

# FCC PART 15.247


## MEASUREMENT AND TEST REPORT

For

### Sunitec Enterprise Co., Ltd.

10F.-1, No. 200, Jingping Rd., Jhonghe City, Taipei Country, Taiwan

**FCC ID: RA8-BH001**

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Original Report		<b>Equipment Type:</b> Bluetooth Mono Headset	
<b>Test Engineer:</b>	King Tang 		
<b>Report No.:</b>	RSZ08041101		
<b>Test Date:</b>	2008-04-23 to 2008-04-25		
<b>Report Date:</b>	2008-04-25		
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**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.

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## GENERAL INFORMATION

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

The *Sunitec Enterprise Co., Ltd.*'s product, model number: *BH670* or the "EUT" as referred to in this report is a *Bluetooth Mono Headset*, which measures approximately: 1.8 cm L x 0.7cm W x 0.3 cm H, input voltage: DC 3.0V Battery .

*\* All measurement and test data in this report was gathered from production sample serial number: 0804022 (Assigned by BAACL, Shenzhen). The EUT was received on 2008-04-11.*

### Objective

This Type approval report is prepared on behalf of *Sunitec Enterprise 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

The special accessories were provided by Bay Area Compliance Laboratories Corp. (Shenzhen).

### Equipment Modifications

No modification was made to the unit tested.

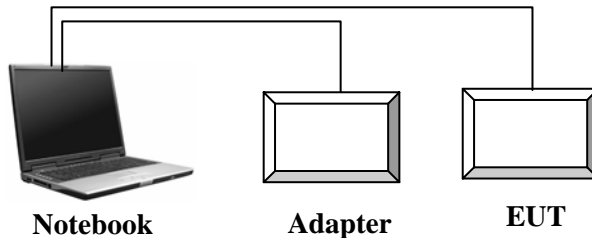
### Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
COMPAQ	Notebook	PP2040	N610Cp180X430VC250	DoC

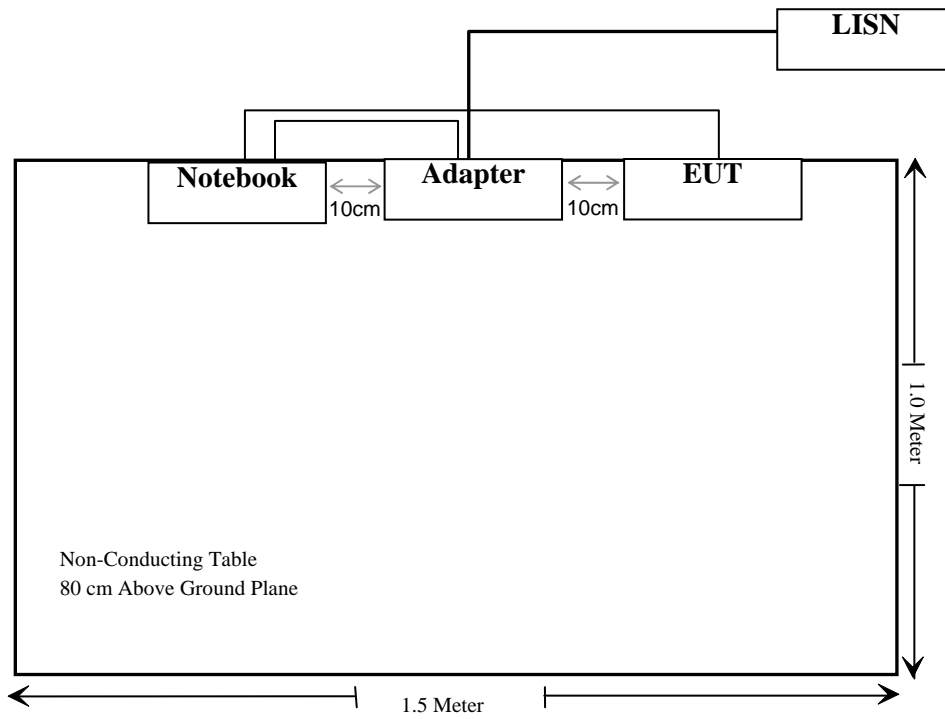
### External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable AC Cable	1.00	Adapter	PC
Unshielded Detachable USB Cable	1.10	EUT	PC

### Configuration of Test Setup



### Block Diagram of Test Setup



## SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
CFR47 §15.247 (i), §1.1307 (b)(1)	RF exposure	Compliant
CFR47 §15.203	Antenna Requirement	Compliant
CFR47 §15.207 (a)	Conducted Emissions	N/A*
CFR47 §15.205, §15.209, §15.247(d)	Radiated Emission	Compliant
CFR47 §15.247 (a)(1)	20 dB Bandwidth	Compliant
CFR47 §15.247(a)(1)	Channel Separation Test	Compliant
CFR47 §15.247(a)(1)(iii)	Time of occupancy (Dwell Time)	Compliant
CFR47 §15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
CFR47 §15.247(b)(1)	Peak Output Power Measurement	Compliant
CFR47 §15.247(d)	Band edges	Compliant

\*: This EUT is battery operation.



## CFR47 §15.247 (i) and §1.1310 §2.1093 - RF EXPOSURE

### Standard Applicable

According to CFR47 § 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, fGHz 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  $2.296 \text{ mW} < 24.58 \text{ mW} = (60/2.440\text{Hz}) \text{ mW}$

The SAR measurement is not necessary.

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**CFR47 §15.203 - ANTENNA REQUIREMENT**

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**Standard Applicable**

According to CFR47 § 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 an attached antenna on PCB. The maximum gain is -3.18 dBi, please refer to the internal photos.

**Result:** Compliance.

## CFR47 §15.205, §15.209, §15.247 - RADIATED EMISSIONS

### Applicable Standard

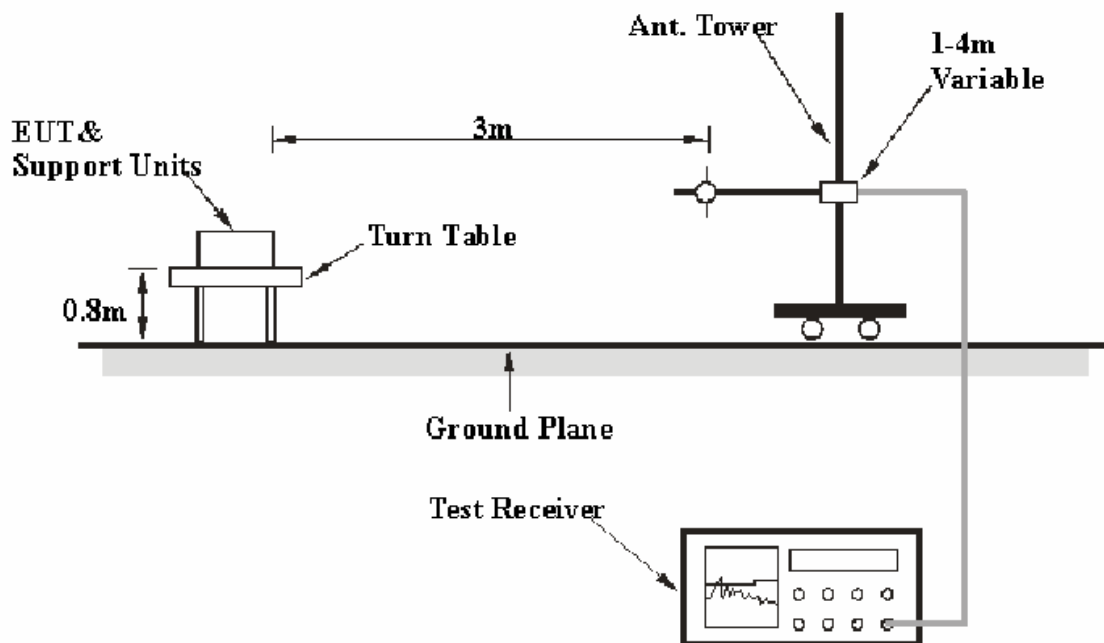
CFR47 §15.205; §15.209; §15.247 (d).

### 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  $\pm 4.0$  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.

## 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	2007-10-16	2008-10-16
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2008-03-11	2009-03-11
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 adapter was 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-1GHz and peak and Average detection modes for frequencies above 1GHz.

## Corrected Amplitude & Margin Calculation

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

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 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:

### Transmitting mode (30 – 1000 MHz):

**12.2 dB** at **897.222875 MHz** in the **Vertical** polarization

### Transmitting mode (Above 1 GHz):

**6.06 dB** at **4804 MHz** in the **Horizontal** polarization (**Low Channel**)

**7.60 dB** at **4882 MHz** in the **Vertical** polarization (**Middle Channel**)

**4.48 dB** at **4960 MHz** in the **Vertical** polarization (**High Channel**)

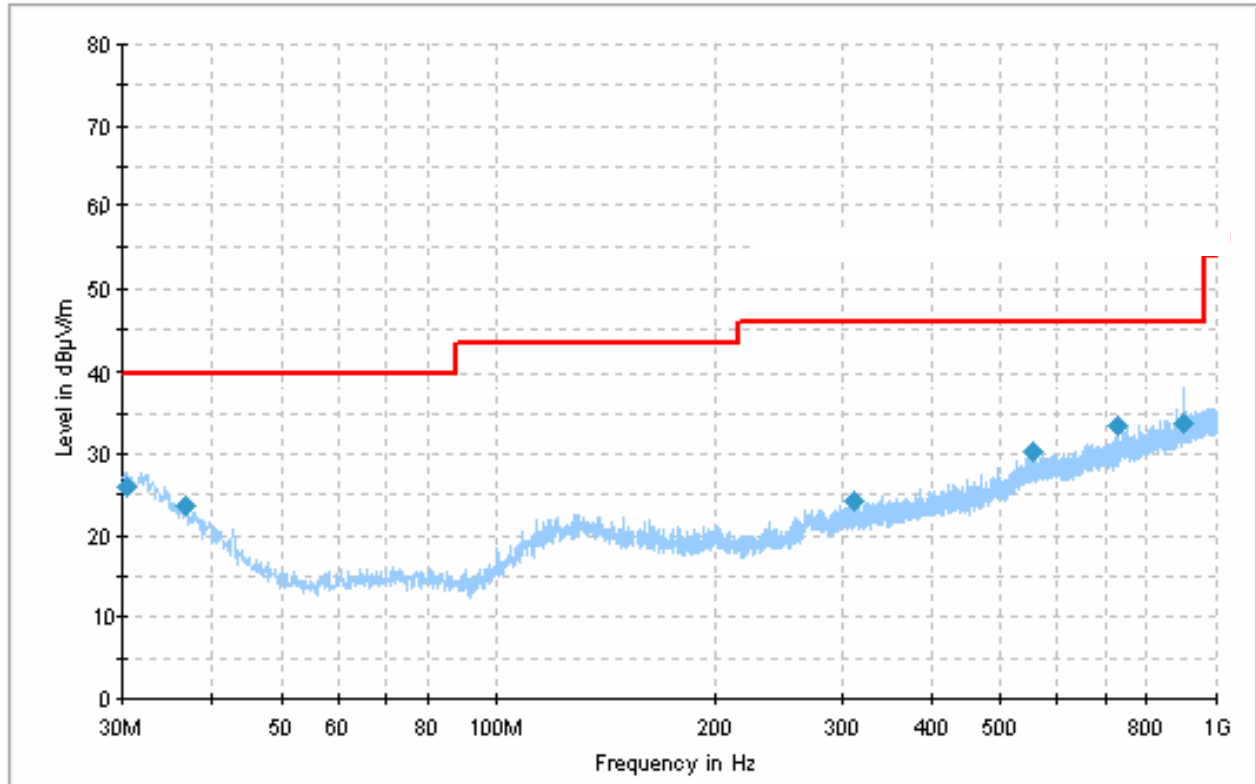
## Test Data

### Environmental Conditions

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

*The testing was performed by King Tang on 2008-04-25*

Test Mode: Transmitting (30 – 1000 MHz)



Frequency (MHz)	Corrected Amp. (dBµV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
897.222875	33.8	163.0	V	1.0	1.2	46.0	12.2
727.066250	33.4	173.0	H	1.0	0.4	46.0	12.6
30.408938	25.9	232.0	V	1.0	-4.3	40.0	14.1
554.794438	30.2	312.0	H	3.0	-3.9	46.0	15.8
36.792125	23.7	155.0	H	1.0	-8.8	40.0	16.3
312.997500	24.3	215.0	V	2.0	-5.1	46.0	21.7

Test Mode: Transmitting (Above 1GHz)

Freq. (MHz)	Meter Reading (dBuV)	Detector PK/QP/AV	Direction Degree	Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Corr. Amp. (dBuV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBuV/m)	Margin (dB)	Remarks
<b>Low Channel (2402 MHz)</b>												
4804	42.10	AV	90	1.5	H	34.6	4.64	33.4	47.94	54	6.06	Harmonic
4804	41.20	AV	300	1.2	V	34.7	4.64	33.4	47.14	54	6.86	Harmonic
1298	44.12	AV	200	1.4	H	24.5	1.14	35.2	34.56	54	19.44	Spurious
4804	47.51	PK	45	1.5	H	34.6	4.64	33.4	53.35	74	20.65	Harmonic
4804	46.10	PK	210	1.3	V	34.7	4.64	33.4	52.04	74	21.96	Harmonic
1298	41.36	AV	0	1.4	V	24.5	1.14	35.2	31.8	54	22.2	Spurious
1298	48.92	PK	360	1.5	V	24.5	1.14	35.2	39.36	74	34.64	Spurious
1298	45.23	PK	162	1.1	H	24.5	1.14	35.2	35.67	74	38.33	Spurious
<b>Middle Channel (2441 MHz)</b>												
4882	40.56	AV	360	1.1	V	34.6	4.64	33.4	46.4	54	7.60	Harmonic
4882	40.25	AV	70	1.5	H	34.7	4.64	33.4	46.19	54	7.81	Harmonic
4882	49.61	PK	80	1.4	H	34.7	4.64	33.4	55.55	74	18.45	Harmonic
4882	48.21	PK	320	1.0	V	34.6	4.64	33.4	54.05	74	19.95	Harmonic
1589	40.26	AV	45	1.3	V	24.5	1.24	35.2	30.8	54	23.2	Spurious
1589	37.82	AV	250	1.4	H	24.5	1.24	35.2	28.36	54	25.64	Spurious
1589	49.66	PK	0	1.2	V	24.5	1.24	35.2	40.2	74	33.8	Spurious
1589	46.30	PK	120	1.5	H	24.5	1.24	35.2	36.84	74	37.16	Spurious
<b>High Channel (2480 MHz)</b>												
4960	43.67	AV	250	1.3	V	34.7	4.55	33.4	49.52	54	4.48	Harmonic
4960	42.38	AV	120	1.4	H	34.6	4.55	33.4	48.13	54	5.87	Harmonic
1937	46.38	AV	220	1.5	H	24.5	1.36	35.1	37.14	54	16.86	Spurious
4960	49.62	PK	90	1.4	V	34.7	4.55	33.4	55.47	74	18.53	Harmonic
4960	48.61	PK	45	1.3	H	34.6	4.55	33.4	54.36	74	19.64	Harmonic
1937	43.58	AV	90	1.3	V	24.5	1.36	35.1	34.34	54	19.66	Spurious
1937	47.98	PK	360	1.2	V	24.5	1.36	35.1	38.74	74	35.26	Spurious
1937	47.59	PK	90	1.5	H	24.5	1.36	35.1	38.35	74	35.65	Spurious

## CFR47 §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	2007-10-16	2008-10-16

\* **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

<b>Temperature:</b>	27 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9 kPa

*The testing was performed by King Tang on 2008-04-23.*



*Test Mode: Transmitting*

Channel	Channel Frequency (MHz)	Channel Separation (kHz)	Limit (kHz)	Result
Low Channel	2402	1008	565.33	Pass
Adjacent Channel	2403			
Mid Channel	2441	1012	560	Pass
Adjacent Channel	2442			
High Channel	2480	1004	562.66	Pass
Adjacent Channel	2479			

**Test Result:** Compliance.

Please refer to following plots

### Low Channel

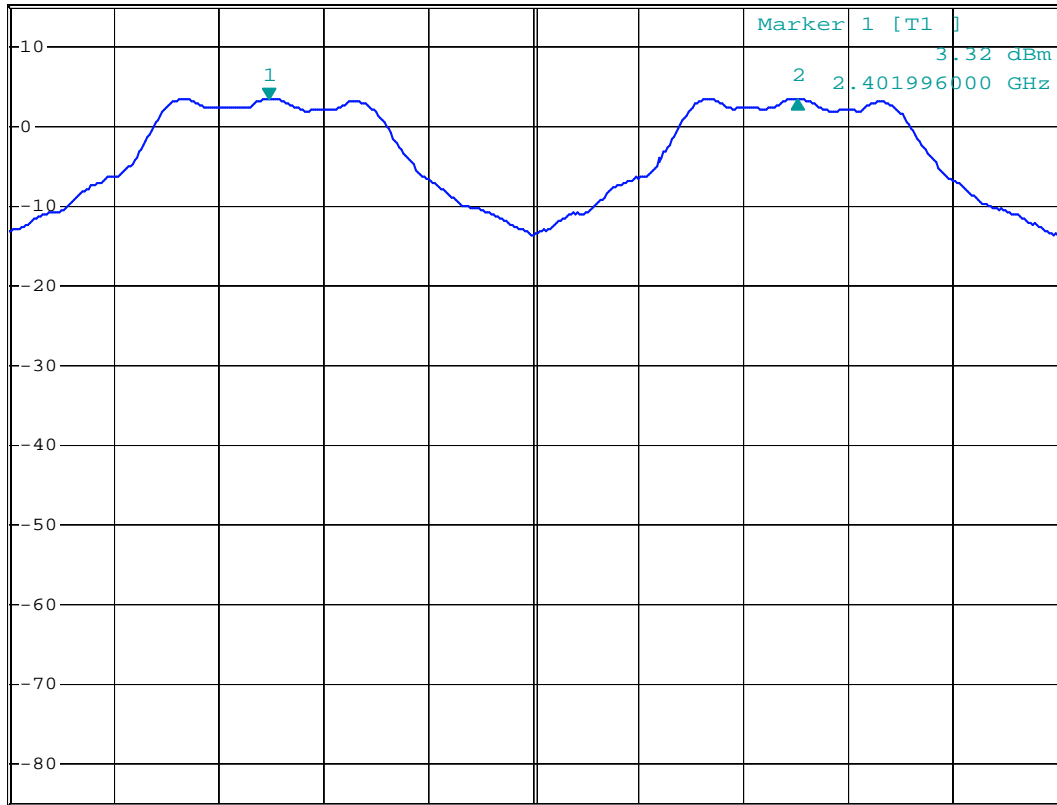


\*RBW 100 kHz Delta 2 [T1 ]  
\*VBW 300 kHz -0.04 dB  
SWT 2.5 ms 1.008000000 MHz

Ref 15 dBm

\*Att 30 dB

1 PK  
MAXH



A

PS

Center 2.4025 GHz

200 kHz/

Span 2 MHz

channel separation low channel

Date: 23.APR.2008 08:58:06

### Middle Channel

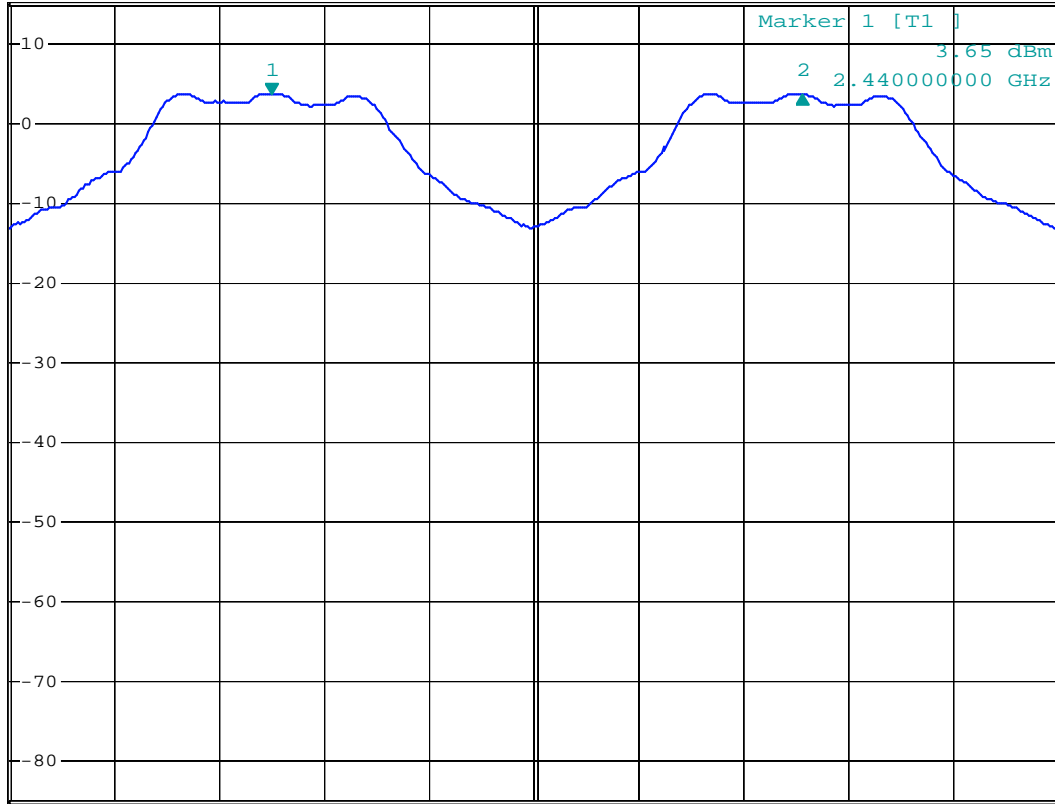


\*RBW 100 kHz Delta 2 [T1 ]  
\*VBW 300 kHz -0.05 dB  
SWT 2.5 ms 1.012000000 MHz

Ref 15 dBm

\*Att 30 dB

1 PK  
MAXH



Center 2.4405 GHz 200 kHz/ Span 2 MHz

channel separation middle channel

Date: 23.APR.2008 09:00:07

### High Channel

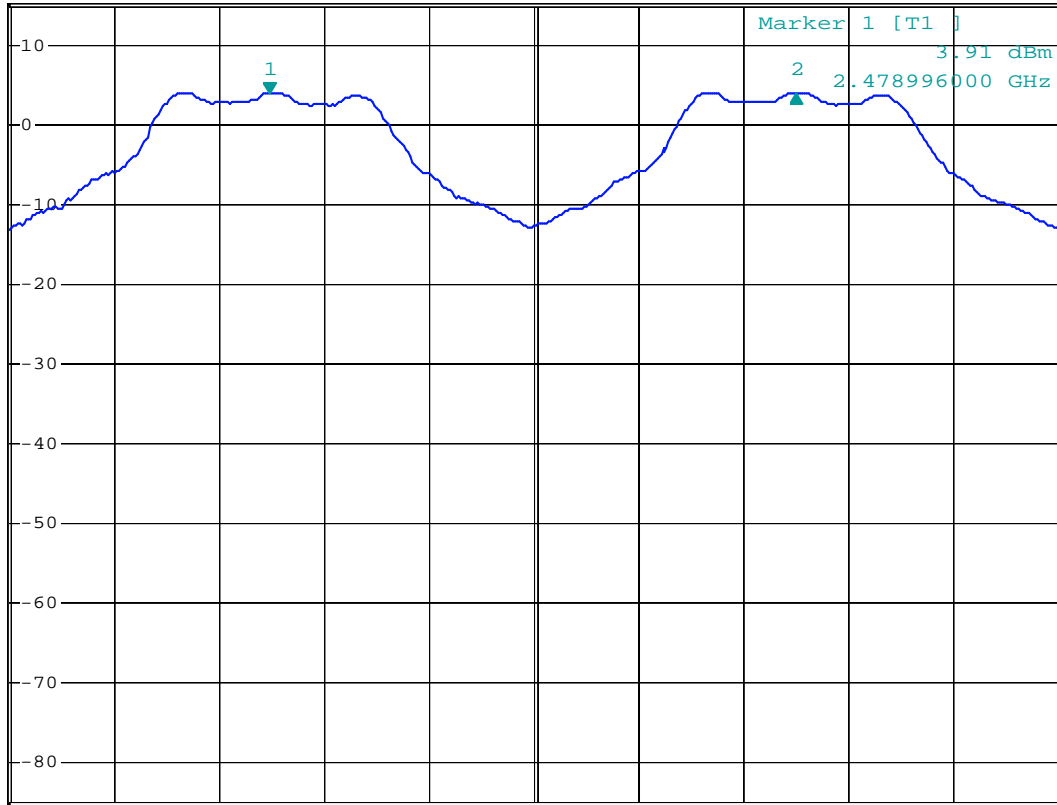


\*RBW 100 kHz Delta 2 [T1 ]  
\*VBW 300 kHz 0.01 dB  
SWT 2.5 ms 1.004000000 MHz

Ref 15 dBm

\*Att 30 dB

1 PK  
MAXH



Center 2.4795 GHz

200 kHz/

Span 2 MHz

channel separation high channel

Date: 23.APR.2008 09:02:22

## CFR47 §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	2007-10-16	2008-10-16

\* **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

<b>Temperature:</b>	27 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9 kPa

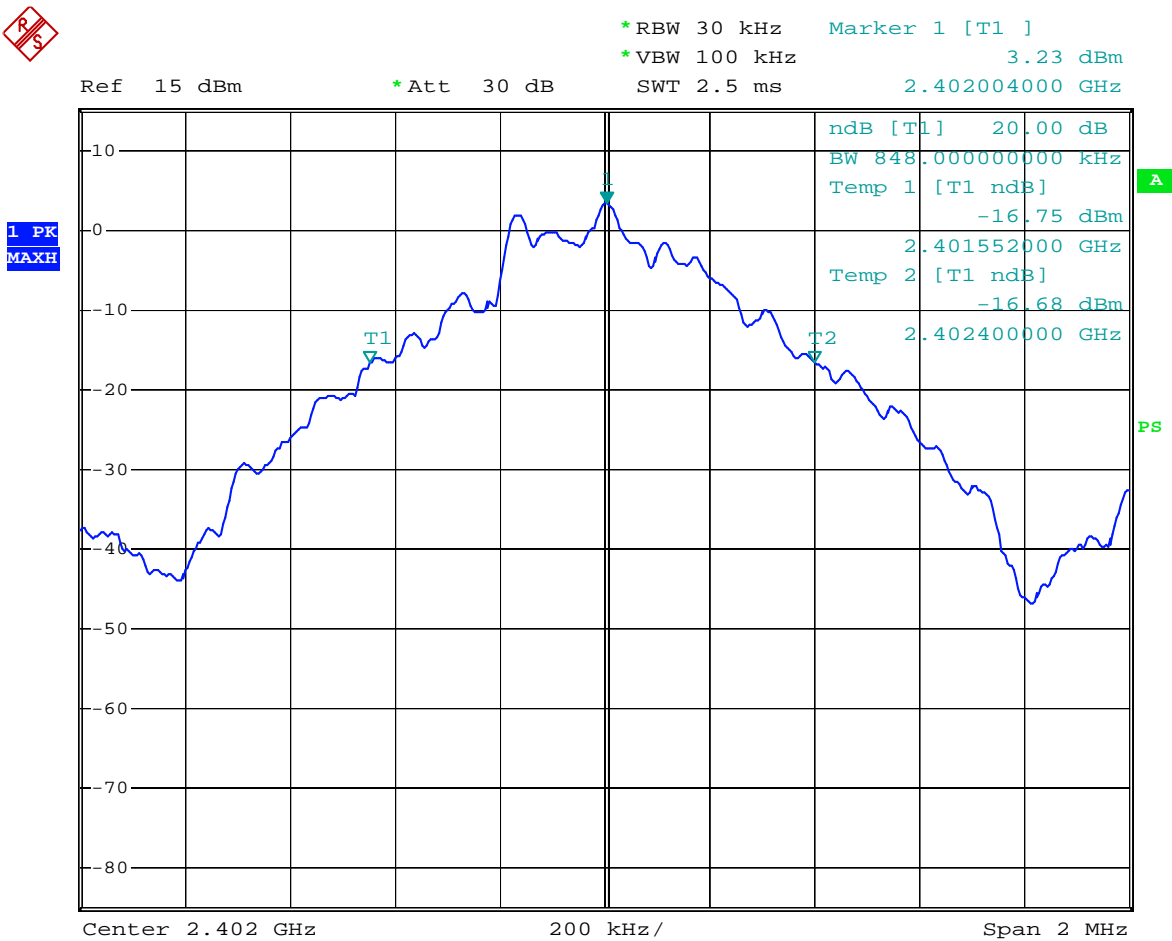
*The testing was performed by King Tang on 2008-04-23.*

**Test Result:** Please refer to the following table and plots.

*Test Mode: Transmitting*

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)
Low	2402	848
Middle	2441	840
High	2480	844

**Low Channel**



20db bandwidth low channel

Date: 23.APR.2008 08:47:27

### Middle Channel

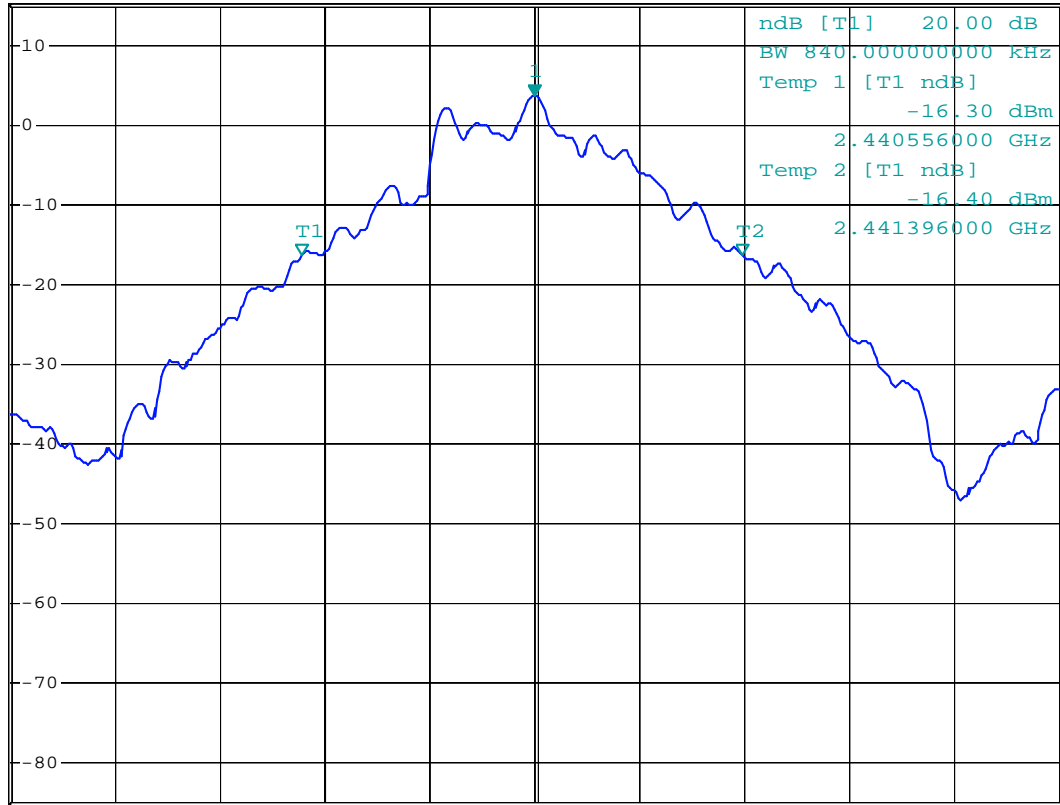


\*RBW 30 kHz    Marker 1 [T1 ]    3.54 dBm  
\*VBW 100 kHz  
SWT 2.5 ms    2.441000000 GHz

Ref 15 dBm

\*Att 30 dB

1 PK  
MAXH



Center 2.441 GHz

200 kHz/

Span 2 MHz

20db bandwidth middle channel

Date: 23.APR.2008 08:48:51

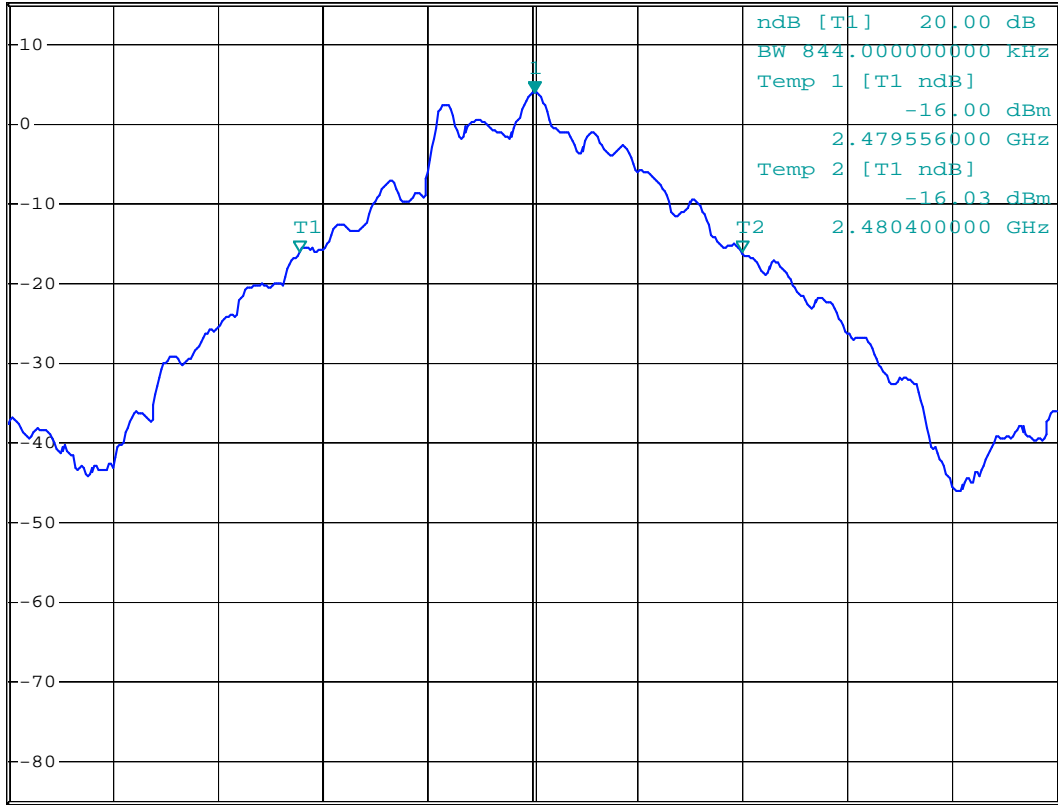
### High Channel



\*RBW 30 kHz      Marker 1 [T1 ]  
\*VBW 100 kHz      3.87 dBm  
SWT 2.5 ms      2.480004000 GHz

Ref 15 dBm      \*Att 30 dB

1 PK  
MAXH



Center 2.48 GHz      200 kHz/      Span 2 MHz

20db bandwidth high channel

Date: 23.APR.2008 08:49:37



## CFR47 §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	2007-10-16	2008-10-16

\* **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

<b>Temperature:</b>	27 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9 kPa

*The testing was performed by King Tang on 2008-04-23.*

*Test Mode: Transmitting*

**Test Result:** Compliance.

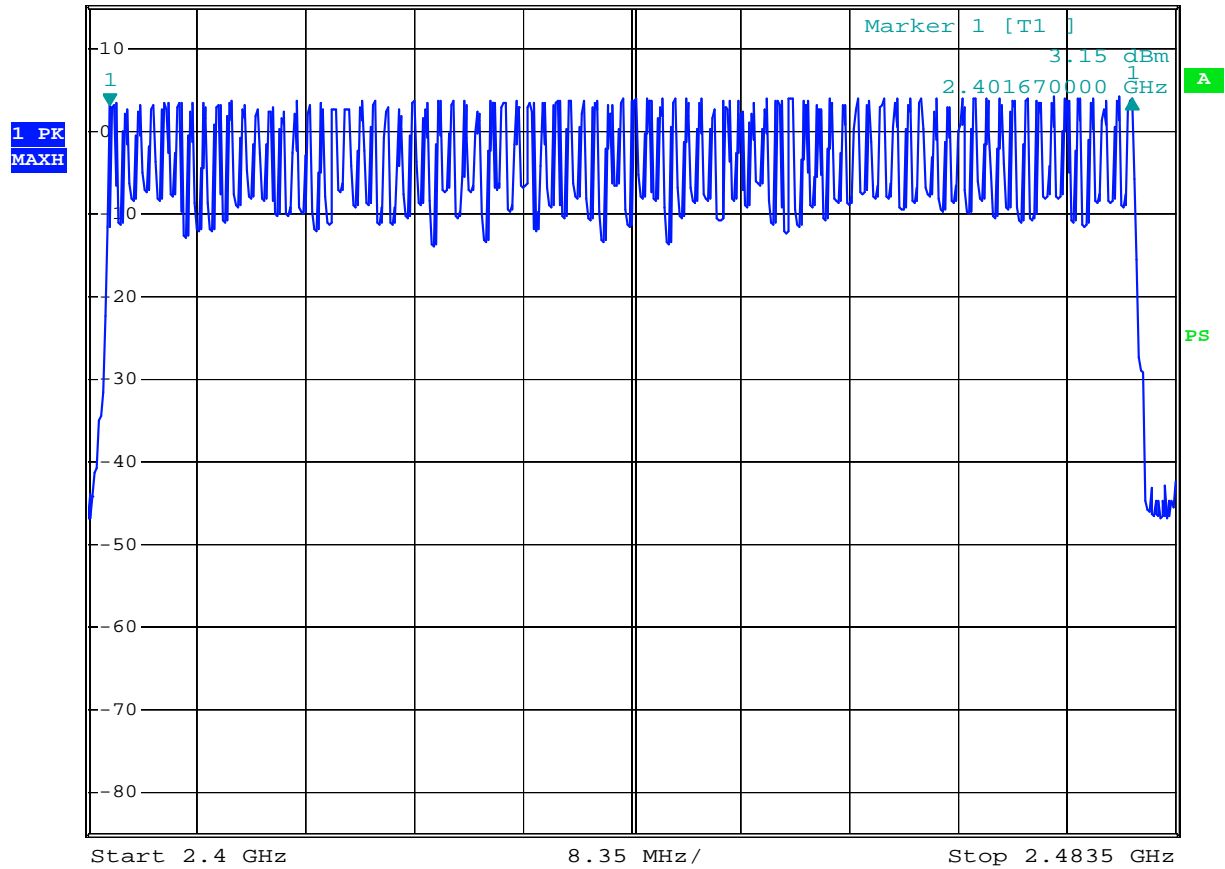
Please refer to following plot.

Frequency Range (MHz)	Number of Hopping Channel	Limit
2402-2480	79	>15

### Number of Hopping Channels



Ref 15 dBm      \*Att 30 dB      SWT 10 ms      78.49000000 MHz  
\*RBW 100 kHz      Delta 1 [T1 ]  
\*VBW 300 kHz      0.73 dB



hopping channels

Date: 23.APR.2008 09:28:02

**CFR47 §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	2007-10-16	2008-10-16

\* **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**

<b>Temperature:</b>	27 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9 kPa

*The testing was performed by King Tang on 2008-04-23.*

*Test Mode: Transmitting*

**Test Result:** Compliance. Please refer to following tables and plots

Channel	Pulse width (msec)	Dwell time (sec)	Limit (sec)	Result
Low	0.54	0.1728	0.4	Pass
Middle	0.535	0.1696	0.4	Pass
High	0.535	0.1696	0.4	Pass

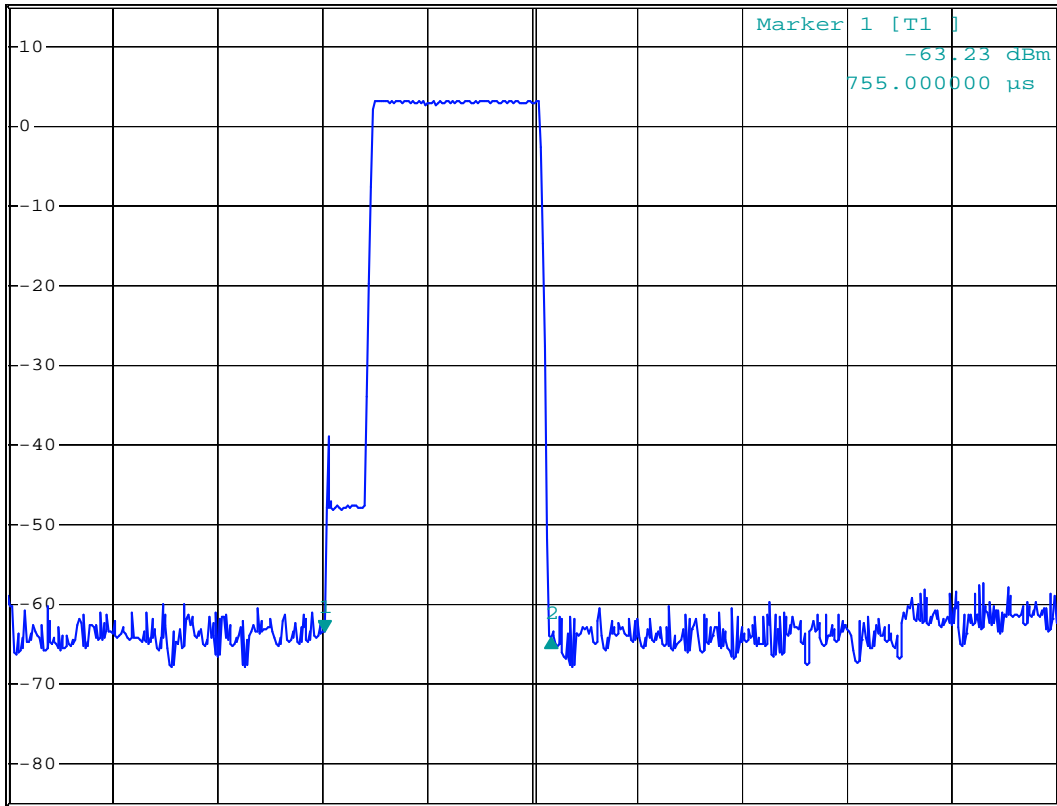
**NOTE:** Dwell time=Pulse width (ms) × (1600 ÷ 2 ÷ 79) × 31.6 Second

### Low Channel



Ref 15 dBm      \*Att 30 dB      RBW 1 MHz      Delta 2 [T1 ]  
\*VBW 3 MHz      -0.91 dB  
SWT 2.5 ms      540.000000 μs

1 PK \*  
CLRWR



Center 2.402 GHz      250 μs/

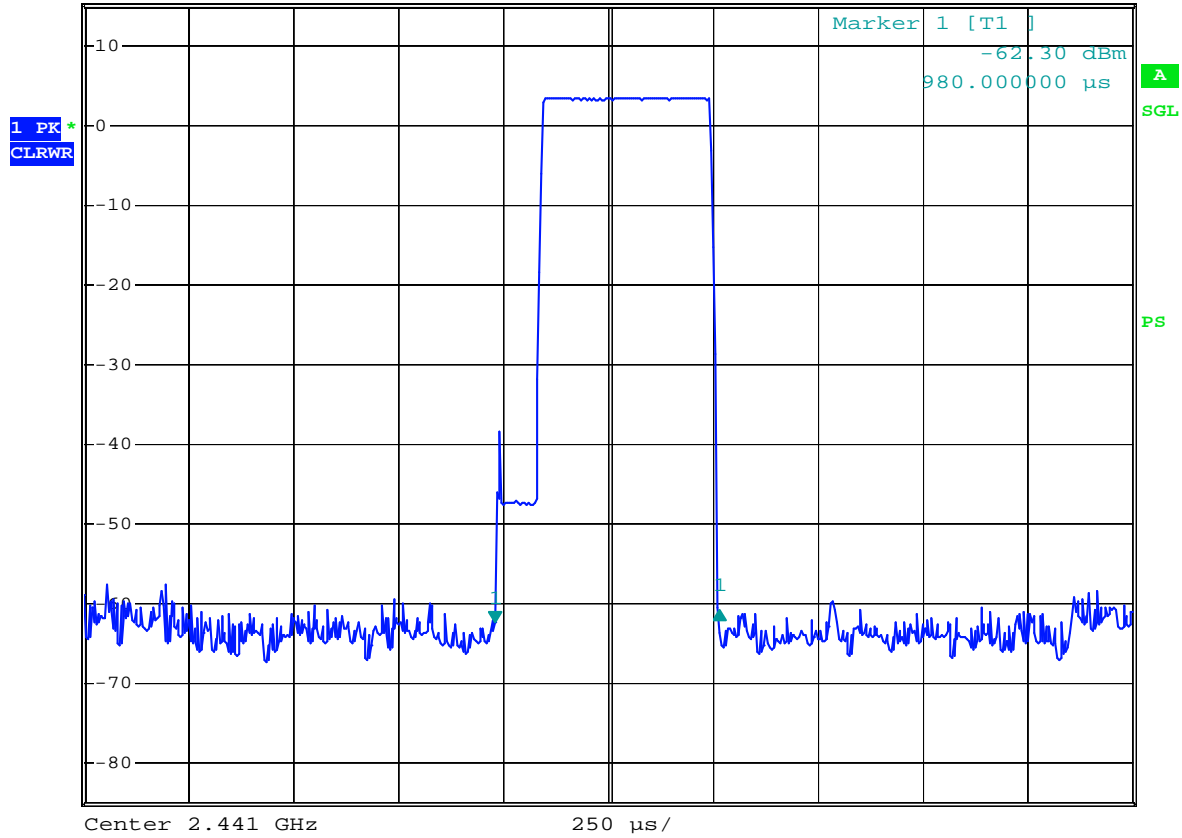
dwll time low channel

Date: 23.APR.2008 09:10:44

### Middle Channel



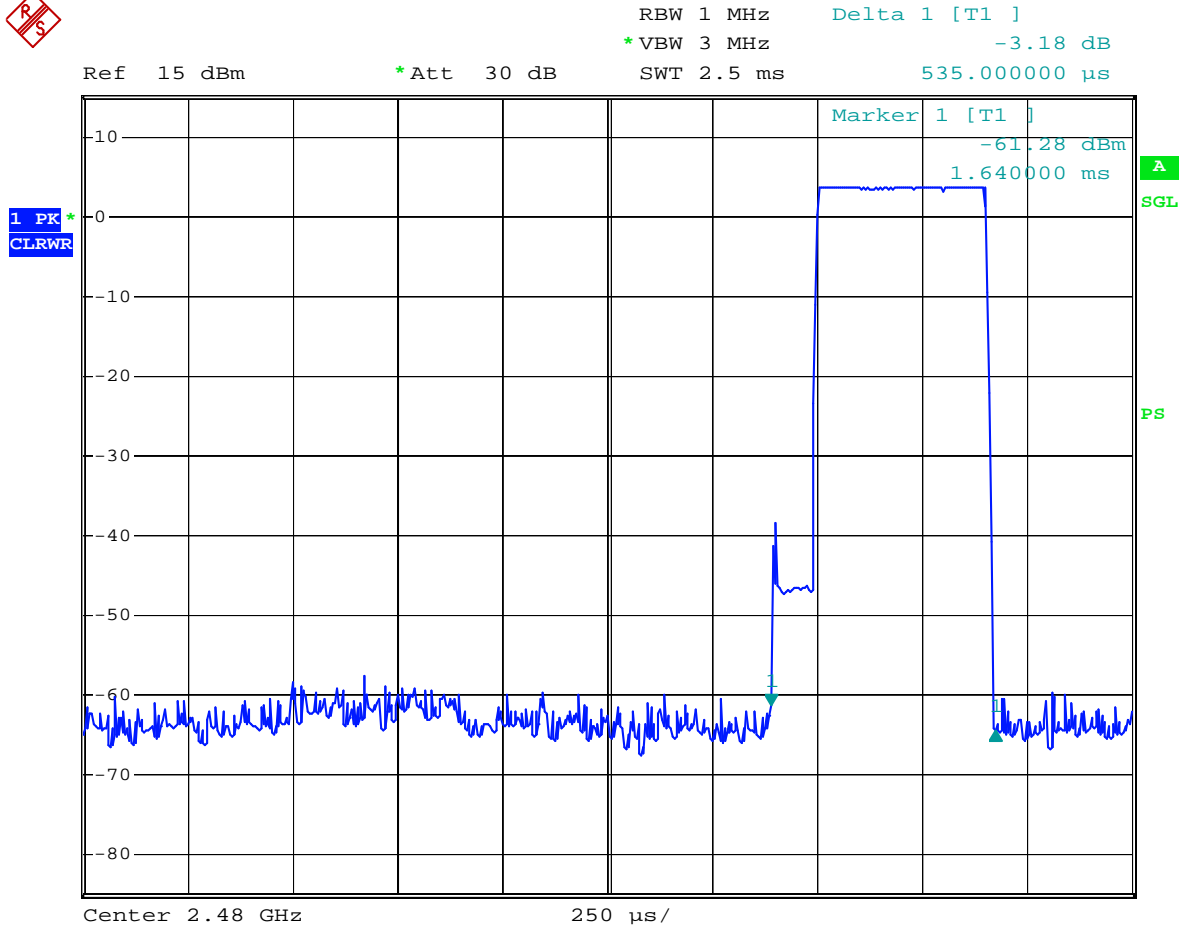
Ref 15 dBm      \*Att 30 dB      RBW 1 MHz      Delta 1 [T1 ]  
\*VBW 3 MHz      1.67 dB  
SWT 2.5 ms      535.000000 μs



dwll time middle channel

Date: 23.APR.2008 09:20:24

### High Channel



dwll time high channel

Date: 23.APR.2008 09:24:27

## CFR47 §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.

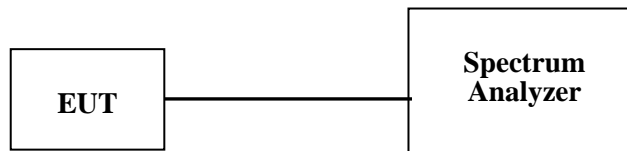
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16

\* **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 Spectrum analyzer / EMI Test Receiver.
3. Add a correction factor to the display.



**Test Data****Environmental Conditions**

<b>Temperature:</b>	27 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9 kPa

*The testing was performed by King Tang on 2008-04-23.*

*Test Mode: Transmitting*

**Test Result:** Compliance.

Please refer to the following table and plots.

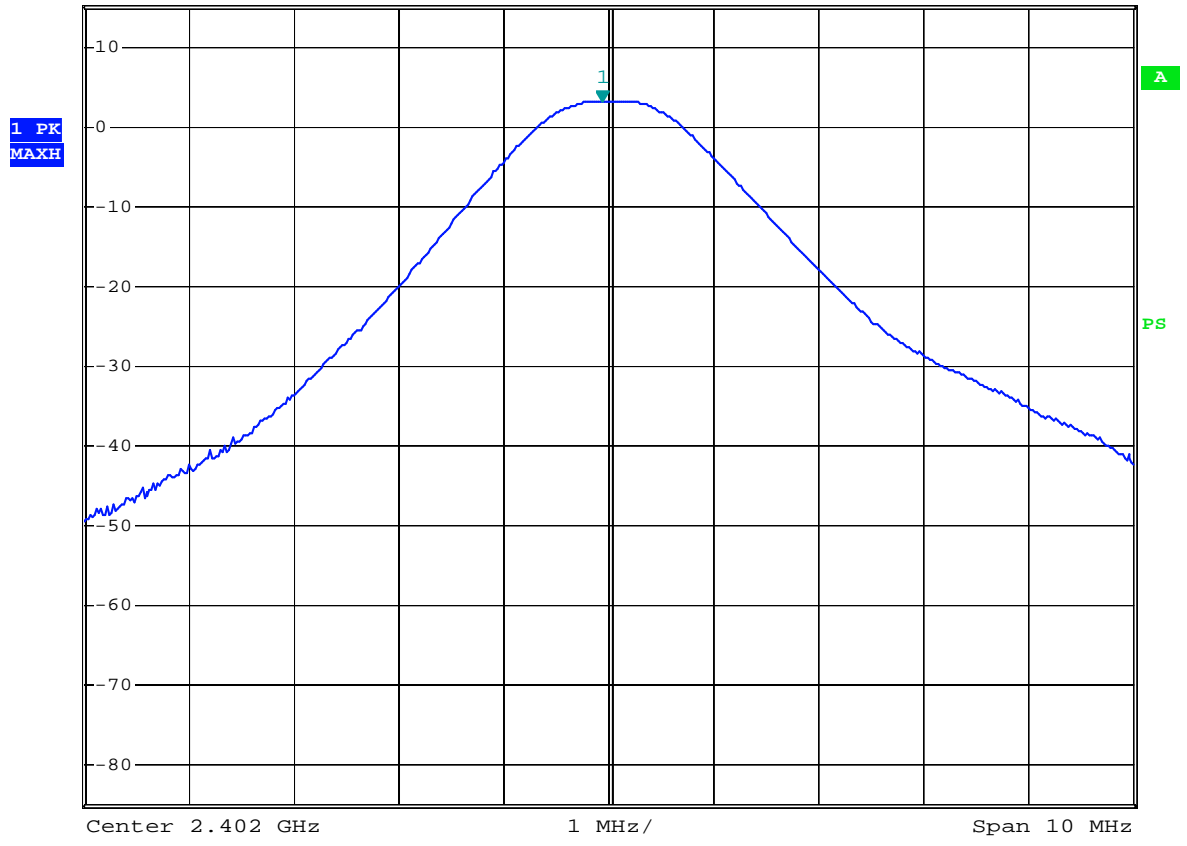
<b>Frequency (MHz)</b>	<b>Conducted Output Power (dBm)</b>	<b>Conducted Output Power (mW)</b>	<b>FCC Part 15.247 Limit (mW)</b>
2402	3.11	2.046	1000
2441	3.41	2.193	1000
2080	3.61	2.296	1000



### Low Channel



Ref 15 dBm      \*Att 30 dB      \*RBW 1 MHz      Marker 1 [T1]      3.11 dBm  
\*VBW 3 MHz      SWT 2.5 ms      2.401940000 GHz



output power low channel

Date: 23.APR.2008 09:51:26

### Middle Channel

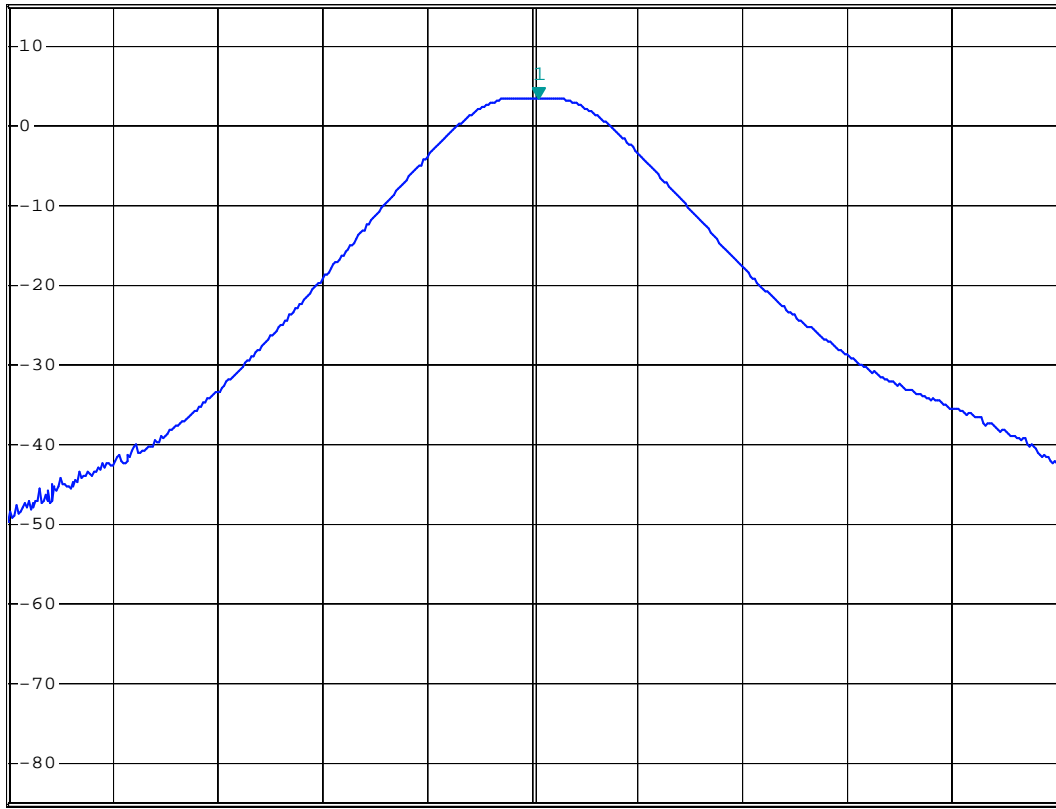


\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      3.41 dBm  
SWT 2.5 ms      2.441060000 GHz

Ref 15 dBm

\*Att 30 dB

1 PK  
MAXH



A

PS

Center 2.441 GHz

1 MHz/

Span 10 MHz

output power middle channel

Date: 23.APR.2008 09:52:29

### High Channel

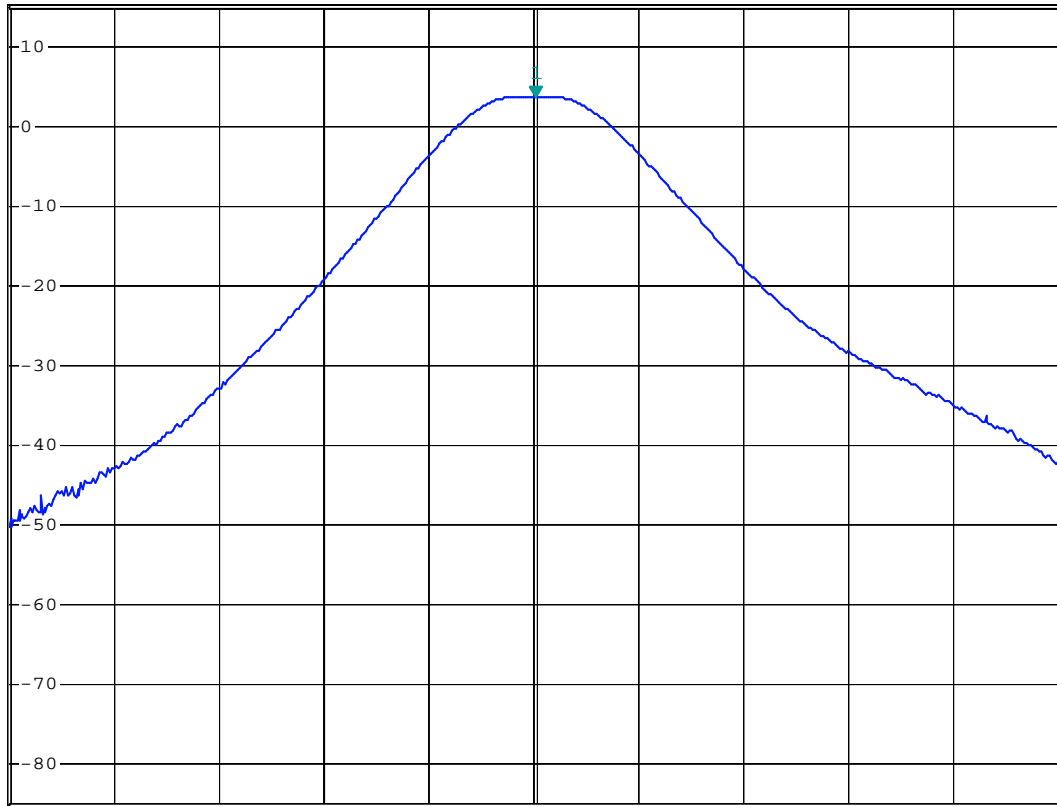


\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      3.61 dBm  
SWT 2.5 ms      2.480020000 GHz

Ref 15 dBm

\*Att 30 dB

1 PK  
MAXH



Center 2.48 GHz

1 MHz/

Span 10 MHz

output power high channel

Date: 23.APR.2008 09:53:28

## CFR47 §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	2007-10-16	2008-10-16

\* **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**

<b>Temperature:</b>	27 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9 kPa

*The testing was performed by King Tang on 2008-04-23.*

*Test Mode: Transmitting*

**Test Result:** Pass

Please refer to the following table and plots.

<b>Frequency (MHz)</b>	<b>Delta Peak to band emission (dBc)</b>	<b>Limit (dBc)</b>
2399.5160	50.16	>20
2483.9560	47.39	>20

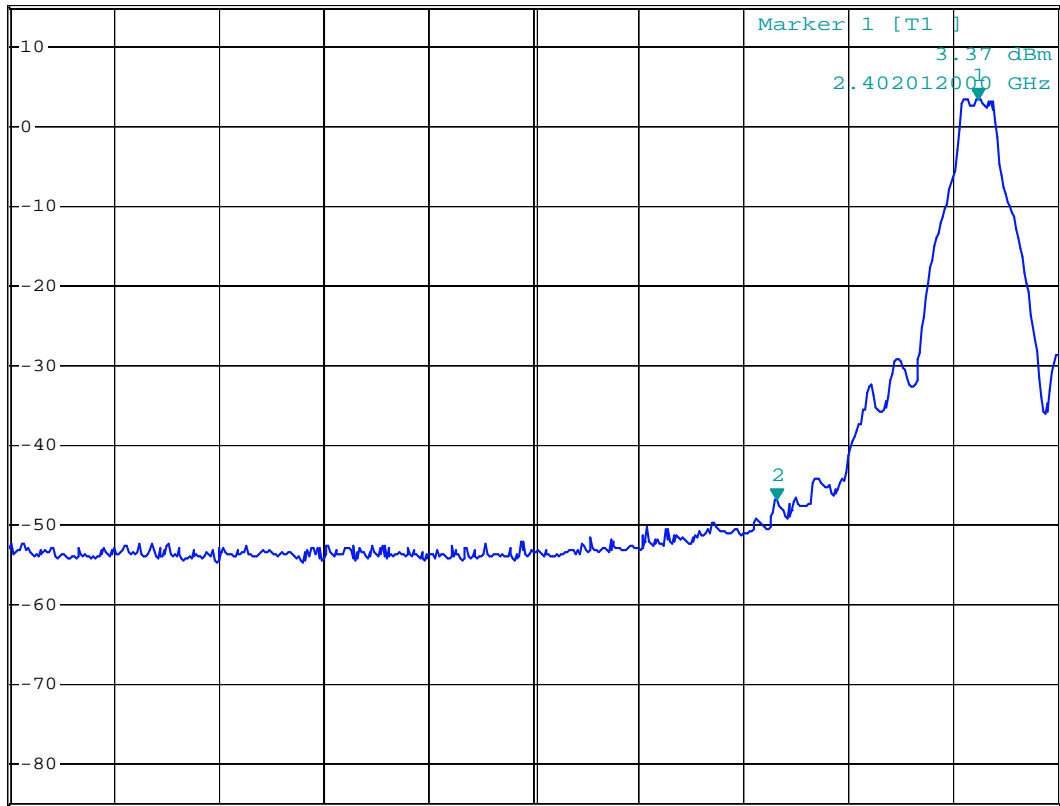
### Band Edge Left Side



\*RBW 100 kHz    Marker 2 [T1 ]  
\*VBW 300 kHz                    -46.79 dBm  
SWT 2.5 ms                        2.399516000 GHz

Ref 15 dBm

\*Att 30 dB



Start 2.39 GHz

1.3 MHz/

Stop 2.403 GHz

band edge left

Date: 23.APR.2008 09:42:59

