NVLAP LAB CODE 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Shenzhen Ether Electronics Co., Ltd.

708Room, 2070A Shennan Zhonglu, Futian, Shenzhen, China

FCC ID: UN9ETHCS800A

Report Type:	Product Type:
Original Report	Bluetooth Speakerphone

Test Engineer: Vicent Kang

Report Number: RSZ08081202

Report Date: 2008-09-24

Reviewed By: Name: Green Xu
Title: EMC Manager

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

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Shenzhen Ether Electronics Co., Ltd.'s* product, model number: *CS-800 o*r the "EUT" as referred to in this report is a *Bluetooth Speakerphone*, which measures approximately: 12.0 cm L x 8.0 cm W x 5.5 cm H, rated input voltage: DC 3.7 V Battery.

** All measurement and test data in this report was gathered from production sample serial number: 0808016 (Assigned by BACL, Shenzhen). The EUT was received on 2008-08-12.*

Objective

This Type approval report is prepared on behalf of *Shenzhen Ether 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 Compliant 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 Compliant 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 Compliant 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 Compliant 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 Compliant 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 Compliant 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 a typical fashion (as normally used by a typical user).

Equipment Modifications

No modifications were made to the EUT.

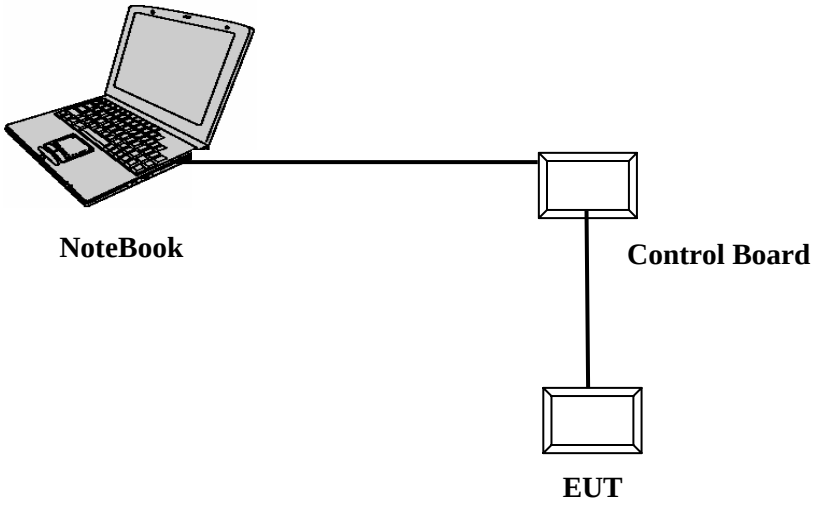
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Greatwall	Notebook PC	GREEN733E Pro	96F46W0004051900304	DoC

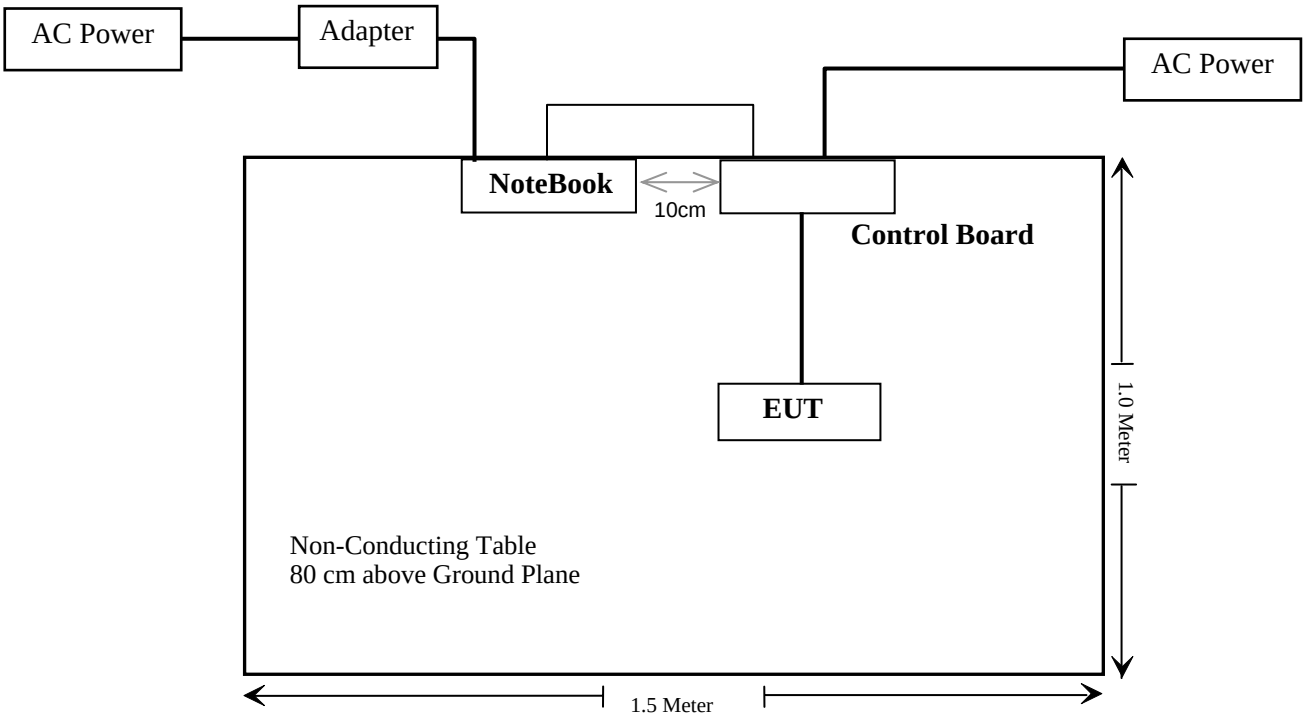
External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable Control Cable	1.07	PC	Control Board
Unshielded Undetachable Data Cable	0.08	Control Board	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)	Maximum Permissible exposure (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	Conducted Emissions	N/A**
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliant*
§15.247 (a)(1)	20 dB Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges	Compliant

Note: *Within Measurement Uncertainty
** The EUT operates with the 3.7 Vdc rechargeable battery which recharged from the vehicle 12 V DC power, no AC/DC adapter provided to the EUT.

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CFR47 §15.247 (i) & §1.1307 (b) (1) - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Standard Applicable

According to subpart 15.247 (i) and subpart 1.1307 (b)(1) and 2.1091, systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3–3.0	614	1.63	*(100)	30
3.0–30	824/f	2.19/f	*($180/f^2$)	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Test Data

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG/4\pi R^2$
S: Power density, in mW/cm^2
P: Power input to the antenna, in mW
G: numeric gain of the antenna
R: distance to the center of the antenna, in cm

Maximum peak output power (dBm):	2.42
Maximum peak output power (mW):	1.746
Prediction distance (cm):	20
Prediction frequency (MHz):	2441
Antenna Gain, typical (dBi):	0
Maximum Antenna Gain (numeric):	1
The worst case is power density at predication frequency at 20 cm:	0.00035
MPE limit for general population exposure at prediction frequency (mW/cm^2):	1.0

Test Result

The EUT complies with 20 cm distance.

CFR47 §15.203 - ANTENNA REQUIREMENT

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 a printed antenna on PCB. Please refer to the internal photos.

Result: Compliant.

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

Applicable Standard

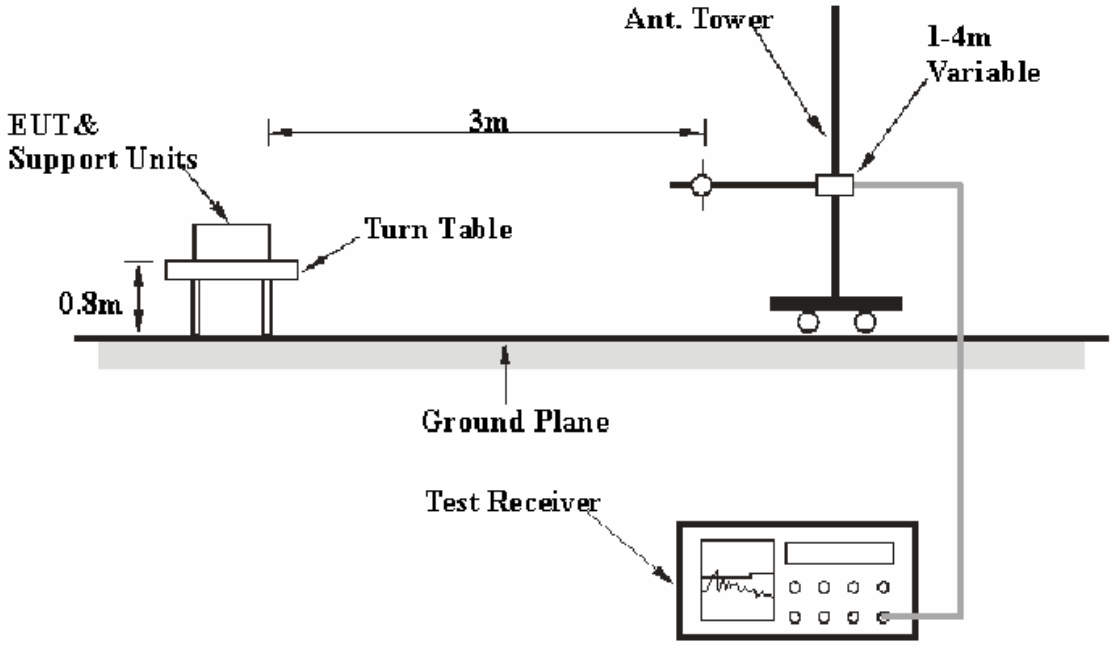
CFR47 §15.205; §15.209; §15.247 (d).

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 Compliant 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.

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***
30 MHz – 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	2008-05-09	2009-05-09

*** Statement of Traceability:** Bay Area Compliant 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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of Compliant with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit for Class B. 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, section 15.109, 15.205, 15.209, and 15.247, with the worst margin reading of:

Transmitting mode (Below 1 GHz):

3.80 dB at **38.730000 MHz** in the **Horizontal** polarization

Transmitting mode (Above 1 GHz):

11.66 dB at **2260 MHz** in the **Vertical** polarization **(Low Channel)**
11.43 dB at **2260 MHz** in the **Vertical** polarization **(Middle Channel)**
11.21 dB at **2260 MHz** in the **Horizontal** polarization **(High Channel)**

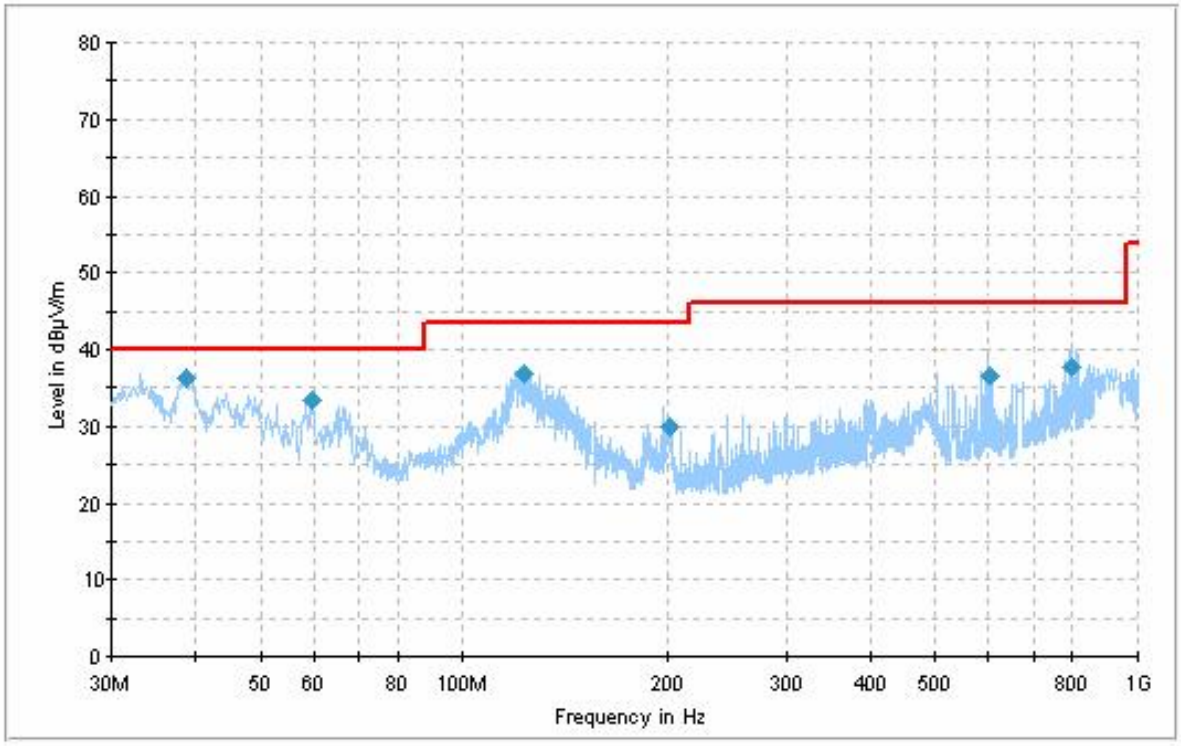
Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.8 kPa

The testing was performed by Vicent Kang on 2008-09-05.

Test Mode: Transmitting (Below 1GHz)



Frequency (MHz)	Corrected Amp. (dBµV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
38.730000	36.2	165.0	H	124.0	-9.7	40.0	3.8*
59.825977	33.3	338.0	H	238.0	-5.2	40.0	6.7
122.875000	36.7	192.0	V	323.0	-0.9	43.5	6.8
795.452700	37.8	164.0	H	143.0	0.1	46.0	8.2
601.451250	36.4	128.0	H	34.0	0.1	46.0	9.6
201.080375	29.8	140.0	H	5.0	-0.4	43.5	13.7

**Within Measurement Uncertainty*

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)				Limit (dBuV/m)	Margin (dB)	Remarks
Frequency in Low Channel												
2402	93.02	PK	25	1.80	H	30.6	3.61	34.0	93.23	-	-	Fund.
2402	81.72	AV	35	1.80	H	30.6	3.61	34.0	81.93	-	-	Fund.
2402	97.41	PK	355	1.75	V	30.6	3.61	34.0	97.62	-	-	Fund.
2402	86.06	AV	354	1.75	V	30.6	3.61	34.0	86.27	-	-	Fund.
2260	39.73	AV	154	1.55	V	30.0	6.51	33.9	42.34	54	11.66	Spurious
2260	39.42	AV	225	1.40	H	30.0	6.51	33.9	42.03	54	11.97	Spurious
4804	31.54	AV	240	1.02	H	36.6	4.64	33.4	39.38	54	14.62	Harmonic
4804	31.63	AV	180	1.05	V	35.4	4.64	33.4	38.27	54	15.73	Harmonic
2260	55.25	PK	225	1.40	H	30.0	6.51	33.9	57.86	74	16.14	Spurious
2260	55.04	PK	155	1.55	V	30.0	6.51	33.9	57.65	74	16.35	Spurious
4804	46.86	PK	240	1.02	H	36.6	4.64	33.4	54.70	74	19.30	Harmonic
4804	46.92	PK	180	1.05	V	35.4	4.64	33.4	53.56	74	20.44	Harmonic
Frequency in Middle Channel												
2441	91.92	PK	25	1.67	H	30.6	3.61	34.0	92.13	-	-	Fund.
2441	80.64	AV	25	1.67	H	30.6	3.61	34.0	80.85	-	-	Fund.
2441	97.48	PK	0	1.67	V	30.6	3.61	34.0	97.69	-	-	Fund.
2441	86.12	AV	0	1.67	V	30.6	3.61	34.0	86.33	-	-	Fund.
2260	39.96	AV	130	1.07	V	30.0	6.51	33.9	42.57	54	11.43	Spurious
2260	39.85	AV	175	1.37	H	30.0	6.51	33.9	42.46	54	11.54	Spurious
4882	32.28	AV	178	1.03	V	36.6	4.64	33.4	40.12	54	13.88	Harmonic
4882	32.05	AV	250	1.00	H	35.4	4.64	33.4	38.69	54	15.31	Harmonic
2260	55.71	PK	130	1.07	V	30.0	6.51	33.9	58.32	74	15.68	Spurious
2260	55.58	PK	175	1.37	H	30.0	6.51	33.9	58.19	74	15.81	Spurious
4882	47.37	PK	178	1.03	V	36.6	4.64	33.4	55.21	74	18.79	Harmonic
4882	47.25	PK	250	1.00	H	35.4	4.64	33.4	53.89	74	20.11	Harmonic
Frequency in High Channel												
2480	91.33	PK	35	1.67	H	30.6	3.61	34.0	91.54	-	-	Fund.
2480	80.05	AV	35	1.67	H	30.6	3.61	34.0	80.26	-	-	Fund.
2480	96.83	PK	355	1.67	V	30.6	3.61	34.0	97.04	-	-	Fund.
2480	85.51	AV	355	1.67	V	30.6	3.61	34.0	85.72	-	-	Fund.
2260	40.18	AV	150	115	H	30.0	6.51	33.9	42.79	54	11.21	Spurious
2260	40.07	AV	280	1.20	V	30.0	6.51	33.9	42.68	54	11.32	Spurious
4960	31.24	AV	35	1.10	H	36.6	4.55	33.4	38.99	54	15.01	Harmonic
4960	32.21	AV	355	1.10	V	35.4	4.55	33.4	38.76	54	15.24	Harmonic
2260	55.95	PK	150	1.15	H	30.0	6.51	33.9	58.56	74	15.44	Spurious
2260	55.63	PK	280	1.20	V	30.0	6.51	33.9	58.24	74	15.76	Spurious
4960	47.36	PK	355	1.10	V	35.4	4.55	33.4	53.91	74	20.09	Harmonic
4960	45.34	PK	35	1.10	H	36.6	4.55	33.4	53.09	74	20.91	Harmonic

CFR47 §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 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 Compliant 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:	100.8 kPa

The testing was performed by Vicent Kang on 2008-09-03.

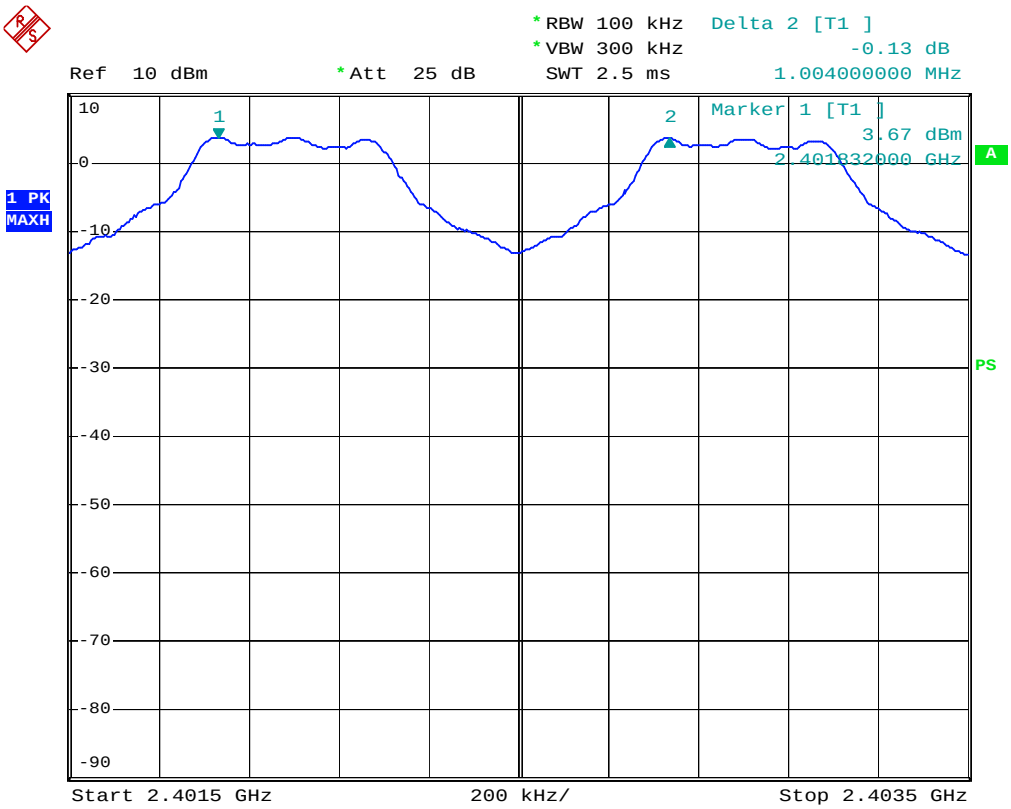
Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (kHz)	Limit (kHz)	Result
Low Channel	2402	1004	541.33	Pass
Adjacent Channel	2403			
Mid Channel	2440	1008	565.33	Pass
Adjacent Channel	2441			
High Channel	2480	1004	562.67	Pass
Adjacent Channel	2479			

Test Result: Compliant.

Please refer to following plots

Low Channel



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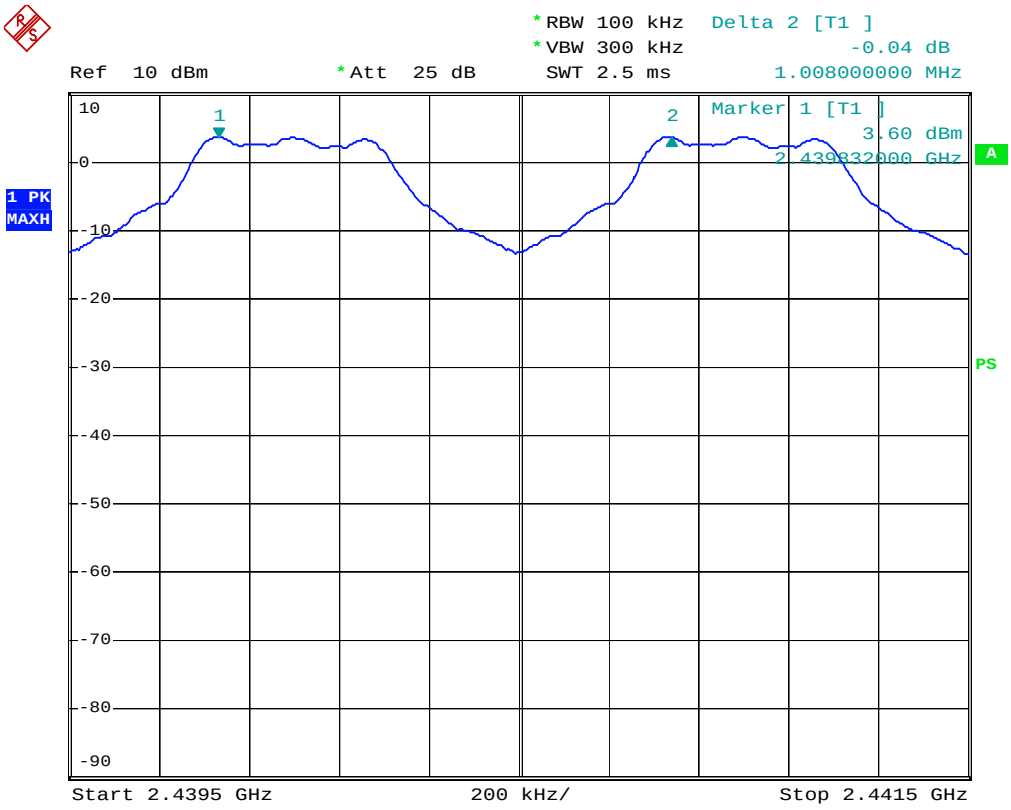
Middle Channel



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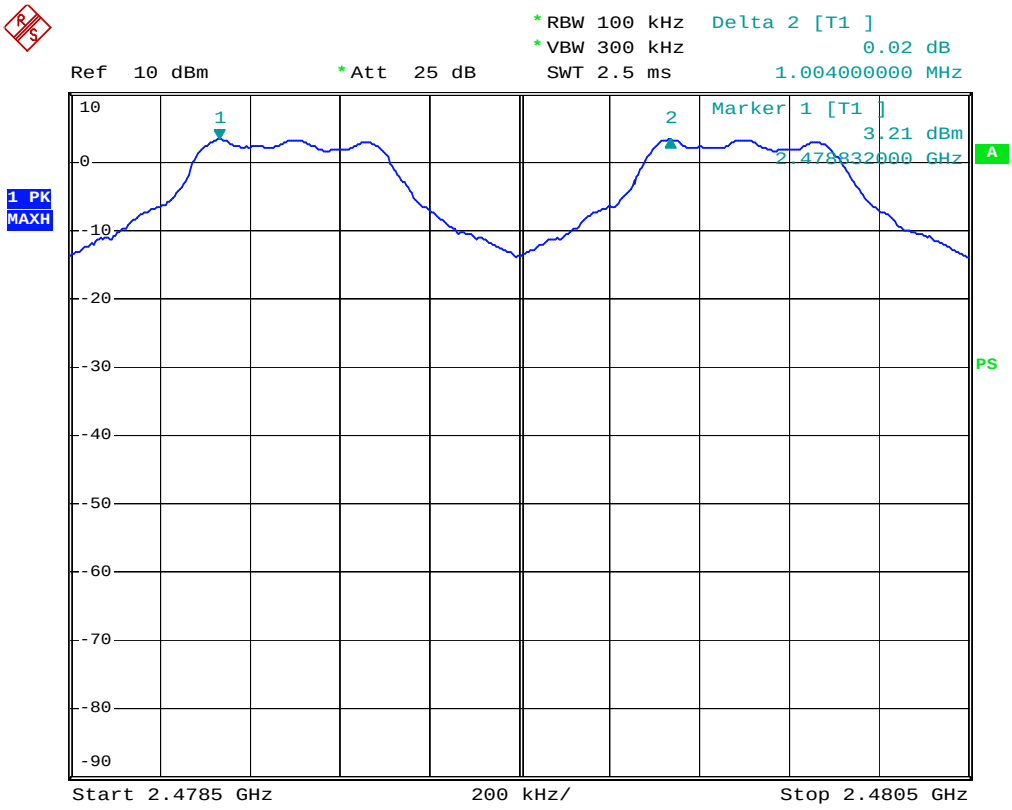
High Channel



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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 Compliant 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:	100.8 kPa

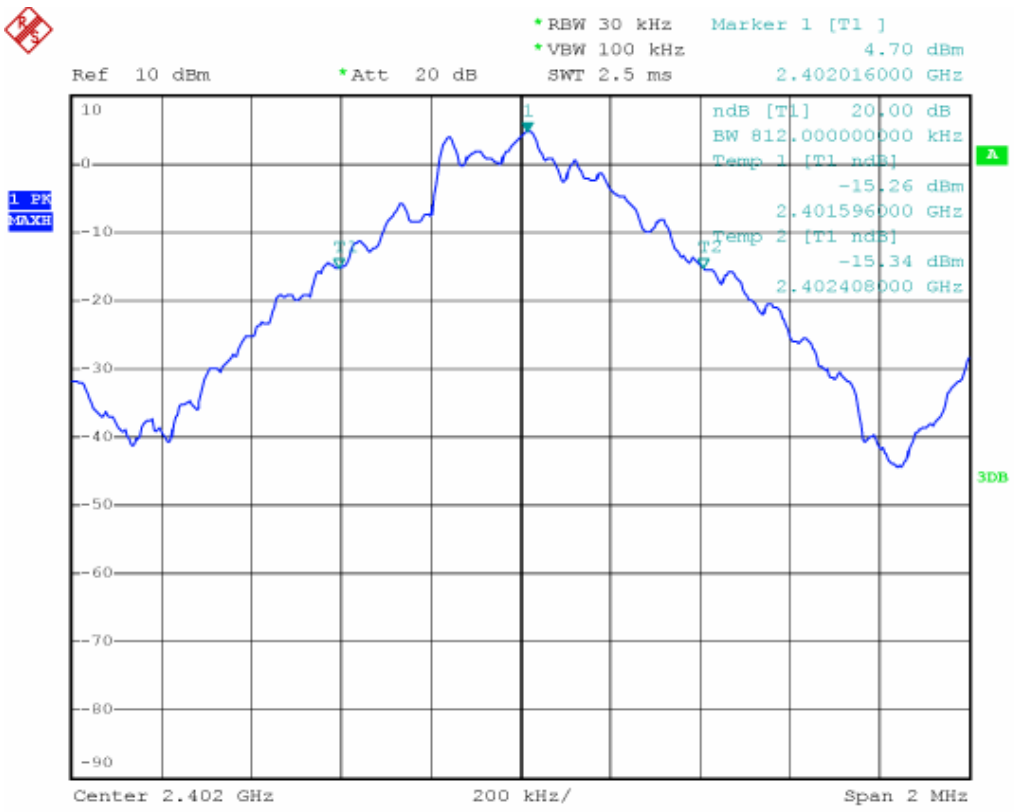
The testing was performed by Vicent Kang on 2008-09-17.

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)
Low	2402	812
Middle	2441	848
High	2480	844

Test Result: Please refer to following plots

Low Channel



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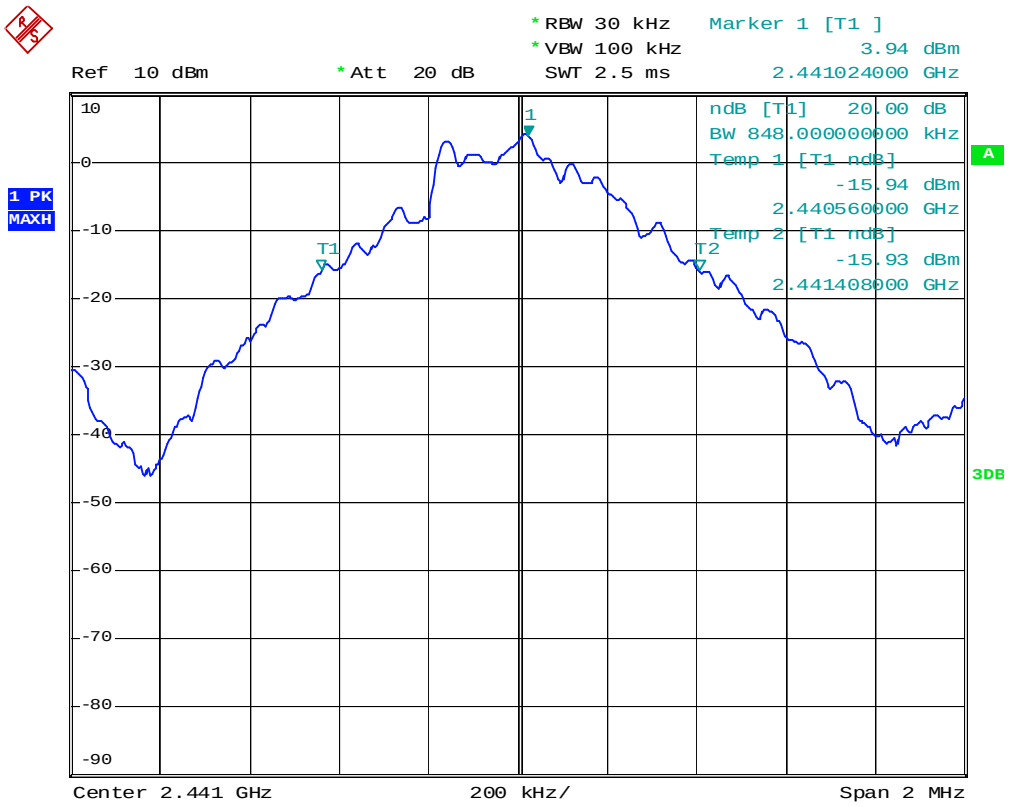
Middle Channel



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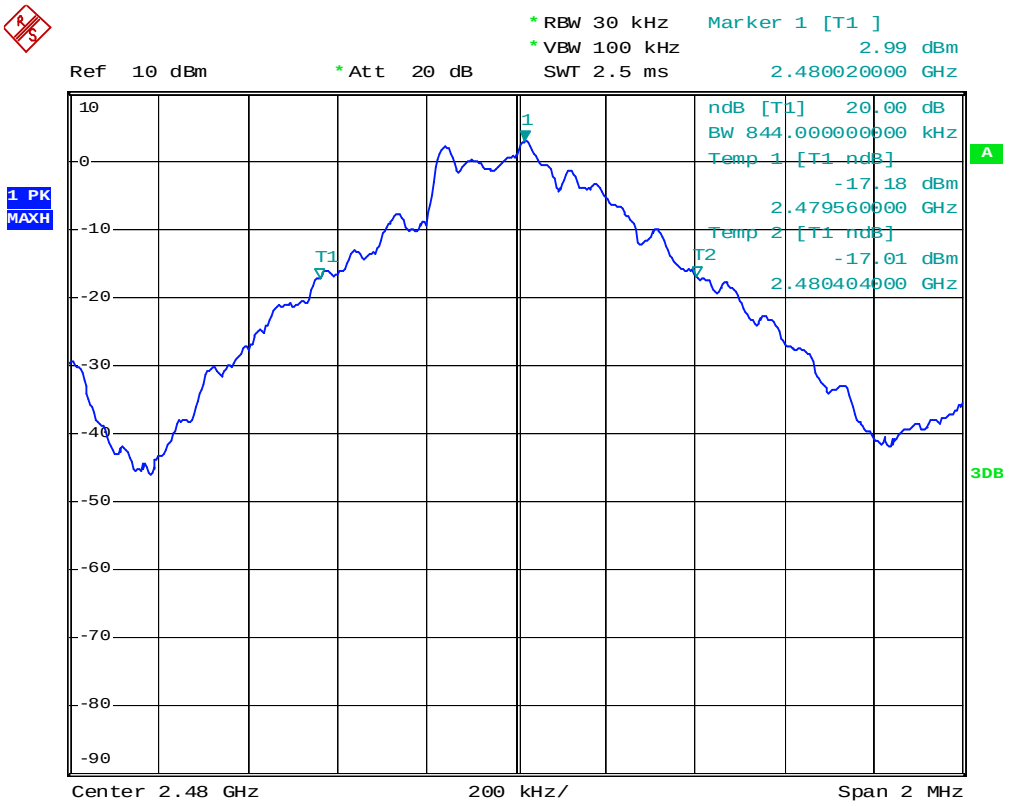
High Channel



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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 Compliant 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:	100.8 kPa

The testing was performed by Vicent Kang on 2008-09-03.

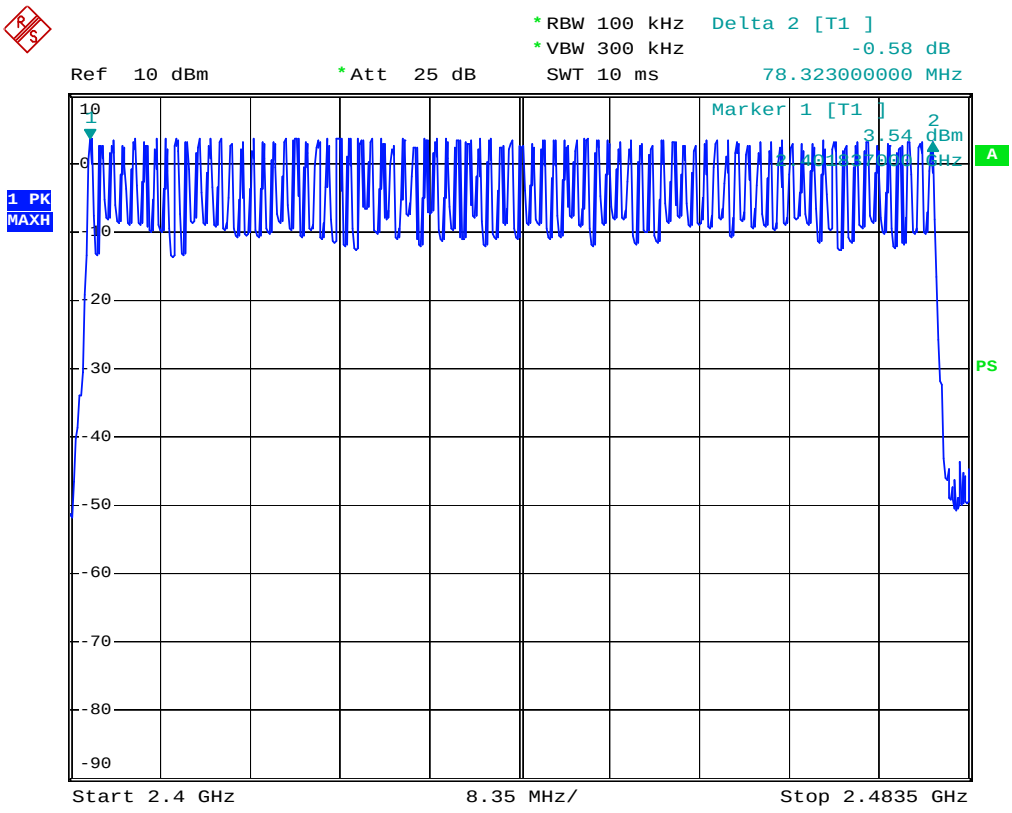
Test Result: Compliant.

Please refer to following plot

Test Mode: Transmitting

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

Number of Hopping Channels



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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 Compliant 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:	100.8 kPa

The testing was performed by Vicent Kang on 2008-09-03.

Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

DH 1

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	0.536	0.172	0.4	Pass
Middle	0.532	0.170	0.4	Pass
High	0.536	0.172	0.4	Pass

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

DH 3

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	1.800	0.288	0.4	Pass
Middle	1.800	0.288	0.4	Pass
High	1.800	0.288	0.4	Pass

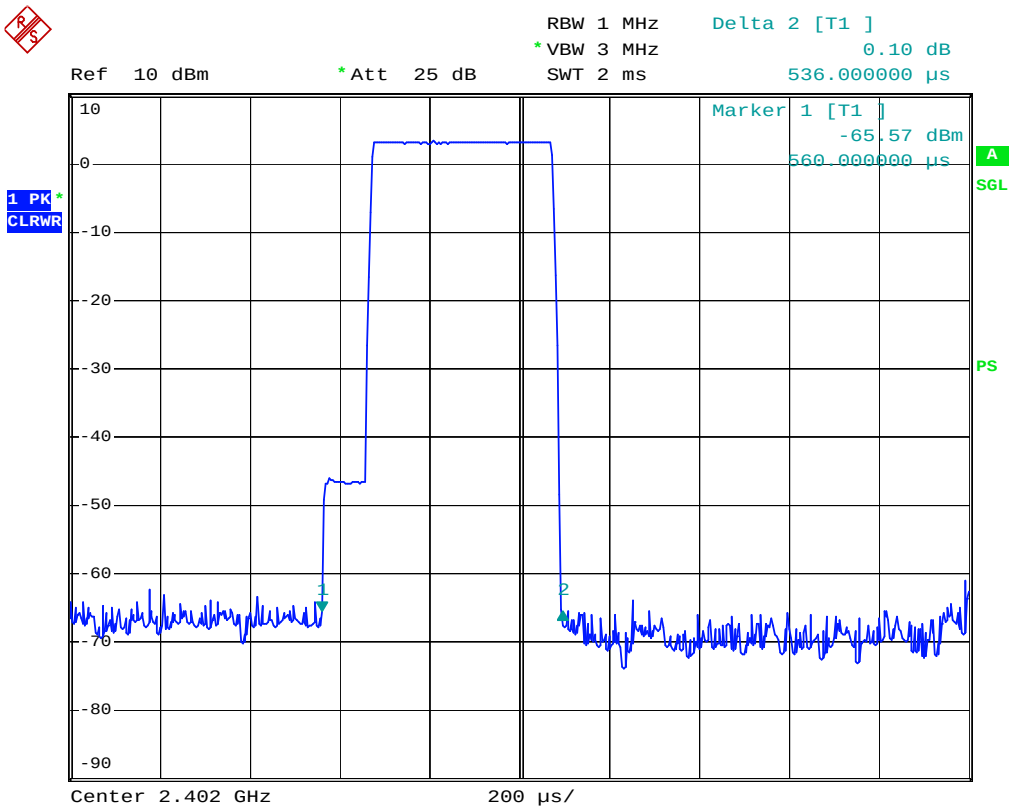
NOTE: Dwell time=Pulse width (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second

DH 5

Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
Low	3.080	0.329	0.4	Pass
Middle	3.080	0.329	0.4	Pass
High	3.080	0.329	0.4	Pass

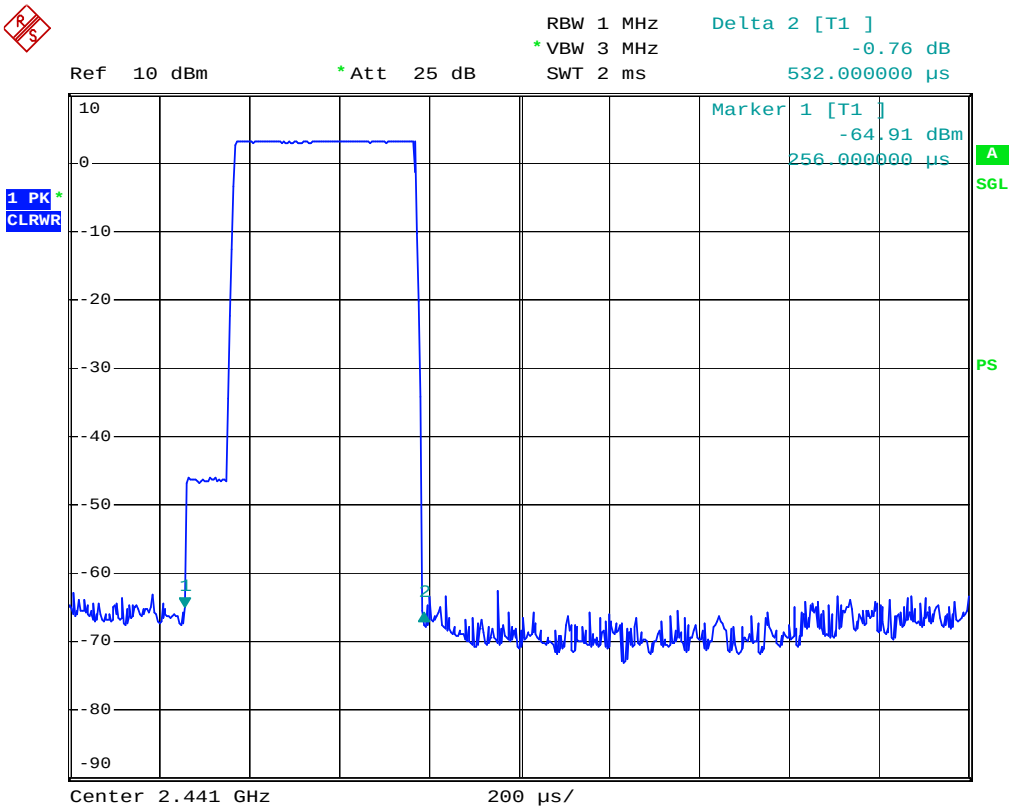
NOTE: Dwell time=Pulse width (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second

Low Channel for DH1



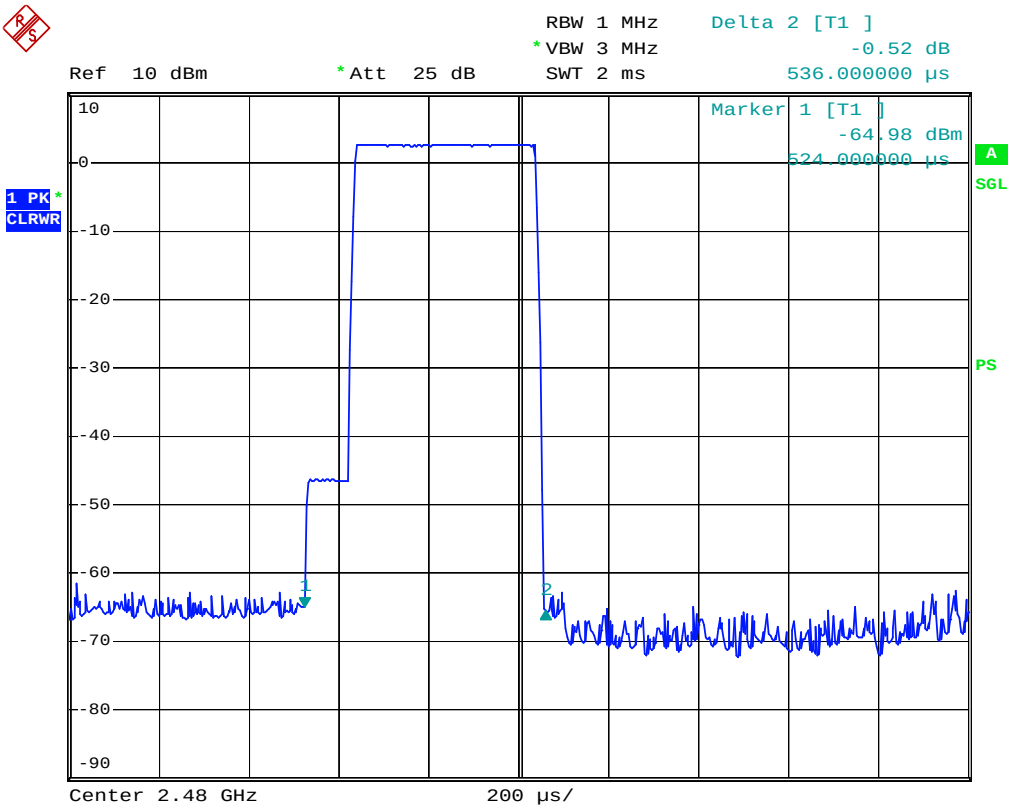
Date: 3.SEP.2008 11:58:54

Middle Channel for DH1



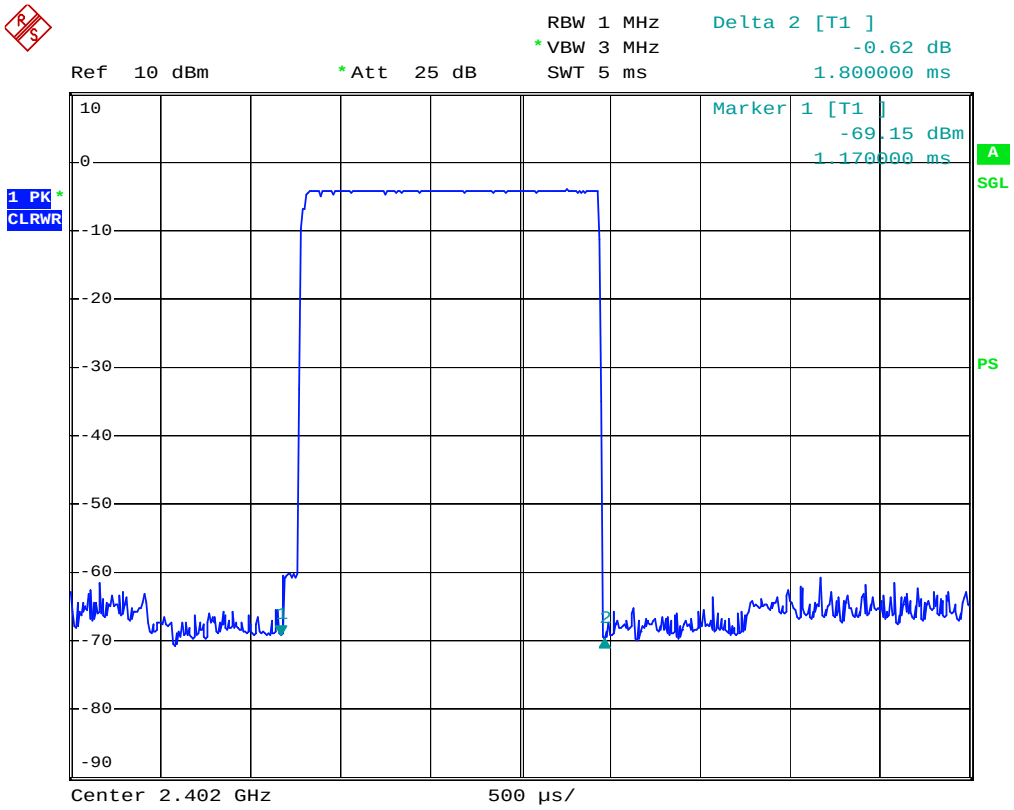
Date: 3.SEP.2008 12:00:38

High Channel for DH1



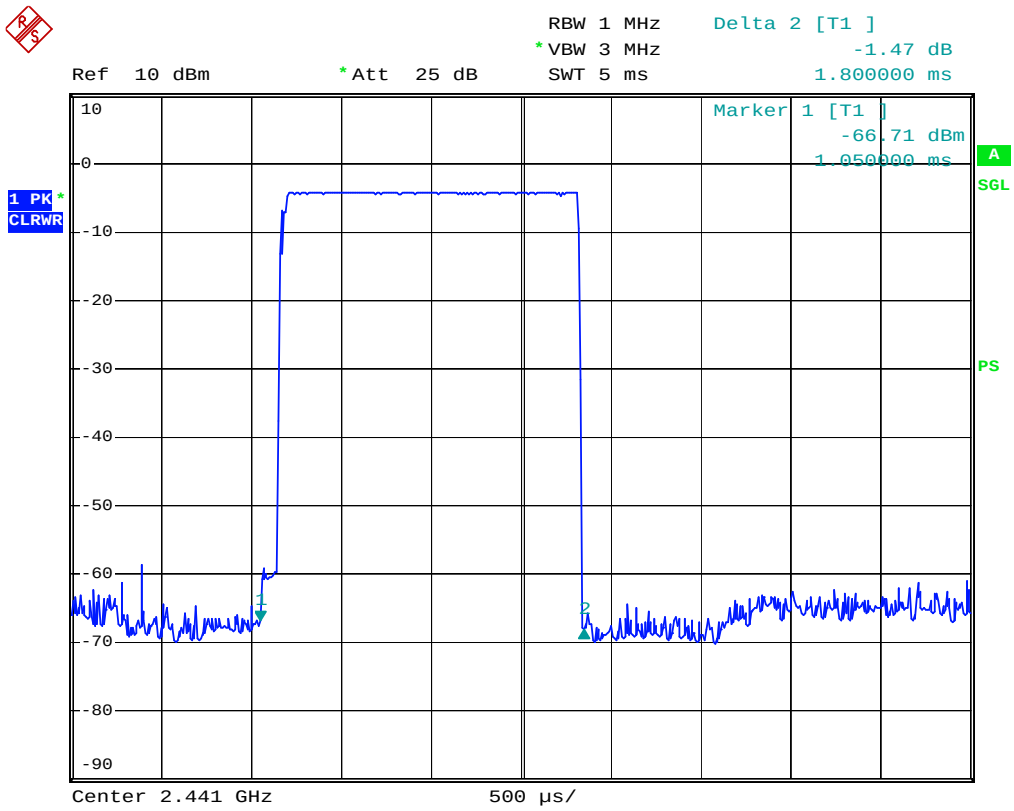
Date: 3.SEP.2008 12:02:09

Low Channel for DH3



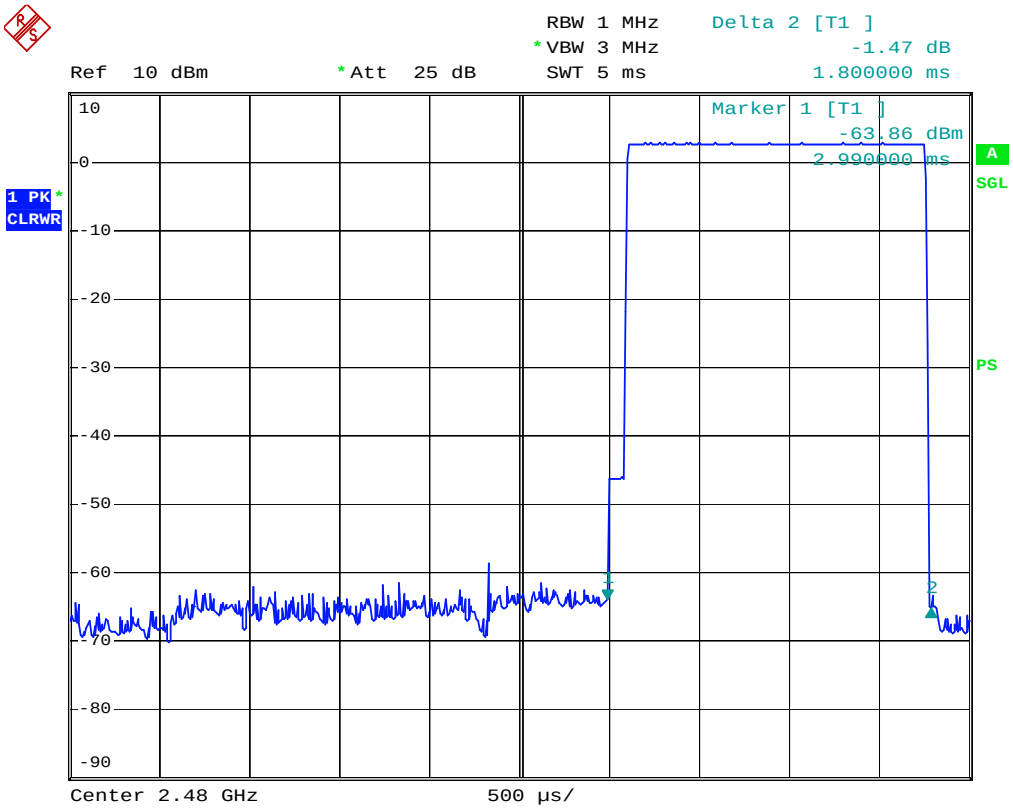
Date: 3.SEP.2008 12:32:54

Middle Channel for DH3



Date: 3.SEP.2008 12:33:34

High Channel for DH3



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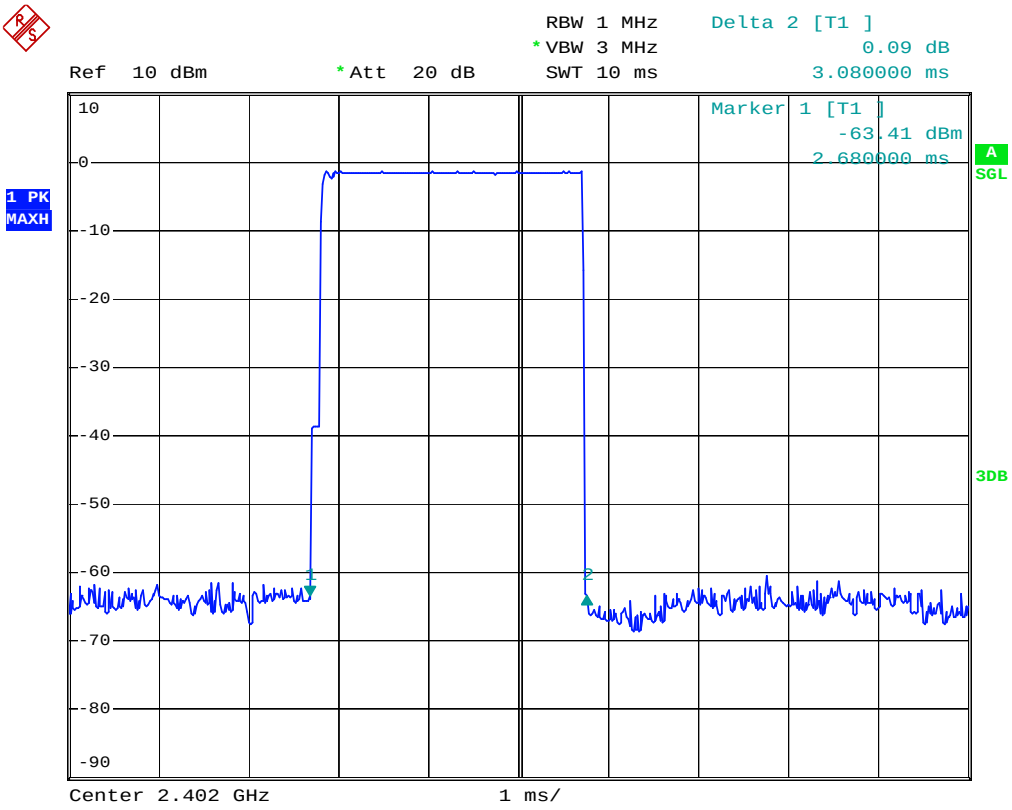
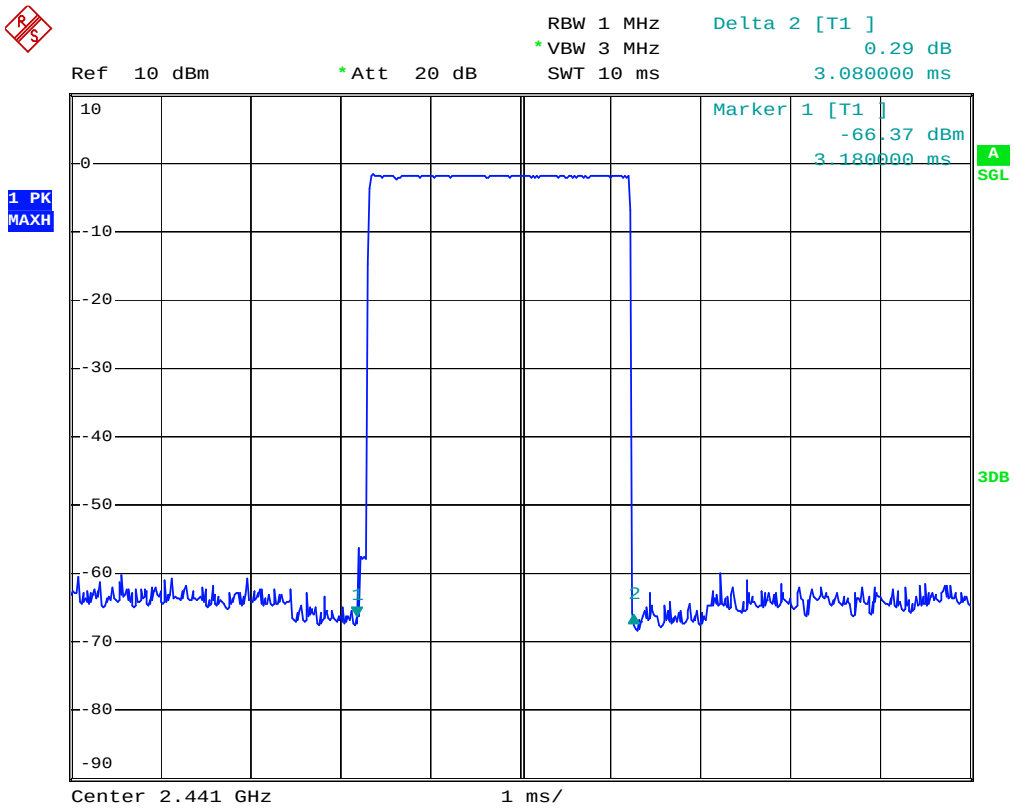
Low Channel for DH5



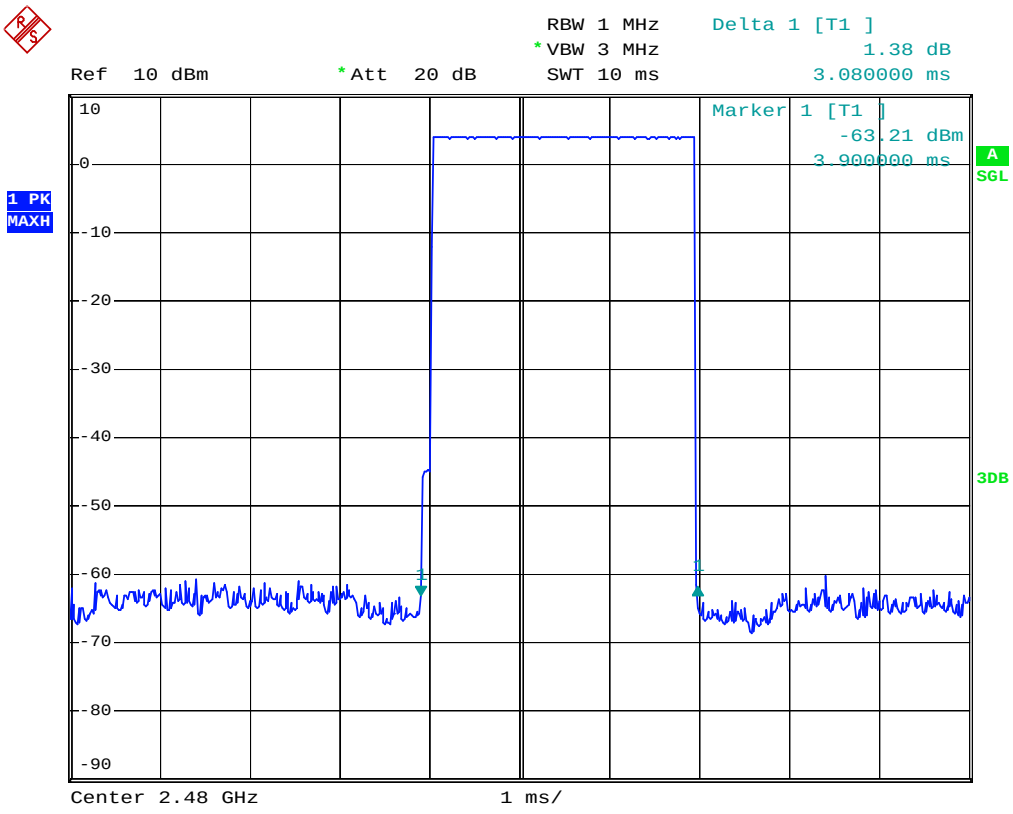
Date: 17.SEP.2008 16:52:51

Middle Channel for DH5



Date: 17.SEP.2008 16:51:35

High Channel for DH5



Date: 17.SEP.2008 16:50:47

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
HP	Amplifier	HP8447D	2944A09795	2007-11-15	2008-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16
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	2008-05-09	2009-05-09

*** Statement of Traceability:** Bay Area Compliant 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 Control Board 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 peak detection modes.

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.8kPa

The testing was performed by Vicent Kang on 2008-09-03.

Test Result: Compliant.

Freq. (MHz)	Receiver Reading (dBμV)	Detector PK/AV	Table Direction Degree	Test Antenna		Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	EIRP		FCC 15.247 Limit (mW)
				Height (m)	Factor (dB)				(dBm)	(mW)	
Low Channel											
2402	97.41	PK	254	1.7	30.6	3.60	34	97.61	2.34	1.714	125
Middle Channel											
2441	97.48	PK	0	1.7	30.6	3.61	34	97.69	2.42	1.746	125
High Channel											
2480	96.83	PK	355	1.6	30.6	3.62	34	97.05	1.78	1.507	125

Note: *P (dBm) = E (dBμV/m) – 95.27*

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 Compliant 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 Compliant 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:	100.8 kPa

The testing was performed by Vicent Kang on 2008-09-03.

Test Mode: Transmitting

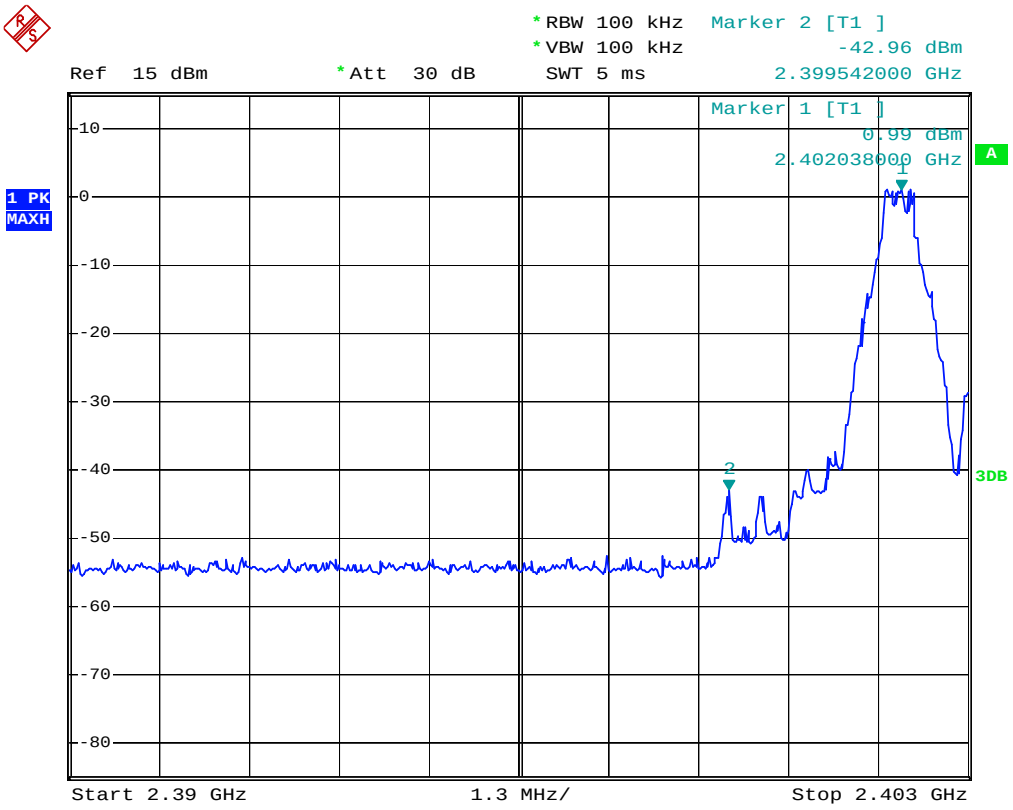
Frequency (MHz)	Attenuation (dBc)	Limit (dBc)
2399.542	43.95	20
2484.460	45.58	20

Note: Attenuation = Peaklevel – Emission Level

Test Result: Compliant.

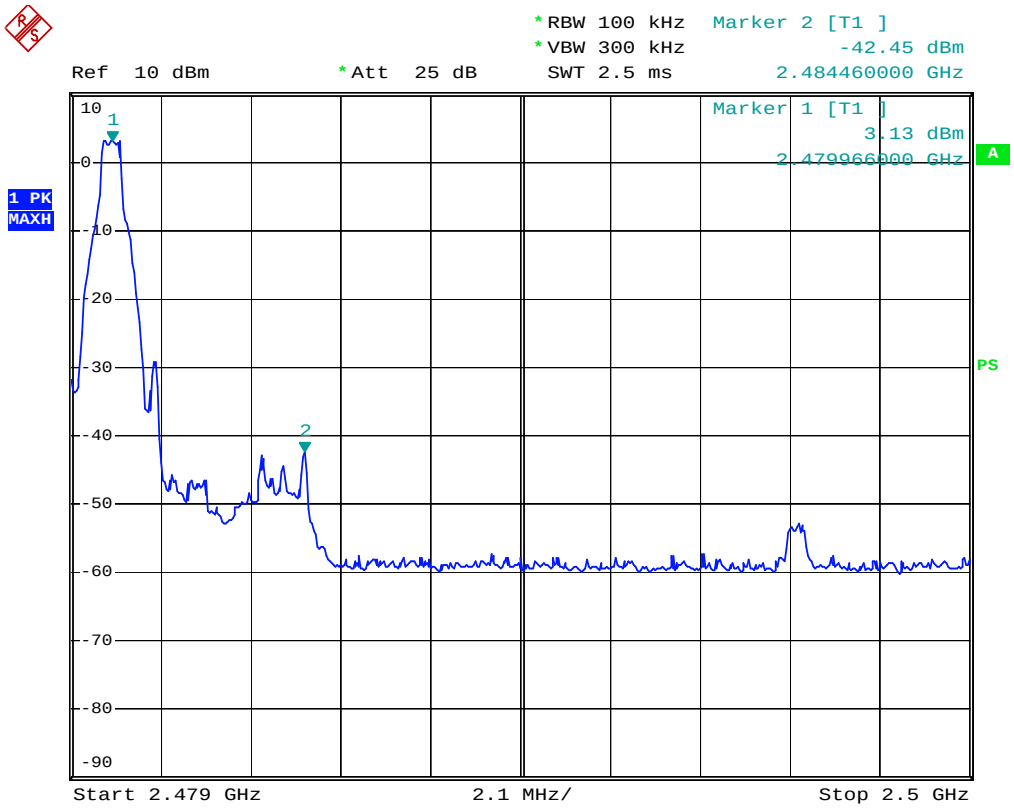
Please refer to following plot.

Band Edge Left Side



Date: 16.SEP.2008 11:45:21

Band Edge Right Side



Date: 3.SEP.2008 11:41:13

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