

FCC PART 15.247
TEST REPORT

For

Eastman Kodak Company

343 State St. Rochester, NY 14650-0124, USA

FCC ID: PA4-M240

Report Type: Original Report	Product Type: Kodak Baby Video Monitor/M240
Test Engineer: Leon Chen	<i>leon chen</i>
Report Number: RSZ111111001-00	
Report Date: 2011-12-06	
Reviewed By: Merry Zhao EMC Engineer	<i>merry.zhao</i>
Test Laboratory:	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 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the equipment 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*, or any agency of the Federal Government.

* This report contains 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

 OBJECTIVE4

 RELATED SUBMITTAL(S)/GRANT(S).....4

 TEST METHODOLOGY4

 TEST FACILITY4

SYSTEM TEST CONFIGURATION.....6

 DESCRIPTION OF TEST CONFIGURATION6

 EQUIPMENT MODIFICATIONS6

 EXTERNAL I/O CABLE.....6

 CONFIGURATION OF TEST SETUP6

 BLOCK DIAGRAM OF TEST SETUP6

SUMMARY OF TEST RESULTS7

FCC §15.247 (i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE).....8

 APPLICABLE STANDARD8

FCC §15.203 – ANTENNA REQUIREMENT9

 APPLICABLE STANDARD9

 ANTENNA CONNECTOR CONSTRUCTION9

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS10

 APPLICABLE STANDARD10

 MEASUREMENT UNCERTAINTY10

 EUT SETUP10

 EMI TEST RECEIVER SETUP.....11

 TEST PROCEDURE11

 TEST EQUIPMENT LIST AND DETAILS.....11

 TEST RESULTS SUMMARY11

 TEST DATA11

FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS.....14

 APPLICABLE STANDARD14

 MEASUREMENT UNCERTAINTY14

 EUT SETUP14

 EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP15

 TEST PROCEDURE15

 CORRECTED AMPLITUDE & MARGIN CALCULATION15

 TEST EQUIPMENT LIST AND DETAILS.....16

 TEST RESULTS SUMMARY16

 TEST DATA16

FCC §15.247(a) (1)-CHANNEL SEPARATION TEST19

 APPLICABLE STANDARD19

 TEST PROCEDURE19

 TEST EQUIPMENT LIST AND DETAILS.....19

 TEST DATA19

FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH TESTING22

 APPLICABLE STANDARD22

TEST PROCEDURE22
 TEST EQUIPMENT LIST AND DETAILS.....22
 TEST DATA22

FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST25
 APPLICABLE STANDARD25
 TEST PROCEDURE25
 TEST EQUIPMENT LIST AND DETAILS.....25
 TEST DATA25

FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME).....27
 APPLICABLE STANDARD27
 TEST PROCEDURE27
 TEST EQUIPMENT LIST AND DETAILS.....27
 TEST DATA27

FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT30
 APPLICABLE STANDARD30
 TEST PROCEDURE30
 TEST EQUIPMENT LIST AND DETAILS.....30
 TEST DATA30

FCC §15.247(d) - BAND EDGES TESTING33
 APPLICABLE STANDARD33
 TEST PROCEDURE33
 TEST EQUIPMENT LIST AND DETAILS.....33
 TEST DATA34

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Eastman Kodak Company*'s product, model number: *M240 (FCC ID: PA4-M240)* or the "EUT" in this report was a *Kodak Baby Video Monitor/M240*, which was measured approximately: 16 cm (L) x 6.5 cm (W) x 2.5 cm (H), rated input voltage: DC 3.7 V battery or DC 5.9V adapter.

Adapter information: Switching Power Supply
Model: EFS00500590550UL
Input: AC 100-240 V, 50/60Hz, 0.2A
Output: DC 5.9V, 0.55A

** All measurement and test data in this report was gathered from production sample serial number: 1111023 (Assigned by BACL, Shenzhen). The EUT was received on 2011-11-11.*

Objective

This report is prepared on behalf of *Eastman Kodak Company* 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 ID: PA4-C10T, FCC Part 15.247 submission of camera part portion.

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.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on 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 an ISO/IEC 17025 accredited laboratory, and is accredited by 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 typical fashion (as normally used by a typical user).

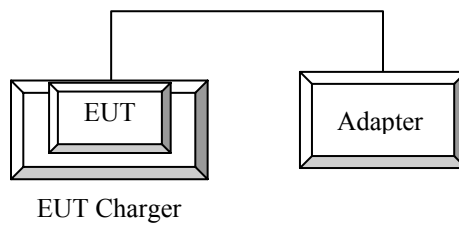
Equipment Modifications

No modification was made to the unit tested.

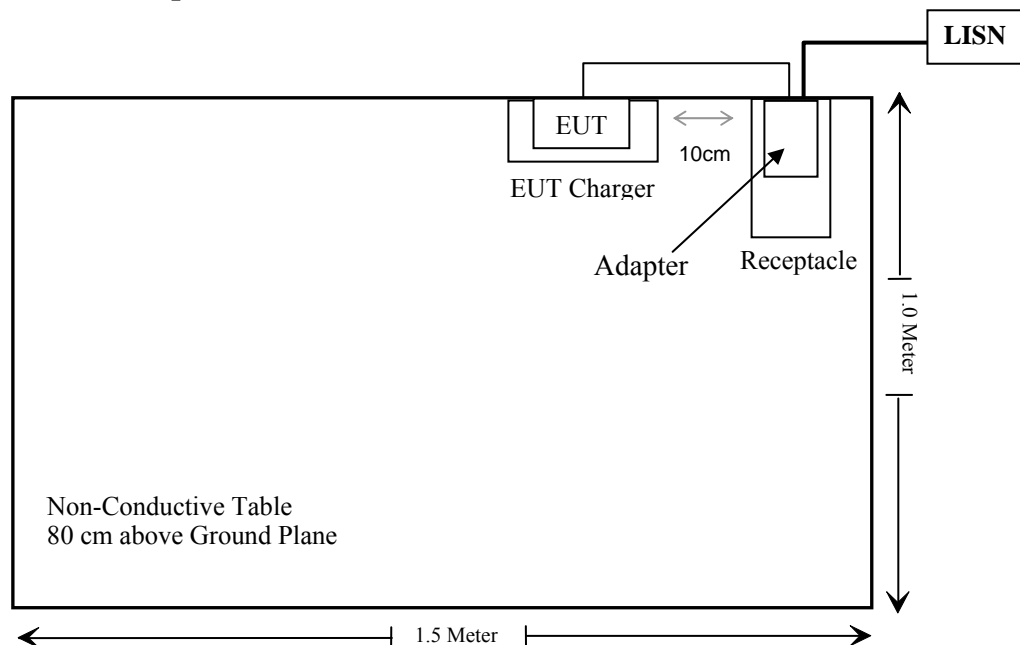
External I/O Cable

Cable Description	Length(m)	From/Port	To
Unshielded Detachable DC Power Cable	3.60	Adapter	EUT

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliance
§15.247(a)(1)	20 dB Emission 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) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

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

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

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz;

* = Plane-wave equivalent power density;

MPE Calculation

Predication of MPE limit at a given distance

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

Where: S = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm²)	MPE Limit (mW/cm²)
	(dBi)	(numeric)	(dBm)	(mW)			
2402	0	1.0	15.98	39.63	20	0.0079	1.0

Result: The device meets FCC MPE limit at 20 cm distance.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has an half wave antenna soldered on PCB, which in accordance to section 15.203, the antenna gain is 0 dBi, please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

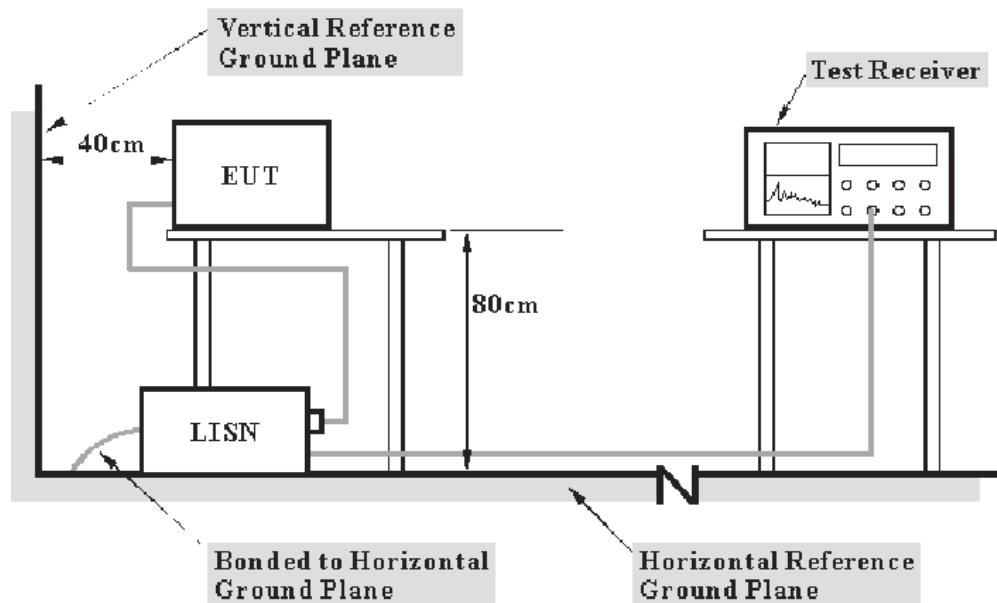
FCC §15.207

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

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 C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

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:

<i>Frequency Range</i>	<i>IF B/W</i>
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2011-03-03	2012-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-03-09	2012-03-08

* **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 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:

9.01 dB at 10.960 MHz in the **Neutral** conducted mode

Test Data

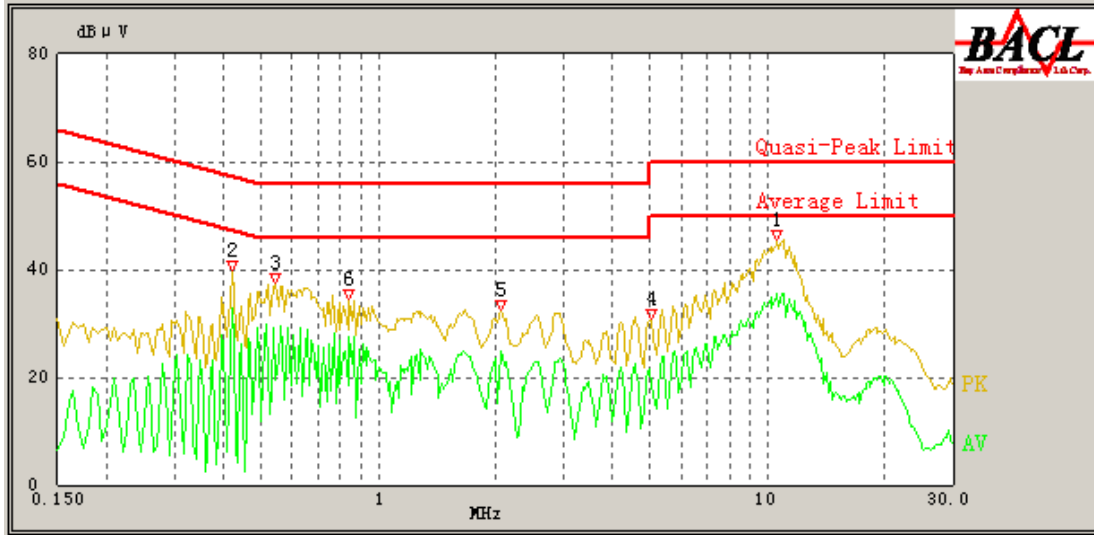
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Leon Chen on 2011-11-21.

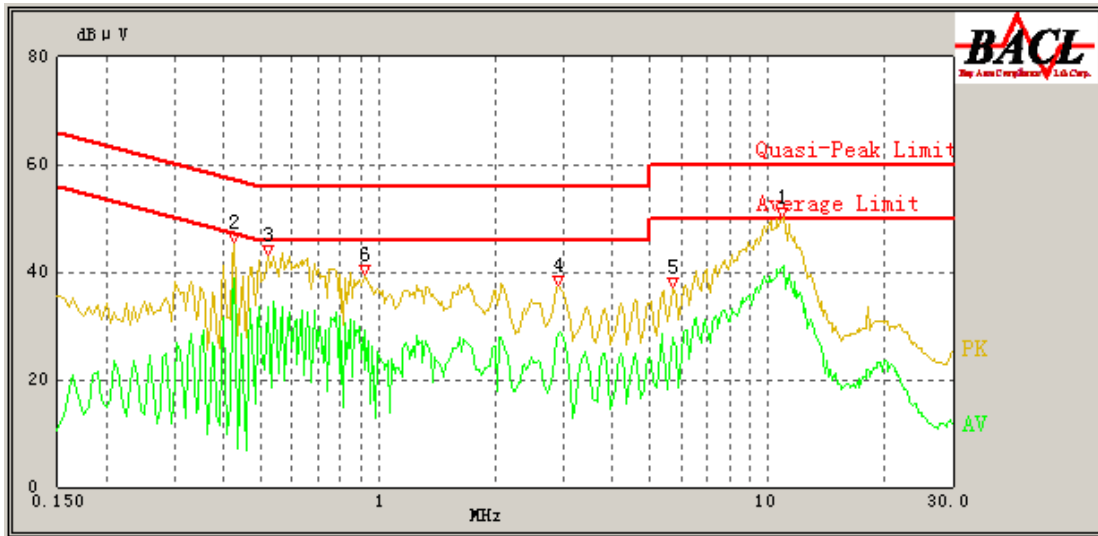
Test Mode: Charging & Transmitting

AC 120 V, 60 Hz, Line:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
10.615	45.64	1.10	60.00	14.36	QP
10.605	35.59	1.10	50.00	14.41	Ave.
0.420	32.98	1.10	48.29	15.31	Ave.
0.420	39.75	1.10	58.29	18.54	QP
0.840	27.44	1.10	46.00	18.56	Ave.
0.545	37.40	1.10	56.00	18.60	QP
2.055	24.68	1.10	46.00	21.32	Ave.
0.840	34.41	1.10	56.00	21.59	QP
2.055	32.34	1.10	56.00	23.66	QP
5.000	21.13	1.10	46.00	24.87	Ave.
0.545	19.37	1.10	46.00	26.63	Ave.
5.010	30.74	1.10	60.00	29.26	QP

AC 120V, 60 Hz, Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
10.960	40.99	1.10	50.00	9.01	Ave.
0.425	38.68	1.10	48.14	9.46	Ave.
10.960	50.29	1.10	60.00	9.71	QP
0.520	33.47	1.10	46.00	12.53	Ave.
0.425	45.55	1.10	58.14	12.59	QP
0.520	43.03	1.10	56.00	12.97	QP
0.925	39.49	1.10	56.00	16.51	QP
2.900	28.20	1.10	46.00	17.80	Ave.
2.900	37.35	1.10	56.00	18.65	QP
5.740	27.50	1.10	50.00	22.50	Ave.
5.730	37.16	1.10	60.00	22.84	QP
0.925	21.75	1.10	46.00	24.25	Ave.

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

Applicable Standard

FCC §15.205; §15.209; §15.247(d)

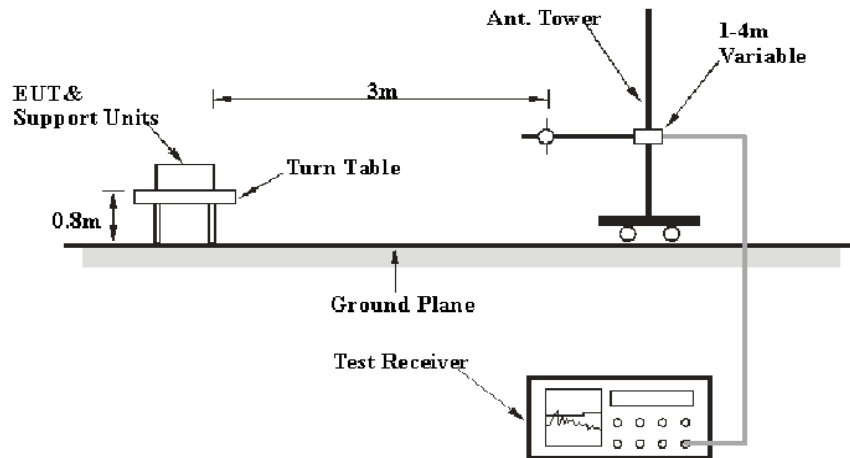
Measurement Uncertainty

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.

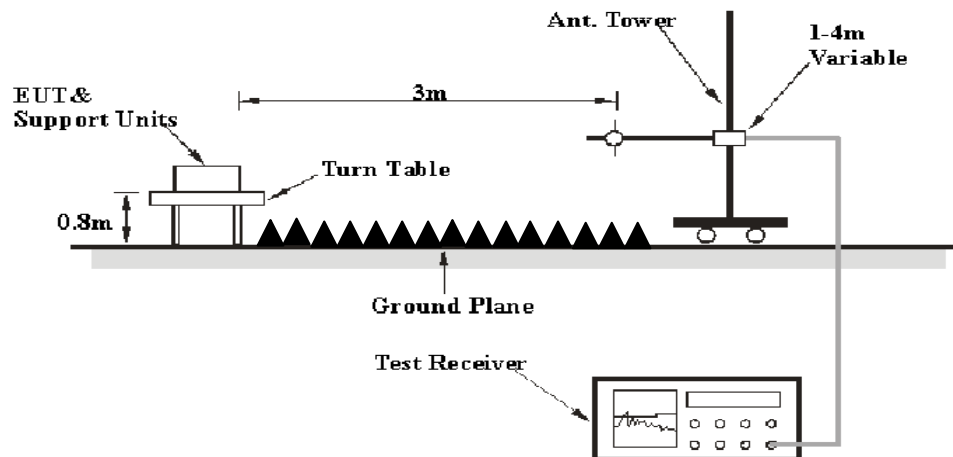
Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ± 4.0 dB. ($k=2$, 95% level of confidence).

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209 and FCC 15.247 limits.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Procedure

During the radiated emission test, the adapter was connected to the outlet of the floor.

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2011-08-02	2012-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2011-07-05	2012-07-04
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2011-03-08	2012-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052604	2011-05-05	2012-05-04
Rohde & Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07

* **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 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:

Worst case:

3.29 dB at 2388.58 MHz in the Vertical polarization above 1 GHz

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	100 kPa

* *The testing was performed by Leon Chen on 2011-11-21.*

1) Below 1 GHz:

Frequency (MHz)	Corrected Amplitude (dB μ V/m)	Detector (PK/QP/Ave)	Turntable Position (degree)	Antenna		Limit (dB μ V/m)	Margin (dB)
				Height (cm)	Polarity (H/V)		
Low Channel (2402 MHz)							
191.99	38.3	QP	172	101.1	V	43.5	5.2
132.57	35.6	QP	286	202.4	V	43.5	7.9
191.99	35.3	QP	168	101	H	43.5	8.2
114.14	35.0	QP	122	100.9	H	43.5	8.5
Middle Channel (2440 MHz)							
191.99	38.8	QP	172	101.1	V	43.5	4.7
132.57	35.1	QP	284	202.4	V	43.5	8.4
191.99	34.9	QP	163	101	H	43.5	8.6
114.14	35.2	QP	113	100.9	H	43.5	8.3
High Channel (2480 MHz)							
191.99	38.4	QP	164	101.1	V	43.5	5.1
132.57	35.4	QP	288	202.4	V	43.5	8.1
191.99	35.6	QP	165	101	H	43.5	7.9
114.14	34.8	QP	121	100.9	H	43.5	8.7

2) Above 1 GHz

Test mode: Transmitting

Frequency (MHz)	Receiver Reading (dBµV)	Detector (PK/QP/Ave)	Direction (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.247/205/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2402 MHz)												
2388.58	46.21	PK	247	1.5	V	29.7	3.3	8.5	70.71	74	3.29*	spurious
2389.65	45.47	PK	309	1.2	H	29.7	3.3	8.5	69.97	74	4.03	spurious
4804.00	38.26	PK	158	1	V	32	5.8	7.4	68.66	74	5.34	harmonic
4804.00	16.18	Ave.	158	1	V	32	5.8	7.4	46.58	54	7.42	harmonic
4804.00	15.36	Ave.	206	1.2	H	32	5.8	7.4	45.76	54	8.24	harmonic
4804.00	35.04	PK	206	1.2	H	32	5.8	7.4	65.44	74	8.56	harmonic
2388.58	19.79	Ave.	247	1.5	V	29.7	3.3	8.5	44.29	54	9.71	spurious
2389.65	18.44	Ave.	309	1.2	H	29.7	3.3	8.5	42.94	54	11.06	spurious
Middle Channel (2440 MHz)												
4880.00	37.71	PK	236	1.1	V	32	5.9	7.4	68.21	74	5.79	harmonic
4880.00	35.41	PK	128	1	H	32	5.9	7.4	65.91	74	8.09	harmonic
4880.00	14.72	Ave.	236	1.1	V	32	5.9	7.4	45.22	54	8.78	harmonic
4880.00	14.05	Ave.	128	1	H	32	5.9	7.4	44.55	54	9.45	harmonic
High Channel (2480 MHz)												
4960.00	37.82	PK	338	1	V	32	6.1	7.4	68.52	74	5.48	harmonic
4960.00	15.89	Ave.	338	1	V	32	6.1	7.4	46.59	54	7.41	harmonic
4960.00	35.73	PK	95	1.2	H	32	6.1	7.4	66.43	74	7.57	harmonic
2484.32	41.05	PK	158	1.2	H	29.7	3.3	8.5	65.55	74	8.45	spurious
2483.67	40.66	PK	316	1.5	V	29.7	3.3	8.5	65.16	74	8.84	spurious
4960.00	13.94	Ave.	95	1.2	H	32	6.1	7.4	44.64	54	9.36	harmonic
2484.32	16.57	Ave.	158	1.2	H	29.7	3.3	8.5	41.07	54	12.93	spurious
2483.67	15.08	Ave.	316	1.5	V	29.7	3.3	8.5	39.58	54	14.42	spurious

*Within measurement uncertainty!

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 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	100 kPa

* *The testing was performed by Leon Chen on 2011-11-21.*

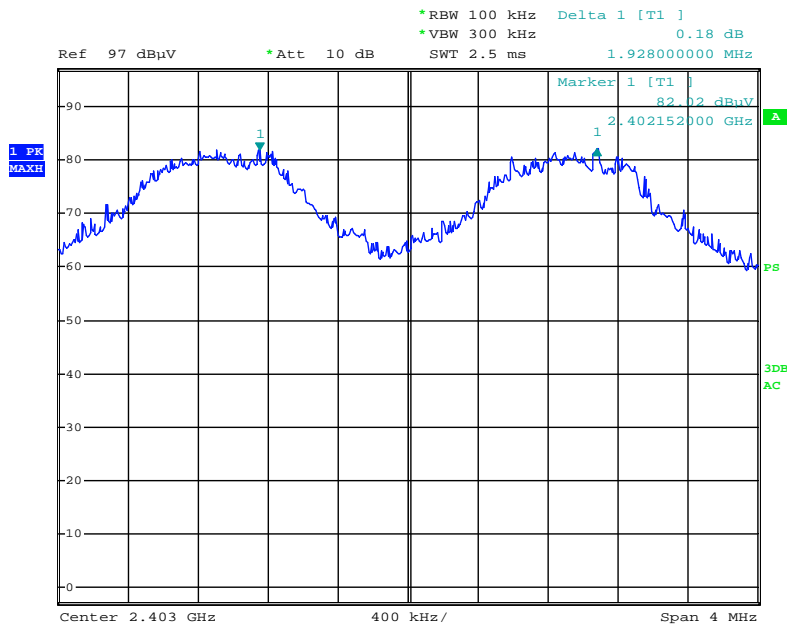
Test Result: Compliance.

Please refer to following tables and plots

Test Mode: Transmitting

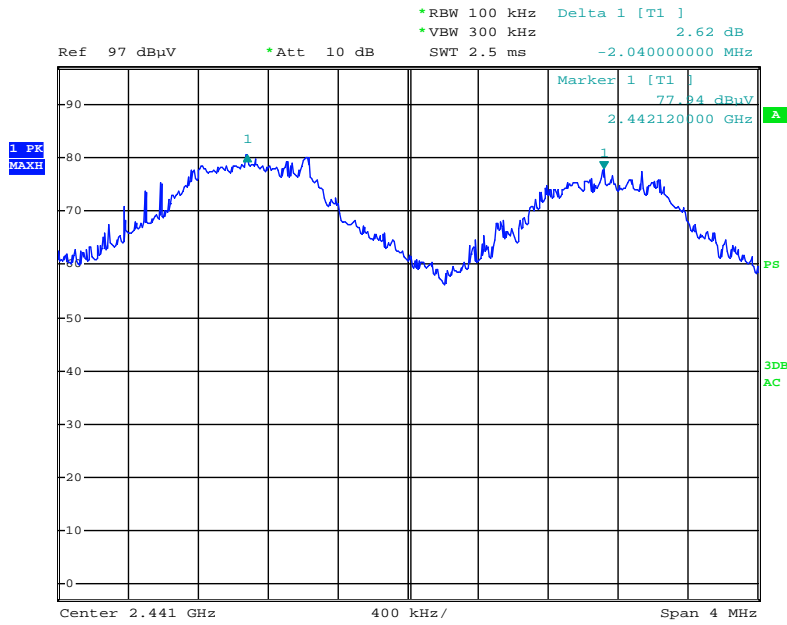
Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low	2402	1.928	1.082	Pass
Adjacent	2404			
Middle	2440	2.040	1.082	Pass
Adjacent	2442			
High	2480	1.960	1.082	Pass
Adjacent	2478			

Low Channel



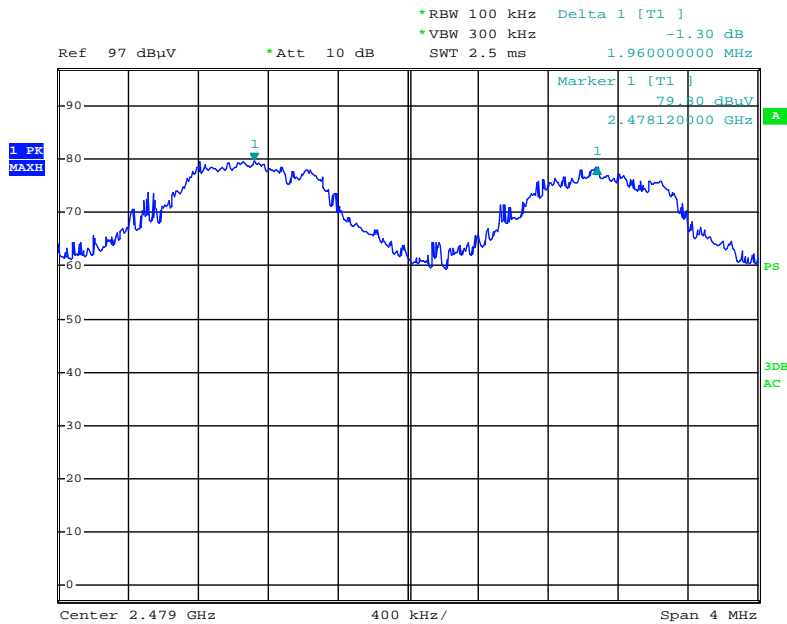
Date: 21.NOV.2011 04:17:10

Middle Channel



Date: 21.NOV.2011 04:24:38

High Channel



Date: 21.NOV.2011 04:26:16

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

Applicable Standard

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	100 kPa

* *The testing was performed by Leon Chen on 2011-11-27.*

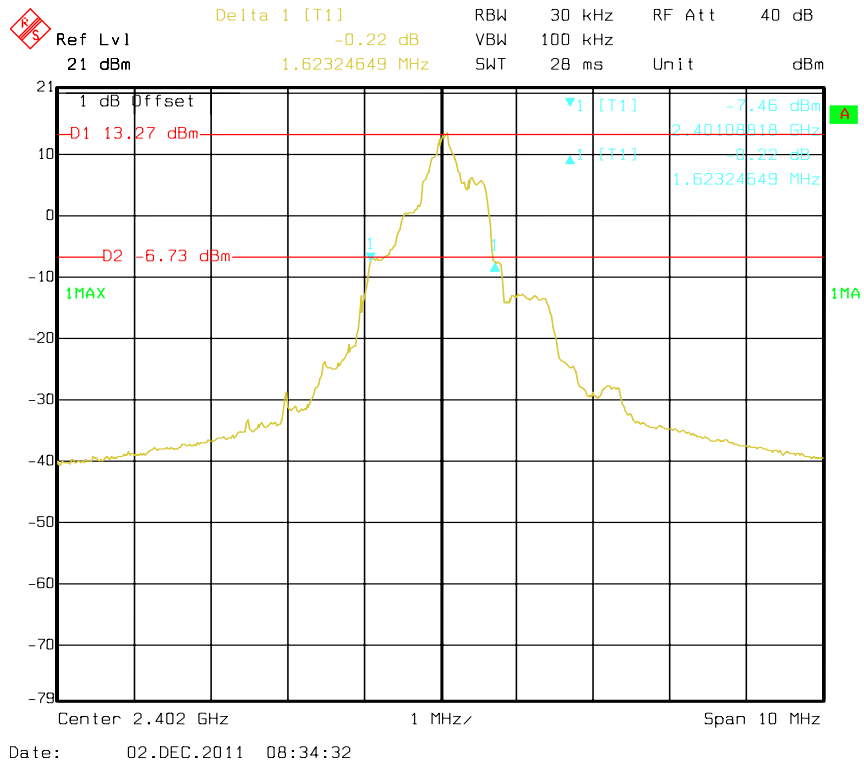
Test Result: Compliance.

Please refer to following tables and plots

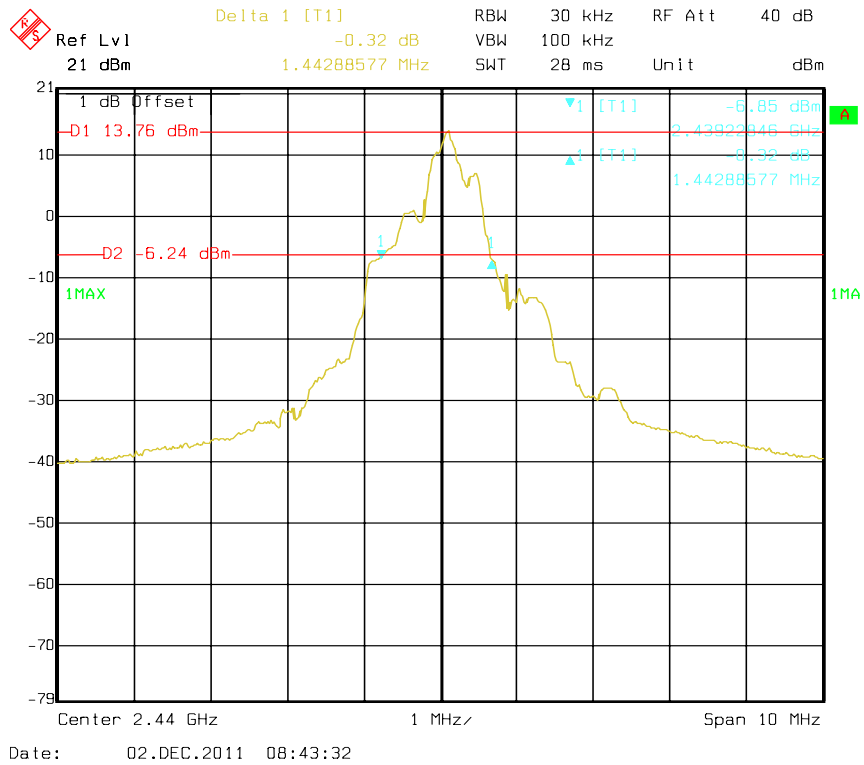
Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2402	1.623
Middle	2440	1.443
High	2480	1.583

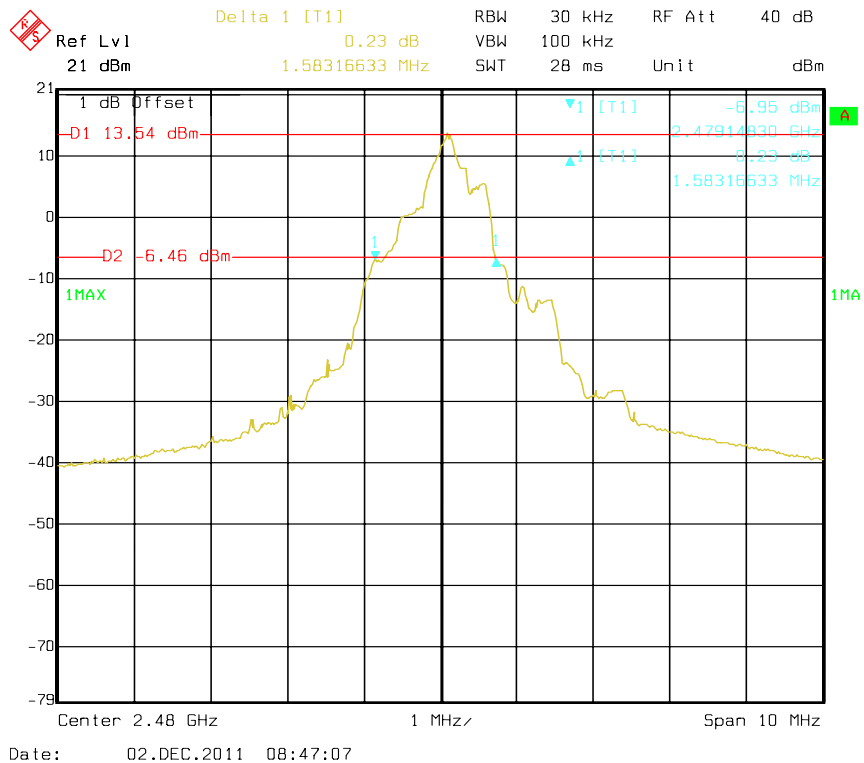
Low Channel



Middle Channel



High Channel



FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in hopping mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	100 kPa

The testing was performed by Leon Chen on 2011-11-21.

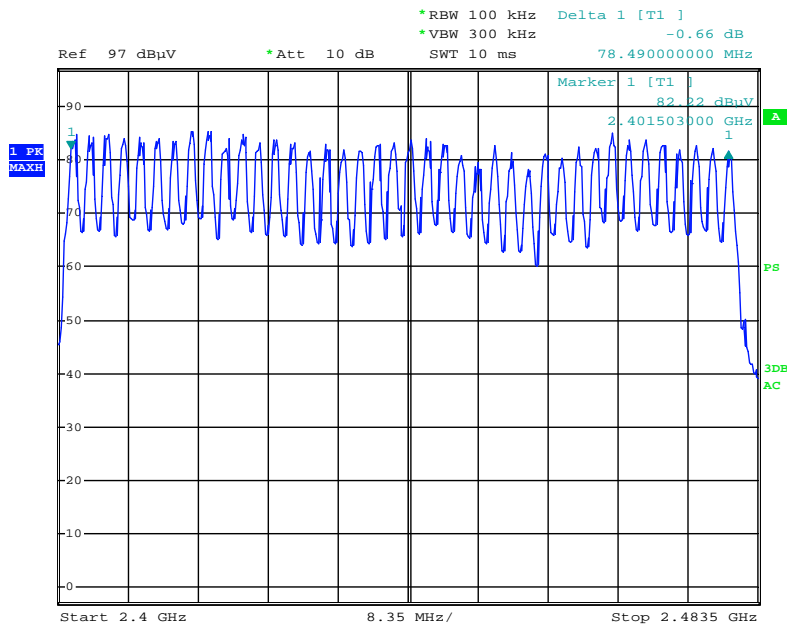
Test Result: Compliance.

Please refer to following table and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
2402-2480	40	≥15

Number of Hopping Channels



Date: 21.NOV.2011 03:49:09

FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

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

Dwell time = Pulse time*hop rate/number of hopping channels*16S
Hop rate=62/S

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	100 kPa

* The testing was performed by Leon Chen on 2011-11-27.

Test Result: Compliance.

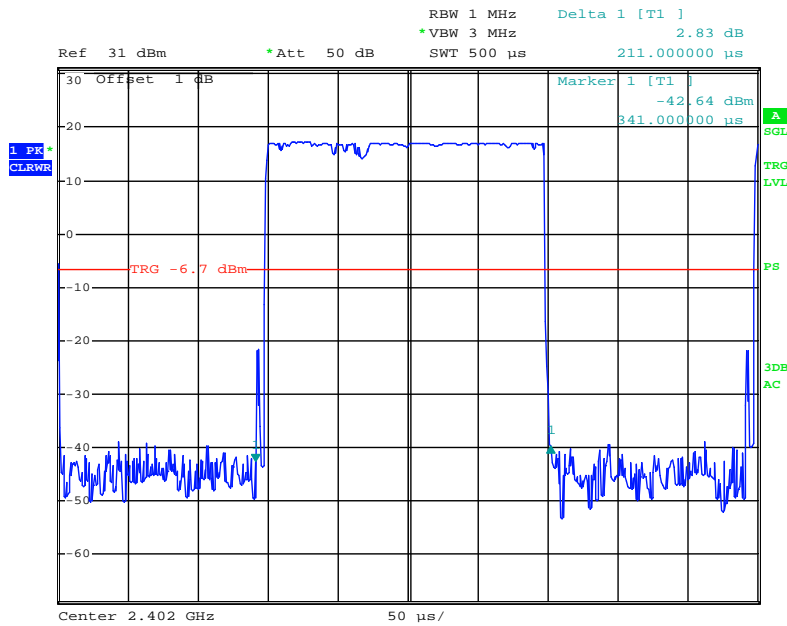
Please refer to following table and plots

Test Mode: Transmitting

Channel	Pulse Width (ms)	Dwell Time (S)	Limit (S)	Result
Low	0.211	0.0053	0.4	Pass
Middle	0.212	0.0053	0.4	Pass
High	0.212	0.0053	0.4	Pass

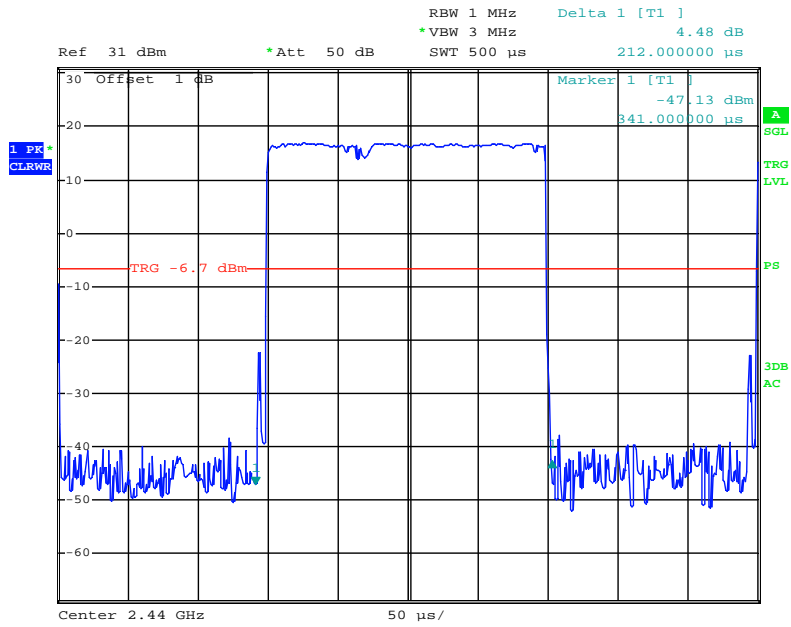
Note: refer to specification files, the fast hopping time is 16ms, So dwell time = (Pulse time/1000)*(1000/16/40)*40*0.4S

Low Channel



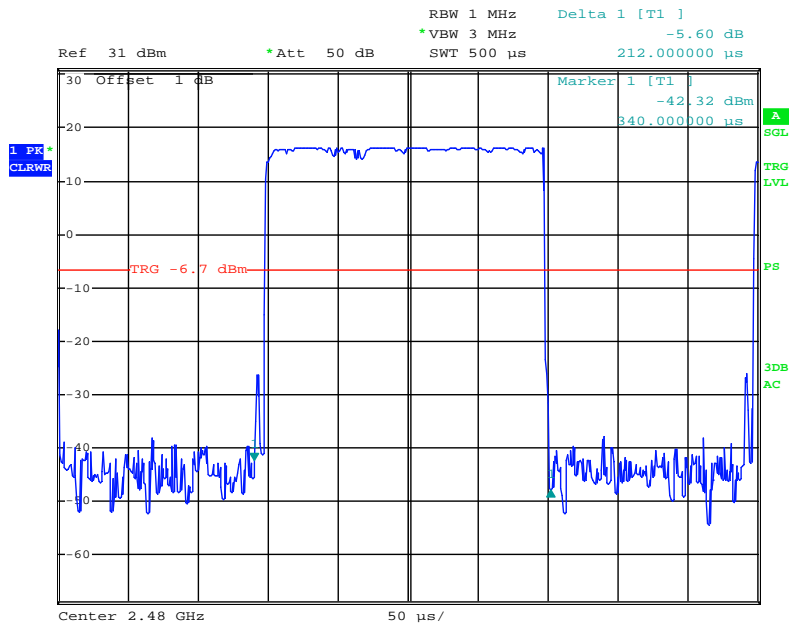
Date: 27.NOV.2011 08:49:07

Middle Channel



Date: 27.NOV.2011 08:48:17

High Channel



Date: 27.NOV.2011 08:48:41

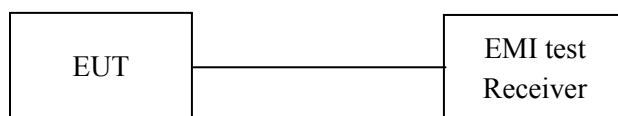
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

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 Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	100 kPa

* *The testing was performed by Leon Chen on 2011-12-04.*

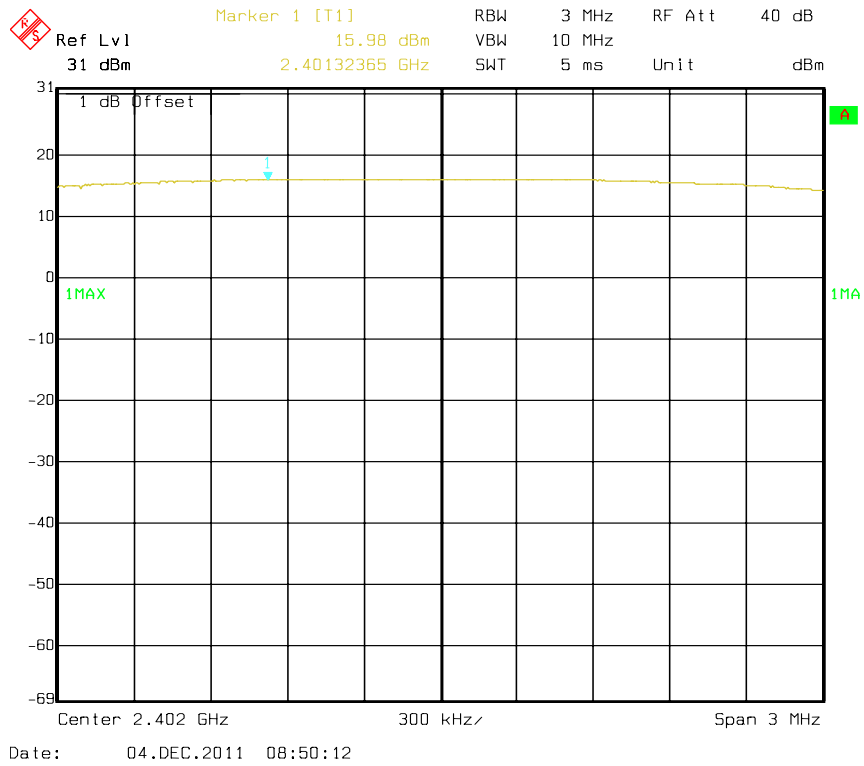
Test Result: Compliance.

Please refer to following table and plots

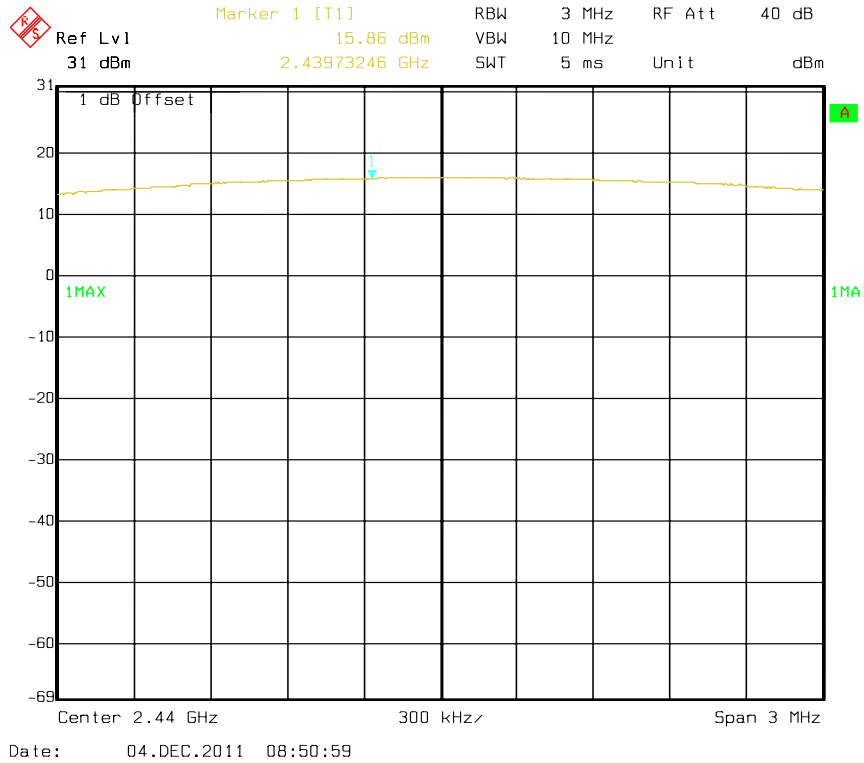
Test Mode: Transmitting

Channel	Frequency (MHz)	Conducted Output Power		Limit (mW)
		(dBm)	(mW)	
Low	2402	15.98	39.63	125
Middle	2440	15.86	38.55	125
High	2480	15.49	35.40	125

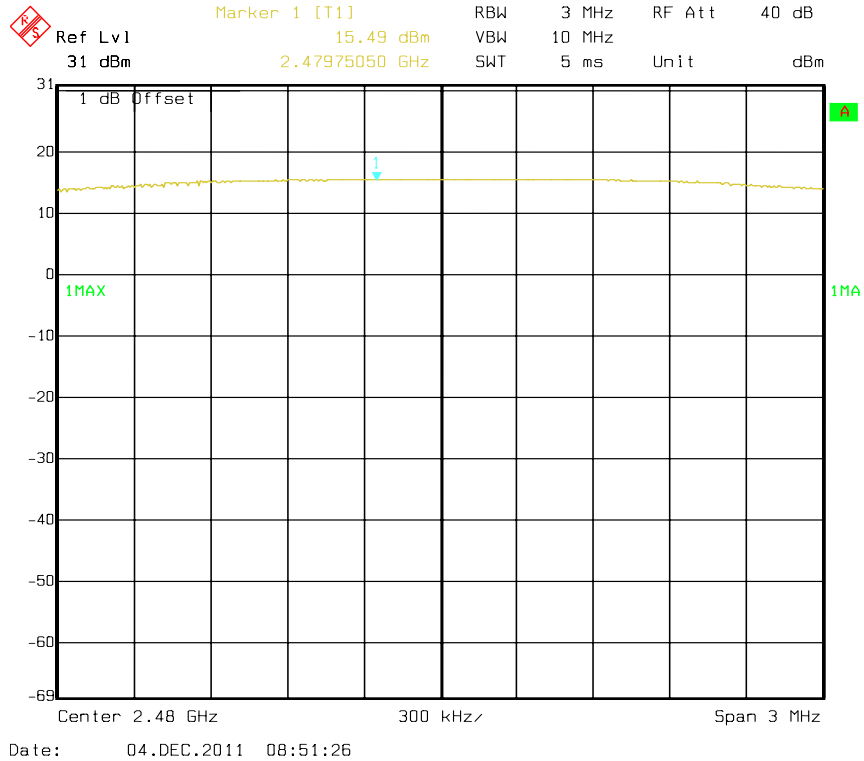
Low Channel



Middle Channel



High Chanel



FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

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

Test Procedure

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

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

* **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 Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	100 kPa

**The testing was performed by Leon Chen on 2011-11-27.*

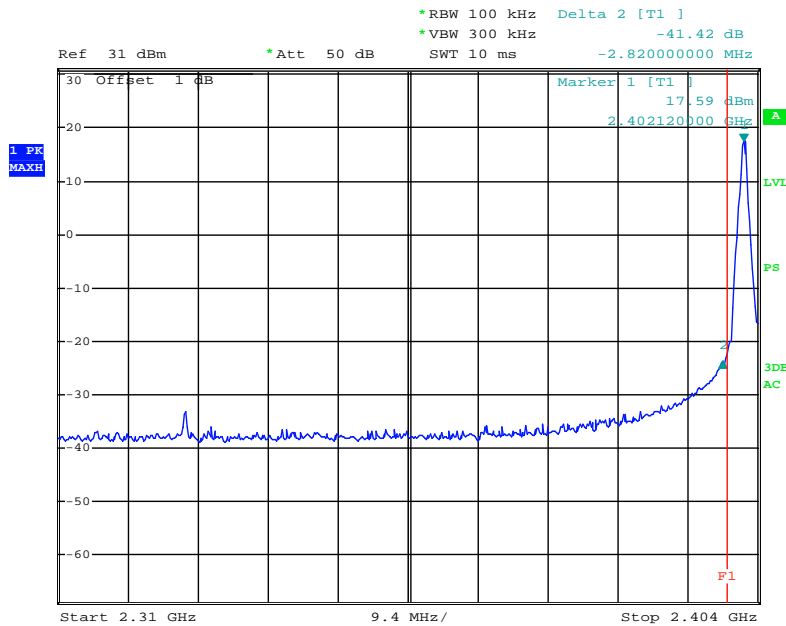
Test Result: Compliance

Please refer to the following table and plots.

Test Mode: Transmitting

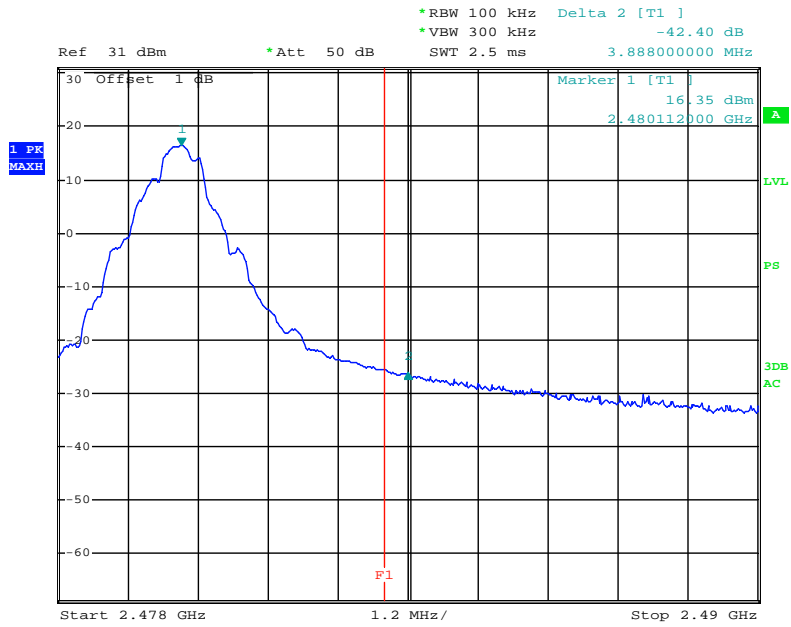
Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.3	41.42	20
2484.0	42.40	20

Band Edge: Left Side



Date: 27.NOV.2011 07:52:06

Band Edge: Right Side



Date: 27.NOV.2011 07:53:54

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