NVLAP LAB CODE 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Arbitron Inc.

9705 Patuxent Woods Drive, Columbia, MD 21076, U.S.A

FCC ID: IGKDA113A

Report Type:	**Product Type:**
Original Report	Gen2 Meter

Test Engineer:	Vicent Kang
Report Number:	RSC10011851-247
Report Date:	2010-02-10
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 *Arbitron Inc.*'s product, model number:*DA113A(FCC ID: IGKDA113A)* or the "EUT" as referred to in this report is a *Gen2 Meter* , which measures approximately: 8.0 cm L x 5.2 cm W x 2.5 cm H, rated input voltage: DC 5V adapter or 3.7V battery.

Adapter Information:
Model: TS22-500500S;
Input: AC 100-240V 50/60Hz 0.2A;
Output: DC 5.0V 500mA.

** All measurement and test data in this report was gathered from production sample serial number: IMEI: 355294030002190 (Assigned by manufacturer). The EUT was received on 2010-01-18.*

Objective

This Type approval report is prepared on behalf of *Arbitron Inc. 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.

Related Submittal(s)/Grant(s)

FCC Part 22H/24E submissions with FCC ID: IGKDA113A.

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).

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.

EUT Exercise Software

META executable provided by manufacturer

Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Motherboard	OWC297	CN-OWC297-70821-566-02BR	DoC
DELL	Power	NPS-250KB D	CN-0H2678-17972-56E8NBM	DoC
Seagate	Hard Disk	ST340014A	5JXK3NAD	DoC
DELL	3.5' Floppy	N/A	CN-0N8893-69802-54Q-02OZ	DoC
Lite-ON	CD-Rom	LTN-489S	N/A	DoC
Intel	CPU	Celeron D-2533	N/A	N/A
ProMOS	Memory	V826632K24SATG-C0	0525-K1933700	N/A
Intel	Ethernet	PRO 10/100 VE	N/A	DoC

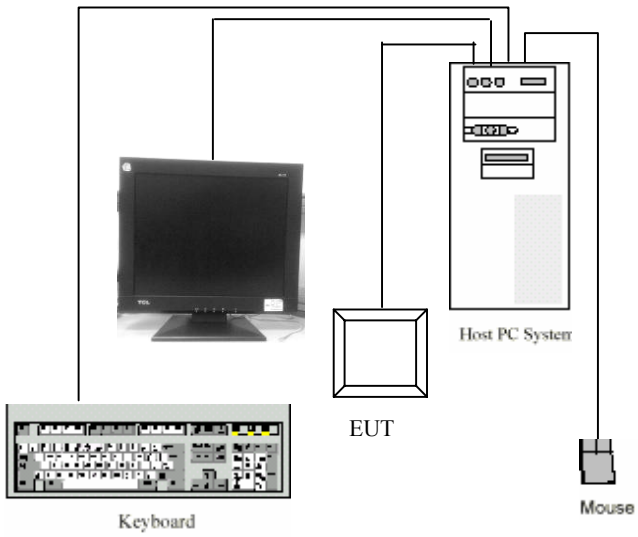
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	PC	2#	N/A	DOC
DELL	Keyboard 2#	L100	CNORH65668907BL05DC	DOC
DELL	Mouse 2#	MOC5UO	G1900NKD	DOC
DELL	LCD Monitor	1505FP	Y4287-7168-574-GBSH	DOC

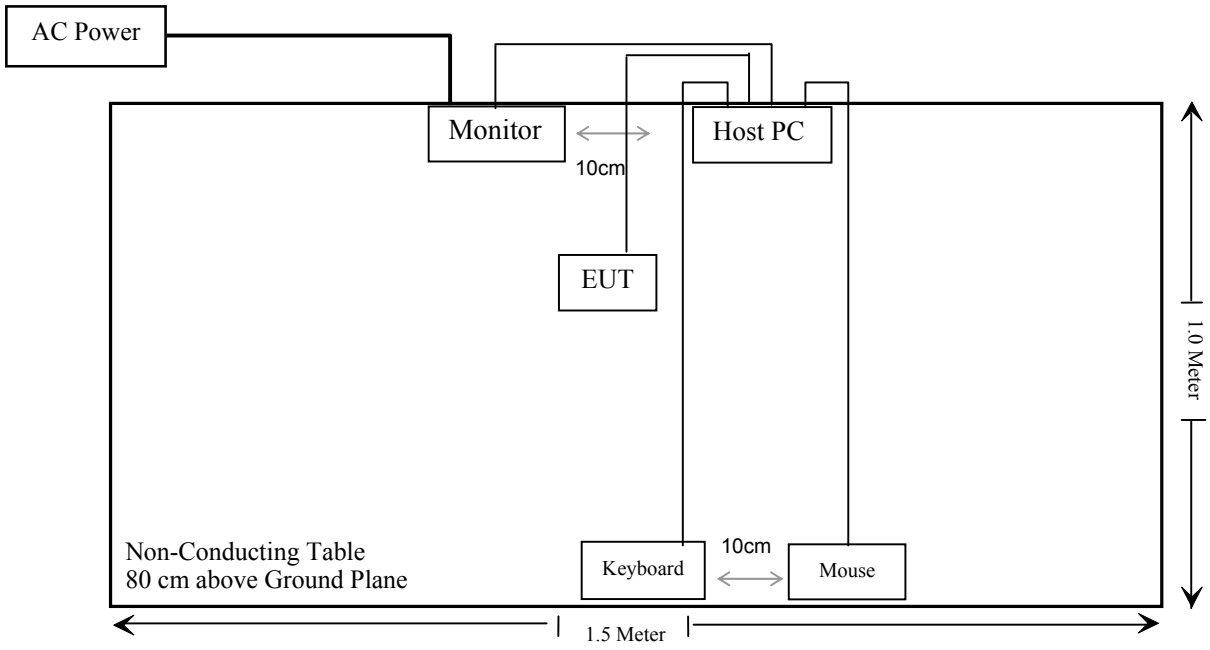
External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielded Detachable K/B Cable	1.50	K/B Port/Host	K/B
Shielded Detachable Mouse Cable	1.50	Mouse Port/Host	Mouse
Shielded DetachableVGA Cable	1.50	VGA Port/Host	Monitor
Unshielded Detachable Power Cable	1.80	EUT	Adapter

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247(i), §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliant
§15.247 (a)(1)	20 dB Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges	Compliant

FCC §15.247(i) & §2.1093 – RF EXPOSURE

Applicable Standard

According to §15.247 (i) and §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.

Table 1 – Output Power Thresholds for Unlicensed Transmitters

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P_{Ref}	12	6	5	mW
Device output power should be rounded to the nearest mW to compare with values specified in this table.				

Table 2 – Summary of SAR Evaluation Requirements for a Cell Phone with Multiple Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	Routine evaluation required	SAR not required: Unlicensed only o when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed o when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas o when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – o output ≤ 60/f: SAR not required o output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when o output ≤ 2·P_{Ref} and antenna is ≥ 5.0 cm from other antennas o output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas o output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required o test SAR on highest output channel for each wireless mode and exposure condition o if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	
Jaw, Mouth and Nose	Flat phantom SAR required o when measurement is required in tight regions of SAM and it is not feasible or the results can be questionable due to probe tilt, calibration, positioning and orientation issues o position rectangular and clam-shell phones according to flat phantom procedures and conduct SAR measurements for these specific locations	When simultaneous transmission SAR testing is required, contact the FCC Laboratory for interim guidance.

According to KDB 647484, For an unlicensed transmitter that does not transmit simultaneously with other transmitters and its output is ≤ 60/f(GHz) mW, 1-g SAR evaluation is not required.
When simultaneous transmission applies, power thresholds (P_{Ref}) derived from multiples of ½.60/f(GHz) are used to reduce stand-alone SAR requirements for unlicensed devices incorporated in cell phones. Values of P_{Ref} for applicable frequencies are shown in Table 1, P_{Ref} is defined as the maximum conducted power available at the antenna according to source based time-averaging requirements of Section 2.1093(d)(5). When the output of an unlicensed transmitter is ≤ P_{Ref} and its antenna(s) is ≥ 2.5 cm from other antennas, stand-alone SAR evaluation is not required for that unlicensed transmitter. When the output of an unlicensed transmitter is ≤ $2P_{Ref}$ and its antenna(s) is ≥ 5.0 cm from other antennas, stand-alone SAR evaluation is also not required for that unlicensed transmitter.

Two antennas are available for the EUT, one is GSM/PCS antenna, the other is Bluetooth antenna, the distance between GSM/PCS and Bluetooth is less than 2.5 cm, according to FCC KDB 648474 D01 SAR Handsets Multi Xmiter and ant, V01r05 released on September 2008, the Max coducted peak output power is 9.24 dBm, antenna gain of Bluetooth radio is 1.4 dBi, the maximum output power of BT is 9.24+1.4=10.64 dBm=11.59 mw < P_{Ref} (12 mw), stand-alone SAR is not required for Bluetooth antenna.

Result:

Standard-alone SAR measurement of Bluetooth antenna can be exempted.

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 antennas; one is for Bluetooth, the gain is 1.4 dBi; other is for GSM/PCS; the gain is 1.0 dBi for PCS and 0 dBi for GSM. Which in accordance to section 15.203.

Result: Compliant.

FCC §15.207(a) - CONDUCTED EMISSIONS

Applicable Standard

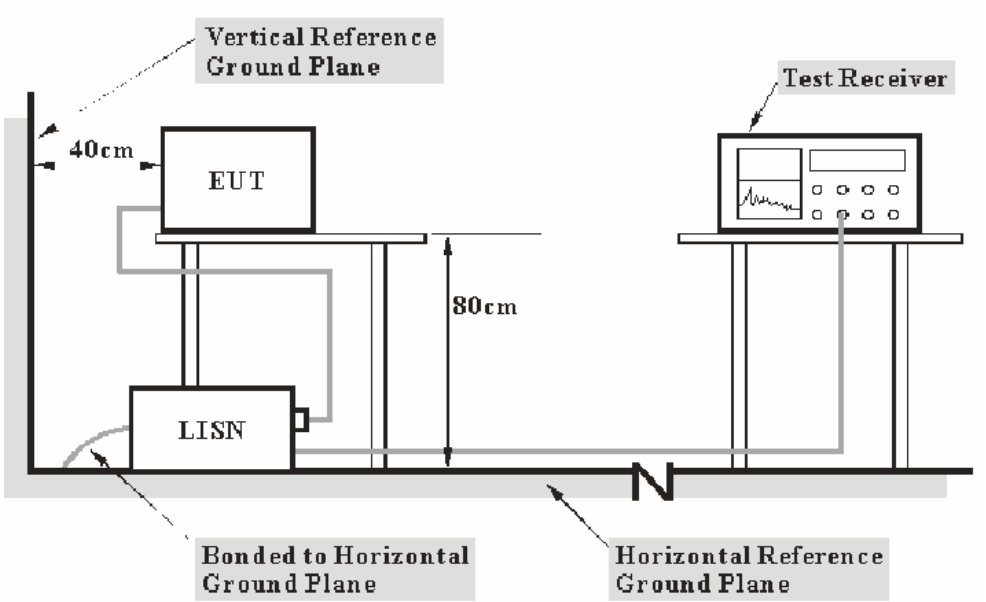
FCC §15.207

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 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.

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

*** 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

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, with the worst margin reading of:

26.13 dB at **7.820 MHz** in the **Line** conductor mode
21.46 dB at **0.770 MHz** in the **Neutral** conductor mode

Test Data

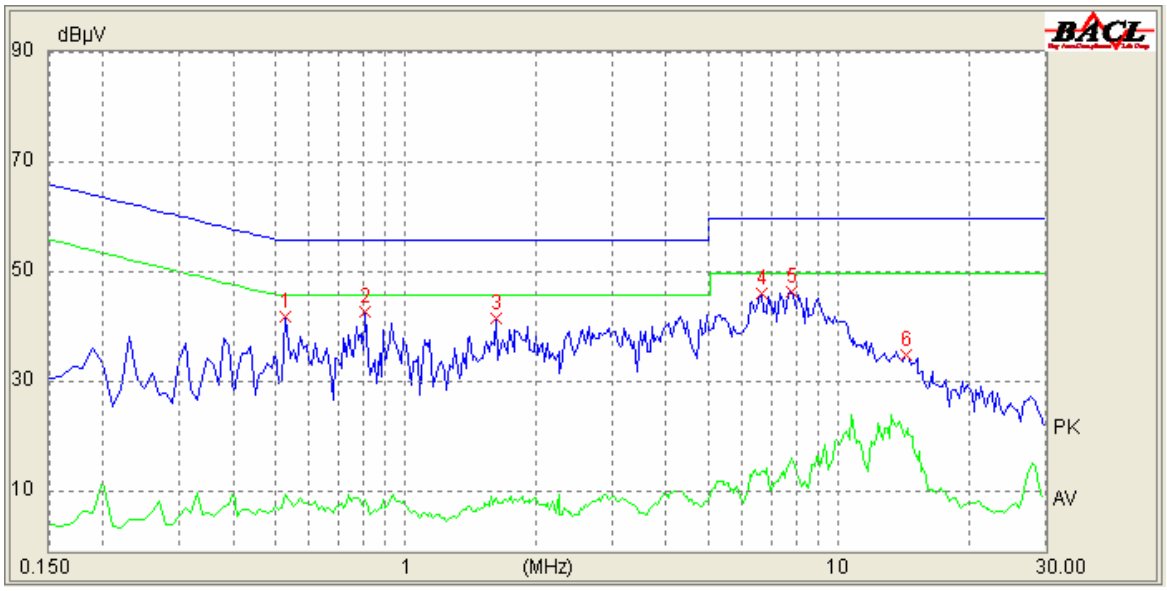
Environmental Conditions

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

** The testing was performed by Vicent Kang on 2010-02-04.*

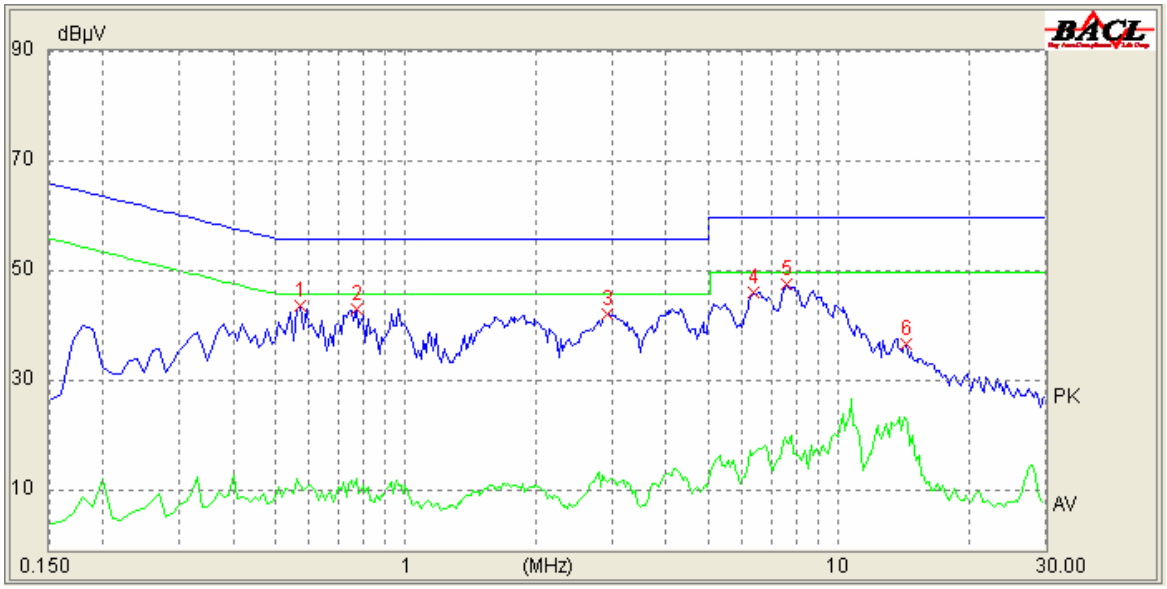
Test Mode: Charging &Transmitting

120 V/60 Hz, Line:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Correction Factor (dB)**	**Cord. Result (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Detector (PK/AV/QP)**
7.820	10.20	33.87	60.00	26.13	QP
6.650	10.20	32.42	60.00	27.58	QP
14.430	10.30	21.98	50.00	28.02	AV
1.620	10.10	27.36	56.00	28.64	QP
0.810	10.10	27.24	56.00	28.76	QP
0.530	10.10	26.37	56.00	29.63	QP
14.290	10.30	30.00	60.00	30.00	QP
7.780	10.20	16.76	50.00	33.24	AV
6.640	10.20	14.37	50.00	35.63	AV
0.530	10.10	10.15	46.00	35.85	AV
1.620	10.10	9.41	46.00	36.59	AV
0.810	10.10	9.11	46.00	36.89	AV

120 V/60 Hz, Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Correction Factor (dB)**	**Cord. Result (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Detector (PK/AV/QP)**
0.770	10.10	34.54	56.00	21.46	QP
0.570	10.10	33.93	56.00	22.07	QP
7.570	10.20	37.65	60.00	22.35	QP
2.930	10.10	33.11	56.00	22.89	QP
6.350	10.20	36.27	60.00	23.73	QP
14.430	10.30	22.82	50.00	27.18	AV
14.300	10.30	30.56	60.00	29.44	QP
7.640	10.20	19.16	50.00	30.84	AV
6.320	10.20	17.10	50.00	32.90	AV
0.770	10.10	12.82	46.00	33.18	AV
2.940	10.10	12.08	46.00	33.92	AV
0.570	10.10	11.58	46.00	34.42	AV

FCC §15.205, §15.209 & §15.247 (d) – RADIATED EMISSIONS

Applicable Standard

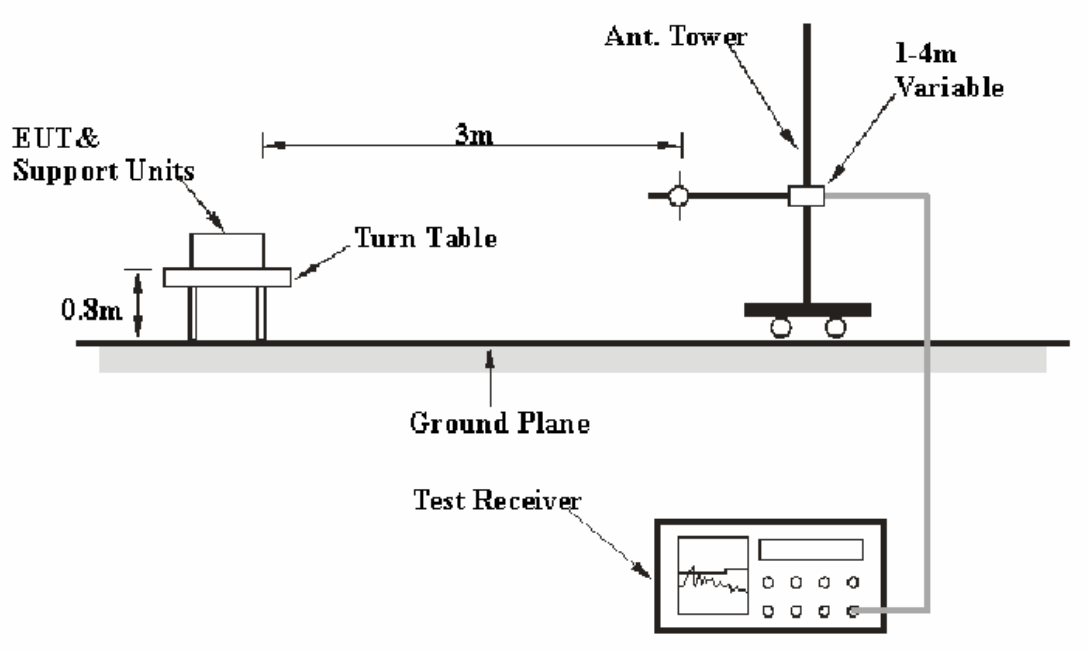
FCC §15.205; §15.209; §15.247 (d)

Measurement Uncertainty

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

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ±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 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***	***Detector***
30MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	AV

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2009-08-02	2010-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-07	2010-11-06
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
HP	Amplifier	8449B	3008A00277	2009-09-12	2010-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2009-09-25	2010-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2009-05-17	2010-05-17
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-08-28	2010-08-27

*** 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, 15.209 and 15.247, with the worst margin reading of:

Below 1 GHz:

1.3 dB at **48.137650 MHz** in the **Vertical** polarization

Above 1 GHz:

17.41 dB at **4804.00 MHz** in the **Vertical** polarization (Low Channel)
12.58 dB at **4882.00 MHz** in the **Vertical** polarization (Middle Channel)
11.11 dB at **4960.00 MHz** in the **Horizontal** polarization (High Channel)

Test Data

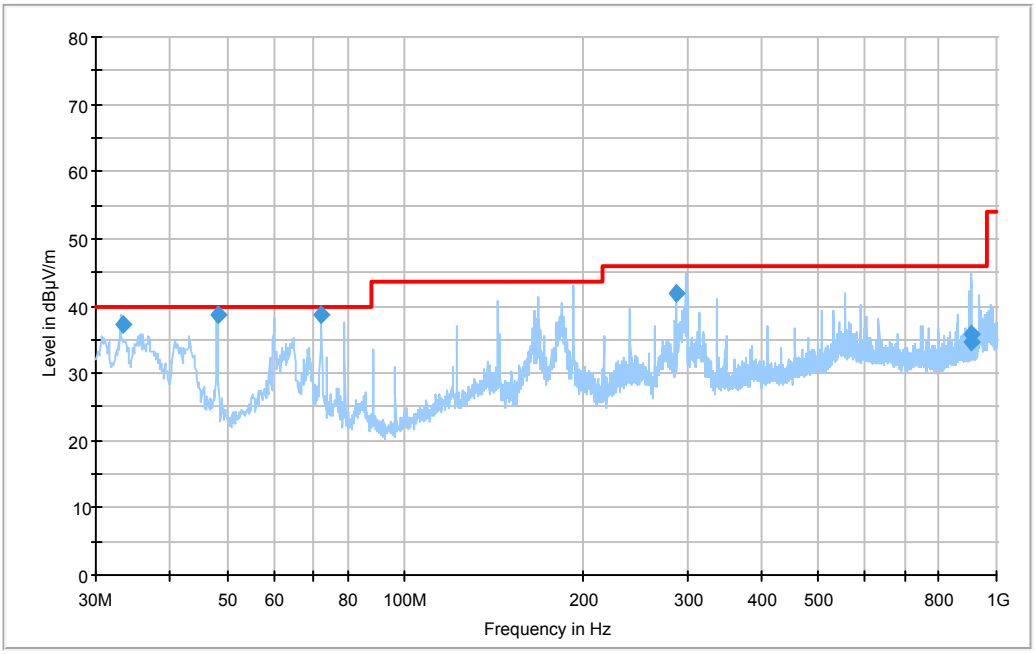
Environmental Conditions

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

** The testing was performed by Vicent Kang on 2010-02-04.*

Test Mode: Transmitting

Below 1 GHz (Worst case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
48.137650	38.7	114.0	V	0.0	-16.2	40.0	1.3*
72.203550	38.6	115.0	V	263.0	-16.8	40.0	1.4*
33.293300	37.2	111.0	V	325.0	-6.3	40.0	2.8*
286.356100	41.9	109.0	H	245.0	-9.9	46.0	4.1
905.731350	35.7	109.0	V	225.0	1.2	46.0	10.3
904.842200	34.6	113.0	V	72.0	1.2	46.0	11.4

*Note: * With measurement uncertainty*

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 (2402 MHz)												
4804.00	29.95	AV	180	1.05	V	35.4	4.64	33.4	36.59	54	17.41	harmonic
2337.04	36.14	AV	355	1.30	H	30.6	3.61	34.0	36.35	54	17.65	spurious
2389.84	35.26	AV	352	1.50	V	30.6	3.61	34.0	35.47	54	18.53	spurious
1833.30	38.89	AV	154	1.55	V	25.8	5.37	34.6	35.46	54	18.54	spurious
4804.00	27.59	AV	240	1.02	H	36.6	4.64	33.4	35.43	54	18.57	harmonic
1451.8	35.20	AV	225	1.00	H	25.8	5.37	34.6	31.77	54	22.23	spurious
4804.00	43.51	PK	240	1.02	H	36.6	4.64	33.4	51.35	74	22.65	harmonic
4804.00	42.34	PK	180	1.05	V	35.4	4.64	33.4	48.98	74	25.02	harmonic
2337.04	47.39	PK	355	1.30	H	30.6	3.61	34.0	47.60	74	26.40	spurious
2389.84	47.10	PK	352	1.50	V	30.6	3.61	34.0	47.31	74	26.69	spurious
1451.80	50.38	PK	225	1.00	H	25.8	5.37	34.6	46.95	74	27.05	spurious
1833.30	50.32	PK	155	1.55	V	25.8	5.37	34.6	46.89	74	27.11	spurious
Middle Channel (2441 MHz)												
4882.00	33.58	AV	178	1.03	V	36.6	4.64	33.4	41.42	54	12.58	harmonic
4882.00	29.14	AV	250	1.00	H	35.4	4.64	33.4	35.78	54	18.22	harmonic
1385.80	38.66	AV	130	1.07	V	25.8	5.37	34.6	35.23	54	18.77	spurious
4882.00	46.16	PK	178	1.03	V	36.6	4.64	33.4	54.00	74	20.00	harmonic
1133.84	38.79	AV	175	1.37	H	24.3	4.88	34.9	33.07	54	20.93	spurious
4882.00	45.42	PK	250	1.00	H	35.4	4.64	33.4	52.06	74	21.94	harmonic
1385.80	52.36	PK	130	1.07	V	25.8	5.37	34.6	48.93	74	25.07	spurious
1133.84	45.73	PK	175	1.37	H	24.3	4.88	34.9	40.01	74	33.99	spurious
High Channal (2480 MHz)												
4960.00	35.14	AV	35	1.10	H	36.6	4.55	33.4	42.89	54	11.11	harmonic
4960.00	36.23	AV	355	1.10	V	35.4	4.55	33.4	42.78	54	11.22	harmonic
4960.00	48.35	PK	355	1.10	V	35.4	4.55	33.4	54.90	74	19.10	harmonic
4960.00	46.88	PK	35	1.10	H	36.6	4.55	33.4	54.63	74	19.37	harmonic
2483.63	33.56	AV	225	1.50	V	30.6	3.61	34.0	33.77	54	20.23	spurious
2484.79	32.15	AV	275	1.30	H	30.6	3.61	34.0	32.36	54	21.64	spurious
1286.00	34.66	AV	150	1.15	H	26.0	5.47	34.5	31.63	54	22.37	spurious
1312.57	34.16	AV	280	1.20	V	24.3	4.88	34.9	28.44	54	25.56	spurious
2483.63	45.27	PK	225	1.50	V	30.6	3.61	34.0	45.48	74	28.52	spurious
1286.00	47.35	PK	150	1.15	H	26.0	5.47	34.5	44.32	74	29.68	spurious
2484.79	42.86	PK	275	1.30	H	30.6	3.61	34.0	43.07	74	30.93	spurious
1312.57	46.89	PK	280	1.20	V	24.3	4.88	34.9	41.17	74	32.83	spurious

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-07	2010-11-06

*** 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 Vicent Kang on 2010-02-03.*

Test Result: Compliant.

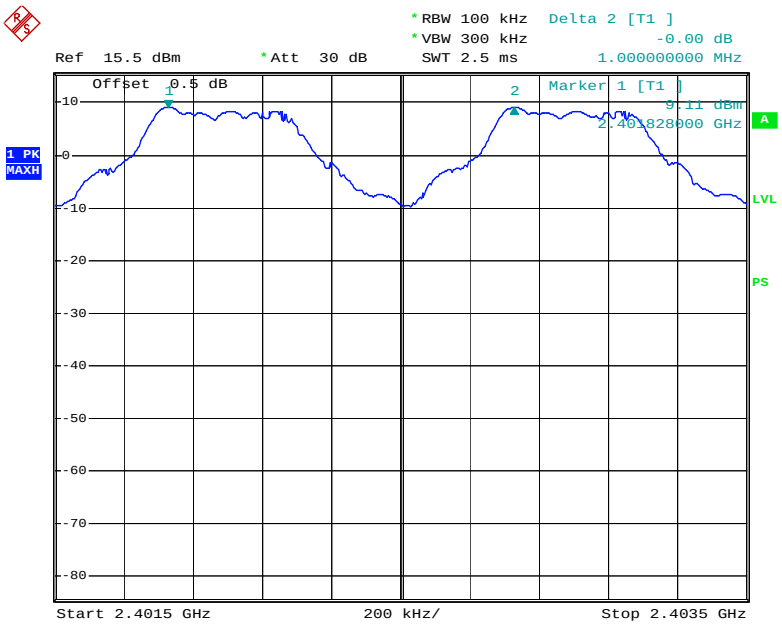
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (kHz)	Limit (kHz)	Result
Low Channel	2402	1000	477.333	Pass
Adjacent Channel	2403			
Mid Channel	2440	1000	472.000	Pass
Adjacent Channel	2441			
High Channel	2480	1000	477.333	Pass
Adjacent Channel	2479			

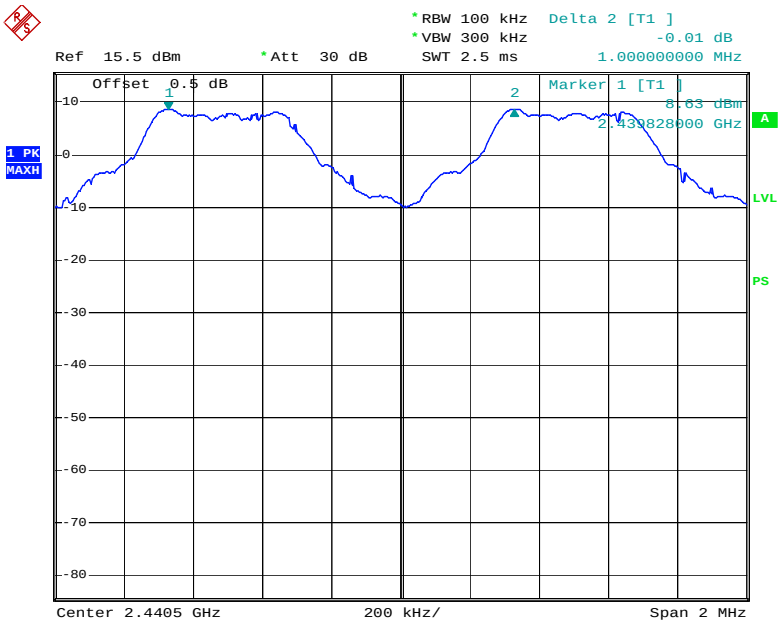
Please refer to the following plots.

Low Channel



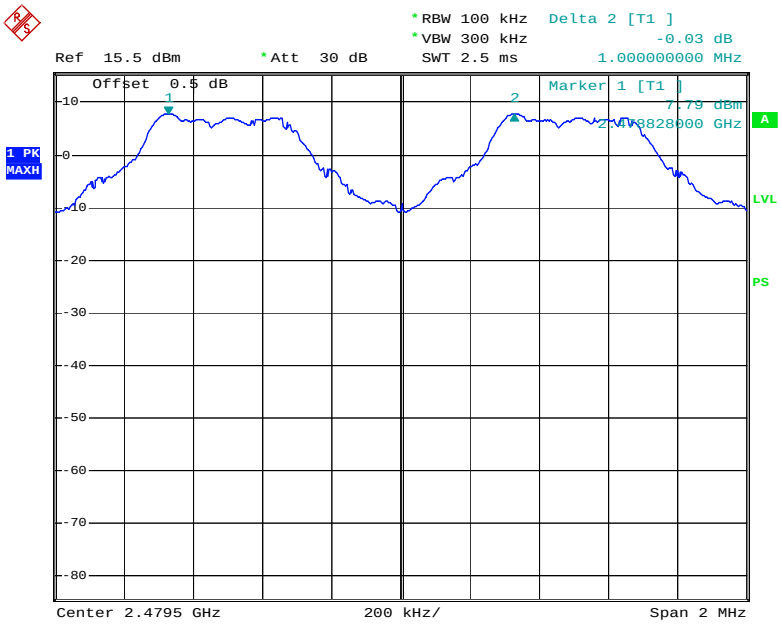
Date: 3.FEB.2010 20:52:53

Middle Channel



Date: 3.FEB.2010 20:54:03

High Channel



Date: 3.FEB.2010 20:55:07

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-07	2010-11-06

*** 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 Vicent Kang on 2010-02-03.*

Test Result: Compliant.

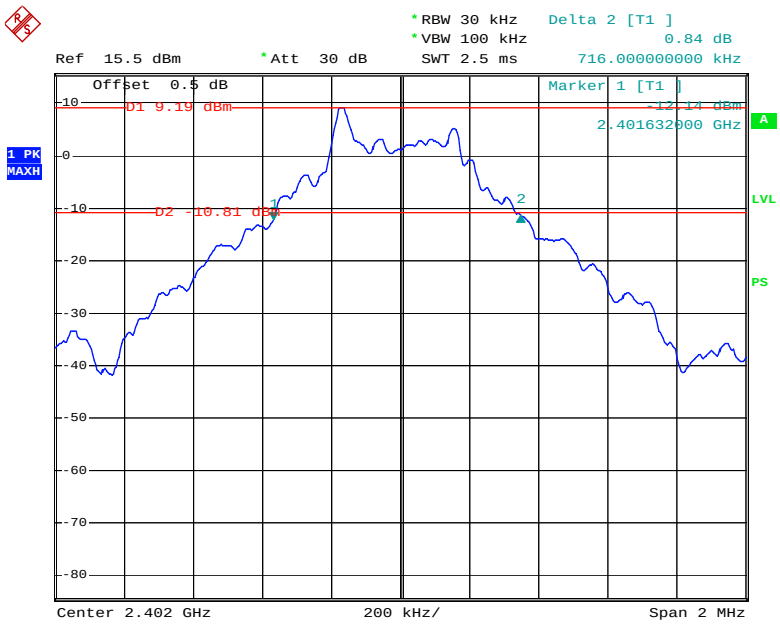
Please refer to following tables and plots

Test Mode: Transmitting

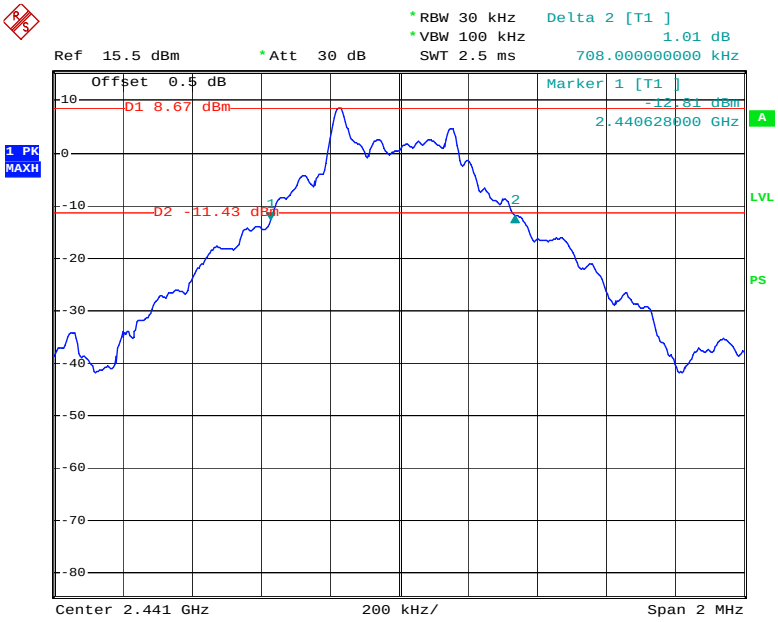
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	0.716
Middle	2441	0.708
High	2480	0.716

Please refer to the following plots.

Low Channel

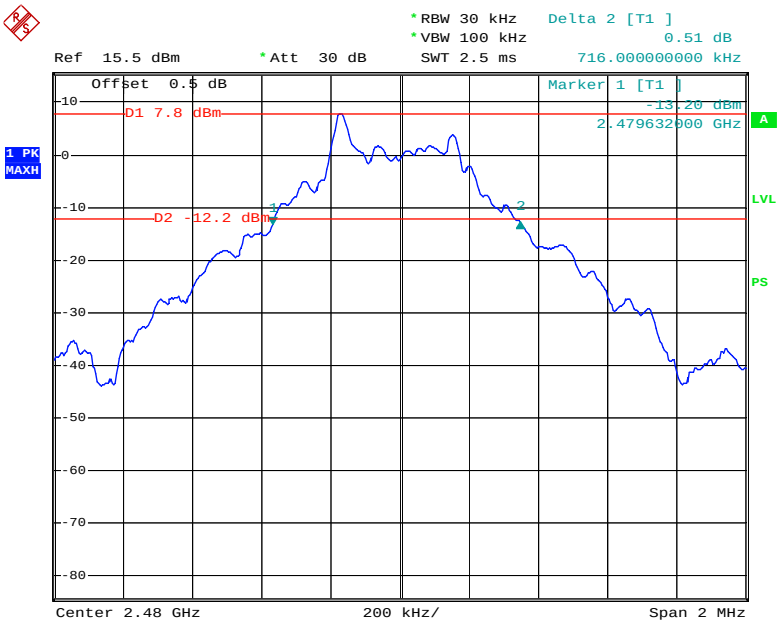


Middle Channel



Date: 3.FEB.2010 20:42:55

High Channel



Date: 3.FEB.2010 20:43:52

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-07	2010-11-06

*** 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 Vicent Kang on 2010-02-03.

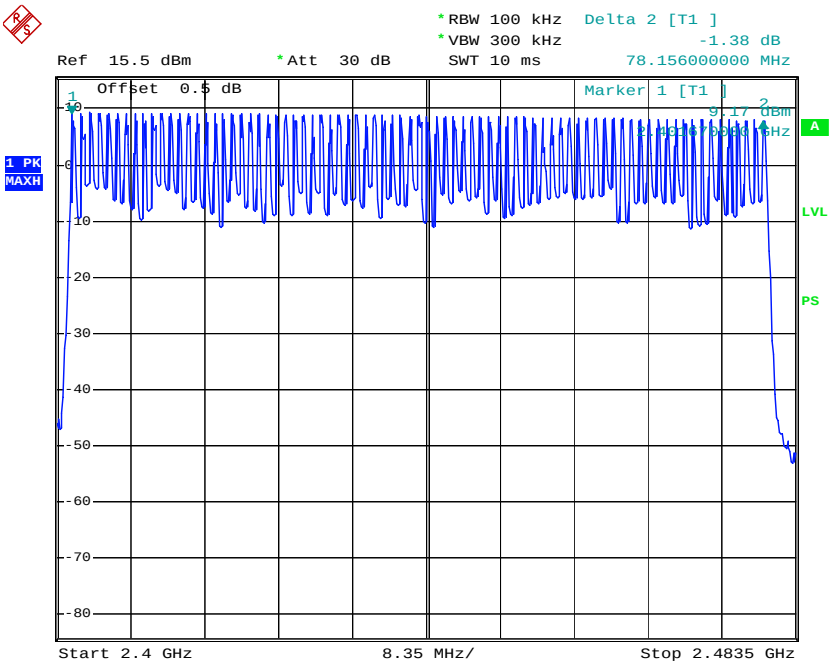
Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	79	≥ 15

Number of Hopping Channels



Date: 3.FEB.2010 20:23:54

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-07	2010-11-06

*** 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 * 31.6s
Hop rate=1600/s

Test Data

Environmental Conditions

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

** The testing was performed by Vicent Kang on 2010-02-03.*

Test Result: Compliant.

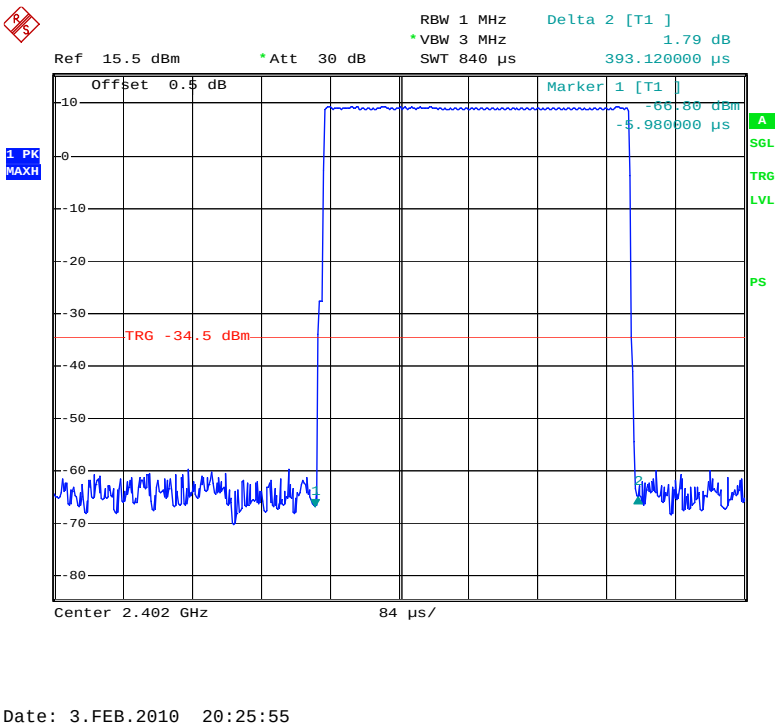
Please refer to following tables and plots

Test Mode: Transmitting

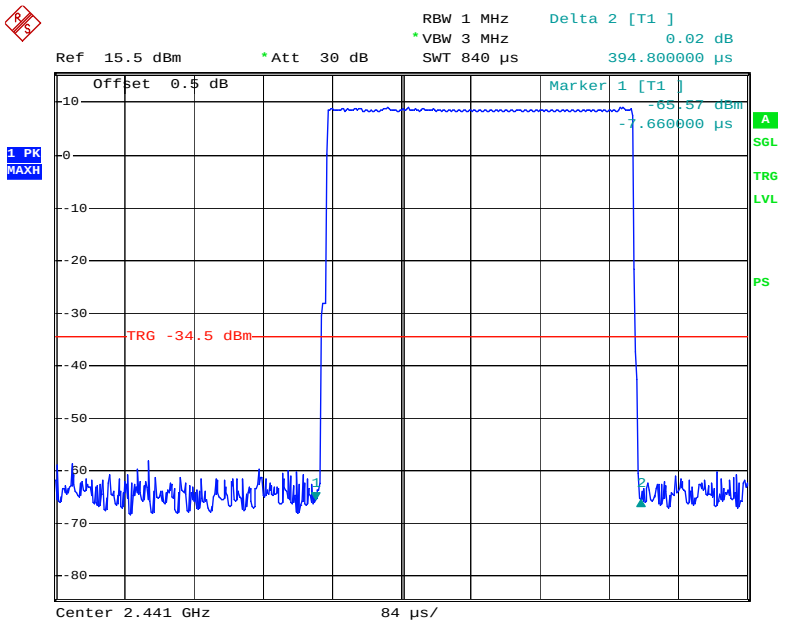
Mode	Channel	Pulse Width (ms)	Dwell Time (Sec)	Limit (Sec)	Result
DH 1	Low	0.39312	0.1258	0.4	Pass
	Middle	0.39480	0.1263	0.4	Pass
	High	0.39312	0.1258	0.4	Pass
	Note: Dwell time=Pulse width (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second				
DH 3	Low	1.672	0.2675	0.4	Pass
	Middle	1.664	0.2662	0.4	Pass
	High	1.664	0.2662	0.4	Pass
	Note: Dwell time=Pulse width (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second				
DH 5	Low	2.936	0.3132	0.4	Pass
	Middle	2.928	0.3123	0.4	Pass
	High	2.920	0.3115	0.4	Pass
	Note: Dwell time=Pulse width (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second				

Please refer to the following plots.

Low Channel for DH1

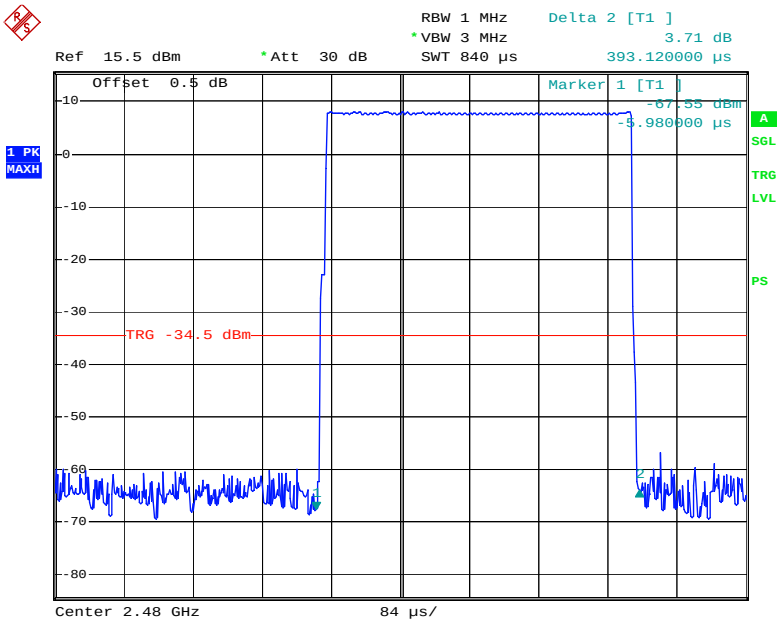


Middle Channel for DH1



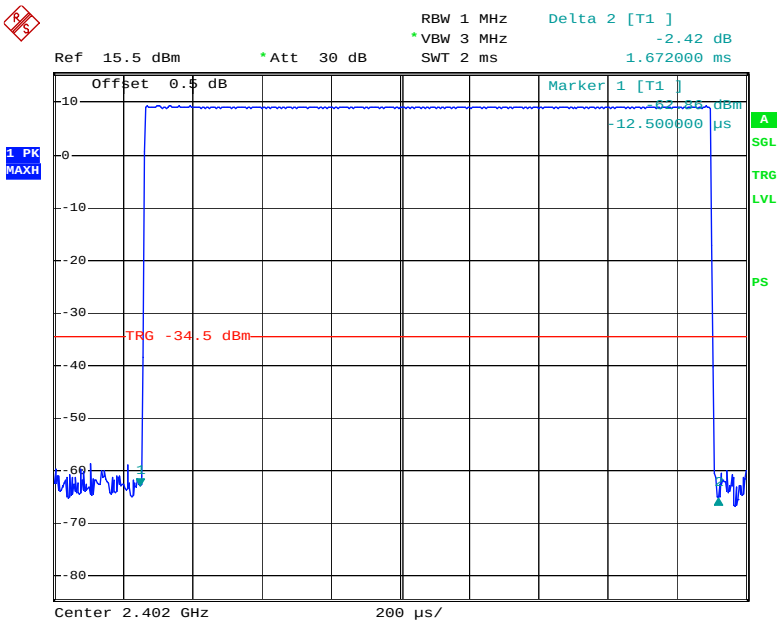
Date: 3.FEB.2010 20:26:32

High Channel for DH1



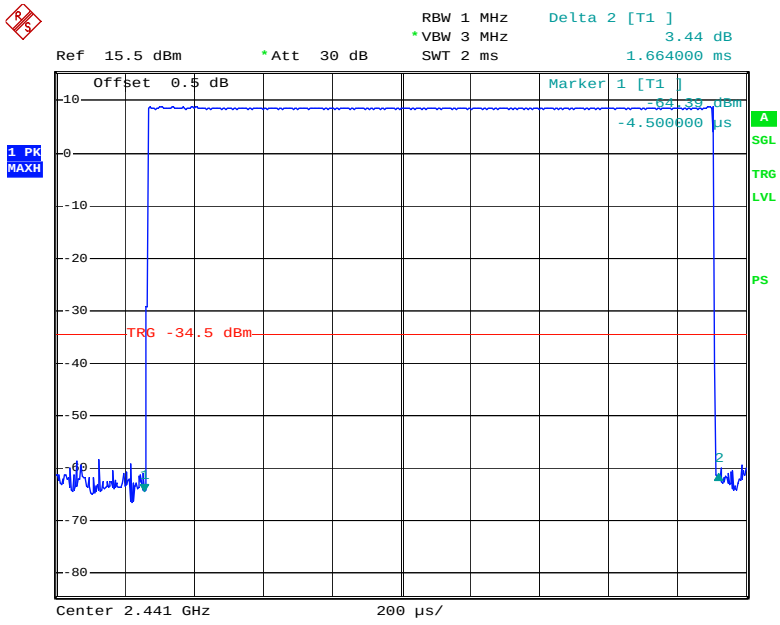
Date: 3.FEB.2010 20:27:23

Low Channel for DH3



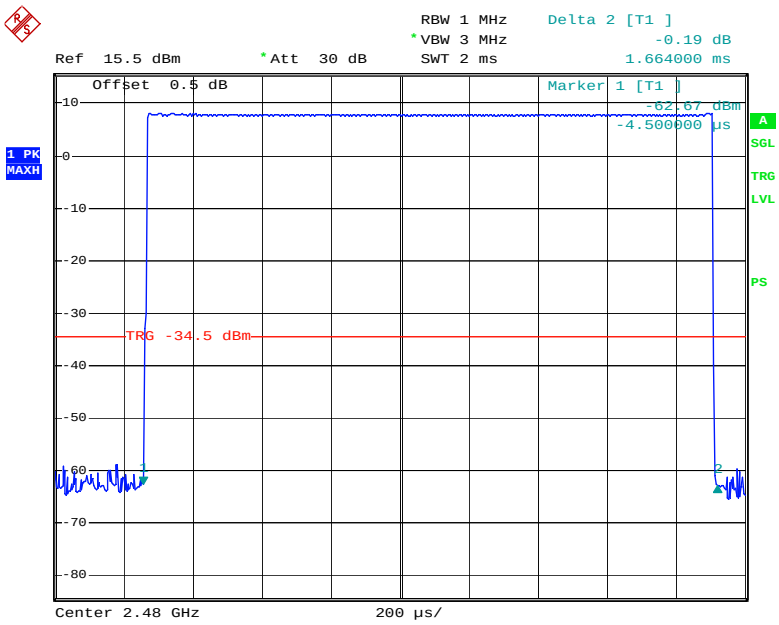
Date: 3.FEB.2010 20:29:19

Middle Channel for DH3



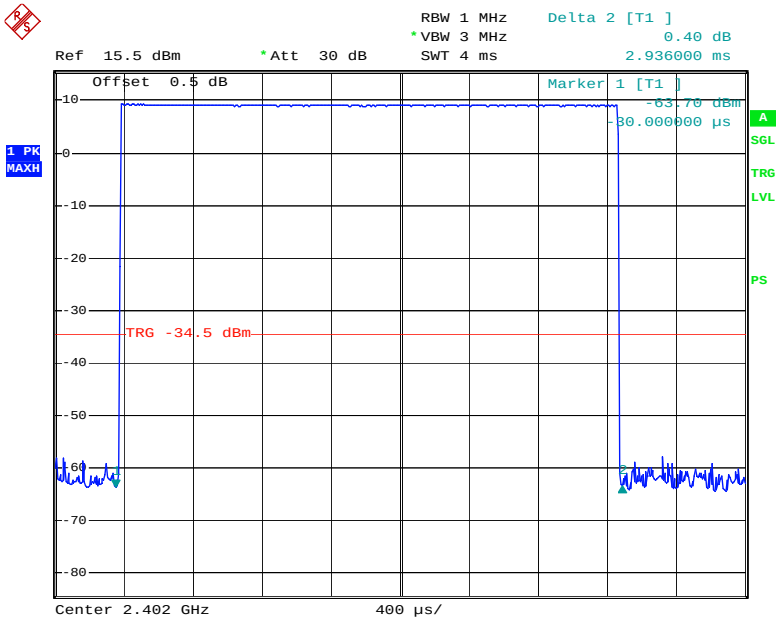
Date: 3.FEB.2010 20:28:50

High Channel for DH3



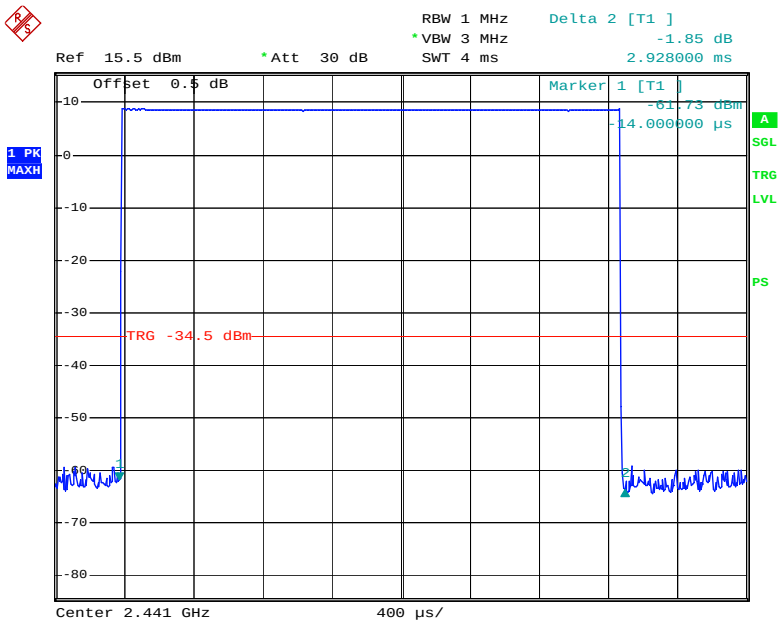
Date: 3.FEB.2010 20:28:24

Low Channel for DH5



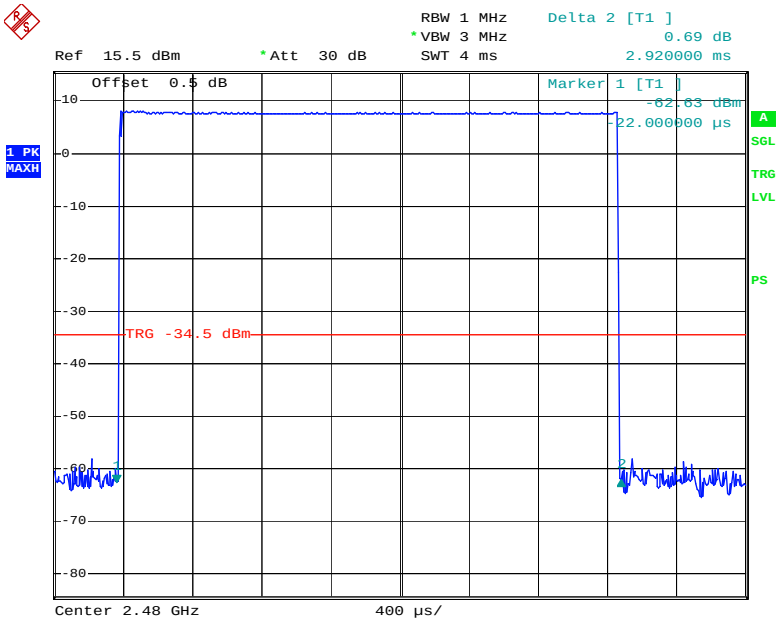
Date: 3.FEB.2010 20:30:32

Middle Channel for DH5



Date: 3.FEB.2010 20:31:03

High Channel for DH5



Date: 3.FEB.2010 20:31:29

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.

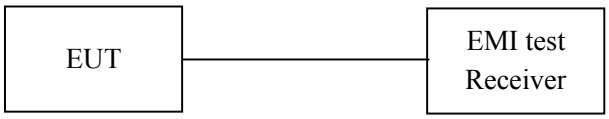
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-07	2010-11-06

*** 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

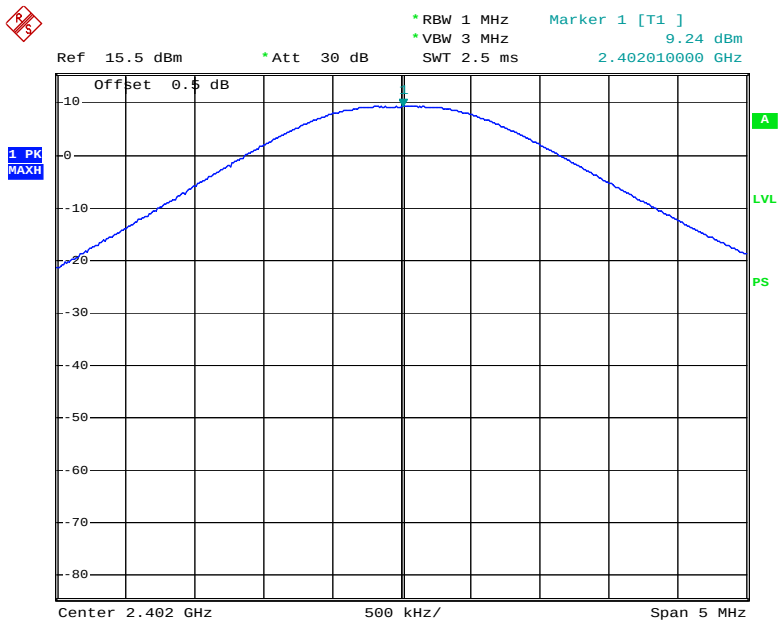
** The testing was performed by Vicent Kang on 2010-02-03.*

Test Result: Compliant.

Test Mode: Transmitting

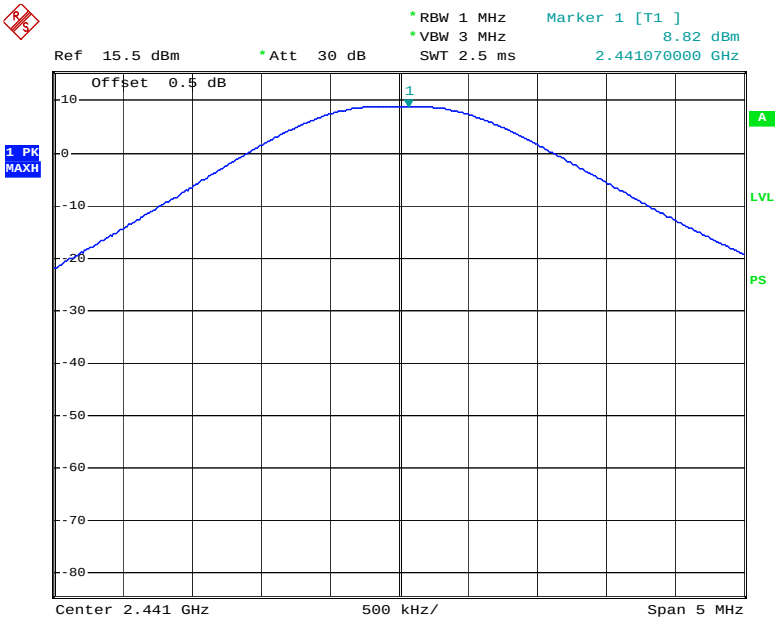
Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	9.24	8.39460	1000
Middle	2441	8.82	7.62079	1000
High	2480	7.98	6.28058	1000

Low Channel



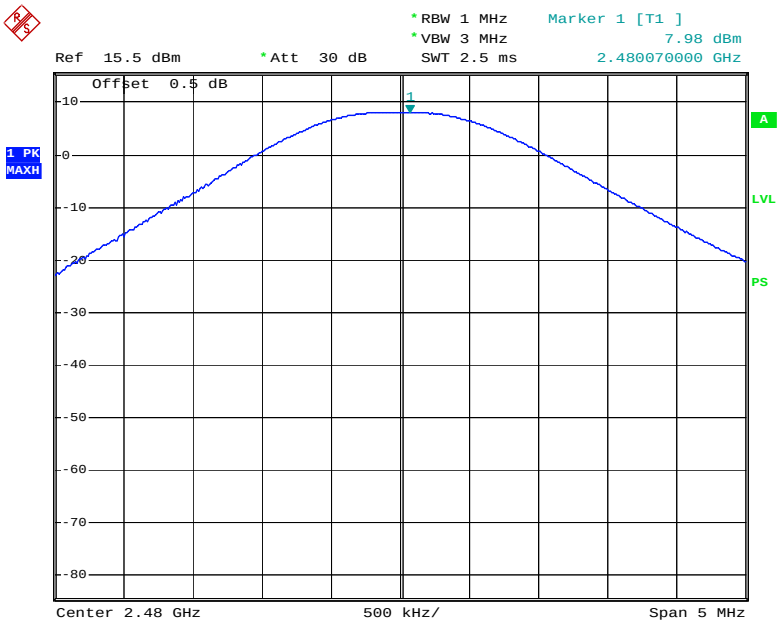
Date: 3.FEB.2010 20:50:04

Middle Channel



Date: 3.FEB.2010 20:50:57

High Chanel



Date: 3.FEB.2010 20:51:24

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-07	2010-11-06

*** 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 Vicent Kang on 2010-02-03.*

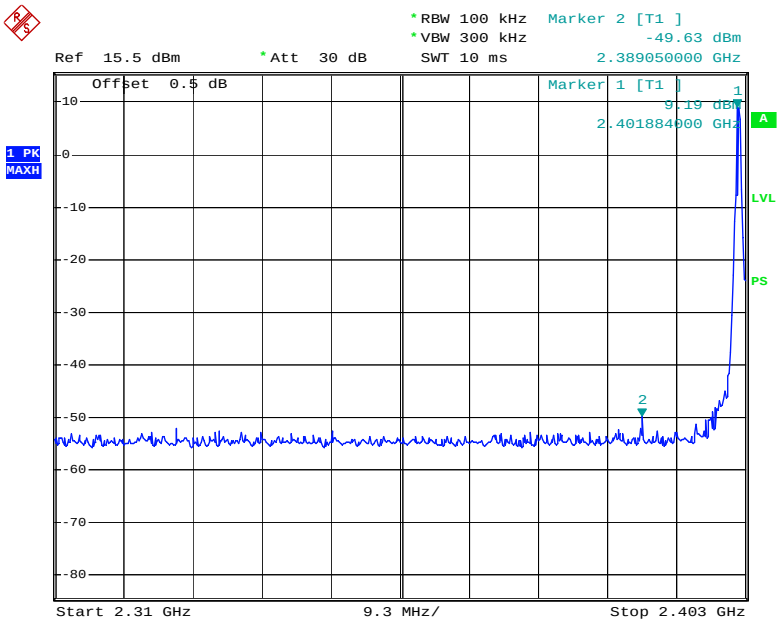
Test Result: Compliant

Please refer to the following table and plots.

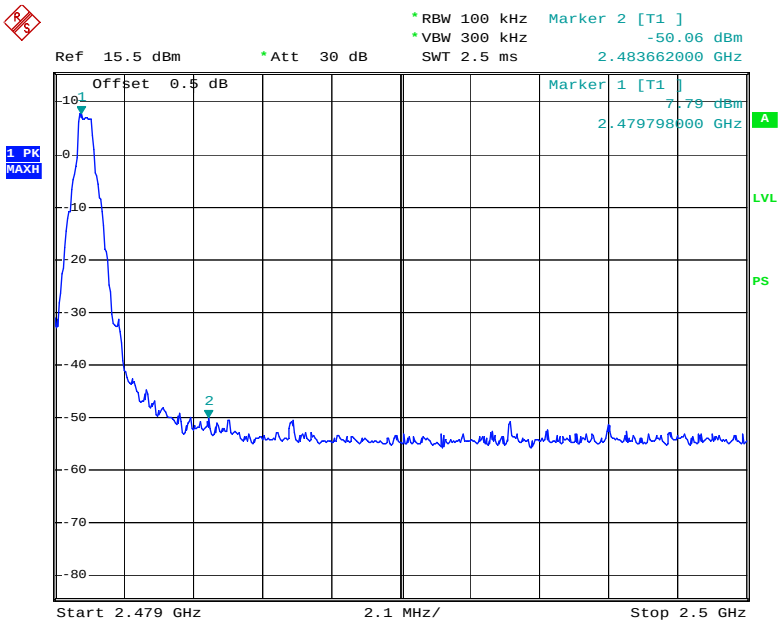
Test Mode: Transmitting

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2389.050	58.82	20
2483.662	57.85	20

Band Edge: Left Side



Band Edge: Right Side



Date: 3.FEB.2010 20:47:05

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