



FCC PART 15.247

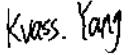
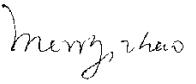
MEASUREMENT AND TEST REPORT

For

Zonda Corporation, S.A. de C.V

Schiller 329 Street, Chapultepec Morales, Zip code 11560, Mexico City, Mexico

FCC ID: YAUZMTN835

Report Type: Original Report	Product Type: GSM Mobile Phone
Test Engineer: <u>Kvass Yang</u> 	
Report Number: <u>RB10091551-247</u>	
Report Date: <u>2010-11-19</u>	
Merry Zhao 	
Reviewed By: <u>EMC Engineer</u>	
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	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" (Rev.2)

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EQUIPMENT MODIFICATIONS	6
EUT EXERCISE SOFTWARE	6
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	6
EXTERNAL I/O CABLE.....	6
CONFIGURATION OF TEST SETUP	7
BLOCK DIAGRAM OF TEST SETUP	8
SUMMARY OF TEST RESULTS.....	9
FCC §15.247 (i) and §2.1093 - RF EXPOSURE.....	10
APPLICABLE STANDARD	10
RESULT:.....	11
FCC §15.203 – ANTENNA REQUIREMENT	12
APPLICABLE STANDARD	12
ANTENNA CONNECTOR CONSTRUCTION	12
FCC §15.207(a) – AC LINE CONDUCTED EMISSIONS	13
APPLICABLE STANDARD	13
MEASUREMENT UNCERTAINTY	13
EUT SETUP	13
EMI TEST RECEIVER SETUP.....	14
TEST EQUIPMENT LIST AND DETAILS.....	14
TEST PROCEDURE	14
TEST RESULTS SUMMARY	14
TEST DATA	14
FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS.....	19
APPLICABLE STANDARDS.....	19
MEASUREMENT UNCERTAINTY	19
EUT SETUP	19
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	20
TEST EQUIPMENT LIST AND DETAILS.....	20
TEST PROCEDURE	20
CORRECTED AMPLITUDE & MARGIN CALCULATION	20
TEST RESULTS SUMMARY	21
TEST DATA	21
FCC §15.247(a) (1)-CHANNEL SEPARATION TEST	26
APPLICABLE STANDARD	26
TEST EQUIPMENT LIST AND DETAILS.....	26
TEST PROCEDURE	26
TEST DATA	26

FCC §15.247(a) (1) – 20 dB BANDWIDTH TESTING	29
APPLICABLE STANDARD	29
TEST EQUIPMENT LIST AND DETAILS.....	29
TEST PROCEDURE	29
TEST DATA	29
FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST.....	32
APPLICABLE STANDARD	32
TEST EQUIPMENT LIST AND DETAILS.....	32
TEST PROCEDURE	32
TEST DATA	32
FCC §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME).....	34
APPLICABLE STANDARD	34
TEST EQUIPMENT LIST AND DETAILS.....	34
TEST PROCEDURE	34
TEST DATA	34
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT	40
APPLICABLE STANDARD	40
TEST EQUIPMENT LIST AND DETAILS.....	40
TEST PROCEDURE	40
TEST DATA	40
FCC §15.247(d) - BAND EDGES TESTING	43
APPLICABLE STANDARD	43
TEST EQUIPMENT LIST AND DETAILS.....	43
TEST PROCEDURE	43
TEST DATA	44

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Zonda Corporation, S.A. de C.V*'s product, model number: *ZMTN835 (FCC ID: YAUZMTN835)* or the "EUT" as referred to in this report is a *GSM Mobile Phone*, which measures approximately: 11.50 cm (L) x 6.20 cm (W) x 1.25 cm (H), rated input voltage: DC 3.7 V battery.

Adapter information:

Manufacturer: SHENZHEN BMT ELECTRONICS CO., LTD

Input: AC 100-240 V Max.120 mA;

Output: DC 5.0 V 600 mA.

All measurement and test data in this report was gathered from production sample serial number: 1009027 (Assigned by BACL, Shenzhen). The EUT was received on 2010-09-15.

Objective

This Type approval report is prepared on behalf of *Zonda Corporation, S.A. de C.V* 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: YAUZMTN835.

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 an engineering mode which was selected by manufacturer.

Equipment Modifications

No modification was made to the unit tested.

EUT Exercise Software

N/A

Local Support Equipment List and Details

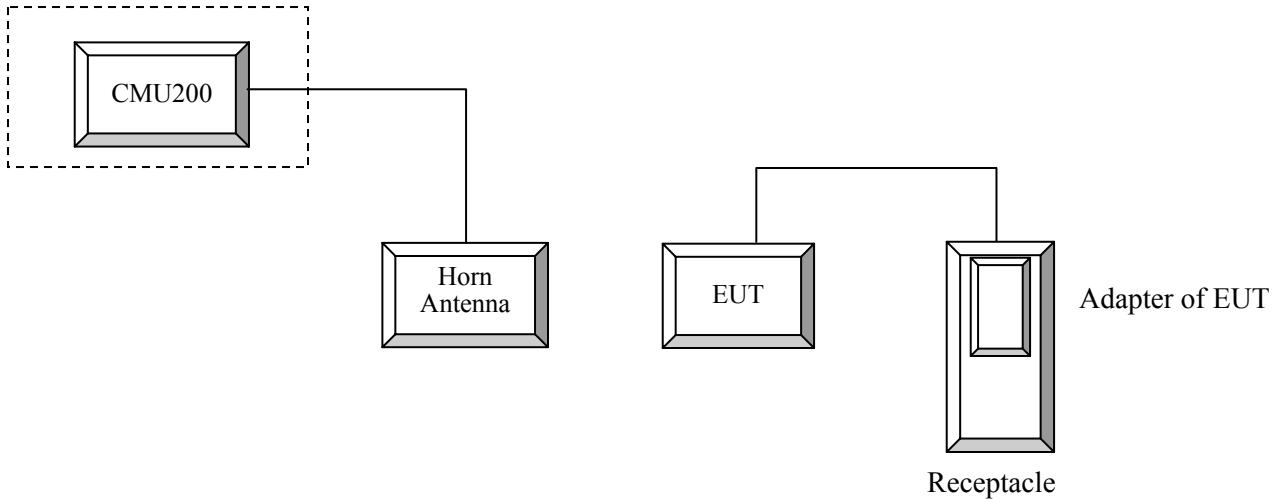
Manufacturer	Description	Model	Serial Number	FCC ID
R & S	Universal Radio CommutationTester	CMU200	1100 0008.02	DOC
Dell	Laptop	D600	N/A	N/A

External I/O Cable

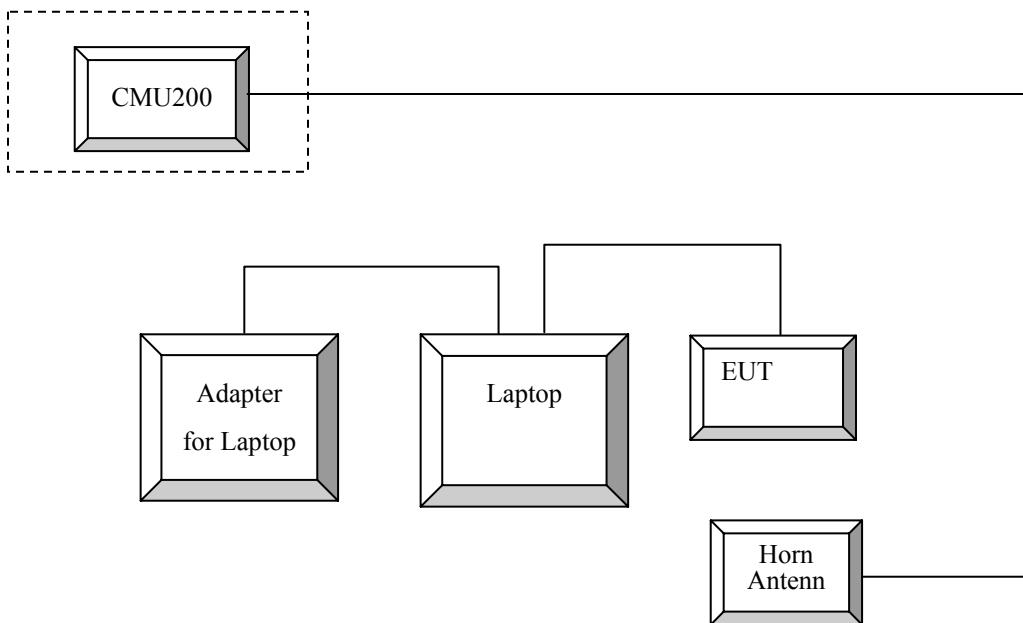
Cable Description	Length (m)	From Port	To
Unshielded Undetachable USB Cabel	1.0	Adapter	EUT

Configuration of Test Setup

For Adapter Charging & Transmitting:

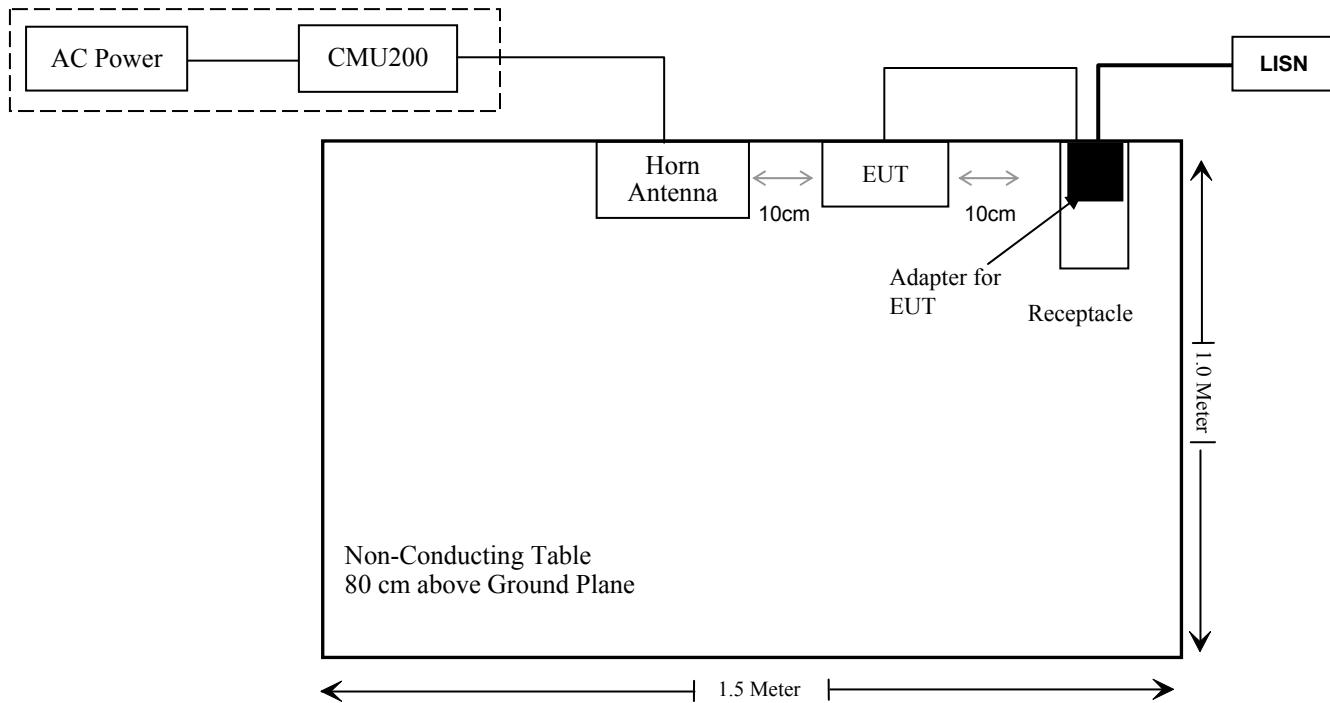


For PC Charging & Transmitting:

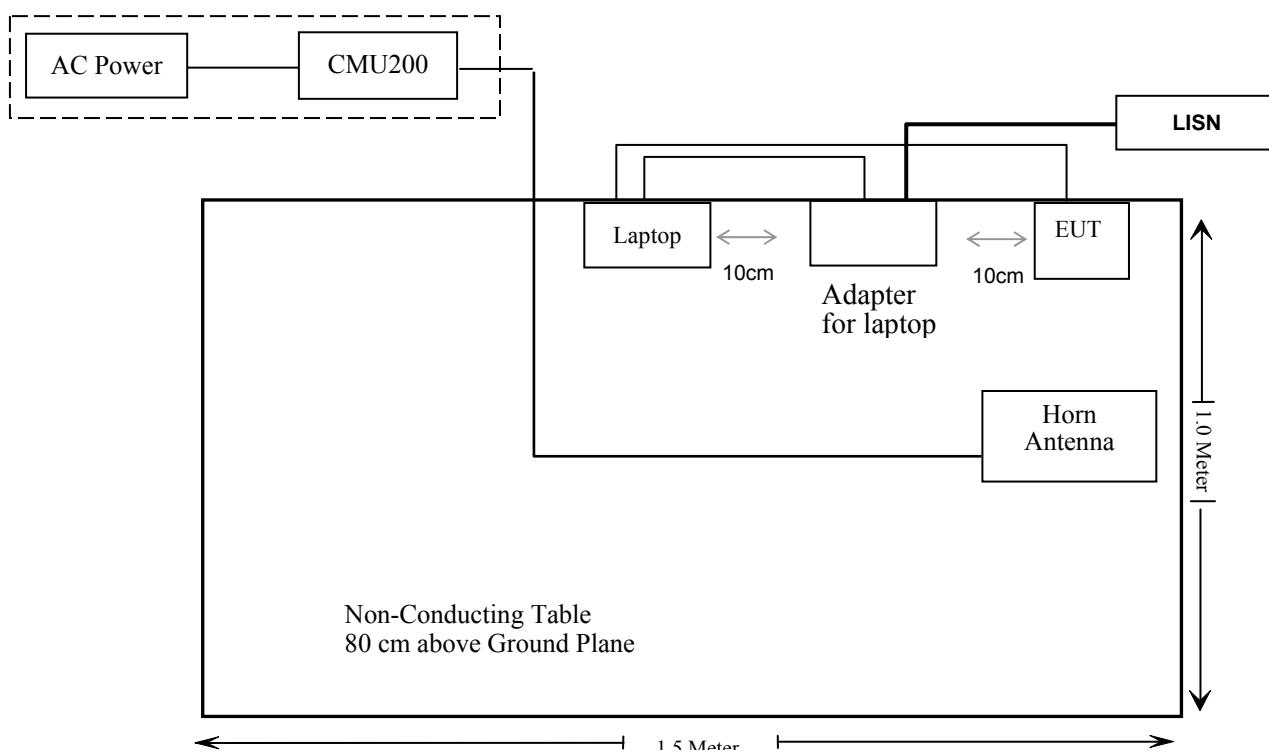


Block Diagram of Test Setup

For Adapter Charging & Transmitting:



For PC Charging & Transmitting:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247(i), §1.1307(b)(1) & §2.1093	RF Exposure	Compliance
§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

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	<u>Routine evaluation required</u>	<u>SAR not required:</u> <u>Unlicensed only</u> <ul style="list-style-type: none"> when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas <u>Licensed & Unlicensed</u> <ul style="list-style-type: none"> when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 <u>SAR required:</u> <u>Licensed & Unlicensed</u> 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 <u>Note:</u> simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Jaw, Mouth and Nose	<u>Flat phantom SAR required</u> <ul style="list-style-type: none"> 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 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, one is GSM/PCS antenna, the other is bluetooth antenna.

Note:

1. The distance between BT and GSM antenna is 7.6 cm >5.0 cm.
2. The average power of Bluetooth is less than 60/f, According to KDB 648474, SAR evaluation is not required for BT antenna.

Result:

The SAR measurement is exempt.

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 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 PIFA antenna connect to RF board, which in accordance to section 15.203, the maximum gain is 0 dBi; please refer to the internal photos.

Result: Compliance.

FCC §15.207(a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

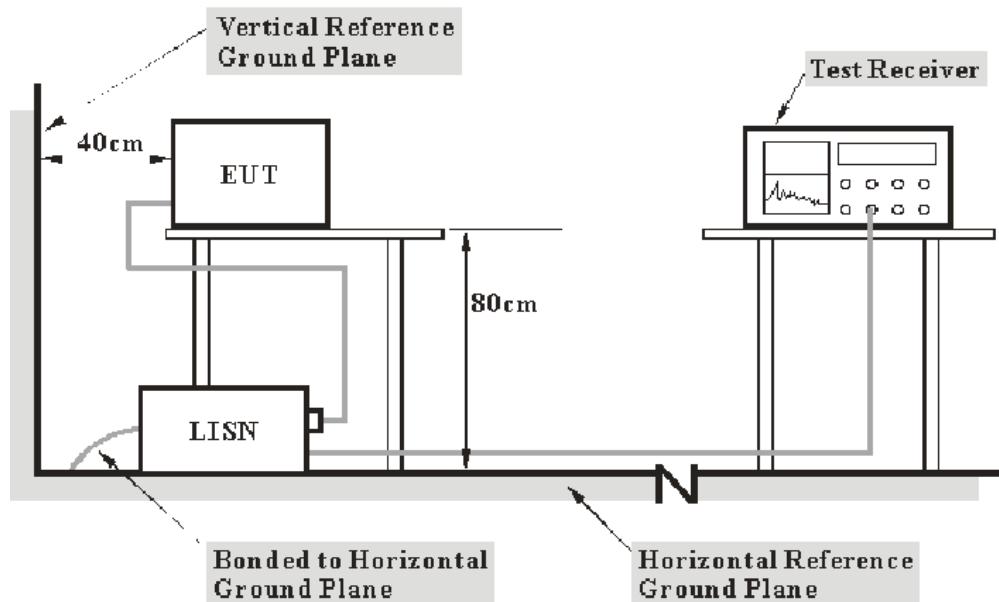
FCC §15.207

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 spacing between the peripherals was 10 cm.

The adapter and test laptop were 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:

<u>Frequency Range</u>	<u>IF B/W</u>
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
SUNOL SCIENCES	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04

* **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 and test laptop were 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:

For Adapter Charging & Transmitting: **12.79 dB** at **0.875 MHz** in the **Line** conductor mode

For PC Charging & Transmitting: **21.44 dB** at **0.535 MHz** in the **Neutral** conductor mode

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

The testing was performed by Kvass Yang on 2010-09-25.

Test Mode: Adapter Charging & Transmitting

AC 120 V/60 Hz, Line



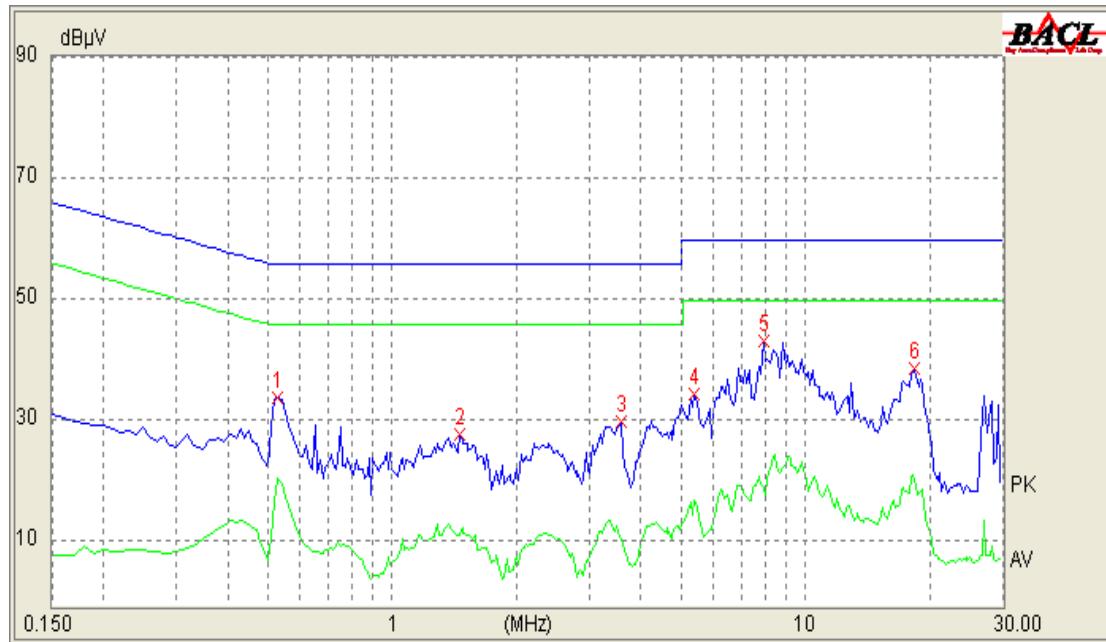
Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
0.875	10.20	33.21	46.00	12.79	Ave
0.330	10.00	35.40	50.86	15.46	Ave
3.195	10.20	39.26	56.00	16.74	QP
0.220	10.10	36.12	54.00	17.88	Ave
0.880	10.20	36.74	56.00	19.26	QP
0.220	10.10	43.94	64.00	20.06	QP
0.330	10.00	40.14	60.86	20.72	QP
11.570	10.10	37.68	60.00	22.32	QP
3.180	10.20	18.26	46.00	27.74	Ave
27.120	10.20	28.42	60.00	31.58	QP
27.120	10.20	18.03	50.00	31.97	Ave
11.670	10.10	14.40	50.00	35.60	Ave

AC 120 V / 60 Hz, Neutral:

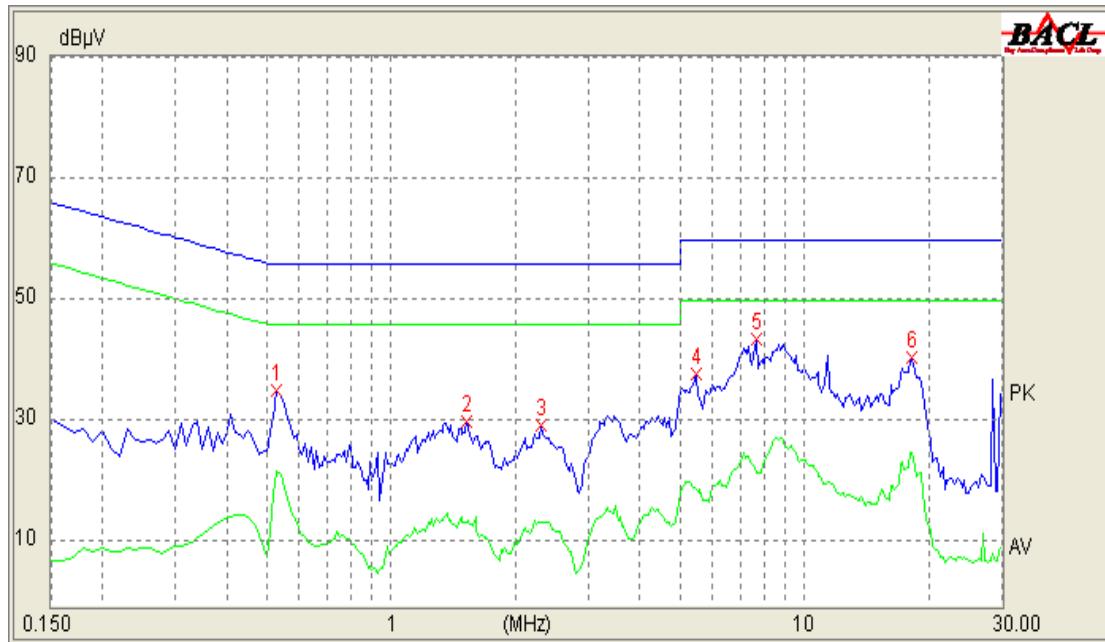
Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave)
0.220	10.10	48.33	64.00	15.67	QP
0.880	10.20	29.79	46.00	16.21	Ave
3.305	10.20	39.33	56.00	16.67	QP
0.330	10.00	43.28	60.86	17.58	QP
0.330	10.00	32.75	50.86	18.11	Ave
0.220	10.10	35.25	54.00	18.75	Ave
0.875	10.20	36.78	56.00	19.22	QP
3.285	10.20	25.38	46.00	20.62	Ave
12.375	10.10	38.65	60.00	21.35	QP
12.365	10.10	22.19	50.00	27.81	Ave
29.020	10.20	29.38	60.00	30.62	QP
29.095	10.20	10.25	50.00	39.75	Ave

Test Mode: PC Charging & Transmitting

AC 120 V/60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
7.960	10.20	35.78	60.00	24.22	QP
0.5355	10.10	31.04	56.00	24.96	QP
0.535	10.10	20.98	46.00	25.02	Ave
18.420	10.30	33.24	60.00	26.76	QP
18.420	10.30	21.98	50.00	28.02	Ave
7.960	10.20	19.64	50.00	30.36	Ave
5.385	10.20	17.01	50.00	32.99	Ave
5.385	10.20	26.59	60.00	33.41	QP
1.475	10.10	11.78	46.00	34.22	Ave
3.575	10.10	11.28	46.00	34.72	Ave
1.475	10.10	20.95	56.00	35.05	QP
3.575	10.10	20.59	56.00	35.41	QP

AC 120 V / 60 Hz, Neutral:

Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
0.535	10.10	34.56	56.00	21.44	QP
0.538	10.10	22.34	46.00	23.66	Ave
18.150	10.30	24.78	50.00	25.22	Ave
18.150	10.30	33.56	60.00	26.44	QP
7.570	10.20	23.20	50.00	26.80	Ave
7.670	10.20	32.01	60.00	27.99	QP
5.475	10.20	29.05	60.00	30.95	QP
5.475	10.20	18.98	50.00	31.02	Ave
1.535	10.10	24.56	56.00	31.44	QP
1.535	10.10	14.02	46.00	31.98	Ave
2.320	10.10	23.78	56.00	32.22	QP
2.320	10.10	13.54	46.00	32.46	Ave

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

Applicable Standards

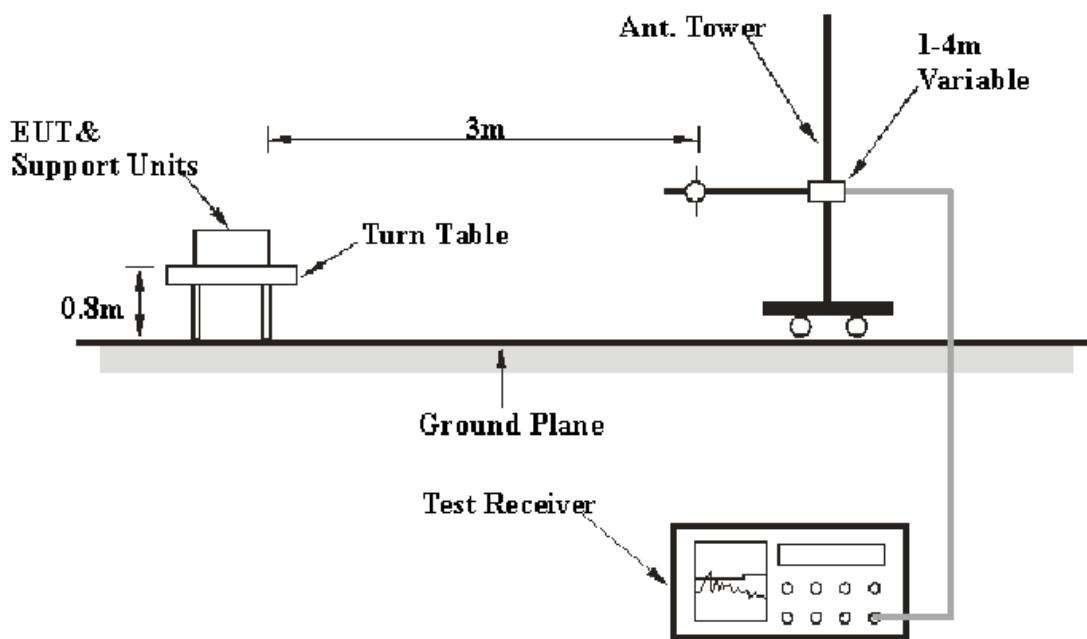
FCC §15.205; §15.209; §15.247(d)

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, 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.

The the adapter and test laptop were connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test 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	2009-11-24	2010-11-24
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-08
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
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04

* **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 and test laptop were 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 -1 GHz and peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

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

For Adapter Charging & Transmitting:

Below 1 GHz:

5.9 dB at 107.739000 MHz in the **Horizontal** polarization

For PC Charging & Transmitting:

Below 1 GHz:

2.5 dB at 720.375750 MHz in the **Vertical** polarization

For Transmitting:

Above 1 GHz:

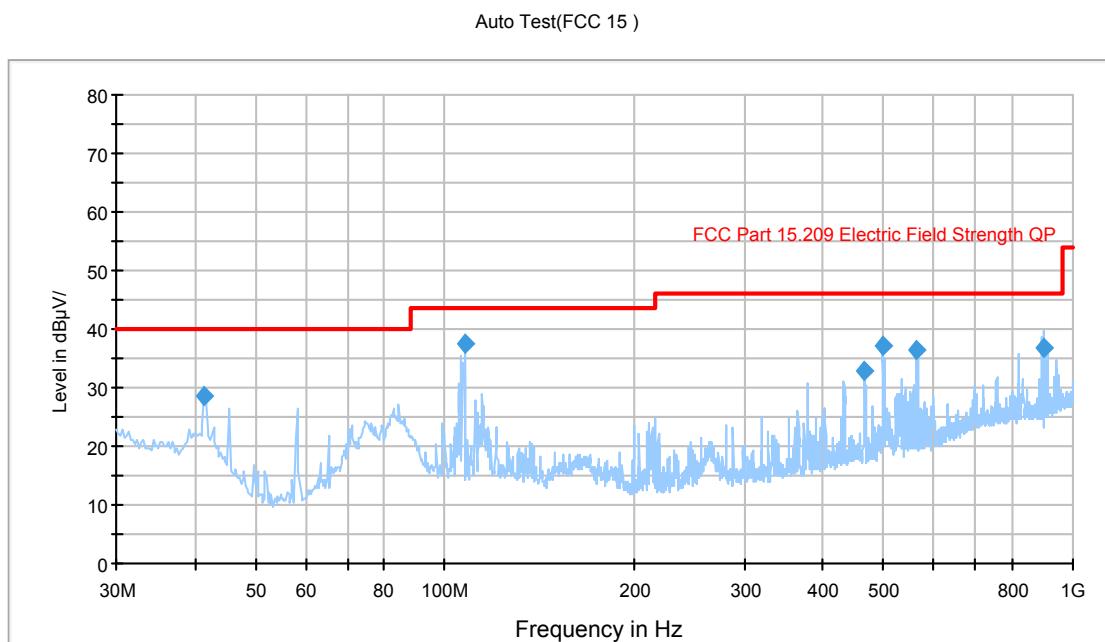
4.32 dB at 1131.24 MHz in the **Vertical** polarization (Low Channel)

Test Data

Environmental Conditions

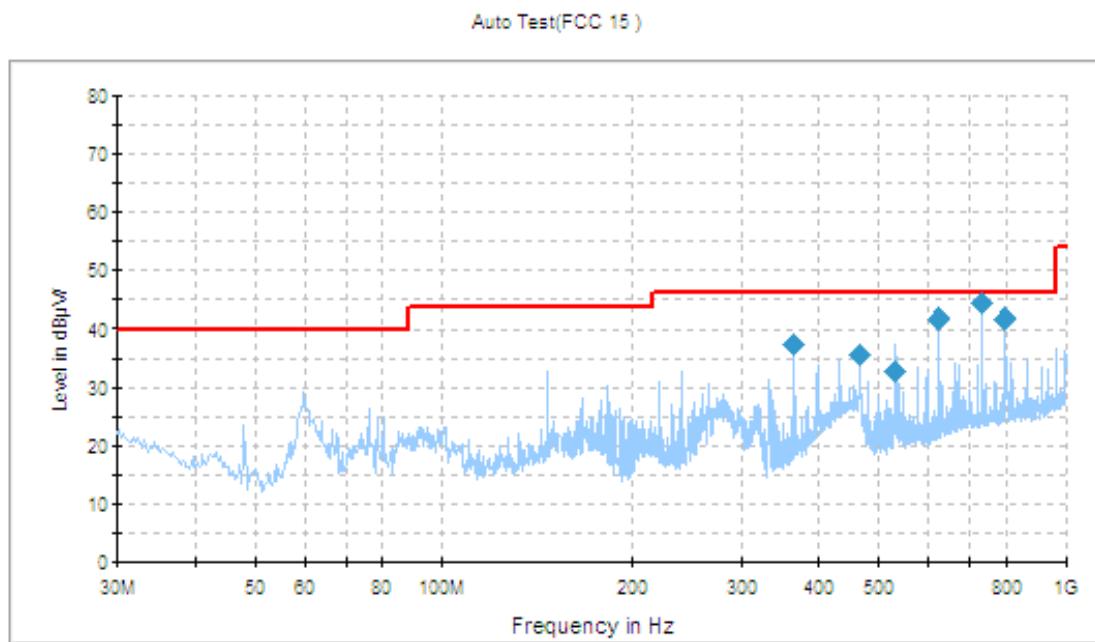
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

* The testing was performed by Kvass Yang on 2010-09-23.

Below 1 GHz*Test Mode: Adapter Charging & Transmitting*

Frequency (MHz)	Corrected Amplitude (dB μ V/m)	Test Antenna		Turntable Position (degree)	Correction Factor (dB)	Limit (dB μ V/m)	Margin (dB)
		Height (cm)	Polarity (H/V)				
107.739000	37.6	205.0	H	170.0	-3.7	43.5	5.9
497.297500	37.1	174.0	H	191.0	-0.8	46.0	8.9
565.197500	36.6	173.0	H	268.0	-0.7	46.0	9.4
897.588500	36.6	125.0	H	145.0	-0.9	46.0	9.4
41.397500	28.4	280.0	H	312.0	-1.5	40.0	11.6
465.530000	32.8	180.0	H	42.0	-0.6	46.0	13.2

Test Mode: PC Charging & Transmitting



Frequency (MHz)	Corrected Amplitude (dB μ V/m)	Test Antenna		Turntable Position (degree)	Correction Factor (dB)	Limit (dB μ V/m)	Margin (dB)
		Height (cm)	Polarity (H/V)				
720.375750	43.5	102.0	V	348.0	-4.0	46.0	2.5*
618.184250	41.5	174.0	V	0.0	-4.7	46.0	4.5
795.083500	40.7	203.0	H	318.0	-0.5	46.0	5.3
362.688250	36.5	124.0	V	135.0	-8.1	46.0	9.5
478.001000	34.2	124.0	H	45.0	-12.8	46.0	11.8
522.644250	33.2	123.0	V	43.0	-10.3	46.0	12.8

*With measurement uncertainty!

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 (dB μ V)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dB μ V/ m)	Limit (dB μ V/m)	Margin (dB)	Comment
Low Channel (2402 MHz)												
1131.24	54.06	Ave	35	1.2	V	24.8	5.62	34.8	49.68	54	4.32	spurious
1131.24	49.22	Ave	220	1.5	H	27.5	5.62	34.8	47.54	54	6.46	spurious
7206.00	31.15	Ave	80	1.6	H	39.2	9.12	33.6	45.87	54	8.13	harmonic
7206.00	32.01	Ave	70	1.2	V	38.00	9.12	33.6	45.53	54	8.47	harmonic
4804.00	35.30	Ave	150	1.2	V	35.00	7.90	33.7	44.5	54	9.5	harmonic
4804.00	32.21	Ave	183	1.5	H	36.3	7.90	33.7	42.71	54	11.29	harmonic
7206.00	45.12	PK	70	1.6	H	39.2	9.12	33.6	59.84	74	14.16	harmonic
7206.00	46.32	PK	60	1.2	V	38.00	9.12	33.6	59.84	74	14.16	harmonic
4804.00	50.15	PK	180	1.2	V	35.00	7.90	33.7	59.35	74	14.65	harmonic
4804.00	47.20	PK	183	1.5	H	36.3	7.90	33.7	57.7	74	16.3	harmonic
1131.24	54.50	PK	220	1.5	H	27.5	5.62	34.4	53.22	74	20.78	spurious
1131.24	57.50	PK	20	1.2	V	24.8	5.62	34.8	53.12	74	20.88	spurious
Middle Channel (2441 MHz)												
1131.24	50.57	Ave	45	1.0	V	27.8	5.62	34.6	49.39	54	4.61	spurious
1131.24	47.76	Ave	30	1.0	H	27.5	5.62	34.4	46.48	54	7.52	spurious
4882.00	33.19	Ave	175	1.0	H	36.3	8.86	33.7	44.65	54	9.35	harmonic
4882.00	33.19	Ave	185	1.1	V	35.00	8.86	33.7	43.35	54	10.65	harmonic
4882.00	49.71	PK	180	1.2	H	36.3	8.86	33.7	61.17	74	12.83	harmonic
4882.00	47.74	PK	180	1.2	V	35.00	8.86	33.7	57.9	74	16.1	harmonic
1131.24	54.38	PK	30	1.0	V	27.8	5.62	34.6	53.2	74	20.8	spurious
1131.24	53.15	PK	45	1.2	H	27.5	5.62	34.4	51.87	74	22.13	spurious
High Channel (2480 MHz)												
1131.24	49.78	Ave	30	1.0	H	27.5	5.37	34.6	48.05	54	5.95	spurious
1131.24	49.16	Ave	0	1.0	V	27.8	5.37	34.6	47.73	54	6.27	spurious
4960.00	32.10	Ave	0	1.0	H	36.3	8.86	33.7	43.56	54	10.44	harmonic
4960.00	32.10	Ave	20	1.0	V	35	8.86	33.7	42.26	54	11.74	harmonic
4960.00	47.66	PK	20	1.2	H	36.3	8.86	33.7	59.12	74	14.88	harmonic
4960.00	47.66	PK	0	1.2	V	35	8.86	33.7	57.82	74	16.18	harmonic
1131.24	53.78	PK	30	1	V	27.8	5.37	34.6	52.35	74	21.65	spurious
1131.24	53.58	PK	0	1.2	H	27.5	5.37	34.6	51.85	74	22.15	spurious

Restrict band spurious emission

Indicated		Detector (PK/Ave)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209/15.205		
Frequency (MHz)	S.A. Reading (dB μ V)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2387.45	33.47	Ave	0	1.0	V	33.9	7.9	30.3	44.97	54	9.03
2484.89	33.53	Ave	0	1.1	H	33.9	7.9	30.9	44.43	54	9.57
2484.89	32.35	Ave	0	1.0	V	33.9	7.9	30.3	43.85	54	10.15
2387.45	31.93	Ave	0	1.1	H	33.9	7.9	30.9	42.83	54	11.17
2387.45	47.35	PK	30	1.2	V	33.9	7.9	30.3	58.85	74	15.15
2484.89	47.20	PK	10	1.1	H	33.9	7.9	30.9	58.1	74	15.9
2484.89	45.91	PK	0	1.2	V	33.9	7.9	30.3	57.41	74	16.59
2387.45	45.26	PK	20	1.2	H	33.9	7.9	30.9	56.16	74	17.84

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

Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB 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 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	2009-11-24	2010-11-24

* **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 trace
3. Measure the channel separation.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

* The testing was performed by Kvass Yang on 2010-09-20.

Test Result: Compliance.

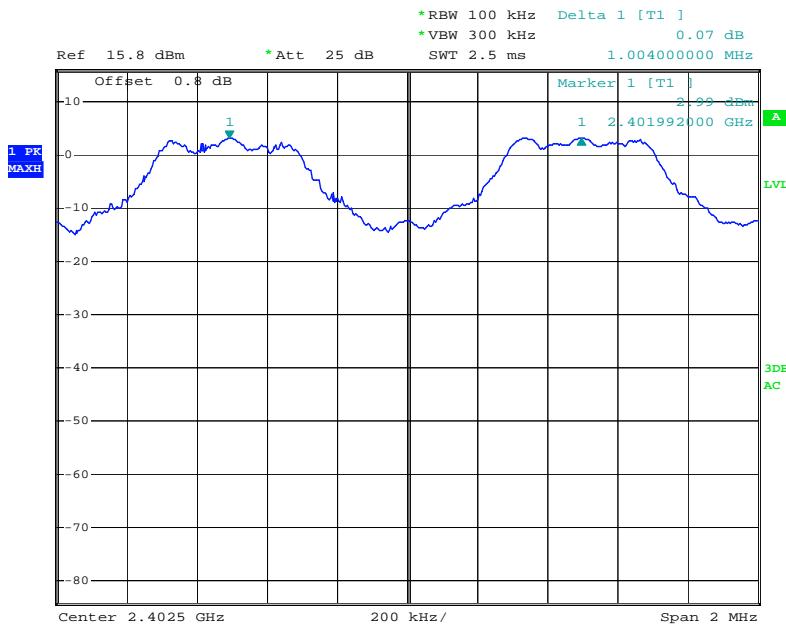
Please refer to following tables and plots

Test Mode: Transmitting

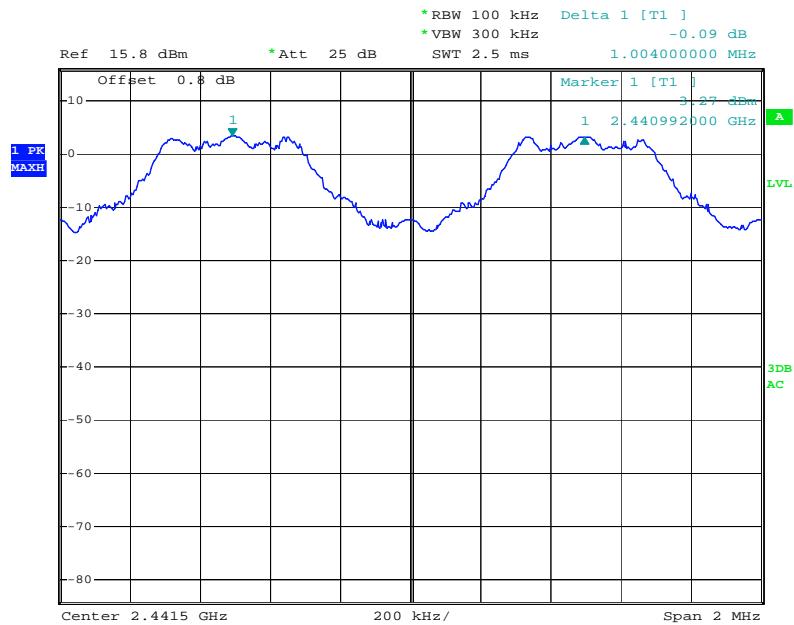
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.004	0.701	Pass
Adjacent	2403			
Middle	2441	1.004	0.699	Pass
Adjacent	2442			
High	2480	1.004	0.699	Pass
Adjacent	2479			

Please refer to the following plots.

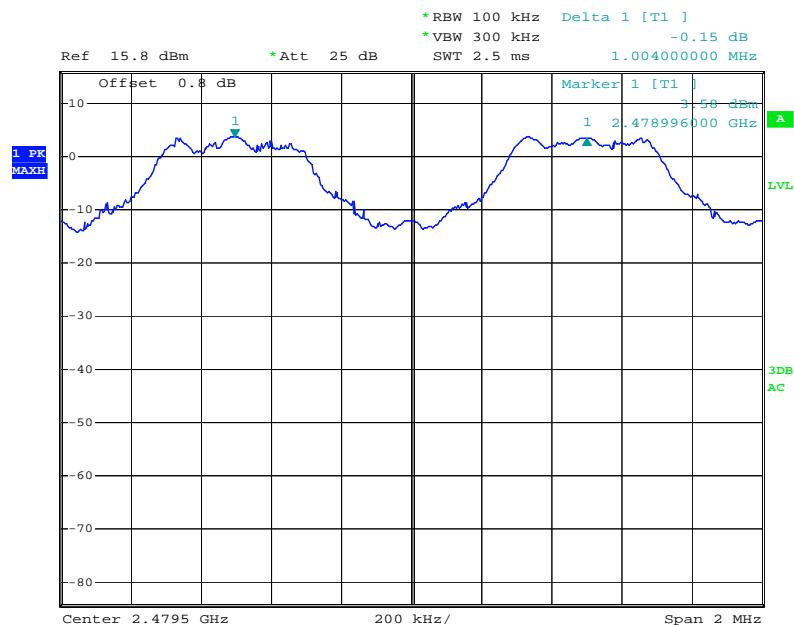
Low Channel



Date: 20.SEP.2010 05:29:08

Middle Channel

Date: 20.SEP.2010 05:30:15

High Channel

Date: 20.SEP.2010 05:31:23

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	2009-11-24	2010-11-24

* **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:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

* The testing was performed by Kvass Yang on 2010-09-20.

Test Result: Compliance.

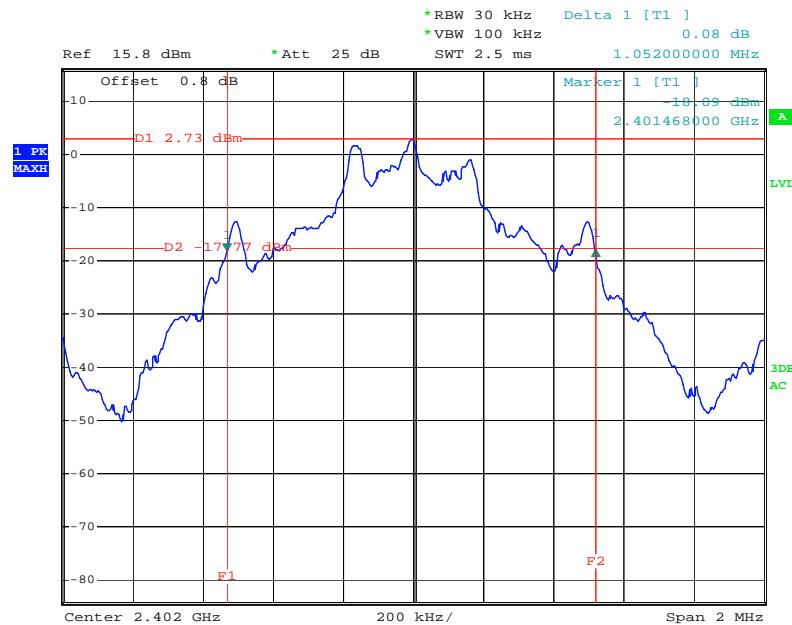
Please refer to following tables and plots

Test Mode: Transmitting

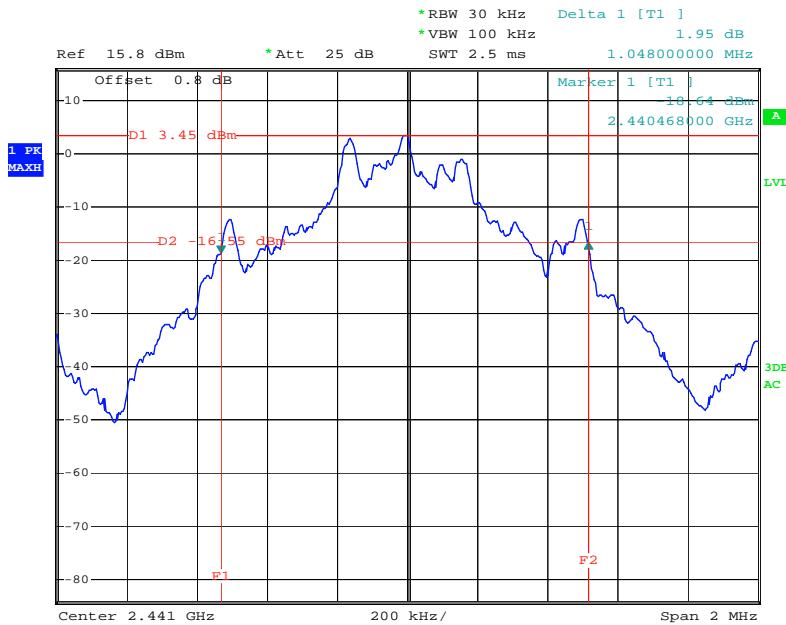
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.052
Middle	2441	1.048
High	2480	1.048

Please refer to the following plots.

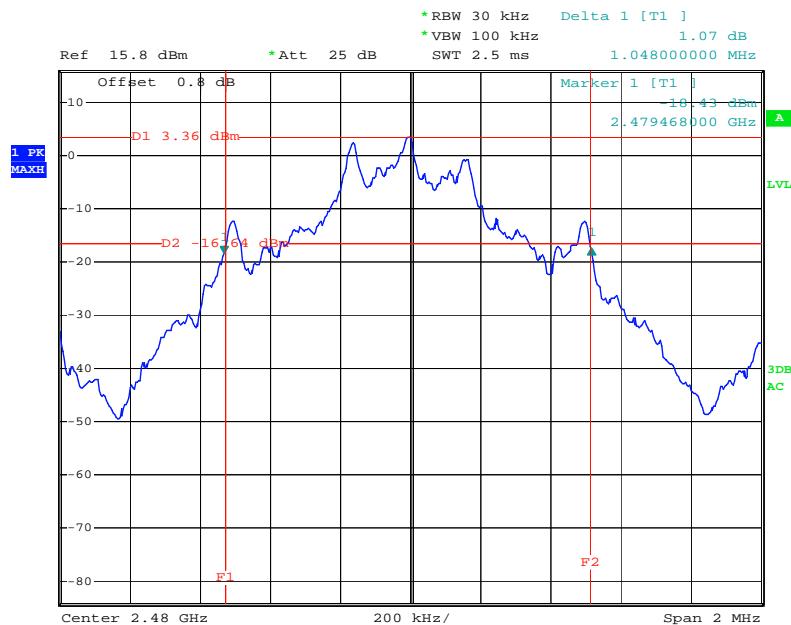
Low Channel



Date: 20.SEP.2010 05:17:41

Middle Channel

Date: 20.SEP.2010 05:19:28

High Channel

Date: 20.SEP.2010 05:20:54

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	2009-11-24	2010-11-24

* **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:	101 kPa

The testing was performed by Kvass Yang on 2010-09-20.

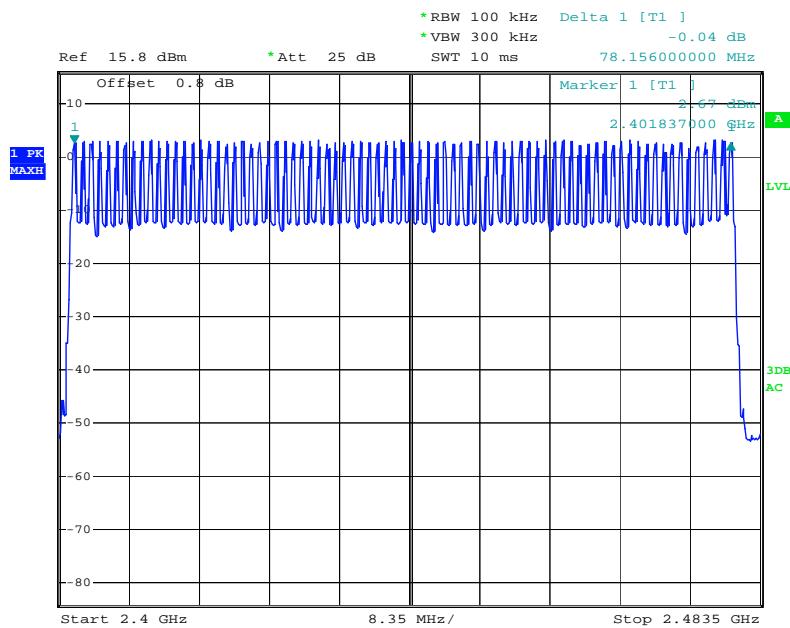
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

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

Number of Hopping Channels



Date: 20.SEP.2010 05:15:34

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	2009-11-24	2010-11-24

* **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

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

* The testing was performed by Kvass Yang on 2010-09-20.

Test Result: Compliance.

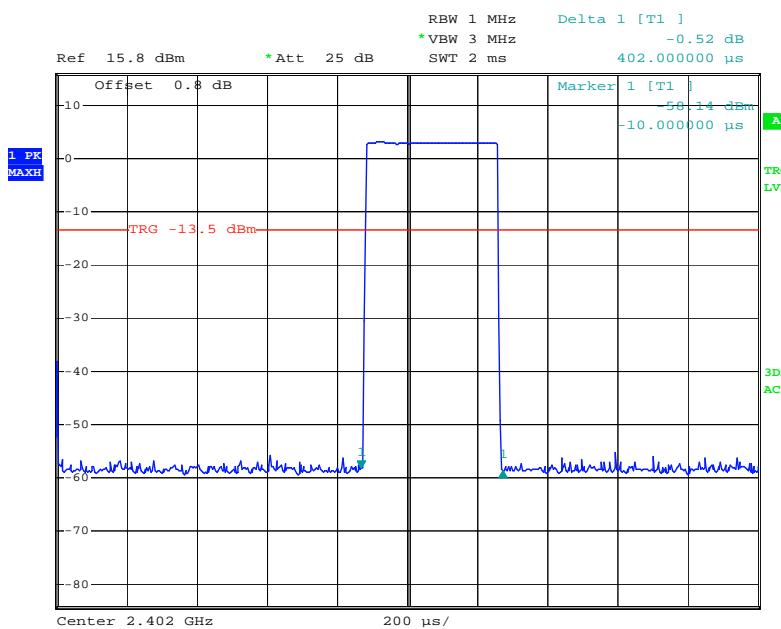
Please refer to following tables and plots

Test Mode: Transmitting

Mode	Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
DH 1	Low	0.402	0.12864	0.4	Pass
	Middle	0.402	0.12864	0.4	Pass
	High	0.402	0.12864	0.4	Pass
Note: Dwell time=Pulse time (ms) \times (1600 \div 2 \div 79) \times 31.6 Second					
DH 3	Low	1.672	0.26752	0.4	Pass
	Middle	1.672	0.26752	0.4	Pass
	High	1.672	0.26752	0.4	Pass
Note: Dwell time=Pulse time (ms) \times (1600 \div 4 \div 79) \times 31.6 Second					
DH 5	Low	2.964	0.31616	0.4	Pass
	Middle	2.964	0.31616	0.4	Pass
	High	2.964	0.31616	0.4	Pass
Note: Dwell time=Pulse Time (ms) \times (1600 \div 6 \div 79) \times 31.6 Second					

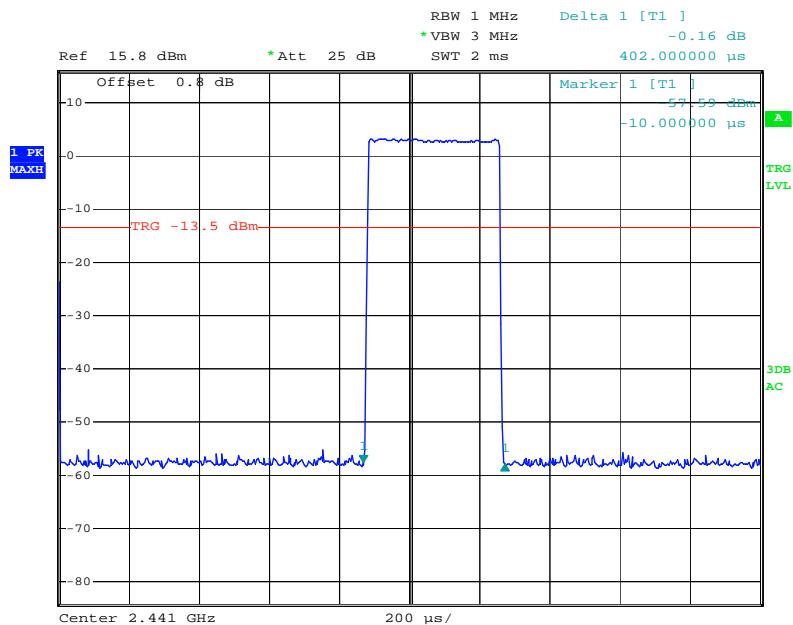
Please refer to the following plots.

Low Channel for DH1



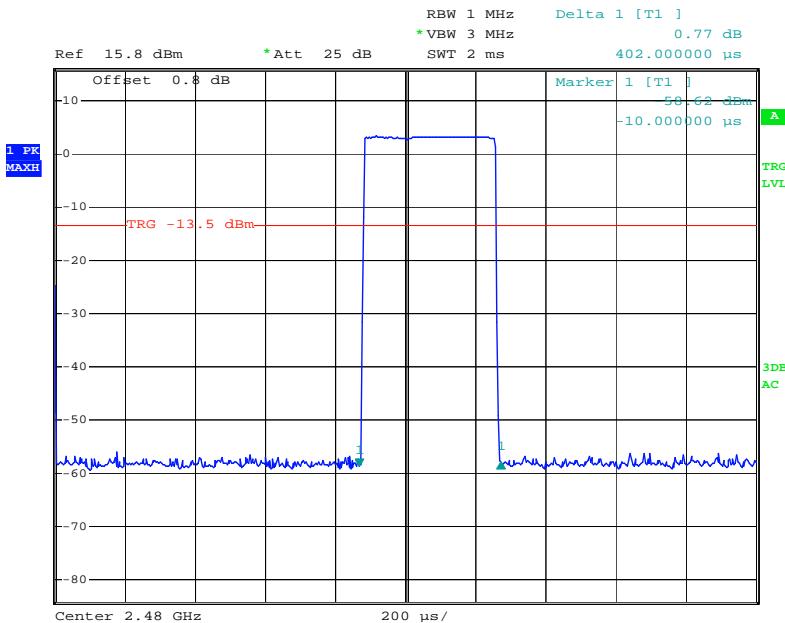
Date: 20.SEP.2010 05:39:01

Middle Channel for DH1



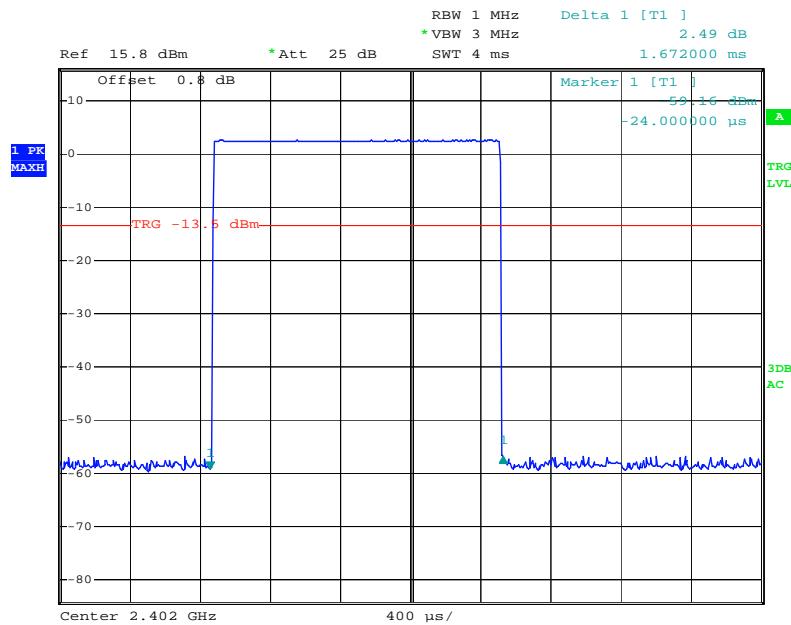
Date: 20.SEP.2010 05:40:02

High Channel for DH1



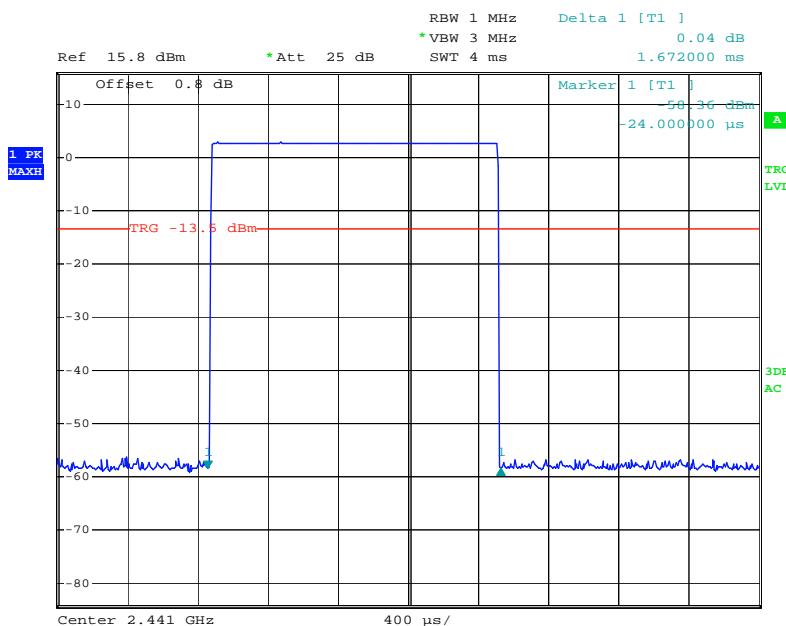
Date: 20.SEP.2010 05:38:42

Low Channel for DH3



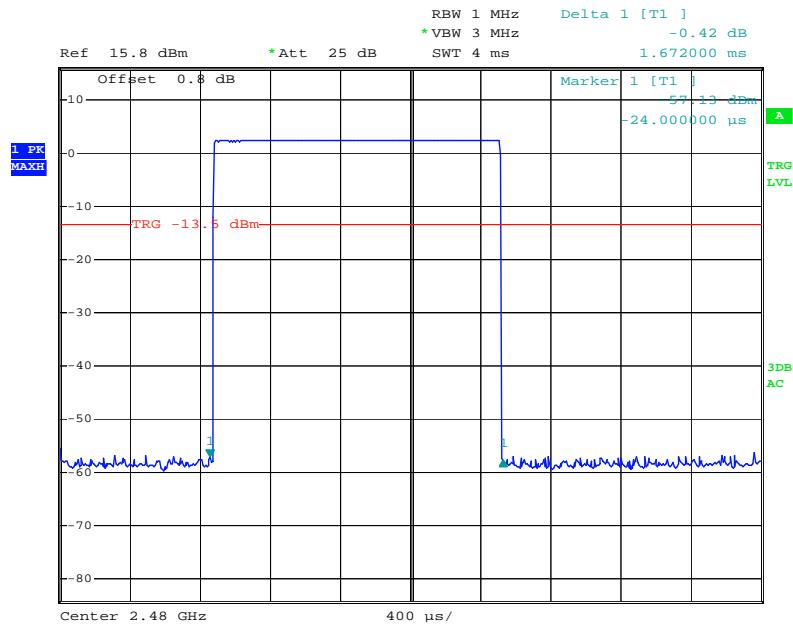
Date: 20.SEP.2010 05:41:52

Middle Channel for DH3



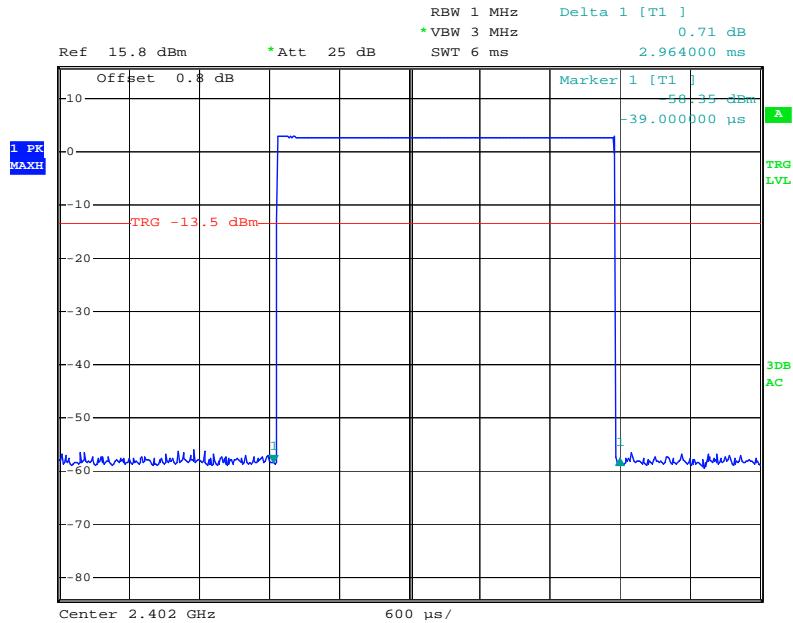
Date: 20.SEP.2010 05:41:28

High Channel for DH3



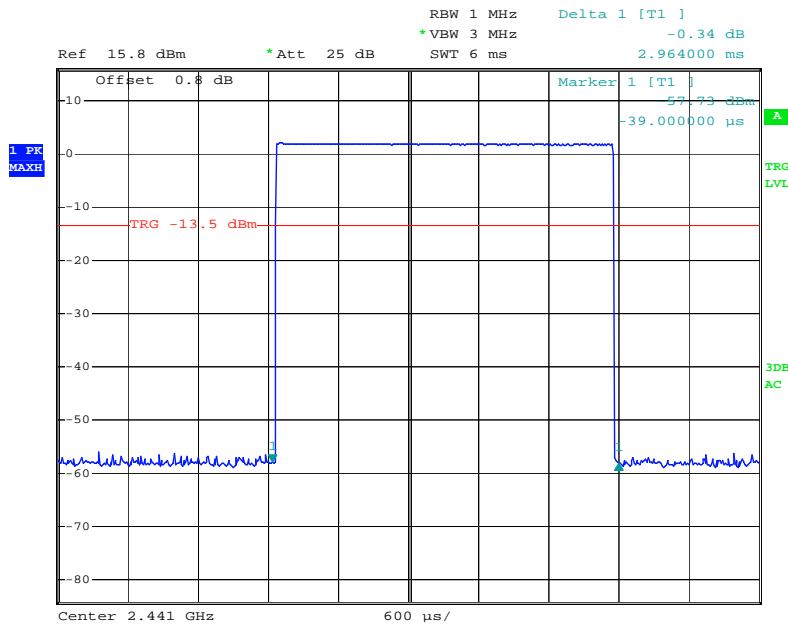
Date: 20.SEP.2010 05:42:17

Low Channel for DH5



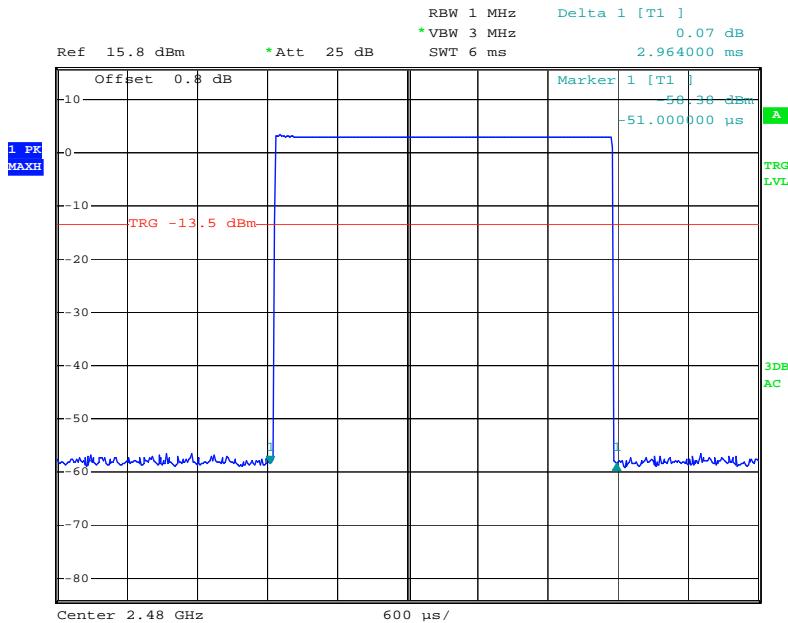
Date: 20.SEP.2010 05:45:44

Middle Channel for DH5



Date: 20.SEP.2010 05:45:03

High Channel for DH5



Date: 20.SEP.2010 05:43:18

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. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

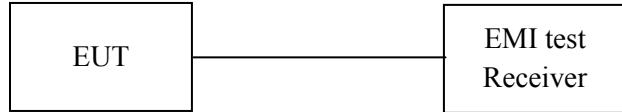
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2009-11-24	2010-11-24

* **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:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

* The testing was performed by Kvass Yang on 2010-09-20.

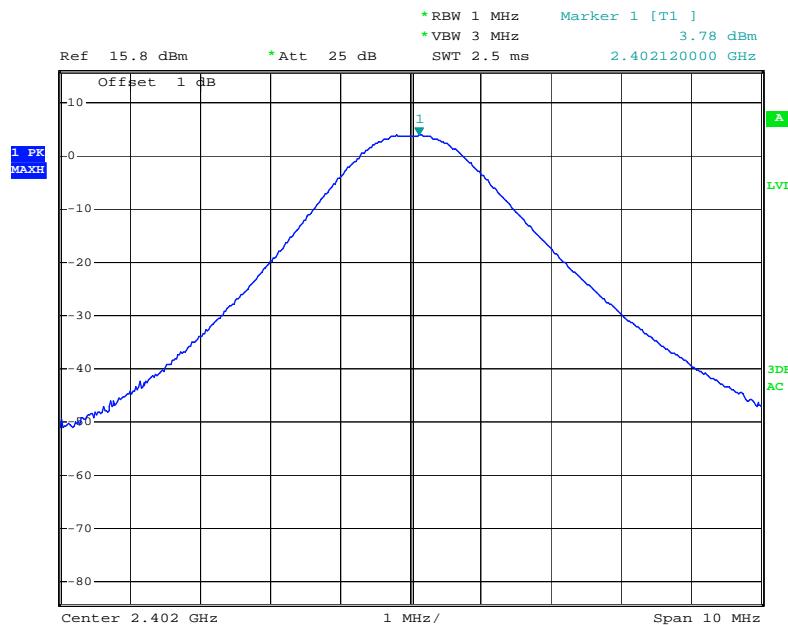
Test Result: Compliance.

Test Mode: Transmitting

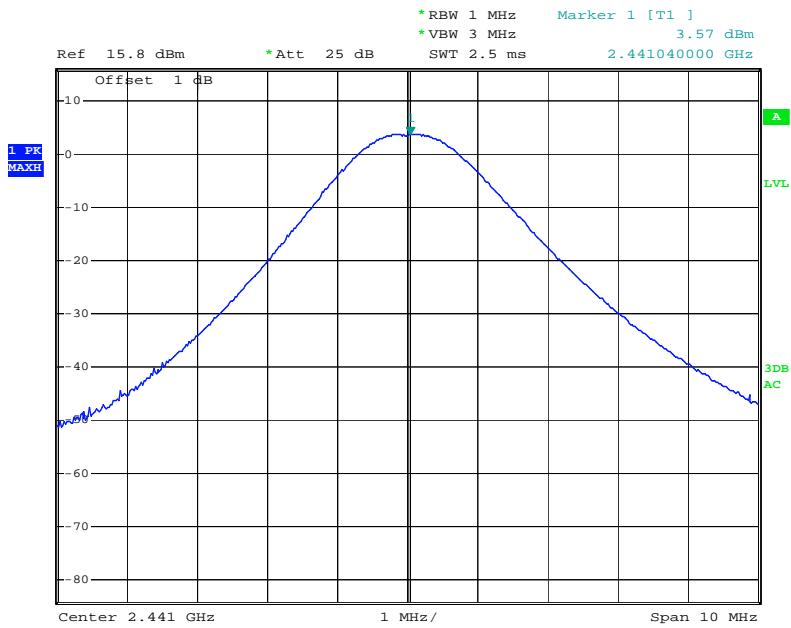
Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	3.78	2.388	1000
Middle	2441	3.57	2.275	1000
High	2480	3.65	2.317	1000

Note: The offset=Cable Loss+ 10log (20dB Bandwidth/RBW)=1 dB

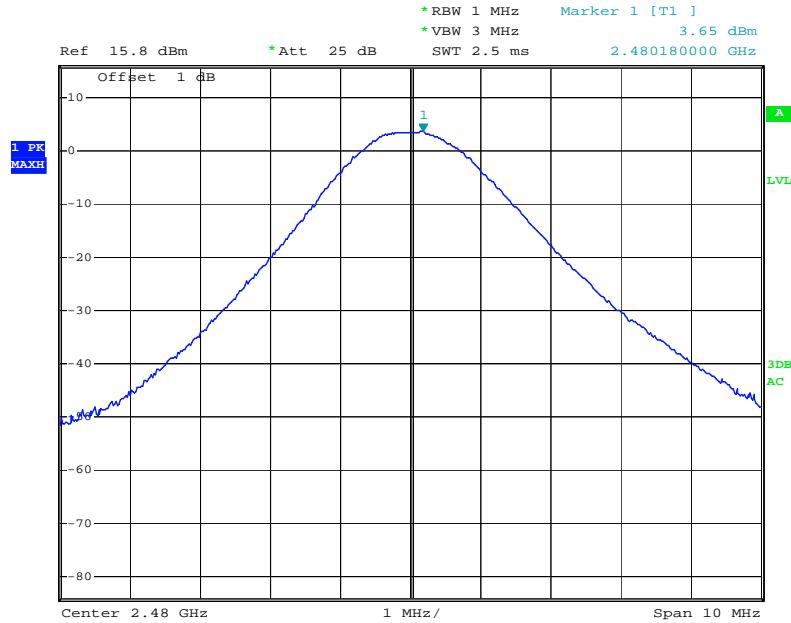
Low Channel



Date: 20.SEP.2010 05:26:11

Middle Channel

Date: 20.SEP.2010 05:25:47

High Chanel

Date: 20.SEP.2010 05:24:32

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	2009-11-24	2010-11-24

* **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 100 kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1 MHz, 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:	101 kPa

*The testing was performed by Kvass Yang on 2010-09-20.

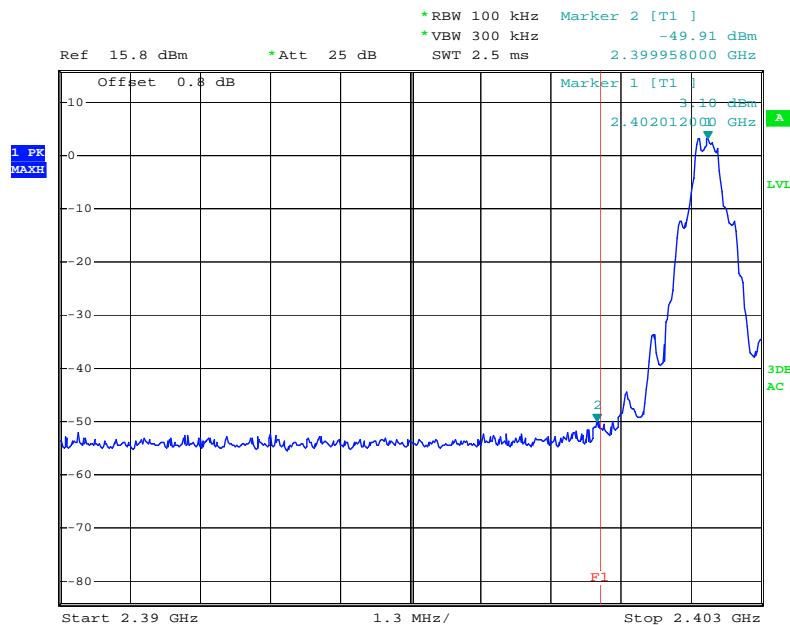
Test Result: Compliance

Please refer to the following table and plots.

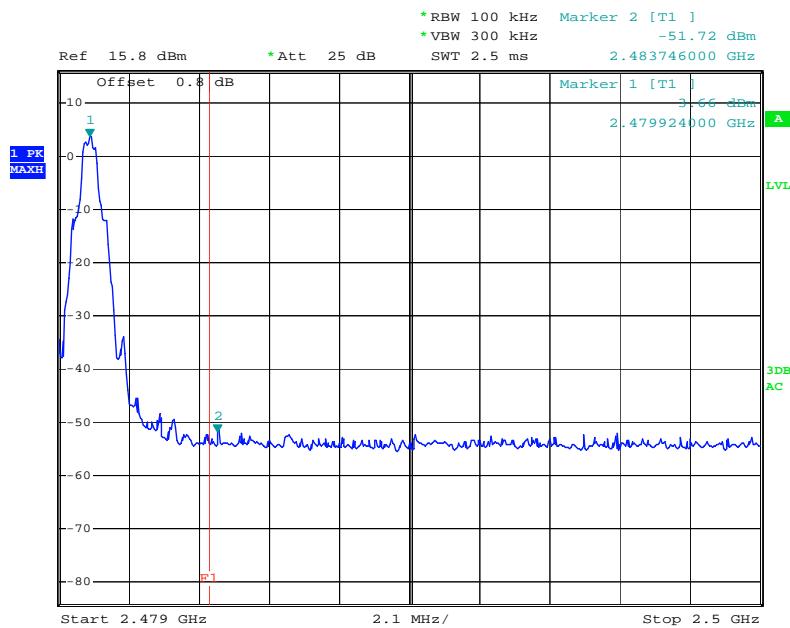
Test Mode: Transmitting

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.958	53.01	20
2483.746	55.38	20

Band Edge: Left Side



Date: 20.SEP.2010 05:27:52

Band Edge: Right Side

Date: 20.SEP.2010 05:33:31

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