



## FCC PART 15.249

## MEASUREMENT AND TEST REPORT

For

# Chongqing Jinshan Science & Technology (Group) Co., Ltd.

No.18, Nishang Road, LiangLu Industrial City, Yubei District,

Chongqing, P.R. of China

FCC ID: XE8CJSMEH-II Model: JS-MEH-II

Report Type: **Product Type:** Wireless CF Card Original Report Cookies. Bu **Test Engineer:** Cookies Bu **Report Number:** RSC09052552 **Report Date:** 2009-07-10 Merry Zhao merry, Thuo **Reviewed By:** EMC Engineer Bay Area Compliance Laboratories Corp. (Shenzhen) Prepared By: 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.

<sup>\*</sup> This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "\*" ...

# **TABLE OF CONTENTS**

GENERAL INFORMATION	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S)	3
TEST METHODOLOGY	
TEST FACILITY	4
SYSTEM TEST CONFIGURATION	5
JUSTIFICATION	5
EQUIPMENT MODIFICATIONS	5
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	5
CONFIGURATION OF TEST SETUP	
BLOCK DIAGRAM OF TEST SETUP	5
SUMMARY OF TEST RESULTS	6
§15.203 - ANTENNA REQUIREMENT	7
Applicable Standard	
§15.205(A) §15.209(A) §15.249(A) §15.249(D) §15.35§15.109 - RADIATED EMISSIONS	8
APPLICABLE STANDARD	
Measurement Uncertainty	
TEST EQUIPMENT SETUP	
EUT SETUP	
TEST EQUIPMENT LIST AND DETAILS.	
TEST PROCEDURE	
CORRECTED AMPLITUDE & MARGIN CALCULATION	
TEST RESULTS SUMMARY	
TEST DATA	
§15.249(D) – OUT OF BAND EMISSIONS	15
APPLICABLE STANDARD	15
TEST PROCEDURE	
MEASUREMENT UNCERTAINTY	
TEST EQUIPMENT SETUP	
TEST EQUIPMENT LIST AND DETAILS.	
TEST DATA	16

#### **GENERAL INFORMATION**

#### **Product Description for Equipment under Test (EUT)**

The Chongqing Jinshan Science & Technology (Group) Co., Ltd. 's product, model JS-MEH-II (FCC ID: XE8CJSMEH-II), or the "EUT" as referred to in this report is a Wireless CF Card which measures approximately 5.00 cm L x 4.27 cm W x 1.00 cm H, rated input voltage: DC 3.3V Battery

#### Product information:

Parameters	Specifications					
	Transmitting	Receiving				
Modulation	GFSK	GFSK				
Frequency Range	2450 ~ 2468 MHz					
Transmission Power	≤0 dBm					

Transmission Channel (10 CH)	Frequency (MHz)
1	2450
2	2452
3	2454
4	2456
5	2458
6	2460
7	2462
8	2464
9	2466
10	2468

<sup>\*</sup> All measurement and test data in this report was gathered from production sample serial number: 0905014 (Assigned by BACL, Shenzhen). The EUT was received on 2009-05-25.

#### **Objective**

This Type approval report is prepared on behalf of *Chongqing Jinshan Science & Technology (Group) Co., Ltd.* in accordance with Part 2, Subpart J, and 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, 15.249 and 15.109 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 radiated and conducted emissions measurement was performed at 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**

#### **Justification**

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

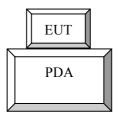
## **Equipment Modifications**

No modifications were made to the unit tested.

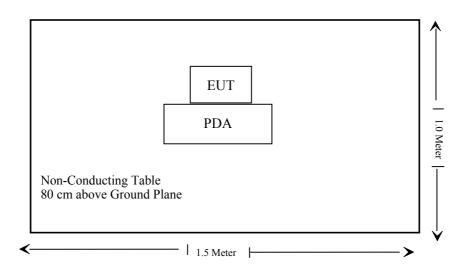
## **Local Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number	FCC ID	
HP	PDA	IPAQ212	N/A	N/A	

## **Configuration of Test Setup**



## **Block Diagram of Test Setup**



# SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	N/A
\$15.205(a), \$15.209(a), 15.249(a), \$15.249(c), \$15.35, \$15.109	Radiated Emissions	Compliant
§15.249(d)	Out of Band Emissions	Compliant

 $\ensuremath{\text{N/A}}\xspace$  . The EUT obtains the power through PDA which is battery operation.

## §15.203 - ANTENNA REQUIREMENT

#### **Applicable Standard**

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

#### **Antenna Connector Construction**

The EUT has an integral antenna on PCB, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

Result: Compliant.

Please refer to the EUT photos.

# §15.205(a) §15.209(a) §15.249(a) §15.249(d) §15.35§15.109 - RADIATED EMISSIONS

#### **Applicable Standard**

As per §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)			
902–928 MHz	50	500			
2400–2483.5 MHz	50	500			
5725–5875 MHz	50	500			
24.0–24.25 GHz	250	2500			

As per §15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

#### **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  $\pm 4.0 \text{ dB}$ .

#### **Test Equipment Setup**

The spectrum analyzer or receiver is set as:

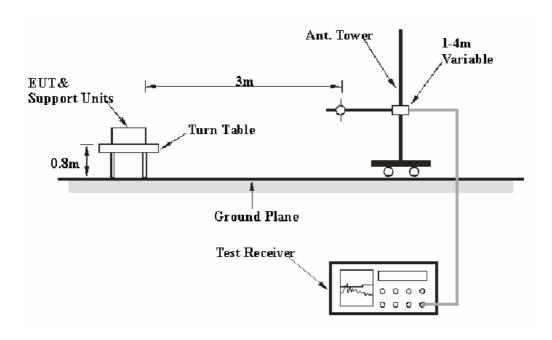
Below 1000 MHz:

Quasi-Peak: RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto Average: RBW = 1MHz / VBW = 10 Hz / Sweep = Auto

#### **EUT Setup**



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, FCC 15.249 and FCC 15.109 limits.

### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2008-11-15	2009-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2008-10-16	2009-10-16
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2009-04-12	2010-04-12
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	2008-08-28	2009-08-27

<sup>\*</sup> 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 EUT, and all support equipment power cords 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.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

#### **Corrected Amplitude & Margin Calculation**

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

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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

Margin = Limit – Corrected Amplitude

#### **Test Results Summary**

According to the data in the following table, the EUT complied with the FCC Part 15.209& 15.109 & 15.249, with the worst margin reading of:

#### **Below 1 GHz:**

Transmitting Mode: **13.4 dB** at **600.002025 MHz** in the **Vertical** polarization. Receiving Mode: **13.2 dB** at **648.024825 MHz** in the **Horizontal** polarization

#### **Above 1GHz:**

Transmitting Mode: **4.34 dB** at **4900 MHz** in the **Horizontal** polarization, Low Channel (2450 MHz) Transmitting Mode: **4.82 dB** at **4916 MHz** in the **Horizontal** polarization, Middle Channel (2458 MHz) Transmitting Mode: **5.33 dB** at **4936 MHz** in the **Horizontal** polarization, High Channel (2468 MHz)

Receiving Mode: 5.75 dB at 6693.38 MHz in the Vertical polarization

## **Test Data**

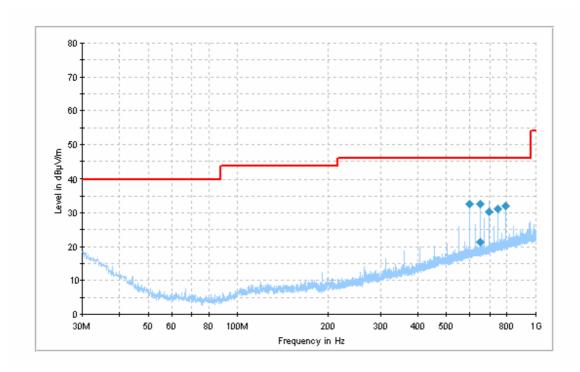
#### **Environmental Conditions**

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

The testing was performed by Cookies Bu on 2009-06-11.

Test Mode: Transmitting

#### **Below 1 GHz:**



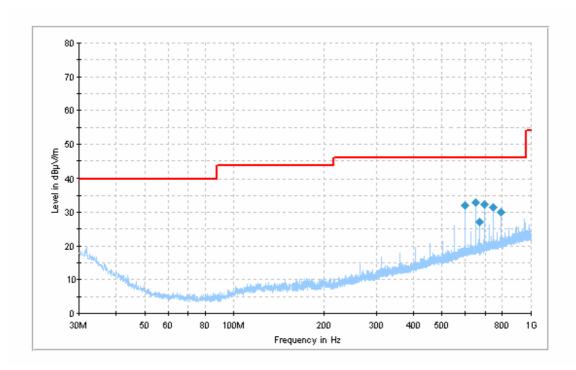
Frequency Corrected Test Ant		ntenna	Turntable	Correction	Limit	Margin		
(MHz)	Amplitude (dBµV/m)	Height (cm)	Polarity (H/V)	Position (deg)	Factor (dB)	(dBµV/m)	(dB)	
600.002025	32.6	120.0	V	130.0	-8.7	46.0	13.4	
648.010000	32.7	116.0	Н	0.0	-3.9	46.0	13.3	
648.020475	21.5	113.0	Н	217.0	-7.7	46.0	24.5	
696.024825	30.3	109.0	Н	115.0	-6.9	46.0	15.7	
744.040000	31.2	120.0	V	167.0	-3.5	46.0	14.8	
792.050000	32.2	130.0	V	298.0	-3.9	46.0	13.8	

**Above 1 GHz:** 

	G .			Test	t Ante	nna	a	Pre-	<i>c</i> .	FCC	15.249/1	5.209
Frequency	S.A.	Detector	Turntable				Cable	Amp.	Cord.			
(MHz)	Reading (dBµV/m)	(PK/AV)	Degree	Height			Loss (dB)	Gain	Amp. (dBµV/m)	Limit	Margin	Comment
	(αΔμ ٧/ΠΙ)			( <b>m</b> )	(H/V)	(dB/m)	(ub)	(dB)	(αΒμ ٧/Π)	(dBµV/m)	(dB)	
				Low	Channe	el (2450	MHz)					
4900.00	39.50	AV	122	2.0	Н	36.30	7.56	33.70	49.66	54	4.34	harmonic
4900.00	58.74	PK	122	2.0	Н	36.30	7.56	33.70	68.90	74	5.10	harmonic
4900.00	57.53	PK	68	1.8	V	35.00	7.56	33.70	66.39	74	7.61	harmonic
4900.00	37.42	AV	68	1.8	V	35.00	7.56	33.70	46.28	54	7.72	harmonic
7250.00	31.28	AV	326	1.5	Н	39.20	9.12	33.60	46.00	54	8.00	harmonic
7350.00	32.21	AV	87	1.5	V	38.00	9.12	33.60	45.73	54	8.27	harmonic
7250.00	44.56	PK	326	1.5	Н	39.20	9.12	33.60	59.28	74	14.72	harmonic
7350.00	45.62	PK	87	1.5	V	38.00	9.12	33.60	59.14	74	14.86	harmonic
2450.00	87.09	PK	233	1.4	V	30.30	7.90	33.90	91.39	114	22.61	Fund.
2450.00	84.27	PK	155	1.0	Н	30.90	7.90	33.90	89.17	114	24.83	Fund.
2450.00	63.56	AV	233	1.4	V	30.30	7.90	33.90	67.86	94	26.14	Fund.
2450.00	62.18	AV	155	1.0	Н	30.90	7.90	33.90	67.08	94	26.92	Fund.
2328.85	46.85	PK	125	1.0	Н	30.30	6.51	33.90	49.76	74	24.24	Spurious
2328.85	33.63	AV	125	1.0	Н	30.30	6.51	33.90	36.54	54	17.46	Spurious
2323.24	46.47	PK	145	1.0	V	30.00	6.51	33.90	49.08	74	24.92	Spurious
2323.24	33.21	AV	145	1.0	V	30.00	6.51	33.90	35.82	54	18.18	Spurious
				Middle	e chani	nel (2458	MHz)		•	•	•	
4916.00	39.02	AV	360	1.4	Н	36.30	7.56	33.70	49.18	54	4.82	harmonic
7374.00	32.71	AV	317	1.7	Н	39.20	9.12	33.60	47.43	54	6.57	harmonic
4916.00	57.01	PK	360	1.4	Н	36.30	7.56	33.70	67.17	74	6.83	harmonic
4916.00	36.45	AV	90	1.1	V	35.00	7.56	33.70	45.31	54	8.69	harmonic
7374.00	31.19	AV	260	1.0	V	38.00	9.12	33.60	44.71	54	9.29	harmonic
4916.00	55.50	PK	90	1.1	V	35.00	7.56	33.70	64.36	74	9.64	harmonic
7374.00	45.14	PK	317	1.7	Н	39.20	9.12	33.60	59.86	74	14.14	harmonic
7374.00	45.67	PK	260	1.0	V	38.00	9.12	33.60	59.19	74	14.81	harmonic
2458.00	86.36	PK	360	1.1	V	30.30	7.90	33.90	90.66	114	23.34	Fund.
2458.00	85.15	PK	32	1.7	Н	30.90	7.90	33.90	90.05	114	23.95	Fund.
2458.00	63.66	AV	360	1.1	V	30.30	7.90	33.90	67.96	94	26.04	Fund.
2458.00	61.67	AV	32	1.7	H	30.90	7.90	33.90	66.57	94	27.43	Fund.
2130.00	01.07	111	32			el (2468N		33.70	00.57		27.13	T difd.
4936.00	37.82	AV	310	1.7	Н	36.60	7.95	33.70	48.67	54	5.33	harmonic
4936.00	55.76	PK	310	1.7	Н	36.60	7.95	33.70	66.61	74	7.39	harmonic
7404.00	31.62	AV	210	1.4	Н	39.40	9.17	33.60	46.59	54	7.41	harmonic
4936.00	35.87	AV	220	1.4	V	35.40	7.95	33.70	45.52	54	8.48	harmonic
7404.00	31.04	AV	145	1.5	V	38.10	9.17	33.60	44.71	54	9.29	harmonic
4936.00	54.98	PK	220	1.4	V	35.40	7.95	33.70	64.63	74	9.37	harmonic
7404.00	44.68	PK	210	1.4	Н	39.40	9.17	33.60	59.65	74	14.35	harmonic
7404.00	44.16	PK	145	1.5	V	38.10	9.17	33.60	57.83	74	16.17	harmonic
2468.00	87.45	PK	0	1.7	Н	30.90	7.90	33.90	92.35	114	21.65	Fund.
2468.00	84.57	PK	0	1.0	V	30.30	7.90	33.90	88.87	114	25.13	Fund.
2468.00	63.42	AV	0	1.7	Н	30.90	7.90	33.90	68.32	94	25.68	Fund.
2468.00	61.45	AV	0	1.0	V	30.30	7.90	33.90	65.75	94	28.25	
2497.52	48.56	PK	264	1.5	H	31.50	8.09	33.90	54.25	74	19.75	Fund.
2497.52	34.36		264	1.5	Н	31.50		33.90	40.05	54	13.95	Spurious
		AV			V		8.09					Spurious
2488.79	43.81 31.12	PK AV	108 108	1.0	V	30.60	8.09	33.90 33.90	48.60 35.91	74 54	25.40 18.09	Spurious Spurious

Test Mode: Receiving (Worst Case)

#### **Below 1 GHz:**



Frequency	Corrected	Test Aı	ntenna	Turntable	Correction	Limit	Margin	
(MHz)	Amplitude (dBµV/m)	- Height Holatity		Position (deg)	Factor (dB)	(dBµV/m)	(dB)	
648.024825	32.8	126.0	Н	119.0	-7.7	46.0	13.2	
696.026250	32.4	237.0	Н	90.0	-3.9	46.0	13.6	
599.996250	32.1	188.0	Н	329.0	-3.9	46.0	13.9	
744.041250	31.5	274.0	Н	291.0	-3.6	46.0	14.5	
792.026250	30.1	152.0	Н	323.0	-3.6	46.0	15.9	
672.018750	27.2	104.0	Н	35.0	-3.5	46.0	18.8	

## **Above 1 GHz:**

E	S.A.	D-44	T4-1-1-		t Ante	nna	Cable	Pre-	Cord.	F	CC 15.10	09
Frequency (MHz)	Reading (dBµV/m)	Detector (PK/AV)	Turntable Degree		Polar Factor (dB/m) Loss (dB)	Amp. Gain (dB)	Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment		
6693.38	35.10	AV	87	1.5	V	37.40	9.35	33.6	48.25	54	5.75	spurious
5771.54	36.02	AV	122	1.0	Н	37.40	8.35	33.6	48.17	54	5.83	spurious
5771.54	46.00	PK	122	1.0	Н	37.40	8.35	33.6	58.15	74	15.85	spurious
1104.20	41.21	AV	326	1.5	Н	25.10	4.78	35.0	36.09	54	17.91	spurious
6693.38	42.54	PK	87	1.5	V	37.40	9.35	33.6	55.69	74	18.31	spurious
1120.24	41.03	AV	68	1.8	V	23.80	4.78	35.0	34.61	54	19.39	spurious
1104.20	46.88	PK	326	1.5	Н	25.10	4.78	35.0	41.76	74	32.24	spurious
1120.24	47.61	PK	68	1.8	V	23.80	4.78	35.0	41.19	74	32.81	spurious

## §15.249(d) – OUT OF BAND EMISSIONS

#### **Applicable Standard**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

#### **Test Procedure**

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission at the band edge. The receiving antenna should be changed the polarization both of horizontal and vertical.

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

#### **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.

#### **Test Equipment Setup**

The spectrum analyzer or receiver is set as:

Above 1000MHz:

Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto

Average: RBW = 1MHz / VBW = 10 Hz / Sweep = Auto

#### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2008-11-07	2009-11-06	
НР	Amplifier	8447E	1937A01046	2008-08-02	2009-08-02	
A.H. System	Horn Antenna	SAS-200/571	135	2009-05-17	2010-05-17	

<sup>\*</sup> Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) Corp. 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:	56%				
ATM Pressure:	100.0 kPa				

<sup>\*</sup>The testing was performed by Cookies Bu on 2009-06-12.

**Test Result:** Compliant

Please refer to the following table:

Test Mode: Transmitting

Frequency (MHz)	Reading	Detector (PK/AV)	Direction Degree	Test Antenna		Cable	Pre-	Cord.	FCC Part 15.249/209			
				Height (m)	Polar H/V	Factor (dB/m)	Loss (dB)	Amp.	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remarks
Out of left side band (2390 ~ 2400 MHz)												
2395.432	33.19	PK	125	1.0	Н	30.70	7.90	33.90	37.89	74	36.11	/
2391.922	35.74	PK	145	1.0	V	30.30	7.90	33.90	40.04	74	33.96	/
Out of right side band (2483.5 ~ 2500 MHz)												
2497.416	43.88	PK	250	1.5	Н	31.50	8.09	33.90	49.57	74	24.43	/
2488.792	38.35	PK	108	1.0	V	30.60	8.09	33.90	43.14	74	30.86	/

Note: The table is the worst case result.

The peak radiated emission level is below the Average limit 54 dB $\mu$ V/m at 3 meter.

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