FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment	:	**Enterprise Access Point**
Brand Name	:	**4ipnet**
Model No.	:	**EAP110v1 / EAP110**
Filing Type	:	**New Application**
Applicant	:	**4IPNET, INC.**
Manufacturer		3F, No. 369, Fusing N. Rd., Taipei 105, Taiwan, R.O.C.
FCC ID	:	**VZ9110002**
Received Date	:	Mar. 04, 2009
Final Test Date	:	Aug. 10, 2011

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.

Testing Laboratory
1190

SPORTON International Inc.

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

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History of This Test Report

Original Issue Date: Sep. 05, 2011
Report No.: FR151735AI
■ 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	:	Enterprise Access Point
Brand Name	:	4ipnet
Model No.	:	EAP110v1 / EAP110
Applicant	:	4IPNET, INC.
		3F, No. 369, Fusing N. Rd., Taipei 105, Taiwan, R.O.C.

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Mar. 04, 2009 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.

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	4.62 dB
3.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	15.41 dB
3.3	15.247(e)	Power Spectral Density	Complies	15.31 dB
3.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
3.5	15.247(d)	Radiated Emissions	Complies	1.01 dB
3.6	15.247(d)	Band Edge Emissions	Complies	1.06 dB
3.7	15.203	Antenna Requirements	Complies	-

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%

2 GENERAL INFORMATION

2.1 Product Details

There are two difference appearance of product. Only the radio detail of IEEE 802.11n is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Power Type	From adapter or POE
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
Channel Band Width (99%)	MCS8 (20MHz) : 17.44 MHz ; MCS8 (40MHz) : 35.68 MHz
Conducted Output Power	MCS8 (20MHz) : 14.01 dBm ; MCS8 (40MHz) : 14.59 dBm

2.2 Accessories

Power	Brand	Model	Rating
Switching power supply	PHIHONG	PSAC05R-050	INPUT : 100-240V~300mA 50-60Hz 12-18VA OUTPUT : +5V 1A MAX

2.3 Table for Filed Antenna

Antenna & Bandwidth

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

Ant.	Antenna Type	Connector	Gain (dBi)	Remark
A	Dipole Antenna	Reversed-SMA	3.00	TX / RX
B	Dipole Antenna	Reversed-SMA	3.00	TX / RX

Antenna: 3dBi Detachable Dipole Antenna x 2 (2T2R Spatial Multiplexing MIMO configuration. These 2 antennas are for signal transmitting and receiving).

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
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
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

2.4 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	-	-

2.5 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 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 Radiated Emissions Below 1GHz	See the Note	Auto	-
Maximum Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth Radiated Emissions Above 1GHz Fundamental Emissions	MCS8 (20MHz)	13 Mbps	1/6/11
	MCS8 (40MHz)	27 Mbps	3/6/9
Band Edge Emissions	MCS8 (20MHz)	13 Mbps	1/11
	MCS8 (40MHz)	27 Mbps	3/9

Note: For the all test, the following modes were tested:
Mode 1. EUT(EAP110v1) + Adapter
Mode 2. EUT(EAP110v1) + POE
Mode 3. EUT(EAP110) + Adapter
Mode 4. EUT(EAP110) + POE
In the Radiated Emissions (Above 1GHz):
Because the EUT RF module is same, so use the Mode 2 is tested in this report.

2.6 Table for Testing Locations

Test Site No.	Site Category	Location
03CH02-HY	SAC	Hwa Ya
CO04-HY	Conduction	Hwa Ya
TH01-HY	OVEN Room	Hwa Ya

Semi Anechoic Chamber (SAC).

2.7 Table for Supporting Units

Mode 1 / Mode 2

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D400	N/A
Modem	ACEEX	DM1414	IFAXDM1414
Mouse (USB)	Microsoft	1004	N/A
Notebook (Remote Workstation)	DELL	D400	N/A
POE (Remote Workstation)	D-Link	DEL-P200	N/A

Mode 3 / Mode 4

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E5500	N/A
Modem	ACEEX	DM1414	DoC
Mouse (USB)	Microsoft	1004	DoC
Notebook (Remote Workstation)	DELL	D400	N/A
POE (Remote Workstation)	D-Link	DWL-P200	N/A
Notebook	DELL	E5500	N/A

2.8 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 802.11n (Ant. A+B)

Test Software Version	RT3052		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n(20MHz)	A:5/B:7	A:12/B:0F	A:15/B:0D
Frequency	2422 MHz	2437 MHz	2452 MHz
IEEE 802.11n(40MHz)	A:09/B:09	A:12/B:0F	A:OD/B:06

2.9 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.
The program was executed as follows :

a. Turn on the power of all equipment.
b. The NB reads the test program from the hard disk drive and runs it.
c. The NB sends "H" messages to the panel and displays "H" patterns on the screen.
d. The NB sends messages to the modem.

At the same time, the following programs were executed:

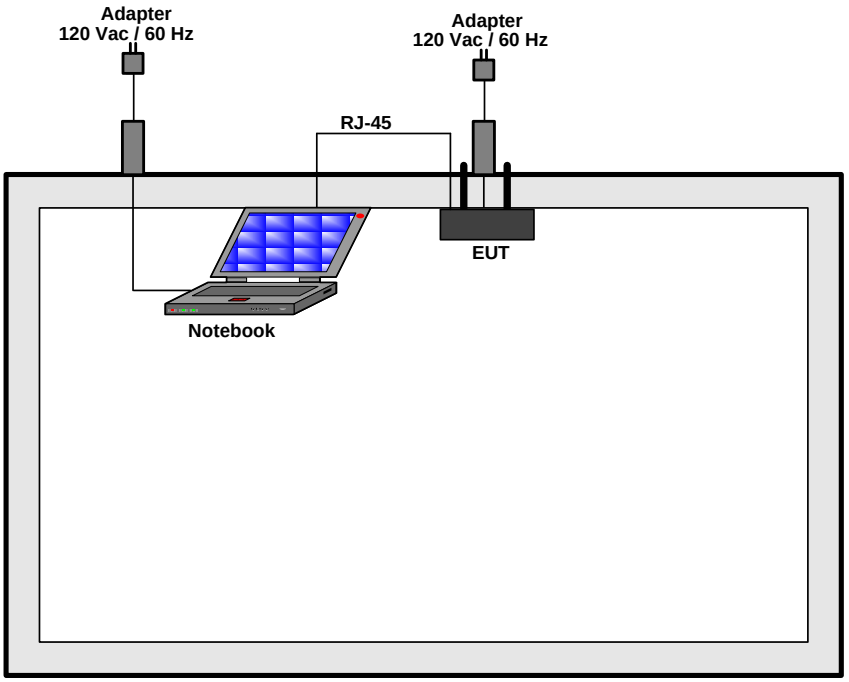
-Executed "ping.exe" to link with the remote workstation to receive and transmit data by LAN and WLAN.

-Executed “RT3052” to keep transmitting signals at fixed frequency. (Only Radiated Emissions tested)

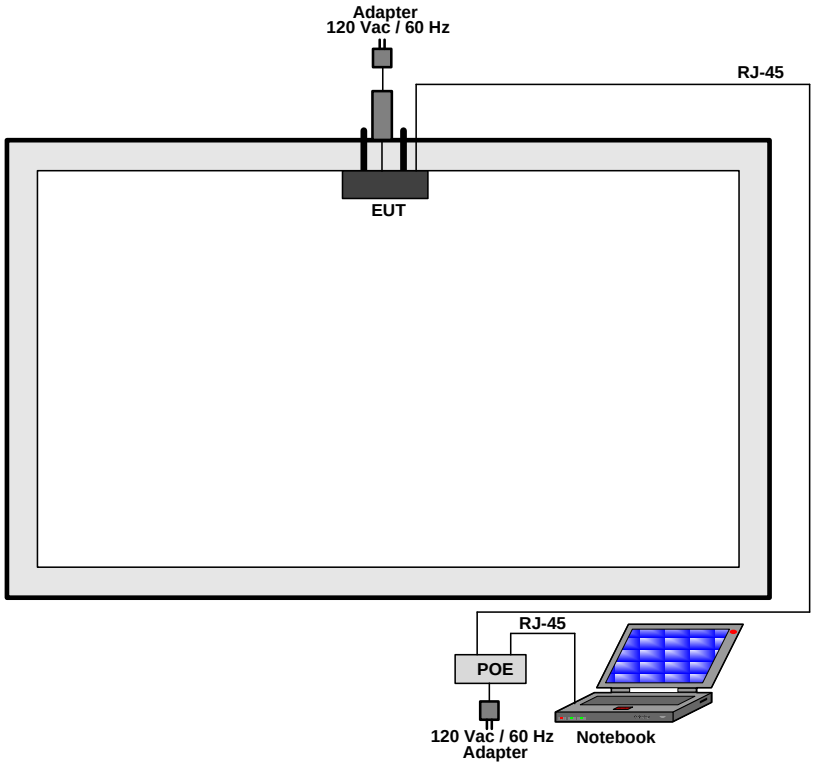
2.10 Test Configuration

Radiation Emissions Test Configuration
For radiated emissions 9kHz~1GHz

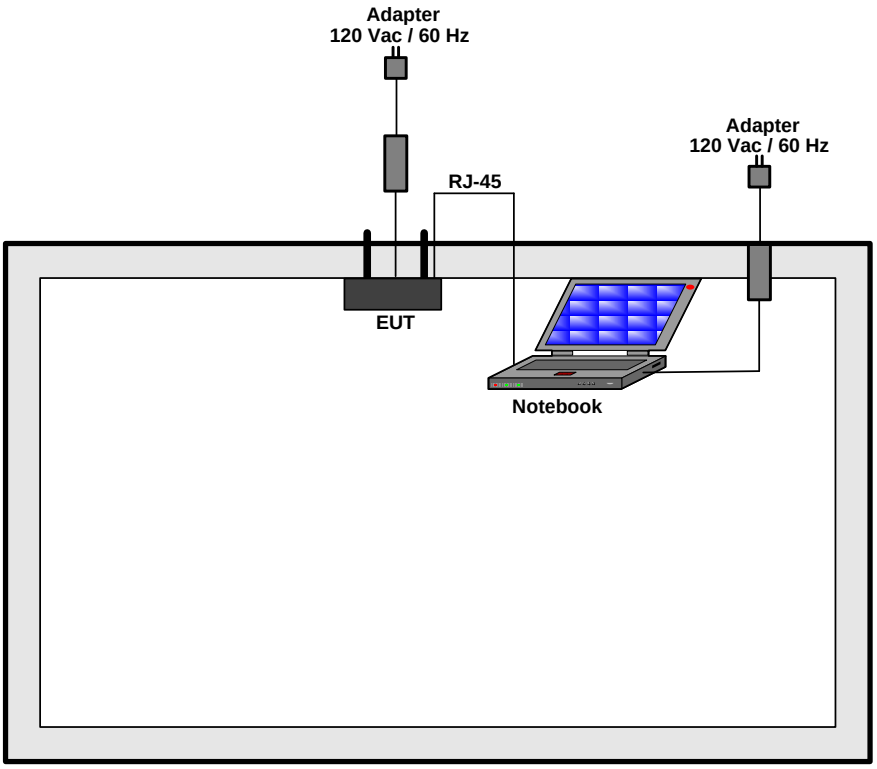
Mode 1



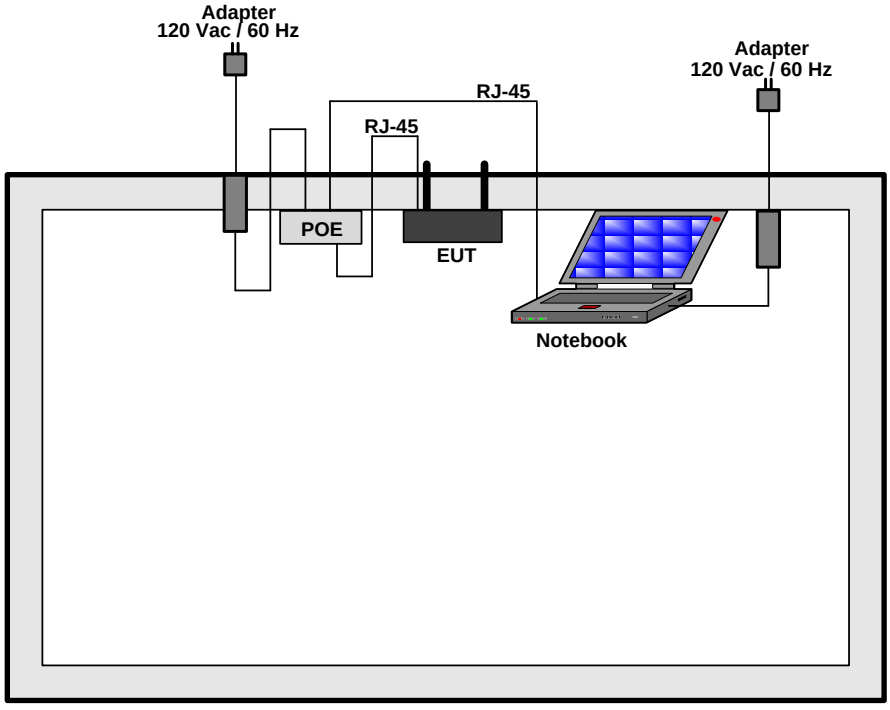
Mode 2



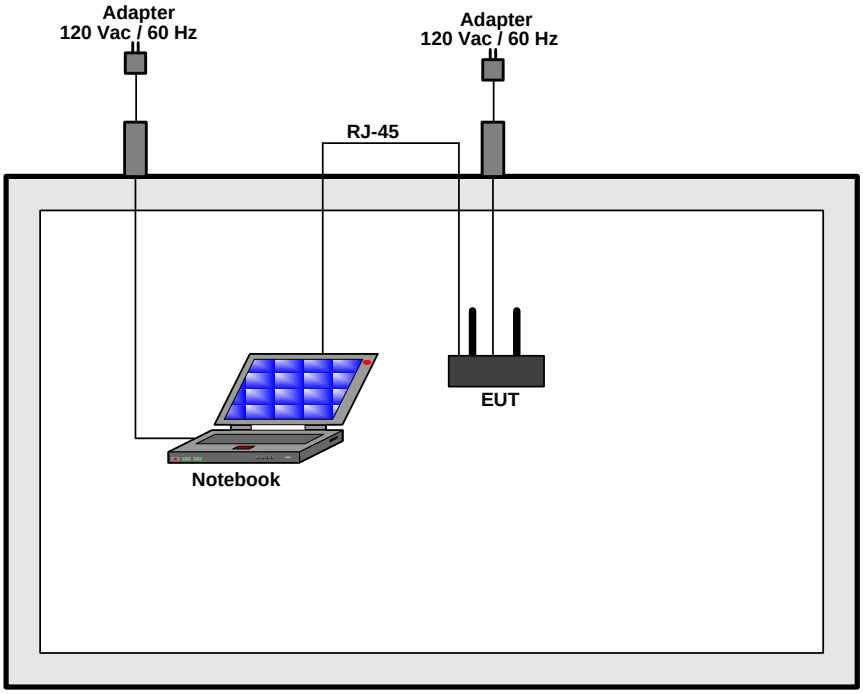
Mode 3


Adapter
120 Vac / 60 Hz
Adapter
120 Vac / 60 Hz
RJ-45
EUT
Notebook

Mode 4


Adapter
120 Vac / 60 Hz
Adapter
120 Vac / 60 Hz
RJ-45
RJ-45
POE
EUT
Notebook

For radiated emissions above 1GHz
Mode 1



3 TEST RESULT

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

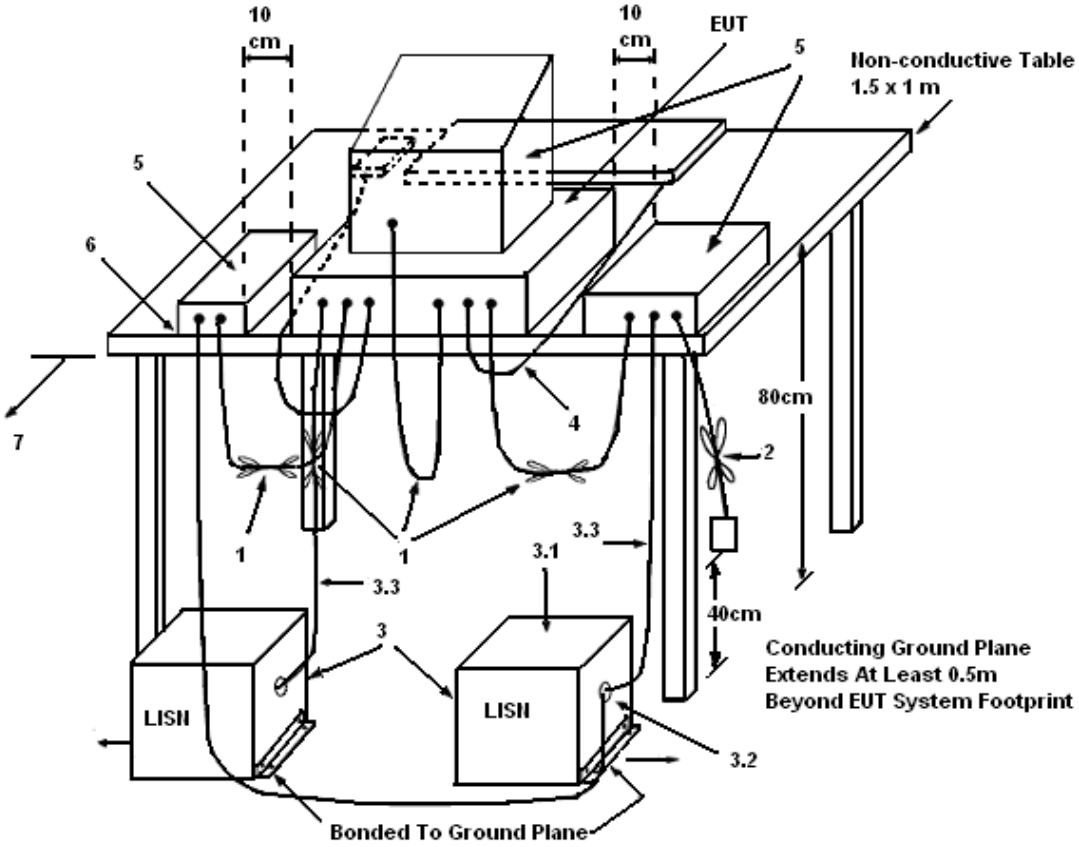
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

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. 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.
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.

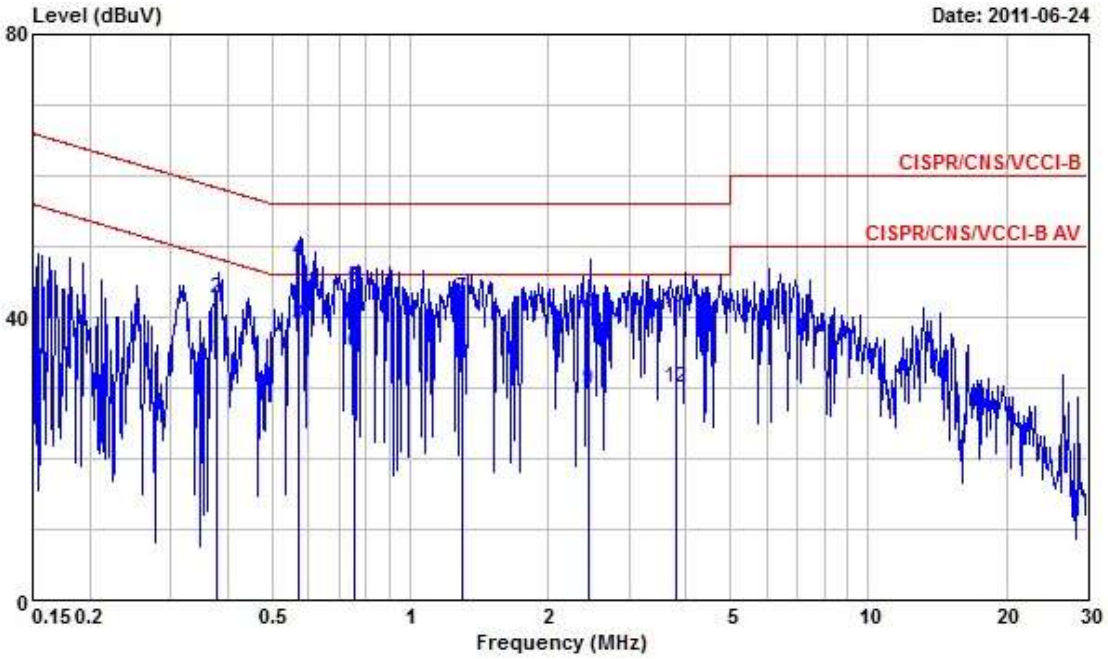
3.1.5 Test Deviation

There is no deviation with the original standard.

3.1.6 Results of AC Power Line Conducted Emissions Measurement

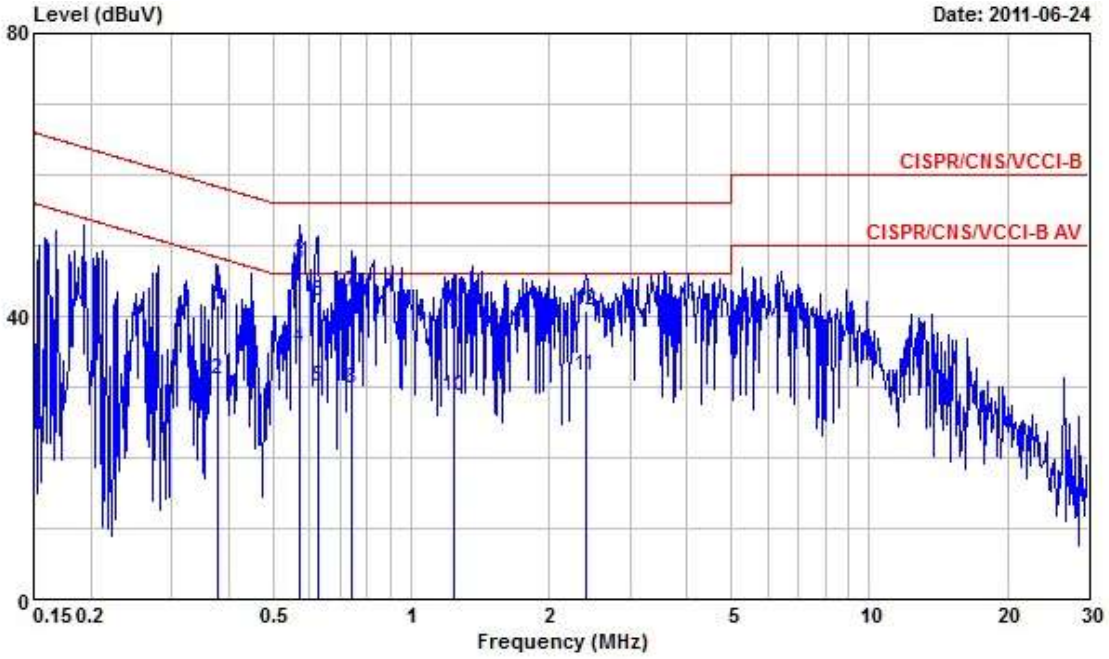
Final Test date	Jun. 24, 2011	**Test Site No.**	CO04-HY
Temperature	25℃	**Humidity**	55%
Test Engineer	Jason	**Configuration**	Mode 1

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.3779040	34.30	-14.03	48.33	34.11	0.09	0.10	Average
2	@0.3779040	42.59	-15.74	58.33	42.40	0.09	0.10	QP
3	@0.5709730	38.92	-7.08	46.00	38.76	0.10	0.06	Average
4	@0.5709730	48.01	-7.99	56.00	47.85	0.10	0.06	QP
5	@0.7550980	44.26	-11.74	56.00	44.13	0.10	0.03	QP
6	@0.7550980	34.90	-11.10	46.00	34.77	0.10	0.03	Average
7	@ 1.298	42.63	-13.37	56.00	42.47	0.12	0.04	QP
8	@ 1.298	33.93	-12.07	46.00	33.77	0.12	0.04	Average
9	@ 2.463	29.81	-16.19	46.00	29.57	0.14	0.10	Average
10	@ 2.463	40.48	-15.52	56.00	40.24	0.14	0.10	QP
11	@ 3.799	39.82	-16.18	56.00	39.56	0.16	0.10	QP
12	@ 3.799	29.96	-16.04	46.00	29.70	0.16	0.10	Average

Neutral

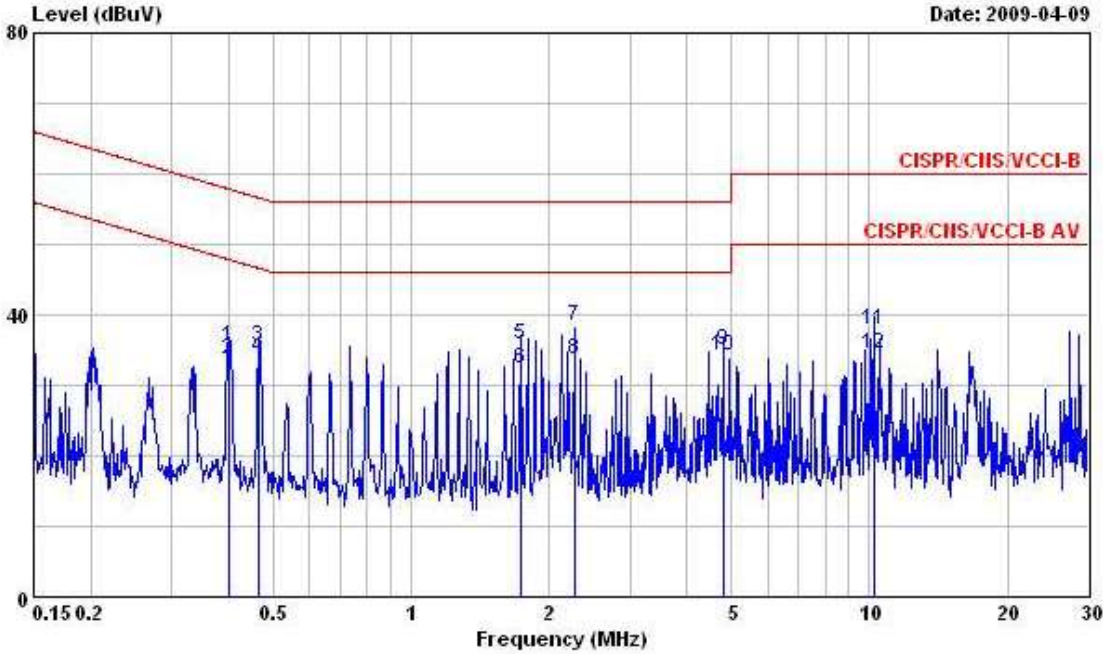


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.3787370	41.54	-16.77	58.31	41.36	0.08	0.10	QP
2	@0.3787370	31.10	-17.21	48.31	30.92	0.08	0.10	Average
3	@0.5731280	47.26	-8.74	56.00	47.11	0.09	0.06	QP
4	@0.5731280	35.51	-10.49	46.00	35.36	0.09	0.06	Average
5	@0.6258330	30.00	-16.00	46.00	29.86	0.09	0.05	Average
6	@0.6258330	42.17	-13.83	56.00	42.03	0.09	0.05	QP
7	@0.7430230	43.33	-12.67	56.00	43.21	0.09	0.03	QP
8	@0.7430230	29.85	-16.15	46.00	29.73	0.09	0.03	Average
9	@ 1.240	40.61	-15.39	56.00	40.48	0.10	0.03	QP
10	@ 1.240	28.56	-17.44	46.00	28.43	0.10	0.03	Average
11	@ 2.400	31.49	-14.51	46.00	31.27	0.12	0.10	Average
12	@ 2.400	40.85	-15.15	56.00	40.63	0.12	0.10	QP

Note:
Level = Read Level + LISN Factor + Cable Loss.

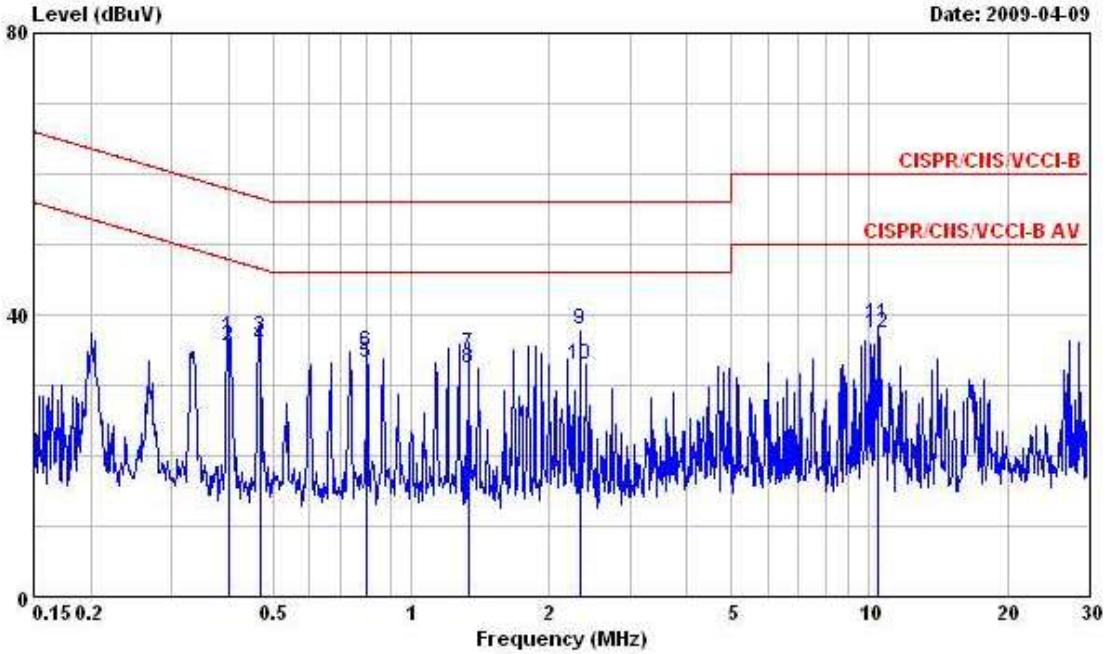
Final Test date	Apr. 09, 2009	**Test Site No.**	CO04-HY
Temperature	25℃	**Humidity**	55%
Test Engineer	Chris	**Configuration**	Mode 2

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.4005980	35.47	-22.37	57.84	35.34	0.09	0.04	QP
2	0.4005980	33.61	-14.23	47.84	33.48	0.09	0.04	Average
3	0.4661350	35.65	-20.93	56.58	35.51	0.09	0.05	QP
4	0.4661350	33.98	-12.60	46.58	33.84	0.09	0.05	Average
5	1.733	35.79	-20.21	56.00	35.54	0.13	0.12	QP
6	1.733	32.31	-13.69	46.00	32.06	0.13	0.12	Average
7	2.266	38.49	-17.51	56.00	38.22	0.14	0.13	QP
8	2.266	33.63	-12.37	46.00	33.36	0.14	0.13	Average
9	4.800	34.87	-21.13	56.00	34.46	0.18	0.23	QP
10	4.800	34.13	-11.87	46.00	33.72	0.18	0.23	Average
11	10.245	37.87	-22.13	60.00	37.25	0.27	0.35	QP
12	10.245	34.38	-15.62	50.00	33.76	0.27	0.35	Average

Neutral

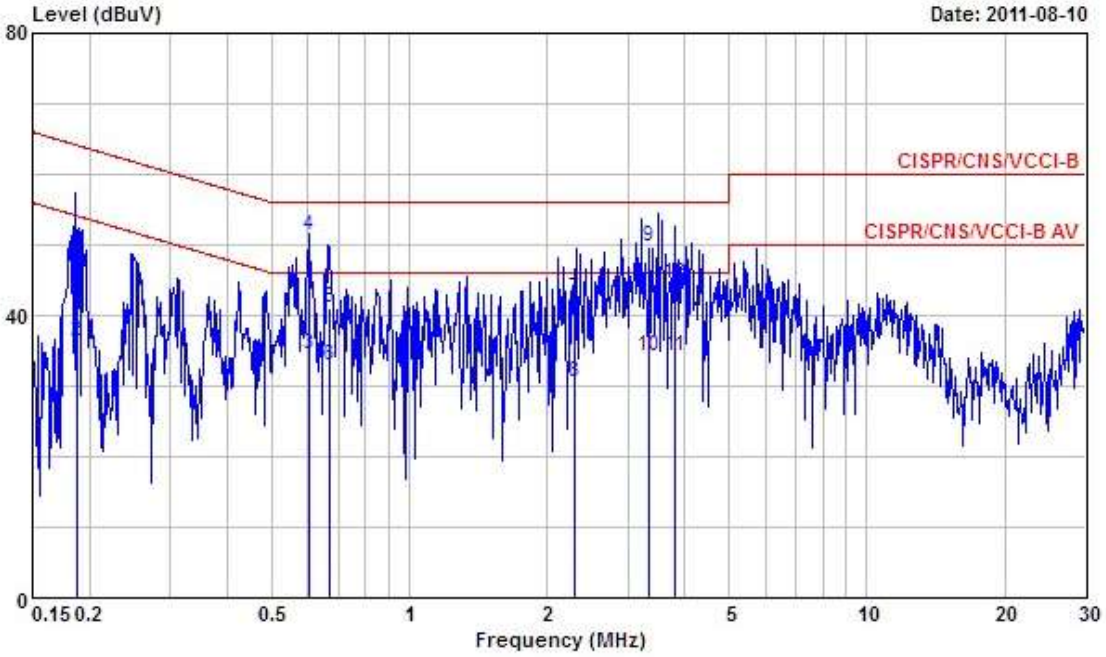


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.3995880	36.90	-20.96	57.86	36.78	0.08	0.04	QP
2	0.3995880	35.59	-12.27	47.86	35.47	0.08	0.04	Average
3	0.4686110	36.80	-19.74	56.54	36.67	0.08	0.05	QP
4	0.4686110	35.55	-10.99	46.54	35.42	0.08	0.05	Average
5	0.8002340	33.04	-12.96	46.00	32.85	0.10	0.09	Average
6	0.8002340	34.83	-21.17	56.00	34.64	0.10	0.09	QP
7	1.333	34.60	-21.40	56.00	34.39	0.10	0.11	QP
8	1.333	32.31	-13.69	46.00	32.10	0.10	0.11	Average
9	2.333	37.90	-18.10	56.00	37.64	0.12	0.14	QP
10	2.333	32.87	-13.13	46.00	32.61	0.12	0.14	Average
11	10.465	38.66	-21.34	60.00	38.03	0.27	0.36	QP
12	10.465	37.27	-12.73	50.00	36.64	0.27	0.36	Average

Note:
Level = Read Level + LISN Factor + Cable Loss.

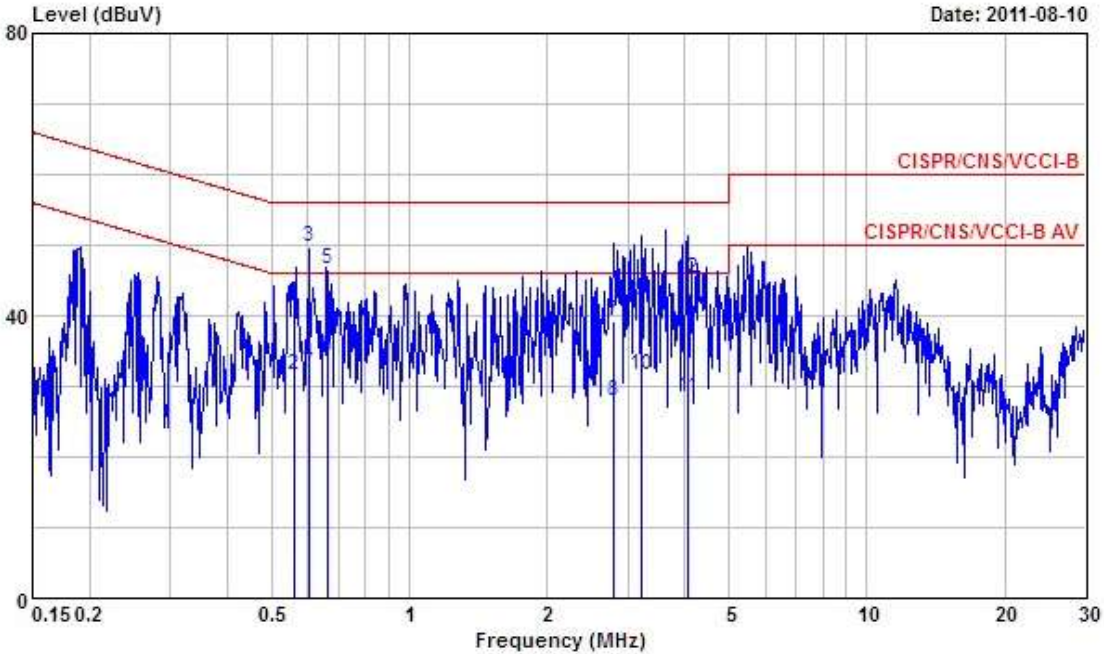
Final Test date	Aug. 10, 2011	**Test Site No.**	CO04-HY
Temperature	26.4℃	**Humidity**	57.1%
Test Engineer	Jason	**Configuration**	Mode 3

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1881600	48.68	-15.44	64.12	48.29	0.30	0.09	QP
2	0.1881600	36.41	-17.71	54.12	36.02	0.30	0.09	Average
3	0.6053130	34.38	-11.62	46.00	33.70	0.29	0.39	Average
4	0.6053130	51.38	-4.62	56.00	50.70	0.29	0.39	QP
5	0.6658710	41.04	-14.96	56.00	40.34	0.29	0.41	QP
6	0.6658710	32.92	-13.08	46.00	32.22	0.29	0.41	Average
7	2.300	42.44	-13.56	56.00	41.62	0.32	0.50	QP
8	2.300	30.48	-15.52	46.00	29.66	0.32	0.50	Average
9	3.330	49.77	-6.23	56.00	48.94	0.33	0.50	QP
10	3.330	34.09	-11.91	46.00	33.26	0.33	0.50	Average
11	3.820	34.21	-11.79	46.00	33.37	0.34	0.50	Average
12	3.820	44.41	-11.59	56.00	43.57	0.34	0.50	QP

Neutral

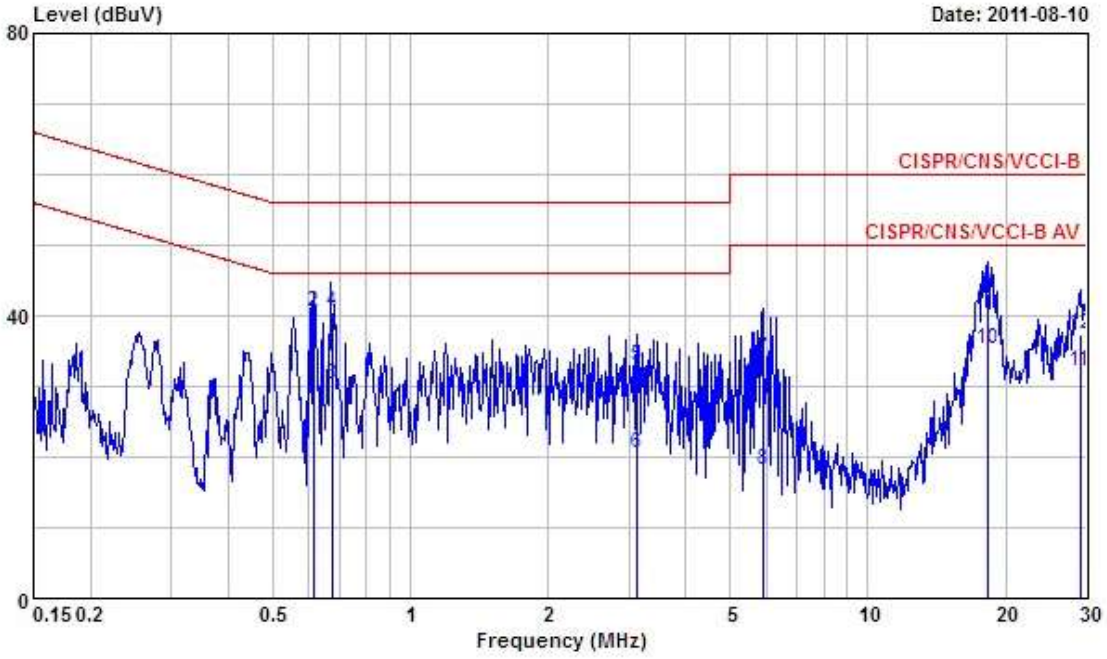


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.5585910	41.67	-14.33	56.00	41.06	0.24	0.37	QP
2	0.5585910	31.47	-14.53	46.00	30.86	0.24	0.37	Average
3	0.6056200	49.66	-6.34	56.00	49.03	0.24	0.39	QP
4	0.6056200	33.18	-12.82	46.00	32.55	0.24	0.39	Average
5	0.6657770	46.55	-9.45	56.00	45.89	0.25	0.41	QP
6	0.6657770	34.20	-11.80	46.00	33.54	0.25	0.41	Average
7	2.790	39.10	-16.90	56.00	38.32	0.28	0.50	QP
8	2.790	27.78	-18.22	46.00	27.00	0.28	0.50	Average
9	3.220	42.21	-13.79	56.00	41.43	0.28	0.50	QP
10	3.220	31.62	-14.38	46.00	30.84	0.28	0.50	Average
11	4.077	28.43	-17.57	46.00	27.64	0.29	0.50	Average
12	4.077	45.35	-10.65	56.00	44.56	0.29	0.50	QP

Note:
Level = Read Level + LISN Factor + Cable Loss.

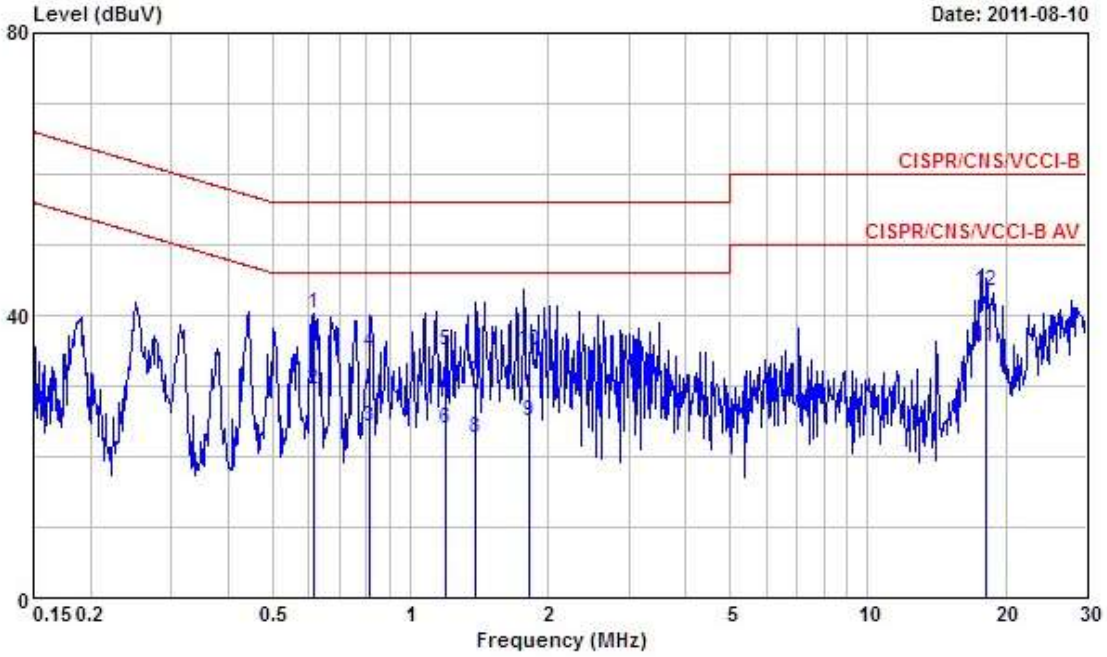
Final Test date	Aug. 10, 2011	**Test Site No.**	CO04-HY
Temperature	26.4℃	**Humidity**	57.1%
Test Engineer	Jason	**Configuration**	Mode 4

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.6139960	30.17	-15.83	46.00	29.49	0.29	0.39	Average
2	0.6139960	40.54	-15.46	56.00	39.86	0.29	0.39	QP
3	0.6722660	30.36	-15.64	46.00	29.66	0.29	0.41	Average
4	0.6722660	40.60	-15.40	56.00	39.90	0.29	0.41	QP
5	3.125	32.78	-23.22	56.00	31.95	0.33	0.50	QP
6	3.125	20.58	-25.42	46.00	19.75	0.33	0.50	Average
7	5.900	33.85	-26.15	60.00	32.96	0.39	0.50	QP
8	5.900	18.27	-31.73	50.00	17.38	0.39	0.50	Average
9	18.330	43.11	-16.89	60.00	41.95	0.56	0.60	QP
10	18.330	35.39	-14.61	50.00	34.23	0.56	0.60	Average
11	29.060	32.16	-17.84	50.00	30.96	0.68	0.52	Average
12	29.060	37.37	-22.63	60.00	36.17	0.68	0.52	QP

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.6139960	40.15	-15.85	56.00	39.52	0.24	0.39	QP
2	0.6139960	29.60	-16.40	46.00	28.97	0.24	0.39	Average
3	0.8173740	24.22	-21.78	46.00	23.51	0.25	0.46	Average
4	0.8173740	34.82	-21.18	56.00	34.11	0.25	0.46	QP
5	1.192	35.00	-21.00	56.00	34.25	0.25	0.50	QP
6	1.192	24.00	-22.00	46.00	23.25	0.25	0.50	Average
7	1.390	30.54	-25.46	56.00	29.78	0.26	0.50	QP
8	1.390	22.61	-23.39	46.00	21.85	0.26	0.50	Average
9	1.818	24.90	-21.10	46.00	24.13	0.27	0.50	Average
10	1.818	35.05	-20.95	56.00	34.28	0.27	0.50	QP
11	18.075	35.56	-14.44	50.00	34.49	0.47	0.60	Average
12	18.075	43.31	-16.69	60.00	42.24	0.47	0.60	QP

Note:
Level = Read Level + LISN Factor + Cable Loss.

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

3.2.2 Measuring Instruments and Setting

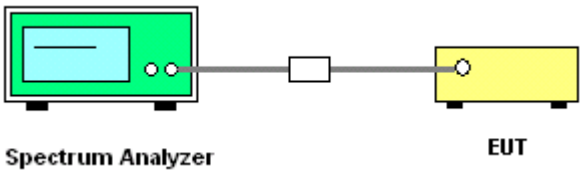
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Power Meter Parameter	Setting
Attenuation	Auto
Span Frequency	0.135 s ~ 26 s
RB	1000 kHz
VB	3000 kHz
Detector	rms
Trace	Max Hold
Sweep Time	Auto

3.2.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with Measurement of Digital Transmission Systems Operating under Section 15.247.
3. When measuring maximum conducted output power within multiple antenna systems, add every result of the values by mathematic formula.

3.2.4 Test Setup Layout



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 Test Result of Maximum Conducted Output Power

Final Test date	Mar. 16, 2009	**Test Site No.**	TH01-HY
Temperature	26℃	**Humidity**	56%
Test Engineer	Josh	**Configuration**	802.11n

For Single Chain
Configuration of IEEE 802.11n (20MHz) Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	6.90	30.00	**Complies**
6	2437 MHz	12.23	30.00	**Complies**
11	2462 MHz	11.63	30.00	**Complies**

Configuration of IEEE 802.11n (20MHz) Ant. B

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	5.24	30.00	**Complies**
6	2437 MHz	9.29	30.00	**Complies**
11	2462 MHz	8.11	30.00	**Complies**

Configuration of IEEE 802.11n (20MHz) Ant. A+B

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	9.16	30.00	**Complies**
6	2437 MHz	14.01	30.00	**Complies**
11	2462 MHz	13.23	30.00	**Complies**

For Two Chain

Configuration of IEEE 802.11n (40MHz) Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	7.36	30.00	**Complies**
6	2437 MHz	9.82	30.00	**Complies**
9	2452 MHz	5.23	30.00	**Complies**

Configuration of IEEE 802.11n (40MHz) Ant. B

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	9.43	30.00	**Complies**
6	2437 MHz	12.83	30.00	**Complies**
9	2452 MHz	9.11	30.00	**Complies**

Configuration of IEEE 802.11n (40MHz) Ant. A+B

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	11.53	30.00	**Complies**
6	2437 MHz	14.59	30.00	**Complies**
9	2452 MHz	10.60	30.00	**Complies**

3.3 Power Spectral Density Measurement

3.3.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

3.3.2 Measuring Instruments and Setting

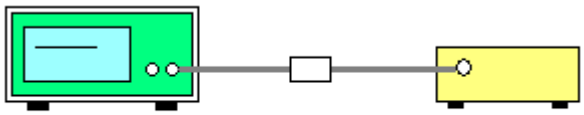
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	1.5MHz
RB	3 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	500s

3.3.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.
5. Measuring multiple antennas, the connectors are required to link with Spectrum Analyzer through a combiner.

3.3.4 Test Setup Layout



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 Power Spectral Density

Final Test date	Mar. 16, 2009	**Test Site No.**	TH01-HY
Temperature	26℃	**Humidity**	56%
Test Engineer	Josh	**Configuration**	802.11n

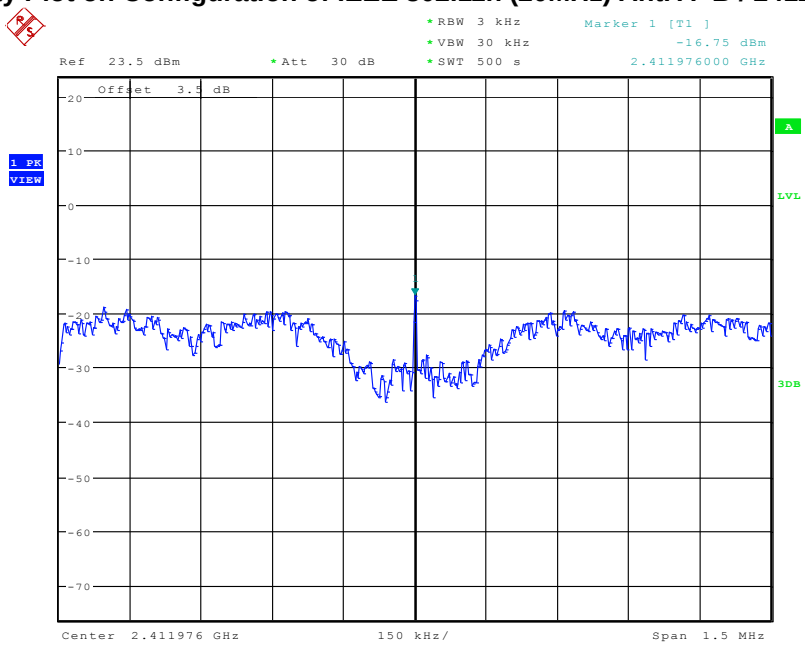
Configuration of IEEE 802.11n (20MHz) Ant. A+B

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-16.75	8.00	**Complies**
6	2437 MHz	-7.62	8.00	**Complies**
11	2462 MHz	-10.04	8.00	**Complies**

Configuration of IEEE 802.11n (40MHz) Ant. A+B

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	-7.31	8.00	**Complies**
6	2437 MHz	-10.62	8.00	**Complies**
9	2452 MHz	-7.51	8.00	**Complies**

Power Density Plot on Configuration of IEEE 802.11n (20MHz) Ant. A+B / 2412 MHz



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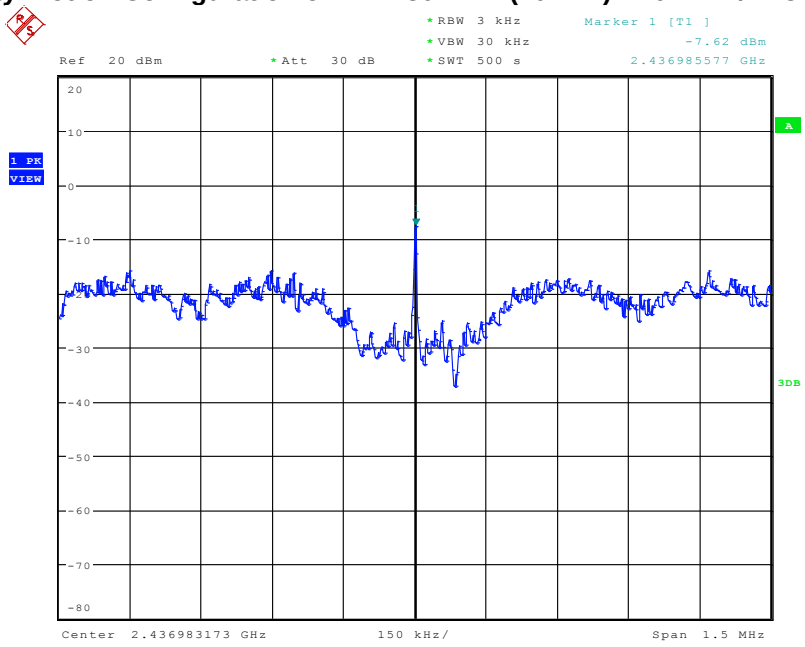
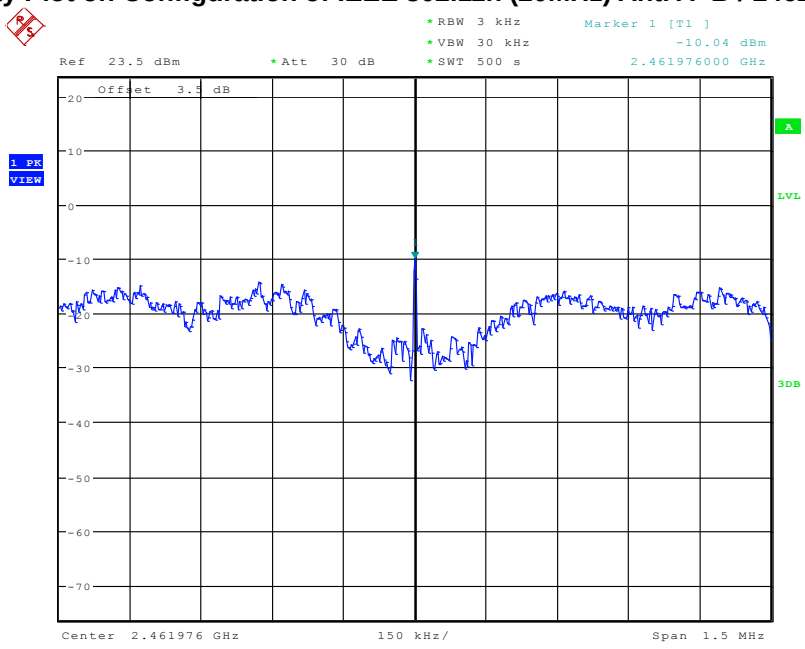
Power Density Plot on Configuration of IEEE 802.11n (20MHz) Ant. A+B / 2437 MHz



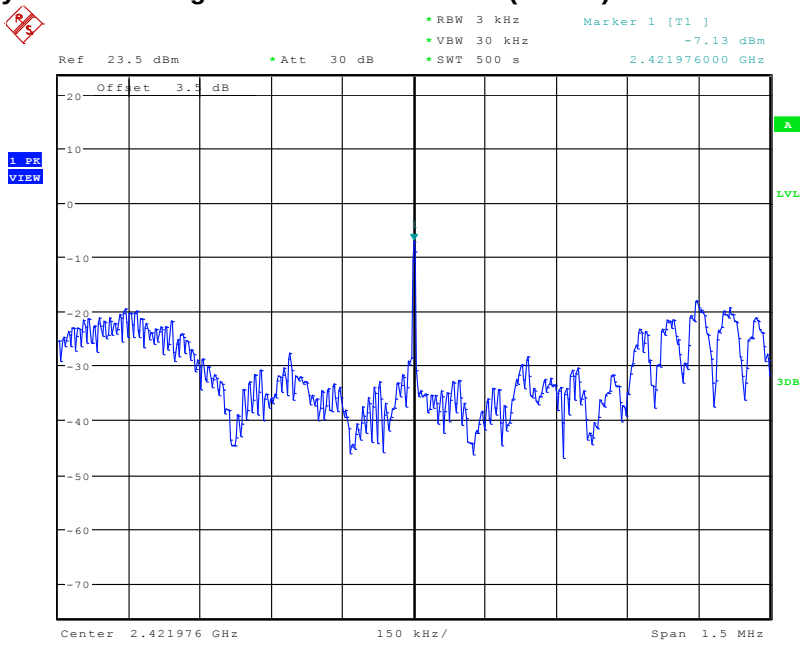
Date: 17.MAR.2009 16:30:58

Power Density Plot on Configuration of IEEE 802.11n (20MHz) Ant. A+B / 2462 MHz



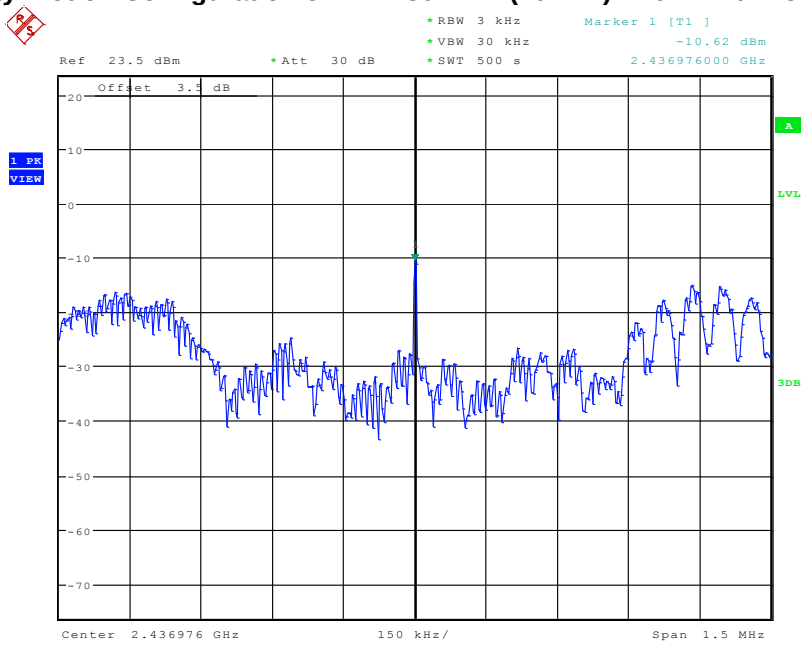
Date: 16.MAR.2009 10:37:40

Power Density Plot on Configuration of IEEE 802.11n (40MHz) Ant. A+B / 2422 MHz



Date: 16.MAR.2009 13:10:44

Power Density Plot on Configuration of IEEE 802.11n (40MHz) Ant. A+B / 2437 MHz



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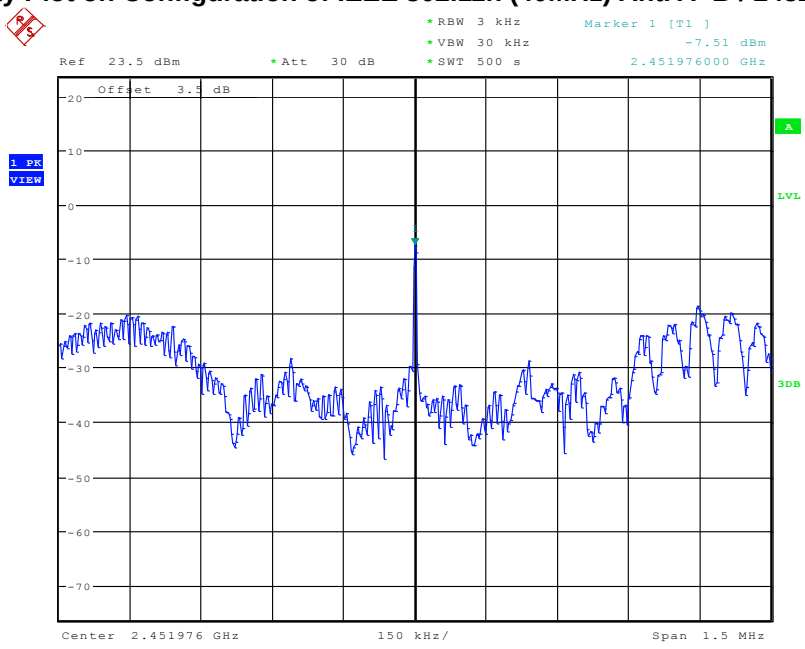
Power Density Plot on Configuration of IEEE 802.11n (40MHz) Ant. A+B / 2452 MHz



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3.4 6dB Spectrum Bandwidth Measurement

3.4.1 Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

3.4.2 Measuring Instruments and Setting

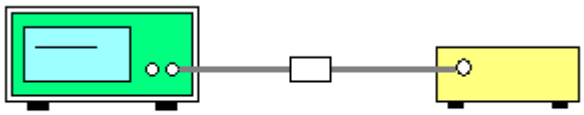
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.4.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.
4. Measuring multiple antennas, the connectors are required to link with Spectrum Analyzer through a combiner.

3.4.4 Test Setup Layout



3.4.5 Test Deviation

There is no deviation with the original standard.

3.4.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.4.7 Test Result of 6dB Spectrum Bandwidth

Final Test date	Mar. 16, 2009	**Test Site No.**	TH01-HY
Temperature	26℃	**Humidity**	56%
Test Engineer	Josh	**Configuration**	802.11n

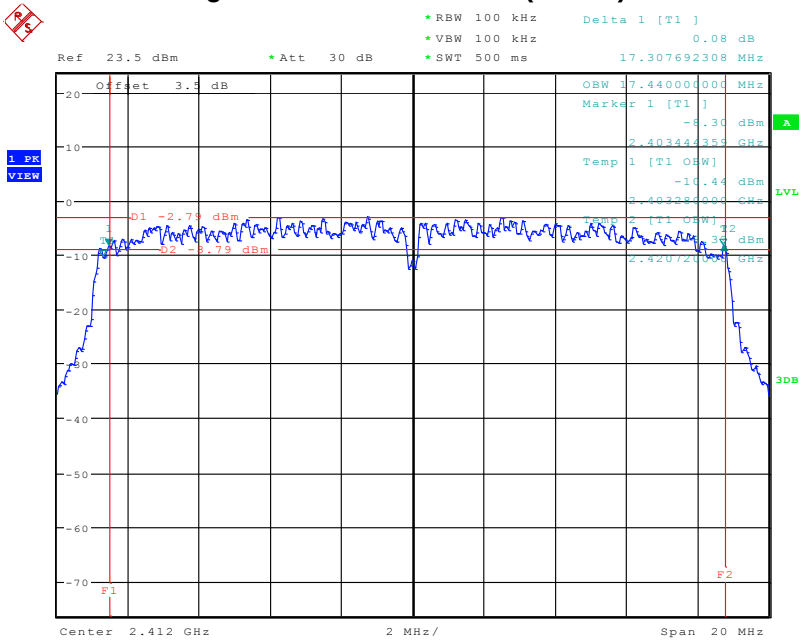
Configuration of IEEE 802.11n (20MHz) Ant. A+B

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.31	17.44	500	**Complies**
6	2437 MHz	17.56	17.44	500	**Complies**
11	2462 MHz	17.26	17.40	500	**Complies**

Configuration of IEEE 802.11n (40MHz) Ant. A+B

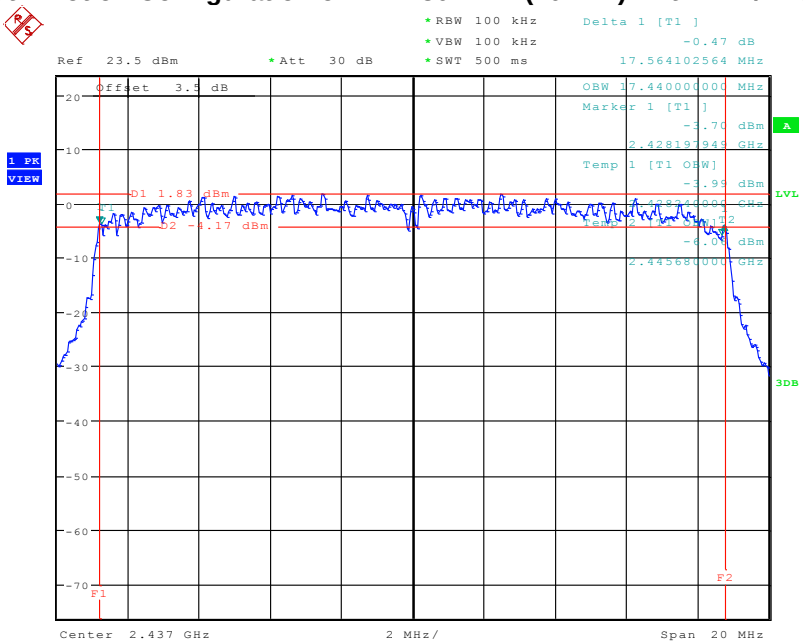
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.45	35.68	500	**Complies**
6	2437 MHz	35.13	35.60	500	**Complies**
9	2452 MHz	35.45	35.60	500	**Complies**

6 dB Bandwidth Plot on Configuration of IEEE 802.11n (20MHz) Ant. A+B / 2412 MHz



Date: 16.MAR.2009 10:41:23

6 dB Bandwidth Plot on Configuration of IEEE 802.11n (20MHz) Ant. A+B / 2437 MHz



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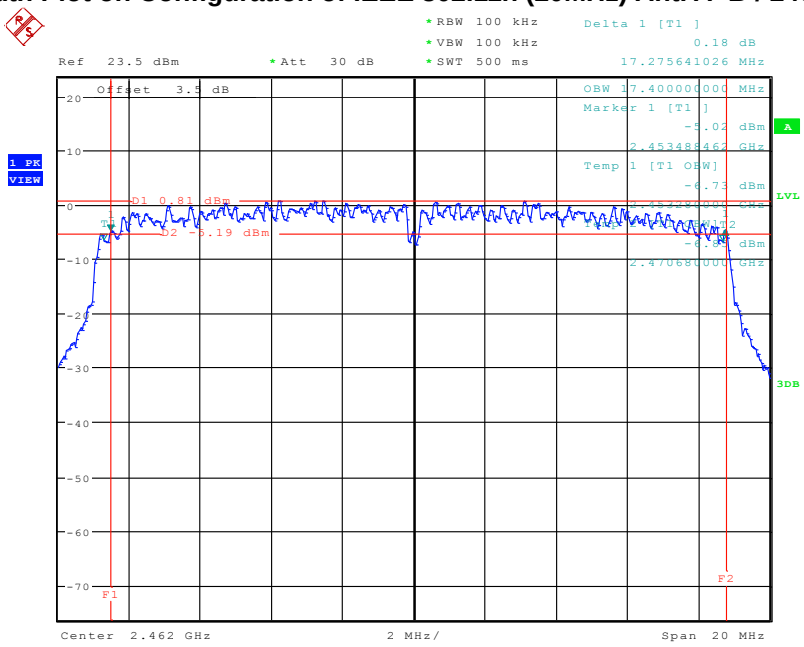
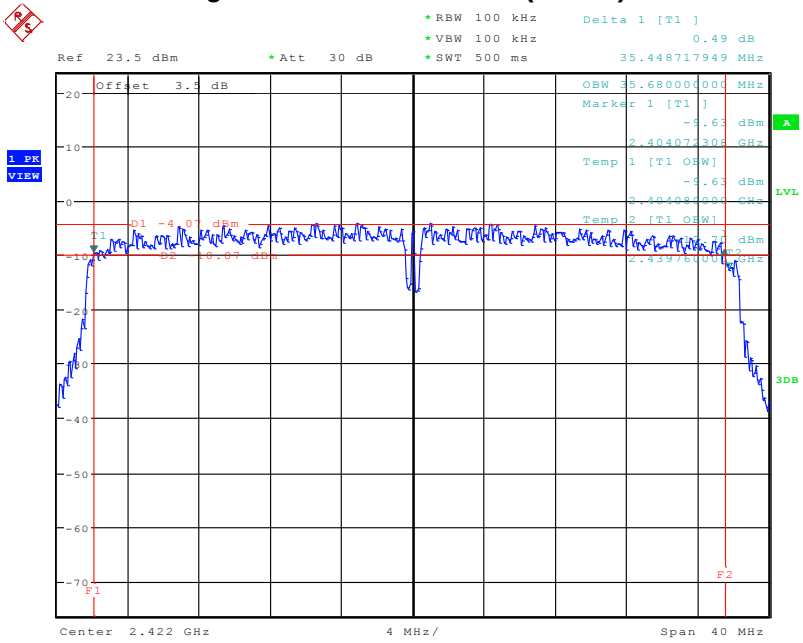
6 dB Bandwidth Plot on Configuration of IEEE 802.11n (20MHz) Ant. A+B / 2462 MHz

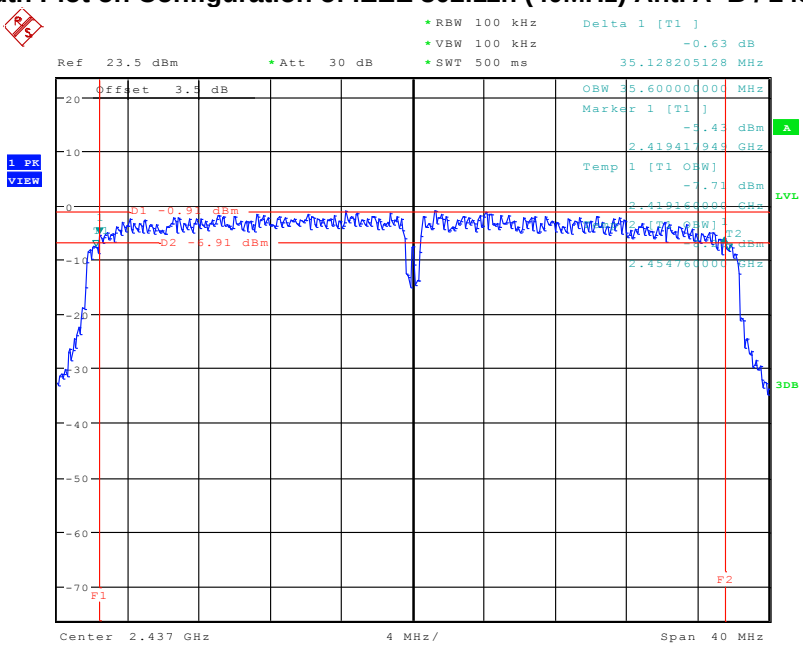


6 dB Bandwidth Plot on Configuration of IEEE 802.11n (40MHz) Ant. A+B / 2422 MHz



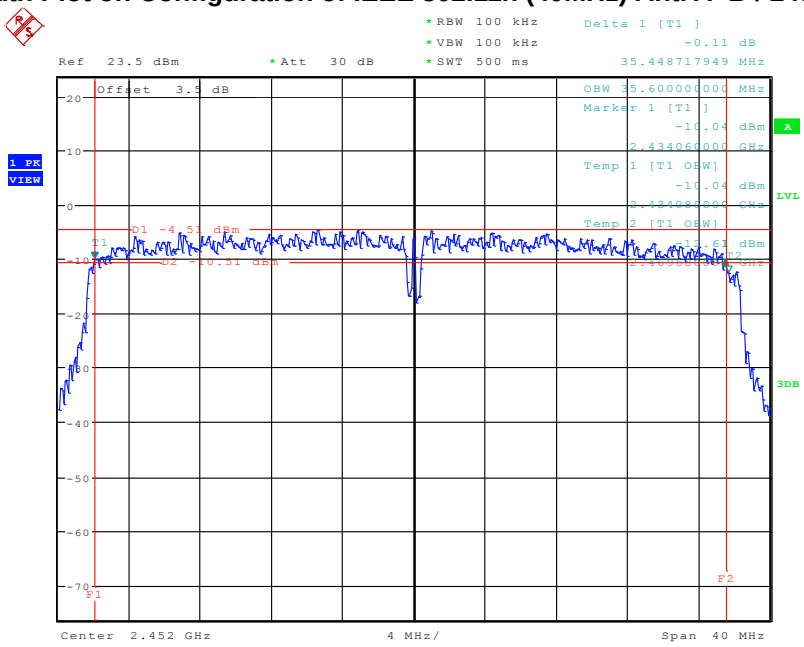
Date: 16.MAR.2009 13:07:55

6 dB Bandwidth Plot on Configuration of IEEE 802.11n (40MHz) Ant. A+B / 2437 MHz



Date: 16.MAR.2009 13:03:58

6 dB Bandwidth Plot on Configuration of IEEE 802.11n (40MHz) Ant. A+B / 2452 MHz



Date: 16.MAR.2009 12:57:53

3.5 Radiated Emissions Measurement

3.5.1 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

3.5.2 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

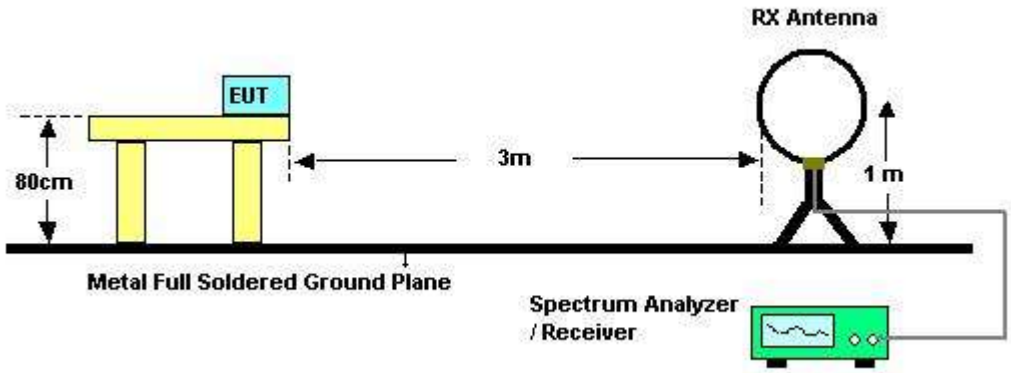
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.5.3 Test Procedures

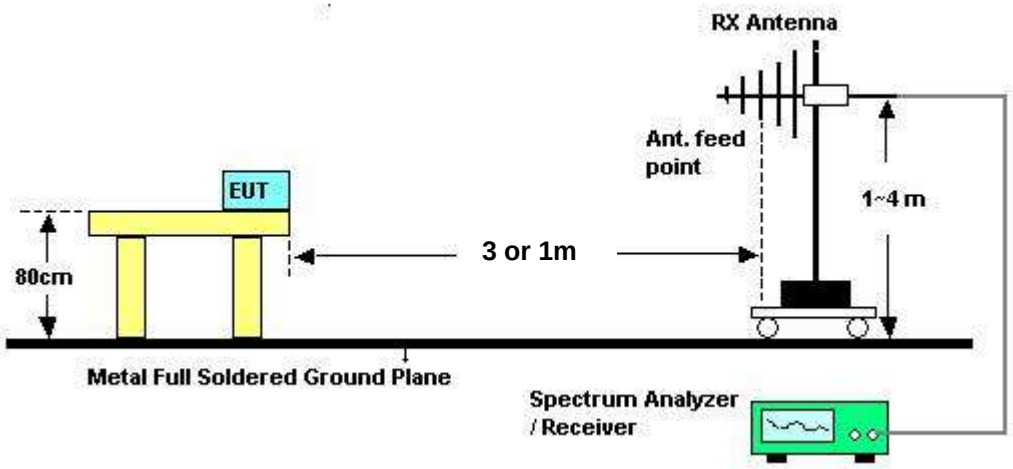
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

3.5.4 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].

3.5.5 Test Deviation

There is no deviation with the original standard.

3.5.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Final Test date	Aug. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	23℃	**Humidity**	63%
Test Engineer	Streak		

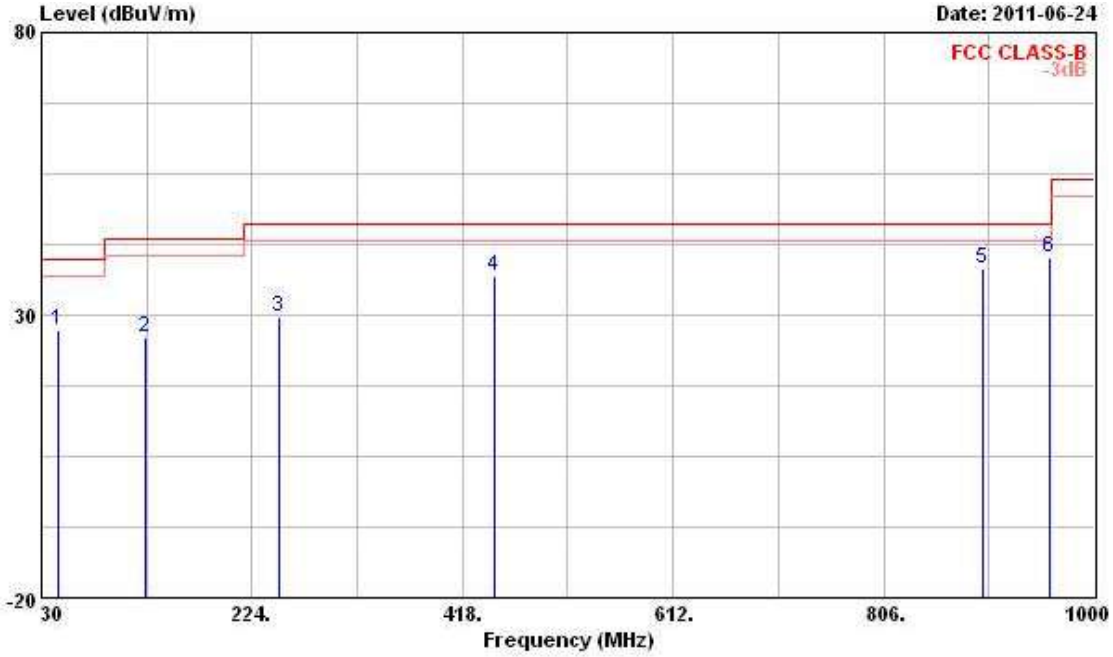
Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

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.

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

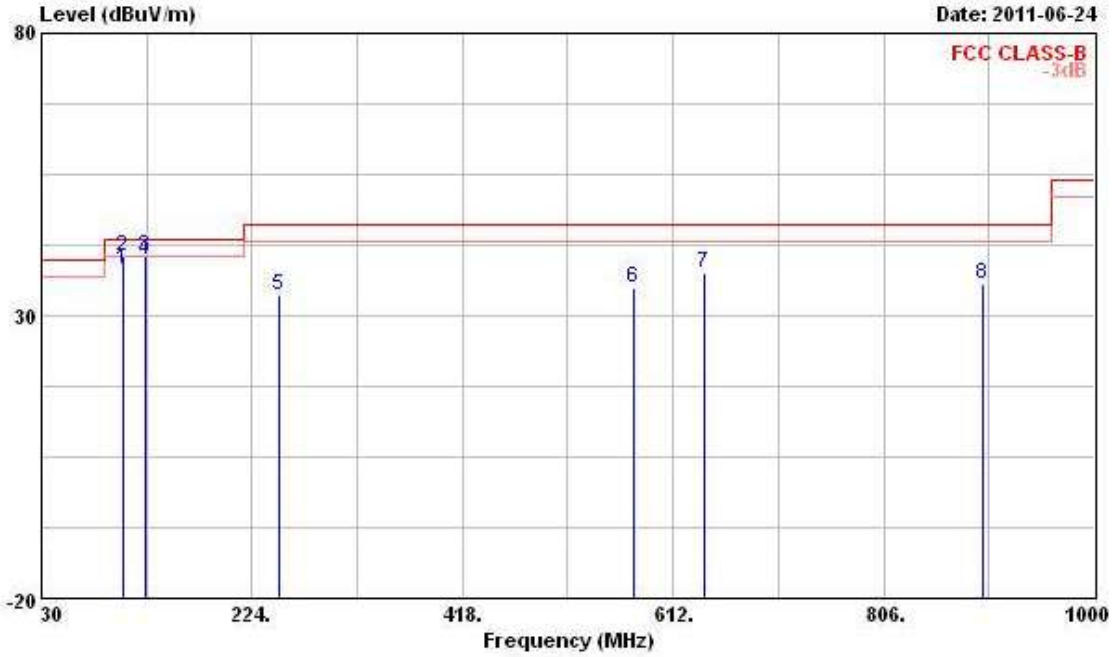
Final Test date	Jun. 24, 2011	**Test Site No.**	03CH02-HY
Temperature	24℃	**Humidity**	64%
Test Engineer	Streak	**Configuration**	Mode 1

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	44.550	27.35	-12.65	40.00	41.69	12.02	1.05	27.41	Peak	---	---
2	125.060	26.09	-17.41	43.50	38.28	13.18	1.82	27.19	Peak	---	---
3	249.220	29.59	-16.41	46.00	40.43	12.97	2.68	26.49	Peak	---	---
4	447.100	36.79	-9.21	46.00	44.38	16.22	3.48	27.29	Peak	---	---
5	897.180	38.15	-7.85	46.00	40.16	20.03	4.99	27.03	Peak	---	---
6 @	959.260	40.07	-5.93	46.00	40.18	21.49	5.28	26.88	Peak	---	---

Vertical

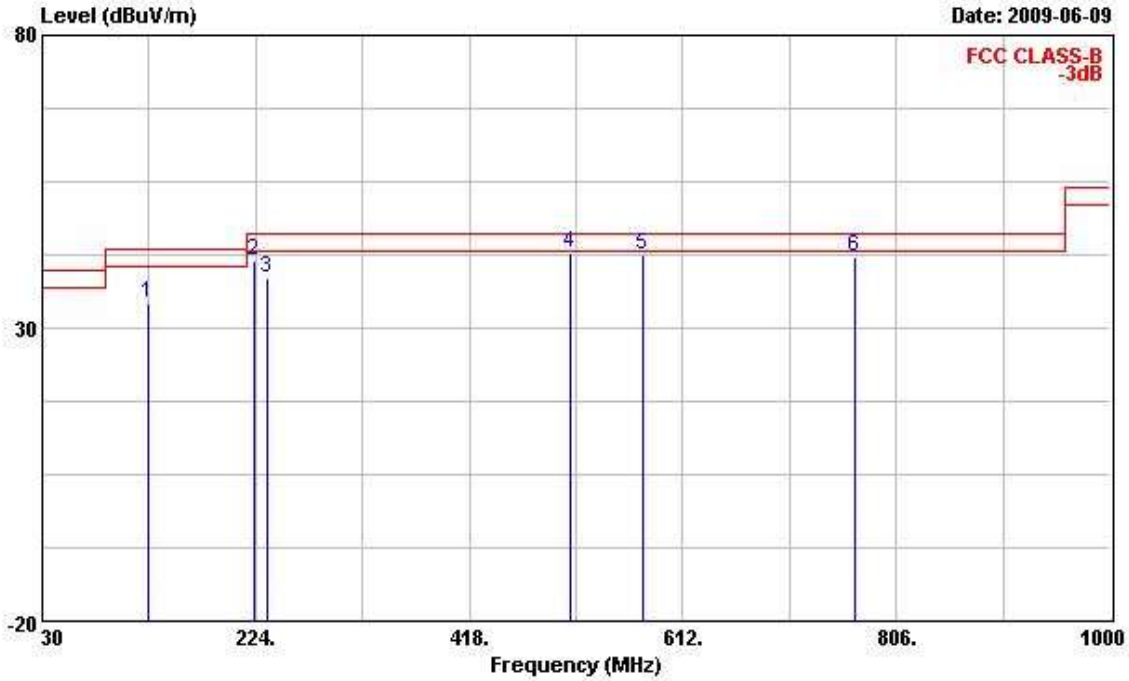


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	105.660	38.35	-5.15	43.50	52.01	11.88	1.66	27.20	QP	---	---
2 @	105.660	40.68	-2.82	43.50	54.34	11.88	1.66	27.20	Peak	---	---
3 @	125.060	40.69	-2.81	43.50	52.88	13.18	1.82	27.19	Peak	---	---
4 @	125.060	39.72	-3.78	43.50	51.91	13.18	1.82	27.19	QP	---	---
5	249.220	33.69	-12.31	46.00	44.53	12.97	2.68	26.49	Peak	---	---
6	575.140	35.02	-10.98	46.00	39.23	19.45	3.90	27.56	Peak	---	---
7	641.100	37.53	-8.47	46.00	41.60	19.63	4.21	27.91	Peak	---	---
8	897.180	35.65	-10.35	46.00	37.66	20.03	4.99	27.03	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.

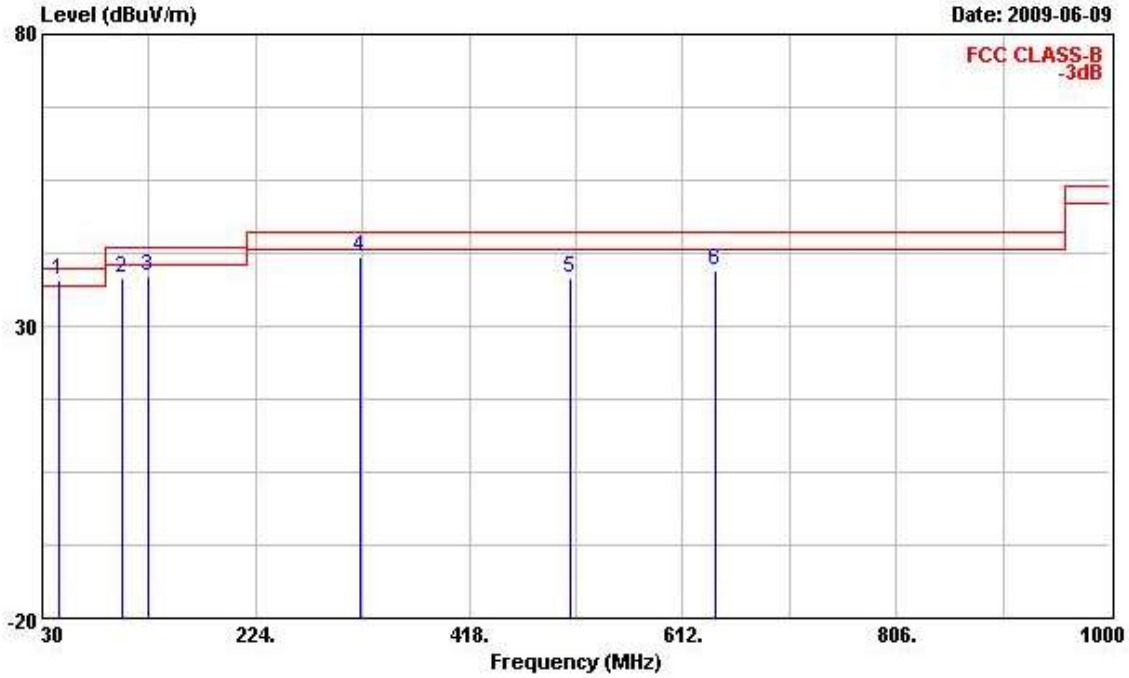
Final Test date	Jun. 09, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	Mode 2

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	126.030	34.38	-9.12	43.50	49.79	13.10	2.23	30.75	---	---	Peak
2	223.030	41.38	-4.62	46.00	56.86	12.11	2.96	30.55	---	---	QP
3	233.700	38.70	-7.30	46.00	53.78	12.46	2.99	30.53	---	---	Peak
4	510.150	42.69	-3.31	46.00	50.66	17.59	4.30	29.87	---	---	QP
5	576.110	42.38	-3.62	46.00	47.92	19.48	4.66	29.67	---	---	Peak
6	769.140	42.06	-3.94	46.00	45.90	19.83	5.40	29.06	---	---	Peak

Vertical

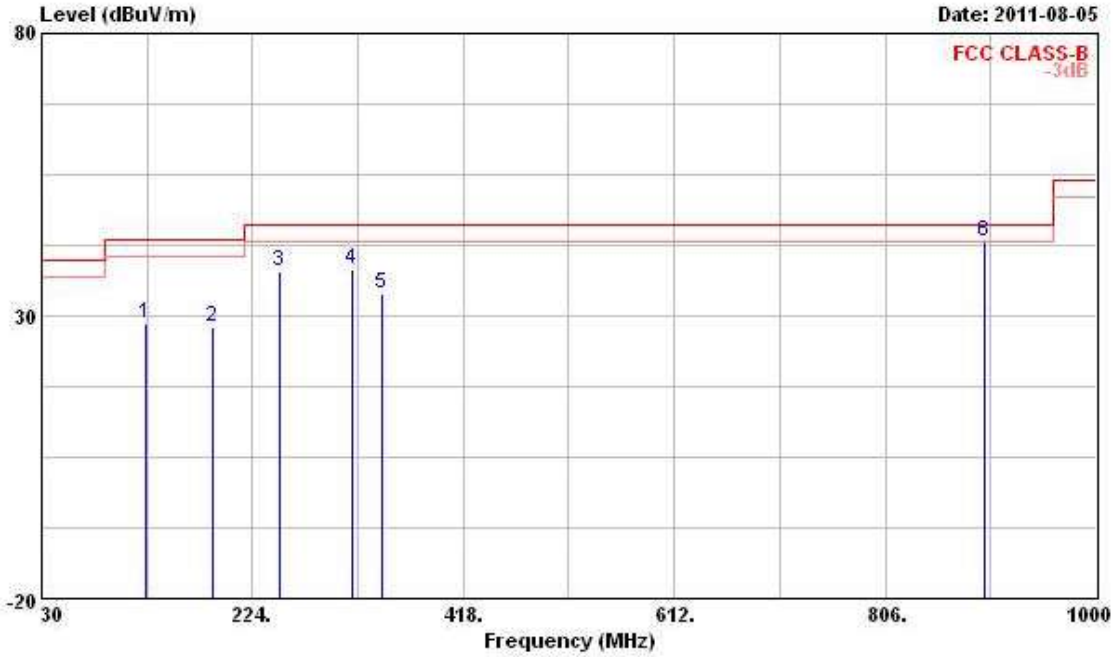


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	44.550	38.00	-2.00	40.00	55.42	12.03	1.38	30.82	---	---	QP
2	102.750	38.09	-5.41	43.50	55.29	11.53	2.07	30.79	---	---	Peak
3	126.030	38.66	-4.84	43.50	54.07	13.10	2.23	30.75	---	---	Peak
4	319.060	41.72	-4.28	46.00	54.67	14.00	3.40	30.36	---	---	QP
5	510.150	38.33	-7.67	46.00	46.30	17.59	4.30	29.87	---	---	Peak
6	641.100	39.49	-6.51	46.00	44.20	19.63	5.10	29.44	---	---	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.

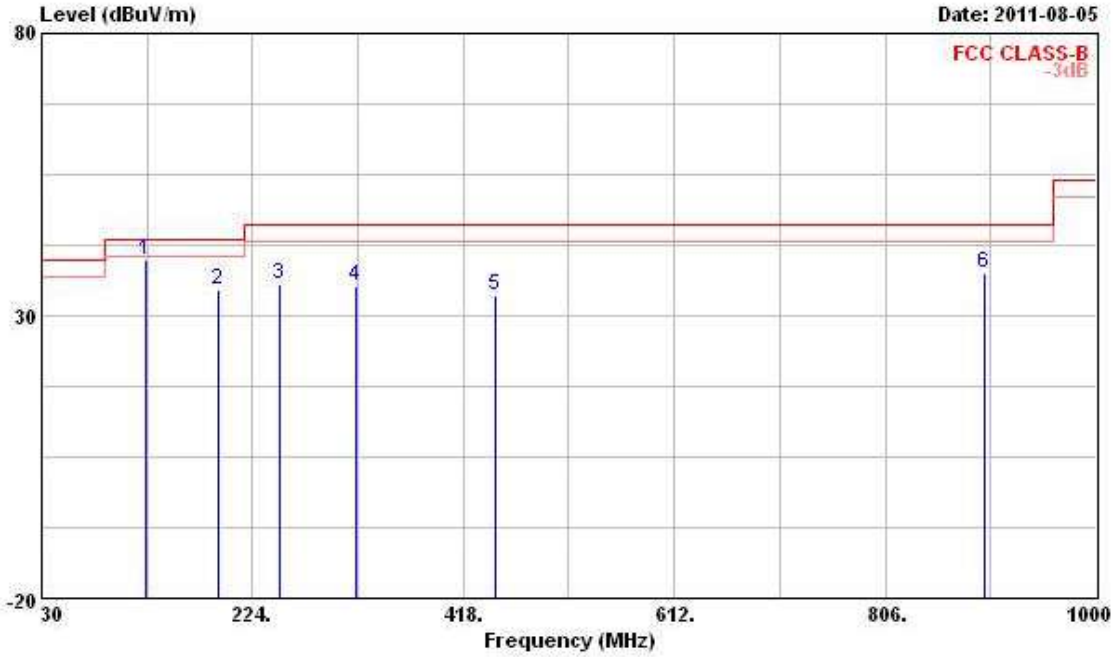
Final Test date	Aug. 05, 2011	**Test Site No.**	03CH02-HY
Temperature	23℃	**Humidity**	63%
Test Engineer	Streak	**Configuration**	Mode 3

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	125.060	28.63	-14.87	43.50	41.16	13.18	1.82	27.53	Peak	---	---
2	188.110	27.93	-15.57	43.50	42.38	10.48	2.25	27.18	Peak	---	---
3	249.220	37.90	-8.10	46.00	49.07	12.97	2.68	26.82	Peak	---	---
4	316.150	38.33	-7.67	46.00	48.35	13.96	2.94	26.92	Peak	---	---
5	342.340	33.87	-12.13	46.00	43.63	14.36	3.00	27.12	Peak	---	---
6 !	897.180	43.30	-2.70	46.00	45.65	20.03	4.99	27.37	QP	---	---

Vertical

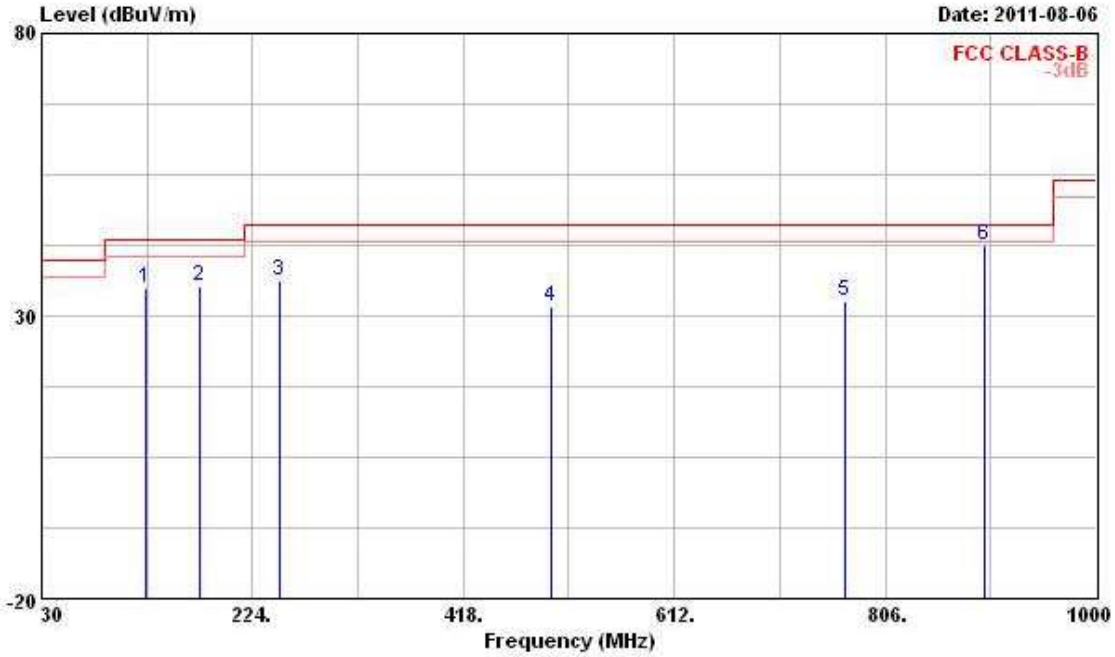


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	125.060	40.03	-3.47	43.50	52.56	13.18	1.82	27.53	Peak	---	---
2	191.990	34.76	-8.74	43.50	48.86	10.77	2.27	27.14	Peak	---	---
3	249.220	35.54	-10.46	46.00	46.71	12.97	2.68	26.82	Peak	---	---
4	319.060	35.38	-10.62	46.00	45.37	14.00	2.95	26.94	Peak	---	---
5	447.100	33.70	-12.30	46.00	41.91	16.22	3.48	27.91	Peak	---	---
6	897.180	37.60	-8.40	46.00	39.95	20.03	4.99	27.37	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.

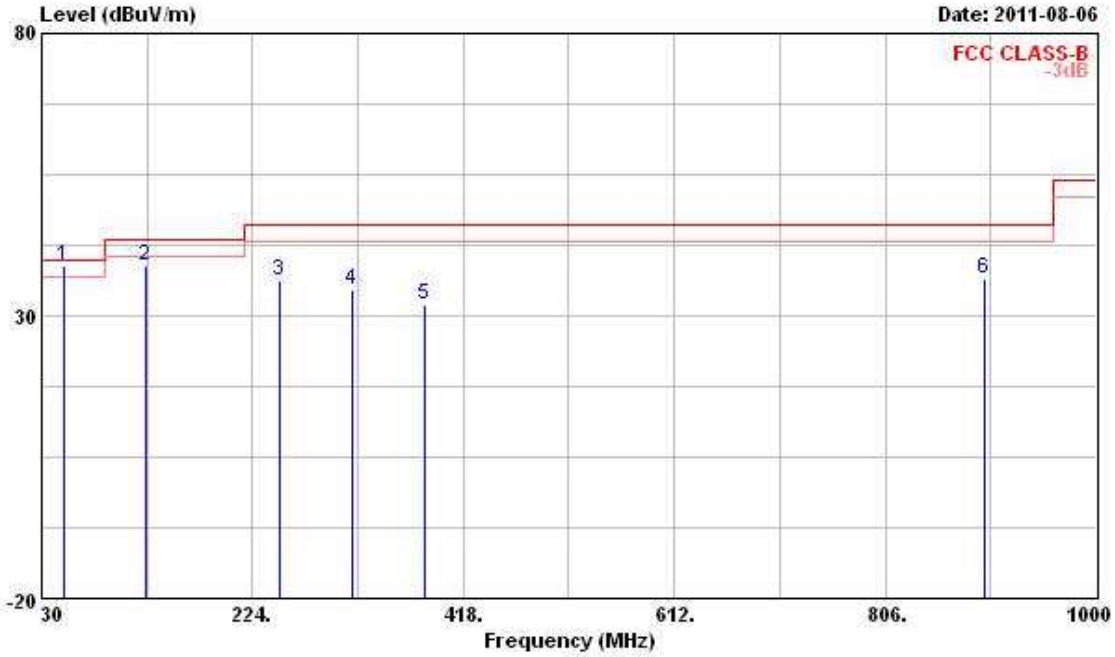
Final Test date	Aug. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	Mode 4

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	125.060	35.06	-8.44	43.50	47.59	13.18	1.82	27.53	Peak	---	---
2	175.500	35.15	-8.35	43.50	50.37	9.88	2.18	27.28	Peak	---	---
3	249.220	36.21	-9.79	46.00	47.38	12.97	2.68	26.82	Peak	---	---
4	498.510	31.53	-14.47	46.00	38.67	17.26	3.78	28.18	Peak	---	---
5	769.140	32.54	-13.46	46.00	35.88	19.83	4.65	27.82	Peak	---	---
6	897.180	42.47	-3.53	46.00	44.82	20.03	4.99	27.37	Peak	---	---

Vertical



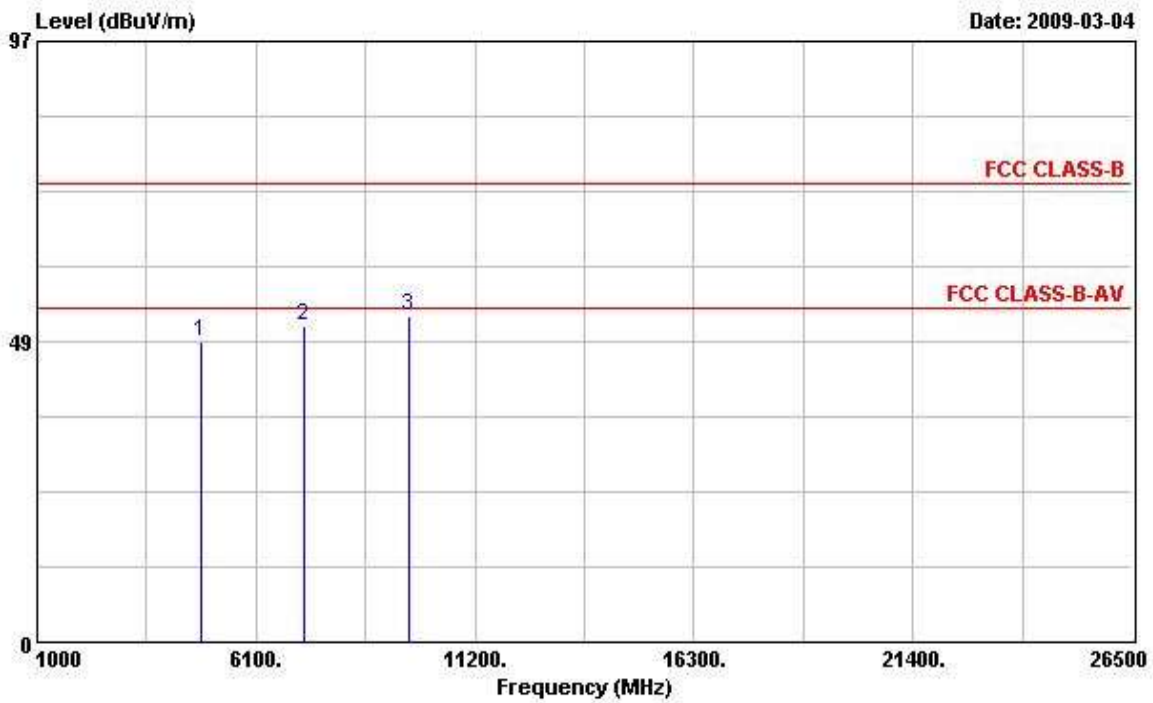
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 !	51.340	38.99	-1.01	40.00	56.49	9.16	1.14	27.80	QP	---	---
2	125.060	38.78	-4.72	43.50	51.31	13.18	1.82	27.53	Peak	---	---
3	249.220	36.19	-9.81	46.00	47.36	12.97	2.68	26.82	Peak	---	---
4	316.150	34.54	-11.46	46.00	44.56	13.96	2.94	26.92	Peak	---	---
5	382.110	31.96	-14.04	46.00	41.25	14.98	3.22	27.49	Peak	---	---
6	897.180	36.42	-9.58	46.00	38.77	20.03	4.99	27.37	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.

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

Final Test date	Mar. 04, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	802.11n Ch. 1 (20MHz)

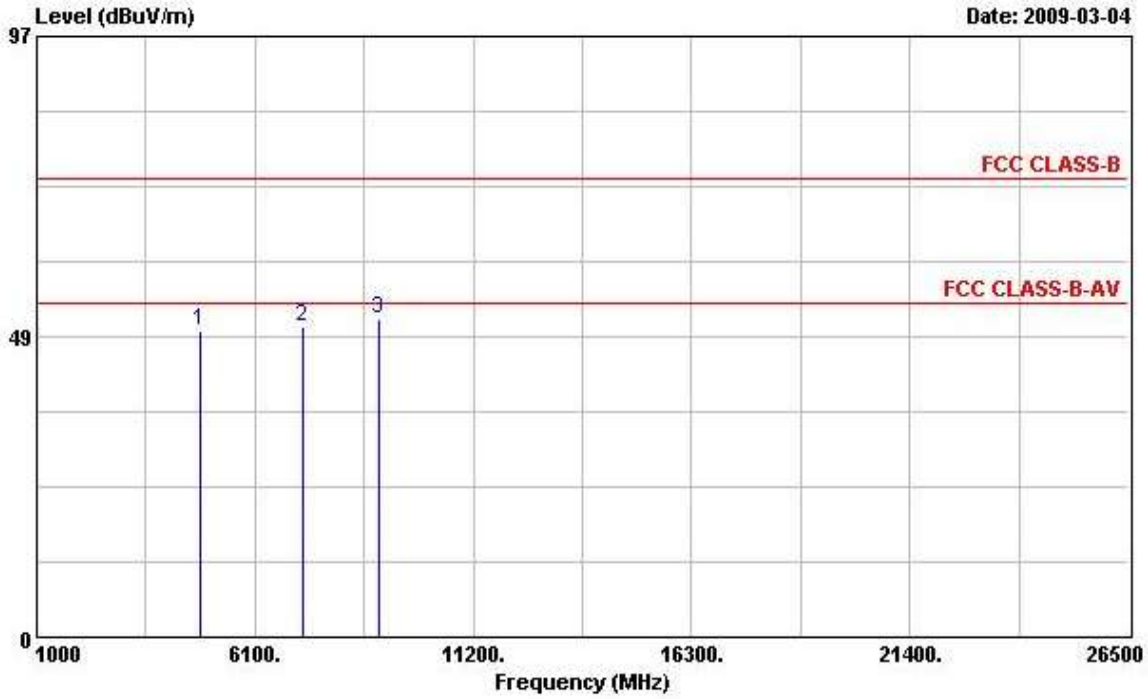
Horizontal



	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	4824.000	48.45	-5.55	54.00	43.04	35.76	4.59	34.94	---	---	PK
2	7236.000	50.92			42.69	37.85	5.63	35.25	---	---	Peak
3	9648.000	52.57			42.54	39.39	6.34	35.70	---	---	PEAK

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

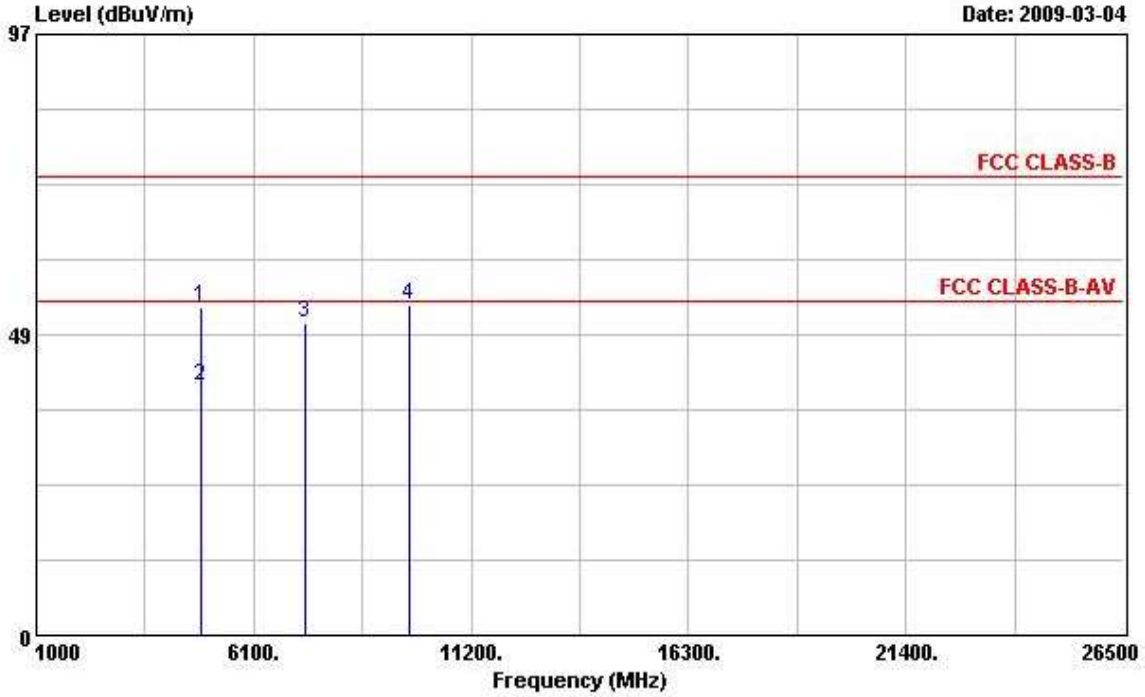


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	49.49	-4.51	54.00	44.70	35.13	4.59	34.94	---	---	PK
2	7236.000	50.17			42.89	36.90	5.63	35.25	---	---	Peak
3	9000.000	51.22			43.26	37.30	6.16	35.50	---	---	PEAK

Note: An item 2 and 3 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	Mar. 04, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	802.11n Ch. 6 (20MHz)

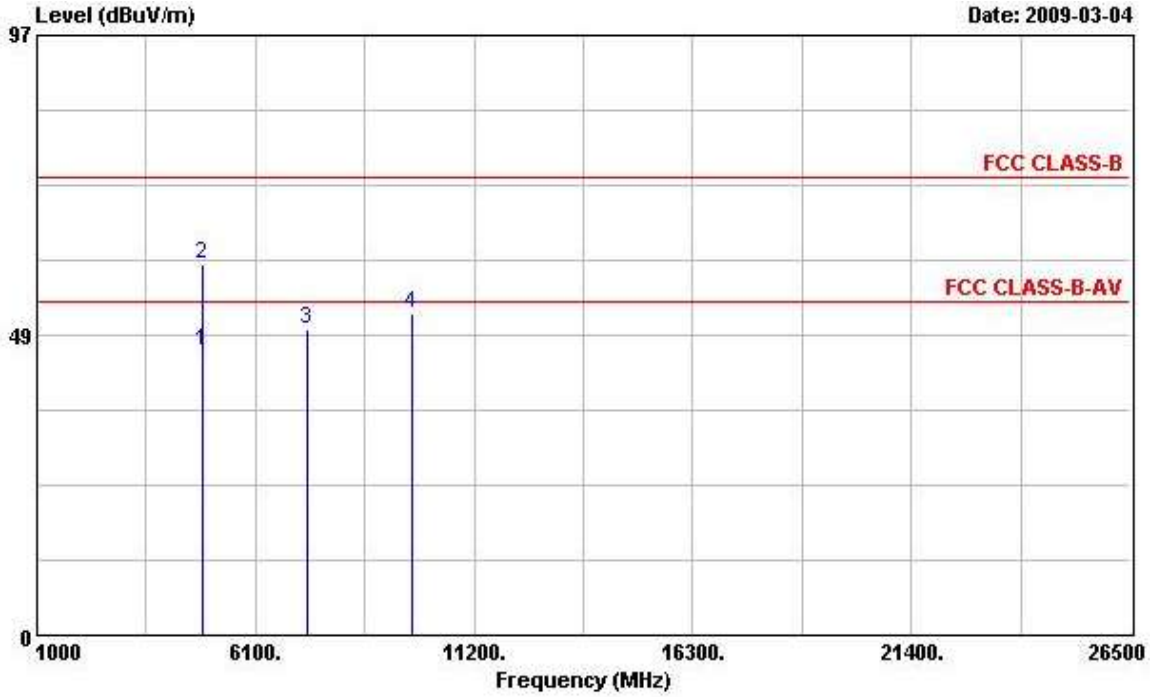
Horizontal



	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	4871.100	52.94	-21.06	74.00	47.42	35.83	4.62	34.93	---	---	PEAK
2	4871.100	40.21	-13.79	54.00	34.69	35.83	4.62	34.93	---	---	Average
3	7315.000	50.45	-3.55	54.00	42.22	37.86	5.64	35.27	---	---	PK
4	9748.000	53.27			43.10	39.51	6.36	35.70	---	---	PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

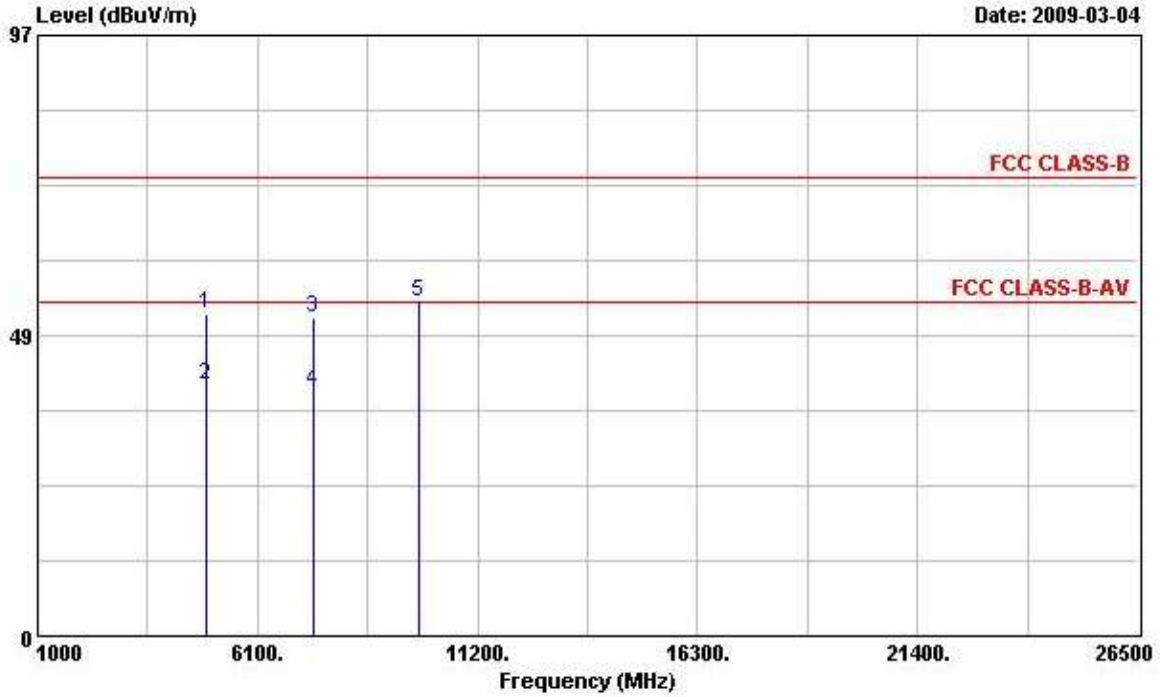


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4874.000	45.90	-8.10	54.00	41.01	35.18	4.64	34.93	---	---	Average
2	4874.000	59.96	-14.04	74.00	55.06	35.18	4.64	34.93	---	---	Peak
3	7311.000	49.49	-4.51	54.00	42.19	36.92	5.64	35.26	---	---	PK
4	9748.000	51.97			42.60	38.71	6.36	35.70	---	---	PEAK

Note: An item 4 is 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	Mar. 04, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	802.11n Ch. 11 (20MHz)

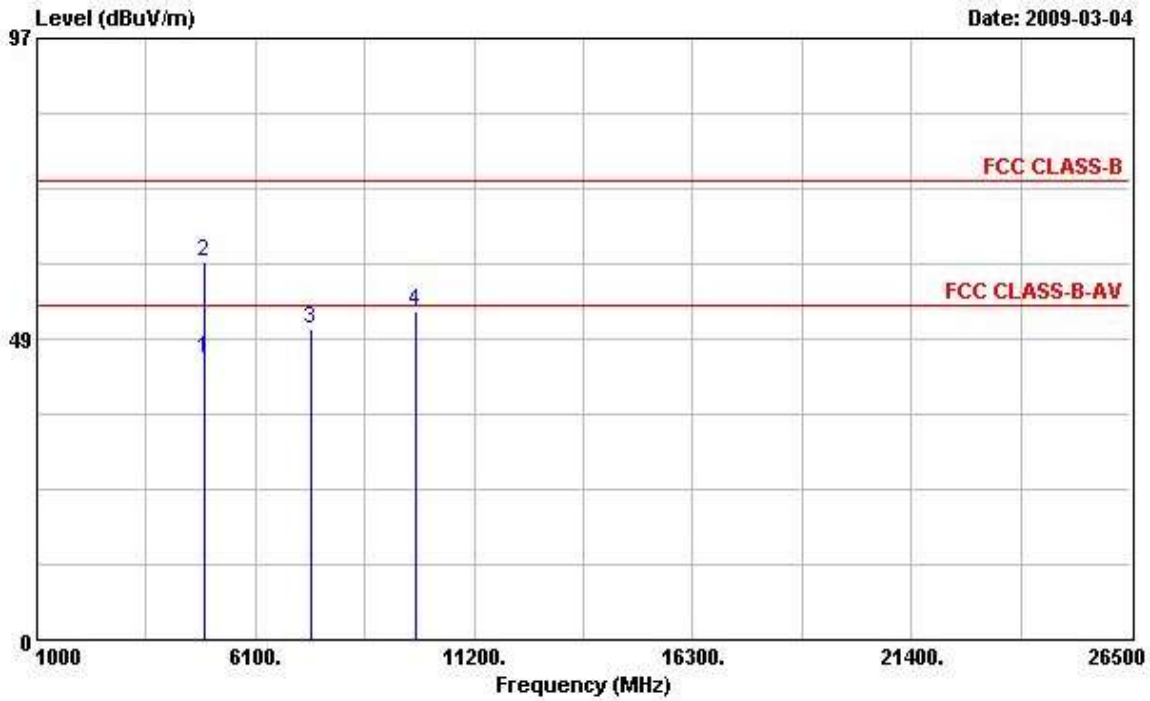
Horizontal



	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	4928.000	52.13	-21.87	74.00	46.47	35.90	4.67	34.92	---	---	PEAK
2	4928.000	40.54	-13.46	54.00	34.89	35.90	4.67	34.92	---	---	Average
3	7386.000	51.38	-22.62	74.00	43.13	37.88	5.65	35.28	---	---	PEAK
4	7386.000	39.48	-14.52	54.00	31.23	37.88	5.65	35.28	---	---	Average
5	9852.000	53.78			43.47	39.63	6.38	35.70	---	---	PEAK

Note: An item 5 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

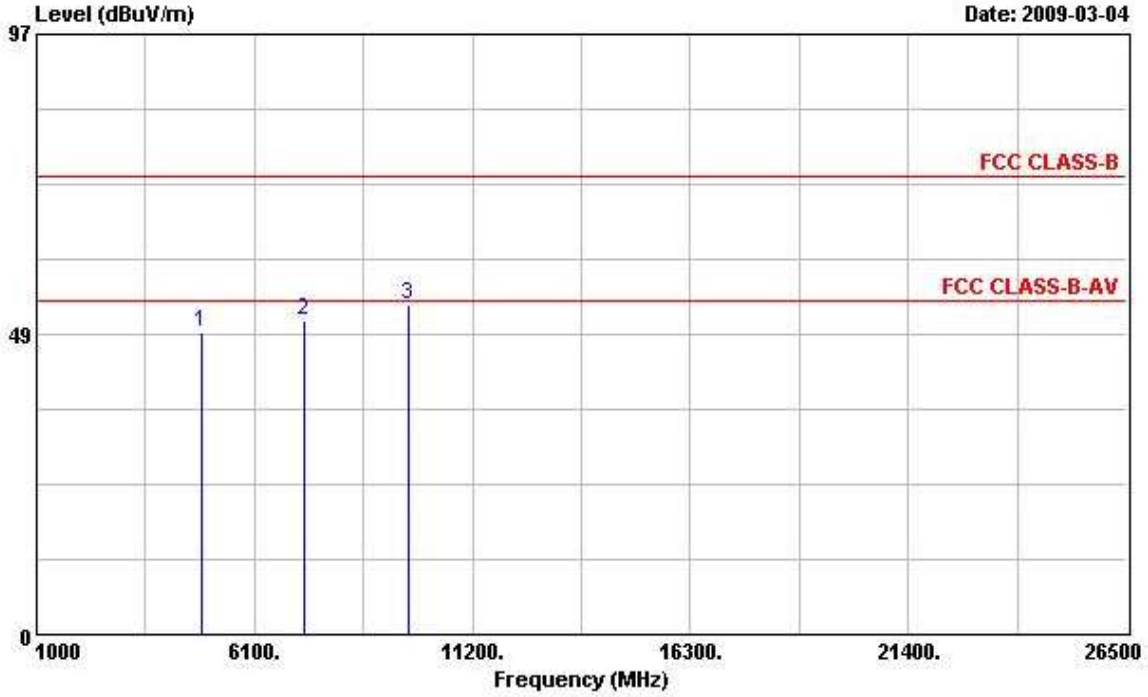


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4924.000	45.41	-8.59	54.00	40.42	35.23	4.67	34.92	---	---	Average
2	4924.000	60.85	-13.15	74.00	55.87	35.23	4.67	34.92	---	---	Peak
3	7390.000	50.21	-3.79	54.00	42.89	36.96	5.65	35.28	---	---	PK
4	9848.000	53.08			43.59	38.81	6.38	35.70	---	---	PEAK

Note: An item 4 is 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	Mar. 04, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	802.11n Ch. 3 (40MHz)

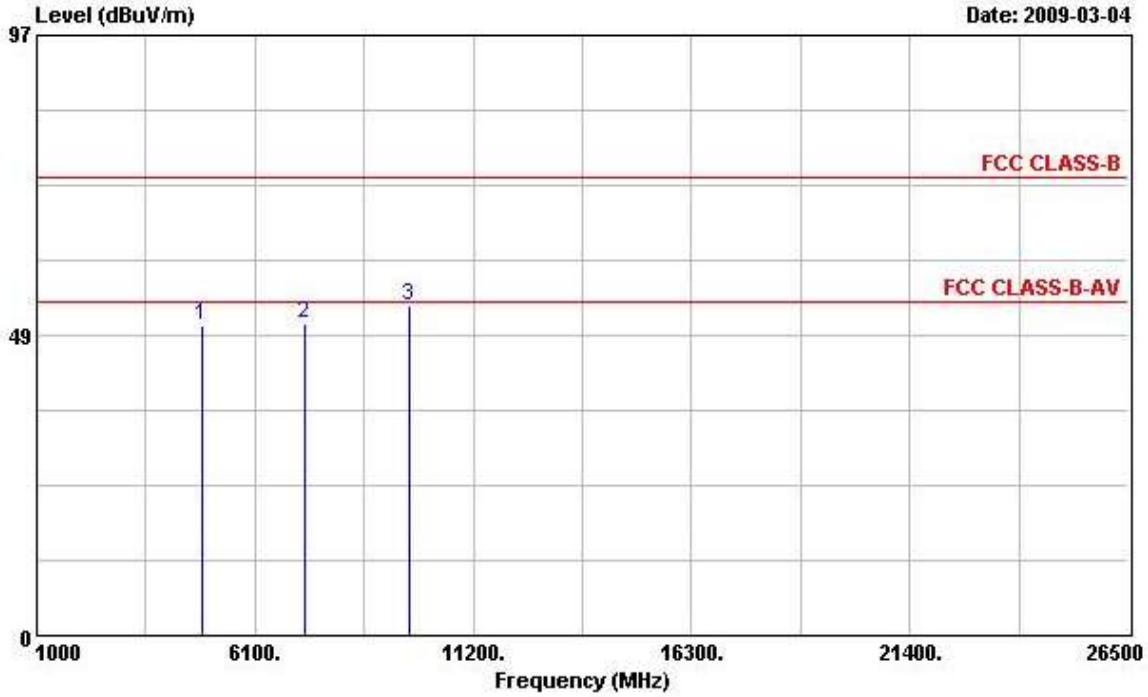
Horizontal



	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	4844.000	48.76	-5.24	54.00	43.29	35.78	4.62	34.93	---	---	PK
2 @	7266.000	50.63	-3.37	54.00	42.40	37.86	5.63	35.26	---	---	PK
3	9688.000	53.22			43.14	39.43	6.35	35.70	---	---	PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

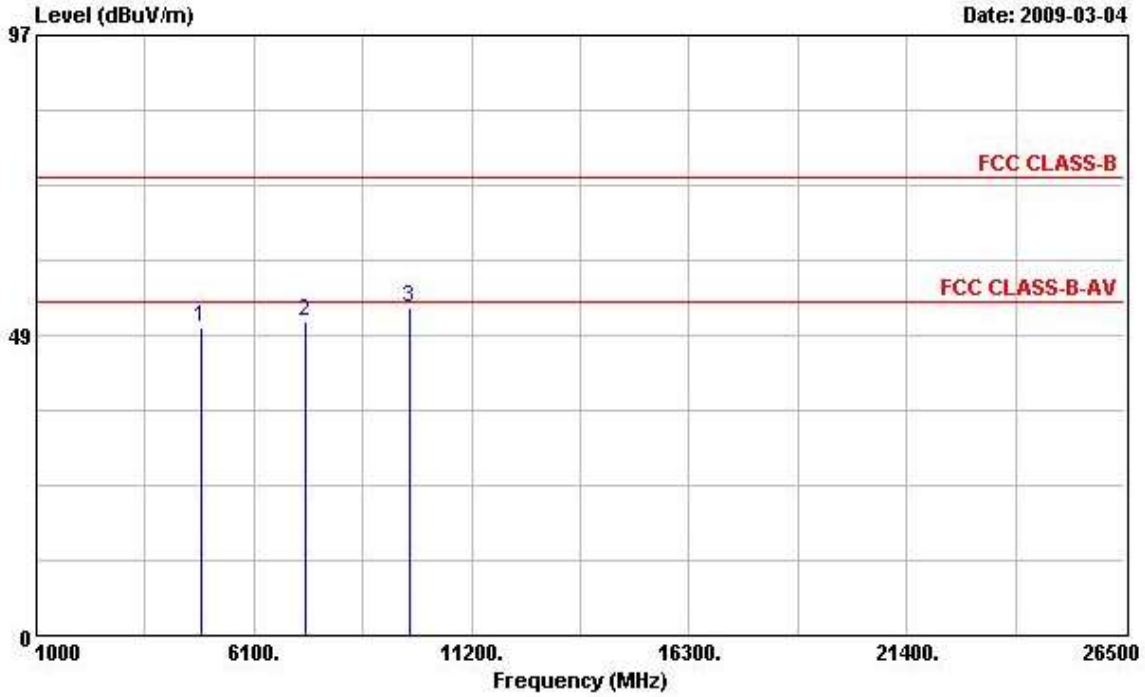


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4848.000	50.20	-3.80	54.00	45.37	35.14	4.62	34.93	---	---	PK
2 @	7262.000	50.54	-3.46	54.00	43.26	36.90	5.63	35.26	---	---	PK
3	9688.000	53.13			43.85	38.63	6.35	35.70	---	---	PEAK

Note: An item 3 is 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	Mar. 04, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	802.11n Ch. 6 (40MHz)

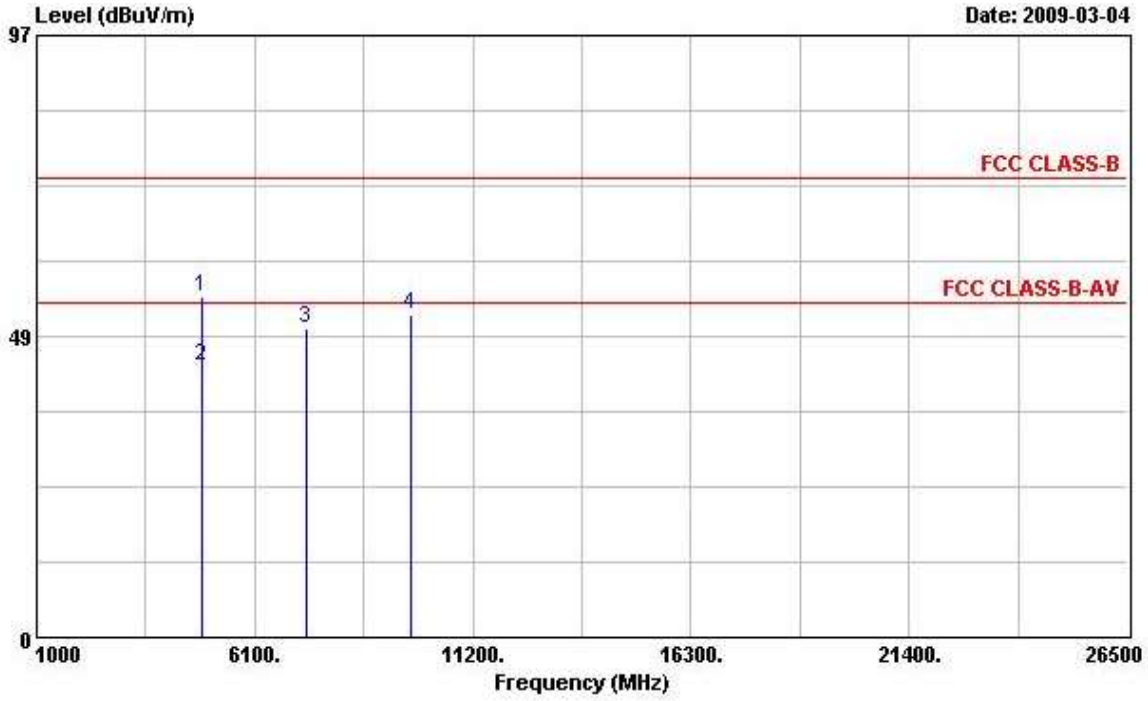
Horizontal



	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	4874.000	49.79	-4.21	54.00	44.24	35.83	4.64	34.93	---	---	PK
2 @	7311.000	50.84	-3.16	54.00	42.60	37.86	5.64	35.26	---	---	PK
3	9748.000	52.91			42.74	39.51	6.36	35.70	---	---	PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

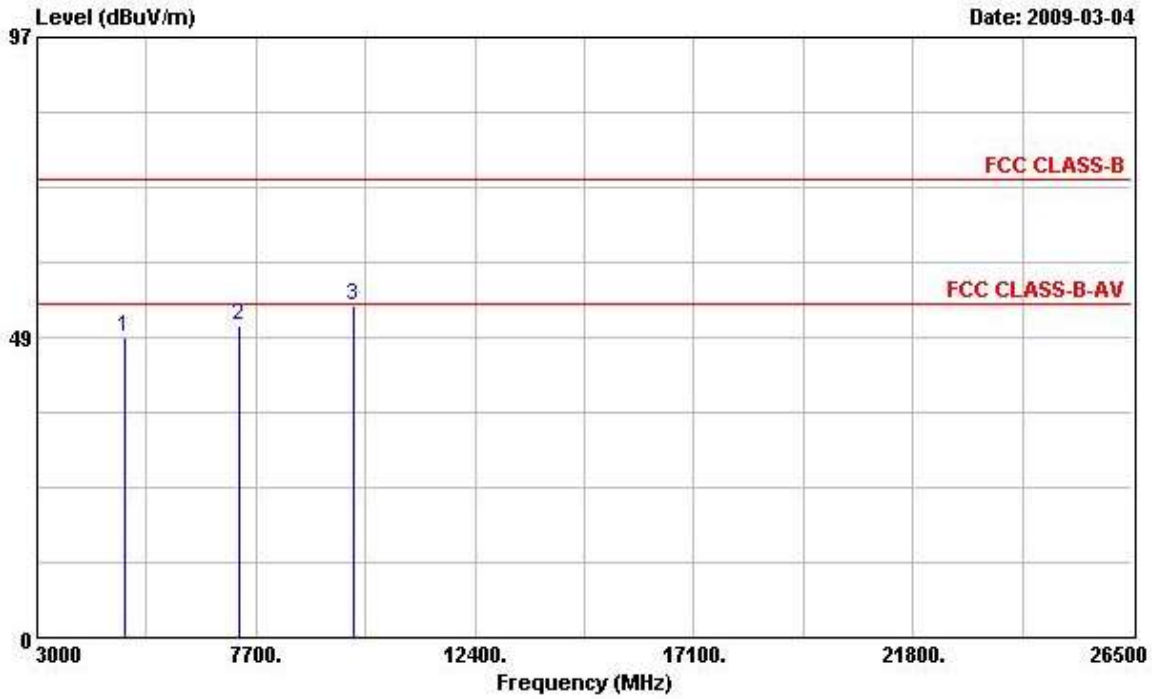


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4876.000	55.03	-18.97	74.00	50.14	35.18	4.64	34.93	---	---	PEAK
2	4876.000	43.61	-10.39	54.00	38.71	35.18	4.64	34.93	---	---	Average
3	7315.000	49.92	-4.08	54.00	42.62	36.92	5.64	35.27	---	---	PK
4	9748.000	51.97			42.59	38.71	6.36	35.70	---	---	PEAK

Note: An item 4 is 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	Mar. 04, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	802.11n Ch. 9 (40MHz)

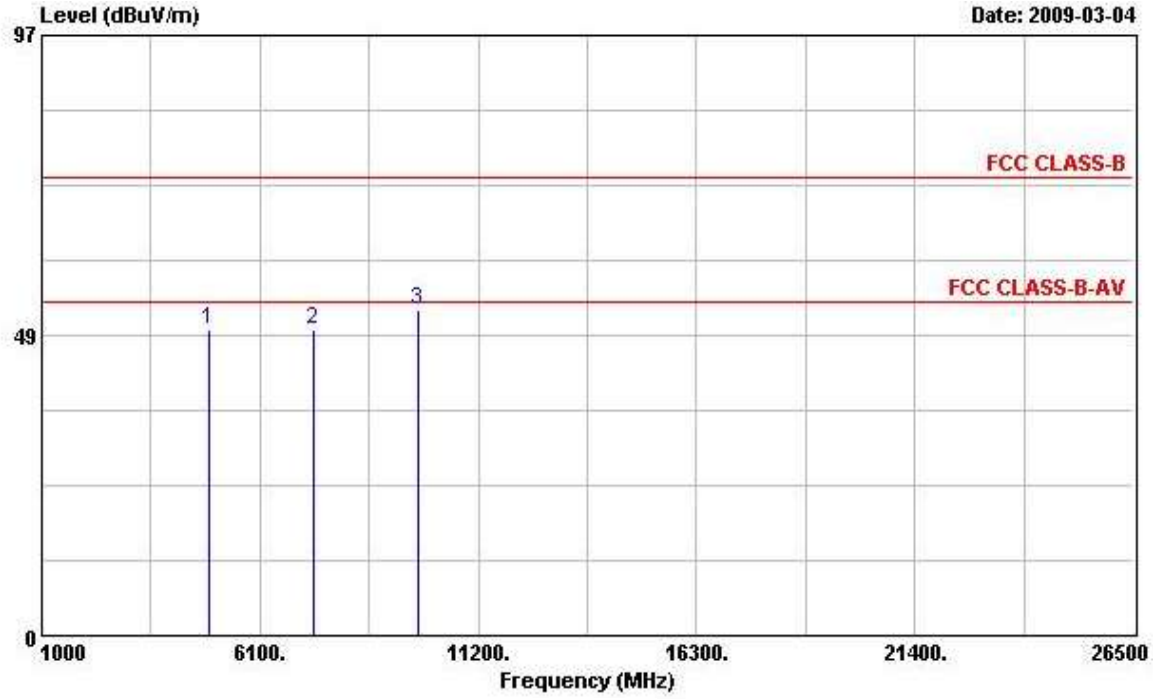
Horizontal



	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	4900.000	48.63	-5.37	54.00	43.05	35.86	4.64	34.92	---	---	PK
2 @	7356.000	50.55	-3.45	54.00	42.30	37.87	5.64	35.27	---	---	PK
3	9808.000	53.67			43.42	39.57	6.37	35.70	---	---	PEAK

Note: An item 3 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	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4904.000	49.54	-4.46	54.00	44.58	35.21	4.67	34.92	---	---	PK
2	7356.000	49.30	-4.70	54.00	41.99	36.94	5.64	35.27	---	---	PK
3	9808.000	52.57			43.12	38.77	6.37	35.70	---	---	PEAK

Note: An item 3 is 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.

3.6 Band Edge and Fundamental Emissions Measurement

3.6.1 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

3.6.2 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)	100 KHz /100 KHz for Peak

3.6.3 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.

3.6.4 Test Setup Layout

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

3.6.5 Test Deviation

There is no deviation with the original standard.

3.6.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.6.7 Test Result of Band Edge and Fundamental Emissions

Final Test date	Mar. 04, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	802.11n Ch. 1, 6, 11 (20MHz)

Channel 1

	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	2390.000	62.06	-11.94	74.00	27.03	32.03	3.00	0.00	---	---	Peak
2 @	2414.500	110.05			74.94	32.09	3.02	0.00	---	---	Peak
1 @	2359.780	51.85	-2.15	54.00	16.97	31.90	2.98	0.00	---	---	Average
2 @	2413.740	96.67			61.56	32.09	3.02	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	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2439.580	115.65			80.40	32.21	3.04	0.00	---	---	Peak
1 @	2440.530	103.55			68.30	32.21	3.04	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	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2459.340	114.21			78.89	32.28	3.04	0.00	---	---	Peak
2	2483.500	66.91	-7.09	74.00	31.51	32.34	3.06	0.00	---	---	Peak
1 @	2458.770	102.49			67.17	32.28	3.04	0.00	---	---	Average
2 @	2483.500	52.94	-1.06	54.00	17.54	32.34	3.06	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	Mar. 04, 2009	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	David	**Configuration**	802.11n Ch. 3, 6, 9 (40MHz)

Channel 3

	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	2388.090	66.98	-7.02	74.00	31.95	32.03	3.00	0.00	---	---	Peak
2 @	2429.700	108.14			72.97	32.15	3.02	0.00	---	---	Peak
1 @	2390.000	52.81	-1.19	54.00	17.78	32.03	3.00	0.00	---	---	Average
2 @	2426.660	96.78			61.61	32.15	3.02	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	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2444.900	112.99			77.74	32.21	3.04	0.00	---	---	Peak
1 @	2439.770	100.95			65.70	32.21	3.04	0.00	---	---	Average

The item 1 is Fundamental Emissions.

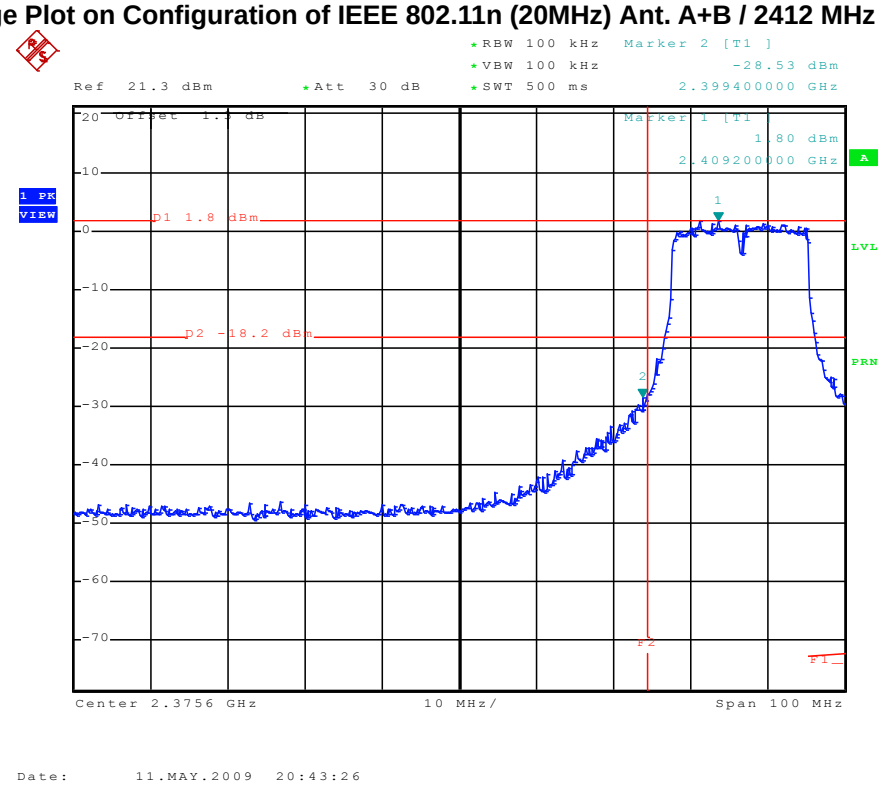
Channel 9

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2460.100	112.33			77.01	32.28	3.04	0.00	---	---	Peak
2 @	2483.500	71.24	-2.76	74.00	35.84	32.34	3.06	0.00	---	---	Peak
1 @	2442.050	97.03			61.78	32.21	3.04	0.00	---	---	Average
2 @	2483.500	52.81	-1.19	54.00	17.41	32.34	3.06	0.00	---	---	Average

The item 1 is Fundamental Emissions.

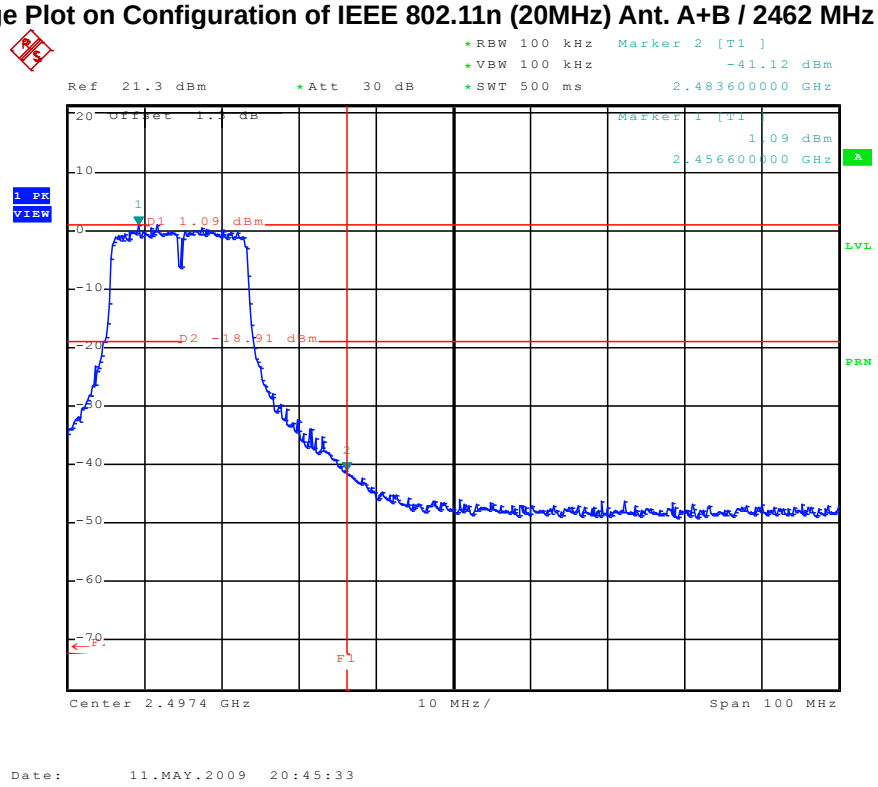
Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Low Band Edge Plot on Configuration of IEEE 802.11n (20MHz) Ant. A+B / 2412 MHz



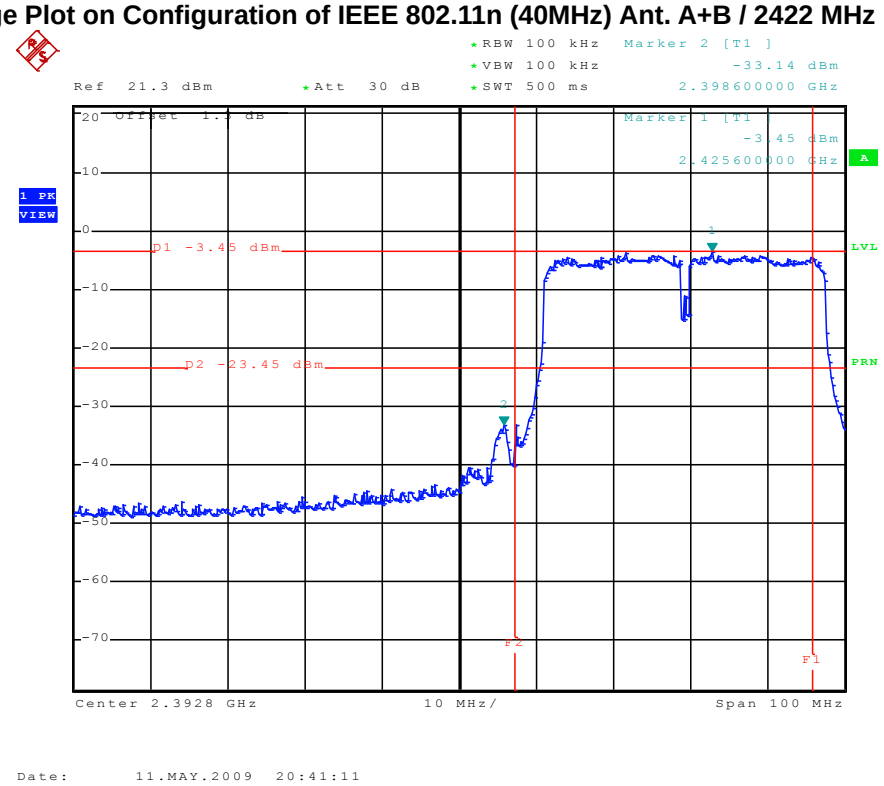
Date: 11.MAY.2009 20:43:26

High Band Edge Plot on Configuration of IEEE 802.11n (20MHz) Ant. A+B / 2462 MHz



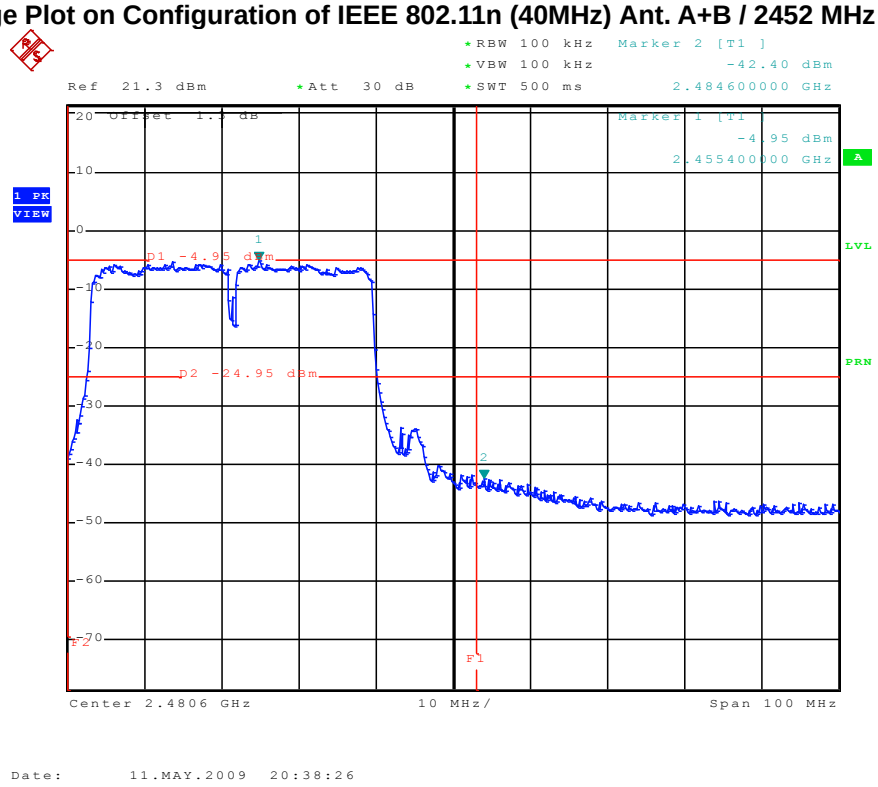
Date: 11.MAY.2009 20:45:33

Low Band Edge Plot on Configuration of IEEE 802.11n (40MHz) Ant. A+B / 2422 MHz



Date: 11.MAY.2009 20:41:11

High Band Edge Plot on Configuration of IEEE 802.11n (40MHz) Ant. A+B / 2452 MHz



Date: 11.MAY.2009 20:38:26

3.7 Antenna Requirements

3.7.1 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.

3.7.2 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
Spectrum Analyzer	R&S	FSU26.5	100015	20Hz ~ 26.5GHz	Oct. 29, 2008	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 11, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jul. 11, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jul. 11, 2008	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2009	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Jul. 18, 2008	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2008	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2008	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Dec. 14, 2008	Conducted (TH01-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 30, 2008*	Conducted (TH01-HY)

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

Mode 1
Conducted Emissions

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Apr. 20, 2011	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99041	9kHz – 30MHz	Mar. 10, 2011	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	May 04, 2011	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	CB049	9kHz – 30MHz	Apr. 21, 2011	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)

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

Radiated Emissions below 1GHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 11, 2011	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz – 1.3 GHz	Jul. 23, 2010	Radiation (03CH02-HY)
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Feb. 11, 2011	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Oct. 16, 2010	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)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz ~ 1GHz	Mar. 07, 2011	Radiation (03CH02-HY)

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

Mode 2
Conducted Emissions

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Apr. 16, 2008	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 23, 2009	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2009	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2008	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)

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

Radiated Emissions below 1GHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 12, 2008	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz – 1.3 GHz	Jul. 11, 2008	Radiation (03CH02-HY)
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Feb. 04, 2009	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Nov. 30, 2008	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)
RF Cable-R03m	Jye Bao	RG142	CB020	30 MHz - 1 GHz	Dec. 17, 2008	Radiation (03CH02-HY)

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

Mode 3 / Mode 4
Conducted Emissions

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Apr. 20, 2011	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99041	9kHz – 30MHz	Mar. 10, 2011	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	May 04, 2011	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	CB049	9kHz – 30MHz	Apr. 21, 2011	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)

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

Radiated Emissions below 1GHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz ~ 40 GHz	Feb. 11, 2011	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz ~ 1 GHz 3m	May 11, 2011	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz ~ 1.3 GHz	Jul. 25, 2011	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz ~ 1 GHz	Mar. 07, 2011	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz ~ 2 GHz	Oct. 16, 2010	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.

Radiated Emissions above 1GHz and Band Edge and Fundamental Emissions

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 12, 2008	Radiation (03CH02-HY)
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Feb. 04, 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)
Amplifier	Agilent	8449B	3008A02373	1GHz – 26.5 GHz	Jul. 16, 2008	Radiation (03CH02-HY)
Horn Antenna	ETS-LINDGREN	3117	00091920	1GHz~18GHz	Oct. 22, 2008	Radiation (03CH02-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX106	03CH02-HY	1GHz~40GHz	Dec. 17, 2008	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is one 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. : L1190-110111

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 : January 11, 2011

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