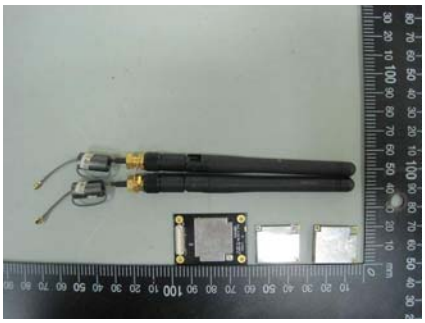
FCC EMC TEST REPORT

Applicant's company	**Z-Com, Inc.**
Applicant Address	5F,No.8 HSIN-ANN RD. HSINCHU SCIENCE PARK, HSINCHU, TAIWAN
Manufacturer's company	**Z-Com, Inc.**
Manufacturer Address	5F,No.8 HSIN-ANN RD. HSINCHU SCIENCE PARK, HSINCHU, TAIWAN

Product Name	IEEE 802.11g Wireless SDIO/SPI Module
Brand Name	ZCOM
Model Name	XG-182M/L/Z
Test Standard	47 CFR FCC Part 15 Subpart B
Classification of ITE	Class B
Received Date	Jan. 17, 2011
Final Test Date	Feb. 20, 2011
Submission Type	Class II Change
Multiple Listing and Class II change	Please refer to section 3.7



Statement

The test result in this report refers exclusively to the presented test model / sample.
Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart B**.
The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

Table of Contents

History of This Test Report

Original Issue Date: Feb. 24, 2011

Report No.: FR8O0312-03

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No.: CB10002110

1. CERTIFICATE OF COMPLIANCE

Product Name	:	IEEE 802.11g Wireless SDIO/SPI Module
Brand Name	:	ZCOM
Model Name	:	XG-182M/L/Z
Applicant	:	Z-Com, Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jan. 17, 2011 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Jordan Hsiao 2011.2.25

Jordan Hsiao
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
-	15.207	AC Power Line Conducted Emissions	Not Applicable	-
-	15.247(b)(3)	Maximum Conducted Output Power	Not Applicable	-
-	15.247(e)	Power Spectral Density	Not Applicable	-
-	15.247(a)(2)	6dB Spectrum Bandwidth	Not Applicable	-
4.1	15.247(d)	Radiated Emissions	Complies	3.92 dB
4.2	15.247(d)	Band Edge Emissions	Complies	5.55 dB
-	15.203	Antenna Requirements	Not Applicable	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	$\pm 8.5\times10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Power Type	From Host System
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11
Channel Band Width (99%)	11b: 14.28 MHz ; 11g: 16.48 MHz
Conducted Output Power	11b: 18.06 dBm ; 11g: 20.09 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

3.2. Accessories

Others
There is an antenna coaxial cable (model name RG-178) with a core in the end side. The core brand is King core (K5B RH 9*16*5).

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	AIRSTOTLE	RFA-25-C2M2	Dipole Antenna	Reversed-SMA	2.00

3.4. Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
Radiated Emissions 9kHz~1GHz	Normal Link	Auto	-	-
Radiated Emissions 1GHz~10th Harmonic	11b/BPSK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1
Band Edge Emissions	11b/BPSK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1

There are three types of EUT as below:

Mode 1: XG-182L+Antenna 1 with PC

Mode 2: XG-182M+Antenna 1 with PC

Mode 3: XG-182Z+Antenna 1 with Notebook

Due to internal circuit boards of XG-182L and XG-182M are exactly identical except whether with 50pin connector. After evaluating, only Mode 2 was selected and recorded the test data in the report.

<Radiated Emissions below 1GHz test>

Mode 2 and Mode 3 were recorded in the report.

<Radiated Emissions above 1GHz test>

Mode 2 and Mode 3 were recorded in the report.

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH01-CB	SAC	Hsin Chu	187376	IC 4086D	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

3.7. Table for Multiple Listing & Class II Change

The brand/model names in the following table are all refer to the identical product.

Brand Name	Model Name	Description
Z-COM	XG-182L	The module without 50pin connector.
	XG-182M	The module with 50pin connector.
	XG-182Z	Difference digital board designed.

This product is an extension of original one reported under Sporton project number: FR8O0312

Below is the table for the change of the product with respect to the original one.

Modifications	Description	Performance Checking
Add second source	Add second source	Radiated Emissions

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Keyboard	iCooky	SK068	DoC
LCD Monitor	HP	FW660AA	DoC
Mouse	iCooky	AMS0706W	DoC
Modem	ACEEX	DM1414	IFAXDM1414
Printer	EPSON	LQ-300+	DoC
PC	DELL	T3500	DoC
Wireless AP	Planex	GW-AP54SGX	DoC
Notebook	DELL	6400	E2KWM3945ABG

3.9. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters of IEEE 802.11b/g

Test Software Version	Arcadyan Mfg Utility		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	13	15	13
IEEE 802.11g	11	14	11

<For Test Mode 2>

An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating " H " pattern was used as the test software.

The program was executed as follows :

a. Turn on the power of all equipment.

b. The PC sends " H" messages to the monitor, and the monitor displays " H " patterns on the screen.

c. The PC sends " H " messages to the printer, then the printer prints them on the paper.

d. The PC sends " H " messages to the modem.

e. Repeat the steps from b to d.

At the same time, "Arcadyan Mfg Utility" was executed the test program to control the EUT continuously transmit RF signal.

<For Test Mode 3>

An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating " H " pattern was used as the test software.

The program was executed as follows :

a. Turn on the power of all equipment.

b. The NB sends " H" messages to the monitor, and the monitor displays " H " patterns on the screen.

c. The NB sends " H " messages to the modem.

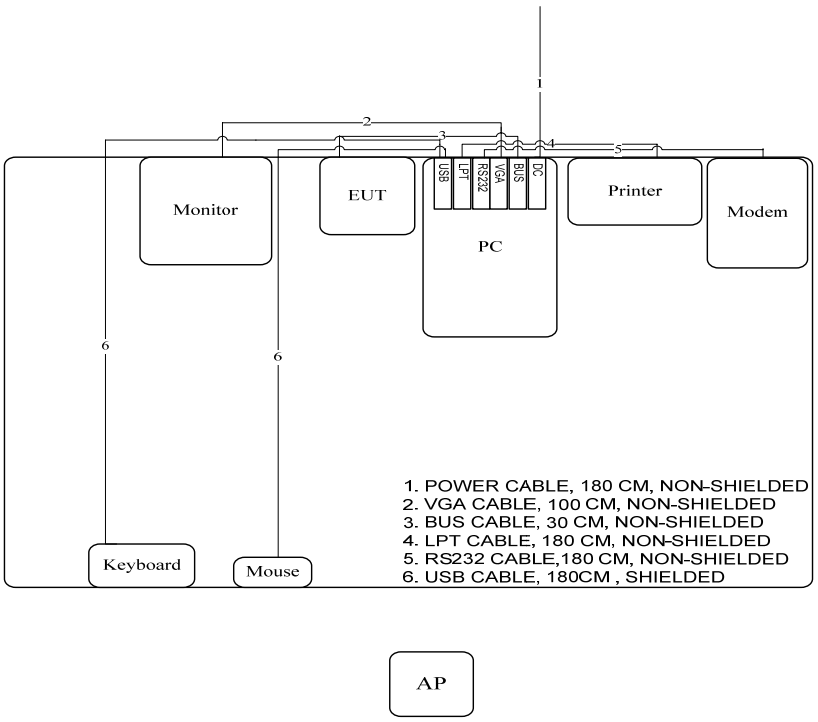
d. Repeat the steps from b to c.

At the same time, "Arcadyan Mfg Utility" was executed the test program to control the EUT continuously transmit RF signal.

3.10. Test Configurations

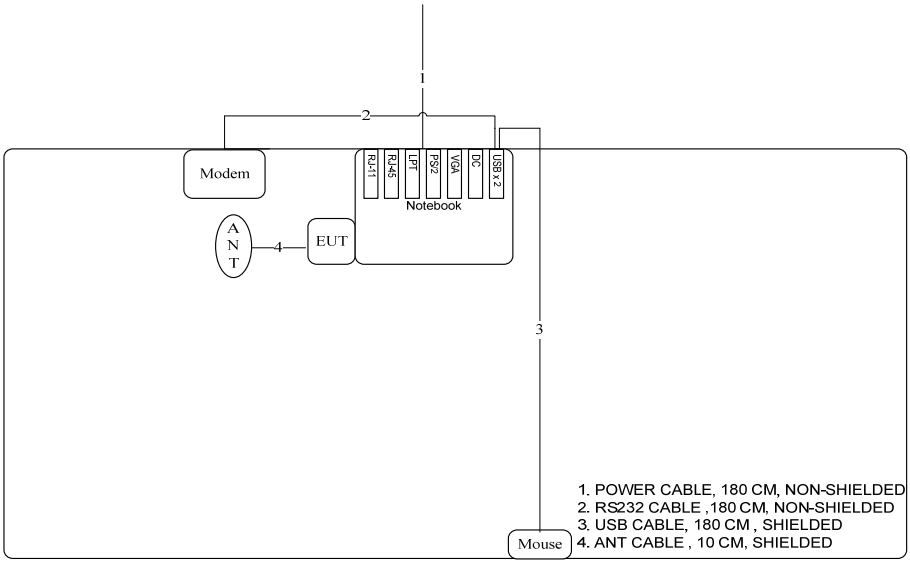
3.10.1. Radiation Emissions Test Configuration

Test Configuration: 9KHz~1GHz/ Mode 2



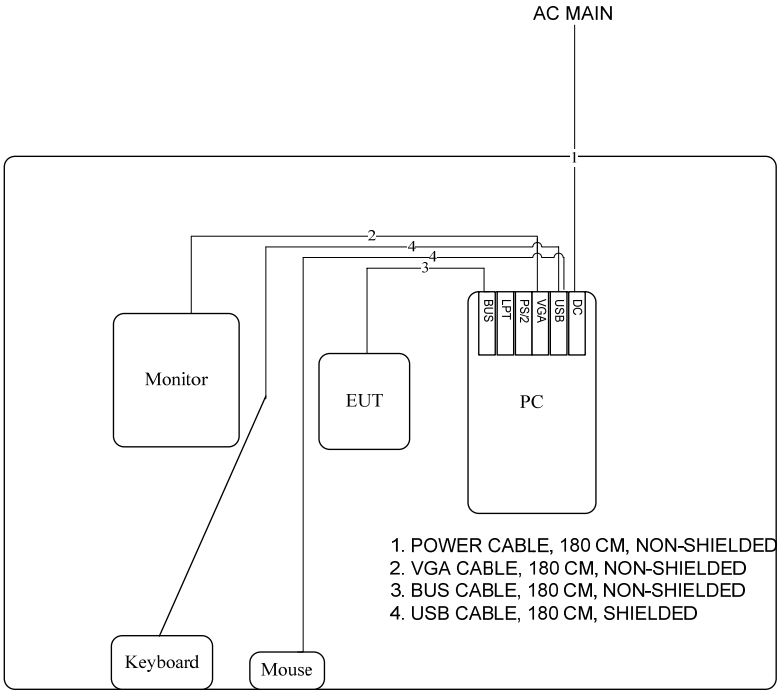
AP

Test Configuration: 9KHz~1GHz/ Mode 3

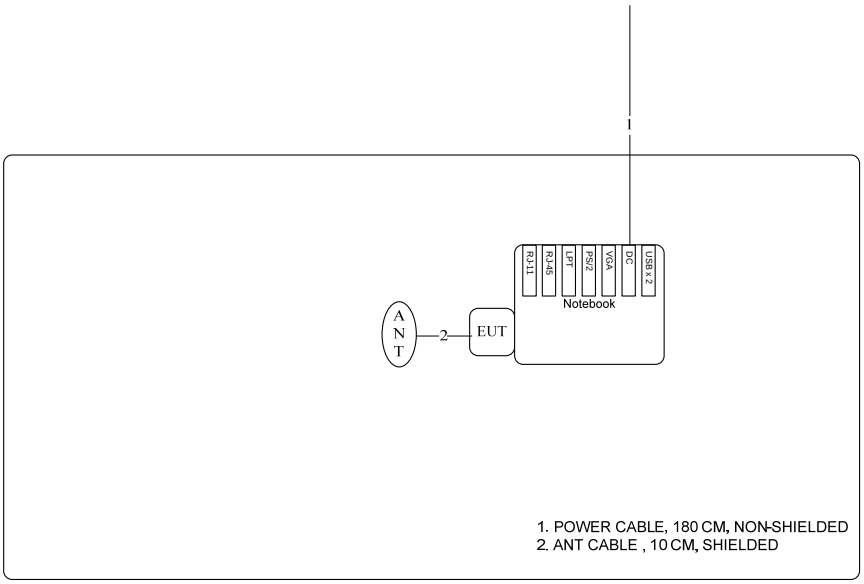


AP

Test Configuration: above 1GHz/ Mode 2



Test Configuration: above 1GHz/ Mode 3



4. TEST RESULT

4.1. Radiated Emissions Measurement

4.1.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.1.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100KHz / 100KHz for peak

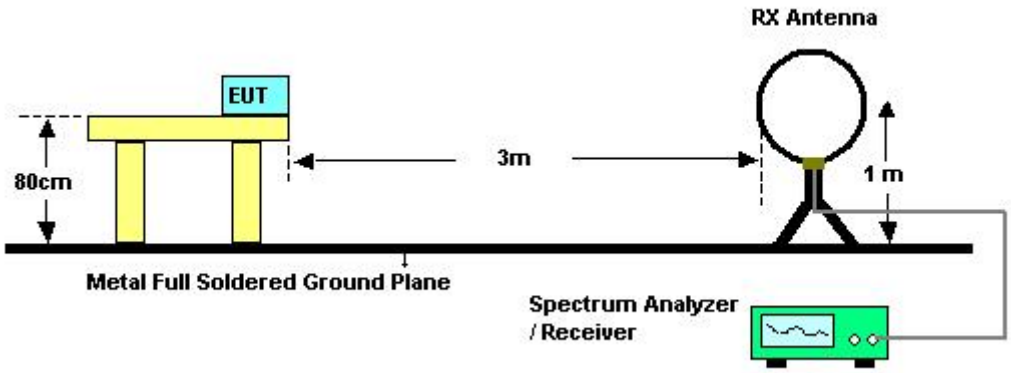
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.1.3. Test Procedures

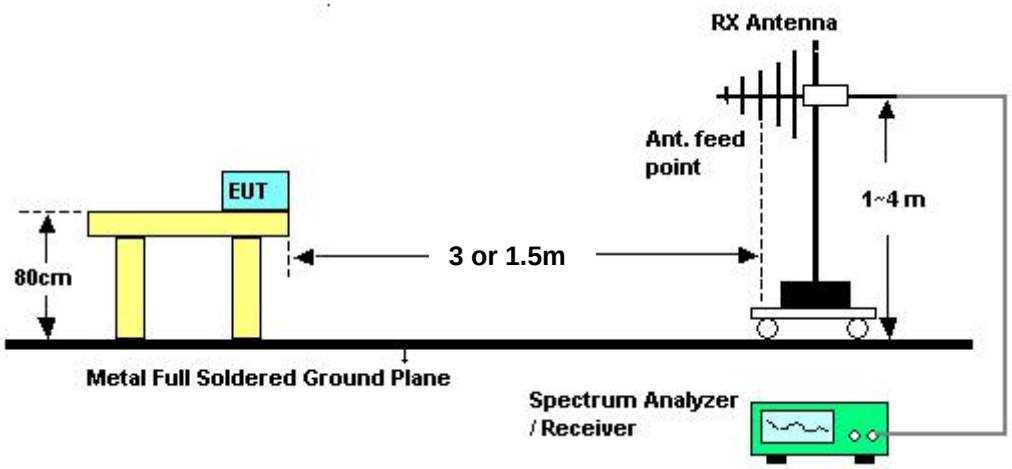
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.1.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	20°C	Humidity	62%
Test Engineer	Allen Liu		
Test Date	Feb. 11, 2011		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

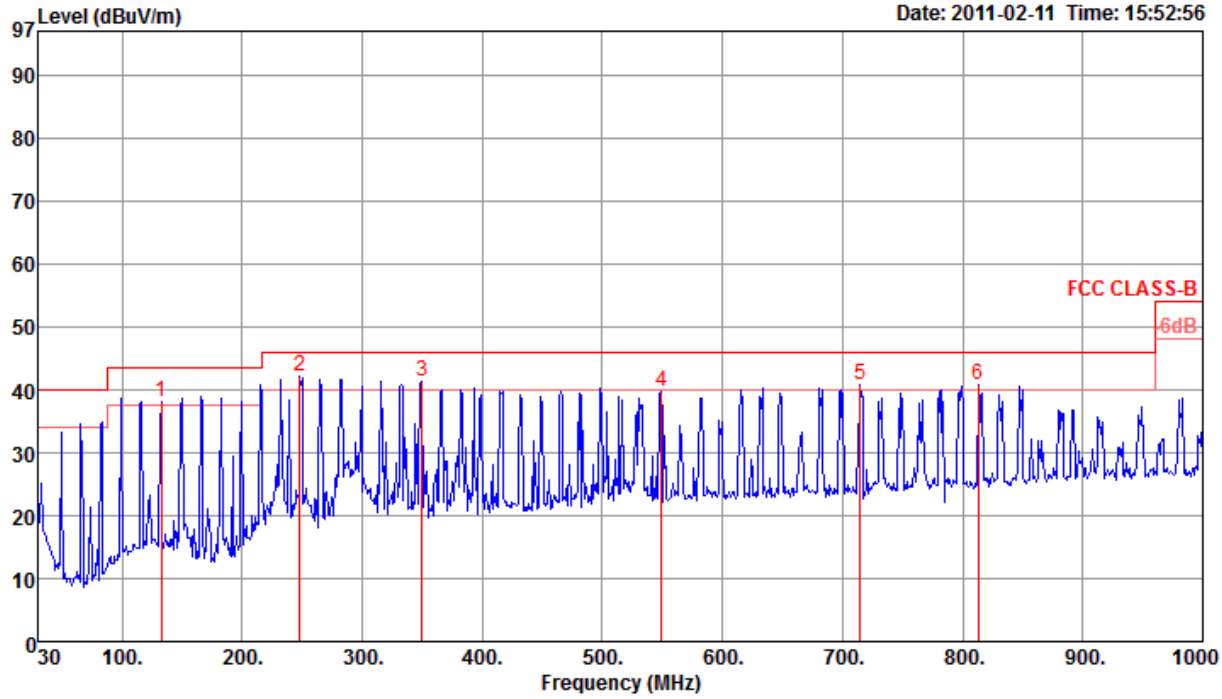
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

4.1.8. Results of Radiated Emissions (30MHz~1GHz)

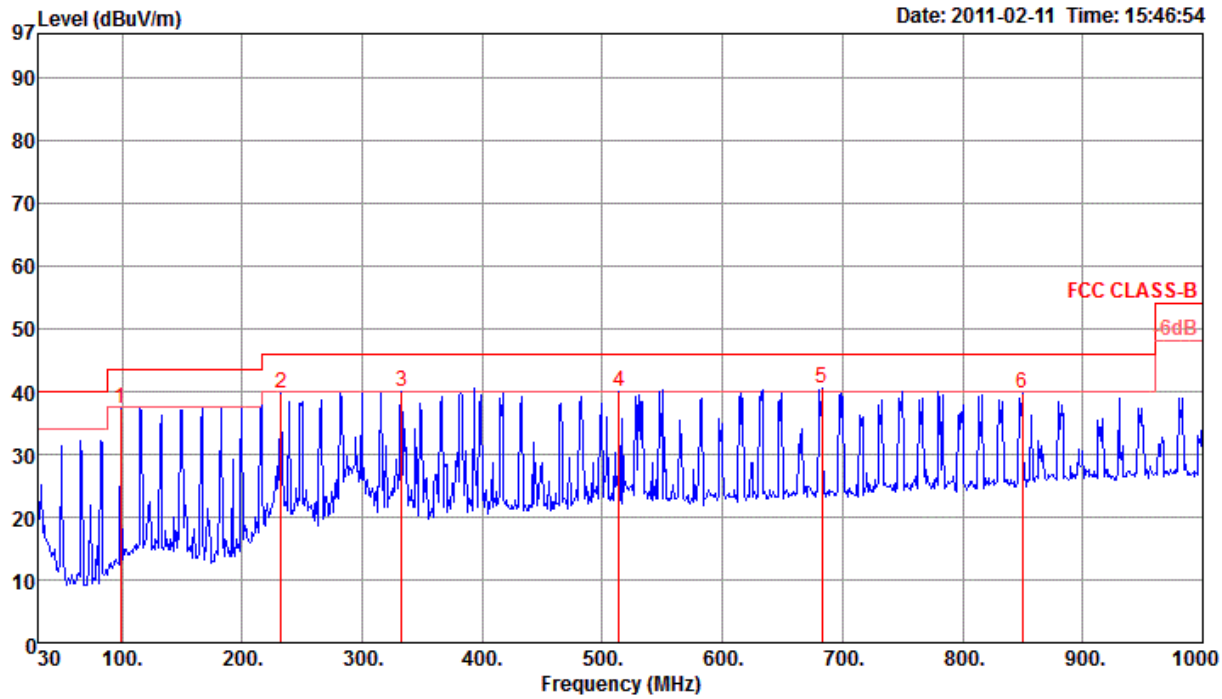
Temperature	20°C	Humidity	62%
Test Engineer	Allen Liu	Configurations	Normal Link/ Mode 2

Horizontal



		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1	!	132.82	38.07	43.50	-5.43	52.35	1.33	27.43	11.82	0	100	Peak	HORIZONTAL	0.0
2	p	248.25	42.08	46.00	-3.92	54.65	1.89	27.00	12.54	249	100	Peak	HORIZONTAL	0.0
3	!	350.10	41.26	46.00	-4.74	51.46	2.20	27.25	14.85	0	100	Peak	HORIZONTAL	0.0
4		548.95	39.71	46.00	-6.29	46.83	2.80	28.10	18.18	0	100	Peak	HORIZONTAL	0.0
5	!	714.82	40.68	46.00	-5.32	46.00	3.36	27.94	19.26	0	100	Peak	HORIZONTAL	0.0
6	!	812.79	40.70	46.00	-5.30	44.56	3.33	27.57	20.38	0	100	Peak	HORIZONTAL	0.0

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1	98.87	37.40	43.50	-6.10	53.22	1.18	27.61	10.61	0	400	Peak	VERTICAL	0.0
2	232.73	39.60	46.00	-6.40	53.26	1.83	27.03	11.54	0	400	Peak	VERTICAL	0.0
3	332.64	39.91	46.00	-6.09	50.49	2.17	27.12	14.37	0	400	Peak	VERTICAL	0.0
4	514.03	39.91	46.00	-6.09	47.53	2.73	28.10	17.75	0	400	Peak	VERTICAL	0.0
5 p	682.81	40.41	46.00	-5.59	46.02	3.37	28.02	19.04	143	100	Peak	VERTICAL	0.0
6	849.65	39.77	46.00	-6.23	43.15	3.40	27.50	20.72	0	400	Peak	VERTICAL	0.0

Note:

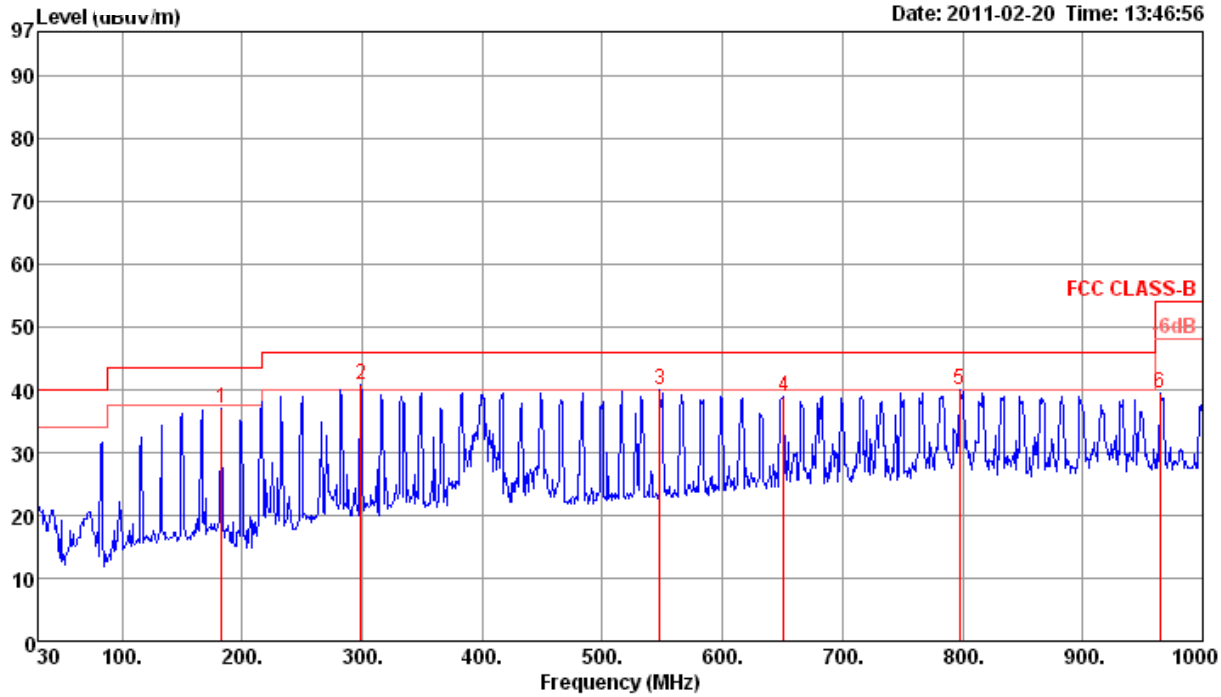
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

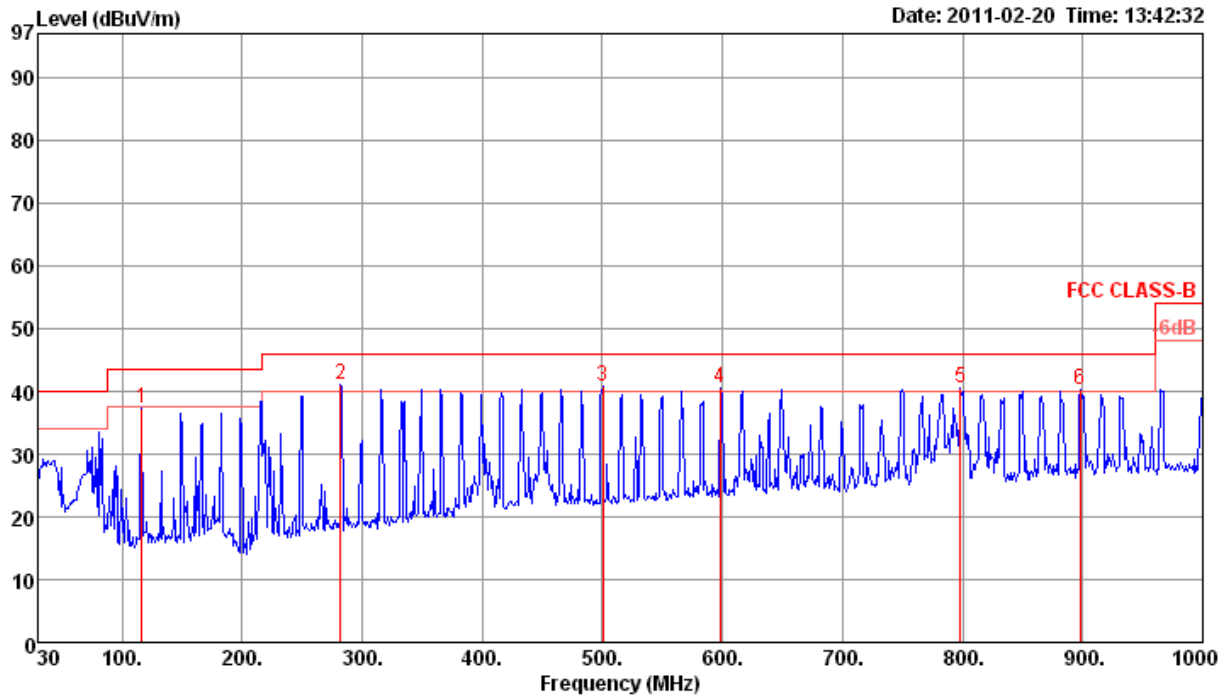
Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	Normal Link/ Mode 3

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	183.26	36.93	43.50	-6.57	49.96	1.62	27.18	12.53	0	100	Peak	HORIZONTAL
2 p	298.69	40.67	46.00	-5.33	52.12	2.10	26.90	13.35	0	100	Peak	HORIZONTAL
3 !	547.98	40.07	46.00	-5.93	47.20	2.80	28.10	18.17	0	100	Peak	HORIZONTAL
4	650.80	38.97	46.00	-7.03	44.59	3.50	28.05	18.93	0	100	Peak	HORIZONTAL
5 !	797.27	40.04	46.00	-5.96	44.59	3.31	27.61	19.75	0	100	Peak	HORIZONTAL
6	964.11	39.42	54.00	-14.58	41.91	3.63	27.14	21.02	0	100	Peak	HORIZONTAL

Vertical



		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1		116.33	37.29	43.50	-6.21	51.37	1.20	27.52	12.24	0	400	Peak	VERTICAL
2	p	282.20	40.94	46.00	-5.06	52.70	2.03	26.94	13.15	0	400	Peak	VERTICAL
3	!	500.45	40.80	46.00	-5.20	48.57	2.70	28.10	17.63	0	400	Peak	VERTICAL
4	!	598.42	40.59	46.00	-5.41	47.04	2.90	28.10	18.75	0	400	Peak	VERTICAL
5	!	798.24	40.45	46.00	-5.55	44.99	3.31	27.61	19.76	0	400	Peak	VERTICAL
6	!	898.15	40.38	46.00	-5.62	43.67	3.59	27.40	20.52	0	400	Peak	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.1.9. Results for Radiated Emissions (1GHz~10th Harmonic)

Temperature	20°C	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11b CH 1/ Mode 2
Test Date	Feb. 09, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 a	4823.87	31.74	54.00	-22.26	29.29	4.26	35.20	33.39	360	100	Average	HORIZONTAL
2 p	4824.95	44.02	74.00	-29.98	41.57	4.26	35.20	33.39	360	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4824.00	44.47	74.00	-29.53	42.02	4.26	35.20	33.39	131	100	Peak	VERTICAL
2 a	4824.16	32.11	54.00	-21.89	29.66	4.26	35.20	33.39	131	100	Average	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11b CH 6/ Mode 2
Test Date	Feb. 09, 2011		

Horizontal

		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1		4874.48	44.79	74.00	-29.21	42.18	4.33	35.20	33.48	236	100	Peak	HORIZONTAL
2		4874.94	31.91	54.00	-22.09	29.30	4.33	35.20	33.48	236	100	Average	HORIZONTAL
3	p	7310.36	48.25	74.00	-25.75	41.81	5.36	35.43	36.51	11	118	Peak	HORIZONTAL
4	a	7311.84	36.79	54.00	-17.21	30.34	5.37	35.43	36.51	11	118	Average	HORIZONTAL

Vertical

		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1		4874.02	33.06	54.00	-20.94	30.45	4.33	35.20	33.48	0	100	Average	VERTICAL
2		4874.11	44.96	74.00	-29.04	42.35	4.33	35.20	33.48	0	100	Peak	VERTICAL
3	p	7309.54	48.30	74.00	-25.70	41.86	5.36	35.43	36.51	330	105	Peak	VERTICAL
4	a	7310.32	36.52	54.00	-17.48	30.08	5.36	35.43	36.51	330	105	Average	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11b CH 11/ Mode 2
Test Date	Feb. 09, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4923.14	44.84	74.00	-29.16	42.07	4.39	35.20	33.58	2	100	Peak	HORIZONTAL
2 a	4924.40	31.48	54.00	-22.52	28.71	4.39	35.20	33.58	2	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4923.23	44.07	74.00	-29.93	41.30	4.39	35.20	33.58	357	100	Peak	VERTICAL
2 a	4924.08	31.60	54.00	-22.40	28.83	4.39	35.20	33.58	357	100	Average	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11g CH 1/ Mode 2
Test Date	Feb. 09, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 a	4823.26	31.67	54.00	-22.33	29.22	4.26	35.20	33.39	357	100	Average	HORIZONTAL
2 p	4824.28	44.19	74.00	-29.81	41.74	4.26	35.20	33.39	357	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 a	4823.17	31.79	54.00	-22.21	29.34	4.26	35.20	33.39	6	100	Average	VERTICAL
2 p	4824.90	43.26	74.00	-30.74	40.81	4.26	35.20	33.39	6	100	Peak	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11g CH 6/ Mode 2
Test Date	Feb. 09, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	4874.01	45.16	74.00	-28.84	42.55	4.33	35.20	33.48	129	100	Peak	HORIZONTAL
2	4874.94	31.95	54.00	-22.05	29.34	4.33	35.20	33.48	129	100	Average	HORIZONTAL
3 a	7310.46	35.21	54.00	-18.79	28.77	5.36	35.43	36.51	315	100	Average	HORIZONTAL
4 p	7311.74	47.37	74.00	-26.63	40.92	5.37	35.43	36.51	315	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	4874.74	43.86	74.00	-30.14	41.25	4.33	35.20	33.48	343	100	Peak	VERTICAL
2	4874.84	31.67	54.00	-22.33	29.06	4.33	35.20	33.48	343	100	Average	VERTICAL
3 p	7310.14	49.03	74.00	-24.97	42.59	5.36	35.43	36.51	97	100	Peak	VERTICAL
4 a	7310.62	35.79	54.00	-18.21	29.35	5.36	35.43	36.51	97	100	Average	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11g CH 11/ Mode 2
Test Date	Feb. 09, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 a	4923.41	31.50	54.00	-22.50	28.73	4.39	35.20	33.58	162	100	Average	HORIZONTAL
2 p	4923.64	44.79	74.00	-29.21	42.02	4.39	35.20	33.58	162	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4923.53	44.49	74.00	-29.51	41.72	4.39	35.20	33.58	314	100	Peak	VERTICAL
2 a	4924.05	31.34	54.00	-22.66	28.57	4.39	35.20	33.58	314	100	Average	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11b CH 1/ Mode 3
Test Date	Feb. 20, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4823.92	43.63	74.00	-30.37	41.18	4.26	35.20	33.39	159	100	Peak	HORIZONTAL
2 a	4824.00	30.93	54.00	-23.07	28.48	4.26	35.20	33.39	159	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4823.95	45.34	74.00	-28.66	42.89	4.26	35.20	33.39	355	100	Peak	VERTICAL
2 a	4824.00	35.16	54.00	-18.84	32.71	4.26	35.20	33.39	355	100	Average	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11b CH 6/ Mode 3
Test Date	Feb. 20, 2011		

Horizontal

		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	a	4874.00	39.11	54.00	-14.89	36.50	4.33	35.20	33.48	208	104	Average	HORIZONTAL
2	p	4874.12	46.93	74.00	-27.07	44.32	4.33	35.20	33.48	208	104	Peak	HORIZONTAL

Vertical

		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	a	4874.00	37.99	54.00	-16.01	35.38	4.33	35.20	33.48	3	100	Average	VERTICAL
2	p	4874.03	46.21	74.00	-27.79	43.60	4.33	35.20	33.48	3	100	Peak	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11b CH 11/ Mode 3
Test Date	Feb. 20, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4923.88	46.29	74.00	-27.71	43.52	4.39	35.20	33.58	202	105	Peak	HORIZONTAL
2 a	4924.03	37.79	54.00	-16.21	35.02	4.39	35.20	33.58	202	105	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4923.90	46.38	74.00	-27.62	43.61	4.39	35.20	33.58	45	100	Peak	VERTICAL
2 a	4924.01	37.94	54.00	-16.06	35.17	4.39	35.20	33.58	45	100	Average	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11g CH 1/ Mode 3
Test Date	Feb. 20, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4823.68	42.76	74.00	-31.24	40.31	4.26	35.20	33.39	111	100	Peak	HORIZONTAL
2 a	4824.20	30.48	54.00	-23.52	28.03	4.26	35.20	33.39	111	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4823.28	42.09	74.00	-31.91	39.64	4.26	35.20	33.39	348	100	Peak	VERTICAL
2 a	4823.96	30.76	54.00	-23.24	28.31	4.26	35.20	33.39	348	100	Average	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11g CH 6/ Mode 3
Test Date	Feb. 20, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4874.32	42.71	74.00	-31.29	40.10	4.33	35.20	33.48	42	100	Peak	HORIZONTAL
2 a	4874.36	30.36	54.00	-23.64	27.75	4.33	35.20	33.48	42	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 a	4874.04	30.34	54.00	-23.66	27.73	4.33	35.20	33.48	295	104	Average	VERTICAL
2 p	4874.52	43.16	74.00	-30.84	40.55	4.33	35.20	33.48	295	100	Peak	VERTICAL

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11g CH 11/ Mode 3
Test Date	Feb. 20, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 a	4923.48	31.33	54.00	-22.67	28.56	4.39	35.20	33.58	264	100	Average	HORIZONTAL
2 p	4924.24	41.14	74.00	-32.86	38.37	4.39	35.20	33.58	264	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	4923.88	41.48	74.00	-32.52	38.71	4.39	35.20	33.58	102	100	Peak	VERTICAL
2 a	4924.04	31.31	54.00	-22.69	28.54	4.39	35.20	33.58	102	100	Average	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.2. Band Edge Emissions Measurement

4.2.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.2.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100 KHz /100 KHz for Peak

4.2.3. Test Procedures

1. The test procedure is the same as section 4.5.3, only the frequency range investigated is limited to 100MHz around bandedges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

4.2.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Band Edge and Fundamental Emissions

Temperature	20°C	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11b CH 1, 6, 11/ Mode 2
Test Date	Feb. 09, 2011		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	Cm		
1	2320.80	57.17	74.00	-16.83	26.45	2.83	0.00	27.89	39	146	Peak	VERTICAL
2	2323.20	47.08	54.00	-6.92	16.36	2.83	0.00	27.89	39	146	Average	VERTICAL
3 p	2413.20	102.39	74.00			2.88	0.00	28.09	39	146	Peak	VERTICAL
4 a	2413.60	98.69	54.00			2.88	0.00	28.09	39	146	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	Cm		
1	2347.60	59.67	74.00	-14.33	28.89	2.85	0.00	27.93	295	130	Peak	VERTICAL
2 !	2349.20	48.18	54.00	-5.82	17.36	2.85	0.00	27.97	295	130	Average	VERTICAL
3 a	2435.40	101.41	54.00			2.89	0.00	28.18	295	130	Average	VERTICAL
4 p	2436.20	105.02	74.00			2.89	0.00	28.18	295	130	Peak	VERTICAL
5	2483.50	45.01	54.00	-8.99	13.82	2.93	0.00	28.26	295	130	Average	VERTICAL
6	2490.30	55.87	74.00	-18.13	24.64	2.93	0.00	28.30	295	130	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	Cm		
1 !	2373.00	48.10	54.00	-5.90	17.23	2.86	0.00	28.01	44	155	Average	VERTICAL
2	2376.00	58.43	74.00	-15.57	27.56	2.86	0.00	28.01	44	155	Peak	VERTICAL
3 a	2460.40	98.38	54.00			2.91	0.00	28.22	44	155	Average	VERTICAL
4 p	2461.20	102.07	74.00			2.91	0.00	28.22	44	155	Peak	VERTICAL
5	2483.50	44.44	54.00	-9.56	13.25	2.93	0.00	28.26	44	155	Average	VERTICAL
6	2494.30	55.11	74.00	-18.89	23.87	2.94	0.00	28.30	44	155	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2462 MHz.

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11g CH 1, 6, 11/ Mode 2
Test Date	Feb. 09, 2011		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	2390.00	58.15	74.00	-15.85	27.22	2.88	0.00	28.05	47	153	Peak	VERTICAL
2	2390.00	46.41	54.00	-7.59	15.48	2.88	0.00	28.05	47	153	Average	VERTICAL
3 a	2413.80	93.30	54.00			2.88	0.00	28.09	47	153	Average	VERTICAL
4 p	2416.20	102.71	74.00			2.89	0.00	28.09	47	153	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	2384.80	47.51	54.00	-6.49	16.60	2.86	0.00	28.05	46	151	Average	VERTICAL
2	2390.00	59.12	74.00	-14.88	28.19	2.88	0.00	28.05	46	151	Peak	VERTICAL
3 a	2430.20	94.47	54.00			2.89	0.00	28.13	46	151	Average	VERTICAL
4 p	2431.00	103.66	74.00			2.89	0.00	28.13	46	151	Peak	VERTICAL
5	2483.50	45.27	54.00	-8.73	14.08	2.93	0.00	28.26	46	46	Average	VERTICAL
6	2485.50	56.60	74.00	-17.40	25.37	2.93	0.00	28.30	46	151	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 a	2455.00	91.47	54.00			2.91	0.00	28.22	151	131	Average	VERTICAL
2 p	2455.40	101.29	74.00			2.91	0.00	28.22	151	131	Peak	VERTICAL
3	2483.50	45.56	54.00	-8.44	14.37	2.93	0.00	28.26	151	131	Average	VERTICAL
4	2485.10	56.22	74.00	-17.78	24.99	2.93	0.00	28.30	151	131	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11b CH 1, 6, 11/ Mode 3
Test Date	Feb. 20, 2011		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	2389.00	55.43	74.00	-18.57	24.52	2.86	0.00	28.05	80	100	Peak	VERTICAL
2	2390.00	44.59	54.00	-9.41	13.66	2.88	0.00	28.05	80	100	Average	VERTICAL
3 p	2413.00	103.95	74.00			2.88	0.00	28.09	80	100	Peak	VERTICAL
4 a	2413.80	100.20	54.00			2.88	0.00	28.09	80	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	2390.00	57.57	74.00	-16.43	26.64	2.88	0.00	28.05	208	100	Peak	VERTICAL
2	2390.00	46.06	54.00	-7.94	15.13	2.88	0.00	28.05	208	100	Average	VERTICAL
3 p	2438.00	105.51	74.00			2.89	0.00	28.18	208	100	Peak	VERTICAL
4 a	2438.80	102.01	54.00			2.89	0.00	28.18	208	100	Average	VERTICAL
5	2483.50	45.41	54.00	-8.59	14.22	2.93	0.00	28.26	208	100	Average	VERTICAL
6	2484.10	56.91	74.00	-17.09	25.72	2.93	0.00	28.26	208	100	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	2463.00	104.04	74.00			2.91	0.00	28.22	214	100	Peak	VERTICAL
2 a	2463.80	100.46	54.00			2.91	0.00	28.22	214	100	Average	VERTICAL
3	2483.50	55.62	74.00	-18.38	24.43	2.93	0.00	28.26	214	100	Peak	VERTICAL
4	2483.50	46.19	54.00	-7.81	15.00	2.93	0.00	28.26	214	100	Average	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	20℃	Humidity	62%
Test Engineer	Allen Liu	Configurations	802.11g CH 1, 6, 11/ Mode 3
Test Date	Feb. 20, 2011		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	2390.00	60.01	74.00	-13.99	29.08	2.88	0.00	28.05	97	100	Peak	VERTICAL
2	2390.00	46.20	54.00	-7.80	15.27	2.88	0.00	28.05	97	100	Average	VERTICAL
3 p	2405.40	102.73	74.00			2.88	0.00	28.09	97	100	Peak	VERTICAL
4 a	2417.60	93.29	54.00			2.89	0.00	28.13	97	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	2389.60	57.23	74.00	-16.77	26.32	2.86	0.00	28.05	210	100	Peak	VERTICAL
2	2390.00	45.49	54.00	-8.51	14.56	2.88	0.00	28.05	210	100	Average	VERTICAL
3 a	2443.40	94.02	54.00			2.91	0.00	28.18	210	100	Average	VERTICAL
4 p	2443.60	103.13	74.00			2.91	0.00	28.18	210	100	Peak	VERTICAL
5	2483.50	55.26	74.00	-18.74	24.07	2.93	0.00	28.26	210	100	Peak	VERTICAL
6	2483.50	45.62	54.00	-8.38	14.43	2.93	0.00	28.26	210	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	2466.60	103.77	74.00			2.93	0.00	28.22	214	100	Peak	VERTICAL
2 a	2468.80	94.82	54.00			2.93	0.00	28.26	214	100	Average	VERTICAL
3	2483.50	64.92	74.00	-9.08	33.73	2.93	0.00	28.26	214	100	Peak	VERTICAL
4 !	2483.50	48.45	54.00	-5.55	17.26	2.93	0.00	28.26	214	100	Average	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.3. Antenna Requirements

4.3.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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 the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.3.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Oct. 17, 2010	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 13, 2010	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Oct. 08, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 06, 2010	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP	100304	9kHz ~ 40GHz	Nov. 06, 2010	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 06, 2010	Radiation (03CH01-CB)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Sep. 09, 2010*	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N/A	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N/A	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	-	30 MHz - 1 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Radiation (03CH01-CB)

Note: Calibration Interval of instruments listed above is one year.

Note: *Calibration Interval of instruments listed above is two year.

6. TEST LOCATION

SHIJR	ADD	:	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL	:	886-2-2696-2468
	FAX	:	886-2-2696-2255
HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	:	886-3-327-3456
	FAX	:	886-3-318-0055
LINKOU	ADD	:	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL	:	886-2-2601-1640
	FAX	:	886-2-2601-1695
DUNGHU	ADD	:	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL	:	886-2-2631-4739
	FAX	:	886-2-2631-9740
JUNGHE	ADD	:	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL	:	886-2-8227-2020
	FAX	:	886-2-8227-2626
NEIHU	ADD	:	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

7. TAF CERTIFICATE OF ACCREDITATION

Certificate No. : L1190-091230

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : December 30, 2009

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The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix