FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment	:	**Travel Router DB**
Brand Name	:	**BELKIN**
Model No.	:	**F9K1107v1, F9K1107xx**
Filing Type	:	**Existing Change**
Applicant	:	**Belkin International inc.**
Manufacturer		12045 East Waterfront Drive, Playa Vista, CA 90094, USA
FCC ID	:	**K7SF9K1107V1**
Received Date	:	Aug. 18, 2011
Final Test Date	:	Sep. 28, 2011

Statement

Test result included is only for the PCB Antenna 802.11a/n (5725~5850 MHz) 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.

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History of This Test Report

Original Issue Date: Oct. 03, 2011
Report No.: FR181025-01AI
□ No additional attachment.
■ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description
FR181025AI	Sep. 28, 2011	Original.
FR181025-01AI	Oct. 03, 2011	Changes equipment appearance and model number.

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment : Travel Router DB
Brand Name : BELKIN
Model No. : F9K1107v1, F9K1107xx
Applicant : Belkin International inc.
12045 East Waterfront Drive, Playa Vista, CA 90094, USA

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Aug. 18, 2011 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

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	5.28 dB
3.2	15.247(b)(3)	Maximum Peak Output Power	Complies	9.40 dB
3.3	15.247(e)	Power Spectral Density	Complies	24.31 dB
3.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
3.5	15.247(d)	Radiated Emissions	Complies	1.02 dB
3.6	15.247(d)	Band Edge and Fundamental Emissions	Complies	-
3.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	$\pm 8.5\times 10^{-8}$	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

The EUT may match the different type of antennas used for random. Only the radio detail of IEEE 802.11b/g/n is shown in this report. Only the radio detail of IEEE 802.11a/n 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	Power from adapter
Data Modulation Data Rate (Mbps)	OFDM for IEEE 802.11a (BPSK / QPSK / 16QAM / 64QAM) (6/9/12/18/24/36/48/54) See the below table for IEEE 802.11n
Frequency Range	5725 ~ 5850MHz
Channel Number	5 for 20MHz bandwidth ; 2 for 40MHz bandwidth
Channel Band Width (99%)	802.11a : 16.48 MHz
	802.11n : MCS 0 (20MHz) : 17.68 MHz ; MCS 0 (40MHz) : 36.08 MHz MCS 8 (20MHz) : 17.68 MHz ; MCS 8 (40MHz) : 36.00 MHz
Conducted Output Power	802.11a : 17.55 dBm
	802.11n : MCS 0 (20MHz) : 17.56dBm ; MCS 0 (40MHz) : 17.64 dBm MCS 8 (20MHz) : 20.60dBm ; MCS 8 (40MHz) : 20.53 dBm

2.2 Accessories

Power	Brand	Model	Rating
AC Adapter	ShunShing	SDCII10B	INPUT : 100-240V~50/60Hz 0.3A OUTPUT : +5V 2.1A
Switching Adapter	DVE	DSC-5CU-05 050100	INPUT : 100-240V~50/60Hz 0.2A OUTPUT : +5V 1A
Switching Adapter	Sunny	SYS1421-0505-W2	INPUT : 100-240V~0.5A MAX 50-60Hz OUTPUT : +5V 1A

Other:
The following items should be included:
• The Universal Wireless HDTV Adapter
• USB 2.0 cable *1
• RJ45 cable * 1
• Quick Installation Guide

2.3 Table for Filed Antenna

Antenna & Bandwidth

Antenna Mode	Single Chain		Two Chain	
Bandwidth Mode	20 MHz	40 MHz	20 MHz	40 MHz
802.11a	V	X	X	X
802.11n	V	V	V	V

Antenna			
No.	**Type**	**Connector**	**Gain (dBi)**
1	PIFA	U.FL	3.60
2	PCB	U.FL	4.06

5GHz Directional Gain					
Set	**Modulaton**	**Transmitter Outputs Signals Correlated**	**Transmitter Outputs (N)**	**Elements Gain (dBi)**	**Directional Gain (dBi)**
1	802.11a	N/A	1	N/A	N/A
2	802.11n	uncorrelated	2	3.60, 3.60	3.60
3	802.11a	N/A	1	N/A	N/A
4	802.11n	uncorrelated	2	4.06, 4.06	4.06

For all transmitter outputs with equal antenna gains, directional gain is to be computed as follows:

- Any transmit signals are correlated, Directional Gain = G_{ANT} + 10 log(N) dBi
- All transmit signals are completely uncorrelated, Directional Gain = G_{ANT}

For all transmitter outputs with unequal antenna gains, directional gain is to be computed as follows:

- Any transmit signals are correlated, Directional Gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2$ /N] dBi
- All transmit signals are completely uncorrelated, Directional Gain = 10 log[$(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10})$/N] dBi

IEEE 802.11n Modulation Scheme

MCS	Spatial	Modulation	Coding Rate	Data rate(Mbps)	
Index	**Streams**	**Type**	**Type**	**20 MHz channel**	**40 MHz channel**
				800nsGI	**800nsGI**
0	1	BPSK	1/2	6.5	13.5
1	1	QPSK	1/2	13	27
2	1	QPSK	3/4	19.5	40.5
3	1	16-QAM	1/2	26	54
4	1	16-QAM	3/4	39	81
5	1	64-QAM	2/3	52	108
6	1	64-QAM	3/4	58.5	121.5
7	1	64-QAM	5/6	65	135
8	2	BPSK	1/2	13	27
9	2	QPSK	1/2	26	54
10	2	QPSK	3/4	39	81
11	2	16-QAM	1/2	52	108
12	2	16-QAM	3/4	78	162
13	2	64-QAM	2/3	104	216
14	2	64-QAM	3/4	117	243
15	2	64-QAM	5/6	130	270

2.4 Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency (20MHz)	Channel No.	Frequency (40MHz)
5725~5850 MHz	149	5745 MHz	151	5755 MHz
	153	5765 MHz	159	5795 MHz
	157	5785 MHz	-	-
	161	5805 MHz	-	-
	165	5825 MHz	-	-

2.5 Test Manner

a. The following test modes were for conducted final test:
Mode 1. EUT with BI-TEK PCB Ant.+ ShunShing Adapter (SDCII10B)
Mode 2. EUT with Mingtek PCB Ant.+ ShunShing Adapter (SDCII10B)
Mode 3. EUT with BI-TEK PCB Ant.+ DVE Adapter (DSC-5CU-05)
Mode 4. EUT with Mingtek PCB Ant.+ DVE Adapter (DSC-5CU-05)
Mode 5. EUT with BI-TEK PCB Ant.+ Sunny Adapter (SYS1421-0505-W2)
Mode 6. EUT with Mingtek PCB Ant.+ Sunny Adapter (SYS1421-0505-W2)
Mode 7. EUT with BI-TEK PCB Ant. (From system)
Mode 8. EUT with Mingtek PCB Ant. (From system)

b. The following test modes were for radiated emissions (Below 1GHz) final test:
Mode 1. EUT with PCB Ant.+ ShunShing Adapter (SDCII10B)
Mode 2. EUT with PCB Ant.+ DVE Adapter (DSC-5CU-05)
Mode 3. EUT with PCB Ant.+ Sunny Adapter (SYS1421-0505-W2)
Mode 4. EUT with PCB Ant. (From system)

c. The following test modes were for radiated emissions (Above 1GHz) final test:
Mode 1. EUT with PCB Ant.+ Sunny Adapter (SYS1421-0505-W2)

**Performed the worst configuration for higher gain was test in final test report.
(Only for conducted and radiated emissions test)

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	Antenna port
AC Power Line Conducted Emissions Radiated Emissions Below 1GHz	Refer to section 2.5	Auto	-	-
Maximum Peak Output Power Power Spectral Density	11a/BPSK	6 Mbps	149/157/165	A
	MCS 0 (20MHz)	6.5 Mbps	149/157/165	
	MCS 0 (40MHz)	13.5 Mbps	151/159	
	MCS 8 (20MHz)	13 Mbps	149/157/165	A/B; A+B
	MCS 8 (40MHz)	27 Mbps	151/159	
6dB Spectrum Bandwidth	11a/BPSK	6 Mbps	149/157/165	A
	MCS 0 (20MHz)	6.5 Mbps	149/157/165	
	MCS 0 (40MHz)	13.5 Mbps	151/159	
	MCS 8 (20MHz)	13 Mbps	149/157/165	A/B
	MCS 8 (40MHz)	27 Mbps	151/159	
Radiated Emissions Above 1GHz Fundamental Emissions	11a/BPSK	6 Mbps	149/157/165	A
	MCS 0 (20MHz)	6.5 Mbps	149/157/165	
	MCS 0 (40MHz)	13.5 Mbps	151/159	
	MCS 8 (20MHz)	13 Mbps	149/157/165	A+B
	MCS 8 (40MHz)	27 Mbps	151/159	
Band Edge Emissions	11a/BPSK	6 Mbps	149/165	A
	MCS 0 (20MHz)	6.5 Mbps	149/157/165	
	MCS 0 (40MHz)	13.5 Mbps	151/159	
	MCS 8 (20MHz)	13 Mbps	149/165	A+B
	MCS 8 (40MHz)	27 Mbps	151/159	

2.7 Table for Testing Locations

Test Site No.	Site Category	Location
CO01-NH	Conduction	Dung Hu
TH01-HY	OVEN Room	Hwa Ya
03CH03-HY	SAC	Hwa Ya

Semi Anechoic Chamber (SAC).

2.8 Table for Supporting Units

Support Unit	Brand	Model	FCC ID	Remark
Personal Computer	DELL	DCTA	DoC	Conducted Emissions
LCD Monitor	DELL	E198WFPF	DoC	
USB Keyboard	DELL	Sk-8175	DoC	
USB Mouse	DELL	MOC5UO	DoC	
Printer	HP	C2642A	DoC	
Modem	ACEEX	DM1414	DoC	
USB2.0 iPod	APPLE	A1137	DoC	
Notebook (Remote Workstation)	HP	541	N/A	
Notebook	DELL	E5500	DoC	Radiated Emissions
Modem	ACEEX	DM1414	DoC	
Mouse	Microsoft	1004	DoC	

Note: For the radiated emissions (Above 1GHz) only tested by using notebook.

2.9 Table for Parameters of Test Software Setting

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

For Single Chain:
Power Parameters of IEEE 802.11a

Test Software Version	MP Test		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	41	41	42

Power Parameters of IEEE 802.11n

Test Software Version	MP Test		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11n(20MHz)	43	43	44
Frequency	5755 MHz	5795 MHz	-
IEEE 802.11n(40MHz)	43	43	-

For Two Chain:
Power Parameters of IEEE 802.11n Ant. A+B

Test Software Version	MP Test		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11n(20MHz)	43&46	43&46	44&47
Frequency	5755 MHz	5795 MHz	-
IEEE 802.11n(40MHz)	44&46	45&47	-

2.10 EUT Operation during Test

For Conducted Emissions :
An executive program, “EMITEST.EXE” under Win XP, which generates a complete line of continuously repeating “H“ pattern was used as the test software.

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

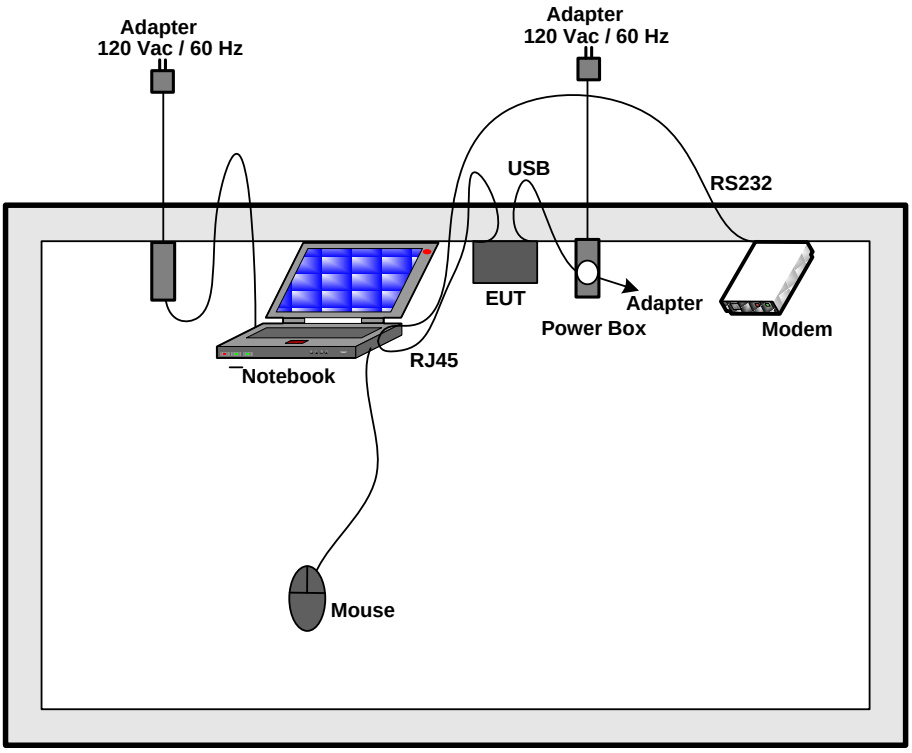
At the same time, the following programs were executed:
- Executed "Ping.exe" to link with the remote workstation to receive and transmit data via RJ45 cable.

For Radiated Emissions :
- Executed “MP Test” to keep transmitting signals at fixed frequency.

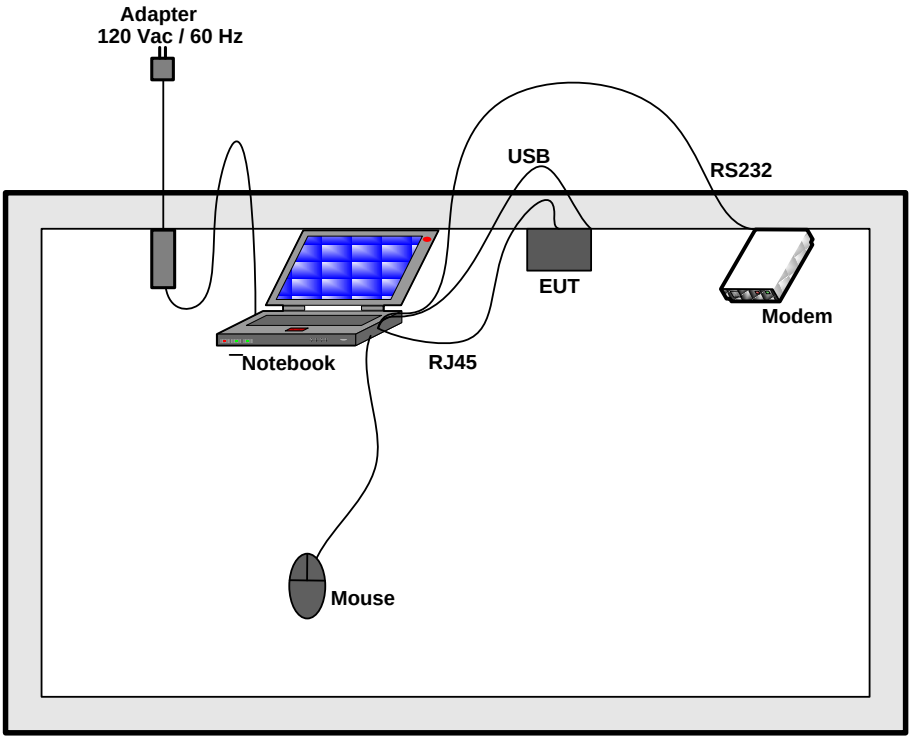
2.11 Test Configuration

2.11.1 Radiation Emissions Test Configuration

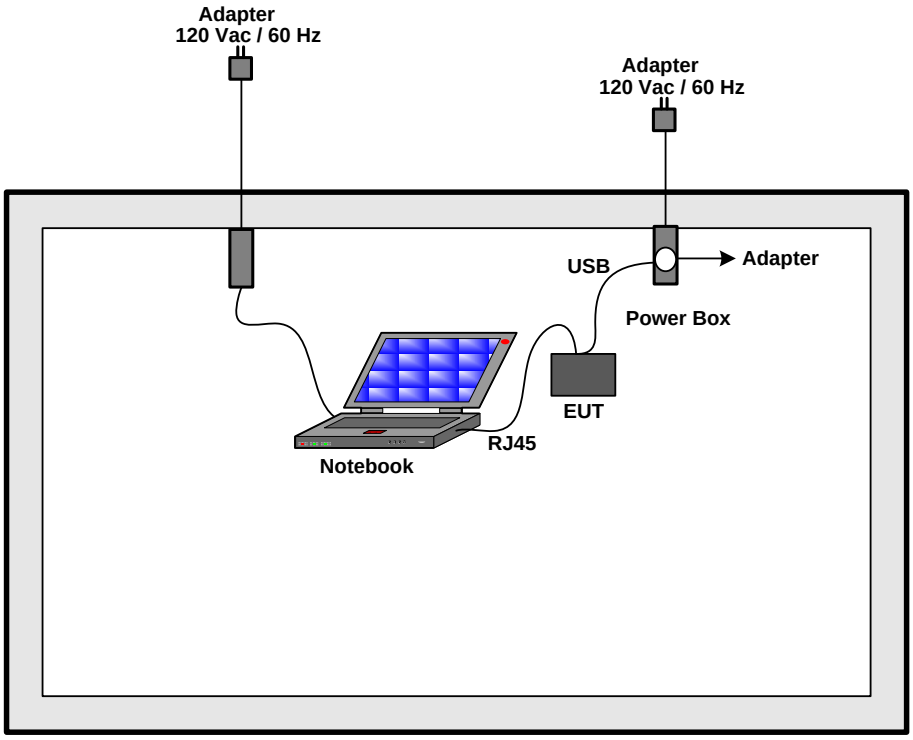
For radiated emissions 9kHz~1GHz
Mode 1~Mode 3



Mode 4



For radiated emissions above 1GHz
Mode 1



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

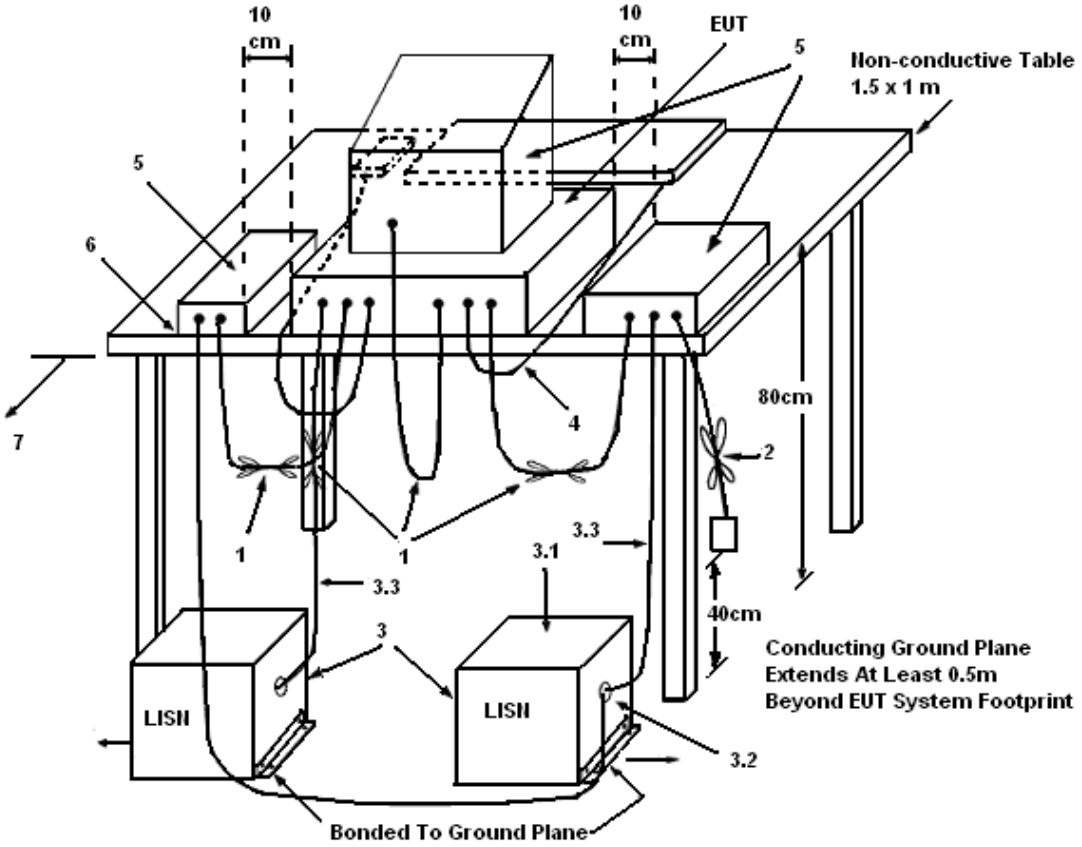
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

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.

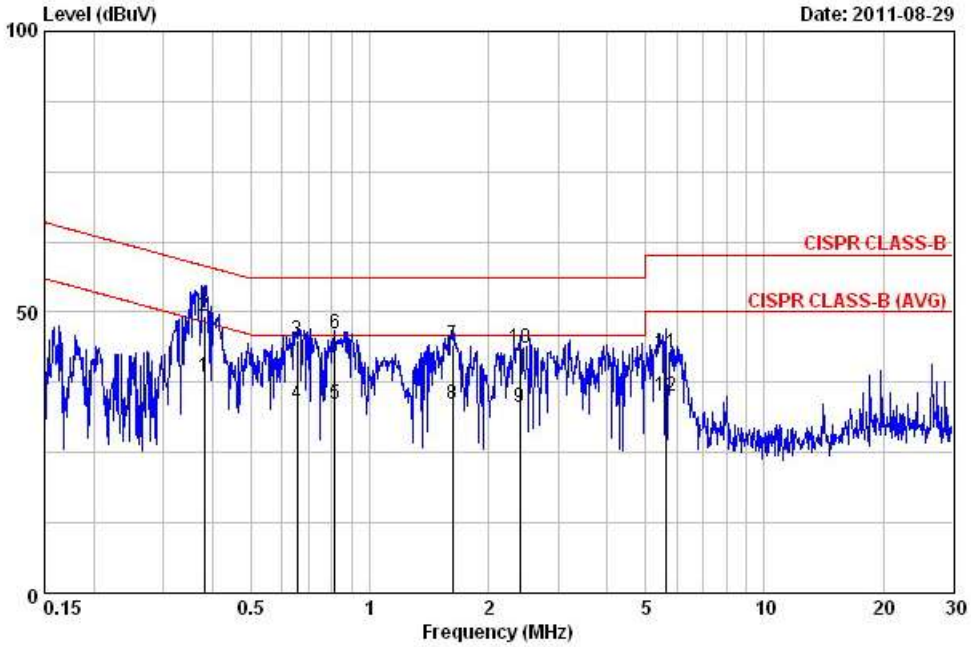
3.1.6 EUT Operation during Test

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

3.1.7 Results of AC Power Line Conducted Emissions Measurement

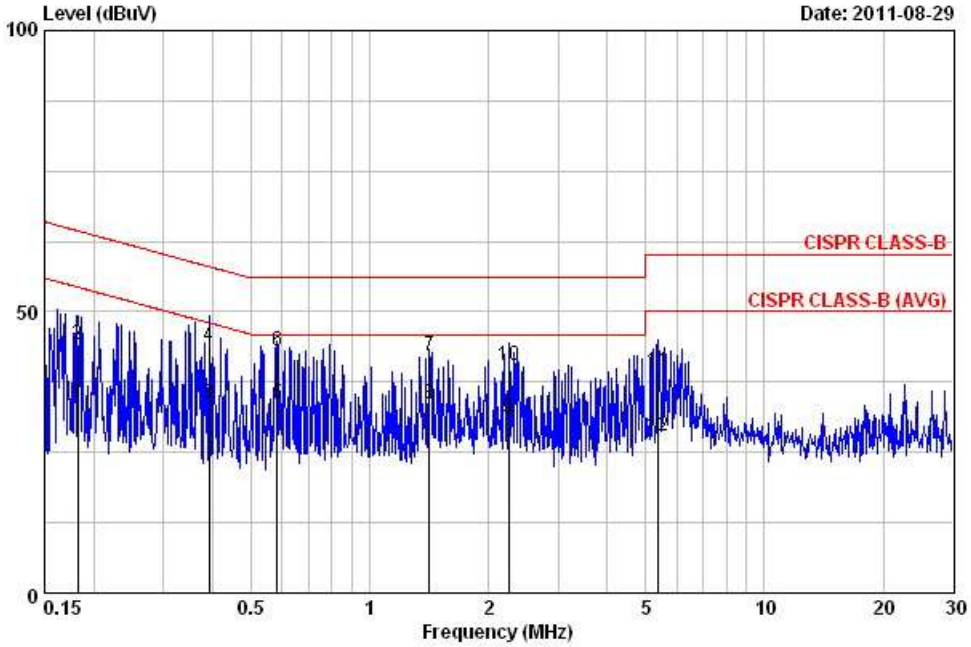
. Final Test Date	Aug. 29, 2011	Test Site No.	CO01-NH
Temperature	24℃	Humidity	54%
Test Engineer	Eddie	Configuration	Mode 1

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.381	38.52	-9.73	48.25	28.38	10.04	0.10	AVERAGE
2	0.381	49.16	-9.09	58.25	39.02	10.04	0.10	QP
3	0.654	45.07	-10.93	56.00	34.92	10.05	0.10	QP
4	0.654	33.61	-12.39	46.00	23.46	10.05	0.10	AVERAGE
5	0.817	33.53	-12.47	46.00	23.38	10.05	0.10	AVERAGE
6	0.817	46.08	-9.92	56.00	35.93	10.05	0.10	QP
7	1.619	44.02	-11.98	56.00	33.79	10.06	0.17	QP
8	1.619	33.74	-12.26	46.00	23.51	10.06	0.17	AVERAGE
9	2.396	33.14	-12.86	46.00	22.86	10.08	0.20	AVERAGE
10	2.396	43.55	-12.45	56.00	33.27	10.08	0.20	QP
11	5.653	42.65	-17.35	60.00	32.33	10.12	0.20	QP
12	5.653	35.09	-14.91	50.00	24.77	10.12	0.20	AVERAGE

Neutral

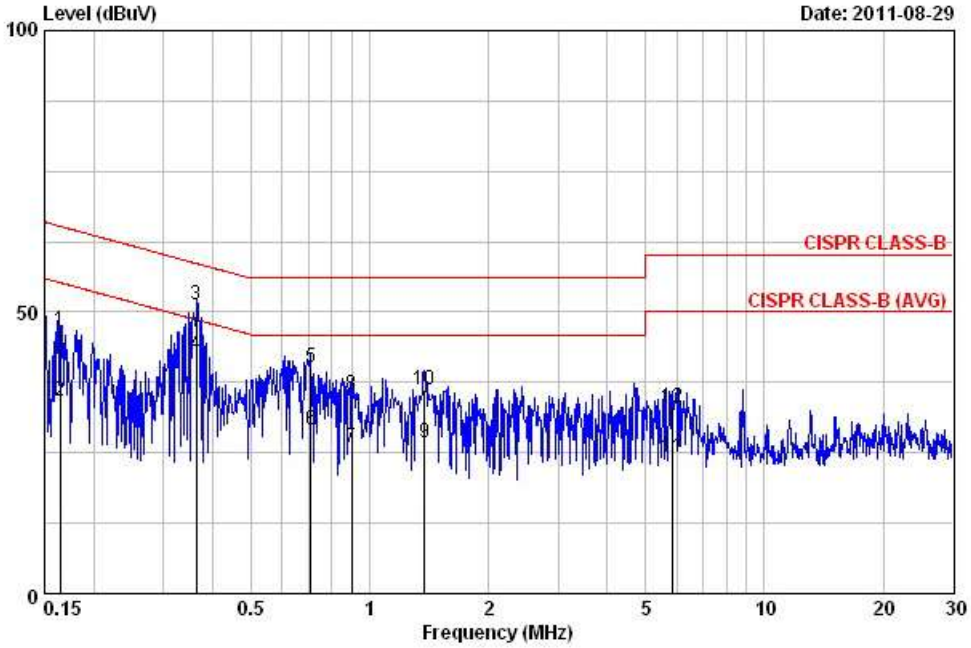


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.182	33.77	-20.60	54.37	23.69	9.98	0.10	AVERAGE
2	0.182	44.12	-20.25	64.37	34.04	9.98	0.10	QP
3	0.391	33.51	-14.53	48.03	23.42	9.99	0.10	AVERAGE
4	0.391	43.95	-14.09	58.03	33.86	9.99	0.10	QP
5	0.582	33.50	-12.50	46.00	23.41	9.99	0.10	AVERAGE
6	0.582	43.00	-13.00	56.00	32.91	9.99	0.10	QP
7	1.418	42.04	-13.96	56.00	31.89	10.00	0.15	QP
8	1.418	33.66	-12.34	46.00	23.51	10.00	0.15	AVERAGE
9	2.249	30.92	-15.08	46.00	20.70	10.01	0.20	AVERAGE
10	2.249	40.34	-15.66	56.00	30.12	10.01	0.20	QP
11	5.362	39.41	-20.59	60.00	29.15	10.06	0.20	QP
12	5.362	27.86	-22.14	50.00	17.60	10.06	0.20	AVERAGE

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

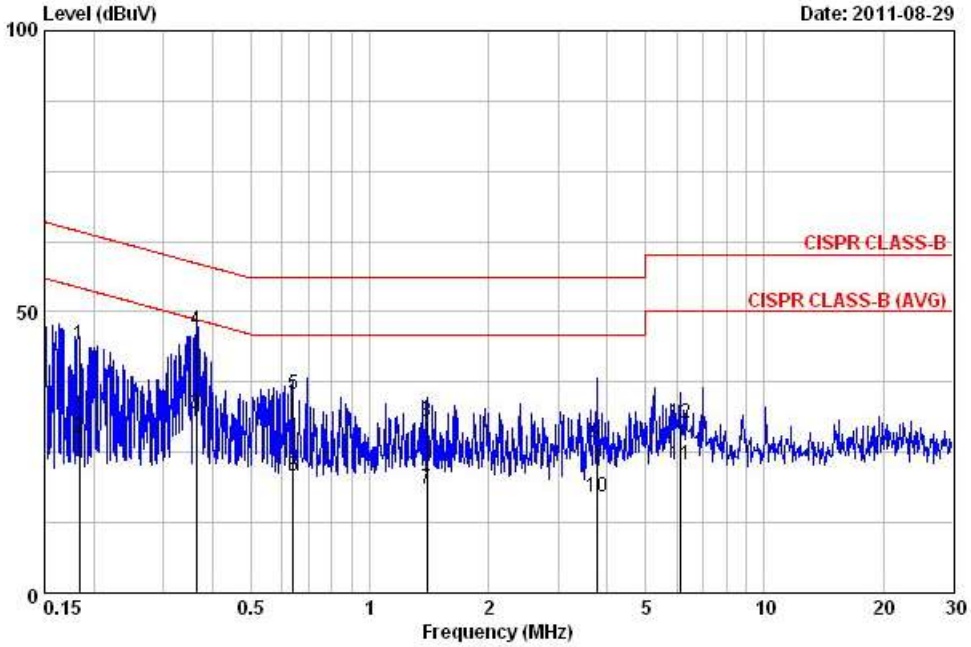
Final Test Date	Aug. 29, 2011	**Test Site No.**	CO01-NH
Temperature	24℃	**Humidity**	54%
Test Engineer	Eddie	**Configuration**	Mode 2

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.164	46.73	-18.52	65.25	36.59	10.04	0.10	QP
2	0.164	34.31	-20.94	55.25	24.17	10.04	0.10	AVERAGE
3 @	0.364	51.28	-7.36	58.64	41.14	10.04	0.10	QP
4 @	0.364	42.57	-6.07	48.64	32.43	10.04	0.10	AVERAGE
5	0.708	40.05	-15.95	56.00	29.90	10.05	0.10	QP
6	0.708	29.02	-16.98	46.00	18.87	10.05	0.10	AVERAGE
7	0.899	26.04	-19.96	46.00	15.89	10.05	0.10	AVERAGE
8	0.899	35.31	-20.69	56.00	25.16	10.05	0.10	QP
9	1.374	26.70	-19.30	46.00	16.50	10.06	0.15	AVERAGE
10	1.374	36.15	-19.85	56.00	25.95	10.06	0.15	QP
11	5.867	24.26	-25.74	50.00	13.93	10.13	0.20	AVERAGE
12	5.867	33.14	-26.86	60.00	22.81	10.13	0.20	QP

Neutral

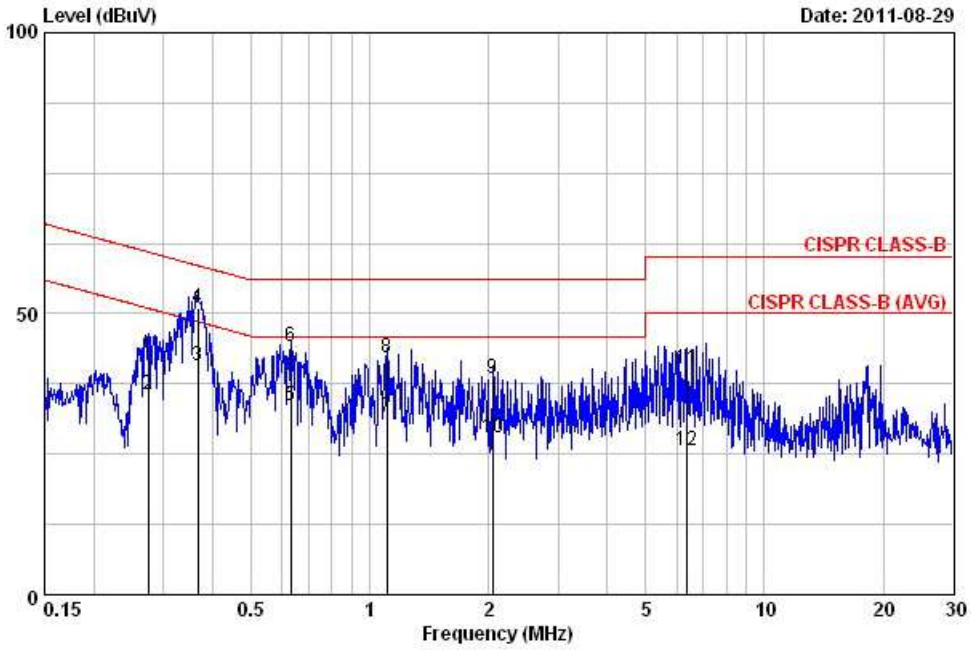


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.183	44.19	-20.14	64.33	34.11	9.98	0.10	QP
2	0.183	27.57	-26.76	54.33	17.49	9.98	0.10	AVERAGE
3	0.363	31.90	-16.75	48.65	21.81	9.99	0.10	AVERAGE
4 @	0.363	46.63	-12.02	58.65	36.54	9.99	0.10	QP
5	0.641	35.33	-20.67	56.00	25.24	9.99	0.10	QP
6	0.641	20.71	-25.29	46.00	10.62	9.99	0.10	AVERAGE
7	1.396	18.40	-27.60	46.00	8.25	10.00	0.15	AVERAGE
8	1.396	30.37	-25.63	56.00	20.22	10.00	0.15	QP
9	3.759	26.49	-29.51	56.00	16.26	10.03	0.20	QP
10	3.759	17.18	-28.82	46.00	6.95	10.03	0.20	AVERAGE
11	6.121	22.69	-27.31	50.00	12.42	10.07	0.20	AVERAGE
12	6.121	30.28	-29.72	60.00	20.01	10.07	0.20	QP

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

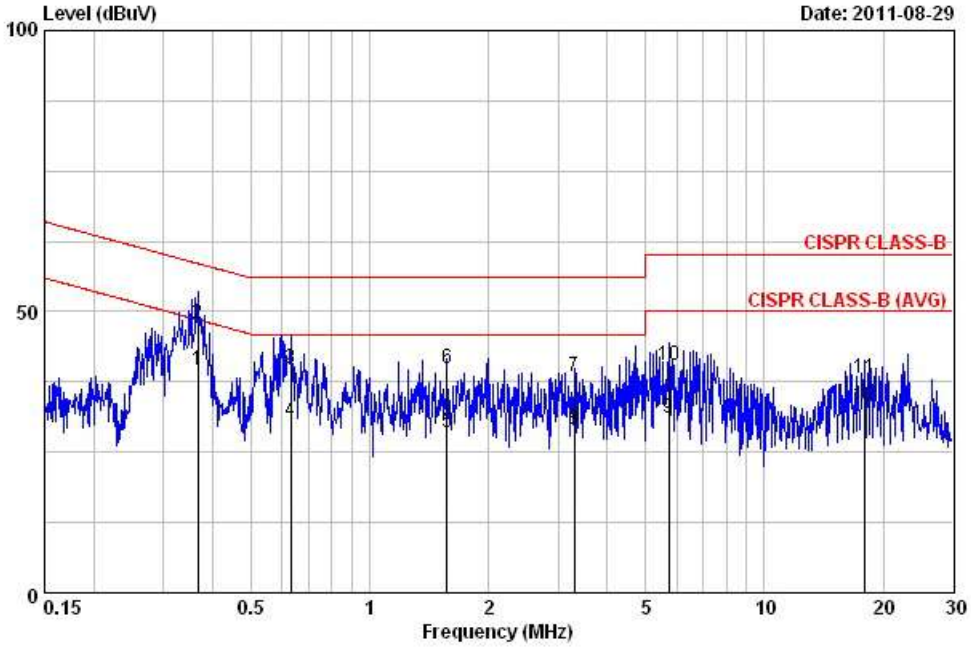
Final Test Date	Aug. 29, 2011	**Test Site No.**	CO01-NH
Temperature	24℃	**Humidity**	54%
Test Engineer	Eddie	**Configuration**	Mode 3

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.274	42.16	-18.82	60.98	32.03	10.03	0.10	QP
2	0.274	35.71	-15.27	50.98	25.58	10.03	0.10	AVERAGE
3	0.367	40.62	-7.94	48.56	30.48	10.04	0.10	AVERAGE
4	0.367	51.09	-7.47	58.56	40.95	10.04	0.10	QP
5	0.630	33.61	-12.39	46.00	23.47	10.04	0.10	AVERAGE
6	0.630	44.02	-11.98	56.00	33.88	10.04	0.10	QP
7	1.106	31.68	-14.32	46.00	21.51	10.05	0.11	AVERAGE
8	1.106	42.06	-13.94	56.00	31.89	10.05	0.11	QP
9	2.044	38.43	-17.57	56.00	28.16	10.07	0.20	QP
10	2.044	27.99	-18.01	46.00	17.72	10.07	0.20	AVERAGE
11	6.386	40.10	-19.90	60.00	29.76	10.14	0.20	QP
12	6.386	25.52	-24.48	50.00	15.18	10.14	0.20	AVERAGE

Neutral

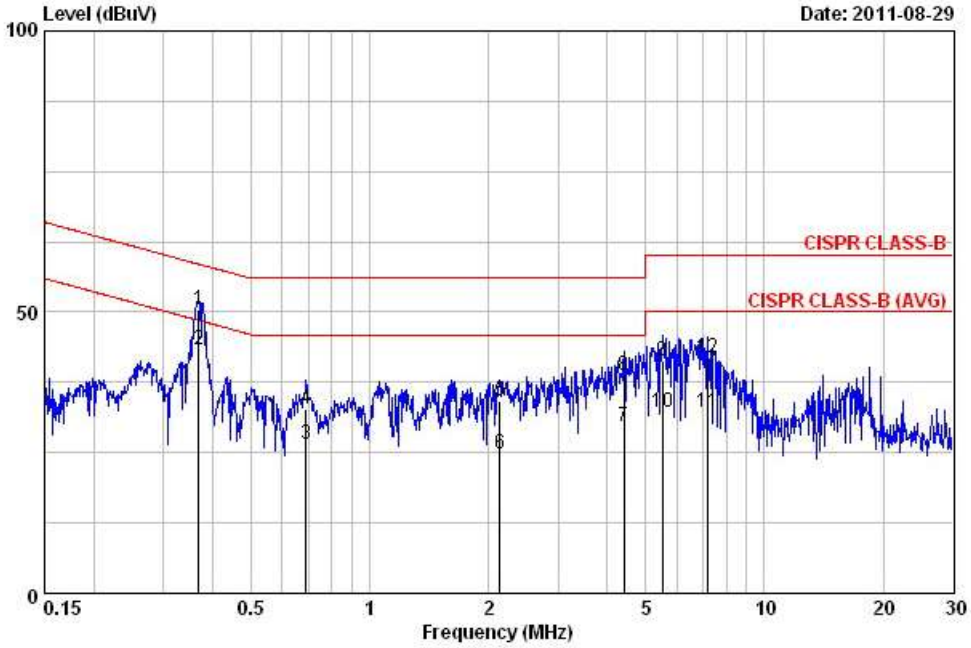


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.367	39.52	-9.04	48.56	29.43	9.99	0.10	AVERAGE
2	0.367	47.94	-10.62	58.56	37.85	9.99	0.10	QP
3	0.630	39.89	-16.11	56.00	29.80	9.99	0.10	QP
4	0.630	30.56	-15.44	46.00	20.47	9.99	0.10	AVERAGE
5	1.568	28.59	-17.41	46.00	18.42	10.00	0.17	AVERAGE
6	1.568	39.96	-16.04	56.00	29.79	10.00	0.17	QP
7	3.293	38.52	-17.48	56.00	28.30	10.02	0.20	QP
8	3.293	29.14	-16.86	46.00	18.92	10.02	0.20	AVERAGE
9	5.713	30.92	-19.08	50.00	20.66	10.06	0.20	AVERAGE
10	5.713	40.58	-19.42	60.00	30.32	10.06	0.20	QP
11	17.944	38.21	-21.79	60.00	27.69	10.26	0.26	QP
12	17.944	33.46	-16.54	50.00	22.94	10.26	0.26	AVERAGE

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

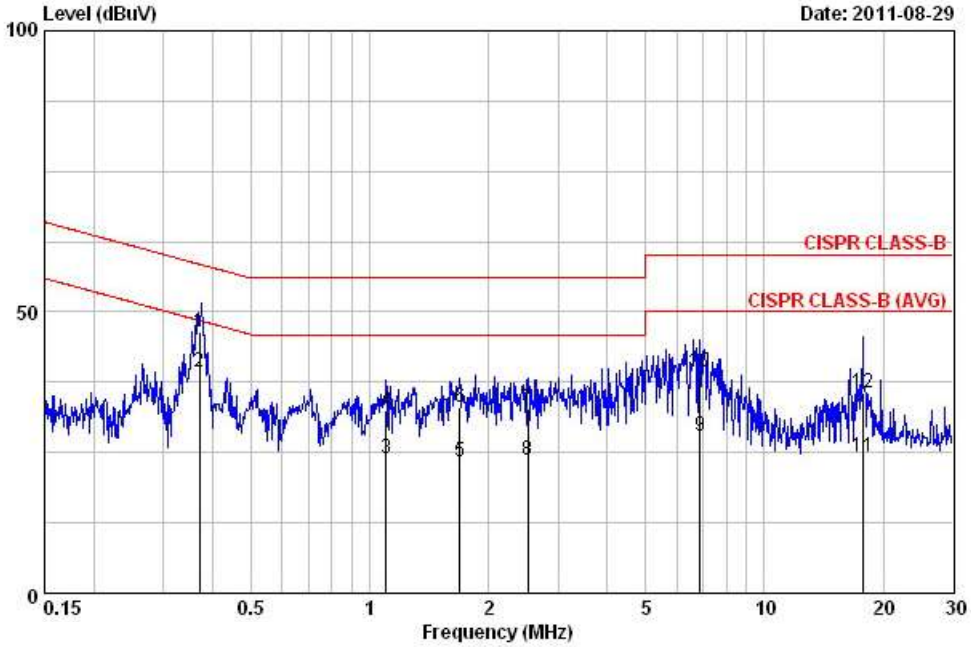
Final Test Date	Aug. 29, 2011	**Test Site No.**	CO01-NH
Temperature	24℃	**Humidity**	54%
Test Engineer	Eddie	**Configuration**	Mode 4

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 @	0.369	50.43	-8.09	58.52	40.29	10.04	0.10	QP
2 @	0.369	43.24	-5.28	48.52	33.10	10.04	0.10	AVERAGE
3	0.690	26.41	-19.59	46.00	16.26	10.05	0.10	AVERAGE
4	0.690	32.85	-23.15	56.00	22.70	10.05	0.10	QP
5	2.133	34.20	-21.80	56.00	23.93	10.07	0.20	QP
6	2.133	24.92	-21.08	46.00	14.65	10.07	0.20	AVERAGE
7	4.407	29.72	-16.28	46.00	19.42	10.10	0.20	AVERAGE
8	4.407	38.67	-17.33	56.00	28.37	10.10	0.20	QP
9	5.505	41.27	-18.73	60.00	30.94	10.12	0.20	QP
10	5.505	32.10	-17.90	50.00	21.77	10.12	0.20	AVERAGE
11	7.213	32.28	-17.72	50.00	21.93	10.15	0.20	AVERAGE
12	7.213	41.78	-18.22	60.00	31.43	10.15	0.20	QP

Neutral

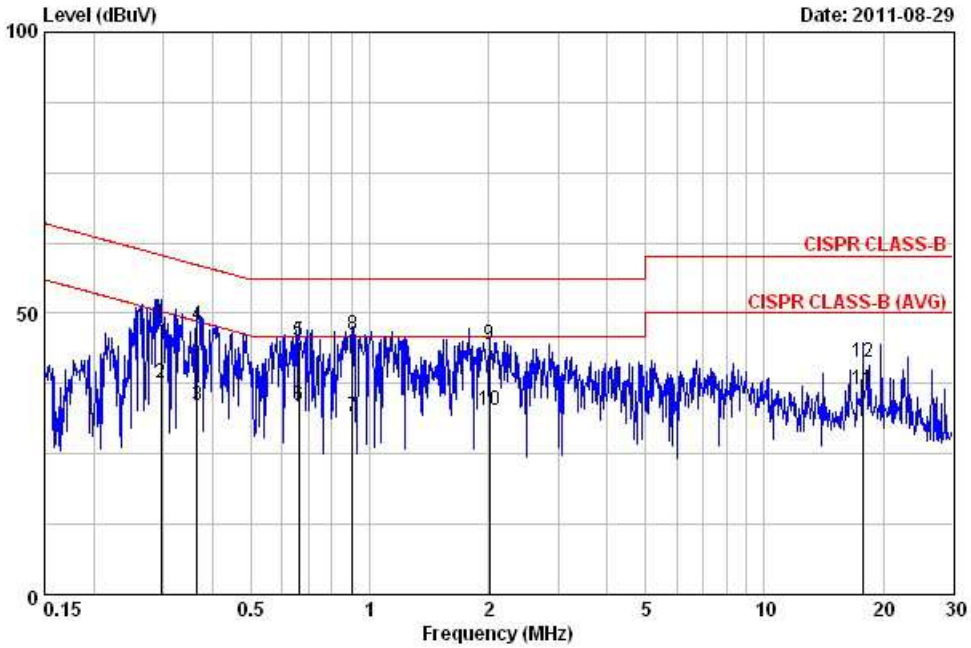


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 @	0.371	46.46	-12.01	58.47	36.37	9.99	0.10	QP
2 @	0.371	39.28	-9.19	48.47	29.19	9.99	0.10	AVERAGE
3	1.100	24.03	-21.97	46.00	13.92	9.99	0.11	AVERAGE
4	1.100	32.60	-23.40	56.00	22.49	9.99	0.11	QP
5	1.689	23.37	-22.63	46.00	13.19	10.01	0.18	AVERAGE
6	1.689	33.11	-22.89	56.00	22.93	10.01	0.18	QP
7	2.513	32.75	-23.25	56.00	22.54	10.02	0.20	QP
8	2.513	23.55	-22.45	46.00	13.34	10.02	0.20	AVERAGE
9	6.878	27.86	-22.14	50.00	17.58	10.08	0.20	AVERAGE
10	6.878	39.29	-20.71	60.00	29.01	10.08	0.20	QP
11	17.755	24.24	-25.76	50.00	13.73	10.25	0.26	AVERAGE
12	17.755	35.72	-24.28	60.00	25.21	10.25	0.26	QP

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

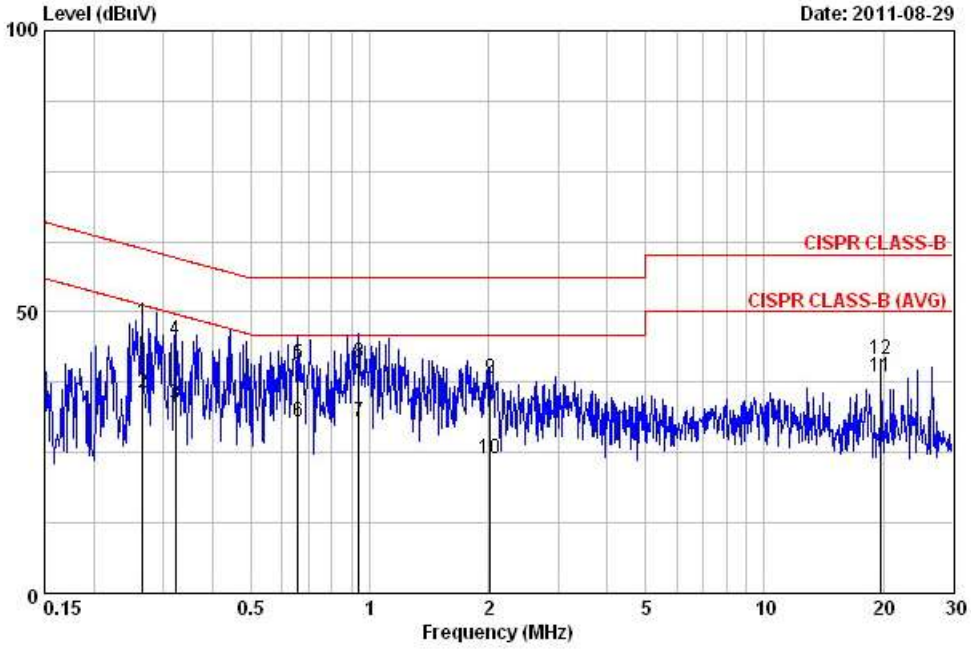
Final Test Date	Aug. 29, 2011	**Test Site No.**	CO01-NH
Temperature	24℃	**Humidity**	54%
Test Engineer	Eddie	**Configuration**	Mode 5

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.296	48.10	-12.26	60.37	37.97	10.04	0.10	QP
2	0.296	37.73	-12.63	50.37	27.60	10.04	0.10	AVERAGE
3	0.365	33.57	-15.03	48.61	23.44	10.04	0.10	AVERAGE
4	0.365	47.89	-10.71	58.61	37.76	10.04	0.10	QP
5	0.661	44.93	-11.07	56.00	34.78	10.05	0.10	QP
6	0.661	33.61	-12.39	46.00	23.46	10.05	0.10	AVERAGE
7	0.904	31.62	-14.38	46.00	21.47	10.05	0.10	AVERAGE
8	0.904	46.10	-9.90	56.00	35.95	10.05	0.10	QP
9	2.012	44.32	-11.68	56.00	34.05	10.07	0.20	QP
10	2.012	32.85	-13.15	46.00	22.58	10.07	0.20	AVERAGE
11	17.755	36.40	-13.60	50.00	25.85	10.30	0.26	AVERAGE
12	17.755	41.30	-18.70	60.00	30.75	10.30	0.26	QP

Neutral

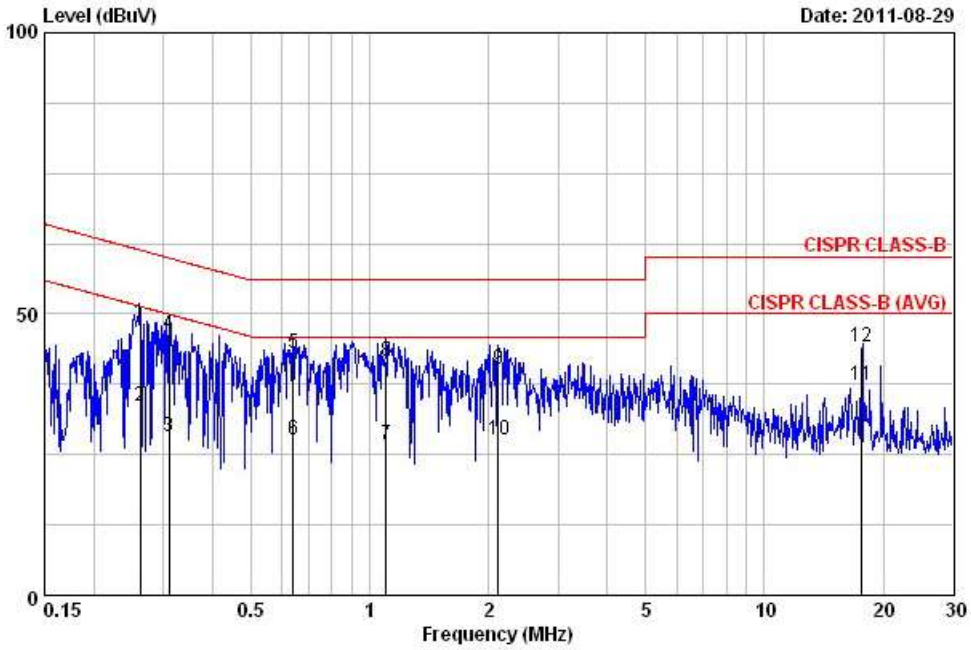


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.266	48.16	-13.09	61.25	38.08	9.98	0.10	QP
2	0.266	35.71	-15.54	51.25	25.63	9.98	0.10	AVERAGE
3	0.322	33.61	-16.05	49.66	23.52	9.99	0.10	AVERAGE
4	0.322	45.02	-14.64	59.66	34.93	9.99	0.10	QP
5	0.658	40.81	-15.19	56.00	30.72	9.99	0.10	QP
6	0.658	30.55	-15.45	46.00	20.46	9.99	0.10	AVERAGE
7	0.938	30.51	-15.49	46.00	20.42	9.99	0.10	AVERAGE
8	0.938	41.05	-14.95	56.00	30.96	9.99	0.10	QP
9	2.023	38.23	-17.77	56.00	28.02	10.01	0.20	QP
10	2.023	23.93	-22.07	46.00	13.72	10.01	0.20	AVERAGE
11	19.740	38.55	-11.45	50.00	27.98	10.28	0.30	AVERAGE
12	19.740	41.47	-18.53	60.00	30.90	10.28	0.30	QP

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

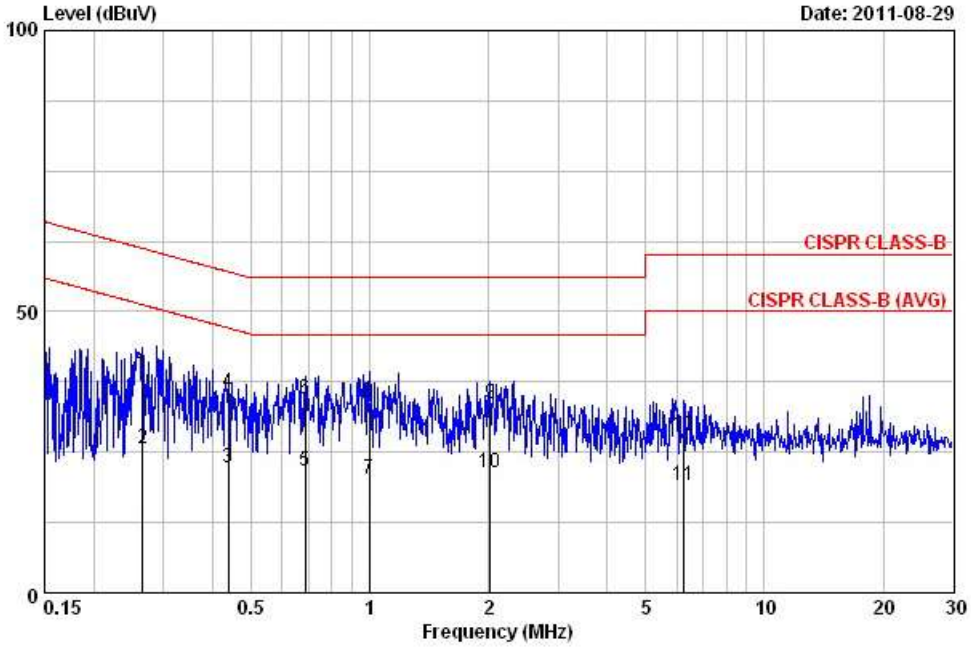
Final Test Date	Aug. 29, 2011	**Test Site No.**	CO01-NH
Temperature	24℃	**Humidity**	54%
Test Engineer	Eddie	**Configuration**	Mode 6

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.262	48.41	-12.97	61.38	38.27	10.03	0.10	QP
2	0.262	33.73	-17.65	51.38	23.59	10.03	0.10	AVERAGE
3	0.310	28.24	-21.73	49.97	18.10	10.04	0.10	AVERAGE
4	0.310	46.38	-13.59	59.97	36.24	10.04	0.10	QP
5	0.641	42.99	-13.01	56.00	32.84	10.05	0.10	QP
6	0.641	27.57	-18.43	46.00	17.42	10.05	0.10	AVERAGE
7	1.100	26.90	-19.10	46.00	16.73	10.05	0.11	AVERAGE
8	1.100	41.50	-14.50	56.00	31.33	10.05	0.11	QP
9	2.121	40.18	-15.82	56.00	29.91	10.07	0.20	QP
10	2.121	27.66	-18.34	46.00	17.39	10.07	0.20	AVERAGE
11 @	17.693	37.34	-12.66	50.00	26.79	10.29	0.26	AVERAGE
12	17.693	44.27	-15.73	60.00	33.72	10.29	0.26	QP

Neutral

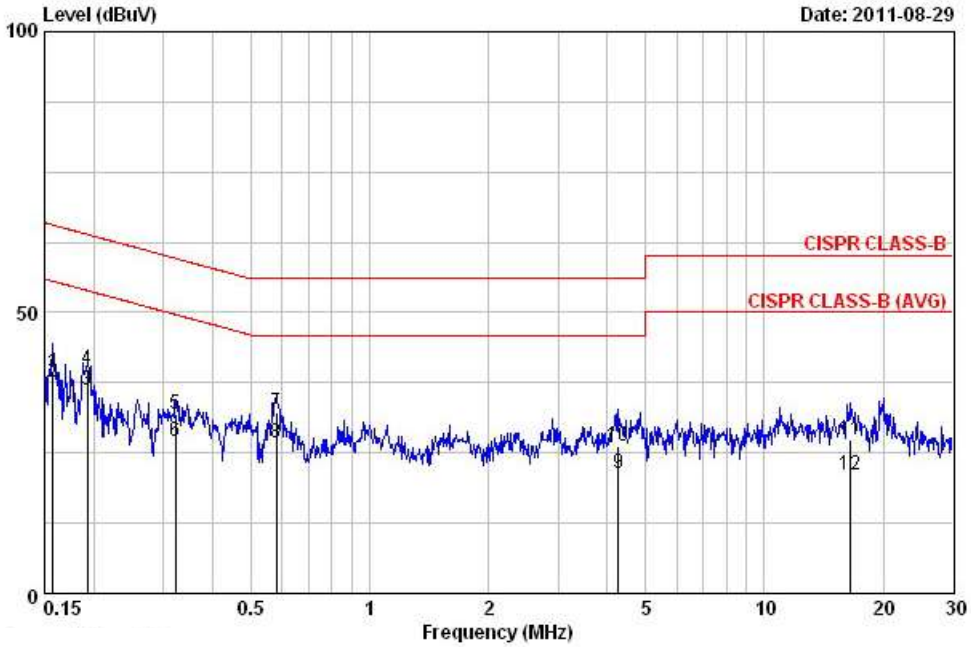


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.266	39.17	-22.08	61.25	29.09	9.98	0.10	QP
2	0.266	25.57	-25.68	51.25	15.49	9.98	0.10	AVERAGE
3	0.437	22.31	-24.80	47.11	12.22	9.99	0.10	AVERAGE
4	0.437	35.51	-21.60	57.11	25.42	9.99	0.10	QP
5	0.686	21.73	-24.27	46.00	11.64	9.99	0.10	AVERAGE
6	0.686	34.41	-21.59	56.00	24.32	9.99	0.10	QP
7	1.000	20.24	-25.76	46.00	10.15	9.99	0.10	AVERAGE
8	1.000	33.80	-22.20	56.00	23.71	9.99	0.10	QP
9	2.023	33.58	-22.42	56.00	23.37	10.01	0.20	QP
10	2.023	21.46	-24.54	46.00	11.25	10.01	0.20	AVERAGE
11	6.252	19.09	-30.91	50.00	8.82	10.07	0.20	AVERAGE
12	6.252	27.85	-32.15	60.00	17.58	10.07	0.20	QP

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

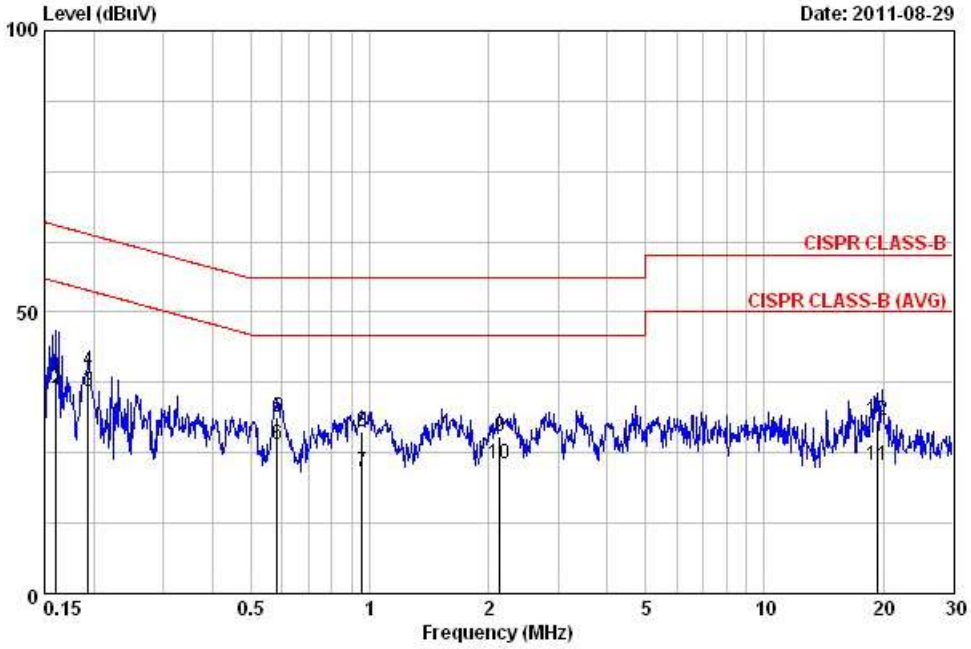
Final Test Date	Aug. 29, 2011	**Test Site No.**	CO01-NH
Temperature	24℃	**Humidity**	54%
Test Engineer	Eddie	**Configuration**	Mode 7

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.157	39.41	-26.20	65.60	29.27	10.04	0.10	QP
2	0.157	37.73	-17.88	55.60	27.59	10.04	0.10	AVERAGE
3	0.192	36.18	-17.75	53.93	26.05	10.03	0.10	AVERAGE
4	0.192	39.84	-24.09	63.93	29.71	10.03	0.10	QP
5	0.322	31.77	-27.89	59.66	21.63	10.04	0.10	QP
6	0.322	27.18	-22.48	49.66	17.04	10.04	0.10	AVERAGE
7	0.579	32.07	-23.93	56.00	21.93	10.04	0.10	QP
8	0.579	26.89	-19.11	46.00	16.75	10.04	0.10	AVERAGE
9	4.269	21.25	-24.75	46.00	10.96	10.10	0.20	AVERAGE
10	4.269	26.16	-29.84	56.00	15.87	10.10	0.20	QP
11	16.486	27.34	-32.66	60.00	16.83	10.28	0.23	QP
12	16.486	21.14	-28.86	50.00	10.63	10.28	0.23	AVERAGE

Neutral

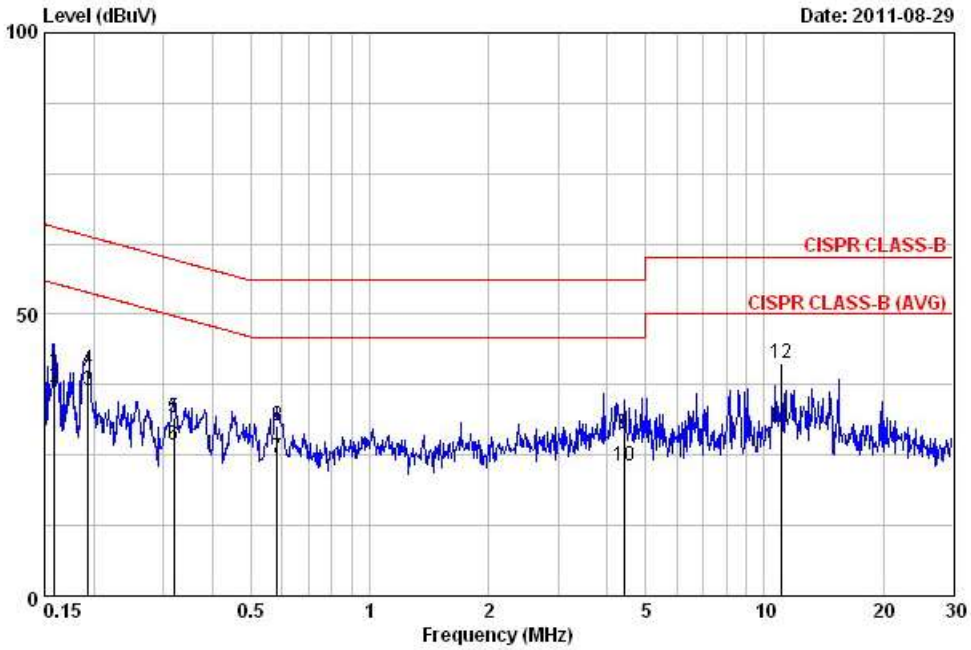


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.161	38.30	-27.12	65.43	28.22	9.98	0.10	QP
2	0.161	36.36	-19.06	55.43	26.28	9.98	0.10	AVERAGE
3	0.193	35.96	-17.93	53.89	25.88	9.98	0.10	AVERAGE
4	0.193	39.50	-24.39	63.89	29.42	9.98	0.10	QP
5	0.582	31.41	-24.59	56.00	21.32	9.99	0.10	QP
6	0.582	26.51	-19.49	46.00	16.42	9.99	0.10	AVERAGE
7	0.958	21.75	-24.25	46.00	11.66	9.99	0.10	AVERAGE
8	0.958	28.74	-27.26	56.00	18.65	9.99	0.10	QP
9	2.133	27.94	-28.06	56.00	17.73	10.01	0.20	QP
10	2.133	23.05	-22.95	46.00	12.84	10.01	0.20	AVERAGE
11	19.326	22.86	-27.14	50.00	12.30	10.27	0.29	AVERAGE
12	19.326	30.64	-29.36	60.00	20.08	10.27	0.29	QP

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

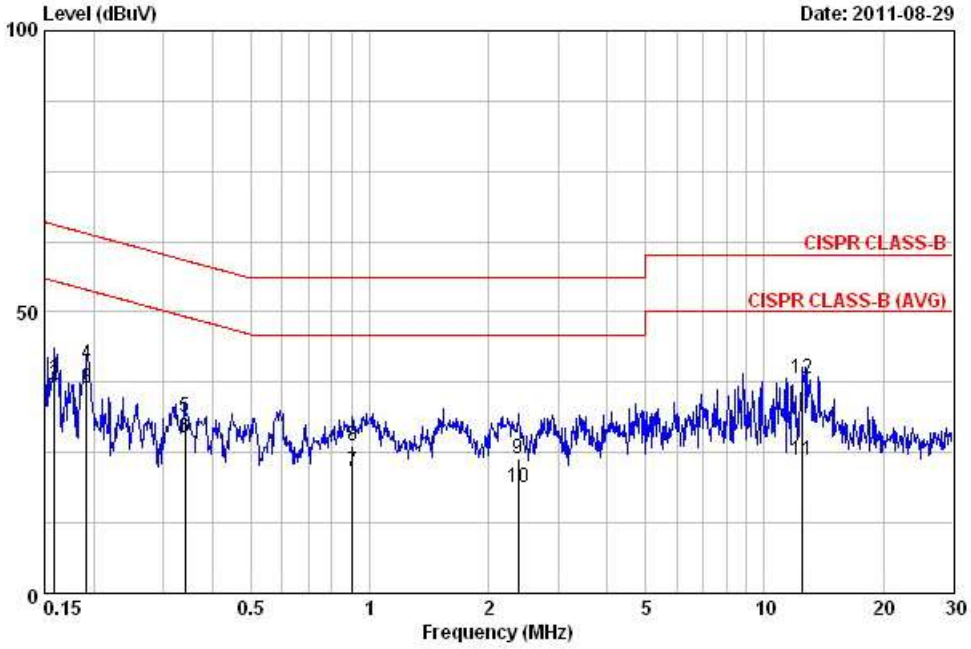
Final Test Date	Aug. 29, 2011	**Test Site No.**	CO01-NH
Temperature	24℃	**Humidity**	54%
Test Engineer	Eddie	**Configuration**	Mode 8

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.159	39.76	-25.76	65.52	29.62	10.04	0.10	QP
2	0.159	37.01	-18.51	55.52	26.87	10.04	0.10	AVERAGE
3	0.193	36.45	-17.44	53.89	26.32	10.03	0.10	AVERAGE
4	0.193	40.28	-23.61	63.89	30.15	10.03	0.10	QP
5	0.318	31.60	-28.15	59.75	21.47	10.04	0.10	QP
6	0.318	26.73	-23.02	49.75	16.60	10.04	0.10	AVERAGE
7	0.582	24.58	-21.42	46.00	14.43	10.04	0.10	AVERAGE
8	0.582	30.28	-25.72	56.00	20.13	10.04	0.10	QP
9	4.407	28.80	-27.20	56.00	18.50	10.10	0.20	QP
10	4.407	23.09	-22.91	46.00	12.79	10.10	0.20	AVERAGE
11	11.089	29.86	-20.14	50.00	19.46	10.20	0.20	AVERAGE
12	11.089	41.24	-18.76	60.00	30.84	10.20	0.20	QP

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.159	38.12	-27.40	65.52	28.04	9.98	0.10	QP
2	0.159	36.95	-18.57	55.52	26.87	9.98	0.10	AVERAGE
3	0.191	36.57	-17.41	53.98	26.49	9.98	0.10	AVERAGE
4	0.191	40.84	-23.14	63.98	30.76	9.98	0.10	QP
5	0.341	31.33	-27.85	59.18	21.25	9.99	0.10	QP
6	0.341	27.60	-21.58	49.18	17.52	9.99	0.10	AVERAGE
7	0.904	21.54	-24.46	46.00	11.45	9.99	0.10	AVERAGE
8	0.904	26.27	-29.73	56.00	16.18	9.99	0.10	QP
9	2.384	23.97	-32.03	56.00	13.75	10.02	0.20	QP
10	2.384	18.87	-27.13	46.00	8.65	10.02	0.20	AVERAGE
11	12.516	23.65	-26.35	50.00	13.27	10.17	0.20	AVERAGE
12	12.516	38.29	-21.71	60.00	27.91	10.17	0.20	QP

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

3.2 Maximum Peak Output Power Measurement

3.2.1 Limit

For systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

3.2.2 Measuring Instruments and Setting

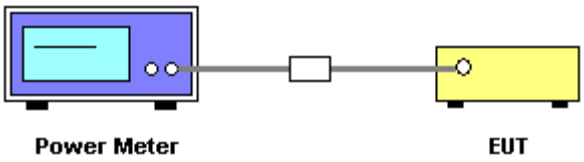
Please refer to section 4 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Peak Sensor	MA2411B

3.2.3 Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.
4. When measuring maximum conducted output power within multiple antenna systems, add every result of the values by mathematic formula. (Only for IEEE 802.11n test)

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 Peak Output Power

Final Test Date	Sep. 17, 2011	**Test Site No.**	TH01-HY
Temperature	23.2℃	**Humidity**	68%
Test Engineer	Cain	**Configurations**	802.11a/n

For Single Chain:
Configuration of IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	17.55	30	**Complies**
157	5785 MHz	17.39	30	**Complies**
165	5825 MHz	17.22	30	**Complies**

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	17.56	30	**Complies**
157	5785 MHz	17.32	30	**Complies**
165	5825 MHz	17.23	30	**Complies**

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	17.64	30	**Complies**
159	5795 MHz	17.43	30	**Complies**

For Two Chain:

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	17.75	30	**Complies**
157	5785 MHz	17.58	30	**Complies**
165	5825 MHz	17.52	30	**Complies**

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	17.43	30	**Complies**
157	5785 MHz	17.37	30	**Complies**
165	5825 MHz	17.09	30	**Complies**

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	20.60	30	**Complies**
157	5785 MHz	20.49	30	**Complies**
165	5825 MHz	20.32	30	**Complies**

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	17.46	30	**Complies**
159	5795 MHz	17.63	30	**Complies**

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	17.35	30	**Complies**
159	5795 MHz	17.41	30	**Complies**

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	20.42	30	**Complies**
159	5795 MHz	20.53	30	**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

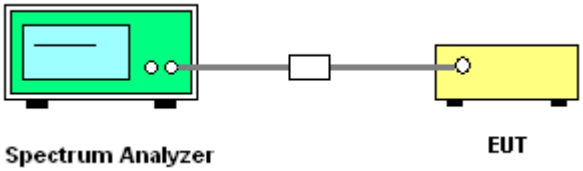
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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. When measuring maximum conducted output power within multiple antenna systems, add every result of the values by mathematic formula. (Only for IEEE 802.11n test)

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	Sep. 17, 2011	**Test Site No.**	TH01-HY
Temperature	23.2℃	**Humidity**	68%
Test Engineer	Cain	**Configurations**	802.11a/n

For Single Chain:
Configuration of IEEE 802.11a

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-22.23	8	**Complies**
157	5785 MHz	-20.92	8	**Complies**
165	5825 MHz	-20.74	8	**Complies**

Configuration of IEEE 802.11n (20MHz)

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-21.19	8	**Complies**
157	5785 MHz	-19.84	8	**Complies**
165	5825 MHz	-18.79	8	**Complies**

Configuration of IEEE 802.11n (40MHz)

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	-23.88	8	**Complies**
159	5795 MHz	-22.20	8	**Complies**

For Two Chain:

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

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-19.46	8	**Complies**
157	5785 MHz	-19.35	8	**Complies**
165	5825 MHz	-18.77	8	**Complies**

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

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-21.29	8	**Complies**
157	5785 MHz	-20.14	8	**Complies**
165	5825 MHz	-19.94	8	**Complies**

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

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-17.27	8	**Complies**
157	5785 MHz	-16.72	8	**Complies**
165	5825 MHz	-16.31	8	**Complies**

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

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	-21.20	8	**Complies**
159	5795 MHz	-19.49	8	**Complies**

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

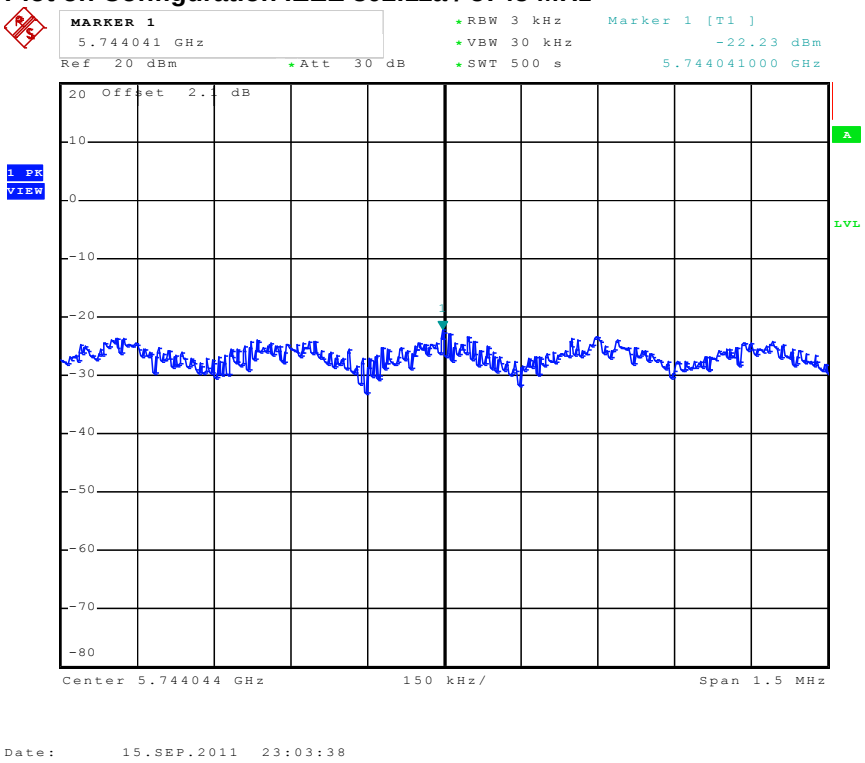
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	-25.11	8	**Complies**
159	5795 MHz	-22.96	8	**Complies**

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

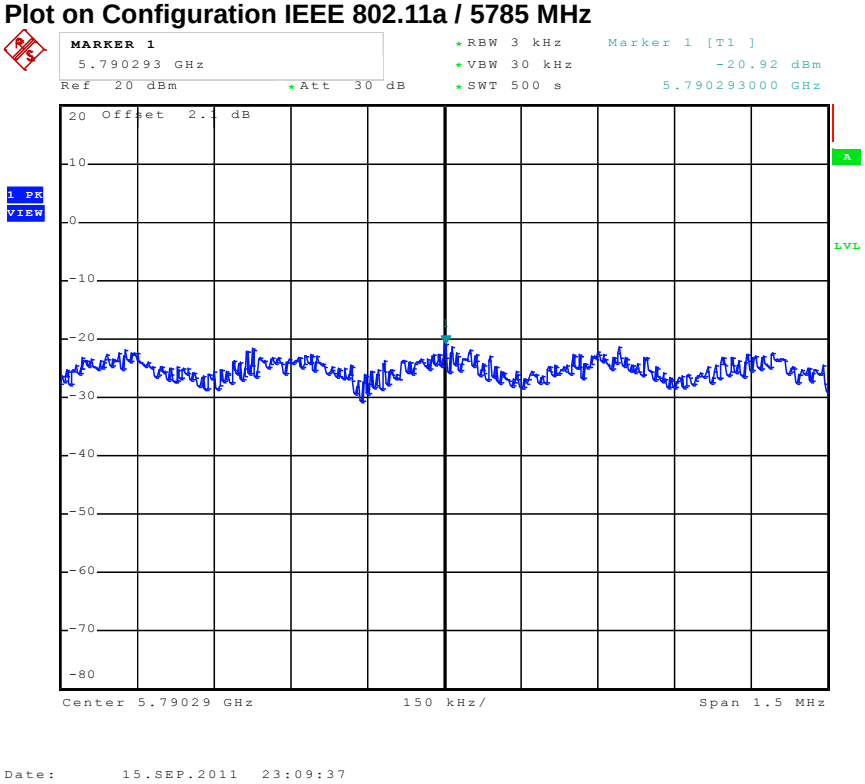
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	-19.72	8	**Complies**
159	5795 MHz	-17.88	8	**Complies**

For Single Chain:

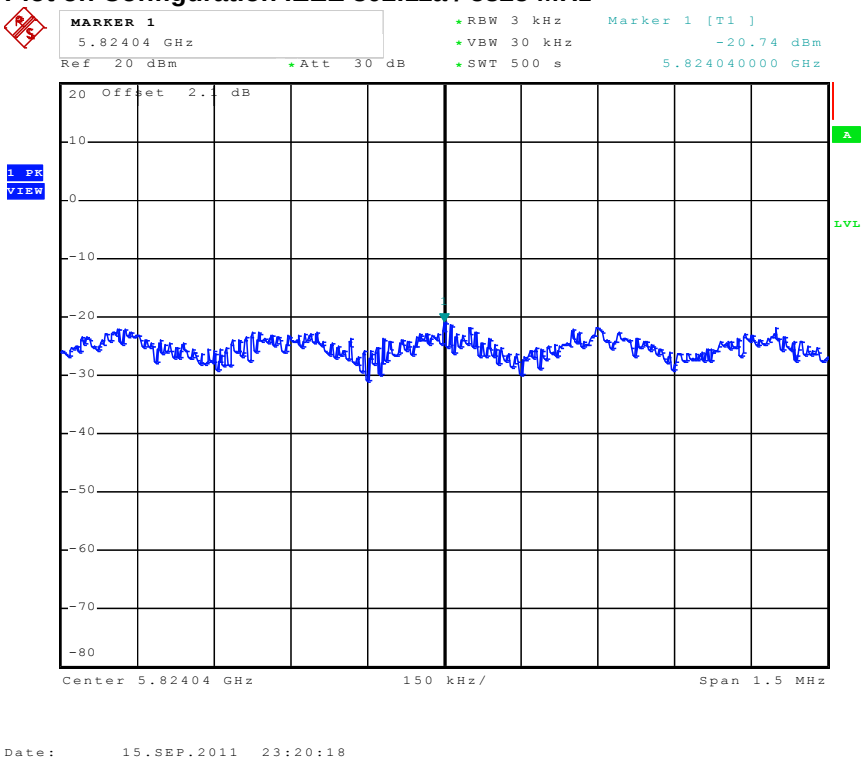
Power Density Plot on Configuration IEEE 802.11a / 5745 MHz



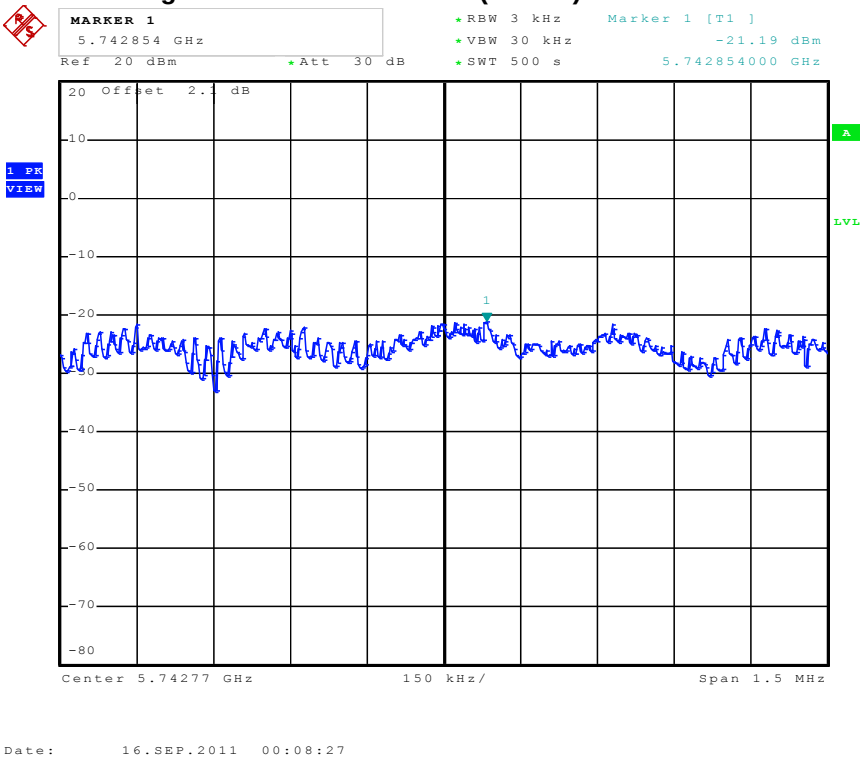
Power Density Plot on Configuration IEEE 802.11a / 5785 MHz



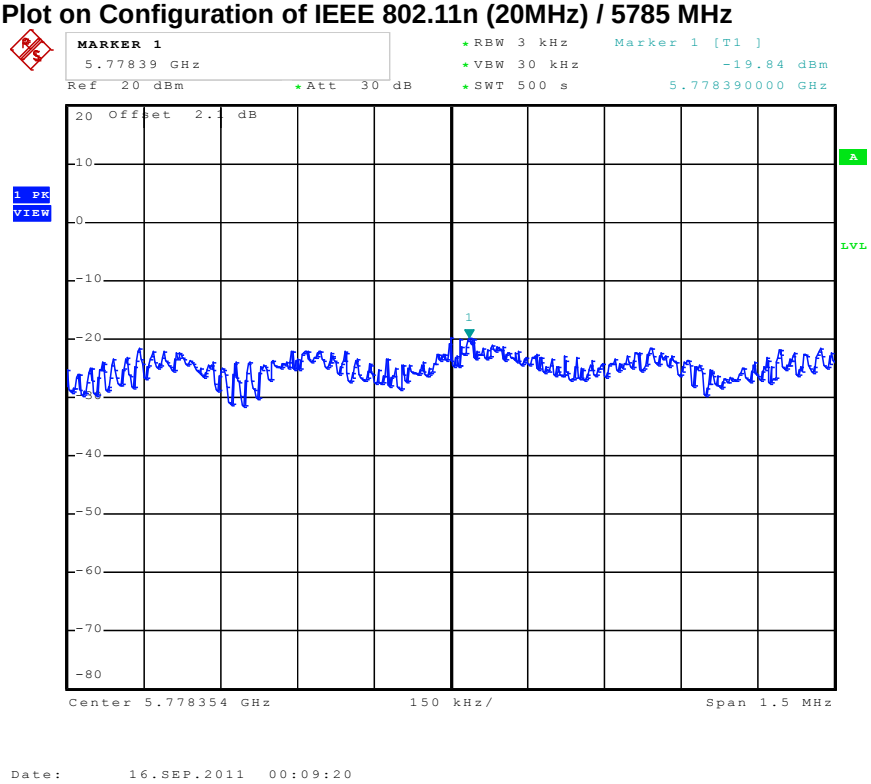
Power Density Plot on Configuration IEEE 802.11a / 5825 MHz



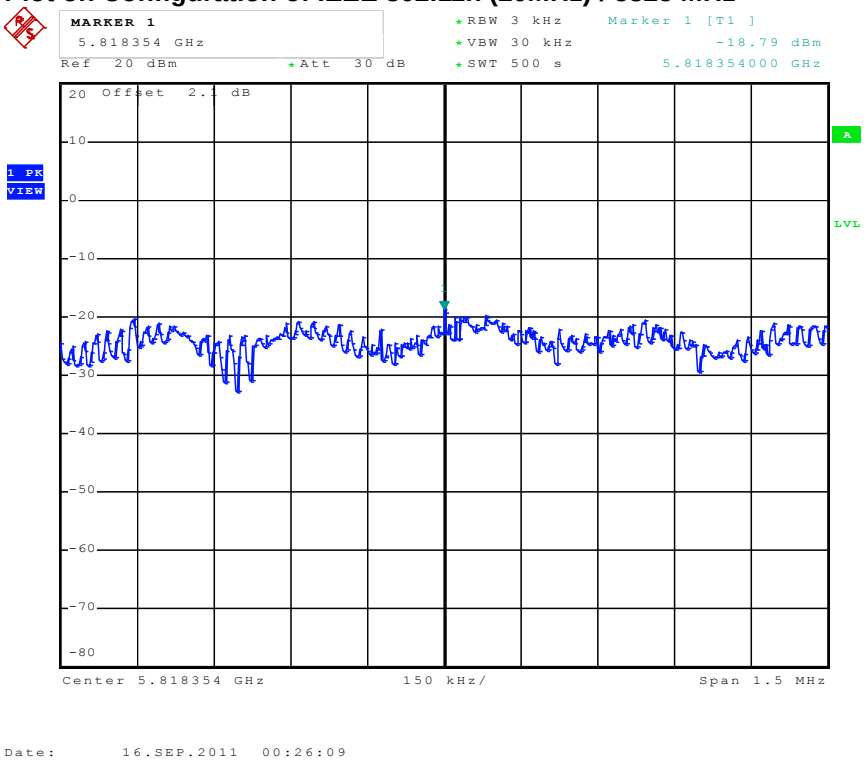
Power Density Plot on Configuration of IEEE 802.11n (20MHz) / 5745 MHz



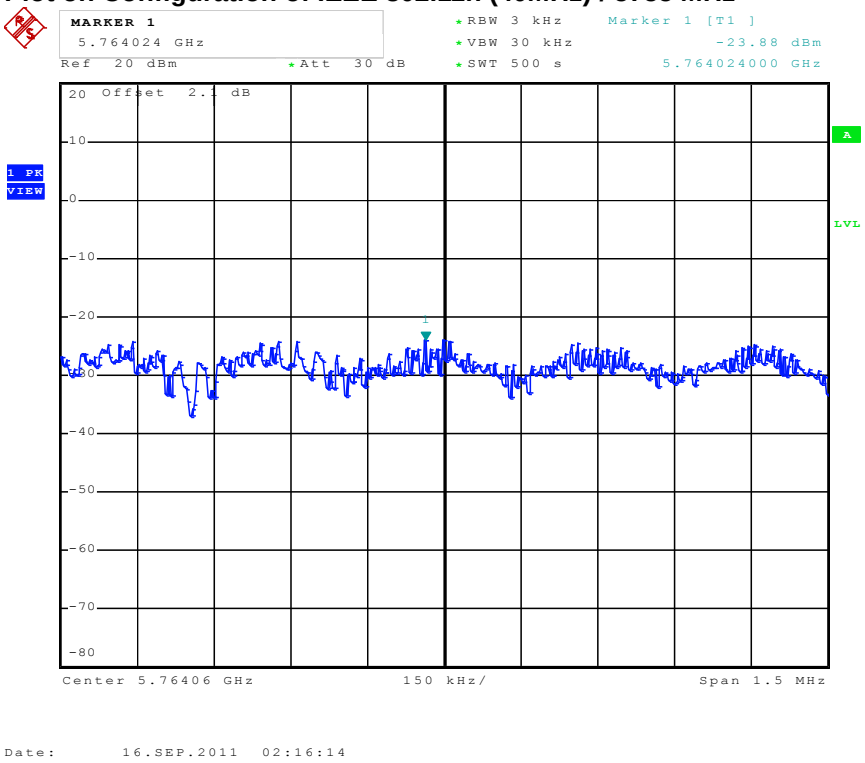
Power Density Plot on Configuration of IEEE 802.11n (20MHz) / 5785 MHz



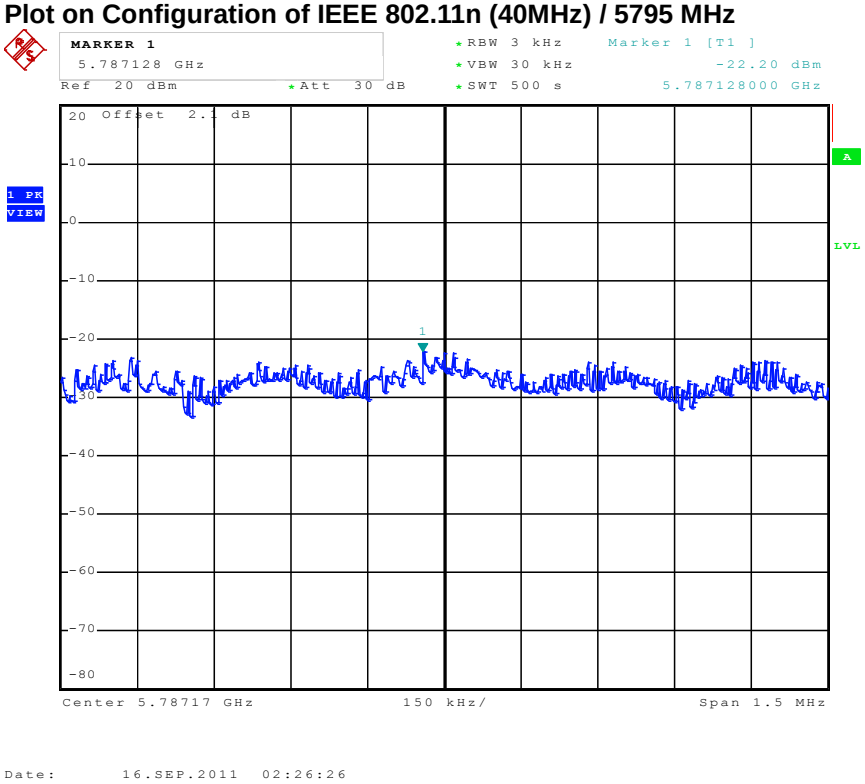
Power Density Plot on Configuration of IEEE 802.11n (20MHz) / 5825 MHz



Power Density Plot on Configuration of IEEE 802.11n (40MHz) / 5755 MHz

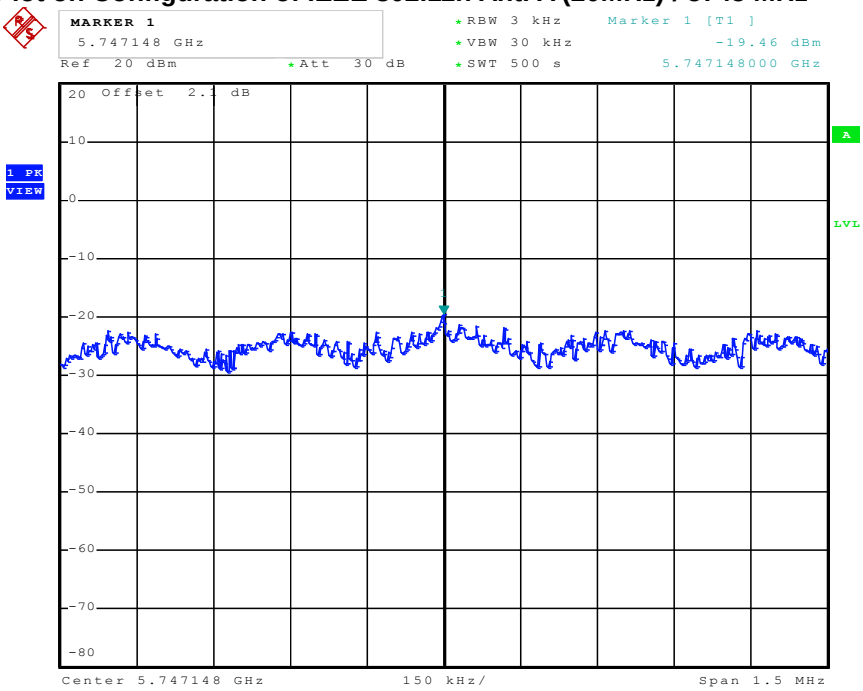


Power Density Plot on Configuration of IEEE 802.11n (40MHz) / 5795 MHz



For Two Chain:

Power Density Plot on Configuration of IEEE 802.11n Ant. A (20MHz) / 5745 MHz



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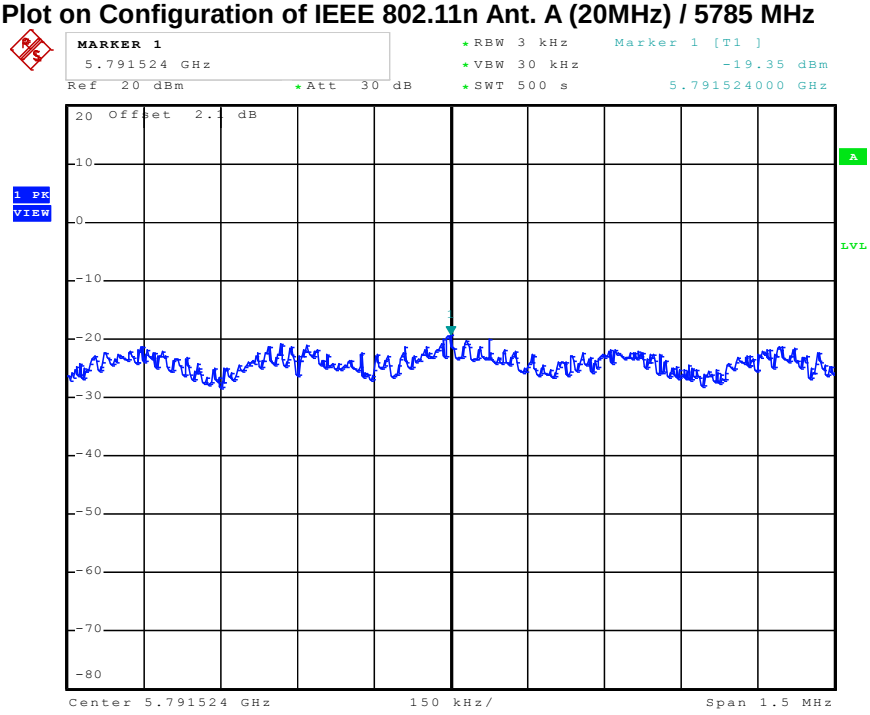
Power Density Plot on Configuration of IEEE 802.11n Ant. A (20MHz) / 5785 MHz



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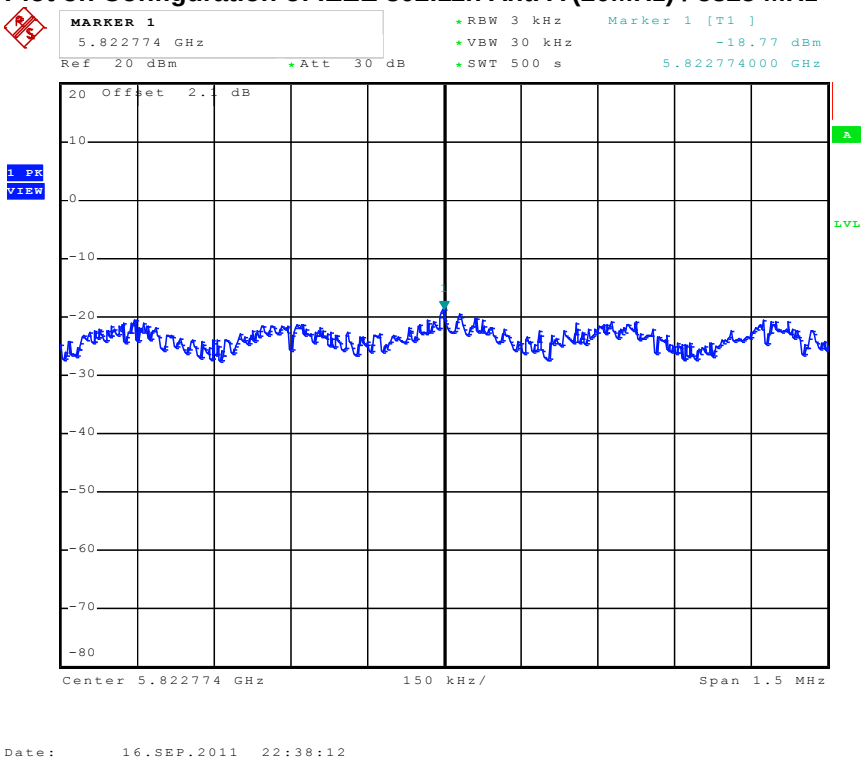
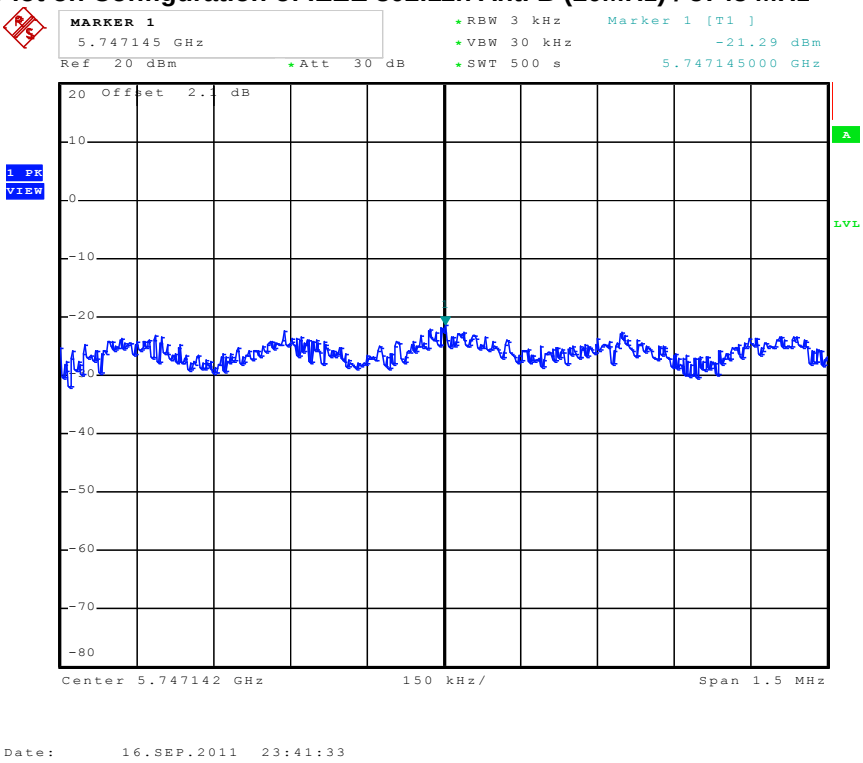
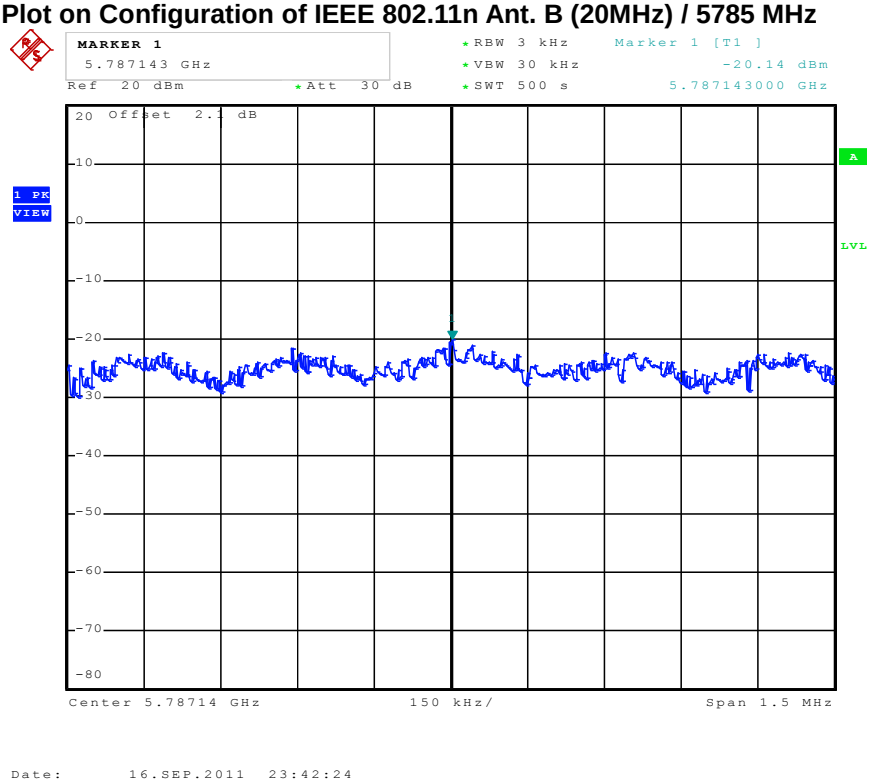
Power Density Plot on Configuration of IEEE 802.11n Ant. A (20MHz) / 5825 MHz



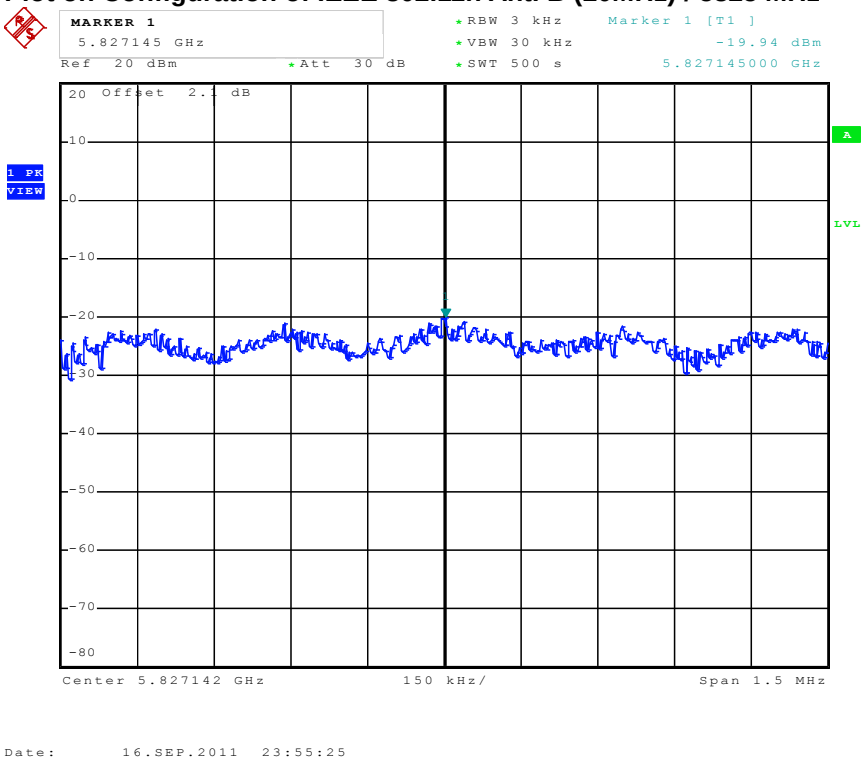
Power Density Plot on Configuration of IEEE 802.11n Ant. B (20MHz) / 5745 MHz



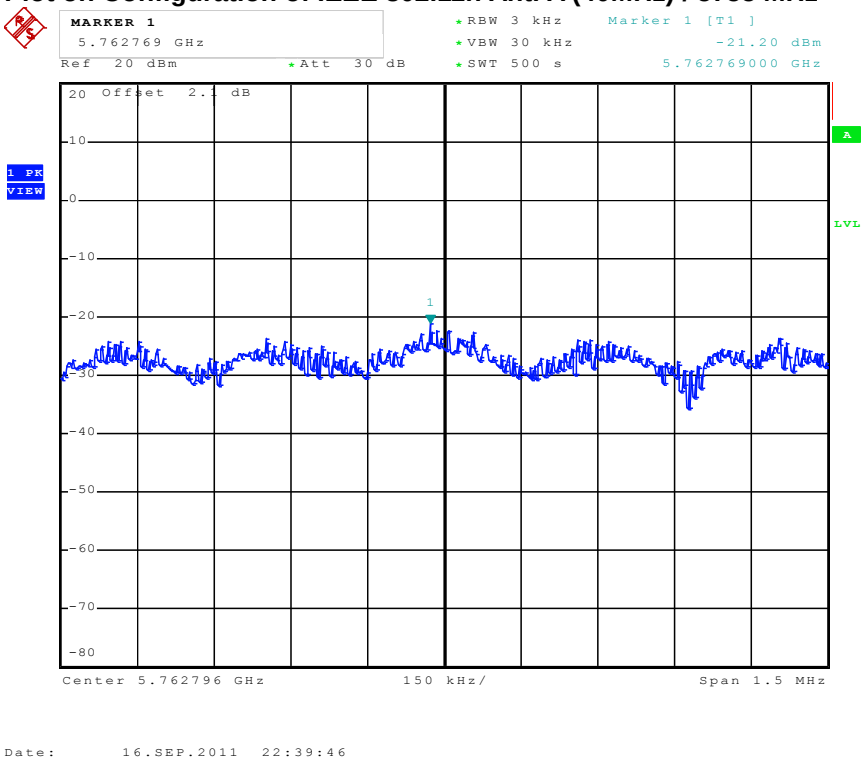
Power Density Plot on Configuration of IEEE 802.11n Ant. B (20MHz) / 5785 MHz



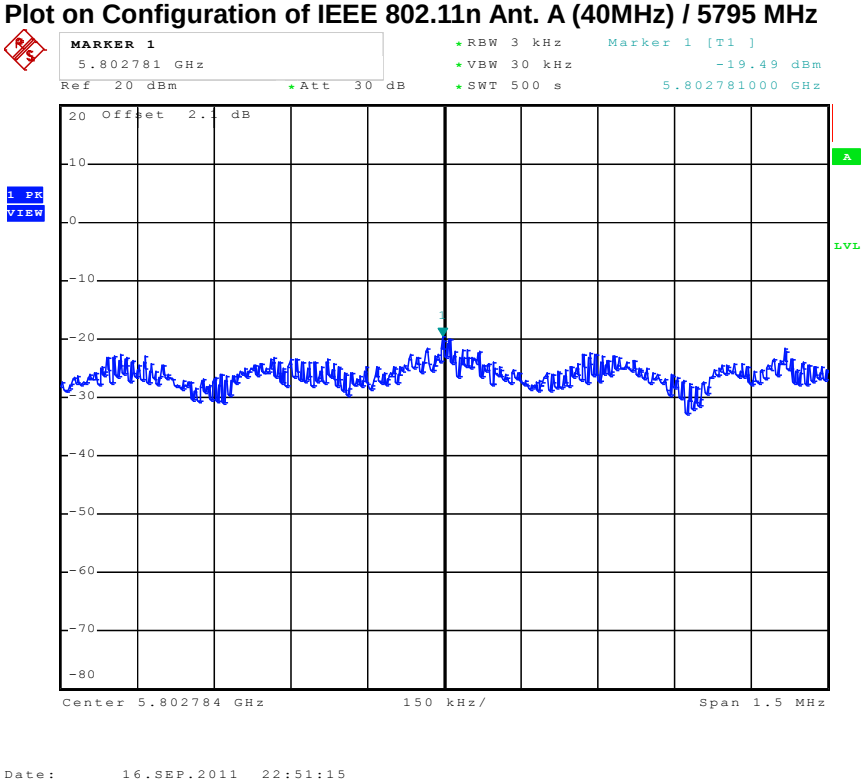
Power Density Plot on Configuration of IEEE 802.11n Ant. B (20MHz) / 5825 MHz



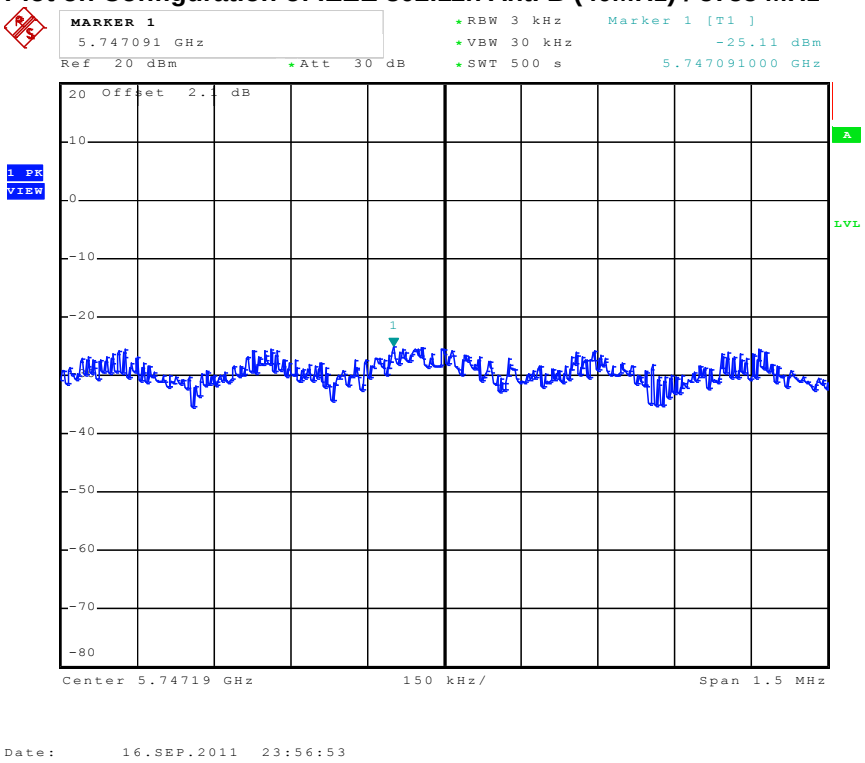
Power Density Plot on Configuration of IEEE 802.11n Ant. A (40MHz) / 5755 MHz



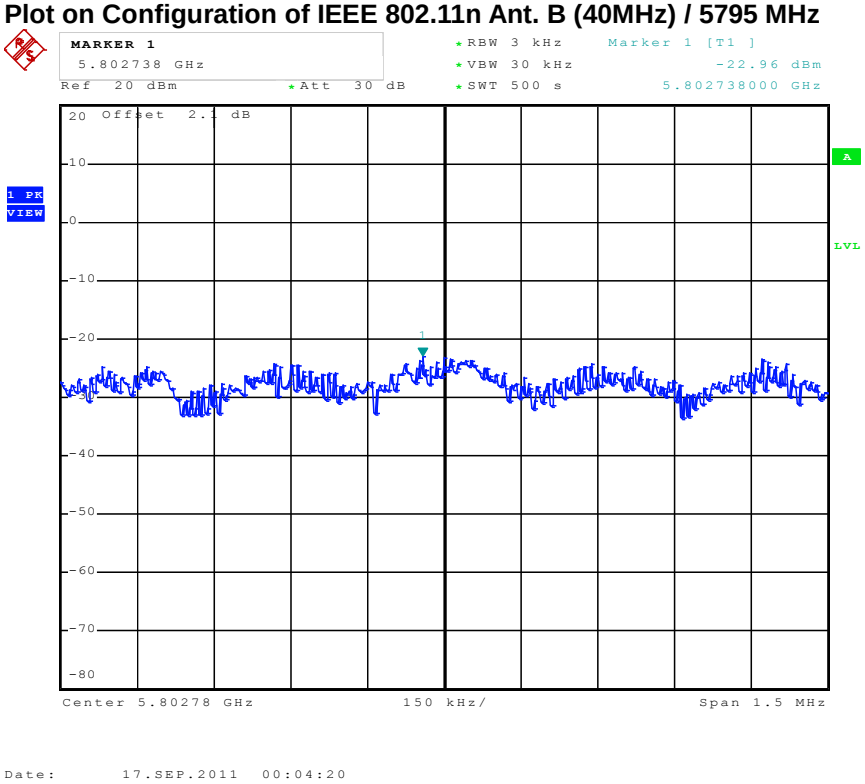
Power Density Plot on Configuration of IEEE 802.11n Ant. A (40MHz) / 5795 MHz



Power Density Plot on Configuration of IEEE 802.11n Ant. B (40MHz) / 5755 MHz



Power Density Plot on Configuration of IEEE 802.11n Ant. B (40MHz) / 5795 MHz



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

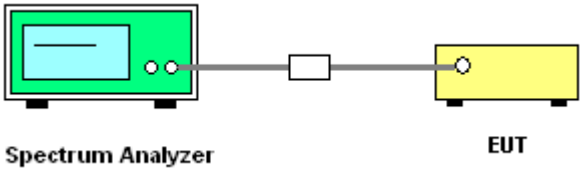
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	300 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 300 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.

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	Sep. 17, 2011	**Test Site No.**	TH01-HY
Temperature	23.2℃	**Humidity**	68%
Test Engineer	Cain	**Configurations**	802.11a/n

For Single Chain:
Configuration of IEEE 802.11a

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.60	16.48	500	Complies
157	5785 MHz	16.60	16.48	500	Complies
165	5825 MHz	16.56	16.44	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.76	17.64	500	Complies
157	5785 MHz	17.76	17.64	500	Complies
165	5825 MHz	17.72	17.68	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.48	36.08	500	**Complies**
159	5795 MHz	36.48	36.00	500	**Complies**

For Two Chain:

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.80	17.64	500	Complies
157	5785 MHz	17.80	17.68	500	Complies
165	5825 MHz	17.80	17.64	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.72	17.64	500	Complies
157	5785 MHz	17.72	17.64	500	Complies
165	5825 MHz	17.68	17.60	500	Complies

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

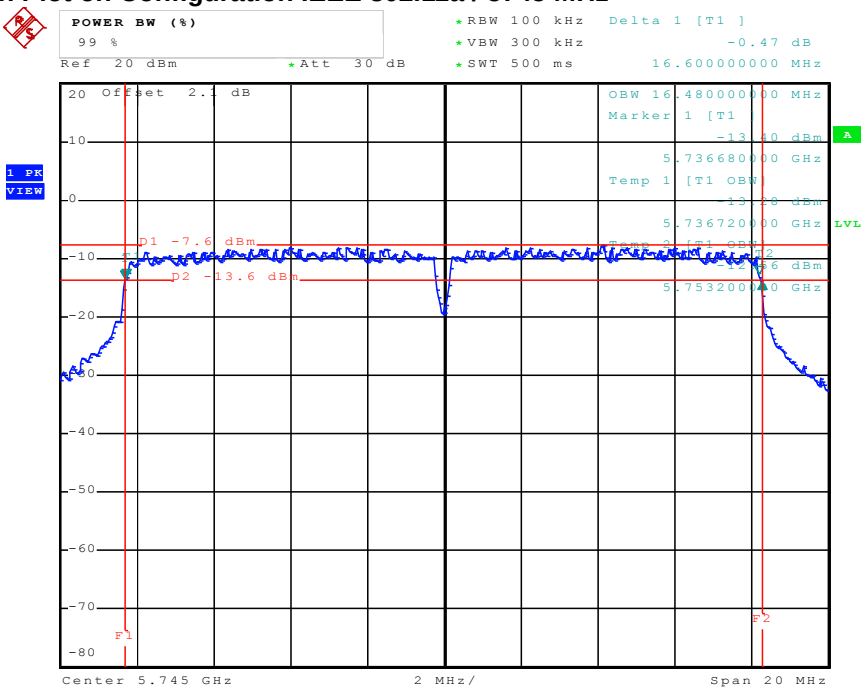
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.48	36.00	500	**Complies**
159	5795 MHz	36.48	36.00	500	**Complies**

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.40	36.00	500	**Complies**
159	5795 MHz	36.40	36.00	500	**Complies**

For Single Chain:

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz



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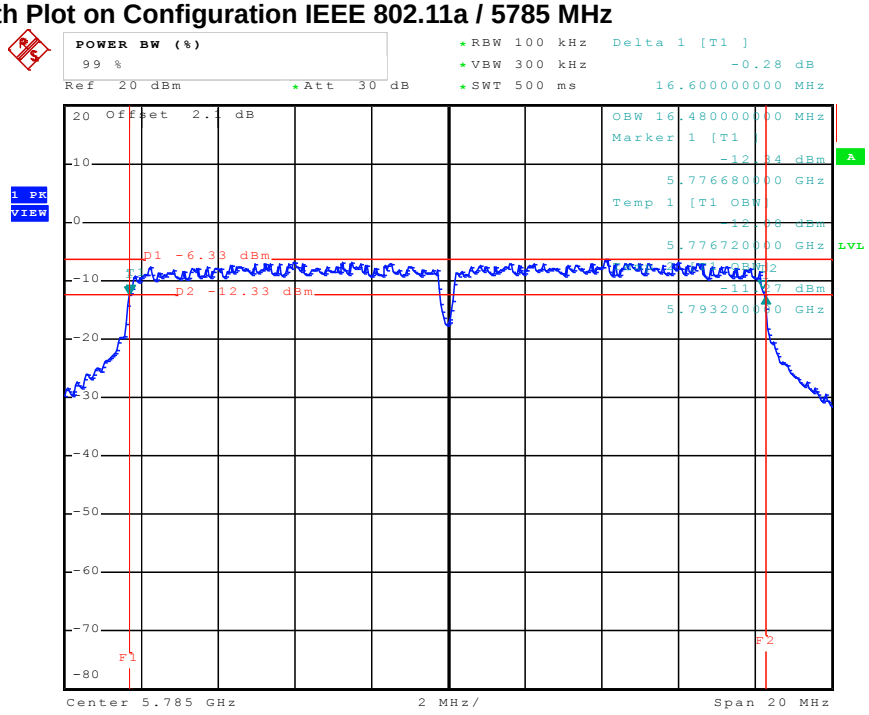
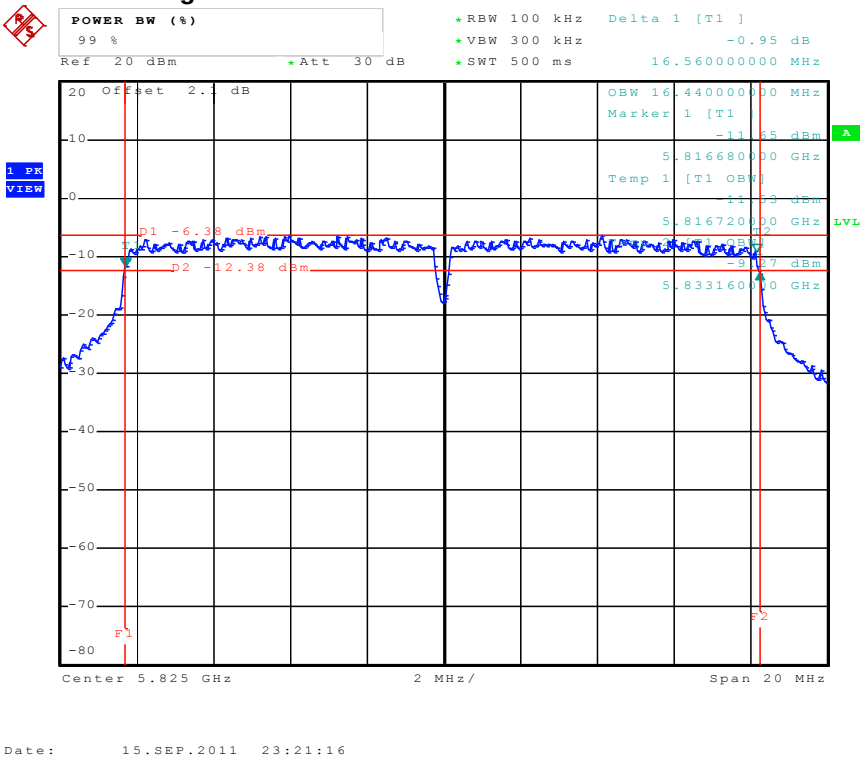
6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz

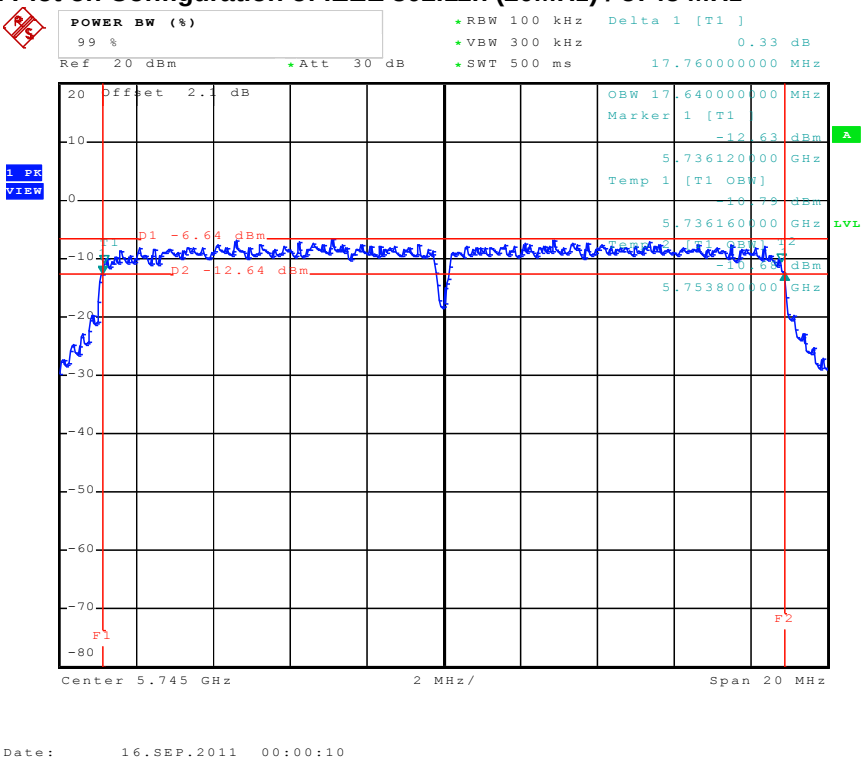


Date: 15.SEP.2011 23:10:40

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5825 MHz

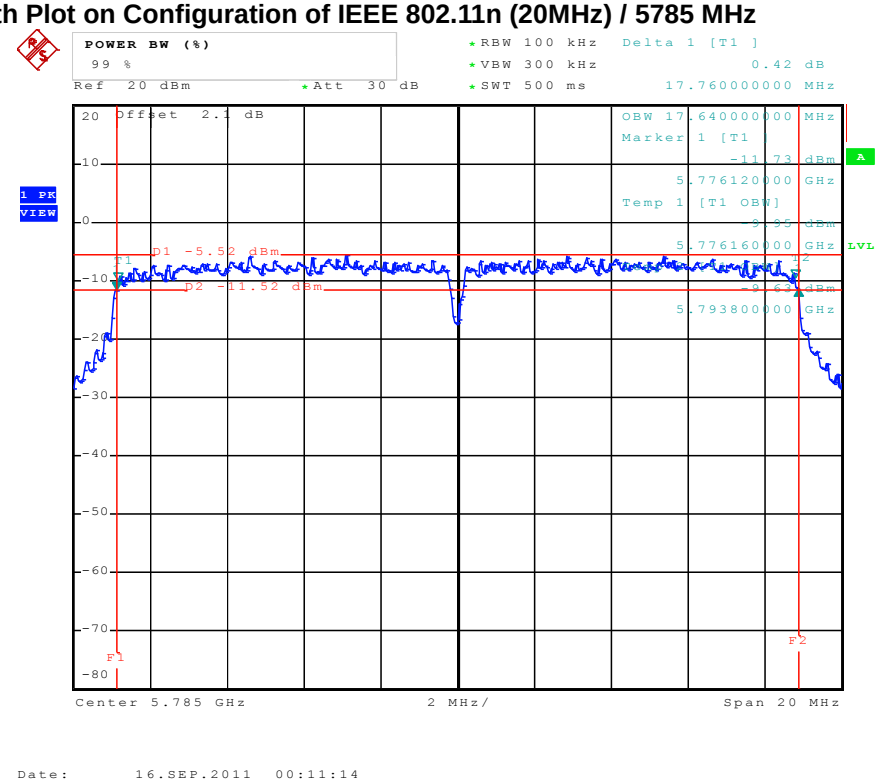


6 dB Bandwidth Plot on Configuration of IEEE 802.11n (20MHz) / 5745 MHz



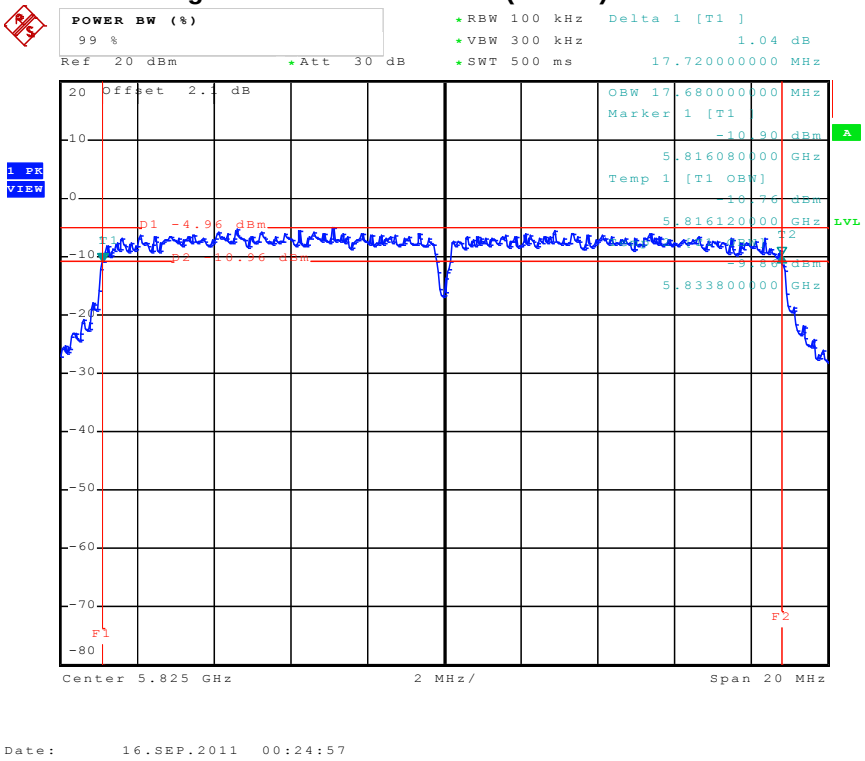
Date: 16.SEP.2011 00:00:10

6 dB Bandwidth Plot on Configuration of IEEE 802.11n (20MHz) / 5785 MHz

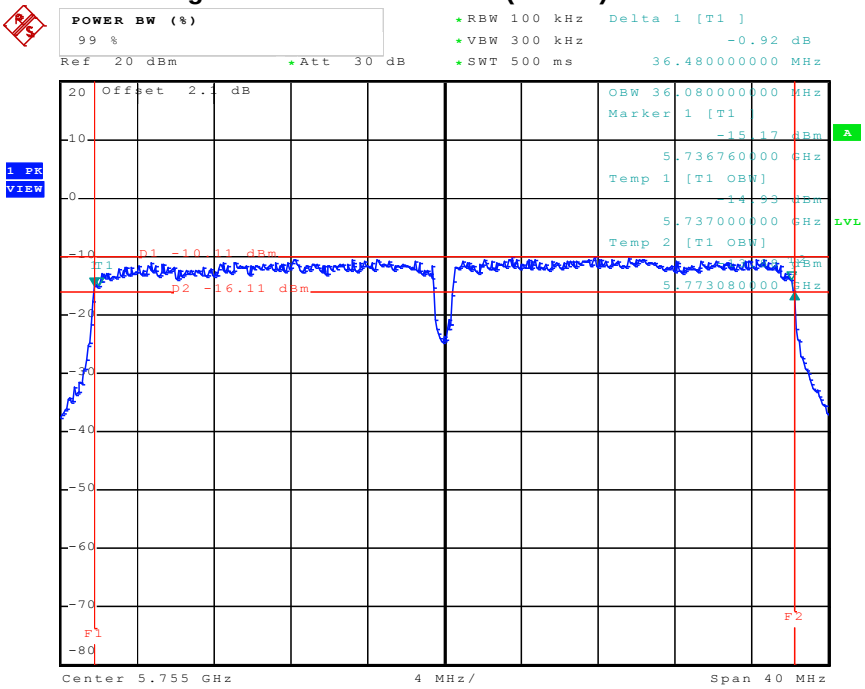


Date: 16.SEP.2011 00:11:14

6 dB Bandwidth Plot on Configuration of IEEE 802.11n (20MHz) / 5825 MHz

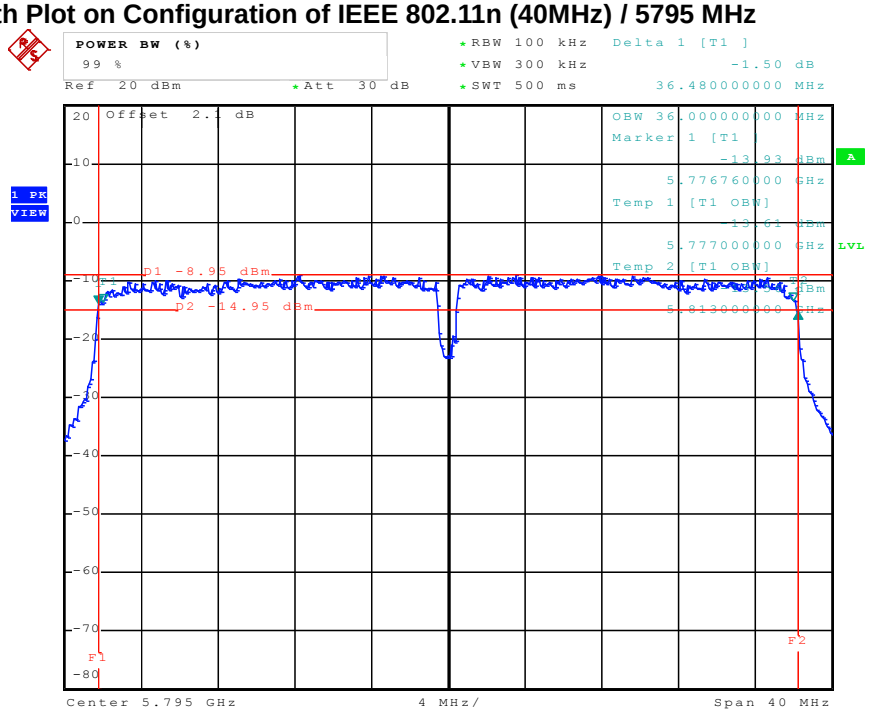


6 dB Bandwidth Plot on Configuration of IEEE 802.11n (40MHz) / 5755 MHz



Date: 16.SEP.2011 02:17:01

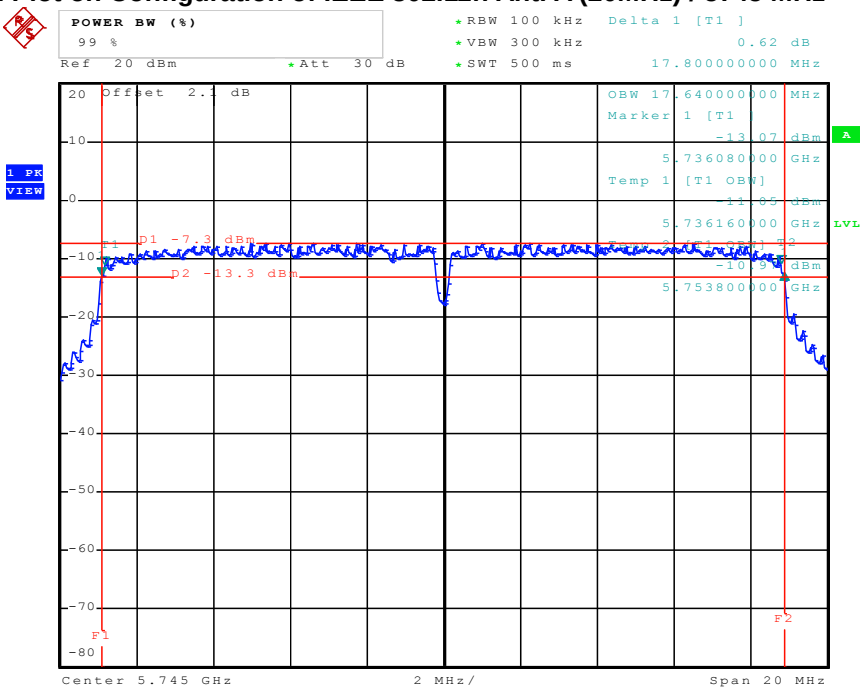
6 dB Bandwidth Plot on Configuration of IEEE 802.11n (40MHz) / 5795 MHz



Date: 16.SEP.2011 02:20:17

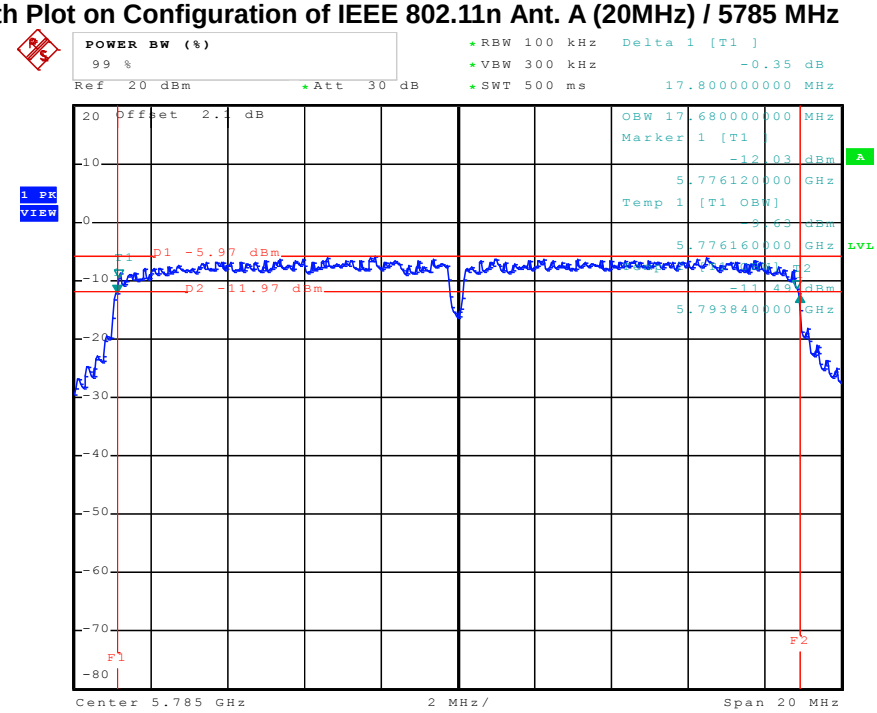
For Two Chain:

6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. A (20MHz) / 5745 MHz



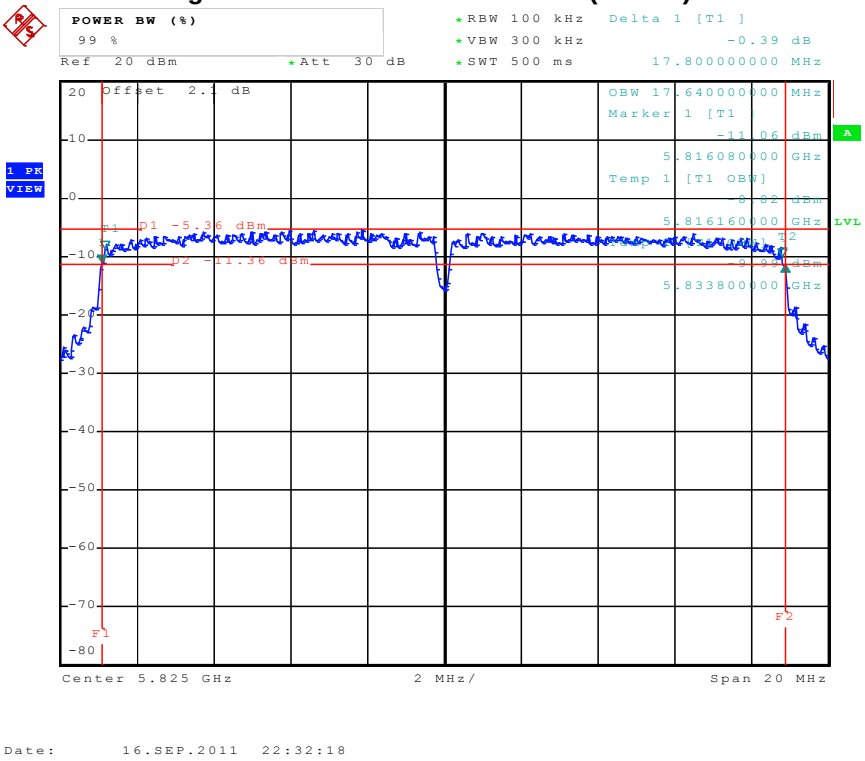
Date: 16.SEP.2011 22:14:35

6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. A (20MHz) / 5785 MHz

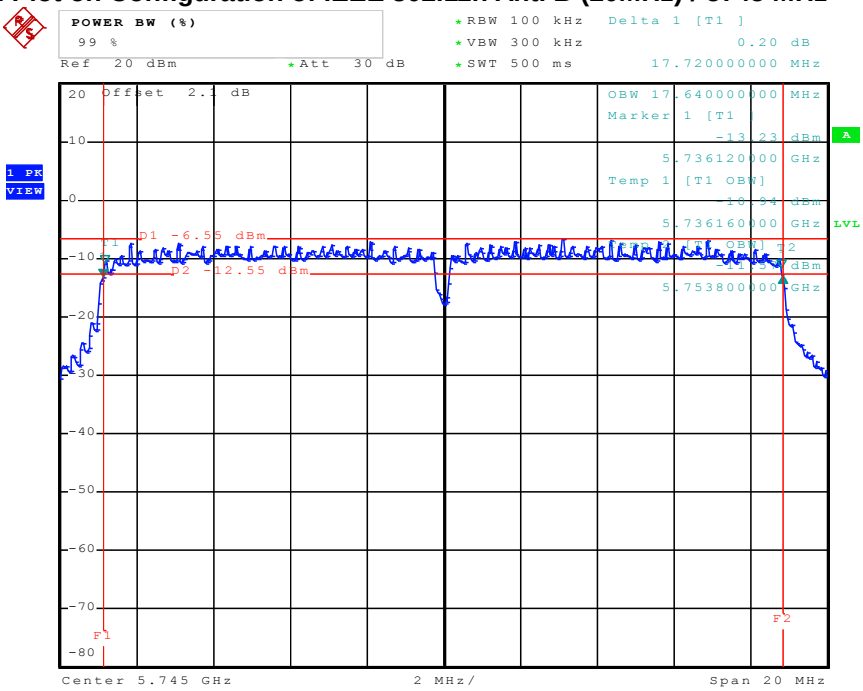


Date: 16.SEP.2011 22:29:53

6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. A (20MHz) / 5825 MHz

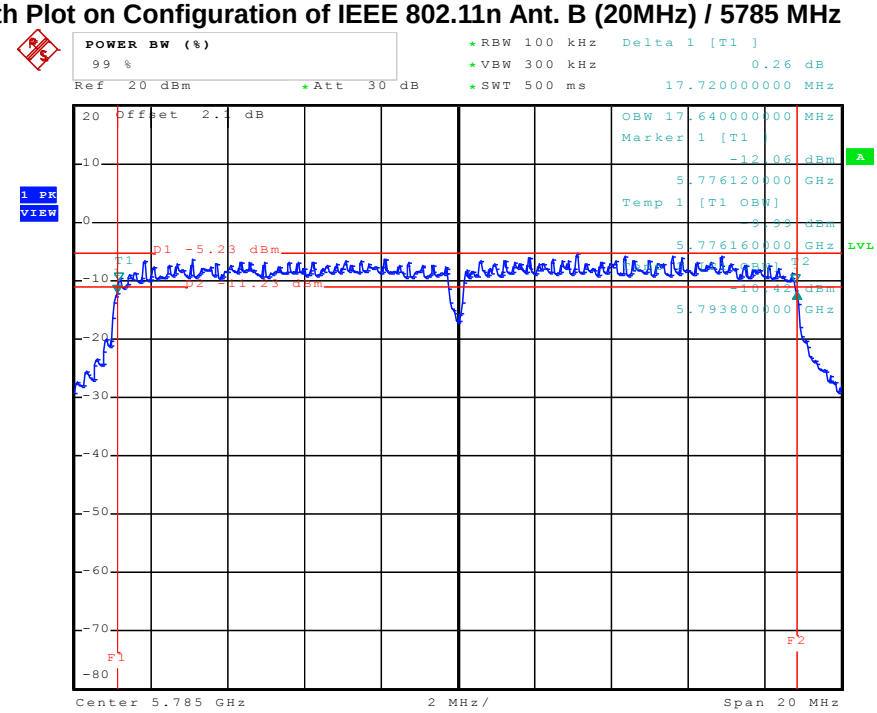


6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. B (20MHz) / 5745 MHz



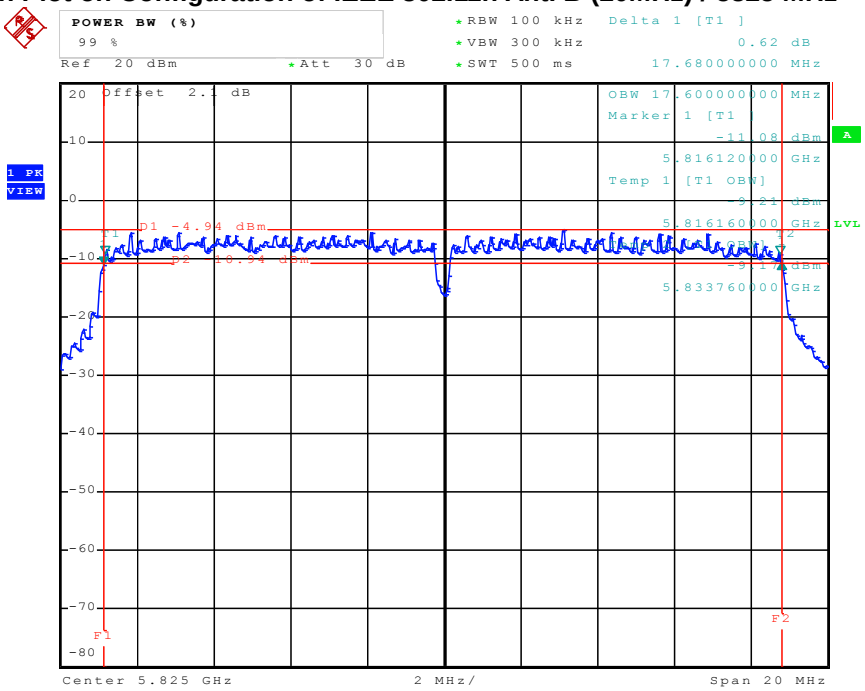
Date: 16.SEP.2011 23:38:21

6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. B (20MHz) / 5785 MHz

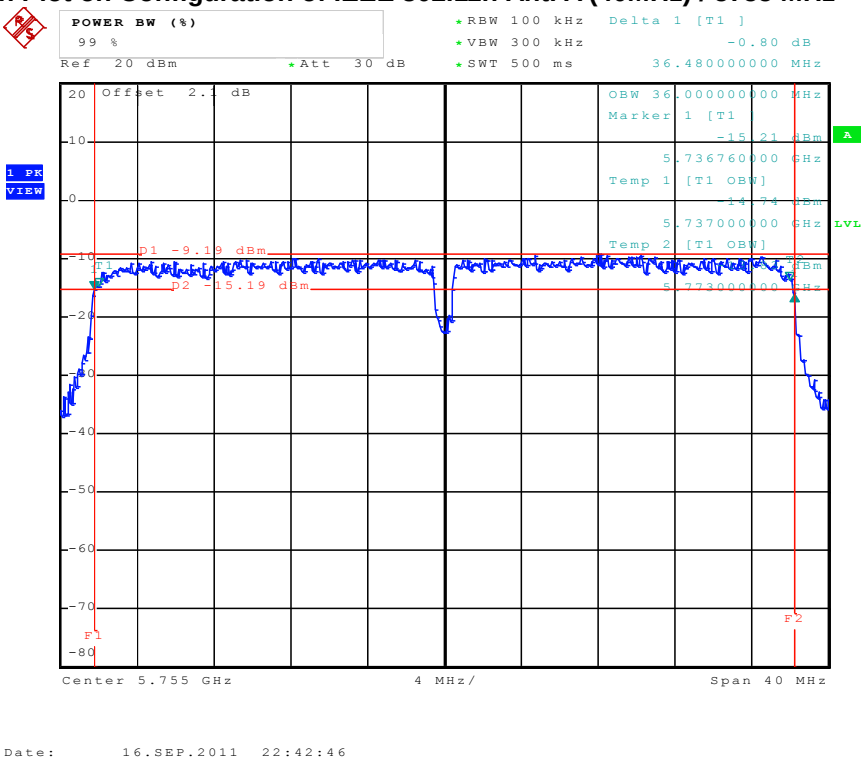


Date: 16.SEP.2011 23:49:01

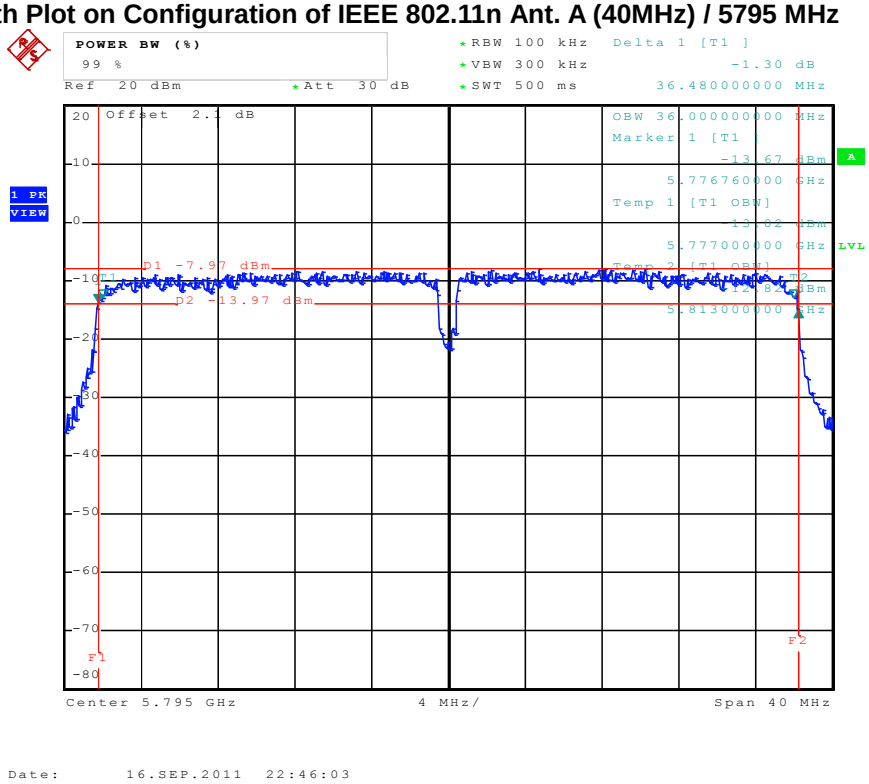
6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. B (20MHz) / 5825 MHz



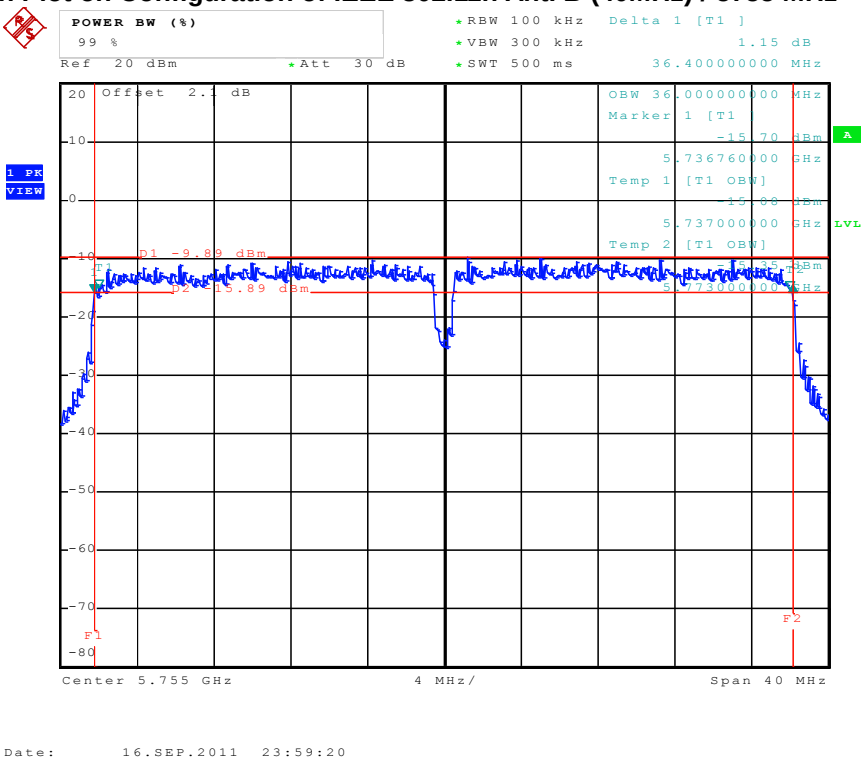
6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. A (40MHz) / 5755 MHz



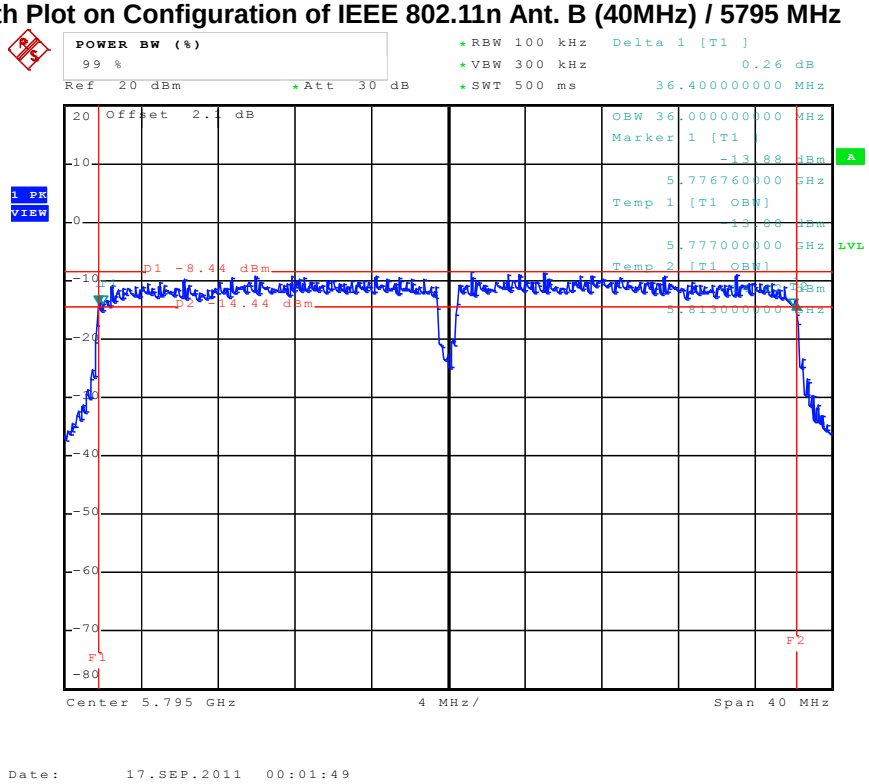
6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. A (40MHz) / 5795 MHz



6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. B (40MHz) / 5755 MHz



6 dB Bandwidth Plot on Configuration of IEEE 802.11n Ant. B (40MHz) / 5795 MHz



3.5 Radiated Emissions Measurement

3.5.1 Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

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

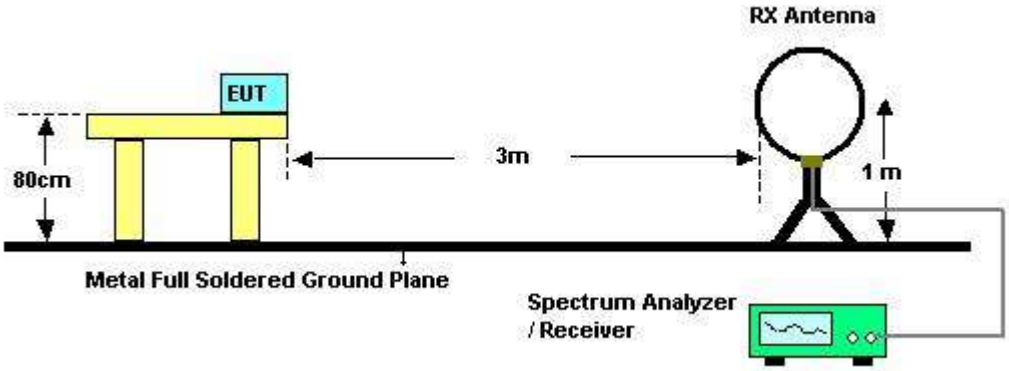
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.5.3 Test Procedures

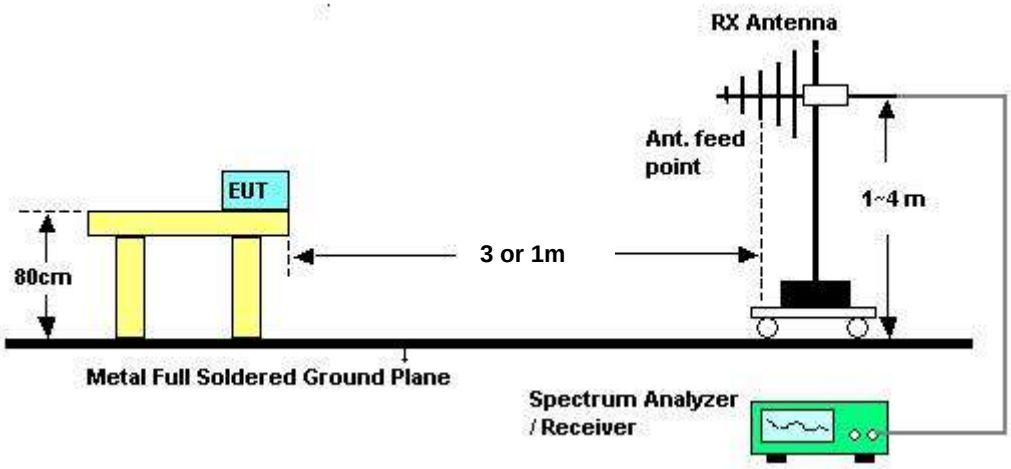
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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 from 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	Sep. 28, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel		

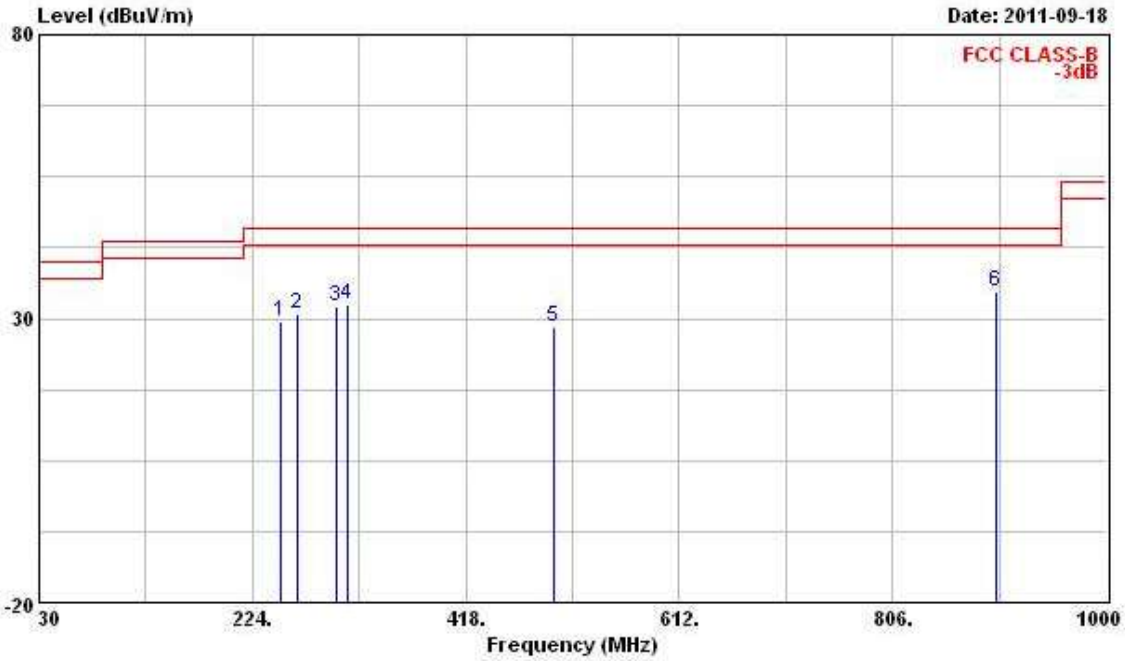
Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

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)

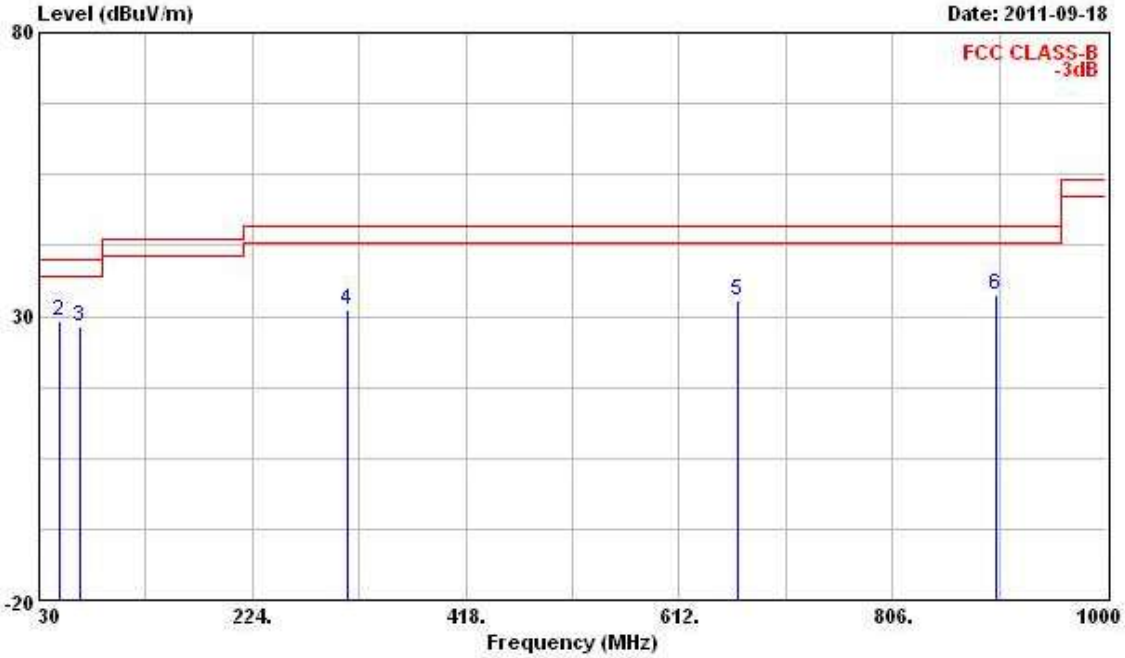
Final Test Date	Sep. 18, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	Mode 1

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	249.220	29.66	-16.34	46.00	43.49	12.58	1.59	28.00	Peak	---	---
2	264.740	30.69	-15.31	46.00	43.52	13.57	1.68	28.08	Peak	---	---
3	299.660	32.03	-13.97	46.00	44.85	13.58	1.88	28.29	Peak	---	---
4	311.300	32.40	-13.60	46.00	44.74	14.02	1.96	28.32	Peak	---	---
5	498.510	28.46	-17.54	46.00	36.61	18.09	2.67	28.91	Peak	---	---
6 @	901.060	34.80	-11.20	46.00	38.21	21.04	4.89	29.35	Peak	---	---

Vertical

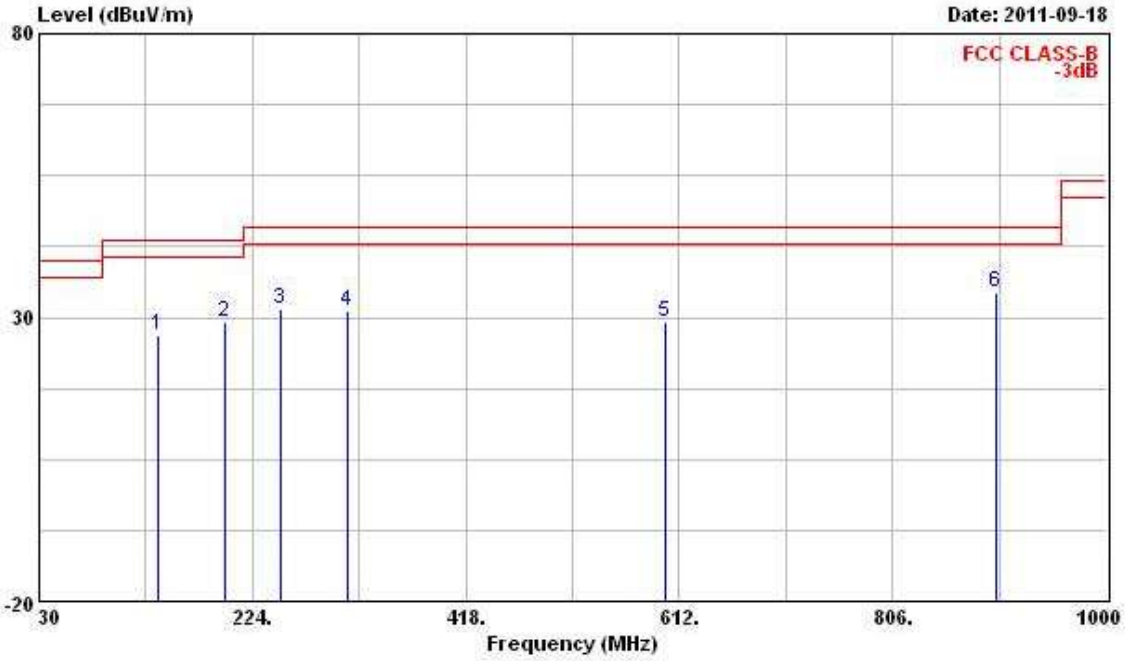


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	30.000	31.23	-8.77	40.00	41.12	18.48	-0.91	27.46	Peak	---	---
2 @	48.430	29.32	-10.68	40.00	48.76	8.86	-0.52	27.78	Peak	---	---
3 @	67.830	28.24	-11.76	40.00	49.75	6.05	-0.09	27.47	Peak	---	---
4	311.300	31.26	-14.74	46.00	43.60	14.02	1.96	28.32	Peak	---	---
5	665.350	32.92	-13.08	46.00	38.96	19.73	3.70	29.47	Peak	---	---
6	901.060	33.82	-12.18	46.00	37.23	21.04	4.89	29.35	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.

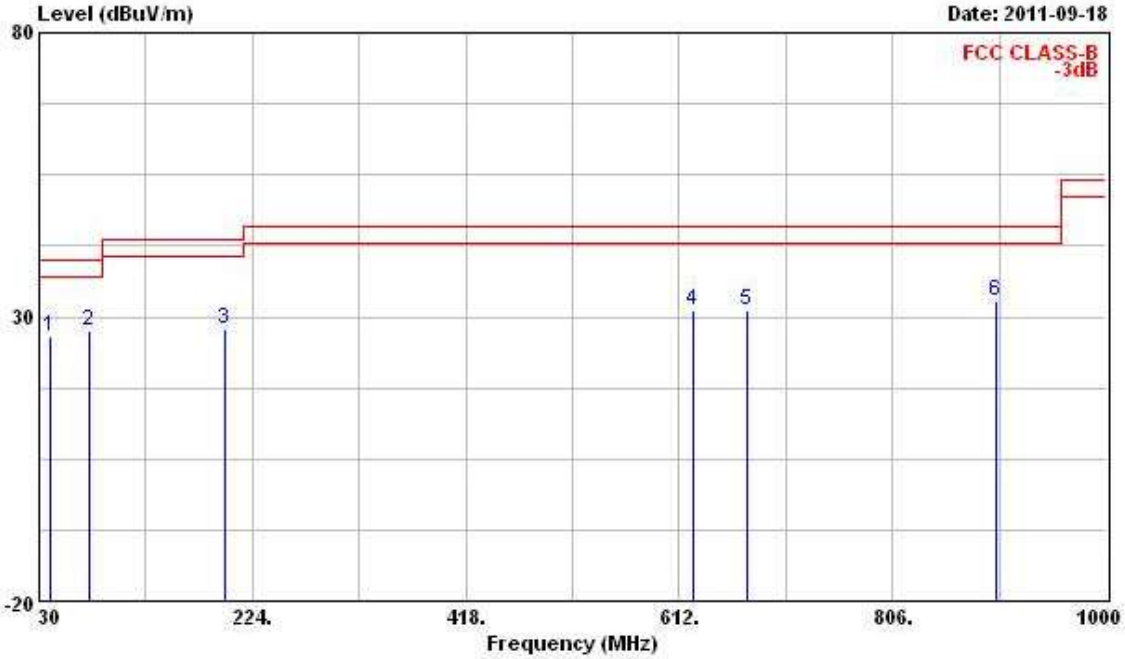
Final Test Date	Sep. 18, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	Mode 2

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	137.670	26.83	-16.67	43.50	41.83	11.64	1.04	27.68	Peak	---	---
2	198.780	29.14	-14.36	43.50	46.27	9.61	1.25	27.98	Peak	---	---
3	249.220	31.50	-14.50	46.00	45.33	12.58	1.59	28.00	Peak	---	---
4	311.300	31.00	-15.00	46.00	43.34	14.02	1.96	28.32	Peak	---	---
5	599.390	29.20	-16.80	46.00	35.78	19.30	3.44	29.32	Peak	---	---
6 @	901.060	34.35	-11.65	46.00	37.76	21.04	4.89	29.35	Peak	---	---

Vertical

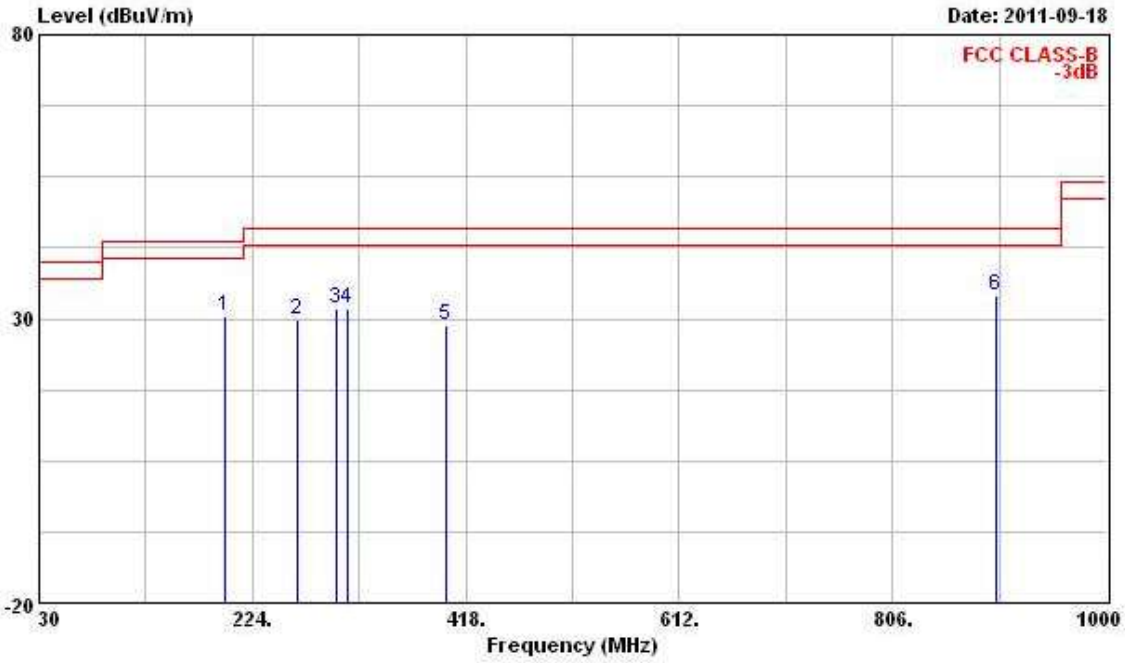


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	40.670	26.52	-13.48	40.00	42.52	12.17	-0.69	27.47	Peak	---	---
2	75.590	27.55	-12.45	40.00	48.11	6.68	0.12	27.36	Peak	---	---
3	198.780	27.72	-15.78	43.50	44.85	9.61	1.25	27.98	Peak	---	---
4	625.580	31.11	-14.89	46.00	37.53	19.47	3.54	29.44	Peak	---	---
5	673.110	31.27	-14.73	46.00	37.19	19.79	3.73	29.43	Peak	---	---
6	901.060	32.90	-13.10	46.00	36.31	21.04	4.89	29.35	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.

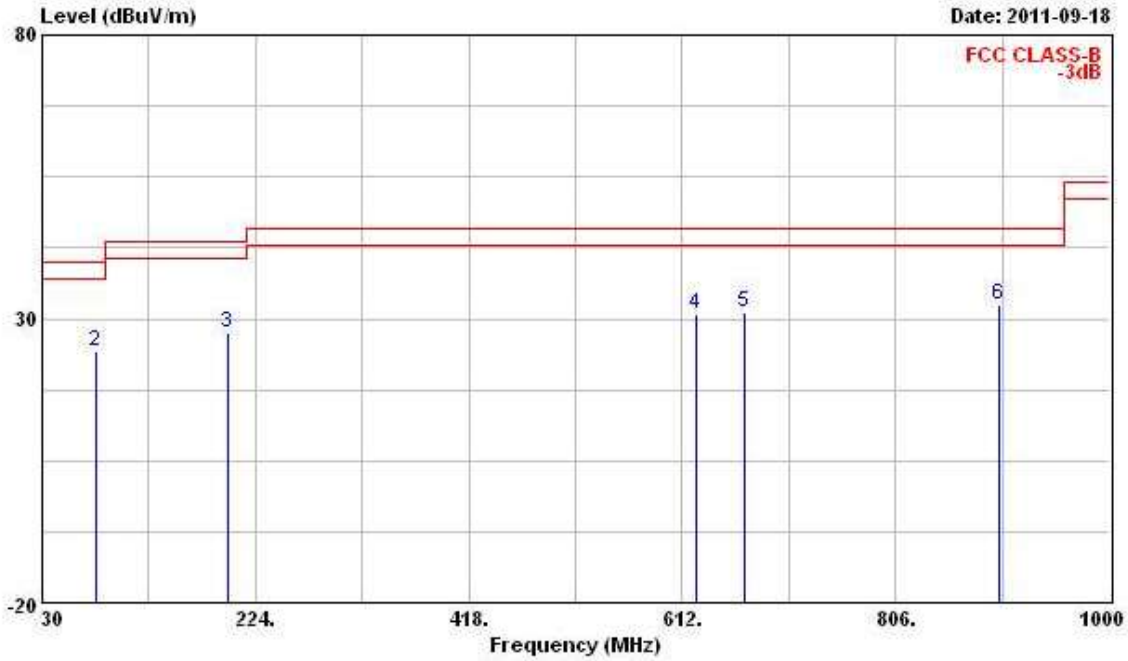
Final Test Date	Sep. 18, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	Mode 3

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	198.780	30.40	-13.10	43.50	47.53	9.61	1.25	27.98	Peak	---	---
2	264.740	29.78	-16.22	46.00	42.61	13.57	1.68	28.08	Peak	---	---
3	299.660	31.85	-14.15	46.00	44.67	13.58	1.88	28.29	Peak	---	---
4	311.300	31.83	-14.17	46.00	44.17	14.02	1.96	28.32	Peak	---	---
5	400.540	28.77	-17.23	46.00	38.43	16.48	2.48	28.62	Peak	---	---
6 @	901.060	33.96	-12.04	46.00	37.37	21.04	4.89	29.35	Peak	---	---

Vertical

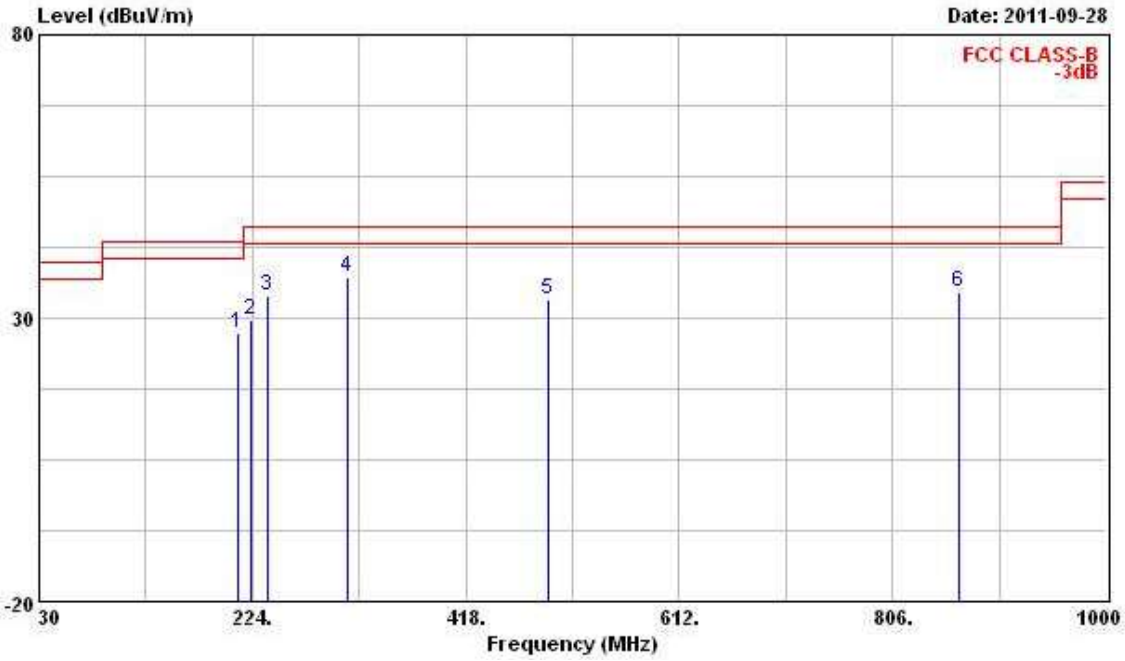


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	30.000	31.63	-8.37	40.00	41.52	18.48	-0.91	27.46	Peak	---	---
2	79.470	24.38	-15.62	40.00	44.05	7.15	0.60	27.41	Peak	---	---
3	198.780	27.52	-15.98	43.50	44.65	9.61	1.25	27.98	Peak	---	---
4	625.580	30.79	-15.21	46.00	37.21	19.47	3.54	29.44	Peak	---	---
5	668.260	31.17	-14.83	46.00	37.16	19.75	3.71	29.45	Peak	---	---
6	901.060	32.49	-13.51	46.00	35.90	21.04	4.89	29.35	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.

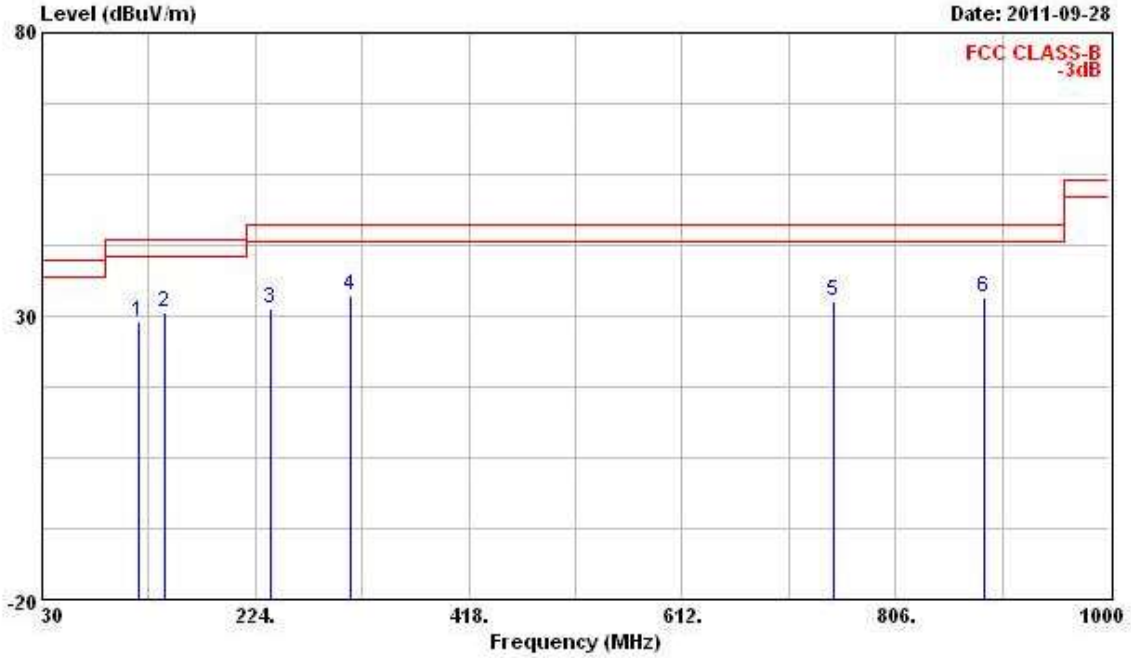
Final Test Date	Sep. 28, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	Mode 4

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	210.420	27.47	-16.03	43.50	44.75	9.39	1.33	27.99	Peak	---	---
2	223.030	29.56	-16.44	46.00	46.63	9.51	1.41	27.99	Peak	---	---
3	238.550	33.96	-12.04	46.00	49.00	11.44	1.52	28.00	Peak	---	---
4 @	311.300	37.30	-8.70	46.00	49.64	14.02	1.96	28.32	Peak	---	---
5	493.660	33.18	-12.82	46.00	41.37	18.05	2.67	28.92	Peak	---	---
6	867.110	34.61	-11.39	46.00	38.40	20.91	4.71	29.41	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	118.270	29.15	-14.35	43.50	43.13	12.61	0.94	27.53	Peak	---	---
2	141.550	30.70	-12.80	43.50	46.10	11.26	1.05	27.71	Peak	---	---
3	238.550	31.30	-14.70	46.00	46.34	11.44	1.52	28.00	Peak	---	---
4	311.300	33.52	-12.48	46.00	45.86	14.02	1.96	28.32	Peak	---	---
5	749.740	32.64	-13.36	46.00	37.35	20.71	4.02	29.43	Peak	---	---
6	886.510	33.31	-12.69	46.00	36.90	20.98	4.81	29.38	Peak	---	---

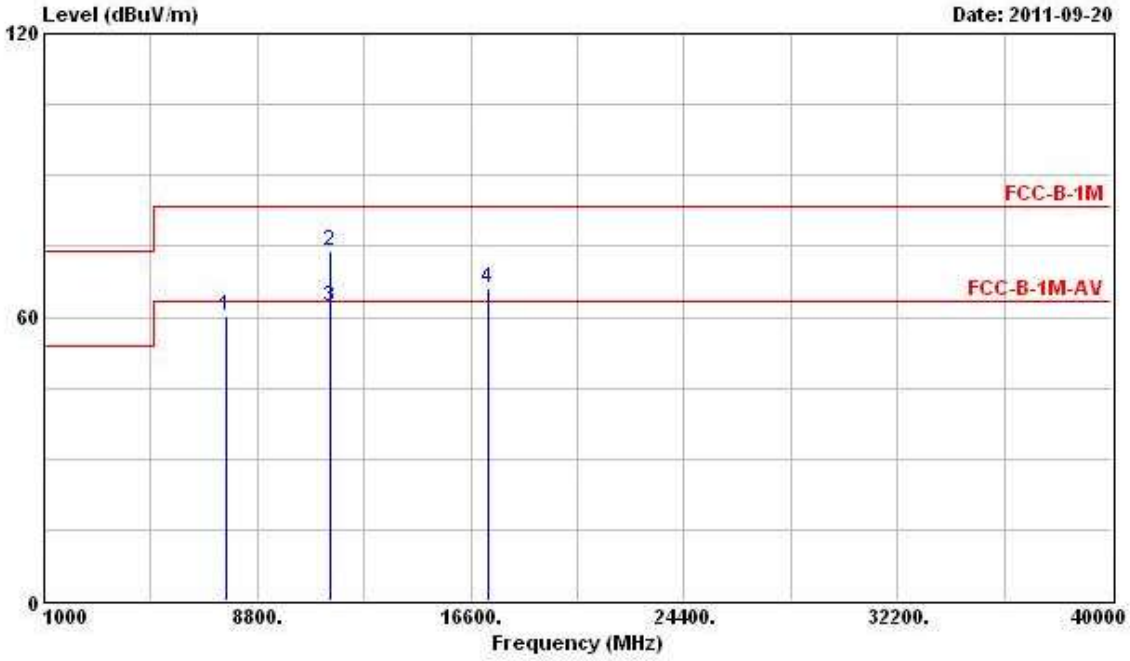
Note:
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

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

For Single Chain:

Final Test Date	Sep. 20, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11a Ch. 149

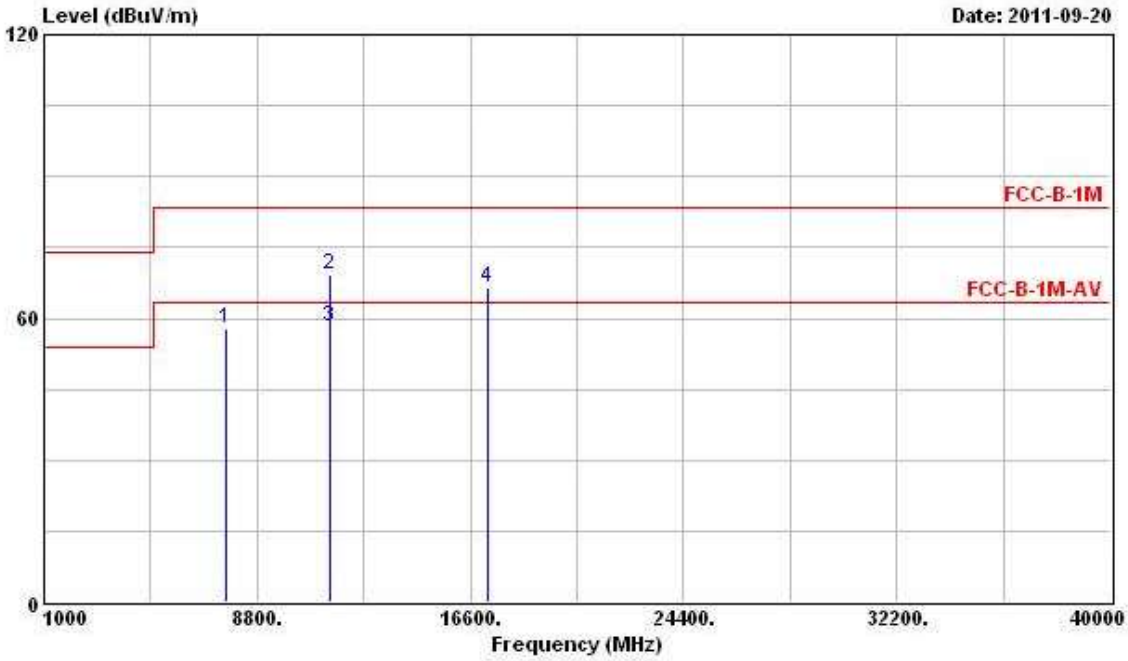
Horizontal



	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 @	7649.000	60.30	-3.24	63.54	49.48	37.80	6.00	32.98	PK	---	---
2 @	11490.000	73.84	-9.70	83.54	59.31	39.77	7.33	32.57	Peak	---	---
3 @	11490.000	62.26	-1.28	63.54	47.73	39.77	7.33	32.57	Average	---	---
4	17235.000	66.21			45.69	43.71	8.48	31.67	Peak	---	---

Note: The 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

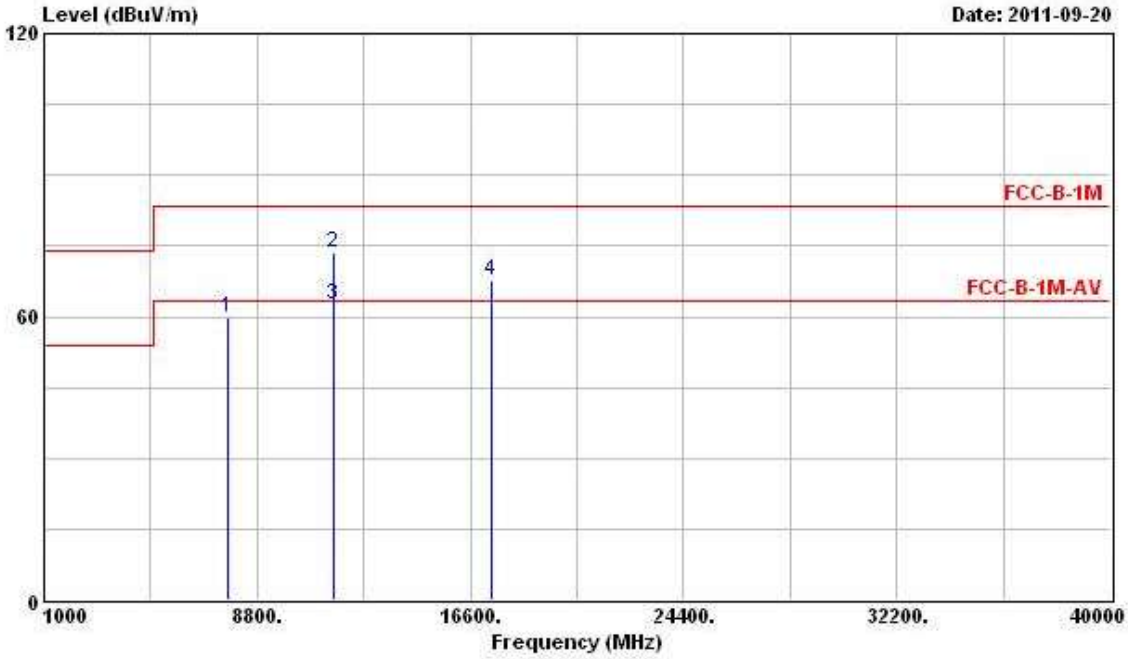


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7649.000	57.68	-5.86	63.54	46.86	37.80	6.00	32.98	PK	---	---
2	11490.000	69.19	-14.35	83.54	54.66	39.77	7.33	32.57	Peak	---	---
3 @	11490.000	58.14	-5.40	63.54	43.61	39.77	7.33	32.57	Average	---	---
4	17235.000	66.53			46.01	43.71	8.48	31.67	Peak	---	---

Note: The 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	Sep. 20, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11a Ch. 157

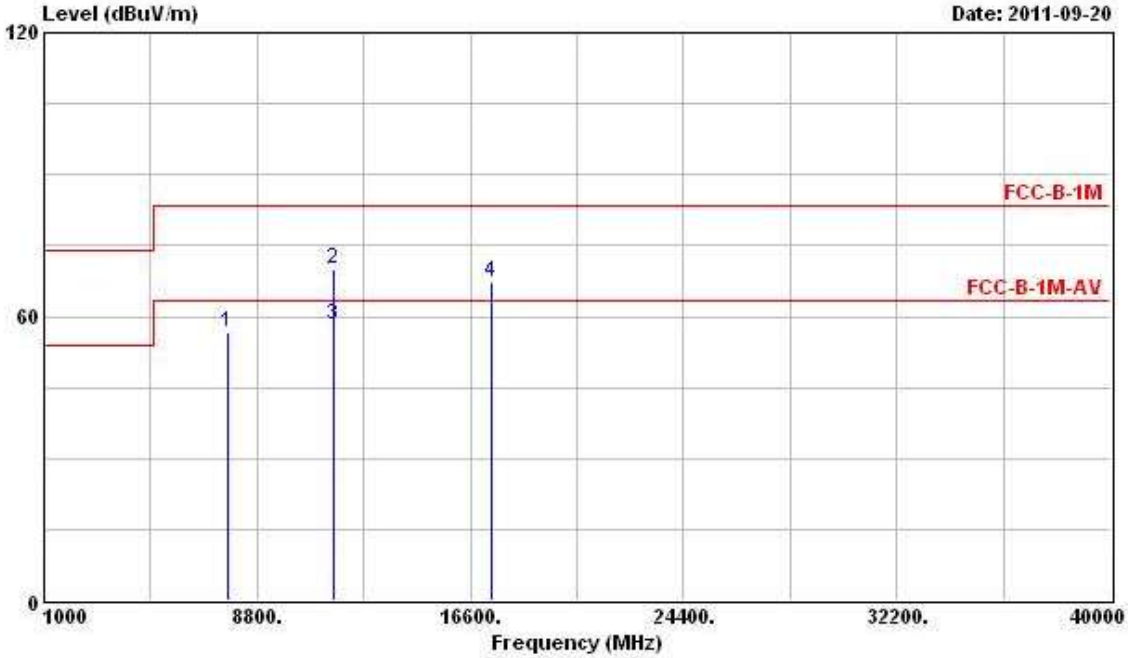
Horizontal



	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 @	7693.000	59.66	-3.88	63.54	48.77	37.80	6.07	32.98	PK	---	---
2 @	11570.000	73.64	-9.90	83.54	59.15	39.72	7.36	32.58	Peak	---	---
3 @	11570.000	62.43	-1.11	63.54	47.94	39.72	7.36	32.58	Average	---	---
4	17355.000	67.55			46.02	44.71	8.52	31.70	Peak	---	---

Note: The 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

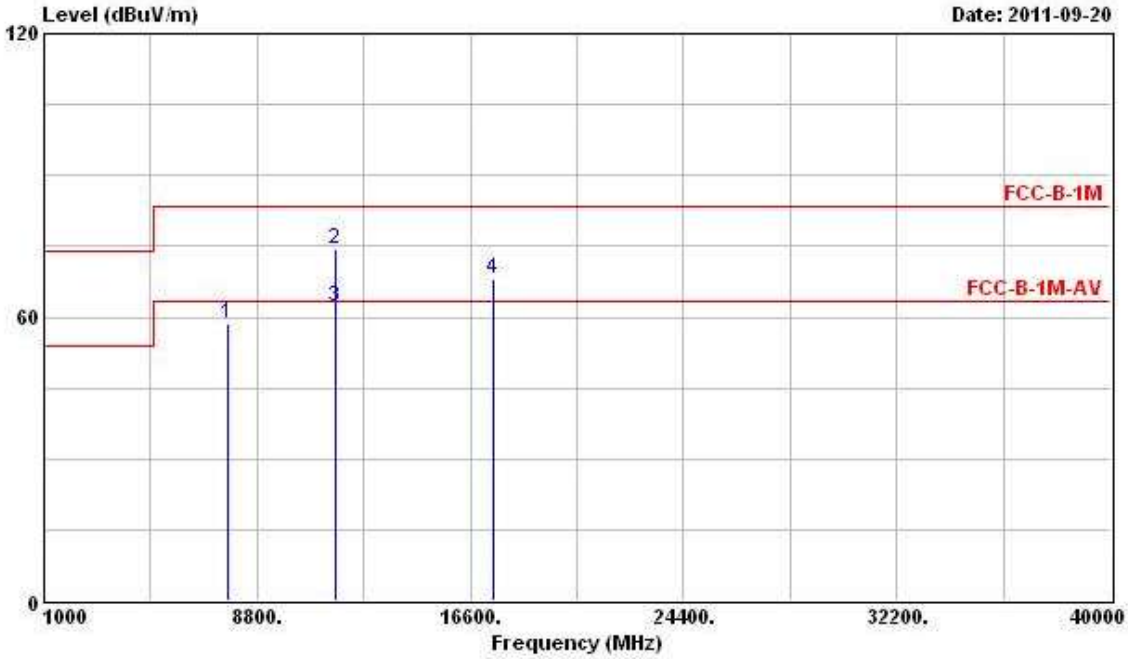


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7693.000	56.47	-7.07	63.54	45.58	37.80	6.07	32.98	PK	---	---
2	11570.000	70.20	-13.34	83.54	55.71	39.72	7.36	32.58	Peak	---	---
3 @	11570.000	58.42	-5.12	63.54	43.93	39.72	7.36	32.58	Peak	---	---
4	17355.000	67.44			45.91	44.71	8.52	31.70	Peak	---	---

Note: The 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	Sep. 20, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11a Ch. 165

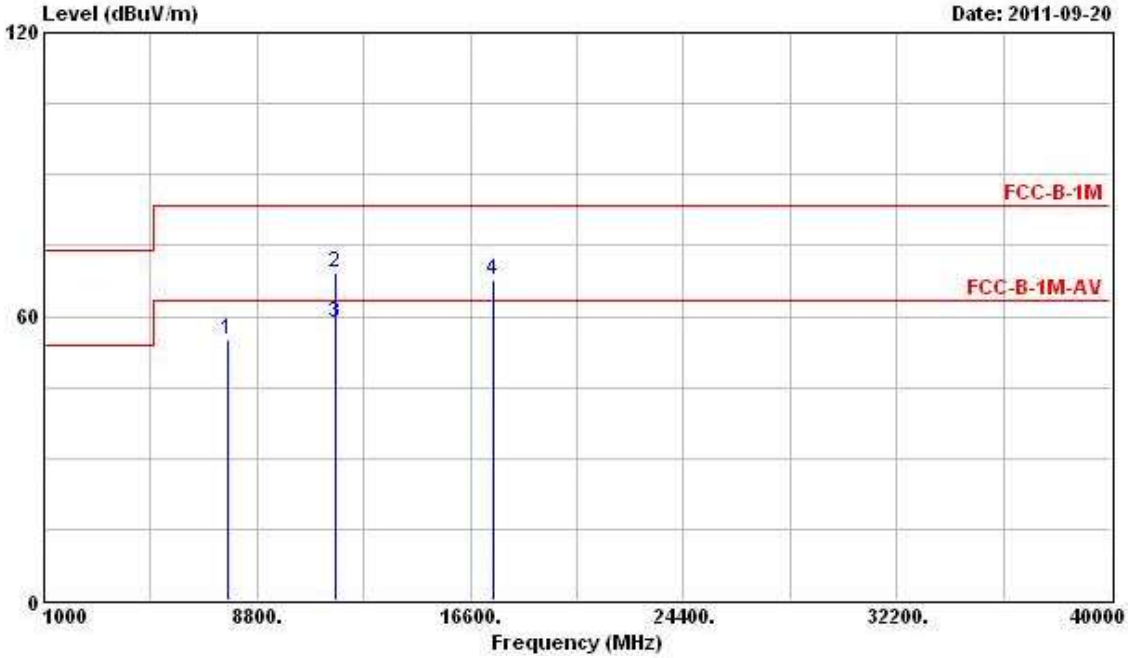
Horizontal



	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 @	7737.000	58.50	-5.04	63.54	47.58	37.80	6.11	32.99	PK	---	---
2 @	11650.000	74.45	-9.09	83.54	60.02	39.63	7.39	32.59	Peak	---	---
3 @	11650.000	62.25	-1.29	63.54	47.82	39.63	7.39	32.59	Average	---	---
4	17475.000	68.21			45.68	45.71	8.55	31.73	Peak	---	---

Note: The 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

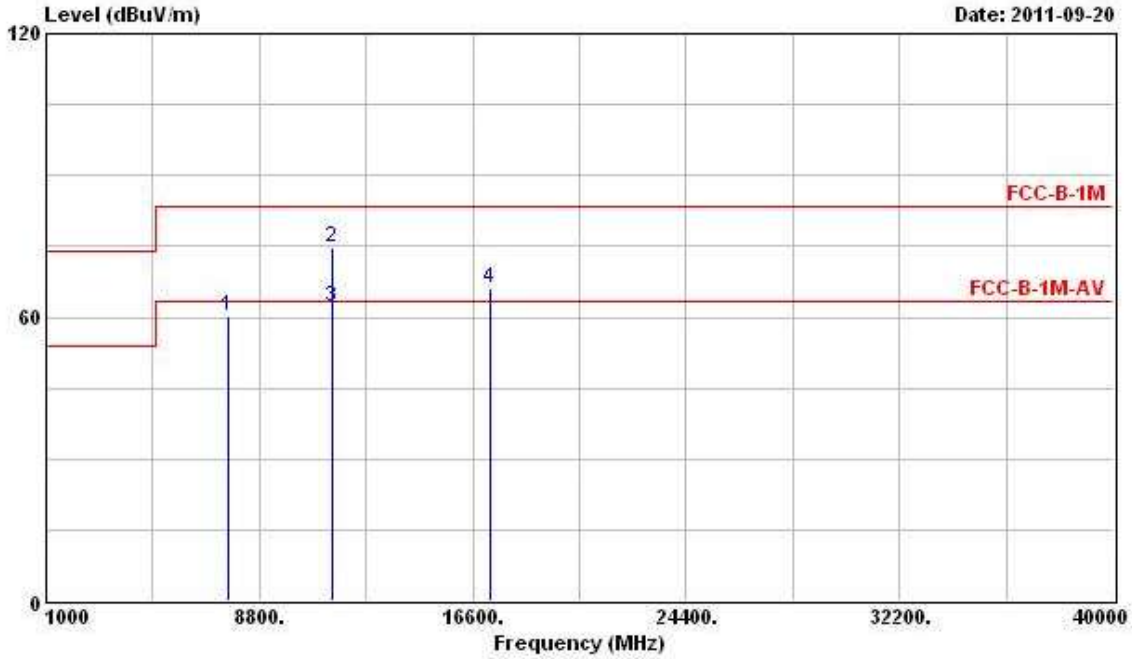


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7737.000	55.08	-8.46	63.54	44.16	37.80	6.11	32.99	PK	---	---
2	11650.000	69.14	-14.40	83.54	54.71	39.63	7.39	32.59	Peak	---	---
3 @	11650.000	58.75	-4.79	63.54	44.32	39.63	7.39	32.59	Average	---	---
4	17475.000	67.67			45.14	45.71	8.55	31.73	Peak	---	---

Note: The 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	Sep. 20, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 149 (20MHz) MCS0 (Ant. A)

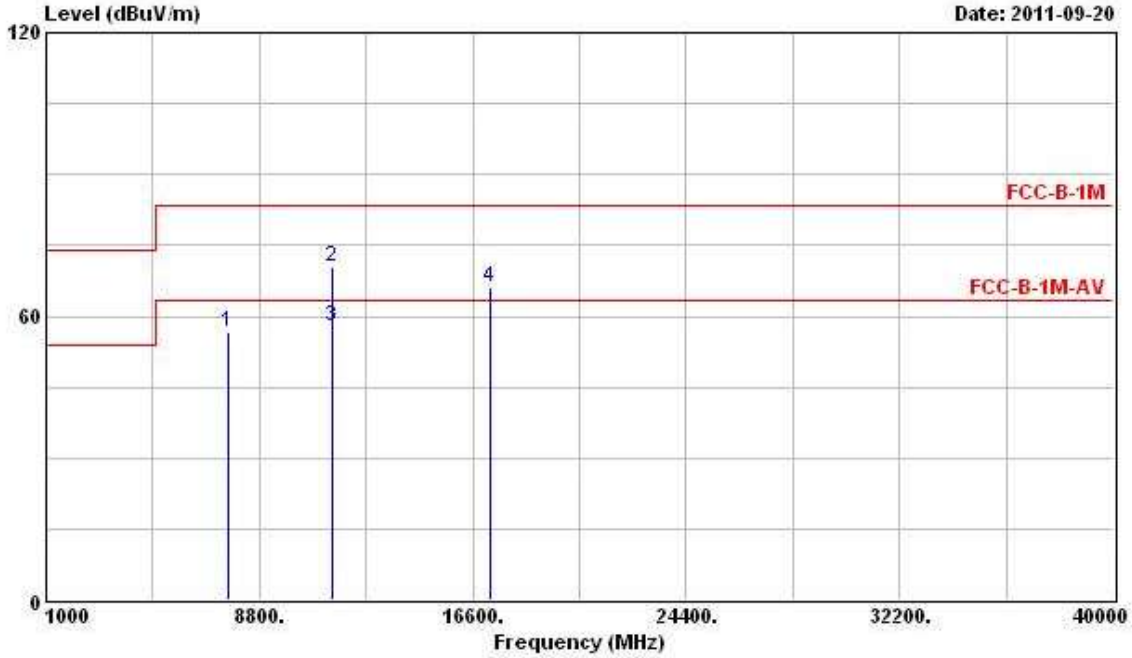
Horizontal



	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 @	7649.000	60.28	-3.26	63.54	49.46	37.80	6.00	32.98	PK	---	---
2 @	11490.000	74.68	-8.86	83.54	60.15	39.77	7.33	32.57	Peak	---	---
3 @	11490.000	62.00	-1.54	63.54	47.47	39.77	7.33	32.57	Average	---	---
4	17235.000	66.21			45.69	43.71	8.48	31.67	Peak	---	---

Note: The 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

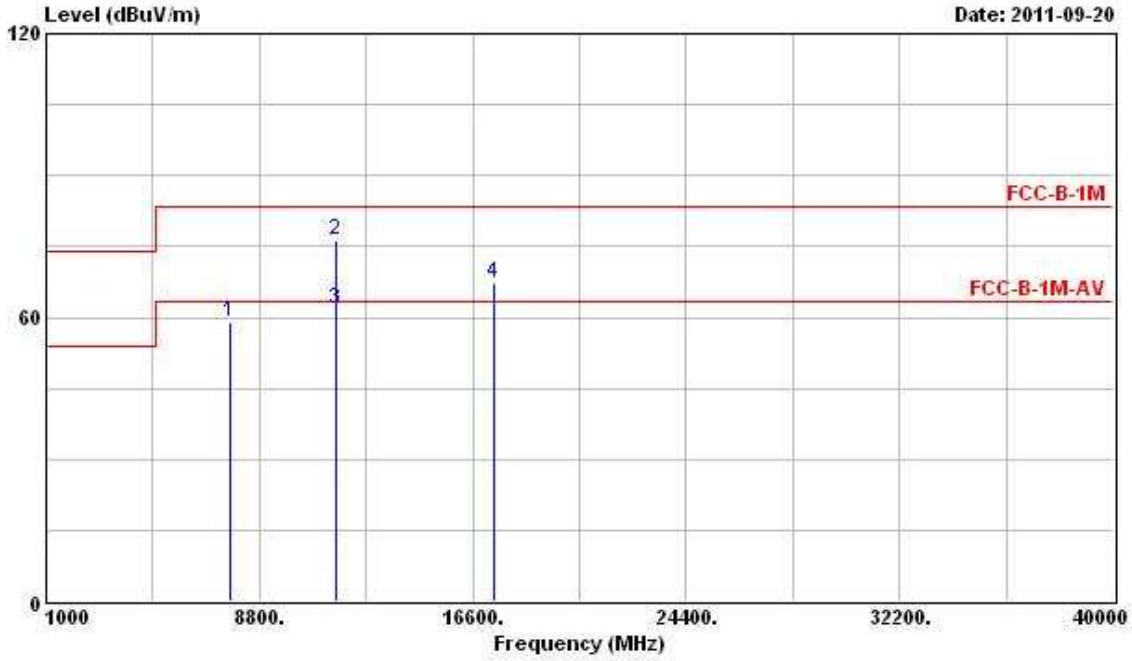


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7649.000	56.53	-7.01	63.54	45.71	37.80	6.00	32.98	PK	---	---
2	11490.000	70.56	-12.98	83.54	56.03	39.77	7.33	32.57	Peak	---	---
3 @	11490.000	57.72	-5.82	63.54	43.19	39.77	7.33	32.57	Average	---	---
4	17235.000	66.09			45.57	43.71	8.48	31.67	Peak	---	---

Note: The 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	Sep. 20, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 157 (20MHz) MCS0 (Ant. A)

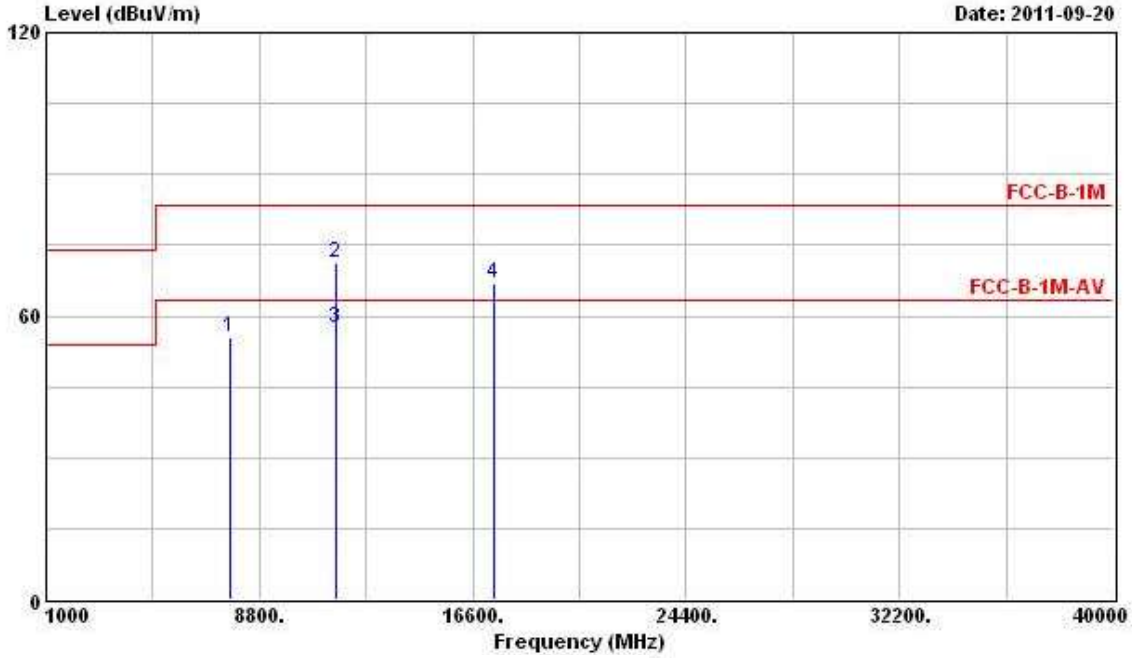
Horizontal



	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 @	7693.000	59.11	-4.43	63.54	48.22	37.80	6.07	32.98	PK	---	---
2 @	11570.000	76.19	-7.35	83.54	61.70	39.72	7.36	32.58	Peak	---	---
3 @	11570.000	61.85	-1.69	63.54	47.36	39.72	7.36	32.58	Average	---	---
4	17355.000	67.47			45.94	44.71	8.52	31.70	Peak	---	---

Note: The 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

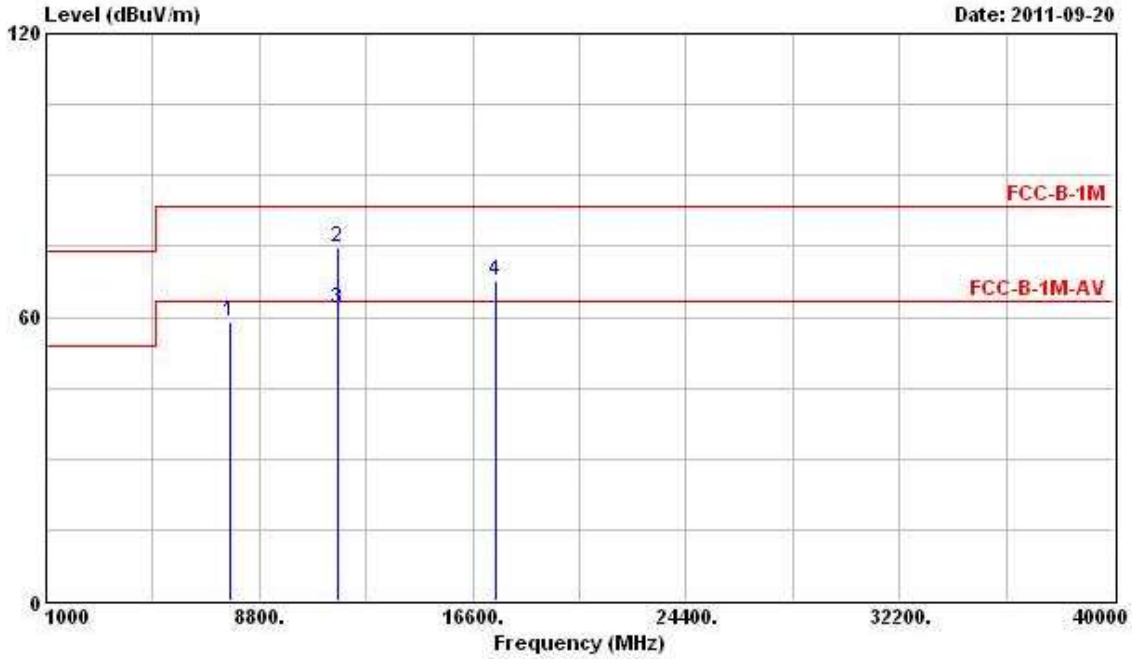


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7693.000	55.58	-7.96	63.54	44.69	37.80	6.07	32.98	PK	---	---
2	11570.000	71.24	-12.30	83.54	56.75	39.72	7.36	32.58	Peak	---	---
3 @	11570.000	57.29	-6.25	63.54	42.80	39.72	7.36	32.58	Average	---	---
4	17355.000	66.92			45.39	44.71	8.52	31.70	Peak	---	---

Note: The 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	Sep. 20, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 165 (20MHz) MCS0 (Ant. A)

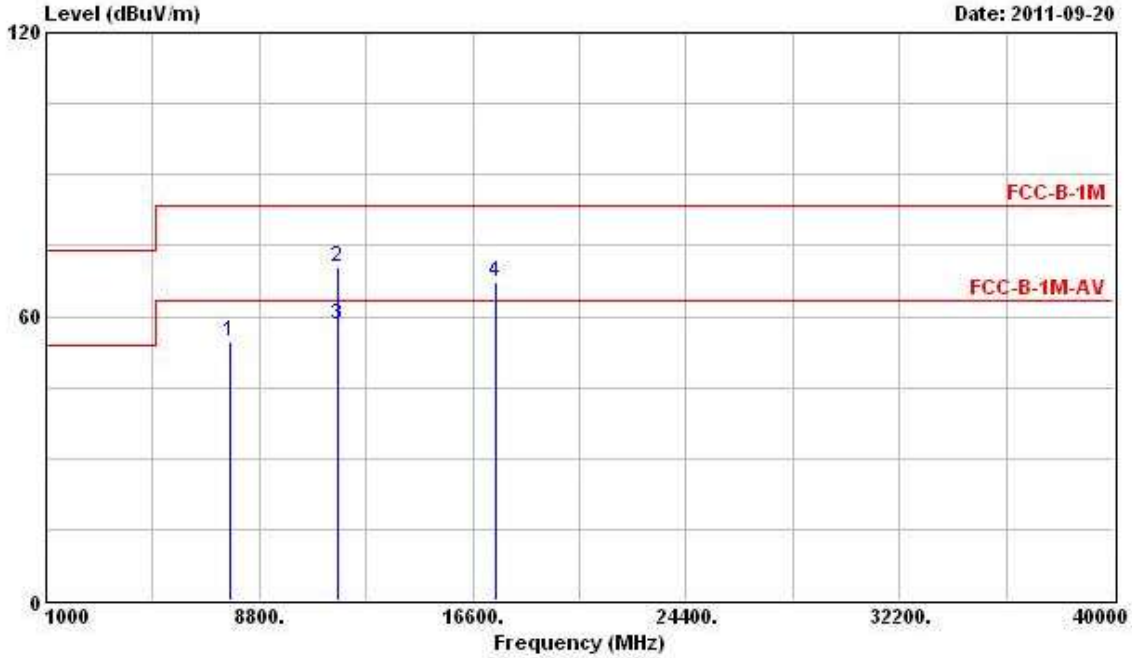
Horizontal



	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 @	7737.000	58.82	-4.72	63.54	47.90	37.80	6.11	32.99	PK	---	---
2 @	11650.000	74.78	-8.76	83.54	60.35	39.63	7.39	32.59	Peak	---	---
3 @	11650.000	61.83	-1.71	63.54	47.40	39.63	7.39	32.59	Average	---	---
4	17475.000	67.80			45.27	45.71	8.55	31.73	Peak	---	---

Note: The 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

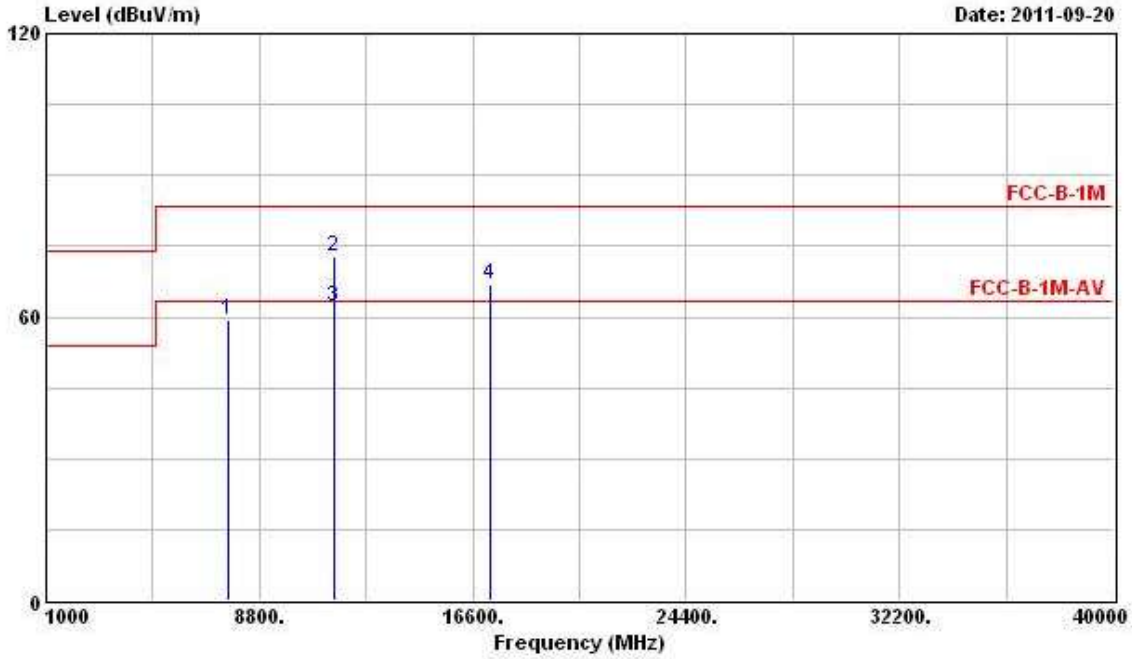


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7737.000	54.61	-8.93	63.54	43.69	37.80	6.11	32.99	PK	---	---
2	11650.000	70.45	-13.09	83.54	56.02	39.63	7.39	32.59	Peak	---	---
3 @	11650.000	58.17	-5.37	63.54	43.74	39.63	7.39	32.59	Average	---	---
4	17475.000	67.47			44.94	45.71	8.55	31.73	Peak	---	---

Note: The 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	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 151 (40MHz) MCS0 (Ant. A)

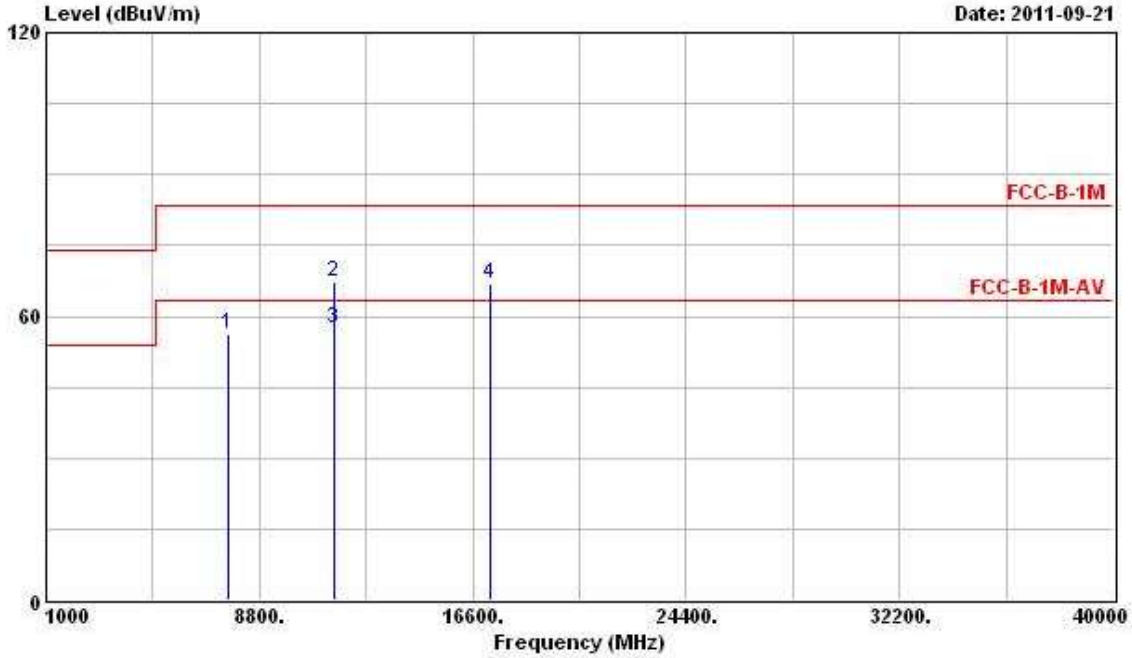
Horizontal



	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 @	7682.000	59.39	-4.15	63.54	48.53	37.80	6.04	32.98	PK	---	---
2 @	11510.000	72.90	-10.64	83.54	58.34	39.80	7.33	32.57	Peak	---	---
3 @	11510.000	62.25	-1.29	63.54	47.69	39.80	7.33	32.57	Average	---	---
4	17265.000	66.76			45.95	43.99	8.49	31.67	Peak	---	---

Note: The 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

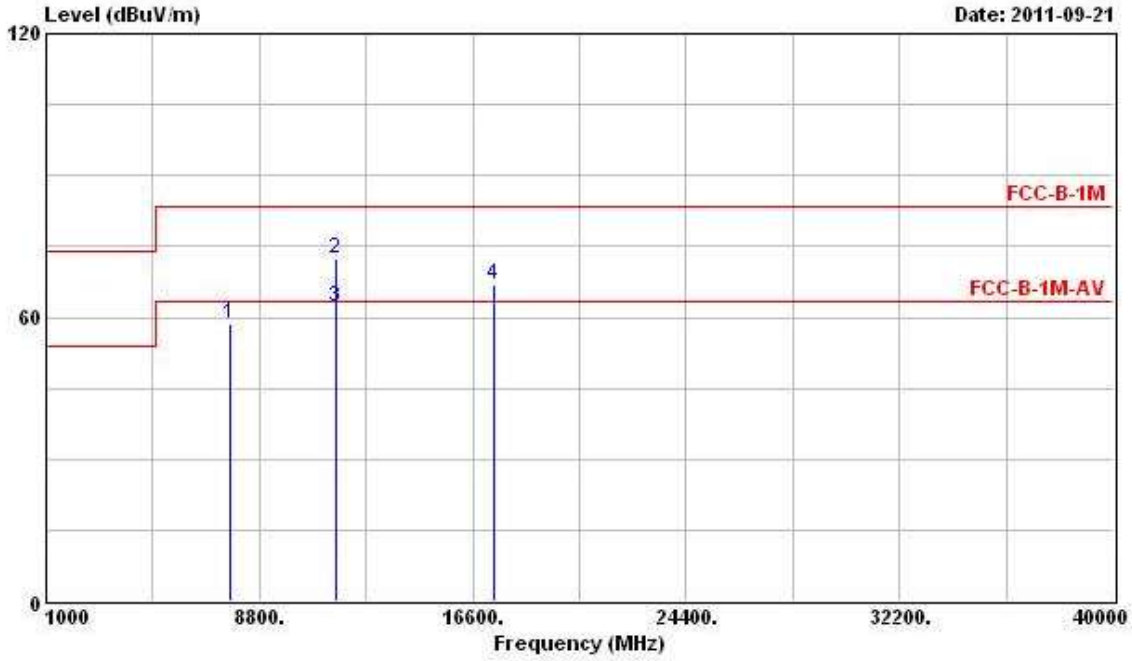


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7649.000	56.43	-7.11	63.54	45.61	37.80	6.00	32.98	PK	---	---
2	11510.000	67.28	-16.26	83.54	52.72	39.80	7.33	32.57	Peak	---	---
3 @	11510.000	57.34	-6.20	63.54	42.78	39.80	7.33	32.57	Average	---	---
4	17265.000	66.72			45.91	43.99	8.49	31.67	Peak	---	---

Note: The 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	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 159 (40MHz) MCS0 (Ant. A)

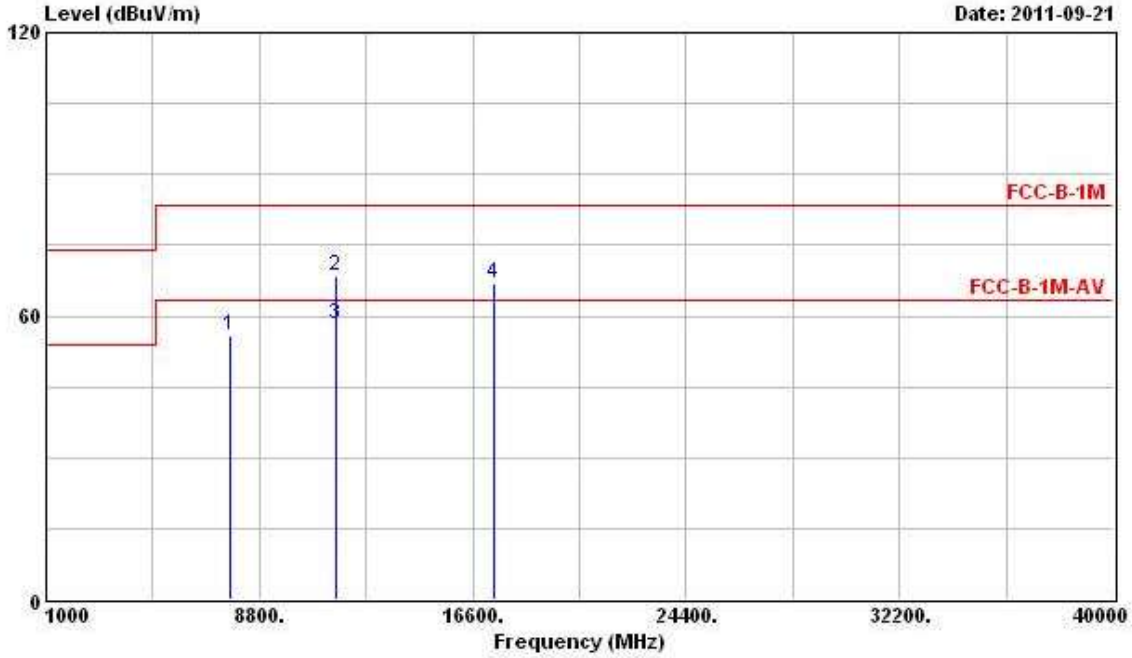
Horizontal



	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 @	7726.000	58.50	-5.04	63.54	47.62	37.80	6.07	32.99	PK	---	---
2 @	11590.000	72.27	-11.27	83.54	57.78	39.70	7.37	32.58	Peak	---	---
3 @	11590.000	62.22	-1.32	63.54	47.73	39.70	7.37	32.58	Average	---	---
4	17385.000	66.82			45.01	45.00	8.53	31.71	Peak	---	---

Note: The 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



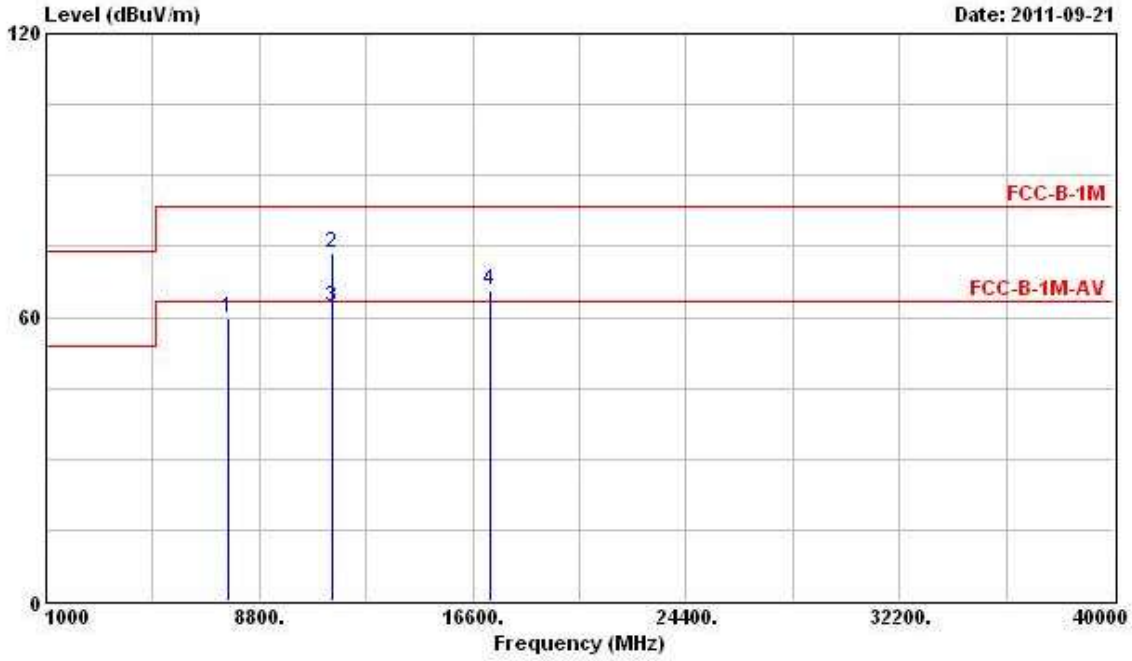
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7726.000	55.72	-7.82	63.54	44.84	37.80	6.07	32.99	PK	---	---
2	11590.000	68.63	-14.91	83.54	54.14	39.70	7.37	32.58	Peak	---	---
3 @	11590.000	58.04	-5.50	63.54	43.55	39.70	7.37	32.58	Average	---	---
4	17385.000	67.08			45.27	45.00	8.53	31.71	Peak	---	---

Note: The 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).

For Two Chain:

Final Test Date	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 149 (20MHz) MCS8 (Ant. A+B)

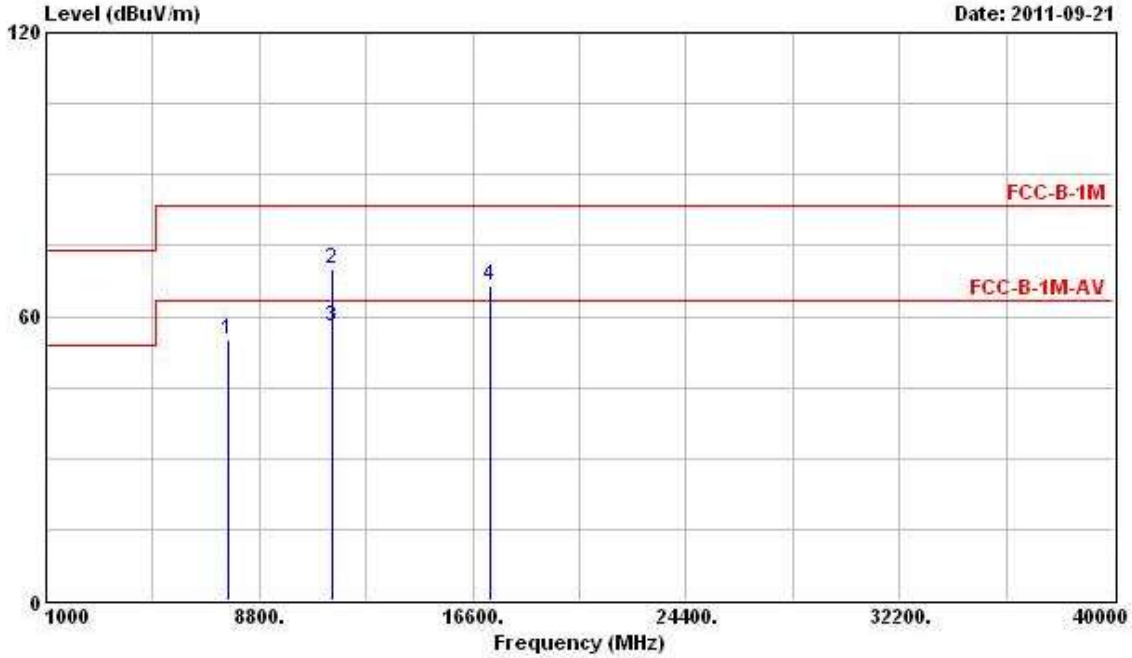
Horizontal



	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 @	7649.000	59.87	-3.67	63.54	49.05	37.80	6.00	32.98	PK	---	---
2 @	11490.000	73.72	-9.82	83.54	59.19	39.77	7.33	32.57	Peak	---	---
3 @	11490.000	62.35	-1.19	63.54	47.82	39.77	7.33	32.57	Average	---	---
4	17235.000	65.77			45.25	43.71	8.48	31.67	Peak	---	---

Note: The 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

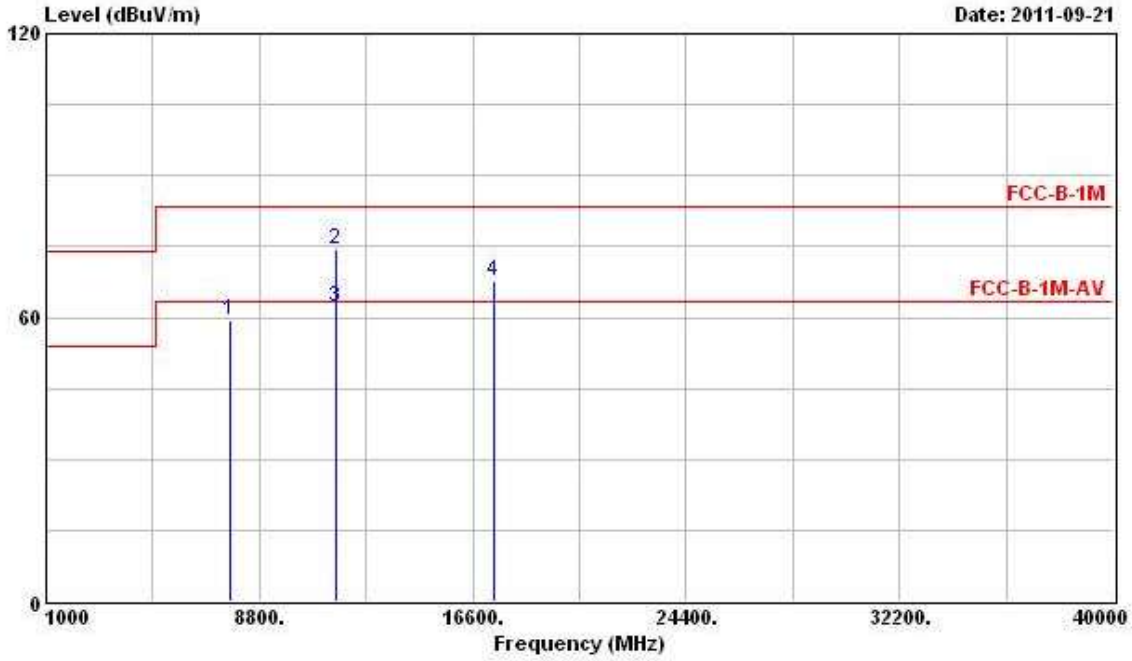


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7649.000	55.13	-8.41	63.54	44.31	37.80	6.00	32.98	PK	---	---
2	11490.000	70.03	-13.51	83.54	55.50	39.77	7.33	32.57	Peak	---	---
3 @	11490.000	57.99	-5.55	63.54	43.46	39.77	7.33	32.57	Average	---	---
4	17235.000	66.50			45.98	43.71	8.48	31.67	Peak	---	---

Note: The 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	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 157 (20MHz) MCS8 (Ant. A+B)

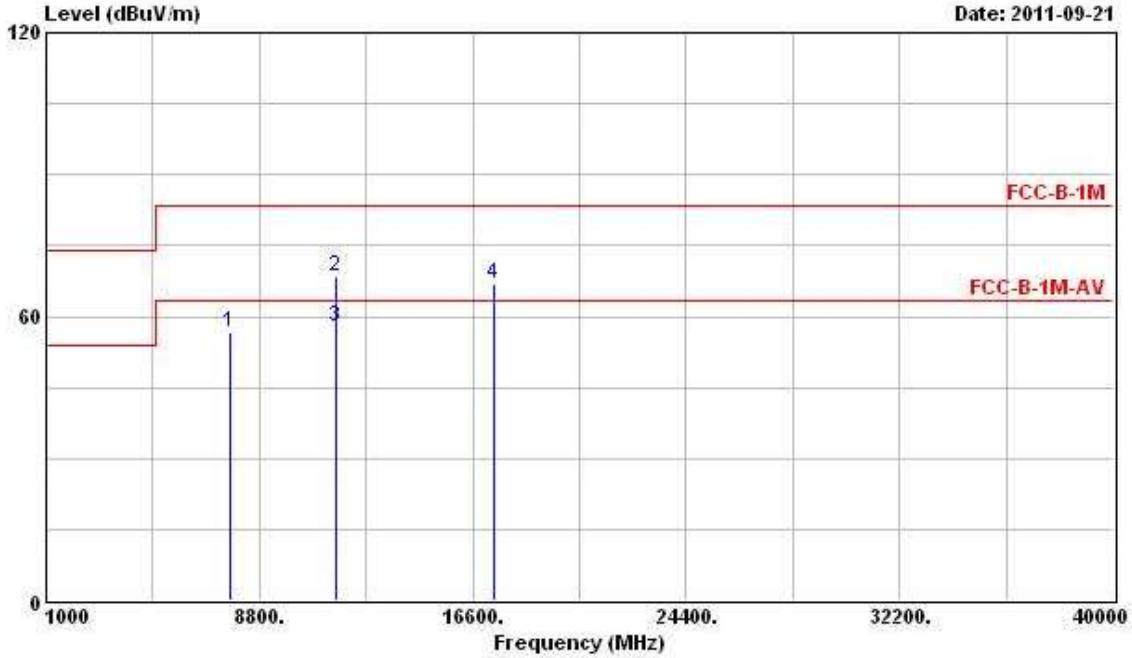
Horizontal



	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 @	7693.000	59.45	-4.09	63.54	48.56	37.80	6.07	32.98	PK	---	---
2 @	11570.000	74.22	-9.32	83.54	59.73	39.72	7.36	32.58	Peak	---	---
3 @	11570.000	62.34	-1.20	63.54	47.85	39.72	7.36	32.58	Average	---	---
4	17355.000	67.67			46.14	44.71	8.52	31.70	Peak	---	---

Note: The 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

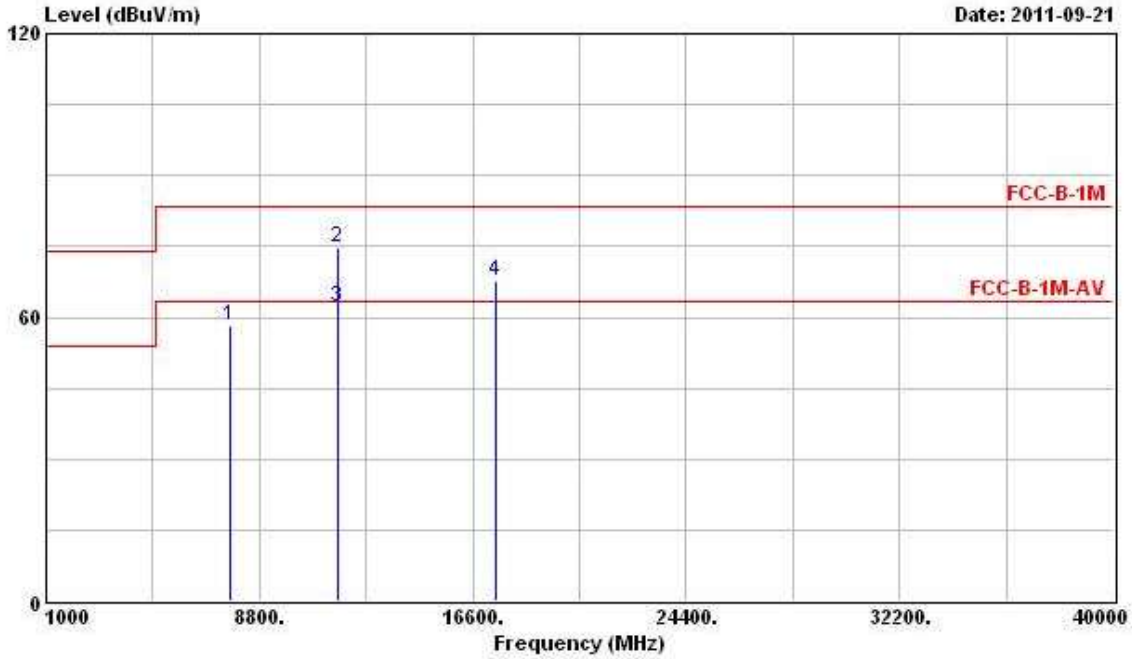


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7693.000	56.76	-6.78	63.54	45.87	37.80	6.07	32.98	PK	---	---
2	11570.000	68.56	-14.98	83.54	54.07	39.72	7.36	32.58	Peak	---	---
3 @	11570.000	57.97	-5.57	63.54	43.48	39.72	7.36	32.58	Average	---	---
4	17355.000	67.02			45.49	44.71	8.52	31.70	Peak	---	---

Note: The 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	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 165 (20MHz) MCS8 (Ant. A+B)

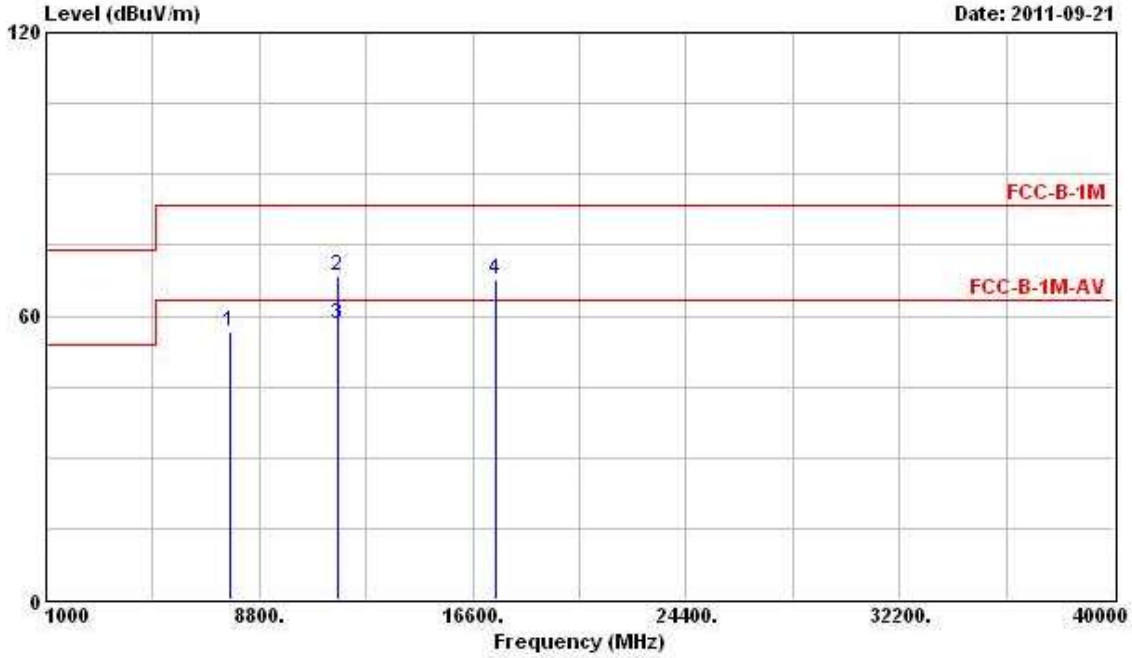
Horizontal



	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 @	7737.000	58.14	-5.40	63.54	47.22	37.80	6.11	32.99	PK	---	---
2 @	11650.000	74.86	-8.68	83.54	60.43	39.63	7.39	32.59	Peak	---	---
3 @	11650.000	62.17	-1.37	63.54	47.74	39.63	7.39	32.59	Average	---	---
4	17475.000	67.76			45.23	45.71	8.55	31.73	Peak	---	---

Note: The 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

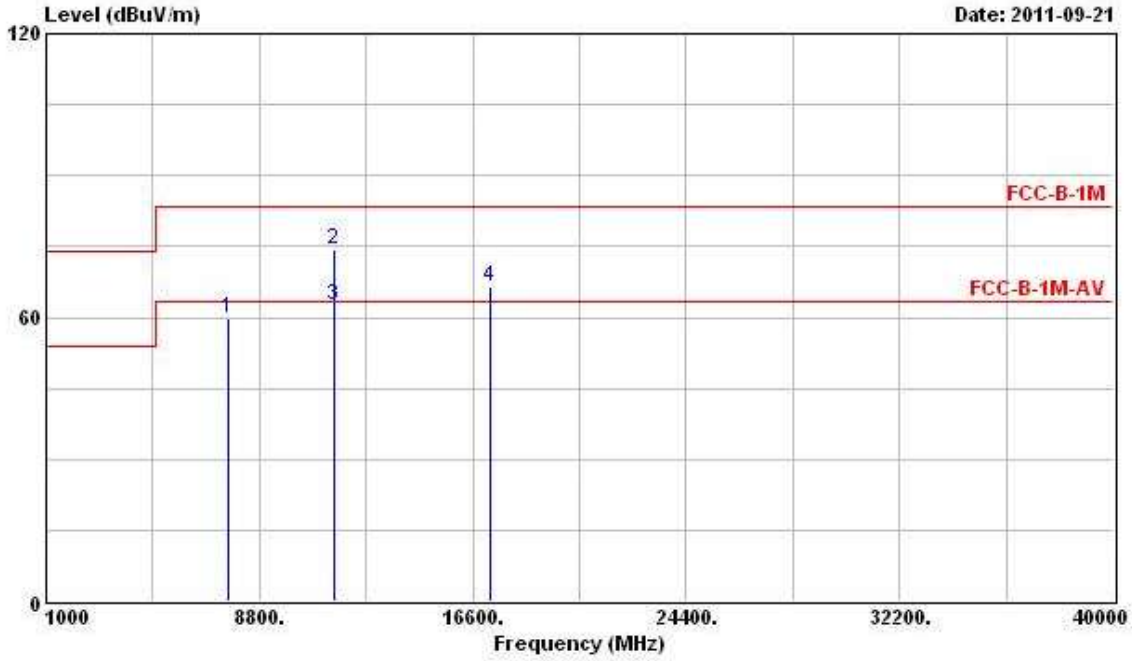


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7737.000	56.50	-7.04	63.54	45.58	37.80	6.11	32.99	PK	---	---
2	11650.000	68.44	-15.10	83.54	54.01	39.63	7.39	32.59	Peak	---	---
3 @	11650.000	58.09	-5.45	63.54	43.66	39.63	7.39	32.59	Average	---	---
4	17475.000	67.60			45.07	45.71	8.55	31.73	Peak	---	---

Note: The 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	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 151 (40MHz) MCS8 (Ant. A+B)

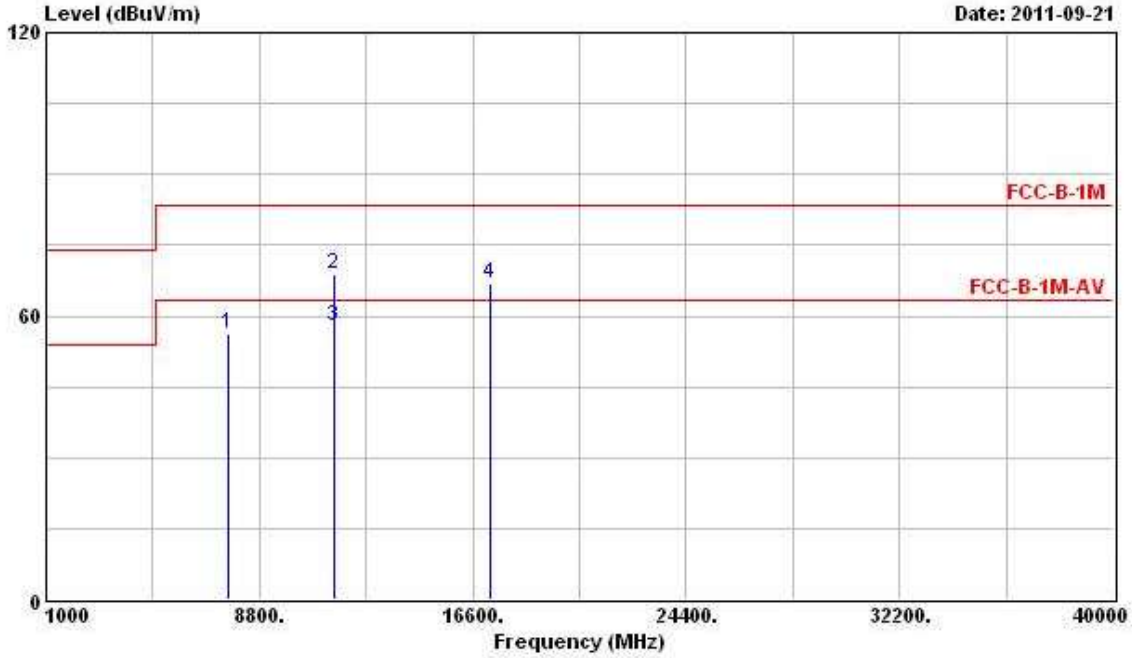
Horizontal



	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 @	7649.000	59.62	-3.92	63.54	48.80	37.80	6.00	32.98	PK	---	---
2 @	11510.000	74.42	-9.12	83.54	59.86	39.80	7.33	32.57	Peak	---	---
3 @	11510.000	62.52	-1.02	63.54	47.96	39.80	7.33	32.57	Average	---	---
4	17265.000	66.42			45.61	43.99	8.49	31.67	Peak	---	---

Note: The 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

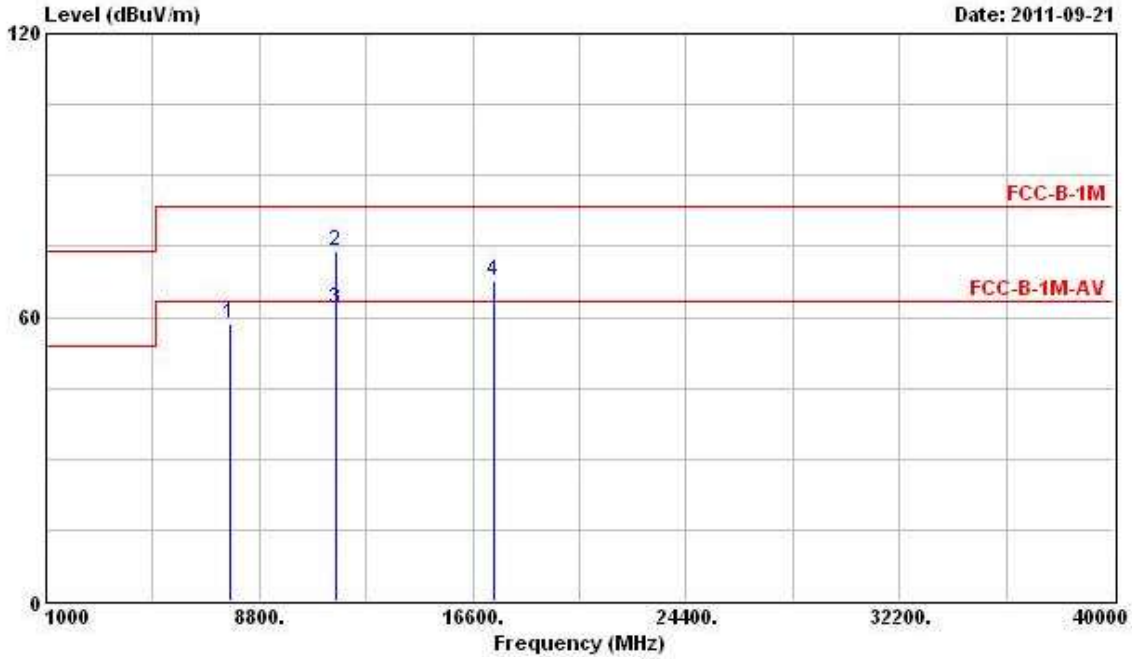


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7649.000	56.16	-7.38	63.54	45.34	37.80	6.00	32.98	PK	---	---
2	11510.000	68.98	-14.56	83.54	54.42	39.80	7.33	32.57	Peak	---	---
3 @	11510.000	57.82	-5.72	63.54	43.26	39.80	7.33	32.57	Average	---	---
4	17265.000	67.03			46.22	43.99	8.49	31.67	Peak	---	---

Note: The 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	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n Ch. 159 (40MHz) MCS8 (Ant. A+B)

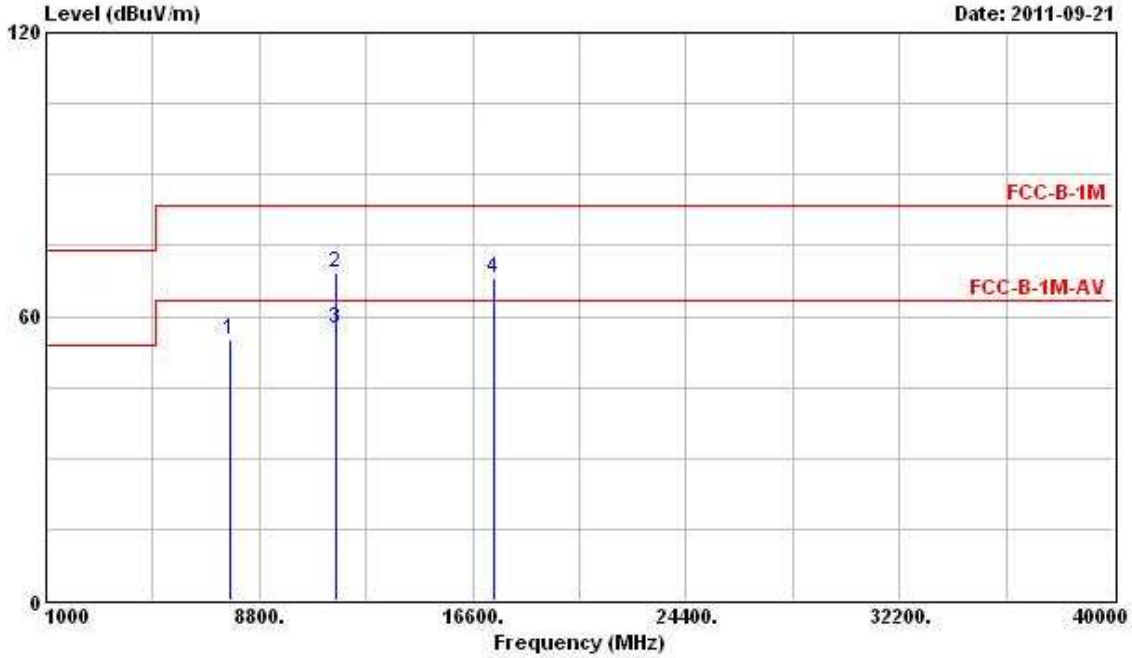
Horizontal



	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 @	7726.000	58.75	-4.79	63.54	47.87	37.80	6.07	32.99	PK	---	---
2 @	11590.000	73.90	-9.64	83.54	59.41	39.70	7.37	32.58	Peak	---	---
3 @	11590.000	61.68	-1.86	63.54	47.19	39.70	7.37	32.58	Average	---	---
4	17385.000	67.60			45.79	45.00	8.53	31.71	Peak	---	---

Note: The 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	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7726.000	55.27	-8.27	63.54	44.39	37.80	6.07	32.99	PK	---	---
2	11590.000	69.20	-14.34	83.54	54.71	39.70	7.37	32.58	Peak	---	---
3 @	11590.000	57.43	-6.11	63.54	42.94	39.70	7.37	32.58	Average	---	---
4	17385.000	67.91			46.10	45.00	8.53	31.71	Peak	---	---

Note: The 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).

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

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

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)	1MHz / 1MHz 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

For Single Chain:

Final Test Date	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11a Ch. 149, 157, 165

Channel 149

	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
2 @	5742.540	107.22			67.06	34.95	5.21	0.00	Average	---	---
2 @	5741.700	117.97			77.81	34.95	5.21	0.00	Peak	---	---

The item 2 is Fundamental Emissions.

Channel 157

	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 @	5724.140	57.05			16.87	34.96	5.23	0.00	Average	---	---
2 @	5782.620	107.91			67.78	34.94	5.19	0.00	Average	---	---
3 @	5858.270	56.58			16.51	34.93	5.14	0.00	Average	---	---
1	5722.780	70.67			30.49	34.96	5.23	0.00	Peak	---	---
2 @	5781.430	118.61			78.48	34.94	5.19	0.00	Peak	---	---
3	5855.380	69.89			29.80	34.93	5.16	0.00	Peak	---	---

The item 2 is fundamental emissions and the items 1 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Channel 165

	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 @	5820.390	108.30			68.20	34.93	5.16	0.00	Average	---	---
2 @	5850.000	61.16			21.07	34.93	5.16	0.00	Average	---	---
1 @	5821.550	119.01			78.91	34.93	5.16	0.00	Peak	---	---
2 @	5850.810	82.65			42.56	34.93	5.16	0.00	Peak	---	---

The item 1 is fundamental emissions and the item 2 is on un-restricted band, so the limit is -20dB for the field strength of the 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	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n (20MHz) Ch. 149, 157, 165 MCS0 (Ant. A)

Channel 149

	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
2 @	5741.770	106.77			66.61	34.95	5.21	0.00	Average	---	---
2 @	5751.290	118.46			78.30	34.95	5.21	0.00	Peak	---	---

The item 2 is Fundamental Emissions.

Channel 157

	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 @	5722.950	56.93			16.75	34.96	5.23	0.00	Average	---	---
2 @	5788.060	107.84			67.71	34.94	5.19	0.00	Average	---	---
3 @	5869.150	56.48			16.41	34.93	5.14	0.00	Average	---	---
1	5701.700	71.09			30.90	34.96	5.23	0.00	Peak	---	---
2 @	5790.950	119.52			79.39	34.94	5.19	0.00	Peak	---	---
3	5854.020	70.69			30.60	34.93	5.16	0.00	Peak	---	---

The item 2 is fundamental emissions and the items 1 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Channel 165

	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 @	5819.570	109.21			69.11	34.93	5.16	0.00	Average	---	---
2 @	5850.000	65.69			25.60	34.93	5.16	0.00	Average	---	---
1 @	5828.530	121.14			81.04	34.93	5.16	0.00	Peak	---	---
2 @	5851.910	86.55			46.46	34.93	5.16	0.00	Peak	---	---

The item 1 is fundamental emissions and the item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Final Test Date	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n (40MHz) Ch. 151, 159 MCS0 (Ant. A)

Channel *151*

	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 @	5725.000	72.97			32.79	34.96	5.23	0.00	Average	---	---
2 @	5745.800	106.35			66.19	34.95	5.21	0.00	Average	---	---
1 @	5723.800	89.60			49.42	34.96	5.23	0.00	Peak	---	---
2 @	5759.800	117.46			77.30	34.95	5.21	0.00	Peak	---	---

The item 2 is fundamental emissions and the item 1 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Channel *159*

	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 @	5803.500	106.76			66.64	34.94	5.19	0.00	Average	---	---
2 @	5851.000	64.03			23.94	34.93	5.16	0.00	Average	---	---
1 @	5803.800	117.72			77.60	34.94	5.19	0.00	Peak	---	---
2 @	5853.400	82.46			42.37	34.93	5.16	0.00	Peak	---	---

The item 1 is fundamental emissions and the item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

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

For Two Chain:

Final Test Date	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n (20MHz) Ch. 149, 157, 165 MCS8 (Ant. A+B)

Channel 149

	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
2 @	5739.740	106.83			66.67	34.95	5.21	0.00	Average	---	---
2 @	5740.860	118.80			78.64	34.95	5.21	0.00	Peak	---	---

The item 2 is Fundamental Emissions.

Channel 157

	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 @	5724.140	56.88			16.70	34.96	5.23	0.00	Average	---	---
2 @	5780.070	106.73			66.60	34.94	5.19	0.00	Average	---	---
3 @	5861.670	56.43			16.36	34.93	5.14	0.00	Average	---	---
1	5702.380	70.91			30.72	34.96	5.23	0.00	Peak	---	---
2 @	5783.300	118.52			78.39	34.94	5.19	0.00	Peak	---	---
3	5860.820	70.24			30.17	34.93	5.14	0.00	Peak	---	---

The item 2 is fundamental emissions and the items 1 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Channel 165

	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 @	5821.050	106.37			66.27	34.93	5.16	0.00	Average	---	---
2 @	5850.000	58.56			18.47	34.93	5.16	0.00	Average	---	---
1 @	5822.430	118.61			78.51	34.93	5.16	0.00	Peak	---	---
2 @	5851.190	76.66			36.57	34.93	5.16	0.00	Peak	---	---

The item 1 is fundamental emissions and the item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Final Test Date	Sep. 21, 2011	**Test Site No.**	03CH03-HY
Temperature	25℃	**Humidity**	56%
Test Engineer	Daniel	**Configuration**	802.11n (40MHz) Ch. 151, 159 MCS8 (Ant. A+B)

Channel *151*

	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 @	5725.000	70.67			30.49	34.96	5.23	0.00	Average	---	---
2 @	5745.800	105.42			65.26	34.95	5.21	0.00	Average	---	---
1 @	5717.800	87.49			47.31	34.96	5.23	0.00	Peak	---	---
2 @	5744.600	116.99			76.83	34.95	5.21	0.00	Peak	---	---

The item 2 is fundamental emissions and the item 1 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Channel *159*

	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 @	5803.400	105.75			65.63	34.94	5.19	0.00	Average	---	---
2 @	5850.000	59.46			19.37	34.93	5.16	0.00	Average	---	---
1 @	5802.700	117.88			77.76	34.94	5.19	0.00	Peak	---	---
2 @	5850.600	78.08			37.99	34.93	5.16	0.00	Peak	---	---

The item 1 is fundamental emissions and the item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

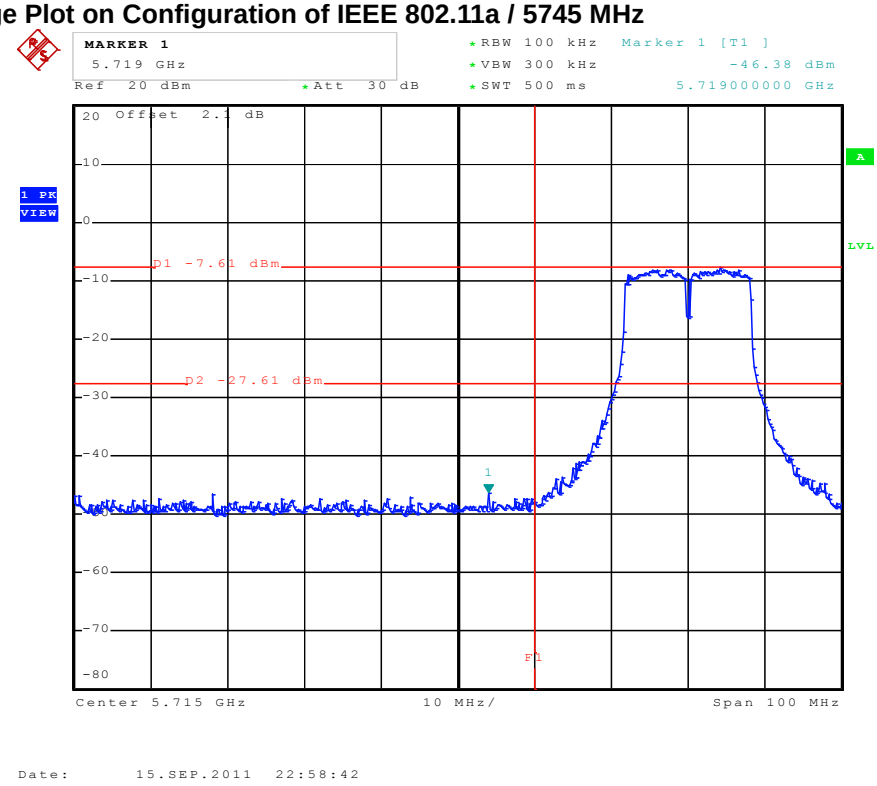
Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

For Emission not in Restricted Band

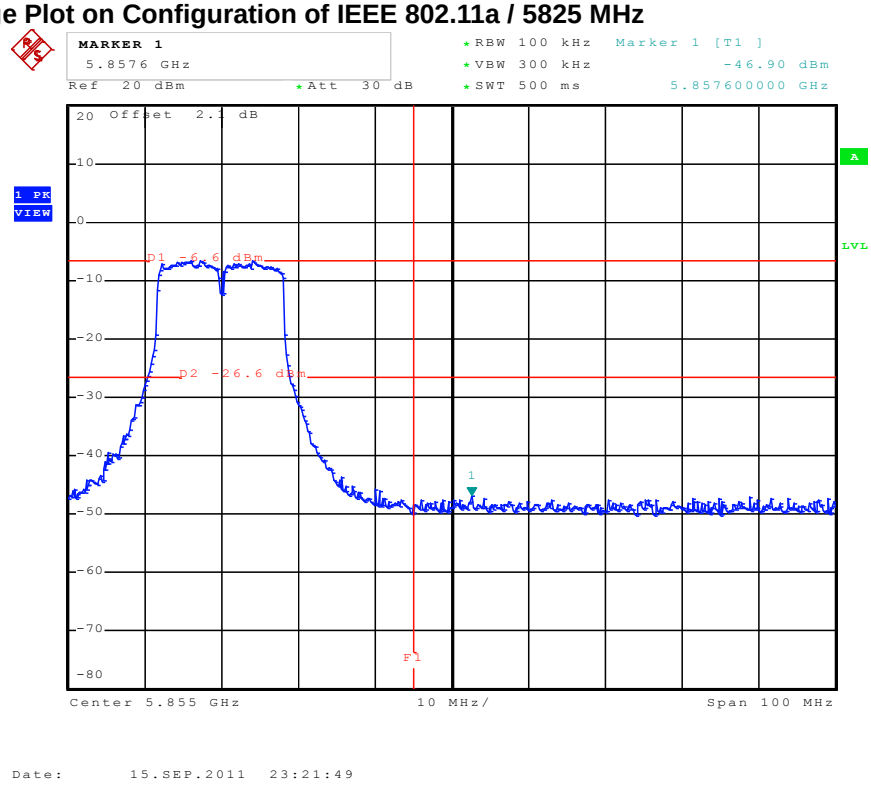
Final Test Date	Sep. 17, 2011	**Test Site No.**	TH01-HY
Temperature	23.2℃	**Humidity**	68%
Test Engineer	Cain	**Configurations**	802.11a/n

For Single Chain:

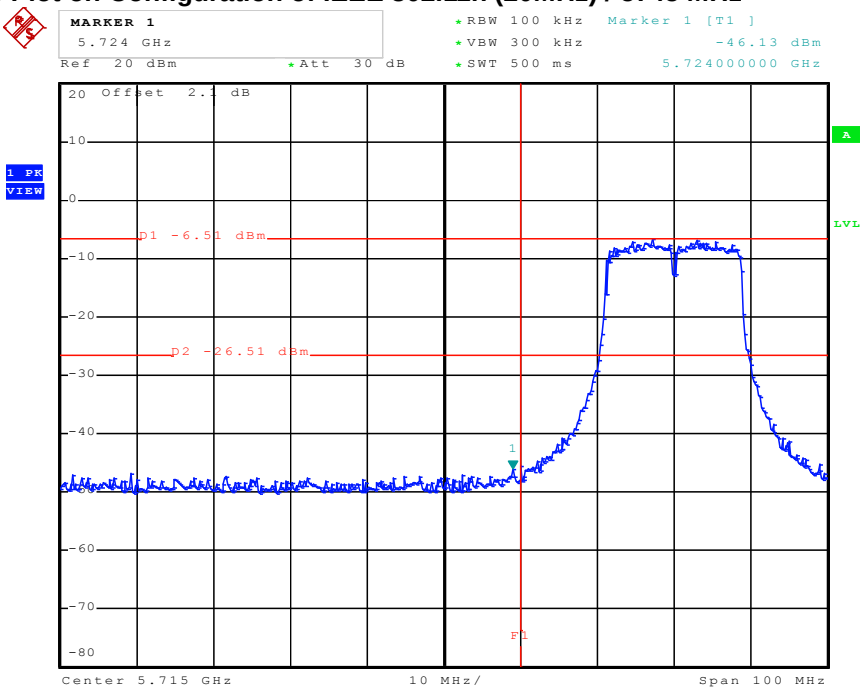
Low Band Edge Plot on Configuration of IEEE 802.11a / 5745 MHz



High Band Edge Plot on Configuration of IEEE 802.11a / 5825 MHz

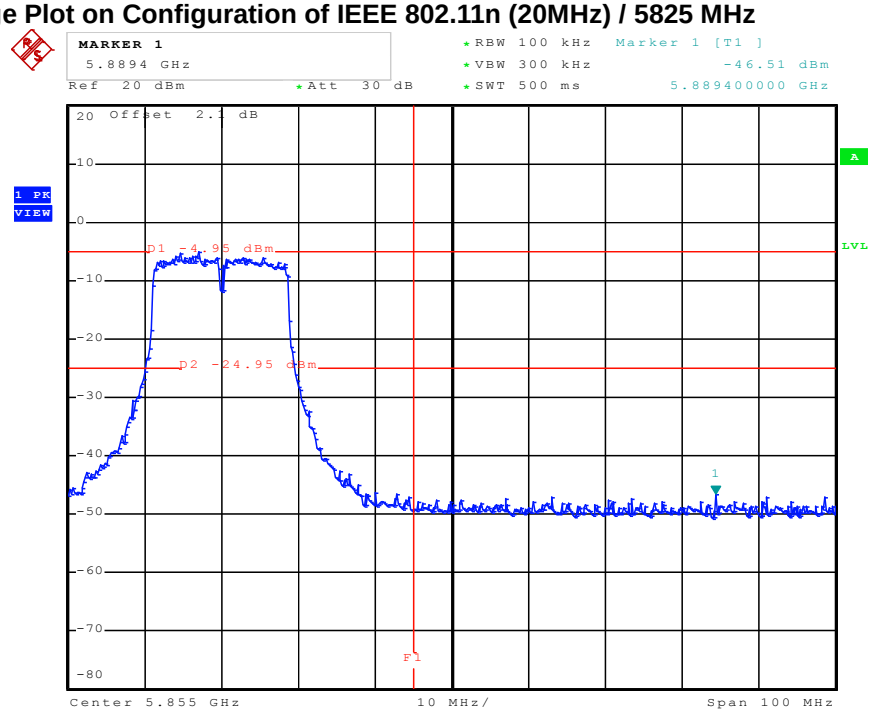


Low Band Edge Plot on Configuration of IEEE 802.11n (20MHz) / 5745 MHz



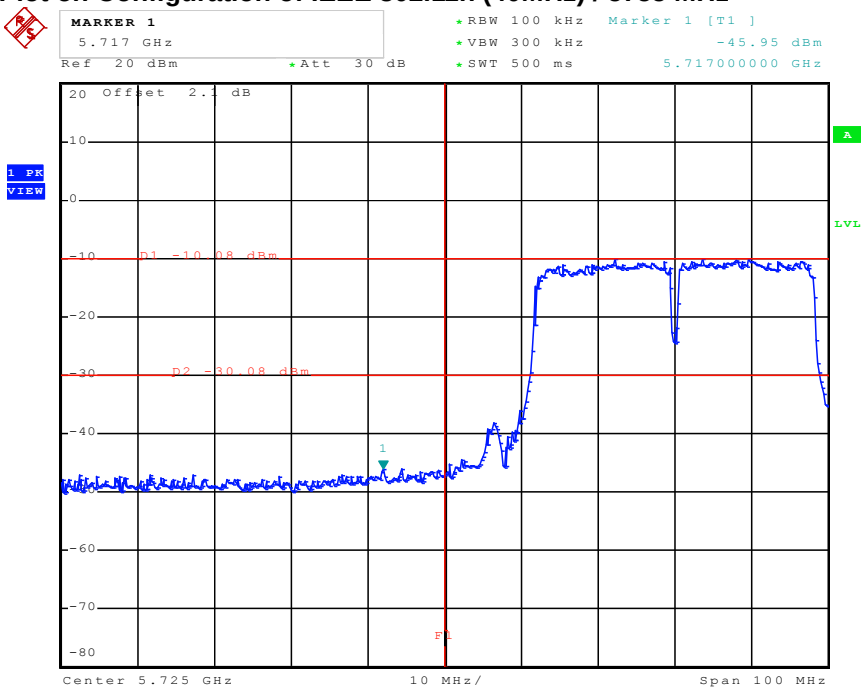
Date: 16.SEP.2011 00:00:53

High Band Edge Plot on Configuration of IEEE 802.11n (20MHz) / 5825 MHz



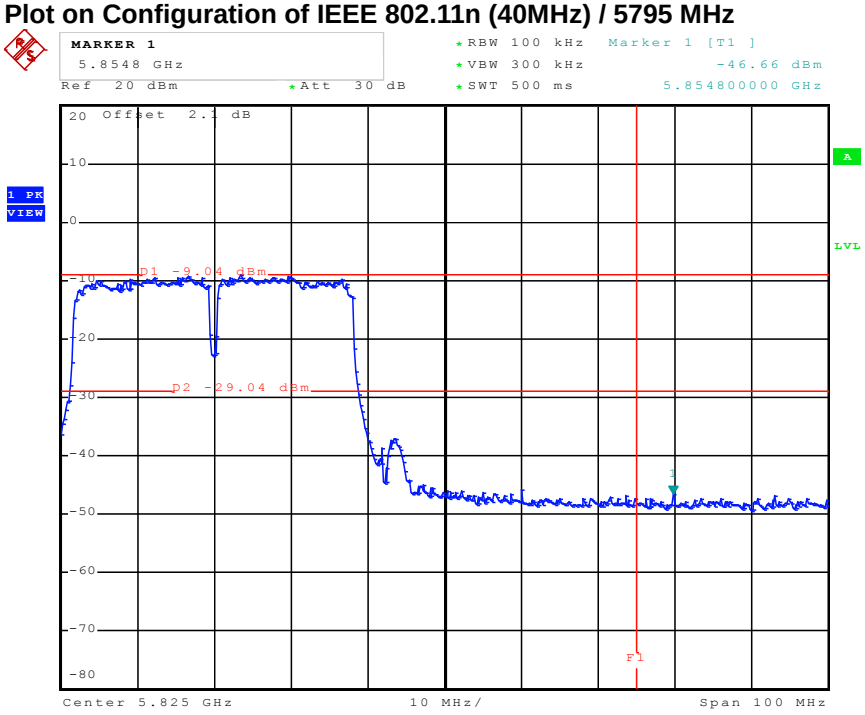
Date: 16.SEP.2011 00:25:30

Low Band Edge Plot on Configuration of IEEE 802.11n (40MHz) / 5755 MHz



Date: 16.SEP.2011 02:18:41

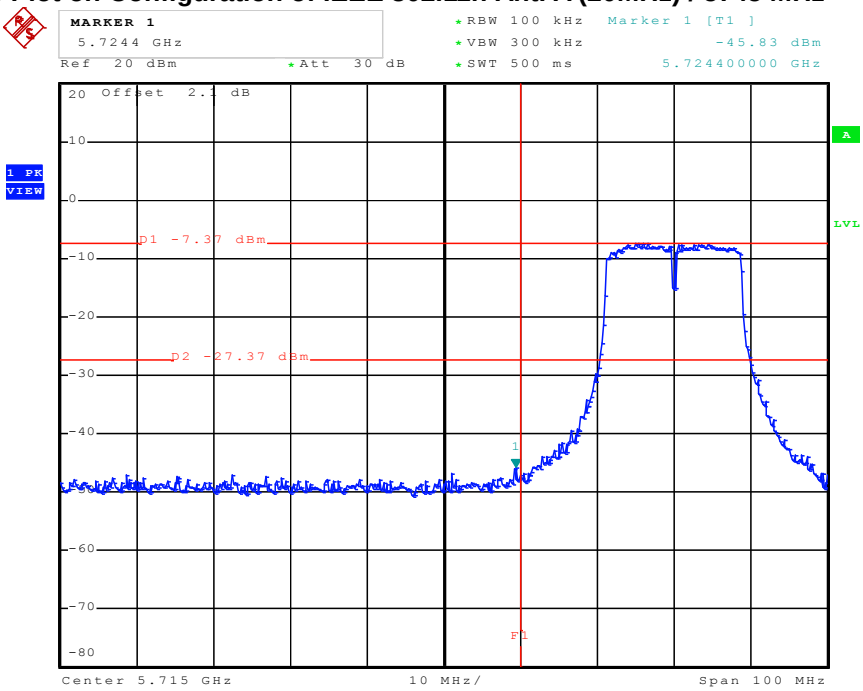
High Band Edge Plot on Configuration of IEEE 802.11n (40MHz) / 5795 MHz



Date: 16.SEP.2011 02:22:25

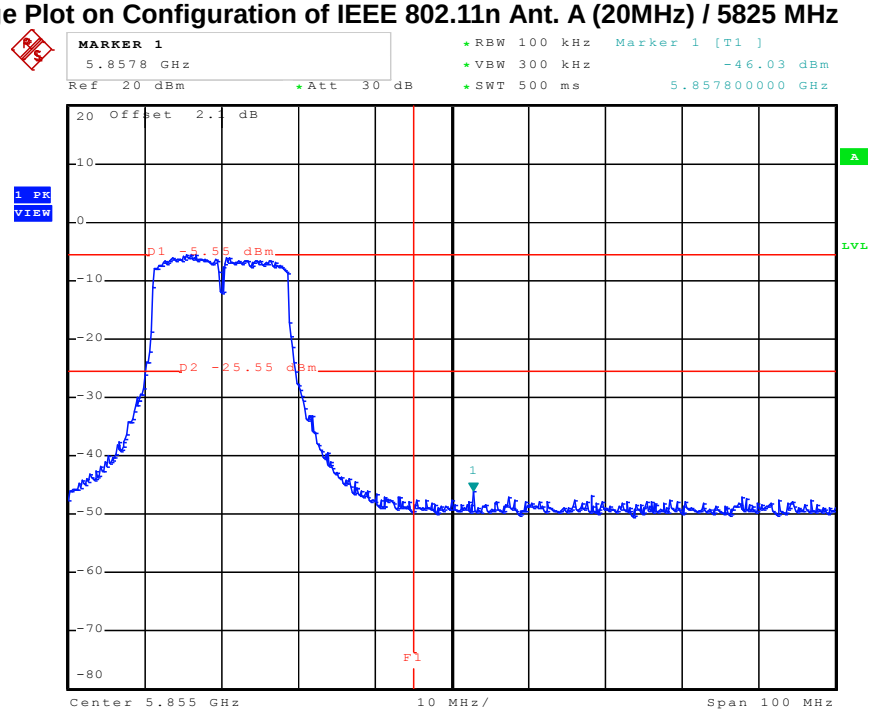
For Two Chain:

Low Band Edge Plot on Configuration of IEEE 802.11n Ant. A (20MHz) / 5745 MHz



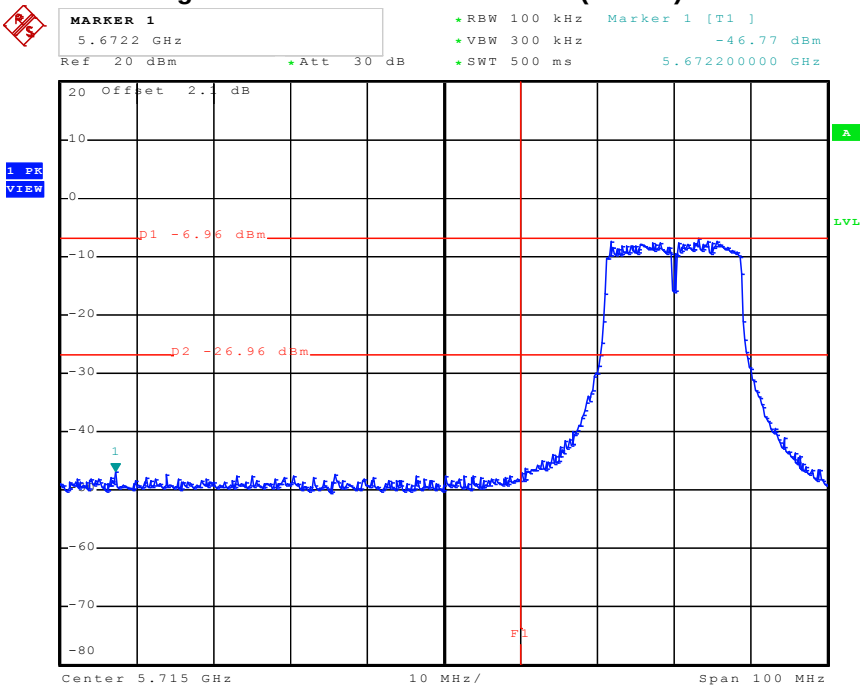
Date: 16.SEP.2011 22:15:09

High Band Edge Plot on Configuration of IEEE 802.11n Ant. A (20MHz) / 5825 MHz



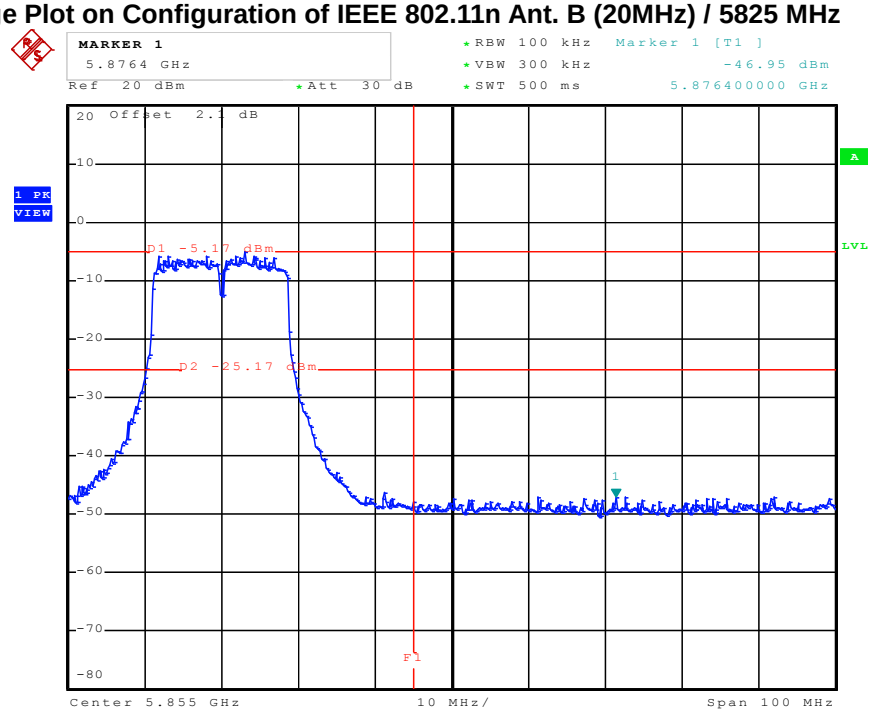
Date: 16.SEP.2011 22:32:59

Low Band Edge Plot on Configuration of IEEE 802.11n Ant. B (20MHz) / 5745 MHz



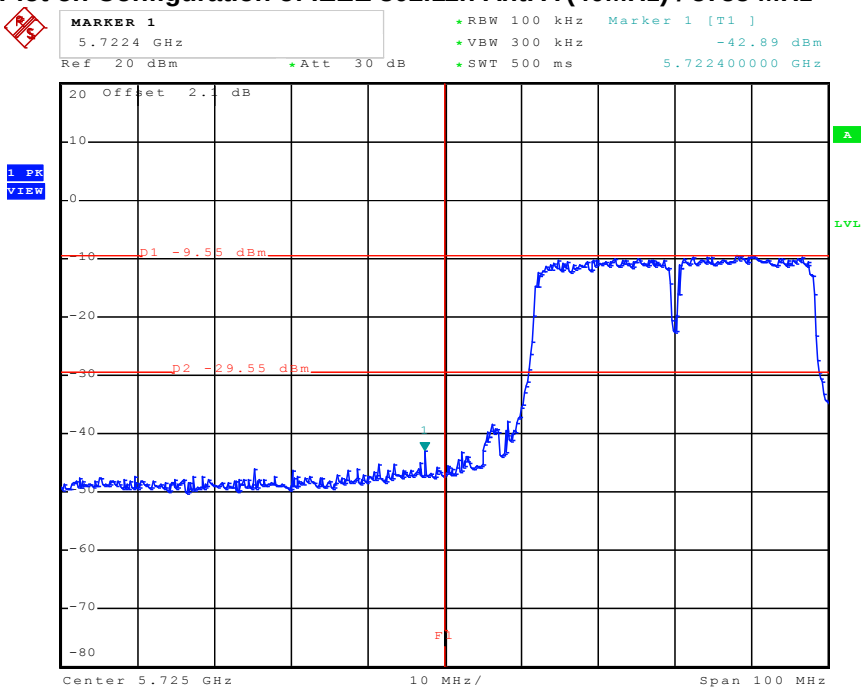
Date: 16.SEP.2011 23:39:01

High Band Edge Plot on Configuration of IEEE 802.11n Ant. B (20MHz) / 5825 MHz



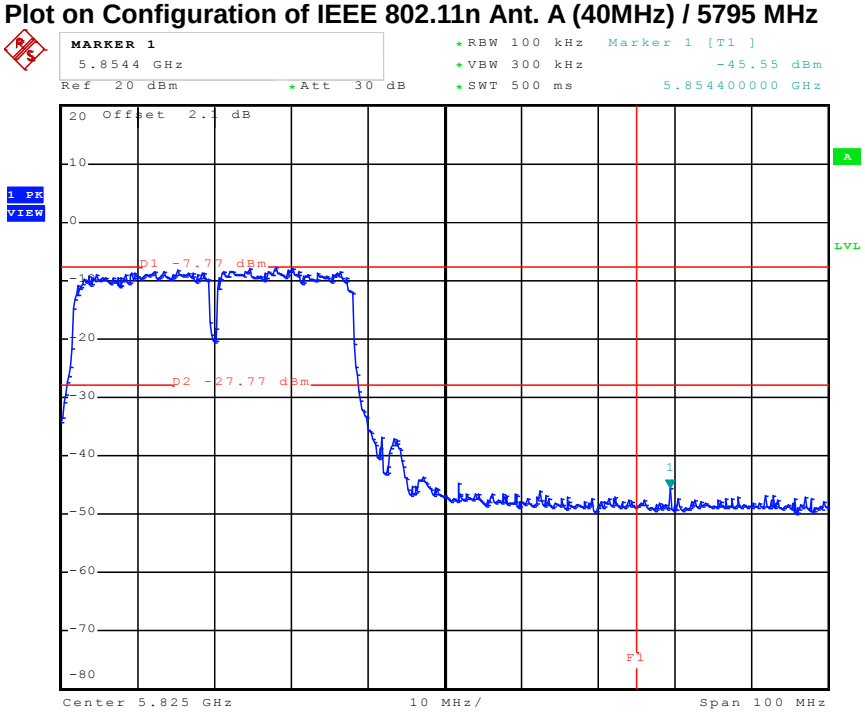
Date: 16.SEP.2011 23:50:27

Low Band Edge Plot on Configuration of IEEE 802.11n Ant. A (40MHz) / 5755 MHz



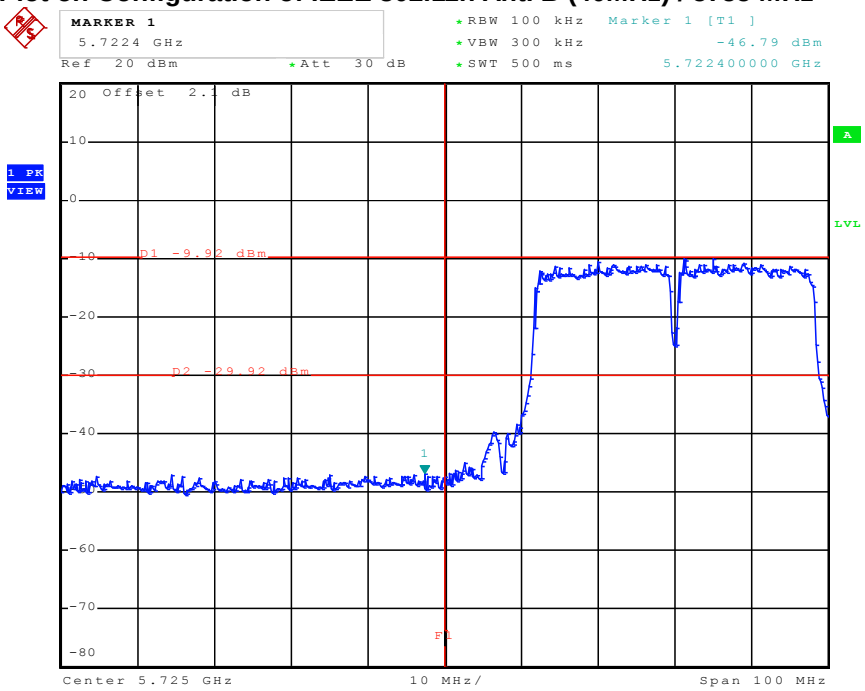
Date: 16.SEP.2011 22:43:33

High Band Edge Plot on Configuration of IEEE 802.11n Ant. A (40MHz) / 5795 MHz



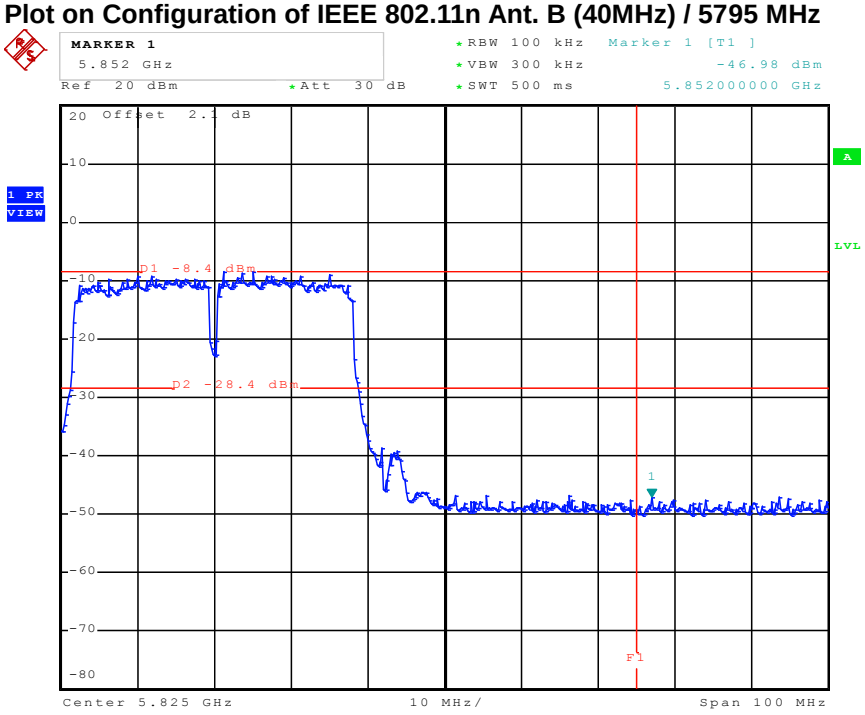
Date: 16.SEP.2011 22:45:09

Low Band Edge Plot on Configuration of IEEE 802.11n Ant. B (40MHz) / 5755 MHz



Date: 17.SEP.2011 00:00:01

High Band Edge Plot on Configuration of IEEE 802.11n Ant. B (40MHz) / 5795 MHz



Date: 17.SEP.2011 00:01:02

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
Receiver	R&S	ESCS 30	100357	9 kHz - 2.75 GHz	Nov. 16, 2010	Conduction (CO01-NH)
LISN	SCHAFFNER	NNB41	04/10153	9kHz - 30MHz	Nov. 16, 2010	Conduction (CO01-NH)
Power Filter	CORCOM	MR12030	N/A	30A*2	N/A	Conduction (CO01-NH)
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9kHz - 30MHz	Dec. 14, 2010	Conduction (CO01-NH)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP 30	100023	9KHz ~ 30GHz	Mar. 15, 2011	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jun. 03, 2011	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Oct. 22, 2010	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 02, 2010	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 02, 2010	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jun. 07, 2011	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	0917017	300MHz~40GHz	Jan. 06, 2011	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	0949003	300MHz~40GHz	Jan. 06, 2011	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	Jun. 09, 2011*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two 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. 17, 2011	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz ~ 2 GHz	Jan. 25, 2011	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz ~ 26.5 GHz	Aug. 04, 2011	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100004	9 kHz ~ 40 GHz	Nov. 17, 2010	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz ~ 1 GHz	Oct. 16, 2010	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1 GHz ~ 18 GHz	May 30, 2011	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz ~ 40 GHz	Jan.13, 2011	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz ~ 1 GHz	Jan. 18, 2011	Radiation (03CH03-HY)
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz ~ 40 GHz	Jan. 18, 2011	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	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

TAF

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

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 11, 2011

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