FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment	:	**802.11b/g/n module USB Wireless Module (build-in CMPD12-A Wed Pad)**
Model No.	:	**LR802UKN**
Brand Name	:	**QCOM**
Filing Type	:	**Class II change**
Applicant	:	**QCOM TECHNOLOGY INC.** 7F, No. 178, Ming Chuan E. Rd. Section 3, Taipei Taiwan
FCC ID	:	**RUJ-LR802UKN**
Manufacturer	:	**MoBitS Electronics, Inc.** 3F-1, 250, Jung-Shan Rd., Linkou Shiang, Taipei Hsien, Taiwan
Received Date	:	Sep. 16, 2010
Final Test Date	:	Oct. 15, 2010

Statement

Test result included is only for the 802.11n of the product.

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 C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

SPORTON International Inc.

No. 52 Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

Table of Contents

History of This Test Report

Original Issue Date: Oct. 26, 2010

Report No.: FR073105AI

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment	:	802.11b/g/n module USB Wireless Module (build-in CMPD12-A Wed Pad)
Model No.	:	LR802UKN
Brand Name	:	QCOM
Applicant	:	QCOM TECHNOLOGY INC. 7F, No. 178, Ming Chuan E. Rd. Section 3, Taipei Taiwan

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Sep. 16, 2010 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.

2010.10.26

Wayne Hsu / Vice Manager

SPORTON International Inc.

No. 52 Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

1 SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
3.1	15.207	AC Power Line Conducted Emissions	Complies	7.12 dB
3.2	15.247(b)(3)	Maximum Conducted Output Power	N/A	-
3.3	15.247(e)	Power Spectral Density	N/A	-
3.4	15.247(a)(2)	6dB Spectrum Bandwidth	N/A	-
3.5	15.247(d)	Radiated Emissions	Complies	1.55 dB
3.6	15.247(d)	Band Edge Emissions	Complies	2.71 dB
3.7	15.203	Antenna Requirements	Complies	-

Note: Standard clause 15.247(b)(3), 15.247(e), 15.247(a)(2) was not performed due to the requirement of manufacturer.

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak 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%

2 GENERAL INFORMATION

2.1 Product Details

Only the radio detail of IEEE 802.11n is shown in this report. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Power Type	19Vdc from AC Adapter ; 14.8Vdc from Li-ion Battery
Modulation	See the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	See the below table for IEEE 802.11n
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11 for 20MHz bandwidth ; 7 for 40MHz bandwidth

2.2 Model Product Description

The model product as tested was selected as the worse case configuration representative of two variant production models as follows:

Description	CMPD12-A (4:3)	CMPD12-A (16:10)
CPU	Intel N270 1.6GHz	Intel N270 1.6GHz
LCD	HYDIS HT121X01-300	AUO B121EW09
LAN	10/100/1000 Gbps	10/100/1000 Gbps
DRAM	DDRII 533 1GB	DDRII 533 1GB
Storage	SSD	SSD
WiFi Module	QCOM LR802UKN, 802.b/g/n	QCOM LR802UKN, 802.b/g/n
Bluetooth Module	QCOM QBTM400	QCOM QBTM400
Barcode Reader	Symbol SE4400 + PL4407	Symbol SE4400 + PL4407
Smart Card Reader	Castles EZM710BU	Castles EZM710BU
Battery Pack	Li-ion / 14Vdc, 2400Mah	Li-ion / 14Vdc, 2400Mah
Programmable Function Keys	x4	X6

Note: The test result of CMPD12-A (16:10) was recorded in this report.

2.3 Accessories

Power	Brand	Model	Rating
AC Adapter	Touch	A3-60S17R-W	INPUT : 100-240V~50/60Hz 1.5A OUTPUT : 19V 3.2A
Li-ion Battery	Mobits	MB01	14.8V / 2400mAh

2.4 Table for Filed Antenna

Ant.	Antenna Type	Connector	Gain (dBi)	Remark
A	PCB Antenna	U.FL	-0.48	TX / RX
B	PCB Antenna	U.FL	-0.48	RX

Note: The antennas are 1T2R spatial Multiplexing MIMO configuration.

IEEE 802.11n Modulation Scheme

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Data rate(Mbps)	
									800nsGI	
					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

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

2.5 Table for Carrier Frequencies

There are two bandwidth systems for IEEE 802.11n.

For 20MHz bandwidth systems, use Channel 1~Channel 11.

For 40MHz bandwidth systems, use Channel 3~Channel 9.

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	-	-

2.6 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 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	Data Rate	Channel
AC Power Line Conducted Emissions	Normal Mode	Auto	-
Radiated Emissions 9kHz~1GHz	Normal Mode	Auto	-
Radiated Emissions Above 1GHz	MCS 0 (20MHz)	6.5 Mbps	1/6/11
	MCS 0 (40MHz)	13.5 Mbps	3/6/9
Band Edge Emissions	MCS 0 (20MHz)	6.5 Mbps	1/11
	MCS 0 (40MHz)	13.5 Mbps	3/9

2.7 Table for Testing Locations

Test Site No.	Site Category	Location
CO01LK	Conduction	Lin Kou
03CH03-HY	SAC	Hwa Ya

Semi Anechoic Chamber (SAC).

2.8 Table for Supporting Units

Support Unit	Brand	Model	FCC ID	Remark
LCD Monitor	DELL	E198WFPB	DoC	Conducted
USB Keyboard	DELL	SK-8175	DoC	
USB Mouse	DELL	MOC5UO	DoC	
Mic.+ Earphone	i-Acon	HOH-323-BK	DoC	
Docking	-	-	-	
SD Card	SANDISK	1G	N/A	
MMC Card	PRETEC	1G	N/A	
Smart Card (Provide by client's)	-	-	-	
AP (Remote Workstation)	D-Link	DIR-300	-	
Mobile phone (Remote Workstation)	NOKIA	5800	N/A	

** In radiated emissions tested EUT was tested alone.

2.9 EUT Operation during Test

< Conducted >

An executive program, “MyHWin.exe” under Win XP for EUT, 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 EUT reads the test program from the hard disk drive and runs it.

c. The EUT sends “H“ messages to the panel, and the panel displays “H“ patterns on the screen.

d. Repeat the step c.

At the same time, the following programs were executed:

- Executed “Media player” to play music to Mic.+ Earphone.
- Executed "EZPUCHK.exe" to run smart card function.
- Executed "Ping.exe" to link with the remote workstation to receive and transmit data via RJ45 cable.
- Executed "WLAN.exe" to link with the remote workstation to receive and transmit data by wireless.
- Executed "Bluetooth.exe" to link with the remote workstation to receive and transmit data by Mobile phone.

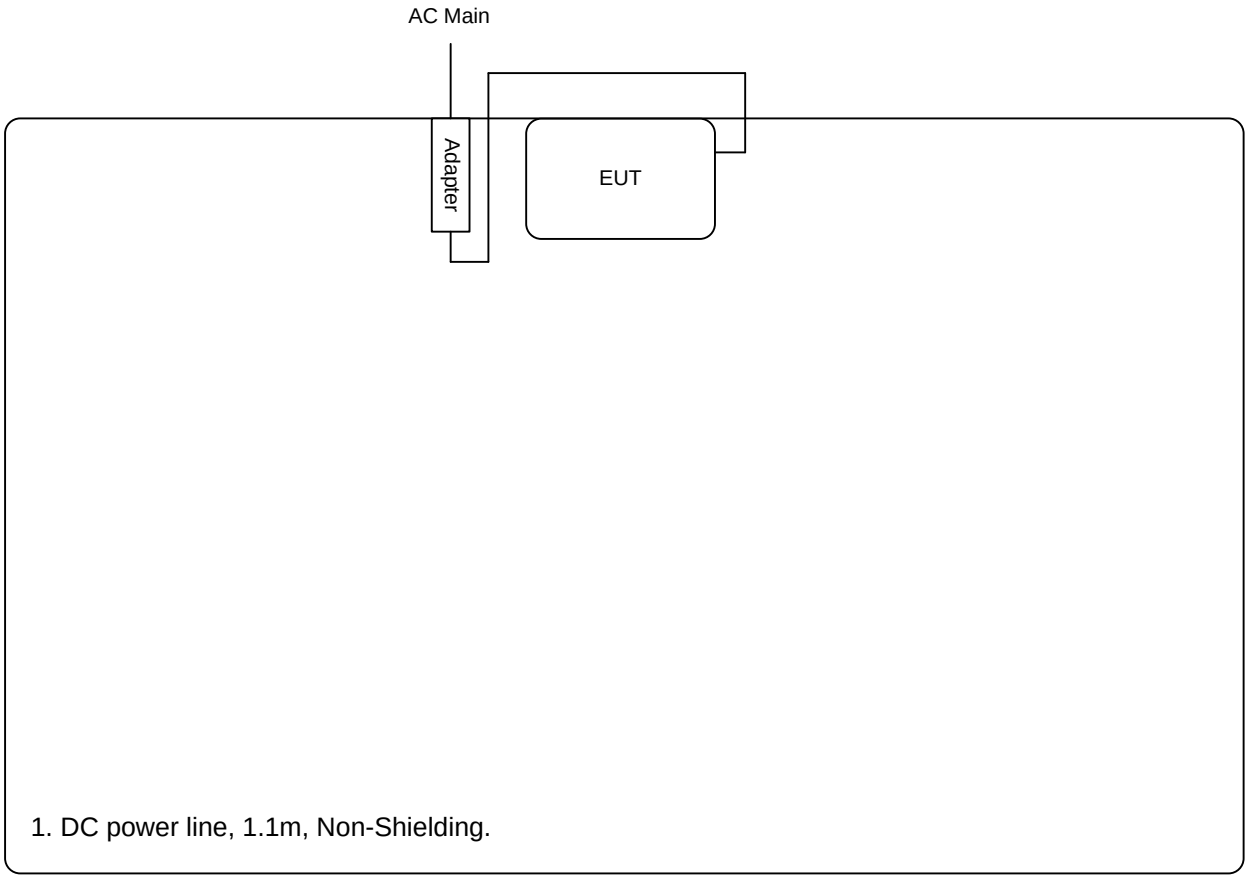
Radiated

- Executed “RT2870QA” to keep transmitting signals at fixed frequency.

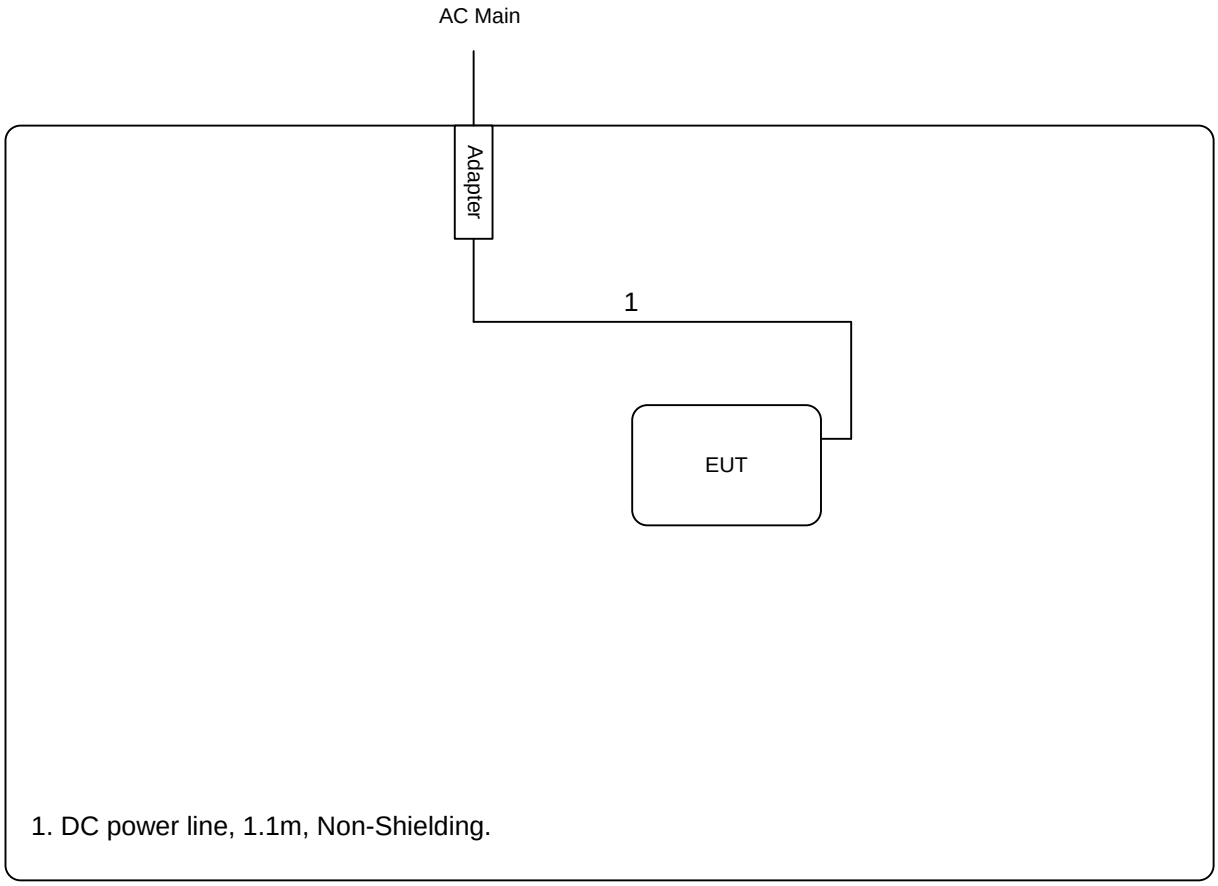
2.10 Test Configuration

2.10.1 Radiation Emissions Test Configuration

For radiated emissions 9kHz~1GHz



For radiated emissions above 1GHz



1. DC power line, 1.1m, Non-Shielding.

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

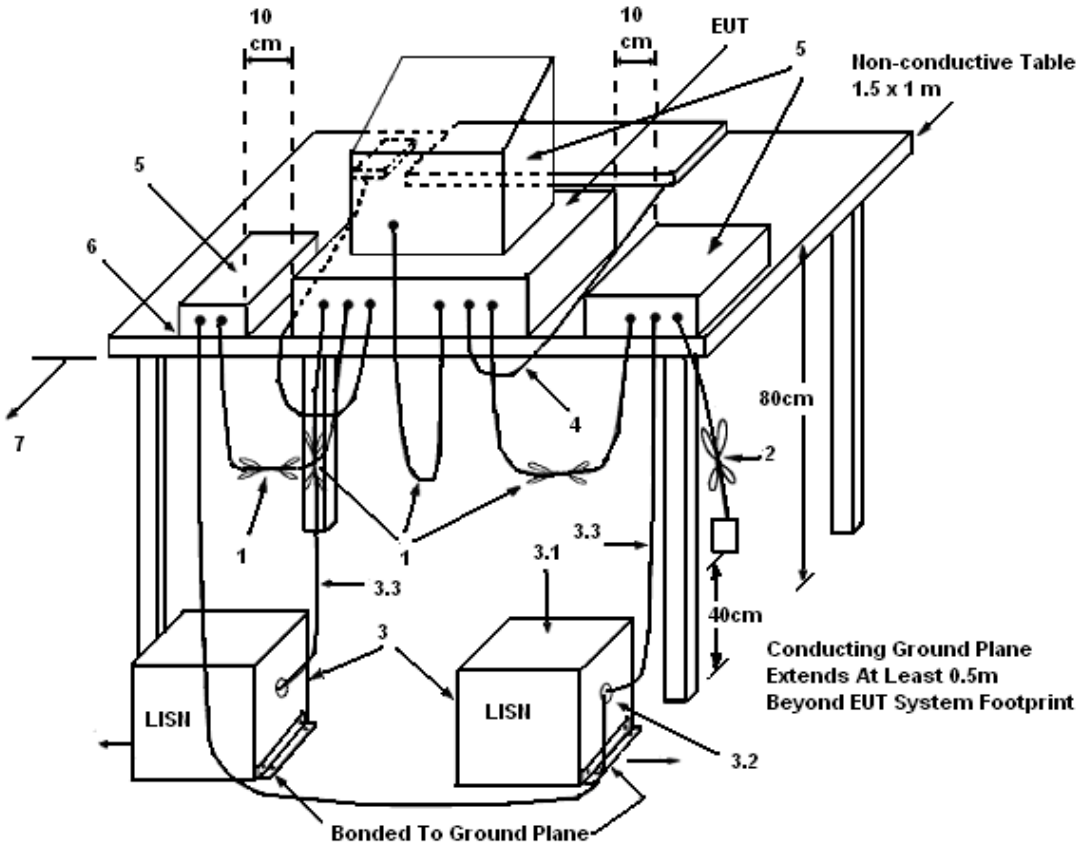
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

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 warm up about 15 minutes then start test.
2. Configure the EUT according to ANSI C63.4. 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.
3. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
7. 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.

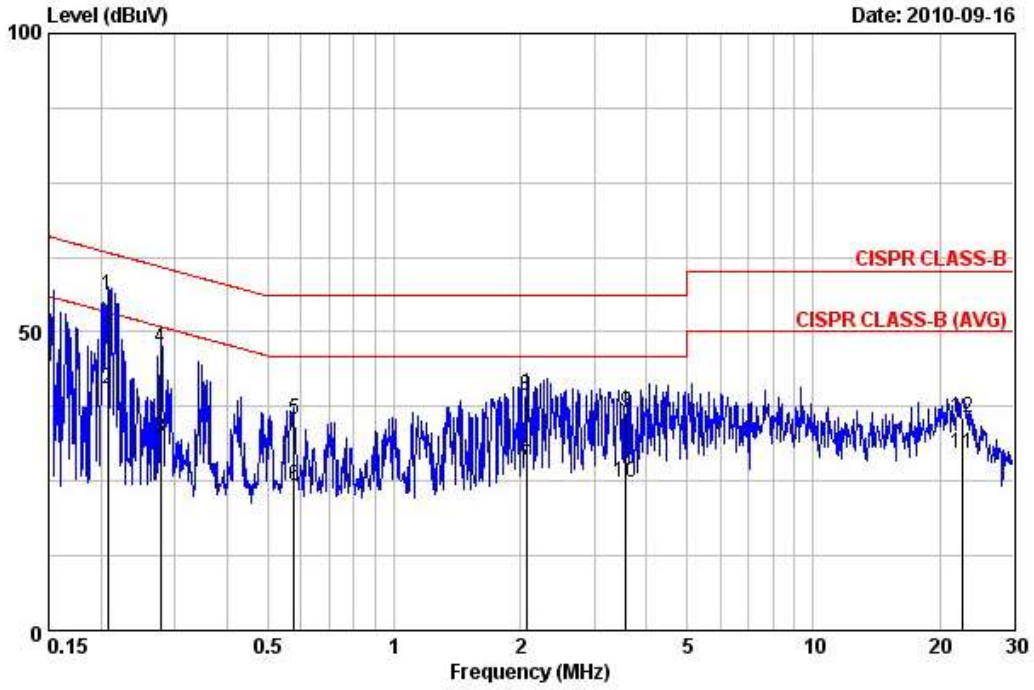
3.1.6 EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

3.1.7 Results of AC Power Line Conducted Emissions Measurement

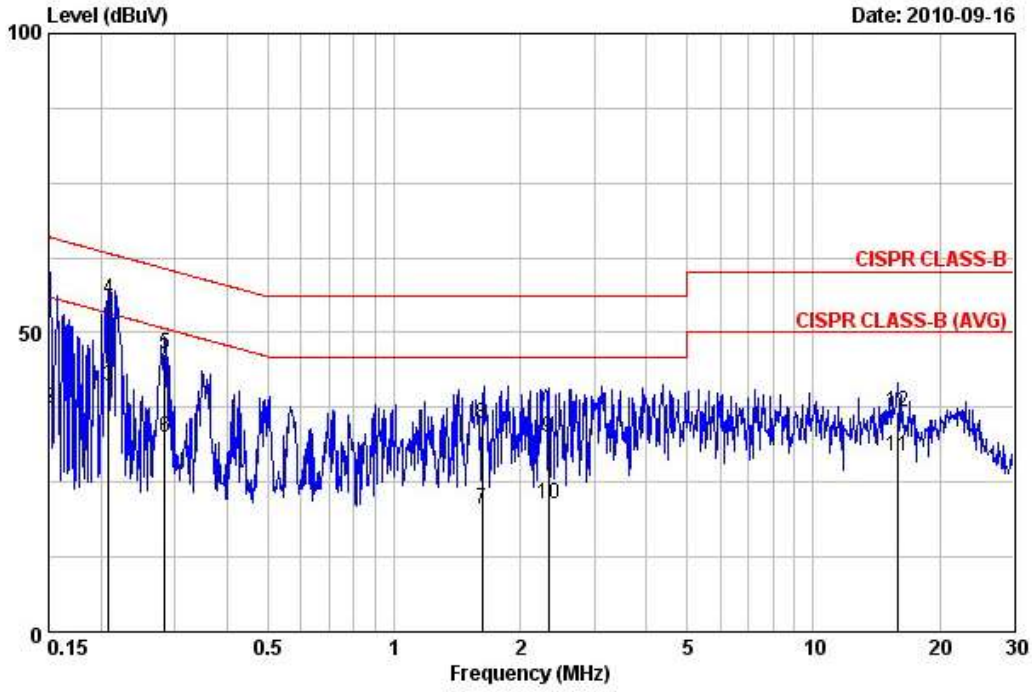
Final Test Date	Sep. 16, 2010	**Test Site No.**	CO01-LK
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	Normal Mode

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.207	56.20	-7.12	63.32	45.42	10.68	0.10	QP
2	0.207	40.33	-12.99	53.32	29.55	10.68	0.10	AVERAGE
3	0.277	32.08	-18.82	50.90	21.32	10.66	0.10	AVERAGE
4	0.277	47.20	-13.70	60.90	36.44	10.66	0.10	QP
5	0.576	35.31	-20.69	56.00	24.57	10.64	0.10	QP
6	0.576	24.32	-21.68	46.00	13.58	10.64	0.10	AVERAGE
7	2.066	27.67	-18.33	46.00	16.83	10.64	0.20	AVERAGE
8	2.066	39.31	-16.69	56.00	28.47	10.64	0.20	QP
9	3.565	36.45	-19.55	56.00	25.60	10.66	0.20	QP
10	3.565	24.77	-21.23	46.00	13.92	10.66	0.20	AVERAGE
11	22.655	29.56	-20.44	50.00	18.38	10.89	0.30	AVERAGE
12	22.655	35.67	-24.33	60.00	24.49	10.89	0.30	QP

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	57.49	-8.51	66.00	47.16	10.23	0.10	QP
2	0.150	37.30	-18.70	56.00	26.97	10.23	0.10	AVERAGE
3	0.208	41.13	-12.14	53.27	30.80	10.23	0.10	AVERAGE
4	0.208	55.52	-7.75	63.27	45.19	10.23	0.10	QP
5	0.283	46.31	-14.40	60.72	35.99	10.22	0.10	QP
6	0.283	32.35	-18.36	50.72	22.03	10.22	0.10	AVERAGE
7	1.619	20.49	-25.51	46.00	10.08	10.24	0.17	AVERAGE
8	1.619	34.88	-21.12	56.00	24.47	10.24	0.17	QP
9	2.334	32.59	-23.41	56.00	22.14	10.25	0.20	QP
10	2.334	21.43	-24.57	46.00	10.98	10.25	0.20	AVERAGE
11	15.885	29.34	-20.66	50.00	18.67	10.45	0.22	AVERAGE
12	15.885	36.64	-23.36	60.00	25.97	10.45	0.22	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

3.2 Radiated Emissions Measurement

3.2.1 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 (microvolt/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

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.

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)	1MHz / 1MHz for peak

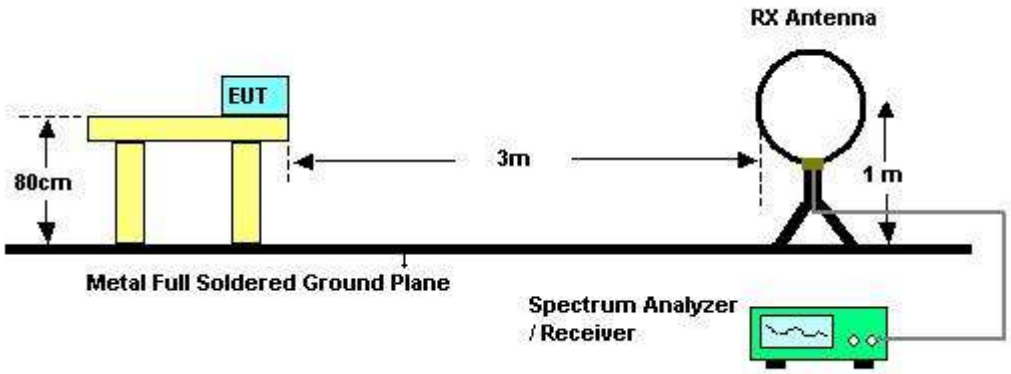
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.3 Test Procedures

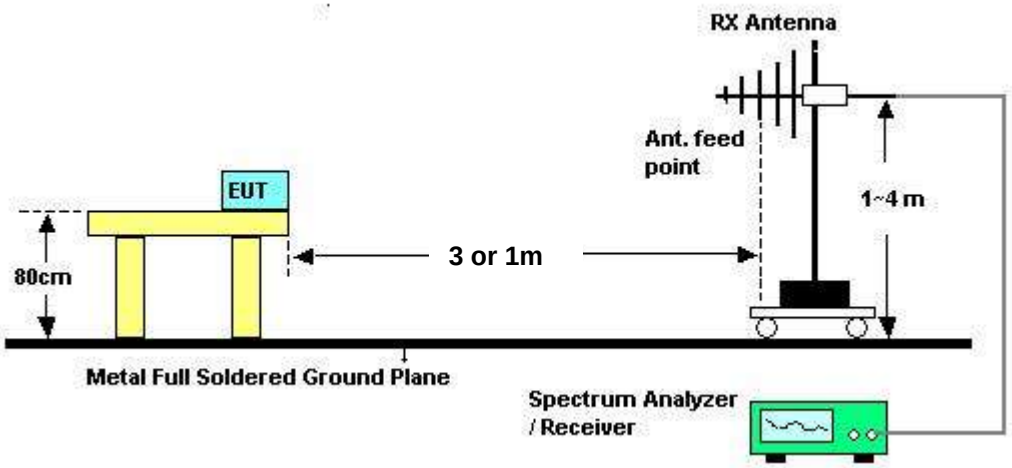
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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.

3.2.4 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 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.2.5 Test Deviation

There is no deviation with the original standard.

3.2.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.2.7 Results of Radiated Emissions (9kHz~30MHz)

Final Test Date	Aug. 31, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie		

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.

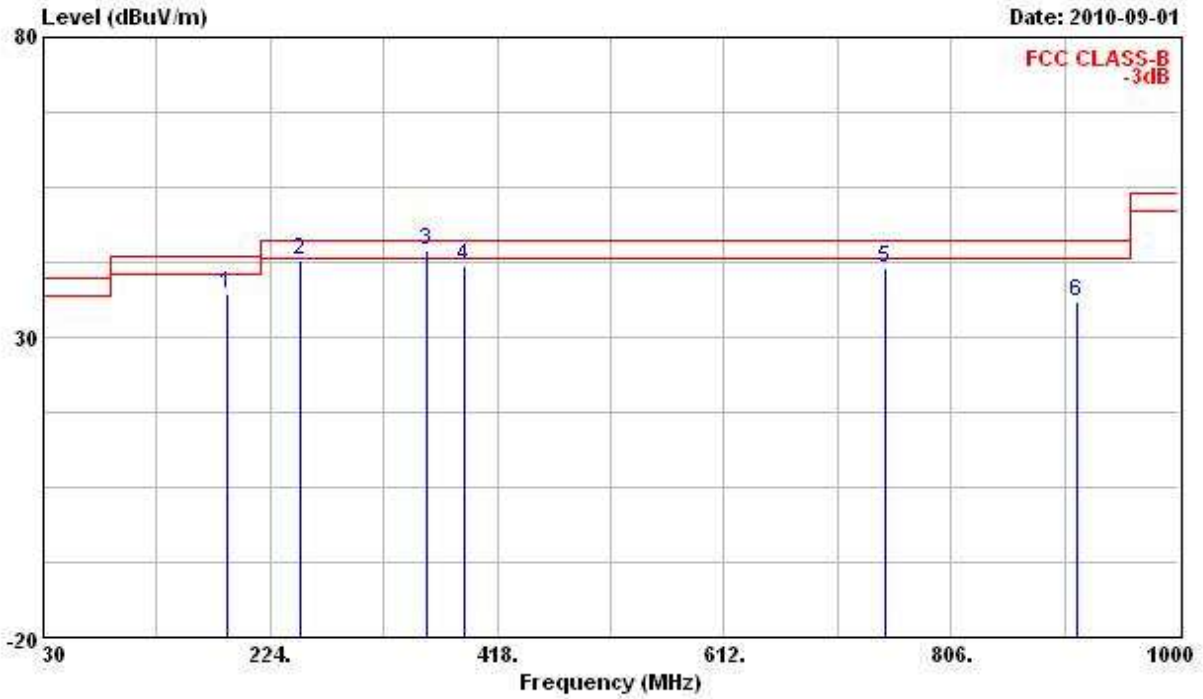
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

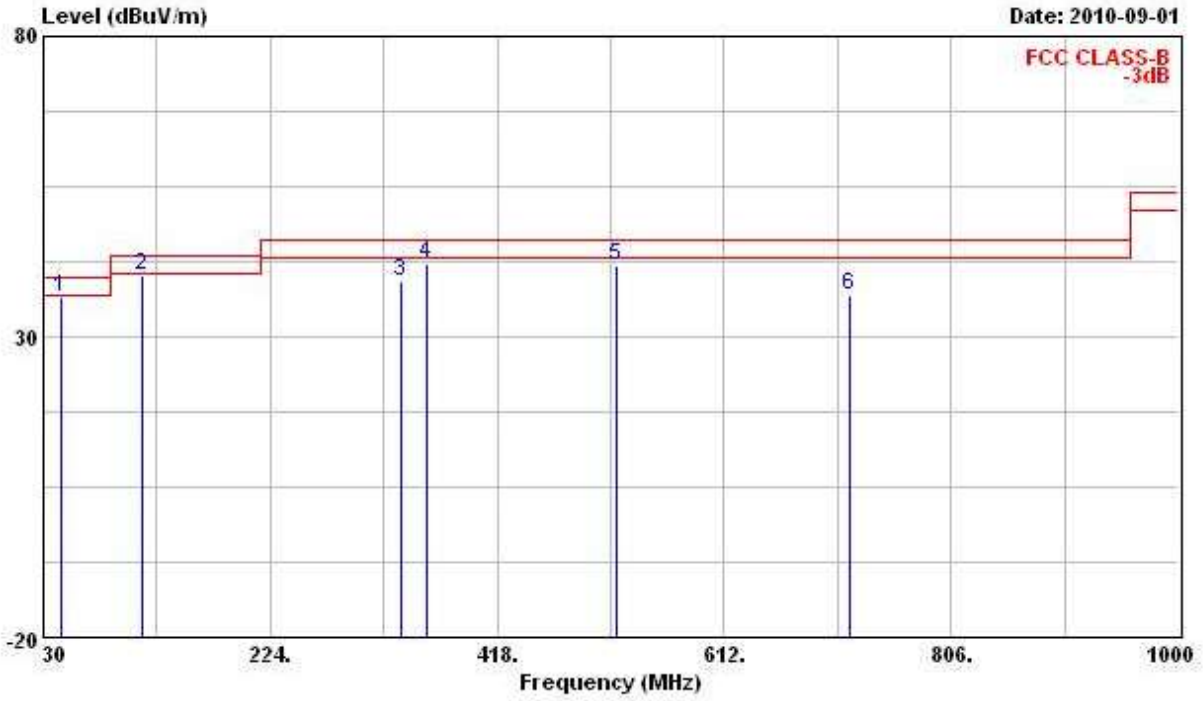
Final Test Date	Sep. 01, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	Normal Mode

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	187.140	37.13	-6.37	43.50	53.82	9.15	2.25	28.10	---	---	Peak
2 @	249.220	42.75	-3.25	46.00	55.19	12.58	2.75	27.77	---	---	Peak
3 @	357.860	44.45	-1.55	46.00	54.11	15.18	3.33	28.16	---	---	QP
4	389.870	41.81	-4.19	46.00	51.24	16.11	3.41	28.95	---	---	Peak
5	749.740	41.35	-4.65	46.00	45.77	20.71	4.91	30.03	---	---	QP
6	913.670	35.86	-10.14	46.00	38.64	21.11	5.61	29.49	---	---	QP

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	44.550	36.66	-3.34	40.00	52.79	10.51	1.02	27.66	---	---	QP
2 @	114.390	40.24	-3.26	43.50	53.58	12.52	1.83	27.68	---	---	Peak
3	335.550	39.37	-6.63	46.00	49.59	14.67	3.23	28.13	---	---	QP
4	357.860	42.11	-3.89	46.00	51.77	15.18	3.33	28.16	---	---	Peak
5	520.820	41.87	-4.13	46.00	48.51	18.62	4.00	29.25	---	---	Peak
6	719.670	36.91	-9.09	46.00	41.54	20.25	4.76	29.64	---	---	QP

Note:

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

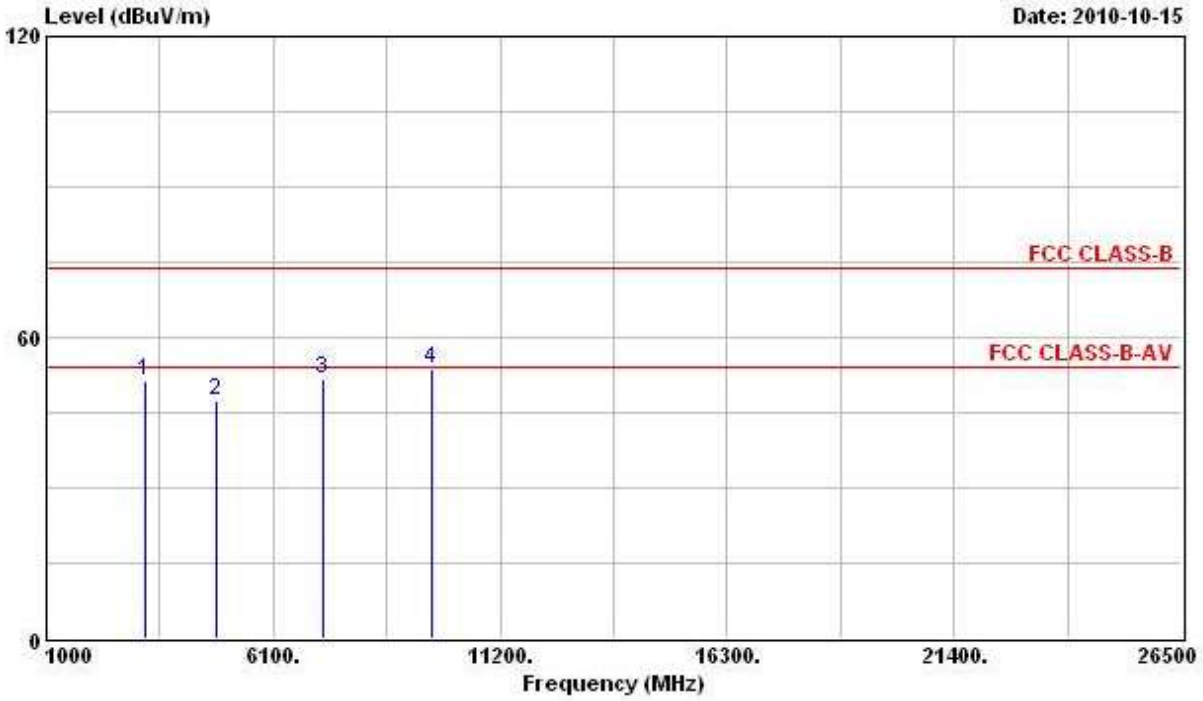
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

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

Final Test Date	Oct. 15, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	802.11n Ch. 1 (20MHz)

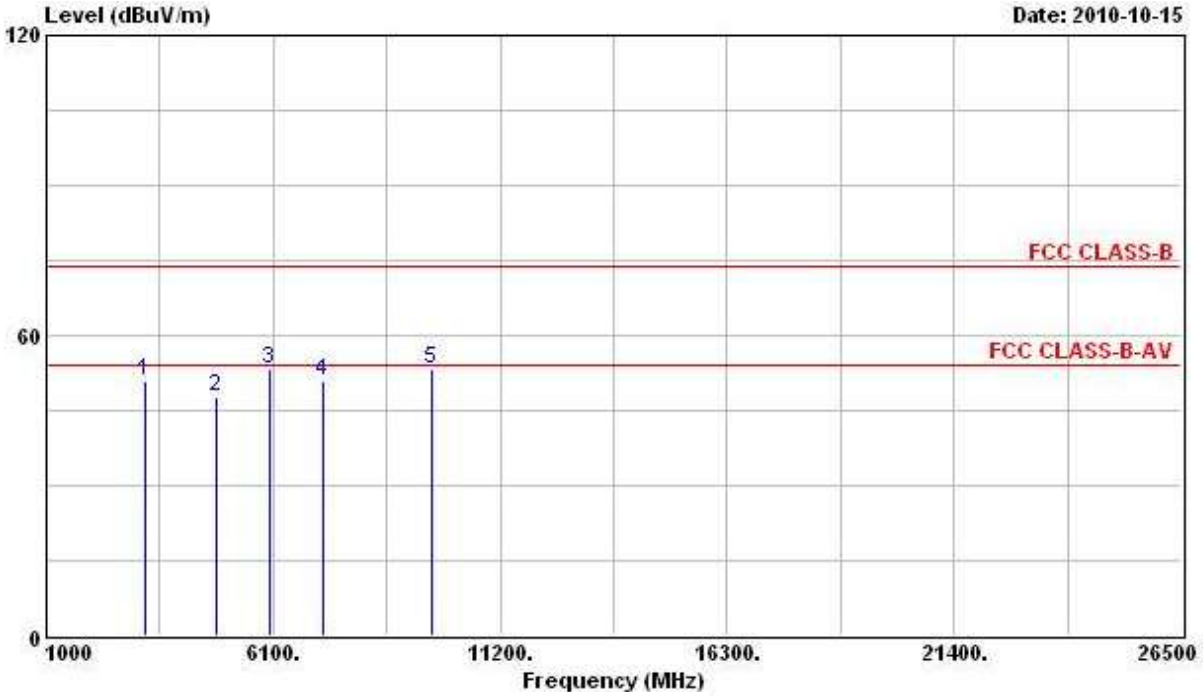
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3216.000	51.45			50.82	30.51	2.91	32.79	Peak
2	4828.000	47.37	-6.63	54.00	44.25	33.06	2.70	32.63	PK
3	7236.000	51.79			44.59	35.53	4.55	32.89	Peak
4	9644.000	53.88			43.52	38.38	5.32	33.34	Peak

Note: The items 1, 3 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

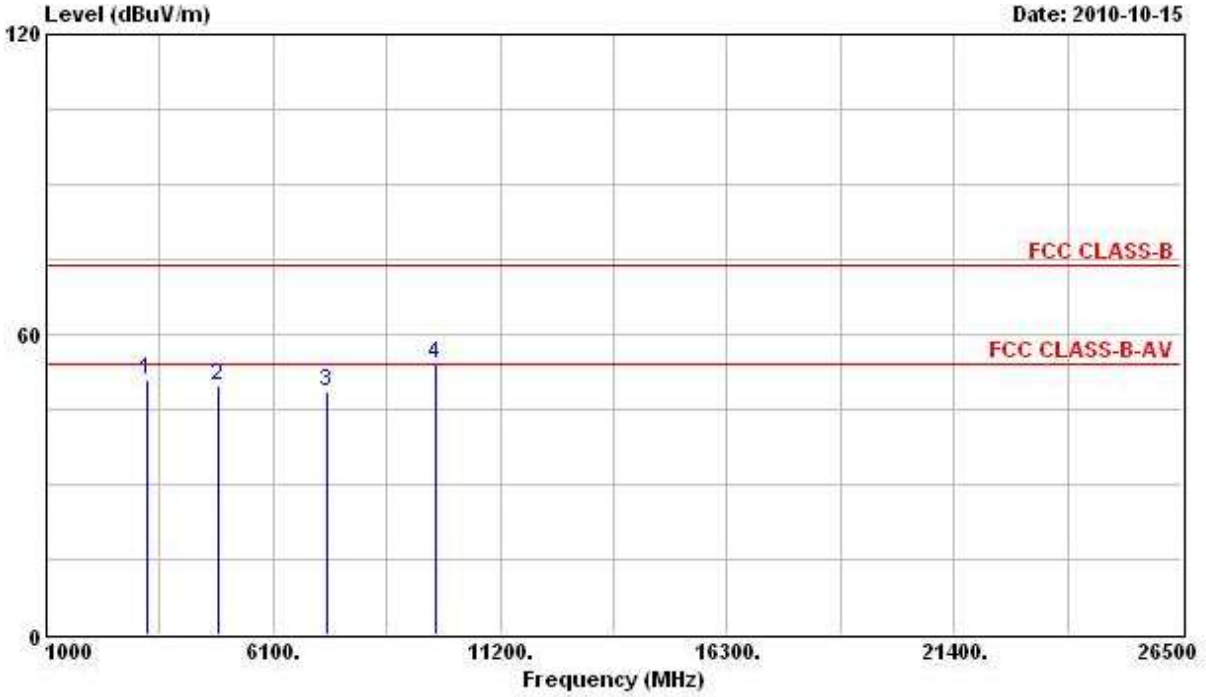


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3216.000	50.91			50.28	30.51	2.91	32.79	PEAK
2	4828.000	47.69	-6.31	54.00	44.57	33.06	2.70	32.63	PK
3	6000.000	53.44			48.00	34.10	3.97	32.63	PEAK
4	7236.000	50.75			43.55	35.53	4.55	32.89	PEAK
5	9644.000	53.32			42.96	38.38	5.32	33.34	PEAK

Note: The items 1, 3, 4 and 5 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Final Test Date	Oct. 15, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	802.11n Ch. 6 (20MHz)

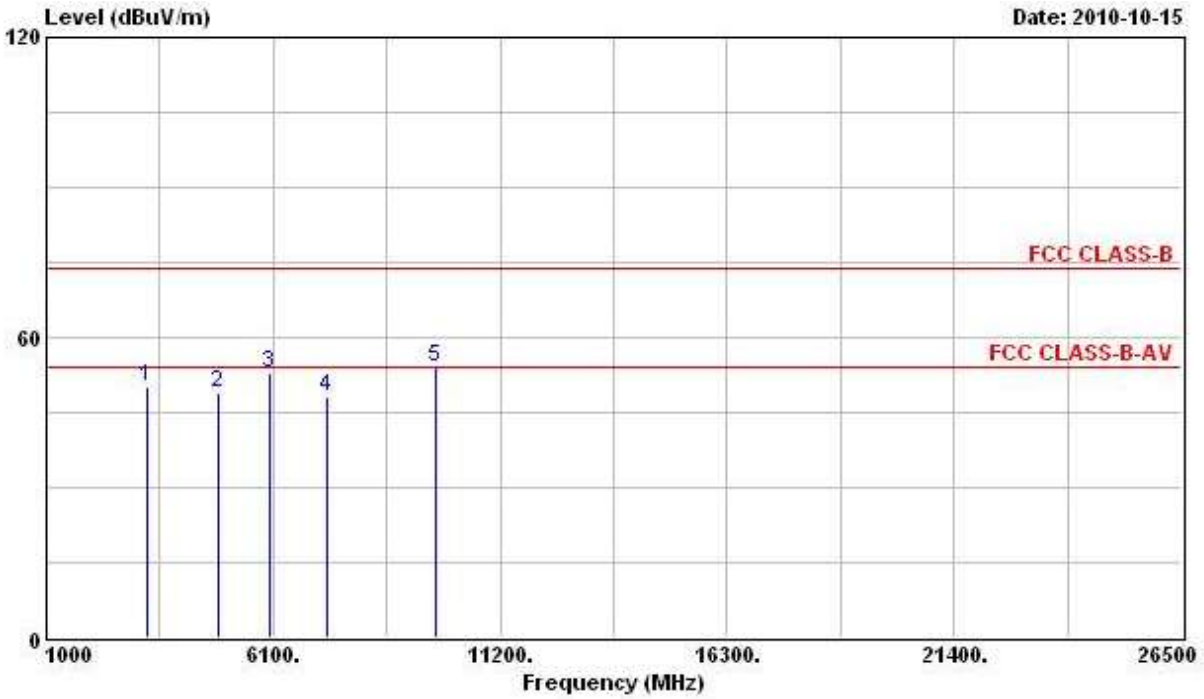
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3248.000	51.01			50.30	30.58	2.91	32.79	Peak
2 @	4876.000	49.83	-4.17	54.00	46.69	33.16	2.60	32.62	PK
3	7307.000	48.36	-5.64	54.00	40.93	35.68	4.65	32.90	PK
4	9744.000	54.08			43.45	38.58	5.39	33.34	Peak

Note: The items 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

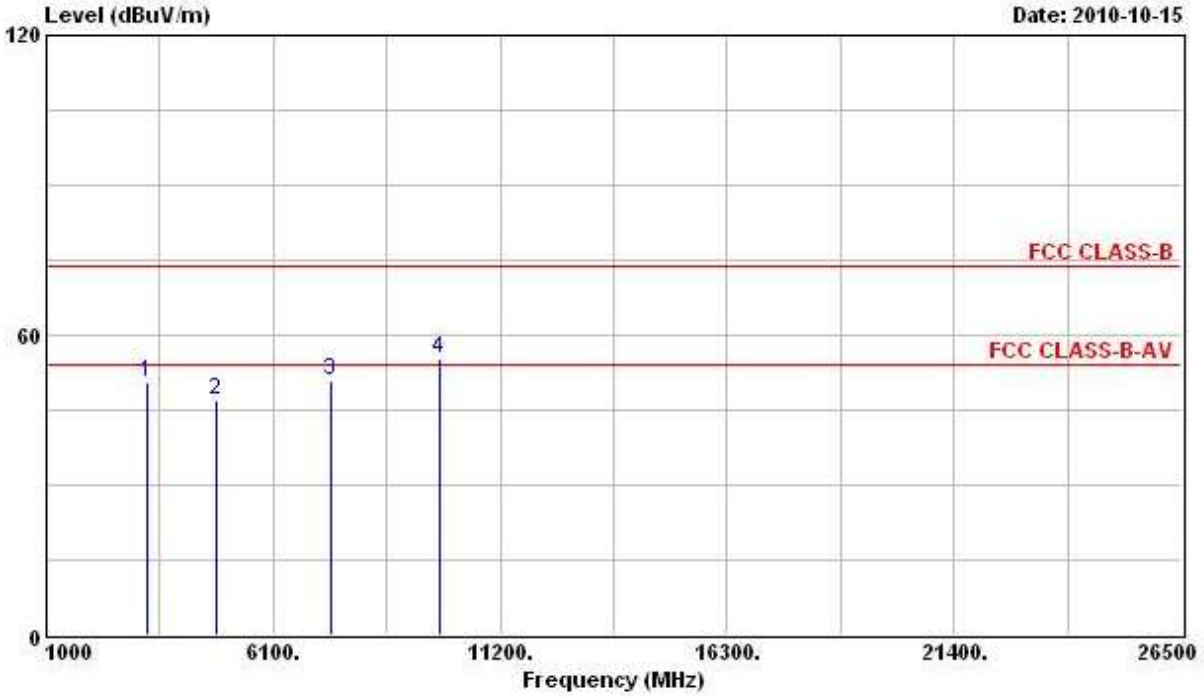


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3246.000	49.95			49.24	30.58	2.91	32.79	PEAK
2 @	4874.000	49.01	-4.99	54.00	45.87	33.16	2.60	32.62	PK
3	6000.000	52.94			47.50	34.10	3.97	32.63	PEAK
4	7303.000	48.30	-5.70	54.00	40.87	35.68	4.65	32.90	PK
5	9748.000	54.20			43.50	38.62	5.42	33.34	Peak

Note: The items 1, 3 and 5 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Final Test Date	Oct. 15, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	802.11n Ch. 11 (20MHz)

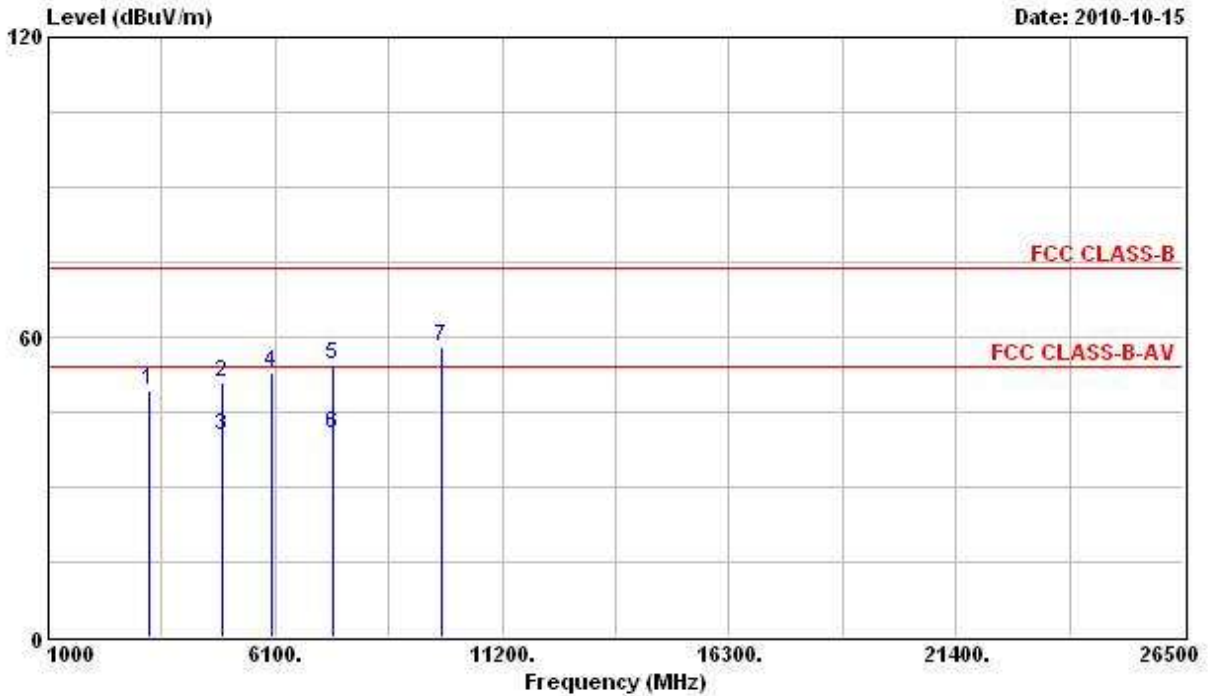
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3280.000	50.70			49.92	30.65	2.92	32.79	PEAK
2	4824.000	46.94	-7.06	54.00	43.82	33.06	2.70	32.63	PK
3 @	7386.000	51.00	-3.00	54.00	43.31	35.87	4.75	32.92	PK
4	9848.000	55.33			44.39	38.79	5.49	33.33	PEAK

Note: The items 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

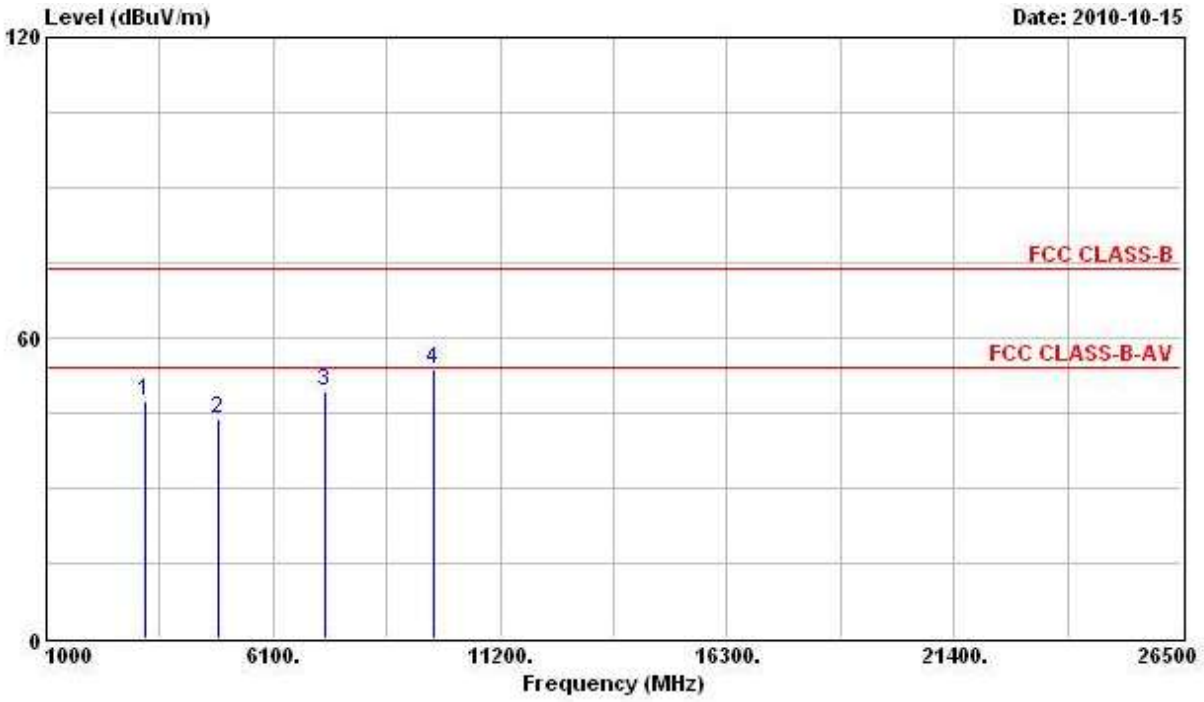


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3278.000	49.15			48.37	30.65	2.92	32.79	PEAK
2	4924.000	51.07	-22.93	74.00	47.86	33.26	2.56	32.61	PEAK
3	4924.000	40.30	-13.70	54.00	37.09	33.26	2.56	32.61	Average
4	6000.000	52.91			47.47	34.10	3.97	32.63	PEAK
5	7386.000	54.34	-19.66	74.00	46.64	35.87	4.75	32.92	PEAK
6	7386.000	40.74	-13.26	54.00	33.04	35.87	4.75	32.92	Average
7	9848.000	58.09			47.14	38.79	5.49	33.33	PEAK

Note: The items 1, 4 and 7 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Final Test Date	Oct. 15, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	802.11n Ch. 3 (40MHz)

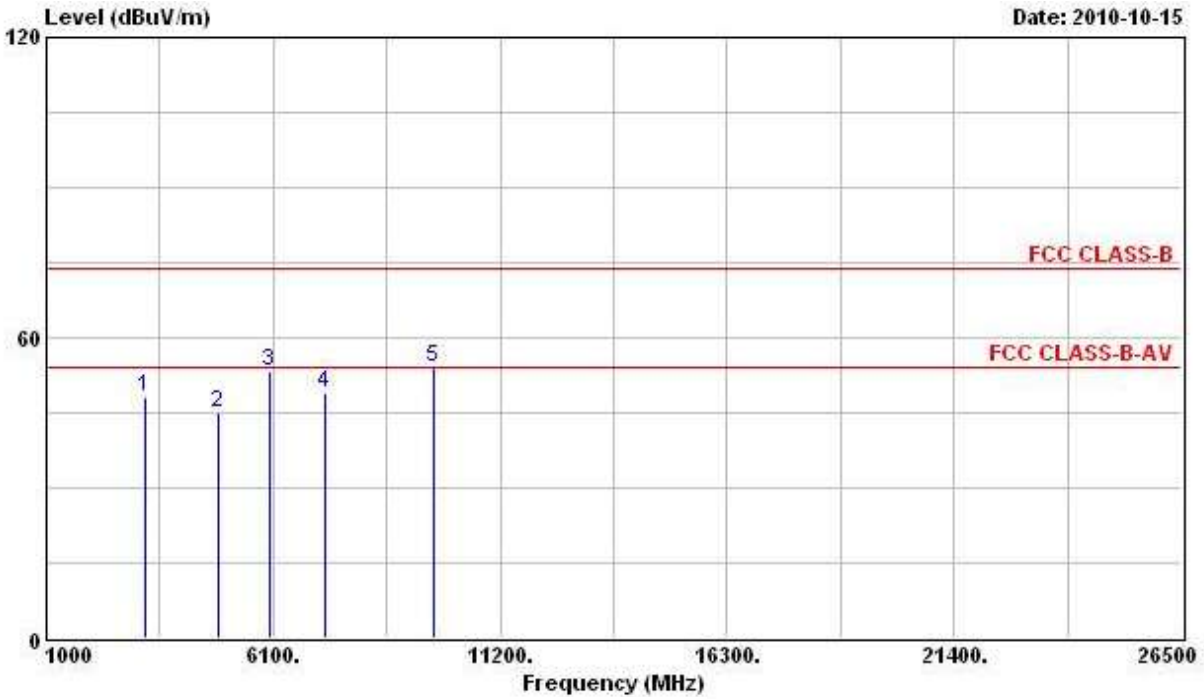
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3228.000	47.32			46.66	30.55	2.91	32.79	PEAK
2	4848.000	43.97	-10.03	54.00	40.86	33.09	2.65	32.63	PK
3 @	7268.000	49.39	-4.61	54.00	42.07	35.61	4.60	32.89	PK
4	9688.000	53.82			43.32	38.48	5.36	33.34	PEAK

Note: The items 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

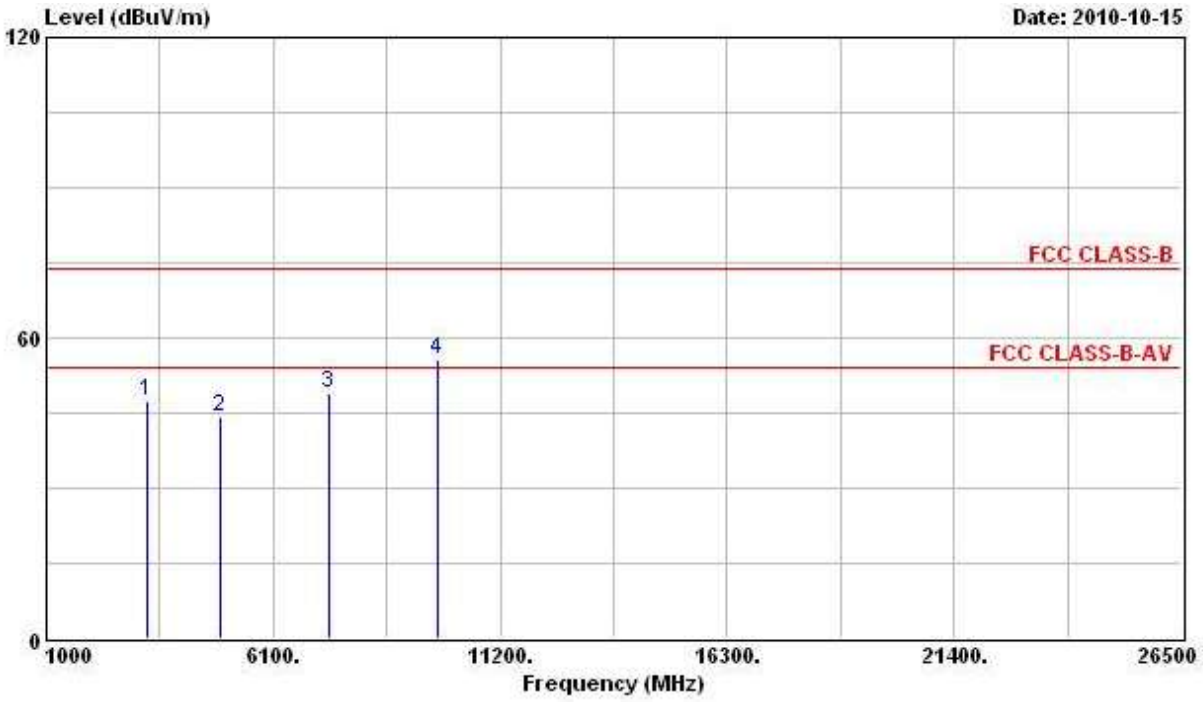


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3228.000	48.30			47.64	30.55	2.91	32.79	PEAK
2	4844.000	44.84	-9.16	54.00	41.73	33.09	2.65	32.63	PK
3	6000.000	53.20			47.76	34.10	3.97	32.63	PEAK
4	7264.000	48.99	-5.01	54.00	41.71	35.57	4.60	32.89	PK
5	9688.000	54.24			43.74	38.48	5.36	33.34	PEAK

Note: The items 1, 3 and 5 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Final Test Date	Oct. 15, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	802.11n Ch. 6 (40MHz)

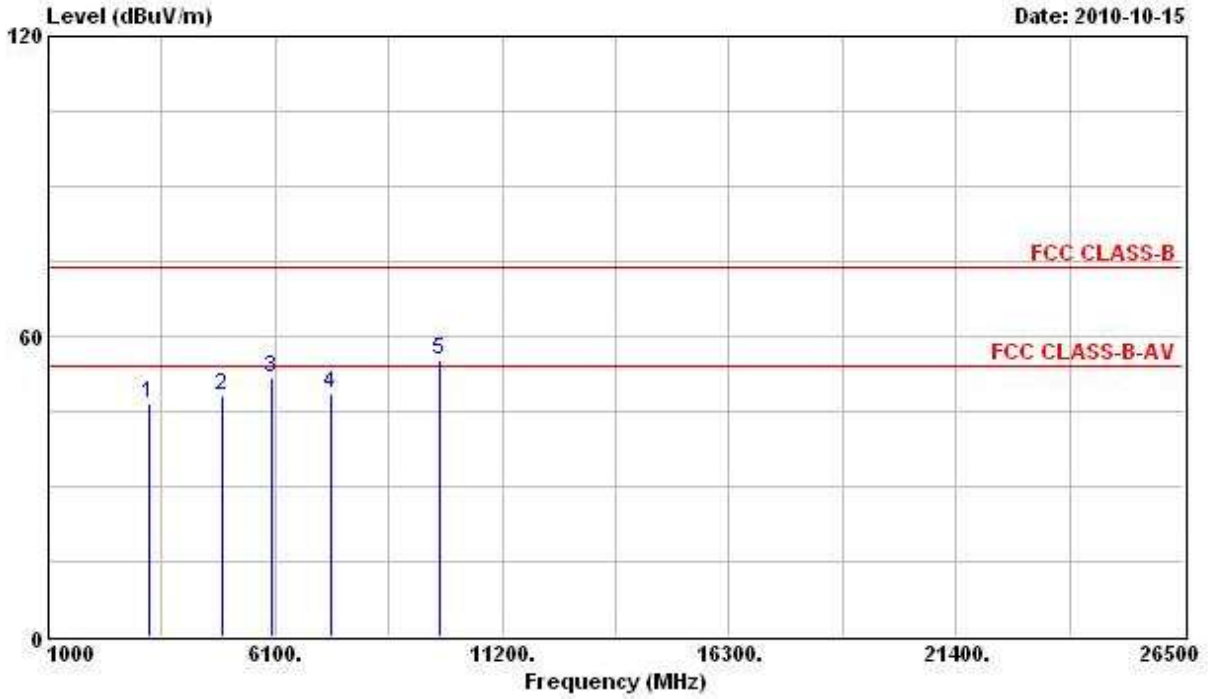
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3268.000	47.39			46.64	30.62	2.91	32.79	PEAK
2	4908.000	44.11	-9.89	54.00	40.89	33.23	2.60	32.62	PK
3	7356.000	48.82	-5.18	54.00	41.24	35.80	4.70	32.92	PK
4	9808.000	55.53			44.69	38.72	5.45	33.33	PEAK

Note: The items 1 and 4 are is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

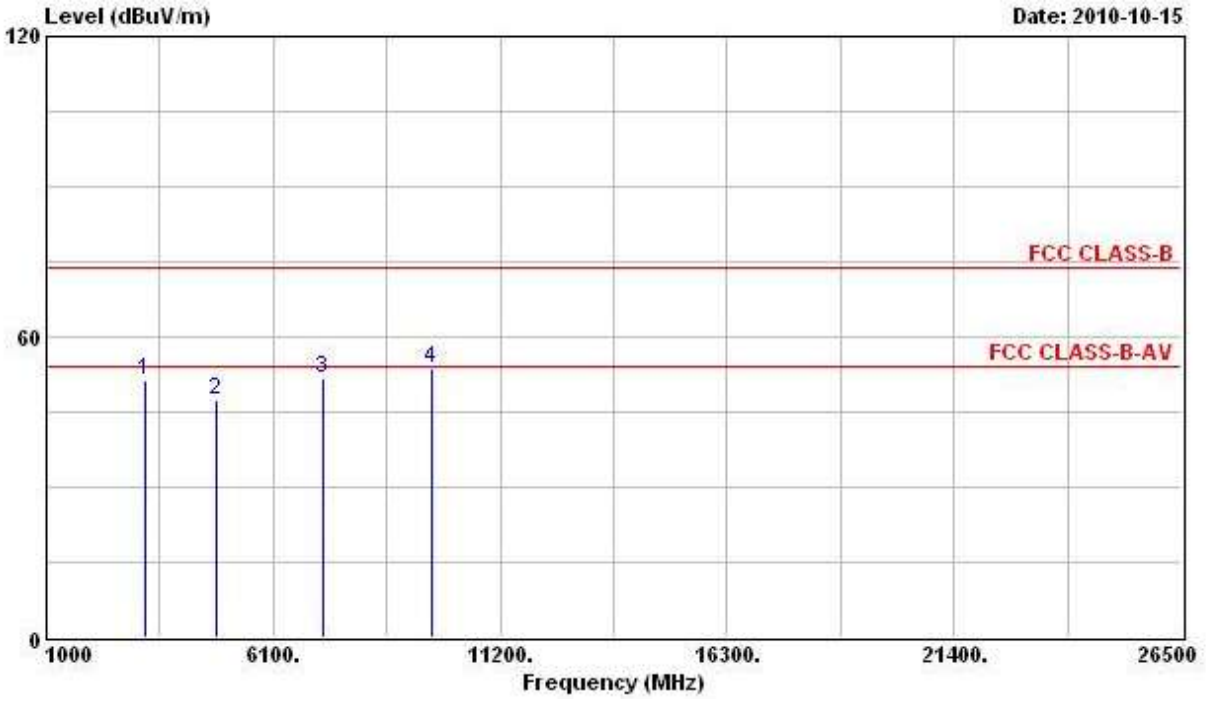


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3268.000	46.43			45.68	30.62	2.91	32.79	PEAK
2	4900.000	48.27	-5.73	54.00	45.09	33.19	2.60	32.62	PK
3	6000.000	51.62			46.18	34.10	3.97	32.63	PEAK
4	7356.000	48.47	-5.53	54.00	40.89	35.80	4.70	32.92	PK
5	9816.000	55.14			44.26	38.76	5.45	33.33	PEAK

Note: The items 1, 3 and 5 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Final Test Date	Oct. 15, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	802.11n Ch. 9 (40MHz)

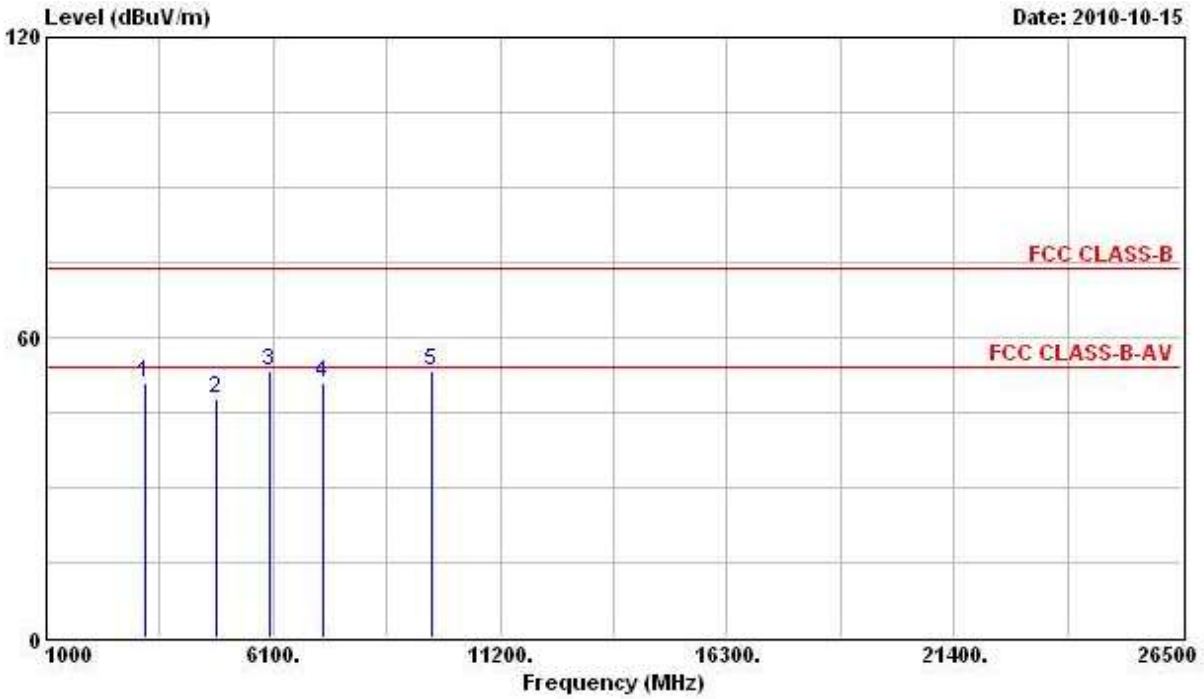
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3216.000	51.45			50.82	30.51	2.91	32.79	Peak
2	4828.000	47.37	-6.63	54.00	44.25	33.06	2.70	32.63	PK
3	7236.000	51.79			44.59	35.53	4.55	32.89	Peak
4	9644.000	53.88			43.52	38.38	5.32	33.34	Peak

Note: The items 1, 3 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	3216.000	50.91			50.28	30.51	2.91	32.79	PEAK
2	4828.000	47.69	-6.31	54.00	44.57	33.06	2.70	32.63	PK
3	6000.000	53.44			48.00	34.10	3.97	32.63	PEAK
4	7236.000	50.75			43.55	35.53	4.55	32.89	PEAK
5	9644.000	53.32			42.96	38.38	5.32	33.34	PEAK

Note: The items 1, 3, 4 and 5 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

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

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

3.3 Band Edge and Fundamental Emissions Measurement

3.3.1 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

3.3.2 Measuring Instruments and Setting

Please refer to section 4 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)	1MHz / 1MHz for Peak

3.3.3 Test Procedures

1. The test procedure is the same as section 3.5.3; only the frequency range investigated is limited to 100MHz around band edges.
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.

3.3.4 Test Setup Layout

This test setup layout is the same as that shown in section 3.5.4.

3.3.5 Test Deviation

There is no deviation with the original standard.

3.3.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.3.7 Test Result of Band Edge and Fundamental Emissions

Final Test Date	Oct. 15, 2010	Test Site No.	03CH03-HY
Temperature	26.3℃	Humidity	52%
Test Engineer	Eddie	Configuration	802.11n Ch. 1, 6, 11 (20MHz)

Channel 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2389.420	66.25	-7.75	74.00	35.53	28.13	2.58	0.00	Peak
2 @	2415.260	97.36			66.59	28.16	2.61	0.00	Peak
1	2390.000	47.17	-6.83	54.00	16.45	28.13	2.58	0.00	Average
2 @	2414.690	86.10			55.33	28.16	2.61	0.00	Average

The item 2 is Fundamental Emissions.

Channel 6

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	2440.340	97.29			66.47	28.22	2.61	0.00	Peak
1 @	2442.050	86.13			55.31	28.22	2.61	0.00	Average

The item 1 is Fundamental Emissions.

Channel 11

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	2458.580	96.14			65.27	28.24	2.63	0.00	Peak
2	2486.130	59.00	-15.00	74.00	28.10	28.27	2.63	0.00	Peak
1 @	2458.770	85.13			54.26	28.24	2.63	0.00	Average
2	2483.500	44.15	-9.85	54.00	13.25	28.27	2.63	0.00	Average

The item 1 is Fundamental Emissions.

Note:

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. 15, 2010	**Test Site No.**	03CH03-HY
Temperature	26.3℃	**Humidity**	52%
Test Engineer	Eddie	**Configuration**	802.11n Ch. 3, 6, 9 (40MHz)

Channel 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2390.000	64.52	-9.48	74.00	33.80	28.13	2.58	0.00	Peak
2 @	2428.940	94.04			63.24	28.19	2.61	0.00	Peak
1 @	2390.000	51.29	-2.71	54.00	20.57	28.13	2.58	0.00	Average
2 @	2428.180	82.41			51.61	28.19	2.61	0.00	Average

The item 2 is Fundamental Emissions.

Channel 6

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	2443.570	94.48			63.66	28.22	2.61	0.00	Peak
1 @	2443.380	82.72			51.90	28.22	2.61	0.00	Average

The item 1 is Fundamental Emissions.

Channel 9

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	2447.180	94.16			63.34	28.22	2.61	0.00	Peak
2	2488.220	64.08	-9.92	74.00	33.15	28.30	2.63	0.00	Peak
1 @	2446.610	82.94			52.12	28.22	2.61	0.00	Average
2	2483.500	48.12	-5.88	54.00	17.22	28.27	2.63	0.00	Average

The item 1 is Fundamental Emissions.

Note:

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

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

3.4 Antenna Requirements

3.4.1 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.

3.4.2 Antenna Connector Construction

Please refer to section 2.3 in this test report; antenna connector complied with the requirements.

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	Apr. 16, 2010	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. 04, 2009	Conduction (CO01-LK)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 18, 2010	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan. 24, 2010	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Aug. 02, 2010	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Feb. 02, 2010	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Nov. 30, 2009	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 20, 2010	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan.11, 2010	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Jan. 05, 2010	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Jan. 05, 2010	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-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. 29, 2010*	Radiation (03CH03-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 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

6 TAF CERTIFICATE OF ACCREDITATION

Certificate No. : L1190-100529

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 : May 29, 2010

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