

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: QISRRN3301

Report Type: Original Report	Product Type: eRelay Remote Node
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Report Number: <u>R1DG140504004-00</u>	
Report Date: <u>2014-05-26</u>	
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Huawei Technologies Co., Ltd.*'s product, model number: *RRN3301* (FCC ID: *QISRRN3301*) or the "EUT" in this report was a *eRelay Remote Node*, which was measured approximately: 200 mm (L) x 340 mm (W) x 60 mm (H), rated with input voltage: DC 48 V from PoE (120V AC input, 48V DC output).

** All measurement and test data in this report was gathered from production sample serial number: 140504004 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2014-05-04.*

Objective

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

Related Submittal(s)/Grant(s)

No related submittal.

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 3650-3700 MHz Band

Applicable Standards: TIA 603-D and ANSI 63.4-2009.

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

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication 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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. 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.

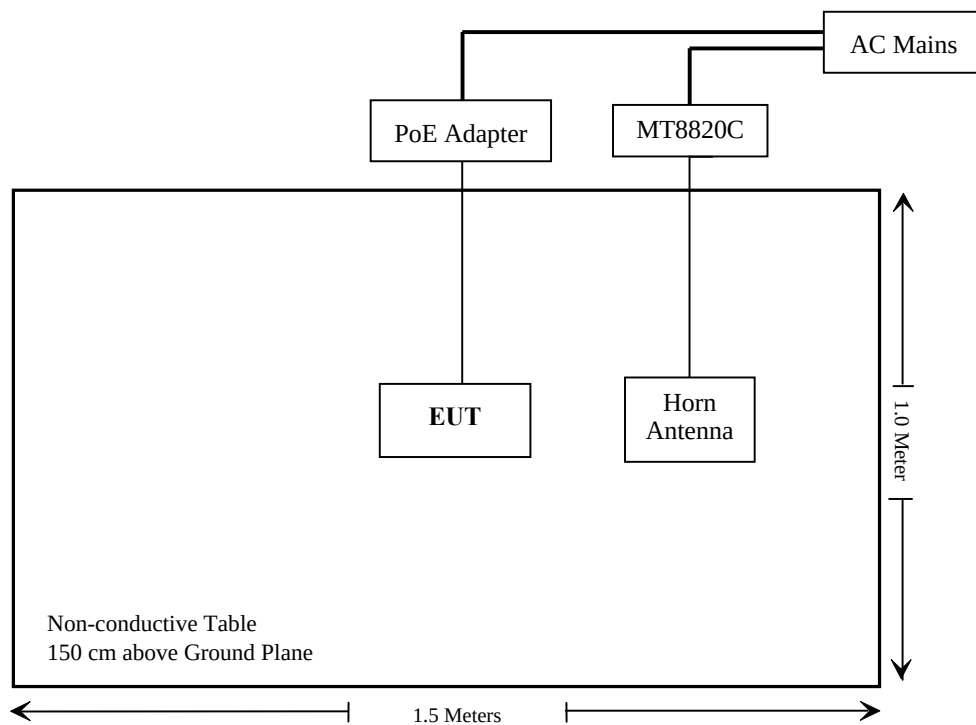
Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Anritsu	Radio Communication Analyzer	MT8820C	6201181469
Huawei	PoE Adapter	UE-PoE-35	--

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1307 (b)(1), §2.1091	Maximum Permissible Exposure (MPE)	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§1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**Applicable Standard**

According to subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

(A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

f = frequency in MHz

* = Plane-wave equivalent power density

Result**Calculated Formulary:**

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
3650-3675	17	50.12	25	316.23	20	3.15	5

Note: Maximum target power is 25 dBm

Radiation Exposure Statement:

To comply with FCC RF exposure requirements, a minimum separation distance of 20cm is required between the antenna and all public persons.

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

FCC §2.1046 and §90.1321

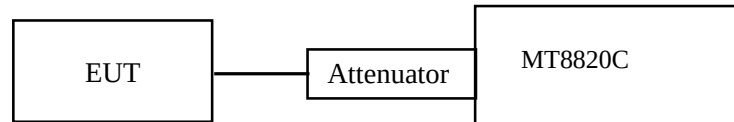
Limit

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.

Test Procedure

The EUT was connected to a MT8820C through a 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
Anritsu	Radio Communication Analyzer	MT8820C	6201181469	2013-11-28	2014-11-27

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2014-05-22.

Test Mode: Transmitting

Test Result: Compliance. Please refer to following table.

LTE Band: 3650-3675MHz

Modulation	Frequency (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
QPSK(10MHz)	3655.0	21.27	17	38.27	40.02
	3662.5	21.48	17	38.48	
	3670.0	21.61	17	38.61	
16QAM(10MHz)	3655.0	21.12	17	38.12	
	3662.5	21.34	17	38.34	
	3670.0	21.47	17	38.47	
64QAM(10MHz)	3655.0	21.12	17	38.12	
	3662.5	21.28	17	38.28	
	3670.0	21.46	17	38.46	
QPSK(20MHz)	3660.0	21.72	17	38.72	43.03
	3662.5	21.68	17	38.68	
	3665.0	21.64	17	38.64	
16QAM(20MHz)	3660.0	21.59	17	38.59	
	3662.5	21.57	17	38.57	
	3665.0	21.55	17	38.55	
64QAM(20MHz)	3660.0	21.58	17	38.58	
	3662.5	21.54	17	38.54	
	3665.0	21.50	17	38.50	

Note: limit = 44dBm + 10Log (Bandwidth/25)

Eg: For 10 MHz Bandwidth, the limit =44dBm + 10Log (10/25) = 40.02 dBm

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

FCC §90.1321 (a); §90.1321 (a)

Limit

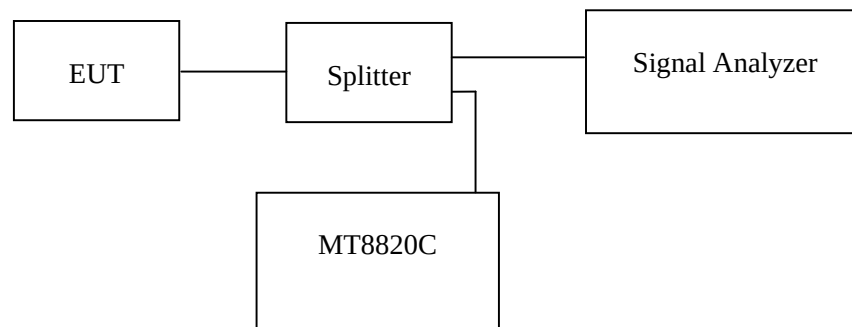
According to FCC §90.1321:

(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.

Test Procedure

The EUT was connected to a MT8820C & signal 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
Anritsu	Radio Communication Analyzer	MT8820C	6201181469	2013-11-28	2014-11-27
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2014-05-22.

Test Mode: Transmitting

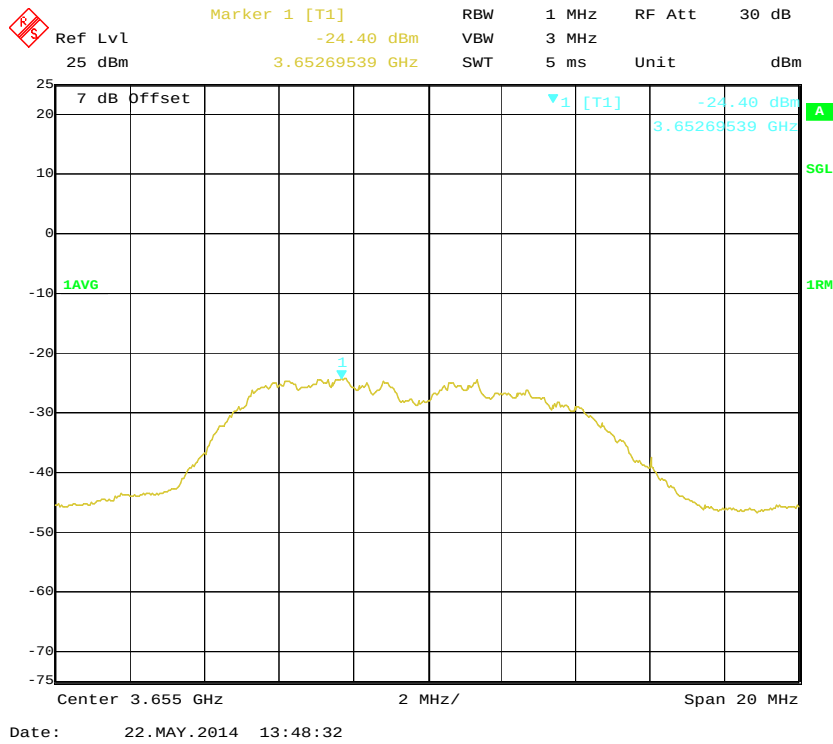
Result: Compliance.

LTE Band: 3650-3675MHz

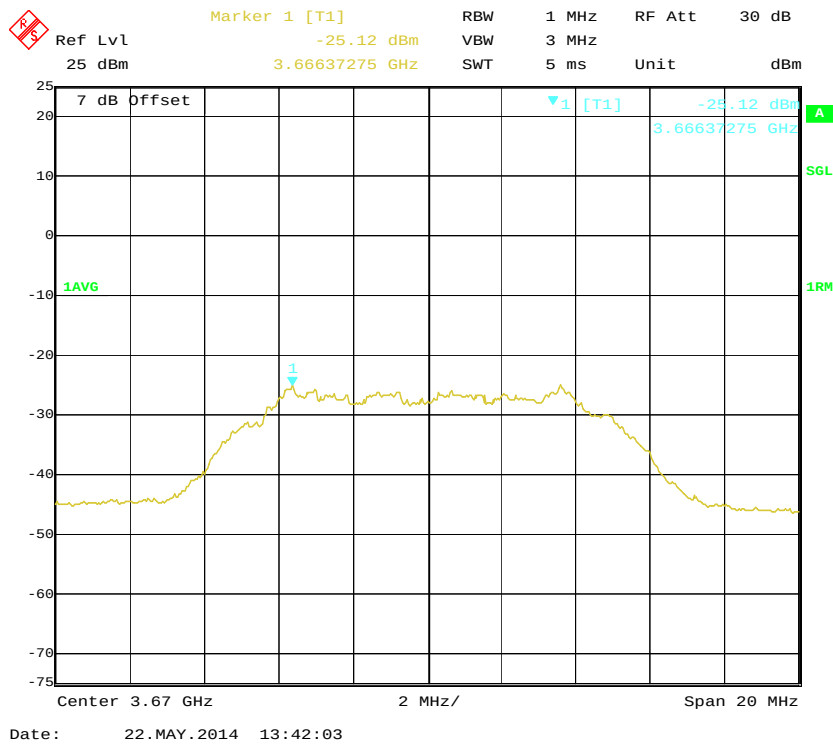
Modulation	Frequency (MHz)	Power Density (dBm/MHz)	Antenna Gain (dBi)	EIRP Power Density (dBm/MHz)	Limit (dBm/MHz)
QPSK (10MHz)	3655	-24.40	17	-7.40	30
	3670	-25.12	17	-8.12	
16QAM (10MHz)	3655	-24.45	17	-7.45	
	3670	-25.13	17	-8.13	
64QAM (10MHz)	3655	-25.09	17	-8.09	
	3670	-23.06	17	-6.06	
QPSK (20MHz)	3660	-25.93	17	-8.93	
	3665	-26.31	17	-9.31	
16QAM (20MHz)	3660	-26.48	17	-9.48	
	3665	-23.65	17	-6.65	
64QAM (20MHz)	3660	-26.19	17	-9.19	
	3665	-24.63	17	-7.63	

Please refer to the following plots

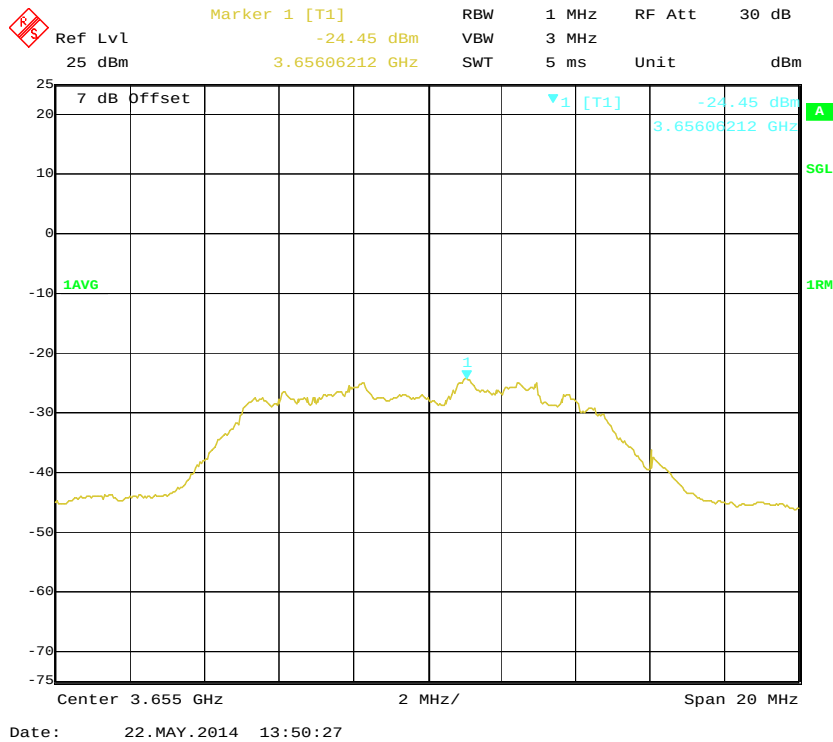
QPSK (10MHz), Low Channel



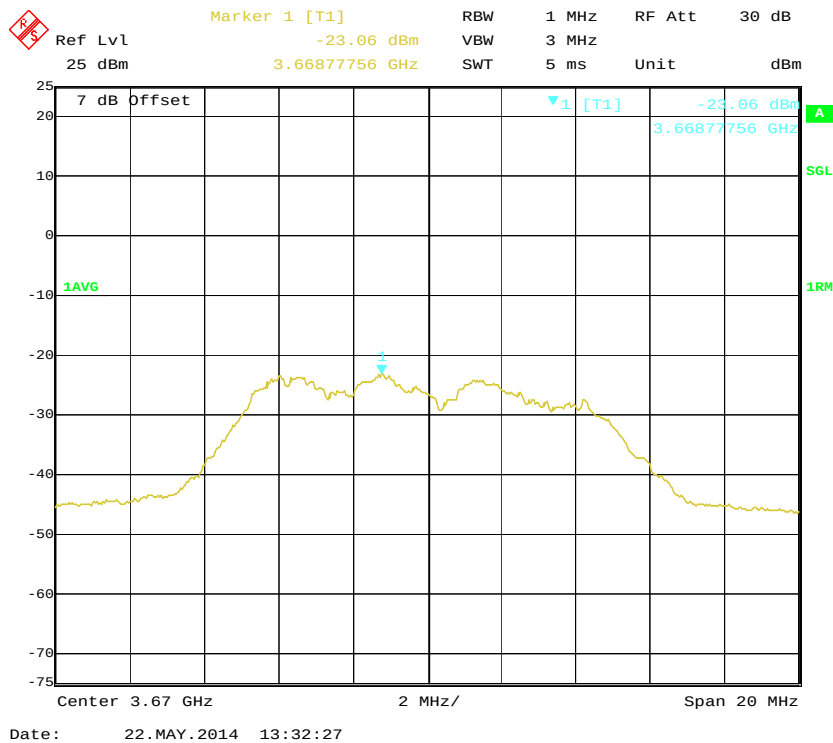
QPSK (10MHz), High Channel



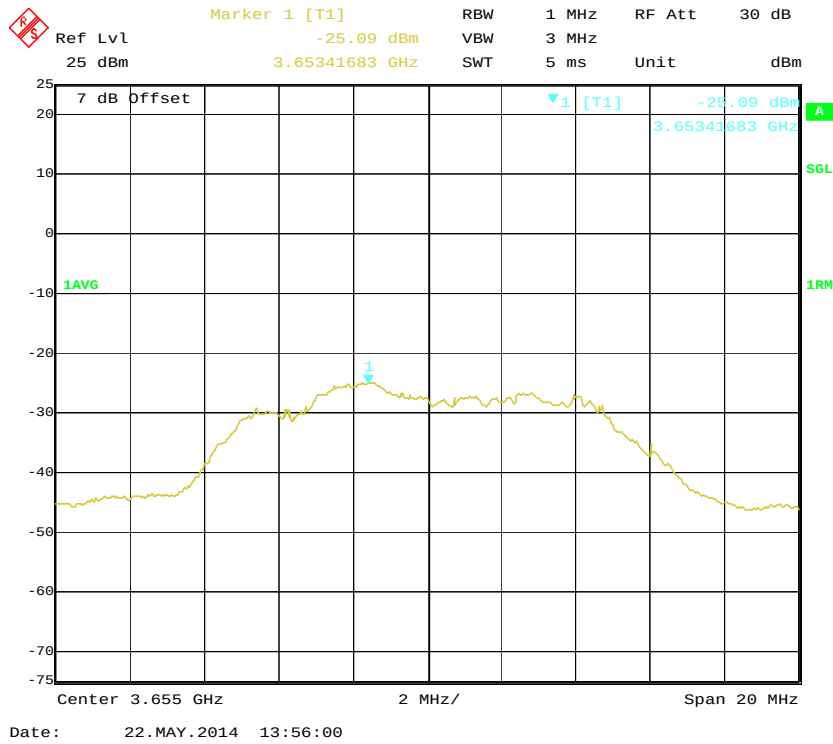
16QAM (10MHz), Low Channel



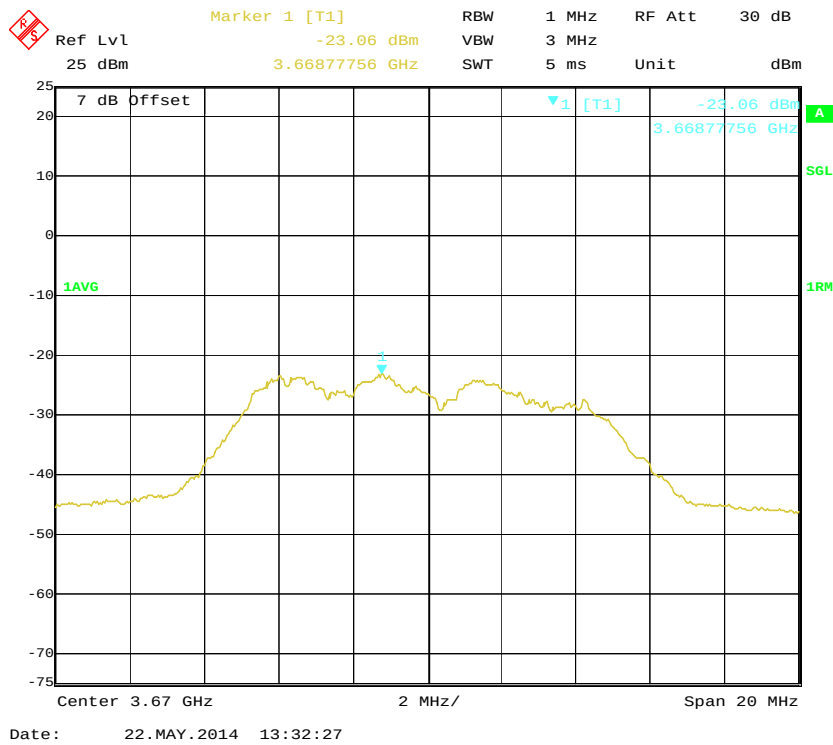
16QAM (10MHz), High Channel



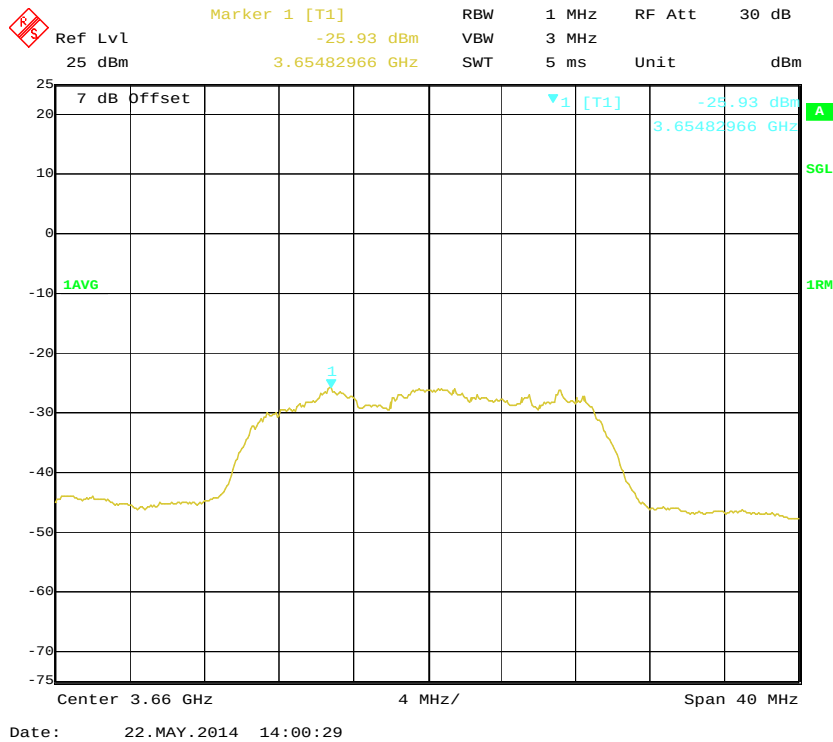
64QAM (10MHz), Low Channel



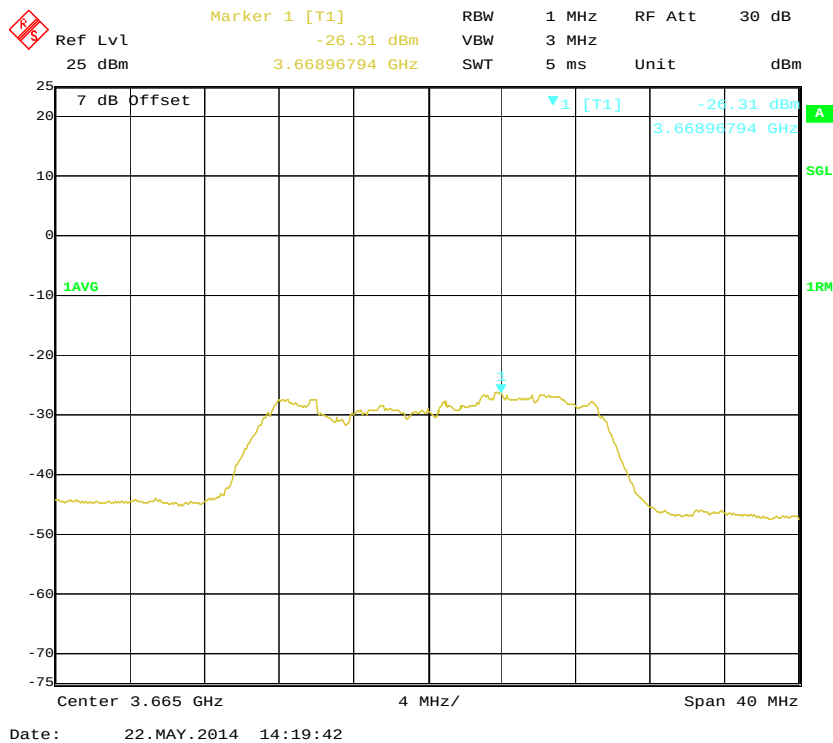
64QAM (10MHz), High Channel



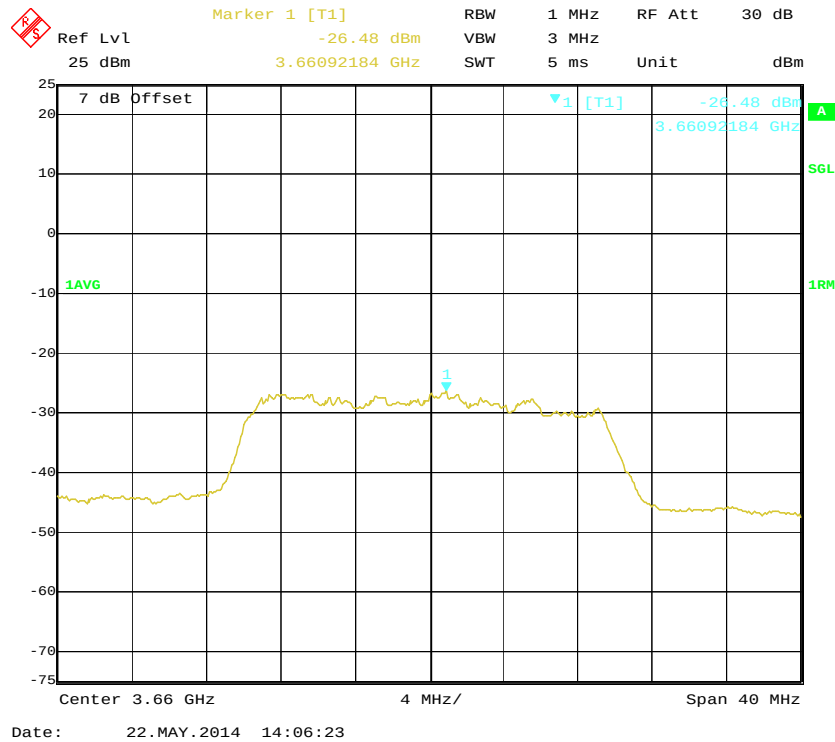
QPSK (20MHz), Low Channel



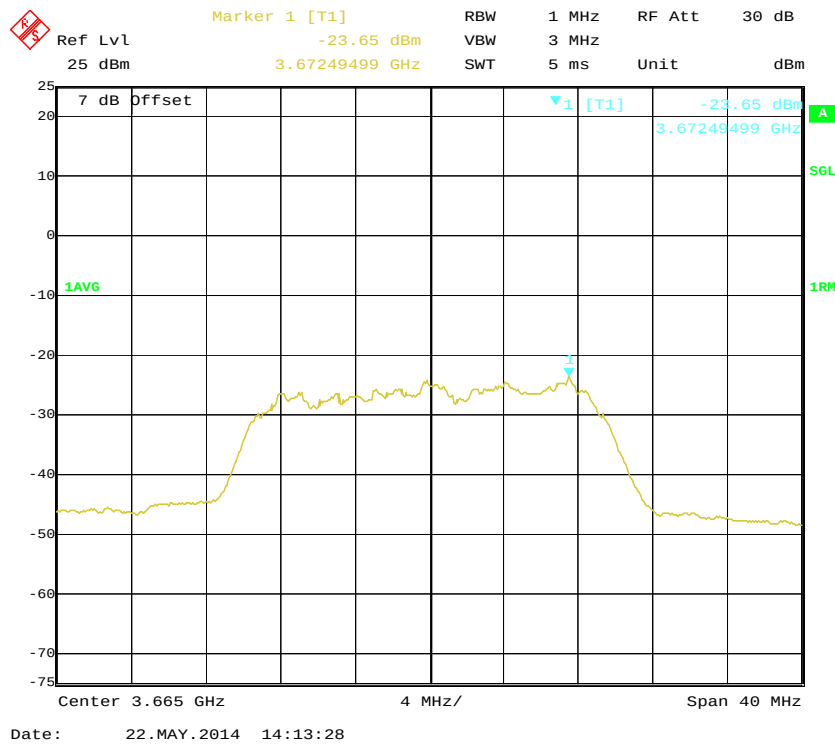
QPSK (20MHz), HighChannel



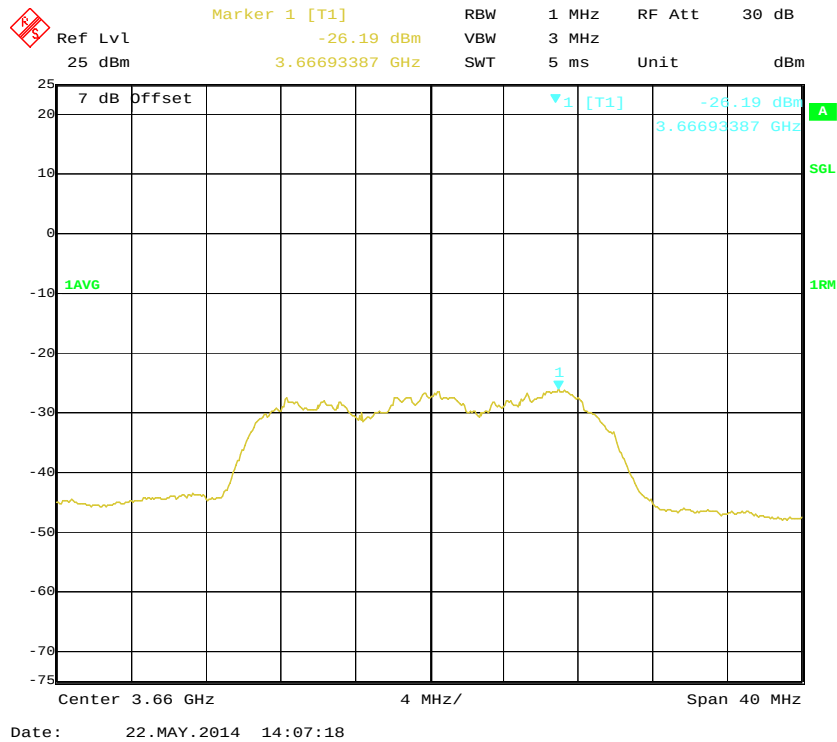
16QAM (20MHz), Low Channel



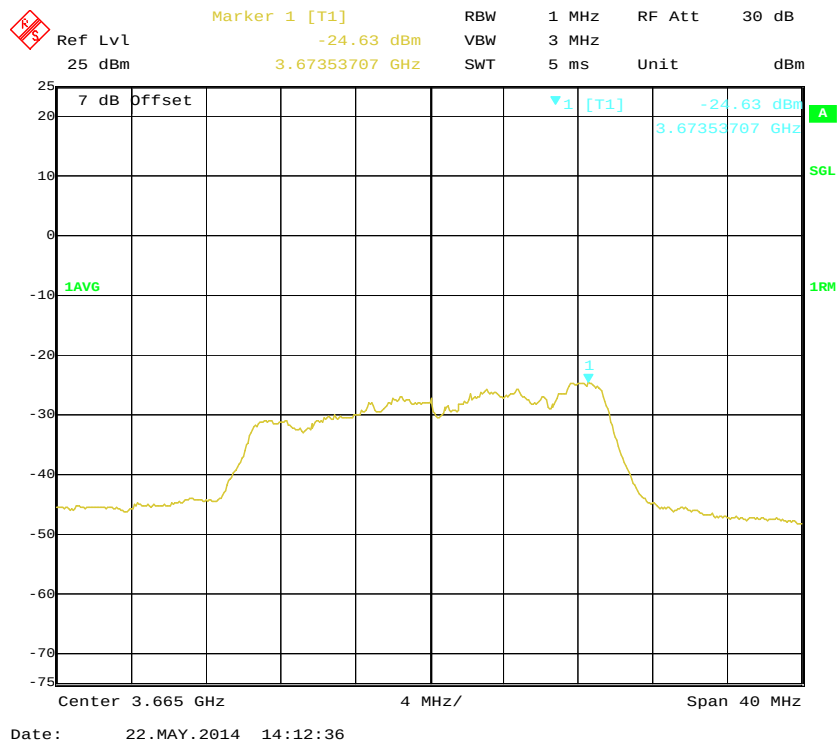
16QAM (20MHz), High Channel



64QAM (20MHz), Low Channel



64QAM (20MHz), High Channel



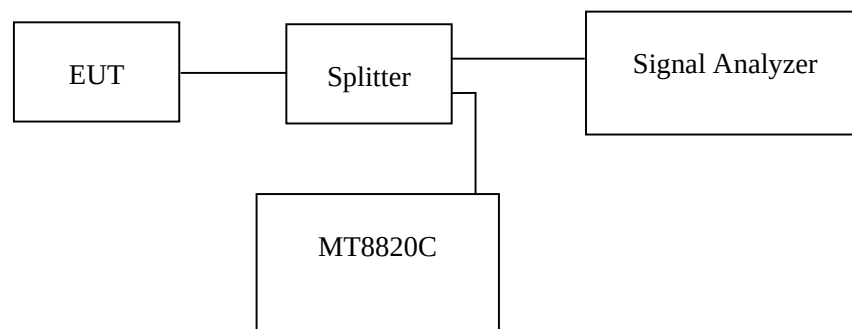
FCC §2.1049 & §90.209 – OCCUPIED BANDWIDTH

Applicable Standard

FCC §2.1049 and §90.209

Test Procedure

The EUT was connected to a MT8820C & signal 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
Anritsu	Radio Communication Analyzer	MT8820C	6201181469	2013-11-28	2014-11-27
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2014-05-22.

LTE Band: 3650-3675MHz

Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK (10MHz)	3655	8.98	9.82
	3670	8.98	9.82
16QAM (10MHz)	3655	8.98	9.86
	3670	8.98	9.86
64QAM (10MHz)	3655	8.98	9.86
	3670	8.98	9.86
QPSK (20MHz)	3660	17.96	19.72
	3665	17.96	19.72
16QAM (20MHz)	3660	17.96	19.64
	3665	17.96	19.64
64QAM (20MHz)	3660	17.88	19.48
	3665	17.88	19.48

Please refer to the following plots:

Ref Lvl 25 dBm

Delta 1 [T1] 0.28 dB

RBW 100 kHz

RF Att 30 dB

SWT 5 ms

Unit dBm

7 dB Offset

D1 10.8 dBm

1MAX

D2 -15.2 dBm

1

1 [T1] 17.45 dBm

1 [T1] 6.28 dBm

OP8 8.97795591 MHz

T1 [T1] 6.57 dBm

T2 [T1] 7.13 dBm

3.65005018 GHz

3.65053106 GHz

3.65056302 GHz

Center 3.655 GHz

2 MHz/

Span 20 MHz

Date: 22.MAY.2014 09:55:57

Delta 1 [T1] 0.96 dB RBW 100 kHz RF Att 30 dB
 Ref Lvl 25 dBm VBW 1 MHz SWT 5 ms Unit dBm

7 dB Offset

D1 10.3 dBm

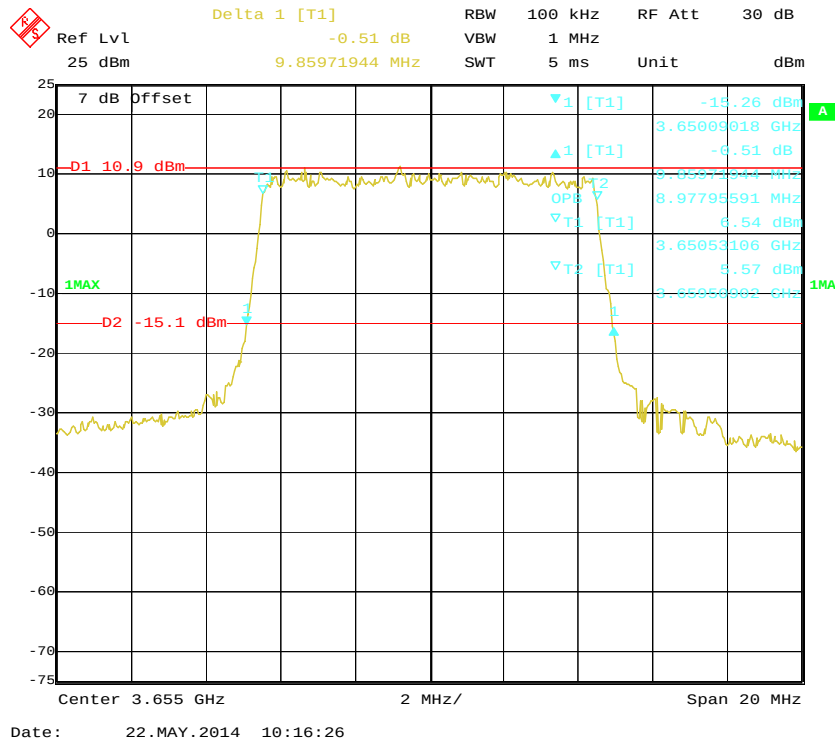
1MAX

D2 -15.7 dBm

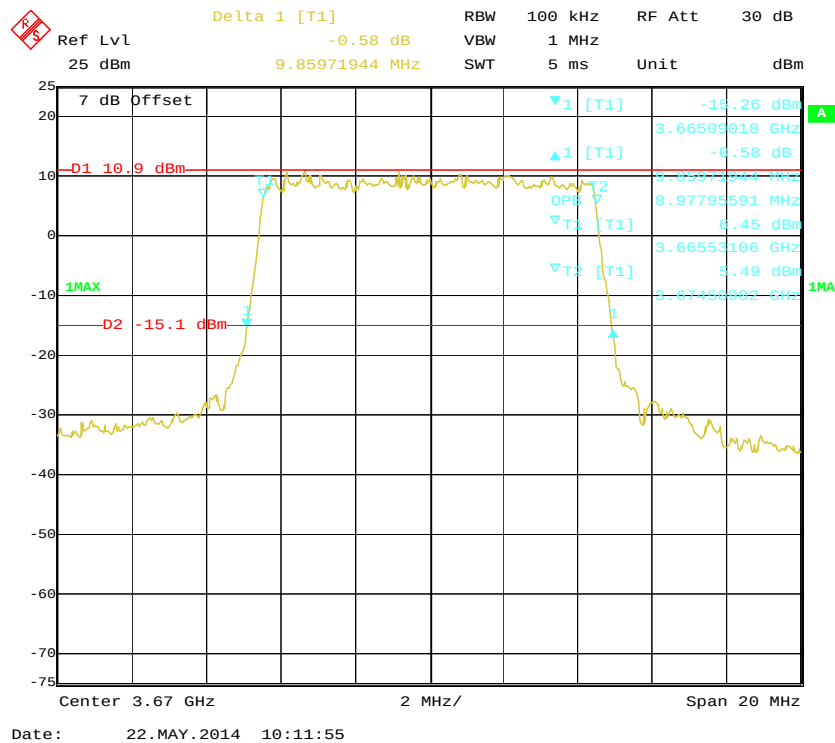
Center 3.67 GHz 2 MHz/ Span 20 MHz

1 [T1] -15.17 dBm
 3.66509018 GHz
 6.96 dB
 8.61961910 MHz
 8.97795591 MHz
 6.97 dBm
 3.66553106 GHz
 7.03 dBm
 9.81466002 GHz

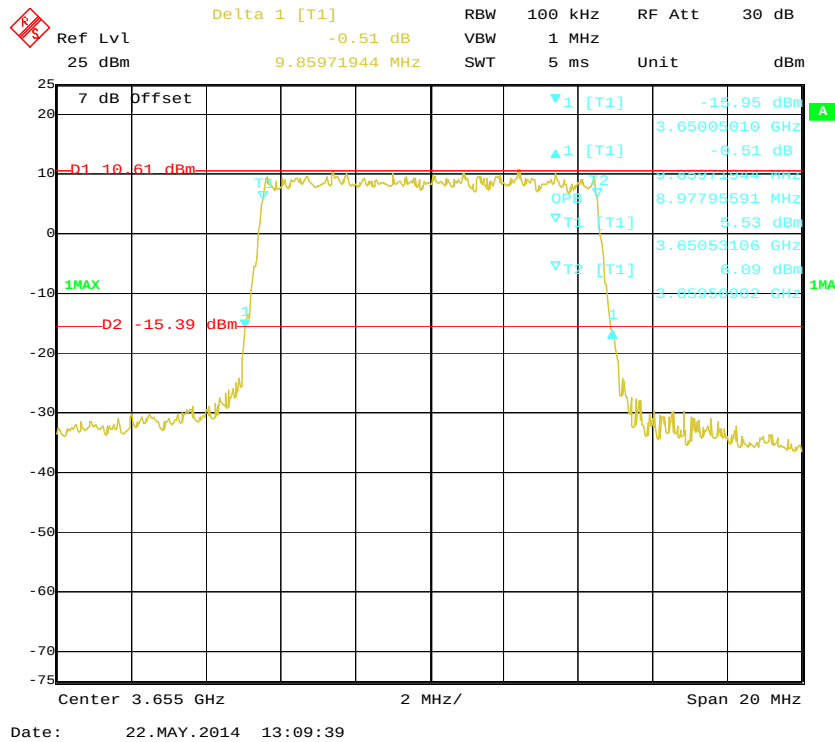
16QAM (10MHz), Low Channel



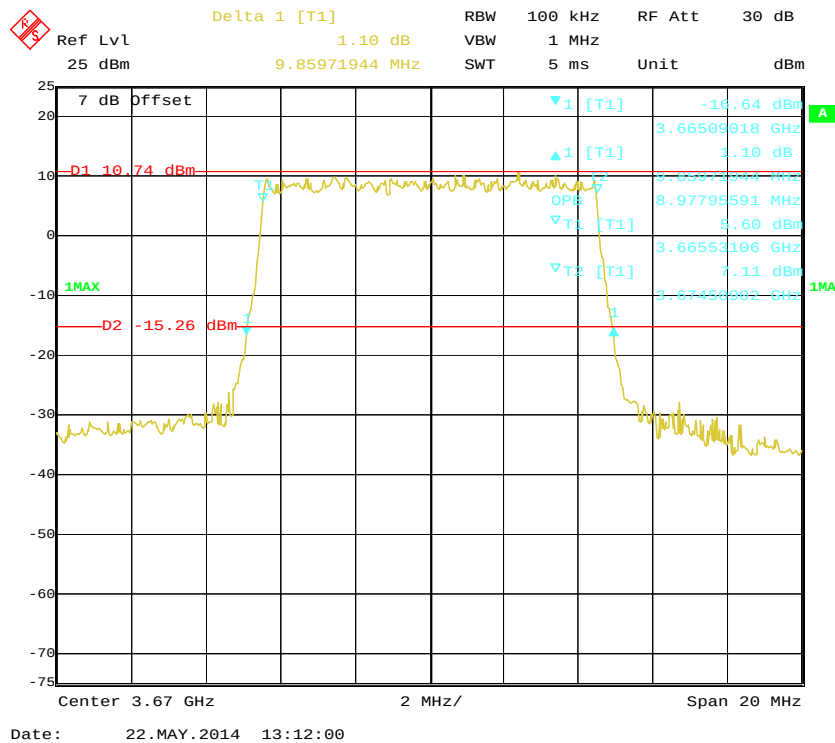
16QAM (10MHz), High Channel



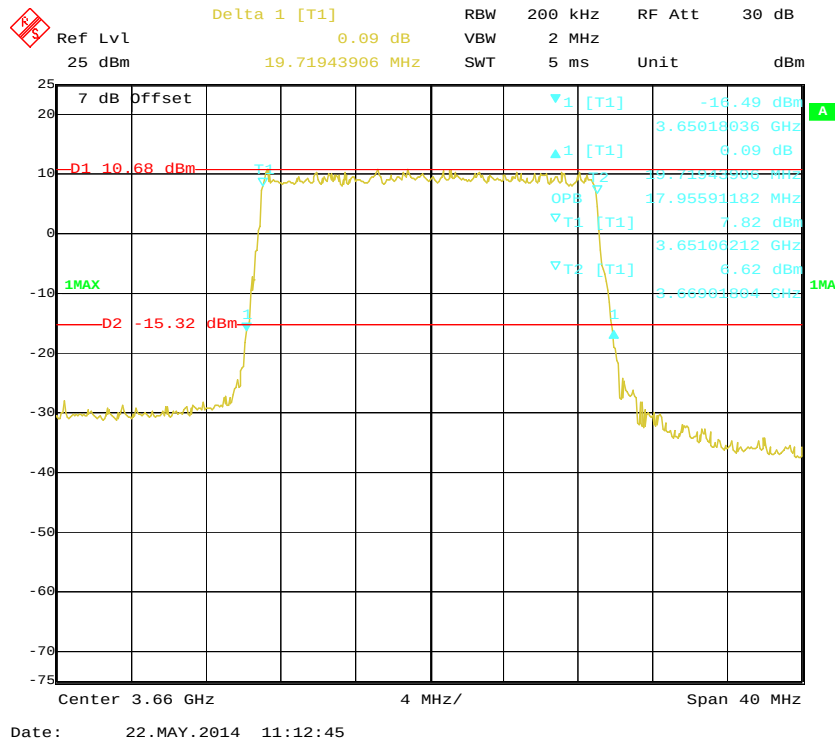
64QAM (10MHz), Low Channel



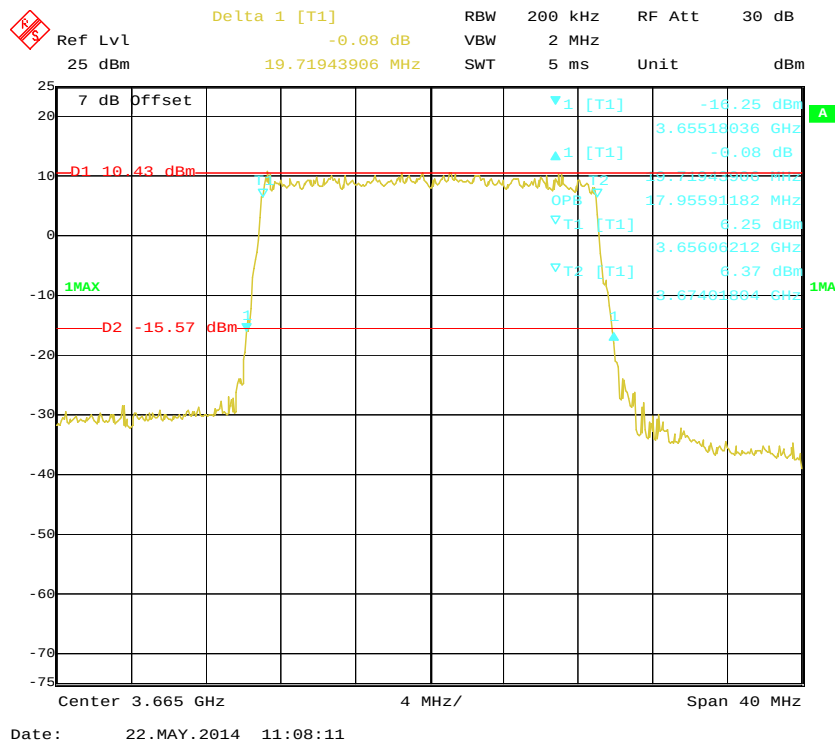
64QAM (10MHz), High Channel



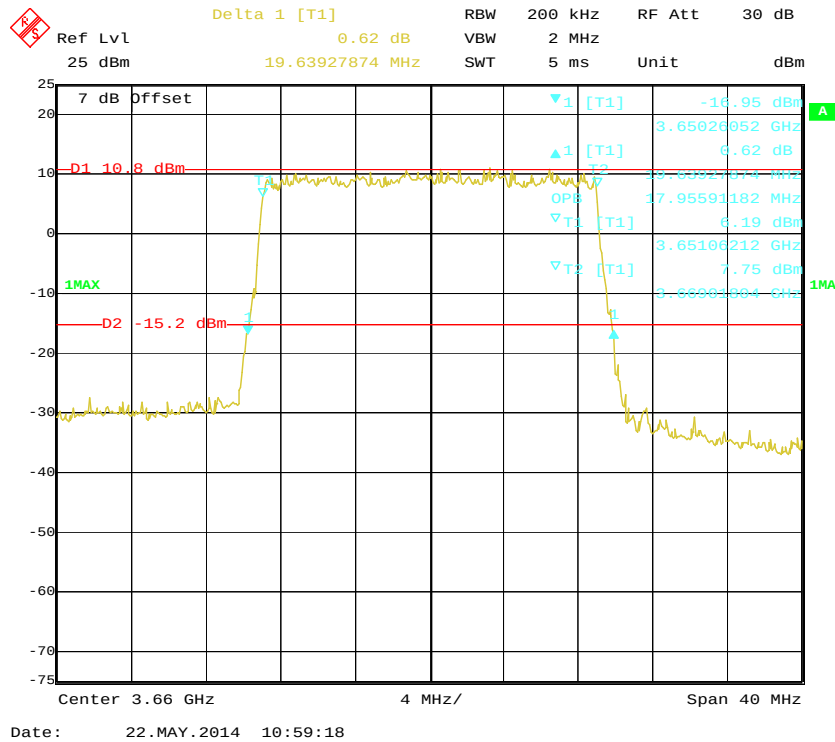
QPSK (20MHz), Low Channel



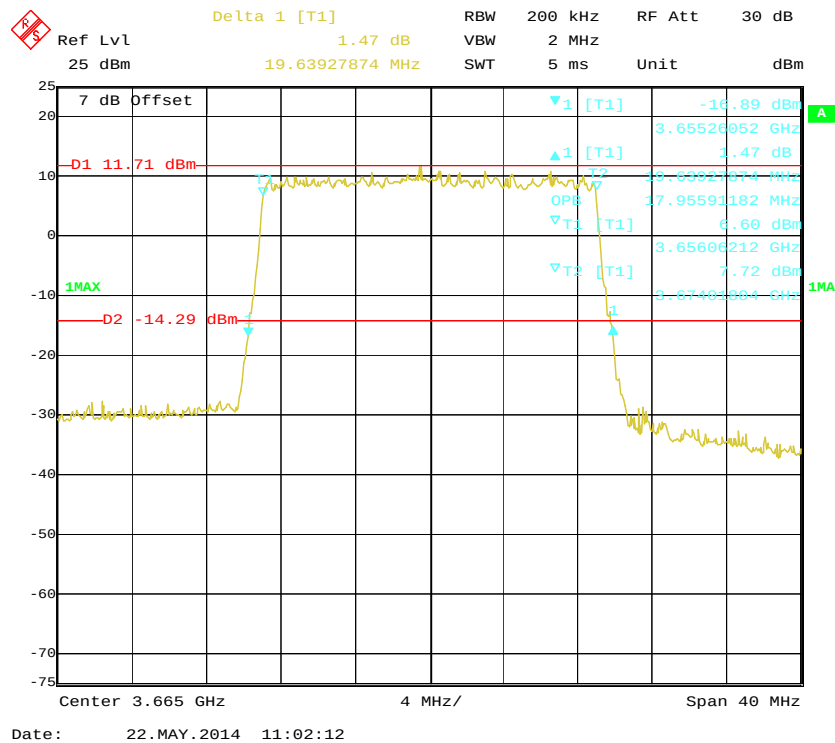
QPSK (20MHz), High Channel



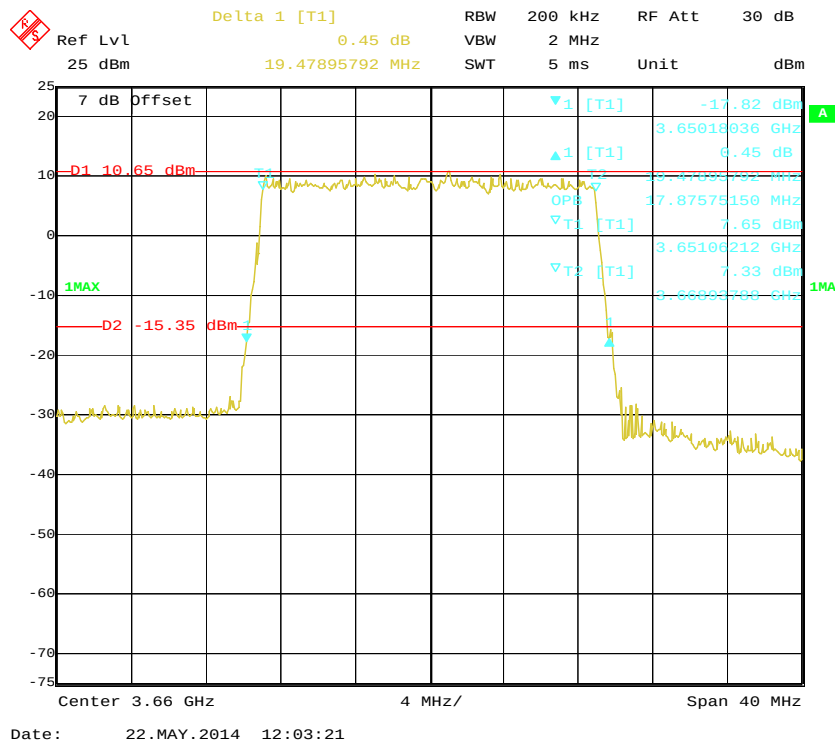
16QAM (20MHz), Low Channel



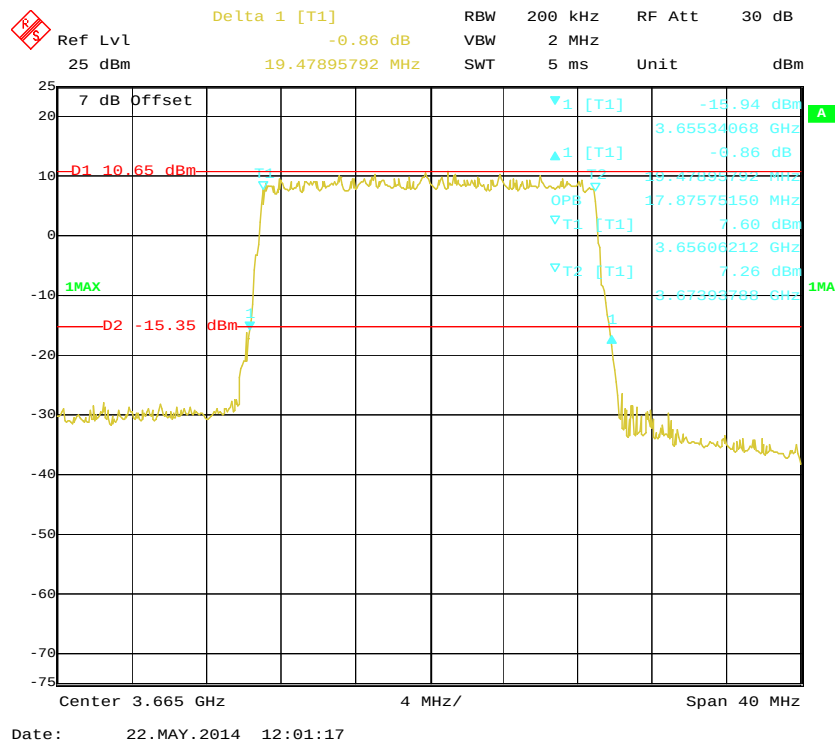
16QAM (20MHz), High Channel



64QAM (20MHz), Low Channel



64QAM (20MHz), High Channel



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

Applicable Standard

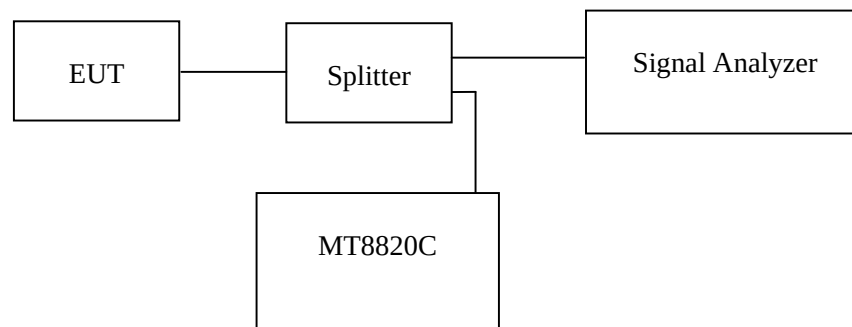
FCC §2.1051 and §90.1323(a)

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 MT8820C & signal 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
Anritsu	Radio Communication Analyzer	MT8820C	6201181469	2013-11-28	2014-11-27
HP	Amplifier	8447E	1937A01046	2013-09-30	2014-09-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12

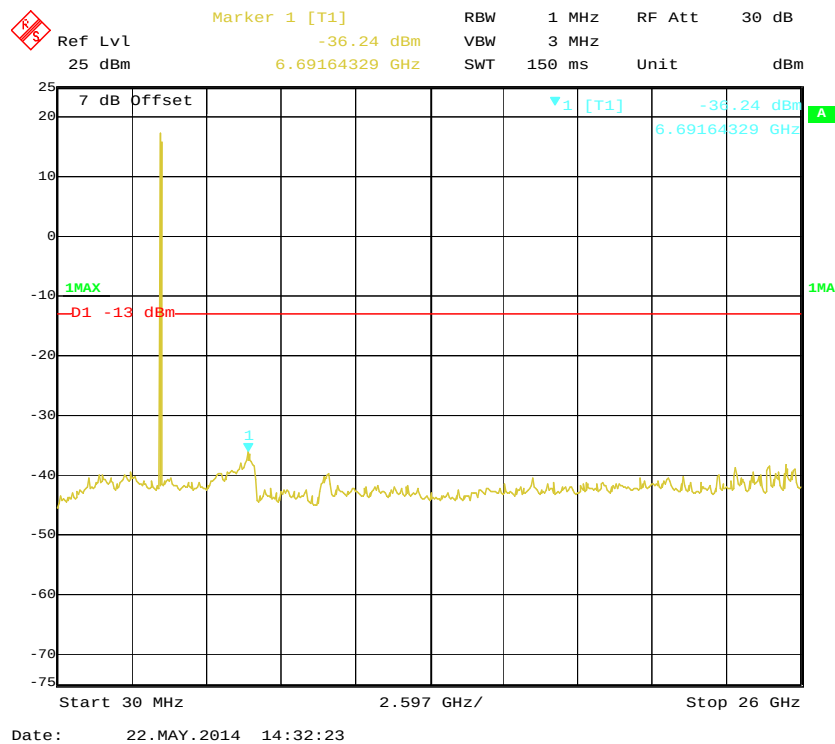
* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

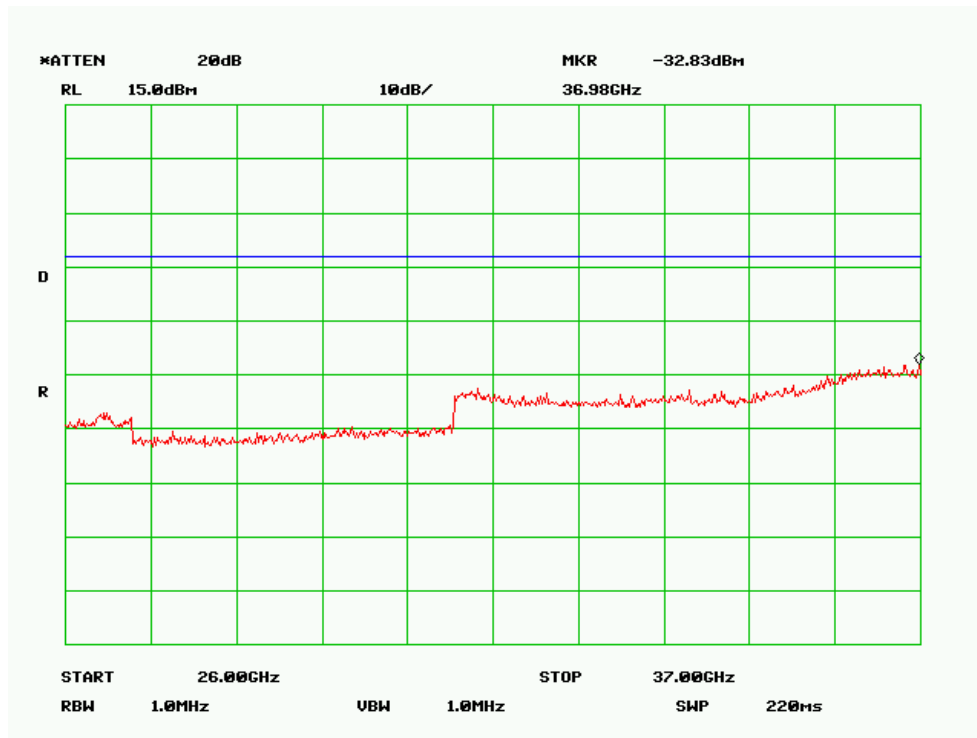
Test Data**Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

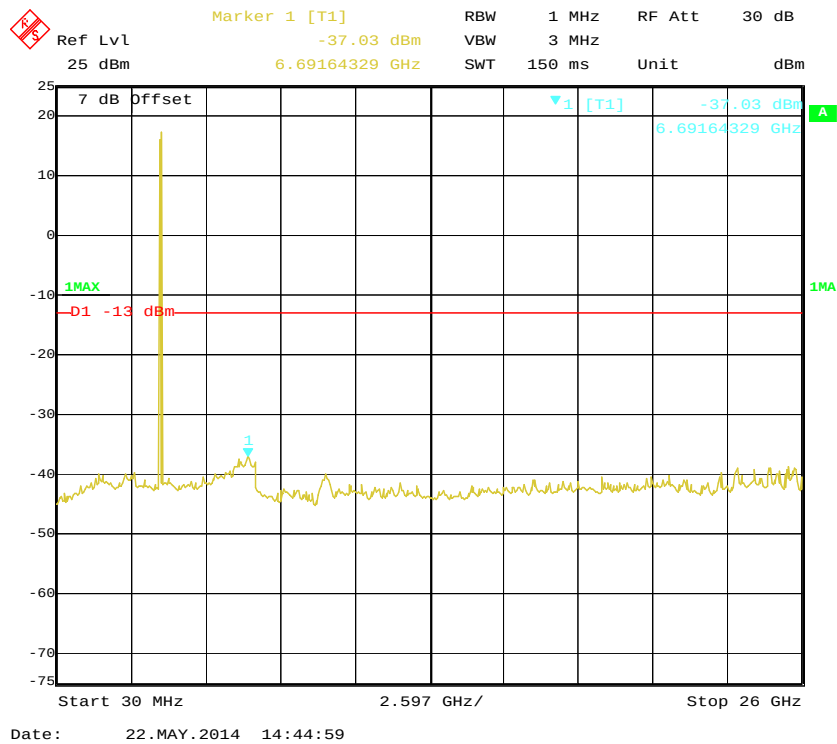
The testing was performed by Gardon Zhang on 2014-05-22.

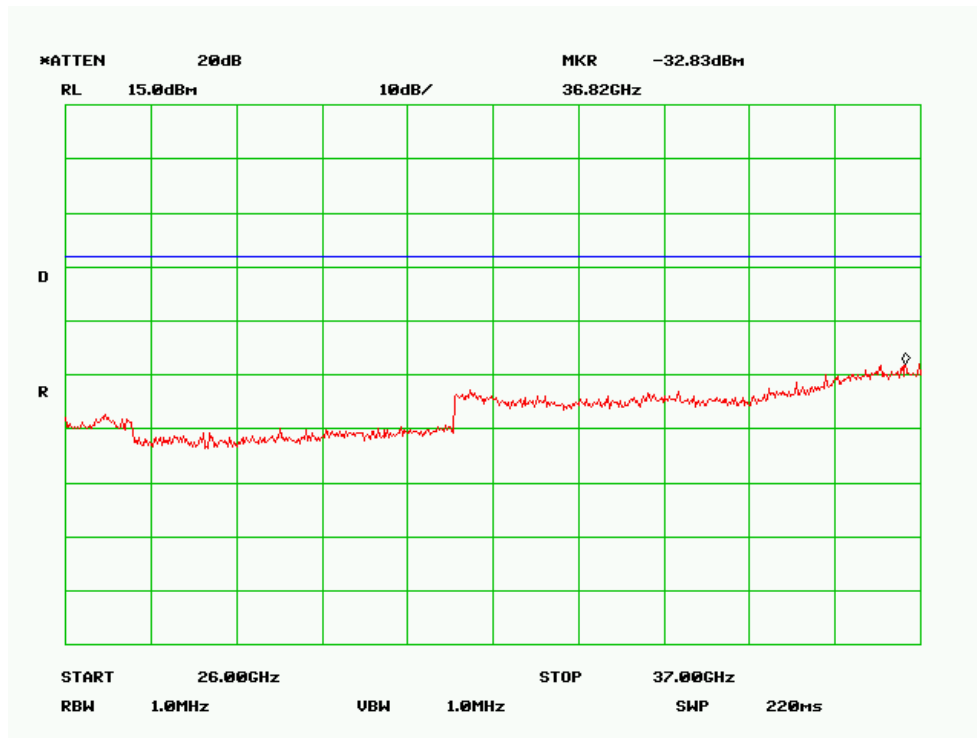
Test Mode: Transmitting

QPSK (10MHz), Low Channel

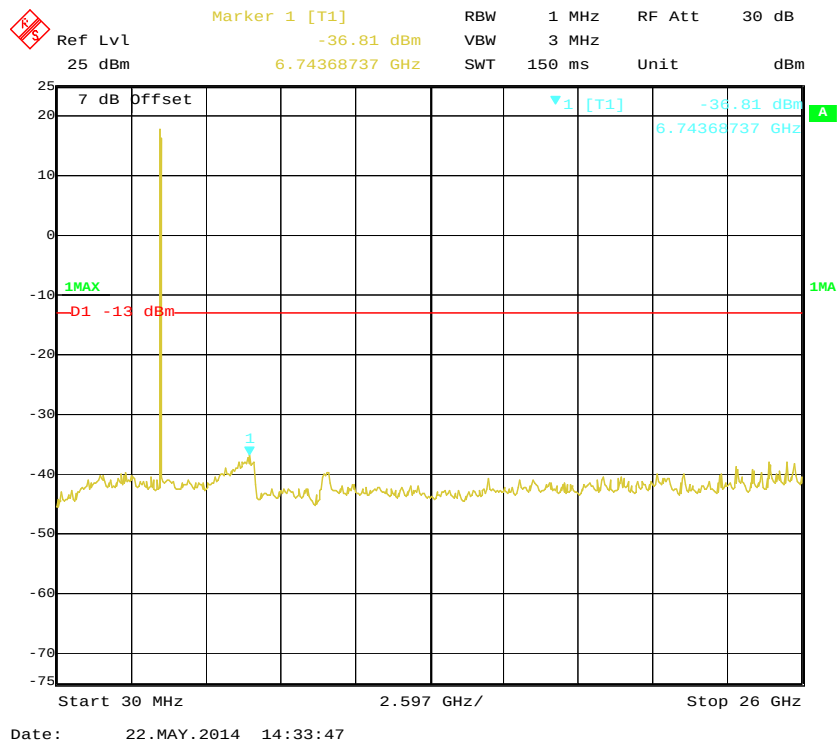


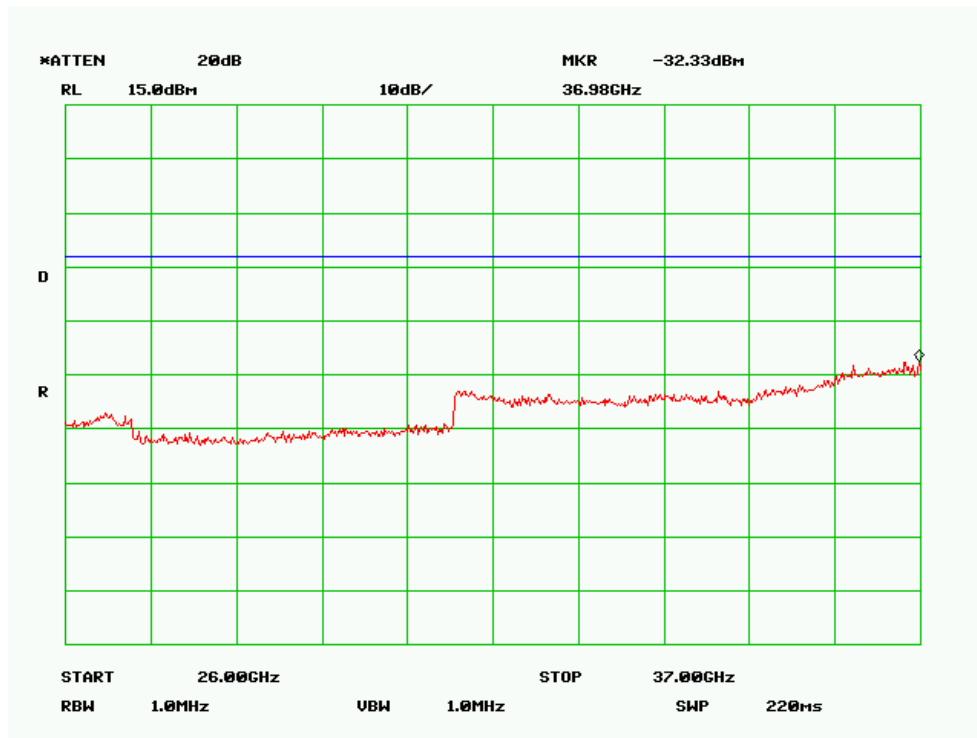
QPSK (10MHz), High Channel



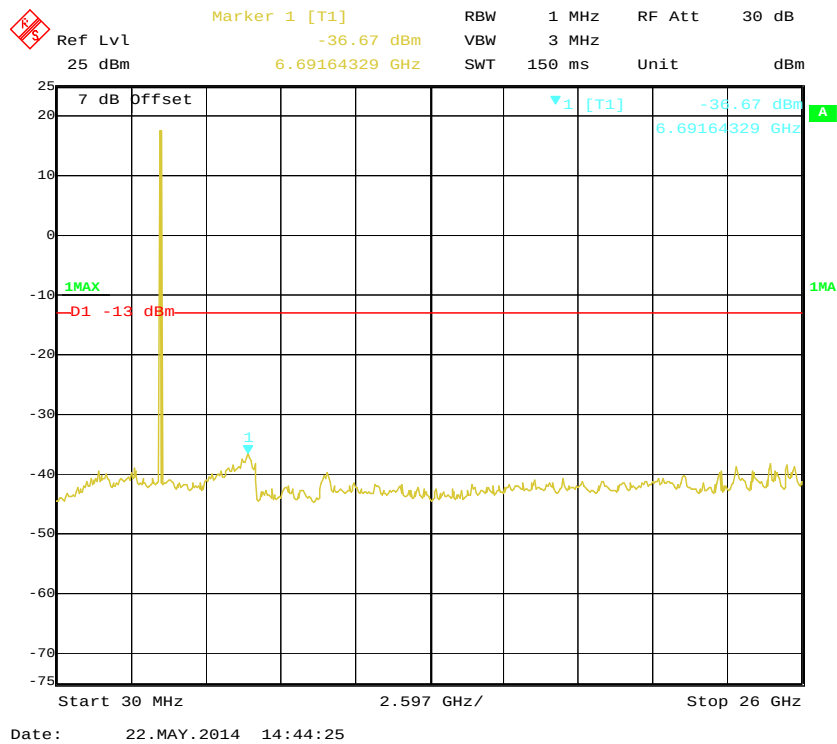


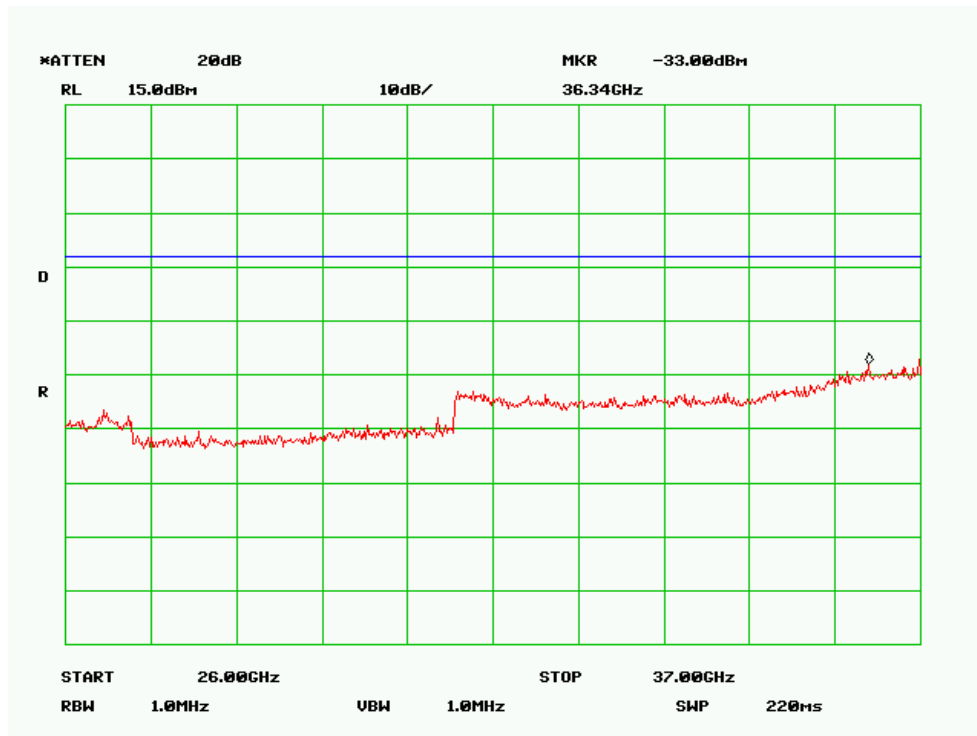
16QAM (10MHz), Low Channel



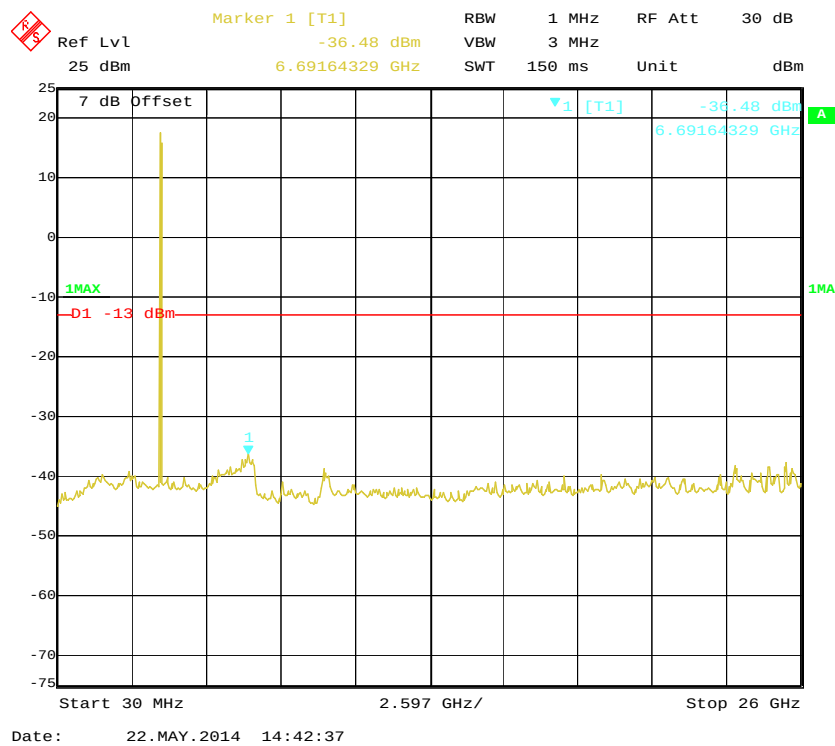


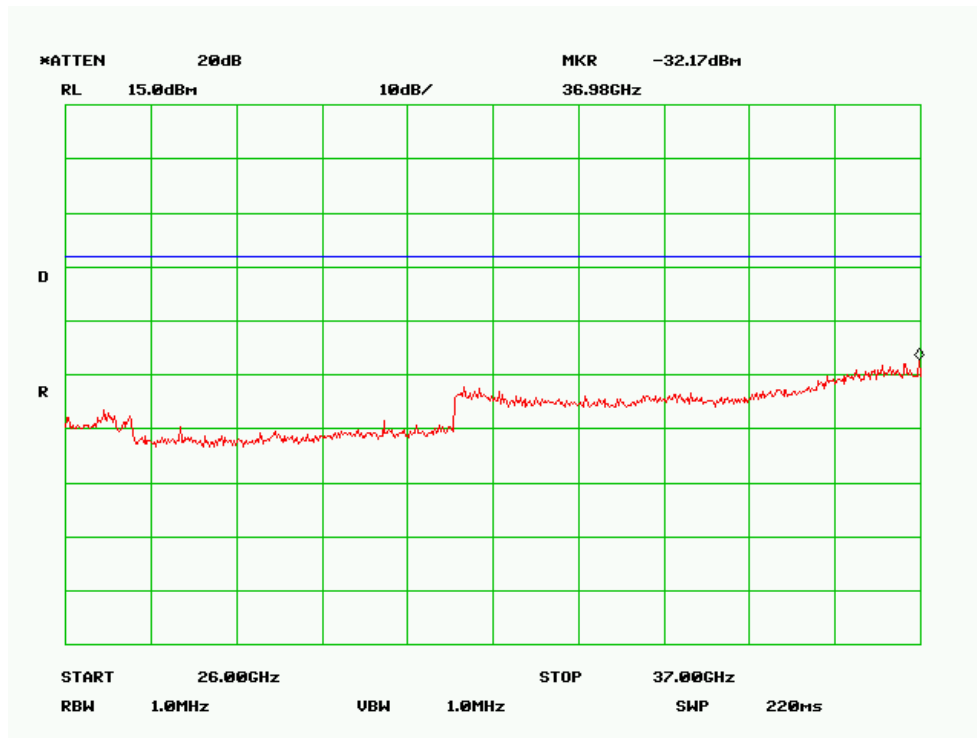
16QAM (10MHz), High Channel



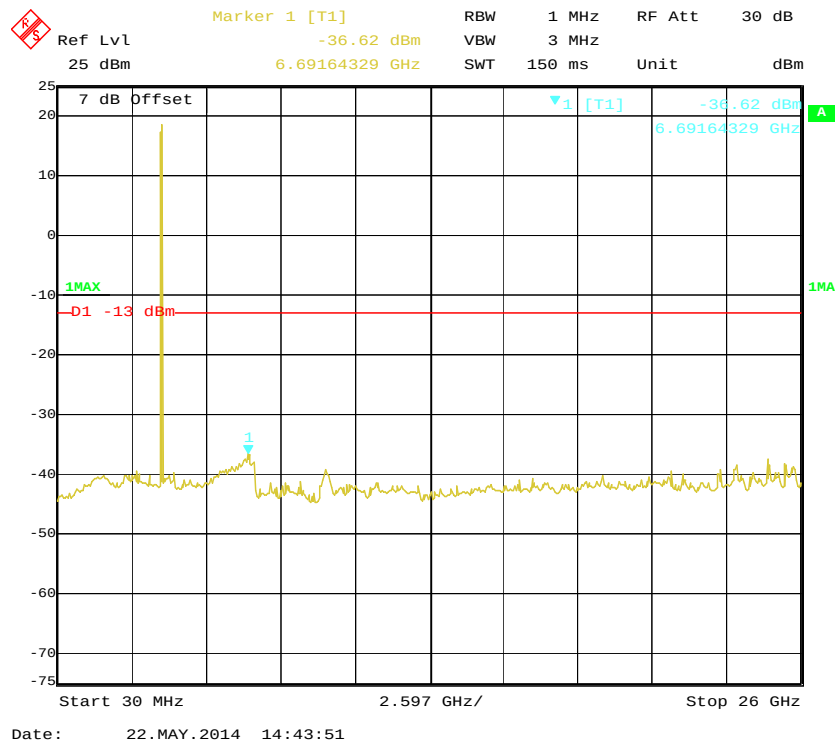


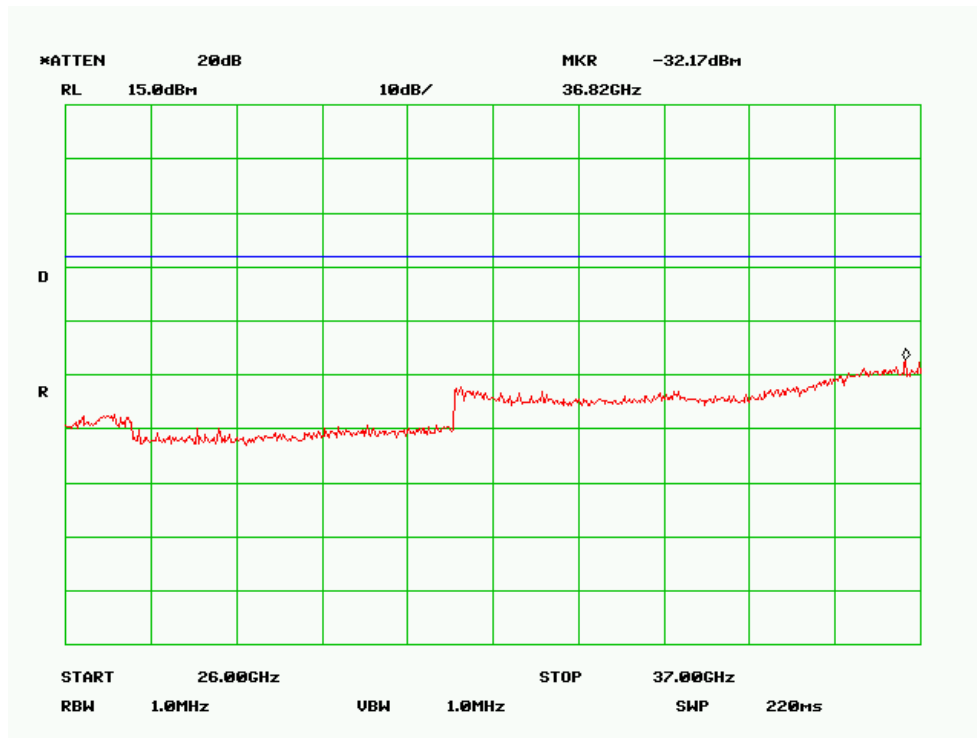
64QAM (10MHz), Low Channel



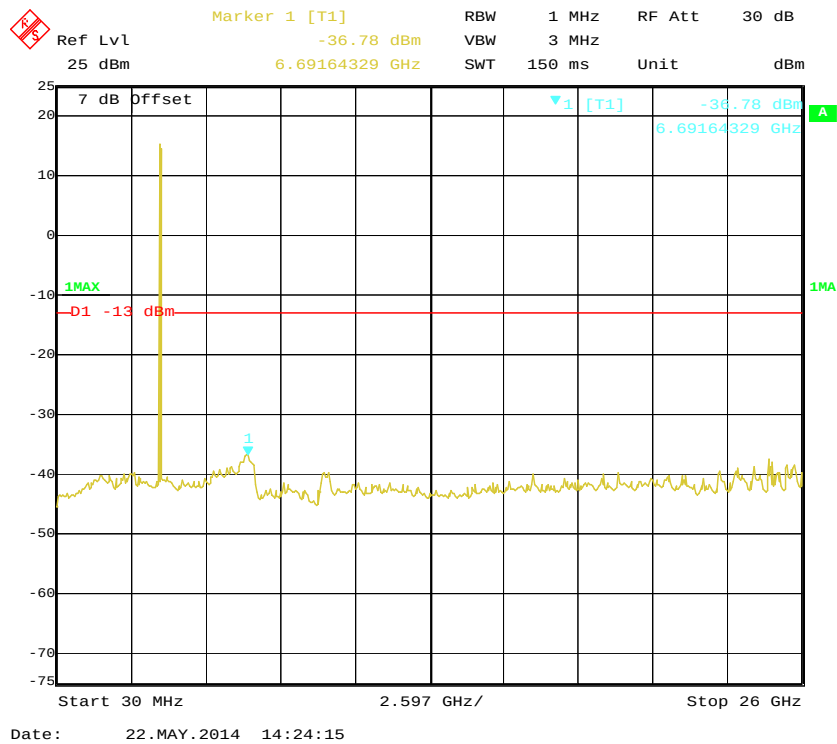


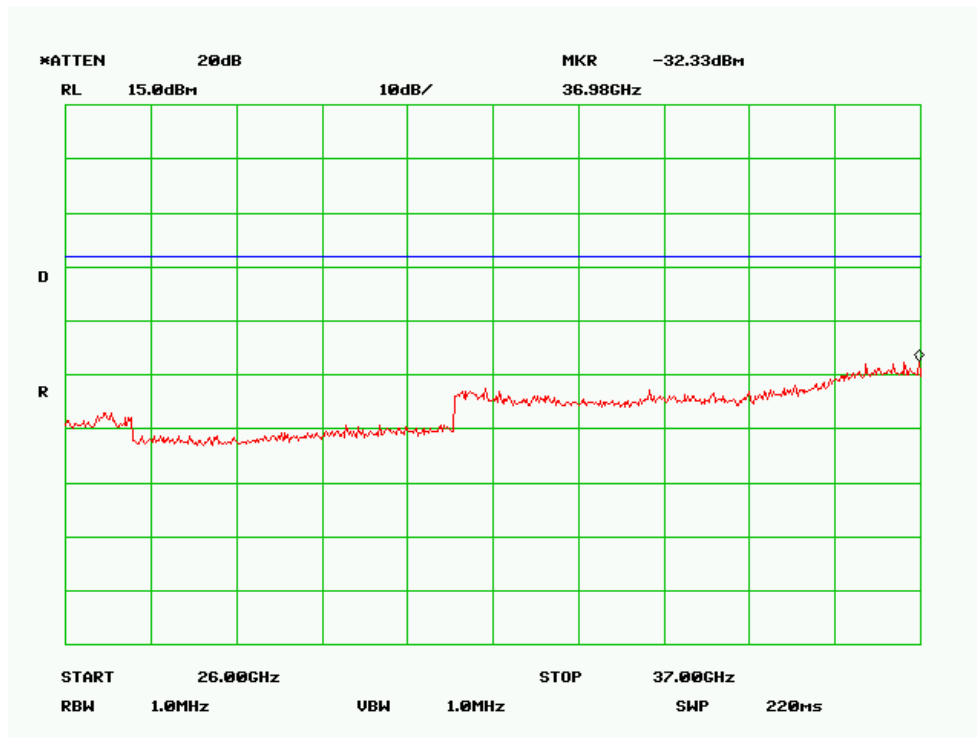
64QAM (10MHz), High Channel



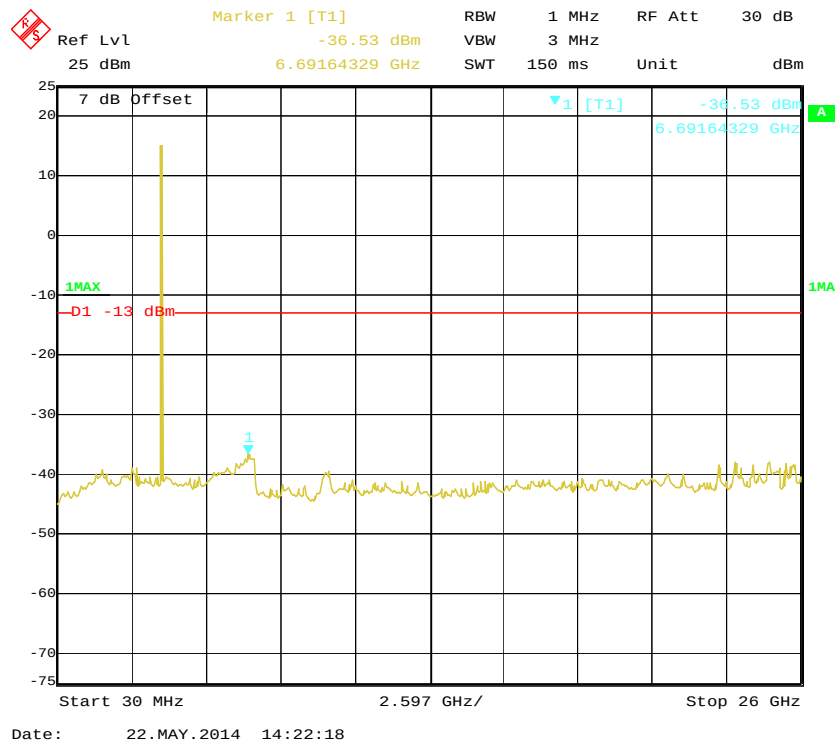


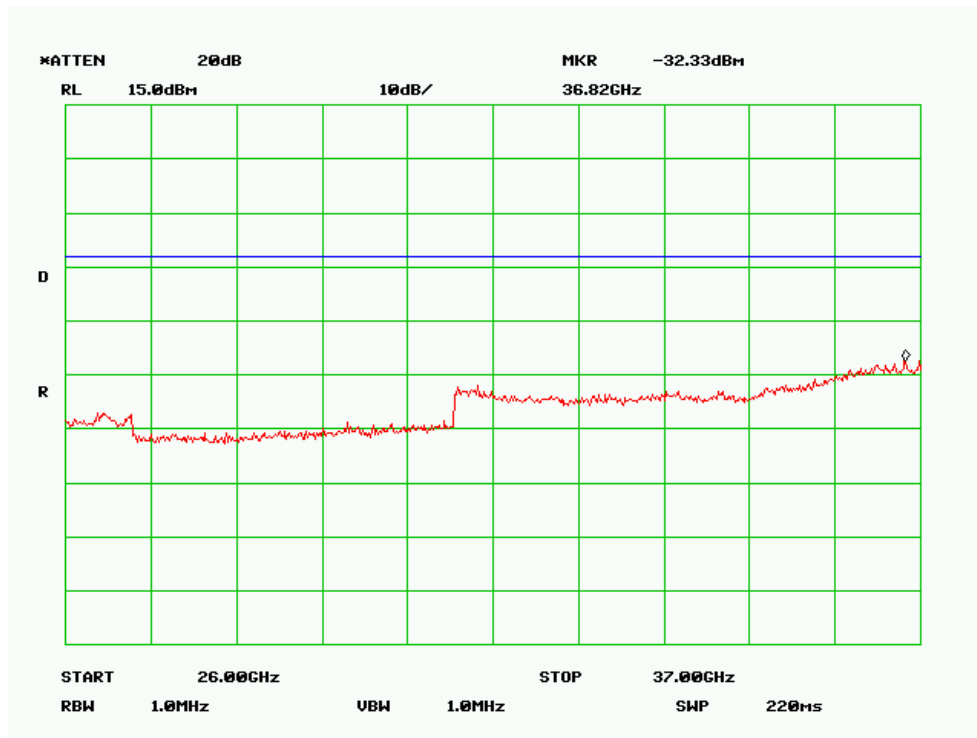
QPSK (20MHz), Low Channel



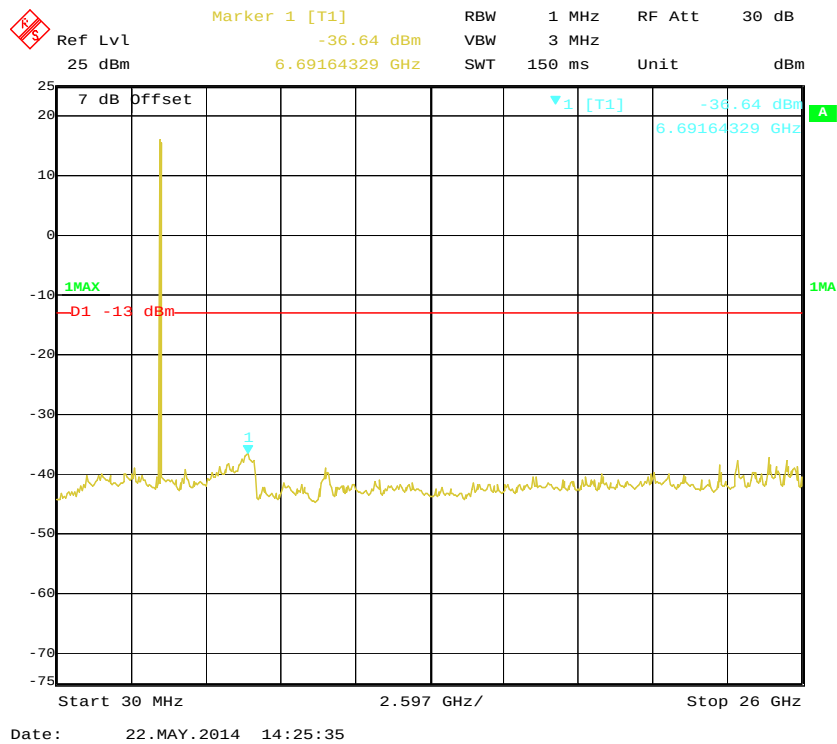


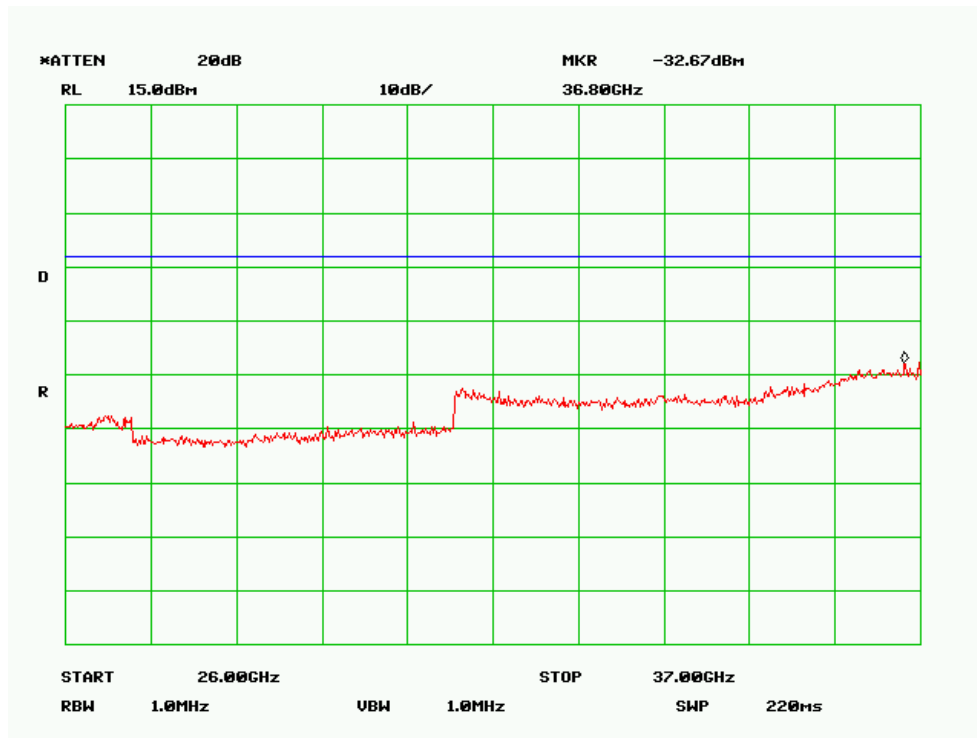
QPSK (20MHz), High Channel



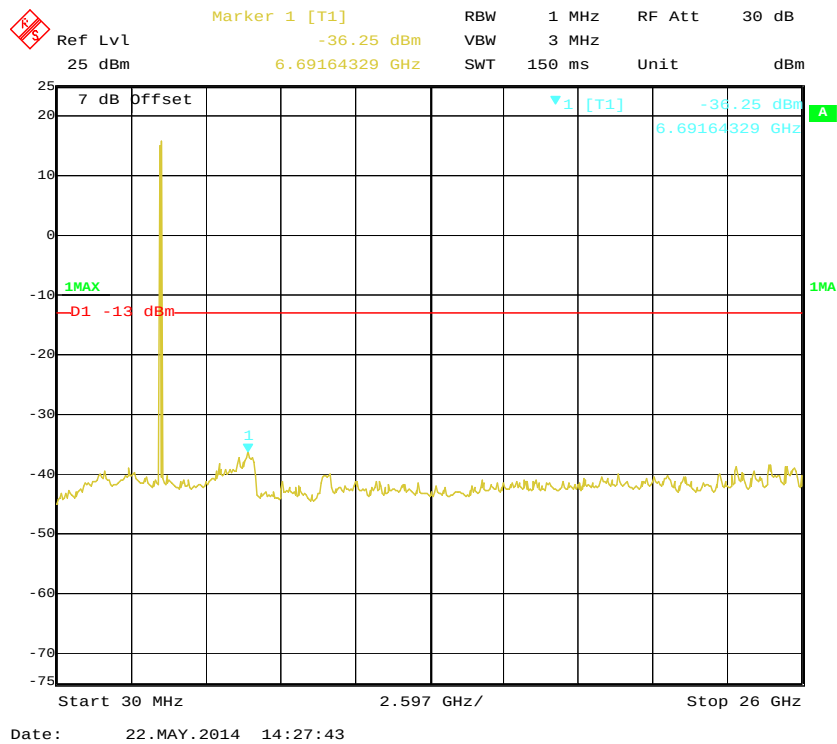


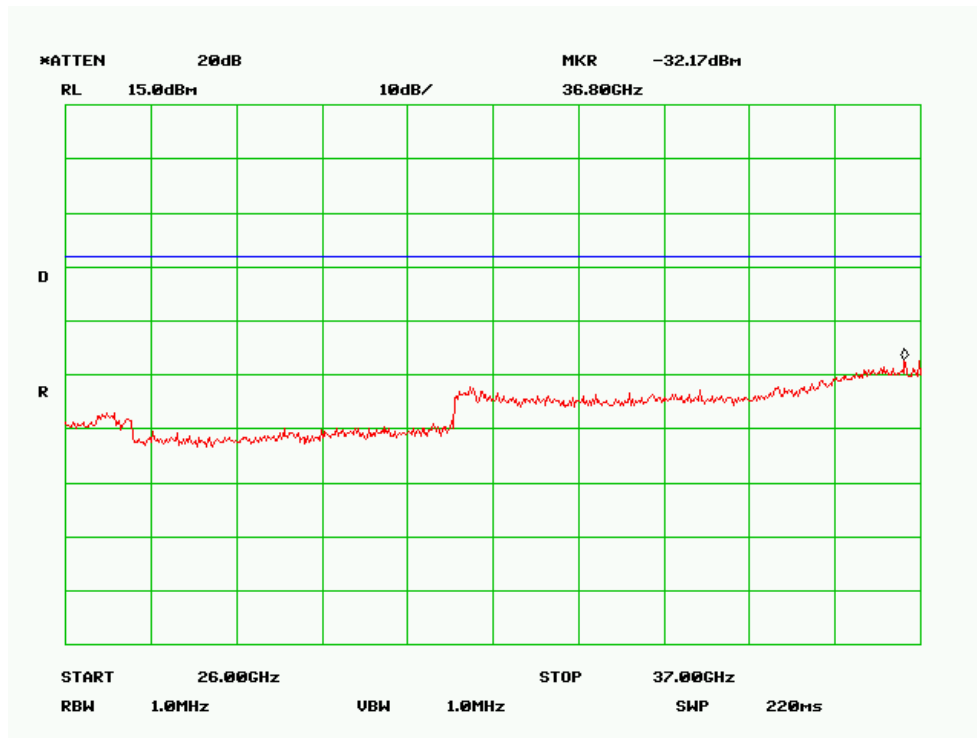
16QAM (20MHz), Low Channel



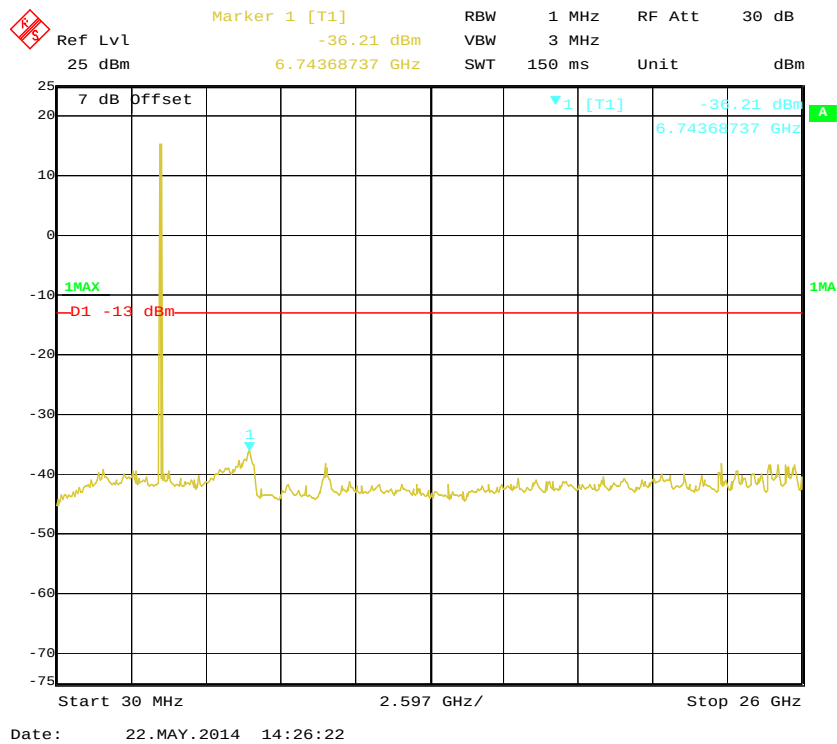


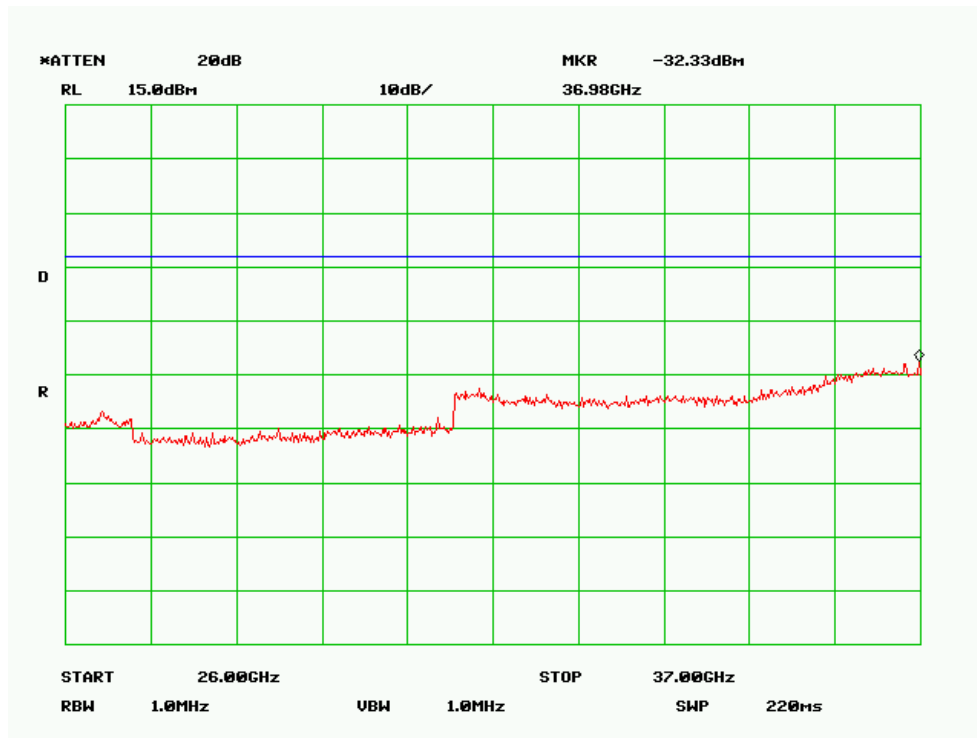
16QAM (20MHz), High Channel



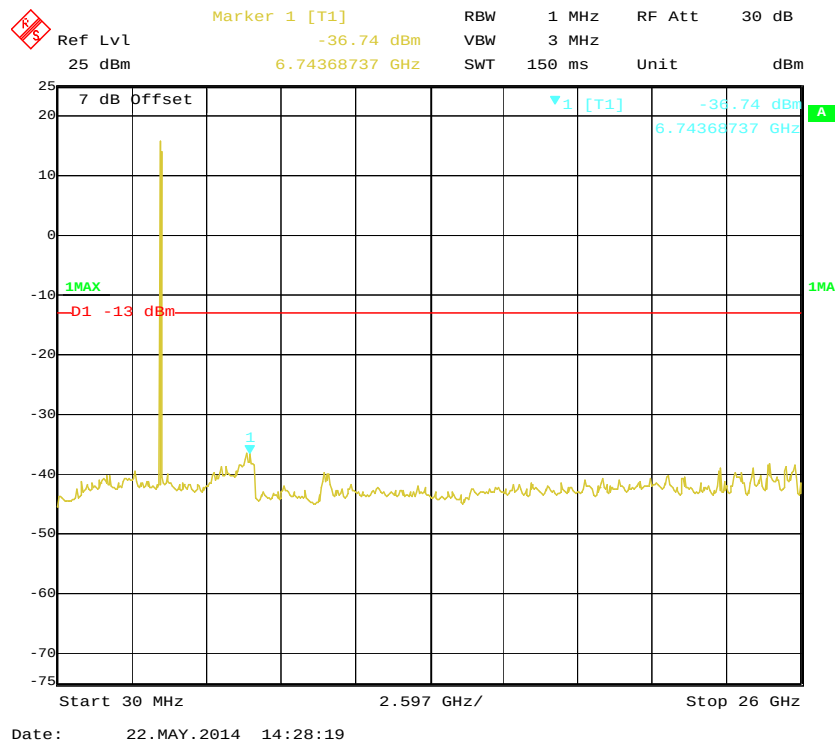


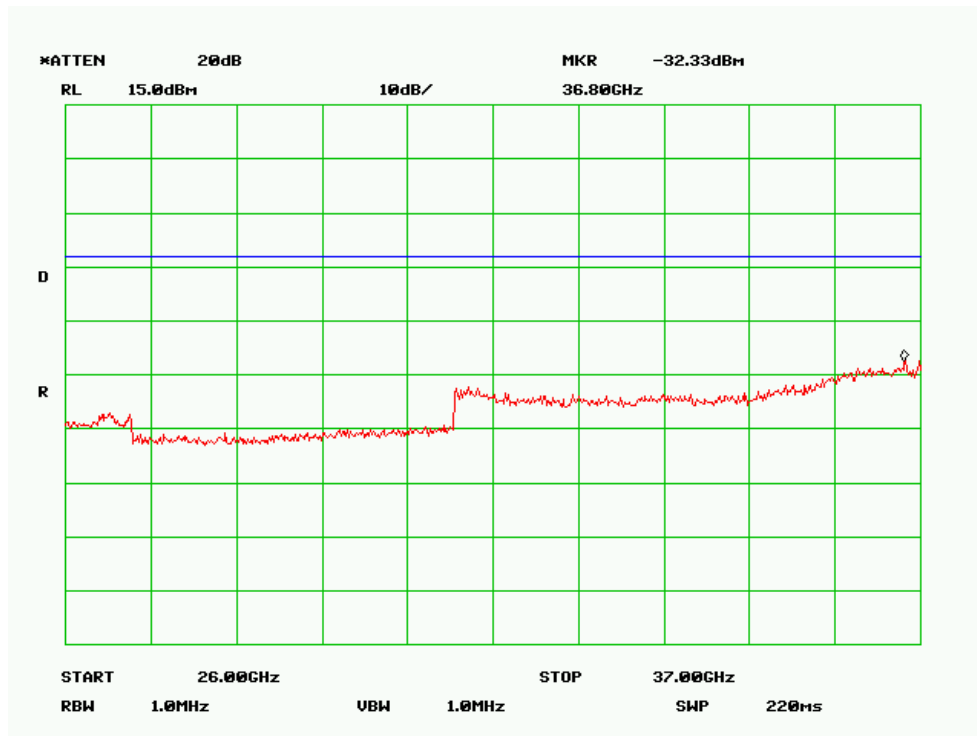
64QAM (20MHz), Low Channel





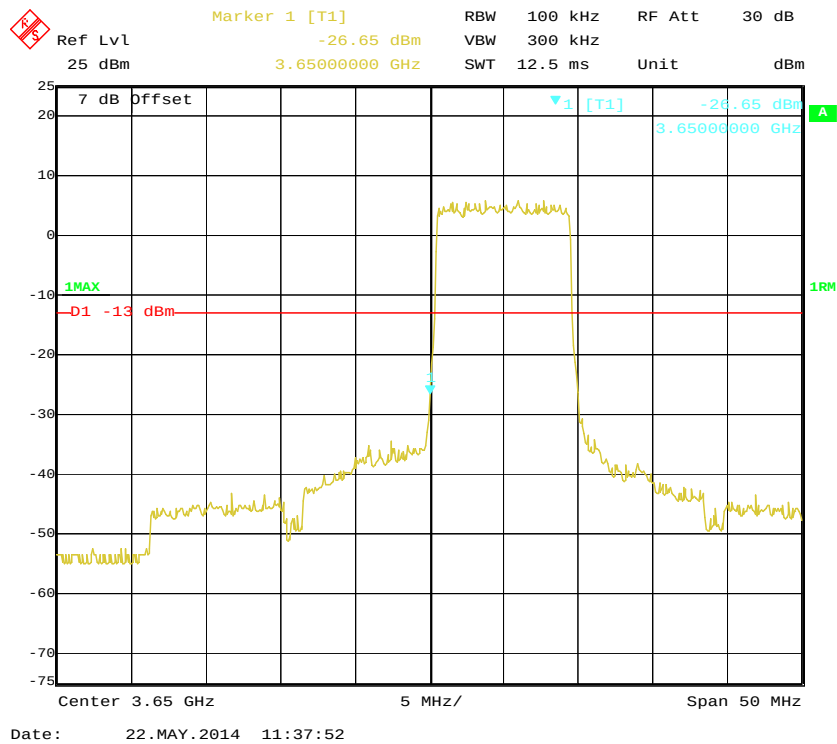
64QAM (20MHz), High Channel



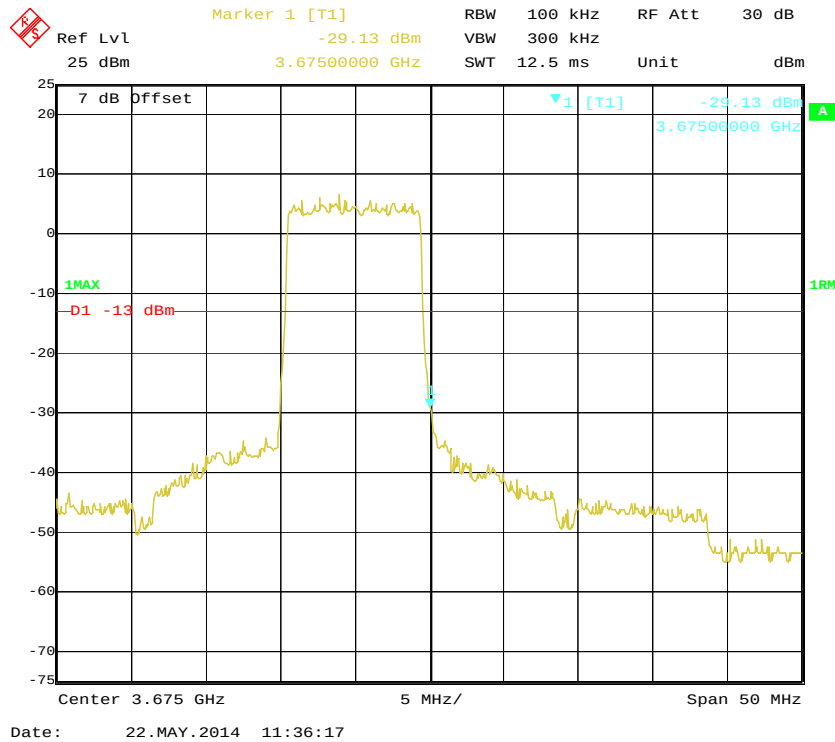


Band Ede:

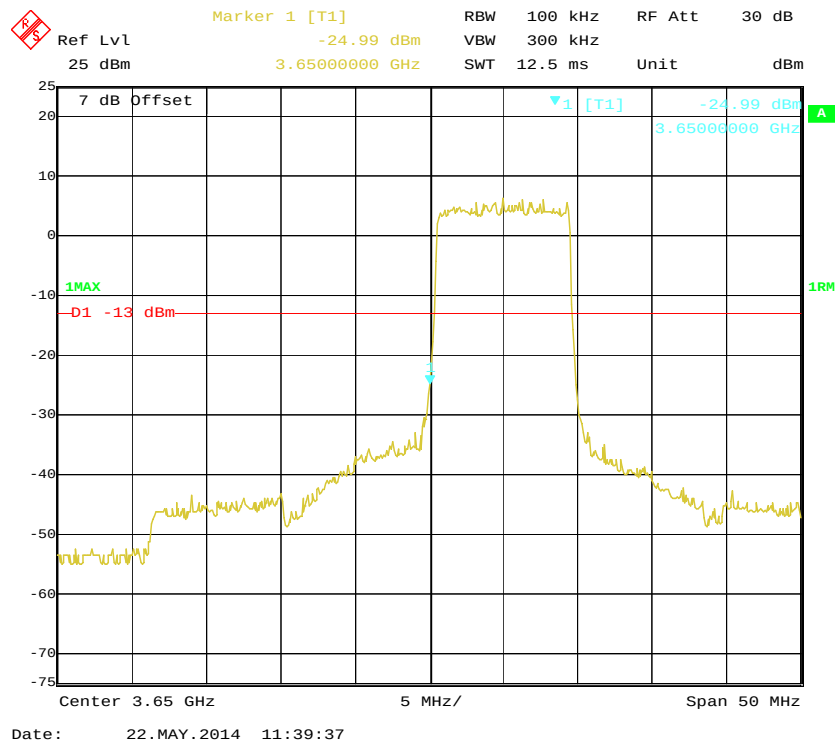
QPSK (10MHz), Left Side



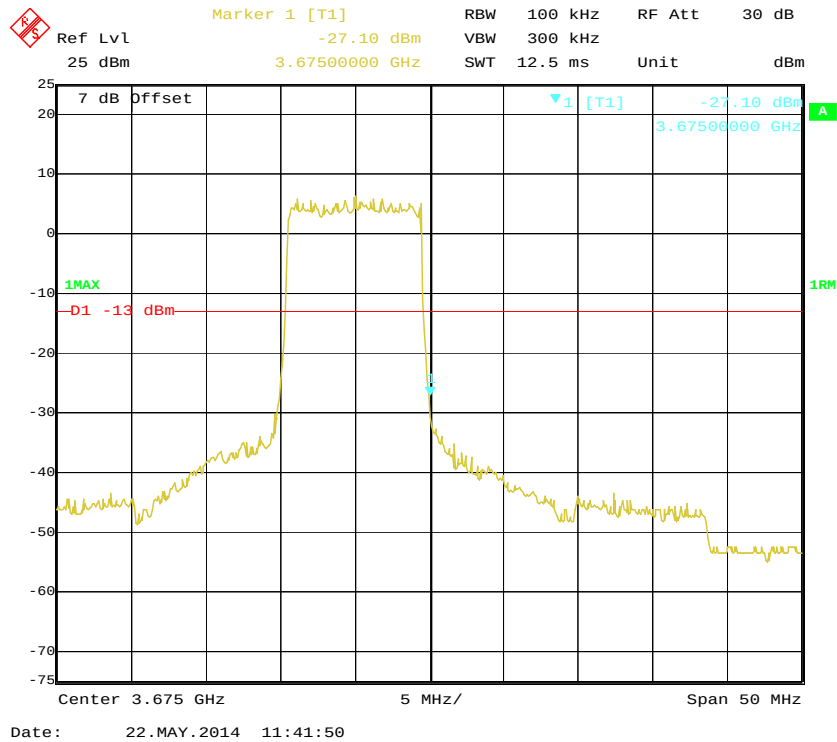
QPSK (10MHz), Right Side



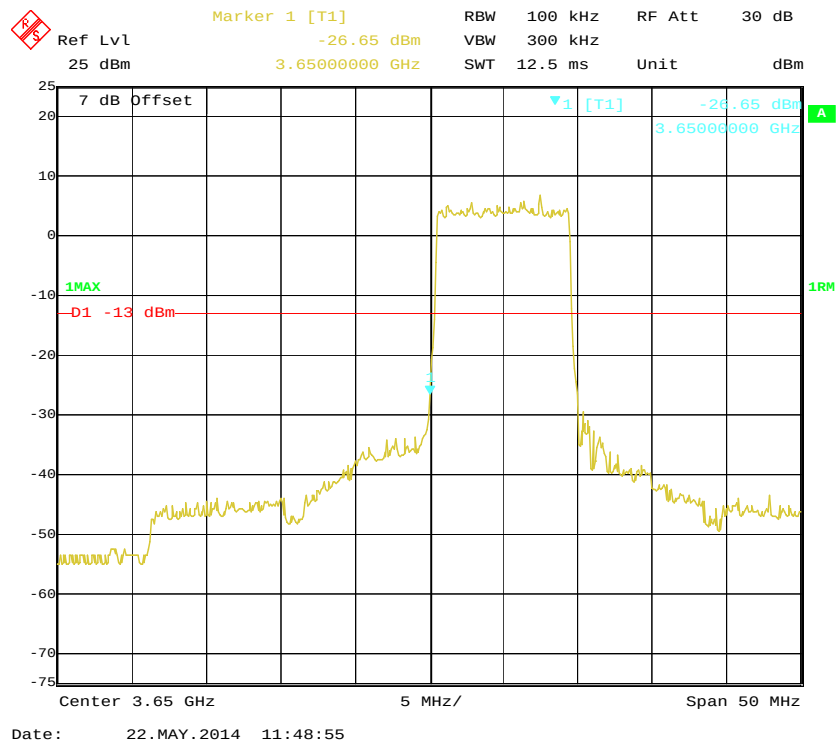
16QAM (10MHz), Left Side



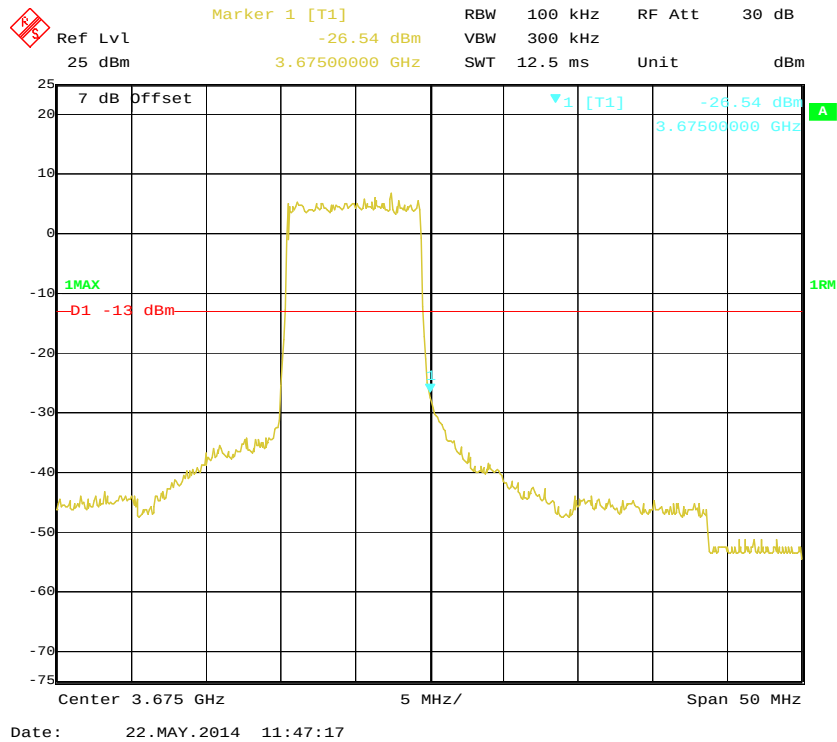
16QAM (10MHz), Right Side



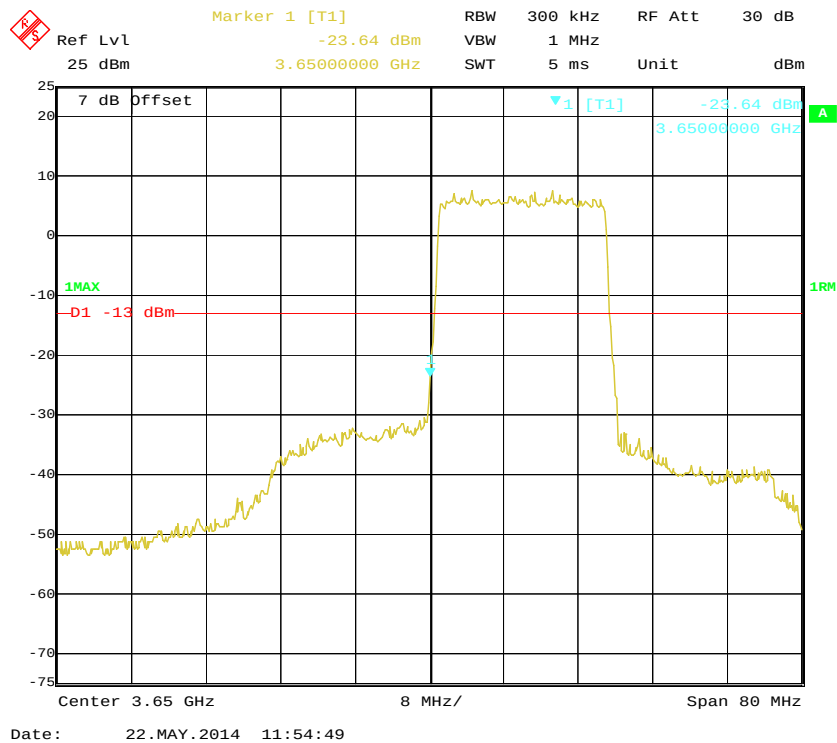
64QAM (10MHz), Left Side



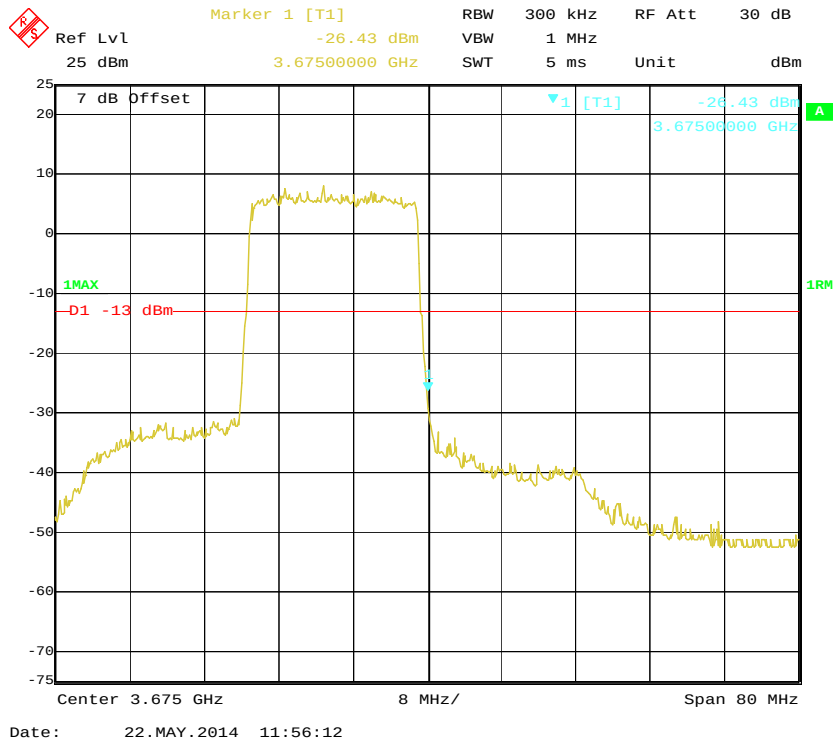
64QAM (10MHz), Right Side



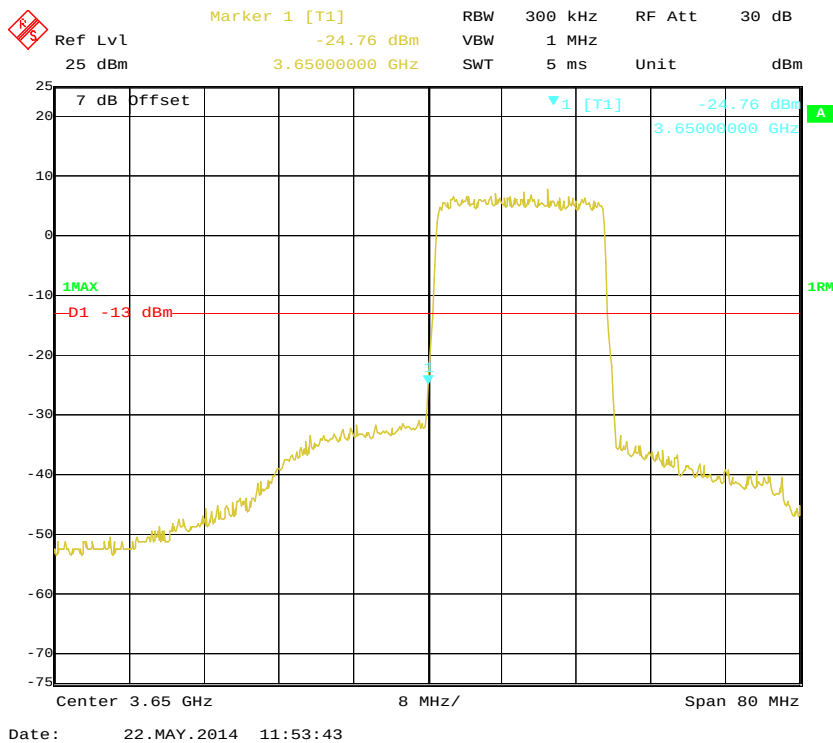
QPSK (20MHz), Left Side



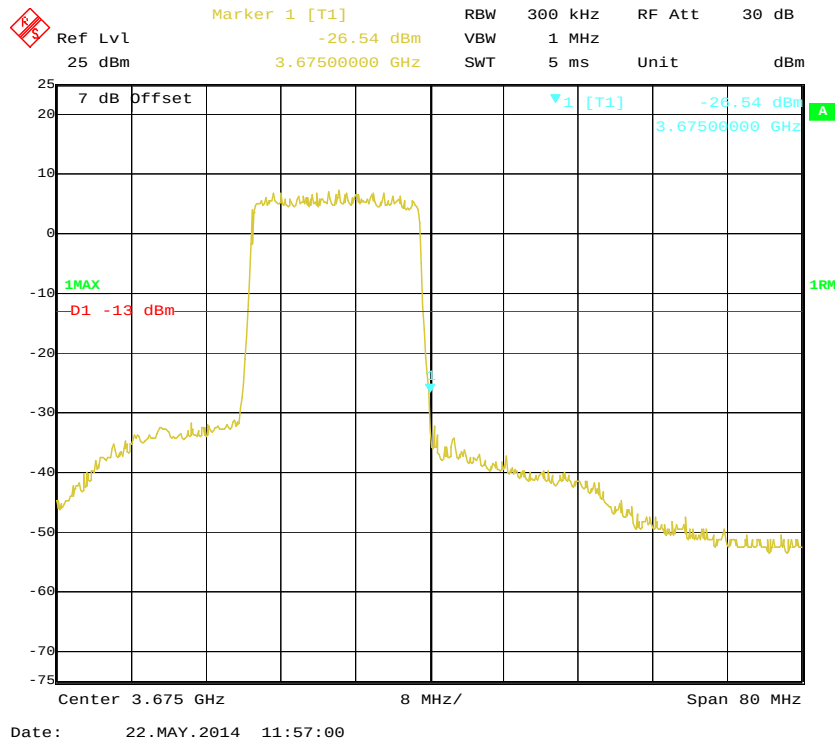
QPSK (20MHz), Right Side



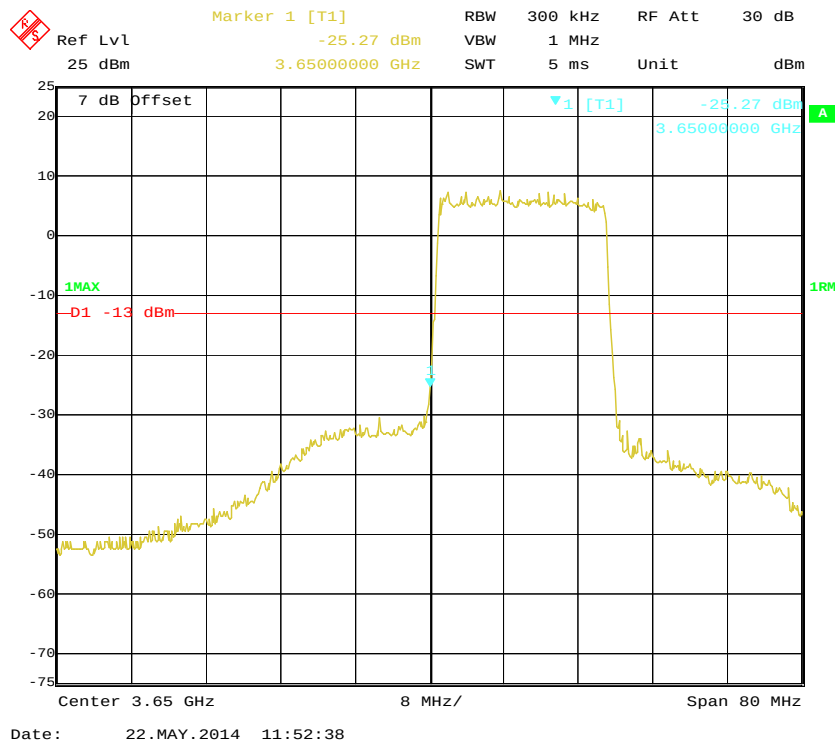
16QAM (20MHz), Left Side



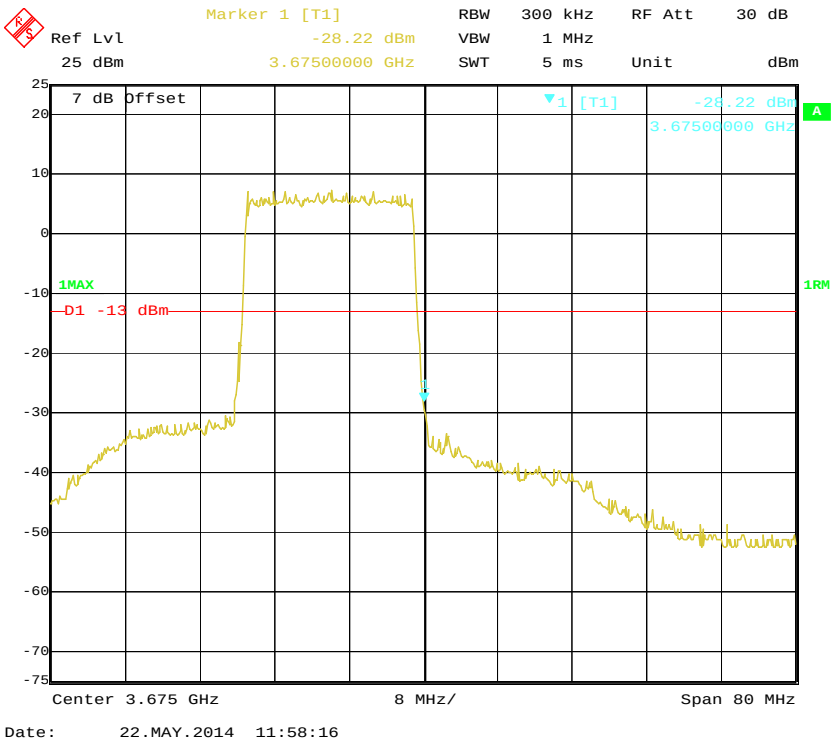
16QAM (20MHz), Right Side



64QAM (20MHz), Left Side



64QAM (20MHz), Right Side



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 = $43 + 10 \log_{10}(\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-09-25	2014-09-25
HP	Amplifier	8447E	1937A01046	2013-09-30	2014-09-30
Mini	Amplifier	ZVA-183-S+	5969001149	2014-04-03	2015-04-03
HP	Signal Generator	8657A	3217A04699	2013-12-19	2014-12-18
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2015-02-10
HP	Synthesized Sweeper	8341B	2624A00116	2014-05-09	2015-05-09
Anritsn	Radio Communication Analyzer	MT8820C	6201181469	2013-11-28	2014-11-27
COM POWER	Dipole Antenna	AD-100	041000	NCR	NCR

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2014-05-22.

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

30MHz - 37GHz:

Frequency (MHz)	Receiver Reading (dBμV)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 90	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
QPSK (10MHz), High Channel (3670 MHz)										
170.8	34.21	132	1.4	H	-62.7	0.28	0	-62.98	-13	49.98
170.8	33.76	48	1.2	V	-63.2	0.28	0	-63.48	-13	50.48
7340.0	46.23	79	1.7	H	-42.4	2.45	12.00	-32.85	-13	19.85
7340.0	45.56	263	1.1	V	-44.1	2.45	12.00	-34.55	-13	21.55
11010.0	46.12	84	1.6	H	-37.2	2.67	13.50	-26.37	-13	13.37
11010.0	45.21	249	1.3	V	-42.4	2.45	12.00	-32.85	-13	19.85
16QAM (10MHz), High Channel (3670 MHz)										
170.8	34.43	145	1.5	H	-62.5	0.28	0	-62.78	-13	49.78
170.8	33.80	52	1.2	V	-63.2	0.28	0	-63.48	-13	50.48
7340.0	46.45	81	1.7	H	-42.2	2.45	12.00	-32.65	-13	19.65
7340.0	45.68	261	1.3	V	-44.0	2.45	12.00	-34.45	-13	21.45
11010.0	45.79	84	1.6	H	-37.5	2.67	13.50	-26.67	-13	13.67
11010.0	44.68	268	1.2	V	-38.9	2.67	13.50	-28.07	-13	15.07
64QAM (10MHz), High Channel (3670 MHz)										
170.8	34.34	140	1.5	H	-62.6	0.28	0	-62.88	-13	49.88
170.8	33.66	49	1.1	V	-63.3	0.28	0	-63.58	-13	50.58
7340.0	46.08	84	1.7	H	-42.6	2.45	12.00	-33.05	-13	20.05
7340.0	45.60	247	1.4	V	-44.1	2.45	12.00	-34.55	-13	21.55
11010.0	45.80	89	1.6	H	-37.5	2.67	13.50	-26.67	-13	13.67
11010.0	44.36	270	1.2	V	-39.2	2.67	13.50	-28.37	-13	15.37
QPSK (20MHz), Low Channel (3660 MHz)										
170.8	35.08	214	1.6	H	-61.9	0.28	0	-62.18	-13	49.18
170.8	33.96	102	1.0	V	-63.0	0.28	0	-63.28	-13	50.28
7320.0	45.96	78	1.7	H	-42.7	2.45	12.00	-33.15	-13	20.15
7320.0	44.72	259	1.3	V	-44.9	2.45	12.00	-35.35	-13	22.35
10980.0	45.26	77	1.6	H	-38.1	2.67	13.50	-27.27	-13	14.27
10980.0	43.98	240	1.3	V	-39.6	2.67	13.50	-28.77	-13	15.77

Frequency (MHz)	Receiver Reading (dBμV)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 90	
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
16QAM (20MHz), Low Channel (3660 MHz)										
170.8	35.31	219	1.7	H	-61.6	0.28	0	-61.88	-13	48.88
170.8	34.12	100	1.1	V	-62.8	0.28	0	-63.08	-13	50.08
7320.0	45.39	70	1.7	H	-43.3	2.45	12.00	-33.75	-13	20.75
7320.0	44.57	256	1.2	V	-45.1	2.45	12.00	-35.55	-13	22.55
10980.0	45.12	74	1.6	H	-38.2	2.67	13.50	-27.37	-13	14.37
10980.0	43.78	243	1.2	V	-39.8	2.67	13.50	-28.97	-13	15.97
64QAM (20MHz), Low Channel (3660 MHz)										
170.8	35.21	212	1.6	H	-61.7	0.28	0	-61.98	-13	48.98
170.8	34.07	108	1.0	V	-62.9	0.28	0	-63.18	-13	50.18
7320.0	45.63	63	1.8	H	-43.0	2.45	12.00	-33.45	-13	20.45
7320.0	44.74	252	1.2	V	-44.9	2.45	12.00	-35.35	-13	22.35
10980.0	45.23	79	1.8	H	-38.1	2.67	13.50	-27.27	-13	14.27
10980.0	44.21	248	1.3	V	-39.3	2.67	13.50	-28.47	-13	15.47

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
Anritsn	Radio Communication Analyzer	MT8820C	6201181469	2013-11-28	2014-11-27
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2013-11-01	2014-11-01

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2014-05-22.

Test Mode: Transmitting

LTE band (3650-3675MHz) Middle Channel

Test Environment		Reference frequency (MHz)	Measured Frequency (MHz)	Frequency Error (ppm)	Result
Power Supplied (V _{AC})	Temperature (°C)				
Frequency Stability versus Input Temperature					
120	50	3662.5	3662.500090	0.025	Compliant
	45	3662.5	3662.500066	0.018	Compliant
	35	3662.5	3662.500084	0.023	Compliant
	25	3662.5	3662.500060	0.016	Compliant
	15	3662.5	3662.500057	0.016	Compliant
	5	3662.5	3662.500060	0.016	Compliant
	-5	3662.5	3662.500066	0.018	Compliant
	-15	3662.5	3662.500080	0.022	Compliant
	-25	3662.5	3662.500057	0.016	Compliant
	-30	3662.5	3662.500060	0.016	Compliant
Frequency Stability versus Input Voltage					
108	25	3662.5	3662.500063	0.017	Compliant
132	25	3662.5	3662.500058	0.016	Compliant

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