



Test Report

Product Name	ROS Home Center
Model No.	005-02004
FCC ID.	BJM-ROS2000A

Applicant	TATUNG CO.
Address	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.

Date of Receipt	Apr. 01, 2010
Issued Date	May, 10, 2010
Report No.	104111R-RFUSP30V01
Report 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: May, 10, 2010

Report No. : 104111R-RFUSP30V01



Product Name	ROS Home Center	
Applicant	TATUNG CO.	
Address	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.	
Manufacturer	TATUNG CO.	
Model No.	005-02004	
FCC ID.	BJM-ROS2000A	
EUT Rated Voltage	AC 100-240V/50-60Hz	
EUT Test Voltage	AC 120V/60Hz	
Trade Name	Prodea Systems	
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2009	
	ANSI C63.4: 2003	
Test Result	Complied	 <small>NVLAP Lab Code: 200533-0</small>

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

Documented By : Joanne Lin
(Adm. Specialist / Joanne Lin)



Tested By : Joe Guo
(Engineer / Joe Guo)

Approved By : Vincent Lin
(Manager / Vincent Lin)



TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION.....	4
1.1. EUT Description.....	4
1.2. Operation Description.....	4
1.3. Tested System Details.....	6
1.4. Configuration of Test System.....	7
1.5. EUT Exercise Software.....	7
1.6. Test Facility.....	8
2. Conducted Emission.....	9
2.1. Test Equipment.....	9
2.2. Test Setup.....	9
2.3. Limits.....	9
2.4. Test Procedure.....	10
2.5. Uncertainty.....	10
2.6. Test Result of Conducted Emission.....	11
3. Radiated Emission.....	13
3.1. Test Equipment.....	13
3.2. Test Setup.....	14
3.3. Limits.....	15
3.4. Test Procedure.....	16
3.5. Uncertainty.....	16
3.6. Test Result of Radiated Emission.....	17
4. Band Edge.....	20
4.1. Test Equipment.....	20
4.2. Test Setup.....	21
4.3. Limit.....	21
4.4. Test Procedure.....	22
4.5. Uncertainty.....	22
4.6. Test Result of Band Edge.....	23
5. EMI Reduction Method During Compliance Testing.....	25
Attachment 1: EUT Test Photographs	
Attachment 2: EUT Detailed Photographs	

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	ROS Home Center
Trade Name	Prodea Systems
FCC ID.	BJM-ROS2000A
Model No.	005-02004
Frequency Range	908.42MHz
Type of Modulation	FSK
Number of Channels	1
Channel Control	Auto
Antenna Type	PIFA
Antenna Gain	Refer to the table "Antenna List"

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	FAVORTRON	E773700182	4.57dBi for 900MHz

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	908.42MHz				

Note:

1. The EUT is a ROS Home Center with a built-in Z-Wave transceiver module.
2. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249.

EMI Test Mode	Mode 1: Transmit
---------------	------------------

1.2. Operation Description

The EUT is a ROS Home Center with a built-in Z-Wave transceiver module. The EUT operation frequency is 908.42MHz. The signals modulated by FSK are transmitted from the PIFA Antenna of the EUT.

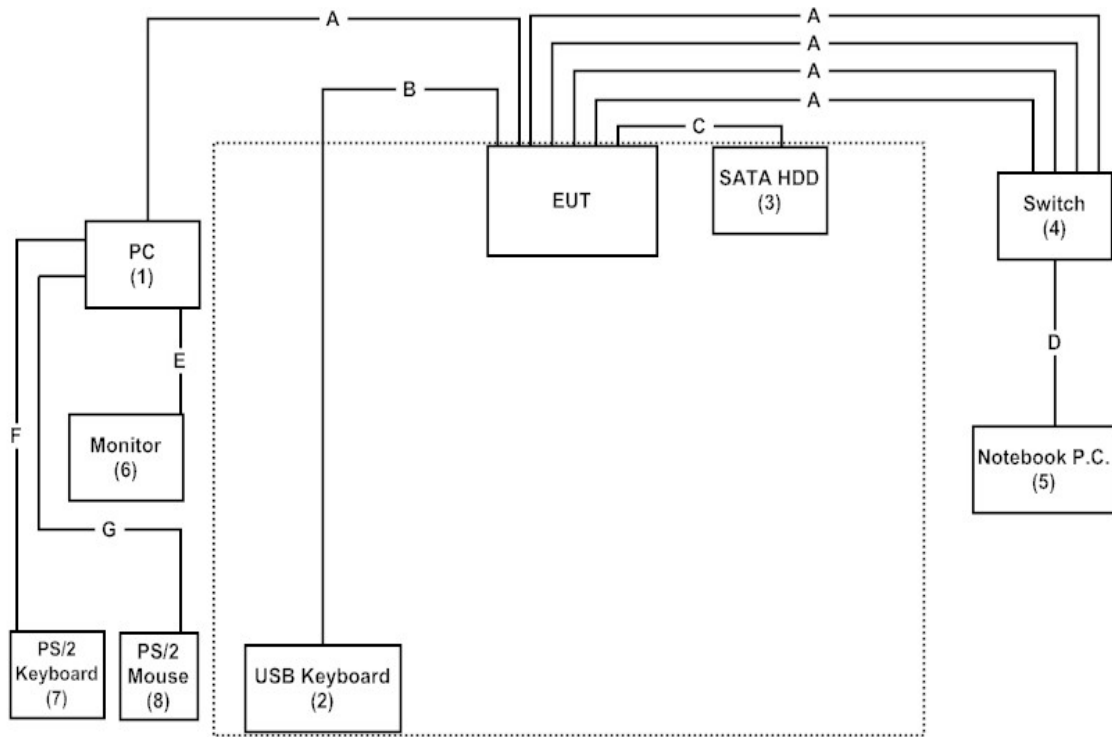
1.3. Tested System Details

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 PC	ASUS	CT5430	N/A	Non-Shielded, 1.8m
2 USB Keyboard (for Conduction test)	BTC	5200U	N/A	N/A
	DELL	SK-8115	MY-0DJ325-71619-7 A2-0327	N/A
3 SATA HDD	Onnto	ST-M10	A03521-H3-0004	Non-Shielded, 1.8m, With Core*1
4 Switch	D-Link	DGS-1008D	F37S279000038	N/A
5 Notebook P.C.	DELL	D630	00144-023-351-283	Non-Shielded, 0.8m
6 Monitor	LG	W2261VT	907YHPB07296	Non-Shielded, 1.8m
7 PS/2 Keyboard	Logitech	Y-SAL85	SY917UK	N/A
8 PS/2 Mouse	Logitech	M-SBM96B	810-000440	N/A

Signal Cable Type	Signal cable Description
A LAN Cable	Non-shielded, 5m, five PCS.
B USB Keyboard Cable	Shielded, 1.8m, with one ferrite core bonded.
C E-SATA Cable	Shielded, 1m
D LAN Cable	Non-Shielded, 3m
E D-SUB Cable	Shielded, 1.8m, with two ferrite cores bonded.
F PS/2 Keyboard Cable	Shielded, 1.8m
G PS/2 Mouse Cable	Shielded, 1.8m

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4.
- (2) Open the EUT power.
- (3) Starts the continuous transmit.
- (4) Verify that the EUT works correctly.

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

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation’s Web Site : <http://tw.quietek.com/modules/myalbum/>
 The address and introduction of Quietek Corporation’s laboratories can be founded in our Web site : <http://www.quietek.com/>

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



Testing Laboratory
0914

2. Conducted Emission

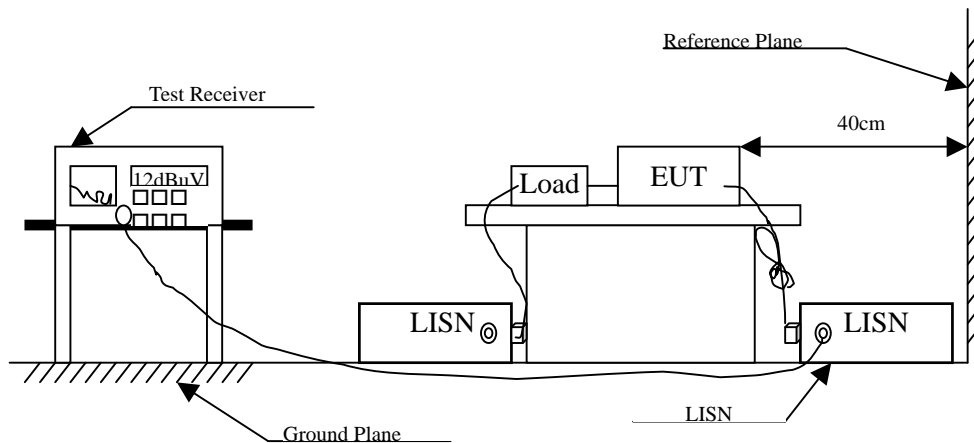
2.1. Test Equipment

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

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2010	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2010	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2010	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2010	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : ROS Home Center
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
Line 1					
Quasi-Peak					
0.209	9.701	38.490	48.191	-16.123	64.314
0.310	9.650	29.090	38.740	-22.689	61.429
0.412	9.646	29.470	39.116	-19.398	58.514
0.517	9.640	28.580	38.220	-17.780	56.000
0.619	9.630	27.710	37.340	-18.660	56.000
3.205	9.690	30.420	40.110	-15.890	56.000
Average					
0.209	9.701	31.560	41.261	-13.053	54.314
0.310	9.650	26.320	35.970	-15.459	51.429
0.412	9.646	29.340	38.986	-9.528	48.514
0.517	9.640	28.080	37.720	-8.280	46.000
0.619	9.630	27.700	37.330	-8.670	46.000
3.205	9.690	26.540	36.230	-9.770	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : ROS Home Center
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
Line 2					
Quasi-Peak					
0.150	9.766	23.220	32.986	-33.014	66.000
0.209	9.711	37.790	47.501	-16.813	64.314
0.412	9.650	29.810	39.460	-19.054	58.514
0.619	9.650	28.420	38.070	-17.930	56.000
0.826	9.670	25.620	35.290	-20.710	56.000
3.103	9.690	30.760	40.450	-15.550	56.000
Average					
0.150	9.766	5.740	15.506	-40.494	56.000
0.209	9.711	31.310	41.021	-13.293	54.314
0.412	9.650	29.570	39.220	-9.294	48.514
0.619	9.650	27.840	37.490	-8.510	46.000
0.826	9.670	25.610	35.280	-10.720	46.000
3.103	9.690	16.180	25.870	-20.130	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Radiated Emission

3.1. Test Equipment

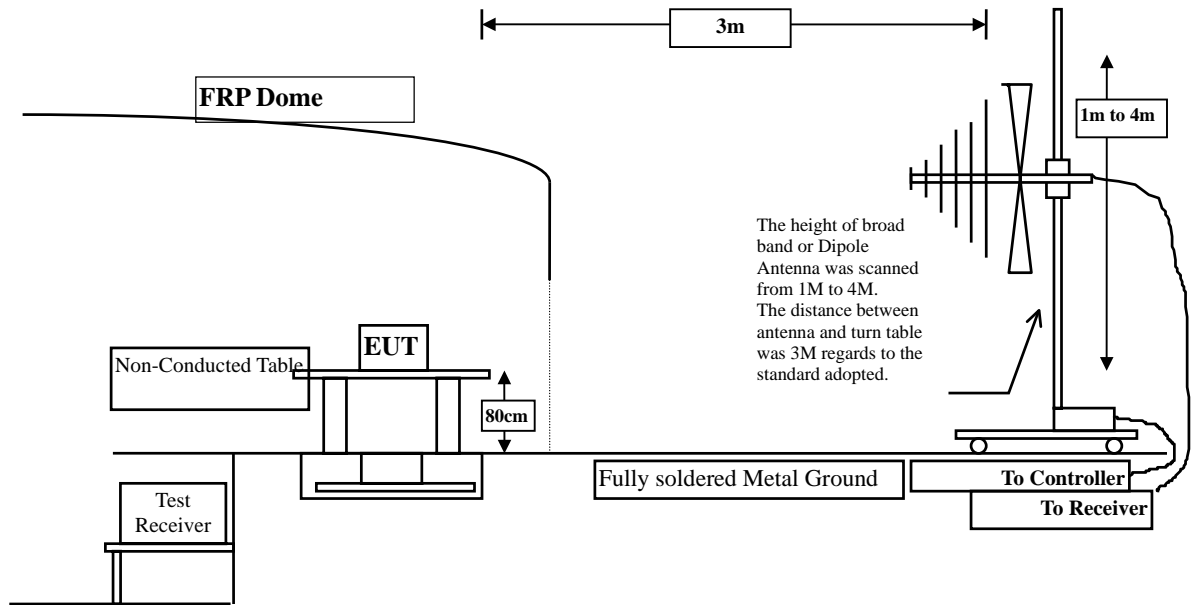
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2009
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2009
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2009
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2009
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2009
	X	Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2010
	X	Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

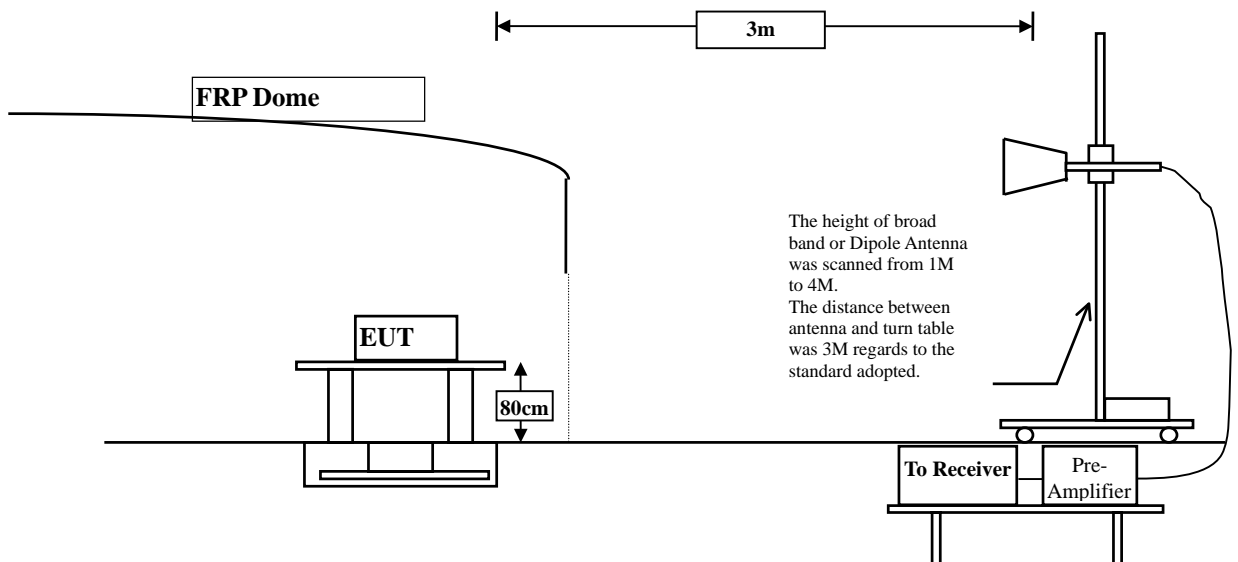
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup

Below 1GHz



Above 1GHz



3.3. Limits

➤ Fundamental and Harmonics Emission Limits

FCC Part 15 Subpart C Paragraph 15.249 Limits				
Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m @3m)	(dBuV/m @3m)	(uV/m @3m)	(dBuV/m @3m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

- Remarks :
1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
 2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB 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 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/m) = 20 log RF Voltage (uV/m)
 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 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: 2003 on radiated measurement.

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 bandwidth of the antenna.

The worst radiated emission is measured on the Final Measurement.

The measurement frequency range form 30MHz - 10th Harmonic of fundamental was investigated.

3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : ROS Home Center
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal (Quasi-Peak)					
908.400	5.990	57.050	63.040	-30.960	94.000
Horizontal Average Detector:					
--					
Vertical (Quasi-Peak)					
908.400	2.503	59.900	62.403	-31.597	94.000
Vertical Average Detector:					
--					

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : ROS Home Center
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
1816.800	-4.390	47.210	42.820	-31.180	74.000
2725.200	-1.076	35.620	34.544	-39.456	74.000
3633.600	-0.394	36.760	36.366	-37.634	74.000
4542.000	1.902	36.790	38.691	-35.309	74.000
5450.400	4.226	36.800	41.026	-32.974	74.000
6358.850	6.502	37.020	43.522	-30.478	74.000
7267.200	11.103	35.140	46.243	-27.757	74.000
8175.600	14.922	35.300	50.222	-23.778	74.000
9084.000	13.022	35.290	48.312	-25.688	74.000
Vertical					
1816.800	-2.612	49.290	46.677	-27.323	74.000
2725.200	-1.228	36.500	35.271	-38.729	74.000
3633.600	0.379	38.650	39.029	-34.971	74.000
4542.000	5.407	36.530	41.937	-32.063	74.000
5450.400	5.974	36.290	42.264	-31.736	74.000
6358.800	7.974	36.810	44.784	-29.216	74.000
7267.200	11.922	35.200	47.122	-26.878	74.000
8175.600	15.634	36.220	51.855	-22.145	74.000
9084.000	13.142	36.170	49.312	-24.688	74.000

Note:

1. All Readings below 1GHz are Quasi-Peak, 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 too weak instrument of signal is unable to test.
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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : ROS Home Center
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
(Quasi-Peak)					
499.480	0.048	41.571	41.619	-4.381	46.000
701.240	2.668	35.086	37.754	-8.246	46.000
749.740	3.320	37.335	40.655	-5.345	46.000
800.180	5.141	36.790	41.931	-4.069	46.000
833.160	5.643	36.409	42.051	-3.949	46.000
901.060	5.591	31.927	37.518	-8.482	46.000
Vertical					
(Quasi-Peak)					
499.480	-0.852	42.964	42.112	-3.888	46.000
549.920	-2.877	39.496	36.619	-9.381	46.000
701.240	0.198	39.860	40.058	-5.942	46.000
749.740	2.510	40.826	43.336	-2.664	46.000
833.160	2.263	39.334	41.597	-4.403	46.000
901.060	3.331	36.909	40.240	-5.760	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

4. Band Edge

4.1. Test Equipment

RF Conducted Measurement

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

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2009
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2009
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010

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.

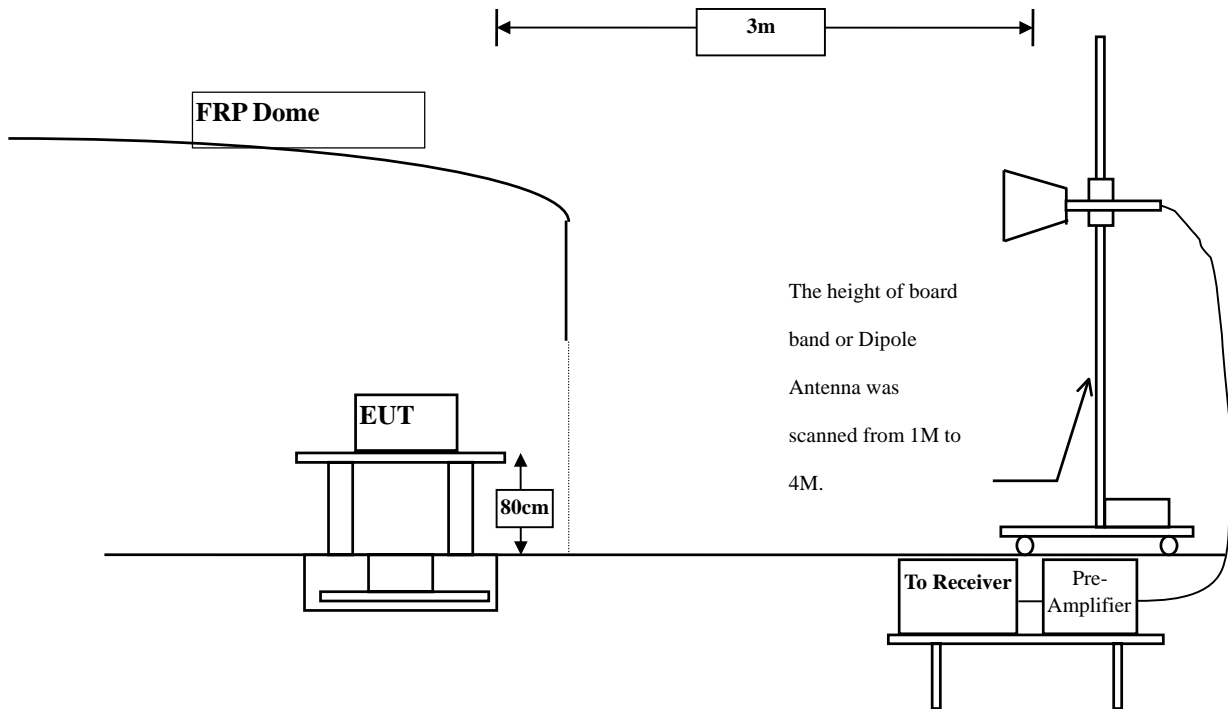
The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2009
		Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2009
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2009
		Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2009
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2009
	X	Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2010
	X	Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

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

4.2. Test Setup

RF Radiated Measurement:



4.3. Limit

Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

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 C63.4:2003 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 kHz, above 1GHz are 1 MHz.

4.5. Uncertainty

Conducted is ± 1.27 dB

Radiated is ± 3.9 dB.

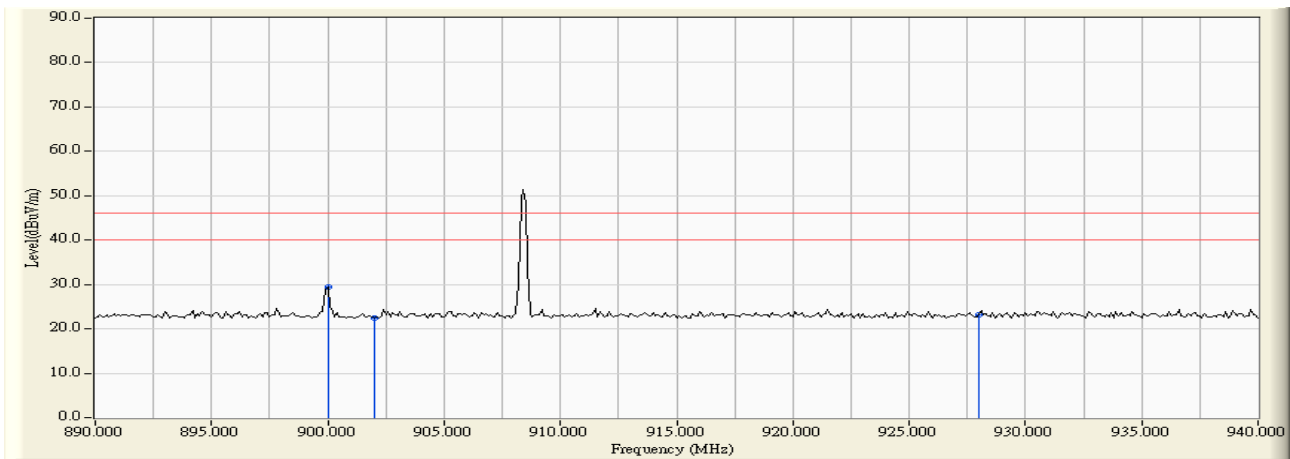
4.6. Test Result of Band Edge

Product : ROS Home Center
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

RF Radiated Measurement (Horizontal):

No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
01(Quasi-Peak)	900.000	-6.239	35.629	29.390	46.020	Pass
02(Quasi-Peak)	902.000	-6.238	28.635	22.397	46.020	Pass
03(Quasi-Peak)	928.000	-6.220	29.495	23.275	46.020	Pass

Figure Channel 01: Horizontal (Quasi-Peak)



Note:

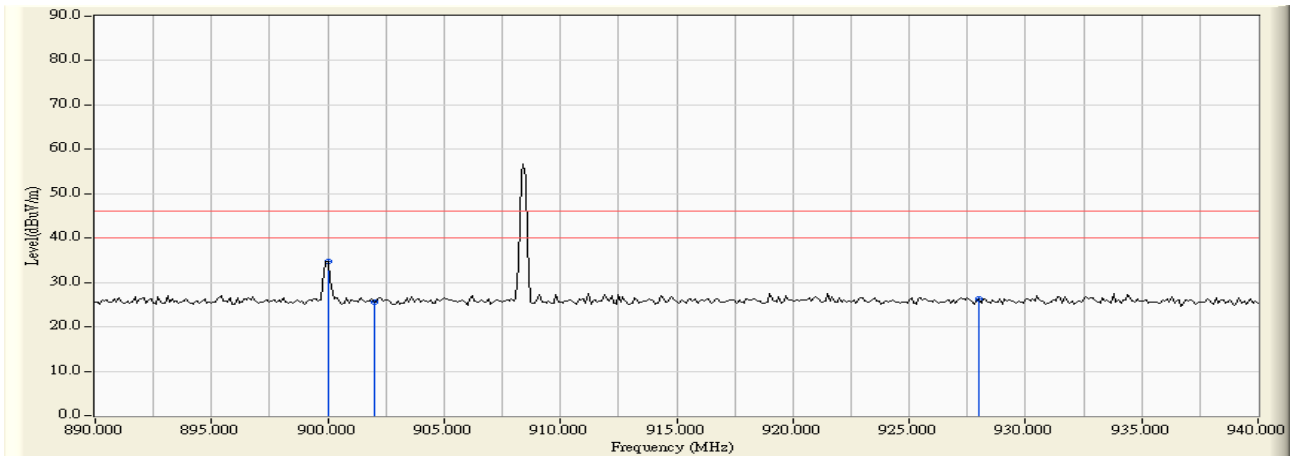
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. “ * ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : ROS Home Center
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

RF Radiated Measurement (Vertical):

No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
01(Quasi-Peak)	900.000	-2.816	37.552	34.736	46.020	Pass
02(Quasi-Peak)	902.000	-2.815	28.429	25.614	46.020	Pass
03(Quasi-Peak)	928.000	-2.797	29.106	26.309	46.020	Pass

Figure Channel 01: Vertical (Quasi-Peak)



Note:

1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. “ * ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.