FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment	:	**PDA Scanner**
Model No.	:	**HT660BTG**
Brand Name	:	**Unitech**
Filing Type	:	**New Application**
Applicant	:	**Unitech Co., Ltd.** 3F, No.236, Sinhu 2nd Rd., Neihu Chiu, Taipei, Taiwan114, R.O.C.
FCC ID	:	**HLEHT660BTG**
Manufacturer	:	**Unitech Co., Ltd.** 5F, No.136, Lan 235, Pao-Chiao Rd., Hsin-Tien City, Taipei Hsien, Taiwan, R.O.C.
Received Date	:	Dec. 01, 2006
Test Date	:	Mar. 01, 2007
Multiple Listing	:	Please refer to section 2.7

Statement

Test result included is only for the 802.11b/g part of the product (collocated with Bluetooth).

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. Lab Code: 200079-0

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

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History of This Test Report

Original Issue Date: Mar. 06, 2007

Report No.: FR6N2405-01

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment	:	PDA Scanner
Model No.	:	HT660BTG
Brand Name	:	Unitech
Applicant	:	**Unitech Co., Ltd.** 3F, No.236, Sinhu 2nd Rd., Neihu Chiu, Taipei, Taiwan114, R.O.C.

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Dec. 01, 2006 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.

Roger Sheng / Manager

Reviewed Data: Mar. 06, 2007

1. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
3.1	15.207	AC Power Line Conducted Emissions	Complies	8.69 dB
3.2	15.247(b)(3)	Maximum Peak Conducted Output Power	Complies	15.48 dB
3.3	15.247(e)	Power Spectral Density	Complies	4.76 dB
3.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
3.5	15.247(d)	Radiated Emissions	Complies	3.65 dB
3.6	15.247(d)	Band Edge Emissions	Complies	11.32 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	$\pm 8.5 \times 10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2. GENERAL INFORMATION

2.1. Product Details

EUT is a PDA Scanner with IEEE 802.11b/g and Bluetooth radio function. Only the radio detail of WLAN 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	5V DC from adapter ; 3.7V DC from battery
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11
Channel Band Width (99%)	11b: 12.56 MHz ; 11g: 16.41 MHz
Conducted Output Power	11b: 13.21 dBm ; 11g: 14.52 dBm

2.2. Accessories

Power	Brand	Model	Rating
Adapter 1	ENG	3A-181WP05	INPUT: 100-240V AC OUTPUT: 5V DC
Li-ion Battery	-	HNP-120	3.7V DC
Others			
Cradle / RJ-11 cable/ RS-232 cable / USB cable			

2.3. Table for Filed Antenna

Ant.	Antenna Type	Connector	Gain (dBi)
1	PIFA Antenna	UFL	0.38

2.4. Table for Carrier Frequencies

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		

2.5. Table for Test Modes

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

Test Items	Mode	Data Rate	Channel	WLAN Antenna
AC Power Line Conducted Emissions	Mode 1	11 Mbps	6	1
Maximum Peak Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth	11b/CCK	11 Mbps	1/6/11	NA
	11g/BPSK	6 Mbps	1/6/11	NA
Radiated Emissions 9kHz~1GHz	CCD Mode (BT+ 802.11bg) / Laser Mode (BT+ 802.11bg)	6 Mbps	6	1
Radiated Emissions 1GHz~10th Harmonic	802.11b on BT on	11 Mbps DH1	1/6/11 0/39/78	1
	802.11g on BT on	6 Mbps DH1	1/6/11 0/39/78	1
Band Edge Emissions	802.11b on BT on	11 Mbps DH1	1/11 0/78	1
	802.11g on BT on	6 Mbps DH1	1/11 0/78	1

The software limits the EUT to have only DH1 mode. **When measuring the radiated spurious emission of WLAN function, the Bluetooth function was turned on to evaluate the collocation effect.**

For EMI test, the following modes were pre-scanned:

Mode 1. RS232+ Cradle / Mode 2. RJ-11+ Cradle / Mode 3. USB+ Cradle

Mode 4. Bar code+ Cradle / Mode 5. Scanner+ Cradle / Mode 6. USB Mode

Cause “mode 1“generated the worst test result, it was reported as final data.

2.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH02-HY	SAC	Hwa Ya	101377	IC 4088	-
CO01-LK	Conduction	Hwa Ya	93596	IC 4087	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

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

Please refer section 6 for Test Site Address.

2.7. Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	Description
HT660-9026ABG	200MHz, 64/64, SE950, WinCE. NET English, CommBT+802.11b/g, S-Pack
HT660-9026TBG	200MHz, 64/64, SE950, WinCE. NET Traditional CHN, CommBT+802.11b/g, S-Pack
HT660-9026CBG	200MHz, 64/64, SE950, WinCE. NET Simple CHN, CommBT+802.11b/g, S-Pack
HT660-9026JBG	200MHz, 64/64, SE950, WinCE. NET Japanese, CommBT+802.11b/g, S-Pack
HT660-9026ACG	200MHz, 64/64, SE950, WinCE. NET English, CommBT+802.11b/g, L-Pack
HT660-9026TCG	200MHz, 64/64, SE950, WinCE. NET Traditional CHN, CommBT+802.11b/g, L-Pack
HT660-9026CCG	200MHz, 64/64, SE950, WinCE. NET Simple CHN, CommBT+802.11b/g, L-Pack
HT660-9026JCG	200MHz, 64/64, SE950, WinCE. NET Japanese, CommBT+802.11b/g, L-Pack
HT660-9046ABG	Intel PXA255, 64/64, SE950, WinCE. NET, MCL, English, CommBT+802.11b/g, S-Pack
HT660-9046ACG	Intel PXA255, 64/64, SE950, WinCE. NET, MCL, English, CommBT+802.11b/g, L-Pack
HT660-5026ABG	200MHz, 64/64, EV10, WinCE. NET English, CommBT+802.11b, S-Pack
HT660-5026TBG	200MHz, 64/64, EV10, WinCE. NET Traditional CHN, CommBT+802.11b, S-Pack
HT660-5026CBG	200MHz, 64/64, EV10, WinCE. NET Simple CHN, CommBT+802.11b, S-Pack
HT660-5026JBG	200MHz, 64/64, EV10, WinCE. NET Japanese, CommBT+802.11b, S-Pack
HT660-5026ACG	200MHz, 64/64, EV10, WinCE. NET English, CommBT+802.11b, L-Pack
HT660-5026TCG	200MHz, 64/64, EV10, WinCE. NET Traditional CHN, CommBT+802.11b, L-Pack
HT660-5026CCG	200MHz, 64/64, EV10, WinCE. NET Simple CHN, CommBT+802.11b, L-Pack
HT660-5026JCG	200MHz, 64/64, EV10, WinCE. NET Japanese, CommBT+802.11b, L-Pack

2.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
PC	COMPAQ	D330UT	DoC
Printer	HP	DJ 400	B94C2642X
Monitor	COMPAQ	S510	DoC
Keyboard (PS2)	COMPAQ	6511-VA	DoC
Mouse (PS2)	COMPAQ	M-S69	JNZ211443
Notebook (Remote workstation)	DELL	PP01L	DoC
Bluetooth Dongle (Remote workstation)	ERGOTECH	ET-BD201	DoC

2.9. Table for Parameters of Test Software Setting

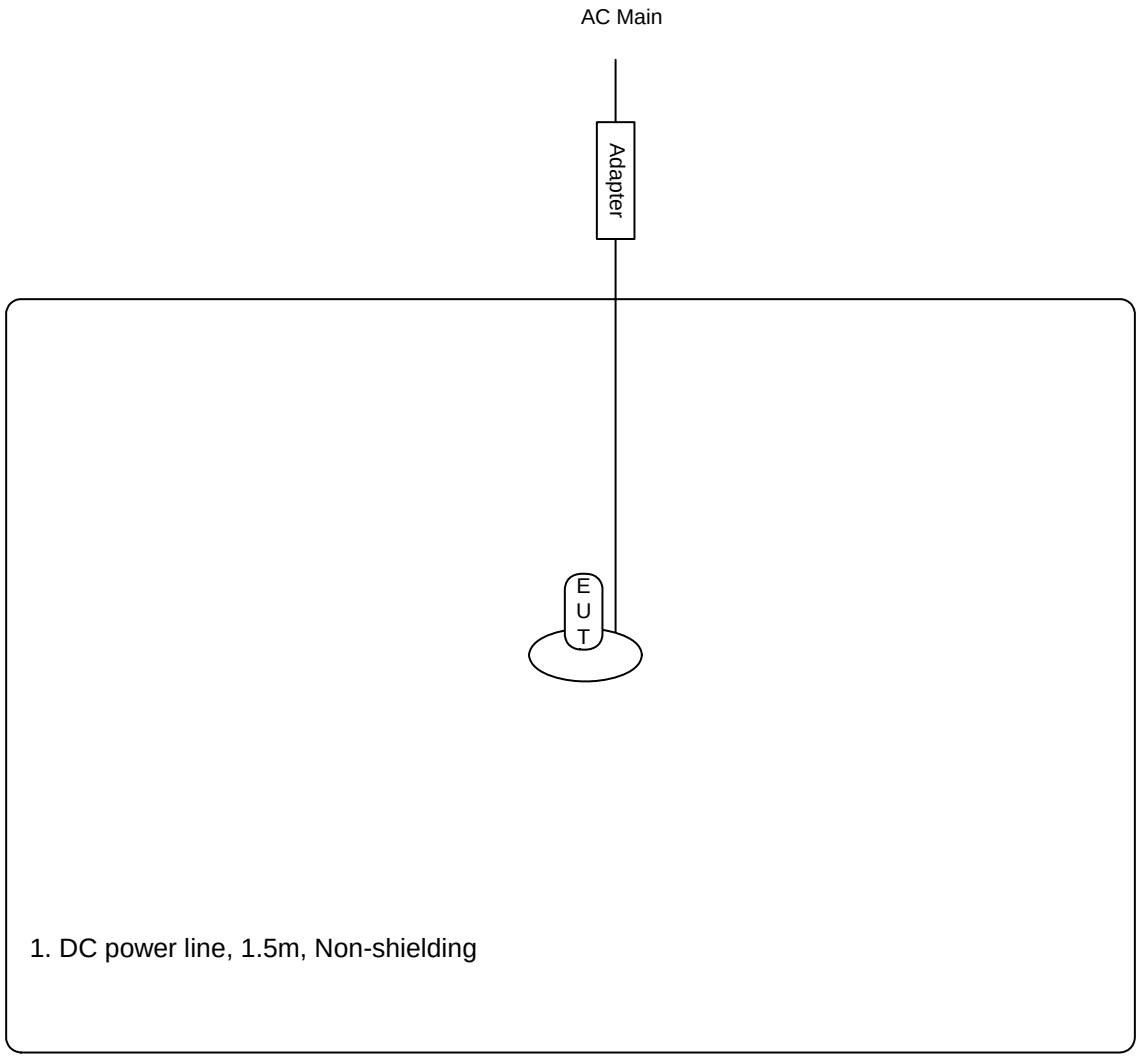
During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final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

Power Parameters of IEEE 802.11b/g

Test Software Version	WLANTEST		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	19.24	19.24	19.24
IEEE 802.11g	19.24	19.24	19.24

2.10. Test Configurations

2.10.1. Radiation Emissions Test Configuration



3. TEST RESULT

3.1. AC Power Line Conducted Emissions Measurement

3.1.1. Limit

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

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

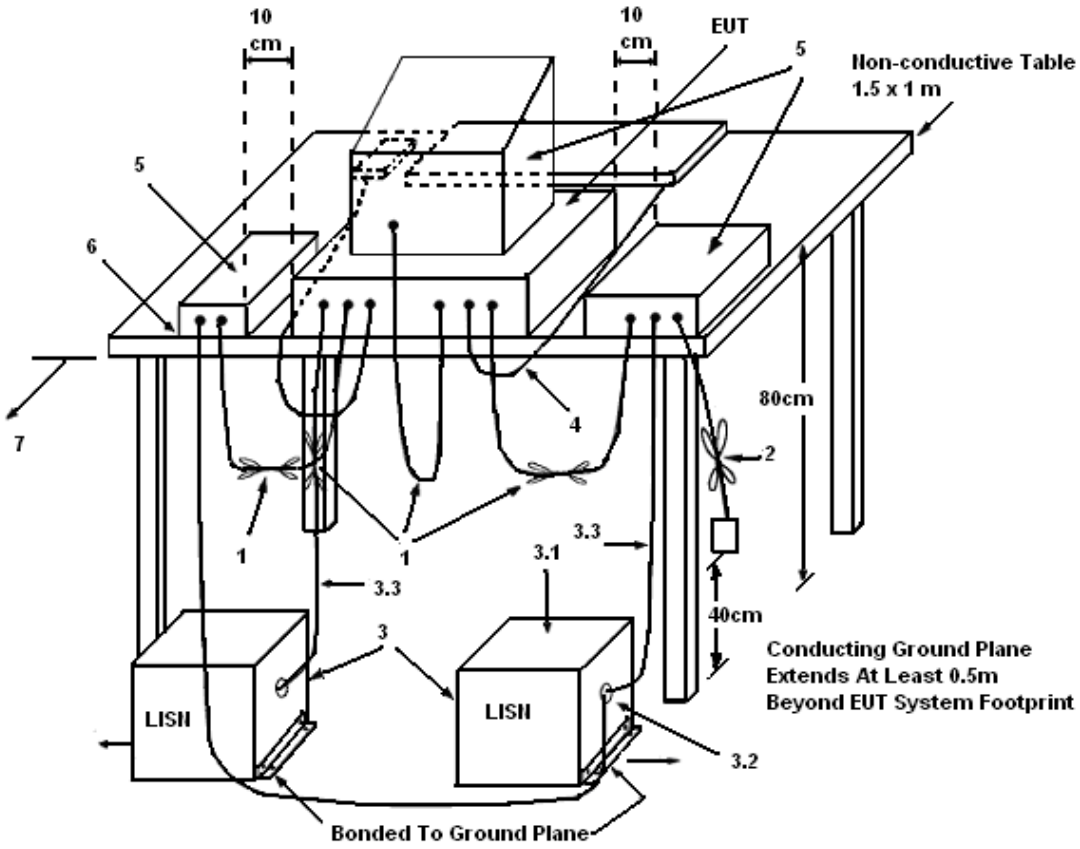
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

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

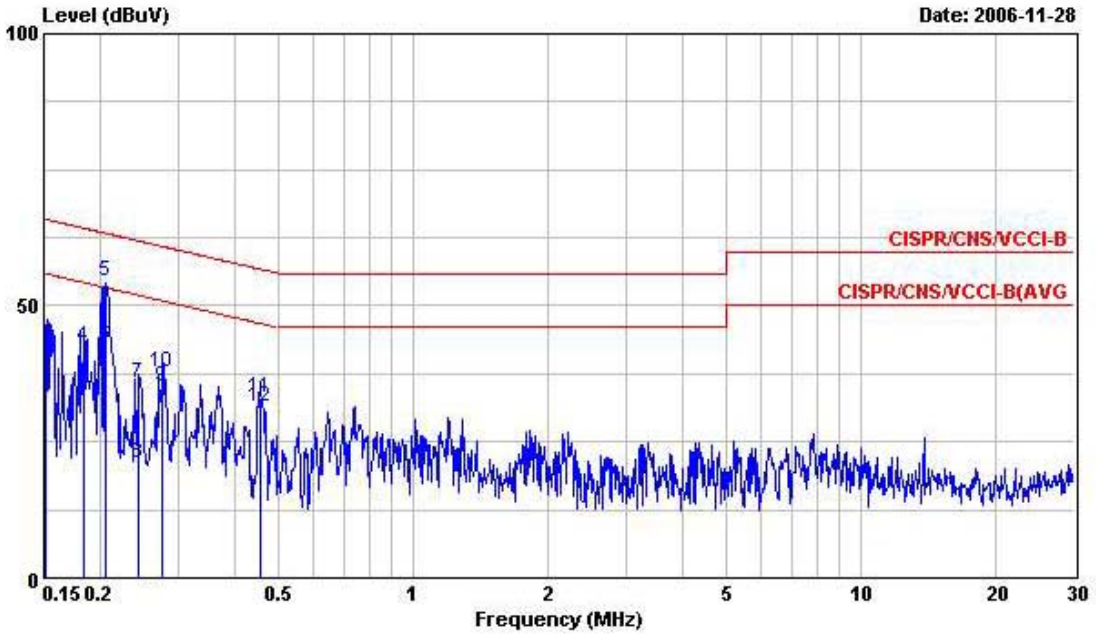
There is no deviation with the original standard.

3.1.6. EUT Operation during Test

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

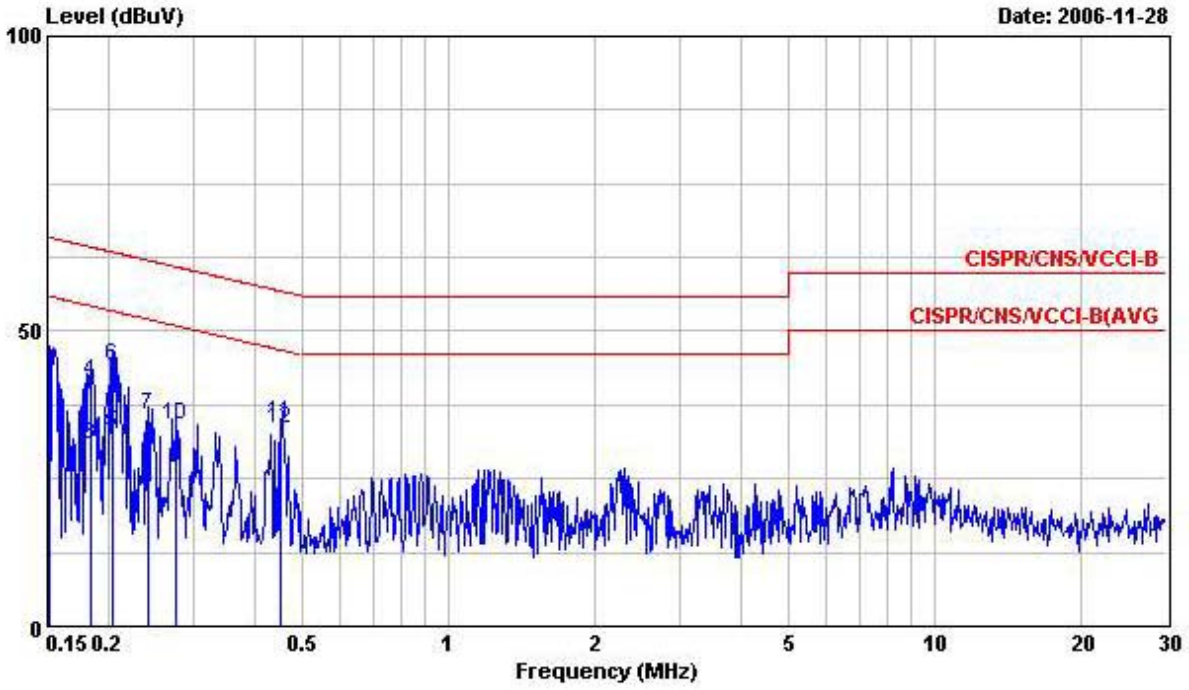
3.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23℃	**Humidity**	47%
Test Engineer	Peter	**Phase**	Line
Configuration	Mode1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 @	0.152	45.56	-20.33	65.89	45.44	0.10	0.02	QP
2 @	0.152	34.93	-20.96	55.89	34.81	0.10	0.02	Average
3 @	0.184	35.71	-18.59	54.30	35.57	0.10	0.04	Average
4	0.184	42.45	-21.85	64.30	42.31	0.10	0.04	QP
5 @	0.206	54.68	-8.69	63.37	54.54	0.10	0.04	QP
6 @	0.206	42.74	-10.63	53.37	42.60	0.10	0.04	Average
7	0.243	35.63	-26.36	61.99	35.49	0.10	0.04	QP
8	0.243	21.23	-30.76	51.99	21.09	0.10	0.04	Average
9 @	0.276	34.97	-15.97	50.94	34.83	0.10	0.04	Average
10	0.276	37.90	-23.04	60.94	37.76	0.10	0.04	QP
11	0.456	33.17	-23.60	56.77	33.02	0.10	0.05	QP
12 @	0.456	31.41	-15.36	46.77	31.26	0.10	0.05	Average

Temperature	23℃	**Humidity**	47%
Test Engineer	Peter	**Phase**	Neutral
Configuration	Mode1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 @	0.152	45.46	-20.43	65.89	45.34	0.10	0.02	QP
2	0.152	33.07	-22.82	55.89	32.95	0.10	0.02	Average
3	0.185	30.75	-23.51	54.26	30.61	0.10	0.04	Average
4	0.185	41.36	-22.90	64.26	41.22	0.10	0.04	QP
5 @	0.205	32.90	-20.51	53.41	32.76	0.10	0.04	Average
6 @	0.205	44.21	-19.20	63.41	44.07	0.10	0.04	QP
7	0.242	35.63	-26.40	62.03	35.49	0.10	0.04	QP
8	0.242	25.14	-26.89	52.03	25.00	0.10	0.04	Average
9	0.276	26.65	-24.29	50.94	26.51	0.10	0.04	Average
10	0.276	34.15	-26.79	60.94	34.01	0.10	0.04	QP
11	0.453	34.62	-22.19	56.81	34.47	0.10	0.05	QP
12 @	0.453	33.45	-13.36	46.81	33.30	0.10	0.05	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 limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

3.2.2. Measuring Instruments and Setting

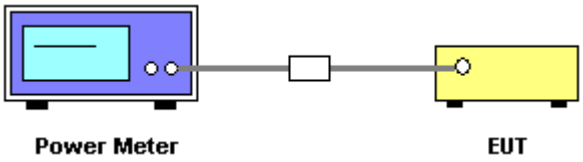
Please refer to section 4 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Peak Sensor	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 needed to be tested.

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

Temperature	26.8℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	802.11b/g

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	12.89	30.00	**Complies**
6	2437 MHz	12.54	30.00	**Complies**
11	2462 MHz	13.21	30.00	**Complies**

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	14.52	30.00	**Complies**
6	2437 MHz	14.23	30.00	**Complies**
11	2462 MHz	14.36	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

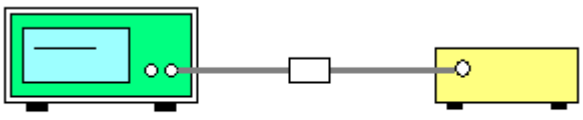
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum 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 analyser.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.

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

Temperature	26.8℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	802.11b/g

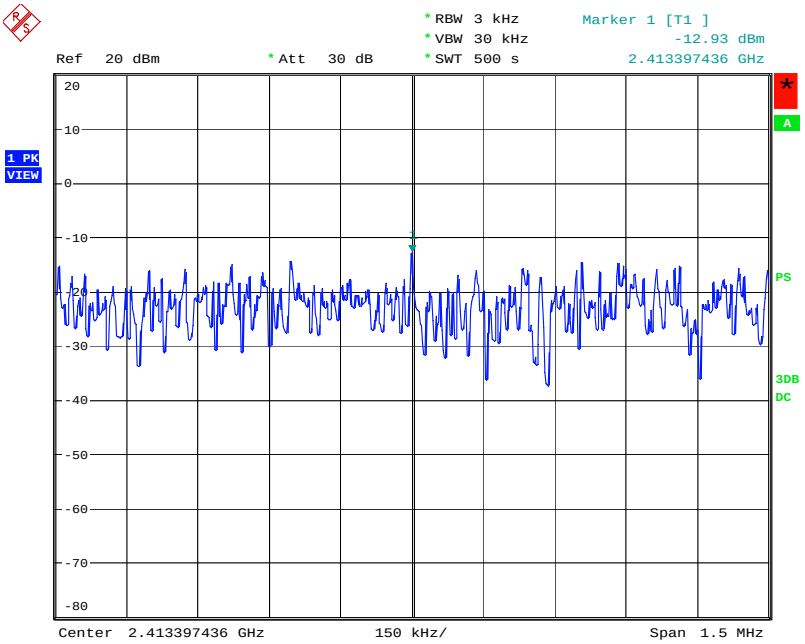
Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-12.93	8.00	**Complies**
6	2437 MHz	-13.43	8.00	**Complies**
11	2462 MHz	-12.76	8.00	**Complies**

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-13.93	8.00	**Complies**
6	2437 MHz	-15.13	8.00	**Complies**
11	2462 MHz	-13.44	8.00	**Complies**

Power Density Plot on Configuration IEEE 802.11b / 2412 MHz



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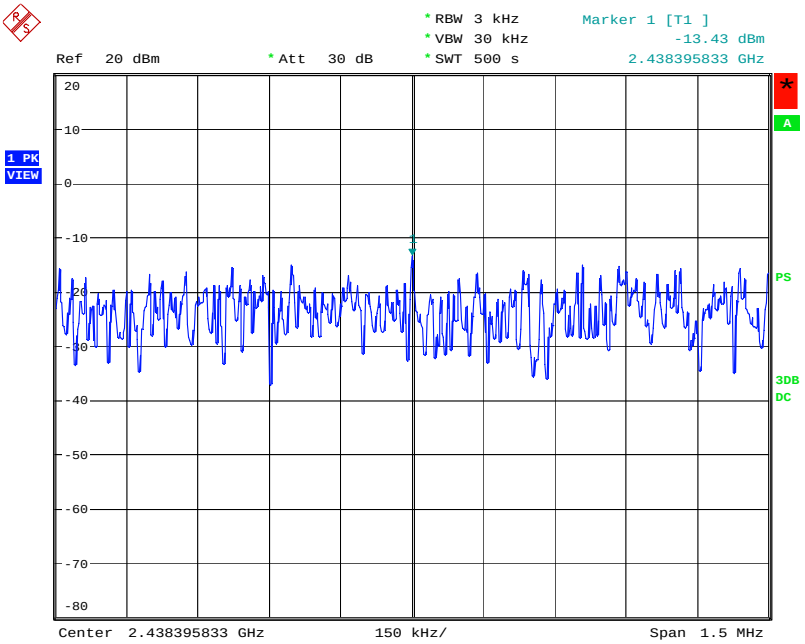
Power Density Plot on Configuration IEEE 802.11b / 2437 MHz



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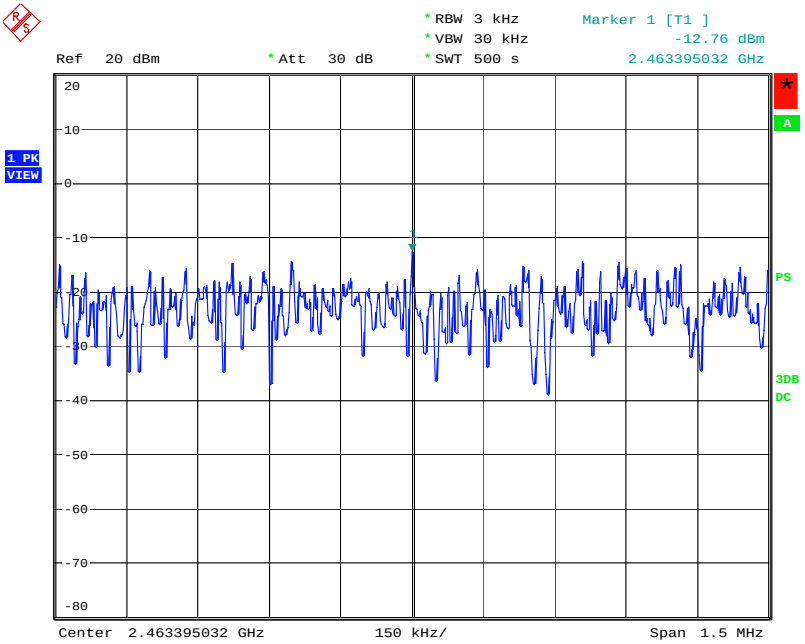
Power Density Plot on Configuration IEEE 802.11b / 2462 MHz



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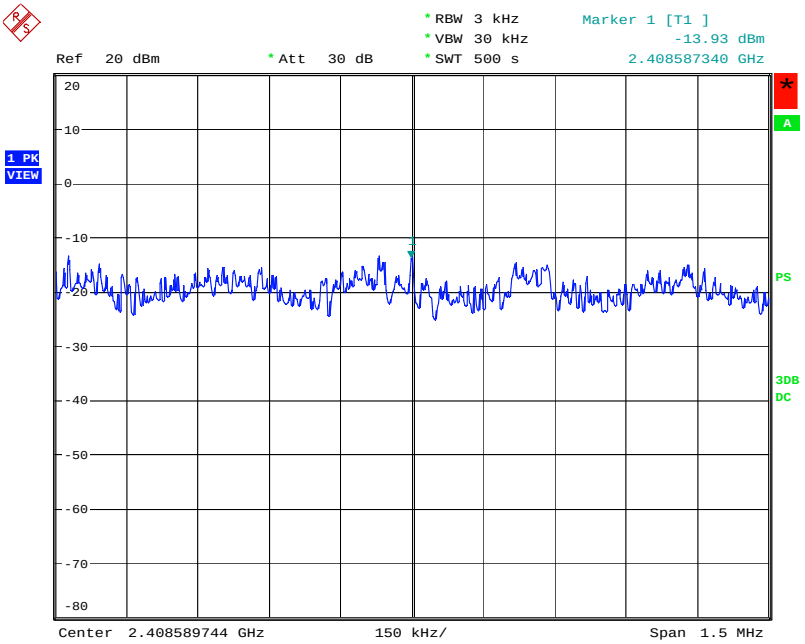
Power Density Plot on Configuration IEEE 802.11g / 2412 MHz



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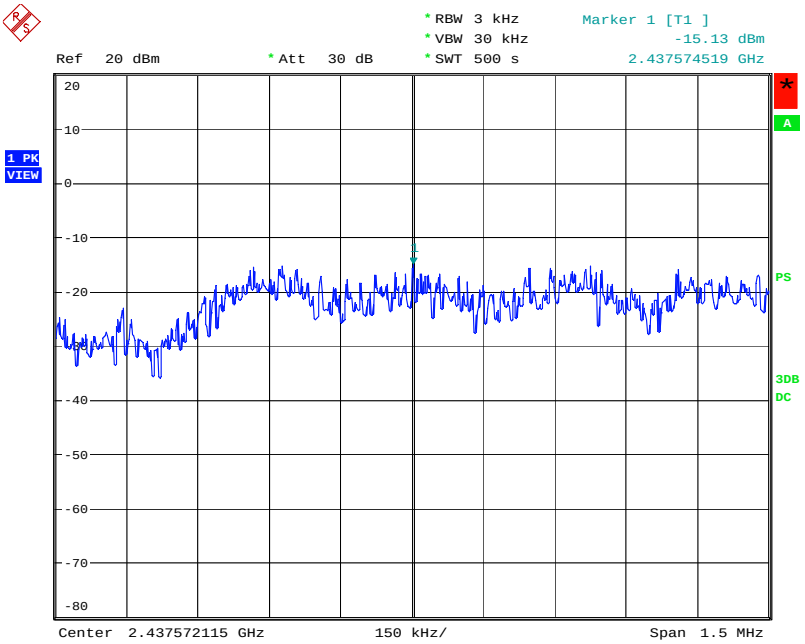
Power Density Plot on Configuration IEEE 802.11g / 2437 MHz



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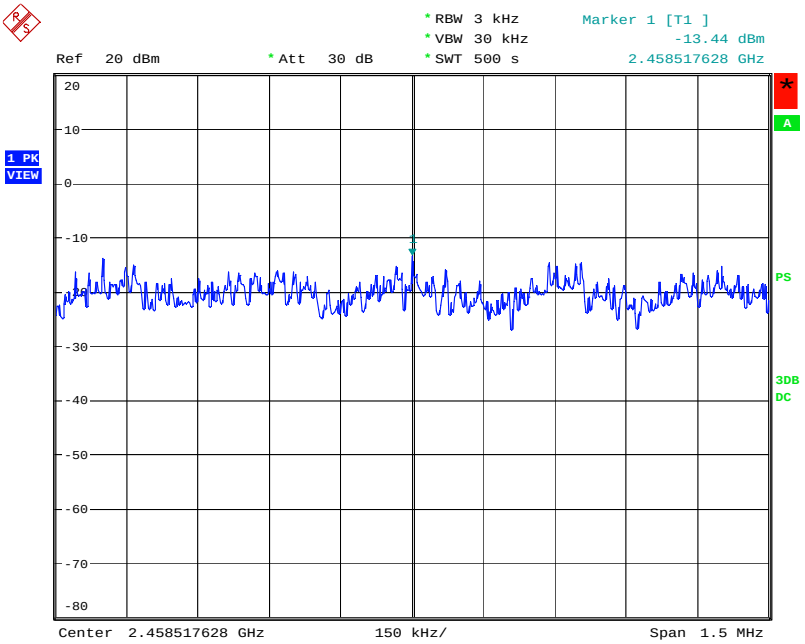
Power Density Plot on Configuration IEEE 802.11g / 2462 MHz



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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

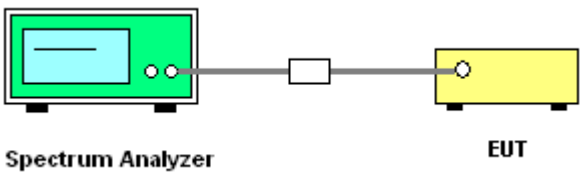
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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.

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

Temperature	26.8℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	802.11b/g

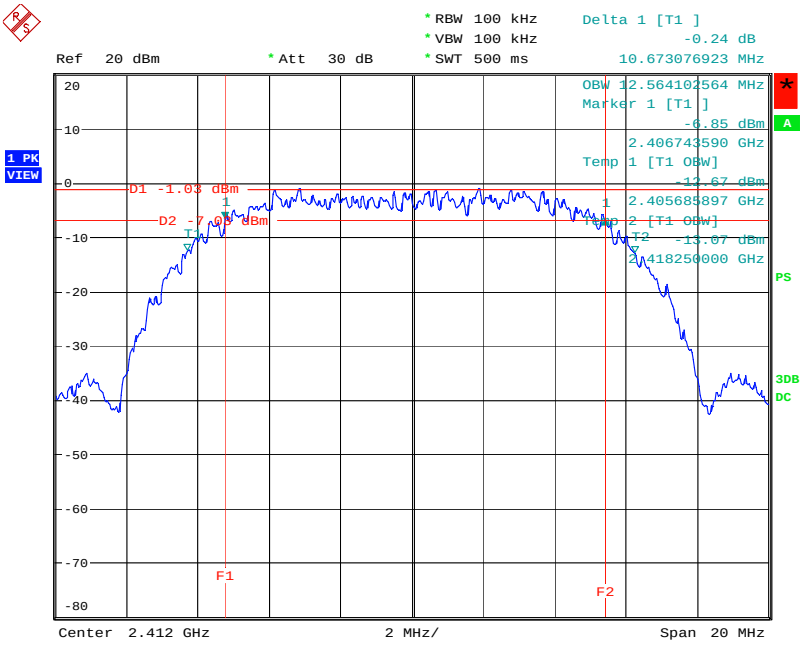
Configuration IEEE 802.11b

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	10.67	12.56	500	**Complies**
6	2437 MHz	10.64	12.53	500	**Complies**
11	2462 MHz	10.64	12.53	500	**Complies**

Configuration IEEE 802.11g

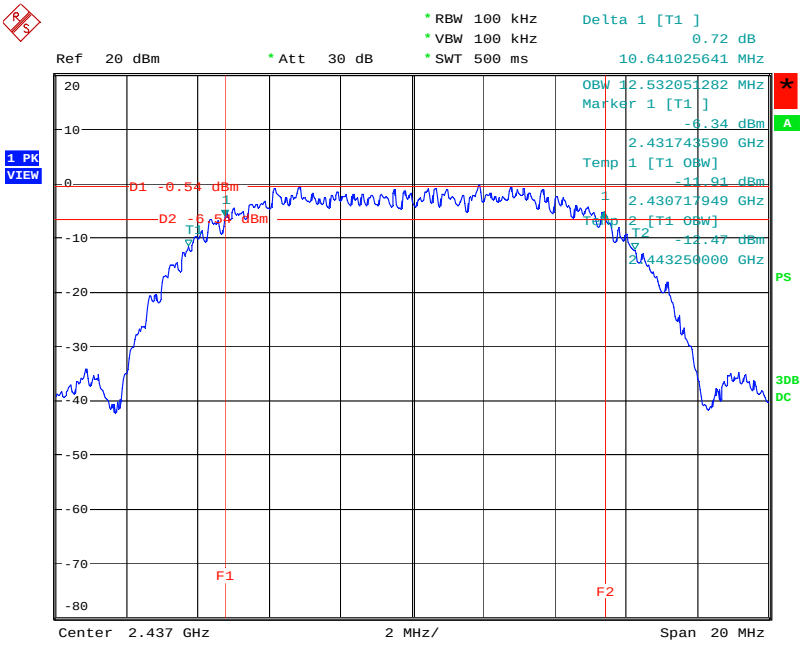
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.34	16.41	500	**Complies**
6	2437 MHz	16.02	16.37	500	**Complies**
11	2462 MHz	16.34	16.41	500	**Complies**

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



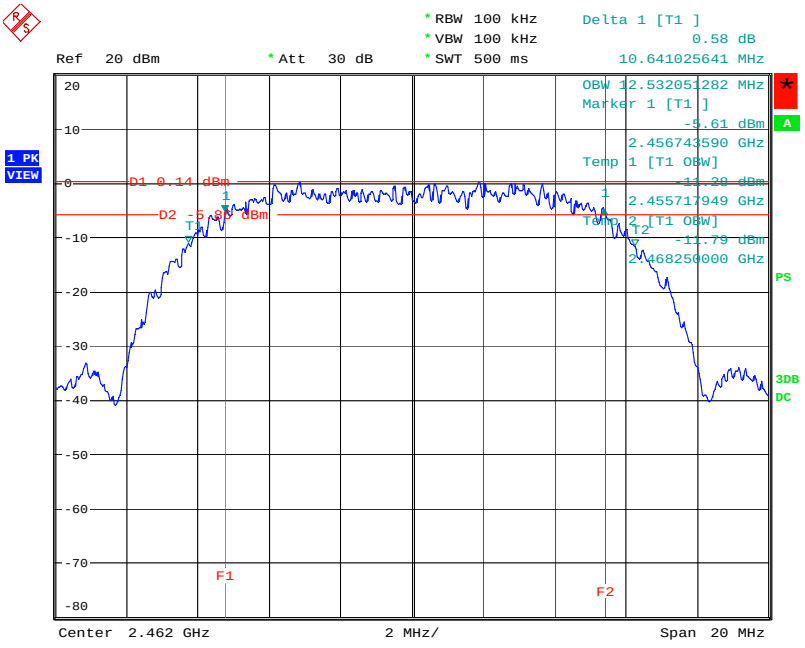
Date: 1.FEB.2007 03:37:47

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

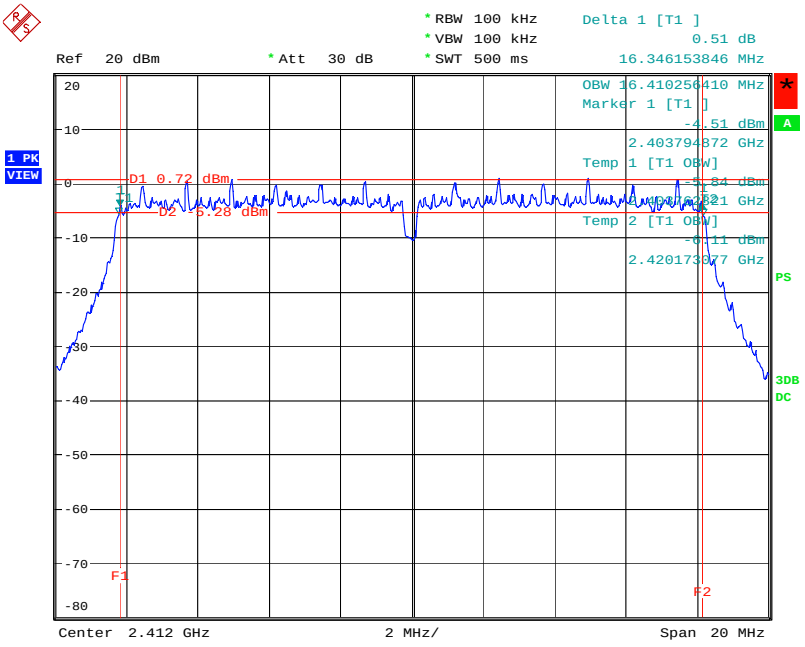


Date: 1.FEB.2007 03:42:26

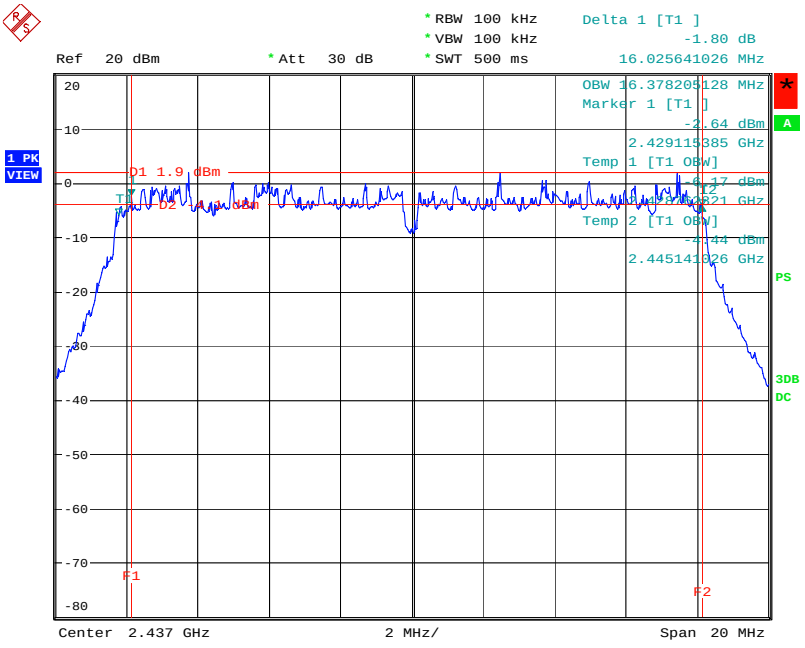
6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz



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

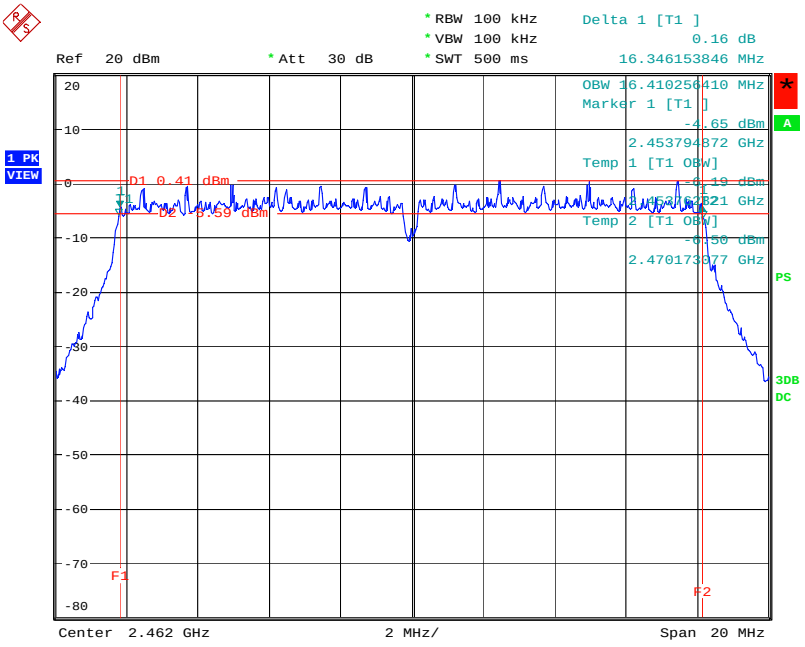


6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz



Date: 1.FEB.2007 18:17:36

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



Date: 1.FEB.2007 18:27:31

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)	100KHz / 100KHz for peak

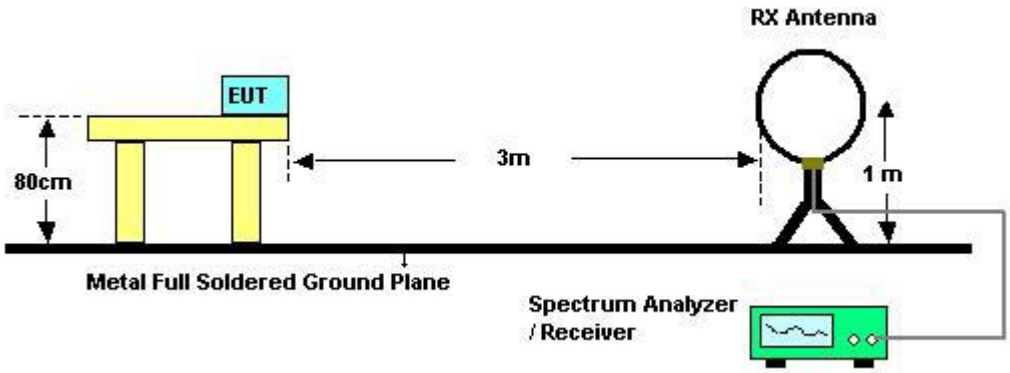
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.5.3. Test Procedures

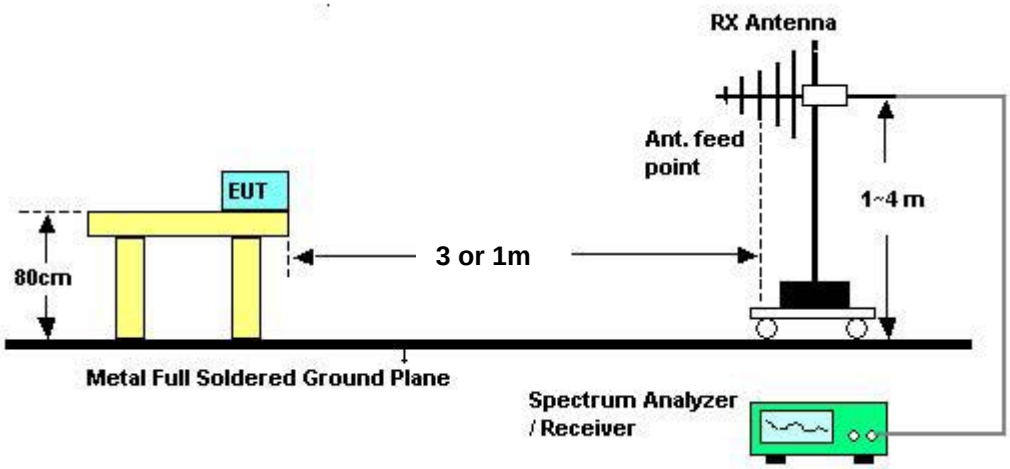
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

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

3.5.5. Test Deviation

There is no deviation with the original standard.

3.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	24℃	**Humidity**	56%
Test Engineer	Vic Hsiao		

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

Note:

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

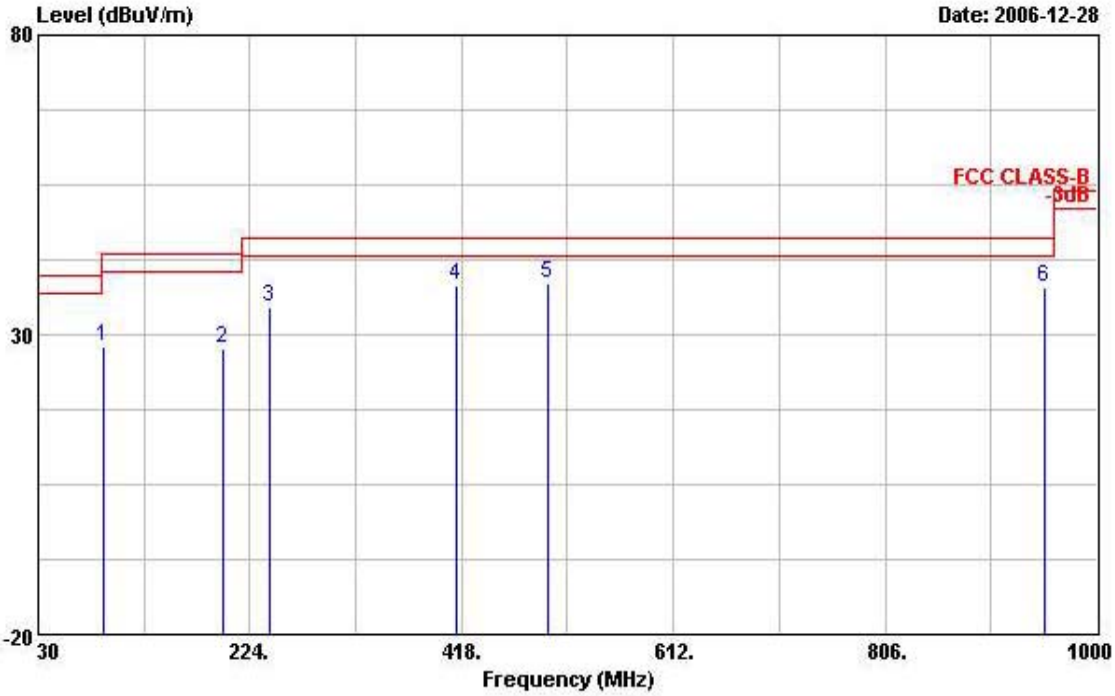
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

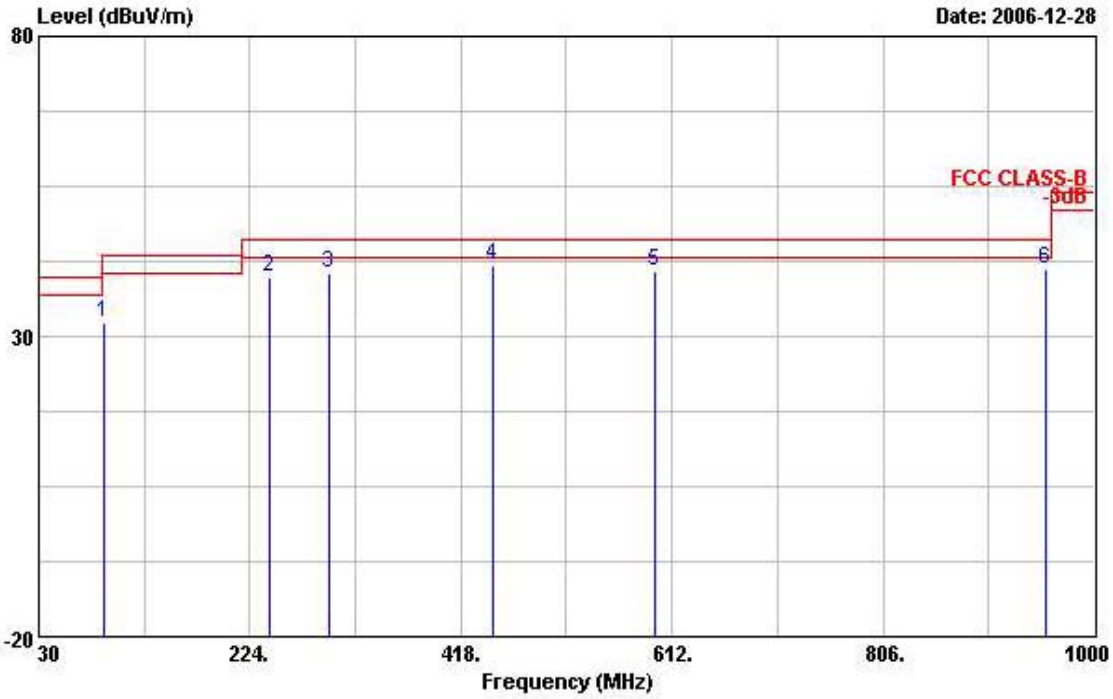
Temperature	24℃	**Humidity**	56%
Test Engineer	Vic Hsiao	**Configurations**	CCD Mode (BT+ 802.11bg)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	90.140	27.91	-15.59	43.50	44.92	9.50	1.30	27.81	Peak	---	---
2 @	198.780	27.80	-15.70	43.50	44.05	9.61	2.30	28.16	Peak	---	---
3 @	242.430	34.76	-11.24	46.00	48.60	11.88	2.64	28.36	Peak	---	---
4 @	413.150	38.12	-7.88	46.00	46.67	17.00	3.46	29.01	Peak	---	---
5 @	497.540	38.44	-7.56	46.00	46.23	18.08	3.81	29.68	Peak	---	---
6 @	952.470	37.94	-8.06	46.00	40.62	21.31	5.60	29.59	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	90.140	32.29	-11.21	43.50	49.30	9.50	1.30	27.81	Peak	---	---
2 @	242.430	39.97	-6.03	46.00	53.81	11.88	2.64	28.36	Peak	---	---
3 @	296.750	40.48	-5.52	46.00	52.73	13.53	2.81	28.59	Peak	---	---
4 @	448.070	41.83	-4.17	46.00	50.33	17.08	3.64	29.23	Peak	---	---
5 @	595.510	40.91	-5.09	46.00	46.90	19.30	4.39	29.68	Peak	---	---
6 @	956.350	41.28	-4.72	46.00	43.93	21.28	5.65	29.58	Peak	---	---

Note:

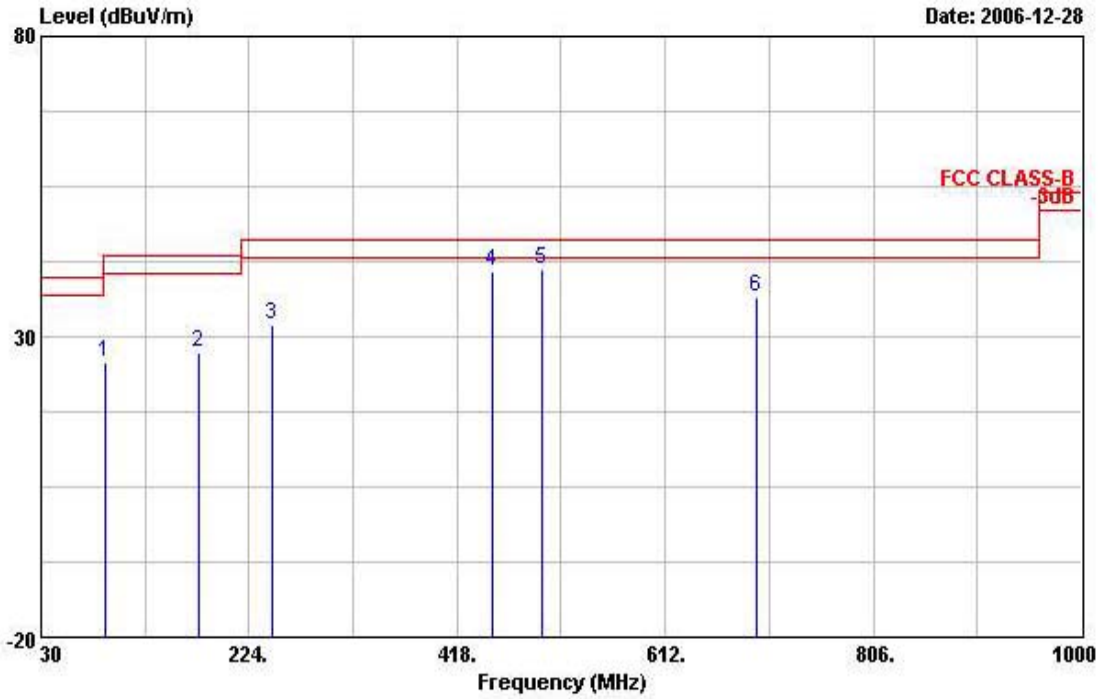
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

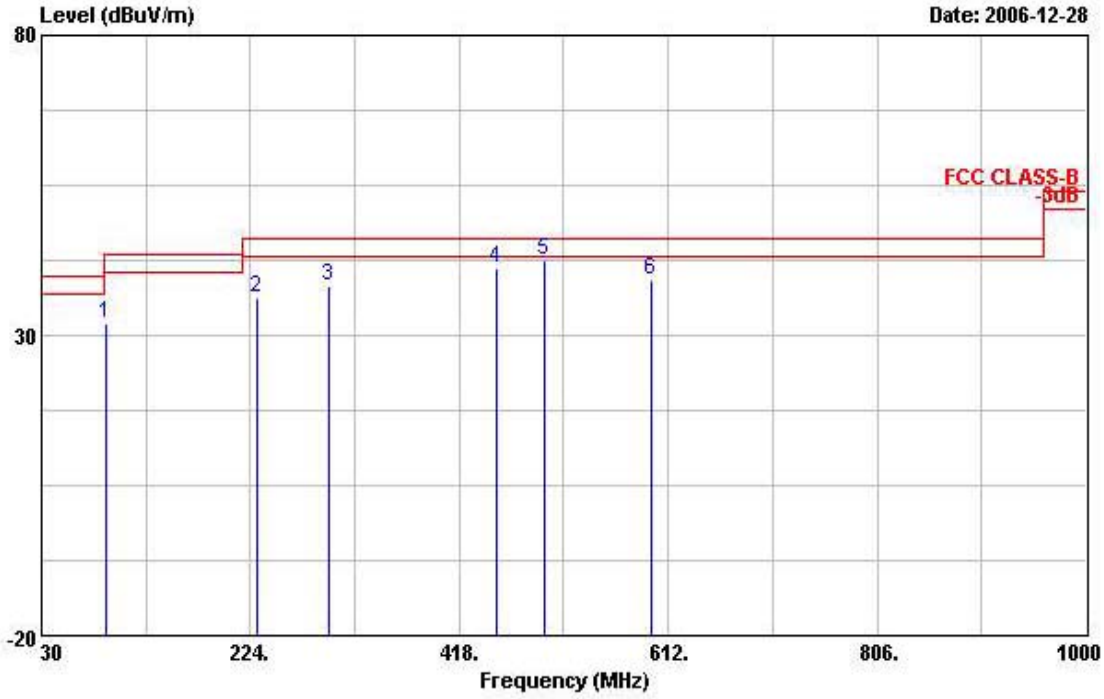
Temperature	24℃	**Humidity**	56%
Test Engineer	Vic Hsiao	**Configurations**	Laser Mode (BT+ 802.11bg)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	90.140	25.56	-17.94	43.50	42.57	9.50	1.30	27.81	Peak	---	---
2 @	176.470	27.33	-16.17	43.50	43.81	9.31	2.22	28.01	Peak	---	---
3 @	245.340	31.99	-14.01	46.00	45.59	12.18	2.58	28.36	Peak	---	---
4 @	450.980	40.90	-5.10	46.00	49.39	17.13	3.66	29.28	Peak	---	---
5 @	497.540	41.17	-4.83	46.00	48.96	18.08	3.81	29.68	Peak	---	---
6 @	696.390	36.74	-9.26	46.00	42.10	19.94	4.62	29.92	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	90.140	31.89	-11.61	43.50	48.90	9.50	1.30	27.81	Peak	---	---
2 @	230.790	36.39	-9.61	46.00	51.81	10.48	2.47	28.36	Peak	---	---
3 @	296.750	38.23	-7.77	46.00	50.48	13.53	2.81	28.59	Peak	---	---
4 @	451.950	41.09	-4.91	46.00	49.58	17.15	3.67	29.30	Peak	---	---
5 @	497.540	42.35	-3.65	46.00	50.14	18.08	3.81	29.68	Peak	---	---
6 @	595.510	39.33	-6.67	46.00	45.32	19.30	4.39	29.68	Peak	---	---

Note:

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

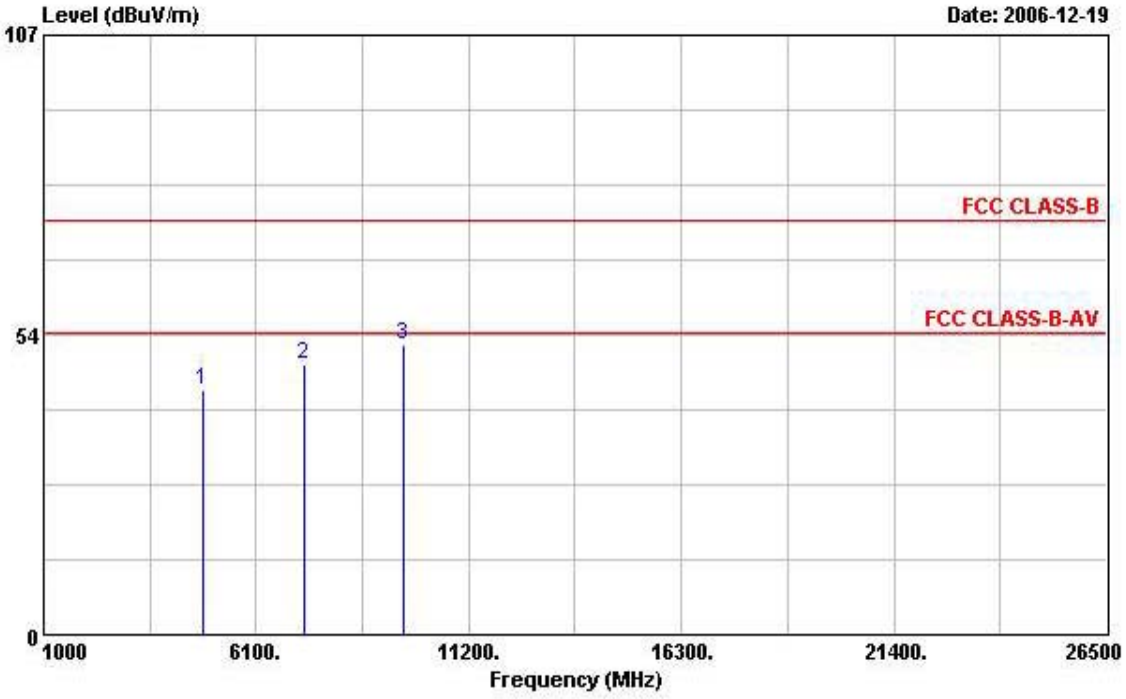
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

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

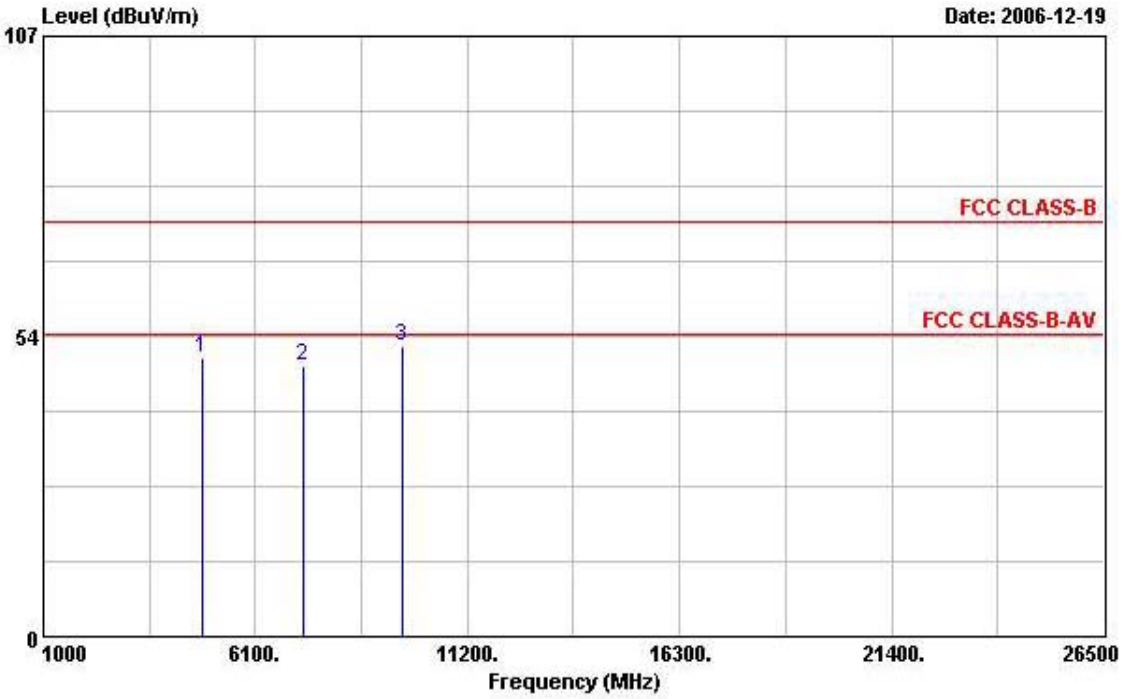
Temperature	24℃	**Humidity**	56%
Test Engineer	Duncan	**Configurations**	CH 1 (BT+ 802.11b)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	4824.000	43.81	-30.19	74.00	40.40	33.09	2.65	32.32	PEAK	---	---
2 @	7232.000	48.14	-25.86	74.00	41.39	35.98	3.32	32.55	PEAK	---	---
3 @	9648.000	51.73	-22.27	74.00	41.41	38.58	4.54	32.80	PEAK	---	---

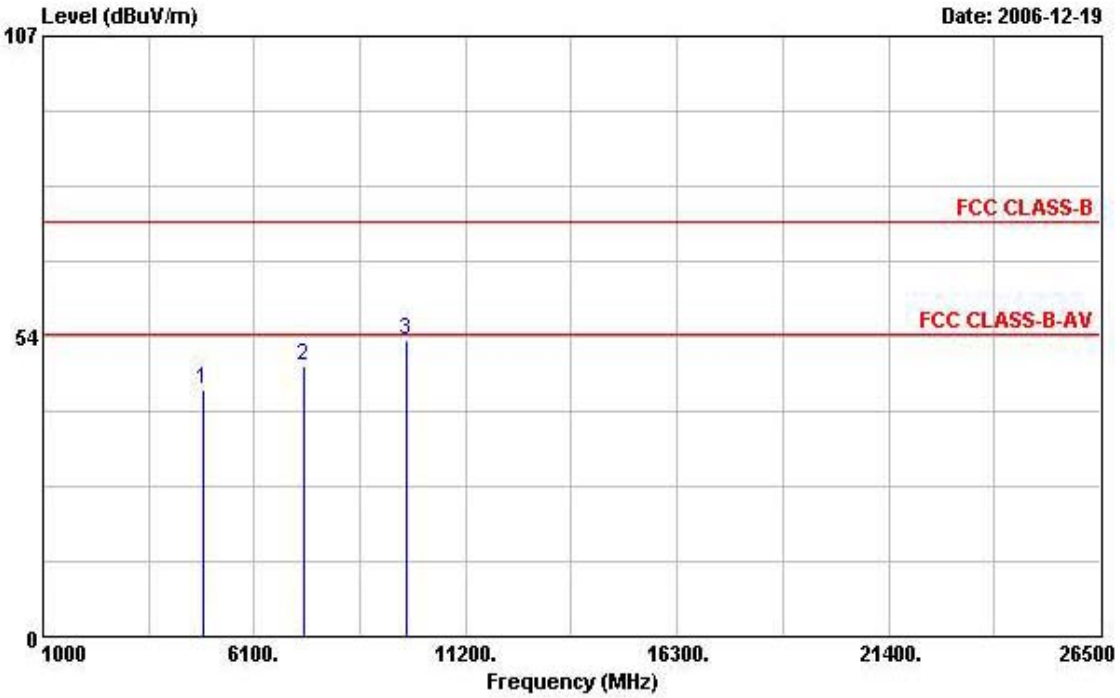
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	4824.000	49.78	-24.22	74.00	46.36	33.09	2.65	32.32	Peak	---	---
2 @	7232.000	48.22	-25.78	74.00	41.47	35.98	3.32	32.55	Peak	---	---
3 @	9648.000	51.83	-22.17	74.00	41.51	38.58	4.54	32.80	PEAK	---	---

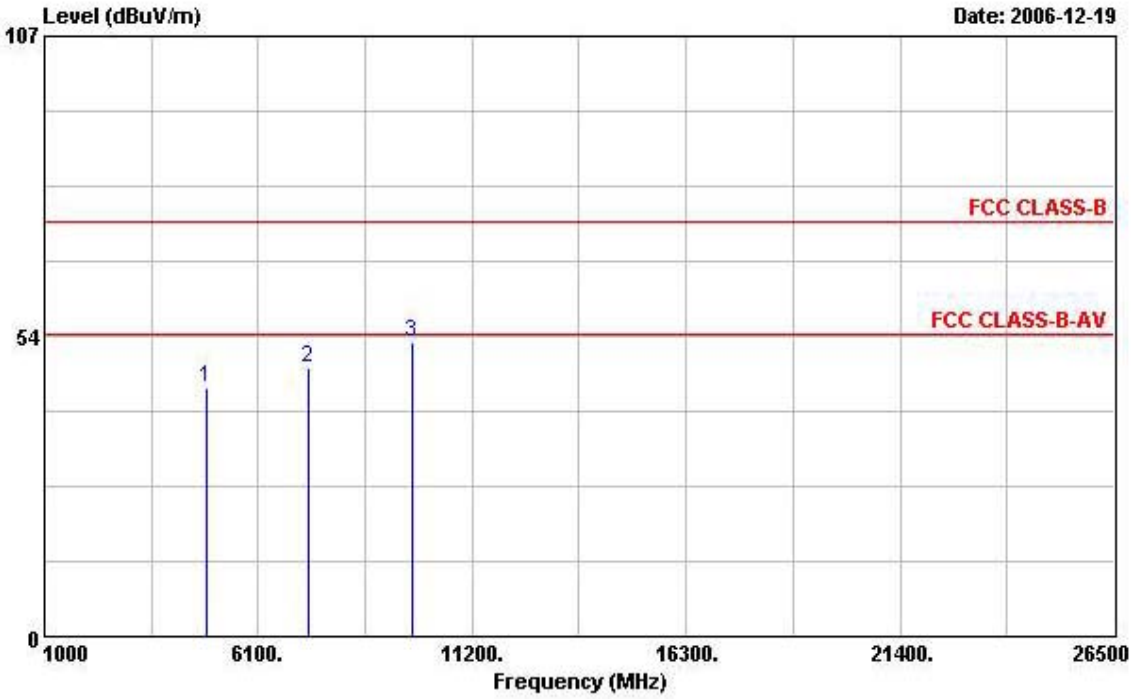
Temperature	24℃	**Humidity**	56%
Test Engineer	Duncan	**Configurations**	CH 6 (BT+ 802.11b)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	4874.000	44.05	-29.95	74.00	40.48	33.18	2.69	32.30	PEAK	---	---
2 @	7315.000	48.37	-25.63	74.00	41.45	36.14	3.38	32.61	PEAK	---	---
3 @	9748.000	52.74	-21.26	74.00	42.18	38.77	4.59	32.80	PEAK	---	---

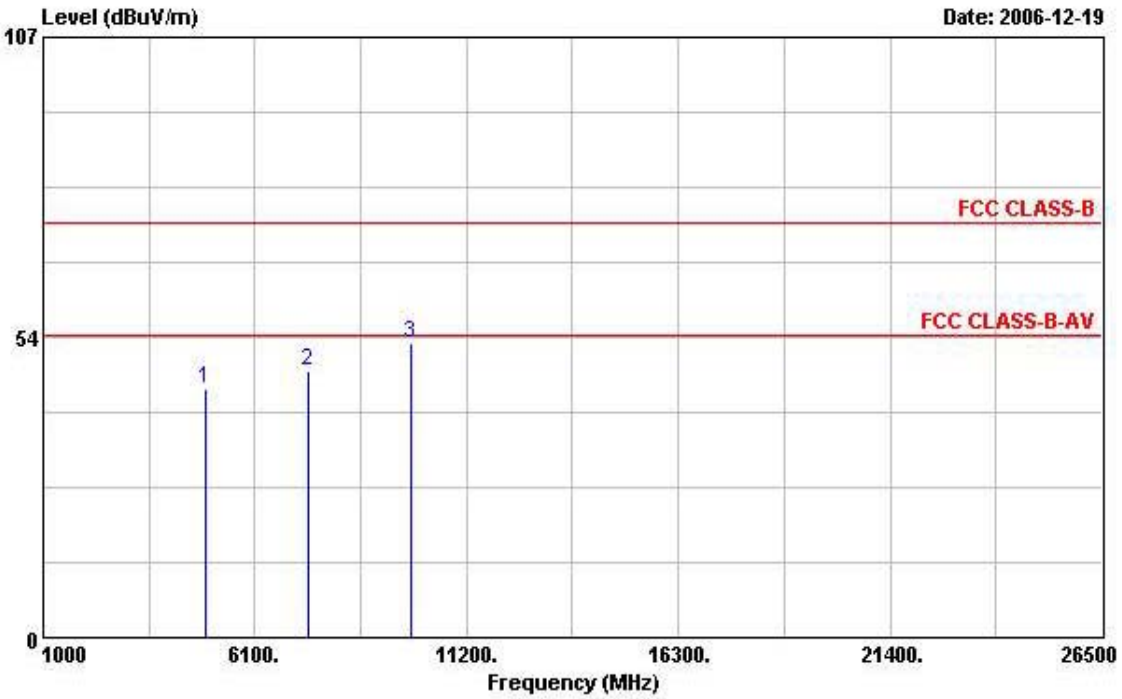
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	4878.000	44.33	-29.67	74.00	40.76	33.18	2.69	32.30	PEAK	---	---
2 @	7315.000	47.93	-26.07	74.00	41.01	36.14	3.38	32.61	PEAK	---	---
3 @	9748.000	52.38	-21.62	74.00	41.82	38.77	4.59	32.80	PEAK	---	---

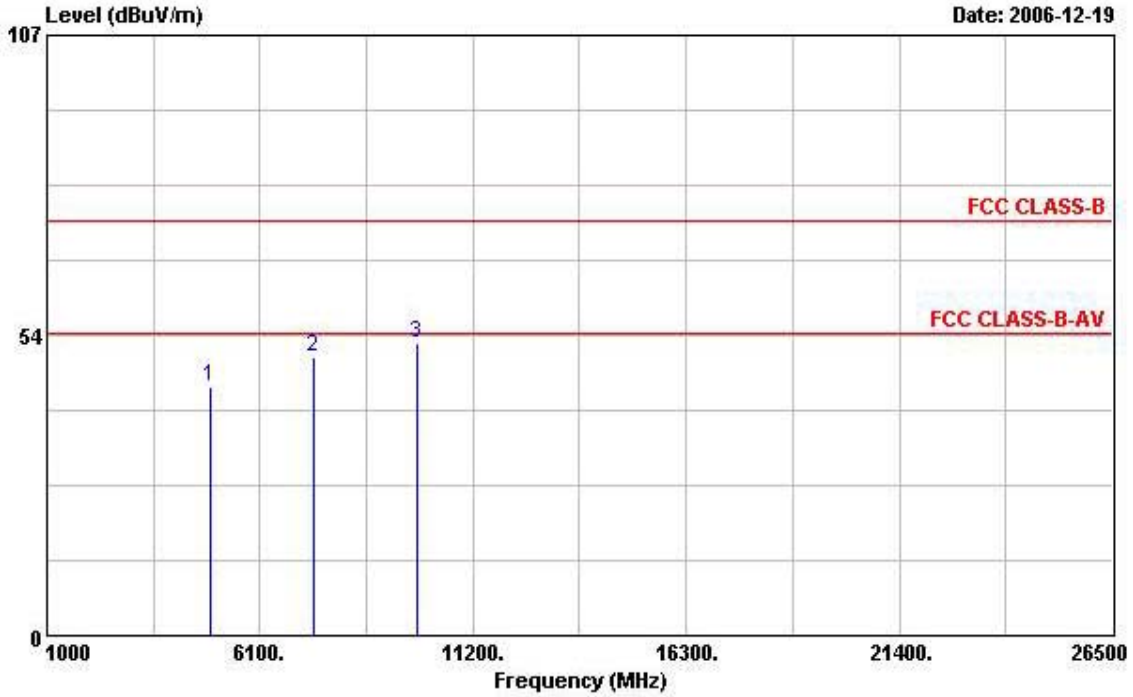
Temperature	24℃	**Humidity**	56%
Test Engineer	Duncan	**Configurations**	CH 11 (BT+ 802.11b)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	4924.000	44.23	-29.77	74.00	40.52	33.28	2.71	32.28	PEAK	---	---
2 @	7382.000	47.52	-26.48	74.00	40.40	36.31	3.44	32.63	PEAK	---	---
3 @	9848.000	52.34	-21.66	74.00	41.59	38.92	4.62	32.79	PEAK	---	---

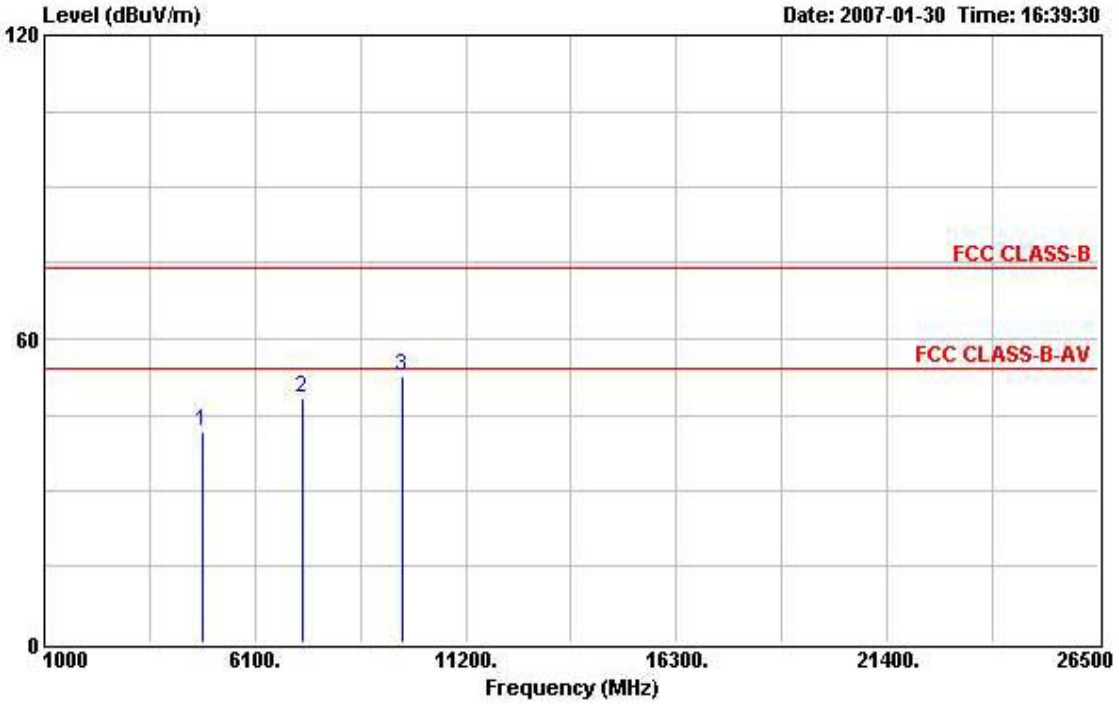
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	4924.000	44.34	-29.66	74.00	40.63	33.28	2.71	32.28	PEAK	---	---
2 @	7382.000	49.50	-24.50	74.00	42.38	36.31	3.44	32.63	PEAK	---	---
3 @	9844.000	52.24	-21.76	74.00	41.50	38.92	4.62	32.79	PEAK	---	---

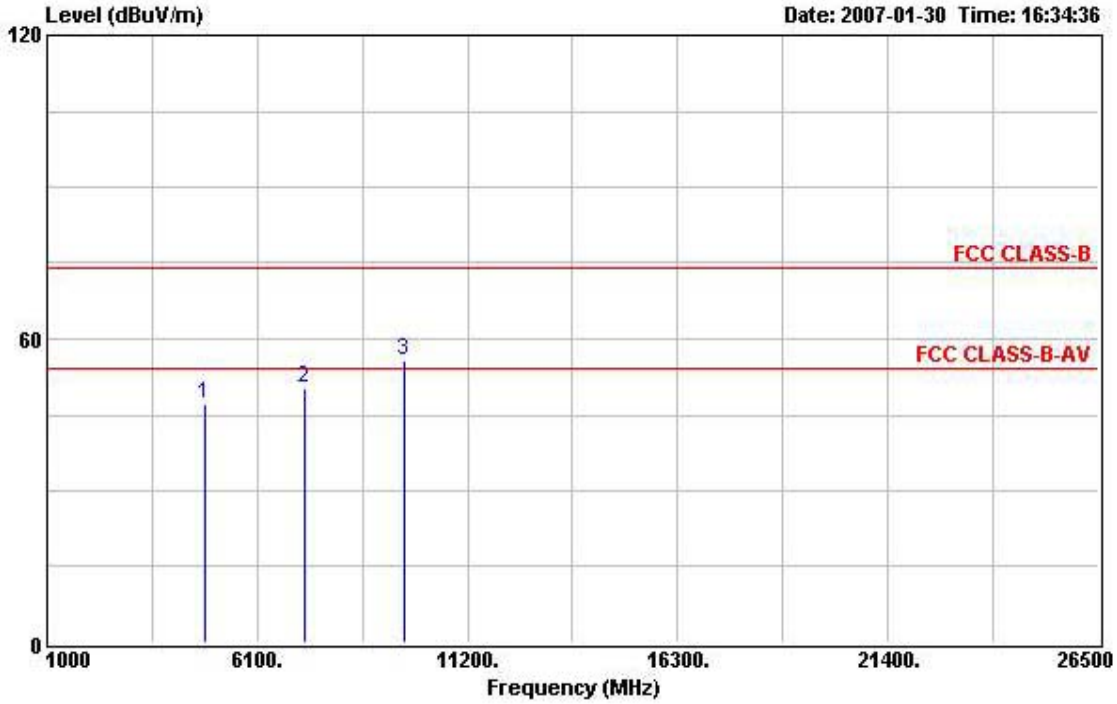
Temperature	24℃	**Humidity**	56%
Test Engineer	Duncan	**Configurations**	CH 1 (BT+ 802.11g)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB		cm	deg
1	4824.000	41.79	-32.21	74.00	32.54	3.16		---	---
2	7236.000	48.15	-25.85	74.00	33.72	3.88		---	---
3	9648.000	52.41	-21.59	74.00	35.74	4.76		---	---

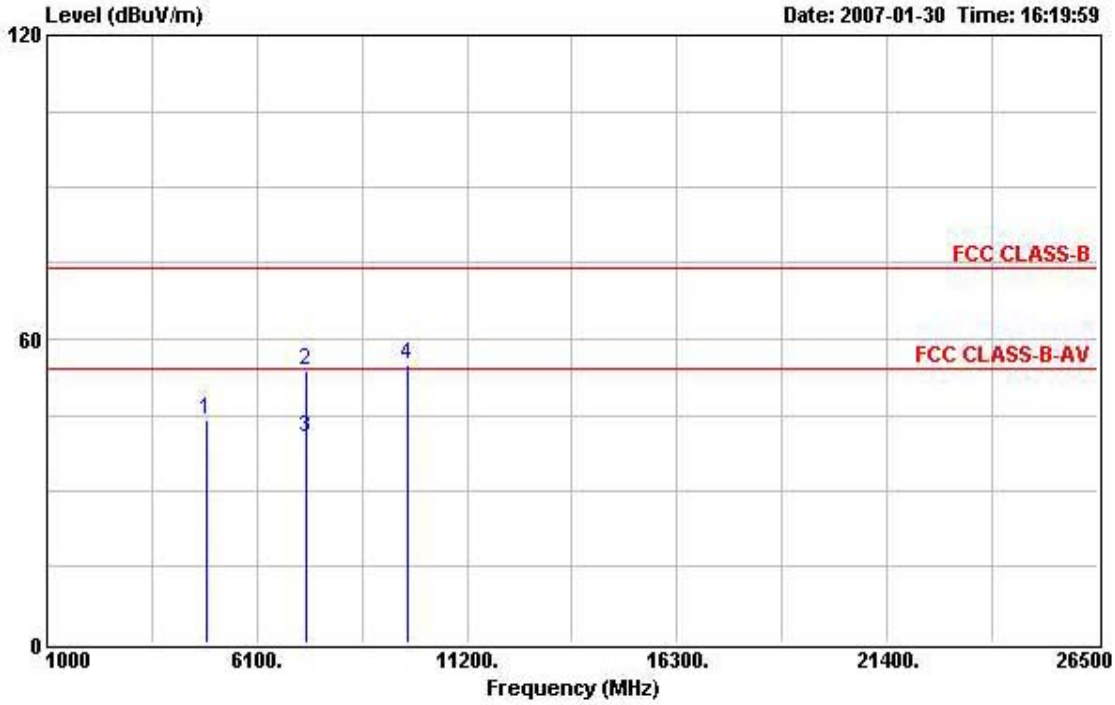
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB		cm	deg
1	4824.000	47.06	-26.94	74.00	37.81	3.16	Peak	---	---
2	7236.000	50.23	-23.77	74.00	35.80	3.88	Peak	---	---
3	9648.000	55.57	-18.43	74.00	38.90	4.76	Peak	---	---

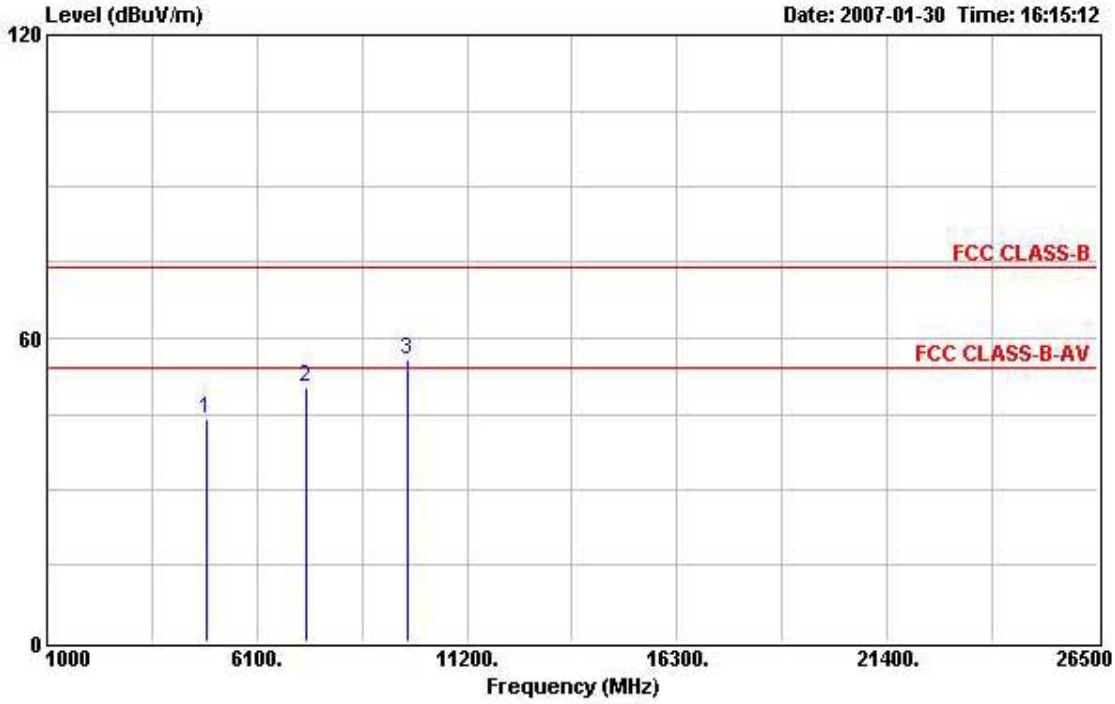
Temperature	24℃	**Humidity**	56%
Test Engineer	Duncan	**Configurations**	CH 6 (BT+ 802.11g)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB		cm	deg
1	4874.000	44.11	-29.89	74.00	34.79	3.17	Peak	---	---
2	7311.000	53.79	-20.21	74.00	39.35	3.88	Peak	---	---
3	7311.000	40.39	-13.61	54.00	25.95	3.88	Average	---	---
4	9748.000	54.89	-19.11	74.00	38.65	4.72	Peak	---	---

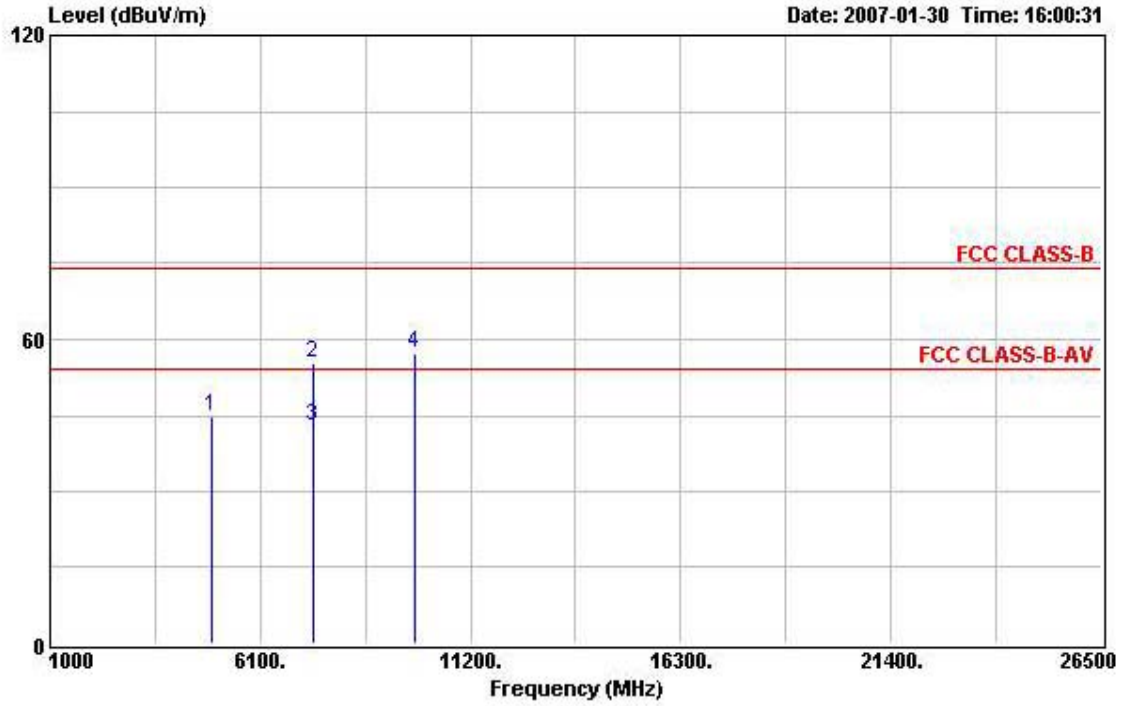
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB		cm	deg
1	4874.000	44.20	-29.80	74.00	34.88	3.17	Peak	---	---
2	7311.000	50.07	-23.93	74.00	35.63	3.88	Peak	---	---
3	9748.000	55.89	-18.11	74.00	39.65	4.72	Peak	---	---

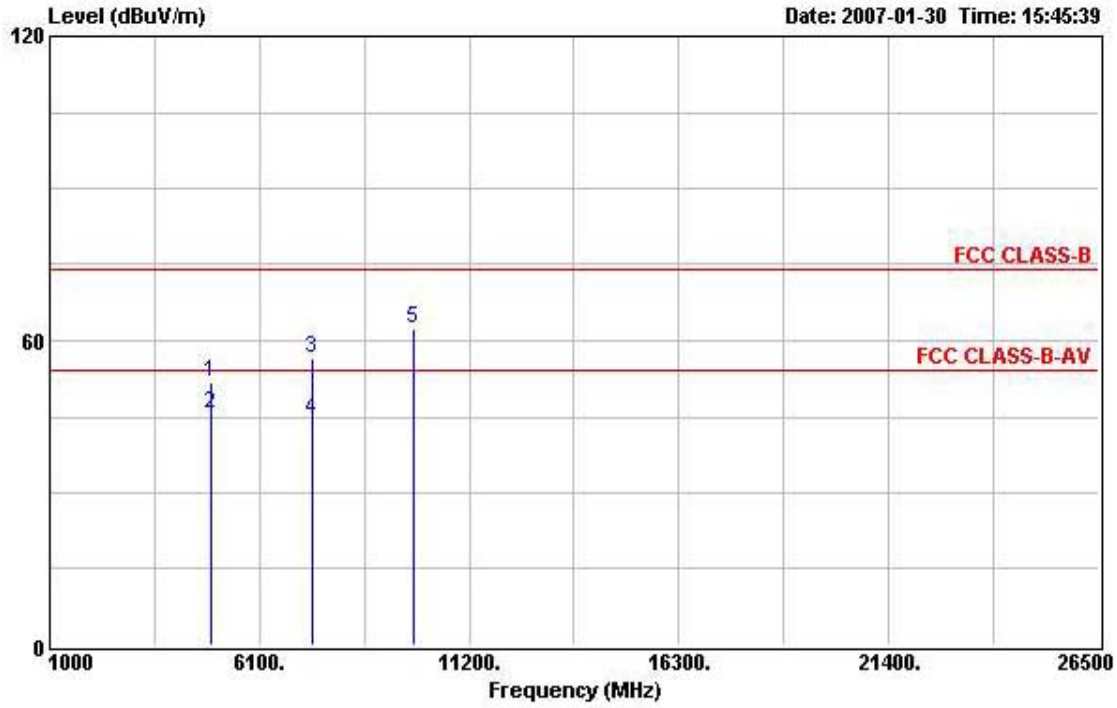
Temperature	24℃	**Humidity**	56%
Test Engineer	Duncan	**Configurations**	CH 11 (BT+ 802.11g)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB		cm	deg
1	4924.000	44.90	-29.10	74.00	35.51	3.17	Peak	---	---
2	7386.000	55.23	-18.77	74.00	40.77	3.88	Peak	---	---
3	7386.000	42.99	-11.01	54.00	28.53	3.88	Average	---	---
4	9848.000	57.20	-16.80	74.00	41.34	4.67	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB		cm	deg
1	4924.000	51.70	-22.30	74.00	42.31	3.17	Peak	---	---
2	4924.000	45.59	-8.41	54.00	36.20	3.17	Average	---	---
3	7386.000	56.32	-17.68	74.00	41.86	3.88	Peak	---	---
4	7386.000	44.53	-9.47	54.00	30.07	3.88	Average	---	---
5	9848.000	62.53	-11.47	74.00	46.67	4.67	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.

3.6. 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 and Fundamental Emissions

Temperature	26.8℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	CH 1, 11 (BT+802.11b)

Channel 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2390.000	53.92	-20.08	74.00	23.99	28.29	1.64	0.00	Peak	---	---
2 @	2409.370				56.81	28.33	1.64	0.00	Peak	---	---
1 @	2390.000	42.43	-11.57	54.00	12.50	28.29	1.64	0.00	Average	---	---
2 @	2409.370				53.56	28.33	1.64	0.00	Average	---	---

Channel 11

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2460.100				54.27	28.43	1.68	0.00	Peak	---	---
2 @	2483.500	53.71	-20.29	74.00	23.56	28.47	1.68	0.00	Peak	---	---
1 @	2460.100				50.40	28.43	1.68	0.00	Average	---	---
2 @	2483.500	42.68	-11.32	54.00	12.53	28.47	1.68	0.00	Average	---	---

Temperature	26.8℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	CH 1, 11 (BT+802.11g)

Channel 1

	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB		cm	deg
1	2390.000	55.56	-18.44	74.00	50.69	2.10	Peak	---	---
2 X	2407.850	-----	-----	-----	93.62	2.10	Peak	---	---
1	2390.000	38.50	-35.50	74.00	33.63	2.10	Peak	---	---
2 X	2407.850				82.18	2.10	Peak	---	---

Channel 11

	Freq	Level	Over Limit	Limit Line	Read Level	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB		cm	deg
1 X	2457.250				92.07	2.11	Peak	---	---
2	2483.500	53.47	-20.53	74.00	48.57	2.12	Peak	---	---
1 X	2457.250				80.46	2.11	Peak	---	---
2	2483.500	37.35	-36.65	74.00	32.45	2.12	Peak	---	---

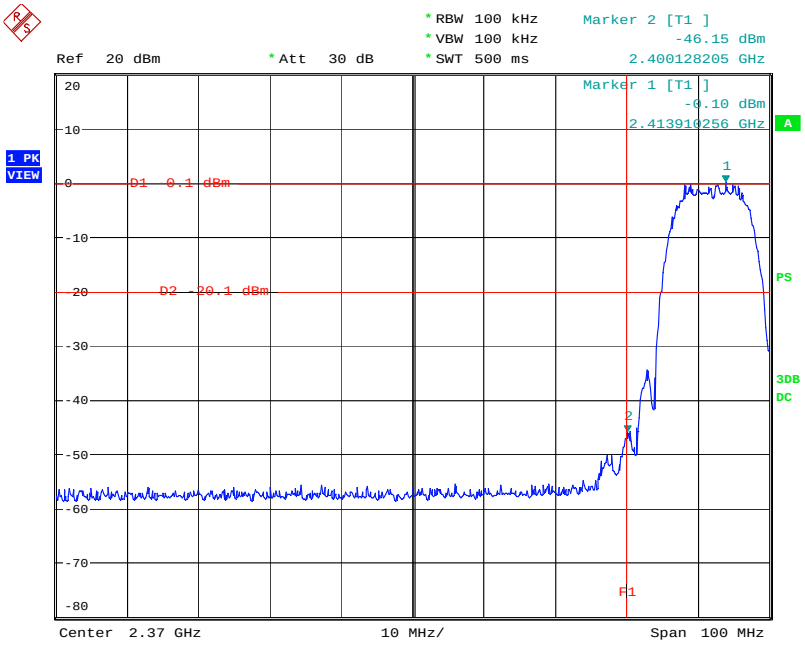
Note:

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

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

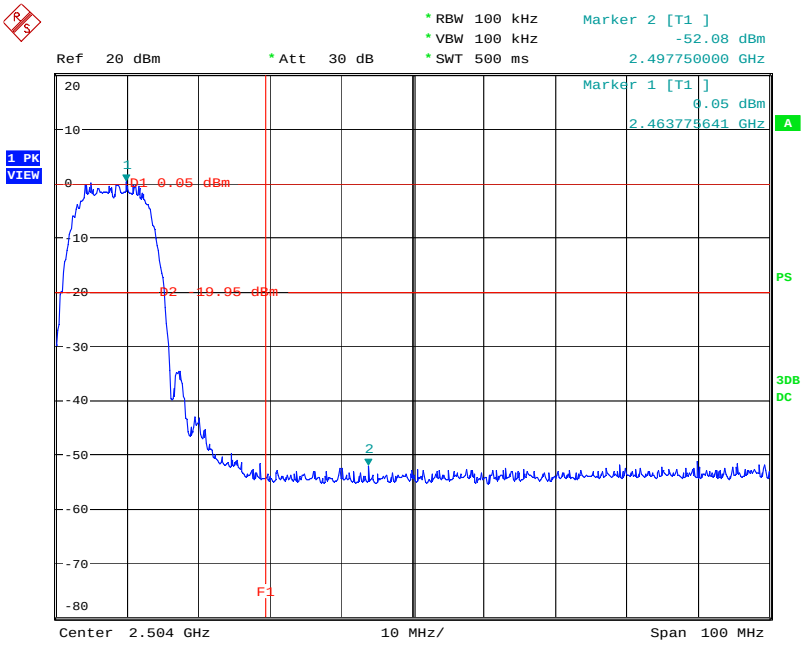
For Emission not in Restricted Band

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



Date: 1.FEB.2007 03:57:28

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



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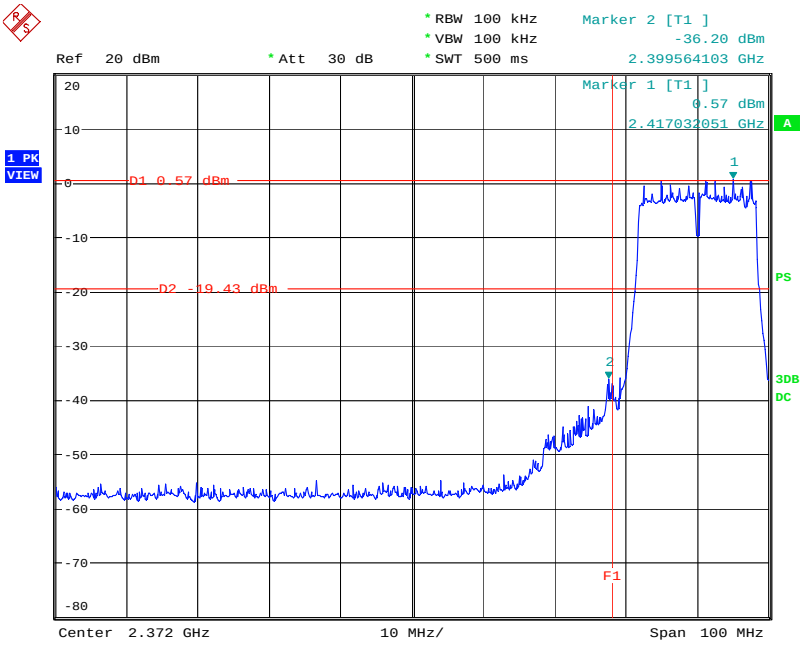
Low Band Edge Plot on Configuration IEEE 802.11g / 2412 MHz



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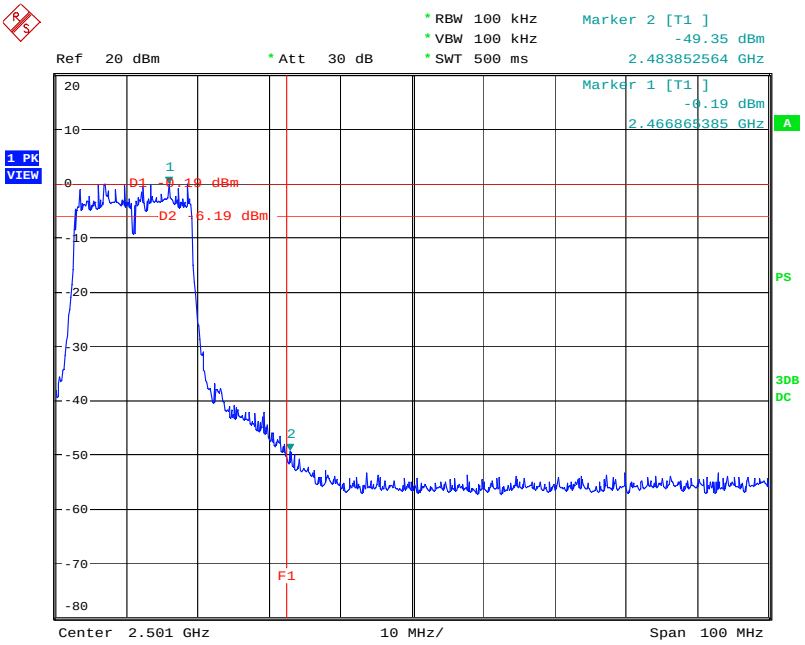
High Band Edge Plot on Configuration IEEE 802.11g / 2462 MHz



Date: 1.FEB.2007 18:34:18

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
Receiver	R&S	ESCS 30	838251/003	9 kHz - 2.75 GHz	Mar. 13, 2006	Conduction (CO01-LK)
LISN	SCHAFFNER	NNB-41	06/10024	9 kHz - 30 MHz	May. 16, 2006	Conduction (CO01-LK)
RF Cable-CON	Suhner Switzerland	RG223/U	CB017	9 kHz - 30 MHz	Dec. 01, 2006	Conduction (CO01-LK)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 19, 2006	Radiation (03CH02-HY)
Amplifier	ADVANTEST	BB525C	CH300001	9 kHz - 2 GHz	Nov. 12, 2006	Radiation (03CH02-HY)
Spectrum Analyzer	R&S	FSP7	838858/039	9 kHz - 7 GHz	Jan. 24, 2007	Radiation (03CH02-HY)
Receiver	SCHAFFNER	SCR3501	416	9 kHz - 1 GHz	Feb. 15, 2007	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Nov. 27, 2006	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)
RF Cable-R03m	Jye Bao	RG142	CB020	30 MHz - 1 GHz	Dec. 01, 2006	Radiation (03CH02-HY)
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Dec. 17, 2006	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100764	DC ~ 40GHz	Jul. 20, 2006	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100666	DC ~ 40GHz	Jul. 20, 2006	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 10, 2006	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Dec. 27, 2006	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 02, 2006	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2006	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2006	Conducted (TH01-HY)
Oscilloscope	Tektronix	TDS1012	CO38515	100MHz / 1GS/s	Jun. 20, 2006	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Dec. 29, 2006	Conducted (TH01-HY)
Data Generator	Tektronix	DG2030	063-2920-50	0.1Hz~400MHz	Jun. 16, 2006	Conducted (TH01-HY)

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

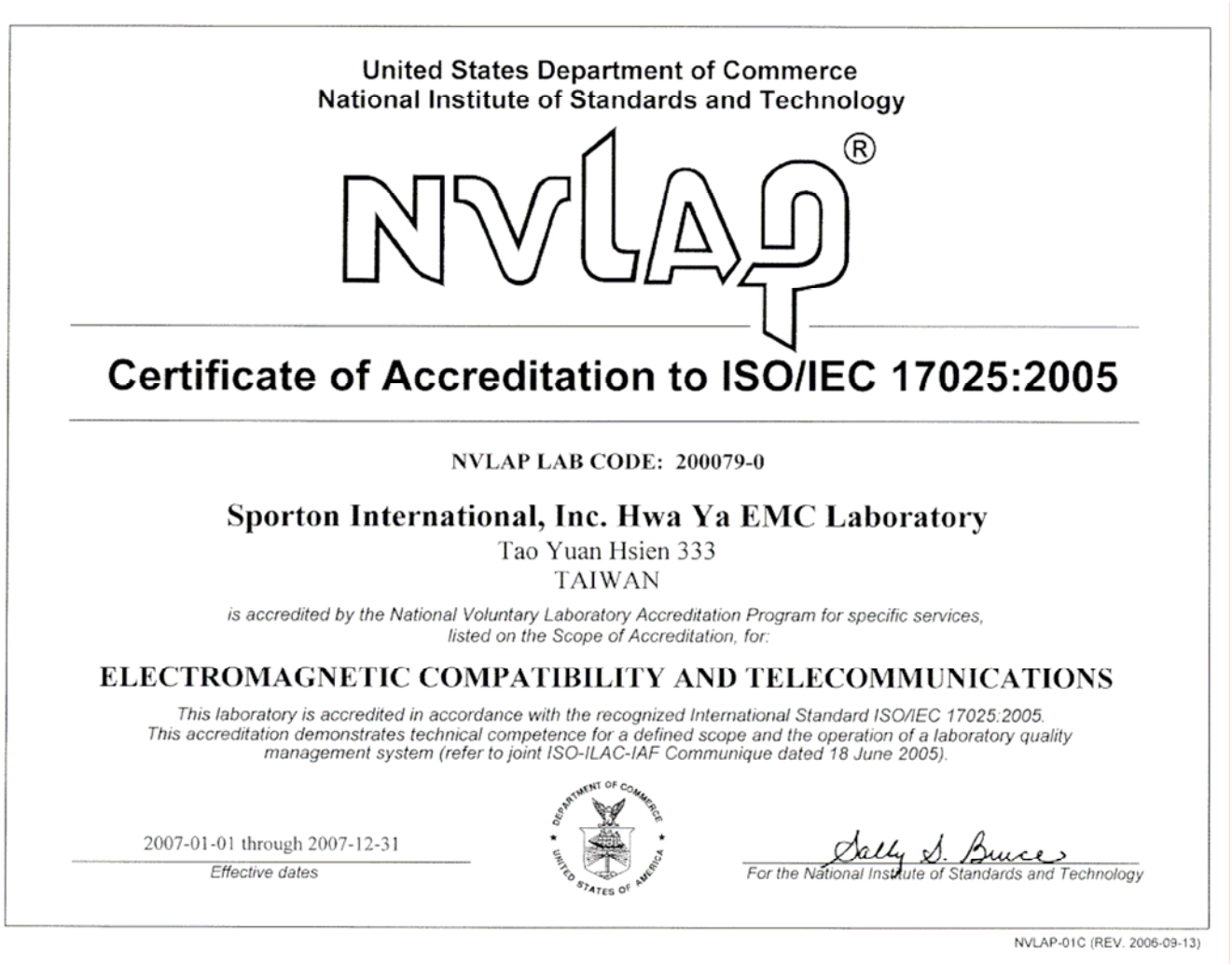
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH02-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Apr. 21, 2005*	Conducted (TH01-HY)

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

5. TEST LOCATION

SHIJR	ADD	: 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL	: 886-2-2696-2468
	FAX	: 886-2-2696-2255
HWA YA	ADD	: No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	: 886-3-327-3456
	FAX	: 886-3-318-0055
LINKOU	ADD	: No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL	: 886-2-2601-1640
	FAX	: 886-2-2601-1695
DUNGHU	ADD	: No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL	: 886-2-2631-4739
	FAX	: 886-2-2631-9740
JUNGHE	ADD	: 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL	: 886-2-8227-2020
	FAX	: 886-2-8227-2626
NEIHU	ADD	: 4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	: 886-2-2794-8886
	FAX	: 886-2-2794-9777
JHUBEI	ADD	: No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	: 886-3-656-9065
	FAX	: 886-3-656-9085

6. NVLAP CERTIFICATE OF ACCREDITATION



United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200079-0

Sporton International, Inc. Hwa Ya EMC Laboratory
Tao Yuan Hsien 333
TAIWAN

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated 18 June 2005).

2007-01-01 through 2007-12-31
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2006-09-13)