

FCC TEST REPORT

for

47 CFR, Part 2, Part 15 and CISPR PUB. 22 Class A

Equipment : Industrial Panel PCs
Model No. : AMB-2020HT/HTT
FCC ID : N/A
Filing Type : Verification
Applicant : **AAEON Technology Inc.**
5F, No. 135, Lane 235, Pao-Chiao Rd.,
Hsin-Tien, Taipei, Taiwan

- The test result refers exclusively to the test presented test model / sample.
- Without the written authorization of the test lab., the Test Report may not be copied.
- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

SPORTON International Inc.

TEL : 886-2-2696-2468
FAX : 886-2-2696-2255

FCC ID : N/A
Page No. : 1 of 22
Issued Date : Dec. 13, 2000

6F, No.106, Sec.1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C. TEL:886-2-26962468 FAX:886-2-26962255

Scope of NVLAP Accreditation: FCC/ISPR 22, FCC Method - 47 CFR Part 15 - Digital Devices, AS-2048



CERTIFICATE OF COMPLIANCE

according to

**European Standard EN 55022:1994/A1:1995/A2:1997 Class A
EN61000-3-2:1995/A12:1996/A13:1997/A1:1998/A2:1998,
EN 61000-3-3:1995/A1:1998 and EN 55024:1998
(EN61000-4-2:1995, EN61000-4-3:1996, EN61000-4-4:1995,
EN61000-4-5:1995, EN61000-4-6:1996, EN61000-4-8:1993,
EN61000-4-11:1994)**

Equipment : Industrial Panel PCs

Model No. : AMB-2020HT/HTT

Applicant : **AAEON Technology Inc.**
5F, No. 135, Lane 235, Pao-Chiao Rd.,
Hsin-Tien, Taipei, Taiwan

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in EUROPEAN COUNCIL DIRECTIVE 89/336/EEC. The equipment was *passed* the test performed according to European Standard EN 55022:1994/A1:1995/A2:1997 Class A , EN61000-3-2:1995/A12:1996/A13:1997/A1:1998/A2:1998, EN61000-3-3:1995/A1:1998 and EN 55024:1998 (EN61000-4-2:1995, EN61000-4-3:1996, EN61000-4-4:1995, EN61000-4-5:1995, EN61000-4-6:1996, EN61000-4-8:1993, EN61000-4-11:1994). The test was carried out on Dec. 18, 2000 at SPORTON International Inc. LAB. in Nei Hwu and Lin Kou.

K. J. Lin Dec. 21, 2000

K. J. Lin
Manager

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

SPORTON International Inc.

TEL : 886-2-2696-2468
FAX : 886-2-2696-2255

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1. General Description of Equipment under Test

1.1. Applicant

AAEON Technology Inc.
5F, No. 135, Lane 235, Pao-Chiao Rd.,
Hsin-Tien, Taipei, Taiwan

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment : Industrial Panel PCs
Model No. : AMB-2020HT/HTT
FCC ID : N/A
Trade Name : AAEON
Data cable : Please see section 2.2 of this test report for details
TP Cable : Non-Shielded, 10m
Power Supply Type : Switching
Power Cord : Non-Shielded, 1.75m, 3 pin

1.4. Feature of Equipment under Test

- 12.1" SVGA color chassis and NEMA. 4/12 compliant plastic front panel
- All-in-one SBC, MediaGX 233MHz
- Brightness and LCD power on/off controller on the aluminum alloy front panel (aluminum front panel optional)
- 16-bit stereo digital audio (optional)
- Four 16C550 RS-232C port, one RS-232C port can be set as RS-422/485 also
- Disk Drive Space for CD-ROM, FDD and HDD
- DiskOnChip flash disk socket
- PC/104 expansion connector
- CPU (Geode™): GXLV 233MHz
- HDD(TOSHIBA): HDD 2143 / Z9N83397T
- Power supply: MPE / MPE-8071 / 100 – 250V

2. Test Configuration of Equipment under Test

2.1. Test Manner

- a. The EUT has been associated peripherals pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The SONY Monitor, DELL PS/2 Keyboard, PRIMAX PS/2 Mouse, BTC USB Keyboard, HP Printer and ACEEX Modem were connected to the EUT for EMI test. The remote workstation included FIC PC, SONY Monitor, DELL PS/2 Keyboard and PRIMAX PS/2 Mouse
- c. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 2000MHz.

2.2. Description of Test System

Support Unit 1. -- Monitor (SONY) for local and remote workstation

FCC ID : AK8GDM17SE2T
Model No. : GDM-17SE2T
Power Supply Type : Switching
Power Cord : Non-Shielded
Serial No. : SP0013
Data Cable : Shielded, 360 degree via metal backshells, 1.15m

Support Unit 2. -- PS/2 Keyboard (DELL) for local and remote workstation

FCC ID : GYUR50SK
Model No. : AT101W
Power Supply Type : From PC
Power Cord : Shielded
Serial No. : SP00188
Data Cable : Shielded, 360 degree via metal backshells, 1.5m

Support Unit 3. -- PS/2 Mouse (PRIMAX) for local and remote workstation

FCC ID : EMJMUSJQ
Model No. : MUS9J
Serial No. : SP0045
Data Cable : Shielded, 360 degree via metal backshells, 1.7m

Support Unit 4. -- USB Keyboard (BTC) for local workstation

FCC ID : E5XKBUC010410
Model No. : 7932
Serial No. : SP0090
Data Cable : Shielded, 360 degree via metal backshells, 1.8m

Support Unit 4. -- USB Keyboard (BTC) for local workstation

FCC ID : E5XKBUC010410
Model No. : 7932
Serial No. : SP0090
Data Cable : Shielded, 360 degree via metal backshells, 1.8m

Support Unit 5. -- Printer (HP) for local workstation

FCC ID : DSI6XU2225
Model No. : 2225C
Power Supply Type : Linear
Power Cord : Non-Shielded
Serial No. : SP0014
Data Cable : Shielded, 360 degree via metal backshells, 1.35m

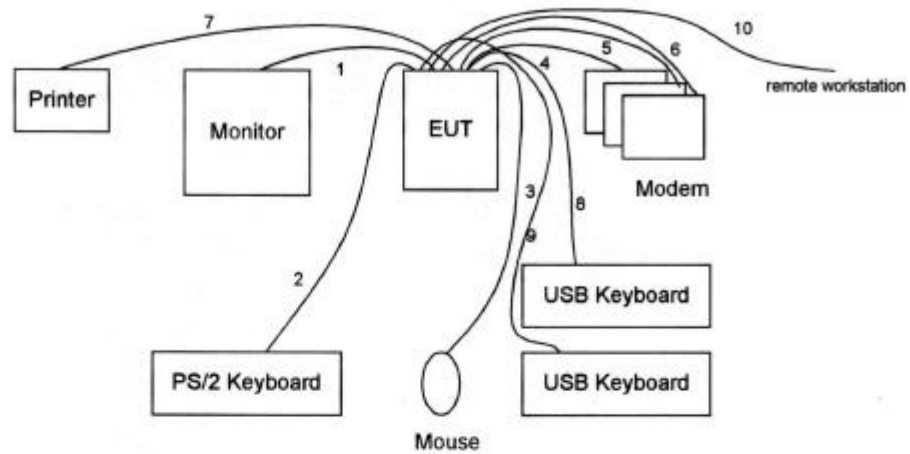
Support Unit 6. -- Modem (ACEEX) for local workstation

FCC ID : IFAXDM1414
Model No. : DM1414
Power Supply Type : Linear
Power Cord : Non-Shielded
Serial No. : SP0015
Data Cable : Shielded, 360 degree via metal backshells, 1.15m

Support Unit 7. -- Personal Computer (FIC) for remote workstation

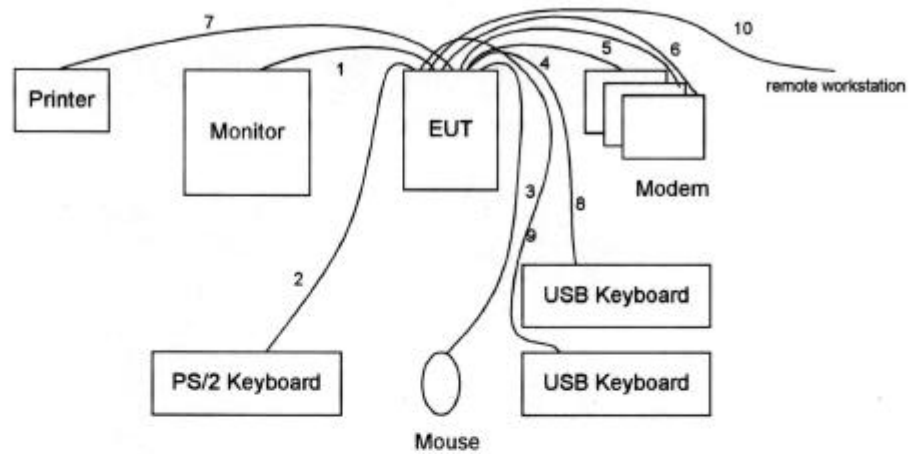
FCC ID : N/A
Model No. : P2L97
Power Supply Type : Switching
Power Cord : Non-Shielded
Serial No. : SP0037
Data Cable : Shielded, 360 degree via metal backshells
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

2.3. Connection Diagram of Test System



1. The I/O cable is connected from EUT to the support unit 1.
2. The I/O cable is connected from EUT to the support unit 2.
3. The I/O cable is connected from EUT to the support unit 3.
4. The I/O cable is connected from EUT to the support unit 6.
5. The I/O cable is connected from EUT to the support unit 6.
6. The I/O cable is connected from EUT to the support unit 6.
7. The I/O cable is connected from EUT to the support unit 5.
8. The I/O cable is connected from EUT to the support unit 4.
9. The I/O cable is connected from EUT to the support unit 4.
10. The TP cable is connected from EUT to the remote workstation.

2.3. Connection Diagram of Test System



1. The I/O cable is connected from EUT to the support unit 1.
2. The I/O cable is connected from EUT to the support unit 2.
3. The I/O cable is connected from EUT to the support unit 3.
4. The I/O cable is connected from EUT to the support unit 6.
5. The I/O cable is connected from EUT to the support unit 6.
6. The I/O cable is connected from EUT to the support unit 6.
7. The I/O cable is connected from EUT to the support unit 5.
8. The I/O cable is connected from EUT to the support unit 4.
9. The I/O cable is connected from EUT to the support unit 4.
10. The TP cable is connected from EUT to the remote workstation.

4. General Information of Test

4.1. Test Facility

This test was carried out by SPORTON International Inc.

Test Site Location : No. 3, Lane 238, Kang Lo Street, Nei Hwu District,
Taipei 11424, Taiwan, R.O.C.
TEL : 886-2-2631-4739
FAX : 886-2-2631-9740

4.2. Standard for Methods of Measurement

ANSI C63.4-1992

4.3. Test in Compliance with

CISPR PUB. 22 Class A

4.4. Frequency Range Investigated

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation : from 30 MHz to 2,000 MHz

4.5. Test Distance

- a. The test distance of radiated emission from antenna to EUT is 10 M (from 30MHz~1000MHz).
- b. The test distance of radiated emission from antenna to EUT is 3 M (from 1GHz~2GHz).

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-1992 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

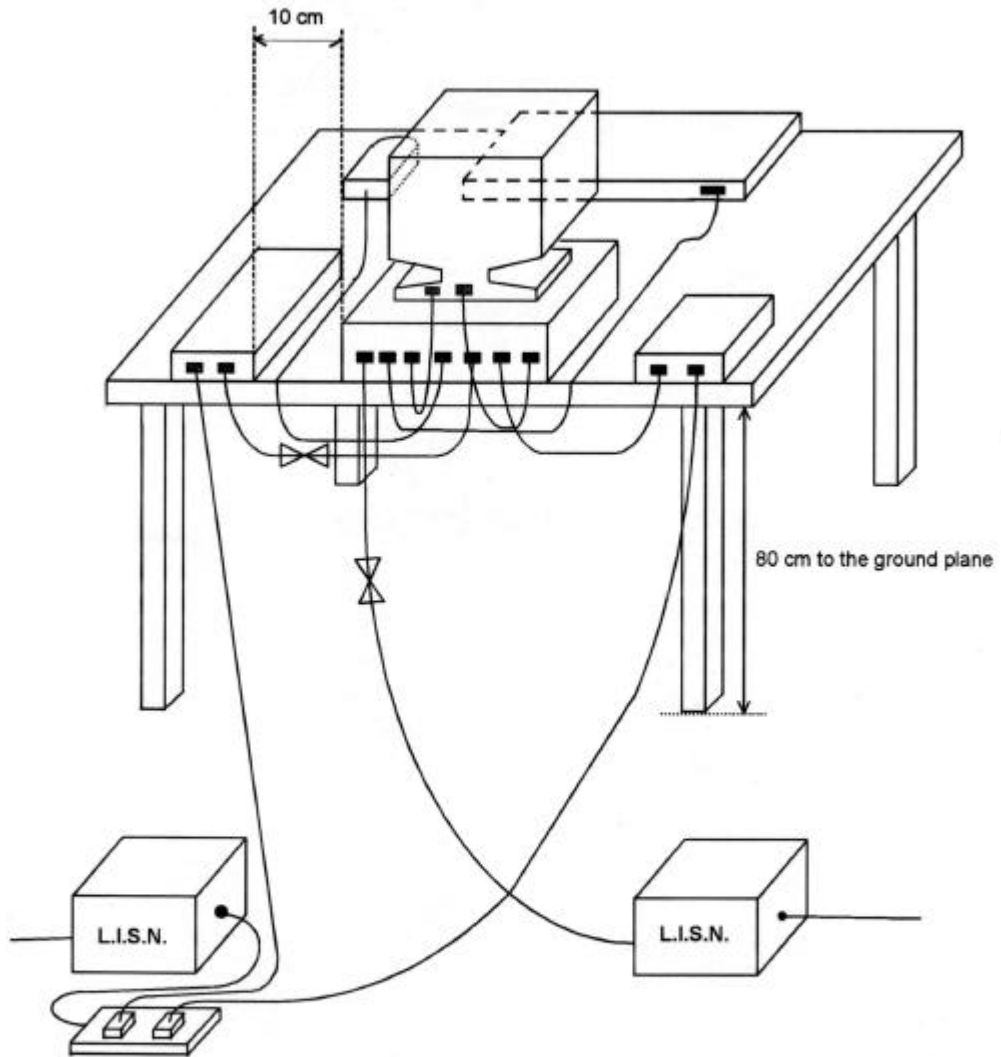
5.1. Major Measuring Instruments

Test Receiver	HP 8591EM
Attenuation	0 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
Step MHz	0.007 MHz
IF Bandwidth	9 kHz

5.2. Test Procedures

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connect to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- i. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be retested one by one using the quasi-peak method and reported.

5.3. Typical Test Setup Layout of Conducted Powerline



5.4. Test Result of AC Powerline Conducted Emission

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 53 %
- Test Date : Nov. 21, 2000

The Conducted Emission test was passed at minimum margin LINE 15.665 MHz / 37.60 dBuV.

Freq. (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.206	L	27.90	25.90	24.83	19.72	79.00	66.00	8912.51	1995.26	-51.1	-40.1
13.651	L	30.50	32.80	33.50	43.65	73.00	60.00	4466.84	1000.00	-42.5	-27.2
15.665	L	37.20	37.60	72.44	75.86	73.00	60.00	4466.84	1000.00	-35.8	-22.4
0.158	N	37.40	22.50	74.13	13.34	79.00	66.00	8912.51	1995.26	-41.6	-43.5
13.615	N	29.90	26.40	31.26	20.89	73.00	60.00	4466.84	1000.00	-43.1	-33.6
15.096	N	22.90	15.90	13.96	6.24	73.00	60.00	4466.84	1000.00	-50.1	-44.1

Test Engineer : Benson
 BENSON TSAI

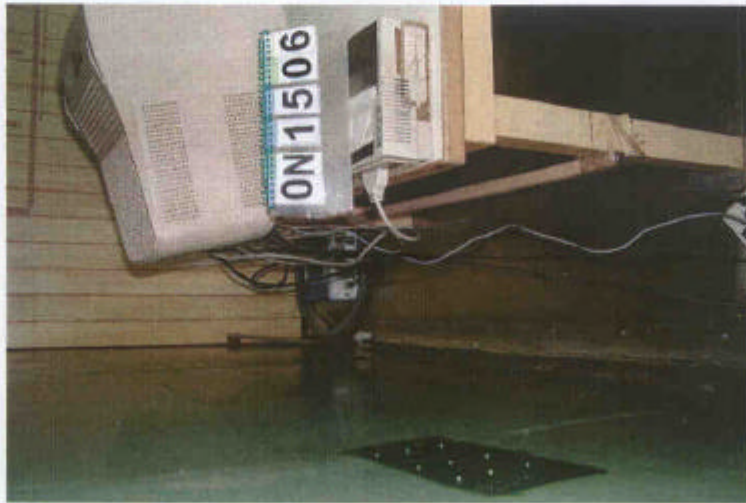
5.5. Photographs of Conducted Powerline Test Configuration

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

FRONT VIEW



REAR VIEW



SIDE VIEW



6. Test of Radiated Emission

Radiated emissions from 30 MHz to 2,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

6.1. Major Measuring Instruments

6.1.1. from 30MHz to 1GHz

- Amplifier (HP 8447D)
 - Attenuation 0 dB
 - RF Gain 25 dB
 - Signal Input 0.1 MHz to 1.3 GHz

- Spectrum Analyzer (ADVANTEST R3261C)
 - Attenuation 0 dB
 - Start Frequency 30 MHz
 - Stop Frequency 1000 MHz
 - Resolution Bandwidth 1 MHz
 - Video Bandwidth 1 MHz
 - Signal Input 9 KHz to 2.6 GHz

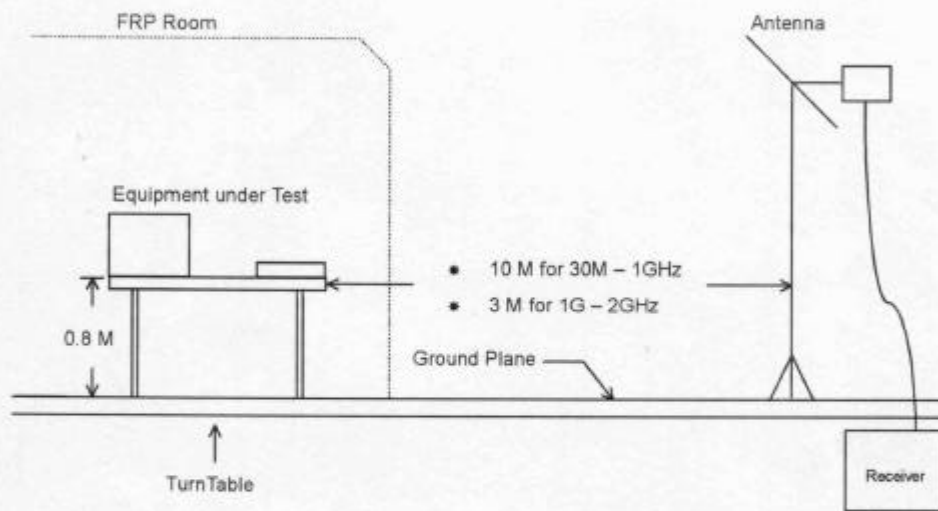
6.1.2. from 1GHz to 2GHz

- Receiver (HP 8546A)
 - Attenuation 0 dB
 - Start Frequency 1000 MHz
 - Stop Frequency 2000 MHz
 - Resolution Bandwidth 1 MHz
 - Video Bandwidth 1 MHz
 - Signal Input 9 KHz to 6.5GHz

6.2. Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. Typical Test Setup Layout of Radiated Emission



6.4. Test Result of Radiated Emission

- Frequency Range of Test : from 30 MHz to 1,000 MHz
- Temperature : 23°C
- Relative Humidity : 51 %
- Test Date : Nov. 15, 2000
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin

127.914 MHz / 36.91 dBuV (VERTICAL) Antenna Height 1 Meter, Turntable Degree 90 °.

Test Distance : 10M for 30MHz ~ 1GHz

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV/m)	Level (uV/m)	Margin (dB)
					(dBuV/m)	(uV/m)			
147.986	H	10.75	2.34	23.49	40.00	100.00	36.58	67.45	-3.42
187.084	H	9.42	2.64	24.35	40.00	100.00	36.41	66.15	-3.59
504.800	H	18.38	4.68	20.29	47.00	223.87	43.35	147.06	-3.65
127.914	V	11.39	2.19	23.33	40.00	100.00	36.91	70.06	-3.09
199.886	V	9.33	2.75	24.50	40.00	100.00	36.58	67.45	-3.42
227.200	V	10.77	3.03	22.61	40.00	100.00	36.41	66.15	-3.59

Test Distance : 3M for 1GHz ~ 2GHz

Remark: Frequency from 1000MHz to 2000MHz, the emission emitted by the EUT is too low to be measured

Test Engineer : Benson Tsai
 BENSON TSAI

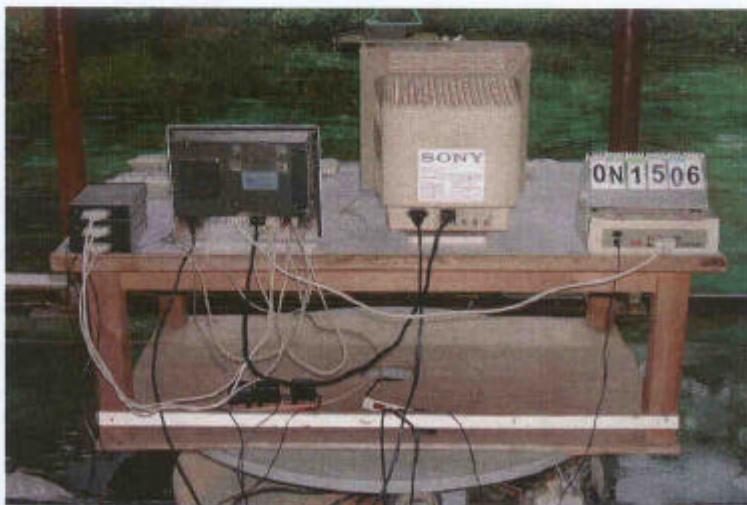
6.5. Photographs of Radiated Emission Test Configuration

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

FRONT VIEW



REAR VIEW



7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	19.2	0.8
35	13.4	0.8
40	13.4	1.0
45	11.5	1.0
50	9.9	1.0
55	7.9	1.1
60	6.0	1.2
65	6.4	1.3
70	6.8	1.4
75	7.1	1.5
80	7.3	1.4
85	8.2	1.5
90	9.2	1.5
95	10.1	1.8
100	11.0	1.8
110	11.4	2.0
120	11.8	2.1
130	11.3	2.2
140	10.8	2.3
150	10.7	2.4
160	9.7	2.4
170	9.4	2.5
180	9.5	2.7
190	9.4	2.6
200	9.3	2.8
220	10.4	3.0
240	11.4	3.2
260	12.2	3.1
280	12.5	3.3
300	12.9	3.4
320	13.3	3.5
340	13.7	3.8
360	14.5	4.0
380	15.5	4.0
400	16.5	4.1
450	16.5	4.3
500	18.3	4.6
550	18.9	5.0
600	20.1	5.1
650	18.1	5.2
700	17.2	5.7
750	17.9	5.9
800	18.0	6.3
850	17.7	6.8
900	21.0	6.8
950	21.0	7.0
1000	20.3	7.4
2000	28.1	5.8

NHOP3

SPORTON International Inc.

TEL : 886-2-2696-2468

FAX : 886-2-2696-2255

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8. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	HP	8591EM	3536A00673	9 KHz - 1.8 GHz	Sep. 04, 2000	Conduction
LISN	EMCO	3810/2	9703-1838	50uH / 50 ohm	Sep. 01, 2000	Conduction
LISN	ROLF HEINE	NNB-2/16Z	99079	50uH / 50 ohm	Dec. 14, 1999	Conduction
Power Filter	CORCOM	MR12030	N/A	30A*2	N/A	Conduction
Spectrum Analyzer (site 3)	Advantest	R3261C	71720471	9KHz - 2.6GHz	Jan. 06, 2000	Radiation
Amplifier (Site 3)	HP	8447D	2944A06292	0.1MHz -1.3GHz	Feb. 19, 2000	Radiation
Bilog Antenna (Site 3)	CHASE	CBL6112A	2218	30MHz - 2GHz	Jan. 29, 2000	Radiation
Half-wave dipole antenna (Site 3)	EMCO	3121C	8912-1285	20MHz - 1GHz	Aug. 06, 2000	Radiation
Turn Table	EMCO	2080	9508-1805	0 - 360 degree	N/A	Radiation
Antenna Mast	EMCO	2075	9804-2151	1 m - 4 m	N/A	Radiation
Receiver	HP	8546A	3325A00108	9KHz-6.5GHz	Dec.15, 1999	Radiation

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TEL : 886-2-2696-2468

FAX : 886-2-2696-2255

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APPENDIX A. Photographs of EUT



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0N1506-02.jpg



0N1506-03.jpg



0N1506-04.jpg



0N1506-05.jpg



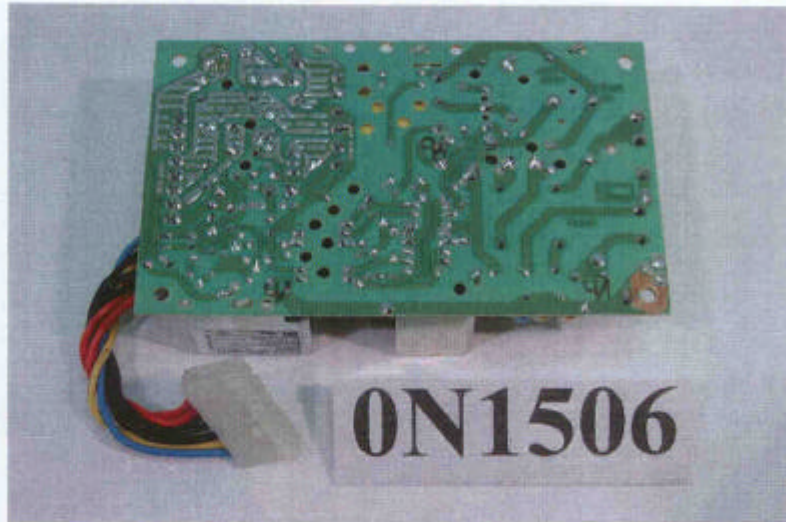
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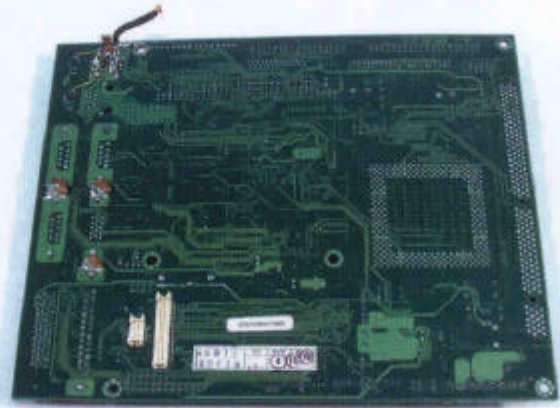
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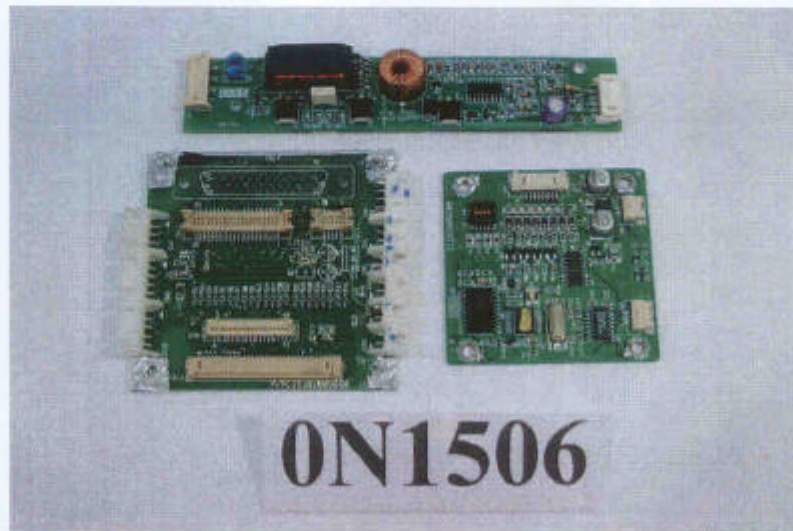


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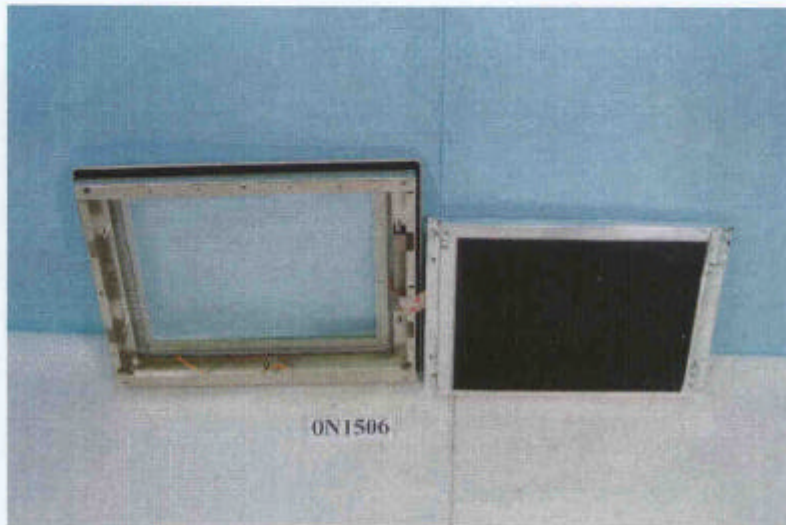
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