

FCC PART 90

TEST REPORT

For

Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

FCC ID: QISE5776S-420

Report Type: Original Report	Product Type: Mobile WIFI
Test Engineer: Allen Qiao	
Report Number: R2DG140620002-00B	
Report Date: 2014-08-01	
Reviewed By: Jerry Zhang EMC Manager	
Test Laboratory: Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan). This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	5
DESCRIPTION OF TEST CONFIGURATION	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
BLOCK DIAGRAM OF TEST SETUP	5
SUMMARY OF TEST RESULTS	6
FCC §1.1310 & §2.1093 - RF EXPOSURE.....	7
APPLICABLE STANDARD	7
TEST RESULT	7
FCC §2.1046, §90.1321(a) - RF OUTPUT POWER	8
APPLICABLE STANDARD	8
TEST PROCEDURE	8
TEST EQUIPMENT LIST AND DETAILS.....	8
TEST DATA	8
FCC §90.1321 (a) - PEAK POWER SPECTRAL DENSITY	10
APPLICABLE STANDARD	10
TEST PROCEDURE	10
TEST EQUIPMENT LIST AND DETAILS.....	10
TEST DATA	11
FCC §2.1049 & §90.209 – OCCUPIED BANDWIDTH	24
APPLICABLE STANDARD	24
TEST PROCEDURE	24
TEST EQUIPMENT LIST AND DETAILS.....	24
TEST DATA	24
FCC §2.1051 & §90.1323(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	30
APPLICABLE STANDARD	30
TEST PROCEDURE	30
TEST EQUIPMENT LIST AND DETAILS.....	30
TEST DATA	30
FCC §2.1053 - RADIATED SPURIOUS EMISSIONS	47
APPLICABLE STANDARD	47
TEST PROCEDURE	47
TEST EQUIPMENT LIST AND DETAILS.....	47
TEST DATA	48
FCC §2.1055 & §90.213- FREQUENCY STABILITY.....	51
APPLICABLE STANDARD	51
TEST PROCEDURE	51
TEST EQUIPMENT LIST AND DETAILS.....	51
TEST DATA	51

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Huawei Technologies Co., Ltd.*'s product, model number: *E5776s-420* (FCC ID: *QISE5776S-420*) or the "EUT" in this report was a *Mobile WIFI*, which was measured approximately: 10.48 cm (L) x 6.60 cm (W) x 1.55 cm (H), rated input voltage: DC 3.7V from Li-Polymer battery or DC 5.0V from adapter.

Adapter information:

Model: HW-050200U3W

Input: AC 100-240V, 50/60Hz, 0.5A Max

Output: DC 5.0V, 2A

** All measurement and test data in this report was gathered from production sample serial number: 140620002 (Assigned by BACL, Dongguan). The EUT was received on 2014-06-20*

Objective

This test report is prepared on behalf of *Huawei Technologies Co., Ltd.* in accordance with Part 2, and Part 90 of the Federal Communications Commission's rules.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: *QISE5776S-420*.

FCC Part 15C DTS submissions with FCC ID: *QISE5776S-420*.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2, Sub-part Z as well as the following individual parts:

Part 90 – Wireless Broadband Services in the 3650-3675 MHz Band

Applicable Standards: TIA 603-D and ANSI 63.4-2003.

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

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a test mode which has been done in the factory.

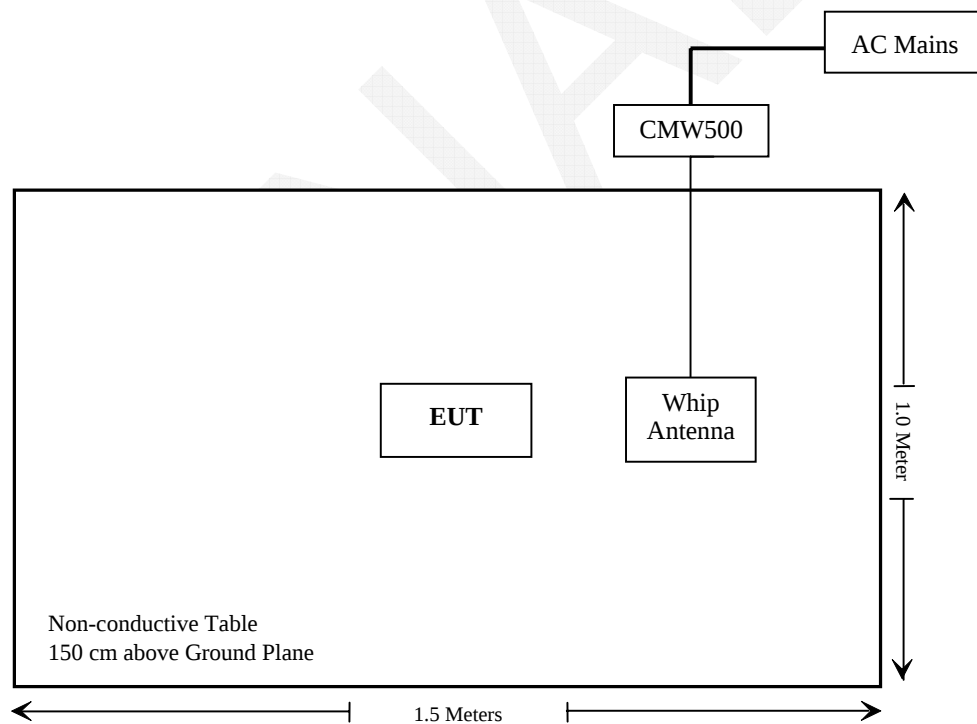
Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R & S	Wideband Radio Communication Tester	CMW500	114772

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1307 (b)(1), §2.1093	RF Exposure	Compliance
§2.1046; §90.1321(a)	RF Output Power	Compliance
§90.1321(a); §90.1321(a)	Peak Power Spectral Density	Compliance
§2.1049; §90.209	Occupied Bandwidth	Compliance
§2.1051; §90.1323(a)	Spurious Emission at Antenna Terminal	Compliance
§2.1053	Spurious Radiated Emissions	Compliance
§2.1055; §90.213	Frequency Stability	Compliance

FCC §1.1310 & §2.1093 - RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: FA482613 issued by SPORTON INTERNATIONAL INC.

FINAL

FCC §2.1046, §90.1321(a) - RF OUTPUT POWER

Applicable Standard

FCC §2.1046 and §90.1321

Limit

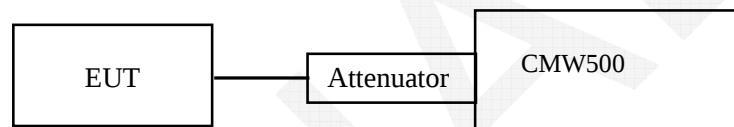
According to FCC §90.1321:

(a) Base and fixed stations are limited to 25 watts/25 MHz equivalent isotropically radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum.

(c) Mobile and portable stations are limited to 1 watt/25 MHz EIRP. In any event, the peak EIRP density shall not exceed 40 milliwatts in any one-megahertz slice of spectrum.

Test Procedure

The EUT was connected to a CMW500 through an attenuator, the EUT power was adjusted to produce maximum output power as specified in the owner's manual, measurements were performed at the low, mid and high channels for each of the EUT's bandwidths and modulations.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15

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

Test Data

Environmental Conditions

Temperature:	30.4 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Allen Qiao on 2014-07-29.

Test Mode: Transmitting

Test Result: Compliance. Please refer to following table.

LTE Band: 3650-3675MHz

Bandwidth	Modulation	Frequency (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
5MHz	QPSK	3652.5	21.24	0	21.24	23.01
		3662.5	21.64	0	21.64	
		3672.5	21.68	0	21.68	
	16QAM	3652.5	20.78	0	20.78	
		3662.5	21.29	0	21.29	
		3672.5	21.48	0	21.48	
10MHz	QPSK	3655	21.39	0	21.39	26.02
		3662.5	21.70	0	21.70	
		3670	21.82	0	21.82	
	16QAM	3655	21.00	0	21.00	
		3662.5	21.08	0	21.08	
		3670	21.30	0	21.30	
15MHz	QPSK	3657.5	22.09	0	22.09	27.78
		3662.5	22.11	0	22.11	
		3667.5	22.06	0	22.06	
	16QAM	3657.5	21.34	0	21.34	
		3662.5	21.59	0	21.59	
		3667.5	21.53	0	21.53	
20MHz	QPSK	3660	22.06	0	22.06	29.03
		3662.5	21.90	0	21.90	
		3665	21.93	0	21.93	
	16QAM	3660	21.55	0	21.55	
		3662.5	21.43	0	21.43	
		3665	21.59	0	21.59	

Note: limit = 30dBm + 10Log (Bandwidth/25)

Eg: For 10 MHz Bandwidth, the limit = 30dBm + 10Log (10/25) = 26.02 dBm

FCC §90.1321 (a) - PEAK POWER SPECTRAL DENSITY**Applicable Standard**

FCC §90.1321 (a); §90.1321 (a)

Limit

According to FCC §90.1321:

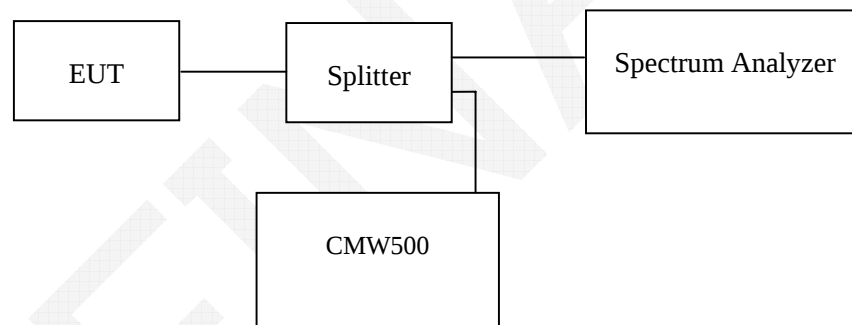
(a) Base and fixed stations are limited to 25 watts/25 MHz equivalent isotropically radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum.

(c) Mobile and portable stations are limited to 1 watt/25 MHz EIRP. In any event, the peak EIRP density shall not exceed 40 milliwatts in any one-megahertz slice of spectrum.

Test Procedure

The EUT was connected to a CMW500 & spectrum analyzer through a splitter, the EUT power was adjusted to produce maximum output power as specified in the owner's manual, measurements were performed at the low, mid and high channels for each of the EUT's bandwidths and modulations.

The resolution bandwidth of the spectrum analyzer was set at 1MHz.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

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

Test Data**Environmental Conditions**

Temperature:	30.4 °C
Relative Humidity:	64 %
ATM Pressure:	99.9 kPa

The testing was performed by Allen Qiao on 2014-07-26.

Test Mode: Transmitting

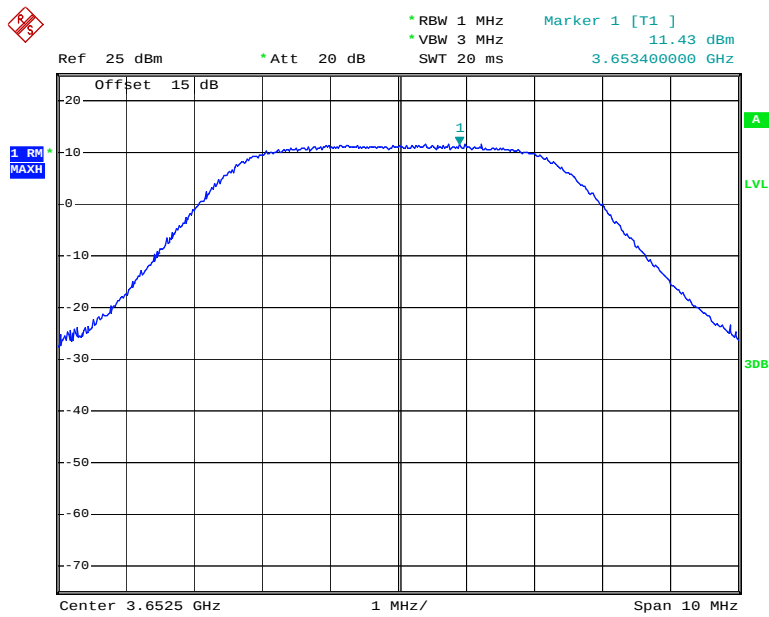
Result: Compliance.

LTE Band: 3650-3675MHz

Bandwidth	Modulation	Frequency (MHz)	Power Density (dBm/MHz)	Antenna Gain (dBi)	EIRP Power Density (dBm/MHz)	Limit (dBm/MHz)
5MHz	QPSK	3652.5	11.79	0	11.79	16
		3662.5	11.22	0	11.22	
		3672.5	11.42	0	11.42	
	16QAM	3652.5	11.43	0	11.43	
		3662.5	11.68	0	11.68	
		3672.5	11.48	0	11.48	
10MHz	QPSK	3655	9.04	0	9.04	
		3662.5	9.14	0	9.14	
		3670	9.17	0	9.17	
	16QAM	3655	9.48	0	9.48	
		3662.5	9.07	0	9.07	
		3670	9.29	0	9.29	
15MHz	QPSK	3657.5	7.29	0	7.29	
		3662.5	7.12	0	7.12	
		3667.5	7.26	0	7.26	
	16QAM	3657.5	6.36	0	6.36	
		3662.5	6.19	0	6.19	
		3667.5	6.12	0	6.12	
20MHz	QPSK	3660	5.62	0	5.62	
		3662.5	5.66	0	5.66	
		3665	5.85	0	5.85	
	16QAM	3660	5.89	0	5.89	
		3662.5	5.89	0	5.89	
		3665	5.69	0	5.69	

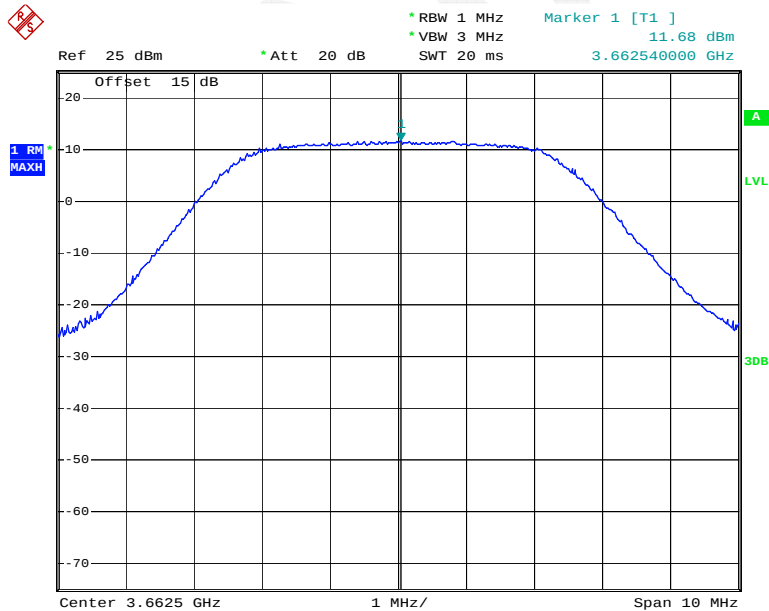
Please refer to the following plots

16QAM, 5MHz, Low Channel



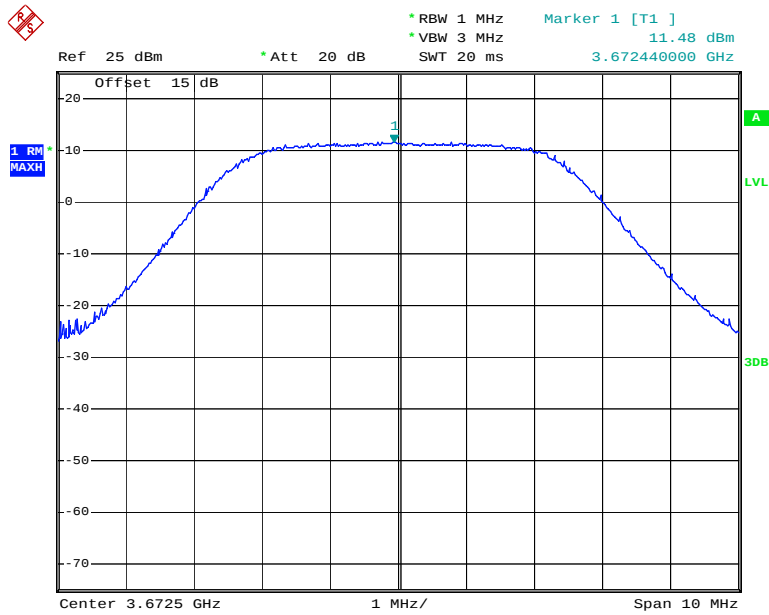
Date: 29.JUL.2014 16:13:26

16QAM, 5MHz, Middle Channel



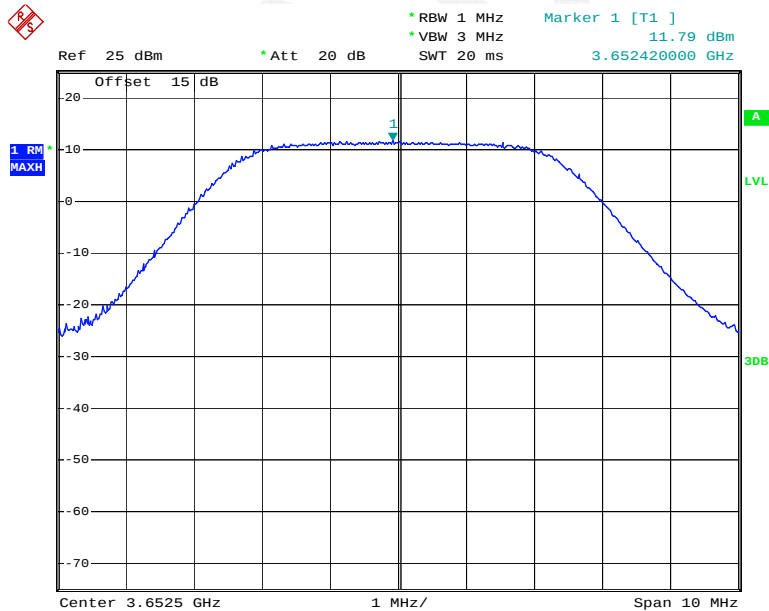
Date: 29.JUL.2014 16:12:22

16QAM, 5MHz, High Channel



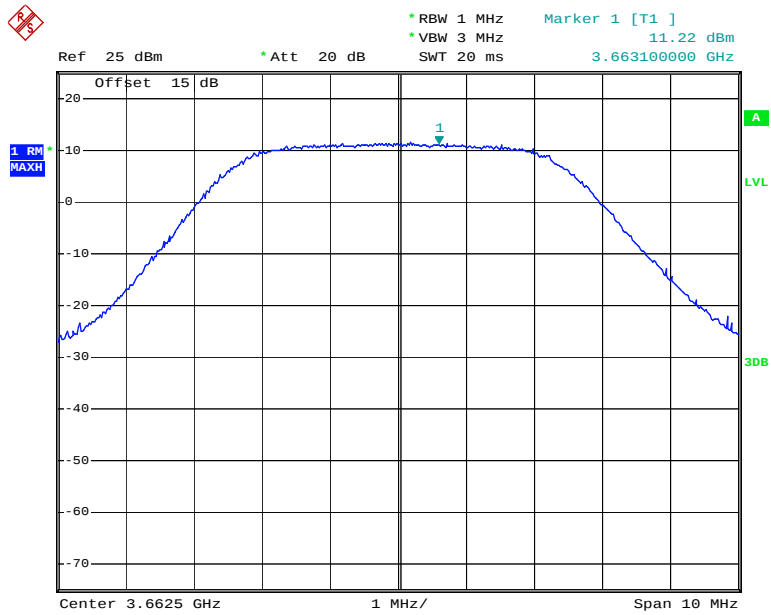
Date: 29.JUL.2014 16:12:46

QPSK, 5MHz, Low Channel



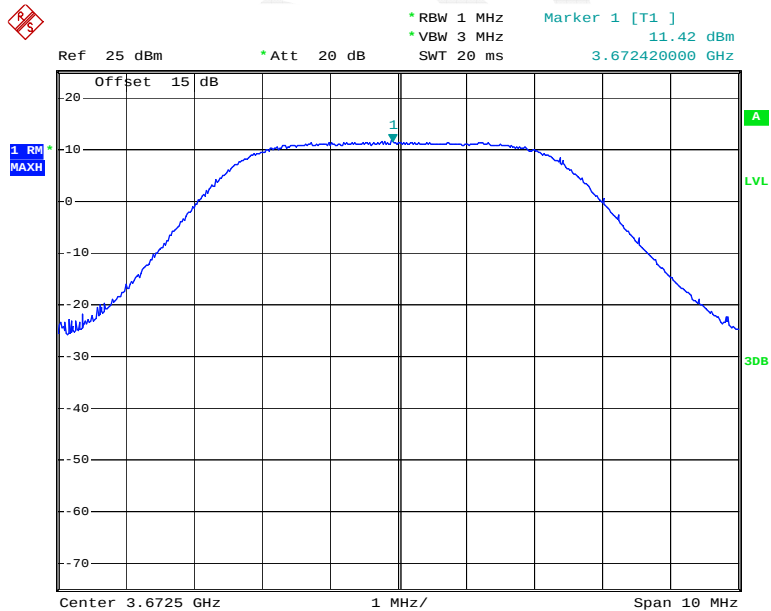
Date: 29.JUL.2014 16:10:28

QPSK, 5MHz, Middle Channel



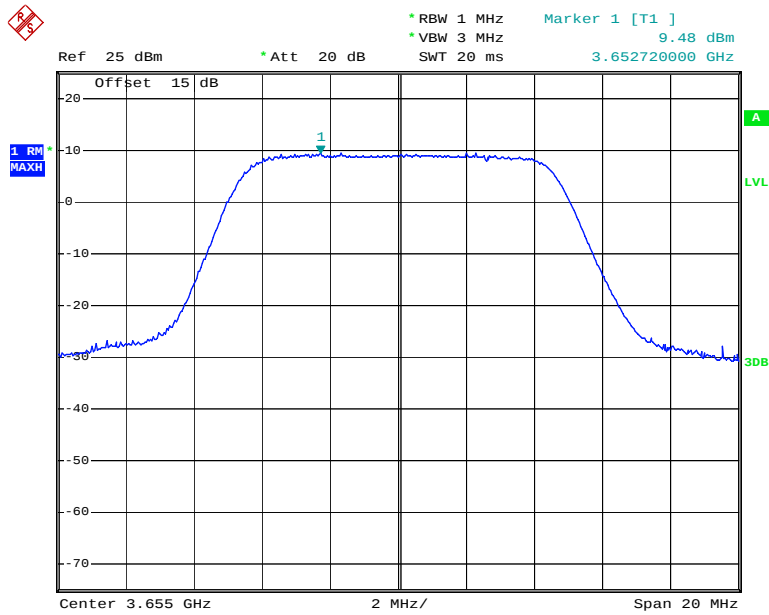
Date: 29.JUL.2014 16:13:54

QPSK, 5MHz, High Channel



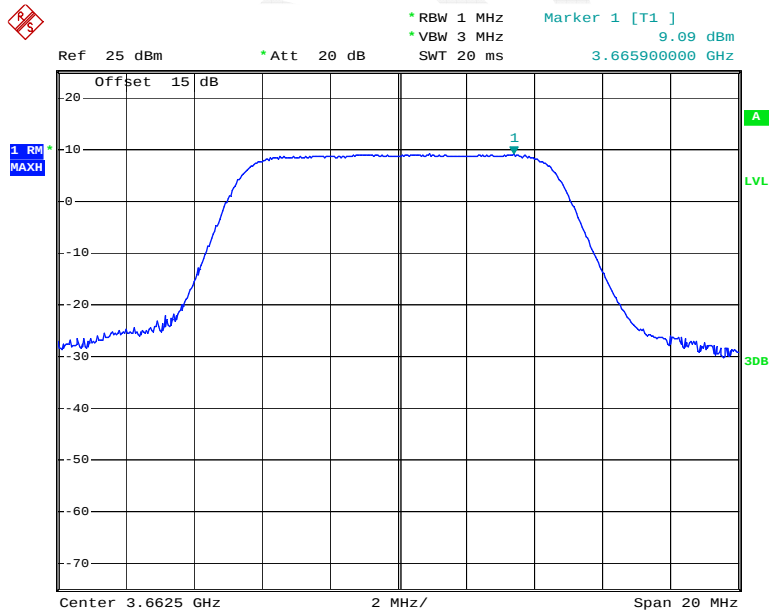
Date: 29.JUL.2014 16:14:16

16QAM, 10MHz, Low Channel



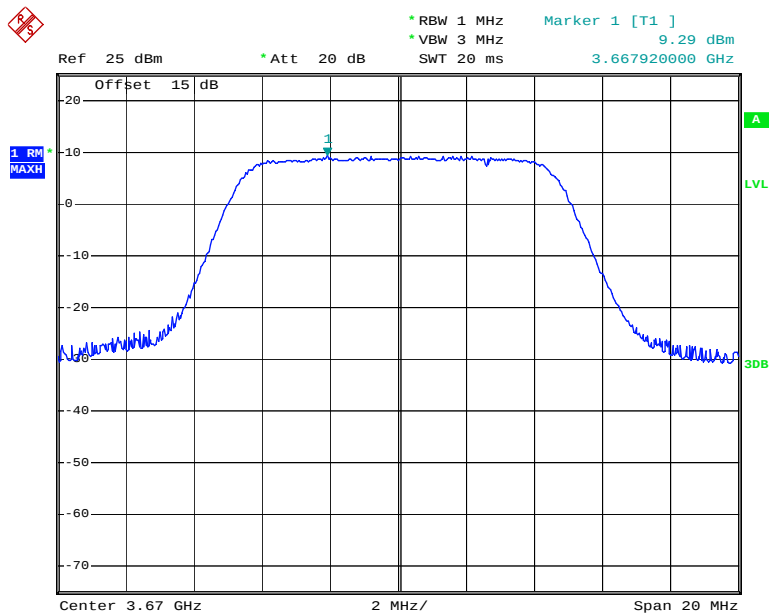
Date: 29.JUL.2014 16:57:41

16QAM, 10MHz, Middle Channel



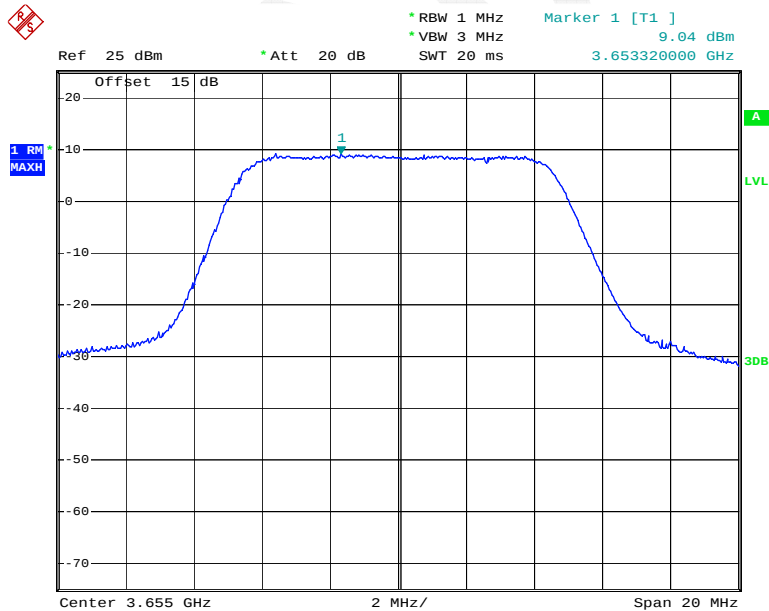
Date: 29.JUL.2014 16:56:58

16QAM, 10MHz, High Channel



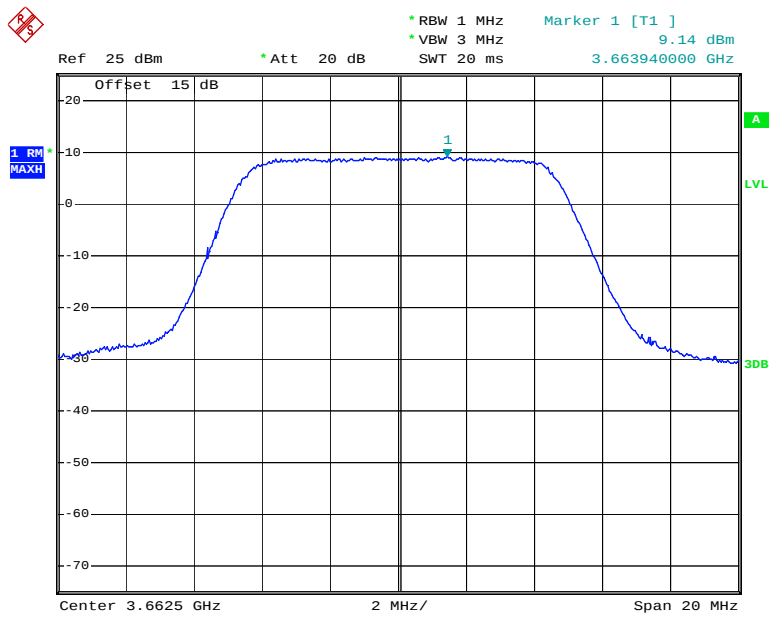
Date: 29.JUL.2014 16:56:04

QPSK, 10MHz, Low Channel



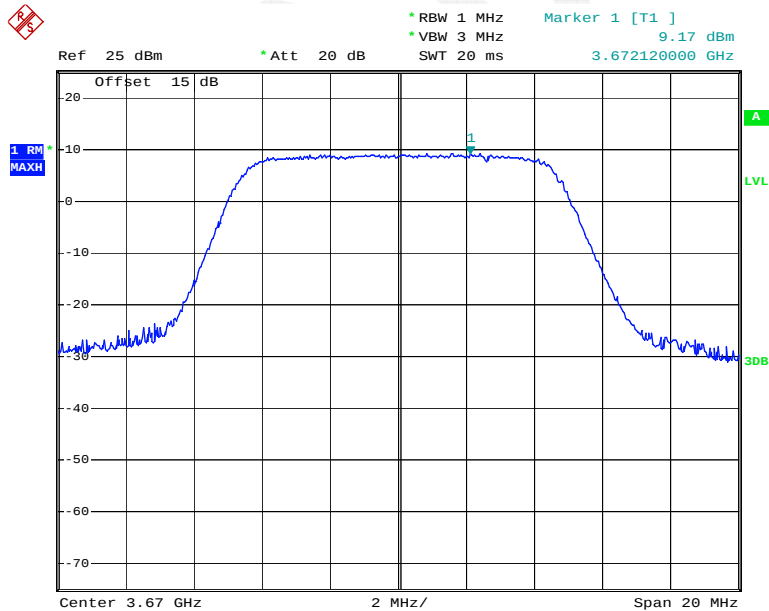
Date: 29.JUL.2014 16:54:50

QPSK, 10MHz, Middle Channel



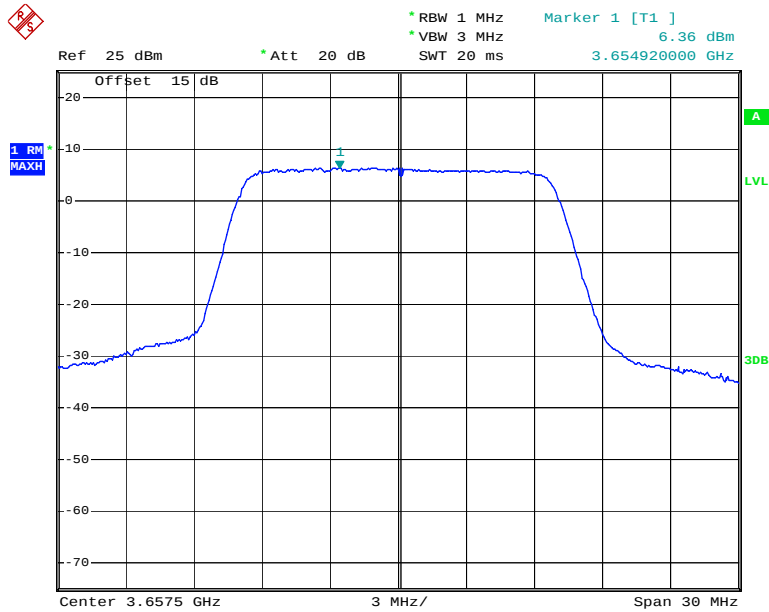
Date: 29.JUL.2014 16:55:11

QPSK, 10MHz, High Channel



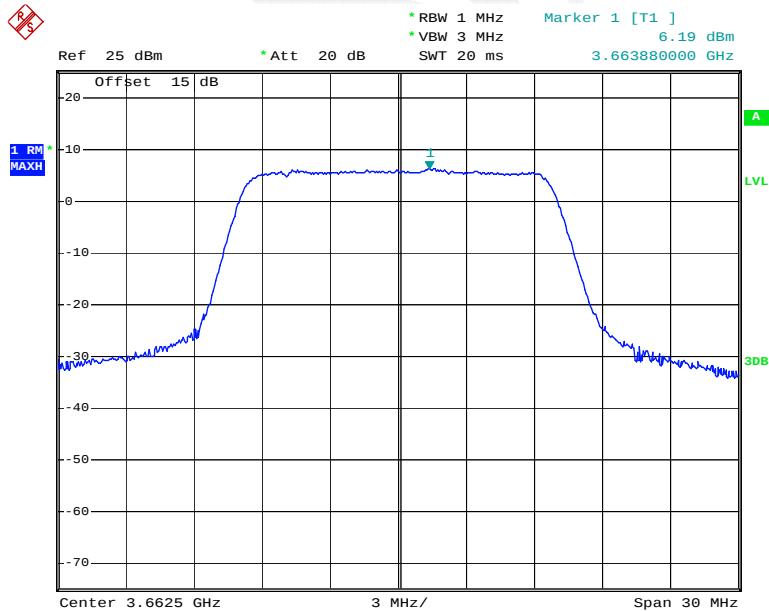
Date: 29.JUL.2014 16:55:37

16QAM, 15MHz, Low Channel

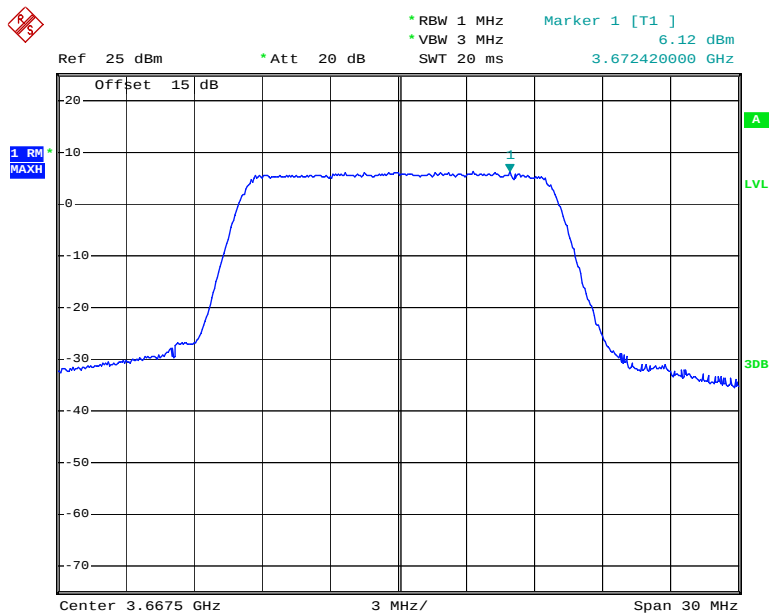


Date: 29.JUL.2014 16:49:00

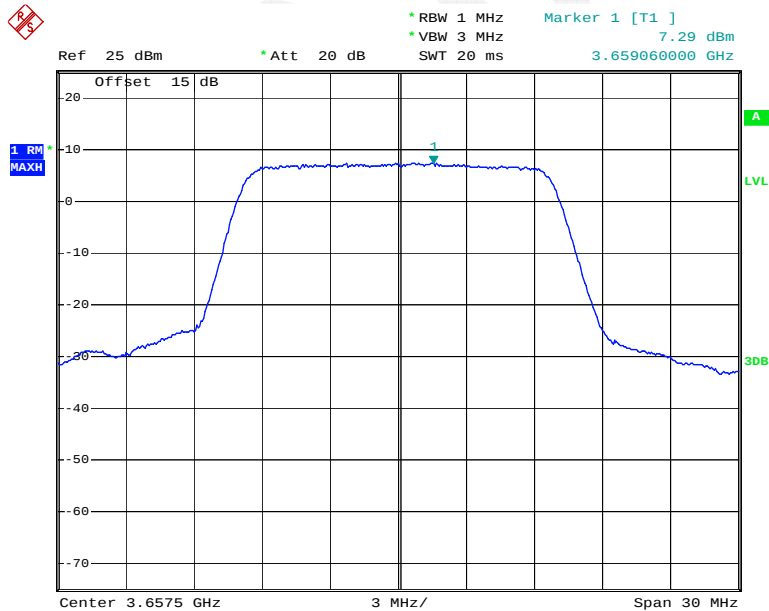
16QAM, 15MHz, Middle Channel



Date: 29.JUL.2014 16:47:30

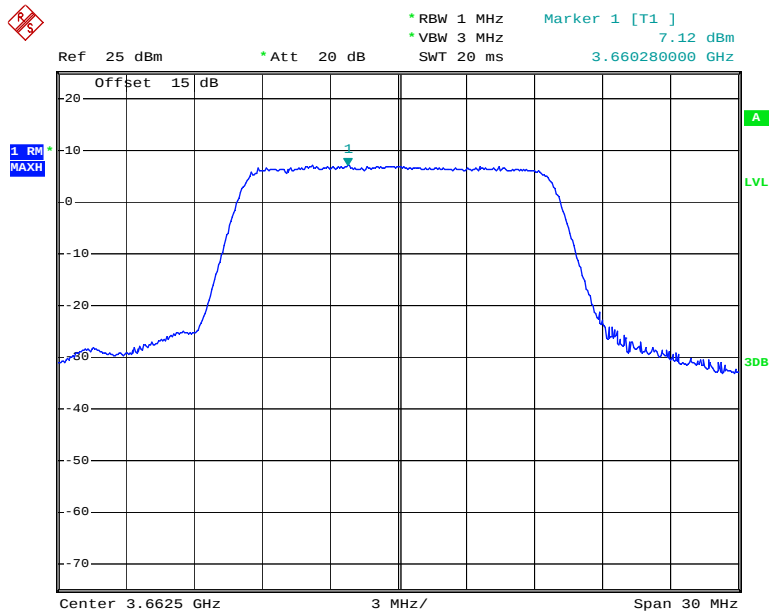
16QAM, 15MHz, High Channel

Date: 29.JUL.2014 16:46:54

QPSK, 15MHz, Low Channel

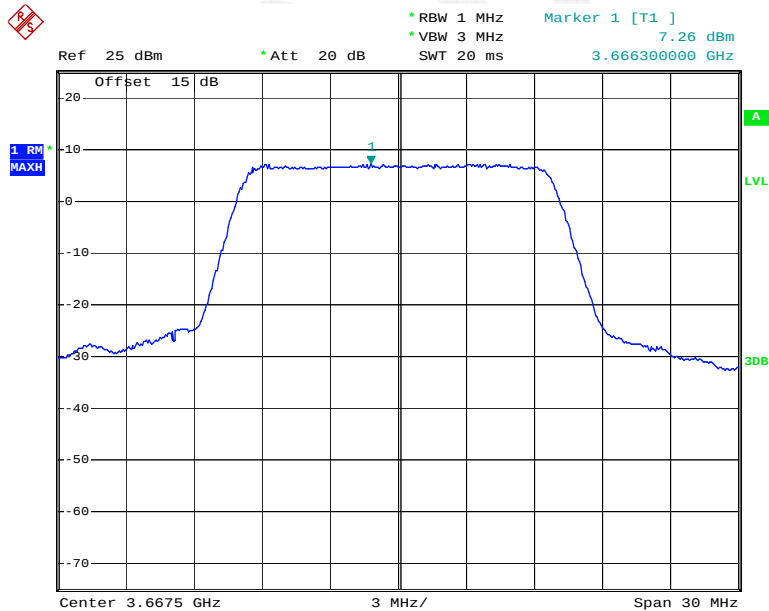
Date: 29.JUL.2014 16:45:33

QPSK, 15MHz, Middle Channel



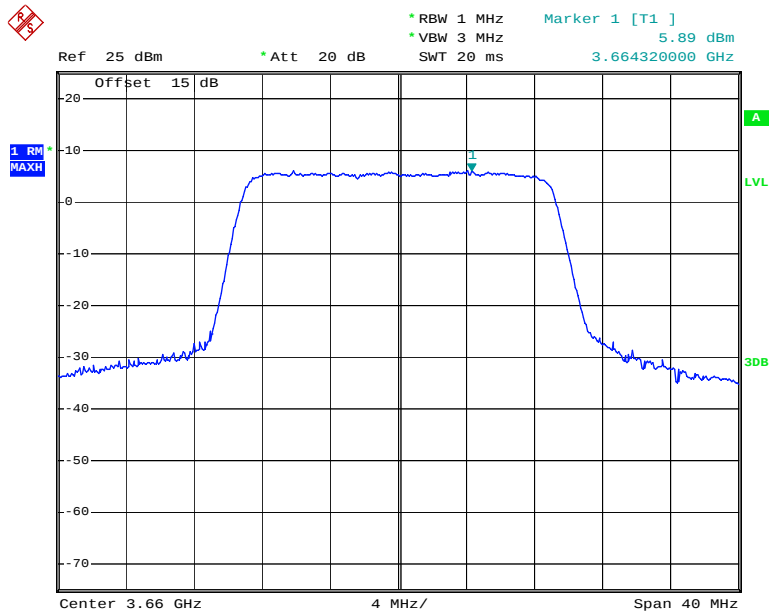
Date: 29.JUL.2014 16:45:51

QPSK, 15MHz, High Channel



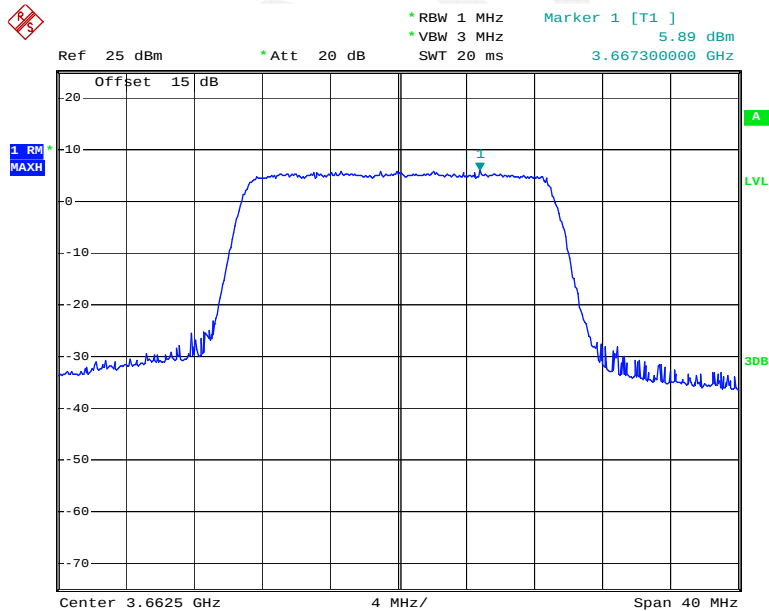
Date: 29.JUL.2014 16:46:10

16QAM, 20MHz, Low Channel



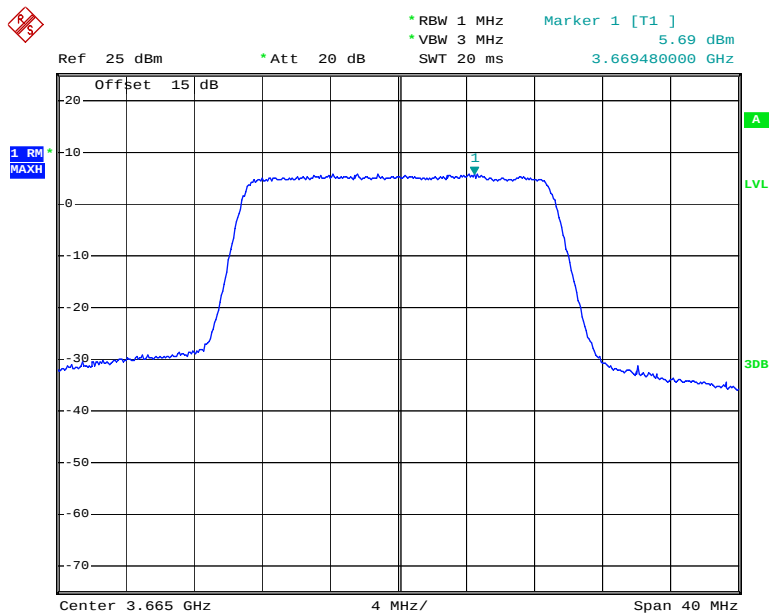
Date: 29.JUL.2014 16:51:15

16QAM, 20MHz, Middle Channel



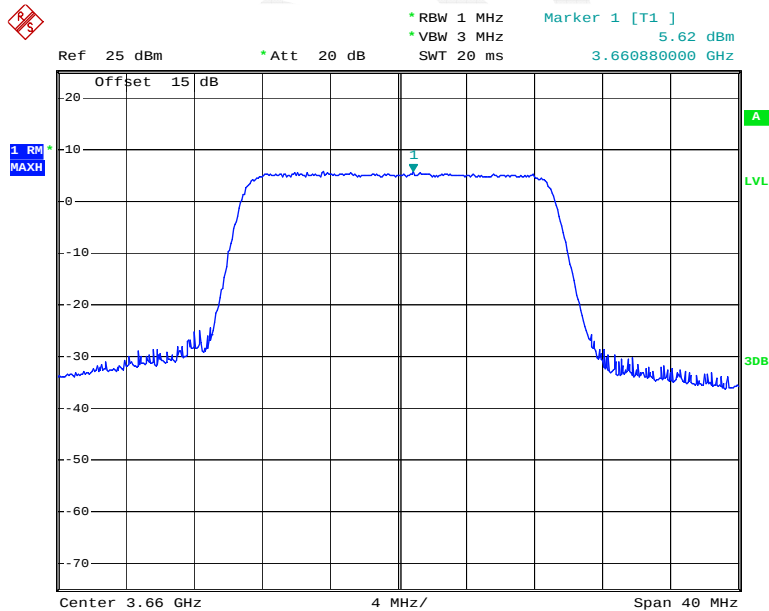
Date: 29.JUL.2014 16:51:29

16QAM, 20MHz, High Channel



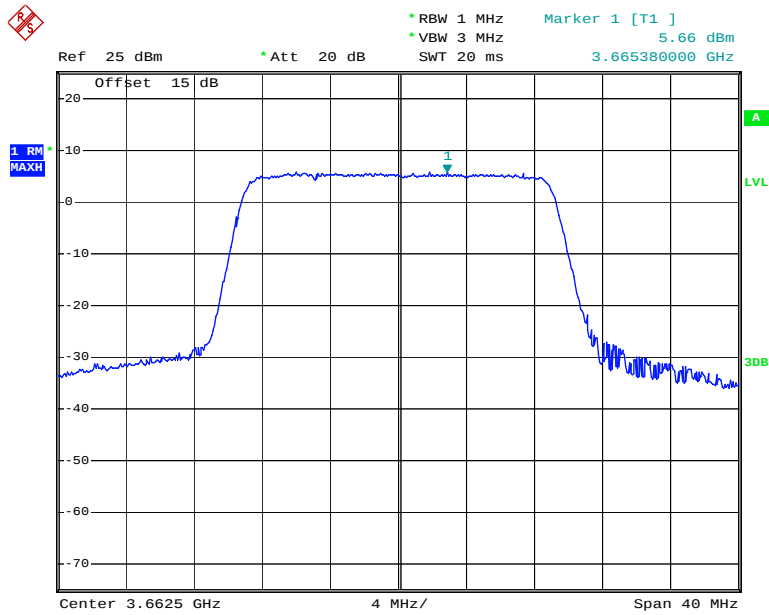
Date: 29.JUL.2014 16:51:45

QPSK, 20MHz, Low Channel



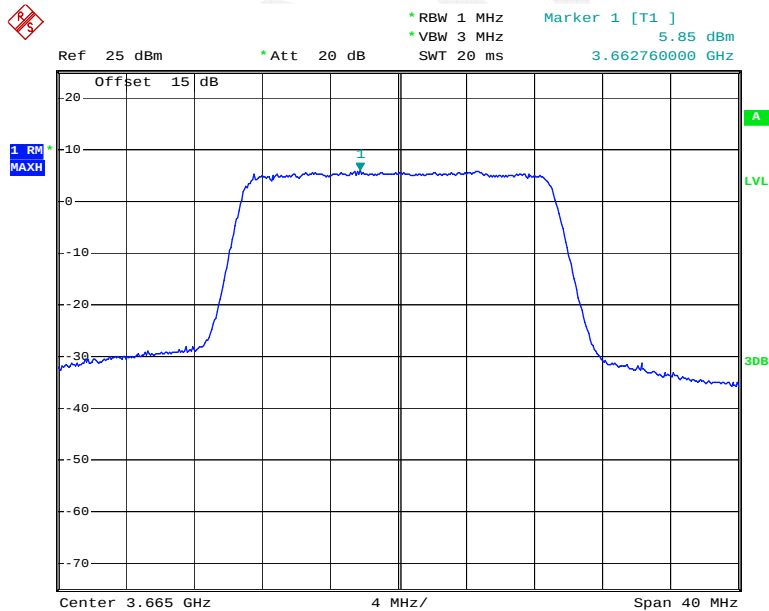
Date: 29.JUL.2014 16:52:47

QPSK, 20MHz, Middle Channel



Date: 29.JUL.2014 16:52:31

QPSK, 20MHz, High Channel



Date: 29.JUL.2014 16:52:08

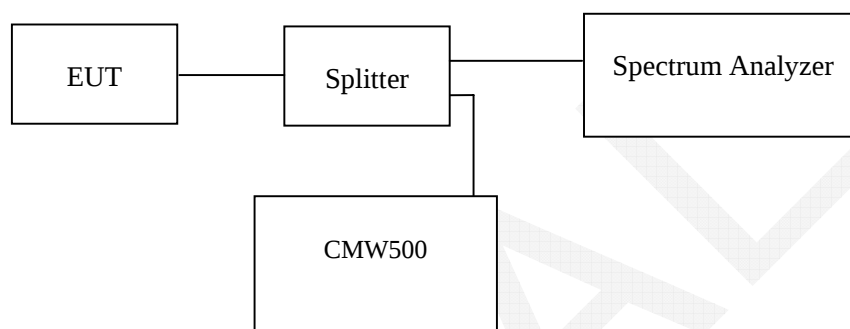
FCC §2.1049 & §90.209 – OCCUPIED BANDWIDTH

Applicable Standard

FCC §2.1049 and §90.209

Test Procedure

The EUT was connected to a CMW500 & spectrum analyzer through a splitter, the EUT power was adjusted to produce maximum output power as specified in the owner's manual, measurements were performed at middle channel for each of the EUT's bandwidths and modulations.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

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

Test Data

Environmental Conditions

Temperature:	30.4 °C
Relative Humidity:	64 %
ATM Pressure:	99.9 kPa

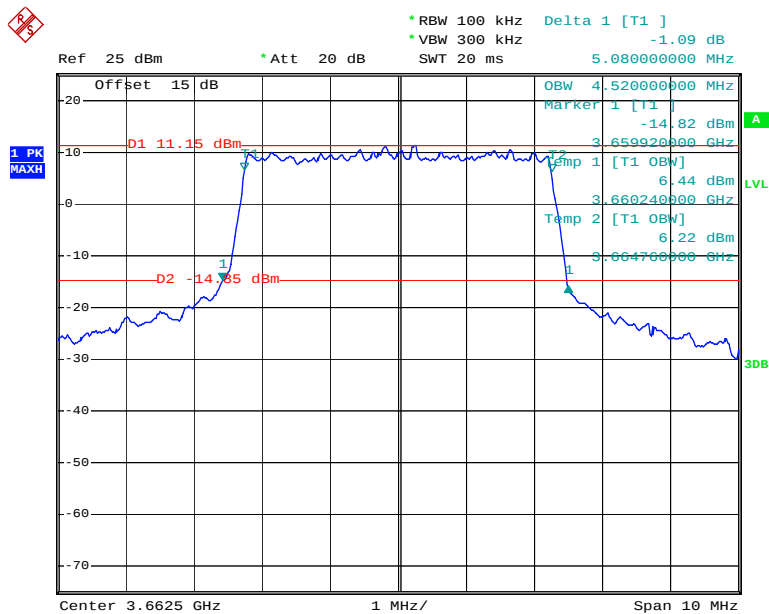
The testing was performed by Allen Qiao on 2014-07-26.

LTE Band: 3650-3675MHz

Bandwidth	Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
5MHz	QPSK	3662.5	4.52	5.08
	16QAM	3662.5	4.52	5.08
10MHz	QPSK	3662.5	9.16	10.52
	16QAM	3662.5	9.16	10.56
15MHz	QPSK	3662.5	13.56	15.16
	16QAM	3662.5	13.56	15.22
20MHz	QPSK	3662.5	18.00	20.90
	16QAM	3662.5	18.00	20.88

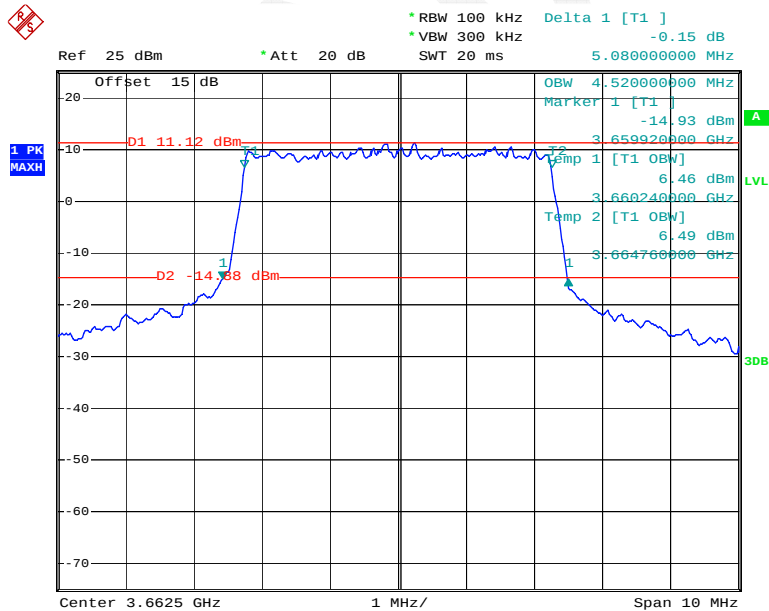
Please refer to the following plots:

16QAM, 5MHz

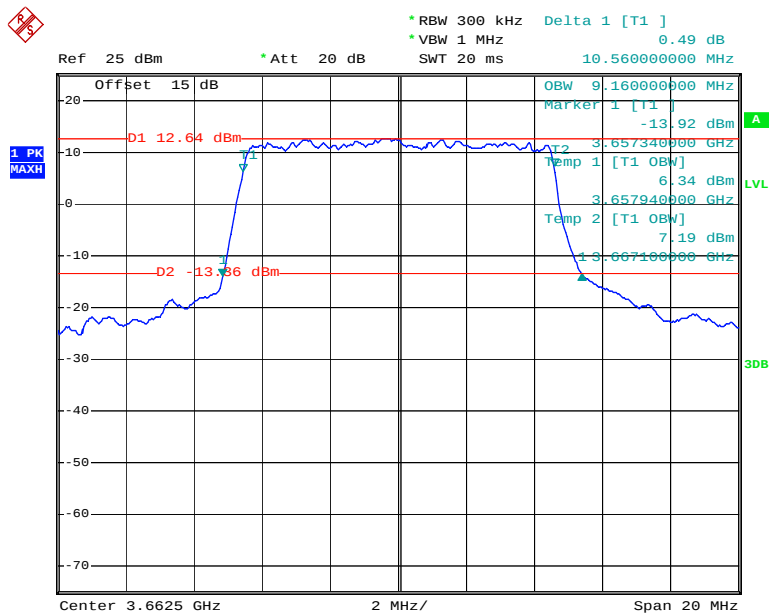


Date: 29.JUL.2014 17:10:29

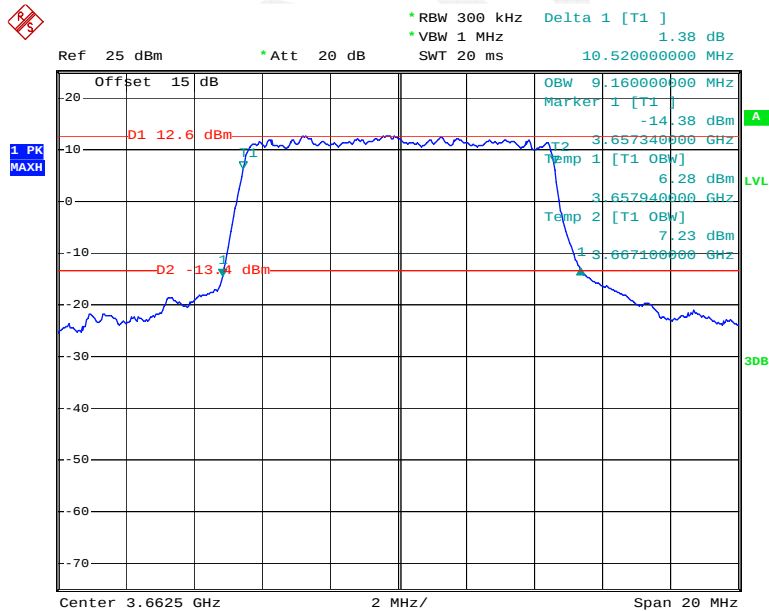
QPSK, 5MHz



Date: 29.JUL.2014 17:08:50

16QAM, 10MHz

Date: 29.JUL.2014 17:03:33

QPSK, 10MHz

Date: 29.JUL.2014 17:04:39

RBW 300 kHz
 VBW 1 MHz
 SWT 20 ms
 Delta 1 [T1]
 1.03 dB
 15.220000000 MHz

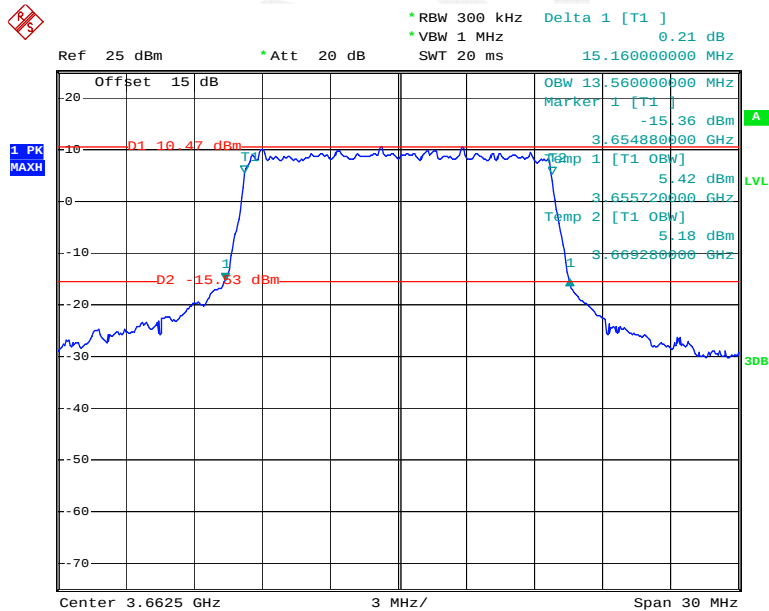
Ref 25 dBm
 Att 20 dB

Offset 15 dB
 OBW 13.560000000 MHz
 Marker 1 [T1]
 -15.53 dBm
 3.654820000 GHz
 Temp 1 [T1 OBW]
 5.58 dBm
 3.655720000 GHz
 Temp 2 [T1 OBW]
 6.44 dBm
 3.669200000 GHz

1 PK MAXH
 D1 10.55 dBm
 D2 -15.55 dBm

Center 3.6625 GHz
 3 MHz/
 Span 30 MHz

QPSK, 15MHz



Page 28 of 52

Ref 25 dBm * Att 20 dB * RBW 300 kHz Delta 1 [T1] -0.50 dB
 * VBW 1 MHz SWT 20 ms 20.880000000 MHz

Offset 15 dB OBW 18.000000000 MHz
 Marker 1 [T1] -15.83 dBm A
 3.651860000 GHz Temp 1 [T1 OBW] 6.06 dBm LVL
 3.653540000 GHz Temp 2 [T1 OBW] 4.89 dBm
 3.671540000 GHz 1

1 PK MAXH D1 10 15 dBm D2 -15 85 dBm 3DB

Center 3.6625 GHz 4 MHz/ Span 40 MHz

Date: 29.JUL.2014 17:16:34

* RBW 300 kHz
 * VBW 1 MHz
 SWT 20 ms

Delta 1 [T1]
 0.03 dB
 20.900000000 MHz

Ref 25 dBm
 * Att 20 dB

Offset 15 dB

1 PK MAXH

OBW 18.000000000 MHz
 Marker 1 [T1]
 -16.10 dBm
 3.651780000 GHz
 Temp 1 [T1 OBW]
 6.65 dBm
 3.653540000 GHz
 Temp 2 [T1 OBW]
 4.71 dBm
 3.671540000 GHz

D1 -10.02 dBm
 D2 -15.97 dBm

Center 3.6625 GHz
 4 MHz/
 Span 40 MHz

Date: 29.JUL.2014 17:15:11

FCC §2.1051 & §90.1323(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

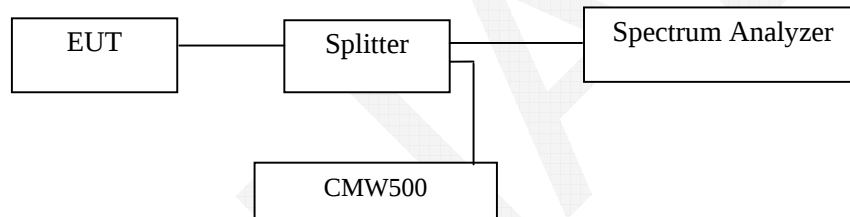
FCC §2.1051 and §90.1323(a)

Limit

According to FCC §90.1323(a), 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 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

Test Procedure

The EUT was connected to a CMW500 & spectrum analyzer through a splitter, the EUT power was adjusted to produce maximum output power as specified in the owner's manual, measurements were performed at low, middle high channels for each of the EUT's bandwidths and modulations.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

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

Test Data

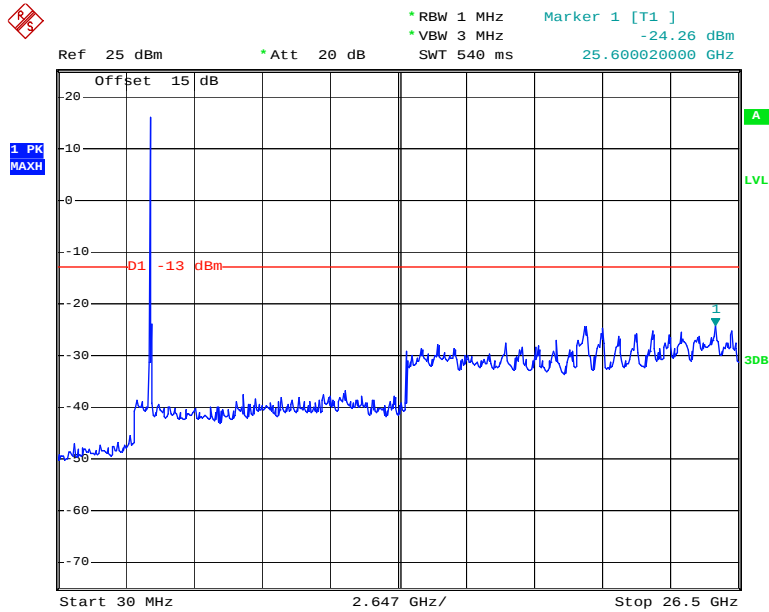
Environmental Conditions

Temperature:	30.4 °C
Relative Humidity:	64 %
ATM Pressure:	99.9 kPa

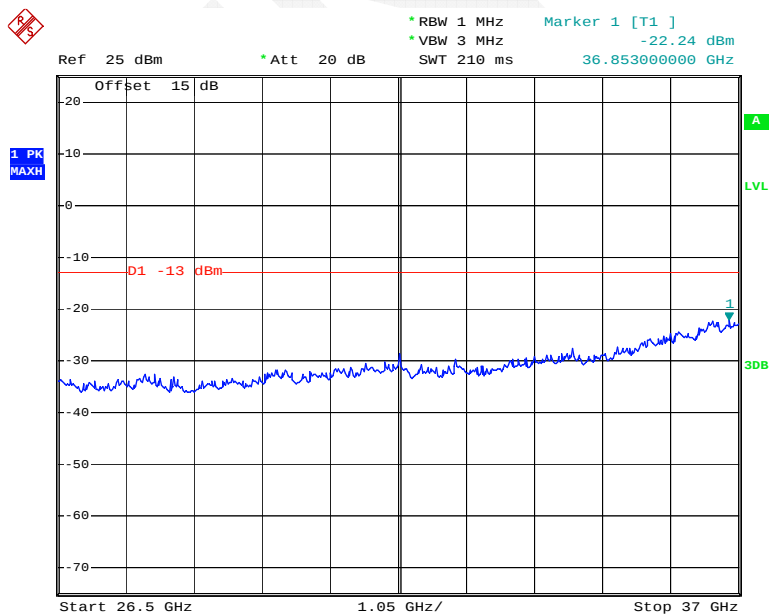
The testing was performed by Allen Qiao on 2014-07-26.

Test Mode: Transmitting

16QAM, 5MHz

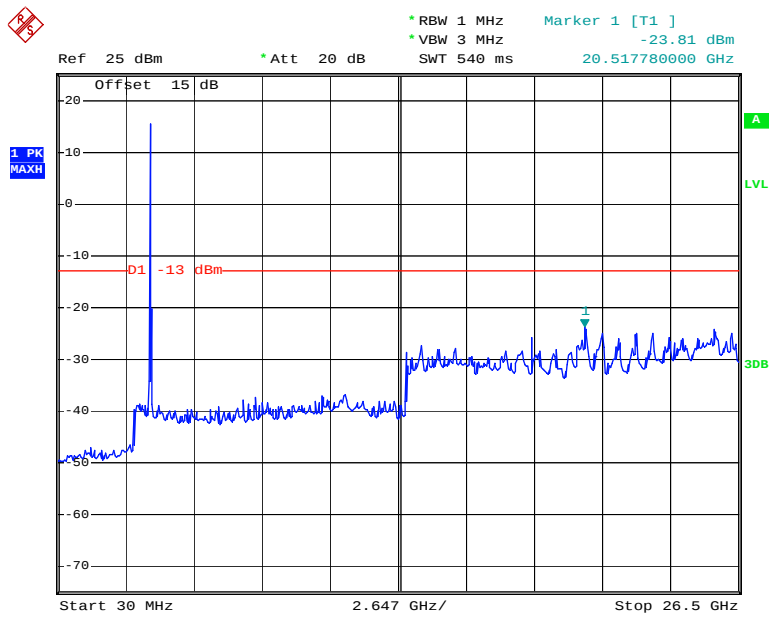


Date: 29.JUL.2014 17:28:01

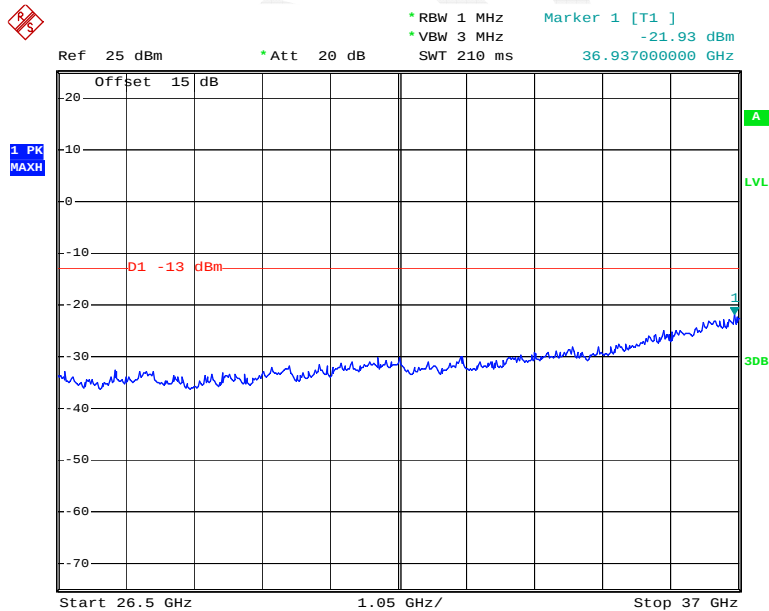


Date: 29.JUL.2014 17:27:42

QPSK, 5MHz

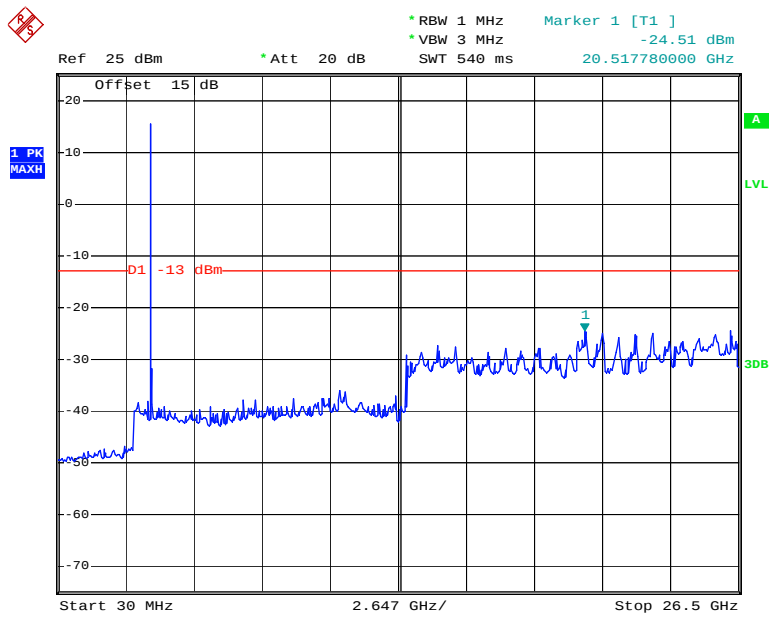


Date: 29.JUL.2014 17:27:13

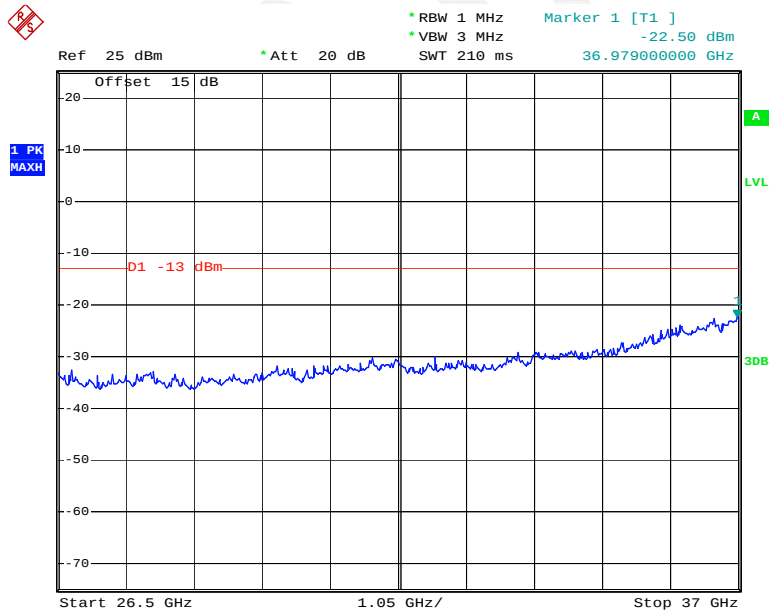


Date: 29.JUL.2014 17:27:26

16QAM, 10MHz

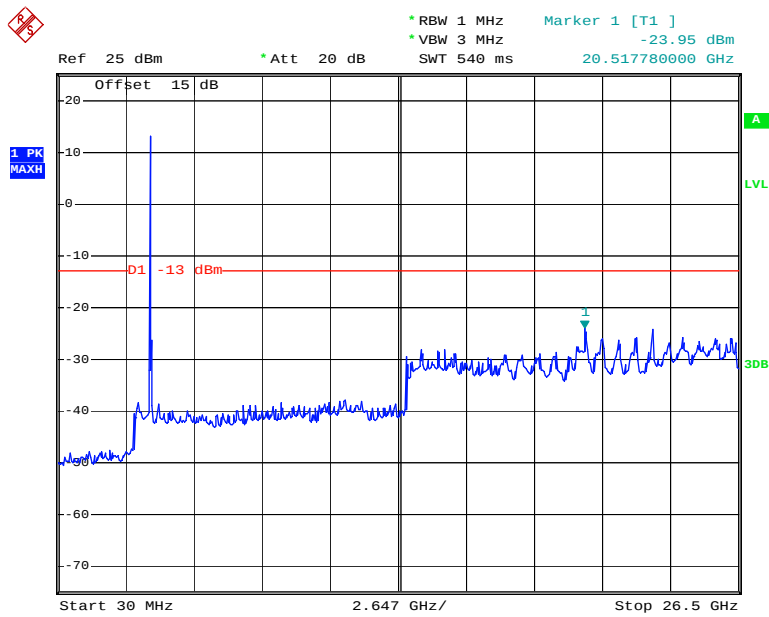


Date: 29.JUL.2014 17:31:18

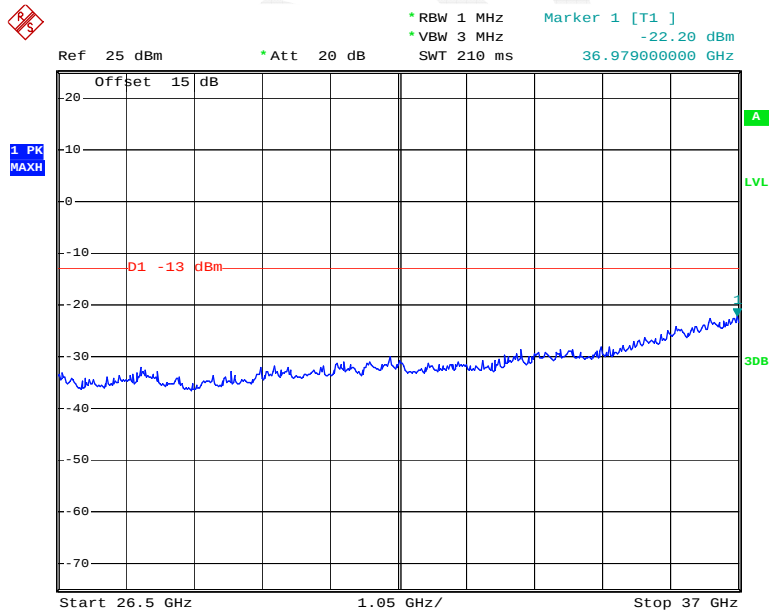


Date: 29.JUL.2014 17:31:29

QPSK, 10MHz

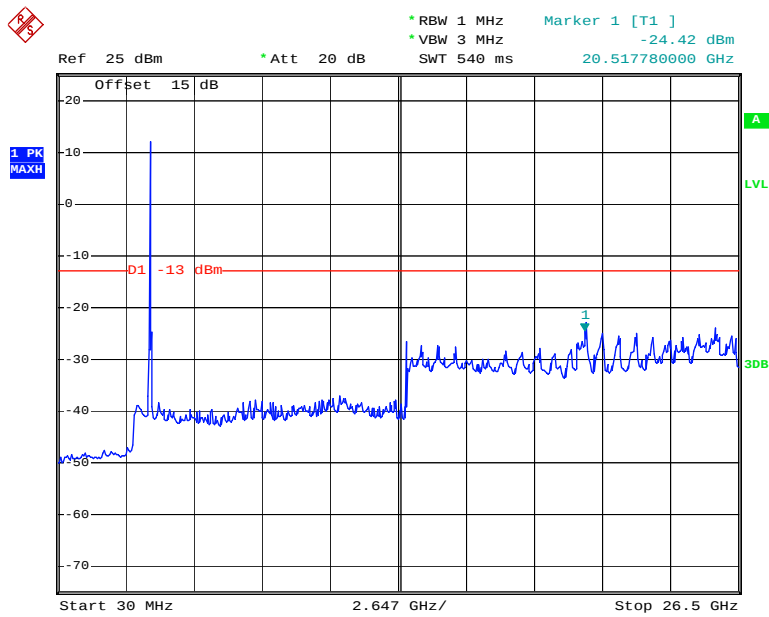


Date: 29.JUL.2014 17:31:55

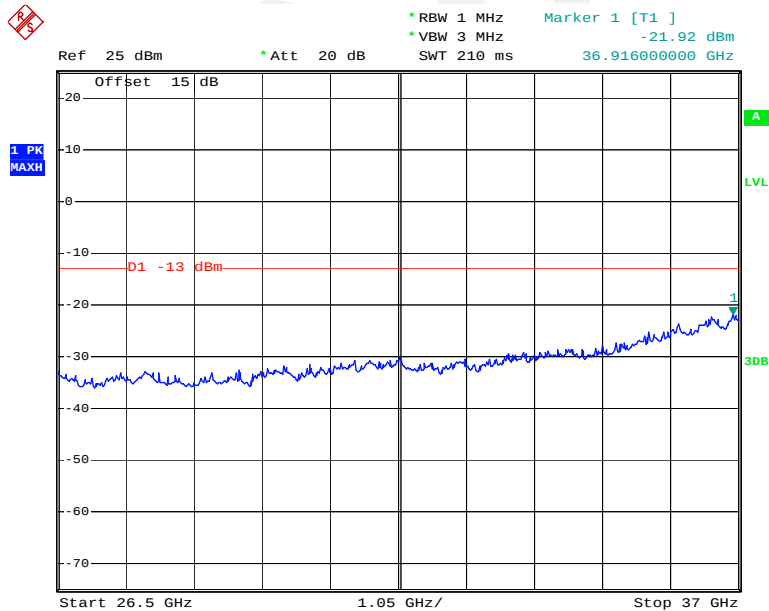


Date: 29.JUL.2014 17:31:43

16QAM, 15MHz

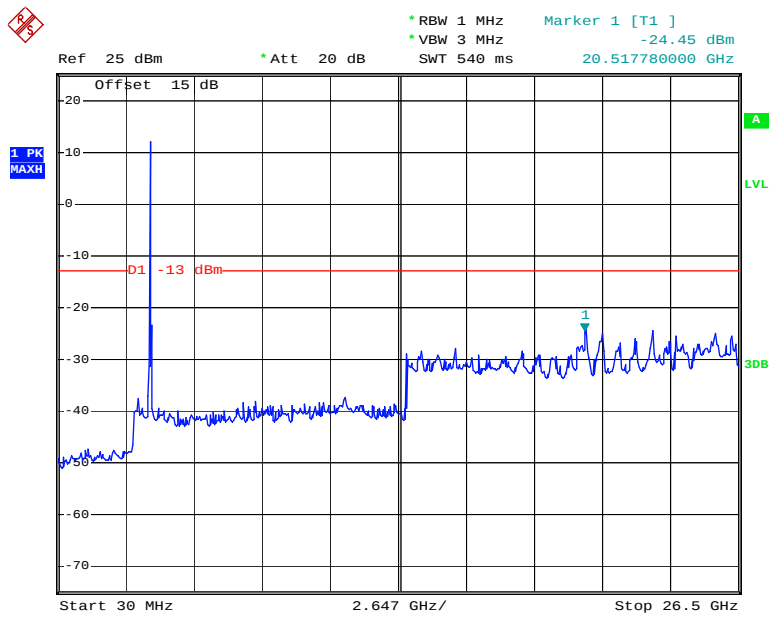


Date: 29.JUL.2014 17:33:52

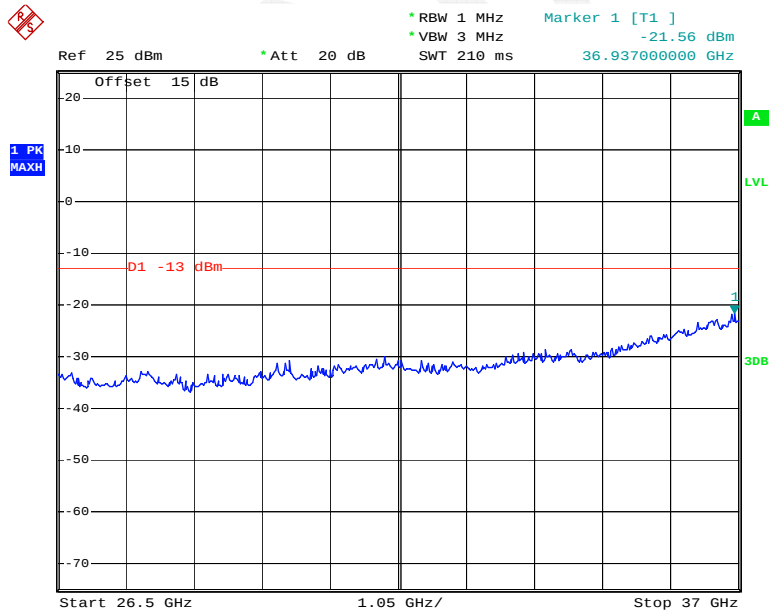


Date: 29.JUL.2014 17:33:25

QPSK, 15MHz

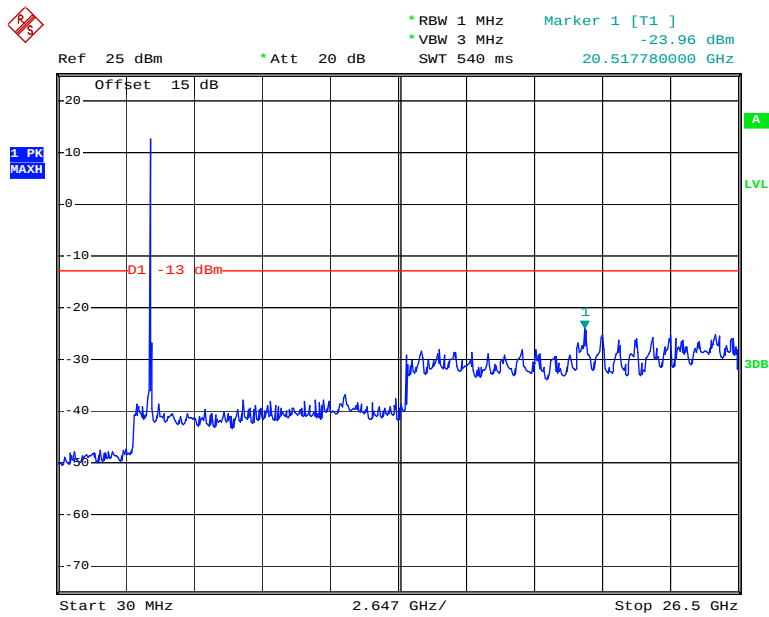


Date: 29.JUL.2014 17:32:45

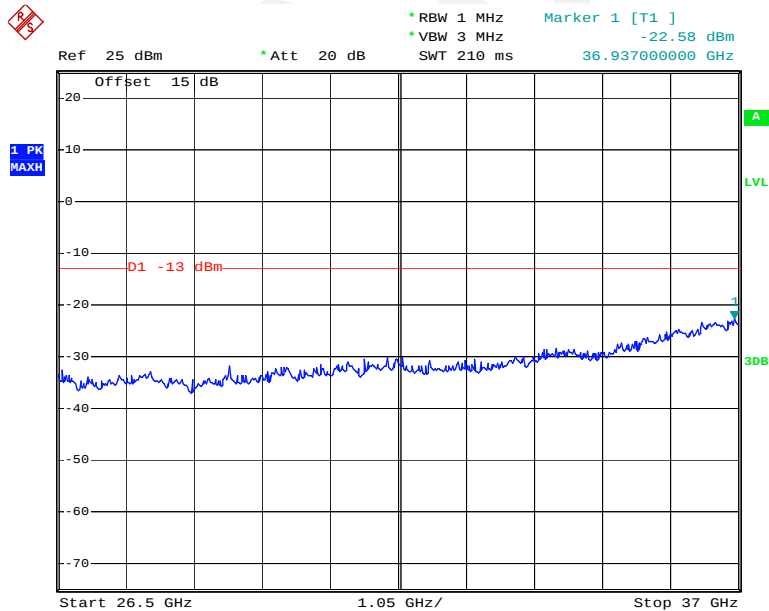


Date: 29.JUL.2014 17:33:06

16QAM, 20MHz

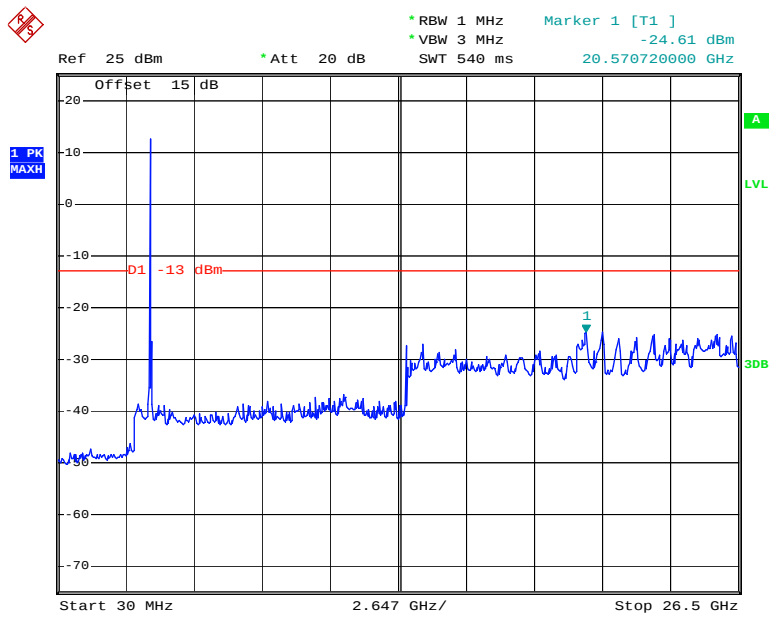


Date: 29.JUL.2014 17:34:32

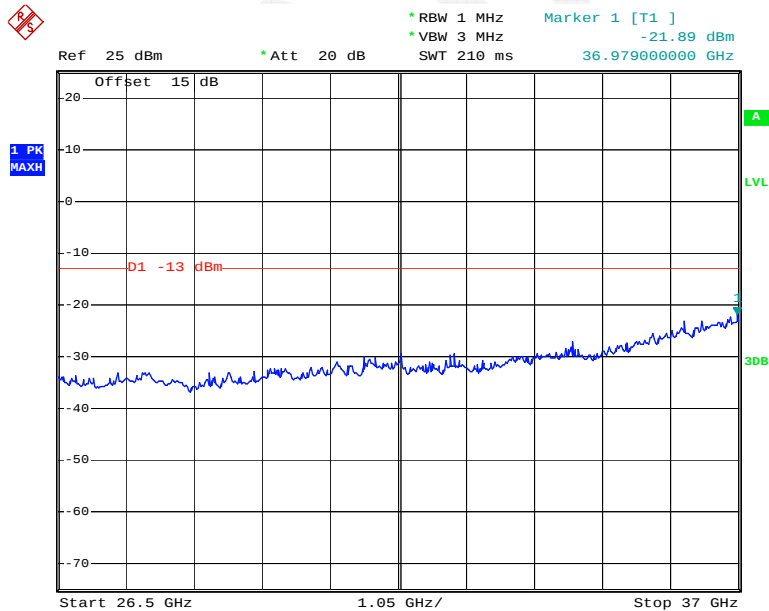


Date: 29.JUL.2014 17:34:41

QPSK, 20MHz



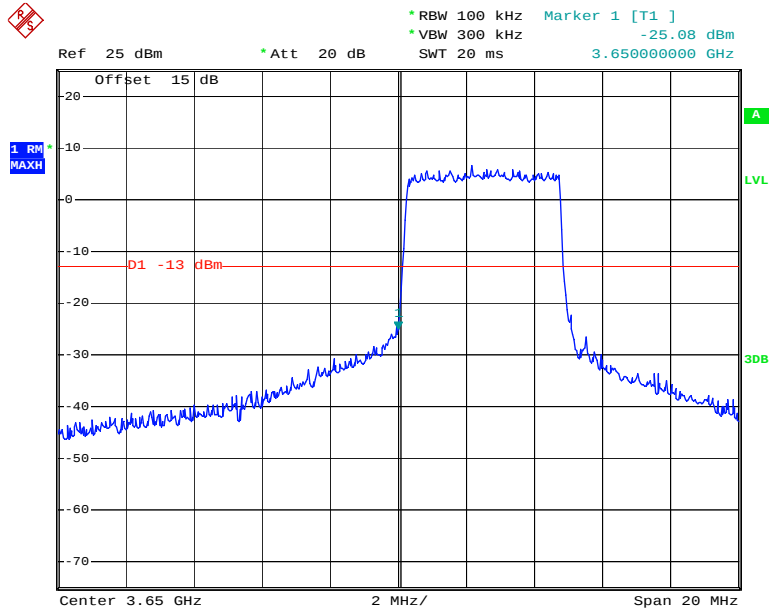
Date: 29.JUL.2014 17:35:12



Date: 29.JUL.2014 17:34:55

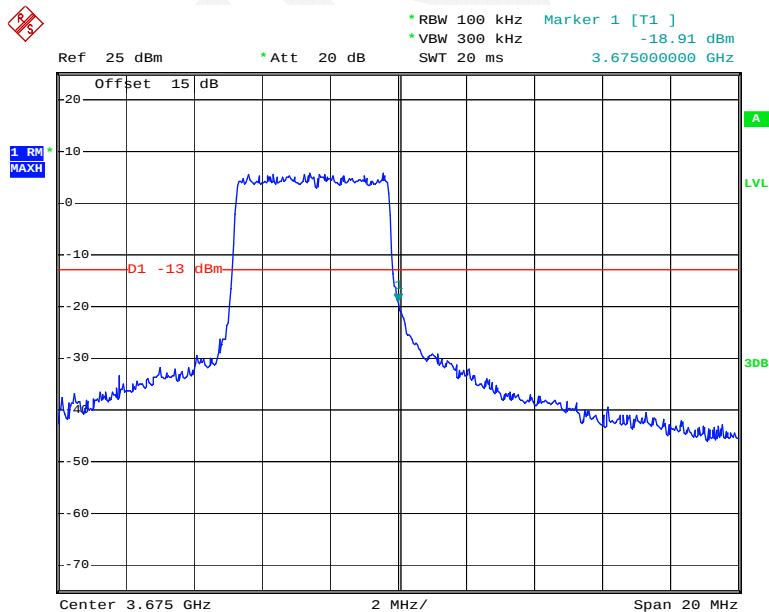
Band Ede:

16QAM, 5MHz, Left Side



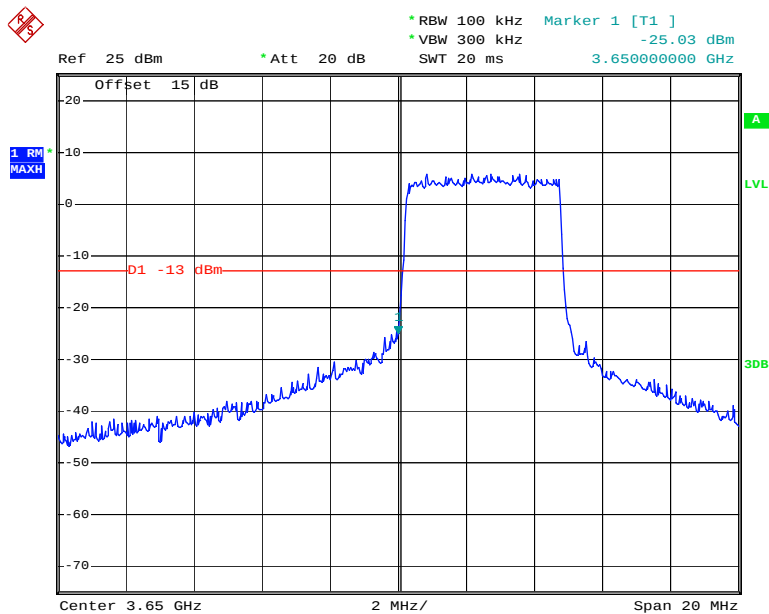
Date: 29.JUL.2014 17:42:31

16QAM, 5MHz, Right Side



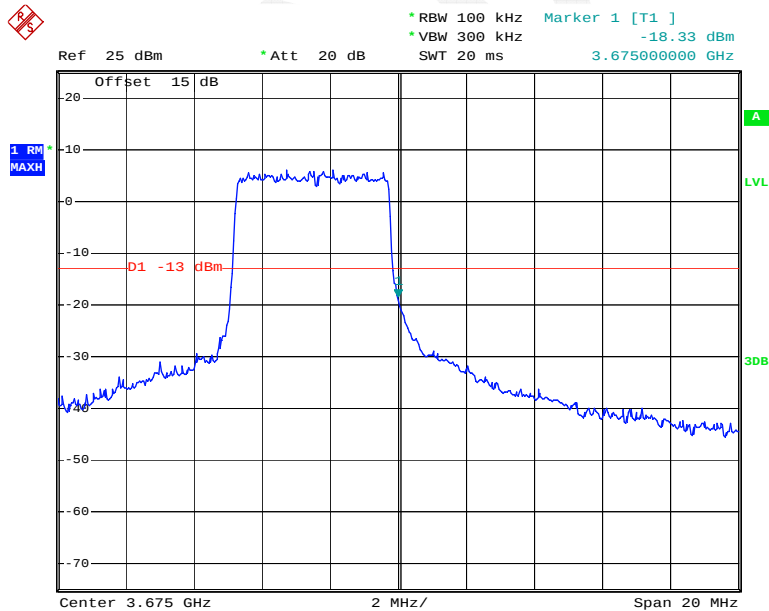
Date: 29.JUL.2014 17:43:07

QPSK, 5MHz, Left Side



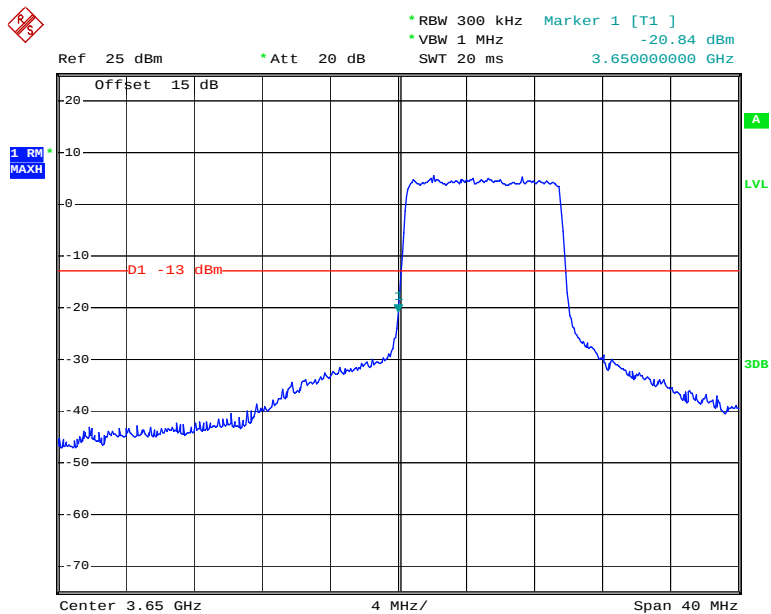
Date: 29.JUL.2014 17:41:52

QPSK, 5MHz, Right Side



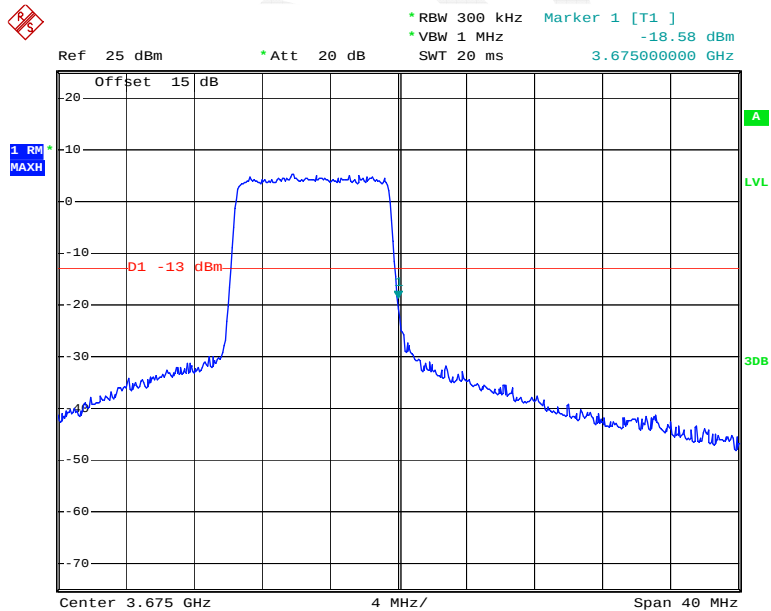
Date: 29.JUL.2014 17:44:58

16QAM, 10MHz, Left Side



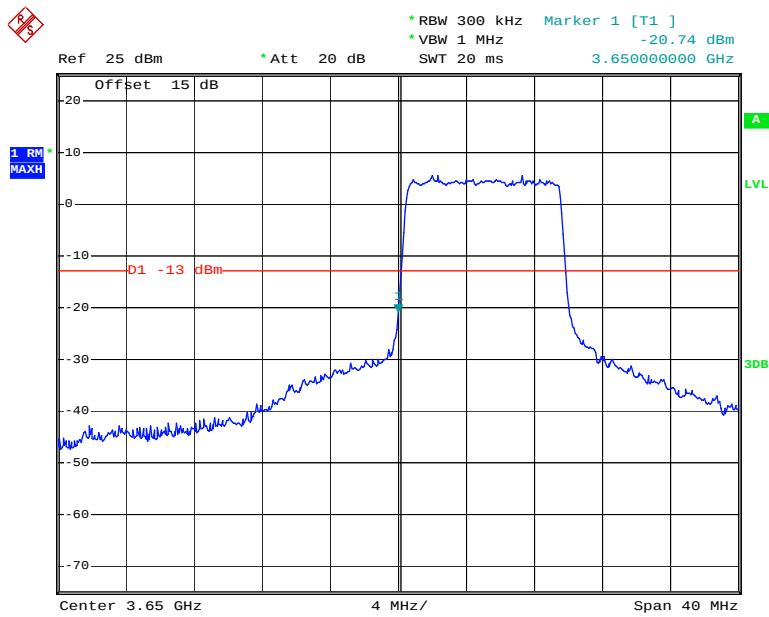
Date: 29.JUL.2014 17:49:59

16QAM, 10MHz, Right Side



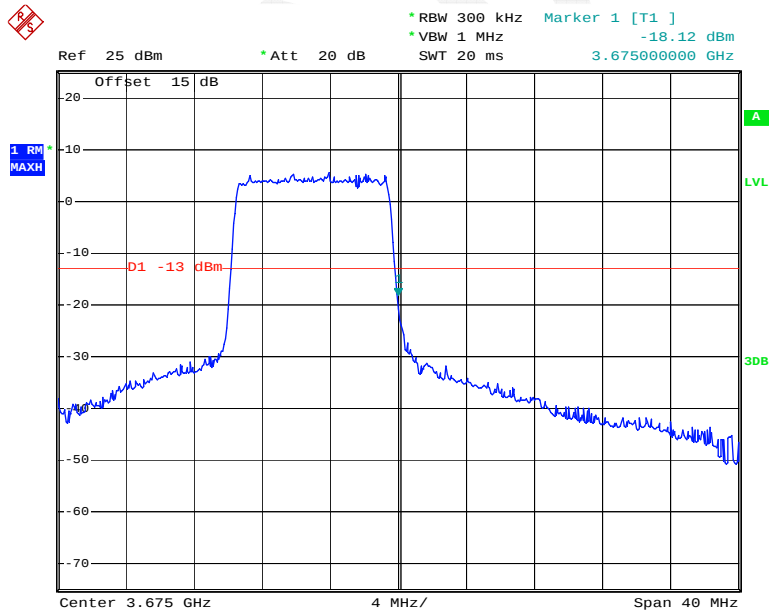
Date: 29.JUL.2014 17:48:57

QPSK, 10MHz, Left Side



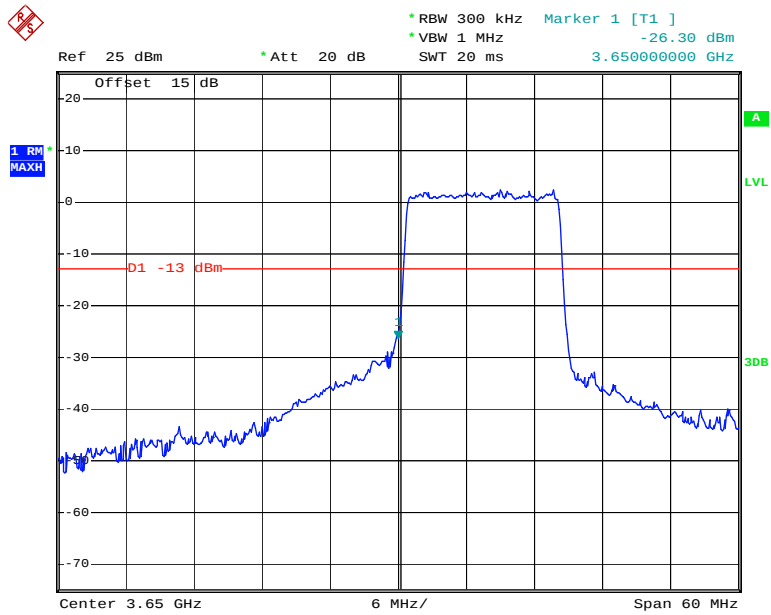
Date: 29.JUL.2014 17:50:50

QPSK, 10MHz, Right Side



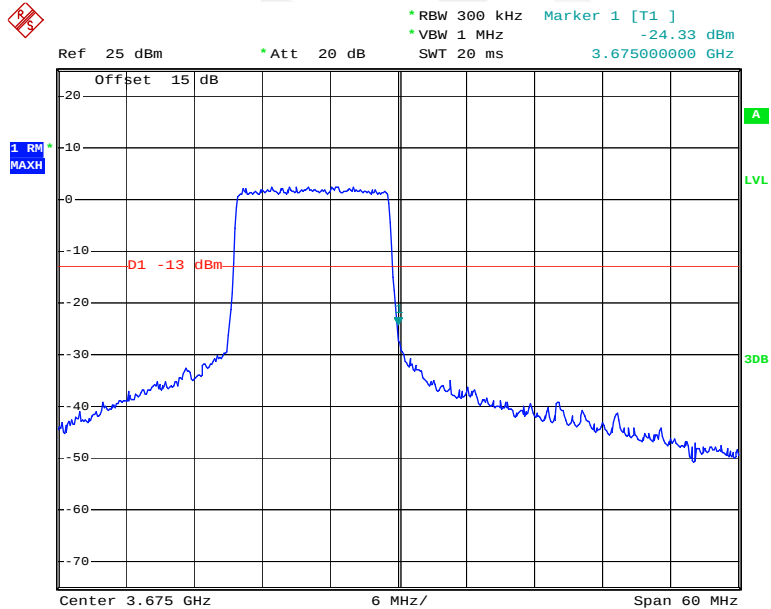
Date: 29.JUL.2014 17:48:34

16QAM, 15MHz, Left Side



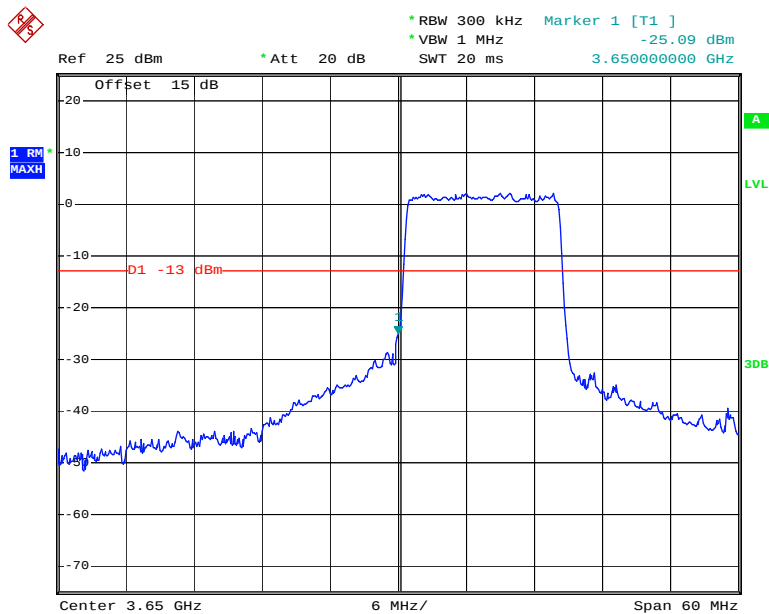
Date: 29.JUL.2014 17:52:35

16QAM, 15MHz, Right Side



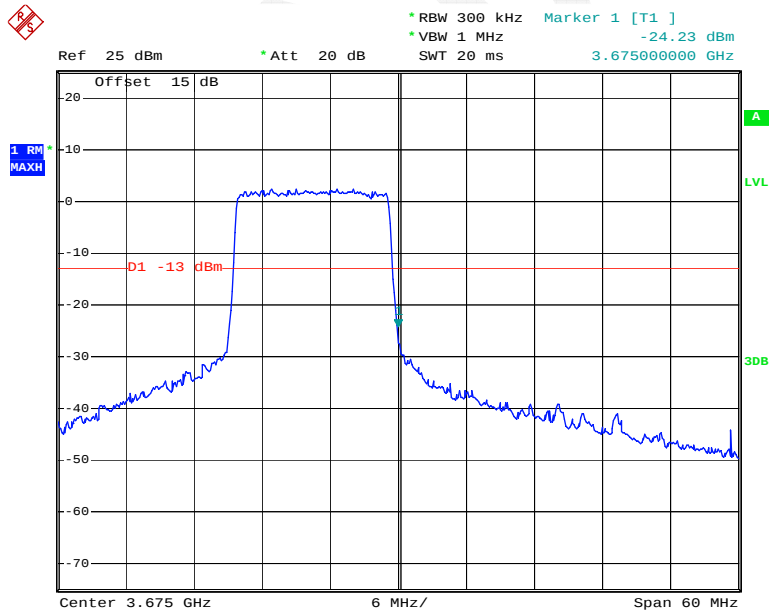
Date: 29.JUL.2014 17:53:26

QPSK, 15MHz, Left Side



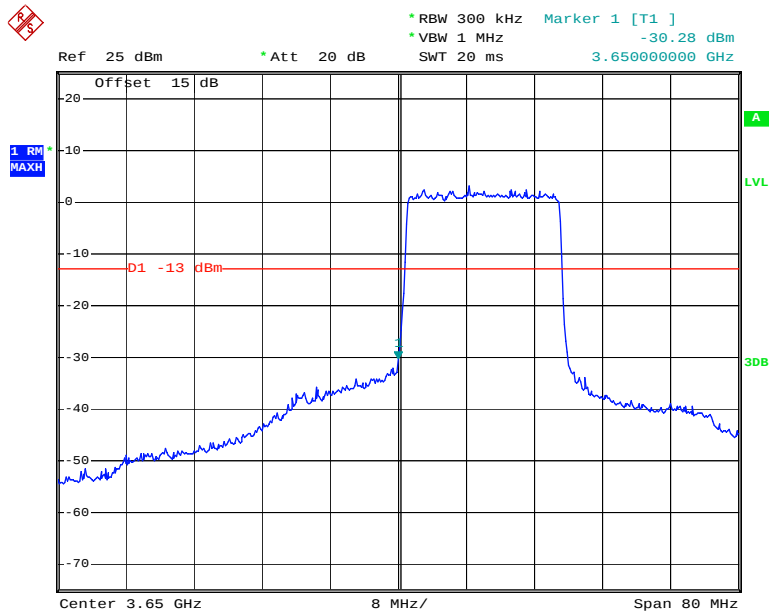
Date: 29.JUL.2014 17:52:10

QPSK, 15MHz, Right Side



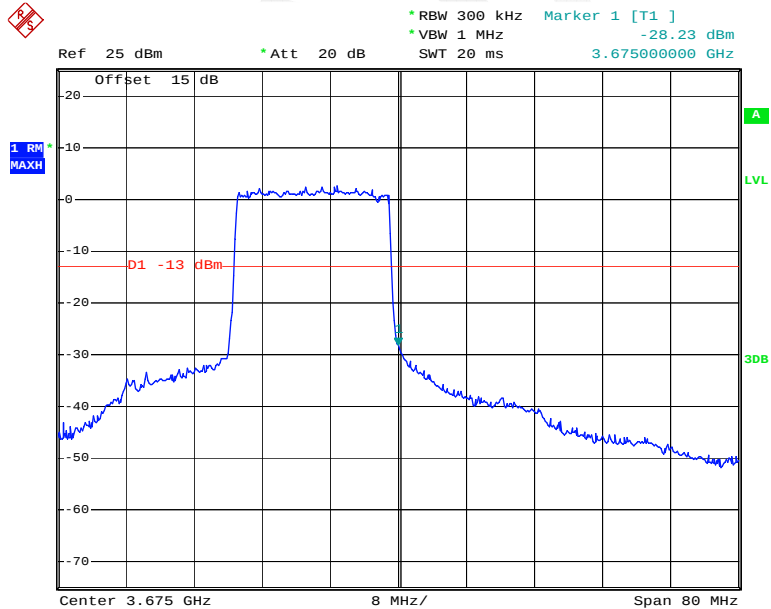
Date: 29.JUL.2014 17:54:28

16QAM, 20MHz, Left Side



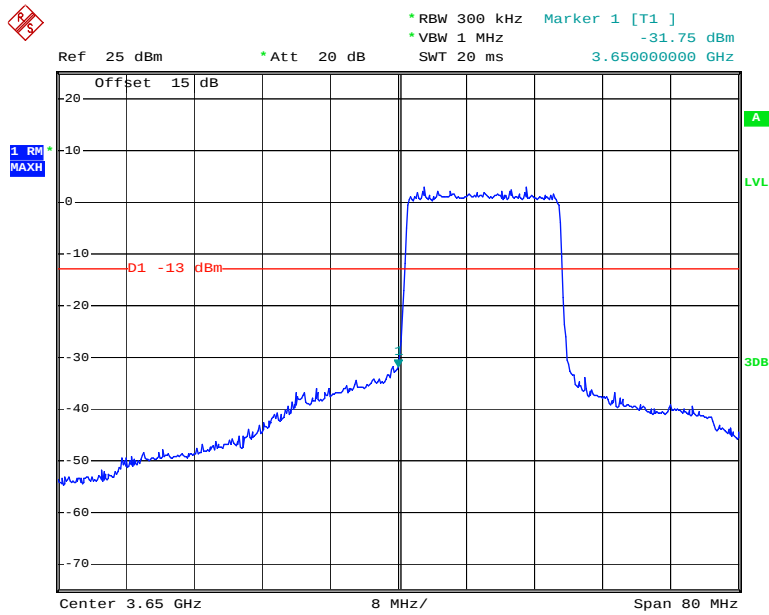
Date: 29.JUL.2014 17:39:05

16QAM, 20MHz, Right Side



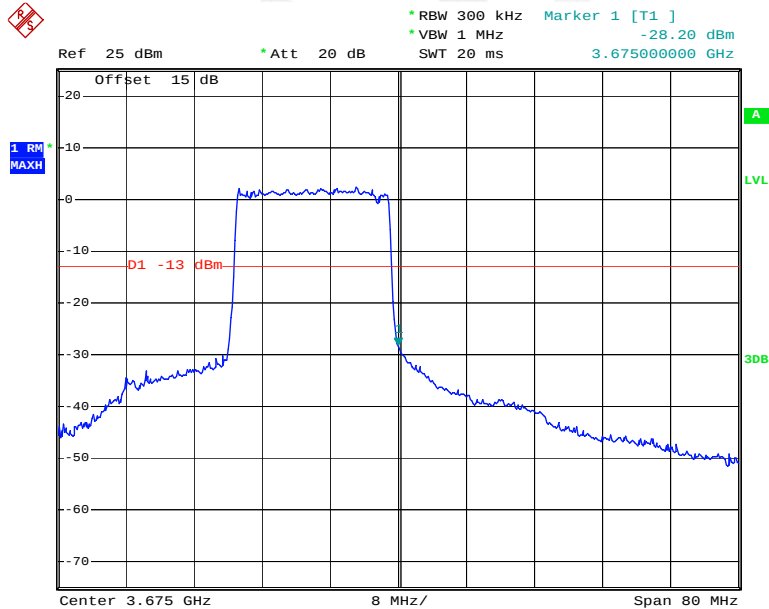
Date: 29.JUL.2014 17:38:00

QPSK, 20MHz, Left Side



Date: 29.JUL.2014 17:39:29

QPSK, 20MHz, Right Side



Date: 29.JUL.2014 17:37:20

FCC §2.1053 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious attenuation limit in dB = $43 + 10 \log_{10}$ (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2014-05-09	2015-05-09
Sunol Sciences	Antenna	JB3	A060611-1	2011-09-06	2014-09-05
HP	Amplifier	8447E	2434A02181	2013-09-06	2014-09-06
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2013-09-06	2014-09-06

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

Test Data**Environmental Conditions**

Temperature:	24.5 °C
Relative Humidity:	66 %
ATM Pressure:	100.1 kPa

The testing was performed by Allen Qiao on 2014-06-30.

Test Mode: Transmitting(prescan with low/middle/high channel,and worst case as below:)

5MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency: 3662.500 MHz (QPSK)								
7325.000	H	36.91	-51.4	13.2	3.1	-41.3	-13.0	28.3
7325.000	V	47.51	-40.5	13.2	3.1	-30.4	-13.0	17.4
10987.500	H	30.56	-51.2	13.1	5.3	-43.4	-13.0	30.4
10987.500	V	32.05	-47.9	13.1	5.3	-40.1	-13.0	27.1
63.900	H	37.11	-62.4	-8.2	0.2	-70.8	-13.0	57.8
63.900	V	38.26	-61.2	-8.2	0.2	-69.6	-13.0	56.6
Frequency: 3662.500 MHz (16-QAM)								
7325.000	H	42.48	-45.8	13.2	3.1	-35.7	-13.0	22.7
7325.000	V	48.93	-39.1	13.2	3.1	-29.0	-13.0	16.0
10987.500	H	30.12	-51.6	13.1	5.3	-43.8	-13.0	30.8
10987.500	V	30.63	-49.3	13.1	5.3	-41.5	-13.0	28.5
63.900	H	37.69	-61.8	-8.2	0.2	-70.2	-13.0	57.2
63.900	V	38.09	-61.4	-8.2	0.2	-69.8	-13.0	56.8

10MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency: 3662.500 MHz (QPSK)								
7325.000	H	38.59	-49.7	13.2	3.1	-39.6	-13.0	26.6
7325.000	V	45.98	-42	13.2	3.1	-31.9	-13.0	18.9
10987.500	H	30.03	-51.7	13.1	5.3	-43.9	-13.0	30.9
10987.500	V	31.26	-48.7	13.1	5.3	-40.9	-13.0	27.9
63.900	H	37.89	-61.6	-8.2	0.2	-70.0	-13.0	57.0
63.900	V	38.56	-60.9	-8.2	0.2	-69.3	-13.0	56.3
Frequency: 3662.500 MHz (16-QAM)								
7325.000	H	39.25	-49.1	13.2	3.1	-39.0	-13.0	26.0
7325.000	V	45.80	-42.2	13.2	3.1	-32.1	-13.0	19.1
10987.500	H	30.23	-51.5	13.1	5.3	-43.7	-13.0	30.7
10987.500	V	30.80	-49.2	13.1	5.3	-41.4	-13.0	28.4
63.900	H	37.25	-62.2	-8.2	0.2	-70.6	-13.0	57.6
63.900	V	38.10	-61.4	-8.2	0.2	-69.8	-13.0	56.8

15MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency: 3662.500 MHz (QPSK)								
7325.000	H	37.31	-51	13.2	3.1	-40.9	-13.0	27.9
7325.000	V	46.05	-42	13.2	3.1	-31.9	-13.0	18.9
10987.500	H	30.87	-50.9	13.1	5.3	-43.1	-13.0	30.1
10987.500	V	30.42	-49.5	13.1	5.3	-41.7	-13.0	28.7
63.900	H	37.12	-62.4	-8.2	0.2	-70.8	-13.0	57.8
63.900	V	38.36	-61.1	-8.2	0.2	-69.5	-13.0	56.5
Frequency: 3662.500 MHz (16-QAM)								
7325.000	H	38.89	-49.4	13.2	3.1	-39.3	-13.0	26.3
7325.000	V	44.96	-43	13.2	3.1	-32.9	-13.0	19.9
10987.500	H	30.56	-51.2	13.1	5.3	-43.4	-13.0	30.4
10987.500	V	30.88	-49.1	13.1	5.3	-41.3	-13.0	28.3
63.900	H	37.26	-62.2	-8.2	0.2	-70.6	-13.0	57.6
63.900	V	38.36	-61.1	-8.2	0.2	-69.5	-13.0	56.5

20MHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency: 3662.500 MHz (QPSK)								
7325.000	H	35.36	-52.9	13.2	3.1	-42.8	-13.0	29.8
7325.000	V	44.47	-43.5	13.2	3.1	-33.4	-13.0	20.4
10987.500	H	29.36	-52.4	13.1	5.3	-44.6	-13.0	31.6
10987.500	V	29.73	-50.2	13.1	5.3	-42.4	-13.0	29.4
63.900	H	37.94	-61.5	-8.2	0.2	-69.9	-13.0	56.9
63.900	V	38.44	-61	-8.2	0.2	-69.4	-13.0	56.4
Frequency: 3662.500 MHz (16-QAM)								
7325.000	H	37.26	-51	13.2	3.1	-40.9	-13.0	27.9
7325.000	V	43.21	-44.8	13.2	3.1	-34.7	-13.0	21.7
10987.500	H	30.20	-51.5	13.1	5.3	-43.7	-13.0	30.7
10987.500	V	31.14	-48.8	13.1	5.3	-41.0	-13.0	28.0
63.900	H	37.67	-61.8	-8.2	0.2	-70.2	-13.0	57.2
63.900	V	38.33	-61.2	-8.2	0.2	-69.6	-13.0	56.6

Note:

Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

FCC §2.1055 & §90.213- FREQUENCY STABILITY**Applicable Standard**

FCC §2.1055, §90.213

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The AC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
R & S	Wideband Radio Communication Tester	CMW500	114772	2013-11-15	2014-11-15
Dongzhixu	High Temperature Test Chamber	DP1000	201105083-3	2013-08-01	2014-08-01

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

Test Data**Environmental Conditions**

Temperature:	27.3 °C
Relative Humidity:	62 %
ATM Pressure:	99.9 kPa

The testing was performed by Allen Qiao on 2014-07-26.

Test Mode: Transmitting

LTE band (3650-3675MHz) Middle Channel

Middle Channel			
Temperature (°C)	Voltage	Frequency Error (Hz)	Frequency Error (ppm)
-30	3.7	13.58	0.0037
-20		14.16	0.0039
-10		10.52	0.0029
0		11.32	0.0031
10		9.68	0.0026
20		14.45	0.0039
30		14.96	0.0041
40		15.83	0.0043
50		16.25	0.0044
25	3.5	15.22	0.0041
25	4.2	14.16	0.0039

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