



NVLAP LAB CODE 200707-0



FCC PART 15.247
MEASUREMENT AND TEST REPORT

For

EXVISION INDUSTRIES LIMITED

RM/B, FLAT/13, KIUFU COMM BLDG, 300-306 LOCKHART,
WAN CHAI, HONG KONG

FCC ID: W8Y-263T

Report Type: Original Report	Product Type: Handheld Color Video Monitor
Test Engineer: <u>Kvass Yang</u>	<i>Kvass. Yang</i>
Report Number: <u>RSZ09031802</u>	
Report Date: <u>2009-04-14</u>	
Reviewed By: <u>EMC Engineer</u>	<i>Simon Mo</i>
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. (Shenzhen). 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	5
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EQUIPMENT MODIFICATIONS	6
EXTERNAL I/O CABLE.....	6
CONFIGURATION OF TEST SETUP	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
§15.247 (i) and §1.1307 (b) (1) - MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	9
STANDARD APPLICABLE	9
MPE CALCULATION.....	9
CFR47 §15.203 - ANTENNA REQUIREMENT.....	10
STANDARD APPLICABLE	10
ANTENNA CONNECTOR CONSTRUCTION	10
CFR47 §15.207 (a) - CONDUCTED EMISSIONS	11
APPLICABLE STANDARD	11
MEASUREMENT UNCERTAINTY.....	11
EUT SETUP	11
EMI TEST RECEIVER SETUP.....	12
TEST EQUIPMENT LIST AND DETAILS.....	12
TEST PROCEDURE	12
TEST RESULTS SUMMARY	12
TEST DATA	13
PLOT(S) OF TEST DATA.....	13
CFR47 §15.205, §15.209, §15.247 - RADIATED EMISSIONS.....	16
APPLICABLE STANDARD	16
MEASUREMENT UNCERTAINTY.....	16
EUT SETUP	16
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	17
TEST EQUIPMENT LIST AND DETAILS.....	17
TEST PROCEDURE	17
CORRECTED AMPLITUDE & MARGIN CALCULATION	17
TEST RESULTS SUMMARY	18
TEST DATA	18
CFR47 §15.247(a) (1)-CHANNEL SEPARATION TEST	22
APPLICABLE STANDARD	22
TEST EQUIPMENT LIST AND DETAILS.....	22

TEST PROCEDURE	22
TEST DATA	22
CFR47 §15.247(a) (1) – 20dB BANDWIDTH TESTING.....	25
APPLICABLE STANDARD	25
TEST EQUIPMENT LIST AND DETAILS.....	25
TEST PROCEDURE	25
TEST DATA	25
CFR47 §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST	28
APPLICABLE STANDARD	28
TEST EQUIPMENT LIST AND DETAILS.....	28
TEST PROCEDURE	28
TEST DATA	28
CFR47 §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME).....	30
APPLICABLE STANDARD	30
TEST EQUIPMENT LIST AND DETAILS.....	30
TEST PROCEDURE	30
TEST DATA	30
CFR47 §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT	34
APPLICABLE STANDARD	34
TEST EQUIPMENT LIST AND DETAILS.....	34
TEST PROCEDURE	34
TEST DATA	34
CFR47 §15.247(d) - BAND EDGES TESTING	36
APPLICABLE STANDARD	36
TEST EQUIPMENT LIST AND DETAILS.....	36
TEST PROCEDURE	36
TEST DATA	37

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *EXVISION INDUSTRIES LIMITED*'s product, model number: 263T or the "EUT" as referred to in this report is a *HANDHELD COLOR VIDEO MONITOR*, which measures approximately: 9.0 cm L x 8.5 cm W x 13.0 cm H, rated input voltage: DC 7.5V adapter.

Adapter Information:

Model: AD150750500;

Input: AC 120 V 250mA 60Hz;

Output: DC 7.5V 500mA

*Note: This is a wireless camera, it use 2.4GHz frequency transmitting data. AV signal can be collected modulated and be transmitted by the product. So you can use receiver to monitor for the technical parameters. As following:

Frequencies: 2408.625-2469.375 MHz;

Transmission Power: <10 dBm;

Modulation mode: FHSS/GFSK;

19 channels are available for 263T and operate at 2408.625, 2412, 2415.375, 2418.75, 2422.125, 2425.5, 2428.875, 2432.25, 2435.625, 2439, 2442.375, 2445.75, 2449.125, 2452.5, 2455.875, 2459.25, 2462.625, 2466, 2469.375 MHz.

** All measurement and test data in this report was gathered from production sample serial number: 0903048 (Assigned by BACL). The EUT was received on 2009-03-18.*

Objective

This Type approval report is prepared on behalf of *EXVISION INDUSTRIES LIMITED* 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)

No Related Submittals.

Test Methodology

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

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

Test Facility

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

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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

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



NVLAP LAB CODE 200707-0

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

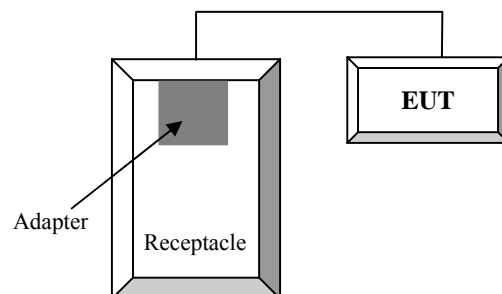
Equipment Modifications

No modification was made to the unit tested.

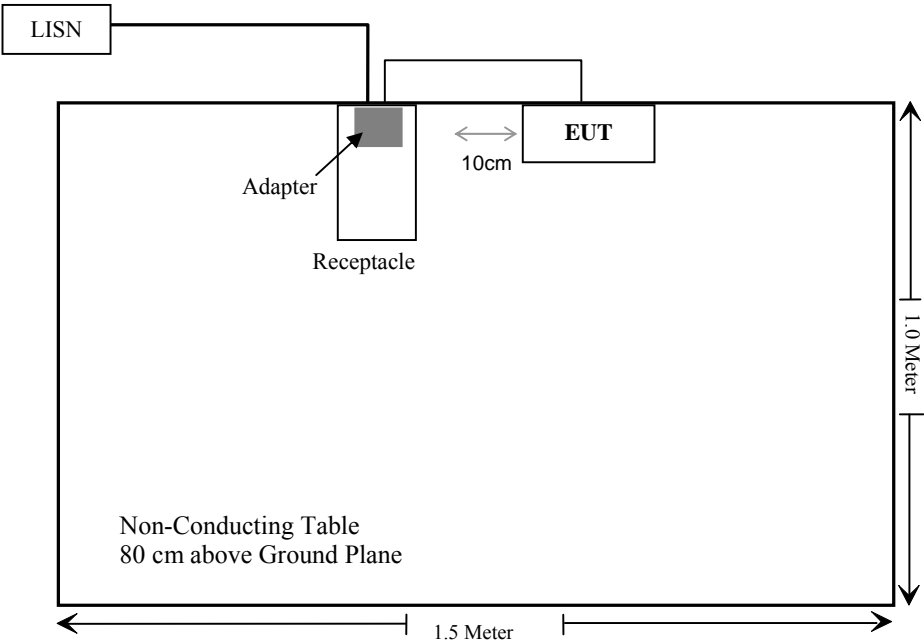
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Undetachable DC Power Cable	3.6	EUT	Adapter

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b)(1)	Maximum Permissible exposure (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	Conducted Emissions	Compliant*
§15.205, §15.209, §15.109, §15.247(d)	Radiated Emissions	Compliant*
§15.247 (a)(1)	20 dB Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges	Compliant

* Within measurement uncertainty.

§15.247 (i) and §1.1307 (b) (1) - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Standard Applicable

According to subpart 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 the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3–3.0	614	1.63	*(100)	30
3.0–30	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, the power gain factor, is normally **numeric** gain.

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

Maximum peak output power at antenna input terminal: 6.11 (dBm)

Maximum peak output power at antenna input terminal: 4.08 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2469.375 (MHz)

Antenna Gain (typical): 0(dBi)

Antenna Gain (typical): 1 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.000812 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm²)

$$0.000812 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$$

Conclusion: The power density of EUT at 20cm complies with 1 mW/cm² limit.

CFR47 §15.203 - ANTENNA REQUIREMENT

Standard Applicable

According to CFR47 § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has a solder antenna on PCB. The maximum gain is 0 dBi; please refer to the EUT internal photos.

Result: Compliant.

CFR47 §15.207 (a) - CONDUCTED EMISSIONS

Applicable Standard

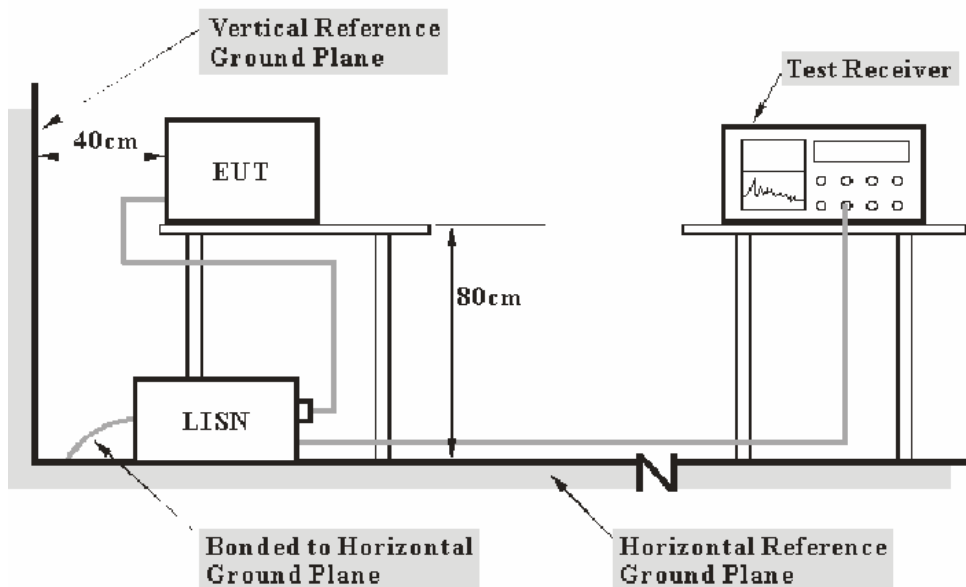
CFR47 §15.207

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 spacing between the peripherals was 10 cm.

The adapter of EUT 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2009-03-25	2010-03-25
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2009-03-25	2010-03-25

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

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

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

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

1.20 dB at 0.6000 MHz in the Neutral conductor mode

Test Data**Environmental Conditions**

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

* The testing was performed by Kvass Yang on 2009-04-08.

Test Mode: Transmitting

Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Conductor (Line/Neutral)	Limit (dBμV)	Margin (dB)
0.6000	54.80	QP	Neutral	56.00	1.20*
0.5900	53.30	QP	Line	56.00	2.70
0.1650	58.30	QP	Neutral	65.21	6.91
0.1600	57.30	QP	Line	65.46	8.16
0.2050	54.40	QP	Neutral	63.41	9.01
0.2050	53.80	QP	Line	63.41	9.61
24.0000	40.30	AV	Line	50.00	9.70
27.1200	40.10	AV	Line	50.00	9.90
27.1200	39.90	AV	Neutral	50.00	10.10
24.0000	39.70	AV	Neutral	50.00	10.30
0.6000	35.40	AV	Neutral	46.00	10.60
0.5900	35.10	AV	Line	46.00	10.90
1.1750	44.10	QP	Line	56.00	11.90
1.1800	43.10	QP	Neutral	56.00	12.90
27.1200	46.60	QP	Line	60.00	13.40
27.1200	46.40	QP	Neutral	60.00	13.60
24.0000	45.00	QP	Line	60.00	15.00
24.0000	44.40	QP	Neutral	60.00	15.60
0.1650	36.20	AV	Neutral	55.21	19.01
0.2050	33.00	AV	Line	53.41	20.41
0.1600	35.00	AV	Line	55.46	20.46
1.1800	24.70	AV	Neutral	46.00	21.30
0.2050	31.70	AV	Neutral	53.41	21.71
1.1800	24.20	AV	Line	46.00	21.80

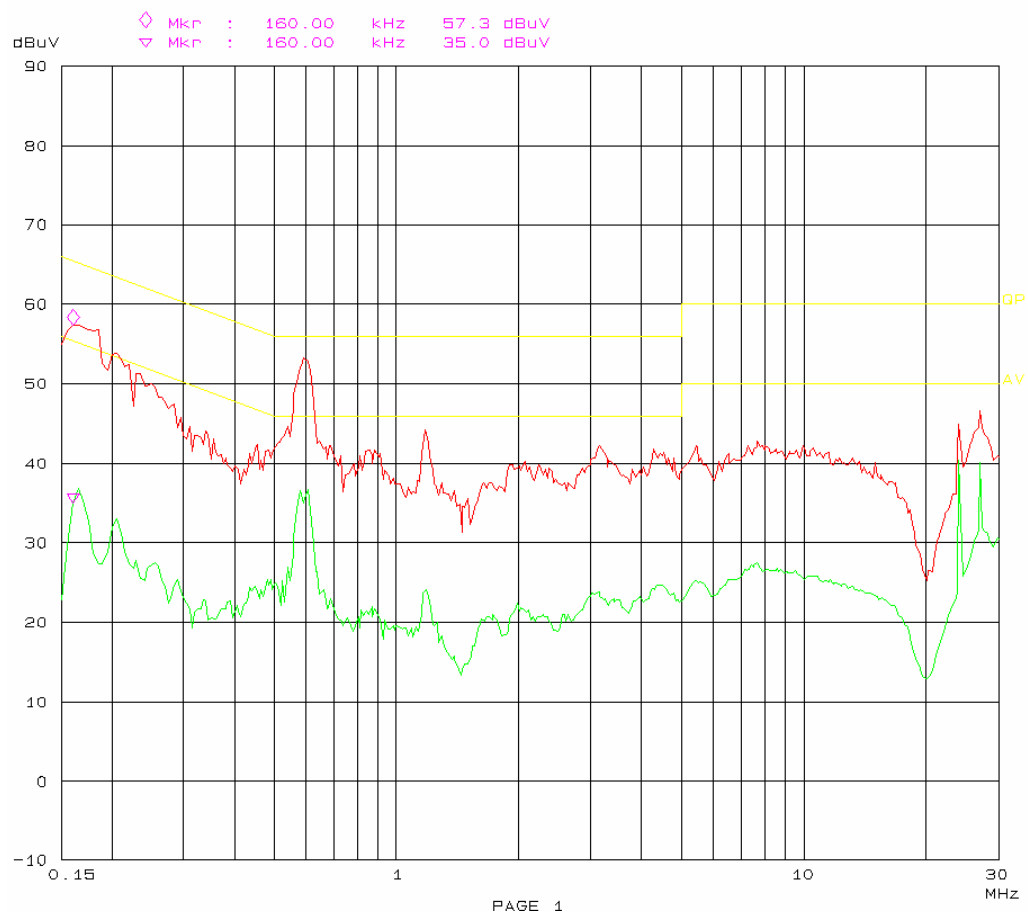
* Within measurement uncertainty.

Plot(s) of Test Data

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

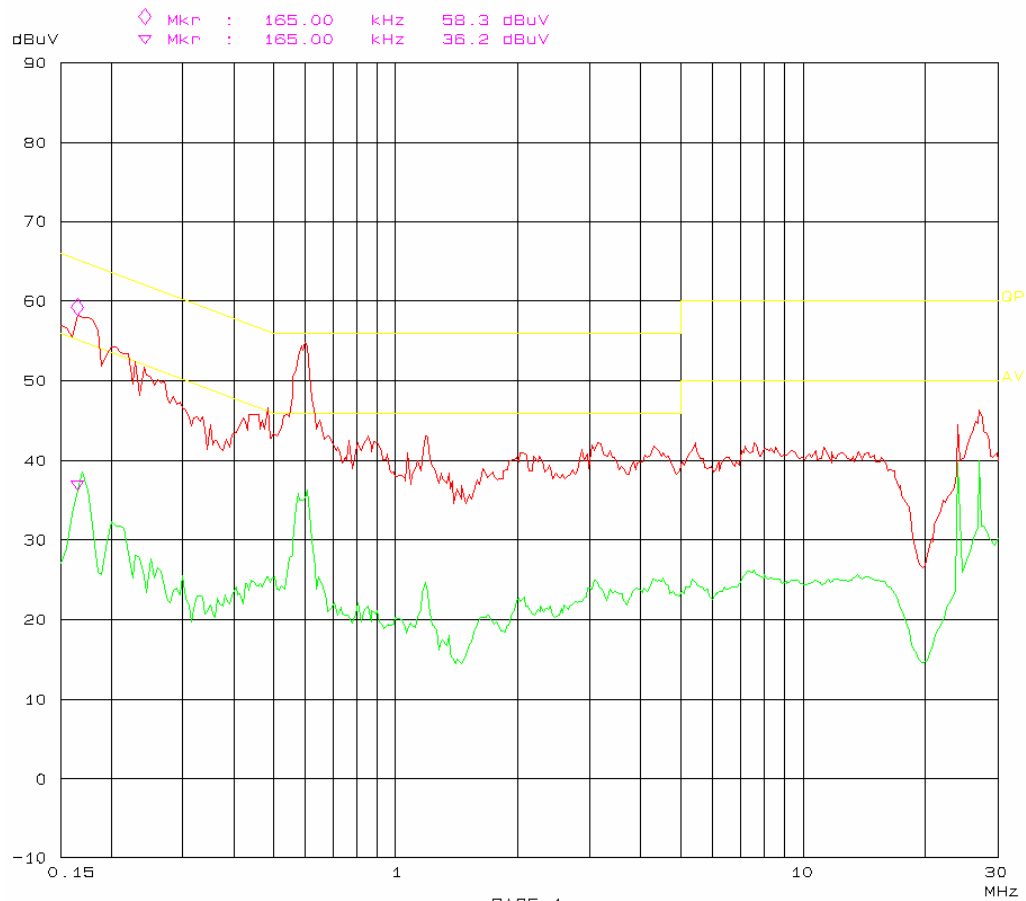
Conducted emission FCC PART 15

Manuf: Exvision Industries Limited M/N: 263T
Op Cond: Transmitting
Operator: Kvass
Test Spec: AC 120V/60Hz L
Comment: Temp: 24 Hum: 50%
BACL



Conducted emission FCC PART 15

Manuf: Exvision Industries Limited M/N: 263T
Op Cond: Transmitting
Operator: Kvass
Test Spec: AC 120V/60Hz N
Comment: Temp: 24 Hum: 50%
BACL



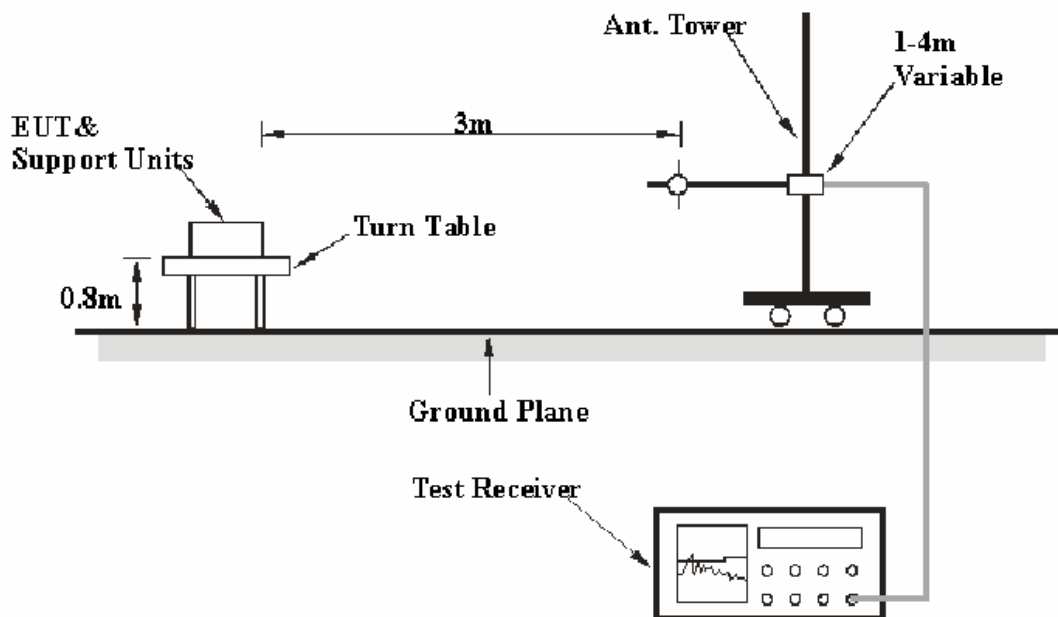
CFR47 §15.205, §15.209, §15.247 - RADIATED EMISSIONS**Applicable Standard**

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

Measurement Uncertainty

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

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

EUT Setup

The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 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 adapter of EUT was 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:

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2008-11-15	2009-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
HP	Amplifier	8449B	3008A00277	2008-09-29	2009-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-05-09	2009-05-09

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

Test Procedure

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

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

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

Corrected Amplitude & Margin Calculation

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

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB 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, section 15.205, 15.209, 15.109, and 15.247, with the worst margin reading of:

Transmitting mode (Below 1GHz):

0.8 dB at 180.003725 MHz in the Vertical polarization

Transmitting mode (Above 1 GHz):

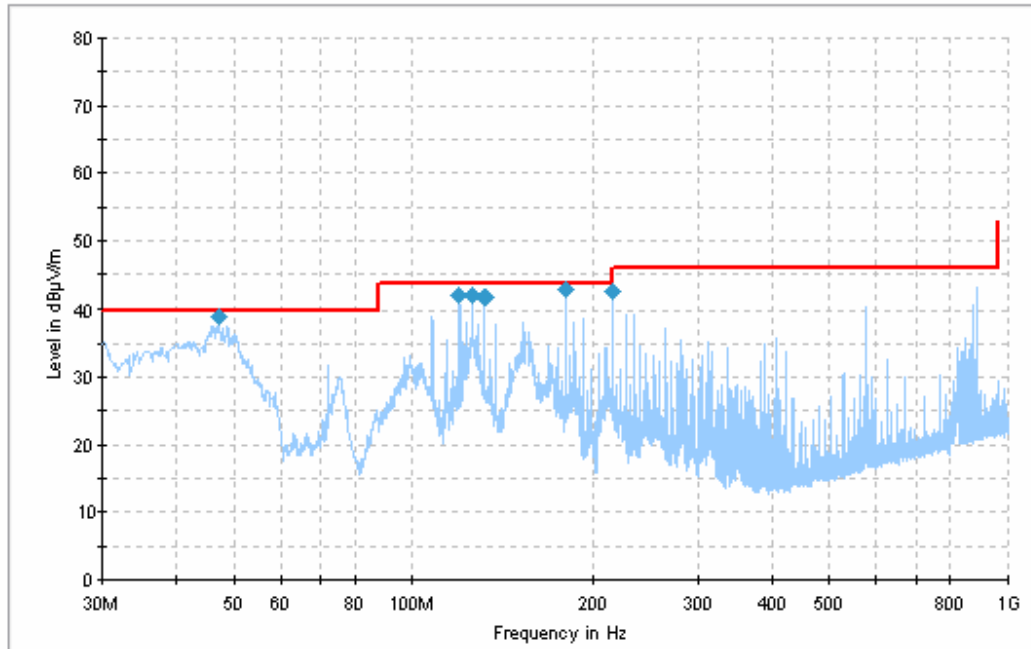
0.65 dB at 7225.875 MHz in the Vertical polarization (Low Channel)
1.04 dB at 9756 MHz in the Horizontal polarization (Middle Channel)
0.51 dB at 9877.5000 MHz in the Horizontal polarization (High Channel)

Test Data**Environmental Conditions**

Temperature:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

** The testing was performed by Kvass Yang on 2009-04-10.*

Test Mode: Transmitting (Below 1 GHz) for worst case



Frequency (MHz)	Corrected Amp. (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
180.003725	42.7	108.0	V	24.0	-17.2	43.5	0.8*
215.999600	42.5	108.0	V	126.0	-17.2	43.5	1.0*
125.980800	42.0	109.0	V	116.0	-18.7	43.5	1.5*
120.004550	41.9	109.0	V	128.0	-18.9	43.5	1.6*
132.009100	41.7	117.0	V	3.0	-18.7	43.5	1.8*
47.170400	37.7	109.0	V	260.0	-19.0	40.0	2.3*

* Within measurement uncertainty.

Test Mode: Transmitting (Above 1 GHz)

Freq. (MHz)	S.A. Reading (dBμV/m)	Detector PK/QP/AV	Direction Degree	Test Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)	Remarks
Low Channel (2408.625 MHz)												
7225.875	39.80	AV	263	1.8	V	38.0	9.15	33.6	53.35	54	0.65*	harmonic
9634.500	34.74	AV	149	1.8	H	41.4	10.79	34.0	52.93	54	1.07*	harmonic
9634.500	35.84	AV	360	1.6	V	40.1	10.79	34.0	52.73	54	1.27*	harmonic
4817.250	42.83	AV	180	1.6	V	35.0	7.56	33.7	51.69	54	2.31*	harmonic
7225.875	36.75	AV	268	1.6	H	39.2	9.15	33.6	51.50	54	2.50*	harmonic
4817.250	40.56	AV	270	1.6	H	36.3	7.56	33.7	50.72	54	3.28*	harmonic
9634.500	46.21	PK	230	1.8	H	41.4	10.79	34.0	64.40	74	9.60	harmonic
9634.500	45.37	PK	358	1.3	V	40.1	10.79	34.0	62.26	74	11.74	harmonic
7225.875	47.99	PK	268	1.6	V	38.0	9.15	33.6	61.54	74	12.46	harmonic
7225.875	45.07	PK	168	1.6	H	39.2	9.15	33.6	59.82	74	14.18	harmonic
4817.250	48.34	PK	250	1	V	35.0	7.56	33.7	57.20	74	16.80	harmonic
4817.250	46.63	PK	49	1.2	H	36.3	7.56	33.7	56.79	74	17.21	harmonic
Middle Channel (2439 MHz)												
9756	34.76	AV	270	1.6	H	41.4	10.8	34	52.96	54	1.04*	harmonic
9756	35.50	AV	180	1.6	V	40.2	10.8	34	52.50	54	1.50*	harmonic
7317	35.18	AV	261	1.0	H	39.2	9.15	33.6	49.93	54	4.07	harmonic
7317	36.13	AV	90	1.2	V	38	9.15	33.6	49.68	54	4.32	harmonic
4878	36.25	AV	270	1.6	H	36.3	7.56	33.7	46.41	54	7.59	harmonic
4878	36.73	AV	180	1.6	V	35	7.56	33.7	45.59	54	8.41	harmonic
9756	45.12	PK	49	1.2	H	41.4	10.8	34	63.32	74	10.68	harmonic
9756	45.24	PK	250	1.0	V	40.2	10.8	34	62.24	74	11.76	harmonic
7317	45.39	PK	180	1.3	H	39.2	9.15	33.6	60.14	74	13.86	harmonic
7317	45.51	PK	180	1.0	V	38	9.15	33.6	59.06	74	14.94	harmonic
4878	45.89	PK	49	1.2	H	36.3	7.56	33.7	56.05	74	17.95	harmonic
4878	46.99	PK	250	1.0	V	35	7.56	33.7	55.85	74	18.15	harmonic
High Channel ((2469.375 MHz)												
9877.500	34.84	AV	149	1.8	H	41.5	10.95	33.8	53.49	54	0.51*	harmonic
9877.500	34.19	AV	360	1.6	V	40.3	10.95	33.8	51.64	54	2.36*	harmonic
7408.125	35.79	AV	268	1.6	H	39.4	9.17	33.6	50.76	54	3.24*	harmonic
7408.125	35.64	AV	263	1.8	V	38.1	9.17	33.6	49.31	54	4.69	harmonic
4938.750	36.78	AV	270	1.6	H	36.4	7.8	33.7	47.28	54	6.72	harmonic
4938.750	36.95	AV	180	1.6	V	35.2	7.8	33.7	46.25	54	7.75	harmonic
9877.500	43.69	PK	250	1.4	H	41.5	10.95	33.8	62.34	74	11.66	harmonic
9877.500	43.23	PK	358	1.3	V	40.3	10.95	33.8	60.68	74	13.32	harmonic
7408.125	44.75	PK	168	1.3	H	39.4	9.17	33.6	59.72	74	14.28	harmonic
7408.125	44.85	PK	268	1.5	V	38.1	9.17	33.6	58.52	74	15.48	harmonic
4938.750	45.32	PK	49	1.6	H	36.4	7.8	33.7	55.82	74	18.18	harmonic
4938.750	45.62	PK	250	1.4	V	35.2	7.8	33.7	54.92	74	19.08	harmonic

* Within measurement uncertainty.

Spurious emission in restricted band

Freq. (MHz)	S.A. Reading (dBμV/m)	Detector (PK/AV)	Direction Degree	Test Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dBμV/m)	FCC Part 15.247/209	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)
2312.72	42.84	AV	327	2.00	V	30.50	7.65	33.90	47.09	54	6.91
2489.22	41.82	AV	152	1.22	V	30.52	8.01	33.90	46.45	54	7.55
2489.22	47.69	PK	152	1.22	V	30.52	8.01	33.90	52.32	74	21.68
2312.72	46.17	PK	327	2.00	V	30.50	7.65	33.90	50.42	74	23.58

CFR47 §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 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16

* **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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

* The testing was performed by Kvass Yang on 2009-04-03.

Test Result: Compliant.

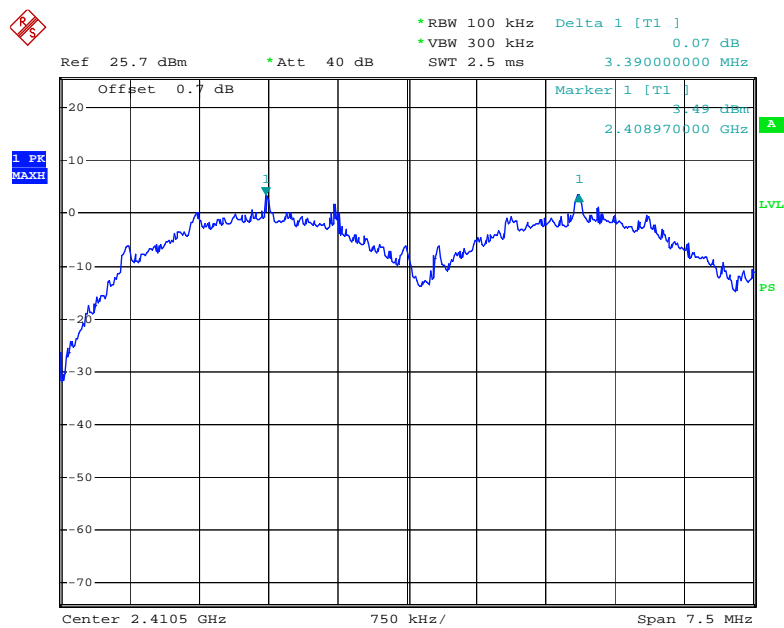
Please refer to following tables and plots

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
Low Channel	2408.625	3.390	2.33	Pass
Adjacent Channel	2412.000			
Mid Channel	2439.000	3.375	2.49	Pass
Adjacent Channel	2442.375			
High Channel	2466.000	3.375	2.47	Pass
Adjacent Channel	2469.375			

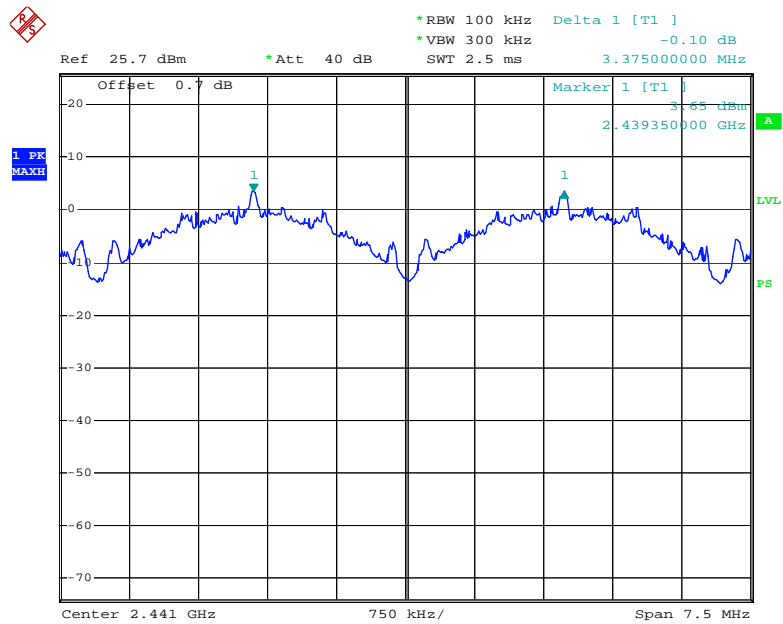
Please refer to the following plots.

Low Channel



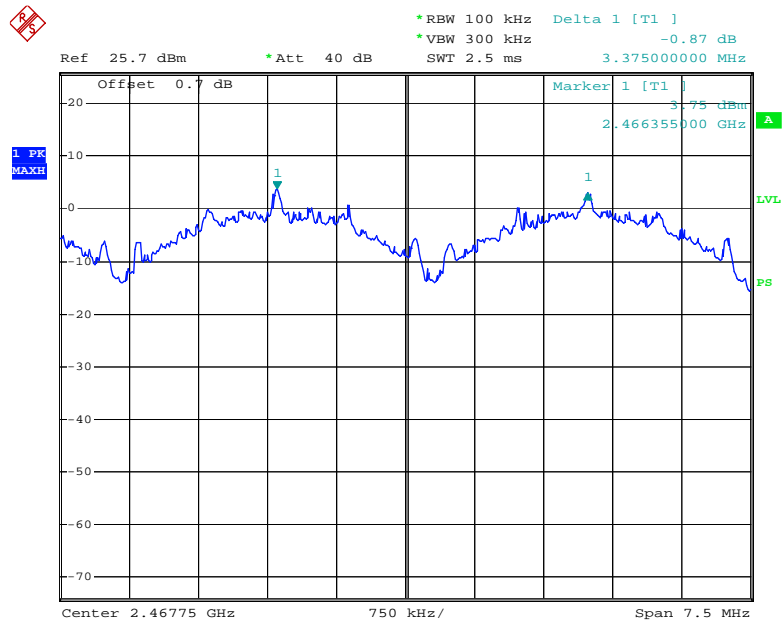
Date: 3.APR.2009 19:59:43

Middle Channel



Date: 3.APR.2009 20:01:55

High Channel



Date: 3.APR.2009 20:03:19

CFR47 §15.247(a) (1) – 20dB BANDWIDTH TESTING

Applicable Standard

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16

* **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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

* The testing was performed by Kvass Yang on 2009-04-03.

Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low	2408.625	3.488
Middle	2439.000	3.728
High	2469.375	3.712

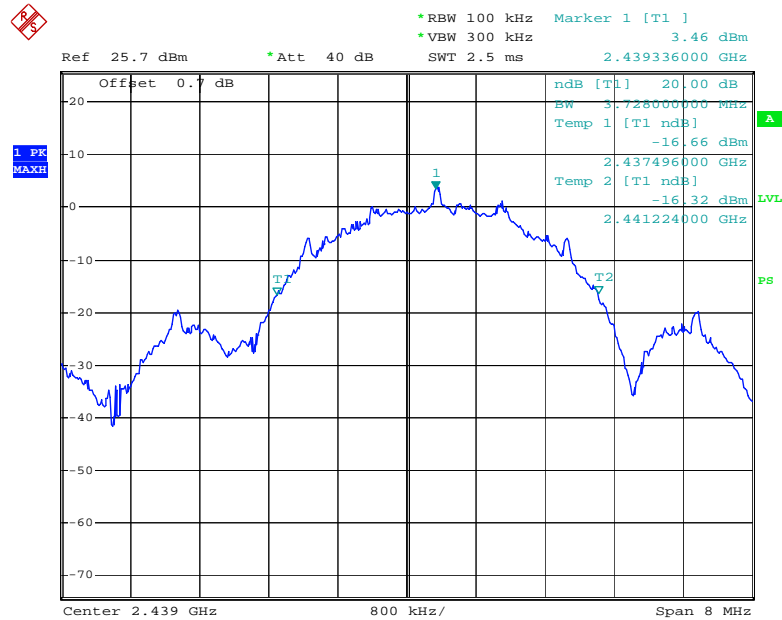
Please refer to the following plots.

Low Channel



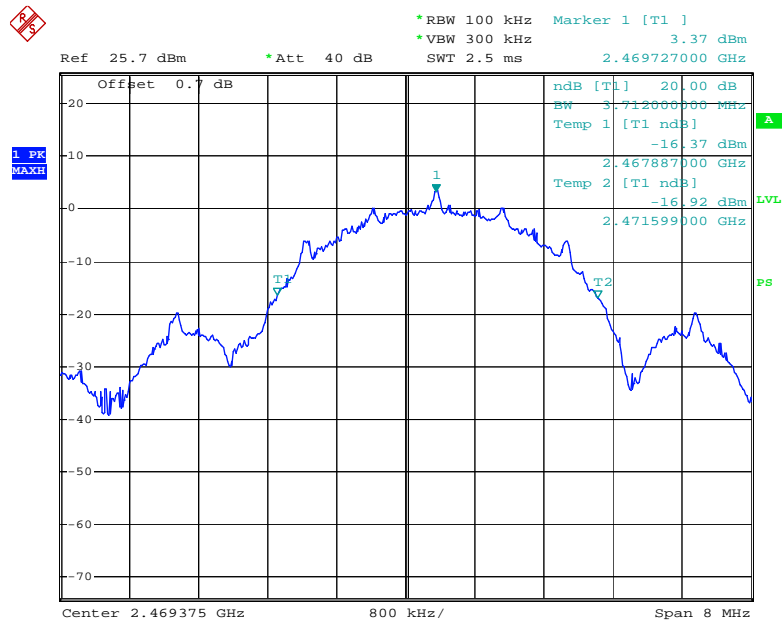
Date: 3.APR.2009 20:38:45

Middle Channel



Date: 3.APR.2009 20:35:07

High Channel



Date: 3.APR.2009 20:33:57

CFR47 §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST**Applicable Standard**

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16

* **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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

* The testing was performed by Kvass Yang on 2009-04-03.

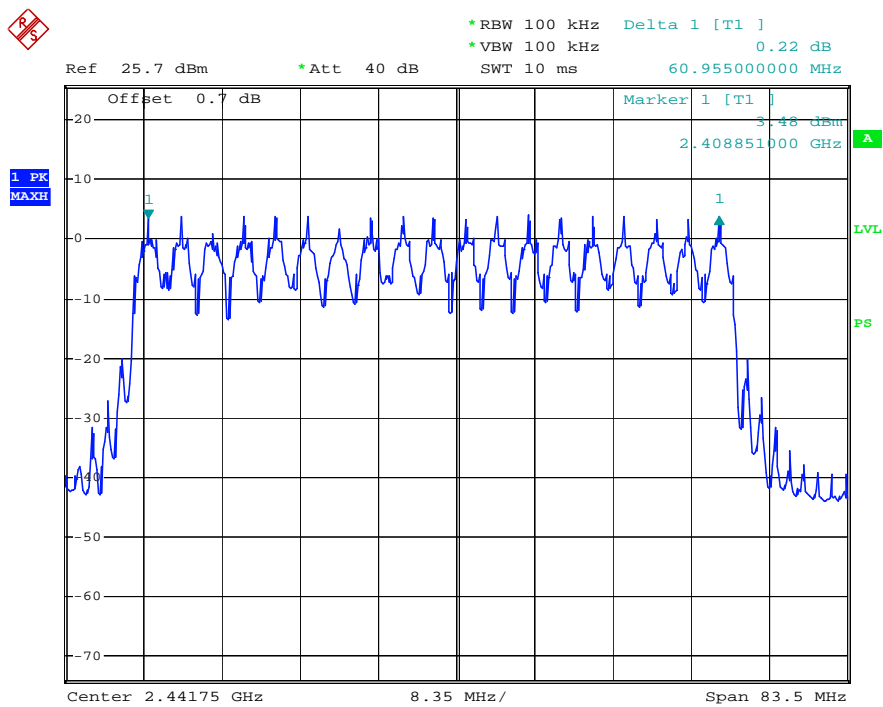
Test Result: Compliant.

Please refer to following tables and plots

Test Mode: Transmitting

Frequency Range (MHz)	Number of Hopping Channel	Limit
2400-2483.5	19	≥ 15

Number of Hopping Channels



Date: 3.APR.2009 19:55:45

CFR47 §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME)**Applicable Standard**

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16

* **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 * 7.6s
Hop Rate=13/s

Test Data**Environmental Conditions**

Temperature:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

* The testing was performed by Kvass Yang on 2009-04-03.

Test Result: Compliant.

Please refer to following tables and plots

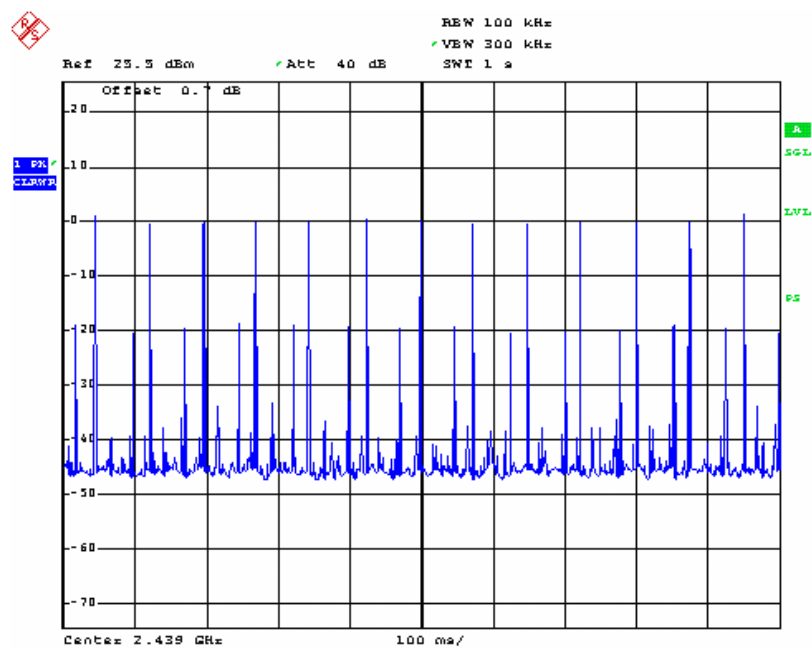
Test Mode: Transmitting

Dwell time = pulse time * 13 * (19 * 0.4) seconds

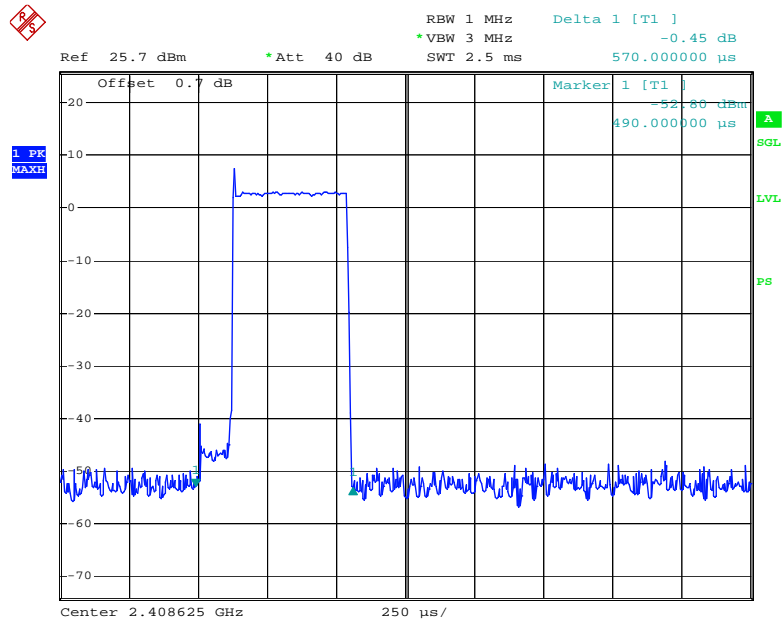
Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
Low	0.570	0.0563	0.4	Pass
Middle	0.555	0.0548	0.4	Pass
High	0.585	0.0578	0.4	Pass

Please refer to the following plots.

Hopping rate:

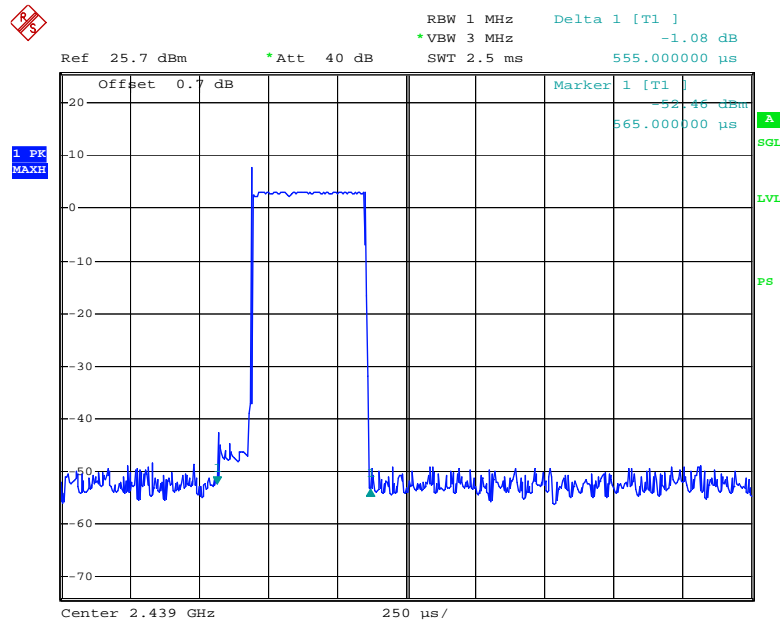


Low Channel



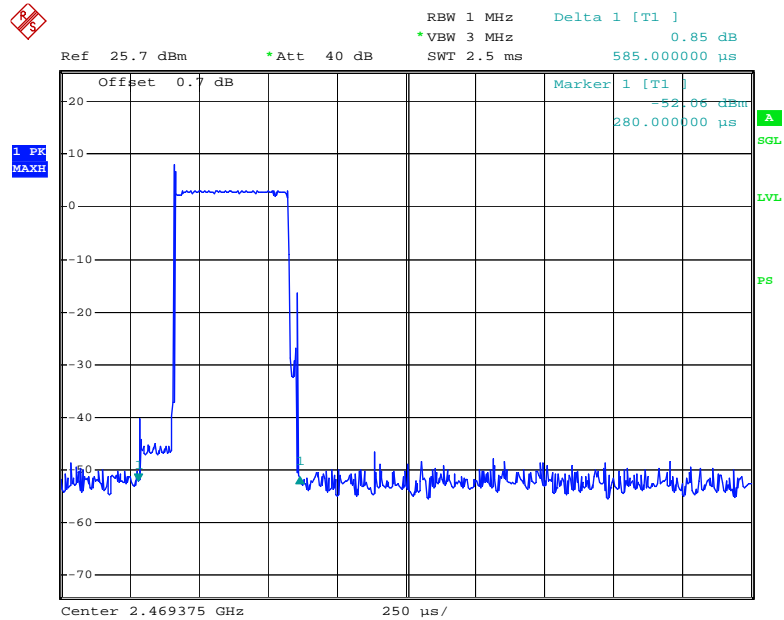
Date: 3.APR.2009 20:27:02

Middle Channel



Date: 3.APR.2009 20:07:57

High Channel



Date: 3.APR.2009 20:06:15

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

Applicable Standard

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

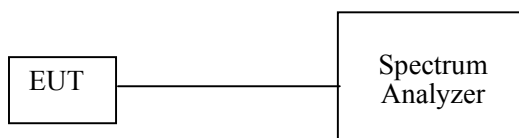
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16

* **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 it 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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

* The testing was performed by Kvass Yang on 2009-04-05.

Test Result: Compliant.

Please refer to following table.

Test Mode: Transmitting

Channel	Channel Frequency (MHz)	Power Output		Limit (mw)
		(dBm)	(mw)	
Low	2408.625	6.03	4.01	125
Mid	2439.000	5.95	3.94	125
High	2469.375	6.11	4.08	125

CFR47 §15.247(d) - BAND EDGES TESTING**Applicable Standard**

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16

* **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 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=100kHz, VBW=300kHz.
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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	100.9 kPa

**The testing was performed by Kvass Yang on 2009-04-10.*

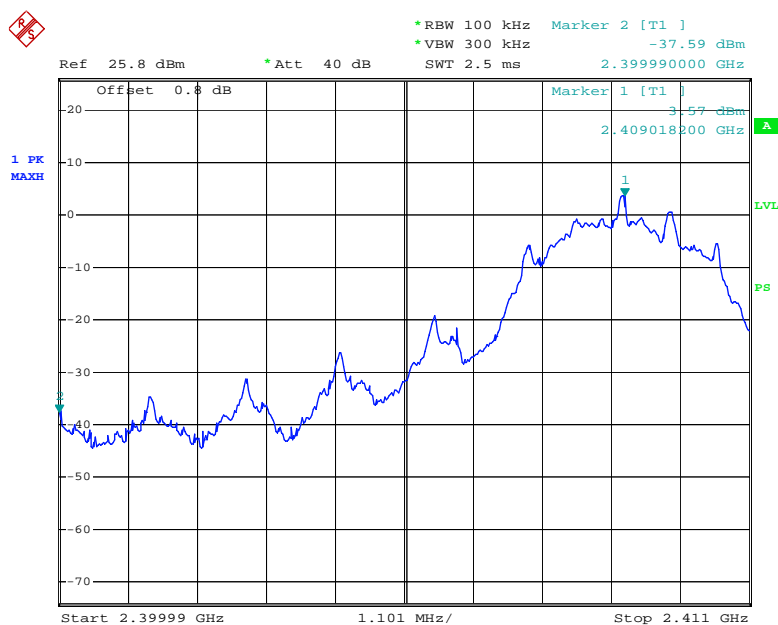
Test Result: Compliant

Please refer to the following table and plots.

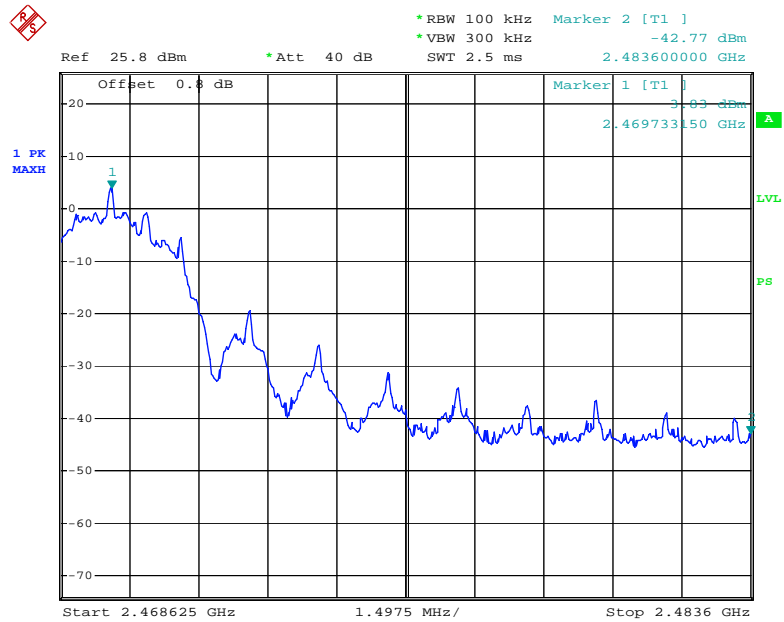
Test Mode: Transmitting

Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)
2399.990	41.16	20
2483.600	46.60	20

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

Band Edge: Left Side

Date: 10.APR.2009 21:15:14

Band Edge: Right Side

Date: 10.APR.2009 21:13:55

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