacional 436 Piso 3 Chapultepec Morales Miguel
Hidalgo Distrito Federal 11570.

Issued by: CCIC-SET

Lab Location: Electronic Testing Building, Shahe Road, Xili, Nanshan District,
Shenzhen China

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Test Report

Product..... : LTE Mobile Phone

Brand Name : M4

Trade Name : M4

Applicant..... : MFOURTEL MEXICO S.A. DE C.V.

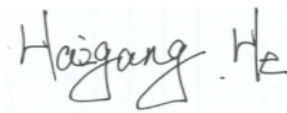
Applicant Address..... : Av. Ejército Nacional 436 Piso 3 Chapultepec Morales
Miguel Hidalgo Distrito Federal 11570.

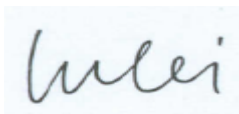
Manufacturer..... : CK Telecom Limited

Manufacturer Address : Technology Road.High-Tech Development Zone. Heyuan,
Guangdong,P.R.China.

Test Standards..... : 47 CFR Part 2 Frequency Allocations and Radio Treaty
Matters; General Rules and Regulations
47 CFR Part 27(H) 27(L)Miscellaneous wireless
communications services

Test Result : PASS

Tested by : 
2014.11.27
Haigang He, Test Engineer

Reviewed by : 
2014.11.27
Shuangwen Zhang, Senior Eginer

Approved by..... : 
2014.11.27
Wu Li'an, Manager



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Change History		
Issue	Date	Reason for change
1.0	2014-11-27	First edition



1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	LTE Mobile Phone
Serial No.	SS44456B4000114
IMEI No.	355616029894916
Hardware Version	A-V1.0
Software Version	M4_SS4445_S10_Ver200
EUT supports Radios application	GSM/GPRS/WCDMA/HSPA/LTE WLAN2.4GHz 802.11b/g/n (HT20/HT40) Bluetooth v4.0 LE
Frequency Range	LTE Band 4 Tx: 1710.7MHz~1754.3MHz Rx: 2110.7MHz~2154.3MHz LTE Band 17 Tx: 706.5MHz - 713.5MHz; Rx: 736.5MHz - 891.6MHz
Maximum Output Power to Antenna	LTE Band 4: 23.65dBm LTE Band 17: 23.57dBm
Bandwidth	LTE Band 4: 1.4MHz/3MHz/5MHz/10MHz15MHz/20MHz LTE Band17: 5MHz/10MHz
Modulation Type	QPSK/16QAM
Antenna Type	PIFA Antenna

1.2 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	BW (MHz)	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP/EIRP(W)
Part 27	LTE Band 4	QPSK	1.4	1M18G7D	0.03	0.0897
Part 27	LTE Band 4	16QAM	1.4	1M19W7D	-	0.0570
Part 27	LTE Band 4	QPSK	3	2M73G7D	0.03	0.0902
Part 27	LTE Band 4	16QAM	3	2M75W7D	-	0.0571
Part 27	LTE Band 4	QPSK	5	4M50G7D	0.04	0.0916
Part 27	LTE Band 4	16QAM	5	4M52W7D		0.0583
Part 27	LTE Band 4	QPSK	10	8M94G7D	0.03	0.0910

Part 27	LTE Band 4	16QAM	10	8M94W7D	-	0.0579
Part 27	LTE Band 4	QPSK	15	13M37G7D	0.03	0.0912
Part 27	LTE Band 4	16QAM	15	13M37W7D	-	0.0577
Part 27	LTE Band 4	QPSK	20	17M83G7D	0.03	0.0944
Part 27	LTE Band 4	16QAM	20	17M77W7D	-	0.0624
Part 27	LTE Band 17	QPSK	5	4M52G7D	0.08	0.0857
Part 27	LTE Band 17	16QAM	5	4M52W7D	-	0.0597
Part 27	LTE Band 17	QPSK	10	9M00G7D	0.07	0.0955
Part 27	LTE Band 17	16QAM	10	8M96W7D	-	0.0624

1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, part27 for the EUT FCC ID Certification:

1. 47 CFR Part 2,27(H)
2. ANSI/TIA/EIA-603-C-2004
3. FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Limit	Result
1	2.1046	Conducted RF Output Power	Reporting Only	PASS
2	27.50(d.5)	Peak to Average Radio	< 13dB	PASS
3	27.50(c.10) 27.50(d)(4)	Effective Radiated Power	ERP < 3Watt	PASS
4	2.1049 27.53(h)(3) 27.53(m)(6)	Occupied Bandwidth	Reporting Only	PASS
5	2.1051 27.53(h)(3)	Band Edge	< 43+10log10(P[watt])	PASS
6	2.1051 27.53(g) 27.53(h)	Conducted Spurious Emission	< 43+10log10(P[watt])	PASS
7	2.1053 27.53(g) 27.53(h)	Radiated Spurious Emission	< 43+10log10(P[watt])	PASS
8	2.1055,	Frequency Stability	< 2.5ppm	PASS



	27.54			
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Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.4 Test Configuration of Equipment Under Test

1.4.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth(MHz)						Modulation		RB#			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	17			✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
Peak-to-Average Ratio	4						✓		✓	✓		✓	✓	✓	✓
	17				✓				✓	✓		✓	✓	✓	✓
26dB and 99% Bandwidth	4	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	
	17			✓	✓			✓	✓			✓		✓	
Conducted Band Edge	4	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
	17			✓	✓			✓	✓	✓		✓	✓		✓
Conducted Spurious Emission	4	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	17			✓	✓			✓	✓	✓			✓	✓	✓
Frequency Stability	4	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓
	17			✓	✓			✓				✓	✓	✓	✓
ERP/EIRP	4	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	17			✓	✓			✓	✓	✓			✓	✓	✓
Radiated Spurious Emission	4	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓
	17			✓	✓			✓		✓			✓	✓	✓
Note	1. The mark “✓” means that this configuration is chosen for testing. 2. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 3. For E.R.P/E.I.R.P. measurement, the widest bandwidth and the bandwidth with the highest conducted power of each band is chosen for testing. Besides, the lowest bandwidth of each band is also measured for reporting only.														

1.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 7.5dB and 10dB attenuator.

Example:

$$\begin{aligned}\text{Offset (dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 7 + 10 = 17 \text{ (dB)}\end{aligned}$$

1.6 Facilities and Accreditations

1.6.1 Test Facilities

CNAS-Lab Code: L1659

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. CCIC is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659. A 12.8*6.8*6.4 (m) fully anechoic chamber was used for the radiated spurious emissions test.

FCC-Registration No.: 406086

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 406086, valid time is until October 28, 2017.

IC-Registration No.: 11185A-1

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on July. 15, 2013, valid time is until July. 15, 2016.

1.6.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 °C - 35 °C
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR PART 2, PART 27H REQUIREMENTS

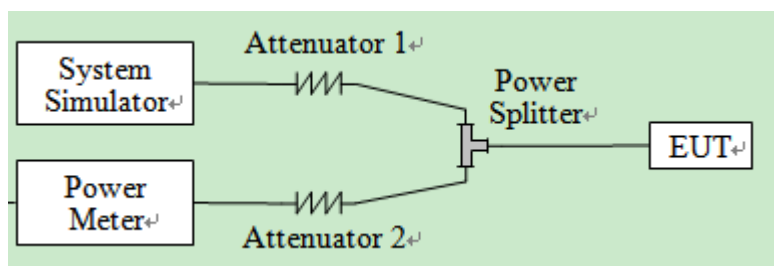
2.1 Conducted RF Output Power

2.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2 Test Description

1. Test Setup:



The EUT, which is powered by 3.8V DC power, is coupled to the Power Meter and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due Date
System Simulator	R&S	CMW500	149333	2014.07.21	2015.07.20
Power Meter	R&S	NRV2	1020.1809.02	2014.06.08	2015.06.07
Power Sensor	R&S	NRV-Z4	823.3618.03	2014.06.08	2015.06.07
Attenuator 1	Resent	10dB	(n.a.)	2014.06.11	2015.06.10
Attenuator 2	Resent	3dB	(n.a.)	2014.06.11	2015.06.10

2.1.3 Test Results

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.



1. LTE Band 4 Conducted Power Test Verdict:

BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				20050	20175	20300
Frequency(MHz)				1720	1732.5	1745
20	QPSK	1	0	23.47	23.59	23.60
20	QPSK	1	49	23.54	23.65	23.57
20	QPSK	1	99	23.51	23.57	23.35
20	QPSK	50	0	22.72	22.84	22.87
20	QPSK	50	24	22.57	22.75	22.81
20	QPSK	50	49	22.64	22.72	22.82
20	QPSK	100	0	22.61	22.75	22.85
20	16QAM	1	0	22.20	23.01	22.91
20	16QAM	1	49	22.34	22.65	22.93
20	16QAM	1	99	22.84	22.90	22.74
20	16QAM	50	0	21.57	21.75	21.78
20	16QAM	50	24	21.59	21.67	21.80
20	16QAM	50	49	21.61	21.71	21.86
20	16QAM	100	0	21.54	21.65	21.81
Channel				20025	20175	20325
Frequency(MHz)				1717.5	1732.5	1747.5
15	QPSK	1	0	23.57	23.60	23.52
15	QPSK	1	37	23.43	23.51	23.44
15	QPSK	1	74	23.49	23.47	23.51
15	QPSK	36	0	22.62	22.77	22.84
15	QPSK	36	18	22.58	22.76	22.81
15	QPSK	36	37	22.56	22.74	22.80
15	QPSK	75	0	22.59	22.76	22.92
15	16QAM	1	0	22.76	22.57	23.03
15	16QAM	1	37	22.10	22.66	23.09
15	16QAM	1	74	22.07	22.92	22.78
15	16QAM	36	0	21.46	21.73	21.84
15	16QAM	36	18	21.49	21.73	21.77
15	16QAM	36	37	21.49	21.70	21.83
15	16QAM	75	0	21.58	21.71	21.81



BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				20000	20175	20350
Frequency(MHz)				1715	1732.5	1750
10	QPSK	1	0	23.47	23.50	23.62
10	QPSK	1	24	23.41	23.62	23.55
10	QPSK	1	49	23.52	23.59	23.46
10	QPSK	25	0	22.54	22.76	22.85
10	QPSK	25	12	22.52	22.69	22.80
10	QPSK	25	24	22.51	22.80	22.85
10	QPSK	50	0	22.66	22.82	22.91
10	16QAM	1	0	22.67	22.75	22.64
10	16QAM	1	24	22.61	22.32	22.65
10	16QAM	1	49	22.28	22.79	22.46
10	16QAM	25	0	21.60	21.73	21.96
10	16QAM	25	12	21.64	21.75	21.82
10	16QAM	25	24	21.52	21.75	21.84
10	16QAM	50	0	21.52	21.74	21.79
Channel				19975	20175	20375
Frequency(MHz)				1712.5	1732.5	1752.5
5	QPSK	1	0	23.47	23.51	23.52
5	QPSK	1	12	23.45	23.48	23.62
5	QPSK	1	24	23.41	23.63	23.48
5	QPSK	12	0	22.51	22.77	22.82
5	QPSK	12	6	22.51	22.80	22.78
5	QPSK	12	11	22.61	22.73	22.77
5	QPSK	25	0	22.55	22.78	22.75
5	16QAM	1	0	22.67	22.96	22.60
5	16QAM	1	12	22.61	22.27	22.49
5	16QAM	1	24	22.19	22.51	22.55
5	16QAM	12	0	21.61	21.71	21.86
5	16QAM	12	6	21.46	21.62	21.69
5	16QAM	12	11	21.50	21.75	21.72
5	16QAM	25	0	21.53	21.72	21.70



BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				19965	20175	20385
Frequency(MHz)				1711.5	1732.5	1753.5
3	QPSK	1	0	23.56	23.64	23.58
3	QPSK	1	7	23.53	23.60	23.50
3	QPSK	1	14	23.52	23.62	23.58
3	QPSK	8	0	22.47	22.71	22.76
3	QPSK	8	4	22.55	22.75	22.78
3	QPSK	8	7	22.59	22.70	22.80
3	QPSK	15	0	22.57	22.67	22.81
3	16QAM	1	0	22.31	22.55	22.49
3	16QAM	1	7	22.57	22.95	22.93
3	16QAM	1	14	22.58	22.60	22.86
3	16QAM	8	0	21.63	21.80	21.82
3	16QAM	8	4	21.64	21.68	21.88
3	16QAM	8	7	21.43	21.72	21.75
3	16QAM	15	0	21.42	21.66	21.78
Channel				19957	20175	20393
Frequency(MHz)				1710.7	1732.5	1754.3
1.4	QPSK	1	0	23.55	23.60	23.49
1.4	QPSK	1	2	23.59	23.52	23.58
1.4	QPSK	1	5	23.49	23.79	23.45
1.4	QPSK	3	0	23.53	23.58	23.42
1.4	QPSK	3	1	23.57	23.47	23.52
1.4	QPSK	3	2	23.56	23.37	23.41
1.4	QPSK	6	0	23.57	23.46	23.53
1.4	16QAM	1	0	22.72	22.97	22.61
1.4	16QAM	1	2	22.63	22.84	23.01
1.4	16QAM	1	5	22.41	22.91	22.94
1.4	16QAM	3	0	22.55	22.74	22.85
1.4	16QAM	3	1	22.52	22.73	22.67
1.4	16QAM	3	2	22.50	22.55	22.67
1.4	16QAM	6	0	22.49	22.55	22.66



2. LTE Band 17 Conducted Power Test Verdict:

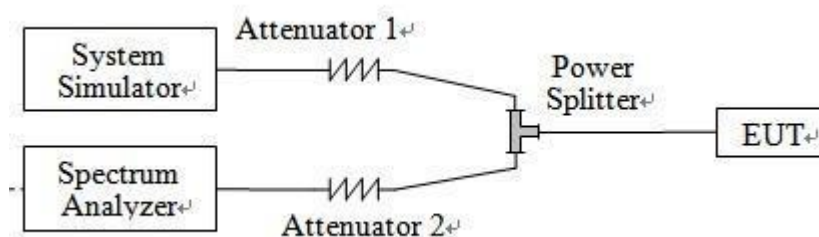
BW(MHz)	Modulation	RB Size	RB Offset	Power(dBm) Low Ch./Freq.	Power(dBm) Middle Ch./Freq.	Power(dBm) High Ch./Freq.
Channel				23780	23790	23800
Frequency(MHz)				709	710	711
10	QPSK	1	0	23.38	23.25	23.33
10	QPSK	1	24	23.49	23.40	23.39
10	QPSK	1	49	23.57	23.40	23.39
10	QPSK	25	0	22.72	22.71	22.76
10	QPSK	25	12	22.67	22.36	22.64
10	QPSK	25	24	22.61	22.61	22.66
10	QPSK	50	0	22.69	22.66	22.67
10	16QAM	1	0	22.14	22.14	22.27
10	16QAM	1	24	22.66	22.11	22.53
10	16QAM	1	49	22.30	22.31	22.42
10	16QAM	25	0	21.41	21.46	21.45
10	16QAM	25	12	21.64	21.75	21.41
10	16QAM	25	24	21.51	21.74	21.46
10	16QAM	50	0	21.53	21.46	21.51
Channel				23755	23790	23825
Frequency(MHz)				706.5	710	713.5
5	QPSK	1	0	23.22	23.34	23.27
5	QPSK	1	12	23.29	23.13	23.46
5	QPSK	1	24	23.51	23.40	23.41
5	QPSK	12	0	22.60	22.63	22.67
5	QPSK	12	6	22.56	22.52	22.52
5	QPSK	12	11	22.56	22.56	22.59
5	QPSK	25	0	22.56	22.53	22.52
5	16QAM	1	0	22.24	22.29	22.19
5	16QAM	1	12	22.25	22.18	22.26
5	16QAM	1	24	22.53	22.47	22.17
5	16QAM	12	0	21.40	21.45	21.45
5	16QAM	12	6	21.42	21.45	21.19
5	16QAM	12	11	21.51	21.54	21.44
5	16QAM	25	0	21.41	21.44	21.44

2.2 Peak to Average Ratio

2.2.1 Definition

According to FCC section 2.1049 and FCC 27.50(d), the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

2.2.2 Test Description



Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due Date
System Simulator	R&S	CMW500	149333	2014.07.21	2015.07.20
Spectrum Analyzer	R&S	FSP40	100341	2014.07.07	2015.07.06
Attenuator 1	Resent	10dB	(n.a.)	2014.06.11	2015.06.10
Attenuator 2	Resent	3dB	(n.a.)	2014.06.11	2015.06.10

2.2.3 Test Verdict

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.

Test procedures:

For LTE operating mode:

- The EUT was connected to spectrum and system simulator via a power divider.
- Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.
- Record the deviation as Peak to Average Ratio.



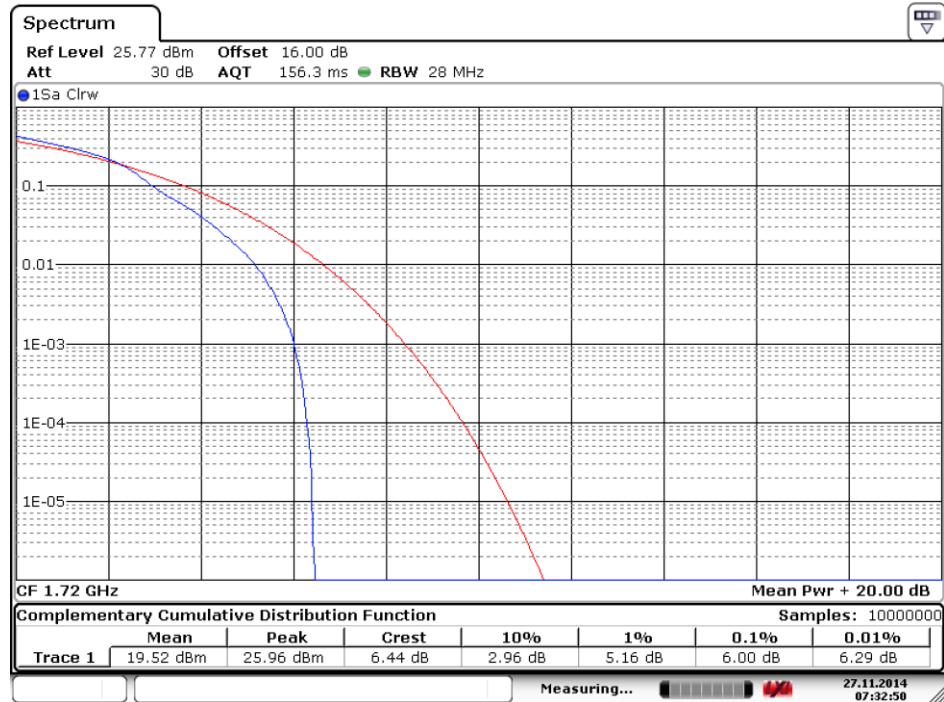
1. Test Result of LTE Band 4 Peak-to-Average Ratio:

BW (MHz)	Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Peak to Average ratio		Limit	Verdict
						dBm	Refer to Plot	dBm	
20	16QAM	20050	1720	1	0	6.00	Plot A1 to A6	13	PASS
				100	0	6.49			
	16QAM	20175	1732.5	1	0	6.43			PASS
				100	0	6.49			
	16QAM	20300	1745	1	0	6.38			PASS
				100	0	6.38			

2. Test Result of LTE Band 17 Peak-to-Average Ratio:

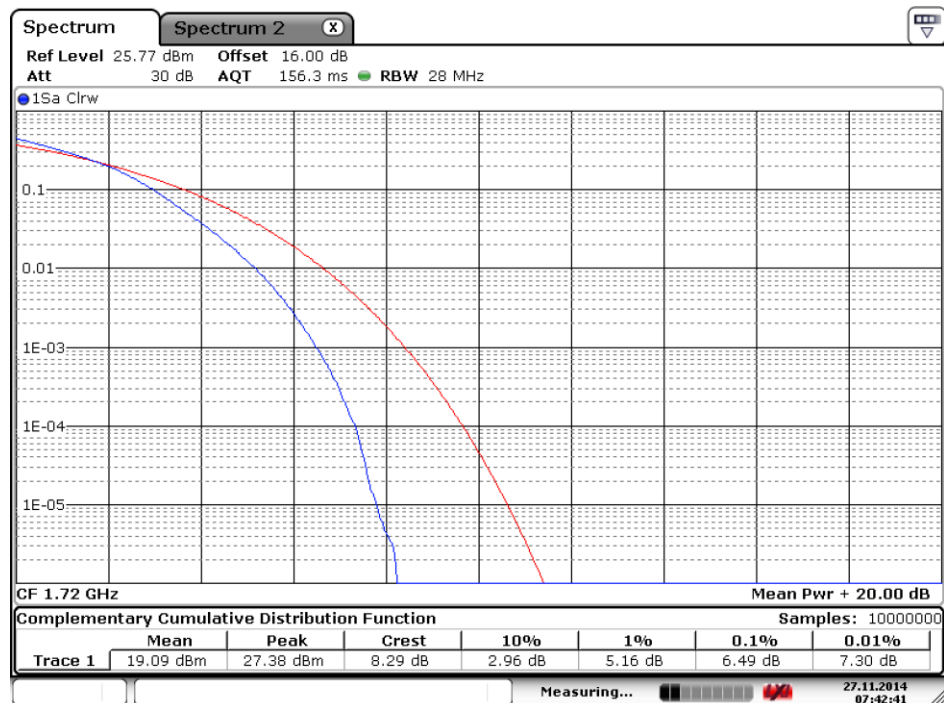
BW (MHz)	Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Peak to Average ratio		Limit	Verdict
						dBm	Refer to Plot	dBm	
10	16QAM	23780	709	1	0	5.88	Plot B1 to B6	13	PASS
				50	0	6.28			
	16QAM	23790	710	1	0	5.64			PASS
				50	0	6.36			
	16QAM	23800	711	1	0	5.52			PASS
				50	0	6.40			

3. LTE Model Test Plots:



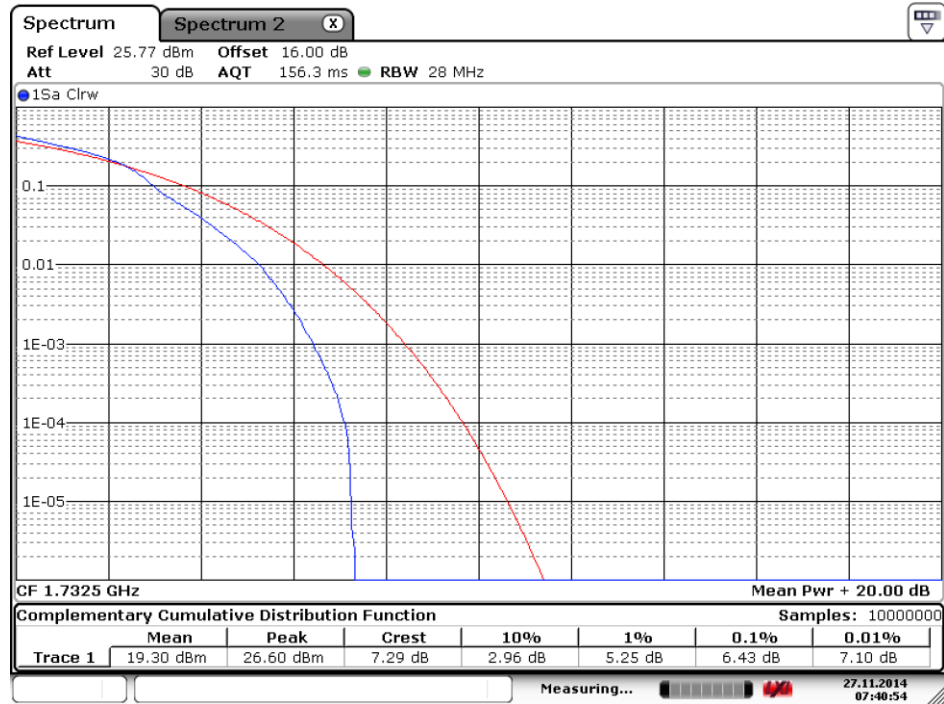
Date: 27.NOV.2014 07:32:51

(Plot A1: 20MHz/16QAM in Ch.20050 1RB Size)



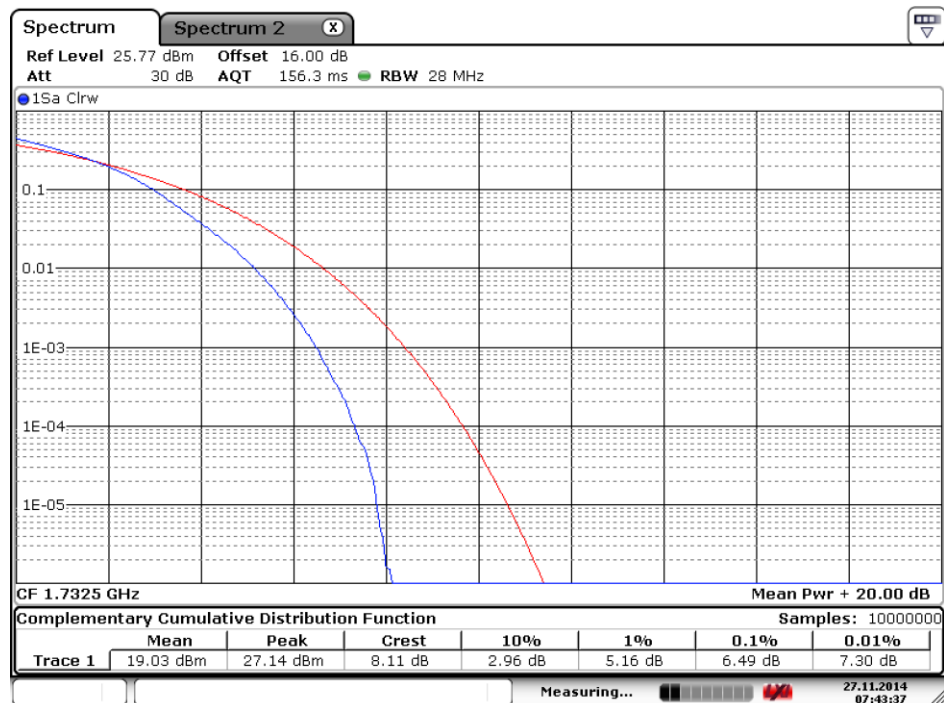
Date: 27.NOV.2014 07:42:41

(Plot A2: 20MHz/16QAM in Ch.20050 100RB Size)



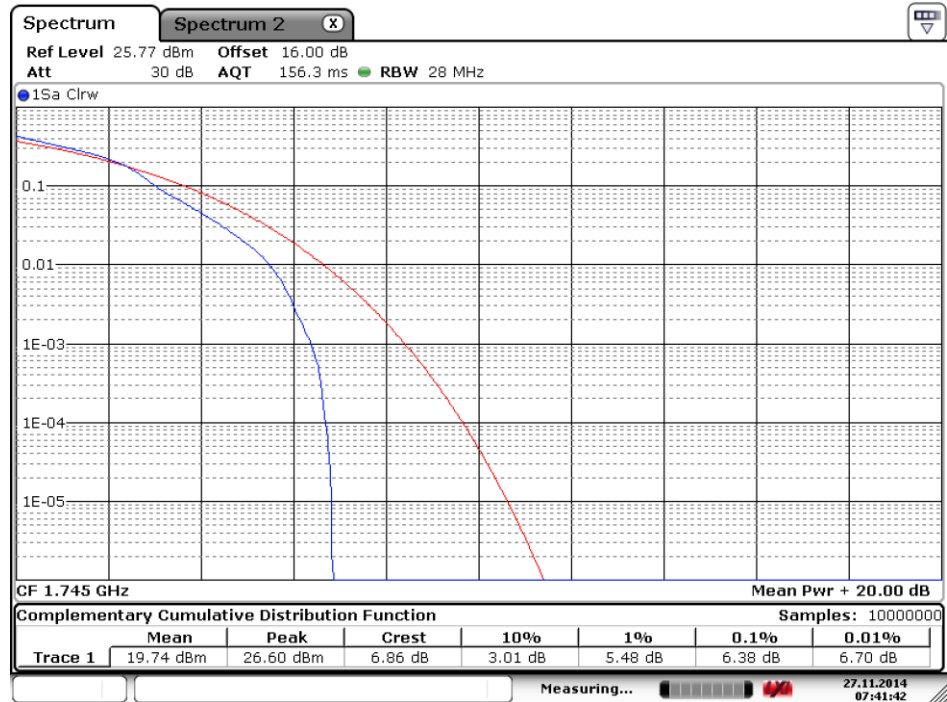
Date: 27.NOV.2014 07:40:54

(Plot A3: 20MHz/16QAM in Ch.20175 1RB Size)



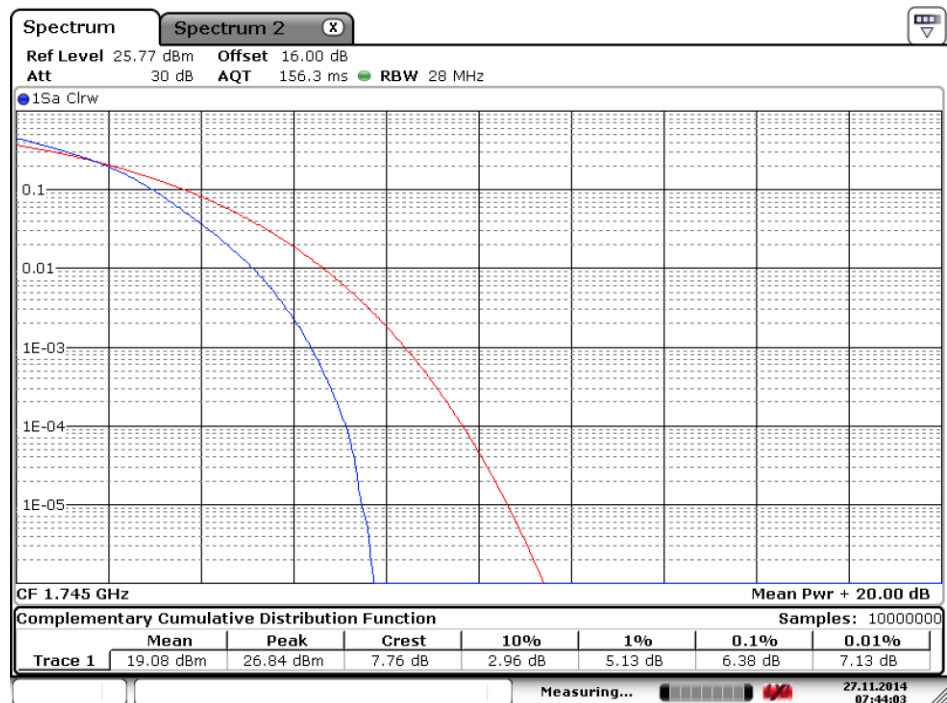
Date: 27.NOV.2014 07:43:37

(Plot A4: 20MHz/16QAM in Ch.20175 100RB Size)



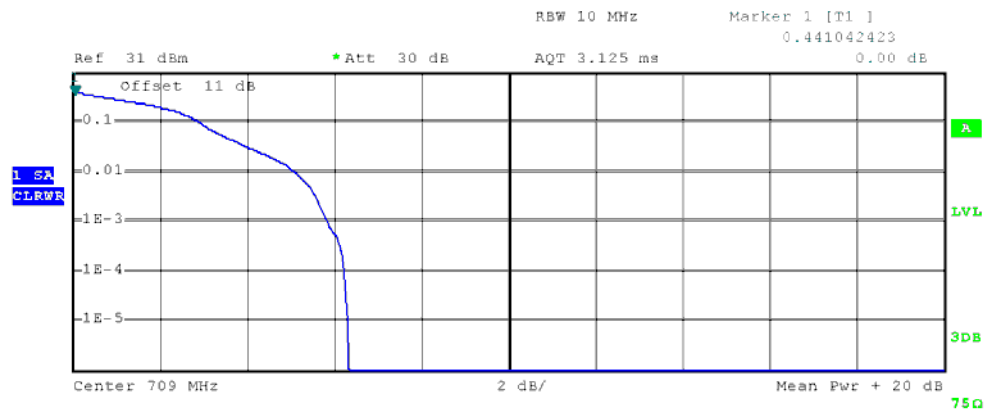
Date: 27.NOV.2014 07:41:42

(Plot A5: 20MHz/16QAM in Ch.20300 1RB Size)



Date: 27.NOV.2014 07:44:03

(Plot A6: 20MHz/16QAM in Ch.20300 100RB Size)



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 14.99 dBm

Peak 21.32 dBm

Crest 6.33 dB

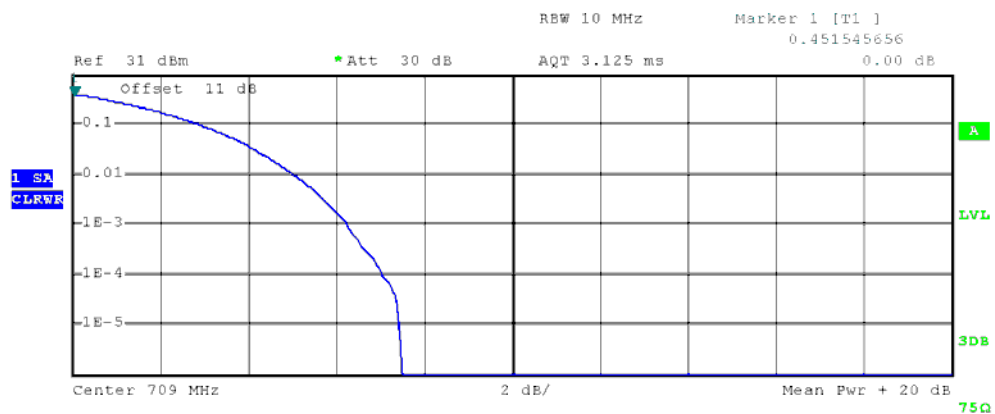
10 % 2.96 dB

1 % 5.12 dB

.1 % 5.88 dB

.01 % 6.24 dB

(Plot B1: 10MHz/16QAM in Ch.23780 1RB Size)



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 15.93 dBm

Peak 23.44 dBm

Crest 7.50 dB

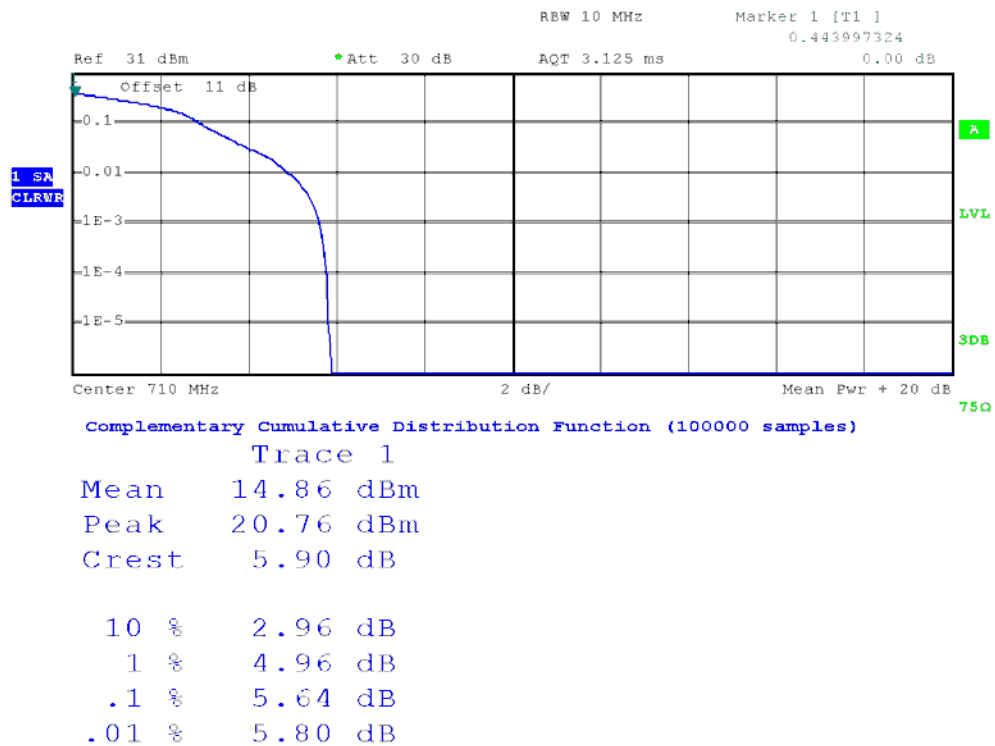
10 % 3.00 dB

1 % 5.08 dB

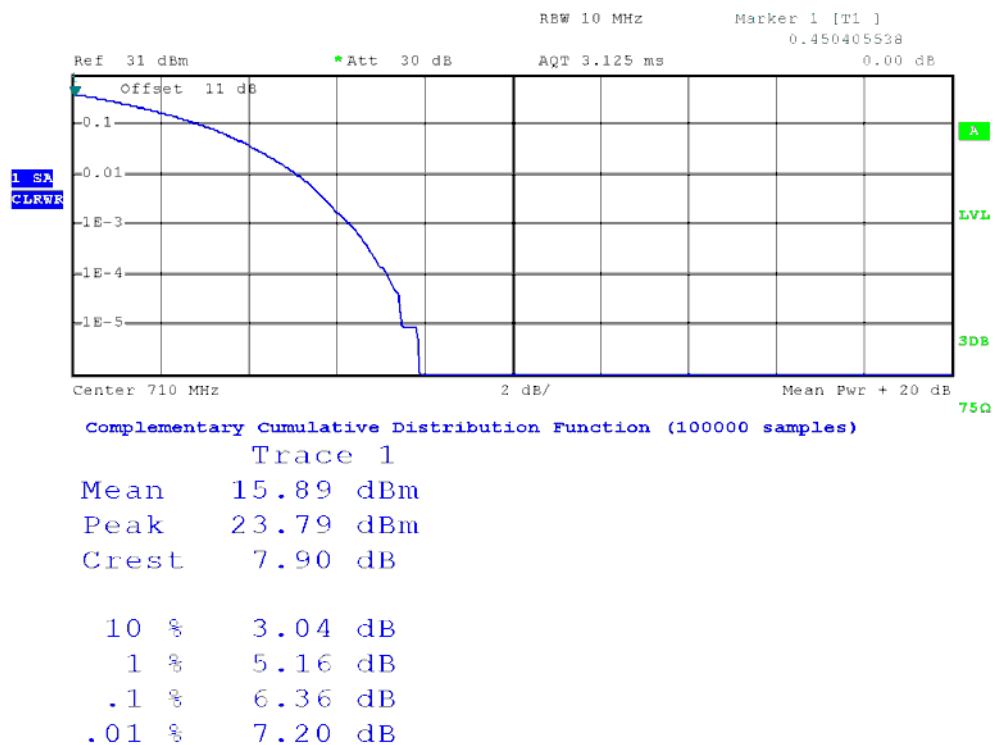
.1 % 6.28 dB

.01 % 7.08 dB

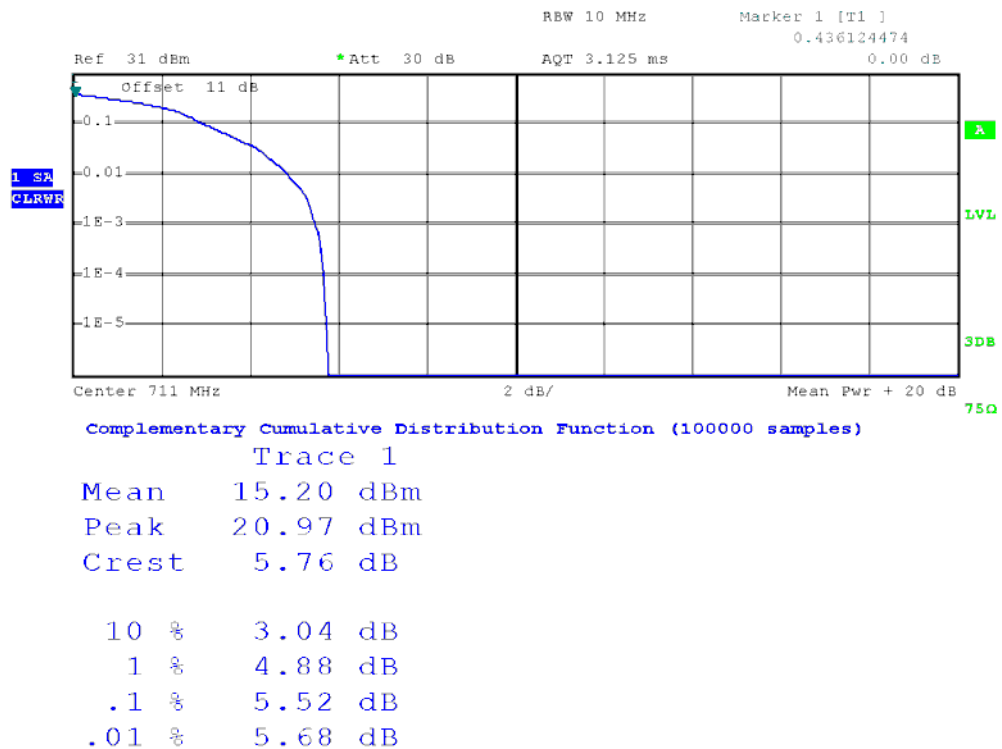
(Plot B2: 10MHz/16QAM in Ch.23780 50RB Size)



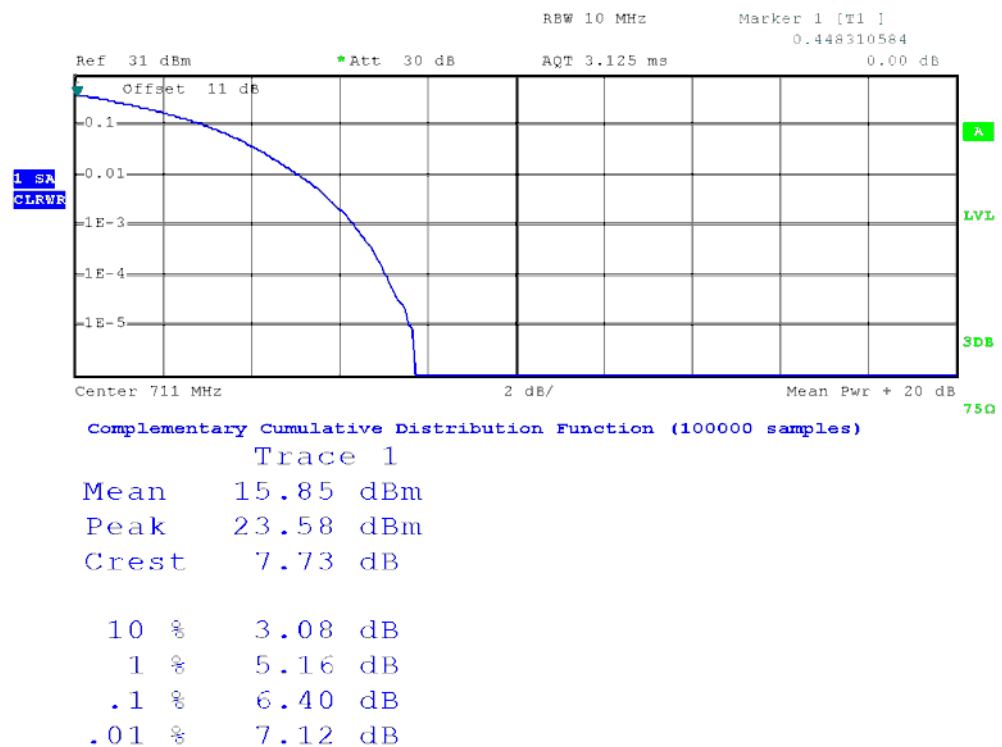
(Plot B3: 10MHz/16QAM in Ch.23790 1RB Size)



(Plot B4: 10MHz/16QAM in Ch.23790 50RB Size)



(Plot B5: 10MHz/16QAM in Ch.23800 1RB Size)



(Plot B6: 10MHz/16QAM in Ch.23800 50RB Size)

2.3 99% Occupied Bandwidth and 26dB Bandwidth

2.3.1 Definition

According to FCC section 2.1049, the occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

2.3.2 Test Description

See section 2.1.2 of this report.

2.3.3 Test Verdict

Here the middle channels are selected to perform testing to verify the 99% occupied bandwidth and 26dB Bandwidth.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

1. Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

LTE Band 4						
BW (MHz)	Channel	Frequency (MHz)	Mode	99% Occupied Bandwidth(MHz)	26dBBandwidth (MHz)	Refer to Plot
1.4	20175	1732.5	QPSK	1.18	1.44	Plot A1 to A2
			16QAM	1.19	1.43	Plot A3 to A4
3	20175	1732.5	QPSK	2.73	3.07	Plot B1 to B2
			16QAM	2.75	3.03	Plot B3 to B4
5	20175	1732.5	QPSK	4.50	4.98	Plot C1 to C2
			16QAM	4.52	4.98	Plot C3 to C4
10	20175	1732.5	QPSK	8.94	9.64	Plot D1 to D2
			16QAM	8.94	9.64	Plot D3 to D4



15	20175	1732.5	QPSK	13.37	14.41	Plot E1 to E2
			16QAM	13.42	14.20	Plot E3 to E4
20	20175	1732.5	QPSK	17.83	18.81	Plot F1 to F2
			16QAM	17.77	18.81	Plot F3 to F4

LTE Band 17

BW (MHz)	Channel	Frequency (MHz)	Mode	99% Occupied Bandwidth(MHz)	26dB Bandwidth (MHz)	Refer to Plot
5	23790	710	QPSK	4.52	5.10	Plot G1 to G2
			16QAM	4.52	5.06	Plot G3 to G4
10	23790	710	QPSK	9.00	9.68	Plot H1 to H2
			16QAM	8.96	9.72	Plot H3 to H4

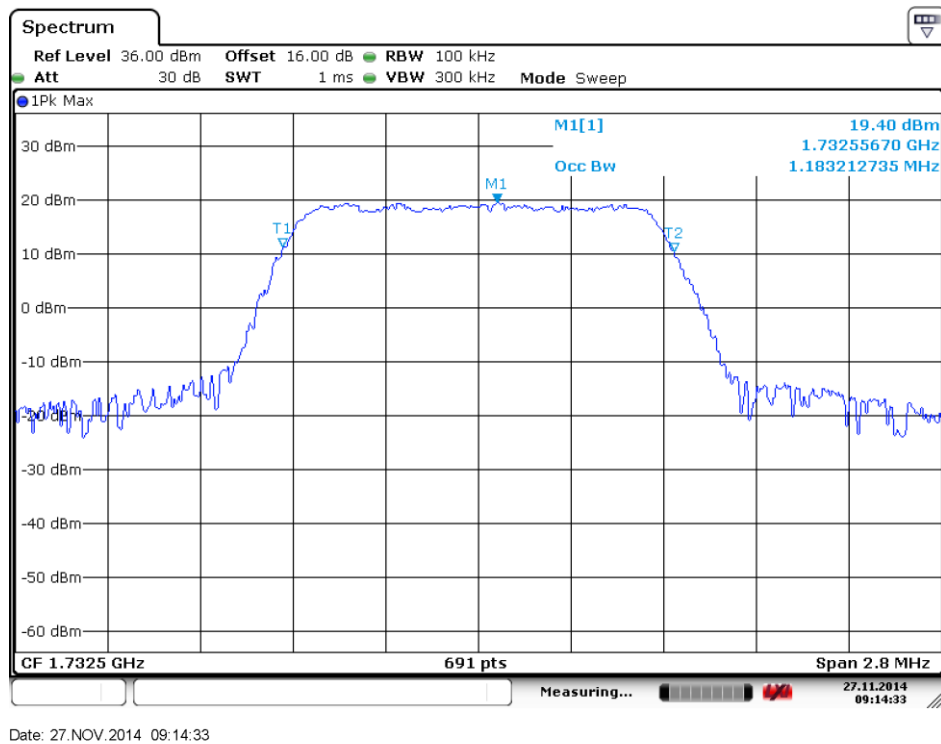
Note: The maximum RB configurations of the 99% Occupied Bandwidth and 26dB Bandwidth summary as below:

BW1.4MHz RB setting: RB Size 6,RB Offset 0 BW3MHz RB setting: RB Size 15,RB Offset 0

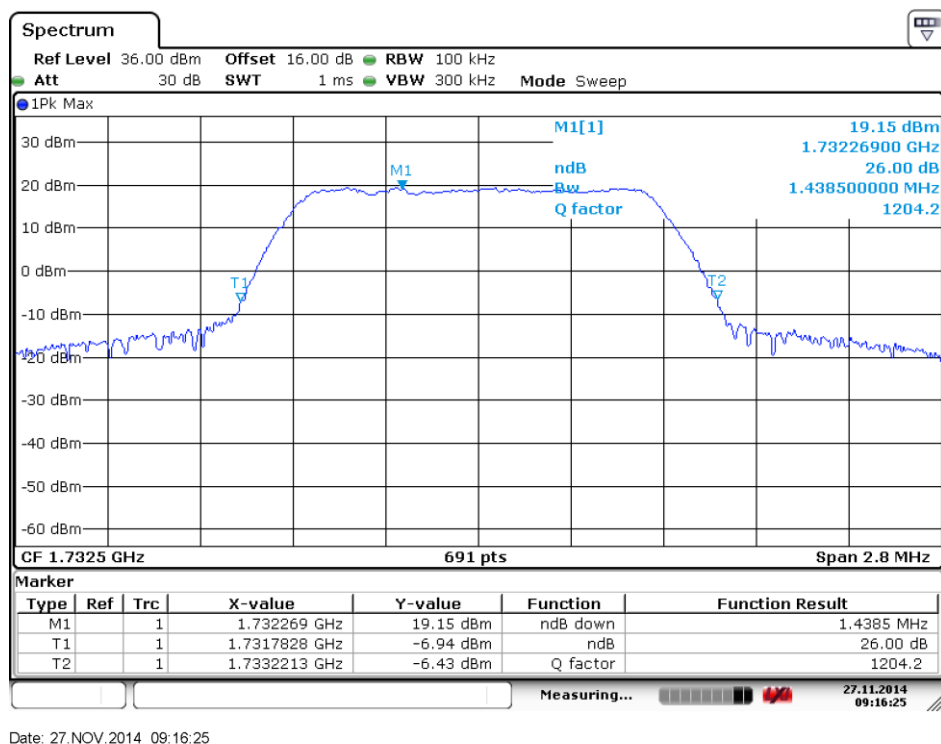
BW5MHz RB setting: RB Size 25,RB Offset 0 BW10MHz RB setting: RB Size 50,RB Offset 0

BW15MHz RB setting: RB Size 75,RB Offset 0 BW20MHz RB setting: RB Size 100,RB Offset 0

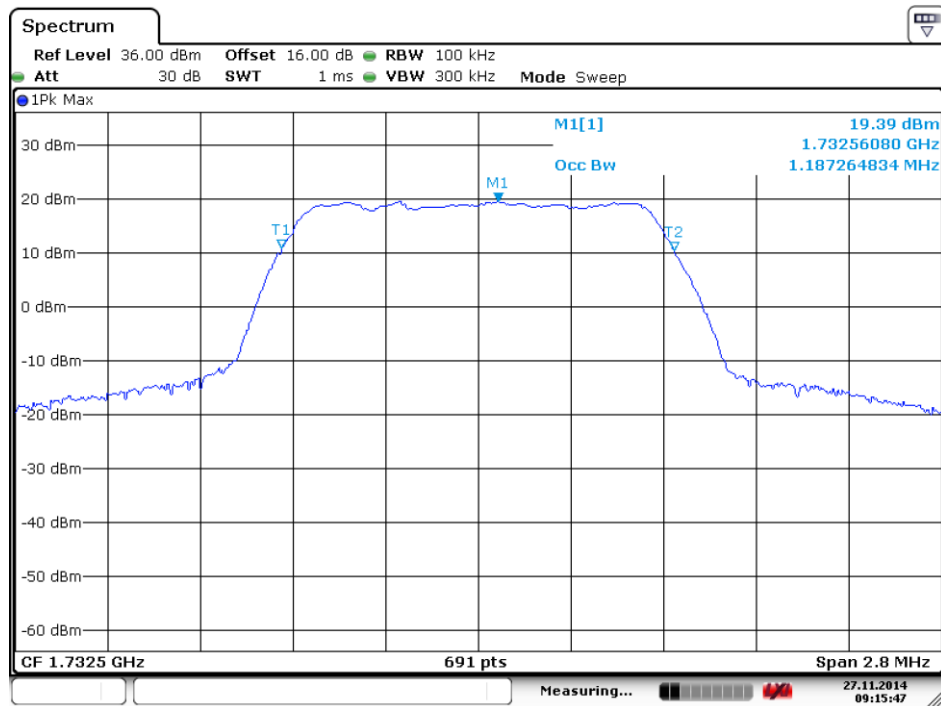
2. Test Plots:



(Plot A1: 99% Occupied Bandwidth LTE Band 4 1.4MHz/QPSK)

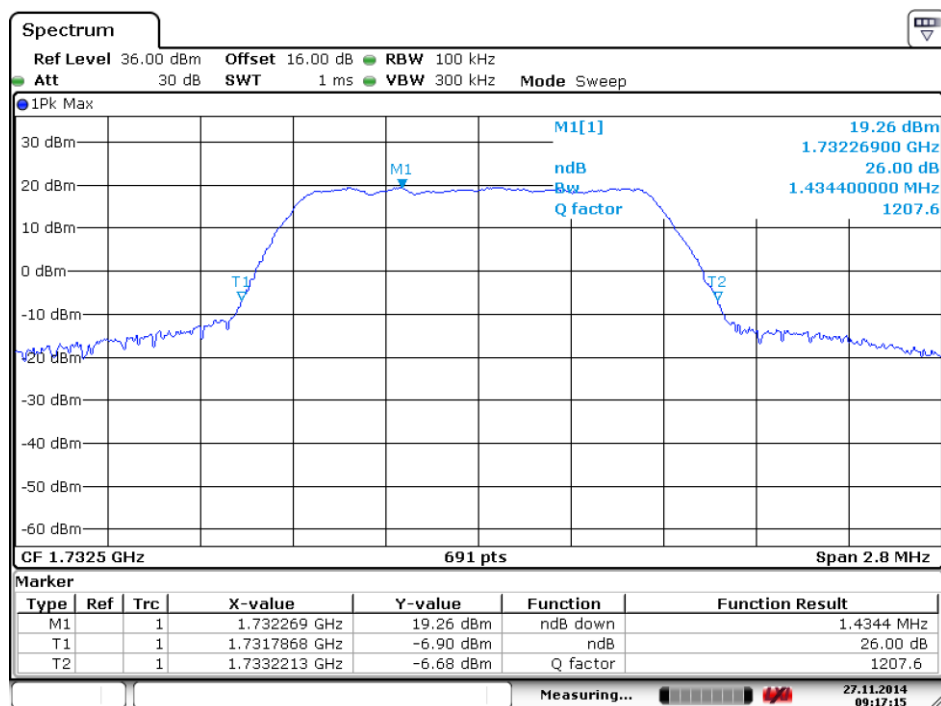


(Plot A2: 26dB Bandwidth LTE Band 4 1.4MHz/QPSK)



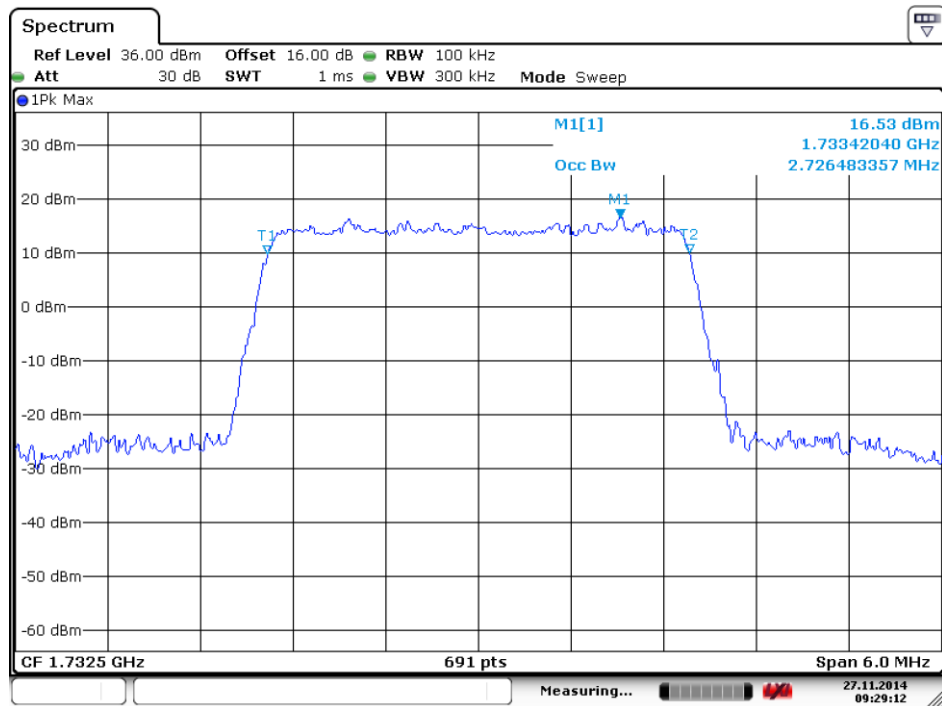
Date: 27.NOV.2014 09:15:47

(Plot A3: 99% Occupied Bandwidth LTE Band 4 1.4MHz/16QAM)



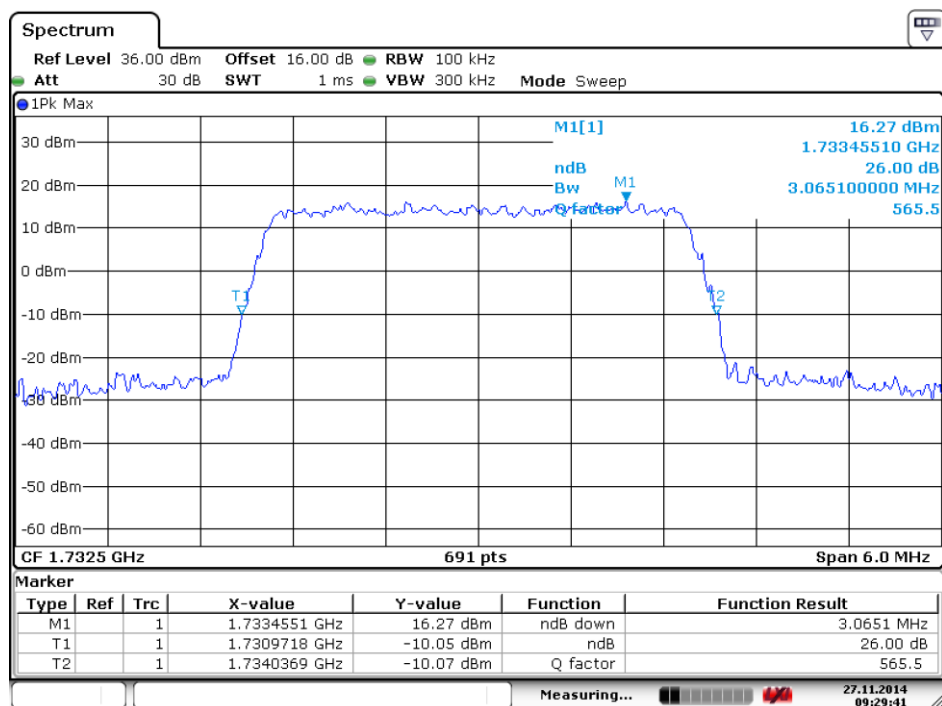
Date: 27.NOV.2014 09:17:15

(Plot A4: 26dB Bandwidth LTE Band 4 1.4MHz/16QAM)



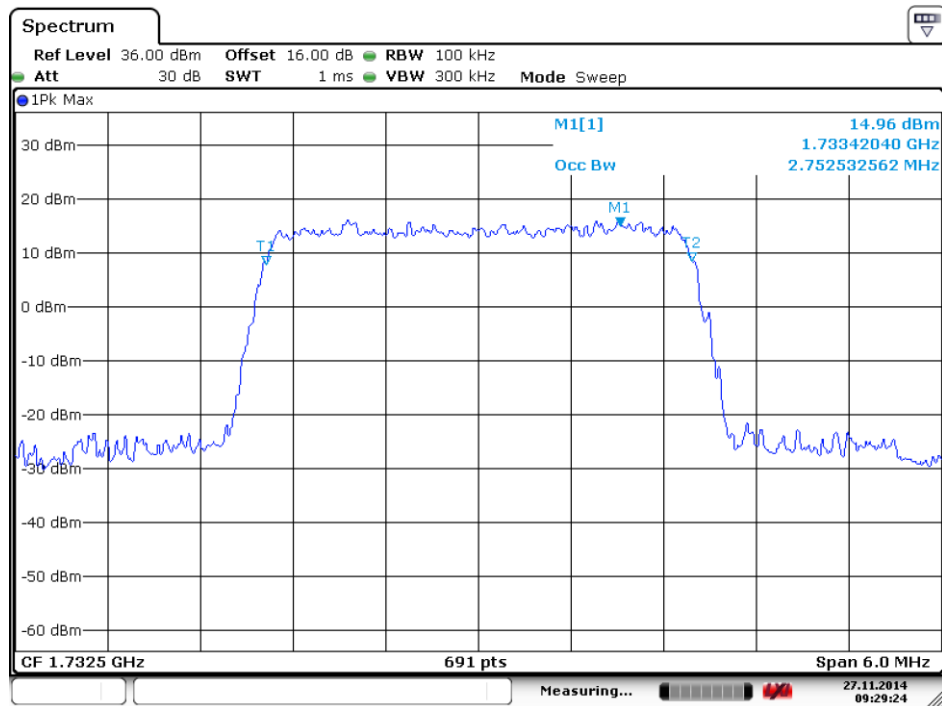
Date: 27.NOV.2014 09:29:12

(Plot B1: 99% Occupied Bandwidth LTE Band 4 3MHz/QPSK)



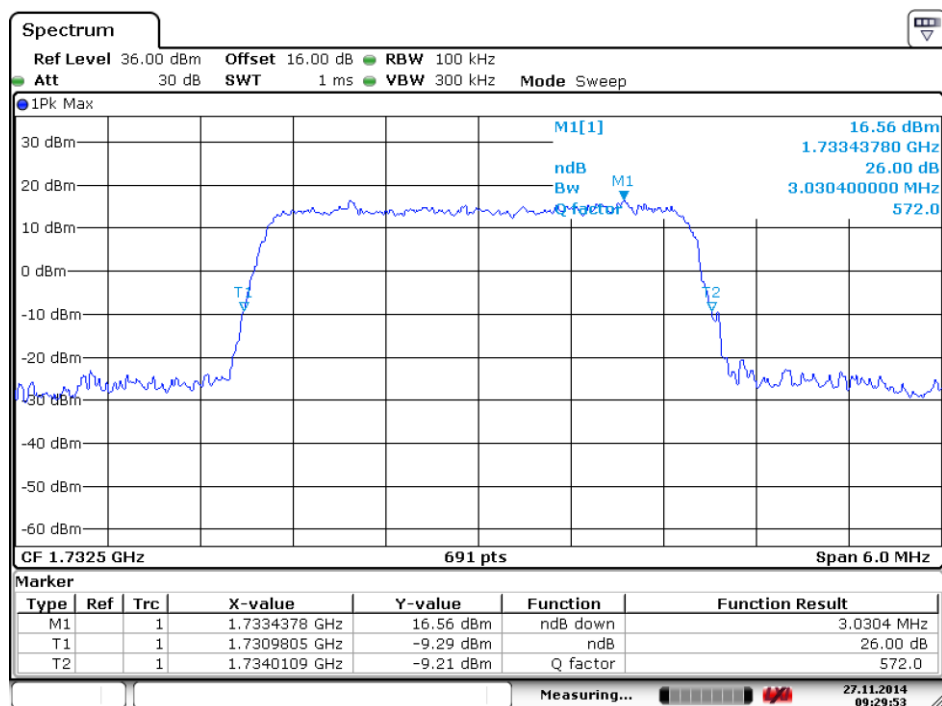
Date: 27.NOV.2014 09:29:42

(Plot B2: 26dB Bandwidth LTE Band 4 3MHz/QPSK)



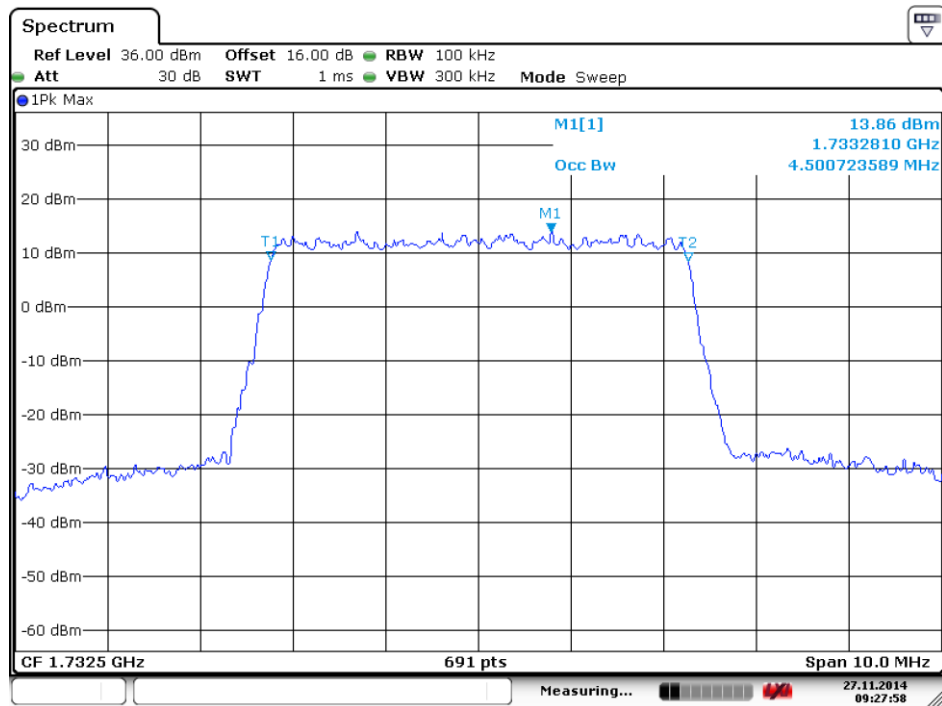
Date: 27.NOV.2014 09:29:24

(Plot B3: 99% Occupied Bandwidth LTE Band 4 3MHz/16QAM)



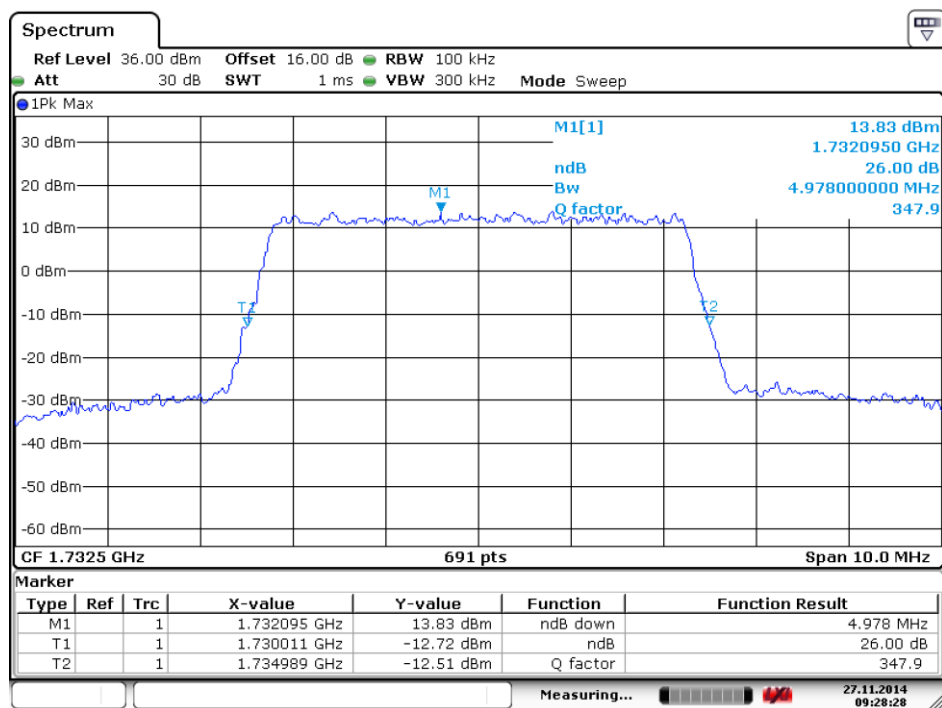
Date: 27.NOV.2014 09:29:54

(Plot B4: 26dB Bandwidth LTE Band 4 3MHz/16QAM)



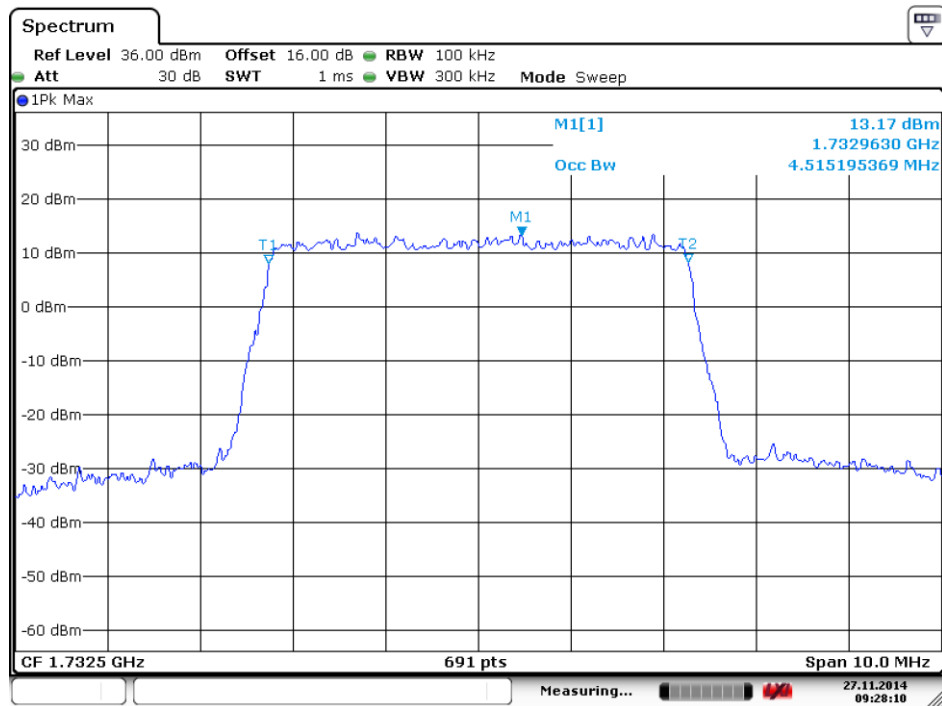
Date: 27.NOV.2014 09:27:59

(Plot C1: 99% Occupied Bandwidth LTE Band 4 5MHz/QPSK)



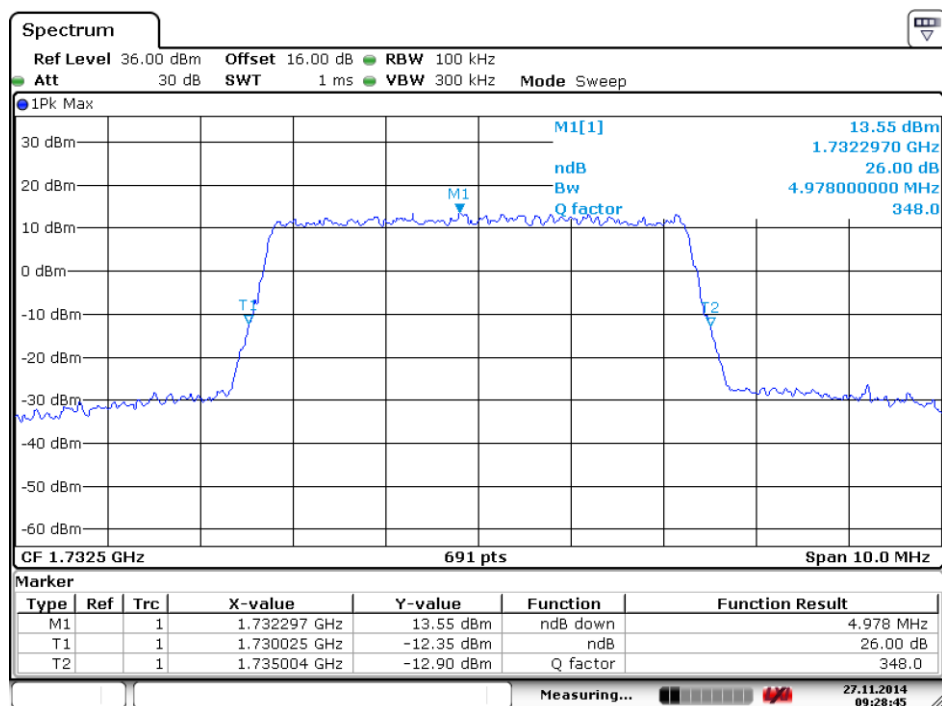
Date: 27.NOV.2014 09:28:29

(Plot C2: 26dB Bandwidth LTE Band 4 5MHz/QPSK)



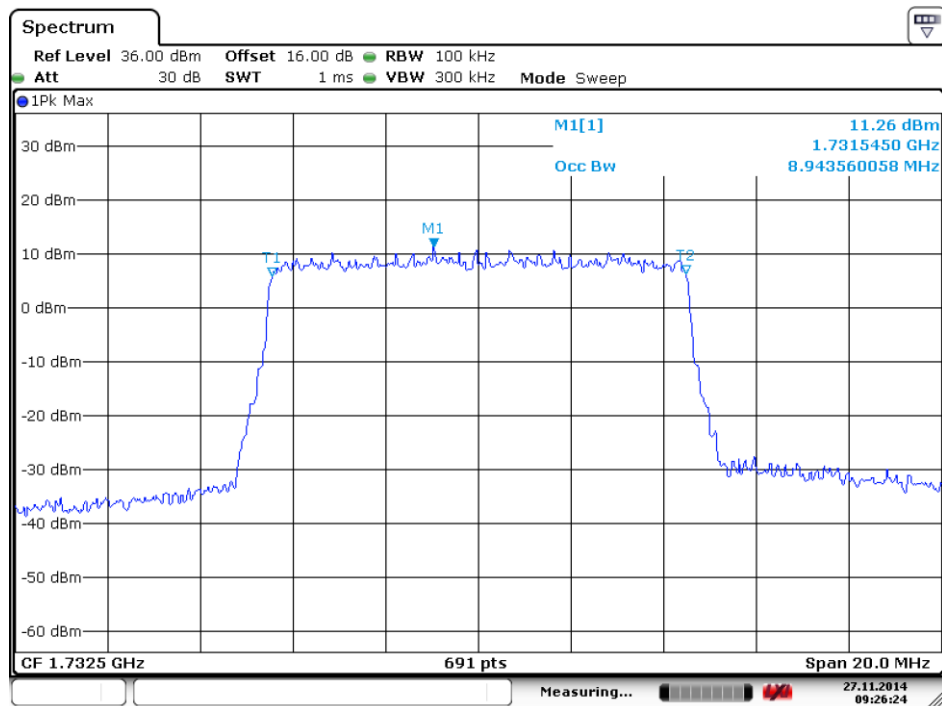
Date: 27.NOV.2014 09:28:10

(Plot C3: 99% Occupied Bandwidth LTE Band 4 5MHz/16QAM)



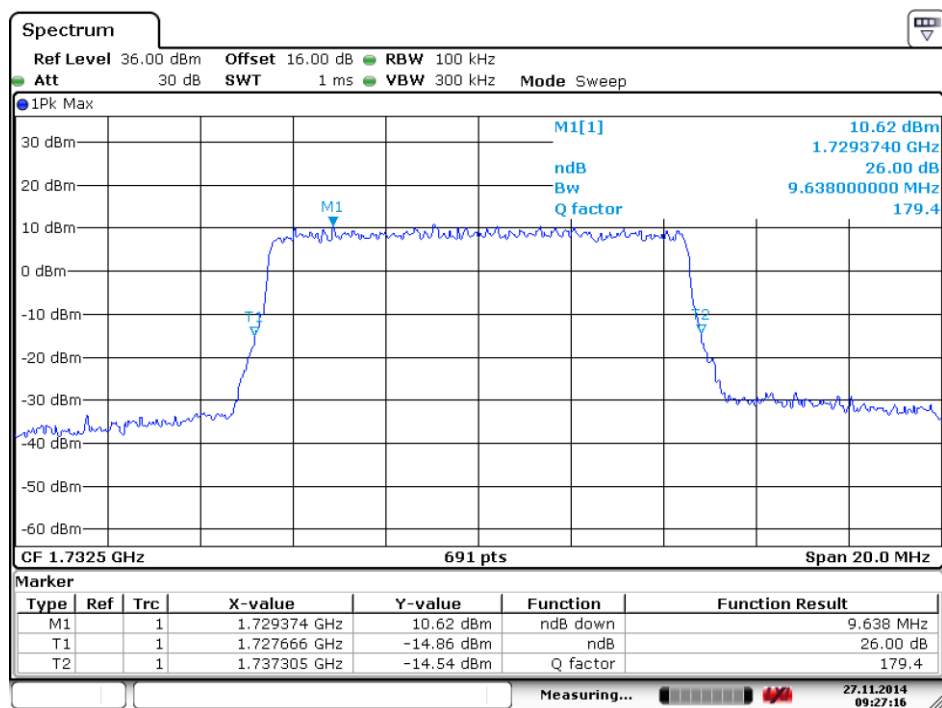
Date: 27.NOV.2014 09:28:44

(Plot C4: 26dB Bandwidth LTE Band 4 5MHz/16QAM)



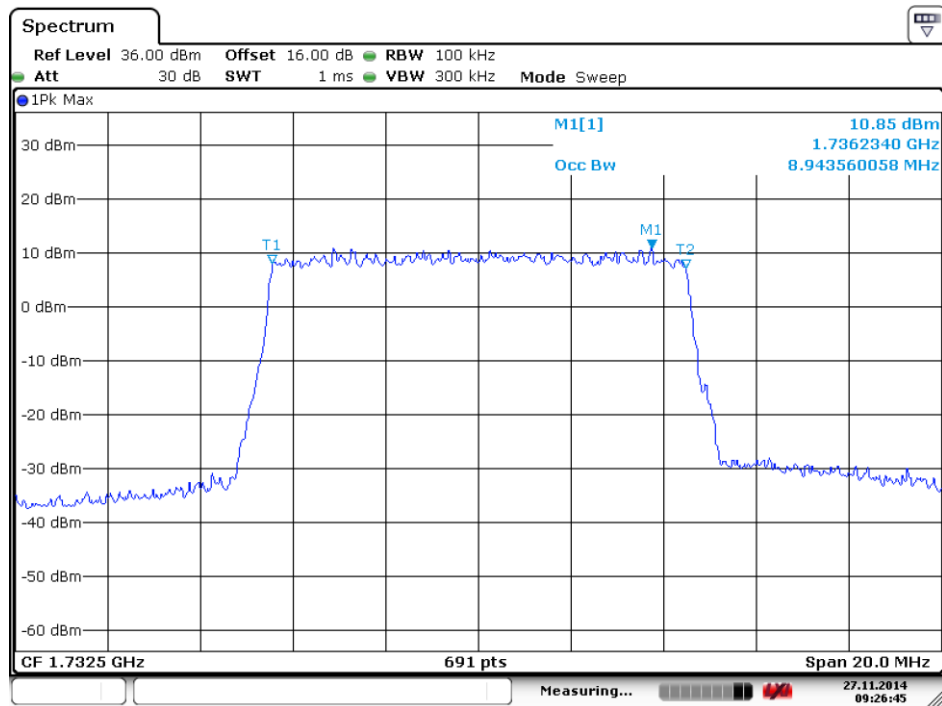
Date: 27.NOV.2014 09:26:23

(Plot D1: 99% Occupied Bandwidth LTE Band 4 10MHz/QPSK)



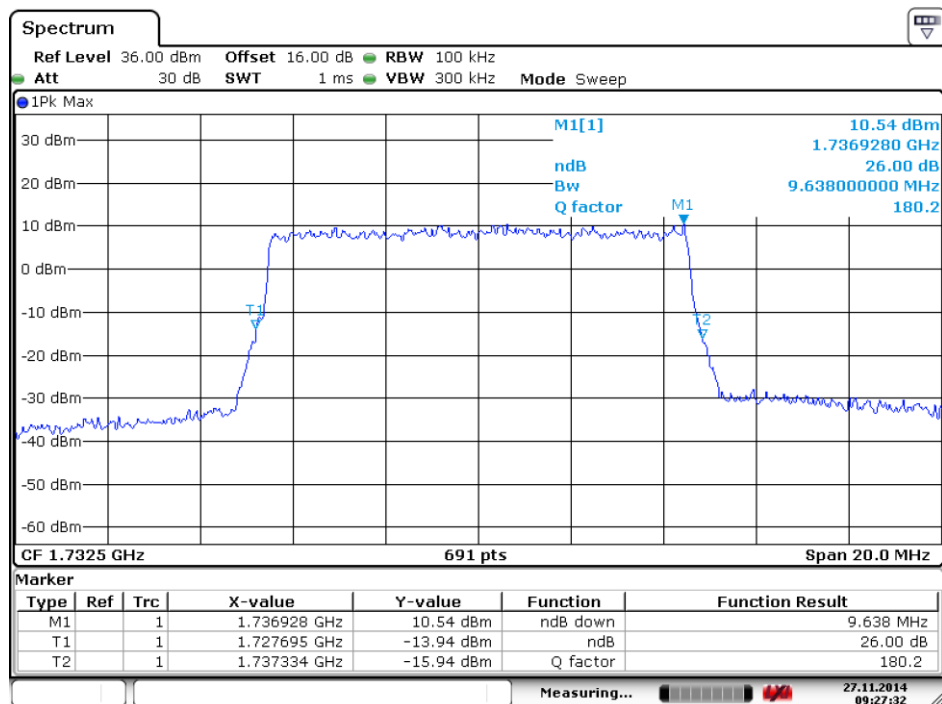
Date: 27.NOV.2014 09:27:16

(Plot D2: 26dB Bandwidth LTE Band 4 10MHz/QPSK)



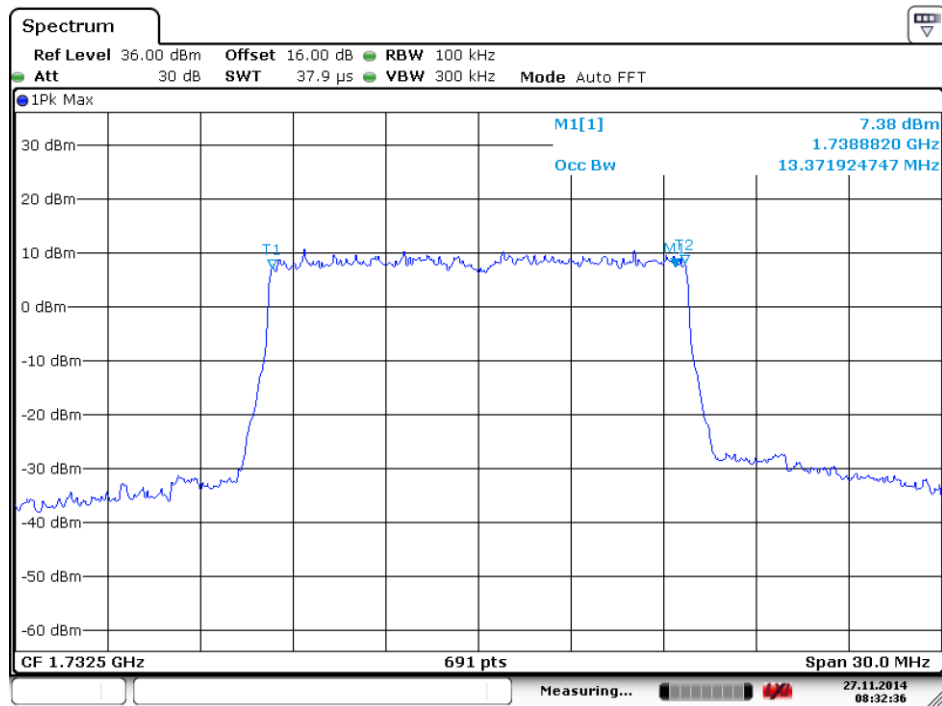
Date: 27.NOV.2014 09:26:45

(Plot D3: 99% Occupied Bandwidth LTE Band 4 10MHz/16QAM)



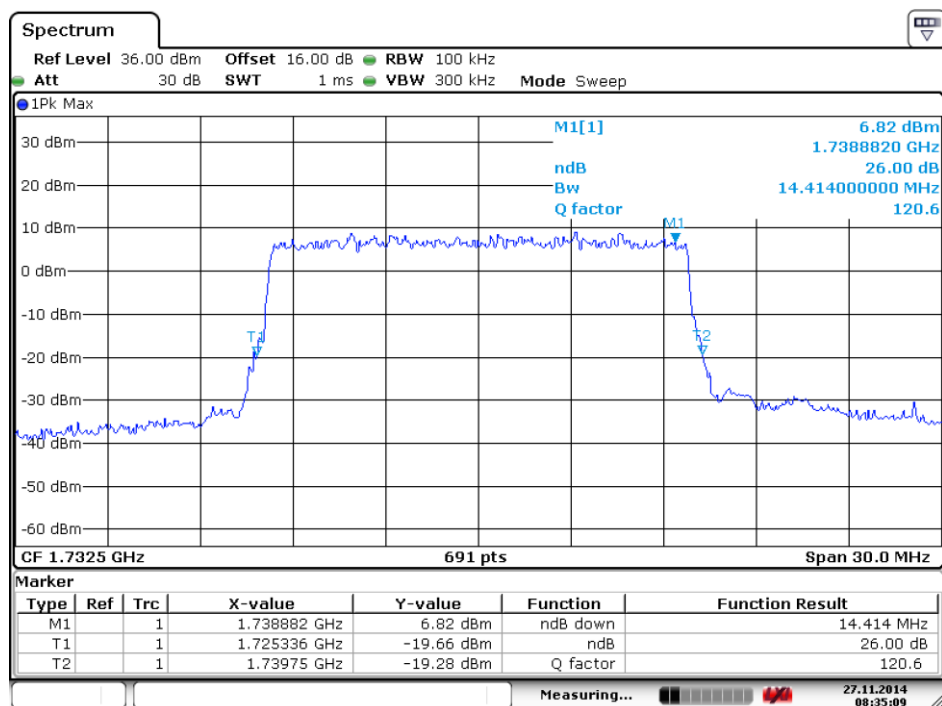
Date: 27.NOV.2014 09:27:32

(Plot D4: 26dB Bandwidth LTE Band 4 10MHz/16QAM)



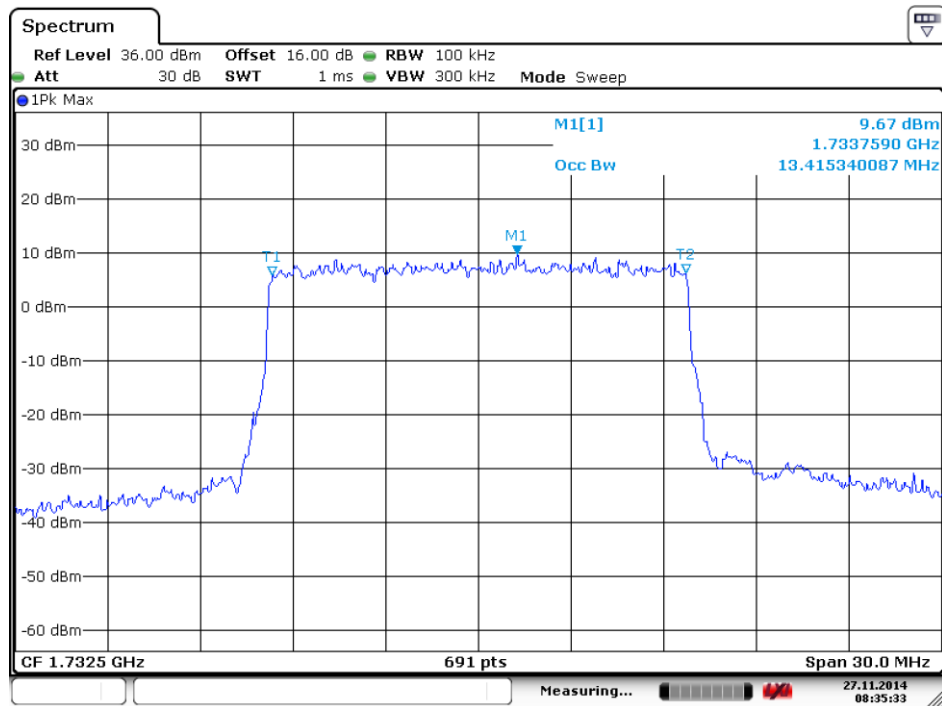
Date: 27.NOV.2014 08:32:36

(Plot E1: 99% Occupied Bandwidth LTE Band 4 15MHz/QPSK)



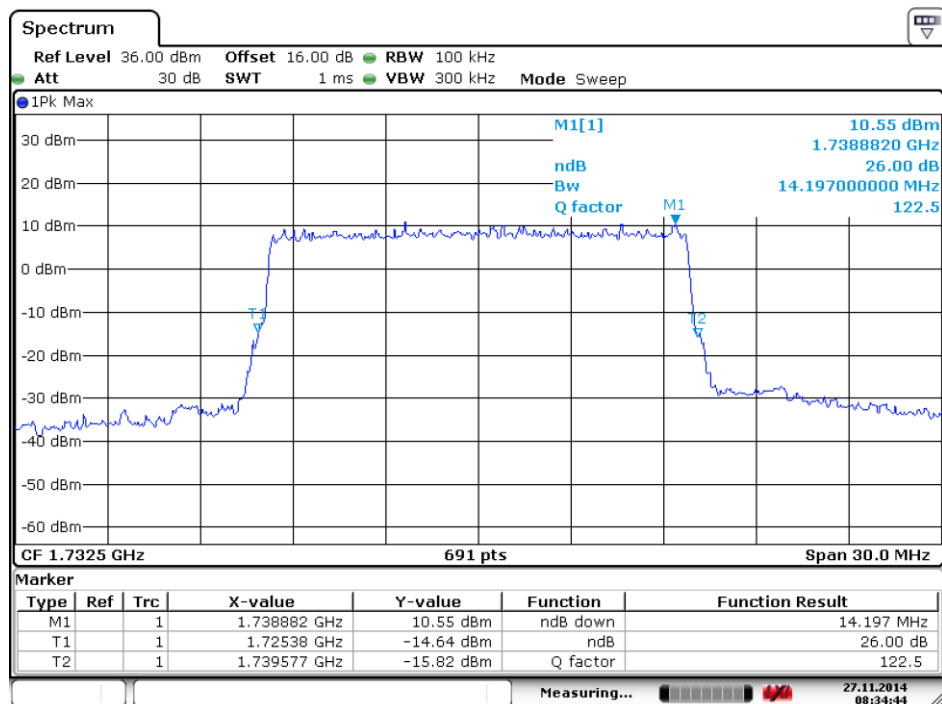
Date: 27.NOV.2014 08:35:09

(Plot E2: 26dB Bandwidth LTE Band 4 15MHz/QPSK)



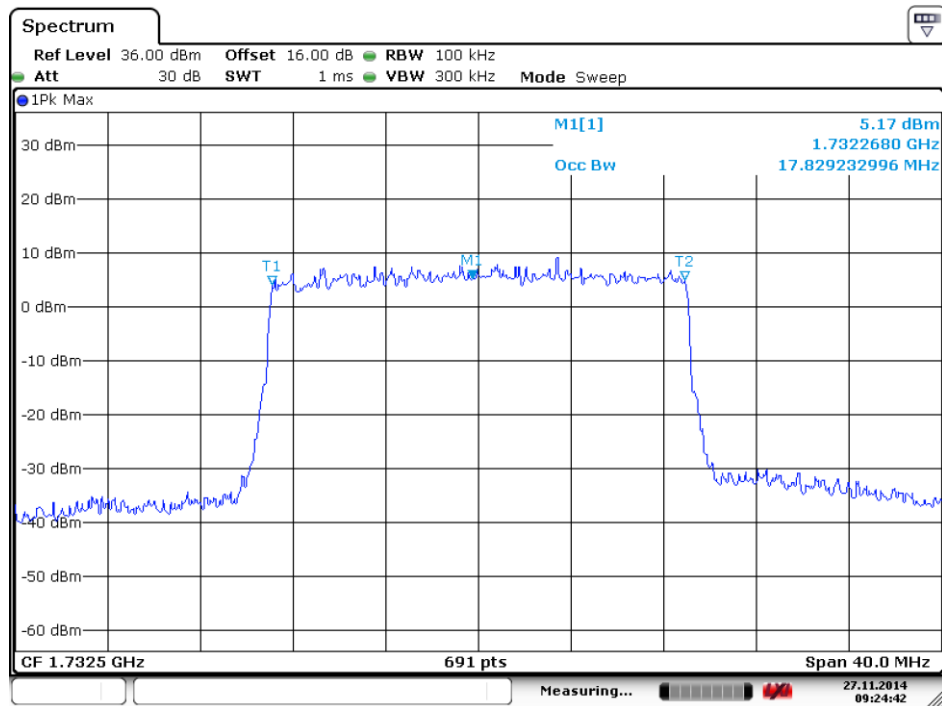
Date: 27.NOV.2014 08:35:34

(Plot E3: 99% Occupied Bandwidth LTE Band 4 15MHz/16QAM)



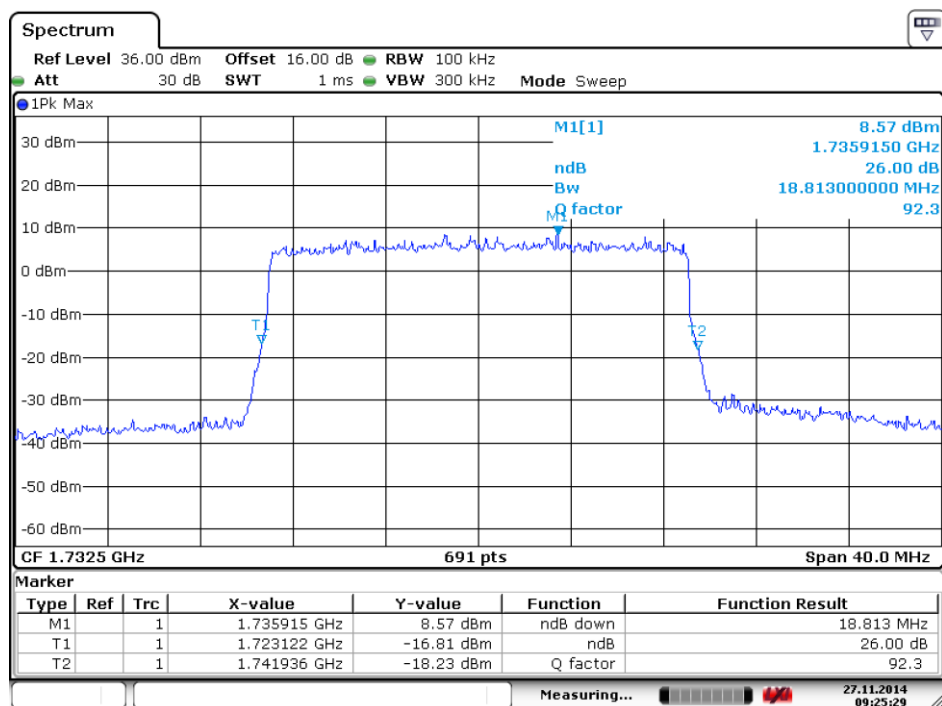
Date: 27.NOV.2014 08:34:44

(Plot E4: 26dB Bandwidth LTE Band 4 15MHz/16QAM)



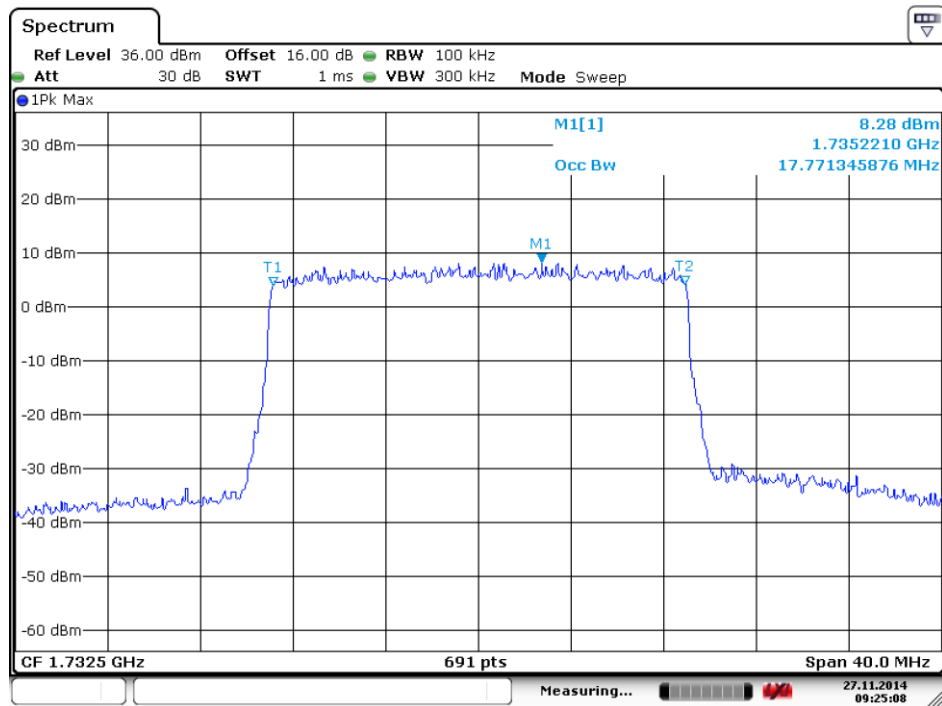
Date: 27.NOV.2014 09:24:42

(Plot F1: 99% Occupied Bandwidth LTE Band 4 20MHz/QPSK)



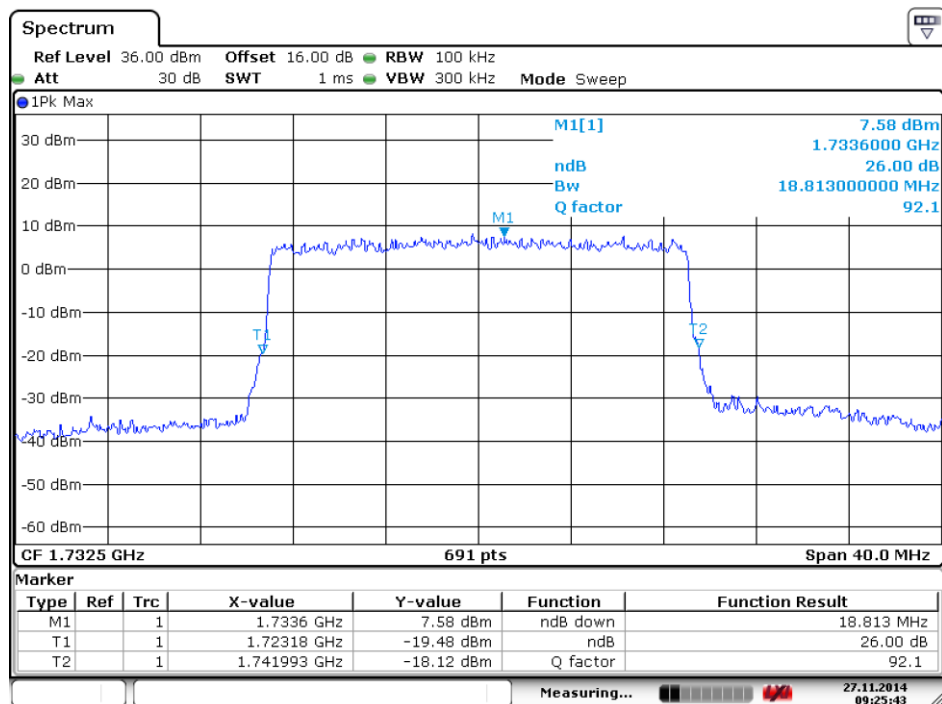
Date: 27.NOV.2014 09:25:29

(Plot F2: 26dB Bandwidth LTE Band 4 20MHz/QPSK)



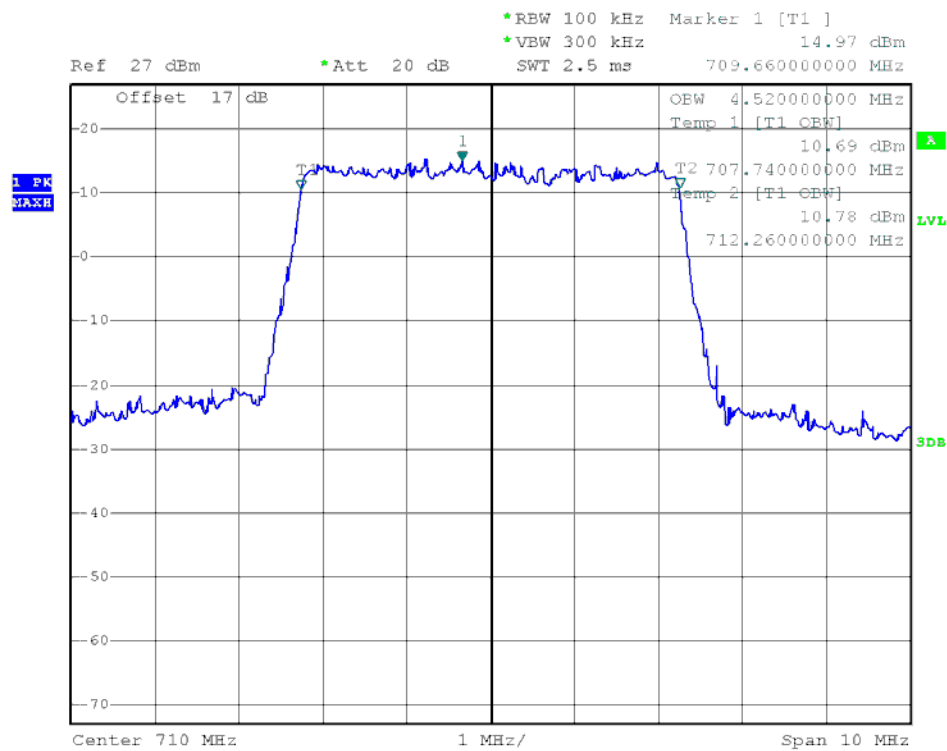
Date: 27.NOV.2014 09:25:07

(Plot F3: 99% Occupied Bandwidth LTE Band 4 20MHz/16QAM)

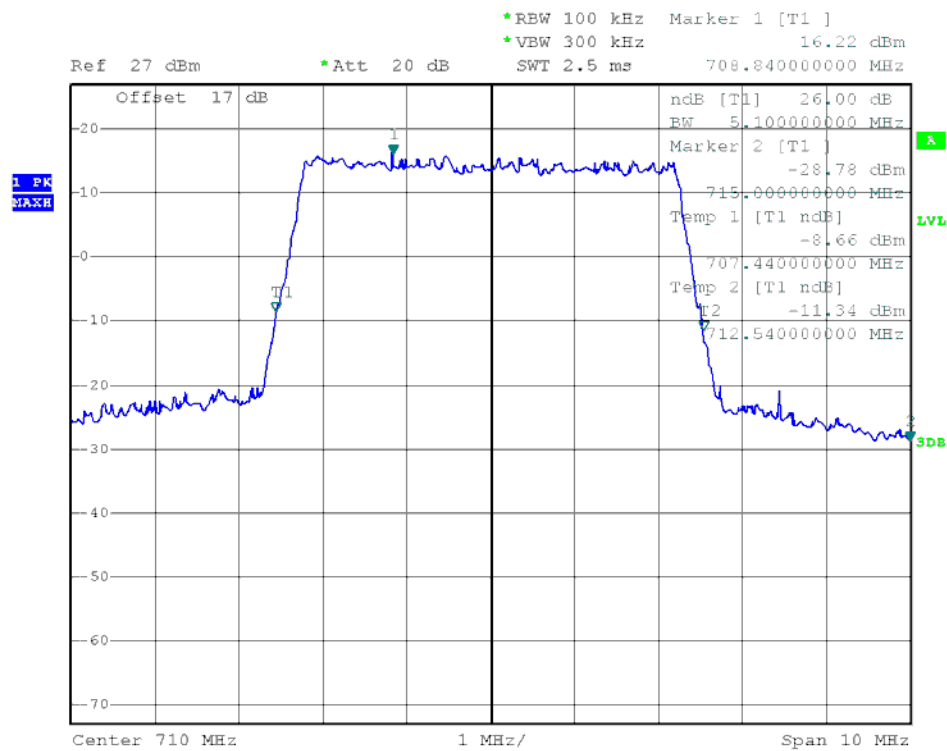


Date: 27.NOV.2014 09:25:43

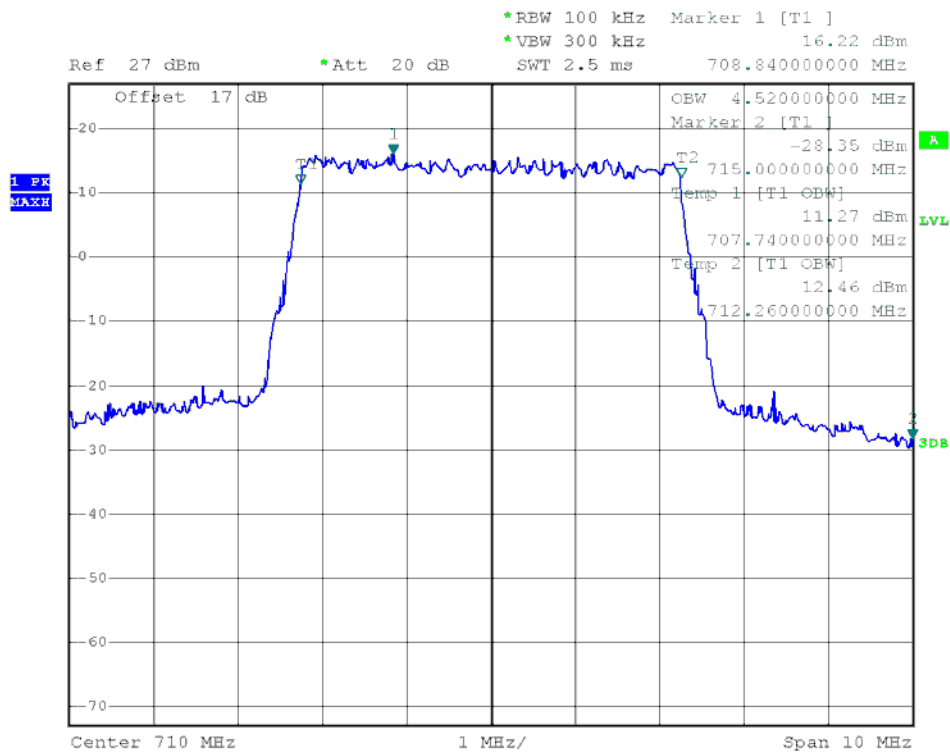
(Plot F4: 26dB Bandwidth LTE Band 4 20MHz/16QAM)



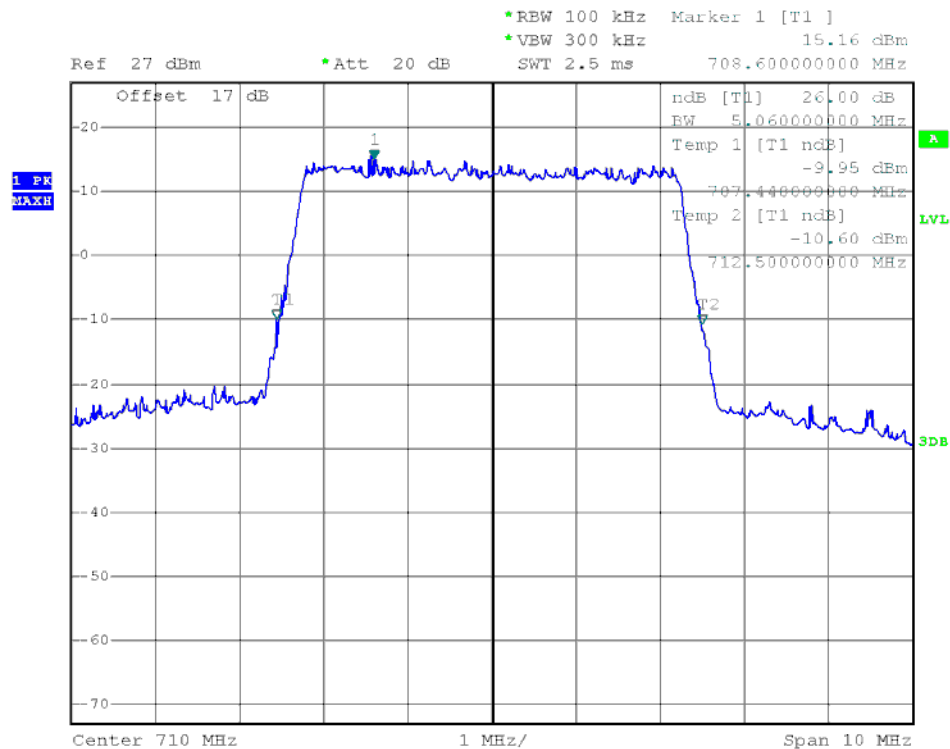
(Plot G1: 99% Occupied Bandwidth LTE Band 17 5MHz/QPSK Channel = 23790)



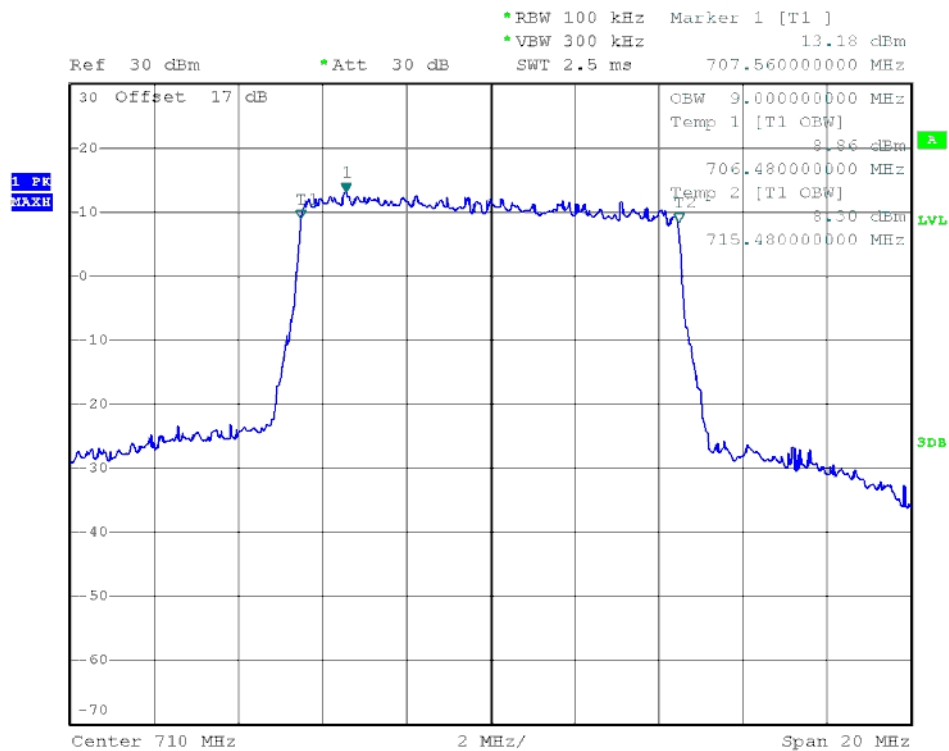
(Plot G2: 26dB Bandwidth LTE Band 17 5MHz/QPSK Channel = 23790)



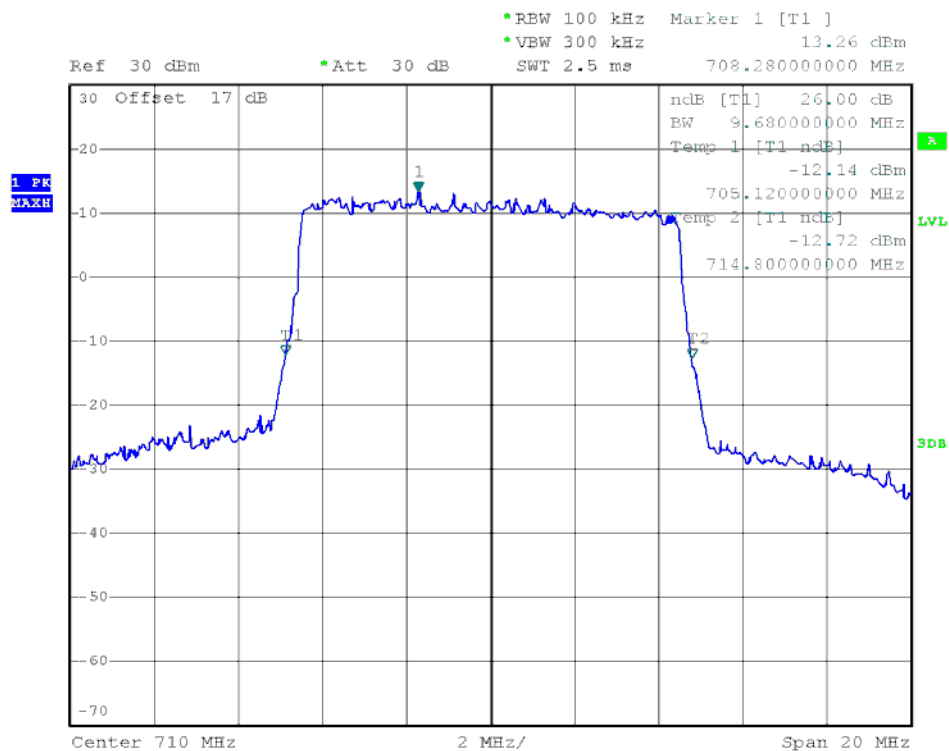
(Plot G3: 99% Occupied Bandwidth LTE Band 17 5MHz/16QAM Channel = 23790)



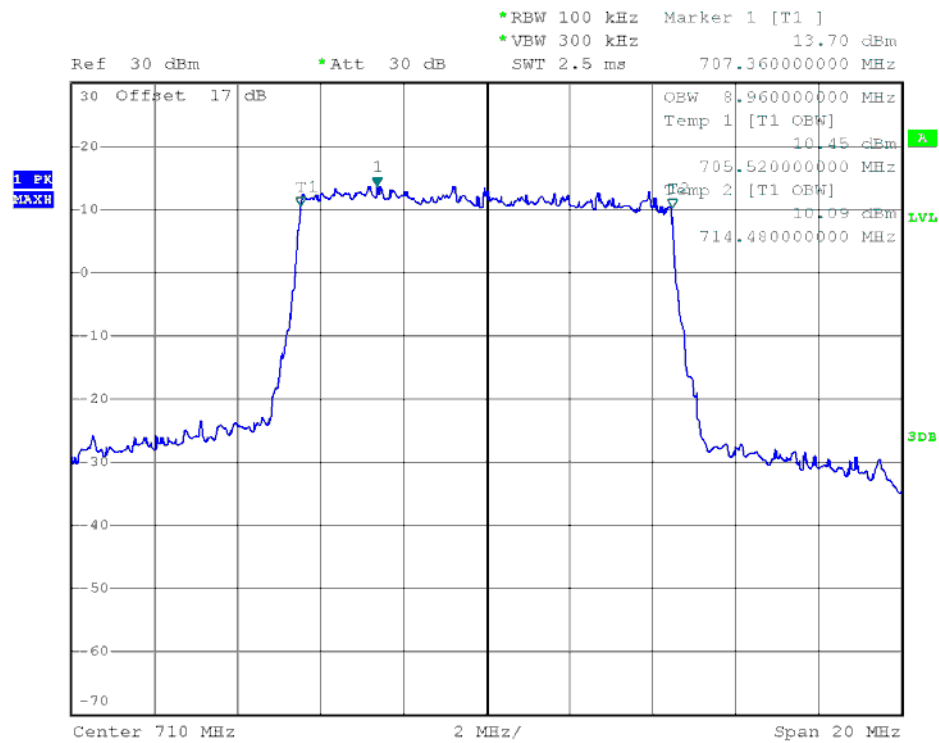
(Plot G4: 26dB Bandwidth LTE Band 17 5MHz/16QAM Channel = 23790)



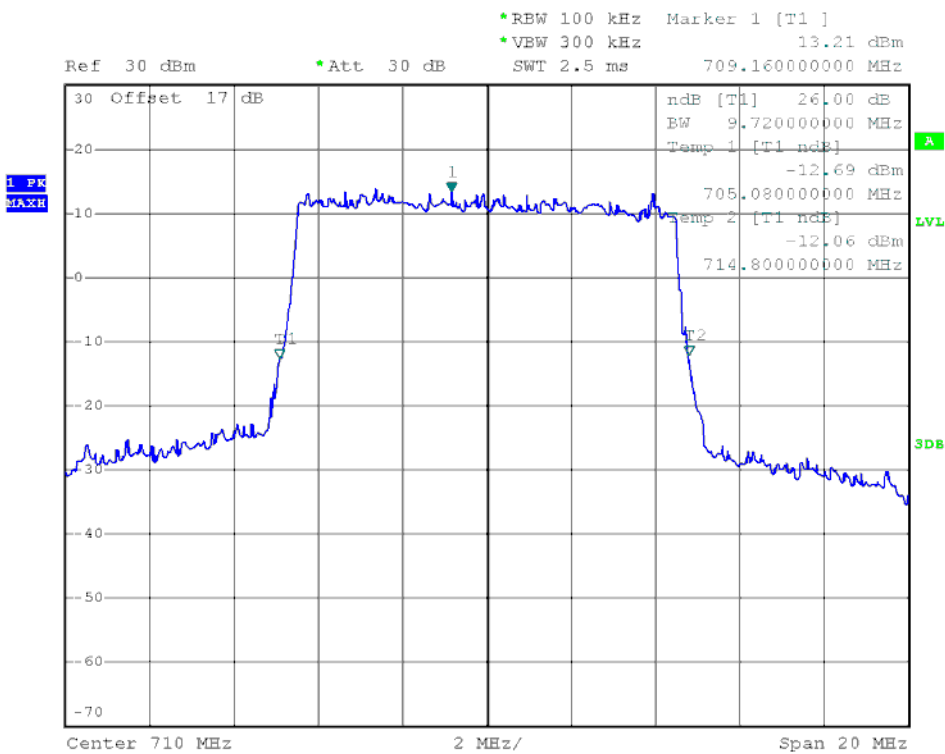
(Plot H1: 99% Occupied Bandwidth LTE Band 17 10MHz/QPSK Channel = 23790)



(Plot H2: 26dB Bandwidth LTE Band 17 10MHz/QPSK Channel = 23790)



(Plot B3: 99% Occupied Bandwidth LTE Band 17 10MHz/16QAM Channel = 23790)



(Plot B4: 26dB Bandwidth LTE Band 17 10MHz/16QAM Channel = 23790)

2.4 Frequency Stability

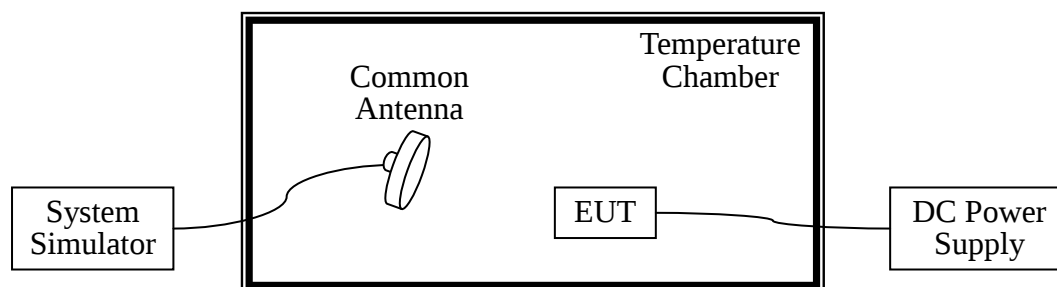
2.4.1 Requirement

According to FCC section 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency. According to FCC section 2.1055, the test conditions are:

- The temperature is varied from $-30\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ at intervals of not more than $10\text{ }^{\circ}\text{C}$.
- For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.4.2 Test Description

1. Test Setup:



2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Data	Cal. Due Data
System Simulator	R&S	CMW500	149333	2014.07.21	2015.07.20
DC Power Supply	Good Will	GPS-3030DD	EF920938	2014.06.11	2015.06.10
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2014.06.11	2015.06.10
Cable	SUNHNER	SUCOFLEX 100	/	2014.06.05	2015.06.04

2.4.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.2VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is $25\text{ }^{\circ}\text{C}$.

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30 °C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10 °C step up to 50 °C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. The variation in frequency was measured for the worst case.

2.4.4 Test Result of Frequency Stability

1. LTE Band 4, QPSK, BW 1.4MHz

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 19957 (1710.7MHz)		Channel = 20175 (1732.5MHz)		Channel = 20393 (1754.5MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	24.89	±4276.75	4.43	±4331.25	4.43	±4386.25	PASS
	-20	38.66		-15.01		-15.01		
	-10	41.47		34.03		34.03		
	0	13.21		44.86		44.86		
	+10	10.35		51.87		51.87		
	+20	-12.03		51.00		51.00		
	+30	21.03		38.12		38.12		
	+40	25.80		17.07		17.07		
	+55	27.93		29.71		29.71		
4.2	+25	3.71	±4276.75	42.55	±4331.25	42.55	±4386.25	PASS
3.6	+25	25.57		53.57		53.57		

2. LTE Band 4, QPSK, BW 3MHz

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 19965 (1711.5MHz)		Channel = 20175 (1732.5MHz)		Channel = 20385 (1753.5MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	-4.32	± 4278.75	27.18	± 4331.25	5.05	± 4383.75	PASS
	-20	35.25		30.07		7.49		
	-10	-19.21		5.48		0.19		
	0	27.75		-1.82		34.30		
	+10	-13.73		19.02		45.99		
	+20	-6.95		44.78		-16.51		
	+30	48.07		21.99		19.46		
	+40	42.00		17.67		-6.80		
	+55	38.85		-19.44		7.58		
4.2	+25	31.42	± 4278.75	-6.76	± 4331.25	3.11	± 4383.75	PASS
3.6	+25	4.49		14.09		-4.93		

3. LTE Band 4, QPSK, BW 5MHz

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 19975 (1712.5MHz)		Channel = 20175 (1732.5MHz)		Channel = 20375 (1752.5MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	20.79	± 4281.75	46.68	± 4331.25	22.69	± 4383.75	PASS
	-20	44.54		28.10		2.39		
	-10	10.45		-4.27		64.53		
	0	10.88		36.69		12.66		
	+10	54.76		13.61		50.37		
	+20	2.46		12.15		-5.39		
	+30	27.07		23.94		35.13		
	+40	-8.66		13.56		-0.53		
	+55	14.23		47.64		37.40		
4.2	+25	63.35	± 4281.75	52.86	± 4331.25	31.75	± 4383.75	PASS
3.6	+25	35.82		3.68		58.60		



4. LTE Band 4, QPSK ,BW 10MHz

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 20000 (1715MHz)		Channel = 20175 (1732.5MHz)		Channel = 20350 (1750MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	18.24	±4287.5	29.27	±4331.25	48.91	±4375	PASS
	-20	48.85		-8.57		11.01		
	-10	42.82		36.13		15.79		
	0	17.61		-14.70		41.59		
	+10	24.98		-8.71		-10.89		
	+20	37.51		-15.98		-7.13		
	+30	24.02		21.63		29.44		
	+40	-42.96		-2.73		-10.34		
	+55	-2.48		8.69		15.41		
4.2	+25	36.37		48.24		32.72		
3.6	+25	15.30		36.41		-9.80		

5. LTE Band 4, QPSK ,BW 15MHz

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 20025 (1717.5MHz)		Channel = 20175 (1732.5MHz)		Channel = 20325 (1747.5MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	33.26	±4293.75	15.73	±4331.25	52.17	±4368.75	PASS
	-20	42.12		-8.20		28.14		
	-10	-0.56		43.40		33.27		
	0	8.20		-13.79		24.72		
	+10	-13.04		28.82		1.91		
	+20	-14.56		25.83		19.59		
	+30	21.86		41.20		48.08		
	+40	-5.39		-10.03		31.98		
	+55	38.99		2.69		41.83		
4.2	+25	36.56		7.29		22.23		
3.6	+25	6.44		17.60		14.12		

6. LTE Band 4, QPSK ,BW 20MHz

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 20050 (1720MHz)		Channel = 20175 (1732.5MHz)		Channel = 20300 (1745MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	4.70	±4300	43.65	±4331.25	4.67	±4362.5	PASS
	-20	10.55		43.75		41.98		
	-10	25.51		7.06		-16.33		
	0	29.06		-16.77		-27.80		
	+10	-1.97		22.20		1.66		
	+20	29.89		18.77		-3.47		
	+30	-9.69		9.44		9.22		
	+40	3.48		55.87		0.97		
	+55	2.69		54.97		-2.52		
4.2	+25	-5.55	±4300	-8.03	±4331.25	28.81	±4362.5	PASS
3.6	+25	16.56		51.53		10.54		

7. LTE Band 17,QPSK ,BW 10MHz

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 23780 (709MHz)		Channel = 23790 (710MHz)		Channel = 23800 (711MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	24.53	±1772.5	29.67	±1775	44.25	±1777.5	PASS
	-20	28.85		-24.35		11.01		
	-10	24.24		36.13		15.79		
	0	17.61		-14.70		41.59		
	+10	24.98		-8.71		-10.89		
	+20	37.51		-15.98		-17.13		
	+30	24.02		21.63		29.41		
	+40	-20.96		-2.73		-10.62		
	+55	-22.48		8.69		15.41		
4.2	+25	31.37	±1772.5	48.24	±1775	32.36	±1777.5	PASS
3.6	+25	15.30		36.41		-19.25		



8. LTE Band 17,QPSK ,BW 5MHz

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 23755 (706.5MHz)		Channel = 23790 (710MHz)		Channel = 23825 (713.5MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.8	-30	2.43	± 1766.2 5	-3.41	± 1775	43.07	± 1783.75	PASS
	-20	20.89		19.91		13.23		
	-10	-5.88		52.80		28.86		
	0	8.65		21.06		12.39		
	+10	44.84		36.30		47.66		
	+20	4.30		-1.87		21.07		
	+30	-1.03		1.12		23.00		
	+40	44.55		34.58		40.56		
	+55	-5.68		5.73		29.13		
4.2	+25	54.31		41.00		2.35		
3.6	+25	29.72		33.14		50.52		

2.5 Conducted Out of Band Emissions

2.5.1 Requirement

According to FCC section 27.53(h), 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. This calculated to be -13dBm.

2.5.2 Test Description

See section 2.1.2 of this report.

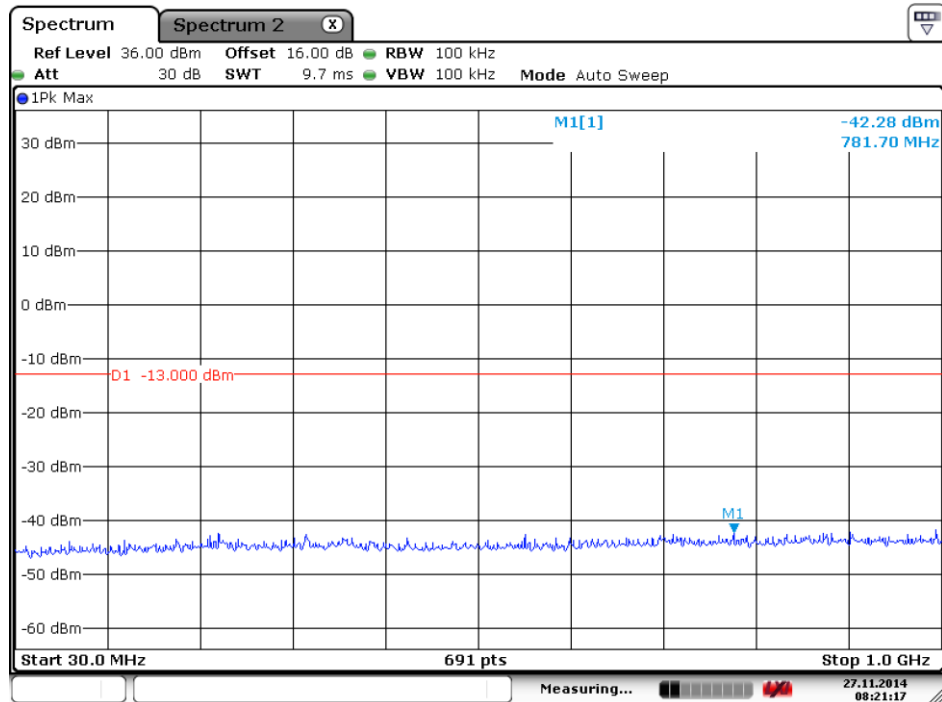
2.5.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$
$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$
$$= -13\text{dBm}.$$

2.5.4 Test Result of Conducted Spurious Emission

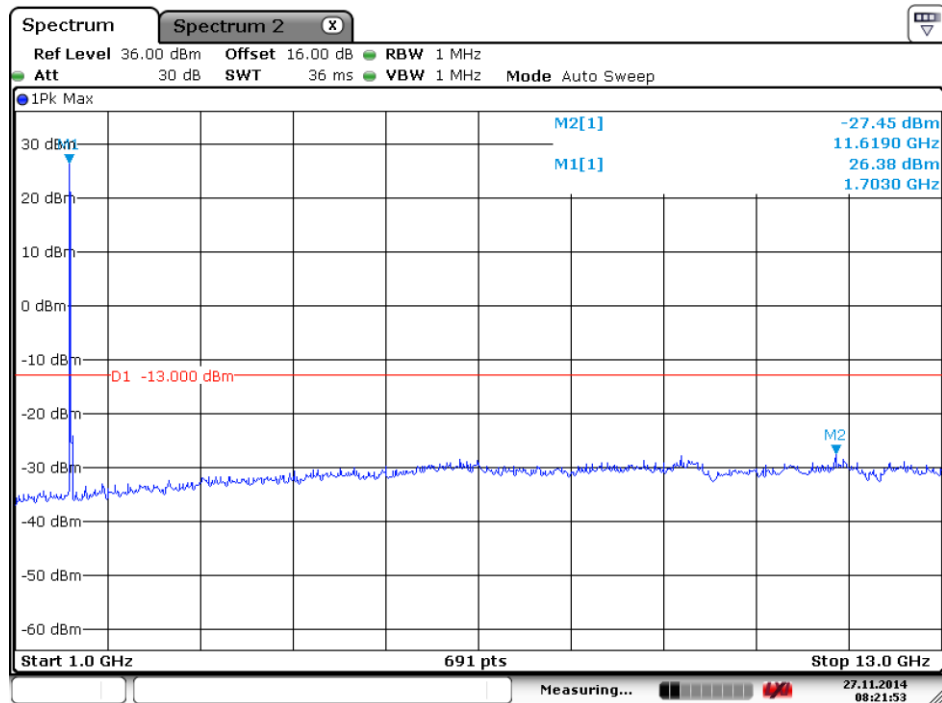
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

Band	LTE Band 4	Channel	Ch 19957(Low)
Bandwidth	1.4MHz	Modulation	QPSK



Date: 27.NOV.2014 08:21:16

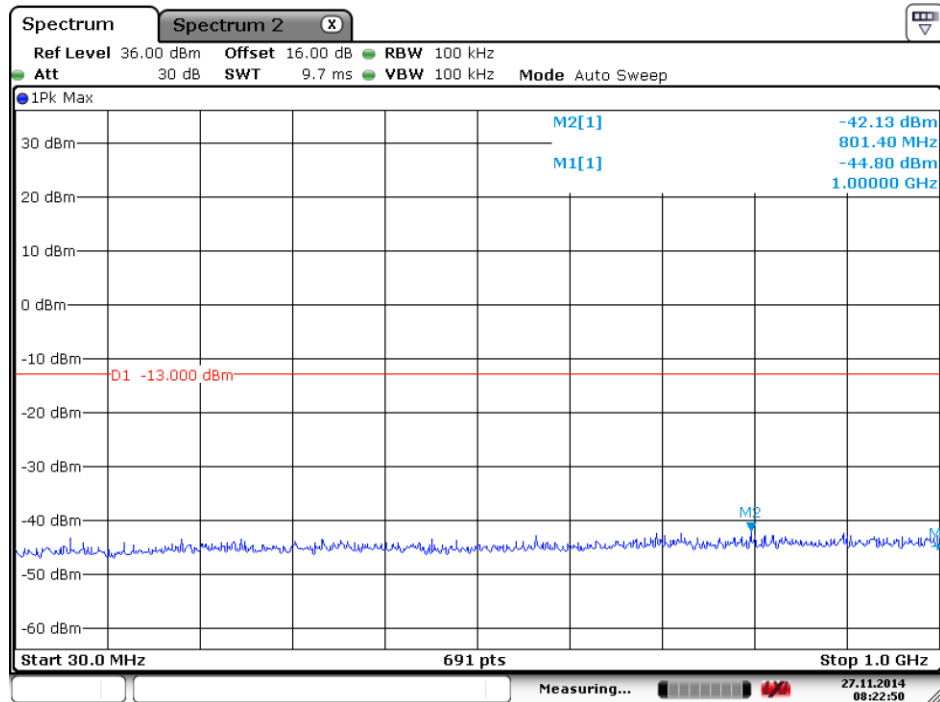
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



Date: 27.NOV.2014 08:21:53

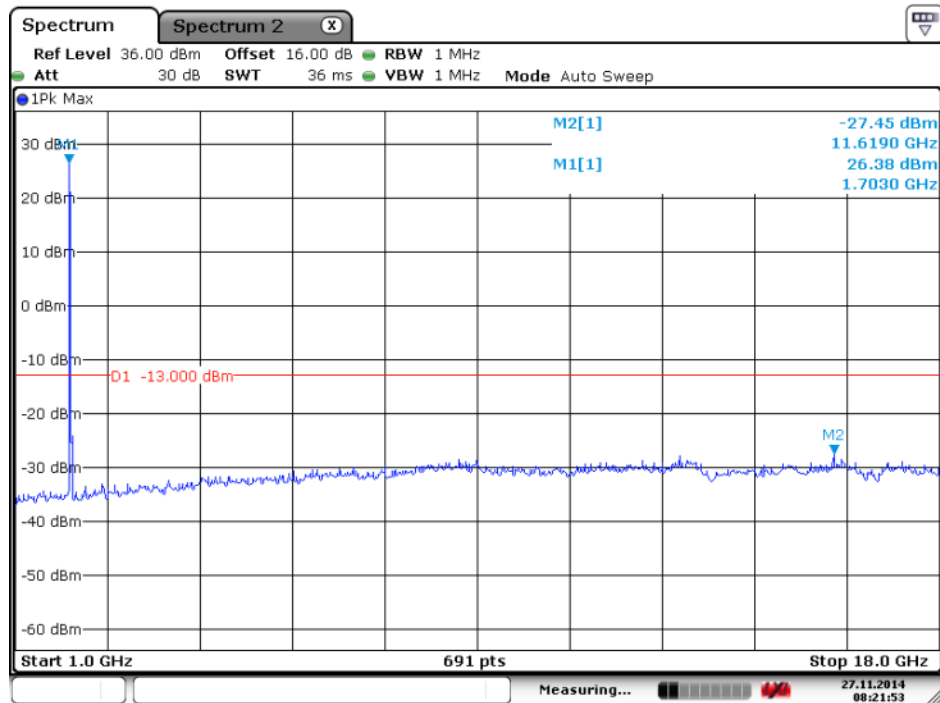
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 20175(Middle)
Bandwidth	1.4MHz	Modulation	QPSK



Date: 27.NOV.2014 08:22:50

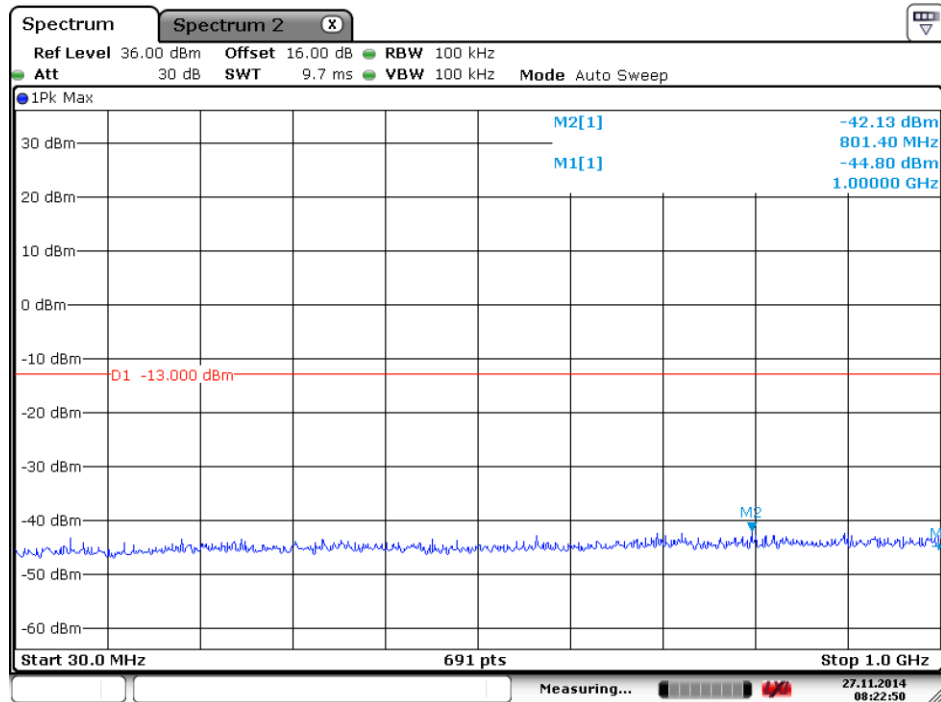
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



Date: 27.NOV.2014 08:21:53

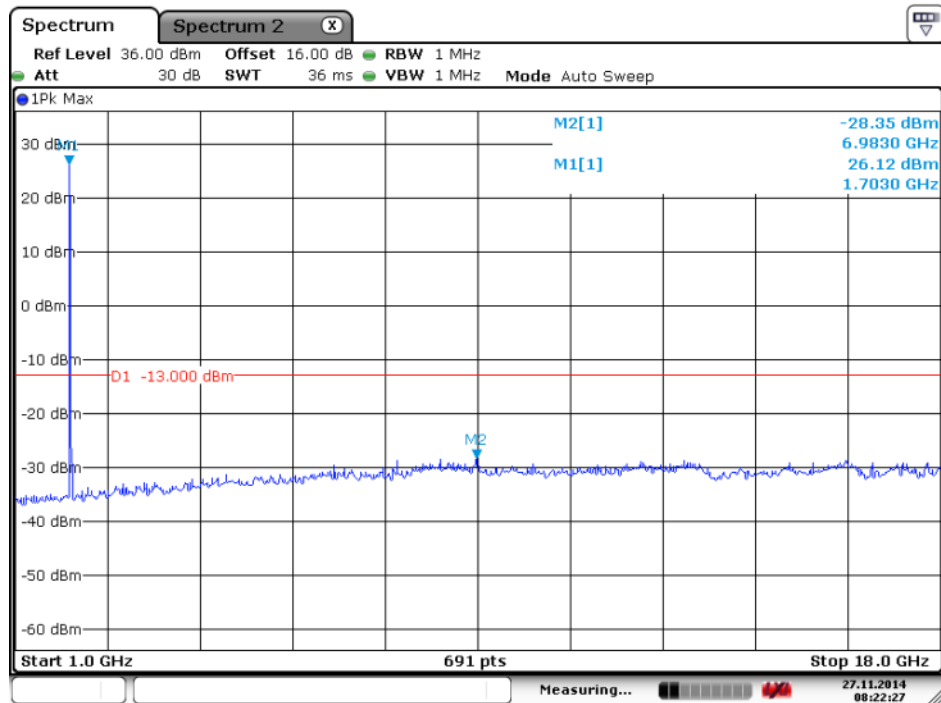
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 20393(High)
Bandwidth	1.4MHz	Modulation	QPSK



Date: 27.NOV.2014 08:22:50

QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

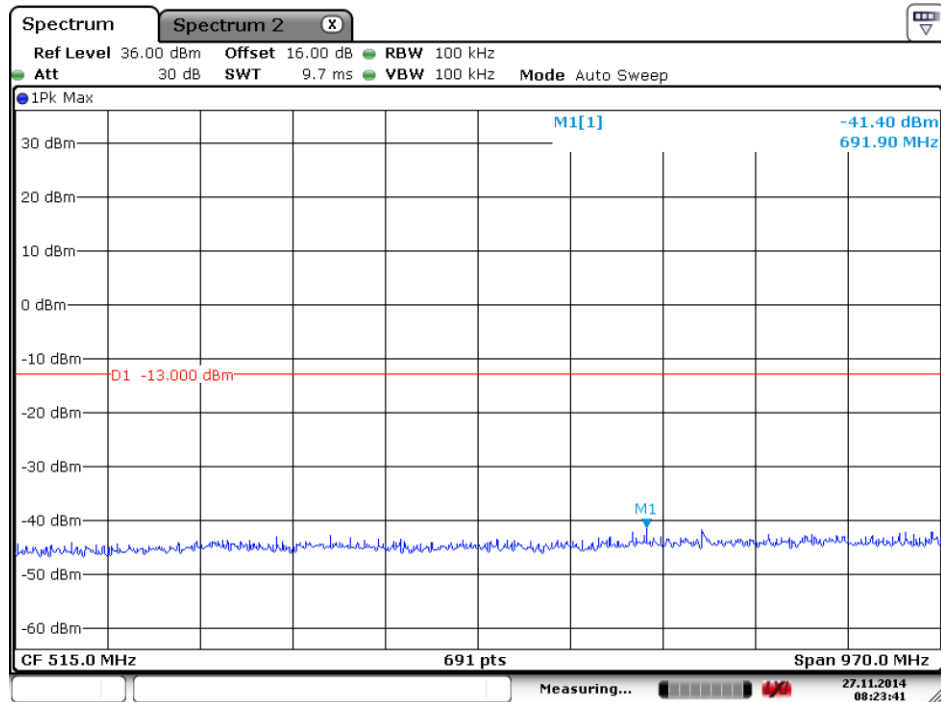


Date: 27.NOV.2014 08:22:27

QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

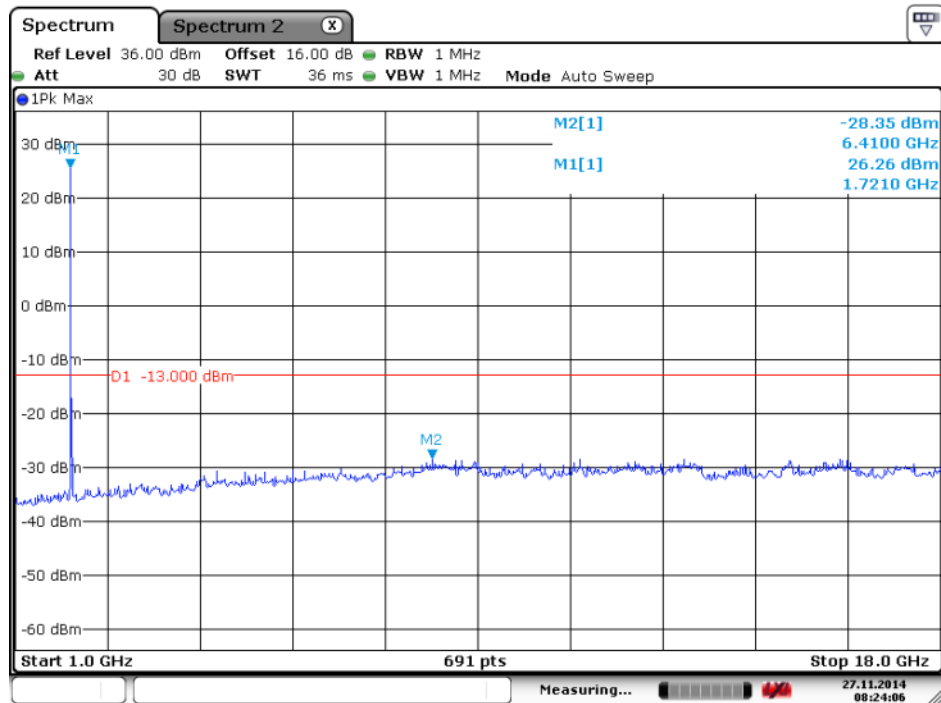


Band	LTE Band 4	Channel	Ch 19965(Low)
Bandwidth	3MHz	Modulation	QPSK



Date: 27.NOV.2014 08:23:40

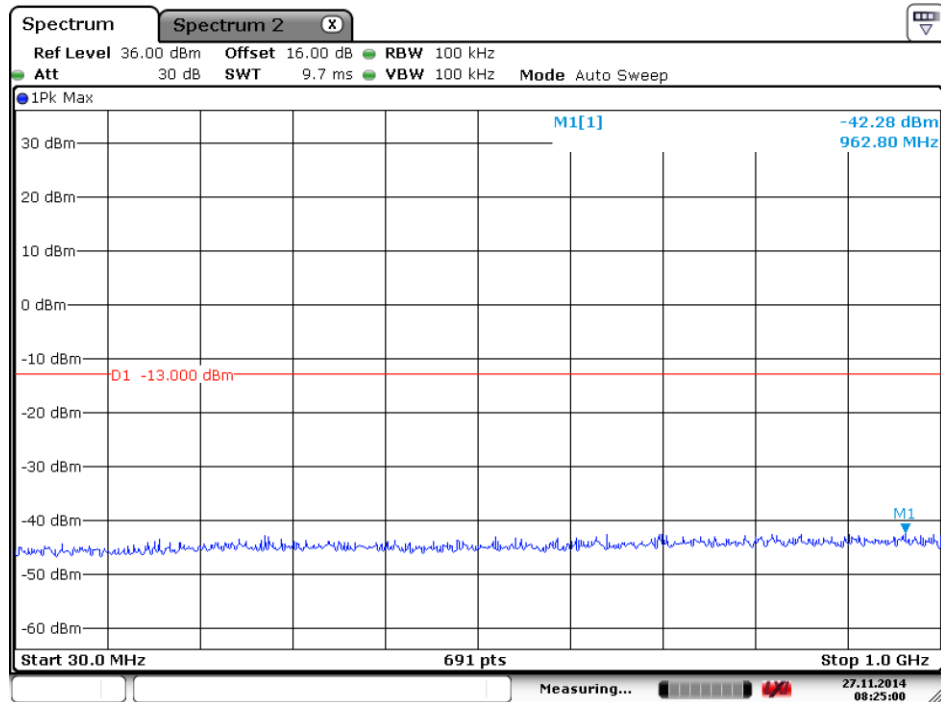
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



Date: 27.NOV.2014 08:24:06

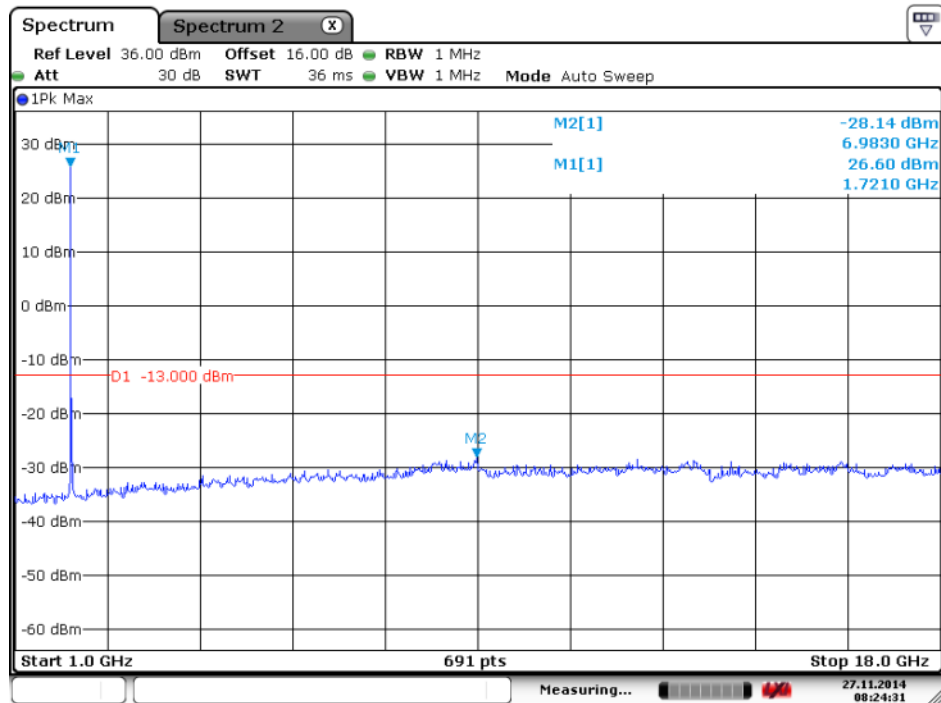
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 20175(Middle)
Bandwidth	3MHz	Modulation	QPSK



Date: 27.NOV.2014 08:25:00

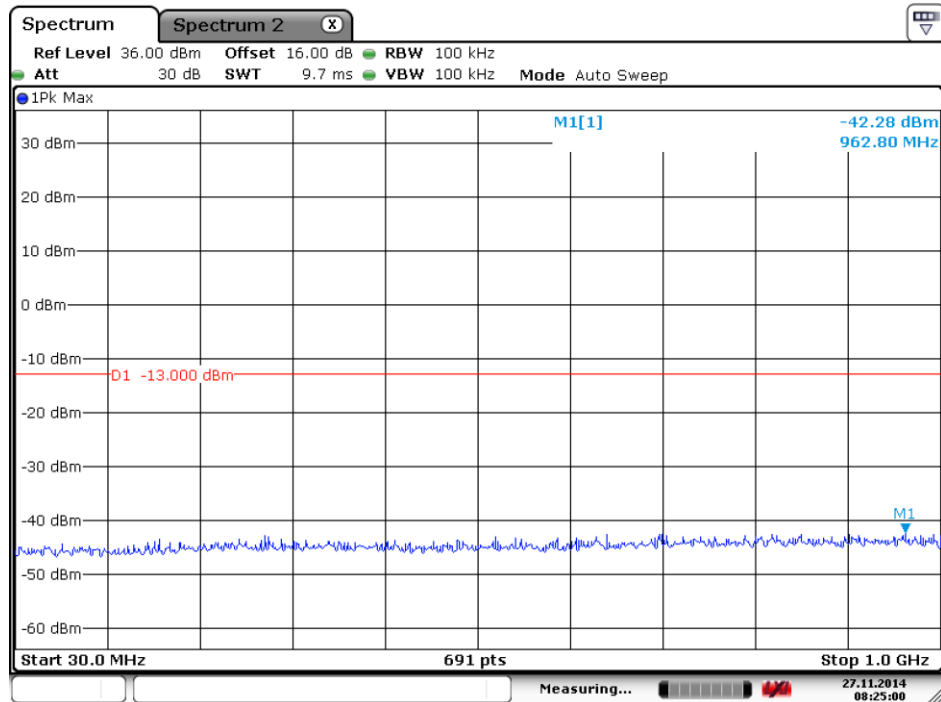
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



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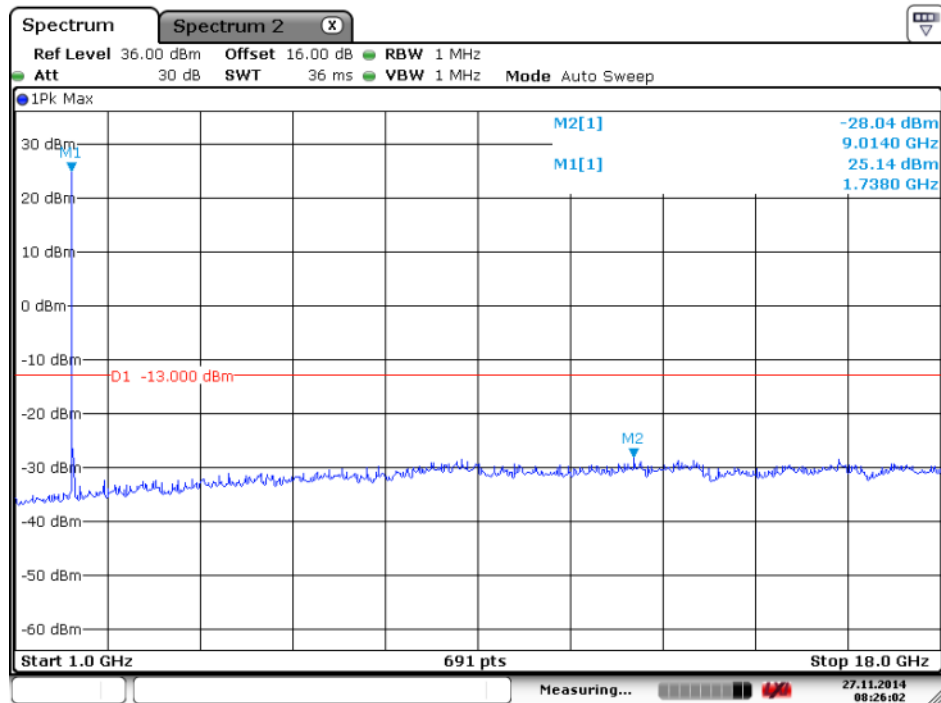
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 20385(High)
Bandwidth	3MHz	Modulation	QPSK



Date: 27.NOV.2014 08:25:00

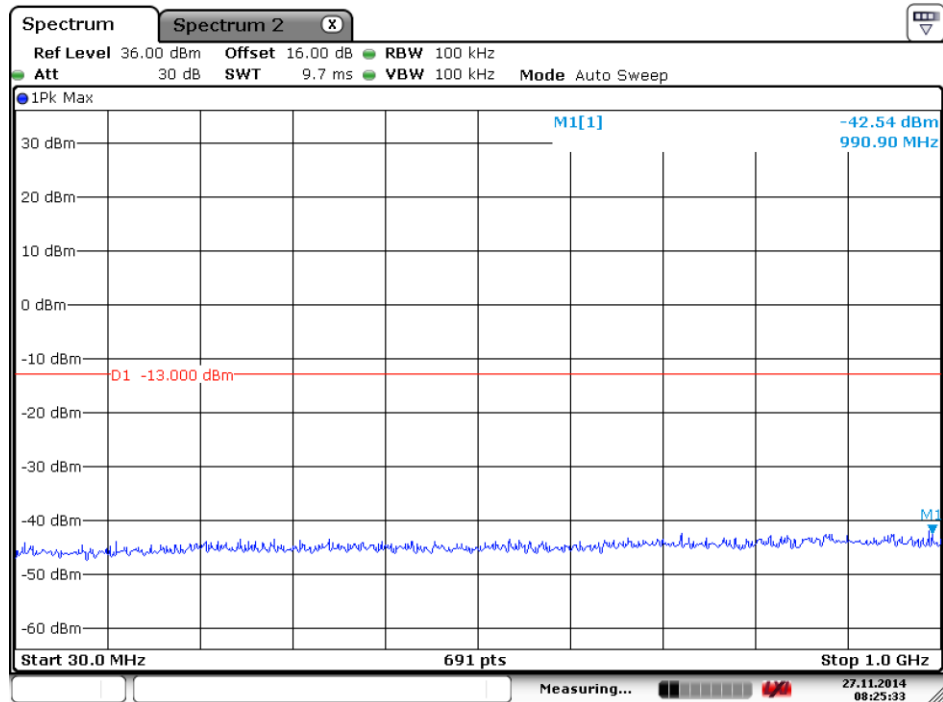
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



Date: 27.NOV.2014 08:26:02

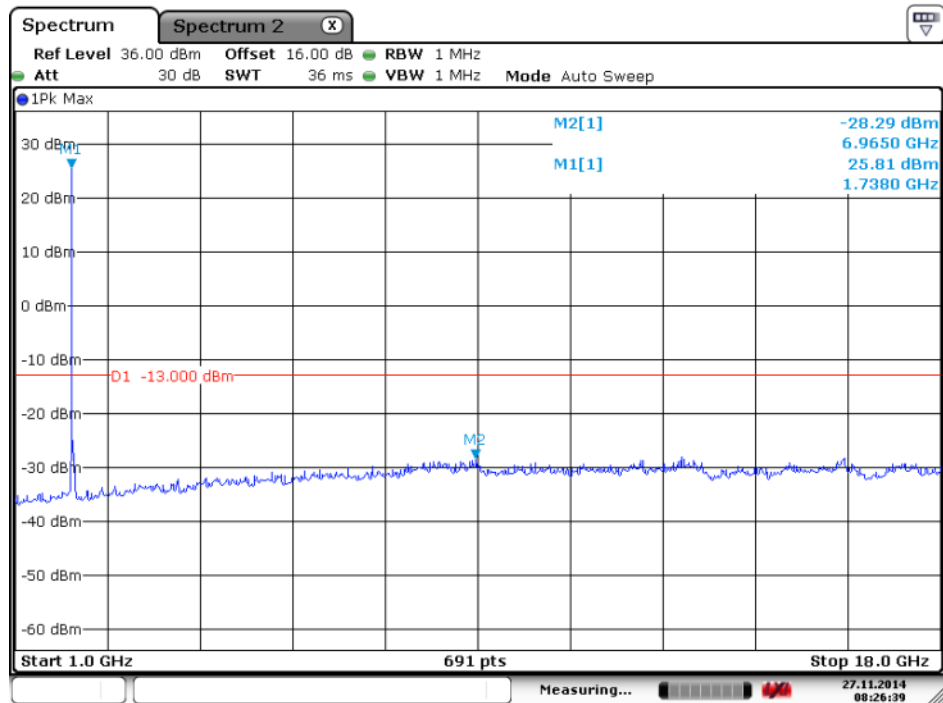
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 19975(Low)
Bandwidth	5MHz	Modulation	QPSK



Date: 27.NOV.2014 08:25:33

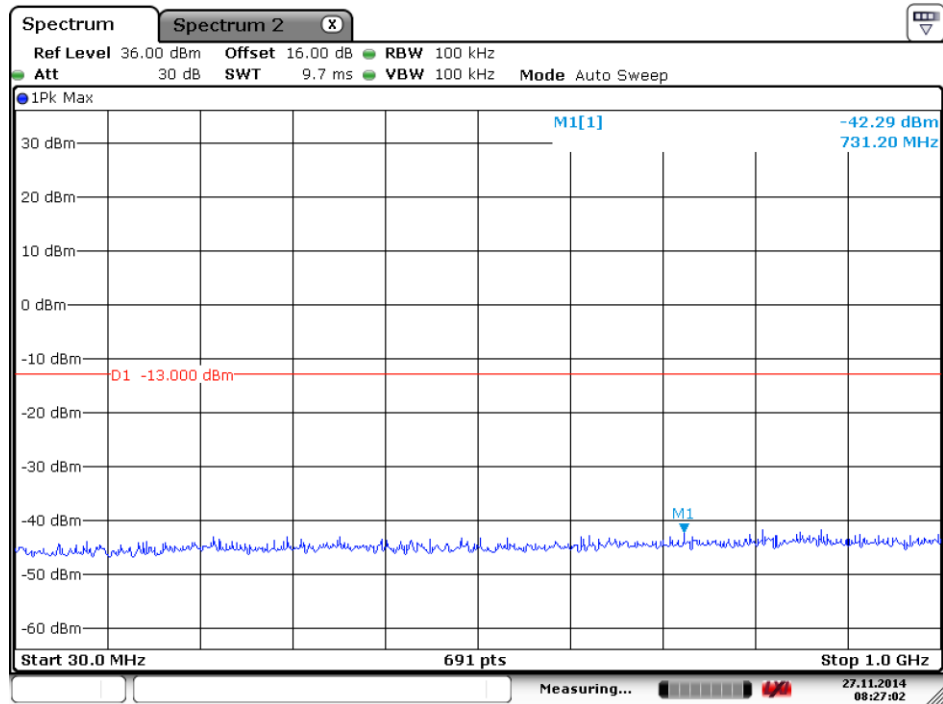
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



Date: 27.NOV.2014 08:26:40

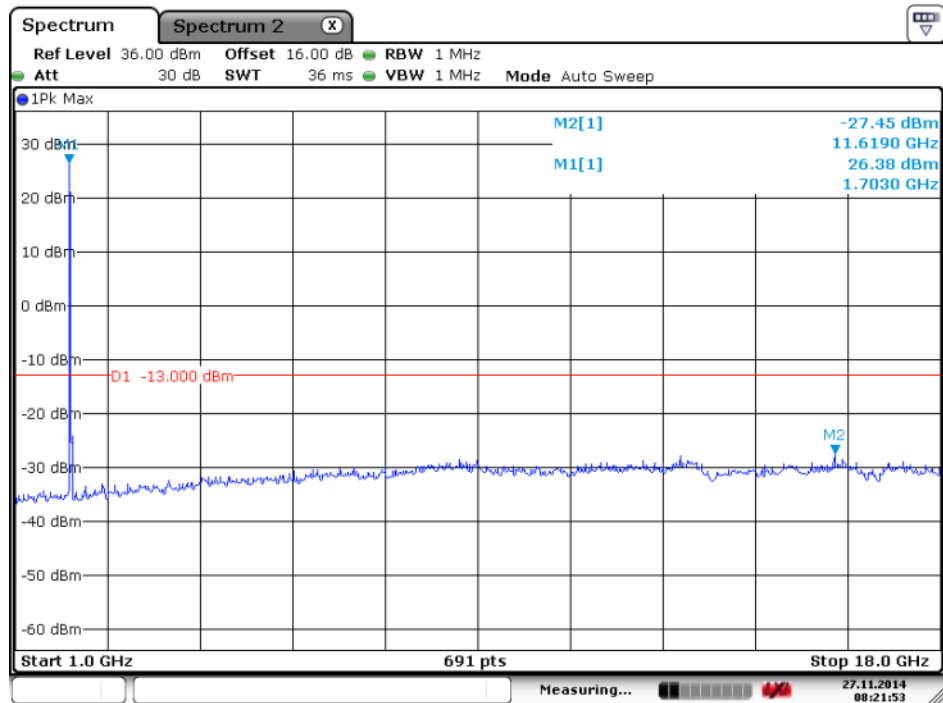
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 20175(Middle)
Bandwidth	5MHz	Modulation	QPSK



Date: 27.NOV.2014 08:27:02

QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

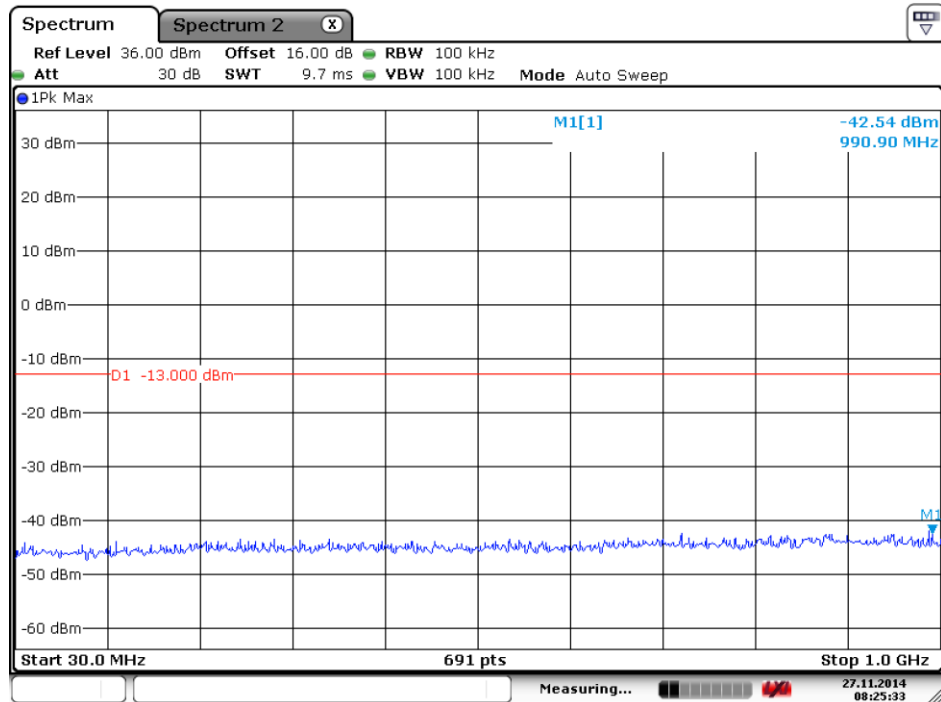


Date: 27.NOV.2014 08:21:53

QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

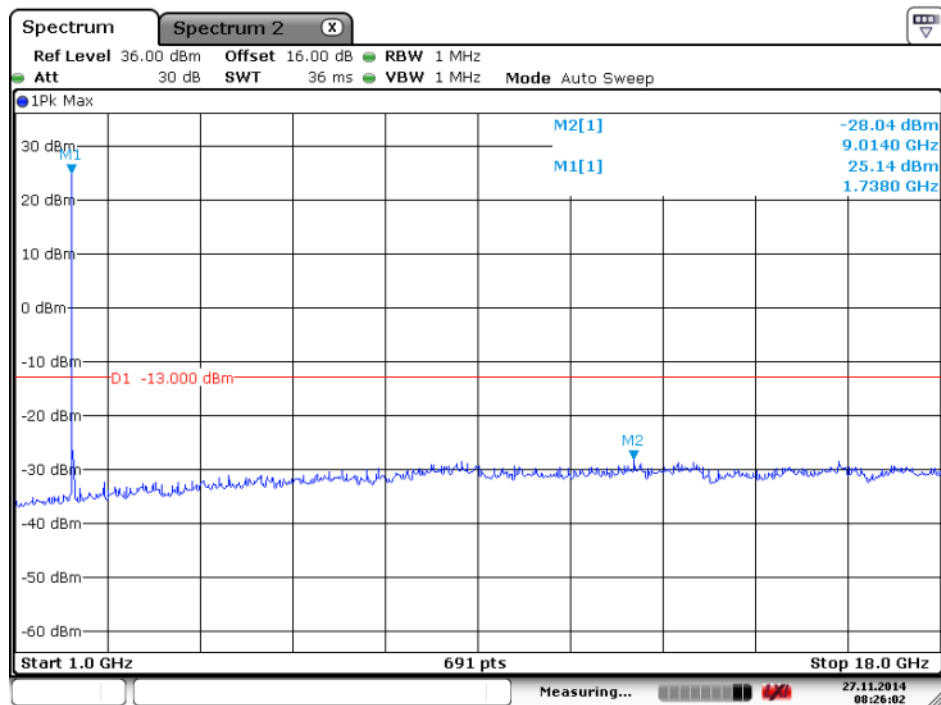


Band	LTE Band 4	Channel	Ch 20375(High)
Bandwidth	5MHz	Modulation	QPSK



Date: 27.NOV.2014 08:25:33

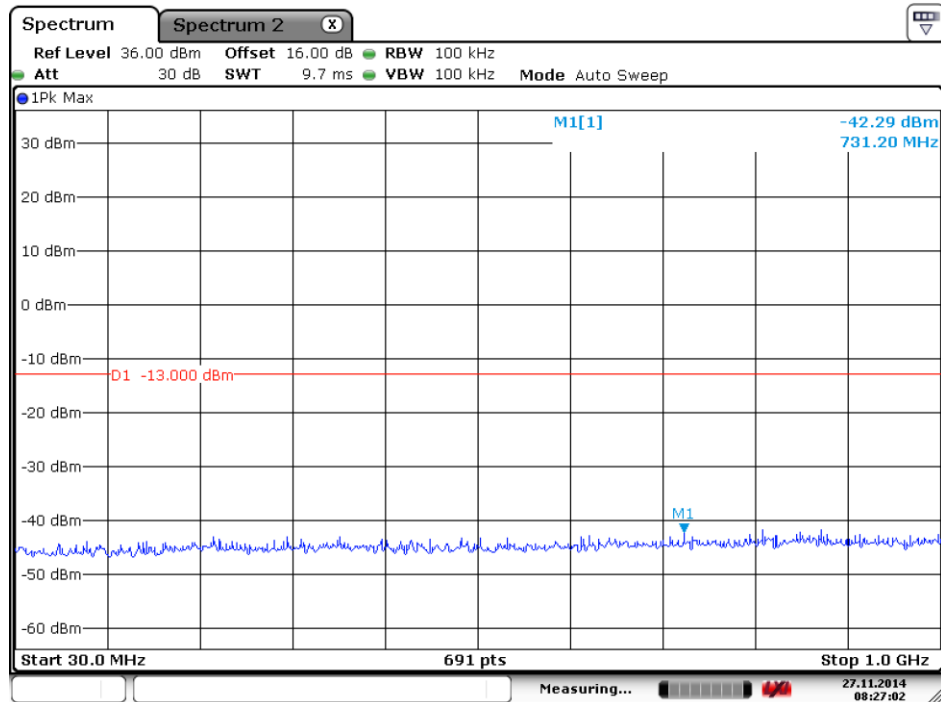
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



Date: 27.NOV.2014 08:26:02

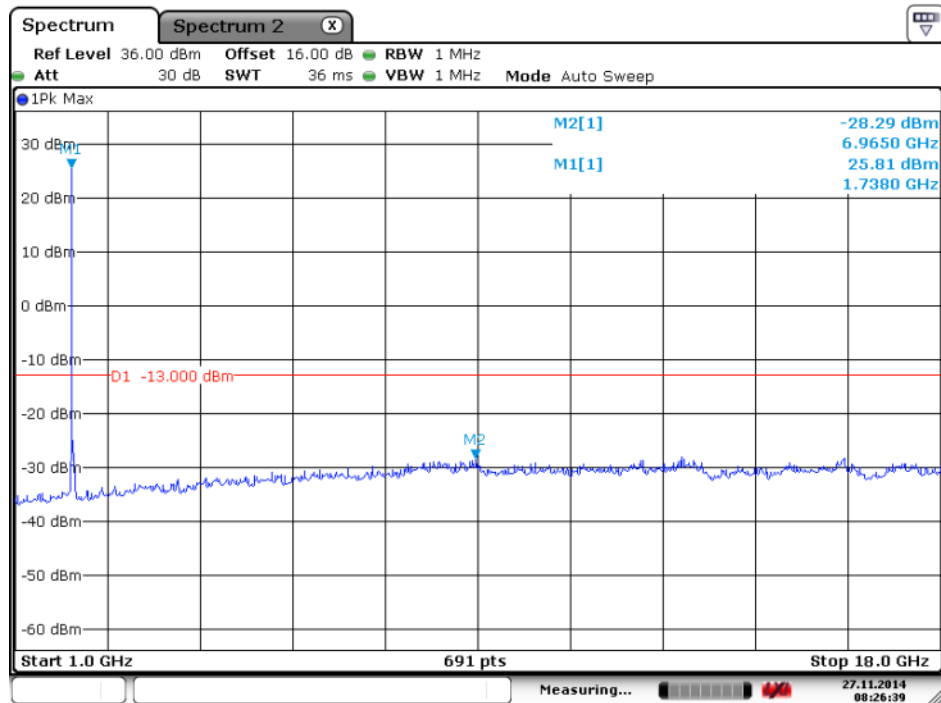
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 20000(Low)
Bandwidth	10MHz	Modulation	QPSK



Date: 27.NOV.2014 08:27:02

QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

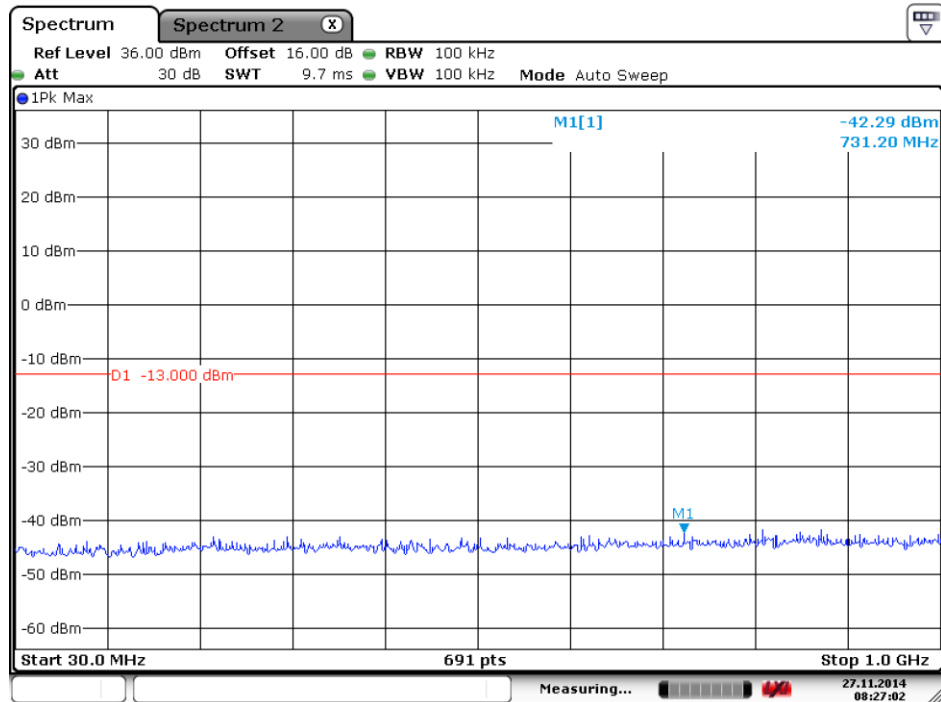


Date: 27.NOV.2014 08:26:40

QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

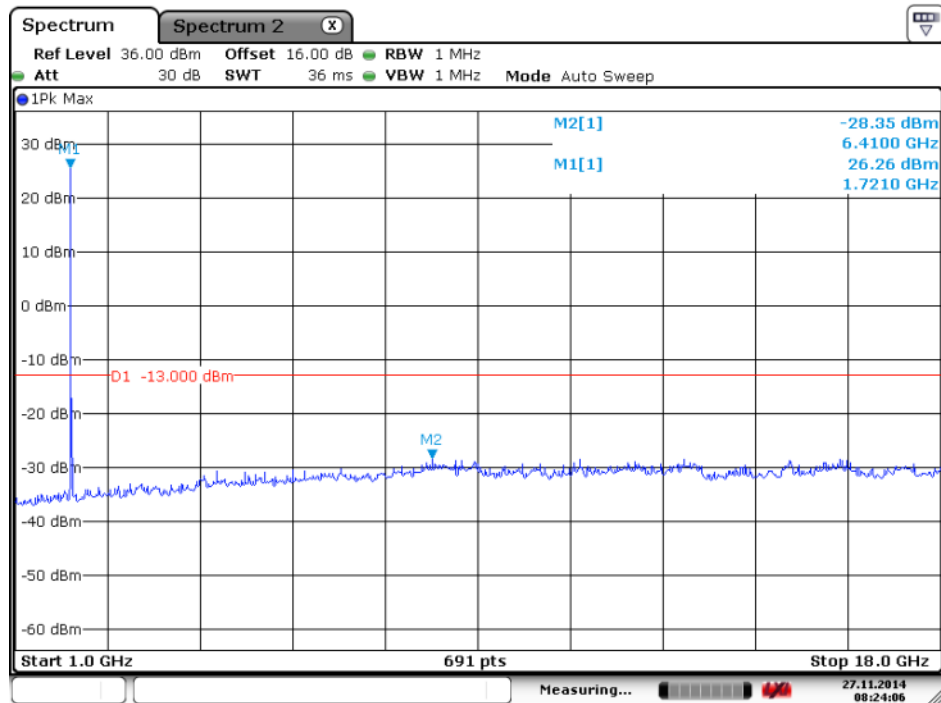


Band	LTE Band 4	Channel	Ch 20175(Middle)
Bandwidth	10MHz	Modulation	QPSK



Date: 27.NOV.2014 08:27:02

QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

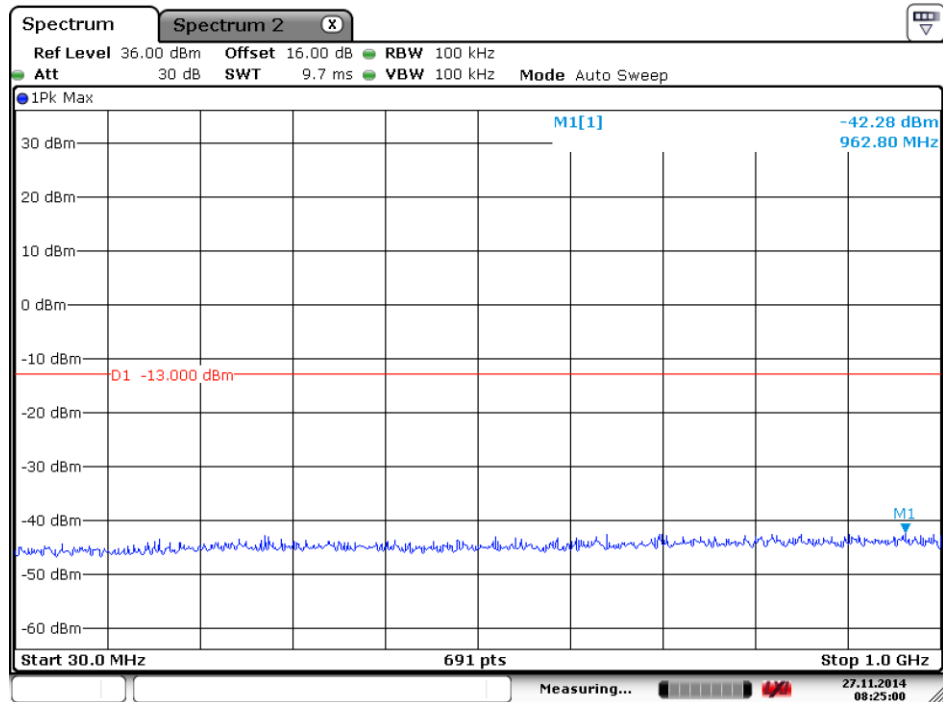


Date: 27.NOV.2014 08:24:06

QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

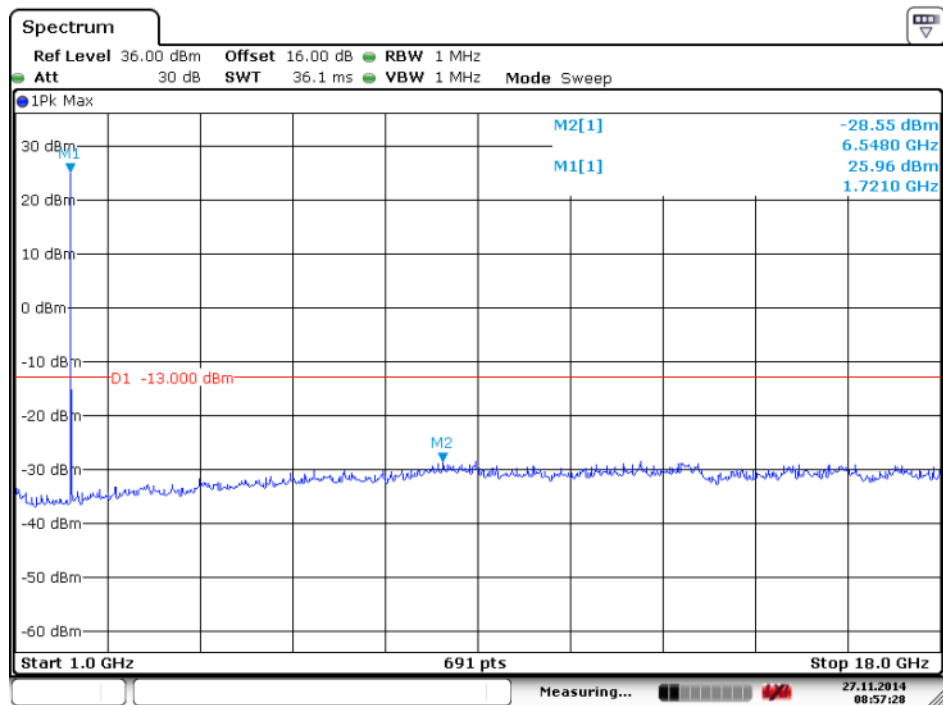


Band	LTE Band 4	Channel	Ch 20350(High)
Bandwidth	10MHz	Modulation	QPSK



Date: 27.NOV.2014 08:25:00

QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

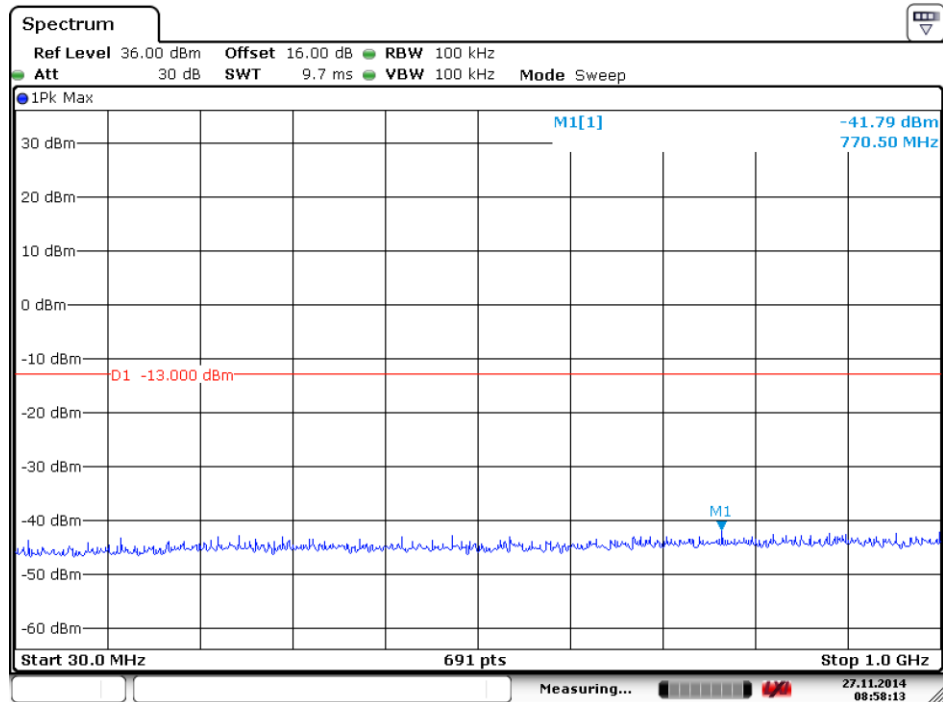


Date: 27.NOV.2014 08:57:28

QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

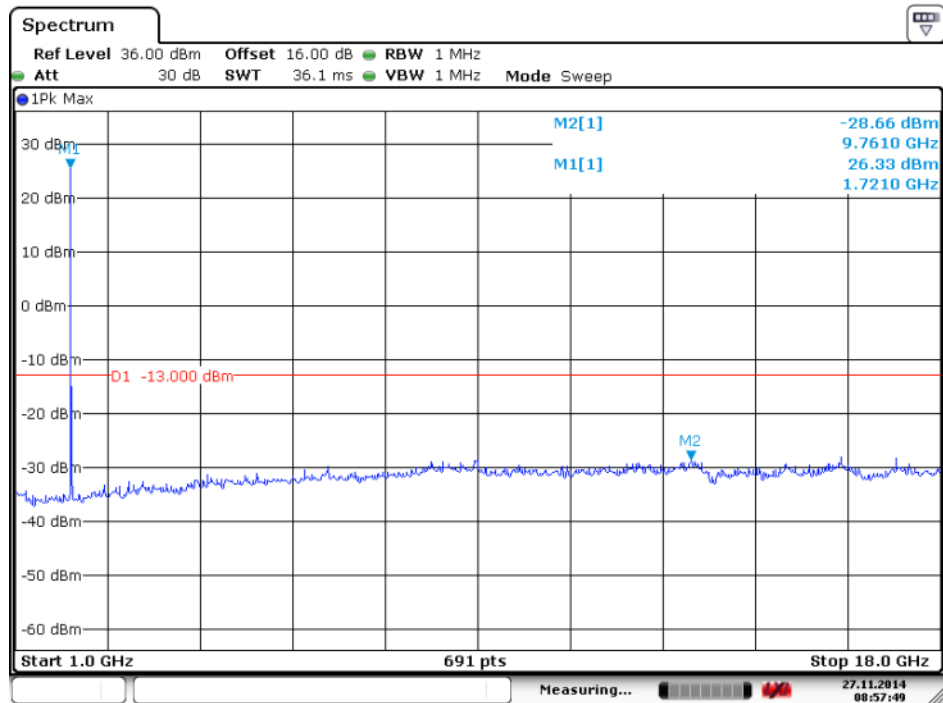


Band	LTE Band 4	Channel	Ch 20025(Low)
Bandwidth	15MHz	Modulation	QPSK



Date: 27.NOV.2014 08:58:13

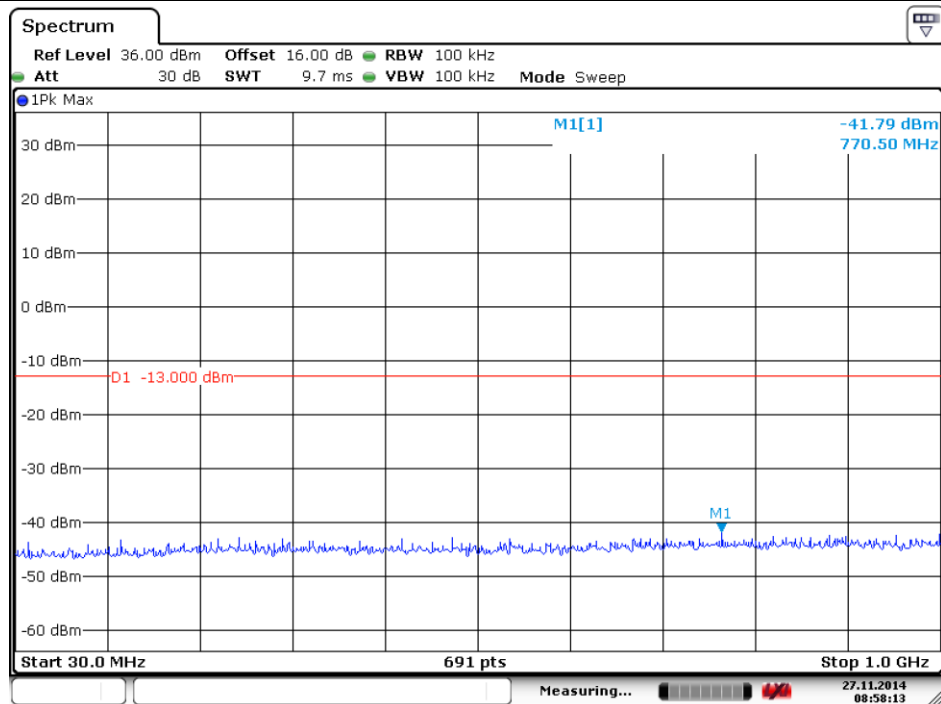
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



Date: 27.NOV.2014 08:57:49

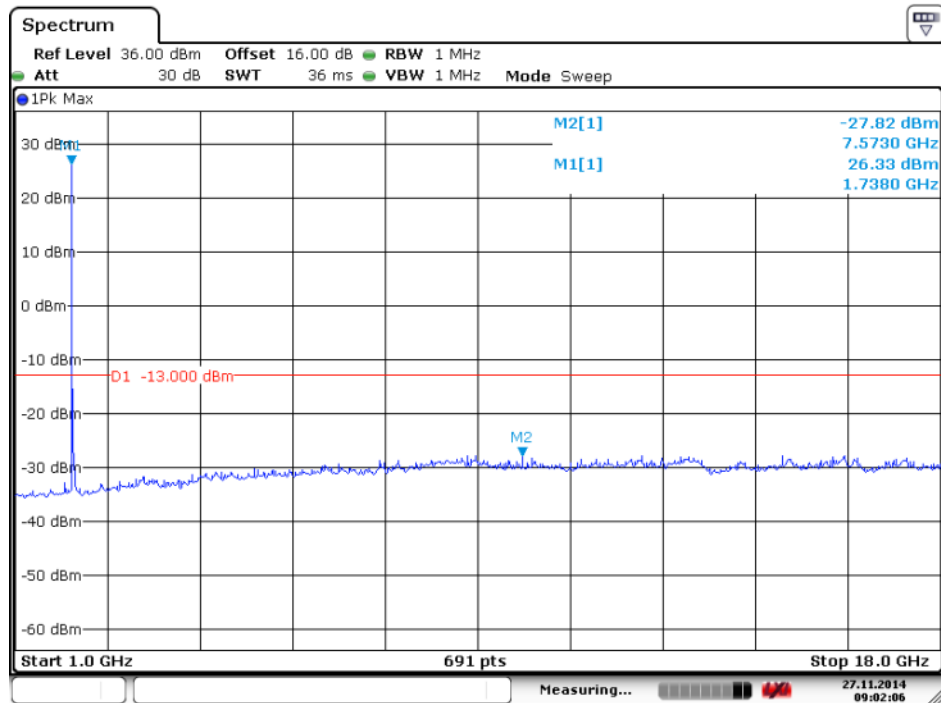
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 20175(Middle)
Bandwidth	15MHz	Modulation	QPSK



Date: 27.NOV.2014 08:58:13

QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

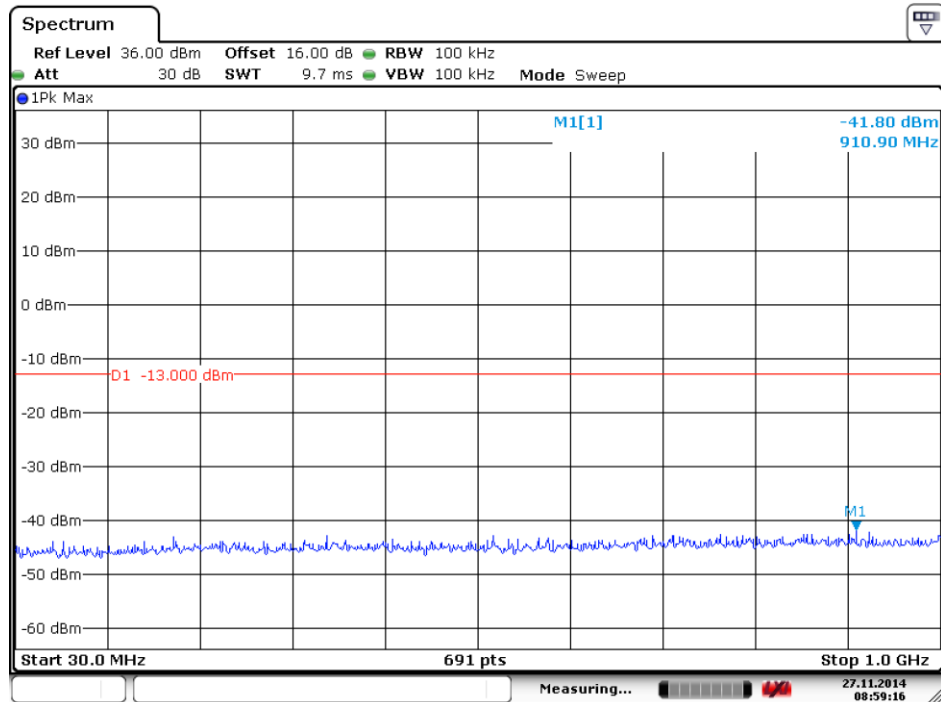


Date: 27.NOV.2014 09:02:07

QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

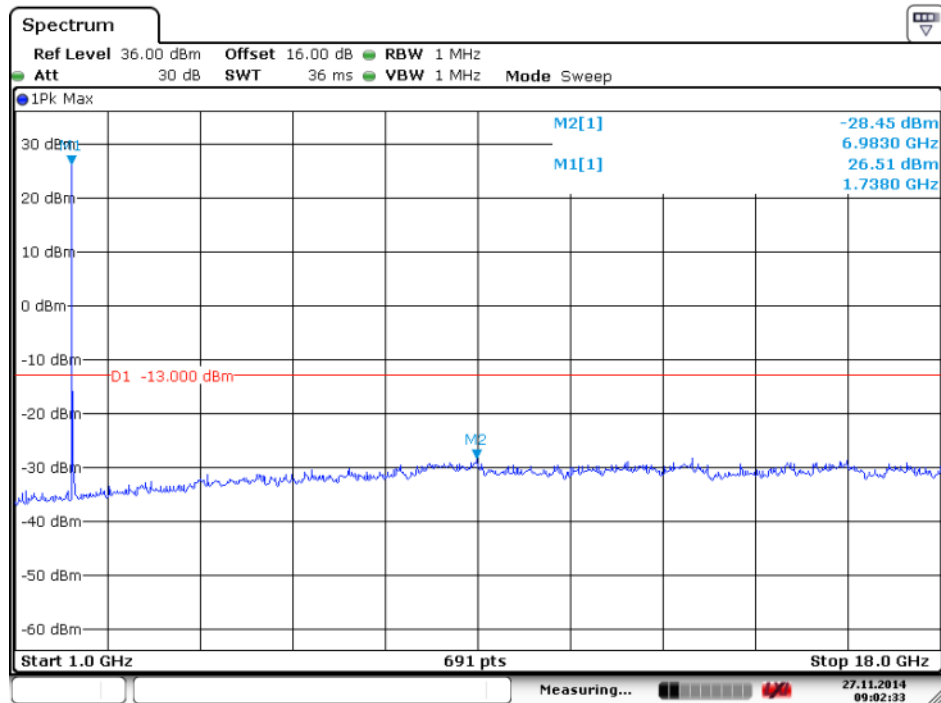


Band	LTE Band 4	Channel	Ch 20325(High)
Bandwidth	15MHz	Modulation	QPSK



Date: 27.NOV.2014 08:59:16

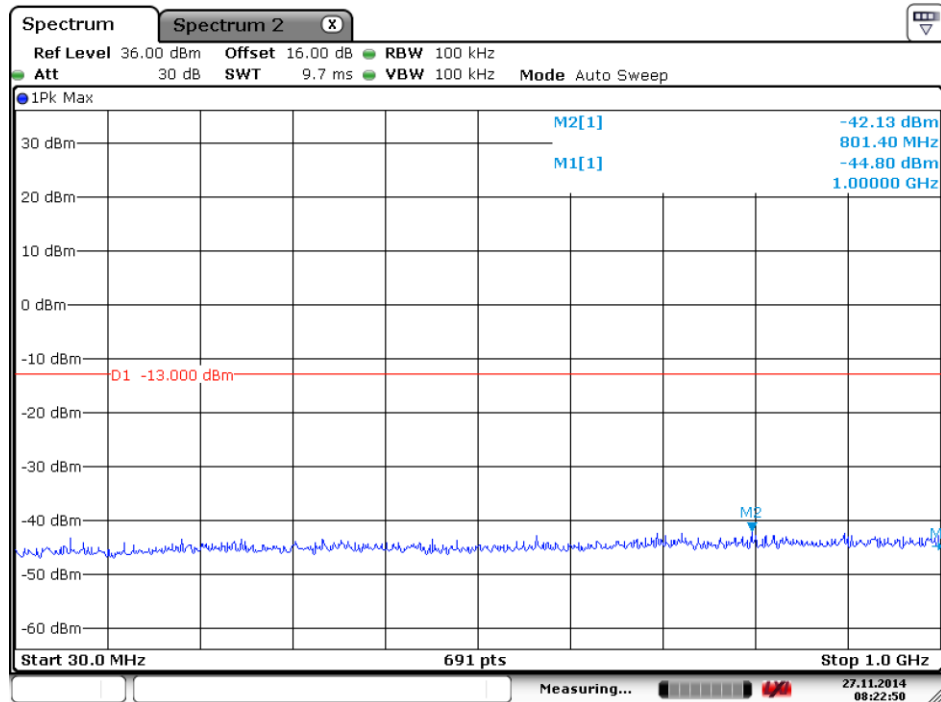
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



Date: 27.NOV.2014 09:02:33

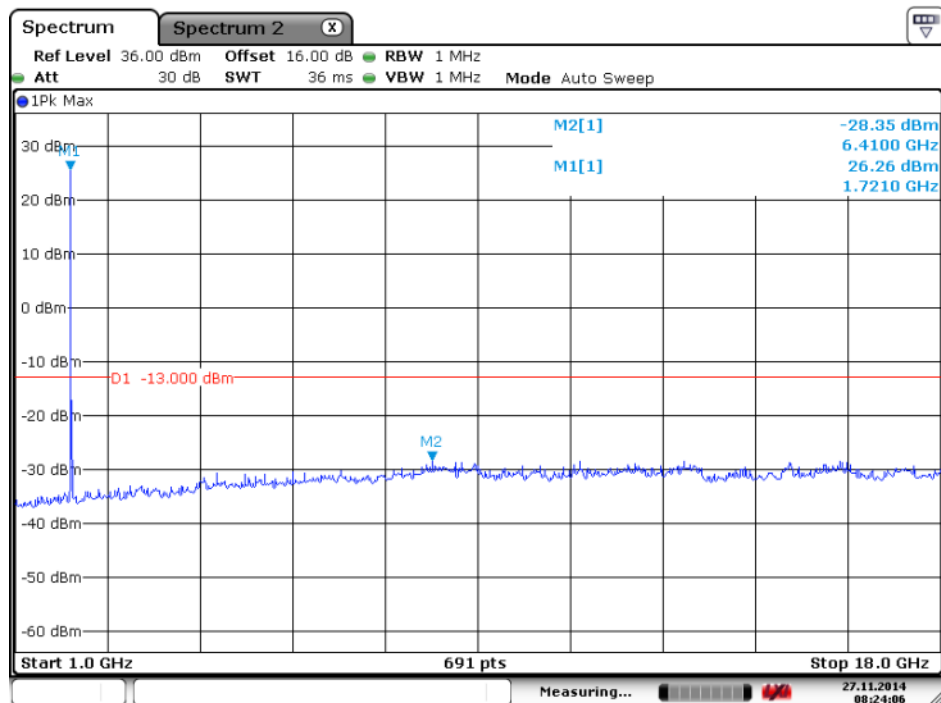
QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 4	Channel	Ch 20050(Low)
Bandwidth	20MHz	Modulation	QPSK



Date: 27.NOV.2014 08:22:50

QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

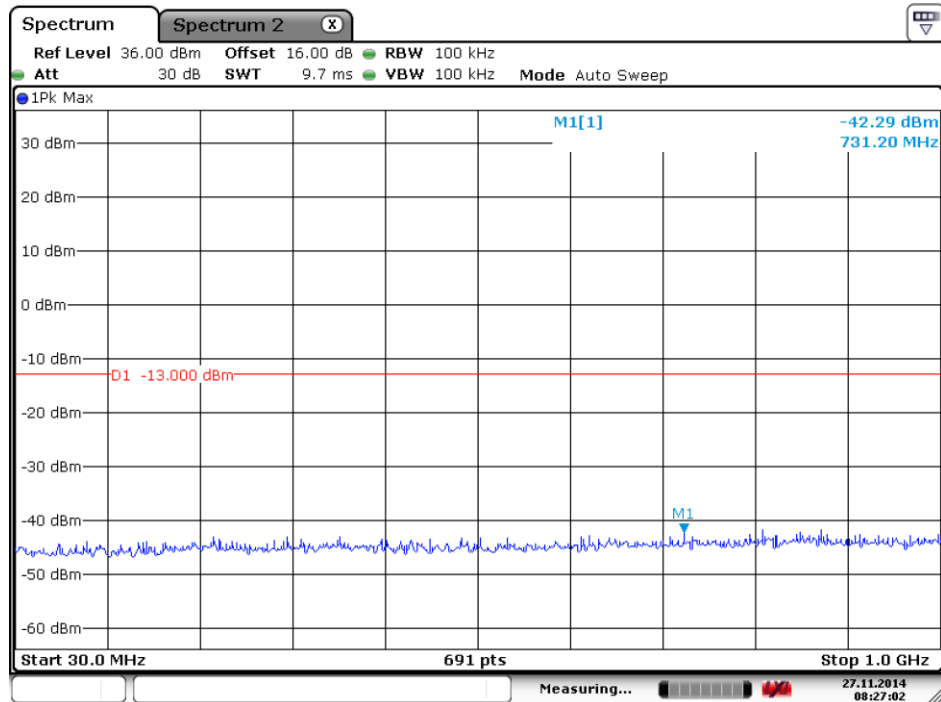


Date: 27.NOV.2014 08:24:06

QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

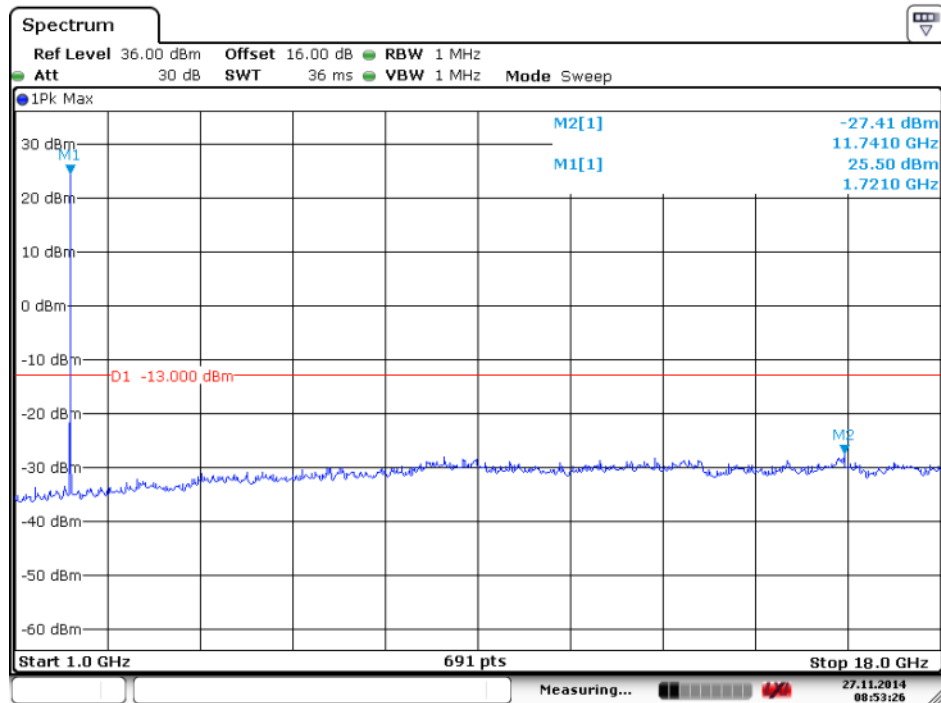


Band	LTE Band 4	Channel	Ch 20175(Middle)
Bandwidth	20MHz	Modulation	QPSK



Date: 27.NOV.2014 08:27:02

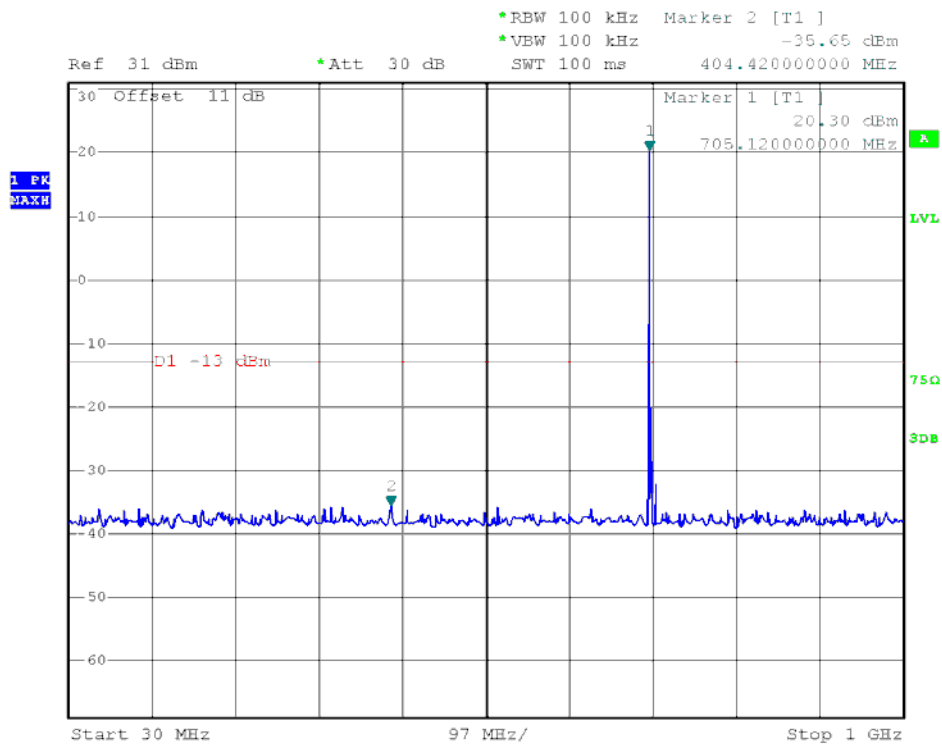
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



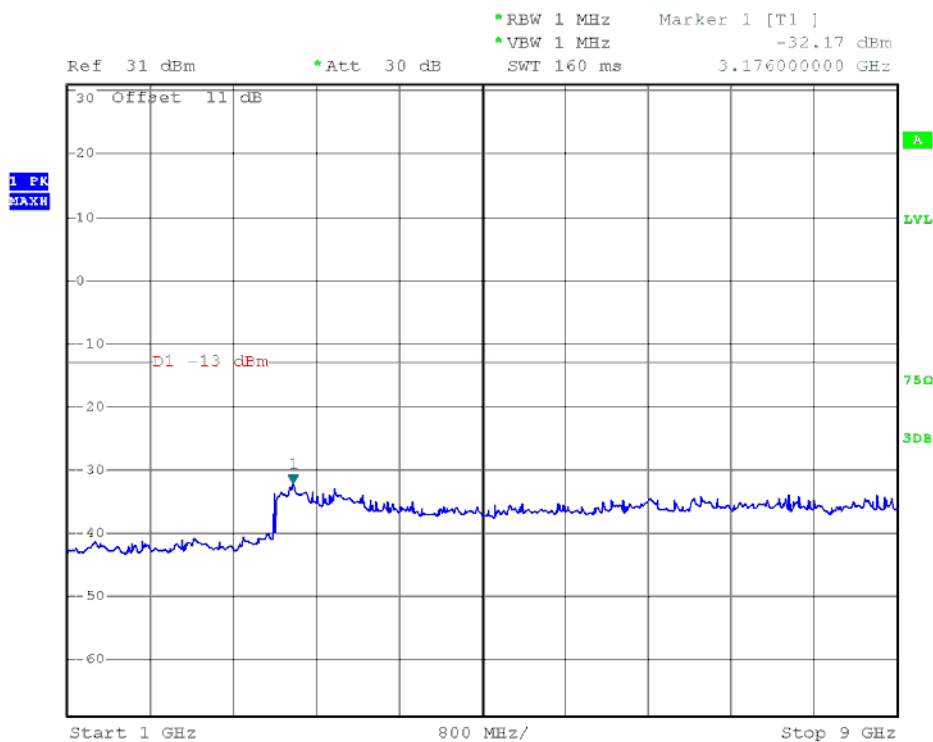
Date: 27.NOV.2014 08:53:27

QPSK, (RB Size 1, RB Offset 0 1GHz to 18GHz)

Band	LTE Band 17	Channel	Ch 23755(Low)
Bandwidth	5MHz	Modulation	QPSK

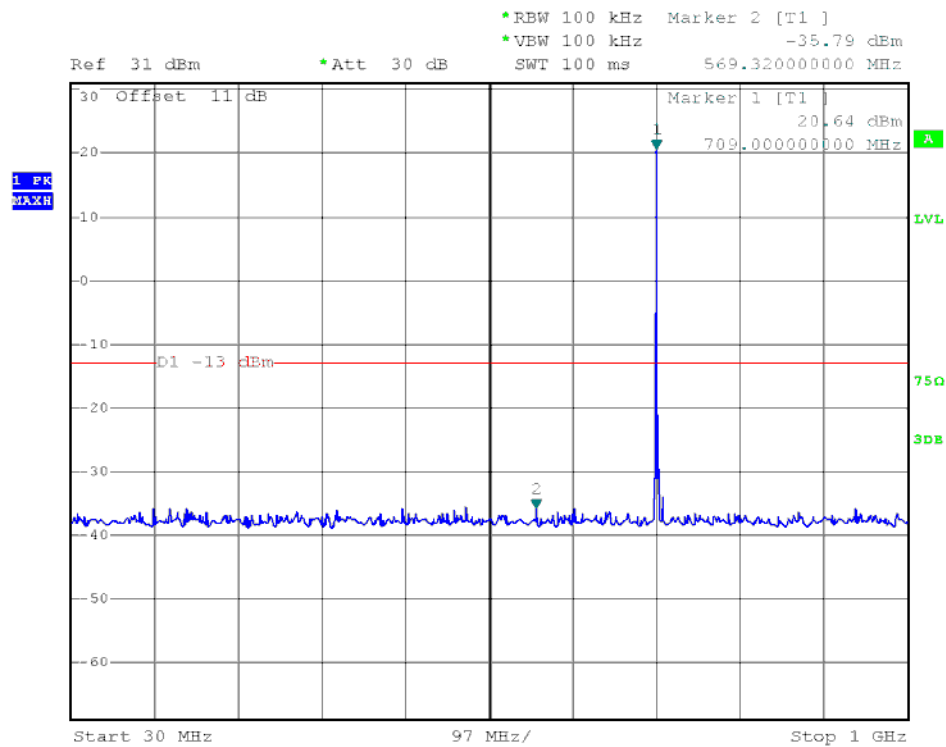


QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

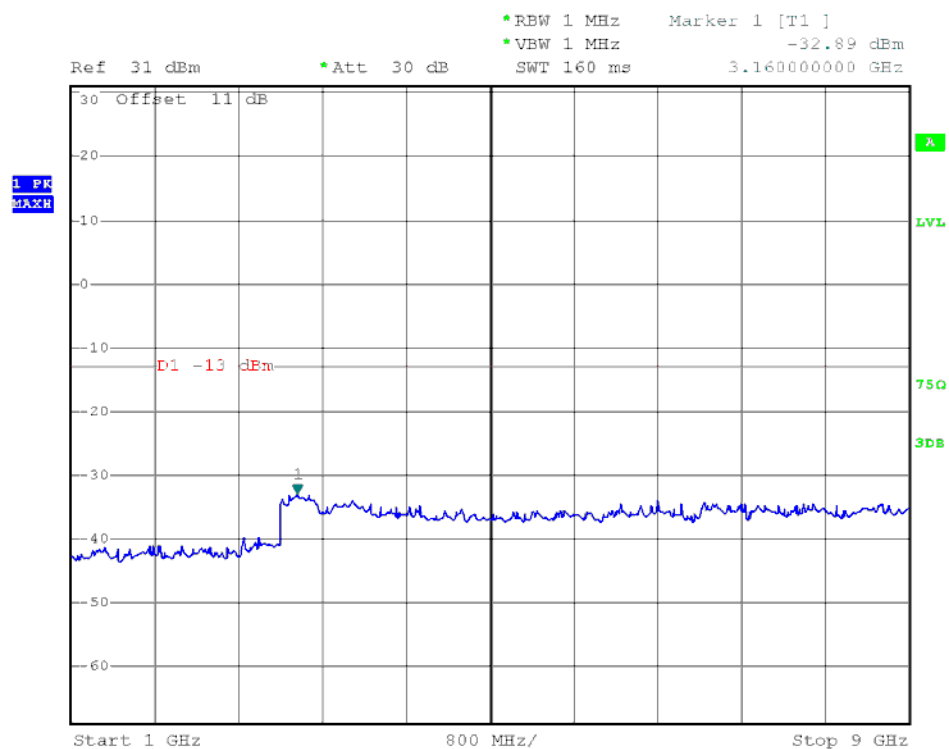


QPSK, (RB Size 1, RB Offset 0 1GHz to 8GHz)

Band	LTE Band 17	Channel:	Ch 23790(Middle)
Bandwidth	5MHz	Modulation	QPSK

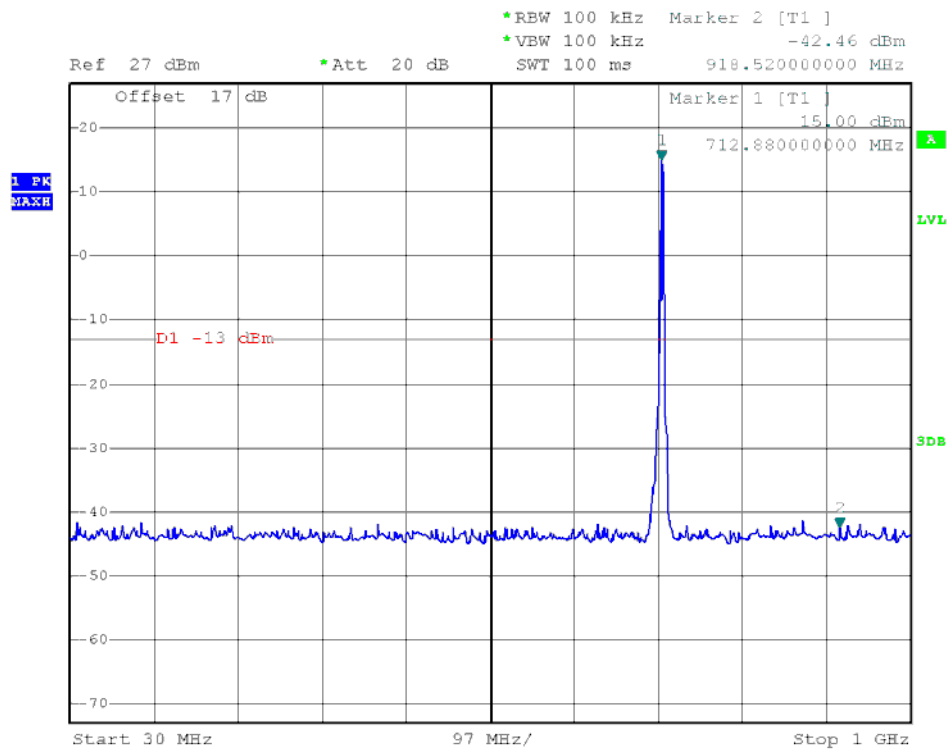


QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

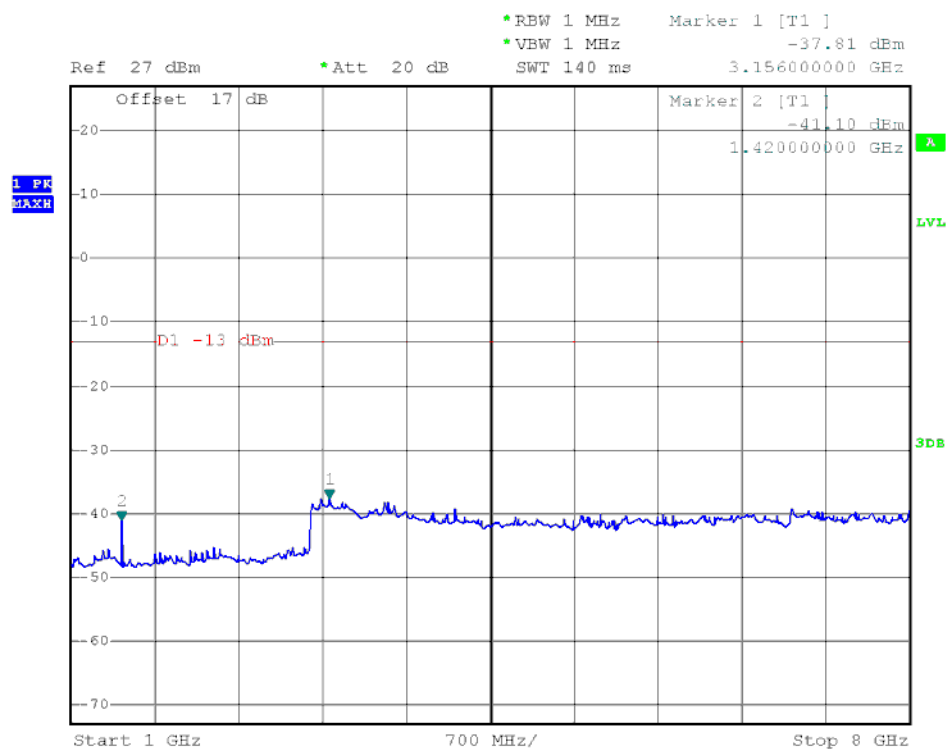


QPSK, (RB Size 1, RB Offset 0 1GHz to 8GHz)

Band	LTE Band 17	Channel:	Ch 23825(High)
Bandwidth	5MHz	Modulation	QPSK

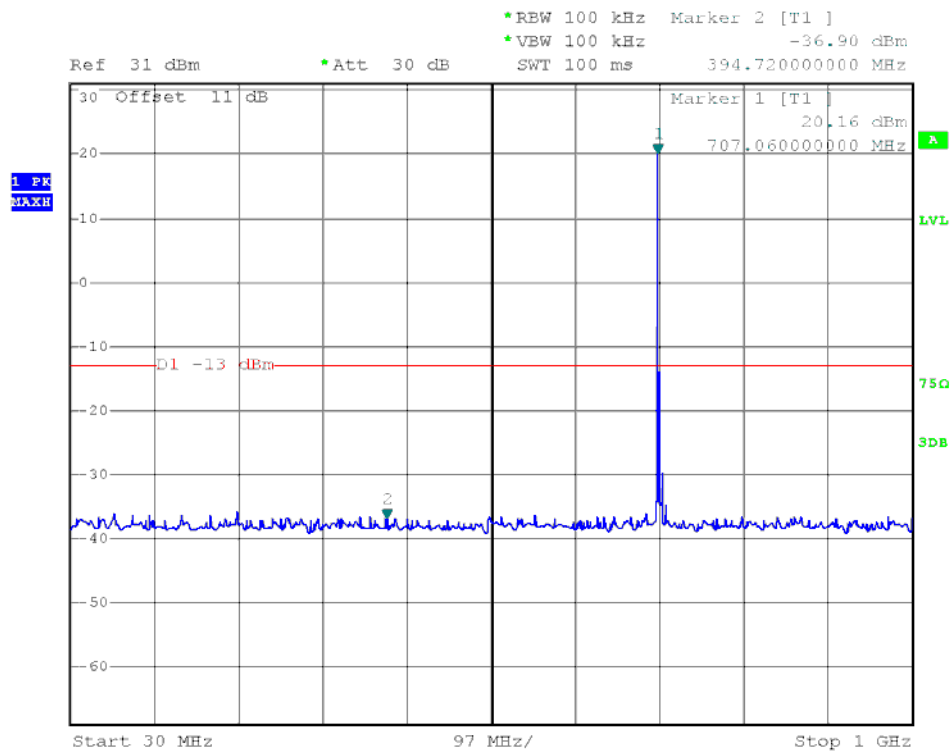


QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)

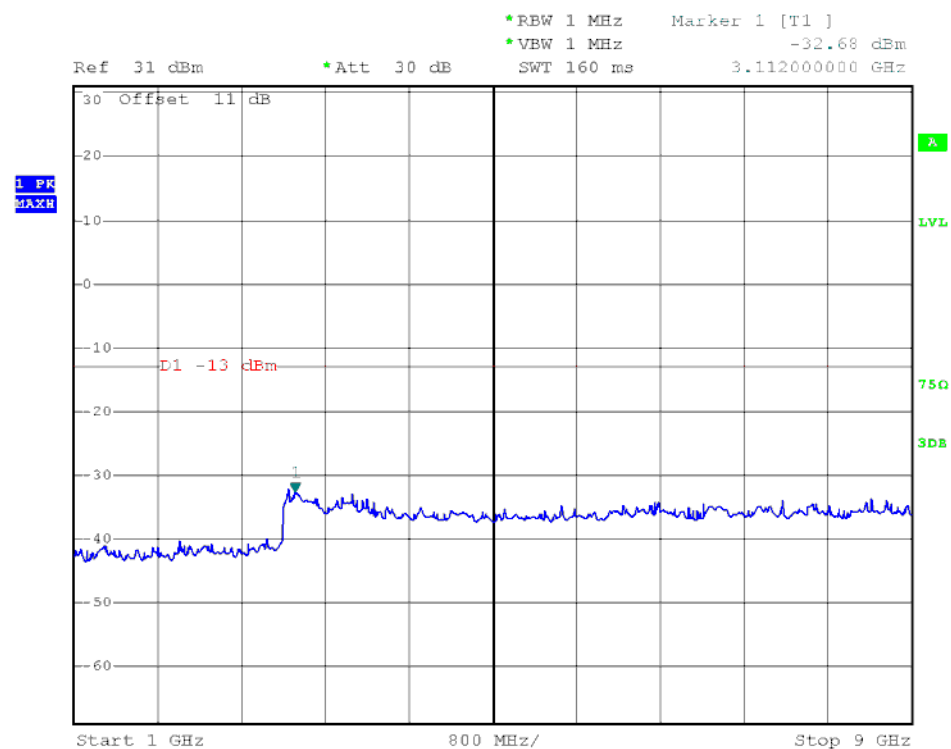


QPSK, (RB Size 1, RB Offset 0 1GHz to 8GHz)

Band	LTE Band 17	Channel:	Ch 23780(Low)
Bandwidth	10MHz	Modulation	QPSK



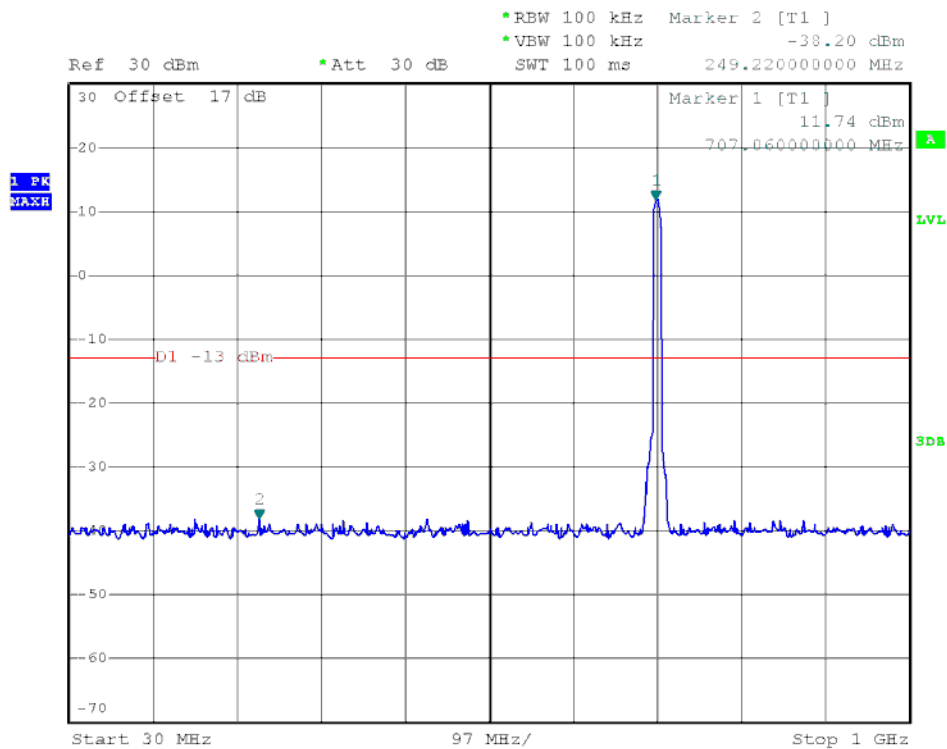
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



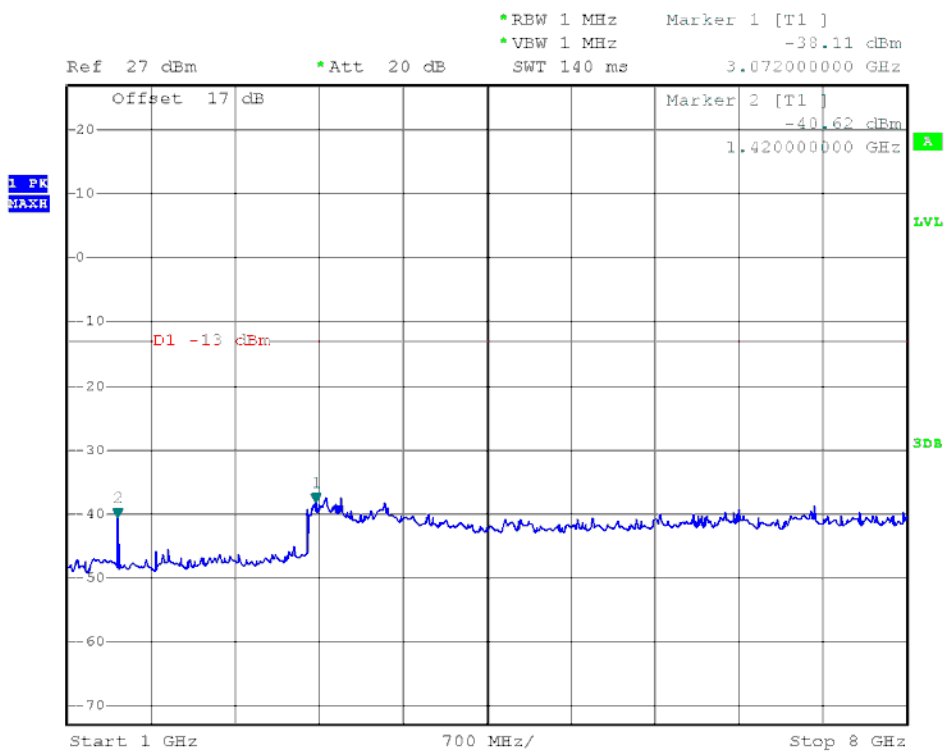
QPSK, (RB Size 1, RB Offset 0 1GHz to 8GHz)



Band	LTE Band 17	Channel	Ch 23790(Middle)
Bandwidth	10MHz	Modulation	QPSK



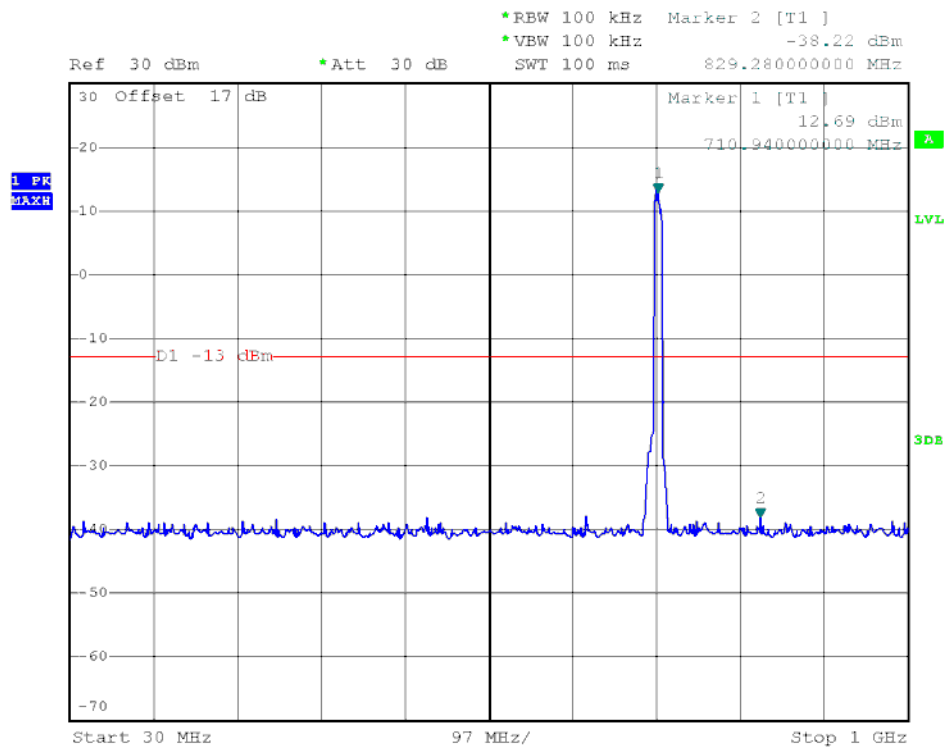
QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



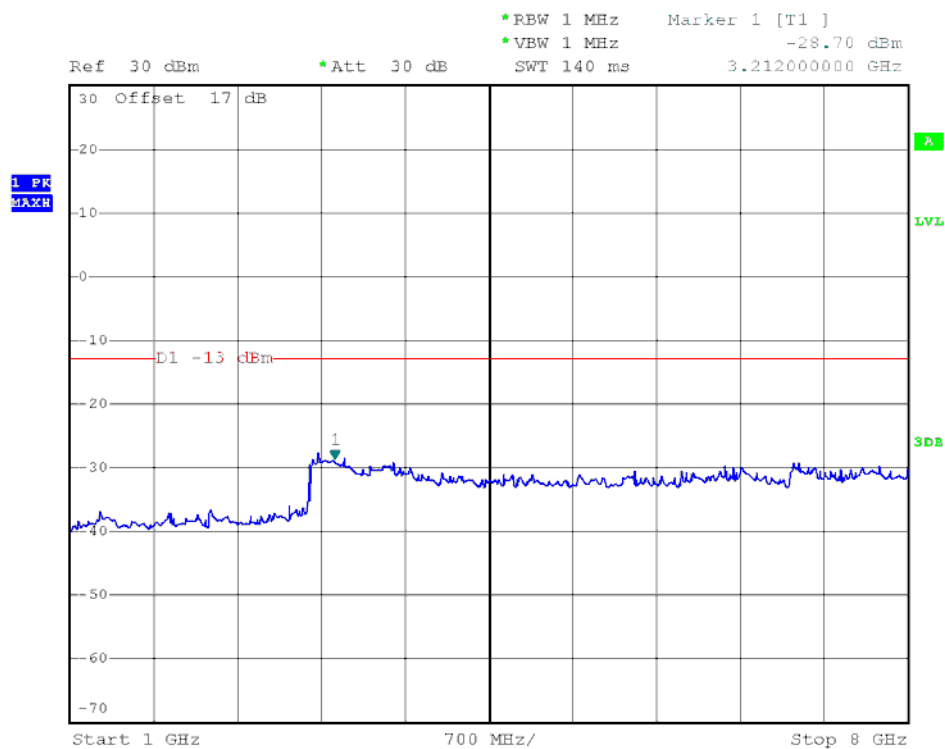
QPSK, (RB Size 1, RB Offset 0 1GHz to 8GHz)



Band	LTE Band 17	Channel	Ch 23800(Low)
Bandwidth	10MHz	Modulation	QPSK



QPSK, (RB Size 1, RB Offset 0 30MHz to 1GHz)



QPSK, (RB Size 1, RB Offset 0 1GHz to 8GHz)

2.6 Conducted Band Edge

2.6.1 Requirement

27.53(g) for Band 17

For operations in the 698 -746 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

27.53(h) for Band 4

For operations in the 1710 – 1755 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

2.6.2 Test Description

See section 2.1.2 of this report.

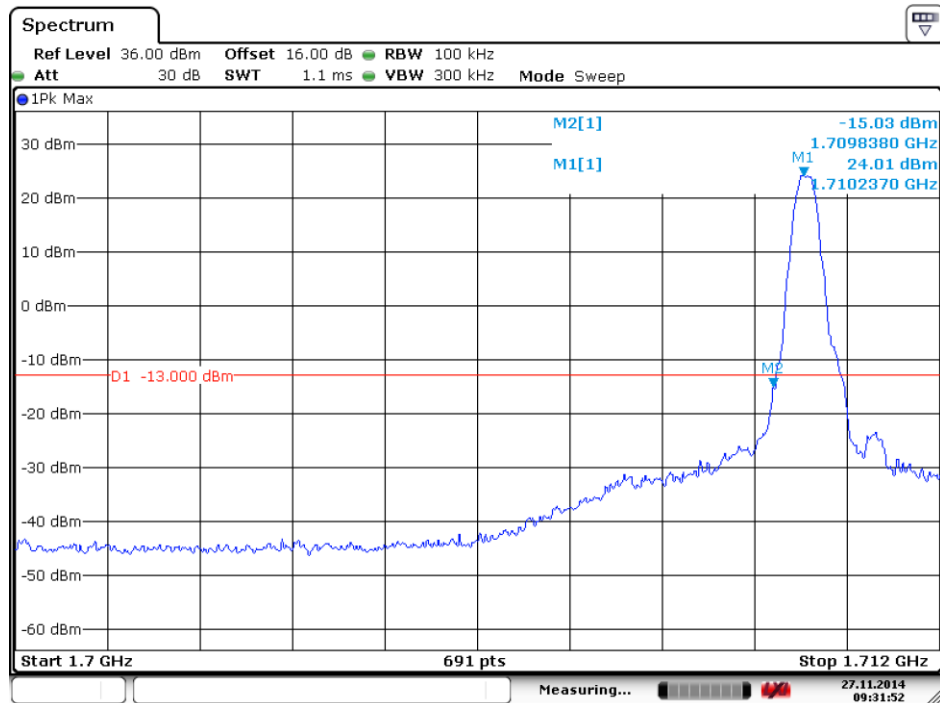
2.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW $\geq 1\%$ EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from $43 + 10\log(P)\text{dB}$ below the transmitter power $P(\text{Watts})$
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

2.6.4 Test Result of Conducted Band Edge

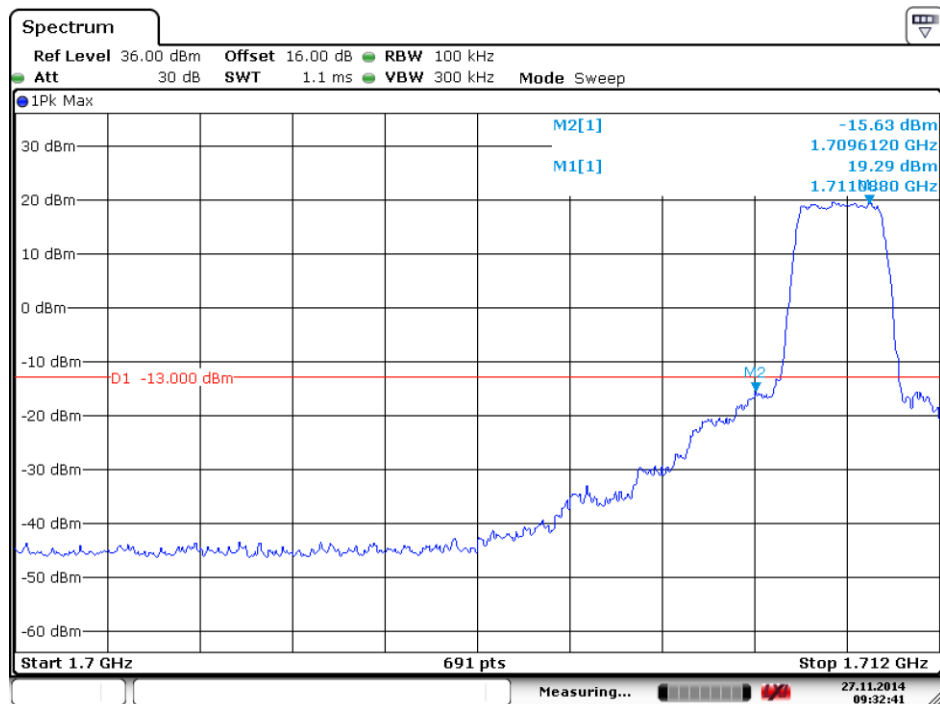
The lowest and highest channels are tested to verify the band edge emissions.

Band	LTE Band 4	Modulation	QPSK
Bandwidth	1.4MHz		



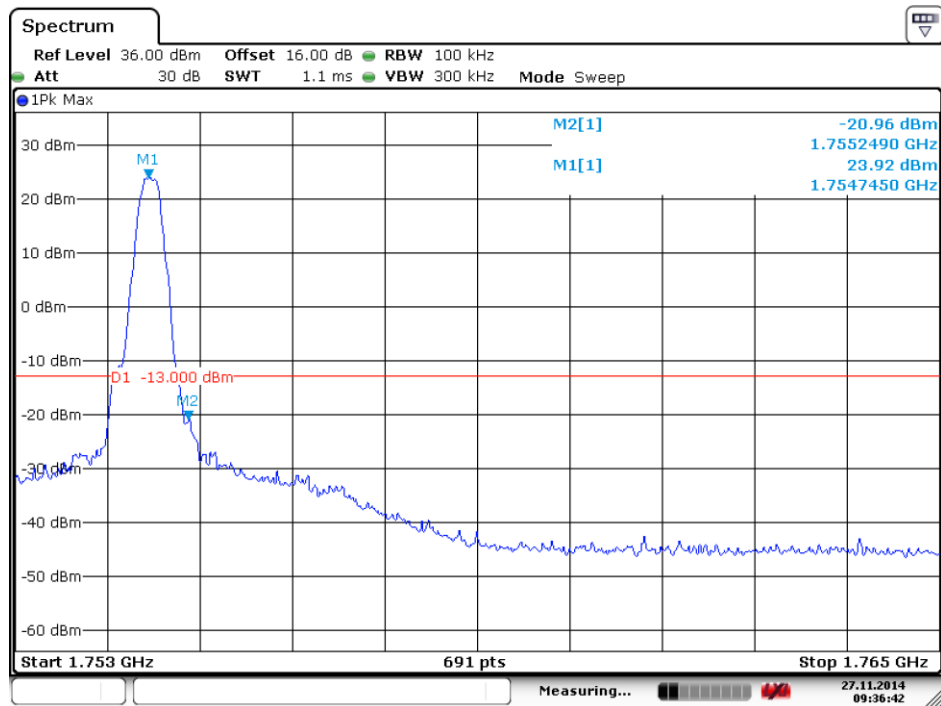
Date: 27.NOV.2014 09:31:52

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



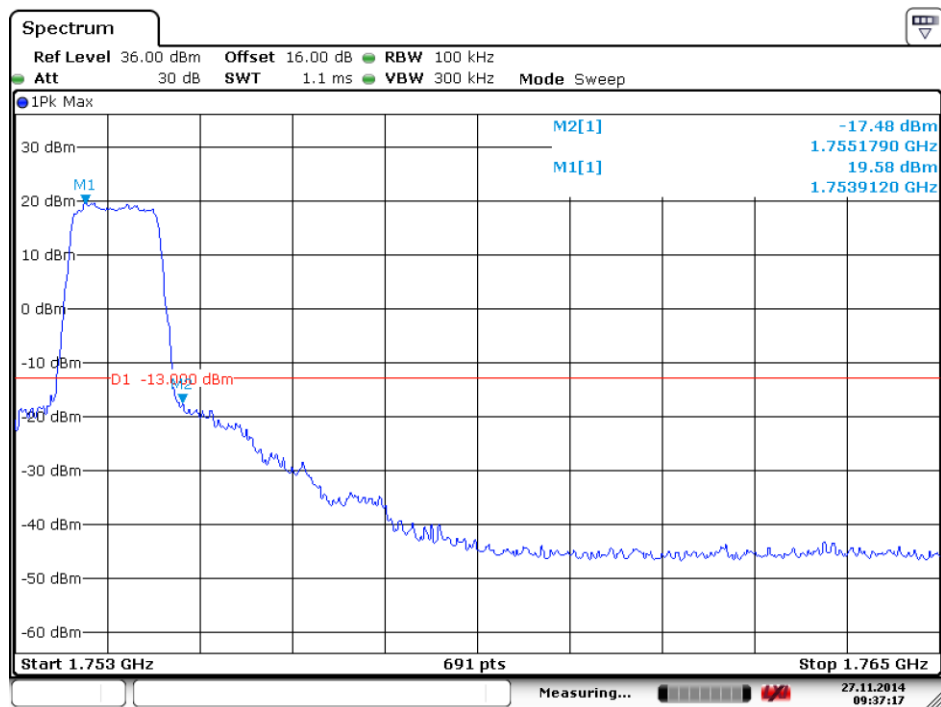
Date: 27.NOV.2014 09:32:41

Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0



Date: 27.NOV.2014 09:36:42

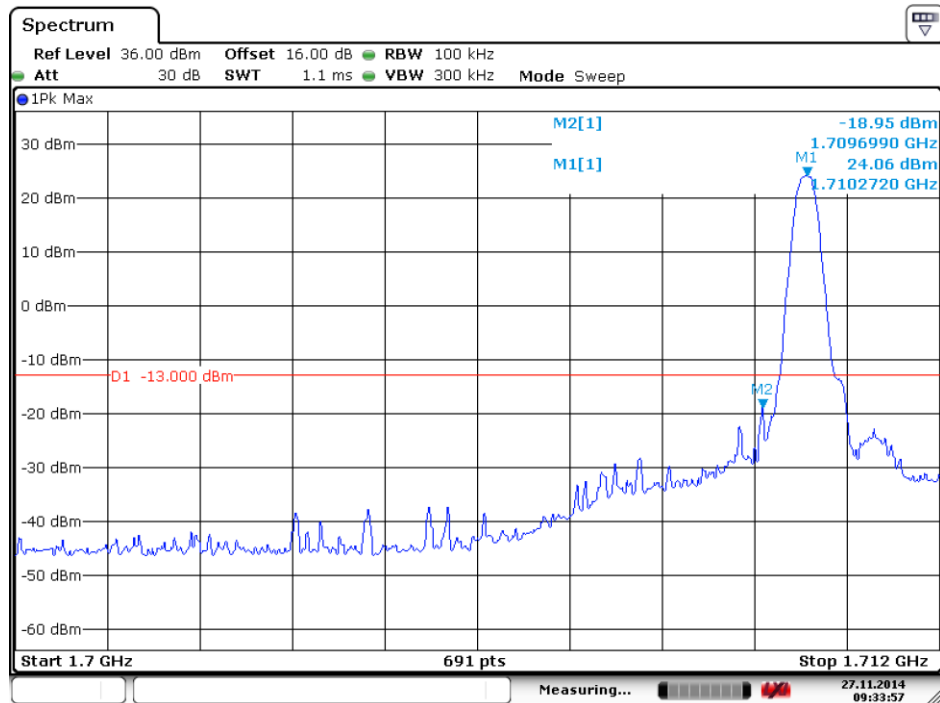
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5



Date: 27.NOV.2014 09:37:16

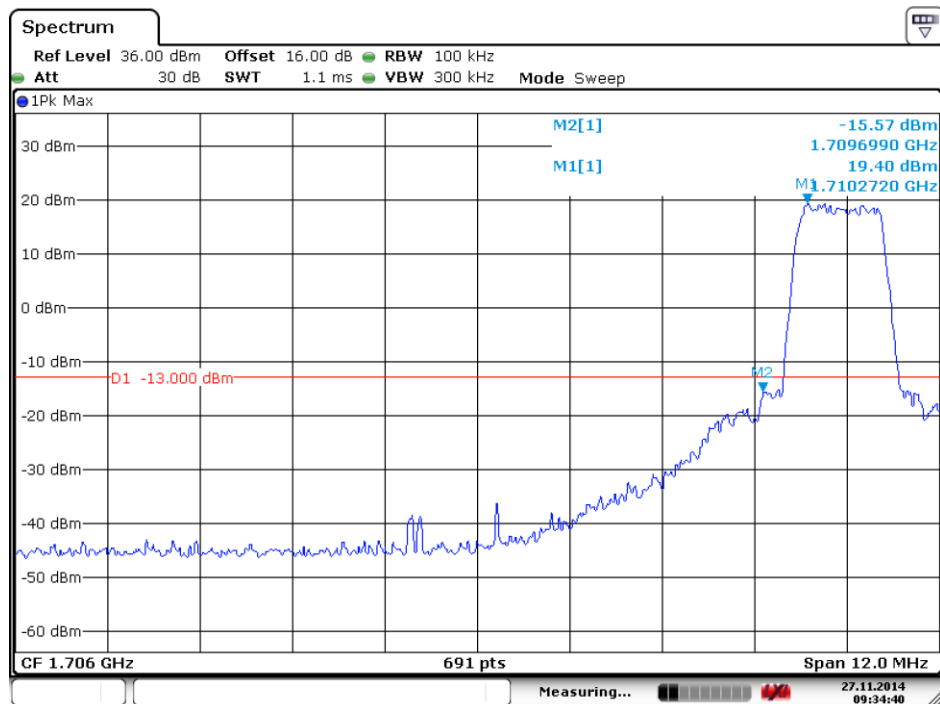
Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0

Band	LTE Band 4	Modulation	16QAM
Bandwidth	1.4MHz		



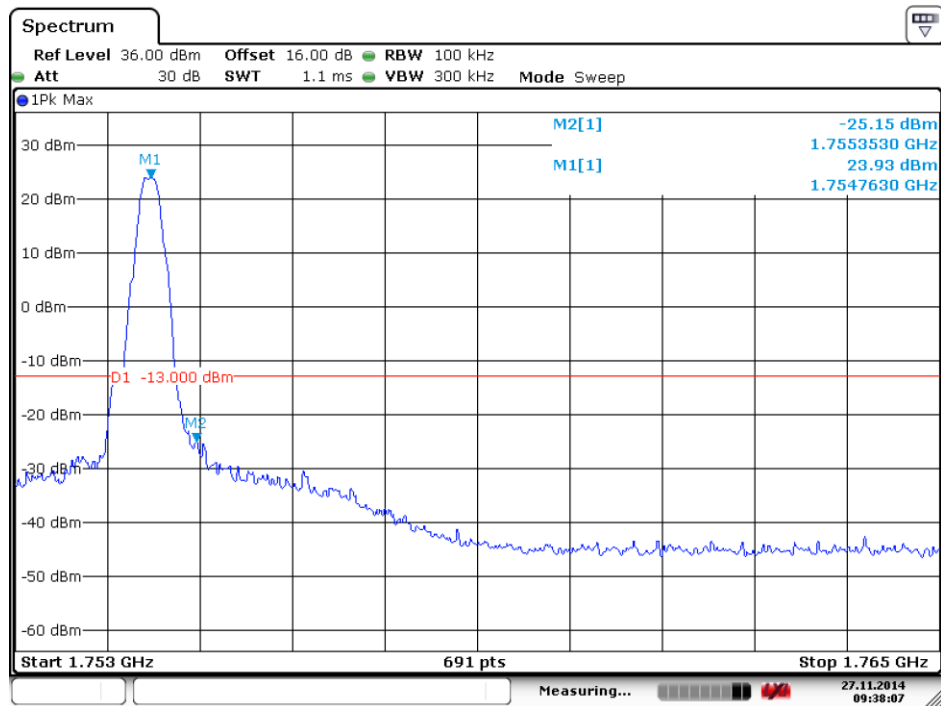
Date: 27.NOV.2014 09:33:57

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



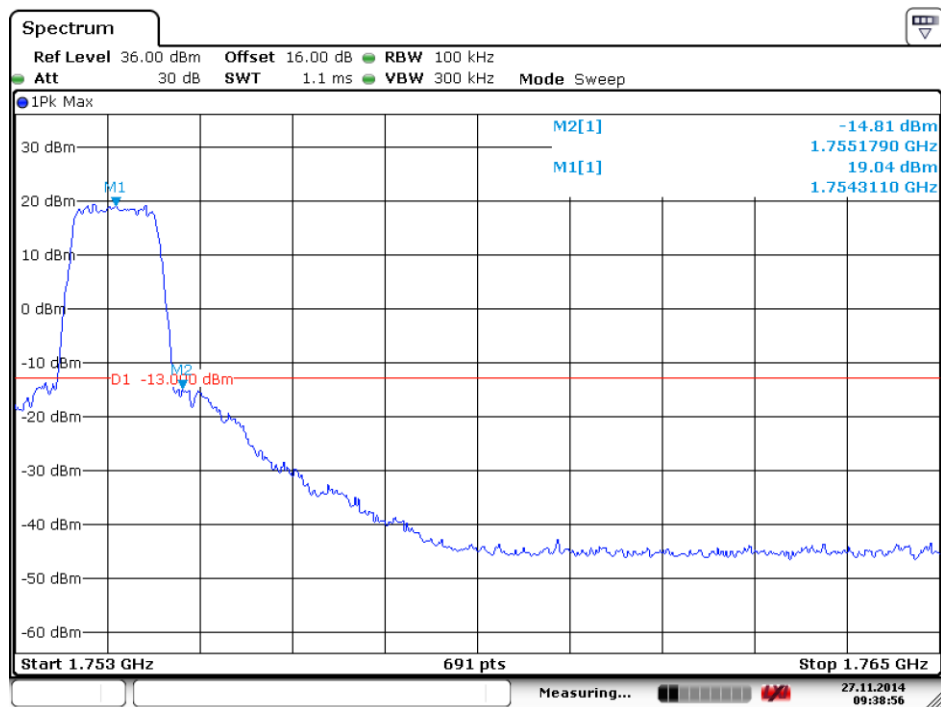
Date: 27.NOV.2014 09:34:41

Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0



Date: 27.NOV.2014 09:38:08

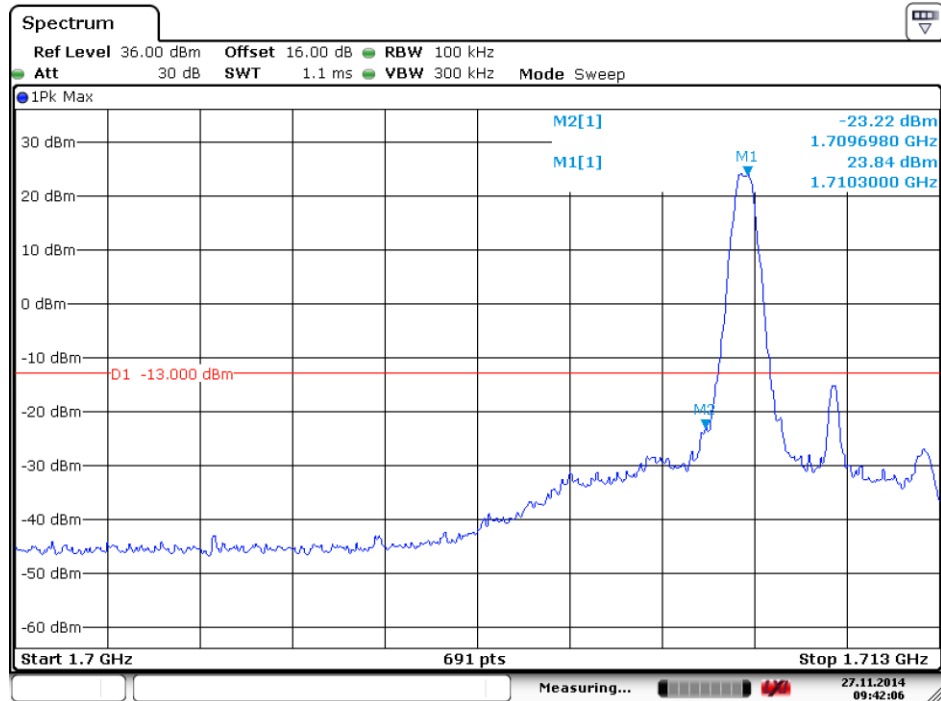
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5



Date: 27.NOV.2014 09:38:56

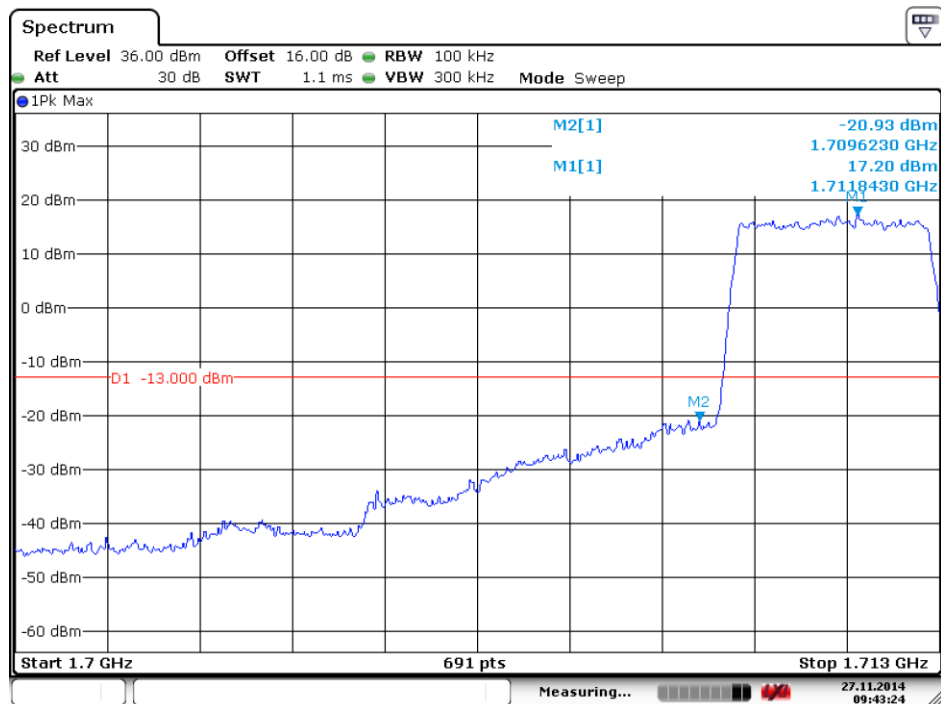
Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0

Band	LTE Band 4	Modulation	QPSK
Bandwidth	3MHz		



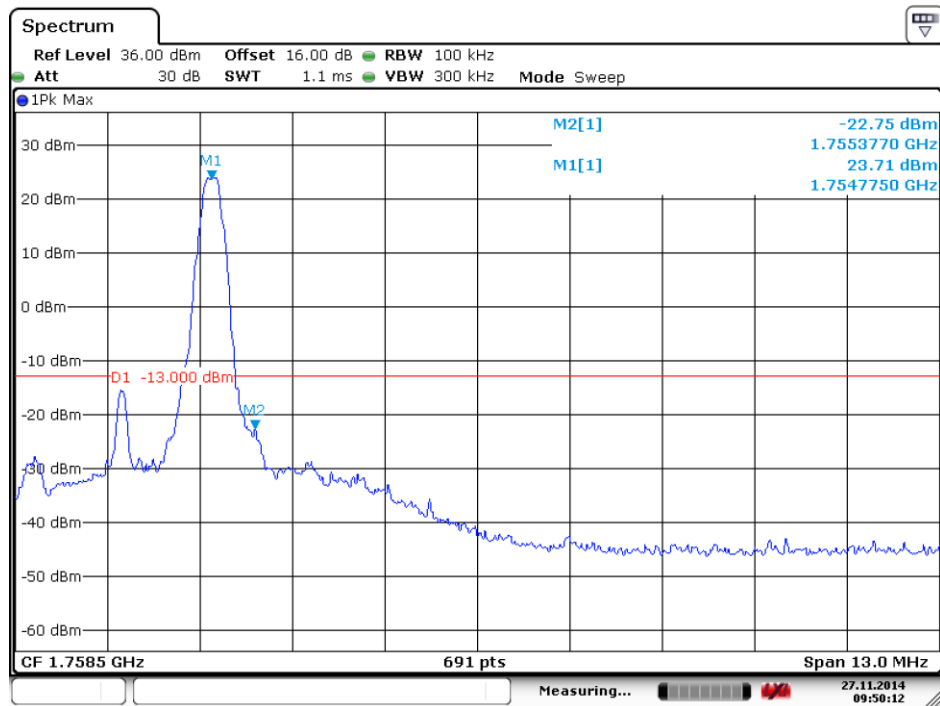
Date: 27.NOV.2014 09:42:06

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



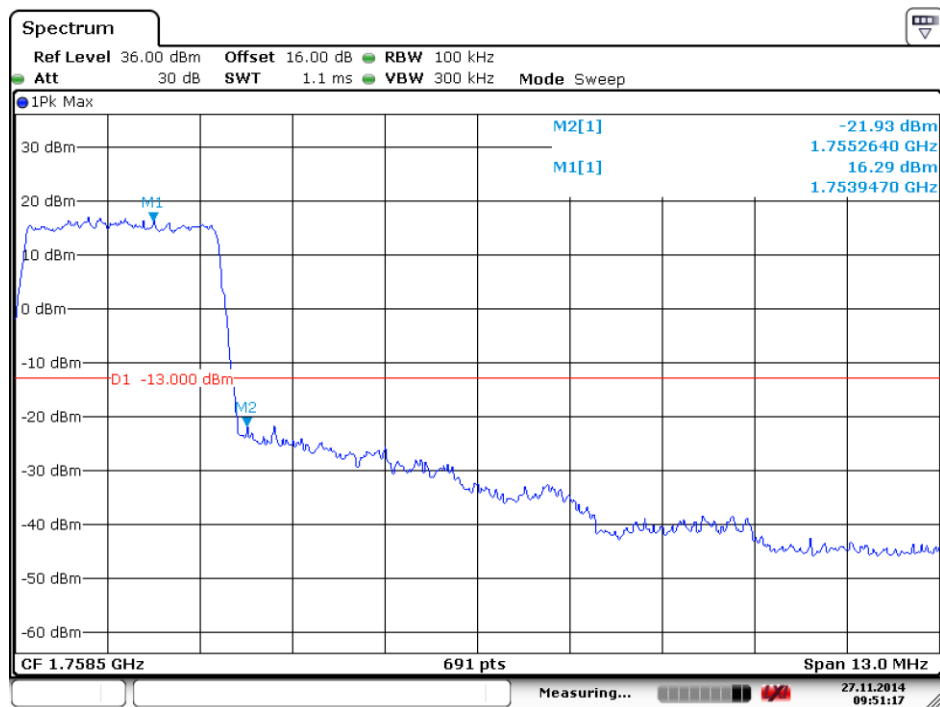
Date: 27.NOV.2014 09:43:24

Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0



Date: 27.NOV.2014 09:50:12

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14



Date: 27.NOV.2014 09:51:17

Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0