

# FCC EMC TEST REPORT CERTIFICATE

according to

47 CFR FCC Part 15 Subpart B

**Equipment** : **Wireless Cable Gateway**  
**Model No.** : **CGX24N v2 , X=D or E or Blank**  
**Brand Name** : **NETGEAR**  
**Filing Type** : **New Application**  
**Applicant** : **NETGEAR Inc.**  
350 East Plumeria Drive, San Jose, CA 95134, USA  
**FCC ID** : **PY309400126**  
**Manufacturer** : **MAINTEK COMPUTER**  
233 Jinfeng Rd., Suzhou, Jiangsu, PRC  
**Received Date** : Aug. 26, 2009  
**Final Test Date** : Oct. 17, 2009

## 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.



**SPORTON International Inc.**

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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# CERTIFICATE OF COMPLIANCE

## CERTIFICATE

according to

47 CFR FCC Part 15 Subpart B

Equipment : Wireless Cable Gateway  
Model No. : CGX24N v2 , X=D or E or Blank  
Brand Name : NETGEAR  
Applicant : NETGEAR Inc.

350 East Plumeria Drive, San Jose, CA 95134, USA

### WE HEREBY CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4-2003 and the energy emitted by this equipment were passed 47 CFR FCC Part 15 Subpart B. Testing was carried out on Oct. 17, 2009 at SPORTON International Inc. LAB.



Wayne Hsu

**SPORTON International Inc.**

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

**1 SUMMARY OF THE TEST RESULT**

<b>Applied Standard: 47 CFR FCC Part 15 Subpart B</b>				
<b>Part</b>	<b>Rule Section</b>	<b>Description of Test</b>	<b>Result</b>	<b>Under Limit</b>
3.1	15.107	AC Power Line Conducted Emissions	Complies	3.63 dB
3.2	15.109	Radiated Emissions	Complies	4.81 dB

<b>Test Items</b>	<b>Uncertainty</b>	<b>Remark</b>
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Radiated Emissions	±1.9dB	Confidence levels of 95%

## 2 GENERAL INFORMATION

### 2.1 Product Details

The detail of EUT is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 2.2 Accessories

Power	Brand	Model	Rating
Adapter 1	NETGEAR	MT12-Y120100-A1	INPUT : 100-240V~60Hz 0.3A OUTPUT : 12V 1A
Adapter 2	NETGEAR	T012LF1209 16100-2LF	INPUT : 100-120V~50/60Hz 0.5A OUTPUT : 12V 1A

### 2.3 Table for Filed Antenna

#### Antenna & Bandwidth

Antenna	Single (TX)		Two (TX)	
	20 MHz	40 MHz	20 MHz	40 MHz
Bandwidth Mode				
802.11b	V	X	X	X
802.11g	V	X	X	X
802.11n (2.4GHz)	V	V	V	V

Ant.	Antenna Type	Connector	Gain (dBi)	Remark
A	PCB Antenna	U.FL	3.57	TX / RX
B	PCB Antenna	U.FL	1.80	TX / RX

**Note: The antennas are 2T2R spatial Multiplexing MIMO configuration.**

IEEE 802.11n Modulation Scheme

MCS Index	Nss	Modulation	R	NBPS	NCBPS		NDBPS		Data rate(Mbps)			
					800nsGI		20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
					20MHz	40MHz						
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5		
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0		
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5		
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0		
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0		
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0		
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5		
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0		
8	2	BPSK	1/2	1	104	216	52	108	13.0	27.0		
9	2	QPSK	1/2	2	208	432	104	216	26.0	54.0		
10	2	QPSK	3/4	2	208	432	156	324	39.0	81.0		
11	2	16-QAM	1/2	4	416	864	208	432	52.0	108.0		
12	2	16-QAM	3/4	4	416	864	312	648	78.0	162.0		
13	2	64-QAM	2/3	6	624	1296	416	864	104.0	216.0		
14	2	64-QAM	3/4	6	624	1296	468	972	117.0	243.0		
15	2	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0		

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPS	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

2.4 Table for Test Modes

Investigation has been done on the entire possible Configuration for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode
AC Power Line Conducted Emissions	Mode 1 / Mode 2
Radiated Emissions (30MHz~1GHz)	Mode 1 / Mode 2
Radiated Emissions (1GHz~5th harmonic of highest frequency)	CRX 802.11g CH 6 / CRX 802.11n CH 6 (20MHz) / CRX 802.11n CH 6 (40MHz)

Note:

For all test, the following modes were tested:

Mode 1. Adapter Mode (model: MT12-Y120100-A1)

Mode 2. Adapter Mode (model: T012LF1209. 16100-2LF)

**2.5 Table for Testing Locations**

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.
CO01-LK	Conduction	Lin Kou	643075	IC 4086C
03CH02-HY	SAC	Hwa Ya	643075	IC 4086B

Semi Anechoic Chamber (SAC).

**2.6 Table for Supporting Units**

Support Unit	Brand	Model	FCC ID	Remark
P.C.	Hp Compaq	D330uT	DoC	Conducted
LCD Monitor	DELL	E198WFPF	DoC	
Keyboard (PS/2)	HP	KB-0133	DoC	
Mouse (PS/2)	HP	M-S69	NZ211443	
Printer	HP	C2642A	B94C2642X	
Modem	ACEEX	DM1414	IFAXDM1414	
Central Office (Remote Workstation)	Arris	DC1006	N/A	
P.C. (Remote Workstation)	ASUS	CT5430	N/A	
LCD Monitor (Remote Workstation)	DELL	E198WFPF	DoC	
Keyboard (PS/2) (Remote Workstation)	HP	KB-0133	DoC	
Mouse (PS/2) (Remote Workstation)	HP	M-S69	NZ211443	
USB 2.0 WAN Card (Remote Workstation)	Abocom	WUG2700	N/A	
P.C.	HP COMPAQ	D330out	DoC	Radiated
Modem	ACEEX	DM1414	IFAXDM1414	
Mouse (PS/2)	HP	M-S69	DoC	
Keyboard (PS/2)	HP	KB-0133	DoC	
Printer	EPSON	LQ-680	DoC	
LCD Monitor	DELL	E198WFPF	DoC	



## 2.7 EUT Operation during Test

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

### For Conducted Emissions test

The program was executed as follows :

- a. Turn on the power of all equipment.
- b. The PC reads the test program from the hard disk drive and runs it.
- c. The PC sends "H" messages to the monitor, and the monitor displays "H" patterns on the screen.
- d. The PC sends "H" messages to the printer, and then the printer prints them on the paper.
- e. The PC sends messages to the modem.
- f. The PC sends "H" messages to the internal hard disk, and the hard disk reads and writes the message.
- g. Repeat the steps from c to f.

At the same time, the following programs were executed:

- The telephones mutual dial "001" and "002".
- The PC executed "Network Register 3.0", "CallAgent" and "tftpd32\_3" at remote workstation to link with EUT and PC at remote workstation to transmission data via CO by coaxial cable.
- Executed "Ping" to link with the remote workstation to receive and transmit data via WLAN.

### For Radiated Emissions test

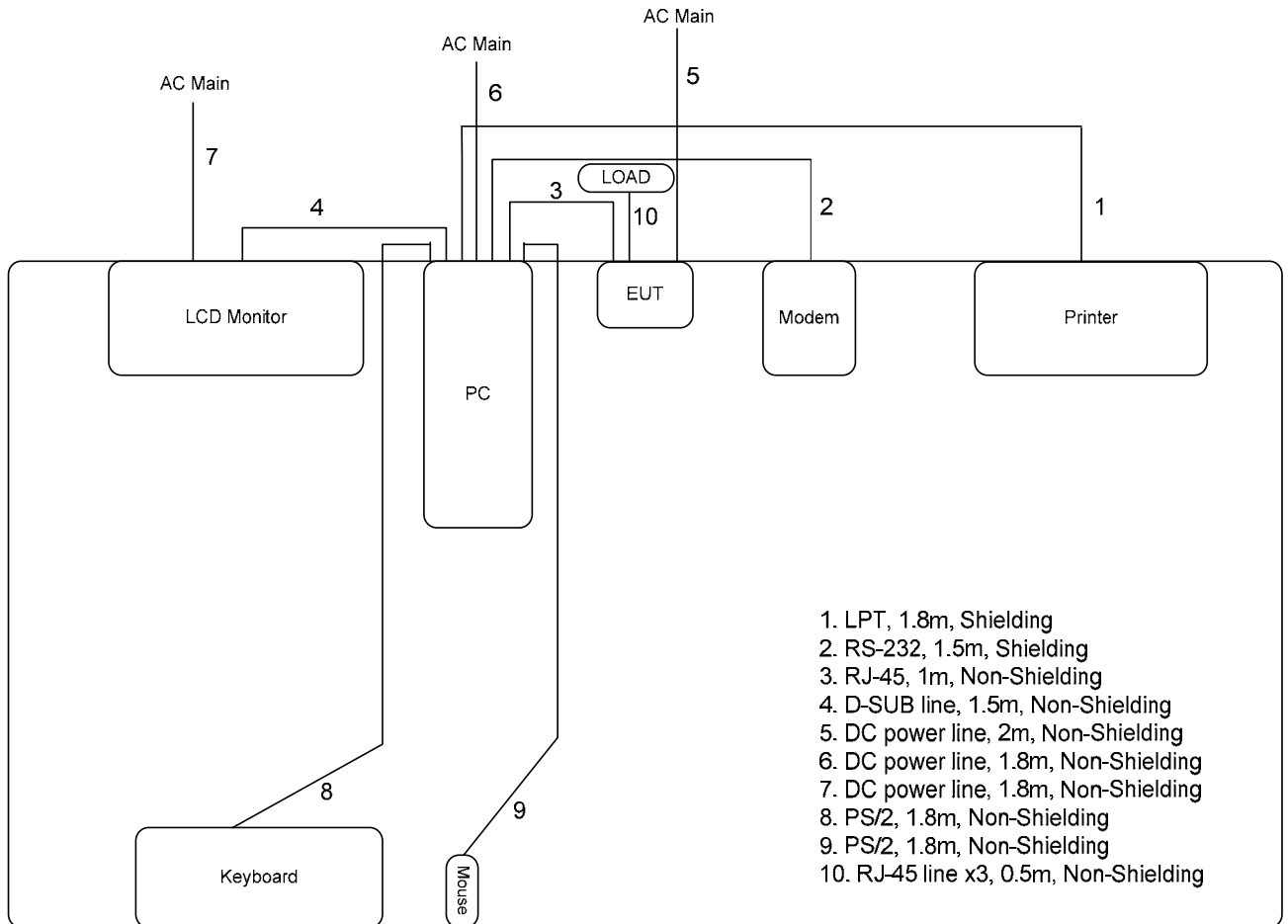
- a. The NB sends "H" messages to the panel, and the panel displays "H" patterns on the screen.
- b. The PC sends messages to the modem.

At the same time, the following programs were executed:

- Executed "Ping" to link with the remote workstation to receive and transmit data via WLAN.

## 2.8 Test Configuration

### 2.8.1 Radiation Emissions Test Configuration



### 3 TEST RESULT

#### 3.1 AC Power Line Conducted Emissions Measurement

##### 3.1.1 Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

**Class B**

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

##### 3.1.2 Measuring Instruments and Setting

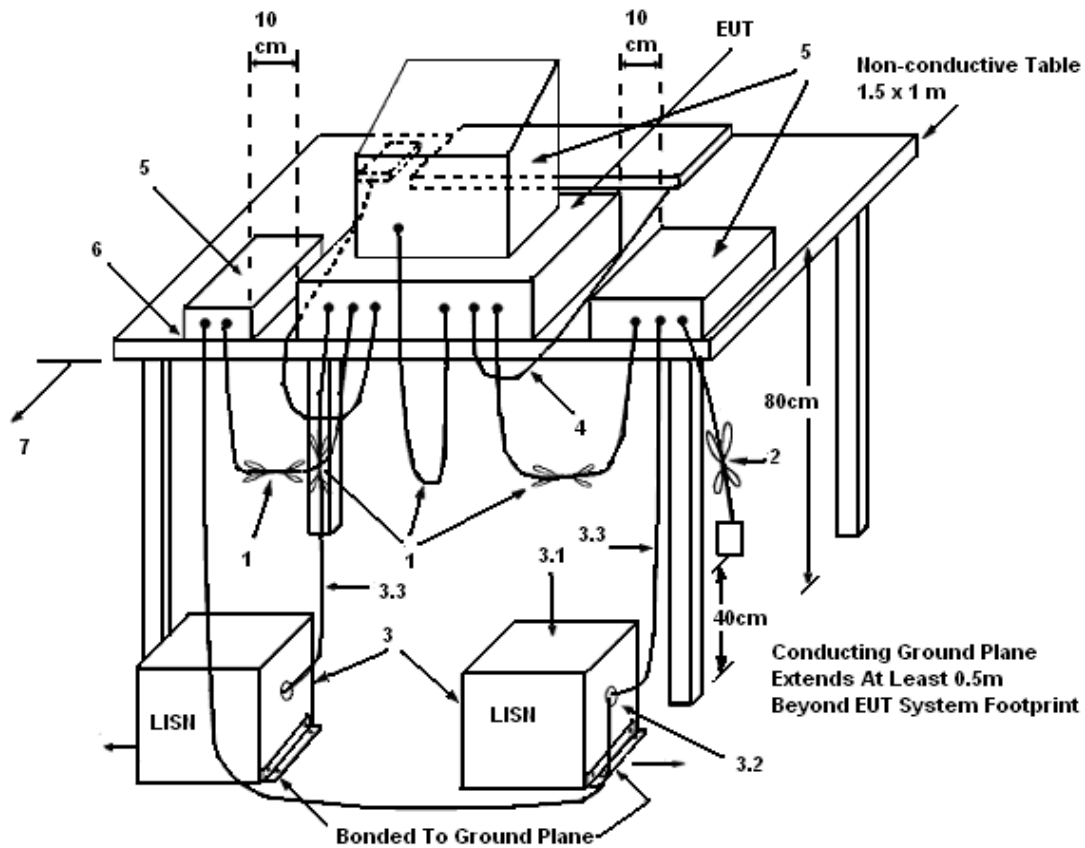
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

##### 3.1.3 Test Procedures

1. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

**3.1.4 Test Setup Layout**



**LEGEND:**

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.
- (3.1) All other equipment powered from additional LISN(s).
- (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
- (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

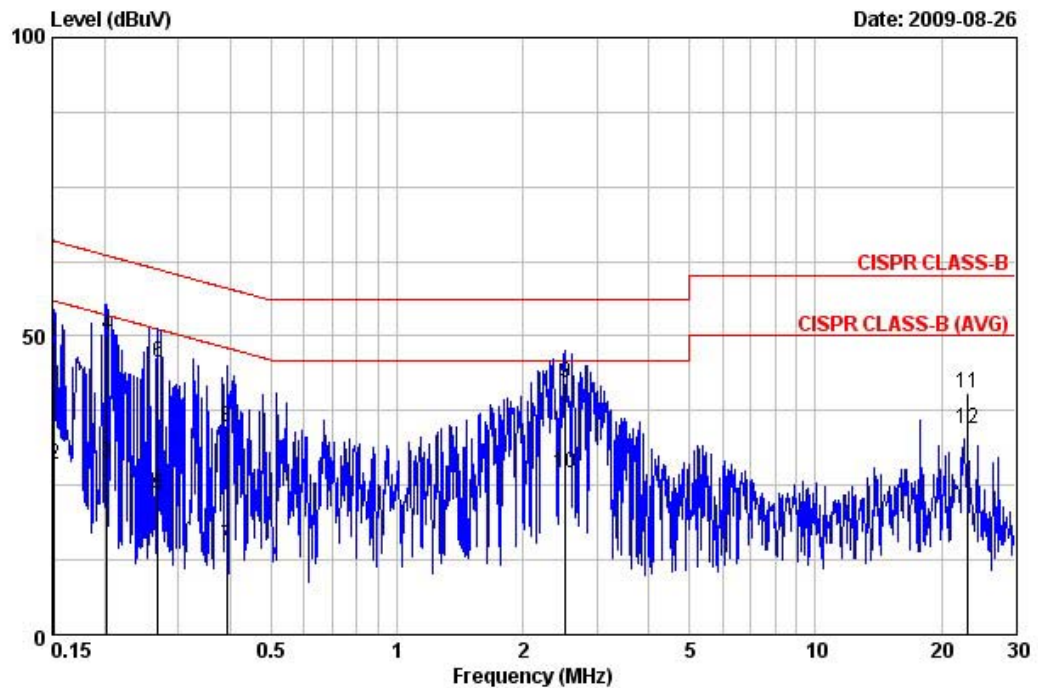
3.1.5 Test Deviation

There is no deviation with the original standard.

3.1.6 Results of AC Power Line Conducted Emissions Measurement

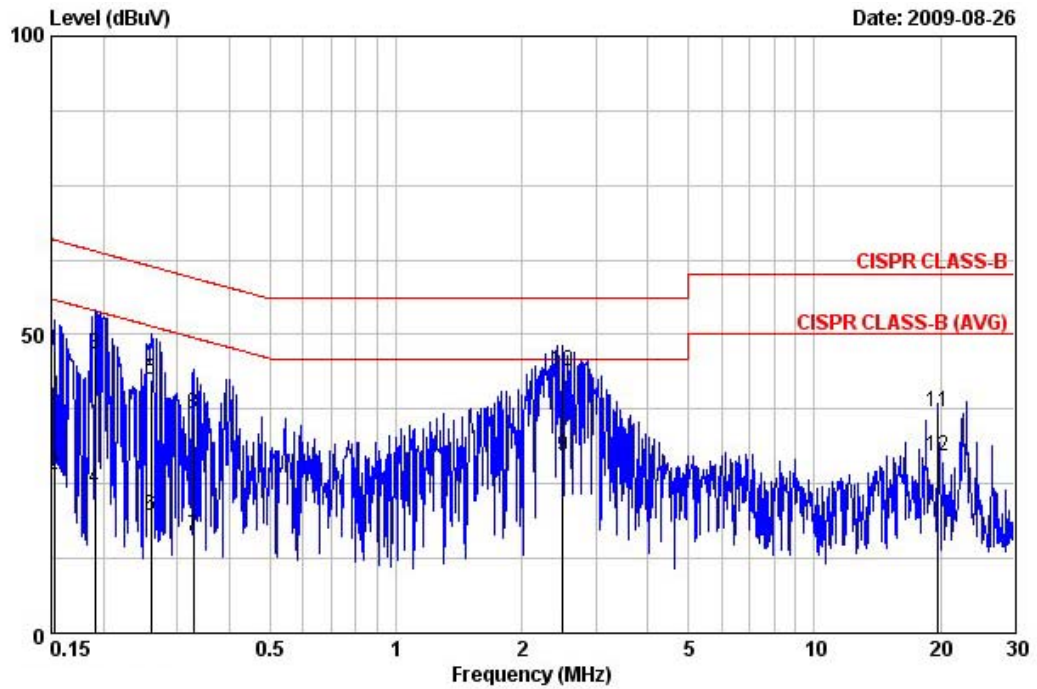
Final Test Date	Aug. 26, 2009	Test Site No.	CO01-LK
Temperature	27	Humidity	50%
Test Engineer	Chris	Configuration	Mode 1

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	48.94	-16.97	65.91	48.90	0.04	0.00	QP
2	0.152	28.35	-27.56	55.91	28.31	0.04	0.00	AVERAGE
3	0.203	28.73	-24.76	53.49	28.69	0.04	0.00	AVERAGE
4	0.203	50.23	-13.26	63.49	50.19	0.04	0.00	QP
5	0.269	23.35	-27.81	51.16	23.31	0.04	0.00	AVERAGE
6	0.269	45.62	-15.54	61.16	45.58	0.04	0.00	QP
7	0.391	14.74	-33.29	48.03	14.70	0.04	0.00	AVERAGE
8	0.391	34.71	-23.32	58.03	34.67	0.04	0.00	QP
9	2.527	42.18	-13.82	56.00	41.97	0.07	0.13	QP
10	2.527	27.02	-18.98	46.00	26.81	0.07	0.13	AVERAGE
11	23.127	40.58	-19.42	60.00	39.99	0.29	0.30	QP
12	23.127	34.54	-15.46	50.00	33.95	0.29	0.30	AVERAGE

Neutral



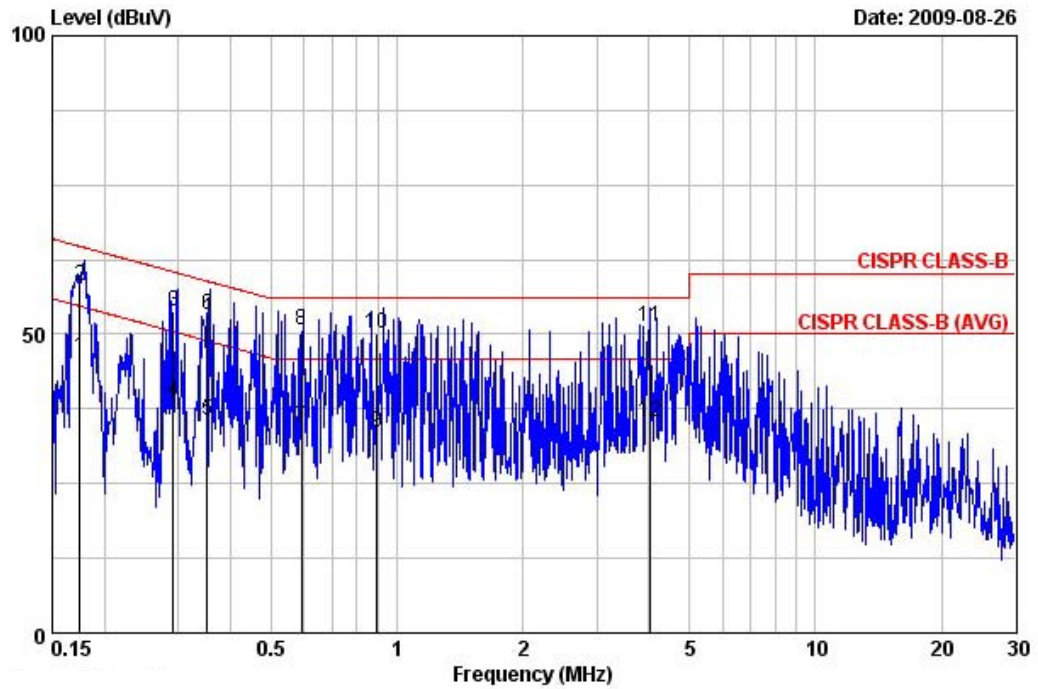
	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.152	47.26	-18.61	65.87	47.22	0.04	0.00	QP
2	0.152	26.40	-29.47	55.87	26.36	0.04	0.00	AVERAGE
3	0.190	46.84	-17.18	64.02	46.80	0.04	0.00	QP
4	0.190	24.19	-29.83	54.02	24.15	0.04	0.00	AVERAGE
5	0.260	42.58	-18.84	61.42	42.54	0.04	0.00	QP
6	0.260	19.55	-31.87	51.42	19.51	0.04	0.00	AVERAGE
7	0.329	16.13	-33.36	49.49	16.09	0.04	0.00	AVERAGE
8	0.329	36.61	-22.88	59.49	36.57	0.04	0.00	QP
9	2.500	29.70	-16.30	46.00	29.51	0.06	0.13	AVERAGE
10	2.500	43.98	-12.02	56.00	43.79	0.06	0.13	QP
11	19.710	37.05	-22.95	60.00	36.52	0.24	0.29	QP
12	19.710	29.76	-20.24	50.00	29.23	0.24	0.29	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss.

Final Test Date	Aug. 26, 2009	Test Site No.	CO01-LK
Temperature	27	Humidity	50%
Test Engineer	Chris	Configuration	Mode 2

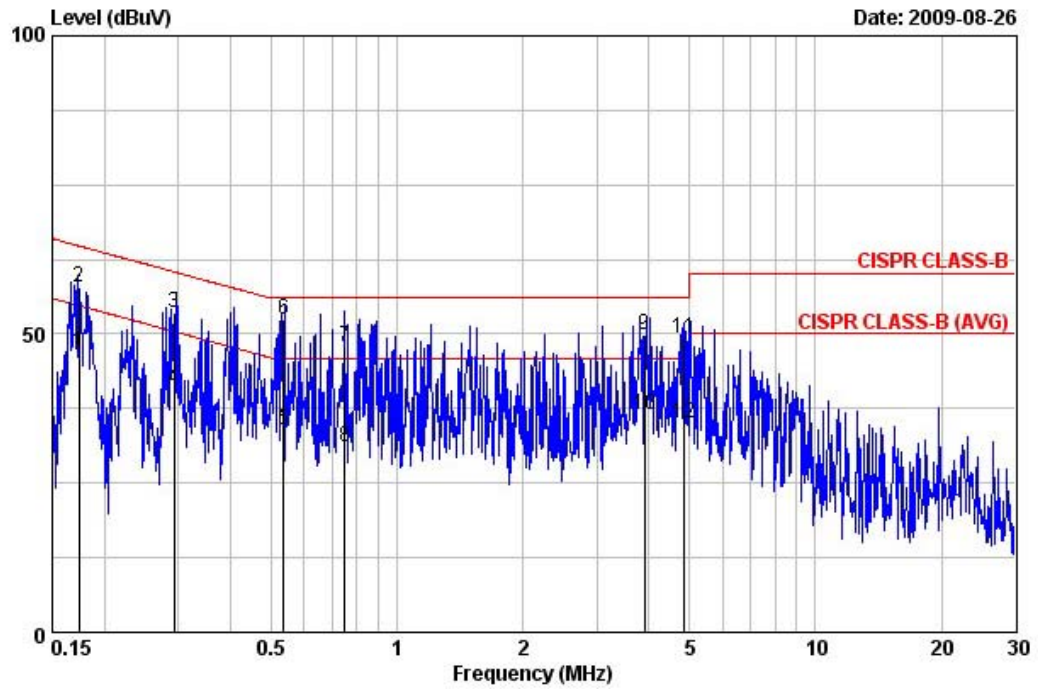
Line



0.00000 0.00000

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.175	46.04	-8.69	54.73	46.00	0.04	0.00	AVERAGE
2	0.175	58.10	-6.63	64.73	58.06	0.04	0.00	QP
3	0.292	53.91	-6.55	60.46	53.87	0.04	0.00	QP
4	0.292	38.82	-11.64	50.46	38.78	0.04	0.00	AVERAGE
5	0.353	35.55	-13.35	48.90	35.51	0.04	0.00	AVERAGE
6	0.353	53.26	-5.64	58.90	53.22	0.04	0.00	QP
7	0.591	34.42	-11.58	46.00	34.38	0.04	0.00	AVERAGE
8	0.591	50.76	-5.24	56.00	50.72	0.04	0.00	QP
9	0.894	33.58	-12.42	46.00	33.53	0.05	0.00	AVERAGE
10	0.894	50.26	-5.74	56.00	50.21	0.05	0.00	QP
11	4.030	51.17	-4.83	56.00	50.89	0.08	0.20	QP
12	4.030	35.32	-10.68	46.00	35.04	0.08	0.20	AVERAGE

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.173	46.96	-7.83	54.79	46.92	0.04	0.00	AVERAGE
2	0.173	57.79	-7.00	64.79	57.75	0.04	0.00	QP
3	0.293	53.58	-6.86	60.44	53.54	0.04	0.00	QP
4	0.293	40.62	-9.82	50.44	40.58	0.04	0.00	AVERAGE
5	0.535	34.03	-11.97	46.00	33.99	0.04	0.00	AVERAGE
6	0.535	52.37	-3.63	56.00	52.33	0.04	0.00	QP
7	0.748	47.84	-8.16	56.00	47.79	0.05	0.00	QP
8	0.748	31.12	-14.88	46.00	31.07	0.05	0.00	AVERAGE
9	3.896	49.82	-6.18	56.00	49.55	0.07	0.20	QP
10	3.896	36.47	-9.53	46.00	36.20	0.07	0.20	AVERAGE
11	4.842	49.31	-6.69	56.00	49.02	0.09	0.20	QP
12	4.842	34.99	-11.01	46.00	34.70	0.09	0.20	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss.



**3.2 Radiated Emissions Measurement**

**3.2.1 Limit**

Measurements shall be made with a quasi-peak measuring receiver in the frequency range 30 MHz to 5th harmonic of highest frequency. The quasi-peak measuring receiver shall be in accordance with clause 2 of CISPR 16-1. Receivers with peak detectors shall be in accordance with clause 3 of CISPR 16-1, and shall have a 6 dB bandwidth in accordance with clause 2 of CISPR 16-1.

Frequency of Emission (MHz)	Field Strength QP Limit (dBuV/m) at 3m
30~88	40
88~216	43.5
216~960	46
Above 960	54

**3.2.2 Measuring Instruments and Setting**

Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

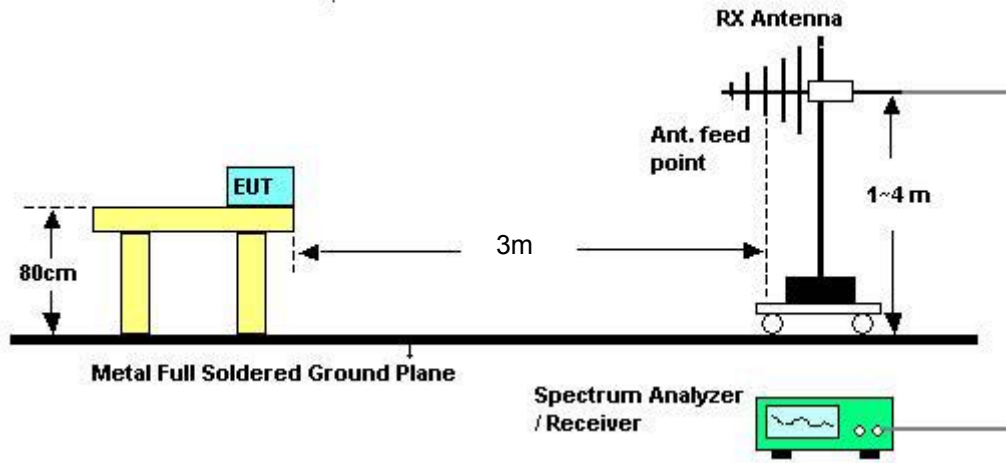
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

Spectrum Parameter	Setting
Start Frequency	1000 MHz
Stop Frequency	5th harmonic of highest frequency
RB / VB	1 MHz / 1MHz for Peak; 1 MHz / 10Hz for Average

**3.2.3 Test Procedures**

1. 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.

3.2.4 Test Setup Layout



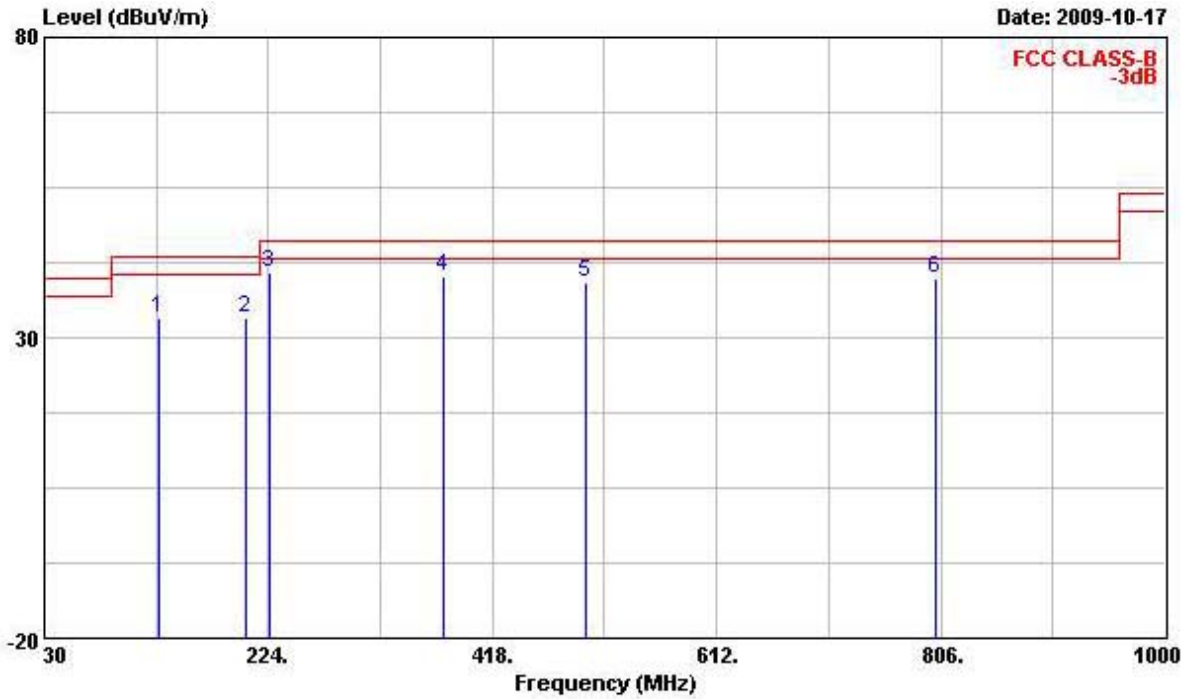
3.2.5 Test Deviation

There is no deviation with the original standard.

3.2.6 Results of Radiated Emissions (30MHz~1GHz)

Final Test Date	Oct. 17, 2009	Test Site No.	03CH02-HY
Temperature	20	Humidity	50%
Test Engineer	Vic	Configuration	Mode 1

Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	129.540	33.22	-10.28	43.50	48.90	12.80	2.26	30.74	Peak
2	205.240	33.35	-10.15	43.50	49.59	11.48	2.87	30.59	Peak
3 @	225.590	40.73	-5.27	46.00	56.10	12.21	2.97	30.55	Peak
4	374.890	40.26	-5.74	46.00	51.89	14.86	3.76	30.25	Peak
5	499.470	39.15	-6.85	46.00	47.53	17.26	4.26	29.90	Peak
6	800.860	39.79	-6.21	46.00	43.02	20.27	5.50	29.00	Peak

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	30.000	29.99	-10.01	40.00	43.56	16.22	1.09	30.88	Peak
2	121.980	23.12	-20.38	43.50	38.31	13.39	2.18	30.76	Peak
3	249.560	22.06	-23.94	46.00	36.49	12.97	3.10	30.50	Peak
4	498.450	35.49	-10.51	46.00	43.87	17.26	4.26	29.90	Peak
5	800.510	32.47	-13.53	46.00	35.70	20.27	5.50	29.00	Peak
6	933.450	34.62	-11.38	46.00	36.30	20.85	6.04	28.57	Peak

Note:

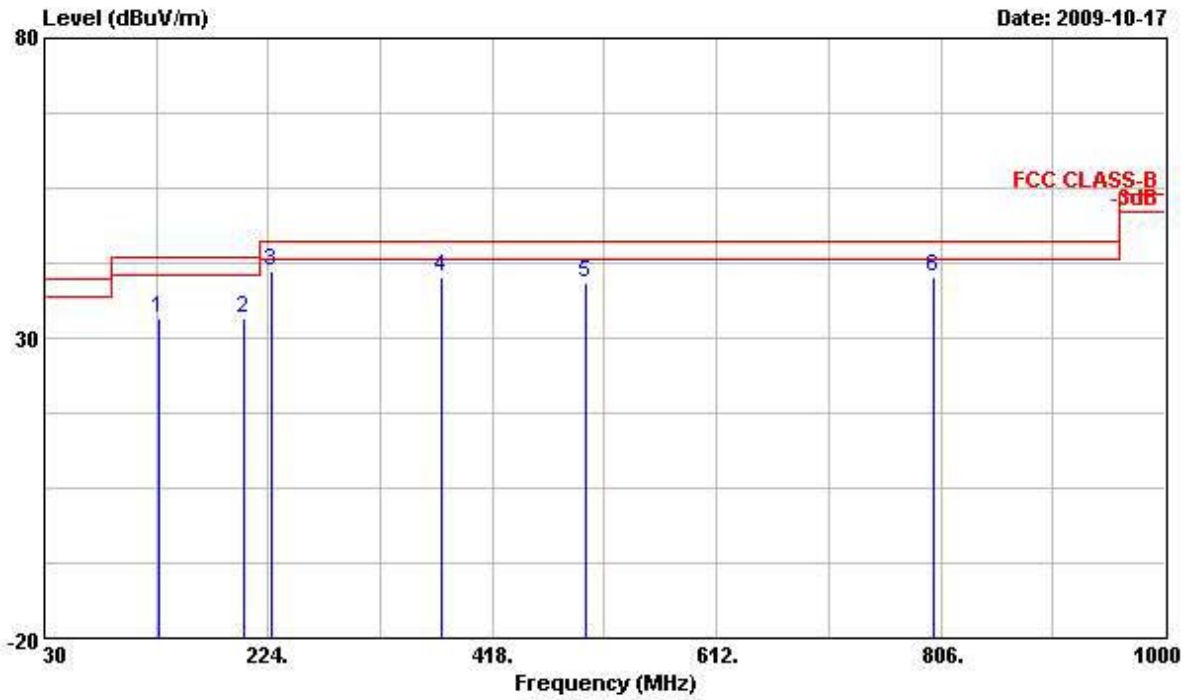
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

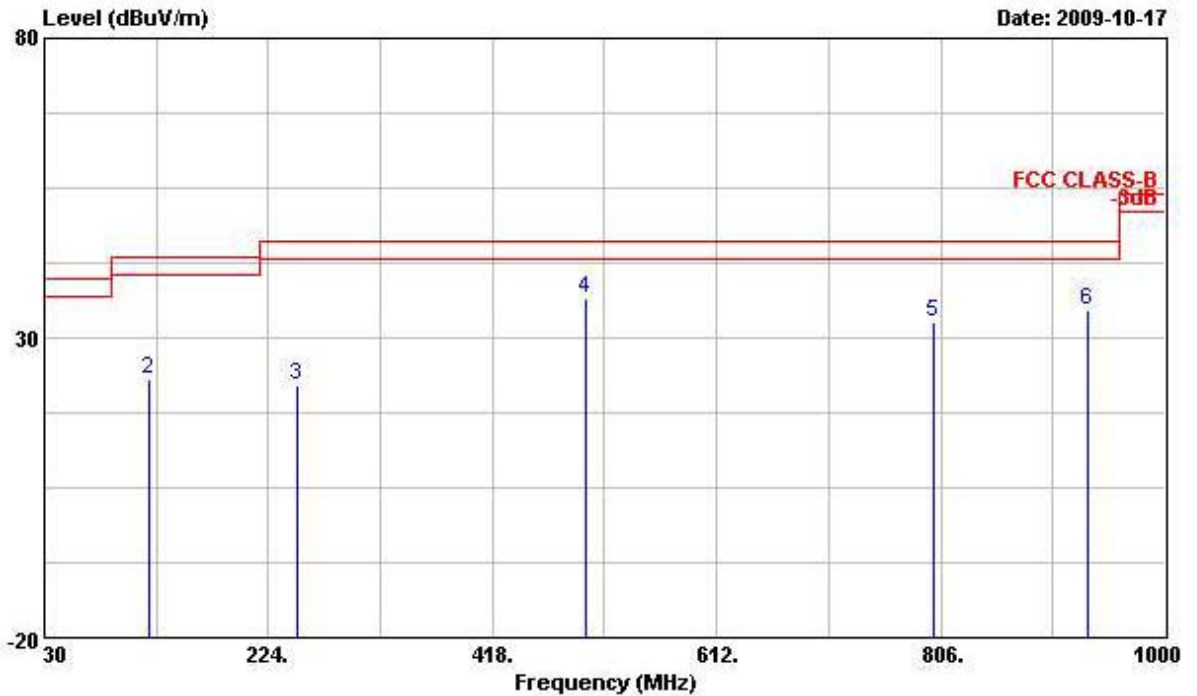
Final Test Date	Oct. 17, 2009	Test Site No.	03CH02-HY
Temperature	20	Humidity	50%
Test Engineer	Vic	Configuration	Mode 2

Horizontal



Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB	
1	129.910	33.28	-10.22	43.50	48.96	12.80	2.26	30.74 Peak
2	203.630	33.40	-10.10	43.50	49.64	11.48	2.87	30.59 Peak
3	225.940	41.19	-4.81	46.00	56.56	12.21	2.97	30.55 Peak
4	374.350	40.33	-5.67	46.00	51.96	14.86	3.76	30.25 Peak
5	498.510	39.32	-6.68	46.00	47.70	17.26	4.26	29.90 Peak
6	800.180	40.23	-5.77	46.00	43.46	20.27	5.50	29.00 Peak

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB	
1	30.000	32.41	-7.59	40.00	45.98	16.22	1.09	30.88	QP
2	121.180	23.16	-20.34	43.50	38.35	13.39	2.18	30.76	Peak
3	249.220	22.11	-23.89	46.00	36.54	12.97	3.10	30.50	Peak
4	498.510	36.47	-9.53	46.00	44.85	17.26	4.26	29.90	Peak
5	800.180	32.54	-13.46	46.00	35.77	20.27	5.50	29.00	Peak
6	933.070	34.69	-11.31	46.00	36.37	20.85	6.04	28.57	Peak

Note:

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

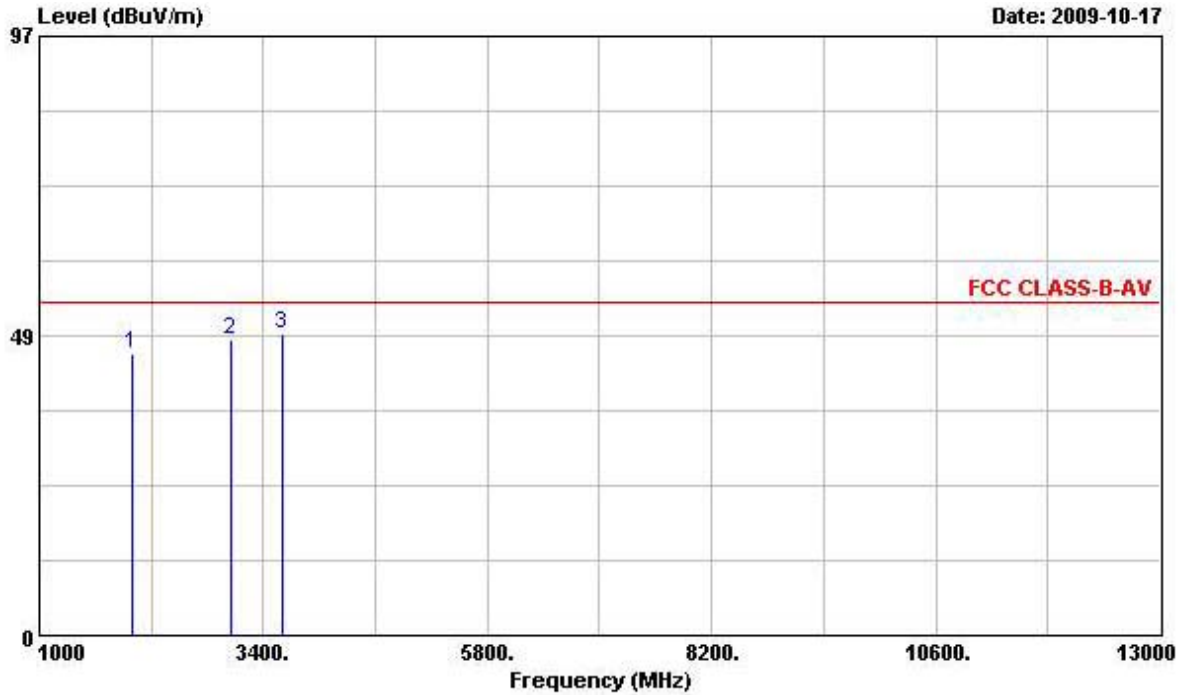
Emission level (dBUV/m) = 20 log Emission level (uV/m).

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

3.2.7 Results for Radiated Emissions (1GHz~5th harmonic of highest frequency)

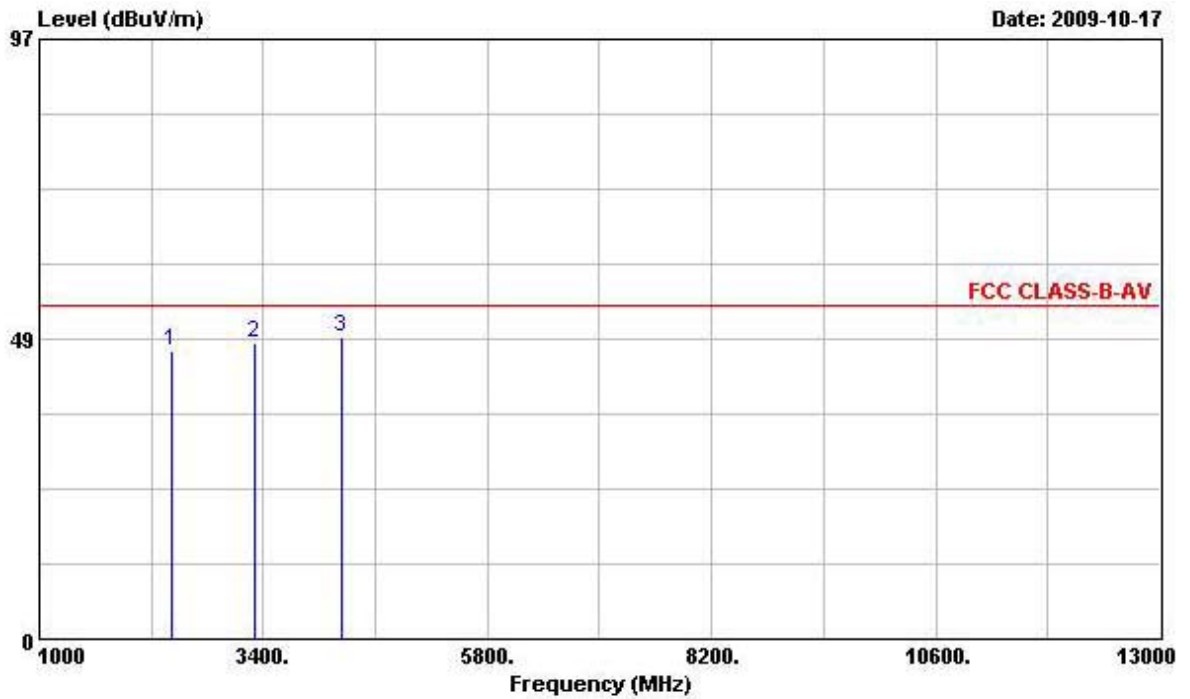
Final Test Date	Oct. 17, 2009	Test Site No.	03CH02-HY
Temperature	20	Humidity	50%
Test Engineer	Vic	Configuration	CRX 802.11g CH 6

Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1995.000	45.75	-8.25	54.00	46.42	30.20	2.72	33.59	Peak
2	3050.000	47.78	-6.22	54.00	44.98	33.40	3.49	34.09	Peak
3	3610.000	48.74	-5.26	54.00	45.85	33.64	3.92	34.67	Peak

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2415.000	46.73	-7.27	54.00	45.78	32.09	3.02	34.16	Peak
2	3310.000	47.71	-6.29	54.00	45.24	33.26	3.68	34.47	Peak
3	4235.000	48.86	-5.14	54.00	44.86	34.48	4.23	34.71	Peak

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).

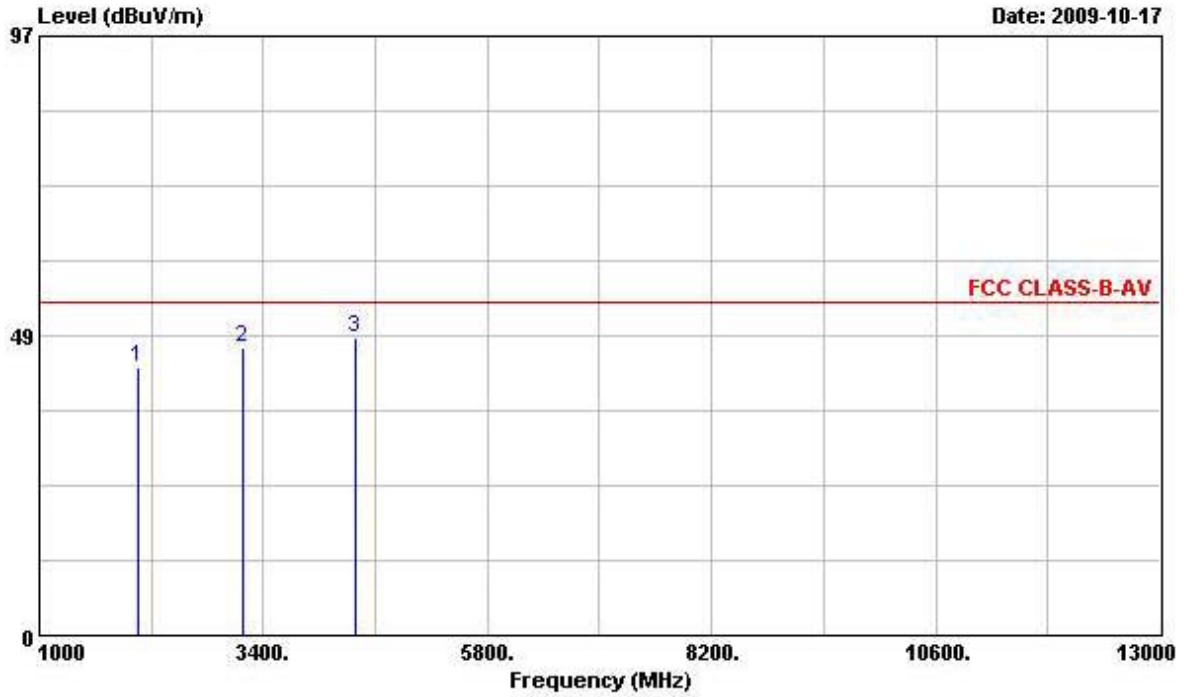
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.



**For Single Chain:**

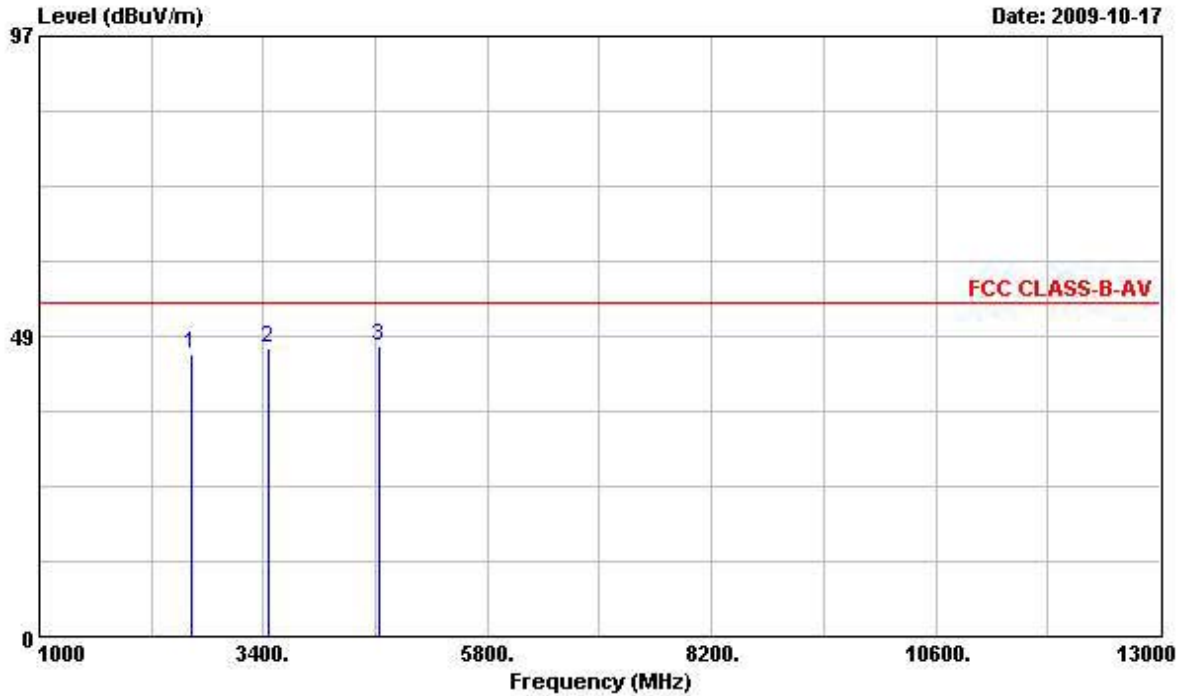
<b>Final Test Date</b>	Oct. 17, 2009	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	20	<b>Humidity</b>	50%
<b>Test Engineer</b>	Vic	<b>Configuration</b>	CRX 802.11n CH 6 (20MHz)

**Horizontal**



	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
<b>1</b>	<b>2065.000</b>	<b>43.28</b>	<b>-10.72</b>	<b>54.00</b>	<b>43.74</b>	<b>30.48</b>	<b>2.75</b>	<b>33.69</b>	<b>Peak</b>
<b>2</b>	<b>3175.000</b>	<b>46.73</b>	<b>-7.27</b>	<b>54.00</b>	<b>44.00</b>	<b>33.40</b>	<b>3.59</b>	<b>34.26</b>	<b>Peak</b>
<b>3</b>	<b>4385.000</b>	<b>48.03</b>	<b>-5.97</b>	<b>54.00</b>	<b>43.51</b>	<b>35.09</b>	<b>4.28</b>	<b>34.85</b>	<b>Peak</b>

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2630.000	45.51	-8.49	54.00	43.95	32.61	3.18	34.23	Peak
2	3445.000	46.45	-7.55	54.00	43.98	33.29	3.82	34.64	Peak
3	4640.000	46.93	-7.07	54.00	42.31	34.94	4.42	34.74	Peak

Note:

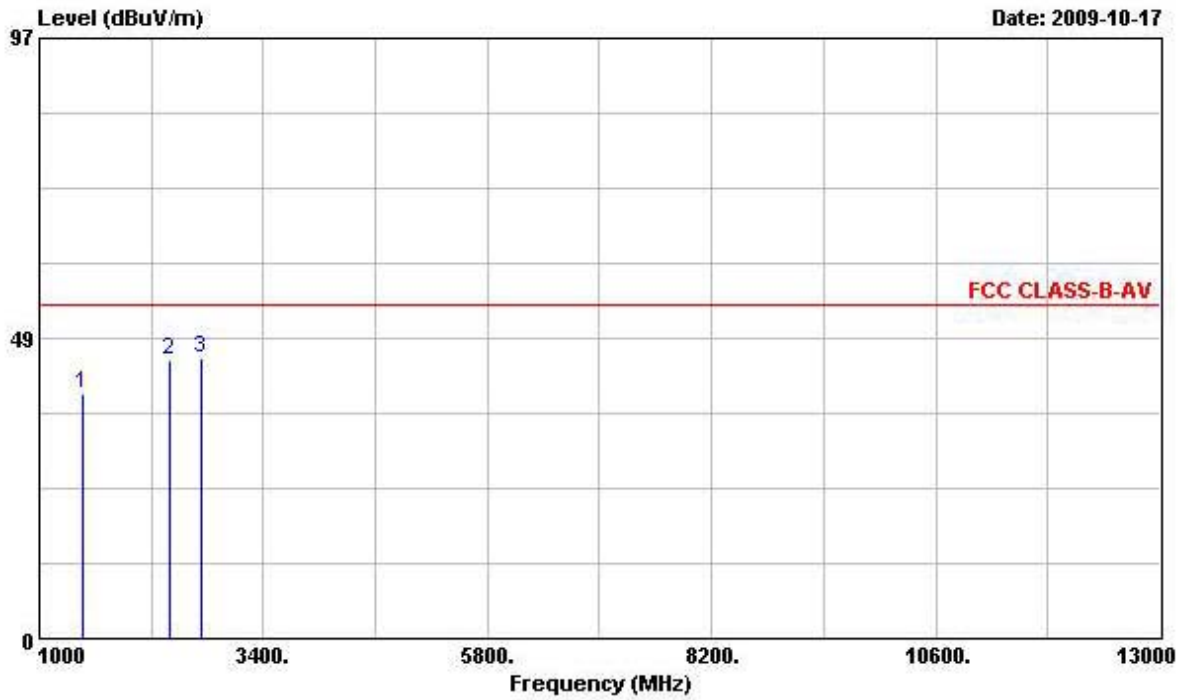
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

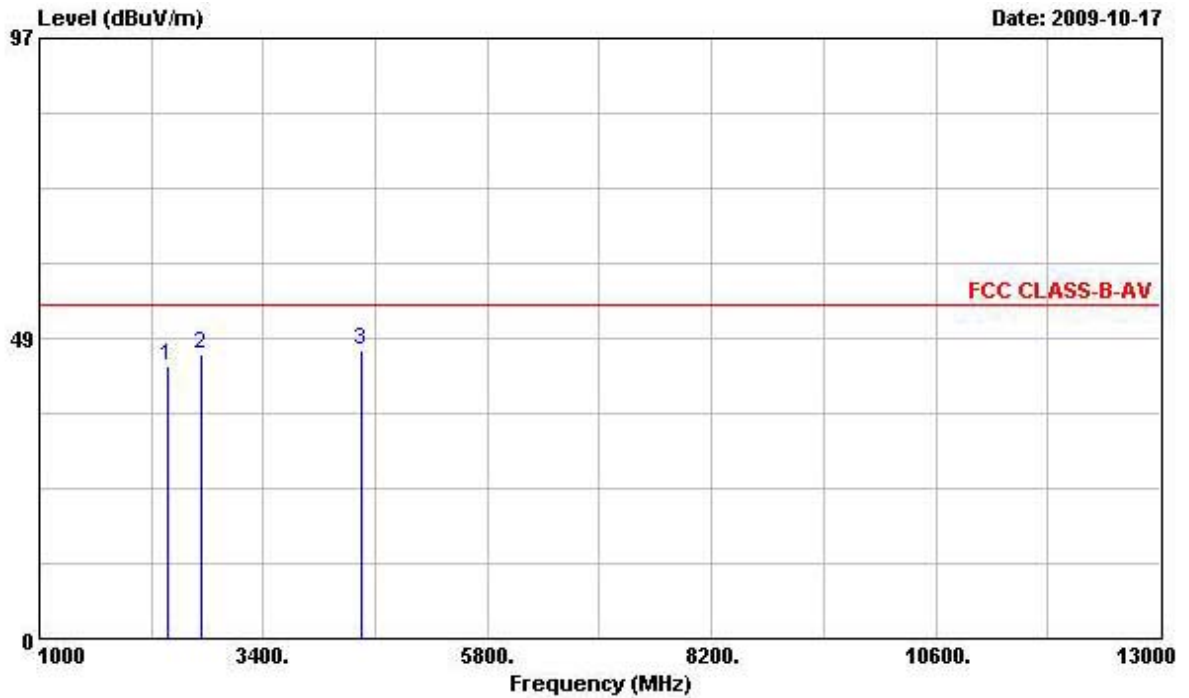
<b>Final Test Date</b>	Oct. 17, 2009	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	20	<b>Humidity</b>	50%
<b>Test Engineer</b>	Vic	<b>Configuration</b>	CRX 802.11n CH 6 (40MHz)

**Horizontal**



	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
<b>1</b>	<b>1460.000</b>	<b>39.55</b>	<b>-14.45</b>	<b>54.00</b>	<b>44.19</b>	<b>27.47</b>	<b>2.26</b>	<b>34.37</b>	<b>Peak</b>
<b>2</b>	<b>2400.000</b>	<b>45.03</b>	<b>-8.97</b>	<b>54.00</b>	<b>44.38</b>	<b>31.79</b>	<b>3.02</b>	<b>34.16</b>	<b>Peak</b>
<b>3</b>	<b>2735.000</b>	<b>45.15</b>	<b>-8.85</b>	<b>54.00</b>	<b>43.32</b>	<b>32.76</b>	<b>3.24</b>	<b>34.17</b>	<b>Peak</b>

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2380.000	44.09	-9.91	54.00	43.26	31.97	2.99	34.13	Peak
2	2735.000	45.96	-8.04	54.00	44.12	32.77	3.24	34.17	Peak
3	4450.000	46.65	-7.35	54.00	42.51	34.74	4.29	34.89	Peak

Note:

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

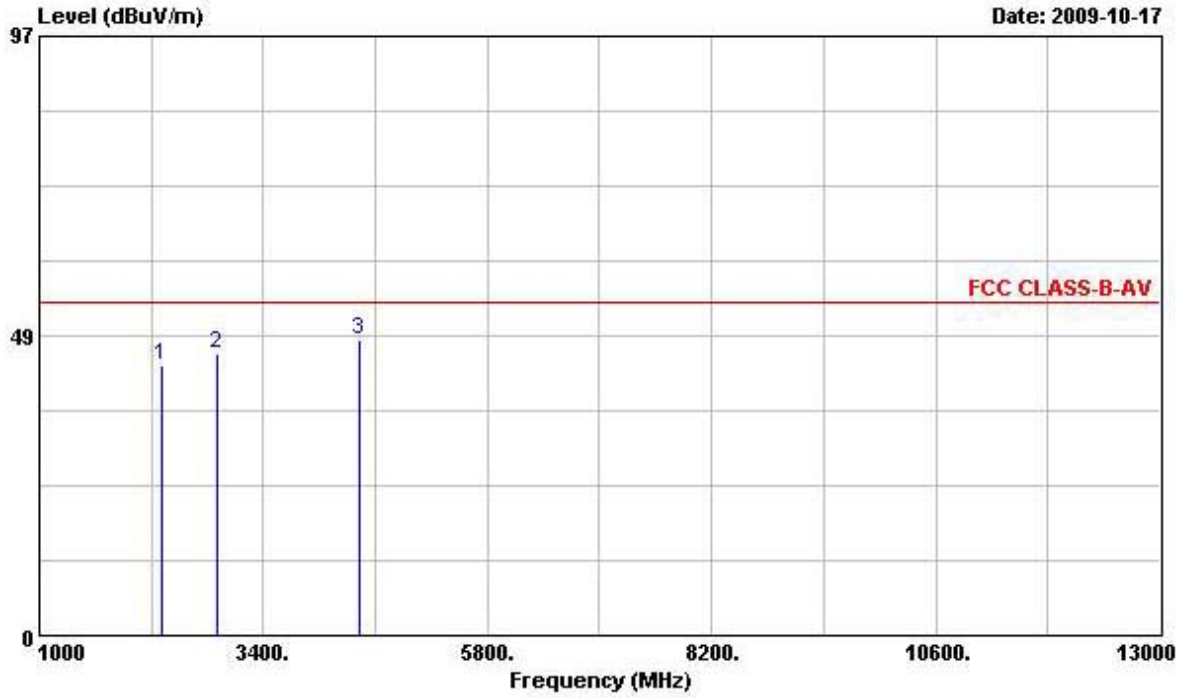
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

**For Two Chain:**

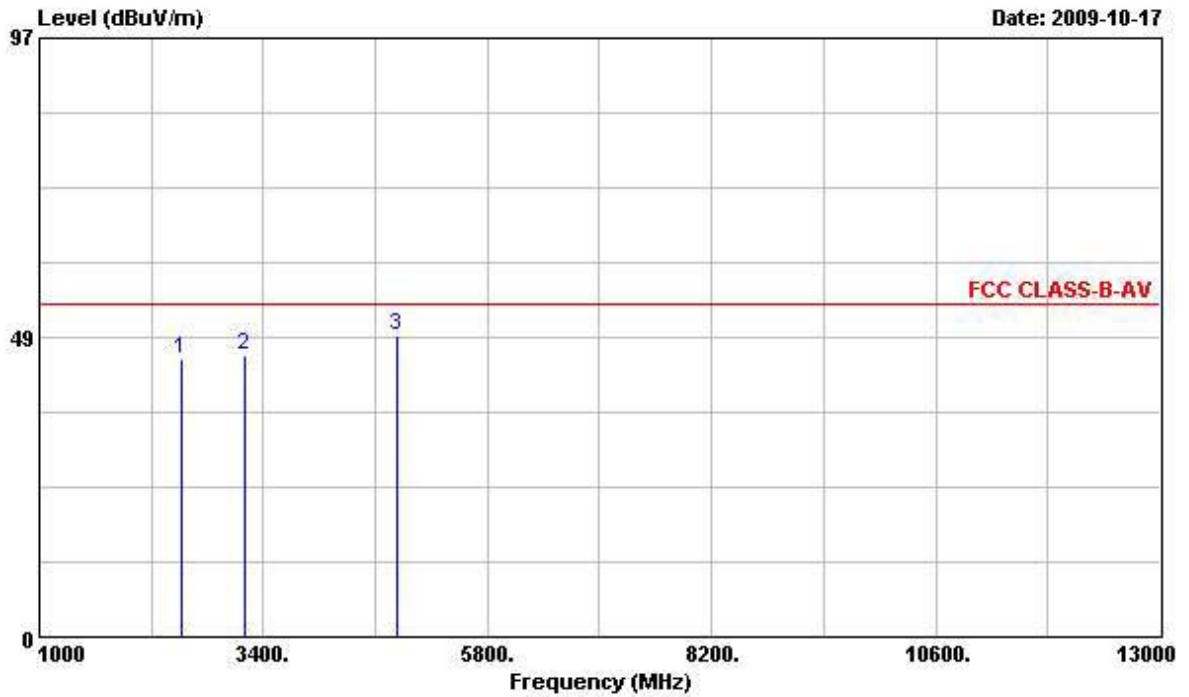
<b>Final Test Date</b>	Oct. 17, 2009	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	20	<b>Humidity</b>	50%
<b>Test Engineer</b>	Vic	<b>Configuration</b>	CRX 802.11n CH 6 (20MHz)

**Horizontal**



	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	<b>MHz</b>	<b>dBuV/m</b>	<b>dB</b>	<b>dBuV/m</b>	<b>dBuV</b>	<b>dB/m</b>	<b>dB</b>	<b>dB</b>	
<b>1</b>	<b>2315.000</b>	<b>43.74</b>	<b>-10.26</b>	<b>54.00</b>	<b>43.39</b>	<b>31.44</b>	<b>2.96</b>	<b>34.05</b>	<b>Peak</b>
<b>2</b>	<b>2900.000</b>	<b>45.69</b>	<b>-8.31</b>	<b>54.00</b>	<b>43.22</b>	<b>33.16</b>	<b>3.37</b>	<b>34.06</b>	<b>Peak</b>
<b>3</b>	<b>4430.000</b>	<b>47.72</b>	<b>-6.28</b>	<b>54.00</b>	<b>43.14</b>	<b>35.18</b>	<b>4.29</b>	<b>34.89</b>	<b>Peak</b>

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2525.000	44.93	-9.07	54.00	43.66	32.45	3.11	34.29	Peak
2	3195.000	45.77	-8.23	54.00	43.23	33.24	3.59	34.29	Peak
3	4825.000	48.95	-5.05	54.00	43.75	35.13	4.58	34.51	Peak

Note:

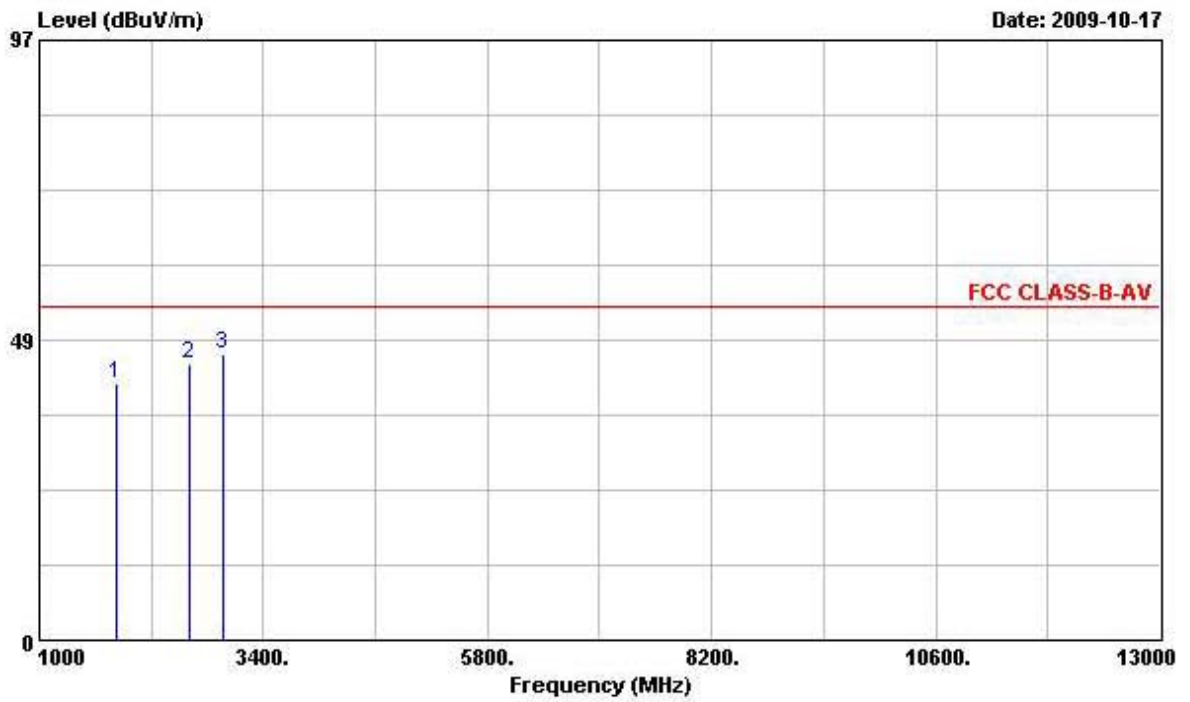
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

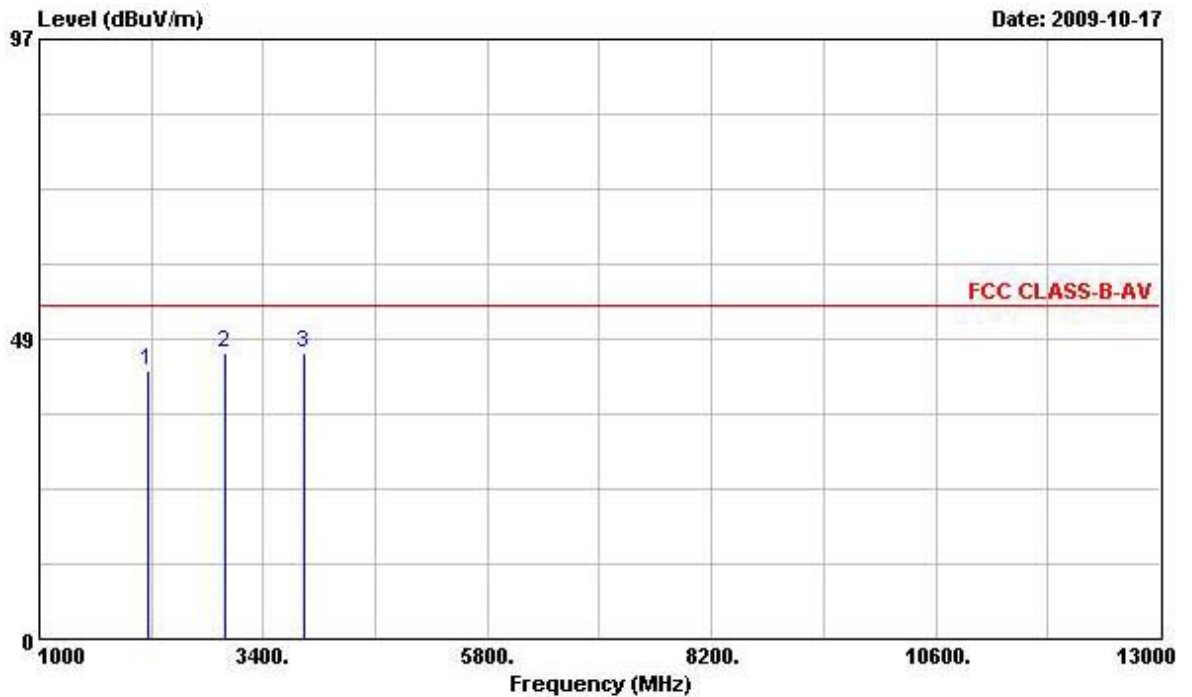
<b>Final Test Date</b>	Oct. 17, 2009	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	20	<b>Humidity</b>	50%
<b>Test Engineer</b>	Vic	<b>Configuration</b>	CRX 802.11n CH 6 (40MHz)

**Horizontal**



	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	<b>MHz</b>	<b>dBuV/m</b>	<b>dB</b>	<b>dBuV/m</b>	<b>dBuV</b>	<b>dB/m</b>	<b>dB</b>	<b>dB</b>	
<b>1</b>	<b>1815.000</b>	<b>41.50</b>	<b>-12.50</b>	<b>54.00</b>	<b>43.59</b>	<b>29.21</b>	<b>2.56</b>	<b>33.86</b>	<b>Peak</b>
<b>2</b>	<b>2610.000</b>	<b>44.76</b>	<b>-9.24</b>	<b>54.00</b>	<b>43.36</b>	<b>32.48</b>	<b>3.16</b>	<b>34.24</b>	<b>Peak</b>
<b>3</b>	<b>2965.000</b>	<b>46.30</b>	<b>-7.70</b>	<b>54.00</b>	<b>43.62</b>	<b>33.32</b>	<b>3.39</b>	<b>34.03</b>	<b>Peak</b>

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2170.000	43.32	-10.68	54.00	43.10	31.22	2.84	33.84	Peak
2	2985.000	46.27	-7.73	54.00	43.70	33.17	3.42	34.02	Peak
3	3845.000	46.24	-7.76	54.00	42.83	33.92	4.06	34.57	Peak

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 LIST OF MEASURING EQUIPMENTS**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Receiver	R&S	ESCS 30	838251/003	9 kHz - 2.75 GHz	Mar. 26, 2009	Conduction (CO01-LK)
LISN	Rolf Heine	NNB-2/16Z	98087	9 kHz - 30 MHz	Oct. 07, 2009	Conduction (CO01-LK)
RF Cable-CON	Suhner Switzerland	RG223/U	CB017	9 kHz - 30 MHz	Nov. 29, 2008	Conduction (CO01-LK)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 28, 2009	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Nov. 30, 2008	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB020	30 MHz - 1 GHz	Dec. 17, 2008	Radiation (03CH02-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX106	03CH02-HY	1GHz~40GHz	Dec. 17, 2008	Radiation (03CH02-HY)
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Feb. 04, 2009	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 11, 2009	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz – 1.3 GHz	Jul. 07, 2009	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A02373	1GHz – 26.5 GHz	Jul. 16, 2009	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0 - 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul 28, 2008*	Radiation (03CH02-HY)

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

## 5 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 2 <sup>nd</sup> 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

6 TAF CERTIFICATE OF ACCREDITATION



Certificate No. : L1190-090318

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, 2007 to January 09, 2010
- 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 Arrangement with Foreign Authorities

Jay-San Chen  
President, Taiwan Accreditation Foundation  
Date : March 18, 2009

P1, total 19 pages

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