



Test Report

Product Name	Wireless to Serial Module
Model No	WE-2100T, WE-2100T-T
FCC ID	SLEWE2100T

Applicant	Moxa Inc.
Address	F1.4, No. 135, Lane 235, Pao-Chiao Rd., Shing Tien City, Taipei, Taiwan, R.O.C.

Date of Receipt	June. 02, 2008
Issued Date	June. 24, 2008
Report No.	086109R-RFUSP09V01
Version	V1.0

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of Quietek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Issued Date: June. 24, 2008

Rport No.: 086109R-RFUSP09V01



Product Name	Wireless to Serial Module
Applicant	Moxa Inc.
Address	F1.4, No. 135, Lane 235, Pao-Chiao Rd., Shing Tien City, Taipei, Taiwan, R.O.C.
Manufacturer	Moxa Inc.
Model No.	WE-2100T, WE-2100T-T
FCC ID.	SLEWE2100T
Rated Voltage	AC 120V/60Hz
Working Voltage	DC 3.3V
Trade Name	Moxa
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2007 ANSI C63.4: 2003
Test Result	Complied



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Tested By : Molin Huang
(Engineer /Molin Huang)



Approved By : Vincent Lin
(Deputy Manager /Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless to Serial Module
Trade Name	Moxa
FCC ID.	SLEWE2100T
Model No.	WE-2100T, WE-2100T-T
Frequency Range	2412 – 2462MHz for 802.11 b/g 5180 – 5240MHz, 5745 – 5805MHz for 802.11a
Number of Channels	11 for 802.11 b/g 8 for 802.11 a
Channel Control	Auto
Data Rate	802.11b – 1, 2, 5.5, 11Mbps 802.11a/g – 6, 9, 12, 18, 24, 36, 48, 54Mbps
Type of Modulation	802.11b:DSSS DBPSK, DQPSK, CCK 802.11 a/g: OFDM BPSK, QPSK, 16QAM, 64QAM
Antenna type	Dipole
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	WANSHIH	WNW1730A1	1.76 dBi for 2.4 GHz 1.47 dBi for 5.0 GHz
2	KINSUN	6602D03081	1.21 dBi for 2.4 GHz 1.73 dBi for 5.0 GHz

Note:

1. Due to Ant 1 and Ant 2 are the same type antennas. Only the 5GHz band higher gain antenna “Ant 2” was tested and recorded in this report.

2.4GHz Band Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	2412 MHz	Channel 5:	2432 MHz	Channel 9:	2452 MHz
Channel 2:	2417 MHz	Channel 6:	2437 MHz	Channel 10:	2457 MHz
Channel 3:	2422 MHz	Channel 7:	2442 MHz	Channel 11:	2462 MHz
Channel 4:	2427 MHz	Channel 8:	2447 MHz		

5GHz Band Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1	5180 MHz	Channel 2	5200 MHz	Channel 3	5220 MHz	Channel 4	5240 MHz
Channel 5	5745 MHz	Channel 6	5765 MHz	Channel 7	5785 MHz	Channel 8	5805 MHz

Note:

1. This device is a Wireless to Serial Module with a built-in 2.4GHz and 5GHz transceiver.
2. The EUT is including two models for different marketing requirement.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps and 802.11a/g is 6Mbps)
4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.

1.2. Operational Description

The EUT is an Wireless to Serial Module with 11 channels. for 802.11b/g and 9 channels for 802.11a. This device provides four kinds of transmitting speed 1, 2, 5.5 and 11Mbps. The modulation of device is BPSK, QPSK and CCK (IEEE 802.11b) and eight kinds of transmitting speed 6, 9, 12, 18, 24, 36, 48 and 54Mbps are provided. The technology of this device used is OFDM (IEEE 802.11 a/g).

The device adapts direct sequence spread spectrum modulation. The antenna provides diversity function to improve the receiving function.

This Wireless to Serial Module, compliant with IEEE 802.11b and IEEE 802.11 a/g, is a high-efficiency Wireless LAN adapter. It allows your computer to connect to a wireless network and to share resources, such as files or printers without being bound to the network wires. Operation in 2.4GHz Direct Sequence Spread Spectrum (DSSS) radio transmission, the Wireless to Serial Module Wired Equivalent Protection (WEP) algorithm is used. In addition, its standard compliance ensures that it can communicate with any IEEE 802.11b and IEEE 802.11 a/g network.

Test Mode	Mode 1: Transmitter 802.11a
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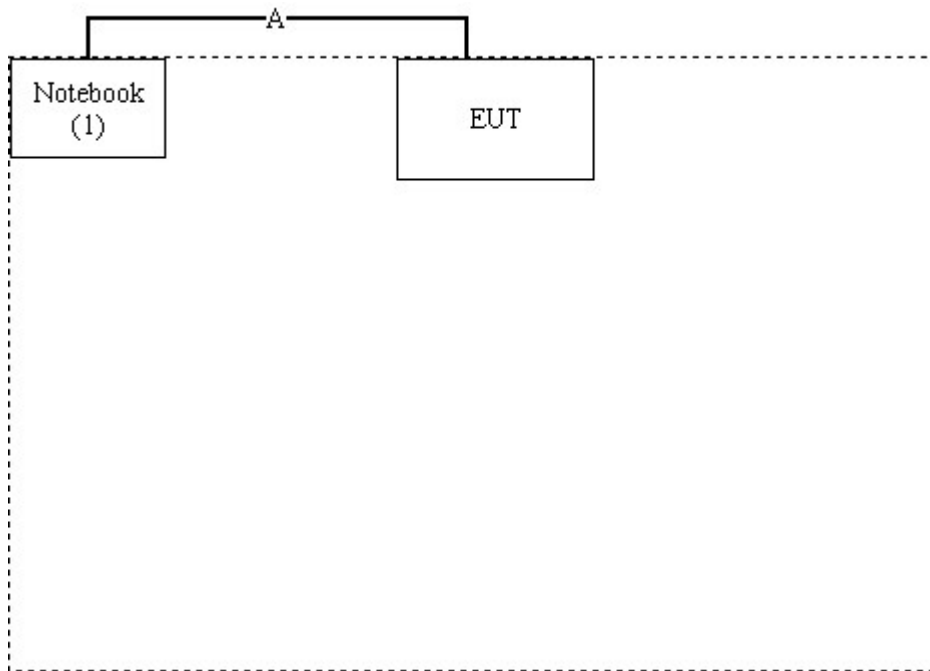
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Notebook PC	DELL	PPT	N/A	Non-Shielded, 1.6m

Signal Cable Type	Signal cable Description
A LAN Cable	Shielded, 1.5m

1.4. Configuration of tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute the RF program (the continuous transmission program) on the EUT
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous transmission.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: File on
 Federal Communications Commission
 FCC Engineering Laboratory
 7435 Oakland Mills Road
 Columbia, MD 21046
 Registration Number: 92195



Accreditation on NVLAP
 NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation
 Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
 Lin-Kou Shiang, Taipei,
 Taiwan, R.O.C.
 TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
 E-Mail : service@quietek.com

FCC Accreditation Number: TW1014



2. Peak Power Output

2.1. Test Equipment

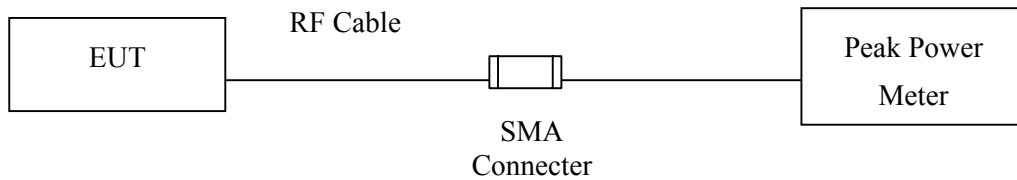
The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2008
X	Power Sensor	Anritsu	MA2491A/034457	May, 2008

- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with “X” are used to measure the final test results.

2.2. Test Setup

Conducted Measurement



2.3. Test procedures

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

2.4. Limits

The maximum peak power shall be less 1 Watt.

2.5. Uncertainty

± 1.27 dB

2.6. Test Result of Peak Power Output

Product : Wireless to Serial Module
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a

Cable loss=0.5dB		Peak Power Output Value (dBm)								Required Limit
Channel No.	Frequency (MHz)	Data Rate (Mbps)								
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps	
1	5180.00	14.81	--	--	--	--	--	--	--	17dBm or $4+10*\log(B)=17.62\text{dBm}$
3	5220.00	14.62	14.61	14.59	14.60	14.58	14.57	14.55	14.56	17dBm or $4+10*\log(B)=17.62\text{dBm}$
4	5240.00	14.75	--	--	--	--	--	--	--	17dBm or $4+10*\log(B)=17.62\text{dBm}$
5	5745.00	14.81	--	--	--	--	--	--	--	30dBm or $17\text{dBm}+10 \log$ $(B= 35.15\text{MHz})=32.45 \text{ dBm}$
7	5785.00	14.42	14.41	14.39	14.38	14.37	14.36	14.35	14.34	30dBm or $17\text{dBm}+10 \log$ $(B=31.85\text{MHz})=32.031\text{dBm}$
8	5805.00	14.41	--	--	--	--	--	--	--	30dBm or $17\text{dBm}+10 \log$ $(B=29.65\text{MHz})=31.72\text{dBm}$

Note: Peak Power Output Value =Reading value on peak power meter + cable loss

3. Undesirable Emission

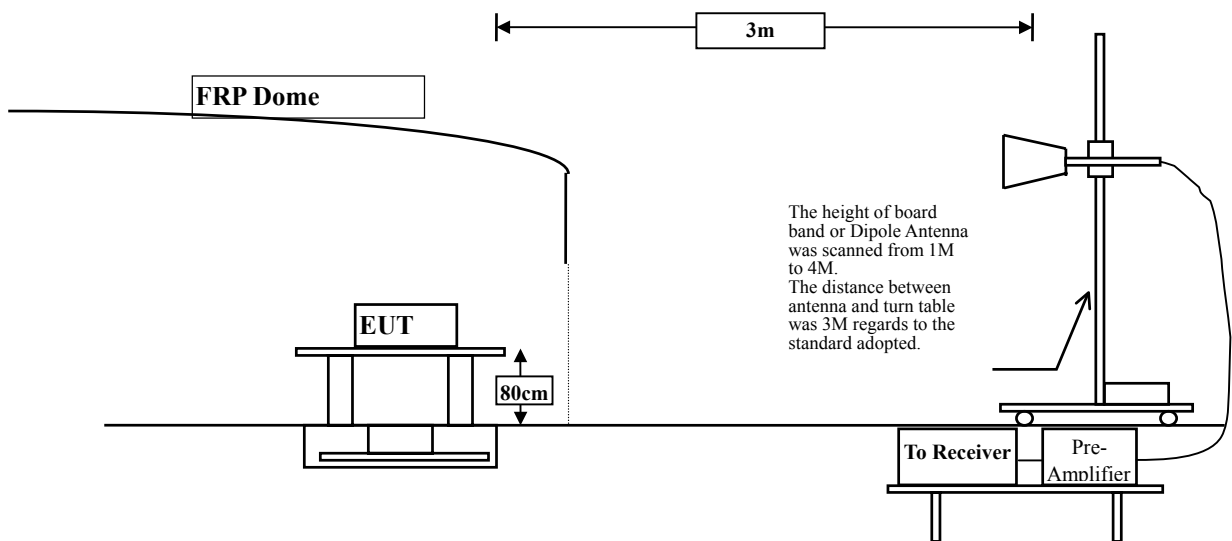
3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	X Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2008
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
	X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2008
	X Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2008
	X Horn Antenna	ETS	3115 / 0005-6160	July, 2007
	X Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007

- Note:
1. All equipments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

3.2. Test Setup



3.3. Limits

Inside of the restricted band(section 15.205): Apply to 15.209 limit.

Outside of the restricted band (section 15.407):

- 5.15GHz - 5.35 GHz < -27 dBm/MHz EIRP,
- 5.47GHz - 5.725 GHz < -27 dBm/MHz EIRP,
- 5.725GHz - 5.825 GHz < -27 dBm/MHz EIRP,
- <-17 dBm/MHz EIRP (all emission within the frequency range from the band edge to 10 MHz above or below the band edge).

3.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to FCC Public Notice DA 02-2138 test procedure for compliance to FCC 47CFR 15. 407 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

3.5. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

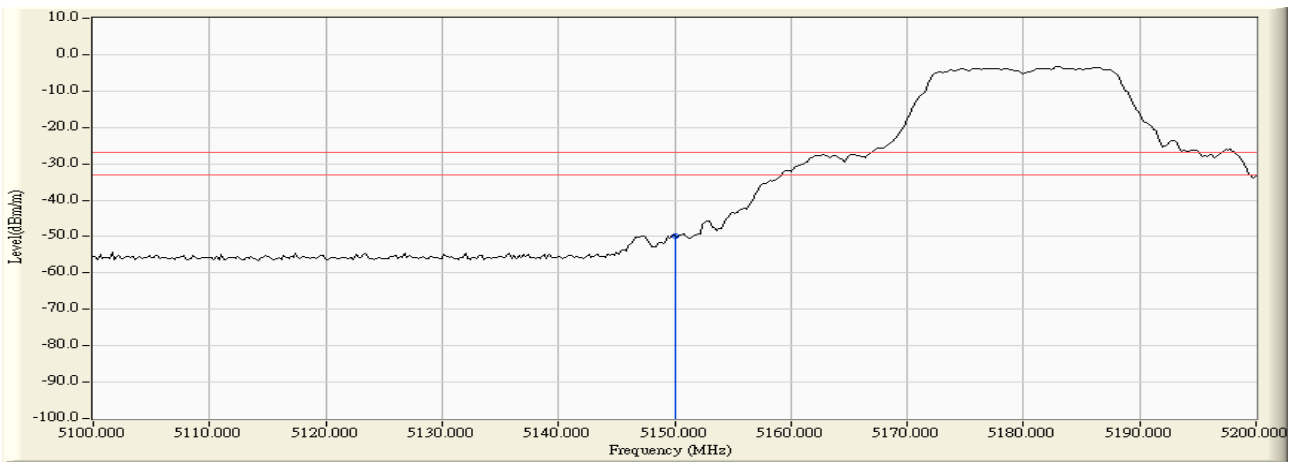
3.6. Test Result of Undesirable Emission

Product : Wireless to Serial Module
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5180MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
1 (Peak)	5150.000	14.272	-57.613	-43.341	-16.341	-27.000	Pass

Figure Channel 1: Horizontal (Peak)



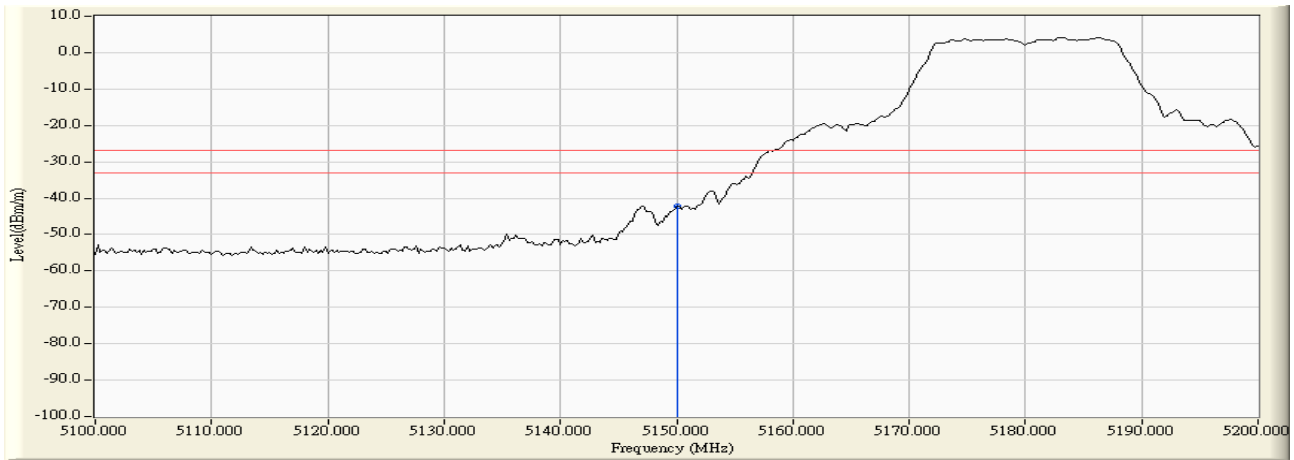
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : Wireless to Serial Module
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5180MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
1 (Peak)	5149.800	14.632	-44.303	-29.672	-2.672	-27.000	Pass

Figure Channel 1: Vertical (Peak)



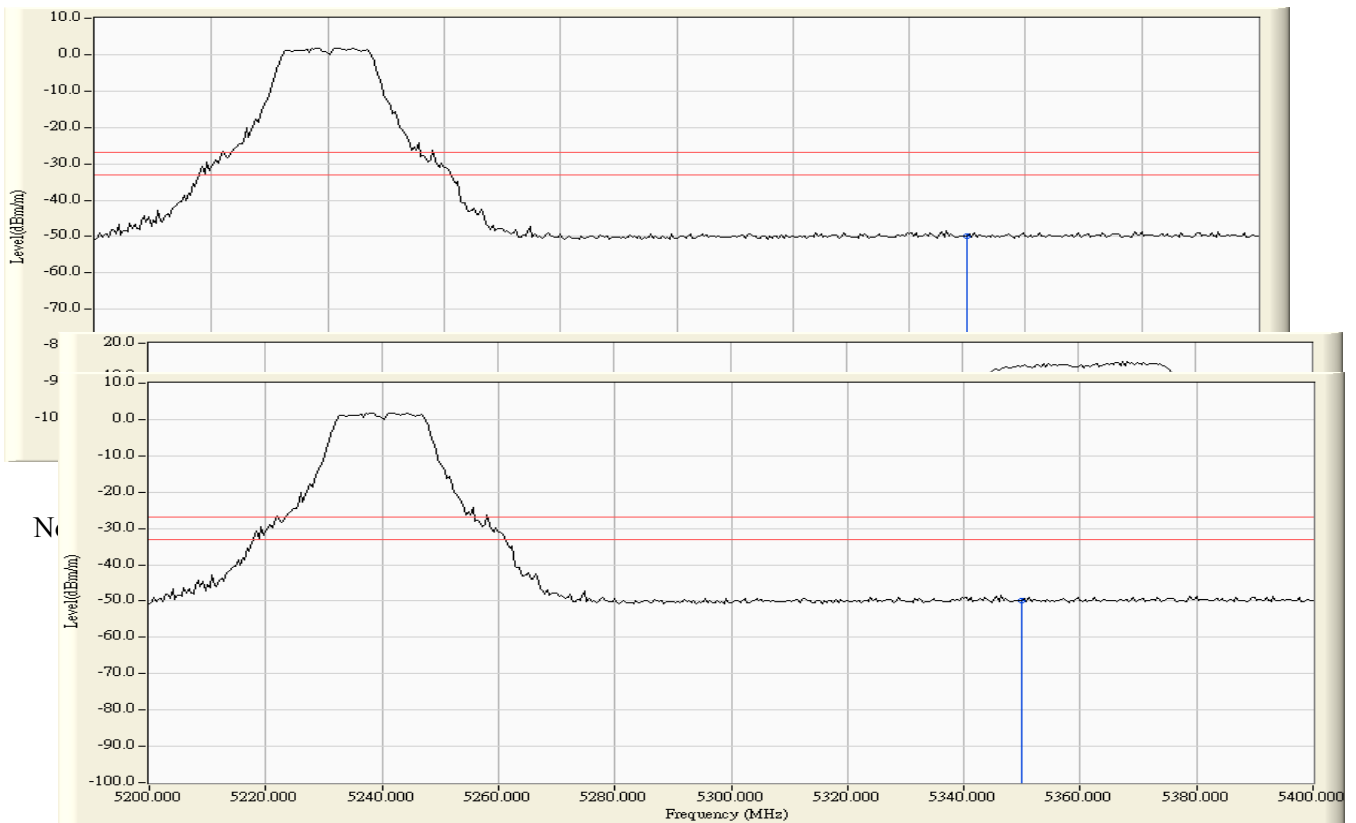
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : Wireless to Serial Module
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5240MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
4 (Peak)	5350.000	14.464	-64.457	-49.993	-22.993	-27.000	Pass

Figure Channel 4: Horizontal (Peak)

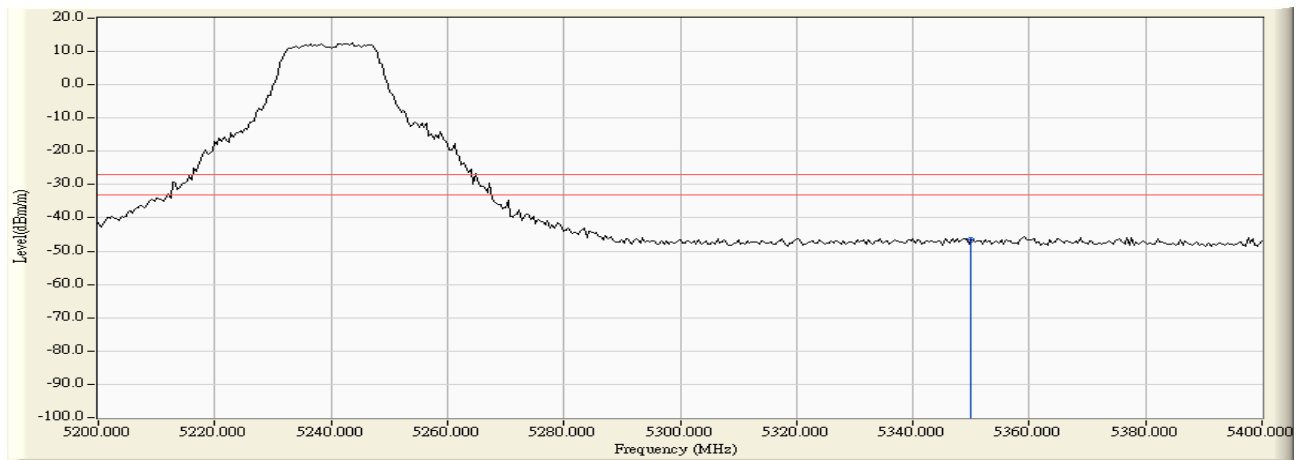


Product : Wireless to Serial Module
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5240MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
4 (Peak)	5350.000	14.773	-61.416	-46.643	-19.643	-27.000	Pass

Figure Channel 4: Vertical (Peak)



Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

4. Radiated Emission

4.1. Test Equipment

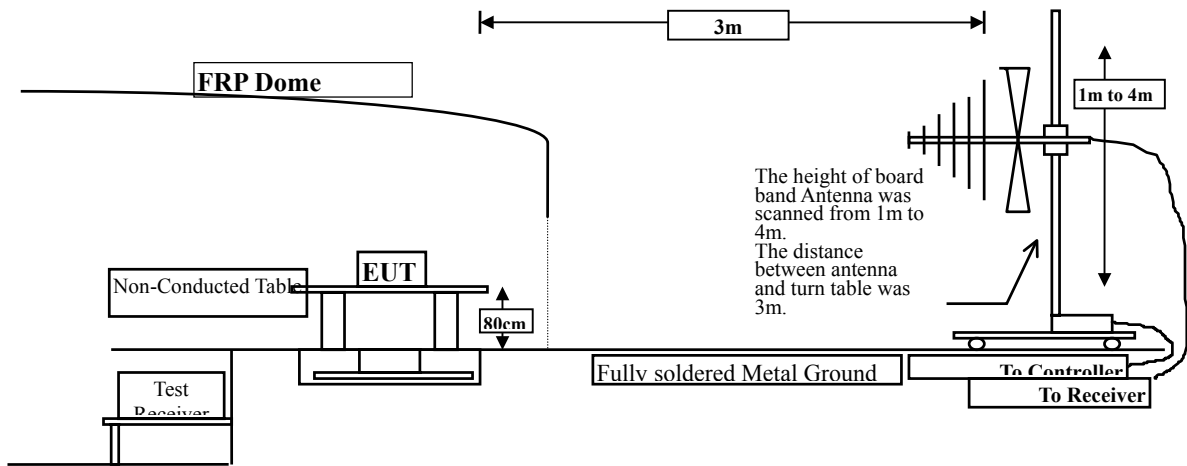
The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1	Test Receiver	R & S	ESCS 30 / 825442/14	May, 2008
	Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2008
	Pre-Amplifier	HP	8447D/3307A01812	May, 2008
	Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2007
	Horn Antenna	EM	EM6917 / 103325	May, 2008
Site # 2	Test Receiver	R & S	ESCS 30 / 825442/17	May, 2008
	Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2008
	Pre-Amplifier	HP	8447D/3307A01814	May, 2008
	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2007
	Horn Antenna	EM	EM6917 / 103325	May, 2008
Site # 3	X Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2008
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
	X Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2008
	X Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2007
	X Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2007
	X Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007
	X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2008
X Pre-Amplifier	HP	8449B / 3008A01123	July, 2007	

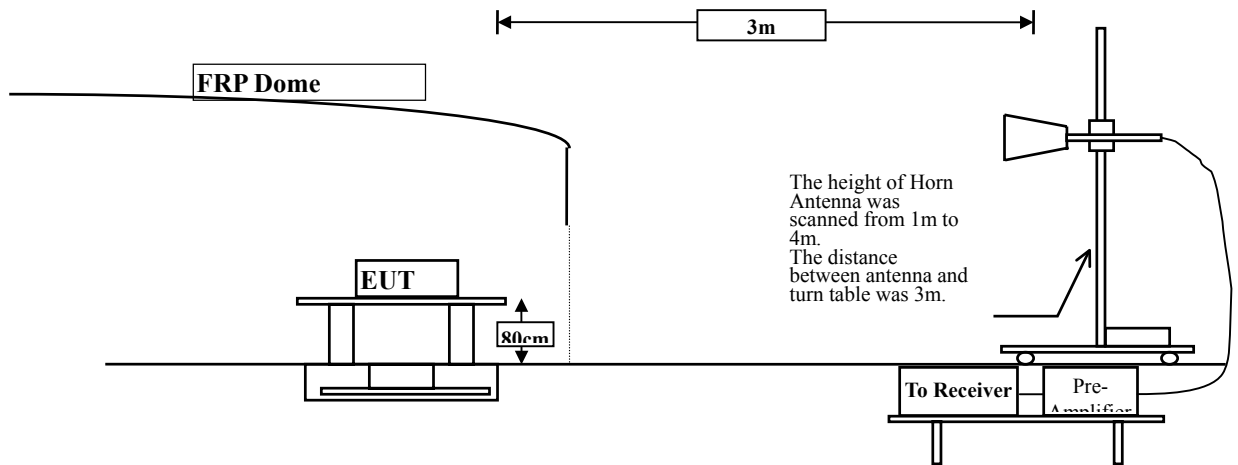
- Note:
1. All instruments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

4.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz. Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas. The measurement is divided into the Preliminary Measurement and the Final Measurement. The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB beam width of the antenna. The worst radiated emission is measured on the Final Measurement. The frequency range from 30MHz to 10th harmonics is checked.

4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : Wireless to Serial Module
 Test Item : Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5180MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector					
10360.000	13.127	37.470	50.597	-23.403	74.000
Average Detector					
--					
Vertical					
Peak Detector					
10360.000	13.127	37.250	50.377	-23.623	74.000
Average Detector					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:10MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:10MHz.
4. Measurement Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Wireless to Serial Module
 Test Item : Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5220MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV/m
	dB	dBuV	dBuV/m		

Horizontal

Peak Detector

10440.000	13.579	36.470	50.049	-23.951	74.000
-----------	--------	--------	--------	---------	--------

Average Detector

Vertical

Peak Detector

10440.000	13.579	37.580	51.159	-22.841	74.000
-----------	--------	--------	--------	---------	--------

Average Detector

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:10MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:10MHz.
4. Measurement Level = Reading Level + Correct Factor..
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Wireless to Serial Module
 Test Item : Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5240MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV/m
	dB	dBuV	dBuV/m		

Horizontal

Peak Detector

10480.000	13.934	37.980	51.914	-22.086	74.000
-----------	--------	--------	--------	---------	--------

Average Detector

Vertical

Peak Detector

10480.000	13.934	38.130	52.064	-21.936	74.000
-----------	--------	--------	--------	---------	--------

Average Detector

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:10MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:10MHz °
4. Measurement Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Wireless to Serial Module
 Test Item : Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5745MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV/m
	dB	dBuV	dBuV/m		

Horizontal

Peak Detector

11490.000	15.456	34.420	49.876	-24.124	74.000
-----------	--------	--------	--------	---------	--------

Average Detector

--

Vertical

Peak Detector

11490.000	15.456	36.270	51.726	-22.274	74.000
-----------	--------	--------	--------	---------	--------

Average Detector

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Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. "█" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : Wireless to Serial Module
 Test Item : Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector					
11570.000	14.834	36.250	51.084	-22.916	74.000
Average Detector					
--					
Vertical					
Peak Detector					
11570.000	14.834	37.240	52.074	-21.926	74.000
Average Detector					
--					

Note:

5. All Readings below 1GHz are Quasi-Peak, above are average value.
6. "█" means the worst emission level.
7. Measurement Level = Reading Level + Correct Factor
8. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : Wireless to Serial Module
 Test Item : Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5805MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV/m
	dB	dBuV	dBuV/m		

Horizontal

Peak Detector

11610.000	14.594	34.380	48.974	-25.026	74.000
-----------	--------	--------	--------	---------	--------

Average Detector

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Vertical

Peak Detector

11610.000	14.594	36.250	50.844	-23.156	74.000
-----------	--------	--------	--------	---------	--------

Average Detector

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Note:

9. All Readings below 1GHz are Quasi-Peak, above are average value.
10. "█" means the worst emission level.
11. Measurement Level = Reading Level + Correct Factor
12. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : Wireless to Serial Module
 Test Item : Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector					
265.930	13.890	16.960	30.850	-15.150	46.000
333.580	14.285	6.215	20.500	-25.500	46.000
452.360	18.324	10.266	28.590	-17.410	46.000
526.400	18.530	7.950	26.480	-19.520	46.000
684.590	20.993	6.597	27.590	-18.410	46.000
815.640	21.635	5.954	27.590	-18.410	46.000
Vertical					
Peak Detector					
158.950	9.839	16.739	26.578	-16.922	43.500
295.680	13.727	12.852	26.580	-19.420	46.000
365.850	16.457	13.123	29.580	-16.420	46.000
512.690	18.761	15.439	34.200	-11.800	46.000
642.360	20.356	6.594	26.950	-19.050	46.000
845.260	21.484	7.106	28.590	-17.410	46.000

Note:

13. All Readings below 1GHz are Quasi-Peak, above are average value.
14. "█" means the worst emission level.
15. Measurement Level = Reading Level + Correct Factor
16. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : Wireless to Serial Module
 Test Item : Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector					
296.360	13.969	14.621	28.590	-17.410	46.000
452.360	18.324	15.156	33.480	-12.520	46.000
537.590	19.191	9.740	28.930	-17.070	46.000
658.950	20.869	7.721	28.590	-17.410	46.000
725.480	21.261	5.180	26.440	-19.560	46.000
836.290	21.952	10.068	32.020	-13.980	46.000
Vertical					
Peak Detector					
296.580	13.727	10.862	24.590	-21.410	46.000
425.680	19.568	0.792	20.360	-25.640	46.000
536.580	19.694	3.786	23.480	-22.520	46.000
625.800	21.104	10.096	31.200	-14.800	46.000
748.360	23.171	3.409	26.580	-19.420	46.000
833.560	21.462	7.108	28.570	-17.430	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. "█" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

5. Band Edge

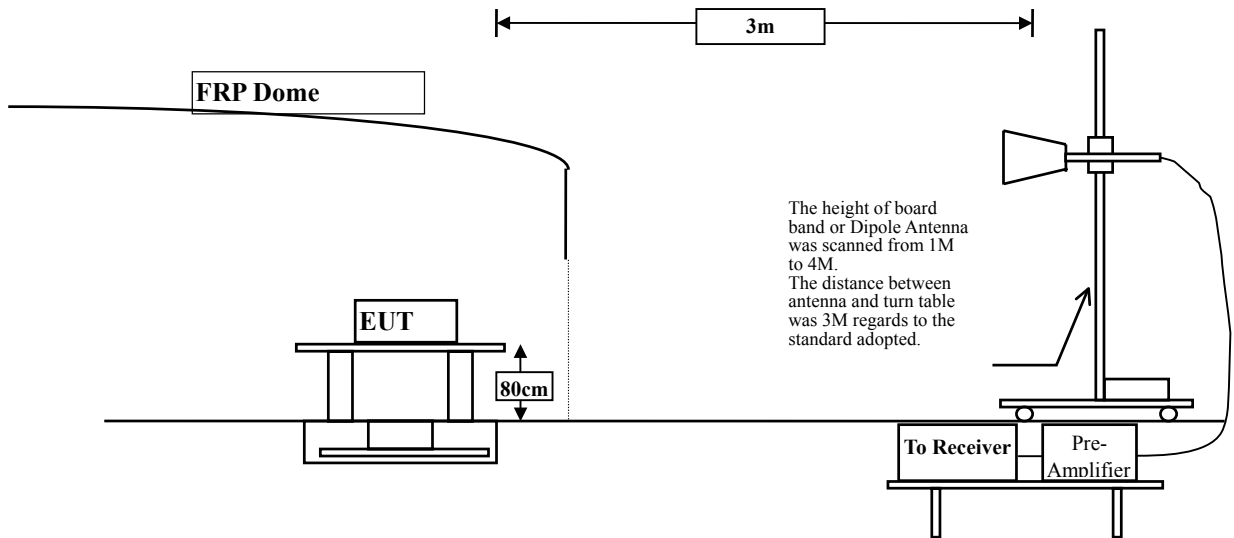
5.1. Test Equipment

The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	X Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2008
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
	X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2008
	X Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2008
	X Horn Antenna	ETS	3115 / 0005-6160	July, 2007
	X Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007

5.2. Test Setup

RF Radiated Measurement:



5.3. Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

5.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:1992 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz.

5.5. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

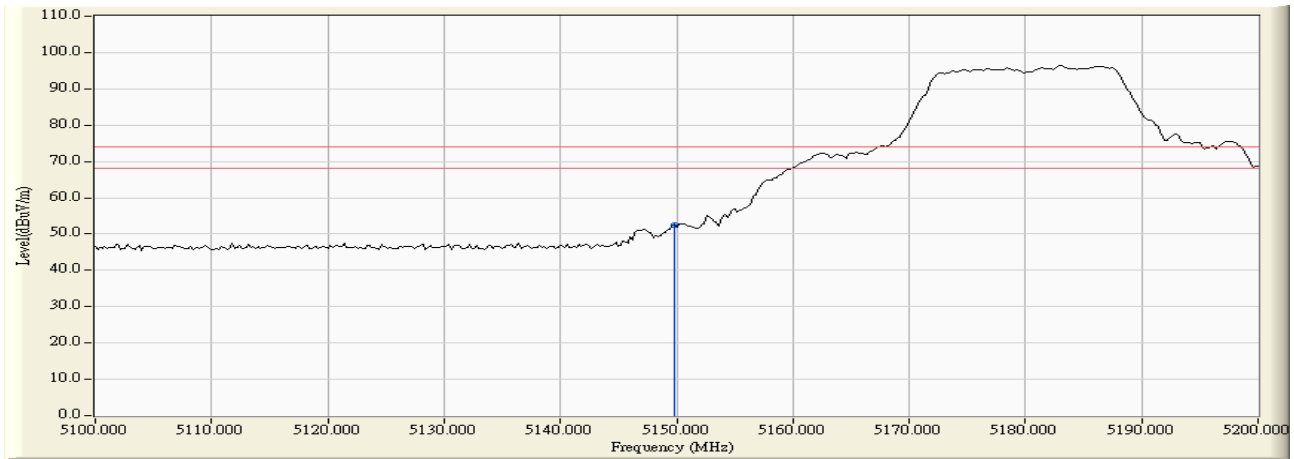
5.6. Test Result of Band Edge

Product : Wireless to Serial Module
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5180MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	5149.800	4.306	48.250	52.555	74.00	54.00	Pass
1 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 1: Horizontal (Peak)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless to Serial Module
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5180MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	5150.000	4.305	57.210	61.515	74.00	54.00	Pass
1 (Average)	5150.000	4.305	33.949	38.254	74.00	54.00	Pass

Figure Channel 1: Vertical (Peak)

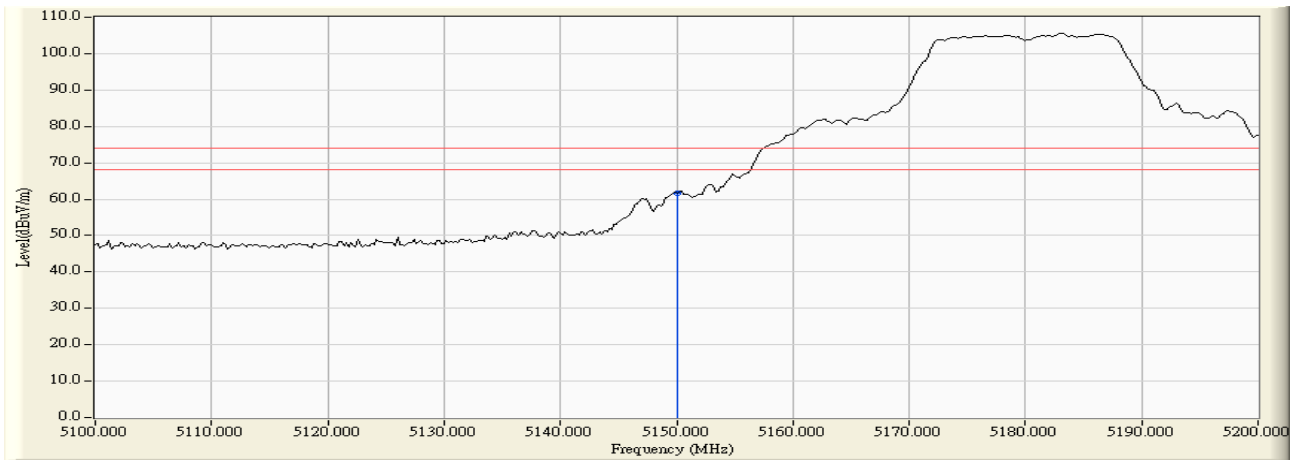
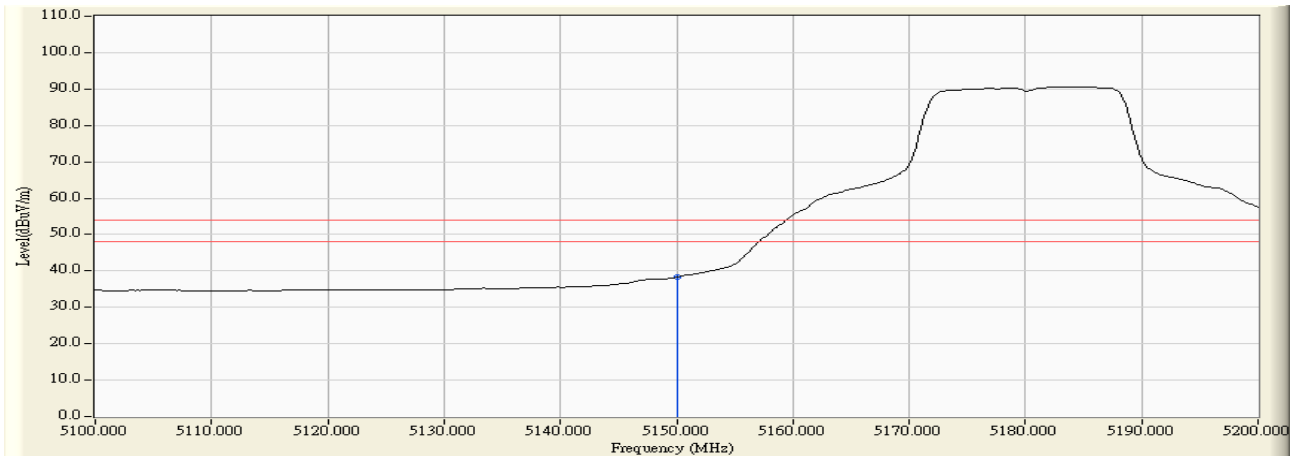


Figure Channel 1: Vertical (Peak)



Note:

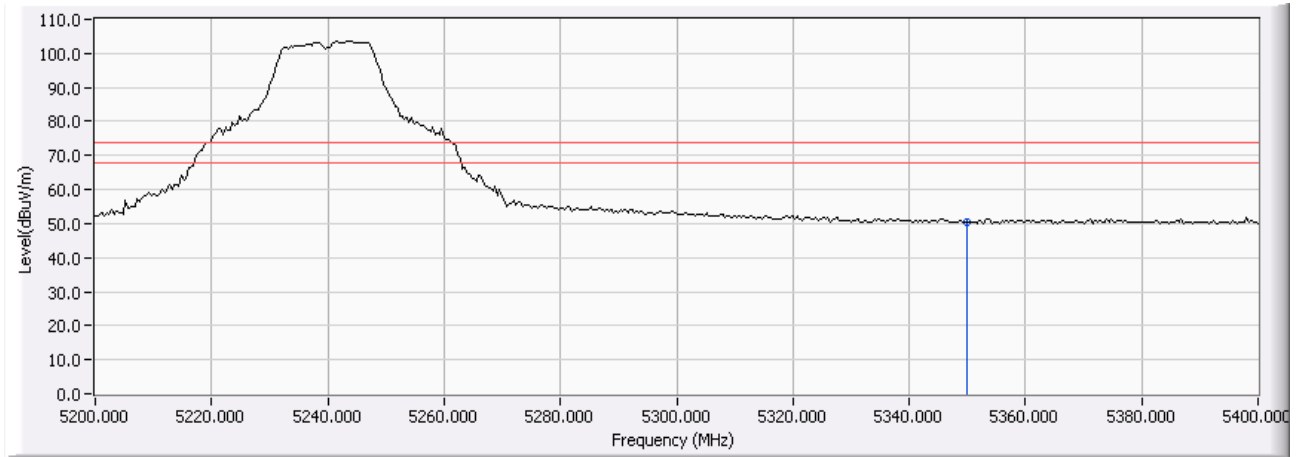
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless to Serial Module
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5240MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
4 (Peak)	5350.000	-0.127	50.670	50.544	74.00	54.00	Pass

Figure Channel 4: Horizontal (Peak)



Note:

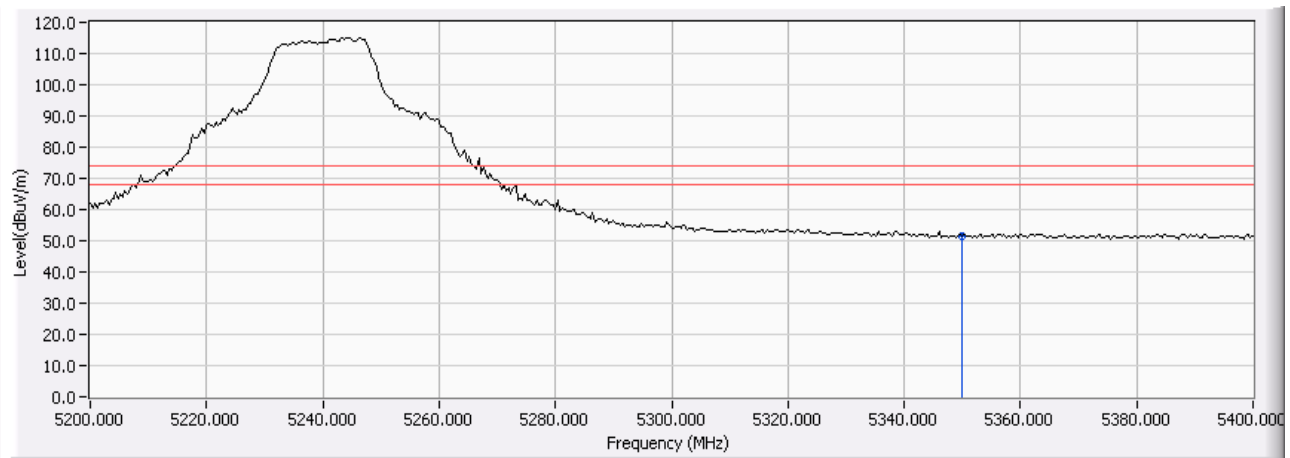
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless to Serial Module
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5240MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
4 (Peak)	5350.000	-0.127	51.563	51.437	74.00	54.00	Pass

Figure Channel 4: Vertical (Peak)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.