

FCC RADIO TEST REPORT

Applicant's company	NETGEAR, Inc.
Applicant Address	350 East Plumeria Drive, San Jose, CA 95134, USA
FCC ID	PY309100105
Manufacturer's company	Ambit Microsystems (Shanghai) Ltd.
Manufacturer Address	No. 1925, Nanle Road, Songjiang Export Processing Zone, Shanghai, China

Product Name	Wireless-N 300 router
Brand Name	NETGEAR
Model Name	WNR2000v2
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Jun. 09, 2009
Final Test Date	Jun. 27, 2009
Submission Type	Original Equipment



Statement

Test result included in this report is for the Draft n and 802.11b/g 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: Sep. 02, 2009

Report No.: FR961908

☒ No additional attachment.

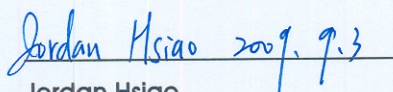
☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. CERTIFICATE OF COMPLIANCE

Product Name : Wireless-N 300 router
Brand Name : NETGEAR
Model Name : WNR2000v2
Applicant : NETGEAR, 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 Jun. 09, 2009 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.


Jordan Hsiao
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	4.68 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	0.66 dB
4.3	15.247(e)	Power Spectral Density	Complies	7.72 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	0.21 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.15 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	±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

Draft n

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	Power Adapter
Modulation	see the below table for draft n
Data Modulation	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) : 17.68 MHz ; MCS8 (40MHz) : 36.24 MHz
Conducted Output Power	MCS8 (20MHz) : 29.31 dBm ; MCS8 (40MHz) : 28.59 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

802.11b/g

Items	Description
Product Type	802.11b/g :WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	Power Adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11
Channel Band Width (99%)	11b: 10.12 MHz ; 11g: 16.20 MHz
Conducted Output Power	11b: 27.56 dBm ; 11g: 29.34 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Two (TX)	
Band width Mode	20 MHz	40 MHz
802.11b	V	X
802.11g	V	X
Draft n	V	V

Draft n spec

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Datarate(Mbps)			
									800nsGI		400nsGI	
					20MHz	40MHz	20MHz	40MHz	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
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

3.2. Accessories

Power	Brand	Model	Rating
Adapter 1	NETGEAR	FA-1201000SUC	Input:120VAC, 60Hz, 0.5A Output:12VDC, 1.0A
Adapter 2	NETGEAR	T012LF1209 16100-2LF	Input:100-120VAC, 50/60Hz, 0.5A Output:12VDC, 1A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
1	RAYSPAN	-	Printed Antenna	N/A	2.80	TX / RX Ant.
2	RAYSPAN	-	Printed Antenna	N/A	2.80	TX / RX Ant.

Note: The EUT has two antennas (2TX, 2RX).

Both Antenna 1 and Antenna 2 will transmit and receive the same signal simultaneously.



3.4. Table for Carrier Frequencies

There are two bandwidth systems for draft n.

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		

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	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Peak Conducted Output Power	MCS8/20MHz	13 Mbps	1/6/11	1/ 2 / 1+2
	MCS8/40MHz	27 Mbps	3/6/9	1/ 2 / 1+2
	11b/BPSK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1/ 2 / 1+2
Power Spectral Density 6dB Spectrum Bandwidth	MCS8/20MHz	13 Mbps	1/6/11	1+2
	MCS8/40MHz	27 Mbps	3/6/9	1+2
	11b/BPSK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2
Radiated Emissions 9kHz~1GHz	Normal Link	-	-	-
Radiated Emissions 1GHz~10 th Harmonic	MCS8/20MHz	13 Mbps	1/6/11	1+2
	MCS8/40MHz	27 Mbps	3/6/9	1+2
	11b/BPSK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2
Band Edge Emissions	MCS8/20MHz	13 Mbps	1/11	1+2
	MCS8/40MHz	27 Mbps	3/9	1+2
	11b/BPSK	1 Mbps	1/11	1+2
	11g/BPSK	6 Mbps	1/11	1+2

Note:

All the test modes were listed as below.

Mode 1: EUT + Adapter 1

Mode 2: EUT + Adapter 2

<For Conducted Emissions Test>:

Due to Mode 2 generated the worst test result, so it was recorded in this report.

<For Radiated Emissions below 1GHz Test>:

Due to Mode 2 generated the worst test result, so it was recorded in this report.

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	480872	IC 4088	-
CO04-HY	Conduction	Hwa Ya	480872	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	1200	E2K4965AGNM
Notebook	DELL	PP25L	E2K4965AGNM
Notebook	DELL	PP25L	E2K4965AGNM
HUB	CNet	CSH-1600E	DoC

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

Test Software Version	DOS		
Frequency	2412 MHz	2437 MHz	2462 MHz
Draft n Ant. 1 / Ant. 2	64	84	58

Power Parameters of Draft n MCS8 40MHz

Test Software Version	DOS		
Frequency	2422 MHz	2437 MHz	2452 MHz
Draft n Ant. 1 / Ant. 2	56	70	52

Power Parameters of IEEE 802.11b/g

Test Software Version	DOS		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b Ant. 1 / Ant. 2	88	84	80
IEEE 802.11g Ant. 1 / Ant. 2	64	82	64

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

During the test, "Ping.exe" under WIN XP was executed to link with the remote workstation to receive and transmit signal by LAN and WLAN.

During testing, the remote wireless network ancillary were connected by EUT.

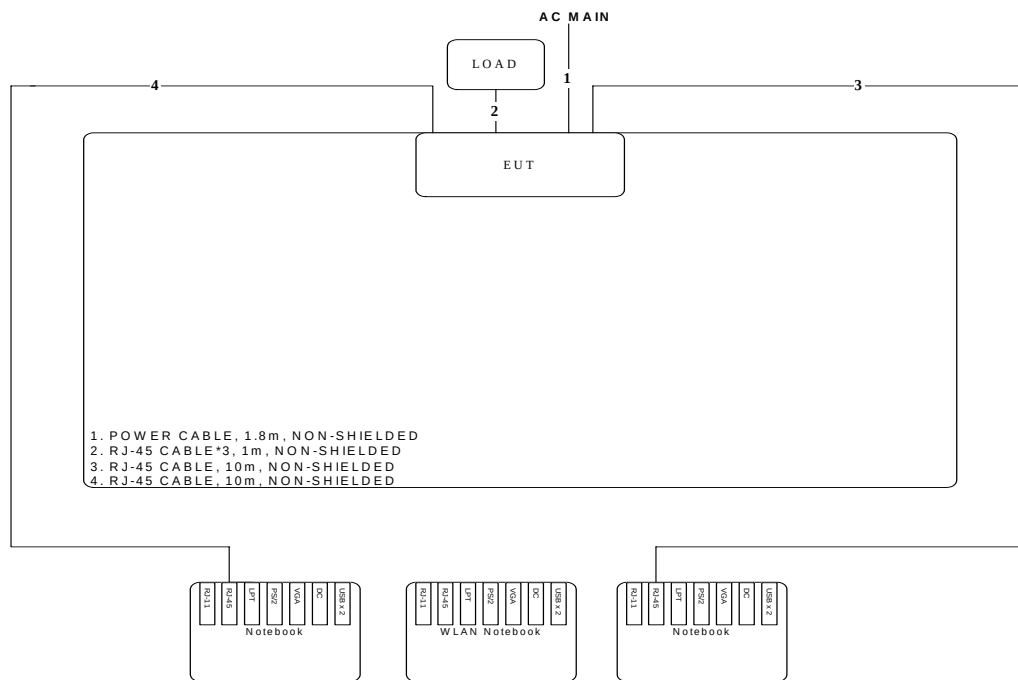
At the same time, "DOS" was executed the test program to control the EUT continuously transmit RF signal.

3.9. Test Configurations

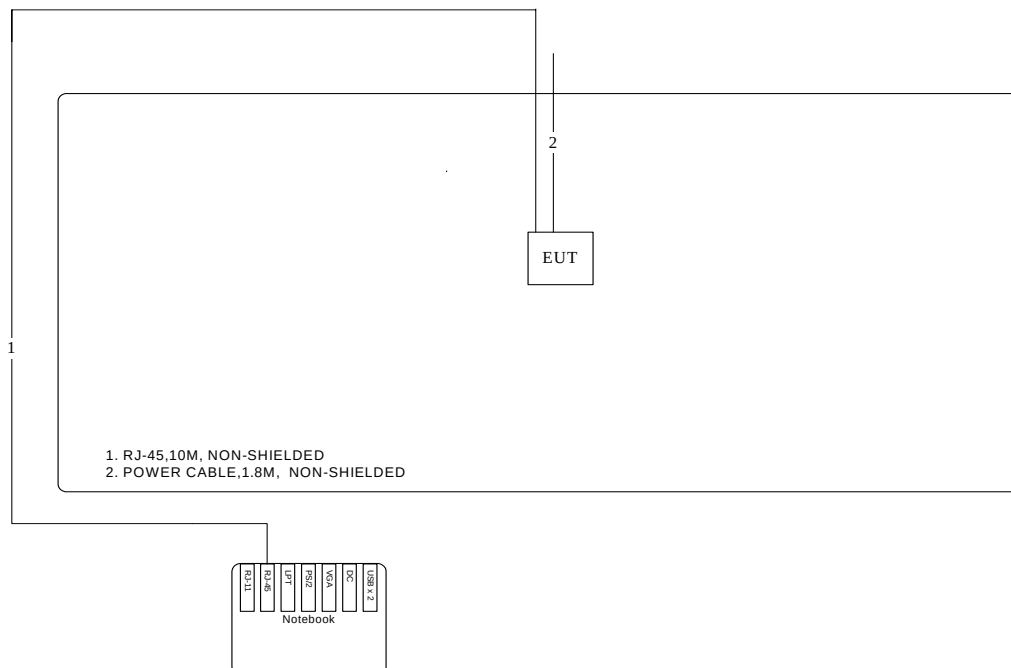
3.9.1. Radiation Emissions Test Configuration

Test Configuration: 30KHz~1GHz

Test Mode: Mode 2

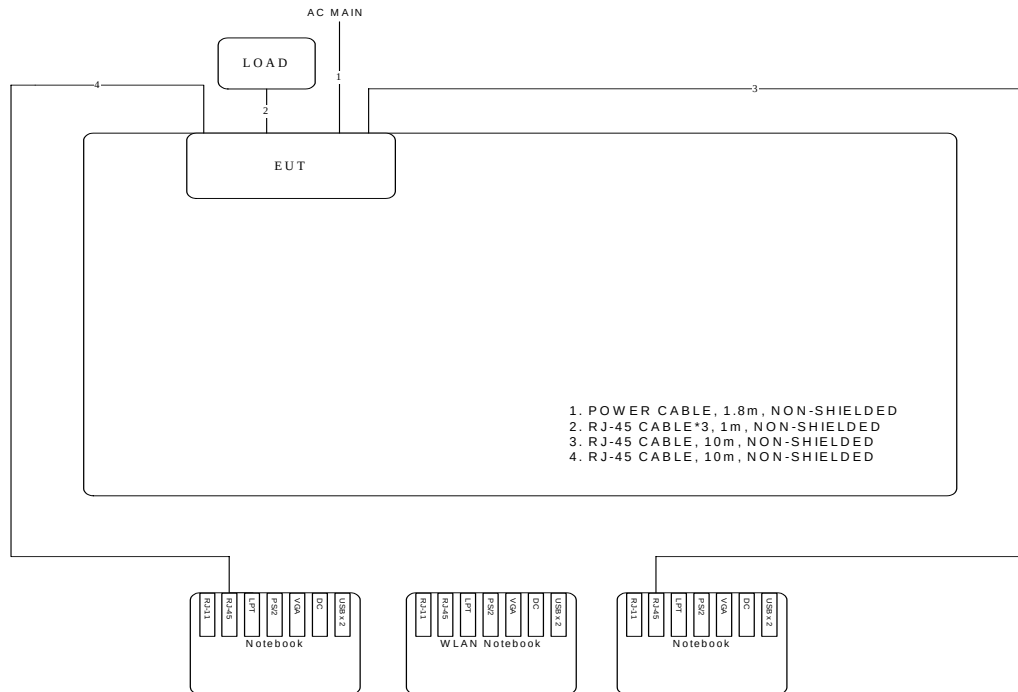


Test Configuration: above 1GHz



3.9.2. AC Power Line Conduction Emissions Test Configuration

Test Mode: Mode 2



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

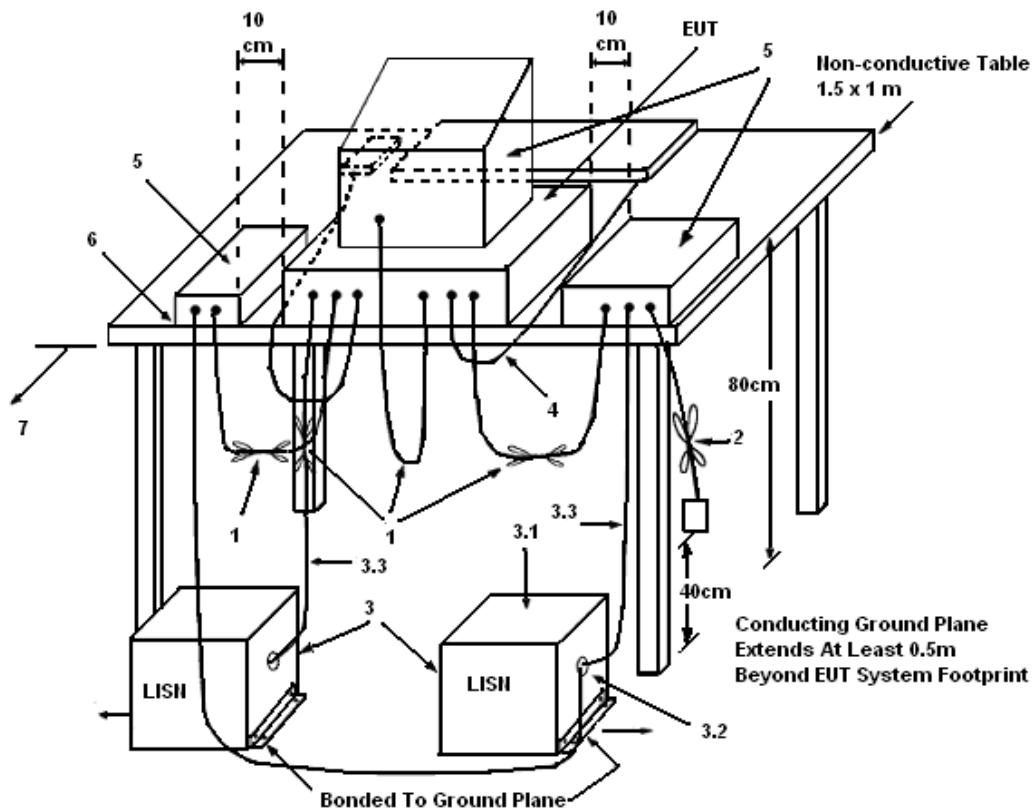
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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 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.

4.1.5. Test Deviation

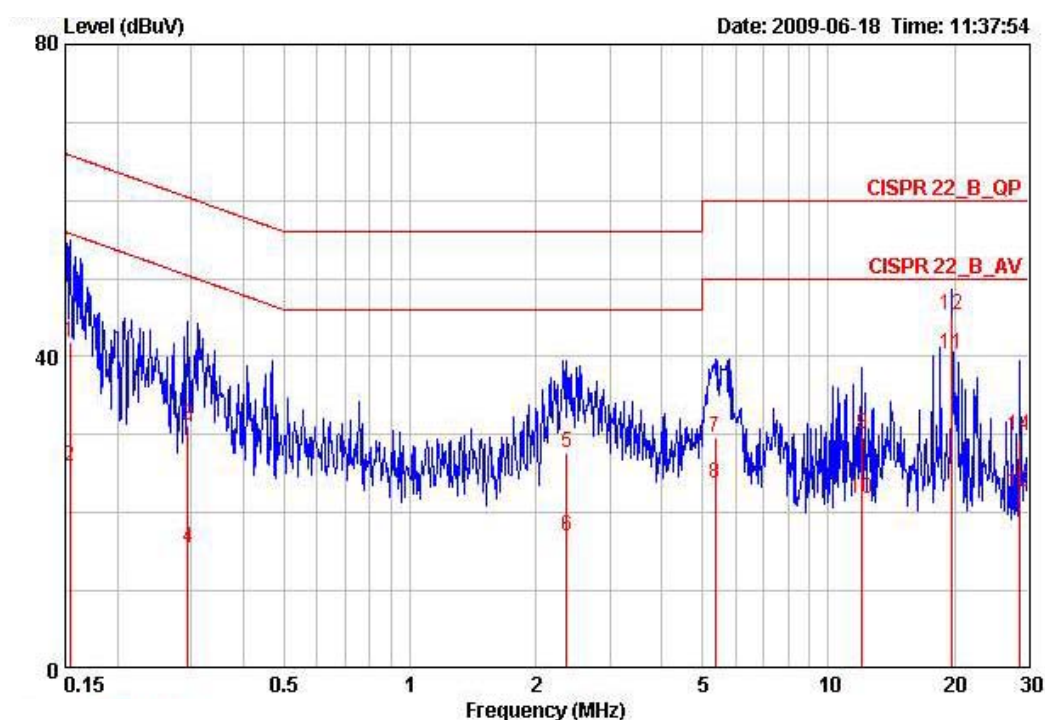
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

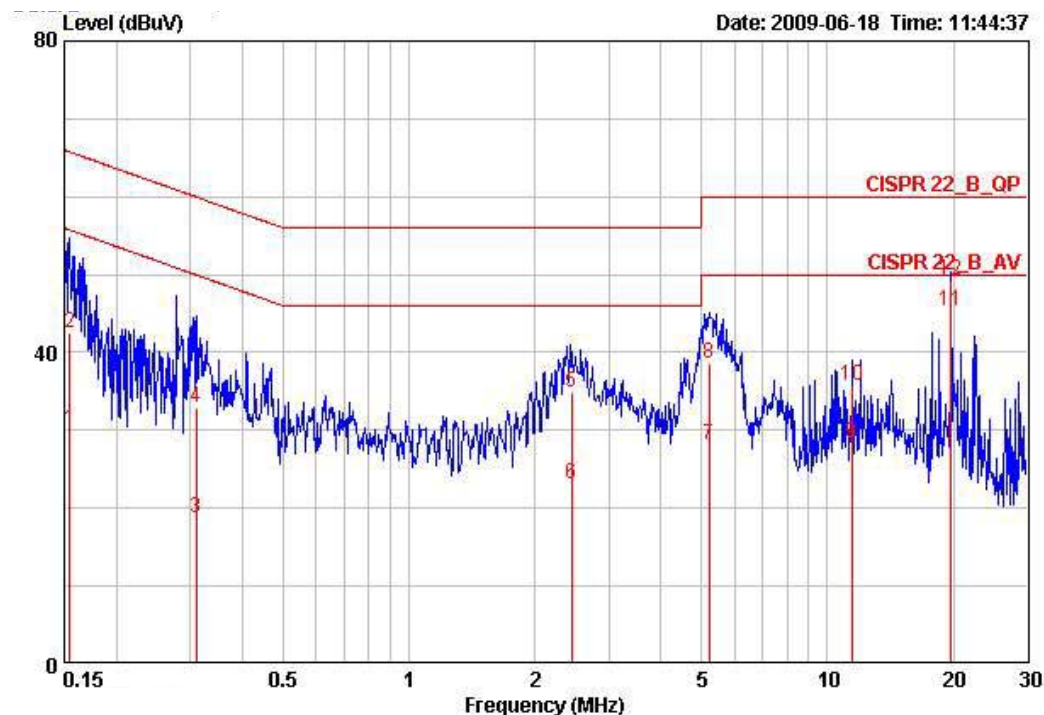
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	57%
Test Engineer	Howar Sung	Phase	Line
Configuration	Normal Link / Mode 2		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15403	41.80	-23.98	65.78	41.53	0.07	0.20	QP
2	0.15403	25.86	-29.92	55.78	25.59	0.07	0.20	AVERAGE
3	0.29398	31.28	-29.13	60.41	31.04	0.04	0.20	QP
4	0.29398	15.56	-34.85	50.41	15.32	0.04	0.20	AVERAGE
5	2.371	27.73	-28.27	56.00	27.47	0.06	0.20	QP
6	2.371	16.99	-29.01	46.00	16.73	0.06	0.20	AVERAGE
7	5.362	29.60	-30.40	60.00	29.12	0.18	0.30	QP
8	5.362	23.68	-26.32	50.00	23.20	0.18	0.30	AVERAGE
9	12.028	30.08	-29.92	60.00	29.24	0.44	0.40	QP
10	12.028	21.74	-28.26	50.00	20.90	0.44	0.40	AVERAGE
11	19.709	40.28	-9.72	50.00	38.97	0.81	0.50	AVERAGE
12	19.709	45.36	-14.64	60.00	44.05	0.81	0.50	QP
13	28.687	22.67	-27.33	50.00	20.71	1.36	0.60	AVERAGE
14	28.687	29.81	-30.19	60.00	27.85	1.36	0.60	QP

Temperature	24°C	Humidity	57%
Test Engineer	Howar Sung	Phase	Neutral
Configuration	Normal Link / Mode 2		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15485	30.04	-25.69	55.74	29.74	0.10	0.20	AVERAGE
2	0.15485	42.54	-23.19	65.74	42.24	0.10	0.20	QP
3	0.30998	18.70	-31.27	49.97	18.43	0.07	0.20	AVERAGE
4	0.30998	32.86	-27.11	59.97	32.59	0.07	0.20	QP
5	2.446	34.85	-21.15	56.00	34.55	0.10	0.20	QP
6	2.446	23.19	-22.81	46.00	22.89	0.10	0.20	AVERAGE
7	5.213	28.17	-21.83	50.00	27.66	0.21	0.30	AVERAGE
8	5.213	38.49	-21.51	60.00	37.98	0.21	0.30	QP
9	11.454	28.24	-21.76	50.00	27.39	0.45	0.40	AVERAGE
10	11.454	35.81	-24.19	60.00	34.96	0.45	0.40	QP
11	19.708	45.32	-4.68	50.00	44.03	0.79	0.50	AVERAGE
12	19.708	49.32	-10.68	60.00	48.03	0.79	0.50	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Conducted 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

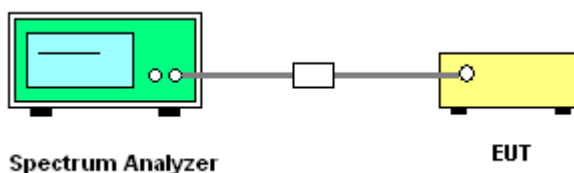
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	PEAK
Trace	Max Hold
Sweep Time	Auto

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005.
3. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

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 Conducted Output Power

Temperature	23°C	Humidity	58%
Test Engineer	Jacky Ho	Configurations	Draft n
Test Date	Jun. 27, 2009		

Configuration Draft n MCS8 20MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	24.05	30.00	Complies
6	2437 MHz	26.70	30.00	Complies
11	2462 MHz	22.28	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	24.09	30.00	Complies
6	2437 MHz	25.86	30.00	Complies
11	2462 MHz	22.09	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	27.08	30.00	Complies
6	2437 MHz	29.31	30.00	Complies
11	2462 MHz	25.20	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	21.48	30.00	Complies
6	2437 MHz	25.21	30.00	Complies
9	2452 MHz	20.27	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	21.76	30.00	Complies
6	2437 MHz	25.92	30.00	Complies
9	2452 MHz	21.64	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	24.63	30.00	Complies
6	2437 MHz	28.59	30.00	Complies
9	2452 MHz	24.02	30.00	Complies

Temperature	25°C	Humidity	60%
Test Engineer	Jacky Ho	Configurations	802.11b/g
Test Date	Jun. 27, 2009		

Configuration IEEE 802.11b Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	25.34	30.00	Complies
6	2437 MHz	24.13	30.00	Complies
11	2462 MHz	22.67	30.00	Complies

Configuration IEEE 802.11b Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.58	30.00	Complies
6	2437 MHz	23.01	30.00	Complies
11	2462 MHz	22.15	30.00	Complies

Configuration IEEE 802.11b Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	27.56	30.00	Complies
6	2437 MHz	26.62	30.00	Complies
11	2462 MHz	25.43	30.00	Complies

Configuration IEEE 802.11g Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.56	30.00	Complies
6	2437 MHz	26.55	30.00	Complies
11	2462 MHz	23.46	30.00	Complies

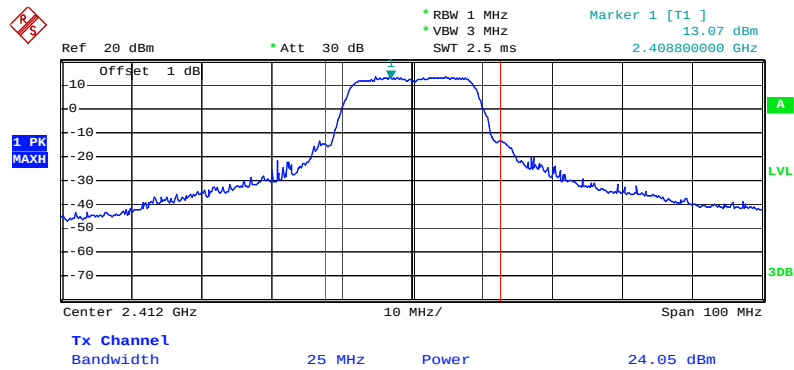
Configuration IEEE 802.11g Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.37	30.00	Complies
6	2437 MHz	26.10	30.00	Complies
11	2462 MHz	23.73	30.00	Complies

Configuration IEEE 802.11g Ant. 1 + Ant. 2

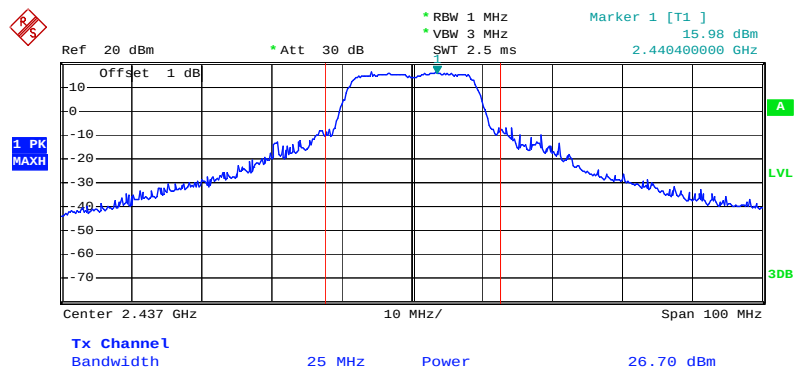
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	26.48	30.00	Complies
6	2437 MHz	29.34	30.00	Complies
11	2462 MHz	26.61	30.00	Complies

Conducted Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 1 / 2412 MHz



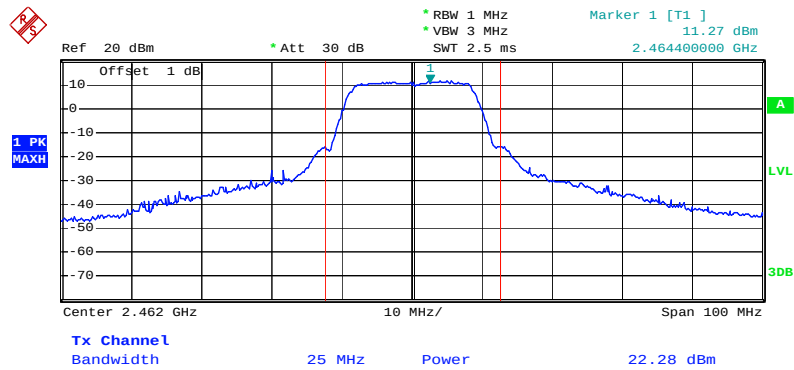
Date: 27.JUN.2009 11:02:12

Conducted Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 1 / 2437 MHz



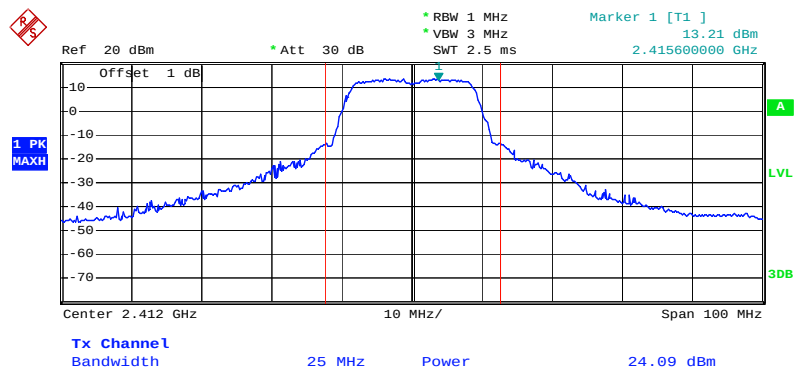
Date: 27.JUN.2009 11:07:01

Conducted Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 1 / 2462 MHz



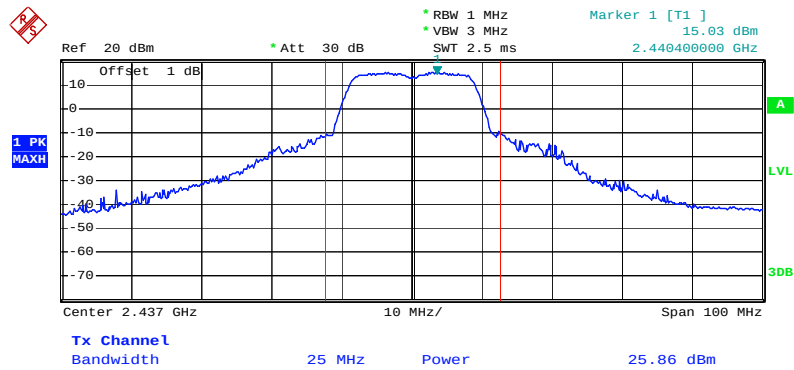
Date: 27.JUN.2009 11:10:33

Conducted Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 2 / 2412 MHz



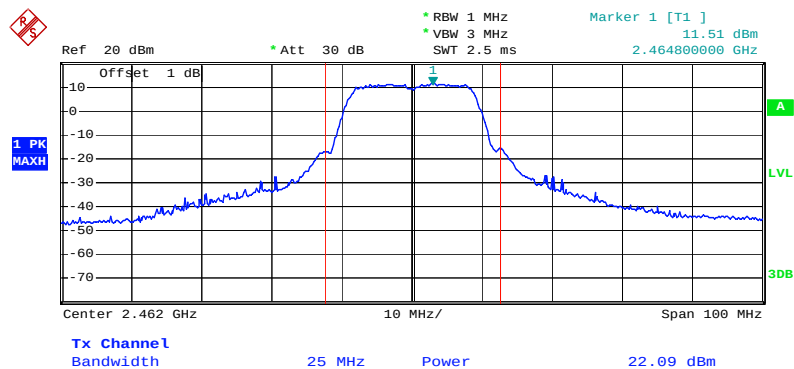
Date: 27.JUN.2009 11:03:27

Conducted Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 2 / 2437 MHz



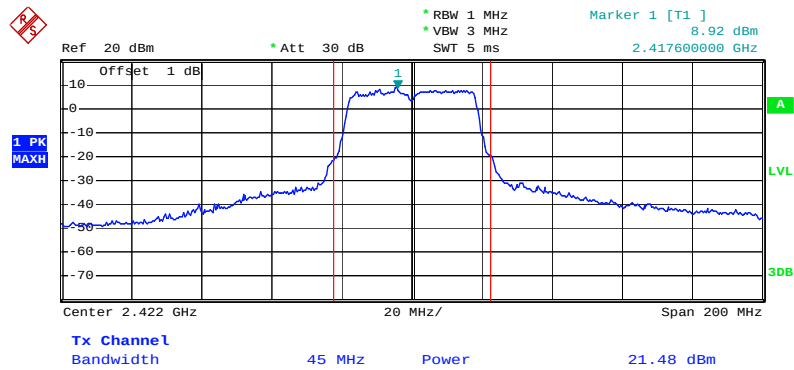
Date: 27.JUN.2009 11:05:57

Conducted Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 2 / 2462 MHz



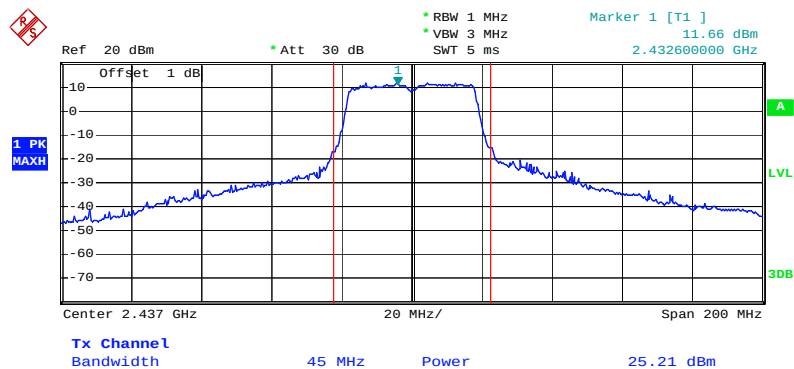
Date: 27.JUN.2009 11:09:15

Conducted Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 1 / 2422 MHz



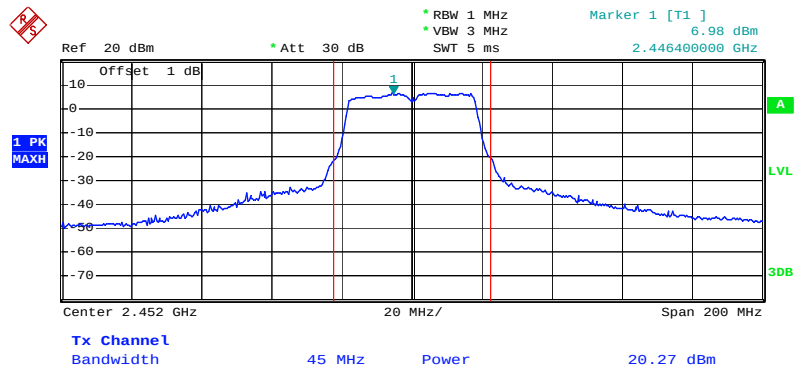
Date: 27.JUN.2009 11:16:49

Conducted Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 1 / 2437 MHz



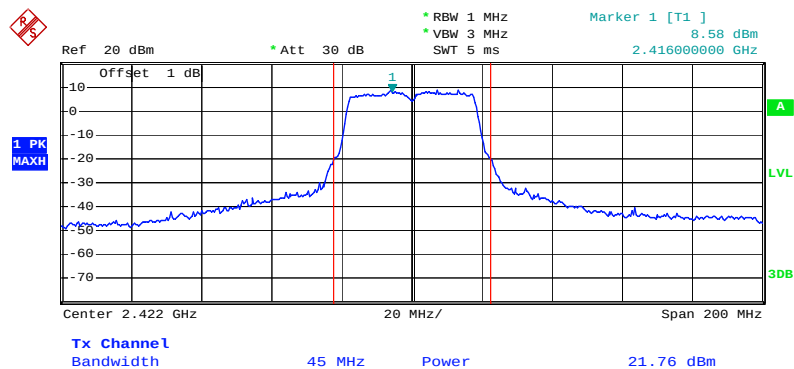
Date: 27.JUN.2009 11:18:42

Conducted Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 1 / 2452 MHz



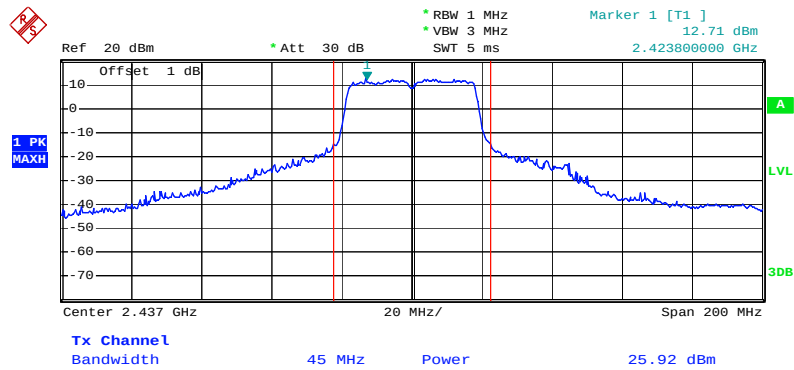
Date: 27.JUN.2009 11:23:00

Conducted Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 2 / 2422 MHz



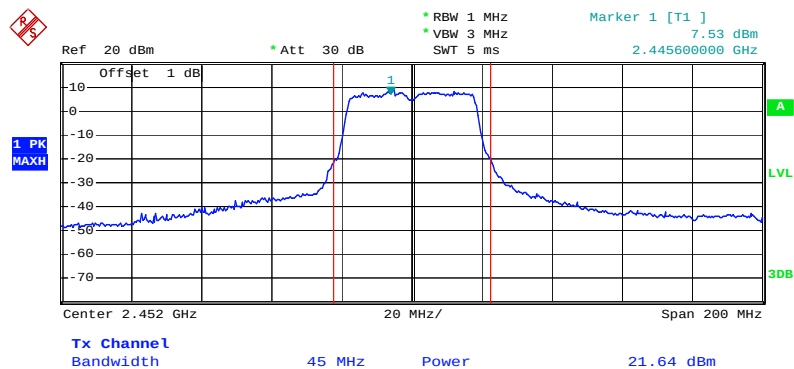
Date: 27.JUN.2009 11:15:03

Conducted Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 2 / 2437 MHz



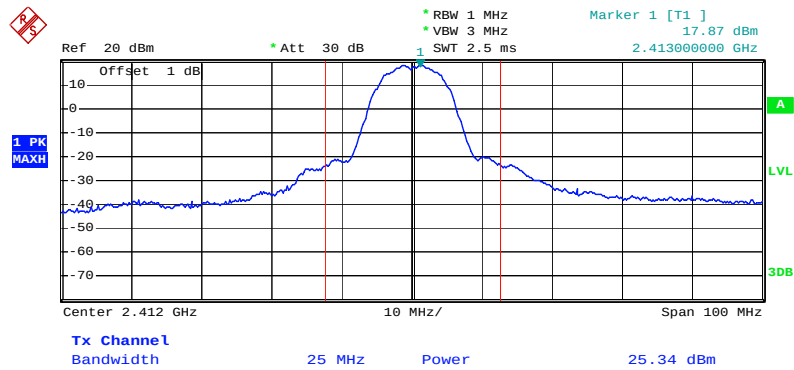
Date: 27.JUN.2009 11:19:32

Conducted Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 2 / 2452 MHz



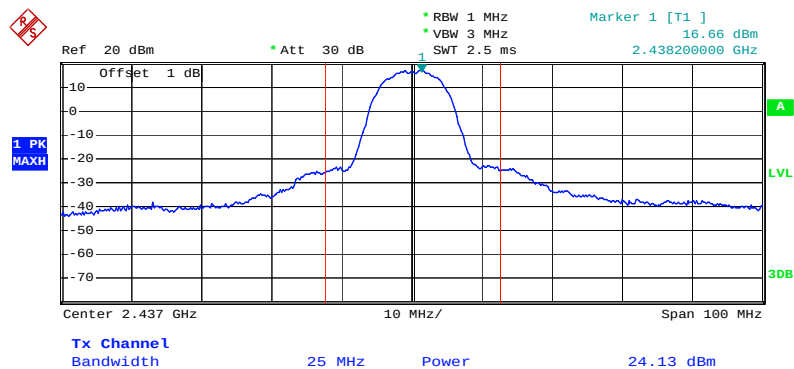
Date: 27.JUN.2009 11:21:53

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 1 / 2412 MHz



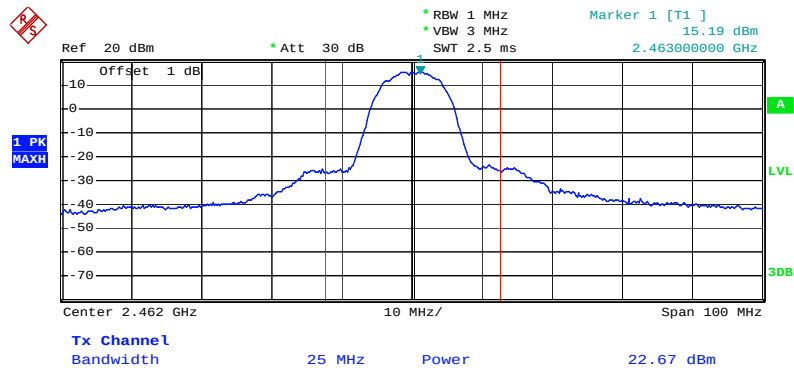
Date: 27.JUN.2009 10:28:07

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 1 / 2437 MHz



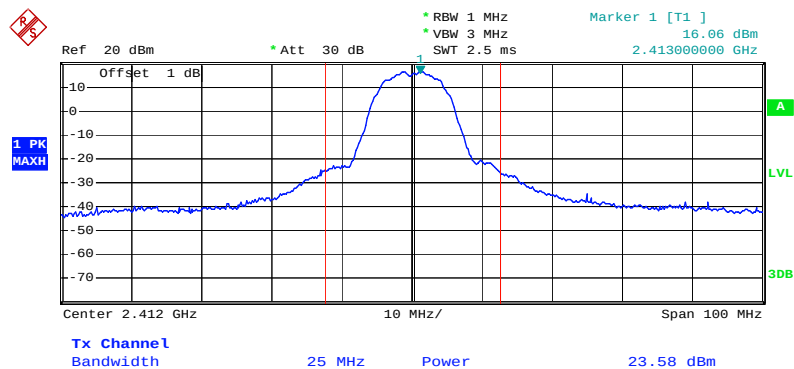
Date: 27.JUN.2009 10:30:58

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 1 / 2462 MHz



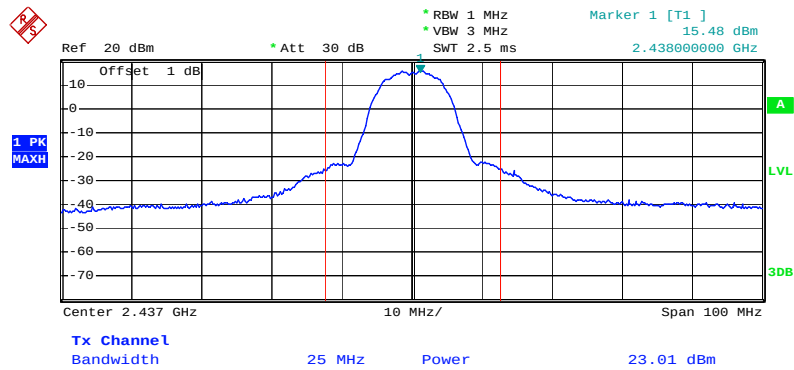
Date: 27.JUN.2009 10:32:16

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 2 / 2412 MHz



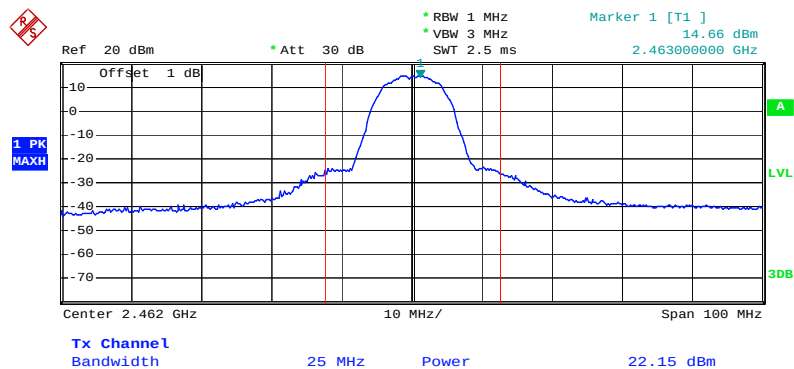
Date: 27.JUN.2009 10:28:41

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 2 / 2437 MHz



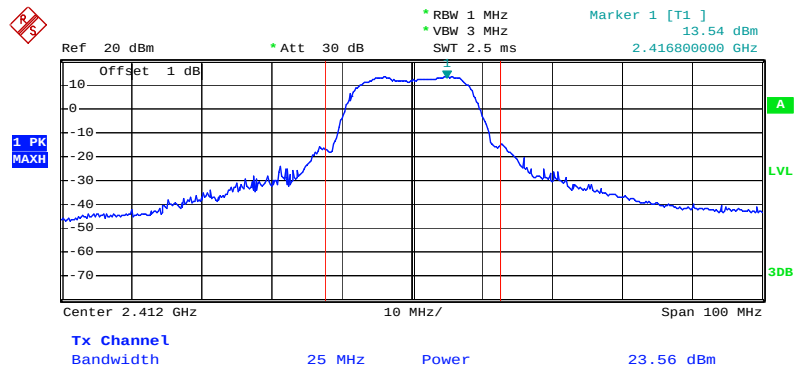
Date: 27.JUN.2009 10:30:11

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 2 / 2462 MHz



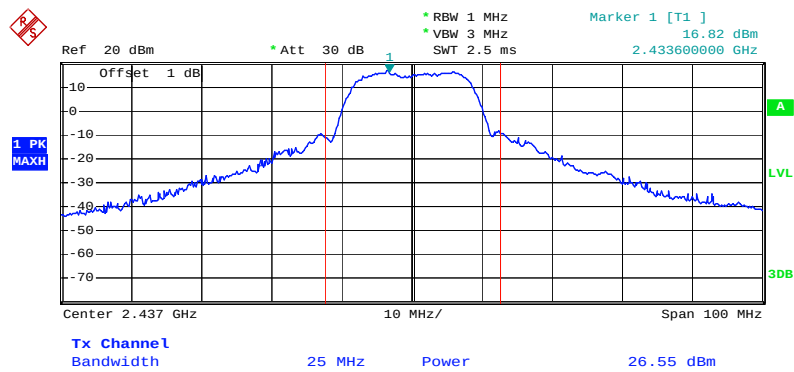
Date: 27.JUN.2009 10:32:49

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 1 / 2412 MHz



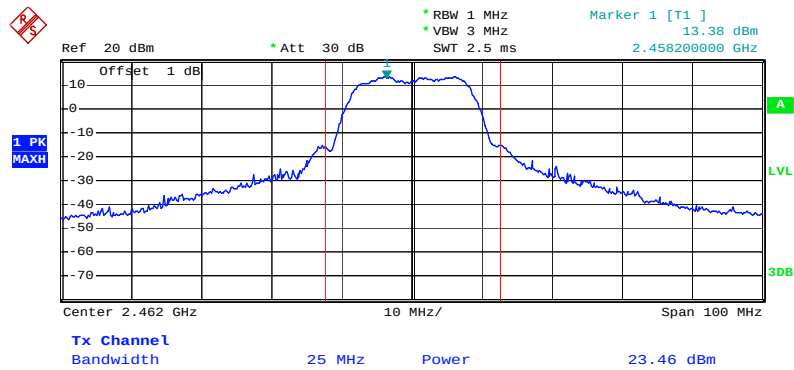
Date: 27.JUN.2009 10:43:39

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 1 / 2437 MHz



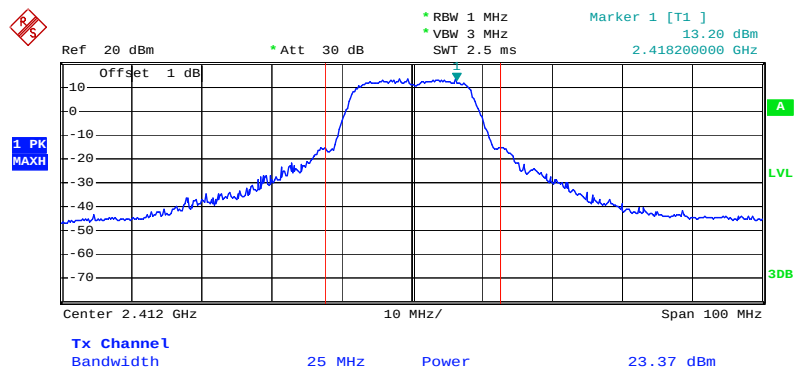
Date: 27.JUN.2009 10:59:33

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 1 / 2462 MHz



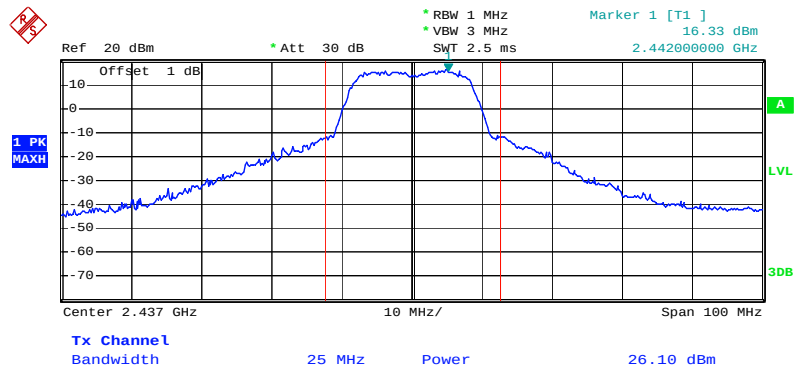
Date: 27.JUN.2009 10:45:41

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 2 / 2412 MHz



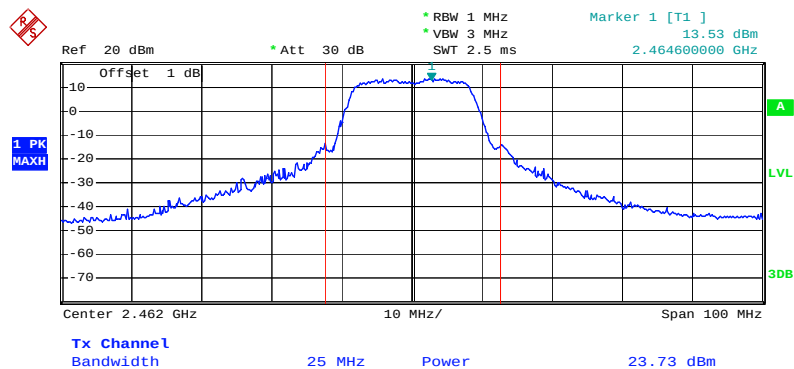
Date: 27.JUN.2009 10:42:35

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 2 / 2437 MHz



Date: 27.JUN.2009 10:56:56

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 2 / 2462 MHz



Date: 27.JUN.2009 10:47:02

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

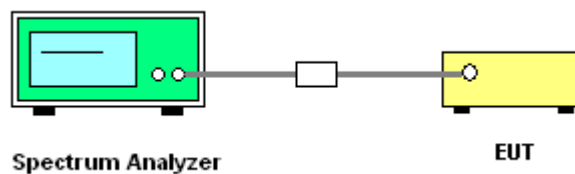
Please refer to section 5 of equipments list in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	30 kHz
RB	3 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	10s

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 30kHz and the sweep time to 10s and record the maximum peak value.
5. Measuring multiple antennas, the connector is required to link with spectrum analyser through a combiner.

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	Jacky Ho	Configurations	Draft n
Test Date	Jun. 21, 2009		

Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm / 3kHz)	Max. Limit (dBm / 3kHz)	Result
1	2412 MHz	-10.80	8.00	Complies
6	2437 MHz	-6.55	8.00	Complies
11	2462 MHz	-14.14	8.00	Complies

Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm / 3kHz)	Max. Limit (dBm / 3kHz)	Result
3	2422 MHz	-13.74	8.00	Complies
6	2437 MHz	-10.89	8.00	Complies
9	2452 MHz	-15.97	8.00	Complies

Temperature	23°C	Humidity	58%
Test Engineer	Jacky Ho	Configurations	802.11b/g
Test Date	Jun. 21, 2009		

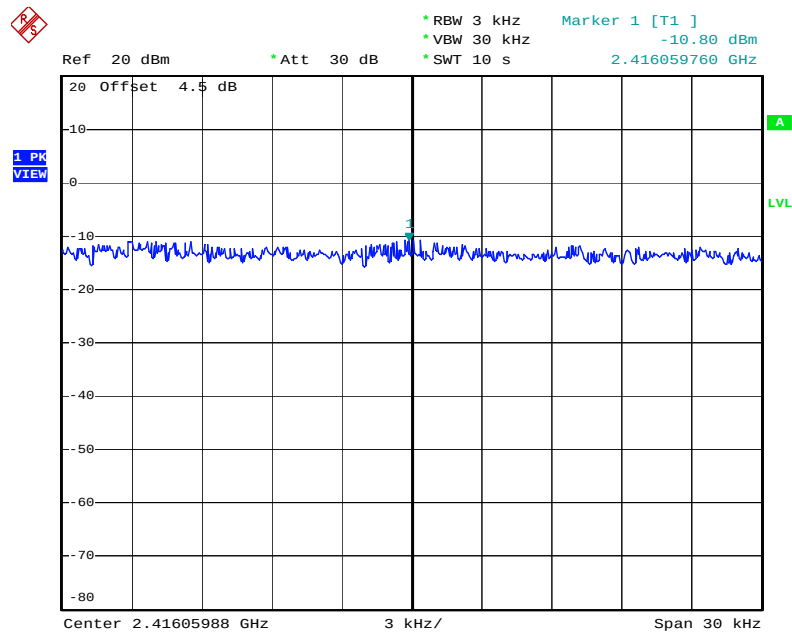
Configuration IEEE 802.11b Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm / 3kHz)	Max. Limit (dBm / 3kHz)	Result
1	2412 MHz	0.28	8.00	Complies
6	2437 MHz	-1.49	8.00	Complies
11	2462 MHz	-2.68	8.00	Complies

Configuration IEEE 802.11g Ant. 1 + Ant. 2

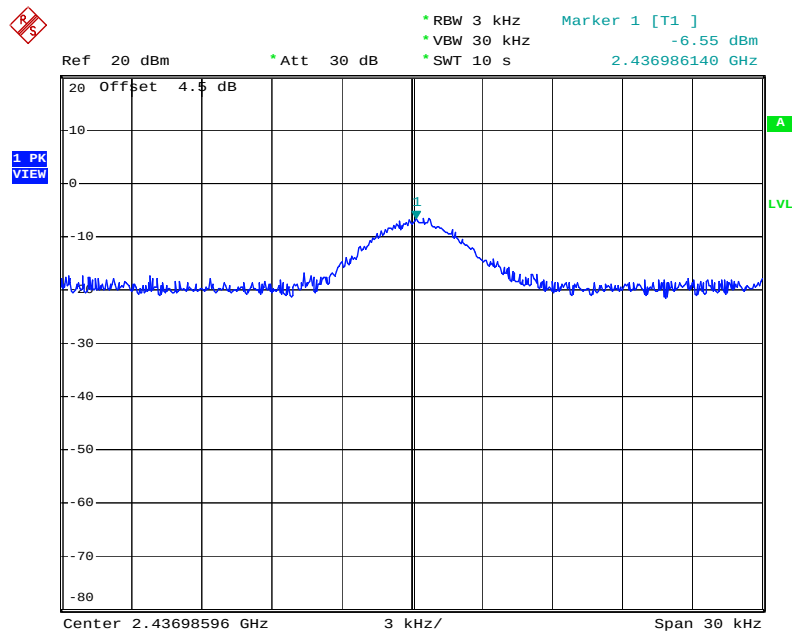
Channel	Frequency	Power Density (dBm / 3kHz)	Max. Limit (dBm / 3kHz)	Result
1	2412 MHz	-9.00	8.00	Complies
6	2437 MHz	-4.73	8.00	Complies
11	2462 MHz	-8.93	8.00	Complies

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. 1 + Ant. 2 / 2412 MHz



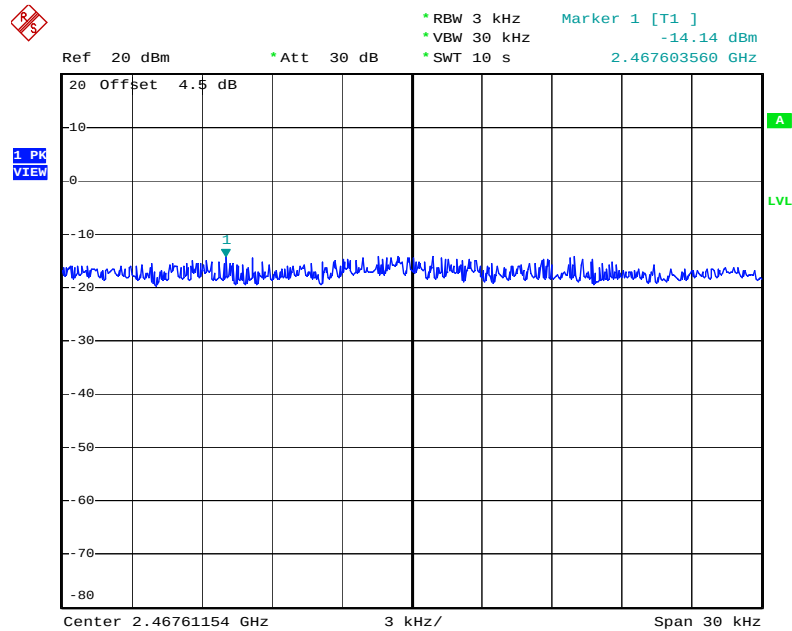
Date: 21.JUN.2009 15:16:57

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. 1 + Ant. 2 / 2437 MHz



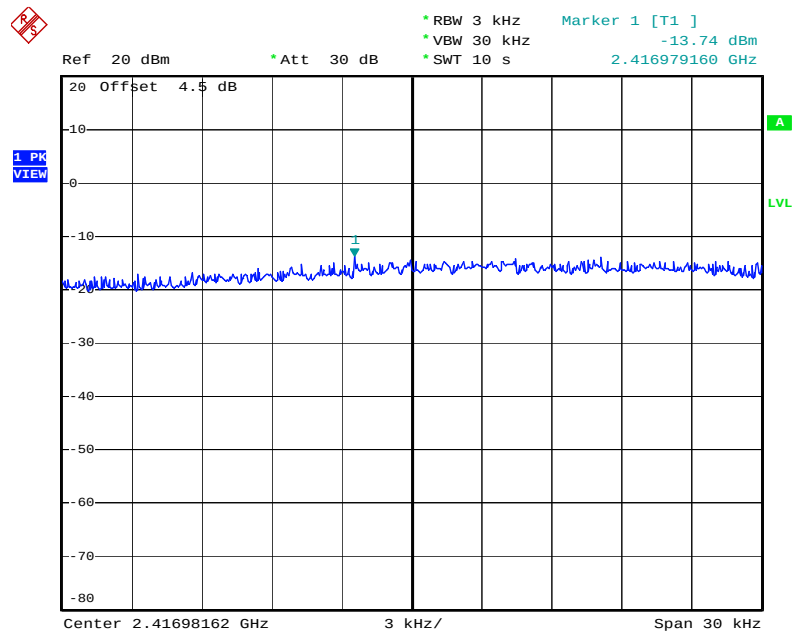
Date: 21.JUN.2009 15:22:49

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. 1 + Ant. 2 / 2462 MHz



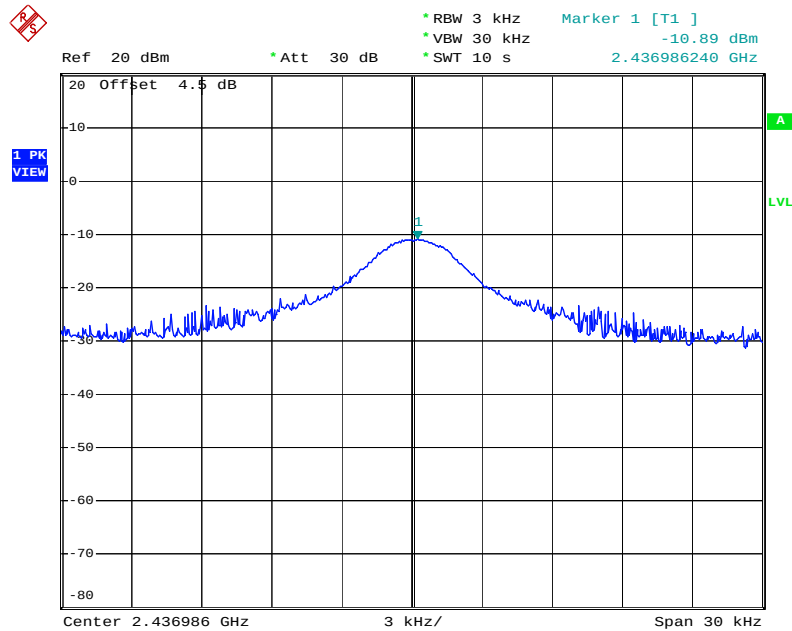
Date: 21.JUN.2009 15:20:10

Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. 1 + Ant. 2 / 2422 MHz



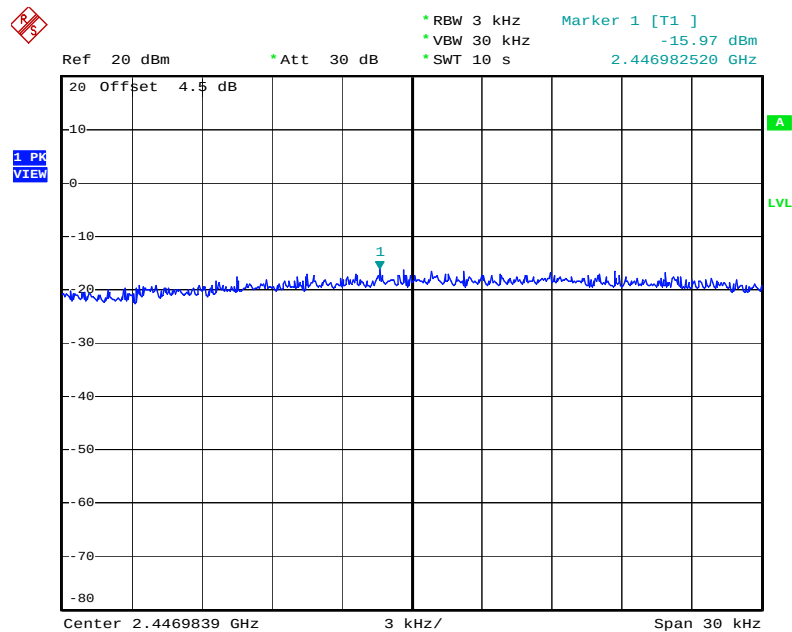
Date: 21.JUN.2009 15:08:41

Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. 1 + Ant. 2 / 2437 MHz



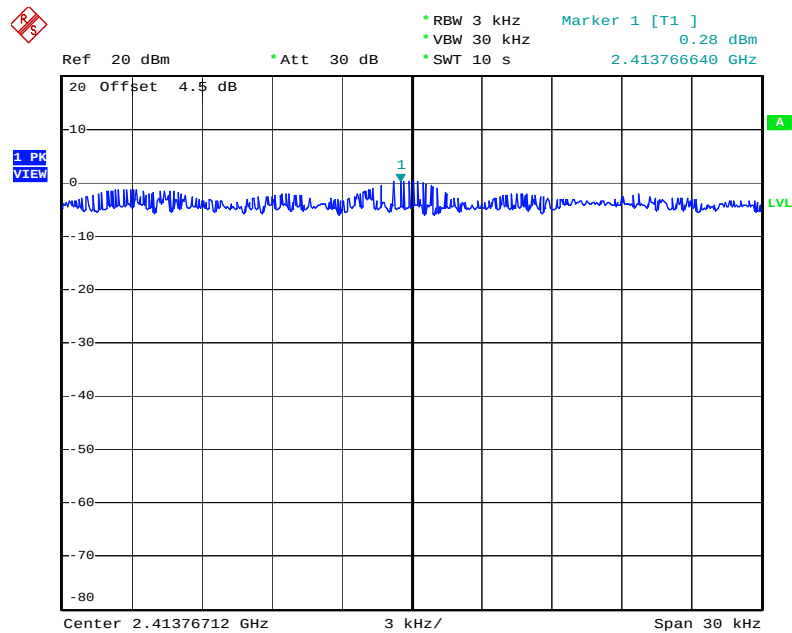
Date: 21.JUN.2009 15:13:06

Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. 1 + Ant. 2 / 2452 MHz



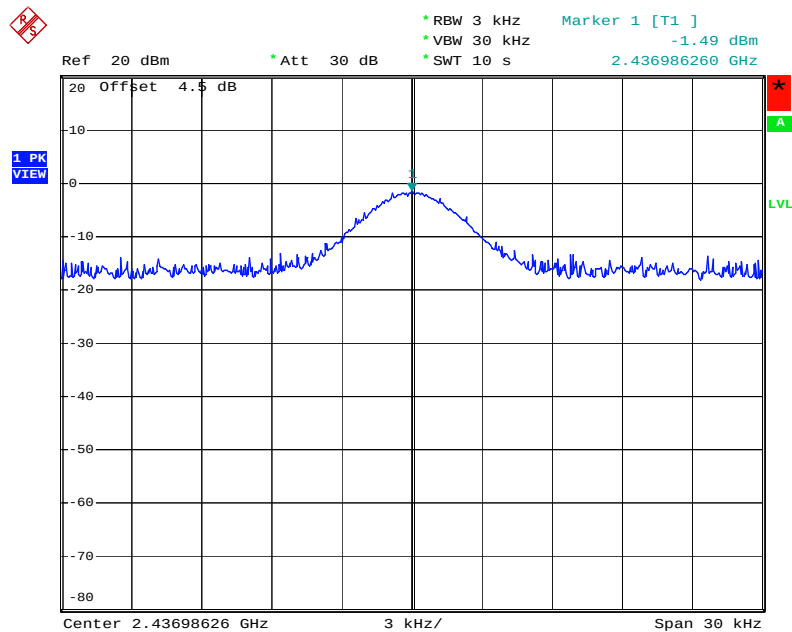
Date: 21.JUN.2009 15:11:00

Power Density Plot on Configuration IEEE 802.11b Ant. 1 + Ant. 2 / 2412 MHz



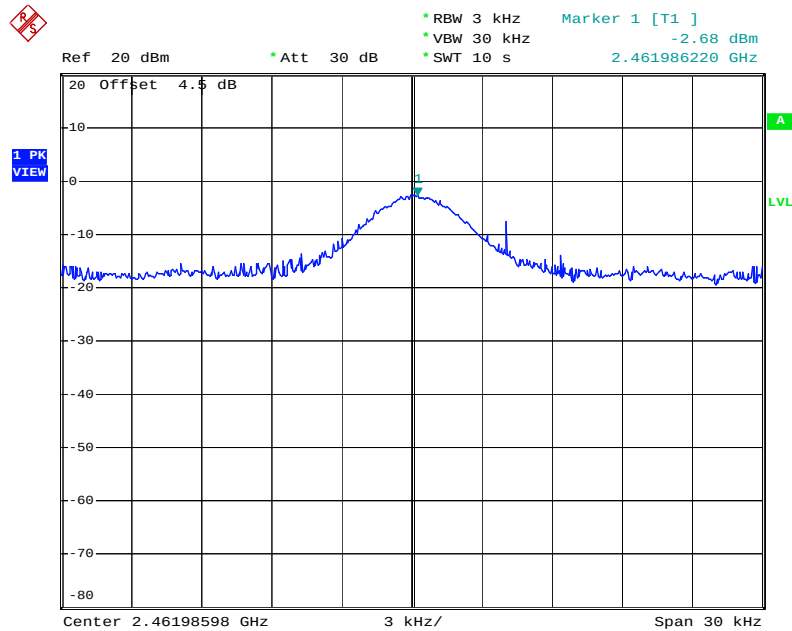
Date: 21.JUN.2009 15:32:02

Power Density Plot on Configuration IEEE 802.11b Ant. 1 + Ant. 2 / 2437 MHz



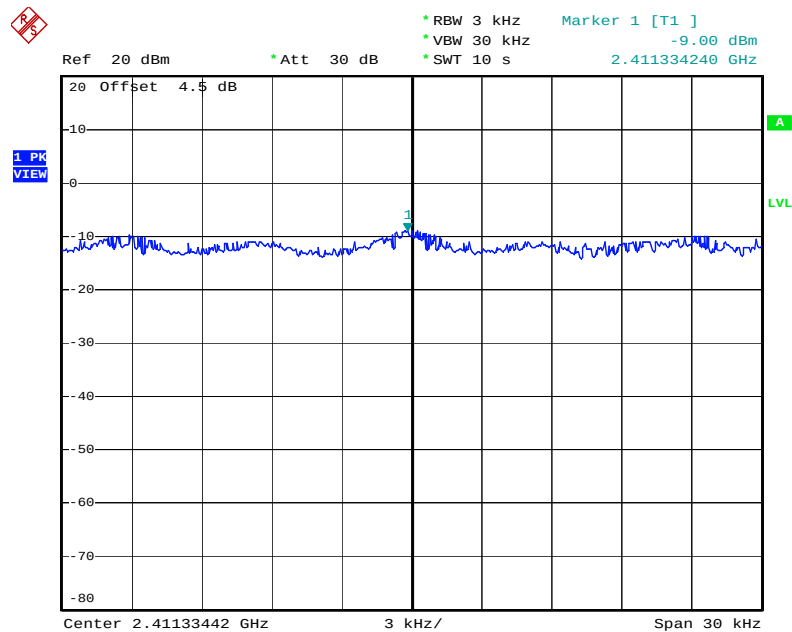
Date: 21.JUN.2009 15:35:11

Power Density Plot on Configuration IEEE 802.11b Ant. 1 + Ant. 2 / 2462 MHz



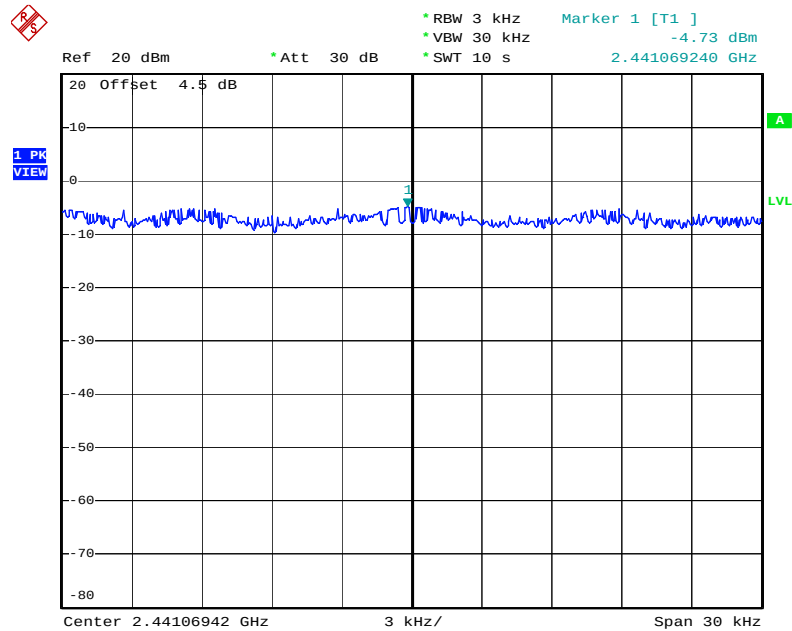
Date: 21.JUN.2009 15:57:55

Power Density Plot on Configuration IEEE 802.11g Ant. 1 + Ant. 2 / 2412 MHz



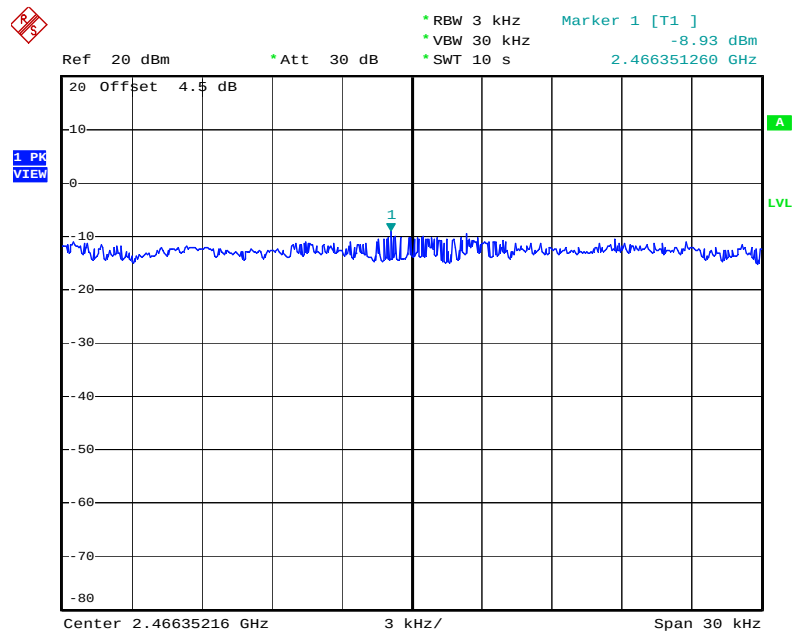
Date: 21.JUN.2009 15:46:23

Power Density Plot on Configuration IEEE 802.11g Ant. 1 + Ant. 2 / 2437 MHz



Date: 21.JUN.2009 15:49:39

Power Density Plot on Configuration IEEE 802.11g Ant. 1 + Ant. 2 / 2462 MHz



Date: 21.JUN.2009 15:43:59

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

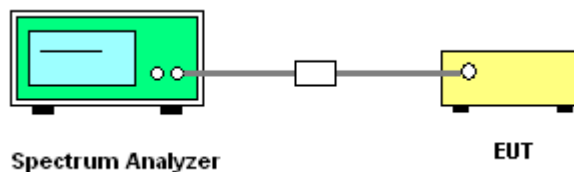
Please refer to section 5 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

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. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

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	Jacky Ho	Configurations	Draft n
Test Date	Jun. 21, 2009		

Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.60	17.64	500	Complies
6	2437 MHz	17.32	17.68	500	Complies
11	2462 MHz	17.56	17.64	500	Complies

Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.36	36.24	500	Complies
6	2437 MHz	35.76	36.24	500	Complies
9	2452 MHz	35.84	36.24	500	Complies

Temperature	25°C	Humidity	60%
Test Engineer	Jacky Ho	Configurations	802.11b/g
Test Date	Jun. 21, 2009		

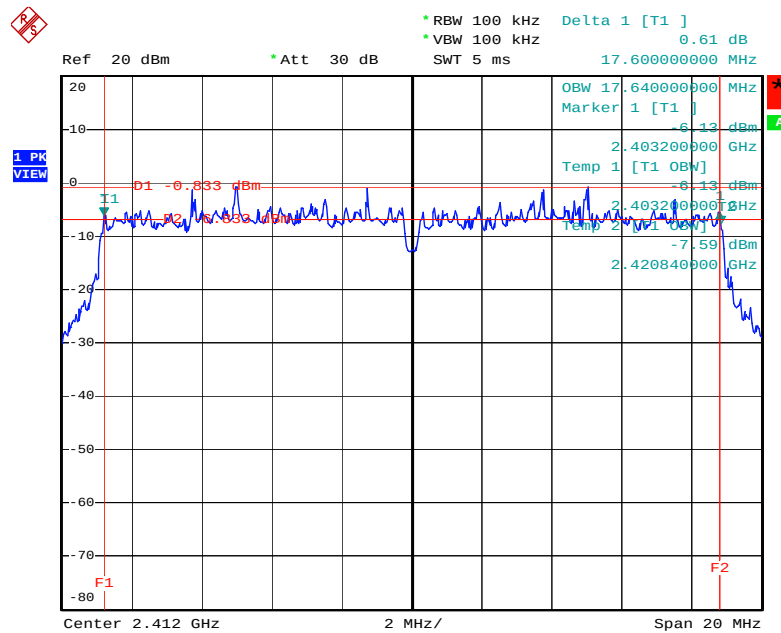
Configuration IEEE 802.11b Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	7.52	10.12	500	Complies
6	2437 MHz	8.04	10.08	500	Complies
11	2462 MHz	8.08	10.12	500	Complies

Configuration IEEE 802.11g Ant. 1 + Ant. 2

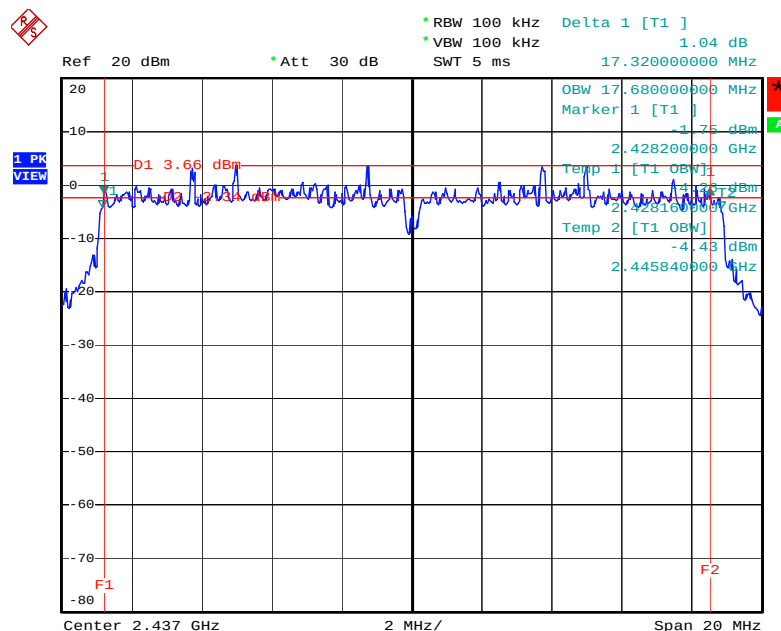
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	15.08	16.04	500	Complies
6	2437 MHz	15.08	16.08	500	Complies
11	2462 MHz	15.72	16.20	500	Complies

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 2412 MHz



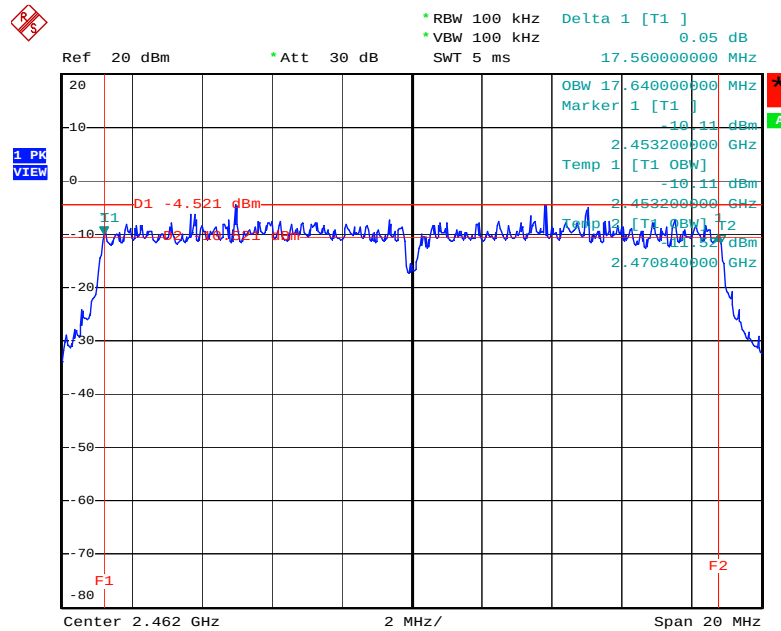
Date: 21.JUN.2009 15:15:30

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 2437 MHz



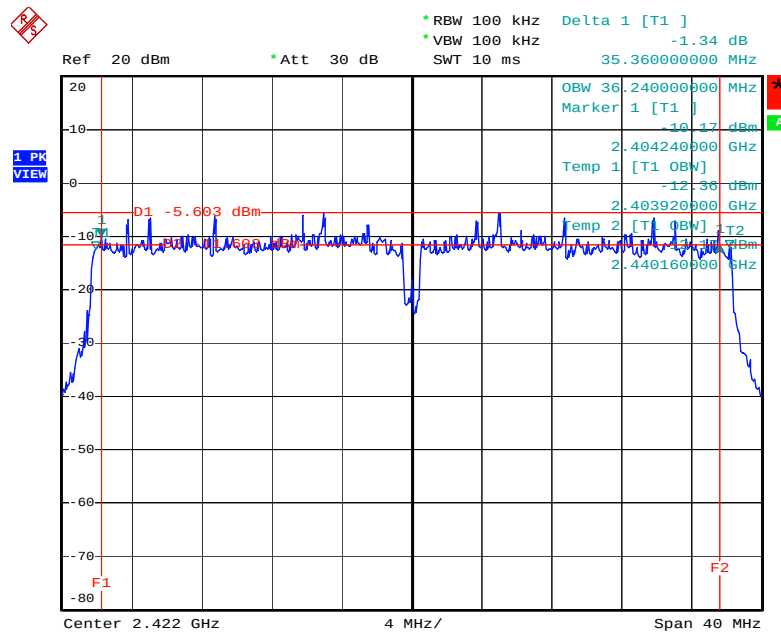
Date: 21.JUN.2009 15:21:33

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 2462 MHz



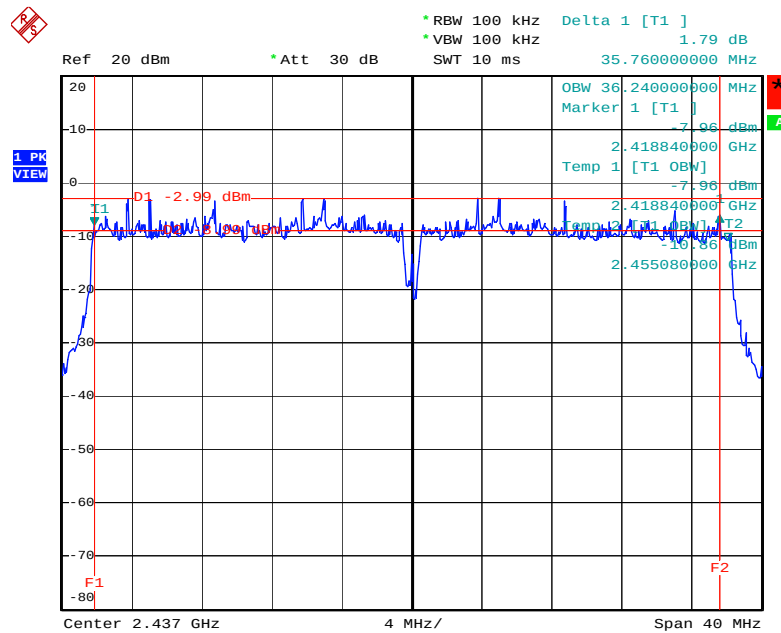
Date: 21.JUN.2009 15:18:43

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2 / 2422 MHz



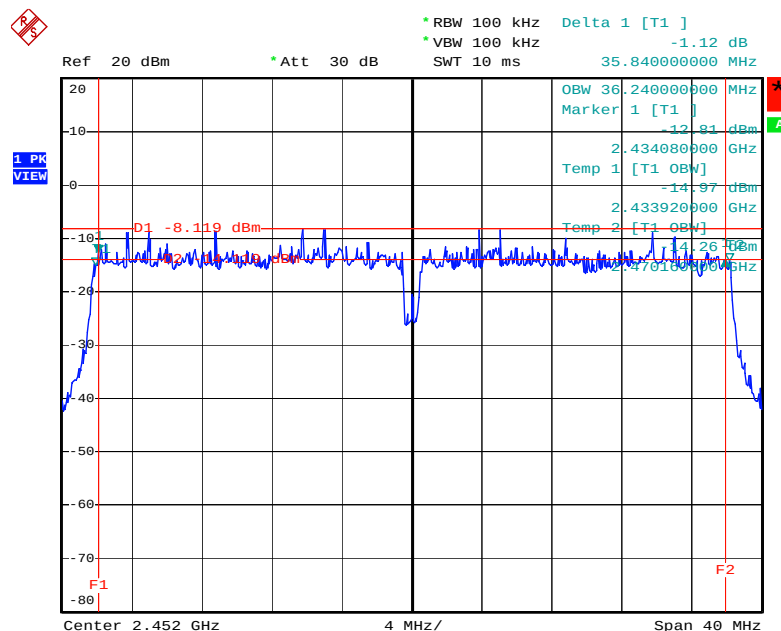
Date: 21.JUN.2009 15:07:14

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2 / 2437 MHz



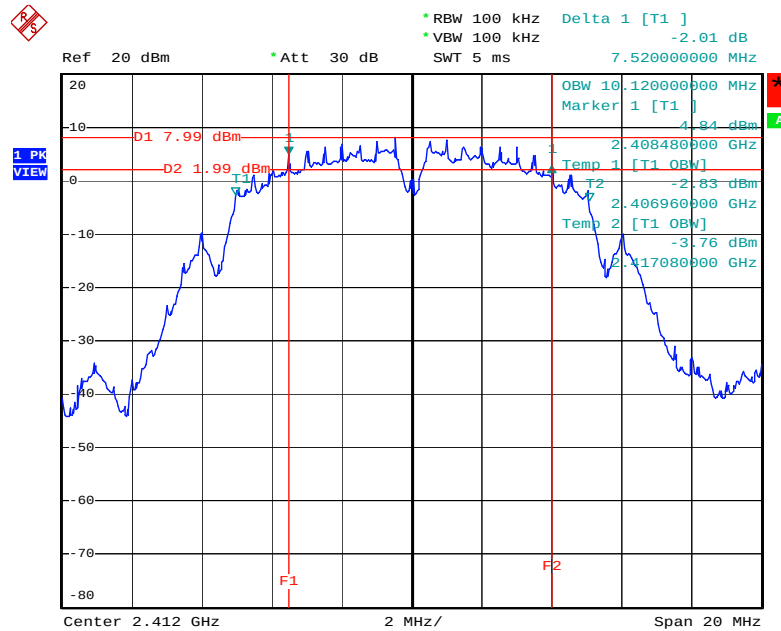
Date: 21.JUN.2009 15:12:08

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2 / 2452 MHz



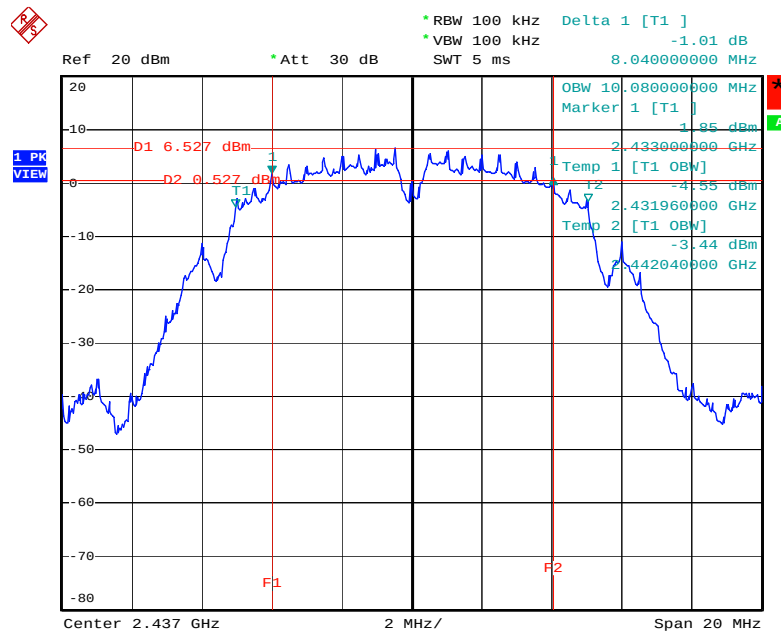
Date: 21.JUN.2009 15:09:33

6 dB Bandwidth Plot on Configuration IEEE 802.11b Ant. 1 + Ant. 2 / 2412 MHz



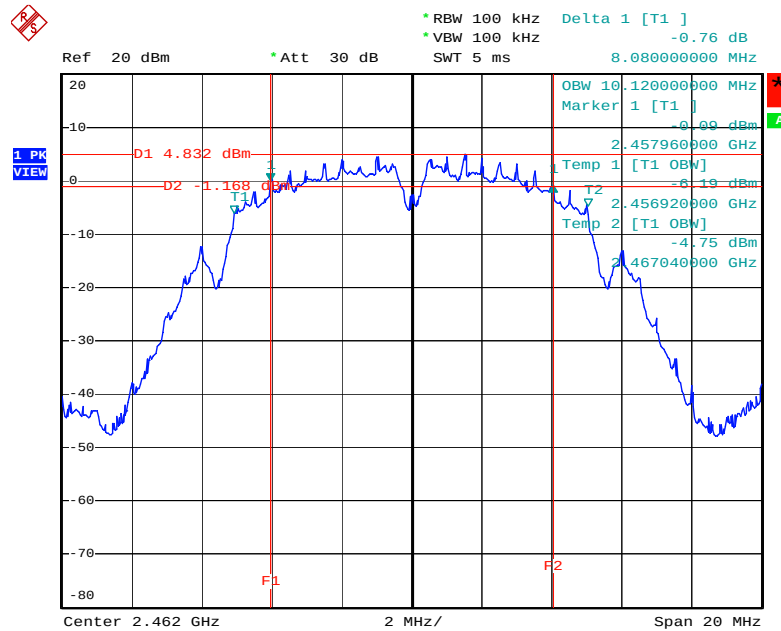
Date: 21.JUN.2009 15:30:35

6 dB Bandwidth Plot on Configuration IEEE 802.11b Ant. 1 + Ant. 2 / 2437 MHz



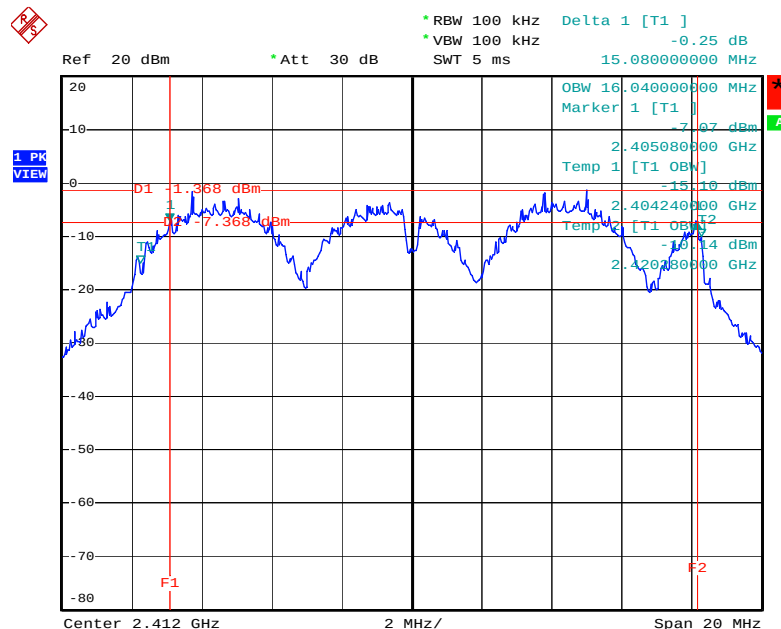
Date: 21.JUN.2009 15:33:17

6 dB Bandwidth Plot on Configuration IEEE 802.11b Ant. 1 + Ant. 2 / 2462 MHz



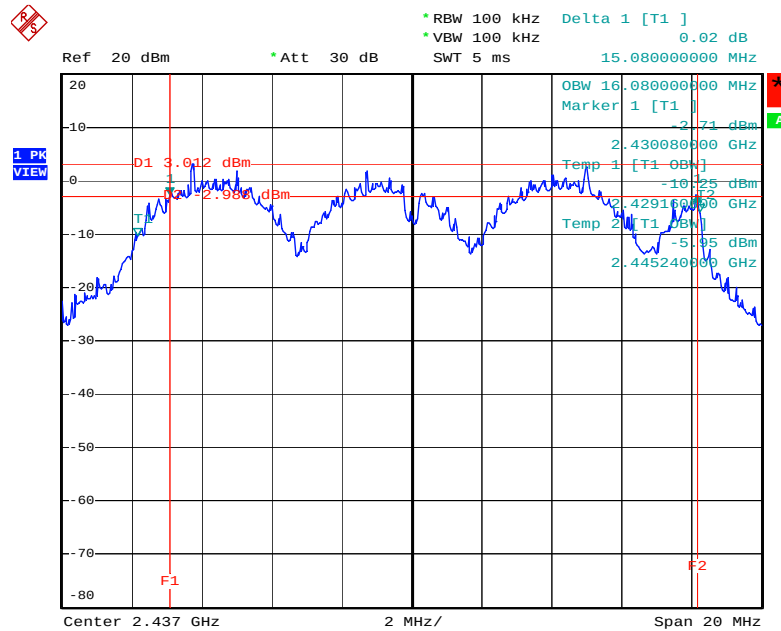
Date: 21.JUN.2009 15:27:52

6 dB Bandwidth Plot on Configuration IEEE 802.11g Ant. 1 + Ant. 2 / 2412 MHz



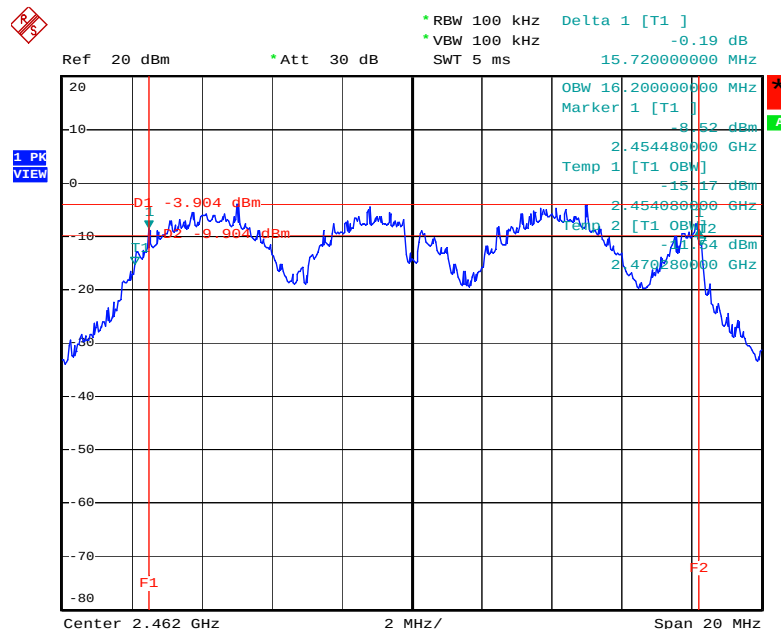
Date: 21.JUN.2009 15:44:56

6 dB Bandwidth Plot on Configuration IEEE 802.11g Ant. 1 + Ant. 2 / 2437 MHz



Date: 21.JUN.2009 15:48:11

6 dB Bandwidth Plot on Configuration IEEE 802.11g Ant. 1 + Ant. 2 / 2462 MHz



Date: 21.JUN.2009 15:42:32

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

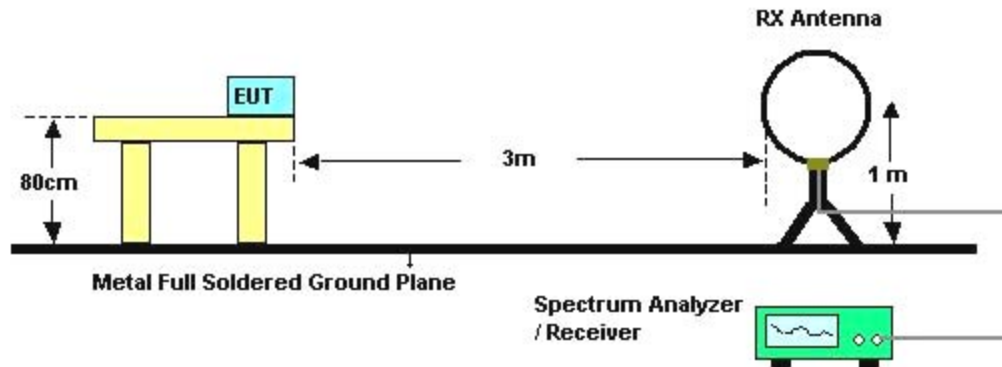
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.5.3. Test Procedures

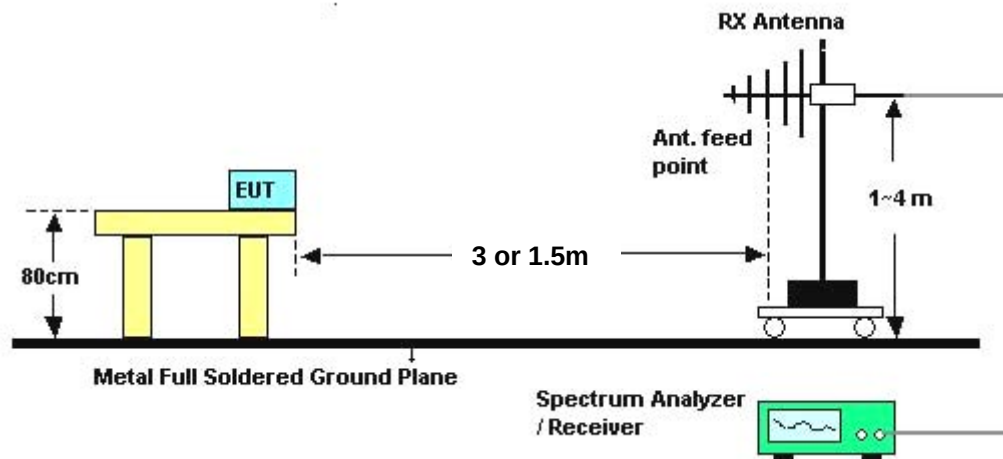
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Normal Link

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.

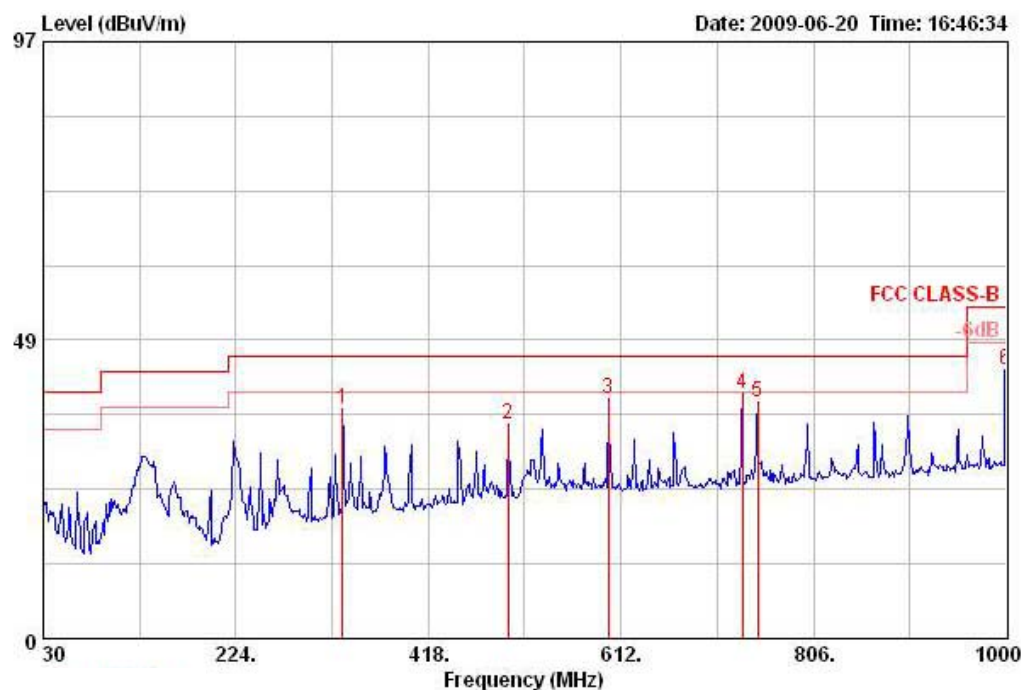
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

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

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

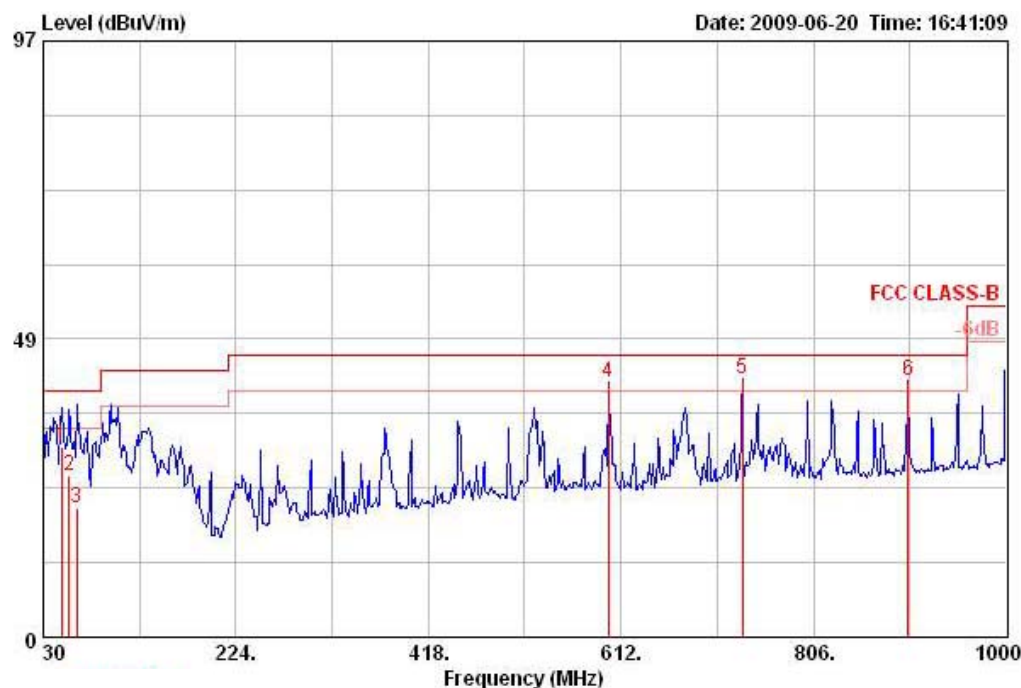
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Normal Link / Mode 2

Horizontal



	Freq	Level	Over	Limit	Read	Antenna	Preamp	Cable	Remark	Pol/Phase	Table	Ant
	MHz	dBuV/m	Limit	Line	Level	Factor	Factor	Loss			Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB			deg	cm
1	331.670	37.20	-8.80	46.00	47.94	14.23	27.12	2.16	Peak	HORIZONTAL	0	100
2	498.510	34.69	-11.31	46.00	42.48	17.60	28.09	2.70	Peak	HORIZONTAL	0	100
3	599.390	38.85	-7.15	46.00	45.30	18.76	28.10	2.90	Peak	HORIZONTAL	0	100
4	734.220	39.72	-6.28	46.00	44.82	19.32	27.86	3.44	Peak	HORIZONTAL	315	131
5	749.740	38.50	-7.50	46.00	43.37	19.43	27.80	3.50	Peak	HORIZONTAL	0	100
6	1000.000	43.78	-10.22	54.00	45.79	21.29	27.00	3.70	Peak	HORIZONTAL	0	100

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna	Preamp	Cable	Remark	Pol/Phase	Table Pos	Ant Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm
1	48.400	31.03	-8.97	40.00	49.00	9.13	27.80	0.70 QP	VERTICAL	70	100
2	56.190	26.29	-13.71	40.00	45.80	7.47	27.78	0.80 QP	VERTICAL	134	100
3	63.950	21.05	-18.95	40.00	41.20	6.72	27.74	0.88 QP	VERTICAL	6	176
4	599.390	41.45	-4.55	46.00	47.89	18.76	28.10	2.90 Peak	VERTICAL	0	400
5	734.220	41.91	-4.09	46.00	47.01	19.32	27.86	3.44 Peak	VERTICAL	0	400
6	901.060	41.82	-4.18	46.00	45.08	20.54	27.39	3.60 Peak	VERTICAL	0	400

Note:

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

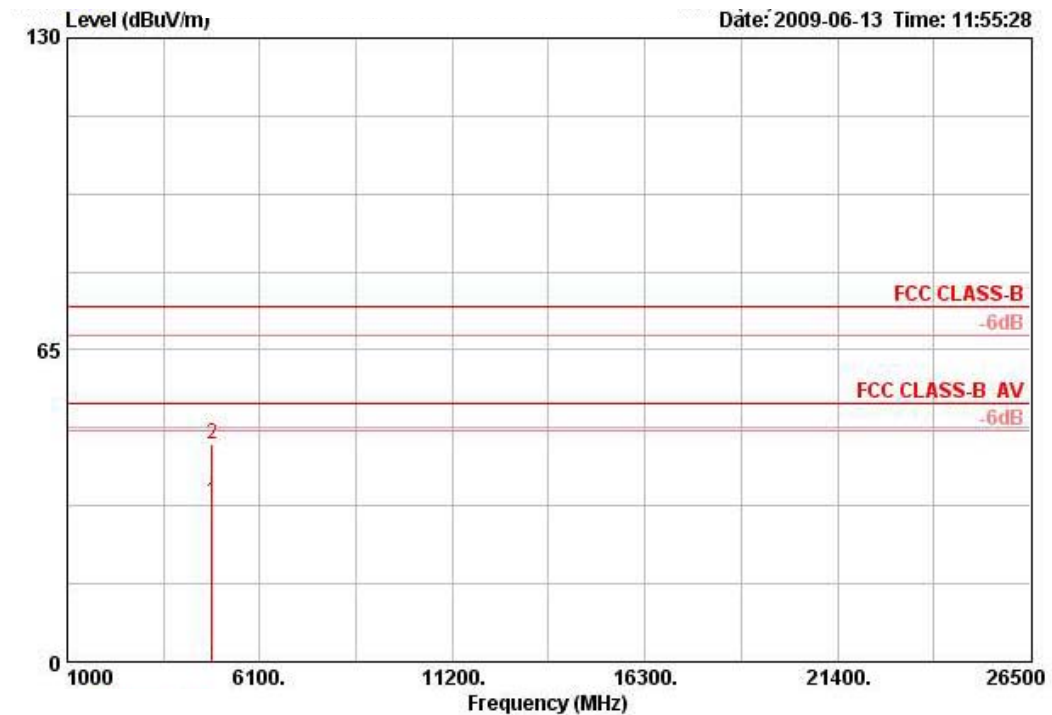
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

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

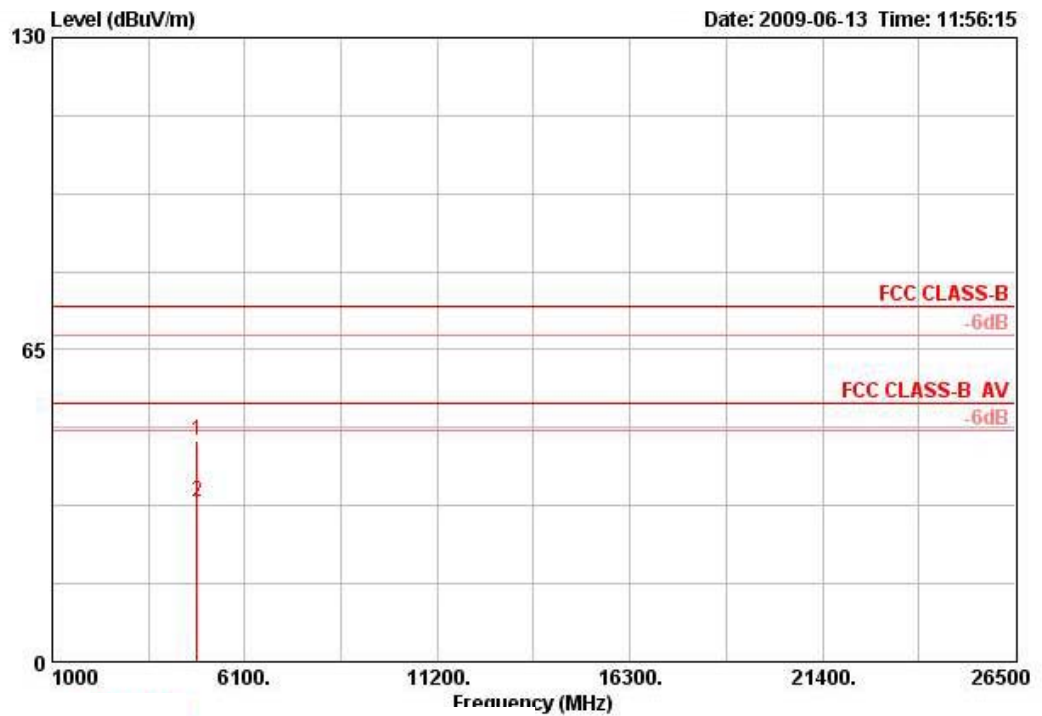
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n MCS8 20MHz Ch 1 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4823.982	33.14	54.00	-20.86	31.16	1.98	AVERAGE	HORIZONTAL	360	100
2	4823.992	45.21	74.00	-28.79	43.23	1.98	PEAK	HORIZONTAL	360	100

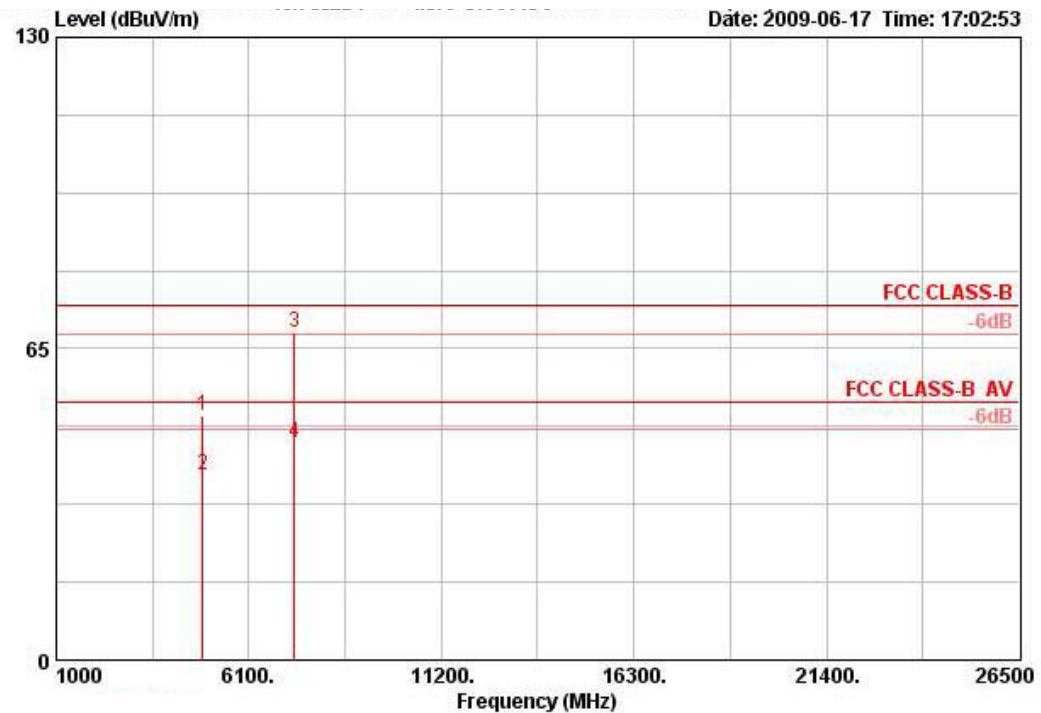
Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4824.011	45.92	74.00	-28.08	43.94	1.98	PEAK	VERTICAL	99	100
2	4824.023	33.12	54.00	-20.88	31.15	1.98	AVERAGE	VERTICAL	99	100

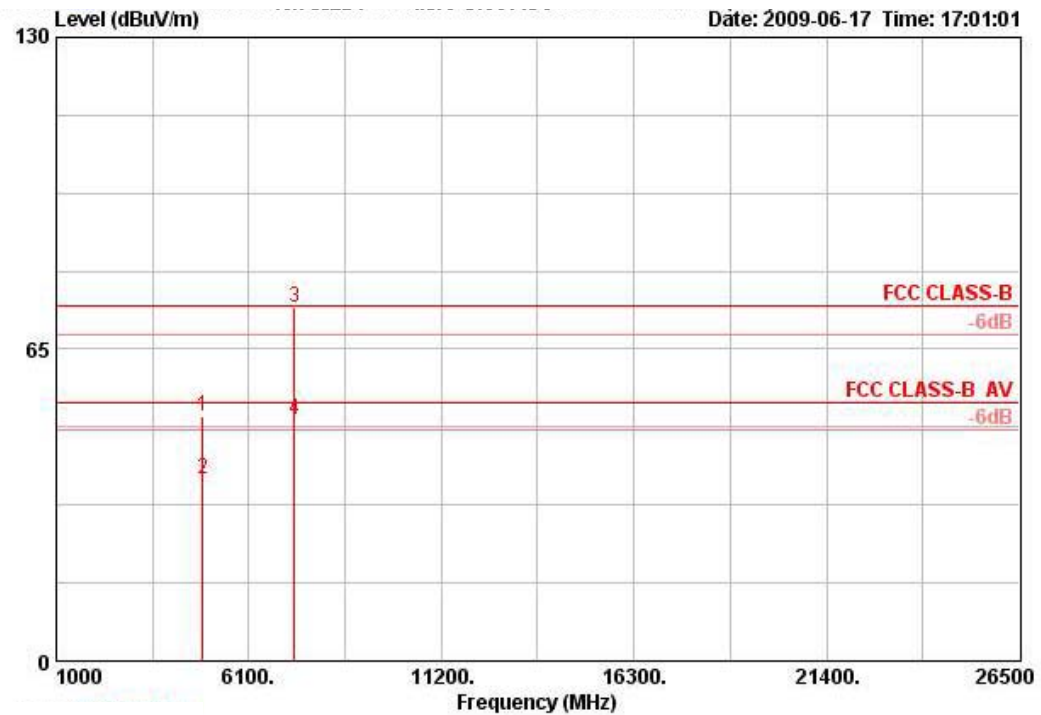
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n MCS8 20MHz Ch 6 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read		Cable	Preamp	Antenna	Table	Ant
	MHz	dBuV/m	dBuV/m	dB	Level	Remark	Loss	Factor	Factor	Pos	Pos
					dBuV		dB	dB	dB/m	deg	cm
1	4873.776	51.10	74.00	-22.90	49.00	PEAK	3.97	35.03	33.16	267	100
2	4874.476	38.52	54.00	-15.48	36.43	AVERAGE	3.97	35.03	33.16	267	100
3	7308.100	68.20	74.00	-5.80	62.47	PEAK	5.18	35.40	35.96	290	100
4	7310.000	45.34	54.00	-8.66	39.61	AVERAGE	5.18	35.40	35.96	290	100

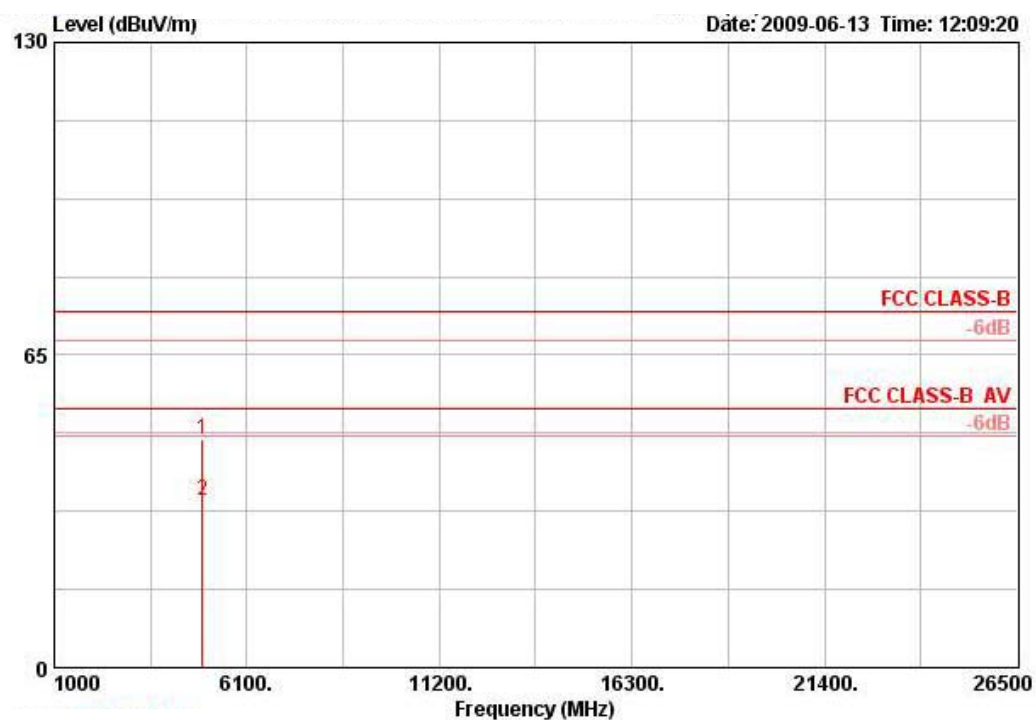
Vertical



	Freq	Level	Limit	Over	Read		Cable	Preamp	Antenna	Table	Ant	
	MHz	dBuV/m	Line	Limit	Level	Remark	Loss	Factor	Factor	Pos	Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV		dB	dB	dB/m	deg	cm	
1	4874.005	51.13	74.00	-22.87	49.03	PEAK	3.97	35.03	33.16	244	100	VERTICAL
2 @	4874.025	37.75	54.00	-16.25	35.65	AVERAGE	3.97	35.03	33.16	244	100	VERTICAL
3 @	7306.300	73.79	74.00	-0.21	68.10	PEAK	5.17	35.40	35.92	101	124	VERTICAL
4 @	7316.200	50.20	54.00	-3.80	44.47	AVERAGE	5.18	35.40	35.96	101	124	VERTICAL

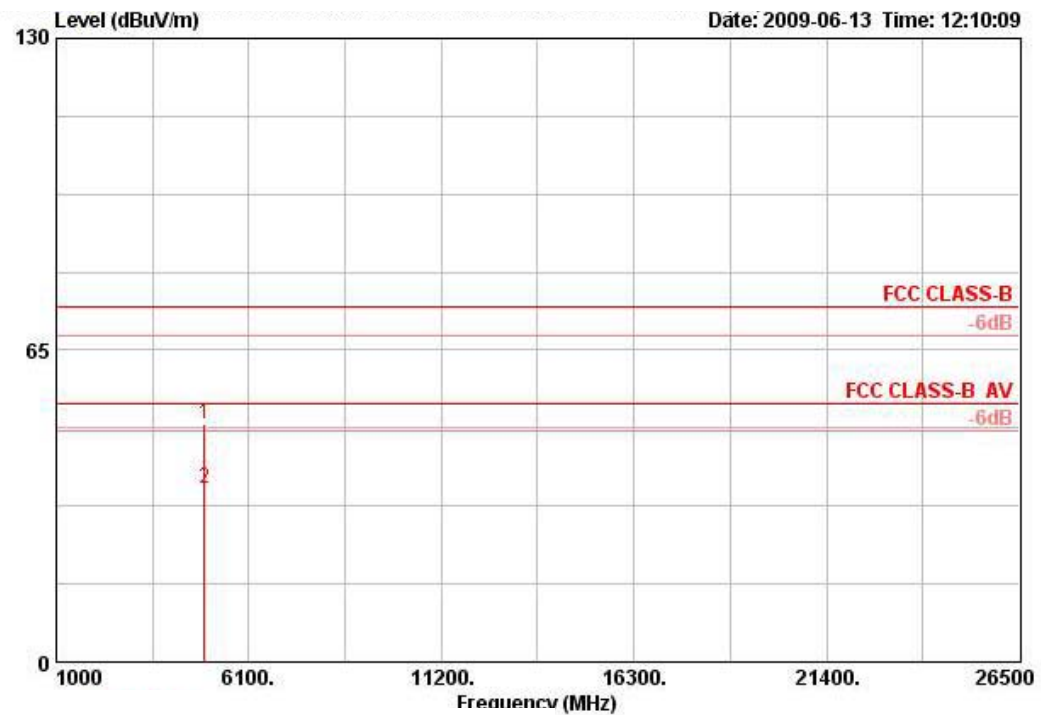
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n MCS8 20MHz Ch11 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4924.008	47.55	74.00	-26.45	45.33	2.22	PEAK	HORIZONTAL	260	100
2	4924.022	34.85	54.00	-19.15	32.63	2.22	AVERAGE	HORIZONTAL	260	100

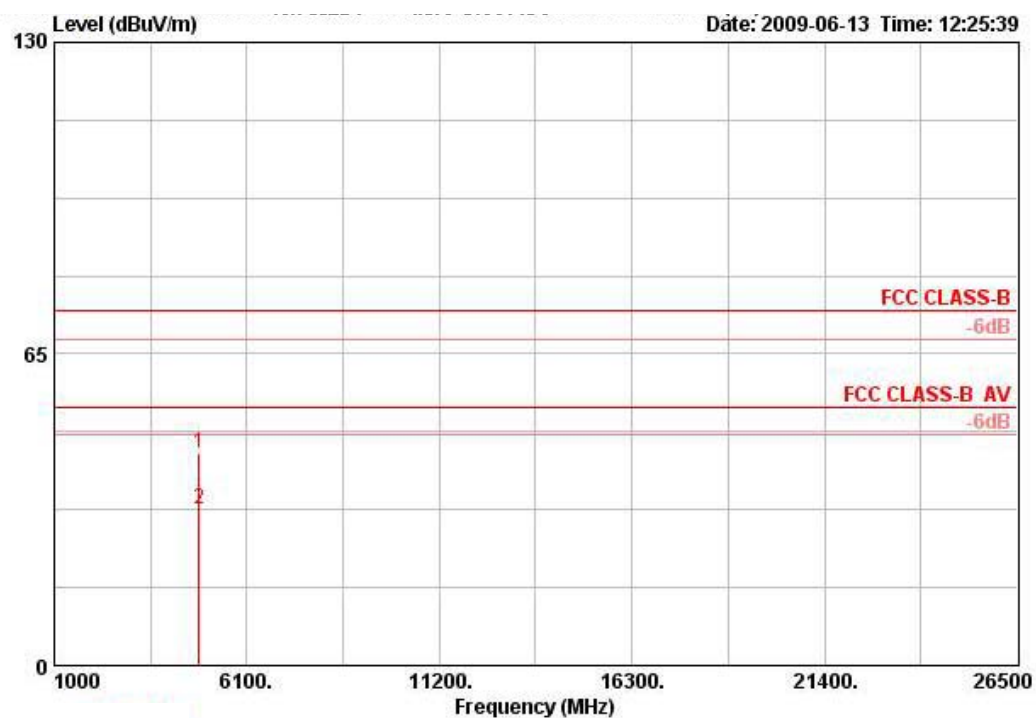
Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4923.991	49.68	74.00	-24.32	47.46	2.22	PEAK	VERTICAL	207	100
2	4924.012	36.01	54.00	-17.99	33.79	2.22	AVERAGE	VERTICAL	207	100

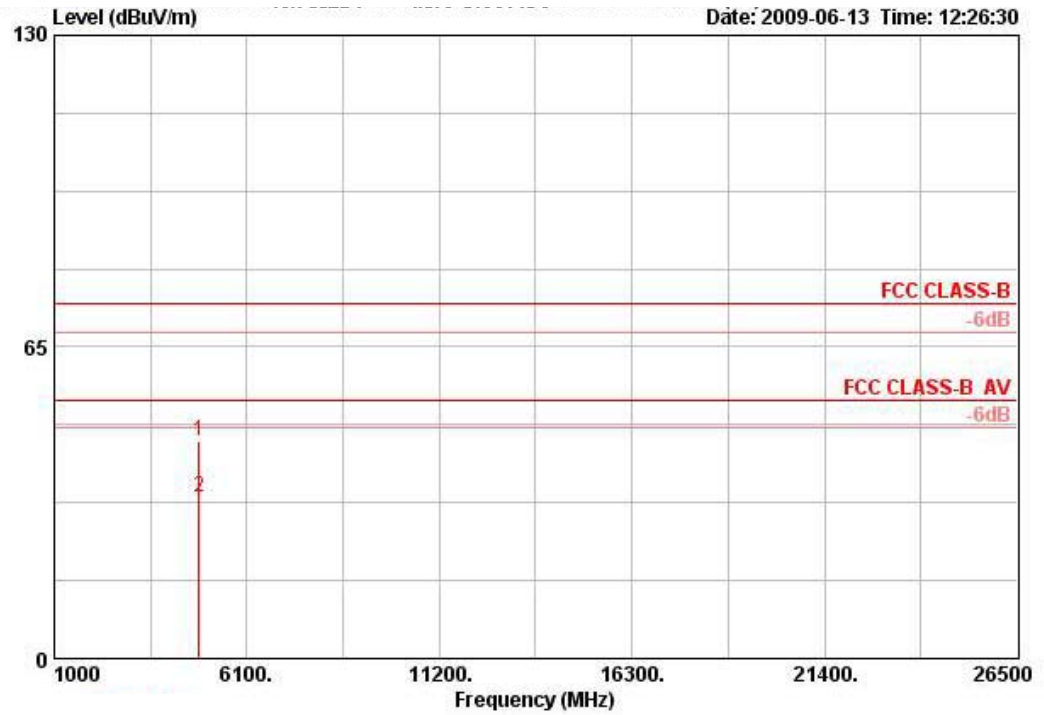
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n MCS8 40MHz Ch 3 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
			dBuV/m	dB	dBuV	dB			deg	cm
1	4843.996	44.22	74.00	-29.78	42.20	2.02	PEAK	HORIZONTAL	360	100
2	4844.013	32.64	54.00	-21.36	30.61	2.02	AVERAGE	HORIZONTAL	360	100

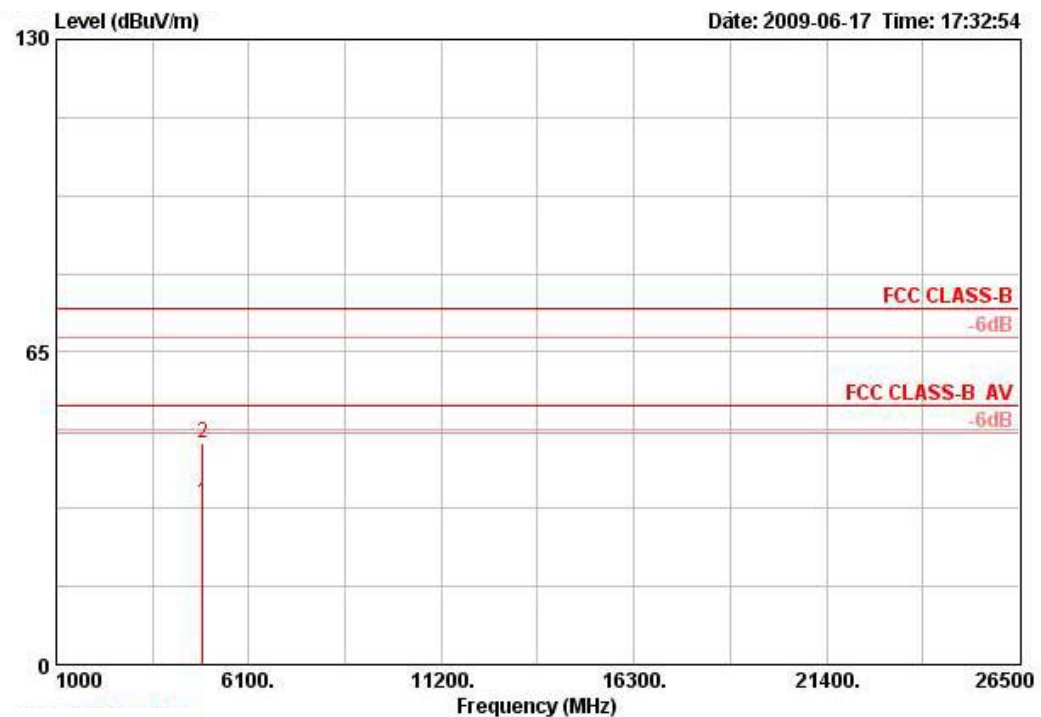
Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4843.985	45.50	74.00	-28.50	43.48	2.02	PEAK	VERTICAL	0	100
2	4844.022	33.75	54.00	-20.25	31.73	2.02	AVERAGE	VERTICAL	0	100

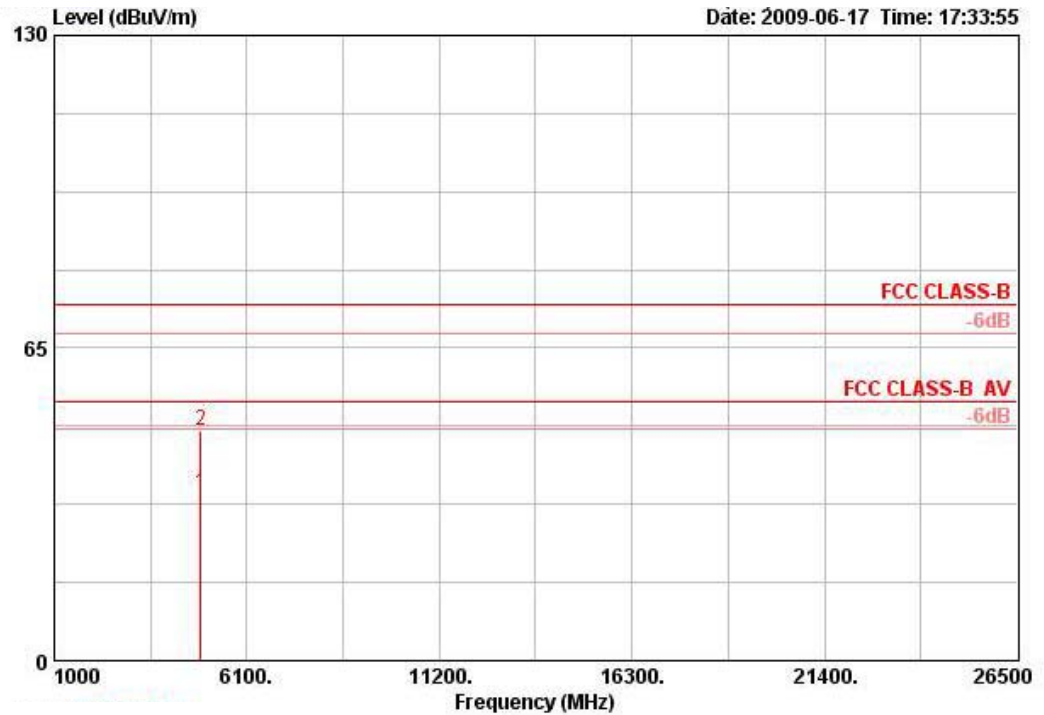
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n MCS8 40MHz Ch 6 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read		Cable	Preamp	Antenna	Table	Ant	
	MHz	dBuV/m	dBuV/m	Limit	Level	Remark	Loss	Factor	Factor	Pos	Pos	Pol/Phase
				dB	dBuV		dB		dB/m	deg	cm	
1	4873.992	33.74	54.00	-20.26	31.64	AVERAGE	3.97	35.03	33.16	272	100	HORIZONTAL
2	4874.023	46.09	74.00	-27.91	43.99	PEAK	3.97	35.03	33.16	272	100	HORIZONTAL

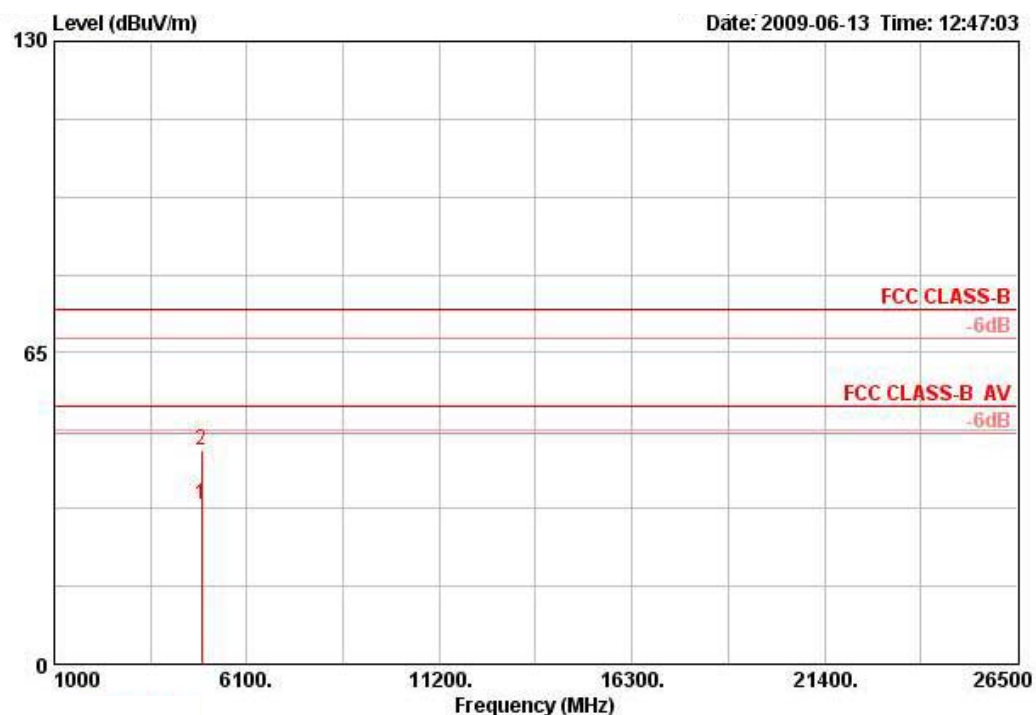
Vertical



	Freq	Level	Limit	Over	Read		Cable	Preamp	Antenna	Table	Ant	
	MHz	dBUV/m	dBUV/m	Limit	Level	Remark	Loss	Factor	Factor	Pos	Pos	Pol/Phase
				dB	dBUV		dB	dB	dB/m	deg	cm	
1	4874.005	34.62	54.00	-19.38	32.52	AVERAGE	3.97	35.03	33.16	244	100	VERTICAL
2	4874.005	47.72	74.00	-26.28	45.62	PEAK	3.97	35.03	33.16	244	100	VERTICAL

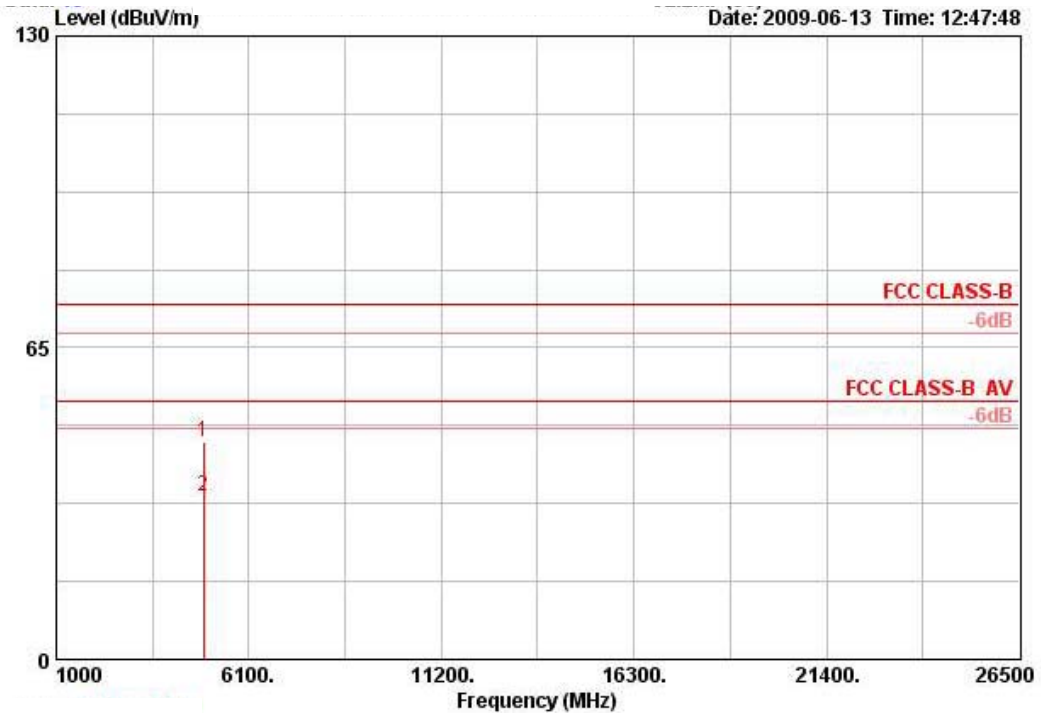
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n MCS8 40MHz Ch 9 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read			Table	Ant
	MHz	dBuV/m	dBuV/m	dB	Level	Factor	Remark	Pos	Pos
					dB			deg	cm
1	4903.996	33.17	54.00	-20.83	31.03	2.14	AVERAGE	360	100
2	4903.997	44.55	74.00	-29.45	42.40	2.14	PEAK	360	100

Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4904.008	45.35	74.00	-28.65	43.21	2.14	PEAK	VERTICAL	0	100
2	4904.011	34.14	54.00	-19.86	31.99	2.14	AVERAGE	VERTICAL	0	100

Note:

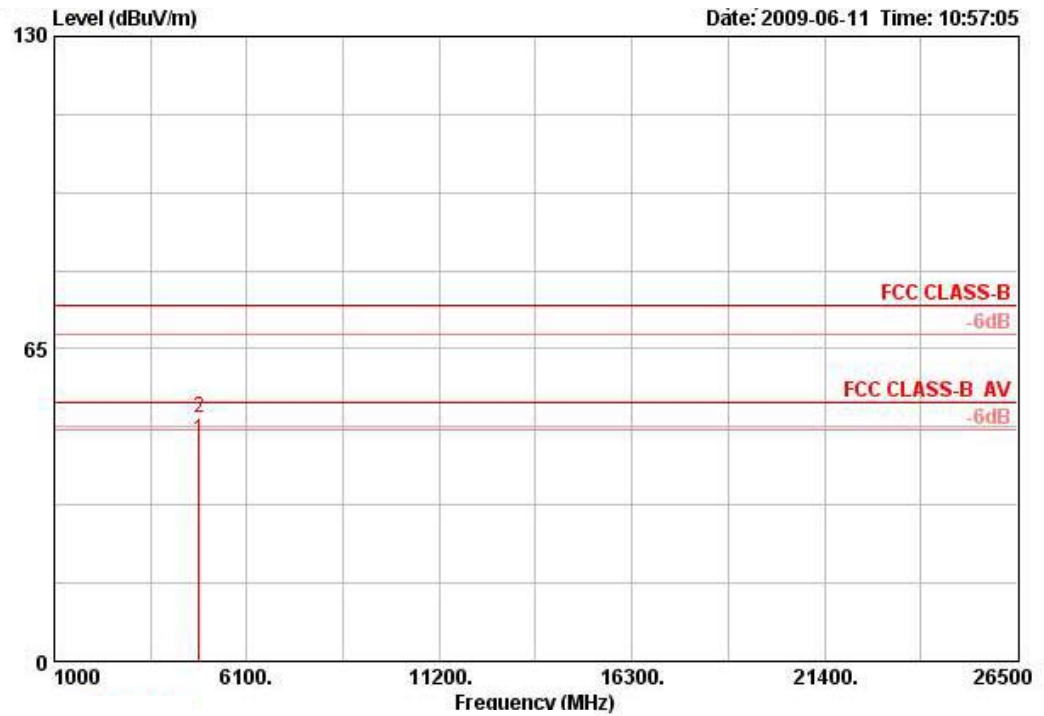
The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

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

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

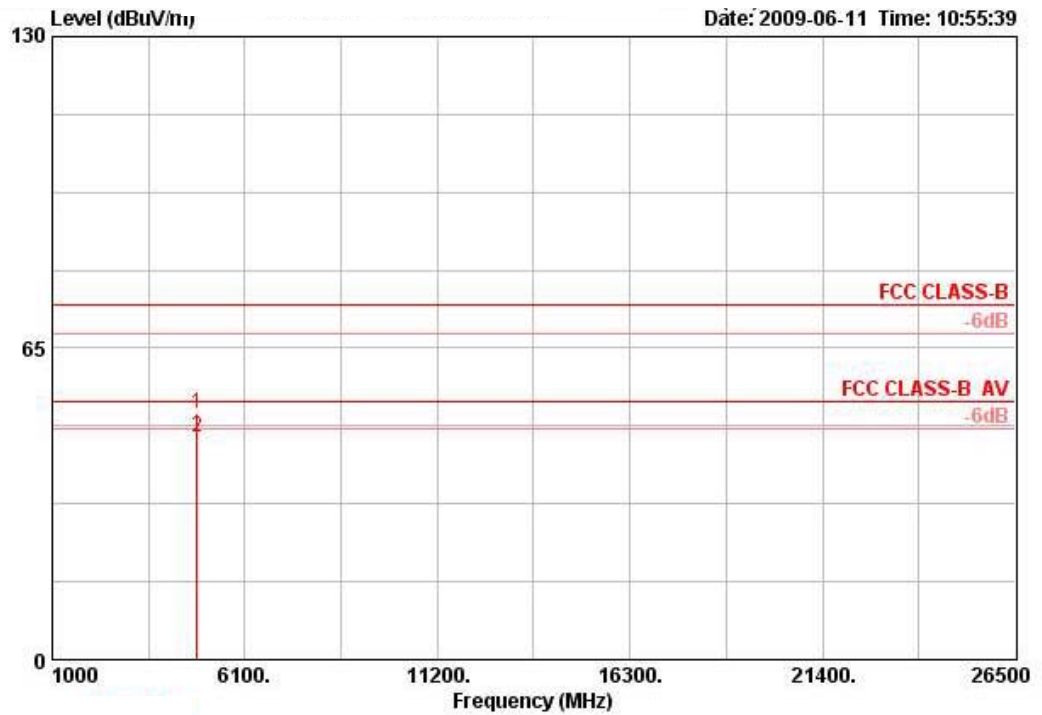
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11b CH 1 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4824.040	45.96	54.00	-8.04	43.98	1.98	AVERAGE	HORIZONTAL	109	139
2	4824.148	50.59	74.00	-23.41	48.62	1.98	PEAK	HORIZONTAL	109	139

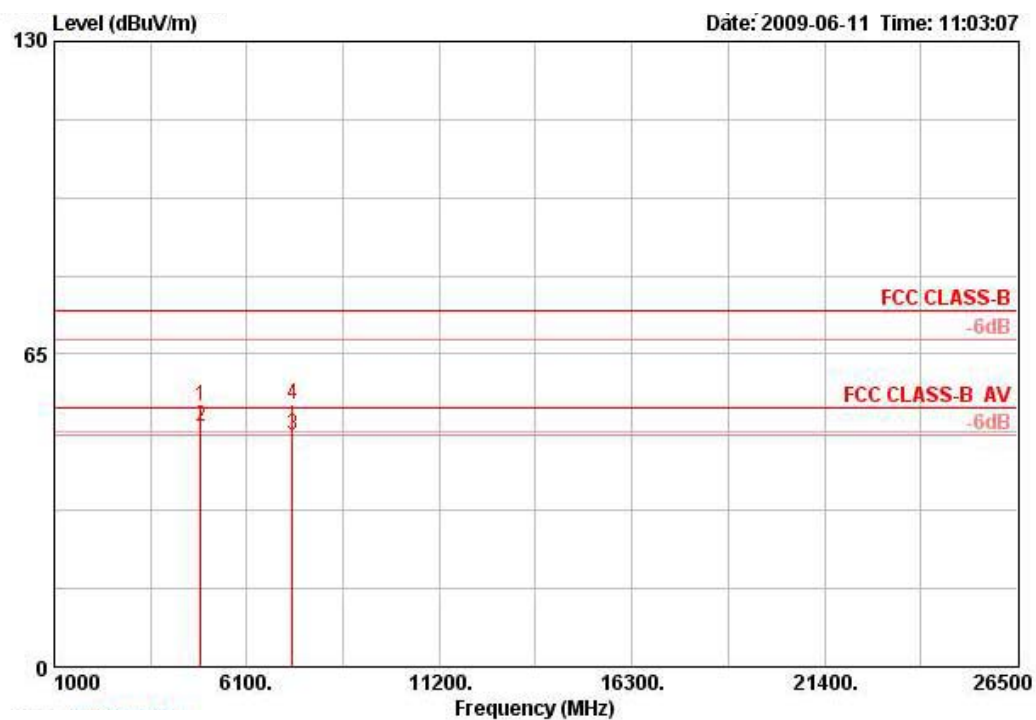
Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4823.900	51.21	74.00	-22.79	49.23	1.98	PEAK	VERTICAL	47	100
2	4823.968	46.49	54.00	-7.51	44.51	1.98	AVERAGE	VERTICAL	47	100

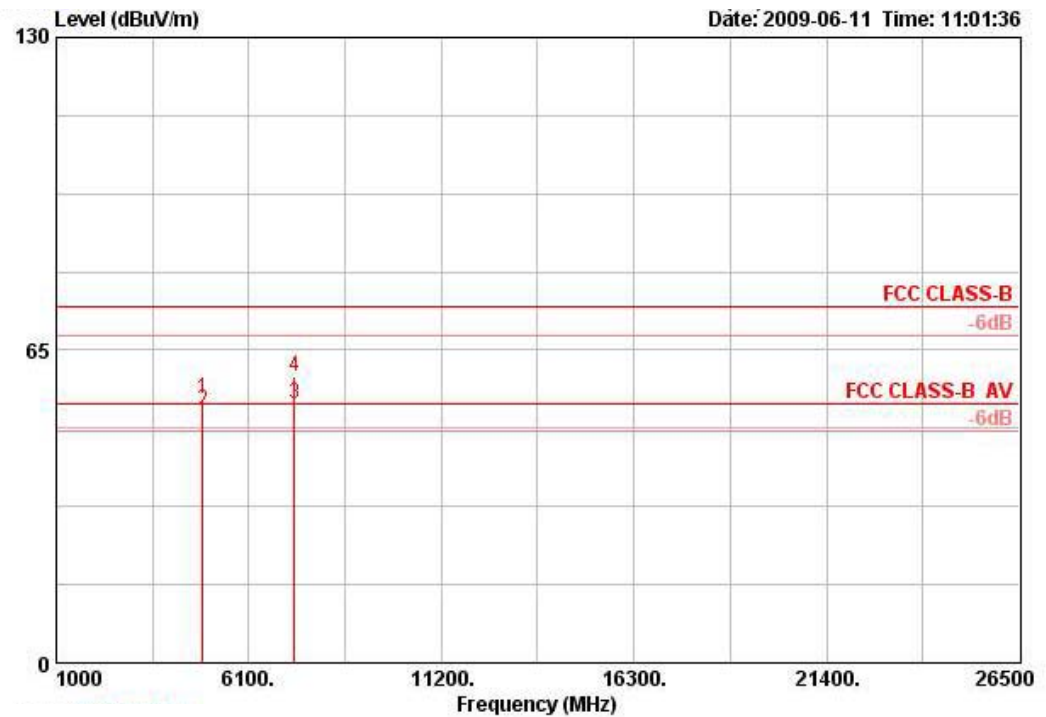
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11b CH 6 Ant. 1

Horizontal



	Freq	Level	Limit	Over	Read			Table	Ant
	MHz	dBUV/m	Line	Limit	Level	Factor	Remark	Pos	Pos
			dBUV/m	dB	dBUV	dB		deg	cm
1	4873.936	54.06	74.00	-19.94	51.97	2.10	PEAK	26	122
2	4873.984	50.10	54.00	-3.90	48.00	2.10	AVERAGE	26	122
3	7310.280	48.28	54.00	-5.72	42.55	5.73	AVERAGE	215	100
4	7310.740	54.63	74.00	-19.37	48.90	5.73	PEAK	215	100

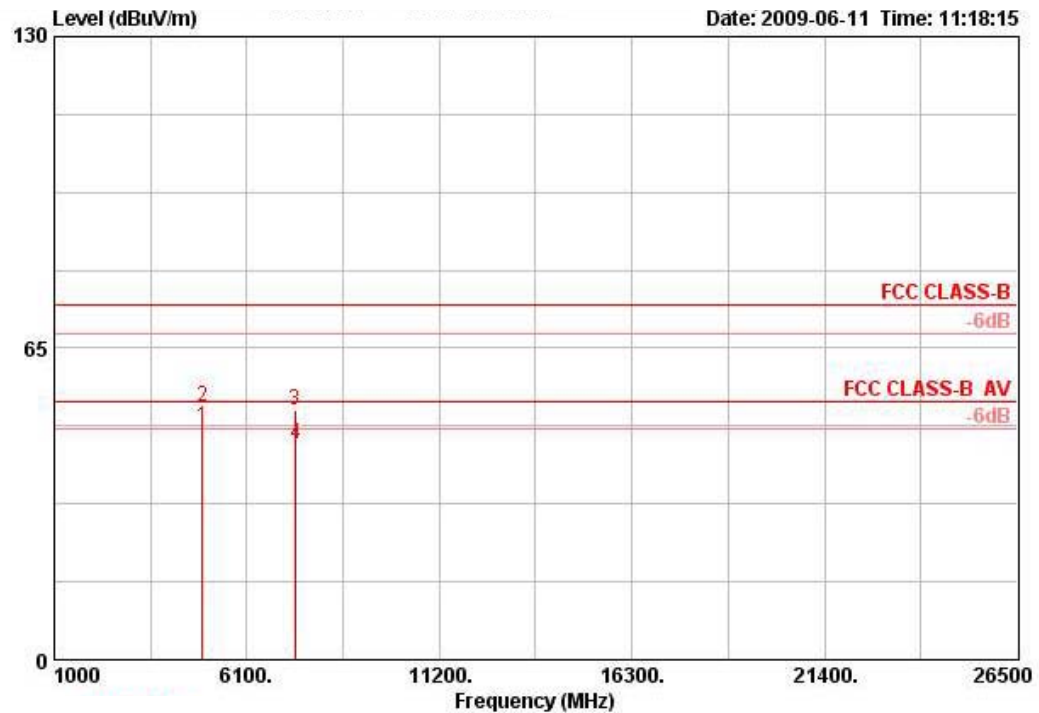
Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
			dBuV/m	dB	dBuV	dB			deg	cm
1	4873.868	54.87	74.00	-19.13	52.77	2.10	PEAK	VERTICAL	231	106
2	4873.988	52.36	54.00	-1.64	50.26	2.10	AVERAGE	VERTICAL	231	106
3	7310.200	53.77	54.00	-0.23	48.04	5.73	AVERAGE	VERTICAL	315	100
4	7311.060	59.40	74.00	-14.60	53.67	5.73	PEAK	VERTICAL	315	100

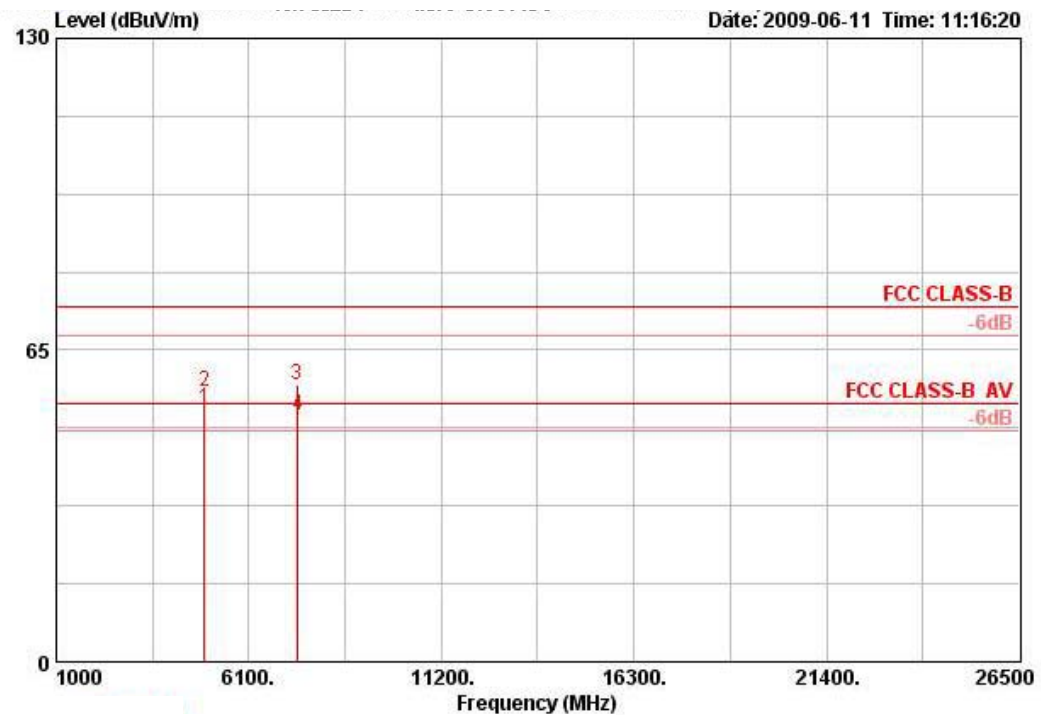
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11b CH 11 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4923.972	48.41	54.00	-5.59	46.20	2.22	AVERAGE	HORIZONTAL	97	117
2	4924.100	52.67	74.00	-21.33	50.45	2.22	PEAK	HORIZONTAL	97	117
3	7386.080	52.10	74.00	-21.90	46.22	5.88	PEAK	HORIZONTAL	250	104
4	7386.760	44.83	54.00	-9.17	38.96	5.88	AVERAGE	HORIZONTAL	250	104

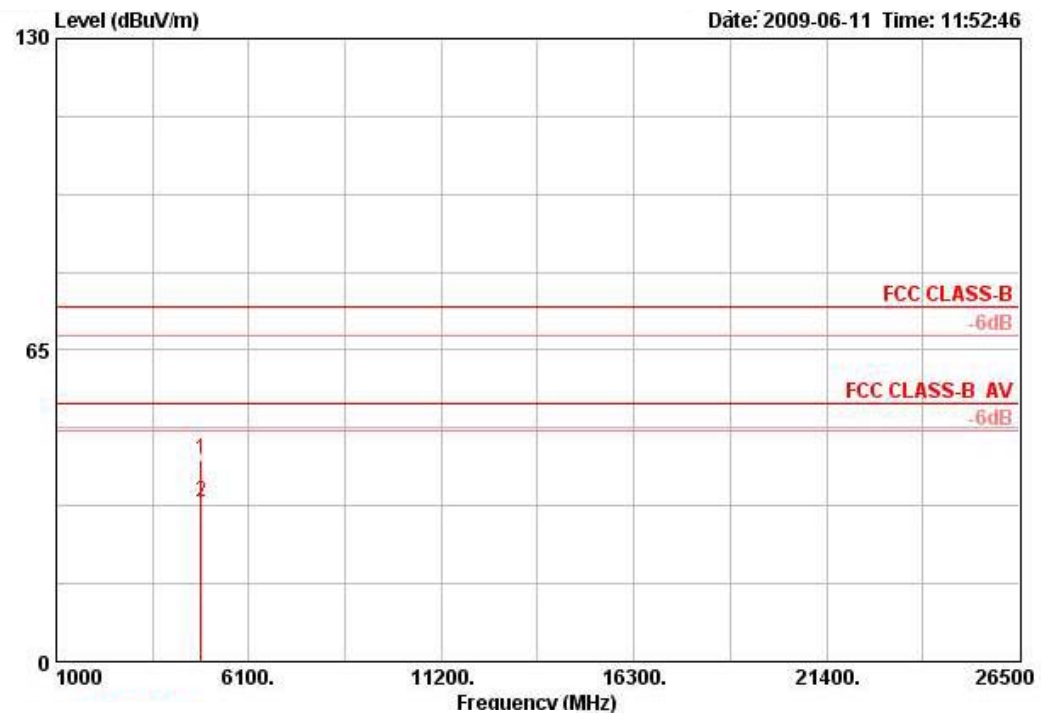
Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
									deg	cm
1	4923.988	52.72	54.00	-1.28	50.50	2.22	AVERAGE	VERTICAL	220	103
2	4923.996	56.32	74.00	-17.68	54.10	2.22	PEAK	VERTICAL	220	103
3	7385.980	57.83	74.00	-16.17	51.95	5.88	PEAK	VERTICAL	142	127
4	7386.700	51.50	54.00	-2.50	45.62	5.88	AVERAGE	VERTICAL	142	127

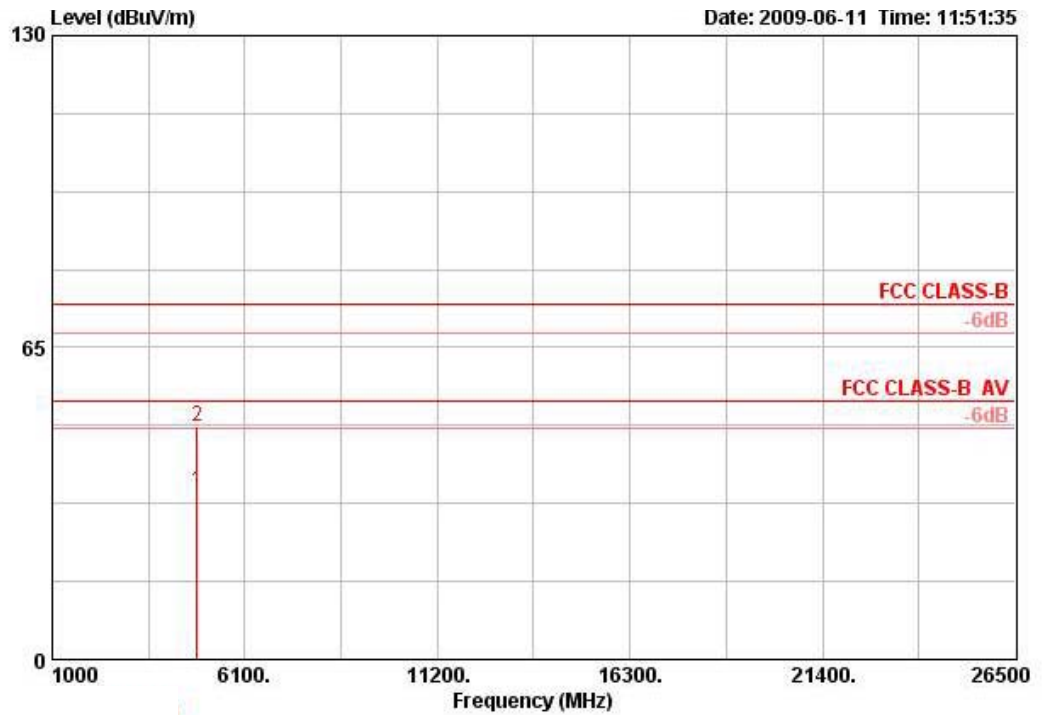
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11g CH 1 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBUV/m	dBUV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBUV	dB			deg	cm
1	4823.986	42.02	74.00	-31.98	40.04	1.98	PEAK	HORIZONTAL	99	100
2	4824.008	33.43	54.00	-20.57	31.45	1.98	AVERAGE	HORIZONTAL	99	100

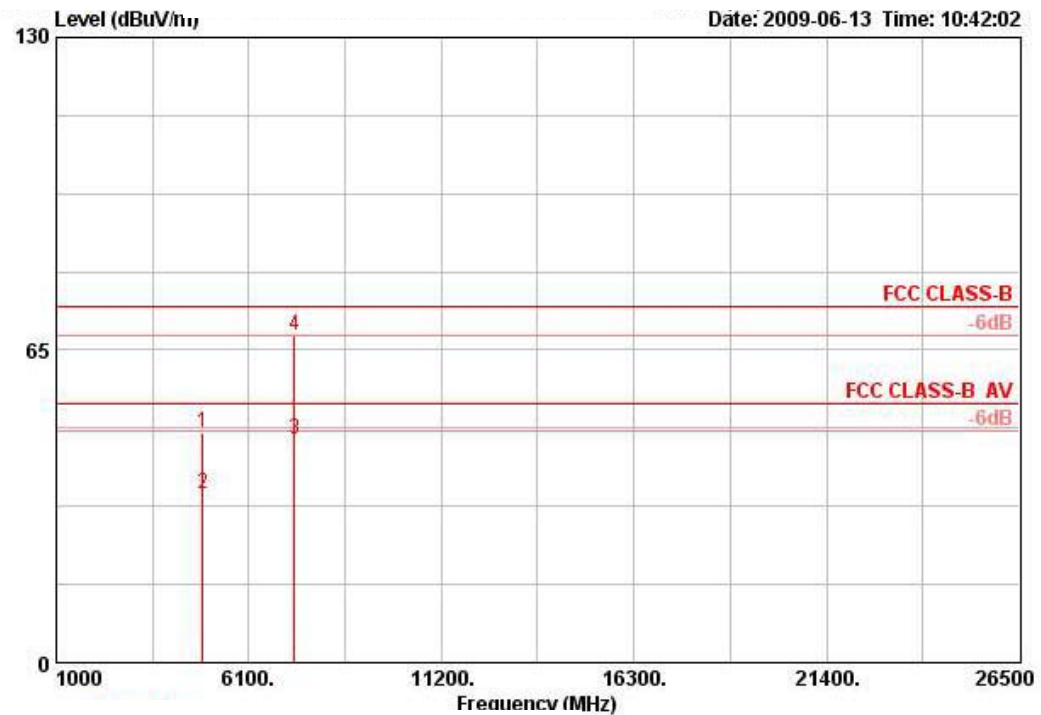
Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4823.992	34.97	54.00	-19.03	32.99	1.98	AVERAGE	VERTICAL	28	100
2	4824.007	48.43	74.00	-25.57	46.45	1.98	PEAK	VERTICAL	28	100

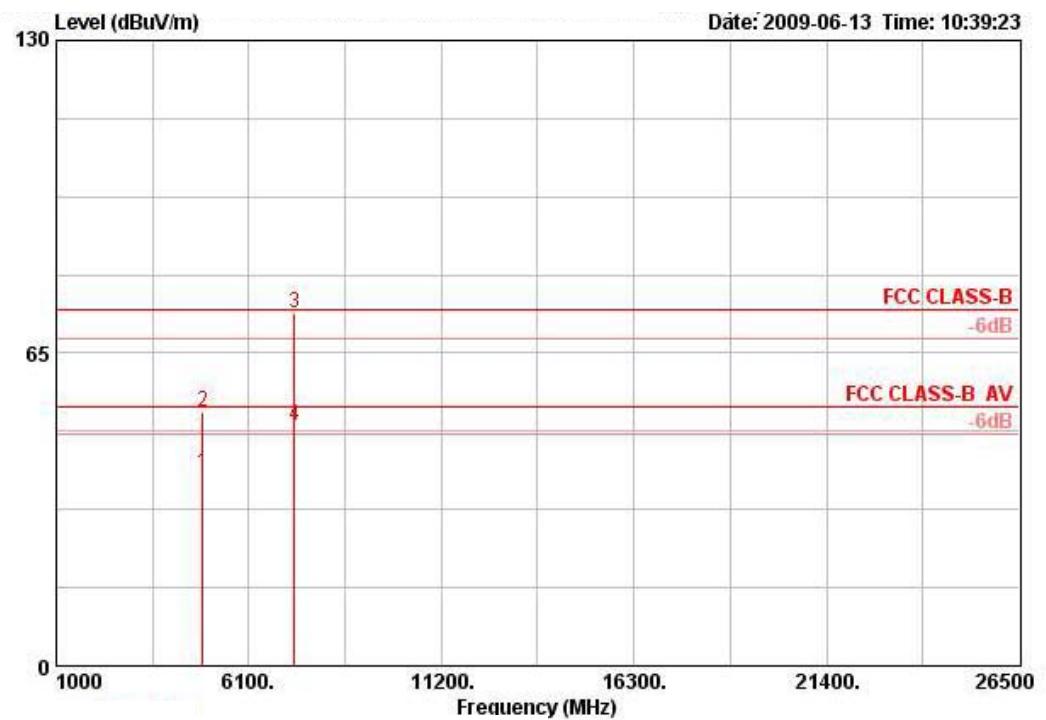
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11g CH 6 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4873.984	47.75	74.00	-26.25	45.65	2.10	PEAK	HORIZONTAL	222	100
2	4874.022	34.90	54.00	-19.10	32.80	2.10	AVERAGE	HORIZONTAL	222	100
3	7313.600	46.50	54.00	-7.50	40.77	5.73	AVERAGE	HORIZONTAL	299	139
4	7315.000	68.12	74.00	-5.88	62.39	5.73	PEAK	HORIZONTAL	299	139

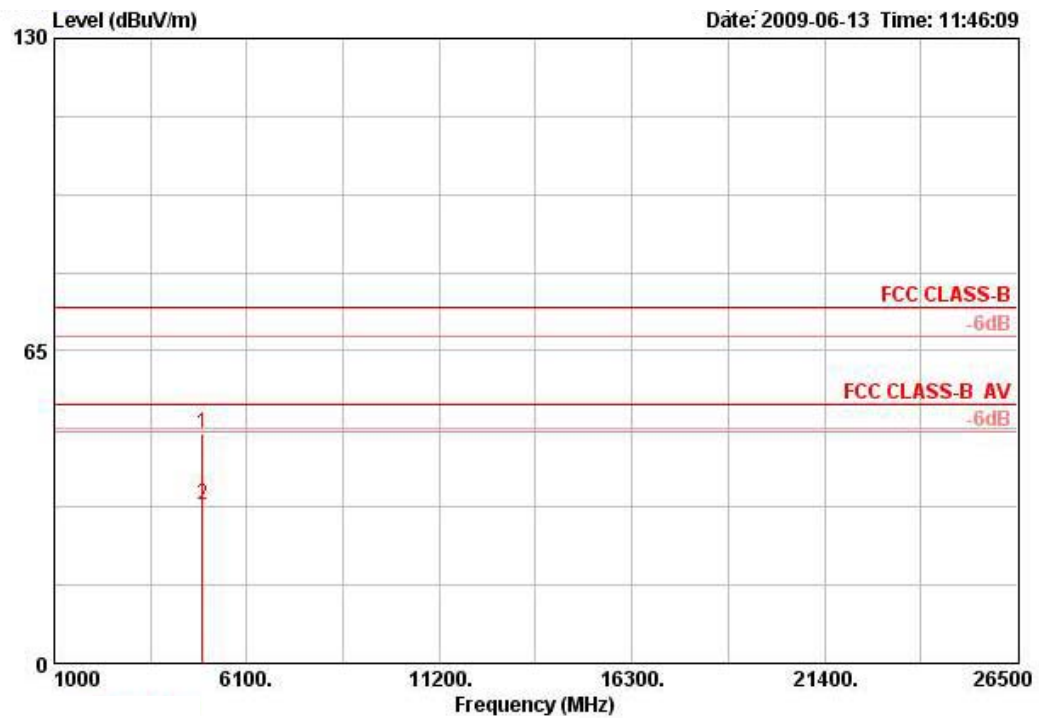
Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
			dBuV/m	dB	dBuV	dB			deg	cm
1	4873.994	39.97	54.00	-14.03	37.88	2.10	AVERAGE	VERTICAL	233	100
2	4873.994	52.90	74.00	-21.10	50.80	2.10	PEAK	VERTICAL	233	100
3	7302.800	73.21	74.00	-0.79	67.52	5.69	PEAK	VERTICAL	324	100
4	7308.600	49.92	54.00	-4.08	44.19	5.73	AVERAGE	VERTICAL	324	100

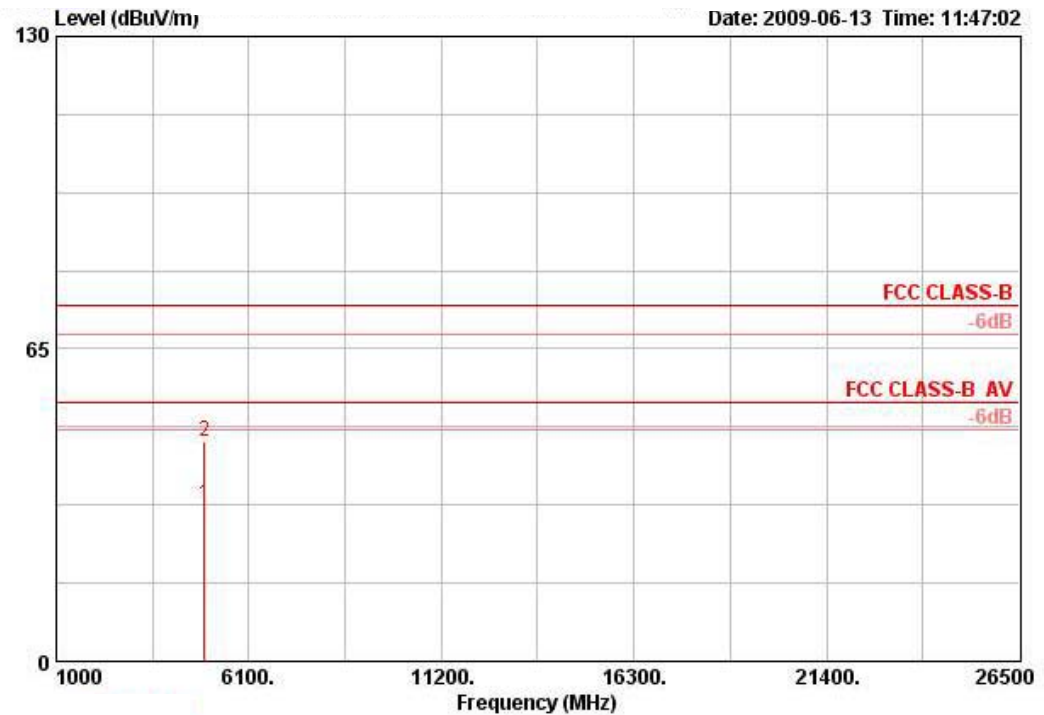
Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11g CH 11 Ant. 1 + Ant. 2

Horizontal



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4923.987	47.69	74.00	-26.31	45.47	2.22	PEAK	HORIZONTAL	184	100
2	4924.008	32.86	54.00	-21.14	30.64	2.22	AVERAGE	HORIZONTAL	184	100

Vertical



	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1	4923.975	32.56	54.00	-21.44	30.35	2.22	AVERAGE	VERTICAL	193	100
2	4924.015	45.81	74.00	-28.19	43.59	2.22	PEAK	VERTICAL	193	100

Note:

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

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

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

4.6. 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 (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

4.6.2. 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	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n MCS8 20MHz Ch 1, 6, 11 Ant. 1 + Ant. 2
Test Date	Jun. 13, 2009		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Pol/Phase	Table Pos	Ant Pos
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB			deg	cm
1 ☒	2390.000	53.39	54.00	-0.61	22.46	30.93	AVERAGE	HORIZONTAL	13	150
2 ☒	2390.000	68.64	74.00	-5.36	37.71	30.93	PEAK	HORIZONTAL	13	150
3 ☒	2409.000	100.93			69.94	30.98	AVERAGE	HORIZONTAL	13	150
4 ☒	2410.000	112.66			81.68	30.98	PEAK	HORIZONTAL	13	150

Item 3, 4 are the fundamental frequency at 2412 MHz

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Remark	Cable Loss	Preamp Factor	Antenna Factor	Table Pos	Ant Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV		dB	dB	dB/m	deg	cm	
1 ☒	2388.200	58.87	74.00	-15.13	27.94	PEAK	2.76	0.00	28.17	0	153	HORIZONTAL
2 ☒	2390.000	47.60	54.00	-6.40	16.67	AVERAGE	2.76	0.00	28.17	0	153	HORIZONTAL
3 ☒	2441.200	103.71			72.64	AVERAGE	2.78	0.00	28.29	0	153	HORIZONTAL
4 ☒	2441.800	112.68			81.61	PEAK	2.78	0.00	28.29	0	153	HORIZONTAL
5 ☒	2483.500	46.21	54.00	-7.79	15.02	AVERAGE	2.81	0.00	28.38	0	153	HORIZONTAL
6 ☒	2486.300	57.12	74.00	-16.88	25.89	PEAK	2.81	0.00	28.42	0	153	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Pol/Phase	Table Pos	Ant Pos
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB			deg	cm
1 ☒	2454.200	106.31			75.18	31.13	PEAK	VERTICAL	61	100
2 ☒	2464.800	94.65			63.52	31.13	AVERAGE	VERTICAL	61	100
3 ☒	2483.500	53.58	54.00	-0.42	22.40	31.18	AVERAGE	VERTICAL	61	100
4 ☒	2484.100	67.62	74.00	-6.38	36.44	31.18	PEAK	VERTICAL	61	100

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

Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n MCS8 40MHz Ch 3, 6, 9 Ant. 1 + Ant. 2
Test Date	Jun. 17, 2009		

Channel 3

	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	dB	dBuV	Factor	Remark	Pol/Phase	Pos	Pos
						dB			deg	cm
1 ☒	2390.000	53.24	54.00	-0.76	22.31	30.93	AVERAGE	HORIZONTAL	17	125
2 ☒	2390.000	66.10	74.00	-7.90	35.17	30.93	PEAK	HORIZONTAL	17	125
3 ☒	2426.800	95.02			64.00	31.02	AVERAGE	HORIZONTAL	17	125
4 ☒	2428.800	108.04			77.01	31.03	PEAK	HORIZONTAL	17	125

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

Channel 6

	Freq	Level	Limit	Over	Read		Cable	Preamp	Antenna	Table	Ant
	MHz	dBuV/m	dBuV/m	dB	dBuV	Remark	Loss	Factor	Factor	Pos	Pos
							dB	dB	dB/m	deg	cm
1 ☒	2389.600	63.62	74.00	-10.38	32.69	PEAK	2.76	0.00	28.17	339	100
2 ☒	2390.000	50.09	54.00	-3.91	19.16	AVERAGE	2.76	0.00	28.17	339	100
3 ☒	2431.400	107.91			76.88	PEAK	2.78	0.00	28.25	339	100
4 ☒	2450.600	94.23			63.16	AVERAGE	2.78	0.00	28.29	339	100
5 ☒	2483.500	53.09	54.00	-0.91	21.91	AVERAGE	2.81	0.00	28.37	339	100
6 ☒	2485.100	70.37	74.00	-3.63	39.15	PEAK	2.81	0.00	28.41	339	100

Item 3, 4 are the fundamental frequency at 2437MHz.

Channel 9

	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	dBuV/m	dB	dBuV	Factor	Remark	Pol/Phase	Pos	Pos
						dB			deg	cm
1 ☒	2464.800	91.98			60.86	31.13	AVERAGE	VERTICAL	349	100
2 ☒	2466.400	103.88			72.75	31.13	PEAK	VERTICAL	349	100
3 ☒	2483.500	53.34	54.00	-0.66	22.16	31.18	AVERAGE	VERTICAL	349	100
4 ☒	2483.500	66.70	74.00	-7.30	35.52	31.18	PEAK	VERTICAL	349	100

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.

Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11b CH 1, 6, 11 Ant. 1 + Ant. 2
Test Date	Jun. 11, 2009		

Channel 1

	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1 ☒	2389.600	63.77	74.00	-10.23	32.84	30.93	PEAK	VERTICAL	269	101
2 ☒	2390.000	53.85	54.00	-0.15	22.92	30.93	AVERAGE	VERTICAL	269	101
3 ☒	2412.800	112.55			81.57	30.98	AVERAGE	VERTICAL	269	101
4 ☒	2413.200	116.54			85.56	30.98	PEAK	VERTICAL	269	101

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1 ☒	2387.400	58.52	74.00	-15.48	27.59	30.93	PEAK	HORIZONTAL	14	153
2 ☒	2390.000	47.63	54.00	-6.37	16.70	30.93	AVERAGE	HORIZONTAL	14	153
3 ☒	2436.000	116.22			85.15	31.07	PEAK	HORIZONTAL	14	153
4 ☒	2436.200	112.31			81.24	31.07	AVERAGE	HORIZONTAL	14	153
5 ☒	2483.500	46.07	54.00	-7.93	14.88	31.19	AVERAGE	HORIZONTAL	14	153
6 ☒	2484.900	56.85	74.00	-17.15	25.66	31.19	PEAK	HORIZONTAL	14	153

Item 3, 4 are the fundamental frequency at 2437MHz.

Channel 11

	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
				dB	dBuV	dB			deg	cm
1 ☒	2461.200	112.88			81.76	31.13	AVERAGE	HORIZONTAL	7	120
2 ☒	2463.000	116.79			85.66	31.13	PEAK	HORIZONTAL	7	120
3 ☒	2483.500	53.57	54.00	-0.43	22.38	31.19	AVERAGE	HORIZONTAL	7	120
4 ☒	2483.500	63.78	74.00	-10.22	32.60	31.19	PEAK	HORIZONTAL	7	120

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

Temperature	23°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11g CH 1, 6, 11 Ant. 1 + Ant. 2
Test Date	Jun. 13, 2009		

Channel 1

	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
			dBuV/m	dB	dBuV	dB			deg	cm
1 ☒	2388.600	52.50	54.00	-1.50	21.57	30.93	AVERAGE	HORIZONTAL	264	124
2 ☒	2388.800	69.79	74.00	-4.21	38.86	30.93	PEAK	HORIZONTAL	264	124
3 ☒	2407.800	103.35			72.37	30.98	AVERAGE	HORIZONTAL	264	124
4 ☒	2408.000	112.95			81.97	30.98	PEAK	HORIZONTAL	264	124

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
			dBuV/m	dB	dBuV	dB			deg	cm
1 ☒	2389.200	58.25	74.00	-15.75	27.32	30.93	PEAK	VERTICAL	349	100
2 ☒	2390.000	46.86	54.00	-7.14	15.93	30.93	AVERAGE	VERTICAL	349	100
3 ☒	2441.000	117.87			86.80	31.07	PEAK	VERTICAL	349	100
4 ☒	2441.200	102.09			71.02	31.07	AVERAGE	VERTICAL	349	100
5 ☒	2485.300	48.78	54.00	-5.22	17.56	31.22	AVERAGE	VERTICAL	349	100
6 ☒	2486.300	59.98	74.00	-14.02	28.76	31.22	PEAK	VERTICAL	349	100

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit	Over	Read				Table	Ant
	MHz	dBuV/m	Line	Limit	Level	Factor	Remark	Pol/Phase	Pos	Pos
			dBuV/m	dB	dBuV	dB			deg	cm
1 ☒	2459.800	111.82			80.70	31.13	PEAK	VERTICAL	120	100
2 ☒	2464.000	97.01			65.89	31.13	AVERAGE	VERTICAL	120	100
3 ☒	2483.500	53.28	54.00	-0.72	22.10	31.18	AVERAGE	VERTICAL	120	100
4 ☒	2483.500	68.26	74.00	-5.74	37.08	31.18	PEAK	VERTICAL	120	100

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

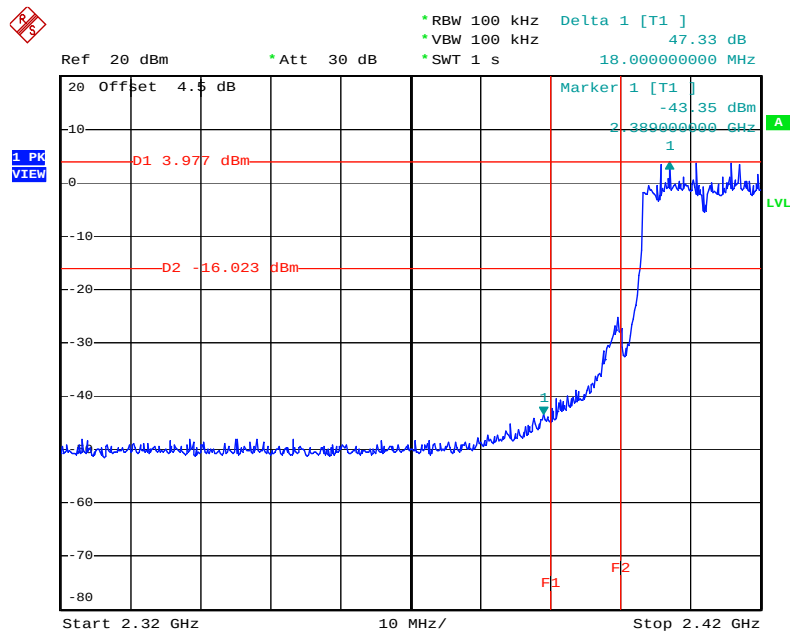
Note:

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

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

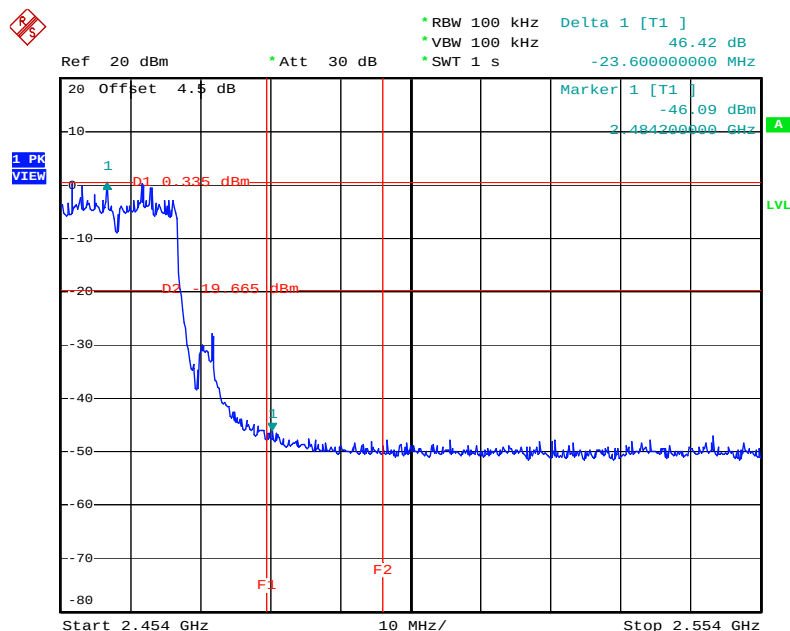
For Emission not in Restricted Band

Low Band Edge Plot on Configuration Drafft n MCS8 20MHz Ant. 1 + Ant. 2 / 2412 MHz



Date: 21.JUN.2009 15:17:05

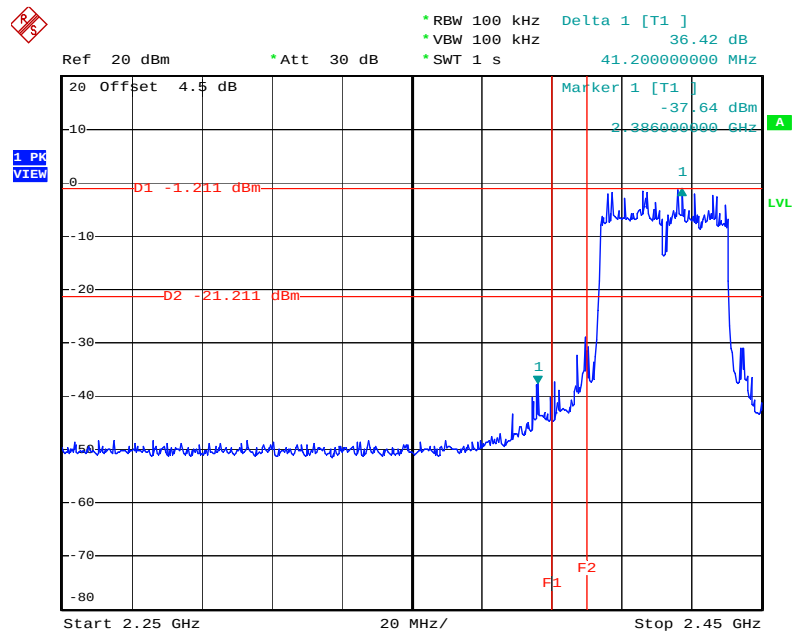
High Band Edge Plot on Configuration Drafft n MCS8 20MHz Ant. 1 + Ant. 2 / 2462 MHz



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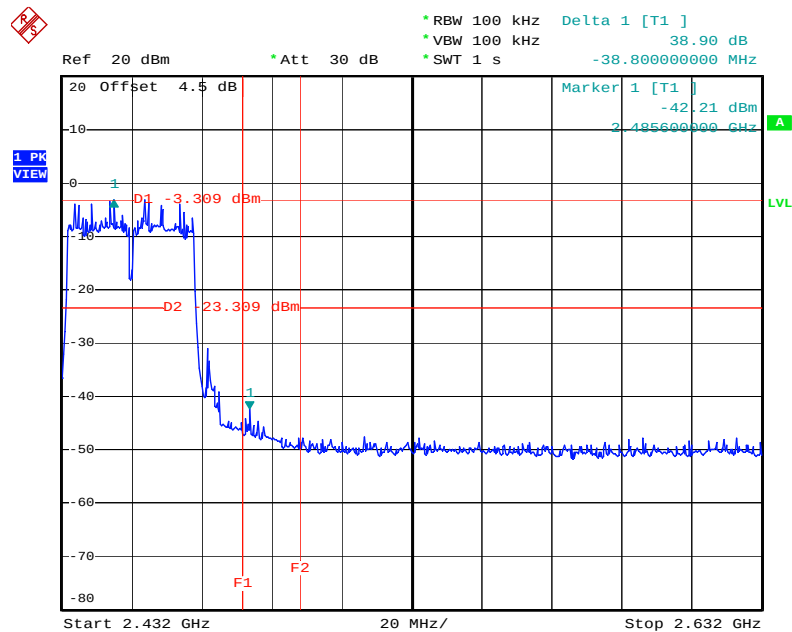
For Emission not in Restricted Band

Low Band Edge Plot on Configuration Drafft n MCS8 40MHz Ant. 1 + Ant. 2 / 2422 MHz



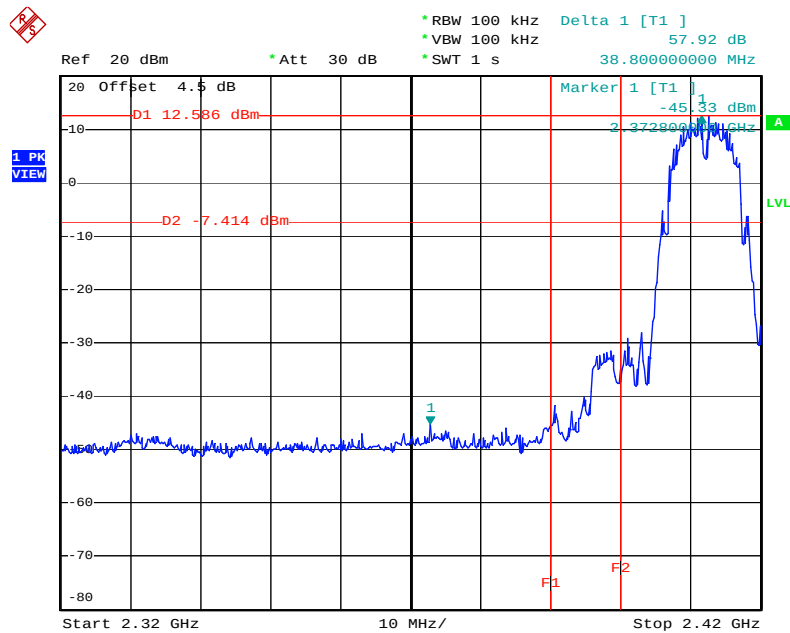
Date: 21.JUN.2009 15:08:49

High Band Edge Plot on Configuration Drafft n MCS8 40MHz Ant. 1 + Ant. 2 / 2452 MHz



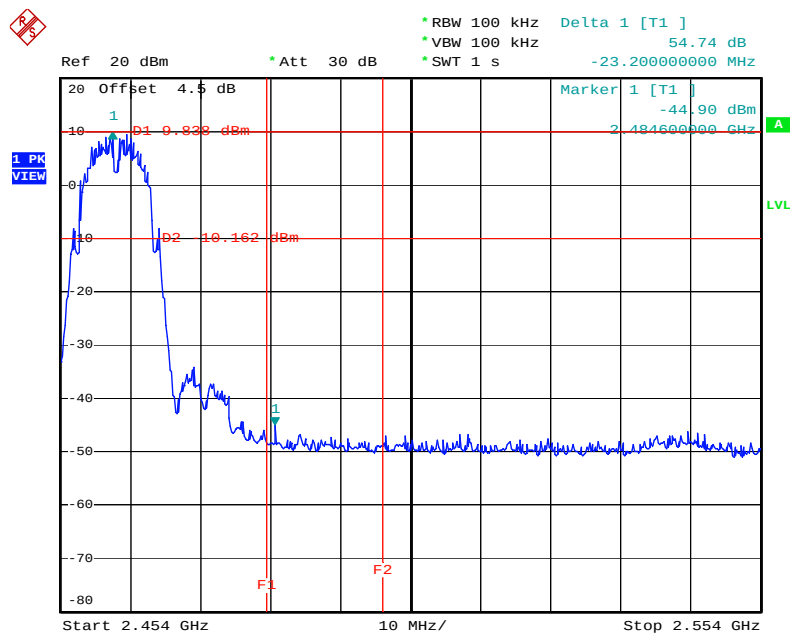
Date: 21.JUN.2009 15:11:08

Low Band Edge Plot on Configuration IEEE 802.11b Ant. 1 + Ant. 2 / 2412 MHz



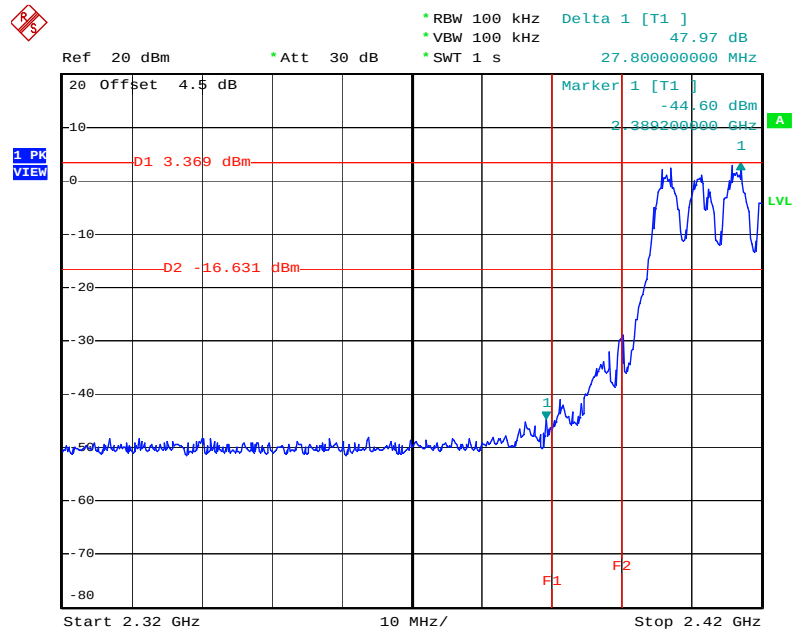
Date: 21.JUN.2009 15:32:10

High Band Edge Plot on Configuration IEEE 802.11b Ant. 1 + Ant. 2 / 2462 MHz



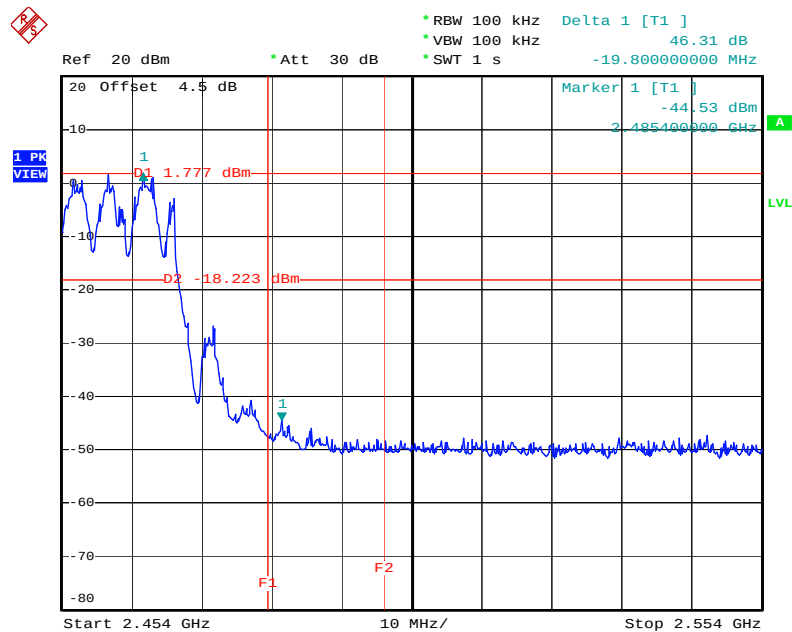
Date: 21.JUN.2009 15:29:27

Low Band Edge Plot on Configuration IEEE 802.11g Ant. 1 + Ant. 2 / 2412 MHz



Date: 21.JUN.2009 15:46:31

High Band Edge Plot on Configuration IEEE 802.11g Ant. 1 + Ant. 2 / 2462 MHz



Date: 21.JUN.2009 15:44:07

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	100174	9kHz – 2.75GHz	Apr. 15, 2009	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 23, 2009	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2009	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2009	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz – 30MHz	Jun. 11, 2009	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. 14, 2008	Radiation (03CH03-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2009	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan. 23, 2009	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jul. 21, 2008	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5 GHz - 40 GHz	Apr. 06, 2009*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP30	100023	9 kHz - 30 GHz	Feb 02, 2009	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul 28, 2008*	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 12, 2008	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 29, 2008	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan.16, 2009	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Jan. 05, 2009	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Jan. 05, 2009	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	FSU26.5	100015	20Hz ~ 26.5GHz	Oct. 29, 2008	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 11, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jul. 11, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jul. 11, 2008	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 30, 2009*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2009	Conducted (TH01-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Jul. 18, 2008	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2008	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2008	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Dec. 14, 2008	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 25, 2009	Conducted (TH01-HY)

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

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

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

7. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : LI190-070110

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2007 to January 09, 2010
Accredited Scope	: Testing Field, see described in the Appendix
Specific Accreditation Program	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory



Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

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