



**FCC TEST REPORT and IC TEST REPORT
(Class II Permissive Change)**

For

LE920-NAG

Model: LE920-NAG

Trade Name: LE920

Issued to

**Telit Communications S.P.A.
Via Stazione di Prosecco 5/B
34010 Sgonico, Trieste - Italy**

Issued by

**Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
<http://www.ccsrf.com>
service@ccsrf.com**

Issued Date: December 11, 2013



Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document.



Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	July 26, 2013	Initial Issue	ALL	Kelly Cheng
01	December 11, 2013	See the following Note Rev. (01)	ALL	Kelly Cheng

Rev. (01):

- 1. Modify the antenna gain to evaluate maximum antenna gain*
- 2. Other information, please refer to the T130708W02 and this test report.*



TABLE OF CONTENTS

1.	TEST RESULT CERTIFICATION	4
2.	EUT DESCRIPTION	7
3.	TEST METHODOLOGY	8
3.1	DESCRIPTION OF TEST TYPE	8
4.	INSTRUMENT CALIBRATION	9
4.1	MEASURING INSTRUMENT CALIBRATION	9
4.2	MEASUREMENT EQUIPMENT USED.....	9
4.3	MEASUREMENT UNCERTAINTY	10
5.	FACILITIES AND ACCREDITATIONS	11
5.1	FACILITIES.....	11
5.2	EQUIPMENT.....	11
5.3	TABLE OF ACCREDITATIONS AND LISTINGS.....	12
6.	SETUP OF EQUIPMENT UNDER TEST	13
6.1	SETUP CONFIGURATION OF EUT	13
6.2	SUPPORT EQUIPMENT	13
7.	TEST PROCEDURE AND RESULT	14
7.1	OUTPUT POWER MEASUREMENT.....	14
7.2	FREQUENCY STABILITY MEASUREMENT.....	16
7.3	OCCUPIED BANDWIDTH MEASUREMENT	19
7.4	BAND EDGE MEASUREMENT	38
7.5	CONDUCTED SPURIOUS EMISSIONS.....	45
7.6	RADIATED EMISSION MEASUREMENT	63
	APPENDIX II PHOTOGRAPHS OF TEST SETUP	95



1. TEST RESULT CERTIFICATION

Applicant: Telit Communications S.P.A.
Via Stazione di Prosecco 5/B
34010 Sgonico, Trieste - ItalyN

Manufacturer: Telit Communications S.P.A.
Via Stazione di Prosecco 5/B
34010 Sgonico, Trieste - ItalyN

Equipment Under Test: LE920-NAG

Trade Name: LE920

Model: LE920-NAG

Date of Test: July 18 ~December 8, 2013



FCC PART 27, SUBPART C, L, FCC PART 2	
OPERATING BAND: 704~716 MHz	
Standard	TEST TYPE AND LIMIT
2.1046 27.50(C)(10) & RSS-130 Issue 1 October 2013 4.4	Maximum Peak Output Power Limit: max. 3 watts e.r.p peak power
2.1055 27.54 & RSS-130 Issue 1 October 2013 4.3	Frequency Stability
2.1049 27.53(g)	Occupied Bandwidth
27.50(d)(5) & RSS-130 Issue 1 October 2013 4.4	Peak to average ratio
27.53(g)	Band Edge Measurements
2.1051 27.53(g) & RSS-130 Issue 1 October 2013 4.6	Conducted Spurious Emissions
2.1053 27.53(g)	Radiated Spurious Emissions

OPERATING BAND: 1710~1755 MHz	
Standard	TEST TYPE AND LIMIT
2.1046 27.50(d)(4) & RSS-139 Issue 2 February 2009 6.4	Maximum Peak Output Power Limit: max. 1 watts e.i.r.p peak power max. 5 watts for Band 17
2.1055 27.54 & RSS-139 Issue 2 February 2009 6.3	Frequency Stability
2.1049 27.53(h) & RSS-139 Issue 2 February 2009 2.3	Occupied Bandwidth
27.50(d)(5) & RSS-139 Issue 2 February 2009 6.4	Peak to average ratio
27.53(h)	Band Edge Measurements
2.1051 27.53(h) & RSS-139 Issue 2 February 2009 6.5	Conducted Spurious Emissions
2.1053 27.53(h) & RSS-139 Issue 2 February 2009 6.5 6.6	Radiated Spurious Emissions

Note: 1. The test result judgment is decided by the limit of test standard
 2. The information of measurement uncertainty is available upon the customer's request.



Deviation from Applicable Standard
None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by

Reviewed by

Miller Lee
Section Manager
Compliance Certification Services Inc.

Angel Cheng
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	LE920-NAG	
Model Number	LE920-NAG	
Model Discrepancy	N/A	
Trade	LE920	
Received Date	December 04, 2013	
Power Source	DC 3.8V powered from Host device.	
Modulation Technology	LTE Band 17	QPSK, 16QAM
	LTE Band 4	QPSK, 16QAM
Frequency Range	LTE Band 17 Channel Bandwidth: 5MHz	706.5MHz ~ 713.5MHz
	LTE Band 17 Channel Bandwidth: 10MHz	709MHz ~ 711MHz
	LTE Band 4 Channel Bandwidth: 5MHz	1712.5MHz ~1752.5MHz
	LTE Band 4 Channel Bandwidth: 10MHz	1715.0MHz ~1750.0MHz
	LTE Band 4 Channel Bandwidth: 20MHz	1710MHz ~1755MHz
Maximum ERP Power	LTE Band 17 Channel Bandwidth: 5MHz	QPSK: 24.95dBm 16QAM: 24.23dBm
	LTE Band 17 Channel Bandwidth: 10MHz	QPSK : 24.29dBm 16QAM: 24.89dBm
Maximum EIRP Power	LTE Band 4 Channel Bandwidth: 5MHz	QPSK: 24.05dBm 16QAM: 24.17dBm
	LTE Band 4 Channel Bandwidth: 10MHz	QPSK: 21.92dBm 16QAM: 23.30dBm
	LTE Band 4 Channel Bandwidth: 20MHz	QPSK: 23.17dBm 16QAM: 23.29dBm
Category	LTE: 3	
Antenna Specification	Antenna gain including cable loss must not exceed 5dBi in the LTE Band 4 and 11.92dBi in the LTE Band 17 for satisfying the requirement of 2.1043 and 2.1091.	
Class II Permissive Change	Modify the antenna gain to evaluate maximum antenna gain	

Note: 1. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



3. TEST METHODOLOGY

3.1 DESCRIPTION OF TEST TYPE

The EUT (model: LE920-NAG) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

LTE Band 17: 704MHz ~ 716MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	5MHz		10MHz	
	Channel	Frequency(MHz)	Channel	Frequency(MHz)
Low channel (L)	23755	706.5	23780	709.0
Middle channel (M)	23790	710.0	23790	710.0
High channel (H)	23825	713.5	23800	711.0

LTE Band 4: 1710MHz ~ 1755MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	5MHz		10MHz		20MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low channel (L)	19975	1712.5	20000	1715.0	20050	1720.00
Middle channel (M)	20175	1732.5	20175	1732.5	20175	1732.50
High channel (H)	20375	1752.5	20350	1750.0	20300	1745.00



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	03/20/2014
Power Meter	Anritsu	ML2495A	1012009	06/04/2014
Power Sensor	Anritsu	MA2411A	0917072	06/04/2014

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510268	11/05/2014
EMI Test Receiver	R&S	ESCI	100064	02/17/2014
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/12/2014
Bilog Antenna	Sunol Sciences	JB3	A030105	02/17/2014
Bilog Antenna	Sunol Sciences	JB3	A030205	10/01/2014
Horn Antenna	EMCO	3117	00055165	02/17/2014
Horn Antenna	EMCO	3117	00055167	01/28/2014
Horn Antenna	EMCO	3116	26370	01/07/2014
Loop Antenna	EMCO	6502	8905/2356	06/12/2014
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/22/2013
Test S/W	EZ-EMC (CCS-3A1RE)			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.




Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Radio Communication Analyzer (Remote)	Anritsu	MT8820C	6200938900	N/A	N/A	N/A

Remark:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*



7. TEST PROCEDURE AND RESULT

7.1 OUTPUT POWER MEASUREMENT

LIMITS

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 698–746 MHz band are limited to 3 watts ERP

Operating in the Frequency Bands 698-756 MHz shall not exceed 5 watts for portable equipment or for indoor fixed subscriber equipment

TEST PROCEDURES

EIRP / ERP MEASUREMENT:

1. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 10MHz for LTE.
2. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
3. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G d. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$
4. $E.R.P = E.I.R.P - 2.15 \text{ dB}$

CONDUCTED POWER MEASUREMENT:

1. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
2. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



Calculation of maximum antenna gain

700MHz frequency band				RF Output Power		Calculations to meet ERP limits		
LTE, Band 17				Max peak tune up power		ERP limit	Antenna Gain to meet	
BAND	MODE	Channel	Frequency	[dBm]	[W]	[W]	Numerical	[dBi]
			[MHz]					
LTE,Band 17	5M	23755	706.5	25	0.31623	3	15.558	11.92
		23790	710	25	0.31623	3	15.558	11.92
		23825	713.5	25	0.31623	3	15.558	11.92
	10M	23780	709	25	0.31623	3	15.558	11.92
		23790	710	25	0.31623	3	15.558	11.92
		23800	711	25	0.31623	3	15.558	11.92

1700MHz frequency band				RF Output Power		Calculations to meet ERP limits		
LTE,Band 4				Max peak tune up power		EIRP limit	Antenna Gain to meet	
BAND	MODE	Channel	Frequency	[dBm]	[W]	[W]	Numerical	[dBi]
			[MHz]					
LTE,Band 4	5M	19975	1712.5	25	0.31623	1	3.162	5.00
		20175	1732.5	25	0.31623	1	3.162	5.00
		20375	1752.5	25	0.31623	1	3.162	5.00
	10M	20000	1715	25	0.31623	1	3.162	5.00
		20175	1732.5	25	0.31623	1	3.162	5.00
		20350	1750	25	0.31623	1	3.162	5.00
	20M	20050	1720	24.71	0.29580	1	3.381	5.29
		20175	1732.5	24.77	0.29992	1	3.334	5.23
		20300	1745	25	0.31623	1	3.162	5.00



7.2 FREQUENCY STABILITY MEASUREMENT

LIMIT

According to the FCC part 27.54 shall be tested the frequency stability. The rule is defined that” The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with the 1055(a)(1) $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$. According to the RSS-139 Issue 2 February 2009, The frequency stability shall be sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

According to the RSS-130 Issue 1 October 2013,, The frequency offset shall be measured according to the procedure described in RSS-Gen and recorded.

TEST PROCEDURE

1. Because of the measure the carrier frequency under the condition of the AFC lock, it shall be used the mobile station in the LTE link mode. This is accomplished with the use of the communication simulator station. The oven room could control the temperatures and humidity.
2. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.
3. Laptop pc is connected the external power supply to control the AC input power. The various Volts from the minimum 126.5 Volts to 93.5 Volts. Each step shall be record the frequency error rate.
4. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing.
5. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.



TEST RESULTS

FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT:

LTE Band 17

Reference Frequency: LTE Band 17 710 MHz @ 20°C						
Limit: ± 2.5 ppm = 1775Hz						
Power Supply Vdc	Environment Temperature (°C)	5M Frequency (Hz)	Delta (Hz)	10M Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.8	50	709999996	-19	709999999	8	1775
3.8	40	709999995	-20	709999997	6	
3.8	30	710000013	-2	709999999	8	
3.8	20	710000015	0	709999991	0	
3.8	10	709999990	-25	710000005	14	
3.8	0	709999992	-23	709999998	7	
3.8	-10	710000011	-4	709999996	5	
3.8	-20	709999984	-31	709999994	3	
3.8	-30	710000007	-8	709999989	-2	

LTE Band 4

Reference Frequency: LTE Band 4 1732.5 MHz @ 20°C								
Limit: ± 2.5 ppm = 4331Hz								
Power Supply Vdc	Environment Temperature (°C)	5M Frequency (Hz)	Delta (Hz)	10M Frequency (Hz)	Delta (Hz)	20M Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.8	50	173249982	-9	173249999	1	173249985	-42	4331
3.8	40	173249997	6	173249997	-1	173250029	2	
3.8	30	173249971	-20	173249999	1	173250019	-8	
3.8	20	173249991	0	173249998	0	173250027	0	
3.8	10	173250018	27	173249995	-3	173249983	-44	
3.8	0	173249966	-25	173249998	0	173250033	6	
3.8	-10	173250011	20	173249996	-2	173250006	-21	
3.8	-20	173249975	-16	173249994	-4	173250013	-14	
3.8	-30	173250007	16	173249989	-9	173250008	-19	



FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:

LTE Band 17

Reference Frequency: LTE Band 17 710 MHz @ 20°C						
Limit: ± 2.5 ppm = 1775Hz						
Power Supply Vdc	Environment Temperature (°C)	5M Frequency (Hz)	Delta (Hz)	10M Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.18	20	709999980	-35	709999999	8	1775
3.8		710000015	0	709999991	0	
3.23		709999977	-38	709999993	2	

LTE Band 4

Reference Frequency: LTE Band 4 1732.5 MHz @ 20°C								
Limit: ± 2.5 ppm = 4331Hz								
Power Supply Vdc	Environment Temperature (°C)	5M Frequency (Hz)	Delta (Hz)	10M Frequency (Hz)	Delta (Hz)	20M Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.18	20	173250018	27	173249999	1	173250000	-27	4331
3.8		173249991	0	173249998	0	173250027	0	
3.23		173250028	37	173249993	-5	173249941	-86	



7.3 OCCUPIED BANDWIDTH MEASUREMENT

LIMITS

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 power of a given emission.

TEST PROCEDURES

1. The EUT makes a phone call to the communication simulator. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels. (low, middle and high operational frequency range.)
2. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
3. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.



TEST RESULTS

LTE Band 17

CHANNEL BANDWIDTH: 5MHz / QPSK

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	706.5	4.5446
Mid	710.0	4.5160
High	713.5	4.5270

CHANNEL BANDWIDTH: 5MHz / 16QAM

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	706.5	4.5343
Mid	710.0	4.5226
High	713.5	4.5281

CHANNEL BANDWIDTH: 10MHz / QPSK

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	709.0	8.9491
Mid	710.0	8.9682
High	711.0	8.8945

CHANNEL BANDWIDTH: 10MHz / 16QAM

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	709.0	8.9374
Mid	710.0	8.9669
High	711.0	8.9140



LTE Band 4

CHANNEL BANDWIDTH: 5MHz / QPSK

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1712.5	4.5046
Mid	1732.5	4.5266
High	1752.5	4.5060

CHANNEL BANDWIDTH: 5MHz / 16QAM

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1712.5	4.5177
Mid	1732.5	4.5149
High	1752.5	4.5147

CHANNEL BANDWIDTH: 10MHz / QPSK

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1715.0	8.9651
Mid	1732.5	8.9750
High	1750.0	8.9427

CHANNEL BANDWIDTH: 10MHz / 16QAM

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	1715.0	8.9622
Mid	1732.5	8.9744
High	1750.0	8.9869



CHANNEL BANDWIDTH: 20MHz / QPSK

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	20050	17.8180
Mid	20170	17.8833
High	20300	17.8736

CHANNEL BANDWIDTH: 20MHz / 16QAM

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
Low	20050	17.8511
Mid	20170	17.9693
High	20300	17.8816



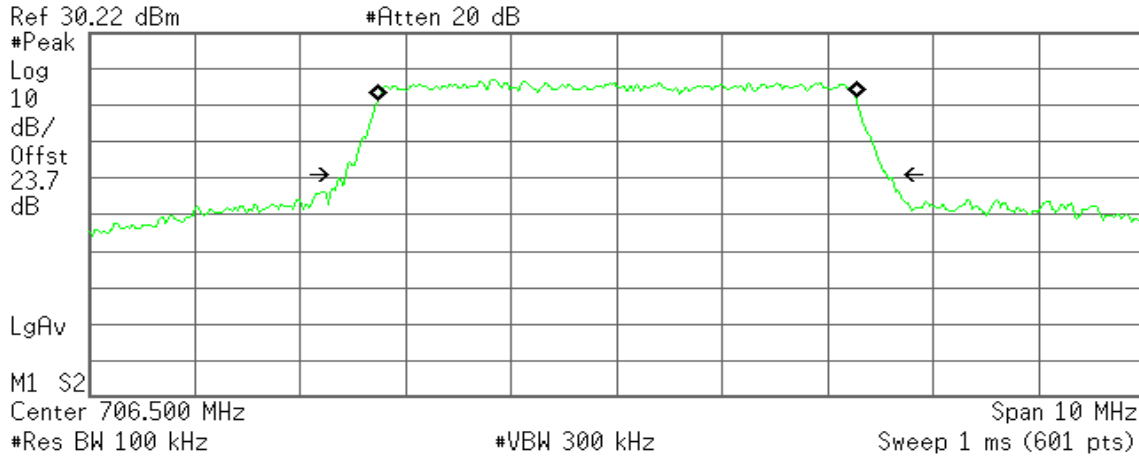
LTE Band 17

CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low

Agilent 19:53:19 Jul 18, 2013

R T



Occupied Bandwidth
4.5446 MHz

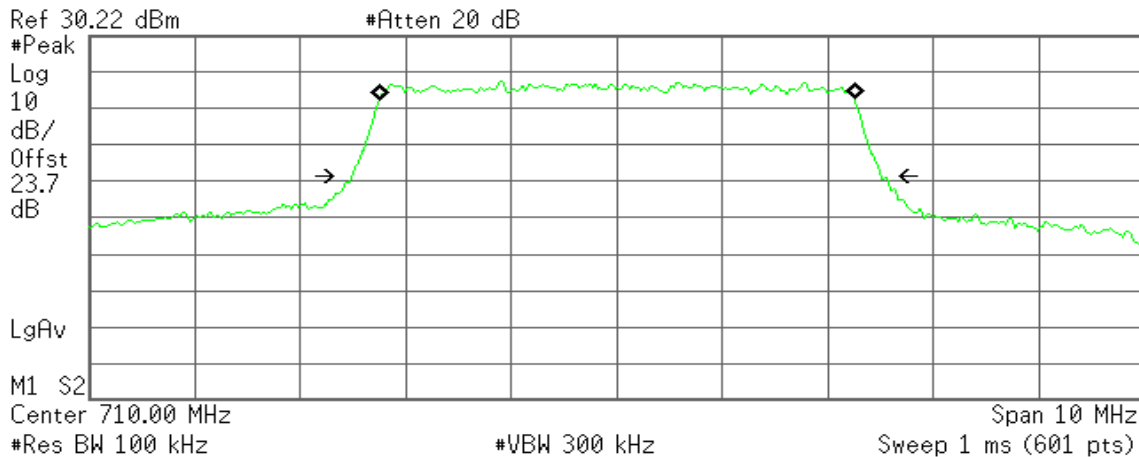
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.731 kHz
x dB Bandwidth 5.133 MHz

CH Mid

Agilent 19:52:29 Jul 18, 2013

R T



Occupied Bandwidth
4.5160 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

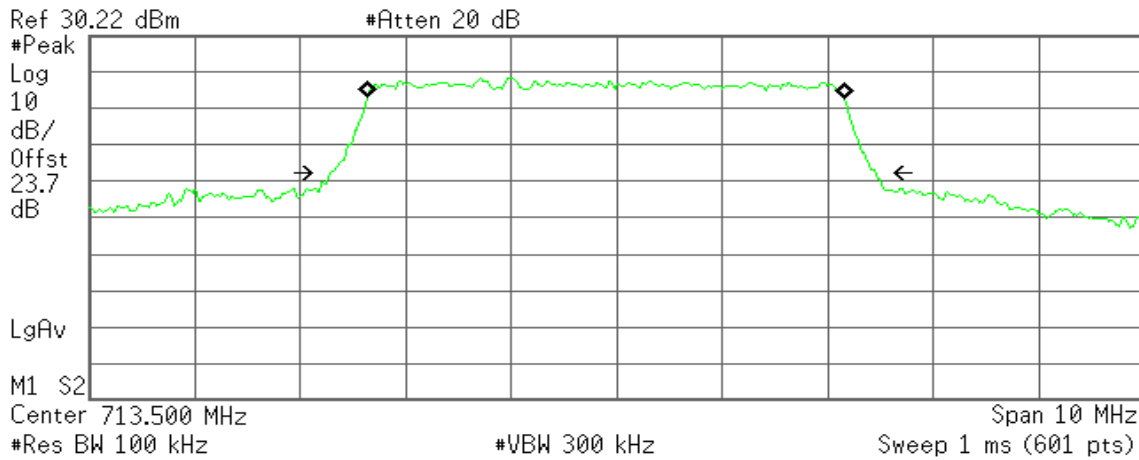
Transmit Freq Error 2.162 kHz
x dB Bandwidth 5.030 MHz



CH High

Agilent 19:51:34 Jul 18, 2013

R T



Occupied Bandwidth
4.5270 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

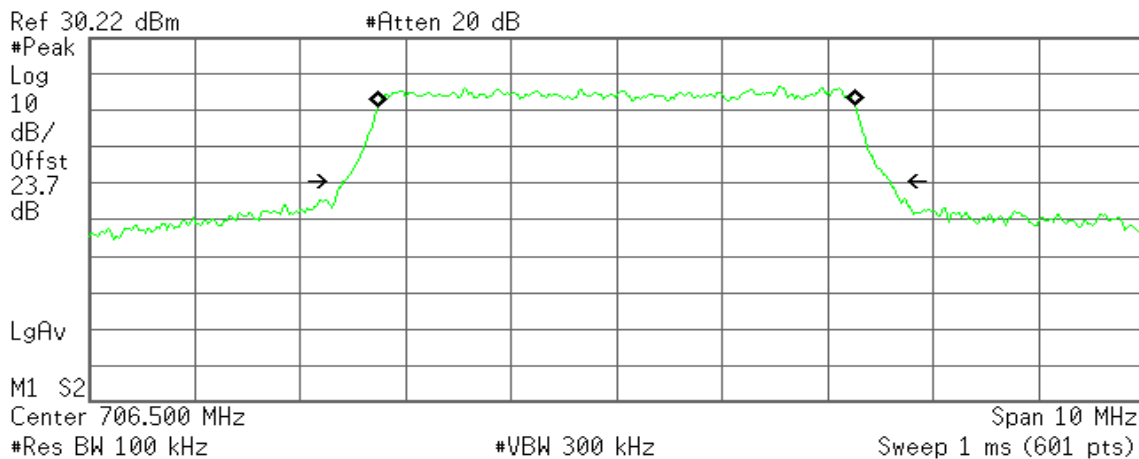
Transmit Freq Error -102.761 kHz
x dB Bandwidth 5.170 MHz

CHANNEL BANDWIDTH: 5MHz / 16QAM

CH Low

Agilent 19:54:10 Jul 18, 2013

R T



Occupied Bandwidth
4.5343 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

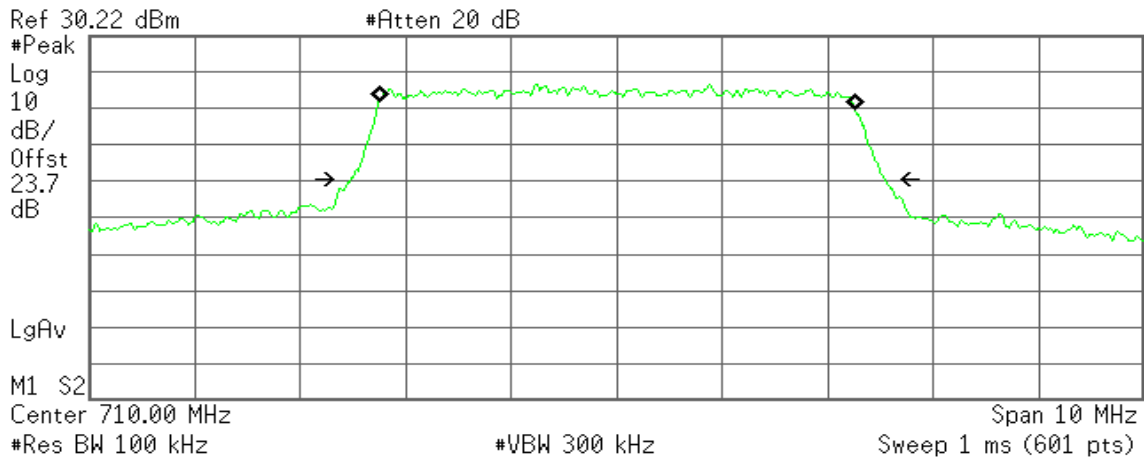
Transmit Freq Error -653.812 Hz
x dB Bandwidth 5.176 MHz



CH Mid

Agilent 19:54:45 Jul 18, 2013

R T



Occupied Bandwidth
4.5226 MHz

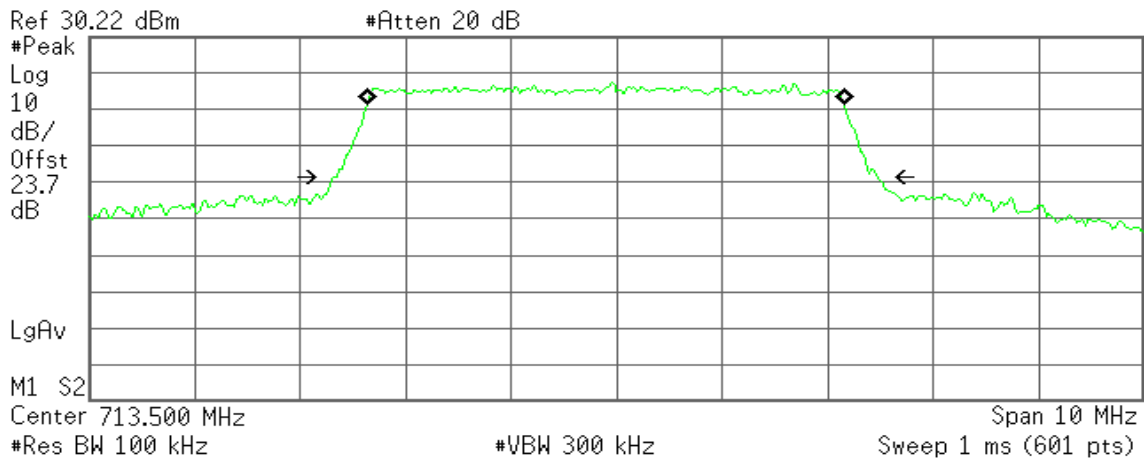
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 3.822 kHz
x dB Bandwidth 5.063 MHz

CH High

Agilent 19:55:29 Jul 18, 2013

R T



Occupied Bandwidth
4.5281 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -102.187 kHz
x dB Bandwidth 5.164 MHz

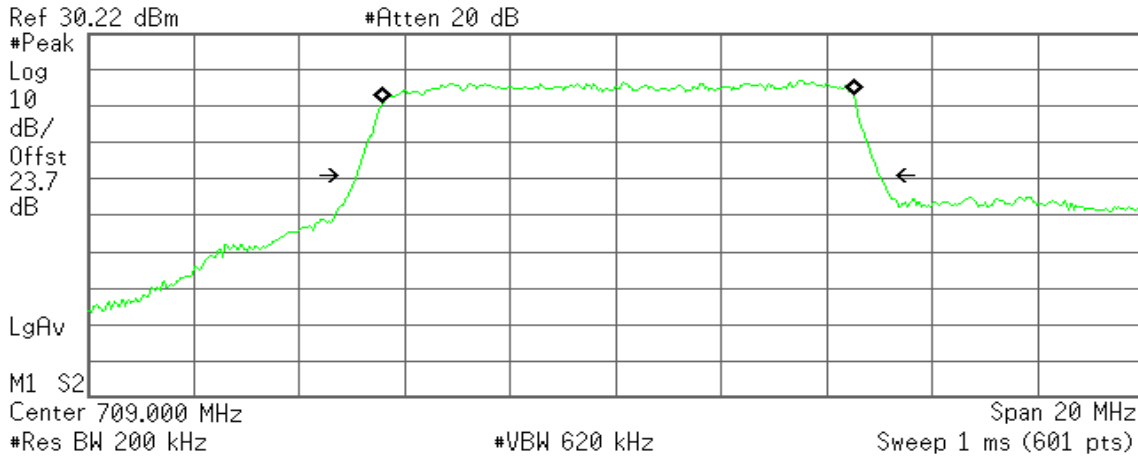


CHANNEL BANDWIDTH: 10MHz / QPSK

CH Low

Agilent 19:46:29 Jul 18, 2013

R T



Occupied Bandwidth
8.9491 MHz

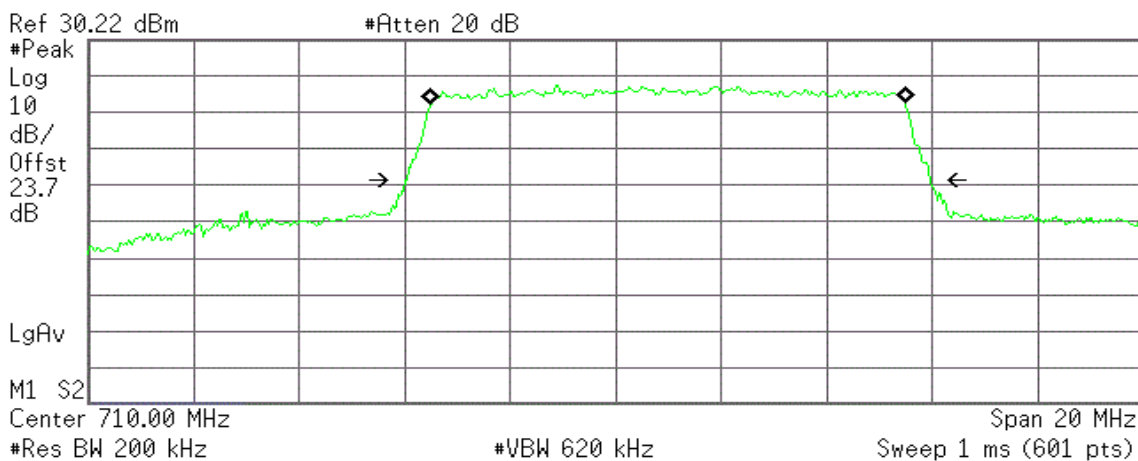
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 51.831 kHz
x dB Bandwidth 9.918 MHz

CH Mid

Agilent 19:43:36 Jul 18, 2013

R T



Occupied Bandwidth
8.9682 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

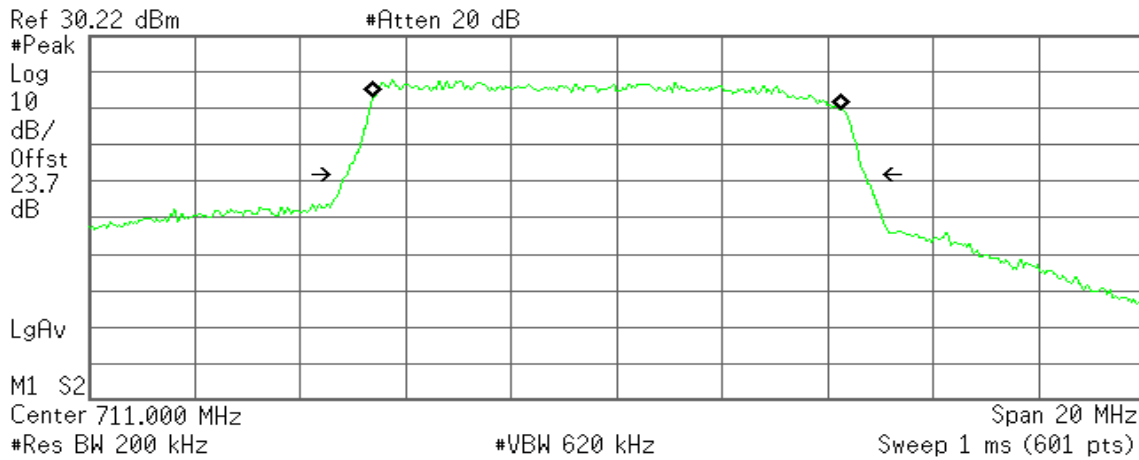
Transmit Freq Error 1.000 MHz
x dB Bandwidth 9.915 MHz



CH High

Agilent 19:44:34 Jul 18, 2013

R T



Occupied Bandwidth
8.8945 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

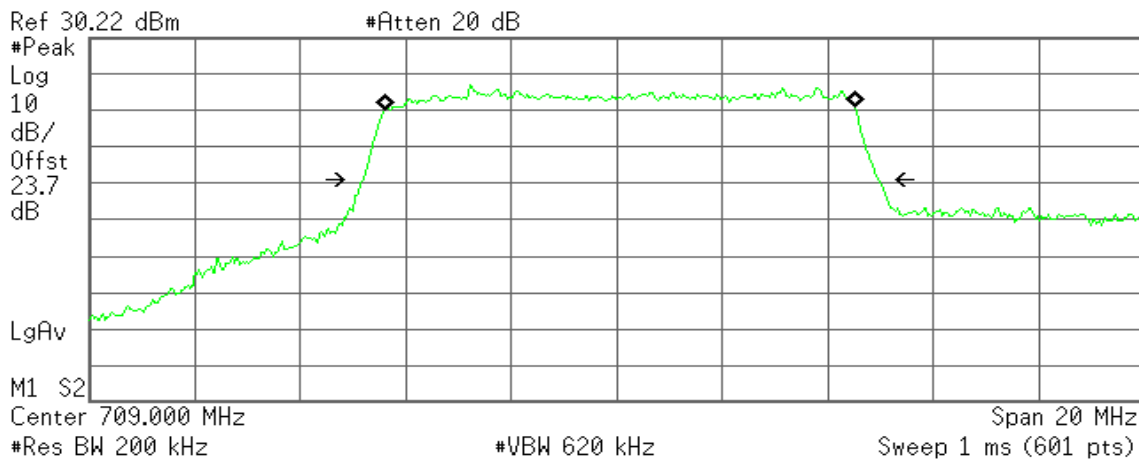
Transmit Freq Error -184.300 kHz
x dB Bandwidth 9.846 MHz

CHANNEL BANDWIDTH: 10MHz / 16QAM

CH Low

Agilent 19:47:26 Jul 18, 2013

R T



Occupied Bandwidth
8.9374 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

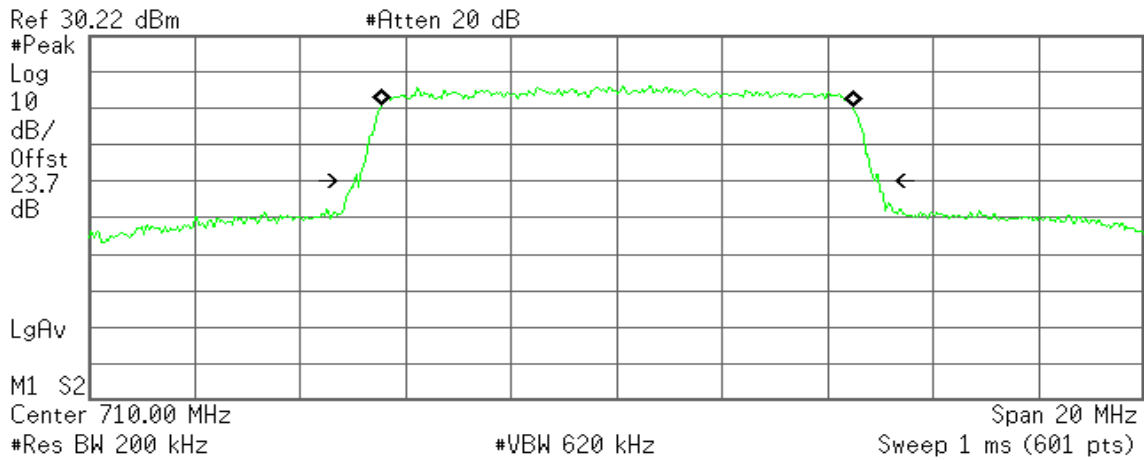
Transmit Freq Error 57.966 kHz
x dB Bandwidth 9.795 MHz



CH Mid

Agilent 19:48:26 Jul 18, 2013

R T



Occupied Bandwidth
8.9669 MHz

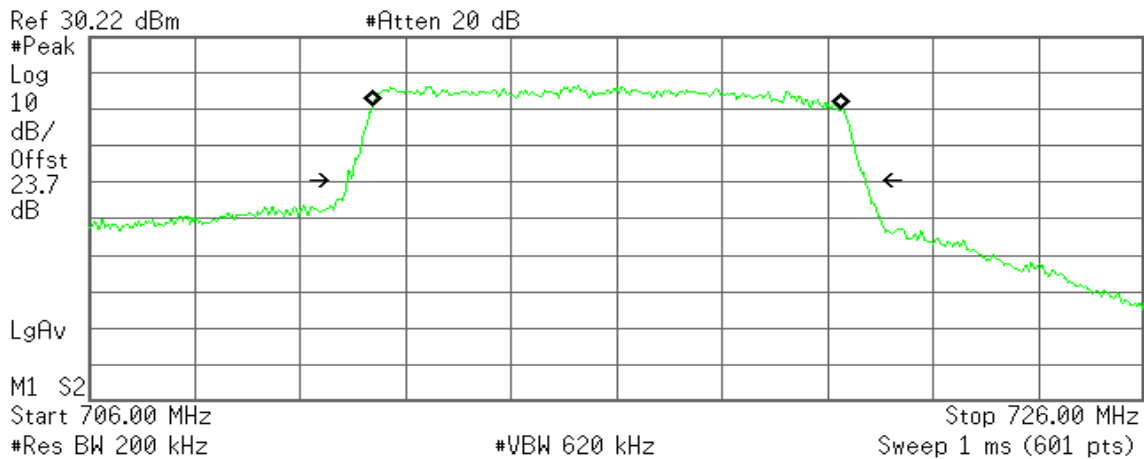
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 8.613 kHz
x dB Bandwidth 9.960 MHz

CH High

Agilent 19:49:23 Jul 18, 2013

R T



Occupied Bandwidth
8.9140 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -174.766 kHz
x dB Bandwidth 9.846 MHz



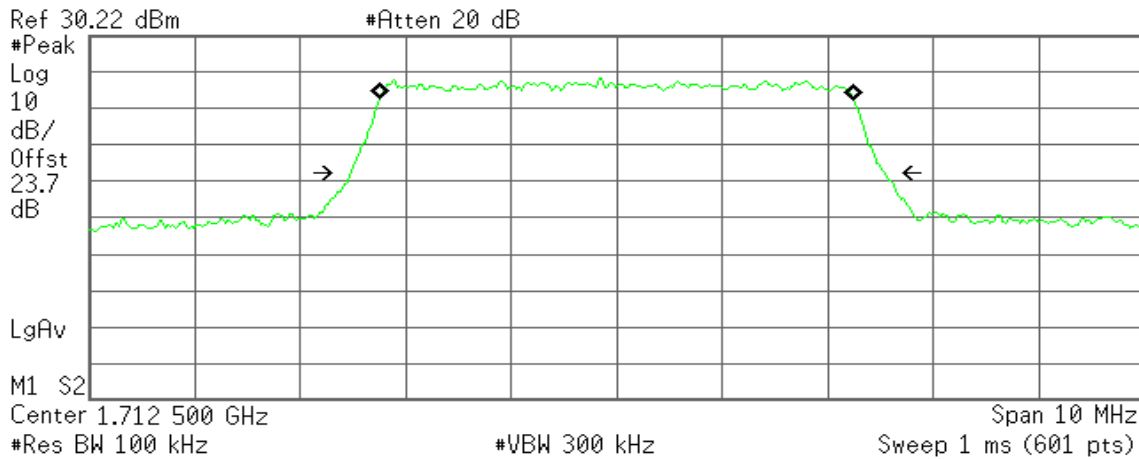
LTE Band 4

CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low

Agilent 20:20:02 Jul 18, 2013

R T



Occupied Bandwidth
4.5046 MHz

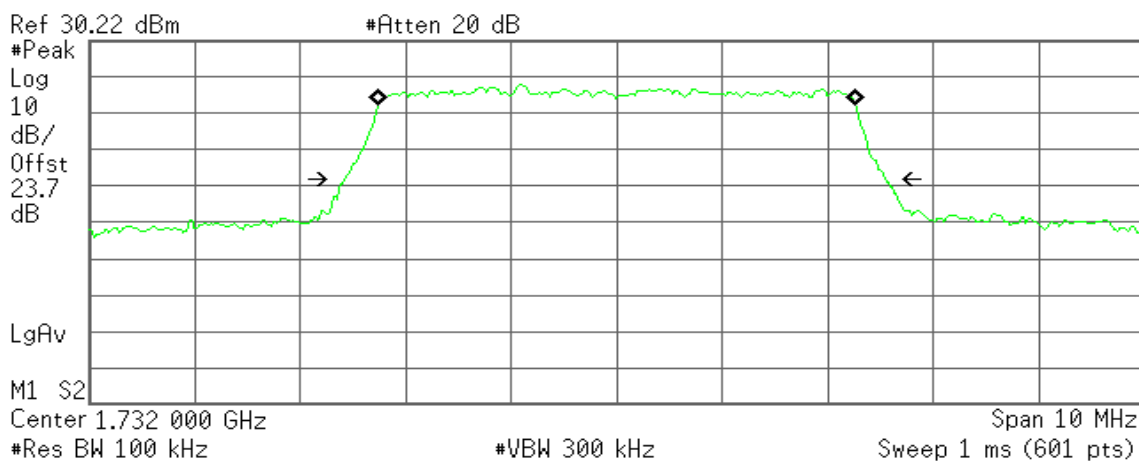
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 1.045 kHz
x dB Bandwidth 5.075 MHz

CH Mid

Agilent 20:21:07 Jul 18, 2013

R T



Occupied Bandwidth
4.5266 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

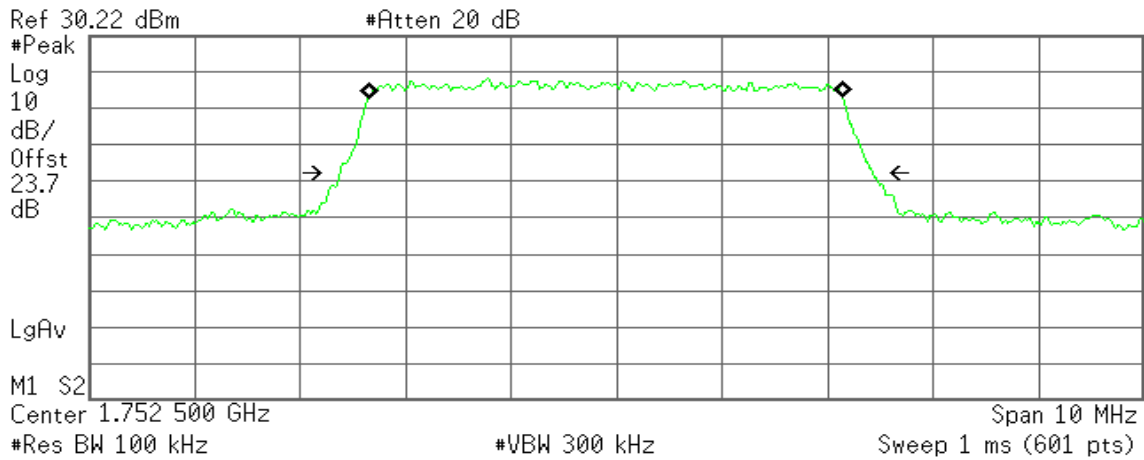
Transmit Freq Error 1.962 kHz
x dB Bandwidth 5.129 MHz



CH High

Agilent 20:21:49 Jul 18, 2013

R T



Occupied Bandwidth
4.5060 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

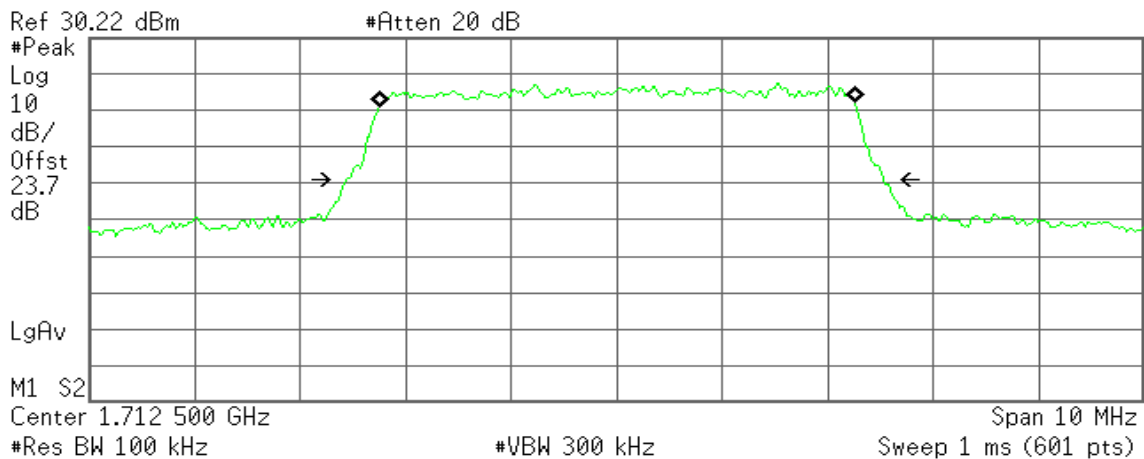
Transmit Freq Error -102.667 kHz
x dB Bandwidth 5.056 MHz

CHANNEL BANDWIDTH: 5MHz / 16QAM

CH Low

Agilent 20:23:52 Jul 18, 2013

R T



Occupied Bandwidth
4.5177 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

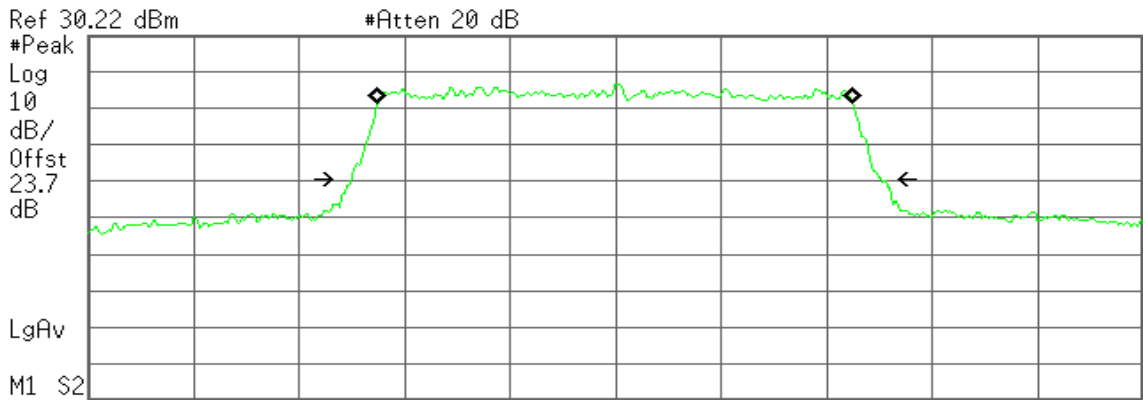
Transmit Freq Error 4.294 kHz
x dB Bandwidth 5.091 MHz



CH Mid

Agilent 20:23:22 Jul 18, 2013

R T



Ref 30.22 dBm #Atten 20 dB
Center 1.732 000 GHz Span 10 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 1 ms (601 pts)

Occupied Bandwidth
4.5149 MHz

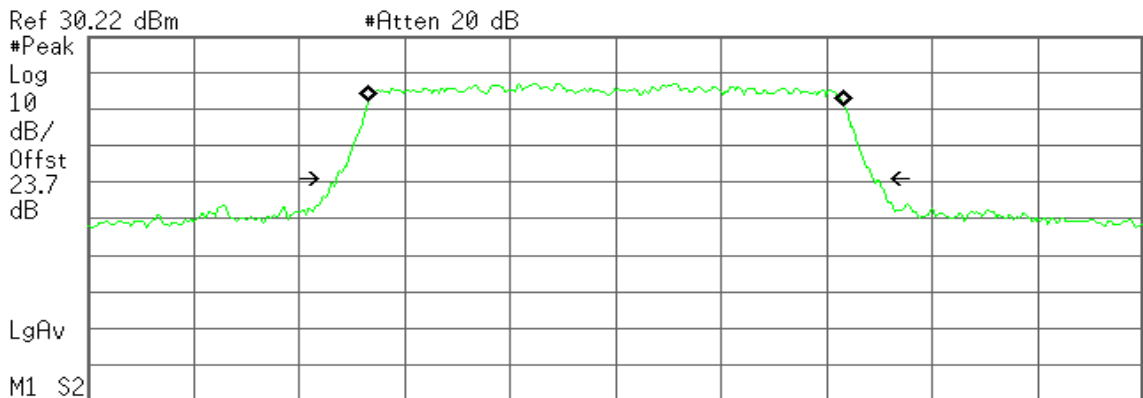
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -1.185 kHz
x dB Bandwidth 5.028 MHz

CH High

Agilent 20:22:56 Jul 18, 2013

R T



Ref 30.22 dBm #Atten 20 dB
Center 1.752 500 GHz Span 10 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 1 ms (601 pts)

Occupied Bandwidth
4.5147 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -88.153 kHz
x dB Bandwidth 5.093 MHz

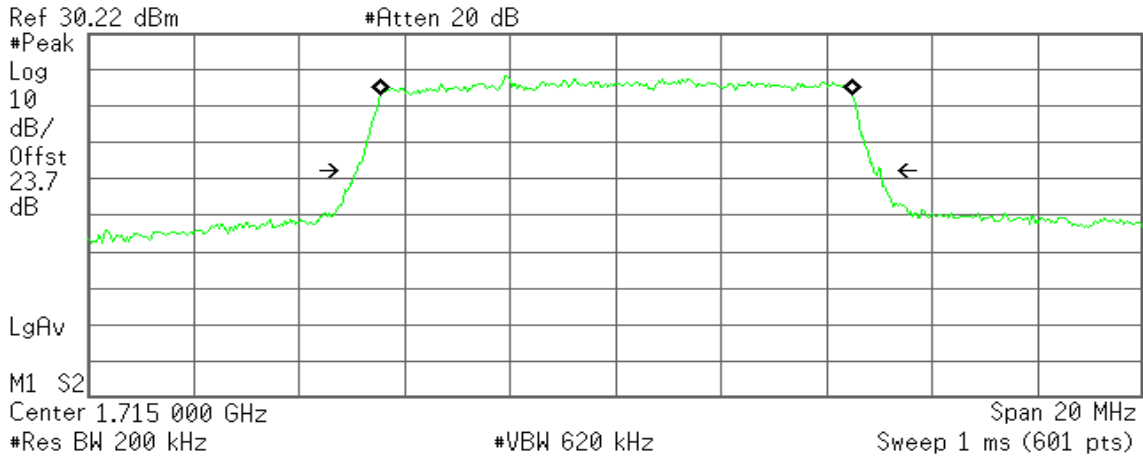


CHANNEL BANDWIDTH: 10MHz / QPSK

CH Low

Agilent 20:25:19 Jul 18, 2013

R T



Occupied Bandwidth
8.9651 MHz

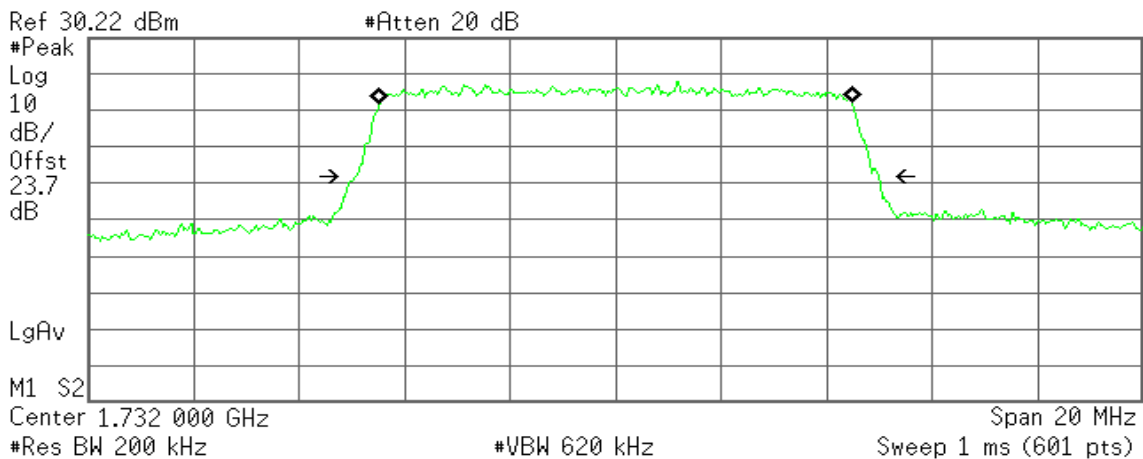
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 13.000 kHz
x dB Bandwidth 9.964 MHz

CH Mid

Agilent 20:26:00 Jul 18, 2013

R T



Occupied Bandwidth
8.9750 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

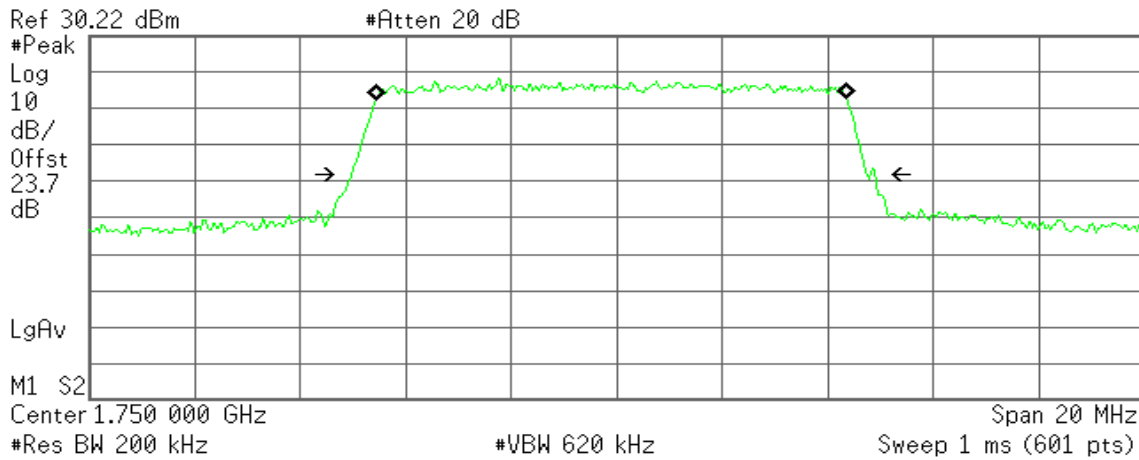
Transmit Freq Error 1.653 kHz
x dB Bandwidth 9.943 MHz



CH High

Agilent 20:26:41 Jul 18, 2013

R T



Occupied Bandwidth
8.9427 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

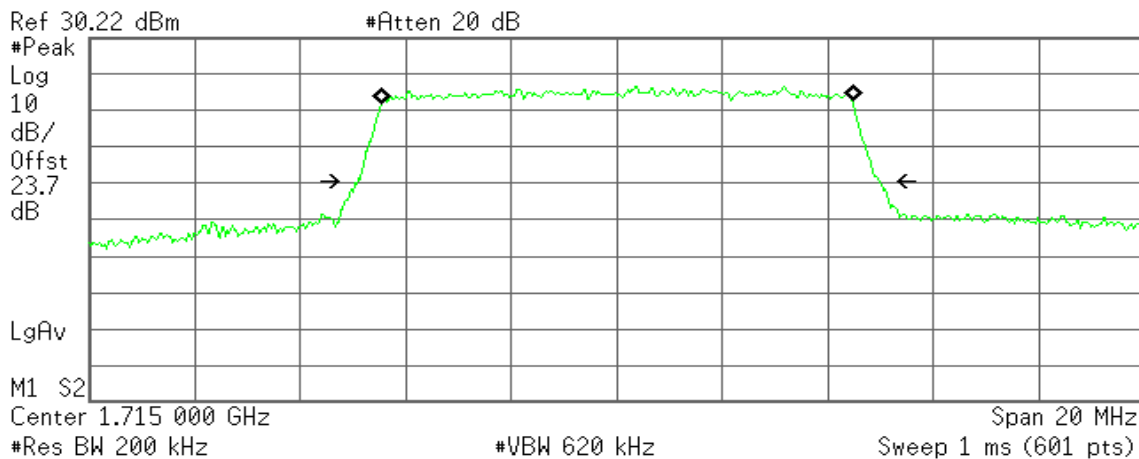
Transmit Freq Error -99.989 kHz
x dB Bandwidth 9.931 MHz

CHANNEL BANDWIDTH: 10MHz / 16QAM

CH Low

Agilent 20:29:46 Jul 18, 2013

R T



Occupied Bandwidth
8.9622 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

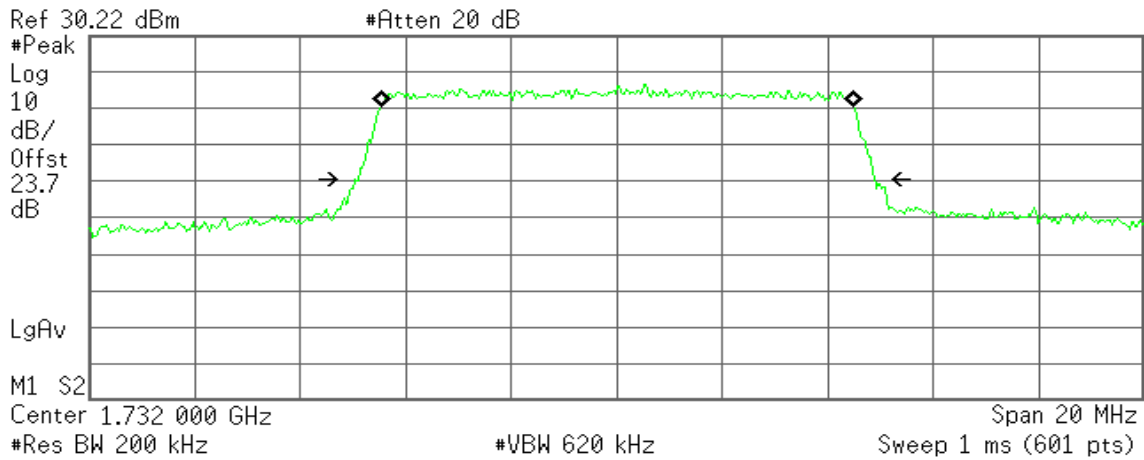
Transmit Freq Error 7.938 kHz
x dB Bandwidth 9.911 MHz



CH Mid

Agilent 20:29:13 Jul 18, 2013

R T



Occupied Bandwidth
8.9744 MHz

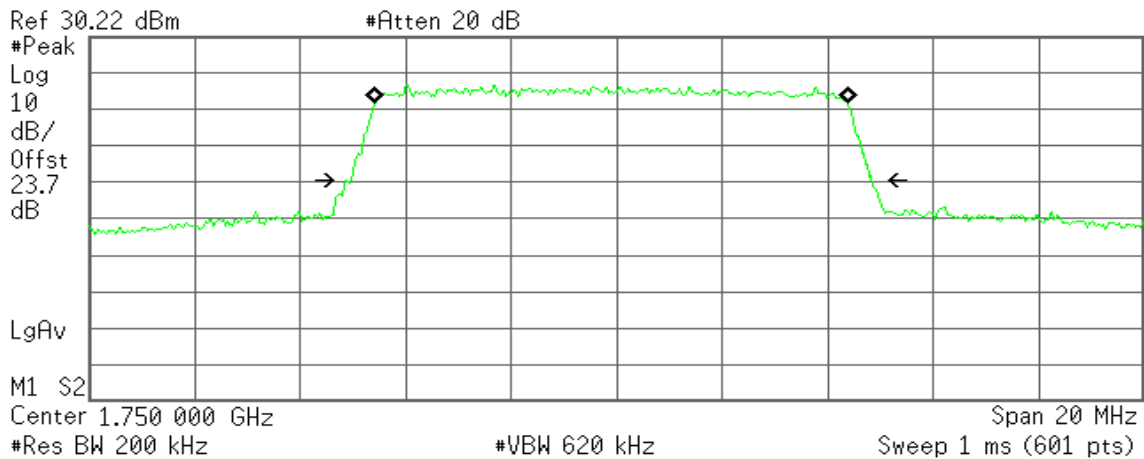
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 6.352 kHz
x dB Bandwidth 9.880 MHz

CH High

Agilent 20:28:45 Jul 18, 2013

R T



Occupied Bandwidth
8.9869 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -97.183 kHz
x dB Bandwidth 9.882 MHz

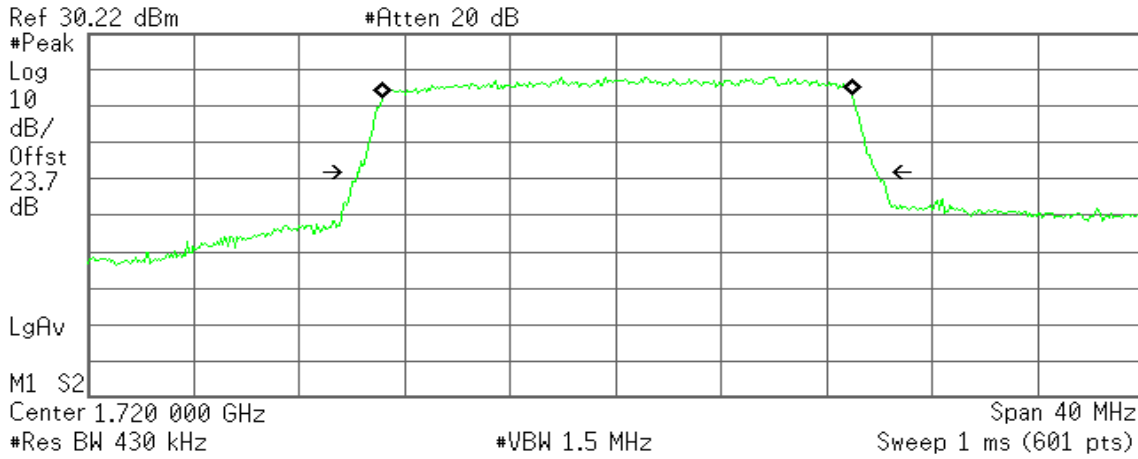


CHANNEL BANDWIDTH: 20MHz / QPSK

CH Low

Agilent 20:31:57 Jul 18, 2013

R T



Occupied Bandwidth
17.8180 MHz

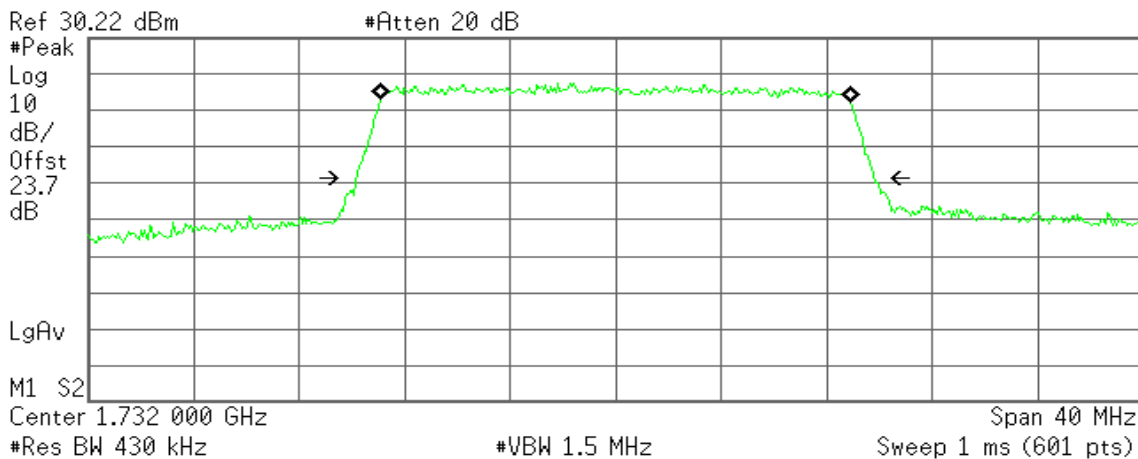
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 60.800 kHz
x dB Bandwidth 19.622 MHz

CH Mid

Agilent 20:32:36 Jul 18, 2013

R T



Occupied Bandwidth
17.8833 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

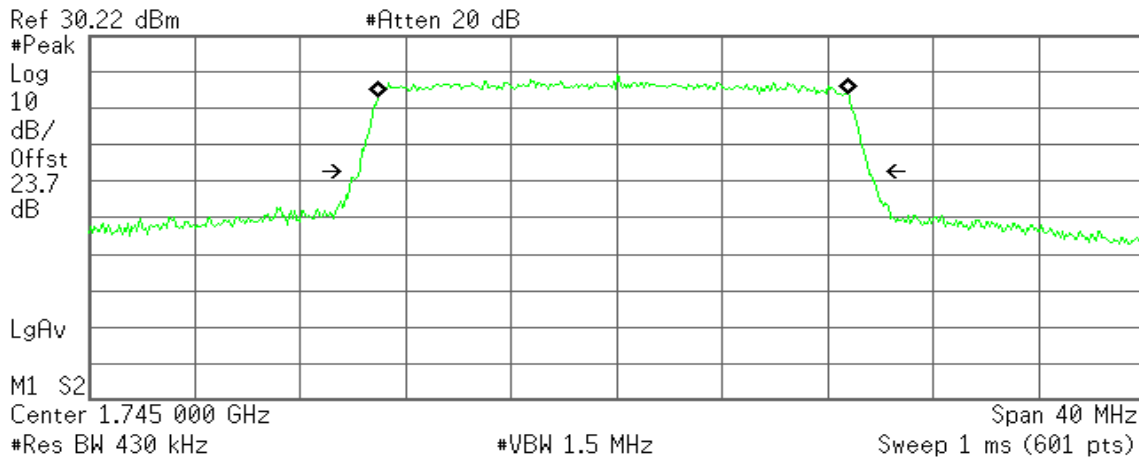
Transmit Freq Error -36.409 Hz
x dB Bandwidth 19.665 MHz



CH High

Agilent 20:33:16 Jul 18, 2013

R T



Occupied Bandwidth
17.8736 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

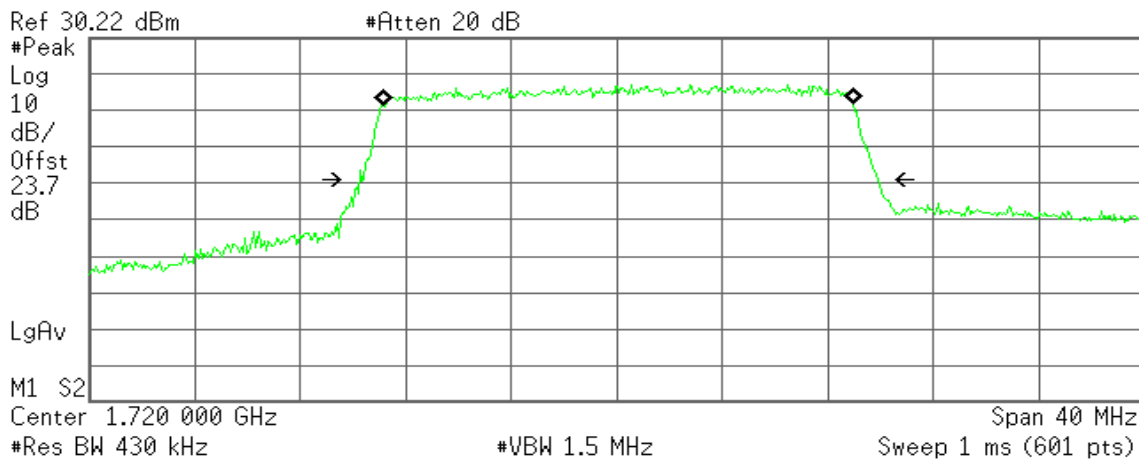
Transmit Freq Error -119.793 kHz
x dB Bandwidth 19.351 MHz

CHANNEL BANDWIDTH: 20MHz / 16QAM

CH Low

Agilent 20:35:14 Jul 18, 2013

R T



Occupied Bandwidth
17.8511 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

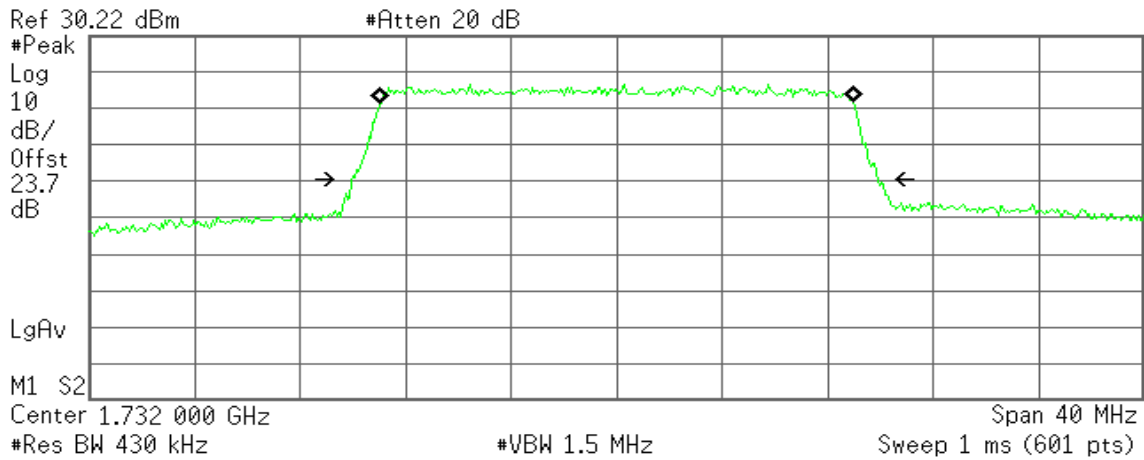
Transmit Freq Error 50.921 kHz
x dB Bandwidth 19.684 MHz



CH Mid

Agilent 20:34:40 Jul 18, 2013

R T



Occupied Bandwidth
17.9693 MHz

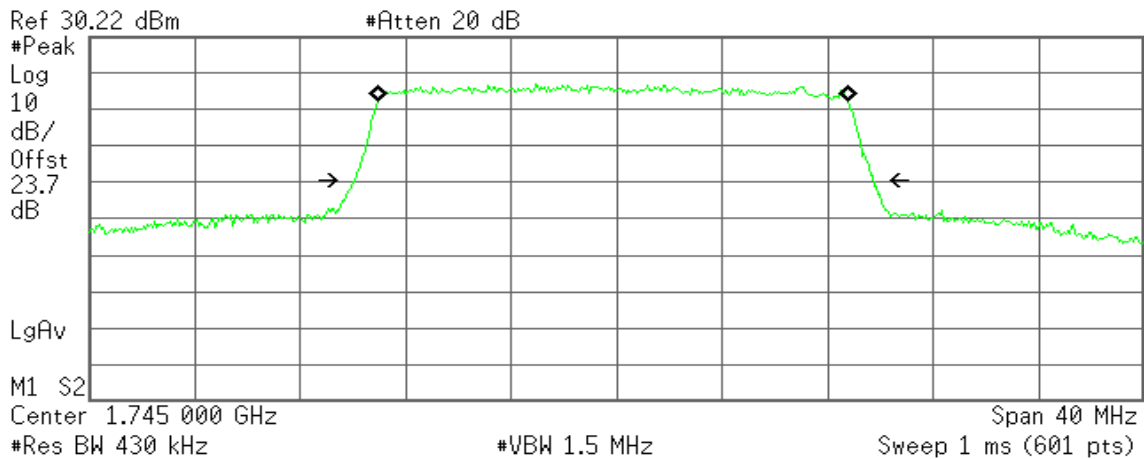
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 4.231 kHz
x dB Bandwidth 19.967 MHz

CH High

Agilent 20:34:02 Jul 18, 2013

R T



Occupied Bandwidth
17.8816 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -129.941 kHz
x dB Bandwidth 19.676 MHz



7.4BAND EDGE MEASUREMENT

LIMIT

For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. 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. For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm . In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

TEST PROCEDURES

1. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
2. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 7.2 dB in the transmitted path track.
3. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 50kHz and VB of the spectrum is 200kHz.
4. Record the max trace plot into the test report.



TEST RESULTS:

LTE Band 17

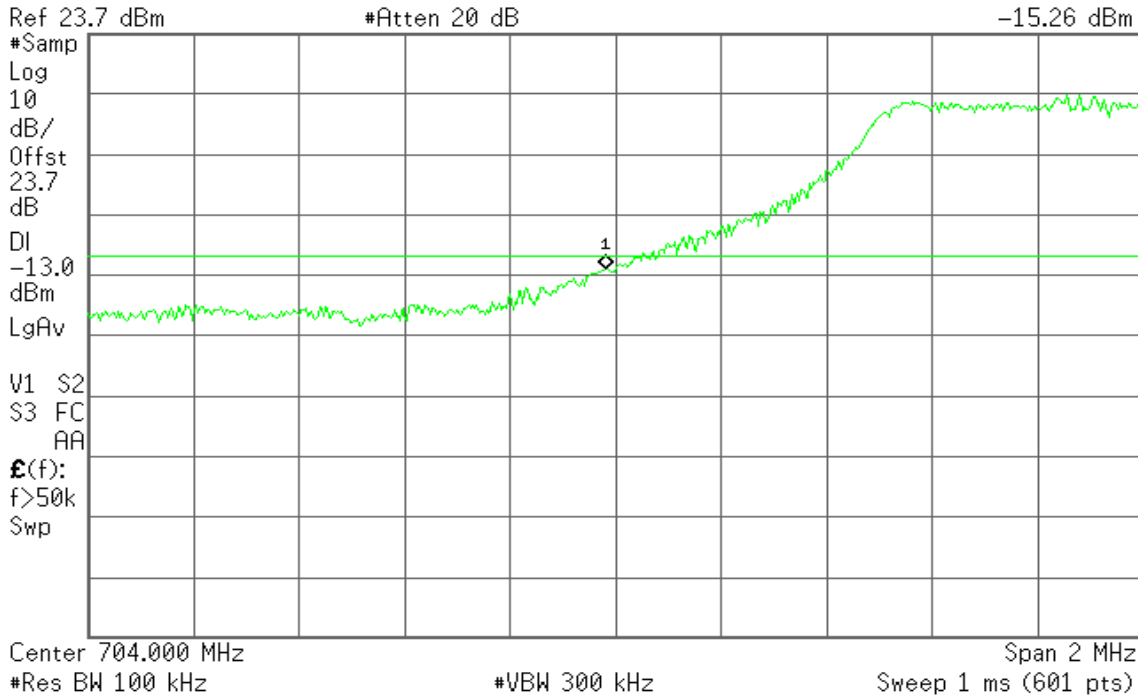
CHANNEL BANDWIDTH: 10MHz / QPSK / FULL RB ALLOCATED

LOWER BAND EDGE

Agilent 21:40:18 Jul 19, 2013

R T S

Mkr1 703.980 MHz
-15.26 dBm

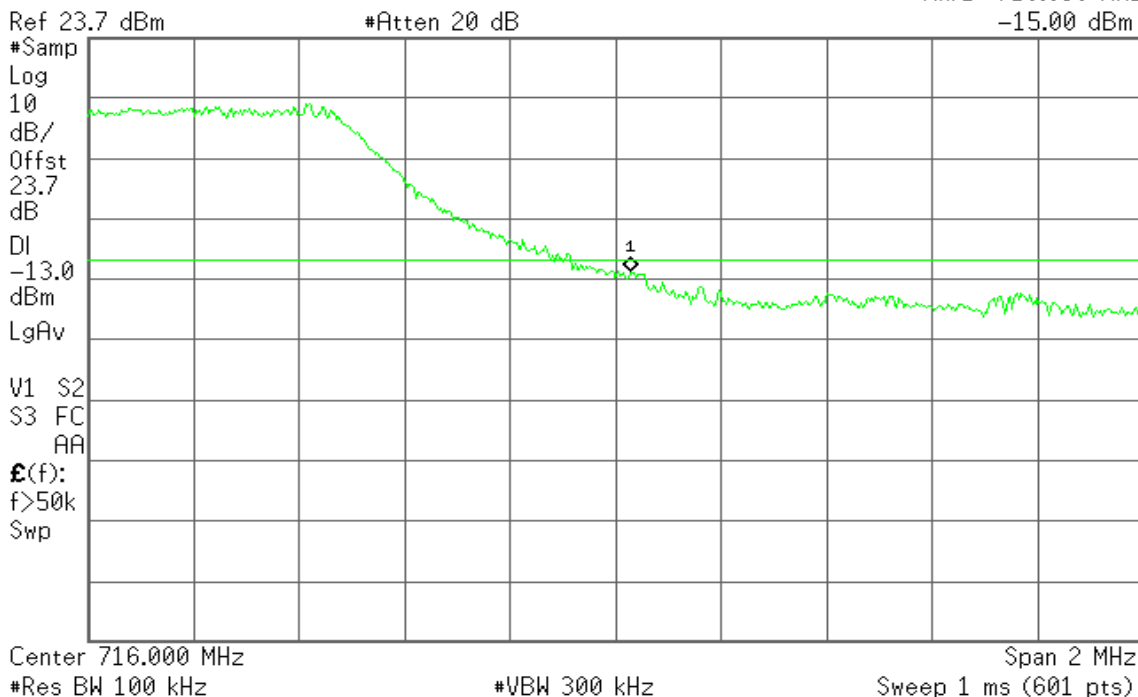


HIGHER BAND EDGE

Agilent 21:46:13 Jul 19, 2013

R T S

Mkr1 716.030 MHz
-15.00 dBm





LTE Band 17

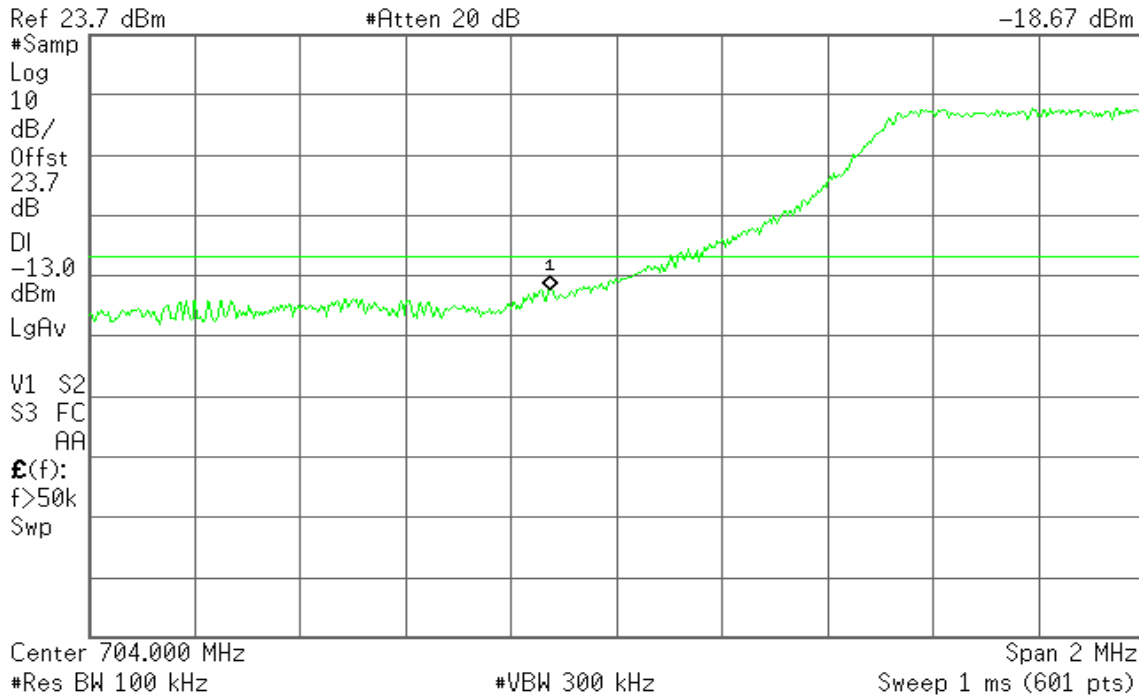
CHANNEL BANDWIDTH: 10MHz / 16QAM / FULL RB ALLOCATED

LOWER BAND EDGE

Agilent 22:08:04 Jul 19, 2013

R T S

Mkr1 703.873 MHz
-18.67 dBm

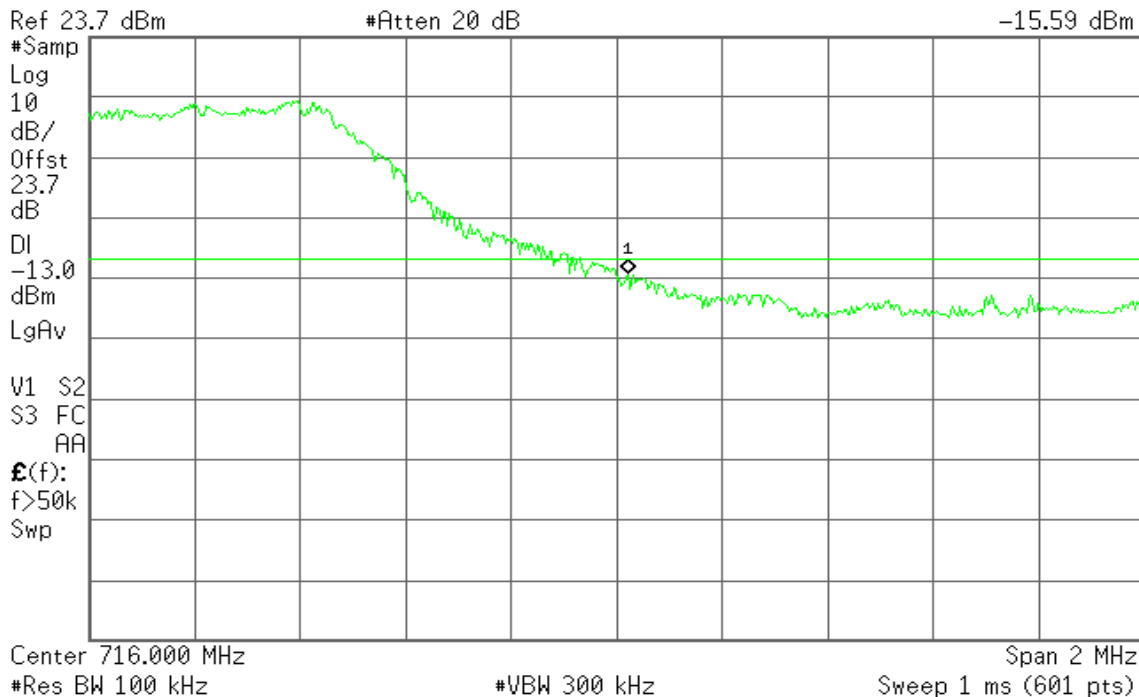


HIGHER BAND EDGE

Agilent 21:44:59 Jul 19, 2013

R T S

Mkr1 716.023 MHz
-15.59 dBm





LTE Band 4

CHANNEL BANDWIDTH: 10MHz / QPSK / FULL RB ALLOCATION

LOWER BAND EDGE

Agilent 22:15:36 Jul 19, 2013

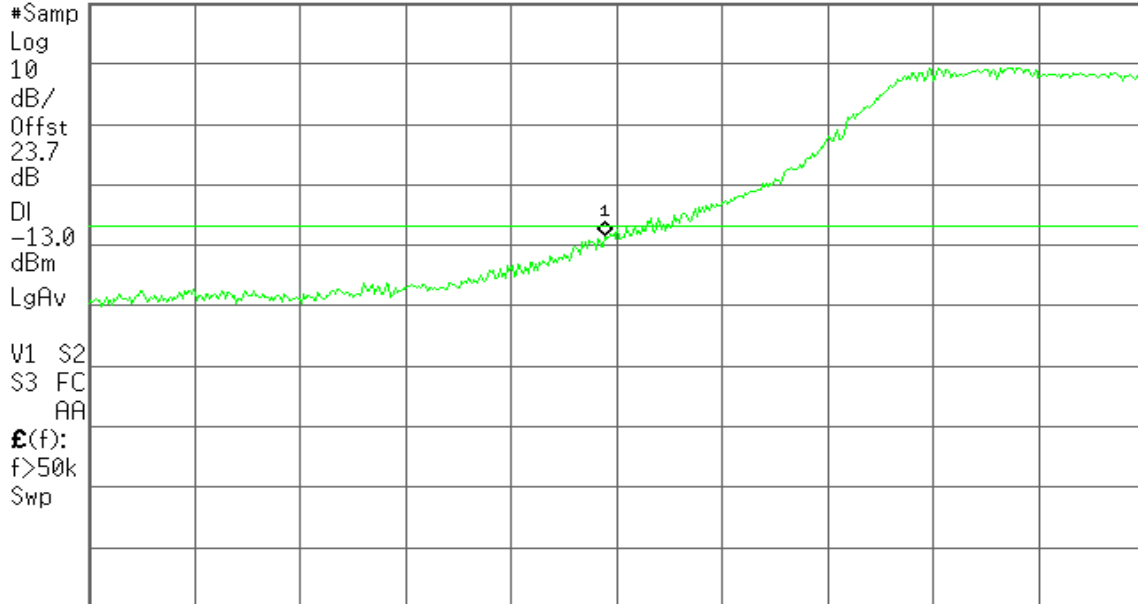
R T S

Mkr1 1.709 977 GHz

-14.66 dBm

Ref 23.7 dBm

#Atten 20 dB



Center 1.710 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 2 MHz

Sweep 1 ms (601 pts)

HIGHER BAND EDGE

Agilent 23:16:02 Jul 19, 2013

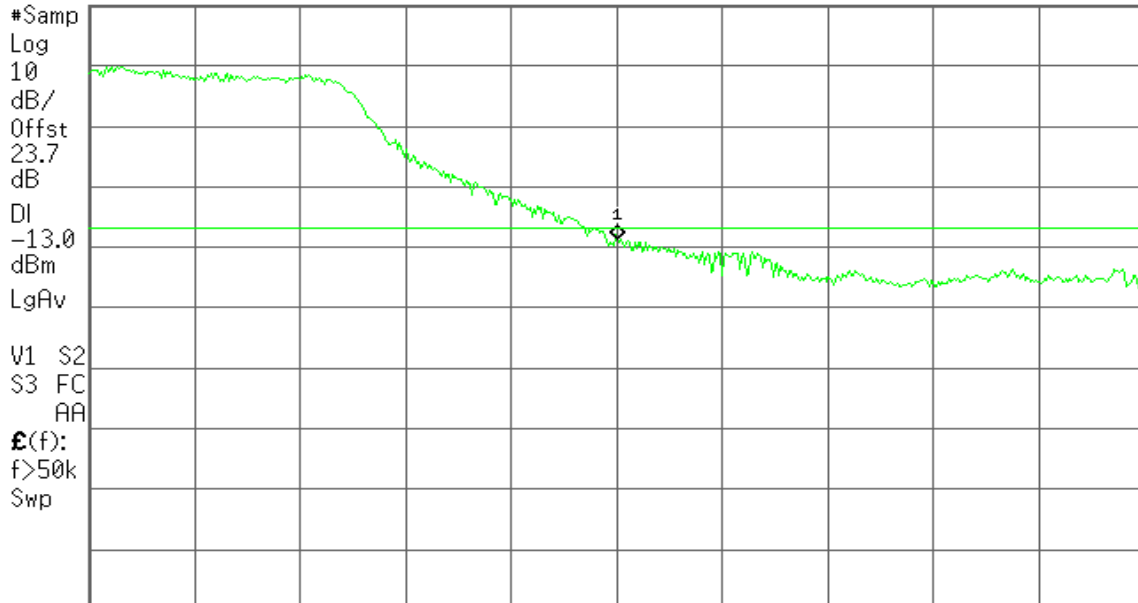
R T S

Mkr1 1.755 003 GHz

-14.84 dBm

Ref 23.7 dBm

#Atten 20 dB



Center 1.755 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 2 MHz

Sweep 1 ms (601 pts)



CHANNEL BANDWIDTH: 10MHz / 16QAM / FULL RB ALLOCATION

LOWER BAND EDGE

Agilent 22:19:59 Jul 19, 2013

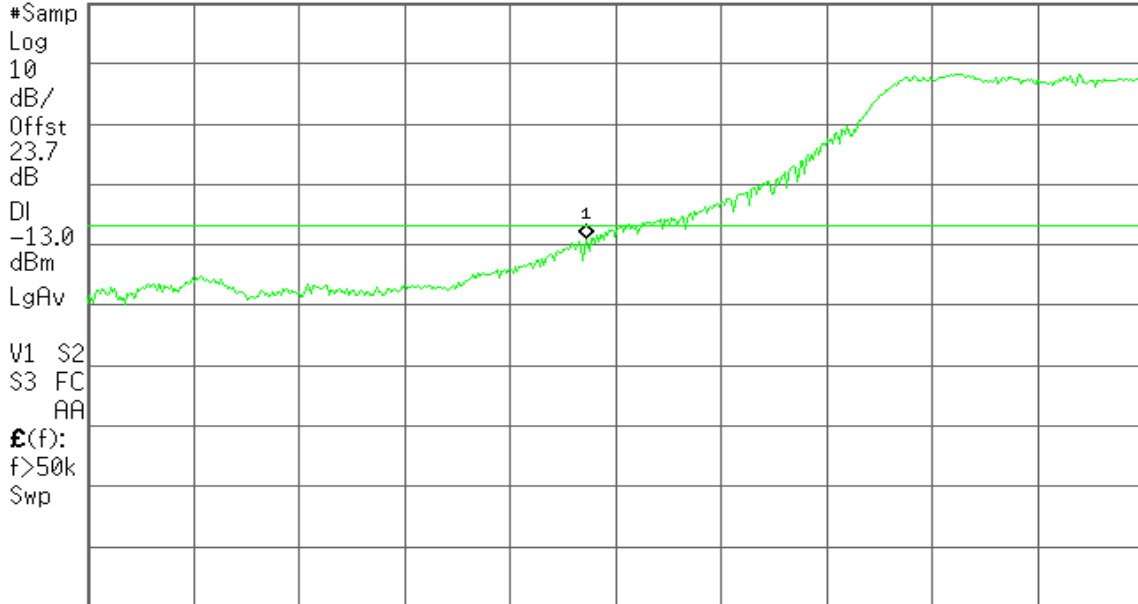
R T S

Mkr1 1.709 943 GHz

-15.24 dBm

Ref 23.7 dBm

#Atten 20 dB



Center 1.710 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 2 MHz

Sweep 1 ms (601 pts)

HIGHER BAND EDGE

Agilent 23:18:17 Jul 19, 2013

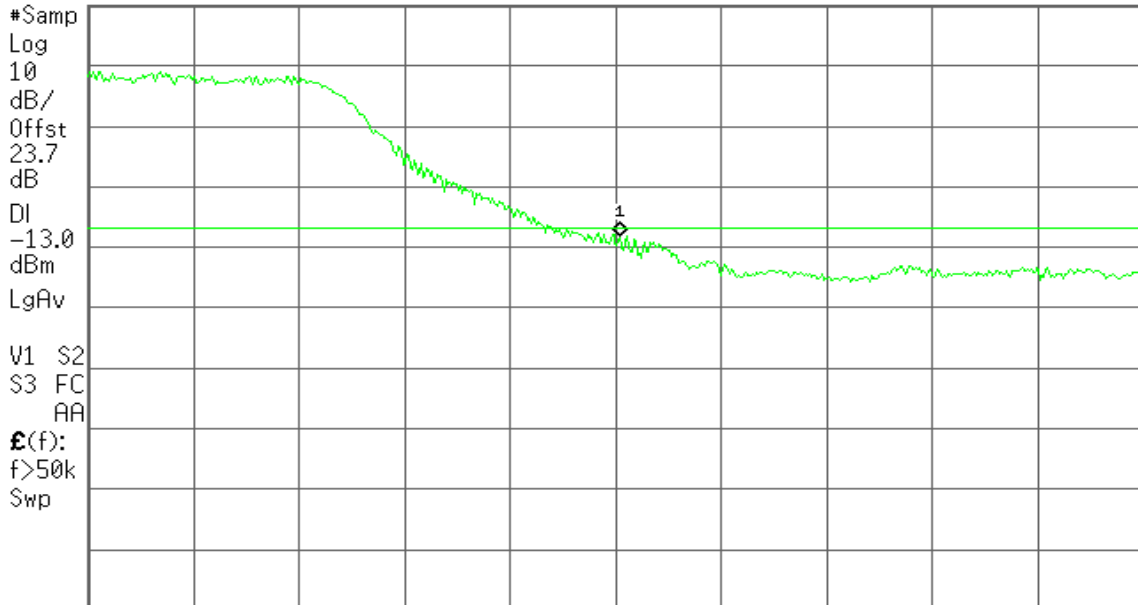
R T S

Mkr1 1.755 010 GHz

-14.50 dBm

Ref 23.7 dBm

#Atten 20 dB



Center 1.755 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 2 MHz

Sweep 1 ms (601 pts)



LTE Band 4

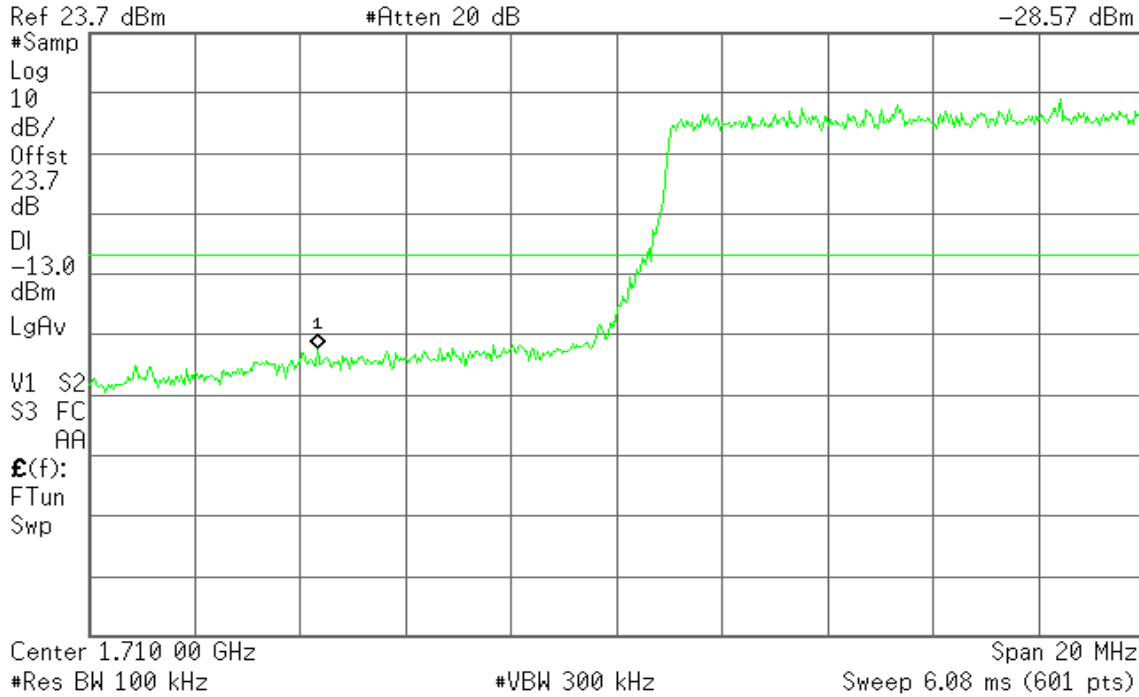
CHANNEL BANDWIDTH: 20MHz / QPSK / FULL RB ALLOCATION

LOWER BAND EDGE

Agilent 22:34:33 Jul 19, 2013

R T S

Mkr1 1.704 33 GHz
-28.57 dBm

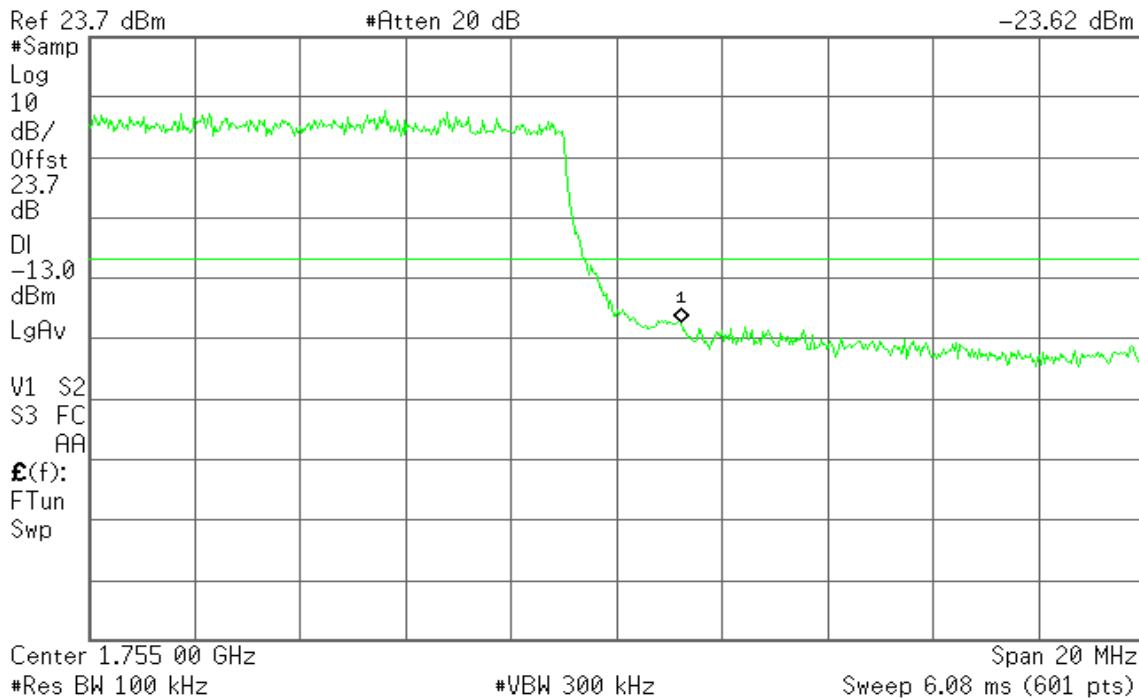


HIGHER BAND EDGE

Agilent 22:31:33 Jul 19, 2013

R T S

Mkr1 1.756 23 GHz
-23.62 dBm





CHANNEL BANDWIDTH: 20MHz / 16QAM / FULL RB ALLOCATION

LOWER BAND EDGE

Agilent 22:33:36 Jul 19, 2013

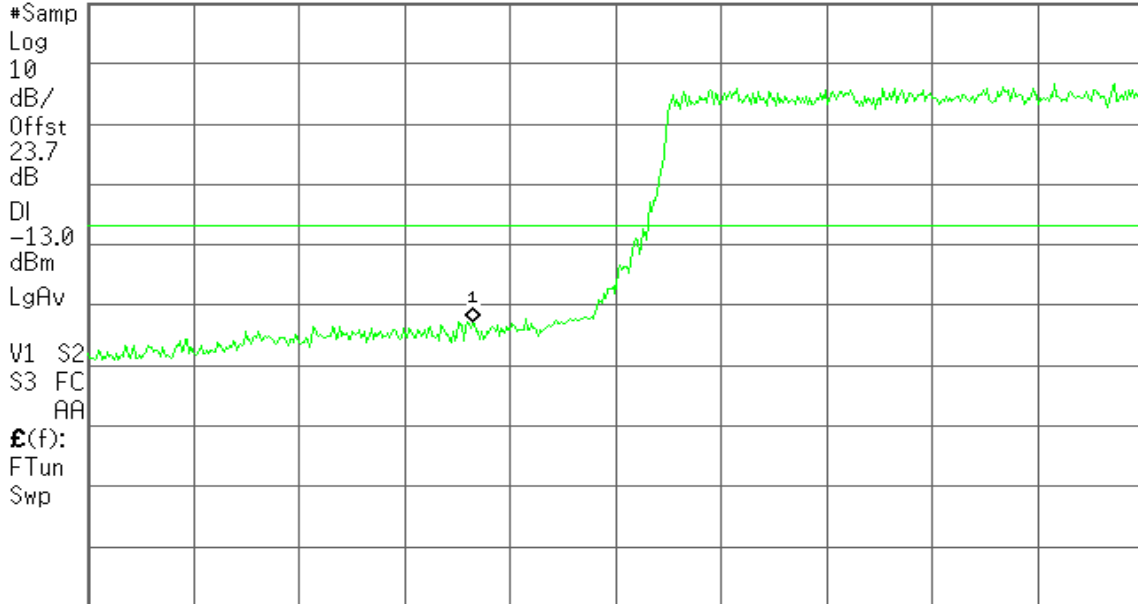
R T S

Mkr1 1.707 30 GHz

-28.92 dBm

Ref 23.7 dBm

#Atten 20 dB



Center 1.710 00 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 20 MHz

Sweep 6.08 ms (601 pts)

HIGHER BAND EDGE

Agilent 22:32:25 Jul 19, 2013

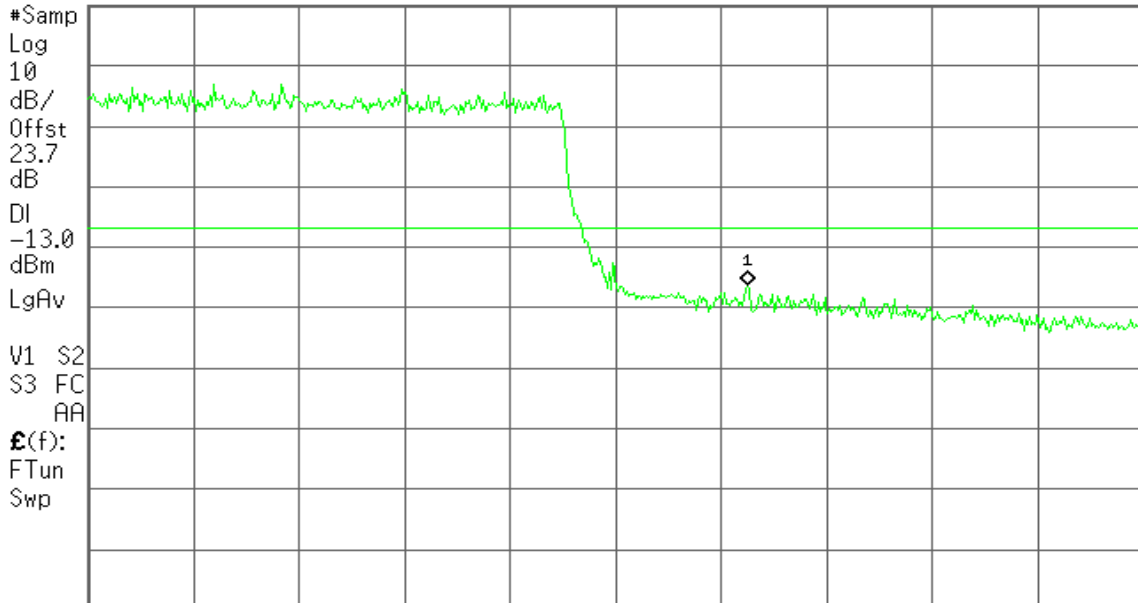
R T S

Mkr1 1.757 50 GHz

-22.51 dBm

Ref 23.7 dBm

#Atten 20 dB



Center 1.755 00 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 20 MHz

Sweep 6.08 ms (601 pts)



7.5 CONDUCTED SPURIOUS EMISSIONS

LIMITS

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

TEST PROCEDURES

1. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range.).
2. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
3. When the spectrum scanned from 30MHz to 3GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.
4. When the spectrum scanned from 3GHz to 20GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.



Out of Band emission at antenna terminals						
LTE Band 4 -5MHz QPSK						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		5		-13	
			5		-13	
Mid	N/A		5		-13	
			5		-13	
High	N/A		5		-13	
			5		-13	
LTE Band 4 -5MHz 16QAM						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		5		-13	
			5		-13	
Mid	N/A		5		-13	
			5		-13	
High	N/A		5		-13	
			5		-13	
LTE Band 4 -10MHz QPSK						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		5		-13	
			5		-13	
Mid	N/A		5		-13	
			5		-13	
High	N/A		5		-13	
			5		-13	
LTE Band 4 -10MHz 16QAM						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		5		-13	
			5		-13	
Mid	N/A		5		-13	
			5		-13	
High	N/A		5		-13	
			5		-13	
LTE Band 4 -20MHz QPSK						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		5		-13	
			5		-13	
Mid	N/A		5		-13	
			5		-13	
High	N/A		5		-13	
			5		-13	



LTE Band 4 -20MHz 16QAM						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		5		-13	
			5		-13	
Mid	N/A		5		-13	
			5		-13	
High	N/A		5		-13	
			5		-13	
LTE Band 17 -5MHz QPSK						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		11.92		-13	
			11.92		-13	
Mid	N/A		11.92		-13	
			11.92		-13	
High	N/A		11.92		-13	
			11.92		-13	
LTE Band 17 -5MHz 16QAM						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		11.92		-13	
			11.92		-13	
Mid	N/A		11.92		-13	
			11.92		-13	
High	N/A		11.92		-13	
			11.92		-13	
LTE Band 17 -10MHz QPSK						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		11.92		-13	
			11.92		-13	
Mid	N/A		11.92		-13	
			11.92		-13	
High	N/A		11.92		-13	
			11.92		-13	
LTE Band 17 -10MHz 16QAM						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max.Ant.Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	N/A		11.92		-13	
			11.92		-13	
Mid	N/A		11.92		-13	
			11.92		-13	
High	N/A		11.92		-13	
			11.92		-13	

Remark: Data of measurement within this frequency range shown “ N/A ” in the table above means the emission is too small to be measured



TEST RESULTS

LTE Band 17

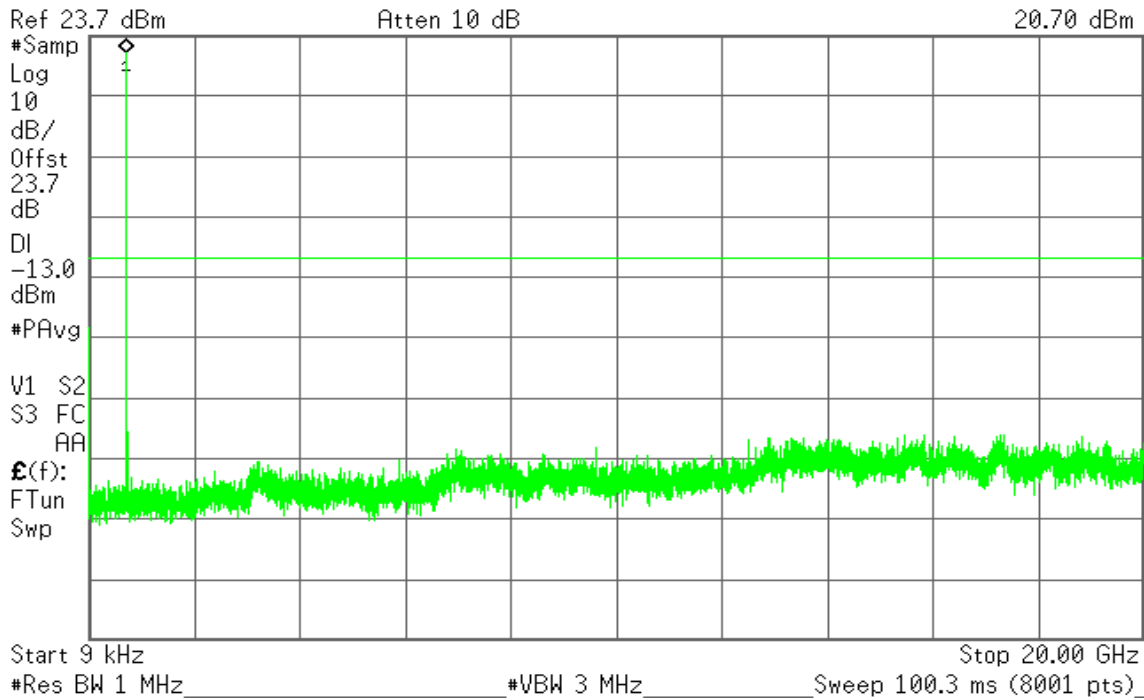
CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low

Agilent 20:00:53 Dec 6, 2013

R T

Mkr1 710 MHz
20.70 dBm

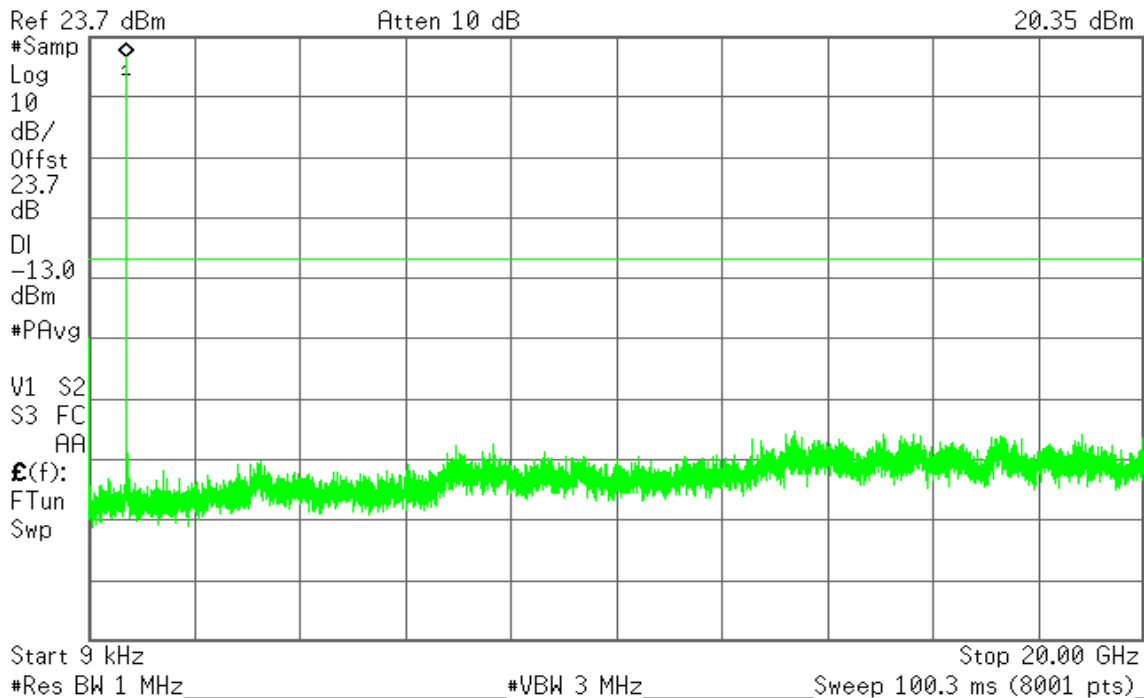


CH Mid

Agilent 20:01:39 Dec 6, 2013

R T

Mkr1 710 MHz
20.35 dBm



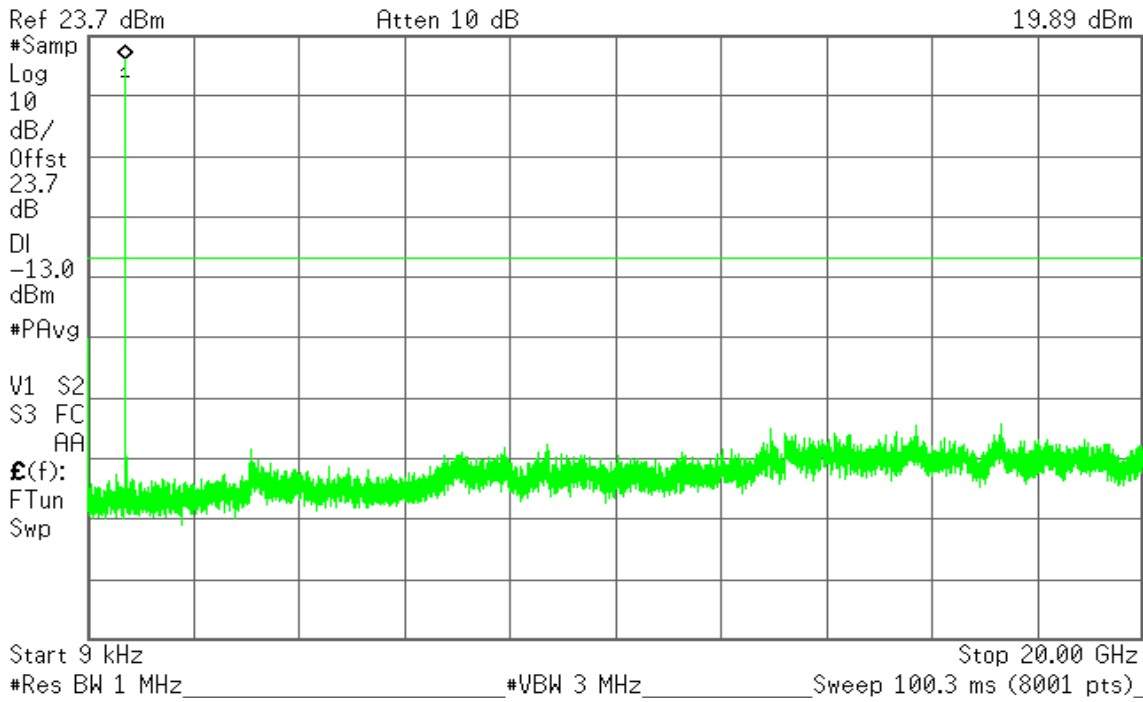


CH High

Agilent 20:03:49 Dec 6, 2013

R T

Mkr1 720 MHz
19.89 dBm



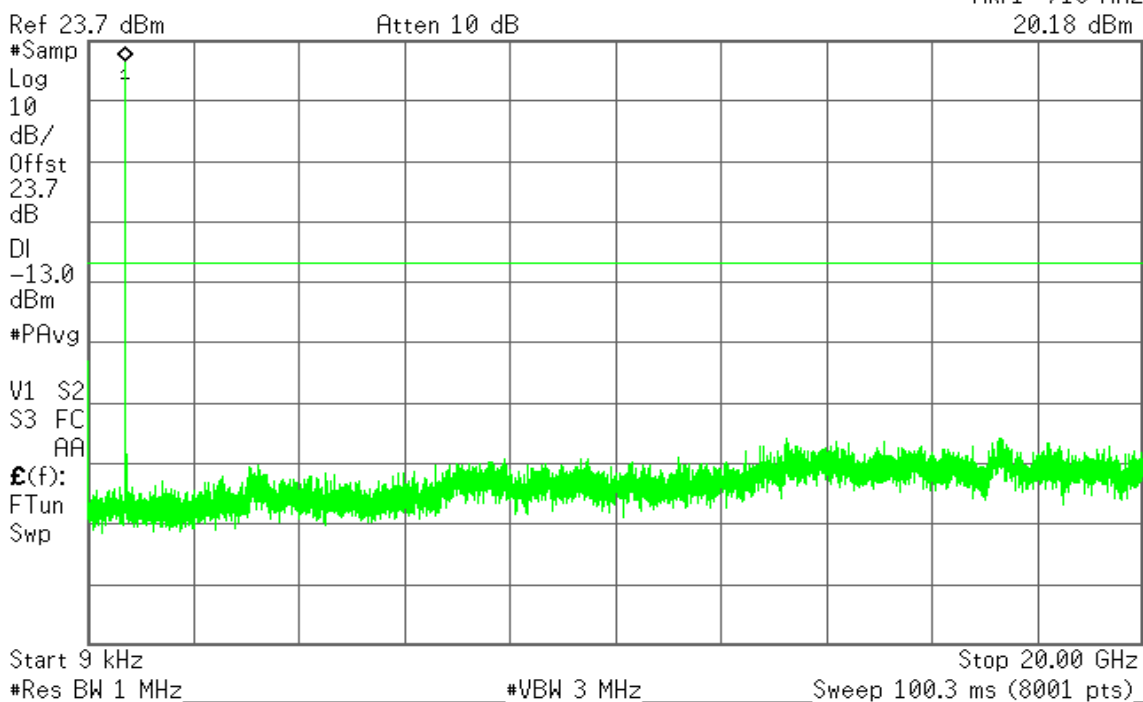
CHANNEL BANDWIDTH: 5MHz / 16QAM

CH Low

Agilent 20:00:24 Dec 6, 2013

R T

Mkr1 710 MHz
20.18 dBm



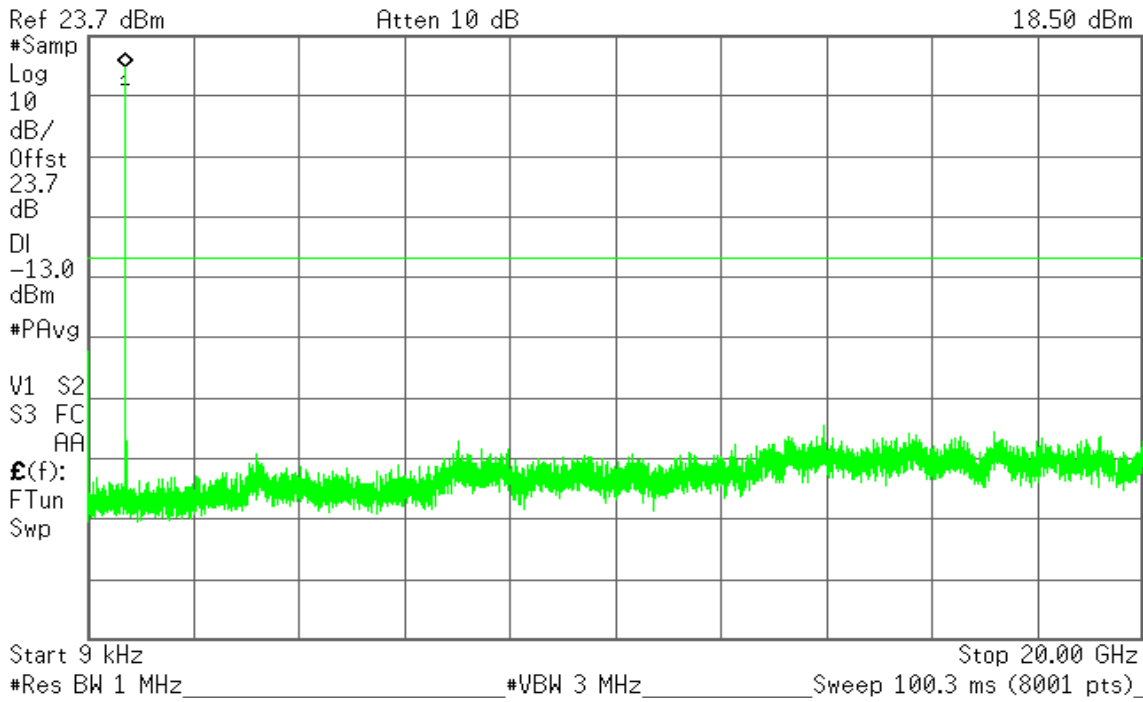


CH Mid

Agilent 20:02:22 Dec 6, 2013

R T

Mkr1 710 MHz
18.50 dBm

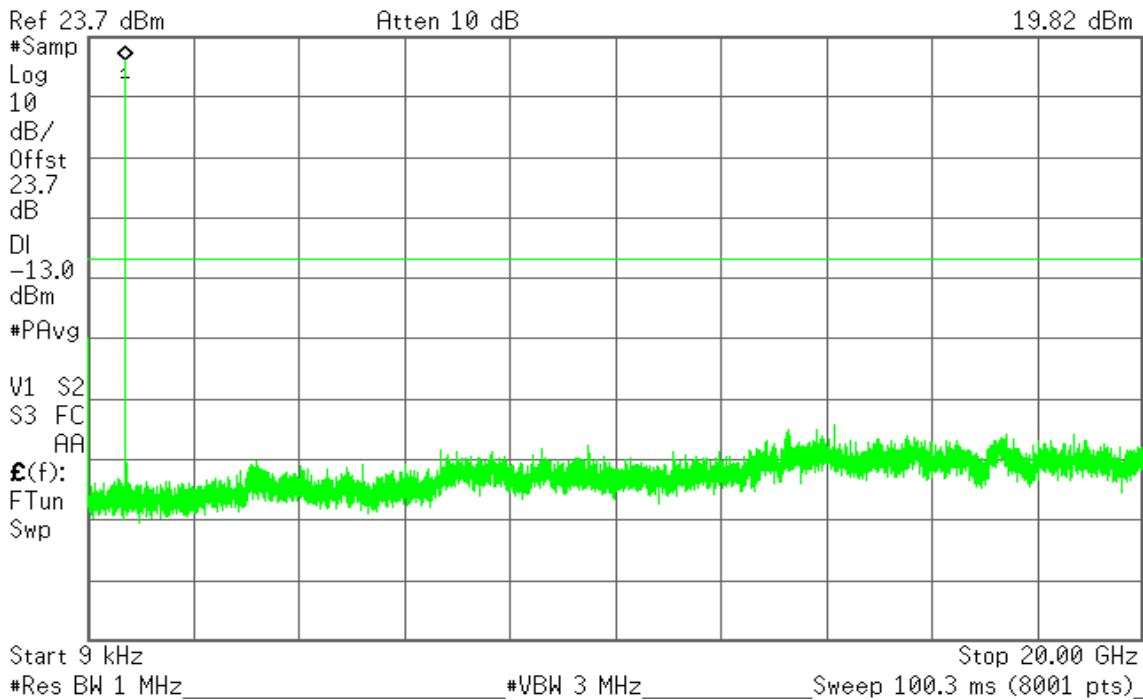


CH High

Agilent 20:03:06 Dec 6, 2013

R T

Mkr1 720 MHz
19.82 dBm





CHANNEL BANDWIDTH: 10MHz / QPSK

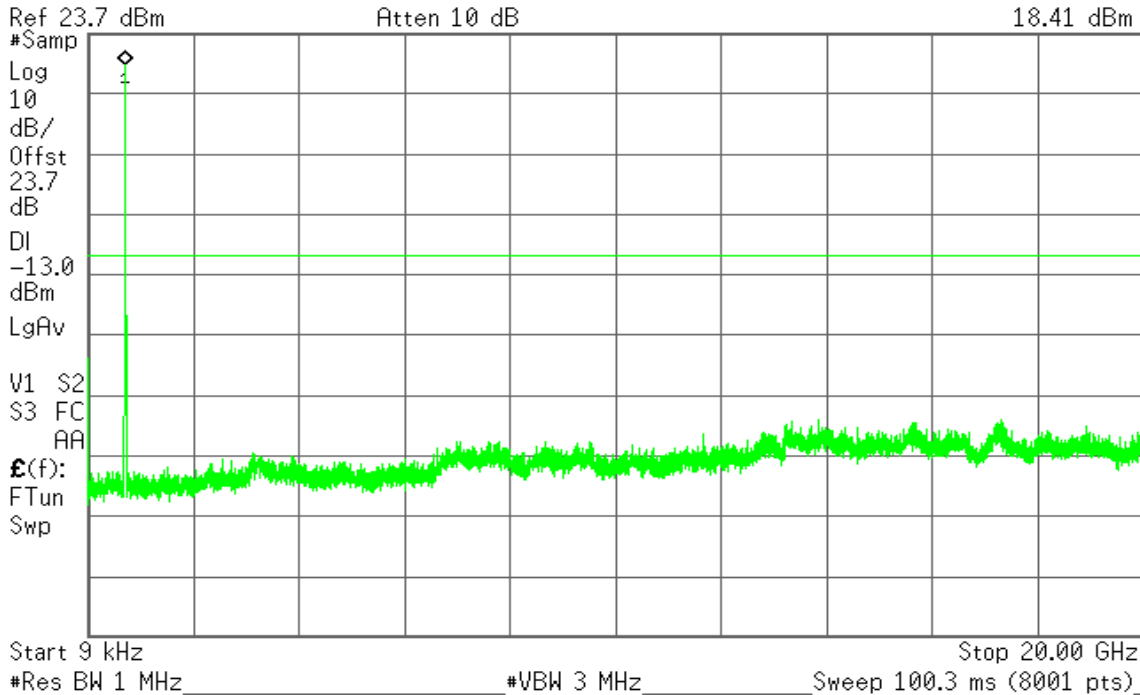
CH Low

Agilent 23:46:10 Jul 26, 2013

R T

Mkr1 710 MHz

18.41 dBm



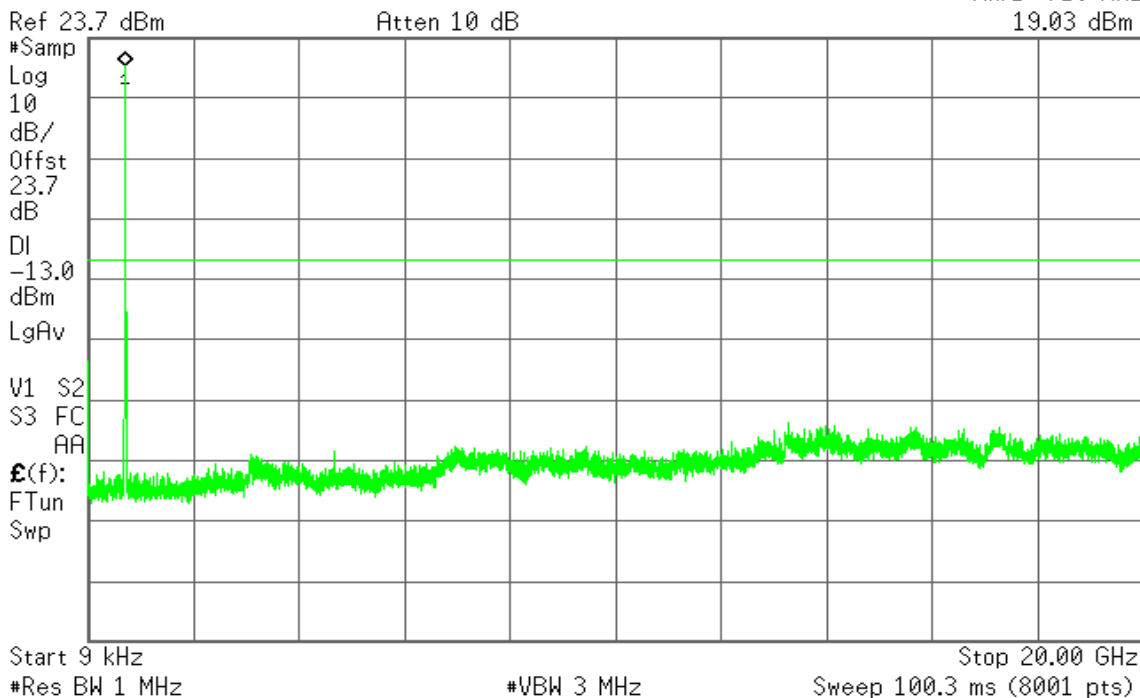
CH Mid

Agilent 23:46:10 Jul 26, 2013

R T

Mkr1 710 MHz

19.03 dBm



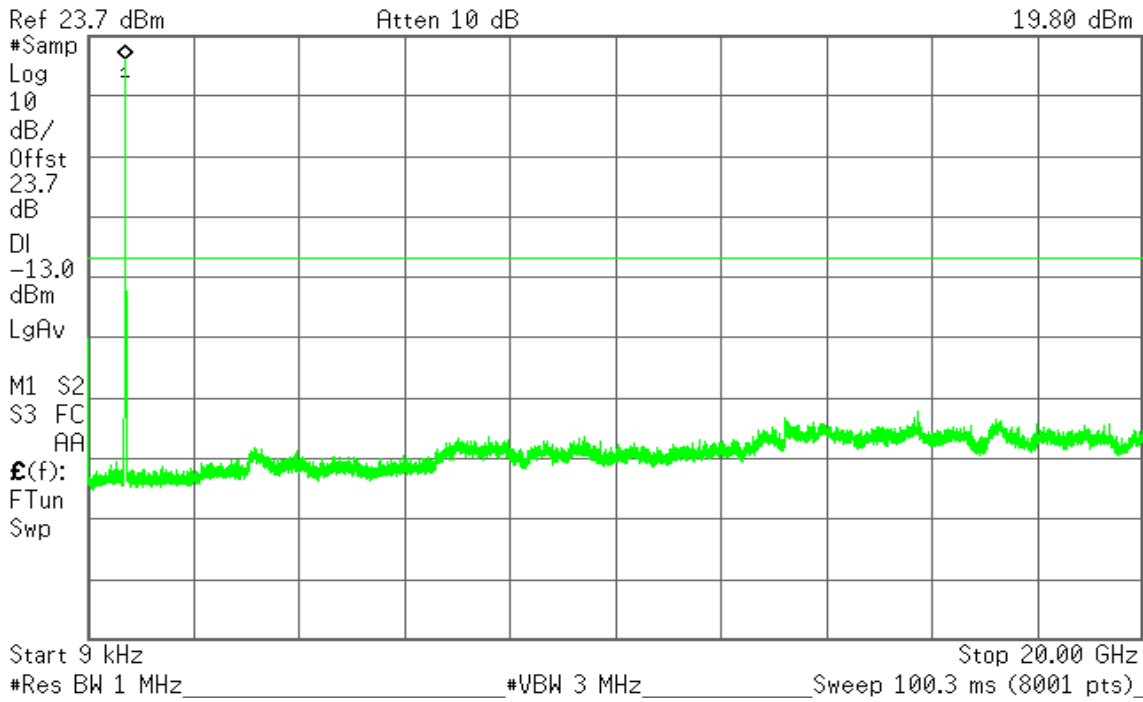


CH High

Agilent 23:46:10 Jul 26, 2013

R T

Mkr1 710 MHz
19.80 dBm



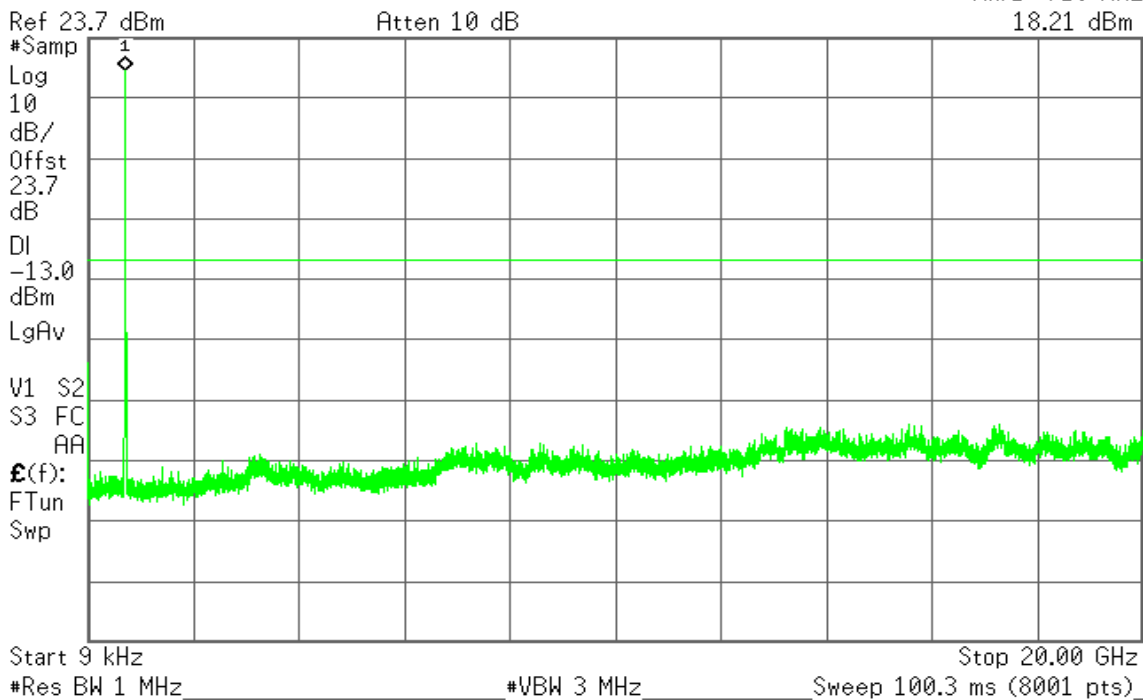
CHANNEL BANDWIDTH: 10MHz / 16QAM

CH Low

Agilent 23:46:10 Jul 26, 2013

R T

Mkr1 710 MHz
18.21 dBm



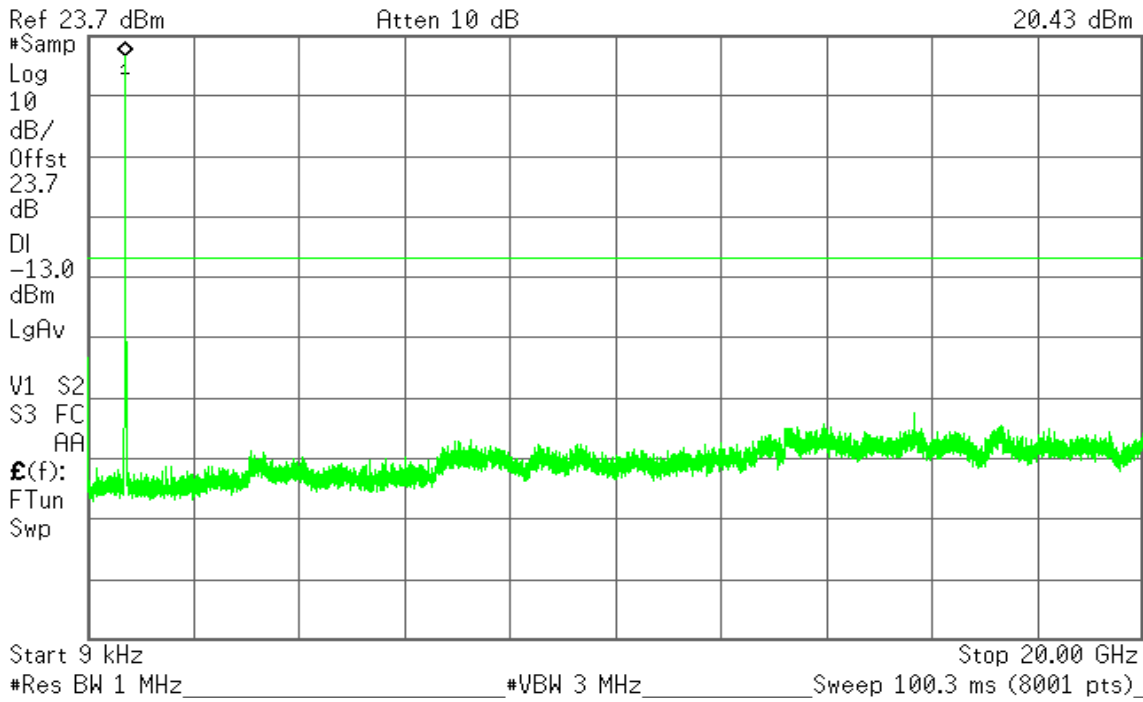


CH Mid

Agilent 23:46:10 Jul 26, 2013

R T

Mkr1 710 MHz
20.43 dBm

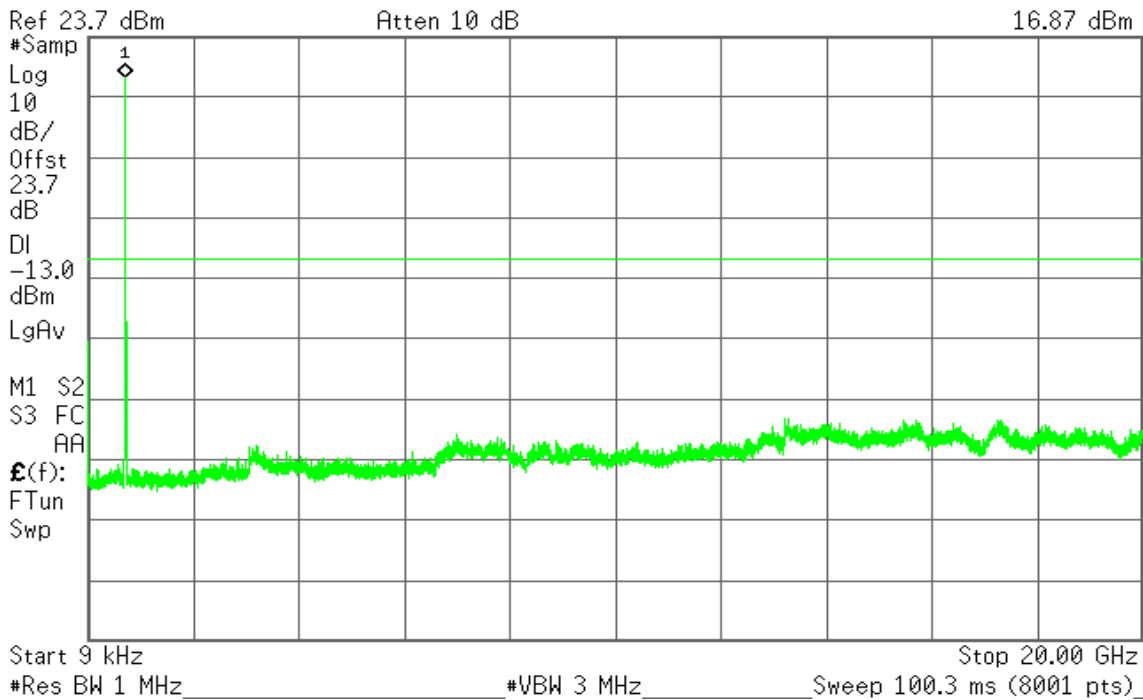


CH High

Agilent 23:46:10 Jul 26, 2013

R T

Mkr1 710 MHz
16.87 dBm





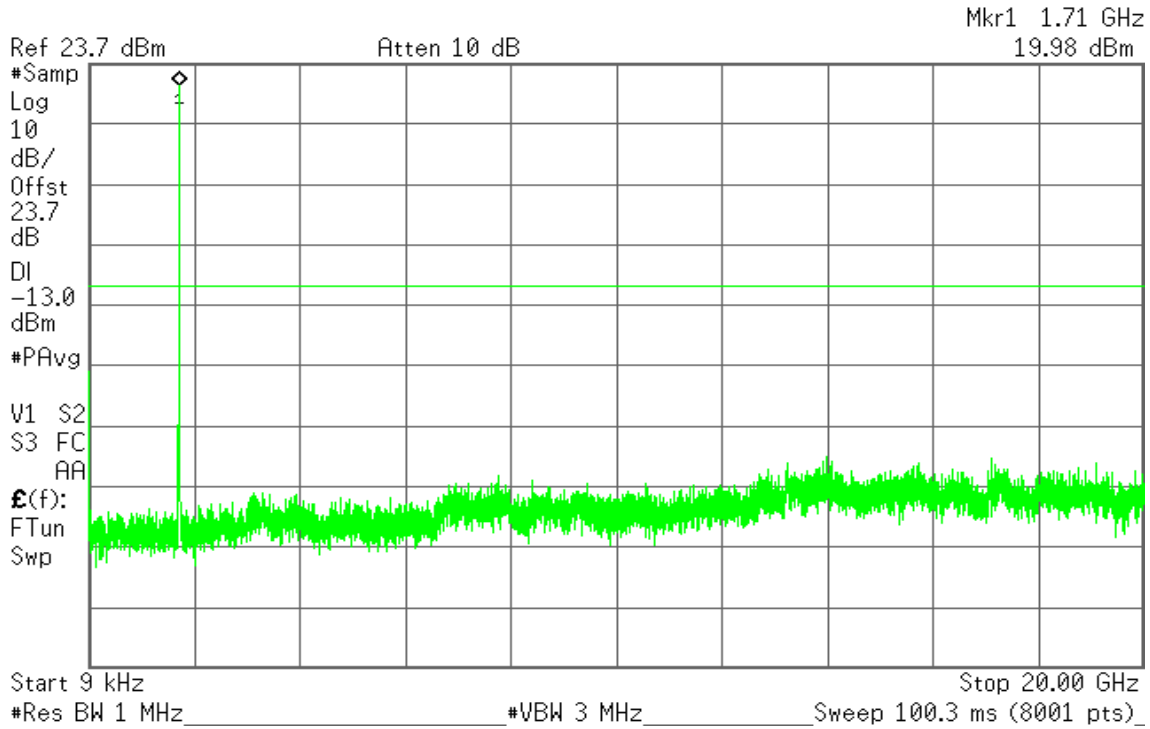
LTE Band 4

CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low

Agilent 19:46:45 Dec 6, 2013

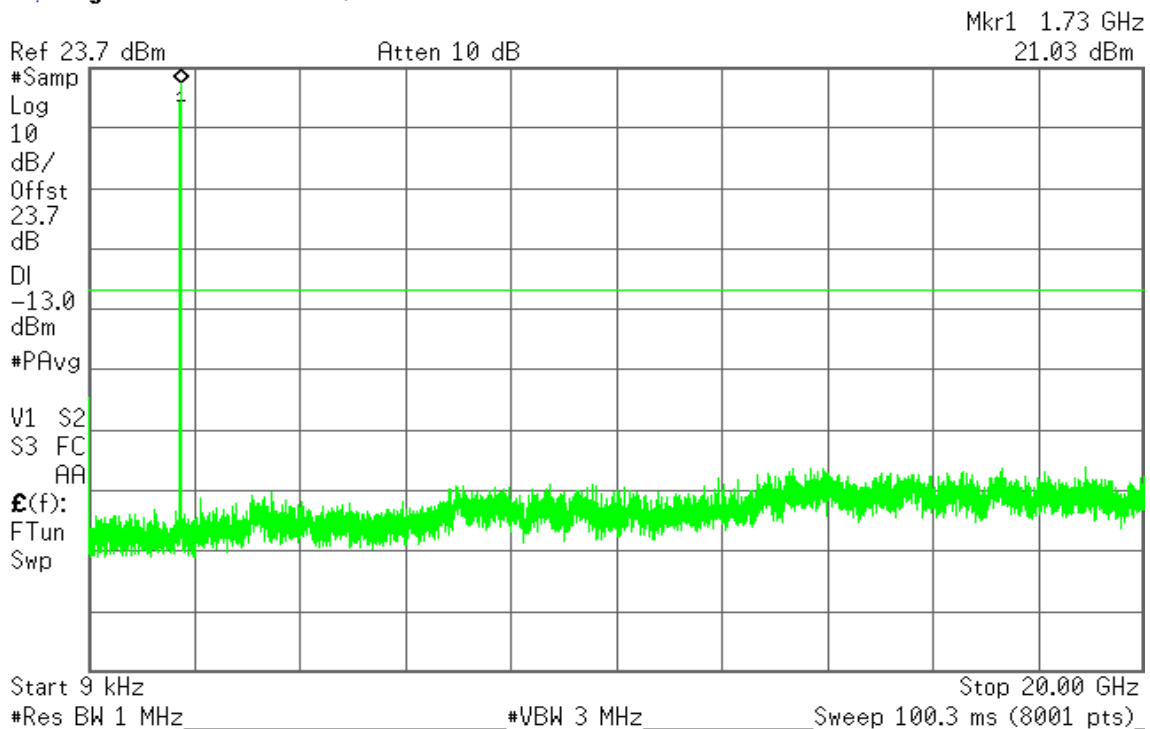
R T



CH Mid

Agilent 19:48:21 Dec 6, 2013

R T

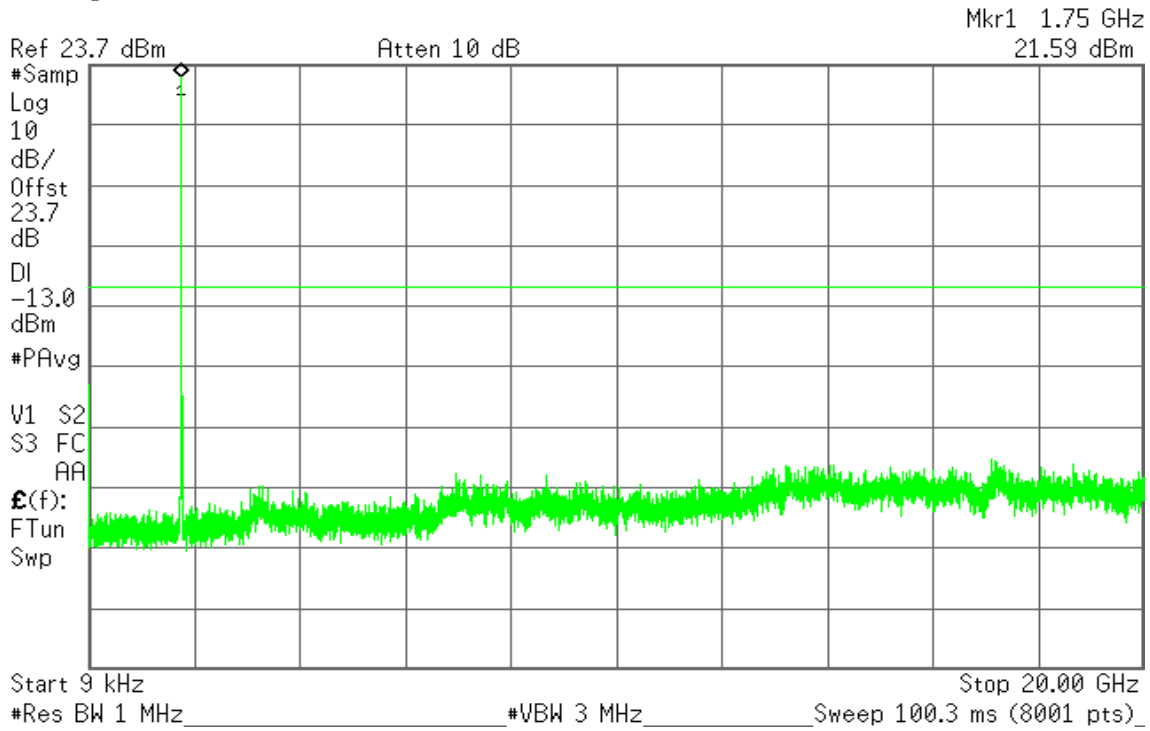




CH High

Agilent 19:49:03 Dec 6, 2013

R T

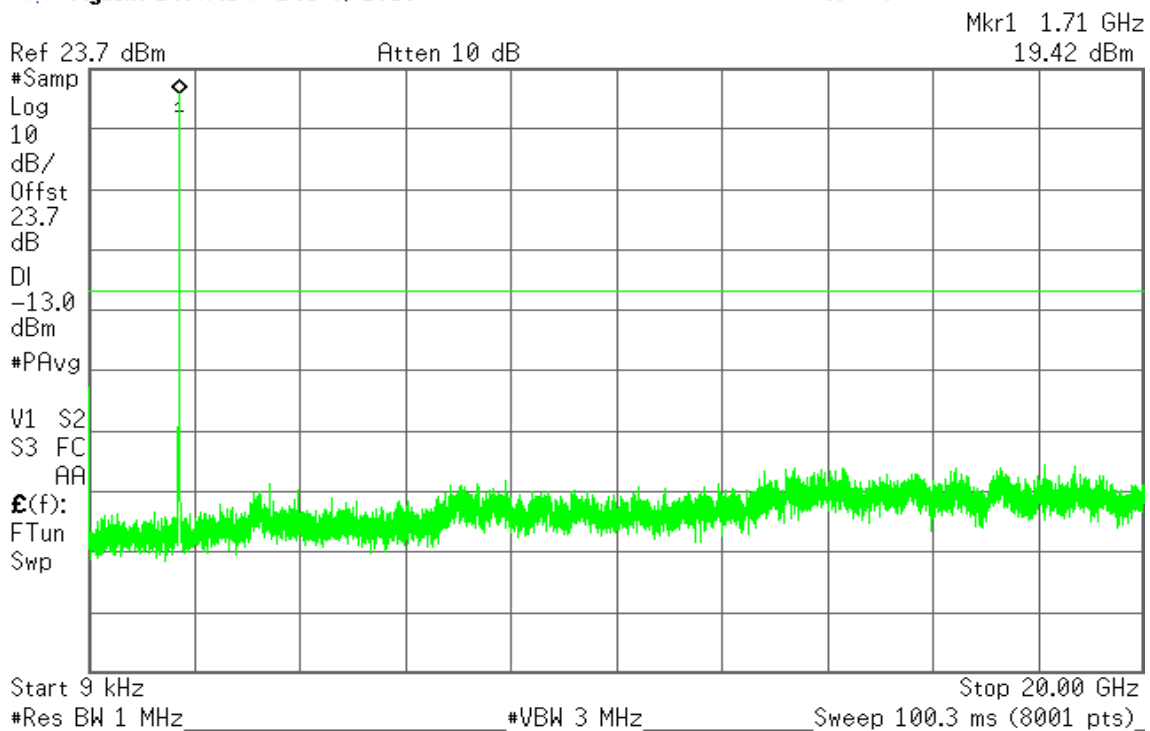


CHANNEL BANDWIDTH: 5MHz / 16QAM

CH Low

Agilent 19:47:14 Dec 6, 2013

R T

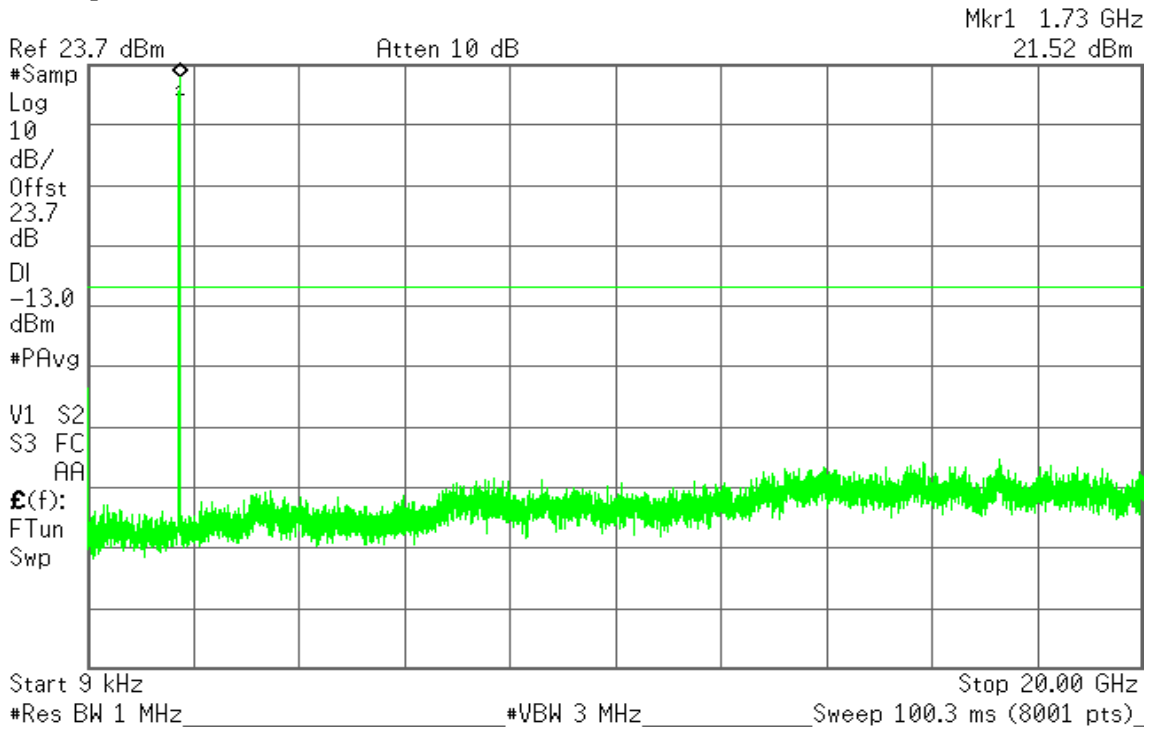




CH Mid

Agilent 19:47:54 Dec 6, 2013

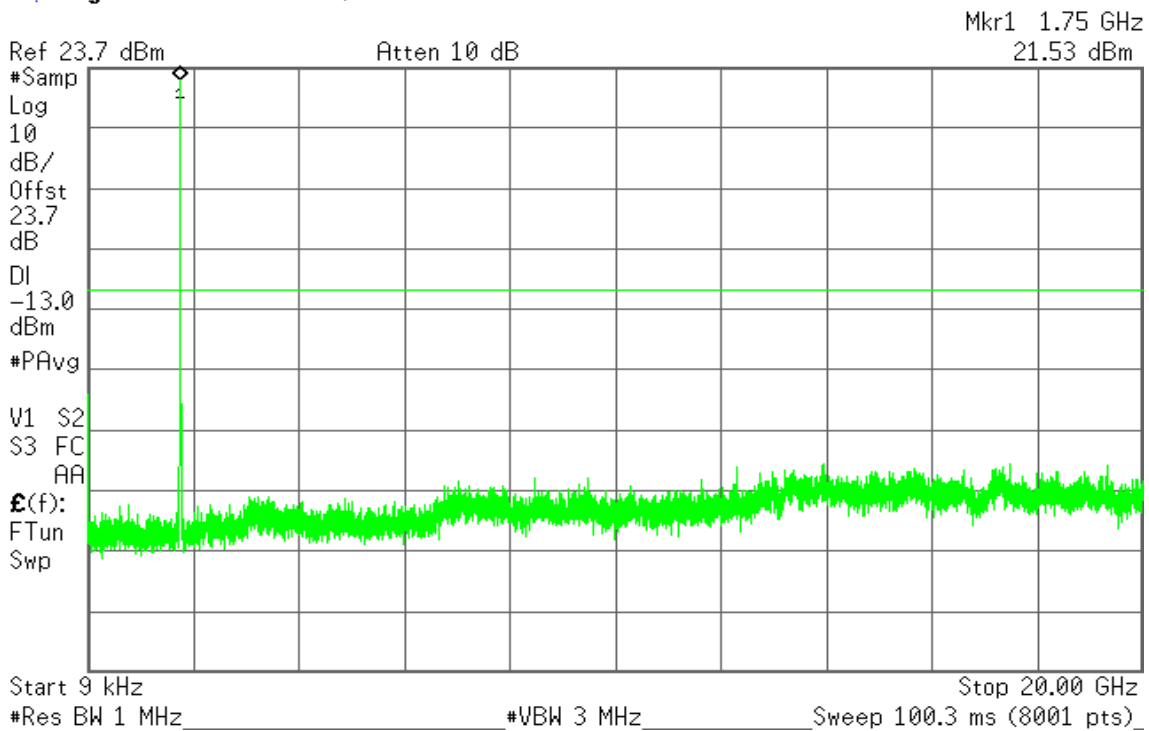
R T



CH High

Agilent 19:49:37 Dec 6, 2013

R T





CHANNEL BANDWIDTH: 10MHz / QPSK

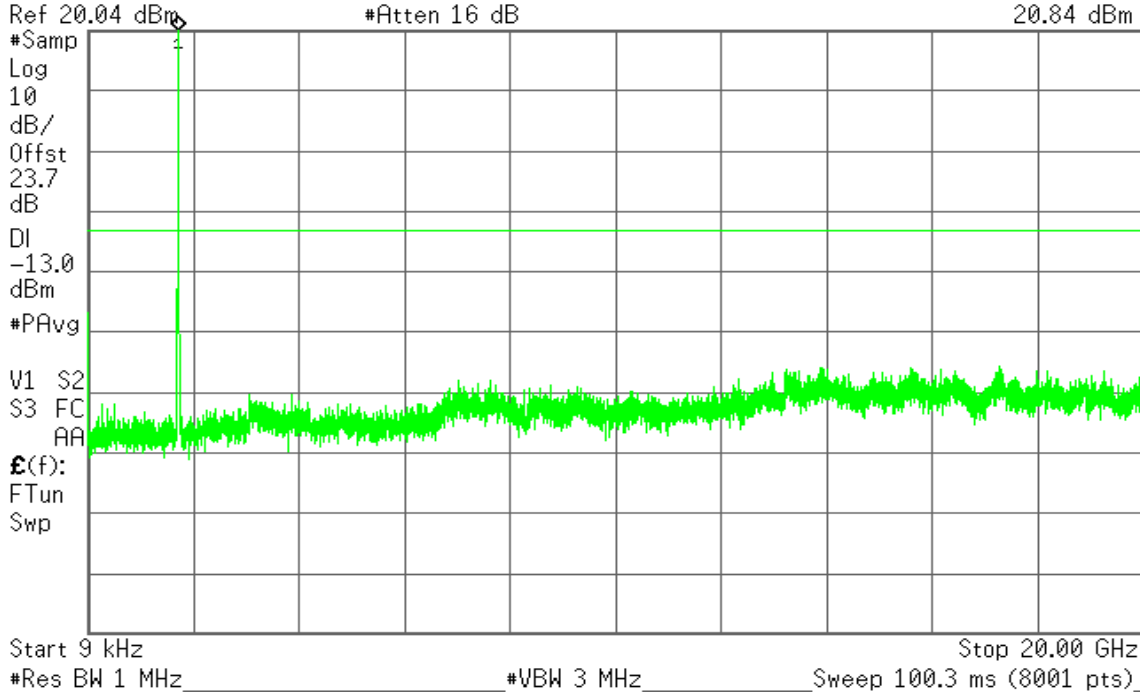
CH Low

Agilent 23:39:29 Jul 18, 2013

R T

Mkr1 1.71 GHz

20.84 dBm



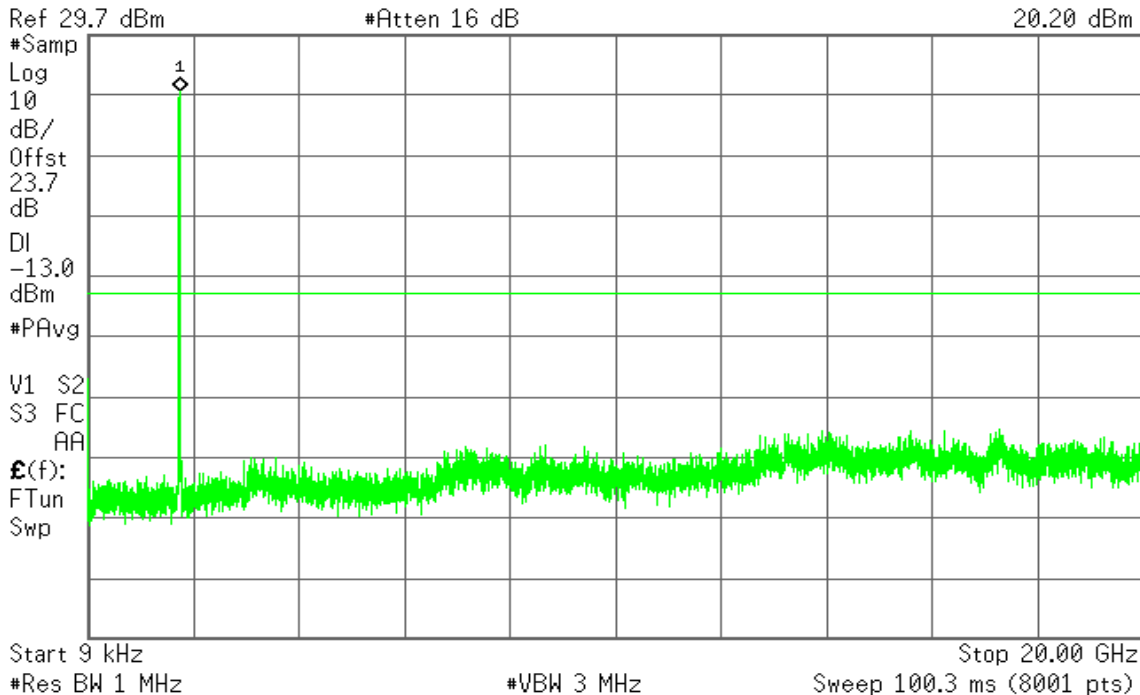
CH Mid

Agilent 00:22:30 Jul 19, 2013

R T

Mkr1 1.73 GHz

20.20 dBm



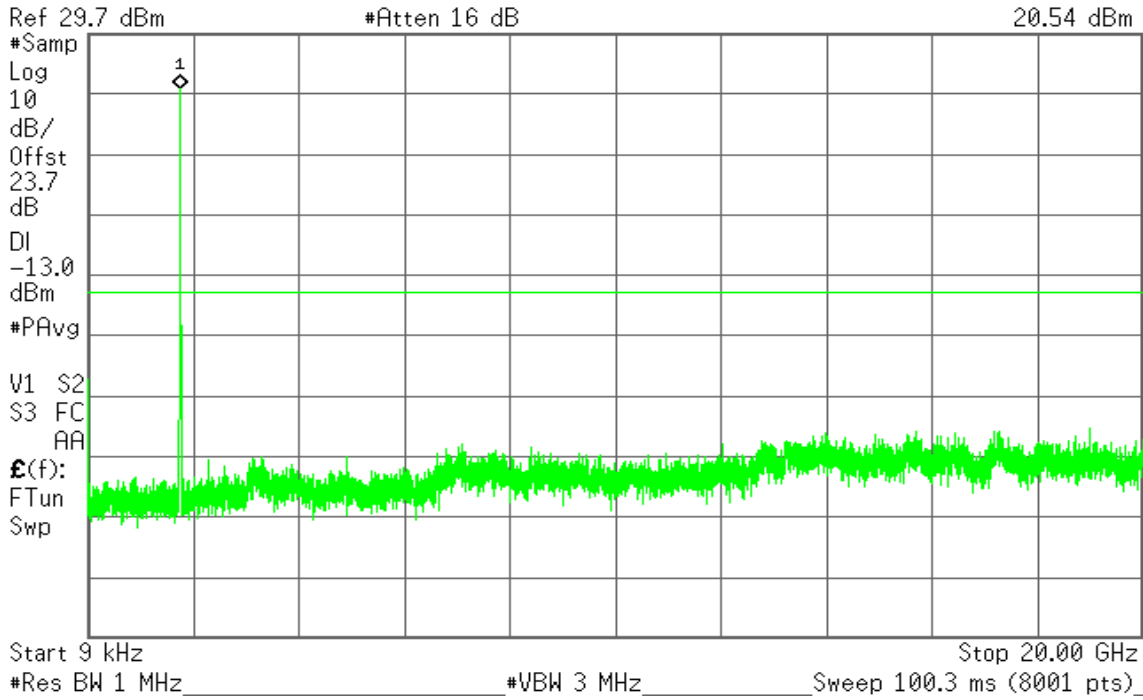


CH High

Agilent 00:23:11 Jul 19, 2013

R T

Mkr1 1.75 GHz
20.54 dBm



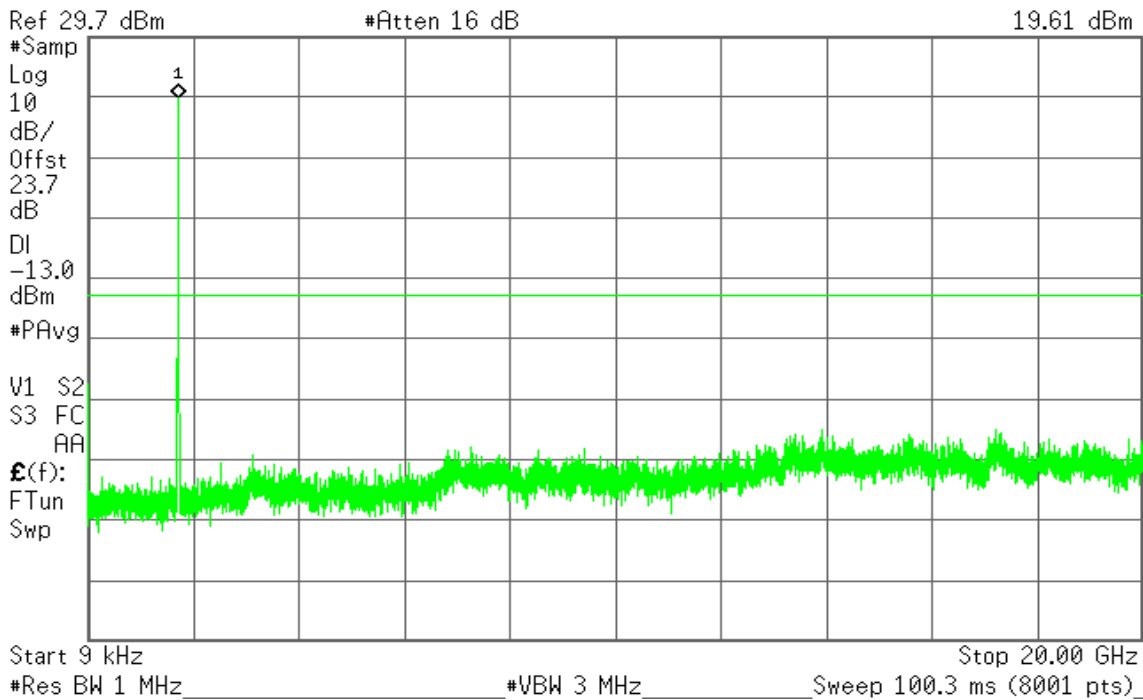
CHANNEL BANDWIDTH: 10MHz / 16QAM

CH Low

Agilent 23:46:29 Jul 18, 2013

R T

Mkr1 1.71 GHz
19.61 dBm



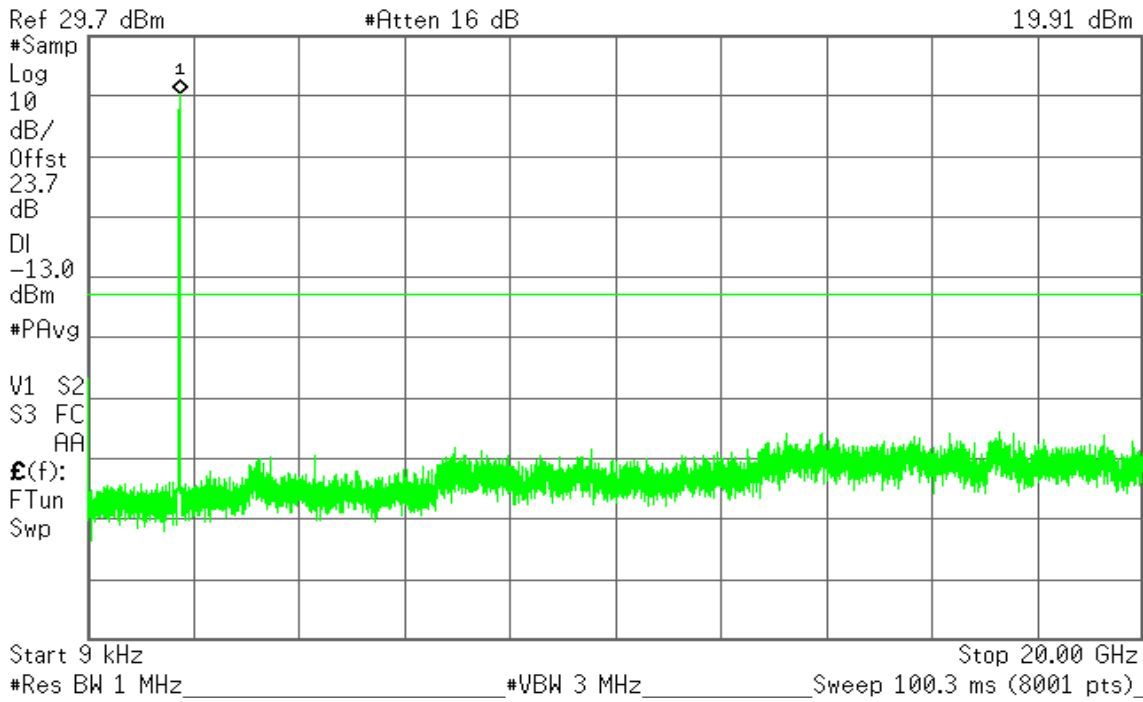


CH Mid

Agilent 00:28:08 Jul 19, 2013

R T

Mkr1 1.74 GHz
19.91 dBm

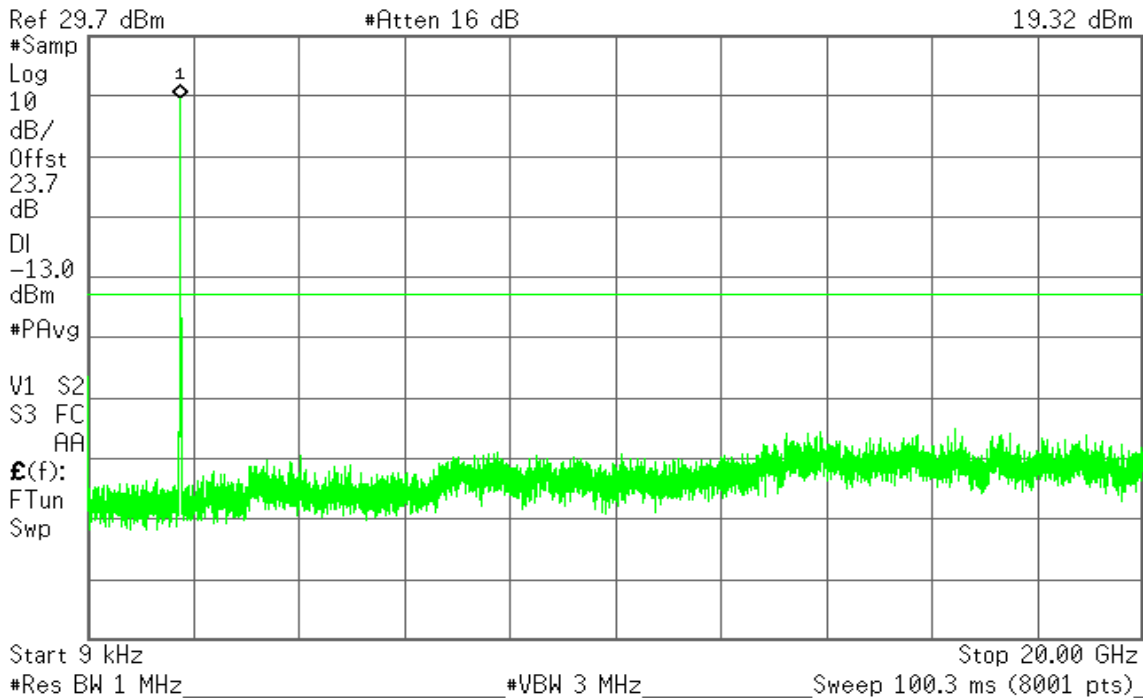


CH High

Agilent 00:27:20 Jul 19, 2013

R T

Mkr1 1.76 GHz
19.32 dBm





CHANNEL BANDWIDTH: 20MHz / QPSK

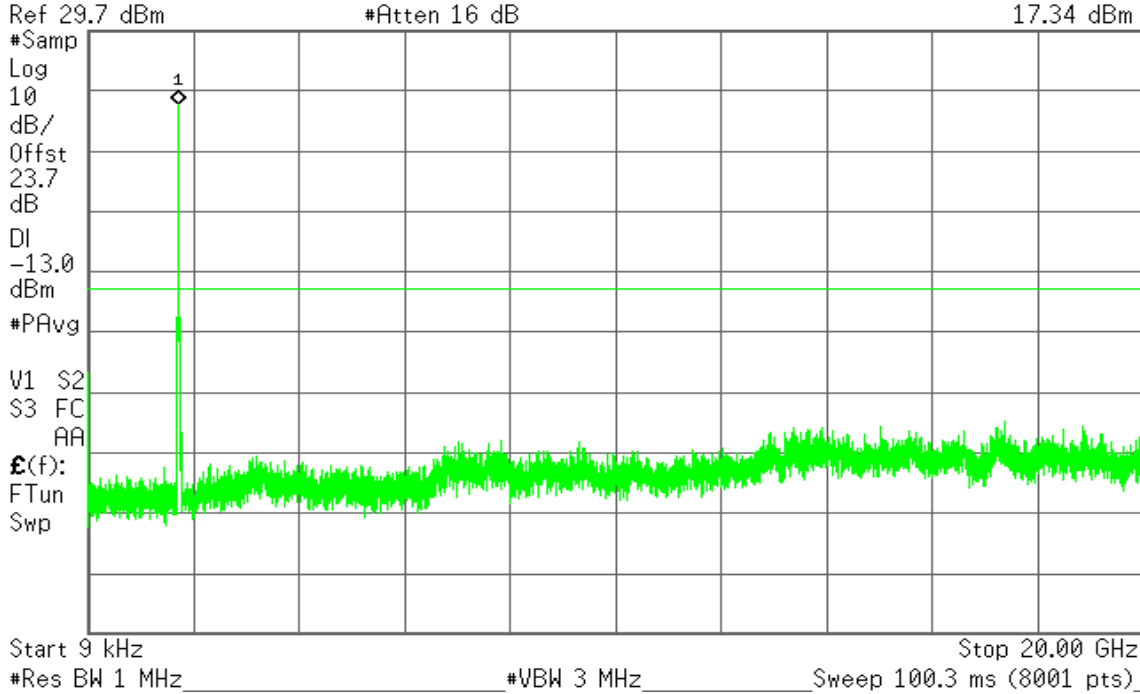
CH Low

Agilent 00:24:56 Jul 19, 2013

R T

Mkr1 1.71 GHz

17.34 dBm



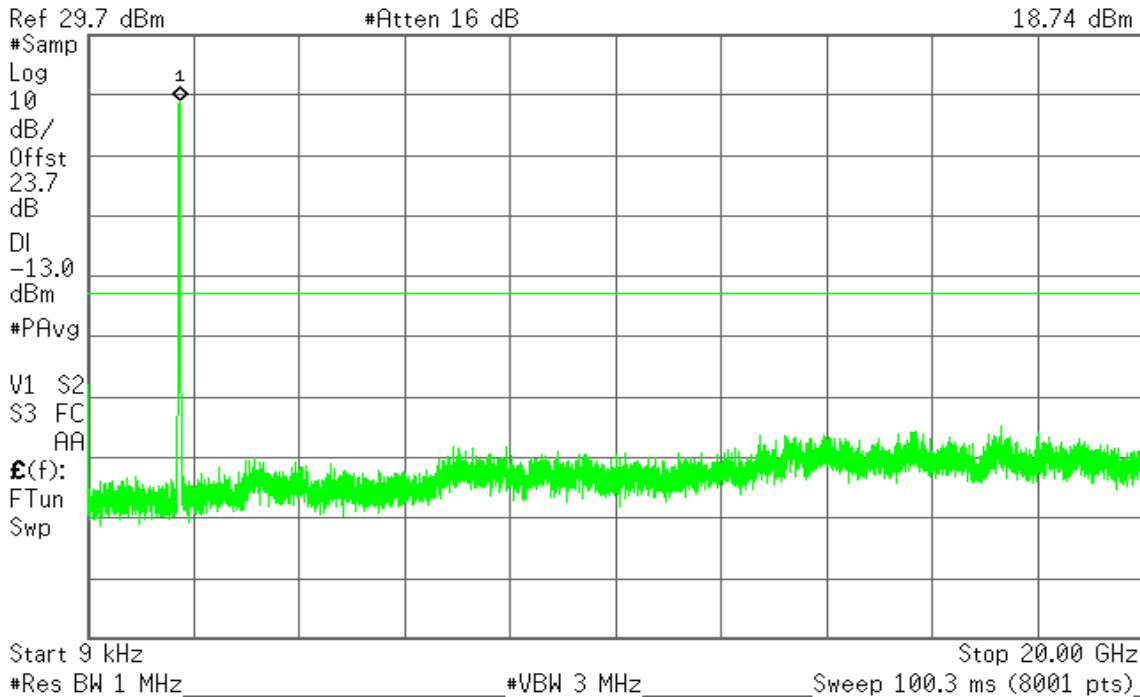
CH Mid

Agilent 00:24:14 Jul 19, 2013

R T

Mkr1 1.74 GHz

18.74 dBm



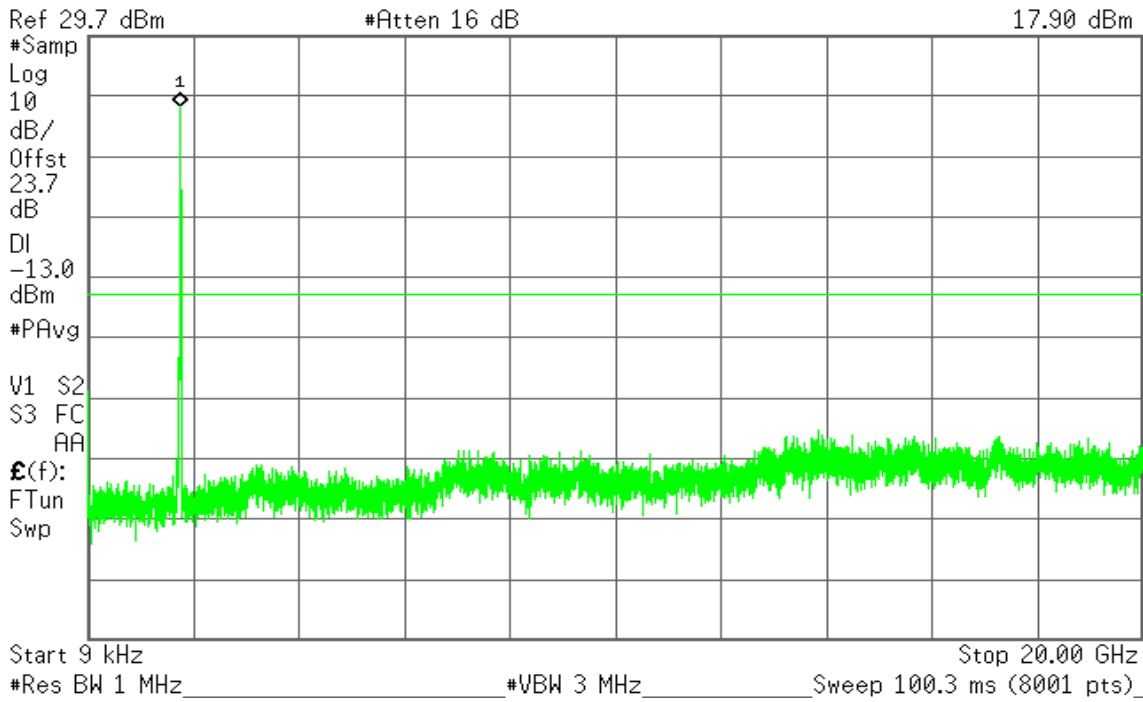


CH High

Agilent 00:23:42 Jul 19, 2013

R T

Mkr1 1.76 GHz
17.90 dBm



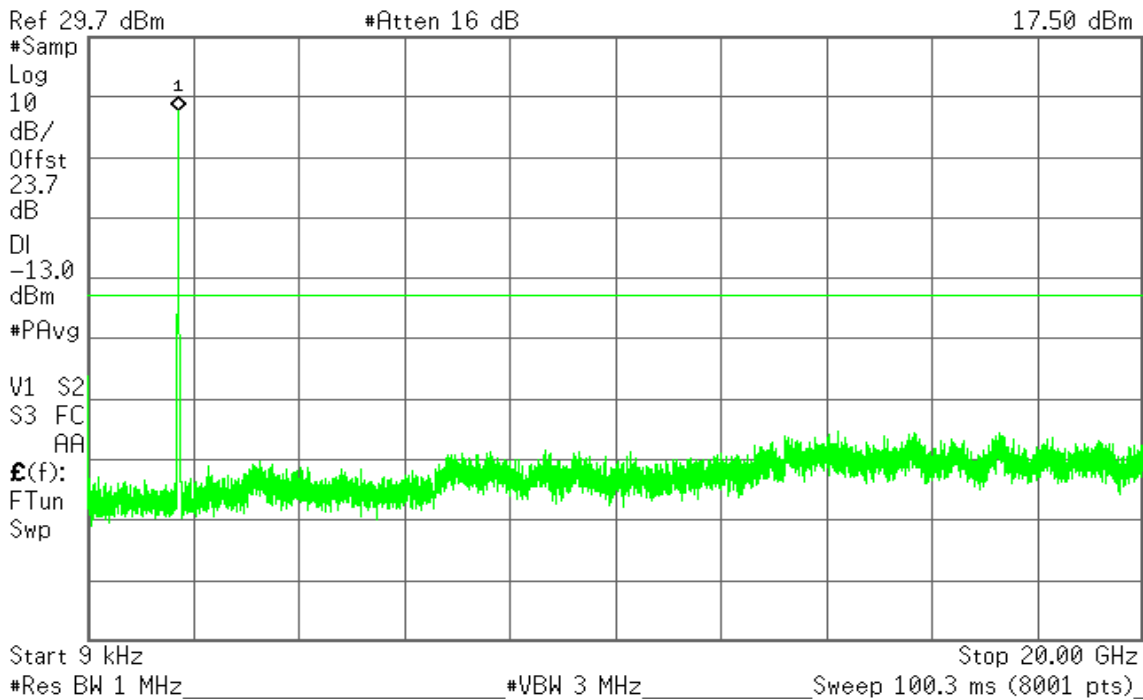
CHANNEL BANDWIDTH: 20MHz / 16QAM

CH Low

Agilent 00:25:48 Jul 19, 2013

R T

Mkr1 1.71 GHz
17.50 dBm



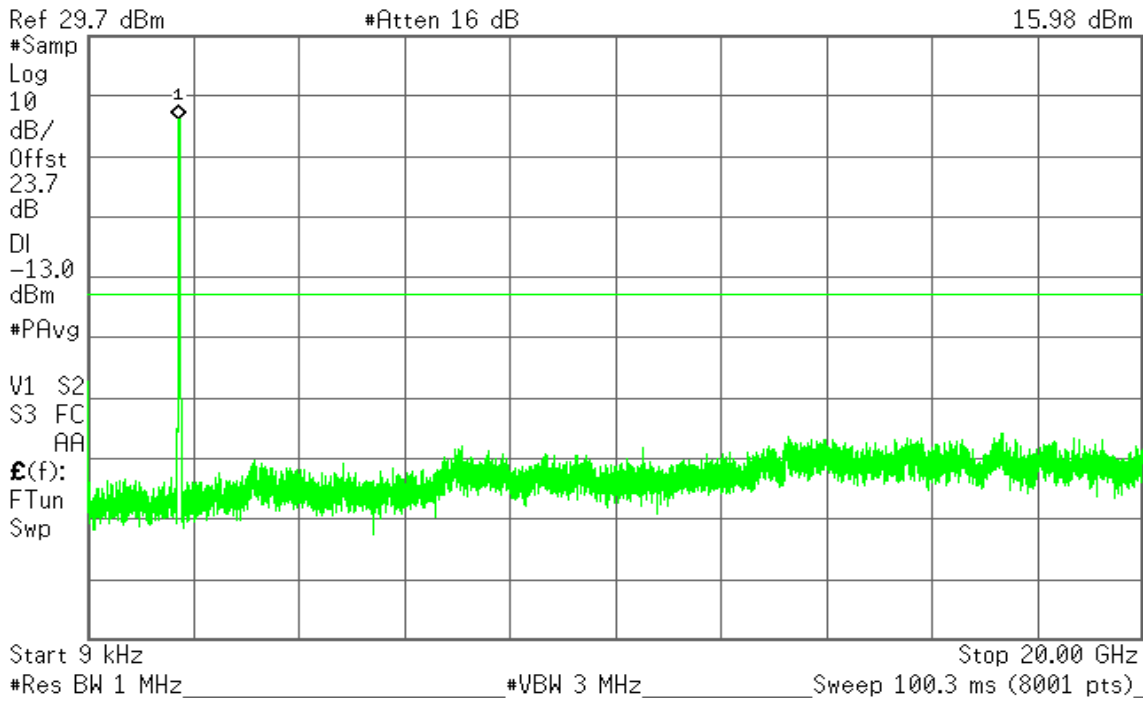


CH Mid

Agilent 00:26:17 Jul 19, 2013

R T

Mkr1 1.73 GHz
15.98 dBm

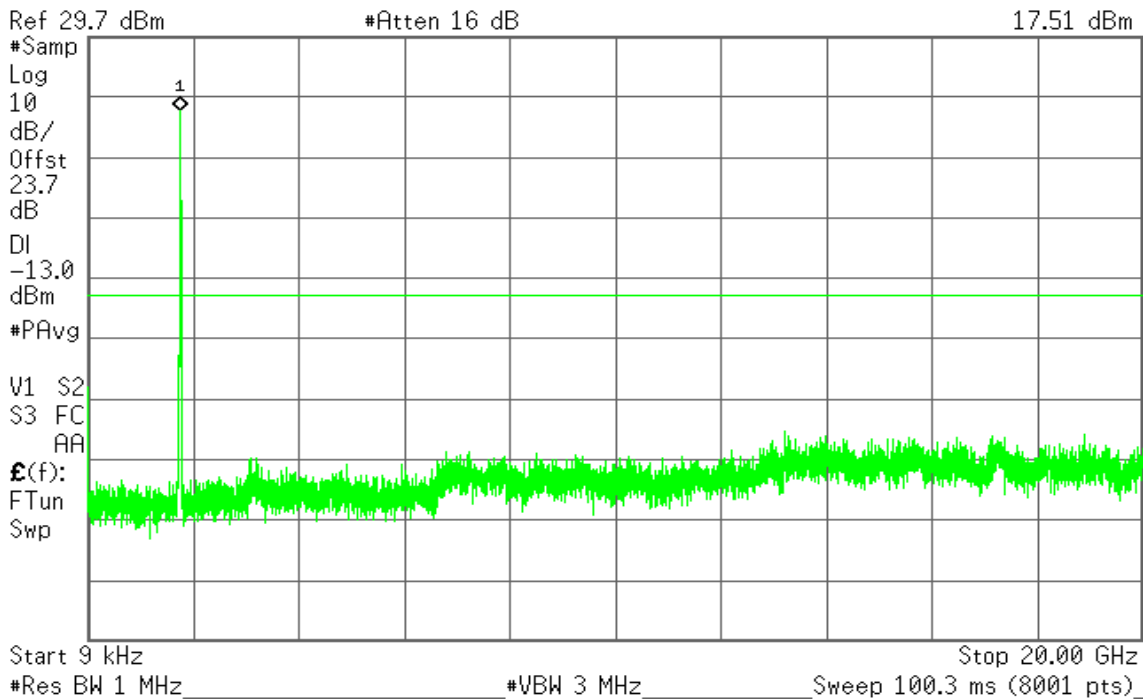


CH High

Agilent 00:26:43 Jul 19, 2013

R T

Mkr1 1.75 GHz
17.51 dBm





7.6 RADIATED EMISSION MEASUREMENT

LIMITS

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13 dBm

So the limit of emission is the same absolute specified line.

Limits	EQUIVALENT FIELD STRENGTH AT 3m (dBuV/m) (NOTE)
-13	82.22

NOTE: The following formula is used to convert the equipment radiated power to field strength.

$$E = [1000000\sqrt{(30P)}] / 3 \text{ uV/m, where P is Watts}$$

TEST PROCEDURES

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the ground.
3. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading and recorded the value.
4. Repeat step 1 ~ 3 for horizontal polarization.

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.



TEST RESULTS

Below 1GHz

LTE Band 17 / CHANNEL BANDWIDTH: 5MHz

Operation Mode:	Tx / Low channel	Test Date:	December 8, 2013
Temperature:	26°C	Tested by:	David Shu
Humidity:	60% RH	Polarity:	Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
95.9600	-64.43	1.13	0.26	-65.30	-13.00	-52.30	V
150.2800	-72.98	1.43	0.71	-73.70	-13.00	-60.70	V
303.5400	-79.18	2.11	5.67	-75.62	-13.00	-62.62	V
330.7000	-76.4	2.16	5.71	-72.85	-13.00	-59.85	V
379.2000	-79.1	2.31	5.98	-75.43	-13.00	-62.43	V
625.5800	-80.34	2.96	6.16	-77.14	-13.00	-64.14	V
101.7800	-59.81	1.16	-0.64	-61.61	-13.00	-48.61	H
161.9200	-67.67	1.5	1.61	-67.56	-13.00	-54.56	H
342.3400	-74.65	2.18	5.8	-71.03	-13.00	-58.03	H
402.4800	-74.25	2.41	5.97	-70.69	-13.00	-57.69	H
468.4400	-76.89	2.62	5.8	-73.71	-13.00	-60.71	H
624.6100	-74.62	2.96	6.15	-71.43	-13.00	-58.43	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / Middle channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
95.9600	-64.78	1.13	0.26	-65.65	-13.00	-52.65	V
150.2800	-72.91	1.43	0.71	-73.63	-13.00	-60.63	V
309.3600	-79.77	2.13	5.78	-76.12	-13.00	-63.12	V
342.3400	-76.6	2.18	5.8	-72.98	-13.00	-59.98	V
382.1100	-77.83	2.31	5.99	-74.15	-13.00	-61.15	V
402.4800	-80.56	2.41	5.97	-77.00	-13.00	-64.00	V
101.7800	-60.26	1.16	-0.64	-62.06	-13.00	-49.06	H
150.2800	-64.8	1.43	0.71	-65.52	-13.00	-52.52	H
339.4300	-75.63	2.17	5.79	-72.01	-13.00	-59.01	H
402.4800	-74.02	2.41	5.97	-70.46	-13.00	-57.46	H
459.7100	-77.34	2.6	5.88	-74.06	-13.00	-61.06	H
616.8500	-75.7	2.94	6.16	-72.48	-13.00	-59.48	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
101.7800	-64.11	1.16	-0.64	-65.91	-13.00	-52.91	V
150.2800	-73.24	1.43	0.71	-73.96	-13.00	-60.96	V
195.8700	-80.38	1.63	3.36	-78.65	-13.00	-65.65	V
297.7200	-78.68	2.08	5.55	-75.21	-13.00	-62.21	V
342.3400	-76.19	2.18	5.8	-72.57	-13.00	-59.57	V
448.0700	-80.61	2.58	5.74	-77.45	-13.00	-64.45	V
71.7100	-58.66	0.97	-1.61	-61.24	-13.00	-48.24	H
101.7800	-60.48	1.16	-0.64	-62.28	-13.00	-49.28	H
150.2800	-64.81	1.43	0.71	-65.53	-13.00	-52.53	H
342.3400	-74.76	2.18	5.8	-71.14	-13.00	-58.14	H
402.4800	-74.05	2.41	5.97	-70.49	-13.00	-57.49	H
459.7100	-76.48	2.6	5.88	-73.20	-13.00	-60.20	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



LTE Band 17 / CHANNEL BANDWIDTH: 10MHz

Operation Mode: Tx / Low channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
71.7100	-59.3	0.97	-1.61	-61.88	-13.00	-48.88	V
150.2800	-68.92	1.43	0.71	-69.64	-13.00	-56.64	V
251.1600	-82.48	1.84	5.69	-78.63	-13.00	-65.63	V
354.9500	-75.62	2.25	5.75	-72.12	-13.00	-59.12	V
448.0700	-79.02	2.58	5.74	-75.86	-13.00	-62.86	V
529.5500	-81.21	2.75	6	-77.96	-13.00	-64.96	V
71.7100	-48.59	0.97	-1.61	-51.17	-13.00	-38.17	H
150.2800	-60.21	1.43	0.71	-60.93	-13.00	-47.93	H
234.6700	-73.6	1.8	5.38	-70.02	-13.00	-57.02	H
321.9700	-72.52	2.18	5.7	-69.00	-13.00	-56.00	H
369.5000	-72.08	2.3	5.8	-68.58	-13.00	-55.58	H
499.4800	-74.66	2.7	5.89	-71.47	-13.00	-58.47	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / Middle channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
101.7800	-61.43	1.16	-0.64	-63.23	-13.00	-50.23	V
150.2800	-69.06	1.43	0.71	-69.78	-13.00	-56.78	V
251.1600	-81.37	1.84	5.69	-77.52	-13.00	-64.52	V
354.9500	-76.19	2.25	5.75	-72.69	-13.00	-59.69	V
450.9800	-79	2.59	5.74	-75.85	-13.00	-62.85	V
516.9400	-80.47	2.7	6.07	-77.10	-13.00	-64.10	V
71.7100	-48.64	0.97	-1.61	-51.22	-13.00	-38.22	H
150.2800	-60.69	1.43	0.71	-61.41	-13.00	-48.41	H
234.6700	-72.95	1.8	5.38	-69.37	-13.00	-56.37	H
319.0600	-72.16	2.17	5.71	-68.62	-13.00	-55.62	H
357.8600	-70.89	2.26	5.72	-67.43	-13.00	-54.43	H
505.3000	-75.86	2.69	5.95	-72.60	-13.00	-59.60	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
71.7100	-59.56	0.97	-1.61	-62.14	-13.00	-49.14	V
150.2800	-68.85	1.43	0.71	-69.57	-13.00	-56.57	V
187.1400	-76.54	1.62	3.89	-74.27	-13.00	-61.27	V
354.9500	-75.39	2.25	5.75	-71.89	-13.00	-58.89	V
450.9800	-79.18	2.59	5.74	-76.03	-13.00	-63.03	V
529.5500	-81.03	2.75	6	-77.78	-13.00	-64.78	V
71.7100	-48.35	0.97	-1.61	-50.93	-13.00	-37.93	H
150.2800	-61.05	1.43	0.71	-61.77	-13.00	-48.77	H
231.7600	-74.9	1.8	5.4	-71.30	-13.00	-58.30	H
357.8600	-69.65	2.26	5.72	-66.19	-13.00	-53.19	H
459.7100	-74.42	2.6	5.88	-71.14	-13.00	-58.14	H
511.1200	-76.17	2.69	6.01	-72.85	-13.00	-59.85	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**LTE Band 4 / CHANNEL BANDWIDTH: 5MHz**

Operation Mode: Tx / Low channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
101.7800	-63.8	1.16	-0.64	-65.60	-13.00	-52.60	V
150.2800	-72.57	1.43	0.71	-73.29	-13.00	-60.29	V
342.3400	-75.86	2.18	5.8	-72.24	-13.00	-59.24	V
448.0700	-81.16	2.58	5.74	-78.00	-13.00	-65.00	V
733.2500	-74.87	3.19	6.31	-71.75	-13.00	-58.75	V
857.4100	-73.53	3.42	6.4	-70.55	-13.00	-57.55	V
71.7100	-58.48	0.97	-1.61	-61.06	-13.00	-48.06	H
150.2800	-64.89	1.43	0.71	-65.61	-13.00	-52.61	H
390.8400	-74.63	2.32	6	-70.95	-13.00	-57.95	H
699.3000	-69.66	3.11	6.4	-66.37	-13.00	-53.37	H
836.0700	-68.39	3.4	6.36	-65.43	-13.00	-52.43	H
960.2300	-70.37	3.67	6.39	-67.65	-13.00	-54.65	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / Middle channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
101.7800	-63.78	1.16	-0.64	-65.58	-13.00	-52.58	V
150.2800	-72.93	1.43	0.71	-73.65	-13.00	-60.65	V
342.3400	-75.53	2.18	5.8	-71.91	-13.00	-58.91	V
721.6100	-77.49	3.17	6.49	-74.17	-13.00	-61.17	V
733.2500	-76.5	3.19	6.31	-73.38	-13.00	-60.38	V
862.2600	-73.57	3.43	6.43	-70.57	-13.00	-57.57	V
101.7800	-59.89	1.16	-0.64	-61.69	-13.00	-48.69	H
150.2800	-64.68	1.43	0.71	-65.40	-13.00	-52.40	H
342.3400	-73.82	2.18	5.8	-70.20	-13.00	-57.20	H
616.8500	-75.68	2.94	6.16	-72.46	-13.00	-59.46	H
699.3000	-70.33	3.11	6.4	-67.04	-13.00	-54.04	H
867.1100	-73.02	3.44	6.48	-69.98	-13.00	-56.98	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the ackground noise floor.*



Operation Mode: Tx / High channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
101.7800	-63.81	1.16	-0.64	-65.61	-13.00	-52.61	V
342.3400	-75.93	2.18	5.8	-72.31	-13.00	-59.31	V
509.1800	-81.1	2.69	5.99	-77.80	-13.00	-64.80	V
637.2200	-80.41	3	6.15	-77.26	-13.00	-64.26	V
733.2500	-76.16	3.19	6.31	-73.04	-13.00	-60.04	V
852.5600	-73.34	3.41	6.4	-70.35	-13.00	-57.35	V
71.7100	-58.77	0.97	-1.61	-61.35	-13.00	-48.35	H
150.2800	-63.94	1.43	0.71	-64.66	-13.00	-51.66	H
390.8400	-74.45	2.32	6	-70.77	-13.00	-57.77	H
666.3200	-72.53	3.07	6.3	-69.30	-13.00	-56.30	H
699.3000	-70.2	3.11	6.4	-66.91	-13.00	-53.91	H
862.2600	-72.03	3.43	6.43	-69.03	-13.00	-56.03	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



LTE Band 4 / CHANNEL BANDWIDTH: 10MHz

Operation Mode: Tx / Low channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
71.7100	-60.26	0.97	-1.61	-62.84	-13.00	-49.84	V
150.2800	-68.82	1.43	0.71	-69.54	-13.00	-56.54	V
309.3600	-79.62	2.13	5.78	-75.97	-13.00	-62.97	V
354.9500	-76.42	2.25	5.75	-72.92	-13.00	-59.92	V
448.0700	-77.44	2.58	5.74	-74.28	-13.00	-61.28	V
769.1400	-76.71	3.27	6.39	-73.59	-13.00	-60.59	V
71.7100	-48.92	0.97	-1.61	-51.50	-13.00	-38.50	H
150.2800	-60.46	1.43	0.71	-61.18	-13.00	-48.18	H
234.6700	-73.56	1.8	5.38	-69.98	-13.00	-56.98	H
369.5000	-71.23	2.3	5.8	-67.73	-13.00	-54.73	H
529.5500	-76.62	2.75	6	-73.37	-13.00	-60.37	H
604.2400	-76.21	2.92	6.36	-72.77	-13.00	-59.77	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / Middle channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
71.7100	-59.95	0.97	-1.61	-62.53	-13.00	-49.53	V
150.2800	-68.79	1.43	0.71	-69.51	-13.00	-56.51	V
309.3600	-79.99	2.13	5.78	-76.34	-13.00	-63.34	V
354.9500	-76.77	2.25	5.75	-73.27	-13.00	-60.27	V
448.0700	-78.88	2.58	5.74	-75.72	-13.00	-62.72	V
733.2500	-78.12	3.19	6.31	-75.00	-13.00	-62.00	V
71.7100	-49.06	0.97	-1.61	-51.64	-13.00	-38.64	H
120.2100	-56.91	1.27	-2.06	-60.24	-13.00	-47.24	H
231.7600	-73.21	1.8	5.4	-69.61	-13.00	-56.61	H
312.2700	-71.44	2.14	5.76	-67.82	-13.00	-54.82	H
369.5000	-70.72	2.3	5.8	-67.22	-13.00	-54.22	H
499.4800	-75.76	2.7	5.89	-72.57	-13.00	-59.57	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
71.7100	-60.25	0.97	-1.61	-62.83	-13.00	-49.83	V
150.2800	-68.77	1.43	0.71	-69.49	-13.00	-56.49	V
256.0100	-81.84	1.88	5.63	-78.09	-13.00	-65.09	V
354.9500	-77	2.25	5.75	-73.50	-13.00	-60.50	V
448.0700	-78.87	2.58	5.74	-75.71	-13.00	-62.71	V
516.9400	-80.49	2.7	6.07	-77.12	-13.00	-64.12	V
71.7100	-49.3	0.97	-1.61	-51.88	-13.00	-38.88	H
150.2800	-60.21	1.43	0.71	-60.93	-13.00	-47.93	H
234.6700	-74.84	1.8	5.38	-71.26	-13.00	-58.26	H
357.8600	-71.08	2.26	5.72	-67.62	-13.00	-54.62	H
402.4800	-71.96	2.41	5.97	-68.40	-13.00	-55.40	H
511.1200	-75.8	2.69	6.01	-72.48	-13.00	-59.48	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



LTE Band 4 / CHANNEL BANDWIDTH: 20MHz

Operation Mode: Tx / Low channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
71.7100	-59.76	0.97	-1.61	-62.34	-13.00	-49.34	V
150.2800	-68.75	1.43	0.71	-69.47	-13.00	-56.47	V
249.2200	-82.77	1.84	5.65	-78.96	-13.00	-65.96	V
354.9500	-76.25	2.25	5.75	-72.75	-13.00	-59.75	V
450.9800	-79.15	2.59	5.74	-76.00	-13.00	-63.00	V
516.9400	-80.17	2.7	6.07	-76.80	-13.00	-63.80	V
71.7100	-48.96	0.97	-1.61	-51.54	-13.00	-38.54	H
120.2100	-57.46	1.27	-2.06	-60.79	-13.00	-47.79	H
222.0600	-74.96	1.77	5.34	-71.39	-13.00	-58.39	H
312.2700	-72.09	2.14	5.76	-68.47	-13.00	-55.47	H
390.8400	-70.73	2.32	6	-67.05	-13.00	-54.05	H
505.3000	-76.05	2.69	5.95	-72.79	-13.00	-59.79	H

Remark:

3. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / Middle channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
101.7800	-61.07	1.16	-0.64	-62.87	-13.00	-49.87	V
150.2800	-68.9	1.43	0.71	-69.62	-13.00	-56.62	V
256.0100	-82.37	1.88	5.63	-78.62	-13.00	-65.62	V
354.9500	-76.81	2.25	5.75	-73.31	-13.00	-60.31	V
448.0700	-78.35	2.58	5.74	-75.19	-13.00	-62.19	V
516.9400	-80.48	2.7	6.07	-77.11	-13.00	-64.11	V
71.7100	-49	0.97	-1.61	-51.58	-13.00	-38.58	H
150.2800	-60.11	1.43	0.71	-60.83	-13.00	-47.83	H
295.7800	-74.23	2.07	5.52	-70.78	-13.00	-57.78	H
342.3400	-71.11	2.18	5.8	-67.49	-13.00	-54.49	H
472.3200	-75.87	2.62	5.72	-72.77	-13.00	-59.77	H
529.5500	-76.39	2.75	6	-73.14	-13.00	-60.14	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
71.7100	-59.73	0.97	-1.61	-62.31	-13.00	-49.31	V
150.2800	-69.09	1.43	0.71	-69.81	-13.00	-56.81	V
309.3600	-79.31	2.13	5.78	-75.66	-13.00	-62.66	V
354.9500	-76.72	2.25	5.75	-73.22	-13.00	-60.22	V
450.9800	-78.07	2.59	5.74	-74.92	-13.00	-61.92	V
511.1200	-81.1	2.69	6.01	-77.78	-13.00	-64.78	V
71.7100	-48.94	0.97	-1.61	-51.52	-13.00	-38.52	H
120.2100	-57.64	1.27	-2.06	-60.97	-13.00	-47.97	H
234.6700	-74.53	1.8	5.38	-70.95	-13.00	-57.95	H
369.5000	-71.03	2.3	5.8	-67.53	-13.00	-54.53	H
499.4800	-74.57	2.7	5.89	-71.38	-13.00	-58.38	H
601.3300	-75.72	2.91	6.39	-72.24	-13.00	-59.24	H

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Above 1GHz

LTE Band 17 / CHANNEL BANDWIDTH: 5MHz

Operation Mode: Tx / Low channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
2120.000	-44.07	5.81	5.57	-44.31	-13.00	-31.31	V
2827.000	-50.99	6.9	6.95	-50.94	-13.00	-37.94	V
4983.000	-50.19	9.38	10.57	-49.00	-13.00	-36.00	V
N/A							
2120.000	-44.07	5.81	5.57	-44.31	-13.00	-31.31	H
2827.000	-53.93	6.9	6.95	-53.88	-13.00	-40.88	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / Middle channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
2127.000	-46.71	5.83	5.58	-46.96	-13.00	-33.96	V
2841.000	-53.77	6.95	6.99	-53.73	-13.00	-40.73	V
4983.000	-50.83	9.38	10.57	-49.64	-13.00	-36.64	V
N/A							
2127.000	-47.21	5.83	5.58	-47.46	-13.00	-34.46	H
2841.000	-53.45	6.95	6.99	-53.41	-13.00	-40.41	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
2155.000	-40.81	5.87	5.62	-41.06	-13.00	-28.06	V
2862.000	-51.12	7.02	7.04	-51.10	-13.00	-38.10	V
4990.000	-49.76	9.39	10.58	-48.57	-13.00	-35.57	V
N/A							
2148.000	-39.72	5.86	5.61	-39.97	-13.00	-26.97	H
2862.000	-53.33	7.02	7.04	-53.31	-13.00	-40.31	H
4997.000	-52.28	9.41	10.6	-51.09	-13.00	-38.09	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



LTE Band 17 / CHANNEL BANDWIDTH: 10MHz

Operation Mode: Tx / Low channel **Test Date:** July 22, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1756.000	-42.05	5.21	5.84	-41.42	-13.00	-28.42	V
2834.000	-55.19	6.93	6.97	-55.15	-13.00	-42.15	V
N/A							
1420.000	-50.48	4.68	5.72	-49.44	-13.00	-36.44	H
1749.000	-37.77	5.2	5.85	-37.12	-13.00	-24.12	H
2134.000	-46.34	5.84	5.59	-46.59	-13.00	-33.59	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / Middle channel **Test Date:** July 22, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1749.000	-44.02	5.2	5.85	-43.37	-13.00	-30.37	V
2841.000	-54.05	6.95	6.99	-54.01	-13.00	-41.01	V
N/A							
1420.000	-48.34	4.68	5.72	-47.30	-13.00	-34.30	H
2127.000	-44.86	5.83	5.58	-45.11	-13.00	-32.11	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
2841.000	-54.16	6.95	6.99	-54.12	-13.00	-41.12	V
4934.000	-53.77	9.31	10.49	-52.59	-13.00	-39.59	V
N/A							
2120.000	-48.03	5.81	5.57	-48.27	-13.00	-35.27	H
3520.000	-56.43	7.92	8.92	-55.43	-13.00	-42.43	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



LTE Band 4 / CHANNEL BANDWIDTH: 5MHz

Operation Mode: Tx / Low channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3422.000	-45.39	7.64	8.67	-44.36	-13.00	-31.36	V
5137.000	-48.5	9.49	10.65	-47.34	-13.00	-34.34	V
6852.000	-46.12	11.42	11.72	-45.82	-13.00	-32.82	V
N/A							
3422.000	-50.31	7.64	8.67	-49.28	-13.00	-36.28	H
5137.000	-51.49	9.49	10.65	-50.33	-13.00	-37.33	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / Middle channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
2498.000	-51.91	6.35	6.1	-52.16	-13.00	-39.16	V
3464.000	-42.14	7.76	8.79	-41.11	-13.00	-28.11	V
4997.000	-50.95	9.41	10.6	-49.76	-13.00	-36.76	V
N/A							
3464.000	-47.74	7.76	8.79	-46.71	-13.00	-33.71	H
6866.000	-48.2	11.45	11.74	-47.91	-13.00	-34.91	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** December 8, 2013
Temperature: 26°C **Tested by:** David Shu
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3506.000	-45.54	7.88	8.91	-44.51	-13.00	-31.51	V
4983.000	-50.9	9.38	10.57	-49.71	-13.00	-36.71	V
N/A							
3506.000	-49.01	7.88	8.91	-47.98	-13.00	-34.98	H
5256.000	-52.6	9.61	10.7	-51.51	-13.00	-38.51	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



LTE Band 4 / CHANNEL BANDWIDTH: 10MHz

Operation Mode: Tx / Low channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1714.000	-39.74	5.14	5.91	-38.97	-13.00	-25.97	V
3429.000	-56.38	7.66	8.69	-55.35	-13.00	-42.35	V
N/A							
1714.000	-23.26	5.14	5.91	-22.49	-13.00	-9.49	H
3429.000	-51.32	7.66	8.69	-50.29	-13.00	-37.29	H
6859.000	-36.49	11.44	11.73	-36.20	-13.00	-23.20	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: Tx / Middle channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1728.000	-47.77	5.16	5.89	-47.04	-13.00	-34.04	V
4360.000	-54.93	8.62	9.69	-53.86	-13.00	-40.86	V
N/A							
1728.000	-30.96	5.16	5.89	-30.23	-13.00	-17.23	H
3464.000	-52.04	7.76	8.79	-51.01	-13.00	-38.01	H
6929.000	-42.27	11.53	11.81	-41.99	-13.00	-28.99	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1749.000	-51.3	5.2	5.85	-50.65	-13.00	-37.65	V
4710.000	-55.06	9.15	10.14	-54.07	-13.00	-41.07	V
N/A							
1749.000	-35.17	5.2	5.85	-34.52	-13.00	-21.52	H
3499.000	-52.67	7.87	8.9	-51.64	-13.00	-38.64	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



LTE Band 4 / CHANNEL BANDWIDTH: 20MHz

Operation Mode: Tx / Low channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1714.000	-42.22	5.14	5.91	-41.45	-13.00	-28.45	V
3443.000	-55.91	7.7	8.73	-54.88	-13.00	-41.88	V
N/A							
1714.000	-25.26	5.14	5.91	-24.49	-13.00	-11.49	H
3443.000	-52.28	7.7	8.73	-51.25	-13.00	-38.25	H
6880.000	-39.13	11.48	11.76	-38.85	-13.00	-25.85	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode: Tx / Middle channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1721.000	-47.34	5.15	5.9	-46.59	-13.00	-33.59	V
5550.000	-52.8	10.06	10.81	-52.05	-13.00	-39.05	V
N/A							
1721.000	-32.13	5.15	5.9	-31.38	-13.00	-18.38	H
3464.000	-54.24	7.76	8.79	-53.21	-13.00	-40.21	H
6915.000	-42.96	11.53	11.8	-42.69	-13.00	-29.69	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Operation Mode: Tx / High channel **Test Date:** July 23, 2013
Temperature: 26°C **Tested by:** Wayne Tasi
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1742.000	-50.89	5.19	5.86	-50.22	-13.00	-37.22	V
4850.000	-55.09	9.29	10.36	-54.02	-13.00	-41.02	V
N/A							
1742.000	-34.87	5.19	5.86	-34.20	-13.00	-21.20	H
3492.000	-54.71	7.85	8.88	-53.68	-13.00	-40.68	H
6978.000	-45.29	11.54	11.87	-44.96	-13.00	-31.96	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*



Calculation of maximum antenna gain

LTE Band 17						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max. Ant. Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	1749	-37.12	11.92	-25.2	-13	-12.2
Mid	1749	-43.37	11.92	-31.45	-13	-18.45
High	2148	-39.97	11.92	-28.05	-13	-15.05
LTE Band 4						
Operation Mode	Frequency (MHz)	Emission level (dBm)	Max. Ant. Gain (dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	1714	-22.49	5	-17.49	-13	-4.49
Mid	1728	-30.23	5	-25.23	-13	-12.23
High	1742	-34.2	5	-29.2	-13	-16.2