

# FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.247

**Equipment** : **Notebook Computer**  
**Model No.** : **ZG5, Aspire one**  
**Brand Name** : **ACER, GATEWAY, PACKARD BELL**  
**Filing Type** : **Existing Change**  
**Applicant** : **Acer Incorporated.**  
8F, 88, Sec.1, Hsin Tai Wu Rd. Hsichih Taipei Hsien 221  
Taiwan, R.O.C.  
**FCC ID** : **HLZZG5WIIM**  
**Manufacturer** : **Quanta Computer Inc.**  
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**Received Date** : Nov. 24, 2008  
**Final Test Date** : Nov. 27, 2008

## Statement

**Test result included is only for the 802.11a/b/g/n part of Intel ® WIFI Link 5150 module in 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.

SPORTON International Inc.

Report Format Version: a

## **Table of Contents**

<b>1 SUMMARY OF THE TEST RESULT .....</b>	<b>2</b>
<b>2 GENERAL INFORMATION.....</b>	<b>3</b>
2.1 Product Details .....	3
2.2 Table for Filed Antenna .....	3
2.3 Table for Carrier Frequencies .....	4
2.4 Table for Test Modes .....	5
2.5 Table for Testing Locations .....	5
2.6 Table for Supporting Units.....	5
2.7 Test Configuration .....	6
<b>3 TEST RESULT .....</b>	<b>8</b>
3.1 Radiated Emissions Measurement.....	8
3.2 Antenna Requirements.....	56
<b>4 LIST OF MEASURING EQUIPMENTS .....</b>	<b>57</b>
<b>5 TEST LOCATION.....</b>	<b>58</b>
<b>6 TAF CERTIFICATE OF ACCREDITATION .....</b>	<b>59</b>
<b>APPENDIX A. TEST PHOTOS .....</b>	<b>A1 ~ A4</b>
<b>APPENDIX B. PHOTOGRAPHS OF EUT .....</b>	<b>B1 ~ B24</b>

## History of This Test Report

Original Issue Date: Dec. 12, 2008

Report No.: FR870804-01AG

■ 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 : Notebook Computer  
Model No. : ZG5, Aspire one  
Brand Name : ACER, GATEWAY, PACKARD BELL  
Applicant : Acer Incorporated.  
8F, 88, Sec.1, Hsin Tai Wu Rd. Hsichih Taipei  
Hsien 221 Taiwan, R.O.C.

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Nov. 24, 2008 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 RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
3.1	15.247(b)(3)	Maximum Conducted Output Power	-	-
3.2	15.247(d)	Radiated Emissions	Complies	3.55 dB
3.3	15.203	Antenna Requirements	Complies	-

Note: Standard clause 3.1 have been done module test by Intel Module Model: 512ANXMMW. Please refer to FCC ID No. PD9512ANXM.

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 <sup>-8</sup>	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

Only the radio detail of IEEE 802.11a/b/g/n is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g/n
Data Modulation	DSSS (CCK, DQPSK, DBPSK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (11, 5.5, 2, 1Mbps) ; OFDM (54, 48, 36, 24, 18, 12, 9, 6 Mbps) See the below table for IEEE 802.11n
Frequency Range	2400 ~ 2483.5MHz

### 2.2 Table for Filed Antenna

#### Antenna & Bandwidth

Antenna	Single (TX)	
Bandwidth Mode	20 MHz	40 MHz
802.11b	V	X
802.11g	V	X
802.11n (2.4GHz)	V	V

Ant.	Antenna Type	Connector	Gain (dBi)		Remark
			2.4G	5G	
A	PIFA Antenna	I-PEX	2.98	1.96	TX / RX
B	PIFA Antenna	I-PEX	2.98	1.96	RX

**Antenna: 1T2R Spatial Multiplexing MIMO configuration. One antenna is for signal transmitting and two antennas are receiving.**

## IEEE 802.11n Modulation Scheme

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Data rate(Mbps)	
									800nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

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

## 2.3 Table for Carrier Frequencies

## Frequency Allocation

For 802.11n (20MHz): Use Channel 149, 153, 157, 161, and 165.

For 802.11n (40MHz): Use Channel 151, 159.

Frequency Band	Channel No.	Frequency
5725~5850 MHz	149	5745 MHz
	151	5755 MHz
	153	5765 MHz
	157	5785 MHz
	159	5795 MHz
	161	5805 MHz
	165	5825 MHz

**Frequency Allocation**

For 802.11n (20MHz): Use Channel 1~Channel 11.

For 802.11n (40MHz): Use Channel 3~Channel 9.

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

**2.4 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 the entire possible configuration for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
Radiated Emissions 1GHz~10 <sup>th</sup> Harmonic	11a/BPSK	6 Mbps	149/157/165	A
	11n/MCS 0 (20MHz)	6.5 Mbps		
	11n/MCS 0 (40MHz)	13.5 Mbps	151/159	A
	11b/CCK	11 Mbps	1/6/11	A
	11g/BPSK	6 Mbps		
	11n/MCS 0 (20MHz)	6.5 Mbps		
	11n/MCS 0 (40MHz)	13.5 Mbps	3/6/9	A
Radiated Emissions 9kHz~1GHz	Normal Mode	Auto	-	-

**2.5 Table for Testing Locations**

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	IC 4086B-1	-

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

**2.6 Table for Supporting Units**

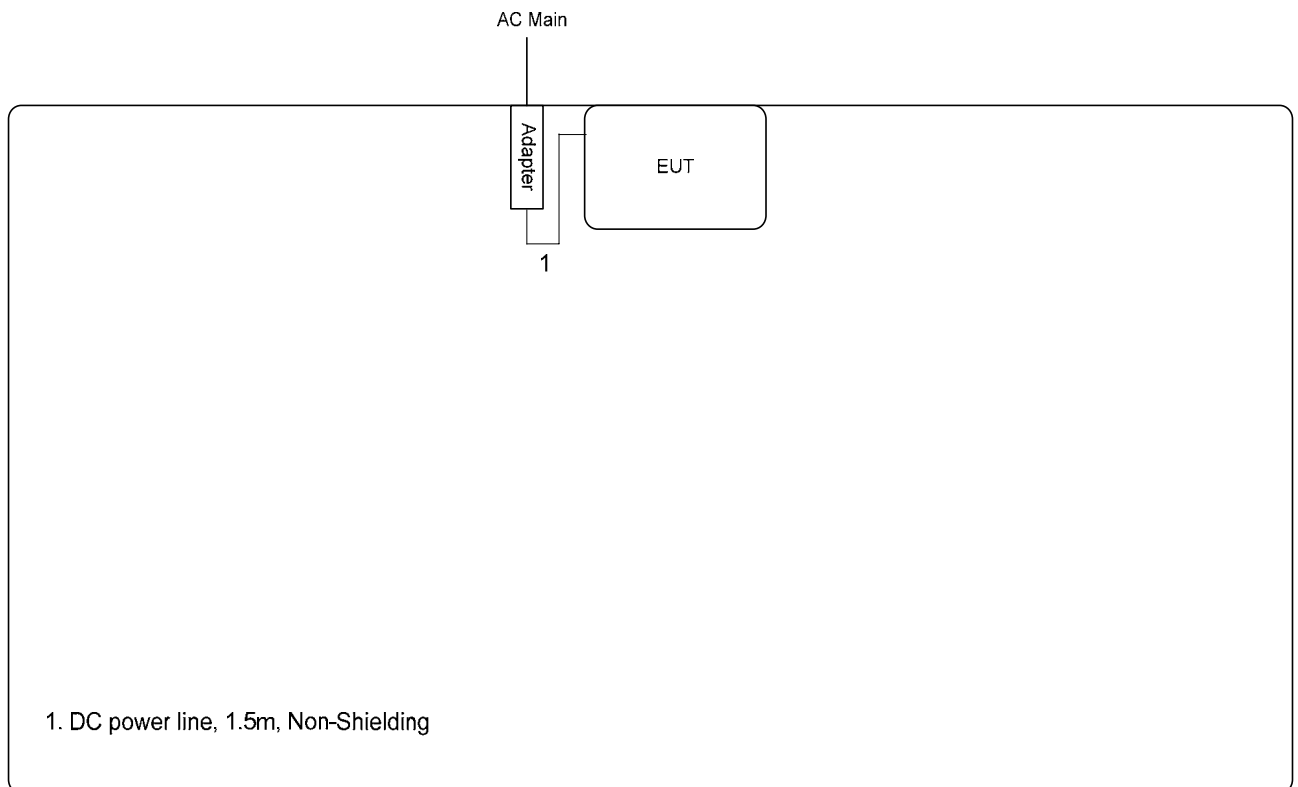
The EUT was tested alone.



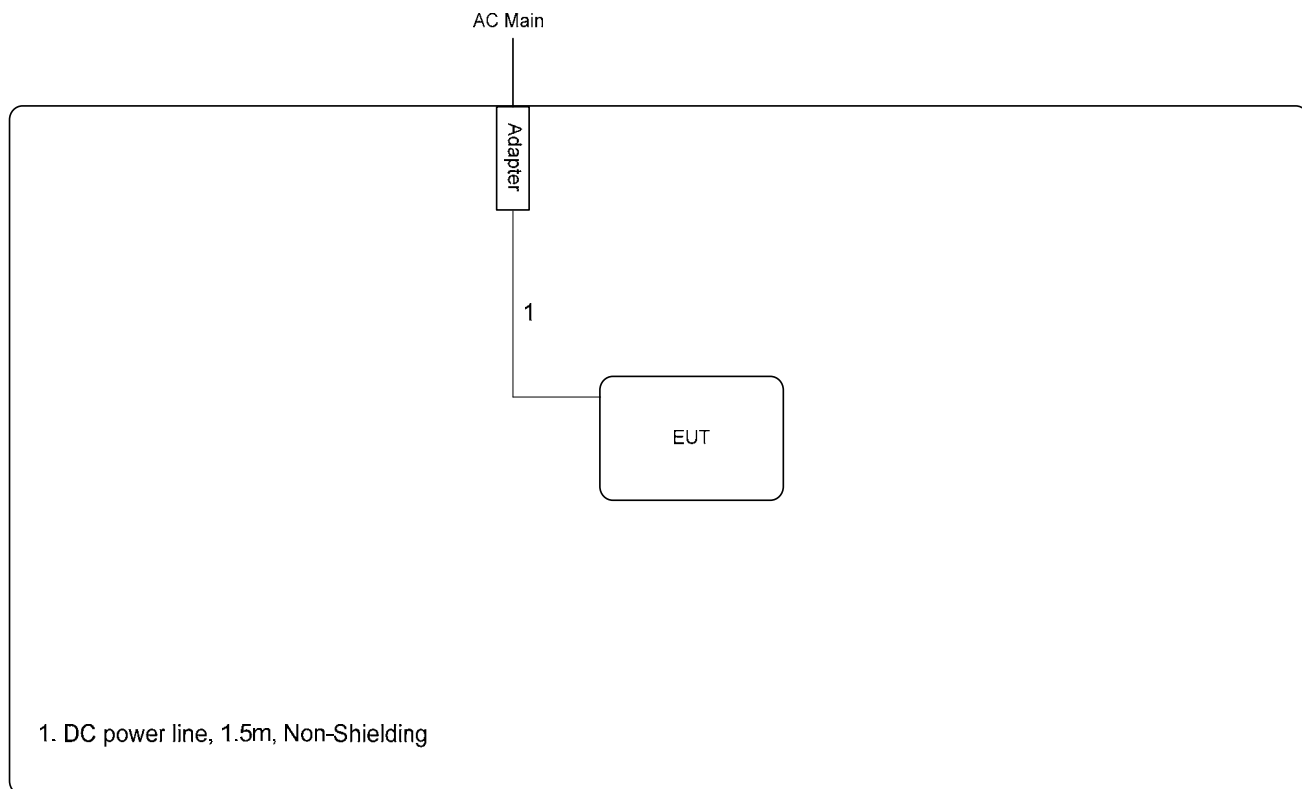
## 2.7 Test Configuration

### 2.7.1 Radiation Emissions Test Configuration

For radiated emissions 9kHz~1GHz



**For radiated emissions above 1GHz**



### 3 TEST RESULT

#### 3.1 Radiated Emissions Measurement

##### 3.1.1 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

##### 3.1.2 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

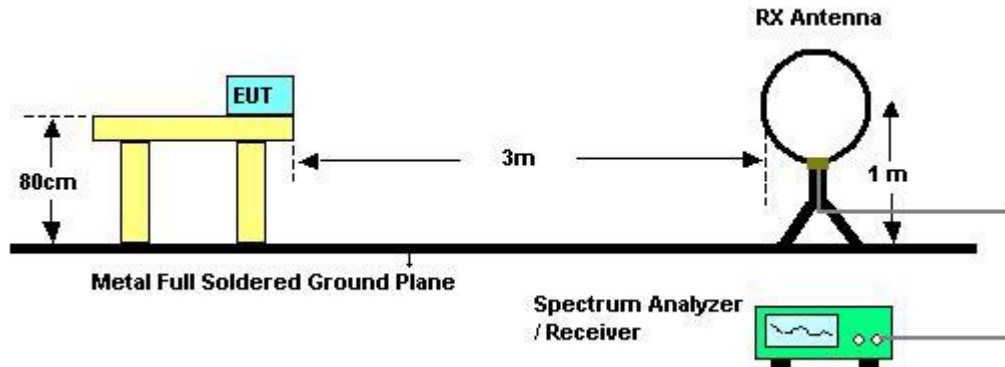
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

**3.1.3 Test Procedures**

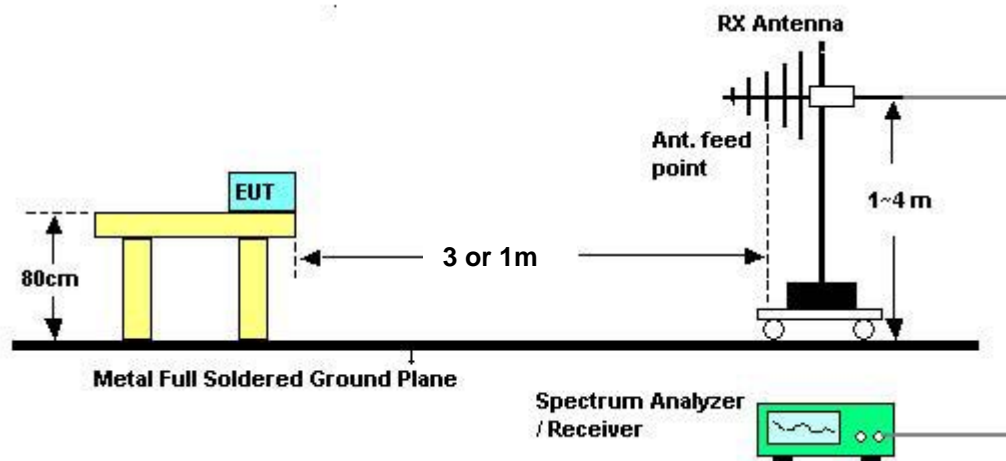
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

### 3.1.4 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].

### 3.1.5 Test Deviation

There is no deviation with the original standard.

### 3.1.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

**3.1.7 Results of Radiated Emissions (9kHz~30MHz)**

<b>Test date</b>	Nov. 27, 2008	<b>Test Site No.</b>	03CH03-HY
<b>Temperature</b>	27.4	<b>Humidity</b>	41%
<b>Test Engineer</b>	Eddie		

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Over Limit (dB)</b>	<b>Limit Line (dBuV)</b>	<b>Remark</b>
-	-	-	-	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.

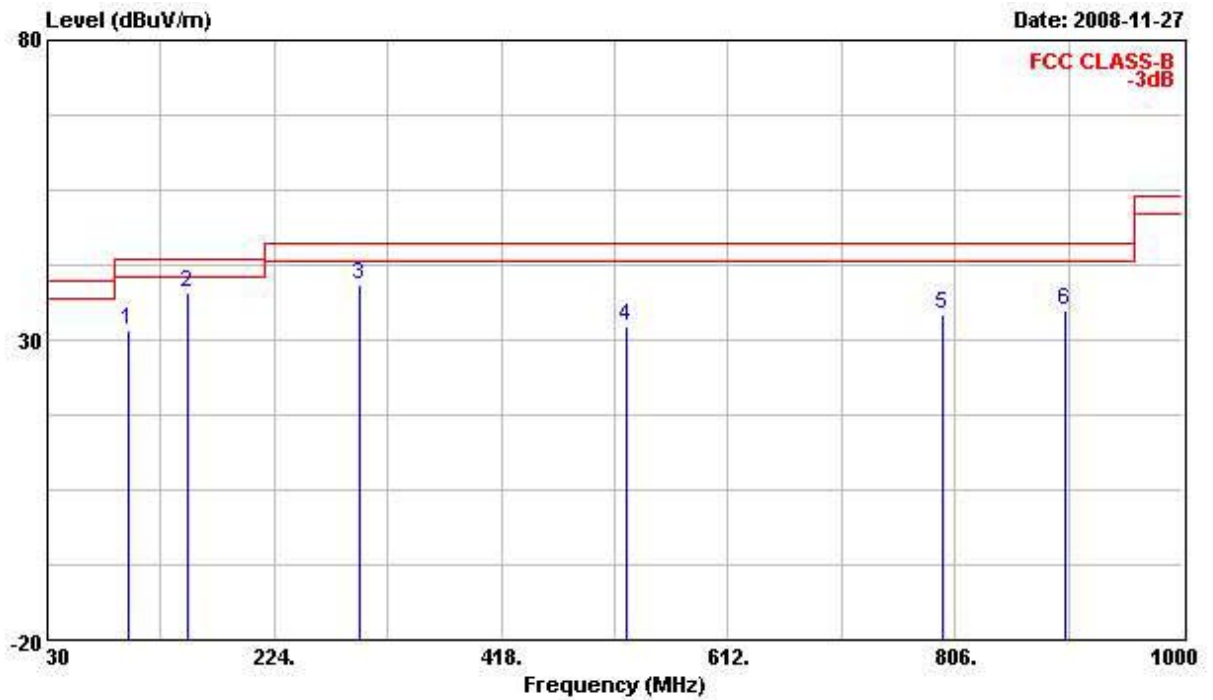
Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB);

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

## 3.1.8 Results of Radiated Emissions (30MHz~1GHz)

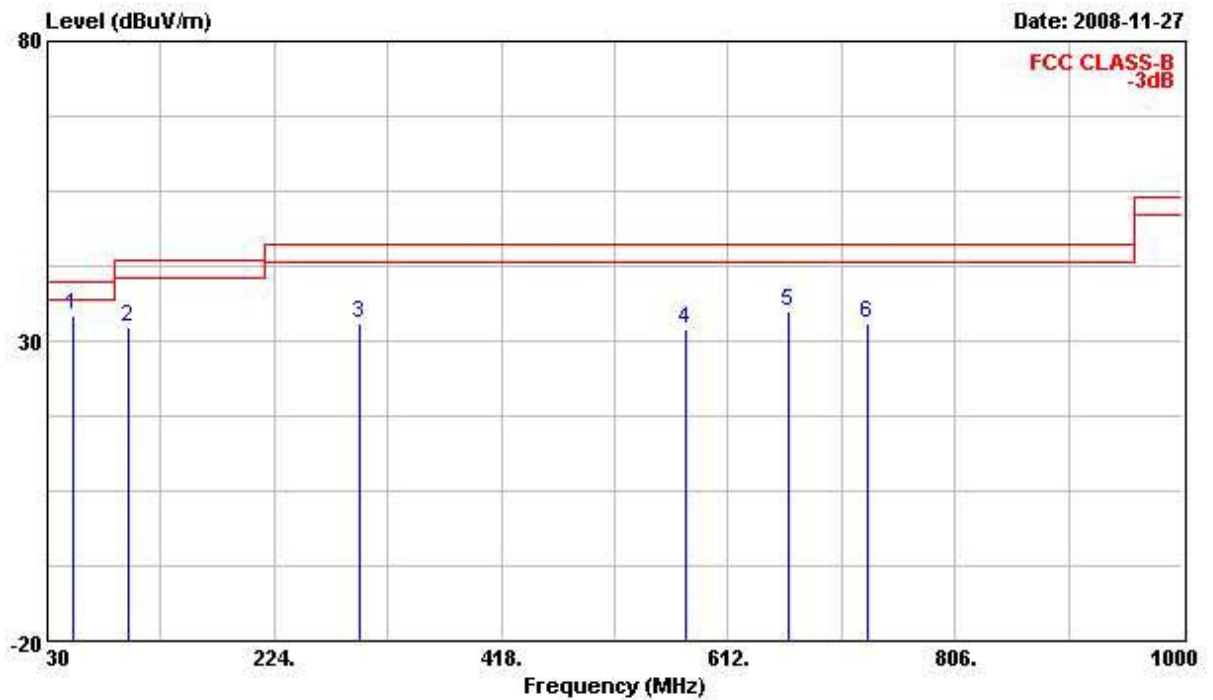
Test date	Nov. 27, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	Normal Mode (5G)

## Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	98.870	31.74	-11.76	43.50	46.81	11.03	1.72	27.82	Peak
2	149.310	37.86	-5.64	43.50	53.03	10.60	2.15	27.91	Peak
3	296.750	39.30	-6.70	46.00	51.27	13.53	2.90	28.39	Peak
4	524.700	32.31	-13.69	46.00	38.43	18.71	3.94	28.77	Peak
5	796.300	34.26	-11.74	46.00	38.26	20.75	4.93	29.68	Peak
6	901.060	34.98	-11.02	46.00	38.02	21.04	5.25	29.33	Peak

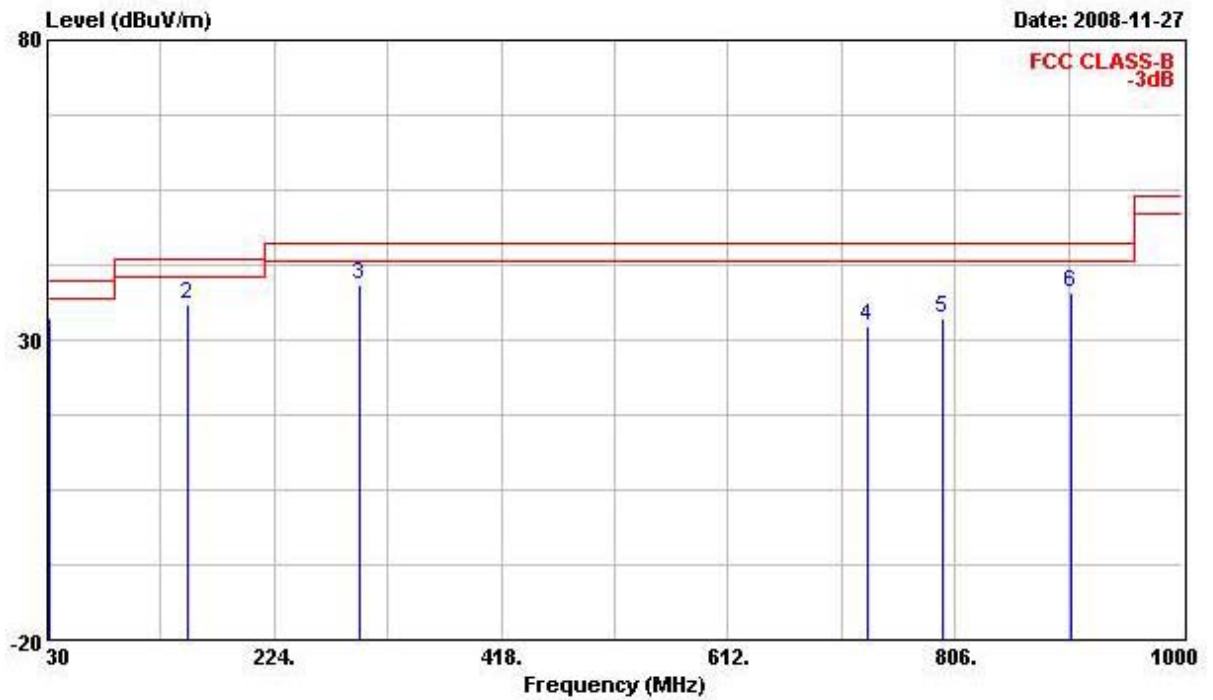
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	51.340	34.28	-5.72	40.00	52.98	7.86	1.25	27.81	QP
2	98.870	32.30	-11.20	43.50	47.37	11.03	1.72	27.82	Peak
3	296.750	33.09	-12.91	46.00	45.06	13.53	2.90	28.39	Peak
4	575.140	32.00	-14.00	46.00	37.62	19.30	4.08	28.99	Peak
5	664.380	35.06	-10.94	46.00	40.41	19.73	4.47	29.54	Peak
6	731.310	32.83	-13.17	46.00	37.36	20.43	4.67	29.62	Peak

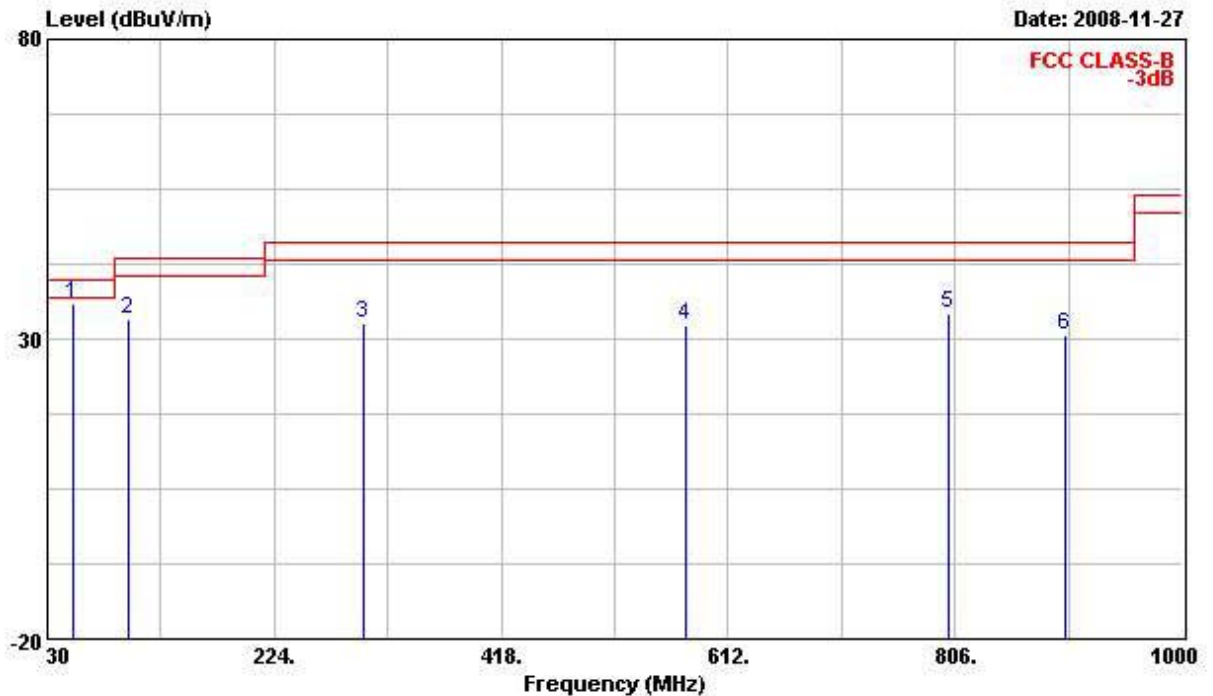


Test date	Nov. 27, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	Normal Mode (2.4G)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	31.940	33.75	-6.25	40.00	43.12	17.30	1.02	27.69 Peak
2	149.310	35.95	-7.55	43.50	51.12	10.60	2.15	27.91 Peak
3	296.750	39.37	-6.63	46.00	51.34	13.53	2.90	28.39 Peak
4	731.310	32.39	-13.61	46.00	36.92	20.43	4.67	29.62 Peak
5	796.300	33.74	-12.26	46.00	37.74	20.75	4.93	29.68 Peak
6	905.910	37.95	-8.05	46.00	41.01	21.06	5.23	29.35 Peak

## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	51.340	35.88	-4.12	40.00	54.58	7.86	1.25	27.81	QP
2	98.870	33.43	-10.07	43.50	48.50	11.03	1.72	27.82	Peak
3	300.630	32.47	-13.53	46.00	44.30	13.62	2.94	28.39	Peak
4	575.140	32.23	-13.77	46.00	37.85	19.30	4.08	28.99	Peak
5	800.180	34.36	-11.64	46.00	38.33	20.75	4.98	29.70	Peak
6	901.060	30.56	-15.44	46.00	33.60	21.04	5.25	29.33	QP

## Note:

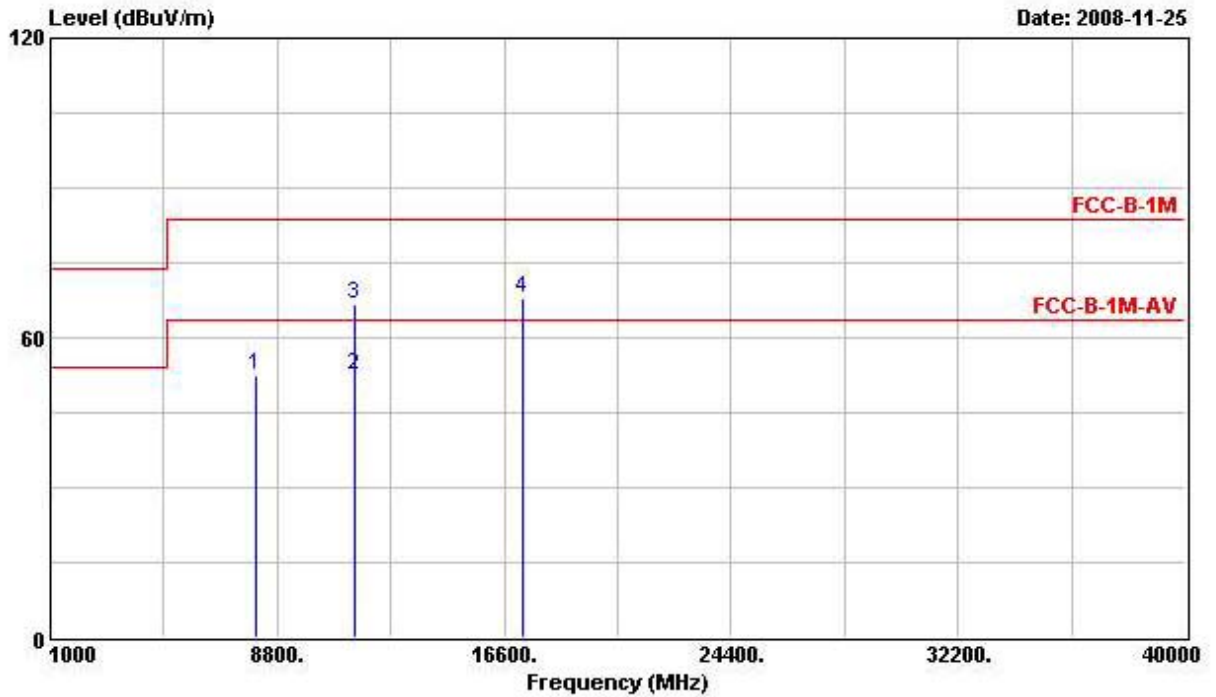
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

3.1.9 Results for Radiated Emissions (1GHz~10<sup>th</sup> Harmonic)

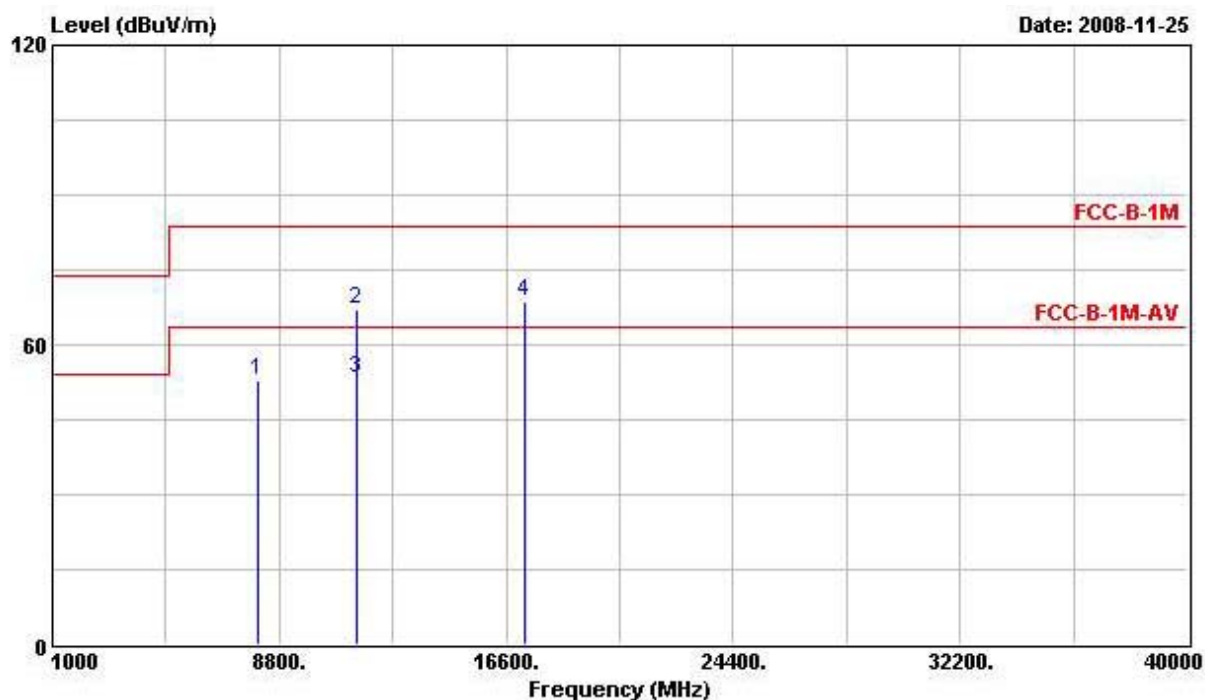
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11a CH 149

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8080.000	52.69	-10.85	63.54	42.77	37.87	4.84	32.79	PK
2	11487.400	52.41	-11.13	63.54	38.27	39.68	6.78	32.31	Average
3	11487.400	66.67	-16.87	83.54	52.53	39.68	6.78	32.31	PEAK
4	17235.000	68.08			45.56	43.26	7.80	28.55	PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

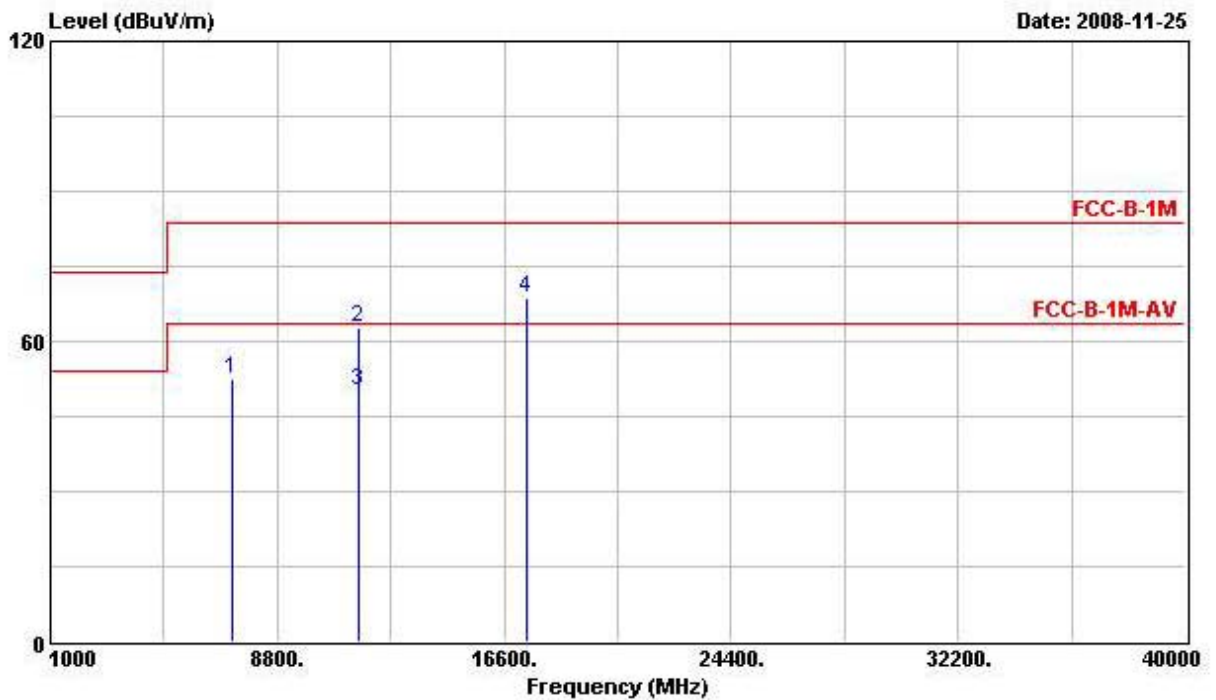
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Preamp Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB
1	8080.000	52.82	-10.72	63.54	42.91	37.87	4.84 32.79 PK
2	11489.900	67.04	-16.50	83.54	52.90	39.68	6.78 32.31 Peak
3	11489.900	53.20	-10.34	63.54	39.05	39.68	6.78 32.31 AVERAGE
4	17233.000	68.63			46.11	43.26	7.80 28.55 PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

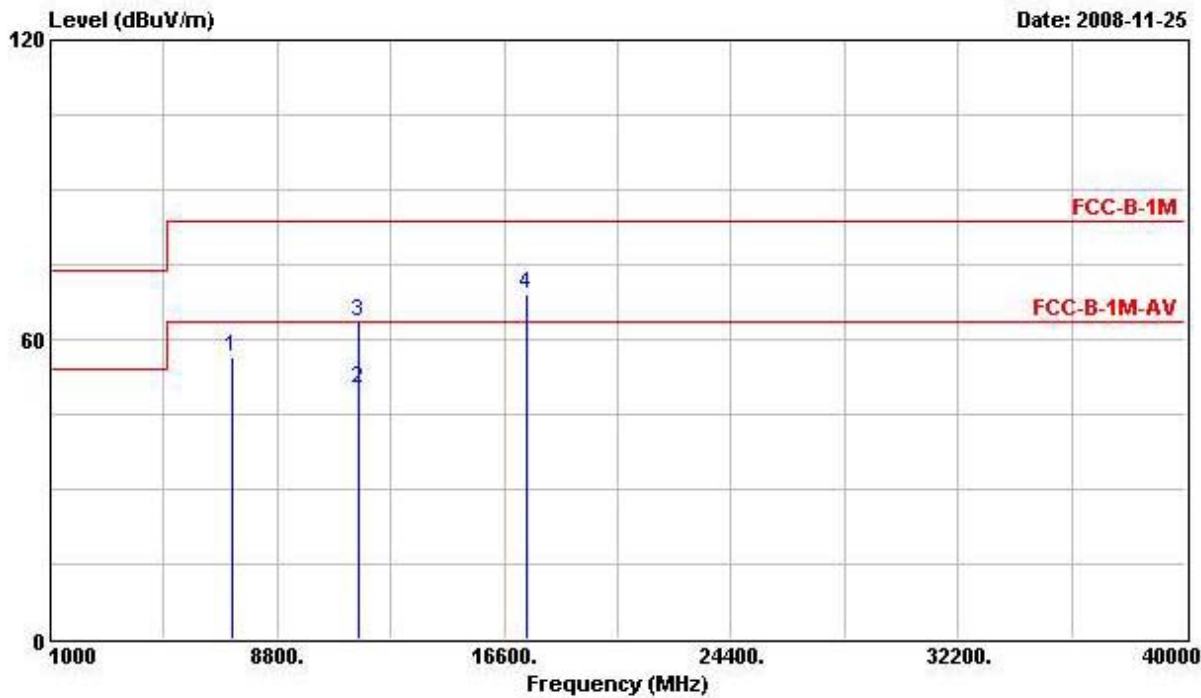
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11a CH 157

**Horizontal**

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB	dB	
1	7224.000	52.36			44.85	36.64	3.67	32.80 PEAK
2	11568.000	62.57	-20.97	83.54	48.76	39.63	6.68	32.49 PEAK
3	11568.000	50.23	-13.31	63.54	36.42	39.63	6.68	32.49 Average
4	17351.000	68.50			44.99	44.24	7.82	28.56 PEAK

Note: An item 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

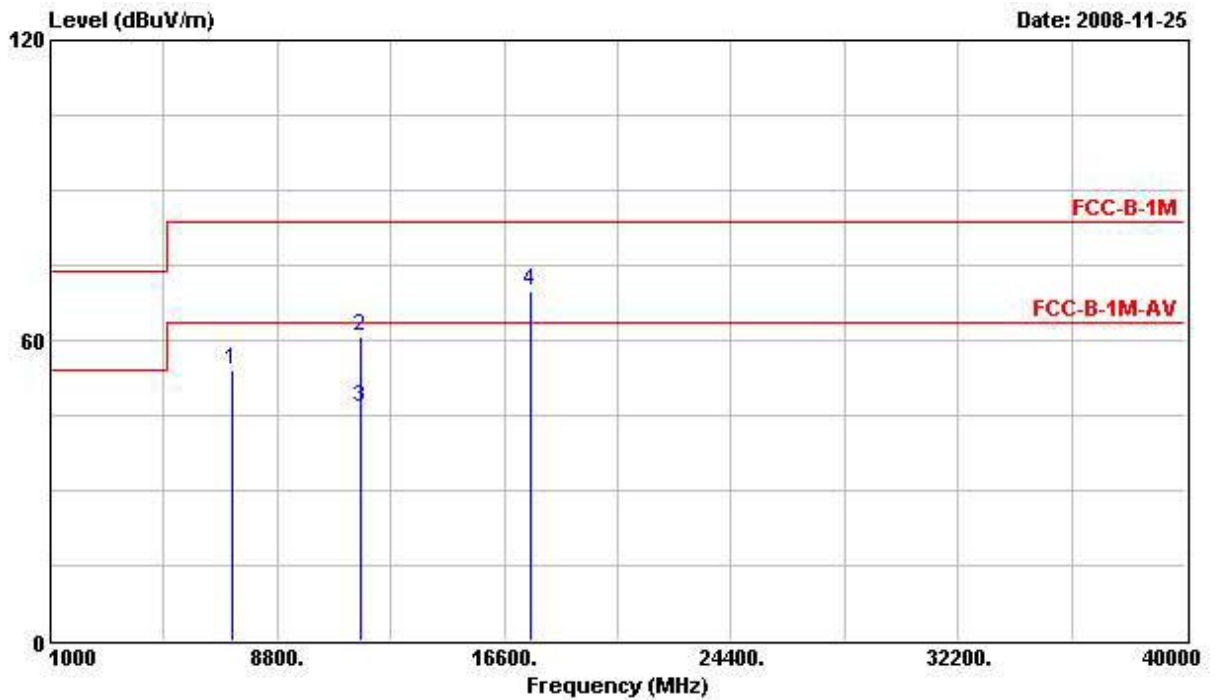
Vertical



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	7228.000	56.39			48.88	36.64	3.67	32.80 PEAK
2	11569.800	50.04	-13.50	63.54	36.25	39.63	6.68	32.52 AVERAGE
3	11569.800	63.73	-19.81	83.54	49.94	39.63	6.68	32.52 Peak
4	17359.000	68.91			45.41	44.24	7.83	28.56 PEAK

Note: An item 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

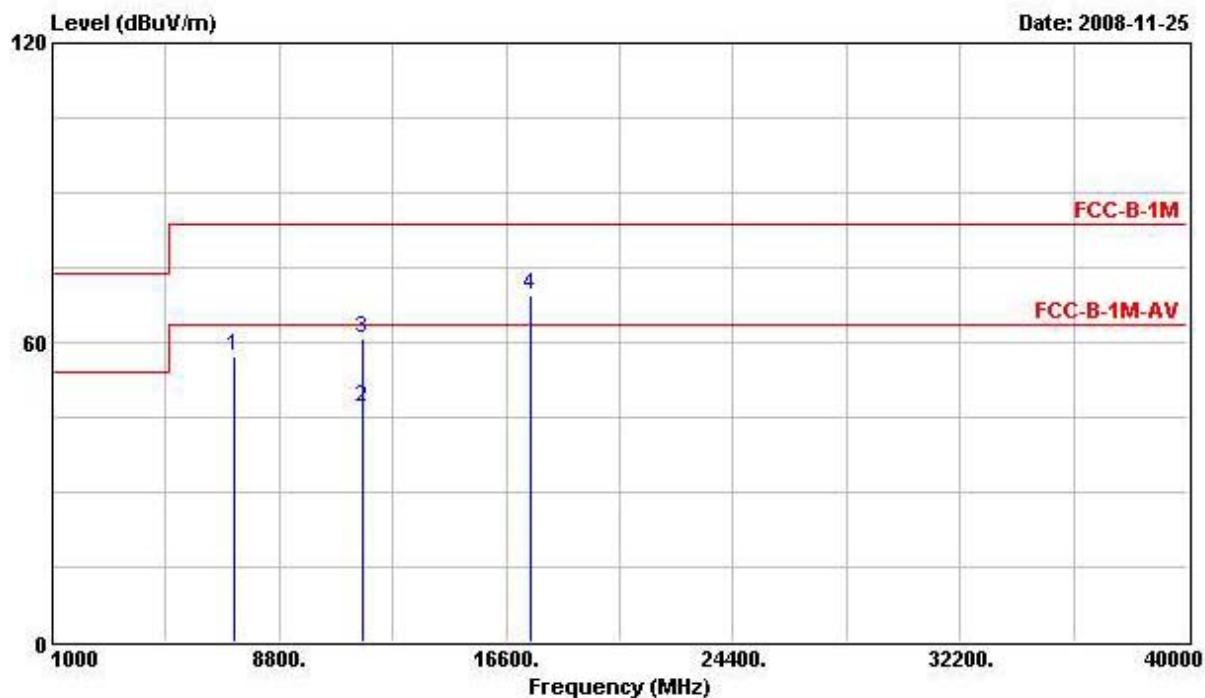
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11a CH 165

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7284.000	53.97	-29.57	83.54	46.20	36.80	3.79	32.83	PEAK
2	11650.000	60.94	-22.60	83.54	47.40	39.56	6.57	32.59	Peak
3	11650.000	46.61	-16.93	63.54	33.07	39.56	6.57	32.59	AVERAGE
4	17479.000	69.68			45.19	45.22	7.84	28.57	PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

## Vertical

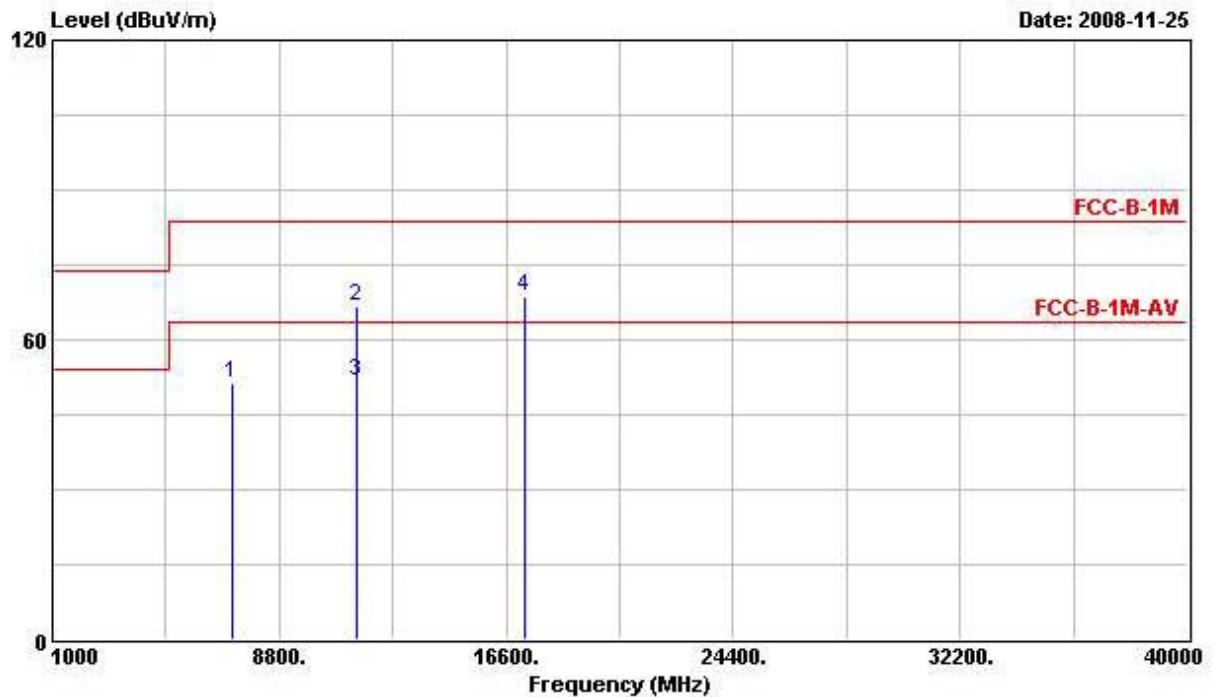


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	7276.000	57.37	-26.17	83.54	49.65	36.76	3.79	32.83 PEAK
2	11649.800	46.97	-16.57	63.54	33.43	39.56	6.57	32.59 AVERAGE
3	11649.800	60.63	-22.91	83.54	47.09	39.56	6.57	32.59 Peak
4	17475.000	69.59			45.10	45.22	7.84	28.57 PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.



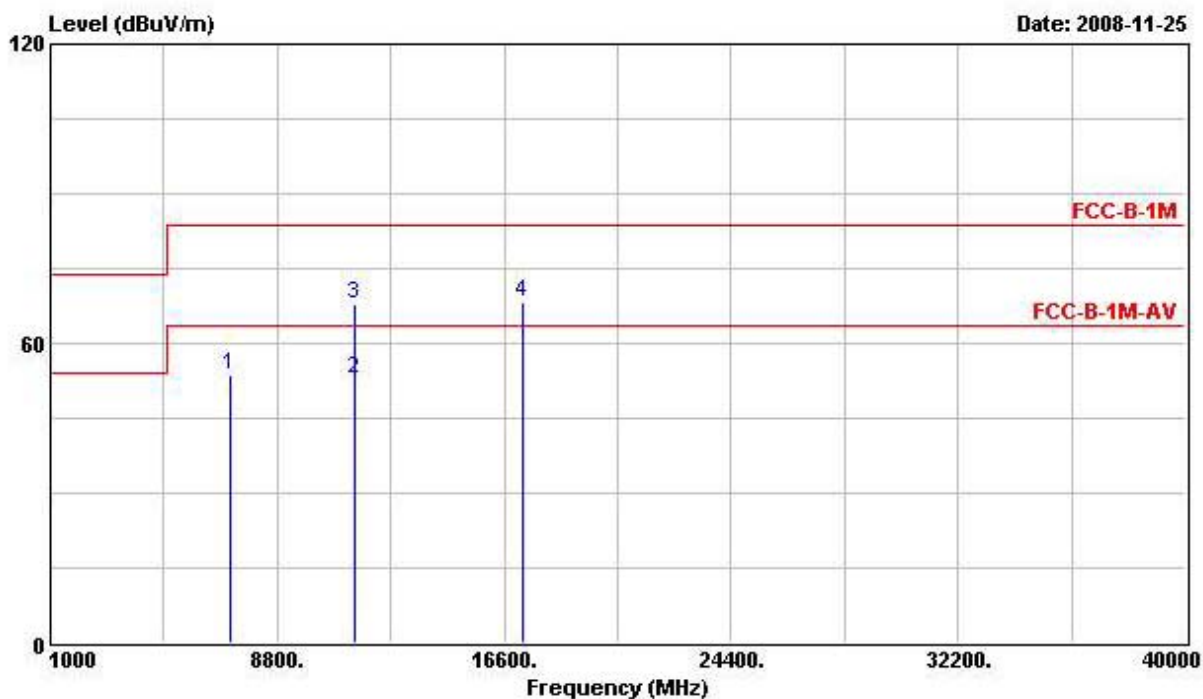
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 149 (20MHz)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7172.000	51.34			44.17	36.51	3.42	32.77	PEAK
2	11490.300	66.63	-16.91	83.54	52.49	39.68	6.78	32.31	Peak
3	11490.300	51.55	-11.99	63.54	37.40	39.68	6.78	32.31	AVERAGE
4	17231.000	68.52			46.00	43.26	7.80	28.55	PEAK

Note: An item 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

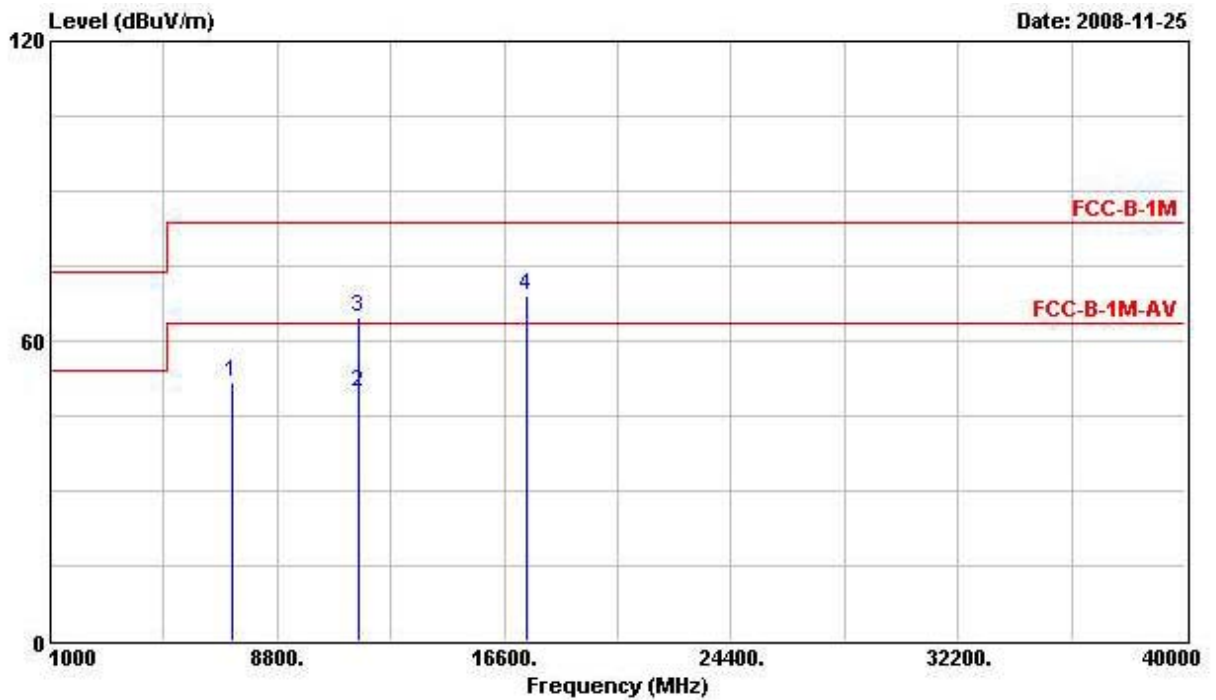
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7180.000	53.66			46.32	36.56	3.55	32.77	PEAK
2	11490.000	52.74	-10.80	63.54	38.59	39.68	6.78	32.31	AVERAGE
3	11490.000	68.07	-15.47	83.54	53.93	39.68	6.78	32.31	Peak
4	17235.000	68.22			45.70	43.26	7.80	28.55	PEAK

Note: An item 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

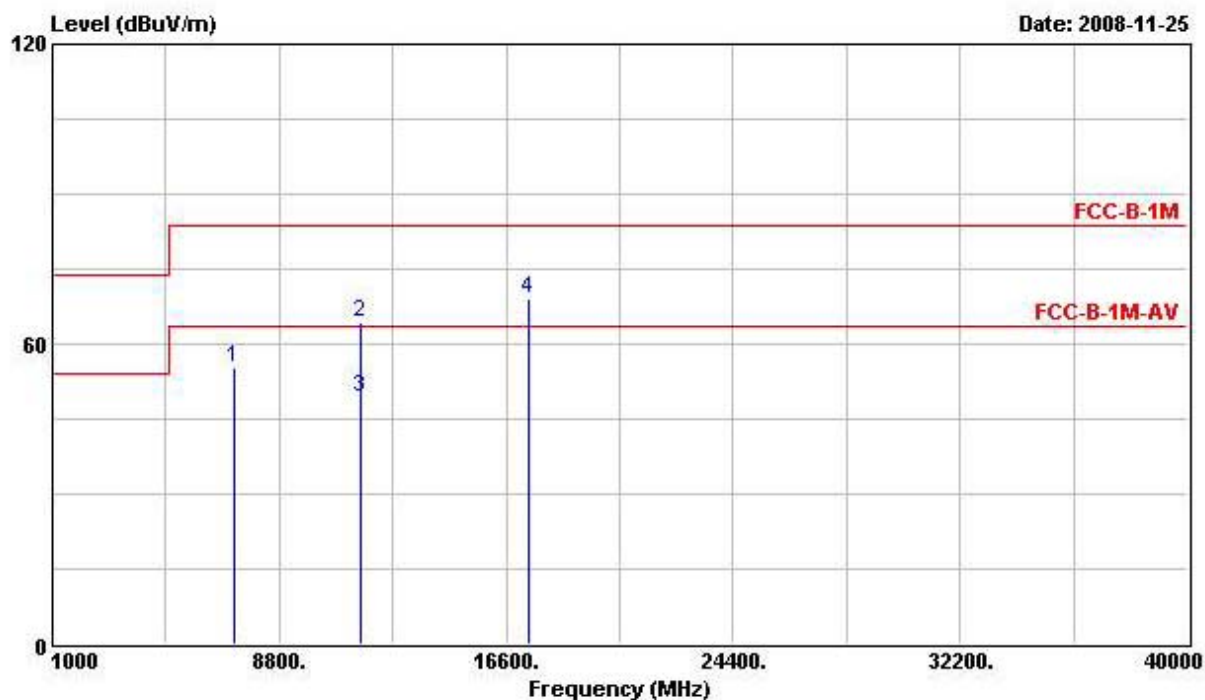
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 157 (20MHz)

**Horizontal**

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB
1	7224.000	51.76			44.25	36.64	3.67	32.80 PEAK
2	11569.600	49.55	-13.99	63.54	35.73	39.63	6.68	32.49 AVERAGE
3	11569.600	64.77	-18.77	83.54	50.96	39.63	6.68	32.49 Peak
4	17359.000	68.96			45.46	44.24	7.83	28.56 PEAK

Note: An item 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

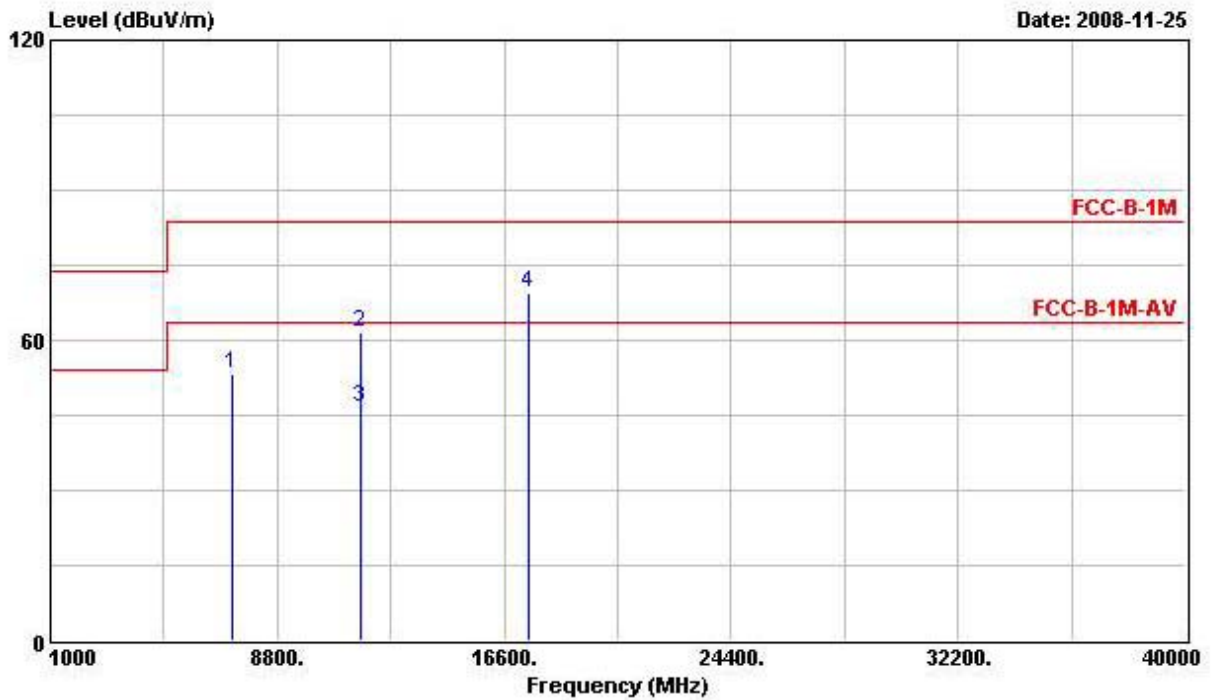
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7224.000	55.31			47.80	36.64	3.67	32.80	PEAK
2	11570.100	64.40	-19.14	83.54	50.61	39.63	6.68	32.52	Peak
3	11570.100	49.17	-14.37	63.54	35.38	39.63	6.68	32.52	AVERAGE
4	17351.000	68.99			45.48	44.24	7.82	28.56	PEAK

Note: An item 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

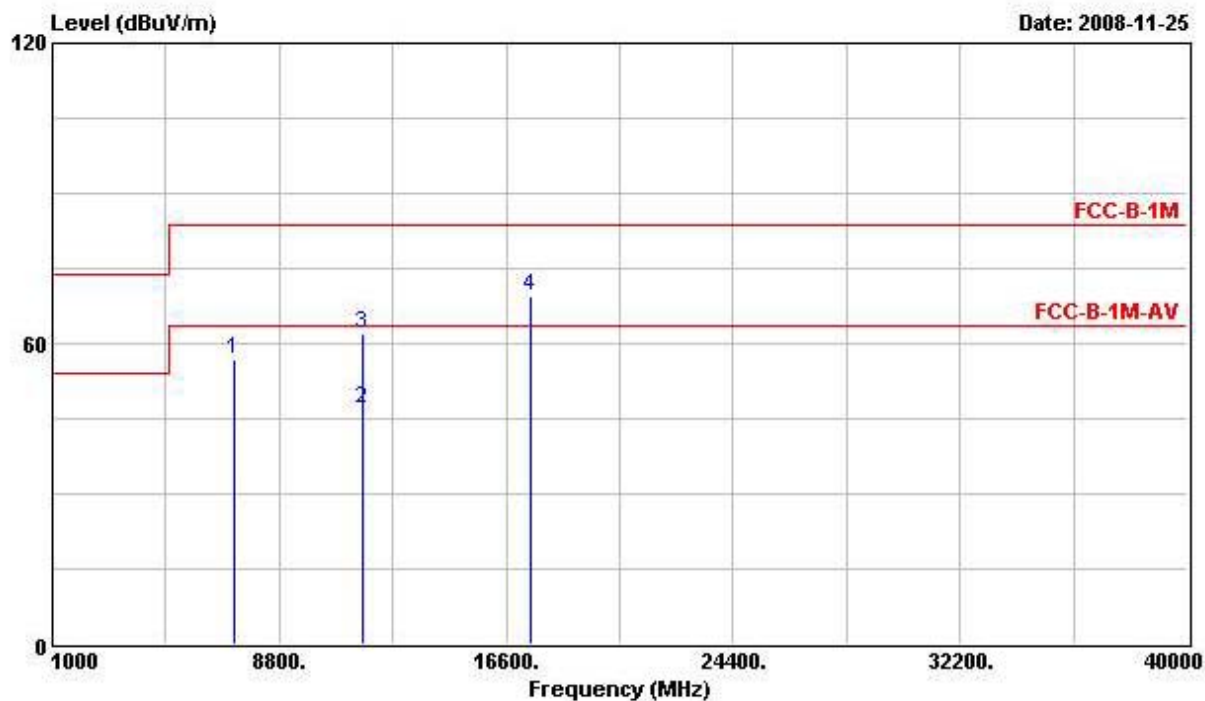
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 165 (20MHz)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7284.000	53.11	-30.43	83.54	45.35	36.80	3.79	32.83	PEAK
2	11650.100	61.44	-22.10	83.54	47.90	39.56	6.57	32.59	Peak
3	11650.100	46.67	-16.87	63.54	33.13	39.56	6.57	32.59	AVERAGE
4	17471.000	69.33			44.85	45.22	7.84	28.57	PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

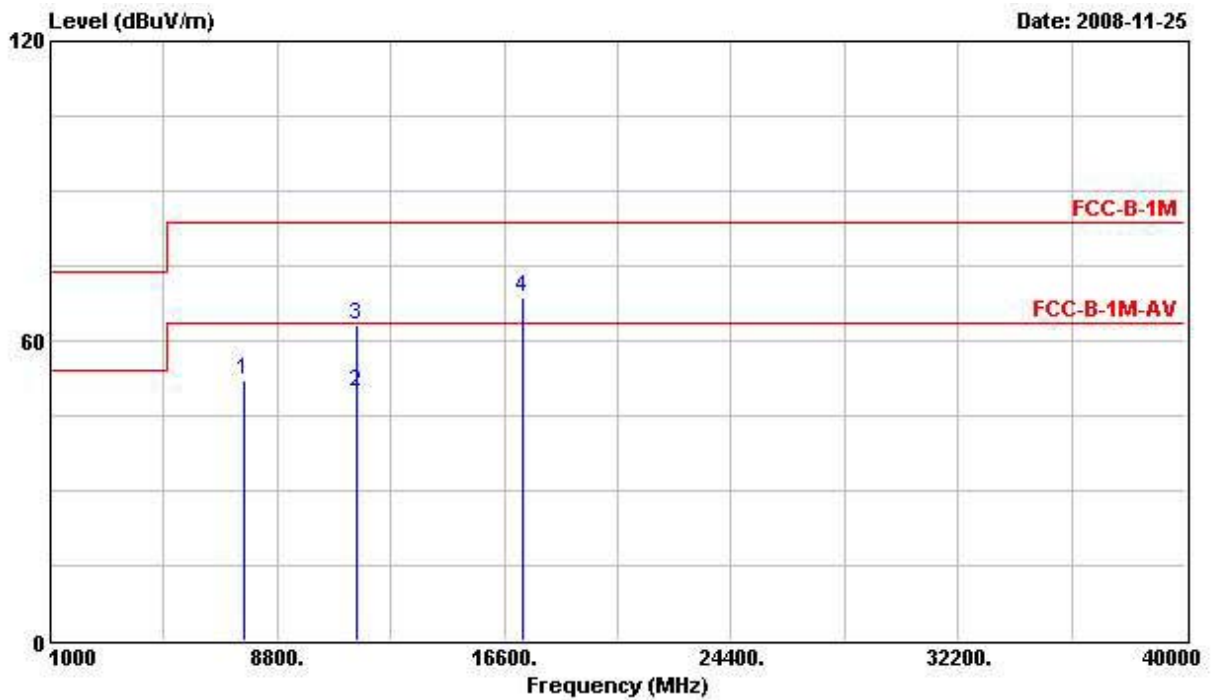
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Preamp Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB
1	7276.000	56.76	-26.78	83.54	49.04	36.76	32.83 PEAK
2	11650.000	46.79	-16.75	63.54	33.25	39.56	32.59 AVERAGE
3	11650.000	61.84	-21.70	83.54	48.30	39.56	32.59 Peak
4	17471.000	69.30			44.82	45.22	28.57 PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

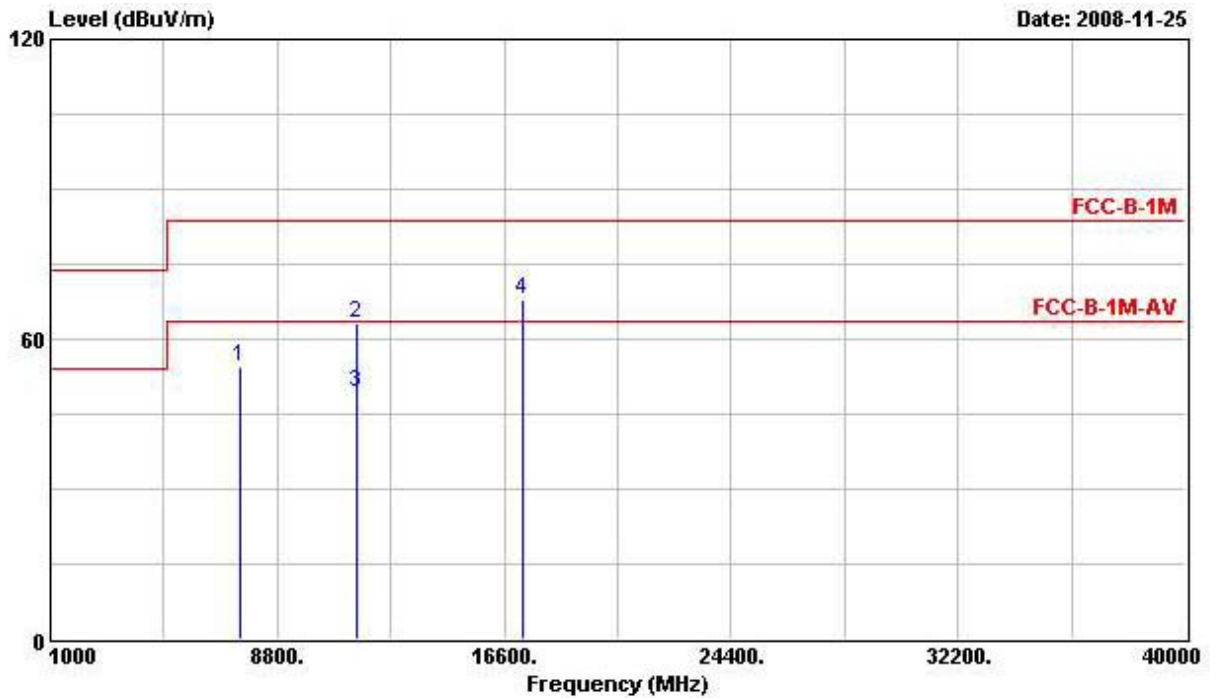
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 151 (40MHz)

**Horizontal**

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB	dB	
1	7640.000	52.22	-31.32	83.54	43.14	37.45	4.57	32.94 PEAK
2	11509.800	49.82	-13.72	63.54	35.84	39.70	6.73	32.45 AVERAGE
3	11509.800	63.34	-20.20	83.54	49.36	39.70	6.73	32.45 Peak
4	17265.000	68.78			45.98	43.54	7.81	28.55 PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

## Vertical

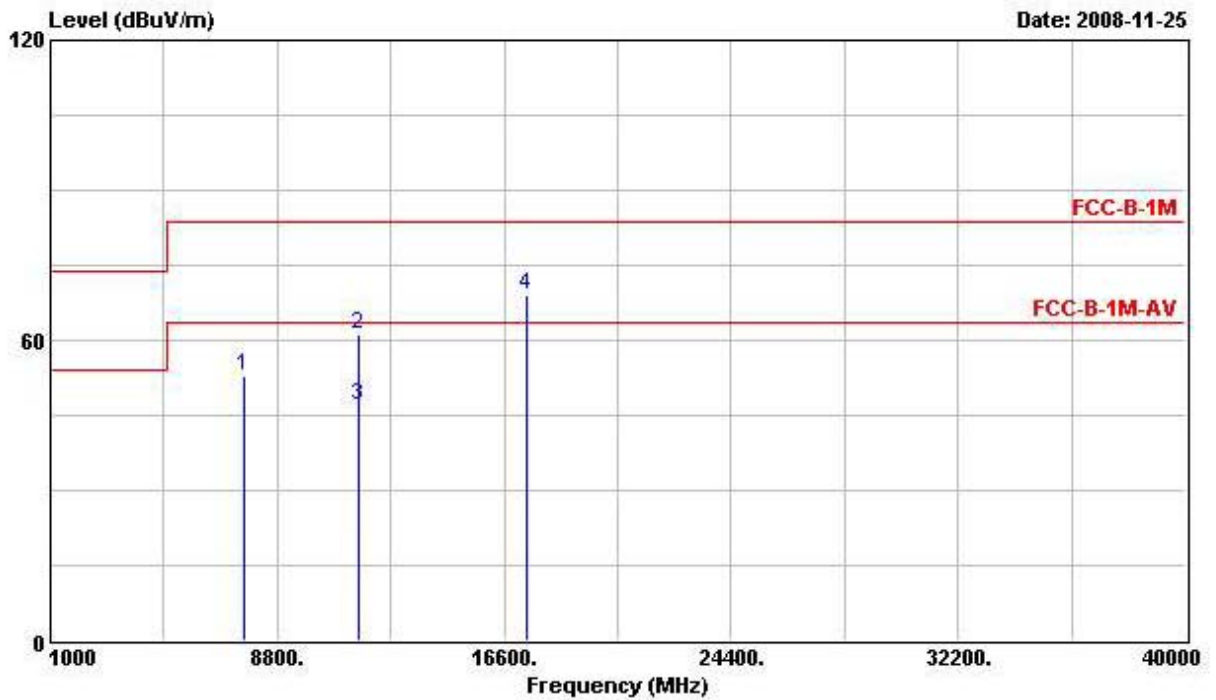


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7492.000	54.67	-28.87	83.54	45.83	37.30	4.52	32.98	PEAK
2	11509.900	63.06	-20.48	83.54	49.08	39.70	6.73	32.45	Peak
3	11509.900	49.44	-14.10	63.54	35.46	39.70	6.73	32.45	AVERAGE
4	17269.000	68.04			45.24	43.54	7.81	28.55	PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.



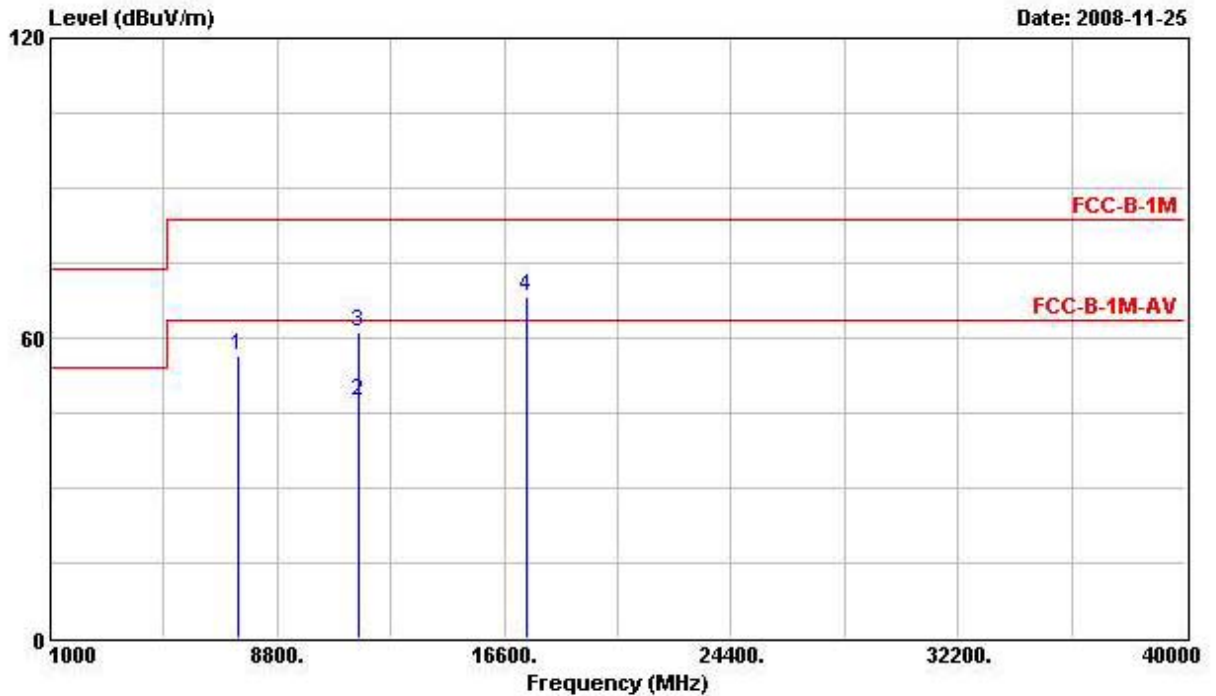
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 159 (40MHz)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	7672.000	52.96	-30.58	83.54	43.82	37.47	4.58	32.92 PEAK
2	11590.000	61.29	-22.25	83.54	47.57	39.61	6.62	32.52 Peak
3	11590.000	46.98	-16.56	63.54	33.26	39.61	6.62	32.52 AVERAGE
4	17385.000	68.90			45.11	44.52	7.83	28.57 PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

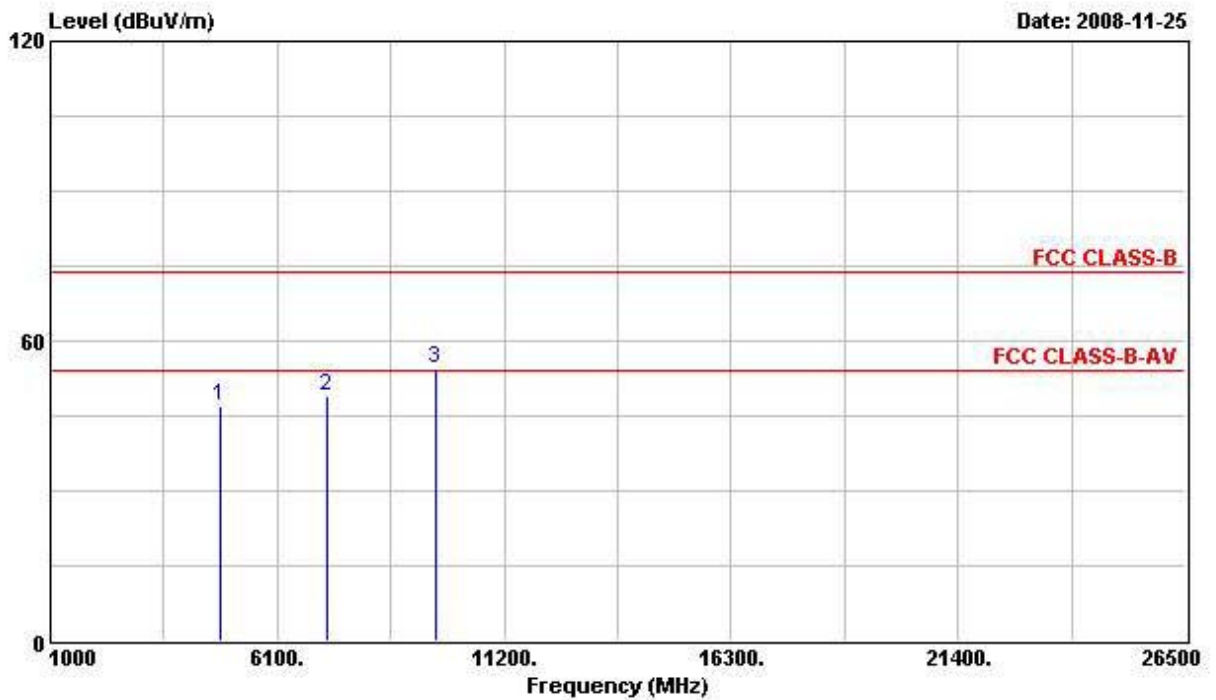
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7484.000	56.31	-27.23	83.54	47.62	37.26	4.40	32.97	PEAK
2	11589.900	47.26	-16.28	63.54	33.54	39.61	6.62	32.52	AVERAGE
3	11589.900	61.02	-22.52	83.54	47.30	39.61	6.62	32.52	Peak
4	17389.000	68.44			44.66	44.52	7.83	28.57	PEAK

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

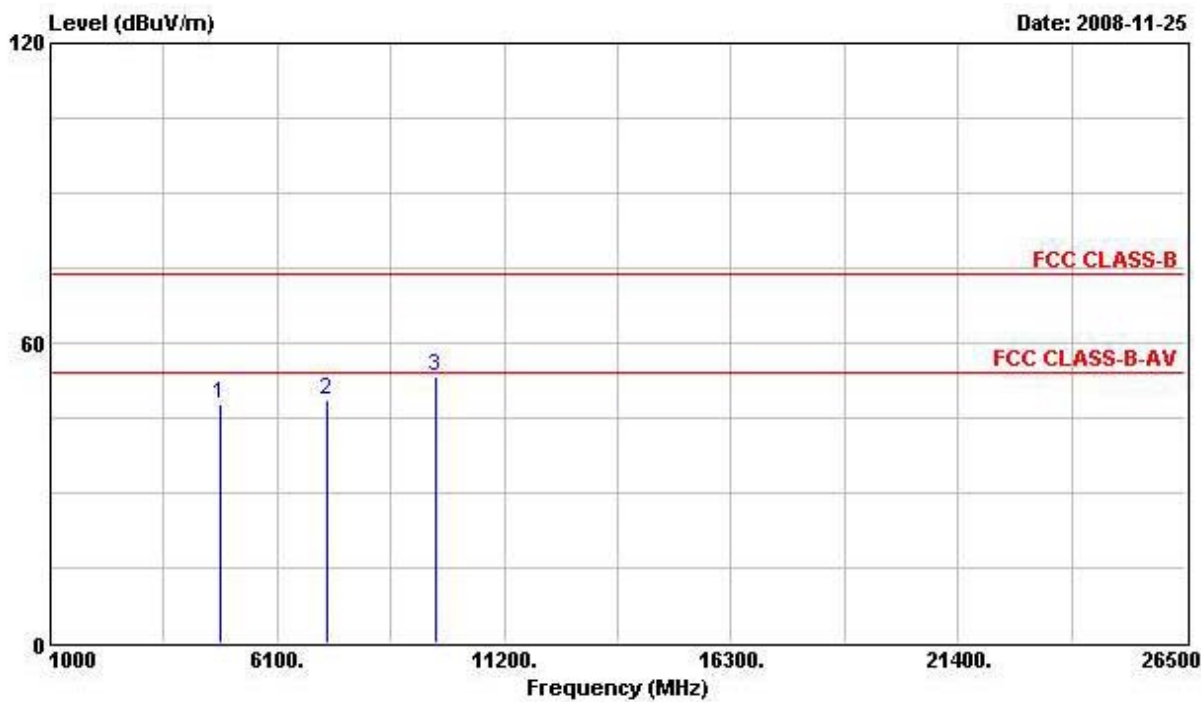
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11b CH 1

**Horizontal**

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB	dB	
1	4824.000	46.97	-7.03	54.00	42.36	33.06	4.03	32.47 PK
2	7232.000	48.91			42.26	35.78	3.67	32.80 PEAK
3	9648.000	54.34			43.67	38.41	5.21	32.95 PEAK

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

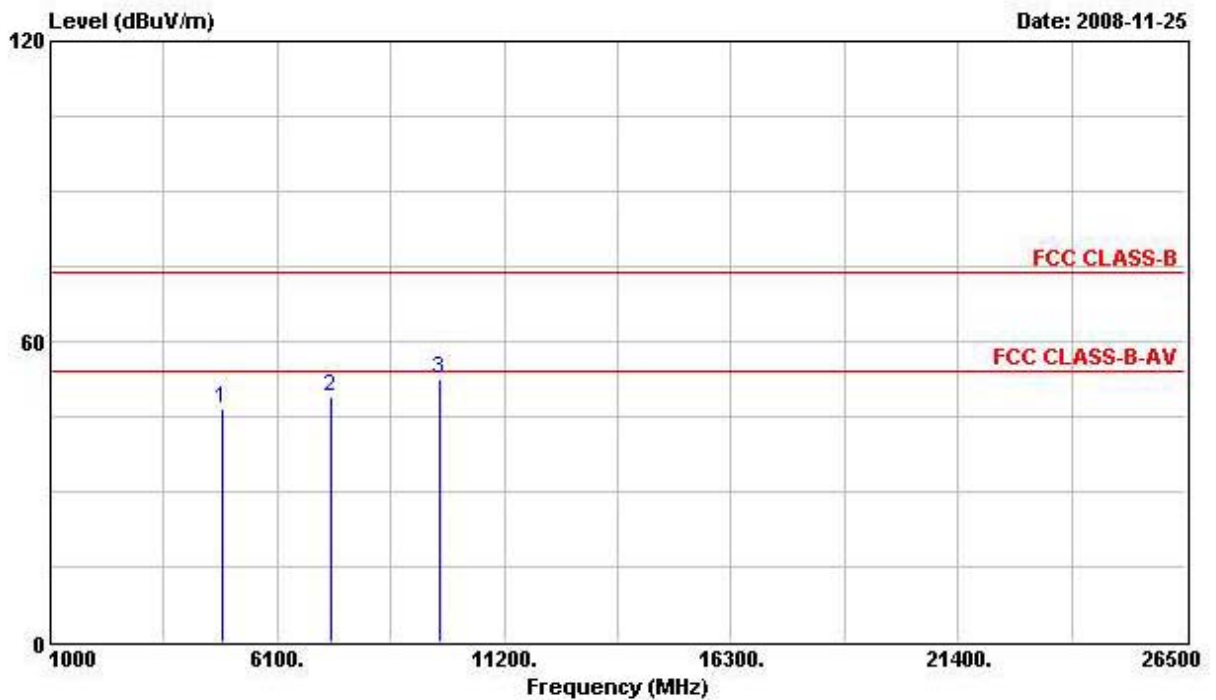
Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4824.000	47.63	-6.37	54.00	43.02	33.06	4.03	32.47 PK
2	7232.000	48.67			42.03	35.78	3.67	32.80 PEAK
3	9648.000	53.21			42.54	38.41	5.21	32.95 PEAK

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

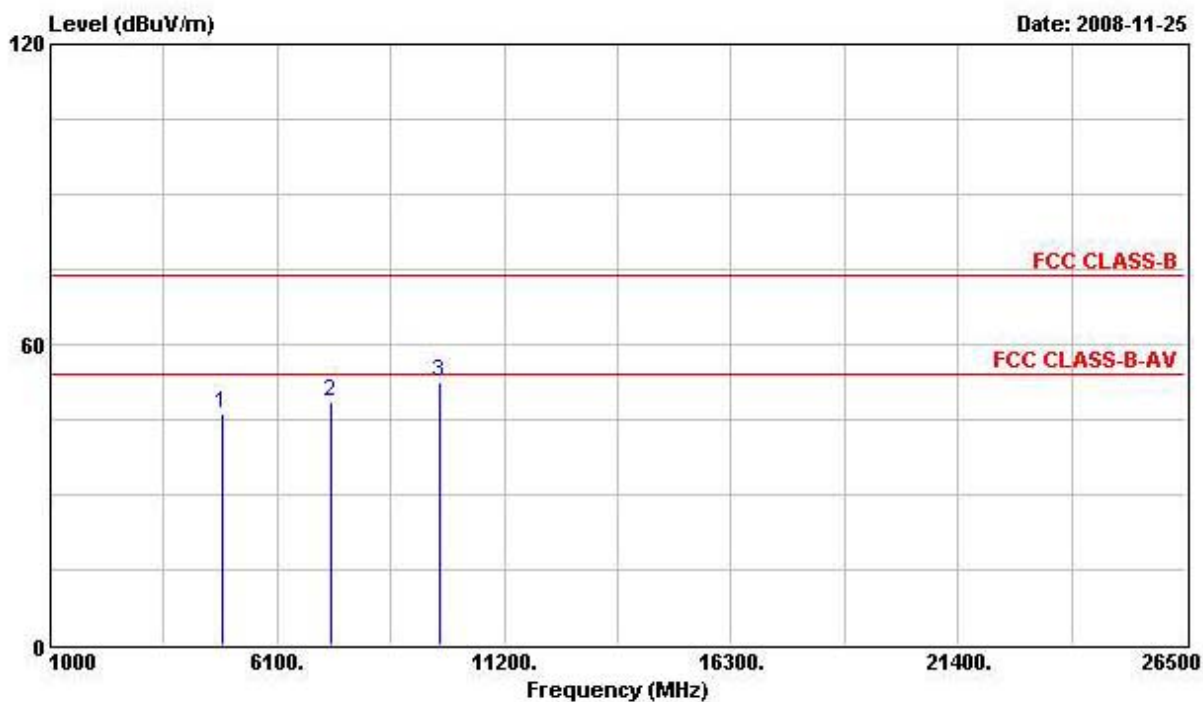
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11b CH 6

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4874.000	46.48	-7.52	54.00	41.77	33.16	4.02	32.47 PK
2	7311.000	49.04	-4.96	54.00	42.03	35.94	3.91	32.85 PK
3	9748.000	52.65			41.64	38.62	5.31	32.92 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

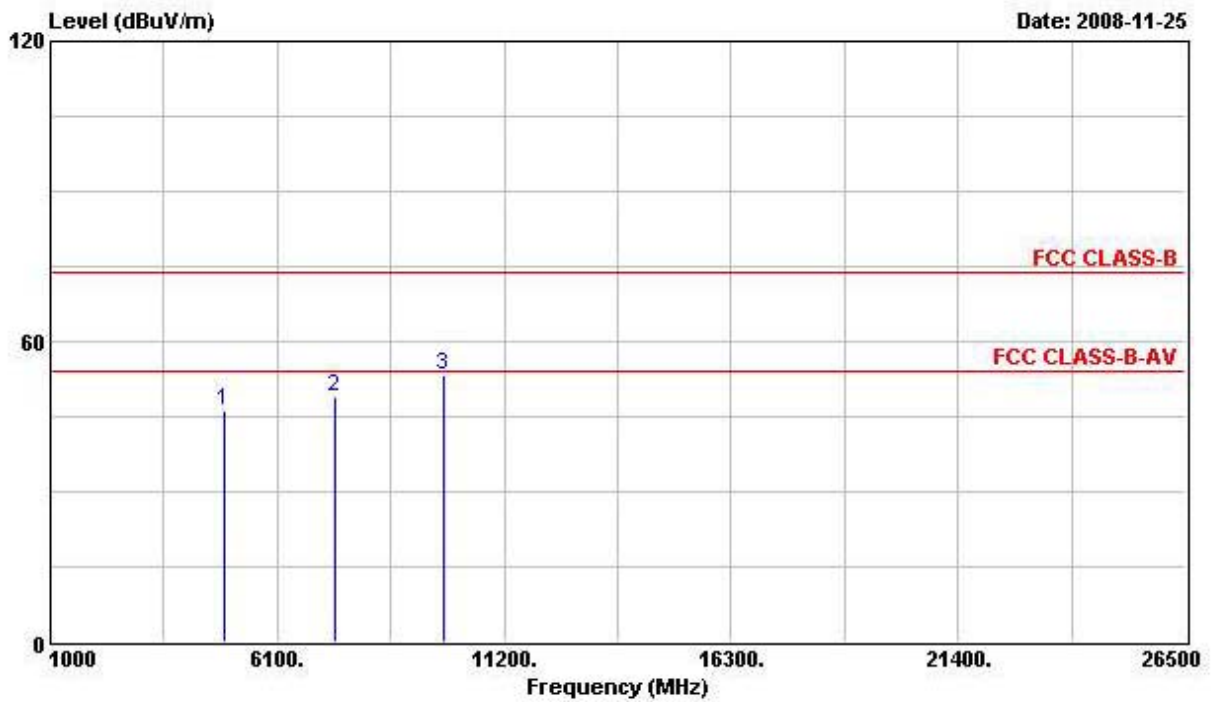
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4878.000	46.20	-7.80	54.00	41.48	33.16	4.02	32.47 PK
2	7307.000	48.69	-5.31	54.00	41.68	35.94	3.91	32.85 PK
3	9752.000	52.50			41.49	38.62	5.31	32.92 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

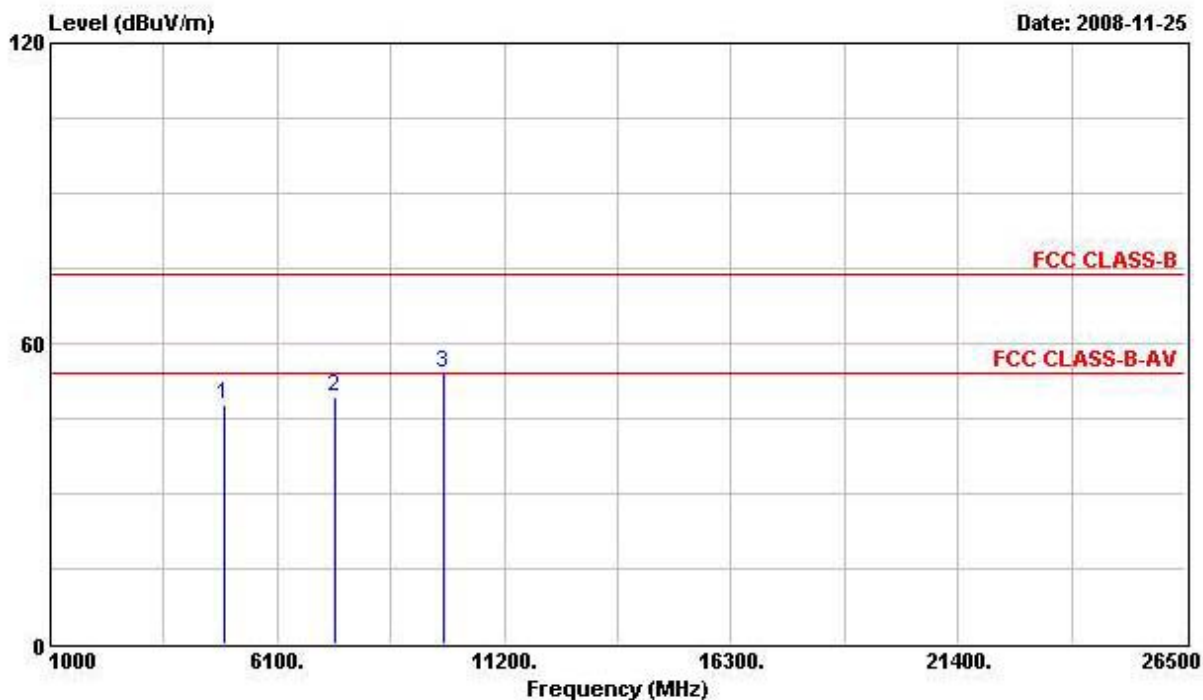
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11b CH 11

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4920.000	46.37	-7.63	54.00	41.55	33.26	4.02	32.46 PK
2	7386.000	49.03	-4.97	54.00	41.62	36.15	4.16	32.90 PK
3	9852.000	53.23			41.84	38.82	5.47	32.89 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

## Vertical

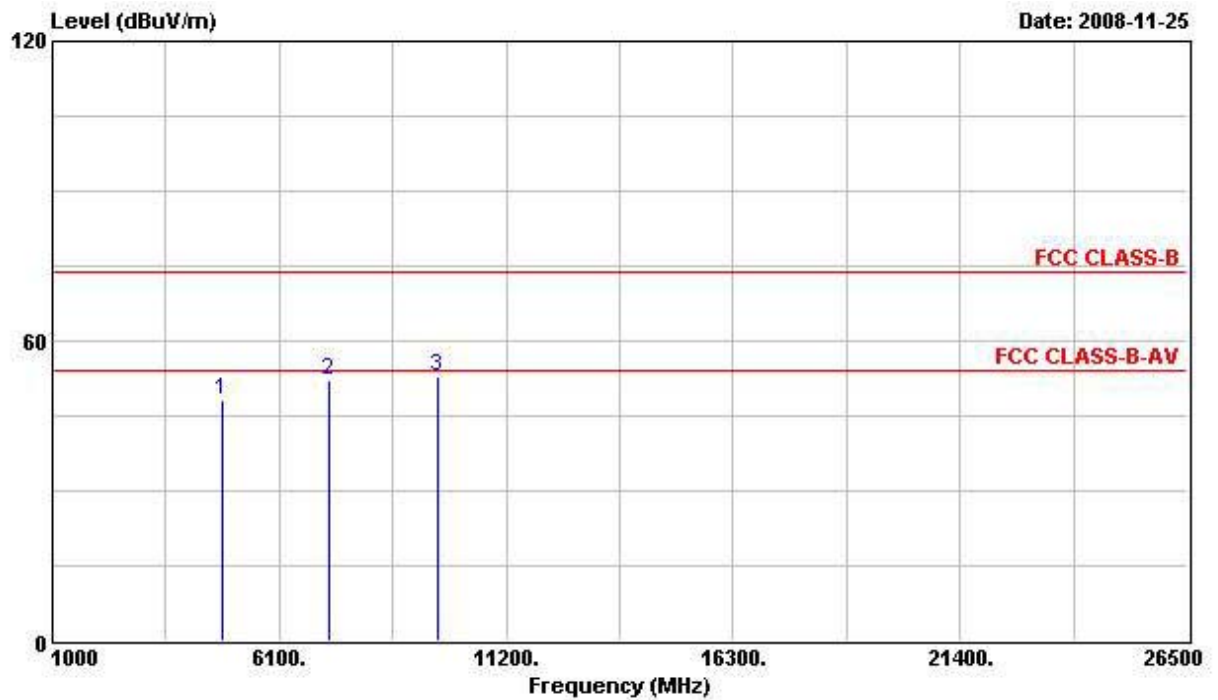


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4924.000	47.72	-6.28	54.00	42.90	33.26	4.02	32.46 PK
2	7386.000	49.29	-4.71	54.00	41.88	36.15	4.16	32.90 PK
3	9848.000	54.02			42.66	38.79	5.47	32.89 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.



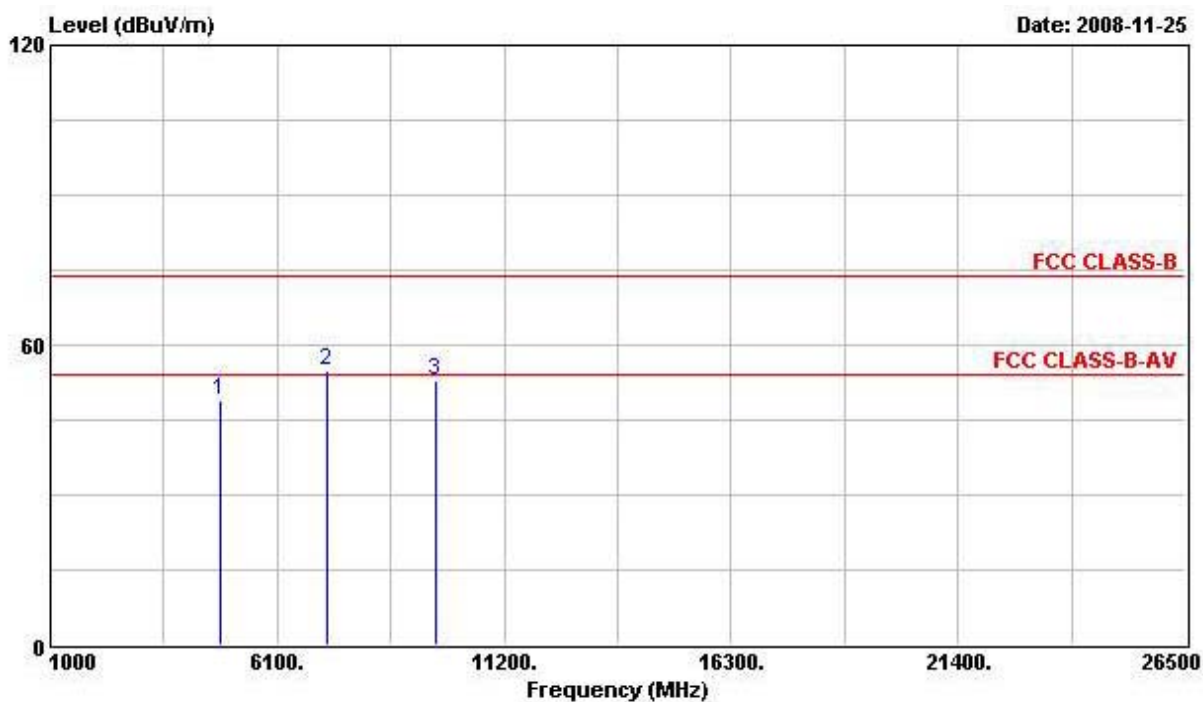
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11g CH 1

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4820.000	48.34	-5.66	54.00	43.73	33.06	4.03	32.47 PK
2	7232.000	52.28			45.63	35.78	3.67	32.80 PEAK
3	9652.000	52.71			42.04	38.41	5.21	32.95 PEAK

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

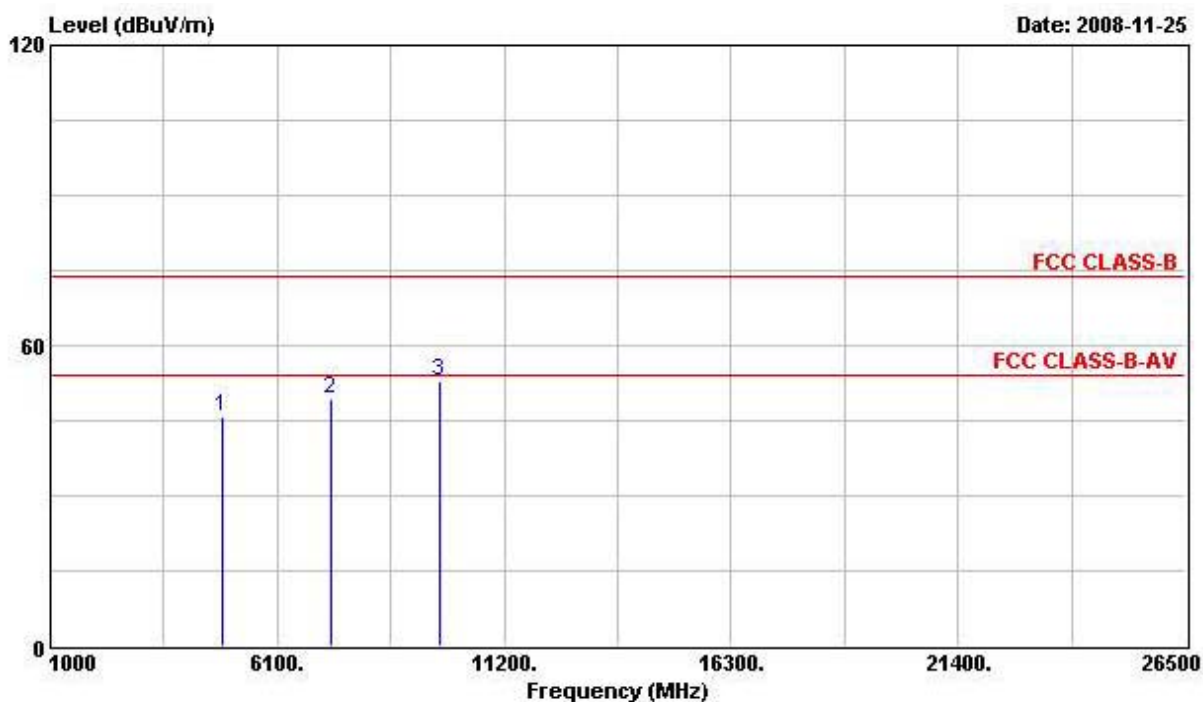
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4820.000	48.87	-5.13	54.00	44.26	33.06	4.03	32.47 PK
2	7230.000	54.97			48.36	35.74	3.67	32.80 PEAK
3	9648.000	52.91			42.24	38.41	5.21	32.95 PEAK

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

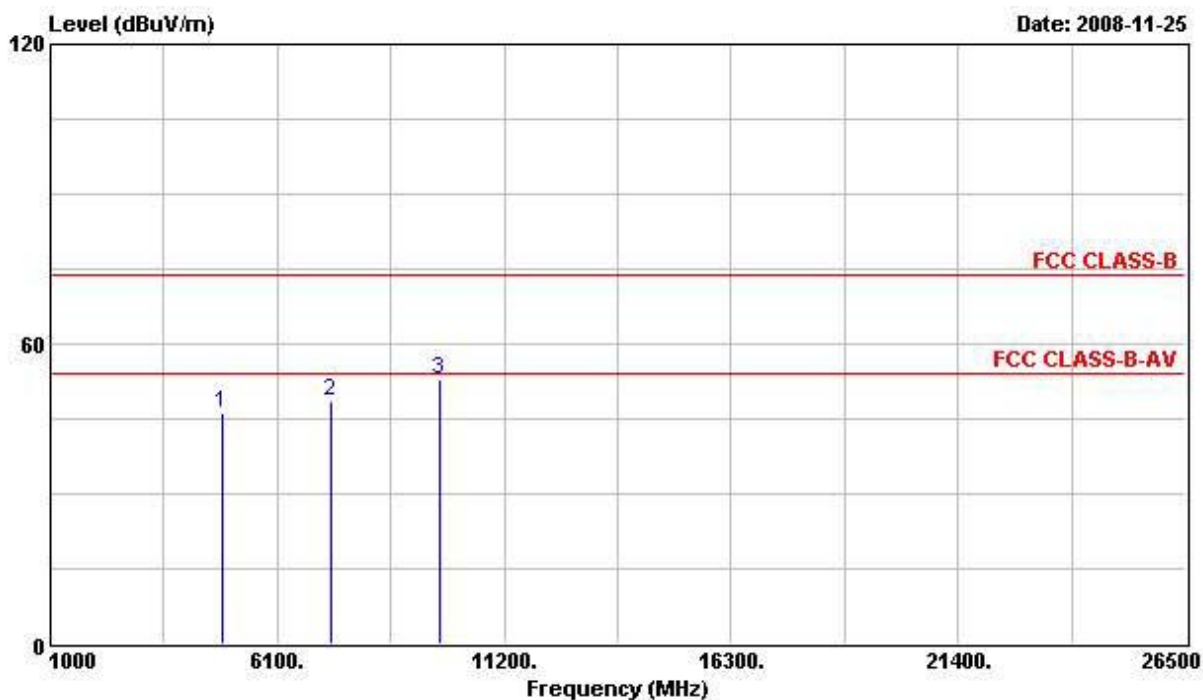
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11g CH 6

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4878.000	45.84	-8.16	54.00	41.13	33.16	4.02	32.47	PK
2	7315.000	49.31	-4.69	54.00	42.32	35.94	3.91	32.87	PK
3	9744.000	52.95			41.98	38.58	5.31	32.92	PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

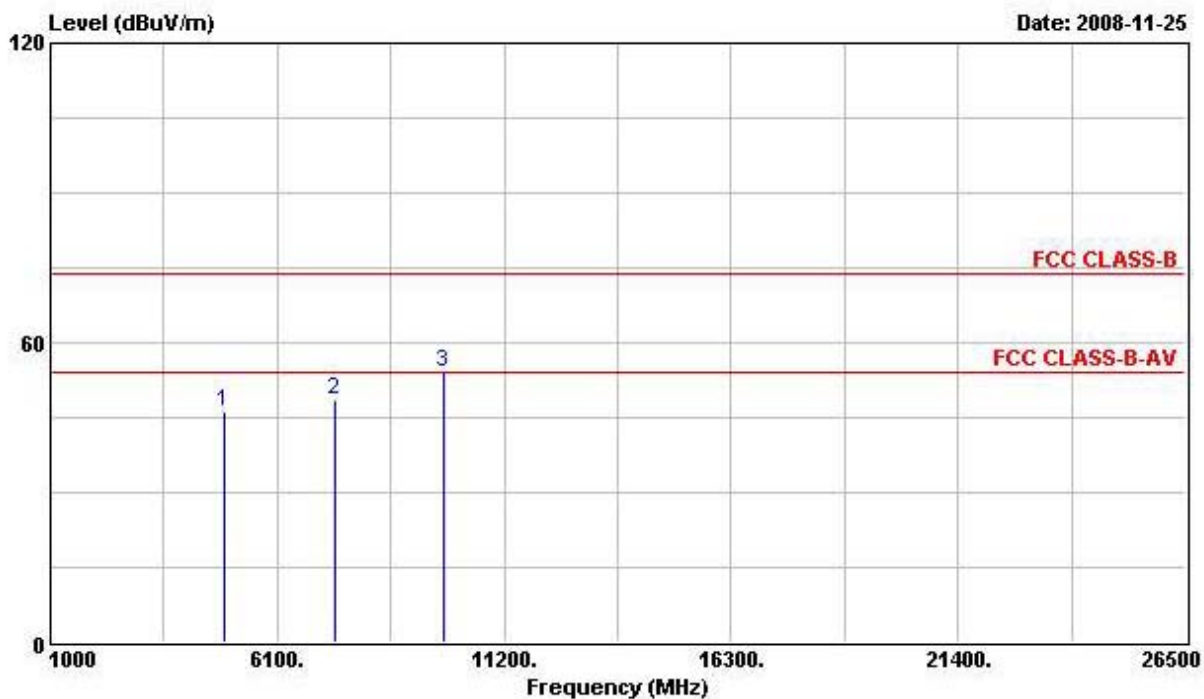
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4870.000	46.30	-7.70	54.00	41.59	33.16	4.02	32.47 PK
2	7315.000	48.72	-5.28	54.00	41.73	35.94	3.91	32.87 PK
3	9748.000	52.95			41.94	38.62	5.31	32.92 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

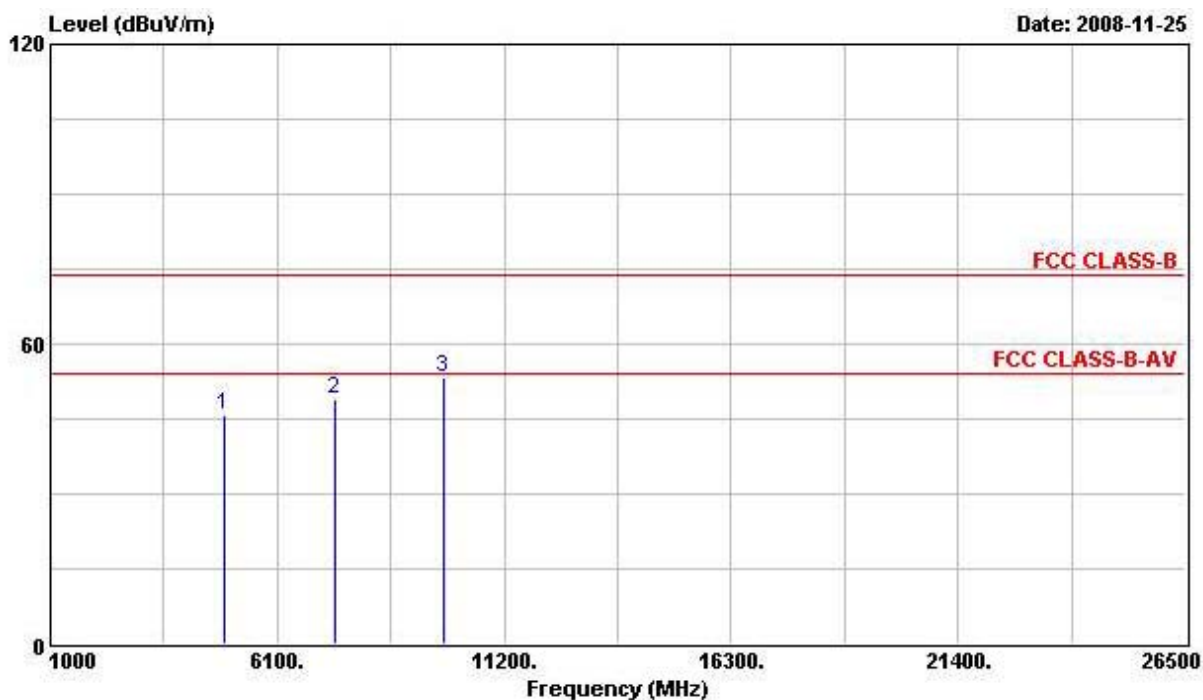
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11g CH 11

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4920.000	46.04	-7.96	54.00	41.23	33.26	4.02	32.46 PK
2	7382.000	48.73	-5.27	54.00	41.36	36.11	4.16	32.90 PK
3	9852.000	54.26			42.86	38.82	5.47	32.89 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

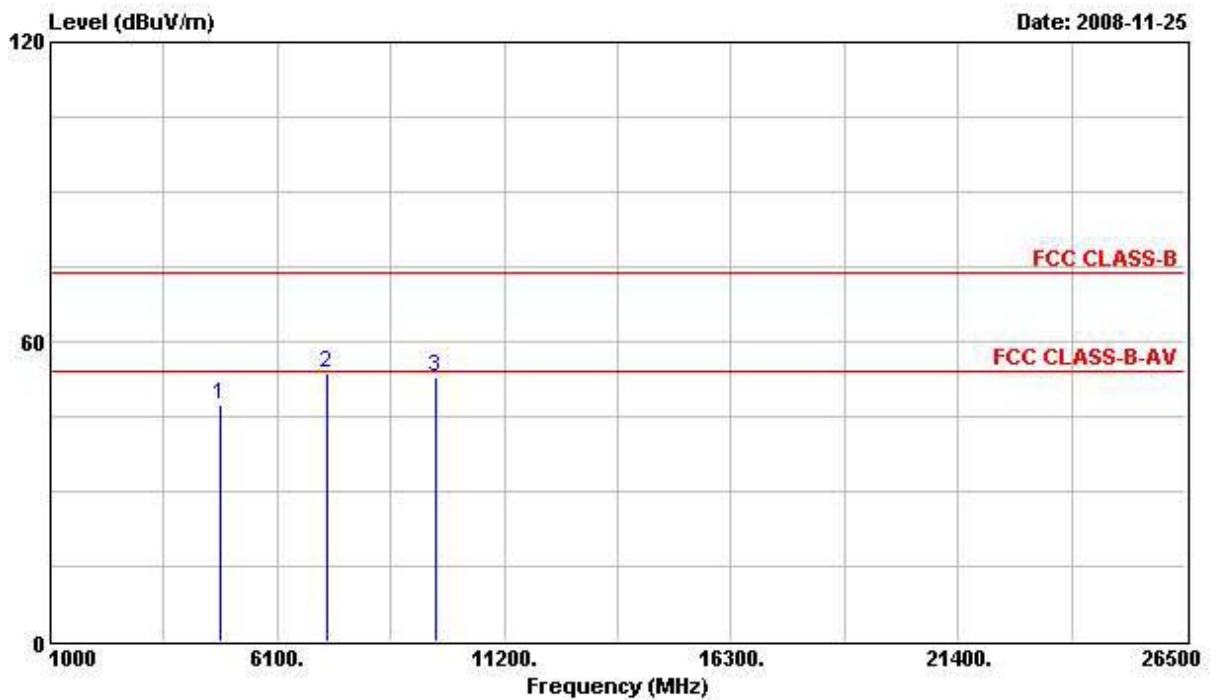
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4920.000	45.95	-8.05	54.00	41.13	33.26	4.02	32.46 PK
2 @	7386.000	48.79	-5.21	54.00	41.38	36.15	4.16	32.90 PK
3	9852.000	53.45			42.05	38.82	5.47	32.89 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

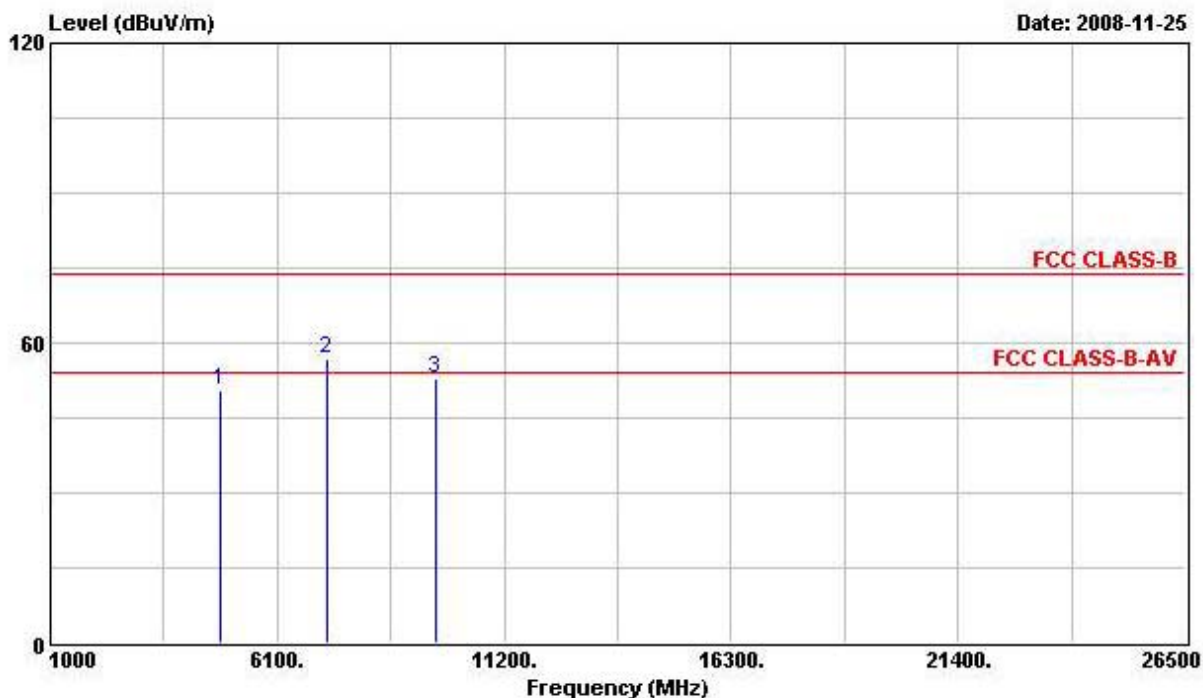
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 1 (20MHz)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4824.000	47.56	-6.44	54.00	42.94	33.06	4.03	32.47	PK
2	7240.000	53.75			47.12	35.78	3.67	32.82	PEAK
3	9644.000	52.84			42.20	38.38	5.21	32.95	PEAK

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

## Vertical

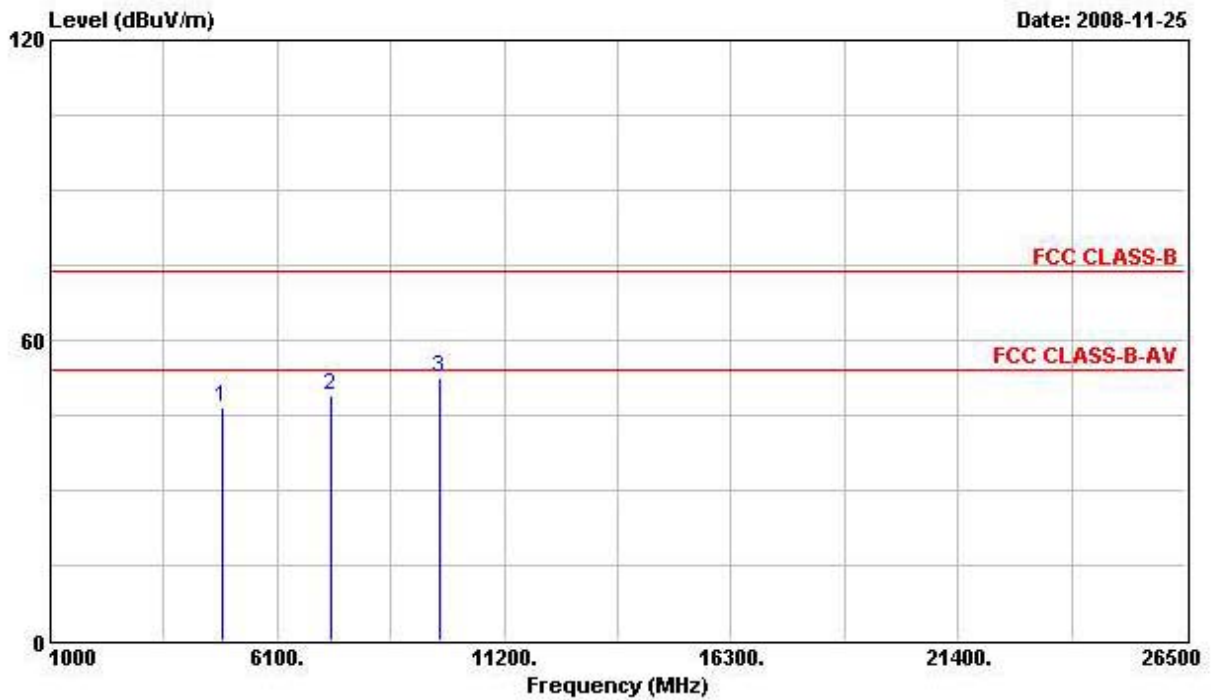


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4828.000	50.45	-3.55	54.00	45.84	33.06	4.03	32.47 PK
2	7236.000	56.77			50.14	35.78	3.67	32.82 PEAK
3	9644.000	53.06			42.42	38.38	5.21	32.95 PEAK

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.



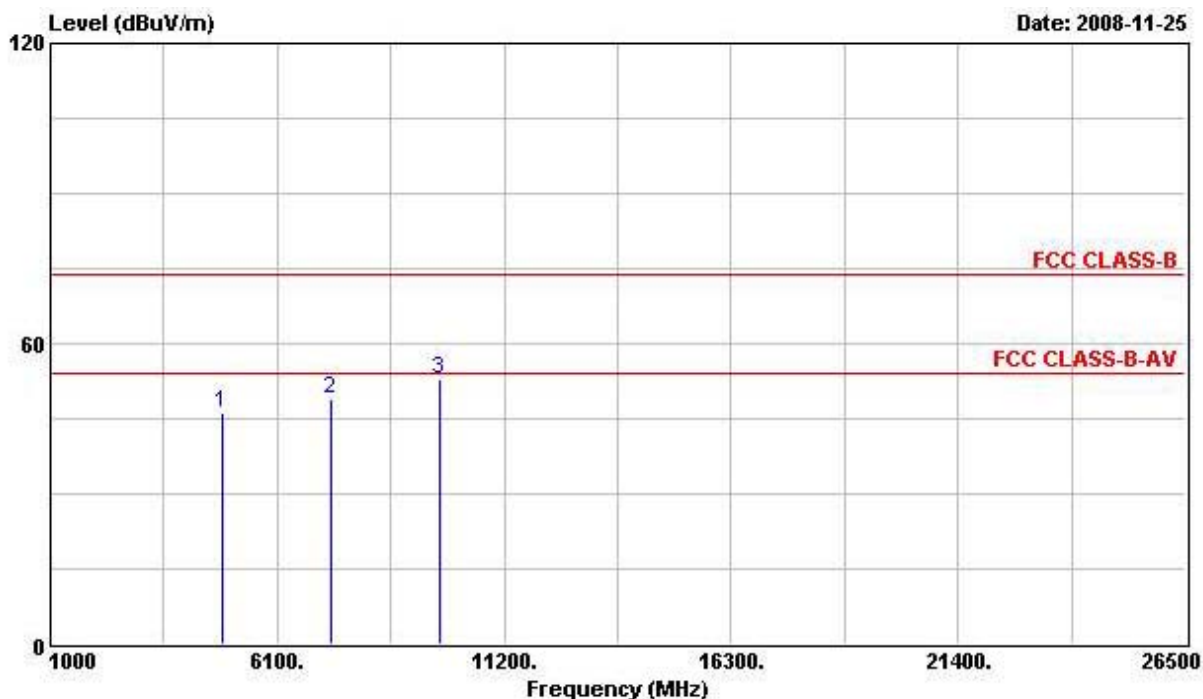
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 6 (20MHz)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4878.000	46.56	-7.44	54.00	41.85	33.16	4.02	32.47 PK
2	7311.000	49.10	-4.90	54.00	42.09	35.94	3.91	32.85 PK
3	9748.000	52.41			41.40	38.62	5.31	32.92 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

## Vertical

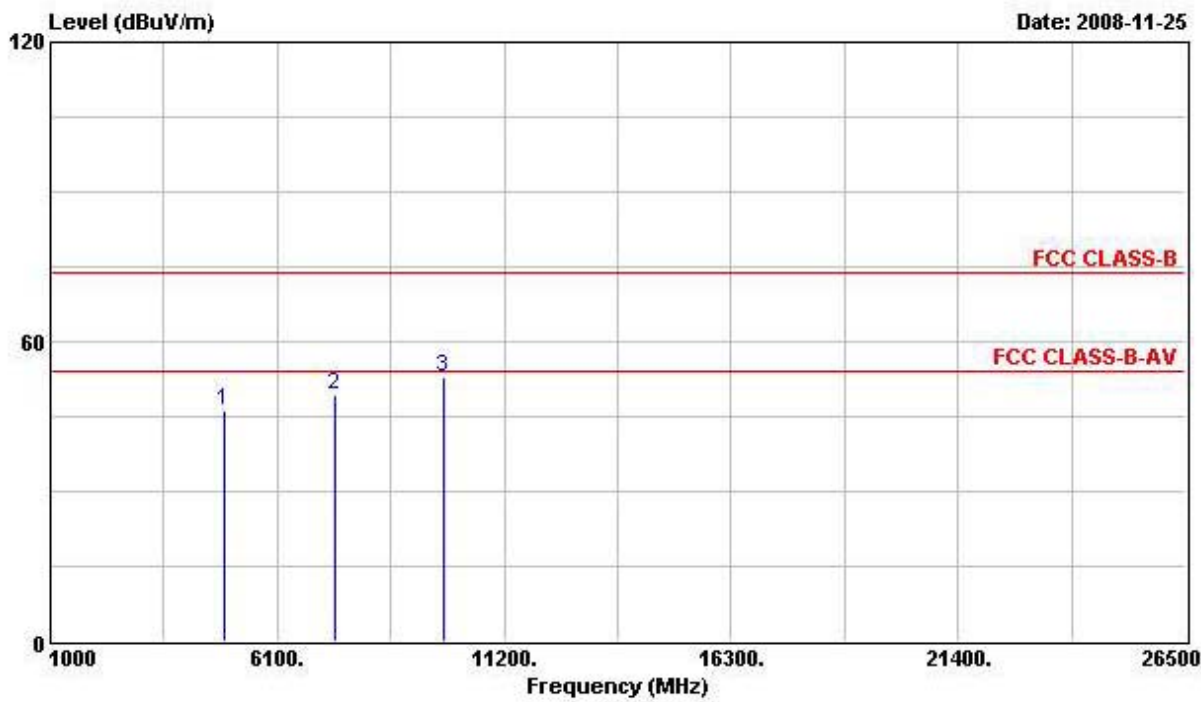


	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor
			dB	dBuV/m	dBuV	dB/m	dB	dB
1	4870.000	46.25	-7.75	54.00	41.54	33.16	4.02	32.47 PK
2	7315.000	48.87	-5.13	54.00	41.88	35.94	3.91	32.87 PK
3	9748.000	53.05			42.04	38.62	5.31	32.92 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 11 (20MHz)

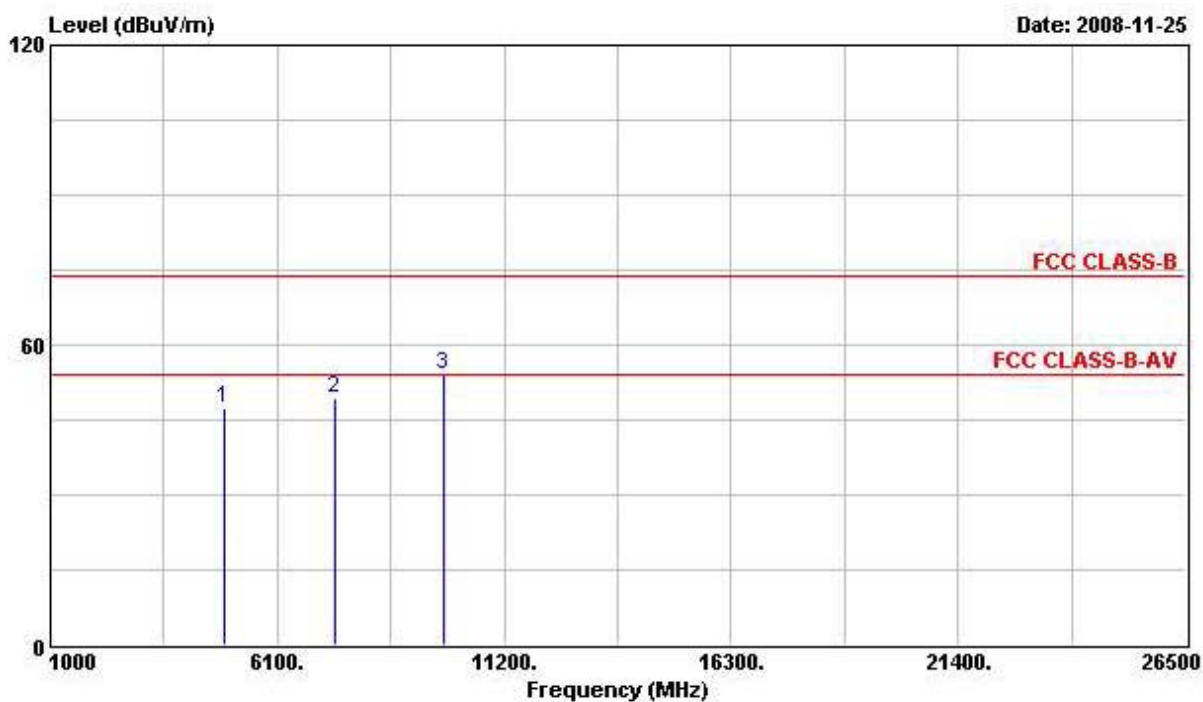
Horizontal



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB
1	4924.000	46.21	-7.79	54.00	41.39	33.26	4.02	32.46 PK
2	7390.000	49.15	-4.85	54.00	41.75	36.15	4.16	32.92 PK
3	9852.000	52.93			41.53	38.82	5.47	32.89 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

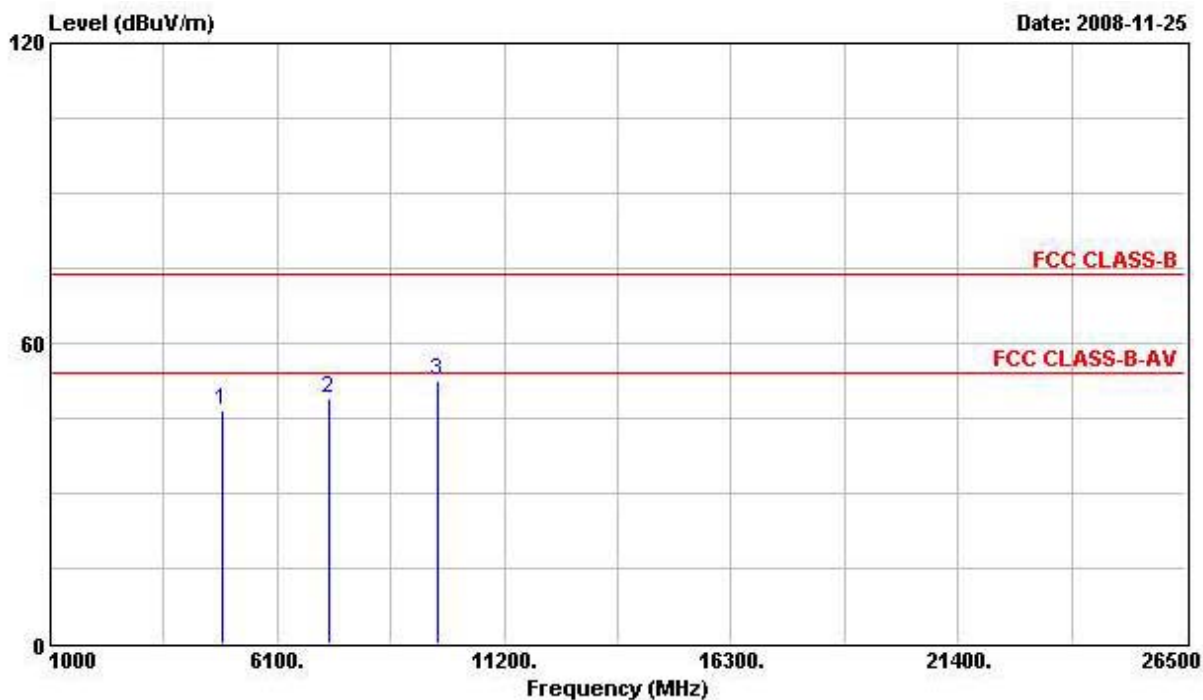
## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4920.000	47.21	-6.79	54.00	42.39	33.26	4.02	32.46 PK
2 @	7386.000	49.30	-4.70	54.00	41.89	36.15	4.16	32.90 PK
3	9848.000	54.22			42.86	38.79	5.47	32.89 PEAK

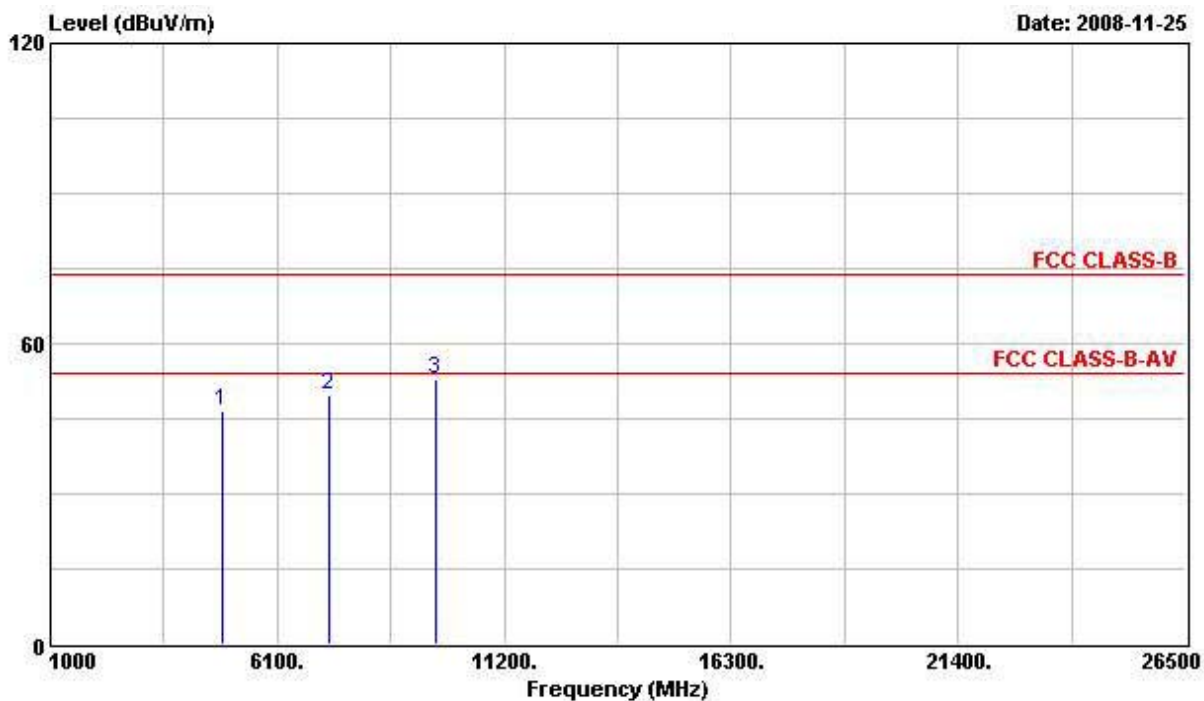
Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 3 (40MHz)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4844.000	46.51	-7.49	54.00	41.86	33.09	4.02	32.47	PK
2	7262.000	49.10	-4.90	54.00	42.32	35.82	3.79	32.83	PK
3	9692.000	52.38			41.57	38.48	5.26	32.94	PEAK

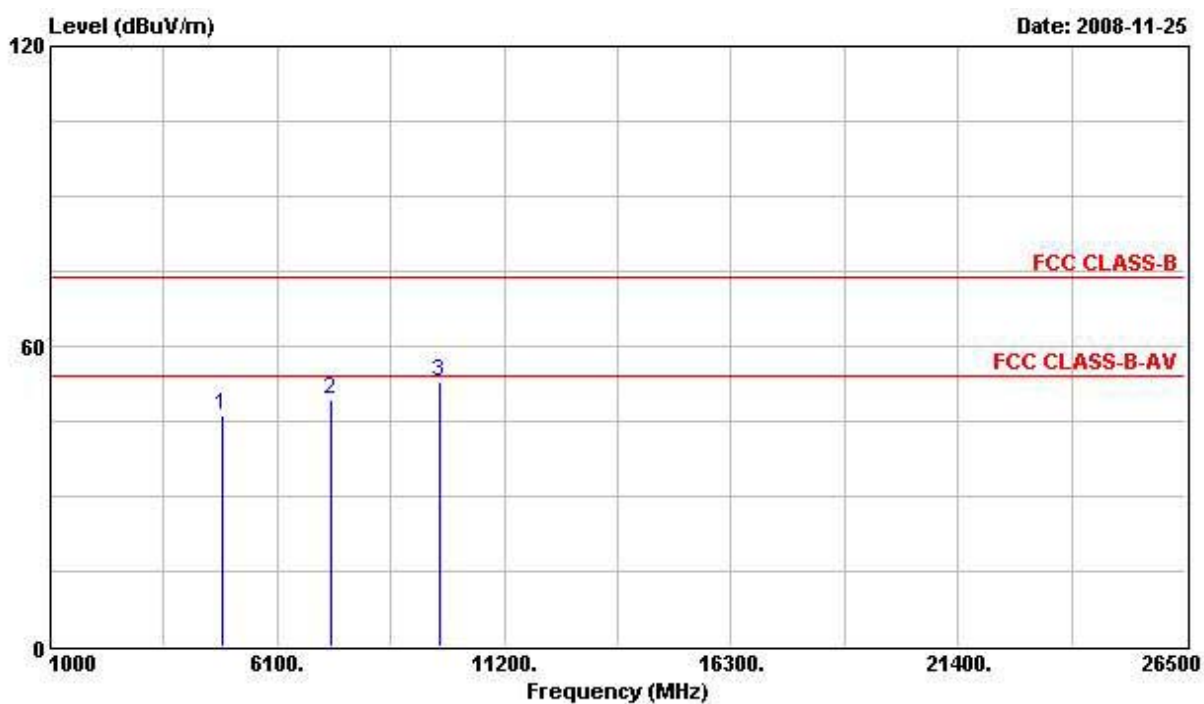
Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

**Vertical**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Preamp Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB
1	4848.000	46.56	-7.44	54.00	41.92	33.09	4.02 32.47 PK
2	7260.000	49.91	-4.09	54.00	43.11	35.82	3.79 32.82 PK
3	9684.000	52.96			42.16	38.48	5.26 32.94 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

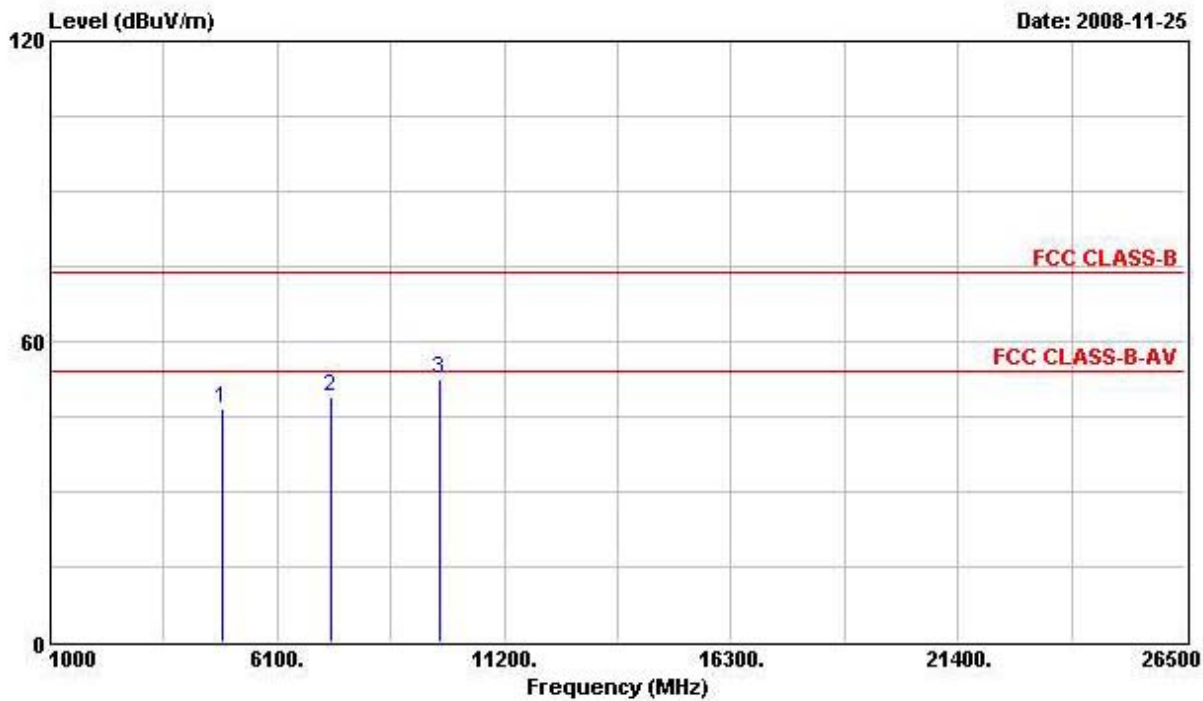
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 6 (40MHz)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4878.000	46.24	-7.76	54.00	41.53	33.16	4.02	32.47	PK
2	7311.000	49.40	-4.60	54.00	42.39	35.94	3.91	32.85	PK
3	9752.000	52.77			41.76	38.62	5.31	32.92	PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

Vertical

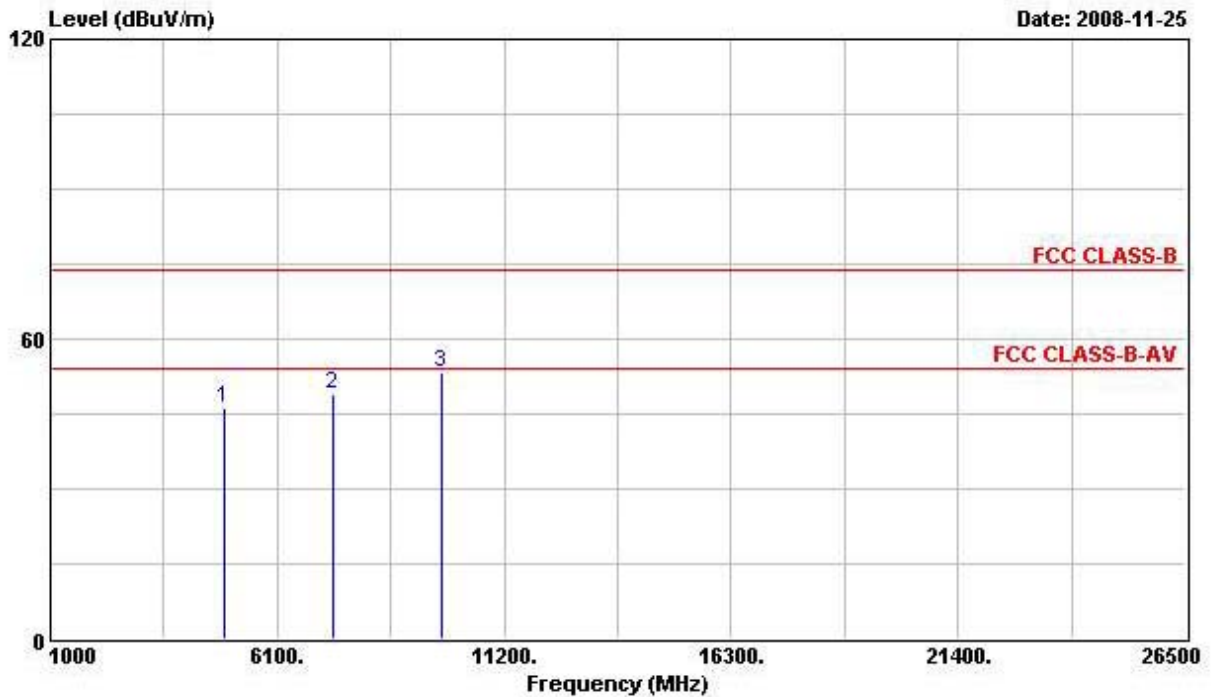


	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB
1	4870.000	46.63	-7.37	54.00	41.91	33.16	4.02	32.47 PK
2	7307.000	49.10	-4.90	54.00	42.09	35.94	3.91	32.85 PK
3	9744.000	52.36			41.38	38.58	5.31	32.92 PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.



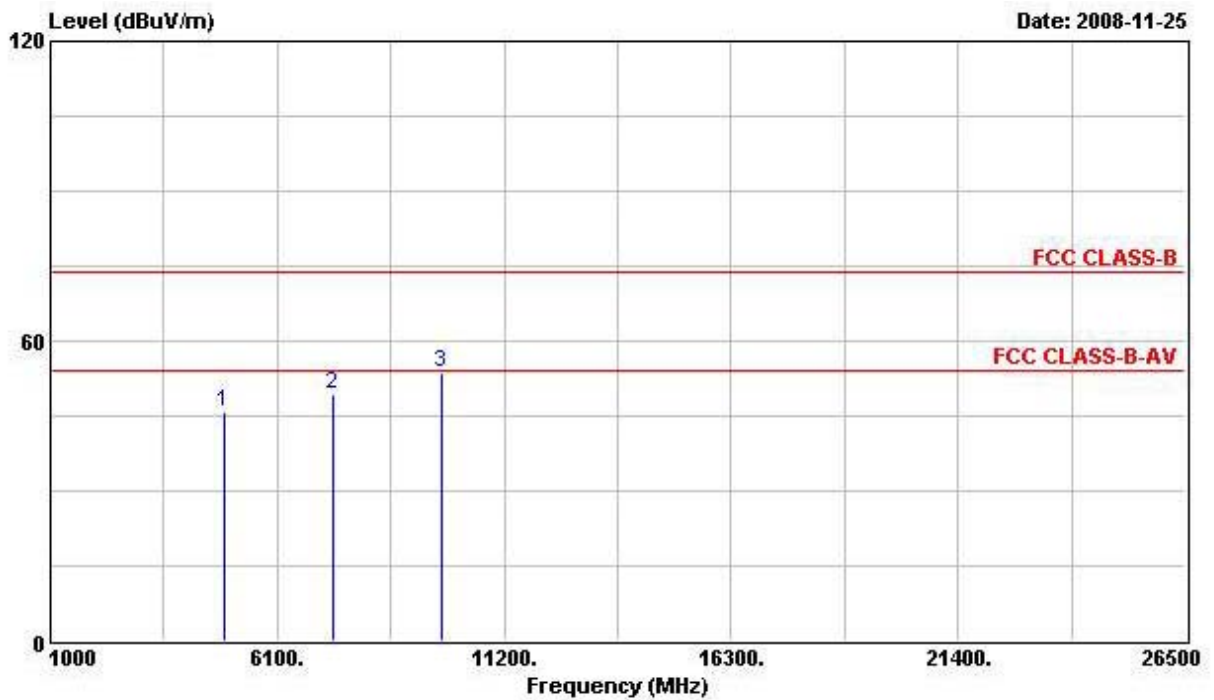
Test date	Nov. 25, 2008	Test Site No.	03CH03-HY
Temperature	27.4	Humidity	41%
Test Engineer	Duncan	Configuration	802.11n CH 9 (40MHz)

**Horizontal**

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4900.000	46.33	-7.67	54.00	41.59	33.19	4.02	32.47	PK
2 @	7352.000	48.84	-5.16	54.00	41.62	36.07	4.03	32.88	PK
3	9808.000	53.28			42.05	38.72	5.42	32.91	PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

## Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4904.000	45.83	-8.17	54.00	41.04	33.23	4.02	32.47	PK
2 @	7360.000	49.43	-4.57	54.00	42.21	36.07	4.03	32.88	PK
3	9812.000	53.58			42.35	38.72	5.42	32.90	PEAK

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions.

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.

## **3.2 Antenna Requirements**

### **3.2.1 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.

### **3.2.2 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
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2008	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan. 14, 2008	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jul. 21, 2008	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP30	100023	9 kHz - 30 GHz	Jan. 10, 2008	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 12, 2008	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 04, 2008	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan.18, 2008	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 03, 2008	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 03, 2008	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)

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	9121372	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul 28, 2008*	Radiation (03CH03-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Jan. 10, 2008	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one 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 2 <sup>nd</sup> Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

## 6 TAF CERTIFICATE OF ACCREDITATION

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

Certificate No. : L1190-070110

## 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.