

FCC PART 15.247
TEST REPORT

For

Legrand Home Systems

301 Fulling Mill Road Suite G, Middletown, PA, 17057 United States

FCC ID: YV8-202650

Report Type: Original Report	Product Type: Wireless Video Door Unit
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Report Number: R2DG130304003-00	
Report Date: 2013-04-15	
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* This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★"
(Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Legrand Home Systems*'s product, model number: 202650(FCC ID: YV8-202650) or ("EUT") in this report is a *Wireless Video Door Unit*, which was measured approximately: 21.0cm (L) x 5.5 cm (W) x 4.0 cm (H), rated input voltage: DC 4.5V from battery or AC 16-20V.

** All measurement and test data in this report was gathered from production sample serial number: 130304003 (Assigned by BACL, Dongguan). The EUT was received on 2013-03-05.*

Objective

This report is prepared on behalf of *Legrand Home Systems* 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 the EUT compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

Room unit of Part 15.247 filing with FCC ID: YV8-202662.

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. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

The uncertainty of any RF tests which use conducted method measurement is ± 0.96 dB, the uncertainty of any radiation on emissions measurement is: 30M~200MHz: 5.0 dB; 200M~1GHz: 6.2 dB; 1G~6GHz: 4.45 dB; 6G~18GHz: 5.23 dB.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) 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 February 02, 2012. 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.: 273710. 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. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).



The current scope of accreditations can be found at <http://ts.nist.gov/standards/scopes/5000690.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

16 hopping channels are provided by manufacturer, and EUT was tested with channel 1, 9 and 16.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2411MHz	9	2437MHz
2	2414MHz	10	2440MHz
3	2418MHz	11	2443MHz
4	2421MHz	12	2446MHz
5	2424MHz	13	2450MHz
6	2427MHz	14	2453MHz
7	2430MHz	15	2456MHz
8	2434MHz	16	2459MHz

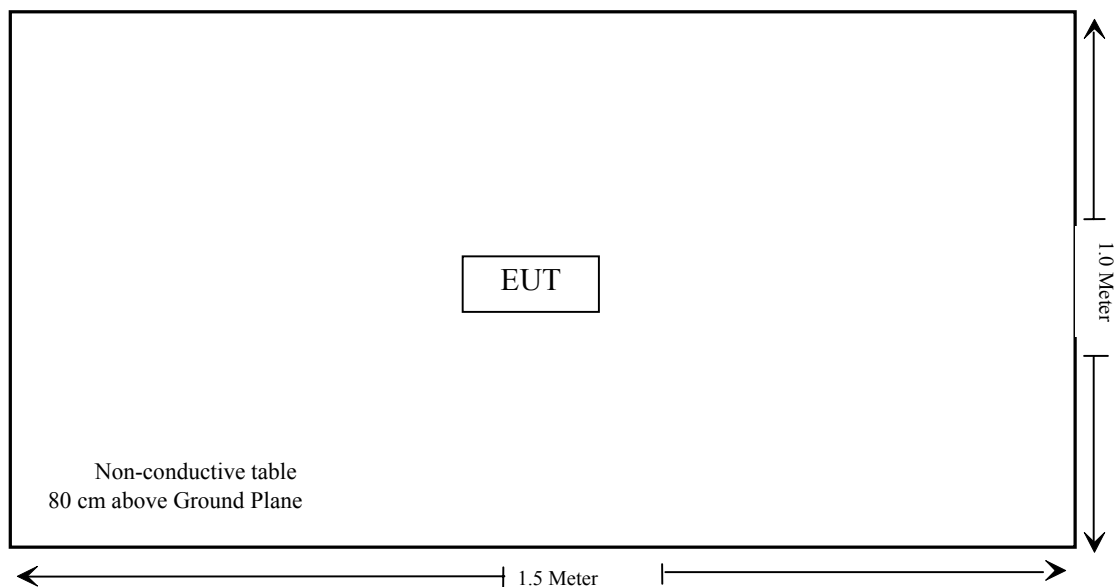
EUT Exercise Software

No EUT 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
FCC §15.247 (i) & §1.1307 (b) (1) & §2.1091	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	N/A
§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) & §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

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

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) 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;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

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);

Calculated Data:

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
2411	0	1	17.31	53.83	20	0.01	1.0

Result: The device meet FCC MPE 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 two printed antennas, which were permanently attached on the PCB, one for TX function another for RX function, which complied with 15.203, the maximum gain is 0 dBi, please refer to the internal photos.

Result: Compliance.

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 2, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

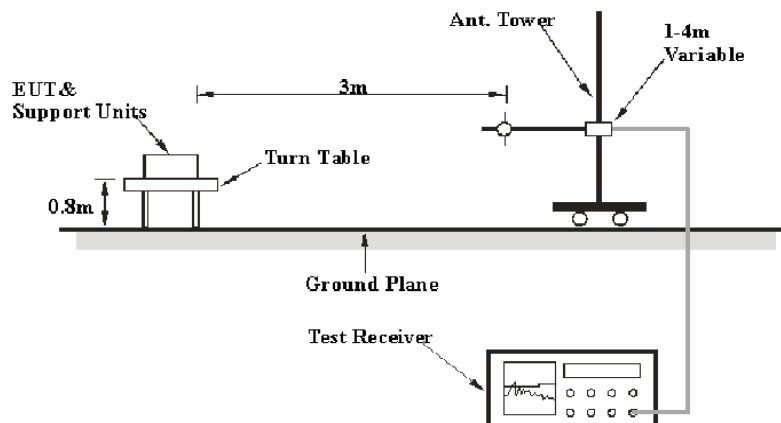
- 30M~200MHz: 5.0 dB
- 200M~1GHz: 6.2 dB
- 1G~6GHz: 4.45 dB
- 6G~18GHz: 5.23 dB

Table 2 – Values of U_{cispr}

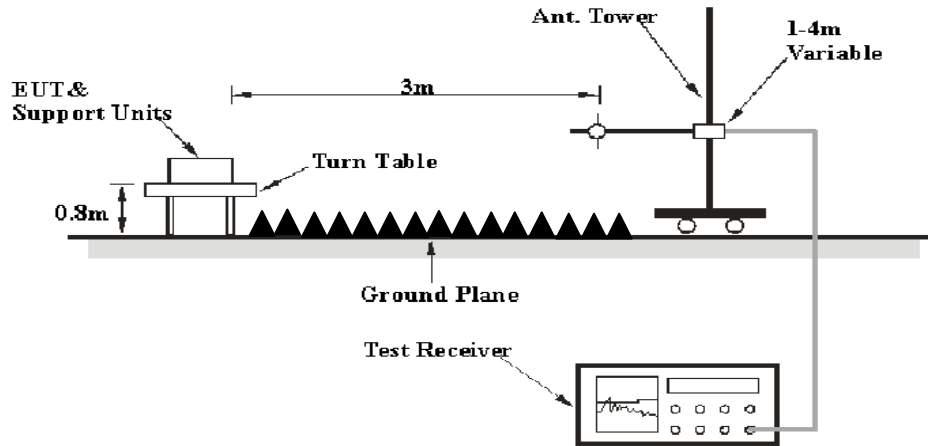
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2003. 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.

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 BW</i>	<i>Detector</i>
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 first AC floor outlet.

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz - 1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI TEST RECIEVER	ESCI	100224	2012-5-14	2013-5-13
Sunol Sciences	Antenna	JB3	A060611-1	2012-9-6	2015-9-5
HP	HP AMPLIFIER	8447E	2434A02181	N/A	N/A
R&S	Spectrum analyzer	FSEM 30	849016/001	2012-9-4	2013-9-3
ETS LINDGREN	horn antenna	3115	000 527 35	2012-9-6	2015-9-5
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

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

5.12 dB at 2390 MHz in the Horizontal polarization

Test Data

Environmental Conditions

Temperature:	22.4°C -22.5°C
Relative Humidity:	68%
ATM Pressure:	101.0 kPa

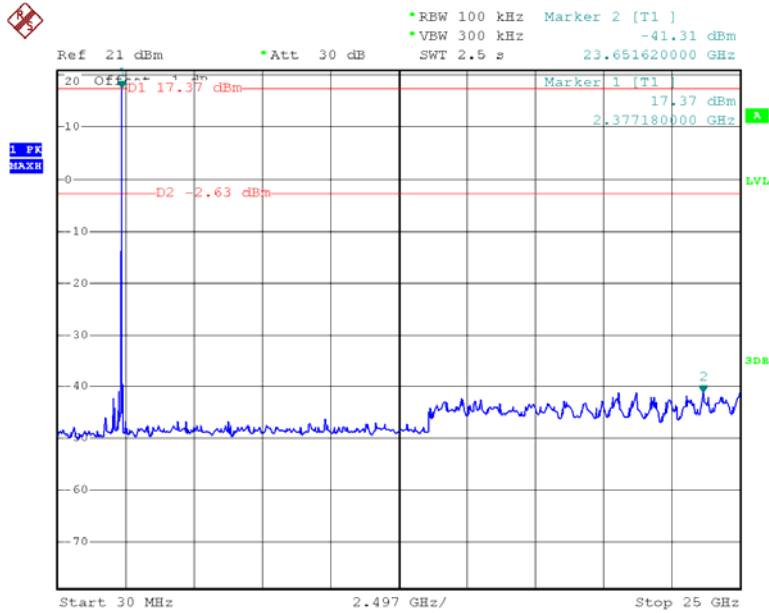
The testing was performed by Leon Chen from 2013-04-10 to 2013-04-11.

Test Mode: Transmitting

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	FCC 15.247	
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBµV/m)	Margin (dB)
Low Channel: 2411(MHz)									
2411	77.38	PK	H	25.67	3.92	0.00	106.97	N/A	N/A
2411	48.8	AV	H	25.67	3.92	0.00	78.39	N/A	N/A
2411	75.27	PK	V	25.67	3.92	0.00	104.86	N/A	N/A
2411	47.44	AV	V	25.67	3.92	0.00	77.03	N/A	N/A
2390	39.43	PK	H	25.61	3.84	0.00	68.88	74.00	5.12
2390	14.14	AV	H	25.61	3.84	0.00	43.59	54.00	10.41
4822	42.4	PK	H	30.64	4.72	27.26	50.50	74.00	23.50
4822	26.19	AV	H	30.64	4.72	27.26	34.29	54.00	19.71
7233	36.74	PK	H	34.16	6.55	26.36	51.09	74.00	22.91
7233	21.76	AV	H	34.16	6.55	26.36	36.11	54.00	17.89
9644	32.56	PK	H	36.05	8.71	26.08	51.24	74.00	22.76
9644	20.2	AV	H	36.05	8.71	26.08	38.88	54.00	15.12
2344.92	32.09	PK	H	25.50	3.67	27.16	34.10	74.00	39.90
2344.92	22.27	AV	H	25.50	3.67	27.16	24.28	54.00	29.72
311.3	43.6	QP	V	14.36	2.19	21.55	38.60	46.00	7.40
Middle Channel: 2437(MHz)									
2437	77.26	PK	H	25.74	3.98	0.00	106.98	N/A	N/A
2437	48.56	AV	H	25.74	3.98	0.00	78.28	N/A	N/A
2437	75.59	PK	V	25.74	3.98	0.00	105.31	N/A	N/A
2437	47.86	AV	V	25.74	3.98	0.00	77.58	N/A	N/A
4874	42.58	PK	H	30.77	4.76	27.26	50.85	74.00	23.15
4874	27.03	AV	H	30.77	4.76	27.26	35.30	54.00	18.70
7311	36.57	PK	H	34.35	6.70	26.51	51.11	74.00	22.89
7311	21.36	AV	H	34.35	6.70	26.51	35.90	54.00	18.10
9748	32.33	PK	H	36.30	8.60	25.68	51.55	74.00	22.45
9748	20.01	AV	H	36.30	8.60	25.68	39.23	54.00	14.77
1306.25	30.54	PK	V	23.10	2.59	27.19	29.04	74.00	44.96
1306.25	18.12	AV	V	23.10	2.59	27.19	16.62	54.00	37.38
2351.23	32.16	PK	H	25.51	3.63	27.16	34.14	74.00	39.86
2351.23	22.34	AV	H	25.51	3.63	27.16	24.32	54.00	29.68
311.84	43.8	QP	V	14.37	2.19	21.55	38.81	46.00	7.19
High Channel: 2459(MHz)									
2459	77.45	PK	H	25.79	3.95	0.00	107.20	N/A	N/A
2459	48.43	AV	H	25.79	3.95	0.00	78.18	N/A	N/A
2459	76.24	PK	V	25.79	3.95	0.00	105.99	N/A	N/A
2459	47.76	AV	V	25.79	3.95	0.00	77.51	N/A	N/A
2483.5	36.44	PK	H	25.86	3.80	0.00	66.10	74.00	7.90
2483.5	13.56	AV	H	25.86	3.80	0.00	43.22	54.00	10.78
4918	41.74	PK	H	30.89	4.71	27.27	50.07	74.00	23.93
4918	25.73	AV	H	30.89	4.71	27.27	34.06	54.00	19.94
7377	34.31	PK	H	34.50	6.83	26.64	49.00	74.00	25.00
7377	20.84	AV	H	34.50	6.83	26.64	35.53	54.00	18.47
9836	33.77	PK	H	36.51	8.50	25.49	53.29	74.00	20.71
9836	19.46	AV	H	36.51	8.50	25.49	38.98	54.00	15.02
2345.6	32.01	PK	H	25.50	3.66	27.16	34.01	74.00	39.99
2345.6	22.37	AV	H	25.50	3.66	27.16	24.37	54.00	29.63
311.26	43.9	QP	V	14.36	2.19	21.55	38.90	46.00	7.10

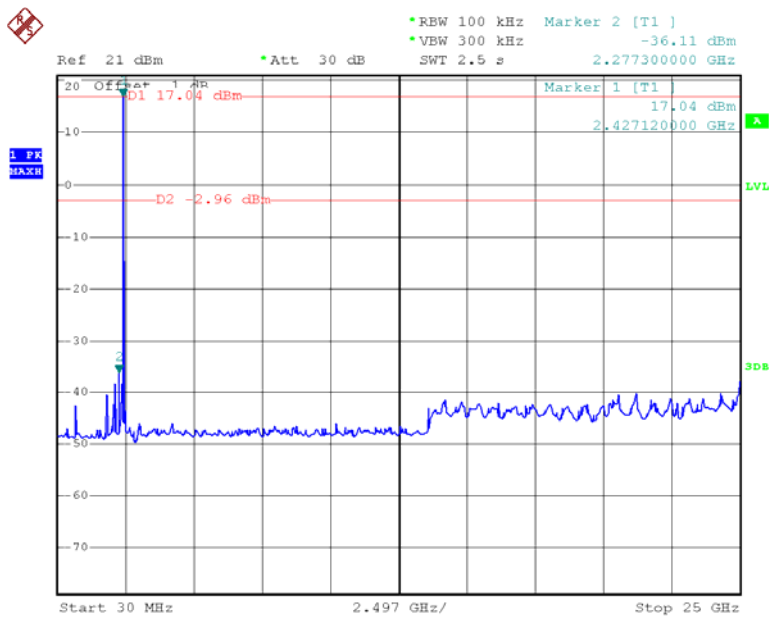
Conducted Spurious Emissions at Antenna Port

Low Channel



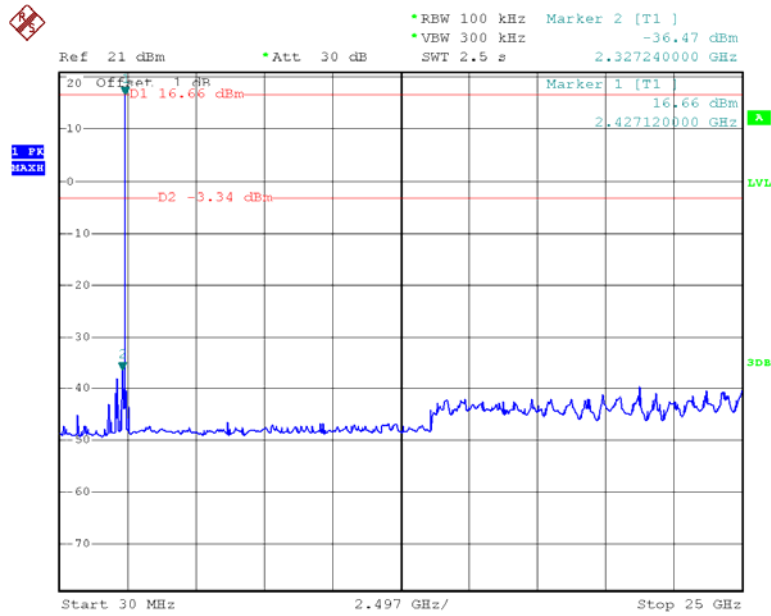
Date: 10.APR.2013 14:25:25

Middle Channel



Date: 11.APR.2013 10:10:05

High Channel



Date: 10.APR.2013 14:20:48

FCC §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 2400-2483.50 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
R&S	Spectrum analyzer	FSP 38	100478	2012-5-14	2013-5-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

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 trace
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	24.7°C
Relative Humidity:	60 %
ATM Pressure:	101.0kPa

The testing was performed by Leon Chen on 2013-04-10.

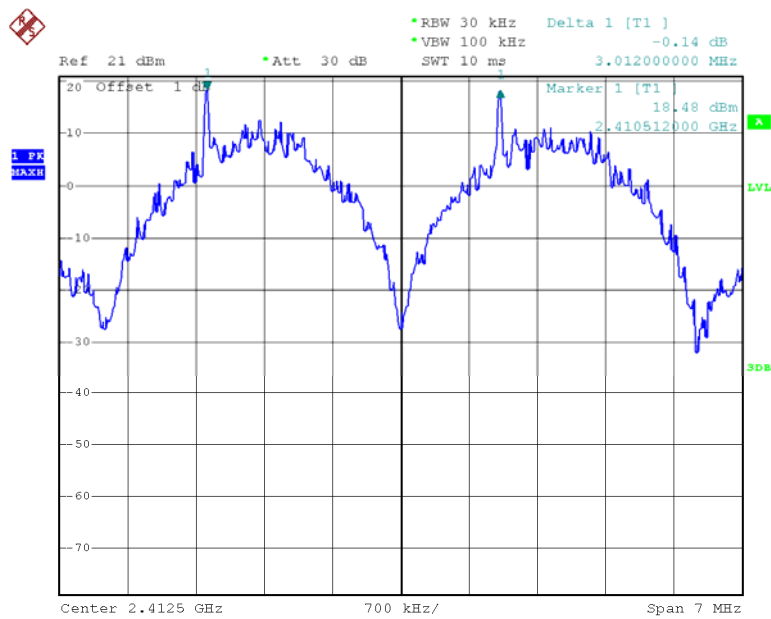
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

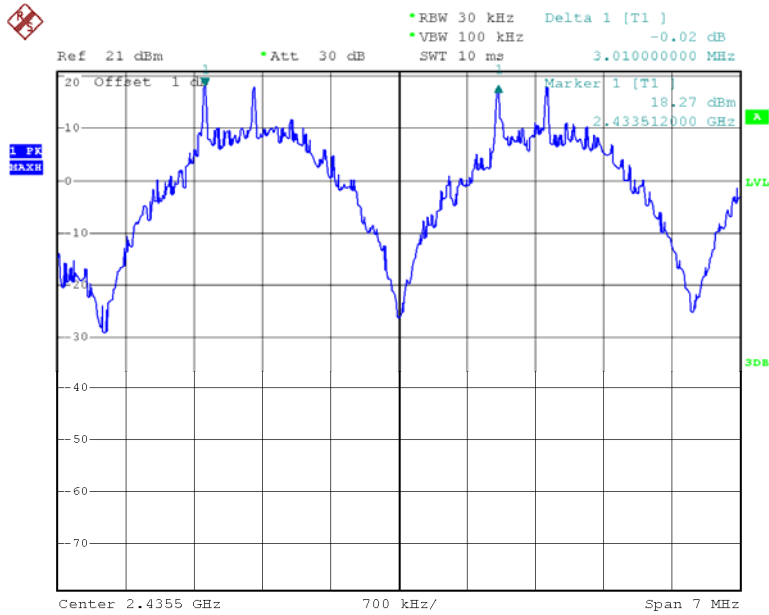
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2411	3.012	1.41	Pass
Adjacent	2414			
Middle	2434	3.010	1.41	Pass
Adjacent	2437			
High	2456	3.010	1.41	Pass
Adjacent	2459			

Low Channel



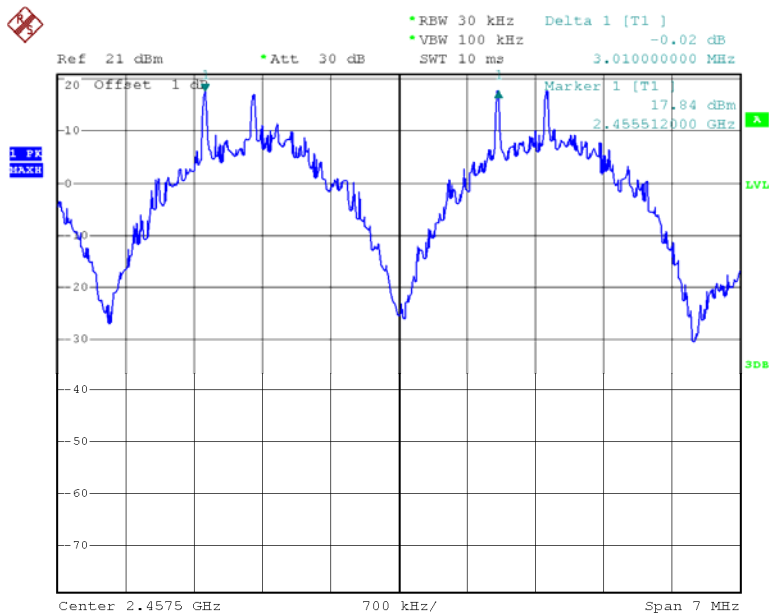
Date: 10.APR.2013 14:51:21

Middle Channel



Date: 10.APR.2013 14:54:23

High Channel



Date: 10.APR.2013 14:55:33

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

Applicable Standard

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

Test 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
R&S	Spectrum analyzer	FSP 38	100478	2012-5-14	2013-5-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23.9°C-24.7°C
Relative Humidity:	60 %-65 %
ATM Pressure:	101.0kPa

The testing was performed by Leon Chen from 2013-04-10 to 2013-04-11.

Test Result: Compliance.

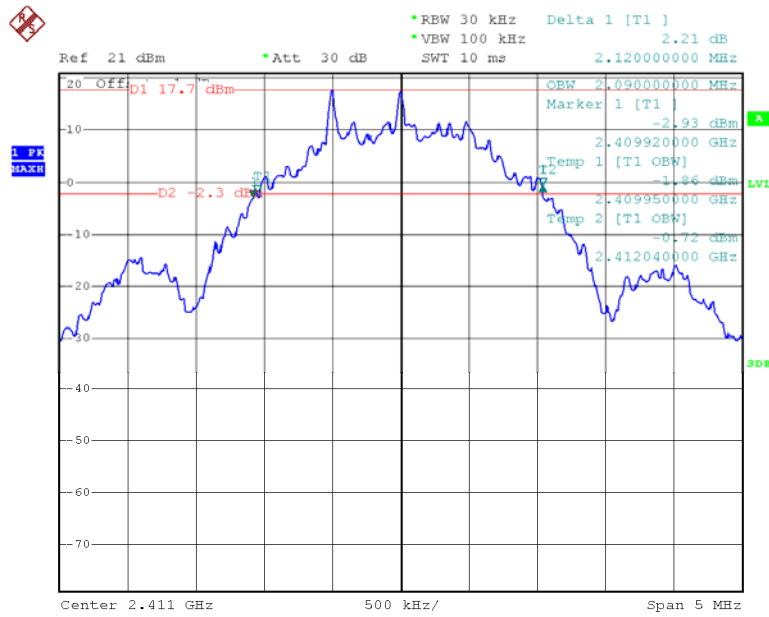
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2411	2.120
Middle	2437	2.120
High	2459	2.110

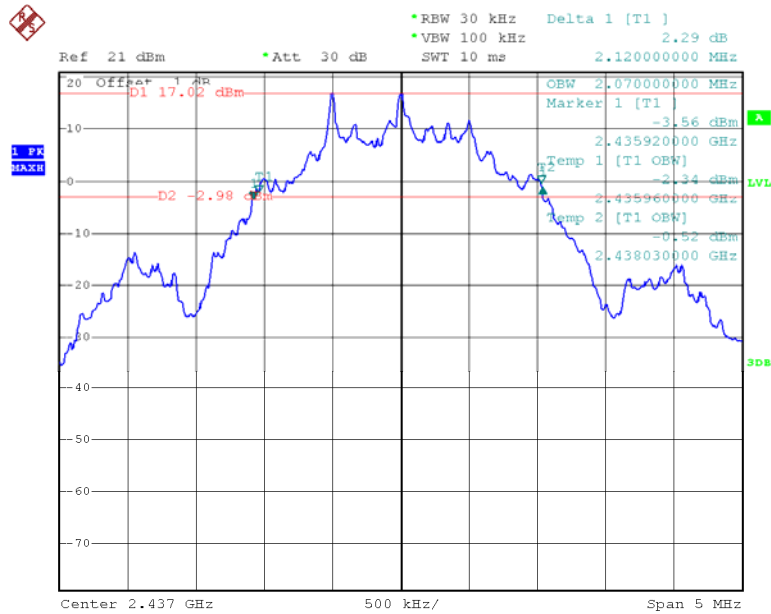
Please refer to the following plots.

Low Channel



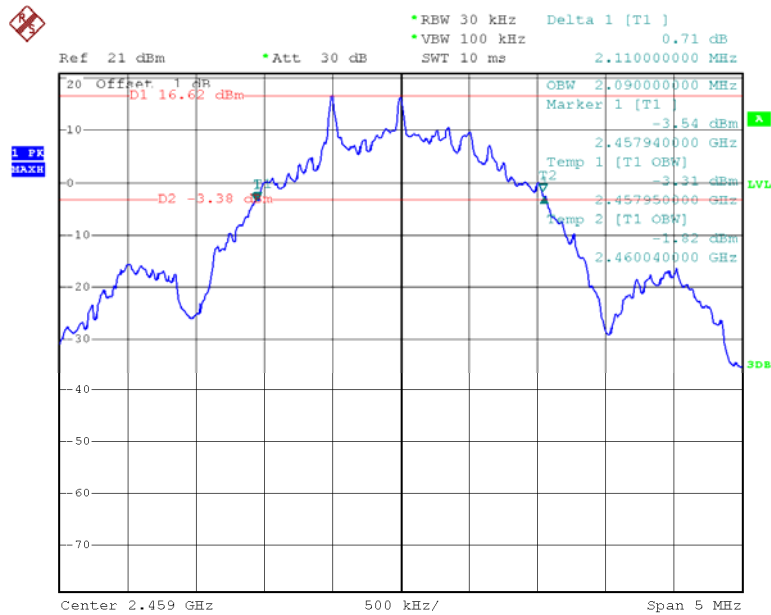
Date: 10.APR.2013 14:22:26

Middle Channel



Date: 11.APR.2013 10:13:00

High Channel



Date: 10.APR.2013 14:17:13

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
R&S	Spectrum analyzer	FSP 38	100478	2012-5-14	2013-5-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	24.7°C
Relative Humidity:	60 %
ATM Pressure:	101.0kPa

The testing was performed by Leon Chen on 2013-04-10.

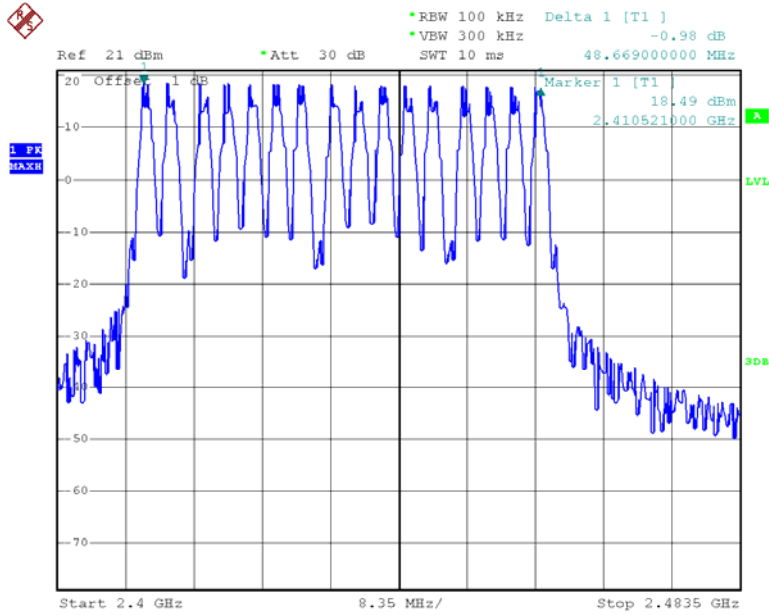
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	16	≥15

Number of Hopping Channels



Date: 10.APR.2013 14:57:40

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

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 * 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 *hopping NO. * 0.4s

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum analyzer	FSP 38	100478	2012-5-14	2013-5-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	24.7°C
Relative Humidity:	60 %
ATM Pressure:	101.0kPa

The testing was performed by Leon Chen on 2013-04-10.

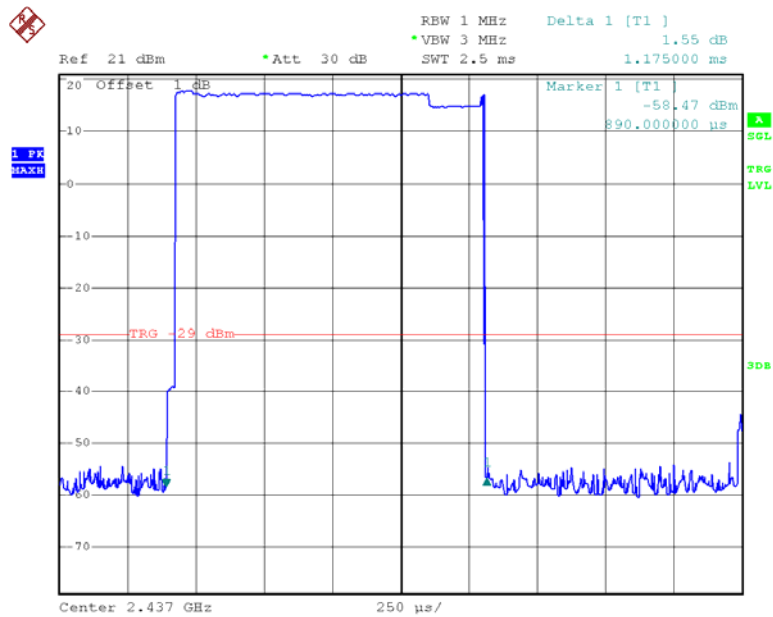
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
Middle	1.175	0.376	0.4	Pass
Dwell Time(s)= time slot length(s)*(500/16)*16 * 0.4				

Note: The EUT hopping 500 times per second, which was declared by manufacturer.



Date: 10.APR.2013 15:00:14

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 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
R&S	Spectrum analyzer	FSP 38	100478	2012-5-14	2013-5-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23.9°C-24.7°C
Relative Humidity:	60 %-65 %
ATM Pressure:	101.0kPa

The testing was performed by Leon Chen from 2013-04-10 to 2013-04-11.

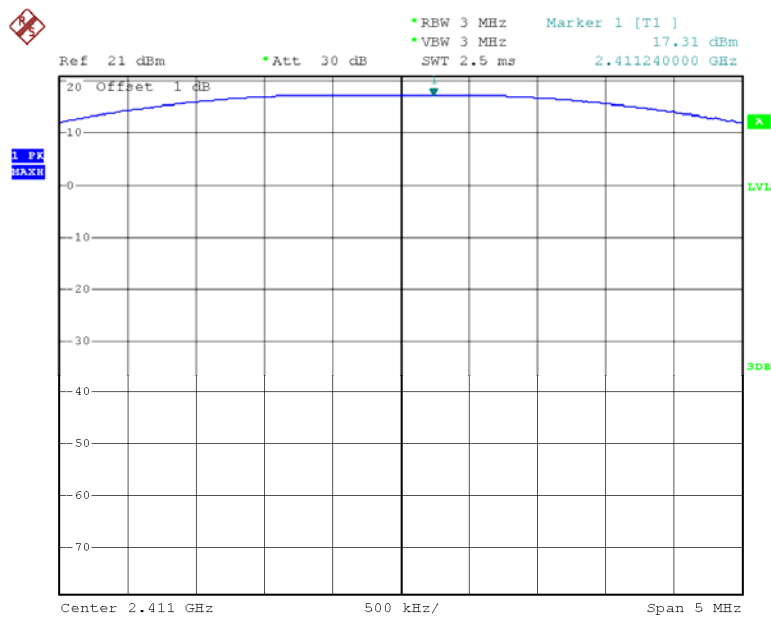
Test Result: Compliance.

Test Mode: Transmitting

Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
Low	2411	17.31	21
Middle	2437	16.92	21
High	2459	16.30	21

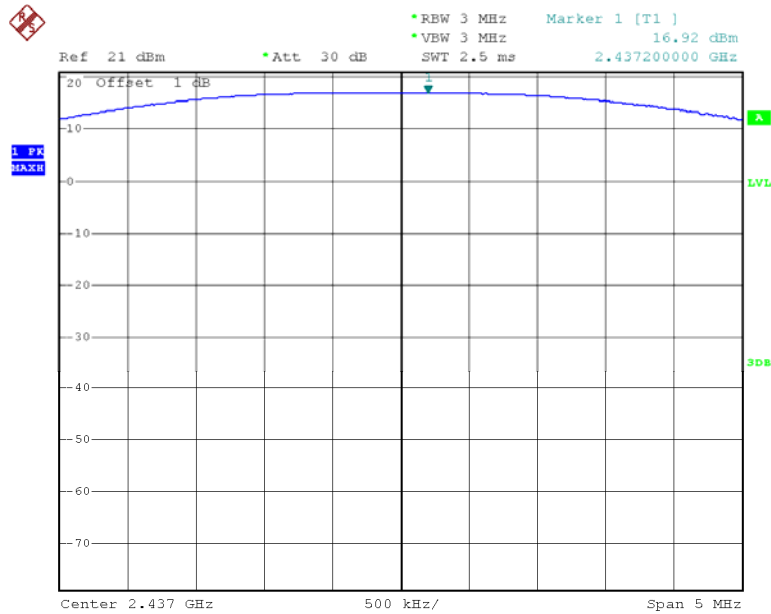
Note: The data above was tested in conducted mode.

Output Power, Low



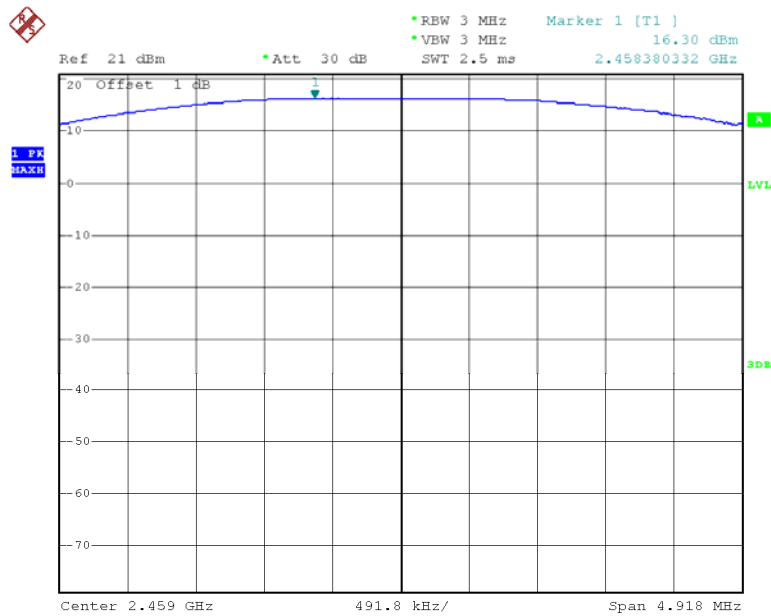
Date: 10.APR.2013 14:22:35

Output Power, Middle



Date: 11.APR.2013 10:11:52

Output Power, High



Date: 10.APR.2013 14:14:27

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. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum analyzer	FSP 38	100478	2012-5-14	2013-5-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

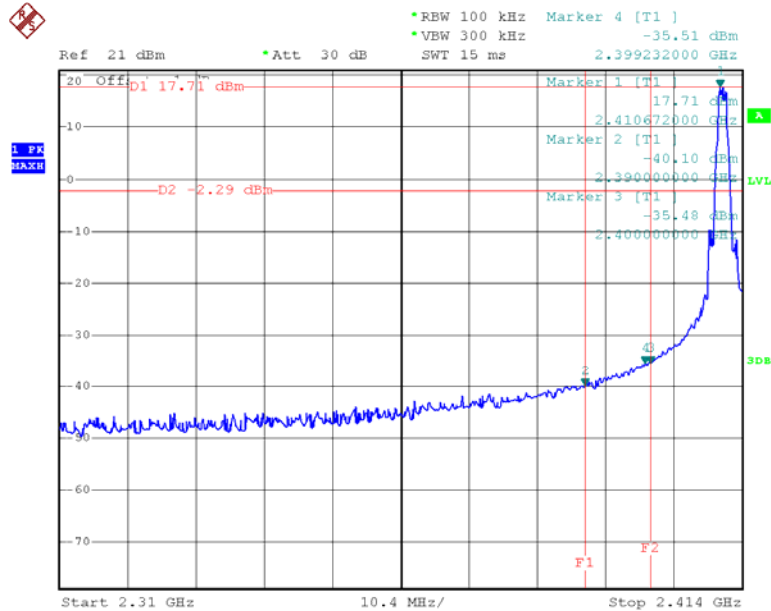
Environmental Conditions

Temperature:	24.7°C
Relative Humidity:	60 %
ATM Pressure:	101.0kPa

The testing was performed by Leon Chen on 2013-04-10.

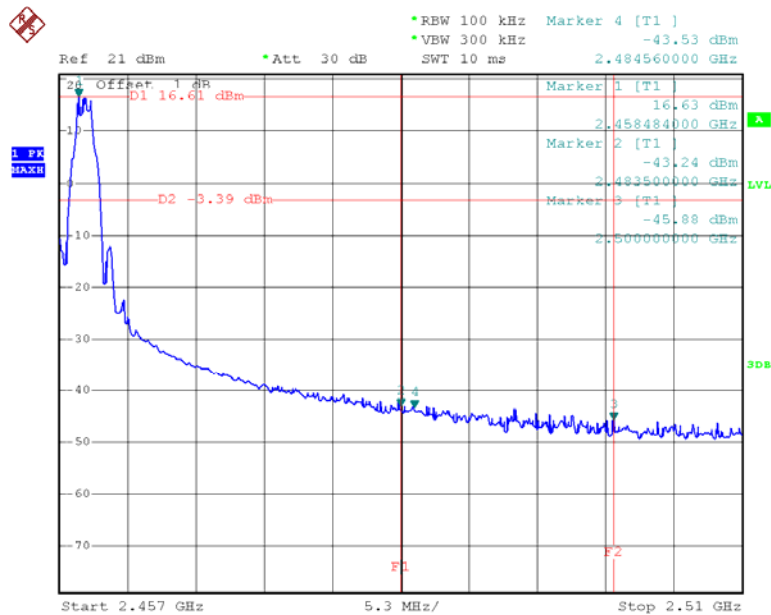
Test Result: Compliance

Band Edge, Left Side



Date: 10.APR.2013 14:24:54

Band Edge, Right Side



Date: 10.APR.2013 14:19:38

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