

FCC PART 15.247

TEST REPORT

For

**Mobi Technologies, Inc.**

5913 Blackwelder St, Culver City, CA 90232, USA

**FCC ID: Y4N-70290R**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Pure Sounds (Receiver unit)
<b>Test Engineer:</b> Tiger Ye	<i>Tiger Ye</i>
<b>Report Number:</b> RSZ111212001-00B	
<b>Report Date:</b> 2012-01-12 Merry Zhao	
<b>Reviewed By:</b> EMC Engineer	<i>Merry Zhao</i>
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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. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP\* or any agency of the Federal Government.

\* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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## GENERAL INFORMATION

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

The *Mobi Technologies, Inc.*'s product, model number: 70290R (FCC ID: Y4N-70290R) (the "EUT") in this report is a receiver unit of *Pure Sounds*, which was measured approximately: 11.0 cm (L) x 5.8 cm (W) x 2.2 cm (H), rated input voltage: DC 2.4 V battery or DC 5V from adapter.

#### Adapter 1 Information (5ESP AC ADAPTER):

Model: 5E-AD050060-U;  
Input: 100-240V~50/60Hz 0.15A;  
Output: DC 5V 0.6A

#### Adapter 2 Information:

Model: GPE003W-050060-1;  
Input: 100-240V~50/60Hz 0.1A;  
Output: DC 5V 600mA 3W LPS

*\* All measurement and test data in this report was gathered from production sample serial number: 01120001 (Assigned by applicant). The EUT was received on 2011-12-12.*

### Objective

This Type approval report is prepared on behalf of *Mobi Technologies, Inc.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

### Related Submittal(s)/Grant(s)

FCC Part 15.247 submission of transmitter unit with FCC ID: Y4N-70290T.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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.

## 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.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in an engineering mode which was selected by manufacturer.

### EUT Exercise Software

No Exercise Software.

### Equipment Modifications

No modification was made to EUT.

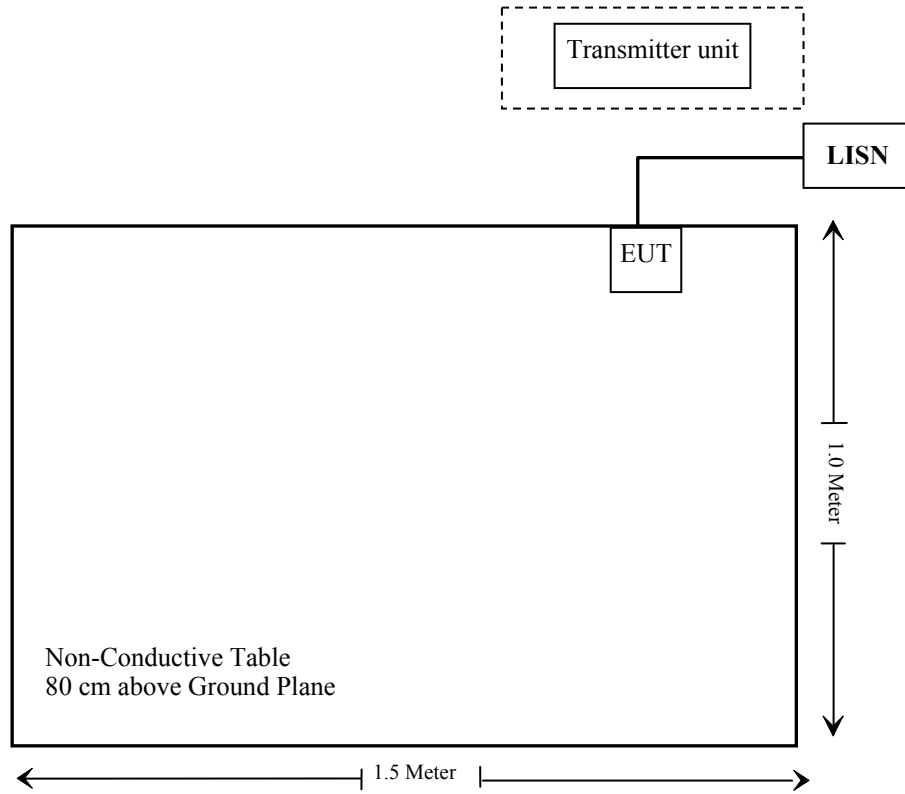
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Mobi	Pure Sounds	70290T (Transmitter unit)	N/A

### External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable DC Power Cable	1.8	EUT	Adapter

### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
§ 15.247 (i); §2.1093	RF Radiation Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliance
§15.247 (a)(1)	20 dB Bandwidth	Compliance
§15.247(a)(1)	Channel Separation Test	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band Edges	Compliance



## FCC §15.247(i) & §2.1093 - RF EXPOSURE

### Applicable Standard

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission’s guideline.

According to KDB 447498 D01 Mobile Portable RF Exposure v03r03, no SAR required if power is lower than the flowing threshold:

When routine evaluation is required for SAR and the output power is  $\leq 60/f(\text{GHz})$  mW, the test reduction and test exclusion procedures given herein, or in KDB 616217 or KDB 648474, are applicable.

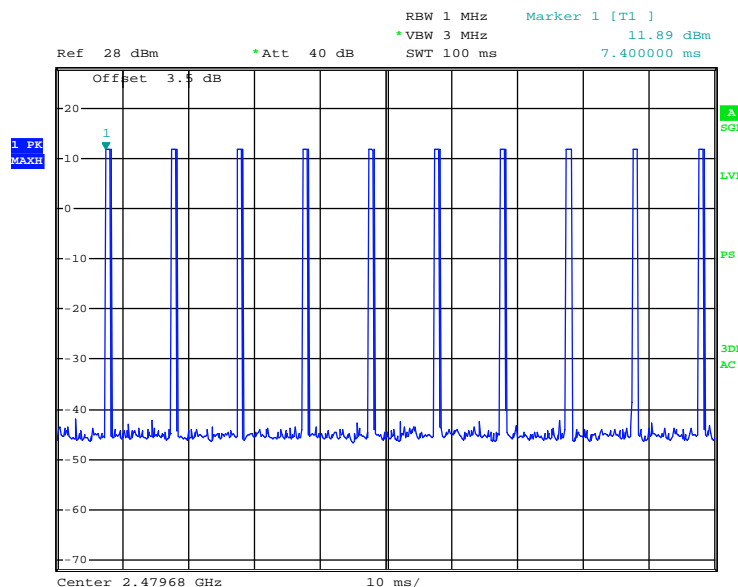
A device may be used in portable exposure conditions with no restrictions on host platforms when either the source-based time-averaged output power is  $\leq 60/f(\text{GHz})$  mW or all measured 1-g SAR are  $< 0.4$  W/kg.10 When SAR evaluation is required, the most conservative exposure conditions for all expected operating configurations must be tested.

### RF Exposure Evaluation

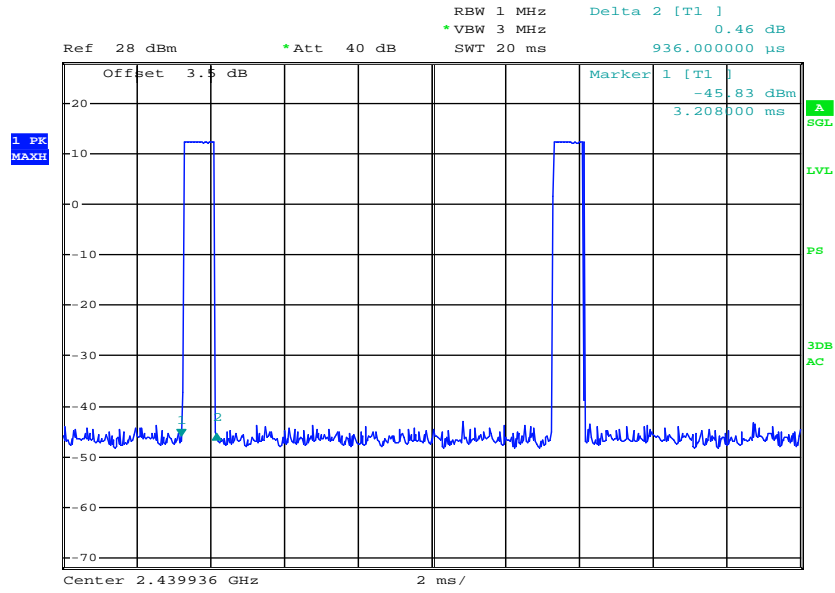
Max Peak output power: 2402.784 MHz: 13.53 dBm = 22.54 mW  
 Duty Cycle =  $T_{on}/T_p = 9.33\%$   
 The source-based average power =  $22.54 \text{ mW} \times 9.33\% = 2.10 \text{ mW}$   
 SAR exclusion threshold =  $60/f = 60/2.402784 = 24.97 \text{ mw}$

SAR evaluation is not necessary.

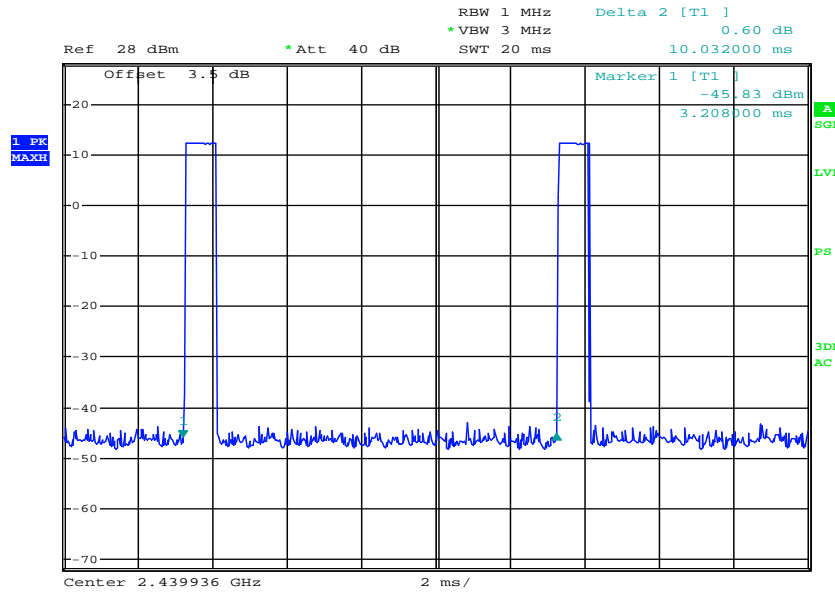
Note: Duty Cycle= $T_{on}/T_p \times 100\%$   
 $T_{on}=936 \mu\text{s} = 0.936 \text{ ms}$ ,  $T_p=10.03 \text{ ms}$   
 Duty Cycle=  $T_{on}/T_p = 9.33\%$



Date: 31.DEC.2011 17:54:33



Date: 31.DEC.2011 17:59:36



Date: 31.DEC.2011 18:00:00

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## **FCC §15.203 – ANTENNA REQUIREMENT**

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### **Applicable Standard**

According to FCC §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

### **Antenna Connector Construction**

The EUT has two monopole antenna permanently soldered to main board, one is transmitting/Receiving antenna, the other is reflecting antenna, the gain was 0 dBi, which fully in accordance to section 15.203, please refer to the EUT photos.

**Result:** Compliance.

## FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

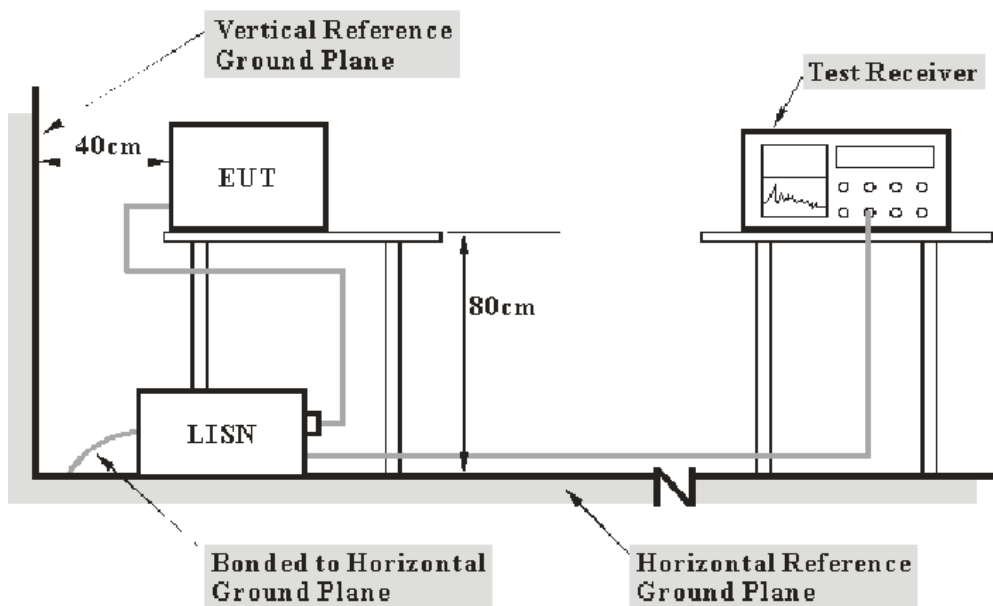
FCC §15.207

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is  $\pm 2.4$  dB ( $k=2$ , 95% level of confidence).

### EUT Setup



- Note: 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

## EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>IF B/W</i>
150 kHz – 30 MHz	9 kHz

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2011-03-03	2012-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-03-09	2012-03-08

\* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

**Powered by adapter 1: 15.03 dB at 0.150 MHz in the Neutral conducted mode**

**Powered by adapter 2: 10.66 dB at 1.755 MHz in the Neutral conducted mode**

## Test Data

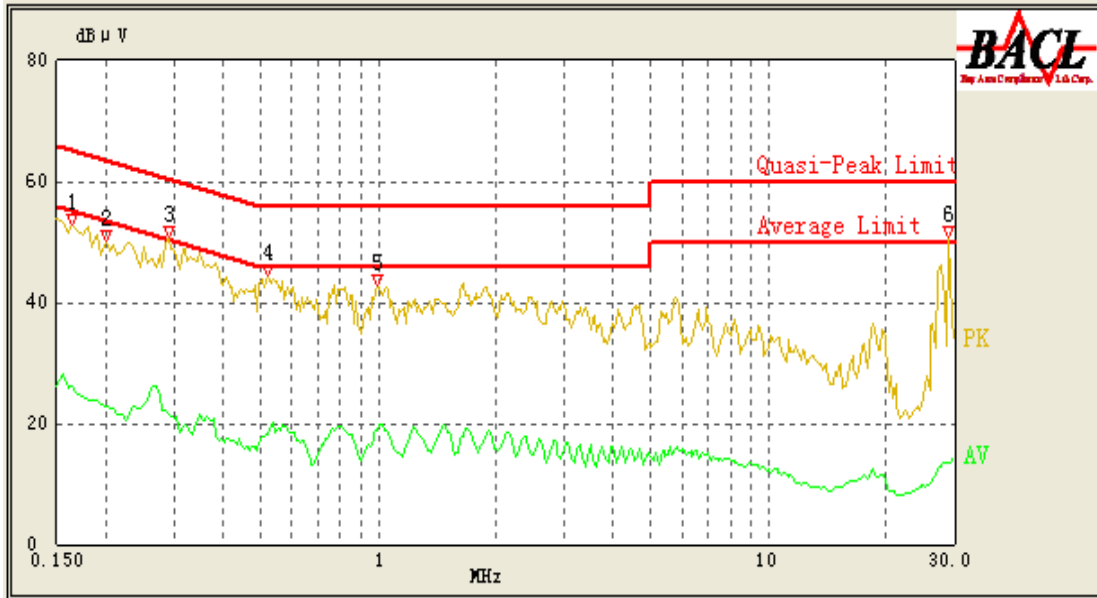
### Environmental Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Tiger Ye on 2012-01-04.*

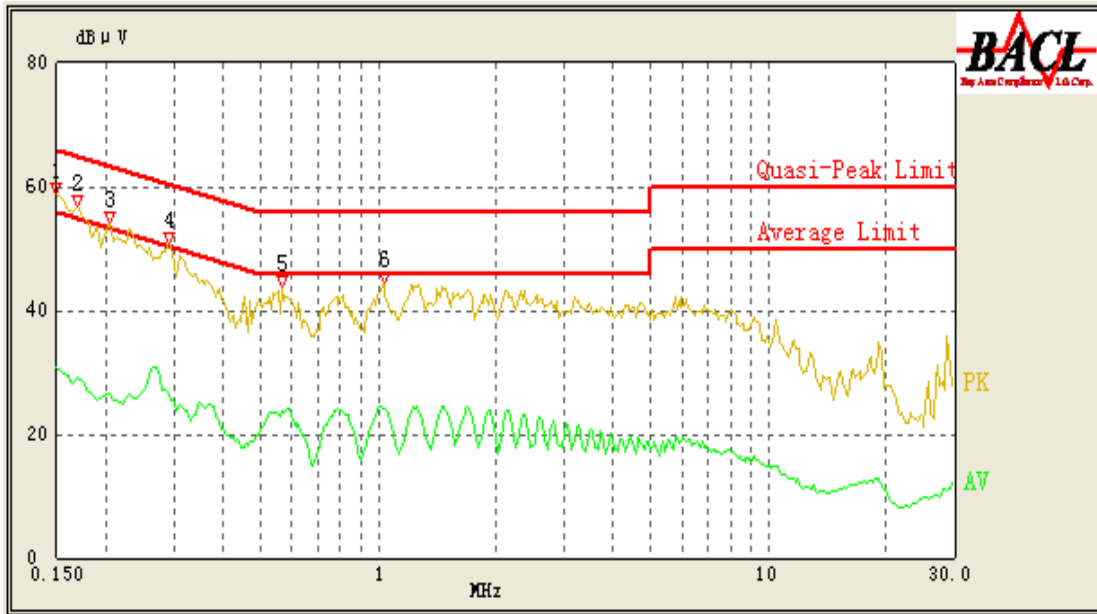
Test Mode: Operating (Powered by adapter 1)

AC 120 V, 60 Hz, Line:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
0.200	48.12	10.23	64.57	16.45	QP
0.165	47.70	10.23	65.57	17.87	QP
0.290	40.77	10.23	62.00	21.23	QP
0.520	32.31	10.23	56.00	23.69	QP
0.995	31.53	10.24	56.00	24.47	QP
0.995	18.97	10.24	46.00	27.03	Ave.
0.520	18.13	10.23	46.00	27.87	Ave.
0.165	26.32	10.23	55.57	29.25	Ave.
0.290	21.41	10.23	52.00	30.59	Ave.
0.200	22.83	10.23	54.57	31.74	Ave.
28.940	23.54	13.03	60.00	36.46	QP
28.900	13.48	13.02	50.00	36.52	Ave.

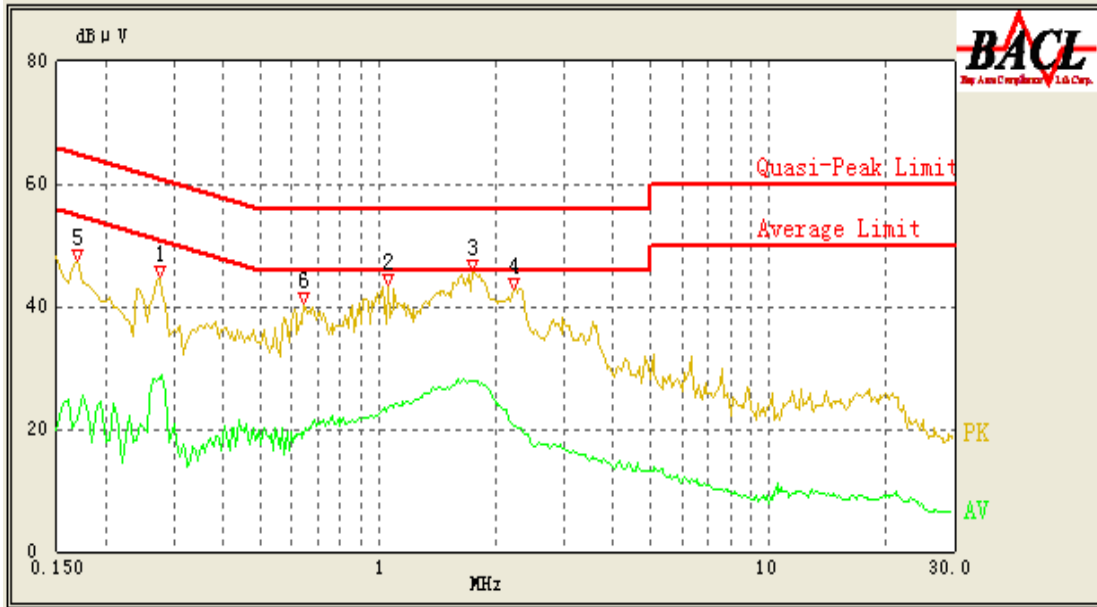
**AC 120V, 60 Hz, Neutral:**



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
0.150	50.97	10.23	66.00	15.03	QP
0.170	49.24	10.23	65.43	16.19	QP
0.205	46.50	10.23	64.43	17.93	QP
1.035	35.66	10.24	56.00	20.34	QP
0.565	35.05	10.23	56.00	20.95	QP
1.025	24.02	10.24	46.00	21.98	Ave.
0.570	23.95	10.23	46.00	22.05	Ave.
0.290	39.25	10.23	62.00	22.75	QP
0.150	30.89	10.23	56.00	25.11	Ave.
0.290	26.47	10.23	52.00	25.53	Ave.
0.170	29.18	10.23	55.43	26.25	Ave.
0.205	26.56	10.23	54.43	27.87	Ave.

Test Mode: Operating (Powered by adapter 2)

AC 120 V, 60 Hz, Line:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
1.740	27.79	10.10	46.00	18.21	Ave.
1.740	36.45	10.10	56.00	19.55	QP
0.275	41.61	10.10	62.43	20.82	QP
1.065	33.55	10.10	56.00	22.45	QP
1.065	23.47	10.10	46.00	22.53	Ave.
0.275	28.03	10.10	52.43	24.40	Ave.
0.170	40.43	10.10	65.43	25.00	QP
0.645	30.83	10.10	56.00	25.17	QP
2.235	20.54	10.10	46.00	25.46	Ave.
0.650	20.27	10.10	46.00	25.73	Ave.
2.235	28.39	10.10	56.00	27.61	QP
0.170	21.55	10.10	55.43	33.88	Ave.



**AC 120V, 60 Hz, Neutral:**



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
1.755	35.34	10.10	46.00	10.66	Ave.
1.755	43.23	10.10	56.00	12.77	QP
1.130	32.77	10.10	46.00	13.23	Ave.
1.135	41.87	10.10	56.00	14.13	QP
0.275	47.61	10.10	62.43	14.82	QP
0.885	41.10	10.10	56.00	14.90	QP
0.275	36.60	10.10	52.43	15.83	Ave.
0.645	29.48	10.10	46.00	16.52	Ave.
0.885	29.06	10.10	46.00	16.94	Ave.
0.650	38.43	10.10	56.00	17.57	QP
2.970	24.01	10.10	46.00	21.99	Ave.
2.955	31.50	10.10	56.00	24.50	QP

## FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

### Applicable Standard

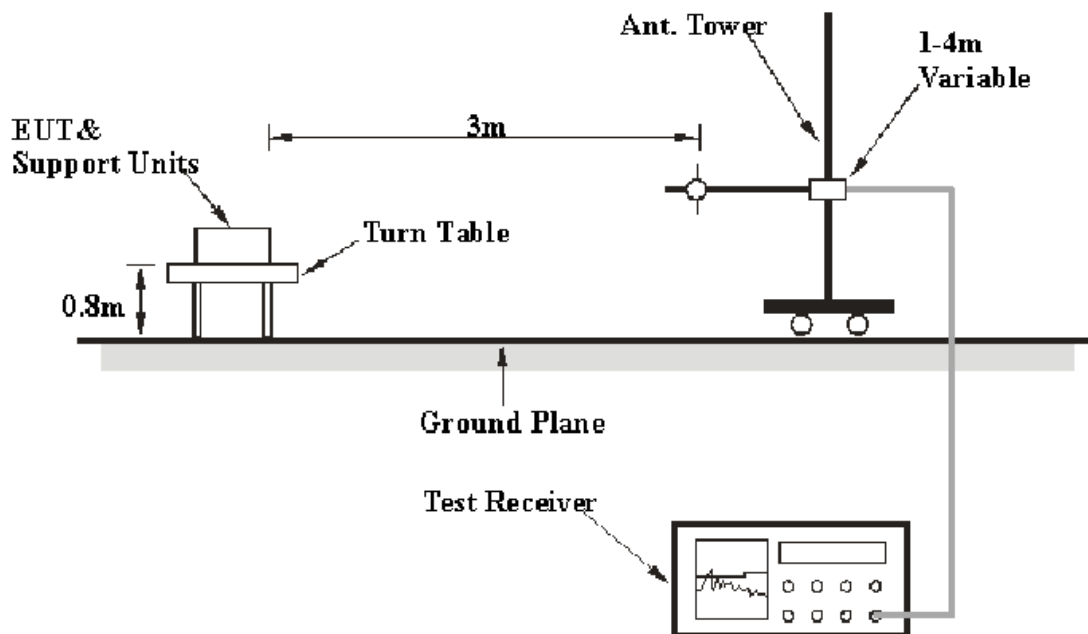
FCC §15.247 (d); §15.209; §15.205;

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is  $\pm 4.0$  dB ( $k=2$ , 95% level of confidence).

### EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

## EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	PK

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2011-08-02	2012-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2011-07-05	2012-07-04
HP	Amplifier	2VA-213+	T-E27H	2011-03-08	2012-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052604	2011-05-05	2012-05-04
Electro-Mechanics	Horn Antenna	3116	9510-2270	2011-10-11	2012-10-10
Rohde&Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Test Procedure

For the radiated emissions test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz and peak and Average detection modes for frequencies above 1GHz.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, with the worst margin reading of:

### 30MHz – 1GHz:

**Powered by adapter 1: 8.0 dB at 345.598750 MHz in the Vertical polarization**

**Powered by adapter 2: 9.6 dB at 345.596750 MHz in the Horizontal polarization**

### 1 - 25 GHz:

**5.42 dB at 4959.4 MHz in the Horizontal polarization at high channel**

## Test Data

### Environmental Conditions

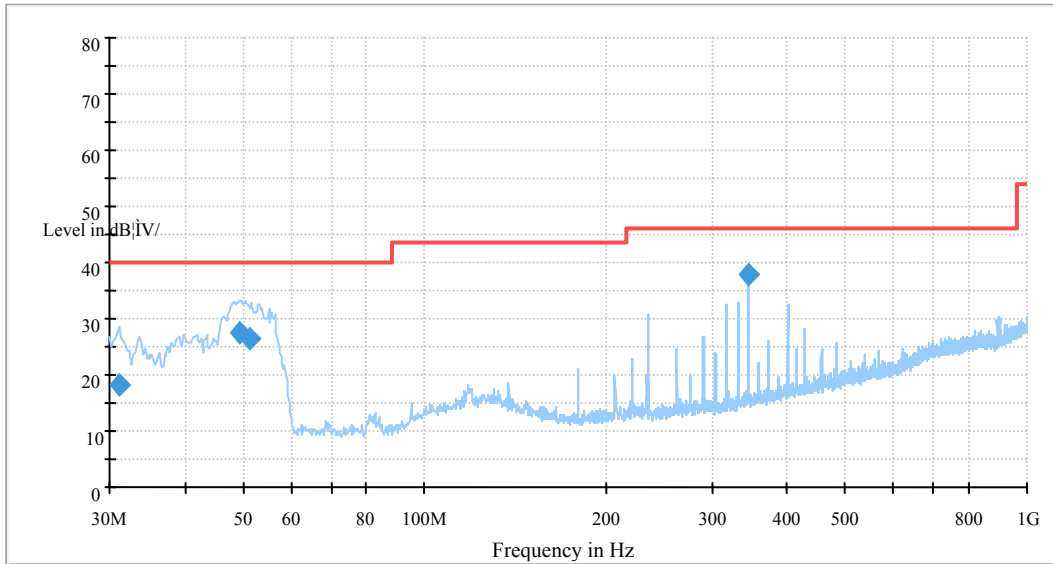
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0kPa

*The testing was performed by Tiger Ye on 2011-12-31 to 2012-01-01.*

**30 MHz – 1 GHz:**

*Test Mode: Transmitting (Powered by adapter 1)*

Auto Test

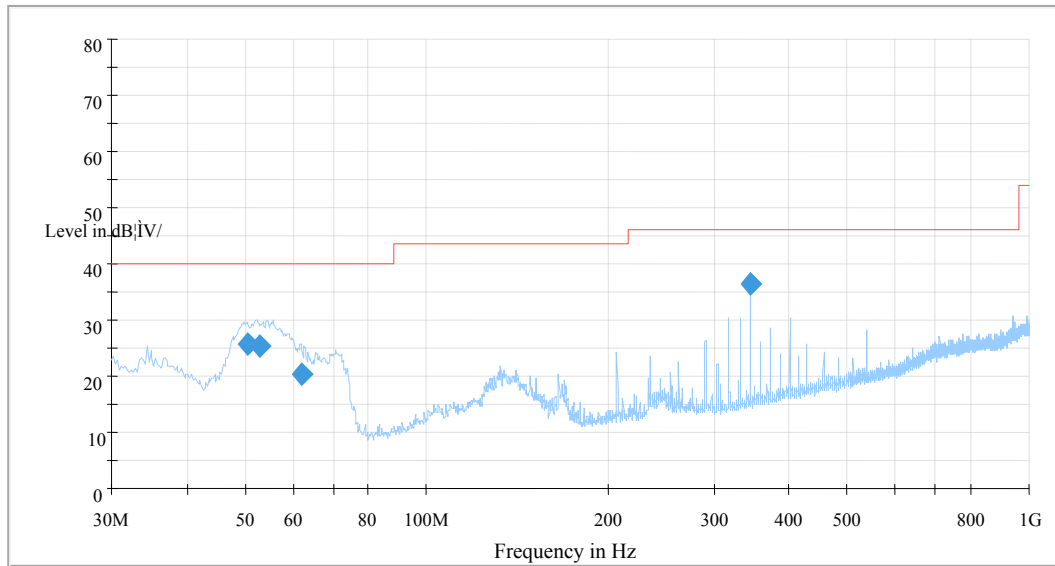


Frequency (MHz)	Corrected Amplitude (dBµV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
345.598750	38.0	178.0	V	96.0	-11.2	46.0	8.0
49.352500	27.7	104.0	V	250.0	-17.0	40.0	12.3
51.205750	26.3	104.0	V	250.0	-17.5	40.0	13.7
31.223000	18.2	104.0	V	179.0	-6.3	40.0	21.8

*Note: the data which below the limit 20 dB was not recorded.*

Test Mode: Transmitting (Powered by adapter 2)

Auto Test



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
345.596750	36.4	103.0	H	250.0	-11.2	46.0	9.6
50.340250	25.6	124.0	V	286.0	-17.3	40.0	14.4
52.723250	25.4	103.0	V	284.0	-17.7	40.0	14.6
62.224000	20.2	103.0	V	276.0	-18.6	40.0	19.8

Note: the data which below the limit 20 dB was not recorded.

1 – 25 GHz:

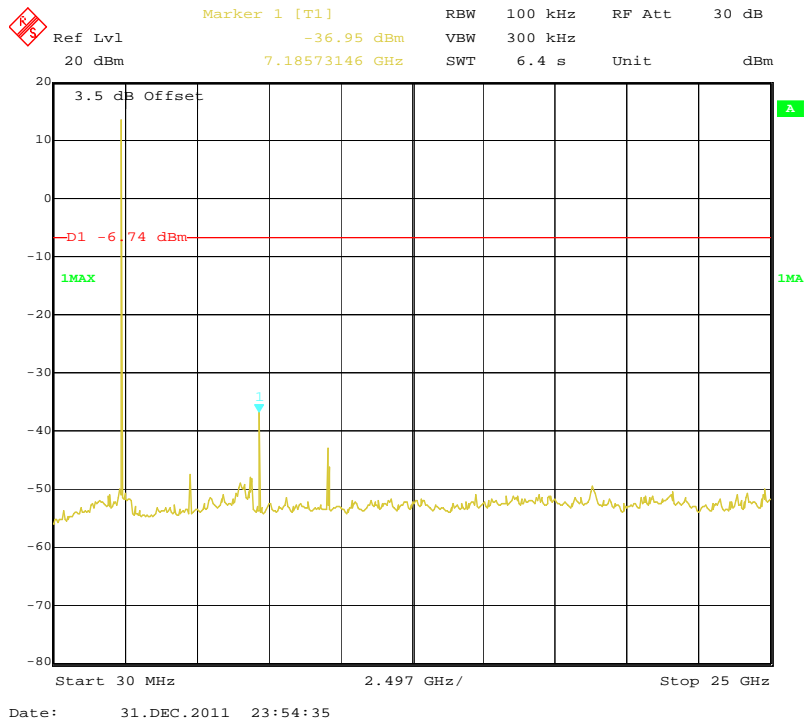
Indicated		Detector (PK/Ave.)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209/15.205			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2402.784 MHz)												
4805	54.69	PK	230	1.2	H	36.3	4.32	26.81	68.50	74	5.50	harmonic
4805	52.34	PK	160	1.0	V	34.1	4.32	26.81	63.95	74	10.05	harmonic
7208	41.96	PK	150	1.3	H	39.2	5.18	26.6	59.74	74	14.26	harmonic
9611	19.01	Ave.	210	1.4	H	41.1	5.98	26.35	39.74	54	14.26	harmonic
7208	42.4	PK	140	1.6	V	37.9	5.18	26.6	58.88	74	15.12	harmonic
9611	19.14	Ave.	150	1.0	V	39.9	5.98	26.35	38.67	54	15.33	harmonic
4805	24.06	Ave.	230	1.2	H	36.3	4.32	26.81	37.87	54	16.13	harmonic
7208	20.03	Ave.	150	1.3	H	39.2	5.18	26.6	37.81	54	16.19	harmonic
9611	38.2	PK	150	1.0	V	39.9	5.98	26.35	57.73	74	16.27	harmonic
9611	36.41	PK	210	1.4	H	41.1	5.98	26.35	57.14	74	16.86	harmonic
7208	20.59	Ave.	140	1.6	V	37.9	5.18	26.6	37.07	54	16.93	harmonic
4805	23.71	Ave.	160	1.0	V	34.1	4.32	26.81	35.32	54	18.68	harmonic
2388.5	43.15	PK	190	1.9	V	31.6	3.03	26.85	50.93	74	23.07	spurious
2388.5	42.01	PK	120	1.2	H	32.5	3.03	26.85	50.69	74	23.31	spurious
2388.5	21.63	Ave.	120	1.2	H	32.5	3.03	26.85	30.31	54	23.69	spurious
2388.5	21.52	Ave.	190	1.5	V	31.6	3.03	26.85	29.30	54	24.70	spurious
Middle Channel (2439.936 MHz)												
4879.8	50.17	PK	160	1.2	H	36.4	4.36	26.77	64.16	74	9.84	harmonic
7319.8	43.41	PK	360	1.8	H	39.1	5.13	26.59	61.05	74	12.95	harmonic
9759.7	19.72	Ave.	180	2.1	H	41.3	6.1	26.29	40.83	54	13.17	harmonic
4879.8	48.32	PK	230	1.5	V	34.6	4.36	26.77	60.51	74	13.49	harmonic
9759.7	38.47	PK	180	2.1	H	41.3	6.1	26.29	59.58	74	14.42	harmonic
9759.7	19.51	Ave.	190	1.3	V	40.2	6.1	26.29	39.52	54	14.48	harmonic
7319.8	42.59	PK	250	1.9	V	37.8	5.13	26.59	58.93	74	15.07	harmonic
7319.8	20.49	Ave.	360	1.8	H	39.1	5.13	26.59	38.13	54	15.87	harmonic
9759.7	37.56	PK	190	1.3	V	40.2	6.1	26.29	57.57	74	16.43	harmonic
7319.8	20.16	Ave.	250	1.9	V	37.8	5.13	26.59	36.50	54	17.50	harmonic
4879.8	22.35	Ave.	160	1.2	H	36.4	4.36	26.77	36.34	54	17.66	harmonic
4879.8	22.14	Ave.	230	1.5	V	34.6	4.36	26.77	34.33	54	19.67	harmonic

Indicated		Detector (PK/Ave.)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209/15.205			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
High Channel (2479.680 MHz)												
4959.4	54.43	PK	150	1.5	H	36.5	4.4	26.75	68.58	74	5.42	harmonic
4959.4	52.56	PK	260	1.6	V	35.2	4.4	26.75	65.41	74	8.59	harmonic
9918.7	20.13	Ave.	290	1.0	H	41.4	6.08	26.24	41.37	54	12.63	harmonic
7438.5	43.32	PK	310	1.2	H	39	5.2	26.56	60.96	74	13.04	harmonic
9918.7	39.26	PK	290	1.0	H	41.4	6.08	26.24	60.50	74	13.50	harmonic
9918.7	20.01	Ave.	130	1.4	V	40.3	6.08	26.24	40.15	54	13.85	harmonic
2484.5	51.96	PK	340	1.4	V	31.8	3.11	26.86	60.01	74	13.99	spurious
7438.5	43.23	PK	180	1.8	V	37.7	5.2	26.56	59.57	74	14.43	harmonic
9918.7	38.14	PK	130	1.4	V	40.3	6.08	26.24	58.28	74	15.72	harmonic
4959.4	23.81	Ave.	150	1.5	H	36.5	4.4	26.75	37.96	54	16.04	harmonic
7438.5	19.64	Ave.	310	1.2	H	39	5.2	26.56	37.28	54	16.72	harmonic
2484.5	48.04	PK	220	1.6	H	32.6	3.11	26.86	56.89	74	17.11	spurious
4959.4	23.54	Ave.	260	1.6	V	35.2	4.40	26.75	36.39	54	17.61	harmonic
7438.5	19.47	Ave.	180	1.8	V	37.7	5.20	26.56	35.81	54	18.19	harmonic
2484.5	21.31	Ave.	220	1.6	H	32.6	3.11	26.86	30.16	54	23.84	spurious
2484.5	21.95	Ave.	340	1.4	V	31.8	3.11	26.86	30.00	54	24.00	spurious

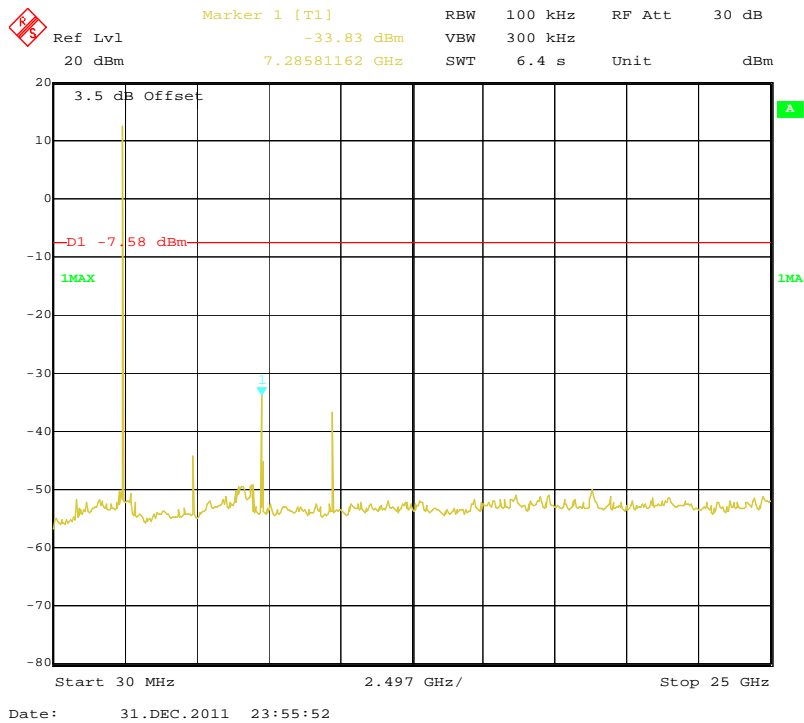


### Spurious Emissions at Antenna Terminal

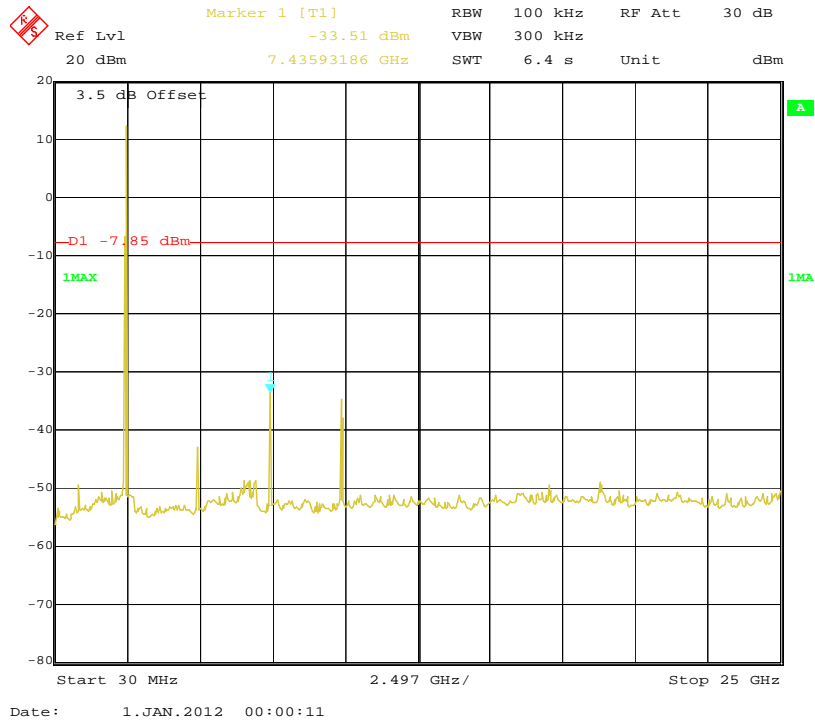
#### Low Channel



#### Middle Channel



### High Channel



## FCC §15.247(a) (1) - CHANNEL SEPARATION TEST

### Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

1. Set the EUT in Operating mode, spectrum Bandwidth was set at 10 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another trace
3. Measure the channel separation.

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

\* The testing was performed by Tiger Ye on 2011-12-31.

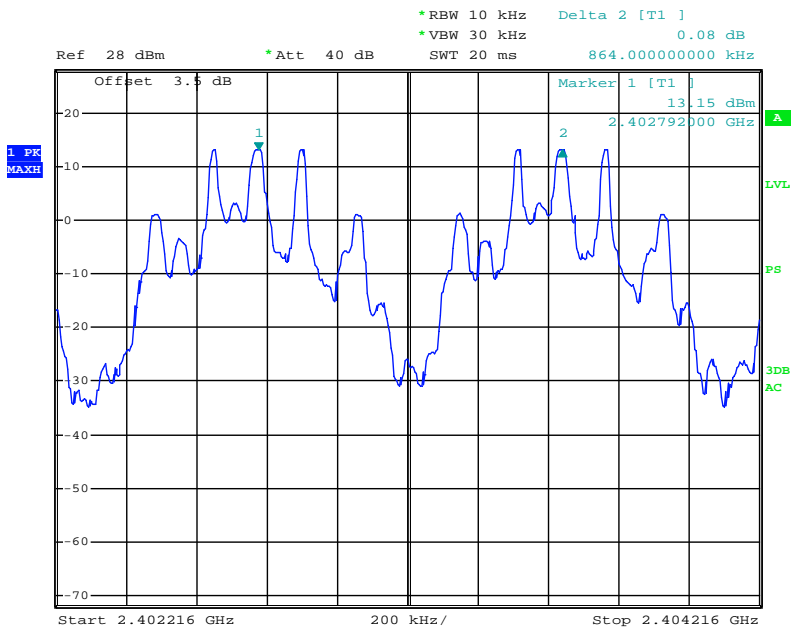
**Test Result:** Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

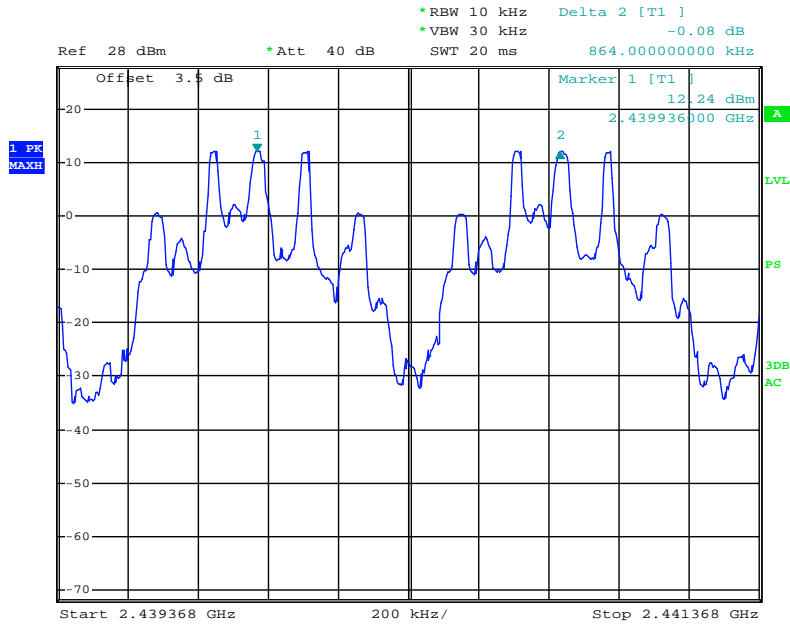
Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low Channel	2402.784	0.864	0.417	Pass
Adjacency Channel	2403.648			
Mid Channel	2439.936	0.864	0.419	
Adjacency Channel	2440.800			
High Channel	2479.680	0.864	0.421	
Adjacency Channel	2478.816			

Low Channel



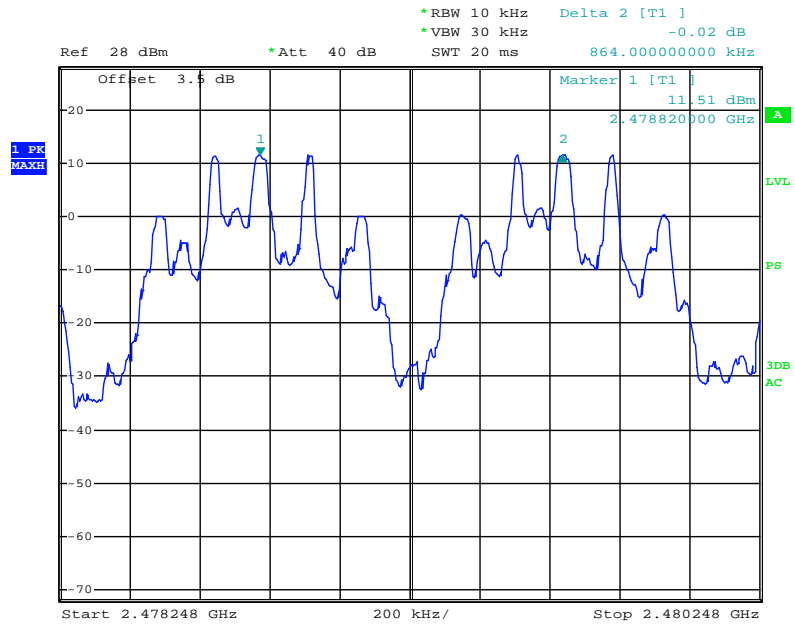
Date: 31.DEC.2011 17:43:13

### Middle Channel



Date: 31.DEC.2011 17:39:54

### High Channel



Date: 31.DEC.2011 17:35:26

## FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING

### Applicable Standard

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

\* The testing was performed by Tiger Ye on 2011-12-31.

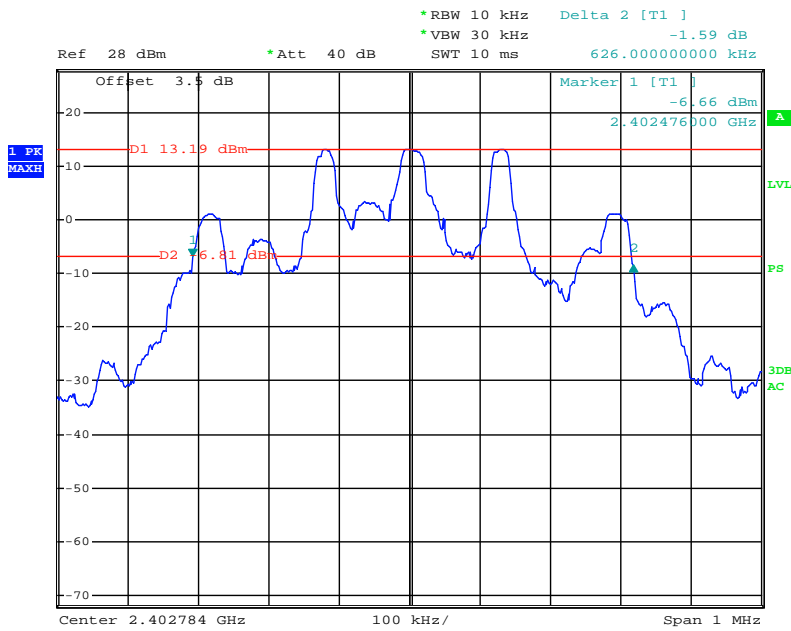
**Test Result:** Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

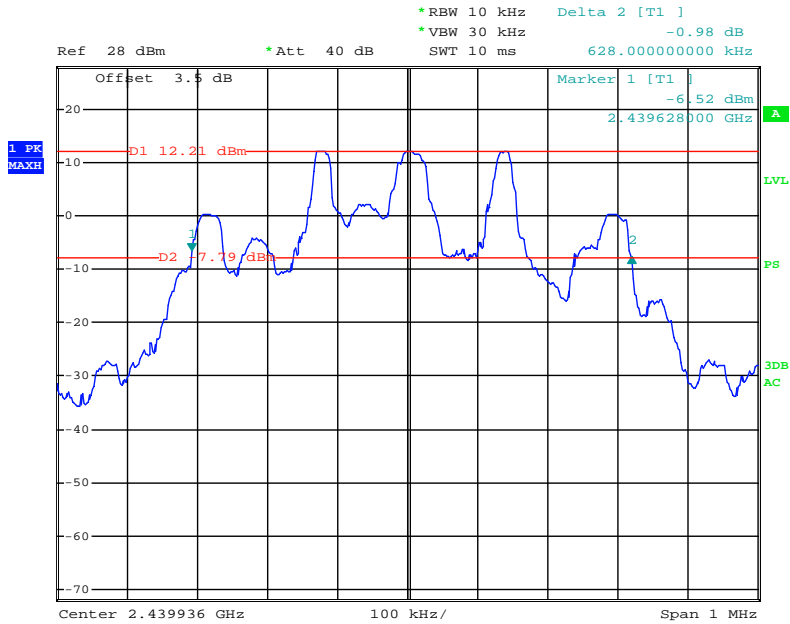
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402.784	0.626
Middle	2439.936	0.628
High	2479.680	0.632

Low Channel



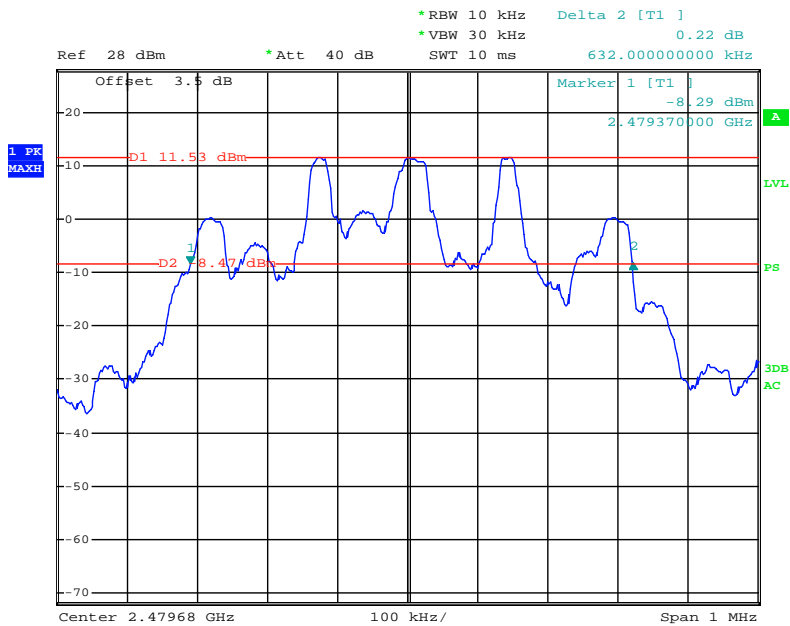
Date: 31.DEC.2011 17:07:50

### Middle Channel



Date: 31.DEC.2011 17:10:32

### High Channel



Date: 31.DEC.2011 17:13:01



## **FCC §15.247(a) (1) (iii) - QUANTITY OF HOPPING CHANNEL TEST**

### **Applicable Standard**

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### **Test Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### **Test Procedure**

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in hopping mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9kPa

*The testing was performed by Tiger Ye on 2011-12-31.*

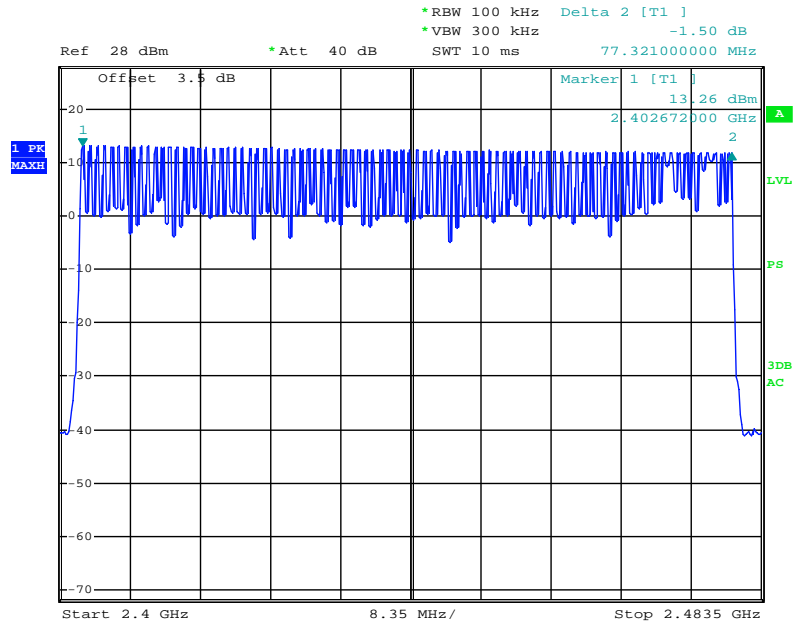
**Test Result:** Compliance.

Please refer to following tables and plots

Test Mode: Operating

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.50	90	≥ 15

Number of Hopping Channels



Date: 31.DEC.2011 16:15:27

## **FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)**

### **Applicable Standard**

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### **Test Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### **Test Procedure**

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 X channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell Time= Time slot length \* hope rate/ number of hopping channels \* hopping NO.\*0.4 s

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0kPa

*The testing was performed by Tiger Ye on 2011-12-31.*

**Test Result:** Compliance.

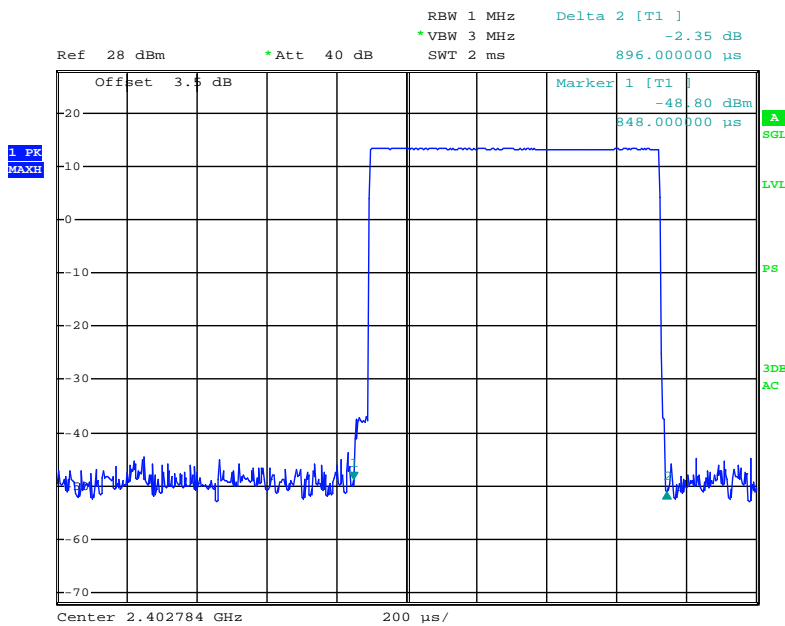
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
Low	0.896	0.0161	0.4	Pass
Middle	0.896	0.0161	0.4	Pass
High	0.896	0.0161	0.4	Pass

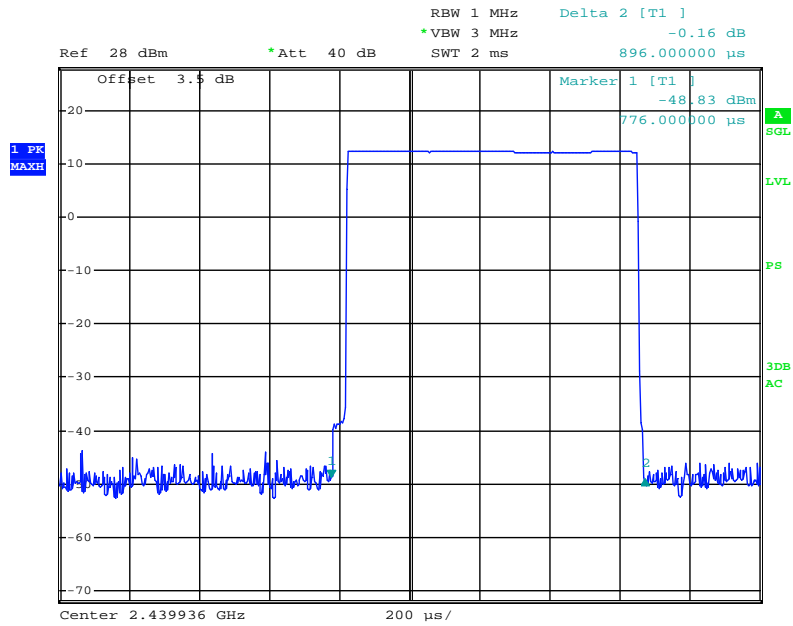
Note: Dwell time= Pulse time\*(90/2/90)\*90\*0.4S

Low Channel



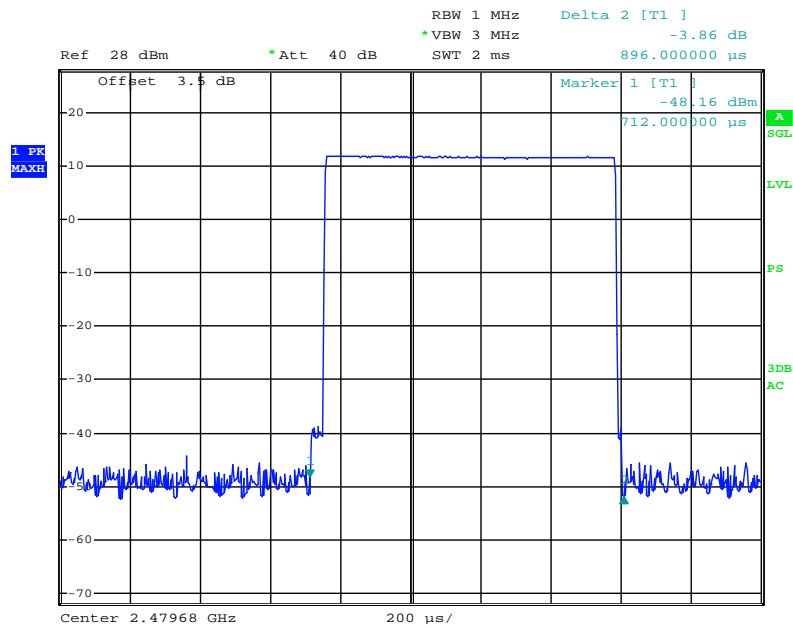
Date: 31.DEC.2011 17:58:34

### Middle Channel



Date: 31.DEC.2011 17:57:54

### High Channel



Date: 31.DEC.2011 17:56:51

## FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

### Applicable Standard

According to FCC §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

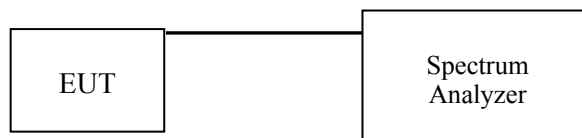
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI Test Receiver.
3. Add a correction factor to the display.



### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

\* The testing was performed by Tiger Ye on 2011-12-31.

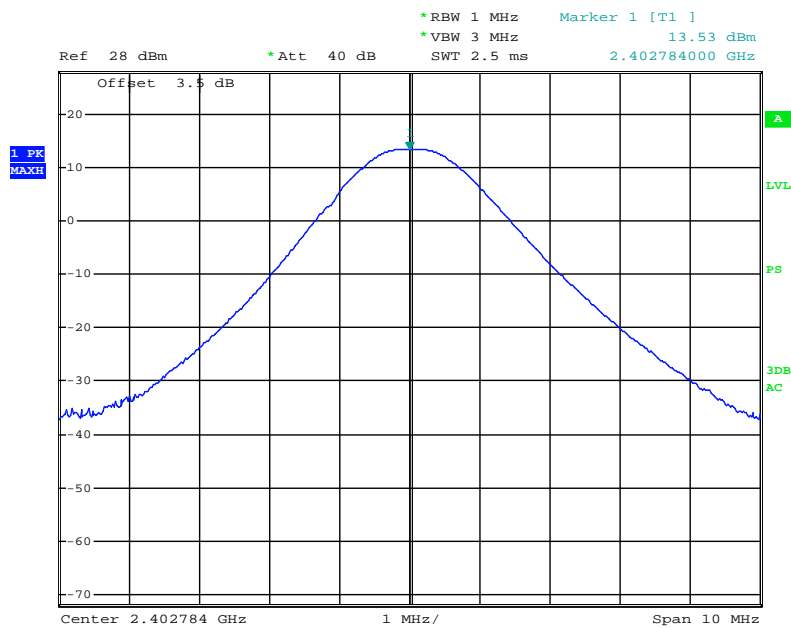
**Test Result:** Compliance.

Test Mode: Transmitting

Please refer to the following tables and plots:

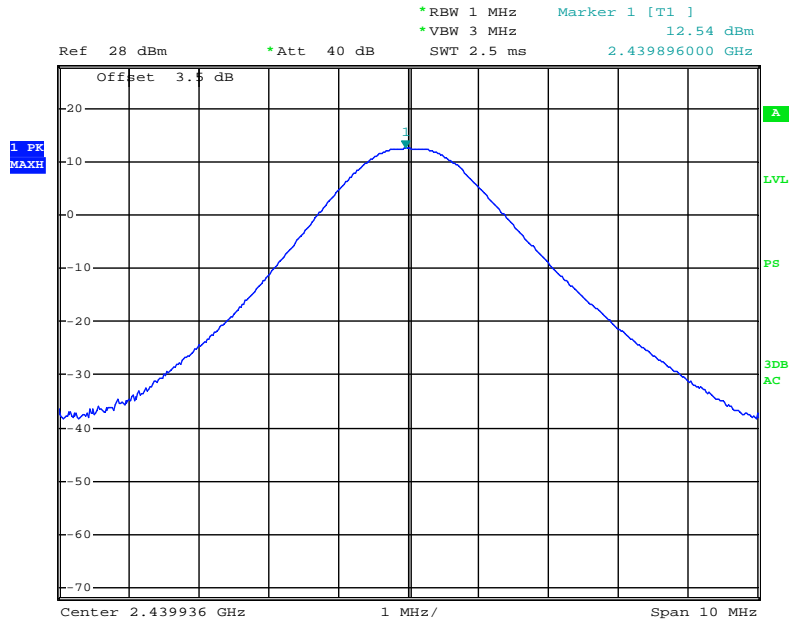
Channel	Channel frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (mW)
Low	2402.784	13.53	22.54	1000
Middle	2439.936	12.54	17.59	1000
High	2479.680	11.93	15.60	1000

Low Channel



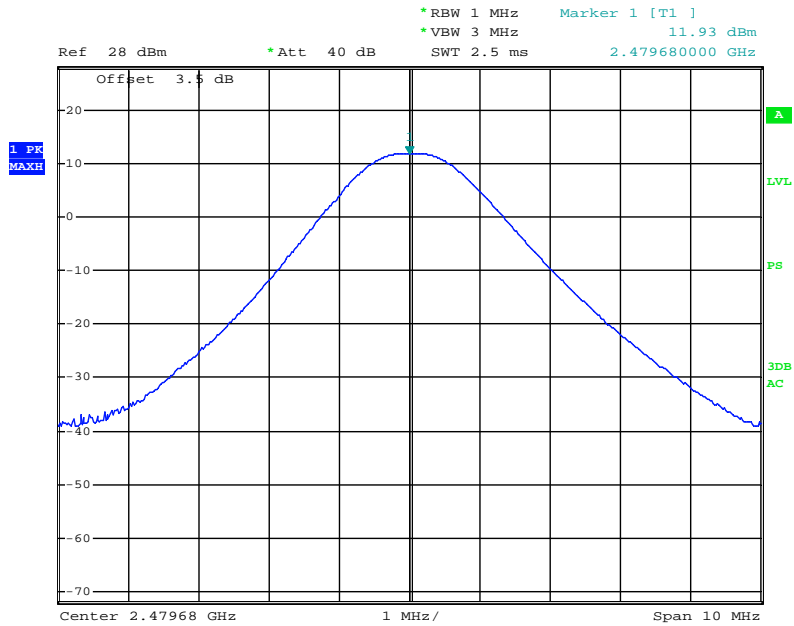
Date: 31.DEC.2011 17:48:52

### Middle Channel



Date: 31.DEC.2011 17:50:29

### High Channel



Date: 31.DEC.2011 17:51:45



## FCC §15.247(d) - BAND EDGES TESTING

### Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in Operating mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

**Test Data**

**Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9kPa

\*The testing was performed by Tiger Ye on 2011-12-31.

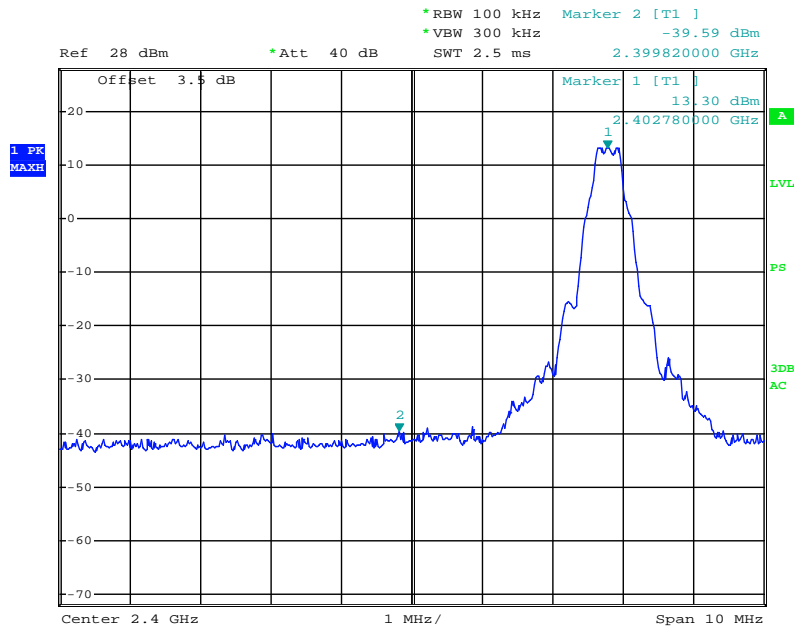
**Test Result:** Compliance.

Test Mode: Transmitting

Please refer to the follow table and plots:

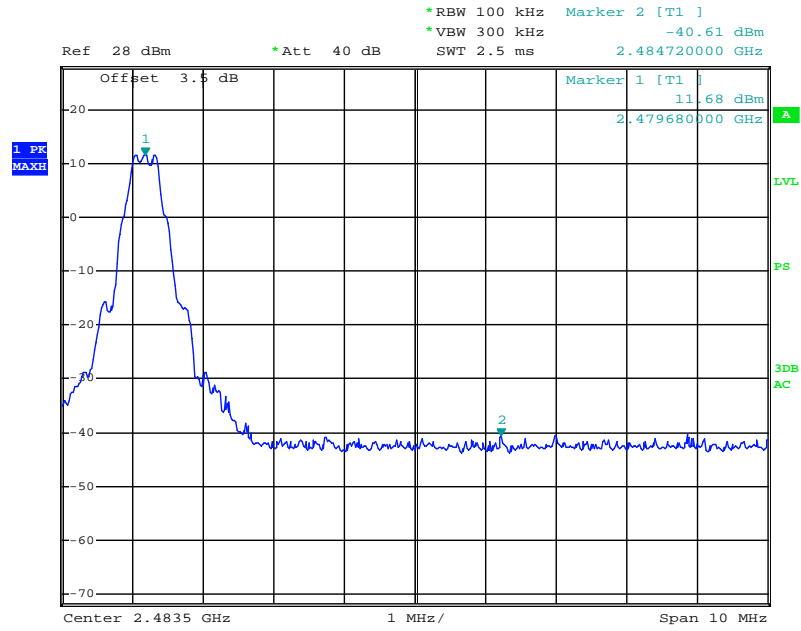
Frequency (MHz)	Delta Peak to Band Emission (dBc)	Delta Limit (dBc)
2399.820	52.89	20
2484.720	52.29	20

**Band Edge: Left Side**



Date: 31.DEC.2011 18:20:42

### Band Edge: Right Side



Date: 31.DEC.2011 17:20:12

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