

RADIO TEST REPORT

According to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment : **Wireless Residential ADSL Gateway**
Model No. : **TG585n DSLWBB883 BB**
 : **TG587n DSLWBB883 AN**
Brand Name : **THOMSON**
Filing Type : **New Application**
Applicant : **Thomson Telecom Belgium**
 : Prins Boudewijnlaan 47 B-2650 Edegem Belgium
FCC ID : **RSE-TG587N**
Manufacturer : **Thomson Telecom Belgium**
 : Prins Boudewijnlaan 47 B-2650 Edegem Belgium
Received Date : Oct. 18, 2007
Final Test Date : Nov. 09, 2007

Statement

This report is only covering the 802.11n 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.



SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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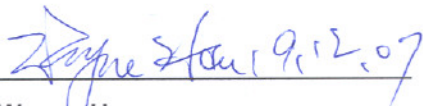
CERTIFICATE OF COMPLIANCE

According to

47 CFR FCC Part 15 Subpart C § 15.247

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Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Oct. 18, 2007 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.


Wayne Hsu

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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	8.74 dB
3.2	15.247(b)(3)	Maximum Peak Conducted Output Power	Complies	5.45 dB
3.3	15.247(e)	Power Spectral Density	Complies	17.81 dB
3.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
3.5	15.247(d)	Radiated Emissions	Complies	1.41 dB
3.6	15.247(d)	Band Edge Emissions	Complies	3.54 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	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2. GENERAL INFORMATION

2.1. Product Details

The EUT is a Wireless Residential ADSL Gateway with IEEE 802.11b/g/n radio functions. Only the radio details of IEEE 802.11n is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Power Type	22VDC from adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g Please refer to section 2.2 for IEEE 802.11n
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	Please refer to section 2.3 for IEEE 802.11n
Frequency Range	2400 ~ 2483.5MHz
Number of Channel	11 for 20MHz bandwidth
Channel Band Width (99%)	Single(Tx) : 17.48 MHz ; Two(Tx) : 17.56 MHz (according from section 3.4.7)
Conducted Output Power	Single(Tx) : 24.55 dBm ; Two(Tx) : 23.76 dBm (according from section 3.2.7)

2.2. Information of the Antenna

Antenna & Band width

Antenna	Single(Tx)		Two(Tx)	
	20 MHz	40 MHz	20 MHz	40 MHz
802.11b	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
802.11g	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
802.11n	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

: Operation Tx

: Not operation Tx

Ant. No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ETON	ET866	Dipole Antenna	N/A	2.50
2	ETON	ET866	Dipole Antenna	N/A	2.50

2.3. IEEE 802.11n spec of Data Rate

The table is the general spec of IEEE 802.11n. However, the EUT is operated in 800nsGI only.

IEEE 802.11n spec

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

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

2.4. Information of the power supply units

TG587n :

Trade Name	Product Name	Input Rating	Output Rating	Type	Company Info
OEM	ADS0271-W 220123	100 Vac ~ 240 Vac	22 Vdc / 1.23 A	Switched / Wall mount	Outstanding Electronic Manufacturer Co., Ltd. 3F, No.541 Chung-Cheng Road, Hsin-Tien, Taipei Taiwan.

TG585n:

Trade Name	Product Name	Input Rating	Output Rating	Type	Company Info
OEM	ADS18B-W 220082	100 Vac ~ 240 Vac	22 Vdc / 0.818 A	Switched / Wall mount	Outstanding Electronic Manufacturer Co., Ltd. 3F, No.541 Chung-Cheng Road, Hsin-Tien, Taipei Taiwan.

2.5. Test Scenarios

SCENARIOS	WL operation of the MODEM				
	MODEM	PSU	radio card	operation freq. band	11n mode OBW
A	TG585n	OEM 18W BLACK	BCM4321 + SKY65227	2.4GHz only	20MHz only
B	TG587n	OEM 27W WHITE	BCM4321 + SKY65227	2.4GHz only	20MHz only

2.6. Information Provided by the Manufacturer

The following product is similar to TG587n, model number DSLWBB863 AN, but with lesser functions and use different power supply. Since the radio part of the product variant is identical to the one of the original product, only the testing on the original unit (TG587n) is necessary.

Therefore, the following product that existed at the time of the qualification of the TG587n can also be covered by this test report:

TG585n DSLWBB883 BB

2.7. Carrier Frequencies

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

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

For draft 802.11n, the two TX Ant. 1 & Ant. 2 could transmit simultaneously or single antenna transmission.

2.8. Test Modes

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

Test Items	Mode	Channel	Antenna
AC Power Line Conducted Emissions	Scenario A, Scenario B	-	-
Maximum Peak Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth	MCS0, MCS8	1/6/11	1, 1+2
Radiated Emissions 9kHz~1GHz	MCS0	6	1+2
Radiated Emissions 1GHz~10 th Harmonic	MCS0, MCS8	1/6/11	1, 1+2
Band Edge Emissions	MCS0, MCS8	1/6/11	1, 1+2

2.9. Testing Locations

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

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

Please refer section 5 for Test Site Addresses.

2.10. Supporting Units

Support Unit	Brand	Model	FCC ID
iPodx2	Apple	nano	DoC
CO.	Provide by the manufacturer		
Notebook (Remote Workstation)	DELL	D400	DoC

2.11. Test Software

During testing, Channel & Power Controlling Software provided by the manufacturer 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 manufacturer and is going to be fixed on the firmware of the final end product.

Power Parameters of IEEE 802.11n MCS0 20MHz Ant. 1

Test Software Version	TTERMPRO		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n	DEFAULT	DEFAULT	DEFAULT

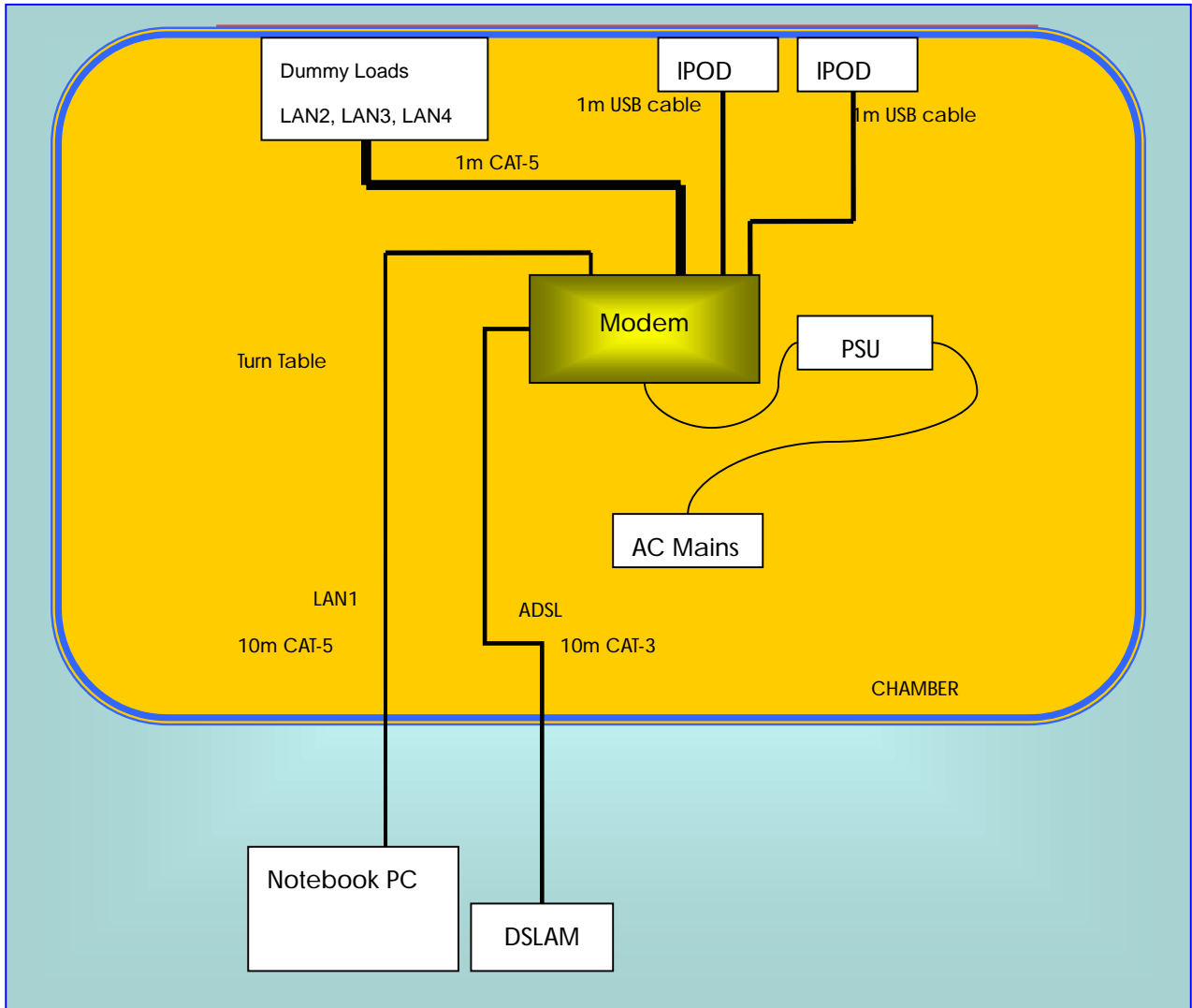
Power Parameters of IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2

Test Software Version	TTERMPRO		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n	DEFAULT	DEFAULT	DEFAULT

2.12. Test Configurations

2.12.1. Radiation Emissions Test Configuration

<For radiated emissions 9KHz~1GHz test>

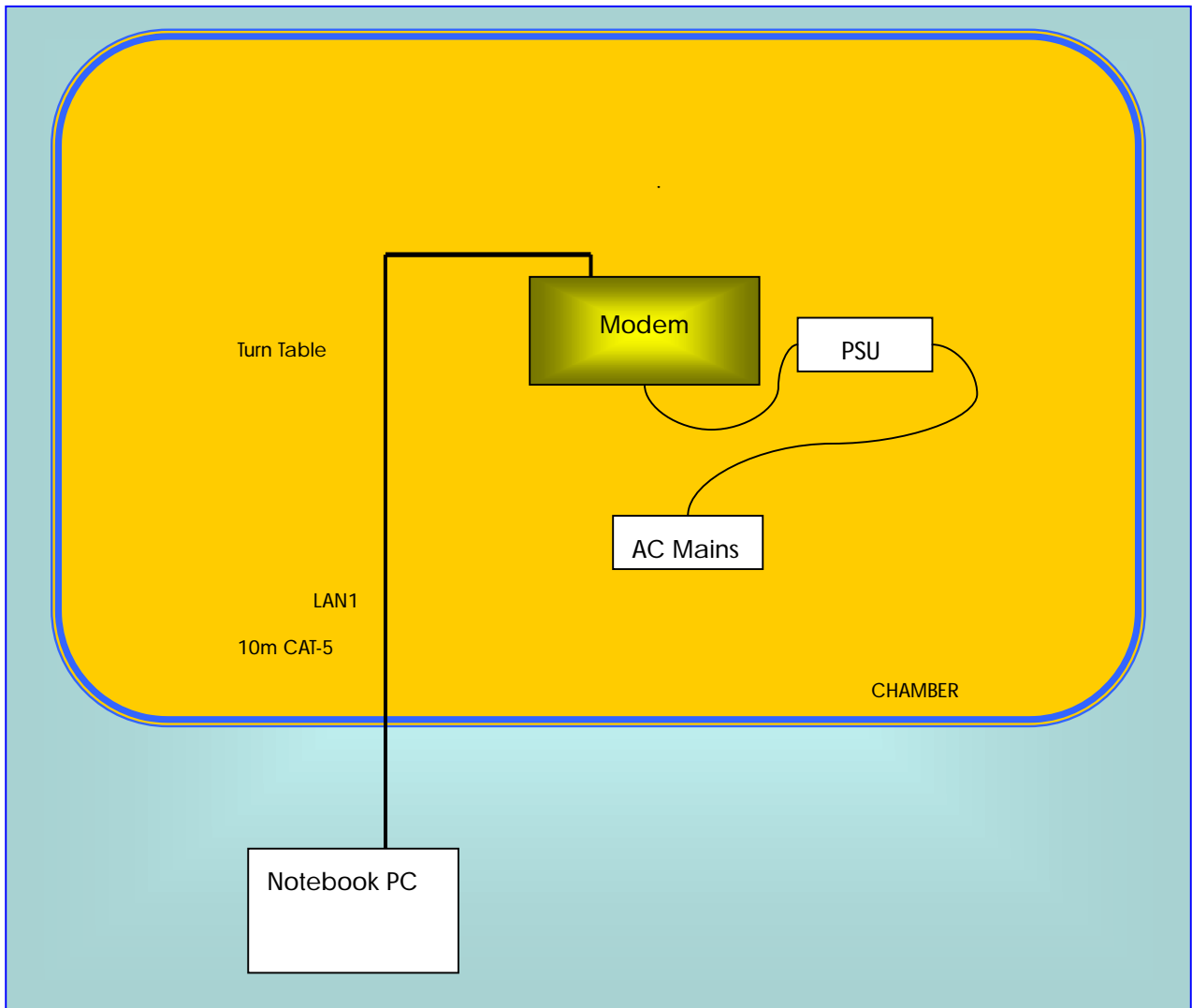


The following items were placed on the turn table:

1. TG587n modem,
2. PSU,
3. dummy loads of LAN2, LAN3 and LAN4 ports, and
4. two USB devices which were connected to the USB host ports with USB cables.

The Notebook PC and the DSLAM were placed outside the chamber.

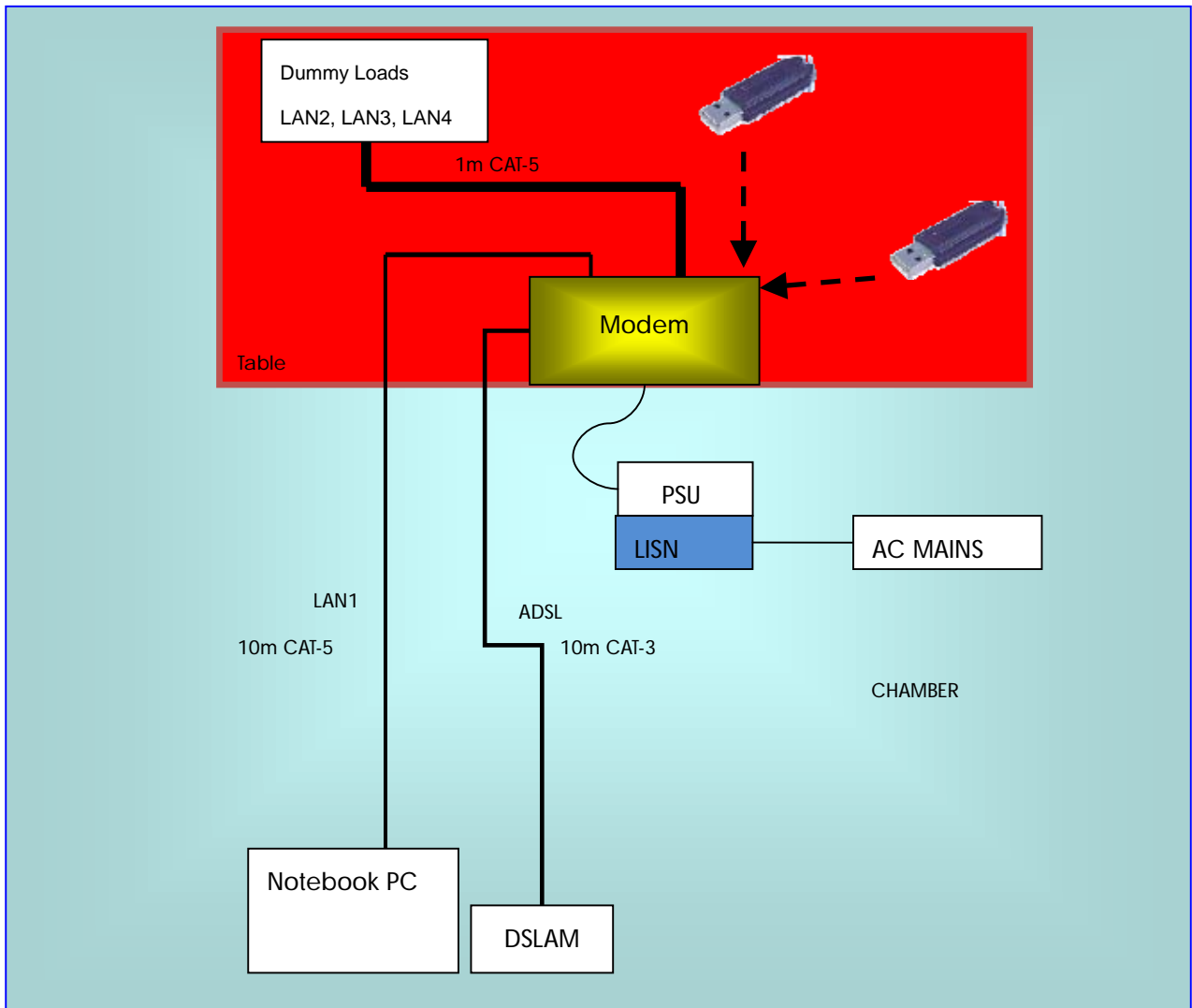
<For radiated emissions above 1GHz test>



Only the TG587n modem and the PSU were placed on the table. For the interface ports connection, only the exception was the LAN1 port was connected to a notebook PC outside the chamber, other ports were left floating.

The notebook PC was used to remote the radio part of the modem to stay in continuous transmitting mode with the particular datarate.

2.12.2. Conducted Emissions Test Configuration



The modem and the dummy loads were placed on the table.

The dummy loads of LAN2, LAN3 and LAN4 ports were connected to the modem with 1 meter CAT-5 cables. Two USB devices (USB flash disk) which were connected directly to the USB host ports without any USB cable.

The ADSL connection between the modem and the DSLAM was established.

The notebook PC was used to remote the radio interface of the modem to keep in a particular datarate and monitor the ADSL connection status.

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

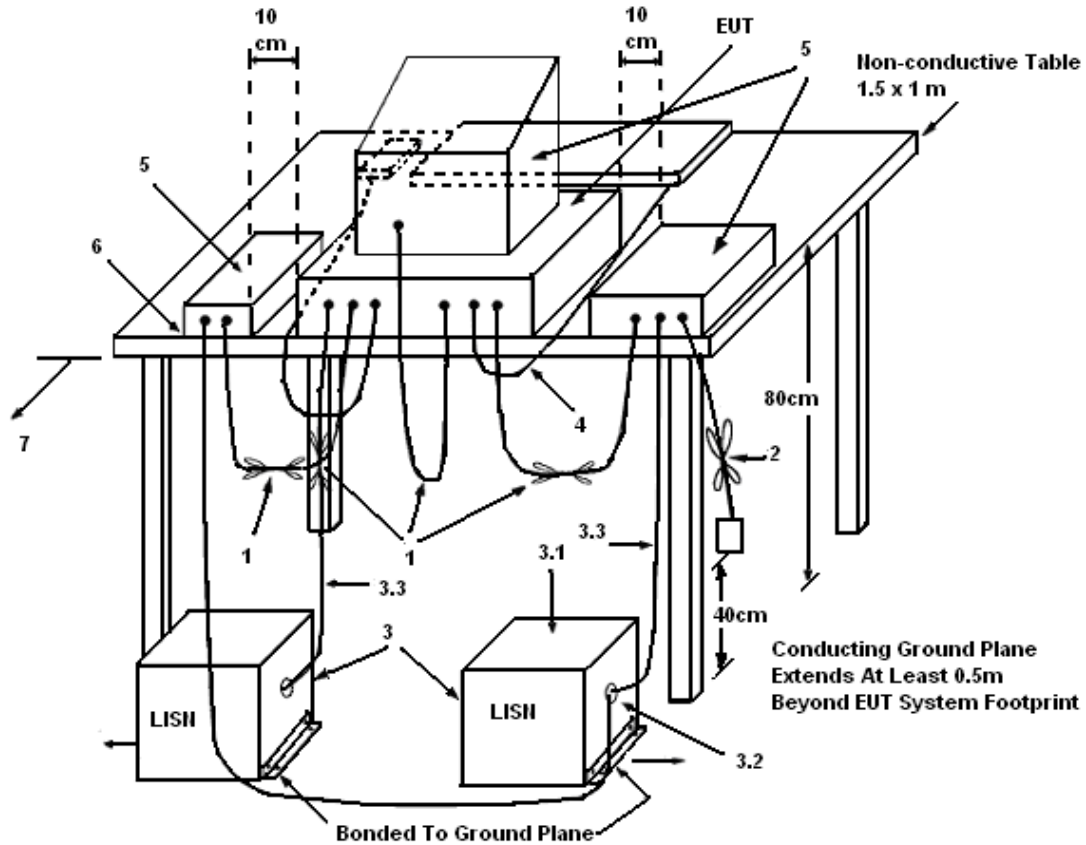
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

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

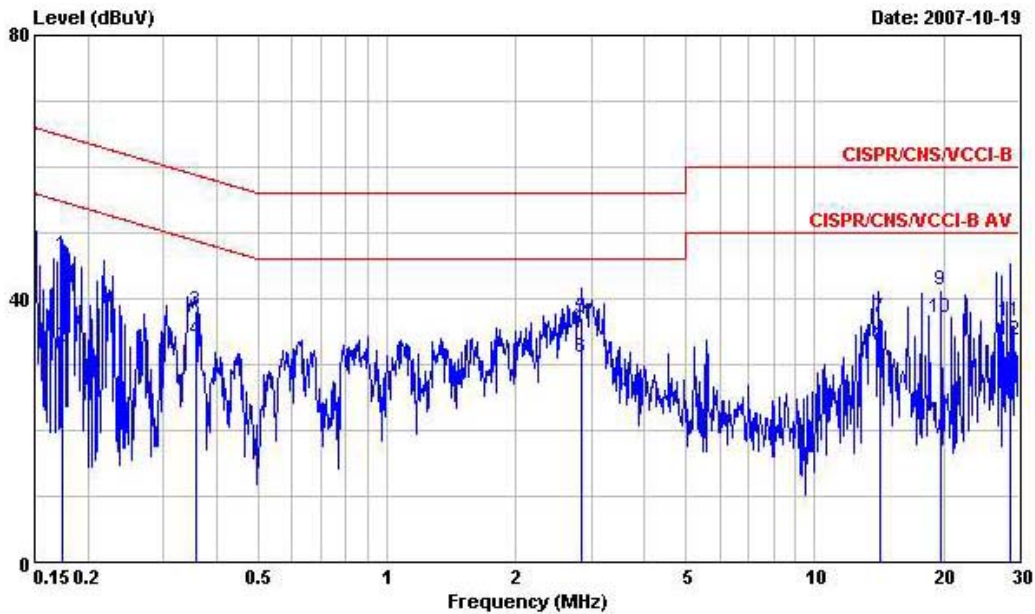
There is no deviation with the original standard.

3.1.6. EUT Operation during Test

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

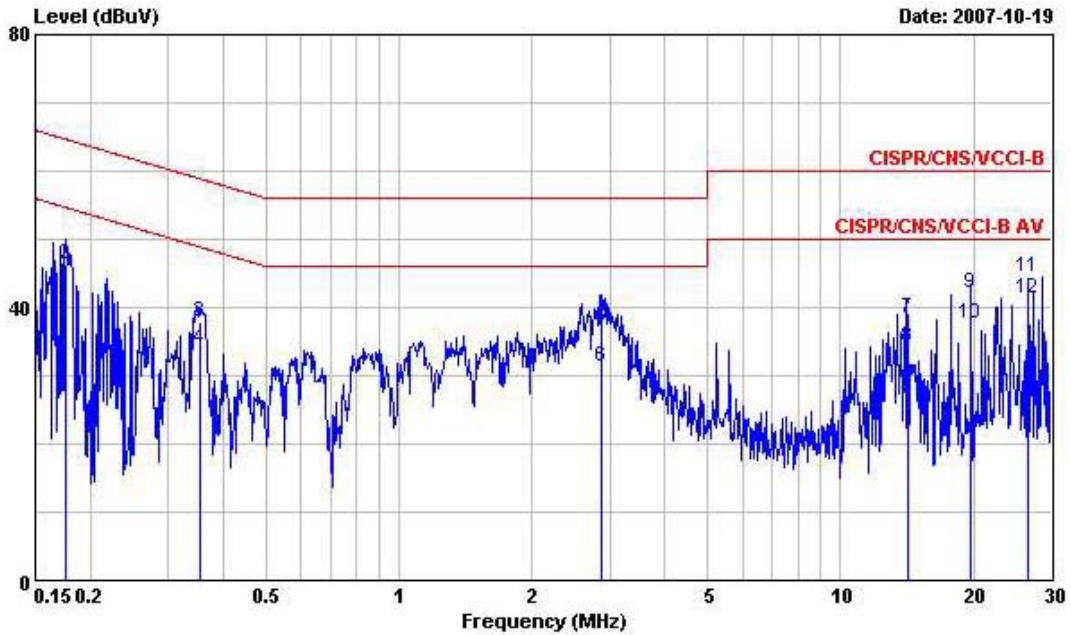
3.1.7. Results of AC Power Line Conducted Emissions Measurement

Test Date	Oct. 19, 2007	Test Site No.	CO04-HY
Temperature	29	Humidity	45%
Test Engineer	Chris Lin	Phase	Line
Configuration	Scenario A		



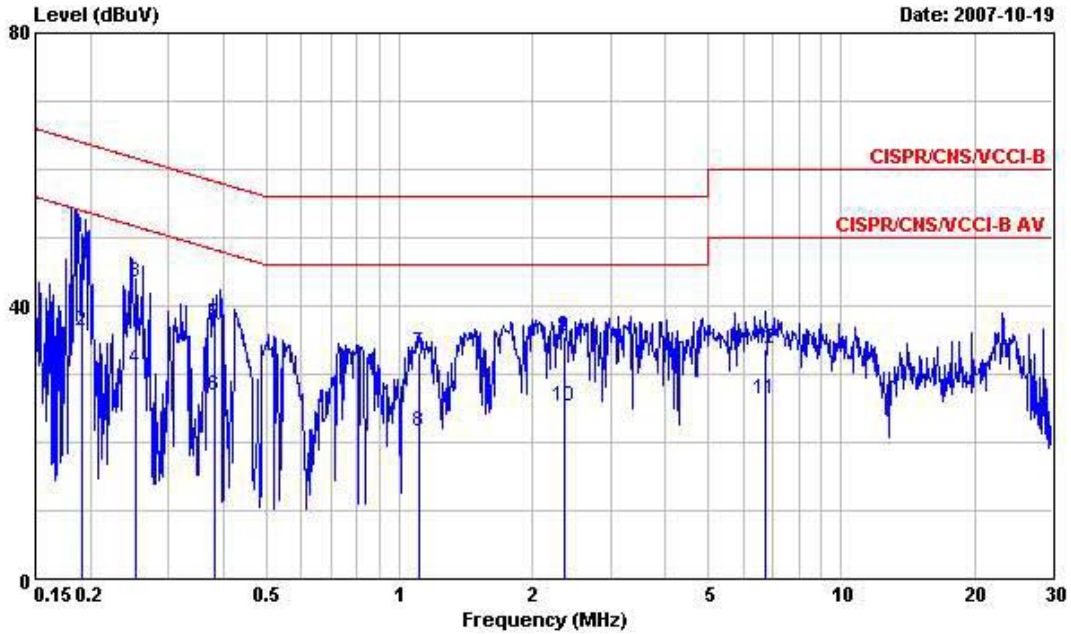
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.1749880	46.64	-18.08	64.72	46.40	0.10	0.14	QP
2	0.1749880	32.75	-21.97	54.72	32.51	0.10	0.14	Average
3	0.3563090	38.18	-20.63	58.81	37.45	0.10	0.63	QP
4	@0.3563090	33.80	-15.01	48.81	33.07	0.10	0.63	Average
5	@ 2.850	37.03	-18.97	56.00	36.56	0.10	0.37	QP
6	@ 2.850	31.02	-14.98	46.00	30.55	0.10	0.37	Average
7	14.155	37.15	-22.85	60.00	36.46	0.54	0.15	QP
8	@ 14.155	32.60	-17.40	50.00	31.91	0.54	0.15	Average
9	@ 19.711	41.36	-18.64	60.00	41.10	0.21	0.05	QP
10	@ 19.711	37.10	-12.90	50.00	36.84	0.21	0.05	Average
11	28.748	36.59	-23.41	60.00	35.99	0.38	0.22	QP
12	@ 28.748	33.75	-16.25	50.00	33.15	0.38	0.22	Average

Test Date	Oct. 19, 2007	Test Site No.	CO04-HY
Temperature	29	Humidity	45%
Test Engineer	Chris Lin	Phase	Neutral
Configuration	Scenario A		



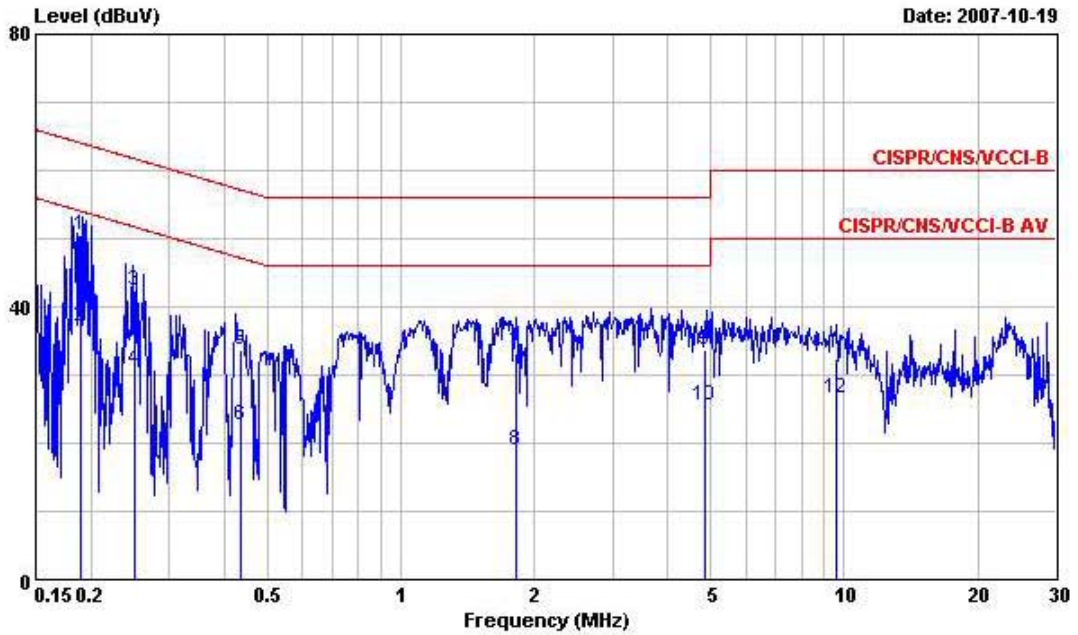
	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.1761220	34.22	-20.45	54.67	33.98	0.10	0.14	Average
2	0.1761220	46.38	-18.29	64.67	46.14	0.10	0.14	QP
3	0.3542110	38.02	-20.84	58.86	37.29	0.10	0.63	QP
4	0.3542110	34.05	-14.81	48.86	33.32	0.10	0.63	Average
5	2.880	37.23	-18.77	56.00	36.71	0.15	0.37	QP
6	2.880	31.28	-14.72	46.00	30.76	0.15	0.37	Average
7	14.152	38.44	-21.56	60.00	37.99	0.30	0.15	QP
8	14.152	34.15	-15.85	50.00	33.70	0.30	0.15	Average
9	19.710	42.03	-17.97	60.00	41.68	0.30	0.05	QP
10	19.710	37.76	-12.24	50.00	37.41	0.30	0.05	Average
11	26.549	44.50	-15.50	60.00	44.11	0.30	0.09	QP
12	26.549	41.26	-8.74	50.00	40.87	0.30	0.09	Average

Test Date	Oct. 19, 2007	Test Site No.	CO04-HY
Temperature	29	Humidity	45%
Test Engineer	Chris Lin	Phase	Line
Configuration	Scenario B		



Freq	Level	Over	Limit	Read	LISN	Cable	Remark
MHz	dBuV	Limit	Line	Level	Factor	Loss	
		dB	dBuV	dBuV	dB	dB	
1 @ 0.1910220	50.00	-13.99	63.99	49.76	0.10	0.14	QP
2 @ 0.1910220	36.24	-17.75	53.99	36.00	0.10	0.14	Average
3 @ 0.2522700	43.36	-18.32	61.68	42.92	0.10	0.34	QP
4 0.2522700	30.92	-20.76	51.68	30.48	0.10	0.34	Average
5 0.3801900	37.32	-20.96	58.28	36.54	0.10	0.68	QP
6 0.3801900	26.95	-21.33	48.28	26.17	0.10	0.68	Average
7 1.110	33.04	-22.96	56.00	32.50	0.10	0.44	QP
8 1.110	21.46	-24.54	46.00	20.92	0.10	0.44	Average
9 @ 2.370	35.52	-20.48	56.00	35.02	0.10	0.40	QP
10 2.370	25.34	-20.66	46.00	24.84	0.10	0.40	Average
11 6.730	26.44	-23.56	50.00	26.02	0.16	0.26	Average
12 6.730	33.77	-26.23	60.00	33.35	0.16	0.26	QP

Test Date	Oct. 19, 2007	Test Site No.	CO04-HY
Temperature	29	Humidity	45%
Test Engineer	Chris Lin	Phase	Neutral
Configuration	Scenario B		



Freq	Level	Over	Limit	Read	LISN	Cable	Remark
MHz	dBuV	Limit	Line	Level	Factor	Loss	
		dB	dBuV	dBuV	dB	dB	
1 @0.1886490	50.41	-13.69	64.10	50.17	0.10	0.14	QP
2 @0.1886490	37.05	-17.05	54.10	36.81	0.10	0.14	Average
3 @0.2509540	42.30	-19.43	61.73	41.87	0.10	0.33	QP
4 0.2509540	30.78	-20.95	51.73	30.35	0.10	0.33	Average
5 0.4372340	33.56	-23.55	57.11	32.76	0.10	0.70	QP
6 0.4372340	22.62	-24.49	47.11	21.82	0.10	0.70	Average
7 1.820	33.11	-22.89	56.00	32.58	0.10	0.43	QP
8 1.820	18.89	-27.11	46.00	18.36	0.10	0.43	Average
9 4.870	33.56	-22.44	56.00	33.04	0.22	0.30	QP
10 4.870	25.47	-20.53	46.00	24.95	0.22	0.30	Average
11 9.550	32.49	-27.51	60.00	31.97	0.29	0.23	QP
12 9.550	26.63	-23.37	50.00	26.11	0.29	0.23	Average

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 Settings

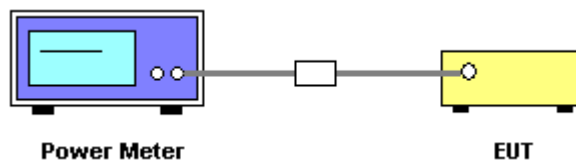
Please refer to section 4 of equipments list in this report. The following table is the setting of the power meter.

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

3.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels need 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	Oct. 25, 2007	Test Site No.	TH01-HY
Temperature	28	Humidity	58%
Test Engineer	Nan	Configurations	802.11n

Configuration IEEE 802.11n MCS0 20MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	24.55	30.00	Complies
6	2437 MHz	23.56	30.00	Complies
11	2462 MHz	22.34	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.02	30.00	Complies
6	2437 MHz	19.67	30.00	Complies
11	2462 MHz	21.09	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.95	30.00	Complies
6	2437 MHz	21.61	30.00	Complies
11	2462 MHz	20.11	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	22.52	30.00	Complies
6	2437 MHz	23.76	30.00	Complies
11	2462 MHz	23.64	30.00	Complies

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	Oct. 25, 2007	Test Site No.	TH01-HY
Temperature	28	Humidity	58%
Test Engineer	Nan	Configurations	802.11n (MCS0)

Configuration IEEE 802.11n MCS0 20MHz Ant. 1

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-12.01	8.00	Complies
6	2437 MHz	-9.89	8.00	Complies
11	2462 MHz	-12.20	8.00	Complies

Test Date	Nov. 05, 2007	Test Site No.	TH01-HY
Temperature	28	Humidity	58%
Test Engineer	Nan	Configurations	802.11n (MCS8)

Configuration IEEE 802.11n MCS8 20MHz Ant. 1

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-14.41	8.00	Complies
6	2437 MHz	-14.82	8.00	Complies
11	2462 MHz	-15.52	8.00	Complies

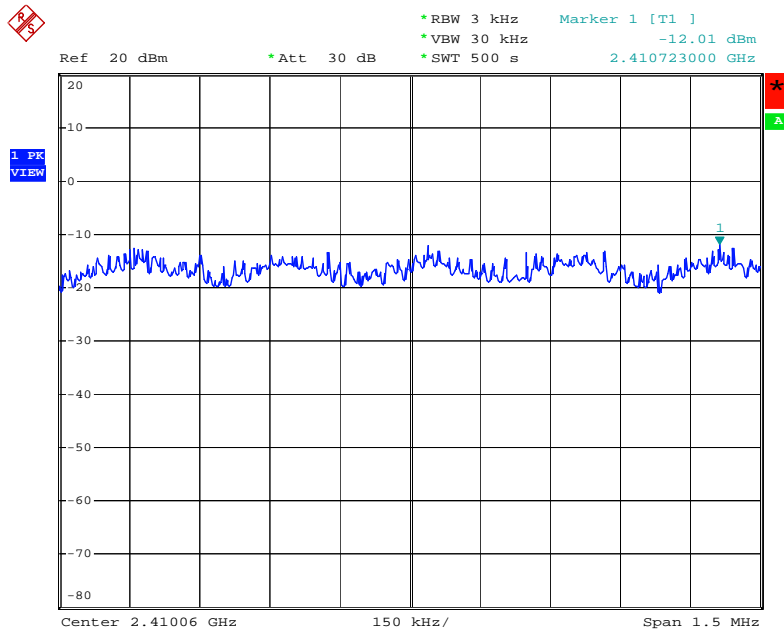
Configuration IEEE 802.11n MCS8 20MHz Ant. 2

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-12.30	8.00	Complies
6	2437 MHz	-11.46	8.00	Complies
11	2462 MHz	-11.74	8.00	Complies

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

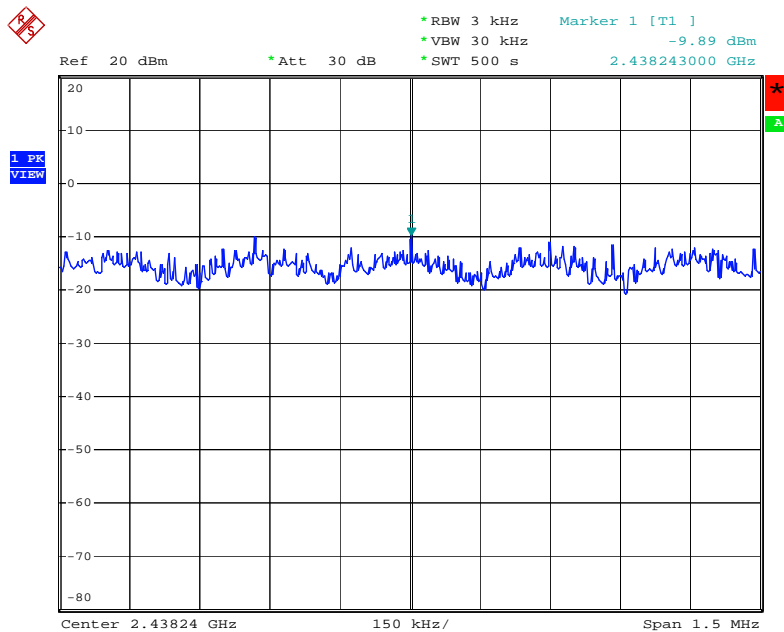
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-10.22	8.00	Complies
6	2437 MHz	-9.81	8.00	Complies
11	2462 MHz	-10.22	8.00	Complies

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2412 MHz



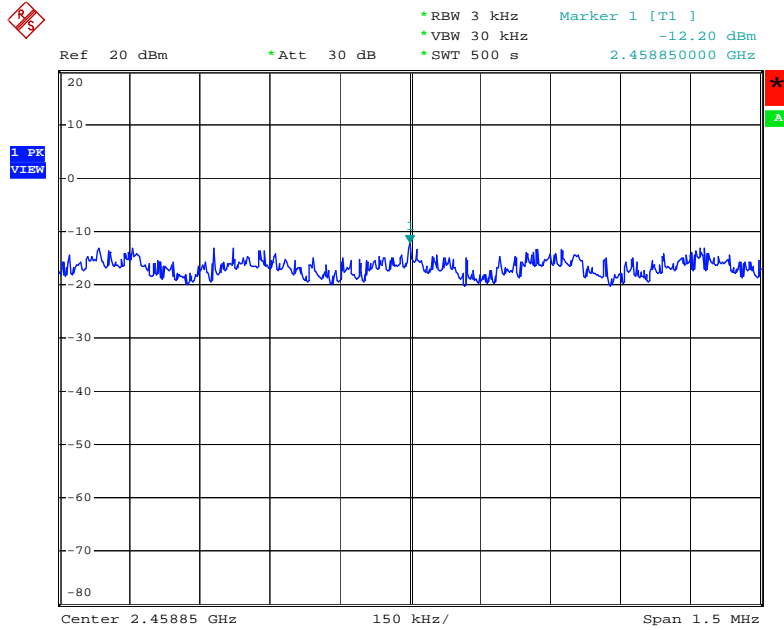
Date: 25.OCT.2007 05:17:32

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2437 MHz



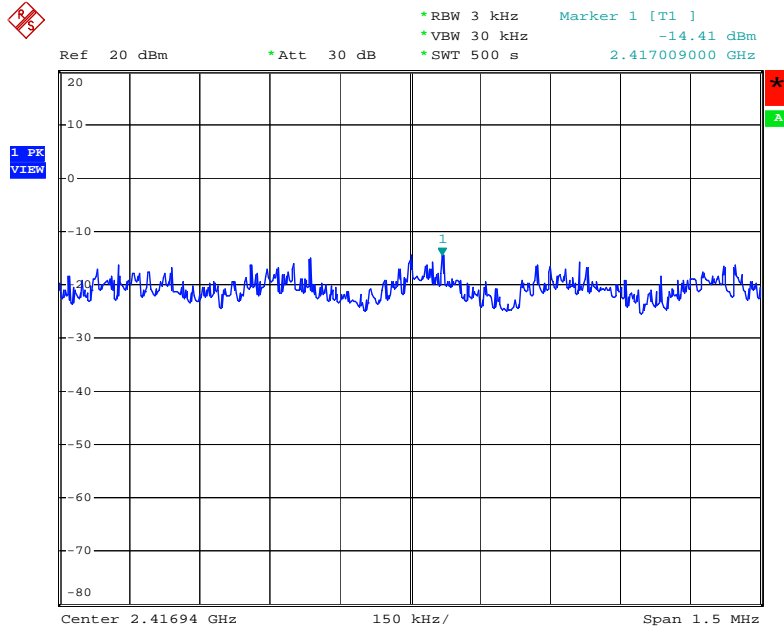
Date: 25.OCT.2007 05:19:05

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2462 MHz



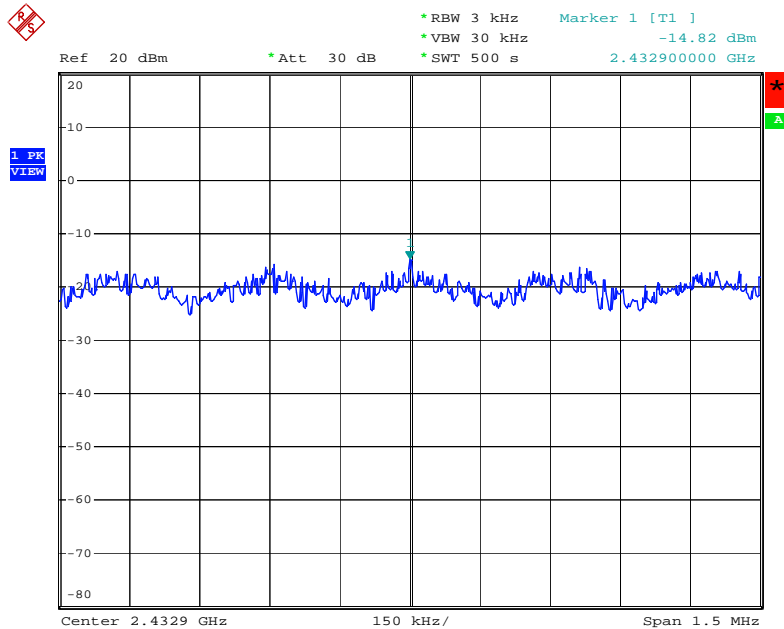
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Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 / 2412 MHz



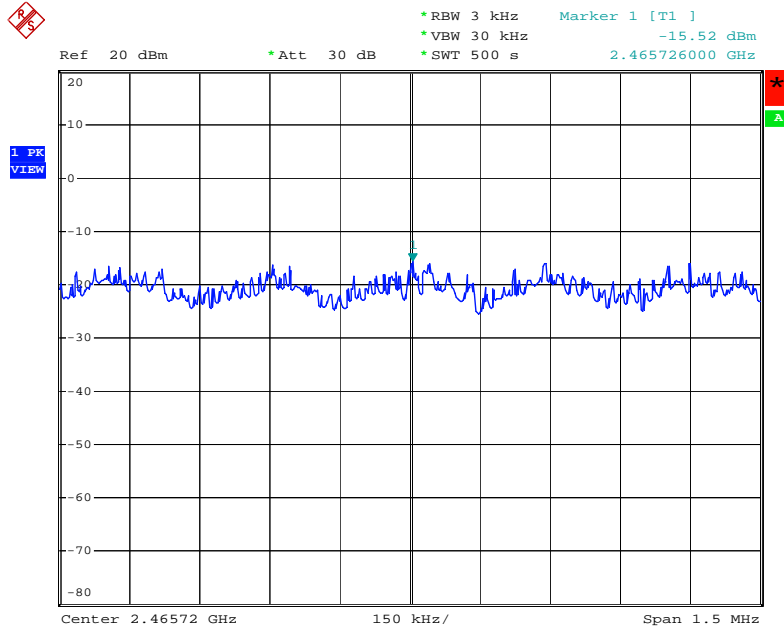
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Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 / 2437 MHz



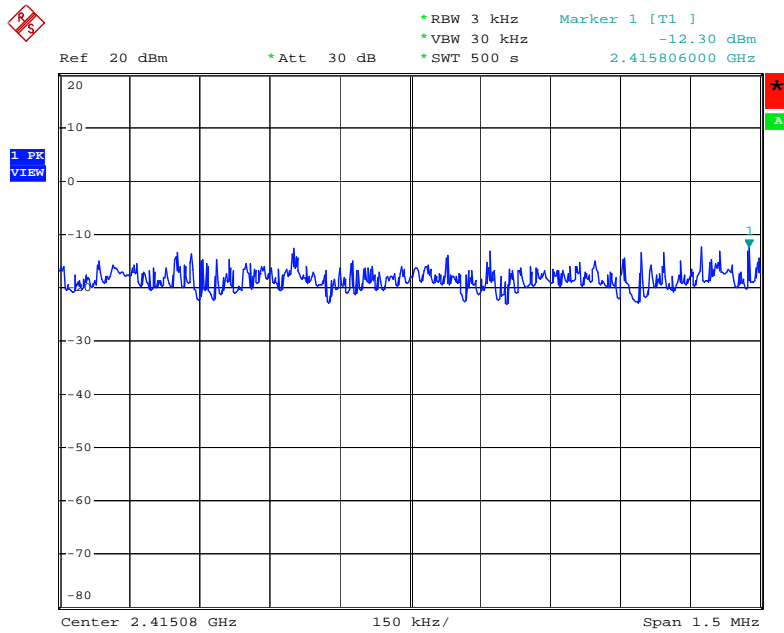
Date: 5.NOV.2007 10:36:23

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



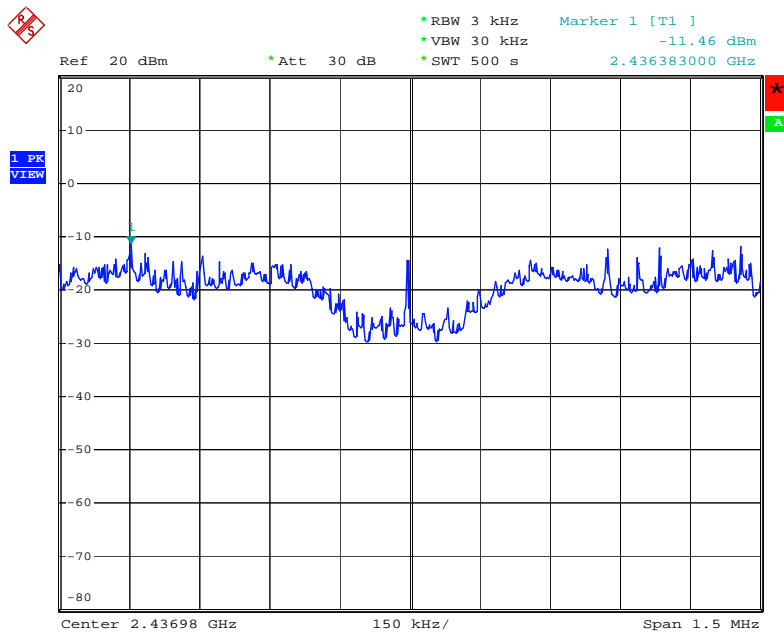
Date: 5.NOV.2007 10:41:18

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



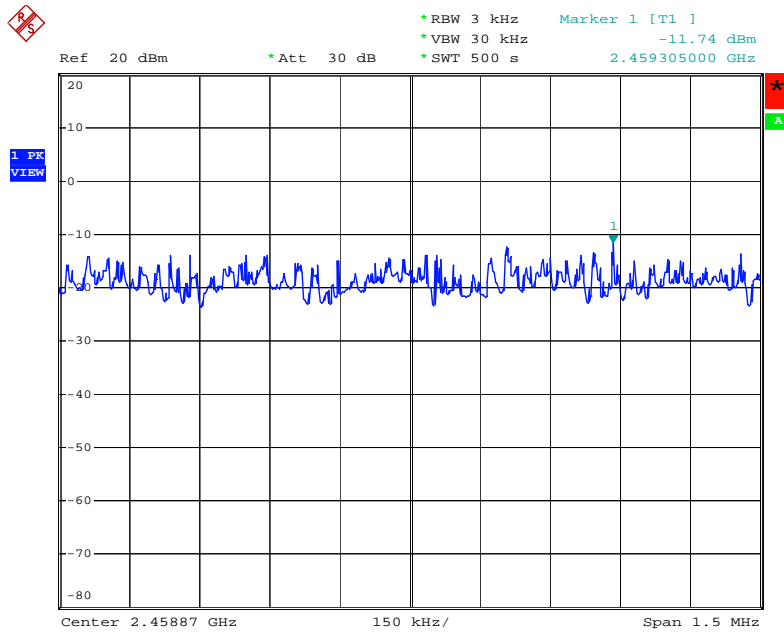
Date: 5.NOV.2007 10:54:05

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



Date: 5.NOV.2007 10:55:34

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



Date: 5.NOV.2007 10:47:51

3.4. 6dB Spectrum Bandwidth Measurement

3.4.1. Limit

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

3.4.2. Measuring Instruments and Setting

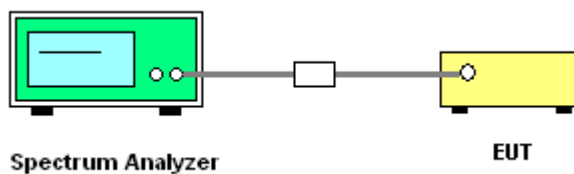
Please refer to section 4 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

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	Oct. 25, 2007	Test Site No.	TH01-HY
Temperature	28	Humidity	58%
Test Engineer	Nan	Configurations	802.11n (MCS0)

Configuration IEEE 802.11n MCS0 20MHz Ant. 1

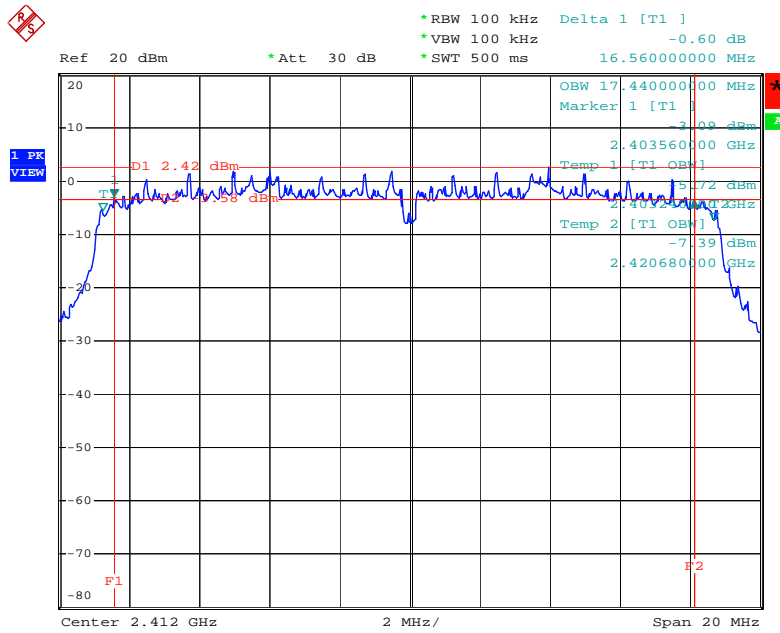
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.56	17.44	500	Complies
6	2437 MHz	16.04	17.48	500	Complies
11	2462 MHz	16.72	17.44	500	Complies

Test Date	Nov. 05, 2007	Test Site No.	TH01-HY
Temperature	28	Humidity	58%
Test Engineer	Nan	Configurations	802.11n (MCS8)

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

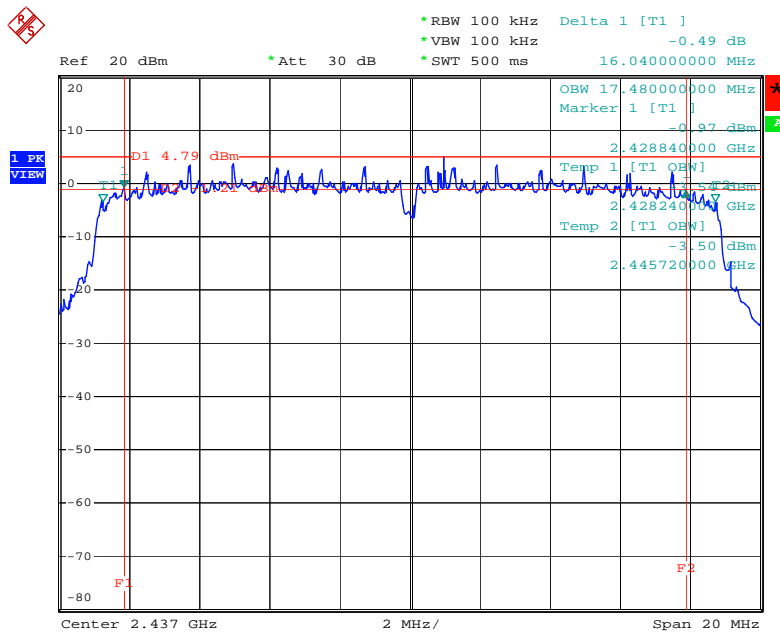
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	15.24	17.48	500	Complies
6	2437 MHz	16.28	17.52	500	Complies
11	2462 MHz	16.32	17.56	500	Complies

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



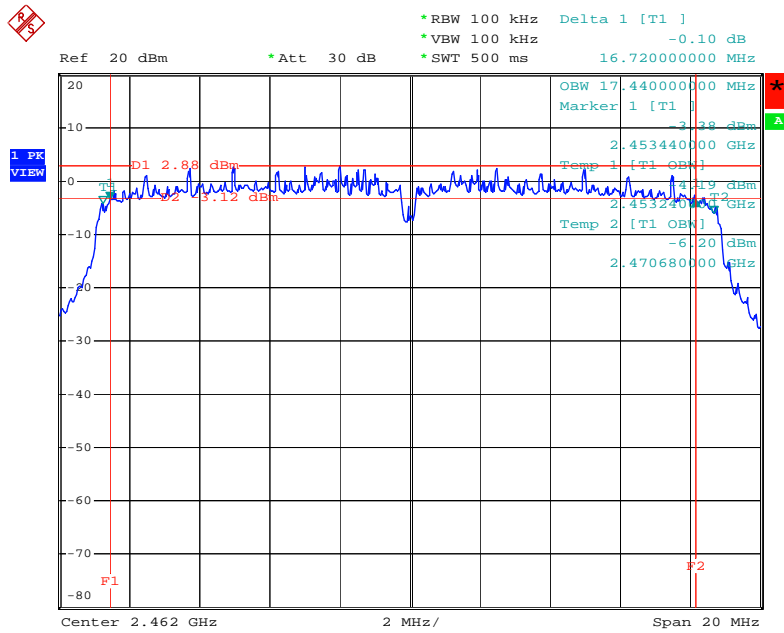
Date: 25.OCT.2007 05:15:10

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



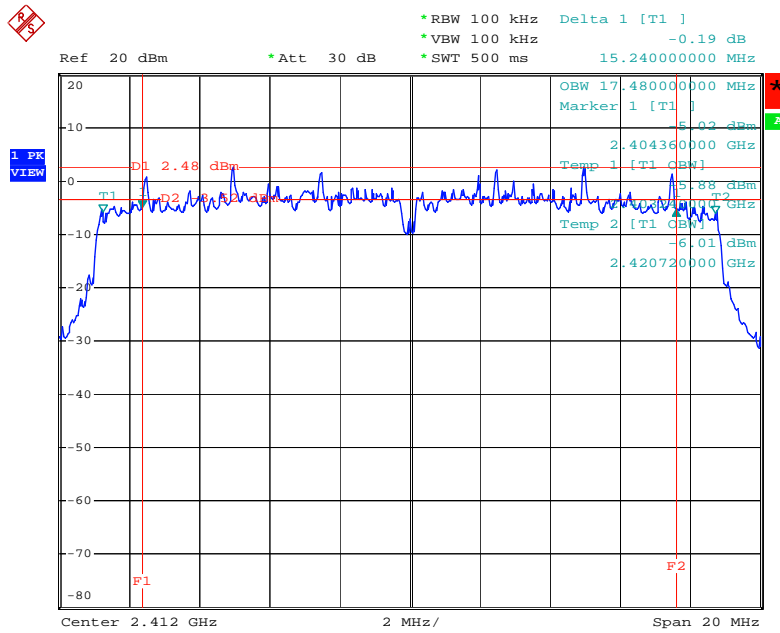
Date: 25.OCT.2007 05:20:11

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



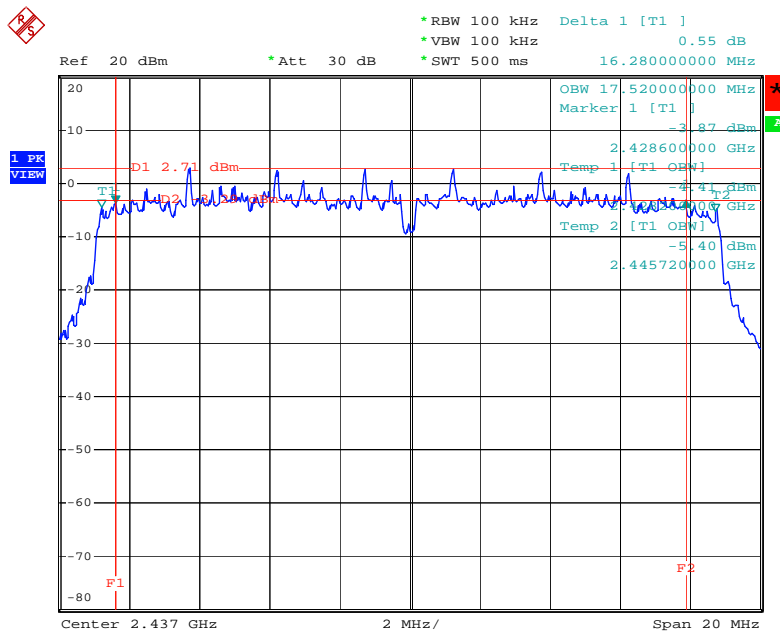
Date: 25.OCT.2007 05:21:38

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



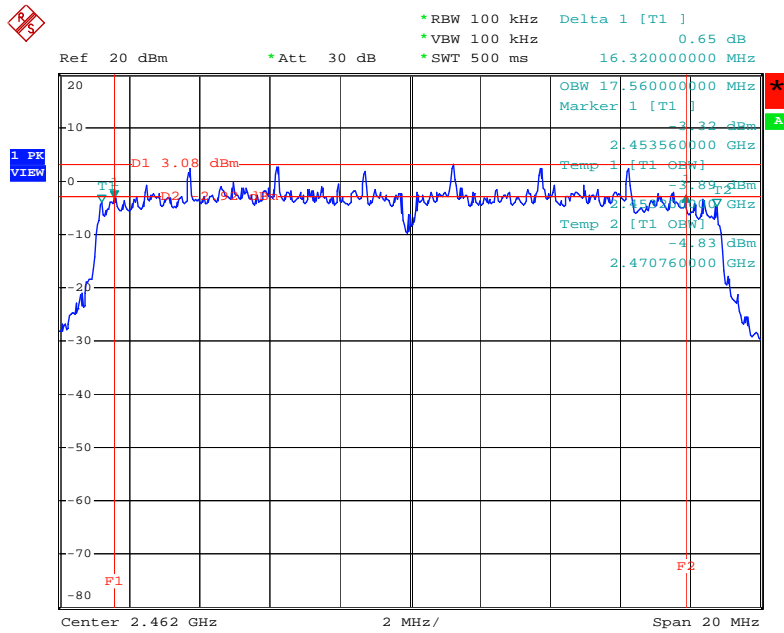
Date: 5.NOV.2007 11:43:05

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



Date: 5.NOV.2007 11:44:27

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



Date: 5.NOV.2007 11:45:38

3.5. Radiated Emissions Measurement

3.5.1. Limit

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

Frequencies (MHz)	Field Strength (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 Setting

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

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

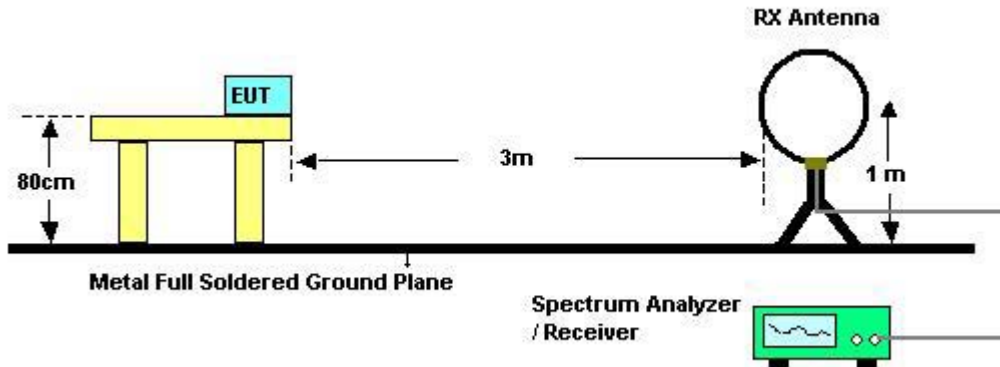
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.5.3. Test Procedures

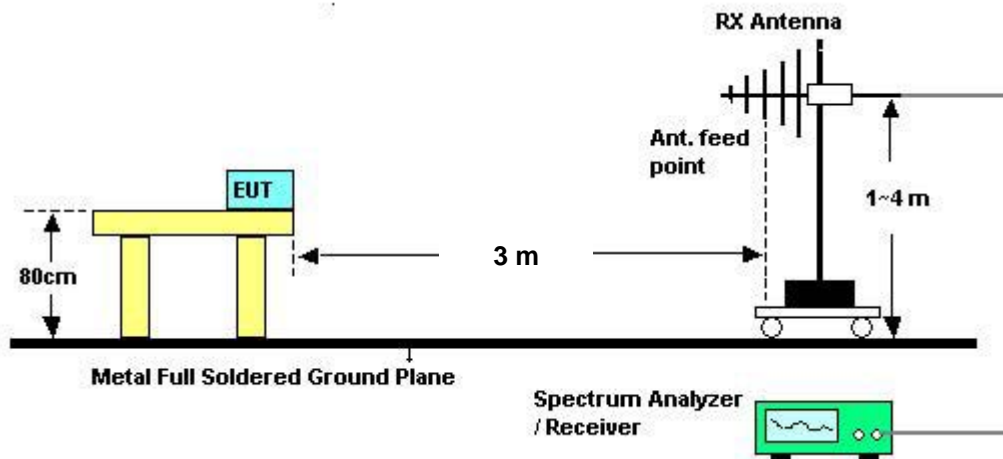
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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. 29, 2007	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	802.11n Ch 6 Ant. 1 + Ant. 2

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

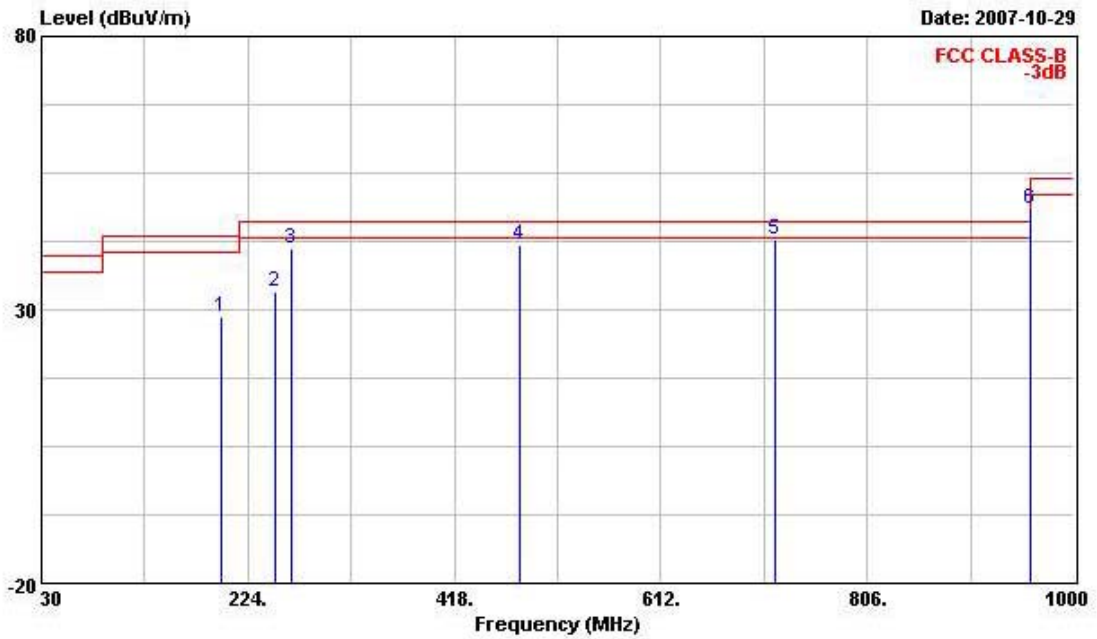
Note:

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

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

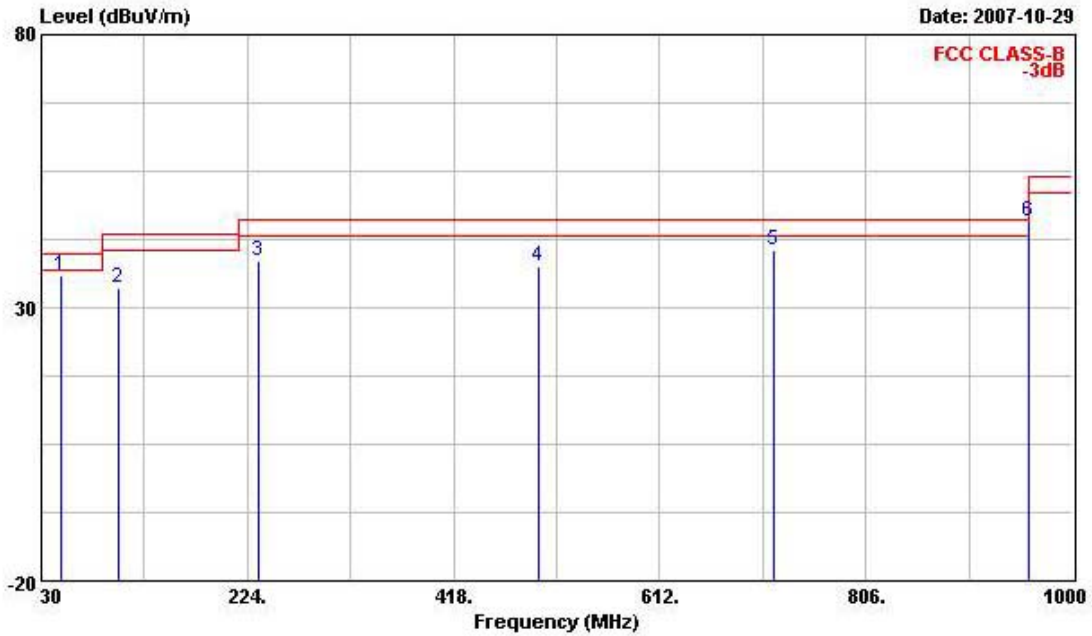
Test Date	Oct. 29, 2007	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	802.11n Ch 6 Ant. 1 + Ant. 2

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	198.780	28.73	-14.77	43.50	43.68	9.61	3.54	28.09	200	0	Peak
2	249.220	33.45	-12.55	46.00	45.21	12.58	3.82	28.16	200	0	Peak
3	265.710	41.06	-4.94	46.00	52.01	13.55	3.73	28.24	200	0	Peak
4	479.110	41.84	-4.16	46.00	48.89	17.90	4.48	29.43	200	0	Peak
5	719.670	42.85	-3.15	46.00	47.10	20.25	5.19	29.70	200	0	QP
6	960.230	48.36	-5.64	54.00	50.27	21.24	6.42	29.57	200	0	QP

Vertical



	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	Remark
1	48.430	36.08	-3.92	40.00	52.04	8.86	2.94	27.75	200	0	Peak
2	102.750	33.63	-9.87	43.50	47.00	11.56	2.82	27.74	200	0	Peak
3	233.700	38.61	-7.39	46.00	52.39	10.84	3.59	28.21	200	0	Peak
4	498.510	37.43	-8.57	46.00	44.01	18.09	4.43	29.10	200	0	Peak
5	719.670	40.61	-5.39	46.00	44.86	20.25	5.19	29.70	200	0	Peak
6	960.230	45.80	-8.20	54.00	47.71	21.24	6.42	29.57	200	0	Peak

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).

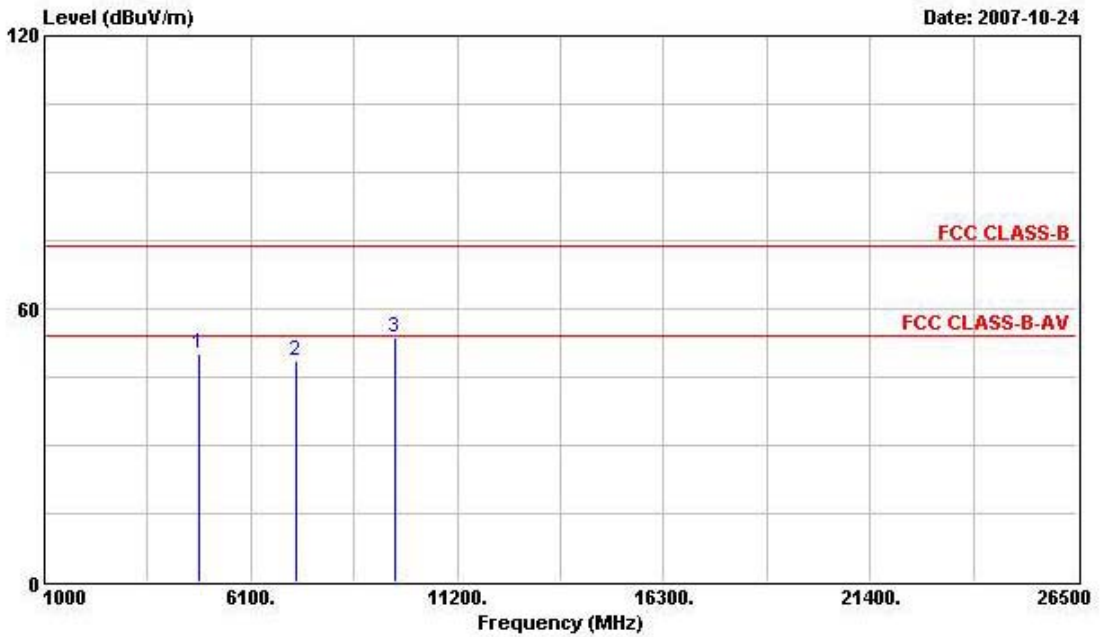
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Pol. : V is Vertical Polarization ; H is Horizontal Polarization.

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

Test Date	Oct. 24, 2007	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	MCS0 20MHz Ch 1 Ant. 1

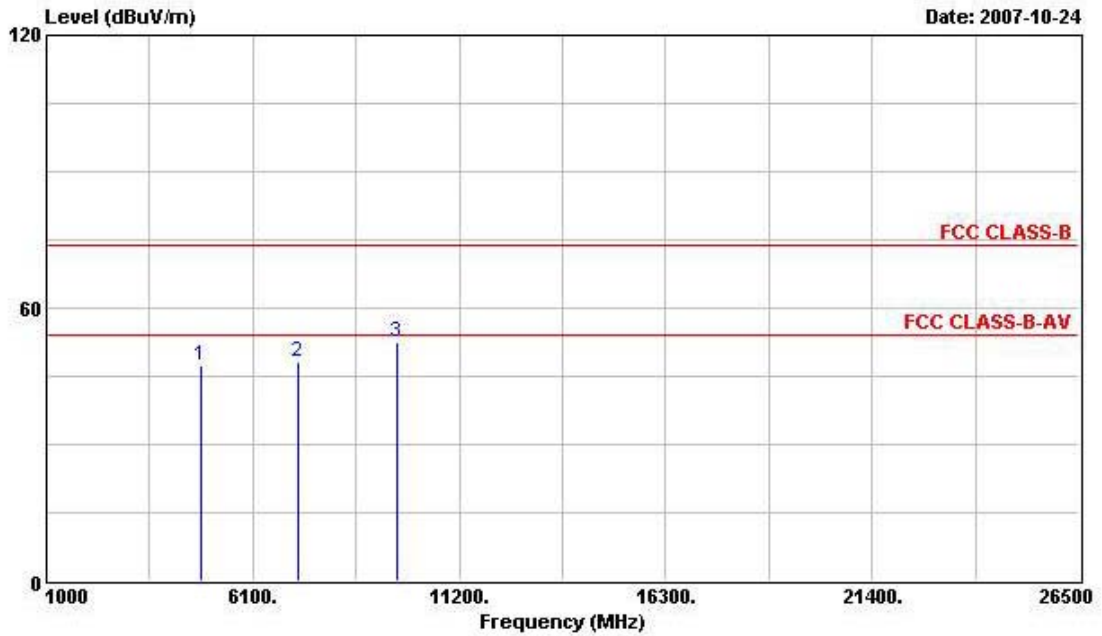
Vertical



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBUV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBUV/m	dBuV	dB	dB	cm	deg	
1	4824.000	50.23	-3.77	54.00	48.53	33.06	1.38	32.74	100	0 Average
2	7232.000	48.50	-5.50	54.00	41.52	35.78	4.14	32.95	100	360 Average
3	9648.000	53.53			43.05	38.41	5.47	33.40	100	0 PEAK

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

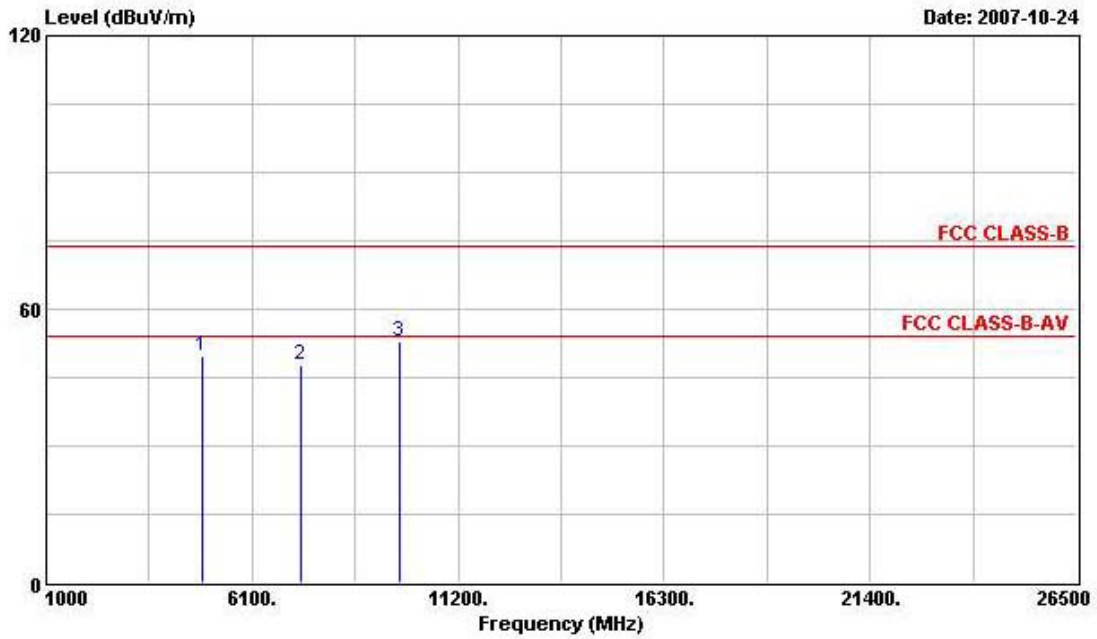
Horizontal



	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	47.27	-6.73	54.00	45.57	33.06	1.38	32.74	200	0	Average
2	7240.000	48.11	-5.89	54.00	41.14	35.78	4.14	32.95	100	0	Average
3	9652.000	52.50	-1.50	54.00	42.02	38.41	5.47	33.40	100	360	Average

Test Date	Oct. 24, 2007	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	MCS0 20MHz Ch 6 Ant. 1

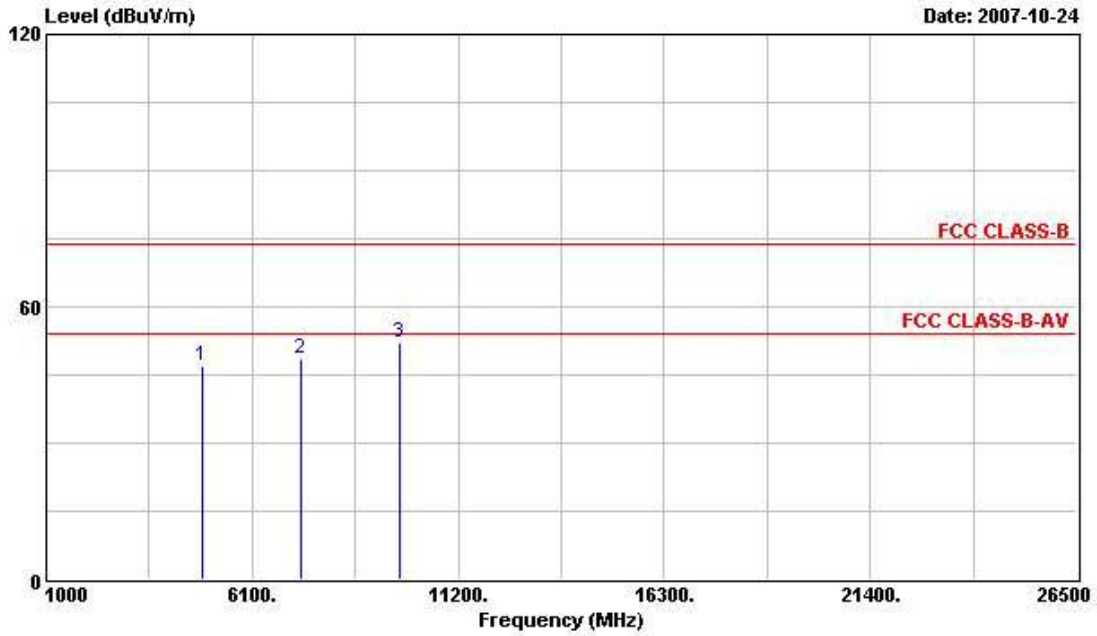
Vertical



	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	4876.000	49.68	-4.32	54.00	47.97	33.16	1.28	32.73	200	0	Average
2	7307.000	47.89	-6.11	54.00	40.64	35.94	4.26	32.96	100	0	Average
3	9748.000	53.01			42.21	38.62	5.57	33.40	100	360	Peak

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

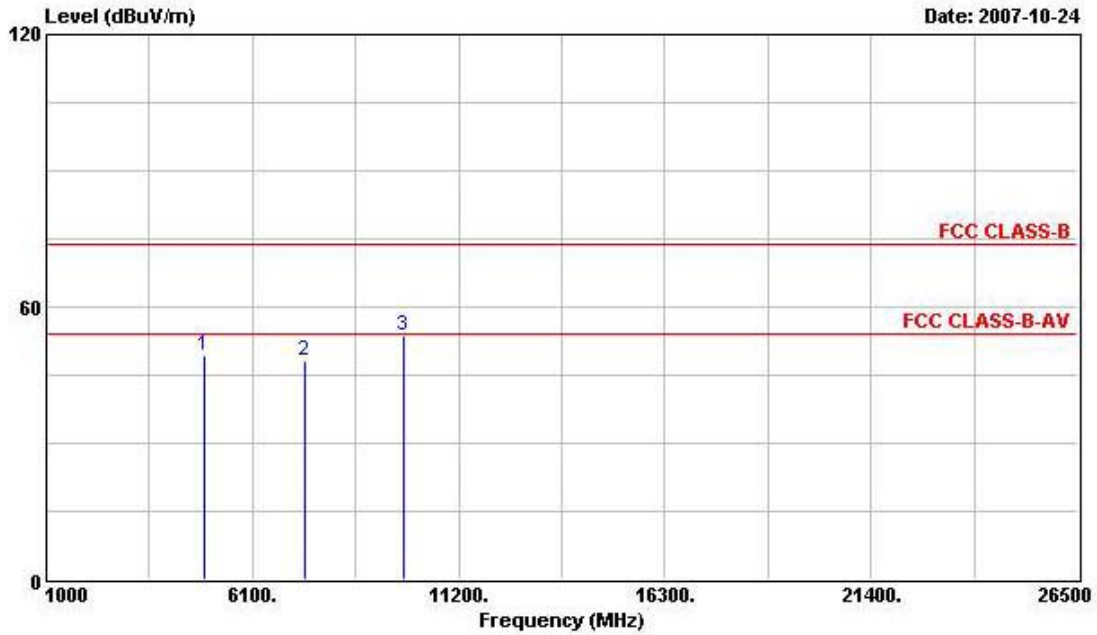
Horizontal



	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	47.03	-6.97	54.00	45.32	33.16	1.28	32.73	200	0	Average
2	7311.000	48.45	-5.55	54.00	41.20	35.94	4.26	32.96	100	360	Average
3	9744.000	52.18	-1.82	54.00	41.42	38.58	5.57	33.40	100	0	Average

Test Date	Oct. 24, 2007	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	MCS0 20MHz Ch 11 Ant. 1

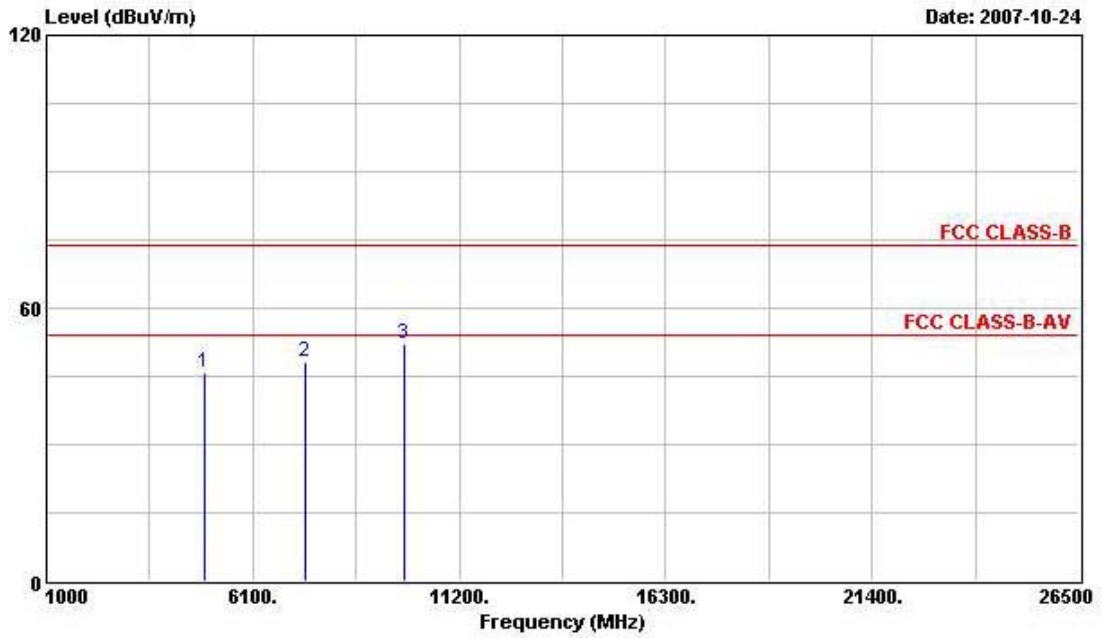
Vertical



	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	49.34	-4.66	54.00	47.73	33.26	1.07	32.72	200	0	Average
2	7382.000	48.25	-5.75	54.00	40.73	36.11	4.38	32.98	100	0	Average
3	9848.000	53.64			42.53	38.79	5.72	33.40	200	0	PEAK

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

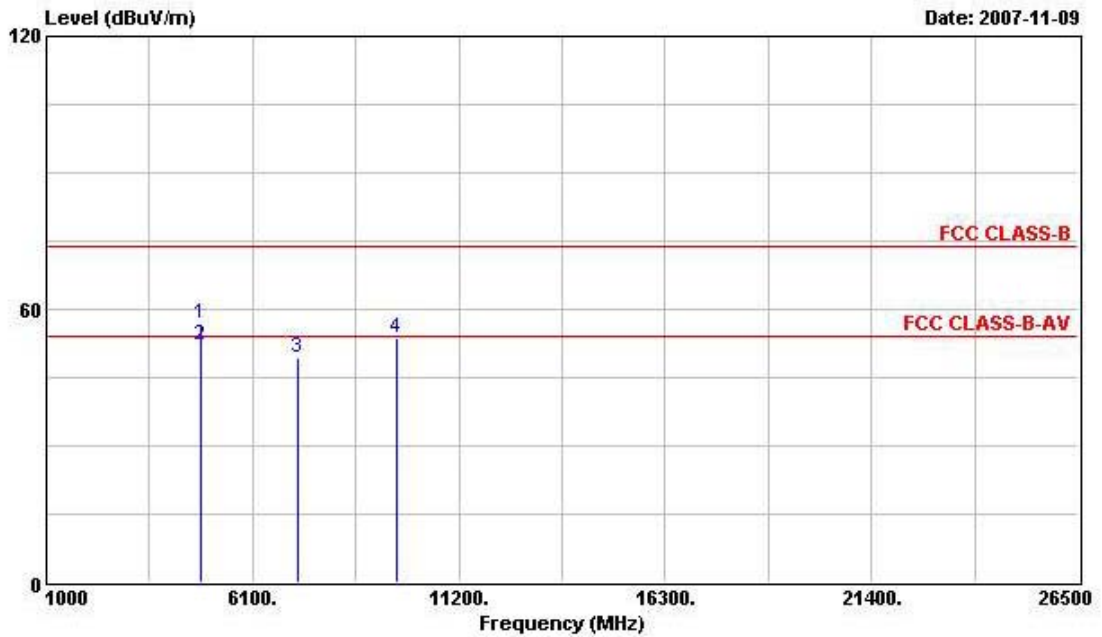
Horizontal



	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	45.94	-8.06	54.00	44.33	33.26	1.07	32.72	200	0	Average
2	7390.000	48.01	-5.99	54.00	40.45	36.15	4.38	32.98	100	0	Average
3	9848.000	52.25	-1.75	54.00	41.14	38.79	5.72	33.40	100	360	Average

Test Date	Nov. 09, 2007	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	MCS8 20MHz Ch 1 Ant. 1 + Ant. 2

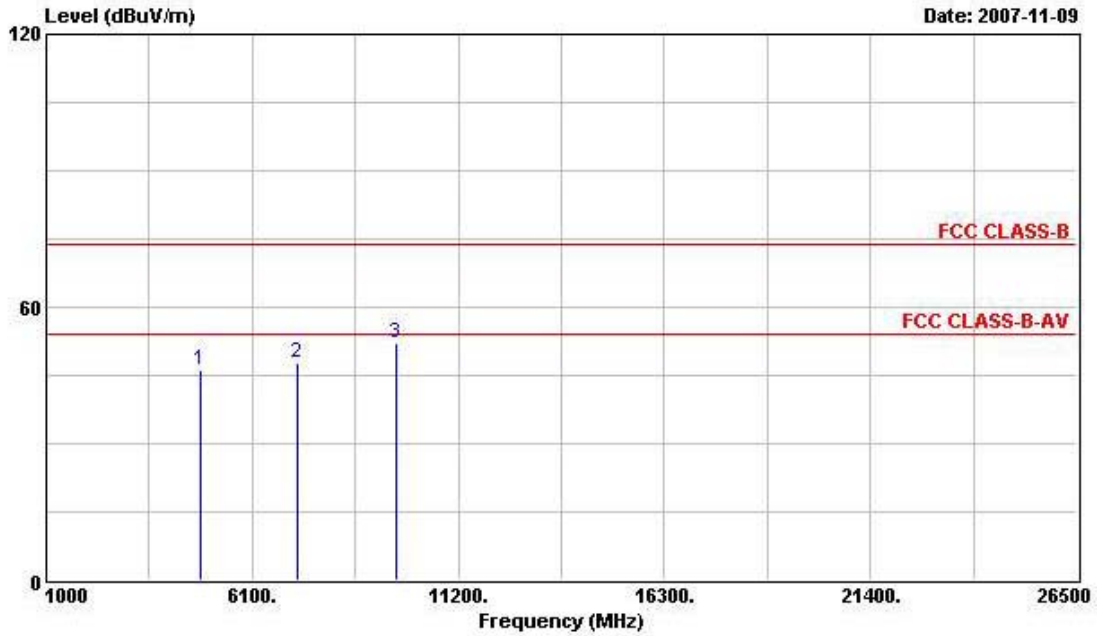
Vertical



	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	4823.900	56.95	-17.05	74.00	55.25	33.06	1.38	32.74	153	262	Peak
2	4823.900	52.16	-1.84	54.00	50.46	33.06	1.38	32.74	153	262	AVERAGE
3	7232.000	49.41	-4.59	54.00	42.43	35.78	4.14	32.95	100	0	AVERAGE
4	9644.000	53.67			43.22	38.38	5.47	33.40	100	360	Peak

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

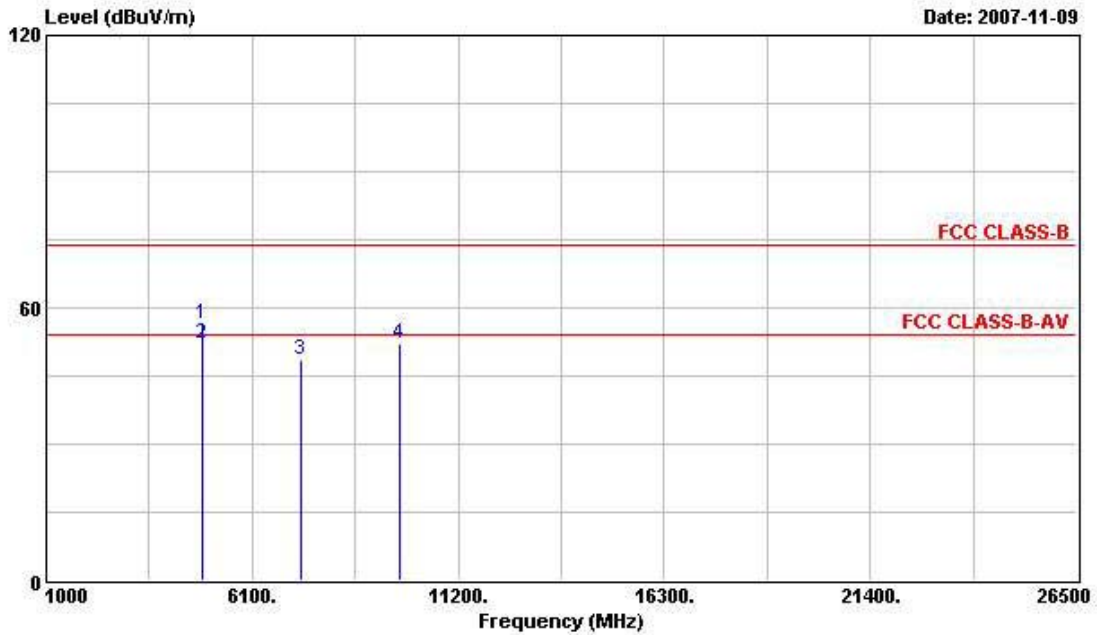
Horizontal



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB	dB	cm	deg	
1	4824.000	46.19	-7.81	54.00	44.49	33.06	1.38	32.74	100	0 AVERAGE
2	7240.000	47.82	-6.18	54.00	40.85	35.78	4.14	32.95	100	360 AVERAGE
3	9648.000	52.29	-1.71	54.00	41.81	38.41	5.47	33.40	100	0 AVERAGE

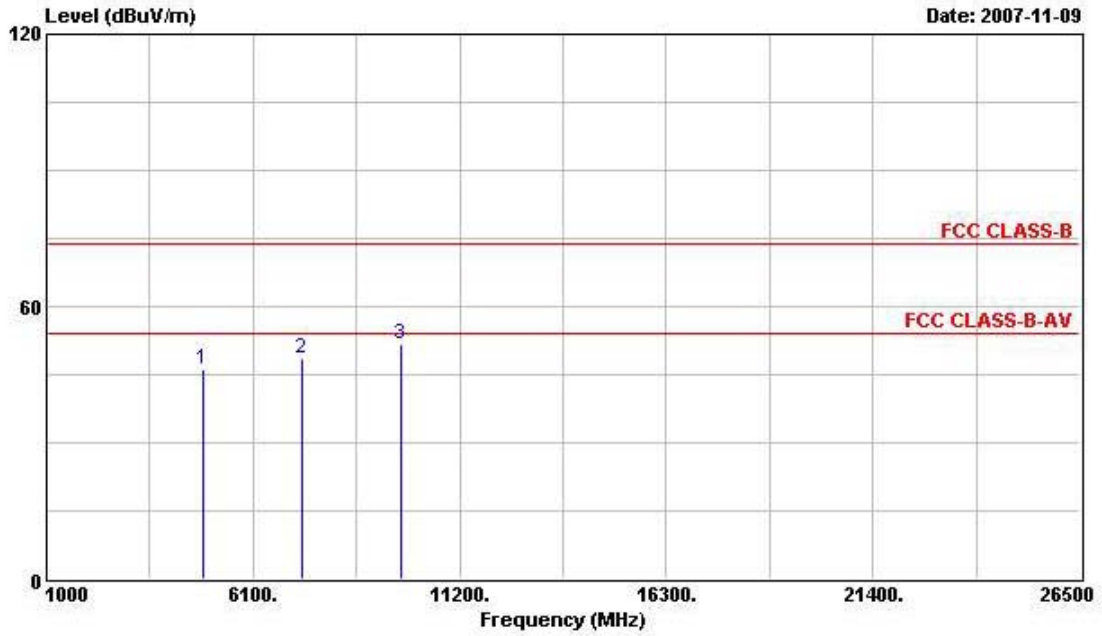
Test Date	Nov. 09, 2007	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	MCS8 20MHz Ch 6 Ant. 1 + Ant. 2

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4876.000	56.48	-17.52	74.00	54.77	33.16	1.28	32.73	100	0	Peak
2	4876.000	52.24	-1.76	54.00	50.53	33.16	1.28	32.73	100	0	Average
3	7307.000	48.51	-5.49	54.00	41.26	35.94	4.26	32.96	100	360	AVERAGE
4	9748.000	52.14	-1.86	54.00	41.35	38.62	5.57	33.40	100	0	AVERAGE

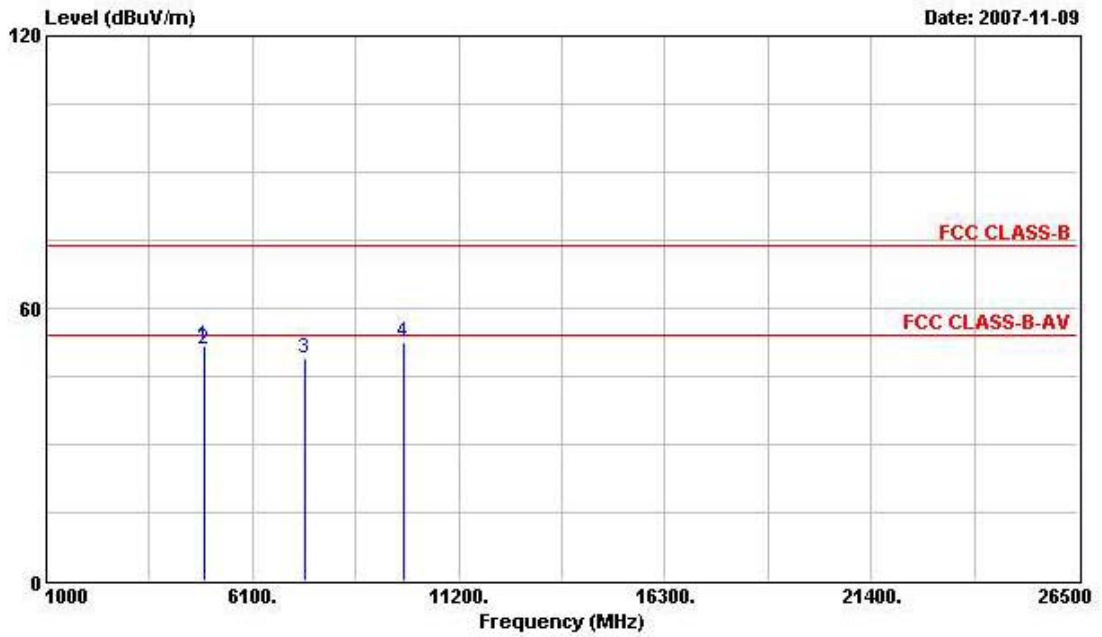
Horizontal



	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	4876.000	46.18	-7.82	54.00	44.47	33.16	1.28	32.73	100	360	AVERAGE
2	7307.000	48.57	-5.43	54.00	41.32	35.94	4.26	32.96	100	0	AVERAGE
3	9748.000	51.90	-2.10	54.00	41.11	38.62	5.57	33.40	100	360	AVERAGE

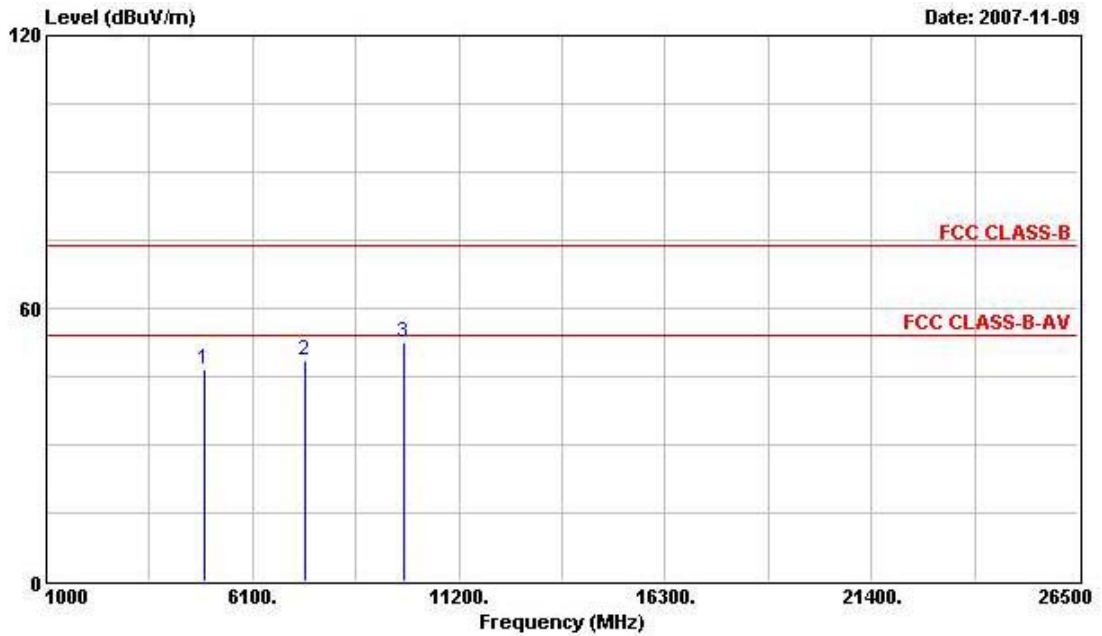
Test Date	Nov. 09, 2007	Test Site No.	03CH03-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	MCS8 20MHz Ch 11 Ant. 1 + Ant. 2

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	51.69	-22.31	74.00	50.08	33.26	1.07	32.72	200	360	PEAK
2	4924.000	51.03	-2.97	54.00	49.42	33.26	1.07	32.72	200	360	Average
3	7382.000	48.78	-5.22	54.00	41.26	36.11	4.38	32.98	100	0	Average
4	9848.000	52.31	-1.69	54.00	41.19	38.79	5.72	33.40	100	360	Average

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	4928.000	46.40	-7.60	54.00	44.78	33.26	1.07	32.72	100	0	AVERAGE
2	7390.000	48.74	-5.26	54.00	41.19	36.15	4.38	32.98	100	360	AVERAGE
3	9848.000	52.59	-1.41	54.00	41.47	38.79	5.72	33.40	100	0	Average

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.

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 4.5.3, only the frequency range investigated is limited to 100MHz around bandedges.

3.6.4. Test Setup Layout

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

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. 25, 2007	Test Site No.	TH01-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	MCS0 20MHz Ch1, 6, 11 Ant. 1

Channel 1

	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	2390.000	63.66	-10.34	74.00	33.14	28.29	2.23	0.00	100	315	Peak
2 X	2408.420	109.72			79.16	28.33	2.23	0.00	100	315	Peak
1	2390.000	50.46	-3.54	54.00	19.94	28.29	2.23	0.00	100	315	Average
2 ☺	2408.420	102.59			72.03	28.33	2.23	0.00	100	315	Average

Channel 6

	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 X	2438.060	108.86			78.21	28.40	2.25	0.00	100	332	Peak
1 ☺	2438.060	99.36			68.71	28.40	2.25	0.00	100	332	Average

Channel 11

	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 X	2457.820	109.58			78.90	28.43	2.25	0.00	100	37	Peak
2	2483.500	60.27	-13.73	74.00	29.53	28.47	2.27	0.00	100	37	Peak
1 ☺	2457.820	94.95			64.27	28.43	2.25	0.00	100	37	Average
2	2483.500	49.22	-4.78	54.00	18.48	28.47	2.27	0.00	100	37	Average

Test Date	Oct. 25, 2007	Test Site No.	TH01-HY
Temperature	24	Humidity	53%
Test Engineer	Duncan	Configurations	MCS8 20MHz Ch 1, 6 , 11 Ant. 1 + Ant. 2

Channel 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2327.290	64.25	-9.75	74.00	33.91	28.16	2.19	0.00	112	336	Peak
2 X	2407.090	109.55			78.99	28.33	2.23	0.00	112	336	Peak
1	2387.330	48.67	-5.33	54.00	18.15	28.29	2.23	0.00	112	336	Average
2 @	2406.900	100.12			69.56	28.33	2.23	0.00	112	336	Average

Channel 6

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 X	2433.500	109.01			78.40	28.36	2.25	0.00	100	141	Peak
1 @	2434.260	102.76			72.15	28.36	2.25	0.00	100	141	Average

Channel 11

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 X	2465.420	108.92			78.22	28.43	2.27	0.00	114	318	Peak
2	2483.500	60.90	-13.10	74.00	30.16	28.47	2.27	0.00	114	318	Peak
1 @	2462.570	98.93			68.23	28.43	2.27	0.00	114	318	Average
2	2483.500	46.42	-7.58	54.00	15.68	28.47	2.27	0.00	114	318	Average

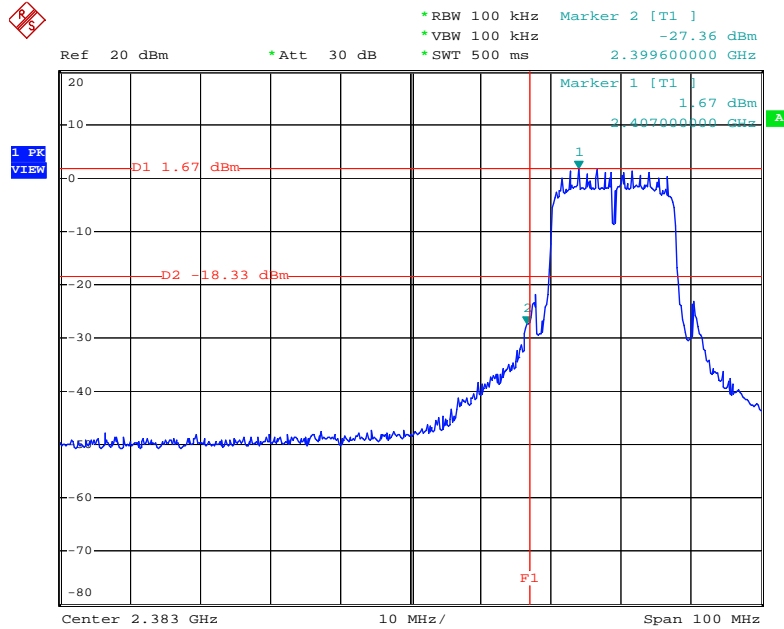
Note:

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

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

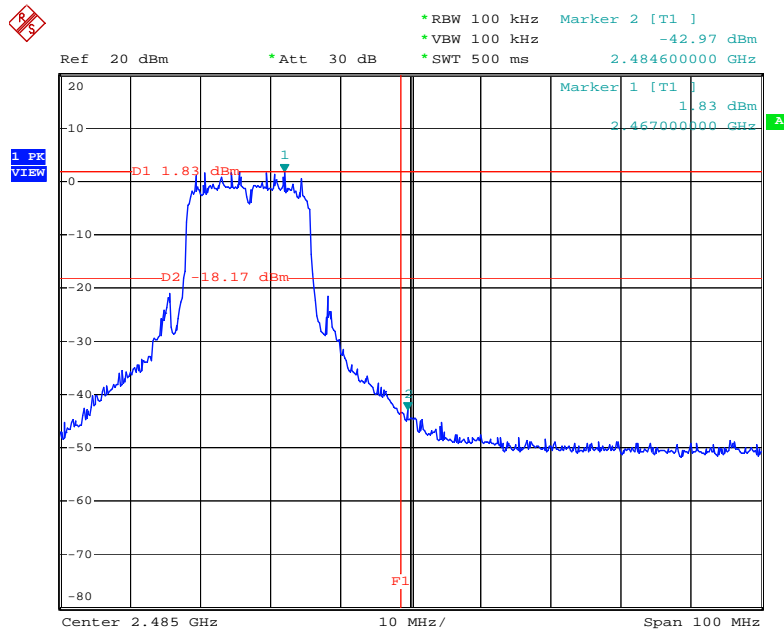
For Emission not in Restricted Band

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



Date: 25.OCT.2007 05:16:05

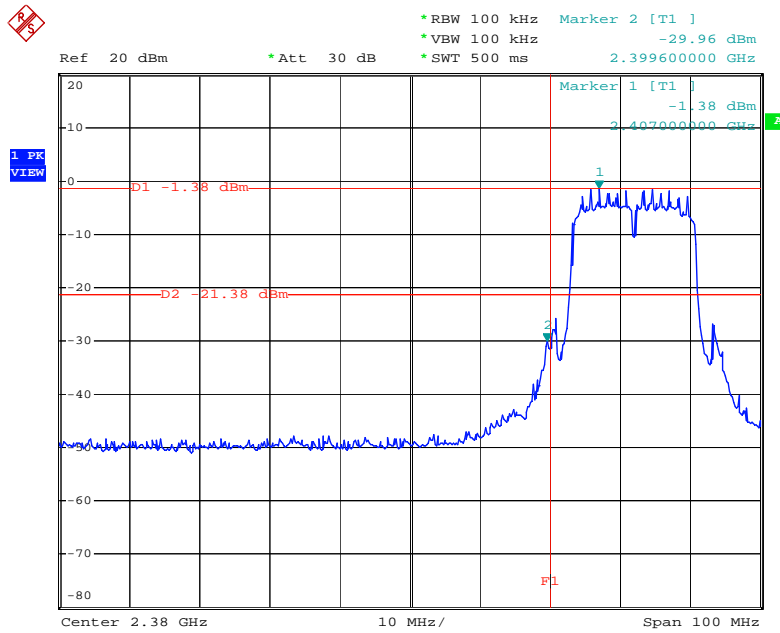
High Band Edge Plot on Configuration IEEE 802.11n MCS0 20MHz Ant. 1 / 2462 MHz



Date: 25.OCT.2007 05:22:36

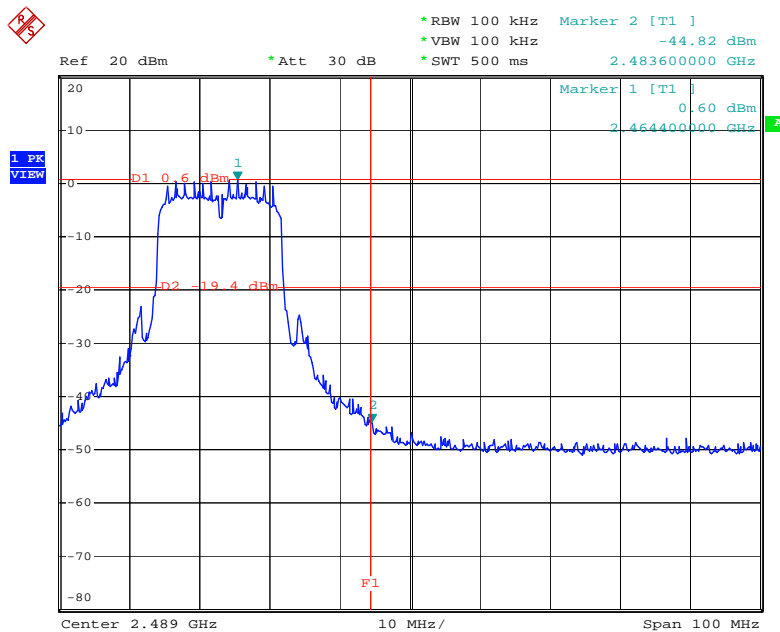
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2 / 2412 MHz



Date: 5.NOV.2007 10:33:59

High Band Edge Plot on Configuration IEEE 802.11n MCS8 20MHz Ant. 1 + Ant. 2 / 2462 MHz



Date: 5.NOV.2007 10:39:55

3.7. Antenna Requirements

3.7.1. Limit

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

3.7.2. Antenna Connector Construction

Please refer to section 2.2 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	100359	9kHz – 2.75GHz	Mar. 01, 2007	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2007	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2007	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2007	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz –30MHz	May 09, 2007	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	N/A	Conduction (CO04-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2007	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	CPA9231A	1886	9 kHz - 2 GHz	Jan. 22, 2007	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jun. 07, 2007	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100305	9 kHz - 40 GHz	Sep. 27, 2007	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 21, 2007	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 04, 2007	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	NCR	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 02, 2006	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 02, 2006	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Dec. 17, 2006	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 27, 2007	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 03, 2007	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2007	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2006	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2006	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Nov. 14, 2006	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 07, 2007	Conducted (TH01-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	MITEQ	AMF-6F-260400	923364	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH03-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 04, 2007*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two 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 728, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

6. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : L1190-070110

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

PI, total 9 pages

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