

EMC TEST REPORT

of

EN 55022:1998/A1:2000 Class B
EN 61000-3-2:2000
EN 61000-3-3:1995/A1:2001
EN 55024:1998/A1: 2001
AS/NZS CISPR22: 2002, Class B

Equipment :Network Camera

Model (Brand) Name :IP6122 (VIVOTEK)

Applicant :VIVOTEK INC.

6F, No. 192, Lien-Cheng Rd., Chung-Ho, Taipei County, Taiwan,
R.O.C.

Manufacturer :Same as applicant

Statements

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

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SPORTON International Inc.

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



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Appendix A. Photographs of EUT..... A1 ~ A32



Report No.: EC462817-05

Certificate No.: EC462817-05

CERTIFICATE OF COMPLIANCE

with

EN 55022:1998/A1:2000 Class B
EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001
EN 55024:1998/A1:2001 (IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4,
IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11)
AS/NZS CISPR22: 2002, Class B

Equipment : Network Camera

Model (Brand) Name : IP6122 (VIVOTEK)

Applicant : VIVOTEK INC.

6F, No. 192, Lien-Cheng Rd., Chung-Ho, Taipei County, Taiwan,
R.O.C.

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 test requirement regulated in the standards listed above has been performed and found in compliance with the standard. The test was carried out on Feb. 22, 2005 at **SPORTON International Inc. LAB**.


Wayne Hsu / Supervisor
Sporton International Inc.



1. General Description of Equipment under Test

1.1 Applicant

VIVOTEK INC.

6F, No. 192, Lien-Cheng Rd., Chung-Ho, Taipei County, Taiwan, R.O.C.

1.2 Manufacturer

Same as applicant

1.3 Basic Description of Equipment under Test

This product is an internet camera. The image captured by this camera can be transmitted to PC and Notebook via internet.

1.4 Equipment Ancillary

LAN cable	: 1 meter, non-shielded.
Power Source	: 2 pin, wall mounted, power adapter.
DC Power Cord	: 1.8 meter, 2 pin, non-shielded.



2. Test Configuration of Equipment under Test

2.1 Test Manner

- a. During testing, the equipment was placed on a non-conducting support.
- b. Frequency range investigated: 30 MHz to 1000MHz for radiation test.

2.2 Description of Test Supporting Units

< EMI >

Support Unit 1. – P.C. (COMPAQ)

FCC ID	: N/A
Model No.	: Evo D380MX
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. – Monitor (SONY)

FCC ID	: N/A
Model No.	: CPD-G420
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 3. – PS2 Mouse (COMPAQ)

FCC ID	: N/A
Model No.	: M-S69
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.



Support Unit 4. – Printer (EPSON)

FCC ID : N/A
Model No. : EPSON STYLUS C61
Power Supply Type : Switching
Power Cord : Non-Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 5. – Modem (ACEEX)

FCC ID : N/A
Model No. : DM1414
Power Supply Type : Switching
Power Cord : Non-Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 6. – Mic+SPK (KOKA)

FCC ID : N/A
Model No. : HD-305
Power Supply Type : Switching
Power Cord : Non-Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.



< EMS >

Support Unit 1. – P.C. (COMPAQ)

FCC ID : N/A
Model No. : Evo D380MX
Power Supply Type : Switching
Power Cord : Non-Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- Monitor (VIEWSONIC)

FCC ID : Doc
Model No. : VCDTS22355-9P
Power Cord : Non-Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 3. – PS2 Mouse (LOGITECH)

FCC ID : Coc
Model No. : M-CAA43
Power Supply Type : Switching
Power Cord : Non-Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 4. – PS2 Keyboard (ACER)

FCC ID : Doc
Model No. : 6311-TA
Power Supply Type : Switching
Power Cord : Non-Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 5. – Mic+SPK (KOKA)

FCC ID : N/A
Model No. : HD-305
Power Supply Type : Switching
Power Cord : Non-Shielded
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.



3. Test Software

< EMI >

An executive program, EMITEST.EXE under WIN XP, which generates a complete line of continuously repeating "H" pattern was used as the test software.

The program was executed as follows:

- a. Turn on the power of all equipment.
- b. The PC reads the test program from the hard disk drive and runs it.
- c. The PC sends "H" messages to the monitor, and the monitor displays "H" patterns on the screen.
- d. The PC sends "H" messages to the printer, then the printer prints them on the paper.
- e. The PC sends "H" messages to the modem.
- f. The PC sends "H" messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
- g. Repeat the steps from c to f.

At the same time, the following programs were executed:

- 1) Executed one self-test program to keep sending signals.
- 2) Executed "Ping.exe " was executed to link with the remote workstation to receive and transmit data by TP cable.

< EMS >

During the test, the following programs under WIN XP were executed:

- 1) Executed one self-test program to keep sending signals.
- 2) Executed "Ping.exe " was executed to link with the remote workstation to receive and transmit data by TP cable.



4. General Information of Test

4.1 Test Facility

<EMI>

Test Site Location : No. 30-2, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,
Taipei Hsien, Taiwan, R.O.C.
TEL : 886-2-2601-1640
FAX : 886-2-2601-1695

Test Site No. : CO02-LK, OS06-LK

<EMS>

Test Site Location : No. 52, Hwa Ya 1St Road, Hwa Ya Technology Park,
Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
TEL : 886-3-3273456
FAX : 886-3-3180055

4.2 Test Normal Voltage

230V/50Hz

4.3 Standard for Methods of Measurement

EMI Test (conduction and radiation) : EN 55022 Class B / AS/NZS CISPR22: 2002, Class B
Harmonics Test : EN 61000-3-2.
Voltage Fluctuations Test : EN 61000-3-3.
EMS Test : EN 55024.
(EN 61000-4-2, EN 61000-4-3, EN 61000-4-4,
EN 61000-4-3, EN 61000-4-5, EN 61000-4-6,
IEC 61000-4-8, EN 61000-4-11)



4.4 Test in Compliance with

EMI Test (conduction and radiation)	: EN 55022 Class B / AS/NZS CISPR22: 2002, Class B
Harmonics Test	: EN 61000-3-2.
Voltage Fluctuations Test	: EN 61000-3-3.
EMS Test	: EN 55024. (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-3, EN 61000-4-5, EN 61000-4-6, IEC 61000-4-8, EN 61000-4-11)

4.5 Frequency Range Investigated

- a. Conducted emission test: from 150 kHz to 30 MHz
- b. Radiated emission test: from 30 MHz to 1,000 MHz
- c. Radio frequency electromagnetic field immunity test: 80-1000 MHz.

4.6 Test Distance

- a. The test distance of radiated emission test from antenna to EUT is 10 M.
- b. The test distance of radio frequency electromagnetic field immunity test from antenna to EUT is 3 M.



5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in European Standard EN 55022 Clause 9. 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 producing maximum conducted emissions.

5.1 Description of Major Test Instruments

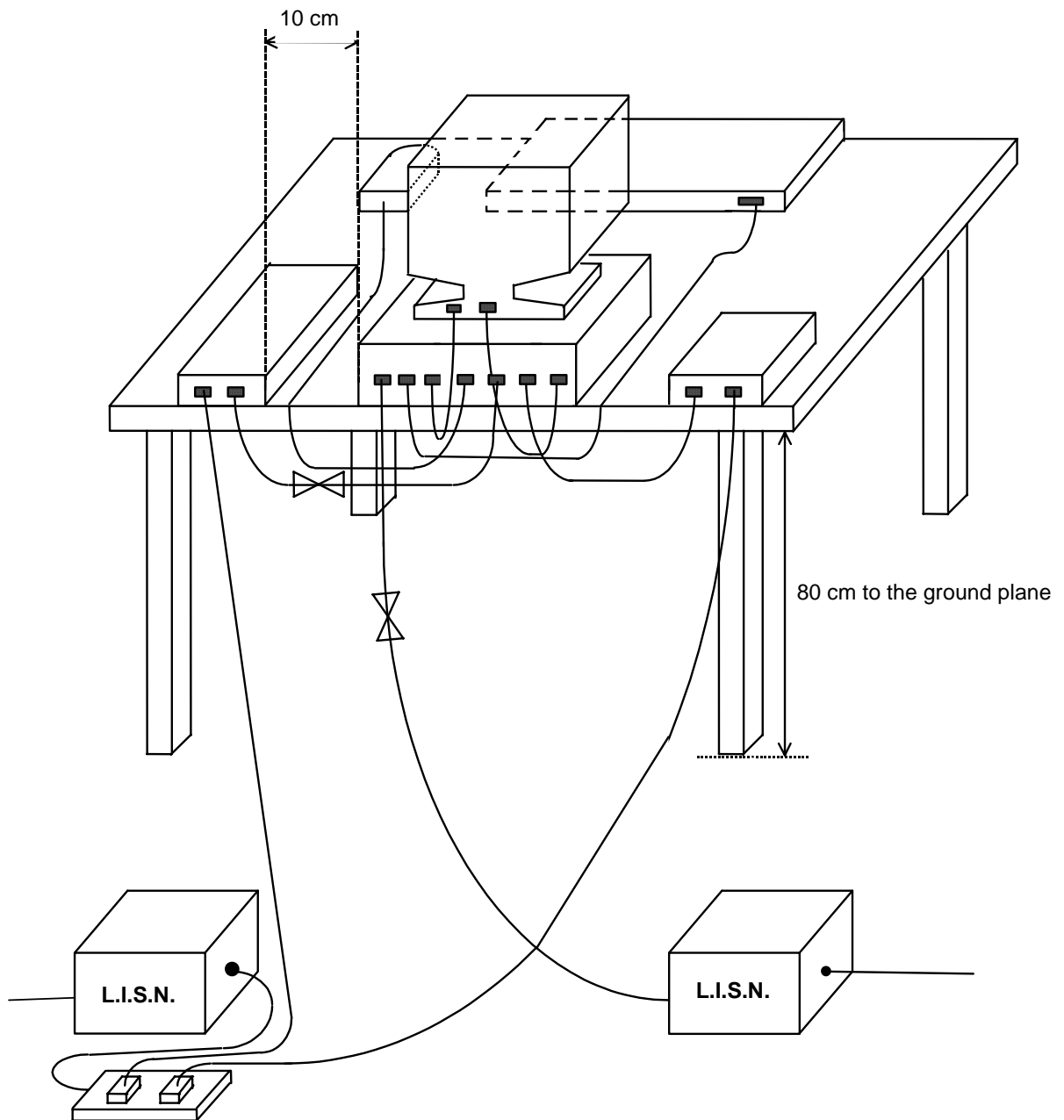
● Test Receiver	(R&S ESCS 30)
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz



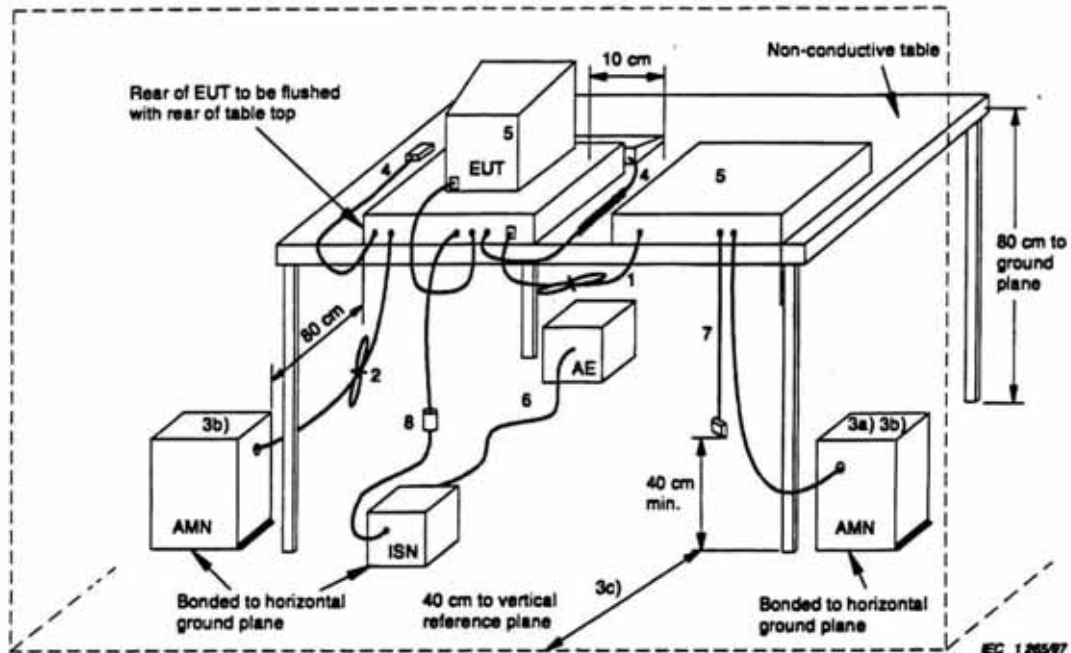
5.2 Test Procedures

1. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connect to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The CISPR states that a 50 ohm, 50 micro-henry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3 Typical Test Setup Layout of Conducted Powerline



5.4 Typical Test Setup for Conducted Emission on the Telecommunication ports



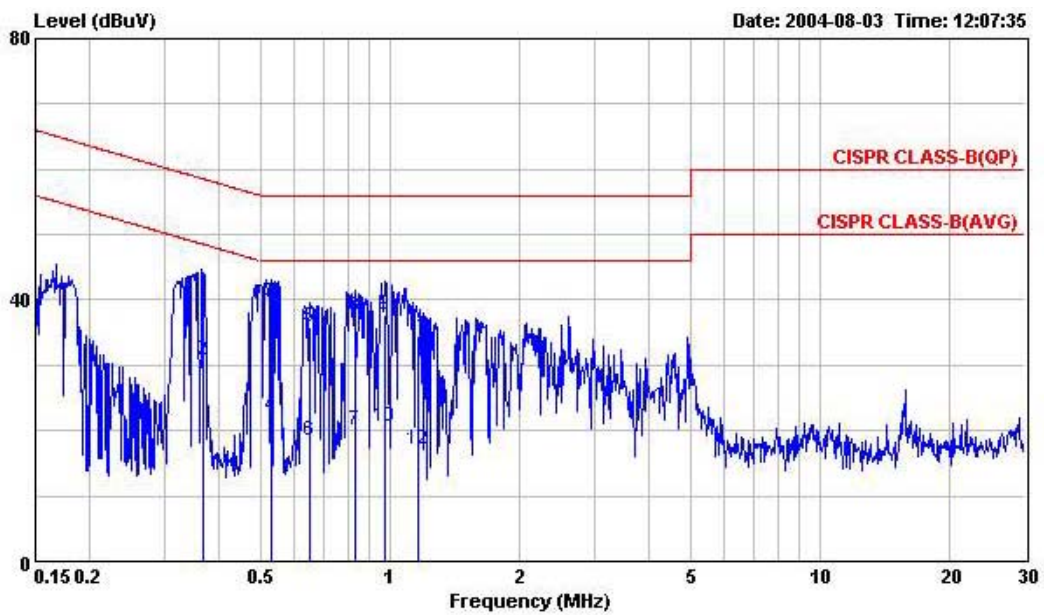
AMN = Artificial mains network
 AE = Associated equipment
 EUT = Equipment under test
 ISN = Impedance stabilization network

- 1) If cables, which hang closer than 40 cm to the horizontal metal groundplane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.
- 2) Excess mains cord shall be bundled in the centre or shortened to appropriate length.
- 3) EUT is connected to one artificial mains network (AMN). All AMNs and ISNs may alternatively be connected to a vertical reference plane or metal wall (see figures 5 and 6).
 - a) All other units of a system are powered from a second AMN. A multiple outlet strip can be used for multiple mains cords.
 - b) AMN and ISN are 80 cm from the EUT and at least 80 cm from other units and other metal planes.
 - c) Mains cords and signal cables shall be positioned for their entire lengths, as far as possible, at 40 cm from the vertical reference plane.
- 4) Cables of hand operated devices, such as keyboards, mice, etc. shall be placed as for normal usage.
- 5) Peripherals shall be placed at a distance of 10 cm from each other and from the controller, except for the monitor which, if this is an acceptable installation practice, shall be placed directly on the top of the controller.
- 6) I/O signal cable intended for external connection.
- 7) The end of the I/O signal cables which are not connected to an AE may be terminated, if required, using correct terminating impedance.
- 8) If used, the current probe shall be placed at 0,1 m from the ISN.

5.5 Test Result of AC Powerline Conducted Emission

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 63%
- All emissions not reported here are more than 10 dB below the prescribed limit.

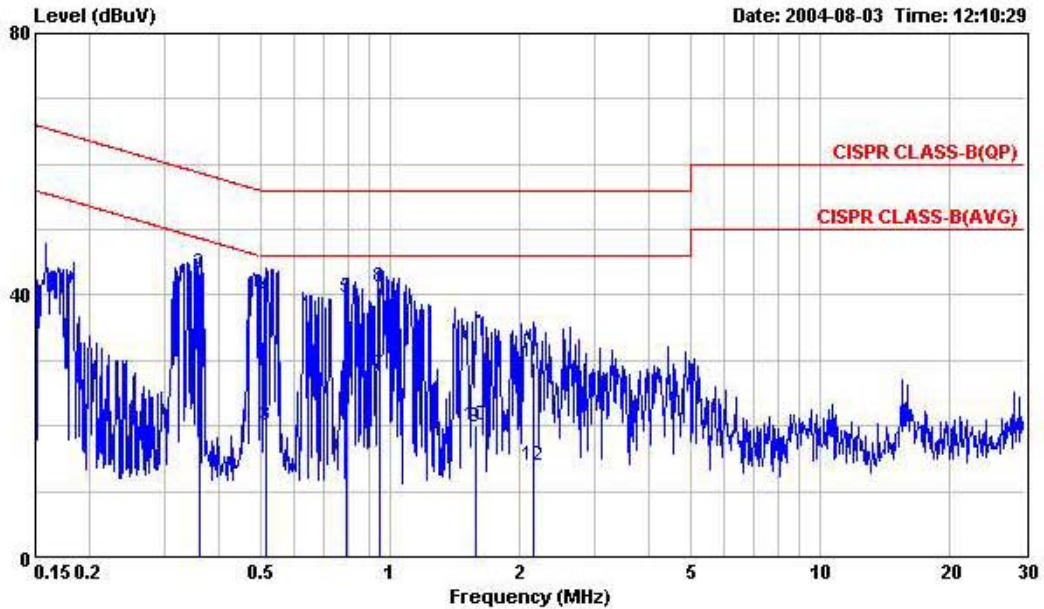
■ The test was passed at the minimum margin that marked by the frame in the following table
 Line



	Freq	Level	Over Limit	Limit Line	Read Level	Cable Factor	LISN Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB
1	0.367	41.66	-16.91	58.57	41.51	0.15	0.05	0.10 QP
2	0.367	30.77	-17.80	48.57	30.62	0.15	0.05	0.10 Average
3	0.533	39.49	-16.51	56.00	39.33	0.16	0.06	0.10 QP
4	0.533	22.10	-23.90	46.00	21.94	0.16	0.06	0.10 Average
5	0.651	35.73	-20.27	56.00	35.57	0.16	0.06	0.10 QP
6	0.651	18.55	-27.45	46.00	18.39	0.16	0.06	0.10 Average
7	0.830	20.14	-25.86	46.00	19.98	0.16	0.06	0.10 Average
8	0.830	37.57	-18.43	56.00	37.41	0.16	0.06	0.10 QP
9	0.974	37.61	-18.39	56.00	37.45	0.16	0.06	0.10 QP
10	0.974	20.57	-25.43	46.00	20.41	0.16	0.06	0.10 Average
11	1.160	34.59	-21.41	56.00	34.43	0.16	0.06	0.10 QP
12	1.160	17.22	-28.78	46.00	17.06	0.16	0.06	0.10 Average



Neutral



SPORTON INTERNATIONAL

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Cable Loss	LISN Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.361	33.77	-14.94	48.71	33.61	0.16	0.06	0.10	Average
2	0.361	43.29	-15.42	58.71	43.13	0.16	0.06	0.10	QP
3	0.518	20.16	-25.84	46.00	20.00	0.16	0.06	0.10	Average
4	0.518	39.65	-16.35	56.00	39.49	0.16	0.06	0.10	QP
5	0.796	39.57	-16.43	56.00	39.41	0.16	0.06	0.10	QP
6	0.796	25.62	-20.38	46.00	25.46	0.16	0.06	0.10	Average
7	0.948	27.82	-18.18	46.00	27.66	0.16	0.06	0.10	Average
8	0.948	41.31	-14.69	56.00	41.15	0.16	0.06	0.10	QP
9	1.590	19.91	-36.09	56.00	19.75	0.16	0.06	0.10	QP
10	1.590	20.08	-25.92	46.00	19.92	0.16	0.06	0.10	Average
11	2.170	29.66	-26.34	56.00	29.48	0.18	0.07	0.11	QP
12	2.170	13.95	-32.05	46.00	13.77	0.18	0.07	0.11	Average

Test Engineer : Jason
Jason Chang

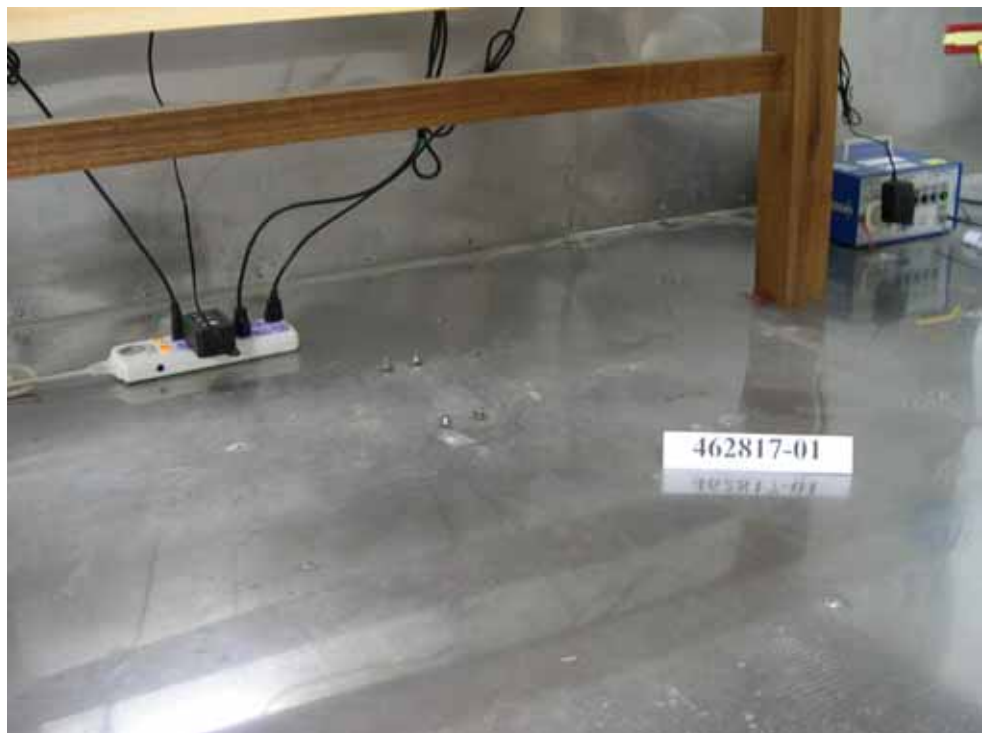
5.6 Photographs of Conducted Powerline Test Configuration

- 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 1000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in European Standard EN 55022, Clause 10. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 7.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

6.1 Description of Major Test Instruments

- Amplifier (SCHAFFNER CPA9231A)
 - RF Gain 30 dB
 - Signal Input 9 KHz to 2 GHz

- Spectrum Analyzer (R&S FSP7)
 - Attenuation 10 dB
 - Start Frequency 30 MHz
 - Stop Frequency 1000 MHz
 - Resolution Bandwidth 120 KHz for below 1GHz
1 MHz for above 1GHz
 - Signal Input 9 KHz to 7 GHz

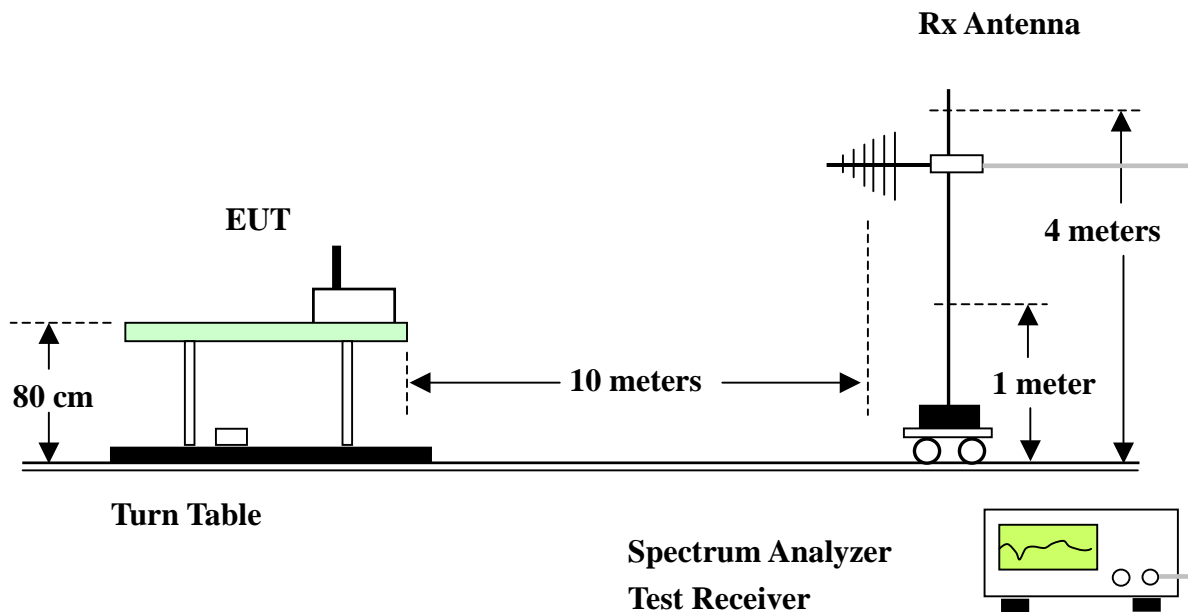
- Test Receiver (R&S ESI 7)
 - Attenuation 10 dB
 - Start Frequency 30 MHz
 - Stop Frequency 1000 MHz
 - Resolution Bandwidth 120 KHz for below 1GHz
1 MHz for above 1GHz
 - Signal Input 20 Hz to 7 GHz



6.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 10 meters from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. 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.
5. 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.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 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 3 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

Temperature: 21°C

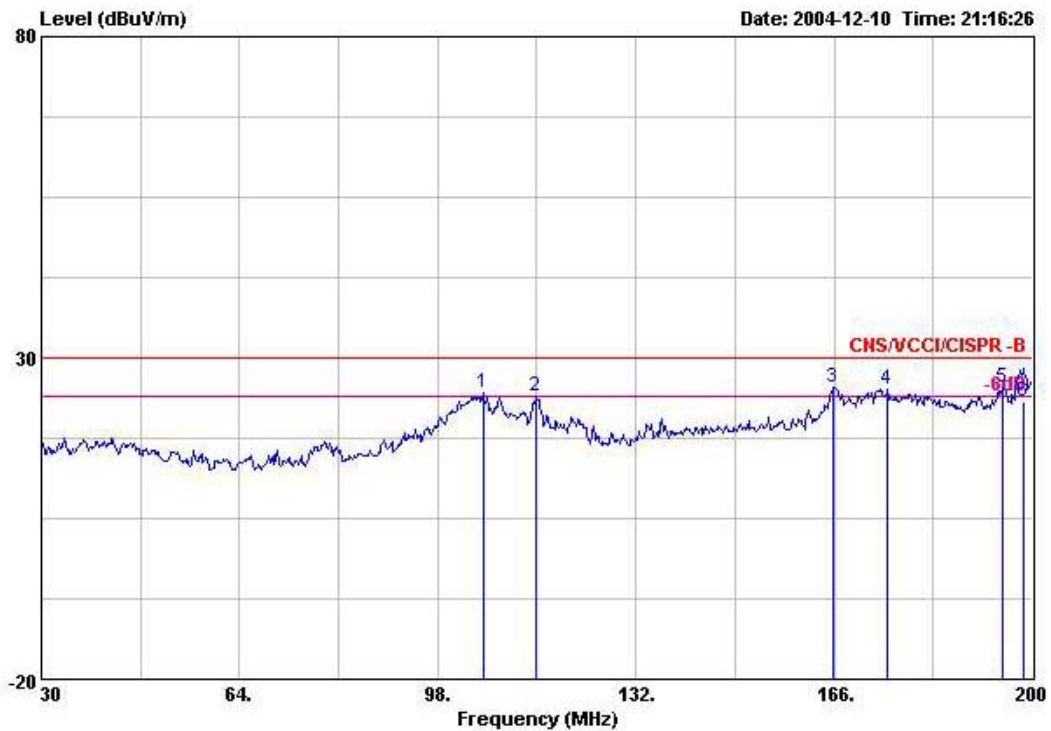
Relative Humidity: 59 %

Test Distance: 10M

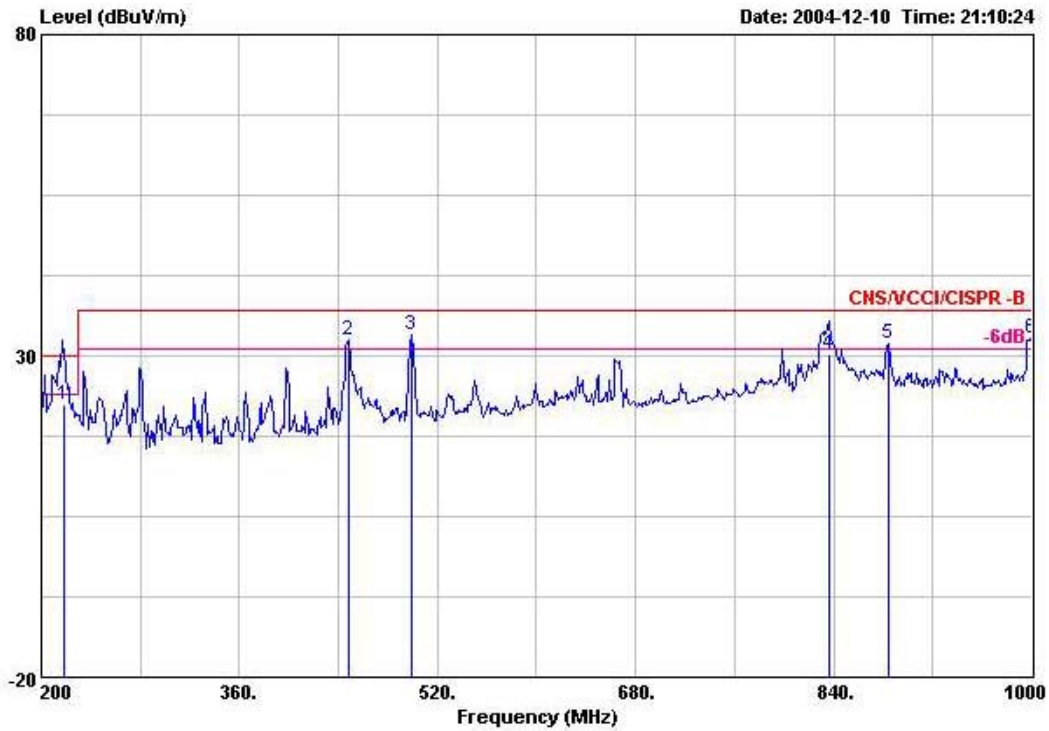
Emission level (dBuV/m) = 20 log Emission level (uV/m)

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

■ The test was passed at the minimum margin that marked by the frame in the following test record
Horizontal



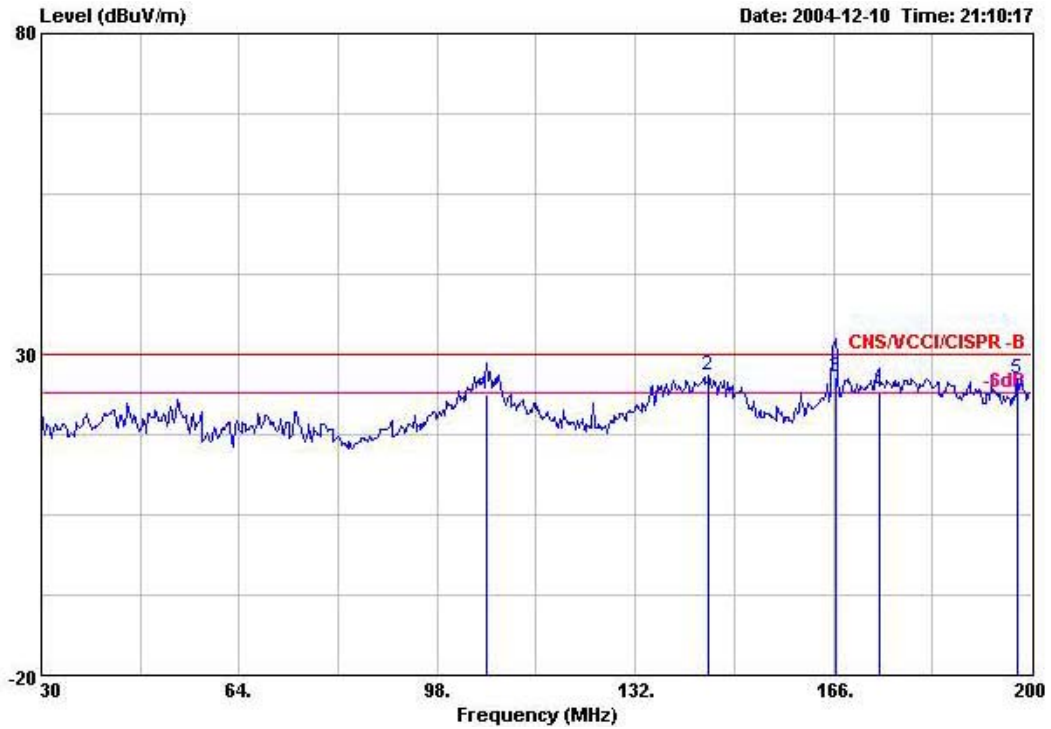
	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1 !	105.820	24.53	-5.47	30.00	39.28	26.92	1.99	10.18	Peak	---	---
2 !	114.830	24.08	-5.92	30.00	38.20	26.94	2.07	10.75	Peak	---	---
3 !	165.830	25.46	-4.54	30.00	37.14	26.92	2.41	12.83	Peak	---	---
4 !	175.180	25.22	-4.78	30.00	36.57	26.99	2.47	13.17	Peak	---	---
5 !	194.900	25.26	-4.74	30.00	34.87	26.90	2.65	14.64	Peak	---	---
6	198.470	23.24	-6.76	30.00	32.47	26.88	2.69	14.96	QP	400	288



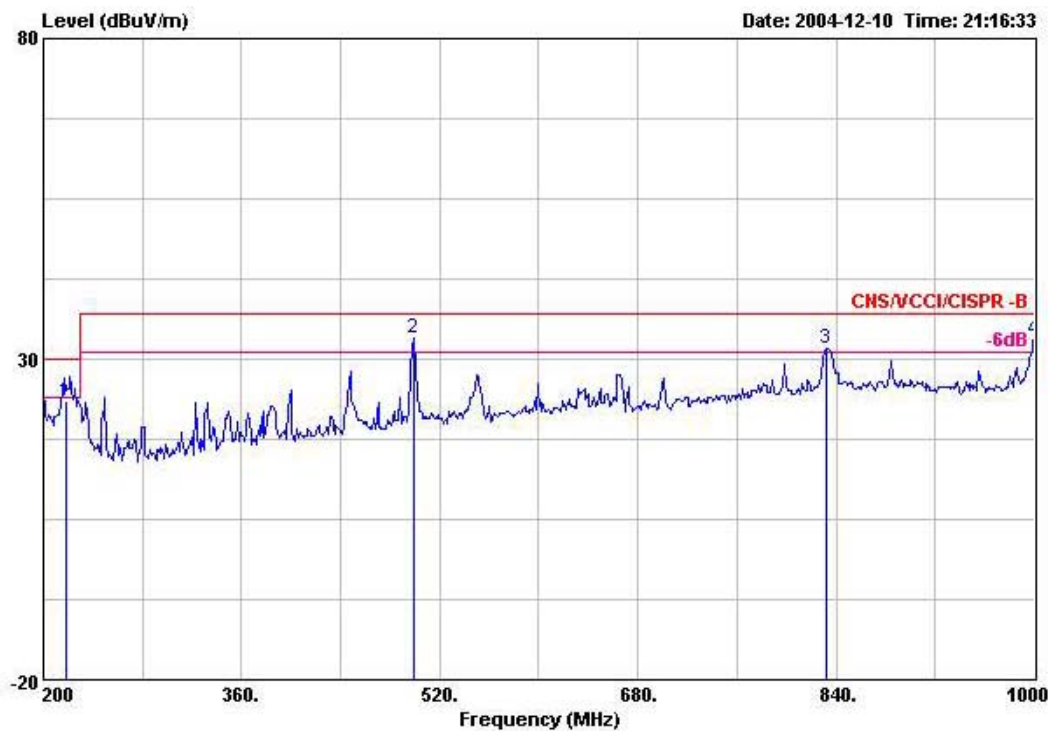
	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	218.270	22.47	-7.53	30.00	34.57	30.04	2.49	15.45	QP	133	100
2 !	448.000	32.52	-4.48	37.00	42.19	30.16	3.52	16.97	Peak	---	---
3 @	499.200	33.38	-3.62	37.00	42.40	30.17	3.59	17.56	Peak	---	---
4	836.550	30.30	-6.70	37.00	33.13	29.76	4.49	22.44	QP	188	360
5 !	884.000	31.78	-5.22	37.00	34.30	29.80	4.80	22.48	Peak	---	---
6 !	1000.000	32.68	-4.32	37.00	34.72	29.11	4.91	22.16	Peak	---	---



Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	106.533	23.73	-6.27	30.00	38.42	26.92	2.00	10.23	QP	100	77
2	144.580	26.71	-3.29	30.00	39.17	26.83	2.29	12.08	Peak	100	144
3	166.520	26.44	-3.56	30.00	38.09	26.93	2.42	12.86	QP	100	120
4	173.820	23.95	-6.05	30.00	35.33	26.97	2.46	13.13	QP	100	69
5	197.620	26.29	-3.71	30.00	35.61	26.89	2.68	14.89	Peak	---	---



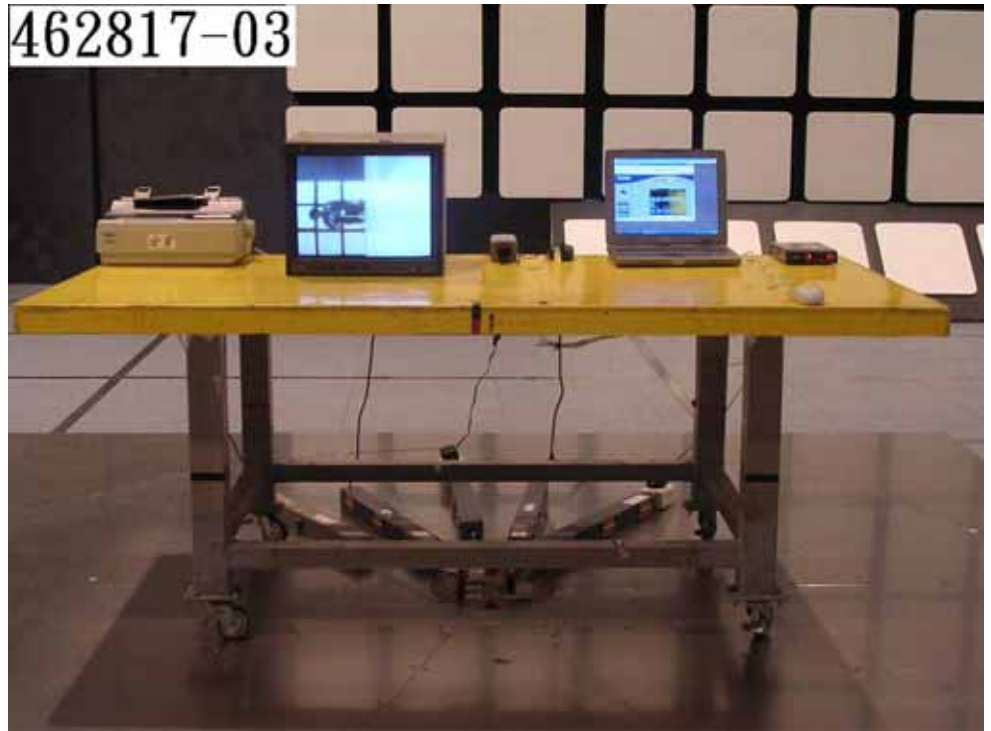
	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	218.340	23.43	-6.57	30.00	35.53	30.04	2.49	15.45	QP	400	334
2	499.200	33.24	-3.76	37.00	42.26	30.17	3.59	17.56	Peak	---	---
3	832.800	31.67	-5.33	37.00	34.52	29.75	4.47	22.43	Peak	---	---
4	1000.000	33.02	-3.98	37.00	35.06	29.11	4.91	22.16	Peak	---	---

Test Engineer : Jason
Jason Chang

6.5 Photographs of Radiated Emission Test Configuration

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

FRONT VIEW



REAR VIEW





7. Harmonics Test

As specified on clause 7 and figure Z1 of EN 61000-3-2:2000, the limits are not specified for equipment with rated power of 75W or less.

The EUT meets the above condition, so it conforms to EN 61000-3-2.

8. Voltage Fluctuations Test

8.1 Standard

- Standard : EN 61000-3-3:1995/A1:2001

8.2 Test Procedures

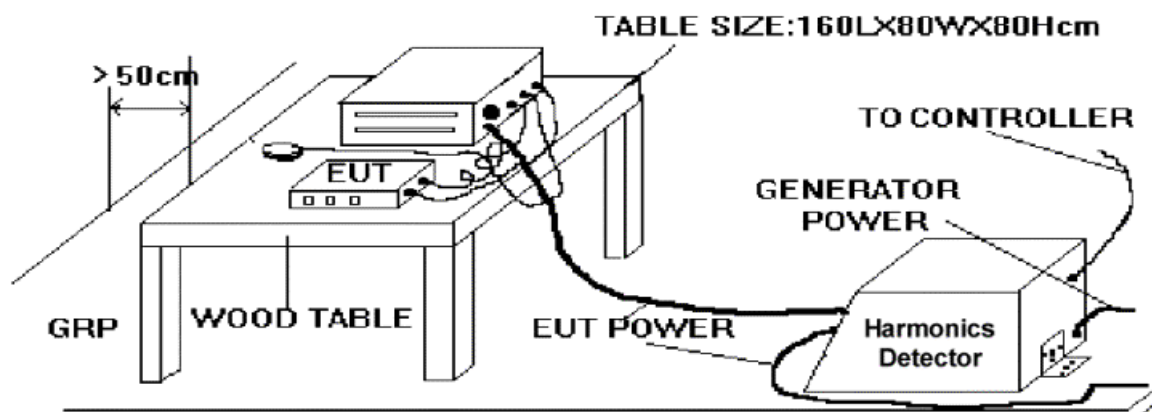
The equipment shall be tested under the conditions of **Clause 5**.

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of $\pm 8\%$ is achieved during the whole assessment procedure.

8.3 Test Equipment Settings

- Line Voltage : 230 V
- Line Frequency : 50 Hz
- Measurement Delay : 10.0 seconds
- Pst Integration Time : 10 minutes
- Pst Integration Periods : 1
- Test Duration : 00:10:00 minutes

8.4 Test Setup



8.6 Photographs of Harmonics Test, Voltage Fluctuation and Flicker Test

FRONT VIEW



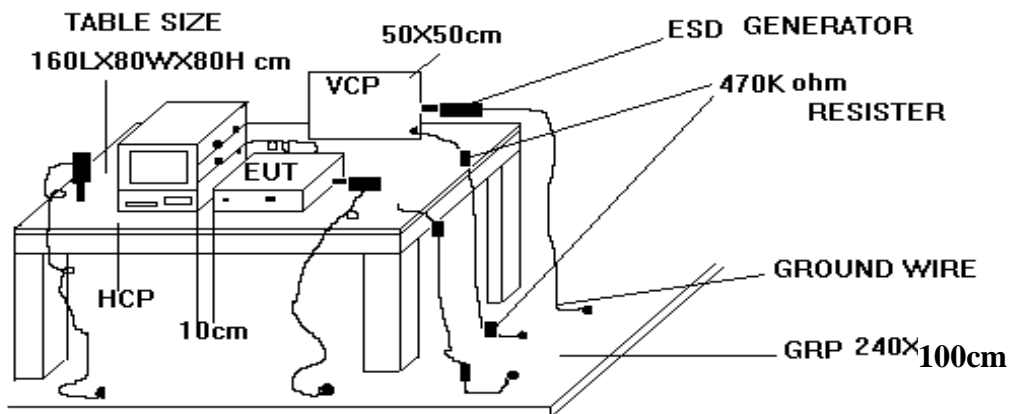
REAR VIEW



9. Electrostatic Discharge Immunity Test (ESD)

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : B
- Basic Standard : IEC 61000-4-2:1995/A1:2000
- Product Standard : EN 55024:1998/A1:2001
- Level : 3 for air discharge,
: 2 for contact discharge
- Tested Voltage : $\pm 2 / \pm 4 / \pm 8$ KV for air discharge,
: $\pm 2 / \pm 4$ KV for contact discharge
- Temperature : 19°C
- Relative Humidity : 56 %
- Atmospheric Pressure : 98.7 kPa
- Test Date : Feb. 22, 2005
- Observation : Normal

9.1 Test Setup



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner :

- a. CONTACT DISCHARGE to the conductive surfaces and to coupling plane;
- b. AIR DISCHARGE at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.



9.2 Test Setup for Tests Performed in Laboratory

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the SPORTON EMC LAB., we provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1m minimum was provided between the EUT and the wall of the lab and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resistor located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.



9.3 ESD Test Procedures

1. In the case of air discharge testing the climatic conditions shall be within the following ranges:
 - ambient temperature: 15°C to 35°C;
 - relative humidity : 30% to 60%;
 - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar).
2. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.
3. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.
4. The test shall be performed with single discharges. On pre-selected points at least ten single discharges (in the most sensitive polarity) shall be applied.
5. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.
6. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.
7. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted:
 - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
 - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
 - The contact discharge test shall not be applied to such surfaces.
8. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT . After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then re-triggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.



9.4 Test Severity Levels

9.4.1 Contact Discharge

Level	Test Voltage (KV) of Contact discharge
1	± 2
2	± 4
3	± 6
4	± 8
X	Specified

Remark : "X" is an open level.

9.4.2 Air Discharge

Level	Test Voltage (KV) of Air Discharge
1	± 2
2	± 4
3	± 8
4	± 15
X	Specified

Remark : "X" is an open level.



9.5 Test Points

9.5.1 Test Result of Air Discharge

Test Point	Voltage	Tested No.
LED	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10
RESET SW	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10
DC input jack	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10
AUDIO PORT	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10

9.5.2 Test Result of Contact Discharge

Polarity	Voltage	Tested No.
Horizontal (At Front)	$\pm 2 / \pm 4$ KV	BY 25
Horizontal (At Left)	$\pm 2 / \pm 4$ KV	BY 25
Horizontal (At Right)	$\pm 2 / \pm 4$ KV	BY 25
Horizontal (At Rear)	$\pm 2 / \pm 4$ KV	BY 25
Vertical (At Front)	$\pm 2 / \pm 4$ KV	BY 25
Vertical (At Left)	$\pm 2 / \pm 4$ KV	BY 25
Vertical (At Right)	$\pm 2 / \pm 4$ KV	BY 25
Vertical (At Rear)	$\pm 2 / \pm 4$ KV	BY 25
Case	$\pm 2 / \pm 4$ KV	BY 25
SCREW	$\pm 2 / \pm 4$ KV	BY 25
RJ45 PORT	$\pm 2 / \pm 4$ KV	BY 25
VIDEO PORT	$\pm 2 / \pm 4$ KV	BY 25

Test Engineer : SKY

Sky Wu

9.6 Photographs of Electrostatic Discharge Immunity Test

FRONT VIEW



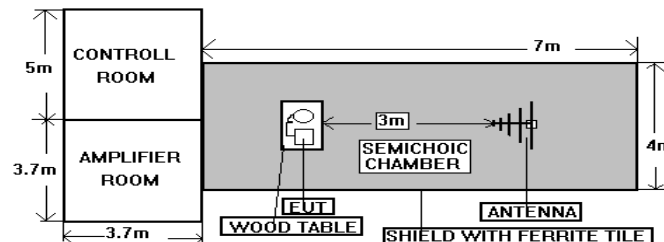
REAR VIEW



10. Radio Frequency Electromagnetic Field Immunity Test (RS)

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Basic Standard : IEC 61000-4-3:1995/A1:1998/A2:2000
- Product Standard : EN 55024:1998/A1:2001
- Level : 2
- Frequency Range : 80-1000 MHz
- Field Strength : 3 V/m (Modulated 80% AM)
- Temperature : 19 °C
- Relative Humidity : 56%
- Atmospheric Pressure : 98.7 kPa
- Test Date : Feb. 22, 2005
- Observation : Normal

10.1 Test Setup



NOTE : The SPORTON 7m x 4m x 4m semi-anechoic chamber is compliance with the sixteen points uniform field requirement as stated in IEC 1000-4-3 Section 6.2.

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.



10.2 Test Procedures

1. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.
2. The bi-log antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.
3. The test is normally performed with the antenna facing the most sensitive side of the EUT. The polarization of the field generated by the bi-conical antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. The circular polarization of the field from the log-spiral antenna makes a change of position of the antenna unnecessary.
4. At each of the above conditions, the frequency range is swept 80-1000 MHz, pausing to adjust the R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of 1.5×10^{-3} decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

10.3 Test Severity Levels

Frequency Band: 80-1000 MHz

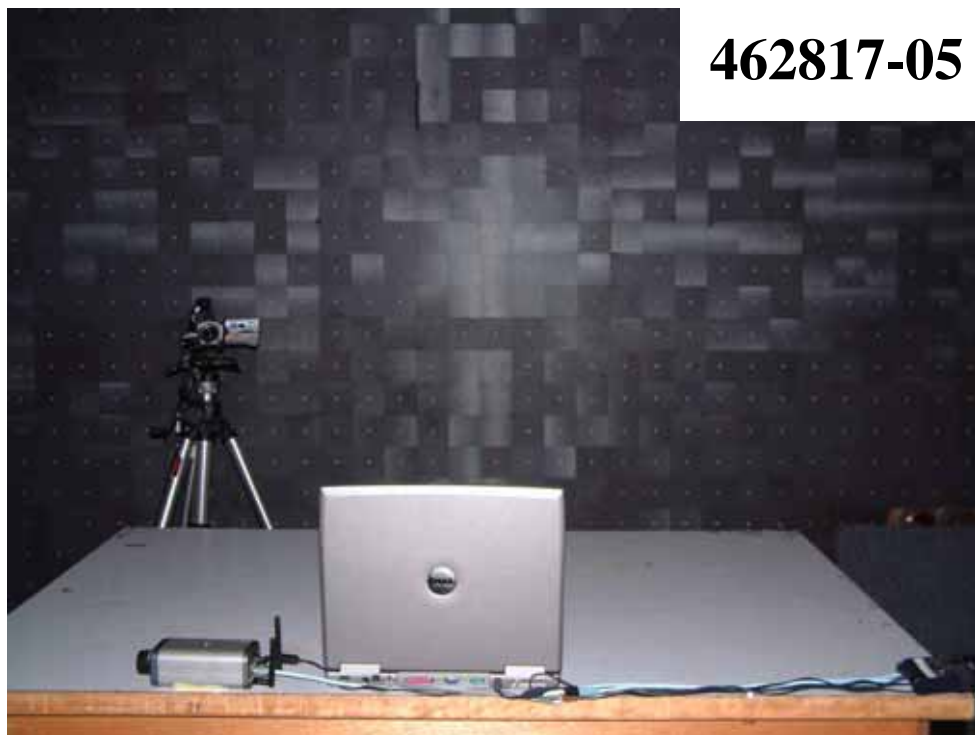
Level	Test field strength (V/m)
1	1
2	3
3	10
X	Specified

Remark : "X" is an open class.

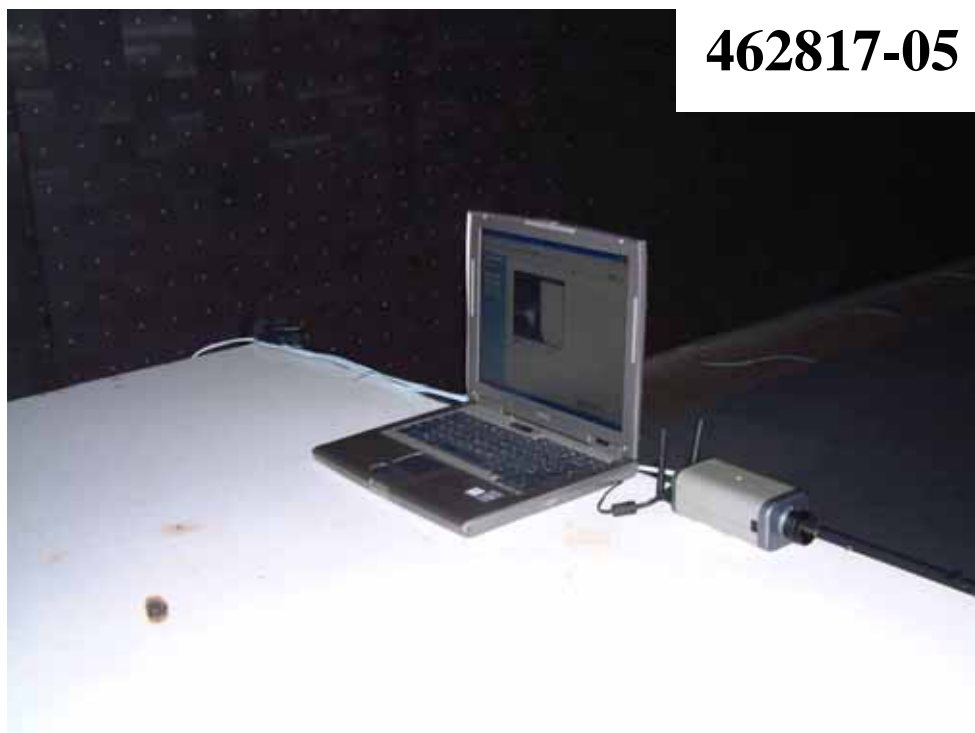
Test Engineer : SKY
SKy Wu

10.4 Photographs of Radio Frequency Electromagnetic Field Immunity Test

FRONT VIEW



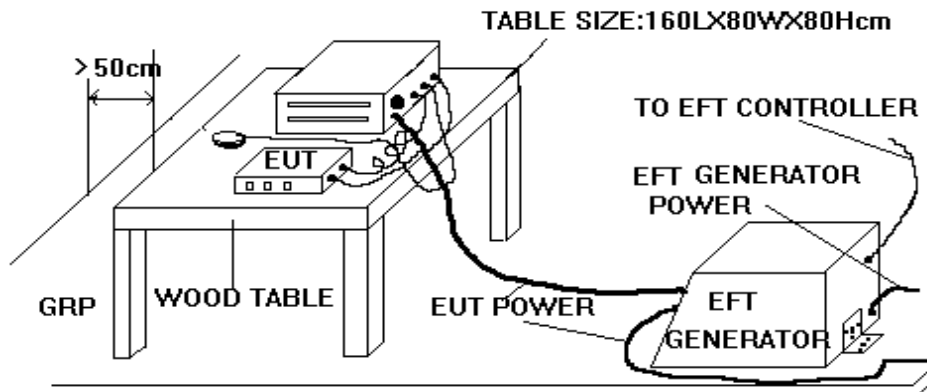
REAR VIEW



11. Electrical Fast Transient/Burst Immunity Test (EFT/Burst)

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : B
- Basic Standard : IEC 61000-4-4:1995/A1:2000/A2:2001
- Product Standard : EN 55024:1998/A1:2001
- Level : on Power Supply -- 2
- Test Voltage : on Power Supply -- 0.5/1.0 KV
- Temperature : 24°C
- Relative Humidity : 53%
- Atmospheric Pressure : 100 kPa
- Test Date : Aug. 19, 2004
- Observation : Normal

11.1 Test Setup



The EUT was placed on a ground reference plane and was insulated from it by an insulating support about 0.1m thick. If the EUT is table-top equipment, it was located approximately 0.8m above the GRP. The GRP was a metallic sheet (copper or aluminum) of 0.25 mm ,minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. It shall project beyond the EUT by at least 0.1m on all sides and connected to the protective earth. In the SPORTON EMC LAB. we provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system. The EUT was arranged and connected according to its functional requirements. The minimum distance between the EUT and other conductive structures, except the GRP. beneath the EUT, was more than 0.5 m. Using the coupling clamp, the minimum distance between the coupling plates and all other conductive structures, except the GRP. beneath the EUT, was more than 0.5 m. The length of the signal and power lines between the coupling device and the EUT was 1m or less.



11.2 Test on Power Line

- a. The EFT/B-generator was located on the GRP.. The length from the EFT/B-generator to the EUT does not exceed 1 m.
- b. The EFT/B-generator provides the ability to apply the test voltage in a non-symmetrical condition to the power supply input terminals of the EUT.

11.3 Test on Communication Lines

- a. The coupling clamp is composed of a clamp unit for housing the cable (length more than 3 m), and was placed on the GRP.
- b. The coupling clamp provides the ability of coupling the fast transient/bursts to the cable under test.

11.4 Test Procedures

1. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:
 - ambient temperature: 15°C to 35°C;
 - relative humidity : 45% to 75%;
 - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar).
2. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.
3. The variety and diversity of equipment and systems to be tested make it difficult to establish general criteria for the evaluation of the effects of fast transients/bursts on equipment and systems.
4. The test results may be classified on the basic of the operating conditions and the functional specification of the equipment under test, according to the following performance criteria :
 - Normal performance within the specification limits.
 - Temporary degradation or loss of function or performance which is self-recoverable.
 - Temporary degradation or loss of function or performance which requires operator intervention or system reset.
 - Degradation or loss of function which is not recoverable due to damage of equipment (components).

11.6 Photographs of Electrical Fast Transient/Burst Immunity Test

FRONT VIEW



REAR VIEW



CLAMP





12. Surge Immunity Test

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : B
- Basic Standard : IEC 61000-4-5 :1995/A1:2000
- Product Standard : EN 55024:1998/A1:2001
- Surge Wave Form (Tr/Th) : 1, 2/50 (8/20) μ s
- Level : 3
- Test Voltage : ± 1.0 KV
- Temperature : 24 °C
- Relative Humidity : 53 %
- Atmospheric Pressure : 100 kPa
- Test Date : Aug. 19, 2004

12.1 Test Record

AC Power Port:

Voltage (KV)	Test Location	Polarity	Phase Angle				Test Result
			0°	90°	180°	270°	
1 KV	L - N	+	A	A	A	A	<u>PASS</u>
		-	A	A	A	A	<u>PASS</u>

12.2 Test Level

Level	Open-circuit test voltage, $\pm 10\%$, KV
1	0.5
2	1.0
3	2.0
4	4.0
x	Specified
NOTE - x is an open class. This level can be specified in the product specification.	

12.3

12.4 Test Procedures

1. Climatic conditions

The climatic conditions shall comply with the following requirements :

- ambient temperature : 15 °C to 35 °C
- relative humidity : 10 % to 75 %
- atmospheric pressure : 86 kPa to 106 kPa (860 mbar to 1060 mbar)

2. Electromagnetic conditions

The electromagnetic environment of the laboratory shall not influence the test results.

3. The test shall be performed according the test plan that shall specify the test set-up with

- generator and other equipment utilized;
- test level (voltage/current);
- generator source impedance;
- internal or external generator trigger;
- number of tests : at least five positive and five negative at the selected points;
- repetition rate : maximum 1/min.
- inputs and outputs to be tested;
- representative operating conditions of the EUT;
- sequence of application of the surge to the circuit;
- phase angle in the case of a.c. power supply;
- actual installation conditions, for example :
 - AC : neutral earthed,
 - DC : (+) or (-) earthed to simulated the actual earthing conditions.

12.6 Photographs of Surge Immunity Test

FRONT VIEW



REAR VIEW





13. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (CS)

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Basic Standard : IEC 61000-4-6 :1996/A1:2001
- Product Standard : EN 55024:1998/A1:2001
- Level : 2
- Test Voltage : 3 V rms (Modulated, 1KHz, 80%, AM)
- Frequency Range : 0.15 MHz to 80 MHz
- Test Port : on AC Power and Signal Ports
- Dwell Time : 2.9 seconds
- Frequency Step Size : 150 KHz 1% increment to 80 MHz
- Coupling Mode : M2 SW for AC Power port, ST08 for Signal port
- Temperature : 24° C
- Relative Humidity : 54 %
- Atmospheric Pressure : 100kPa
- Test Date : Aug. 19, 2004
- Observation : Normal

13.1 Test Level

Level	Voltage Level (EMF),
1	1 V
2	3 V
3	10 V
x	Specified

NOTE - x is an open class.
This level can be specified in the product specification.

13.2 Operating Condition

Full system



13.3 Test Procedures

1. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
2. This test method test can be performed without using a sell shielded enclosure. This is because the disturbance levels applied and the geometry of the setups are not likely to radiated a high amount of energy, especially at the lower frequencies. If under certain circumstances the radiated energy is too high, a shielded enclosure has to be used.
3. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
4. The frequency range is swept from 150 KHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
5. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency(ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
6. An alternative test procedure may be adopted, wherein the frequency range is swept incrementally, with a step size not exceeding 4% of the start ad thereafter 4% of the preceding frequency value. The test level should be at least twice the value of the specified test level.
7. In cases of dispute, the test procedure using a step size not exceeding 1% of the start and thereafter 1% of preceding frequency value shall take precedence.
8. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.
9. The use of special exercising programs is recommended.
10. Testing shall be performed according to a Test Plan, which shall be included in the test report.
11. It may be necessary to carry out some investigatory testing in order to establish some aspects of the test plan.

Test Engineer : _____

A handwritten signature in blue ink that reads 'SAM'.

Sam Chang

13.4 Photographs of CS Test

FRONT VIEW



REAR VIEW



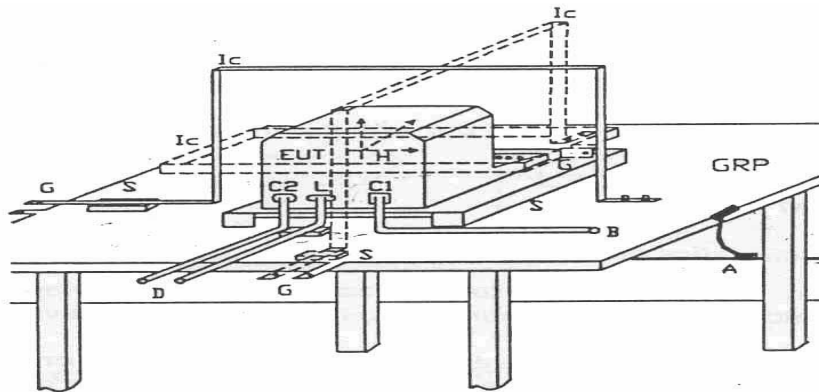
14. Power Frequency Magnetic Field Immunity Tests

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Basic Standard : IEC 61000-4-8 (1993)
- Product Standard : EN 55024:1998/A1:2001
- Temperature : 23 °C
- Relative Humidity : 54 %
- Atmospheric Pressure : 100 kPa
- Test Date : Aug. 19, 2004
- Observation : Normal

14.1 Test Record

Power Frequency Magnetic Field	Testing duration	Coil Orientation	Results
50Hz, 1A/m	1.0 Min	X-axis	Pass
50Hz, 1A/m	1.0 Min	Y-axis	Pass
50Hz, 1A/m	1.0 Min	Z-axis	Pass

14.2 Test Setup



- | | | | |
|------|----------------------|-----|-----------------------------|
| GRP: | Ground plane | C1: | Power supply circuit |
| A: | Safety earth | C2: | Signal circuit |
| S: | Insulating support | L: | Communication line |
| EUT: | Equipment under test | B: | To power supply source |
| Lc: | Induction coil | D: | To signal source, simulator |
| E: | Earth terminal | G: | To the test generator |

Test Engineer : 

Sam Chang

14.3 Photographs of Power Frequency Magnetic Field Immunity Tests

FRONT VIEW



REAR VIEW



15. Voltage Dips and Voltage Interruptions Immunity Tests

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : C for voltage interruption, A for voltage dips
- Required Performance Criteria : C for voltage interruption, B/C for voltage dips
- Basic Standard : IEC 61000-4-11 :1994/A1:2001
- Product Standard : EN 55024:1998/A1:2001
- Temperature : 23 °C
- Relative Humidity : 53 %
- Atmospheric Pressure : 100 kPa
- Test Date : Aug. 19, 2004
- Observation : Normal

15.1 Test Record of Voltage Interruption

Voltage (V)	Phase Angle		% Reduction	Periods (s)	Observation
	0 °	180 °			
230	C	C	>95%	250	After the interruption, the power of EUT reset automatically.

15.2 Test Record of Voltage Dips

Voltage (V)	Phase Angle		% Reduction	Periods (s)	Observation
	0 °	180 °			
230	A	A	30	25	Normal
230	A	A	>95 %	0.5	Normal



15.3 Testing Requirement and Procedure

The test was based on IEC 61000-4-11 :1994/A1:2001

15.4 Test Conditions

1. Source voltage and frequency : 230V / 50Hz, Single phase.
2. Test of interval : 10 sec.
3. Level and duration : Sequence of 3 dips/interrupts.
4. Voltage rise (and fall) time : 1 ~ 5 μ s.
5. Test severity :

Voltage dip and Interrupt reduction (%)	Test Duration (ms)
30	500
60	100
100	10
100	80
100	5000

15.5 Operating Condition

Full system

Test Engineer : 

Sam Chang

15.6 Photographs of Voltage Dips and Voltage Interruptions Immunity Tests

FRONT VIEW



REAR VIEW





16. List of Measuring Equipment Used

<EMI>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Receiver	R&S	ESCS 30	100168	9 KHz - 2.75 GHz	Dec. 09, 2003	Conduction (CO02-LK)
LISN	Rolf Heine	NNB-2/16Z	02/10070	9KHz ~ 30MHz	Sep. 02, 2003	Conduction (CO02-LK)
LISN	Rolf Heine	NNB-2/16Z	02/10084	9KHz ~ 30MHz	Sep. 02, 2003	Conduction (CO02-LK)
RF Cable-CON	Suhner Switzerland	RG223/U	CB018	9KHz~30MHz	Feb. 09, 2004	Conduction (CO02-LK)
Open Area Test Site	SPORTON	OATS-10	OS06-LK	30MHz~1GHz 10m,3m	Oct. 25, 2003	Radiation (OS06-LK)
Spectrum Analyzer	R&S	FSP7	838858/007	9KHz - 7GHz	Jul. 03, 2004	Radiation (OS06-LK)
Receiver	R&S	ESCS 30	100167	9KHz~2.75GHz	Dec. 10, 2003	Radiation (OS06-LK)
Amplifier	HP	8447D	2944A08290	100KHz - 1.3GHz	Jan. 27, 2004	Radiation (OS06-LK)
Bilog Antenna	SCHAFFNER	CBL6111C	2722	30MHz -1GHz	Jun. 10, 2004	Radiation (OS06-LK)
Turn Table	EMCO	1670	N/A	0 ~ 360 degree	N/A	Radiation (OS06-LK)
Antenna Mast	EMCO	2070-2	2263	1 m- 4 m	N/A	Radiation (OS06-LK)
RF Cable-R10m	MIYAZAKI	5DFB	CB015	30MHz~1GHz	Sep. 01, 2003	Radiation (OS06-LK)
RF Cable-R03m	MIYAZAKI	5DFB	CB016	30MHz~1GHz	Sep. 01, 2003	Radiation (OS06-LK)

※ Calibration Interval of instruments listed above is one year.



<EMS>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
ESD Simulator	KEYTEK	MZ-15/EC	0406338	Air: 0 KV - 15 KV Contact: 0 KV -8KV	Jul.16, 2004	ESD
Antenna	CHASE	CBL6121A	1027	26 MHz - 1 GHz	Dec. 07, 2004	RS01
Field Strength Monitoring Antennas (Probe)	AR	FP3000A	16077	0.1 MHz - 1 GHz	Aug. 12, 2004	RS
RS immunity Test system	HP	EMS test System	2062	80 MHz - 1 GHz 3V/m 10v/m	Dec. 07, 2004	RS
Amplifier	AR	100W 1000M3	16060	80 MHz - 1 GHz	Dec. 07, 2004	RS
Power Meter	EMC Automation	438A	3513U04050	100 KHz -4.2 GHz	Dec. 07, 2004	RS
Signal Generator	HP	8648A	3426A00771	100 KHz - 1 GHz	Dec. 03, 2004	RS
Power Sensor	HP	8481D	3318A13140	100 KHz - 1 GHz	Dec. 07, 2004	RS
Power Sensor	HP	8482A	3318A26464	100 KHz - 1 GHz	Dec. 07, 2004	RS
Attenuator	HP	8491A	53603	100 KHz - 1 GHz	Dec. 07, 2004	RS
EFT Generator	KEYTEK	EMCPRO	0303194	0 KV - 4.4 KV	Mar. 05, 2004	EFT
SURGE Generator	KEYTEK	EMCPRO	0303194	0 KV -6 KV/2Ω 0KV-500V/12Ω	Mar. 05, 2004	SURGE
Waveform Generator	Arbitrary morphing	WG-810		150KHz ~ 230MHz	Apr. 09, 2004	CS(*)
Coupling and Decoupling Network	SCHAFFNER	CDN T08	19529	150KHz ~ 230MHz	Apr. 16, 2004	CS(*)
Magnetic field Antenna	EMC PARTNER AG Switzerland	MF-1000	MF-1000-51	0.5 up to 150A / m	N/A	Magnetic
PQF Generator	KEYTEK	EMCPRO	0303194	230VA/50Hz/60Hz 0%Open/5S 0%Short/5S 40%/0.10S 70%/0.01S	Mar. 04, 2004	DIP



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Harmonic/Flicker Test System	EMC PARTNER	Harmonics -1000	HAR1000-41	4000VA 16A PEAK	Nov. 18, 2003	Harmonics, Flicker
RS immunity Test system	FRANKONIA	EMS test System		80 MHz - 1 GHz 3V/m 10v/m	Jun. 24, 2004	RS
Power Amplifier	MILMEGA	AS0825-65	1004599	1MHz -3 GHz	Apr. 08, 2004	RS
Power Amplifier	FRANKONIA	FLH200/100	0014	80 MHz - 1 GHz	May.04, 2004	RS
Power Meter	Dr.Hubert	PMS-1081	1081A3117	100 KHz -4.2 GHz	May. 11, 2004	RS
Power Meter	Dr.Hubert	PMS-1081	1081A3118	100 KHz -4.2 GHz	May. 11, 2004	RS
Signal Generator	R&S	SML-03	101137	100 KHz – 3 GHz	May. 18, 2004	RS
Signal Generator	R&S	SMR40	1104.0002.40	10MHz-40GHz	Nov. 06, 2003	RS
Antenna	FRANKONIA	BTA-L	02002L	30 MHz –2.5 GHz	Jun. 24, 2004	RS01
Directional coupler	FRANKONIA	C5982	1127	100 KHz -3 GHz	Mar. 30, 2004	RS
Directional coupler	FRANKONIA	C6148	1125	100 KHz -3 GHz	Mar. 30, 2004	RS
RADIATION METERS	NARDA	EMR-20	AS0087	100 KHz – 3 GHz	Apr. 18, 2004	RS
Waveform Generator	M&R	WG810		100 KHz – 3 GHz		RS

※ Calibration Interval of instruments listed above is two year.



17. Notice for Class A Product

This Notice is for class A product only. If the Equipment under Test is a class B product, this notice should be disregarded.

Class A ITE is a category of all other ITE which satisfies the class A ITE limits but not the class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

18. Declaration of Conformity and the CE Mark

There are three possible procedures pertaining to the declaration of conformity :

18.1 Conformity Testing and Declaration of Conformity by the Manufacturer or His Authorized Representative Established within the Community or by an Importer.

- Article 10 (1) of the EMC Directive,
- § 3 (1) no. 2a of the EMC Act.

18.2 Declaration of Conformity Issued by the Manufacturer or His Authorized Representative Established within the Community or by an Importer Following Testing of the Product and Issued of an EC certificate of conformity by a competent body.

- Article 10 (2) of the EMC Directive,
- § 3 (1) no. 2b of the EMC Act.

18.3 Declaration of Conformity Issued by the Manufacturer or His Authorized Representative Established within the Community or by an Importer Following Testing and Certification of the Product by a Notified Body.

- Article 10 (5) of the EMC Directive,
- § 3 (1) no. 2b of the EMC Act (radio transmitting installations).

18.4 Specimen For The CE Marking Of Electrical / Electronical Equipment

The components of the CE marking shall have substantially the same vertical dimension, which may not be less than 5 mm.

