

RADIO TEST REPORT

According to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment : TG789vn DSLCBB643 LN
TG789vn DSLCBB643 US
TG789vn DSLCBB643 UB
Brand Name : THOMSON
Filing Type : New Application
Applicant : Thomson Telecom Belgium
Prins Boudewijnlaan 47 B-2650 Edegem Belgium
FCC ID : RSE-TG789VN
Received Date : Aug. 28, 2009
Final Test Date : Oct. 07, 2009

Statement

This report is only covering the 802.11b/g/n modes of operation 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.


Wayne Hsu



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History of This Test Report

Report No.	Issue Date	Description
FR910708	Oct. 22, 2009	Original report

1. SUMMARY OF THE TEST RESULTS

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
3.1	15.207	AC Power Line Conducted Emissions	Complies	9.01 dB
3.2	15.247(b)(3)	Maximum Peak Conducted Output Power	Complies	14.51 dB
3.3	15.247(e)	Power Spectral Density	Complies	15.71 dB
3.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
3.5	15.247(d)	Radiated Emissions	Complies	3.10 dB
3.6	15.247(d)	Band Edge Emissions	Complies	3.78 dB
3.7	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%

2. GENERAL INFORMATION

Trade Name : THOMSON
 Hardware Version : PEM4

2.1. Interface Ports

The table below shows the interface ports that are equipped on the models:

Equipment	Product code	POWER	DSL	PSTN	VoIP	Ethernet 1000 base-T (GbE)	Ethernet 10/100 base-T	USB (Host)	Wireless LAN IEEE802.11n
TG789vn	DSLCCBB643 LN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (2-ports)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (4-ports)	<input checked="" type="checkbox"/> (2-ports)	<input checked="" type="checkbox"/>
TG789vn	DSLCCBB643 US	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (2-ports)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (4-ports)	<input checked="" type="checkbox"/> (2-ports)	<input checked="" type="checkbox"/>
TG789vn	DSLCCBB643 UB	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (2-ports)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (4-ports)	<input checked="" type="checkbox"/> (2-ports)	<input checked="" type="checkbox"/>

: Equipped : Not equipped

The equipment has both ADSL and VDSL2 functions which share with the same RJ11 connector.
 TG789vn is the DSL modems used over POTS – Plain Old Telephone Service.

2.2. Information of the Power Supply Unit:

Trade Name	Product Number	Input Rating	Output Rating	Type	Company Info
FRIWO	FW7582/US/22	100Vac ~ 240Vac	22 Vdc / 1.23 A	Switched / Wall mount	FRIWO Gerätebau GmbH / FRIWO Mobile Power GmbH P.O. Box 1164 Von-Liebig-Straße 11D-48346 Ostbevern

2.3. Information of the Radio Interface

The EUT is with IEEE 802.11b/g/n radio functions.

IEEE 802.11b/g

Items	Description
Power Type	22Vdc from adapter
Modulation	DSSS for IEEE 802.11b; OFDM for IEEE 802.11g
Data Modulation	DSSS (DBPSK / DQPSK / 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 Band	2400 ~ 2483.5MHz
Total Amount of Channels	11

IEEE 802.11n

Items	Description
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Frequency Band	2400 ~ 2483.5MHz
Total Amount of Channels	11

The table below is the general spec of IEEE 802.11n. However, the radio is operated only in 800nsGI mode with Occupied Band Width (OBW) of 20 MHz.

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

2.4. Table for Filed Antenna

The table below shows the maximum antenna gain of each antenna equipped inside the EUT.

Ant. No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	-	-	PCB Antenna	NA	2.09
2	WHA YU	-	PIFA Antenna	NA	2.40

2.5. Table for Carrier Frequencies

The table below is the mapping between the carrier frequencies and the channel numbers.

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

2.6. 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 data 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. (All the test results are for 120V /60Hz)

Test Items	Mode	Data Rate	Channel
AC Power Line Conducted Emissions	See Note	-	-
Maximum Peak Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth	11b/BPSK	1 Mbps	1/6/11
	11g/BPSK	6 Mbps	1/6/11
	11n/MCS0	6.5 Mbps	1/6/11
	11n/MCS8	13 Mbps	1/6/11
Radiated Emissions 9kHz~1GHz	11g/BPSK	6 Mbps	6
Radiated Emissions 1GHz~10th Harmonic	11b/BPSK	1 Mbps	1/6/11
	11g/BPSK	6 Mbps	1/6/11
	11n/MCS0	6.5 Mbps	1/6/11
	11n/MCS8	13 Mbps	1/6/11
Band Edge Emissions	11b/BPSK	1 Mbps	1/6/11
	11g/BPSK	6 Mbps	1/6/11
	11n/MCS0	6.5 Mbps	1/6/11
	11n/MCS8	13 Mbps	1/6/11

Note :

The followings are the modes for Conducted Emissions:

Mode 1. Measured on AC port – ADSL2+ Annex A

Mode 2. Measured on AC port– VDSL2 Annex A band plan : 998E

2.7. Testing Locations

Test Site No.	Site Category	Location
03CH02-HY	SAC	Hwa Ya
10CH02-HY	SAC	Hwa Ya
CO04-HY	Conduction	Hwa Ya
TH01-HY	OVEN Room	Hwa Ya

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

Please refer section 5 for Test Site Addresses.

2.8. Supporting Units

Support Unit	Brand	Model	FCC ID
Telephone x2	HTT	HTT-806	-
Flash	Sony	128MB	-
Central Office (Remote Workstation)	Easy Switch	SMS-4 PLUS	-
ADSL CO. (Remote Workstation)	ALCATEL	7300UD	-
VDSL CO. (Remote Workstation)	IKANOS	CO5	-
Notebook (Remote Workstation)	DELL	D400	DoC
Telephone (Remote Workstation)	HTT	HTT-806	-

2.9. Test Software

The testing software/command was provided by the manufacturer and was used to control the operating channel and the proper data rate for the testing.

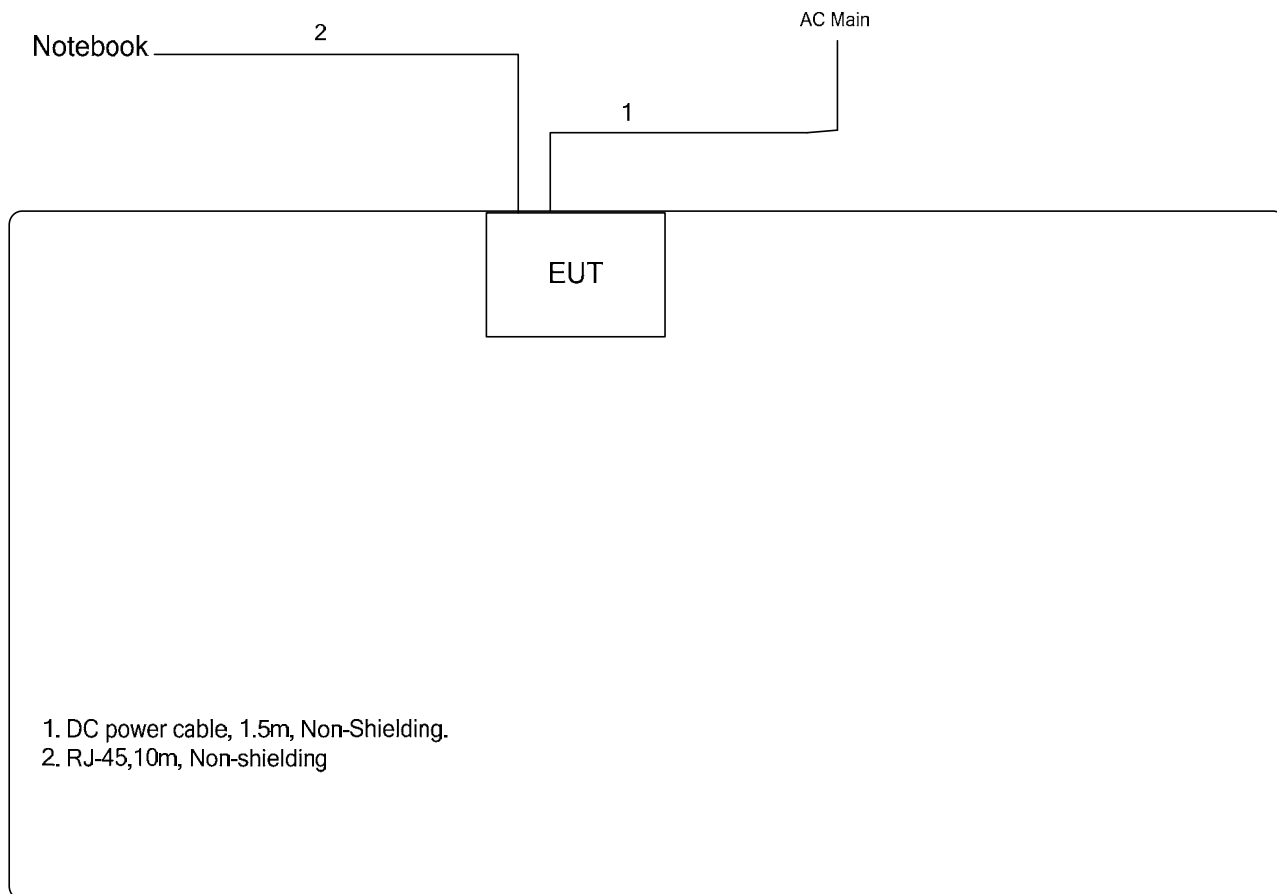
Power Parameters of IEEE 802.11b/g/n

Test Software Version	TTERMPRO		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	DEFAULT	DEFAULT	DEFAULT
IEEE 802.11g	DEFAULT	DEFAULT	DEFAULT
IEEE 802.11n (MCS0)	DEFAULT	DEFAULT	DEFAULT
IEEE 802.11n (MCS8)	DEFAULT	DEFAULT	DEFAULT

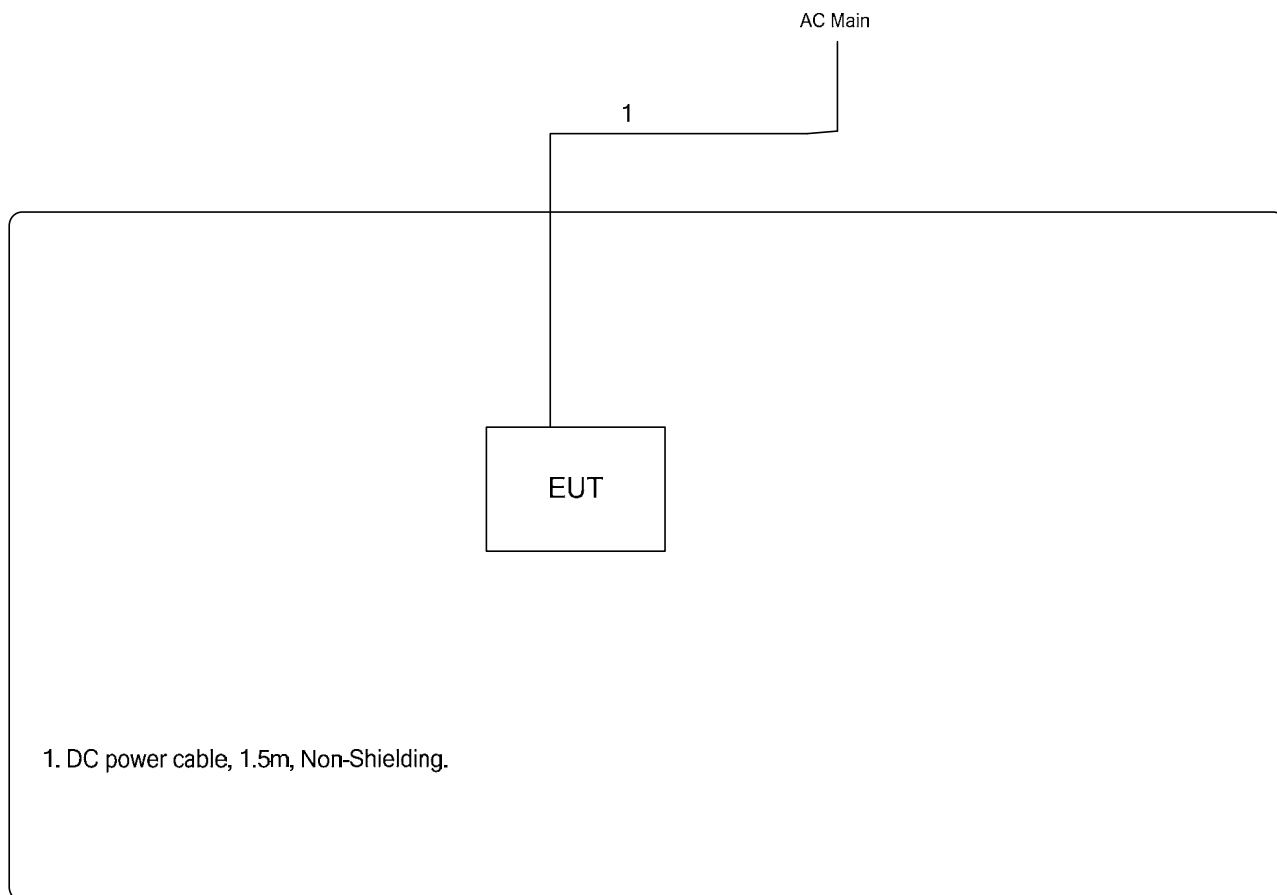
2.10. Test Configurations

2.10.1. Radiation Emissions Test Configuration

<For radiated emissions 9KHz ~ 1GHz test>



<For radiated emissions above 1GHz test>



3. TEST RESULTS

3.1. AC Power Line Conducted Emissions Measurement

3.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

3.1.2. Measuring Instruments and Setting

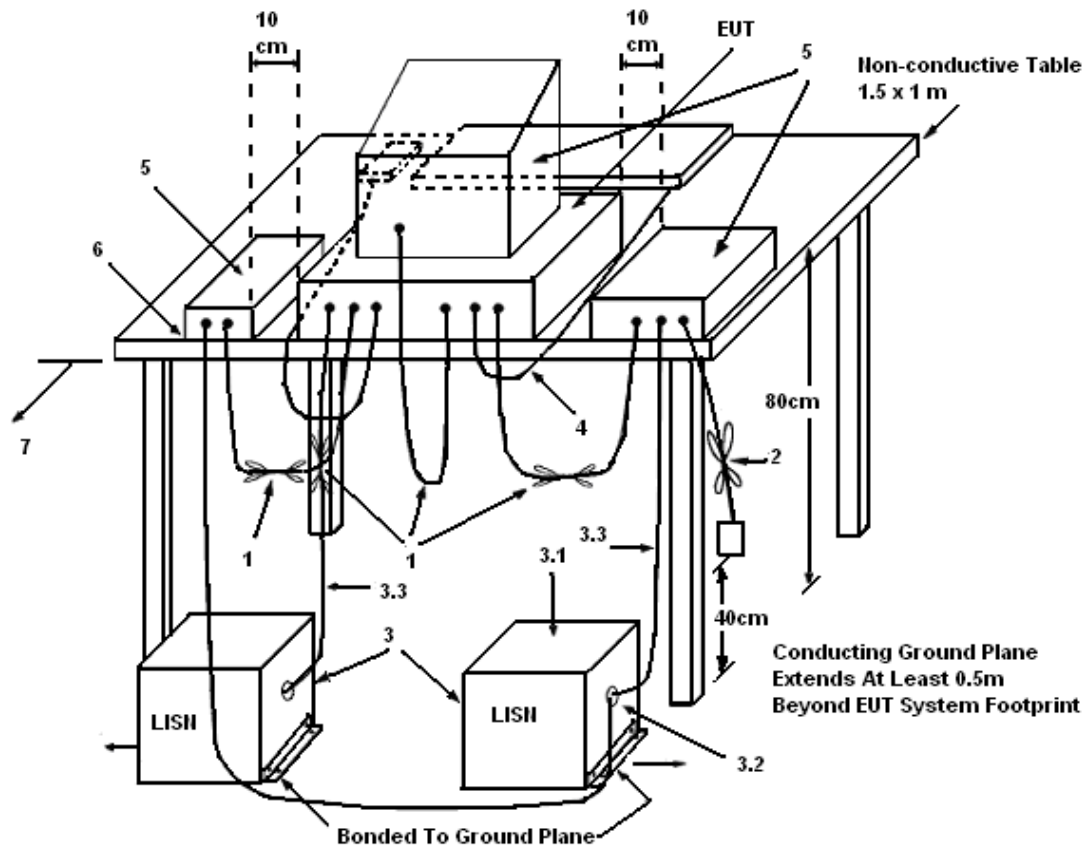
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

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

3.1.3. Test Procedures

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

3.1.4. Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.
- (3.1) All other equipment powered from additional LISN(s).
- (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
- (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

3.1.5. Test Deviation

There is no deviation with the original standard.

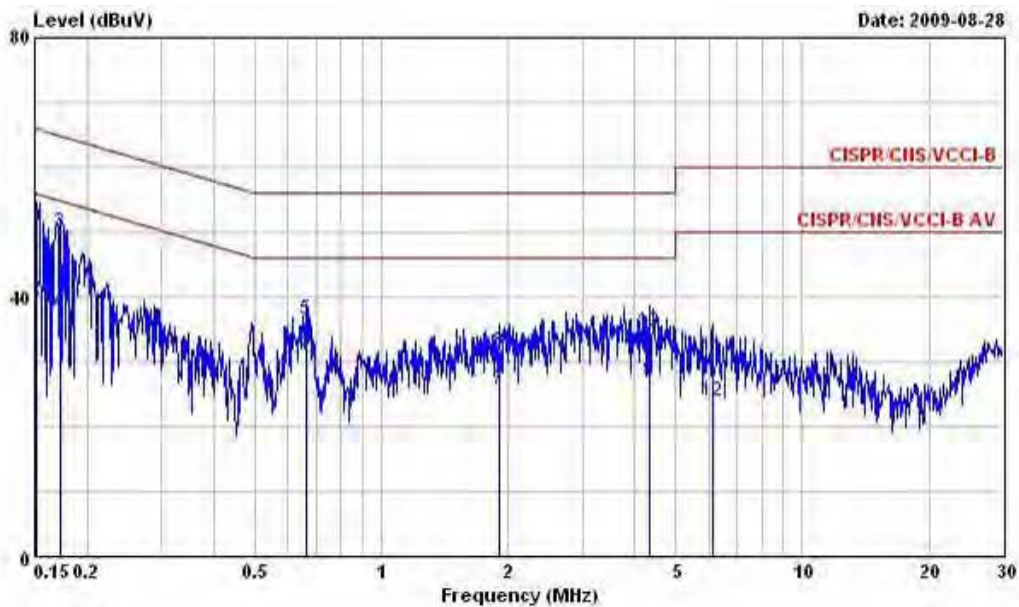
3.1.6. EUT Operation during Test

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

3.1.7. Results of AC Power Line Conducted Emissions Measurement

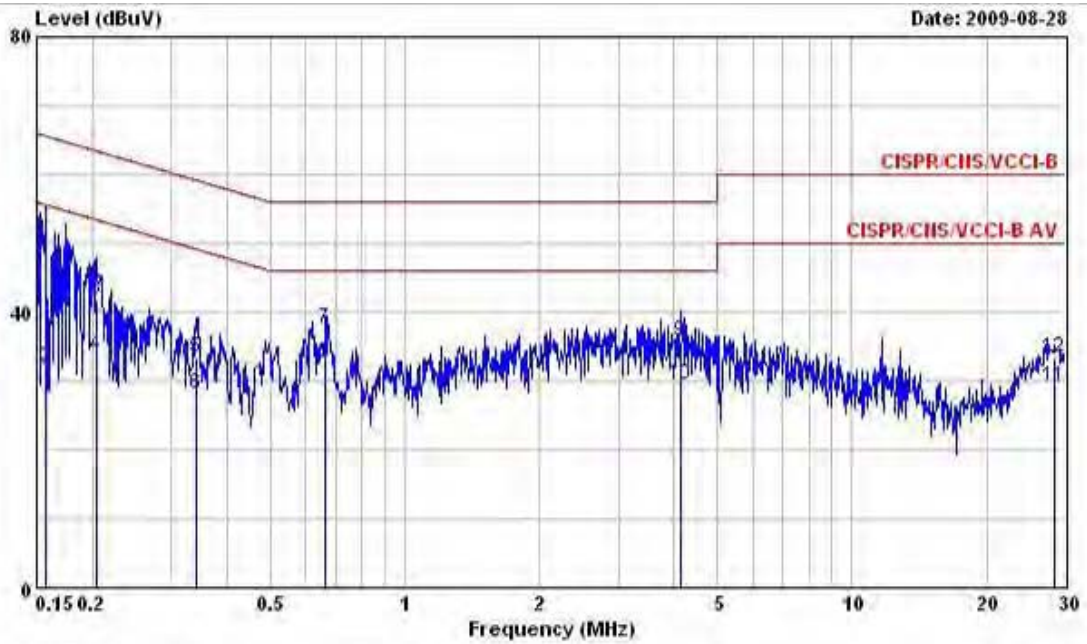
Test Date	Aug. 28, 2009	Test Site No.	CO04-HY
Temperature	25°C	Humidity	55%
Test Engineer	Chris Lin		
Configuration	Mode 1 : Measured on AC port – ADSL2+ Annex A		

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1515980	52.18	-13.73	65.91	51.83	0.09	0.26	QP
2	0.1515980	39.75	-16.16	55.91	39.40	0.09	0.26	Average
3	0.1721540	49.89	-14.97	64.86	49.52	0.08	0.29	QP
4	0.1721540	37.66	-17.20	54.86	37.29	0.08	0.29	Average
5	0.6647840	36.64	-19.36	56.00	36.43	0.10	0.11	QP
6	0.6647840	31.66	-14.34	46.00	31.45	0.10	0.11	Average
7	1.900	25.76	-20.24	46.00	25.49	0.13	0.14	Average
8	1.900	31.61	-24.39	56.00	31.34	0.13	0.14	QP
9	4.340	27.20	-18.80	46.00	26.80	0.17	0.23	Average
10	4.340	34.67	-21.33	56.00	34.27	0.17	0.23	QP
11	6.120	30.87	-29.13	60.00	30.38	0.21	0.28	QP
12	6.120	23.92	-26.08	50.00	23.43	0.21	0.28	Average

Neutral



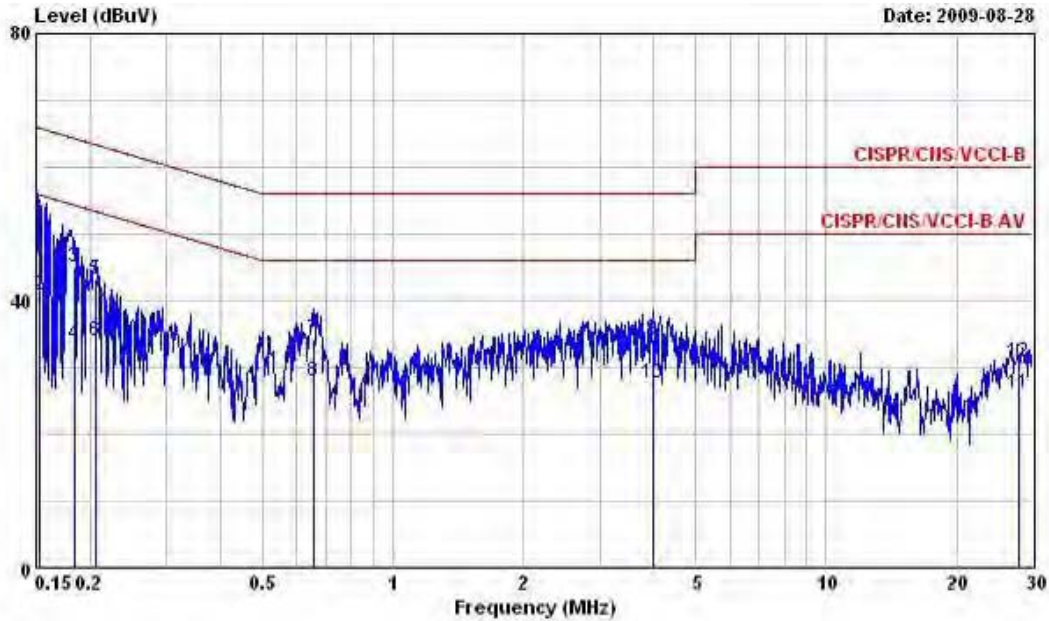
	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.1573260	47.56	-18.04	65.60	47.21	0.08	0.27	QP
2	0.1573260	31.87	-23.73	55.60	31.52	0.08	0.27	Average
3	0.2039630	41.81	-21.64	63.45	41.41	0.08	0.32	QP
4	0.2039630	33.58	-19.87	53.45	33.18	0.08	0.32	Average
5	0.3409970	33.44	-25.74	59.18	33.21	0.08	0.15	QP
6	0.3409970	28.19	-20.99	49.18	27.96	0.08	0.15	Average
7	0.6647840	37.63	-18.37	56.00	37.43	0.09	0.11	QP
8	0.6647840	32.71	-13.29	46.00	32.51	0.09	0.11	Average
9	4.140	35.92	-20.08	56.00	35.55	0.15	0.22	QP
10	4.140	29.58	-16.42	46.00	29.21	0.15	0.22	Average
11	28.450	29.15	-20.85	50.00	28.02	0.55	0.58	Average
12	28.450	33.46	-26.54	60.00	32.33	0.55	0.58	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

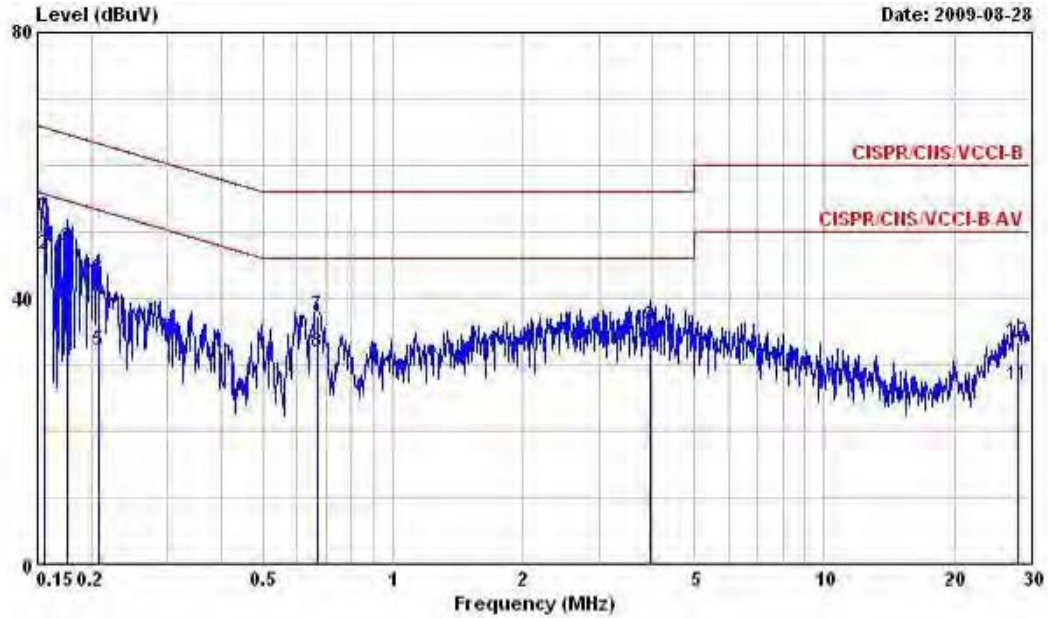
Test Date	Aug. 28, 2009	Test Site No.	CO04-HY
Temperature	25°C	Humidity	55%
Test Engineer	Chris Lin		
Configuration	Mode 2 : Measured on AC port- VDSL2 Annex A band plan : 998E		

Line



Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 @ 0.1524030	52.88	-12.99	65.87	52.53	0.09	0.26	QP
2 0.1524030	40.90	-14.97	55.87	40.55	0.09	0.26	Average
3 0.1844300	44.94	-19.34	64.28	44.55	0.08	0.31	QP
4 0.1844300	33.54	-20.74	54.28	33.15	0.08	0.31	Average
5 0.2061360	43.17	-20.19	63.36	42.77	0.08	0.32	QP
6 0.2061360	33.82	-19.54	53.36	33.42	0.08	0.32	Average
7 0.6543010	34.18	-21.82	56.00	33.97	0.10	0.11	QP
8 0.6543010	27.96	-18.04	46.00	27.75	0.10	0.11	Average
9 3.990	34.10	-21.90	56.00	33.72	0.16	0.22	QP
10 3.990	27.62	-18.38	46.00	27.24	0.16	0.22	Average
11 27.710	25.99	-24.01	50.00	24.90	0.52	0.57	Average
12 27.710	30.69	-29.31	60.00	29.60	0.52	0.57	QP

Neutral



Peak	Freq (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Remark
1	0.1556680	52.46	-13.23	65.69	52.12	0.08	0.26	QP
2	0.1556680	46.68	-9.01	55.69	46.34	0.08	0.26	Average
3	0.1758420	47.67	-17.01	64.68	47.29	0.08	0.30	QP
4	0.1758420	41.24	-13.44	54.68	40.86	0.08	0.30	Average
5	0.2072310	32.15	-21.17	53.32	31.75	0.08	0.32	Average
6	0.2072310	42.85	-20.47	63.32	42.45	0.08	0.32	QP
7	0.6683160	37.49	-18.51	56.00	37.29	0.09	0.11	QP
8	0.6683160	31.94	-14.06	46.00	31.74	0.09	0.11	Average
9	3.940	35.74	-20.26	56.00	35.37	0.15	0.22	QP
10	3.940	31.94	-14.06	46.00	31.57	0.15	0.22	Average
11	28.150	26.97	-23.03	50.00	25.85	0.54	0.58	Average
12	28.150	33.34	-26.66	60.00	32.22	0.54	0.58	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

3.2. Maximum Peak Output Power Measurement

3.2.1. Limit

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

3.2.2. Measuring Instruments and Setting

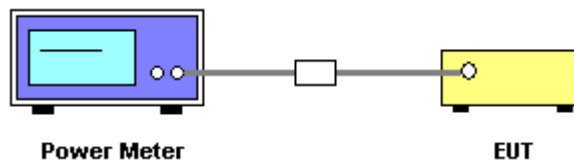
Please refer to section 4 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Analyzer Parameter	Setting
Attenuation	Auto
Span Frequency	50MHz
RB	1 MHz
VB	3 MHz
Detector	r.m.s.
Trace	Max Hold
Sweep Time	Auto
Channel Bandwidth	40 MHz

3.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the Spectrum Analyzer.
2. Turn on the EUT and Spectrum Analyzer and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.
4. As two antenna that we use in the test, we measured the individual antenna data and plus two data together.

3.2.4. Test Setup Layout



3.2.5. Test Deviation

There is no deviation with the original standard.

3.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.2.7. Test Result of Maximum Peak Output Power

Test Date	Sep. 15, 2009	Test Site No.	TH01-HY
Temperature	22.5°C	Humidity	65%
Test Engineer	Duncan	Configurations	802.11b/g

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	14.84	30.00	Complies
6	2437 MHz	14.94	30.00	Complies
11	2462 MHz	14.84	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	15.22	30.00	Complies
6	2437 MHz	15.39	30.00	Complies
11	2462 MHz	15.21	30.00	Complies

Test Date	Sep. 15, 2009	Test Site No.	TH01-HY
Temperature	22.5°C	Humidity	65%
Test Engineer	Duncan	Configurations	802.11n

For Single Chain

Configuration IEEE 802.11n MCS0 20MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	15.49	30.00	Complies
6	2437 MHz	15.40	30.00	Complies
11	2462 MHz	14.08	30.00	Complies

For Two Chain

Configuration IEEE 802.11n MCS8 20MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	11.83	30.00	Complies
6	2437 MHz	11.96	30.00	Complies
11	2462 MHz	11.55	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	11.10	30.00	Complies
6	2437 MHz	11.02	30.00	Complies
11	2462 MHz	10.77	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	14.49	30.00	Complies
6	2437 MHz	14.53	30.00	Complies
11	2462 MHz	14.19	30.00	Complies

3.3. Power Spectral Density Measurement

3.3.1. Limit

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

3.3.2. Measuring Instruments and Setting

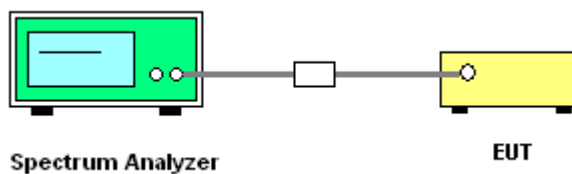
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

3.3.3. Test Procedures

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

3.3.4. Test Setup Layout



3.3.5. Test Deviation

There is no deviation with the original standard.

3.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.3.7. Test Result of Power Spectral Density

Test Date	Sep. 15, 2009	Test Site No.	TH01-HY
Temperature	22.5°C	Humidity	65%
Test Engineer	Duncan	Configurations	802.11b/g

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-7.71	8.00	Complies
6	2437 MHz	-9.76	8.00	Complies
11	2462 MHz	-9.99	8.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-11.18	8.00	Complies
6	2437 MHz	-9.31	8.00	Complies
11	2462 MHz	-11.10	8.00	Complies

Test Date	Sep. 15, 2009	Test Site No.	TH01-HY
Temperature	22.5°C	Humidity	65%
Test Engineer	Duncan	Configurations	802.11n (MCS0)

For Single Chain

Configuration IEEE 802.11n MCS0 20MHz

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-11.64	8.00	Complies
6	2437 MHz	-10.70	8.00	Complies
11	2462 MHz	-11.43	8.00	Complies

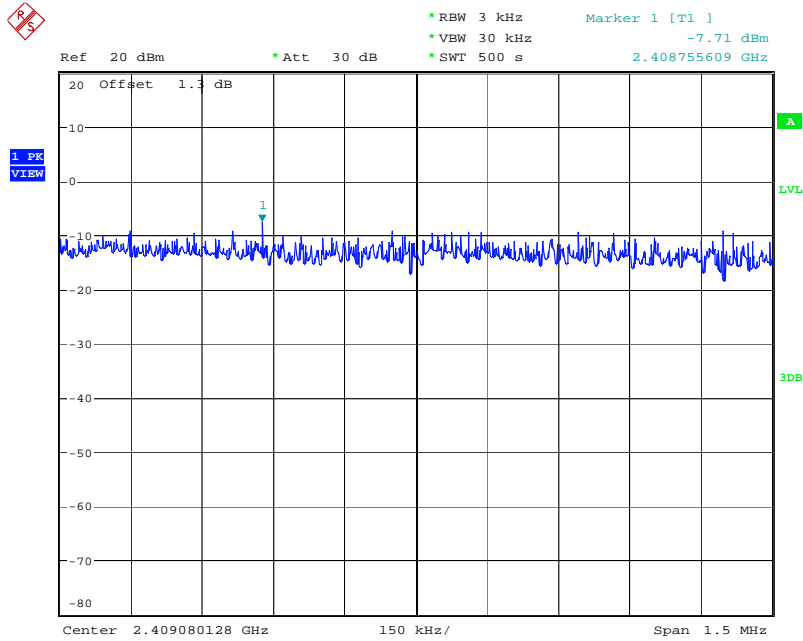
Test Date	Sep. 15, 2009	Test Site No.	TH01-HY
Temperature	22.5°C	Humidity	65%
Test Engineer	Duncan	Configurations	802.11n (MCS8)

For Two Chain

Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2

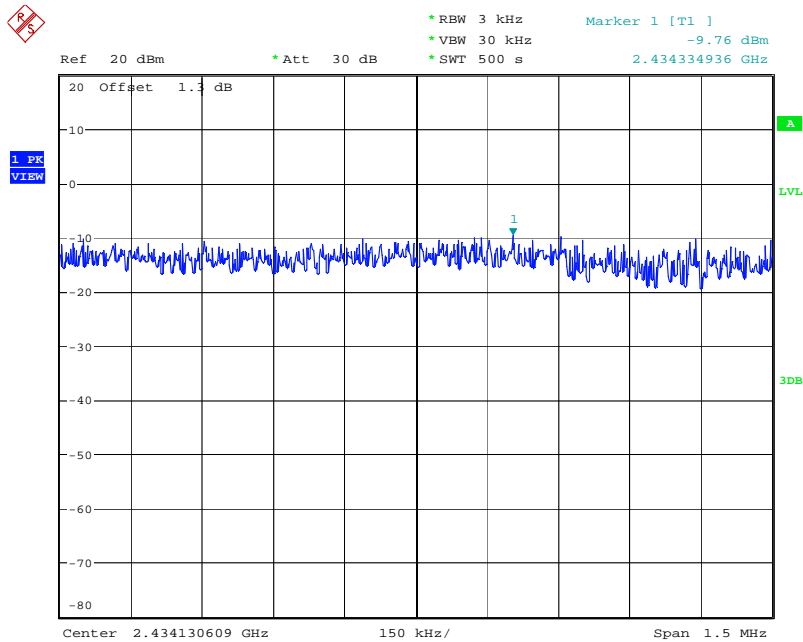
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-8.72	8.00	Complies
6	2437 MHz	-10.92	8.00	Complies
11	2462 MHz	-10.54	8.00	Complies

Power Density Plot on Configuration IEEE 802.11b / 2412 MHz



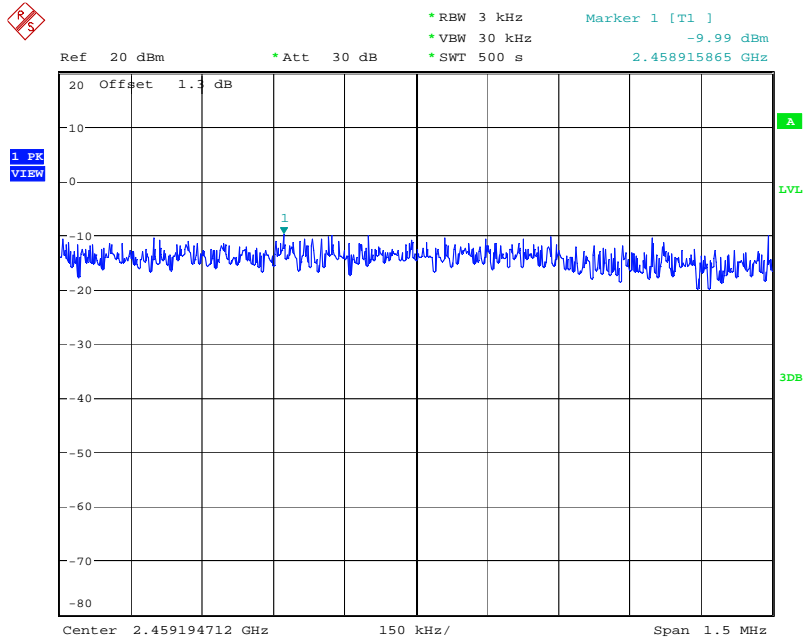
Date: 15.SEP.2009 11:36:54

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz



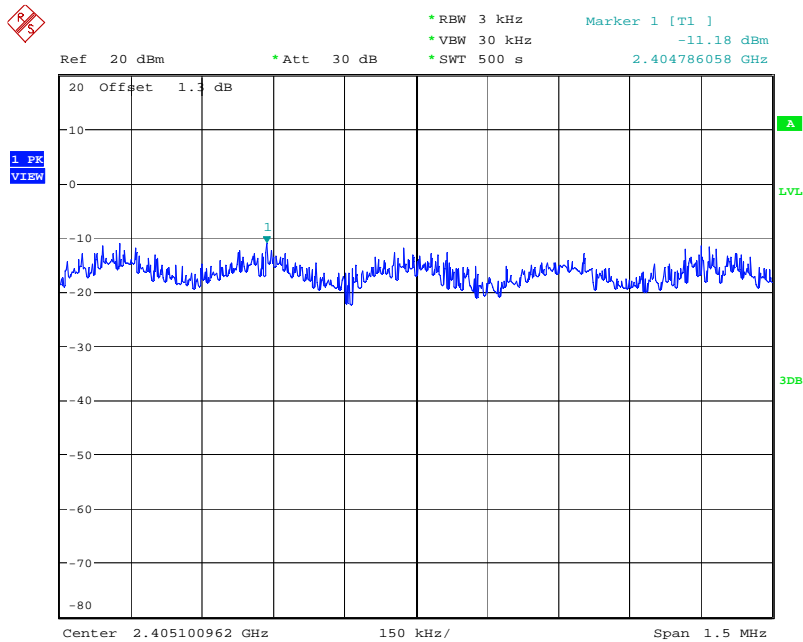
Date: 15.SEP.2009 11:39:06

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz



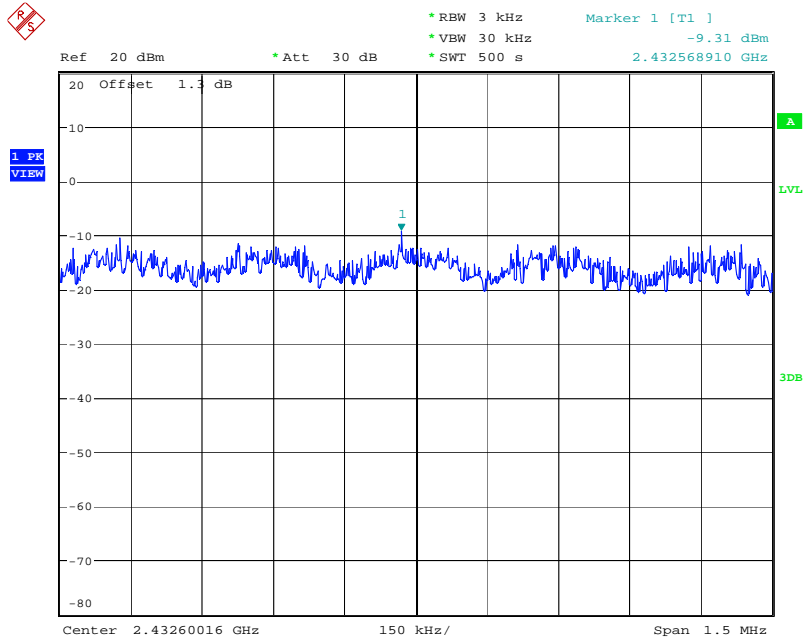
Date: 15.SEP.2009 11:40:12

Power Density Plot on Configuration IEEE 802.11g / 2412 MHz



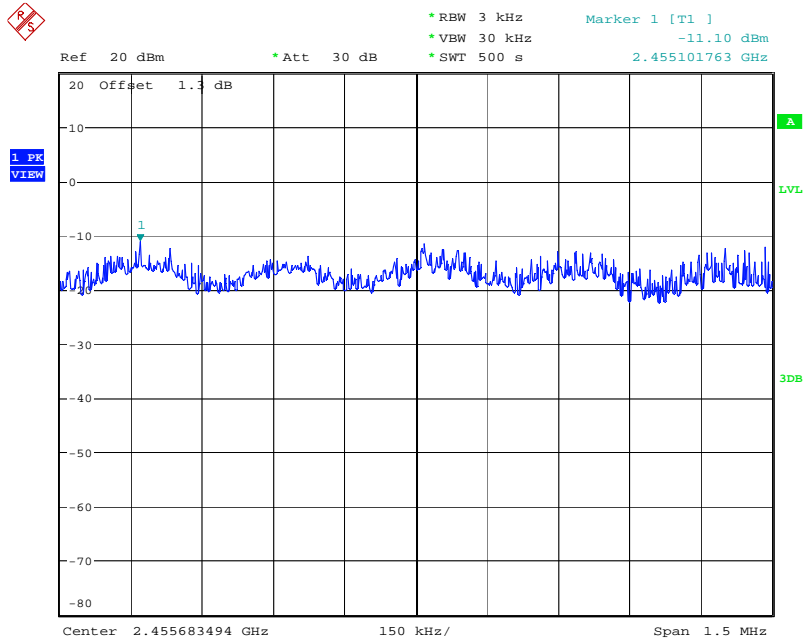
Date: 15.SEP.2009 11:42:19

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz



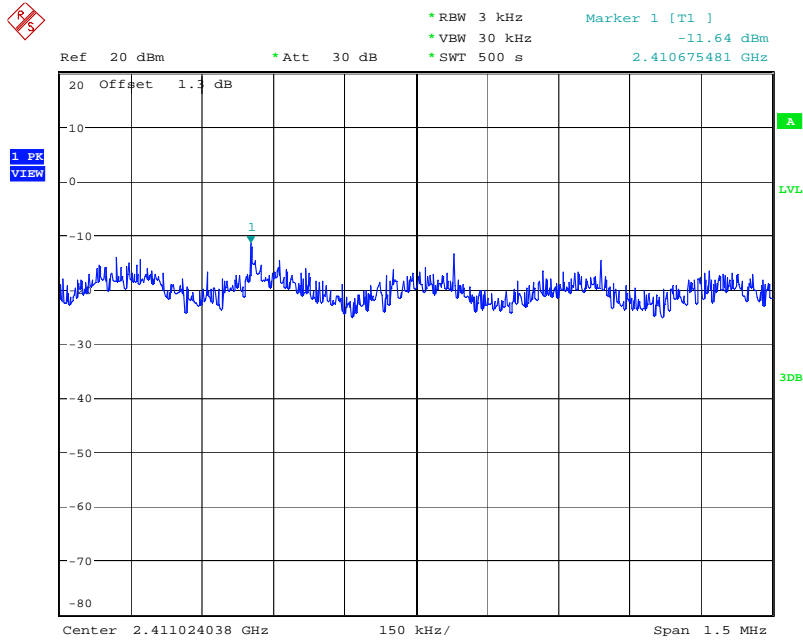
Date: 15.SEP.2009 11:43:37

Power Density Plot on Configuration IEEE 802.11g / 2462 MHz



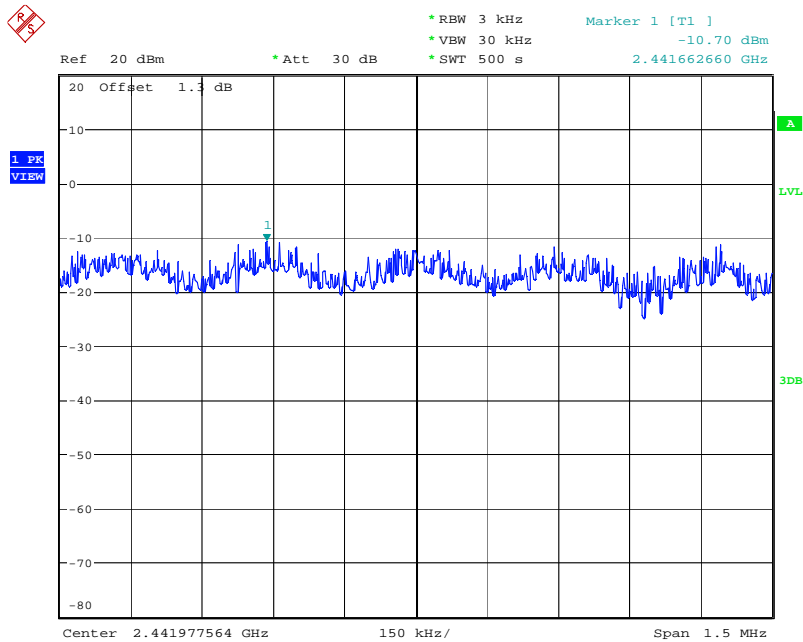
Date: 15.SEP.2009 11:44:33

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 2412 MHz



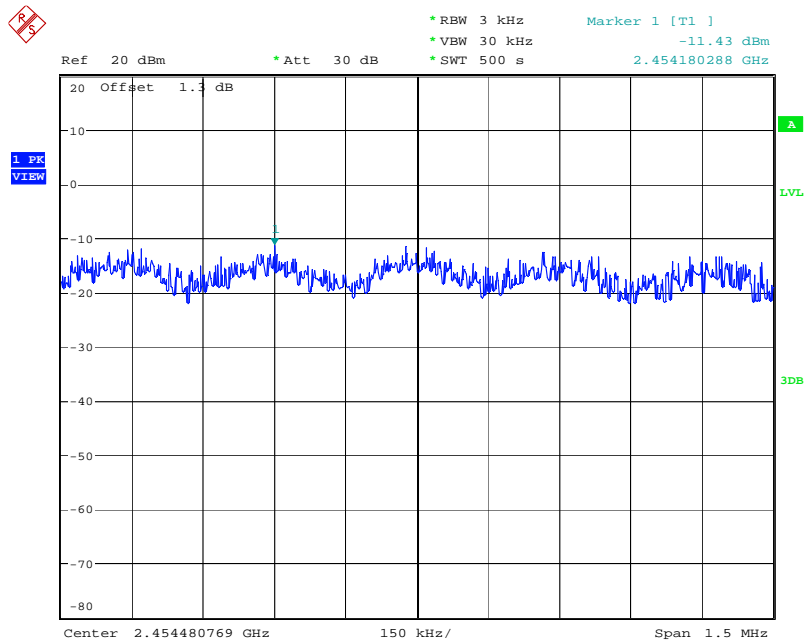
Date: 15.SEP.2009 11:50:07

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 2437 MHz



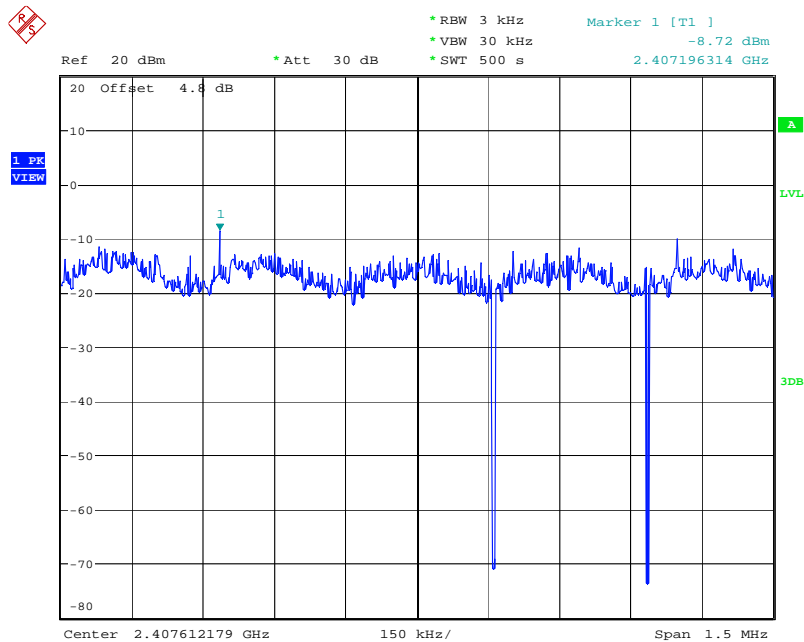
Date: 15.SEP.2009 11:56:46

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 2462 MHz



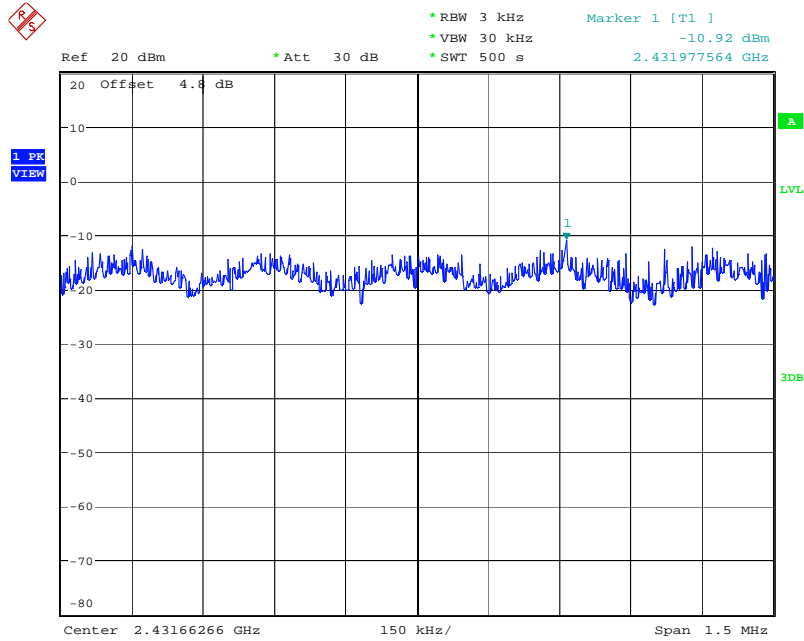
Date: 15.SEP.2009 12:00:21

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2 / 2412 MHz



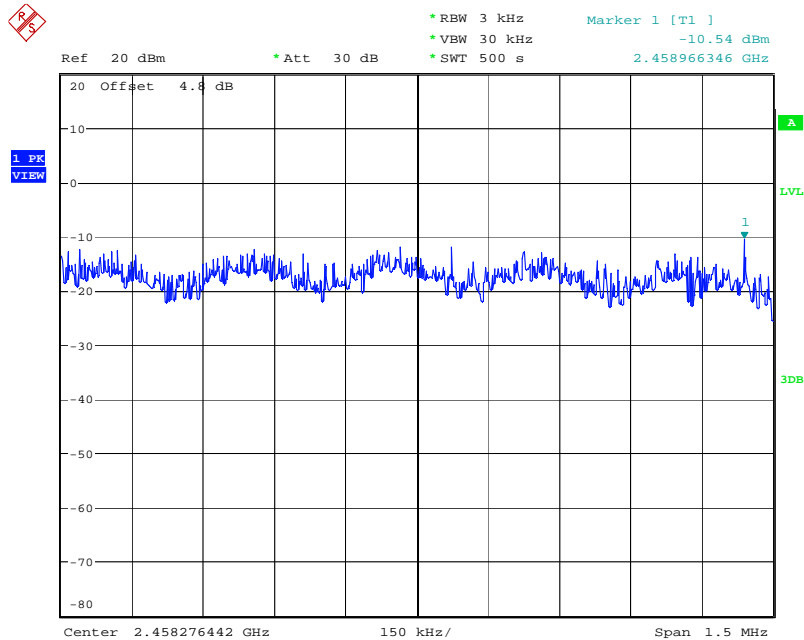
Date: 15.SEP.2009 13:44:28

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2 / 2437 MHz



Date: 15.SEP.2009 13:46:23

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2 / 2462 MHz



Date: 15.SEP.2009 13:54:58

3.4. 6dB Spectrum Bandwidth Measurement

3.4.1. Limit

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

3.4.2. Measuring Instruments and Setting

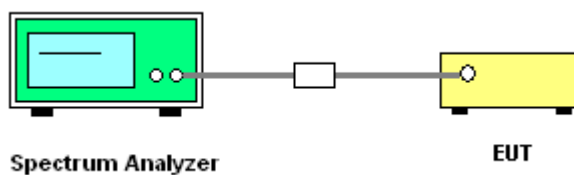
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

3.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum 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. In case of conducted measurements on smart antenna systems (devices with multiple transmit chains) a power splitter/combiner shall be used to combine all the transmit chains (antenna outputs) into a single test point. The insertion loss of the power splitter/combiner shall be taken into account.

3.4.4. Test Setup Layout



3.4.5. Test Deviation

There is no deviation with the original standard.

3.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.4.7. Test Result of 6dB Spectrum Bandwidth

Test Date	Sep. 15, 2009	Test Site No.	TH01-HY
Temperature	22.5°C	Humidity	65%
Test Engineer	Duncan	Configurations	802.11b/g

Configuration IEEE 802.11b

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	10.13	13.04	500	Complies
6	2437 MHz	10.10	13.08	500	Complies
11	2462 MHz	10.13	13.08	500	Complies

Configuration IEEE 802.11g

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.38	16.54	500	Complies
6	2437 MHz	16.38	16.54	500	Complies
11	2462 MHz	16.47	16.54	500	Complies

Test Date	Sep. 15, 2009	Test Site No.	TH01-HY
Temperature	22.5°C	Humidity	65%
Test Engineer	Duncan	Configurations	802.11n (MCS0)

For Single Chain

Configuration IEEE 802.11n MCS0 20MHz

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.56	17.63	500	Complies
6	2437 MHz	17.60	17.66	500	Complies
11	2462 MHz	17.63	17.63	500	Complies

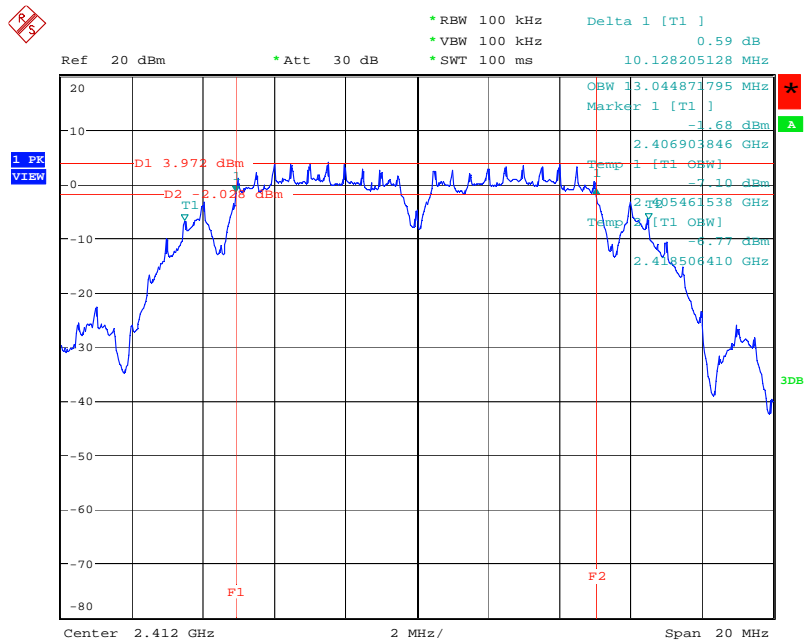
Test Date	Sep. 15, 2009	Test Site No.	TH01-HY
Temperature	22.5°C	Humidity	65%
Test Engineer	Duncan	Configurations	802.11n (MCS8)

For Two Chain

Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2

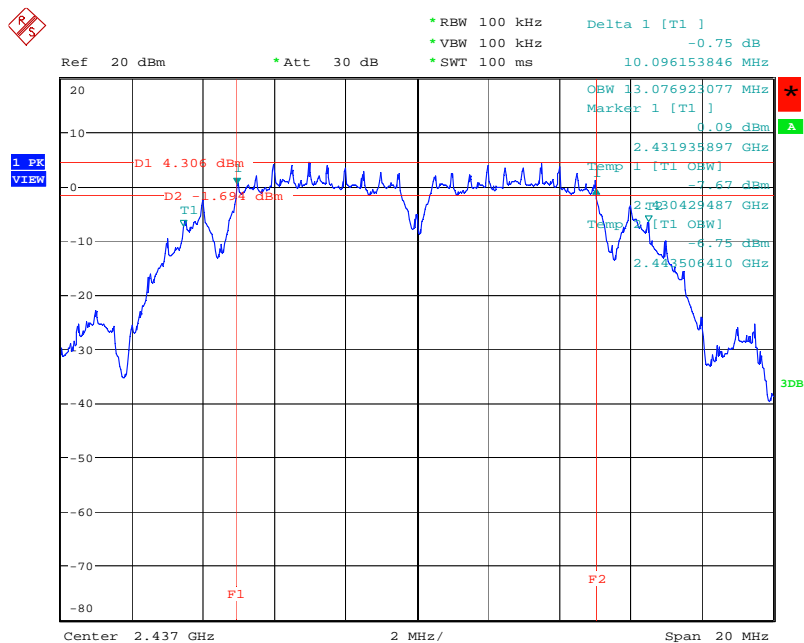
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.53	17.66	500	Complies
6	2437 MHz	16.41	17.66	500	Complies
11	2462 MHz	17.53	17.66	500	Complies

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz



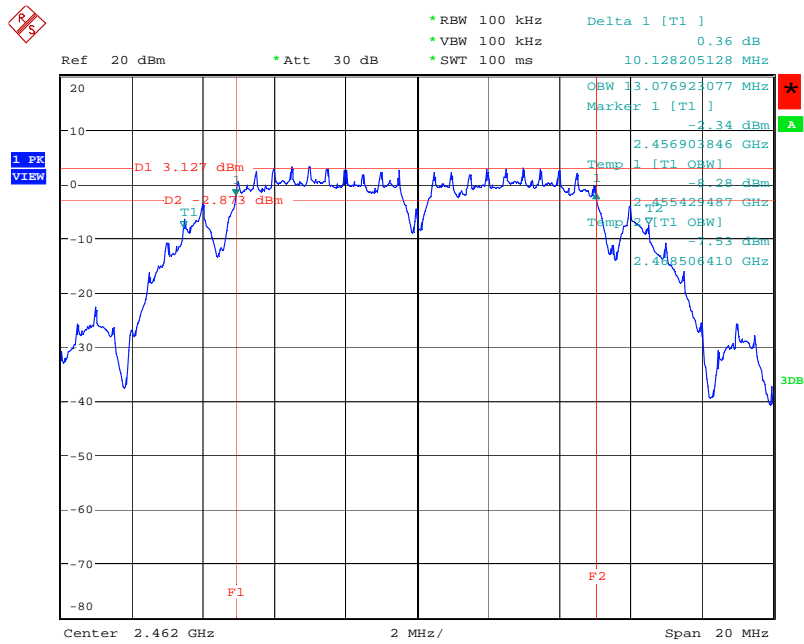
Date: 15.SEP.2009 11:37:07

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz



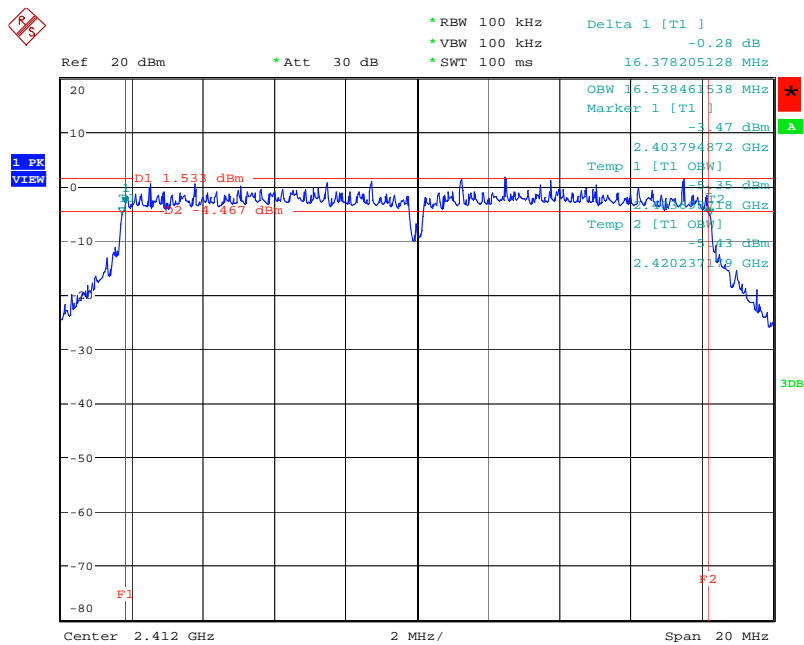
Date: 15.SEP.2009 11:39:15

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz



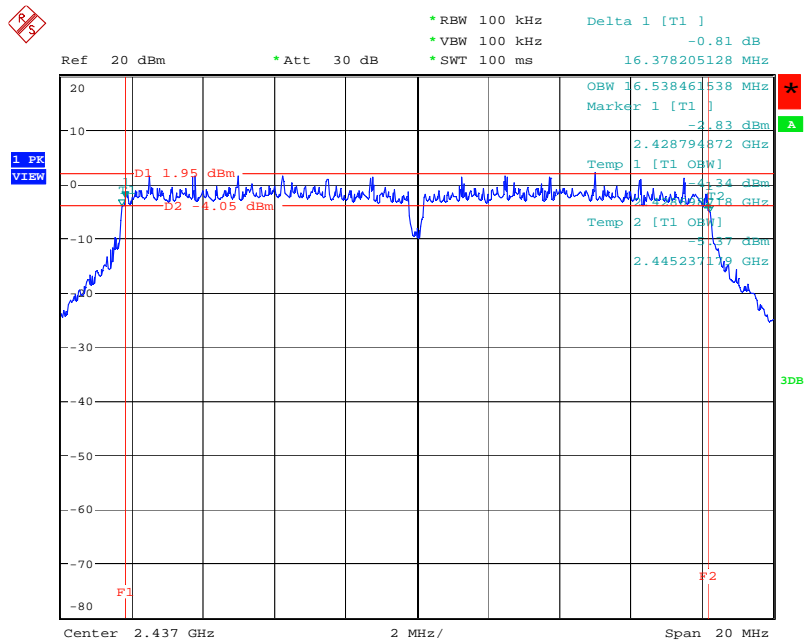
Date: 15.SEP.2009 11:40:20

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz



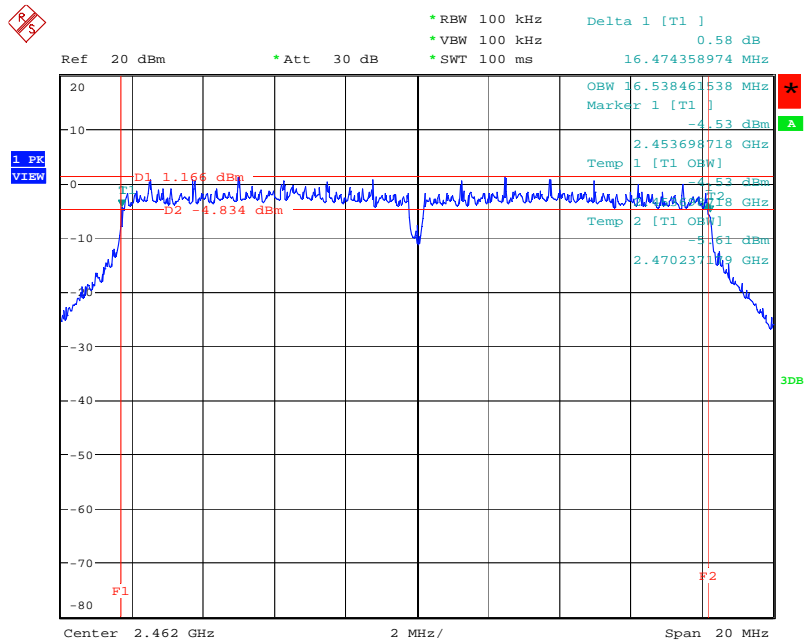
Date: 15.SEP.2009 11:42:27

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz



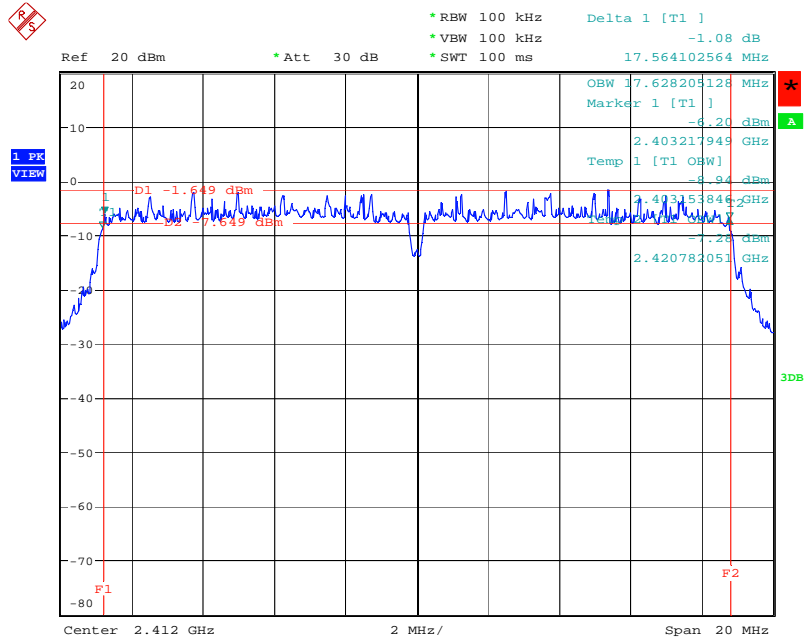
Date: 15.SEP.2009 11:43:45

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2462 MHz



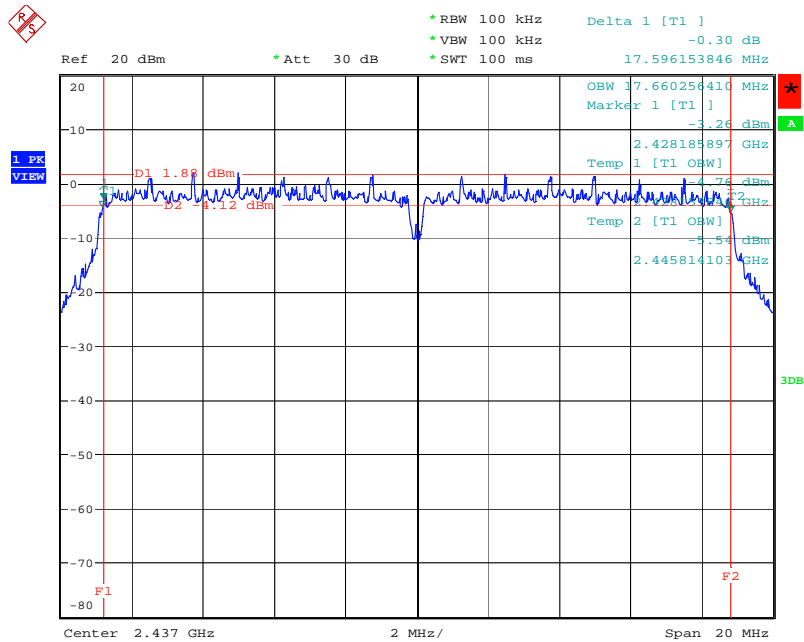
Date: 15.SEP.2009 11:44:41

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2412 MHz



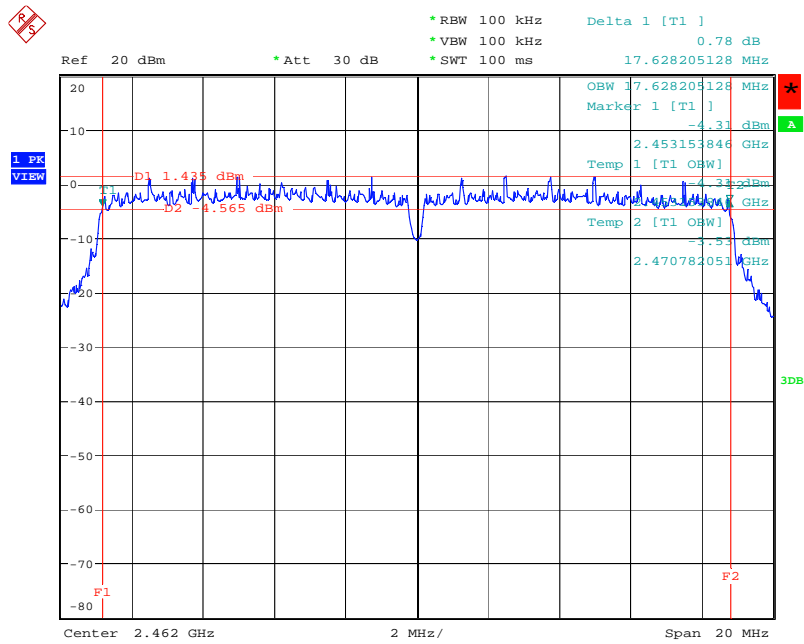
Date: 15.SEP.2009 11:50:15

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2437 MHz



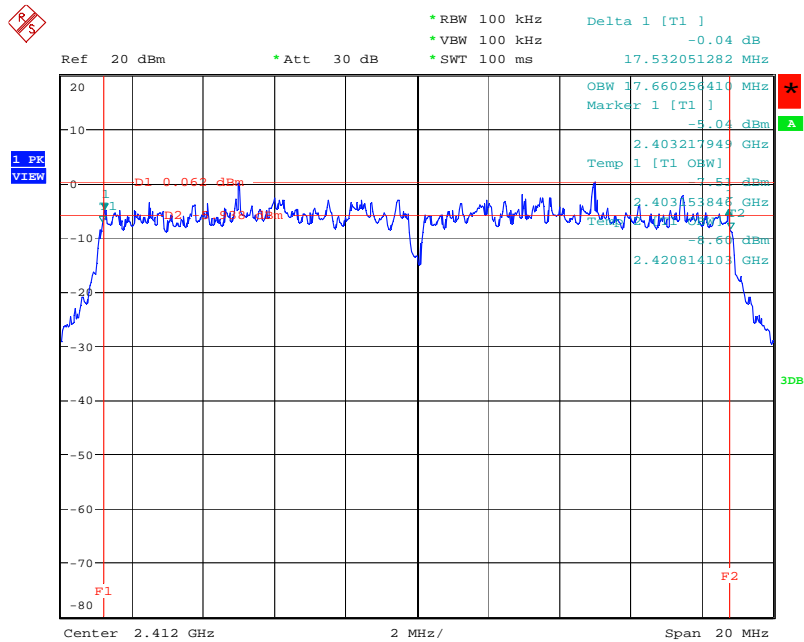
Date: 15.SEP.2009 11:56:55

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2462 MHz



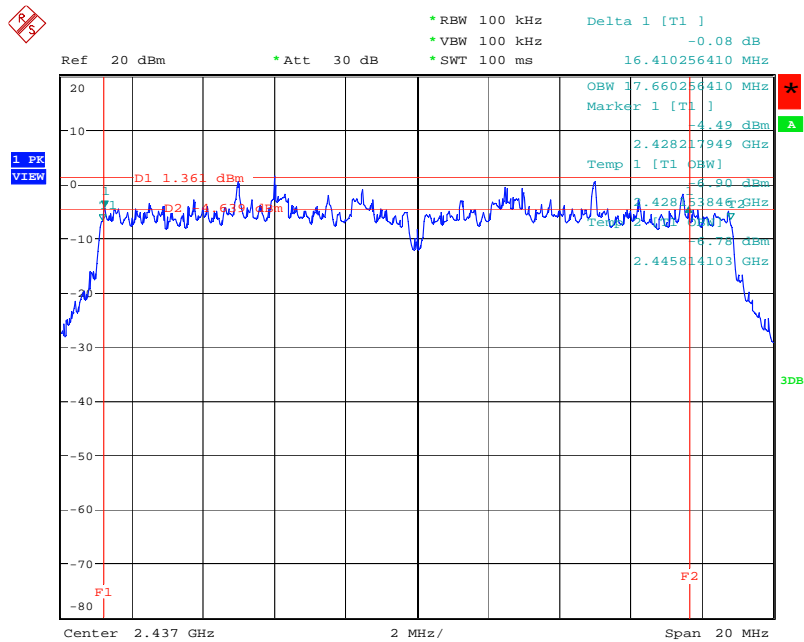
Date: 15.SEP.2009 12:00:29

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2 / 2412 MHz



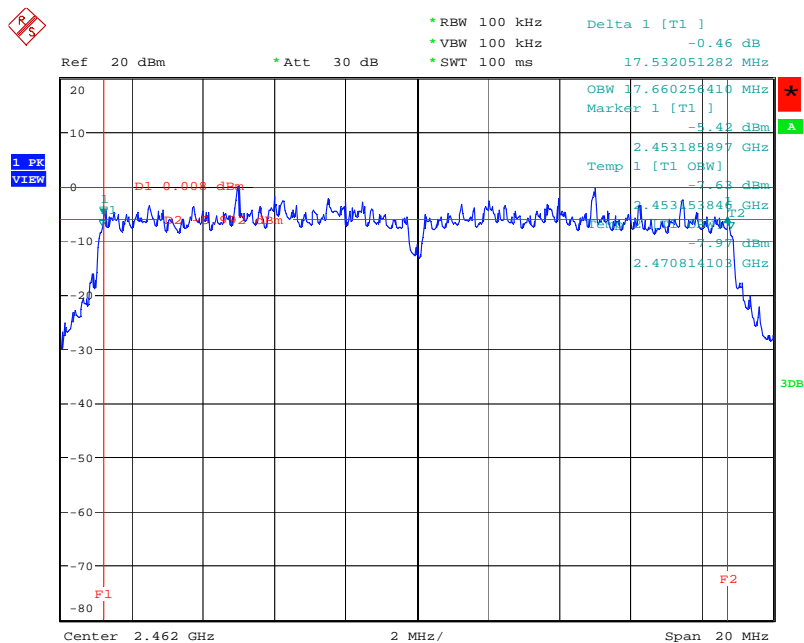
Date: 15.SEP.2009 13:44:36

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2 / 2437 MHz



Date: 15.SEP.2009 13:46:31

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2 / 2462 MHz



Date: 15.SEP.2009 13:55:06

3.5. Radiated Emissions Measurement

3.5.1. Limit

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

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

3.5.2. Measuring Instruments and Settings

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100KHz / 100KHz for peak

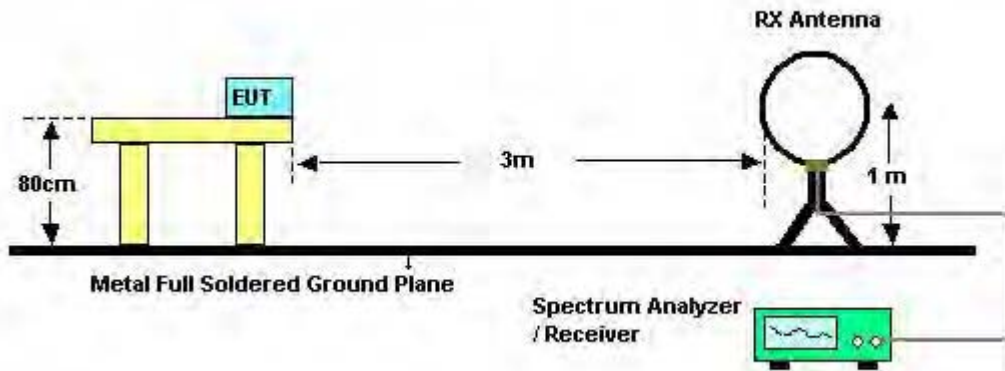
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.5.3. Test Procedures

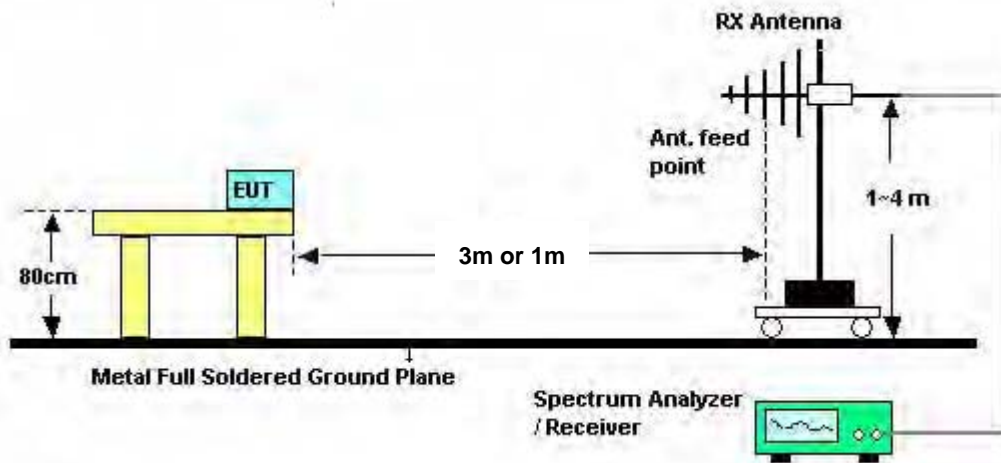
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.5.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB);

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

3.5.5. Test Deviation

There is no deviation with the original standard.

3.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Test Date	Oct. 07,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe		

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

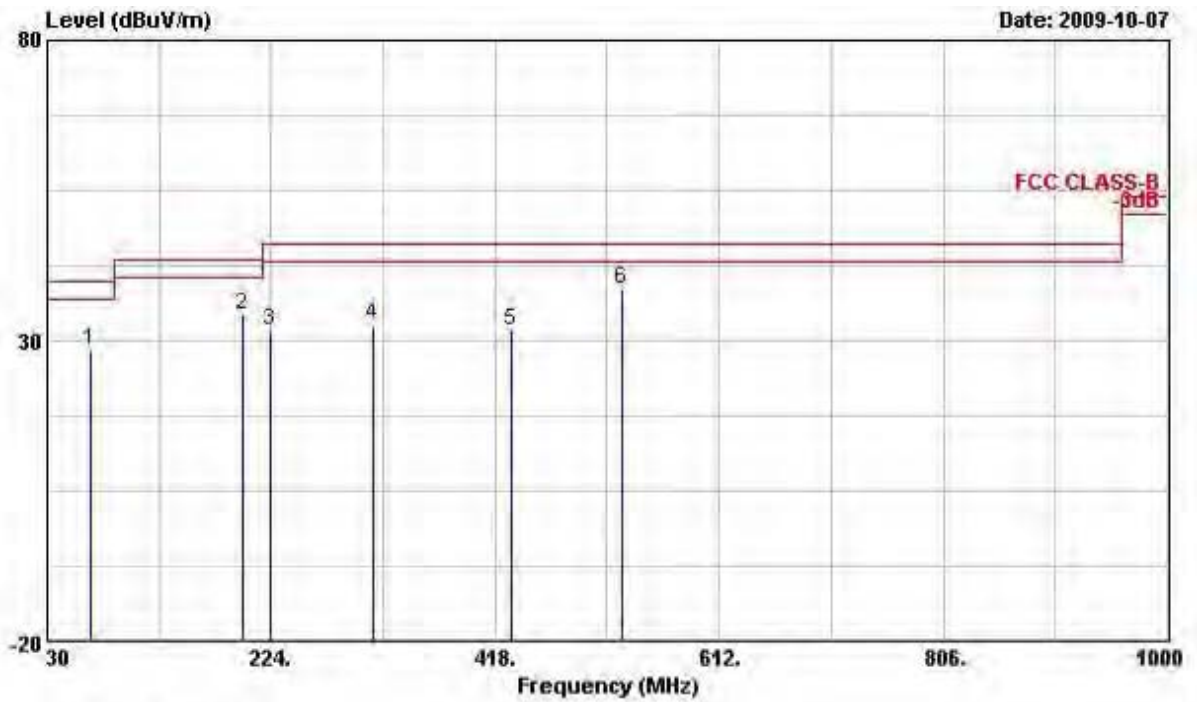
Note:

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

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

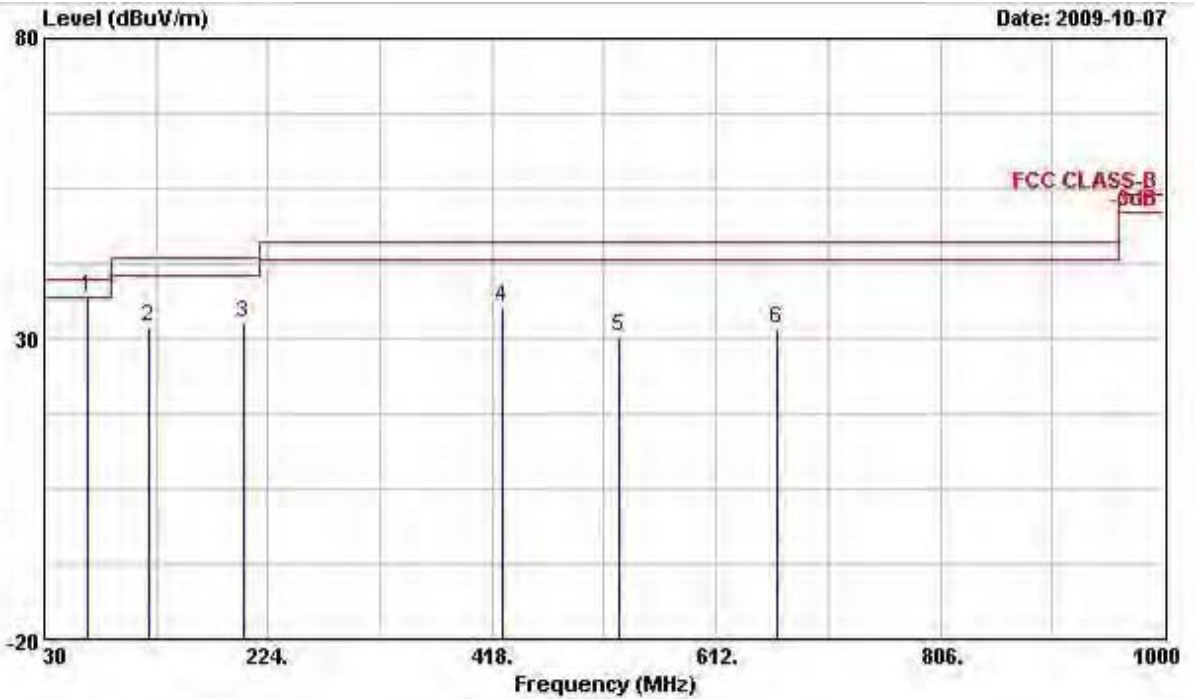
Test Date	Oct. 07,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11g CH 6 (Ant. 1)

Horizontal



Peak	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	67.830	28.28	-11.72	40.00	50.56	6.81	1.71	30.80 Peak
2	198.780	34.16	-9.34	43.50	50.64	11.28	2.84	30.60 Peak
3	223.030	31.53	-14.47	46.00	47.01	12.11	2.96	30.55 Peak
4	312.270	32.51	-13.49	46.00	45.55	13.90	3.43	30.37 Peak
5	431.580	31.65	-14.35	46.00	41.86	15.90	4.00	30.11 Peak
6	528.580	38.43	-7.57	46.00	45.76	18.10	4.39	29.82 Peak

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	67.830	36.90	-3.10	40.00	59.18	6.81	1.71	30.80	Peak
2	121.180	31.95	-11.55	43.50	47.14	13.39	2.18	30.76	Peak
3	202.660	32.63	-10.87	43.50	48.91	11.45	2.86	30.59	Peak
4	427.700	35.35	-10.65	46.00	45.68	15.82	3.97	30.12	Peak
5	528.580	30.26	-15.74	46.00	37.59	18.10	4.39	29.82	Peak
6	665.350	31.57	-14.43	46.00	36.46	19.31	5.14	29.34	Peak

Note:

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

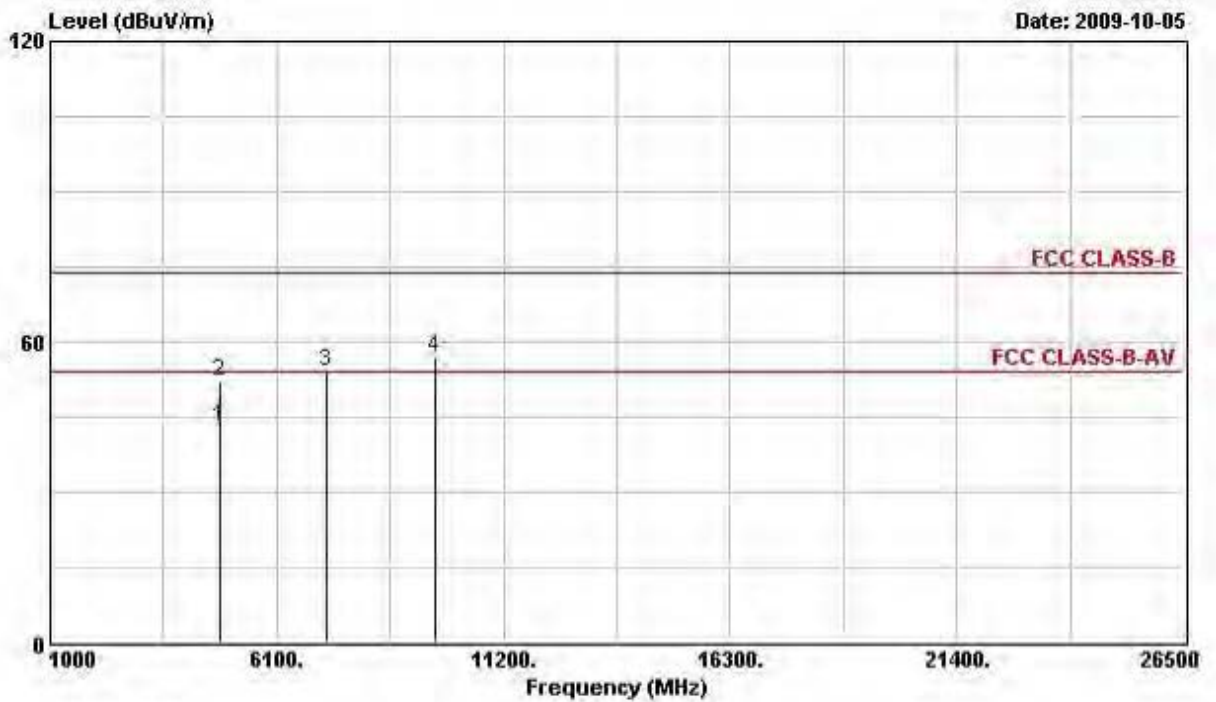
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11b CH 1 (Ant. 1)

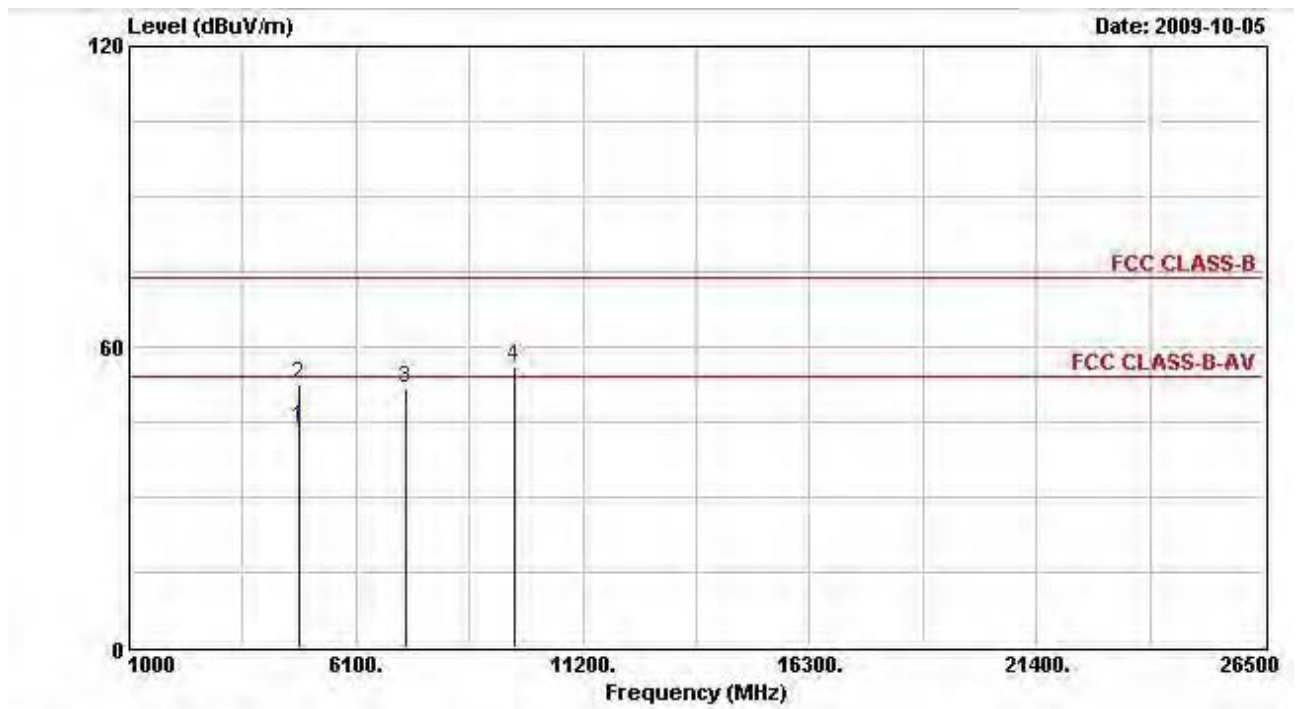
Horizontal



	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	43.12	-10.88	54.00	37.30	35.76	4.58	34.51	---	---	Average
2	4824.000	52.10	-21.90	74.00	46.28	35.76	4.58	34.51	---	---	Peak
3	7236.000	54.08			44.89	37.85	5.63	34.29	---	---	Peak
4	9648.000	56.75			45.65	39.39	6.34	34.63	---	---	Peak

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

Vertical

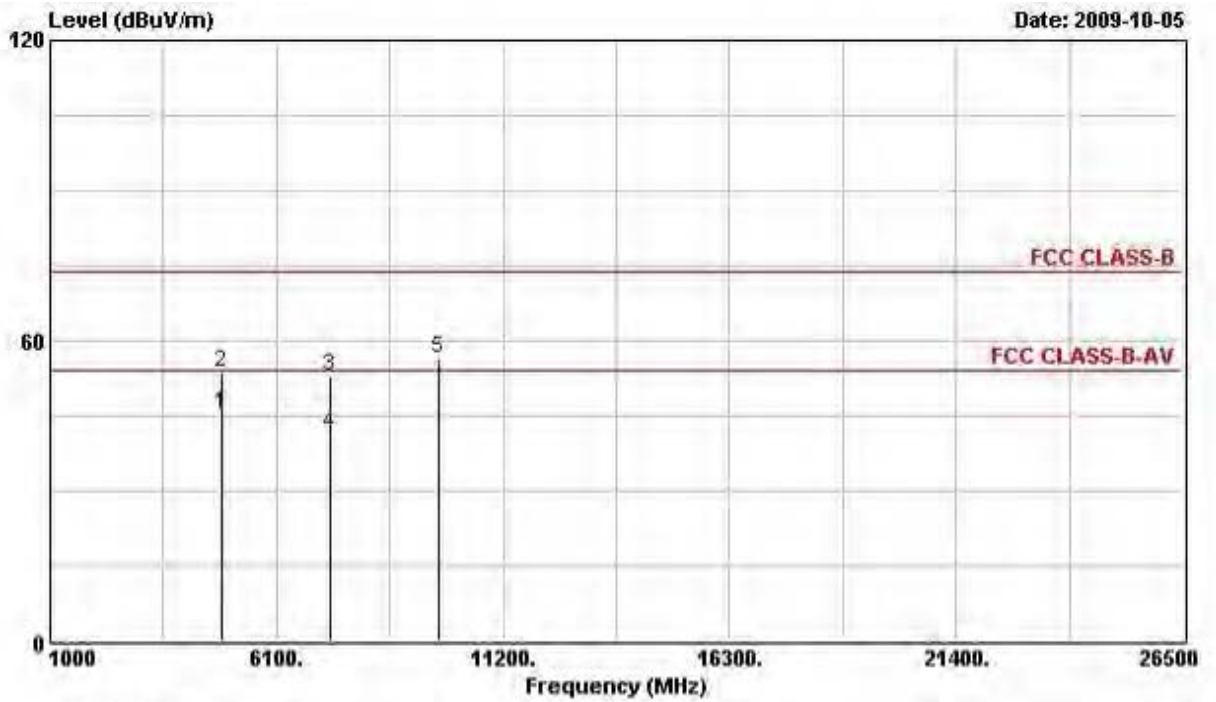


	Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable	Preamp	Ant	Table	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	43.92	-10.08	54.00	38.73	35.13	4.58	34.51	---	---	Averag
2	4824.000	52.34	-21.66	74.00	47.15	35.13	4.58	34.51	---	---	Peak
3	7236.000	51.79			43.55	36.90	5.63	34.29	---	---	Peak
4	9648.000	56.01			45.71	38.59	6.34	34.63	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11b CH 6 (Ant. 1)

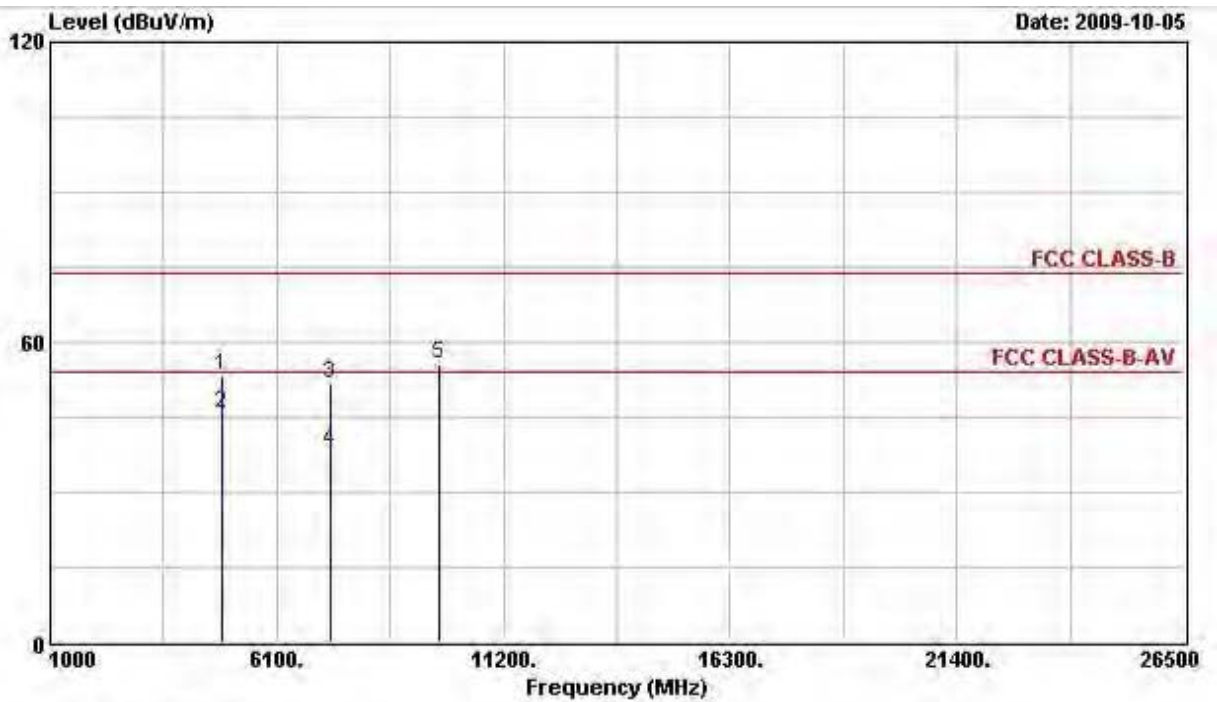
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4874.000	45.33	-8.67	54.00	39.34	35.83	4.61	34.45	---	---	Average
2	4874.000	53.56	-20.44	74.00	47.57	35.83	4.61	34.45	---	---	Peak
3	7311.000	52.92	-21.08	74.00	43.71	37.86	5.64	34.29	---	---	Peak
4	7311.000	41.36	-12.64	54.00	32.15	37.86	5.64	34.29	---	---	Average
5	9748.000	56.52			45.24	39.51	6.36	34.58	---	---	Peak

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

Vertical

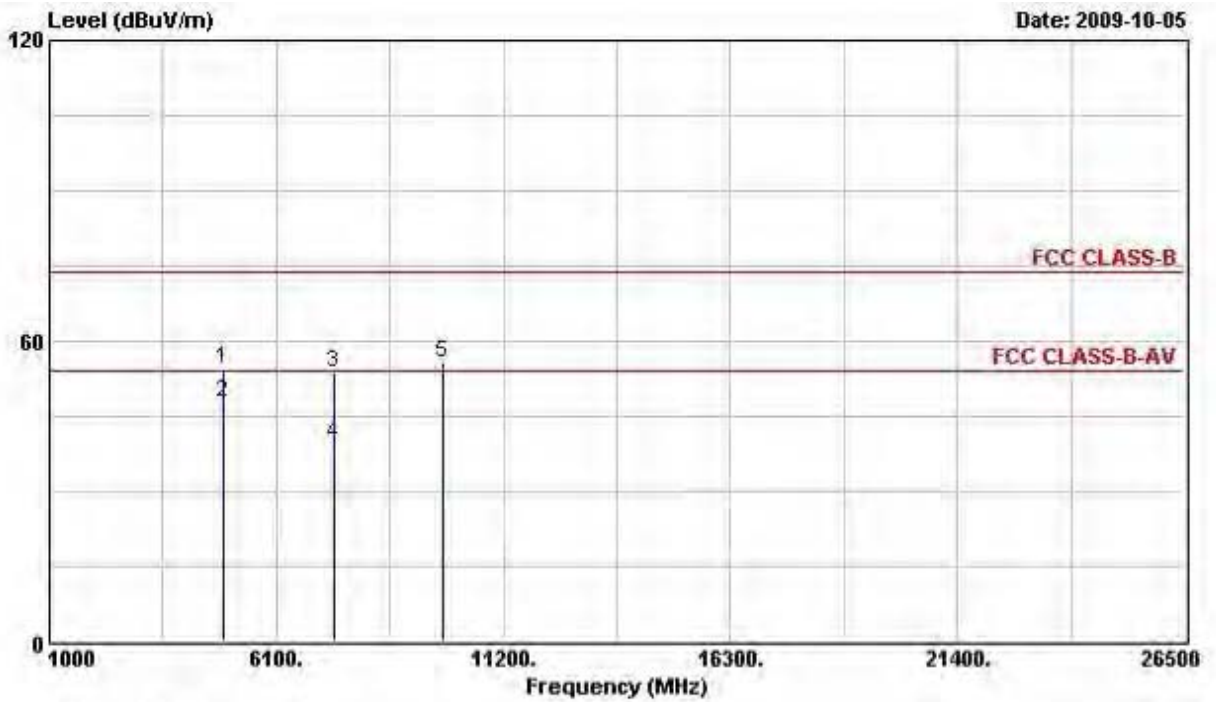


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4874.000	53.48	-20.52	74.00	48.14	35.18	4.61	34.45	---	---	Peak
2	4874.000	45.83	-8.17	54.00	40.49	35.18	4.61	34.45	---	---	Average
3	7311.000	51.57	-22.43	74.00	43.30	36.92	5.64	34.29	---	---	Peak
4	7311.000	38.42	-15.58	54.00	30.15	36.92	5.64	34.29	---	---	Average
5	9748.000	55.66			45.18	38.71	6.36	34.58	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11b CH 11 (Ant. 1)

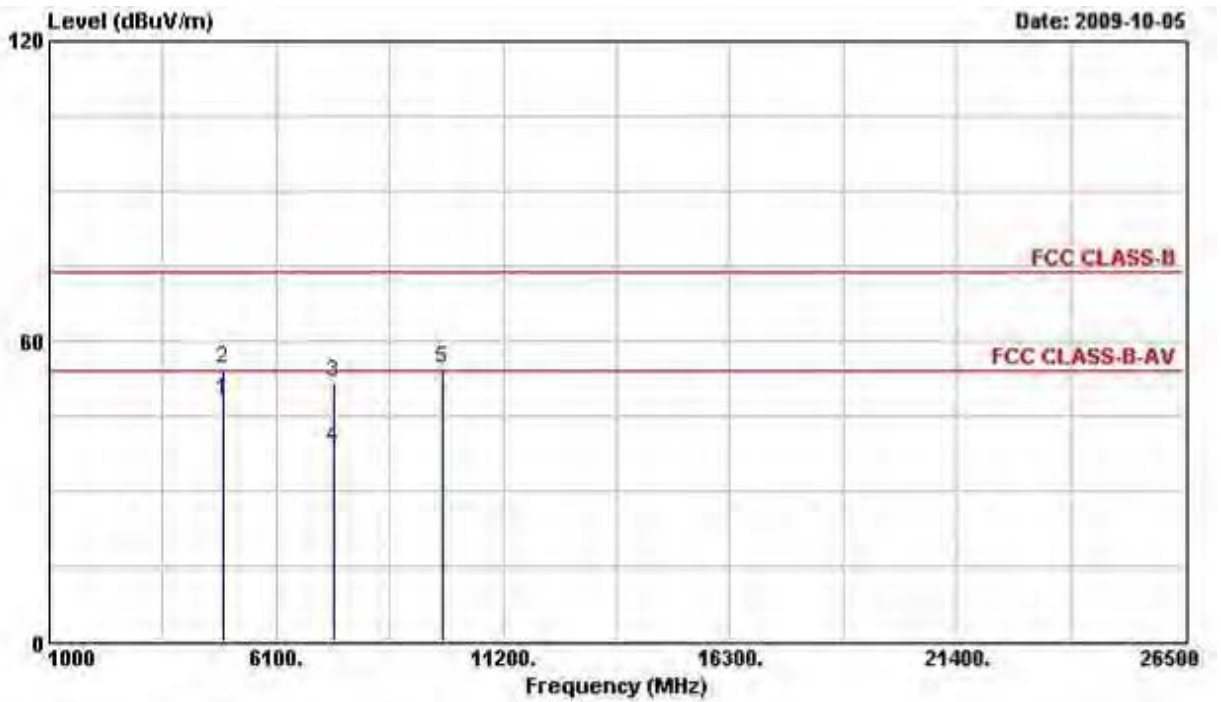
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4924.000	54.39	-19.61	74.00	48.19	35.90	4.68	34.38	---	---	Peak
2 @	4924.000	47.96	-6.04	54.00	41.76	35.90	4.68	34.38	---	---	Average
3	7386.000	53.85	-20.15	74.00	44.62	37.88	5.65	34.29	---	---	Peak
4	7386.000	39.35	-14.65	54.00	30.12	37.88	5.65	34.29	---	---	Average
5	9848.000	55.69			44.24	39.61	6.38	34.54	---	---	Peak

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

Vertical

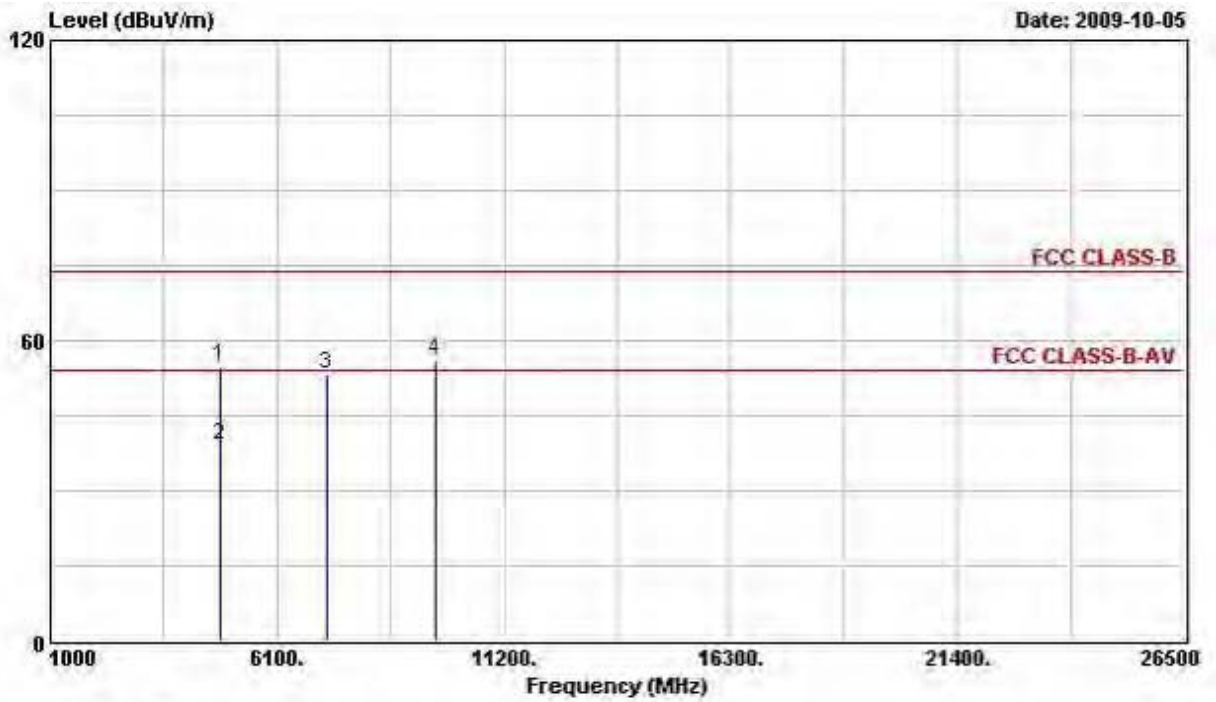


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	4924.000	48.29	-5.71	54.00	42.77	35.23	4.68	34.38	---	---	Average
2	4924.000	54.53	-19.47	74.00	49.01	35.23	4.68	34.38	---	---	Peak
3	7386.000	51.82	-22.18	74.00	43.51	36.96	5.65	34.29	---	---	Peak
4	7386.000	38.64	-15.36	54.00	30.33	36.96	5.65	34.29	---	---	Average
5	9848.000	54.31			43.66	38.81	6.38	34.54	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11g CH 1 (Ant. 1)

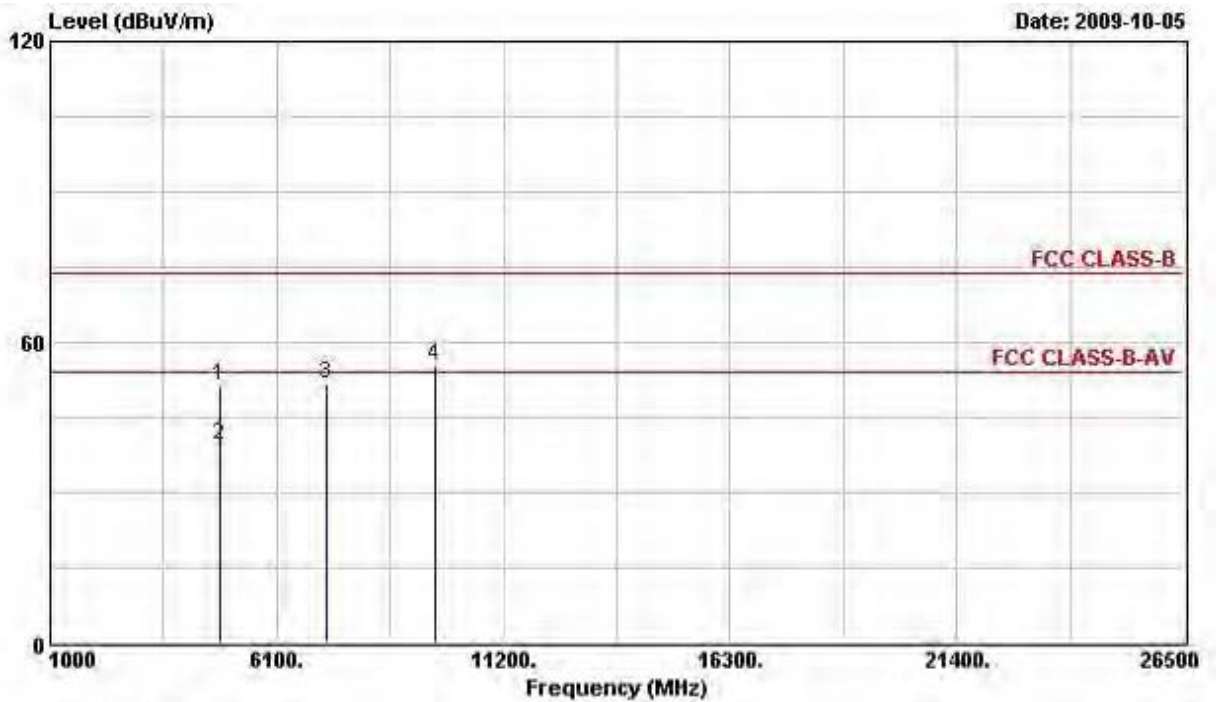
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	54.82	-19.18	74.00	48.99	35.76	4.58	34.51	---	---	Peak
2	4824.000	38.94	-15.06	54.00	33.12	35.76	4.58	34.51	---	---	Average
3	7236.000	53.22			44.03	37.85	5.63	34.29	---	---	Peak
4	9648.000	56.06			44.96	39.39	6.34	34.63	---	---	Peak

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

Vertical

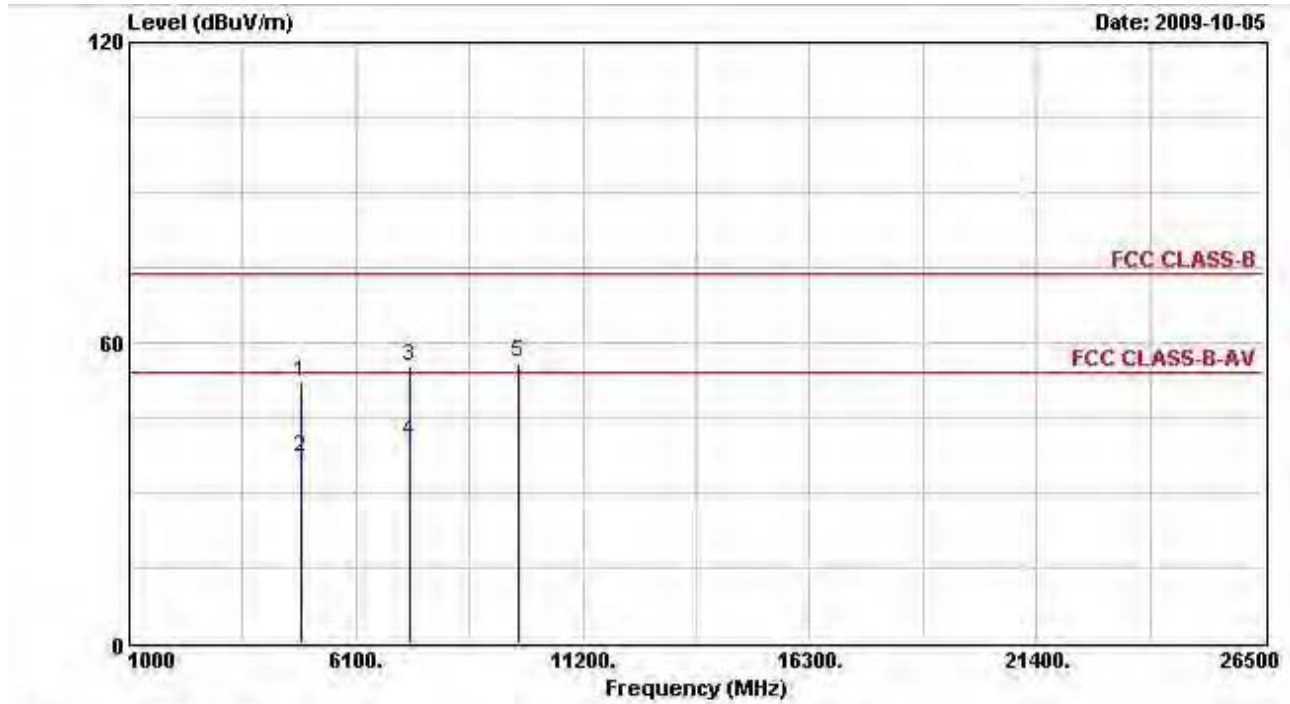


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	51.39	-22.61	74.00	46.20	35.13	4.58	34.51	---	---	Peak
2	4824.000	39.46	-14.54	54.00	34.26	35.13	4.58	34.51	---	---	Average
3	7236.000	51.89			43.65	36.90	5.63	34.29	---	---	Peak
4	9648.000	55.15			44.85	38.59	6.34	34.63	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11g CH 6 (Ant. 1)

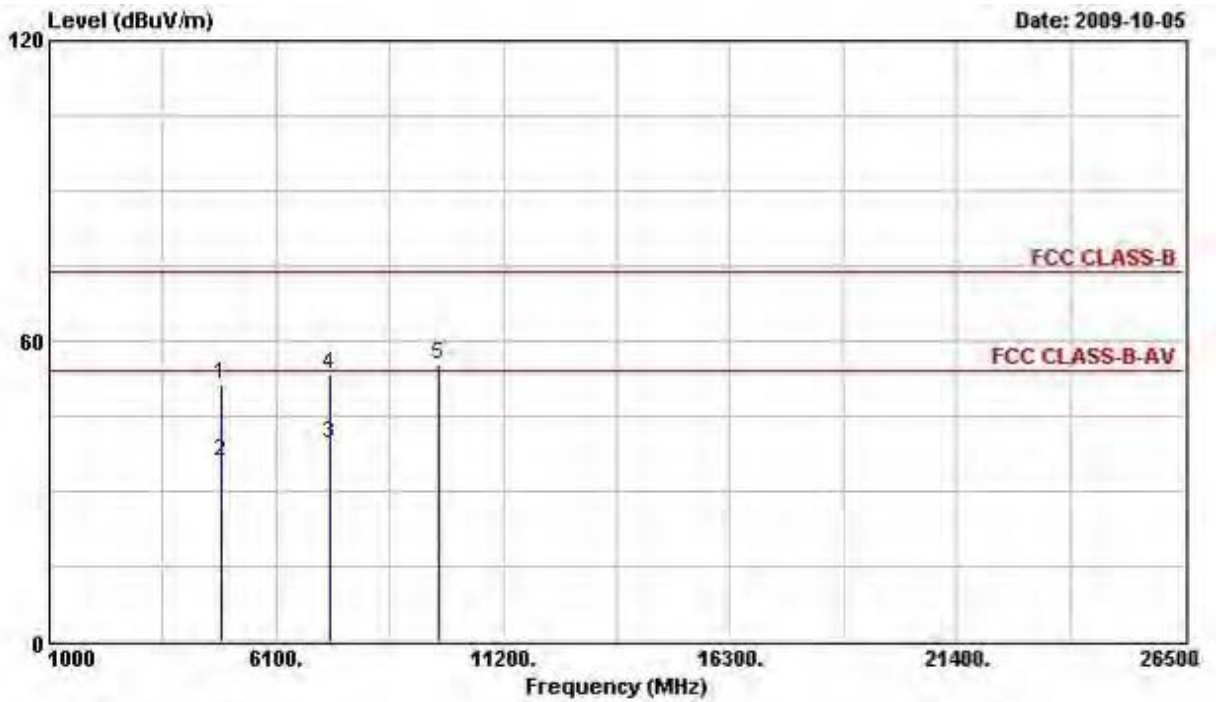
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4874.000	52.02	-21.98	74.00	46.03	35.83	4.61	34.45	---	---	Peak
2	4874.000	36.93	-17.07	54.00	30.94	35.83	4.61	34.45	---	---	Average
3	7311.000	55.41	-18.59	74.00	46.20	37.86	5.64	34.29	---	---	Peak
4	7311.000	40.32	-13.68	54.00	31.11	37.86	5.64	34.29	---	---	Average
5	9748.000	56.06			44.78	39.51	6.36	34.58	---	---	Peak

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

Vertical

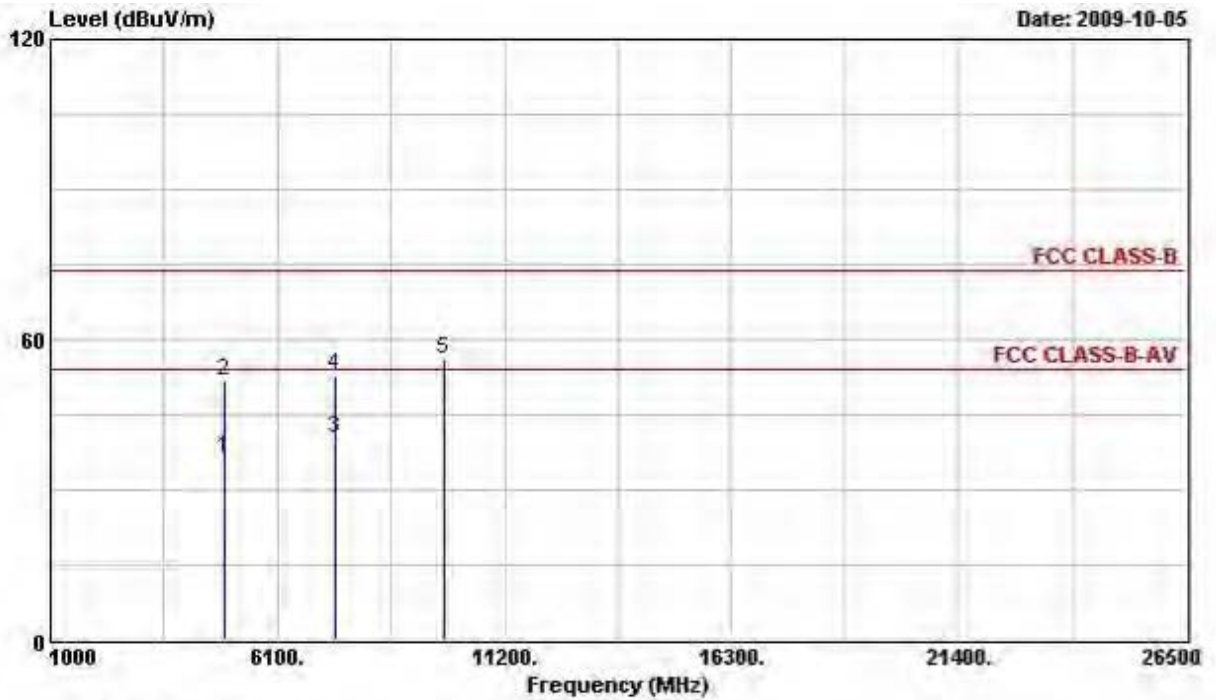


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4874.000	51.42	-22.58	74.00	46.08	35.18	4.61	34.45	---	---	Peak
2	4874.000	35.88	-18.12	54.00	30.54	35.18	4.61	34.45	---	---	Average
3	7311.000	39.38	-14.62	54.00	31.11	36.92	5.64	34.29	---	---	Average
4	7311.000	53.18	-20.82	74.00	44.91	36.92	5.64	34.29	---	---	Peak
5	9748.000	55.34			44.86	38.71	6.36	34.58	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11g CH 11 (Ant. 1)

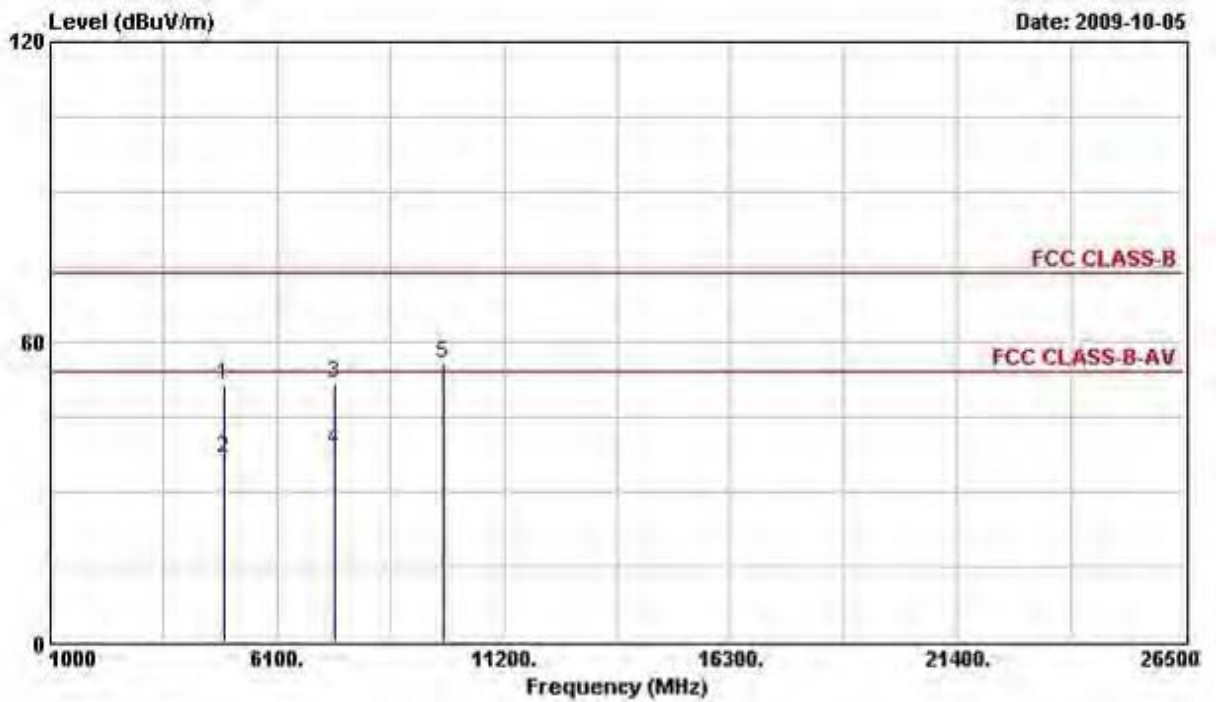
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4924.000	36.41	-17.59	54.00	30.21	35.90	4.68	34.38	---	---	Average
2	4924.000	51.54	-22.46	74.00	45.34	35.90	4.68	34.38	---	---	Peak
3	7386.000	40.45	-13.55	54.00	31.22	37.88	5.65	34.29	---	---	Average
4	7386.000	52.79	-21.21	74.00	43.56	37.88	5.65	34.29	---	---	Peak
5	9848.000	56.23			44.78	39.61	6.38	34.54	---	---	Peak

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

Vertical

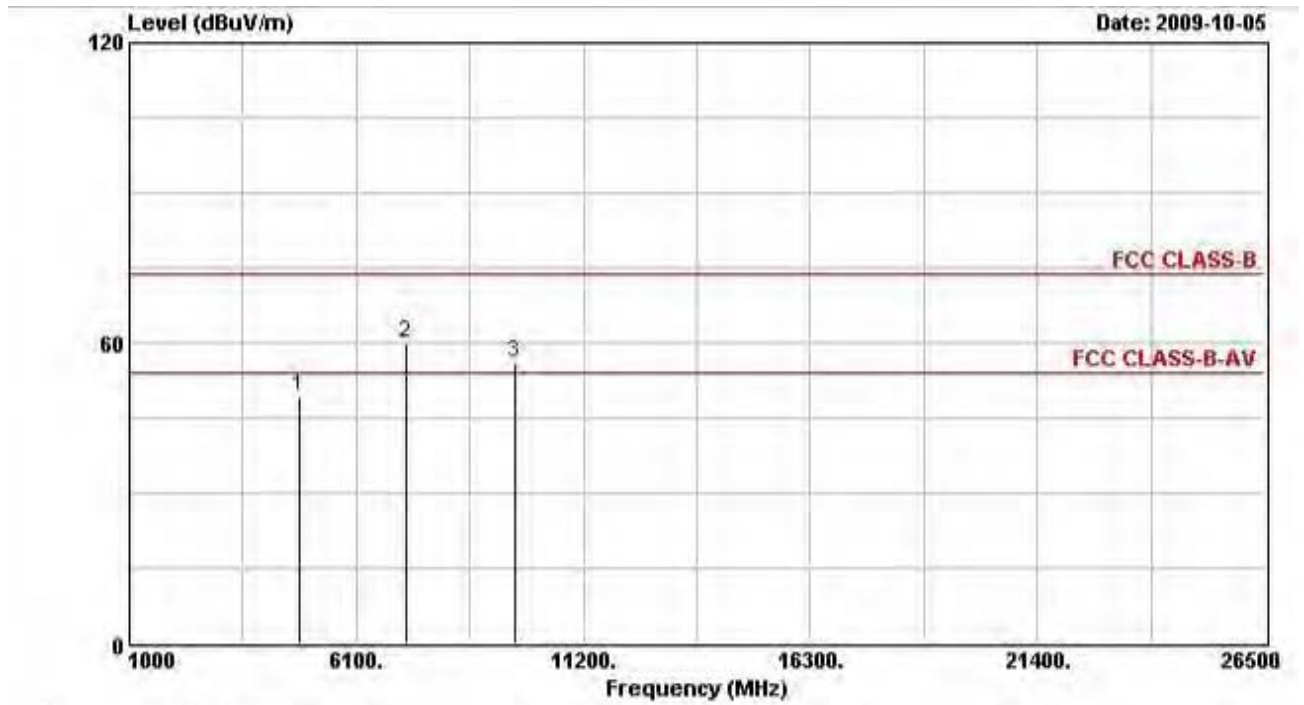


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4924.000	51.22	-22.78	74.00	45.70	35.23	4.68	34.38	---	---	Peak
2	4924.000	36.77	-17.23	54.00	31.25	35.23	4.68	34.38	---	---	Average
3	7386.000	51.58	-22.42	74.00	43.27	36.96	5.65	34.29	---	---	Peak
4	7386.000	38.46	-15.54	54.00	30.15	36.96	5.65	34.29	---	---	Average
5	9848.000	55.82			45.17	38.81	6.38	34.54	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	MCS0 20MHz Ch 1 (Ant. 1)

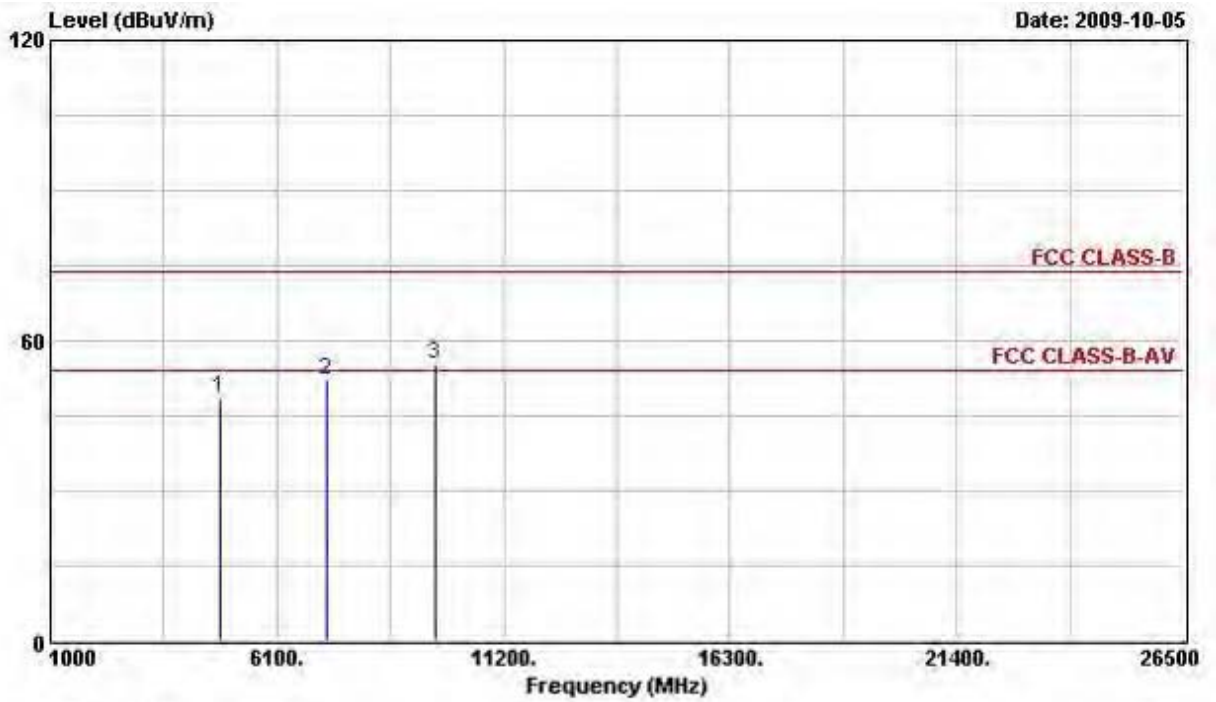
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	49.23	-4.77	54.00	43.41	35.76	4.58	34.51	---	---	PK
2	7236.000	59.92			50.73	37.85	5.63	34.29	---	---	Peak
3	9648.000	56.24			45.14	39.39	6.34	34.63	---	---	Peak

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

Vertical

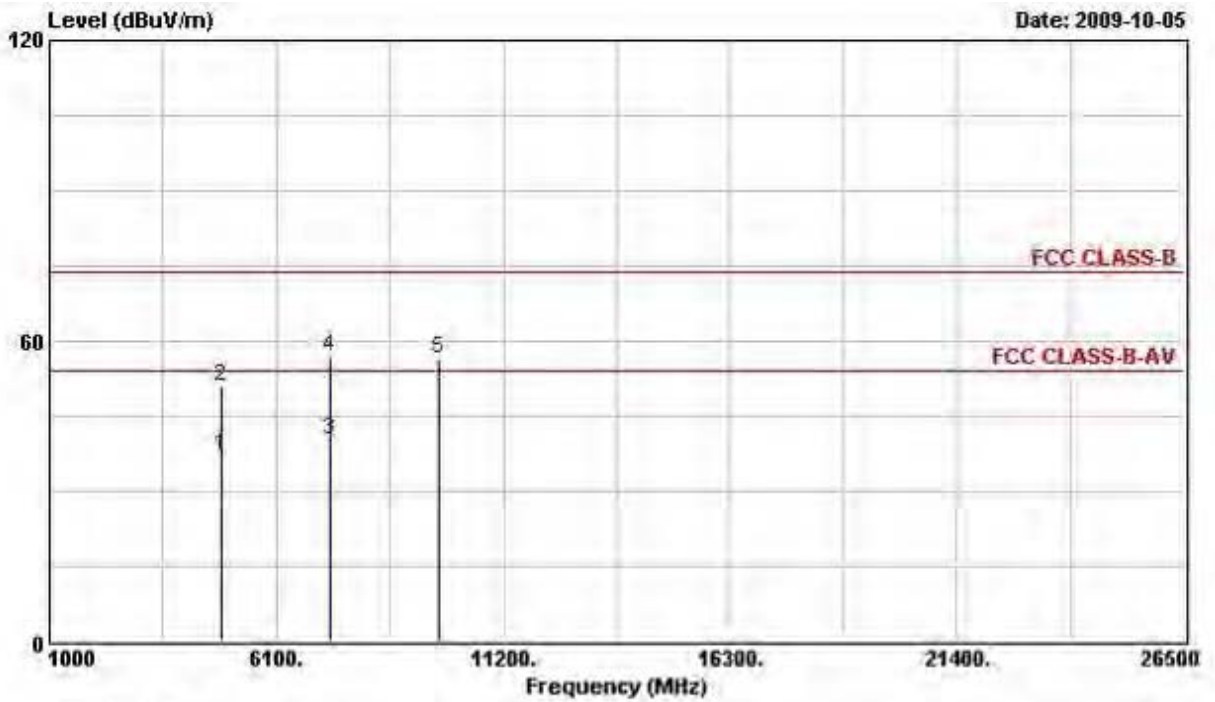


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	48.43	-5.57	54.00	43.24	35.13	4.58	34.51	---	---	PK
2	7236.000	52.25			44.01	36.90	5.63	34.29	---	---	Peak
3	9648.000	55.15			44.85	38.59	6.34	34.63	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	MCS0 20MHz Ch 6 (Ant. 1)

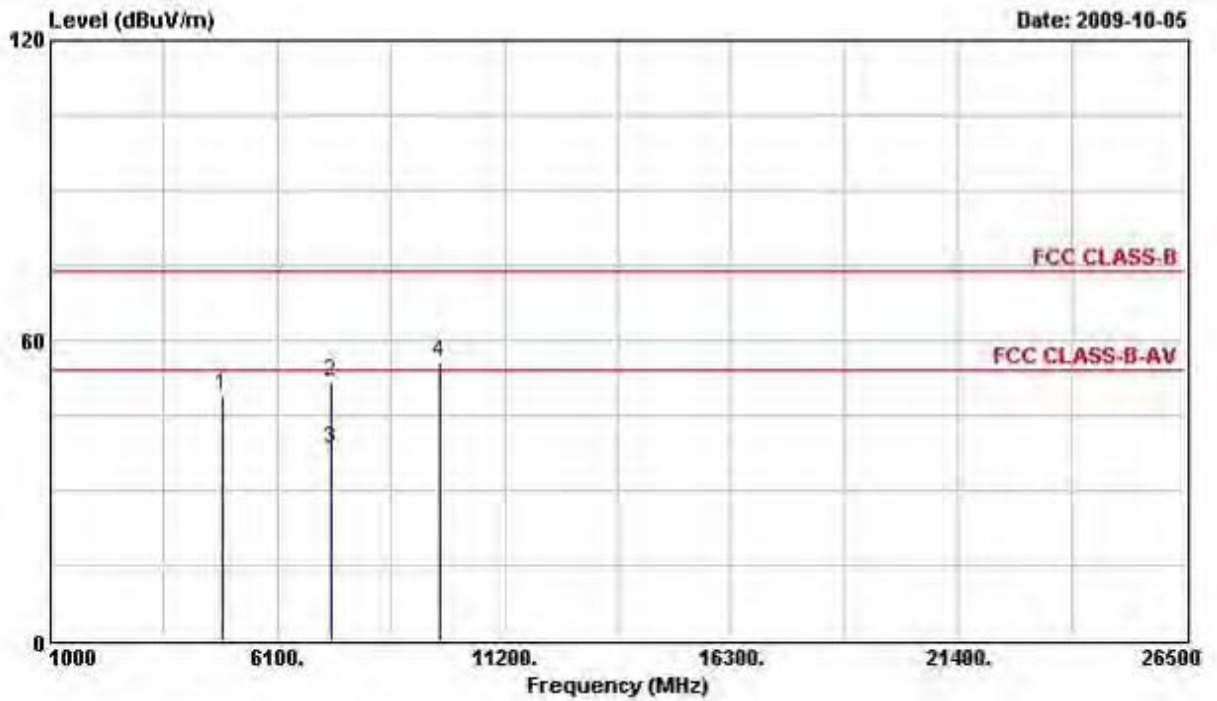
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4874.000	37.11	-16.89	54.00	31.12	35.83	4.61	34.45	---	---	Average
2	4874.000	51.05	-22.95	74.00	45.06	35.83	4.61	34.45	---	---	Peak
3	7311.000	40.33	-13.67	54.00	31.12	37.86	5.64	34.29	---	---	Average
4	7311.000	56.92	-17.08	74.00	47.71	37.86	5.64	34.29	---	---	Peak
5	9748.000	56.54			45.26	39.51	6.36	34.58	---	---	Peak

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

Vertical

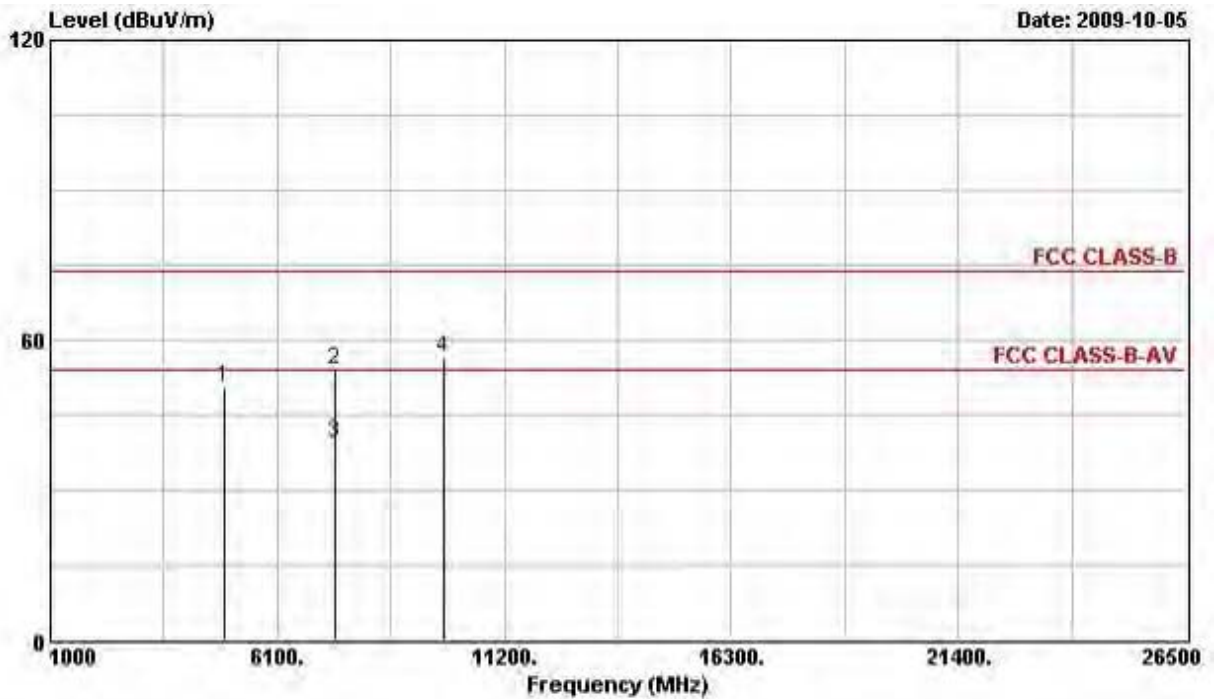


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	4874.000	49.07	-4.93	54.00	43.73	35.18	4.61	34.45	---	---	PK
2	7311.000	51.74	-22.26	74.00	43.47	36.92	5.64	34.29	---	---	Peak
3	7311.000	38.48	-15.52	54.00	30.21	36.92	5.64	34.29	---	---	Average
4	9748.000	55.58			45.10	38.71	6.36	34.58	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	MCS0 20MHz Ch 11 (Ant. 1)

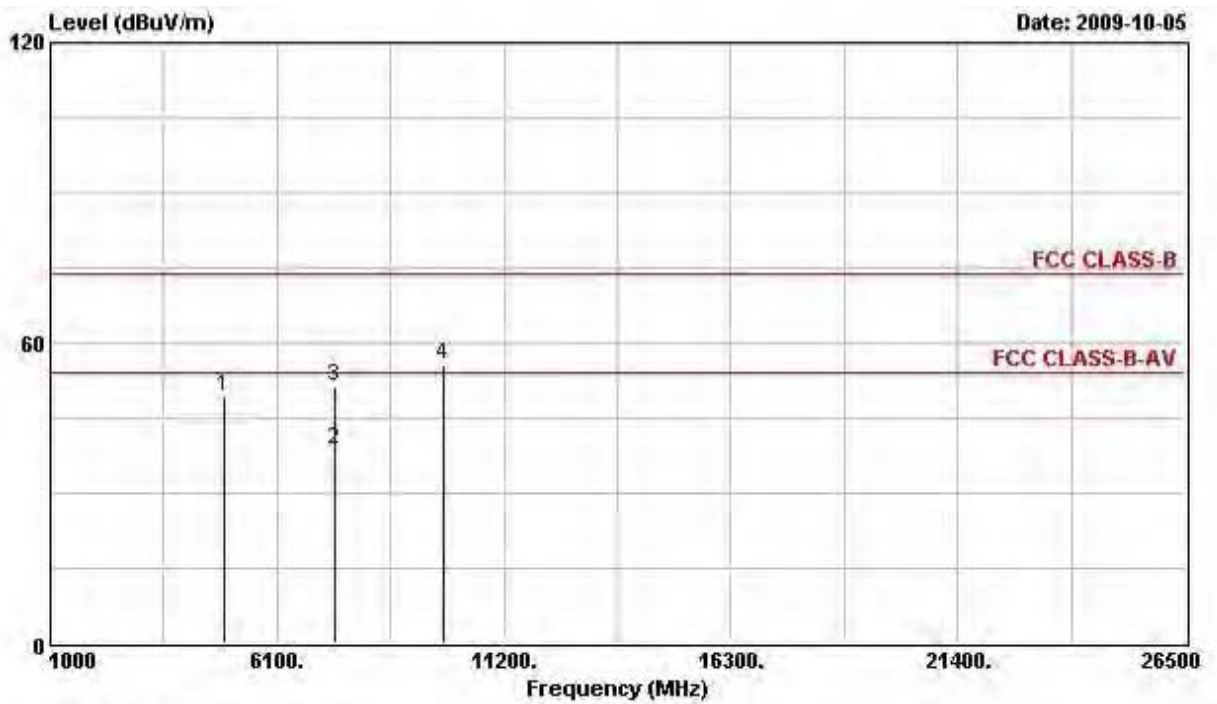
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4924.000	50.36	-3.64	54.00	44.16	35.90	4.68	34.38	---	---	PK
2	7386.000	54.12	-19.88	74.00	44.89	37.88	5.65	34.29	---	---	Peak
3	7386.000	39.49	-14.51	54.00	30.26	37.88	5.65	34.29	---	---	Averag
4	9848.000	56.38			44.93	39.61	6.38	34.54	---	---	Peak

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

Vertical

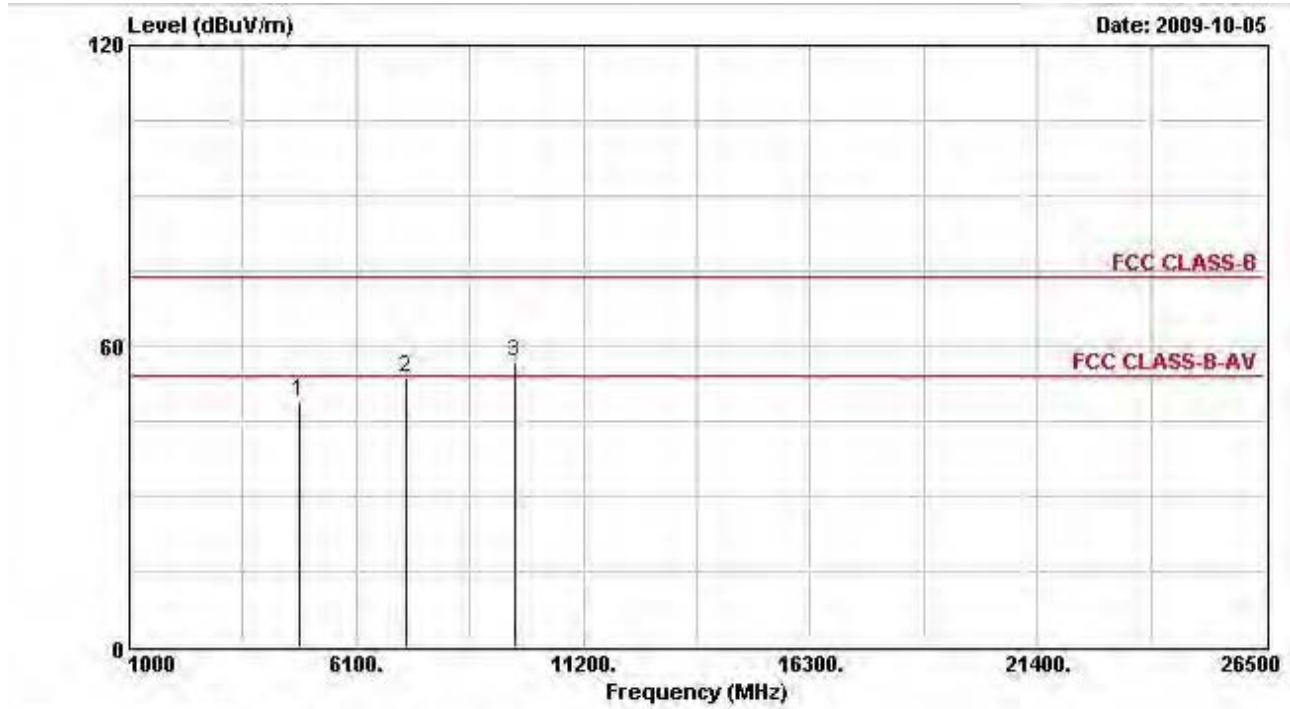


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4924.000	49.41	-4.59	54.00	43.89	35.23	4.68	34.38	---	---	PK
2	7386.000	38.54	-15.46	54.00	30.23	36.96	5.65	34.29	---	---	Average
3	7386.000	51.12	-22.88	74.00	42.81	36.96	5.65	34.29	---	---	Peak
4	9848.000	55.59			44.94	38.81	6.38	34.54	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	MCS8 20MHz Ch 1 (Ant. 1 + Ant. 2)

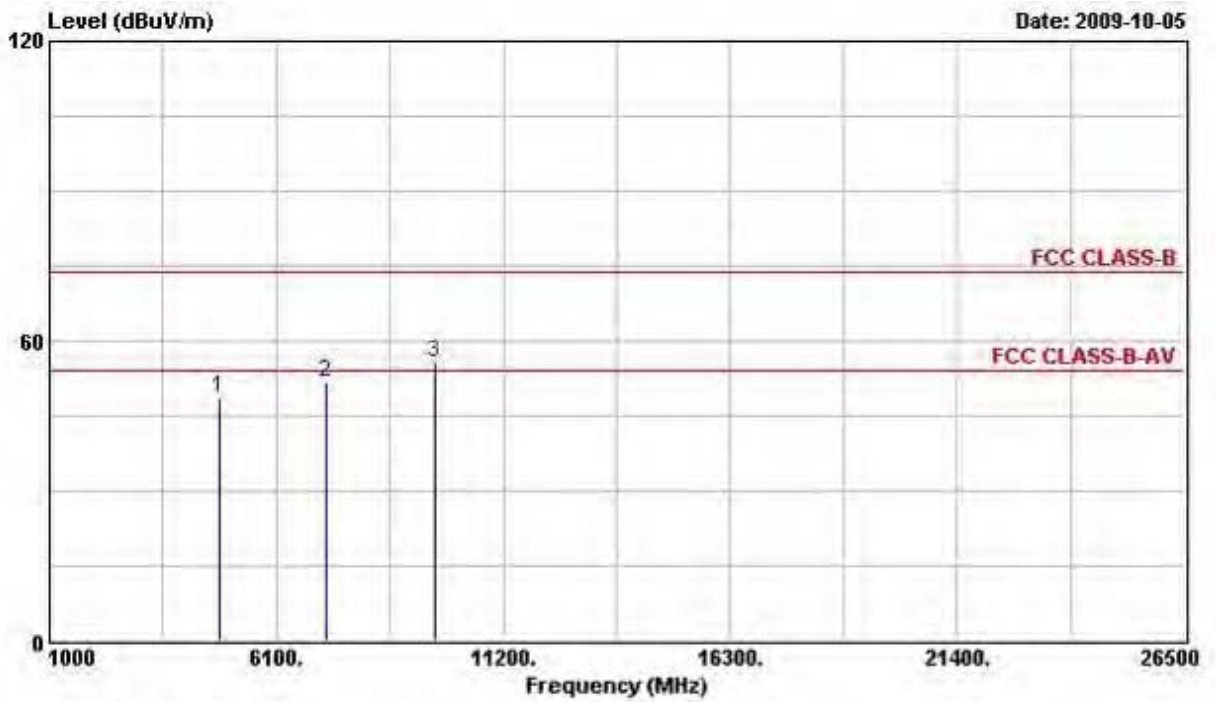
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	49.04	-4.96	54.00	43.22	35.76	4.58	34.51	---	---	PK
2	7236.000	53.83	-20.17	74.00	44.64	37.85	5.63	34.29	---	---	Peak
3	9648.000	56.68			45.58	39.39	6.34	34.63	---	---	Peak

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

Vertical

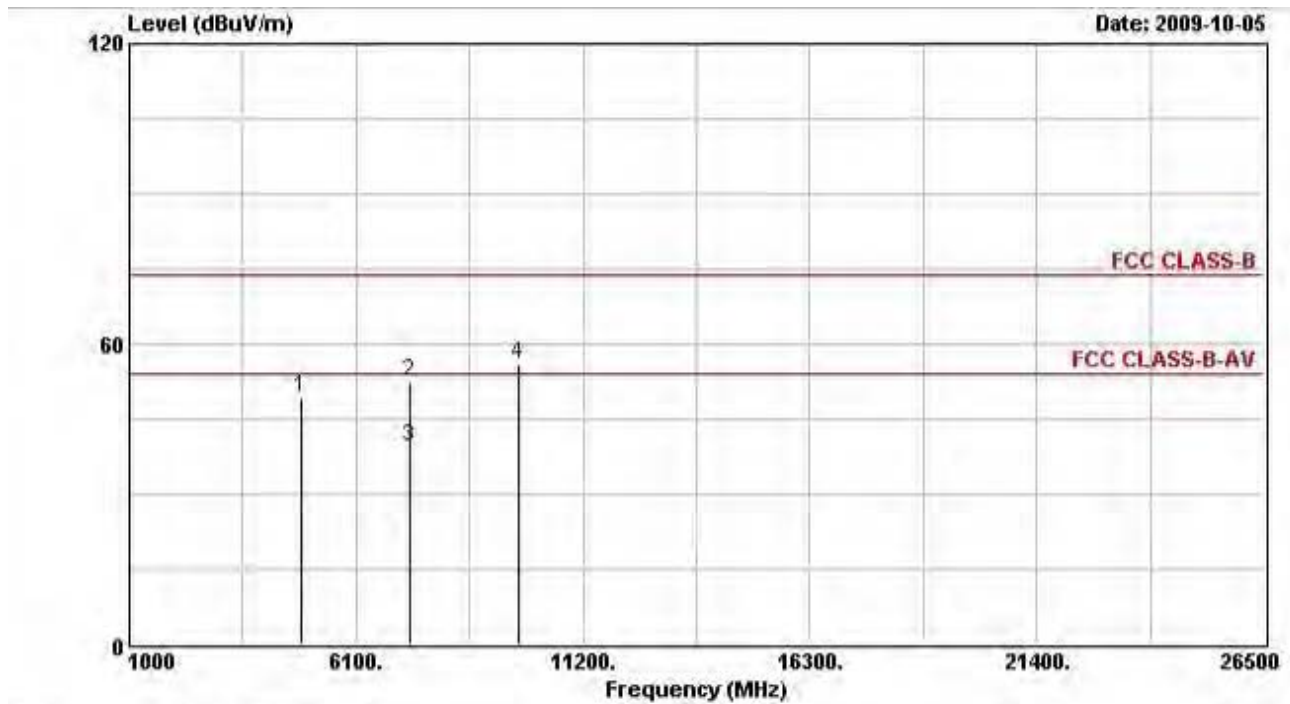


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4824.000	48.59	-5.41	54.00	43.40	35.13	4.58	34.51	---	---	PK
2	7236.000	51.77	-22.23	74.00	43.53	36.90	5.63	34.29	---	---	Peak
3	9648.000	55.64			45.34	38.59	6.34	34.63	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	MCS8 20MHz Ch 6 (Ant. 1 + Ant. 2)

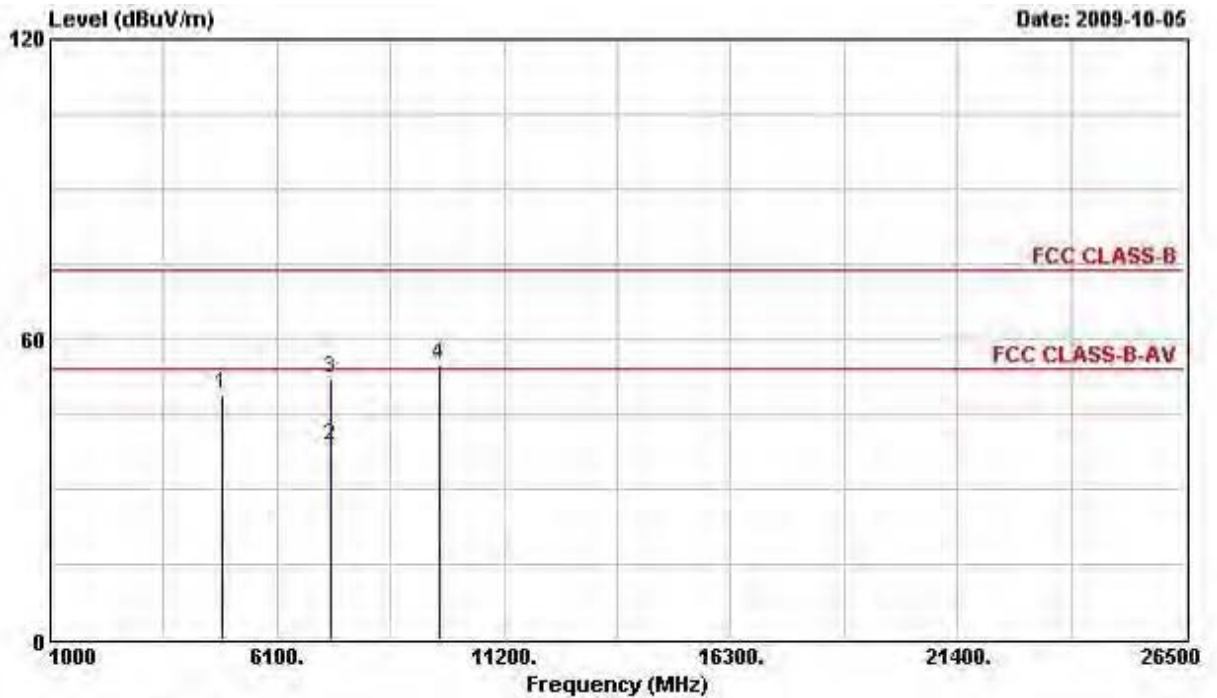
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4874.000	49.44	-4.56	54.00	43.45	35.83	4.61	34.45	---	---	PK
2	7311.000	52.47	-21.53	74.00	43.26	37.86	5.64	34.29	---	---	Peak
3	7311.000	39.37	-14.63	54.00	30.16	37.86	5.64	34.29	---	---	Average
4	9748.000	56.00			44.72	39.51	6.36	34.58	---	---	Peak

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

Vertical

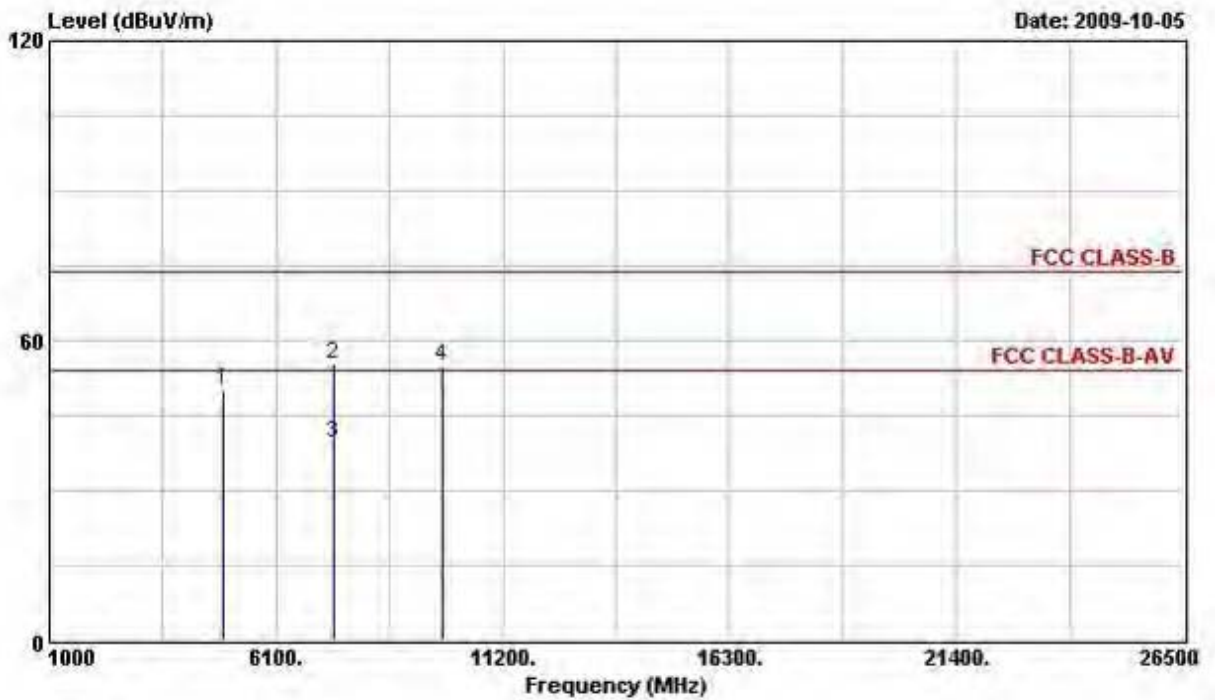


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4874.000	49.06	-4.94	54.00	43.72	35.18	4.61	34.45	---	---	PK
2	7311.000	38.49	-15.51	54.00	30.22	36.92	5.64	34.29	---	---	Average
3	7311.000	52.23	-21.77	74.00	43.96	36.92	5.64	34.29	---	---	Peak
4	9748.000	54.78			44.30	38.71	6.36	34.58	---	---	Peak

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

Test Date	Oct. 05,2009	Test Site No.	03CH02-HY
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	MCS8 20MHz Ch 11 (Ant. 1 + Ant. 2)

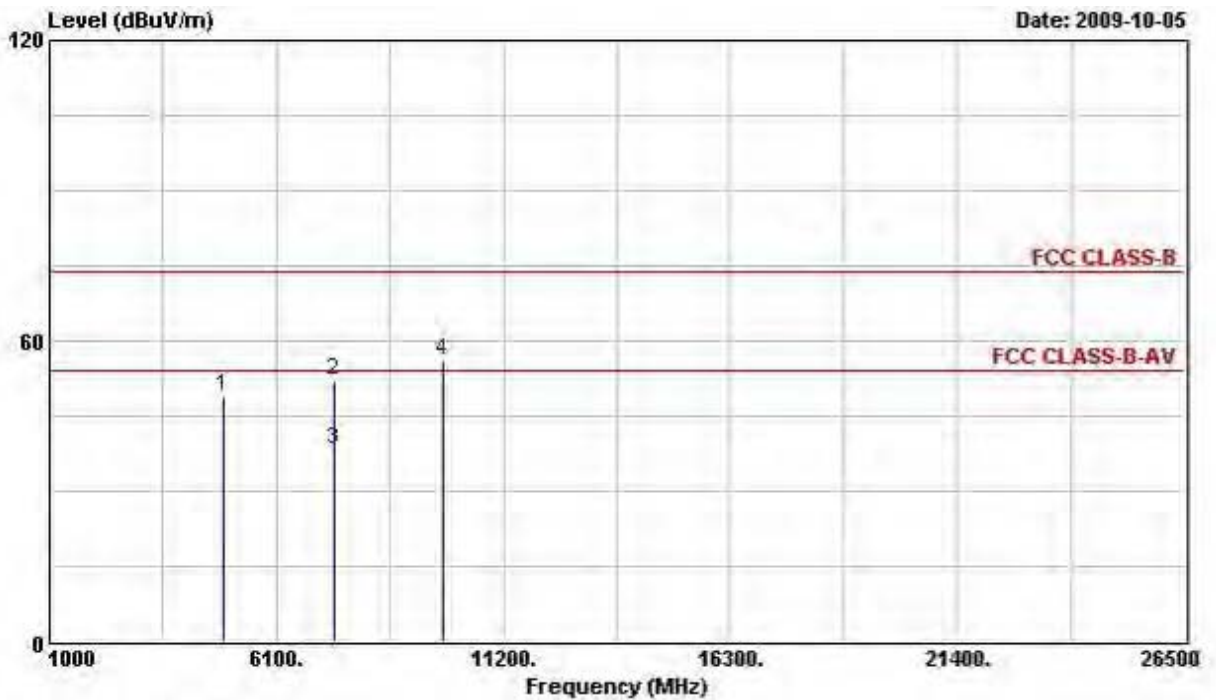
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	4924.000	50.05	-3.95	54.00	43.85	35.90	4.68	34.38	---	PK
2	7386.000	55.28	-18.72	74.00	46.05	37.88	5.65	34.29	---	Peak
3	7386.000	39.48	-14.52	54.00	30.25	37.88	5.65	34.29	---	Average
4	9848.000	55.06			43.61	39.61	6.38	34.54	---	Peak

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

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	4924.000	49.04	-4.96	54.00	43.52	35.23	4.68	34.38	---	---	PK
2	7386.000	52.26	-21.74	74.00	43.95	36.96	5.65	34.29	---	---	Peak
3	7386.000	38.46	-15.54	54.00	30.15	36.96	5.65	34.29	---	---	Average
4	9848.000	55.99			45.34	38.81	6.38	34.54	---	---	Peak

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

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

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

3.6. Band Edge Emissions Measurement

3.6.1. Limit

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

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

3.6.2. Measuring Instruments and Setting

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

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

3.6.3. Test Procedures

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

3.6.4. Test Setup Layout

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

3.6.5. Test Deviation

There is no deviation with the original standard.

3.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.6.7. Test Result of Band Edge Emissions

Test Date	Oct. 05,2009	Test Site No.	10CH02-HY for Channel 1 and 11 03CH02-HY for Channel 6
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11b CH 1, 6, 11 (Ant. 1)

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2387.140	59.42	-14.58	74.00	24.75	27.97	6.70	0.00	Peak
2	2387.140	45.42	-8.58	54.00	10.75	27.97	6.70	0.00	Average
3	X 2415.450	105.05			70.31	28.01	6.73	0.00	Peak
4	Q 2415.450	93.89			59.15	28.01	6.73	0.00	Average

Item 3 and 4 are Fundamental Emissions.

Channel 6

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	Q 2434.260	108.88			77.55	28.31	3.02	0.00	Peak
1	Q 2434.260	102.22			70.89	28.31	3.02	0.00	Average

An item 1 is Fundamental Emissions.

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	X 2464.090	92.92			57.98	28.12	6.82	0.00	Average
2	X 2464.090	103.37			68.43	28.12	6.82	0.00	Peak
3	2483.090	59.16	-14.84	74.00	24.15	28.16	6.85	0.00	Peak
4	2483.090	46.16	-7.84	54.00	11.15	28.16	6.85	0.00	Average

Item 1 and 2 are Fundamental Emissions.

Note:

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

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

Test Date	Oct. 05,2009	Test Site No.	10CH02-HY for Channel 1 and 11 03CH02-HY for Channel 6
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	802.11g CH 1, 6, 11 (Ant. 1)

Channel 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2388.850	46.42	-7.58	54.00	11.75	27.97	6.70	0.00	Average
2	2388.850	69.27	-4.73	74.00	34.60	27.97	6.70	0.00	Peak
3	X 2408.420	106.91			72.17	28.01	6.73	0.00	Peak
4	X 2408.420	92.24			57.50	28.01	6.73	0.00	Average

Item 3 and 4 are Fundamental Emissions.

Channel 6

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	Ⓢ 2432.740	107.48			76.15	28.31	3.02	0.00	
1	Ⓢ 2440.340	100.62			69.22	28.36	3.04	0.00	

An item 1 is Fundamental Emissions.

Channel 11

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	X 2457.820	106.96			72.02	28.12	6.82	0.00	Peak
2	X 2457.820	92.13			57.19	28.12	6.82	0.00	Average
3	2483.660	49.13	-4.87	54.00	14.12	28.16	6.85	0.00	Average
4	2483.660	66.50	-7.50	74.00	31.49	28.16	6.85	0.00	Peak

Item 1 and 2 are Fundamental Emissions.

Note:

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

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

Test Date	Oct. 05,2009	Test Site No.	10CH02-HY for Channel 1 and 11 03CH02-HY for Channel 6
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	MCS0 20MHz Ch1, 6, 11 (Ant. 1)

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2389.990	49.95	-4.05	54.00	15.28	27.97	6.70	0.00	Average
2	2389.990	69.98	-4.02	74.00	35.31	27.97	6.70	0.00	Peak
3	X 2406.140	106.76			72.02	28.01	6.73	0.00	Peak
4	X 2406.140	92.92			58.18	28.01	6.73	0.00	Average

Item 3 and 4 are Fundamental Emissions.

Channel 6

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	⊖ 2440.530	106.42			75.02	28.36	3.04	0.00	
1	⊖ 2438.060	100.24			68.84	28.36	3.04	0.00	

An item 1 is Fundamental Emissions.

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	X 2457.820	92.83			57.89	28.12	6.82	0.00	Average
2	X 2457.820	107.31			72.37	28.12	6.82	0.00	Peak
3	2483.660	67.63	-6.37	74.00	32.62	28.16	6.85	0.00	Peak
4	2483.660	50.22	-3.78	54.00	15.21	28.16	6.85	0.00	Average

Item 1 and 2 are Fundamental Emissions.

Note:

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

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

Test Date	Oct. 05,2009	Test Site No.	10CH02-HY for Channel 1 and 11 03CH02-HY for Channel 6
Temperature	25.5°C	Humidity	52%
Test Engineer	Kobe	Configurations	MCS8 20MHz Ch 1, 6 , 11 (Ant. 1 + Ant. 2)

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2389.990	44.54	-9.46	54.00	9.87	27.97	6.70	0.00	Average
2	2389.990	61.61	-12.39	74.00	26.94	27.97	6.70	0.00	Peak
3	X 2407.660	102.91			68.17	28.01	6.73	0.00	Peak
4	X 2407.660	88.57			53.83	28.01	6.73	0.00	Average

Item 3 and 4 are Fundamental Emissions.

Channel 6

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2432.170	107.78			76.45	28.31	3.02	0.00	
1	2434.070	99.09			67.76	28.31	3.02	0.00	

An item 1 is Fundamental Emissions.

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	X 2464.850	103.51			68.57	28.12	6.82	0.00	Peak
2	X 2464.850	87.43			52.49	28.12	6.82	0.00	Average
3	2485.180	46.00	-8.00	54.00	10.99	28.16	6.85	0.00	Average
4	2485.180	62.97	-11.03	74.00	27.96	28.16	6.85	0.00	Peak

Item 1 and 2 are Fundamental Emissions.

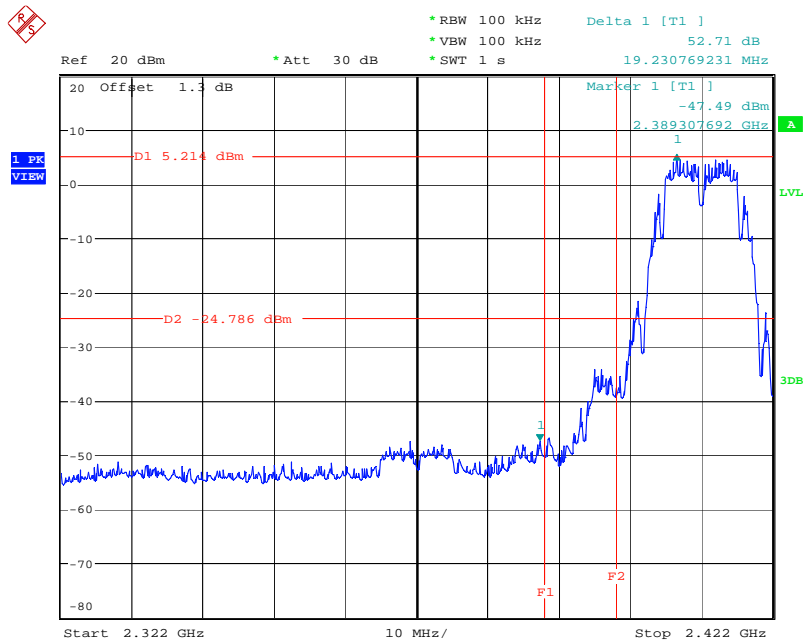
Note:

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

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

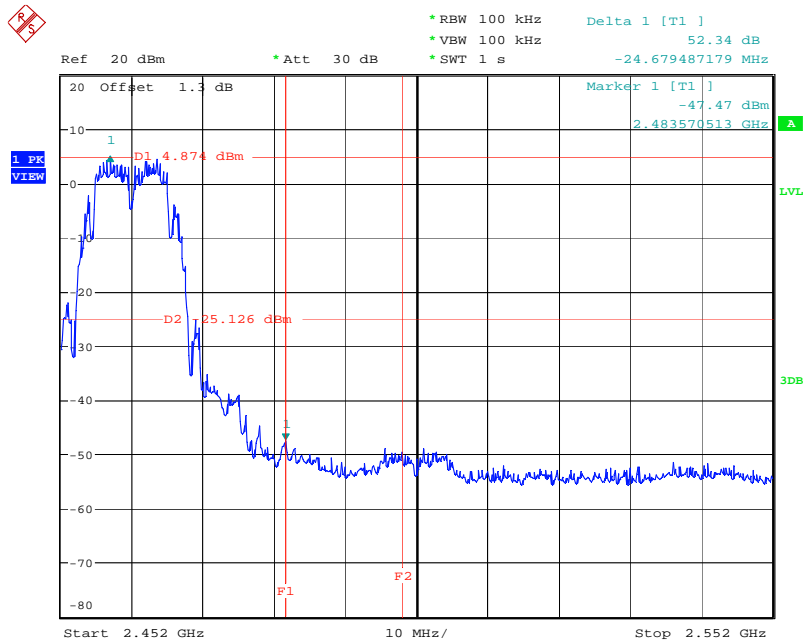
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11b / 2412 MHz



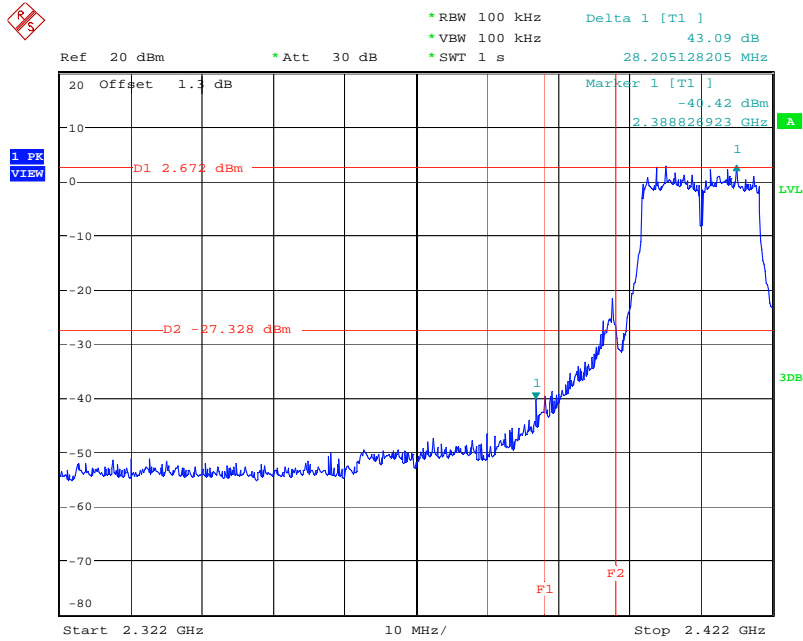
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High Band Edge Plot on Configuration IEEE 802.11b / 2462 MHz



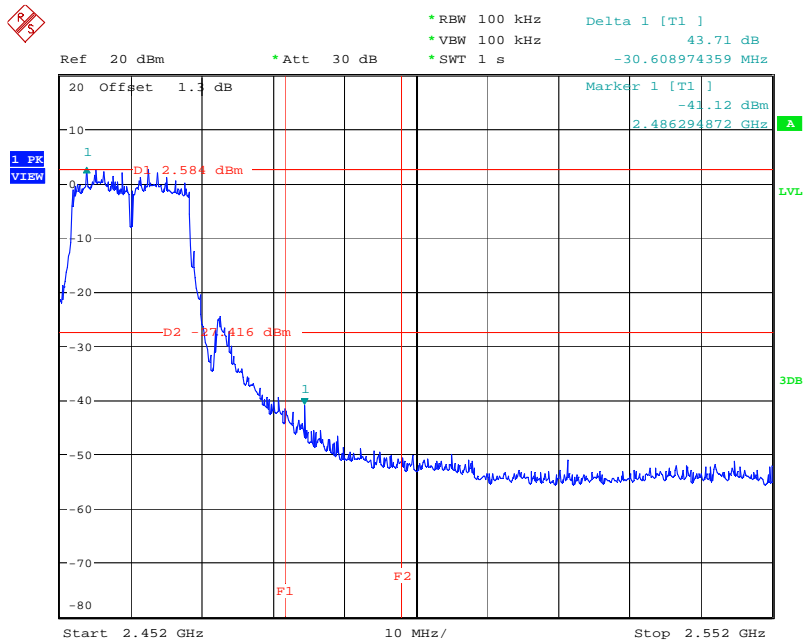
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Low Band Edge Plot on Configuration IEEE 802.11g / 2412 MHz



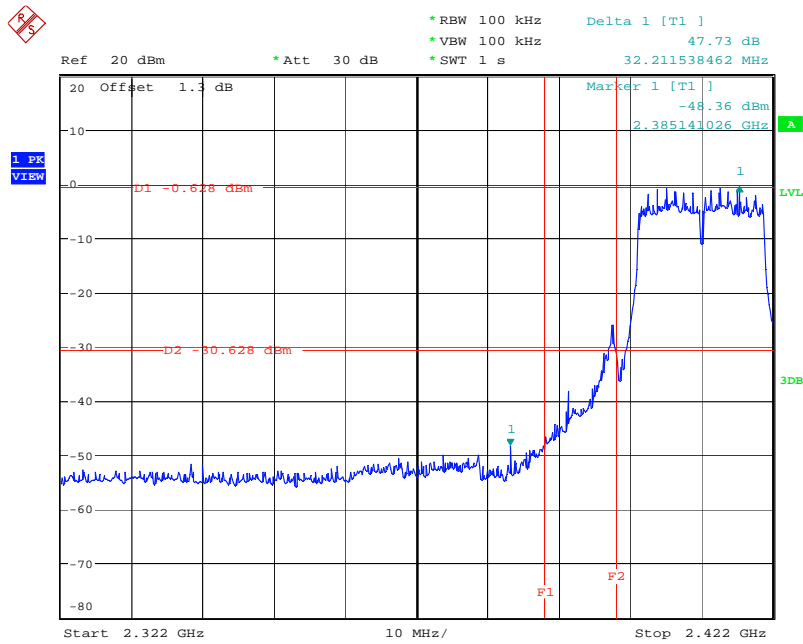
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High Band Edge Plot on Configuration IEEE 802.11g / 2462 MHz



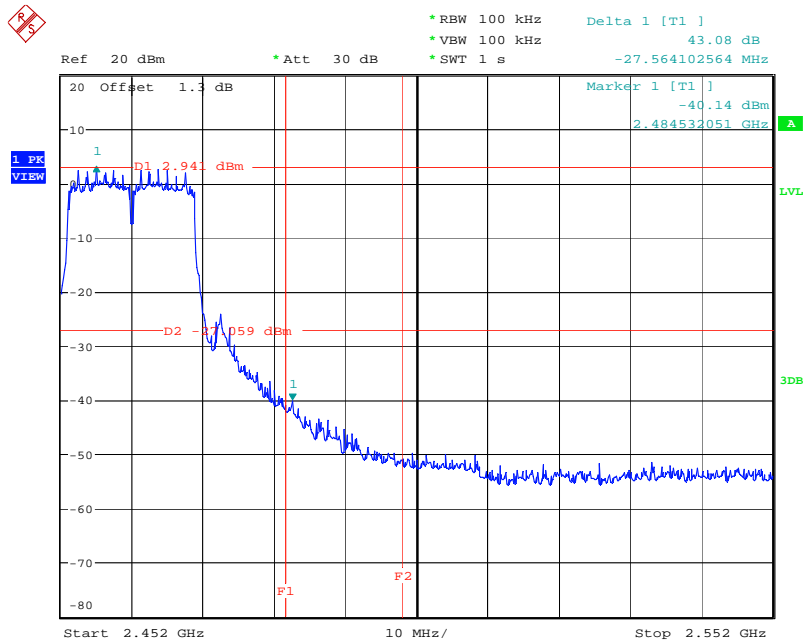
Date: 15.SEP.2009 11:44:50

Low Band Edge Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2412 MHz



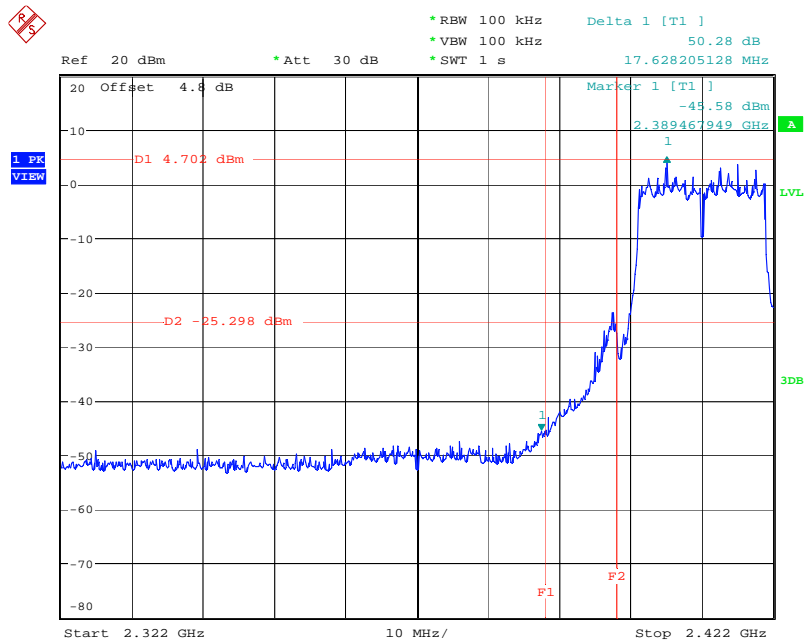
Date: 15.SEP.2009 11:50:24

High Band Edge Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2462 MHz



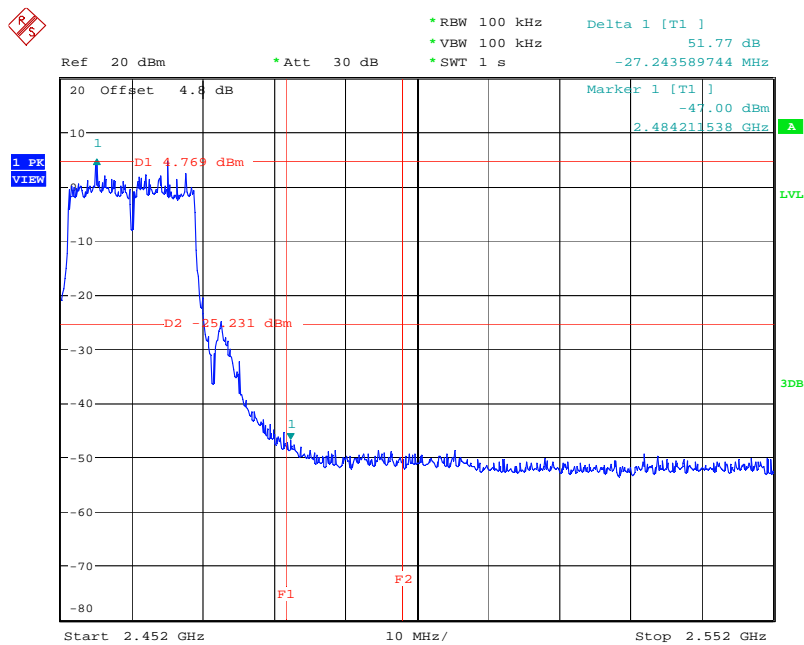
Date: 15.SEP.2009 12:00:38

Low Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz 2412 MHz



Date: 15.SEP.2009 13:44:46

High Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz 2462 MHz



Date: 15.SEP.2009 13:55:16

3.7. Antenna Requirements**3.7.1. Limit**

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

3.7.2. Antenna Connector Construction

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

4. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
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)
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Apr. 15, 2009	Conduction (CO04-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSU26.5	100015	20Hz ~ 26.5GHz	Oct. 28, 2008	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 31, 2009	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100666	DC ~ 30GHz	Aug. 05, 2009	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jul. 31, 2009	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2009	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Aug. 06, 2009	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	Feb. 13, 2009	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.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 11, 2009	Radiation (03CH02-HY)
Horn Antenna	ETS-LINDGREN	3117	00091920	1GHz~18GHz	Oct. 22, 2008	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Nov. 30, 2008	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB020	30 MHz - 1 GHz	Dec. 17, 2008	Radiation (03CH02-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX106	03CH02-HY	1GHz~40GHz	Dec. 17, 2008	Radiation (03CH02-HY)
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Feb. 04, 2009	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 11, 2009	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz – 1.3 GHz	Jul. 07, 2009	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A02373	1GHz – 26.5 GHz	Jul. 16, 2009	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0 - 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)
10m Semi Anechoic Chamber	TDK	SAC-10M	10CH02-HY	30MHz~1GHz 10m,3m	Mar. 04, 2009	Radiation (10CH02-HY)
Amplifier	AGILENT	8447D	2944A10827	100KHz – 1.3GHz	Jun. 04, 2009	Radiation (10CH02-HY)
Amplifier	AGILENT	8447D	2944A10828	100KHz – 1.3GHz	Jun. 10, 2009	Radiation (10CH02-HY)
Receiver	R&S	ESI	838496/008	20Hz - 7GHz	Apr. 27, 2009	Radiation (10CH02-HY)
Spectrum Analyzer	R&S	FSP7	100645	9KHz – 7GHz	Aug. 26, 2009	Radiation (10CH02-HY)
Biconical Antenna	Schwarzbeck	VHBB 9124	287	30MHz – 200MHz	Dec. 22, 2008	Radiation (10CH02-HY)
Log Antenna	Schwarzbeck	VUSLP 9111	207	200MHz -1GHz	Dec. 22, 2008	Radiation (10CH02-HY)
Turn Table	HD	DS 430	430/360	0 ~ 360 degree	N/A	Radiation (10CH02-HY)
Antenna Mast	HD	MA240	240/664	1 m - 4 m	N/A	Radiation (10CH02-HY)
Antenna Mast	HD	MA240	240/667	1 m - 4 m	N/A	Radiation (10CH02-HY)
RF Cable-R10m	Jye Bao	RG142	CB027-INSIDE	30MHz~1GHz	Feb. 13, 2009	Radiation (10CH02-HY)
RF Cable-R10m	Suhner Switzerland + BELDEN	RG223/U + RG8/U	CB026-DOOR	30MHz~1GHz	Feb. 13, 2009	Radiation (10CH02-HY)
Amplifier	Agilent	8449B	3008A02364	1 - 26.5GHz	Apr. 21, 2009	Radiation (10CH02-HY)
Horn antenna	ETS	3115	6903	1~18G	Apr. 22, 2009	Radiation (10CH02-HY)
Spectrum Analyzer	R&S	FSP7	100645	9KHz – 7GHz	Aug. 26, 2009	Radiation (10CH02-HY)
RF Cable 5M	SUHNER	SUCOFLEX 104	SN : 304379/4	1GHz~18GHz	Mar. 11, 2009	Radiation (10CH02-HY)
RF Cable 13M	SUHNER	SUCOFLEX 104	SN : 16647/4	1GHz~18GHz	Mar. 11, 2009	Radiation (10CH02-HY)
10m Semi Anechoic Chamber	TDK	SAC-10M	10CH02-HY	1G~6G 3m	Jan. 15, 2009	Radiation (10CH02-HY)

Note: Calibration Interval of instruments listed above is one year. NCR: Non-Calibration required.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	MITEQ	AMF-6F-260400	923364	26.5 GHz - 40 GHz	Jan. 22, 2009*	Radiation (03CH02-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2009*	Radiation (03CH02-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Jul. 12, 2009*	Conducted (TH01-HY)

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

5. TEST LOCATIONS

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

6. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : I.1190-081212

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
Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : December 12, 2008

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