Lab Code: 200707-0

FCC PART 15.247

TEST REPORT

For

Shenzhen Gospell Smarthome Electronic Co., Ltd.

5 Floor/Block 2, Vision (SZ) Park, Hi-Tech Industrial Park,

Shenzhen, Guangdong, China

FCC ID: TW5GD7104

Report Type:	**Product Type:**
Original Report	4 CH Digital Wireless Security System (Monitor)

Test Engineer:	Gardon Zhang
Report Number:	RSZ120823002-00
Report Date:	2012-09-25
Reviewed By:	Alvin Huang RF Leader
Test Laboratory:	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 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Shenzhen GOSPELL Smarthome Electronic Co., Ltd.*'s product, model number: *GD7104 (FCC ID: TW5GD7104)* or the "EUT" in this report was a monitor of *4CH DIGITAL WIRELESS SECURITY SYSTEM,* which was measured approximately: 21.4 cm (L) x 15.7 cm (W) x 2.6 cm (H), rated input voltage: DC 5V adapter.

Adapter information: SWITCHING MODE POWER SUPPLY
Model: GP303U-050-200
Input: AC 100-240V, 50/60Hz, 0.8A
Output: DC 5V, 2A

** All measurement and test data in this report was gathered from production sample serial number: 1208103 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2012-08-23.*

Objective

This report is prepared on behalf of *Shenzhen GOSPELL Smarthome Electronic 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, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

Submitted with the part of a system with FCC ID: TW5GD8104

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode which was selected by manufacturer.

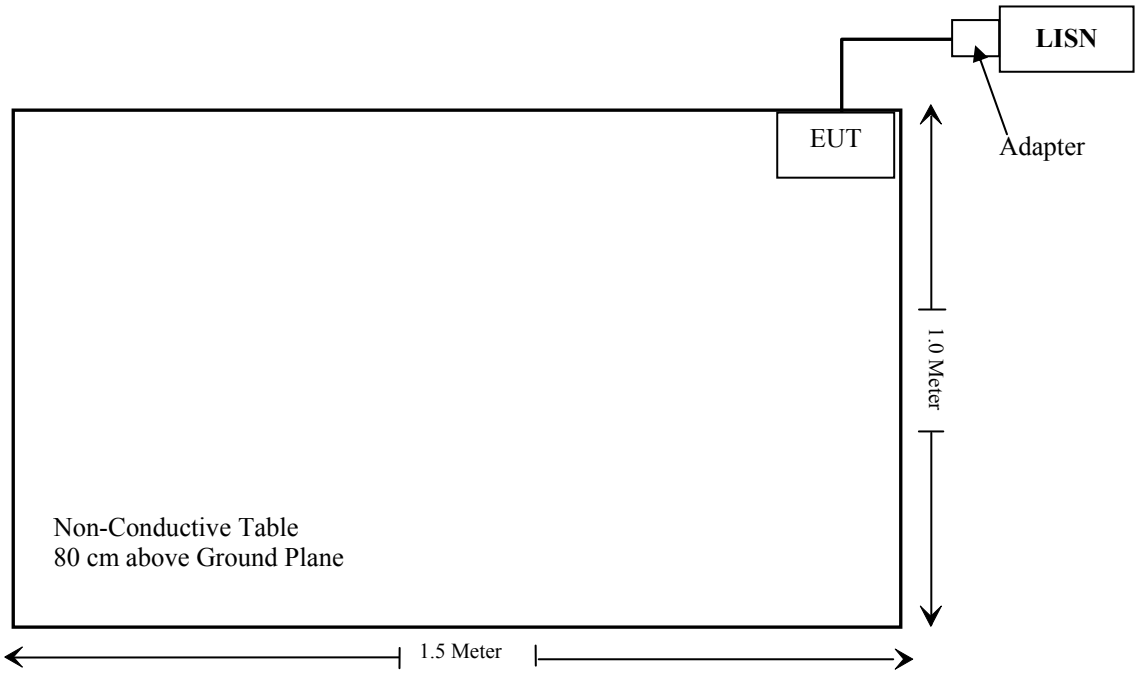
EUT Exercise Software

No exercise software was used.

Equipment Modifications

No modification was made to the EUT tested.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliance
§15.247 (a)(1)	20 dB Bandwidth	Compliance
§15.247(a)(1)	Channel Separation Test	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band Edges	Compliance

FCC §15.247 (i) & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Standard Applicable

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 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

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 (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	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

MPE Calculation

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally ***numeric*** gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2478	2	1.58	17.11	51.40	20	0.016	1.0

Result: The EUT meets FCC MPE limit at 20 cm distance.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has a monopole antenna with reverse port connect to RF board, which in accordance to section 15.203; the maximum gain is 2 dBi. Please refer to the external photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

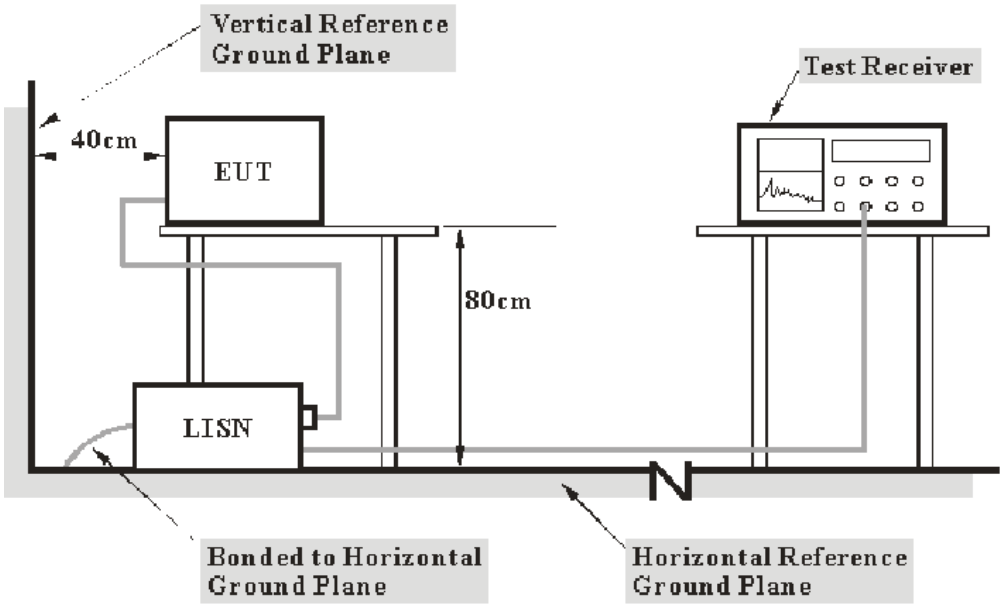
FCC §15.207

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on CISPR-16-4-4, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is 2.4 dB (k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

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

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	***IF B/W***
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Rohde & Schwarz	Attenuator	ESH3Z2	DE25985	2012-07-08	2013-07-07

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

23.62 dB at **2.840 MHz** in the **Line** conducted mode

Test Data

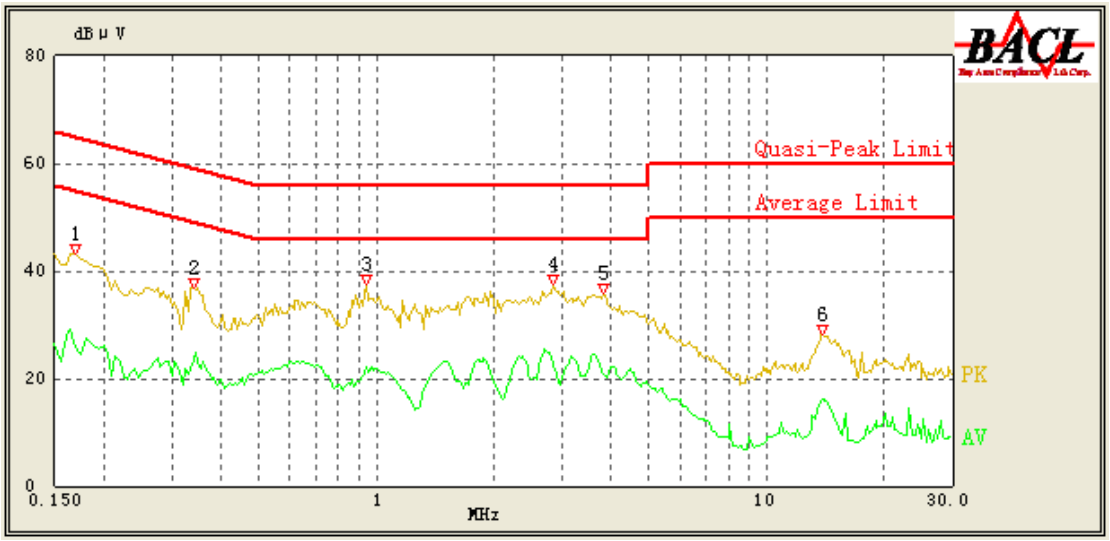
Environmental Conditions

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

The testing was performed by Gardon Zhang on 2012-08-30.

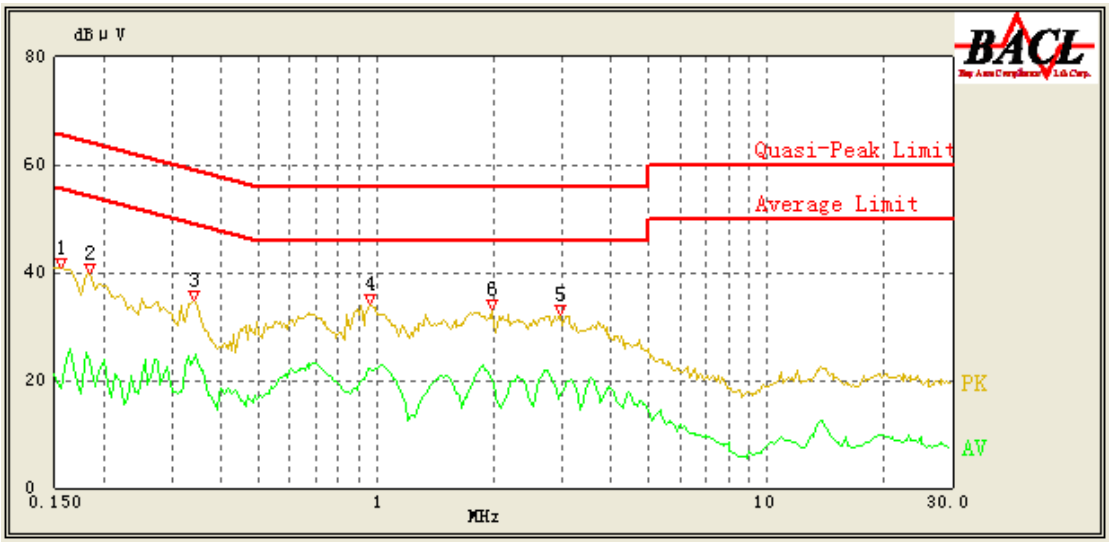
Test Mode: Transmitting

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
2.840	22.38	10.23	46.00	23.62	Ave.
0.945	22.33	10.18	46.00	23.67	Ave.
3.820	20.71	10.25	46.00	25.29	Ave.
0.340	33.72	10.25	60.57	26.85	QP
0.945	28.95	10.18	56.00	27.05	QP
2.850	28.94	10.23	56.00	27.06	QP
0.340	23.36	10.25	50.57	27.21	Ave.
3.805	27.26	10.25	56.00	28.74	QP
0.170	25.91	10.24	55.43	29.52	Ave.
0.170	34.72	10.24	65.43	30.71	QP
14.065	16.12	11.10	50.00	33.88	Ave.
13.950	21.56	11.08	60.00	38.44	QP

AC 120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
0.970	21.88	10.17	46.00	24.12	Ave.
1.960	20.76	10.20	46.00	25.24	Ave.
0.340	23.98	10.25	50.57	26.59	Ave.
0.960	29.05	10.18	56.00	26.95	QP
0.340	32.60	10.25	60.57	27.97	QP
2.985	17.77	10.23	46.00	28.23	Ave.
1.970	26.82	10.20	56.00	29.18	QP
0.185	35.36	10.24	65.00	29.64	QP
0.155	35.08	10.24	65.86	30.78	QP
2.970	24.96	10.23	56.00	31.04	QP
0.185	23.58	10.24	55.00	31.42	Ave.
0.155	18.48	10.24	55.86	37.38	Ave.

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

Applicable Standard

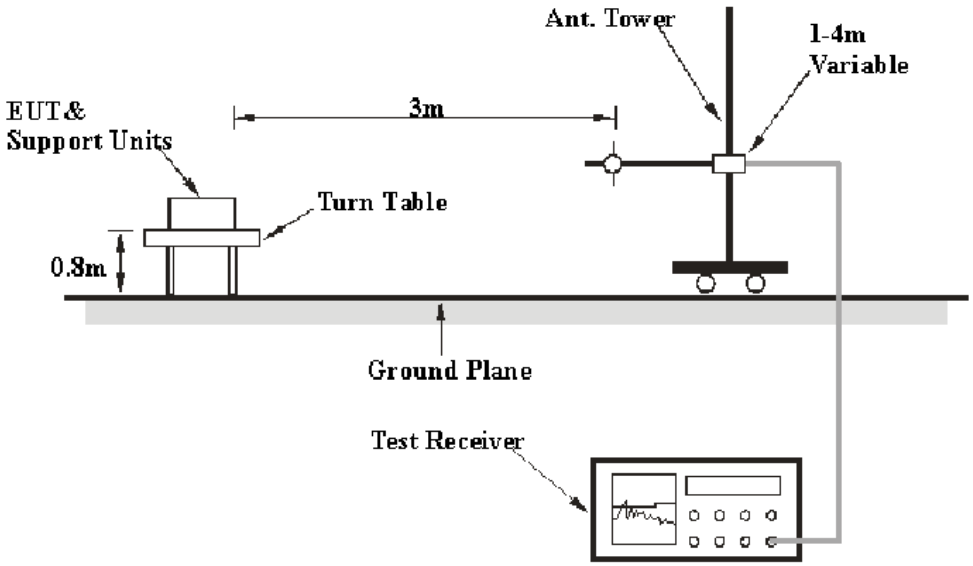
FCC §15.247 (d); §15.209; §15.205;

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 CISPR 16-4-4, 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 (k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for all the test data recorded in the report.

EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209 and FCC 15.247 limits.

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

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	***RBW***	***Video B/W***	***Detector***
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	Ave.

Test 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 to 1GHz and peak and Average detection modes for frequencies above 1GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27
HP	Amplifier	ZVA-213+	N/A	2011-11-24	2012-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Electro-Mechanics	Horn antenna	3116	9510-2270	2011-10-14	2012-11-13

*** 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.

Corrected Amplitude & Margin Calculation

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

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

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, with the worst margin reading of:

2.5 dB at **509.9 MHz** in the **Horizontal** polarization

Test Data

Environmental Conditions

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

The testing was performed by Gardon Zhang on 2012-08-28.

30 MHz -25 GHz

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Correction Factor (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.247	
	Reading (dBµV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H /V)			Limit (dBµV/m)	Margin (dB)
Low Channel (2403 MHz)									
2403.0	98.21	PK	48	1.2	H	6.13	104.34	/	/
2403.0	62.28	Ave.	48	1.2	H	6.13	68.41	/	/
2403.0	105.22	PK	56	1.2	V	6.13	111.35	/	/
2403.0	69.33	Ave.	56	1.2	V	6.13	75.46	/	/
509.9	53.6	QP	104	1.1	H	-10.1	43.5	46	2.5*
9612.0	17.98	Ave.	63	1.2	H	19.28	37.26	54	16.74
4806.0	44.46	PK	225	1.3	V	12.40	56.86	74	17.14
7209.0	18.02	Ave.	158	1.2	V	17.06	35.08	54	18.92
4806.0	20.73	Ave.	225	1.3	V	12.40	33.13	54	20.87
9612.0	33.26	PK	63	1.2	H	19.28	52.54	74	21.46
2486.3	24.55	Ave.	157	1.2	V	6.81	31.36	54	22.64
7209.0	34.25	PK	158	1.2	V	17.06	51.31	74	22.69
2486.3	43.28	PK	157	1.2	V	6.81	50.09	74	23.91
2331.8	24.03	Ave.	22	1.1	H	5.48	29.51	54	24.49
2365.7	23.49	Ave.	168	1.2	V	5.48	28.97	54	25.03
2365.7	41.33	PK	168	1.2	V	5.48	46.81	74	27.19
2331.8	41.26	PK	22	1.1	H	5.48	46.74	74	27.26
Middle Channel (2439 MHz)									
2439.0	97.68	PK	75	1.1	H	7.21	104.89	/	/
2439.0	61.22	Ave.	75	1.1	H	7.21	68.43	/	/
2439.0	104.39	PK	26	1.2	V	6.81	111.20	/	/
2439.0	68.37	Ave.	26	1.2	V	6.81	75.18	/	/
570.0	51.5	QP	39	1.1	V	-8.9	42.6	46	3.4*
4878.0	44.85	PK	223	1.2	V	12.46	57.31	74	16.69
9756.0	17.45	Ave.	54	1.2	H	19.40	36.85	54	17.15
7317.0	17.46	Ave.	85	1.1	V	16.49	33.95	54	20.05
9756.0	33.95	PK	54	1.2	H	19.40	53.35	74	20.65
4878.0	20.16	Ave.	223	1.2	V	12.46	32.62	54	21.38
7317.0	33.67	PK	85	1.1	V	16.49	50.16	74	23.84
2485.1	22.85	Ave.	47	1.2	V	6.81	29.66	54	24.34
2335.8	24.06	Ave.	126	1.2	H	5.48	29.54	54	24.46
2363.2	23.26	Ave.	35	1.3	V	5.48	28.74	54	25.26
2485.1	41.18	PK	47	1.2	V	6.81	47.99	74	26.01
2363.2	41.39	PK	35	1.3	V	5.48	46.87	74	27.13
2335.8	41.25	PK	126	1.2	H	5.48	46.73	74	27.27

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Correction Factor (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2478 MHz)									
2478.0	99.23	PK	63	1.2	H	7.21	106.44	/	/
2478.0	63.06	Ave.	63	1.2	H	7.21	70.27	/	/
2478.0	103.87	PK	45	1.2	V	6.81	110.68	/	/
2478.0	67.63	Ave.	45	1.2	V	6.81	74.44	/	/
690.0	50.4	QP	278	1.6	H	-7.2	43.2	46	2.8*
9912.0	17.22	Ave.	285	1.1	H	19.38	36.60	54	17.40
4956.0	42.39	PK	28	1.3	V	12.50	54.89	74	19.11
7434.0	17.46	Ave.	55	1.2	V	15.90	33.36	54	20.64
4956.0	20.83	Ave.	28	1.3	V	12.50	33.33	54	20.67
9912.0	33.67	PK	285	1.1	H	19.38	53.05	74	20.95
2485.3	24.88	Ave.	38	1.3	V	6.81	31.69	54	22.31
2485.3	43.39	PK	38	1.3	V	6.81	50.20	74	23.80
7434.0	33.29	PK	55	1.2	V	15.90	49.19	74	24.81
2335.7	23.25	Ave.	67	1.2	H	5.48	28.73	54	25.27
2362.9	23.21	Ave.	55	1.2	V	5.48	28.69	54	25.31
2362.9	41.19	PK	55	1.2	V	5.48	46.67	74	27.33
2335.7	40.29	PK	67	1.2	H	5.48	45.77	74	28.23

*Within measurement uncertainty.

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

Applicable Standard

Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 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 Procedure

1. Set the EUT in Operating mode, radio spectrum Bandwidth was set at 100 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another trace
3. Measure the channel separation.

Test Equipment List and Details

Manufacturer	Description	Model	Serial No.	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

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

** The testing was performed by Gardon Zhang on 2012-08-24.*

Test Result: Compliance.

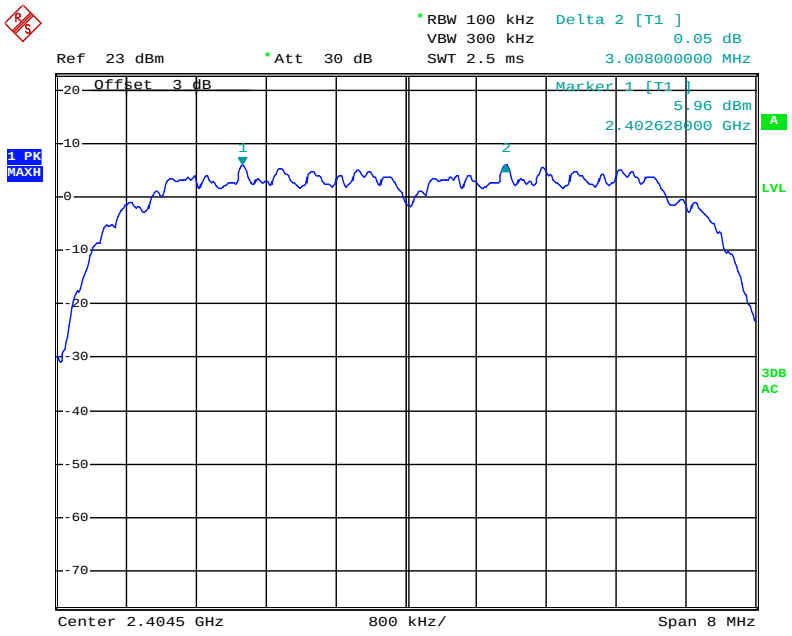
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2403	3.008	2.967	Pass
Adjacent	2406			
Middle	2439	3.008	2.967	
Adjacent	2442			
High	2478	3.008	2.967	
Adjacent	2475			

Please refer to the following plots.

Low Channel



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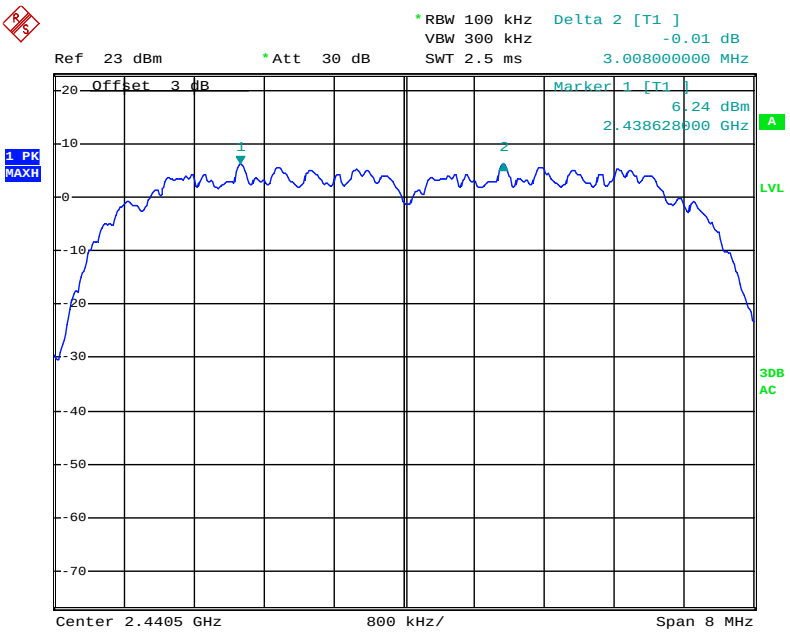
Middle Channel



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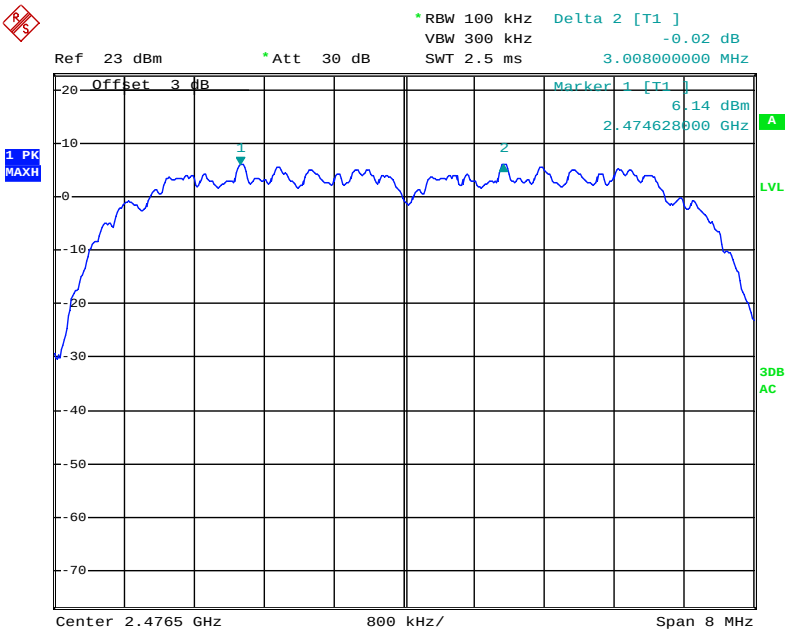
High Channel



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FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING

Applicable Standard

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

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

** The testing was performed by Gardon Zhang on 2012-08-24.*

Test Result: Compliance.

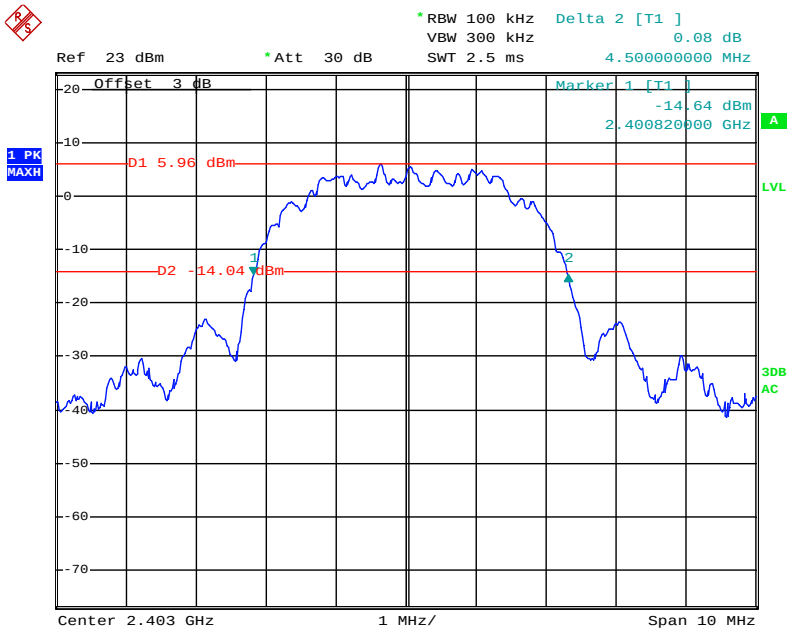
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2403	4.450
Middle	2439	4.450
High	2478	4.450

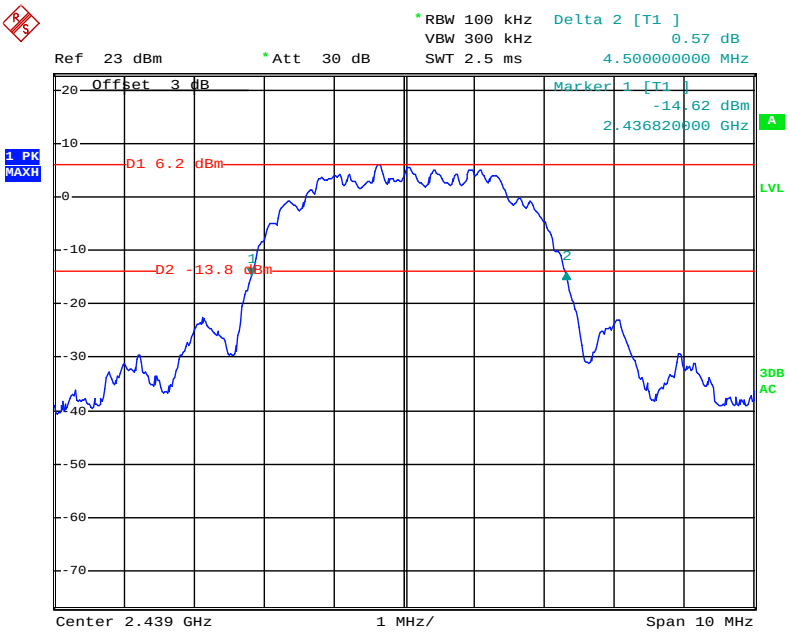
Please refer to the following plots.

Low Channel



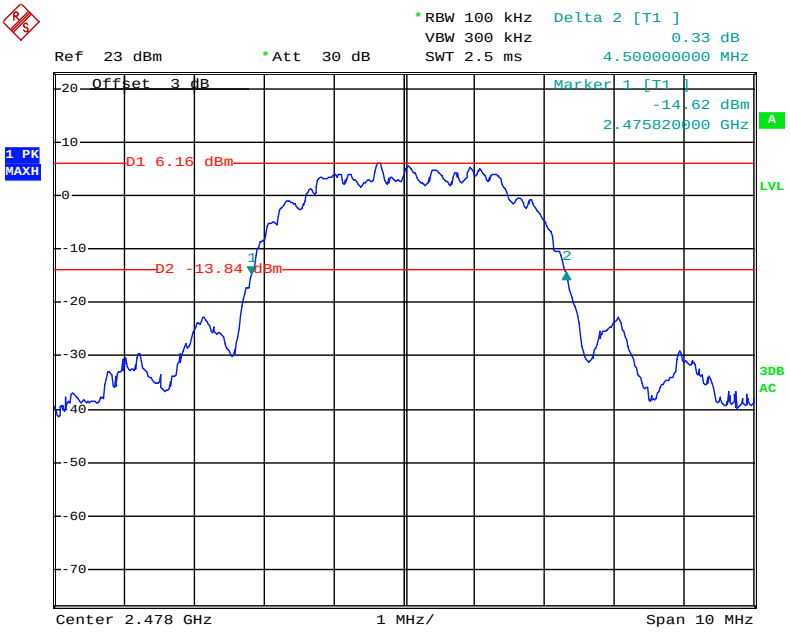
Date: 24.AUG.2012 09:53:20

Middle Channel



Date: 24.AUG.2012 10:02:38

High Channel



Date: 24.AUG.2012 10:10:38

FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

2. Set the EUT in hopping mode from first channel to last.

3. By using the max-hold function record the quantity of the channel.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

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

The testing was performed by Gardon Zhang on 2012-08-27.

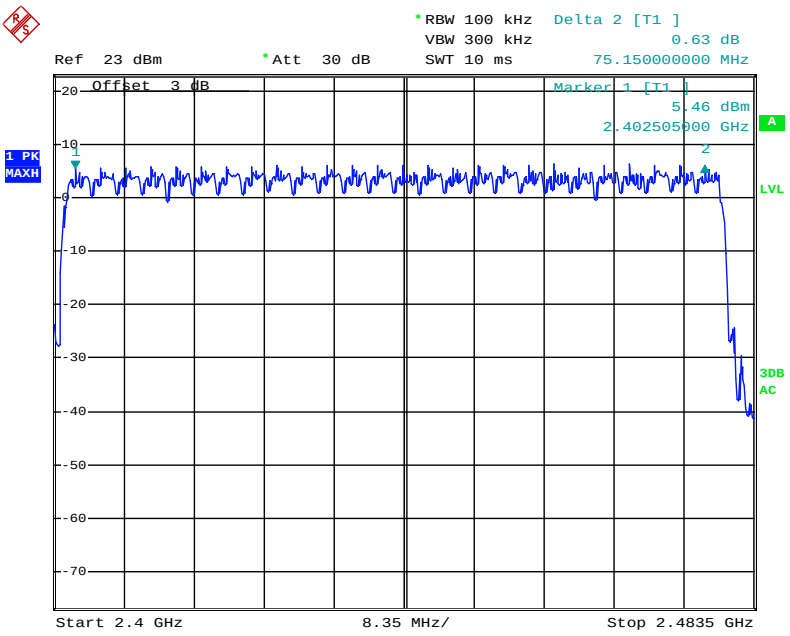
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	26	≥ 15

Number of Hopping Channels



Date: 27.AUG.2012 08:51:45

FCC §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

Dwell Time= Pulse time (ms) * hope rate/2/ number of hopping channels * hopping No.*0.4 s.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

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

The testing was performed by Gardon Zhang on 2012-08-24.

Test Result: Compliance.

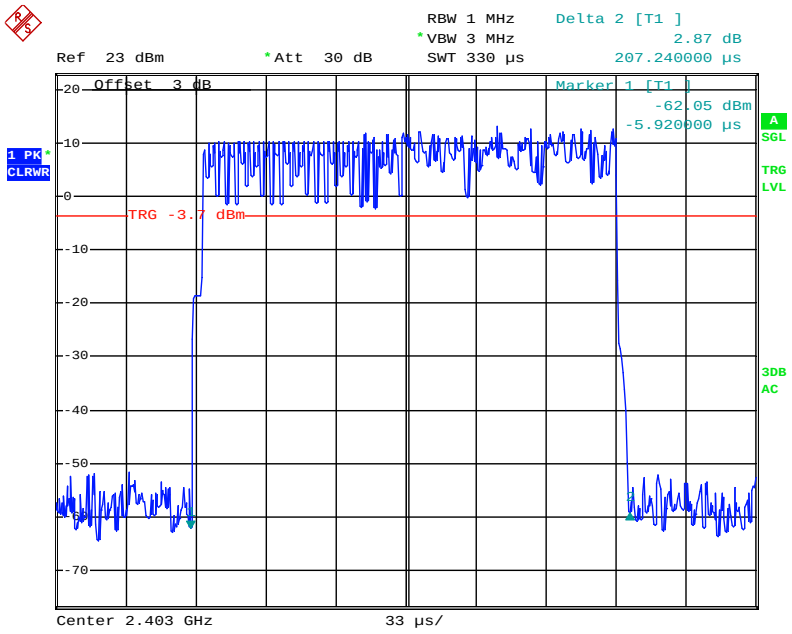
Please refer to following tables and plots

Test Mode: Transmitting

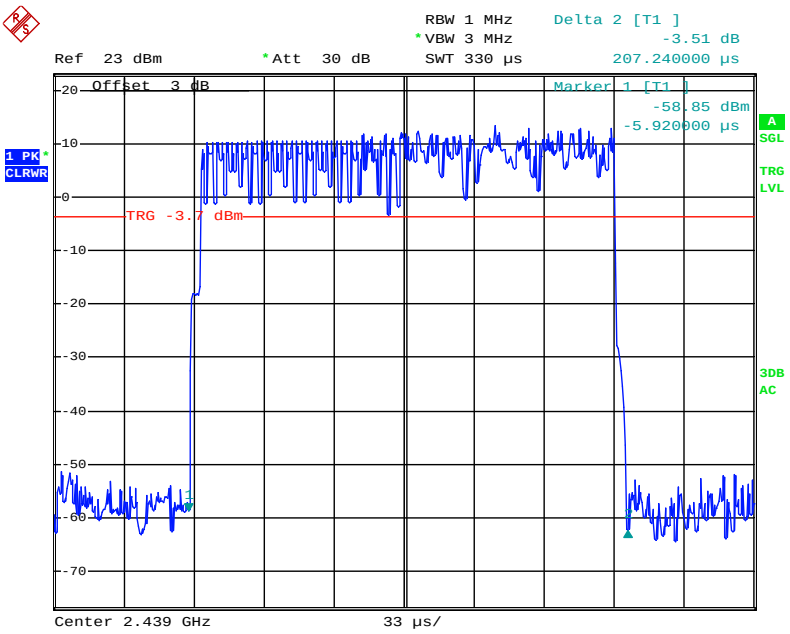
Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
Low	0.20724	0.024869	0.4	Pass
Middle	0.20724	0.024869	0.4	Pass
High	0.20724	0.024869	0.4	Pass
Note: Dwell time = Pulse time(600/2/26)*10.4 S*				

Please refer to the following plots.

Low Channel

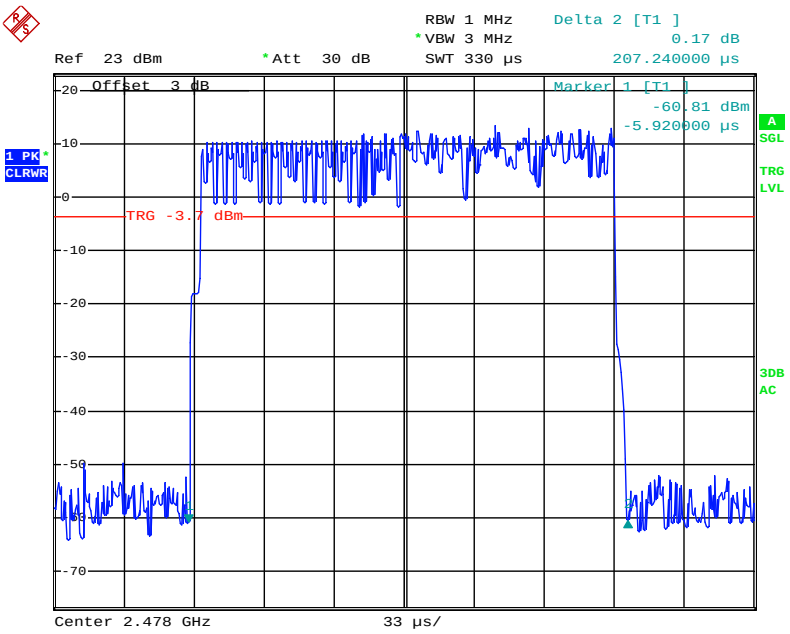


Middle Channel



Date: 24.AUG.2012 09:46:11

High Channel



Date: 24.AUG.2012 09:45:33

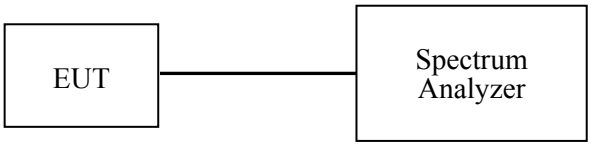
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

Test 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

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

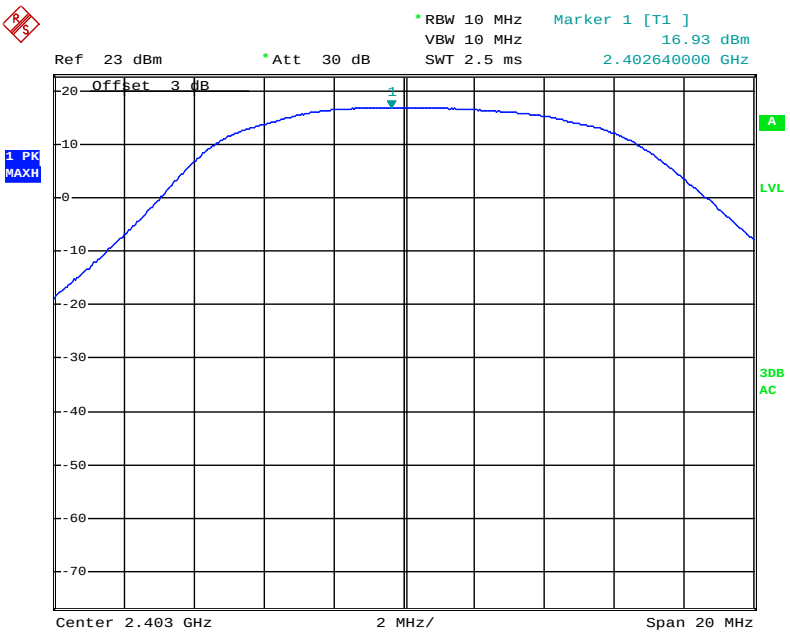
** The testing was performed by Gardon Zhang on 2012-08-24.*

Test Result: Compliance.

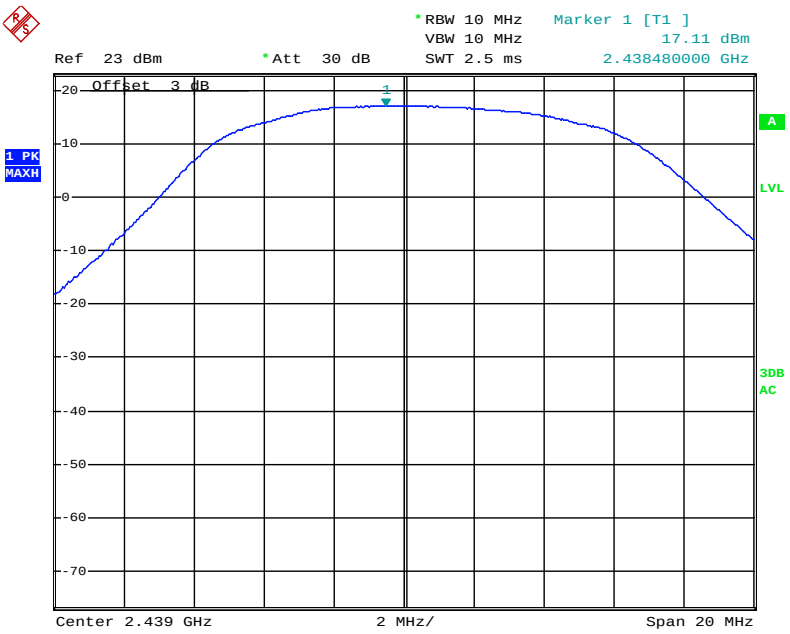
Test Mode: Transmitting

Channel	Frequency (MHz)	Conducted Peak Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2403	16.93	49.317	125
Middle	2439	17.11	51.404	125
High	2478	17.11	51.404	125

Low Channel

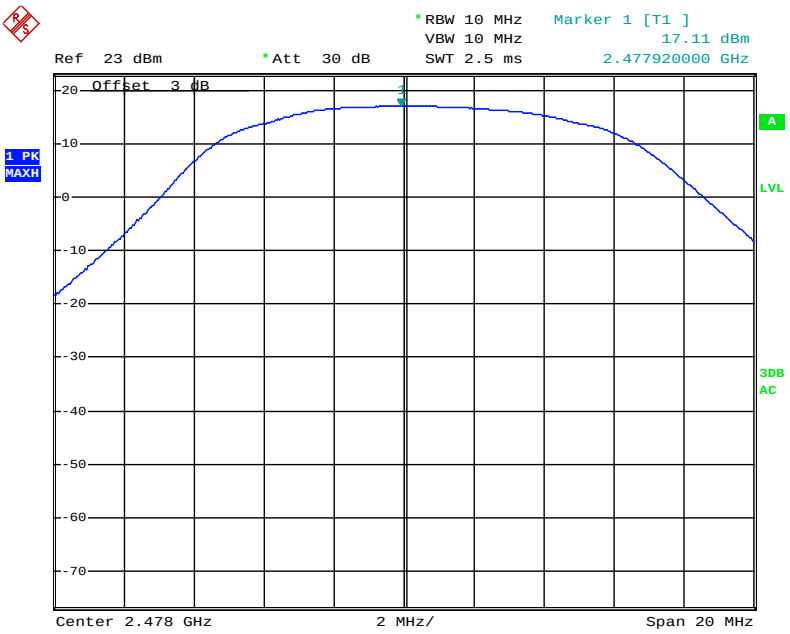


Middle Channel



Date: 24.AUG.2012 10:04:33

High Channel



Date: 24.AUG.2012 10:07:59

FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test 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 Operating 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. 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.
4. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

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

**The testing was performed by Gardon Zhang on 2012-08-24.*

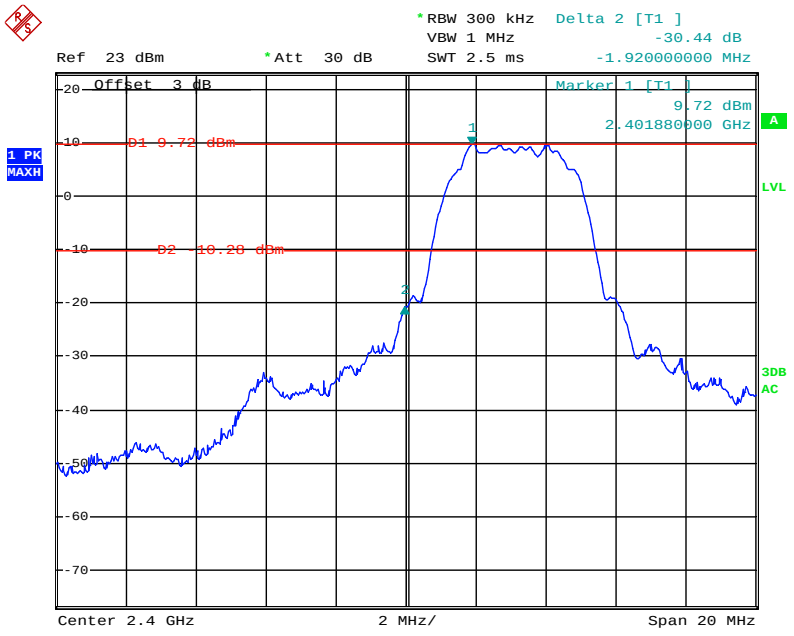
Test Result: Compliance.

Test Mode: Transmitting

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2400	30.44	20
2483.5	44.05	20

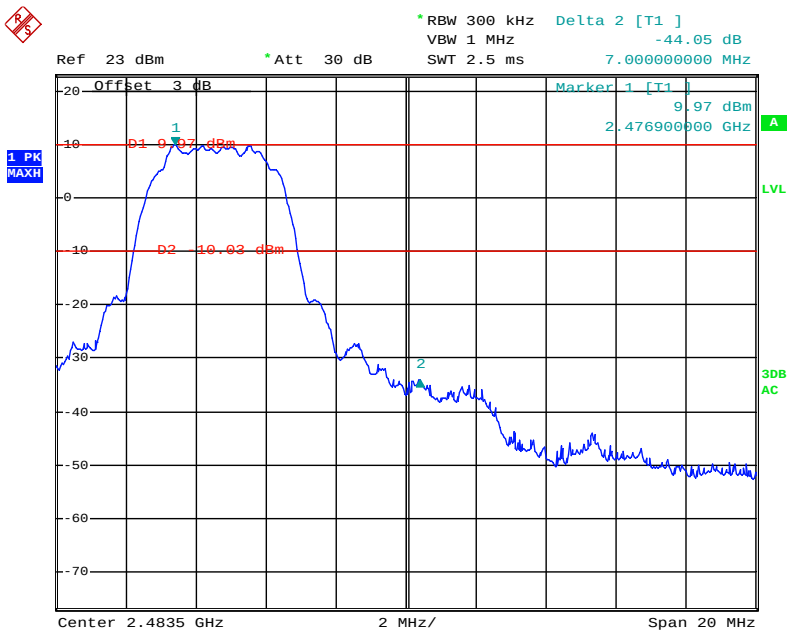
Please refer to follow plots:

Band Edge: Left Side



Date: 24.AUG.2012 09:56:45

Band Edge: Right Side



Date: 24.AUG.2012 10:13:43

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