Lab Code: 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Verykool USA Inc

4350 Executive Dr. #100, San Diego, CA 92121, USA

FCC ID: WA6I315

Report Type:	Product Type:
Original Report	GSM&GPRS Dual Standby Mobile Phone

Test Engineer:	Kvass Yang
Report Number:	RSZ11012701-15.247
Report Date:	2011-03-10
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

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Verykool USA Inc*'s product, model number: *i315 (FCC ID: WA6I315)* or the "EUT" as referred to in this report is a *GSM&GPRS Dual Standby Mobile Phone,* which measures approximately: 8.0 cm (L) x 3.5 cm (W) x 1.6 cm (H), rated input voltage: DC 3.7 V battery.

Frequency Range:

Cellular Band: 824-849 MHz (Tx), 869-894 MHz (Rx)
PCS Band: 1850-1910 MHz (Tx), 1930-1990 MHz (Rx)
Bluetooth: 2400-2483.5 MHz (Tx/Rx)

Modulation Mode: GMSK (PCS/DCS); GFSK (Bluetooth)

Transmitter Output Power:

GSM Cellular Band: 33 dBm, GSM PCS Band: 30 dBm
Bluetooth: -6~4 dBm

** All measurement and test data in this report was gathered from production sample serial number: 11010092 (Assigned by BACL, Shenzhen). The EUT was received on 2011-01-27.*

Objective

This Type approval report is prepared on behalf of *Verykool USA 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 submission with FCC ID: WA6I315.

Test Methodology

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

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

Note: The uncertainty of any RF test which use conducted method measurement is ± 0.96 dB, the uncertainty of any radiation emissions measurement is ± 4.0 dB.

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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

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

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is 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 an engineering mode, which is provided by manufacture.

EUT Exercise Software

N/A

Equipment Modifications

No modification was made to the unit tested.

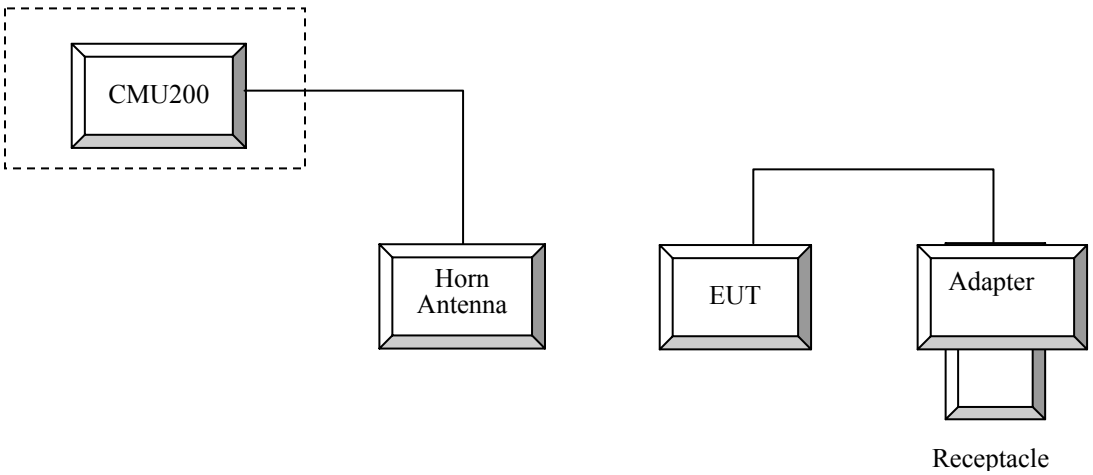
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
R & S	Universal Radio Commutation Tester	CMU200	11000008.02	DOC

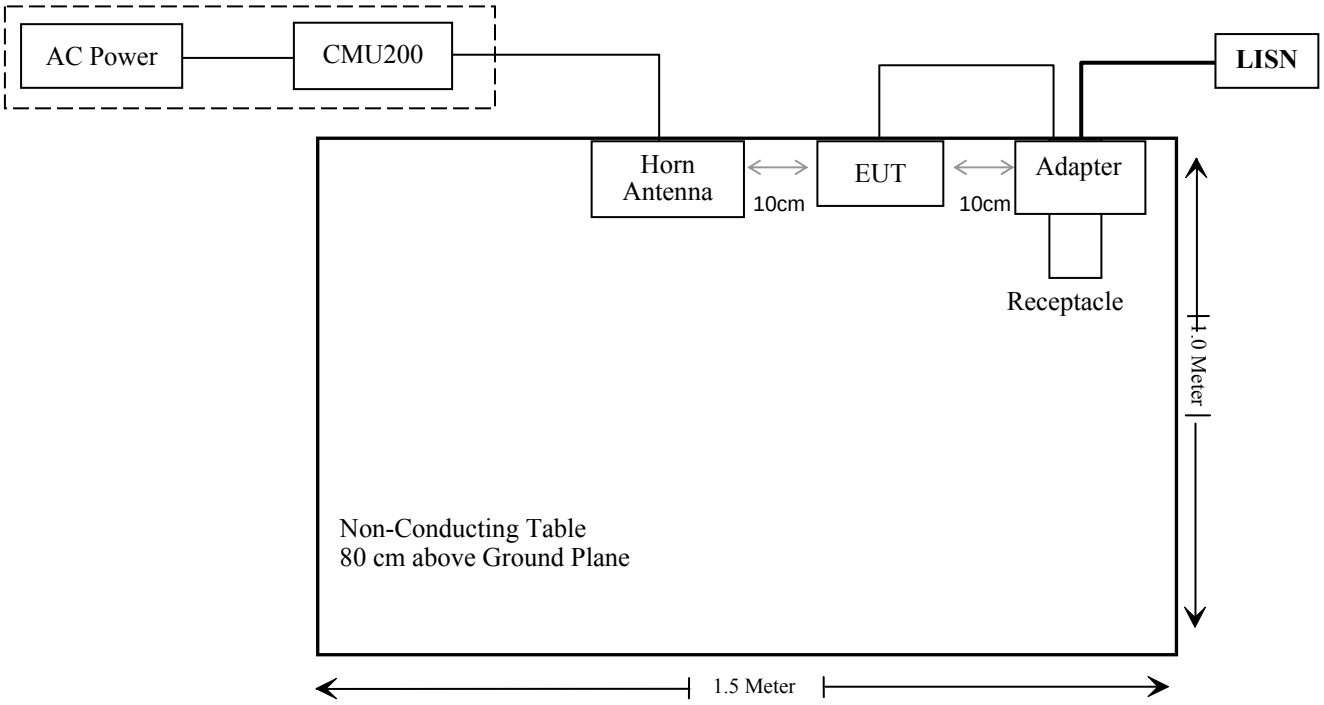
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Undetachable DC Power Cable	1.1	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	Compliace
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Spurious Emissions	Compliance
§15.247 (a)(1)	20 dB Bandwidth	Compliance
§15.247(a)(1)	Channel Separation Test	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(a)(1)(iii)	Quantity of Hopping Channel Test	Compliance
§15.247(b)(1)	Peak Output Power Measurement	Compliance
§15.247(d)	Band Edges	Compliance

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

Applicable Standard

According to FCC §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 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.

Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

Two antennas are available for the EUT, (GSM antenna, Bluetooth antenna), The distance between Bluetooth antenna and GSM antenna is less than 2.5 cm, the SAR of GSM antenna is less than 1.2 W/Kg, according to KDB 648474, simultaneous SAR measurement is not required.

Result:

The SAR measurement is exempt.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to §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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has a monopole antenna of Bluetooth, the gain is 0 dBi, which are in accordance to section 15.203, please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

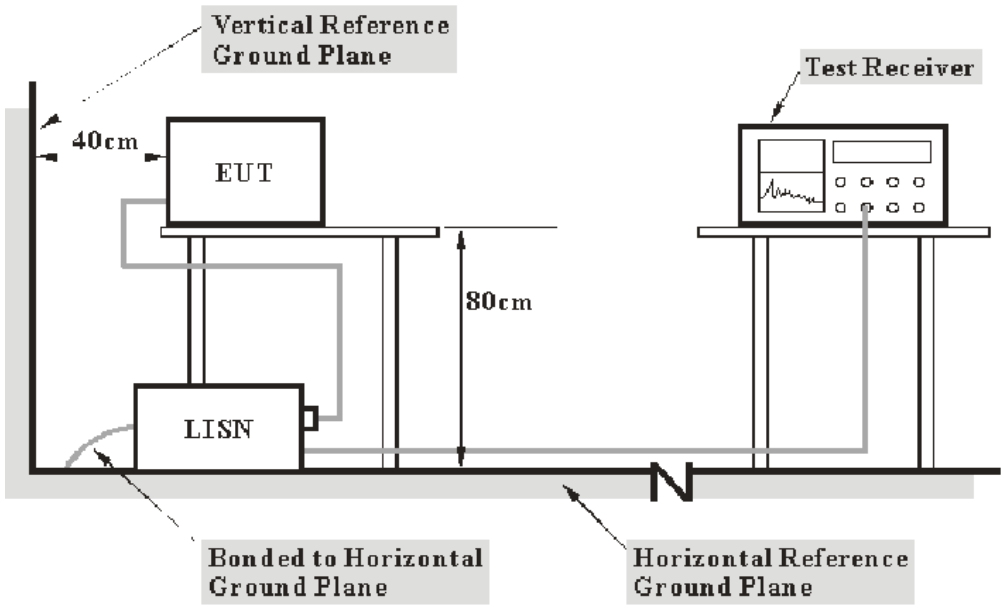
FCC §15.207

Measurement Uncertainty

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

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

EMI Test Receiver Setup

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2010-03-03	2011-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2010-03-09	2011-03-08

*** 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, with the worst margin reading of:

11.15 dB at **1.730 MHz** in the **Neutral** conductor mode

Test Data

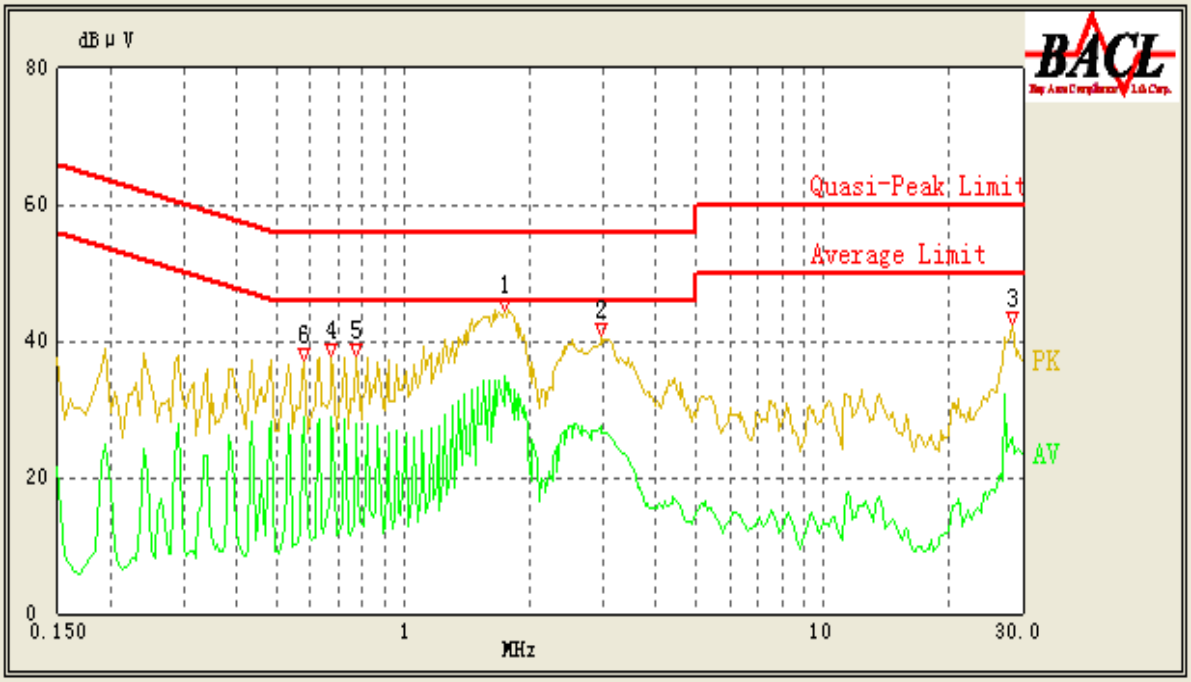
Environmental Conditions

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

** The testing was performed by Kvass Yang on 2011-02-24.*

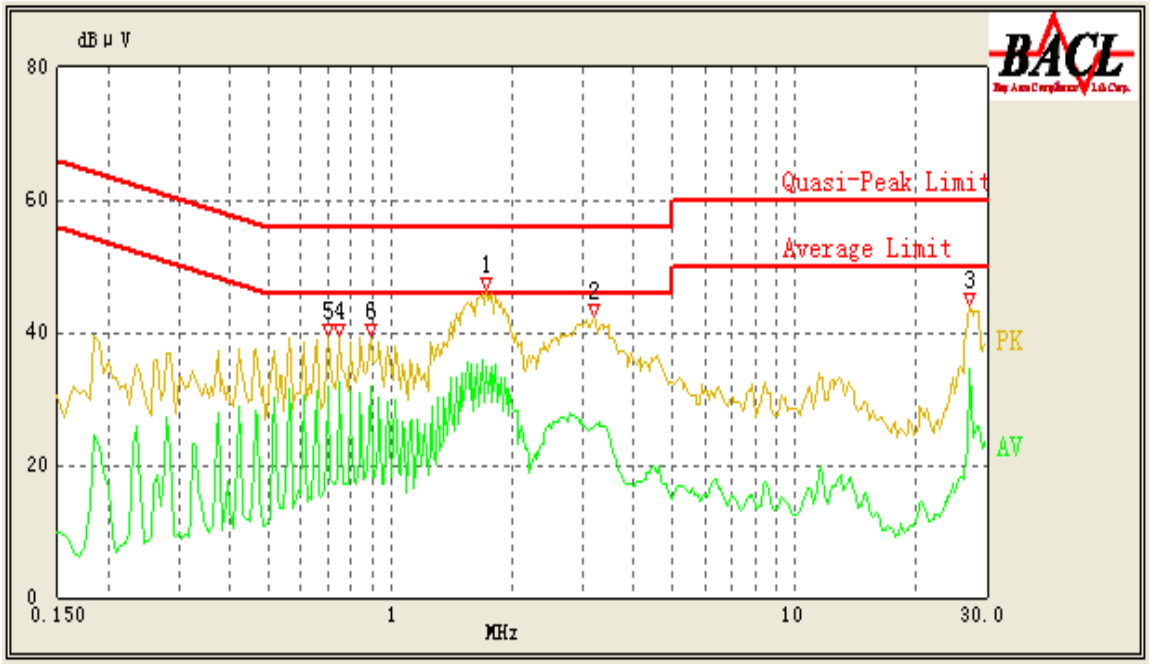
Test Mode: Adapter Charging & Transmitting

120 V, 60 Hz, Line:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Cord. Result (dBµV)**	**Correction Factor (dB)**	**Limit (dBµV)**	**Margin (dB)**	**Remark (PK/QP/Ave)**
1.740	34.69	10.17	46.00	11.31	Ave
1.740	39.18	10.17	56.00	16.82	QP
0.580	28.73	10.18	46.00	17.27	Ave
0.675	28.71	10.16	46.00	17.29	Ave
0.775	27.77	10.15	46.00	18.23	Ave
2.955	26.45	10.15	46.00	19.55	Ave
28.185	36.58	10.12	60.00	23.42	QP
2.955	32.56	10.15	56.00	23.44	QP
28.215	25.94	10.12	50.00	24.06	Ave
0.775	26.72	10.15	56.00	29.28	QP
0.580	25.20	10.18	56.00	30.80	QP
0.675	24.69	10.16	56.00	31.31	QP

120V, 60 Hz, Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Cord. Result (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Remark (PK/QP/Ave.)
1.730	34.85	10.17	46.00	11.15	Ave
0.750	32.36	10.15	46.00	13.64	Ave
0.700	31.98	10.16	46.00	14.02	Ave
0.890	31.83	10.12	46.00	14.17	Ave
27.120	34.65	10.13	50.00	15.35	Ave
3.185	25.93	10.14	46.00	20.07	Ave
27.120	26.34	10.13	60.00	33.66	QP
0.750	19.95	10.15	56.00	36.05	QP
0.700	19.32	10.16	56.00	36.68	QP
0.890	17.52	10.12	56.00	38.48	QP
1.730	15.92	10.17	56.00	40.08	QP
3.180	14.07	10.14	56.00	41.93	QP

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

Applicable Standard

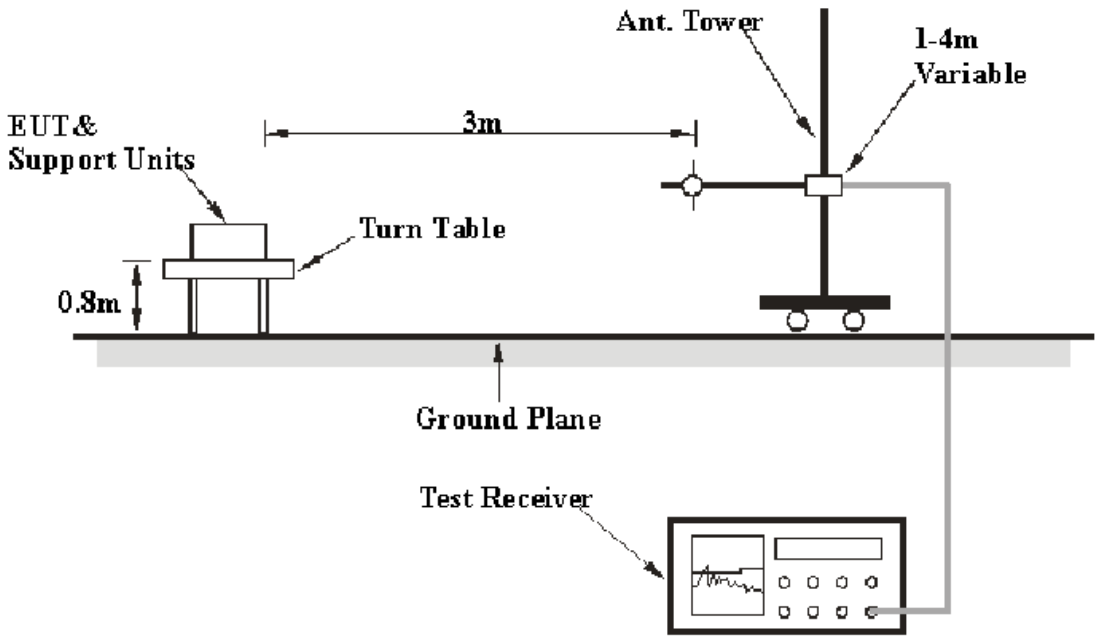
FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

Based on 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.

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

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-10
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-07
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-07

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

Test Procedure

For the radiated emissions test, 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 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 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

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

Below 1 GHz:

4.7 dB at **42.197250 MHz** in the **Vertical** polarization

Above 1 GHz:

8.70 dB at **4960.0 MHz** in the **Horizontal** polarization (Middle Channel)

Test Data

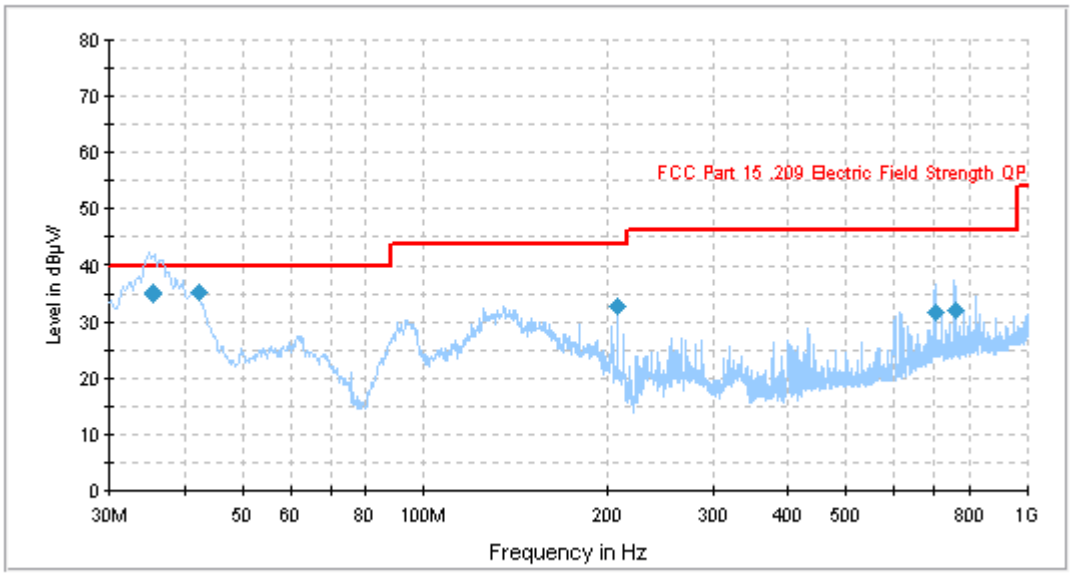
Environmental Conditions

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

The testing was performed by Kvass Yang on 2011-02-26.

Below 1 GHz

Test Mode: Adapter Charging & Transmitting



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)				
42.197250	35.3	102.0	V	77.0	-10.5	40.0	4.7
35.408250	35.2	103.0	V	115.0	-9.1	40.0	4.8
35.509750	35.1	102.0	V	128.0	-9.1	40.0	4.9
208.212750	33.0	145.0	H	245.0	-14.2	43.5	10.5
756.247750	32.2	205.0	V	171.0	-2.4	46.0	13.8
701.116500	31.9	173.0	V	0.0	-3.0	46.0	14.1

Test Mode: Transmitting

Above 1 GHz (worst case)

Indicated		Detector (PK/Ave.)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2402 MHz)												
7206.00	30.21	Ave	80	1.0	H	36.4	5.22	26.60	45.23	54	8.77	harmonic
7206.00	28.70	Ave	70	1.2	V	37.0	5.22	26.60	44.32	54	9.68	harmonic
4804.00	30.79	Ave	160	1.0	H	33.5	4.30	26.80	41.79	54	12.21	harmonic
4804.00	28.88	Ave	150	1.2	V	32.8	4.30	26.80	39.18	54	14.82	harmonic
7206.00	43.10	PK	70	1.0	H	36.4	5.22	26.60	58.12	74	15.88	harmonic
1134.26	37.30	Ave	12	1.0	H	24.2	2.02	26.49	37.03	54	16.97	spurious
1134.26	37.11	Ave	35	1.2	V	24.3	2.02	26.49	36.94	54	17.06	spurious
7206.00	40.78	PK	60	1.2	V	37.0	5.22	26.60	56.40	74	17.60	harmonic
4804.00	44.30	PK	180	1.0	H	33.5	4.30	26.80	55.30	74	18.70	harmonic
4804.00	42.93	PK	180	1.2	V	32.8	4.30	26.80	53.23	74	20.77	harmonic
1134.26	50.11	PK	20	1.2	V	24.3	2.02	26.49	49.94	74	24.06	spurious
1134.26	49.14	PK	20	1.0	H	24.2	2.02	26.49	48.87	74	25.13	spurious
Middle Channel (2441 MHz)												
7323.00	29.92	Ave	15	1.1	H	36.3	5.09	26.57	44.74	54	9.26	harmonic
7323.00	29.14	Ave	10	1.0	V	37.0	5.09	26.57	44.66	54	9.34	harmonic
4882.00	30.25	Ave	175	1.0	H	33.7	4.36	26.78	41.53	54	12.47	harmonic
4882.00	30.25	Ave	185	1.1	V	33.0	4.36	26.78	40.83	54	13.17	harmonic
7323.00	42.61	PK	0	1.0	H	36.3	5.09	26.57	57.43	74	16.57	harmonic
7323.00	41.57	PK	0	1.2	V	37.0	5.09	26.57	57.09	74	16.91	harmonic
4882.00	44.02	PK	180	1.2	V	33.0	4.36	26.78	54.60	74	19.40	harmonic
4882.00	42.18	PK	180	1.2	H	33.7	4.36	26.78	53.46	74	20.54	harmonic
1260.52	31.85	Ave	30	1.0	H	24.5	2.06	26.52	31.89	54	22.11	spurious
1448.89	31.74	Ave	45	0	V	24.6	2.06	26.52	31.88	54	22.12	spurious
1260.52	46.55	PK	45	1.2	H	24.5	2.06	26.52	46.59	74	27.41	spurious
1448.89	44.53	PK	30	1.0	V	24.6	2.06	26.52	44.67	74	29.33	spurious
High Channel (2480 MHz)												
4960.0	33.05	Ave	0	1.0	H	34.6	4.40	26.75	45.30	54	8.70	harmonic
7440.0	29.74	Ave	0	1.1	H	36.6	5.20	26.55	44.99	54	9.01	harmonic
7440.0	29.12	Ave	15	1.0	V	37.0	5.20	26.55	44.77	54	9.23	harmonic
4960.0	31.34	Ave	20	1.0	V	34.7	4.40	26.75	43.69	54	10.31	harmonic
7440.0	43.12	PK	10	1.0	H	36.3	5.20	26.55	58.07	74	15.93	harmonic
7440.0	40.84	PK	10	1.2	V	37.0	5.20	26.55	56.49	74	17.51	harmonic
4960.0	42.23	PK	0	1.2	V	34.7	4.40	26.75	54.58	74	19.42	harmonic
1450.9	33.61	Ave	30	1.0	H	25.3	2.24	26.58	34.57	54	19.43	spurious
4960.0	41.80	PK	20	1.2	H	34.6	4.40	26.75	54.05	74	19.95	harmonic
1450.9	30.67	Ave	0	1.0	V	25.5	2.24	26.58	31.83	54	22.17	spurious
1450.9	44.72	PK	30	1.0	V	25.5	2.24	26.58	45.88	74	28.12	spurious
1450.9	44.35	PK	0	1.2	H	25.3	2.24	26.58	45.31	74	28.69	spurious

Spurious Emissions in Restrict Bands:

Indicated		Detector (PK/Ave.)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209/15.205			
Frequency (MHz)	S.A. Reading (dBμV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
2336.696	31.93	Ave	0	1.1	H	28.7	3.00	26.84	36.79	54	17.21	spurious
2489.836	31.35	Ave	0	1.0	V	29.1	3.00	26.84	36.61	54	17.39	spurious
2318.460	30.78	Ave	230	1.2	H	29.1	3.00	26.84	36.04	54	17.96	spurious
2318.460	30.47	Ave	0	1.0	V	29.1	3.00	26.84	35.73	54	18.27	spurious
2336.696	30.54	Ave	145	1.2	V	28.7	3.00	26.84	35.40	54	18.60	spurious
2489.176	30.53	Ave	0	1.1	H	28.7	3.00	26.84	35.39	54	18.61	spurious
2489.836	41.91	PK	0	1.2	V	29.1	3.00	26.84	47.17	74	26.83	spurious
2336.696	42.26	PK	20	1.2	H	28.7	3.00	26.84	47.12	74	26.88	spurious
2318.460	41.35	PK	30	1.2	V	29.1	3.00	26.84	46.61	74	27.39	spurious
2489.176	41.20	PK	10	1.1	H	28.7	3.00	26.84	46.06	74	27.94	spurious
2318.460	40.65	PK	230	1.8	H	29.1	3.00	26.84	45.91	74	28.09	spurious
2336.696	40.01	PK	145	1.2	V	28.7	3.00	26.84	44.87	74	29.13	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	2010-11-24	2011-11-23

*** 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:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

** The testing was performed by Kvass Yang on 2011-02-25.*

Test Result: Compliant.

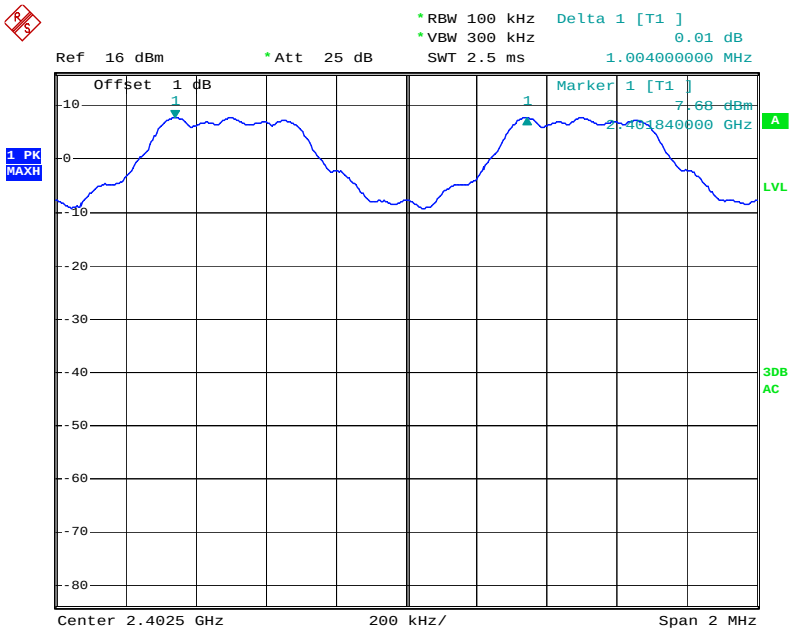
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.004	0.701	Pass
Adjacent	2403			
Middle	2441	1.004	0.701	Pass
Adjacent	2442			
High	2480	1.004	0.701	Pass
Adjacent	2479			

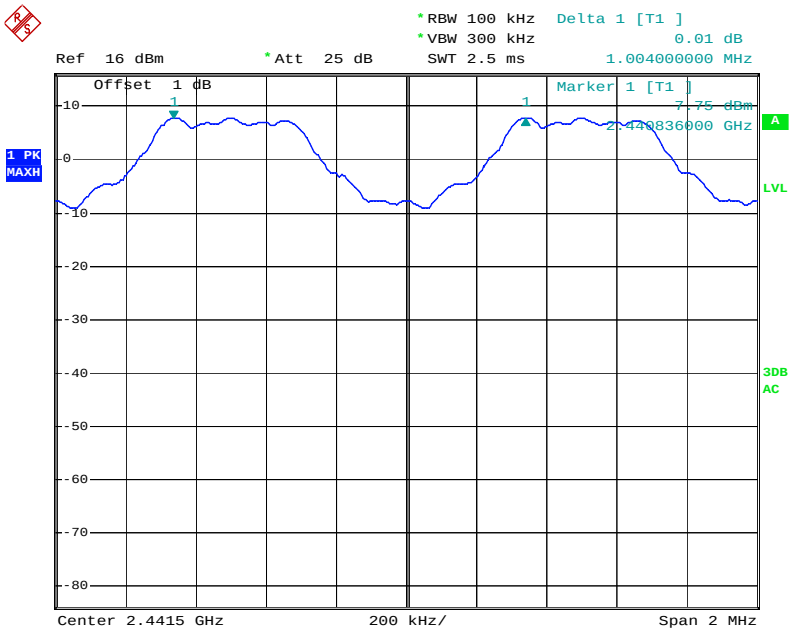
Please refer to the following plots.

Low Channel



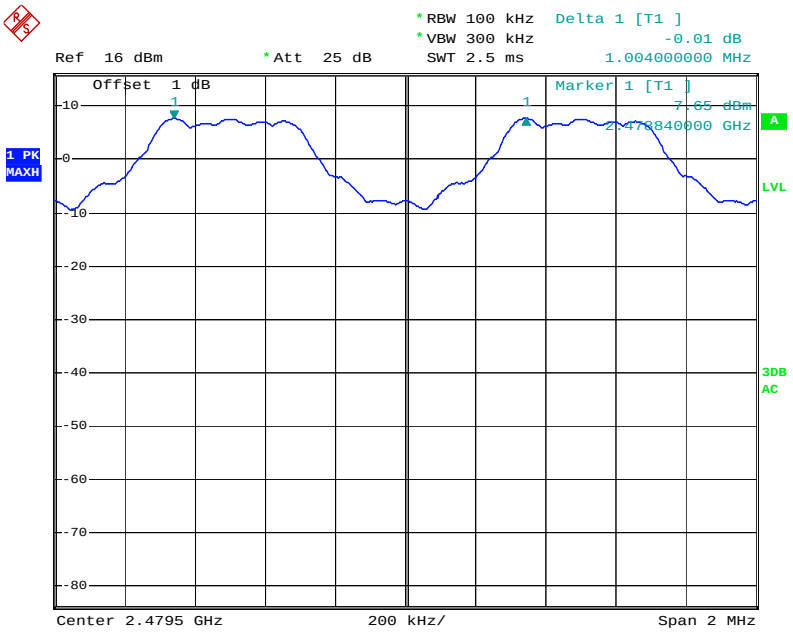
Date: 25.FEB.2011 16:13:55

Middle Channel



Date: 25.FEB.2011 16:12:55

High Channel



Date: 25.FEB.2011 16:12:04

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	2010-11-24	2011-11-23

*** 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 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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

** The testing was performed by Kvass Yang on 2011-02-25.*

Test Result: Compliance.

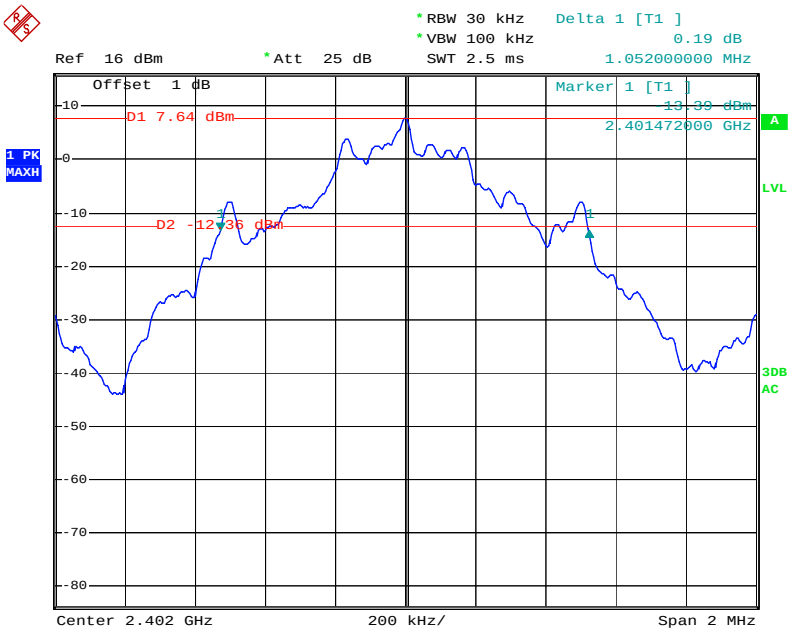
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.052
Middle	2441	1.052
High	2480	1.052

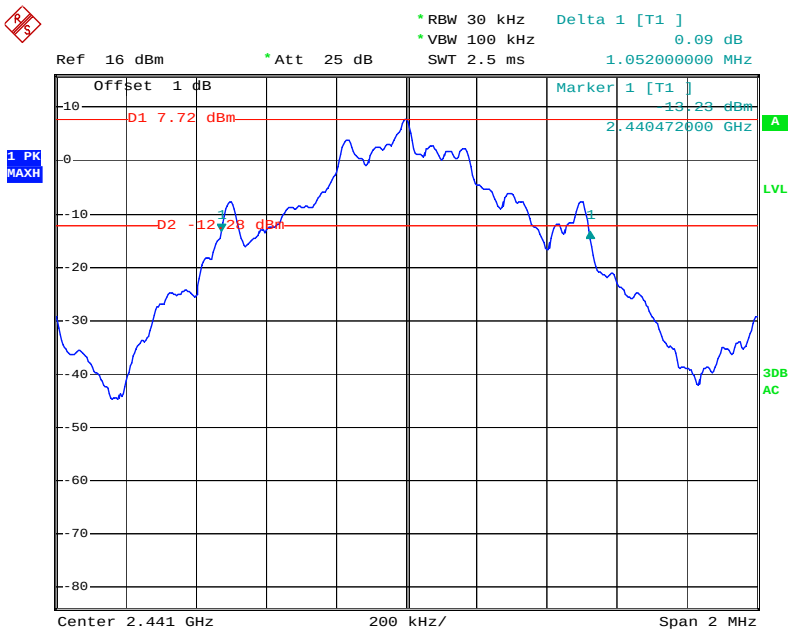
Please refer to the following plots.

Low Channel



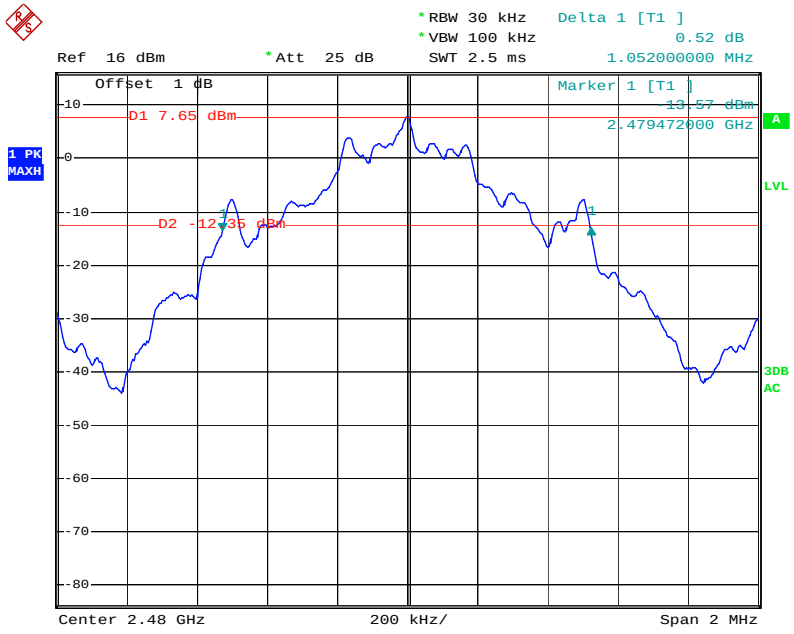
Date: 25.FEB.2011 16:05:16

Middle Channel



Date: 25.FEB.2011 16:06:15

High Channel



Date: 25.FEB.2011 16:07:58

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	2010-11-24	2011-11-23

*** 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:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

The testing was performed by Kvass Yang on 2011-02-25.

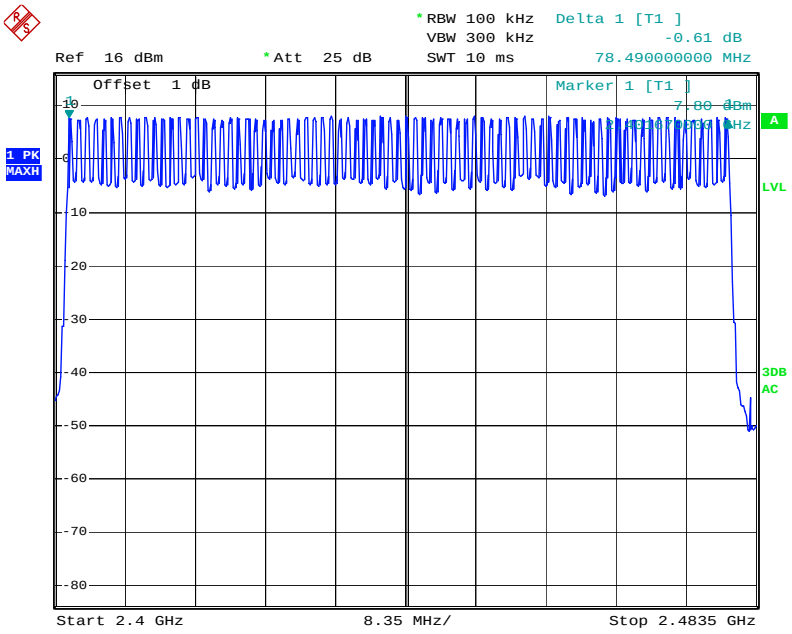
Test Result: Compliance.

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: 25.FEB.2011 16:00:22

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	2010-11-24	2011-11-23

*** 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 * channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

Dwell Time= time slot length * hope rate/ number of hopping channels * 31.6s
Hop rate=1600/s

Test Data

Environmental Conditions

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

** The testing was performed by Kvass Yang on 2011-02-25.*

Test Result: Compliance.

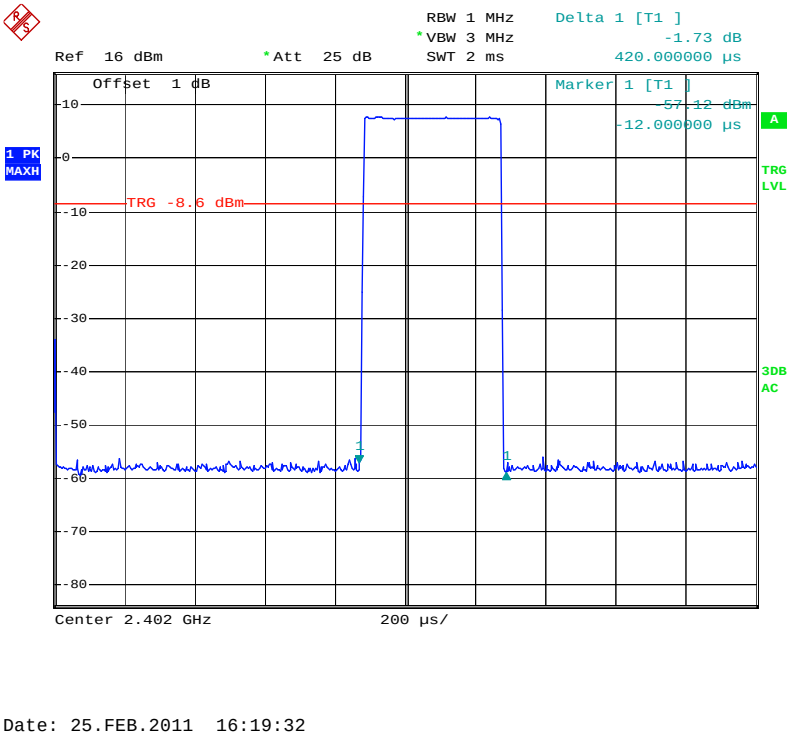
Please refer to following tables and plots

Test Mode: Transmitting

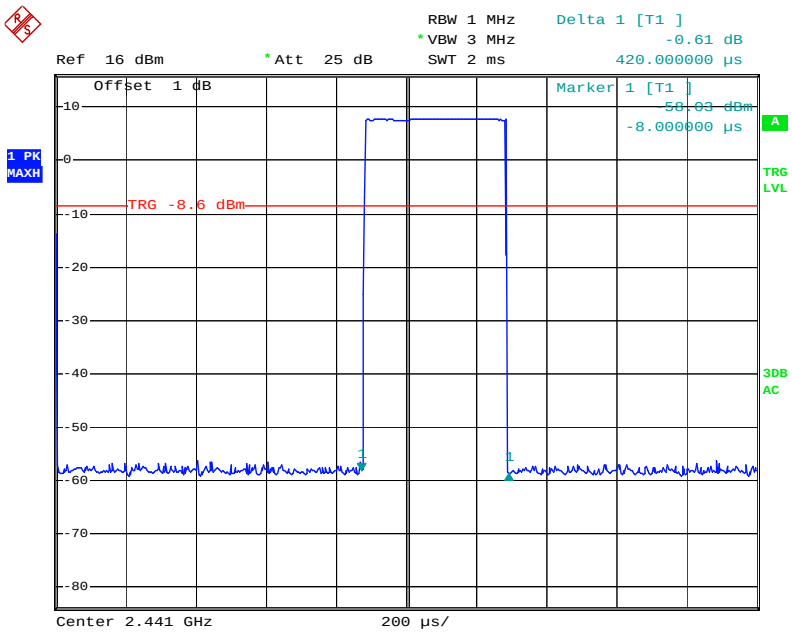
Mode	Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
DH 1	Low	0.420	0.13440	0.4	Pass
	Middle	0.420	0.13440	0.4	Pass
	High	0.424	0.13568	0.4	Pass
	Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
DH 3	Low	1.698	0.27168	0.4	Pass
	Middle	1.686	0.26976	0.4	Pass
	High	1.686	0.26976	0.4	Pass
	Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
DH 5	Low	2.968	0.316587	0.4	Pass
	Middle	2.968	0.316587	0.4	Pass
	High	2.968	0.316587	0.4	Pass
	*Note: DH5:*Dwell time = Pulse time*(1600/6/79)*31.6S				

Please refer to the following plots.

Low Channel for DH1

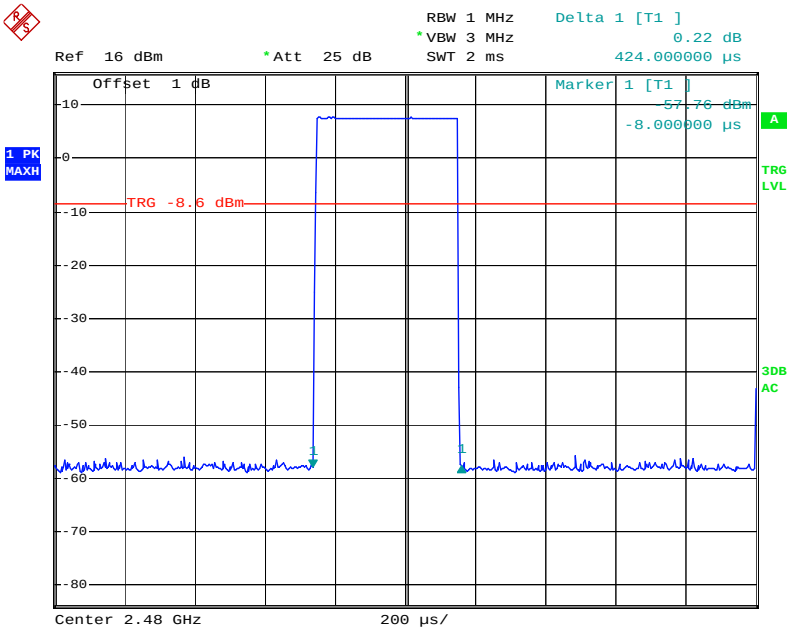


Middle Channel for DH1



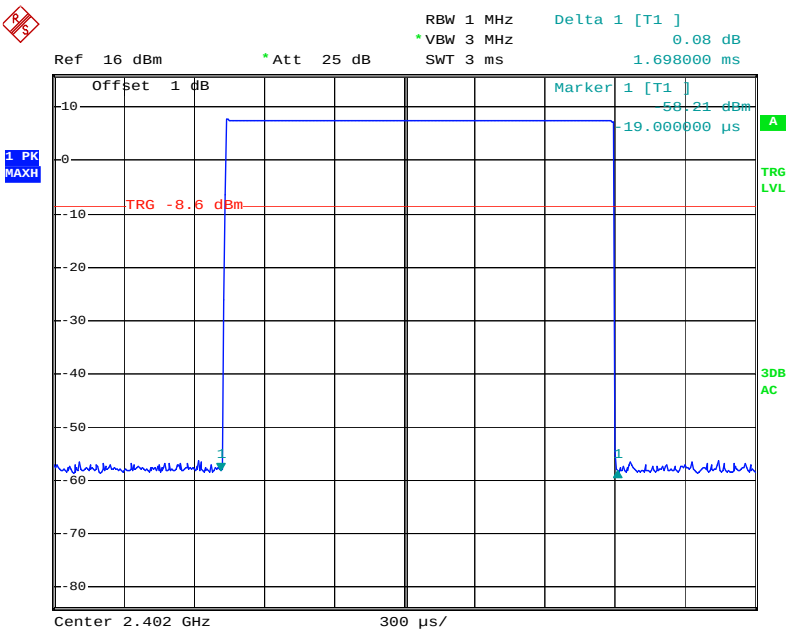
Date: 25.FEB.2011 16:18:46

High Channel for DH1



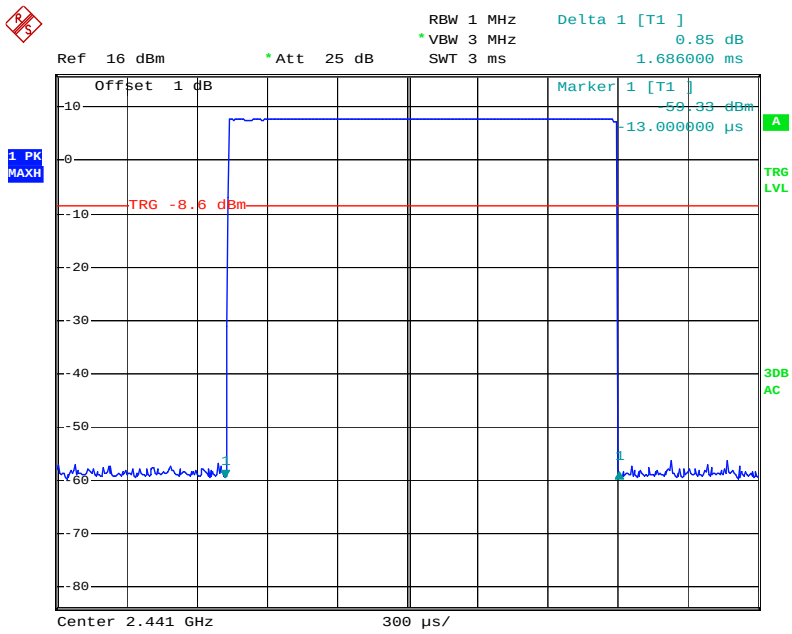
Date: 25.FEB.2011 16:21:28

Low Channel for DH3



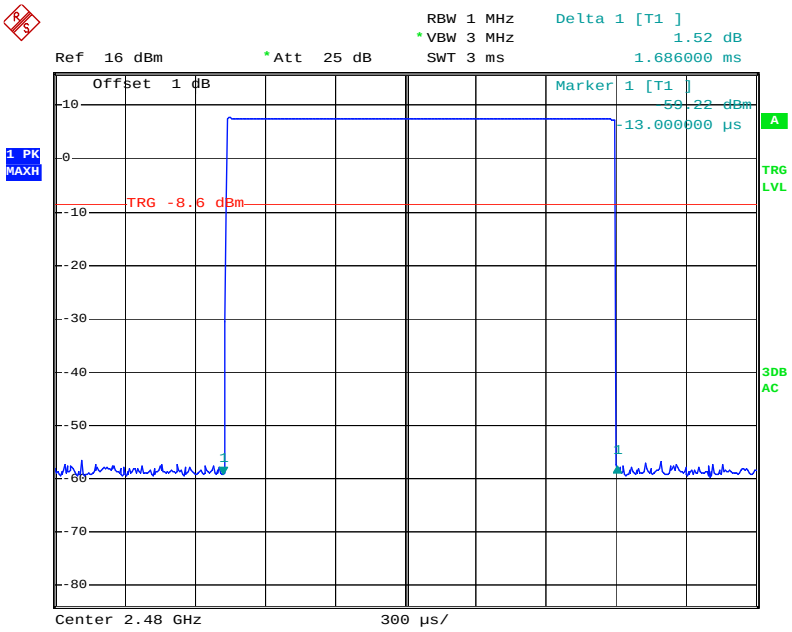
Date: 25.FEB.2011 16:25:20

Middle Channel for DH3



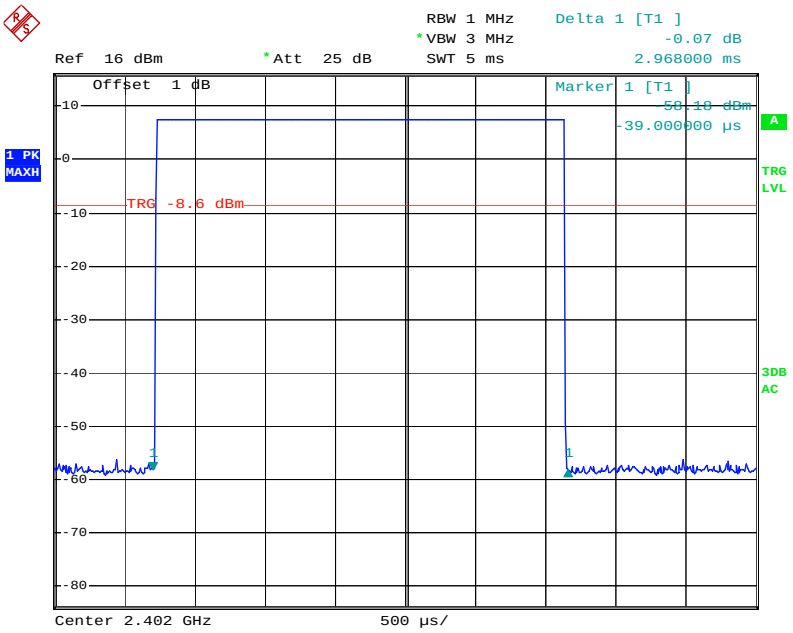
Date: 25.FEB.2011 16:22:58

High Channel for DH3



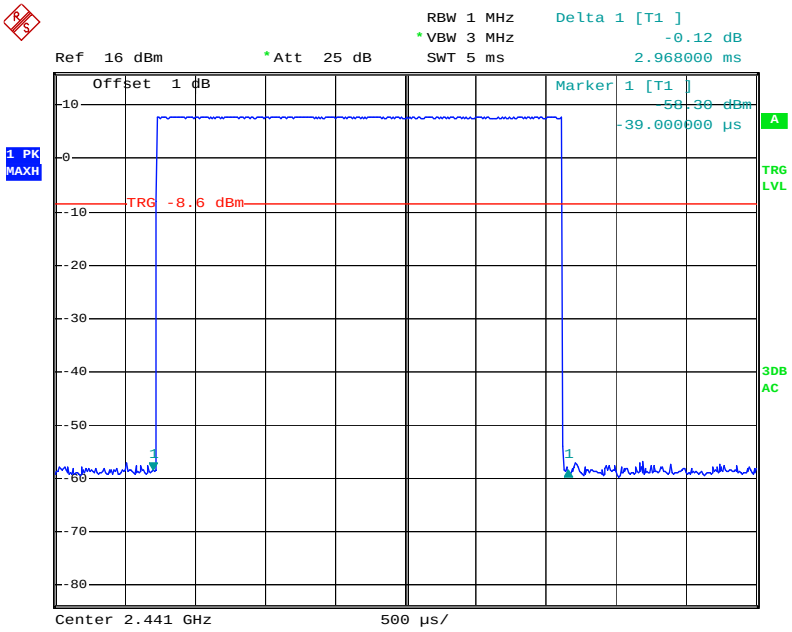
Date: 25.FEB.2011 16:22:34

Low Channel for DH5



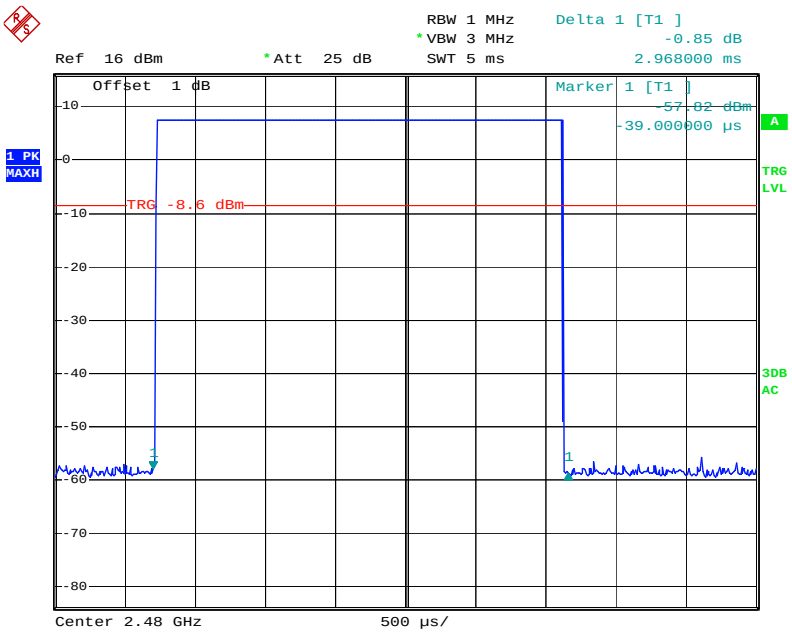
Date: 25.FEB.2011 16:26:34

Middle Channel for DH5



Date: 25.FEB.2011 16:27:02

High Channel for DH5



Date: 25.FEB.2011 16:27:40

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

Applicable Standard

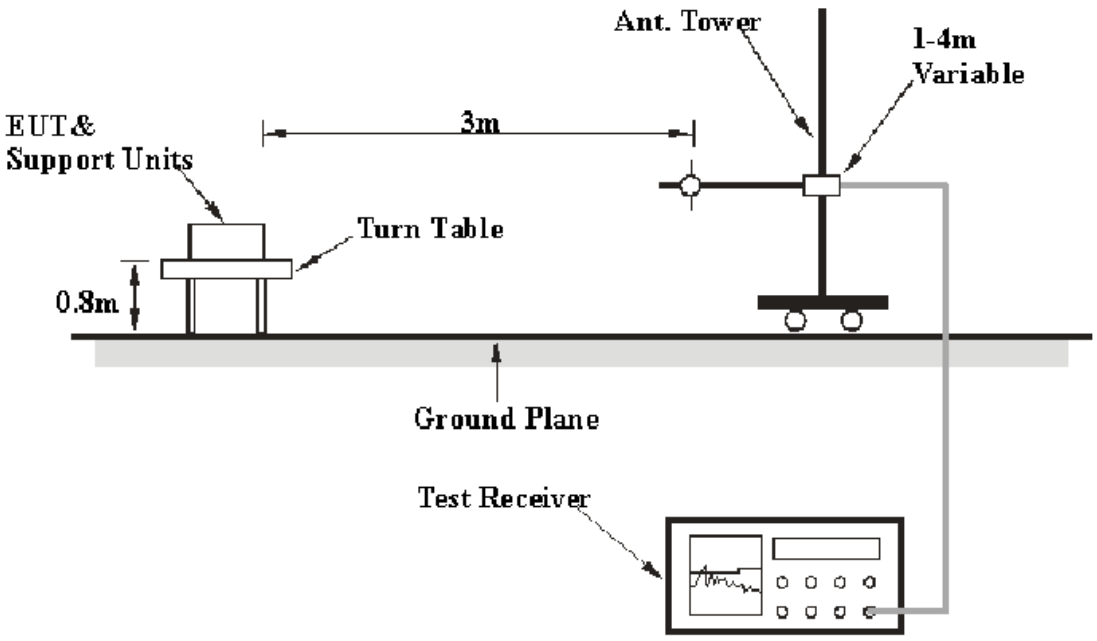
FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

Based on 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 (k=2, 95% level of confidence).

EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009.

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

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	***RBW***	***Video B/W***
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	2010-08-02	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
HP	Amplifier	8449B	3008A00277	2010-09-12	2011-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

*** 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

FCC DA 00-705

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 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

** The testing was performed by Kvass Yang on 2011-02-25.*

Test Result: Compliance.

Indicated		Detector (PK/Ave)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247				
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBµV/m)	Cord. Amp. (dBm	Cord. Amp. (mW)	Limit (mW)	Result
Low Channel (2402 MHz)													
2402	92.73	PK	180	1.8	V	30.1	3.03	26.84	99.02	3.75	2.37	1000	Pass
2402	86.87	PK	160	1.0	H	30.2	3.03	26.84	93.26	-2.01	0.96	1000	Pass
middle Channel (2441 MHz)													
2441	88.15	PK	70	2.0	V	30.2	3.05	26.85	94.55	-0.72	0.85	1000	Pass
2441	83.64	PK	80	1.1	H	30.3	3.05	26.85	90.14	-5.13	0.31	1000	Pass
high Channel (2480 MHz)													
2480	84.06	PK	20	1.7	V	30.4	3.07	26.86	90.67	-4.60	0.35	1000	Pass
2480	79.05	PK	12	1.0	H	30.4	3.07	26.86	85.66	-9.61	0.11	1000	Pass

Note: In 3 m chamber, P dBm = E (dBµV/m) - 95.27

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
HP	Amplifier	8449B	3008A00277	2010-09-12	2011-09-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

*** 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. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3 MHz.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.9kPa

**The testing was performed by Kvass Yang on 2011-02-25.*

Test Result: Compliance

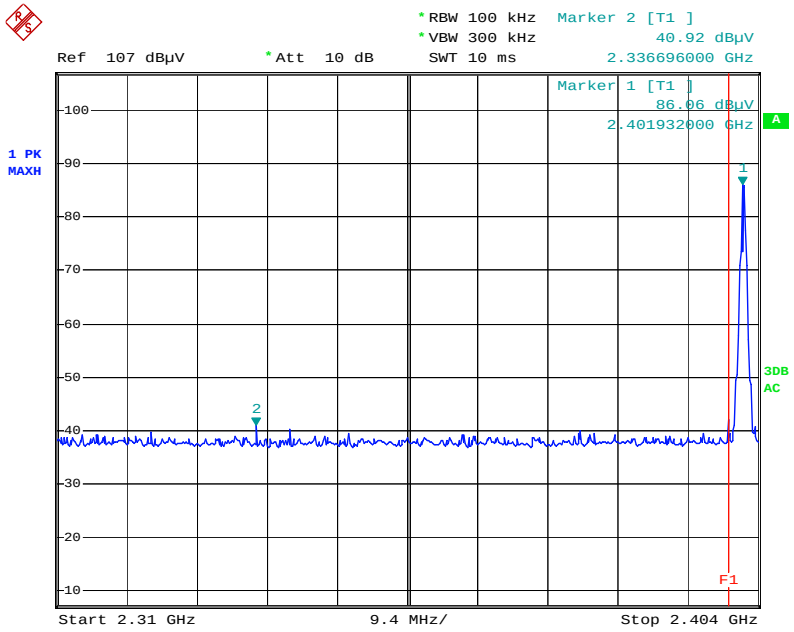
Test Mode: Transmitting

Frequency (MHz)	Delta Peak to band emission (dBc)	Antenna Polar (H/V)	Limit (dBc)
2336.696	45.14	H	20
2318.460	51.13	V	20
2489.176	38.76	H	20
2489.836	43.47	V	20

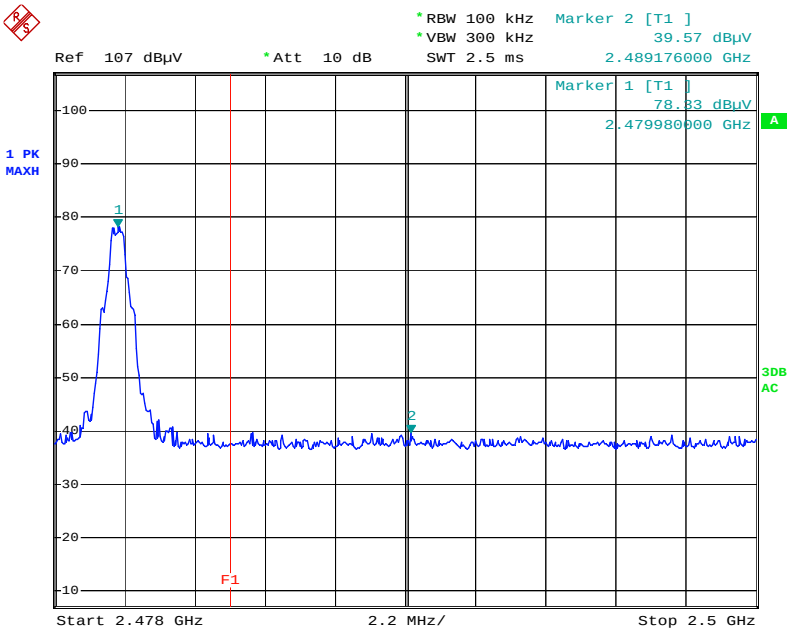
Note: The point fall into the stricted band was in FCC 15.209, please refer to the restrict band testing.

Please refer to follow plots:

Band Edge: Left Side (Horizontal)

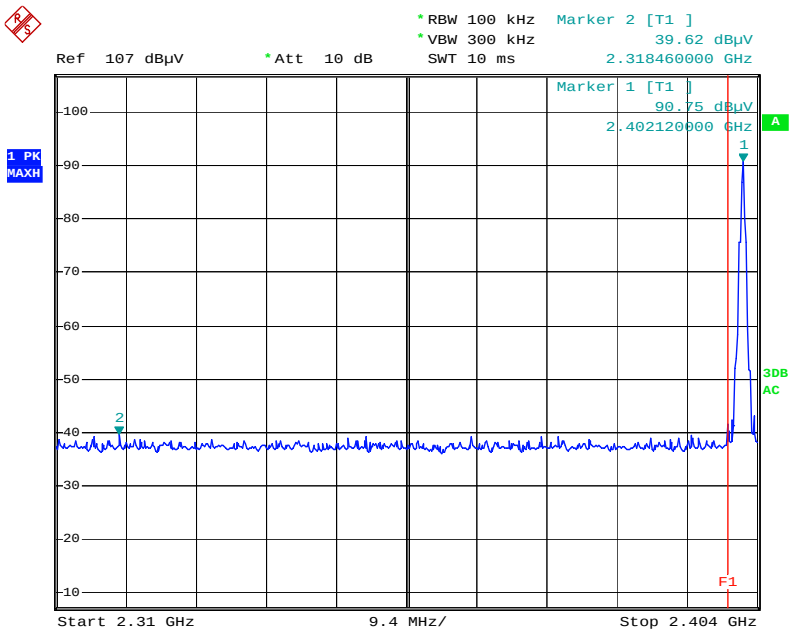


Band Edge: Right Side (Horizontal)



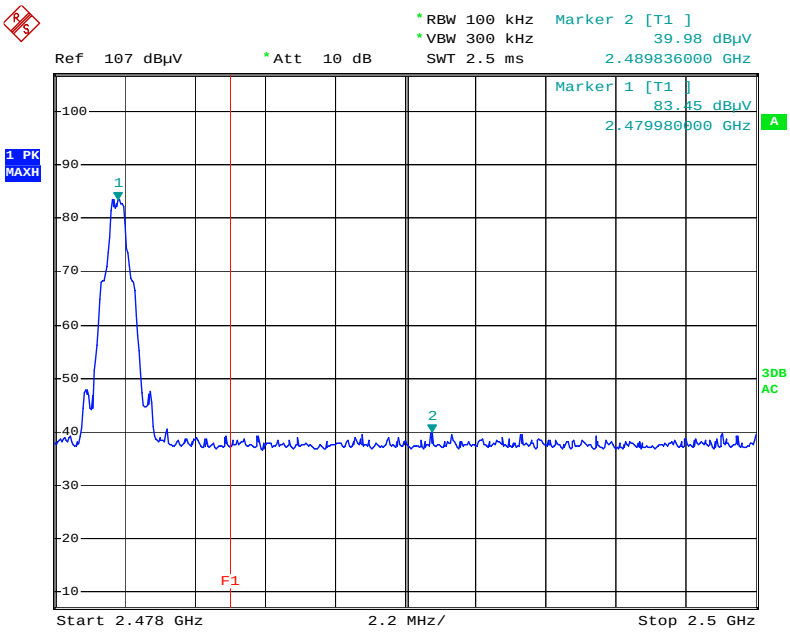
Date: 25.FEB.2011 15:14:08

Band Edge: Left Side (Vertical)



Date: 25.FEB.2011 16:00:35

Band Edge: Right Side (Vertical)



Date: 25.FEB.2011 15:19:18

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