



NVLAP LAB CODE 200707-0



FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

SHENZHEN HRT ELECTRONICS CO., LTD

Building 2, Jingnan Road, Huamei Industrial Zone, Buji,
Shenzhen City, Guangdong Province, China

FCC ID: VVD9201

This Report Concerns: <input checked="" type="checkbox"/> Original Report		Equipment Type: Professional Bluetooth Hands-Free Car Kits	
Test Engineer:	Simon Mo	<i>simon mo</i>	
	Jim Li	<i>Jim Li</i>	
Report No.:	RSZ07112201		
Test Date:	2007-12-03		
Report Date:	2007-12-04		
Reviewed By:	EMC Manager: Green Xu <i>Green Xu</i>		
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		

Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Shenzhen). This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the Federal Government.

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S)	4
TEST METHODOLOGY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EUT EXERCISE SOFTWARE	6
SPECIAL ACCESSORIES	6
EQUIPMENT MODIFICATIONS	6
HOST SYSTEM CONFIGURATION LIST AND DETAILS	6
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	6
EXTERNAL I/O CABLE.....	7
CONFIGURATION OF TEST SETUP	7
BLOCK DIAGRAM OF TEST SETUP	8
SUMMARY OF TEST RESULTS	9
§15.247 (i) & §2.1093 - RF EXPOSURE.....	10
§15.203 - ANTENNA REQUIREMENT.....	11
STANDARD APPLICABLE	11
ANTENNA CONNECTOR CONSTRUCTION	11
§15.109, §15.205, §15.209, §15.247 - RADIATED EMISSIONS.....	12
APPLICABLE STANDARD	12
MEASUREMENT UNCERTAINTY	12
EUT SETUP	12
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	13
TEST EQUIPMENT LIST AND DETAILS.....	13
TEST PROCEDURE	13
CORRECTED AMPLITUDE & MARGIN CALCULATION	13
TEST RESULTS SUMMARY	14
TEST DATA	14
§15.247(a) (1) - CHANNEL SEPARATION TEST.....	19
APPLICABLE STANDARD	19
TEST EQUIPMENT LIST AND DETAILS.....	19
TEST PROCEDURE	19
TEST DATA	19
§15.247(a) (1) –20dB BANDWIDTH TESTING	23
APPLICABLE STANDARD	23
TEST EQUIPMENT LIST AND DETAILS.....	23
TEST PROCEDURE	23
TEST DATA	23
§15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST	27
APPLICABLE STANDARD	27
TEST EQUIPMENT LIST AND DETAILS.....	27
TEST PROCEDURE	27

TEST DATA	27
§15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME).....	29
APPLICABLE STANDARD	29
TEST EQUIPMENT LIST AND DETAILS.....	29
TEST PROCEDURE	29
TEST DATA	29
§15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT	33
APPLICABLE STANDARD	33
TEST EQUIPMENT LIST AND DETAILS.....	33
TEST PROCEDURE	33
TEST DATA	33
§15.247(d) - BAND EDGES TESTING.....	37
APPLICABLE STANDARD	37
TEST EQUIPMENT LIST AND DETAILS.....	37
TEST PROCEDURE	37
TEST DATA	37

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The SHENZHEN HRT ELECTRONICS CO., LTD's product, model number: H8122 or the "EUT" as referred to in this report is a *Professional Bluetooth Hands-Free Car Kits*, which measures approximately 13.0 cm L x 8.0 cm W x 2.8 cm H, rated input voltage: DC 9-25V Battery.

** All measurement and test data in this report was gathered from production sample serial number: 0711031 (Assigned by BACL, Shenzhen). The EUT was received on 2007-11-22.*

Objective

This Type approval report is prepared on behalf of SHENZHEN HRT ELECTRONICS CO., LTD 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, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, 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 November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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



NVLAP 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 a typical fashion (as normally used by a typical user).

EUT Exercise Software

N/A.

Special Accessories

N/A.

Equipment Modifications

No modifications were made to the EUT.

Host System Configuration List and Details

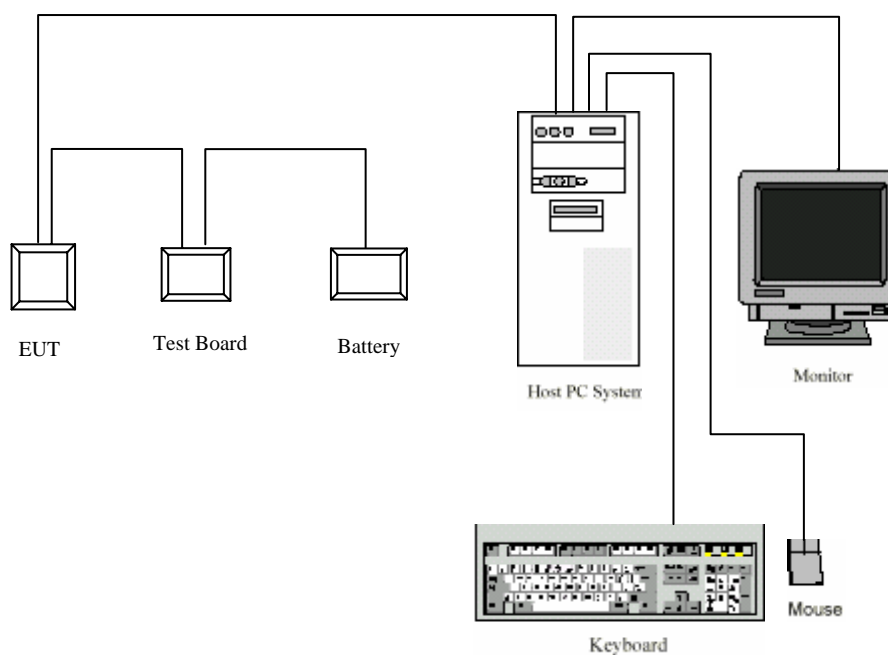
Manufacturer	Description	Model	Serial Number	FCC ID
DELL	PC	DELL 170L	CN-0TC670-70821-560-F4Q6	DoC
DELL	Keyboard	SK-8110	CN07N244-71616-56A-1B1E	DoC
DELL	Mouse	M071KC	520027907	DoC
DELL	LCD Monitor	1505FP	Y4287-7168-571-GBSH	DoC
ProMOS	Memory	V826632K24SATG-C0	0525-K1933700	N/A
Intel	CPU	Celeron D-2533	N/A	N/A

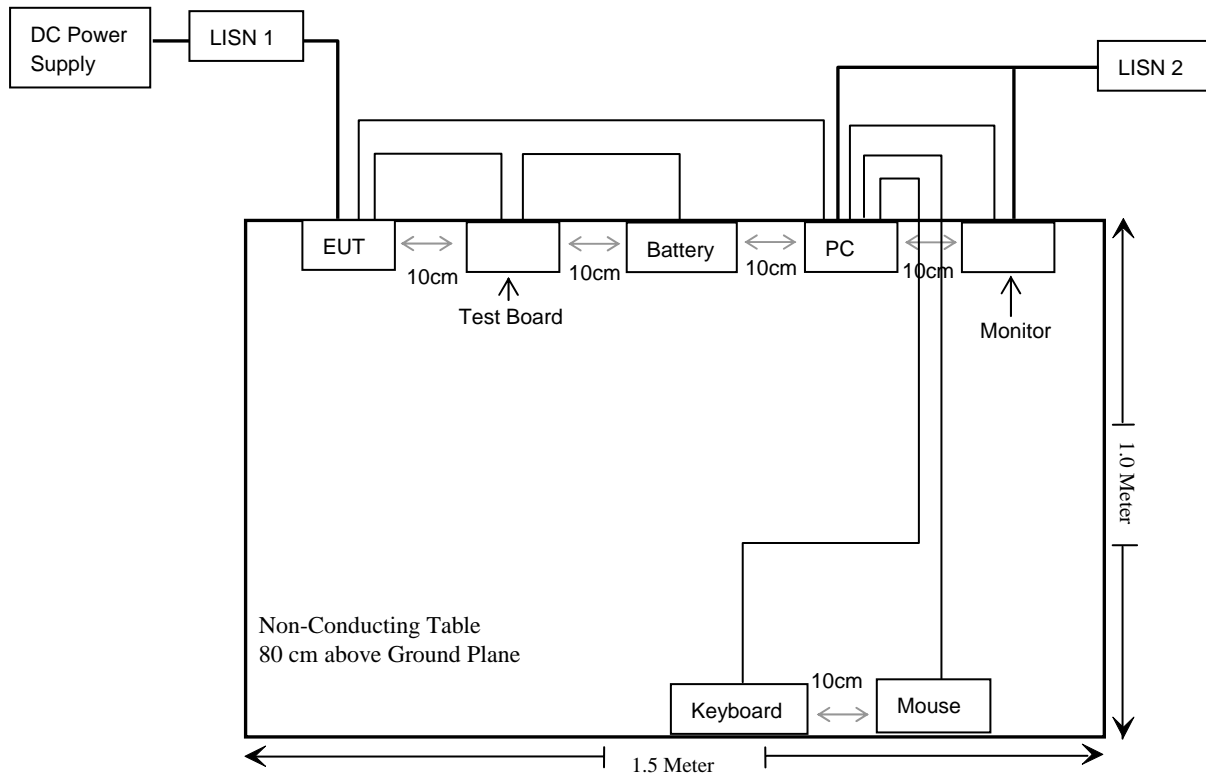
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Motherboard	OWC297	CN-OWC297-70821-564-00NI	DoC
DELL	Power	NPS-250KB D	CN-0H2678-17972-56E-80BM	DoC
Seagate	Hard Disk	ST340014A	5JXK3GXE	DoC
DELL	3.5' Floppy	N/A	CN-0N8893-69802-54Q-02P0	DoC
Lite-ON	CD-Rom	LTN-489S	N/A	DoC
Intel	Ethernet	PRO 10/100 VE	N/A	DoC
CS	Smart Card	ACOS2	N/A	DoC

External I/O Cable

Cable Description	Length (M)	From Port	To
Shielded Detachable K/B Cable	1.5	K/B Port /Host	K/B
Shielded Detachable Mouse Cable	1.5	Mouse Port /Host	Mouse
Unshielded Detachable DC Cable	0.5	EUT	DC Power Supply
Shielded Detachable Parallel Cable	0.8	Test Board	PC

Configuration of Test Setup

Block Diagram of Test Setup

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i) & §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.207 (a)	Conducted Emission	N/A*
§15.109, §15.205, §15.209, §15.247(d)	Radiated Emission	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)	20 dB Bandwidth Testing	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(a)(1)(iii)	Time of occupancy (Dwell Time)	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges testing	Compliant

Note:

N/A—The EUT is used in car, it does not connect to AC.

§15.247 (i) & §2.1093 - RF EXPOSURE

Standard Applicable

According to § 1.1310, 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 Exclusion list, In the following table, f_{GHz} is mid-band frequency in GHz, and d is the distance to a person's body, excluding hands, wrists, feet, and ankles.

Exposure category	<u>low threshold</u>	<u>high threshold</u>
general population	$(60/f_{\text{GHz}})$ mW, $d < 2.5$ cm $(120/f_{\text{GHz}})$ mW, $d \geq 2.5$ cm	$(900/f_{\text{GHz}})$ mW, $d < 20$ cm
occupational	$(375/f_{\text{GHz}})$ mW, $d < 2.5$ cm $(900/f_{\text{GHz}})$ mW, $d \geq 2.5$ cm	$(2250/f_{\text{GHz}})$ mW, $d < 20$ cm

Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

Measurement Result:

This is a portable device and the Max peak output power is $0.498 \text{ mW} < 49.16 \text{ mW} = (120/2.441 \text{ GHz}) \text{ mW}$

The SAR measurement is not required.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

According to § 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.

Antenna Connector Construction

The EUT has a component antenna, which, in accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EUT photo for details.

§15.109, §15.205, §15.209, §15.247 - RADIATED EMISSIONS

Applicable Standard

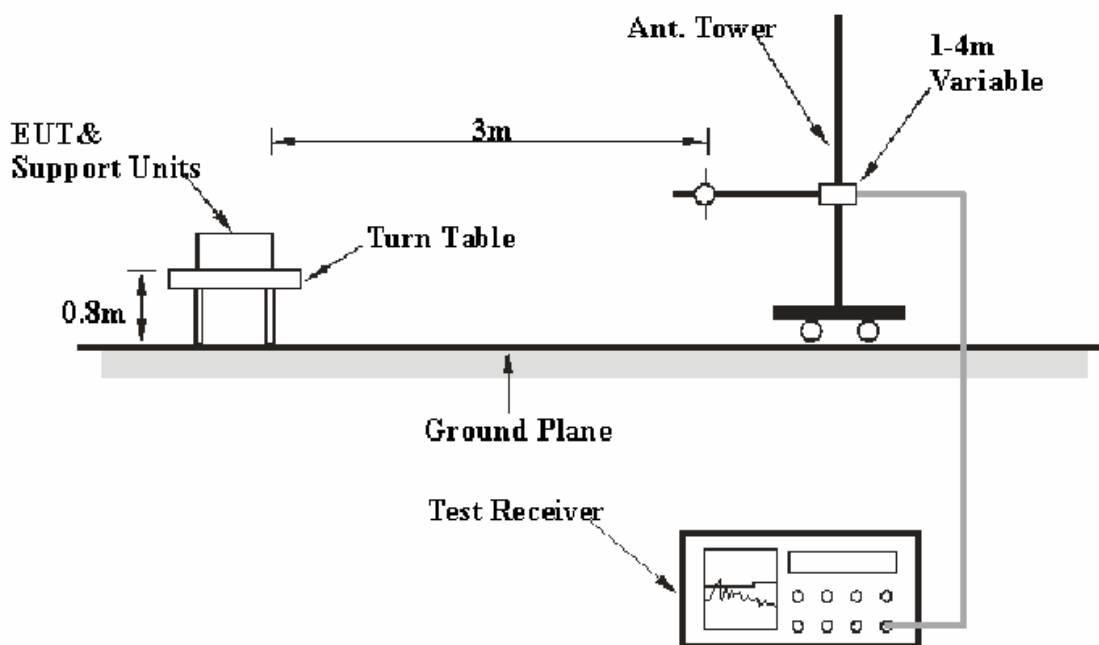
According to FCC §15.247 (d)

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 chamber B test site, using the setup accordance with the ANSI C63.4-2003. 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 EUT was connected to DC 12V 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:

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2007-11-15	2008-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-09-29	2008-09-29
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2007-08-14	2008-08-14
HP	Amplifier	8449B	3008A00277	2007-09-29	2008-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2007-09-25	2008-09-25
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2007-05-09	2008-05-09

* **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 host PC and all other support equipment power cords were connected to AC floor outlet.

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

All data was recorded in the PK&AV detection mode.

Corrected Amplitude & Margin Calculation

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

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

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 maximum 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 15.109, 15.205, 15.209, and 15.247, with the worst margin reading of:

30 – 1000 MHz:

7.0 dB at 528.062450 MHz in the Horizontal polarization, for Low Channel

7.1 dB at 30.909125 MHz in the Vertical polarization, for Middle Channel

7.7 dB at 528.070325 MHz in the Horizontal polarization, for High Channel

Above 1000 MHz:

7.18 dB at 4804 MHz in the Vertical polarization, for above 1 GHz (Low Channel)

4.83 dB at 4882 MHz in the Vertical polarization, for above 1 GHz (Middle Channel)

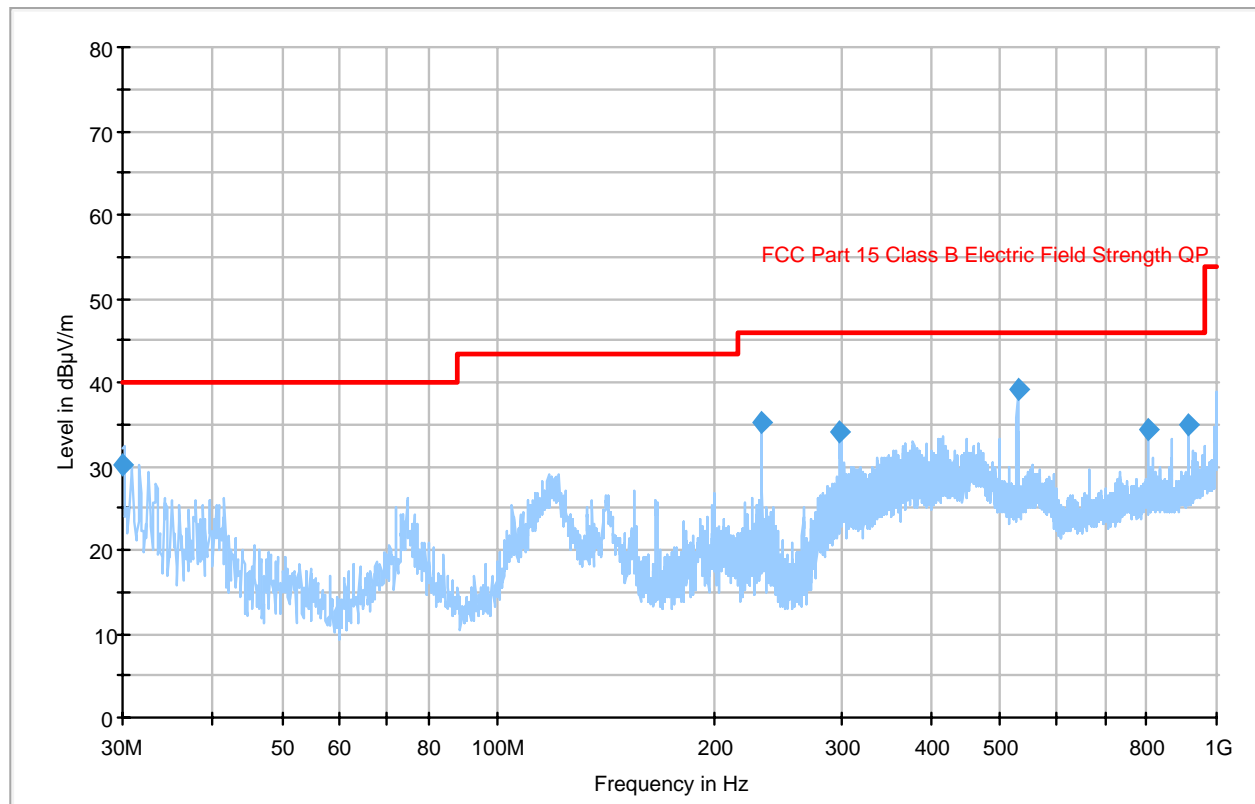
5.18 dB at 4960 MHz in the Horizontal polarization, for above 1 GHz (High Channel)

Test Data

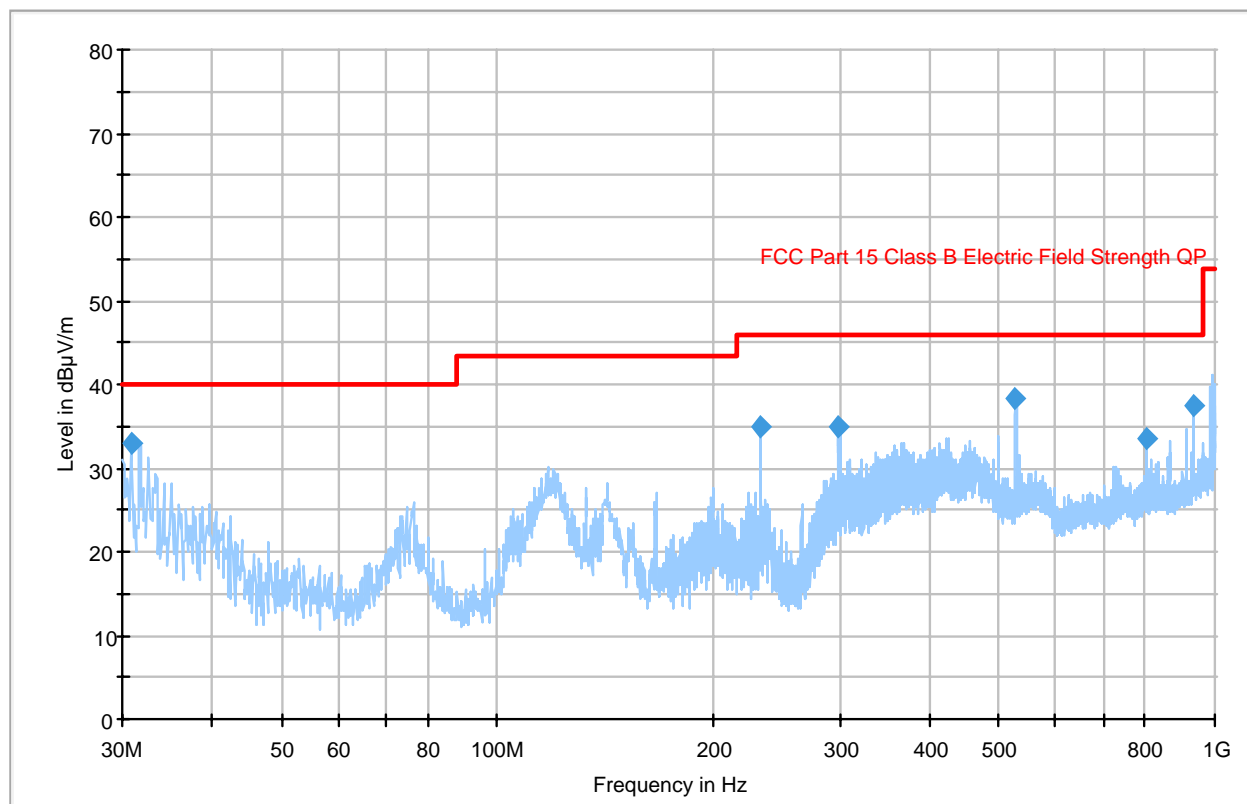
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	52%
ATM Pressure:	100.9 kPa

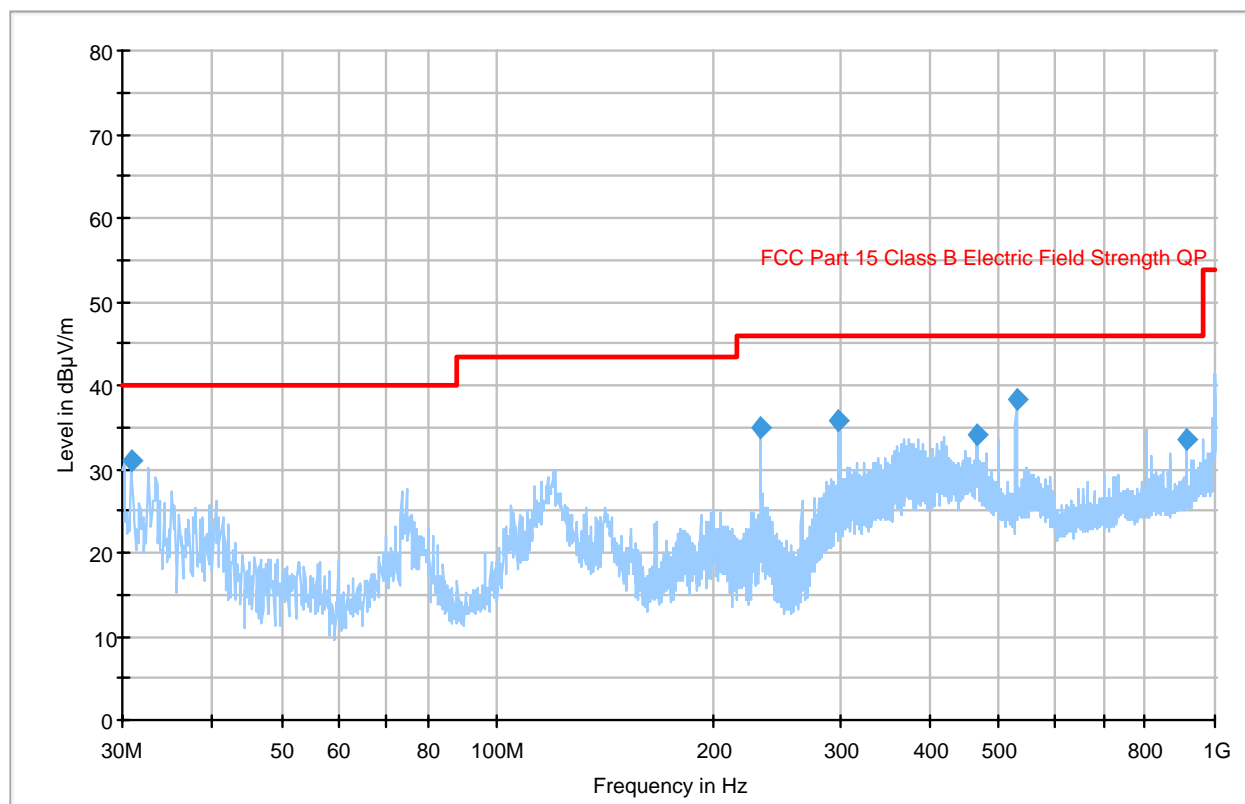
The testing was performed by Simon Mo on 2007-12-01.

Test Mode: Transmitting (Low Channel)

Frequency (MHz)	Corrected Amplitude (dB μ V/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dB μ V/m)	Margin (dB)
528.062450	39.0	119.0	H	223.0	-6.4	46.0	7.0
30.070928	30.0	124.0	V	283.0	-5.6	40.0	10.0
233.135450	35.2	270.0	V	316.0	-13.5	46.0	10.8
912.097350	34.8	215.0	H	230.0	-0.2	46.0	11.2
802.811450	34.4	201.0	V	9.0	-1.7	46.0	11.6
298.671400	34.2	100.0	H	251.0	-10.8	46.0	11.8

Test Mode: Transmitting (Middle Channel)

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
30.909125	32.9	124.0	V	234.0	-6.6	40.0	7.1
528.035900	38.2	98.0	V	209.0	-6.4	46.0	7.8
932.710675	37.6	130.0	H	52.0	0.4	46.0	8.4
298.667900	35.0	100.0	H	287.0	-10.8	46.0	11.0
233.147900	34.9	241.0	V	301.0	-13.5	46.0	11.1
802.708950	33.5	197.0	V	0.0	-1.7	46.0	12.5

Test Mode: Transmitting (High Channel)

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
528.070325	38.3	114.0	H	242.0	-6.4	46.0	7.7
30.928025	31.1	115.0	V	294.0	-6.7	40.0	8.9
298.689400	35.8	125.0	H	300.0	-10.8	46.0	10.2
233.163650	34.8	261.0	V	324.0	-13.5	46.0	11.2
466.397275	34.2	119.0	V	271.0	-7.0	46.0	11.8
912.115425	33.6	100.0	V	347.0	-0.2	46.0	12.4

Test Mode: Transmitting (Above 1 GHz)

Freq. (MHz)	Meter Reading (dBuV)	Detector PK/QP/AV	Direction Degree	Antenna		Antenna Factor (dB/m)	Cable Loss (dB)	Pre- Amp. Gain (dB)	Corrected Amp. (dBuV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)					Limit (dBuV/m)	Margin (dB)	Remarks
Low Channel												
2402	81.40	PK	90	1.0	H	28.9	3.61	35.0	78.91			Fund.
2402	64.44	AV	45	1.0	H	28.9	3.61	35.0	61.95			Fund.
2402	89.07	PK	90	1.0	V	29.1	3.61	35.0	86.78			Fund.
2402	72.14	AV	45	1.0	V	29.1	3.61	35.0	69.85			Fund.
4804	40.88	AV	90	1.0	V	34.7	4.64	33.4	46.82	54	7.18	Harmonic
4804	40.79	AV	90	1.0	H	34.6	4.64	33.4	46.63	54	7.37	Harmonic
1601	50.24	AV	180	1.2	V	26.0	2.77	35.0	44.01	54	9.99	Harmonic
1601	48.56	AV	180	1.2	H	26.5	2.77	35.0	42.83	54	11.17	Harmonic
4804	46.93	PK	180	1.2	V	34.7	4.64	33.4	52.87	74	21.13	Harmonic
4804	46.53	PK	180	1.2	H	34.6	4.64	33.4	52.37	74	21.63	Harmonic
1601	54.46	PK	45	1.2	V	26.0	2.77	35.0	48.24	74	25.76	Harmonic
1601	53.55	PK	45	1.2	H	26.5	2.77	35.0	47.82	74	26.18	Harmonic
Middle Channel												
2441	80.38	PK	60	1.4	H	29.1	3.61	35.0	78.09			Fund.
2441	63.10	AV	152	1.3	H	29.1	3.61	35.0	60.81			Fund.
2441	89.15	PK	128	1.5	V	28.9	3.61	35.0	86.66			Fund.
2441	71.96	AV	156	1.2	V	28.9	3.61	35.0	69.47			Fund.
4882	43.33	AV	243	1.4	V	34.6	4.64	33.4	49.17	54	4.83	Harmonic
4882	40.98	AV	142	1.6	H	34.7	4.64	33.4	46.92	54	7.08	Harmonic
1627	52.01	AV	135	1.3	H	26.0	2.77	35.0	45.78	54	8.22	Harmonic
1627	51.28	AV	85	1.5	V	26.5	2.77	35.0	45.55	54	8.45	Harmonic
4882	47.05	PK	153	1.5	V	34.6	4.64	33.4	52.89	74	21.11	Harmonic
4882	46.02	PK	234	1.8	H	34.7	4.64	33.4	51.95	74	22.05	Harmonic
1627	54.65	PK	265	1.4	V	26.5	2.77	35.0	48.92	74	25.08	Harmonic
1627	54.57	PK	156	1.4	H	26.0	2.77	35.0	48.34	74	25.66	Harmonic
High Channel												
2480	80.06	PK	89	1.5	H	28.9	3.61	35.0	77.57			Fund.
2480	61.59	AV	65	1.5	H	28.9	3.61	35.0	59.10			Fund.
2480	88.83	PK	65	1.4	V	29.1	3.61	35.0	86.54			Fund.
2480	69.06	AV	65	1.6	V	29.1	3.61	35.0	66.77			Fund.
4960	43.07	AV	256	1.8	H	34.6	4.55	33.4	48.82	54	5.18	Harmonic
4960	42.35	AV	142	1.5	V	34.7	4.55	33.4	48.20	54	5.80	Harmonic
1653	53.76	AV	210	1.2	V	26.0	2.77	35.0	47.53	54	6.47	Spurious
1653	52.28	AV	156	1.2	H	26.5	2.77	35.0	46.55	54	7.45	Spurious
4960	46.23	PK	142	1.4	V	34.7	4.55	33.4	52.08	74	21.92	Harmonic
4960	46.11	PK	145	1.4	H	34.6	4.55	33.4	51.86	74	22.14	Harmonic
1653	56.95	PK	128	1.5	H	26.5	2.77	35.0	51.22	74	22.78	Spurious
1653	56.04	PK	240	1.4	V	26.0	2.77	35.0	49.81	74	24.19	Spurious

§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	2007-09-29	2008-09-29

* **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:	100.0 kPa

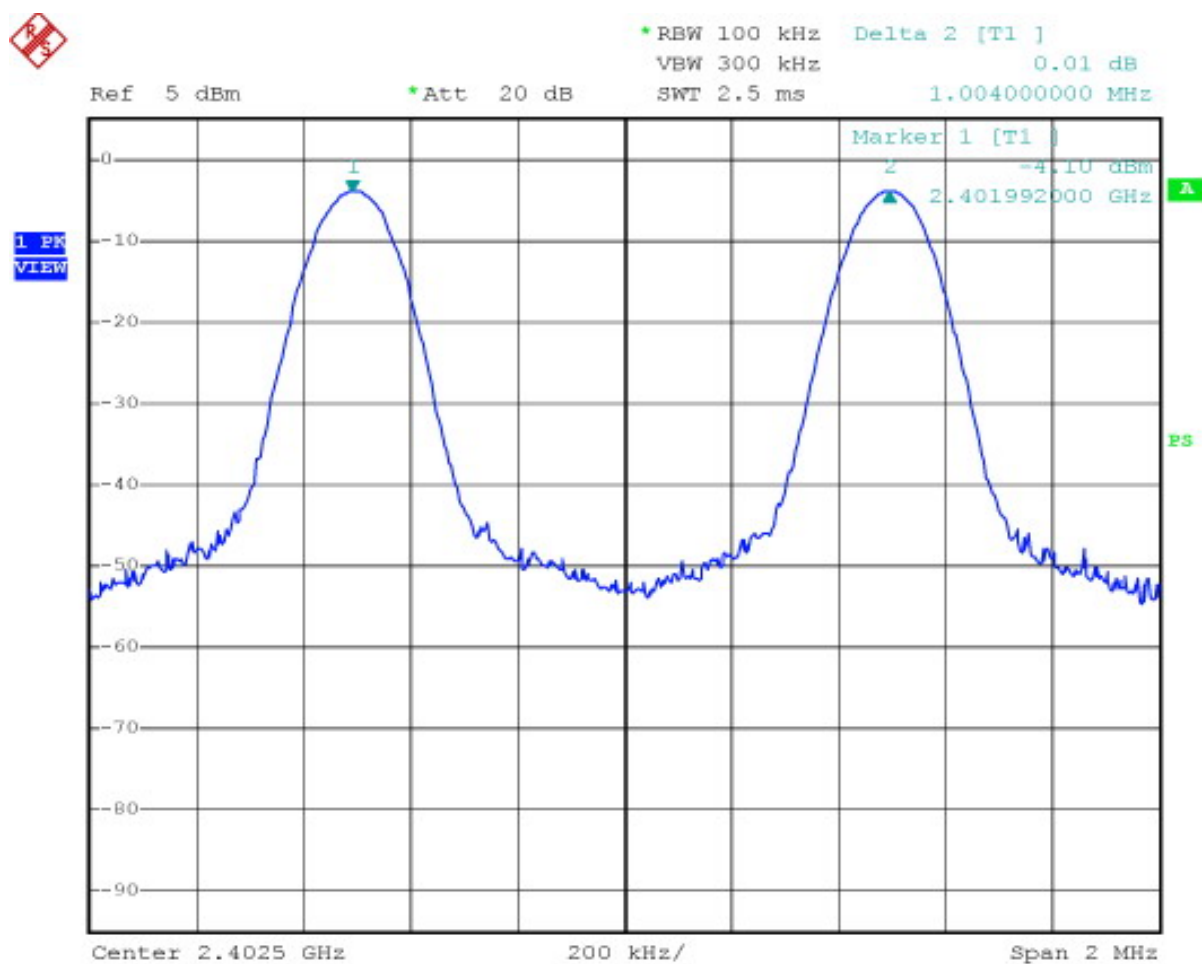
The testing was performed by Simon Mo on 2007-12-01.

Test Result: Pass

Please refer to following table and plots.

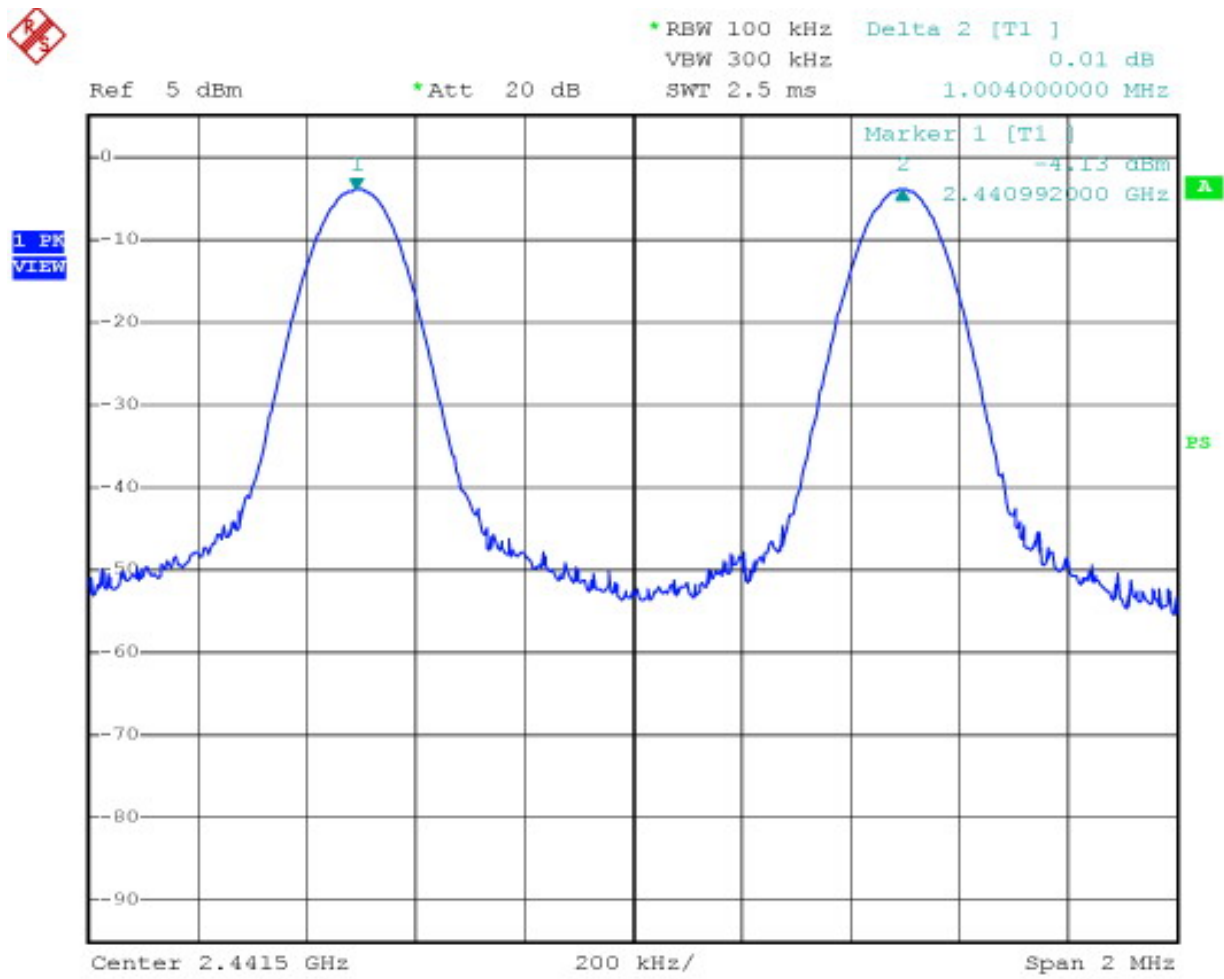
Channel	Channel Frequency (MHz)	Channel Separation (kHz)	Limit (kHz)
Low Channel	2402	1004	181
Adjacent Channel	2403		
Mid Channel	2441	1004	181
Adjacent Channel	2442		
High Channel	2480	1004	181
Adjacent Channel	2479		

Low Channel



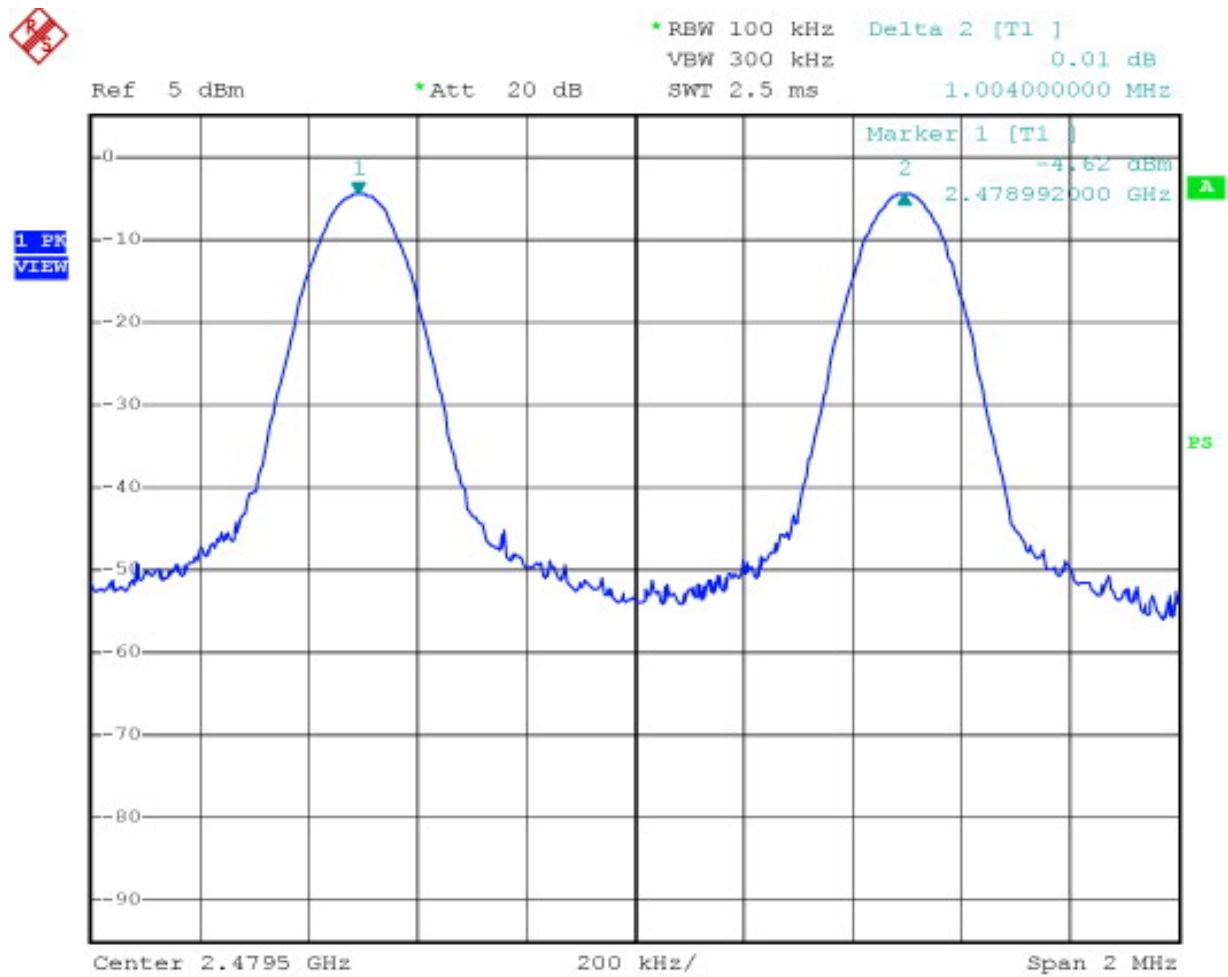
CHANNEL SEPRATION L

Middle Channel



CHANNEL SEPRATION M

High Channel



CHANNEL SEPRATION H

§15.247(a) (1) –20dB 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	2007-09-29	2008-09-29

* **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:	53%
ATM Pressure:	1009mbar

The testing was performed by Simon Mo on 2007-11-22.

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)
Low Channel	2402	268
Mid Channel	2441	268
High Channel	2480	264

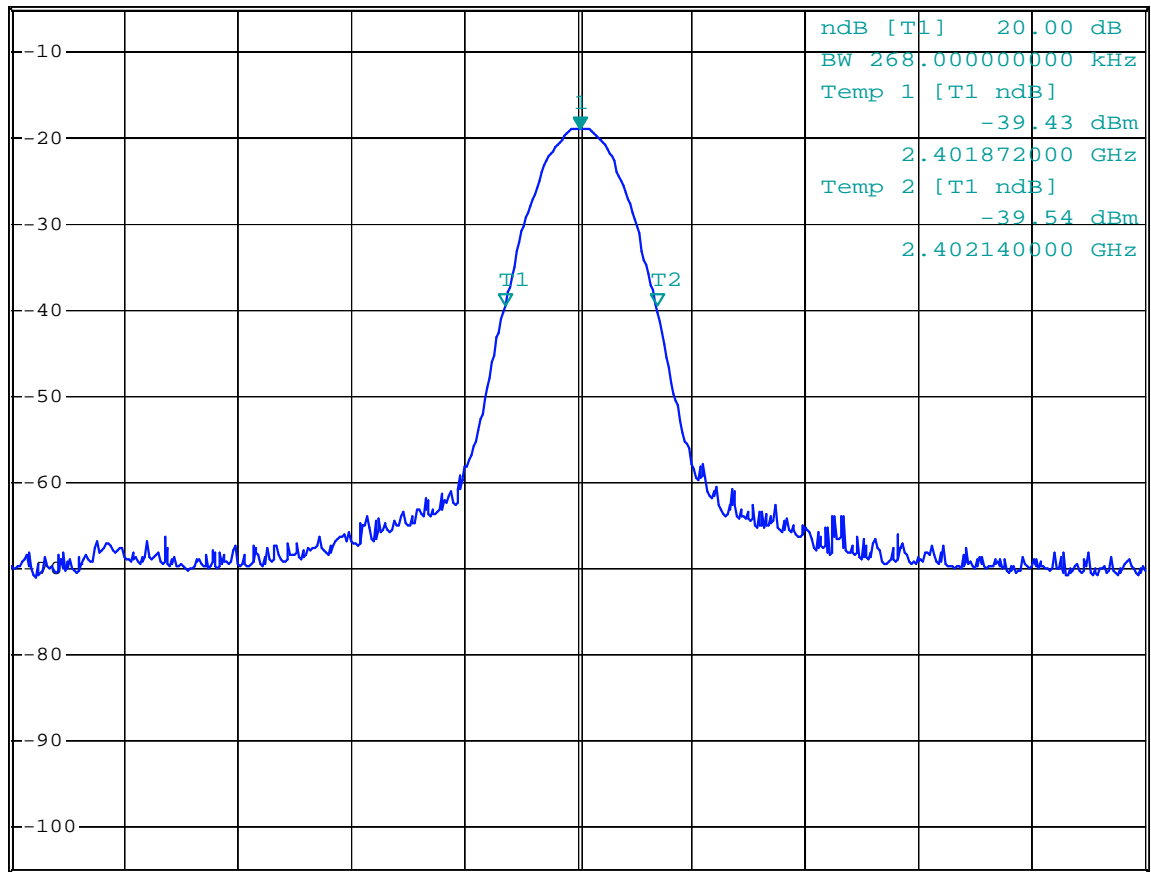
Please refer to following plots

Low Channel



1 PK
MAXH

Ref -5 dBm * Att 10 dB * RBW 100 kHz Marker 1 [T1] -18.95 dBm
SWT 2.5 ms 2.402004000 GHz



Center 2.402 GHz

200 kHz/

Span 2 MHz

20dB bandwidth-low channel

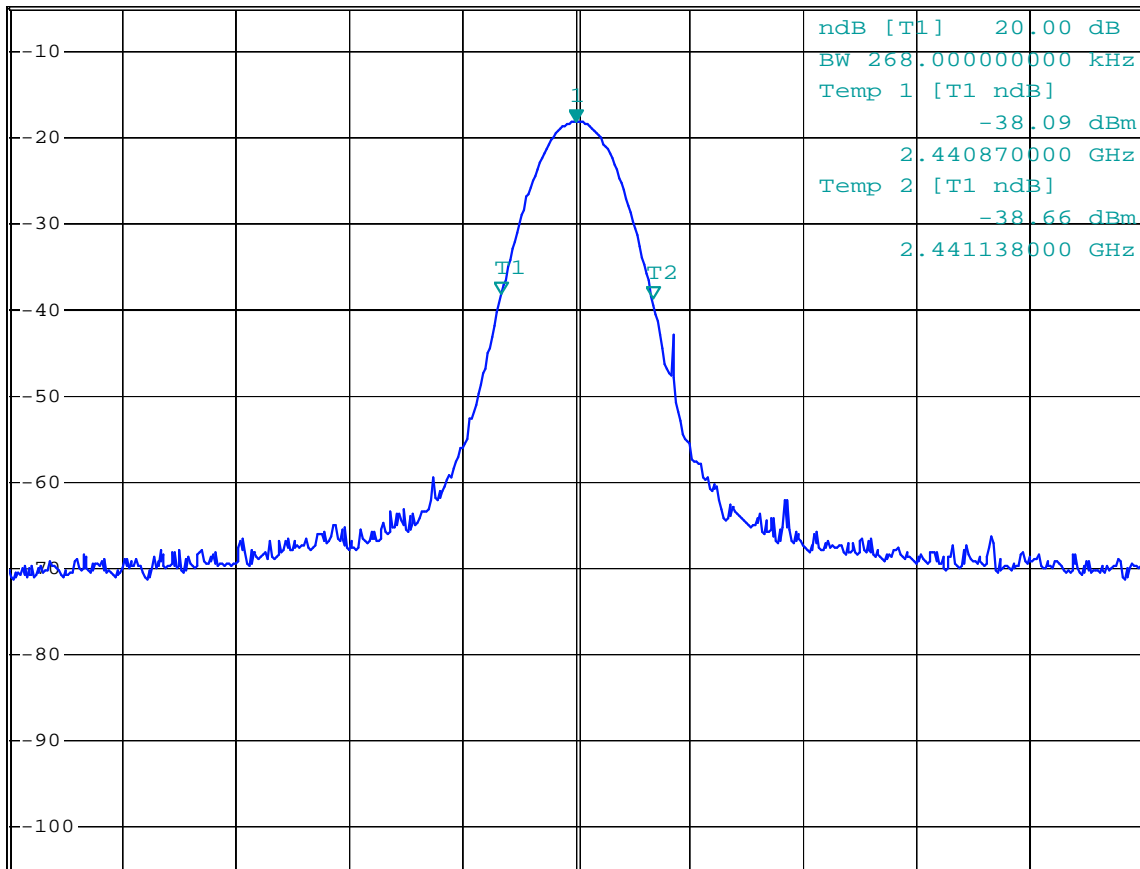
Date: 28.NOV.2007 11:39:10

Middle Channel



*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz -18.20 dBm
Ref -5 dBm *Att 10 dB SWT 2.5 ms 2.441002000 GHz

1 PK
MAXH



Center 2.441002 GHz

200 kHz/

Span 2 MHz

20dB bandwidth-middle channel

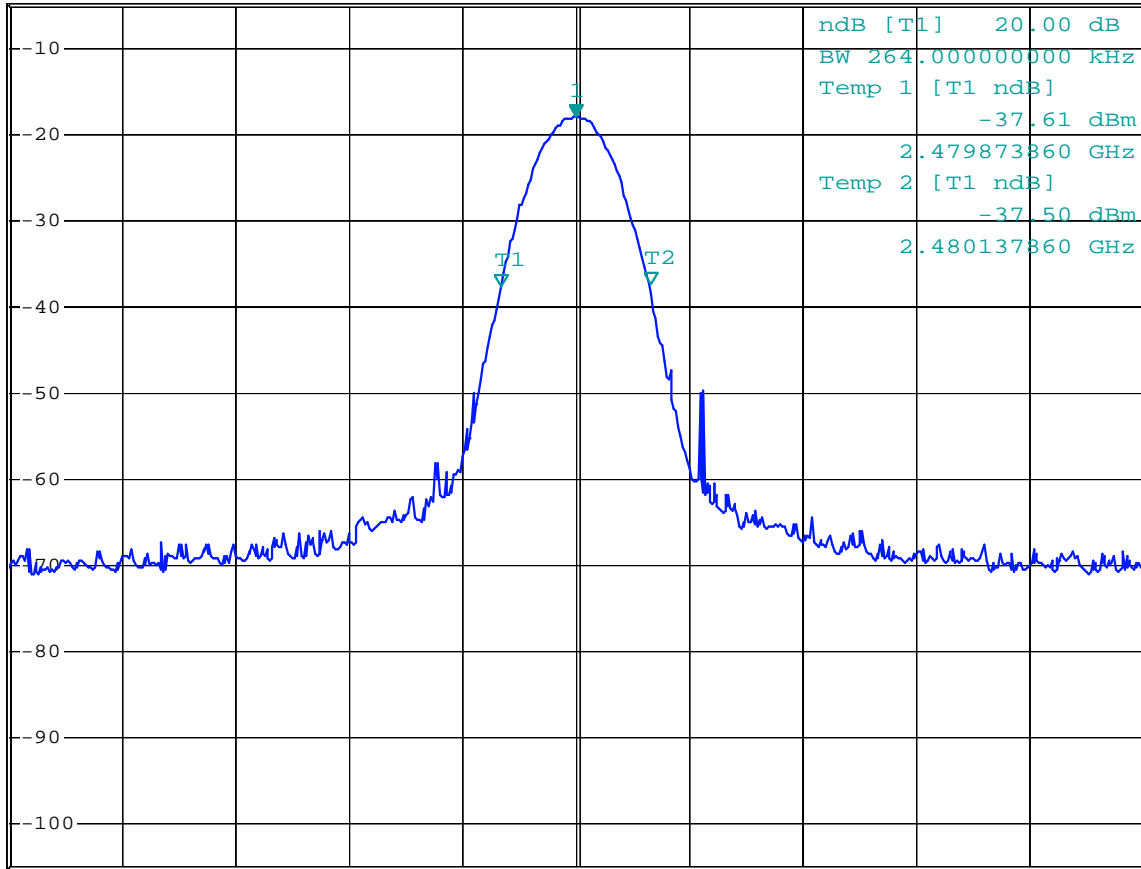
Date: 28.NOV.2007 11:42:10

High Channel



*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz -18.10 dBm
Ref -5 dBm *Att 10 dB SWT 2.5 ms 2.480005860 GHz

1 PK
MAXH



PS

Center 2.48000586 GHz 200 kHz/ Span 2 MHz

20dB bandwidth-high channel

Date: 28.NOV.2007 11:45:51

§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	2007-09-29	2008-09-29

* **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 transmitting 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:	100.0 kPa

The testing was performed by Simon Mo on 2007-12-01.

Test mode: Transmitting

Test Result: Pass

Please refer to following plot



*RBW 100 kHz Delta 2 [T1]

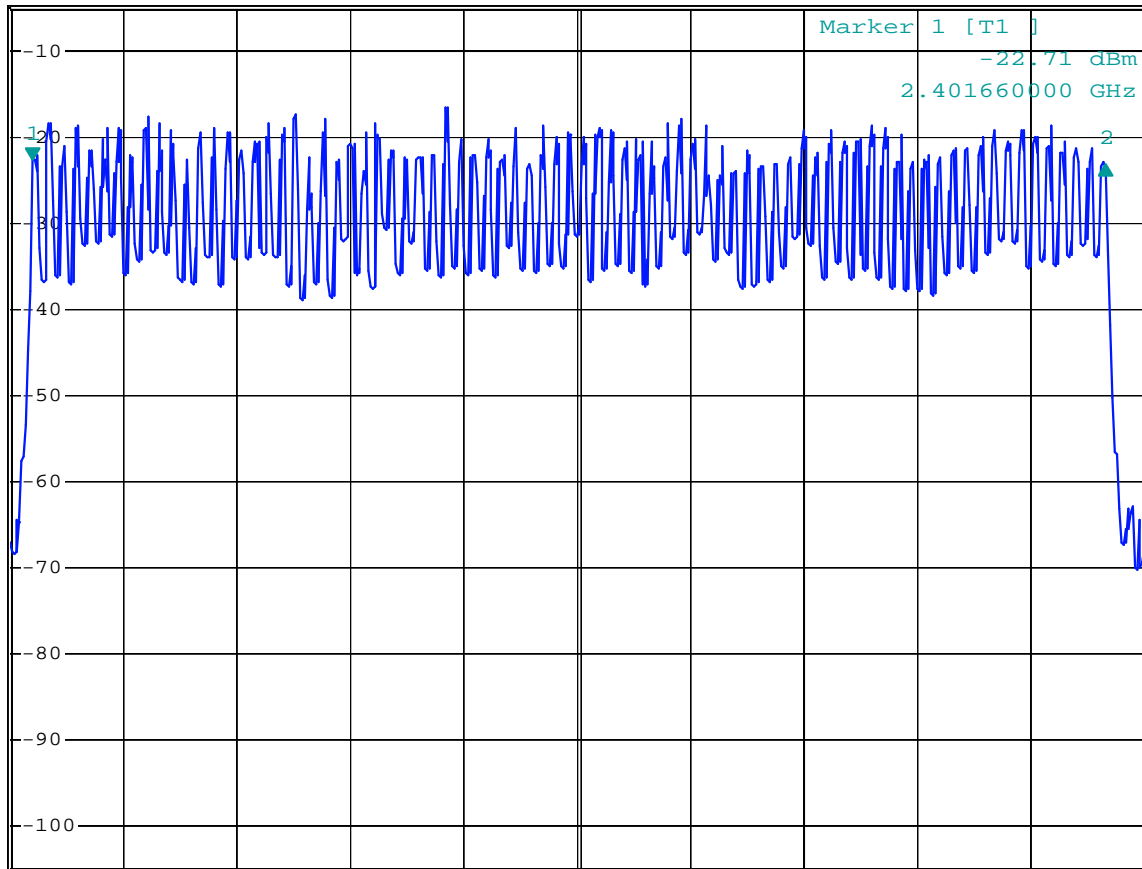
*VBW 300 kHz -0.58 dB

Ref -5 dBm

*Att 10 dB

SWT 10 ms

78.51800000 MHz

1 PK
MAXH

Start 2.4 GHz

8.3 MHz/

Stop 2.483 GHz

hopping channels

Date: 29.NOV.2007 06:56:06

§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	2007-09-29	2008-09-29

* **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:	100.0 kPa

The testing was performed by Simon Mo on 2007-12-01.

Test mode: Transmitting

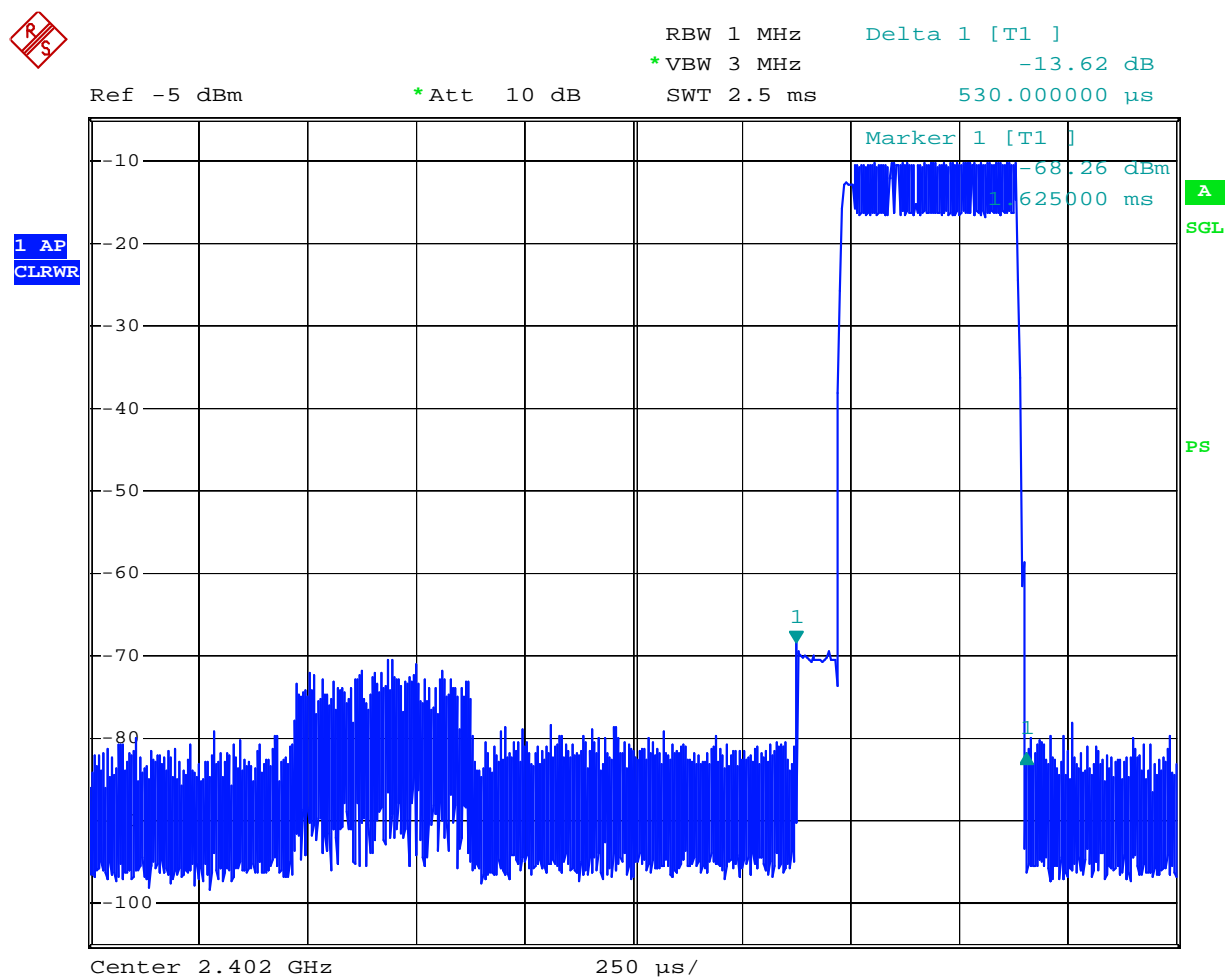
Test Result: Pass

Please refer to following table and plots.

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)
Low Channel	0.53	0.1696	0.4
Mid Channel	0.53	0.1696	0.4
High Channel	0.53	0.1696	0.4

NOTE: Dwell time= Pulse time*(1600/2/79)*31.6S

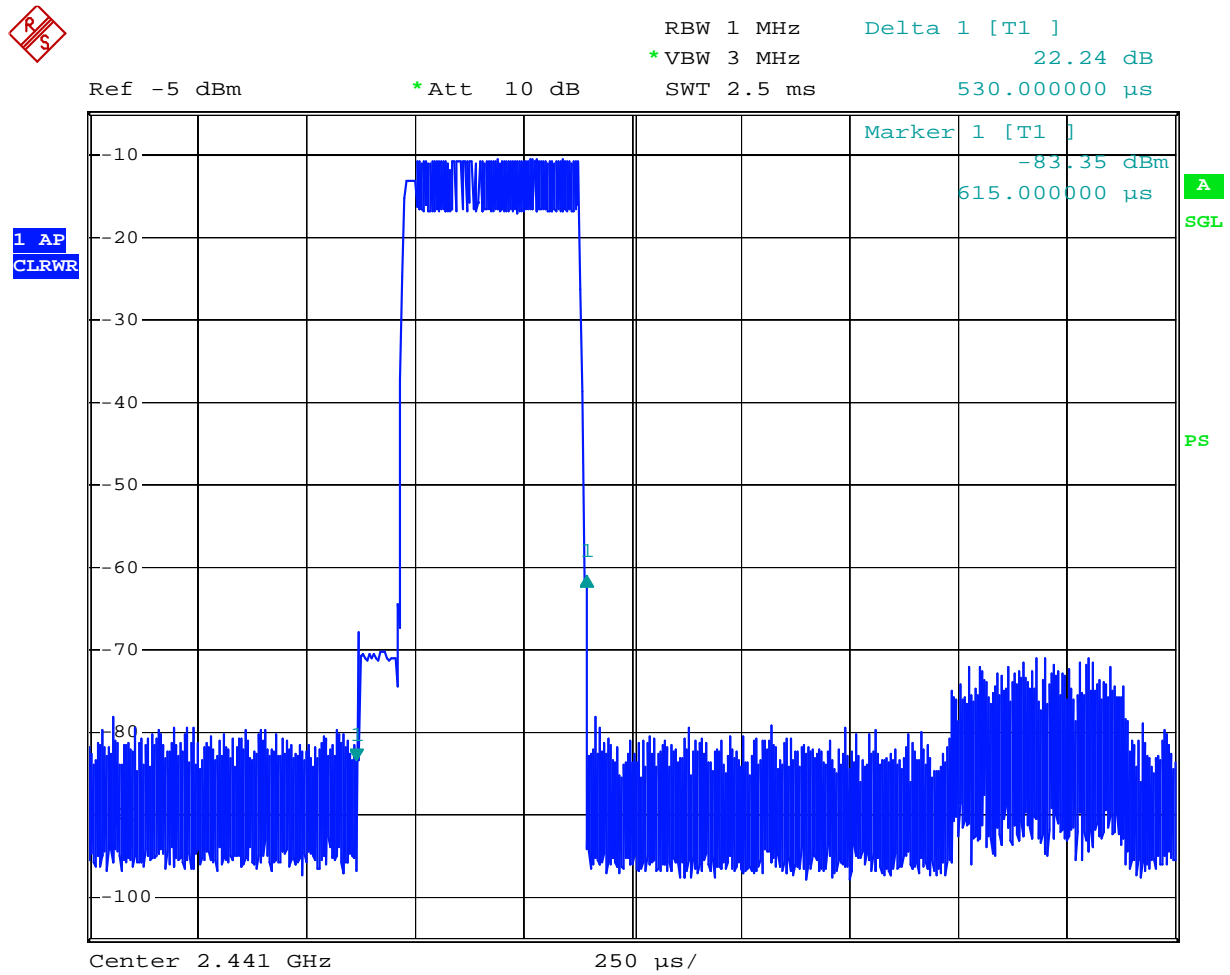
Low Channel



Dwell time low

Date: 29.NOV.2007 09:40:18

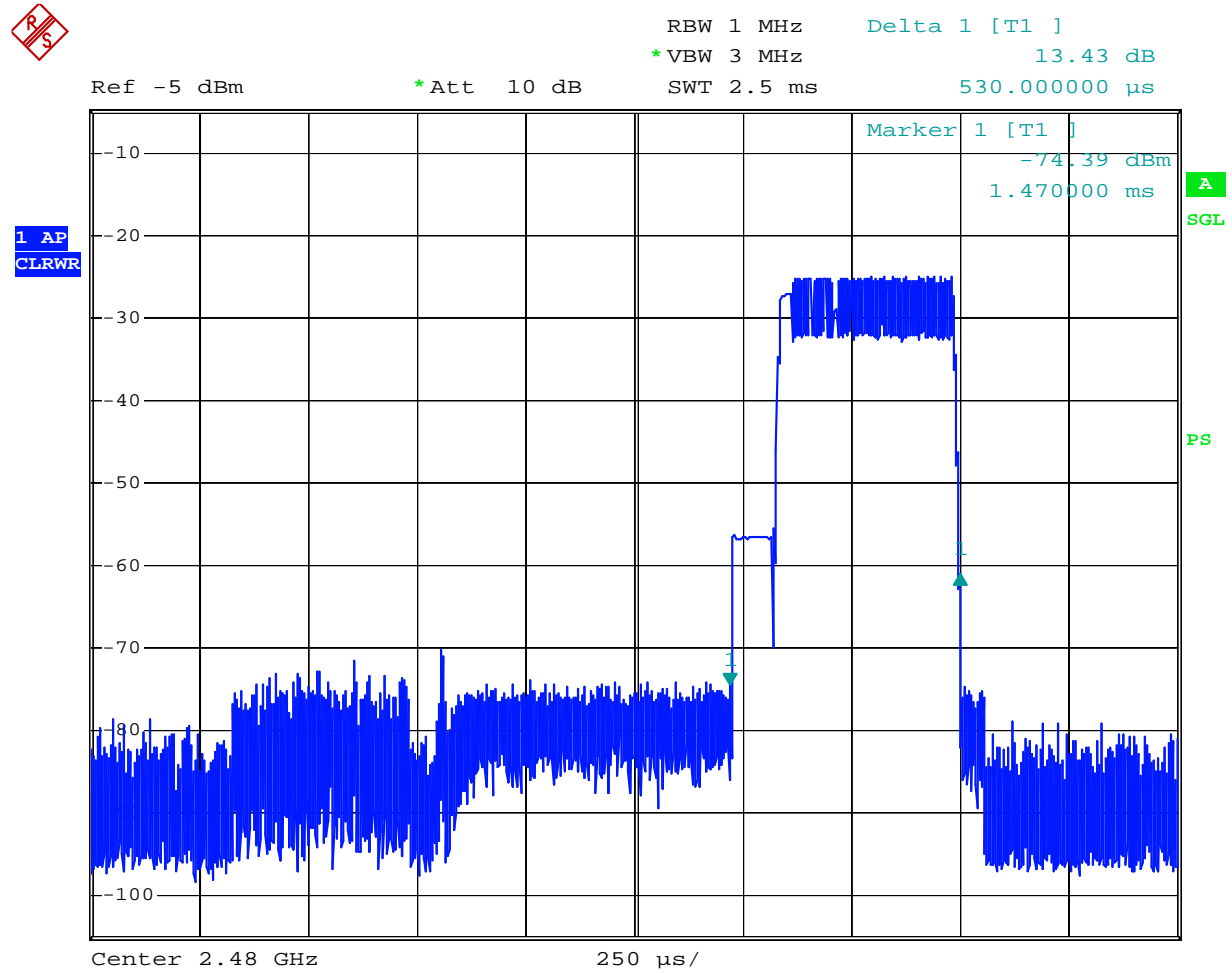
Middle Channel



Dwell time middle

Date: 29.NOV.2007 09:42:36

High Channel



Dwell time high

Date: 29.NOV.2007 09:46:22

§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.

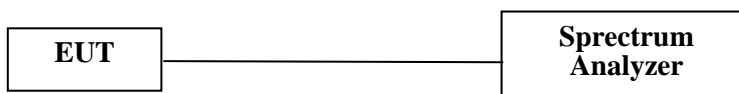
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-09-29	2008-09-29

* **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:	100.0 kPa

The testing was performed by Simon Mo on 2007-12-01.

Test Result: Pass

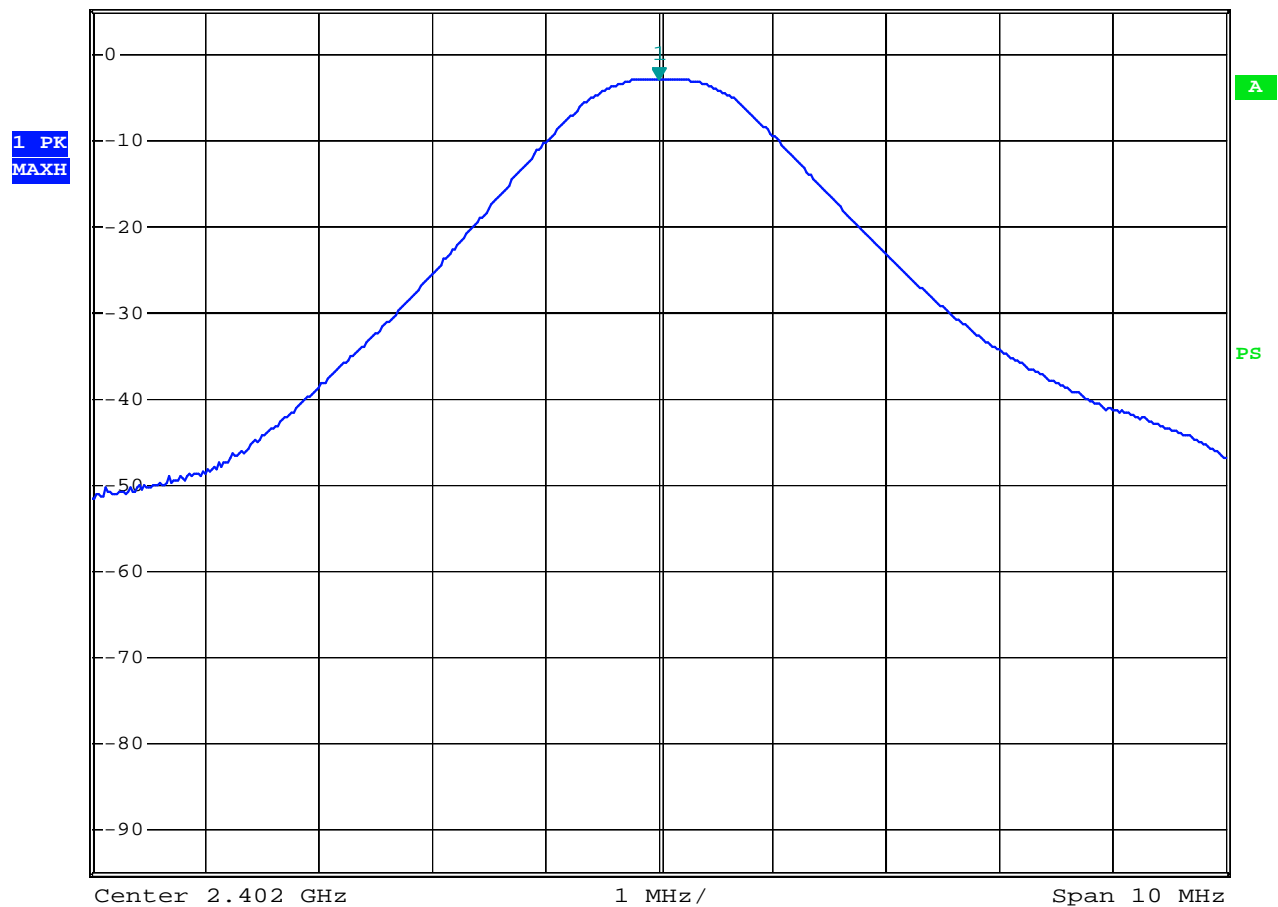
Please refer to the following table and plots.

Channel	Channel Frequency (MHz)	Power Output		Limit (watt)
		(dBm)	(mw)	
Low Channel	2402	-3.02	0.498	1
Mid Channel	2441	-3.53	0.443	1
High Channel	2480	-4.41	0.362	1

Low Channel



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -3.02 dBm
Ref 5 dBm *Att 20 dB SWT 2.5 ms 2.40200000 GHz



output power low channel

Date: 29.NOV.2007 10:16:53

Middle Channel



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -3.53 dBm
SWT 2.5 ms 2.441000000 GHz

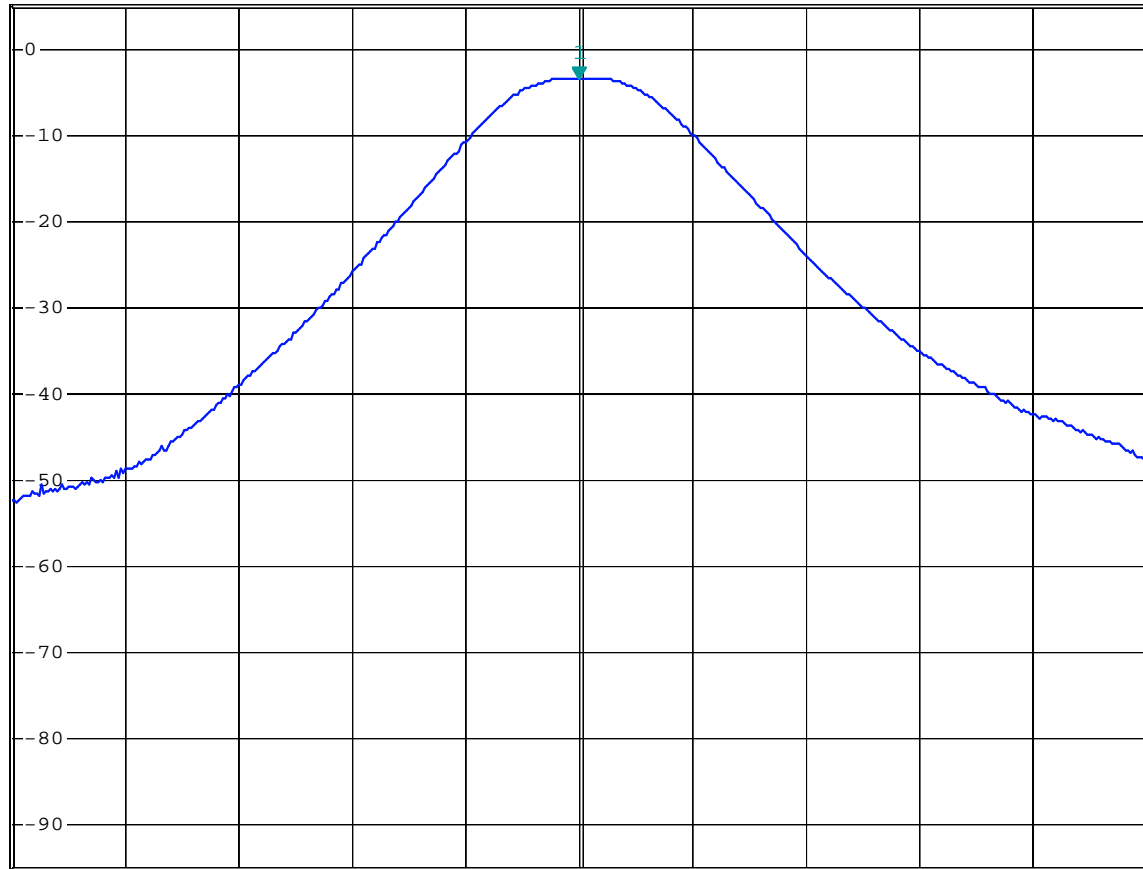
Ref 5 dBm

*Att 20 dB

SWT 2.5 ms

2.441000000 GHz

1 PK
MAXH



Center 2.441 GHz

1 MHz/

Span 10 MHz

output power middle channel

Date: 29.NOV.2007 10:19:04

High Channel

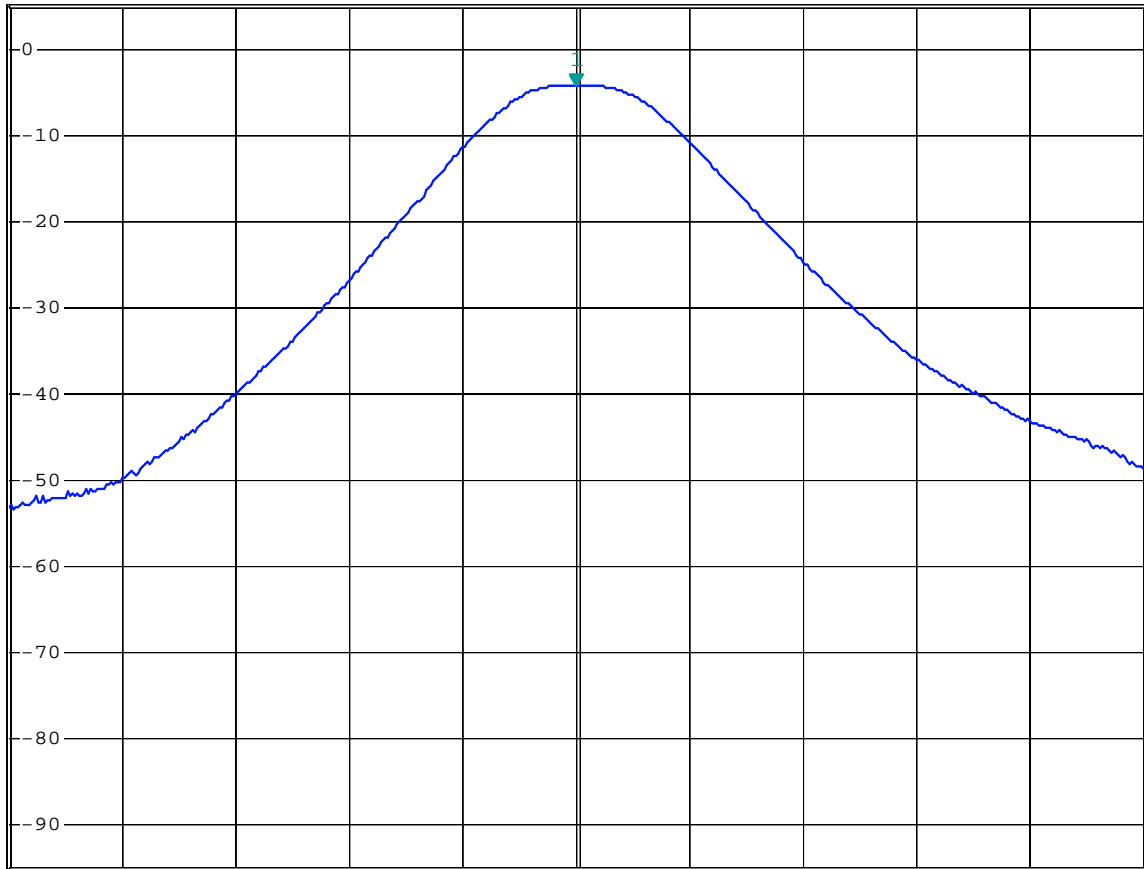


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -4.41 dBm
SWT 2.5 ms 2.48000000 GHz

Ref 5 dBm

*Att 20 dB

1 PK
MAXH



A

PS

Center 2.48 GHz

1 MHz/

Span 10 MHz

output power high channel

Date: 29.NOV.2007 10:23:25

§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	2007-09-29	2008-09-29

* **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 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 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

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

The testing was performed by Simon Mo on 2007-12-01.

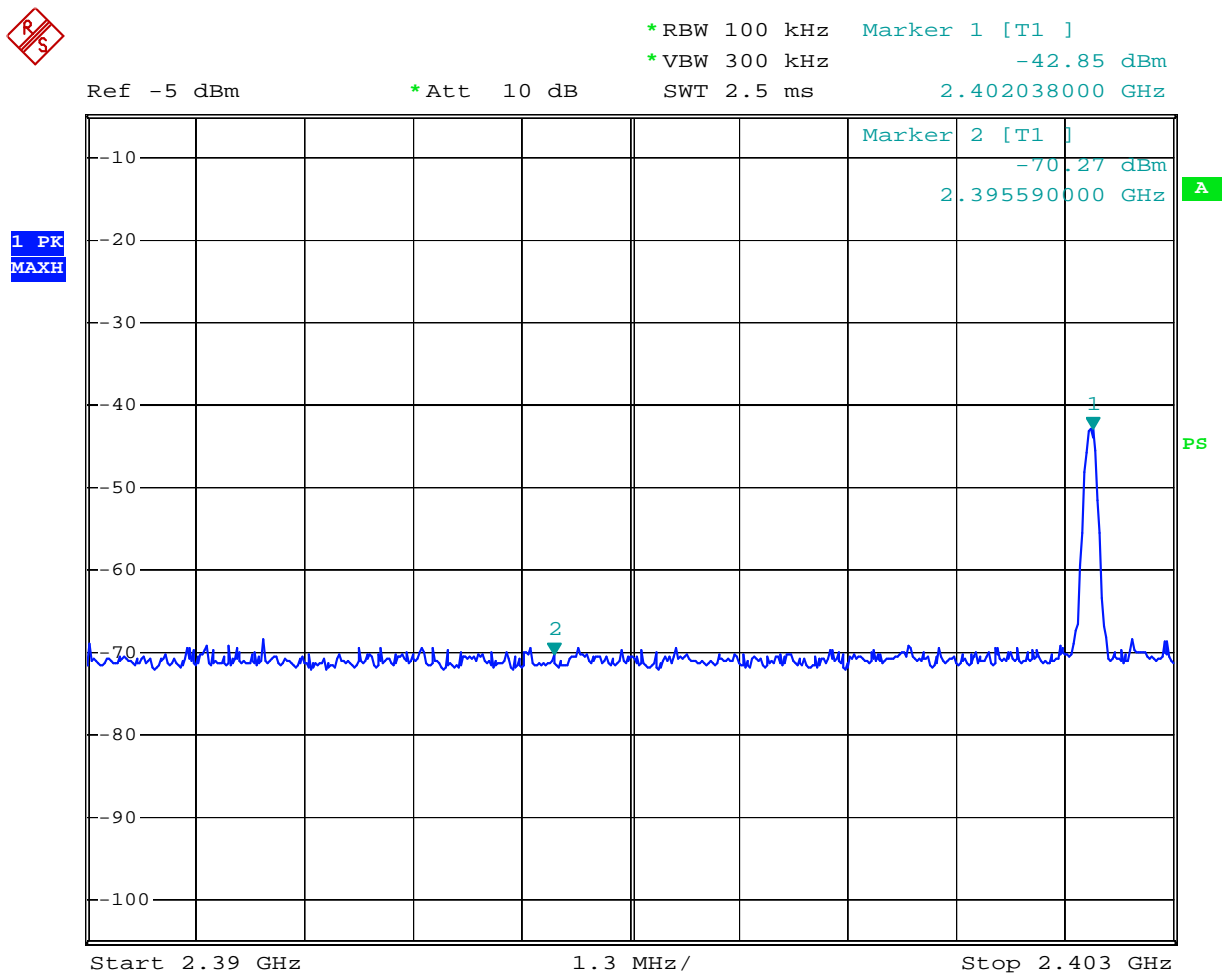
Test Mode: Transmitting

Frequency (MHz)	Attenuation (dBc)	Limit (dBc)
2395.590	27.42	20
2496.052	34.55	20

Note: Attenuation = Highest Peak – Emission Level

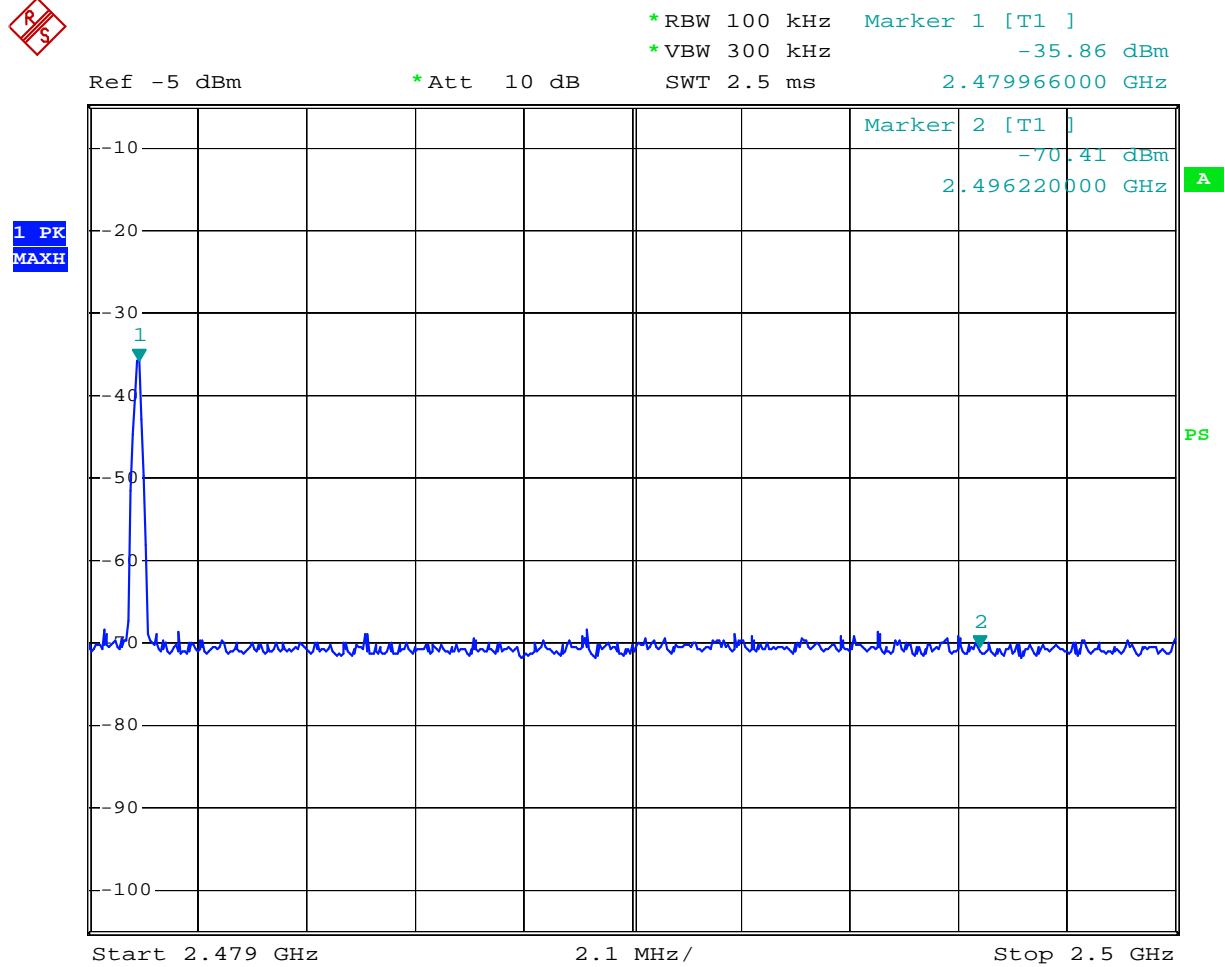
Test Result: Pass

Please refer to the following plots



out of band-left

Date: 28.NOV.2007 11:58:28



out of band-right

Date: 28.NOV.2007 11:56:19

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