



Test Report

Product Name : 2G Wireless NPort
Model No : NPort W2150 Plus, NPort W2250 Plus, NPort
W2150 Plus-T, NPort W2250 Plus-T
FCC ID : SLEW2250Plus

Applicant : Moxa Inc.

Address : Fl.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. 19, 2008
Report No. : 086111R-RFUSP08V01
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. 19, 2008

Rport No.: 086111R-RFUSP08V01



Product Name : 2G Wireless NPort
 Applicant : Moxa Inc.
 Address : Fl.4, No. 135, Lane 235, Pao-Chiao Rd., Shing Tien City, Taipei, Taiwan, R.O.C.
 Manufacturer : Moxa Inc.
 Model No. : NPort W2150 Plus, NPort W2250 Plus,NPort W2150 Plus-T, NPort W2250 Plus-T
 FCC ID. : SLEW2250Plus
 Rated Voltage : AC 120V/60Hz
 Working Voltage : DC 12V
 Trade Name : Moxa
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart E: 2007
 ANSI C63.4: 2003



Test Result : Complied

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

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 (Senior Engineer /Tim Sung)



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

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	: 2G Wireless NPort
Trade Name	: Moxa
FCC ID.	: SLEW2250Plus
Model No.	: NPort W2150 Plus, NPort W2250 Plus,NPort W2150 Plus-T, NPort W2250 Plus-T
Frequency Range	: 2412 – 2462MHz for 802.11 b/g 5180 – 5240MHz, 5745 – 5805MHz for 802.11a
Number of Channels	: 11 in 2.4GHz band, 8 in 5GHz band
Channel Separation	: 5MHz in 2.4GHz band, 20MHz in 5GHz band
Channel Control	: Auto
Data Rate	: 802.11b – 1, 2, 5.5, 11Mbps 802.11a/g – 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11b:DSSS
Type of Modulation	: DBPSK, DQPSK, CCK 802.11 a/g: OFDM BPSK, QPSK, 16QAM, 64QAM
Antenna type	: Connector (Reverse SMA)
Antenna Gain	: Refer to the table “Antenna List”
Power Adapter	: MFR: BLANCE, M/N: GPSA-1200120 Input: AC 100-240V, 50-60Hz, 0.5A Output: DC 12V-1.2A Cable out: Non-Shielded, 1.9m with one ferrite core bonded.

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.

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 2G Wireless NPort with a built-in 2.4GHz and 5GHz transceiver.
2. 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)
3. 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.
4. The EUT is including four models for different marketing requirement.

1.2. Operational Description

The EUT is an 2G Wireless NPort 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 2G Wireless NPort, 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 2G Wireless NPort 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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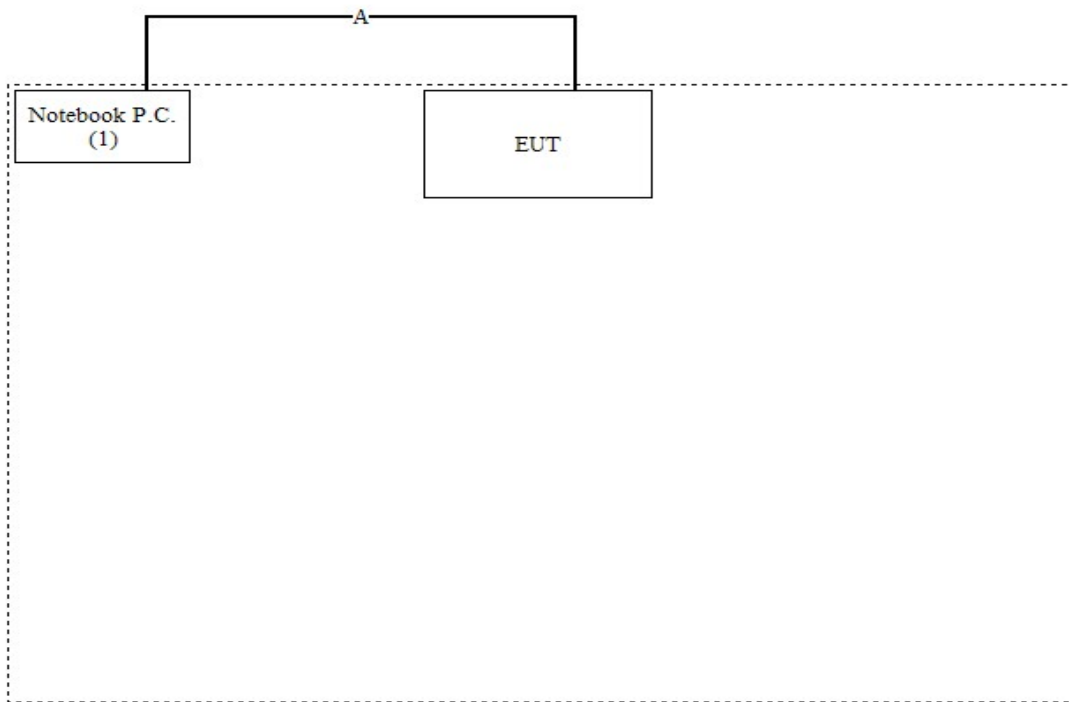
1.3. Tested System Details

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	PP18L	42649348672	Non-Shielded, 0.8m

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 Telnet IP on the notebook.
- (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. Undesirable Emission

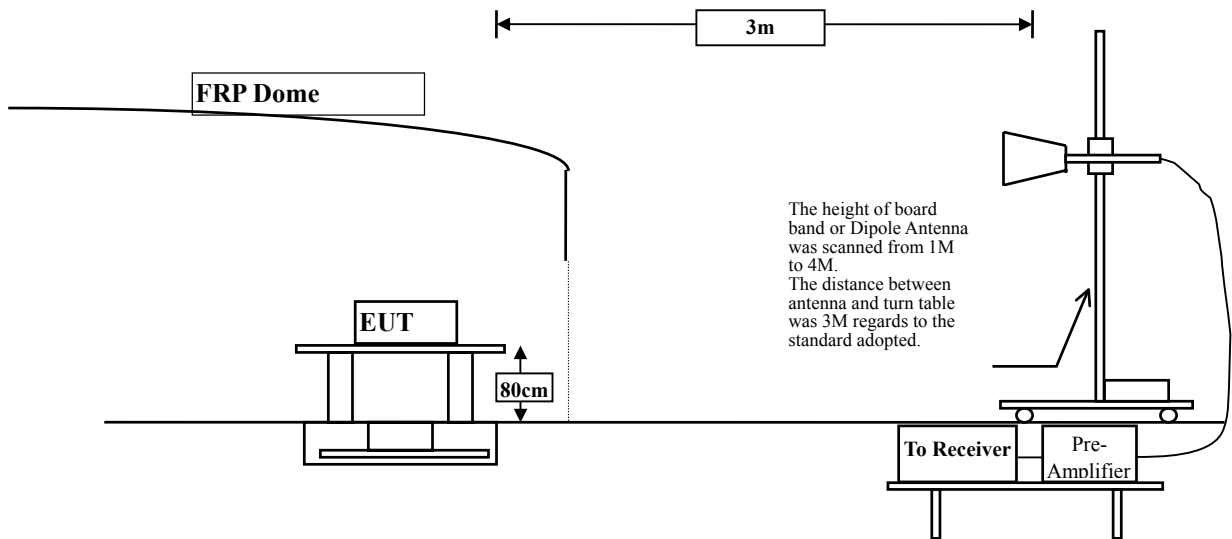
2.1. Test Equipment

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.

2.2. Test Setup



2.3. 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).

2.4. 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.

2.5. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

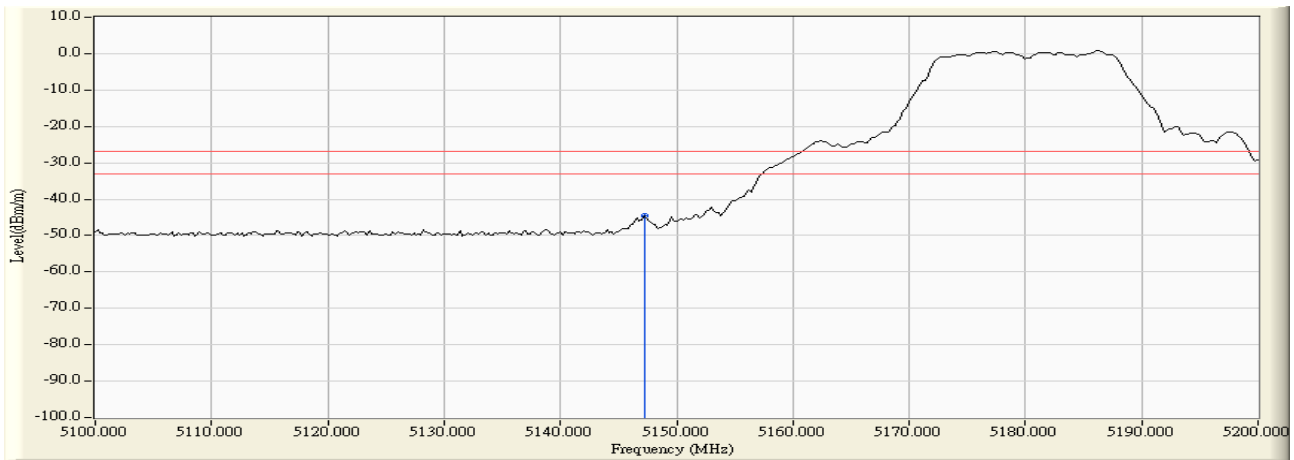
2.6. Test Result of Undesirable Emission

Product : 2G Wireless NPort
 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)	5147.200	14.275	-58.703	-44.428	-17.428	-27.000	Pass

Figure Channel 1: Horizontal (Peak)



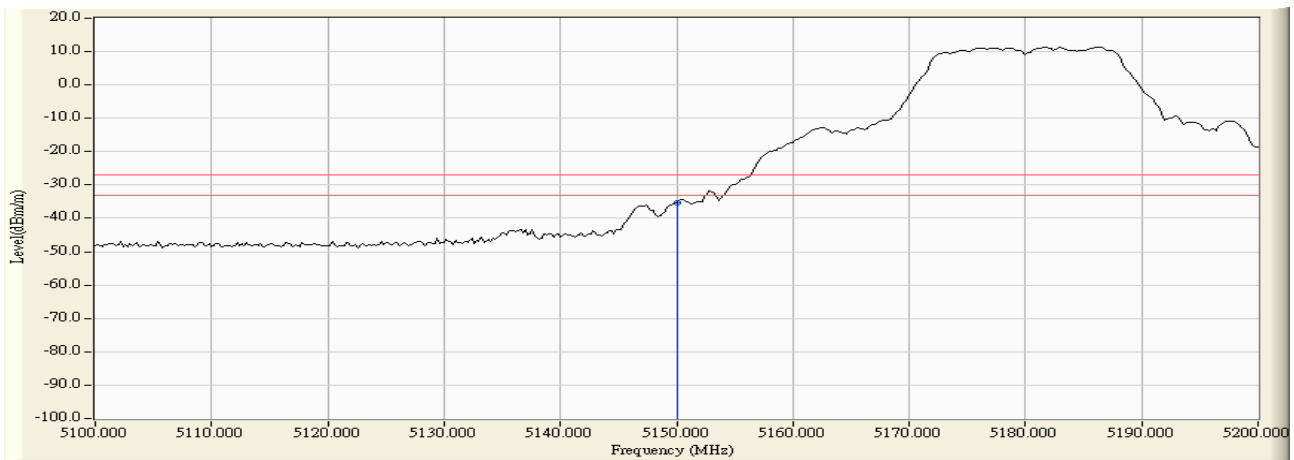
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : 2G Wireless NPort
 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)	5150.000	14.631	-49.909	-35.278	-8.278	-27.000	Pass

Figure Channel 1: Vertical (Peak)



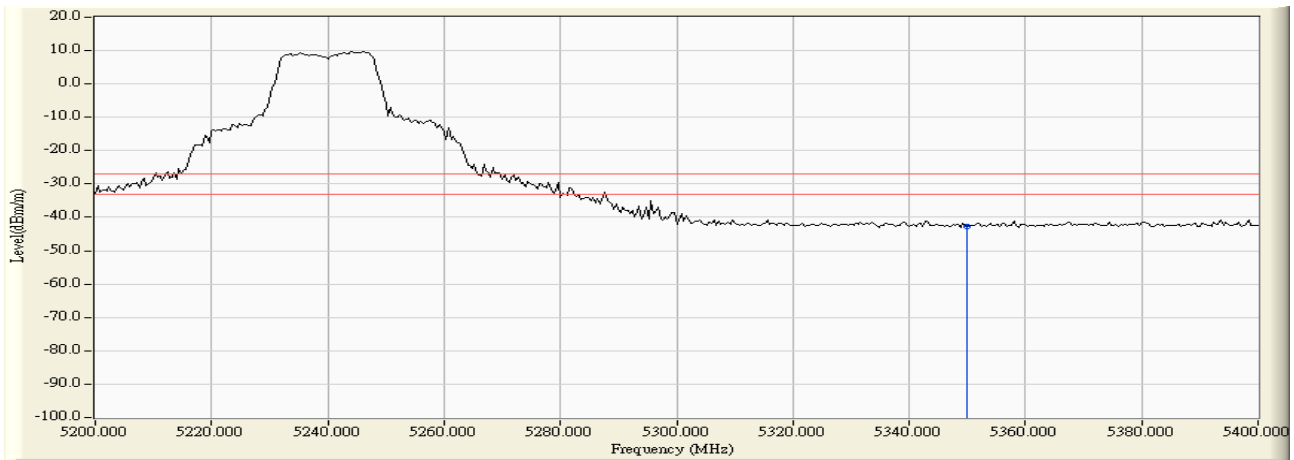
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : 2G Wireless NPort
 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	-57.250	-42.786	-15.786	-27.000	Pass

Figure Channel 4: Horizontal (Peak)



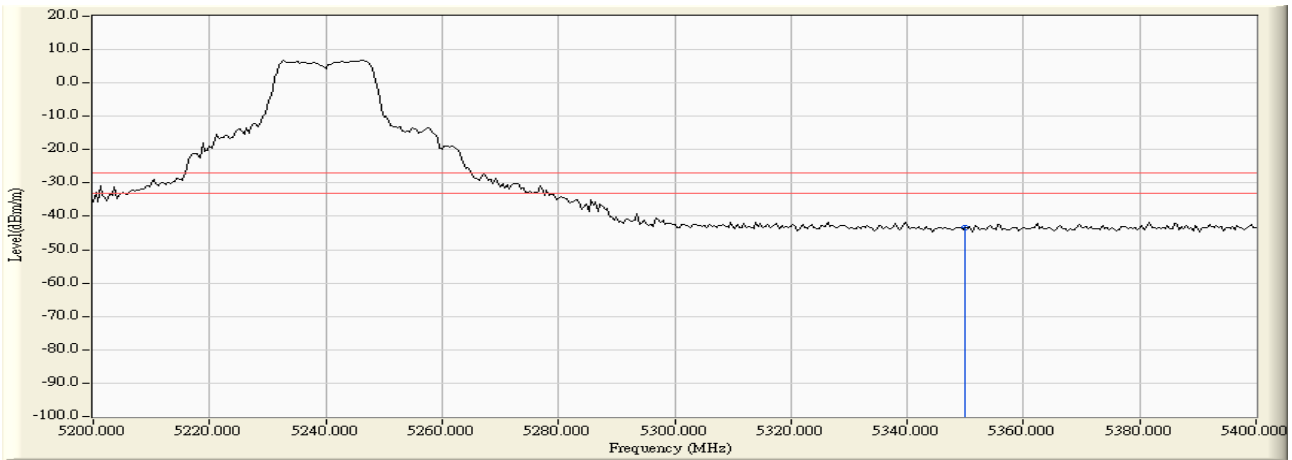
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : 2G Wireless NPort
 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	-58.216	-43.443	-16.443	-27.000	Pass

Figure Channel 4: Vertical (Peak)



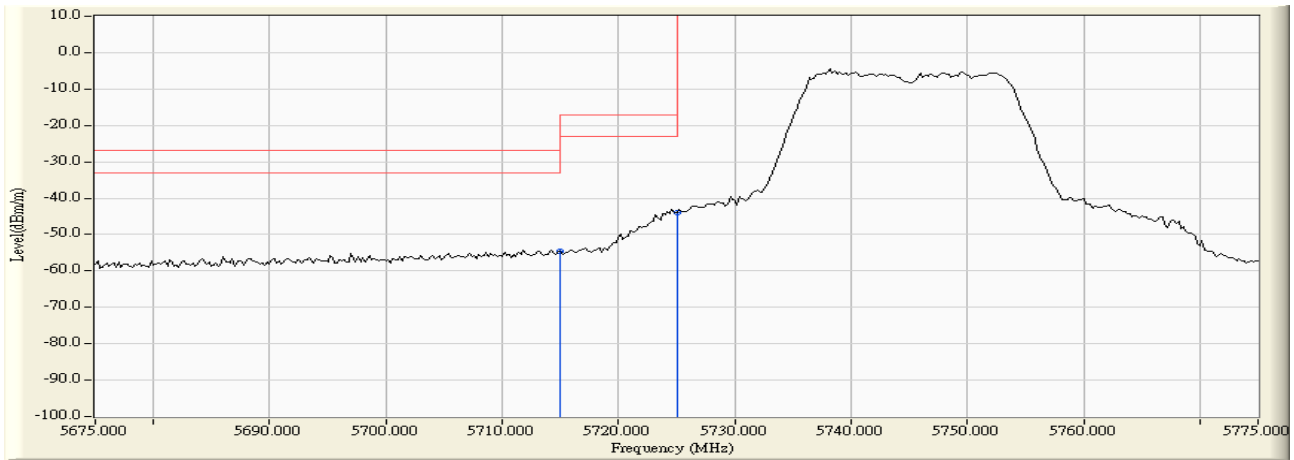
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : 2G Wireless NPort
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5745MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
5 (Peak)	5715.000	4.791	-59.498	-54.707	-27.707	-27.000	Pass
5 (Peak)	5725.000	4.802	-48.874	-44.072	-27.072	-17.000	Pass

Figure Channel 5: Horizontal (Peak)



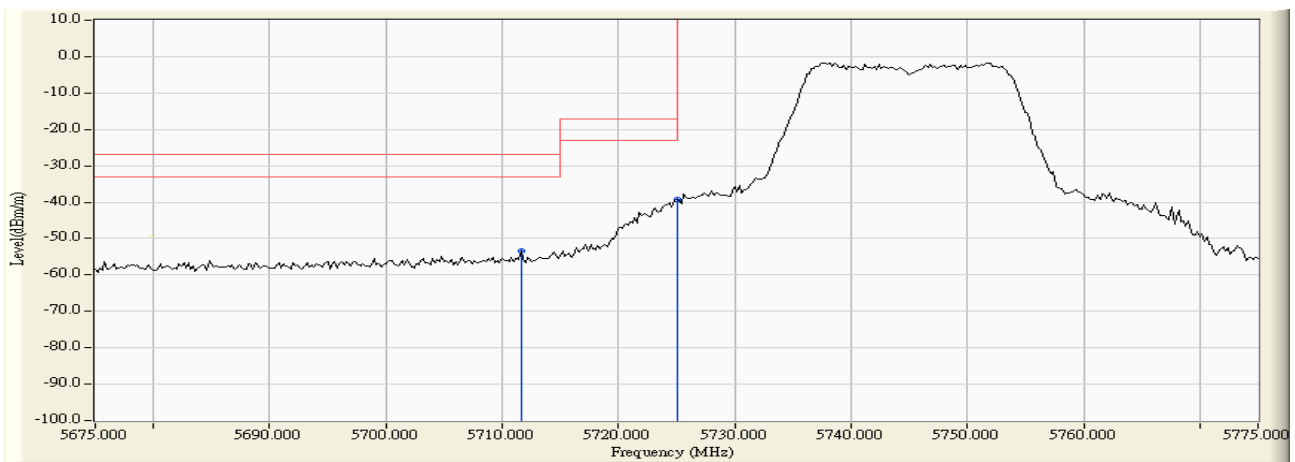
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : 2G Wireless NPort
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5745MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
5 (Peak)	5711.600	4.788	-58.100	-53.313	-26.313	-27.000	Pass
5 (Peak)	5725.000	4.802	-44.101	-39.299	-22.299	-17.000	Pass

Figure Channel 5: Vertical (Peak)



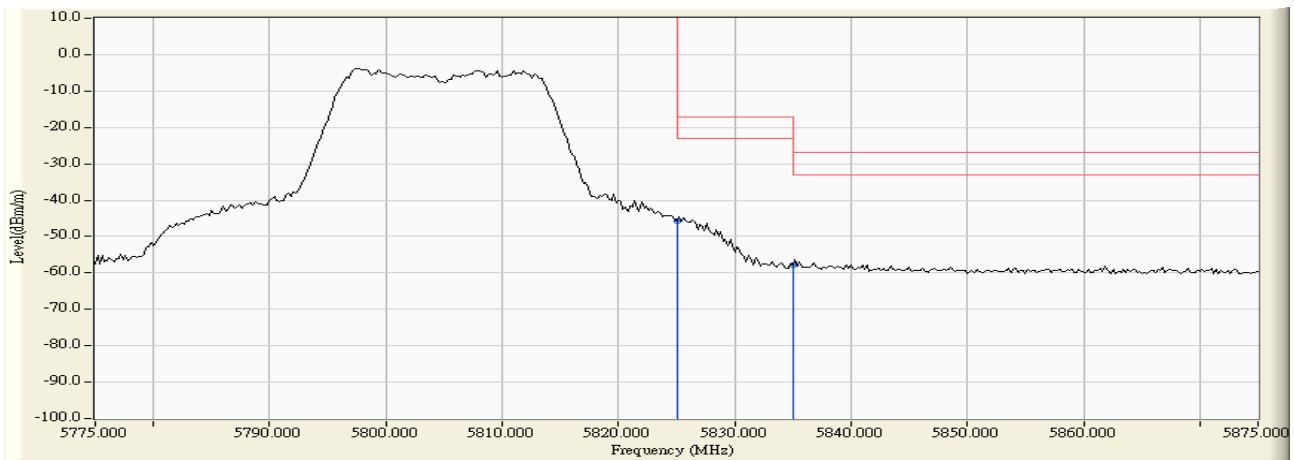
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : 2G Wireless NPort
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5805MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
8 (Peak)	5825.000	4.946	-50.602	-45.656	-28.656	-17.000	Pass
8 (Peak)	5835.000	4.958	-62.894	-57.936	-30.936	-27.000	Pass

Figure Channel 8: Horizontal (Peak)



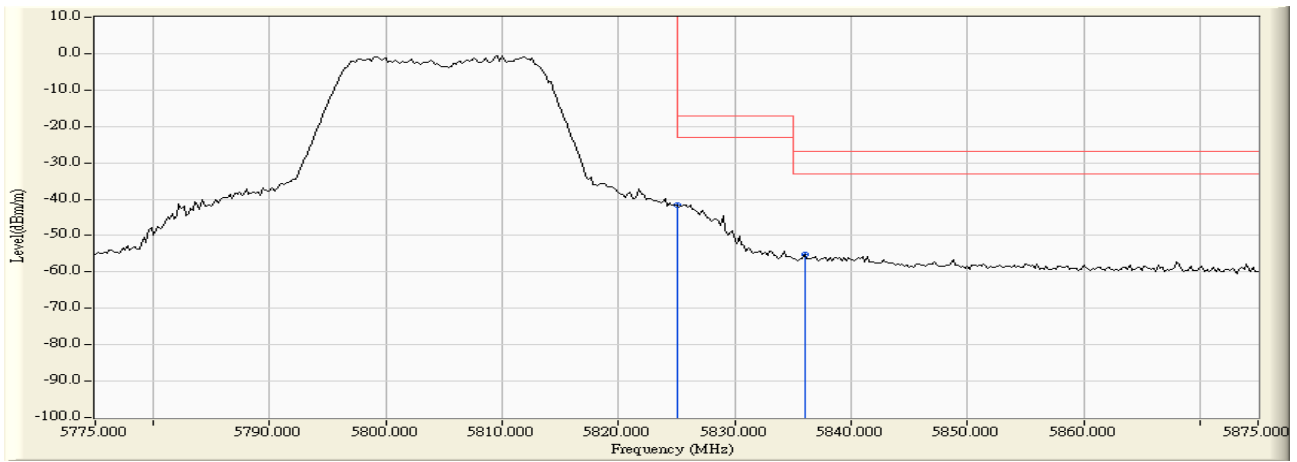
Note: Spectrum setting: Detector=Peak detector and maximum hold,
 RBW= 1MHz, VBW=3 MHz.

Product : 2G Wireless NPort
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5805MHz)

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
8 (Peak)	5825.000	4.946	-46.543	-41.597	-24.597	-17.000	Pass
8 (Peak)	5836.000	4.960	-60.003	-55.043	-28.043	-27.000	Pass

Figure Channel 8: Vertical (Peak)



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

3. Radiated Emission

3.1. Test Equipment

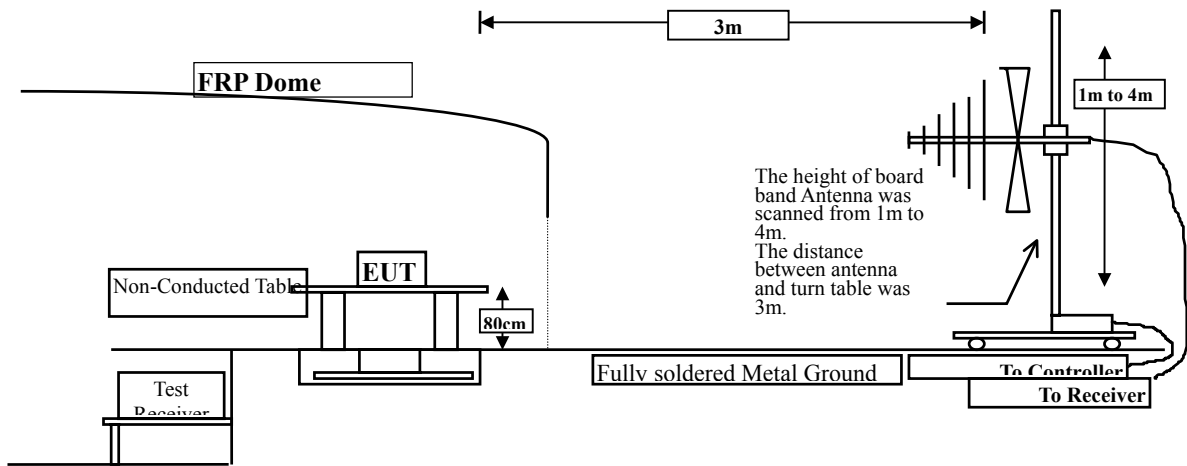
The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 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

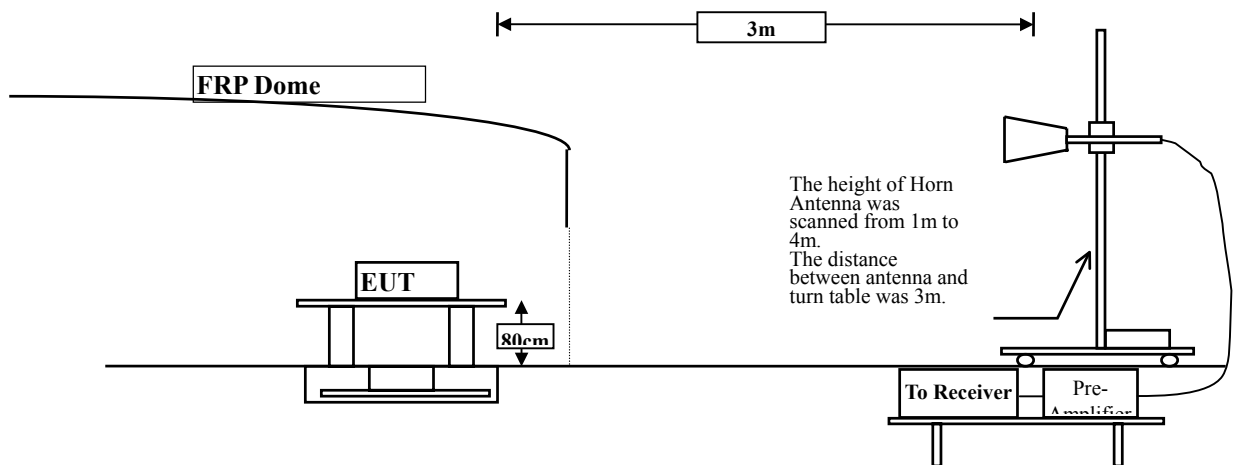
- Note:
1. All instruments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. 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.

3.4. 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.

3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : 2G Wireless NPort
 Test Item : Undesirable 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	13.175	35.140	48.315	-25.685	74.000
Average Detector					
--					
Vertical					
Peak Detector					
10360.000	13.175	37.111	50.286	-23.714	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:100MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz.
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 : 2G Wireless NPort
 Test Item : Undesirable 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	13.599	35.780	49.379	-24.621	74.000
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Average Detector

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Vertical

Peak Detector

10440.000	13.599	36.140	49.739	-24.261	74.000
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Average Detector

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Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz.
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 : 2G Wireless NPort
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5240MHz)

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

10480.000	13.934	35.780	49.714	-24.286	74.000
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Average Detector

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Vertical
Peak Detector

10480.000	13.934	35.890	49.824	-24.176	74.000
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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:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz ◦
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 : 2G Wireless NPort
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5745Hz)

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

Horizontal
Peak Detector

11490.000	15.784	33.980	49.763	-24.237	74.000
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Average Detector

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Vertical
Peak Detector

11490.000	15.784	34.950	50.733	-23.267	74.000
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Average Detector

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Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz ◦
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 : 2G Wireless NPort
 Test Item : Undesirable 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	15.226	33.740	48.965	-25.035	74.000
Average Detector					
--					
Vertical					
Peak Detector					
11570.000	15.226	35.840	51.065	-22.935	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:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz ◦
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 : 2G Wireless NPort
 Test Item : Undesirable Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11a (5805MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector					
11610.000	15.016	34.170	49.186	-24.814	74.000
Average Detector					
--					
Vertical					
Peak Detector					
11610.000	15.016	35.210	50.226	-23.774	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:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz ◦
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 : 2G Wireless NPort
 Test Item : Undesirable 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					
336.580	14.434	13.156	27.590	-18.410	46.000
431.580	17.742	13.908	31.650	-14.350	46.000
465.980	18.699	5.881	24.580	-21.420	46.000
625.480	20.832	6.019	26.850	-19.150	46.000
724.580	21.155	8.425	29.580	-16.420	46.000
864.250	22.207	9.373	31.580	-14.420	46.000
Vertical					
Peak Detector					
288.250	13.845	20.405	34.250	-11.750	46.000
342.590	14.611	11.969	26.580	-19.420	46.000
465.850	18.455	8.395	26.850	-19.150	46.000
625.360	21.144	3.707	24.850	-21.150	46.000
735.590	23.173	6.408	29.580	-16.420	46.000
811.260	21.703	5.947	27.650	-18.350	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.

Product : 2G Wireless NPort
 Test Item : Undesirable 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					
288.250	13.483	13.097	26.580	-19.420	46.000
383.450	15.804	13.146	28.950	-17.050	46.000
512.480	19.077	9.373	28.450	-17.550	46.000
625.400	20.839	6.011	26.850	-19.150	46.000
833.200	21.825	2.674	24.500	-21.500	46.000
931.400	22.910	5.449	28.360	-17.640	46.000
Vertical					
Peak Detector					
265.850	14.363	17.488	31.850	-14.150	46.000
336.520	14.364	12.486	26.850	-19.150	46.000
431.590	19.266	12.424	31.690	-14.310	46.000
523.400	18.824	7.476	26.300	-19.700	46.000
605.400	21.817	5.783	27.600	-18.400	46.000
733.480	23.135	4.455	27.590	-18.410	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.

4. Band Edge

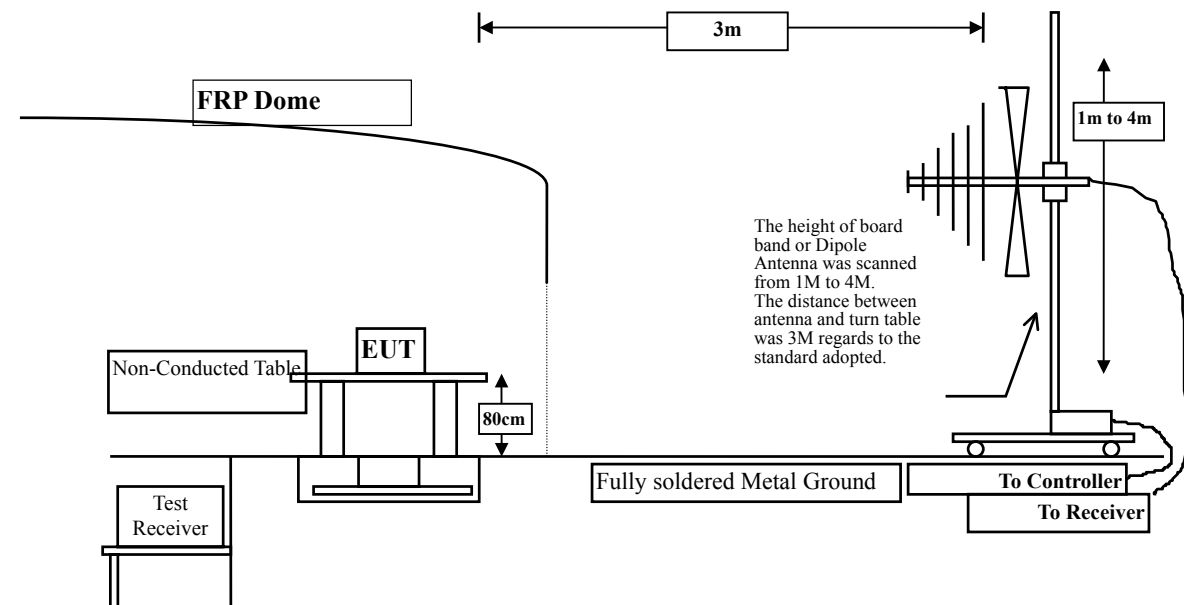
4.1. Test Equipment

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

4.2. Test Setup

RF Radiated Measurement:



4.3. 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.

4.4. 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.

4.5. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

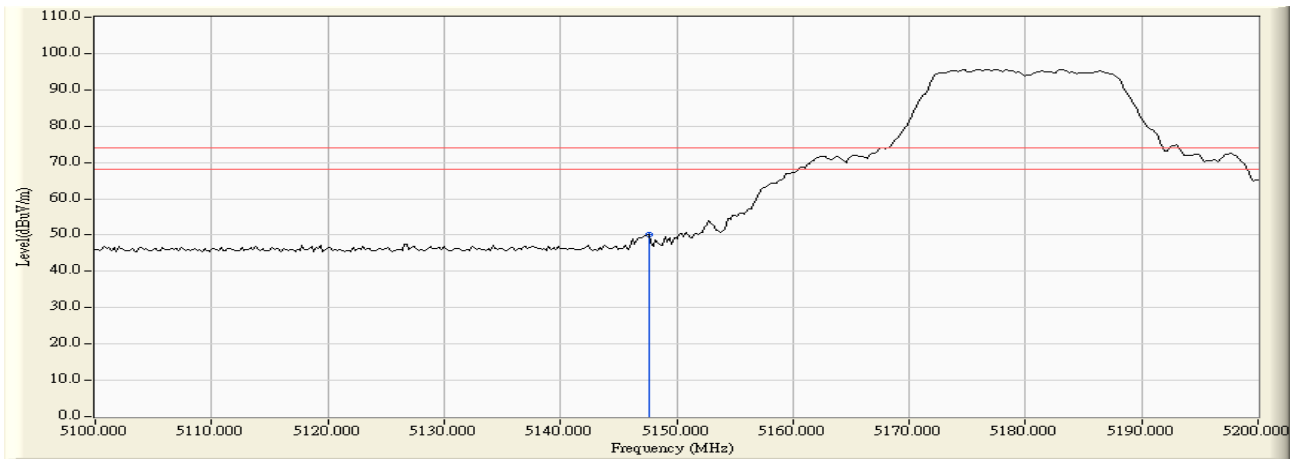
4.6. Test Result of Band Edge

Product : 2G Wireless NPort
 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)	5147.600	4.304	45.828	50.133	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 : 2G Wireless NPort
 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)	5147.000	4.305	53.564	57.868	74.00	54.00	Pass
1 (Average)	5150.000	4.305	36.020	40.325	74.00	54.00	Pass

Figure Channel 1: Vertical (Peak)

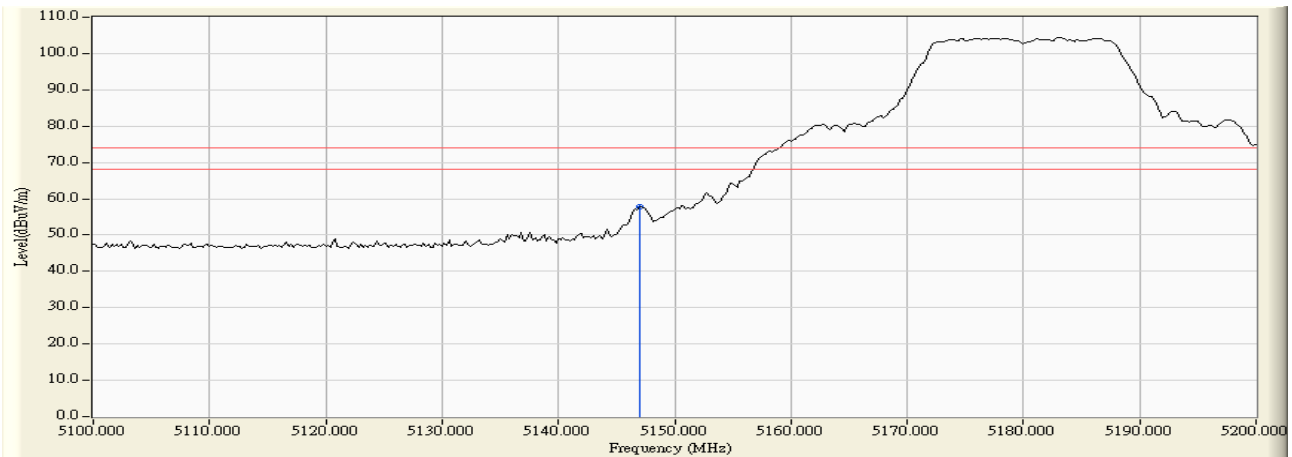
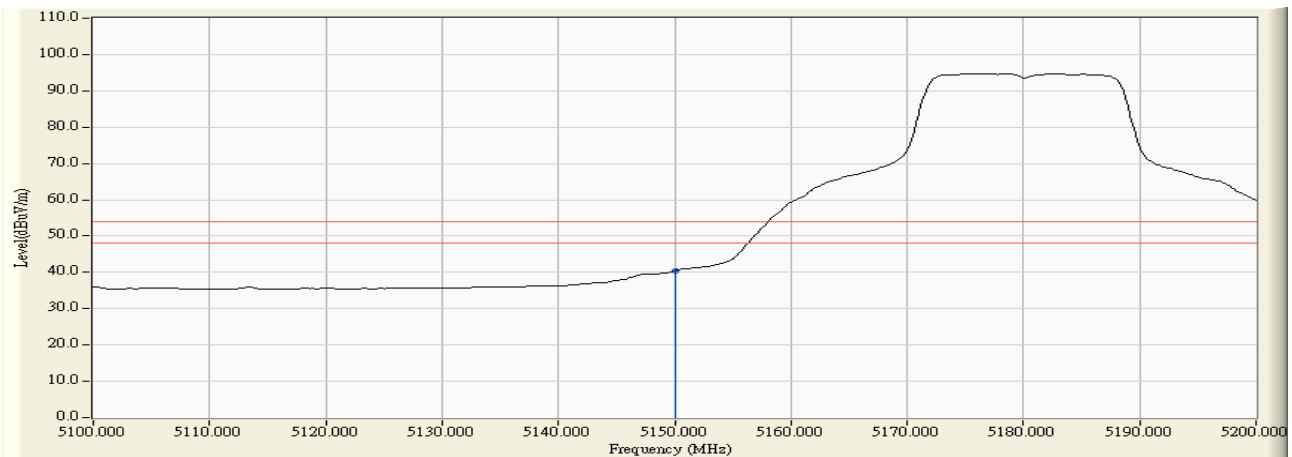


Figure Channel 1: Vertical (Average)



Note:

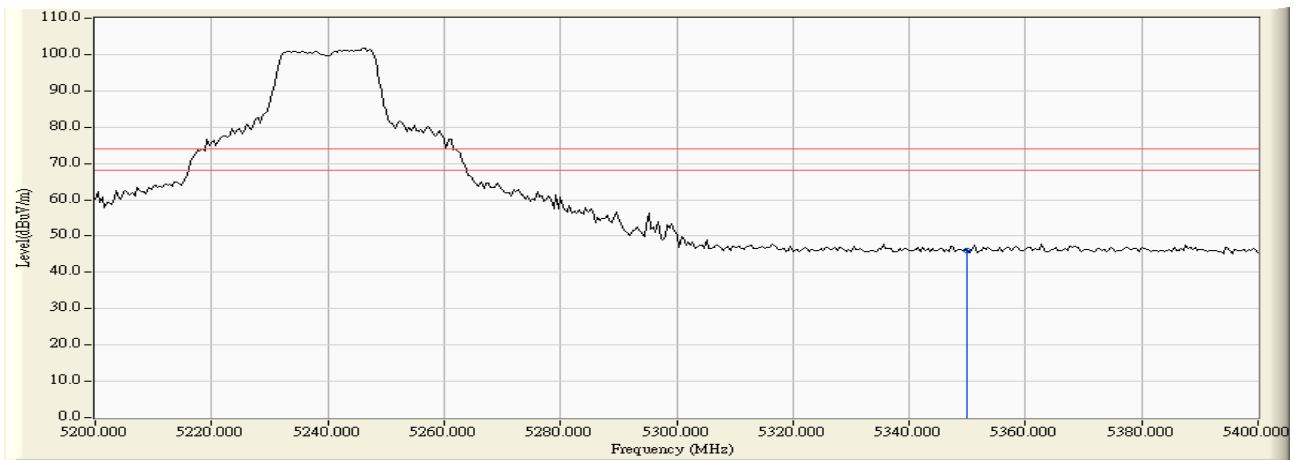
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : 2G Wireless NPort
 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	4.446	41.500	45.946	74.00	54.00	Pass
4 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 4: Horizontal (Peak)



Note:

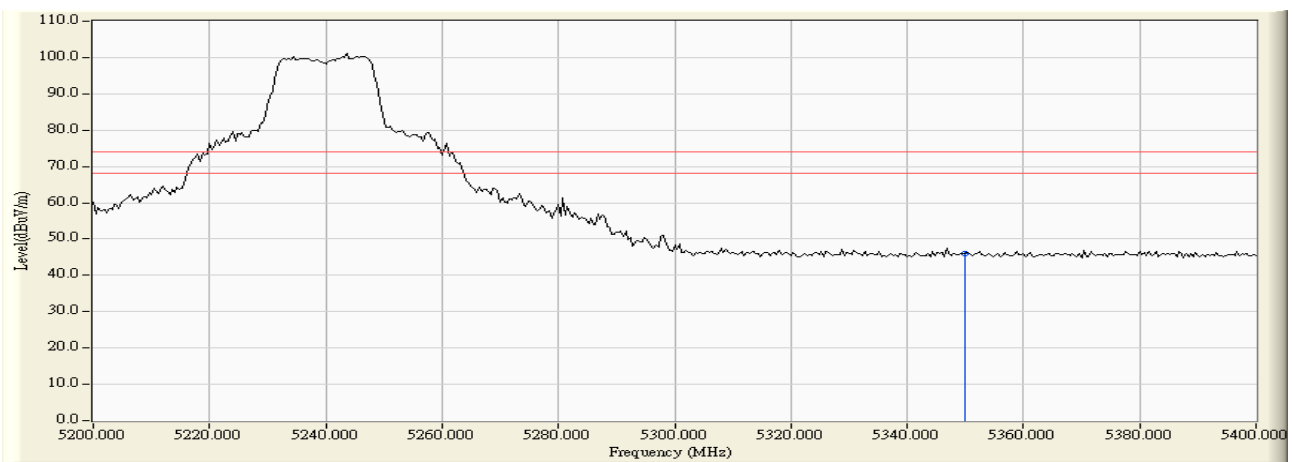
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : 2G Wireless NPort
 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	4.446	41.559	46.005	74.00	54.00	Pass
4 (Average)	--	--	--	--	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.

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.