

Test Report for FCC Part 15 Subpart B & C & E Class II Permissive Change

of

Product Name & Model

AR5BXB6 802.11 a/b/g PCI Express Module

Applied by:

Atheros Communications, Inc.
5480 Great America Parkway
Santa Clara, CA 95054
USA

Test Performed by:

International Standards Laboratory

No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Lung-Tan Hsiang, Tao Yuan County 325
Taiwan, R.O.C.
Tel:(03)407-1718 Fax:(03)407-1738

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ISL-T10-R2-3

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1. General

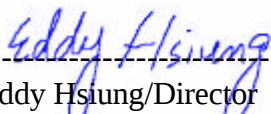
1.1 Certification of Accuracy of Test Data

Standards:	CFR 47 Part 15 Subpart B Class B CFR 47 Part 15 Subpart C (Section 15.247) CFR 47 Part 15 Subpart E (Section 15.407)
Test Procedure:	ANSI C63.4:2003
Product Name & Model:	AR5BXB6 802.11 a/b/g PCI Express Module
Built-In Tablet PC	Brand Name: Lenovo Model Name: 7762/7763/7764/7767/7768/7769 Project Name: ThinkPad X61 Tablet Series
Applied by:	Atheros Communications, Inc.
Sample received Date:	2007/03/08
Final test Date :	2007/03/23
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 86 pages, including 1 cover page, 3 contents page, and 82 pages for the test description. This report must not be used 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	SAR 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	SAR report attached
15.247 (d)	Power Spectral Density	Pass	

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

Tested Standards: 47 CFR Part 15 Subpart E			
Standard Section	Test Type	Result	Remarks
15.407 (a)(1)(2)(3)	Peak Transmit Power	Pass	
15.407 (a)(1)(2)(3)	Peak Power Spectral Density	Pass	
15.407 (a)(6)	Peak Power Excursion	Pass	
15.407 (b)(5)	AC Power Line Emissions	Pass	
15.407 (b)(5)	Radiated Emissions 30MHz – 40 GHz	Pass	
15.407(f)	Radiation exposure	Pass	SAR report attached
15.407 (g)	Frequency Stability	Pass	

3. Description of Equipment Under Test (EUT)

Product Name & Model No.:	AR5BXB6 802.11 a/b/g PCI Express Module
FCC ID:	PPD-AR5BXB6
Brand:	Atheros
Frequency Range 802.11a:	5150~5350 MHz, 5725~5850 MHz
Frequency Range 802.11b/g:	2400~2483.5 MHz
Support channel:	
802.11a Normal mode	13 Channels
802.11a Turbo mode	4 Channels
802.11b/g	11 Channels
802.11g Turbo mode	1 Channel
Modulation Skill:	
802.11a Normal mode	OFDM (6 Mbps – 54 Mbps)
802.11a Turbo mode	OFDM (12 Mbps – 108 MBps)
802.11b	DBPSK(1Mbps), DQPSK(2Mbps), CCK(5.5/11Mbps)
802.11g	OFDM (6M - 54Mbps)
802.11g Turbo mode	OFDM (6M - 54Mbps)
Antennas Type:	
Main antenna:	IFA (P/N: 25.90354.001) made by Wistron NeWeb Corp.
Main antenna:	IFA (P/N: 25.90424.001) (new addition) made by Wistron NeWeb Corp.
Aux antenna:	IFA (P/N: 25.90355.001) made by Wistron NeWeb Corp.
Antenna Connected:	Connected to RF connector on the PCB of the 802.11a/b/g WLAN Adapter .The user is not possible to change the antenna without disassembling the notebook computer.
Antenna peak Gain:	
Main antenna:	0.9 dBi (11b,11g), 1.92 dBi (11a)
Main antenna	-0.9 dBi (11b,11g), 2.97 dBi (11a) (new addition)
AUX antenna	1.52 dBi (11b,11g), 2.78 dBi (11a)
Power Type of wireless module:	3.3V DC from Notebook PC

The channel and the operation frequency of 802.11a Normal Mode is listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	40	5200
44	5220	48	5240
52	5260	56	5280
60	5300	64	5320
149	5745	153	5765
157	5785	161	5805
165	5825		

The channel and the operation frequency of 802.11a Turbo Mode is listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
40	5200	58	5290
152	5760	161	5805

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	Turbo g	2437

Configuration 1:

We used the original antennas , and built the EUT in a Tablet PC (an updated version). Please refer the details to the last filing granted on 01/09/2007 with test report ISL-06LR020FC. And in this configuration, WLAN and WWAN can not transmit at the same time.

Configuration 2:

We have replaced a new main antenna, and built the EUT in a Tablet PC. Please refer the details to the last filing granted on 01/09/2007 with test report ISL-06LR020FC. But in this configuration is only built in WLAN only (without WWAN).

4. TEST RESULTS (802.11a)

4.1 Maximum Peak Output Power [Section 15.407 (a)(1)(2)(3)]

4.1.1 Test Procedure

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

4.1.2 Test Setup



Frequency Band	Limit
5.15 – 5.25 GHz	The lesser of 50mW (17dBm) or 4dBm+10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm+10logB
5.725-5.825GHz	The lesser of 1W (30dBm) or 17dBm+10logB

Note: B is the 26dB emission bandwidth in MHz

4.1.3 Test Data: (Normal Mode)

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

Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
36	5180	14.52	1.4	39.08	15.92	30	Pass
48	5240	14.58	1.4	39.63	15.98	30	Pass
52	5260	14.56	1.4	39.45	15.96	30	Pass
64	5320	13.05	1.4	27.86	14.45	30	Pass

4.1.4 Test Data: (Turbo Mode)

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

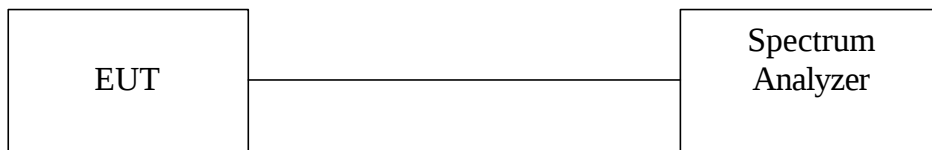
Channel	Frequency (Mhz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
40	5200	13.43	1.4	30.41	14.83	30	Pass
58	5290	14.67	1.4	40.46	16.07	30	Pass

4.2 Peak Power Spectral Density [Section 15.407(a)(1)(2)(3)]

4.2.1 Test Procedure

1. The Transmitter output of EUT was connected to the spectrum analyzer.
Equipment mode: Spectrum analyzer
Detector function: Peak mode
SPAN: 30MHz or 50MHz
RBW: 1MHz
VBW: 3MHz
Sweep time: 30 or 50 sec.
Center frequency: fundamental frequency tested
2. Peak search was read to the peak power after maximum hold function is completed.

4.2.2 Test Setup



4.2.3 Test Data: (Normal Mode)

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

4.2.4 Test Data: (Turbo Mode)

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

4.3 Peak Power Excursion Measurement [Section 15.407(a)(6)]

4.3.1 Test Procedure

1. The Transmitter output of EUT was connected to the spectrum analyzer.
2. Frequency SPAN of Spectrum: 30MHz or 50MHz.
3. Trace 1 : RBW: 1MHz, VBW: 3MHz. Using positive detector and Max -hold
4. Trace 2 : RBW: 1MHz, VBW: 3MHz. Using Sample detector and Max-hold
5. Record the largest difference between Trace 1 and Trace 2.

4.3.2 Test Setup



4.3.3 Test Data: (Normal Mode)

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

4.3.4 Test Data: (Turbo Mode)

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

4.4 Powerline Conducted Emissions **[Section 15.207 & 15.407 (b)(5)]**

4.4.1 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.

4.4.2 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.

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

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

4.4.4 Test Data:

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

4.5 Radiated Emission Measurement [Section 15.209 & 15.407(b)(5)]

4.5.1 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.

4.5.2 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 – 40GHz: 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 para. 6.5.3.

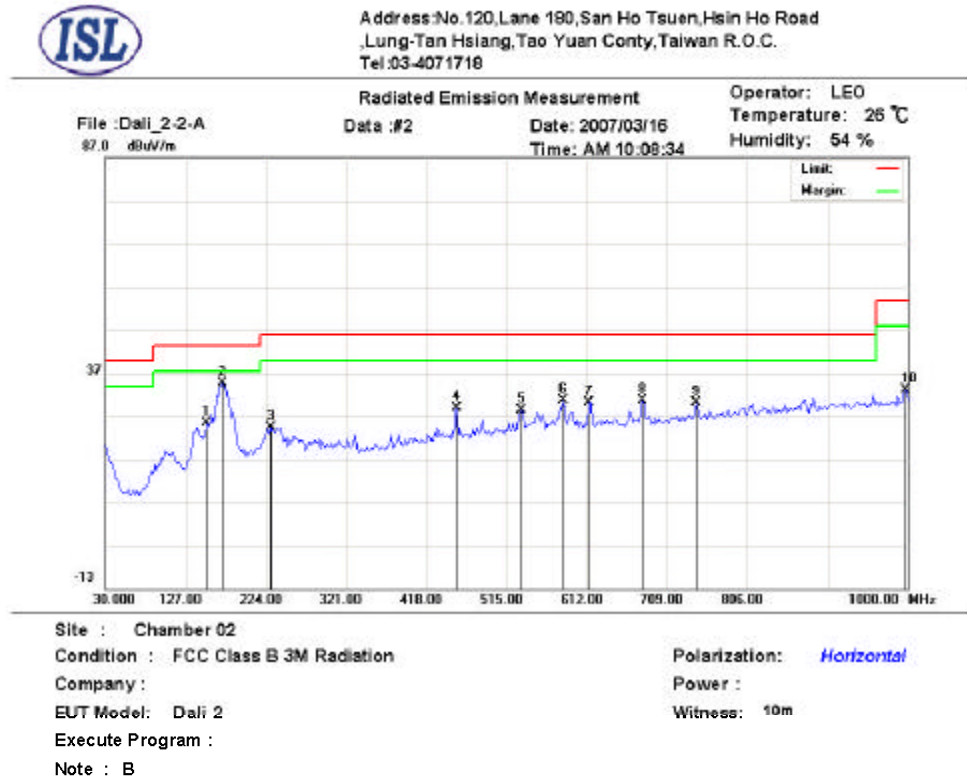
For the test of 2nd to 10th harmonics frequencies, the equipment setup was also refer to para.6.5.3. The frequencies were tested using Peak mode first, if the test data is higher than the emissions limit, an additional measurement using Average mode will be performed and the average reading will be compared to the limit and record in test report.

4.5.3 EMI Receiver/Spectrum Analyzer Configuration

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz
Frequency Range Tested:	1GHz – 40 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	3MHz
Frequency Range Tested:	30MHz – 40 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

4.5.4 Test Data (30MHz – 1GHz) .

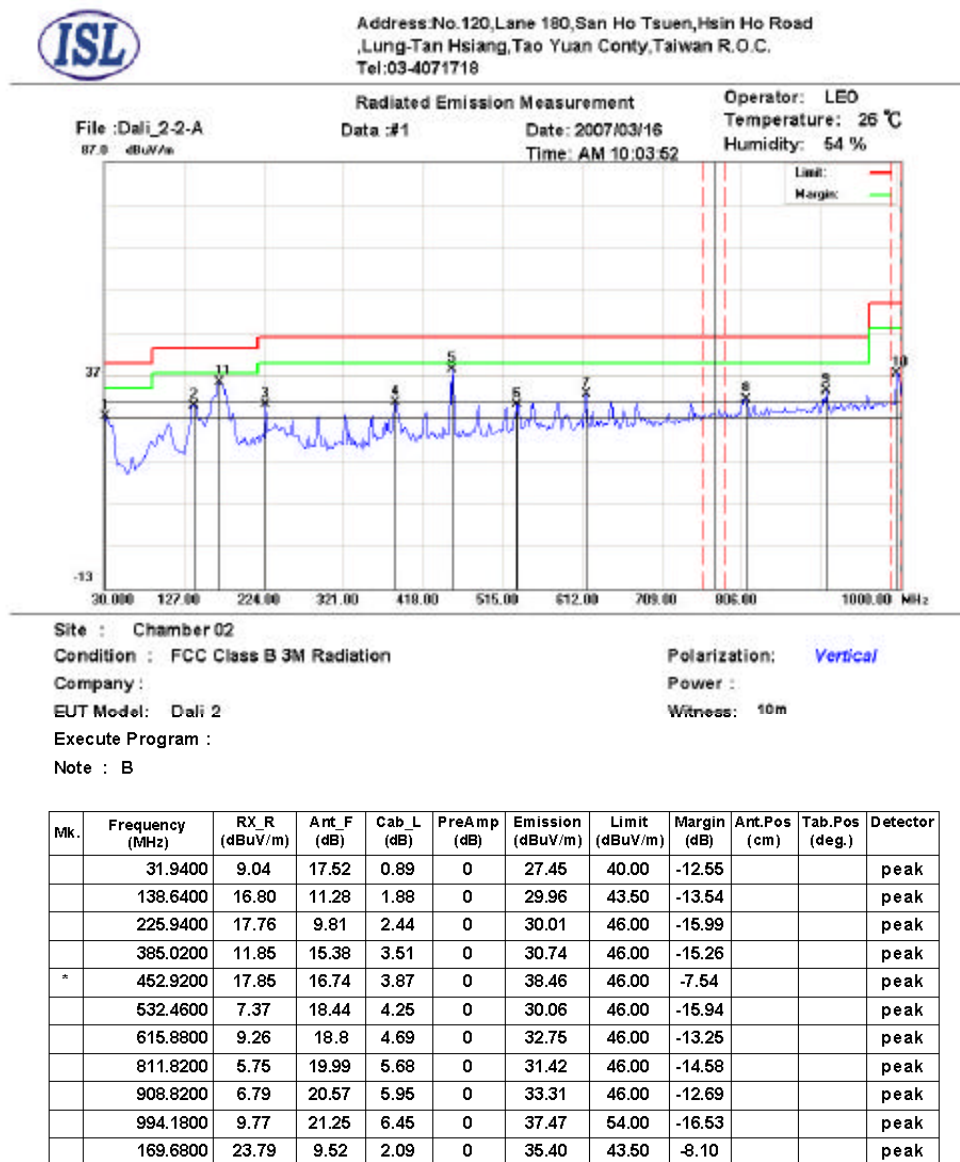
30M – 1GHz Open Field Radiated Emissions (Horizontal)



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cal_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	152.2199	13.21	10.18	1.93	0	25.32	43.50	-18.18			peak
*	171.6200	23.12	9.47	2.1	0	34.69	43.50	-8.81			peak
	229.8199	11.71	10.28	2.45	0	24.44	46.00	-21.56			peak
	454.8600	8.11	16.77	3.88	0	28.76	46.00	-17.24			peak
	532.4600	5.70	18.44	4.25	0	28.39	46.00	-17.61			peak
	582.8999	7.20	18.8	4.55	0	30.55	46.00	-15.45			peak
	613.9400	6.69	18.78	4.67	0	30.14	46.00	-15.86			peak
	679.8999	6.64	18.94	4.99	0	30.57	46.00	-15.43			peak
	743.9199	5.11	19.69	5.32	0	30.12	46.00	-15.88			peak
	996.1200	5.45	21.27	6.46	0	33.18	54.00	-20.82			peak

*:Maximum data x:Over limit !:over margin

30M – 1GHz Open Field Radiated Emissions (Vertical)



*:Maximum data x:Over limit !:over margin

* NOTE: During the pre-test, the EUT has been tested for Channel 36, 48, 52, 64 of Normal Mode, Channel 40, 58 of Turbo Mode and 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

International Standards Laboratory

Report Number: ISL-07LR013FC

HC LAB: NVLAP:200234-0; VCCI: R-341, C-354; NEMKO: ELA 113A; BSMI: SL2-IN-E-0037; SL2-R1-E-0037; CNLA: 1178; IC: IC4067

LT LAB: NVLAP:200234-0; VCCI: R-1435, C-1440; NEMKO: ELA 113B; CNLA: 0997; IC: IC4164-1

4.5.5 Test Data (1GHz – 40 GHz, Transmitting) .

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 36: 5180 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1661.74	45.02pk	28.16	2.35	23.75	51.78pk	54.00av	-2.22	101	66
5589.01	35.09pk	35.96	2.92	27.48	46.49pk	54.00av	-7.51	100	169

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 36: 5180 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1661.74	47.88pk	28.16	2.35	23.75	54.63pk	74.00pk	-19.37	101	66
1657.91	30.17av	28.16	2.35	23.75	36.92av	54.00av	-17.08	101	66
2395.4	41.76pk	30.92	1.44	24.6	49.52pk	54.00av	-4.48	101	167
10353.8	33.34pk	39.52	3.28	25.39	50.74pk	54.00av	-3.26	101	82

Note: “ * ”: Fundamental Frequency

“ pk ”: peak reading

“ av ”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 48: 5240 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1654.55	41.92pk	28.1	2.34	23.75	48.61pk	54.00av	-5.39	101	67

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 48: 5240 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1575.42	44.56pk	27.43	2.29	23.75	50.53pk	54.00av	-3.47	101	72
1661.74	47.97pk	28.16	2.35	23.75	54.73pk	74.00pk	-19.27	101	66
1667.62	29.94av	28.16	2.35	23.75	36.7 av	54.00av	-17.3	101	66
2158.04	39.49pk	30.97	2.12	24.09	48.49pk	54.00av	-5.51	100	93
2395.4	40.41pk	30.92	1.44	24.6	48.17pk	54.00av	-5.83	101	167

Note: “*”: Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 52: 5260 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1661.74	42.88pk	28.16	2.35	23.75	49.64pk	54.00av	-4.36	101	66
2388.21	38.44pk	30.92	1.42	24.59	46.19pk	54.00av	-7.81	101	165

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 52: 5260 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1568.23	41.49pk	27.37	2.28	23.75	47.40pk	54.00av	-6.6	101	73
1654.55	48.87pk	28.1	2.34	23.75	55.56pk	74.00pk	-18.44	101	67
1659.57	31.09av	28.1	2.34	23.75	37.78av	54.00av	-16.22	101	67
2388.21	41.79pk	30.92	1.42	24.59	49.54pk	54.00av	-4.46	101	165
10520.3	31.70pk	39.4	3.23	25.74	48.58pk	54.00av	-5.42	102	121
10353.8	26.55pk	39.52	3.28	34.55	44.80pk	54.00av	-9.20	101	82

Note: “*”: Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 64: 5320 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1654.55	42.48pk	28.1	2.34	23.75	49.17pk	54.00av	-4.83	101	67
2395.4	38.42pk	30.92	1.44	24.6	46.18pk	54.00av	-7.82	101	167

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 64: 5320 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1661.74	46.64pk	28.16	2.35	23.75	53.40pk	54.00av	-0.6	101	66
2395.4	43.91pk	30.92	1.44	24.6	51.67pk	54.00av	-2.33	101	167
4970.43	35.60pk	35.49	2.16	27.28	45.97pk	54.00av	-8.03	100	3

Note: “*”: Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Turbo Mode, Channel 40: 5200 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1597	49.97pk	27.61	2.3	23.75	56.14pk	74.00pk	-17.86	101	71
1591.48	30.07av	27.61	2.3	23.75	36.24av	54.00av	-17.76	101	71
1661.74	48.44pk	28.16	2.35	23.75	55.20pk	74.00pk	-18.8	101	66
1661.74	30.62av	28.16	2.35	23.75	37.38av	54.00av	-16.62	101	66

1GHz~ 40 GHz (Vertical), Turbo Mode, Channel 40: 5200 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1539.46	40.73pk	27.13	2.26	23.75	46.38pk	54.00av	-7.62	101	75
1597	58.80pk	27.61	2.3	23.75	64.97pk	74.00pk	-9.03	101	71
1596.47	33.89av	27.61	2.3	23.75	40.06av	54.00av	-13.94	101	71
1625.77	41.23pk	27.86	2.32	23.75	47.66pk	54.00av	-6.34	101	69
1661.74	55.41pk	28.16	2.35	23.75	62.17pk	74.00pk	-11.83	101	66
1665.28	34.59av	28.16	2.35	23.75	41.35av	54.00av	-12.65	101	66
10393	33.69pk	39.49	3.26	25.48	50.96pk	54.00av	-3.04	101	92

Note: “*” : Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Turbo Mode, Channel 58: 5290 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1597	47.20pk	27.61	2.3	23.75	53.37pk	54.00av	-0.63	101	71
1661.74	50.27pk	28.16	2.35	23.75	57.02pk	74.00pk	-16.98	101	66
1665.01	29.74av	28.16	2.35	23.75	36.49av	54.00av	-17.51	101	66
7674.93	30.92pk	40.14	2.34	26.56	46.84pk	54.00av	-7.16	100	208
8077.72	30.46pk	40.77	2.62	26.64	47.21pk	54.00av	-6.79	100	237

1GHz~ 40 GHz (Vertical), Turbo Mode, Channel 58: 5290 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1546.65	42.04pk	27.19	2.26	23.75	47.75pk	54.00av	-6.25	101	74
1597	53.86pk	27.61	2.3	23.75	60.03pk	54.00pk	-13.97	101	71
1596.46	31.68av	27.61	2.3	23.75	37.85av	74.00av	-16.15	101	71
1625.77	42.95pk	27.86	2.32	23.75	49.37pk	54.00av	-4.63	101	69
1654.55	55.88pk	28.1	2.34	23.75	62.58pk	74.00pk	-11.42	101	67
1659.82	31.26av	28.1	2.34	23.75	37.96pk	54.00av	-16.04	101	67

Note: “*”: Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

4.6 Band Edge Measurement (Section 15.407 (b) (1) (2))

4.6.1 Test Procedure (Conducted)

1. The Transmitter output of EUT was connected to the spectrum analyzer.
Equipment mode: Spectrum analyzer

Peak Mode:	
SPAN	100MHz
RBW	1MHz
VBW	1MHz
Sweep Time	200msec.

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.

4.6.2 Test Setup (Conducted)



4.6.3 Test Data (conducted):

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

4.6.4 Bandedge Measurement Test Procedure (Radiated)

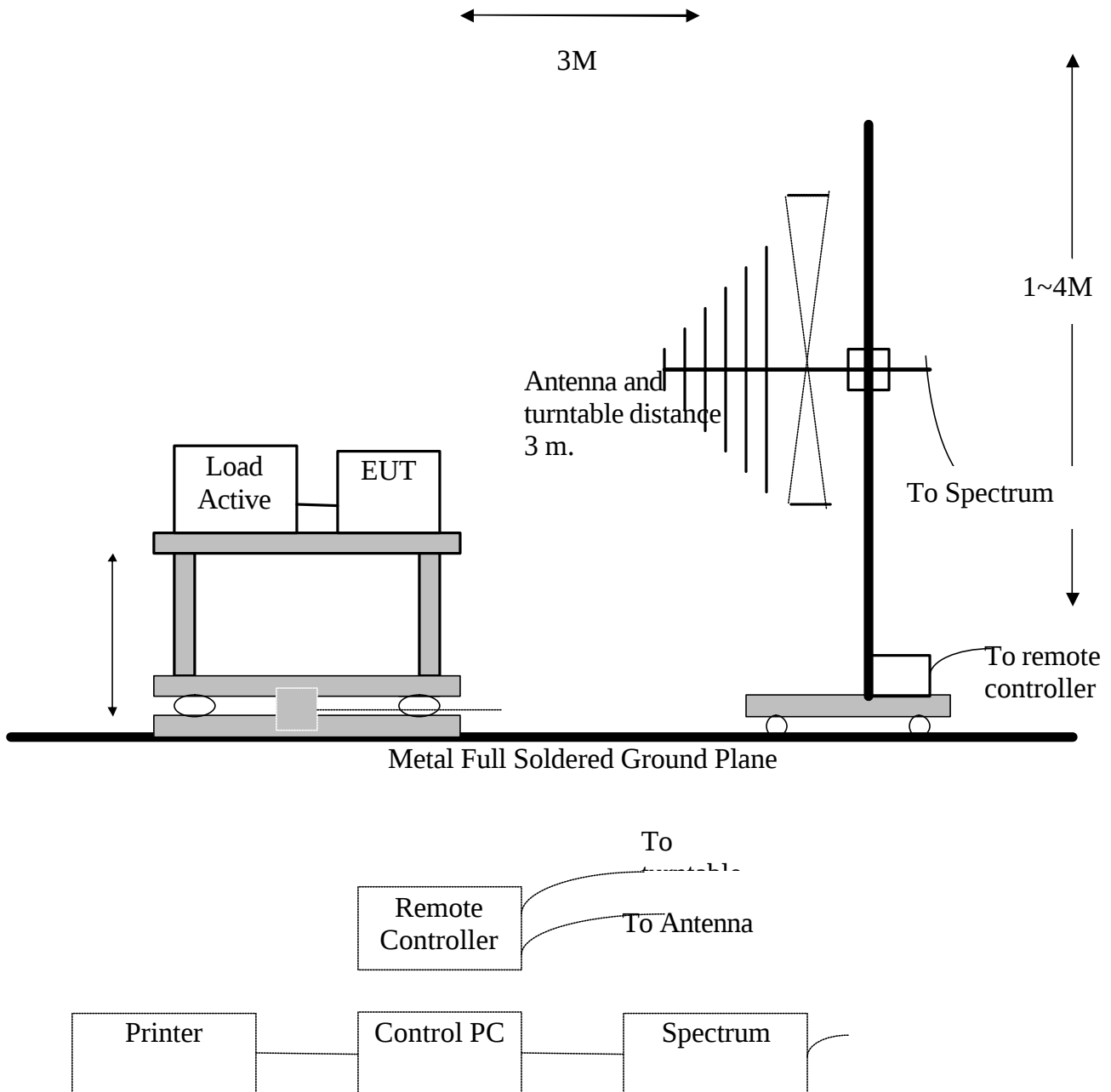
1. Antenna and Turntable test procedure same as Radiated Emissions measurement listed in Para. 6.5

Equipment mode: Spectrum analyzer

Peak Mode:	
SPAN	100MHz
RBW	1MHz
VBW	3MHz
Sweep Time	200msec.
AVE Mode:	
SPAN	100MHz
RBW	1MHz
VBW	10Hz
Sweep Time	20 sec.

2. Using Peak Search to read the peak power of Carrier frequencies after Maximun Hold function is completed.
3. Find the next peak frequency outside the operation frequency band.
4. Get the spectrum reading after Maximun Hold function is completed.

4.6.5 Test Setup (Radiated)



4.6.6 Test Data (Radiated):

Band Edge measurement (Radiated)

Test Engineer: Jerry Chiou Temperature (deg. C): 25
Humidity (%): 50

Outside Channel (Normal)	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Pass/Fail
36 (Peak)	5150	21.05	39.03	60.08	74	Pass
36 (Average)	5150	9.05	39.03	48.08	54	Pass
64 (Peak)	5350	21.45	39.34	60.79	74	Pass
64 (Average)	5350	9.2	39.34	48.54	54	Pass
Outside Channel (Turbo)	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Pass/Fail
40 (Peak)	5150	21.75	39.03	60.78	74	Pass
40 (Average)	5150	9.07	39.03	48.1	54	Pass
58 (Peak)	5350	21.21	39.34	60.55	74	Pass
58 (Average)	5350	9.18	39.34	48.52	54	Pass

Note: "pk": peak reading

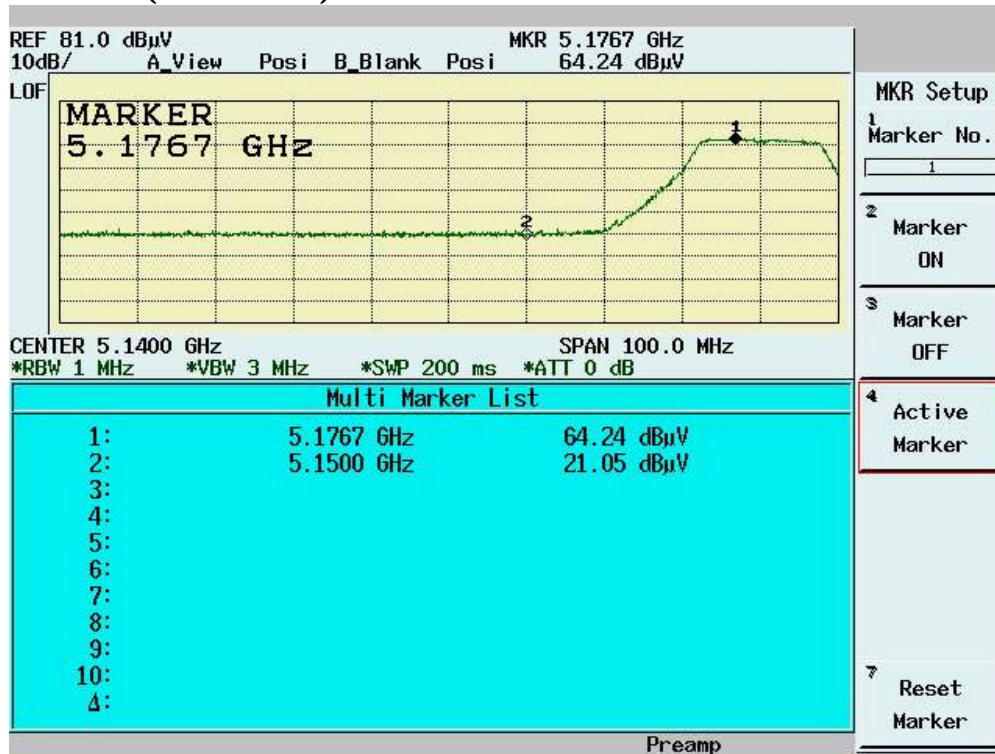
"av": average reading

Emission Level=Spectrum Reading+Correction Factor

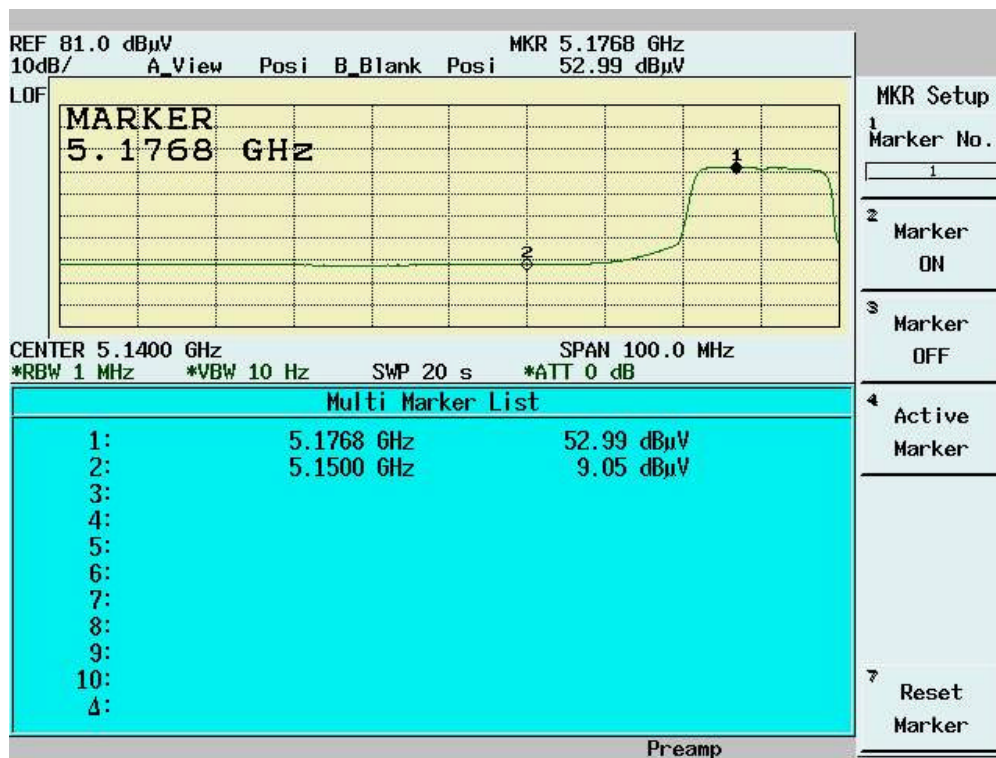
Correction Factor =Antenna Factor+cable loss

Both Horizontal and Vertical polarization have been tested and the worst data is listed above.

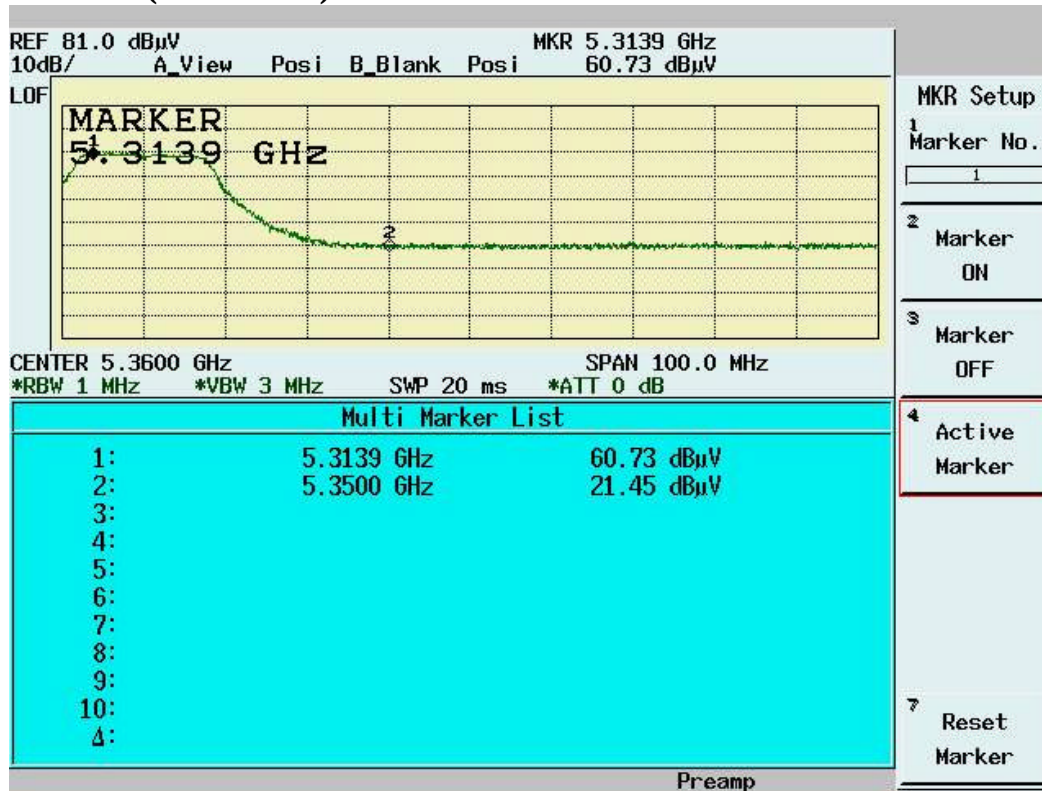
Band Edge measurement for radiated emission in Restricted Band(Radiated) Normal Mode (Channel 36) Peak data



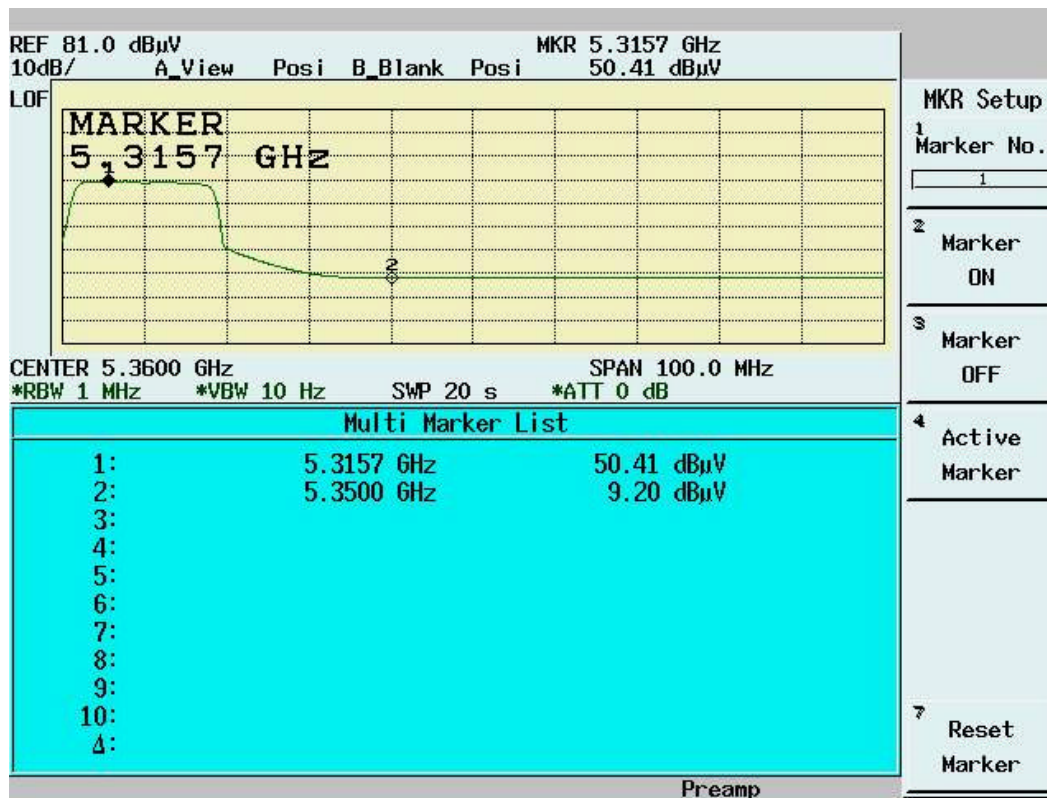
Normal Mode (Channel 36) Average Data



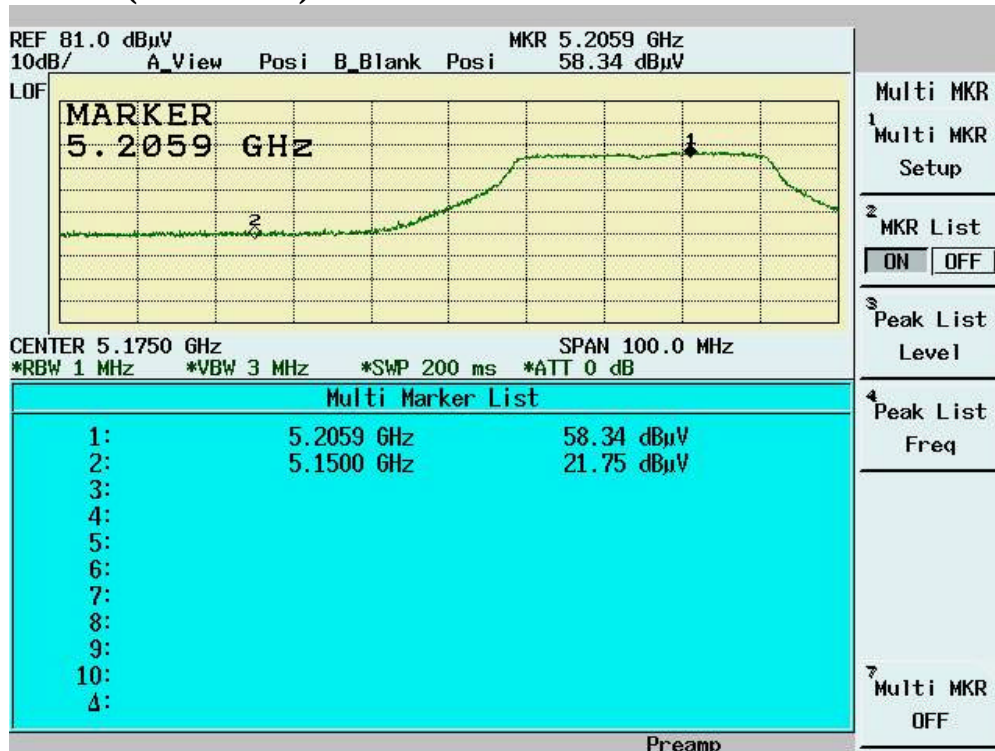
Normal Mode (Channel 64) Peak data



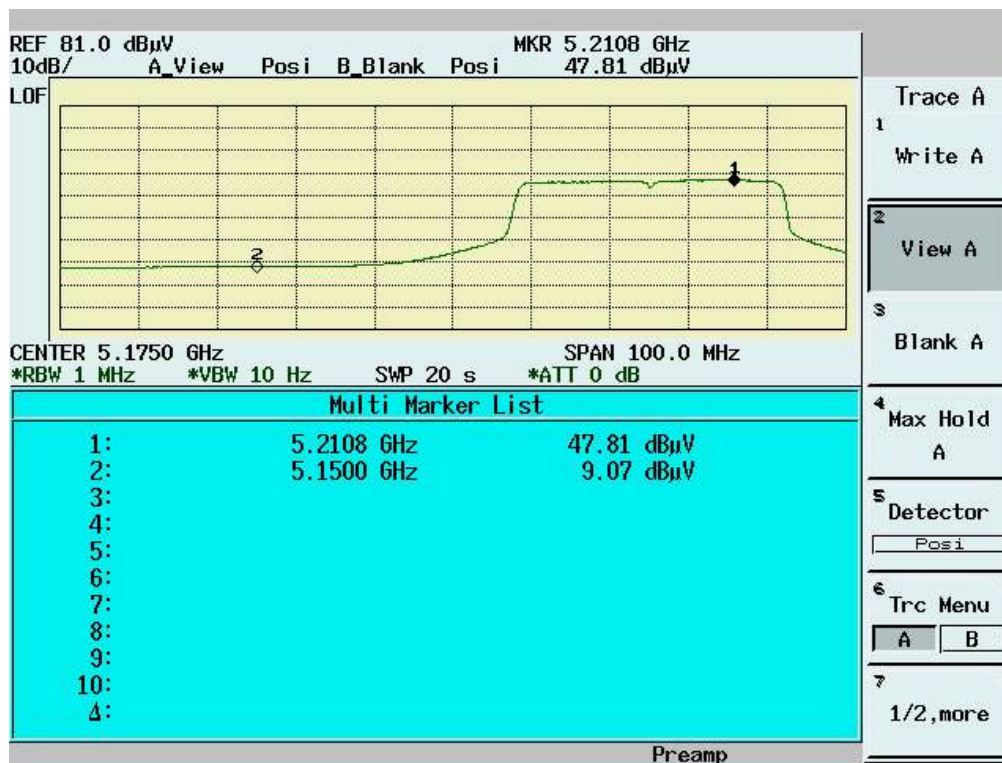
Normal Mode (Channel 64) Average data



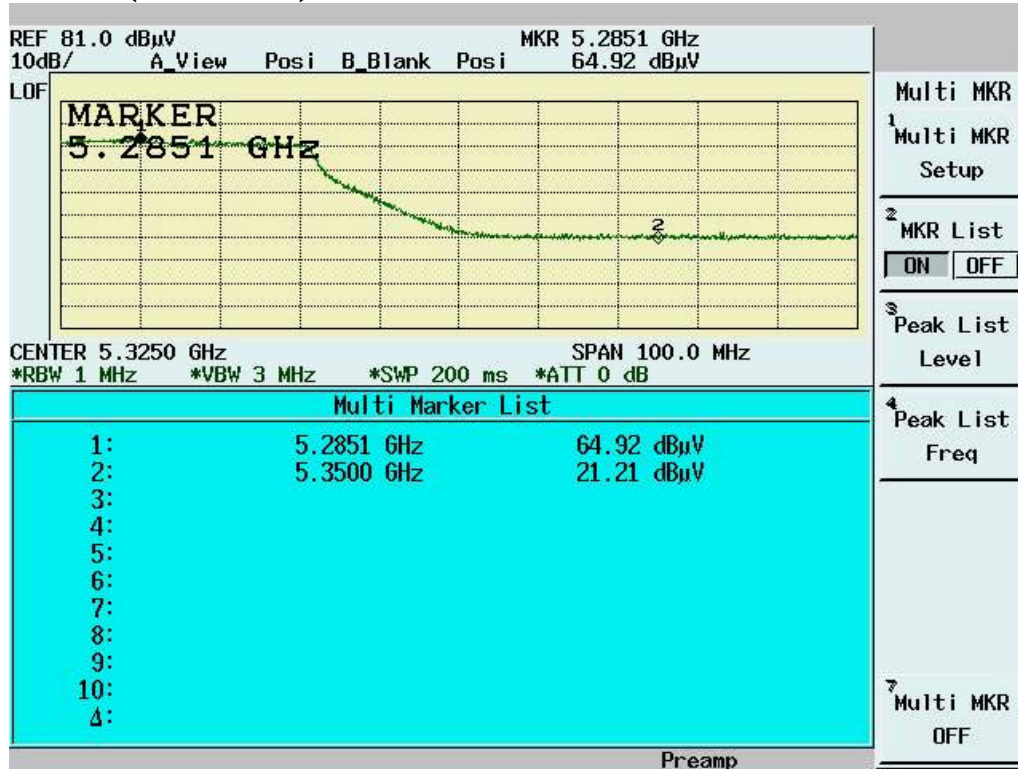
Band Edge measurement for radiated emission in Restricted Band(Radiated) Turbo Mode (Channel 40) Peak data



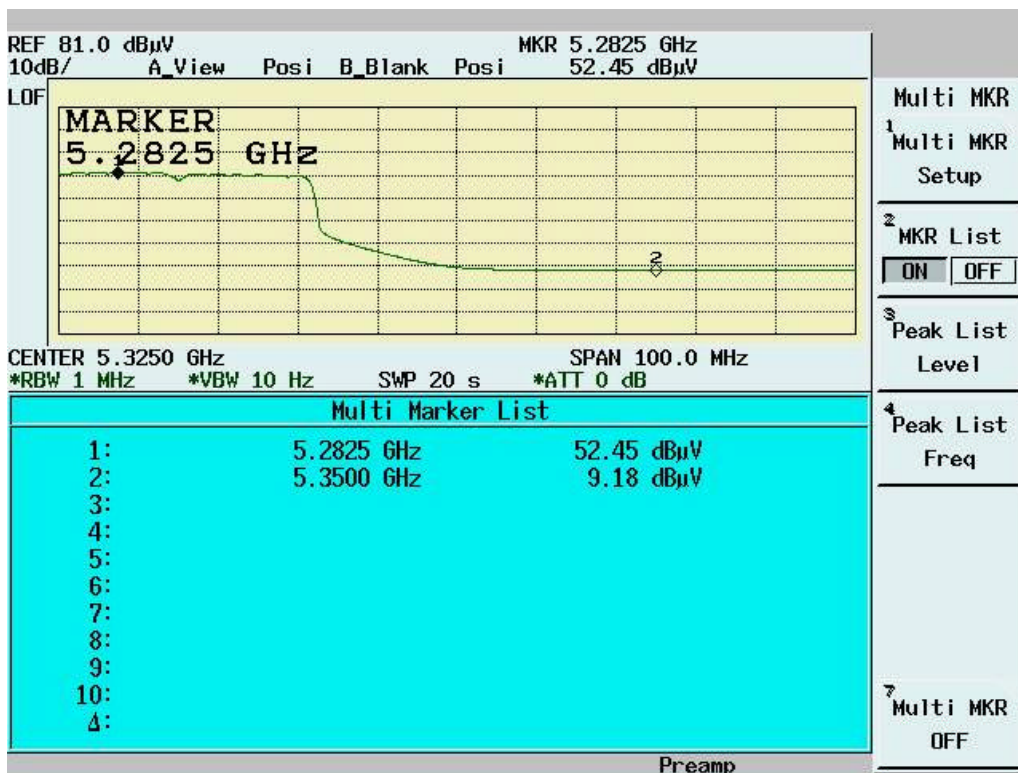
Turbo Mode (Channel 40) Average data



Turbo Mode (Channel 58) Peak data



Turbo Mode (Channel 58) Average Data



4.7 RF Exposure Measurement [Section 15.407(f)(4) & 1.1307(b)]

Refer to SAR Test Report

4.8 Frequency Stability [Section 15.407(g)]

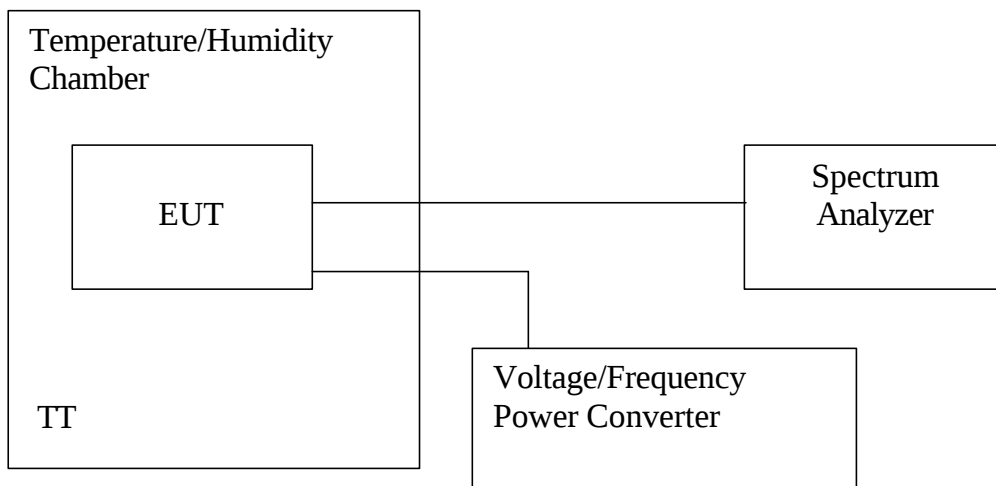
4.8.1 Limits of Frequency Stability Measurement

The frequency tolerance of the carrier sing shall be maintained within +/- 0.02% of the operating frequency over the operation temperature range of EUT (0°C~35°C), and variation in the primary supply voltage from 85% to 115% of the rated supply voltage (115V AC) at 20°C.

4.8.2 Test Procedure

1. The EUT was placed in the Temperature/Humidity Chamber and powered by a Voltage/Frequency Power converter.
2. Connect the RF output of EUT to Spectrum. Turn on the EUT.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the chamber temperature to stabilize. Turn the EUT on and measure the operating frequency after 2, 5, 10 minutes.
5. Set the Voltage/Frequency Power Converter to 85% and 115% of supply voltage, then repeat step 2, 3, 4 respectively.
6. Repeat step 2, 3, 4, 5 with the temperature of chamber set to the lowest temperature.
7. Repeat step 2, 3, 4, 5 with the temperature of chamber set to 20°C.

4.8.3 Test Setup



4.8.4 Test Data

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

5. TEST RESULTS (802.11a(5725MHz~5850MHz)&802.11b)

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

5.1.4 Test Data:

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

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

5.2.1 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

5.2.2 Test Setup



5.2.3 Test Data:

Please refer to Elliott Laboratories, Inc. Report Number: R60260
FCC ID: PPD-AR5BXB6

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

5.3.1 Test Procedure

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

5.3.2 Test Setup



5.3.3 Test Data

Maximum Peak Output Power

802.11a 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
149	5745	20	1.3	134.90	21.3	30	Pass
157	5785	20.1	1.3	138.04	21.4	30	Pass
165	5825	20	1.3	134.90	21.3	30	Pass
152	5760	19.9	1.3	131.83	21.2	30	Pass
161	5805	19.9	1.3	131.83	21.2	30	Pass

802.11b 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	18.9	1.1	100.00	20	30	Pass
6	2437	18.4	1.1	89.13	19.5	30	Pass
11	2462	18.5	1.1	91.20	19.6	30	Pass

Note: Two RF output(MAIN & AUX) have been test,the worse data shown above.

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

5.4.1 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.

5.4.2 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.

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

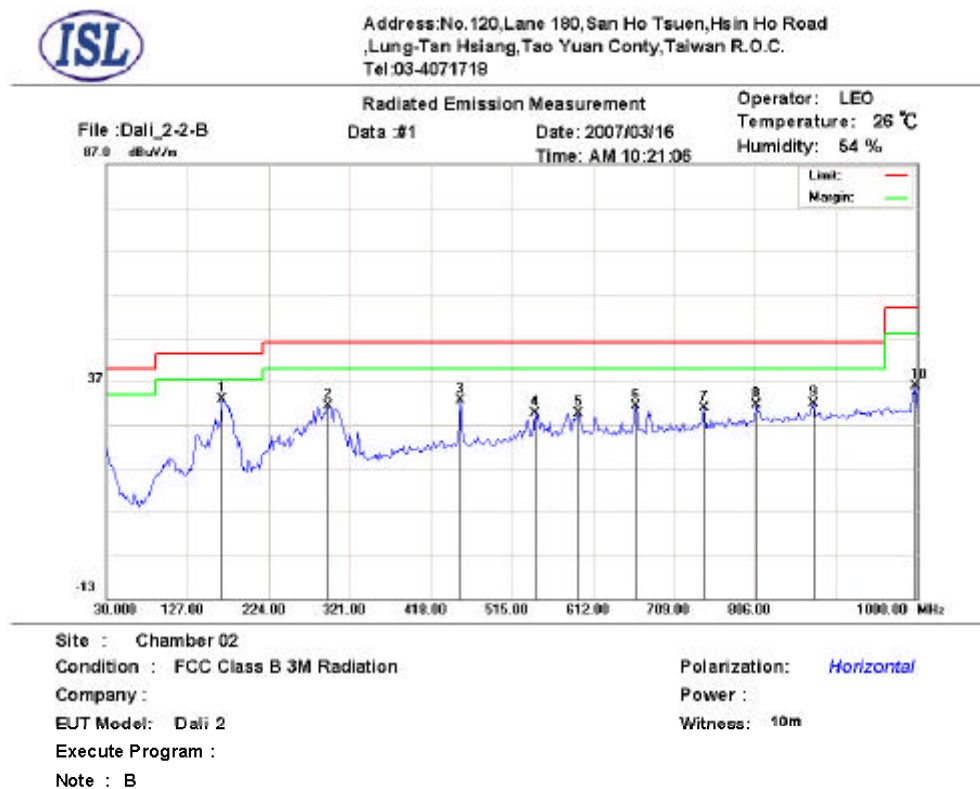
Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz

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

5.4.4 Test Data (30MHz – 1GHz):

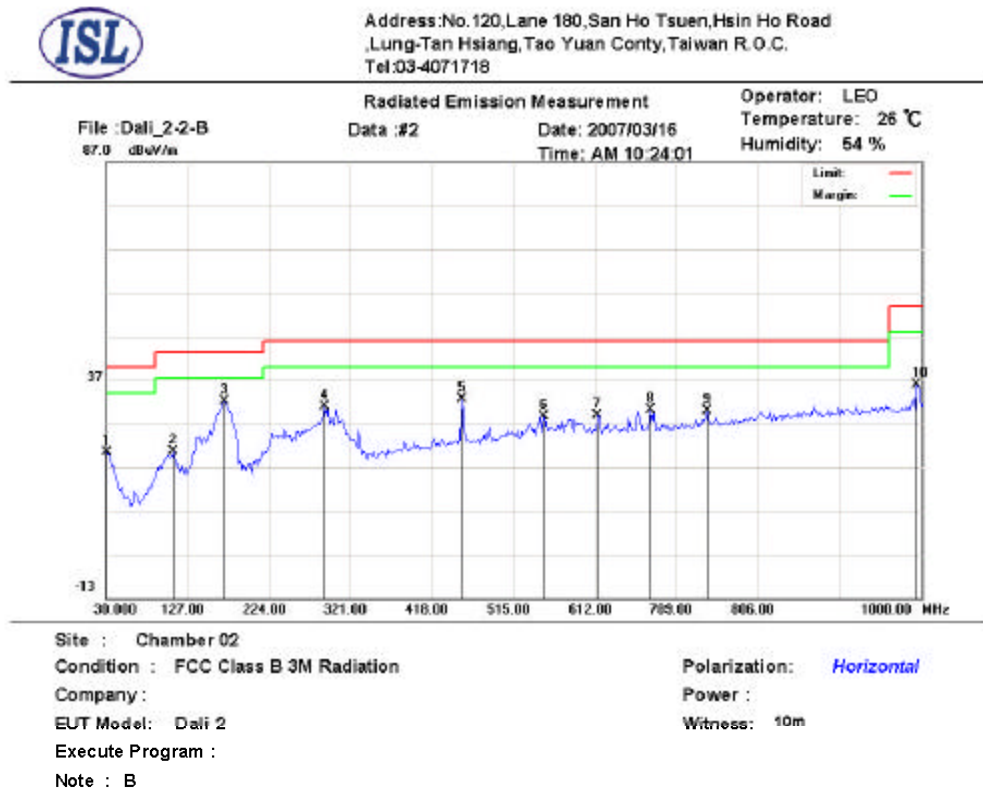
30M – 1GHz Open Field Radiated Emissions (Horizontal)



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
*	167.7400	21.22	9.64	2.08	0	32.94	43.50	-10.56			peak
	295.7800	15.47	13.12	2.9	0	31.49	46.00	-14.51			peak
	452.9200	12.03	16.74	3.87	0	32.64	46.00	-13.36			peak
	542.1600	6.52	18.75	4.31	0	29.58	46.00	-16.42			peak
	594.5400	6.41	18.73	4.57	0	29.71	46.00	-16.29			peak
	664.3800	7.50	18.97	4.91	0	31.38	46.00	-14.62			peak
	745.8600	5.85	19.73	5.34	0	30.92	46.00	-15.08			peak
	807.9400	5.98	19.96	5.67	0	31.61	46.00	-14.39			peak
	875.8400	5.45	20.4	5.93	0	31.78	46.00	-14.22			peak
	998.0600	8.13	21.28	6.47	0	35.88	54.00	-18.12			peak

*:Maximum data x:Over limit !:over margin

30M – 1GHz Open Field Radiated Emissions (Vertical)



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
	30.0000	0.76	18.8	0.84	0	20.40	40.00	-19.60			peak
	109.5400	6.54	12.32	1.66	0	20.52	43.50	-22.98			peak
*	169.6800	20.59	9.52	2.09	0	32.20	43.50	-11.30			peak
	289.9600	15.02	13	2.85	0	30.87	46.00	-15.13			peak
	452.9200	12.09	16.74	3.87	0	32.70	46.00	-13.30			peak
	549.9200	5.37	19	4.36	0	28.73	46.00	-17.27			peak
	613.9400	5.42	18.78	4.67	0	28.87	46.00	-17.13			peak
	677.9600	6.08	18.94	4.99	0	30.01	46.00	-15.99			peak
	745.8600	4.83	19.73	5.34	0	29.90	46.00	-16.10			peak
	994.1800	8.20	21.25	6.45	0	35.90	54.00	-18.10			peak

*:Maximum data x:Over limit !:over margin

NOTE:

➤ 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

5.4.5 Test Data .

802.11a

1GHz~ 40 GHz (Horizontal), Normal Mode Channel 149: 5745 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1654.55	42.33pk	28.1	2.34	23.75	49.02pk	54.00av	-4.98	101	67
2388.21	38.99pk	30.92	1.42	24.59	46.74pk	54.00av	-7.26	101	165
11479.7	35.82pk	40.65	3.08	28.47	51.09pk	54.00av	-2.91	101	162

1GHz~ 40 GHz (Vertical) Normal Mode, Channel 149: 5745 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1575.42	42.71pk	27.43	2.29	23.75	48.68pk	54.00av	-5.32	101	72
1604.2	41.07pk	27.68	2.31	23.75	47.30pk	54.00av	-6.7	101	70
1654.55	49.06pk	28.1	2.34	23.75	55.76pk	74.00pk	-18.24	101	67
1662.72	30.85av	28.1	2.34	23.75	37.55av	54.00av	-16.45	101	67
2388.21	42.63pk	30.92	1.42	24.59	50.37pk	54.00av	-3.63	101	165
11479.7	35.38pk	40.65	3.08	28.47	50.64pk	54.00av	-3.36	101	162

Note: “*” : Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode Channel 157: 5785 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1661.74	41.95pk	28.16	2.35	23.75	48.70pk	54.00av	-5.3	101	66
2395.4	39.25pk	30.92	1.44	24.6	47.01pk	54.00av	-6.99	101	167
5596.2	34.51pk	35.96	2.93	27.48	45.92pk	54.00av	-8.08	100	171
11567.8	36.78pk	40.92	3.15	28.55	52.29pk	54.00av	-1.71	101	149

1GHz~ 40 GHz (Vertical) Normal Mode, Channel 157: 5785 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1597	41.59pk	27.61	2.3	23.75	47.75pk	54.00av	-6.25	101	71
1654.55	49.77pk	28.1	2.34	23.75	56.47pk	74.00pk	-17.53	101	67
1661.85	30.19av	28.1	2.34	23.75	36.89av	54.00av	-17.11	101	67
2388.21	42.82pk	30.92	1.42	24.59	50.57pk	54.00av	-3.43	101	165
11558	37.80pk	40.89	3.14	28.56	53.27pk	54.00av	-0.73	101	150

Note: “*”: Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 165: 5825 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1661.74	42.80pk	28.16	2.35	23.75	49.56pk	54.00av	-4.44	101	66
2388.21	38.58pk	30.92	1.42	24.59	46.33pk	54.00av	-7.67	101	165
11646.2	37.38pk	41.17	3.24	28.55	53.24pk	54.00av	-0.76	101	137

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 165: 5825 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1589.81	41.09pk	27.55	2.3	23.75	47.19pk	54.00av	-6.81	101	71
1654.55	48.77pk	28.1	2.34	23.75	55.47pk	74.00pk	-18.53	101	67
1649.53	29.83av	28.1	2.34	23.75	36.53av	54.00av	-17.47	101	67
2395.4	41.08pk	30.92	1.44	24.6	48.84pk	54.00av	-5.16	101	167
4992.01	36.09pk	35.57	2.17	27.25	46.58pk	54.00av	-7.42	100	1
11646.2	37.61pk	41.17	3.24	28.55	53.47pk	54.00av	-0.53	101	137

Note: “*”: Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Turbo Mode, Channel 152 : 5760 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1589.81	46.84pk	27.55	2.3	23.75	52.94pk	54.00av	-1.06	101	71
1654.55	48.97pk	28.1	2.34	23.75	55.66pk	74.00pk	-19.34	101	67
1659.76	27.72av	28.1	2.34	23.75	34.41av	54.00av	-19.59	101	67
5603.4	35.18pk	35.96	2.94	27.47	46.60pk	54.00av	-7.4	100	173
11518.9	35.17pk	40.76	3.09	28.56	50.47pk	54.00av	-3.53	101	156

1GHz~ 40 GHz (Vertical) , Turbo Mode, Channel 152: 5760 MHz

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1597	55.70pk	27.61	2.3	23.75	61.87pk	74.00pk	-12.13	101	71
1596.77	31.23av	27.61	2.3	23.75	37.4av	54.00av	-16.6	101	71
1625.77	43.01pk	27.86	2.32	23.75	49.44pk	54.00av	-4.56	101	69
1661.74	54.74pk	28.16	2.35	23.75	61.50pk	74.00pk	-12.5	101	66
1664.52	33.03av	28.16	2.35	23.75	39.79av	54.00av	-14.21	101	66
11509.1	37.96pk	40.73	3.08	28.56	53.21pk	54.00av	-0.79	101	158

Note: “ * ”: Fundamental Frequency

“ pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal) , Turbo Mode, Channel 161 : 5805 MHZ

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1597	51.11pk	27.61	2.3	23.75	57.28pk	74.00pk	-16.72	101	71
1594.59	29.43av	27.61	2.3	23.75	35.6av	54.00av	-18.4	101	71
1661.74	49.47pk	28.16	2.35	23.75	56.23pk	74.00pk	-17.77	101	66
1664.12	30.49av	28.16	2.35	23.75	37.25av	54.00av	-16.75	101	66
5488.31	35.23pk	35.99	2.85	27.53	46.53pk	54.00av	-7.47	100	140
5589.01	35.13pk	35.96	2.92	27.48	46.53pk	54.00av	-7.47	100	169
11597.2	33.79pk	41.01	3.18	28.55	49.43pk	54.00av	-4.57	101	145

1GHz~ 40 GHz (Vertical), Turbo Mode, Channel 161 : 5805 MHZ

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1496.3	43.01pk	26.78	2.23	23.75	48.27pk	54.00av	-5.73	101	78
1546.65	42.61pk	27.19	2.26	23.75	48.32pk	54.00av	-5.68	101	74
1589.81	56.80pk	27.55	2.3	23.75	62.91pk	74.00pk	-11.09	101	71
1592.48	32.14av	27.55	2.3	23.75	38.25av	54.00av	-15.75	101	71
1661.74	54.03pk	28.16	2.35	23.75	60.79pk	74.00pk	-13.21	101	66
1665.17	33.95av	28.16	2.35	23.75	40.71av	54.00av	-13.29	101	66
11597.2	36.20pk	41.01	3.18	28.55	51.84pk	54.00av	-2.16	101	145

Note: “*” : Fundamental Frequency

“pk”: peak reading

“av”: average reading

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 40 GHz have been tested.

802.11b

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1596.9	54.26pk	27.61	2.3	23.75	60.42pk	74.00pk	-13.58	101	71
1594.2	32.71av	27.61	2.3	23.75	38.87av	54.00av	-15.13	101	71
1661.84	43.94pk	28.16	2.35	23.75	50.70pk	54.00av	-3.3	101	66
2491.01	39.68pk	30.9	1.41	24.81	47.18pk	54.00av	-6.82	101	197

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1594.41	59.23pk	27.59	2.3	23.75	65.38pk	74.00pk	-8.62	101	71
1597.11	38.95av	27.59	2.3	23.75	45.10av	54.00av	-8.9	101	71
1659.34	48.42pk	28.14	2.35	23.75	55.16pk	74.00pk	-18.84	101	67
1659.34	29.18av	28.14	2.35	23.75	35.92av	54.00av	-18.08	101	67
2493.51	43.53pk	30.9	1.4	24.82	51.01pk	54.00av	-2.99	101	198
4818.18	33.20pk	34.11	5.14	27.49	44.95pk	54.00av	-9.05	100	18

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 (%): 56
Temperature (C): 24

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
1594.41	54.49pk	27.59	2.3	23.75	60.64pk	74.00pk	-13.36	101	71
1591.89	33.17av	27.59	2.3	23.75	39.32av	54.00av	-14.68	101	71
1661.84	43.30pk	28.16	2.35	23.75	50.06pk	54.00av	-3.94	101	66
2491.01	38.84pk	30.9	1.41	24.81	46.34pk	54.00av	-7.66	101	197

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1596.9	57.42pk	27.61	2.3	23.75	63.59pk	74.00pk	-10.41	101	71
1593.14	34.86av	27.61	2.3	23.75	41.03av	54.00av	-12.97	101	71
1661.84	47.90pk	28.16	2.35	23.75	54.66pk	74.00pk	-19.34	101	66
1661.84	29.29av	28.16	2.35	23.75	36.05av	54.00av	-17.95	101	66
2488.51	42.93pk	30.9	1.42	24.81	50.45pk	54.00av	-3.55	101	196
7295.2	32.76pk	38.38	3.88	26.57	48.45pk	54.00av	-5.55	101	152

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 (%): 56
Temperature (C): 24

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
1591.91	52.30pk	27.57	2.3	23.75	58.42pk	74.00pk	-15.58	101	71
1587.54	36.44av	27.57	2.3	23.75	42.56av	54.00av	-11.44	101	71
1661.84	43.92pk	28.16	2.35	23.75	50.68pk	54.00av	-3.32	101	66
3325.17	38.36pk	31.36	1.62	25.69	45.65pk	54.00av	-8.35	103	273
7367.63	30.68pk	38.67	3.92	26.54	46.73pk	54.00av	-7.27	101	163

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

Operator: Jerry Chiou

RBW: 1MHz
Humidity (%): 56
Temperature (C): 24

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
1596.9	55.45pk	27.61	2.3	23.75	61.62pk	74.00pk	-12.38	101	71
1593.81	37.75av	27.61	2.3	23.75	43.92av	54.00av	-10.08	101	71
1634.37	42.48pk	27.93	2.33	23.75	48.99pk	54.00av	-5.01	101	68
1661.84	52.34pk	28.16	2.35	23.75	59.10pk	74.00pk	-14.9	101	66
1658.26	31.18av	28.16	2.35	23.75	37.94av	54.00av	-16.06	101	66
7367.63	31.89pk	38.67	3.92	26.54	47.94pk	54.00av	-6.06	101	163

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.