

FCC TEST REPORT

CATEGORY : Mobile End Product
PRODUCT NAME : 2.4GHz Laser Hand Track
FCC ID. : **SAWM4L3OCC10**
FILING TYPE : Certification
MODEL NAME : 3G-M34-H,3G-M33-R

APPLICANT : **3G GREEN GREEN GLOBE CO., LTD**
10F, No. 259, Sec. 1, Fuhsing S. Rd., Taipei, Taiwan, R.O.C.
MANUFACTURER : **FORWARD ELECTRONIC CO., LTD**
393, Chung Rd. Sec. 1 San-Hsia Town, Taipei County Taiwan,
237, R.O.C.

ISSUED BY : **SPORTON INTERNATIONAL INC.**
6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien,
Taiwan, R.O.C.

Statements

The test result in this report refers exclusively to the presented test model / sample.

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Certificate or Test Report could not be used by the applicant to claim the product endorsement by CNLA, NVLAP or any agency of U.S. government.

The test equipment used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.



Dr. Alan Lane
Vice General Manager



Lab Code: 200079-0

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History of this test report

☒ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description



1. General Description of Equipment under Test

1.1 Applicant

3G GREEN GREEN GLOBE CO.,LTD

10F, No. 259, Sec. 1, Fuhsing S. Rd., Taipei, Taiwan, R.O.C.

1.2 Manufacturer

FORWARD ELECTRONIC CO.,LTD

393, Chung Rd. Sec. 1 San-Hsia Town, Taipei County, Taiwan, 237, R.O.C.

1.3 Basic Description of Equipment under Test

This product is a 2.4GHz Laser Hand Track. The technical data has been listed on section "Features of Equipment under Test". This product is used as a laser pointer used in the class room or seminar. Also it is able to be used as an wireless mouse. The receiver part of this device is plugged on the USB port of the computer. The transmitter is able to be charged by the USB port through a cable.

1.4 Features of Equipment under Test

ITEMS	DESCRIPTION
Type of Modulation	FSK
Number of Channels	8
Frequency Band	2454~2482MHz
Carrier Frequency of Each Channel	Please reference table below.
Channel Bandwidth	1MHz
Antenna Type / Gain	Printed Antenna / 2 dBi
Function Type	Transmitter
Power Rating (DC/AC, Voltage)	3.0 VDC for Transmitter from batteries, 3.3 VDC for Receiver from host
Duty Cycle	N/A
Humidity / Temperature Range (Operating)	10% ~ 90% / 0 ~ 40°C



2. Test Configuration of the Equipment under Test

2.1 Description of the Test

- a. The EUT has been programmed to continuously transmit or receive during testing. The used peripherals as well as the configuration fulfill the requirements of ANSI C63.4:2001.
- b. The following 3 modes (RF Link) was tested:
 - Mode 1: CH 01 (2454MHz)
 - Mode 2: CH 04 (2468MHz)
 - Mode 3: CH 08 (2482MHz)
- c. Spurious emission was tested on 3 configurations of the EUT, X, Y, Z-axis.
- d. PL circuit is used for carrier frequency, so only CH08 was tested for spurious below 1GHz.
- e. Since the transmitter is able to be charged by the USB port through a cable, so an extra mode "charging mode" was tested for AC power line conduction and spurious emission below 1GHz.
- f. The configuration is operated in a manner which tends to maximize its emission characteristics in a typical application.
- g. 3 meters measurement distance in semi-anechoic chamber was used in this test.

2.1 Frequency Range Investigated

Radiated emission test : from 30 MHz to 10th harmonic of the highest operating frequency or 40GHz whichever is lower.

2.2 Description of Test Supporting Units

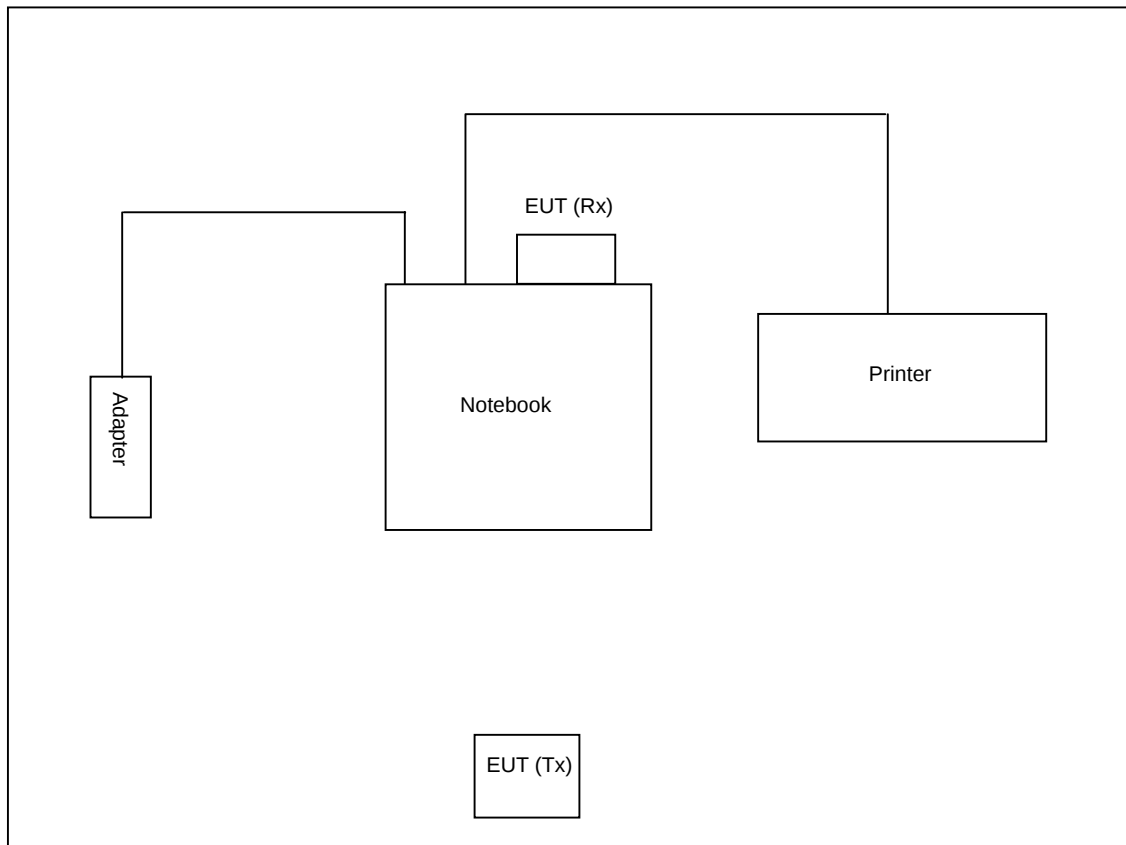
Support Unit 1. -- Notebook (COMPAQ)

FCC ID	: N/A
Model No.	: Presario 1500
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP004
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- Printer (EPSON)

FCC ID	: N/A
Model No.	: STYLUS COLOR 680
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0048
Data Cable	: Shielded, 1.35m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity..

2.3 Connection Diagram of Test System



2.4 Test Software

No test software is required for this testing.

3. Test Location and Standards

3.1 Test Location

Test Location : Sporton Hwa Ya Testing Building

Address : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
Tel: +886 3 327 3456 Fax: +886 3 318 0055

Test Site No. : 03CH03-HY

3.2 Test Conditions

Normal Voltage : 3VDC
Extreme Voltages : 2.55VDC and 3.45VDC
Normal Temperature : 20 °C
Extreme Temperature : 0 °C and 40 °C

3.3 Standards for Methods of Measurement

Here is the list of the standards followed in this test report.

ANSI C63.4-2001

47 CFR Part 15 Subpart C (Section 15.249)



4. List of Measurements

4.1 Summary of the Test Results

Applied Standard: 47 CFR Part 15 and Part 2			
Paragraph	FCC Rule	Description of Test	Result
5.1	15.249(a)	Carrier field strength	Pass
5.2	15.107/15.207	AC Power Line Conducted Emission	Pass
5.3	15.249(a)/ 15.249(d)	Spurious Radiated Emission	Pass
5.4	15.235(c)(3)	Antenna Requirement	Pass

5. Test Result

5.1 Carrier Field Strength

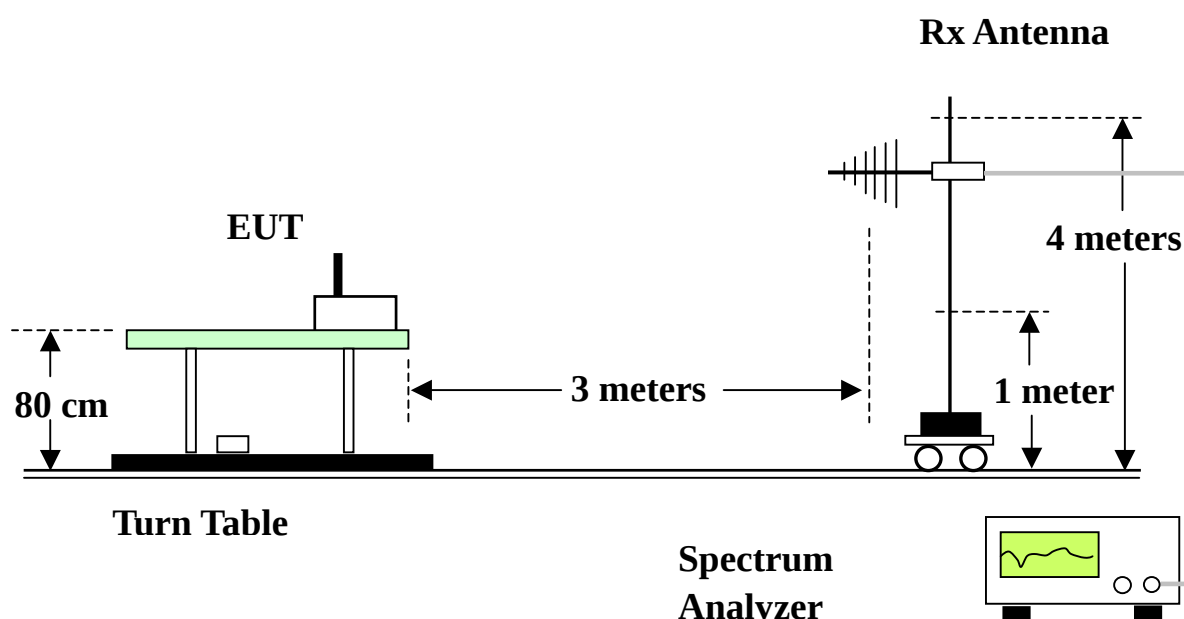
5.1.1 Measuring Instruments

Item 1~9 of the table on section 7.

5.1.2 Test Procedures

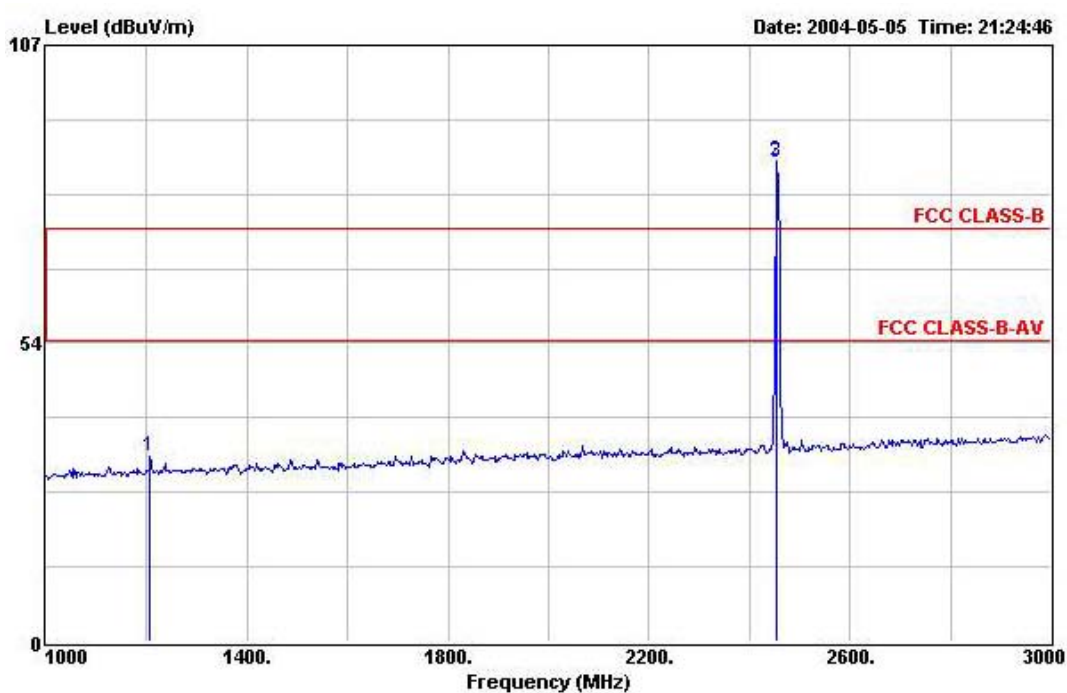
- a) Configure the EUT according to ANSI C63.4.
- b) The EUT was placed on the top of the turn table 0.8 meter above ground.
- c) The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
- d) Power on the EUT and all the supporting units.
- e) The turn table was rotated by 360 degrees to determine the position of the highest radiation.
- f) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
- g) For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- h) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- i) For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- j) If the emission level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz and average method for above the 1GHz. the reported.
- k) For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

5.1.3 Test Setup Layout



5.1.4 Test Result

Test Channel	Mode 1 (Z axis)	Temperature	27 deg. C	Tested By	Steve Chen
Frequency	2454MHz	Humidity	64%		



Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Detect Mode
2454.000	86.17	12.17	114	97.26	28.31	1.78	41.18	Peak
2454.000	85.80	31.80	94	96.89	28.31	1.78	41.18	AV

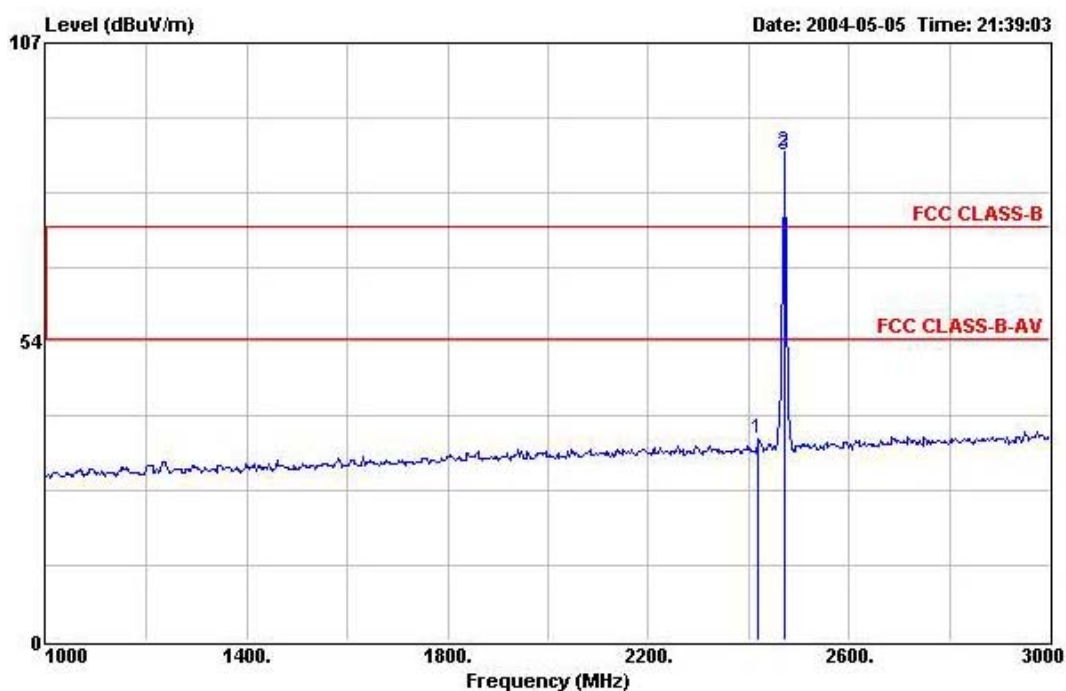


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Report No.: F430910

Test Channel	Mode 2 (Y axis)	Temperature	27 deg. C	Tested By	Steve Chen
Frequency	2468MHz	Humidity	64%		



Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Detect Mode
2468.000	87.38	13.38	114	98.42	28.35	1.80	41.19	Peak
2468.000	87.00	33.00	94	98.04	28.35	1.80	41.19	AV

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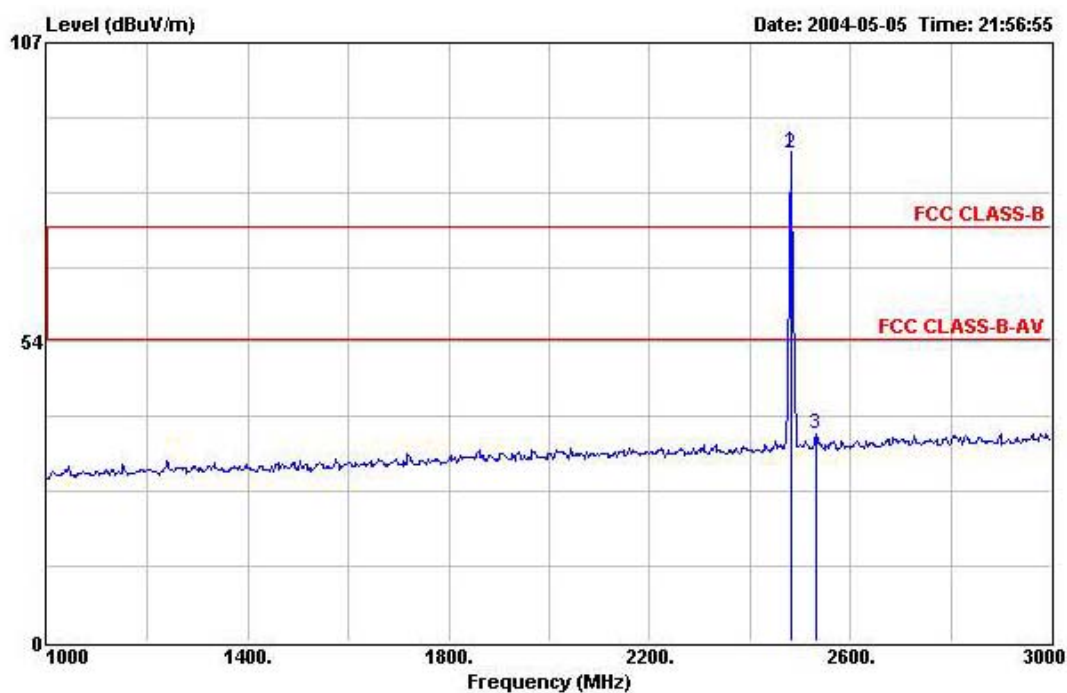


FCC ID: SAWM4L3OCC10

Issued on Jul. 1, 2004

Report No.: F430910

Test Channel	Mode 3 (Y axis)	Temperature	27 deg. C	Tested By	Steve Chen
Frequency	2482MHz	Humidity	64%		



Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Detect Mode
2482.000	87.41	13.41	114	98.40	28.39	1.82	41.20	Peak
2482.000	87.04	33.04	94	98.03	28.39	1.82	41.20	AV

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5.2 AC Power Line Conducted Emission

5.2.1 Measuring Instruments

Please reference item 1~7 in chapter 6 for the instruments used for testing.

5.2.2 Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connected to the other LISNs. The LISN should provides 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Use the Channel & Power Controlling software to make the EUT working on selected channel and expected output power, then use the "H" Patter Generator software to make the supporting equipments stay on working condition.
7. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
8. The measurement has to be done between each power line and ground at the power terminal for each RF channel. Only one RF channel has to be investigated since this test is independent with the RF channel selection.

5.2.3 Test Result of Conducted Emission

Test Mode	RF LINK	Tested By	Brian Lin
Temperature / Humidity	24deg. C / 53%		

Line to Ground

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1694400	47.28	-17.71	64.99	47.18	0.10	0.00	QP
2	0.1694400	34.90	-20.09	54.99	34.80	0.10	0.00	Average
3	0.2028850	42.77	-20.72	63.49	42.67	0.10	0.00	QP
4	0.2028850	41.51	-11.98	53.49	41.41	0.10	0.00	Average
5	0.4837480	37.29	-18.98	56.27	37.19	0.10	0.00	QP
6	0.4837480	35.34	-10.93	46.27	35.24	0.10	0.00	Average
7	1.040	37.35	-18.65	56.00	37.25	0.10	0.00	QP
8	1.040	33.88	-12.12	46.00	33.78	0.10	0.00	Average
9	1.177	27.73	-18.27	46.00	27.63	0.10	0.00	Average
10	1.177	32.96	-23.04	56.00	32.86	0.10	0.00	QP
11	1.730	25.85	-20.15	46.00	25.75	0.10	0.00	Average
12	1.730	30.49	-25.51	56.00	30.39	0.10	0.00	QP

Neutral to Ground

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1694400	46.90	-18.09	64.99	46.80	0.10	0.00	QP
2	0.1694400	33.39	-21.60	54.99	33.29	0.10	0.00	Average
3	0.2058110	42.35	-21.02	63.37	42.25	0.10	0.00	QP
4	0.2058110	40.60	-12.77	53.37	40.50	0.10	0.00	Average
5	0.4837480	37.17	-19.10	56.27	37.07	0.10	0.00	QP
6	0.4837480	35.57	-10.70	46.27	35.47	0.10	0.00	Average
7	0.6848100	30.33	-25.67	56.00	30.23	0.10	0.00	QP
8	0.6848100	26.38	-19.62	46.00	26.28	0.10	0.00	Average
9	1.038	34.87	-11.13	46.00	34.77	0.10	0.00	Average
10	1.038	37.65	-18.35	56.00	37.55	0.10	0.00	QP
11	1.930	32.23	-23.77	56.00	32.13	0.10	0.00	QP
12	1.930	26.99	-19.01	46.00	26.89	0.10	0.00	Average



Test Mode	Charging Mode	Tested By	Brian Lin
Temperature / Humidity	24deg. C / 53%		

Line to Ground

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1667680	47.70	-17.42	65.12	47.60	0.10	0.00	QP
2	0.1667680	35.33	-19.79	55.12	35.23	0.10	0.00	Average
3	0.2028850	42.75	-20.74	63.49	42.65	0.10	0.00	QP
4	0.2028850	41.51	-11.98	53.49	41.41	0.10	0.00	Average
5	0.4837480	36.75	-19.52	56.27	36.65	0.10	0.00	QP
6	0.4837480	34.45	-11.82	46.27	34.35	0.10	0.00	Average
7	1.040	37.63	-18.37	56.00	37.53	0.10	0.00	QP
8	1.040	34.37	-11.63	46.00	34.27	0.10	0.00	Average
9	1.200	29.43	-26.57	56.00	29.33	0.10	0.00	QP
10	1.200	22.50	-23.50	46.00	22.40	0.10	0.00	Average
11	2.200	30.86	-25.14	56.00	30.76	0.10	0.00	QP
12	2.200	26.04	-19.96	46.00	25.94	0.10	0.00	Average

Neutral to Ground

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1667680	47.60	-17.52	65.12	47.50	0.10	0.00	QP
2	0.1667680	34.05	-21.07	55.12	33.95	0.10	0.00	Average
3	0.2028850	42.29	-21.20	63.49	42.19	0.10	0.00	QP
4	0.2028850	40.77	-12.72	53.49	40.67	0.10	0.00	Average
5	0.4811910	37.21	-19.11	56.32	37.11	0.10	0.00	QP
6	0.4811910	36.09	-10.23	46.32	35.99	0.10	0.00	Average
7	0.7589380	36.09	-19.91	56.00	35.99	0.10	0.00	QP
8	0.7589380	34.38	-11.62	46.00	34.28	0.10	0.00	Average
9	1.040	37.33	-18.67	56.00	37.23	0.10	0.00	QP
10	1.040	33.97	-12.03	46.00	33.87	0.10	0.00	Average
11	1.670	31.13	-24.87	56.00	31.03	0.10	0.00	QP
12	1.670	26.98	-19.02	46.00	26.88	0.10	0.00	Average

5.2.4 Photographs of Conducted Emission Test Configuration

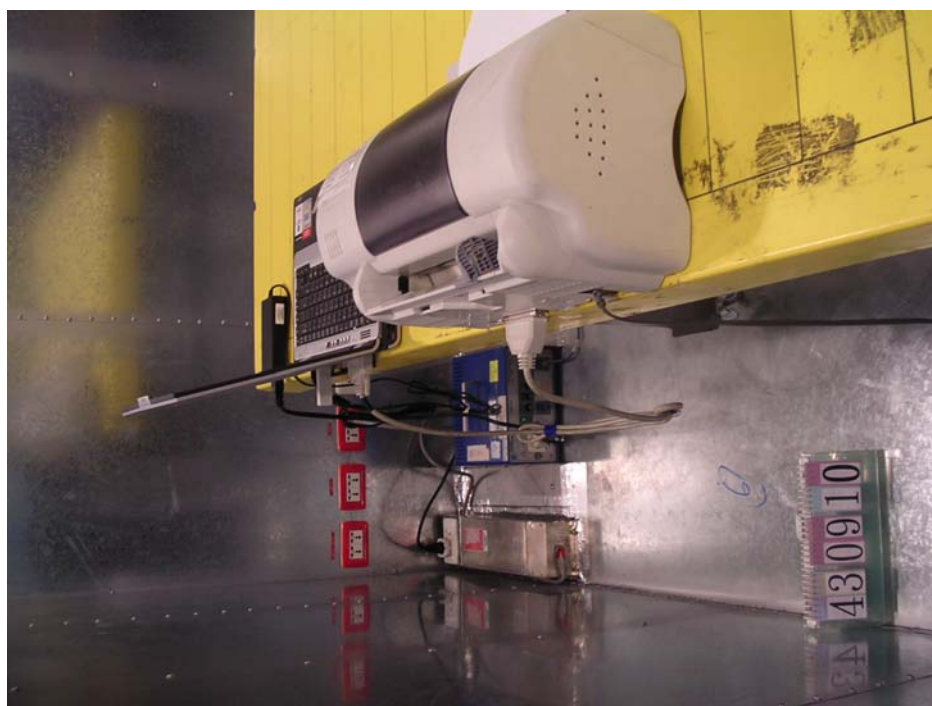
- The photographs show the configuration that generates the maximum emission.

RF Link

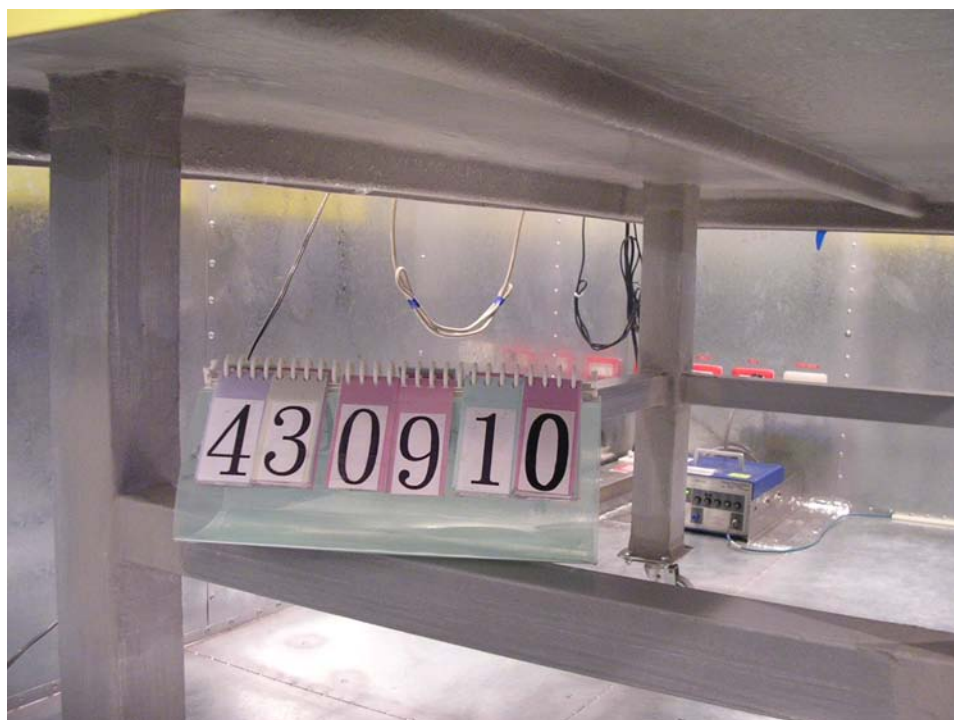
FRONT VIEW



REAR VIEW



SIDE VIEW

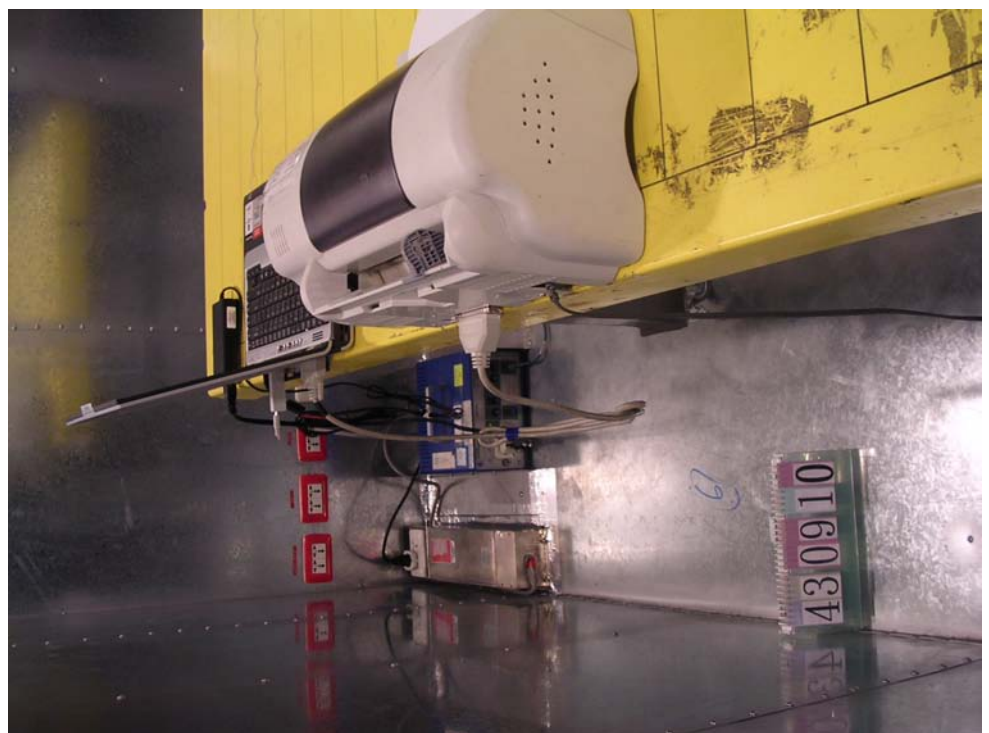


Charging Mode

FRONT VIEW



REAR VIEW



SIDE VIEW





5.3 Test of Radiated Emission

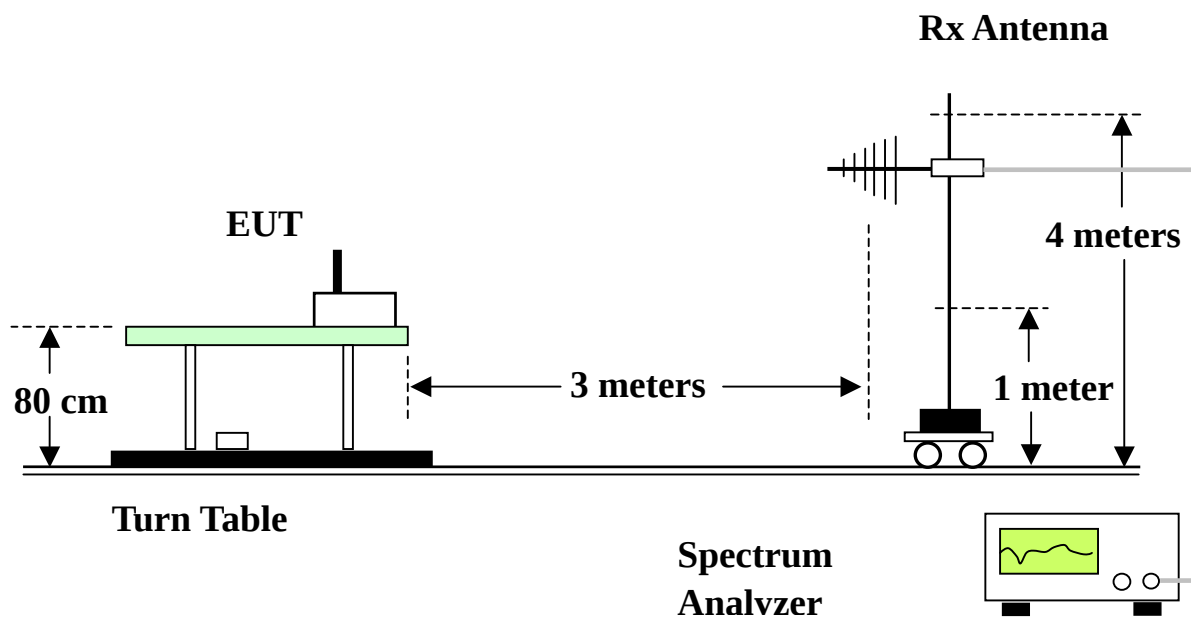
5.3.1 Measuring Instruments

Item 1~9 of the table on section 7.

5.5.2 Test Procedures

- a) Configure the EUT according to ANSI C63.4.
- b) The EUT was placed on the top of the turn table 0.8 meter above ground.
- c) The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
- d) Power on the EUT and all the supporting units.
- e) The turn table was rotated by 360 degrees to determine the position of the highest radiation.
- f) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
- g) For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- h) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- i) For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- j) If the emission level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz and average method for above the 1GHz. the reported.
- k) For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

5.4.3. Test Setup Layout





5.5.4 Test Results and Limit

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

Test Mode	RF LINK	Temperature	27 deg. C	Tested By	Steve Chen
Freq. Range	30MHz~1GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	133.020	28.71	-14.79	43.50	43.03	11.48	2.03	27.83	QP	---	---
2	144.580	27.94	-15.56	43.50	41.59	12.03	2.13	27.81	QP	---	---
3	186.060	31.60	-11.90	43.50	42.71	14.16	2.46	27.73	QP	---	---
1	343.200	38.76	-7.24	46.00	47.76	15.30	3.21	27.51	QP	---	---
2	397.600	39.75	-6.25	46.00	48.34	15.74	3.46	27.79	QP	---	---
3	441.600	34.20	-11.80	46.00	42.37	16.35	3.65	28.17	QP	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	72.670	30.12	-9.88	40.00	47.62	9.01	1.44	27.95	QP	---	---
2	107.350	30.99	-12.51	43.50	46.75	10.27	1.85	27.88	QP	---	---
3	132.340	30.08	-13.42	43.50	44.41	11.45	2.05	27.83	QP	---	---
1	343.200	38.14	-7.86	46.00	47.14	15.30	3.21	27.51	QP	---	---
2	397.600	39.94	-6.06	46.00	48.53	15.74	3.46	27.79	QP	100	125
3	441.600	33.67	-12.33	46.00	41.84	16.35	3.65	28.17	QP	---	---



Test Mode	Charging Mode	Temperature	27 deg. C	Tested By	Steve Chen
Freq. Range	30MHz~1GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	56.350	31.91	-8.09	40.00	48.32	10.31	1.27	27.99	QP	---	---
2	73.180	29.11	-10.89	40.00	46.59	9.03	1.44	27.95	QP	---	---
3	122.140	32.15	-11.35	43.50	47.29	10.75	1.97	27.86	QP	---	---
1	343.200	39.93	-6.07	46.00	48.93	15.30	3.21	27.51	QP	100	136
2	432.000	37.48	-8.52	46.00	45.71	16.24	3.62	28.09	QP	---	---
3	441.600	37.47	-8.53	46.00	45.64	16.35	3.65	28.17	QP	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	72.500	30.13	-9.87	40.00	47.64	9.00	1.44	27.95	QP	---	---
2	112.620	31.83	-11.67	43.50	47.33	10.48	1.89	27.87	QP	---	---
3	132.340	35.16	-8.34	43.50	49.49	11.45	2.05	27.83	QP	---	---
1 !	343.200	40.47	-5.53	46.00	49.47	15.30	3.21	27.51	QP	---	---
2	397.600	39.55	-6.45	46.00	48.14	15.74	3.46	27.79	QP	---	---
3	441.600	37.29	-8.71	46.00	45.46	16.35	3.65	28.17	QP	---	---



Test Mode	Mode 1 (X axis)	Temperature	27 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1228.000	36.01	-17.99	54.00	50.61	24.47	1.27	40.34	Average	---	---
2	2428.000	38.86	-15.14	54.00	50.03	28.24	1.75	41.16	Average	---	---
1	7370.000	47.85	-6.15	54.00	51.23	36.42	2.74	42.54	Average	102	131
1	4910.000	44.79	-9.21	54.00	51.37	33.43	2.48	42.49	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	7370.000	52.67	-21.33	74.00	56.05	36.42	2.74	42.54	Peak	---	---
2	7370.000	47.64	-6.36	54.00	51.02	36.42	2.74	42.54	Average	---	---
1	4910.000	45.77	-8.23	54.00	52.35	33.43	2.48	42.49	Average	---	---



Test Mode	Mode 1 (Y axis)	Temperature	27 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	7370.000	53.88	-20.12	74.00	57.26	36.42	2.74	42.54	Peak	102	136
2	7370.000	50.83	-3.17	54.00	54.21	36.42	2.74	42.54	Average	---	---
1	4910.000	50.46	-3.54	54.00	57.04	33.43	2.48	42.49	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1228.000	34.37	-19.63	54.00	48.97	24.47	1.27	40.34	Average	---	---
2	2428.000	37.58	-16.42	54.00	48.75	28.24	1.75	41.16	Average	---	---
1	7370.000	51.46	-22.54	74.00	54.84	36.42	2.74	42.54	Peak	---	---
2	7370.000	45.67	-8.33	54.00	49.05	36.42	2.74	42.54	Average	---	---
1	4910.000	47.41	-6.59	54.00	53.99	33.43	2.48	42.49	Average	---	---



Test Mode	Mode 1 (Z axis)	Temperature	27 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1206.000	33.20	-20.80	54.00	47.89	24.41	1.22	40.32	Average	---	---
1	7370.000	56.20	-17.80	74.00	59.58	36.42	2.74	42.54	Peak	100	176
2	7370.000	52.28	-1.72	54.00	55.66	36.42	2.74	42.54	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1228.000	34.78	-19.22	54.00	49.38	24.47	1.27	40.34	Average	---	---
2	2428.000	39.64	-14.36	54.00	50.81	28.24	1.75	41.16	Average	---	---
1	7370.000	50.10	-3.90	54.00	53.48	36.42	2.74	42.54	Average	---	---
1	4910.000	46.75	-7.25	54.00	53.33	33.43	2.48	42.49	Average	---	---



Test Mode	Mode 2 (X axis)	Temperature	27deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1230.000	35.02	-18.98	54.00	49.60	24.48	1.28	40.34	Average	---	---
2	1852.000	35.82	-18.18	54.00	48.44	26.57	1.63	40.82	Average	---	---
3	2420.000	38.11	-15.89	54.00	49.30	28.22	1.75	41.16	Average	---	---
1	7409.000	48.62	-5.38	54.00	51.74	36.51	2.87	42.50	Average	---	---
1	4942.000	46.68	-7.32	54.00	53.27	33.50	2.45	42.54	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	7409.000	52.71	-21.29	74.00	55.83	36.51	2.87	42.50	Peak	---	---
2	7409.000	47.59	-6.41	54.00	50.71	36.51	2.87	42.50	Average	---	---
1	4942.000	50.82	-3.18	54.00	57.41	33.50	2.45	42.54	Average	102	175



Test Mode	Mode 2 (Y axis)	Temperature	27deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamplifier Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2420.000	36.01	-17.99	54.00	47.20	28.22	1.75	41.16	Average	---	---
1	7409.000	54.04	-19.96	74.00	57.16	36.51	2.87	42.50	Peak	---	---
2	7409.000	50.31	-3.69	54.00	53.43	36.51	2.87	42.50	Average	---	---
1	4942.000	55.03	-18.97	74.00	61.62	33.50	2.45	42.54	Peak	---	---
2	4942.000	51.61	-2.39	54.00	58.20	33.50	2.45	42.54	Average	105	182

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamplifier Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1236.000	33.83	-20.17	54.00	48.38	24.49	1.31	40.35	Average	---	---
2	2420.000	37.99	-16.01	54.00	49.18	28.22	1.75	41.16	Average	---	---
1	7409.000	49.09	-4.91	54.00	52.21	36.51	2.87	42.50	Average	---	---
1	4942.000	52.28	-21.72	74.00	58.87	33.50	2.45	42.54	Peak	---	---
2	4942.000	49.81	-4.19	54.00	56.40	33.50	2.45	42.54	Average	---	---



Test Mode	Mode 2 (Z axis)	Temperature	27deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2438.000	36.52	-17.48	54.00	47.66	28.27	1.76	41.17	Average	---	---
1	7409.000	54.32	-19.68	74.00	57.44	36.51	2.87	42.50	Peak	---	---
2	7409.000	50.34	-3.66	54.00	53.46	36.51	2.87	42.50	Average	---	---
2	4942.000	50.89	-3.11	54.00	57.48	33.50	2.45	42.54	Average	101	171

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1230.000	34.52	-19.48	54.00	49.10	24.48	1.28	40.34	Average	---	---
2	2422.000	39.31	-14.69	54.00	50.49	28.23	1.75	41.16	Average	---	---
1	4942.000	53.35	-20.65	74.00	59.94	33.50	2.45	42.54	Peak	---	---
2	4942.000	50.71	-3.29	54.00	57.30	33.50	2.45	42.54	Average	---	---
1	7409.000	55.15	-18.85	74.00	58.27	36.51	2.87	42.50	Peak	---	---
2	7409.000	50.83	-3.17	54.00	53.95	36.51	2.87	42.50	Average	---	---



Test Mode	Mode 3 (X axis)	Temperature	27 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1238.000	35.76	-18.24	54.00	50.30	24.50	1.31	40.35	Average	---	---
2	1860.000	35.53	-18.47	54.00	48.14	26.59	1.62	40.82	Average	---	---
3	2430.000	38.15	-15.85	54.00	49.31	28.25	1.76	41.17	Average	---	---
1	7445.000	49.75	-4.25	54.00	52.61	36.60	2.99	42.45	Average	105	174
1	4966.000	47.09	-6.91	54.00	53.64	33.55	2.47	42.57	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	4966.000	49.05	-4.95	54.00	55.60	33.55	2.47	42.57	Average	---	---
1	7445.000	52.40	-21.60	74.00	55.26	36.60	2.99	42.45	Peak	---	---
2	7445.000	47.29	-6.71	54.00	50.15	36.60	2.99	42.45	Average	---	---



Test Mode	Mode 3 (Y axis)	Temperature	27 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	7445.000	54.29	-19.71	74.00	57.15	36.60	2.99	42.45	Peak	---	---
2	7445.000	49.66	-4.34	54.00	52.52	36.60	2.99	42.45	Average	---	---
2	4966.000	49.79	-4.21	54.00	56.34	33.55	2.47	42.57	Average	102	131

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1238.000	35.78	-18.22	54.00	50.32	24.50	1.31	40.35	Average	---	---
2	2430.000	37.62	-16.38	54.00	48.78	28.25	1.76	41.17	Average	---	---
1	7445.000	49.79	-4.21	54.00	52.65	36.60	2.99	42.45	Average	---	---
1	4966.000	51.14	-22.86	74.00	57.69	33.55	2.47	42.57	Peak	---	---
2	4966.000	48.18	-5.82	54.00	54.73	33.55	2.47	42.57	Average	---	---



Test Mode	Mode 3 (Z axis)	Temperature	27 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	64%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	7445.000	54.61	-19.39	74.00	57.47	36.60	2.99	42.45	Peak	100	146
2	7445.000	49.93	-4.07	54.00	52.79	36.60	2.99	42.45	Average	---	---
2	4966.000	47.58	-6.42	54.00	54.13	33.55	2.47	42.57	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1238.000	36.14	-17.86	54.00	50.68	24.50	1.31	40.35	Average	---	---
2	2430.000	39.77	-14.23	54.00	50.93	28.25	1.76	41.17	Average	---	---
1	7445.000	51.26	-22.74	74.00	54.12	36.60	2.99	42.45	Peak	---	---
2	7445.000	45.34	-8.66	54.00	48.20	36.60	2.99	42.45	Average	---	---
1	4966.000	51.17	-22.83	74.00	57.72	33.55	2.47	42.57	Peak	---	---
2	4966.000	48.91	-5.09	54.00	55.46	33.55	2.47	42.57	Average	---	---

5.5.5 Photographs of Radiated Emission Test Configuration

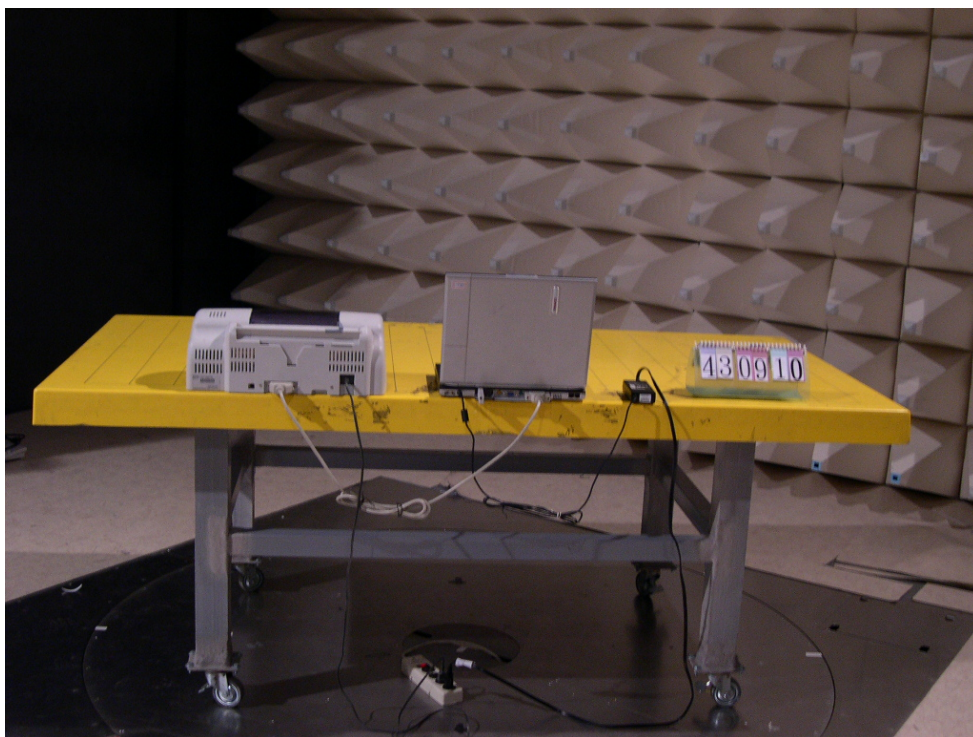
- The photographs show the configuration that generates the maximum emission.

RF Link

FRONT VIEW

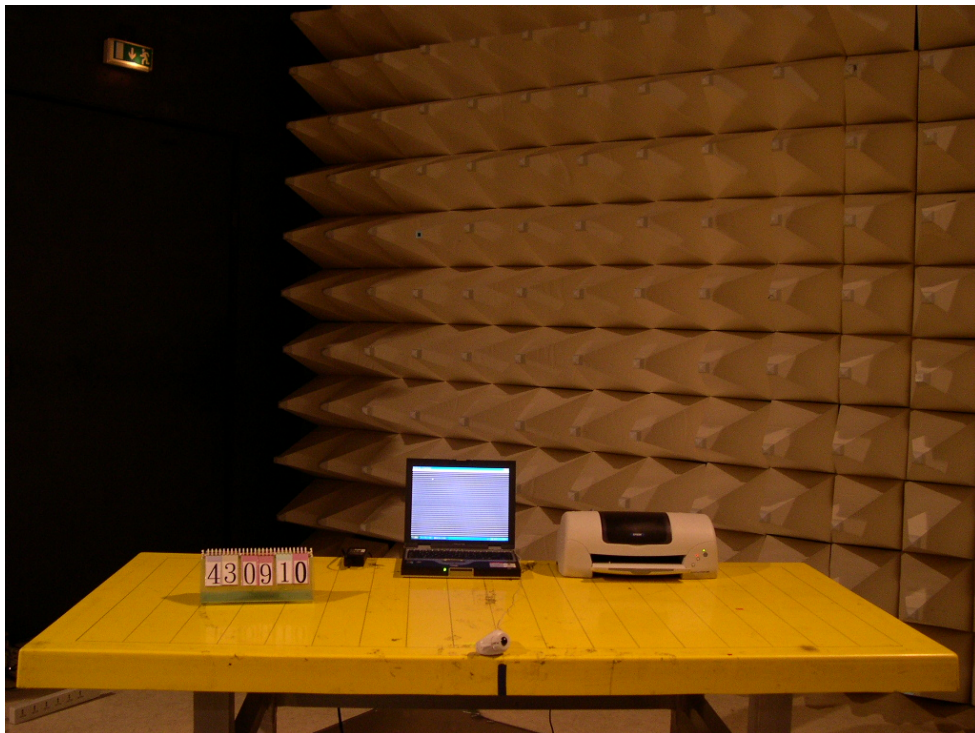


REAR VIEW

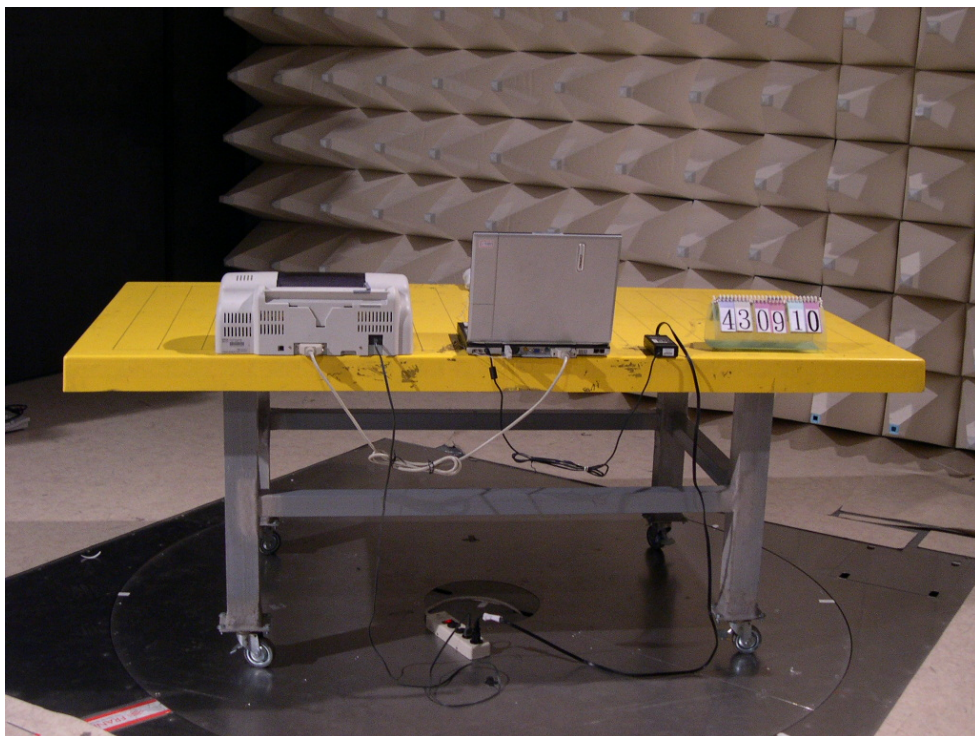


Charging Mode

FRONT VIEW



REAR VIEW





6 Antenna Requirements

6.1 Standard Applicable

47 CFR Part15 Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

47 CFR Part15 Section 15.235 (c):

The antenna shall be a single element, one meter or less in length, permanently mounted on the enclosure containing the device.

6.2 Antenna Construction

The antenna used in this device is printed antenna, there is no antenna connector.

7 List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 20, 2004	Radiation (03CH03-HY)
2	Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 23, 2003	Radiation (03CH03-HY)
3	Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 05, 2003	Radiation (03CH03-HY)
4	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 24, 2003	Radiation (03CH03-HY)
5	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 24, 2003	Radiation (03CH03-HY)
6	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
7	Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 23, 2003	Radiation (03CH03-HY)
8	Horn Antenna	COM-POWER	3115	6821	1GHz – 18GHz	Sep. 12, 2003	Radiation (03CH03-HY)
9	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
10	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
11	Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 01, 2004	Radiation (03CH03-HY)
12	RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 05, 2003	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year.