FCC TEST REPORT

CATEGORY	:	Fixed
PRODUCT NAME	:	Satellite Radio Receiver
FCC ID.	:	NKRUPAUS002
FILING TYPE	:	Certification
BRAND NAME	:	Xact
MODEL NAME	:	UPA-BK
APPLICANT	:	**Wistron NeWeb Corporation** No. 10-1, Li-hsin Road I, Science-baded Industrial Park, Hsinchu 300, Taiwan, R.O.C.
MANUFACTURER	:	Same as applicant
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.
Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

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.

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HISTORY OF THIS TEST REPORT

Received Date: Feb. 05, 2005
Test Date: Feb. 28, 2005
Original Report Issue Date: Mar. 10, 2005
Report No.: FR520501

■ 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	:	Satellite Radio Receiver
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MODEL NAME	:	UPA-BK
APPLICANT	:	**Wistron NeWeb Corporation** No. 10-1, Li-hsin Road I, Science-baded Industrial Park, Hsinchu 300, Taiwan, R.O.C.
MANUFACTURER	:	Same as applicant

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 Feb. 28, 2005 at SPORTON International Inc. LAB.

Dr. Alan Lane
Vice General Manager
Sporton International Inc.

1. General Description of Equipment under Test

1.1. Applicant

Wistron NeWeb Corporation
No. 10-1, Li-hsin Road I, Science-baded Industrial Park, Hsinchu 300, Taiwan, R.O.C.

1.2. Manufacturer

Same as applicant

1.3. Basic Description of Equipment under Test

This product is a FM Transmitter with GPS receiver. The technical data has been listed on section " Features of Equipment under Test ".

1.4. Features of Equipment under Test

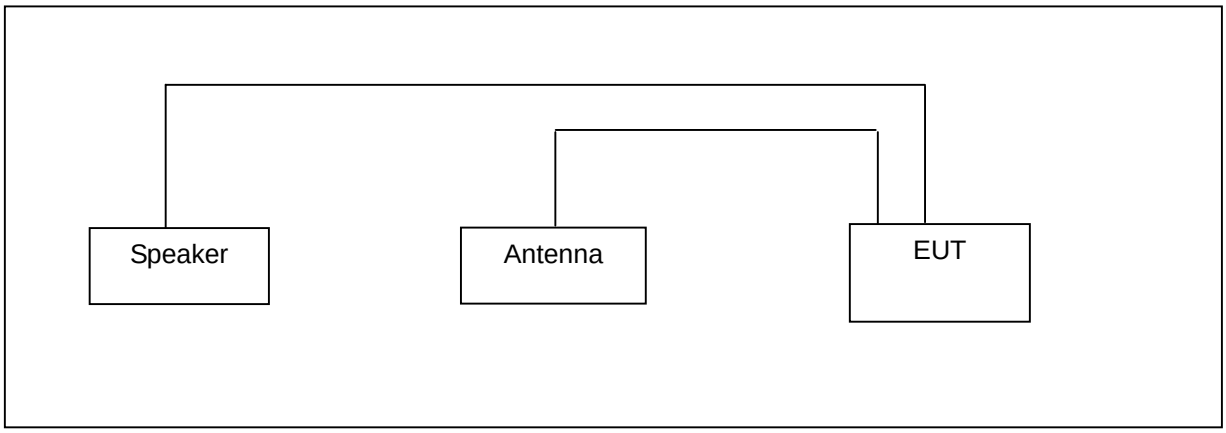
Items	Description
Type of Modulation	FM
Number of Channels	3
Frequency Band	88.10 MHz ~ 107.90 MHz
Carrier Frequency	See section 1.5 for details
Channel Bandwidth	150kHz
Antenna Type	Inverted-F Antenna
Testing Duty Cycle	100.00%
Test Power Source	110VAC to 6.5VDC power adapter
Temperature Range (Operating)	-10 ~ 55 °C

1.5. Table for Carrier Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	88.10 MHz	-	-	-	-	-	-
02	97.01 MHz	-	-	-	-	-	-
03	107.90 MHz	-	-	-	-	-	-
-	-	-	-	-	-	-	-

2. Test Configuration of the Equipment under Test

2.1. Connection Diagram of Test System



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. AC conduction emission is independent of channel selection, there will be no effect on test results so only channel 03 with FM modulation was tested.

2.3. Description of Test Supporting Units

Support unit	Brand	Model No.	Serial No.	FCC ID	Data cable (m)
Speaker	HYUNDAI	KY-480	-	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 / CO01-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. DoC Statement

This EUT is also classified as a device of computer peripheral Class B which DoC has to be followed. It has been verified according to the rule of 47 CFR part 15 Subpart B, and found that all the requirements has been fulfilled.

3.4. Frequency Range Investigated

Radiated emission test: from 30 MHz to 10th carrier harmonic

3.5. Test Distance

The test distance of radiated emission (30MHz~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.

3.6. Test Software

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	15.239(b)	Maximum Field Strength of Fundamental	Pass
5.2	15.207	AC Power Line Conducted Emission	Pass
5.4	15.239(c)	Spurious Radiated Emission	Pass
5.5	15.203	Antenna Requirement	Pass

5. Test Result

5.1. Test of Maximum Field Strength of Fundamental

5.1.1. Applicable Standard

Section 15.239(b): The field strength of fundamental emissions shall not exceed 250 microvolts/meter at 3 meters (measurement instrumentation employing an average detector).

5.1.2. Measuring Instruments

Item 6~17 of the table is on section 6.

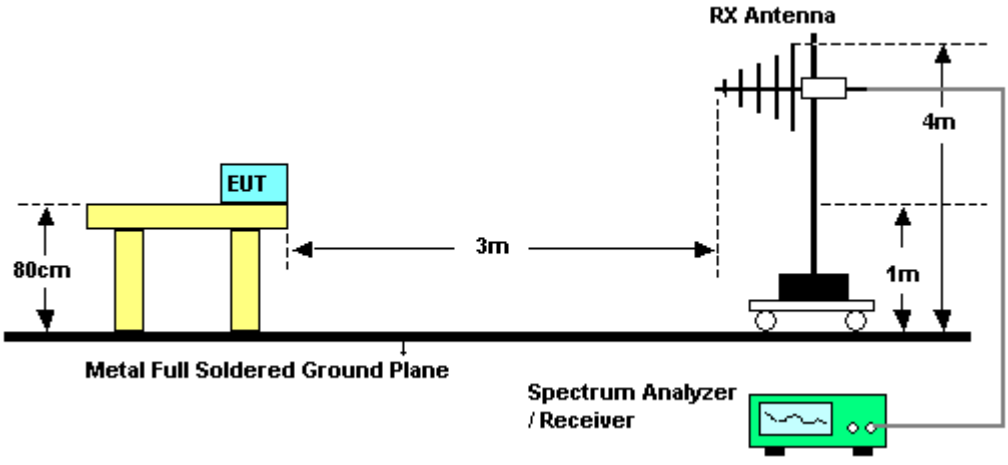
5.1.3. Description of Major Test Instruments Setting

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

5.1.4. 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 9kHz RBW of Receiver for reading under average and peak detector.

5.1.5. Test Setup Layout



5.1.6. Test Criteria

All test results complied with the requirements of 15.239(b). Measurement Uncertainty is 2.26dB.

5.1.7. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ming Da, Kou

Channel No.	Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Detector
01	88.10 MHz	27.41	-12.59	40.00	48.50	Average
01	88.10 MHz	40.05	0.05	40.00	61.14	Peak
02	97.01 MHz	21.67	-18.33	40.00	40.63	Average
02	97.01 MHz	30.93	-12.57	43.50	50.51	Peak
03	107.90 MHz	39.79	-3.71	43.50	57.75	Average
03	107.90 MHz	39.82	-3.68	43.50	57.78	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 Emission Bandwidth

5.2.1. Applicable Standard

Section 錯誤! 找不到參照來源。: Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency.

5.2.2. Measuring Instruments

Item 7 of the table is on section 6.

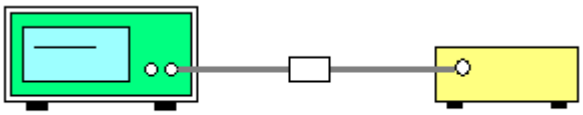
5.2.3. Description of Major Test Instruments Setting

- Spectrum Analyzer : R&S FSP40
  Attenuation : Auto
  Center Frequency : Carrier frequency
  Span Frequency : Suitable for observe
  RB : 10 kHz
  VB : 10 kHz

5.2.4. Test Procedures

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 1% of occupied bandwidth
3. Set the 99% occupied bandwidth function to measure the bandwidth of EUT.

5.2.5. Test Setup Layout



5.2.6. Test Criteria

All test results complied with the requirements of 錯誤! 找不到參照來源。. Measurement Uncertainty is $1x10^{-5}$.

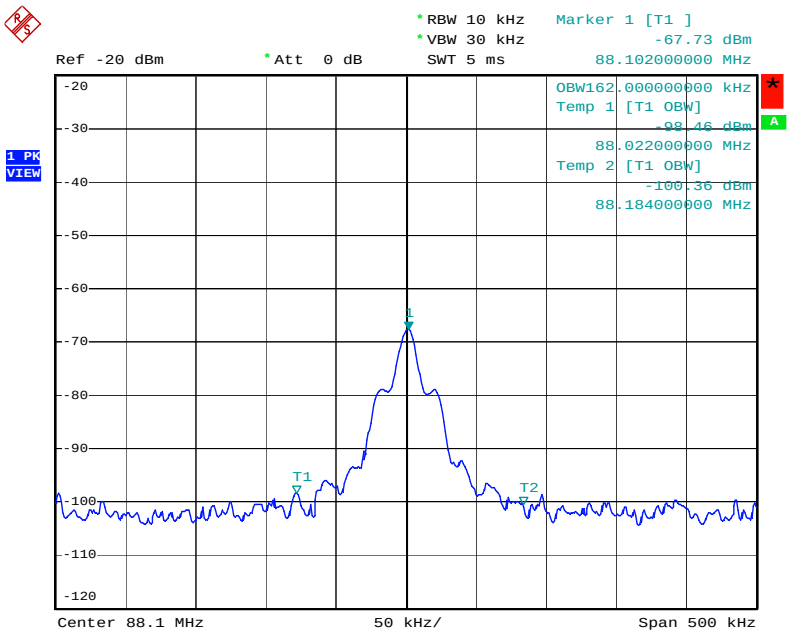
5.2.7. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Bunny Yao

Channel	Frequency (MHz)	Bandwidth (kHz)	Max. Limit (kHz)
01	88.10 MHz		200
02	97.01 MHz		200

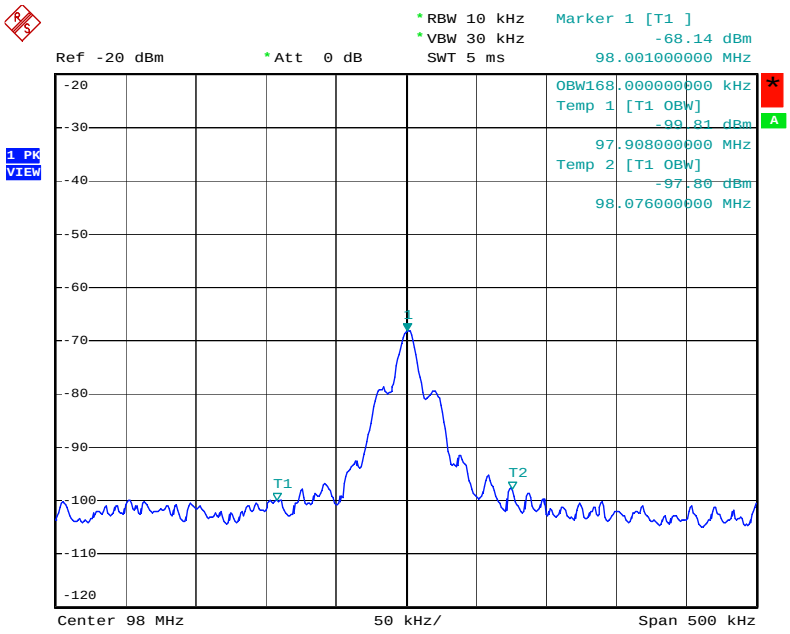
03	107.90 MHz		200

Modulation Type: FM (Channel 01)：



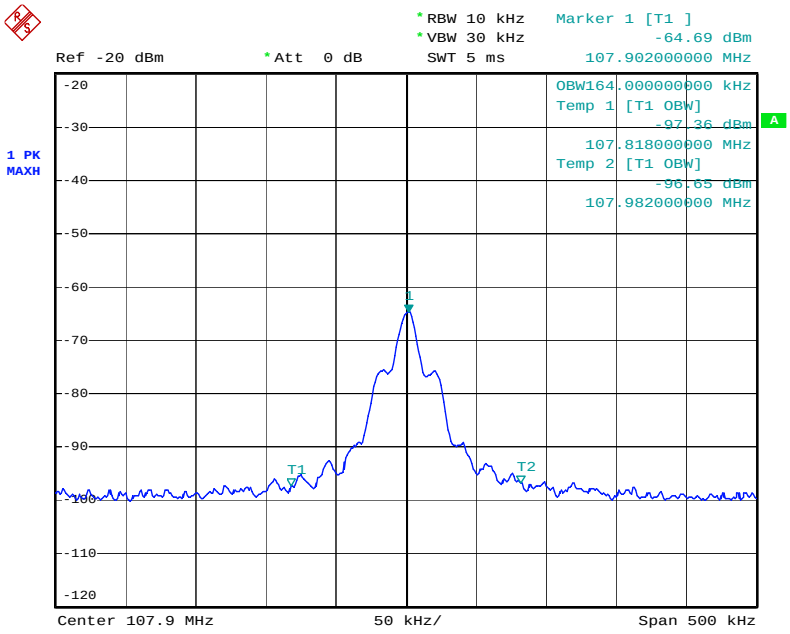
Date: 15.MAR.2005 04:03:17

Modulation Type: FM (Channel 02)：



Date: 15.MAR.2005 04:05:05

Modulation Type: FM (Channel 03)：



Date: 15.MAR.2005 03:56:25

5.3. Test of AC Power Line Conducted Emission

5.3.1. 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

5.3.2. Measuring Instruments

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

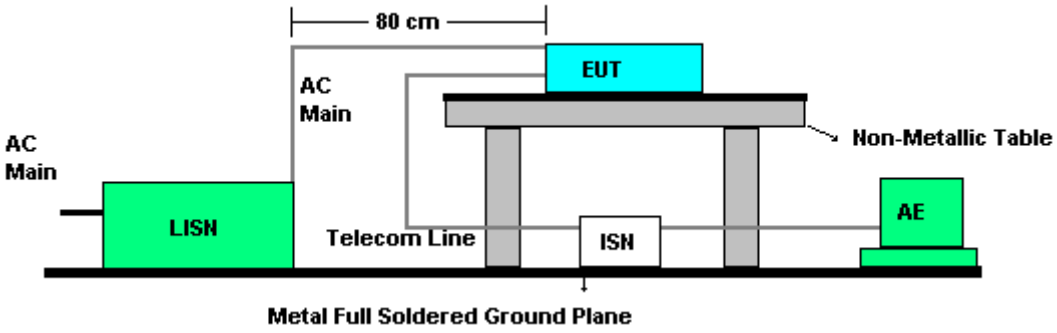
5.3.3. Description of Major Test Instruments Setting

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

5.3.4. 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 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.

5.3.5. Test Setup Layout



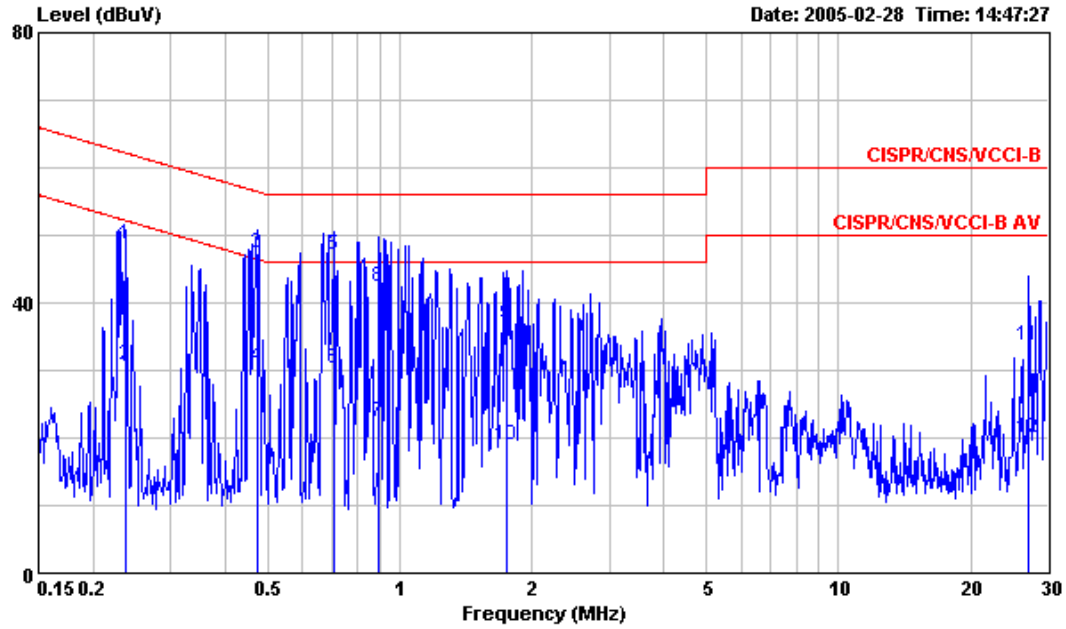
5.3.6. Test Criteria

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

5.3.7. Test Result of Conducted Emission for CH 03 / 107.90 MHz

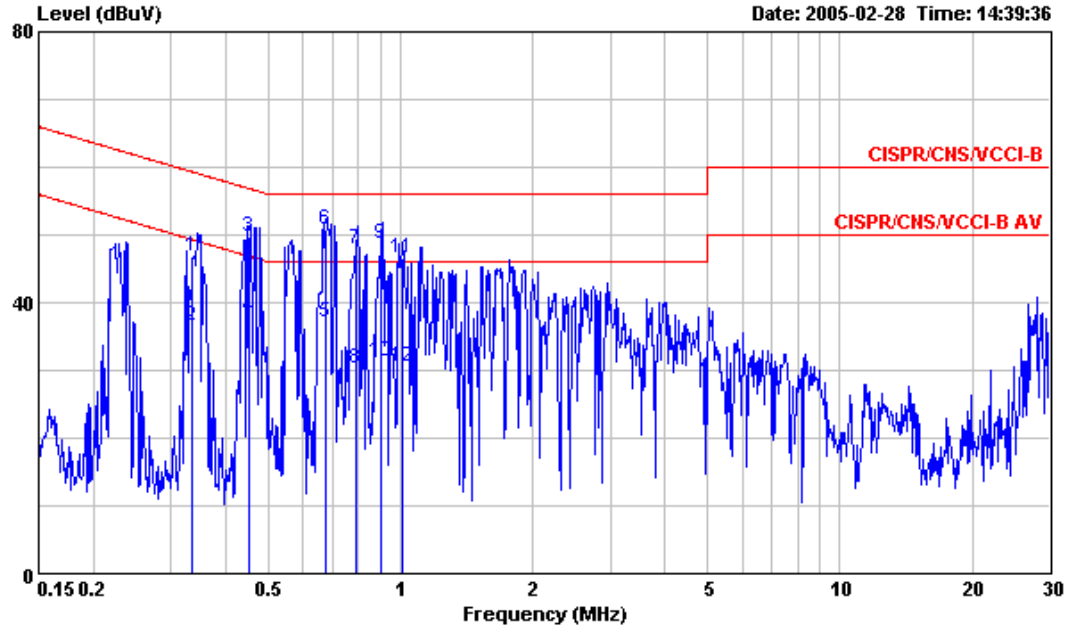
- Temperature: 26°C
- Relative Humidity: 64%
- Test Engineer: Sky Wu

Line to Ground



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2365680	48.75	-13.47	62.22	48.44	0.06	0.25	QP
2	0.2365680	30.79	-21.43	52.22	30.48	0.06	0.25	Average
3	0.4736030	47.26	-9.19	56.45	46.98	0.06	0.22	QP
4	0.4736030	30.42	-16.03	46.45	30.14	0.06	0.22	Average
5	0.7059500	47.01	-8.99	56.00	46.17	0.11	0.73	QP
6	0.7059500	30.24	-15.76	46.00	29.40	0.11	0.73	Average
7	0.8969640	22.28	-23.72	46.00	21.50	0.11	0.67	Average
8	0.8969640	42.42	-13.58	56.00	41.64	0.11	0.67	QP
9	1.754	36.89	-19.11	56.00	36.48	0.11	0.30	QP
10	1.754	18.92	-27.08	46.00	18.51	0.11	0.30	Average
11	27.129	33.60	-26.40	60.00	32.74	0.40	0.46	QP
12	27.129	20.11	-29.89	50.00	19.25	0.40	0.46	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	0.3359100	46.74	-12.56	59.30	46.33	0.11	0.30	QP
2	0.3359100	36.69	-12.61	49.30	36.28	0.11	0.30	Average
3	@0.4502700	49.69	-7.18	56.87	49.34	0.11	0.24	QP
4	0.4502700	37.82	-9.05	46.87	37.47	0.11	0.24	Average
5	0.6763850	37.00	-9.00	46.00	36.10	0.23	0.67	Average
6	@0.6763850	50.85	-5.15	56.00	49.95	0.23	0.67	QP
7	@0.7945250	47.77	-8.23	56.00	46.84	0.23	0.70	QP
8	0.7945250	30.18	-15.82	46.00	29.25	0.23	0.70	Average
9	@0.9061940	48.79	-7.21	56.00	47.89	0.23	0.67	QP
10	0.9061940	31.24	-14.76	46.00	30.34	0.23	0.67	Average
11	1.013	46.61	-9.39	56.00	45.75	0.23	0.63	QP
12	1.013	30.44	-15.56	46.00	29.58	0.23	0.63	Average

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

5.3.8. Photographs of Conducted Emission Test Configuration

FRONT VIEW

REAR VIEW

5.4. Test of Spurious Radiated Emission

5.4.1. Applicable Standard

Section 15.239(c): The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in Section 15.209.

5.4.2. Measuring Instruments

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

5.4.3. 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

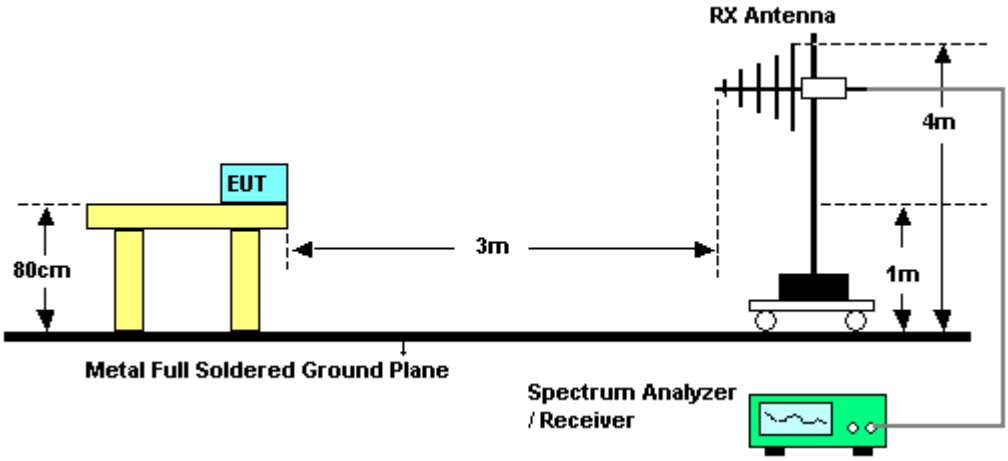
- Test Receiver : R&S ESCS 30
  Attenuation : Auto
  Start Frequency : 30 MHz
  Stop Frequency : 1000 MHz
  RB : 120 KHz for QP or PK

5.4.4. 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.

5.4.5. Test Setup Layout



5.4.6. Test Criteria

All test results complied with the requirements of 15.239(c). Measurement Uncertainty is 2.26dB.

5.4.7. Test Results for CH 01 / 88.10 MHz

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ming Da, Kou

(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		
43.580	14.23	-25.77	40.00	10.30	0.56	29.83	33.19	HORIZONTAL	
87.230	27.41	-12.59	40.00	8.20	0.75	30.04	48.50	HORIZONTAL	
299.660	18.06	-27.94	46.00	13.00	1.37	30.16	33.85	HORIZONTAL	
351.070	19.54	-26.46	46.00	14.44	1.48	30.58	34.20	HORIZONTAL	
418.970	20.45	-25.55	46.00	16.58	1.61	30.36	32.62	HORIZONTAL	
552.830	22.01	-23.99	46.00	18.42	1.87	30.64	32.36	HORIZONTAL	
735.190	23.00	-23.00	46.00	19.86	2.15	30.17	31.16	HORIZONTAL	
850.620	24.15	-21.85	46.00	20.27	2.36	29.93	31.44	HORIZONTAL	

(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		
87.230	40.05	0.05	40.00	8.20	0.75	30.04	61.14	VERTICAL	
118.270	24.48	-19.02	43.50	11.62	0.88	30.04	42.02	VERTICAL	
160.950	20.12	-23.38	43.50	9.55	1.01	30.17	39.72	VERTICAL	
191.020	17.89	-25.61	43.50	8.47	1.09	29.96	38.29	VERTICAL	
552.830	22.02	-23.98	46.00	18.42	1.87	30.64	32.37	VERTICAL	
621.700	22.32	-23.68	46.00	18.72	1.96	30.64	32.27	VERTICAL	
882.630	25.53	-20.47	46.00	20.33	2.39	29.15	31.96	VERTICAL	

Note:

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

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

5.4.8. Test Results for CH 02 / 97.01 MHz

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ming Da, Kou

(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		
94.990	30.93	-12.57	43.50	9.75	0.79	30.12	50.51	HORIZONTAL	
109.540	18.80	-24.70	43.50	11.50	0.84	30.07	36.53	HORIZONTAL	
272.500	15.72	-30.28	46.00	12.50	1.31	30.04	31.95	HORIZONTAL	
299.660	18.23	-27.77	46.00	13.00	1.37	30.16	34.02	HORIZONTAL	
419.940	19.18	-26.82	46.00	16.60	1.61	30.36	31.33	HORIZONTAL	
660.500	22.48	-23.52	46.00	18.90	2.05	30.34	31.88	HORIZONTAL	
780.780	24.01	-21.99	46.00	19.80	2.22	30.10	32.10	HORIZONTAL	

(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		
43.580	21.67	-18.33	40.00	10.30	0.56	29.83	40.63	VERTICAL	
94.990	36.08	-7.42	43.50	9.75	0.79	30.12	55.65	VERTICAL	
118.270	24.43	-19.07	43.50	11.62	0.88	30.04	41.97	VERTICAL	
160.950	19.80	-23.70	43.50	9.55	1.01	30.17	39.40	VERTICAL	
191.020	17.19	-26.31	43.50	8.47	1.09	29.96	37.59	VERTICAL	
400.540	18.58	-27.42	46.00	15.94	1.59	30.35	31.40	VERTICAL	
455.830	19.83	-26.17	46.00	16.52	1.69	30.47	32.09	VERTICAL	
859.350	24.64	-21.36	46.00	20.21	2.37	29.72	31.78	VERTICAL	

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

5.4.9. Test Results for CH 03 / 107.90 MHz

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ming Da, Kou

(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		
30.000	33.80	-6.20	40.00	18.10	0.47	29.80	45.03	HORIZONTAL	
43.580	22.41	-17.59	40.00	10.30	0.56	29.83	41.37	HORIZONTAL	
106.630	39.79	-3.71	43.50	11.29	0.83	30.08	57.75	HORIZONTAL	
125.060	23.00	-20.50	43.50	11.85	0.89	30.03	40.28	HORIZONTAL	
143.490	19.42	-24.08	43.50	10.70	0.94	30.06	37.83	HORIZONTAL	
160.950	19.34	-24.16	43.50	9.55	1.01	30.17	38.94	HORIZONTAL	
188.110	16.51	-26.99	43.50	8.36	1.08	29.98	37.04	HORIZONTAL	
417.030	18.51	-27.49	46.00	16.53	1.61	30.36	30.73	HORIZONTAL	
528.580	20.76	-25.24	46.00	17.70	1.83	30.58	31.81	HORIZONTAL	
722.580	23.01	-22.99	46.00	19.50	2.14	30.26	31.63	HORIZONTAL	
800.180	23.47	-22.53	46.00	20.00	2.26	30.13	31.34	HORIZONTAL	

(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		
30.000	33.42	-6.58	40.00	18.10	0.47	29.80	44.65	VERTICAL	
83.350	20.73	-19.27	40.00	7.40	0.73	29.97	42.57	VERTICAL	
106.630	39.82	-3.68	43.50	11.29	0.83	30.08	57.78	VERTICAL	
160.950	19.20	-24.30	43.50	9.55	1.01	30.17	38.80	VERTICAL	
191.020	17.95	-25.55	43.50	8.47	1.09	29.96	38.35	VERTICAL	
206.540	14.85	-28.65	43.50	8.80	1.13	29.99	34.90	VERTICAL	
292.870	15.68	-30.32	46.00	12.86	1.36	30.08	31.54	VERTICAL	
361.740	17.17	-28.83	46.00	14.81	1.50	30.56	31.42	VERTICAL	
463.590	20.03	-25.97	46.00	16.73	1.71	30.50	32.10	VERTICAL	
579.990	21.60	-24.40	46.00	18.70	1.90	30.78	31.78	VERTICAL	
649.830	21.70	-24.30	46.00	18.89	2.02	30.32	31.11	VERTICAL	
754.590	23.60	-22.40	46.00	19.91	2.16	30.07	31.60	VERTICAL	
827.340	23.66	-22.34	46.00	20.27	2.31	30.03	31.11	VERTICAL	
908.820	26.28	-19.72	46.00	20.59	2.43	28.79	32.06	VERTICAL	

Note:

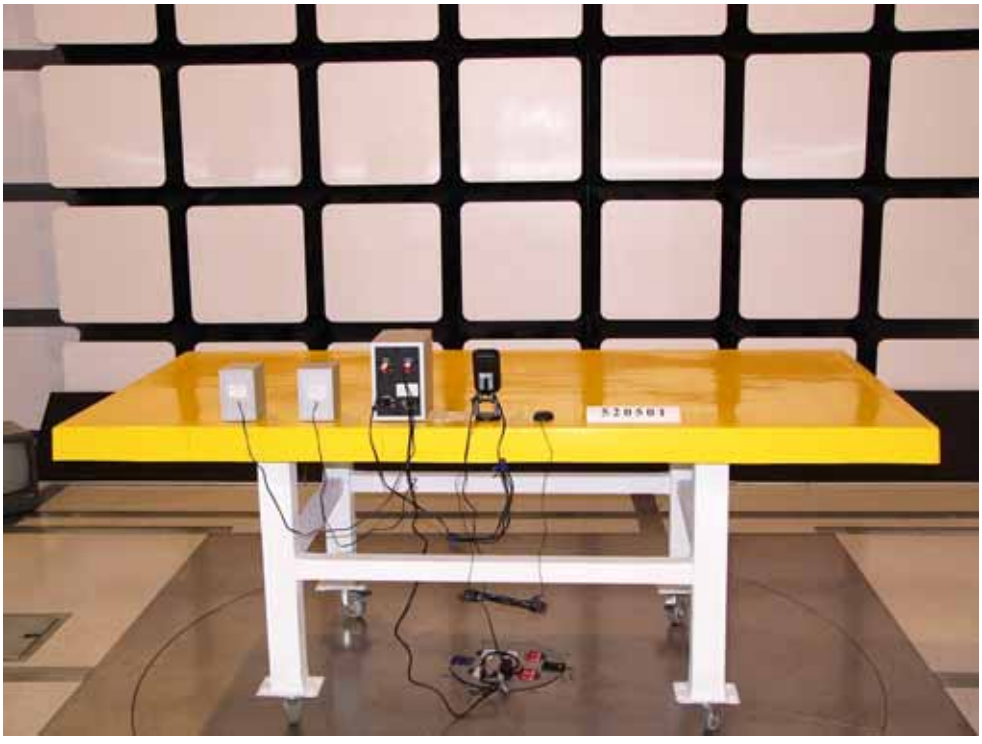
Emission level (dBuV/m) = 20 log Emission level (uV/m)

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

5.4.10. Photographs of Radiated Emission Test Configuration

FRONT VIEW

REAR VIEW



5.5. Antenna Requirements

5.5.1. 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.

5.5.2. Antenna Connected Construction

There is no antenna connector for Inverted-F antenna.

5.5.3. Test Criteria

All test results complied with the requirements of 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	100132	9 KHz – 2.75 GHz	Jun. 23, 2004	Conduction (CO01-HY)
2	LISN	MessTec	NNB-2/16Z	2001/008	9 KHz – 30 MHz	May 03, 2004	Conduction (CO01-HY)
3	LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9 KHz – 30 MHz	Apr. 19, 2004	Conduction (CO01-HY)
4	EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	Conduction (CO01-HY)
5	EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	Conduction (CO01-HY)
6	RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Dec. 23, 2004	Conduction (CO01-HY)
7	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2004	Radiation (03CH03-HY)
8	Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 31, 2004	Radiation (03CH03-HY)
9	Amplifier	SCHAFFNER	CPA9231A	18667	9KHz – 2GHz	Jan. 10, 2005	Radiation (03CH03-HY)
10	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 28, 2004	Radiation (03CH03-HY)
11	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 28, 2004	Radiation (03CH03-HY)
12	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 02, 2004	Radiation (03CH03-HY)
13	Amplifier	MITEQ	AFS44	849984	100MHz~26.5GHz	Mar. 26, 2004	Radiation (03CH03-HY)
14	Horn Antenna	EMCO	3115	6741	1GHz – 18GHz	Apr. 07, 2004	Radiation (03CH03-HY)
15	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
16	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
17	Horn Antenna	Schwarzbeck	BBHA9170	154	18GHz~40GHz	Jun. 09, 2004	Radiation (03CH03-HY)
18	RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 04, 2004	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：	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL：	02-2696-2468
	FAX：	02-2696-2255
HWA YA	ADD：	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL：	03-327-3456
	FAX：	03-318-0055
LINKOU	ADD：	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL：	02-2601-1640
	FAX：	02-2601-1695
DUNGHU	ADD：	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL：	02-2631-4739
	FAX：	02-2631-9740
JUNGHE	ADD：	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL：	02-8227-2020
	FAX：	02-8227-2626
NEIHU	ADD：	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL：	02-2794-8886
	FAX：	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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