



SPORTON International Inc.

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FCC RADIO TEST REPORT

Applicant's company	Belkin International, Inc.
Applicant Address	501 West Walnut Street, Compton, CA 90220-5221, U.S.A.
FCC ID	K7SF5D8233-4
Manufacturer's company	Arcadyan Technology Corporation
Manufacturer Address	4F, No.9, Park Avenue II, Science-based Industrial Park, Hsinchu 300, Taiwan, R.O.C.

Product Name	N Wireless Router
Brand Name	Belkin
Model Name	F5D8233-4
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Apr. 4, 2007
Final Test Date	May 9, 2007
Submission Type	Original Equipment



Statement

Test result included is only for the 802.11n part 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.



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History of This Test Report

Original Issue Date: May 16, 2007

Report No.: FR741903-AA

No additional attachment.

Additional attachment were issued as following record:

Attachment No.	Issue Date	Description



1. CERTIFICATE OF COMPLIANCE

Product Name : N Wireless Router
Brand Name : Belkin
Model Name : F5D8233-4
Applicant : Belkin International, Inc.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Apr. 4, 2007 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.

A handwritten signature in blue ink that reads 'Wayne Hsu (0.5.07)'. The signature is written in a cursive style.

Wayne Hsu

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	6.15 dB
4.2	15.247(b)(3)	Maximum Peak Conducted Output Power	Complies	10.50 dB
4.3	15.247(e)	Power Spectral Density	Complies	18.34 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	1.07 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.06 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	±8.5×10 ⁻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°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Adapter
Modulation&	see the below table for draft 802.11n
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for Draft n
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Band Width (99%)	MCS8 (20MHz) : 17.66 MHz, MCS8 (40MHz) : 36.08 MHz
Conducted Output Power	MCS8 (20MHz) : 19.50 dBm, MCS8 (40MHz) : 19.20 dBm
Carrier Frequencies	Please refer to section 3.5
Antenna	Please refer to section 3.4

Antenna & Band width

Antenna	Two (TX)	
Band width Mode	20 MHz	40 MHz
Draft n	V	V

IEEE 802.11n spec

MCS Index	Nss	Modulation	R	NBPS	NCBPS		NDBPS		Datarate(Mbps)			
					20MHz	40MHz	20MHz	40MHz	800nsGI		400nsGI	
									20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.200	15
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.400	30
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.700	45
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.900	60
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.300	90
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.800	120
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.000	135
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.200	150
8	2	BPSK	1/2	1	104	216	52	108	13.0	27.0	14.444	30
9	2	QPSK	1/2	2	208	432	104	216	26.0	54.0	28.889	60
10	2	QPSK	3/4	2	208	432	156	324	39.0	81.0	43.333	90
11	2	16-QAM	1/2	4	416	864	208	432	52.0	108.0	57.778	120
12	2	16-QAM	3/4	4	416	864	312	648	78.0	162.0	86.667	180
13	2	64-QAM	2/3	6	624	1296	416	864	104.0	216.0	115.556	240
14	2	64-QAM	3/4	6	624	1296	468	972	117.0	243.0	130.000	270
15	2	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0	144.444	300

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

3.2. Accessories

Power	Brand	Model	Rating
Adapter 1	LEADER	MT12-4120100-A1	Input: 120VAC, 60Hz, 0.3A Output: 12VDC, 1.0A
Adapter 2	DVE	DSA-12R-12 AUS 120120	Input: 100-120VAC, 50/60Hz, 0.3A Output: 12VDC, 1.0A

Note: < **Conduction** > :

Cause "**Adapter 1**" generated the worst test result, it was reported as final data.

< **Radiation** > :

Cause "**Adapter 2**" generated the worst test result, it was reported as final data.

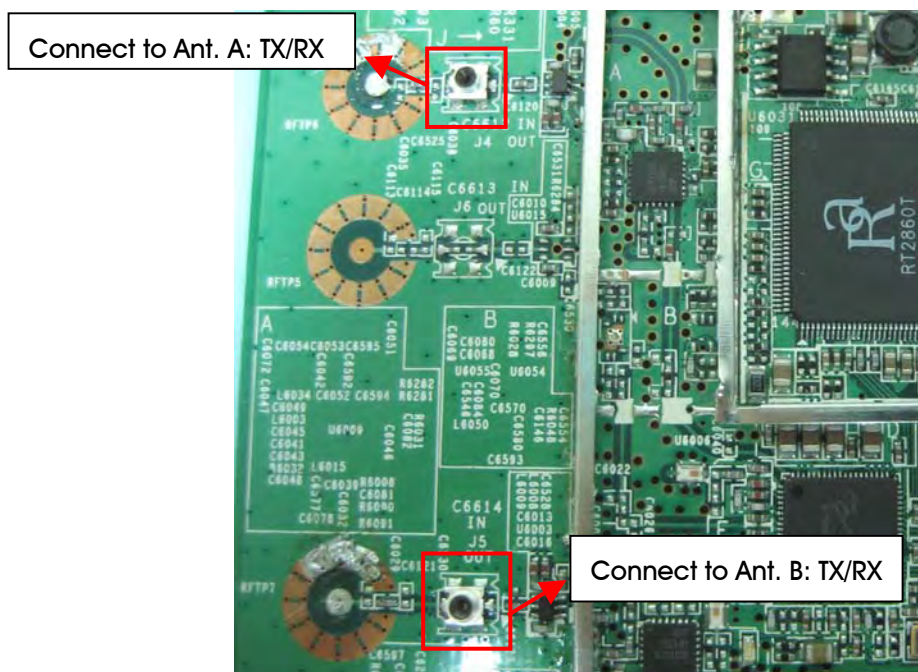
3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
A	Arcadyan	120300018400J	Dipole Antenna	NA	2.00	TX ant. / RX ant.
B	Arcadyan	120300018500J	Dipole Antenna	NA	2.00	TX ant. / RX ant.

The EUT has two antennas.

Both antenna A and B can be used as transmit antenna.

Both antenna A and B can be used as receiving antenna.



3.4. Table for Carrier Frequencies

There are two bandwidth systems for draft 802.11n.

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

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

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

For draft 802.11n, the two TX Ant. A & Ant. B could transmit simultaneously.

3.5. Table for Test Modes

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

Test Items	Mode	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	6	A+B
6dB Spectrum Bandwidth	MCS8/20MHz	1/6/11	A+B
	MCS8/40MHz	3/6/9	A+B
Maximum Peak Conducted Output Power Power Spectral Density	MCS8/20MHz	1/6/11	A+B
	MCS8/40MHz	3/6/9	A+B
Radiated Emissions 9kHz~1GHz	Draft n /BPSK	6	A+B
Radiated Emissions 1GHz~10 th Harmonic	MCS8/20MHz	1/6/11	A+B
	MCS8/40MHz	3/6/9	A+B
Band Edge Emissions	MCS8/20MHz	1/11	A+B
	MCS8/40MHz	3/9	A+B

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	IC 4088	-
CO04-HY	Conduction	Hwa Ya	101377	IC 4088	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

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

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D505	E2K24GBRL
Notebook	DELL	D400	E2K24GBRL
Notebook	DELL	D400	E2K24GBRL

3.8. Table for Parameters of Test Software Setting

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

Power Parameters of Draft n MCS8 20MHz Ant. A + Ant. B

Test Software Version	ATE		
Frequency	2412 MHz	2437 MHz	2462 MHz
Draft n Ant. A	4	10	4
Draft n Ant. C	1	7	4

Power Parameters of Draft n MCS8 40MHz Ant. A + Ant. B

Test Software Version	ATE		
Frequency	2422 MHz	2437 MHz	2452 MHz
Draft n Ant. A	10	10	9
Draft n Ant. C	7	7	9

During the test, the following programs under WIN XP were executed:

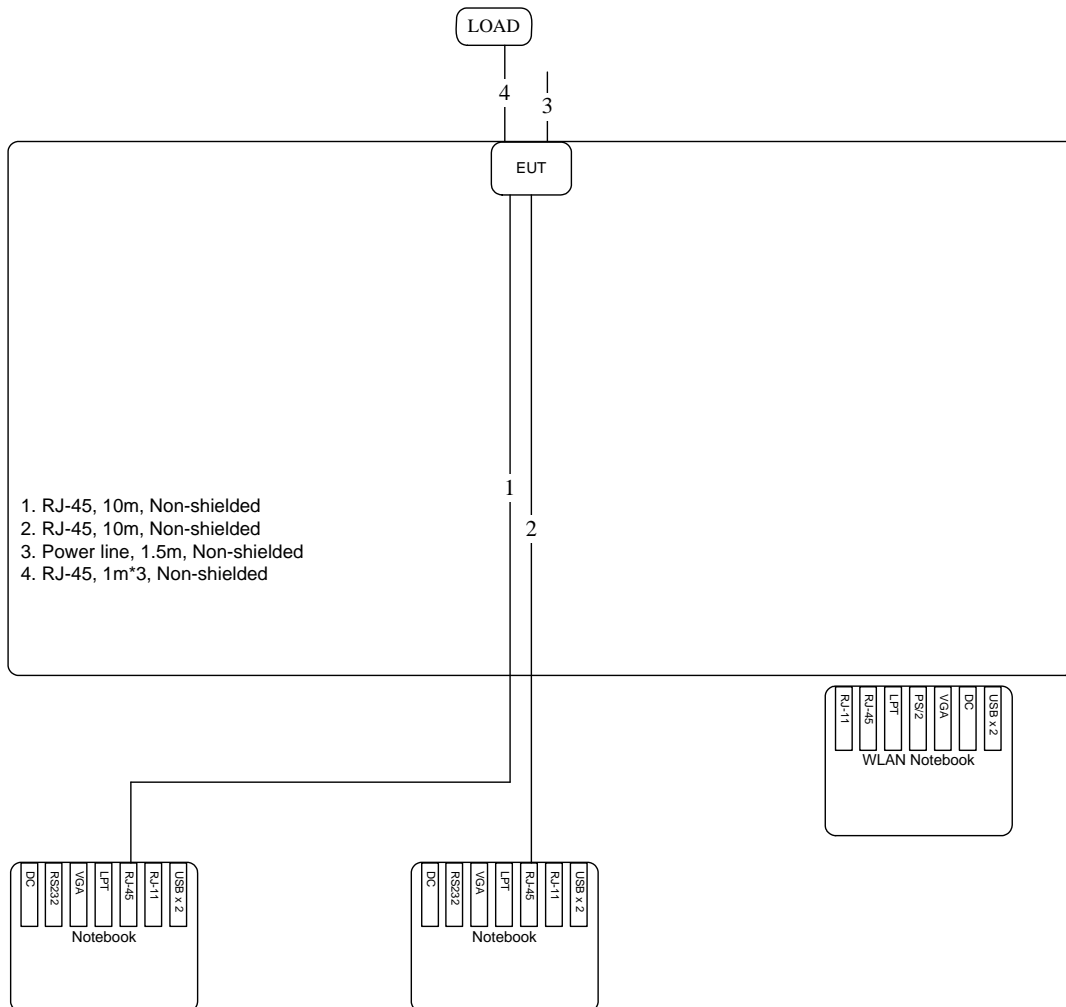
Executed "ping.exe" to link with the remote workstation to receive and transmit data by LAN and WLAN..

At the same time, "ATE.exe" was executed to control the EUT continuously transmit RF signal.

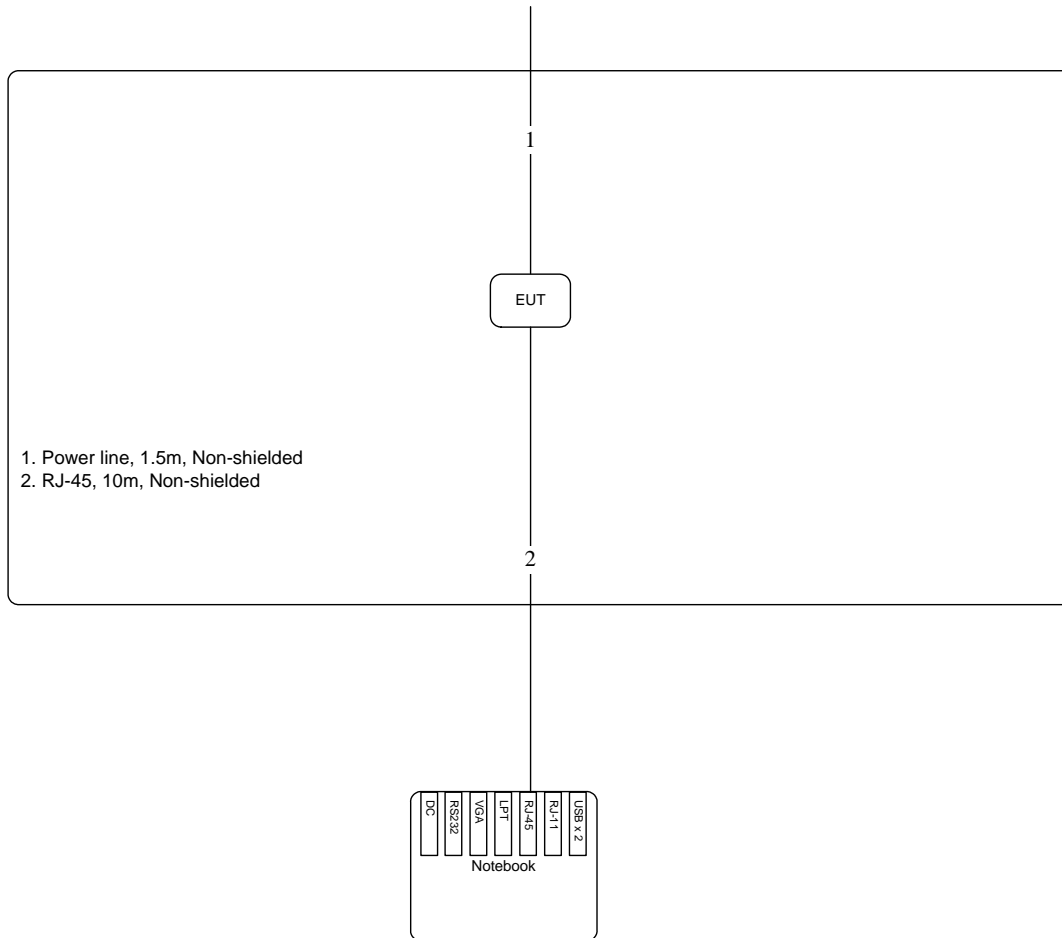
3.9. Test Configurations

3.9.1. Radiation Emissions Test Configuration

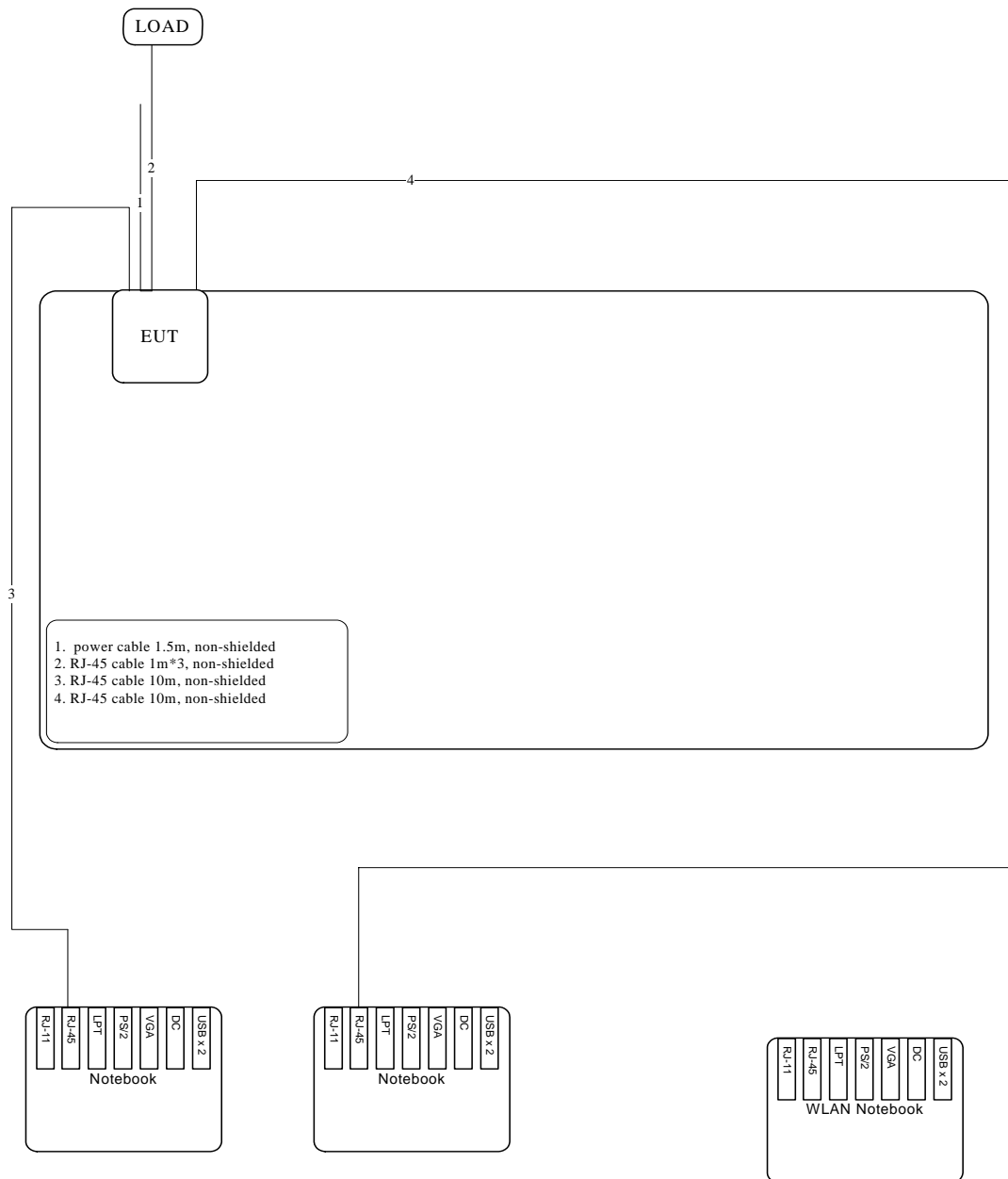
Test Configuration: 9KHz~1GHz



Test Configuration: above 1GHz



3.9.2. AC Power Line Conduction Emissions Test Configuration



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. 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.

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

4.1.2. Measuring Instruments and Setting

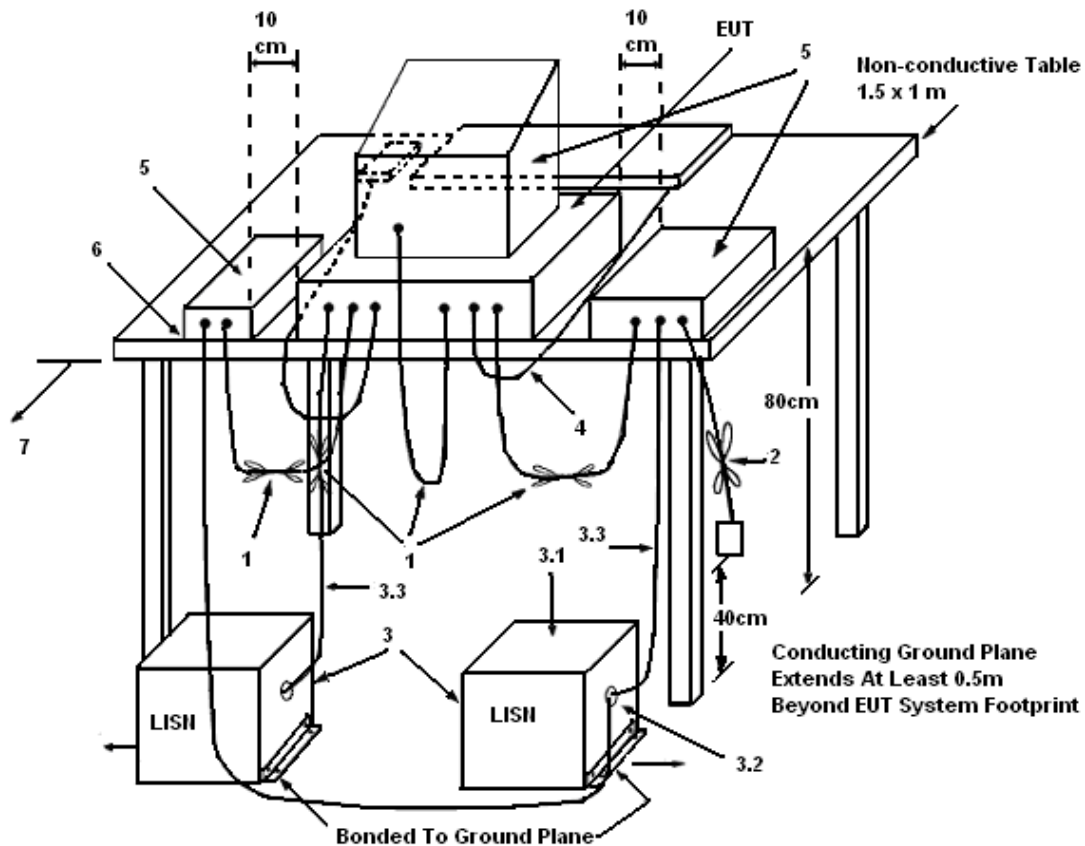
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. 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 50Ω . 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.

4.1.5. Test Deviation

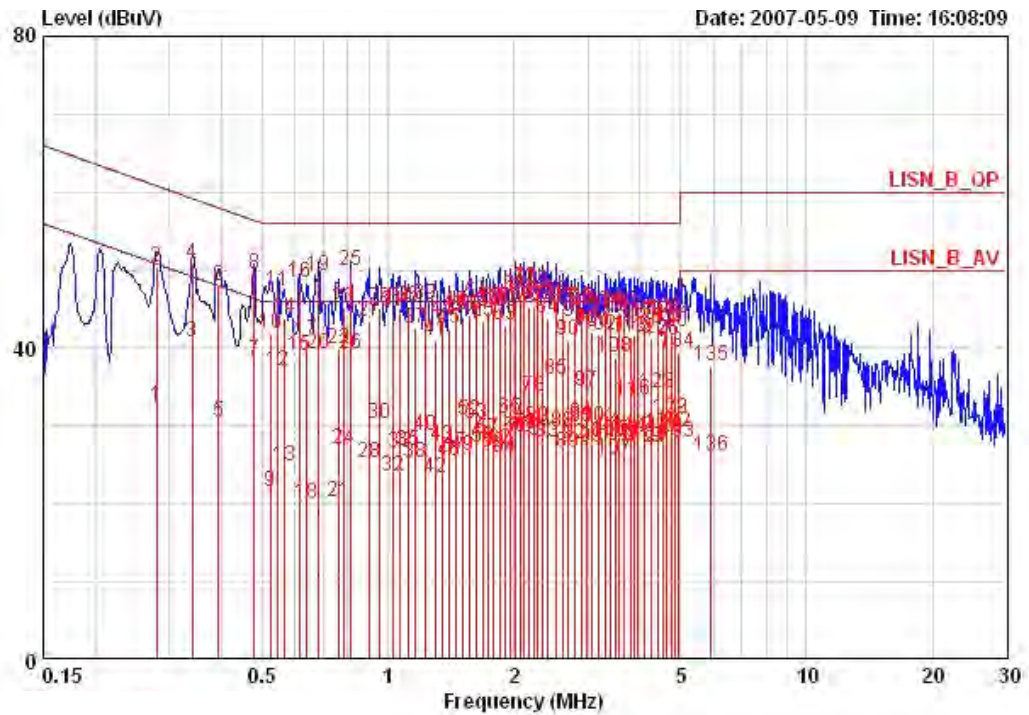
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	20°C	Humidity	59%
Test Engineer	Barry Chen	Phase	Line
Configuration	Normal Link		



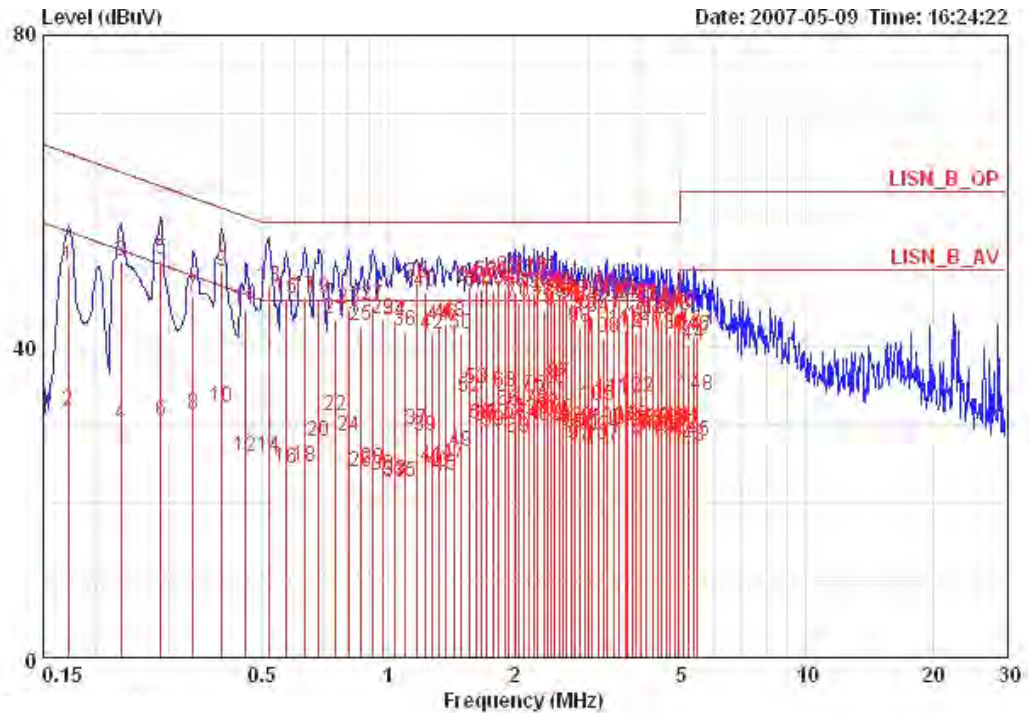
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.28029	32.46	-18.35	50.81	32.16	0.10	0.20	AVERAGE	LINE
2	0.28029	50.32	-10.49	60.81	50.02	0.10	0.20	QP	LINE
3	0.34100	40.75	-8.43	49.18	40.45	0.10	0.20	AVERAGE	LINE
4	0.34100	50.72	-8.46	59.18	50.42	0.10	0.20	QP	LINE
5	0.39344	30.57	-17.42	47.99	30.27	0.10	0.20	AVERAGE	LINE
6	0.39344	47.88	-10.11	57.99	47.58	0.10	0.20	QP	LINE
7	0.47865	38.28	-8.08	46.36	38.07	0.09	0.13	AVERAGE	LINE
8	0.47865	49.52	-6.84	56.36	49.31	0.09	0.13	QP	LINE
9	0.52376	21.53	-24.48	46.00	21.25	0.08	0.20	AVERAGE	LINE
10	0.52376	41.93	-14.08	56.00	41.65	0.08	0.20	QP	LINE
11	0.54644	47.37	-8.63	56.00	47.09	0.08	0.20	QP	LINE
12	0.54644	37.08	-8.92	46.00	36.80	0.08	0.20	AVERAGE	LINE
13	0.56409	24.88	-21.12	46.00	24.61	0.07	0.20	AVERAGE	LINE
14	0.56409	43.78	-12.22	56.00	43.51	0.07	0.20	QP	LINE
15	0.61400	38.95	-7.05	46.00	38.69	0.06	0.20	AVERAGE	LINE
16	0.61400	48.29	-7.71	56.00	48.03	0.06	0.20	QP	LINE
17	0.64058	40.90	-15.10	56.00	40.64	0.06	0.20	QP	LINE
18	0.64058	20.10	-25.90	46.00	19.84	0.06	0.20	AVERAGE	LINE
19	0.68263	49.24	-6.76	56.00	48.99	0.05	0.20	QP	LINE
20	0.68263	39.13	-6.87	46.00	38.88	0.05	0.20	AVERAGE	LINE
21	0.75894	20.29	-25.71	46.00	20.05	0.04	0.20	AVERAGE	LINE
22	0.75894	39.89	-16.11	56.00	39.65	0.04	0.20	QP	LINE
23	0.78345	45.23	-10.78	56.00	44.99	0.04	0.20	QP	LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
24	0.78345	26.94	-19.07	46.00	26.70	0.04	0.20	AVERAGE	LINE
25	0.81737	49.85	-6.15	56.00	49.62	0.03	0.20	QP	LINE
26	0.81737	39.17	-6.83	46.00	38.94	0.03	0.20	AVERAGE	LINE
27	0.89917	43.34	-12.67	56.00	43.12	0.02	0.20	QP	LINE
28	0.89917	25.23	-20.78	46.00	25.01	0.02	0.20	AVERAGE	LINE
29	0.95819	45.02	-10.99	56.00	44.81	0.01	0.20	QP	LINE
30	0.95819	30.26	-15.75	46.00	30.05	0.01	0.20	AVERAGE	LINE
31	1.027	44.62	-11.38	56.00	44.43	0.00	0.19	QP	LINE
32	1.027	23.48	-22.52	46.00	23.29	0.00	0.19	AVERAGE	LINE
33	1.065	26.69	-19.31	46.00	26.51	0.00	0.18	AVERAGE	LINE
34	1.065	45.06	-10.94	56.00	44.88	0.00	0.18	QP	LINE
35	1.117	26.89	-19.11	46.00	26.72	0.00	0.17	AVERAGE	LINE
36	1.117	45.27	-10.73	56.00	45.10	0.00	0.17	QP	LINE
37	1.166	42.52	-13.48	56.00	42.36	0.00	0.16	QP	LINE
38	1.166	25.27	-20.73	46.00	25.11	0.00	0.16	AVERAGE	LINE
39	1.229	45.59	-10.41	56.00	45.44	0.00	0.15	QP	LINE
40	1.229	28.70	-17.30	46.00	28.55	0.00	0.15	AVERAGE	LINE
41	1.303	40.99	-15.01	56.00	40.85	0.00	0.14	QP	LINE
42	1.303	23.30	-22.70	46.00	23.16	0.00	0.14	AVERAGE	LINE
43	1.345	27.44	-18.56	46.00	27.31	0.00	0.13	AVERAGE	LINE
44	1.345	43.52	-12.48	56.00	43.39	0.00	0.13	QP	LINE
45	1.403	42.44	-13.56	56.00	42.32	0.00	0.12	QP	LINE
46	1.403	25.56	-20.44	46.00	25.44	0.00	0.12	AVERAGE	LINE
47	1.456	26.62	-19.38	46.00	26.51	0.00	0.11	AVERAGE	LINE
48	1.456	44.69	-11.31	56.00	44.58	0.00	0.11	QP	LINE
49	1.511	26.23	-19.77	46.00	26.13	0.00	0.10	AVERAGE	LINE
50	1.511	44.01	-11.99	56.00	43.91	0.00	0.10	QP	LINE
51	1.568	44.33	-11.67	56.00	44.22	0.00	0.11	QP	LINE
52	1.568	30.68	-15.32	46.00	30.57	0.00	0.11	AVERAGE	LINE
53	1.619	30.20	-15.80	46.00	30.07	0.00	0.13	AVERAGE	LINE
54	1.619	45.88	-10.12	56.00	45.75	0.00	0.13	QP	LINE
55	1.680	43.46	-12.54	56.00	43.32	0.00	0.14	QP	LINE
56	1.680	27.21	-18.79	46.00	27.07	0.00	0.14	AVERAGE	LINE
57	1.734	28.39	-17.61	46.00	28.24	0.00	0.15	AVERAGE	LINE
58	1.734	44.71	-11.29	56.00	44.56	0.00	0.15	QP	LINE
59	1.781	26.58	-19.42	46.00	26.42	0.00	0.16	AVERAGE	LINE
60	1.781	45.12	-10.88	56.00	44.96	0.00	0.16	QP	LINE
61	1.848	44.86	-11.14	56.00	44.69	0.00	0.17	QP	LINE
62	1.848	26.93	-19.07	46.00	26.76	0.00	0.17	AVERAGE	LINE
63	1.908	42.93	-13.07	56.00	42.75	0.00	0.18	QP	LINE
64	1.908	25.86	-20.14	46.00	25.68	0.00	0.18	AVERAGE	LINE
65	1.959	30.85	-15.15	46.00	30.66	0.00	0.19	AVERAGE	LINE
66	1.959	45.06	-10.94	56.00	44.87	0.00	0.19	QP	LINE
67	2.012	46.64	-9.36	56.00	46.44	0.00	0.20	QP	LINE
68	2.012	28.56	-17.44	46.00	28.36	0.00	0.20	AVERAGE	LINE
69	2.066	46.31	-9.69	56.00	46.11	0.00	0.20	QP	LINE
70	2.066	28.58	-17.42	46.00	28.38	0.00	0.20	AVERAGE	LINE
71	2.121	29.06	-16.94	46.00	28.86	0.00	0.20	AVERAGE	LINE
72	2.121	47.74	-8.26	56.00	47.54	0.00	0.20	QP	LINE
73	2.121	47.42	-8.58	56.00	47.22	0.00	0.20	QP	LINE
74	2.121	29.06	-16.94	46.00	28.86	0.00	0.20	AVERAGE	LINE
75	2.178	28.02	-17.98	46.00	27.82	0.00	0.20	AVERAGE	LINE
76	2.178	45.25	-10.75	56.00	45.05	0.00	0.20	QP	LINE
77	2.237	45.37	-10.63	56.00	45.17	0.00	0.20	QP	LINE
78	2.237	33.74	-12.26	46.00	33.54	0.00	0.20	AVERAGE	LINE
79	2.285	47.21	-8.79	56.00	47.01	0.00	0.20	QP	LINE
80	2.285	29.79	-16.21	46.00	29.59	0.00	0.20	AVERAGE	LINE
81	2.346	29.14	-16.86	46.00	28.94	0.00	0.20	AVERAGE	LINE
82	2.346	45.64	-10.36	56.00	45.44	0.00	0.20	QP	LINE
83	2.409	27.82	-18.18	46.00	27.62	0.00	0.20	AVERAGE	LINE
84	2.409	43.90	-12.10	56.00	43.70	0.00	0.20	QP	LINE
85	2.513	35.88	-10.12	46.00	35.68	0.00	0.20	AVERAGE	LINE



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
86	2.513	46.09	-9.91	56.00	45.89	0.00	0.20	QP	LINE
87	2.622	45.04	-10.96	56.00	44.84	0.00	0.20	QP	LINE
88	2.622	29.25	-16.75	46.00	29.05	0.00	0.20	AVERAGE	LINE
89	2.692	26.65	-19.35	46.00	26.45	0.00	0.20	AVERAGE	LINE
90	2.692	41.08	-14.92	56.00	40.88	0.00	0.20	QP	LINE
91	2.794	43.44	-12.56	56.00	43.24	0.00	0.20	QP	LINE
92	2.794	27.69	-18.31	46.00	27.49	0.00	0.20	AVERAGE	LINE
93	2.900	29.94	-16.06	46.00	29.74	0.00	0.20	AVERAGE	LINE
94	2.900	30.31	-15.69	46.00	30.11	0.00	0.20	AVERAGE	LINE
95	2.900	45.20	-10.80	56.00	45.00	0.00	0.20	QP	LINE
96	2.900	44.84	-11.16	56.00	44.64	0.00	0.20	QP	LINE
97	2.978	34.52	-11.48	46.00	34.32	0.00	0.20	AVERAGE	LINE
98	2.978	42.55	-13.45	56.00	42.35	0.00	0.20	QP	LINE
99	3.074	27.29	-18.71	46.00	27.07	0.00	0.22	AVERAGE	LINE
100	3.074	42.05	-13.95	56.00	41.83	0.00	0.22	QP	LINE
101	3.190	29.97	-16.03	46.00	29.73	0.00	0.24	AVERAGE	LINE
102	3.190	41.53	-14.47	56.00	41.29	0.00	0.24	QP	LINE
103	3.293	28.86	-17.14	46.00	28.60	0.00	0.26	AVERAGE	LINE
104	3.293	44.75	-11.25	56.00	44.49	0.00	0.26	QP	LINE
105	3.399	28.16	-17.84	46.00	27.88	0.00	0.28	AVERAGE	LINE
106	3.399	43.95	-12.05	56.00	43.67	0.00	0.28	QP	LINE
107	3.491	25.73	-20.27	46.00	25.43	0.00	0.30	AVERAGE	LINE
108	3.491	38.82	-17.18	56.00	38.52	0.00	0.30	QP	LINE
109	3.565	27.99	-18.01	46.00	27.69	0.00	0.30	AVERAGE	LINE
110	3.565	44.73	-11.27	56.00	44.43	0.00	0.30	QP	LINE
111	3.681	27.89	-18.11	46.00	27.59	0.00	0.30	AVERAGE	LINE
112	3.681	44.22	-11.78	56.00	43.92	0.00	0.30	QP	LINE
113	3.799	41.34	-14.66	56.00	41.04	0.00	0.30	QP	LINE
114	3.799	28.64	-17.36	46.00	28.34	0.00	0.30	AVERAGE	LINE
115	3.860	41.58	-14.42	56.00	41.28	0.00	0.30	QP	LINE
116	3.860	33.37	-12.63	46.00	33.07	0.00	0.30	AVERAGE	LINE
117	3.964	43.12	-12.88	56.00	42.82	0.00	0.30	QP	LINE
118	3.964	27.64	-18.36	46.00	27.34	0.00	0.30	AVERAGE	LINE
119	4.114	27.21	-18.79	46.00	26.91	0.00	0.30	AVERAGE	LINE
120	4.114	42.51	-13.49	56.00	42.21	0.00	0.30	QP	LINE
121	4.247	27.21	-18.79	46.00	26.91	0.00	0.30	AVERAGE	LINE
122	4.247	41.17	-14.83	56.00	40.87	0.00	0.30	QP	LINE
123	4.407	34.19	-11.81	46.00	33.88	0.01	0.30	AVERAGE	LINE
124	4.407	43.44	-12.56	56.00	43.13	0.01	0.30	QP	LINE
125	4.525	40.93	-15.07	56.00	40.62	0.01	0.30	QP	LINE
126	4.525	29.00	-17.00	46.00	28.69	0.01	0.30	AVERAGE	LINE
127	4.622	43.89	-12.11	56.00	43.58	0.01	0.30	QP	LINE
128	4.622	28.52	-17.48	46.00	28.21	0.01	0.30	AVERAGE	LINE
129	4.746	31.02	-14.98	46.00	30.71	0.01	0.30	AVERAGE	LINE
130	4.746	42.08	-13.92	56.00	41.77	0.01	0.30	QP	LINE
131	4.848	42.92	-13.08	56.00	42.61	0.01	0.30	QP	LINE
132	4.848	29.12	-16.88	46.00	28.81	0.01	0.30	AVERAGE	LINE
133	4.926	27.81	-18.19	46.00	27.49	0.02	0.30	AVERAGE	LINE
134	4.926	39.39	-16.61	56.00	39.07	0.02	0.30	QP	LINE
135	5.929	37.62	-22.38	60.00	37.29	0.03	0.30	QP	LINE
136	5.929	26.17	-23.83	50.00	25.84	0.03	0.30	AVERAGE	LINE

Temperature	20°C	Humidity	59%
Test Engineer	Barry Chen	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.17215	50.37	-14.49	64.86	49.92	0.25	0.20	QP	NEUTRAL
2	0.17215	31.83	-23.03	54.86	31.38	0.25	0.20	AVERAGE	NEUTRAL
3	0.23040	51.03	-11.40	62.44	50.65	0.18	0.20	QP	NEUTRAL
4	0.23040	30.12	-22.31	52.44	29.74	0.18	0.20	AVERAGE	NEUTRAL
5	0.28630	51.32	-9.31	60.63	50.97	0.15	0.20	QP	NEUTRAL
6	0.28630	30.42	-20.21	50.63	30.07	0.15	0.20	AVERAGE	NEUTRAL
7	0.34281	46.63	-12.50	59.13	46.30	0.13	0.20	QP	NEUTRAL
8	0.34281	31.42	-17.71	49.13	31.09	0.13	0.20	AVERAGE	NEUTRAL
9	0.40187	49.68	-8.13	57.81	49.38	0.10	0.20	QP	NEUTRAL
10	0.40187	32.31	-15.50	47.81	32.01	0.10	0.20	AVERAGE	NEUTRAL
11	0.45636	44.85	-11.91	56.76	44.55	0.10	0.20	QP	NEUTRAL
12	0.45636	25.96	-20.80	46.76	25.66	0.10	0.20	AVERAGE	NEUTRAL
13	0.51824	47.80	-8.20	56.00	47.50	0.10	0.20	QP	NEUTRAL
14	0.51824	25.92	-20.08	46.00	25.62	0.10	0.20	AVERAGE	NEUTRAL
15	0.57313	46.19	-9.81	56.00	45.89	0.10	0.20	QP	NEUTRAL
16	0.57313	24.44	-21.56	46.00	24.14	0.10	0.20	AVERAGE	NEUTRAL
17	0.63048	46.43	-9.57	56.00	46.13	0.10	0.20	QP	NEUTRAL
18	0.63048	24.68	-21.32	46.00	24.38	0.10	0.20	AVERAGE	NEUTRAL
19	0.68263	46.25	-9.75	56.00	45.95	0.10	0.20	QP	NEUTRAL
20	0.68263	27.89	-18.11	46.00	27.59	0.10	0.20	AVERAGE	NEUTRAL
21	0.74697	43.61	-12.39	56.00	43.31	0.10	0.20	QP	NEUTRAL
22	0.74697	31.21	-14.79	46.00	30.91	0.10	0.20	AVERAGE	NEUTRAL
23	0.80449	44.91	-11.09	56.00	44.61	0.10	0.20	QP	NEUTRAL



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
24	0.80449	28.51	-17.49	46.00	28.21	0.10	0.20	AVERAGE	NEUTRAL
25	0.86185	42.76	-13.24	56.00	42.46	0.10	0.20	QP	NEUTRAL
26	0.86185	23.98	-22.02	46.00	23.68	0.10	0.20	AVERAGE	NEUTRAL
27	0.91843	45.34	-10.66	56.00	45.04	0.10	0.20	QP	NEUTRAL
28	0.91843	24.50	-21.50	46.00	24.20	0.10	0.20	AVERAGE	NEUTRAL
29	0.97354	43.54	-12.46	56.00	43.24	0.10	0.20	QP	NEUTRAL
30	0.97354	23.51	-22.49	46.00	23.21	0.10	0.20	AVERAGE	NEUTRAL
31	1.037	22.76	-23.24	46.00	22.47	0.10	0.19	AVERAGE	NEUTRAL
32	1.037	43.35	-12.65	56.00	43.06	0.10	0.19	QP	NEUTRAL
33	1.037	22.85	-23.15	46.00	22.56	0.10	0.19	AVERAGE	NEUTRAL
34	1.037	43.35	-12.65	56.00	43.06	0.10	0.19	QP	NEUTRAL
35	1.094	22.57	-23.43	46.00	22.29	0.10	0.18	AVERAGE	NEUTRAL
36	1.094	42.05	-13.95	56.00	41.77	0.10	0.18	QP	NEUTRAL
37	1.172	29.36	-16.64	46.00	29.10	0.10	0.16	AVERAGE	NEUTRAL
38	1.172	48.21	-7.79	56.00	47.95	0.10	0.16	QP	NEUTRAL
39	1.229	28.63	-17.37	46.00	28.38	0.10	0.15	AVERAGE	NEUTRAL
40	1.229	47.07	-8.93	56.00	46.82	0.10	0.15	QP	NEUTRAL
41	1.269	24.65	-21.35	46.00	24.41	0.10	0.14	AVERAGE	NEUTRAL
42	1.269	41.68	-14.32	56.00	41.44	0.10	0.14	QP	NEUTRAL
43	1.324	23.92	-22.08	46.00	23.69	0.10	0.13	AVERAGE	NEUTRAL
44	1.324	42.83	-13.17	56.00	42.60	0.10	0.13	QP	NEUTRAL
45	1.374	23.60	-22.40	46.00	23.38	0.10	0.12	AVERAGE	NEUTRAL
46	1.374	42.85	-13.15	56.00	42.63	0.10	0.12	QP	NEUTRAL
47	1.441	25.15	-20.85	46.00	24.94	0.10	0.11	AVERAGE	NEUTRAL
48	1.441	43.16	-12.84	56.00	42.95	0.10	0.11	QP	NEUTRAL
49	1.495	26.49	-19.51	46.00	26.29	0.10	0.10	AVERAGE	NEUTRAL
50	1.495	41.72	-14.28	56.00	41.52	0.10	0.10	QP	NEUTRAL
51	1.560	47.82	-8.18	56.00	47.61	0.10	0.11	QP	NEUTRAL
52	1.560	33.57	-12.43	46.00	33.36	0.10	0.11	AVERAGE	NEUTRAL
53	1.619	34.74	-11.26	46.00	34.51	0.10	0.13	AVERAGE	NEUTRAL
54	1.619	47.05	-8.95	56.00	46.82	0.10	0.13	QP	NEUTRAL
55	1.671	29.99	-16.01	46.00	29.75	0.10	0.14	AVERAGE	NEUTRAL
56	1.671	47.56	-8.44	56.00	47.32	0.10	0.14	QP	NEUTRAL
57	1.725	29.84	-16.16	46.00	29.59	0.10	0.15	AVERAGE	NEUTRAL
58	1.725	48.41	-7.59	56.00	48.16	0.10	0.15	QP	NEUTRAL
59	1.781	29.15	-16.85	46.00	28.89	0.10	0.16	AVERAGE	NEUTRAL
60	1.781	47.27	-8.73	56.00	47.01	0.10	0.16	QP	NEUTRAL
61	1.839	48.25	-7.75	56.00	47.98	0.10	0.17	QP	NEUTRAL
62	1.839	30.16	-15.84	46.00	29.89	0.10	0.17	AVERAGE	NEUTRAL
63	1.898	34.17	-11.83	46.00	33.89	0.10	0.18	AVERAGE	NEUTRAL
64	1.898	47.57	-8.43	56.00	47.29	0.10	0.18	QP	NEUTRAL
65	1.949	49.03	-6.97	56.00	48.74	0.10	0.19	QP	NEUTRAL
66	1.949	31.75	-14.25	46.00	31.46	0.10	0.19	AVERAGE	NEUTRAL
67	2.012	30.33	-15.67	46.00	30.03	0.10	0.20	AVERAGE	NEUTRAL
68	2.012	47.10	-8.90	56.00	46.80	0.10	0.20	QP	NEUTRAL
69	2.055	28.37	-17.63	46.00	28.07	0.10	0.20	AVERAGE	NEUTRAL
70	2.055	45.82	-10.18	56.00	45.52	0.10	0.20	QP	NEUTRAL
71	2.121	48.35	-7.65	56.00	48.05	0.10	0.20	QP	NEUTRAL
72	2.121	30.71	-15.29	46.00	30.41	0.10	0.20	AVERAGE	NEUTRAL
73	2.178	46.92	-9.08	56.00	46.62	0.10	0.20	QP	NEUTRAL
74	2.178	30.03	-15.97	46.00	29.73	0.10	0.20	AVERAGE	NEUTRAL
75	2.237	33.69	-12.31	46.00	33.39	0.10	0.20	AVERAGE	NEUTRAL
76	2.237	46.85	-9.15	56.00	46.55	0.10	0.20	QP	NEUTRAL
77	2.285	48.71	-7.29	56.00	48.41	0.10	0.20	QP	NEUTRAL
78	2.285	31.85	-14.15	46.00	31.55	0.10	0.20	AVERAGE	NEUTRAL
79	2.358	44.73	-11.27	56.00	44.43	0.10	0.20	QP	NEUTRAL
80	2.358	30.53	-15.47	46.00	30.23	0.10	0.20	AVERAGE	NEUTRAL
81	2.396	48.94	-7.06	56.00	48.64	0.10	0.20	QP	NEUTRAL
82	2.396	31.33	-14.67	46.00	31.03	0.10	0.20	AVERAGE	NEUTRAL
83	2.448	29.79	-16.21	46.00	29.49	0.10	0.20	AVERAGE	NEUTRAL
84	2.448	47.36	-8.64	56.00	47.06	0.10	0.20	QP	NEUTRAL
85	2.500	45.85	-10.15	56.00	45.55	0.10	0.20	QP	NEUTRAL



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
86	2.500	34.69	-11.31	46.00	34.39	0.10	0.20	AVERAGE	NEUTRAL
87	2.567	35.37	-10.63	46.00	35.07	0.10	0.20	AVERAGE	NEUTRAL
88	2.567	46.83	-9.17	56.00	46.53	0.10	0.20	QP	NEUTRAL
89	2.622	46.69	-9.31	56.00	46.39	0.10	0.20	QP	NEUTRAL
90	2.622	30.79	-15.21	46.00	30.49	0.10	0.20	AVERAGE	NEUTRAL
91	2.678	30.09	-15.91	46.00	29.79	0.10	0.20	AVERAGE	NEUTRAL
92	2.678	46.23	-9.77	56.00	45.93	0.10	0.20	QP	NEUTRAL
93	2.736	29.57	-16.43	46.00	29.27	0.10	0.20	AVERAGE	NEUTRAL
94	2.736	45.65	-10.35	56.00	45.35	0.10	0.20	QP	NEUTRAL
95	2.794	29.09	-16.91	46.00	28.79	0.10	0.20	AVERAGE	NEUTRAL
96	2.794	45.09	-10.91	56.00	44.79	0.10	0.20	QP	NEUTRAL
97	2.869	27.46	-18.54	46.00	27.16	0.10	0.20	AVERAGE	NEUTRAL
98	2.869	42.57	-13.43	56.00	42.27	0.10	0.20	QP	NEUTRAL
99	2.946	44.20	-11.80	56.00	43.90	0.10	0.20	QP	NEUTRAL
100	2.946	28.73	-17.27	46.00	28.43	0.10	0.20	AVERAGE	NEUTRAL
101	3.009	29.58	-16.42	46.00	29.28	0.10	0.20	AVERAGE	NEUTRAL
102	3.009	45.78	-10.22	56.00	45.48	0.10	0.20	QP	NEUTRAL
103	3.074	28.57	-17.43	46.00	28.25	0.10	0.22	AVERAGE	NEUTRAL
104	3.074	43.80	-12.20	56.00	43.48	0.10	0.22	QP	NEUTRAL
105	3.173	32.56	-13.44	46.00	32.22	0.10	0.24	AVERAGE	NEUTRAL
106	3.173	46.47	-9.53	56.00	46.13	0.10	0.24	QP	NEUTRAL
107	3.276	27.54	-18.46	46.00	27.18	0.10	0.26	AVERAGE	NEUTRAL
108	3.276	41.30	-14.70	56.00	40.94	0.10	0.26	QP	NEUTRAL
109	3.346	29.49	-16.51	46.00	29.12	0.10	0.27	AVERAGE	NEUTRAL
110	3.346	45.55	-10.45	56.00	45.18	0.10	0.27	QP	NEUTRAL
111	3.454	33.44	-12.56	46.00	33.05	0.10	0.29	AVERAGE	NEUTRAL
112	3.454	47.07	-8.93	56.00	46.68	0.10	0.29	QP	NEUTRAL
113	3.565	45.89	-10.11	56.00	45.49	0.10	0.30	QP	NEUTRAL
114	3.565	29.76	-16.24	46.00	29.36	0.10	0.30	AVERAGE	NEUTRAL
115	3.700	28.19	-17.81	46.00	27.79	0.10	0.30	AVERAGE	NEUTRAL
116	3.700	42.37	-13.63	56.00	41.97	0.10	0.30	QP	NEUTRAL
117	3.740	44.18	-11.82	56.00	43.78	0.10	0.30	QP	NEUTRAL
118	3.740	28.43	-17.57	46.00	28.03	0.10	0.30	AVERAGE	NEUTRAL
119	3.840	45.54	-10.46	56.00	45.14	0.10	0.30	QP	NEUTRAL
120	3.840	29.91	-16.09	46.00	29.51	0.10	0.30	AVERAGE	NEUTRAL
121	3.922	41.91	-14.09	56.00	41.51	0.10	0.30	QP	NEUTRAL
122	3.922	33.57	-12.43	46.00	33.17	0.10	0.30	AVERAGE	NEUTRAL
123	4.006	45.55	-10.45	56.00	45.15	0.10	0.30	QP	NEUTRAL
124	4.006	29.03	-16.97	46.00	28.63	0.10	0.30	AVERAGE	NEUTRAL
125	4.136	29.30	-16.70	46.00	28.90	0.10	0.30	AVERAGE	NEUTRAL
126	4.136	42.78	-13.22	56.00	42.38	0.10	0.30	QP	NEUTRAL
127	4.292	45.11	-10.89	56.00	44.71	0.10	0.30	QP	NEUTRAL
128	4.292	29.50	-16.50	46.00	29.10	0.10	0.30	AVERAGE	NEUTRAL
129	4.407	43.56	-12.44	56.00	43.16	0.10	0.30	QP	NEUTRAL
130	4.407	28.83	-17.17	46.00	28.43	0.10	0.30	AVERAGE	NEUTRAL
131	4.501	43.57	-12.43	56.00	43.17	0.10	0.30	QP	NEUTRAL
132	4.501	28.61	-17.39	46.00	28.21	0.10	0.30	AVERAGE	NEUTRAL
133	4.622	29.54	-16.46	46.00	29.14	0.10	0.30	AVERAGE	NEUTRAL
134	4.622	45.39	-10.61	56.00	44.99	0.10	0.30	QP	NEUTRAL
135	4.696	28.08	-17.92	46.00	27.68	0.10	0.30	AVERAGE	NEUTRAL
136	4.696	41.56	-14.44	56.00	41.16	0.10	0.30	QP	NEUTRAL
137	4.848	29.46	-16.54	46.00	29.06	0.10	0.30	AVERAGE	NEUTRAL
138	4.848	44.06	-11.94	56.00	43.66	0.10	0.30	QP	NEUTRAL
139	4.952	28.77	-17.23	46.00	28.37	0.10	0.30	AVERAGE	NEUTRAL
140	4.952	44.53	-11.47	56.00	44.13	0.10	0.30	QP	NEUTRAL
141	5.085	29.54	-20.46	50.00	29.14	0.10	0.30	AVERAGE	NEUTRAL
142	5.085	42.01	-17.99	60.00	41.61	0.10	0.30	QP	NEUTRAL
143	5.221	27.33	-22.67	50.00	26.93	0.10	0.30	AVERAGE	NEUTRAL
144	5.221	40.33	-19.67	60.00	39.93	0.10	0.30	QP	NEUTRAL
145	5.362	27.84	-22.16	50.00	27.44	0.10	0.30	AVERAGE	NEUTRAL
146	5.362	41.39	-18.61	60.00	40.99	0.10	0.30	QP	NEUTRAL
147	5.476	41.36	-18.64	60.00	40.96	0.10	0.30	QP	NEUTRAL
148	5.476	33.68	-16.32	50.00	33.28	0.10	0.30	AVERAGE	NEUTRAL

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

4.2. Maximum Peak Output Power Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

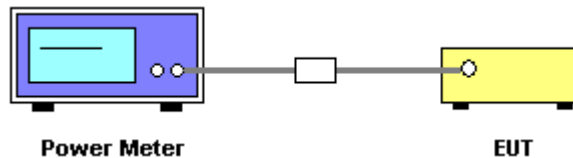
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Peak Sensor	NRV-Z32 (model 04)

4.2.3. 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.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Peak Output Power

Temperature	23°C	Humidity	58%
Test Engineer	Beck Wu	Configurations	802.11b/g

Configuration IEEE 802.11n MCS8 20MHz Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	13.50	30.00	Complies
6	2437 MHz	16.71	30.00	Complies
11	2462 MHz	13.04	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. B

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	13.71	30.00	Complies
6	2437 MHz	16.26	30.00	Complies
11	2462 MHz	12.95	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.62	30.00	Complies
6	2437 MHz	19.50	30.00	Complies
11	2462 MHz	16.01	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	16.09	30.00	Complies
6	2437 MHz	15.66	30.00	Complies
9	2452 MHz	15.16	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Ant. B

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	16.29	30.00	Complies
6	2437 MHz	16.66	30.00	Complies
9	2452 MHz	16.67	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	19.20	30.00	Complies
6	2437 MHz	19.20	30.00	Complies
9	2452 MHz	18.99	30.00	Complies

4.3. Power Spectral Density Measurement

4.3.1. 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.

4.3.2. Measuring Instruments and Setting

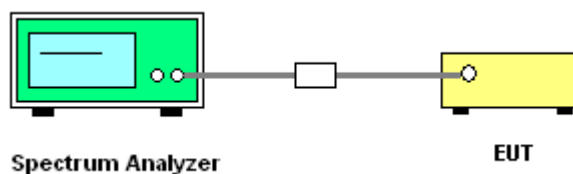
Please refer to section 5 of equipments list in this report. The following table is the setting of Spectrum Analyzer.

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

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
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.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	23°C	Humidity	58%
Test Engineer	Beck Wu	Configurations	802.11n

Configuration IEEE 802.11n MCS8 20MHz Ant. A

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-17.52	8.00	Complies
6	2437 MHz	-14.48	8.00	Complies
11	2462 MHz	-20.76	8.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. B

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-20.05	8.00	Complies
6	2437 MHz	-14.61	8.00	Complies
11	2462 MHz	-16.54	8.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-12.54	8.00	Complies
6	2437 MHz	-10.34	8.00	Complies
11	2462 MHz	-13.75	8.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Ant. A

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	-17.57	8.00	Complies
6	2437 MHz	-18.10	8.00	Complies
9	2452 MHz	-18.77	8.00	Complies

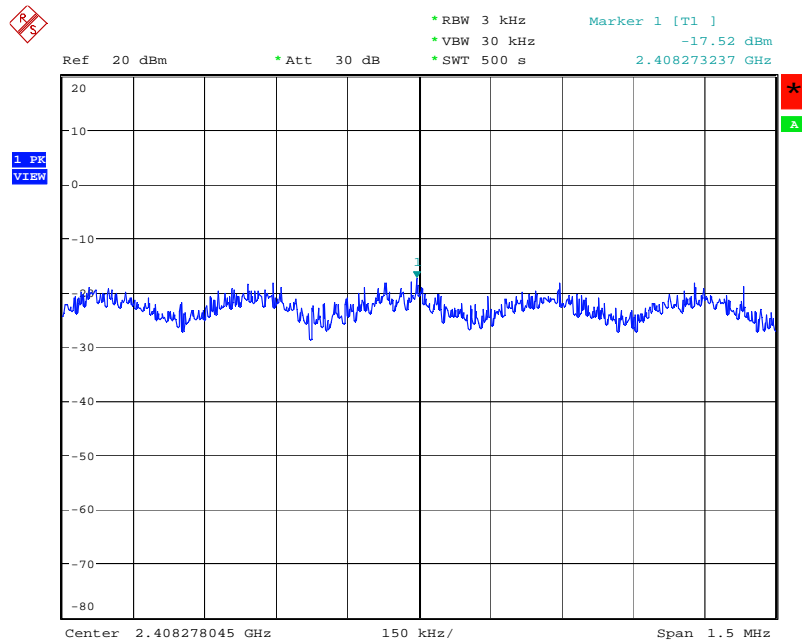
Configuration IEEE 802.11n MCS8 40MHz Ant. B

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	-18.47	8.00	Complies
6	2437 MHz	-18.75	8.00	Complies
9	2452 MHz	-18.81	8.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B

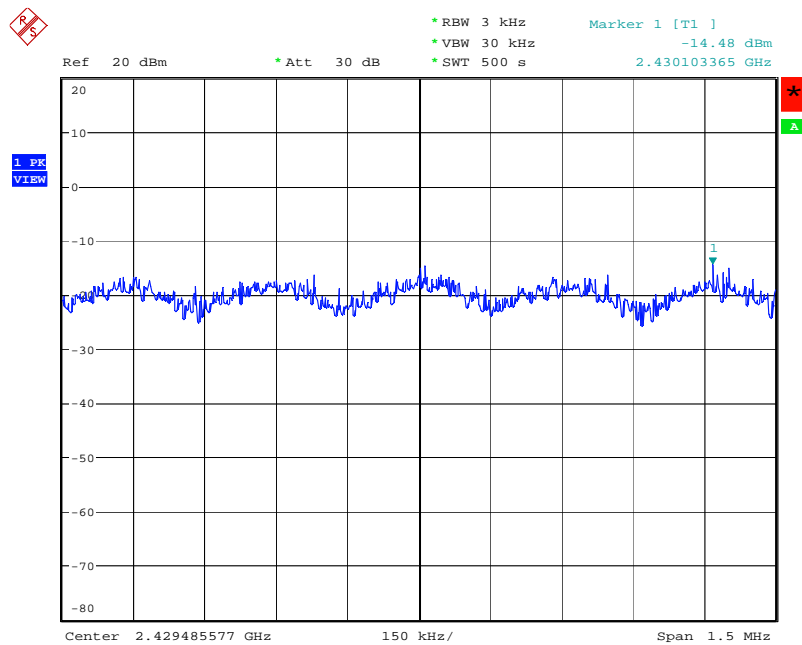
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	-11.75	8.00	Complies
6	2437 MHz	-11.65	8.00	Complies
9	2452 MHz	-12.27	8.00	Complies

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A / 2412 MHz



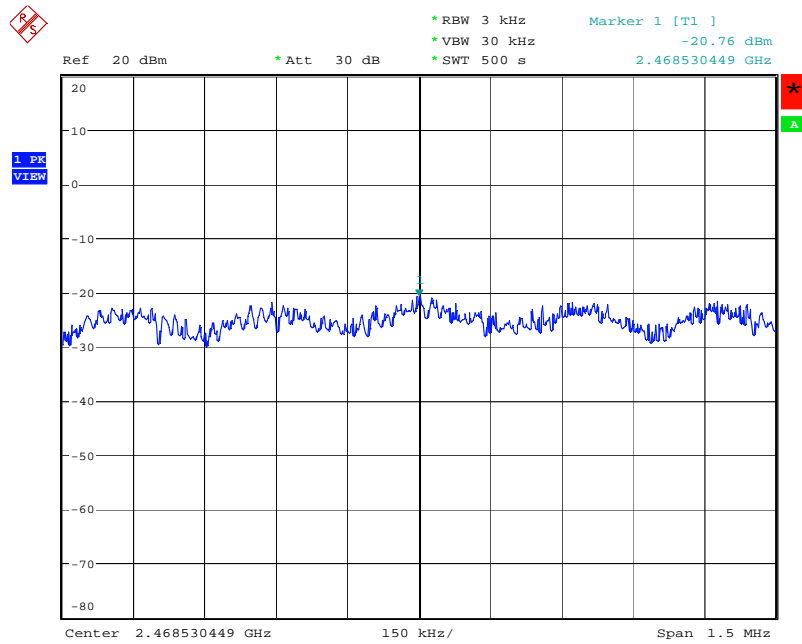
Date: 6.MAY.2007 20:52:19

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A / 2437 MHz



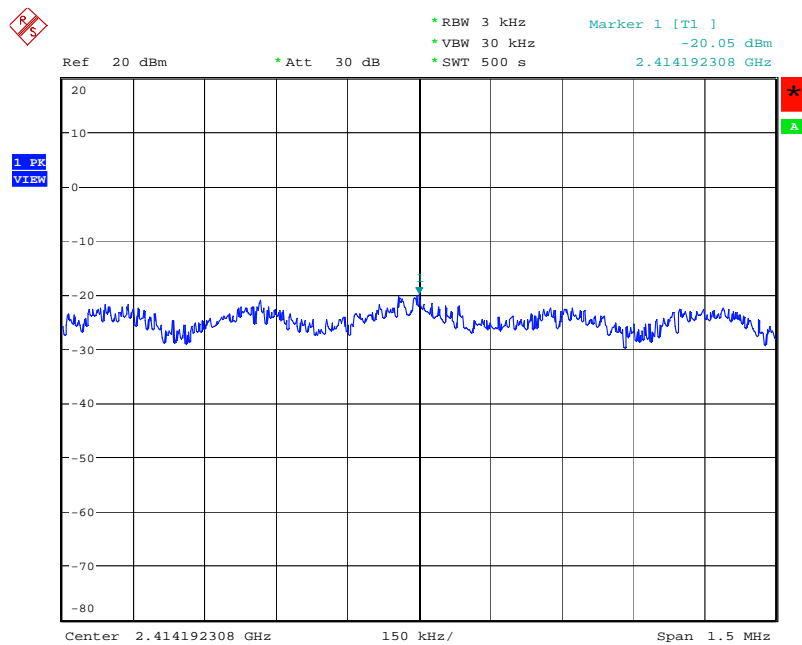
Date: 6.MAY.2007 20:53:34

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A / 2462 MHz



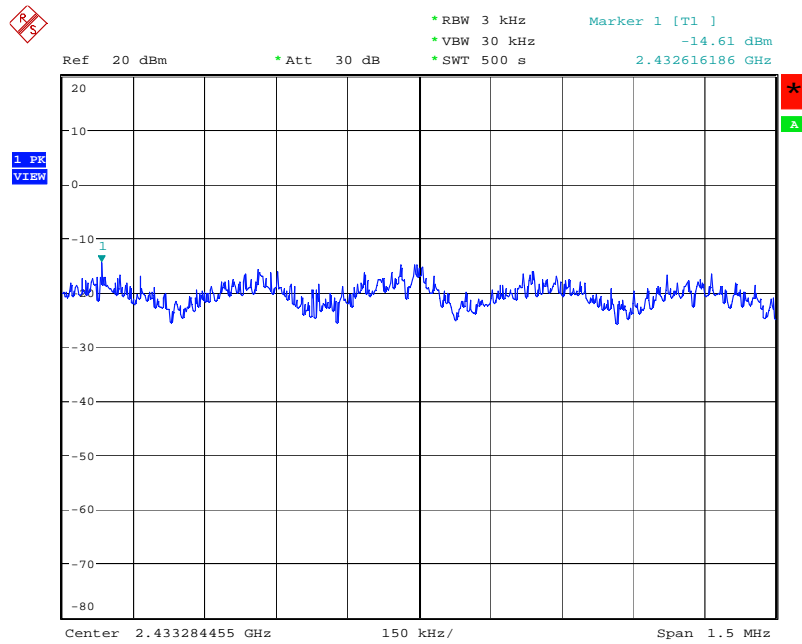
Date: 6.MAY.2007 21:29:41

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. B / 2412 MHz



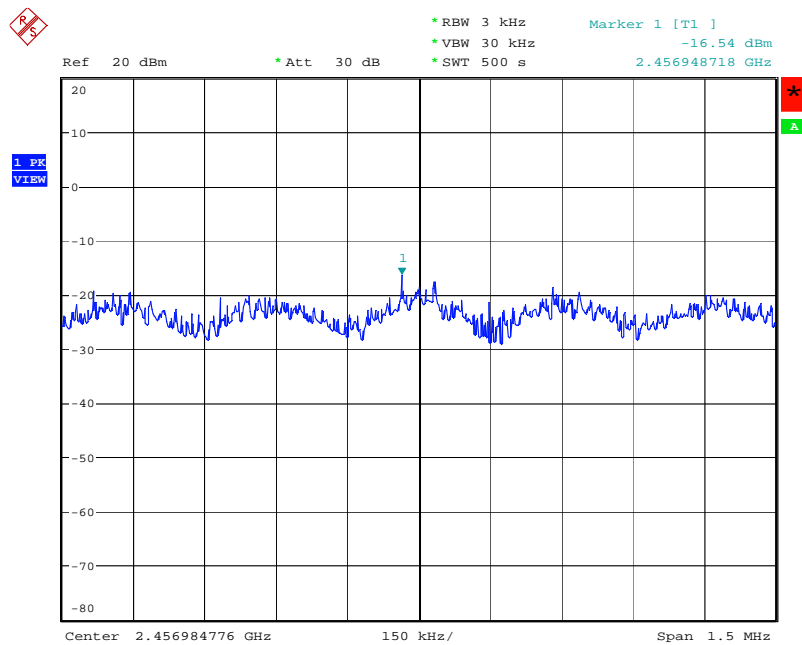
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Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. B/ 2437 MHz



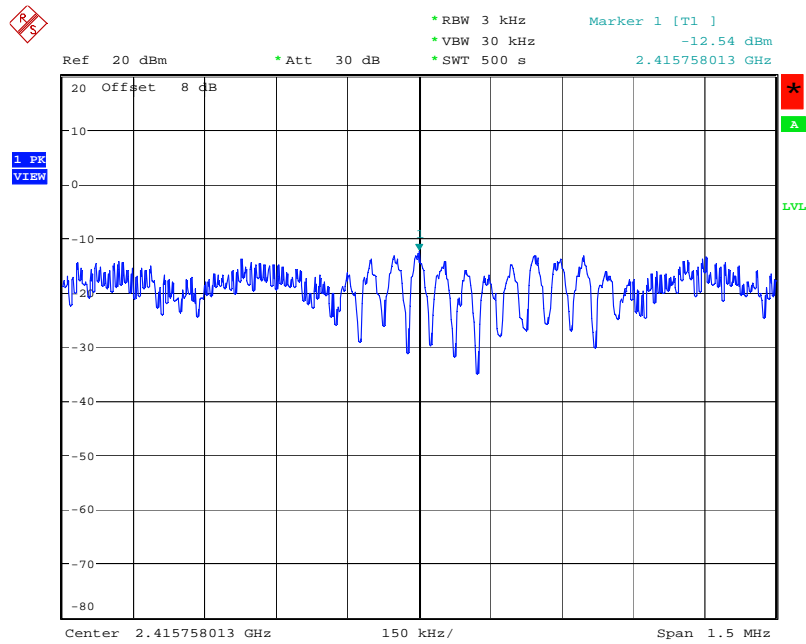
Date: 6.MAY.2007 20:57:17

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. B/ 2462 MHz



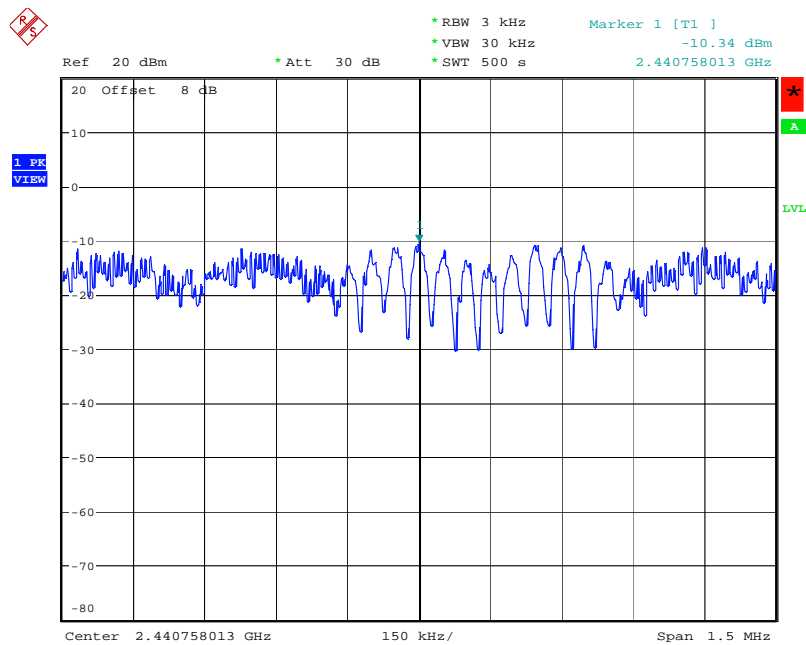
Date: 6.MAY.2007 20:56:26

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B / 2412 MHz



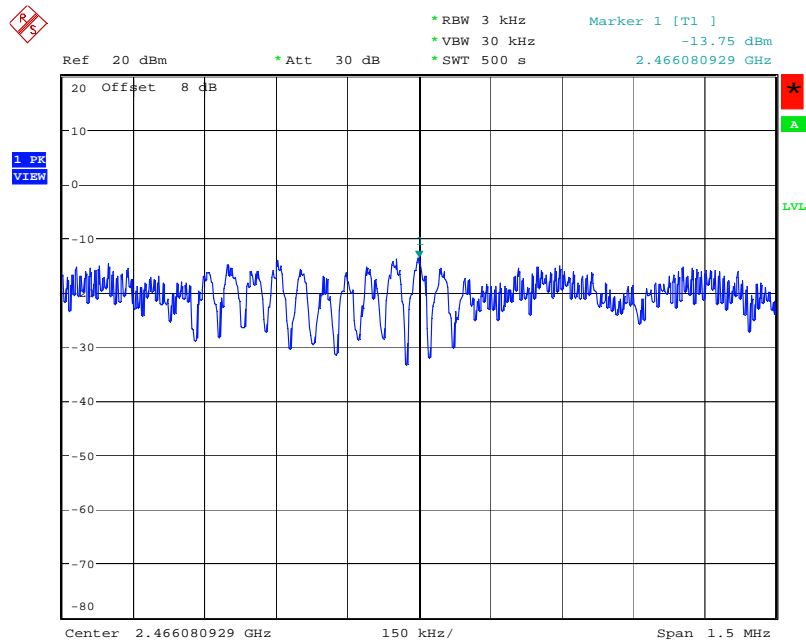
Date: 6.MAY.2007 23:04:37

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B / 2437 MHz



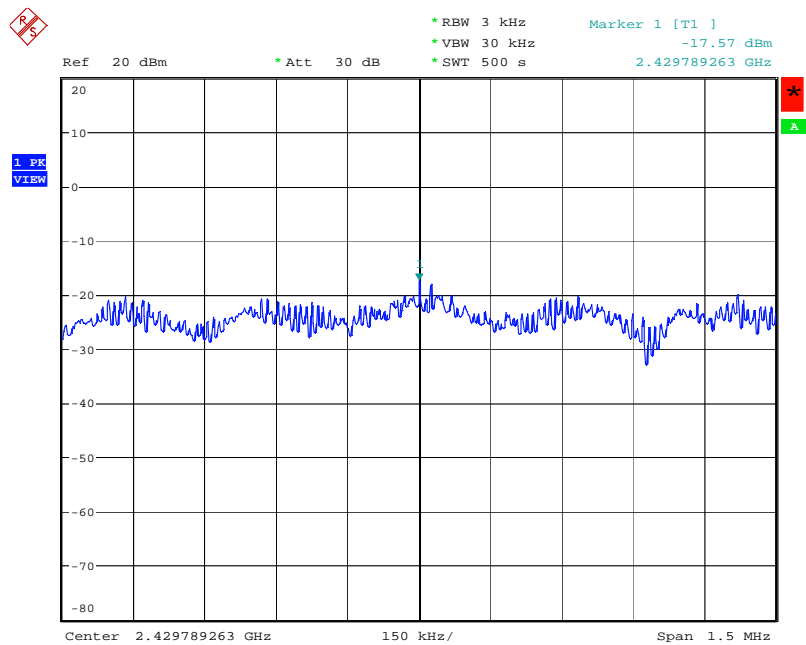
Date: 6.MAY.2007 23:03:36

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B / 2462 MHz



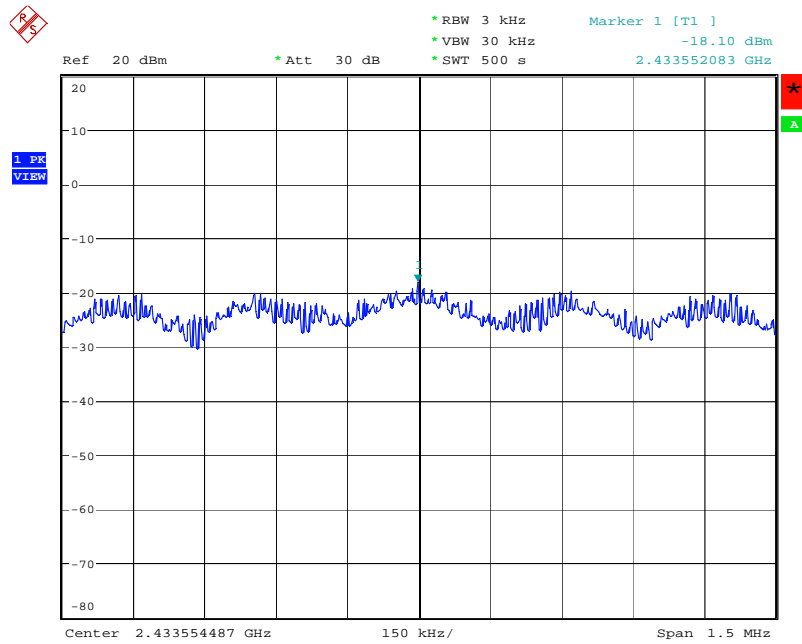
Date: 6.MAY.2007 23:01:56

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A / 2422 MHz



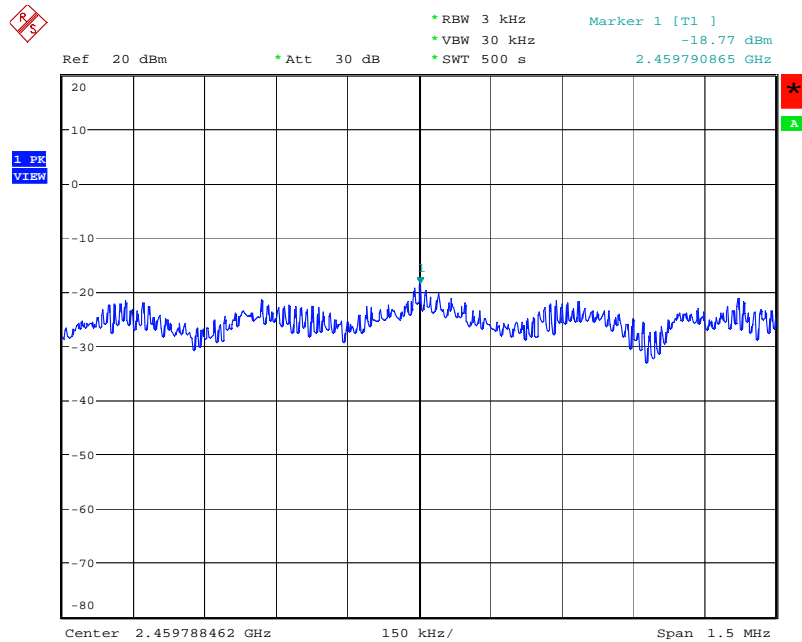
Date: 6.MAY.2007 22:36:02

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A / 2437 MHz



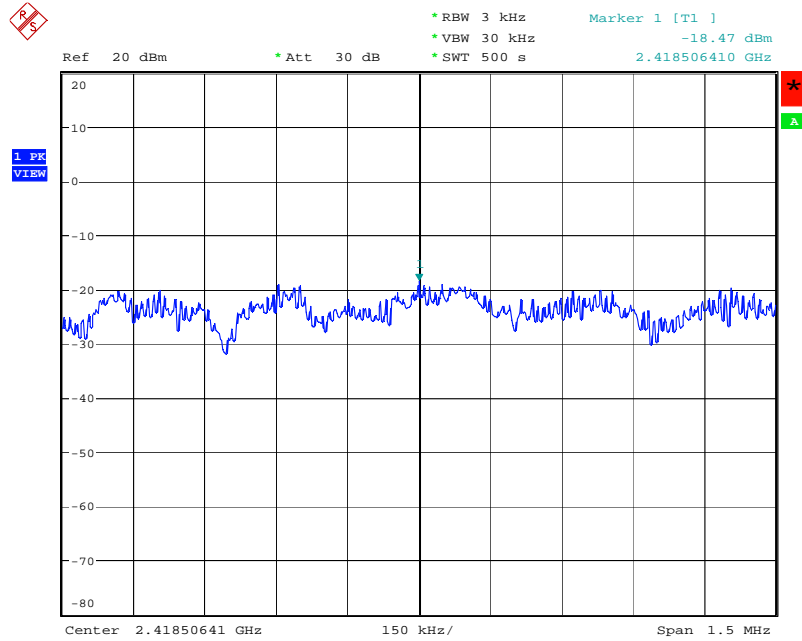
Date: 6.MAY.2007 22:40:57

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A / 2452 MHz



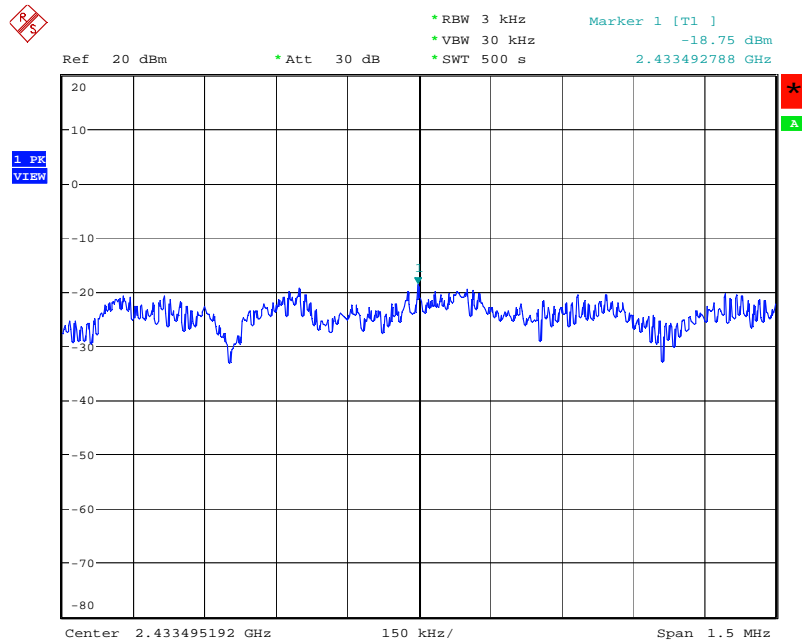
Date: 6.MAY.2007 22:44:57

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. B / 2422 MHz



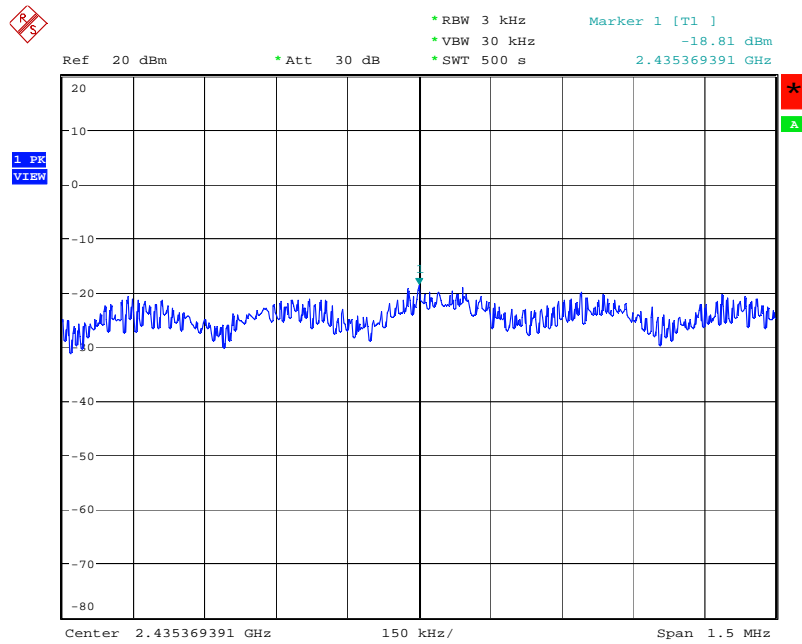
Date: 6.MAY.2007 22:09:13

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. B / 2437 MHz



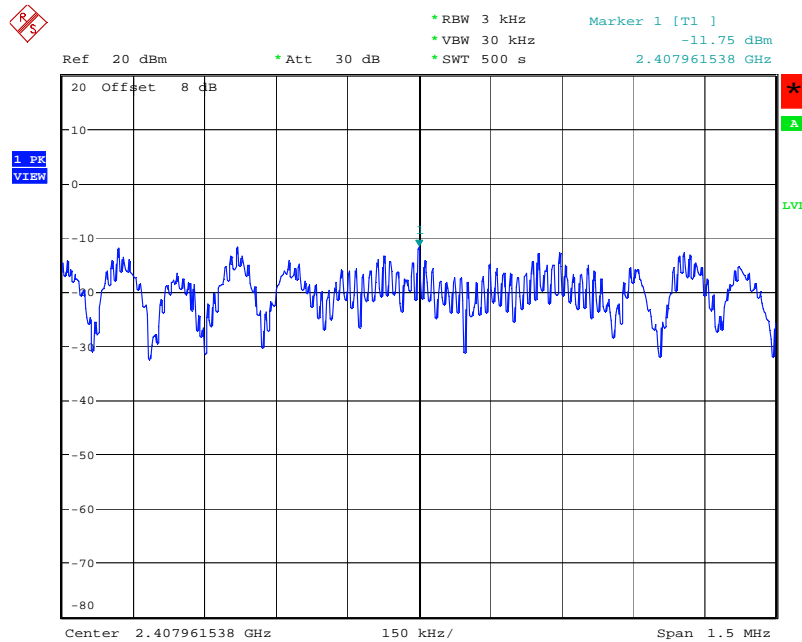
Date: 6.MAY.2007 22:14:47

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. B / 2452 MHz



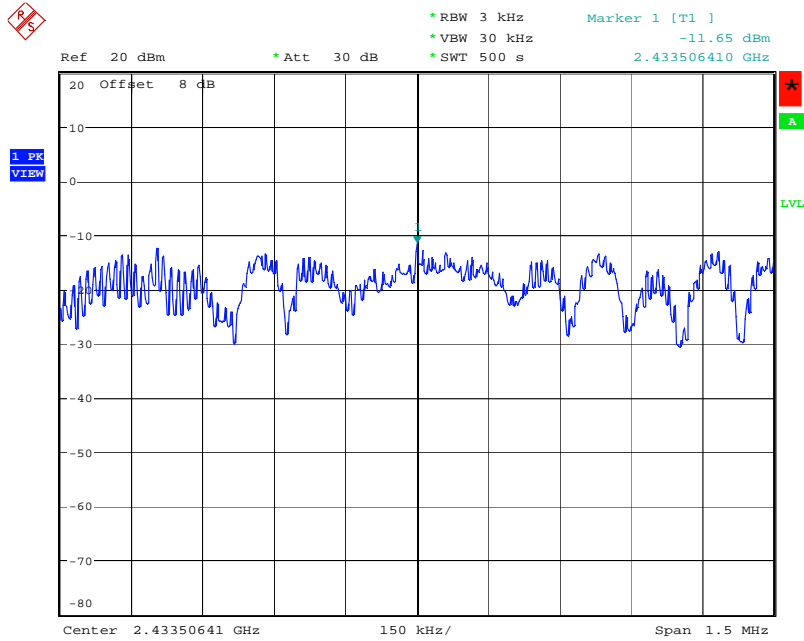
Date: 6.MAY.2007 22:19:39

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B / 2422 MHz



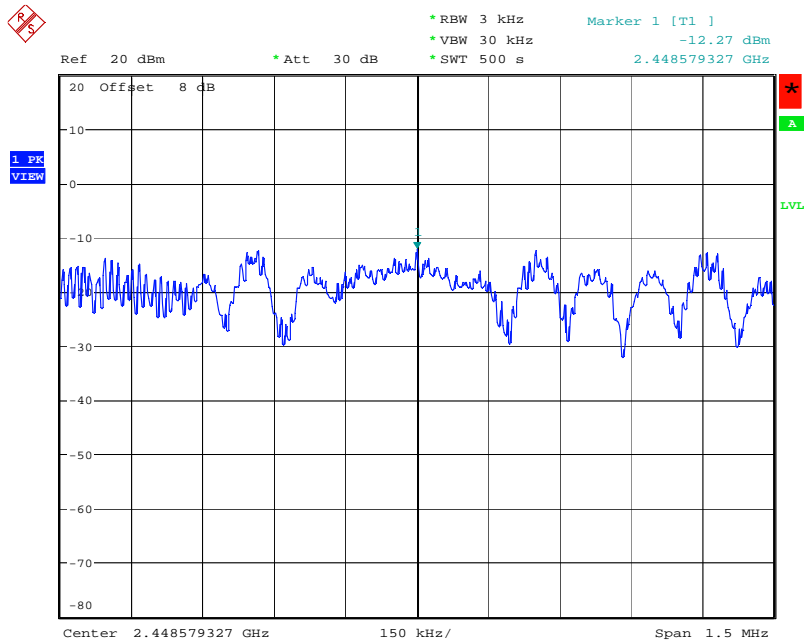
Date: 6.MAY.2007 23:10:20

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B / 2437 MHz



Date: 6.MAY.2007 23:17:09

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B / 2452 MHz



Date: 6.MAY.2007 23:21:20

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

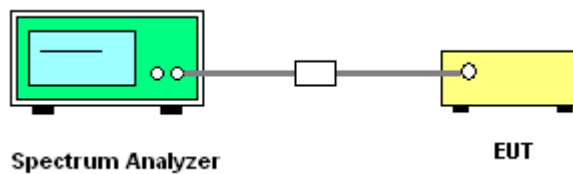
Please refer to section 5 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

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

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	23°C	Humidity	58%
Test Engineer	Beck Wu	Configurations	802.11n

Configuration IEEE 802.11n MCS8 20MHz Ant. A

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.33	17.59	500	Complies
6	2437 MHz	17.56	17.59	500	Complies
11	2462 MHz	17.66	17.59	500	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. B

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.33	17.56	500	Complies
6	2437 MHz	17.37	17.59	500	Complies
11	2462 MHz	17.30	17.56	500	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.66	17.62	500	Complies
6	2437 MHz	17.69	17.66	500	Complies
11	2462 MHz	17.66	17.59	500	Complies

Configuration IEEE 802.11n MCS8 40MHz Ant. A

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.41	36.02	500	Complies
6	2437 MHz	36.47	36.08	500	Complies
9	2452 MHz	36.47	36.08	500	Complies

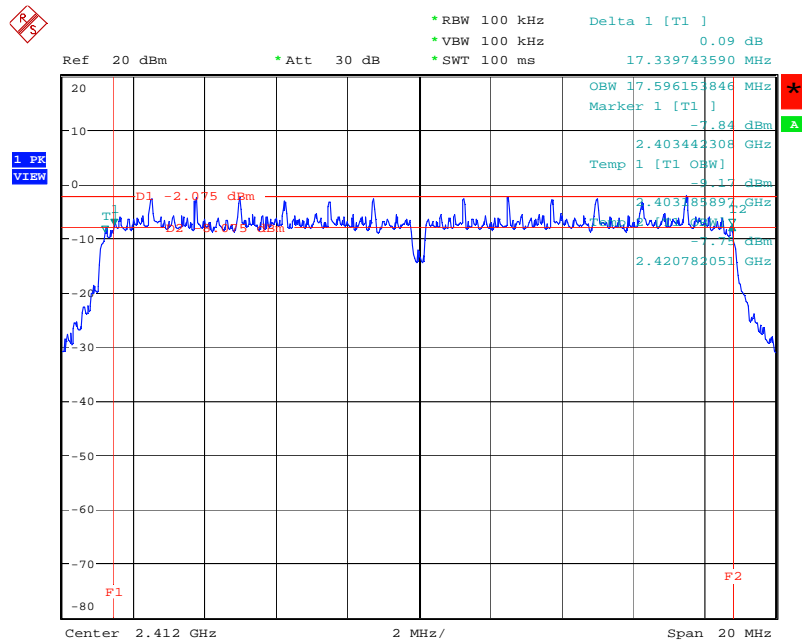
Configuration IEEE 802.11n MCS8 40MHz Ant. B

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.41	36.08	500	Complies
6	2437 MHz	36.34	36.08	500	Complies
9	2452 MHz	36.34	36.08	500	Complies

Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B

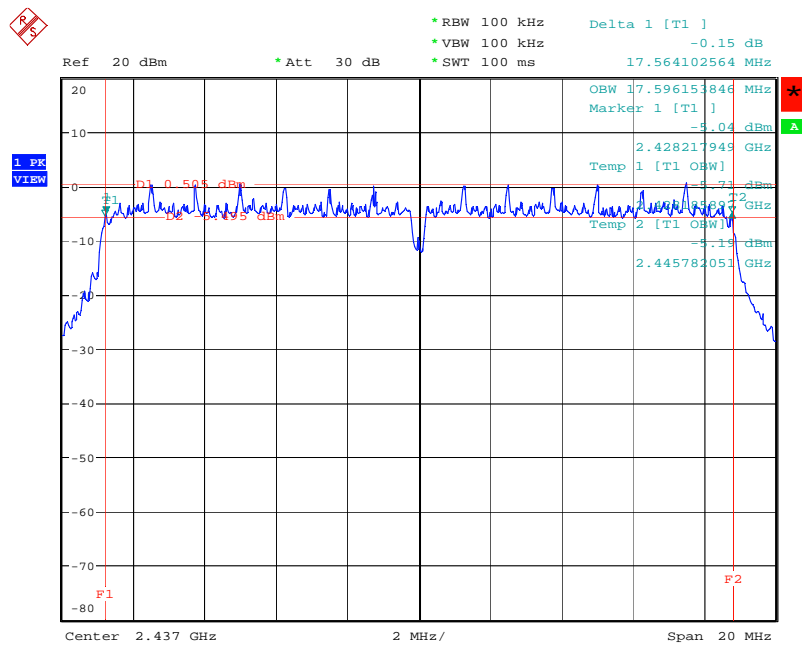
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.34	35.96	500	Complies
6	2437 MHz	36.34	36.02	500	Complies
9	2452 MHz	36.41	35.96	500	Complies

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A / 2412 MHz



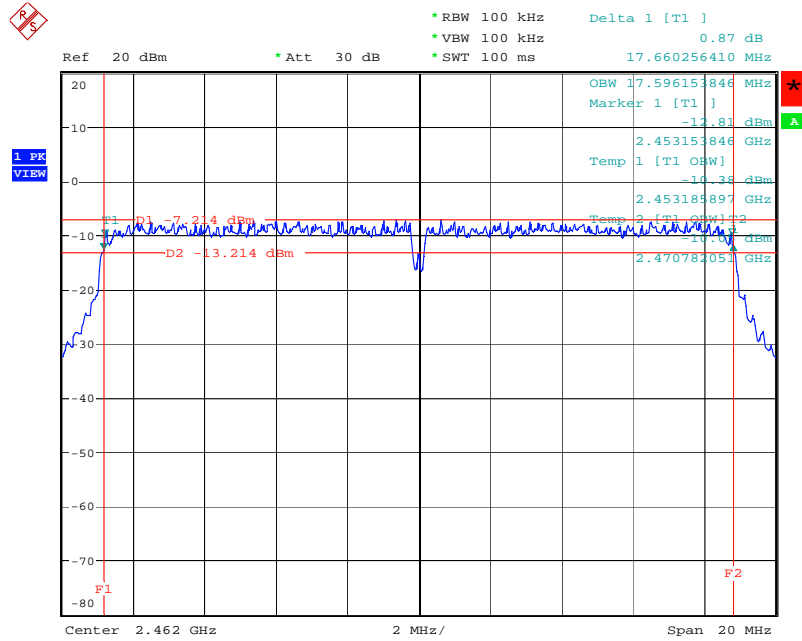
Date: 6.MAY.2007 20:51:53

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A / 2437 MHz



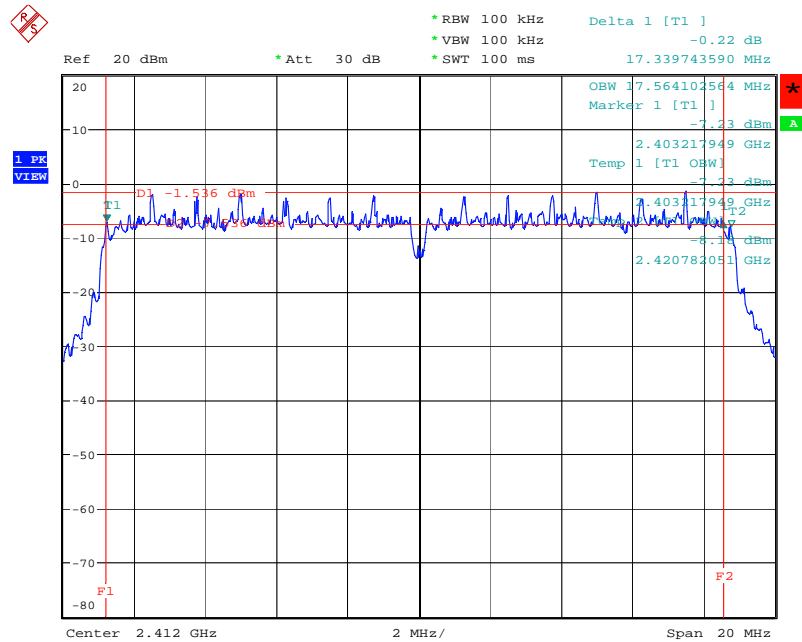
Date: 6.MAY.2007 20:53:17

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A / 2462 MHz



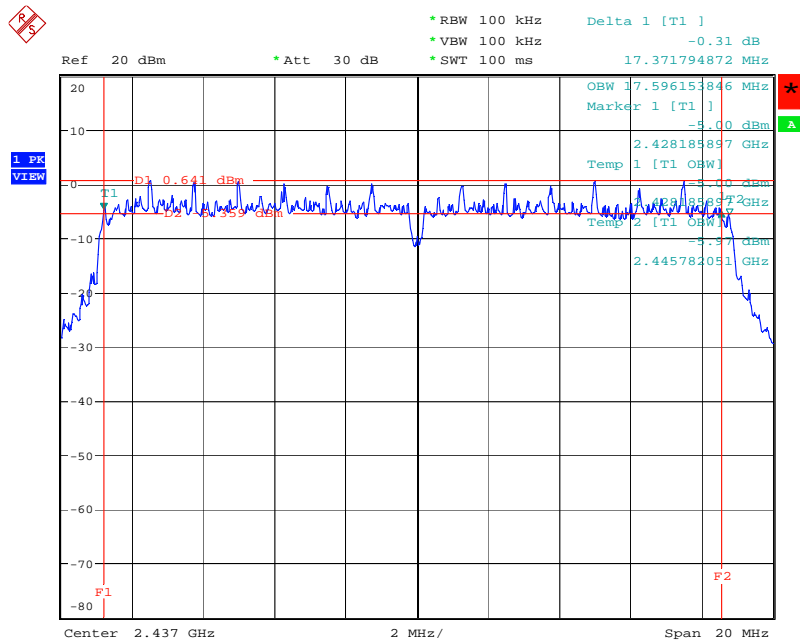
Date: 6.MAY.2007 21:29:26

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. B / 2412 MHz



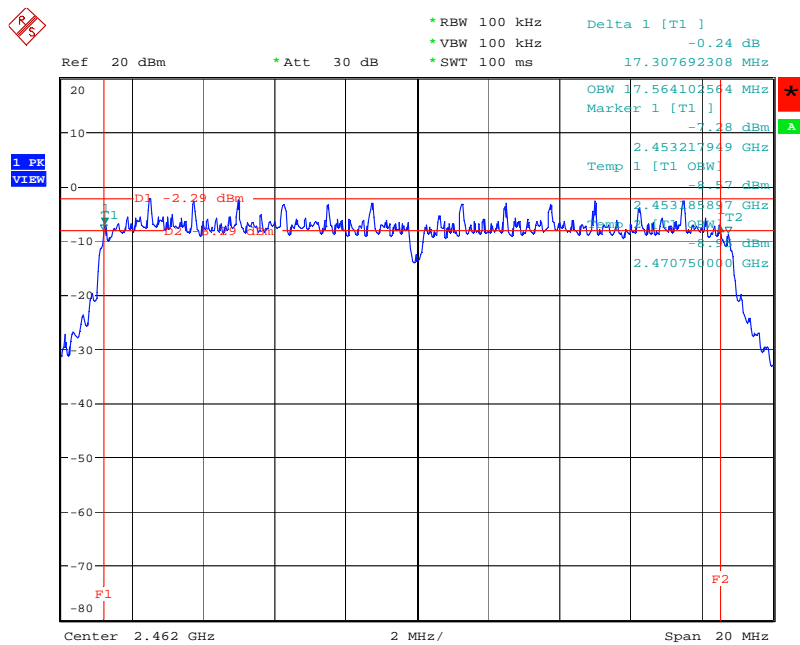
Date: 6.MAY.2007 20:58:13

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. B/ 2437 MHz



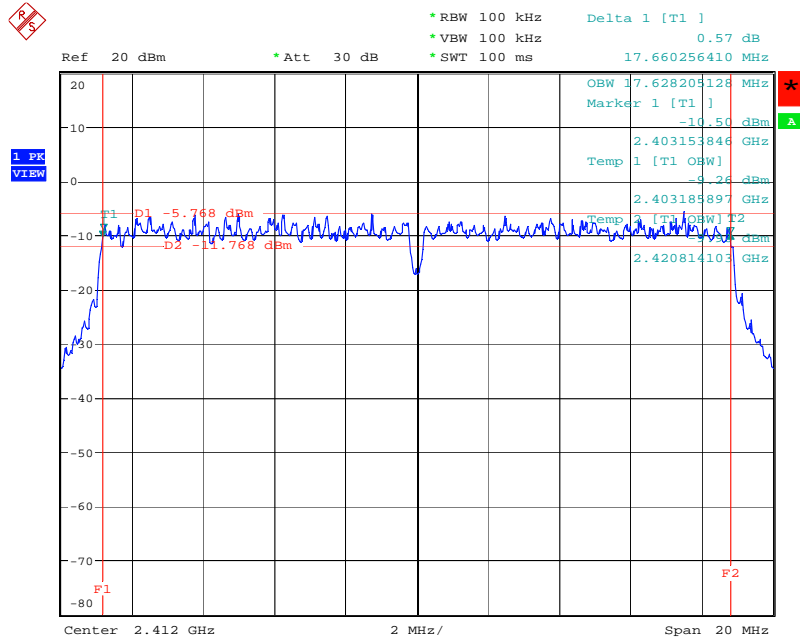
Date: 6.MAY.2007 20:57:01

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. B/ 2462 MHz



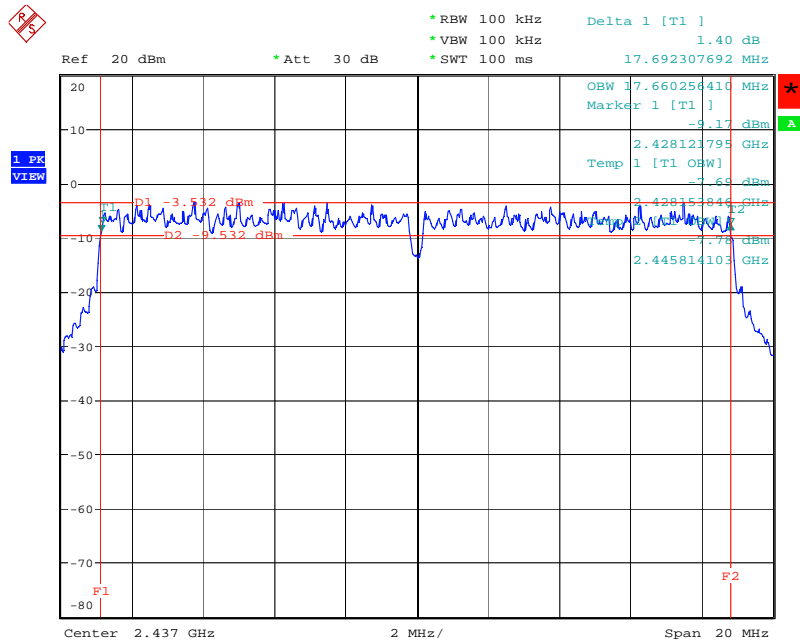
Date: 6.MAY.2007 20:56:10

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B / 2412 MHz



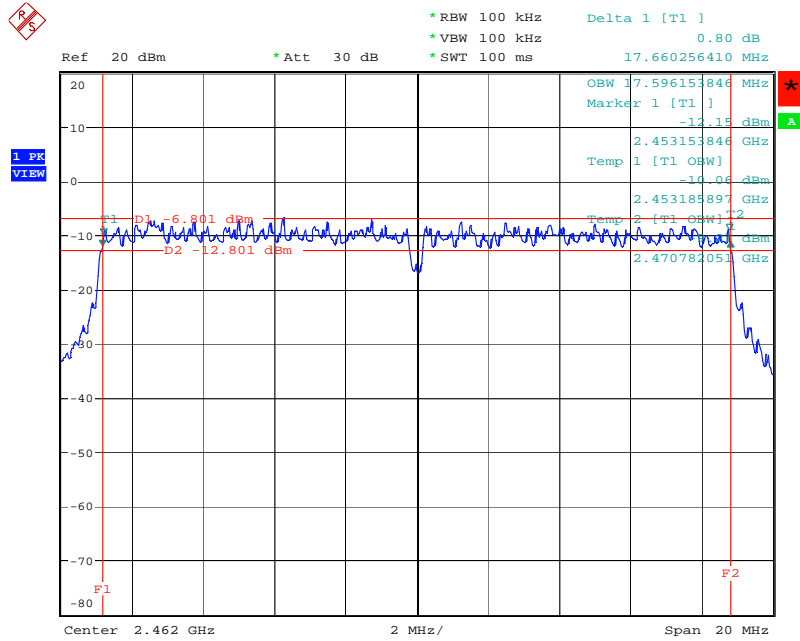
Date: 6.MAY.2007 23:04:12

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B / 2437 MHz



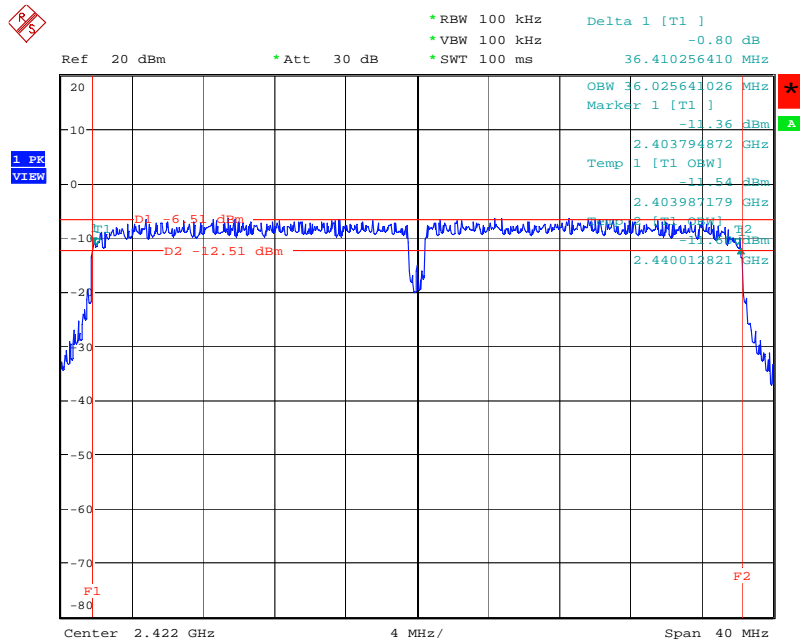
Date: 6.MAY.2007 23:03:20

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B / 2462 MHz



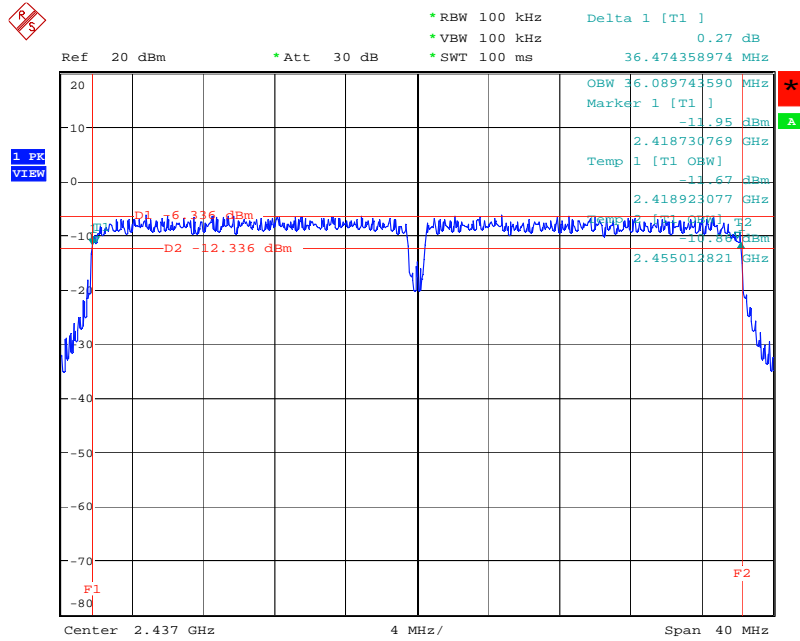
Date: 6.MAY.2007 23:01:41

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A / 2422 MHz



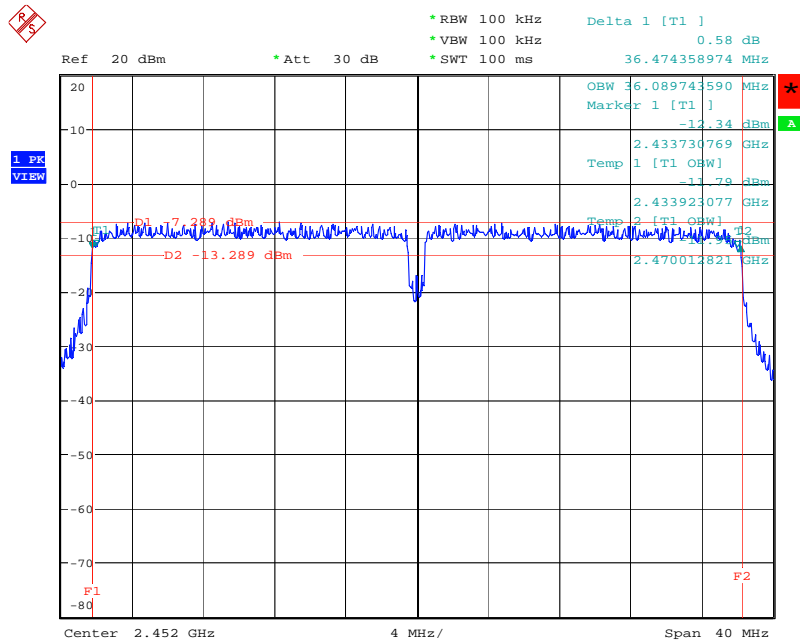
Date: 6.MAY.2007 22:32:13

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A / 2437 MHz



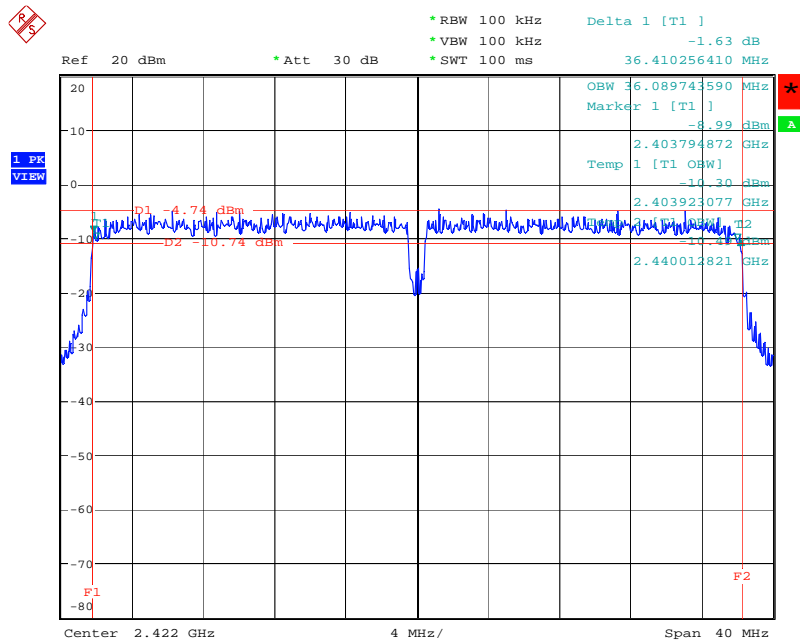
Date: 6.MAY.2007 22:40:32

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A / 2452 MHz



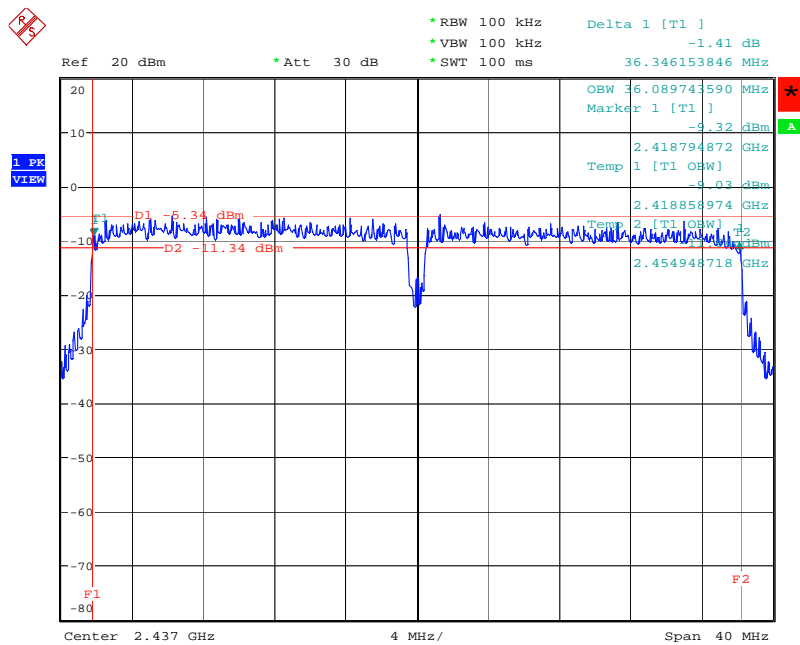
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6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. B / 2422 MHz



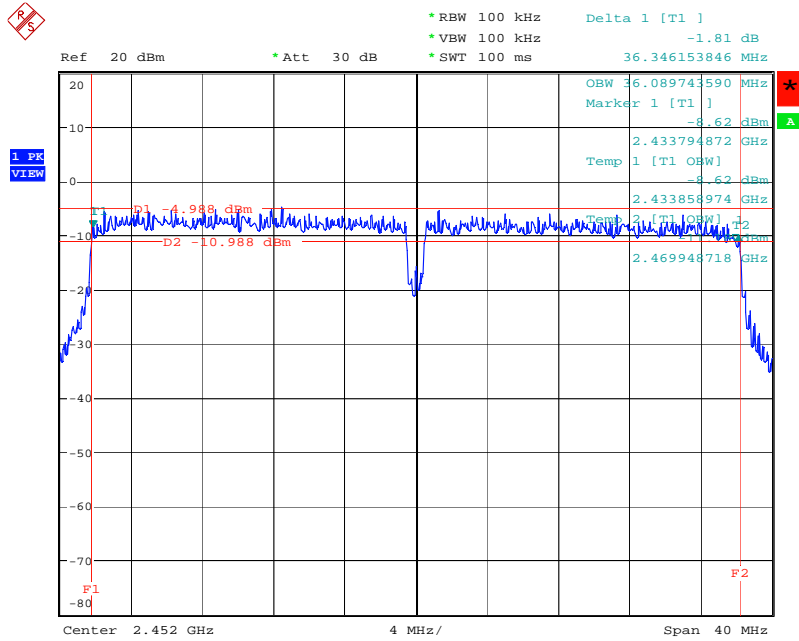
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6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. B / 2437 MHz



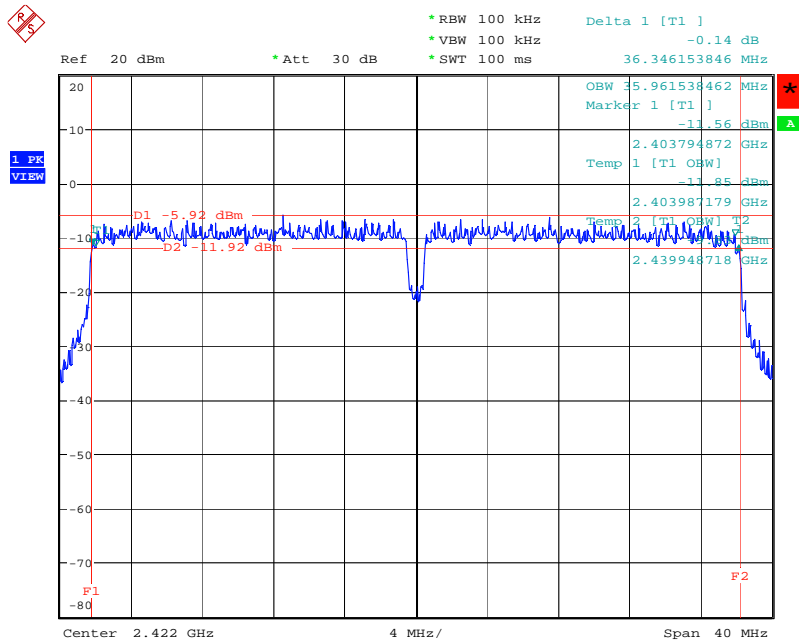
Date: 6.MAY.2007 22:14:21

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. B / 2452 MHz



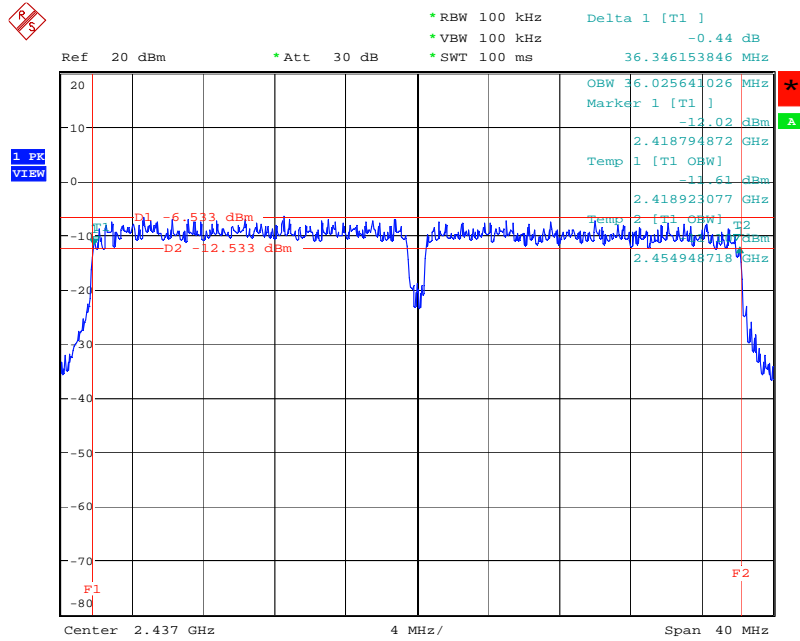
Date: 6.MAY.2007 22:19:13

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B / 2422 MHz



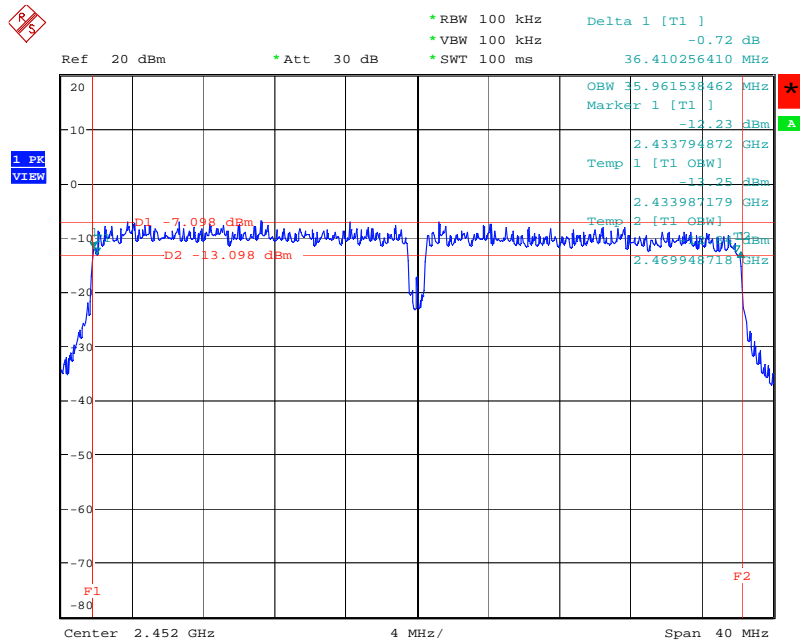
Date: 6.MAY.2007 23:13:32

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B / 2437 MHz



Date: 6.MAY.2007 23:16:44

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B / 2452 MHz



Date: 6.MAY.2007 23:20:54

4.5. Radiated Emissions Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

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

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

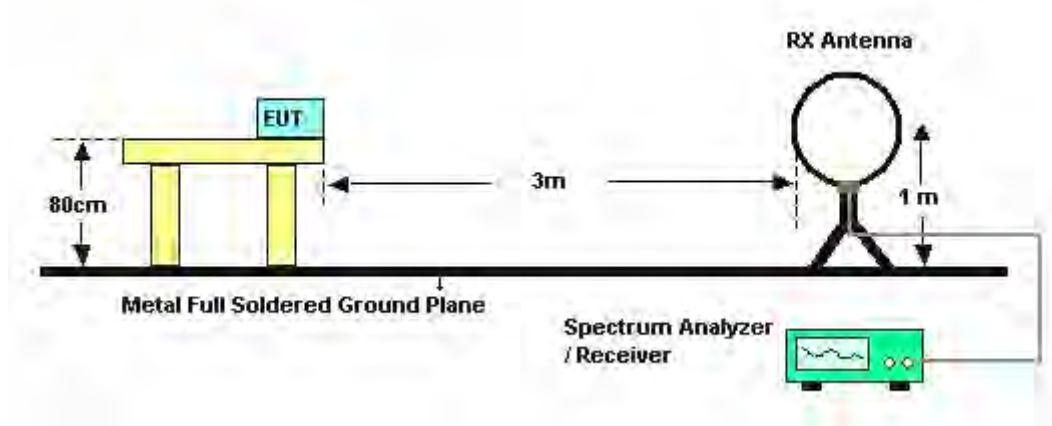
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.5.3. Test Procedures

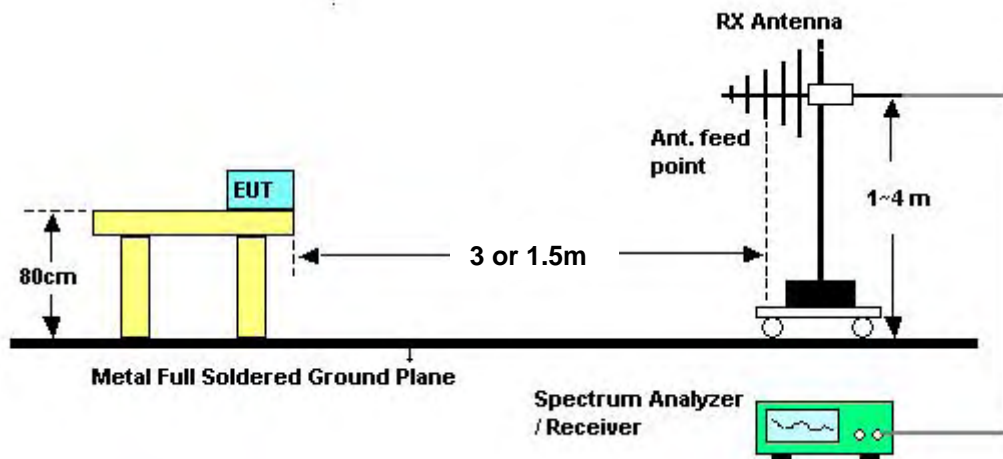
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

4.5.4. 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 1.5m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1.5m]})$ (dB);

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

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Draft n Ch 6 40MHz Ant. A + Ant. B

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

Note:

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

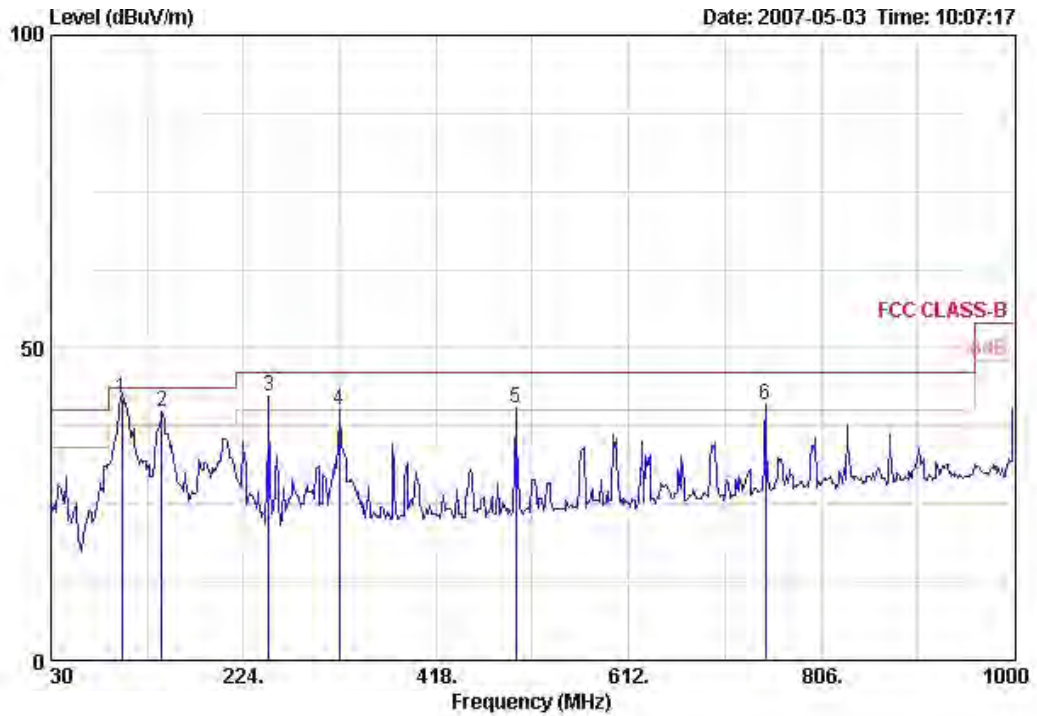
Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);

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

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

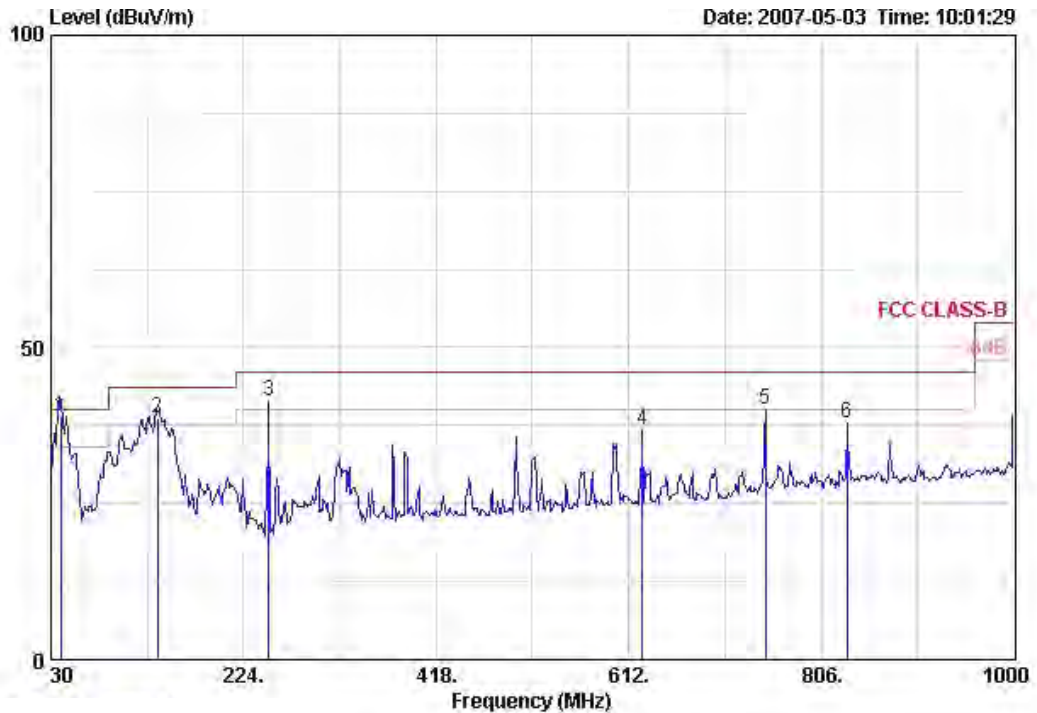
Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	802.11n Ch 6 Ant. A + Ant. B

Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna 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 !	101.780	41.88	-1.62	43.50	56.00	11.46	0.36	25.93	QP	269	241
2 !	141.550	39.89	-3.61	43.50	53.35	11.85	0.49	25.80	Peak	100	0
3 !	249.220	42.13	-3.87	46.00	53.57	12.84	1.15	25.42	Peak	100	0
4 !	320.030	40.00	-6.00	46.00	49.35	14.47	1.15	24.96	Peak	100	0
5 !	498.510	40.36	-5.64	46.00	47.12	17.78	1.80	26.33	Peak	100	0
6 !	749.740	40.98	-5.02	46.00	43.45	20.10	2.48	25.05	Peak	100	0

Vertical



	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp		Ant	Table
	MHz	dBUV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
			dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg
1	39.700	38.93	-1.07	40.00	50.80	14.10	0.63	26.60	QP	100	238
2	137.670	38.59	-4.91	43.50	51.80	12.10	0.51	25.83	QP	100	142
3	249.220	41.44	-4.56	46.00	52.88	12.84	1.15	25.42	Peak	400	0
4	625.580	36.73	-9.27	46.00	41.53	19.31	2.12	26.21	Peak	400	0
5	749.740	39.97	-6.03	46.00	42.44	20.10	2.48	25.05	Peak	400	0
6	832.190	37.85	-8.15	46.00	39.12	21.15	2.52	24.94	Peak	400	0

Note:

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

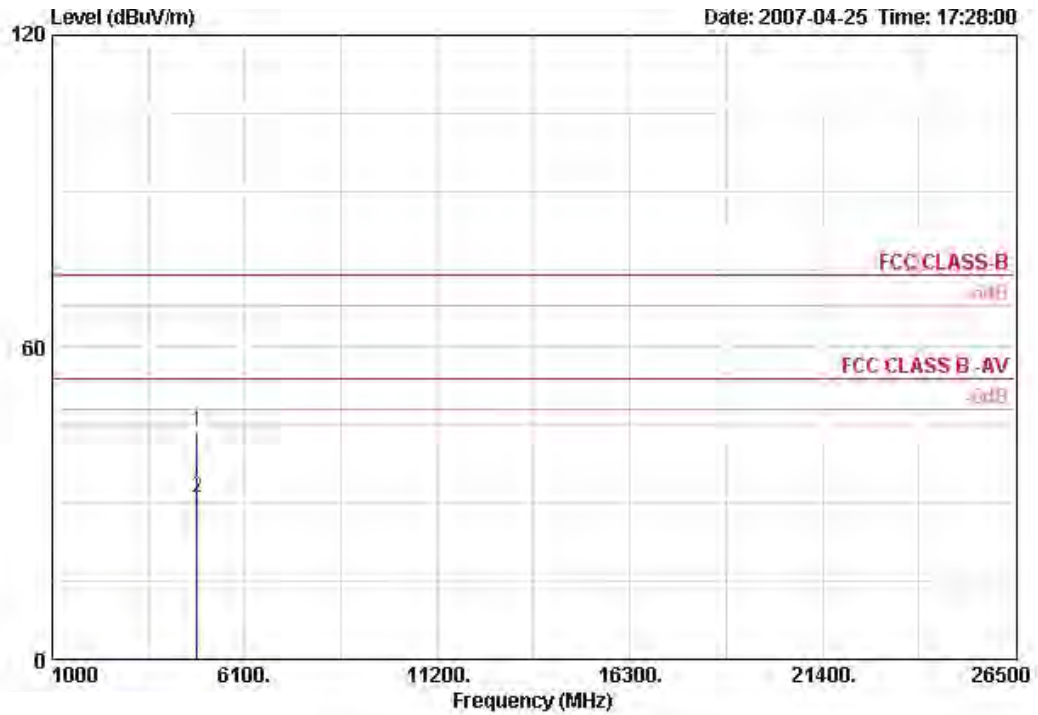
Emission level (dBUV/m) = 20 log Emission level (uV/m).

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

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

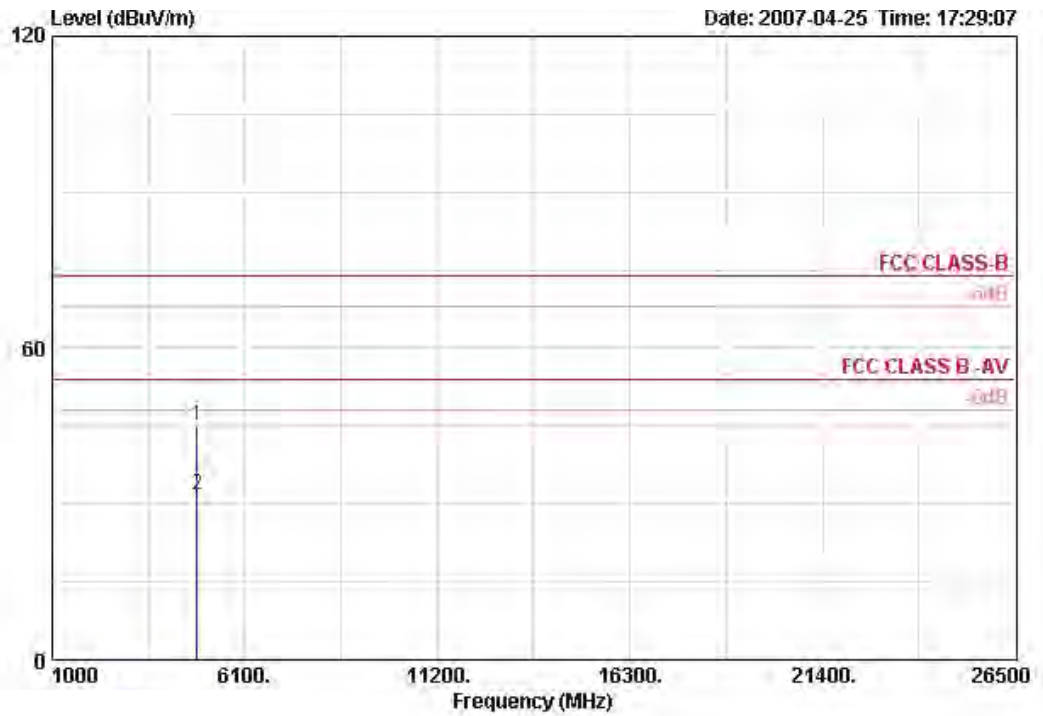
Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Draft n MCS8 20MHz Ch 1 Ant. A + Ant. B

Horizontal



	Freq	Read Level	Limit Level	Limit Line	OverLimit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4824.584	41.68	43.87	74.00	-30.13	33.06	35.16	4.30	PEAK	100	0	HORIZONTAL
2	4824.876	28.86	31.05	54.00	-22.95	33.06	35.16	4.30	AVERAGE	100	0	HORIZONTAL

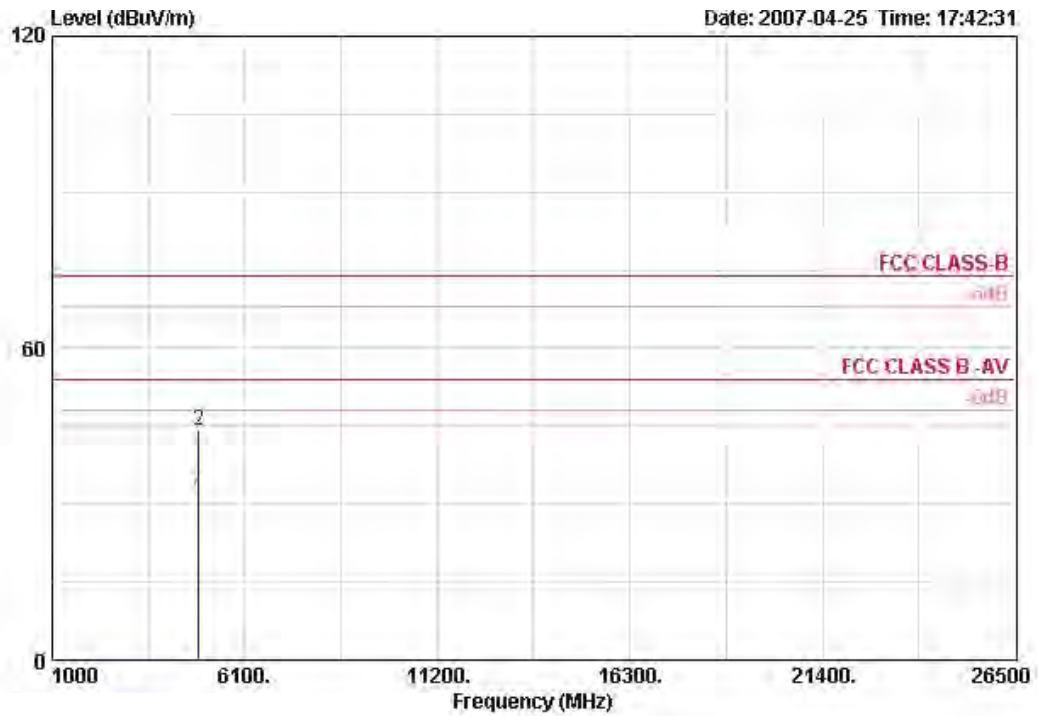
Vertical



	Read Freq	Read Level	Read Level	Limit Line	OverLimit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4823.048	42.99	45.18	74.00	-28.82	33.06	35.16	4.30	PEAK	100	181	VERTICAL
2 *	4824.736	29.55	31.74	54.00	-22.26	33.06	35.16	4.30	AVERAGE	100	181	VERTICAL

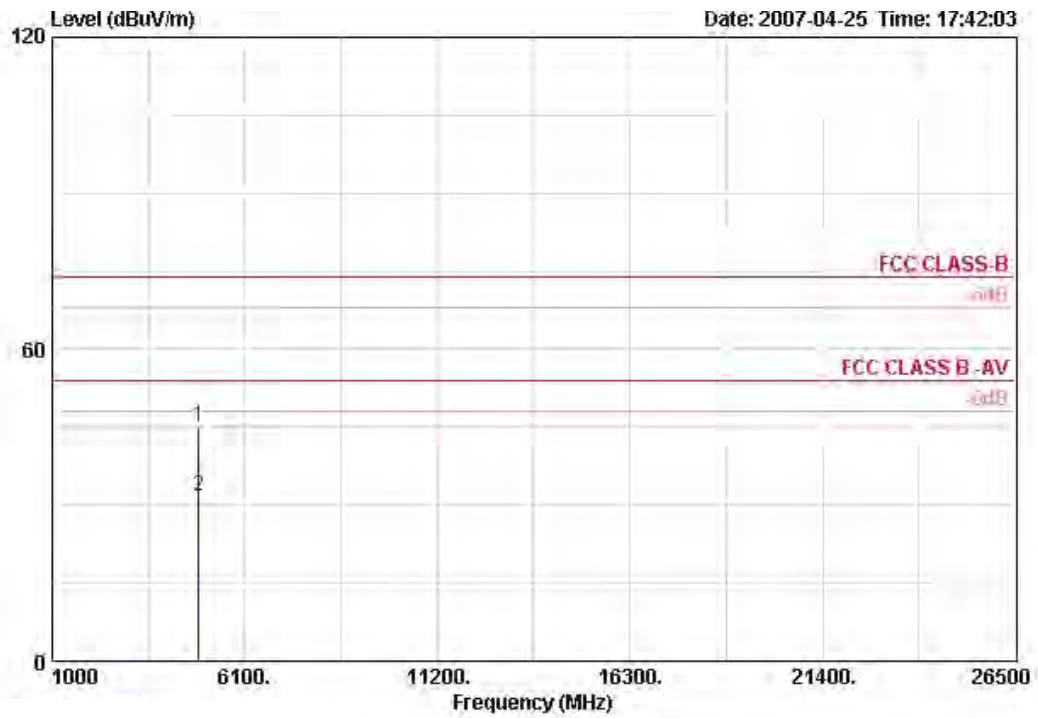
Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Draft n MCS8 20MHz Ch 6 Ant. A + Ant. B

Horizontal



	Read Freq	Read Level	Read Level	Limit Line	OverLimit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4873.704	28.70	31.00	54.00	-23.00	33.16	35.15	4.30	AVERAGE	100	360	HORIZONTAL
2	4874.180	41.98	44.28	74.00	-29.72	33.16	35.15	4.30	PEAK	100	360	HORIZONTAL

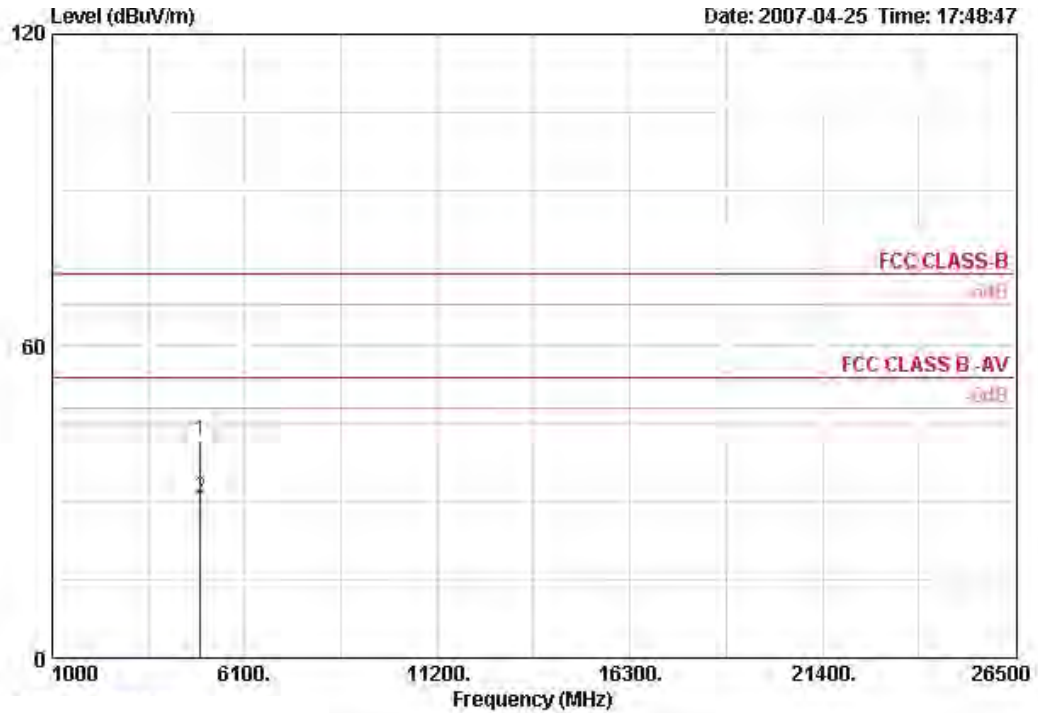
Vertical



	Read	Limit	OverAntenna	Preamp	Cable	Ant	Table				
	Freq	Level	Line	Limit	Factor	Factor	Loss	Remark	Pos	Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB		cm	deg	
1	4874.410	42.66	44.97	74.00	-29.03	33.16	35.15	4.30 PEAK	100	360	VERTICAL
2 *	4874.500	29.30	31.61	54.00	-22.39	33.16	35.15	4.30 AVERAGE	100	360	VERTICAL

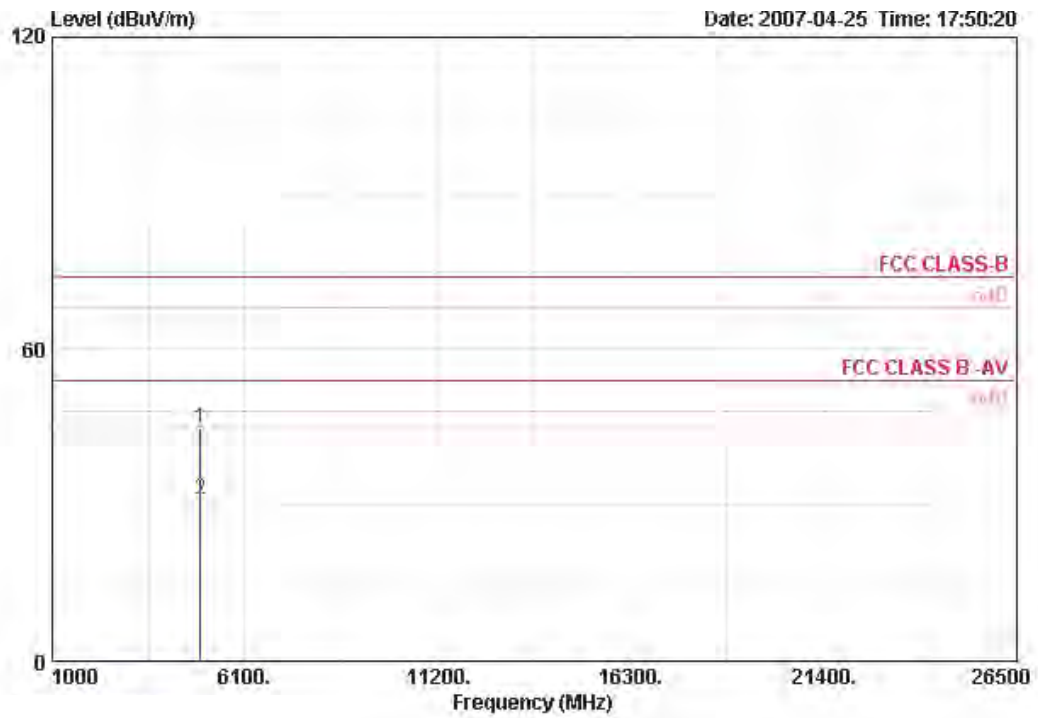
Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Drafft n MCS8 20MHz Ch11 Ant. A + Ant. B

Horizontal



	Read	Limit	Over	Antenna	Preamp	Cable	Ant	Table				
1	Level	Line	Limit	Factor	Factor	Loss	Pos	Pos				
2	Level	Line	Line	Factor	Factor	Loss	Pos	Pos				
	MHz	dBUV	dBUV/m	dB	dB/m	dB	cm	deg				
1	4923.882	39.50	41.92	74.00	-32.08	33.26	35.14	4.30	PEAK	100	360	HORIZONTAL
2	4924.398	28.33	30.75	54.00	-23.25	33.26	35.14	4.30	AVERAGE	100	360	HORIZONTAL

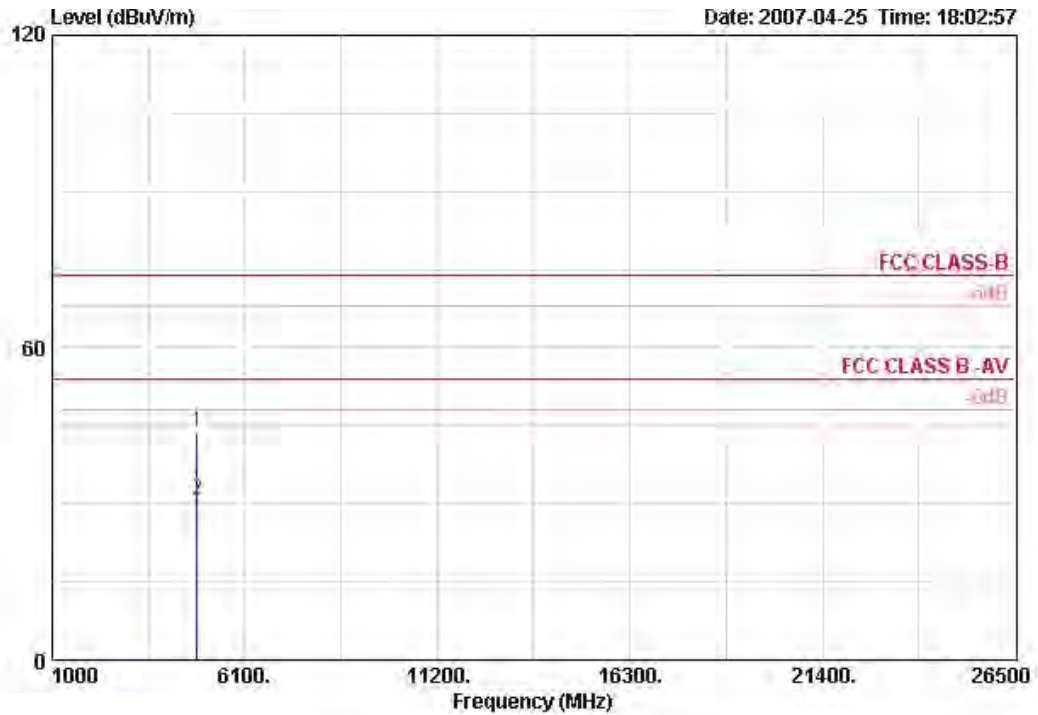
Vertical



	Read	Limit	OverAntenna	Preamp	Cable	Ant	Table				
Freq	Level	Level	Line	Limit	Factor	Factor	Loss	Remark	Pos	Pos	Pol/Phase
MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4923.824	42.42	44.84	74.00	-29.16	33.26	35.14	4.30 PEAK	100	360	VERTICAL
2	4924.296	28.53	30.95	54.00	-23.05	33.26	35.14	4.30 AVERAGE	100	360	VERTICAL

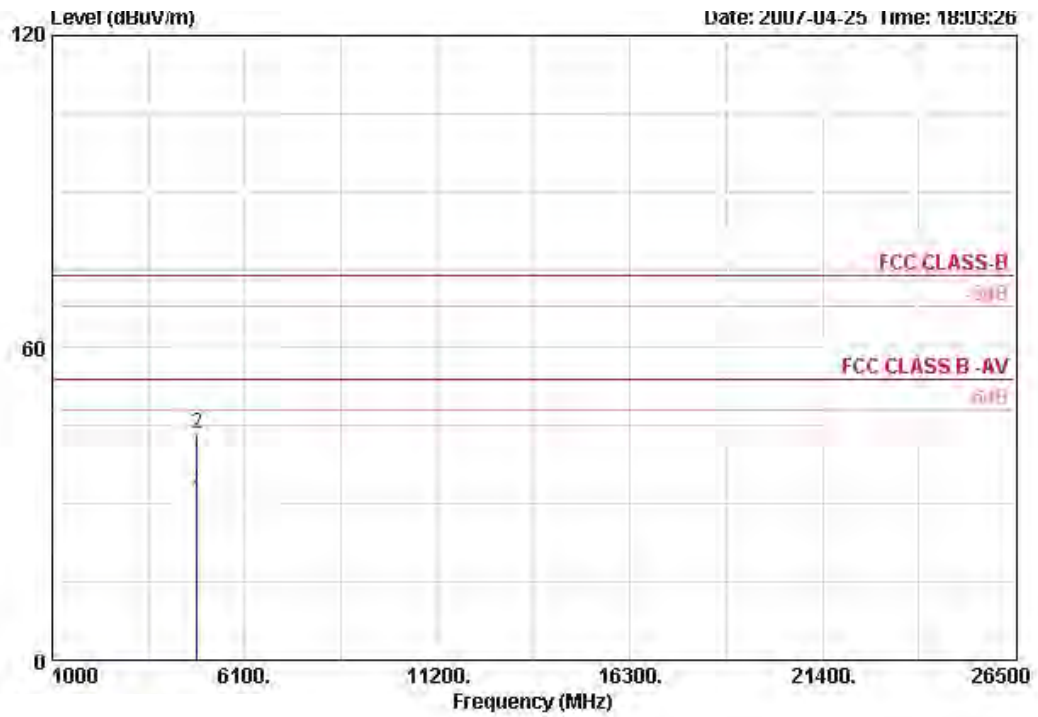
Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Draft n MCS8 40MHz Ch 3 Ant. A + Ant. B

Horizontal



	Read Freq	Read Level	Limit Level	Limit Line	OverAntenna Limit	Preamp Factor	Cable Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4843.622	41.65	43.88	74.00	-30.12	33.09	35.16	4.30	PEAK	100	360	HORIZONTAL
2	4844.052	28.36	30.59	54.00	-23.41	33.09	35.16	4.30	AVERAGE	100	360	HORIZONTAL

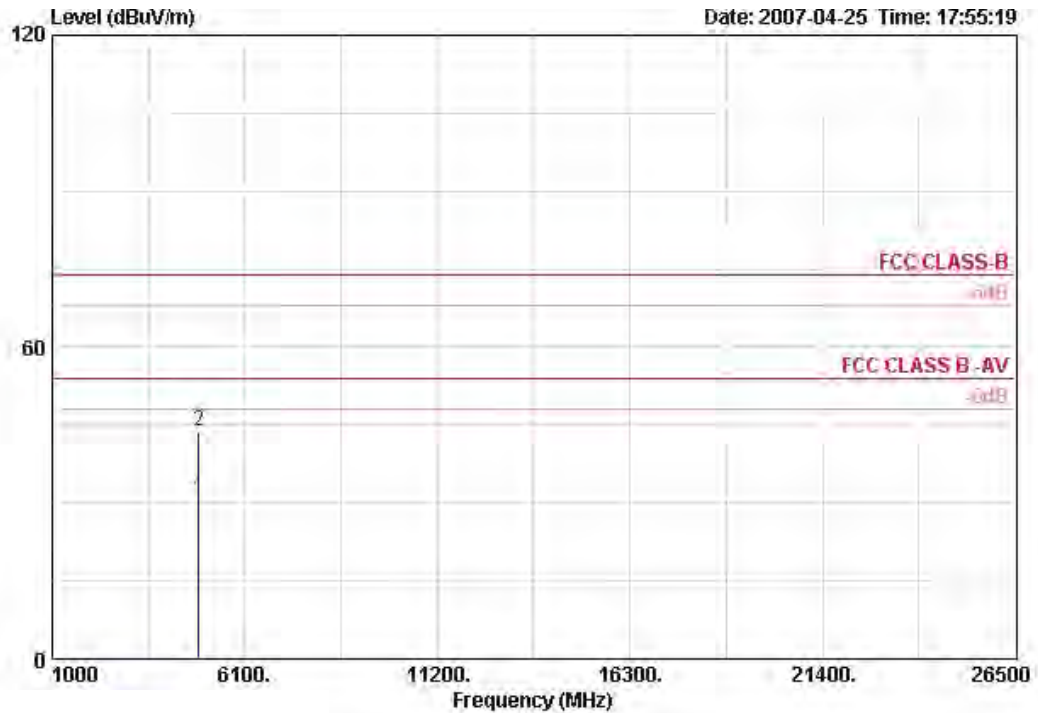
Vertical



	Read Freq	Read Level	Read Level	Limit Line	OverLimit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4843.602	28.64	30.87	54.00	-23.13	33.09	35.16	4.30	AVERAGE	100	360	VERTICAL
2	4844.242	41.35	43.58	74.00	-30.42	33.09	35.16	4.30	PEAK	100	360	VERTICAL

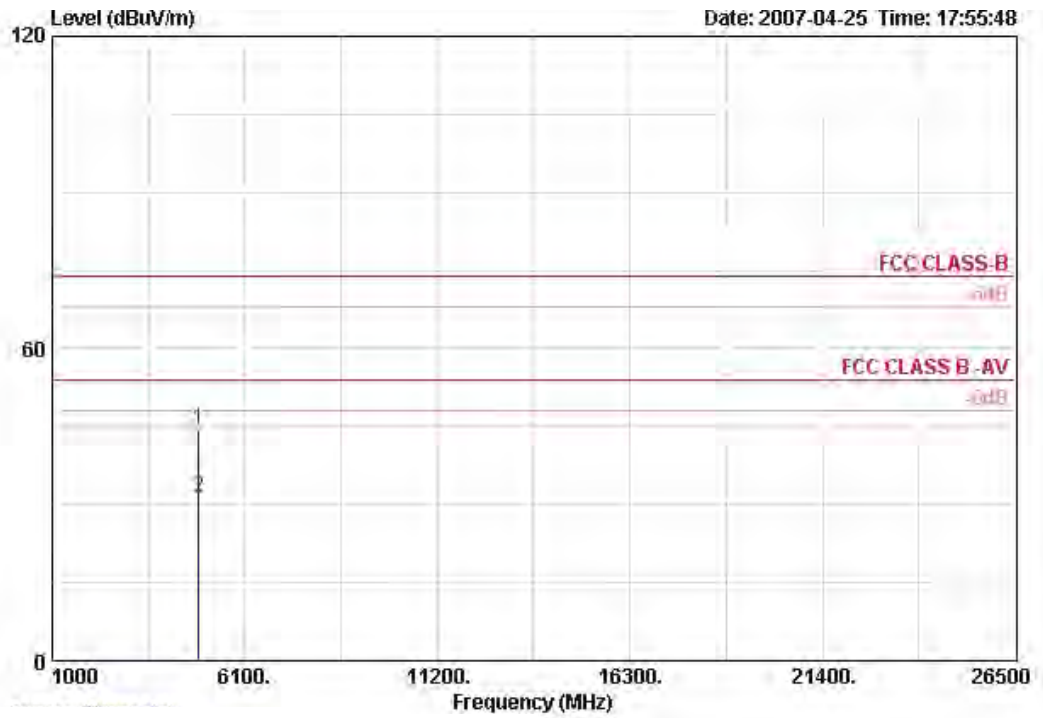
Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Draft n MCS8 40MHz Ch 6 Ant. A + Ant. B

Horizontal



	Read Freq	Read Level	Read Level	Limit Line	OverLimit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4874.194	28.41	30.72	54.00	-23.28	33.16	35.15	4.30	AVERAGE	100	360	HORIZONTAL
2	4874.448	41.62	43.93	74.00	-30.07	33.16	35.15	4.30	PEAK	100	360	HORIZONTAL

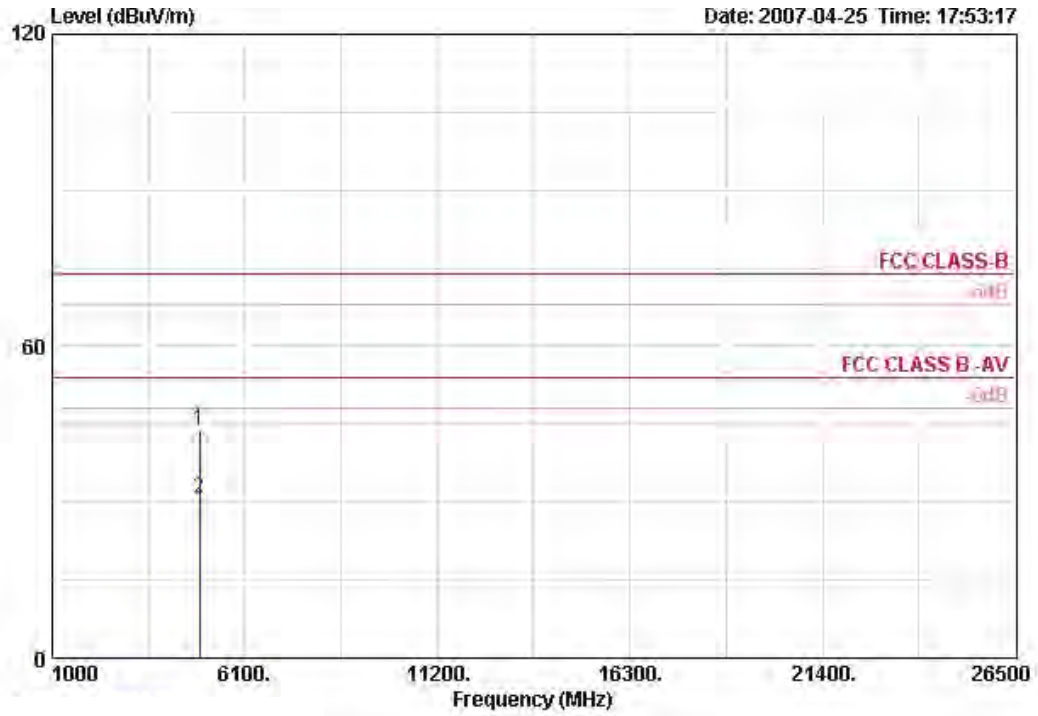
Vertical



	Read Freq	Read Level	Read Level	Limit Line	OverLimit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4873.742	42.24	44.55	74.00	-29.45	33.16	35.15	4.30	PEAK	100	330	VERTICAL
2	4874.132	29.01	31.31	54.00	-22.69	33.16	35.15	4.30	AVERAGE	100	330	VERTICAL

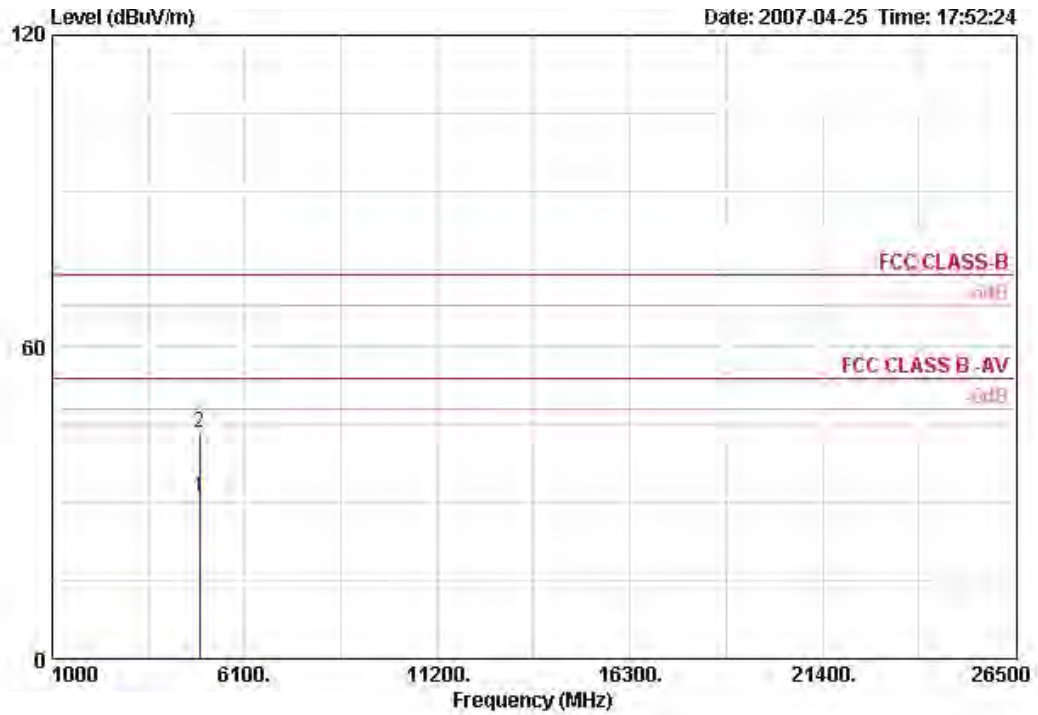
Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Draft n MCS8 40MHz Ch 9 Ant. A + Ant. B

Horizontal



	Read Freq	Read Level	Read Level	Limit Line	OverLimit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4904.212	41.30	43.68	74.00	-30.32	33.23	35.15	4.30	PEAK	100	360	HORIZONTAL
2	4904.214	28.41	30.79	54.00	-23.21	33.23	35.15	4.30	AVERAGE	100	360	HORIZONTAL

Vertical



	Read Freq	Read Level	Read Level	Limit Line	Over Limit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1	4903.888	28.71	31.09	54.00	-22.91	33.23	35.15	4.30	AVERAGE	100	360	VERTICAL
2	4904.406	41.22	43.60	74.00	-30.40	33.23	35.15	4.30	PEAK	100	360	VERTICAL

Note:

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

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

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

4.6. Band Edge Emissions Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

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

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

4.6.3. Test Procedures

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

4.6.4. Test Setup Layout

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

4.6.5. Test Deviation

There is no deviation with the original standard.

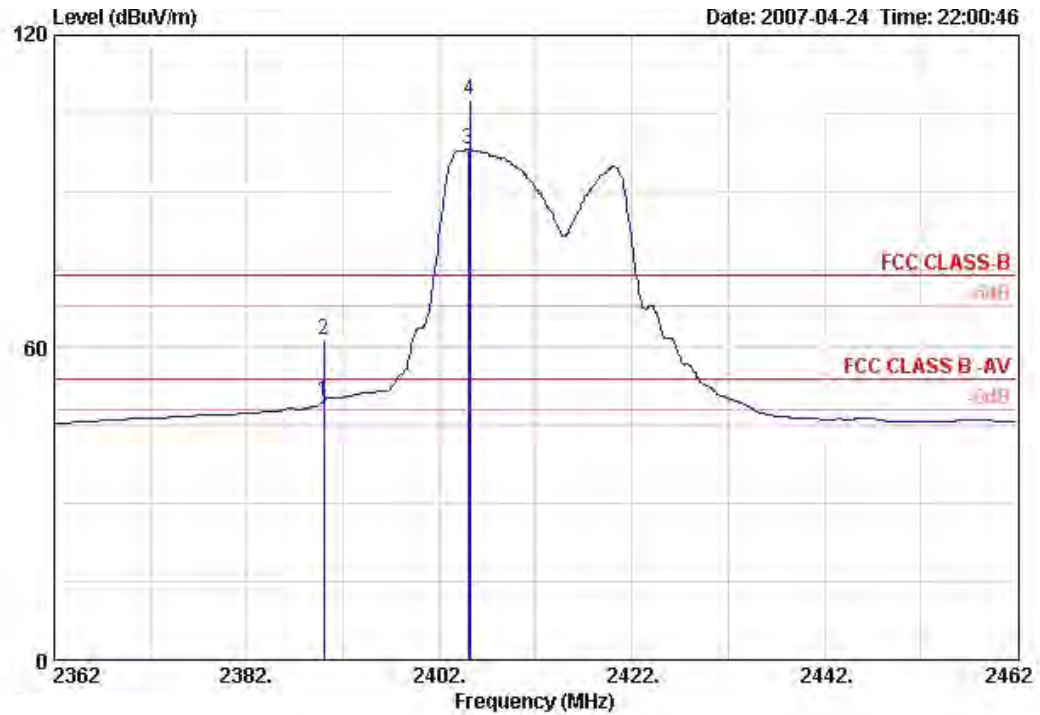
4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Draft n MCS8 20MHz Ch 1, 11 Ant. A + Ant. B

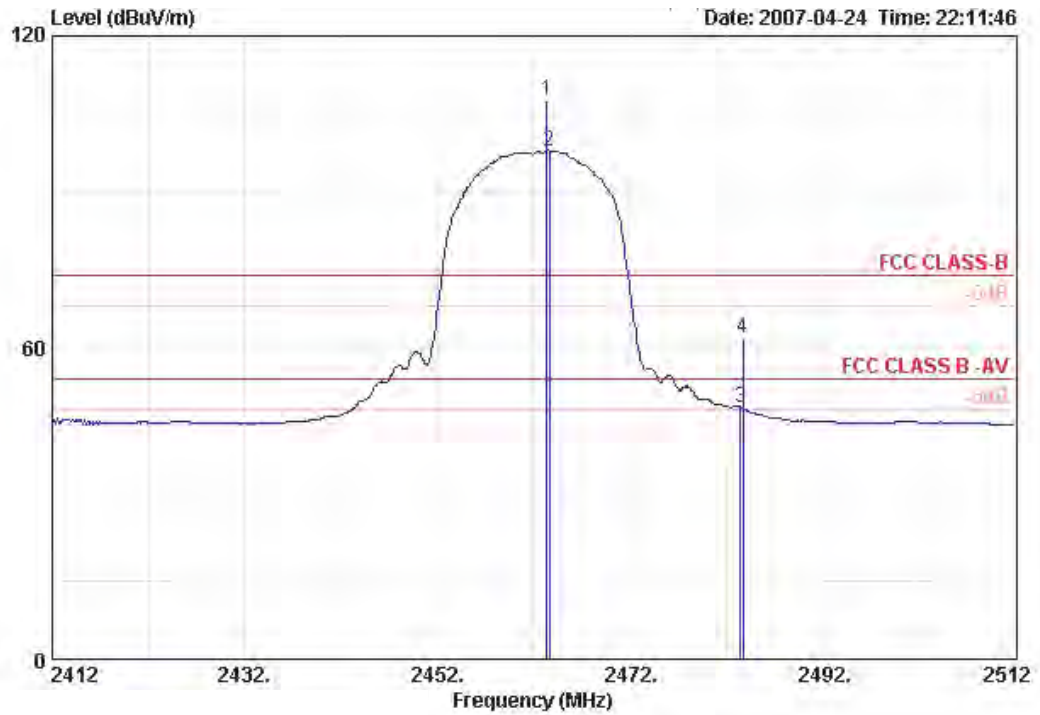
Channel 1



	Read	Limit	Over	Antenna	Preamp	Cable		Ant	Table			
	Freq	Level	Line	Limit	Factor	Factor	Loss	Pos	Pos			
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	cm	deg			
1 *	2390.000	18.76	49.70	54.00	-4.30	28.17	0.00	2.76	AVERAGE	100	217	VERTICAL
2 *	2390.000	30.56	61.50	74.00	-12.50	28.17	0.00	2.76	PEAK	100	217	VERTICAL
3 *	2405.000	67.07	98.04			28.21	0.00	2.76	AVERAGE	100	217	VERTICAL
4 *	2405.200	76.52	107.49			28.21	0.00	2.76	PEAK	100	217	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz

Channel 11

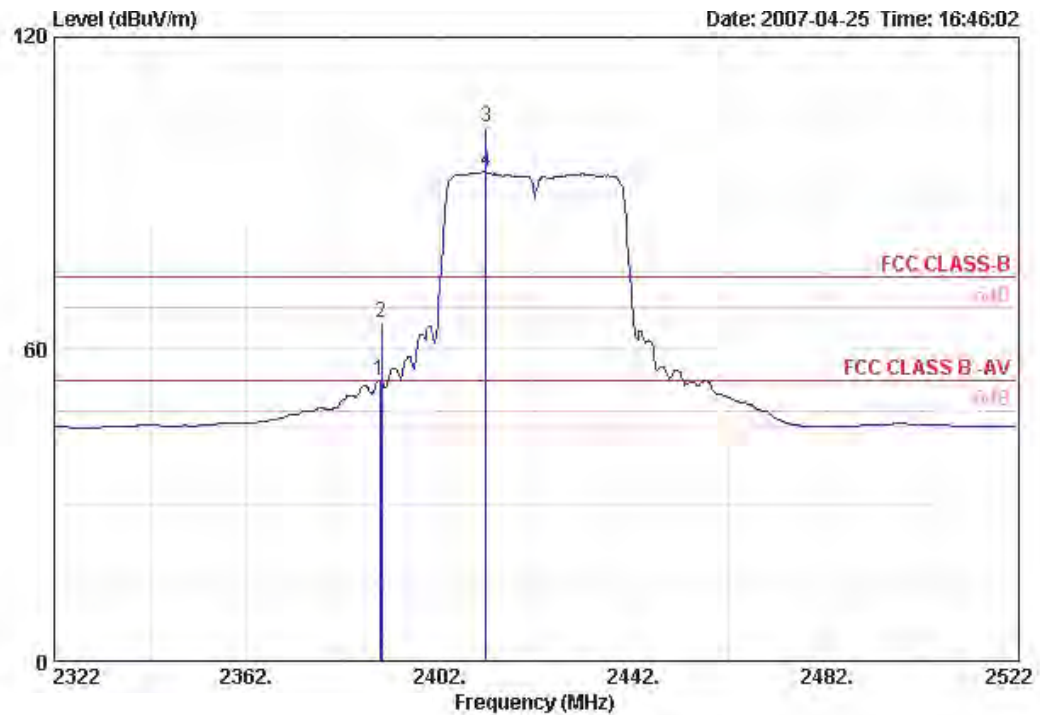


	Read Freq	Read Level	Limit Level	Limit Line	Over Limit	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	dB		cm	deg	
1 *	2463.400	76.27	107.41			28.32	0.00	2.81	PEAK	119	220	VERTICAL
2 *	2463.600	66.77	97.91			28.32	0.00	2.81	AVERAGE	119	220	VERTICAL
3 *	2483.500	17.27	48.47	54.00	-5.53	28.36	0.00	2.84	AVERAGE	119	220	VERTICAL
4 *	2483.700	30.49	61.69	74.00	-12.31	28.36	0.00	2.84	PEAK	119	220	VERTICAL

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

Temperature	24°C	Humidity	56%
Test Engineer	Roy Huang	Configurations	Draft n MCS8 40MHz Ch 3, 9 Ant. A + Ant. B

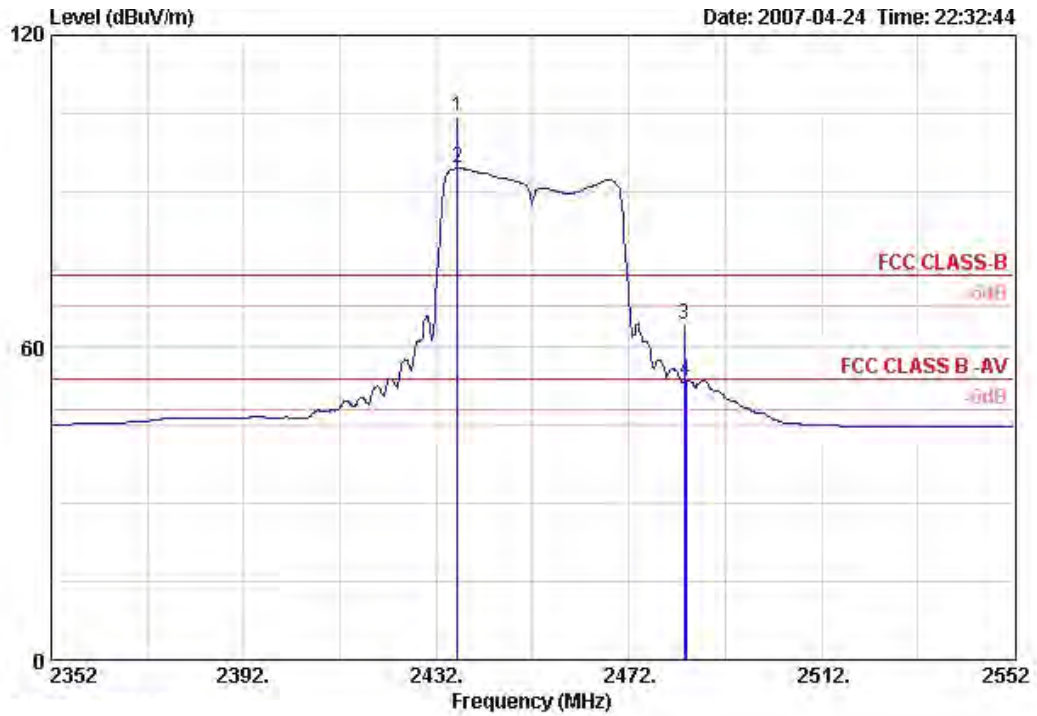
Channel 3



	Read	Limit	Over	Antenna	Preamp	Cable		Ant	Table			
	Freq	Level	Line	Limit	Factor	Factor	Loss	Pos	Pos			
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	cm	deg			
1 *	2389.600	23.01	53.94	54.00	-0.06	28.17	0.00	2.76	AVERAGE	100	217	VERTICAL
2 *	2390.000	34.13	65.06	74.00	-8.94	28.17	0.00	2.76	PEAK	100	217	VERTICAL
3 *	2411.600	71.66	102.66			28.21	0.00	2.79	PEAK	100	217	VERTICAL
4 *	2411.600	63.03	94.03			28.21	0.00	2.79	AVERAGE	100	217	VERTICAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

Channel 9



	Read Freq	Read Level	Limit Level	OverAntenna Limit	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV	dBuV/m	dBuV/m	dB	dB/m	dB	cm	deg	
1	2436.400	73.21	104.25		28.25	0.00	2.79 PEAK	100	33	VERTICAL
2 *	2436.400	63.44	94.48		28.25	0.00	2.79 AVERAGE	100	33	VERTICAL
3	2483.500	33.17	64.37	74.00	-9.63	28.36	0.00 2.84 PEAK	100	33	VERTICAL
4 !	2483.900	22.52	53.72	54.00	-0.28	28.36	0.00 2.84 AVERAGE	100	33	VERTICAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

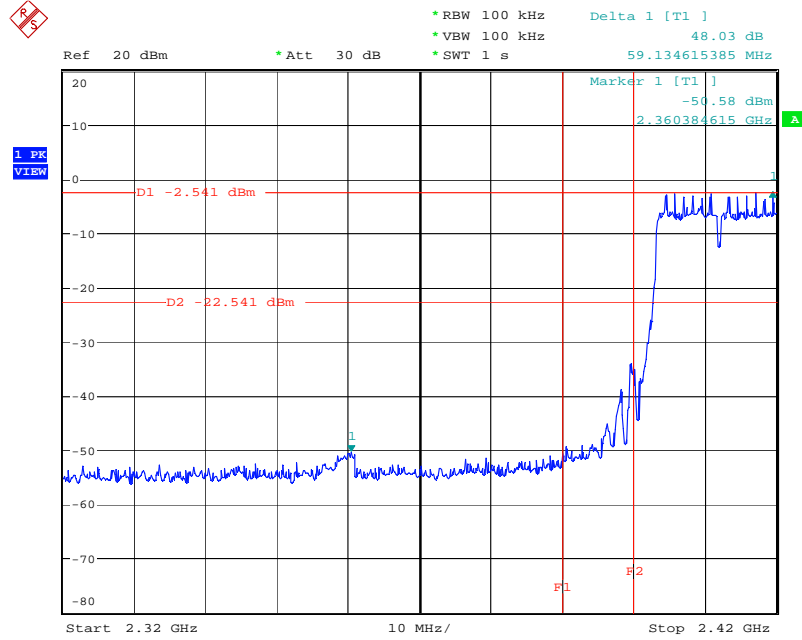
Note:

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

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

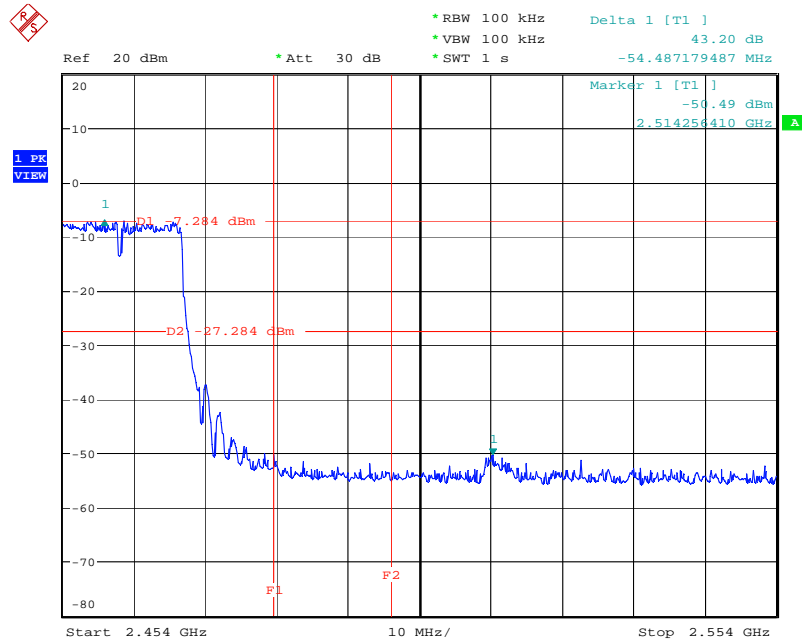
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A / 2412 MHz



Date: 6.MAY.2007 20:52:27

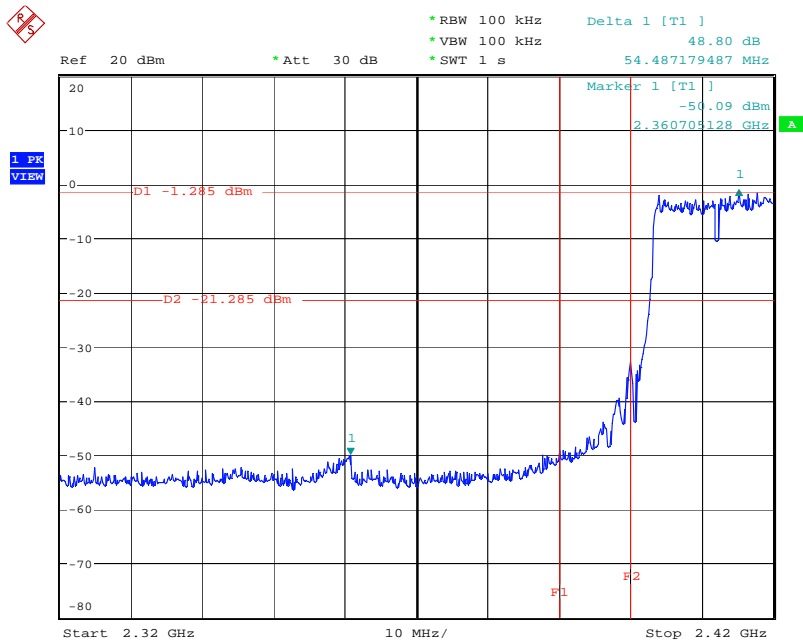
High Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A / 2462 MHz



Date: 6.MAY.2007 21:29:50

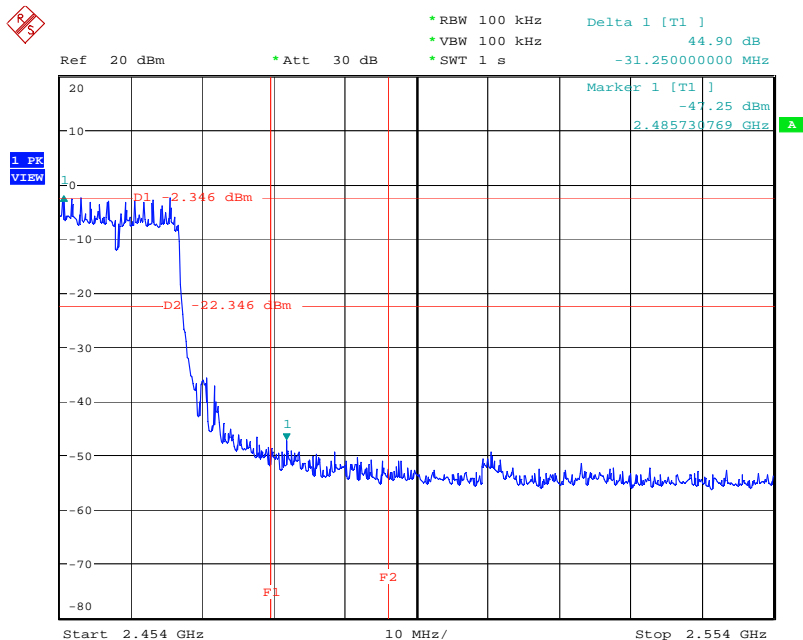
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. B / 2412 MHz



Date: 4.MAY.2007 10:14:54

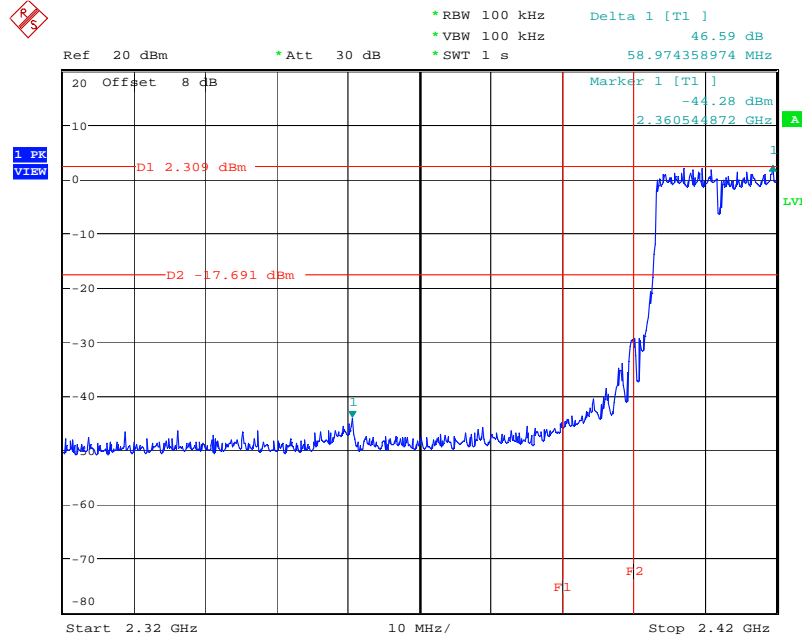
High Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. B / 2462 MHz



Date: 6.MAY.2007 20:56:34

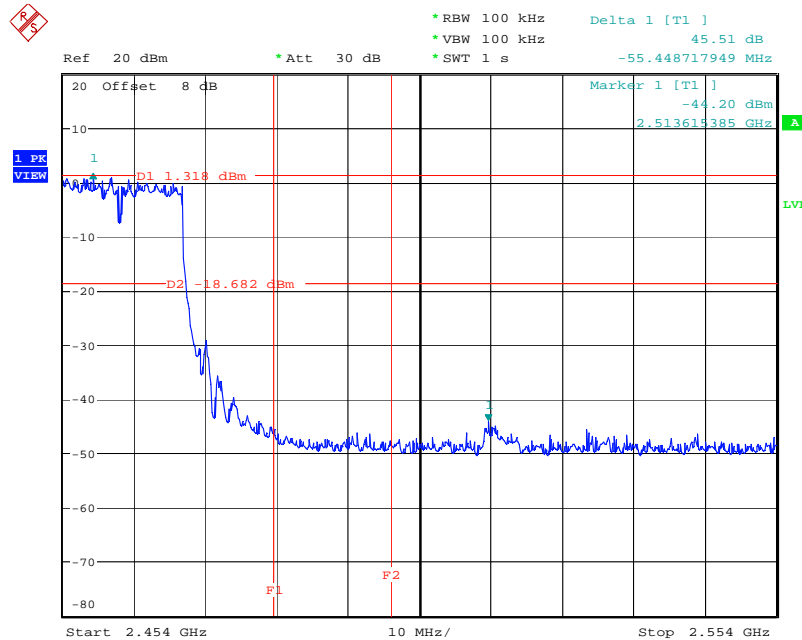
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B / 2412 MHz



Date: 6.MAY.2007 23:04:46

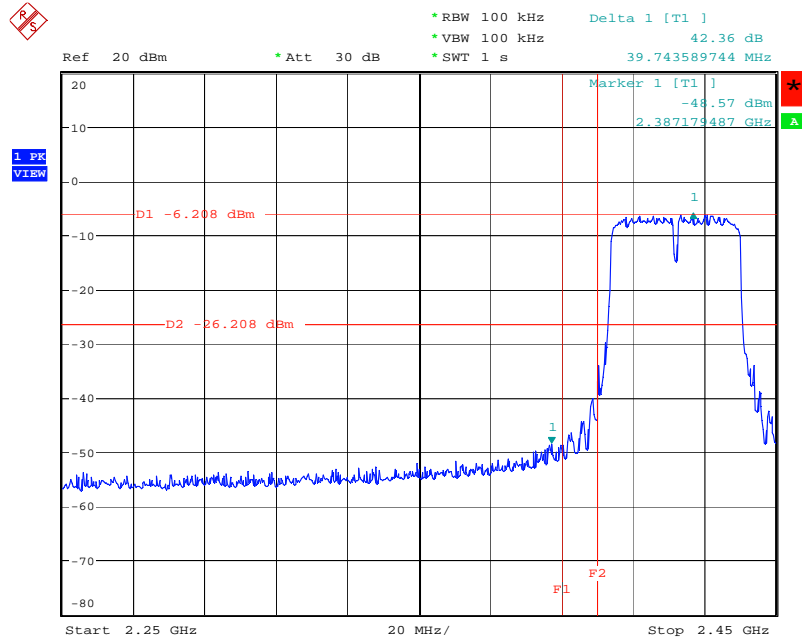
High Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. A + Ant. B / 2462 MHz



Date: 6.MAY.2007 23:02:05

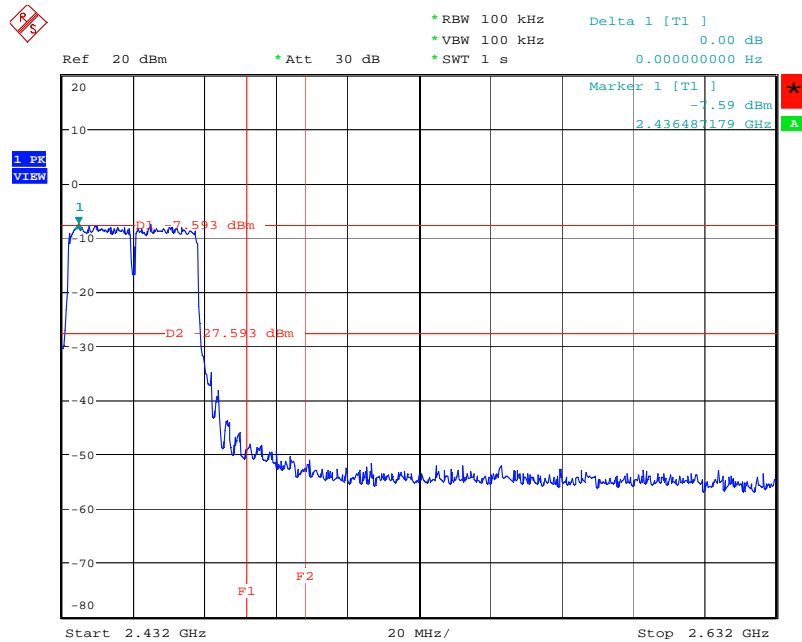
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A / 2422 MHz



Date: 6.MAY.2007 22:36:11

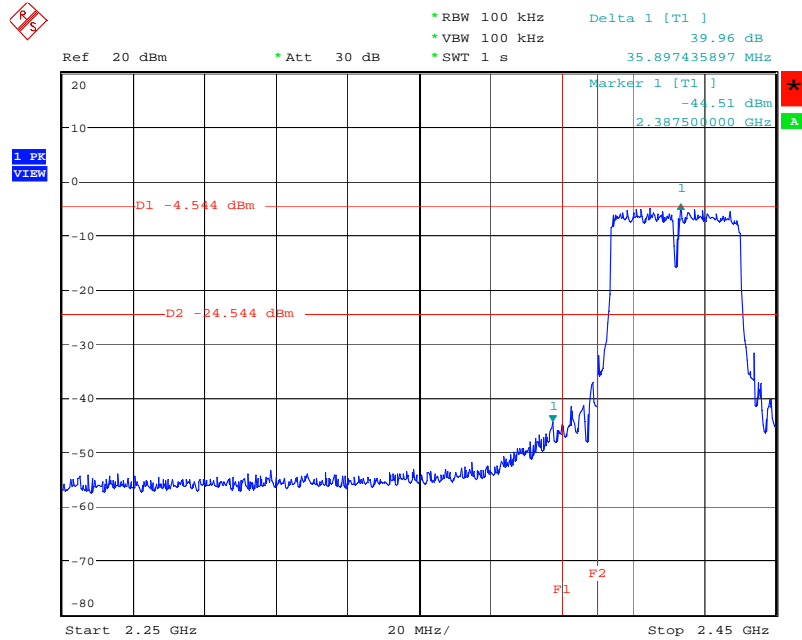
High Band Edge Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A / 2452 MHz



Date: 6.MAY.2007 22:45:06

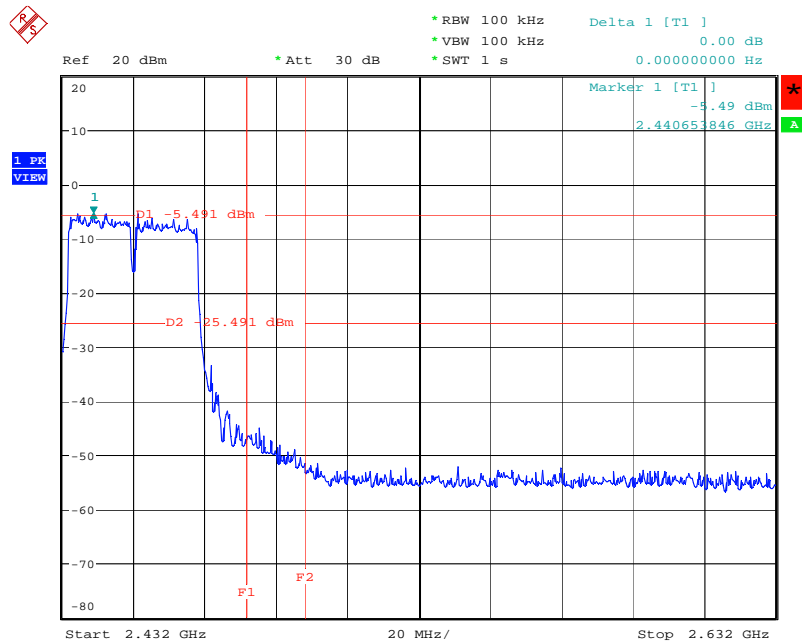
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. B / 2422 MHz



Date: 6.MAY.2007 22:09:21

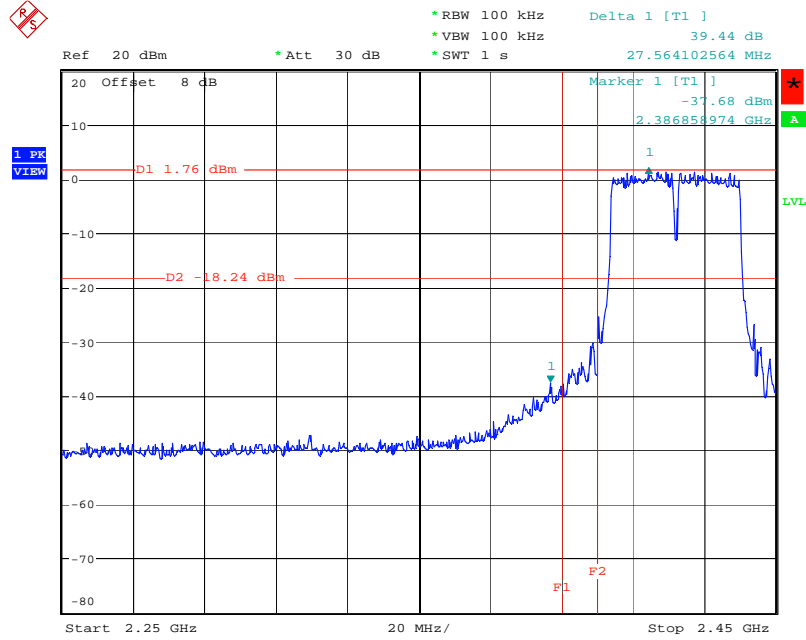
High Band Edge Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. B / 2452 MHz



Date: 6.MAY.2007 22:19:47

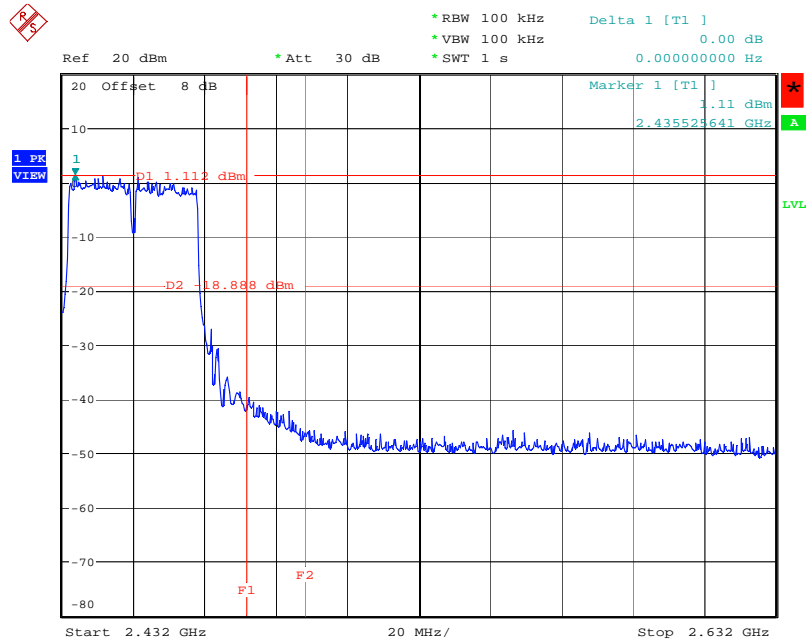
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B / 2422 MHz



Date: 6.MAY.2007 23:10:29

High Band Edge Plot on Configuration IEEE 802.11n MCS8 40MHz Ant. A + Ant. B / 2452 MHz



Date: 6.MAY.2007 23:21:28

4.7. Antenna Requirements

4.7.1. 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. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.7.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100359	9kHz – 2.75GHz	Mar. 01, 2007	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2007	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2007	Conduction (CO04-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9kHz – 30MHz	Dec. 15, 2006	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz – 30MHz	Mar. 27, 2007	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 15, 2006	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	CPA9231A	1886	9 kHz - 2 GHz	Jan. 22, 2007	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	May 29, 2006	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	923364	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100004/040	9 kHz - 40 GHz	Sep. 21, 2006	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 24, 2006	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 17, 2007	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	NCR	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 02, 2006	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 02, 2006	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Dec. 17, 2006	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100764	DC ~ 40GHz	Jul. 20, 2006	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100666	DC ~ 40GHz	Jul. 20, 2006	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 10, 2006	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Apr. 21, 2007*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 03, 2007	Conducted (TH01-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 02, 2006	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2006	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2006	Conducted (TH01-HY)
Oscilloscope	Tektronix	TDS1012	CO38515	100MHz / 1GS/s	Jun. 20, 2006	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 07, 2007	Conducted (TH01-HY)
Data Generator	Tektronix	DG2030	063-2920-50	0.1Hz~400MHz	Jun. 16, 2006	Conducted (TH01-HY)

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

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

Note: NCR means Non-Calibration required.

6. TEST LOCATION

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