NVLAP LAB CODE 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Hull Base International Ltd.

Room 1004, New Lee Wah Centre, 88 Tokwawan Road,

Tokwawan, Hong Kong

FCC ID: XGGH100M09
Model: H100 (Monitor Unit: H100M)

Report Type:	**Product Type:**
Original Report	2.4 GHz Wireless Monitoring Device

Test Engineer:	Weir Zhong
Report Number:	RSZ09060303
Report Date:	2009-08-05
Reviewed By:	Merry Zhao EMC Engineer
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 *Hull Base International Ltd.*'s product, model number: *H100 (Monitor Unit: H100M) (FCC ID: XGGH100M09)* or the "EUT" as referred to in this report is a *Wireless Monitoring Device*, which measures approximately: 15.5 cm L x 8.0 cm W x 3.0 cm H for monitor, rated input voltage: DC 6V adapter or DC 3.7V battery.

Adapter Information: OEM POWER ADAPTOR
Model: ADS10-W060100
Input: 100-240V 50-60 Hz, 0.5A
Output: 6V, 1.0A

All measurement and test data in this report was gathered from production sample serial number: 0906014(Assigned by BACL, Shenzhen). The EUT was received on 2009-06-03.

Objective

This Type approval report is prepared on behalf of *Hull Base International Ltd. in* accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209, and 15.247 rules.

This measurement and test report only pertains to the monitor unit portion of the EUT; for measurement and test results to the camera unit please refer to report RSZ09060304 issued by Shenzhen BACL.

Related Submittal(s)/Grant(s)

FCC Part 15.247 submission with FCC ID: XGGH100C09.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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

Test Facility

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

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21,

2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

NVLAP LAB CODE 200707-0

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

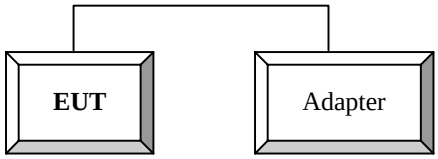
Equipment Modifications

No modification was made to the unit tested.

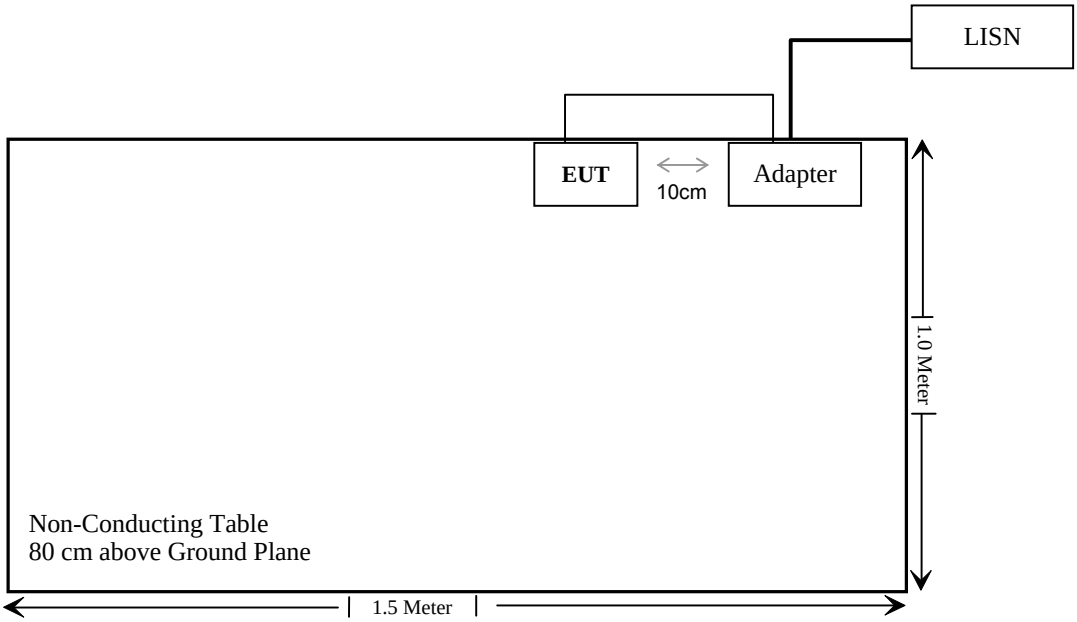
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Undetachable DC Power Cable	1.6	Adapter	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), §2.1091	Maximum Permissible Exposure (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a), §15.107	Conducted Emissions	Compliant
§15.205, §15.209, §15.109, §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

CFR47 §15.247 (i), §1.1307 (b) (1) & §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

Test Data

Predication of MPE limit at a given distance

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

S = 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)

Maximum peak output power at antenna input terminal: 15.87 (dBm)
Maximum peak output power at antenna input terminal: 38.637 (mW)
Prediction distance: 20 (cm)
Predication frequency: 2437.875 (MHz)
Antenna Gain (typical): 1.2 (dBi)
Antenna Gain (typical): 1.318(numeric)
The power density at predication frequency at 20 cm: 0.0101(mW/cm^2)
MPE limit for General Population/Uncontrolled exposure at prediction frequency: 1.0 (mW/cm^2)

Result:

The predicted power density level at 20 cm is 0.0101 mw/cm^2 which is below the uncontrolled exposure limit of 1.0 mw/cm^2 ,The EUT is used at least 20 cm away from user's body. It is determined as mobile equipment and complies with the MPE limit.

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 an integral antenna soldered to the PCB, which in accordance to section 15.203, the maximum gain is 1.2 dBi; please refer to the internal photos.

Result: Compliant.

CFR47 §15.207 (a) §15.107- CONDUCTED EMISSIONS

Applicable Standard

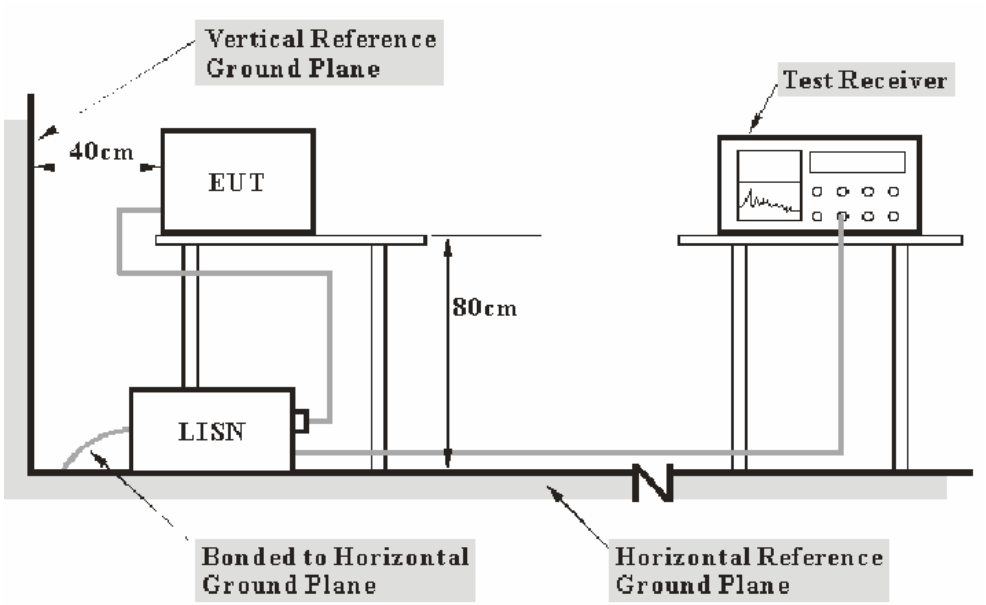
CFR47 §15.207, §15.107.

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 NIS 81, 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.

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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

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

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120V 60Hz 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2009-04-28	2010-04-27
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2009-04-28	2010-04-27

***** Com-Power's LISN were used as the supporting equipment.
*** 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 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 Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, 15.107, with the worst margin reading of:

Charging mode: 13.10 dB at **0.1500 MHz** in the **Neutral** conductor mode

Transmitting mode: 10.40 dB at **29.9450 MHz** in the **Line** conductor mode

Test Data

Environmental Conditions

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

** The testing was performed by Weir Zhong on 2009-06-17.*

Test Mode: Charging

Line Conducted Emissions				FCC Part 15.107	
Frequency (MHz)	**Amplitude (dBμV)**	**Detector (QP/AV)**	**Conductor (Line/Neutral)**	**Limit (dBμV)**	**Margin (dB)**
0.1500	52.90	QP	Neutral	66.00	13.10
0.2000	48.50	QP	Neutral	63.61	15.11
0.1500	49.70	QP	Line	66.00	16.30
0.1950	45.90	QP	Line	63.82	17.92
0.1500	37.70	AV	Neutral	56.00	18.30
0.2000	33.70	AV	Neutral	53.61	19.91
28.9300	26.90	AV	Neutral	50.00	23.10
28.9100	25.60	AV	Line	50.00	24.40
0.1500	30.30	AV	Line	56.00	25.70
0.2700	35.30	QP	Line	61.12	25.82
0.3050	34.10	QP	Neutral	60.11	26.01
0.1950	27.40	AV	Line	53.82	26.42
28.9100	32.10	QP	Line	60.00	27.90
0.3050	21.90	AV	Neutral	50.11	28.21
28.9300	31.50	QP	Neutral	60.00	28.50
1.6850	26.30	QP	Neutral	56.00	29.70
0.6050	15.60	AV	Neutral	46.00	30.40
0.6050	25.30	QP	Neutral	56.00	30.70
1.3330	25.30	QP	Line	56.00	30.70
1.6850	15.30	AV	Neutral	46.00	30.70
1.3330	15.20	AV	Line	46.00	30.80
13.2850	17.70	AV	Line	50.00	32.30
13.2850	27.50	QP	Line	60.00	32.50
0.2450	19.10	AV	Line	51.92	32.82

Test Mode: Transmitting

Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	**Amplitude (dBμV)**	**Detector (QP/AV)**	**Conductor (Line/Neutral)**	**Limit (dBμV)**	**Margin (dB)**
29.9450	49.60	QP	Line	60.00	10.40
0.1850	52.90	QP	Neutral	64.26	11.36
29.4850	47.50	QP	Neutral	60.00	12.50
0.2500	47.50	QP	Neutral	61.76	14.26
0.1850	36.90	AV	Neutral	54.26	17.36
0.1900	46.60	QP	Line	64.04	17.44
11.9850	42.50	QP	Neutral	60.00	17.50
0.2500	34.20	AV	Neutral	51.76	17.56
29.3500	31.70	AV	Neutral	50.00	18.30
29.6450	31.60	AV	Line	50.00	18.40
0.2500	42.30	QP	Line	61.76	19.46
0.1900	32.70	AV	Line	54.04	21.34
0.3150	27.50	AV	Neutral	49.84	22.34
1.4600	23.60	AV	Line	46.00	22.40
0.3150	37.10	QP	Neutral	59.84	22.74
1.4600	32.90	QP	Line	56.00	23.10
0.1500	32.40	AV	Line	56.00	23.60
1.5900	29.40	QP	Neutral	56.00	26.60
0.3800	30.10	QP	Line	58.28	28.18
0.3800	19.70	AV	Line	48.28	28.58
1.5950	16.20	AV	Neutral	46.00	29.80
15.0650	29.90	QP	Line	60.00	30.10
14.9800	15.20	AV	Line	50.00	34.80
12.0200	10.60	AV	Neutral	50.00	39.40

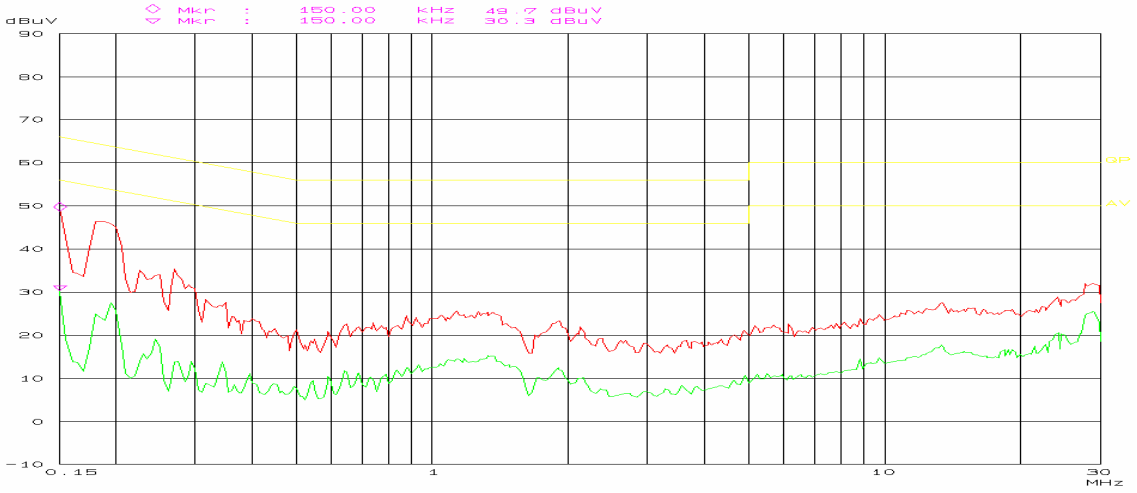
Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Charging Mode:

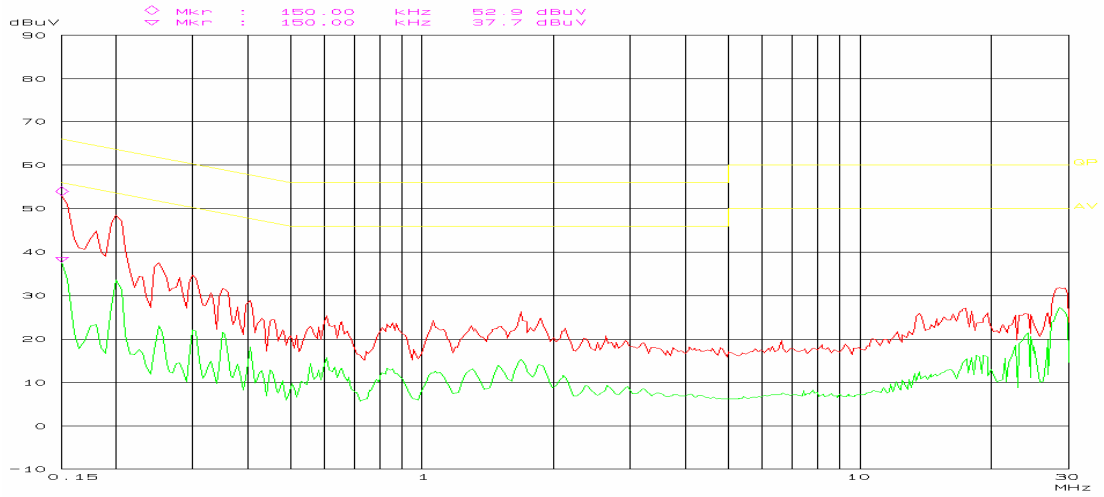
Conducted emission
FCC PART 15

EUT: Wireless Monitoring Device M/N: H100M
Manuf: Hull Base International Ltd.
Op Cond: Receiving&Charging
Operator: Weir
Test Spec: Adapter input AC 120V/60Hz Line
Comment: Temp: 25 Hum: 56%
BACL

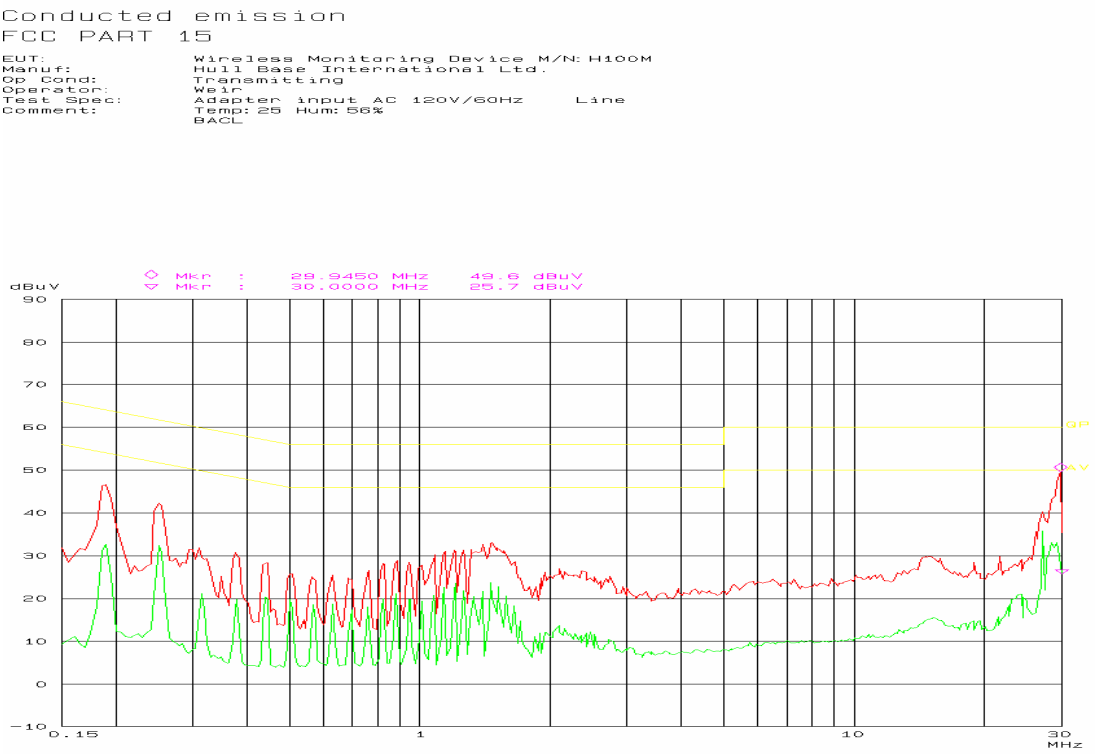


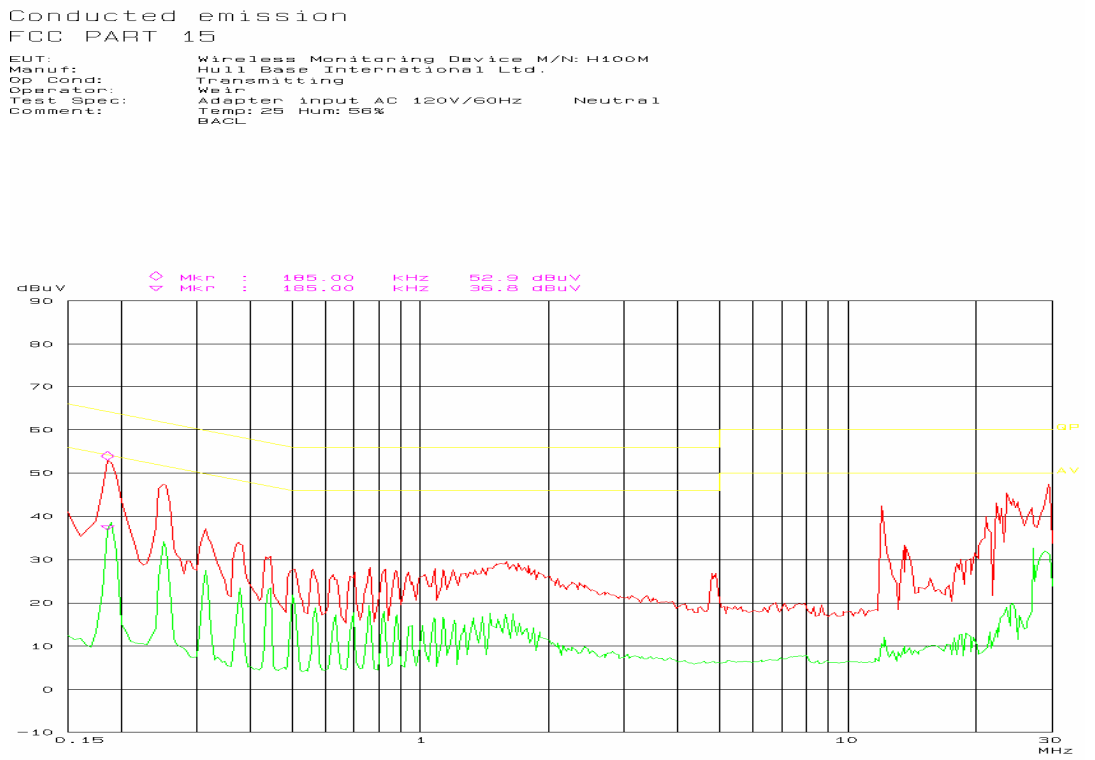
Conducted emission
FCC PART 15

EUT: Wireless Monitoring Device M/N: H100M
Manuf: Hull Base International Ltd.
Op Cond: Receiving&Charging
Operator: Weir
Test Spec: Adapter input AC 120V/60Hz Neutral
Comment: Temp: 25 Hum: 56%
BACL



Transmitting Mode:





CFR47 §15.205, §15.209, §15.109 & §15.247 – RADIATED EMISSIONS

Applicable Standard

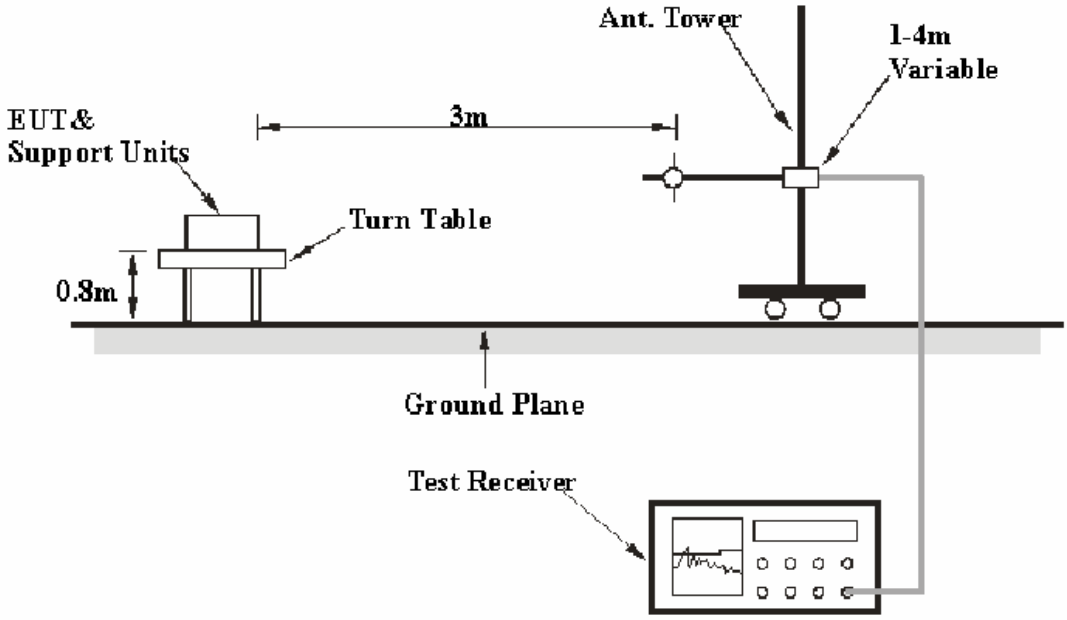
CFR47 §15.205; §15.209; §15.109; §15.247 (d)

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ±4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, FCC 15.109 and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2008-08-02	2009-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
HP	Amplifier	8449B	3008A00277	2008-09-12	2009-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-08-28	2009-08-27

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

Test Procedure

For the radiated emissions test, the adapter was connected to the AC floor outlet.

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

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

Corrected Amplitude & Margin Calculation

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

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

Below 1GHz:

Charging mode: 17.9 dB at **34.326925 MHz** in the **Horizontal** polarization
Transmitting mode: 13.3 dB at **672.018525 MHz** in the **Vertical** polarization

Above 1 GHz:

Transmitting mode: 9.77 dB at **4828.50 MHz** in the **Horizontal** polarization (Low Channel)
Transmitting mode: 9.03 dB at **4875.75 MHz** in the **Horizontal** polarization (Middle Channel)
Transmitting mode: 9.58 dB at **4923.00 MHz** in the **Horizontal** polarization (High Channel)

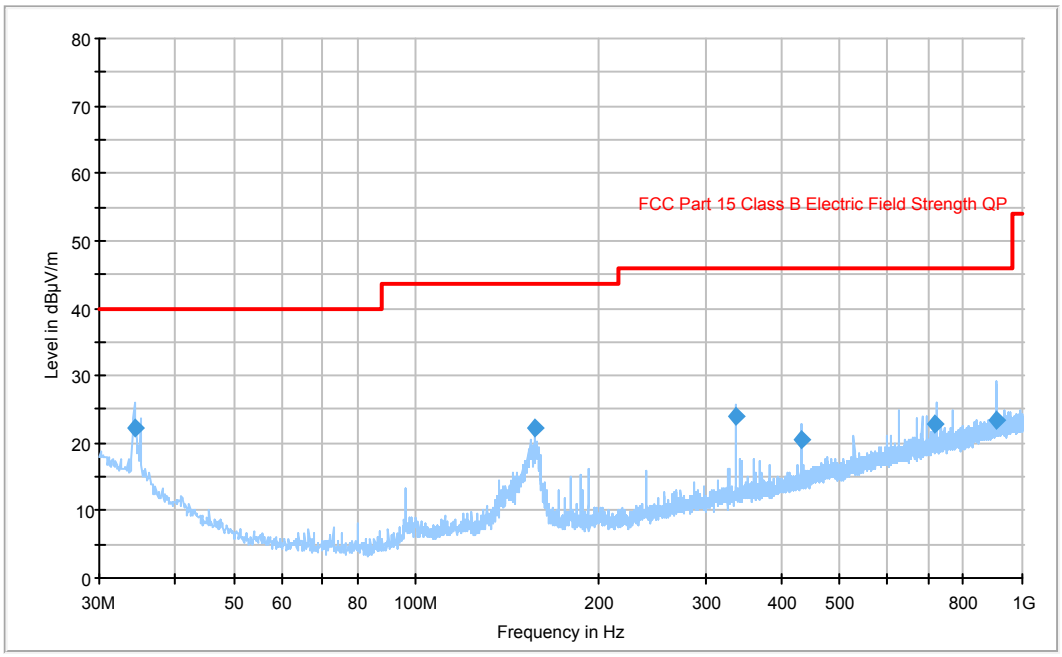
Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

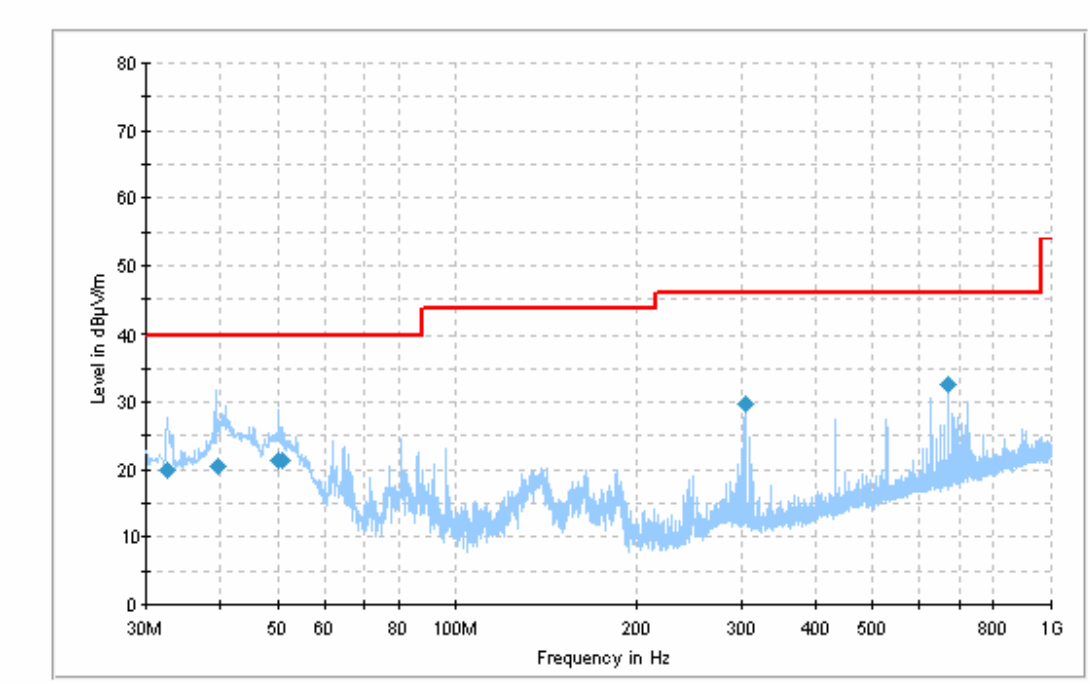
** The testing was performed by Weir Zhong on 2009-07-22.*

Test Mode: Charging (below 1 GHz)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
34.326925	22.1	105.0	H	135.0	-11.5	40.0	17.9
156.435100	22.3	102.0	V	156.0	-14.0	43.5	21.2
336.035000	24.1	156.0	V	45.0	-11.2	46.0	21.9
905.941700	23.4	108.0	H	0.0	-3.6	46.0	22.6
719.764875	22.8	222.0	V	281.0	-6.5	46.0	23.2
431.945235	20.5	100.0	V	340.0	-9.7	46.0	25.5

Test Mode: Transmitting (below 1 GHz)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
672.018525	32.7	111.0	V	83.0	-7.3	46.0	13.3
310.251056	28.1	108.0	V	170	-11.4	46.0	17.9
50.002600	21.5	115.0	V	39.0	-20.2	40.0	18.5
50.777800	21.5	121.0	V	35.0	-20.4	40.0	18.6
39.581050	20.4	119.0	V	276.0	-15.1	40.0	19.6
32.689800	20.0	109.0	V	63.0	-10.4	40.0	20.0

Test Mode: Transmitting (Above 1 GHz)

Frequency (MHz)	S.A. Reading (dBμV/m)	Detector PK/QP/AV	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Remarks
Low Channel (2414.25 MHz)												
4828.50	33.50	AV	180	2.0	H	36.50	7.93	33.70	44.23	54	9.77	harmonic
4828.50	33.62	AV	218	1.5	V	35.20	7.93	33.70	43.05	54	10.95	harmonic
4828.50	47.73	PK	218	1.5	V	35.20	7.93	33.70	57.16	74	16.84	harmonic
4828.50	44.43	PK	180	2.0	H	36.50	7.93	33.70	55.16	74	18.84	harmonic
1593.15	33.88	AV	0	2.0	H	27.10	5.45	34.50	31.93	54	22.07	spurious
2290.50	33.86	AV	241	1.0	V	26.50	5.45	34.50	31.31	54	22.69	spurious
1593.15	48.40	PK	0	2.0	H	27.10	5.45	34.50	46.45	74	27.55	spurious
2290.50	48.09	PK	241	1.0	V	26.50	5.45	34.50	45.54	74	28.46	spurious
Middle Channel (2437.875 MHz)												
4875.75	34.21	AV	185	2.0	H	36.52	7.94	33.70	44.97	74	9.03	harmonic
4875.75	34.70	AV	25	1.1	V	35.30	7.94	33.70	44.24	74	9.76	harmonic
2710.50	33.47	AV	181	2.0	H	31.80	7.88	33.80	39.35	54	14.65	spurious
2710.50	33.50	AV	210	1.5	V	30.75	7.88	33.80	38.33	54	15.67	spurious
4875.75	47.95	PK	25	1.1	V	35.30	7.94	33.70	57.49	74	16.51	harmonic
4875.75	46.08	PK	185	2.0	H	36.52	7.94	33.70	56.84	74	17.16	harmonic
2710.50	47.59	PK	181	2.0	H	31.80	7.88	33.80	53.47	54	20.53	spurious
2710.50	47.61	PK	210	1.5	V	30.75	7.88	33.80	52.44	54	21.56	spurious
High Channel (2461.5 MHz)												
4923.00	33.57	AV	25	2.0	H	36.60	7.95	33.70	44.42	74	9.58	harmonic
4923.00	33.60	AV	210	1.0	V	35.40	7.95	33.70	43.25	74	10.75	harmonic
4923.00	45.96	PK	210	1.0	V	35.40	7.95	33.70	55.61	74	18.39	harmonic
4923.00	44.49	PK	25	2.0	H	36.60	7.95	33.70	55.34	74	18.66	harmonic
1585.25	34.64	AV	5	1.1	V	27.40	5.45	34.50	32.99	54	21.01	spurious
1585.25	34.35	AV	188	1.7	H	27.10	5.45	34.50	32.4	54	21.6	spurious
1585.25	47.93	PK	5	1.1	V	27.40	5.45	34.50	46.28	54	27.72	spurious
1585.25	47.63	PK	188	1.7	H	27.10	5.45	34.50	45.68	54	28.32	spurious

Spurious emission in restricted band

Frequency (MHz)	S.A. Reading (dBμV/m)	Detector PK/QP/AV	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Remarks
Out of left side band (2310 – 2390 MHz)												
2389.13	61.25	PK	177	1.0	V	30.30	7.88	33.90	65.53	74	8.47	spurious
2389.35	57.36	PK	180	2.0	H	30.90	7.88	33.90	62.24	74	11.76	spurious
2389.13	34.52	AV	177	1.0	V	30.30	7.88	33.90	38.80	54	15.2	spurious
2389.35	33.60	AV	180	2.0	H	30.90	7.88	33.90	38.48	54	15.52	spurious
Out of left side band (2483.5 – 2500 MHz)												
2483.63	62.35	PK	135	1.1	V	30.32	7.90	33.90	66.67	74	7.33	spurious
2483.55	55.59	PK	180	2.0	H	30.92	7.90	33.90	60.51	74	13.49	spurious
2483.63	34.67	AV	135	1.1	V	30.32	7.90	33.90	38.99	54	15.01	spurious
2483.55	33.50	AV	180	2.0	H	30.92	7.90	33.90	38.42	54	15.58	spurious

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	2008-11-07	2009-11-06

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

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Weir Zhong on 2009-07-24.*

Test Result: Compliant.

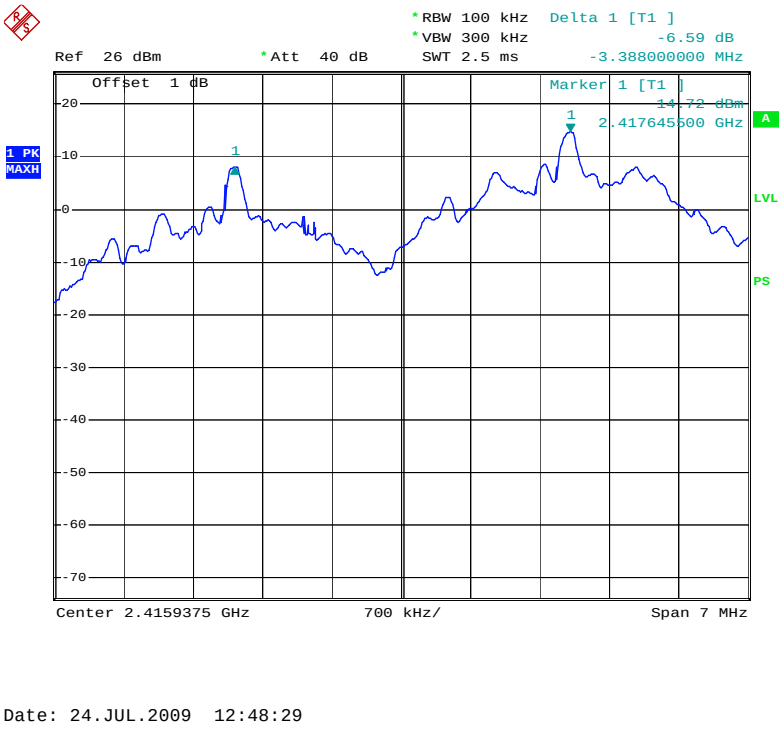
Please refer to following tables and plots

Test Mode: Transmitting& Charging

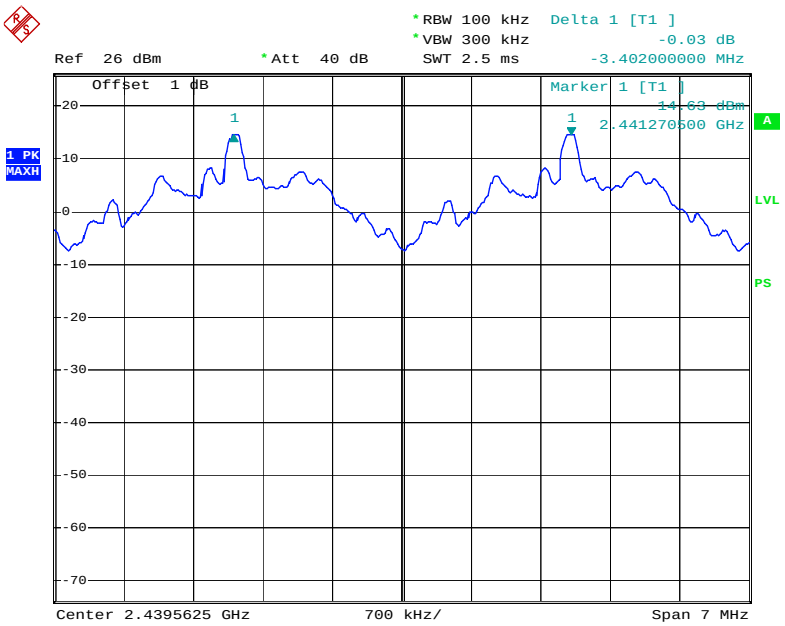
Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low Channel	2414.250	3.388	2.09	Pass
Adjacent Channel	2417.625			
Mid Channel	2437.875	3.402	2.15	Pass
Adjacent Channel	2441.250			
High Channel	2461.500	3.388	2.09	Pass
Adjacent Channel	2458.125			

Please refer to the following plots.

Low Channel

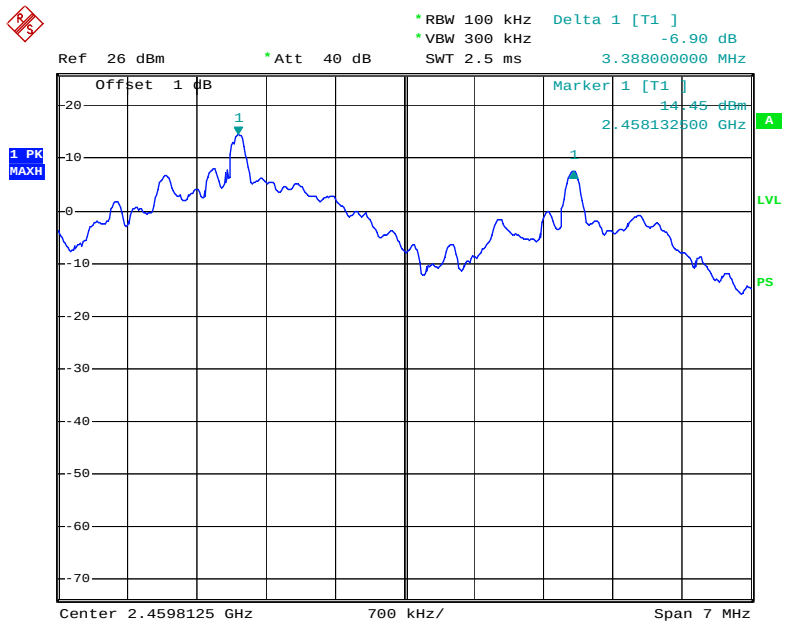


Middle Channel



Date: 24.JUL.2009 12:50:25

High Channel



Date: 24.JUL.2009 12:51:47

CFR47 §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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06

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

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Weir Zhong on 2009-07-24.*

Test Result: Compliant.

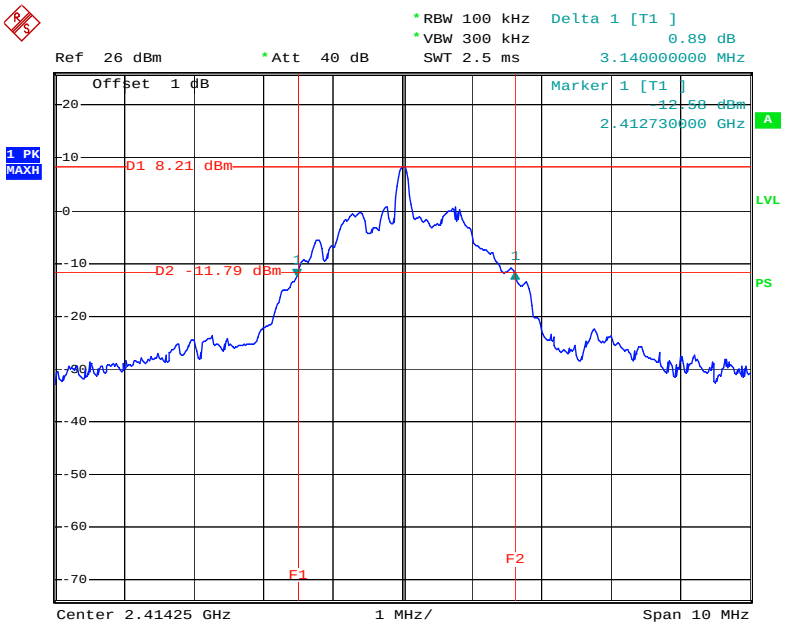
Please refer to following tables and plots

Test Mode: Transmitting& Charging

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2414.250	3.14
Middle	2437.875	3.22
High	2461.500	3.14

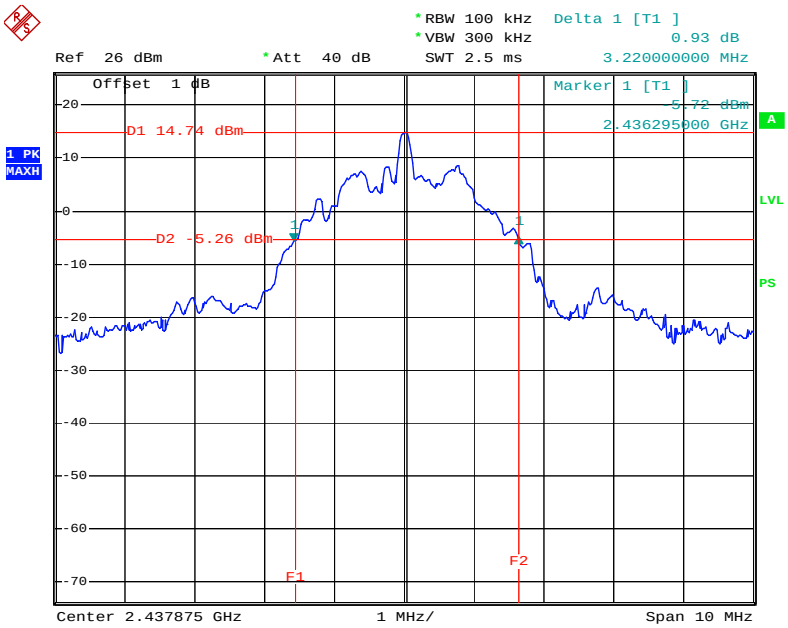
Please refer to the following plots.

Low Channel



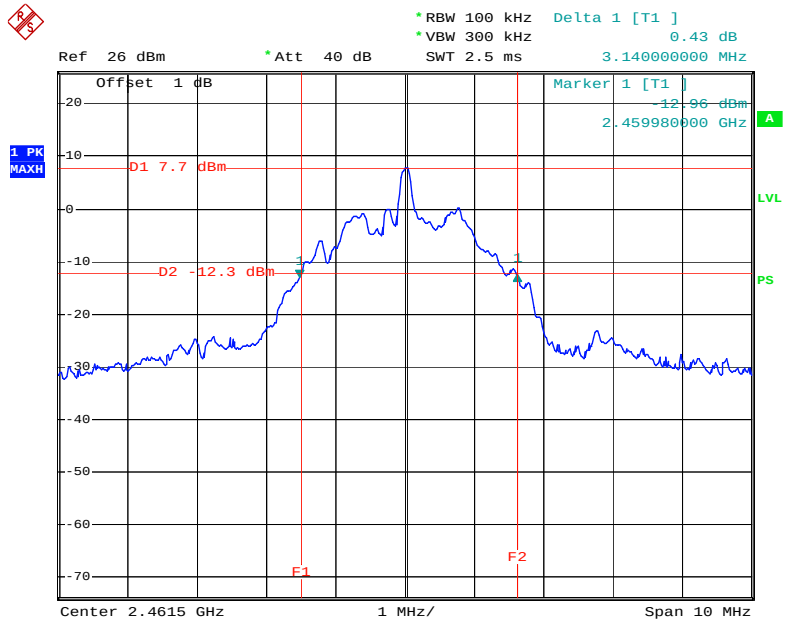
Date: 24.JUL.2009 12:34:50

Middle Channel



Date: 24.JUL.2009 12:38:17

High Channel



Date: 24.JUL.2009 12:40:36

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	2008-11-07	2009-11-06

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

Test Procedure

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

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

3. By using the Max-Hold function record the Quantity of the channel.

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

The testing was performed by Weir Zhong on 2009-07-24.

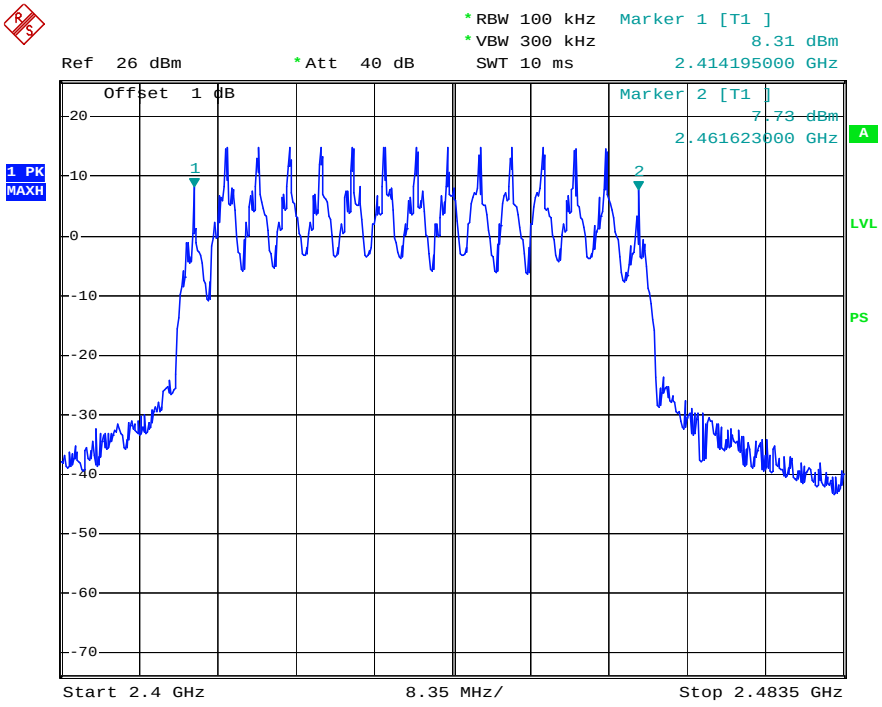
Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting& Charging

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

Number of Hopping Channels



Date: 24.JUL.2009 13:06:54

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	2008-11-07	2009-11-06

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

Test Procedure

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 X channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell Time= time slot length * hope rate/ number of hopping channels *15*0.4s
Hop rate=770/s

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Weir Zhong on 2009-07-24.*

Test Result: Compliant.

Please refer to following tables and plots

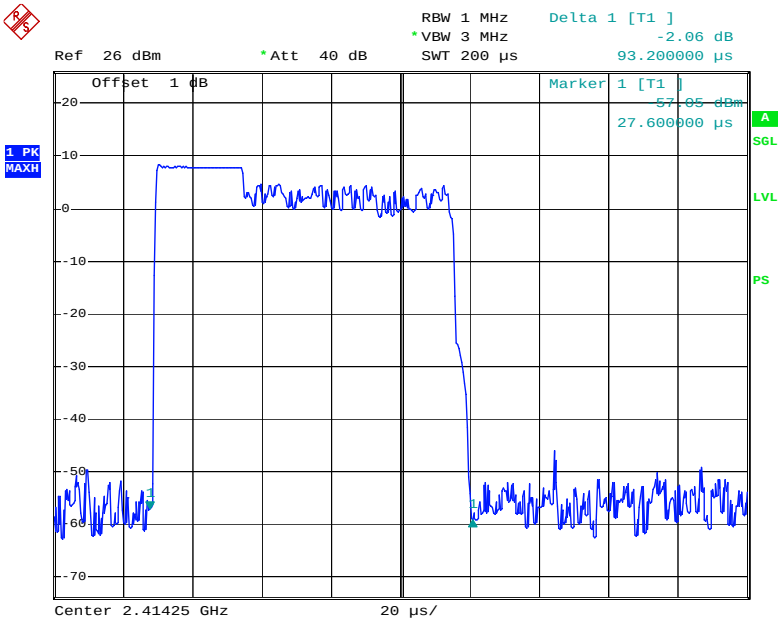
Test Mode: Transmitting & Charging

Channel	Pulse Width (ms)	Dwell Time (Sec)	Limit (Sec)	Result
Low	0.0932	0.0143528	0.4	Pass
Middle	0.0940	0.0144760	0.4	Pass
High	0.0936	0.0144144	0.4	Pass

Note: Dwell Time= Pulse time*（770/2/15)*15*0.4S

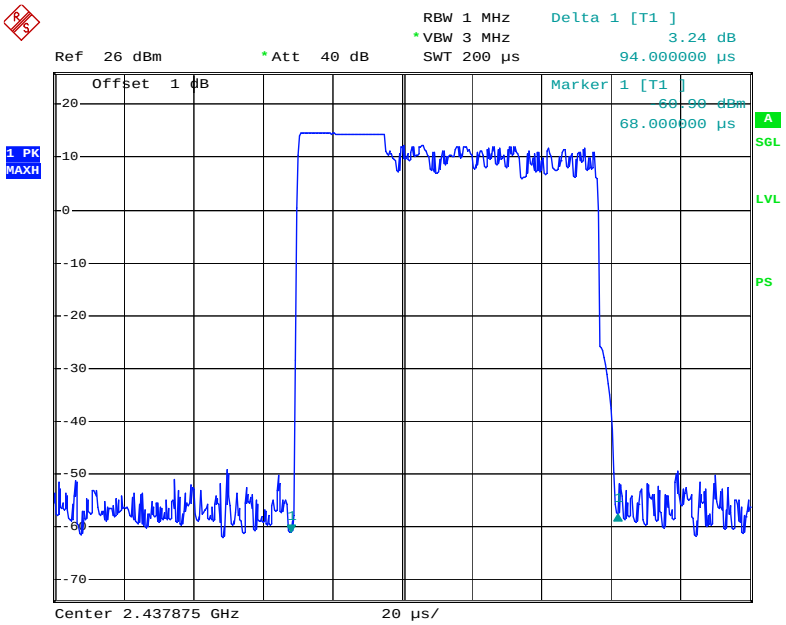
Please refer to the following plots.

Low Channel



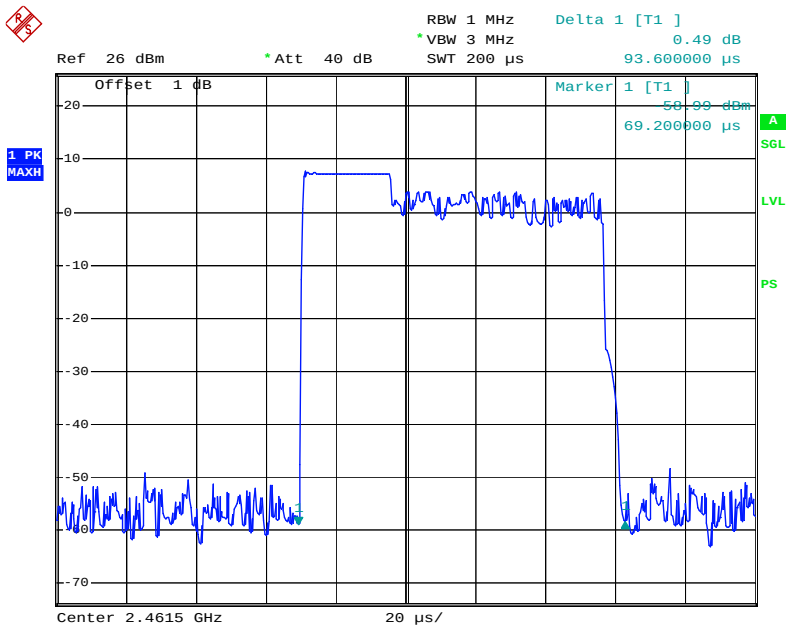
Date: 24.JUL.2009 13:00:34

Middle Channel



Date: 24.JUL.2009 13:02:18

High Channel



Date: 24.JUL.2009 13:03:34

CFR47 §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

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

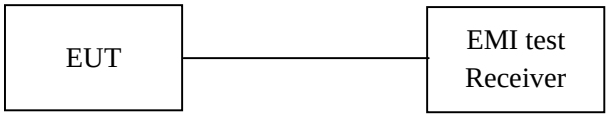
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06

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

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI test receiver.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

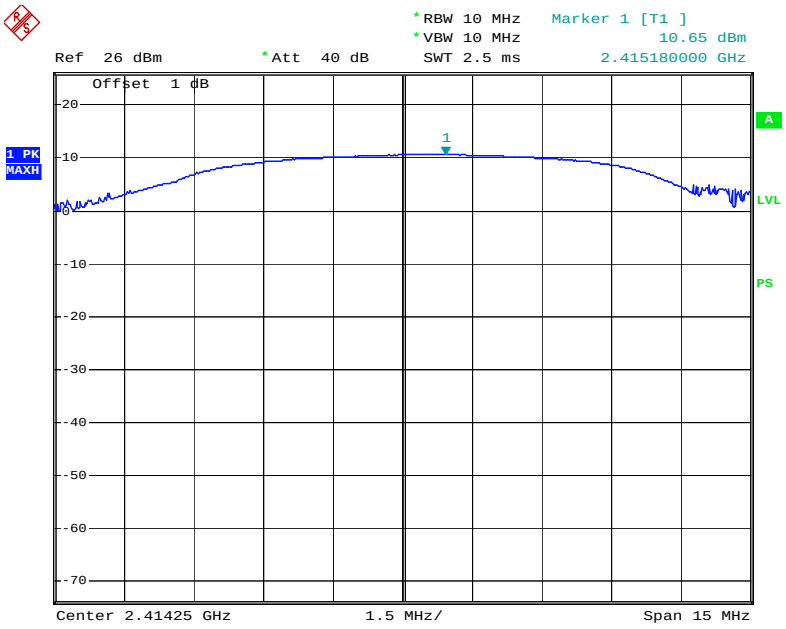
** The testing was performed by Weir Zhong on 2009-07-24.*

Test Result: Compliant.

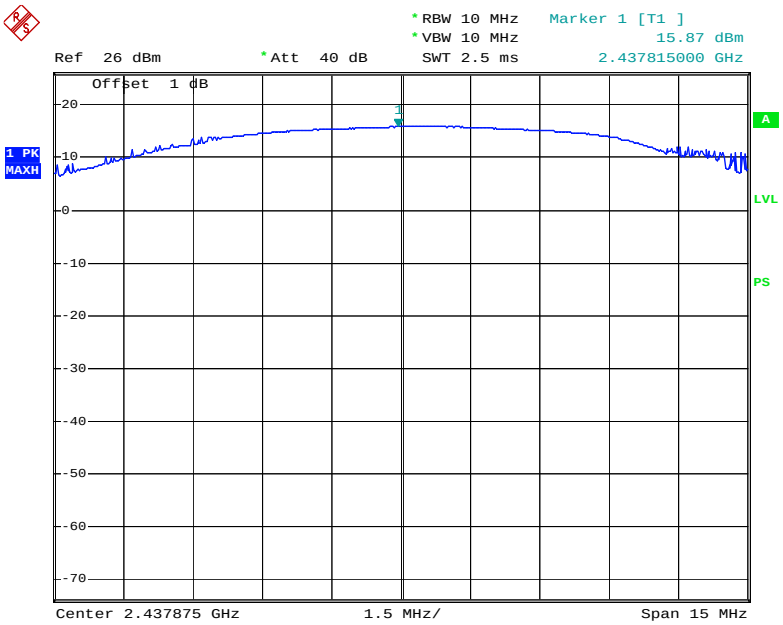
Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Conducted Output Power		Limit (mw)
		(dBm)	(mw)	
Low	2414.250	10.65	11.614	125
Middle	2437.875	15.87	38.637	125
High	2461.500	10.34	10.814	125

Low Channel

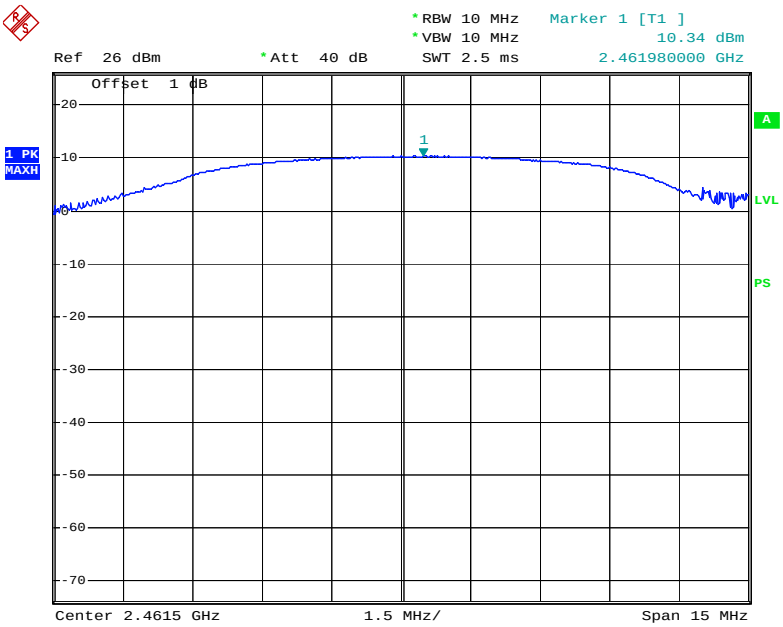


Middle Channel



Date: 24.JUL.2009 12:20:08

High Chanel



Date: 24.JUL.2009 12:22:22

CFR47 §15.247(d) - BAND EDGES TESTING

Applicable Standard

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-11-07	2009-11-06

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. 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 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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

**The testing was performed by Weir Zhong on 2009-07-24.*

Test Result: Compliant

Test Mode: Transmitting

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2398.96	39.51	20
2483.63	41.85	20

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