FCC TEST REPORT

CATEGORY	:	Portable
PRODUCT NAME	:	2.4GHzWireless PC Gamepad
FCC ID.	:	S8DGGE917-H
FILING TYPE	:	Certification
BRAND NAME	:	Game Elements
MODEL NAME	:	GGE917
APPLICANT	:	**Kinnix Electronic Company** Flat B4, 7/F., Block B, Tuen Mun Industrial Centre, 2 San Ping Circuit, Tuen Mun, N.T. H.K.
MANUFACTURER	:	**ZHI LI PLASTICS FACTORY** Chung Fon Industrial Zone, Cheong On District, Dongguan City, China
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 and any agency of U.S. government.

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

1190
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HISTORY OF THIS TEST REPORT

Received Date: Apr. 12, 2005
Test Date: May 16, 2005
Original Report Issue Date: May 17, 2005
Report No.: FR541207-01

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

with

47 CFR FCC Part 15 Subpart C

PRODUCT NAME : 2.4GHzWireless PC Gamepad

BRAND NAME : Game Elements

MODEL NAME : GGE917

APPLICANT : **Kinnix Electronic Company**
Flat B4, 7/F., Block B, Tuen Mun Industrial Centre, 2 San Ping Circuit, Tuen Mun, N.T. H.K.

MANUFACTURER : **ZHI LI PLASTICS FACTORY**
Chung Fon Industrial Zone, Cheong On District, Dongguan City, China

I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4-2003 and all test are performed according to 47 CFR FCC Part 15 Subpart C. Testing was carried out on May 16, 2005 at SPORTON International Inc. LAB.

Wayne Hsu / Supervisor
Sporton International Inc.

1. General Description of Equipment under Test

1.1. Applicant

Kinnix Electronic Company
Flat B4, 7/F., Block B, Tuen Mun Industrial Centre, 2 San Ping Circuit, Tuen Mun, N.T. H.K.

1.2. Manufacturer

ZHI LI PLASTICS FACTORY
Chung Fon Industrial Zone, Cheong On District, Dongguan City, China

1.3. Basic Description of Equipment under Test

This product is a 2.4GHz Wireless PC Gamepad. The technical data has been listed on section " Features of Equipment under Test ". The host unit is plugged on the USB port of the computer, and the hand held unit is powered by chargeable battery and it can be charged through host unit. This report is for the host unit only.

1.4. Features of Equipment under Test

Items	Description
Type of Modulation	GFSK
Number of Channels	80
Frequency Band	2402 MHz ~ 2481 MHz
Carrier Frequency	See section 1.5 for details
Antenna Type	On Board Antenna
Communication Type	Transceiver
Testing Duty Cycle	100.00%
Test Power Source	Host: DC 5V / 3.5V; Device: DC4.4~6.0V
Temperature Range (Operating)	0 ~ 50 °C

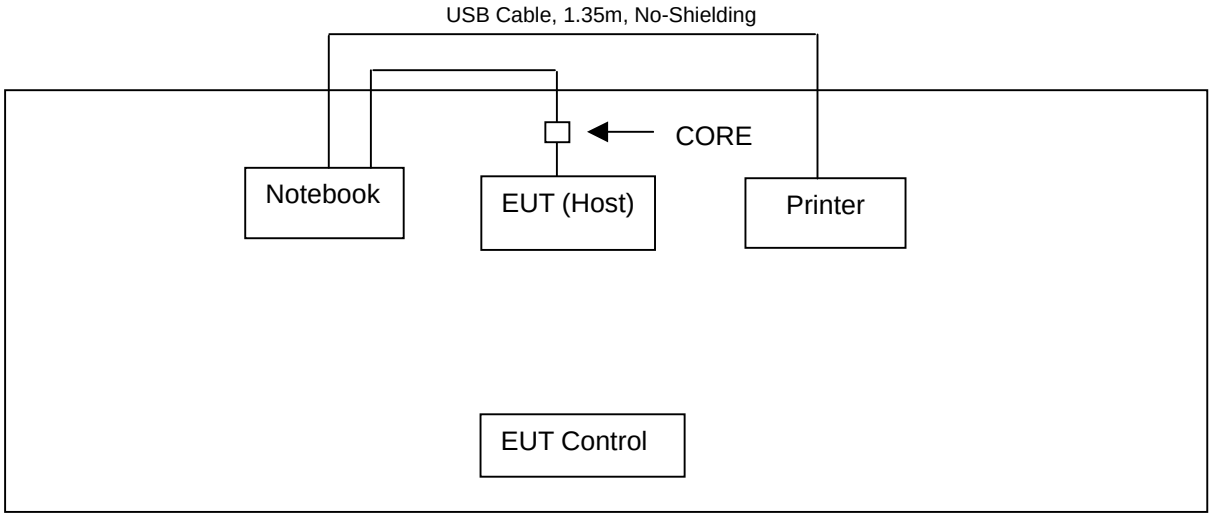
1.5. Table for Carrier Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	20	2422 MHz	40	2442 MHz	60	2462 MHz
01	2417 MHz	21	2423 MHz	41	2443 MHz	61	2463 MHz
02	2422 MHz	22	2424 MHz	42	2444 MHz	62	2464 MHz
03	2427 MHz	23	2425 MHz	43	2445 MHz	63	2465 MHz
04	2403 MHz	24	2426 MHz	44	2446 MHz	64	2466 MHz
05	2404 MHz	25	2427 MHz	45	2447 MHz	65	2467 MHz
06	2405 MHz	26	2428 MHz	46	2448 MHz	66	2468 MHz
07	2406 MHz	27	2429 MHz	47	2449 MHz	67	2469 MHz
08	2407 MHz	28	2430 MHz	48	2450 MHz	68	2470 MHz
09	2408 MHz	29	2431 MHz	49	2451 MHz	69	2471 MHz
10	2409 MHz	30	2432 MHz	50	2452 MHz	70	2472 MHz
11	2410 MHz	31	2433 MHz	51	2453 MHz	71	2473 MHz
12	2411 MHz	32	2434 MHz	52	2454 MHz	72	2474 MHz
13	2412 MHz	33	2435 MHz	53	2455 MHz	73	2475 MHz
14	2413 MHz	34	2436 MHz	54	2456 MHz	74	2476 MHz
15	2414 MHz	35	2437 MHz	55	2457 MHz	75	2477 MHz
16	2415 MHz	36	2438 MHz	56	2458 MHz	76	2478 MHz
17	2416 MHz	37	2439 MHz	57	2459 MHz	77	2479 MHz
18	2417 MHz	38	2440 MHz	58	2460 MHz	78	2480 MHz
19	2418 MHz	39	2441 MHz	59	2461 MHz	79	2481 MHz

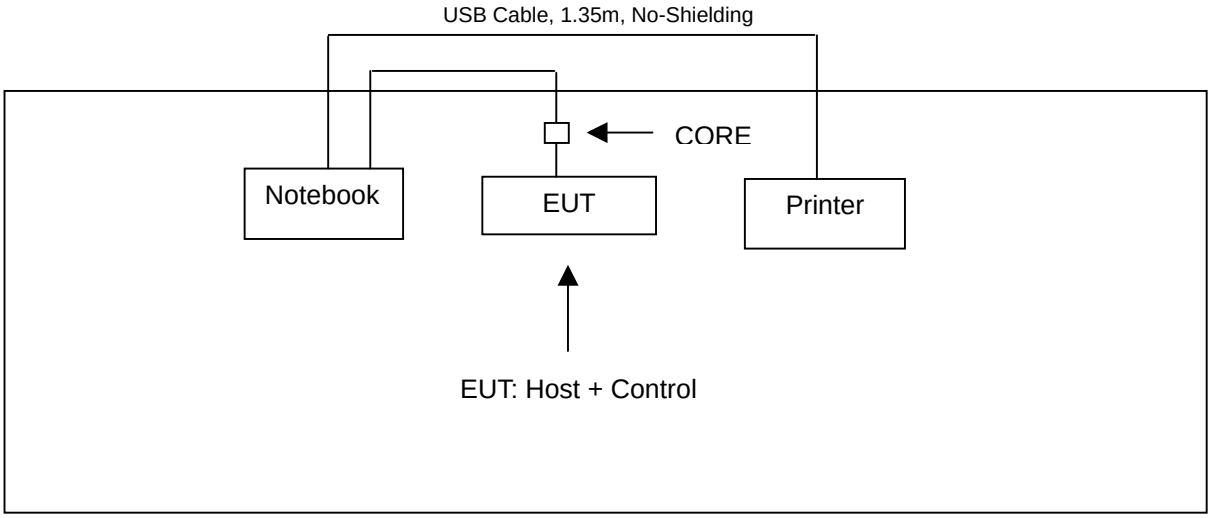
2. Test Configuration of the Equipment under Test

2.1. Connection Diagram of Test System

RF LINK Mode



Charge Mode



2.2. The Test Mode Description

1. According to ANSI C63.4-2003: Frequency range of EUT is more than 10 MHz, we have to test the lowest, middle and highest channels of EUT.
2. Spurious emission below 1GHz is independent of channel selection and there will be no effect on test results so only channel 39 with GFSK modulation was tested.
3. AC conduction emission is independent of channel selection and types of antenna, so only channel 39 with GFSK modulation was tested.
4. For conduction test and spurious below 1GHz, the following modes were tested:
   - Mode 1: Stand-alone.
   - Mode 2: Charged mode
5. For maximum field strength of fundamental, the worst case is X-axis of horizontal polarization.

2.3. Description of Test Supporting Units

Support unit	Brand	Model No.	FCC ID
Notebook	DELL	PP01L (D505)	DoC
Printer	EPSON	LQ-680	DoC

3. General Information of Test

3.1. Test Facility

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
	:	TEL 886-3-327-3456
	:	FAX 886-3-318-0055
Test Site No	:	03CH03-HY / CO04-HY

3.2. Standards for Methods of Measurement

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

ANSI C63.4-2003

47 CFR FCC Part 15 Subpart C

3.3. Frequency Range Investigated

Radiated emission test: from 9kHz to 10th carrier harmonic

3.4. Test Distance

The test distance of radiated emission (9kHz~1GHz) test from antenna to EUT is 3 M.

The test distance of radiated emission (1GHz~10th carrier harmonic) test from antenna to EUT is 3 M.

3.5. Test Software

During testing, there is no test software for the test.

4. List of Measurements

4.1. Summary of the Test Results

Applied Standard: 47 CFR FCC Part 15 Subpart C			
Paragraph	**FCC Rule**	**Description of Test**	**Result**
5.1	15.249(a)	Maximum Field Strength of Fundamental	Pass
5.2	15.207	AC Power Line Conducted Emission	Pass
5.3	15.249(d)	Spurious Radiated Emission	Pass
5.4	15.203	Antenna Requirement	Pass

5. Test Result

5.1. Test of Maximum Field Strength of Fundamental

5.1.1. Applicable Standard

Section 15.249(a): The field strength of emissions within these bands specified at a distance of 3 meters (measurement instrumentation employing an average detector) shall comply with the following table. The peak field strength of any emission shall not exceed the maximum permitted average limits specified in the table by more than 20 dB under any condition of modulation

Fundamental Frequency (MHz)	Field Strength of Fundamental (millivolts/meter)	Unwanted Emission (microvolts/meter)
2400-2483.5	50	500
5725-5875	50	500

5.1.2. Measuring Instruments

Item 6~17 of the table on section 6.

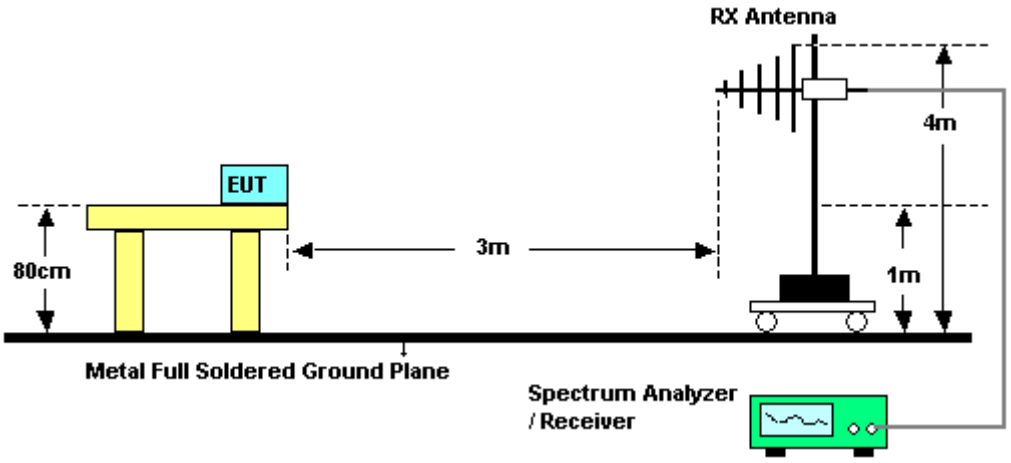
5.1.3. Description of Major Test Instruments Setting

- Spectrum Analyzer : R&S FSP40 (Radiated Measurement)
  Attenuation : Auto
  Center Frequency : Carrier Frequency
  Span Frequency : Suitable for observe
  RB : 1 MHz for PK value / 1 MHz for AV value
  VB : 1 MHz for PK value / 10 Hz for AV value
  Detector : Peak
  Trace : Max Hold
  Sweep Time : Auto

5.1.4. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. 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.
4. For carrier field strength emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. For carrier field strength emission, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.

5.1.5. Test Setup Layout



5.1.6. Test Criteria

All test results complied with the requirements of Section 15.249(a). Measurement Uncertainty is 2.26dB.

5.1.7. Test Result

- Temperature: 19°C
- Relative Humidity: 60%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steven Lu

Channel No.	Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV/m)	Detector
00	2402 MHz	63.66	-30.34	94.00	33.53	Average
00	2402 MHz	71.50	-42.50	114.00	41.37	Peak
39	2441 MHz	63.60	-30.40	94.00	33.31	Average
39	2441 MHz	71.00	-43.00	114.00	40.71	Peak
79	2481 MHz	41.47	-52.53	94.00	11.07	Average
79	2481 MHz	59.09	-54.91	114.00	39.09	Peak

Note:
Correct Factor = Antenna Factor + Cable Loss - Preamp Factor.
Read Level = Level of Receiver or Spectrum.
Level = Read Level + Correct Factor.

5.2. Test of AC Power Line Conducted Emission

5.2.1. Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

5.2.2. Measuring Instruments

Please reference item 1~5 in chapter 6 for the instruments used for testing.

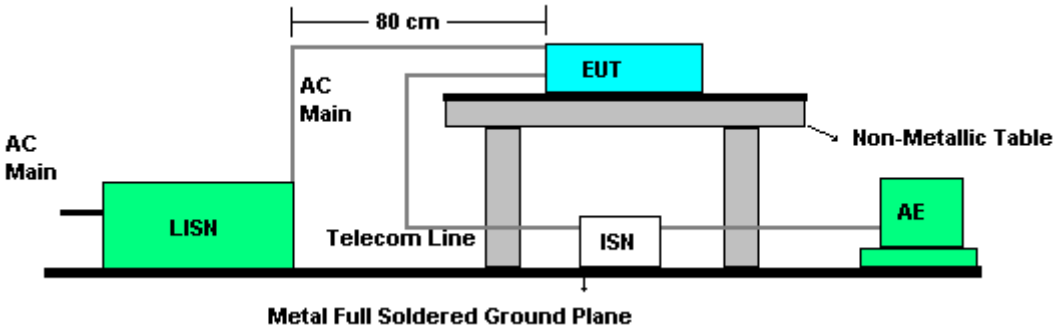
5.2.3. Description of Major Test Instruments Setting

- Test Receiver : R&S ESCS 30
  Attenuation : 10 dB
  Start Frequency : 0.15 MHz
  Stop Frequency : 30 MHz
  IF Bandwidth : 9 KHz

5.2.4. 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 provide 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.

5.2.5. Test Setup Layout



5.2.6. Test Criteria

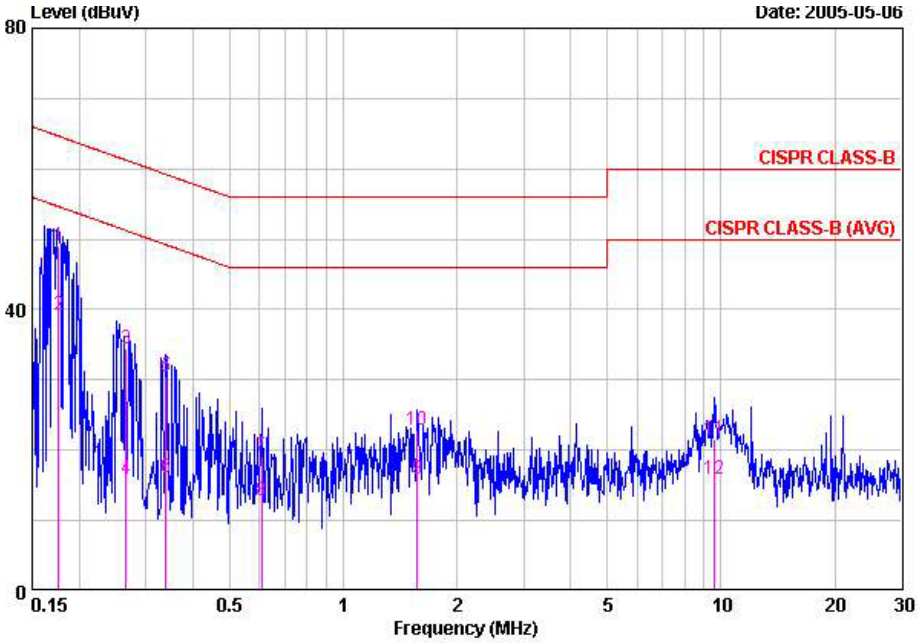
All test results complied with the requirements of Section 15.207. Measurement Uncertainty is 2.54dB.

5.2.7. Test Result of Conducted Emission for CH 79 / 2481 MHz

- Temperature: 19°C
- Relative Humidity: 60%
- Test Engineer: Steven Lu

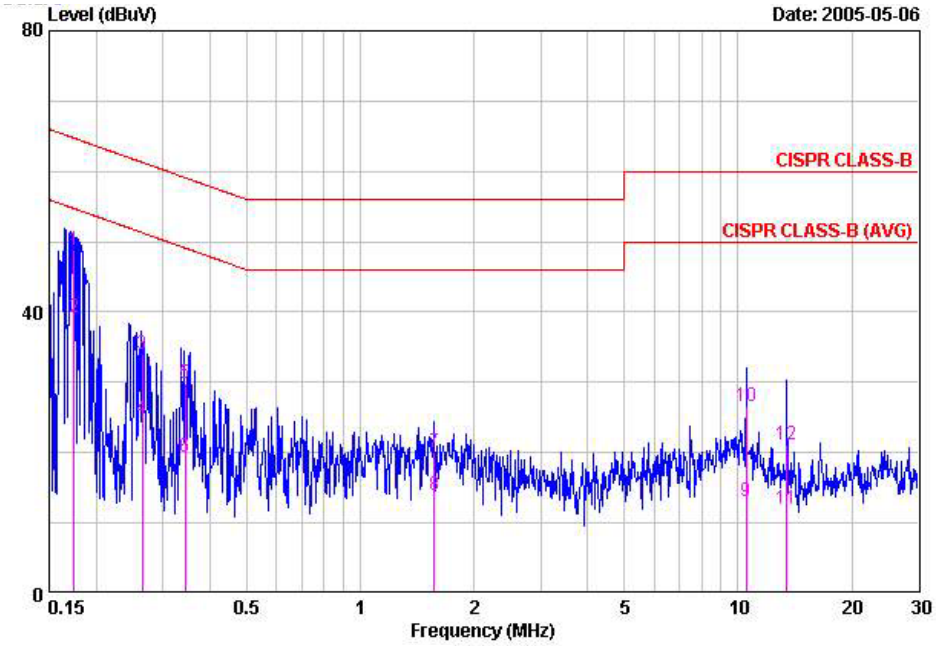
Mode 1

Line to Ground



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17630	49.00	-15.65	64.66	48.86	0.14	0.00	QP
2	0.17630	39.18	-15.47	54.66	39.04	0.14	0.00	AVERAGE
3	0.26553	34.43	-26.83	61.26	34.37	0.06	0.00	QP
4	0.26553	15.88	-35.38	51.26	15.82	0.06	0.00	AVERAGE
5	0.33920	30.42	-28.80	59.22	30.40	0.02	0.00	QP
6	0.33920	16.14	-33.08	49.22	16.12	0.02	0.00	AVERAGE
7	0.60752	19.28	-36.72	56.00	19.28	0.00	0.00	QP
8	0.60752	12.79	-33.21	46.00	12.79	0.00	0.00	AVERAGE
9	1.568	15.91	-30.09	46.00	15.91	0.00	0.00	AVERAGE
10	1.568	22.79	-33.21	56.00	22.79	0.00	0.00	QP
11	9.552	21.55	-38.45	60.00	21.46	0.09	0.00	QP
12	9.552	16.01	-33.99	50.00	15.92	0.09	0.00	AVERAGE

Neutral to Ground



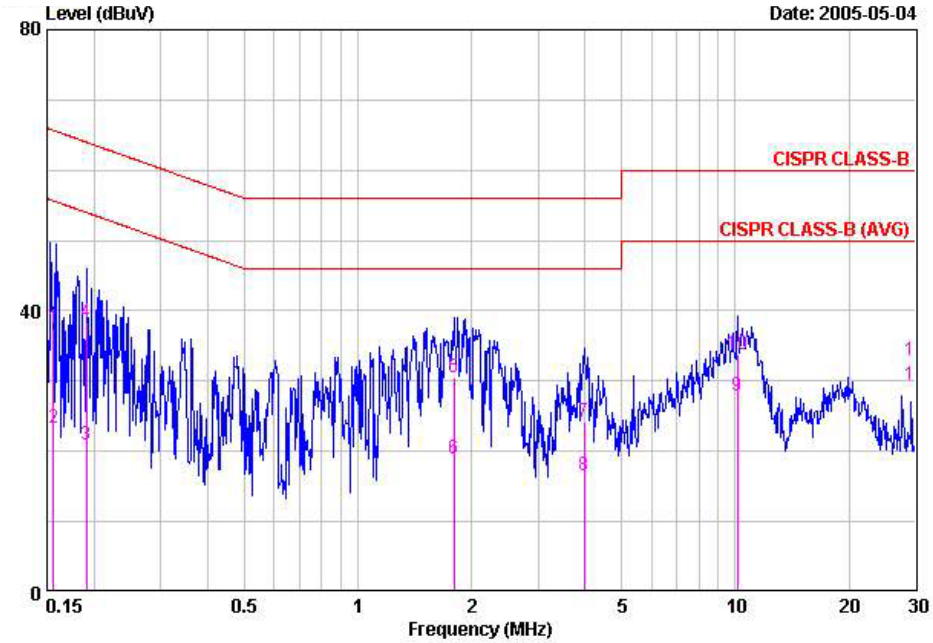
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17489	48.85	-15.88	64.72	48.70	0.15	0.00	QP
2	0.17489	39.29	-15.44	54.72	39.14	0.15	0.00	AVERAGE
3	0.26460	33.92	-27.37	61.29	33.82	0.10	0.00	QP
4	0.26460	24.77	-26.52	51.29	24.67	0.10	0.00	AVERAGE
5	0.34385	29.90	-29.21	59.11	29.80	0.10	0.00	QP
6	0.34385	19.40	-29.71	49.11	19.30	0.10	0.00	AVERAGE
7	1.566	20.03	-35.97	56.00	20.03	0.00	0.00	QP
8	1.566	14.03	-31.97	46.00	14.03	0.00	0.00	AVERAGE
9	10.508	13.09	-36.91	50.00	13.09	0.00	0.00	AVERAGE
10	10.508	26.51	-33.49	60.00	26.51	0.00	0.00	QP
11	13.479	12.07	-37.93	50.00	12.07	0.00	0.00	AVERAGE
12	13.479	21.18	-38.82	60.00	21.18	0.00	0.00	QP

Note:

Corrected Reading: Probe (LISN / ISN) Factor + Cable Loss + Read Level = Level.

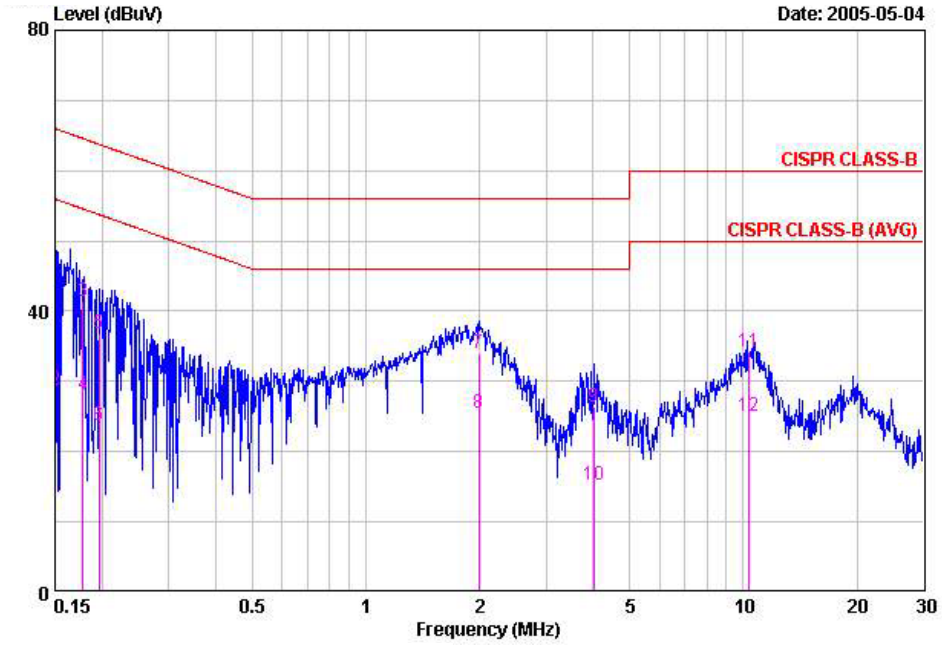
Mode 2

Line to Ground



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15573	37.54	-28.15	65.69	37.35	0.19	0.00	QP
2	0.15573	23.32	-32.37	55.69	23.13	0.19	0.00	AVERAGE
3	0.19039	20.93	-33.09	54.02	20.81	0.12	0.00	AVERAGE
4	0.19039	38.46	-25.56	64.02	38.34	0.12	0.00	QP
5	1.800	30.54	-25.46	56.00	30.54	0.00	0.00	QP
6	1.800	18.93	-27.07	46.00	18.93	0.00	0.00	AVERAGE
7	3.985	24.22	-31.78	56.00	24.22	0.00	0.00	QP
8	3.985	16.57	-29.43	46.00	16.57	0.00	0.00	AVERAGE
9	10.125	27.94	-22.06	50.00	27.84	0.10	0.00	AVERAGE
10	10.125	33.78	-26.22	60.00	33.68	0.10	0.00	QP
11	30.000	33.00	-27.00	60.00	32.80	0.20	0.00	QP
12	30.000	29.39	-20.61	50.00	29.19	0.20	0.00	AVERAGE

Neutral to Ground



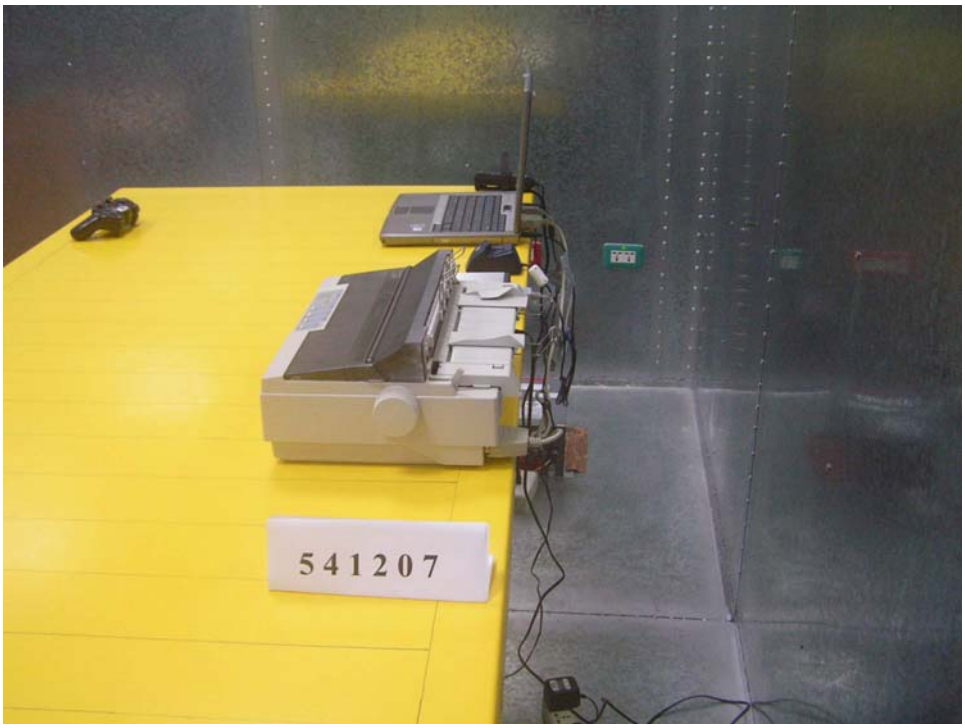
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15001	40.07	-25.93	66.00	39.87	0.20	0.00	QP
2	0.15001	28.73	-27.27	56.00	28.53	0.20	0.00	AVERAGE
3	0.17789	41.44	-23.14	64.58	41.30	0.14	0.00	QP
4	0.17789	28.10	-26.48	54.58	27.96	0.14	0.00	AVERAGE
5	0.19665	36.81	-26.95	63.75	36.70	0.11	0.00	QP
6	0.19665	23.85	-29.91	53.75	23.74	0.11	0.00	AVERAGE
7	1.991	34.03	-21.97	56.00	34.03	0.00	0.00	QP
8	1.991	25.52	-20.48	46.00	25.52	0.00	0.00	AVERAGE
9	4.006	26.41	-29.59	56.00	26.41	0.00	0.00	QP
10	4.006	15.16	-30.84	46.00	15.16	0.00	0.00	AVERAGE
11	10.327	34.33	-25.67	60.00	34.33	0.00	0.00	QP
12	10.327	25.13	-24.87	50.00	25.13	0.00	0.00	AVERAGE

5.2.8. Photographs of Conducted Emission Test Configuration

Mode 1

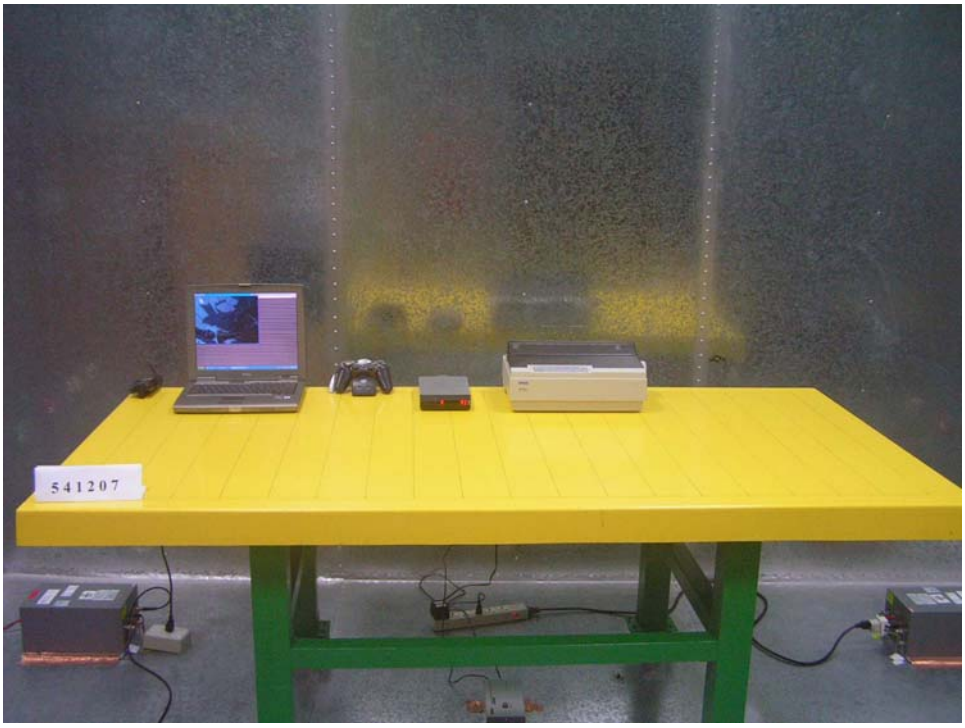
FRONT VIEW

REAR VIEW

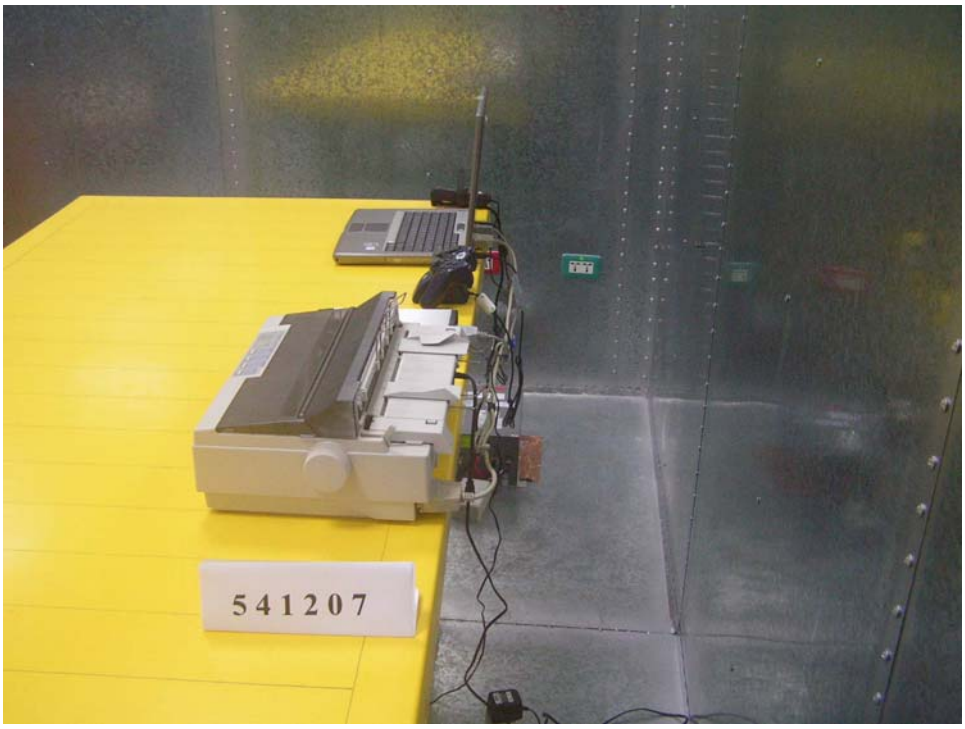


Mode 2

FRONT VIEW



REAR VIEW



5.3. Test of Spurious Radiated Emission

5.3.1. Applicable Standard

Section 15.249(d): Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

5.3.2. Measuring Instruments

Please reference item 1~17 in chapter 6 for the instruments used for testing.

5.3.3. Description of Major Test Instruments Setting

- Spectrum Analyzer : R&S FSP40
  Attenuation : Auto
  Start Frequency : 1000 MHz
  Stop Frequency : 10th carrier harmonic
  RB / VB : 1 MHz / 1MHz for Peak
  RB / VB : 1 MHz / 10Hz for Average

- Test Receiver : R&S ESCS 30
  Attenuation : Auto
  Start Frequency : 9 kHz
  Stop Frequency : 1000 MHz
  RB : 120 KHz for QP or PK

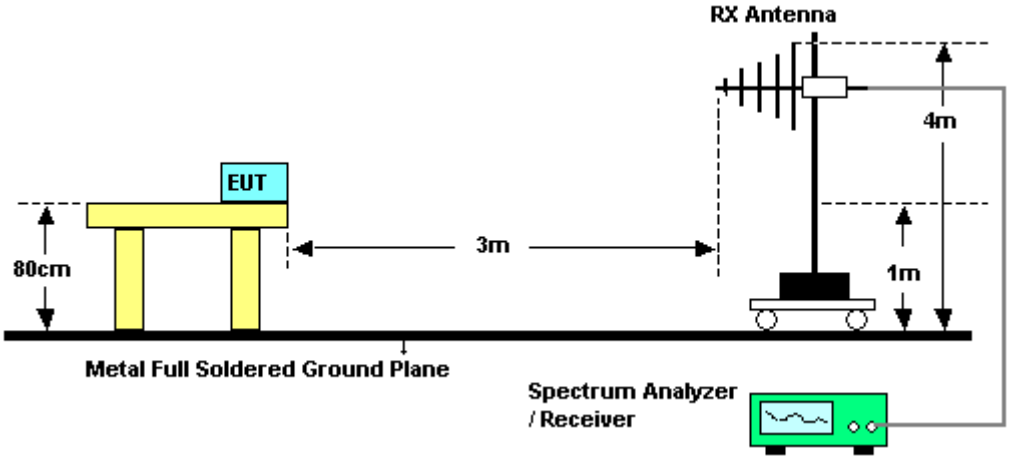
5.3.4. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. 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 turntable.
4. Power on the EUT and all the supporting units.
5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
6. 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.
7. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
10. 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.

11. 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.

5.3.5. Test Setup Layout



5.3.6. Test Criteria

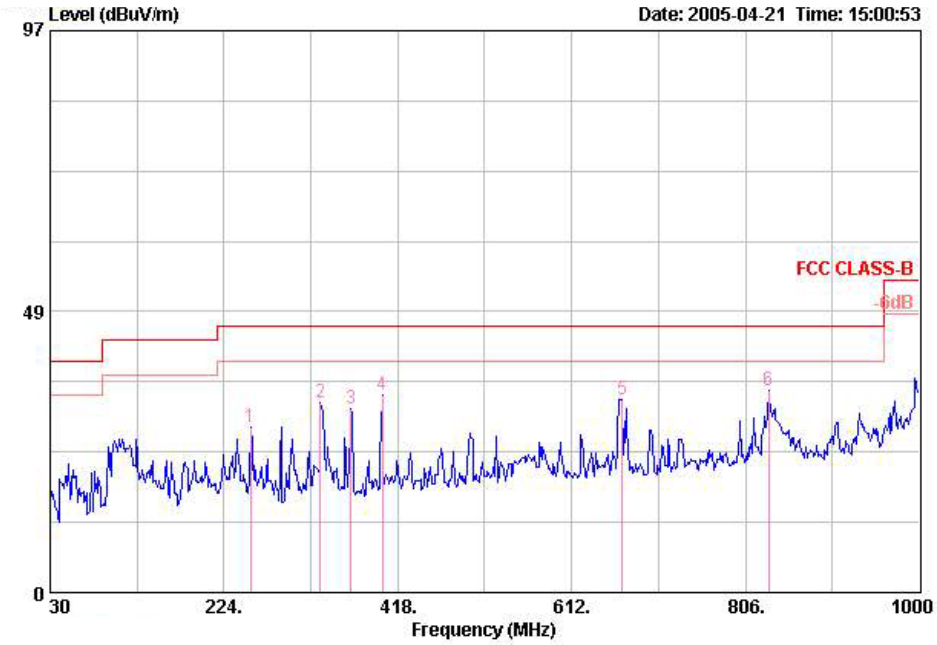
All test results complied with the requirements of Section 15.249(d). Measurement Uncertainty is 2.26dB.

5.3.7. Test Results for CH 39 / 2441 MHz(for emission below 1GHz)

- Temperature: 19°C
- Relative Humidity: 60%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steven Lu

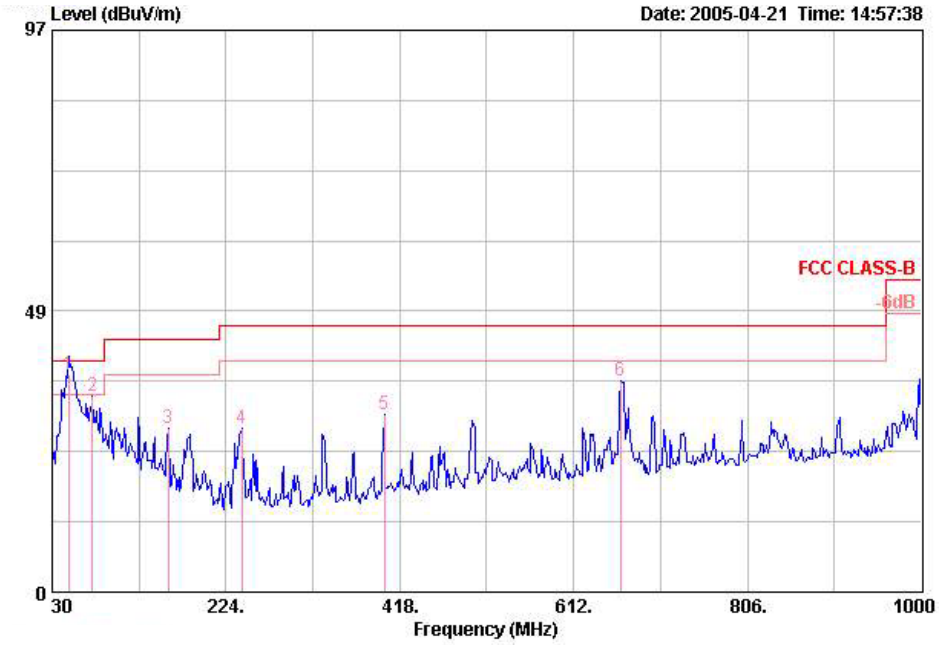
Mode 1

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1 @	254.070	28.53	-17.47	46.00	12.38	1.25	30.11	45.01	HORIZONTAL	Peak
2 @	331.670	32.75	-13.25	46.00	13.90	1.44	30.51	47.94	HORIZONTAL	Peak
3 @	365.620	31.60	-14.40	46.00	14.83	1.51	30.55	45.81	HORIZONTAL	Peak
4 @	400.540	34.18	-11.82	46.00	15.94	1.59	30.35	47.00	HORIZONTAL	Peak
5 @	668.260	33.33	-12.67	46.00	18.91	2.06	30.36	42.71	HORIZONTAL	Peak
6 @	832.190	35.00	-11.00	46.00	20.30	2.32	30.01	42.40	HORIZONTAL	Peak

(B) Polarization: Vertical



	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1 @	48.430	37.57	-2.43	40.00	8.50	0.59	29.83	58.31	VERTICAL	Peak
2 @	74.620	33.73	-6.27	40.00	6.05	0.70	29.98	56.97	VERTICAL	Peak
3 @	159.980	28.33	-15.17	43.50	9.60	1.01	30.16	47.88	VERTICAL	Peak
4 @	241.460	28.35	-17.65	46.00	11.12	1.22	30.09	46.10	VERTICAL	Peak
5 @	400.540	30.73	-15.27	46.00	15.94	1.59	30.35	43.54	VERTICAL	Peak
6 @	664.380	36.56	-9.44	46.00	18.90	2.05	30.35	45.95	VERTICAL	Peak

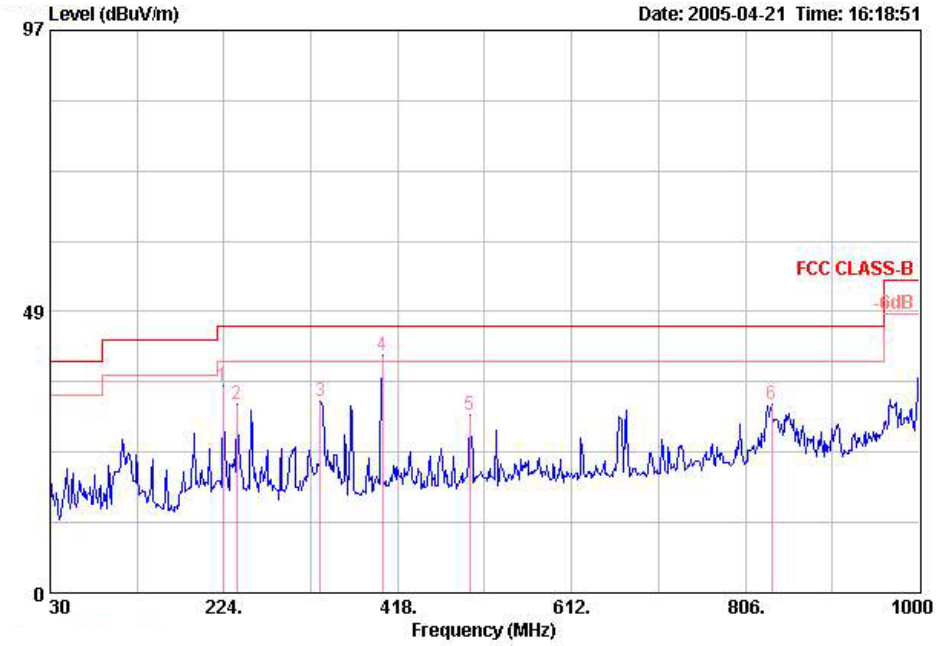
Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.3.8. Test Results for CH 39 / 2441 MHz(for emission below 1GHz)

- Temperature: 19°C
- Relative Humidity: 60%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steven Lu

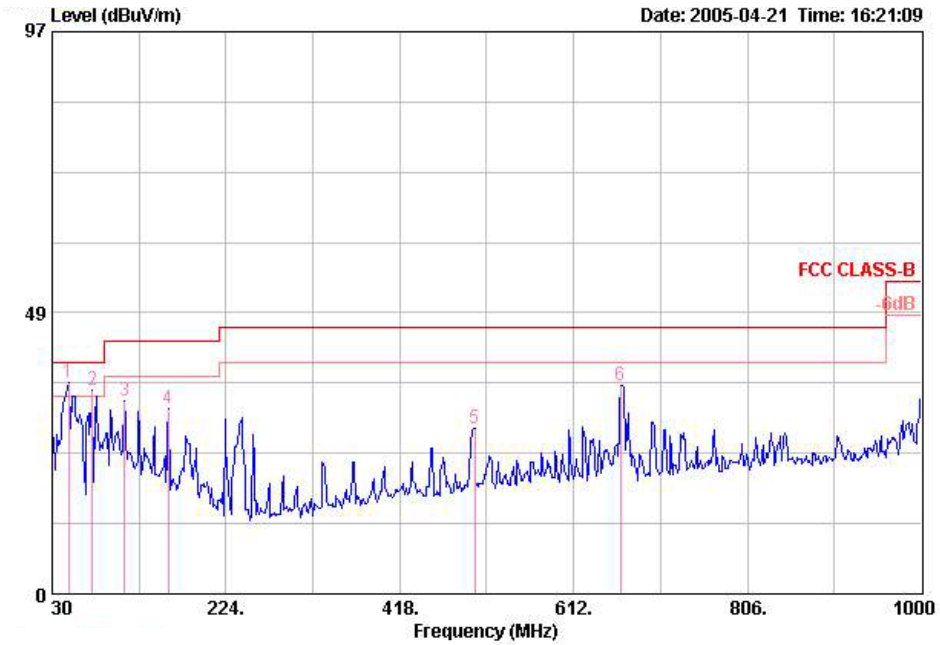
Mode 2

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1 @	223.030	35.66	-10.34	46.00	8.80	1.18	30.04	55.72	HORIZONTAL	Peak
2 @	238.550	32.40	-13.60	46.00	10.80	1.22	30.08	50.46	HORIZONTAL	Peak
3 @	331.670	33.15	-12.85	46.00	13.90	1.44	30.51	48.33	HORIZONTAL	Peak
4 @	400.540	40.97	-5.03	46.00	15.94	1.59	30.35	53.79	HORIZONTAL	Peak
5 @	498.510	30.61	-15.39	46.00	17.36	1.77	30.53	42.01	HORIZONTAL	Peak
6 @	835.100	32.51	-13.49	46.00	20.29	2.33	30.00	39.89	HORIZONTAL	Peak

(B) Polarization: Vertical

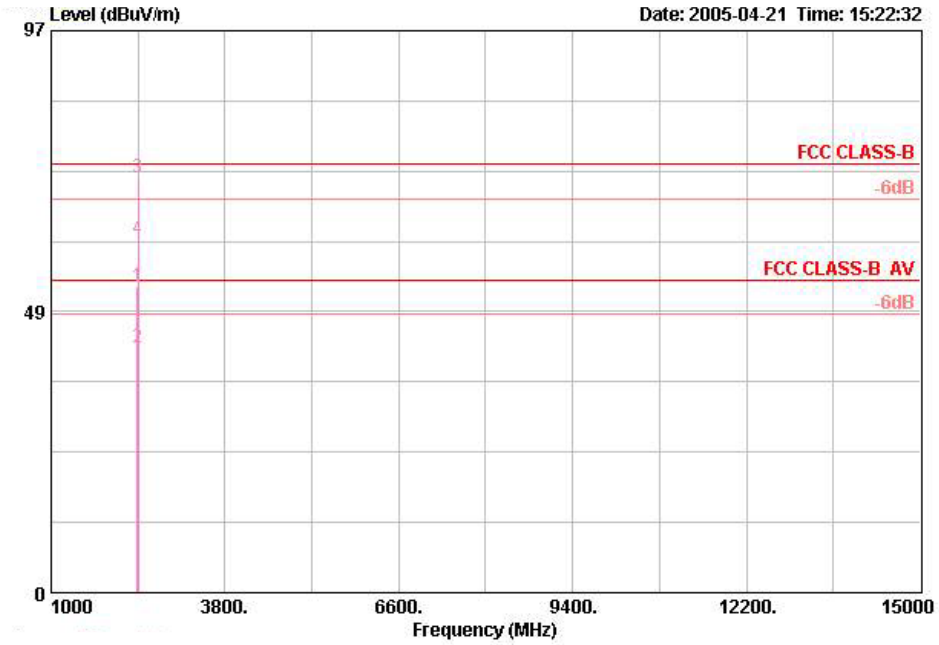


	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1 @	48.430	36.57	-3.43	40.00	8.50	0.59	29.83	57.31	VERTICAL	Peak
2 @	74.620	35.17	-4.83	40.00	6.05	0.70	29.98	58.40	VERTICAL	Peak
3 @	110.510	33.27	-10.23	43.50	11.50	0.84	30.07	51.00	VERTICAL	Peak
4 @	159.980	32.00	-11.50	43.50	9.60	1.01	30.16	51.55	VERTICAL	Peak
5 @	501.420	28.61	-17.39	46.00	17.42	1.77	30.52	39.95	VERTICAL	Peak
6 @	664.380	36.07	-9.93	46.00	18.90	2.05	30.35	45.46	VERTICAL	Peak

5.3.9. Test Results for CH 00 / 2402 MHz (for emission above 1GHz)

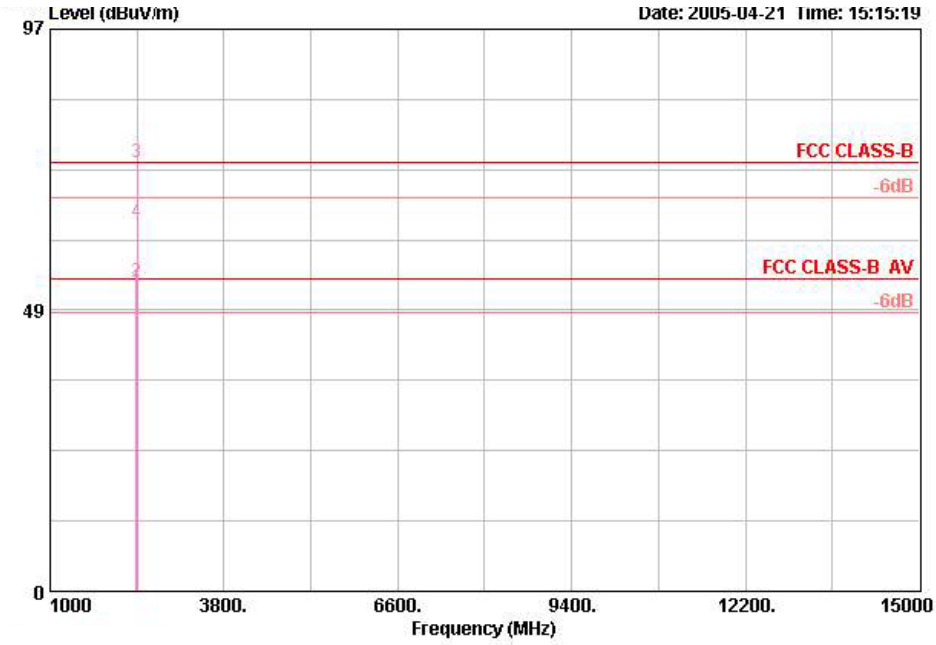
- Temperature: 19°C
- Relative Humidity: 60%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steven Lu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1 @	2390.000	52.79	-21.21	74.00	28.13	2.00	0.00	22.65	HORIZONTAL	PEAK
2 @	2390.000	42.39	-11.61	54.00	28.13	2.00	0.00	12.26	HORIZONTAL	Average

(B) Polarization: Vertical



	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1 @	2390.000	52.38	-21.62	74.00	28.13	2.00	0.00	22.25	VERTICAL	AVERAGE
2 @	2390.000	53.26	-0.74	54.00	28.13	2.00	0.00	23.13	VERTICAL	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.3.10. Test Results for CH 39 / 2441 MHz and CH 79 / 2481 MHz (for emission above 1GHz)

- Temperature: 19°C
- Relative Humidity: 60%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steven Lu

Spurious Emissions are below ambient noise.

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5.3.11. Photographs of Radiated Emission Test Configuration

FRONT VIEW

REAR VIEW

5.4. Antenna Requirements

5.4.1. Standard Applicable

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

5.4.2. Antenna Connected Construction

There is no antenna connector for integral Board Antenna. So there is need to fulfill the unique antenna connector requirement.

5.4.3. Test Criteria

All test results complied with the requirements of Section 15.203.

6. List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Feb. 19, 2005	Conduction (CO04-HY)
2	LISN	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 15, 2005	Conduction (CO04-HY)
3	LISN (Support Unit)	MessTec	NNB-2/16Z	99041	9kHz – 30MHz	Apr. 08, 2005	Conduction (CO04-HY)
4	EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
5	RF Cable-CON	UTIFLEX	3102-26886-4	CB044	9kHz – 30MHz	Apr. 20, 2005	Conduction (CO04-HY)
6	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2004	Radiation (03CH03-HY)
7	Spectrum Analyzer	R&S	FSP40	100004	9KHZ~4GHz	Aug. 31, 2004	Radiation (03CH03-HY)
8	Amplifier	Schaffner	CPA9231A	18667	9KHz – 2GHz	Jan. 04, 2005	Radiation (03CH03-HY)
9	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 23, 2004	Radiation (03CH03-HY)
10	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 23, 2004	Radiation (03CH03-HY)
11	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 02, 2004	Radiation (03CH03-HY)
12	Amplifier	MITEQ	AFS44	879984	1GHz~26.5GHz	Mar. 25, 2005	Radiation (03CH03-HY)
13	Horn Antenna	COMPOWER	AH-118	10092	1GHz – 18GHz	Feb. 18, 2005	Radiation (03CH03-HY)
14	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
15	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
16	Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 09, 2004	Radiation (03CH03-HY)
17	RF Cable-HIGH	SUHNER	SUCOFLES 106	SN30094/6	1GHz~26.5GHz	Mar. 05, 2005	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year.

7. Company Profile

SPORTON Lab. was established in 1986 with one shielded room: the first private EMI test facility, offering local manufacturers an alternative EMI test familial apart from ERSO. In 1988, one 3M and 10M/3M open area test site were setup and also obtained official accreditation from FCC, VCCI and NEMKO. In 1993, a Safety laboratory was founded and obtained accreditation from UL of USA, CSA of Canada and TUV (Rhineland & PS) of Germany. In 1995, one EMC lab, including EMI and EMS test facilities was setup. In 1997, SPORTON Group has provided financial expense to relocate the headquarter to Orient Scientific Park in Taipei Hsien to offer more comprehensive, more qualified and better service to local suppliers and manufactures. In 1999, Safety Group and Component Group were setup. In 2001, SPORTON has established 3M/10M chamber in Hwa Ya Technology Park.

7.1. Certificate of Accreditation

Taiwan	BSMI, CNLA, DGT
USA	FCC, NVLAP, UL
EU	Nemko, TUV
Japan	VCCI
Canada	Industry Canada

7.2. Test Location

SHIJR	ADD： TEL： FAX：	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. 02-2696-2468 02-2696-2255
HWA YA	ADD： TEL： FAX：	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. 03-327-3456 03-318-0055
LINKOU	ADD： TEL： FAX：	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C 02-2601-1640 02-2601-1695
DUNGHU	ADD： TEL： FAX：	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. 02-2631-4739 02-2631-9740
JUNGHE	ADD： TEL： FAX：	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. 02-8227-2020 02-8227-2626
NEIHU	ADD： TEL： FAX：	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C. 02-2794-8886 02-2794-9777

8. CNLA Certificate of Accreditation

Test Lab.	:	Sporton International Inc.
Accreditation Number	:	1190
Originally Accredited	:	2003/12/15
Effective Period	:	2003/12/15~2006/12/14
Accredited Scope	:	47 CFR FCC Part 15 Subpart C (9kHz~40GHz)

Taiwan Accreditation Foundation
Chinese National Laboratory Accreditation
Certificate of Accreditation

Accreditation Criteria:	ISO 17025
Accreditation Number:	1190
Organization/Laboratory:	EMC & Wireless Communications Laboratory,Sporton International Inc.
Originally Accredited:	December 15, 2003
Effective Period:	December 15, 2003 To December 14, 2006
Accredited Scope:	Electrical Testing Field, 7 items, details shown in the following pages.
Specific Accreditation Program:	Recognition and Approval of Designated Laboratory for Commodities Inspection

President, Taiwan Accreditation Foundation
Date:July 19, 2004

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