

Test Report for FCC Part 15 Subpart B & C

of

Product Name

802.11 BG Wireless Module

Model

VNT6656GEV00

(Brand:VIA)

Applied by:

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Test Performed by:

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LT LAB: NVLAP:200234-0; VCCI: R-1435, C-1440; NEMKO: ELA 113B; BSMI: SL2-IN-E-0013; TAF: 0997; IC: IC4164-1

ISL-T10-R2-3

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1. General

1.1 Certification of Accuracy of Test Data

Standards: CFR 47 Part 15 Subpart B Class B
CFR 47 Part 15 Subpart C (Section 15.247)

Test Procedure: ANSI C63.4:2003

Equipment Tested: 802.11 BG Wireless Module

Model: VNT6656GEV00

Applied by: VIA Technologies, Inc.

Sample received Date: 2006/12/22

Final test Date : 2006/12/25-2006/12/28

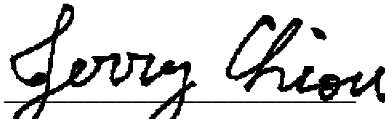
Test Result PASS

Test Site: Chamber 02, Conduction 02

Temperature Refer to each site test data

Humidity: Refer to each site test data

Test Engineer:


Jerry Chiou

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Approve & Signature



Eddy Hsiung/Director

Test results given in this report apply only to the specific sample(s) tested under stated test conditions. This report shall not be reproduced other than in full without the explicit written consent of ISL. This report totally contains 65 pages, including 1 cover page, 2 contents page, and 62 pages for the test description. This report must not be use to claim product endorsement by NVLAP or any agency of the U.S. Government.

This test data shown below is traceable to NIST or national or international standard. International Standards Laboratory certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

2. Test Results Summary

The 802.11b functions of EUT has been tested according to the FCC regulations listed below:

Tested Standards: 47 CFR Part 15 Subpart C			
Standard Section	Test Type	Result	Remarks
15.207	AC Power Line Emissions	Pass	
15.247(a)(2)	Spectrum Bandwidth Of DSSS device	Pass	
15.247(b)	Max. Peak Output Power	Pass	
15.247(c)	Radiated Emissions 30MHz – 25 GHz	Pass	
15.247 (c)	Band Edge Measurement	Pass	
15.247(b)(4)	Radiation Exposure	Pass	MPE report attached
15.247 (d)	Power Spectral Density	Pass	

The 802.11g functions of EUT has been tested according to the FCC regulations listed below:

Tested Standards: 47 CFR Part 15 Subpart C			
Standard Section	Test Type	Result	Remarks
15.207	AC Power Line Emissions	Pass	
15.247(a)(2)	Spectrum Bandwidth Of DSSS device	Pass	
15.247(b)	Max. Peak Output Power	Pass	
15.247(c)	Radiated Emissions 30MHz – 25 GHz	Pass	
15.247 (c)	Band Edge Measurement	Pass	
15.247(b)(4)	Radiation Exposure	Pass	MPE report attached
15.247 (d)	Power Spectral Density	Pass	

3. Description of Equipment Under Test (EUT)

Description:	802.11 BG Wireless Module
Model No.:	VNT6656GEV00
Brand:	VIA
Frequency Range 802.11b/g:	2400~2483.5 MHz
Support channel: 802.11b/g	11 Channels
Modulation Skill: 802.11b	DBPSK(1Mbps), DQPSK(2Mbps), CCK(5.5/11Mbps)
802.11g	OFDM (6M - 54Mbps)
Antennas Type:	
Antenna 1: PIFA	(6-23-7M59K-021 , made by FAVORTRON CO., LTD)
Antenna 2: PIFA	(6-23-7M59K-011 , made by FAVORTRON CO., LTD)
Antenna 3: PIFA	(13-130-F14911, made by VSO ELECTRIC CO., LTD)
Antenna 4: PIFA	(13-130-F14931 , made by VSO ELECTRIC CO., LTD)
Antenna 5: PIFA	(13-130-F53021 , made by VSO ELECTRIC CO., LTD)
Antenna 6: PIFA	(13-130-F62011 , made by VSO ELECTRIC CO., LTD)
Antenna 7: PIFA	(13-130-F62021 , made by VSO ELECTRIC CO., LTD)
Antenna 8: PIFA	(14-211-F66021 , made by VSO ELECTRIC CO., LTD)
Antenna 9: PIFA	(14-211-F66041 , made by VSO ELECTRIC CO., LTD)
Antenna 10: PIFA	(K05008004451 , made by FAVORTRON CO., LTD)
Antenna 11: PIFA	(K05008004351 , made by FAVORTRON CO., LTD)
Antenna 12: PIFA	(K05008003651 , made by FAVORTRON CO., LTD)
Antenna 13: PIFA	(K05008003751 , made by FAVORTRON CO., LTD)
Antenna 14: PIFA	(K05004002251 , made by FAVORTRON CO., LTD)
Antenna 15: PIFA	(K05004002351 , made by FAVORTRON CO., LTD)
Antenna 16: PIFA	(WDAN-U1L41001-DF , made by Hon Hai Precision Industry Co.,Ltd.)
Antenna 17: PIFA	(WDAN -U1L51002 -DF , made by Hon Hai Precision Industry Co.,Ltd.)
Antenna Connected:	The antenna is connected to the RF connector of the WLAN adapter.
Antenna peak Gain:	
Antenna 1:	-0.01 dBi (2.4GHz, Main/Aux)
Antenna 2:	-0.97 dBi (2.4GHz, Main/Aux)
Antenna 3:	-4.4 dBi (2.4GHz, Main/Aux)
Antenna 4:	-4.4 dBi (2.4GHz, Main/Aux)
Antenna 5:	-3.37 dBi (2.4GHz, Main) Grey -6.03 dBi (2.4GHz, Aux) Black
Antenna 6:	-0.22 dBi (2.4GHz, Main/Aux)
Antenna 7:	-0.22 dBi (2.4GHz, Main/Aux)
Antenna 8:	-0.31 dBi (2.4GHz, Main/Aux)
Antenna 9:	-1.55 dBi (2.4GHz, Main/Aux)

- Antenna 10: 0.79 dBi (2.4GHz, Main/Aux)
- Antenna 11: -0.08 dBi (2.4GHz, Main/Aux)
- Antenna 12: 0.74 dBi (2.4GHz, Main/Aux)
- Antenna 13: 0.18 dBi (2.4GHz, Main/Aux)
- Antenna 14: 2.80 dBi (2.4GHz, Right)
1.68 dBi (2.4GHz, Left)
- Antenna 15: 0.93 dBi (2.4GHz, Right)
1.26 dBi (2.4GHz, Left)
- Antenna 16: -1.38 dBi (2.4GHz, Main)
0 dBi (2.4GHz, Aux)
- Antenna 17: -1.99 dBi (2.4GHz, Left)
-1.4 dBi (2.4GHz, Right)

WLAN Power Type : 3.3V DC from the EUT

The channel and the operation frequency of 802.11b and 802.11g is listed below:

Channel	Frequency(MHz)	Channel	Frequency (MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437		

During the test, the EUT was tested as a modular device of a notebook PC using a USB extender board to extend the EUT outside the notebook PC enclosure. There are 17 PIFA antennas in the EUT:

The antenna 1~9 has already been tested in the original application. Please refer to ISL report-06LR016FC. Due to the typo errors, we need to modify the model numbers for antenna 8 and 9 on this test report (The antenna reports were correct). The antenna 10~17 are newly-increased.

All of antennas have been tested. The worse data of each antenna type are shown. Configuration list as below:

VNT6656GEV00	PIFA Antenna
802.11b/g	Antenna 14

4. TEST RESULTS (802.11b)

4.1 Powerline Conducted Emissions [Section 15.207]

4.1.1 EUT Configuration

The EUT was set up on the non-conductive table that is 1.0 by 1.5 meter, 80cm above ground. The wall of the shielded room was located 40cm to the rear of the EUT.

Power to the EUT was provided through the LISN. The impedance vs. frequency characteristic of the LISN is complied with the limit used.

Both lines (neutral and hot) were connected to the LISN in series at testing. A coaxial-type connector which provides one 50 ohms terminating impedance was provided for connecting the test instrument. The excess length of the power cord was folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

If the EUT is a Personal Computer or a peripheral of personal computer, and the personal computer has an auxiliary AC outlet which can be used for providing power to an external monitor, then all measurements will be made with the monitor power from first the computer-mounted AC outlet and then a floor-mounted AC outlet.

4.1.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The main power line conducted EMI tests were run on the hot and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

At the frequencies where the peak values of the emissions were higher than 6dB below the applicable limits, the emissions were also measured with the quasi-peak detectors. At the frequencies where the quasi-peak values of the emissions were higher than 6dB below the applicable average limits, the emissions were also measured with the average detectors.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

4.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range	150 KHz--30MHz
Detector Function	Quasi-Peak/Average
Bandwidth (RBW)	9KHz

4.1.4 Test Data:

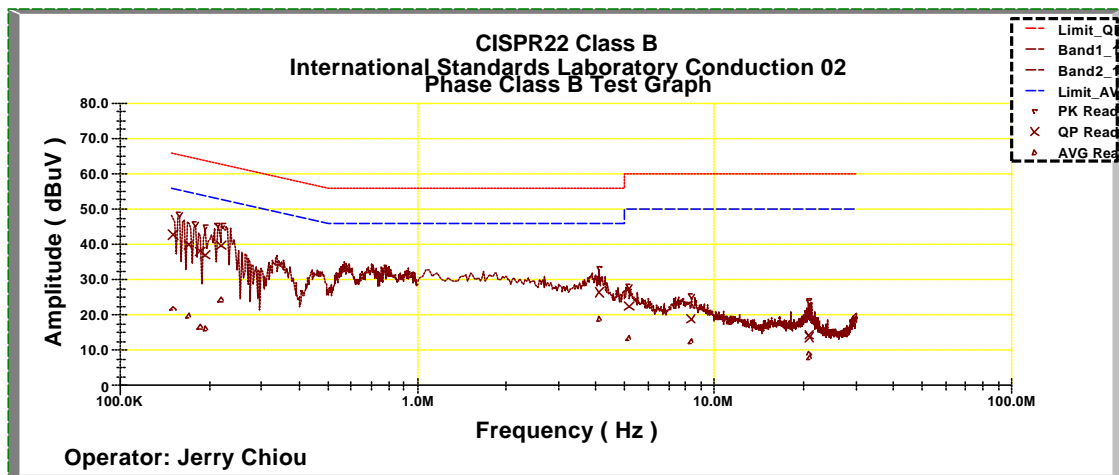
Power Line Conducted Emissions (Hot) Channel 1, 6, 11

Operator: Jerry Chiou

Temperature (C): 25

Humidity (%): 56

Frequency	LISN Loss	Cable Loss	QP Corct.	QP Limit	QP Margin	AVE Corct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.150949	0.15	0.02	42.75	65.97	-23.22	21.72	55.97	-34.25
0.17046	0.17	0.03	39.86	65.42	-25.55	19.57	55.42	-35.85
0.18623	0.19	0.04	38.01	64.96	-26.96	16.66	54.96	-38.31
0.19396	0.19	0.04	37.02	64.74	-27.73	16.26	54.74	-38.48
0.21903	0.19	0.06	39.73	64.03	-24.30	24.32	54.03	-29.71
4.09813	0.20	0.14	26.36	56.00	-29.64	18.94	46.00	-27.06
5.14422	0.25	0.15	22.48	60.00	-37.52	13.29	50.00	-36.71
8.3358	0.40	0.19	18.86	60.00	-41.14	12.34	50.00	-37.66
20.7521	0.92	0.34	14.29	60.00	-45.71	9.03	50.00	-40.97
20.8405	0.92	0.34	13.82	60.00	-46.18	7.90	50.00	-42.10



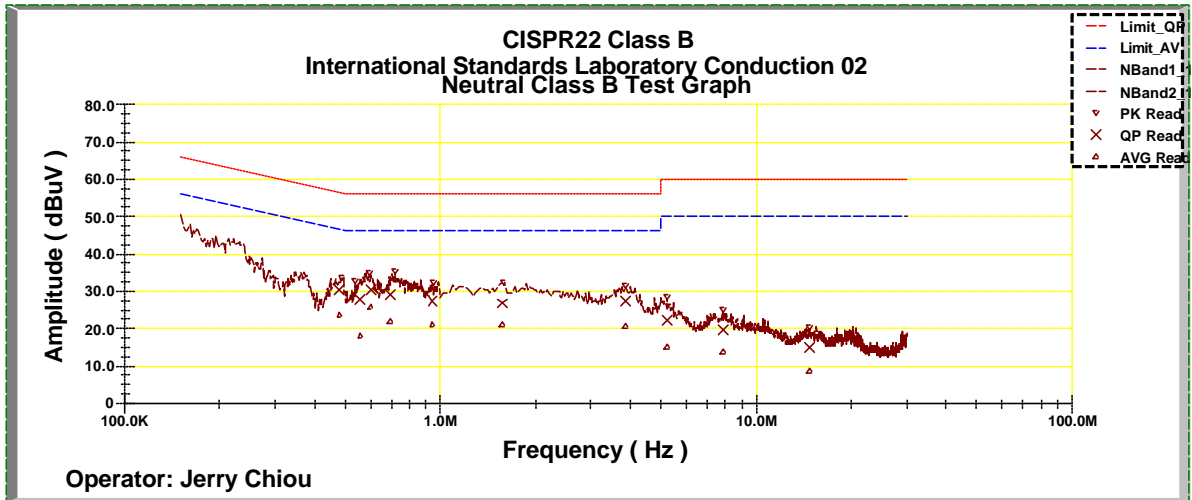
Power Line Conducted Emissions (Neutral) Channel 1, 6, 11

Operator: Jerry Chiou

Temperature (C): 25

Humidity (%): 56

Frequency MHz	LISN Loss (dB)	Cable Loss (dB)	QP Correkt. Amp.(dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVE Correkt. Amp.(dBuV)	AVE Limit (dBuV)	AVE Margin (dB)
0.47953	0.10	0.07	30.40	56.58	-26.18	23.79	46.58	-22.79
0.55783	0.10	0.07	27.90	56.00	-28.10	18.09	46.00	-27.91
0.60076	0.10	0.07	30.50	56.00	-25.50	25.63	46.00	-20.37
0.69498	0.10	0.07	29.00	56.00	-27.00	21.81	46.00	-24.19
0.9448	0.10	0.07	27.44	56.00	-28.56	20.86	46.00	-25.14
1.57213	0.14	0.08	26.74	56.00	-29.26	21.20	46.00	-24.80
3.86712	0.10	0.14	27.24	56.00	-28.76	20.46	46.00	-25.54
5.23075	0.13	0.15	22.16	60.00	-37.84	14.98	50.00	-35.02
7.85313	0.21	0.18	19.46	60.00	-40.54	13.78	50.00	-36.22
14.7324	0.39	0.30	14.84	60.00	-45.16	8.77	50.00	-41.23



* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT Channel between 1, 6, 11 to get the maximum reading of all these channels.
Margin = Amplitude + Insertion Loss- Limit
A margin of -8dB means that the emission is 8dB below the limit

4.2 Bandwidth for DSSS [Section 15.247 (a)(2)]

4.2.1 Test Procedure

The Transmitter output of EUT was connected to the spectrum analyzer. The 6 dB bandwidth of the fundamental frequency was measured. The setting of spectrum analyzer is as follows

Equipment mode	Spectrum analyzer
Detector function	Peak mode
RBW	100KHz
VBW	100KHz

4.2.2 Test Setup



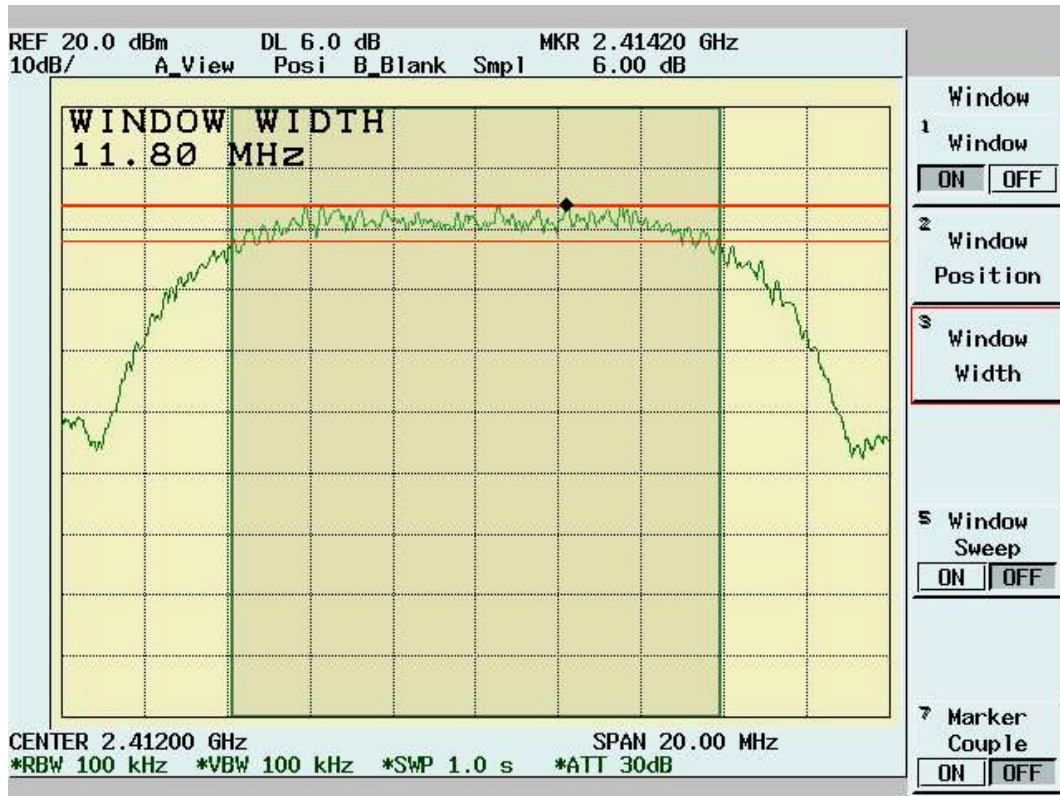
4.2.3 Test Data:

6dB Bandwidth

Temp. (deg. C): 25
 Humidity (%): 50
 Test Engr: Jerry Chiou

Chennel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	11.8	0.5	Pass
6	2437	11.8	0.5	Pass
11	2462	11.8	0.5	Pass

Channel 1:



Channel 6:



Channel 11:



4.3 DSSS Maximum Peak Output Power [Section 15.247 (b)(1)]

4.3.1 Test Procedure

The Transmitter output of EUT was connected to the peak power analyzer.

4.3.2 Test Setup



4.3.3 Test Data

Maximum Peak Output Power

Temp. (deg. C): 25

Test Engr: Jerry Chiou

Humidity (%): 50

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	18.031	1.1	81.87	19.131	30	Pass
6	2437	18.124	1.1	83.64	19.224	30	Pass
11	2462	17.812	1.1	77.84	18.912	30	Pass

4.4 Radiated Emission Measurement [Section [15.247(c)(4)]

4.4.1 EUT Configuration

The equipment under test was set up on the 10 meter chamber with measurement distance of 3 meters. The EUT was placed on a non-conductive table 80cm above ground.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

4.4.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. We found the maximum readings by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured.

30M to 1GHz: The highest emissions between 30 MHz to 1000 MHz were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission.

1GHz – 25GHz: The highest emissions were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in peak mode to determine the precise amplitude of the emission. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission. During test the EMI receiver and spectrum was setup according to *EMI Receiver/Spectrum Analyzer Configuration*.

For the test of 2nd to 10th harmonics frequencies, the equipment setup was also refer to *EMI Receiver/Spectrum Analyzer Configuration*. The frequencies were tested using Peak mode first, if the test data is higher than the emissions limit, an additional measurement using Average mode will be performed and the average reading will be compared to the limit and record in test report.

4.4.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	3MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

4.4.4 Test Data (30MHz – 1GHz):

30M – 1GHz Open Field Radiated Emissions (Horizontal) Channel 1, 6, 11

Operator: Jerry Chiou

Temperature (C): 23

Humidity (%): 63

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmp Gain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
41.64	12.66	12.05	1.21	0.00	25.91	40.00	-14.09	97.00	35.00
119.24	20.03	12.58	1.91	0.00	34.52	43.50	-8.98	97.00	244.00
159.98	18.86	10.10	2.39	0.00	31.35	43.50	-12.15	97.00	218.00
239.52	20.90	11.44	2.90	0.00	35.24	46.00	-10.76	97.00	8.00
320.03	18.27	13.68	3.26	0.00	35.21	46.00	-10.79	97.00	61.00
449.04	9.52	16.68	3.95	0.00	30.16	46.00	-15.84	97.00	218.00
596.48	7.08	18.72	4.49	0.00	30.29	46.00	-15.71	97.00	297.00
764.29	8.92	19.83	5.00	0.00	33.75	46.00	-12.25	97.00	271.00
808.91	5.84	19.97	5.12	0.00	30.93	46.00	-15.07	97.00	35.00
827.34	6.34	20.12	5.19	0.00	31.65	46.00	-14.35	97.00	166.00

30M – 1GHz Open Field Radiated Emissions (Vertical) Channel 1, 6, 11

Operator: Jerry Chiou

Temperature (C): 23

Humidity (%): 63

Frequency	Rx Amp.	Ant Fact	CableLoss	PreAmp Gain	Corrct. Emi.	Limit	Margin	Ant. Pos.	Table Pos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
41.64	12.70	12.05	1.21	0.00	25.96	40.00	-14.04	97.00	35.00
47.46	21.29	9.02	1.27	0.00	31.58	40.00	-8.42	97.00	140.00
115.36	20.05	12.51	1.83	0.00	34.38	43.50	-9.12	97.00	218.00
119.24	20.03	12.58	1.91	0.00	34.52	43.50	-8.98	97.00	244.00
161.92	18.68	9.98	2.39	0.00	31.06	43.50	-12.44	97.00	218.00
239.52	21.26	11.44	2.90	0.00	35.60	46.00	-10.40	97.00	8.00
320.03	18.06	13.68	3.26	0.00	35.01	46.00	-10.99	97.00	61.00
764.29	6.16	19.83	5.00	0.00	30.99	46.00	-15.01	97.00	271.00
815.7	5.85	20.03	5.16	0.00	31.04	46.00	-14.96	97.00	8.00
831.22	5.51	20.15	5.16	0.00	30.82	46.00	-15.18	97.00	88.00

NOTE:

➤ During the Pre-test, the EUT has been tested for Channel 1, 6, 11 transmit from Main and Aux antenna respectively to get all the critical emission frequencies. In the final test all the critical emission frequencies has been tested and the test data are listed above.

➤ Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 30MHz to 1GHz have been tested

4.4.5 Test Data (1GHz – 25 GHz) .

1GHz~ 25 GHz (Horizontal), Channel 1: 2412 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 59
Temperature (C): 25

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
4818.18	33.49pk	34.11	5.14	27.49	45.25pk	54.00av	-8.75	100	18
9641.86	29.68pk	38.84	3.94	24.84	47.62pk	54.00av	-6.38	102	7

1GHz~ 25 GHz (Vertical), Channel 1: 2412 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 59
Temperature (C): 25

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
4818.18	31.59pk	34.11	5.14	27.49	43.34pk	54.00av	-10.66	100	18
9641.86	30.76pk	38.84	3.94	24.84	48.70pk	54.00av	-5.30	102	7

Note:

- According to the standards used, Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.
- “ * ”: Fundamental Frequency
- “**”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk”: peak mode
- “ av”: average mode
- “---“: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal) , Channel 6 : 2437 MHz

Operator: Jerry Chiou

RBW: 1MHz
 Humidity (%): 59
 Temperature (C): 25

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
4861.64	31.72pk	34.27	5.13	27.43	43.70pk	54.00av	-10.30	100	14

1GHz~ 25 GHz (Vertical), Channel 6 : 2437 MHz

Operator: Jerry Chiou

RBW: 1MHz
 Humidity (%): 59
 Temperature (C): 25

Frequency MHz	Rx_R. dBuV	Ant_F. dB/m	Cab_L. dB	PreAmpl dB	Emission dBuV/m	Limit dBuV/m	Margin dB	A.Tower cm	T.Table deg
4861.64	31.55pk	34.27	5.13	27.43	43.53pk	54.00av	-10.47	100	14
9728.77	31.40pk	38.69	4.00	24.78	49.30pk	54.00av	-4.70	102	5

Note:

- According to the standards used, Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.
- “ * ”: Fundamental Frequency
- “**”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk” : peak mode
- “ av” : average mode
- “--“: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal), Channel 11: 2462 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 59
Temperature (C): 25

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
4919.58	31.52pk	34.49	5.13	27.35	43.79pk	54.00av	-10.21	100	8

1GHz~ 25 GHz (Vertical), Channel 11 : 2462 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 59
Temperature (C): 25

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
4905.09	32.79pk	34.44	5.13	27.37	44.99pk	54.00av	-9.01	100	9
9830.17	32.84pk	38.51	4.07	24.72	50.70pk	54.00av	-3.30	101	3

Note:

- According to the standards used, Where limits are specified by agencies for both average and peak (or quasi-peak) detection , if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.
- “ * ”: Fundamental Frequency
- “**”: Not in the restricted band, Limit level=Fundamental Emission-20dB
- “ pk”: peak mode
- “av”: average mode
- “-“-: No meter reading data due to the emission level is smaller than spectrum noise level.
- The Spectrum noise level+Correction Factor < Limit - 6 dB
- Margin=Corrected Amplitude – Limit
- Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
- A margin of -8dB means that the emission is 8dB below the limit.

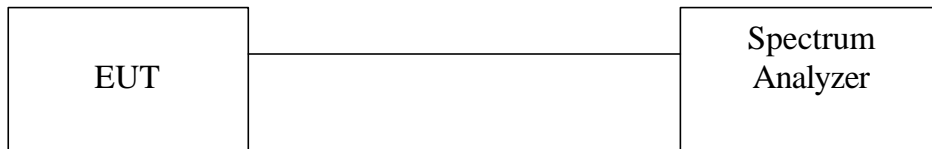
All frequencies from 1GHz to 25 GHz have been tested.

4.5 Band Edge Measurement

4.5.1 Test Procedure (Conducted)

1. The transmitter output of EUT was connected to the spectrum analyzer.
 Equipment mode: Spectrum analyzer
 Detector function: Peak mode
 SPAN: 100MHz
 RBW: 100KHz
 VBW: 100KHz
 Center frequency: 2.4GHz, 2.4835GHz.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed
3. Find the next peak frequency outside the operation frequency band

4.5.2 Test Setup (Conducted)



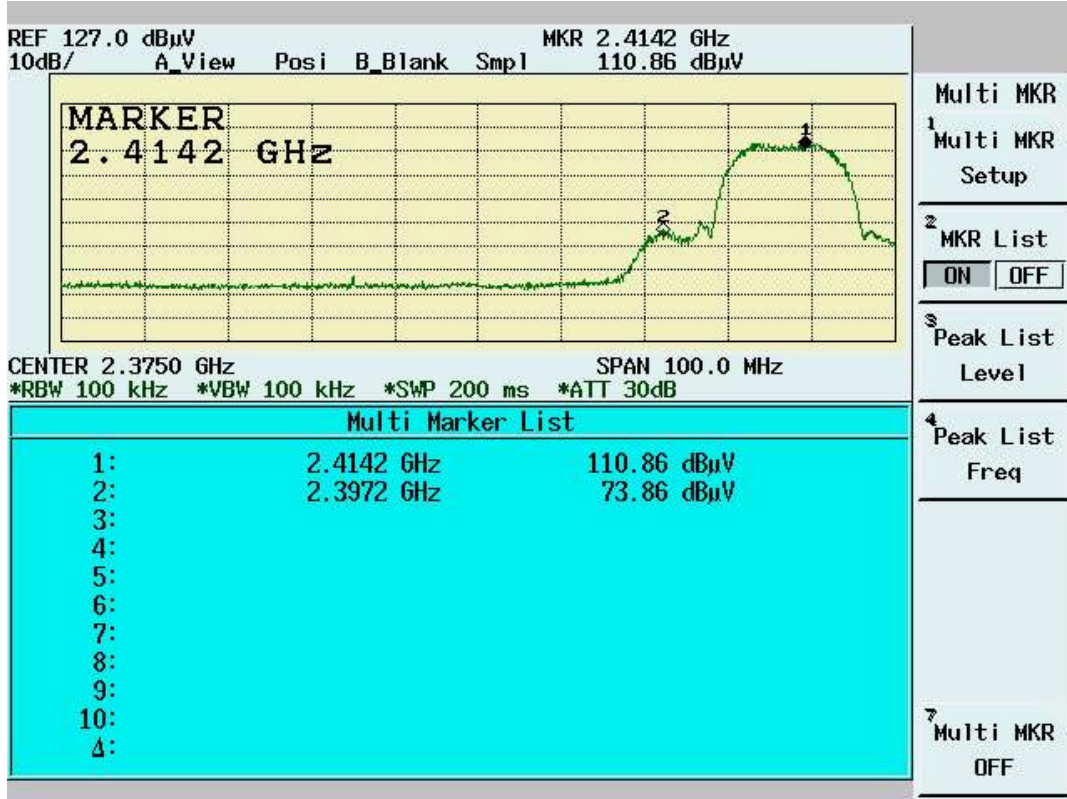
4.5.3 Test Data:

Table: Band Edge measurement (Conducted)

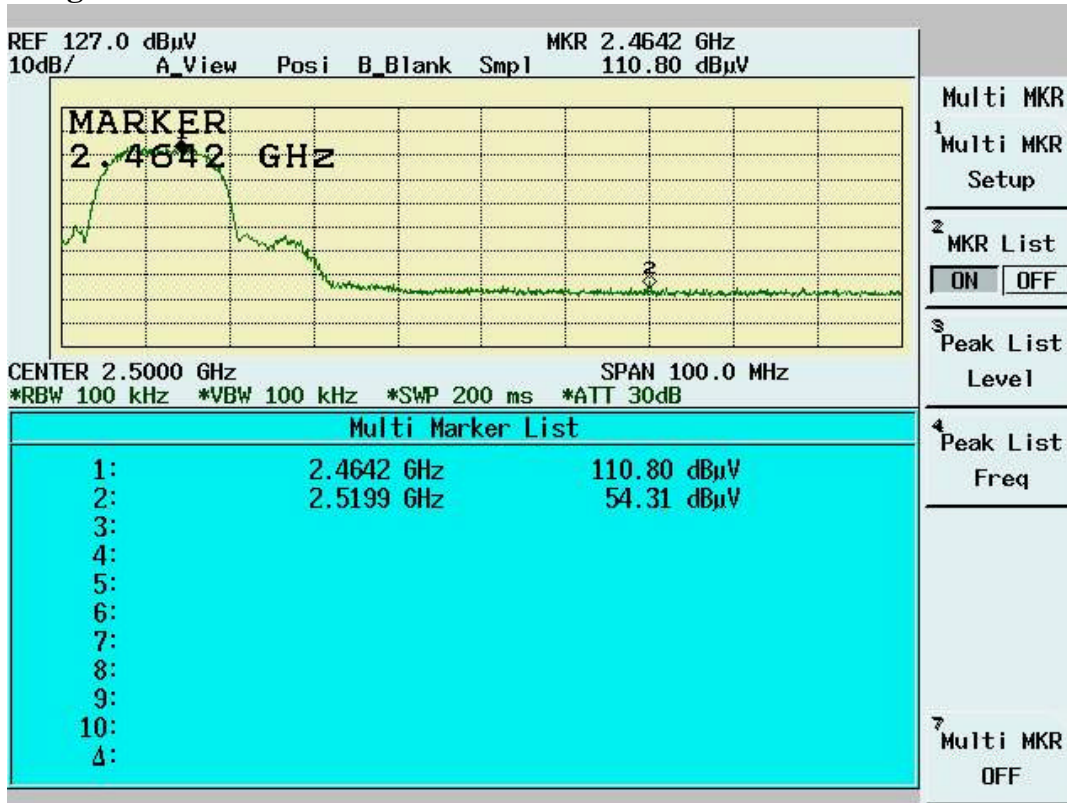
Temp. (deg. C): 25
 Humidity (%): 50
 Test Engr: Jerry Chiou

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: >20dB (dB)	Pass/Fail
1	2414.2	110.86	---	---
Outside band	2397.2	73.86	37	Pass
11	2464.2	110.8	---	---
Outside band	2519.9	54.31	56.49	Pass

Band Edge Conducted measurement



Band Edge Conducted Measurement



4.5.4 Test Procedure (Radiated)

1. Antenna and Turntable test procedure same as Radiated Emission Measurement.
Equipment mode: Spectrum analyzer
Detector function: Peak mode
SPAN: 100MHz
RBW: 1MHz
VBW: 3MHz
Center frequency: 2.395GHz, 2.48GHz.
2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed.
3. Find the next peak frequency outside the operation frequency band
4. For peak frequency emission level measurement in Restricted Band
Change RBW: 1MHz
VBW: 10Hz
Span: 100MHz.
5. Get the spectrum reading after Maximum Hold function is completed.

4.5.5 Test Setup (Radiated)

Same as *Radiated Emission Measurement*

4.5.6 Test Data

Table Band Edge measurement (Radiated)

Temp. (deg. C): 25

Test Engr: Jerry Chiou

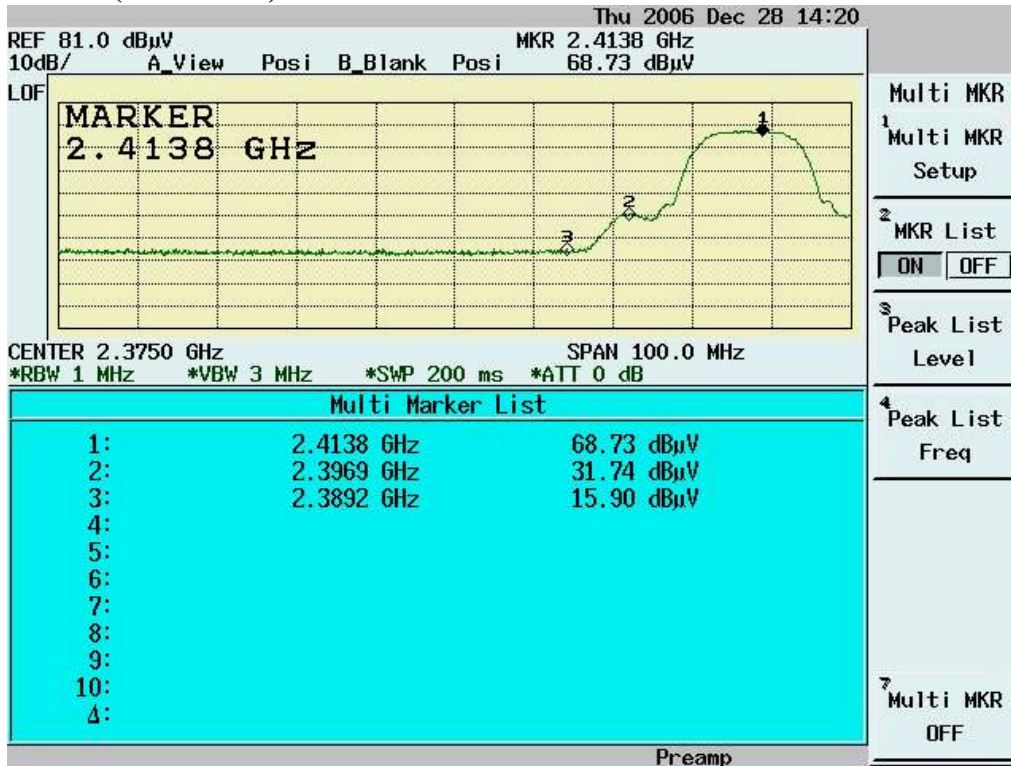
Humidity (%): 50

Description	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	dBc (Limit: > 20dBc)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
Channel_1 (average mode)	2414.3	60.8	35.48	96.28	---	---	10Hz	---
Channel_1 (peak mode)	2413.8	68.73	35.48	104.21	---	---	3MHz	---
Outside band (peak mode)	2396.9	31.74	35.48	67.22	36.99	---	3MHz	Pass
Channel_11 (average mode)	2464.2	65.31	35.5	100.81	---	---	10Hz	---
Channel_11 (peak mode)	2463.8	73.48	35.5	108.98	---	---	3MHz	---
Outside band (peak mode)	2487.9	19.19	35.51	54.7	54.28	---	3MHz	Pass
Channel_1 Restricted band (peak mode)	2389.2	15.9	35.47	51.37	---	74	3MHz	Pass
Restricted band (average mode)	2390	5.38	35.47	40.85	---	54	10Hz	Pass
Channel_11 Restricted band (peak mode)	2487.3	19.19	35.51	54.7	---	74	3MHz	Pass
Restricted band (average mode)	2483.5	7.37	35.51	42.88	---	54	10Hz	Pass

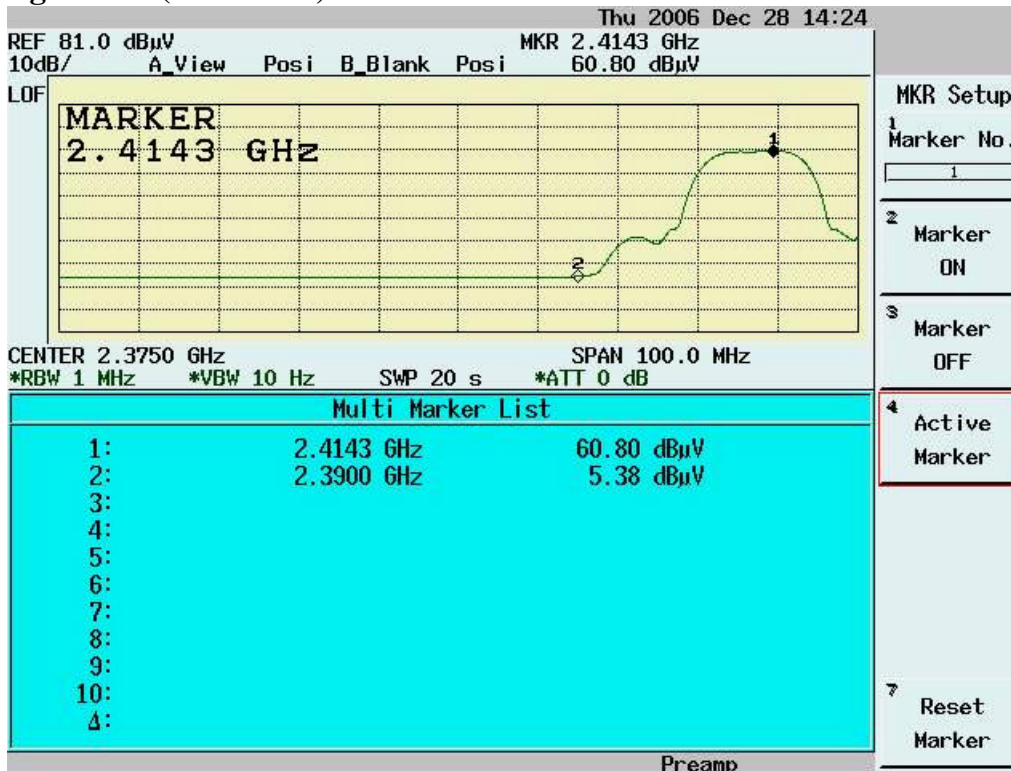
Note:

- The Spectrum plot of emission level measurement in Restricted band is attached.
- Emission Level=Spectrum Reading+Correction Factor
- Correction Factor=Antenna Factor+cable loss–amplifier gain
- Both Horizontal and Vertical polarization have been tested and the worst data is listed above.

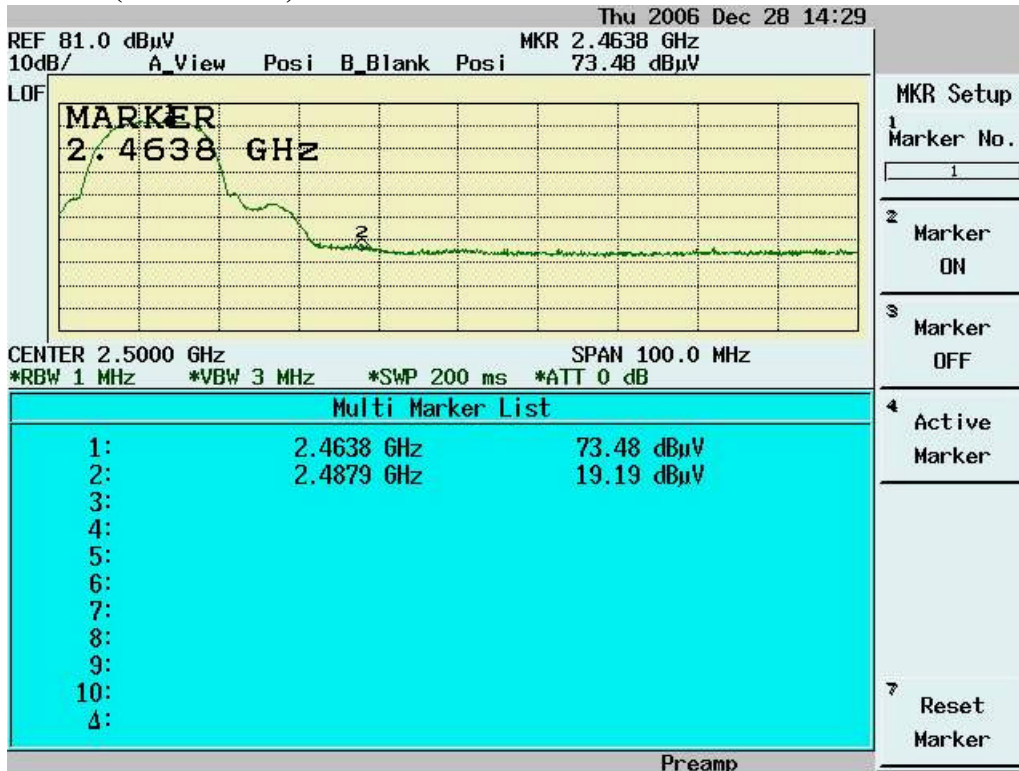
Band Edge measurement for radiated emission in Restricted Band(Radiated) Peak Mode (Channel 1)



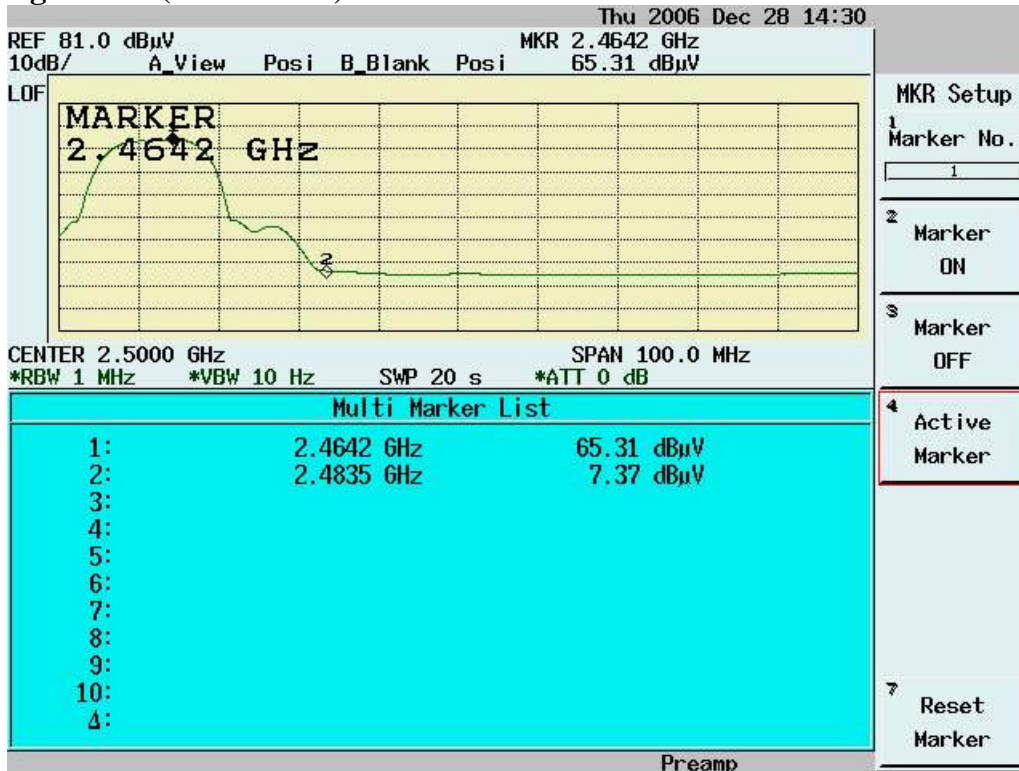
Band Edge measurement for radiated emission in Restricted Band(Radiated) Average Mode (Channel 1)



Band Edge measurement for radiated emission in Restricted Band(Radiated) Peak Mode (Channel 11)



Band Edge measurement for radiated emission in Restricted Band(Radiated) Average Mode (Channel 11)



4.6 RF Exposure Measurement [Section 15.247(b)(4) & 1.1307(b)]

See MPE report

4.7 DSSS Peak Power Spectral Density [Section 15.247(d)]

4.7.1 Test Procedure

1. The Transmitter output of EUT was connected to the spectrum analyzer.
 Equipment mode: Spectrum analyzer
 Detector function: Peak mode
 SPAN:1.5MHz
 RBW: 3KHz
 VBW: 30KHz
 Center frequency: fundamental frequency tested.
 Sweep time= 500 sec.
2. Using Peak Search to read the peak power after Maximum Hold function is completed.

4.7.2 Test Setup



4.7.3 Test Data

Maximum Peak Output Power Density

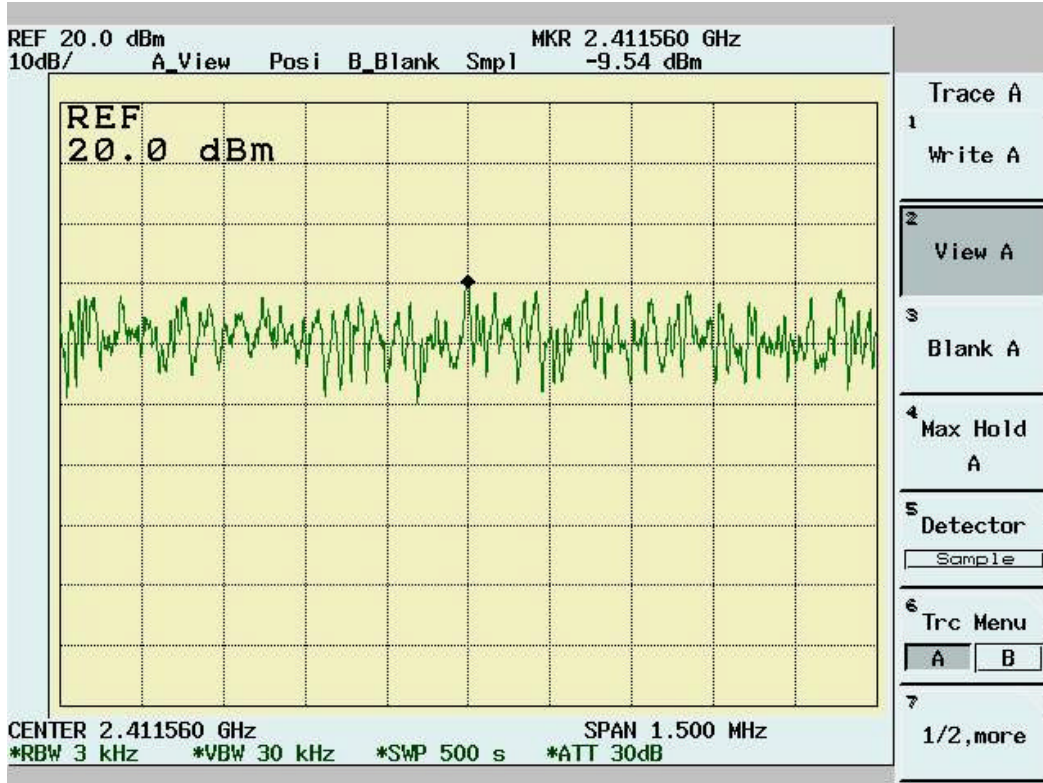
Temp. (deg. C): 25

Test Engr: Jerry Chiou

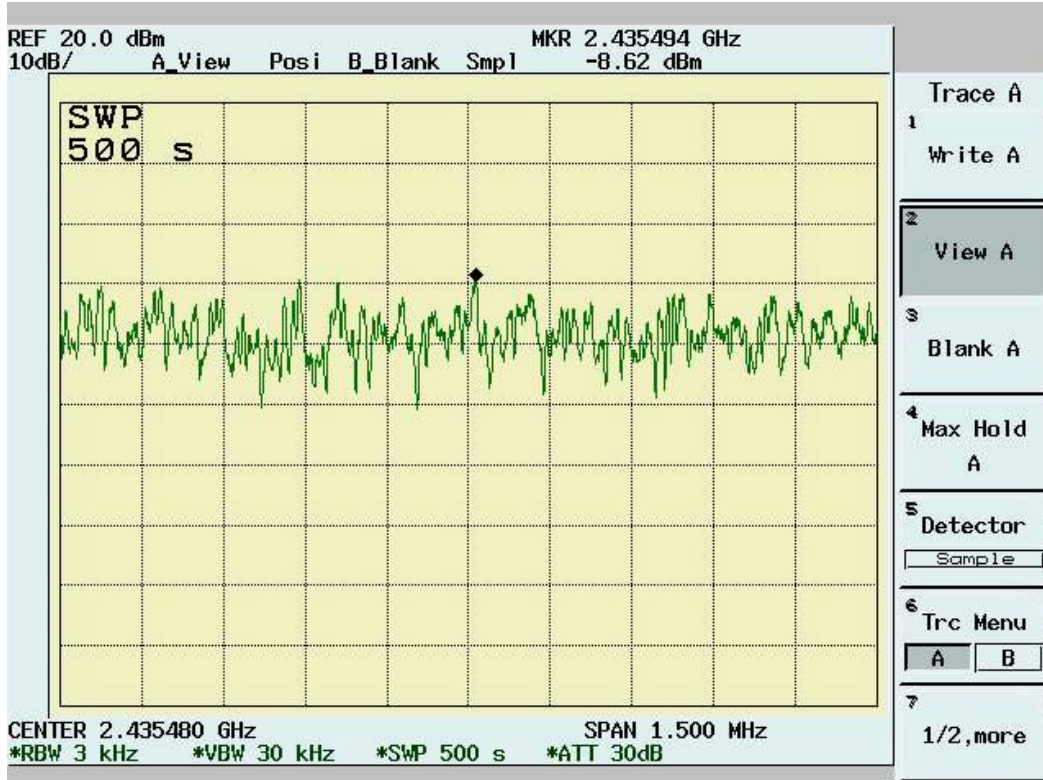
Humidity (%): 50

Chennel	Frequency (MHz)	Spectrum Reading (dBm/3KHz)	Cable Loss (dB)	Peak Power Output (dBm/3KHz)	Limit (dBm/3KHz)	Pass/Fail
1	2412	-9.54	1.1	-8.44	8	Pass
6	2437	-8.62	1.1	-7.52	8	Pass
11	2462	-8.94	1.1	-7.84	8	Pass

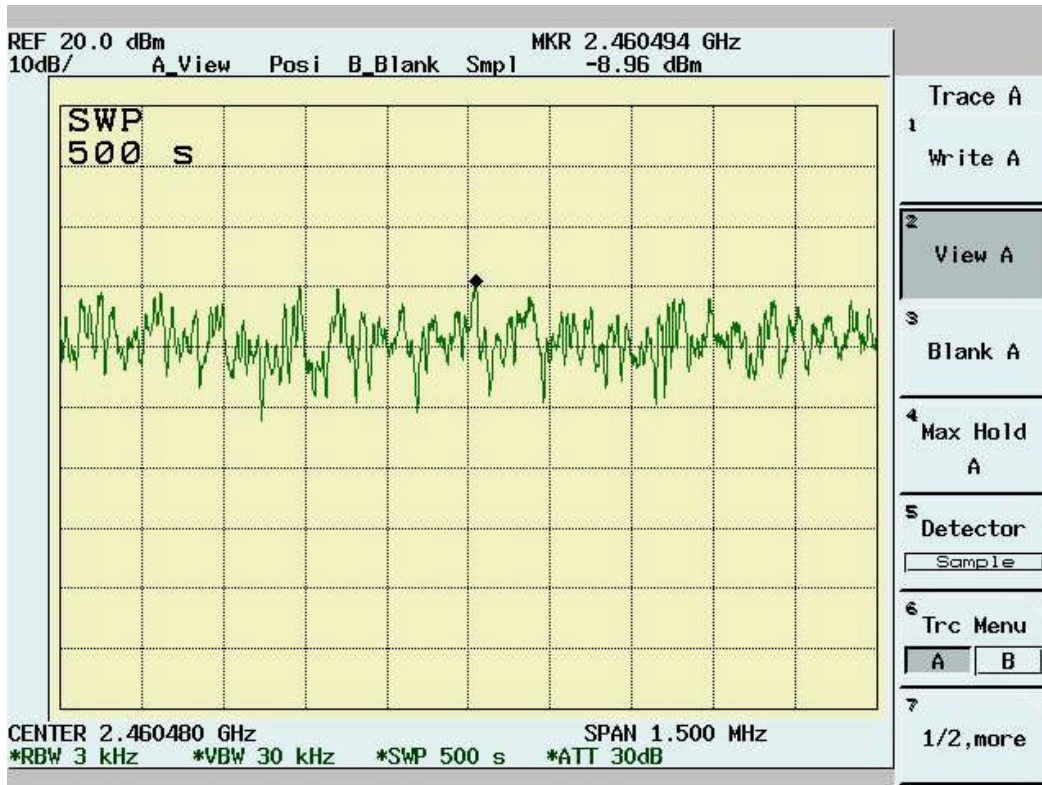
Channel 1



Channel 6



Channel 11



5. TEST RESULTS (802.11g)

5.1 Powerline Conducted Emissions [Section 15.207]

5.1.1 EUT Configuration

The EUT was set up on the non-conductive table that is 1.0 by 1.5 meter, 80cm above ground. The wall of the shielded room was located 40cm to the rear of the EUT.

Power to the EUT was provided through the LISN. The impedance vs. frequency characteristic of the LISN is complied with the limit used.

Both lines (neutral and hot) were connected to the LISN in series at testing. A coaxial-type connector which provides one 50 ohms terminating impedance was provided for connecting the test instrument. The excess length of the power cord was folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

If the EUT is a Personal Computer or a peripheral of personal computer, and the personal computer has an auxiliary AC outlet which can be used for providing power to an external monitor, then all measurements will be made with the monitor power from first the computer-mounted AC outlet and then a floor-mounted AC outlet.

5.1.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The main power line conducted EMI tests were run on the hot and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

At the frequencies where the peak values of the emissions were higher than 6dB below the applicable limits, the emissions were also measured with the quasi-peak detectors. At the frequencies where the quasi-peak values of the emissions were higher than 6dB below the applicable average limits, the emissions were also measured with the average detectors.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

5.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range	150 KHz--30MHz
Detector Function	Quasi-Peak/Average
Bandwidth (RBW)	9KHz