

FCC PART 15.247  
TEST REPORT

For

**ClearSounds Communications, Inc.**

1743 Quincy Avenue #155, Naperville, IL 60540, USA

**FCC ID: WG8QUATTRO**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Bluetooth Amplified Neckloop
<b>Test Engineer:</b> Felix Li	<i>Felix Li</i>
<b>Report Number:</b> RSZ110621009-00	
<b>Report Date:</b> 2011-10-12	
<b>Reviewed By:</b> EMC Engineer	Merry Zhao <i>merry.zhao</i>
<b>Test Laboratory:</b>	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>

**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. 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 *ClearSounds Communications, Inc.*'s product, model number: *Quattro*, FCC ID: *WG8QUATTRO*, or (the "EUT") in this report is a *Bluetooth Amplified Neckloop*, which was measured approximately: 7.5 cm (L) x 4.5 cm (W) x 2.0 cm (H), rated input voltage: DC 3.7 V built-in rechargeable Li-Polymer battery or DC 5.0 V adapter and PC USB Port for charging.

Adaptor information: Switching Power Supply  
I.T.E Power Supply  
Model: P6USB050050 US  
Input: 100-240V AC 50/60 Hz 0.2A  
Output: DC 5.0V 0.5A  
P/N: B3410-1050

*Note: the product Bluetooth Amplified Neckloop, model number Quattro and XL-9037BT are electrically identical, they have the same schematic and PCB layout. We select Quattro for testing, which was explained for details in the attached declaration letter.*

*\* All measurement and test data in this report was gathered from production sample serial number: 1106060 (Assigned by BACL, Shenzhen). The EUT was received on 2011-06-21.*

### Objective

This report is prepared on behalf of *ClearSounds Communications, 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 the compliance of EUT with FCC Part 15, Subpart B & C, and section 15.107, 15.109, 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

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

N/A

### 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.

The uncertainty of any RF tests which use conducted method measurement is  $\pm 0.96$ dB; the uncertainty of any radiation emissions measurement is  $\pm 4.0$  dB.

## 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

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### Description of Test Configuration

The system was configured for testing in an engineering mode, which is provided by manufacture.

### EUT Exercise Software

Bluesuite V2.1

### Equipment Modifications

No modification was made to the unit tested.

### Local Support Equipment List and Details

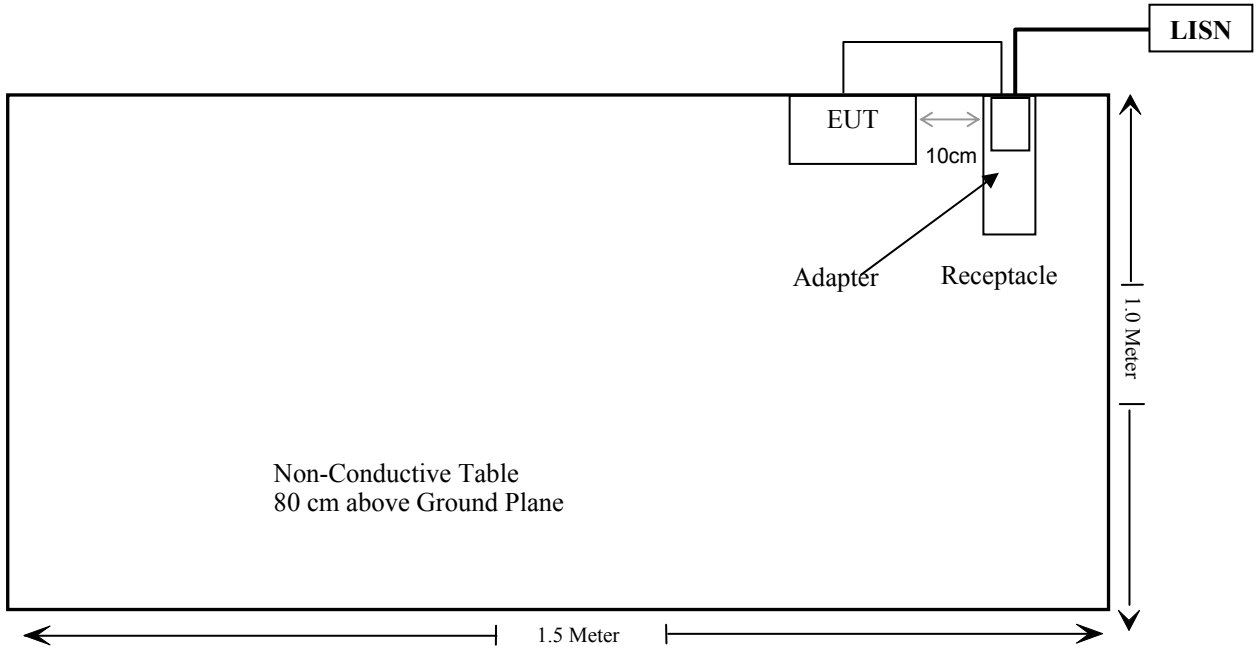
Manufacturer	Description	Model	Serial Number
DELL	Laptop	D600	00045-438-852-864

### External I/O Cable

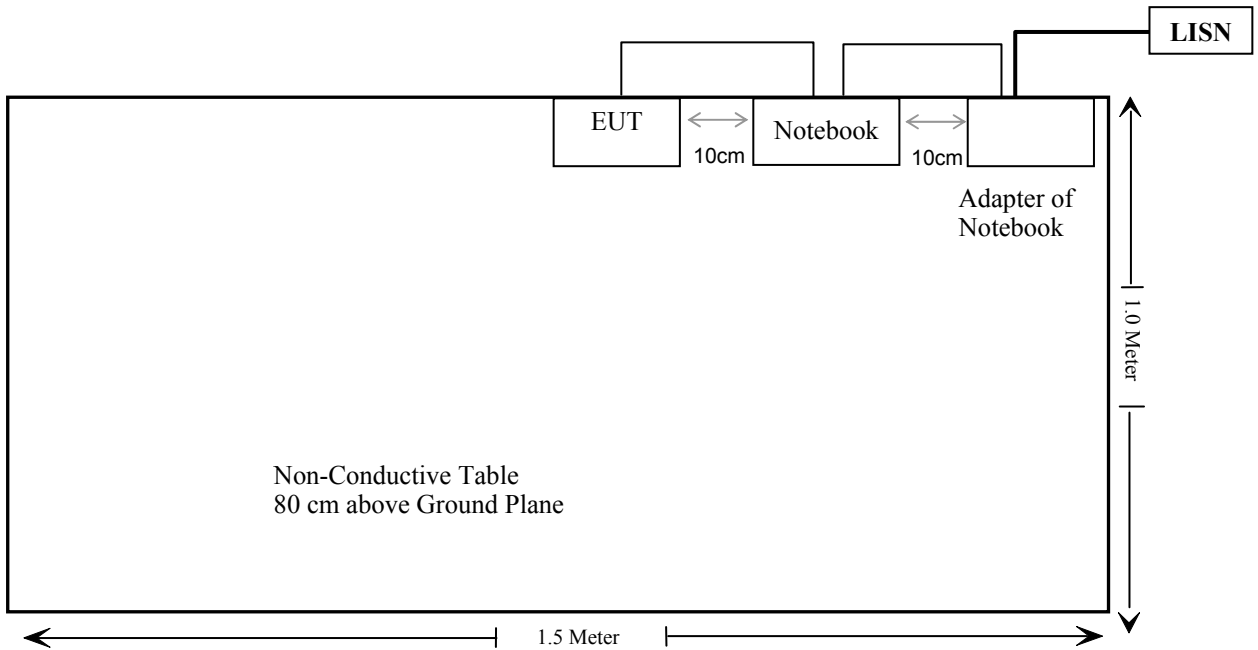
Cable Description	Length (m)	From Port	To
Unshielded Detachable USB Charging Cable	1.2	EUT	Adapter/PC

### Block Diagram of Test Setup

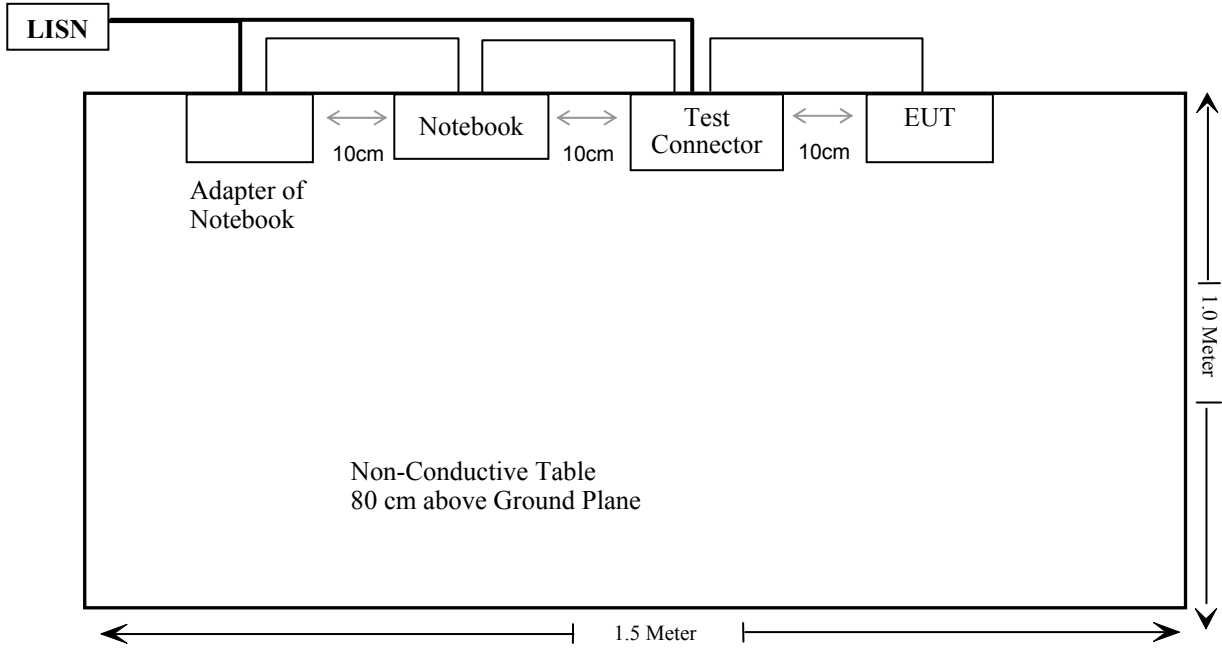
For adapter charging mode



For PC charging mode



For transmitting mode





**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
§15.247 (i), §2.1093	RF Exposure Information	Compliance
§15.203	Antenna Requirement	Compliance
15.107&§15.207 (a)	AC Line Conducted Emissions	Compliance
15.109,§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 INFORMATION****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 FCC KDB 447498, no SAR evaluation required if products that meet the following conditions:

(1) (c) Unless excluded by specified FCC test procedures, portable device with output power is  $\geq 60/f_{(\text{GHz})}$  mW shall include SAR data for equipment approval.

**Result:**

Mode	Conducted Power (dBm)	Max. Antenna Gain (dBi)	EIRP (mW)
BDR	0.74	0	1.1858
EDR	-0.14	0	0.9683

This is a portable device and the EIRP of EUT is less than  $60/f_{(\text{GHz})}$ , i.e.24.58 mW, so the SAR measurement is not necessary

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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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

### **Antenna Connector Construction**

The antenna was printed on the PCB, the gain is 0 dBi, which are in accordance to section 15.203, please refer to the internal photos.

**Result:** Compliance.

## FCC §15.107 & §15.207(a) – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

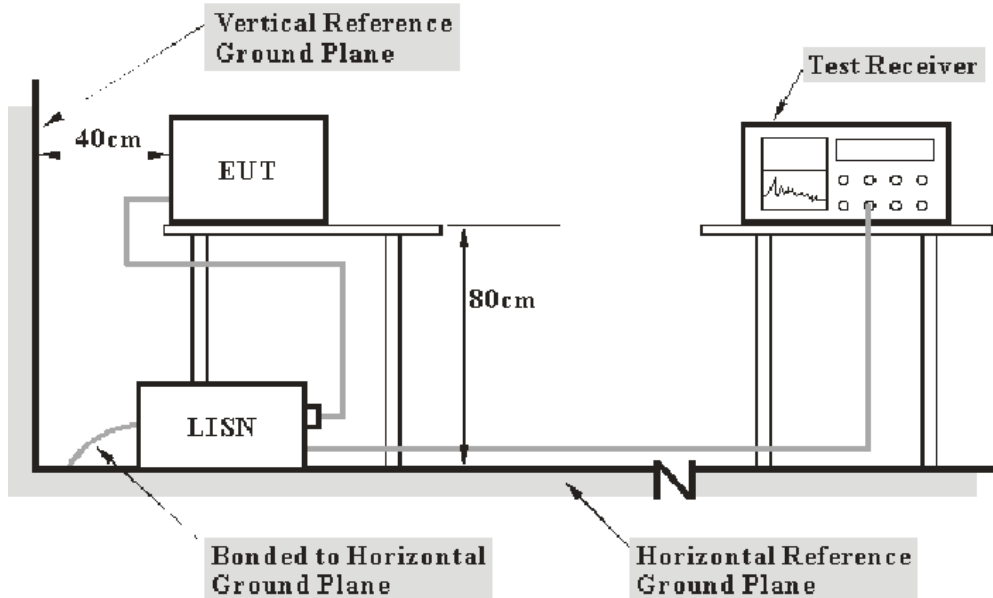
FCC §15.107 & §15.207

### 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 15.107 & 207 limits.

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

The adapter was connected to a 120 VAC/60 Hz power source for adapter charging mode.

The adapter of notebook was connected to a 120 VAC/60 Hz power source for PC charging mode.

## 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 for adapter charging mode; the adapter was connected to the outlet of the LISN for PC charging mode

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 15.107 & 15.207, with the worst margin reading of:

**19.62 dB at 27.120 MHz** in the **Line** conducted mode for adapter charging mode

## Test Data

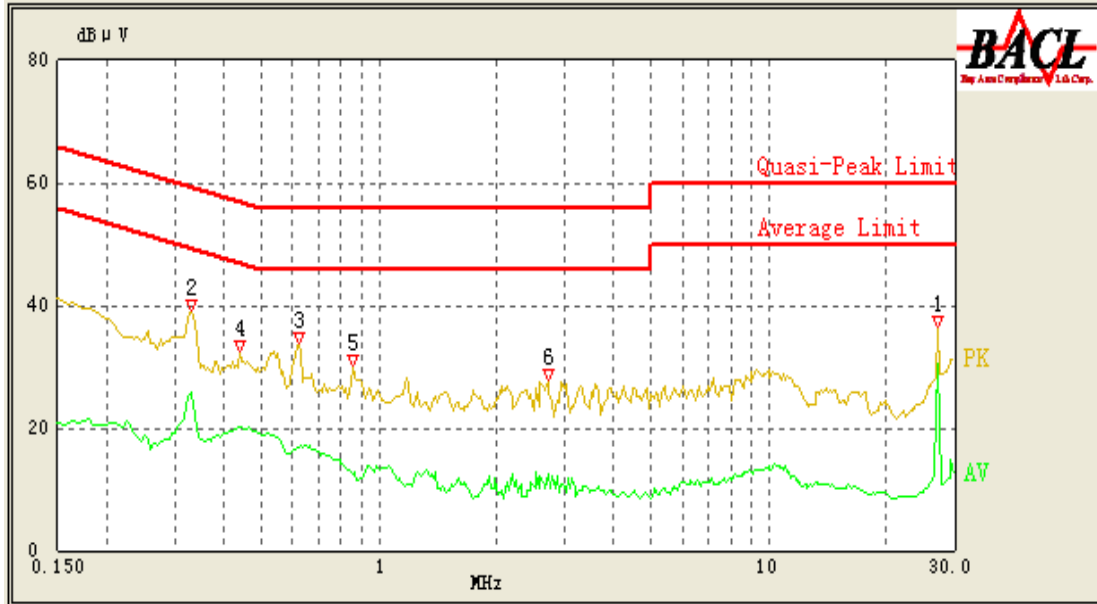
### Environmental Conditions

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

\* *The testing was performed by Felix Li on 2011-06-24.*

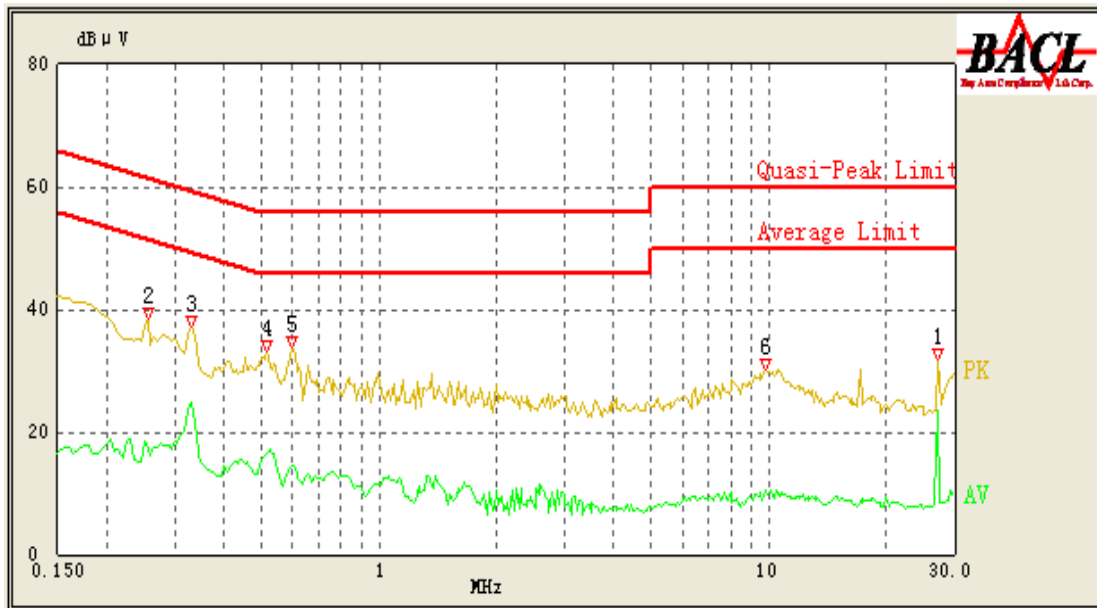
Test Mode: Adapter Charging

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
27.120	30.38	10.20	50.00	19.62	Ave.
0.330	25.83	10.10	50.86	25.03	Ave.
27.120	33.46	10.20	60.00	26.54	QP
0.440	20.05	10.10	47.71	27.66	Ave.
0.625	16.99	10.10	46.00	29.01	Ave.
0.330	29.61	10.10	60.86	31.25	QP
0.440	25.94	10.10	57.71	31.77	QP
0.855	12.62	10.11	46.00	33.38	Ave.
2.720	12.52	10.15	46.00	33.48	Ave.
0.625	20.15	10.10	56.00	35.85	QP
0.860	17.02	10.11	56.00	38.98	QP
2.720	16.30	10.15	56.00	39.70	QP

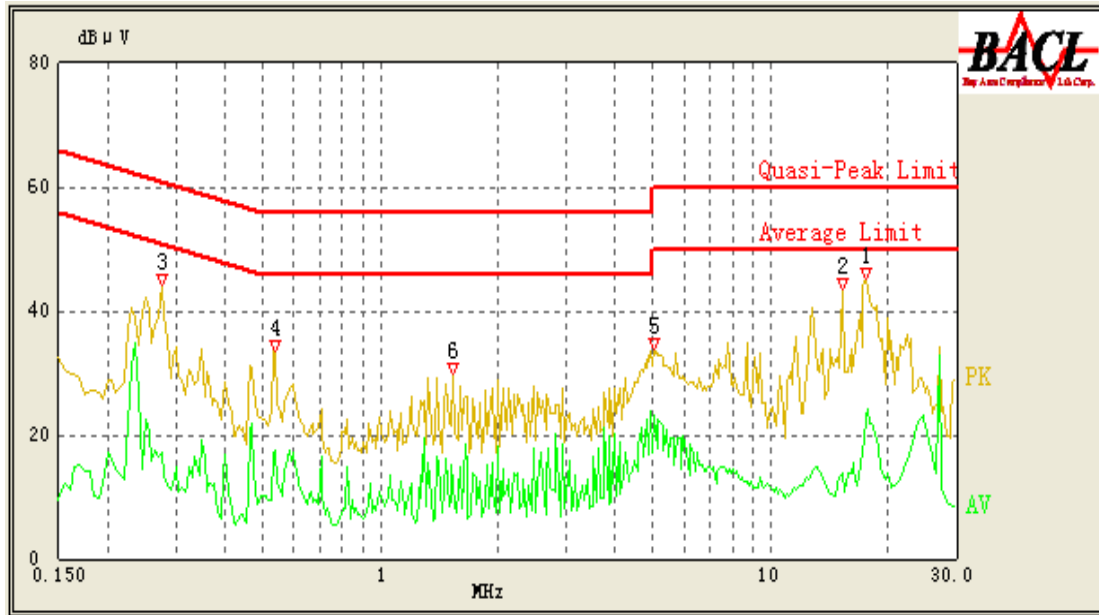
AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
0.330	24.82	10.10	50.86	26.04	Ave.
27.120	23.56	10.20	50.00	26.44	Ave.
0.520	16.84	10.10	46.00	29.16	Ave.
0.515	25.84	10.10	56.00	30.16	QP
0.330	30.33	10.10	60.86	30.53	QP
27.120	28.61	10.20	60.00	31.39	QP
0.600	14.57	10.10	46.00	31.43	Ave.
0.600	23.38	10.10	56.00	32.62	QP
0.255	30.34	10.10	63.00	32.66	QP
0.255	17.52	10.10	53.00	35.48	Ave.
9.820	24.45	10.20	60.00	35.55	QP
9.810	10.62	10.20	50.00	39.38	Ave.

Test Mode: PC Charging

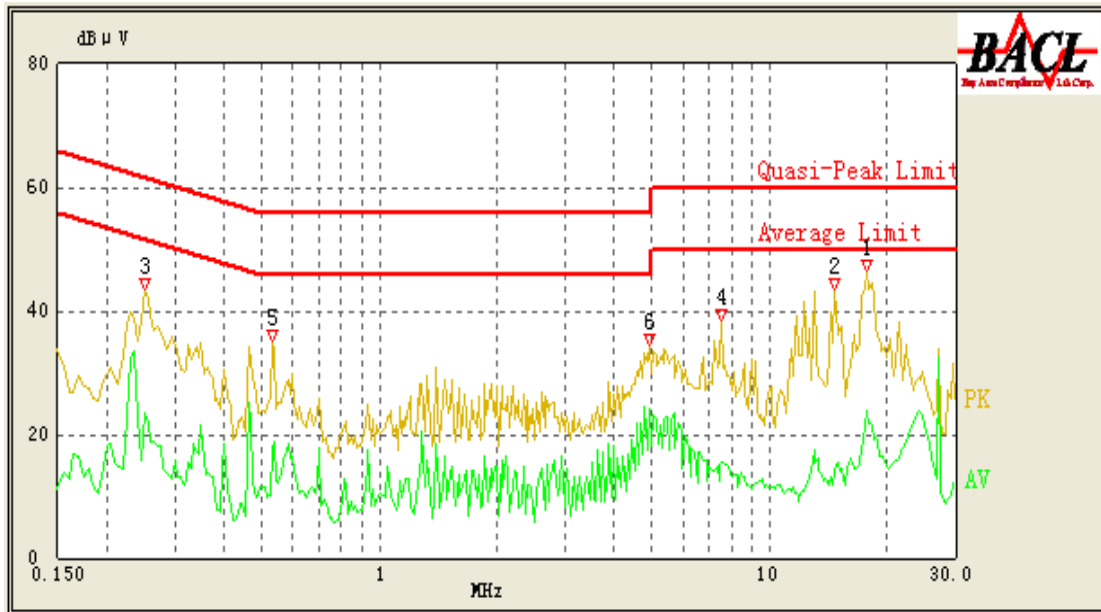
AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
5.045	23.14	10.20	50.00	26.86	Ave.
17.615	22.77	10.20	50.00	27.23	Ave.
0.535	17.60	10.10	46.00	28.40	Ave.
0.535	27.22	10.10	56.00	28.78	QP
17.495	29.60	10.20	60.00	30.40	QP
1.525	15.19	10.12	46.00	30.81	Ave.
1.530	24.87	10.12	56.00	31.13	QP
0.275	28.54	10.10	62.43	33.89	QP
5.045	24.83	10.20	60.00	35.17	QP
0.275	17.15	10.10	52.43	35.28	Ave.
15.300	13.74	10.20	50.00	36.26	Ave.
15.360	22.15	10.20	60.00	37.85	QP



AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
4.905	24.26	10.20	46.00	21.74	Ave.
0.250	37.61	10.10	63.14	25.53	QP
17.695	23.95	10.20	50.00	26.05	Ave.
0.530	28.95	10.10	56.00	27.05	QP
0.530	17.41	10.10	46.00	28.59	Ave.
17.705	31.25	10.20	60.00	28.75	QP
0.250	23.39	10.10	53.14	29.75	Ave.
4.905	24.18	10.20	56.00	31.82	QP
7.480	15.26	10.20	50.00	34.74	Ave.
14.715	14.26	10.20	50.00	35.74	Ave.
14.715	22.06	10.20	60.00	37.94	QP
7.540	19.97	10.20	60.00	40.03	QP

## FCC §15.109, §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

### Applicable Standard

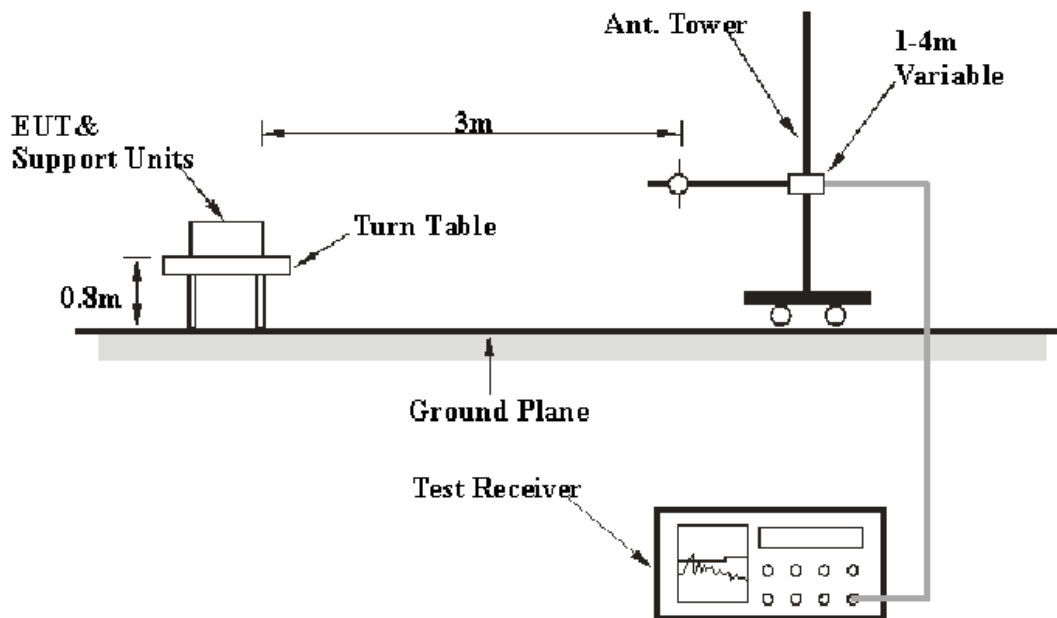
FCC §15.247 (d); §15.209; §15.205; §15.109

### 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 chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.109, 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.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source for adapter charging mode.

The adapter of notebook was connected to a 120 VAC/60 Hz power source for PC charging mode and transmitting mode.

## 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	Ave

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-07-05	2011-07-04
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2011-03-08	2012-03-07
Sunol Sciences	Horn Antenna	DRH-118	A052604	2011-05-05	2012-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-07

\* **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 for adapter charging mode; the adapter of notebook was connected to the outlet of the LISN for PC charging mode and transmitting mode.

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-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

## 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 7dB means the emission is 7dB 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 Part 15, Subpart B & C, and section 15.109, 15.205, 15.209 and 15.247, with the worst margin reading of:

**3.9 dB at 47.31350 MHz in the Vertical polarization for transmitting (EDR mode)**

### Test Data

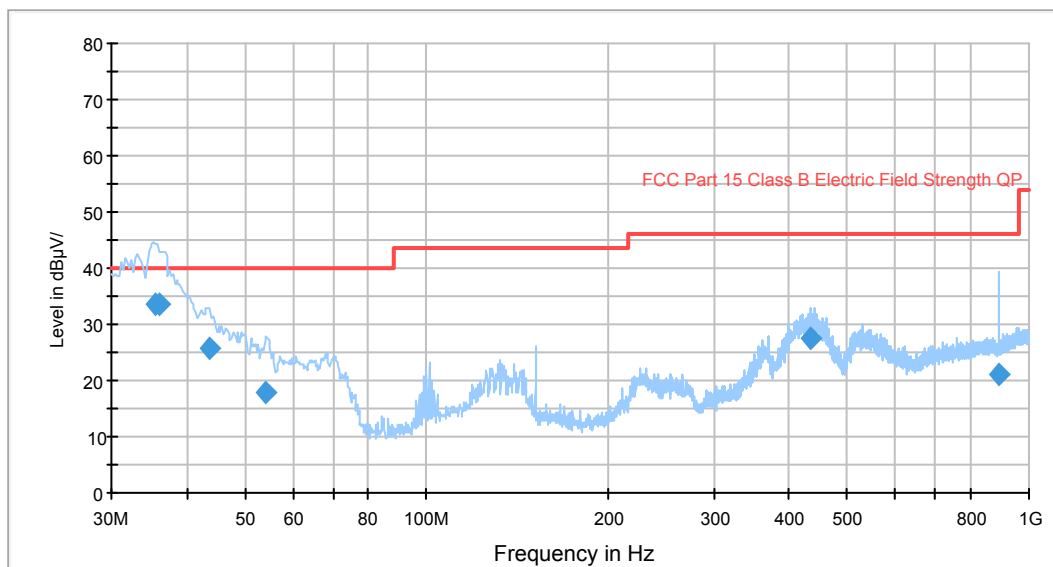
#### Environmental Conditions

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

The testing was performed by Felix Li on 2011-06-24.

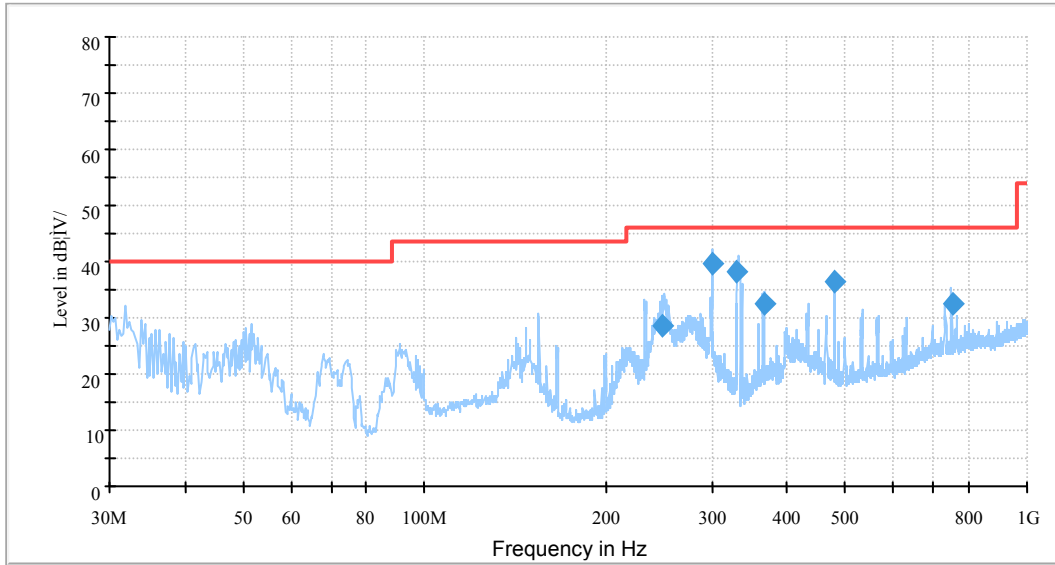
Test Mode: Adapter Charging

Auto Test(FCC 15 Class B)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Position (degree)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
36.017250	33.7	100.0	V	306.0	40.0	6.3
35.447250	33.6	101.0	V	0.0	40.0	6.4
43.582250	25.6	100.0	V	268.0	40.0	14.4
433.754250	27.7	101.0	H	55.0	46.0	18.3
53.946250	17.8	120.0	V	208.0	40.0	22.2
890.468000	21.0	169.0	V	254.0	46.0	25

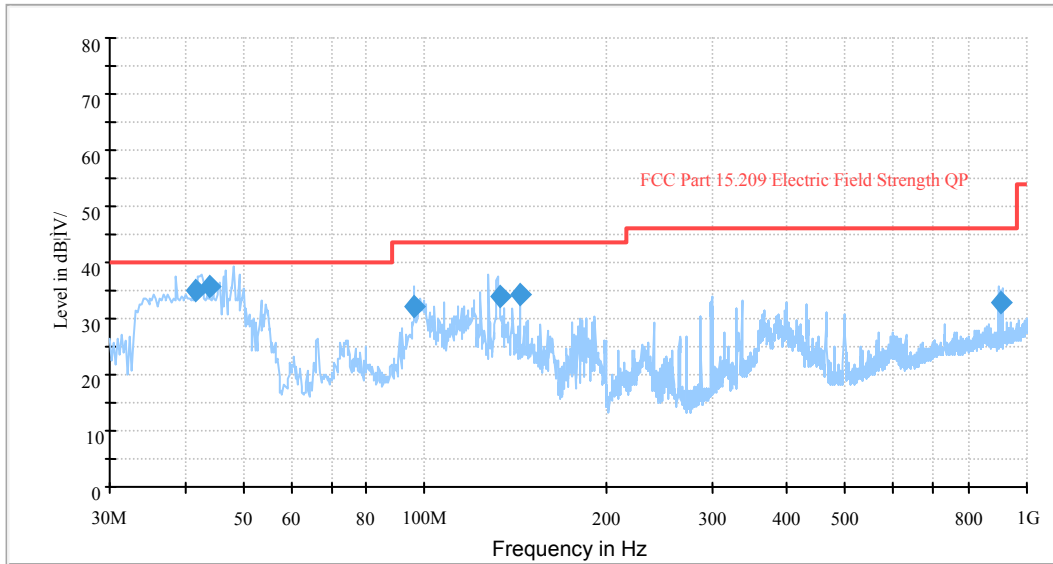
Test Mode: PC Charging



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Position (degree)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
300.089500	39.5	100.0	H	78.0	46.0	6.5
248.029750	28.7	102.0	V	285.0	46.0	24.3
366.835500	32.6	303.0	V	227.0	46.0	24.4
751.021750	32.5	122.0	V	253.0	46.0	24.5
480.669000	36.3	188.0	V	335.0	46.0	24.7
330.235250	38.2	203.0	V	26.0	46.0	24.8

Test Mode: Transmitting (BDR mode)

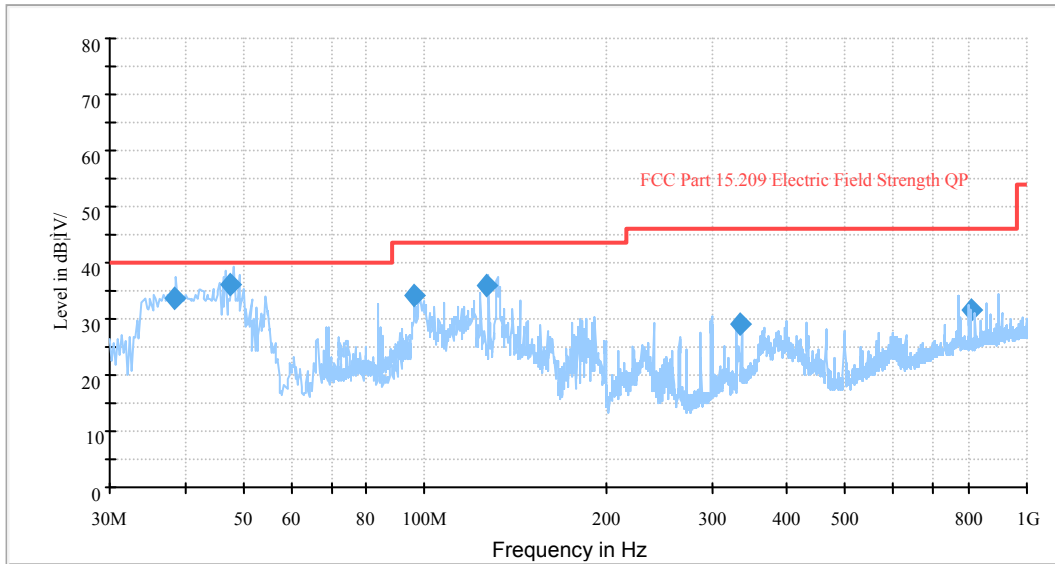
**Below 1 GHz**



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Position (degree)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
44.030000	35.7	100.0	V	111.0	40.0	4.3
41.560750	34.9	102.0	V	135.0	40.0	5.1
144.004250	34.4	199.0	H	0.0	43.5	9.1
133.220500	33.8	316.0	H	25.0	43.5	9.7
96.000250	32.1	220.0	H	187.0	43.5	11.4
907.193750	32.8	100.0	H	173.0	46.0	13.2

Test Mode: Transmitting (EDR mode)

**Below 1 GHz**



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Position (degree)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
47.31350	36.1	120.0	V	224.0	40.0	3.9*
38.45860	34.2	106.0	V	135.0	40.0	5.8
135.236400	35.8	227.0	H	87.0	43.5	7.7
98.023250	33.5	230.0	V	345.0	43.5	10
801.138780	31.2	100.0	H	23.0	46.0	14.8
322.054350	29.5	136.0	H	0.0	46.0	16.5

**Above 1 GHz**

Test Mode: Transmitting (BDR mode)

Indicated		Detector (PK/Ave.)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel												
4804	29.52	Ave.	93	1.3	V	35.4	4.30	26.75	42.47	54	11.53	harmonic
4804	27.55	Ave.	98	1.2	H	36.6	4.30	26.75	41.70	54	12.30	harmonic
4804	44.99	PK	93	1.3	V	35.4	4.30	26.75	57.94	74	16.06	harmonic
4804	43.01	PK	98	1.2	H	36.6	4.30	26.75	57.16	74	16.84	harmonic
2316.73	21.43	Ave.	76	1.3	H	30.6	2.98	26.83	28.18	54	25.82	spurious
2316.85	20.52	Ave.	196	1.3	V	30.6	2.98	26.83	27.27	54	26.73	spurious
2316.85	35.05	PK	196	1.3	V	30.6	2.98	26.83	41.80	74	32.20	spurious
2316.73	34.90	PK	76	1.3	H	30.6	2.98	26.83	41.65	74	32.35	spurious
Middle Channel												
4882	23.56	Ave.	218	1.2	H	36.6	4.36	26.75	37.77	54	16.23	harmonic
4882	24.53	Ave.	39	1.3	V	35.4	4.36	26.75	37.54	54	16.46	harmonic
4882	43.52	PK	39	1.3	V	35.4	4.36	26.75	56.53	74	17.47	harmonic
4882	40.94	PK	218	1.2	H	36.6	4.36	26.75	55.15	74	18.85	harmonic
High Channel												
4960	28.61	Ave.	79	1.3	H	36.6	4.40	26.75	42.86	54	11.14	harmonic
4960	27.92	Ave.	270	2.0	V	35.4	4.40	26.75	40.97	54	13.03	harmonic
4960	46.11	P K	270	2.0	V	35.4	4.40	26.75	59.16	74	14.84	harmonic
4960	43.78	PK	79	1.3	H	36.6	4.40	26.75	58.03	74	15.97	harmonic
2487.93	22.26	Ave.	254	1.4	H	30.6	3.03	26.88	29.01	54	24.99	spurious
2484.95	22.24	Ave.	125	1.3	V	29.8	3.03	26.88	28.19	54	25.81	spurious
2487.93	36.24	PK	254	1.4	H	30.6	3.03	26.88	42.99	74	31.01	spurious
2484.95	36.13	PK	125	1.3	V	29.8	3.03	26.88	42.08	74	31.92	spurious



**Above 1 GHz**

Test Mode: Transmitting (EDR mode)

Indicated		Detector (PK/Ave.)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel												
4804	25.48	Ave.	309	1.3	H	36.6	4.30	26.75	39.63	54	14.37	harmonic
4804	26.58	Ave.	39	1.3	V	35.4	4.30	26.75	39.53	54	14.47	harmonic
4804	43.81	PK	39	1.3	V	35.4	4.30	26.75	56.76	74	17.24	harmonic
4804	39.76	PK	309	1.3	H	36.6	4.30	26.75	53.91	74	20.09	harmonic
2314.8	23.63	Ave.	226	1.3	H	30.6	2.98	26.83	30.38	54	23.62	spurious
2327.6	22.19	Ave.	325	1.2	V	30.6	2.98	26.83	28.94	54	25.06	spurious
2314.8	35.18	PK	226	1.3	H	30.6	2.98	26.83	41.93	74	32.07	spurious
2327.6	34.95	PK	325	1.2	V	30.6	2.98	26.83	41.70	74	32.30	spurious
Middle Channel												
4882	25.63	Ave.	345	1.4	V	35.4	4.36	26.75	38.64	54	15.36	harmonic
4882	24.15	Ave.	125	1.5	H	36.6	4.36	26.75	38.36	54	15.64	harmonic
4882	40.59	PK	345	1.4	V	35.4	4.36	26.75	53.60	74	20.40	harmonic
4882	38.48	PK	125	1.5	H	36.6	4.36	26.75	52.69	74	21.31	harmonic
High Channel												
4960	24.03	Ave.	158	1.2	H	36.6	4.40	26.75	38.28	54	15.72	harmonic
4960	24.85	Ave.	136	1.3	V	35.4	4.40	26.75	37.90	54	16.10	harmonic
4960	38.12	PK	158	1.2	H	36.6	4.40	26.75	52.37	74	21.63	harmonic
4960	39.12	PK	136	1.3	V	35.4	4.40	26.75	52.17	74	21.83	harmonic
2483.53	23.36	Ave.	165	1.2	V	29.8	3.03	26.88	29.31	54	24.69	spurious
2483.56	22.21	Ave.	324	1.2	H	30.6	3.03	26.88	28.96	54	25.04	spurious
2483.53	37.45	PK	165	1.2	V	29.8	3.03	26.88	43.40	74	30.60	spurious
2483.56	36.52	PK	324	1.5	H	30.6	3.03	26.88	43.27	74	30.73	spurious

## 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 20dB 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	2010-11-11	2011-11-10

\* **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 transmitting mode, spectrum Bandwidth was set at 100 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another truce
3. Measure the channel separation.

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

\* The testing was performed by Felix Li on 2011-06-28

**Test Result:** Compliance.

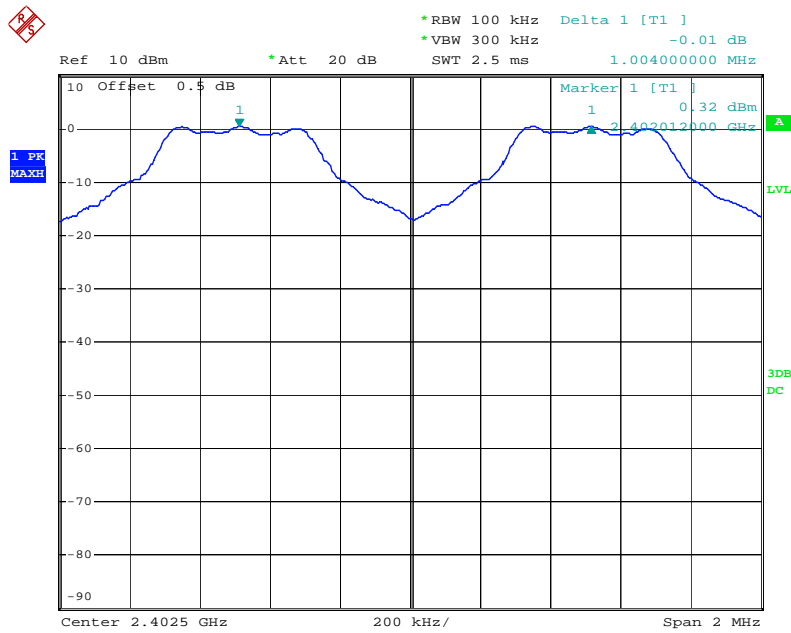
Please refer to following tables and plots

Test Mode: Transmitting (BDR)

Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.004	0.557	Pass
Adjacent	2403			
Middle	2441	1.008	0.552	Pass
Adjacent	2442			
High	2480	1.008	0.547	Pass
Adjacent	2479			

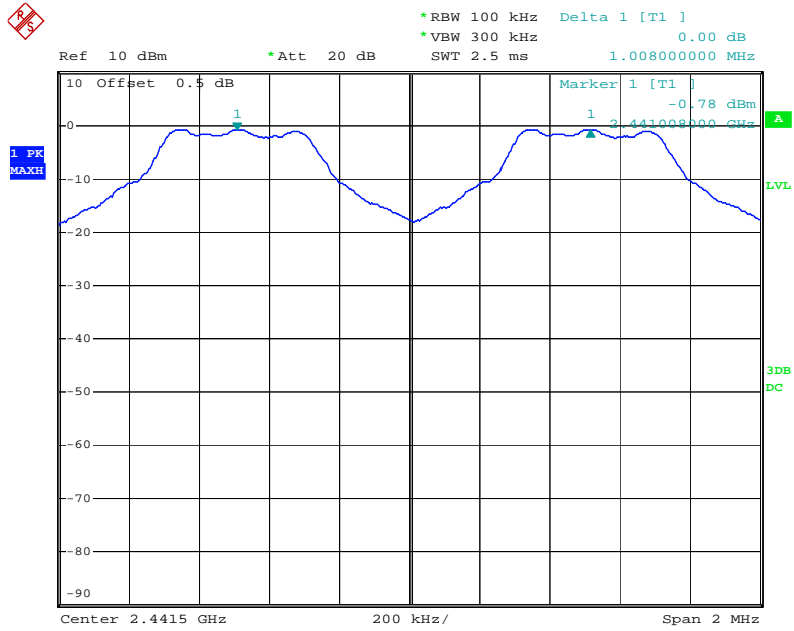
Please refer to the following plots.

Low Channel



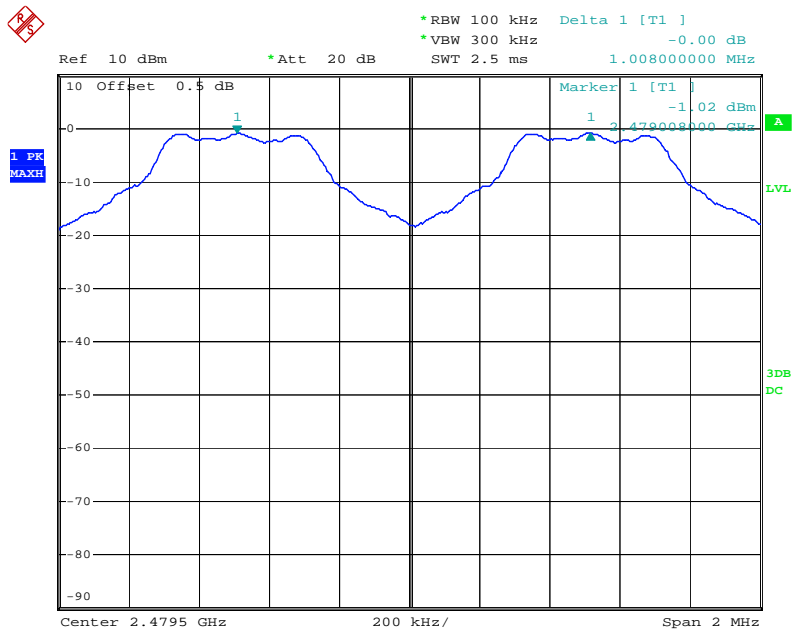
Date: 21.JUN.2011 17:50:25

### Middle Channel



Date: 21.JUN.2011 17:51:59

### High Channel



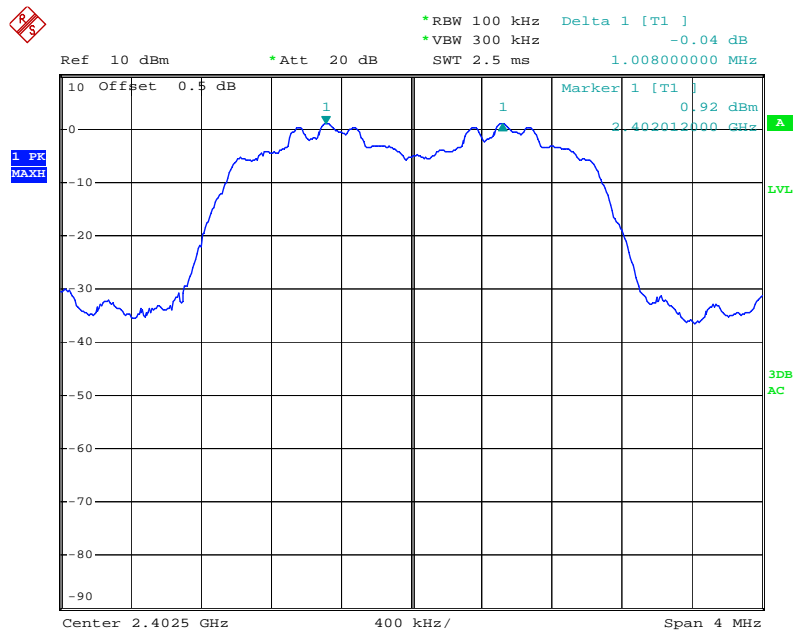
Date: 21.JUN.2011 17:52:59

Test Mode: Transmitting (EDR)

Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.008	0.808	Pass
Adjacent	2403			
Middle	2441	1.008	0.811	Pass
Adjacent	2442			
High	2480	1.008	0.811	Pass
Adjacent	2479			

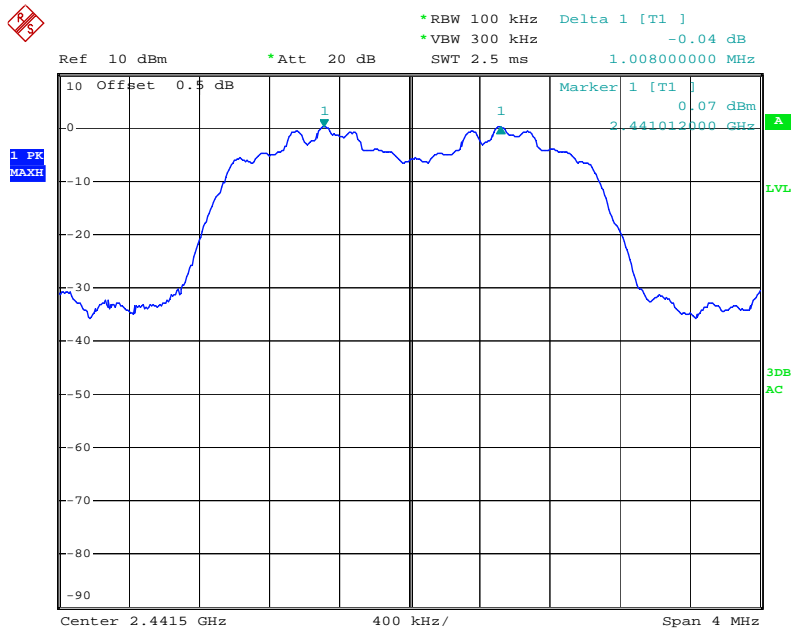
Please refer to the following plots.

Low Channel



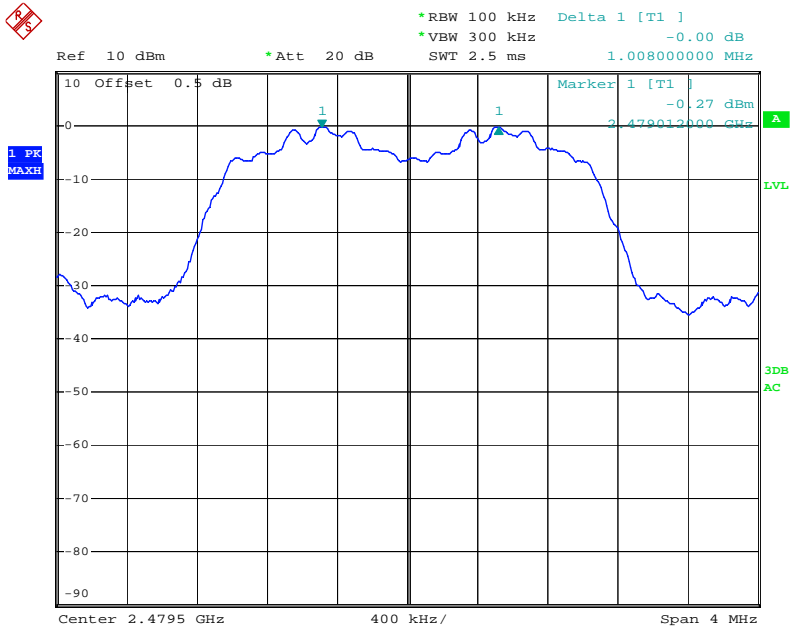
Date: 21.JUN.2011 18:26:30

### Middle Channel



Date: 21.JUN.2011 18:27:50

### High Channel



Date: 21.JUN.2011 18:28:57

## 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 125 mW.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10

\* **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:	100.0kPa

\* *The testing was performed by Felix Li on 2011-06-21.*

**Test Result:** Compliance.

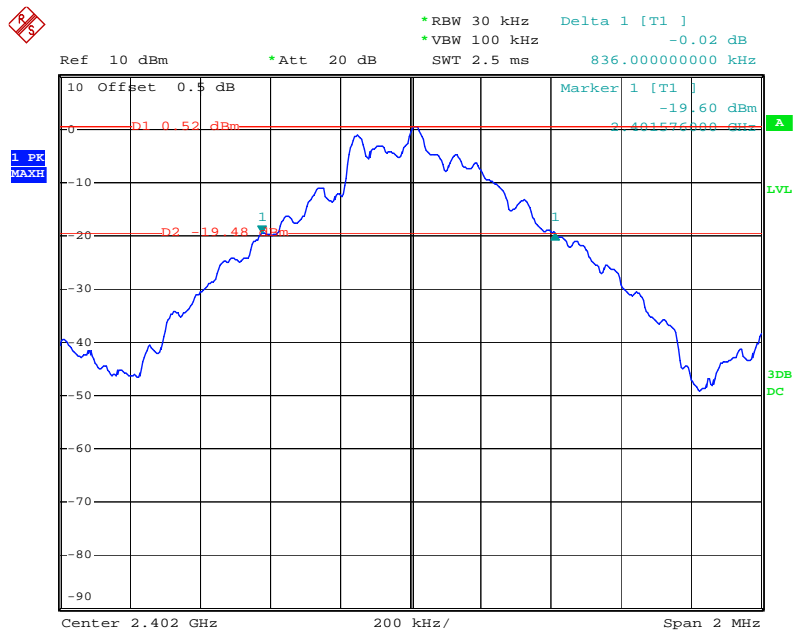
Please refer to following tables and plots

Test Mode: Transmitting (BDR mode)

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	0.836
Middle	2441	0.828
High	2480	0.820

Please refer to the following plots.

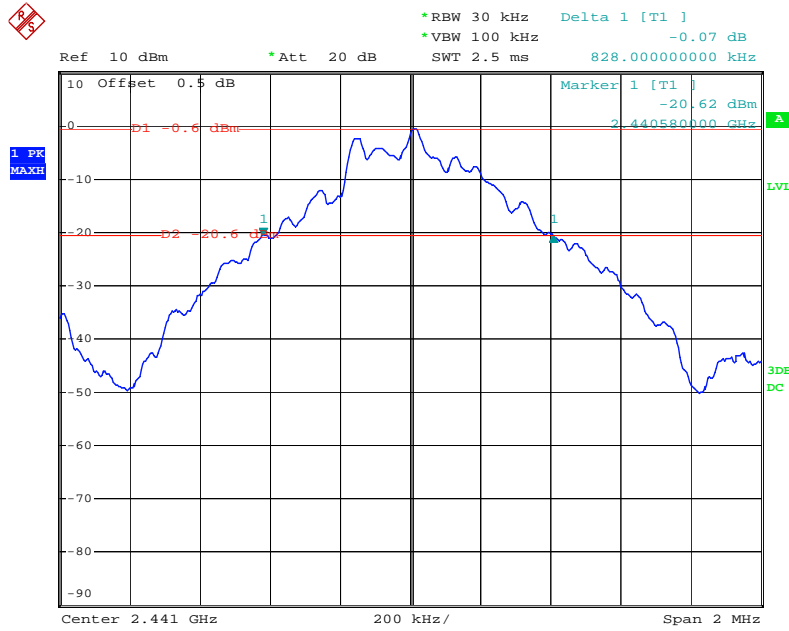
Low Channel



Date: 21.JUN.2011 17:40:50

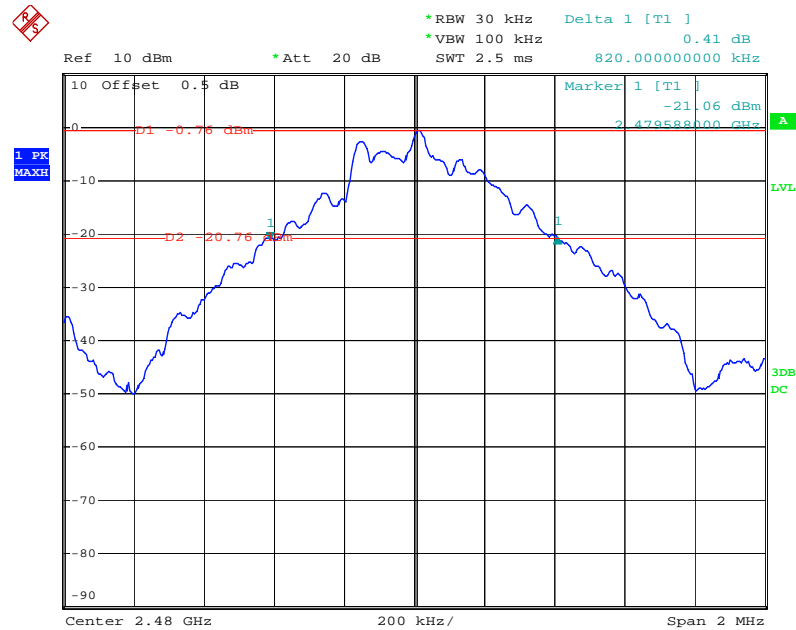


### Middle Channel



Date: 21.JUN.2011 17:42:14

### High Channel



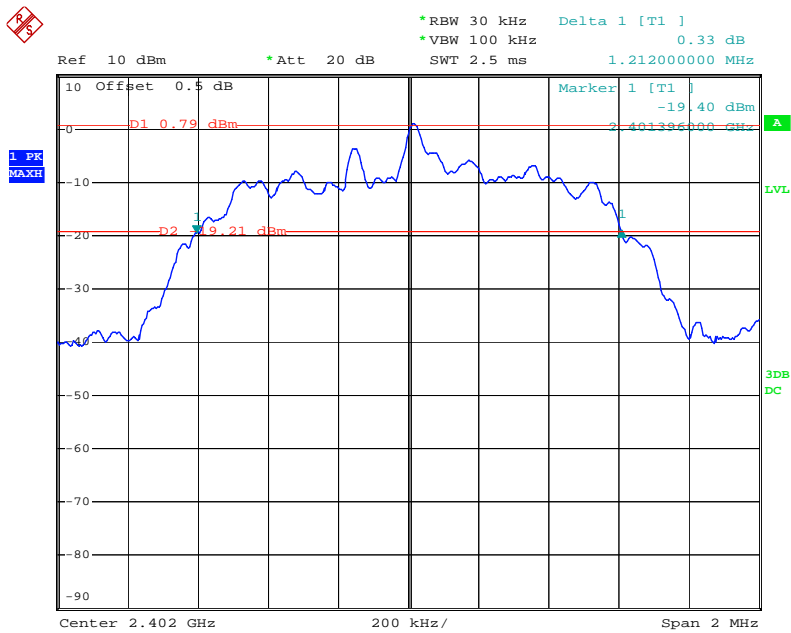
Date: 21.JUN.2011 17:43:43

Test Mode: Transmitting (EDR mode)

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.212
Middle	2441	1.216
High	2480	1.216

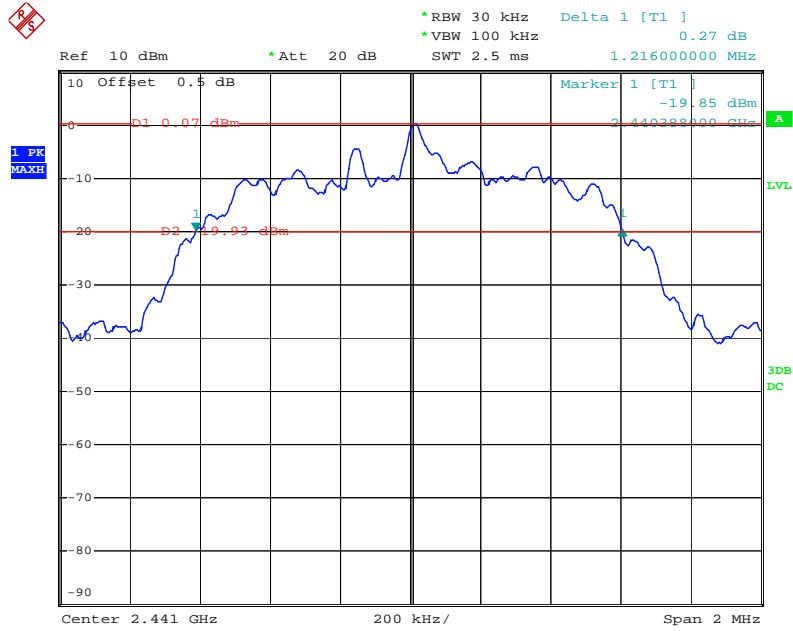
Please refer to the following plots.

Low Channel



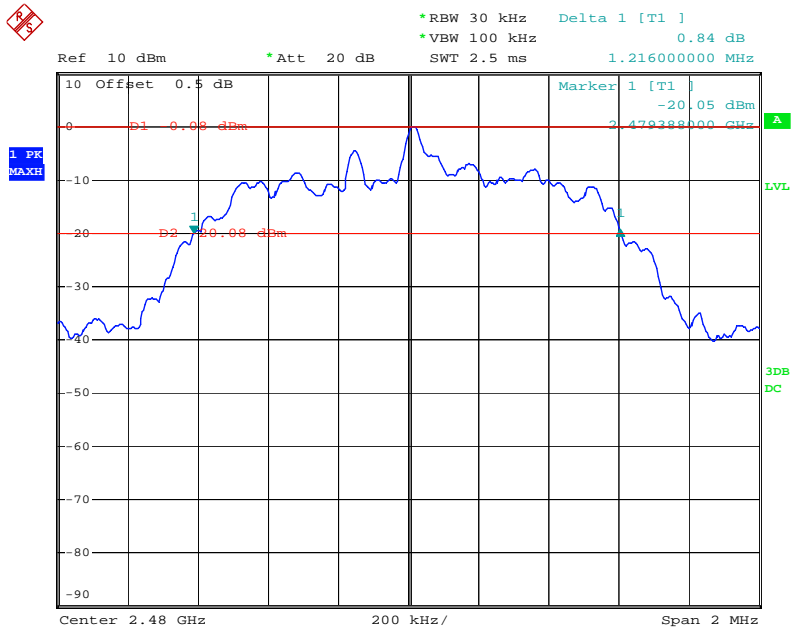
Date: 21.JUN.2011 18:18:00

### Middle Channel



Date: 21.JUN.2011 18:15:48

### High Channel



Date: 21.JUN.2011 18:14:28

## **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	2010-11-11	2011-11-10

\* **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>	100.0kPa

*The testing was performed by Felix Li on 2011-06-21.*

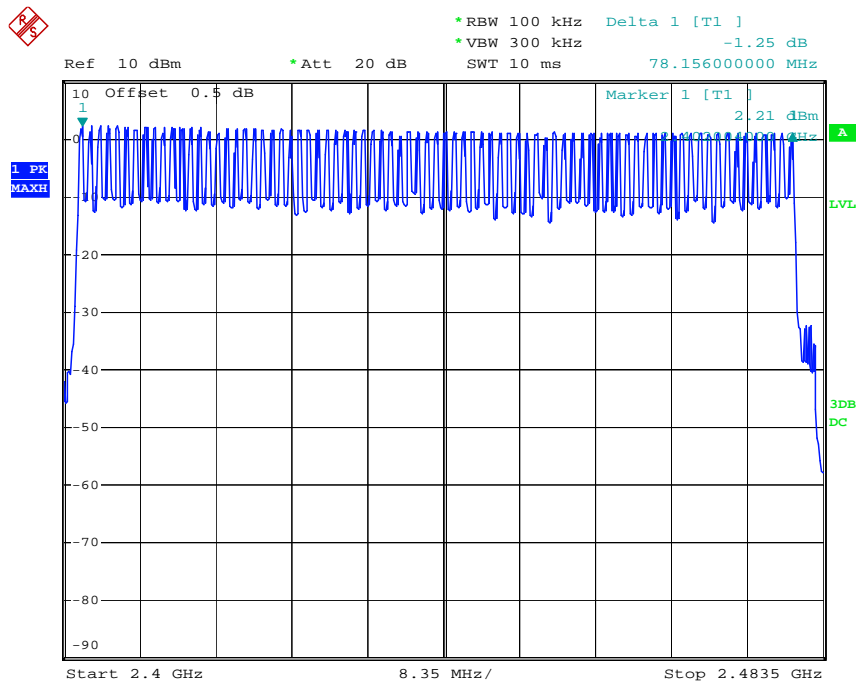
**Test Result:** Compliance.

Please refer to following tables and plots

Test Mode: Transmitting (BDR mode)

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	79	≥ 15

### Number of Hopping Channels

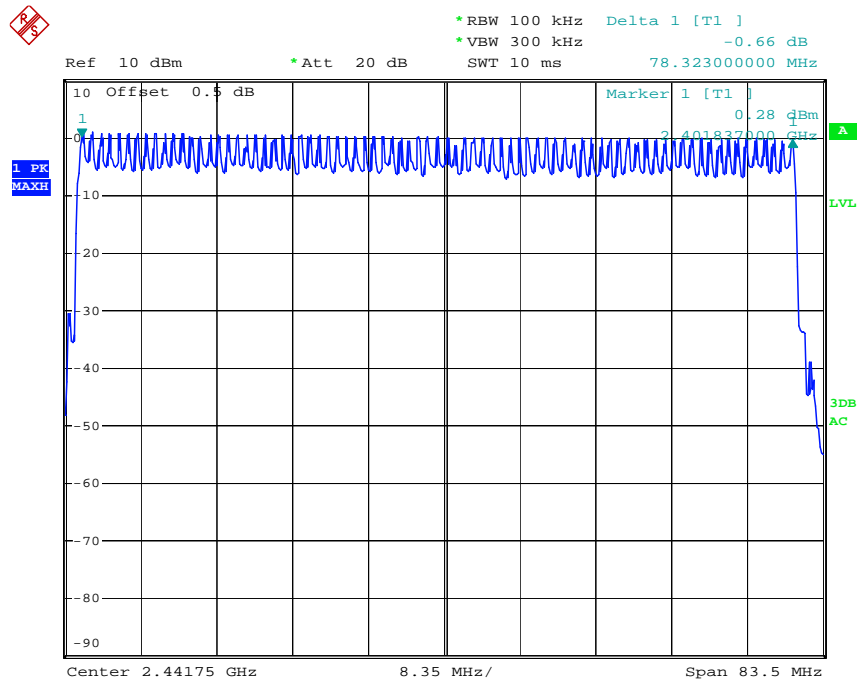


Date: 21.JUN.2011 17:35:39

Test Mode: Transmitting (EDR mode)

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	79	≥ 15

### Number of Hopping Channels



Date: 21.JUN.2011 18:33:02

## **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	2010-11-11	2011-11-10

\* **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 \* 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 \* 31.6s

Hop rate=1600/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 Felix Li on 2011-06-21.*

**Test Result:** Compliance.

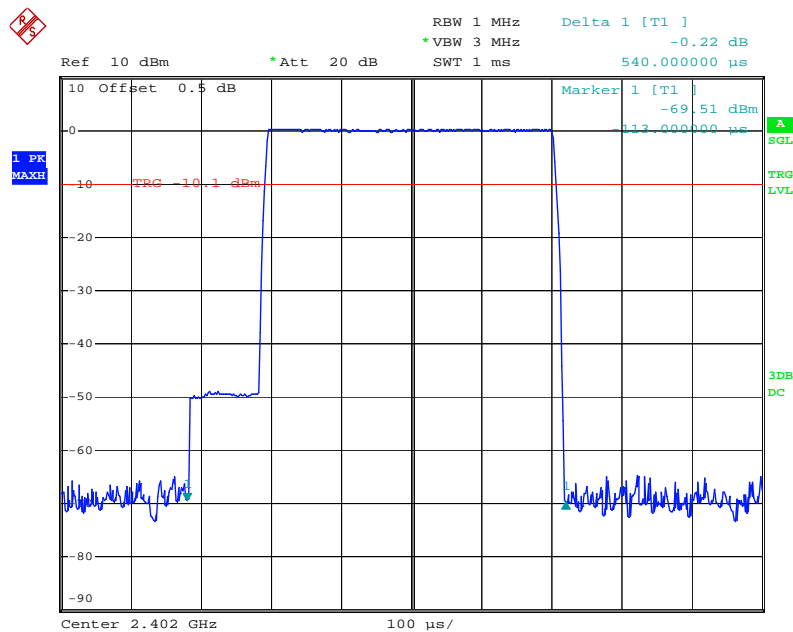
Please refer to following tables and plots

Test Mode: Transmitting (BDR mode)

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.540	0.1728	0.4	Pass
	Middle	0.542	0.1734	0.4	Pass
	High	0.540	0.1728	0.4	Pass
Note: DH1, Dwell time = Pulse time*(1600/2/79)*31.6s					
DH 3	Low	1.824	0.2918	0.4	Pass
	Middle	1.818	0.2908	0.4	Pass
	High	1.824	0.2918	0.4	Pass
Note: DH3, Dwell time = Pulse time*(1600/4/79)*31.6s					
DH 5	Low	2.28	0.2432	0.4	Pass
	Middle	2.27	0.2421	0.4	Pass
	High	2.26	0.2410	0.4	Pass
Note: DH5, Dwell time = Pulse time*(1600/6/79)*31.6s					

Please refer to the following plots.

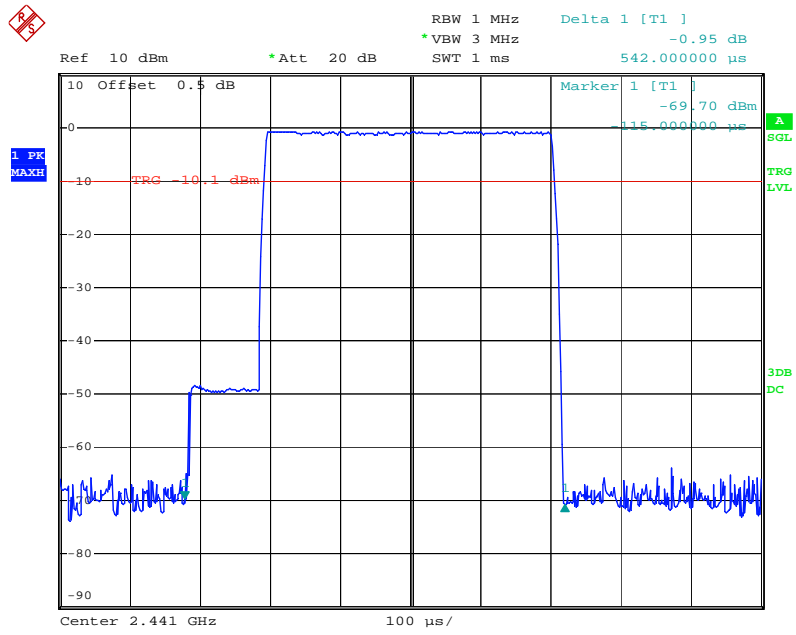
Low Channel for DH1



Date: 21.JUN.2011 17:58:32

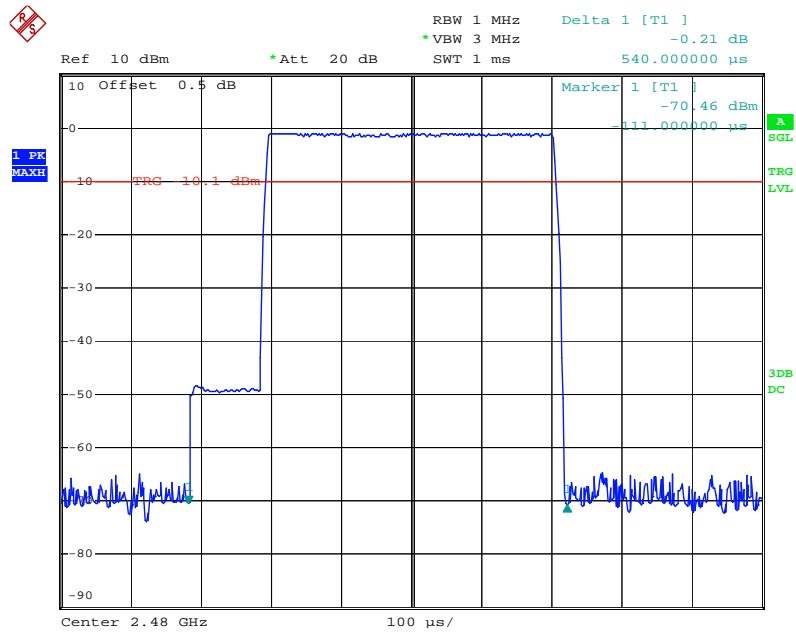


### Middle Channel for DH1



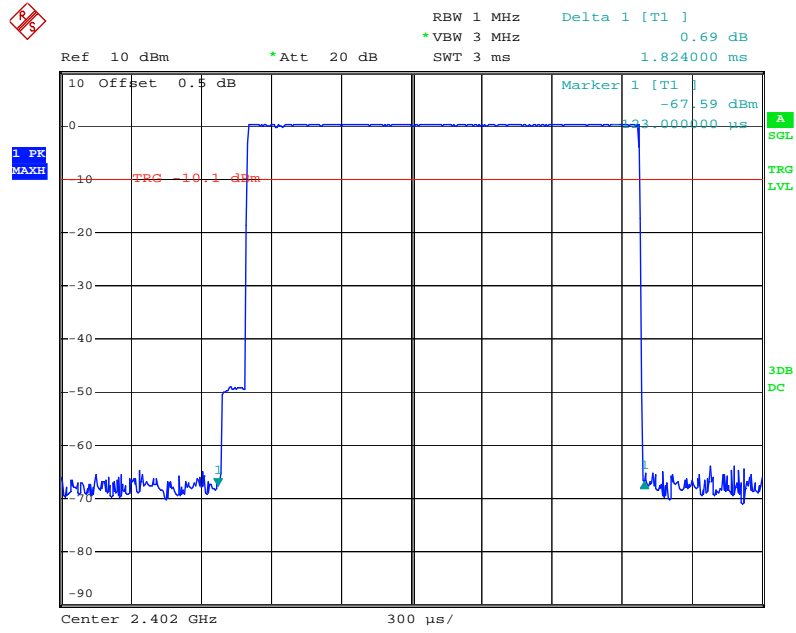
Date: 21.JUN.2011 17:57:24

### High Channel for DH1



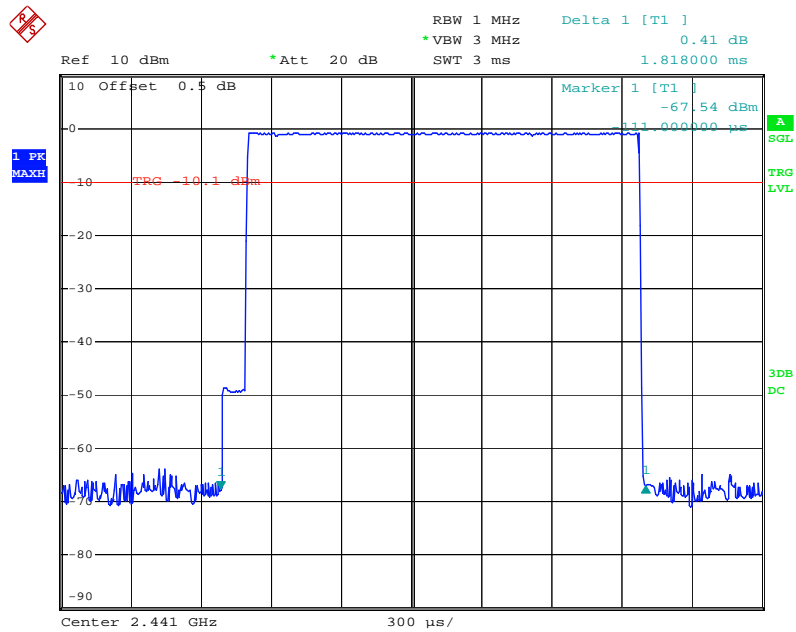
Date: 21.JUN.2011 17:55:55

### Low Channel for DH3



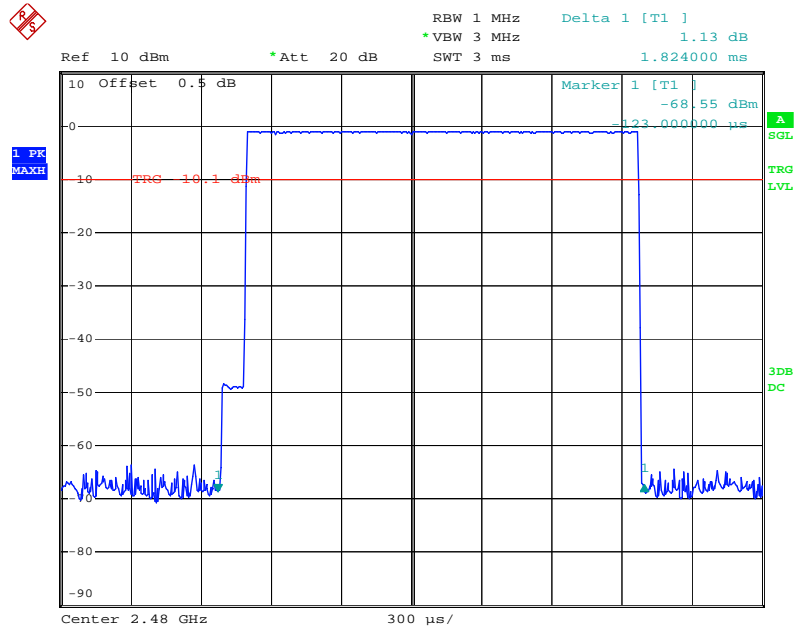
Date: 21.JUN.2011 17:59:58

### Middle Channel for DH3



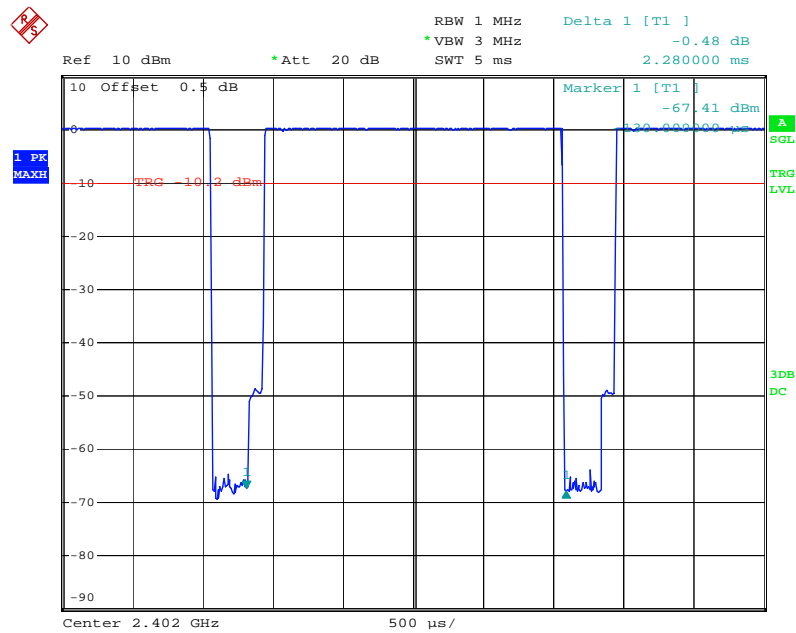
Date: 21.JUN.2011 18:00:53

### High Channel for DH3



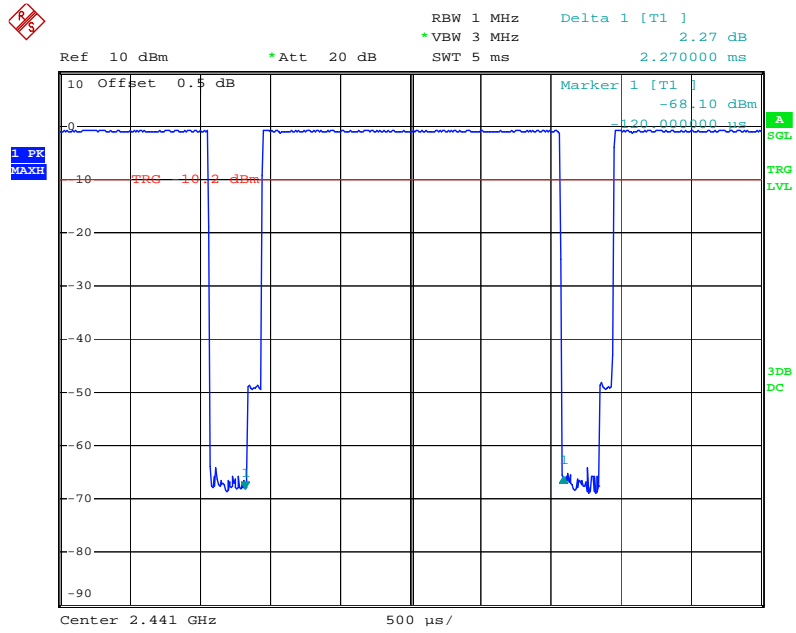
Date: 21.JUN.2011 18:01:48

### Low Channel for DH5



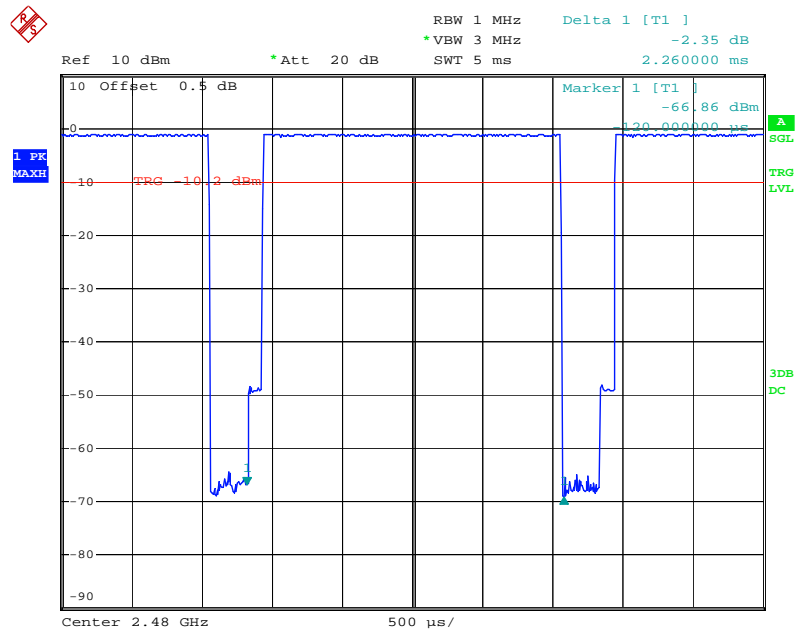
Date: 21.JUN.2011 18:06:52

### Middle Channel for DH5



Date: 21.JUN.2011 18:06:05

### High Channel for DH5



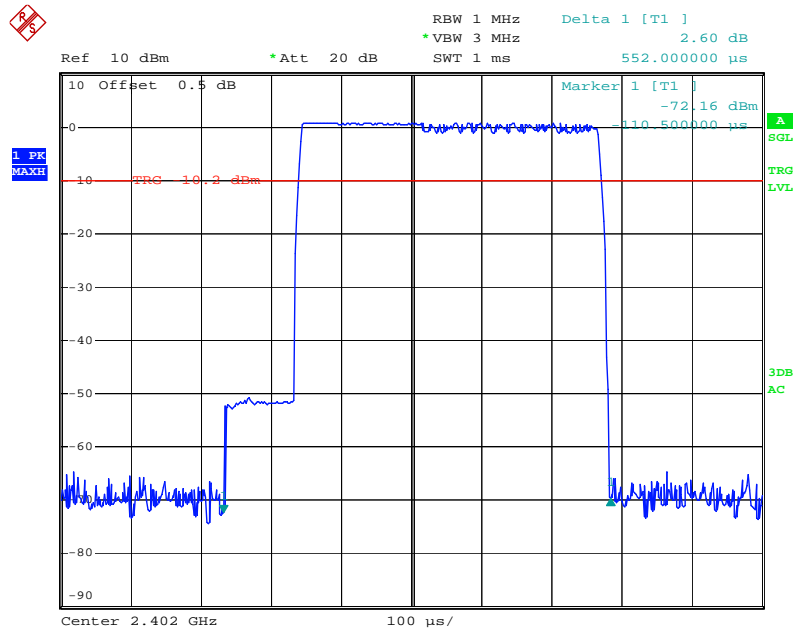
Date: 21.JUN.2011 18:04:58

Test Mode: Transmitting (EDR mode)

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.552	0.1766	0.4	Pass
	Middle	0.554	0.1772	0.4	Pass
	High	0.556	0.1779	0.4	Pass
Note: DH1, Dwell time = Pulse time*(1600/2/79)*31.6s					
DH 3	Low	1.818	0.2908	0.4	Pass
	Middle	1.824	0.2918	0.4	Pass
	High	1.824	0.2918	0.4	Pass
Note: DH3, Dwell time = Pulse time*(1600/4/79)*31.6s					
DH 5	Low	3.07	0.3275	0.4	Pass
	Middle	3.08	0.3285	0.4	Pass
	High	3.08	0.3285	0.4	Pass
Note: DH5, Dwell time = Pulse time*(1600/6/79)*31.6s					

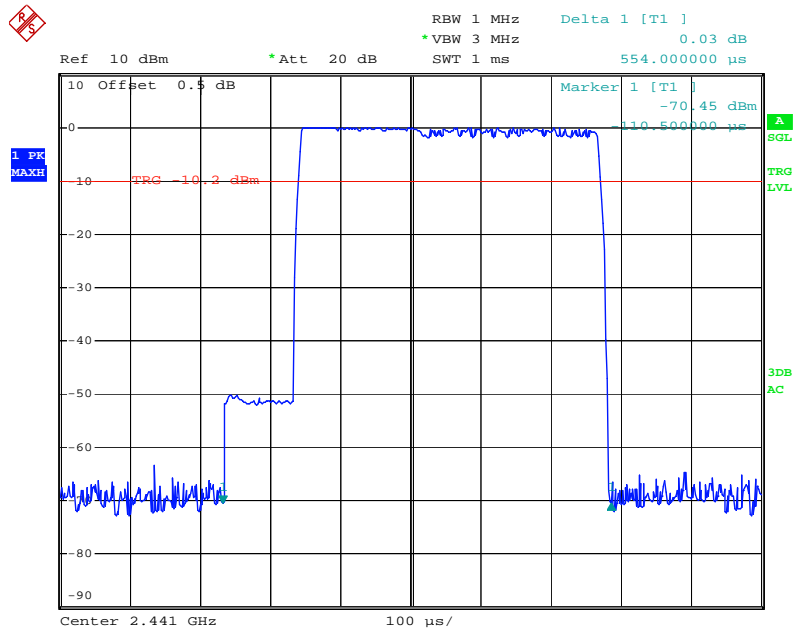
Please refer to the following plots.

Low Channel for DH1



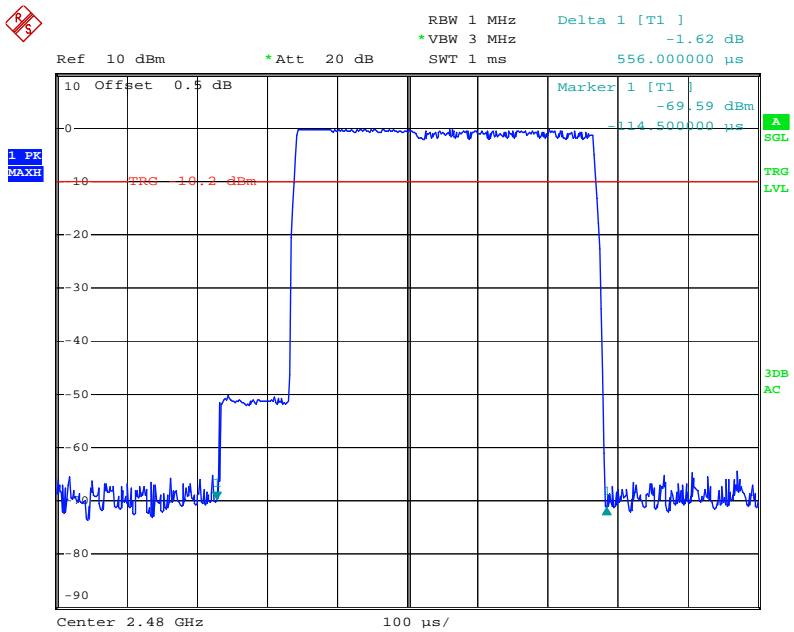
Date: 21.JUN.2011 18:39:10

### Middle Channel for DH1



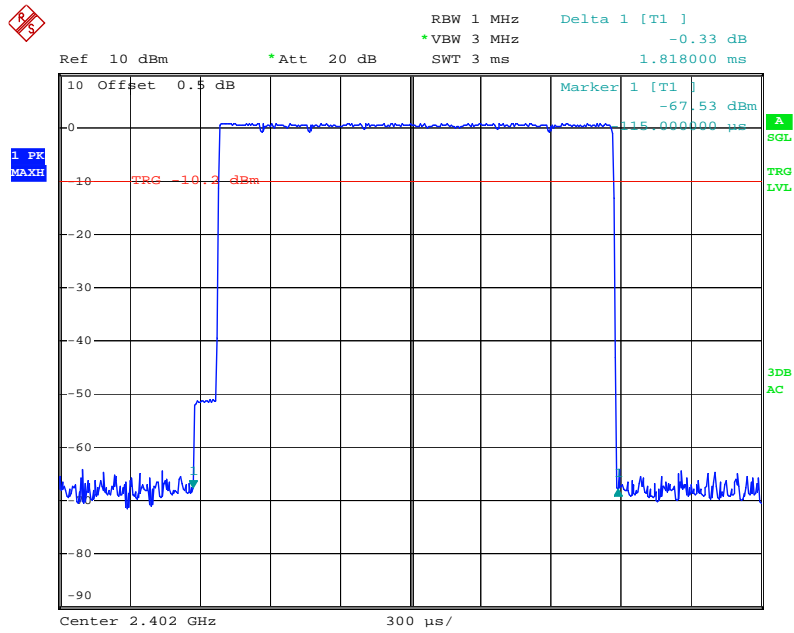
Date: 21.JUN.2011 18:37:46

### High Channel for DH1



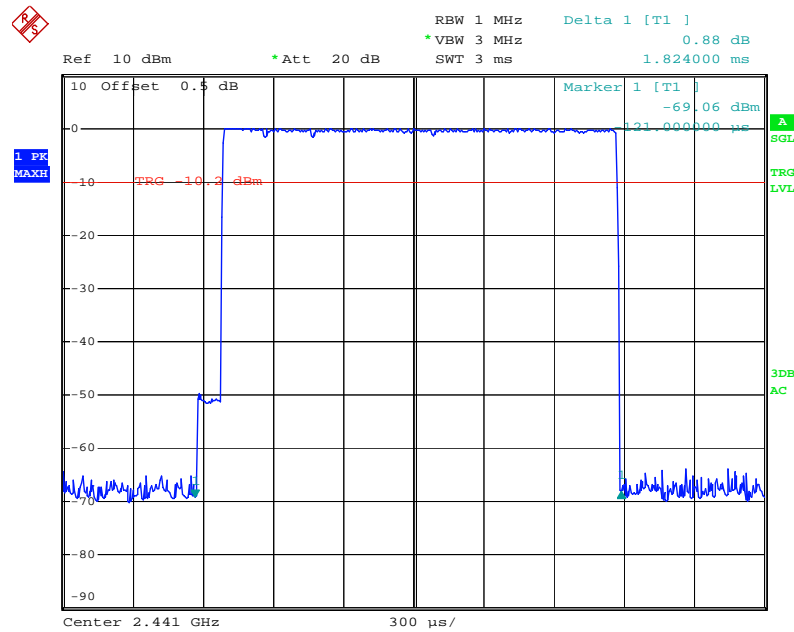
Date: 21.JUN.2011 18:40:10

### Low Channel for DH3



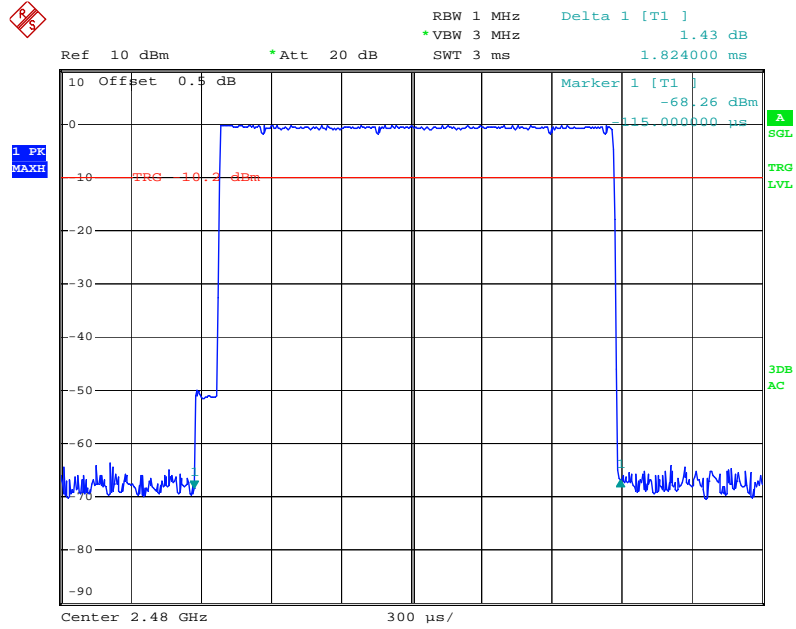
Date: 21.JUN.2011 18:43:08

### Middle Channel for DH3



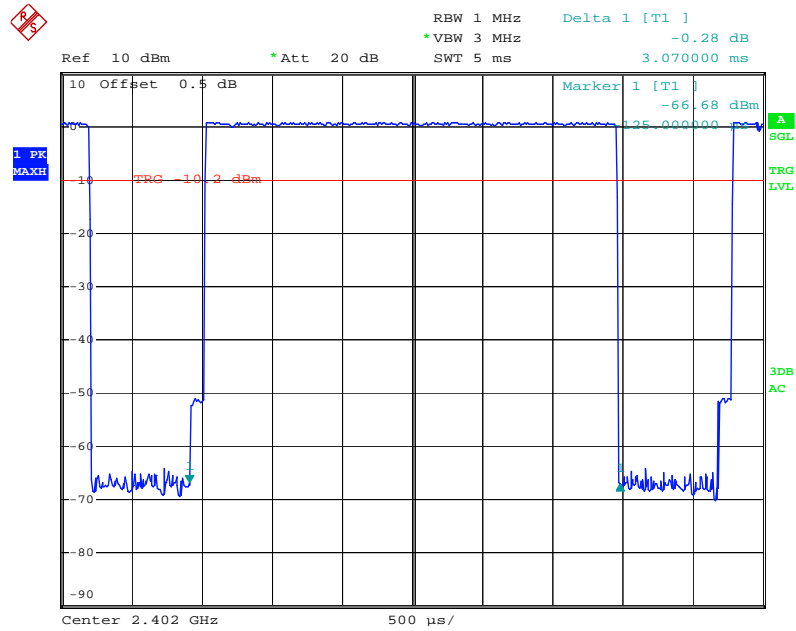
Date: 21.JUN.2011 18:42:29

### High Channel for DH3



Date: 21.JUN.2011 18:41:39

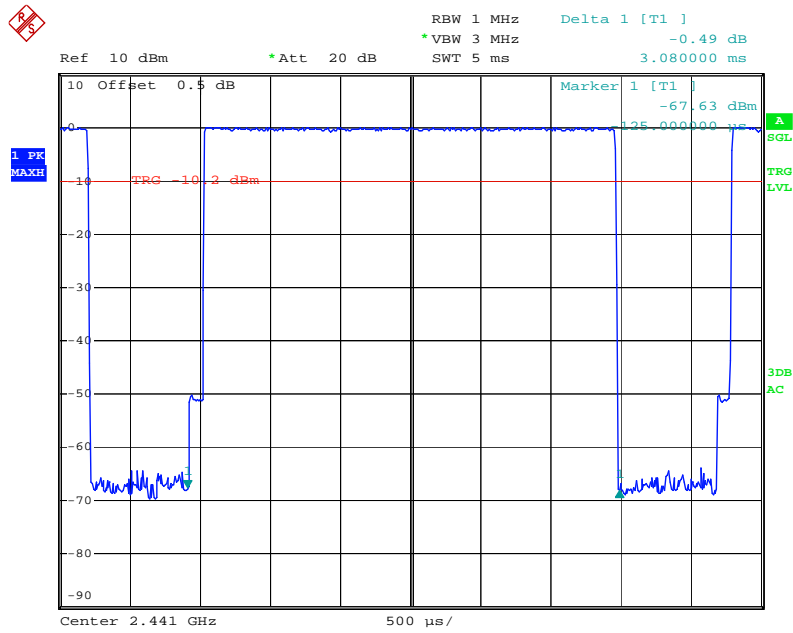
### Low Channel for DH5



Date: 21.JUN.2011 18:45:25

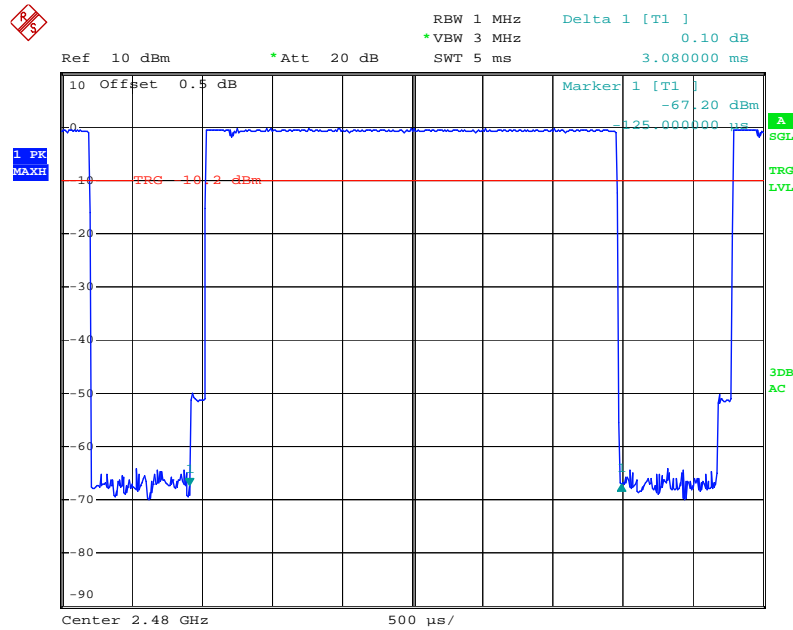


### Middle Channel for DH5



Date: 21.JUN.2011 18:46:50

### High Channel for DH5



Date: 21.JUN.2011 18:48:16

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

### Applicable Standard

According to §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.

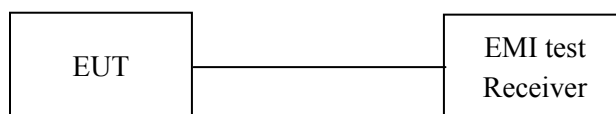
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10

\* **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 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:	100.0kPa

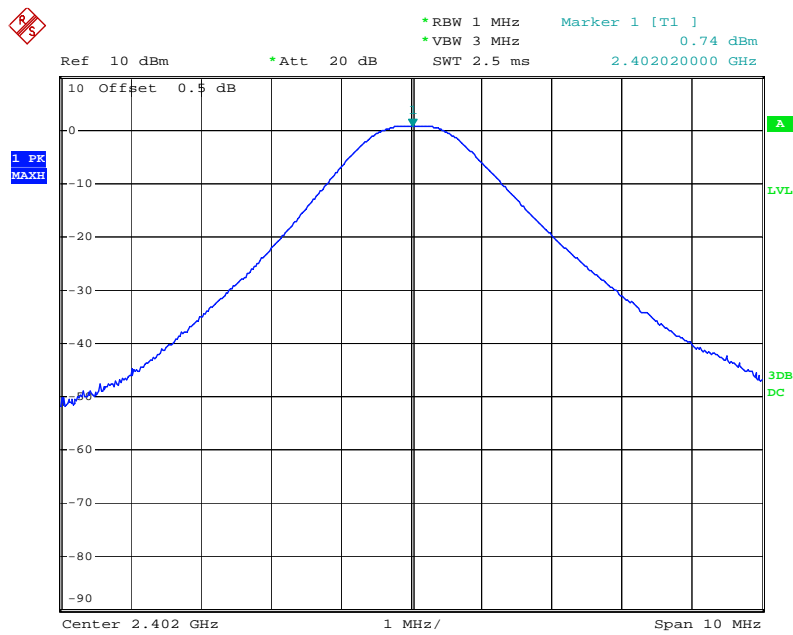
\* The testing was performed by Felix Li on 2011-06-21 and 2011-08-09.

**Test Result:** Compliance.

Test Mode: Transmitting (BDR mode)

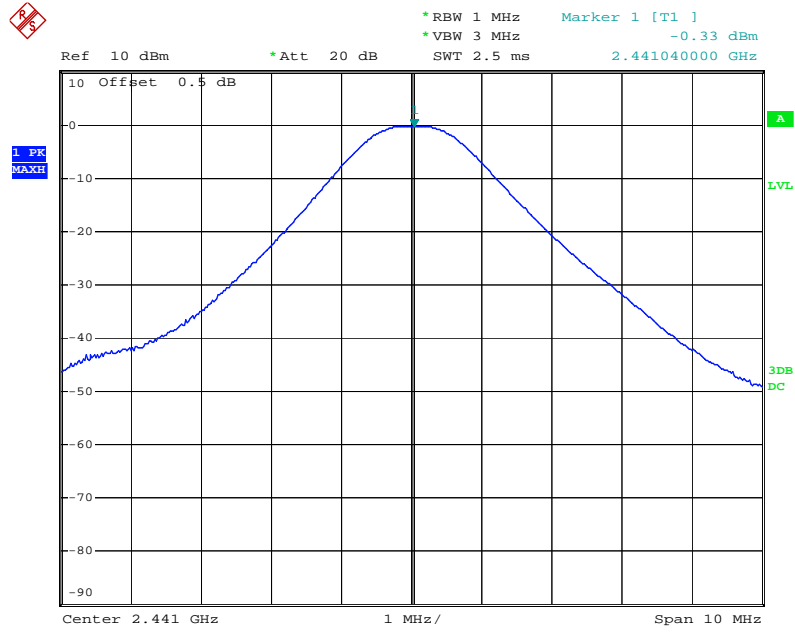
Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)
		(dBm)	(mw)	
Low	2402	0.74	1.186	21
Middle	2441	-0.33	0.927	21
High	2480	-0.58	0.875	21

Low Channel



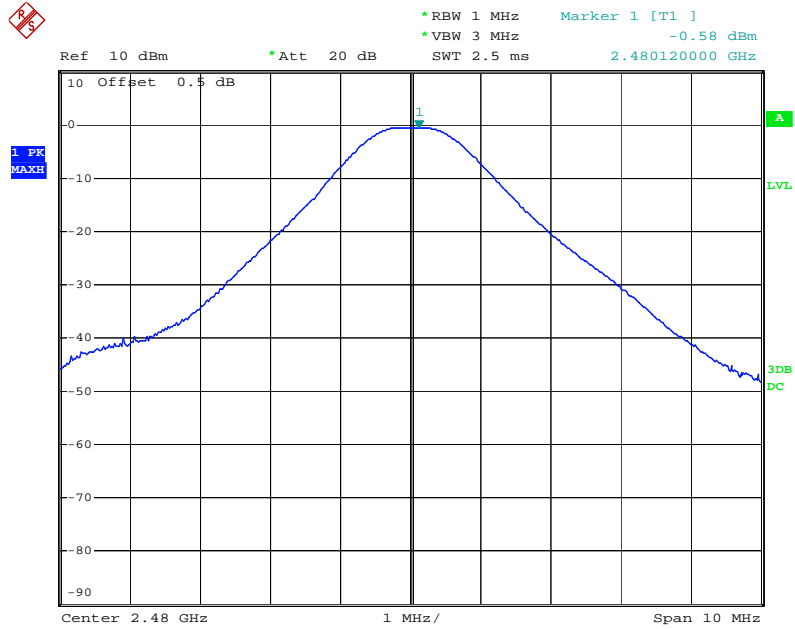
Date: 21.JUN.2011 17:30:50

### Middle Channel



Date: 21.JUN.2011 17:30:05

### High Chanel

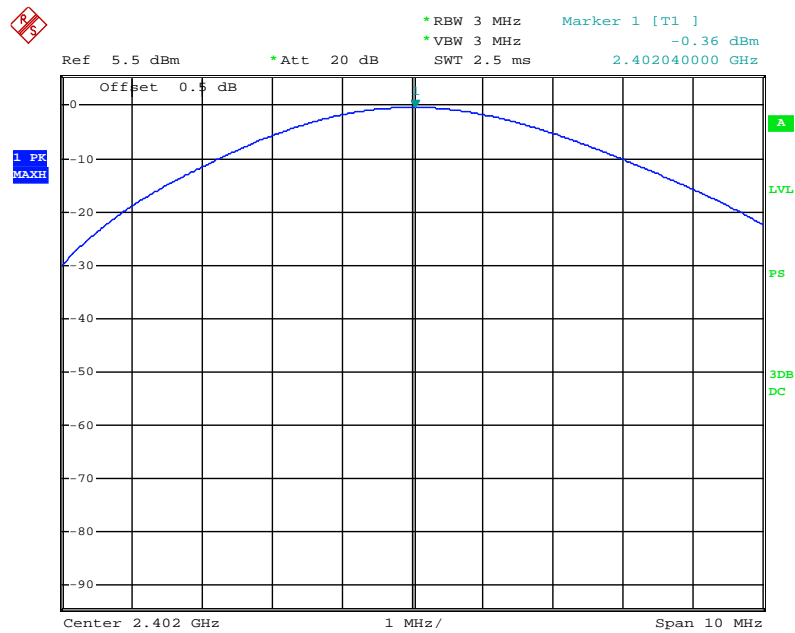


Date: 21.JUN.2011 17:31:48

Test Mode: Transmitting (EDR mode)

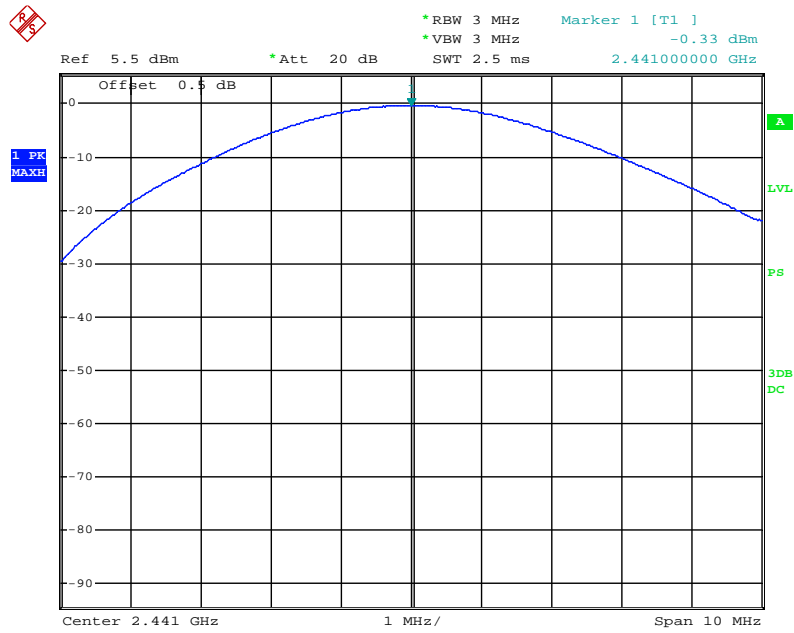
Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)
		(dBm)	(mw)	
Low	2402	-0.36	0.920	21
Middle	2441	-0.33	0.927	21
High	2480	-0.14	0.968	21

Low Channel



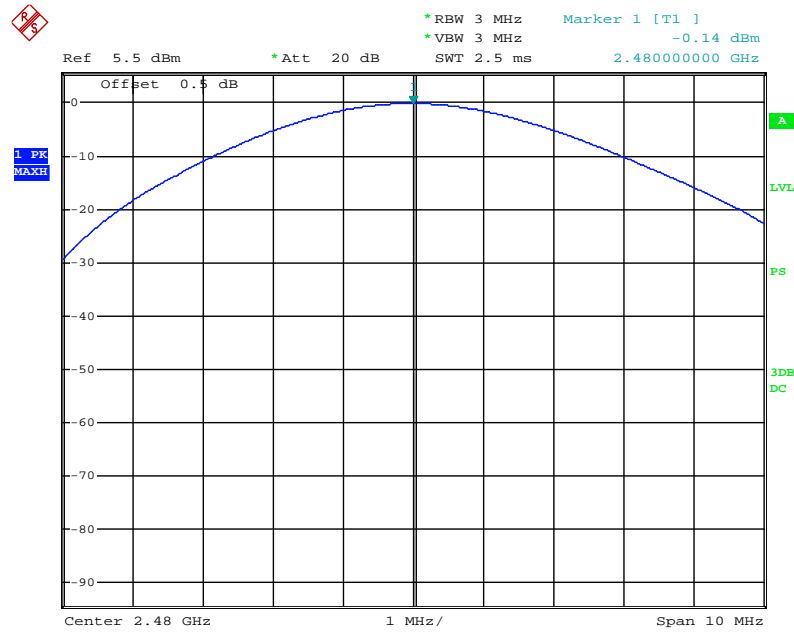
Date: 9.AUG.2011 16:36:37

### Middle Channel



Date: 9.AUG.2011 16:37:19

### High Channel



Date: 9.AUG.2011 16:38:37

## 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	2010-11-11	2011-11-10

\* **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. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting 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 100 kHz bandwidth from band edge.
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>	100.0 kPa

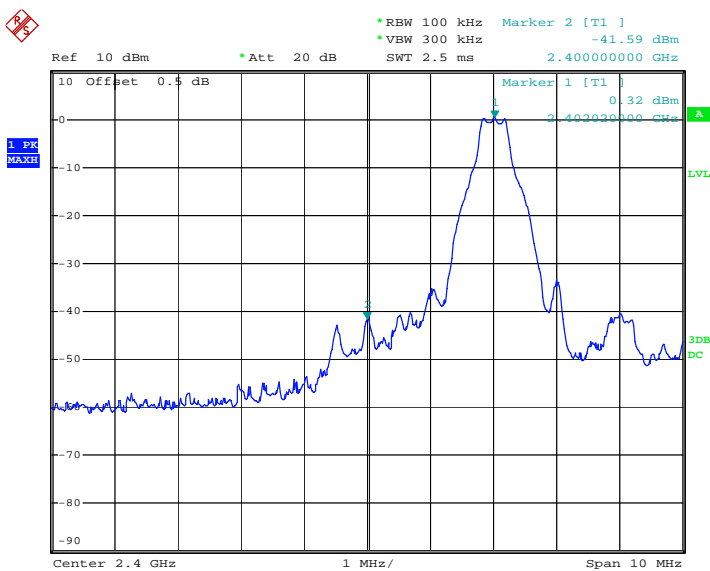
\*The testing was performed by Felix Li on 2011-06-21.

**Test Result:** Compliance, please refer to the following tables and plots.

Test Mode: Transmitting (BDR mode)

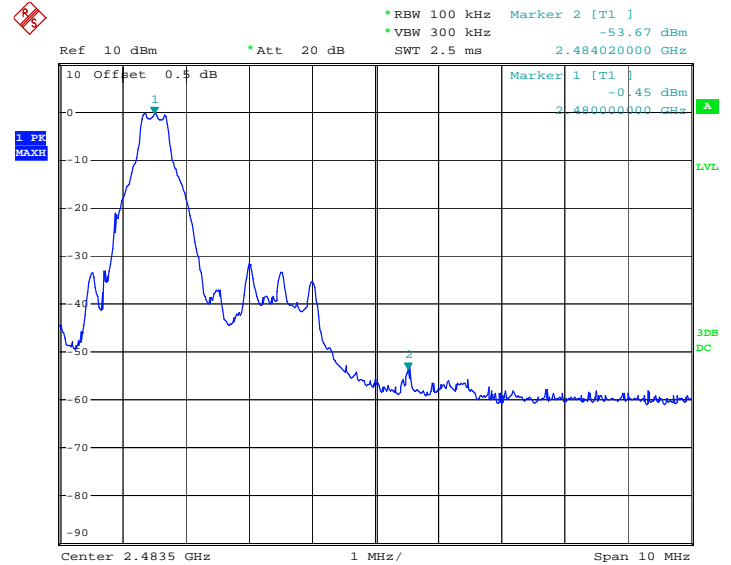
Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2400.00	41.59	20
2484.02	53.67	20

**Band Edge: Left Side**



Date: 21.JUN.2011 17:47:47

**Band Edge: Right Side**



Date: 21.JUN.2011 17:46:28

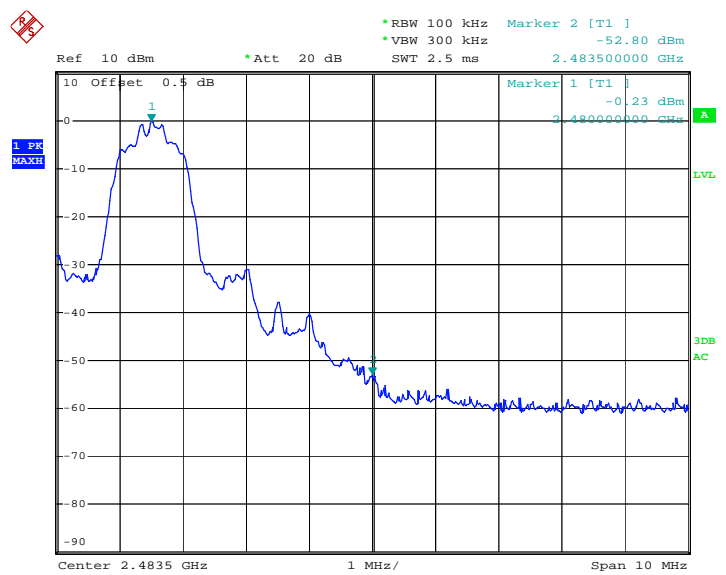
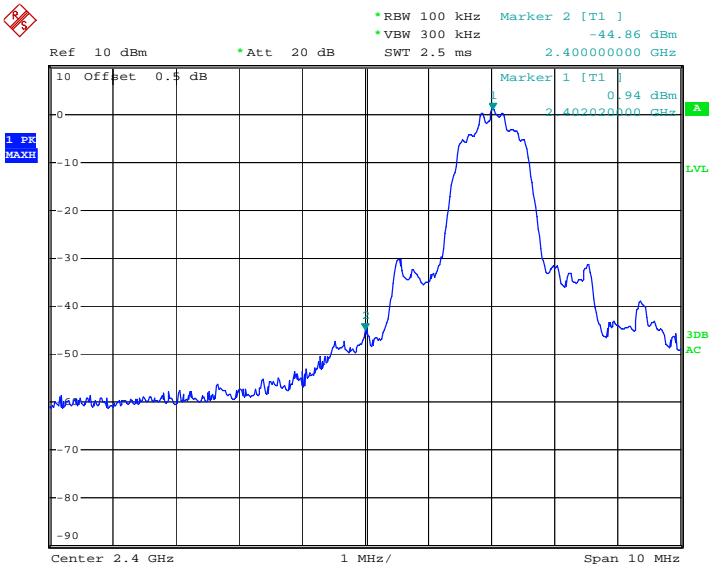


Test Mode: Transmitting (EDR mode)

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2400.00	44.86	20
2484.02	52.80	20

Band Edge: Left Side

Band Edge: Right Side



Date: 21.JUN.2011 18:24:01

Date: 21.JUN.2011 18:24:56

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## PRODUCT SIMILARITY DECLARATION LETTER

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1743 Quincy Avenue, Suite 155  
Naperville, IL 60540  
800-965-9043—Voice  
888-814-5359—TTY  
info@clearsounds.com  
www.clearsounds.com

To: Bay Area Compliance Laboratories Corp

### Declaration of Similarity

To whom it may concern,

We,

**ClearSounds Communications, Inc.**

Address: 1743 Quincy Avenue #155 Naperville, IL 60540 U.S.A

Hereby declare that

Product Name: **Bluetooth Amplified Neckloop**

Model No. **Quattro**

belong to **ClearSounds Communications, Inc.** with the trade name is **ClearSounds; HITEC**, it is exactly same with the telephone model no. XL-9037BT, and belong to Xingtet. These two models are electrically and mechanically identical, the only difference between them is the model name and trade name!

Regards,  
**ClearSounds Communications, Inc.**

(signature)

Michele Ahlman

President

June 16, 2011

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