Lab Code: 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

PageFlip, Inc.

111 Woodmere Blvd South,

Woodmere, NY 11598, USA

FCC ID: XKEPFCICADA01

Report Type:	Product Type:
Original Report	Bluetooth Page Flip

Test Engineer:	Tim Zhang
Report Number:	RSZ10110805
Report Date:	2010-12-17
Reviewed By:	Merry Zhao EMC Engineer
Prepared By:	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

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *PageFlip, Inc.'s* product, model number: *PFCICADA-01 (FCC ID: XKEPFCICADA01)* or the "EUT" as referred to in this report is a *PageFlip Cicada,* which measures approximately: 17.1 cm (L) x 11.8 cm (W) x 3.4 cm (H), rated input voltage: DC 5 V adapter or DC 3V(2*1.5V AA) battery

Adapter information:
Model: PRS-C13050050VU;
Input: AC 100-240 V 50/60 Hz 0.4A Max.
Output: DC 5 V 0.5A

All measurement and test data in this report was gathered from production sample serial number: 1011041 (Assigned by BACL, Shenzhen). The EUT was received on 2010-11-08.

Objective

This Type approval report is prepared on behalf of *PageFlip, 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, and section 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.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in 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 a National Institute of Standards and Technology (NIST) accredited laboratory, under the 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 engineering mode which was selected by manufacturer.

Equipment Modifications

No modification was made to the unit tested.

EUT Exercise Software

N/A

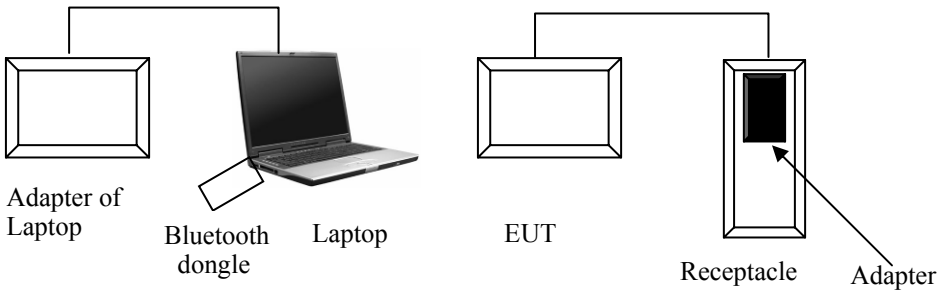
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Laptop	PP01L	59804A00	DOC
Cyber Blue (HK) Limited	Bluetooth Dongle	USB06M	N/A	N/A

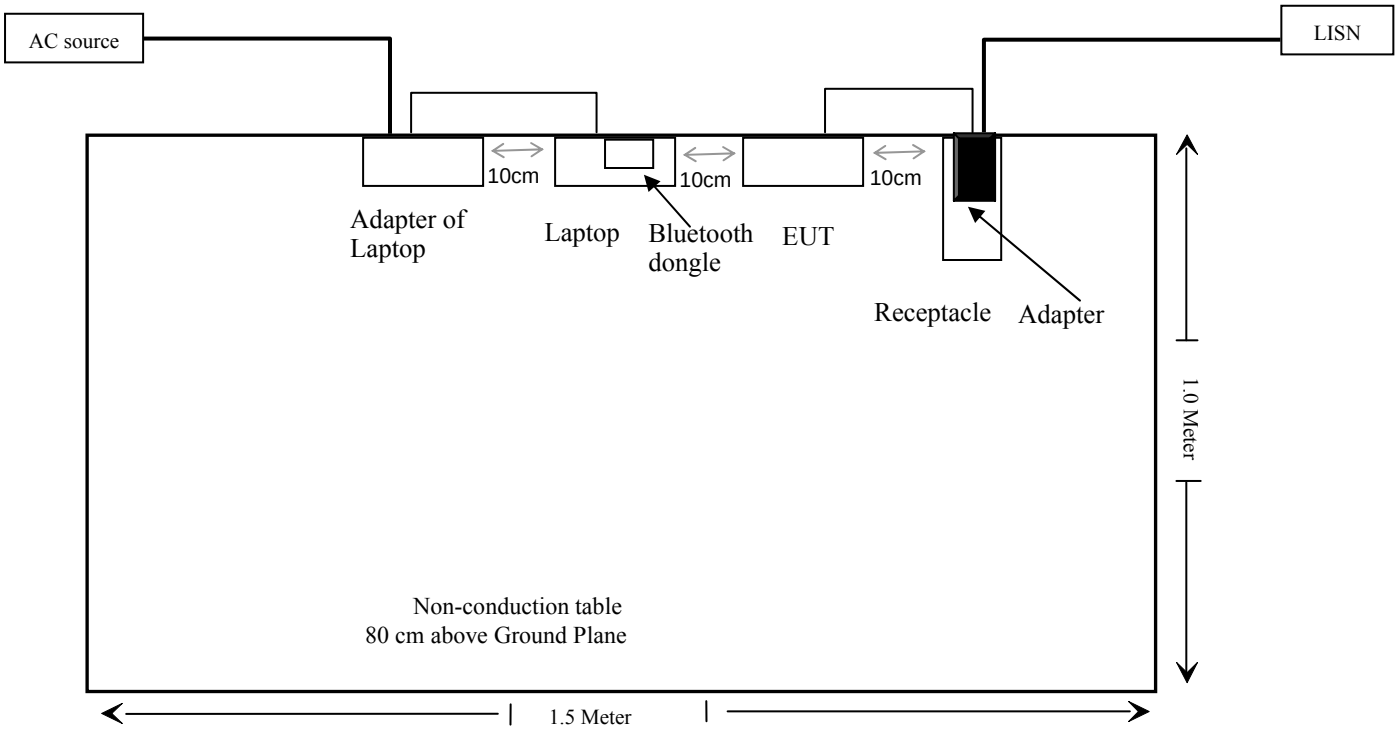
External I/O Cable

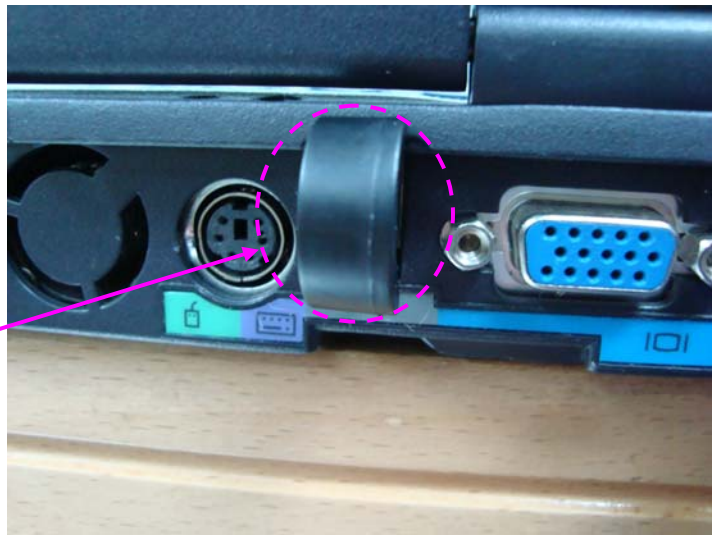
Cable Description	Length (m)	From/Port	To
Unshielded Detachable USB Cable	1.9	Adapter	EUT

Configuration of Test Setup



Block Diagram of Test Setup





SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b)(1), §2.1093	RF Exposure Information	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209 & §15.247(d)	Radiated Spurious 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) & §1.1307 (b) (1) & §2.1093- RF EXPOSURE

Applicable Standard

According to§15.247(e)(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 ≤ 60/f(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 ≤ 60/f(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.

Measurement Result:

Max Peak output power:
2402 MHz: -5.91 dBm + 1.87 dBi= -4.04 dBm= 0.394 mW
$60/f_{GHz}$ = 60/2.402= 24.98 mW
Max Peak output power < $60/f_{GHz}$

So the SAR measurement is not necessary.

FCC §15.203 – ANTENNA REQUIREMENT

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 a PCB antenna on RF board, which in accordance to section 15.203, the maximum gain is 1.87 dBi; please refer to the internal photos.

Result: Compliance.

FCC §15.207(a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

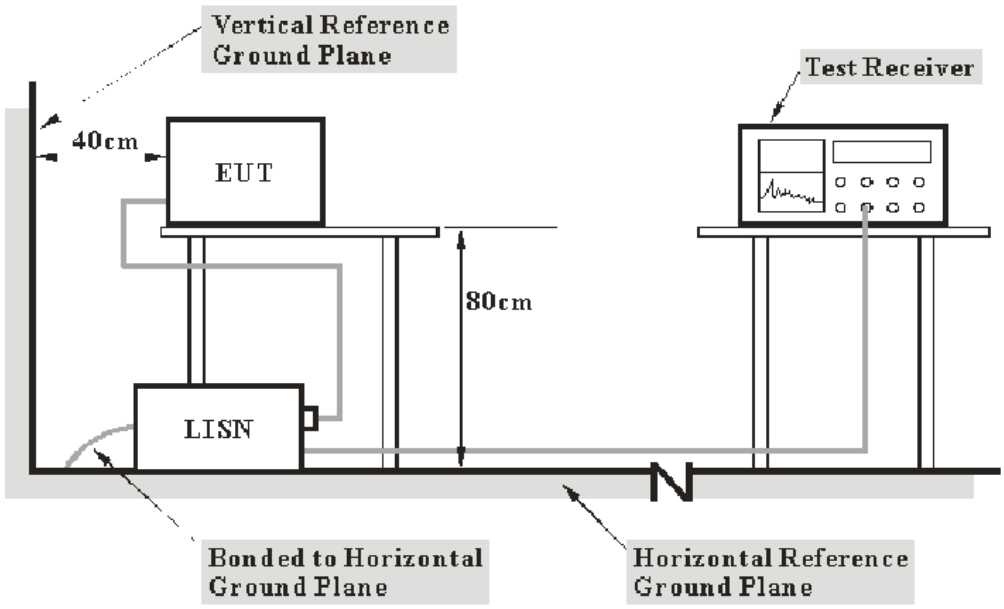
FCC§15.207

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 ±2.4 dB.

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.

The spacing between the peripherals was 10 cm.

The receptacle was connected to a 120 VAC/60 Hz power source.

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:

Frequency Range	***IF B/W***
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	2010-03-03	2011-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2010-03-09	2011-03-08

*** 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 receptacle was connected to the outlet of the first LISN and the adapter of laptop was connected to the outlet of the second 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:

26.65 dB at **1.810 MHz** in the **Neutral** conductor mode

Test Data

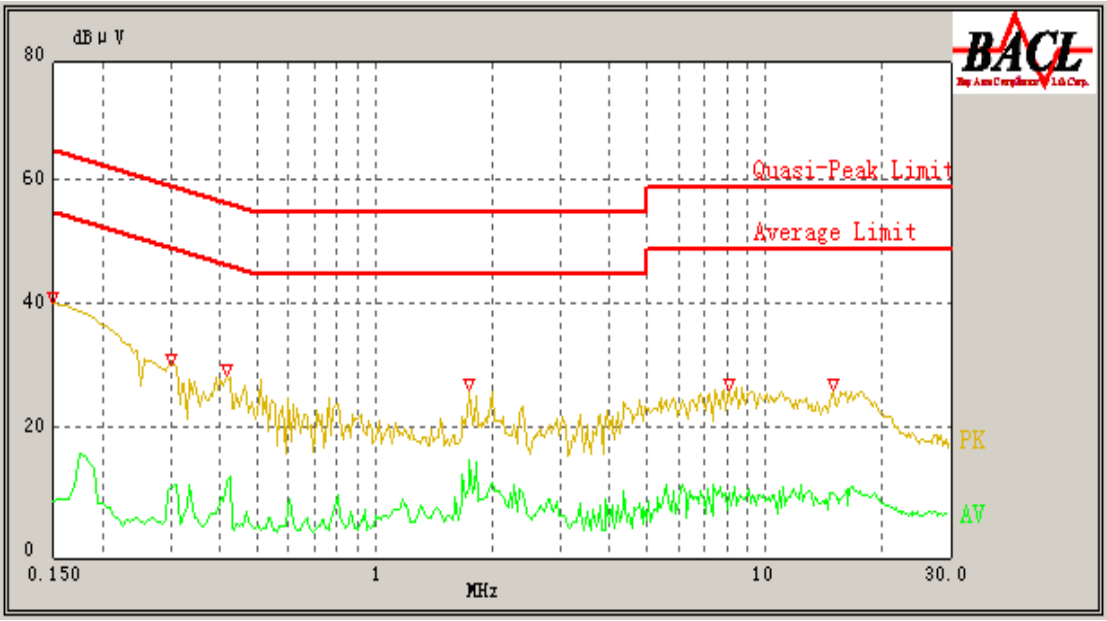
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

The testing was performed by Tim Zhang on 2010-12-11.

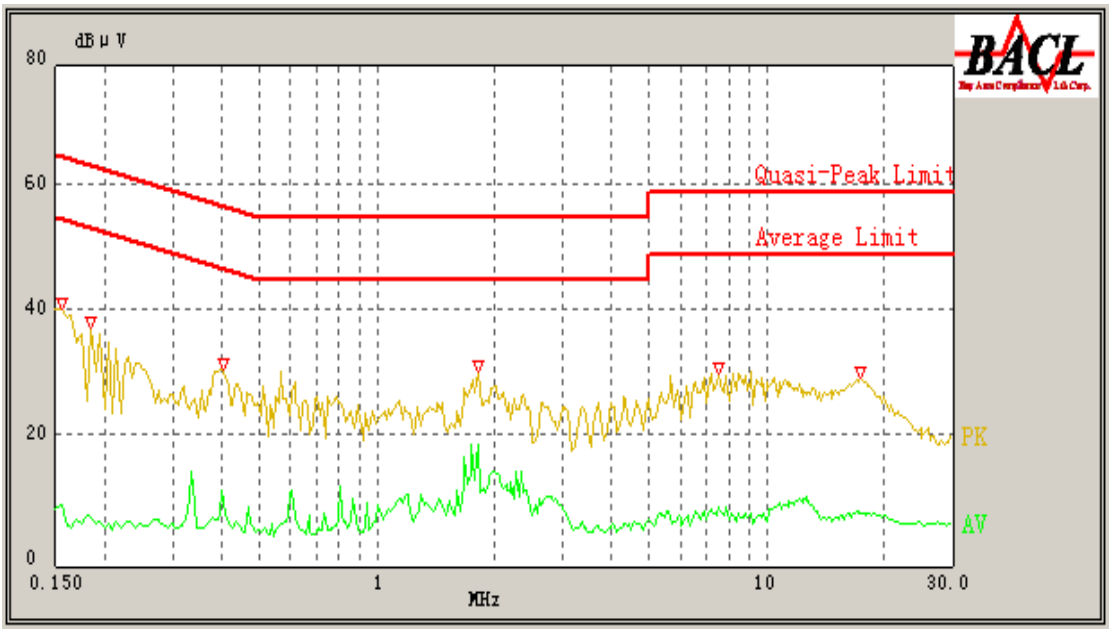
Test Mode: Adapter mode

AC 120 V/60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Detector (PK/QP/Ave)**
1.745	15.91	10.17	46.00	30.09	Ave
1.745	23.39	10.17	56.00	32.61	QP
0.150	30.36	10.10	66.00	35.64	QP
0.415	12.28	10.11	48.43	36.15	Ave
8.085	10.37	10.10	50.00	39.63	Ave
14.965	10.34	10.15	50.00	39.66	Ave
0.300	11.58	10.00	51.71	40.13	Ave
0.415	17.96	10.11	58.43	40.47	QP
0.300	20.66	10.00	61.71	41.05	QP
8.105	17.02	10.10	60.00	42.98	QP
15.035	13.13	10.15	60.00	46.87	QP
0.150	9.12	10.10	56.00	46.88	Ave

AC 120 V/ 60 Hz, Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
1.810	19.35	10.18	46.00	26.65	Ave
0.155	37.08	10.10	65.86	28.78	QP
1.810	26.82	10.18	56.00	29.18	QP
0.185	34.38	10.08	65.00	30.62	QP
0.405	27.67	10.10	58.71	31.04	QP
7.525	23.91	10.10	60.00	36.09	QP
17.295	23.85	10.17	60.00	36.15	QP
0.400	12.21	10.10	48.86	36.65	Ave
7.545	9.34	10.10	50.00	40.66	Ave
17.225	8.47	10.17	50.00	41.53	Ave
0.155	9.97	10.10	55.86	45.89	Ave
0.185	7.86	10.08	55.00	47.14	Ave

FCC §15.205, §15.209 & §15.247(d) – RADIATED SPURIOUS EMISSIONS

Applicable Standard

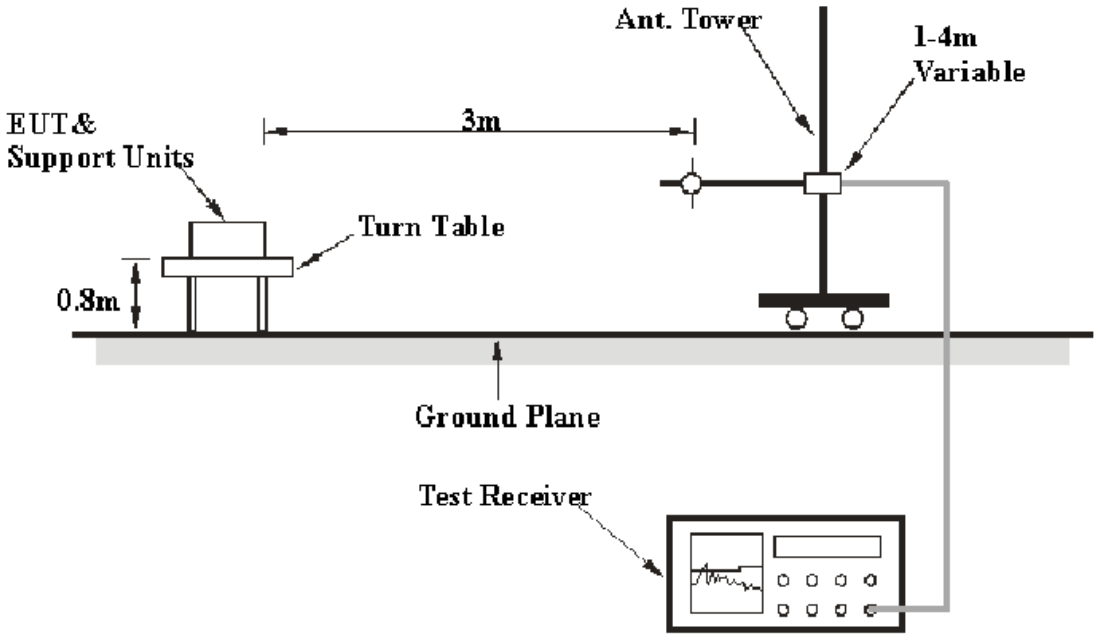
FCC §15.205; §15.209; §15.247(d)

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 ±4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters, 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.

The spacing between the peripherals was 10 cm.
The adapter was connected to a 120 VAC/60 Hz power source.

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:

Frequency Range	***RBW***	***Video B/W***	***Detector***
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	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-24
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-07-05	2011-07-04
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

*** 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 receptacle and all the other relevant support equipments were connected to the AC floor outlet.

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 and 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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss- 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 maximum limit. The equation for margin calculation is as follows:

Margin = Limit - 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, and section 15.205, 15.209 and 15.247, with the worst margin reading of:

Below 1 GHz

8.2 dB at **274.861750 MHz** in the **Horizontal** polarization for Adapter running and transmitting mode
8.2 dB at **275.761700 MHz** in the **Horizontal** polarization for Battery running and transmitting mode

Above 1 GHz

10.18 dB at **7206.00 MHz** in the **Horizontal** polarization for low channel

Test Data

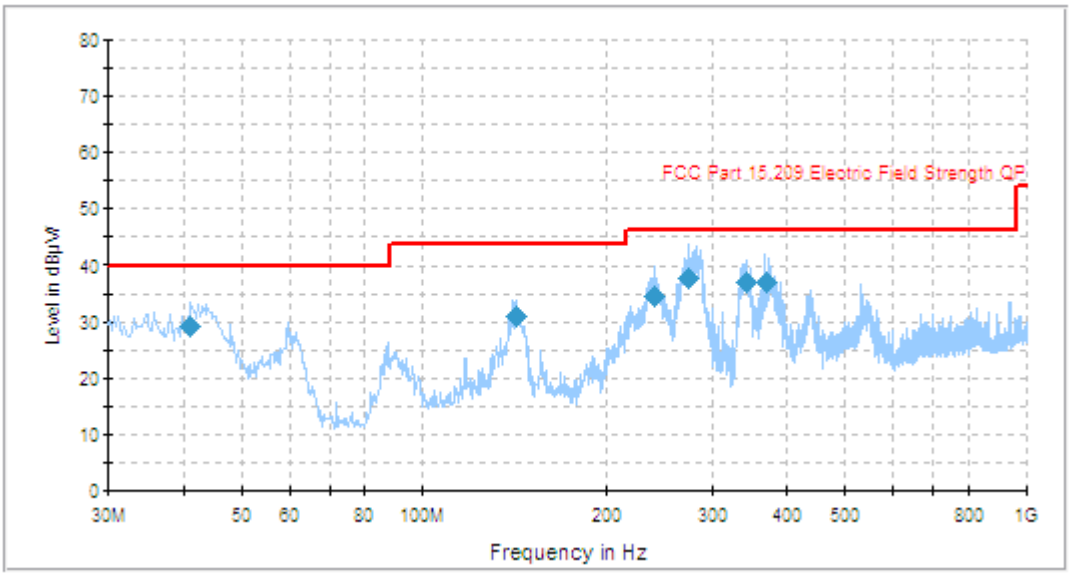
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

** The testing was performed by Tim Zhang on 2010-12-11.*

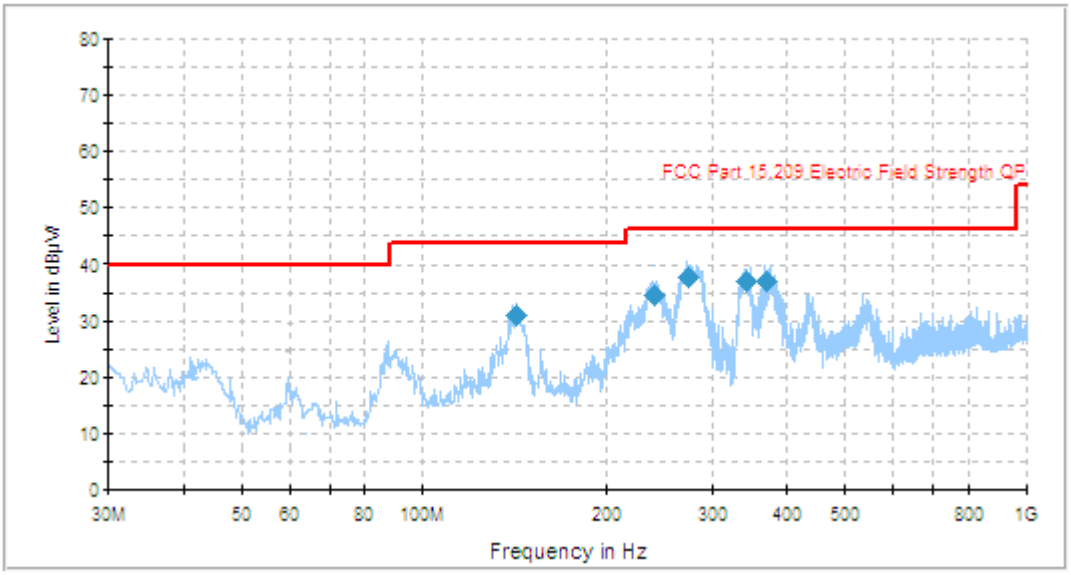
Below 1 GHz:

Test mode: Adapter running and transmitting mode



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)				
274.861750	37.8	118.0	H	6.0	-12.6	46.0	8.2
342.278750	37.3	100.0	H	2.0	-11.3	46.0	8.7
368.564000	37.2	100.0	H	8.0	-10.7	46.0	8.8
40.912500	29.2	301.0	H	4.0	-18.8	40.0	10.8
240.990000	34.6	201.0	H	56.0	-12.9	46.0	11.4
141.792500	30.9	190.0	V	126.0	-16.8	43.5	12.6

Test mode: Battery running and transmitting mode



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)				
275.761700	37.8	118.0	H	306.0	-12.6	46.0	8.2
341.178700	37.3	100.0	H	262.0	-11.3	46.0	8.7
368.586000	37.2	100.0	H	18.0	-10.7	46.0	8.8
241.785000	34.6	201.0	H	56.0	-12.9	46.0	11.4
141.789500	30.9	190.0	V	126.0	-16.8	43.5	12.6

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

Above 1 GHz (transmitting adapter mode is worst case)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/QP/Ave)	Direction (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)
Low Channel (2402 MHz)											
7206.00	28.80	Ave	70	1.0	H	36.4	5.22	26.60	45.82	54	10.18
7206.00	28.11	Ave	60	1.2	V	37.0	5.22	26.60	45.73	54	10.27
4804.00	31.89	Ave	180	1.0	H	33.5	4.30	26.80	42.89	54	11.11
4804.00	31.11	Ave	180	1.2	V	32.8	4.30	26.80	41.41	54	12.59
7206.00	41.90	PK	70	1.0	H	36.4	5.22	26.60	56.92	74	17.08
1134.26	36.07	Ave	20	1.0	H	24.2	2.02	26.49	37.80	54	18.20
1134.26	35.53	Ave	20	1.2	V	24.3	2.02	26.49	40.36	54	18.64
7206.00	39.58	PK	60	1.2	V	37.0	5.22	26.60	55.20	74	18.80
4804.00	43.10	PK	180	1.0	H	33.5	4.30	26.80	54.10	74	19.9
4804.00	41.73	PK	180	1.2	V	32.8	4.30	26.80	52.03	74	21.97
1134.26	48.91	PK	20	1.2	V	24.3	2.02	26.49	48.74	74	25.26
1134.26	47.94	PK	20	1.0	H	24.2	2.02	26.49	47.67	74	26.33
Middle Channel (2441 MHz)											
7323.00	28.31	Ave	232	1.2	H	36.3	5.09	26.57	45.13	54	10.87
7323.00	27.53	Ave	253	1.7	V	37.0	5.09	26.57	44.05	54	10.95
4882.00	31.14	Ave	23	1.5	H	33.7	4.36	26.78	42.42	54	11.58
4882.00	31.64	Ave	263	1.8	V	33.0	4.36	26.78	42.22	54	11.78
7323.00	40.00	PK	232	1.2	H	36.3	5.09	26.57	54.82	74	19.18
7323.00	38.96	PK	253	1.7	V	37.0	5.09	26.57	54.48	74	19.52
4882.00	42.57	PK	23	1.5	H	33.7	4.36	26.78	53.85	74	20.15
1260.52	32.24	Ave	36	2.0	H	24.5	2.06	26.52	32.28	54	21.72
4882.00	41.41	PK	263	1.8	V	33.0	4.36	26.78	51.99	74	22.01
1448.89	30.13	Ave	351	2.0	V	24.6	2.06	26.52	30.27	54	23.73
1260.52	43.94	PK	36	2.0	H	24.5	2.06	26.52	43.98	74	30.02
1448.89	41.92	PK	351	2.0	V	24.6	2.06	26.52	42.06	74	31.94
High Channel (2480 MHz)											
4960.00	30.58	Ave	0	1.0	H	34.6	4.40	26.75	42.83	54	11.17
7440.00	26.27	Ave	0	1.1	H	36.6	5.20	26.55	41.52	54	12.48
4960.00	28.87	Ave	20	1.0	V	34.7	4.40	26.75	41.22	54	12.78
7440.00	23.65	Ave	15	1.0	V	37.0	5.20	26.55	39.30	54	14.70
4960.00	41.33	PK	20	1.2	H	34.6	4.40	26.75	53.58	74	20.42
7440.00	37.65	PK	10	1.0	H	36.3	5.20	26.55	52.60	74	21.40
4960.00	39.76	PK	0	1.2	V	34.7	4.40	26.75	52.11	74	21.89
1450.90	31.14	Ave	30	1.0	H	25.3	2.24	26.58	32.10	54	21.90
7440.00	35.37	PK	10	1.2	V	37.0	5.20	26.55	51.02	74	22.98
1450.90	29.52	Ave	0	1.0	V	25.5	2.24	26.58	30.68	54	23.32
1450.90	42.88	PK	0	1.2	H	25.3	2.24	26.58	43.84	74	30.16
1450.90	39.25	PK	30	1.0	V	25.5	2.24	26.58	40.41	74	33.59

Restrict band spurious emission

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/QP/Ave)	Direction (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.247/209/205	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
2387.42	33.47	Ave	0	1.0	V	29.1	3.00	26.84	38.73	54	15.27
2484.78	33.53	Ave	0	1.0	H	28.7	3.00	26.84	38.39	54	15.61
2484.78	32.35	Ave	0	1.0	V	29.1	3.00	26.84	37.61	54	16.39
2387.42	31.93	Ave	0	1.0	H	28.7	3.00	26.84	36.79	54	17.21
2387.42	47.35	PK	30	1.2	V	29.1	3.00	26.84	52.61	74	21.39
2484.78	47.2	PK	10	1.0	H	28.7	3.00	26.84	52.06	74	21.94
2484.78	45.91	PK	0	1.2	V	29.1	3.00	26.84	51.17	74	22.83
2387.42	45.26	PK	20	1.2	H	28.7	3.00	26.84	50.12	74	23.88

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

Applicable Standard

Frequency hopping systems shall have hoping 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 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	2010-11-24	2011-11-24

*** 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:	101 kPa

** The testing was performed by Tim Zhang on 2010-12-12.*

Test Result: Compliance.

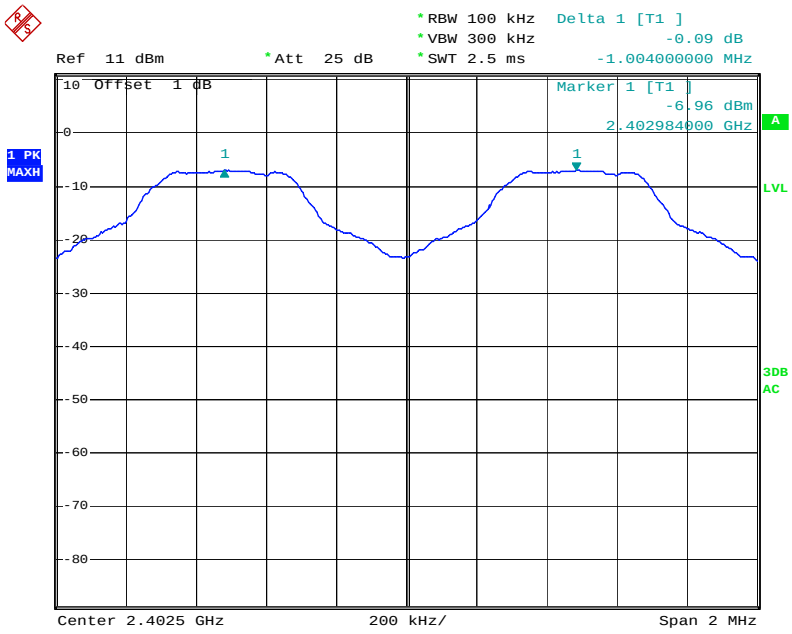
Please refer to following tables and plots

Test Mode: Transmitting

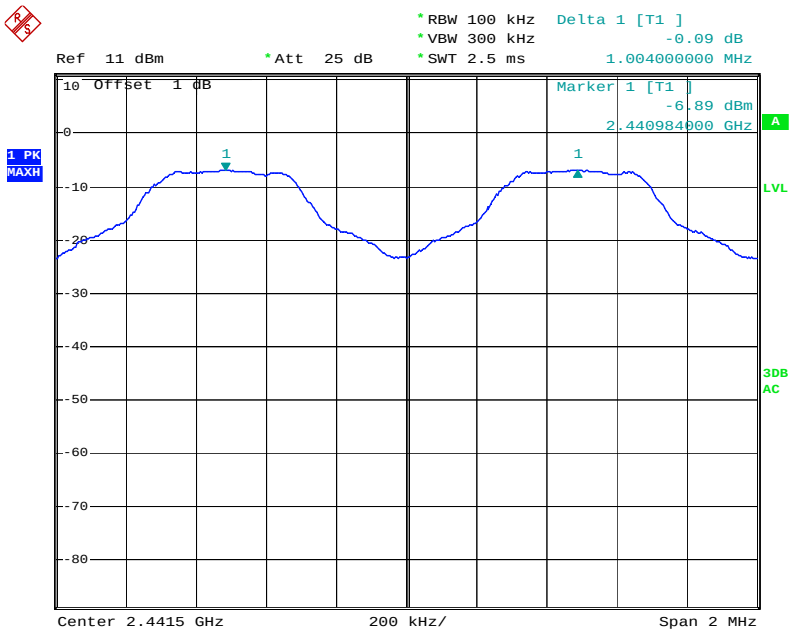
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.004	0.645	Pass
Adjacent	2403			
Middle	2441	1.004	0.645	Pass
Adjacent	2442			
High	2480	1.004	0.648	Pass
Adjacent	2479			

Please refer to the following plots.

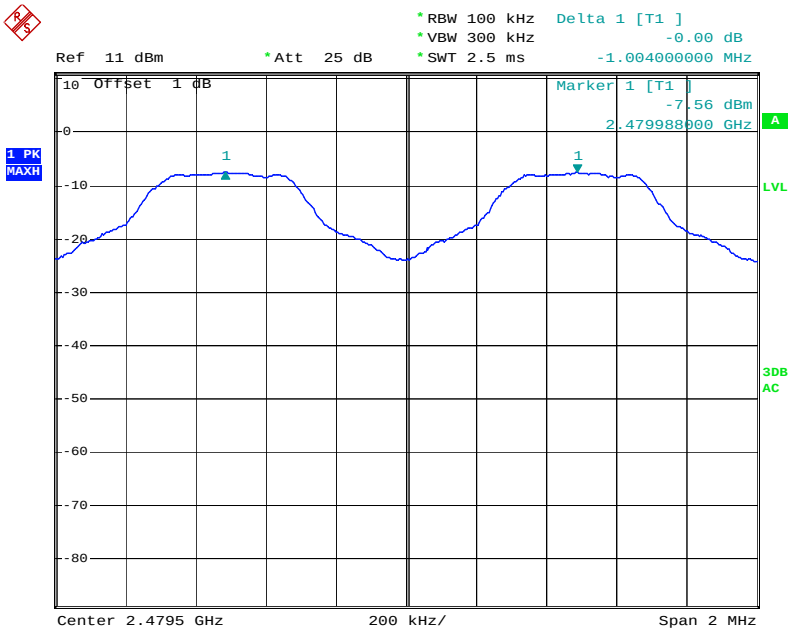
Low Channel



Middle Channel



High Channel



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	2010-11-24	2011-11-24

*** 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. Turn on the EUT and connect it to measurement instrument. 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:	101 kPa

** The testing was performed by Tim Zhang on 2010-12-12.*

Test Result: Compliance.

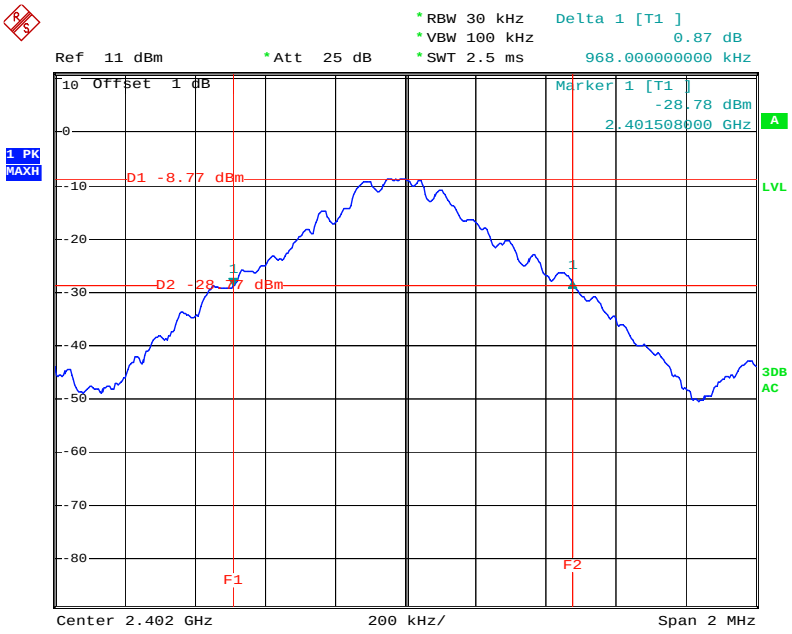
Please refer to following tables and plots

Test Mode: Transmitting

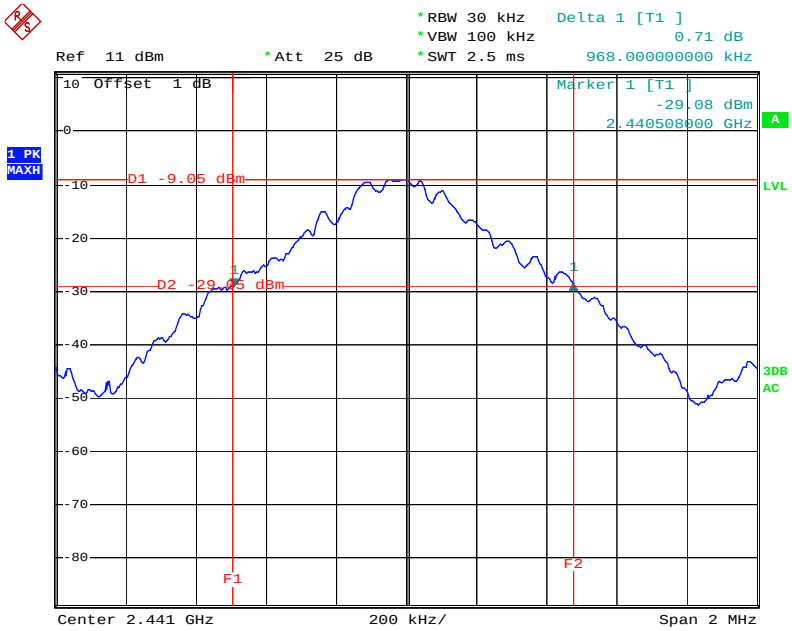
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	0.968
Middle	2441	0.968
High	2480	0.972

Please refer to the following plots.

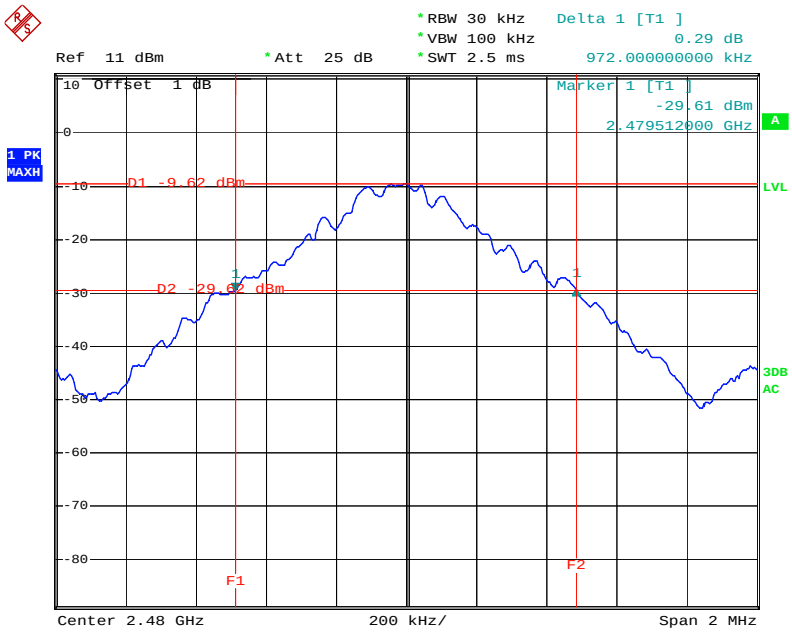
Low Channel



Middle Channel



High Channel



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

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-24

*** 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

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

The testing was performed by Tim Zhang on 2010-12-12.

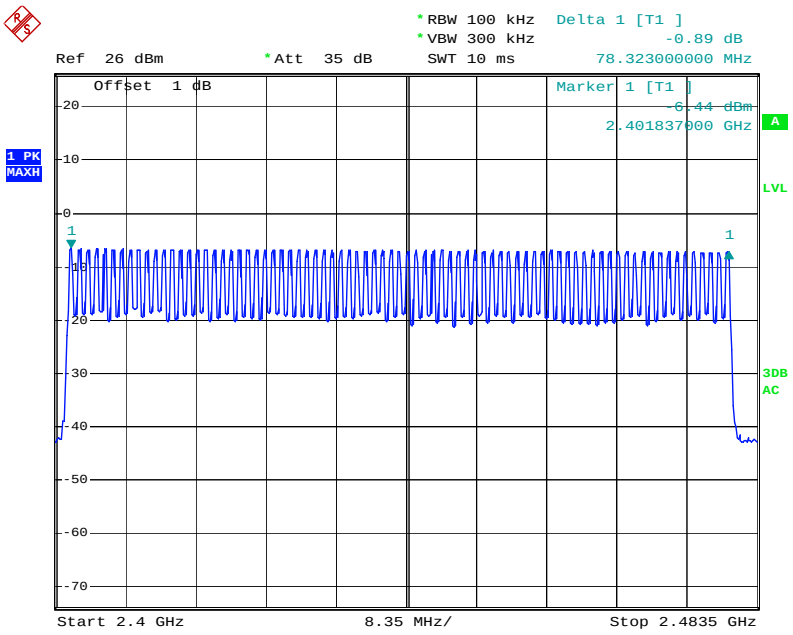
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
2400~2483.5	79	> 15

Number of Hopping Channels



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

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-24

*** 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 * 31.6s
Hop rate=1600/s

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

** The testing was performed by Tim Zhang on 2010-12-12.*

Test Result: Compliance.

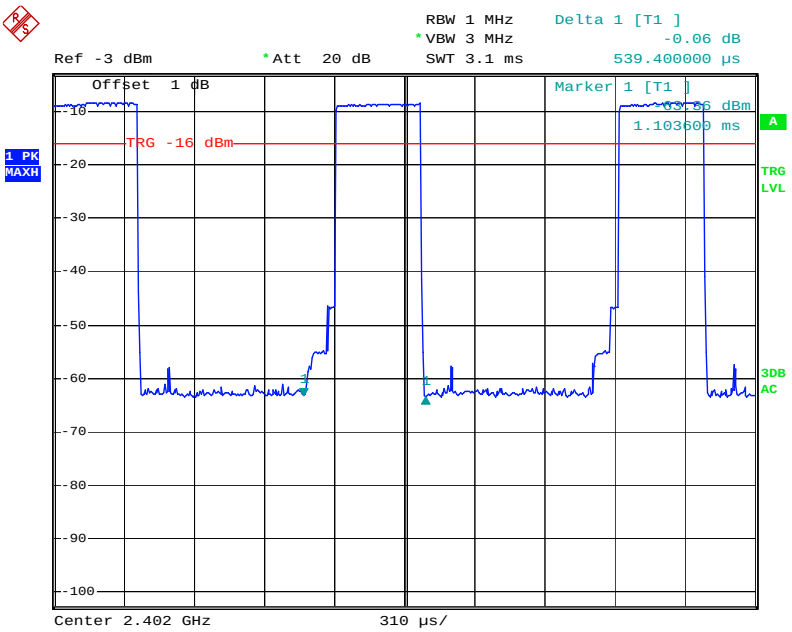
Please refer to following tables and plots

Test Mode: Transmitting

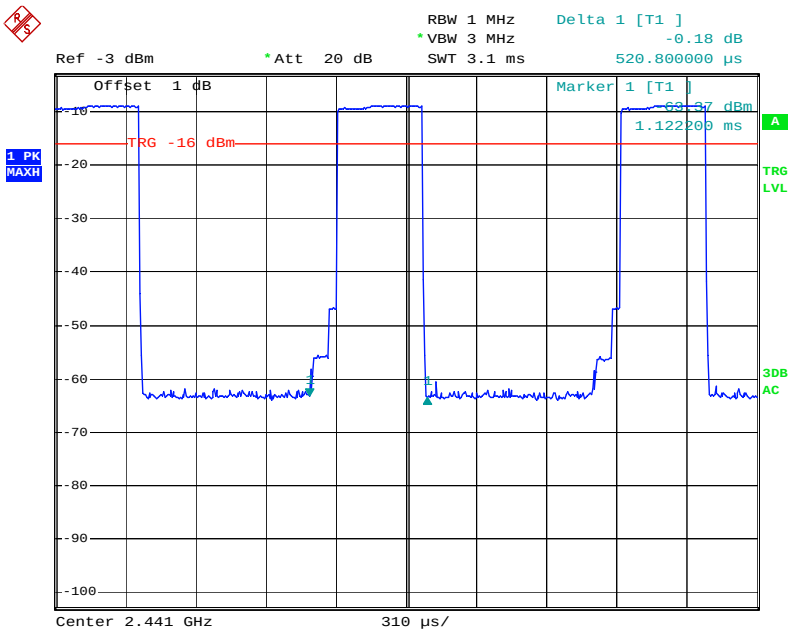
Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.5394	0.1726	0.4	Pass
	Middle	0.5208	0.1667	0.4	Pass
	High	0.5340	0.1709	0.4	Pass
	Note: Dwell time=Pulse width (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second				
DH 3	Low	1.8048	0.2888	0.4	Pass
	Middle	1.8048	0.2888	0.4	Pass
	High	1.8236	0.2918	0.4	Pass
	Note: Dwell time=Pulse width (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second				
DH 5	Low	3.0884	0.3294	0.4	Pass
	Middle	3.0720	0.3277	0.4	Pass
	High	3.0720	0.3277	0.4	Pass
	Note: Dwell time=Pulse width (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second				

Please refer to the following plots.

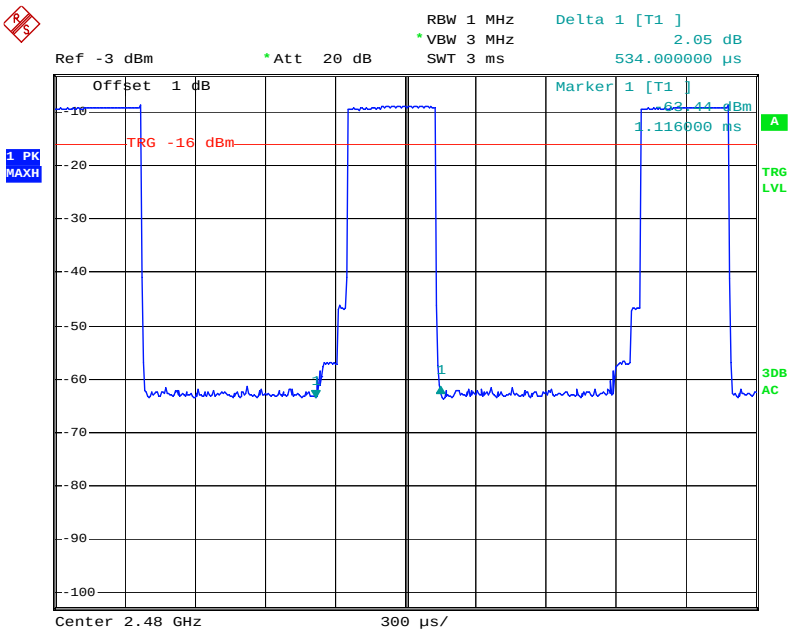
Low Channel for DH1



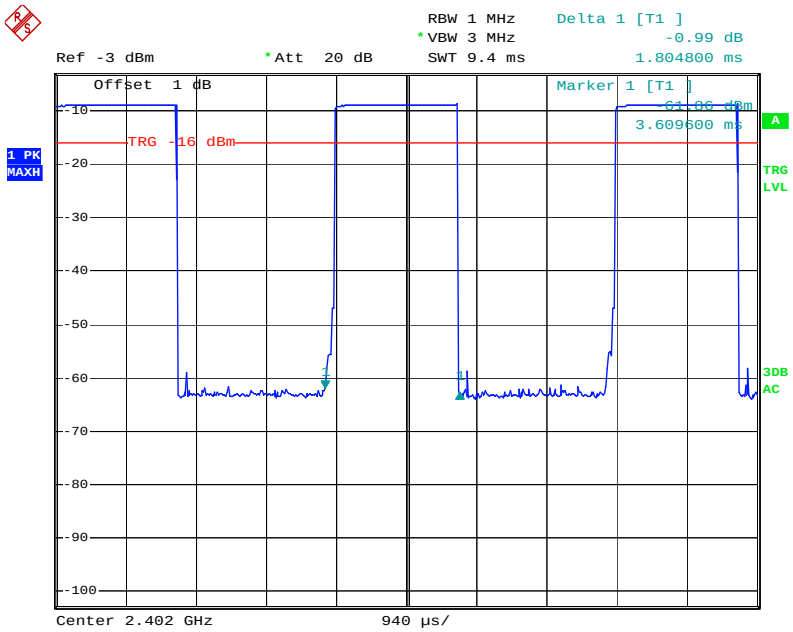
Middle Channel for DH1



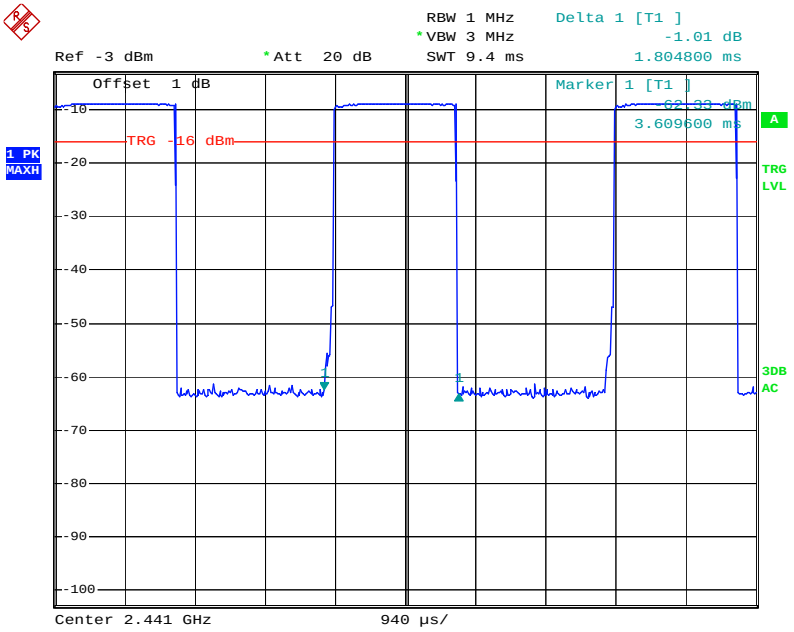
High Channel for DH1



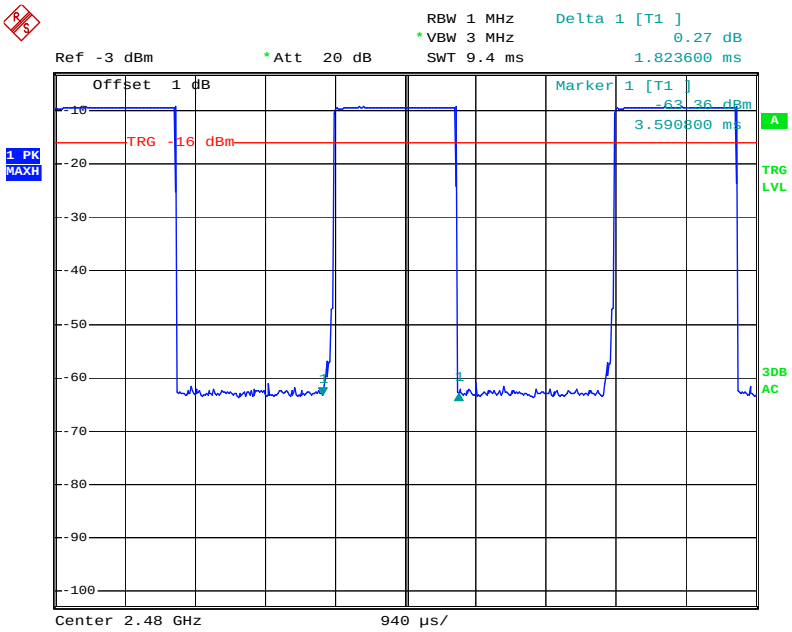
Low Channel for DH3



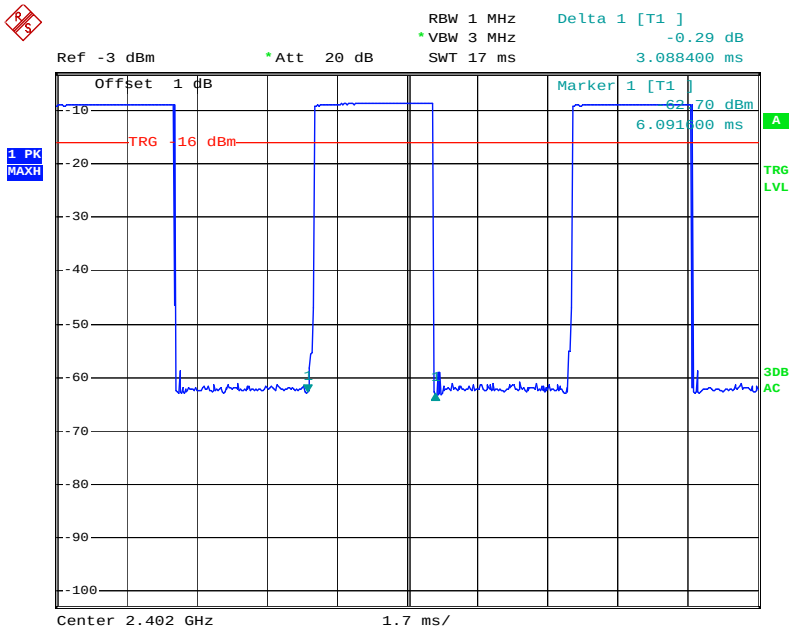
Middle Channel for DH3



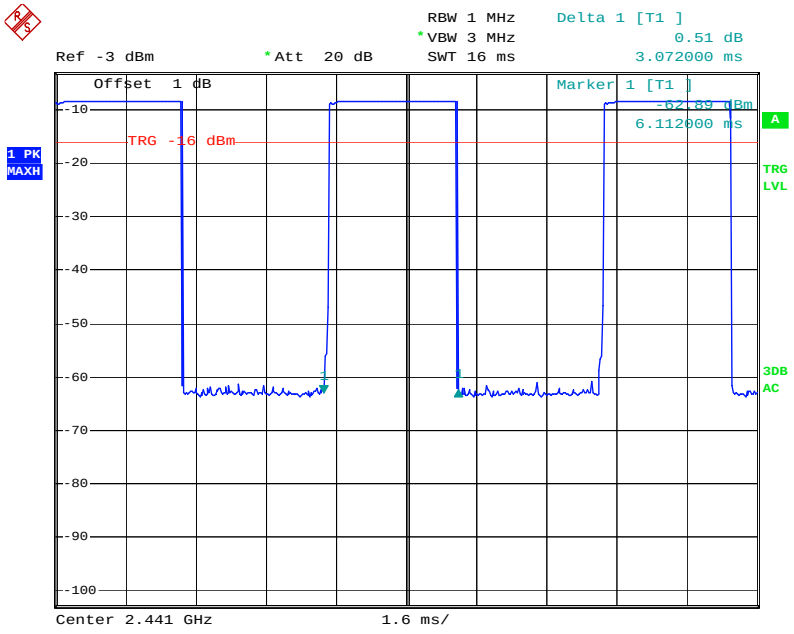
High Channel for DH3



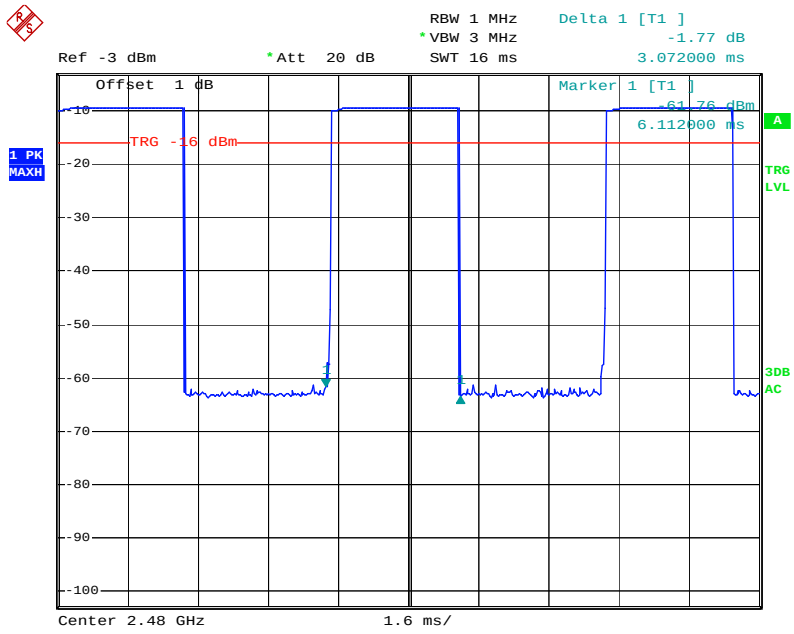
Low Channel for DH5



Middle Channel for DH5



High Channel for DH5



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. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

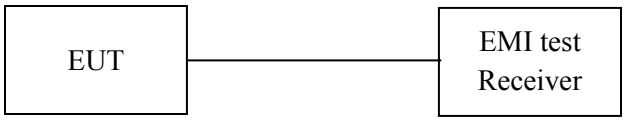
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-24

*** 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:	101 kPa

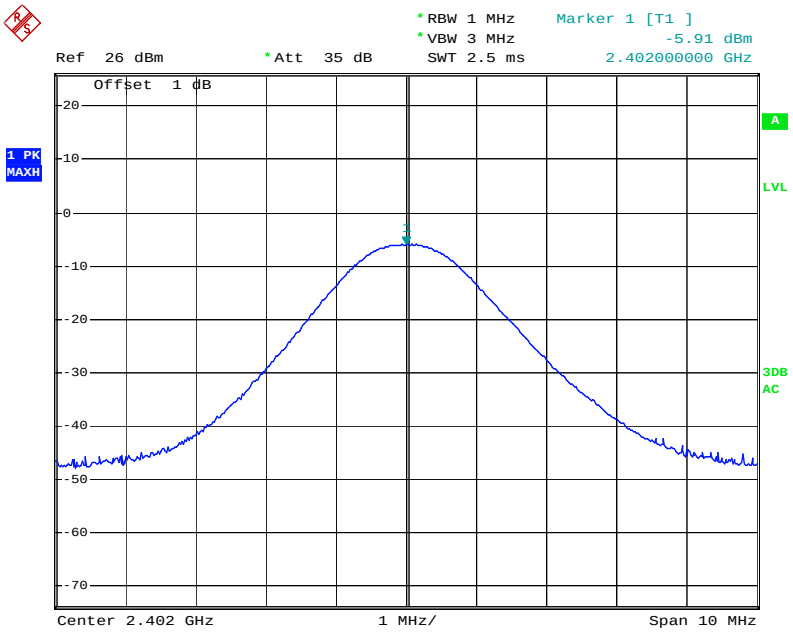
** The testing was performed by Tim Zhang on 2010-12-12.*

Test Result: Compliance.

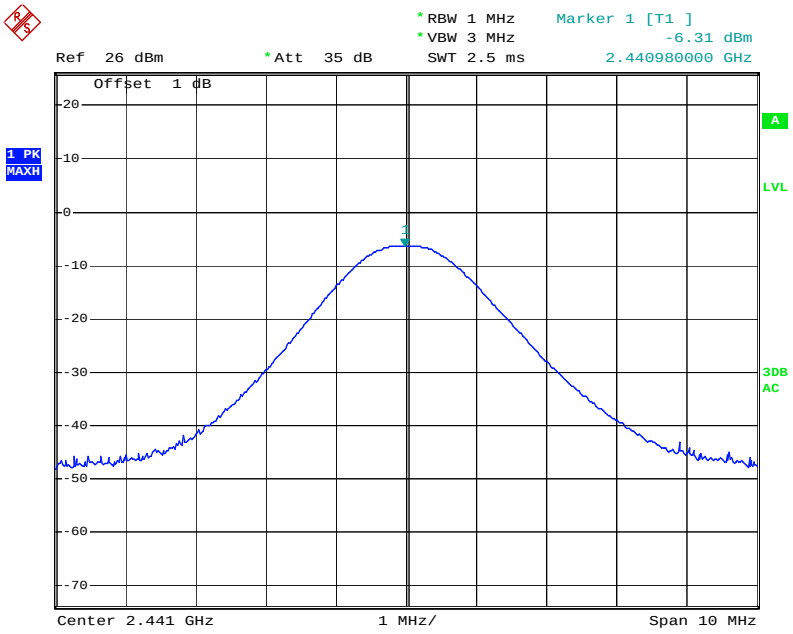
Test Mode: Transmitting

Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	-5.91	0.256	1000
Middle	2441	-6.31	0.234	1000
High	2480	-6.57	0.220	1000

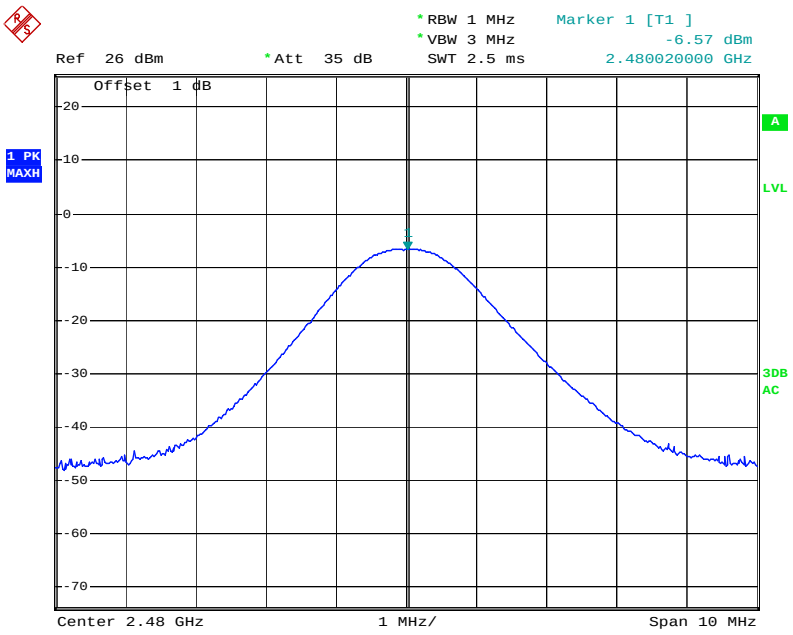
Low Channel



Middle Channel



High Chanel



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	2010-11-24	2011-11-24

*** 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, for Radiated emissions restricted band RBW=1 MHz, VBW=3 MHz.
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

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

**The testing was performed by Tim Zhang on 2010-12-12*

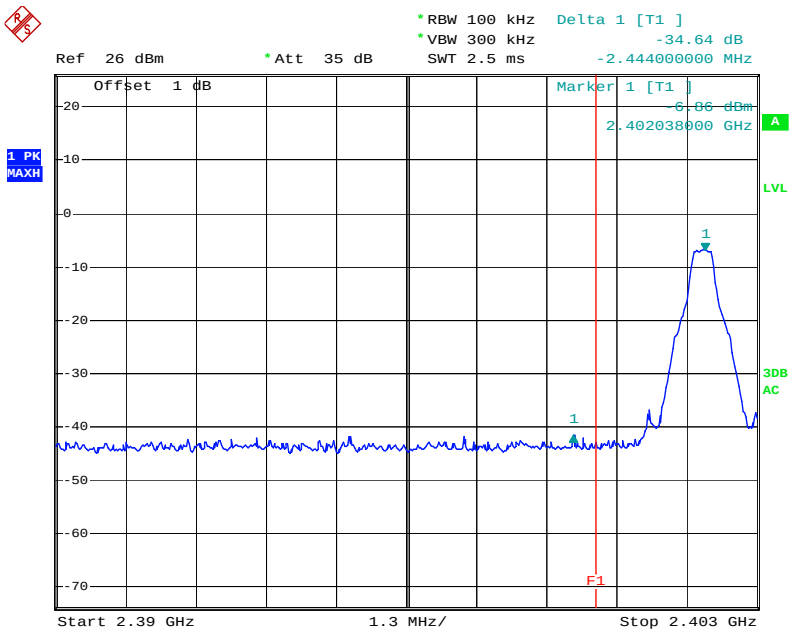
Test Result: Compliance

Please refer to the following table and plots.

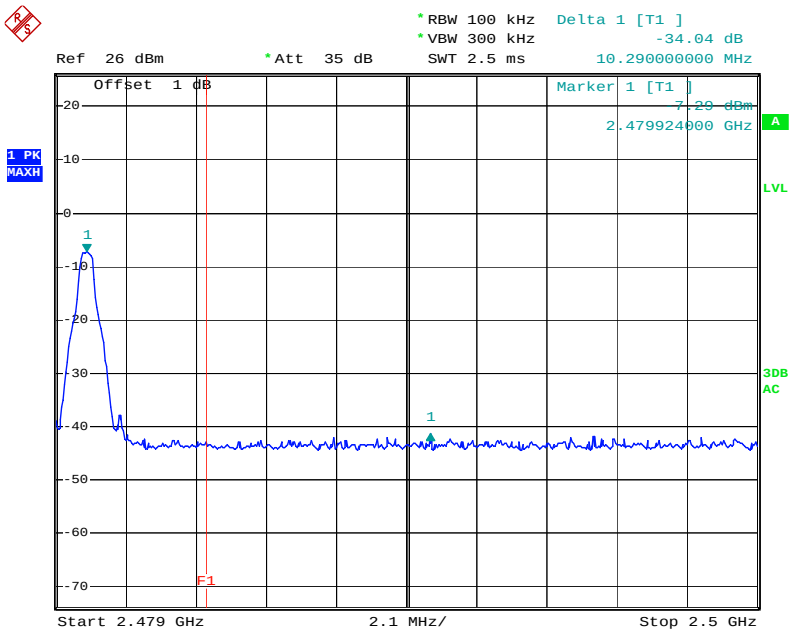
Test Mode: Transmitting

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.594	27.78	20
2490.214	26.81	20

Band Edge: Left Side



Band Edge: Right Side



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