CE MARK TECHNICAL FILE

AUSTRALIA EMC CONSTRUCTION FILE

of

PCM-3350 CPU Board Series

Model/ Type/ Machine Type

PCM-3350 Series

Contains:

1. Declaration of Conformity
2. EN55022/CISPR 22, AS/NZS 3548 Class A EMI test report
3. EN55024, AS/NZS 4252.1, EN61000-3-2, and EN61000-3-3 test report
4. Block Diagram and Schematics
5. User`s manual

Date: 2001/08/17

ISL-01B084E22

Declaration of Conformity

Name of Manufacturer:	Advantech Co., Ltd.
Address of Manufacturer:	FL.4, No. 108-3, Ming-Chuan Road Shing-Tien City, Taipei, Taiwan, R. O. C.
Declares that product:	PCM-3350 CPU Board Series
Model/ Type/ Machine Type:	PCM-3350 Series
Assembled by:	Same as above
Address:	Same as above

Conforms to the EMC Directive 89/336/EEC as attested by conformity with the following harmonized standards:

EN55022 Class A: 1998: Class A Limits and Methods of Measurement of Radio Interference characteristics of Information Technology Equipment

EN55024:1998: Information technology equipment--Immunity characteristics --Limits and methods of measurement

EN61000-3-2: 1995: A1:1998/A2:1998: Limits for harmonics current emissions

EN61000-3-3: 1995: Limits for voltage fluctuations and flicker in low-voltage supply systems

Conforms to the Low Voltage Directive 73/23/EEC as attested by conformity with the following harmonized standard:

Conforms to the C-Tick Mark requirement as attested by conformity with the following standards:

AS/NZS 3548: 1995 /A1:1997 /A2:1997: Information technology equipment
AS/NZS 4252.1:1994: Generic Immunity

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Charles Chang / Manager Date
Advantech Co., Ltd.

Test Report No.: 01B084C/ 01B084E
Date of Test: 2001/08/16/2001/08/17

Product Name:	PCM-3350 CPU Board Series
Model Number(s):	**PCM-3350 Series**
Responsible Party	**Advantech Co., Ltd.**
Address:	FL.4, No. 108-3, Ming-Chuan RoadShing-Tien City, Taipei,Taiwan, R. O. C.
Contact Person:	Charles Chang / Manager
Phone No.:	886-2-2118-4567 Ext : 293
FAX No.:	886-2-2118-0045

We, **International Standards Laboratory**, hereby certify that:

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in EUROPEAN COUNCIL DIRECTIVE 89/336/EEC. The device was passed the test performed according to :

EN55024	**AS/NZS 4252.1**
EN55022/CISPR 22	**EN61000-4-2 1995**
AS/NZS 3548 Class A	**EN61000-4-3 1996**
EN61000-3-2 1995A1:1998/A2:1998	**EN61000-4-4 1995**
EN61000-3-3 1995	**EN61000-4-5 1995**
	EN61000-4-6 1996
	EN61000-4-8 1993
	EN61000-4-11 1994

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

(NVLAP Lab. Code: 200234-0)

L. Y. Soong / Director
International Standards Laboratory

EN55024 / AS/NZS 4252.1 / IMMUNITY
EN61000-3-2 / HARMONICS
EN61000-3-3 / VOLTAGE FLUCTUATIONS

TEST REPORT

of

PCM-3350 CPU Board Series

Model/ Type/ Machine Type

PCM-3350 Series

Applied by:

Advantech Co., Ltd.
FL.4, No. 108-3, Ming-Chuan Road
Shing-Tien City, Taipei,
Taiwan, R. O. C.

Test Performed by:

(NVLAP Lab. Code: 200234-0)
International Standards Laboratory
No. 21, Alley 37, Lane 122, Sec. 2
Hsiwan Rd. Hsichih
Taipei Hsien 22117
Taiwan, R.O.C.

Tel:(02)2646-2550
Fax:(02)2646-4641

Report Number: ISL-01B084E22 Version: 0 Test Date: 2001/08/17

NVLAP Lab. Code: 200234-0; VCCI: R-341, C-354; NEMKO Aut. No: ELA 113; BSMI Lab. Code: SL2-IN-E-0013

Contents of Report

1. General

1.1 Certification of Accuracy of Test Data

The immunity tests which this report describes were conducted by an independent electromagnetic compatibility consultant, International Standards Laboratory in accordance with the EN55024:1998 / AS/NZS 4252.1:1994 which include EN61000-4 series regulations, Harmonic Current Emissions EN61000-3-2: 1995: A1:1998/A2:1998, and Voltage Fluctuations EN61000-3-3: 1995.

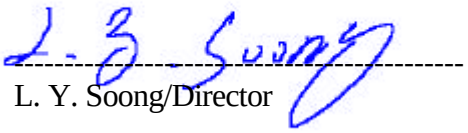
Equipment Tested: PCM-3350 CPU Board Series
Model/ Type/ Machine Type: PCM-3350 Series
Applied by Advantech Co., Ltd.

Date of test: 2001/08/17

Test Engineer: David Y.Y. Wu

Standard	Comment	Test Results
EN61000-3-2: 1995 A1:1998/A2:1998	Harmonic Current Emissions	Complies
EN61000-3-3: 1995	Voltage Fluctuations	Complies
EN61000-4-2: 1995	Electrostatic Discharge	Complies
EN61000-4-3: 1996	Radio-Frequency, Electromagnetic Field	Complies
EN61000-4-4: 1995	Electrical Fast Transient/Burst	Complies
EN61000-4-5: 1995	Surge	Complies
EN61000-4-6: 1996	Conductive Disturbance	Complies
EN61000-4-8: 1993	Power Frequency Magnetic Field	Complies
EN61000-4-11: 1994	Voltage Dips / Short Interruption and Voltage Variation	Complies

Approve & Signature



L. Y. Soong/Director

This test report accurately contains the test results of the above standards at the time of the test.

The results in this report apply only to the sample(s) tested.

This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory.

2. Product Information

EUT

Description：	PCM-3350 CPU Board Series
Condition：	Pre-Production
AC Power during Test:	230VAC/50Hz
Model：	PCM-3350 Series
CPU:	Cyrix 300MHz
Serial Number：	N/A
Power Supply Type：	N/A
Power Cord：	N/A
Keyboard Connector:	one 6 pins
Serial Port:	tow 9-pins
Parallel Port:	one 25-pins
VGA port:	one 15-pins
LAN Port：	one 8-pins
Maximum Resolution :	1280 X 1024, V:60Hz

EMI Noise Source：
None

EMI solution:
None

Description:	Personal Computer
Model:	IPC-610D
Power Supply Type :	Switching SKYNET (Model: ADT-925C) 260W
Power Rating:	100-240VAC, 47-63, 2-3A
Hard Disk Driver:	Quantum Fireball
Floppy Driver:	HP (Model : EPSON SMD-1340)
Power Cord:	Nonshielded, Detachable
Data Cable:	Shielded, Detachable

3. Summary

3.1.1 Applicant Information

Applicant:	Advantech Co., Ltd. FL.4, No. 108-3, Ming-Chuan Road Shing-Tien City, Taipei, Taiwan, R. O. C.

3.1.2 Operation Environment

Power supply : 230 Vac / 50 Hz

3.2 Description of Equipment Under Test

3.2.1 Description of Support Equipment

Support Unit 1.

Description:	HP Printer (for parallel interface port)
Model Number:	2225C
Serial Number:	N/A
Power Supply Type:	Switching (AC to AC Xfmr, Wall Mounted Type)
Power Cord:	Nonshielded, Detachable With Grounding Pin
FCC ID:	DSI6XU2225

Support Unit 2.

Description:	Aceex Modem (for serial interface port)
Model Number:	DM1414
Serial Number:	960063771
Power Supply Type:	Linear, Power Adapter (AC to AC Xfmr, Wall Mounted Type)
Power Cord:	Nonshielded, Without Grounding Pin
FCC ID:	IFAXDM1414

Support Unit 3.

Description:	Acer Monitor
Model:	7377xe
Serial Number:	999027100501700055P644E1 P
Power Supply Type:	Switching
Power Cord:	Nonshielded, Detachable
FCC ID:	(Comply with FCC DOC)

Support Unit 4.

Description:	Acer Keyboard
Model Number:	6511-TW4C
Serial Number:	916600704C83D11076S00000
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	JVPKBS-WIN

Support Unit 5.

Description:	Personal Computer
Model:	IBM 2170
Serial No.:	N/A
Power Supply Type :	Switching Delta (Model: DPS-145PB-80A)
Hard Disk Drive:	Maxtor (Model: 91303D6) 13.3GB
Floppy Driver:	Panasonic (Model: JU256A276P)
CD-ROM Drive:	AOpen (Model: CD-940E/TKU PRO)
ZIP Driver:	Iomega (Model:Z100ATAPI)
LAN Card	Accton (Model: EN1207D-TX1)
FDD/HDD Controller and VGA port/ Parallel/ Serial port:	Built on Motherboard
VGA port:	one 15-pin
Parallel Port:	one 25-pin
Serial Port:	one 9-pin
Keyboard Connector:	6-pin
Mouse Connector:	6-pin
USB Connector:	two 4-pin
Game Port:	one 15-pin
Speaker Port:	one
Microphone Port:	one
Line In Port:	one
Power Cord:	Nonshielded, Detachable
FCC ID:	N/A (comply witch FCC DOC)

Support Unit 6.

Description:	Logitech Mouse
Model Number:	M-M35
Serial Number:	LZA80458279
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	DZL210365

3.2.2 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

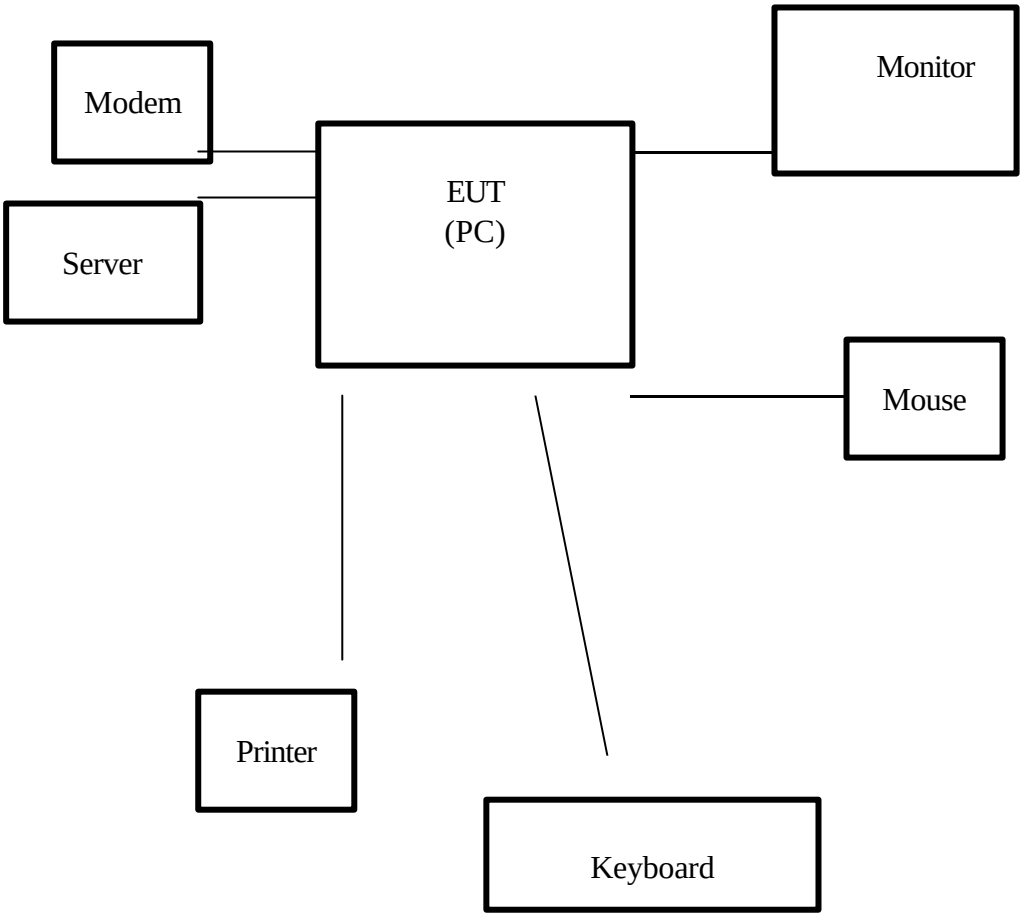
A. Read and write to the disk drives.
B. Send H pattern to the parallel port device (Printer).
C. Send H pattern to the serial port device (Modem).
D. Send H pattern to the video port device (Monitor).
E. Send signal form EUT to server through LAN port.
F. Repeat the above steps.

	Filename	Issued Date
LAN	EMC.exe	11/22/1996
Monitor	HH.bat	8/20/1991
Modem 1	Hm.bat	8/20/1991
Printer1	Wordpad.exe	11/11/1999

3.2.3 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to AC Power Cord Inlet (3-pin)	1.8M	Nonshielded, Detachable	Plastic Head Plastic Hood
Server Data Cable	Server to EUT LAN port	33 feet	Nonshielded, Detachable	RJ-45, with Metal Head, Metal Hood
Keyboard Data Cable	Keyboard to PC Keyboard port	1.8M	Shielded, Undetachable	Metal Head Plastic Hood
Monitor Data Cable	Monitor to PC VGA port	1.6M	Shielded, Detachable	Metal Head Plastic Hood
Modem Data Cable	Modem to PC COM 1 port	1.5M	Shielded, Detachable	Metal Head Metal Hood
Printer Data Cable	Printer to PC Parallel port	1.5M	Shielded, Detachable	Metal Head Plastic Hood

3.3 Layout of EUT and Support Equipments



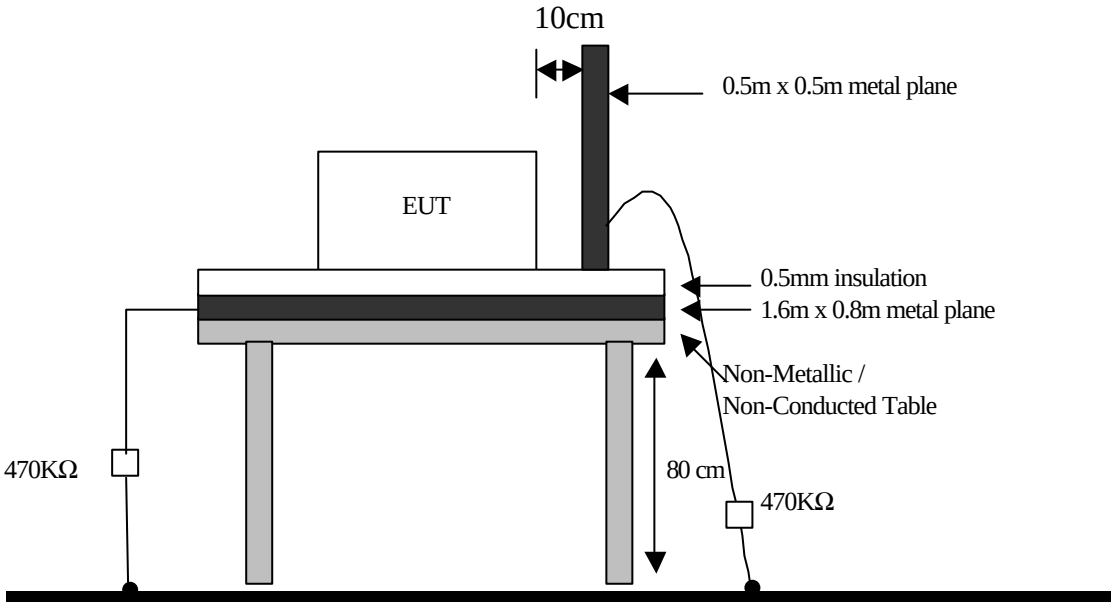
4. Electrostatic discharge (ESD) immunity

4.1 Electrostatic discharge (ESD) immunity test

Port:	Enclosure	
Basic Standard:	EN61000-4-2	
Requirements:	Air	+/- 8 kV
	Contact	+/- 4 kV
Criteria:	B	
Temperature:	25 degree C	
Humidity:	58%	

Test Setup

EUT is 1m from the wall and other metallic structure.



Metal Full Soldered Ground Plane

Observation Description

Direct Application			Test Result	
Discharge Level (kV)	Ploarity (+/-)	Test point	Horizontal Coupling	Vertical Coupling
8	+/-	1-4	N/A	Note
4	+/-	1-4	Note	N/A

Description of test point

1. Nonmetallic connector
2. Metallic Connector
3. Nonmetallic Screw
4. Metallic Screw

Note: There was no change compared with initial operation during the test

Indirect Application			Test Result	
Discharge Level (kV)	Ploarity (+/-)	Test point	Horizontal Coupling	Vertical Coupling
4	+/-	1-4	Pass	N/A

Description of test point

1. Front Side
2. Rear Side
3. Right Side
4. Left Side

Note: There was no change compared with initial operation during the test

Test Result

Performance of EUT complies with the given specification.

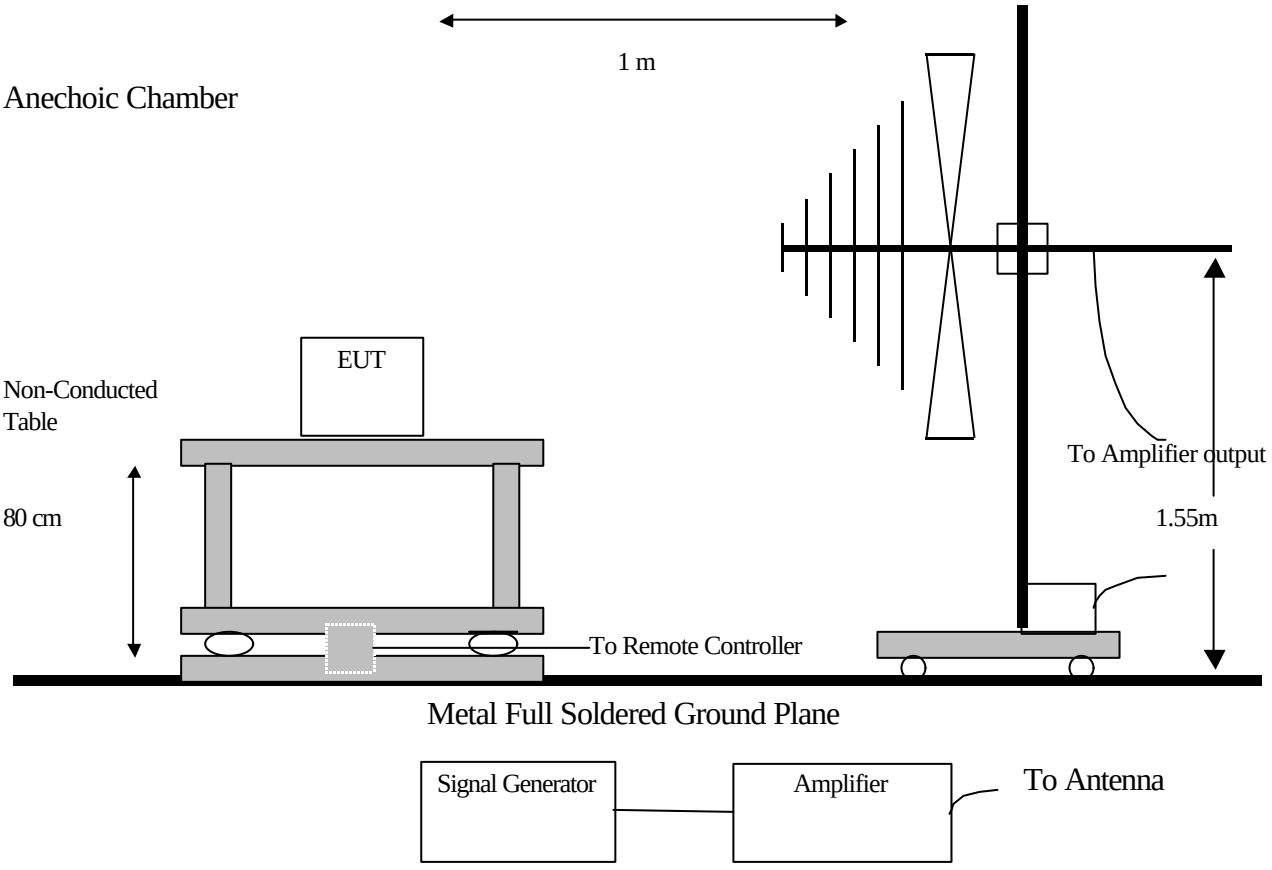
5. Radio-Frequency, Electromagnetic Field immunity

5.1 Radio-Frequency, Electromagnetic Field immunity test

Port:	Enclosure
Basic Standard:	EN61000-4-3
Modulation	AM 1KHz 80%
Requirements:	3 V/m
Frequency range:	80 MHz~1 GHz
Step:	1% of last step frequency
Step time:	800 ms
Polarization:	Vertical and Horizontal
Criteria:	A
Temperature:	24 degree C
Humidity:	46%

Test Setup

The field sensor is placed at one calibration grid point to check the intensity of the established fields on both polarizations. EUT is adjust to have each side of EUT face coincident with the calibration plane. A CCD camera is used to monitor the condition of EUT for the performance judgment.



Test Result

Performance of EUT complies with the given specification.

6. Electrical Fast transients/burst immunity

6.1 Electrical Fast transient/burst immunity test

Port:	AC mains
Basic Standard:	EN61000-4-4
Requirements:	1 KV
Criteria:	B
Rise Time:	5ns
Hold Time:	50ns
Repetition Frequency:	5KHz
Temperature:	25 degree C
Humidity:	58%

Test Procedure

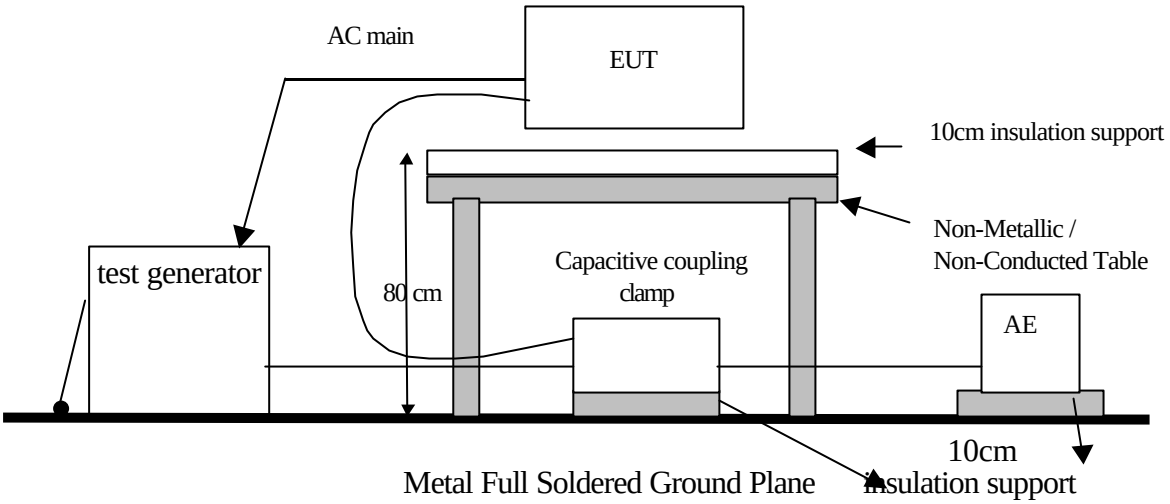
The EUT was setup on a nonconductive table 0.8 m above a reference ground plane.

	Voltage	1 KV	
Test Points	**Polarity**	**Result**	**Comment**
Line	+	N	60 sec
	-	N	60 sec
Neutral	+	N	60 sec
	-	N	60 sec
Ground	+	N	60 sec
	-	N	60 sec
Line to Neutral	+	N	60 sec
	-	N	60 sec
Line to Ground	+	N	60 sec
	-	N	60 sec
Neutral to Ground	+	N	60 sec
	-	N	60 sec
Line to Neutral to Ground	+	N	60 sec
	-	N	60 sec

Note: ' N' means normal, the EUT function is correct during the test.

Test Setup

EUT is at least 50cm from the conductive structure .



Test Result

Performance of EUT complies with the given specification.

6.2 Electrical Fast transient/burst immunity test for I/O cable

Port:	twisted pairs LAN port
Basic Standard:	EN61000-4-4
Requirements:	0.5 kV
Criteria:	B
Rise Time:	5ns
Hold Time:	50ns
Repetition Frequency:	5KHz
Temperature:	25 degree C
Humidity:	58%

Test Result

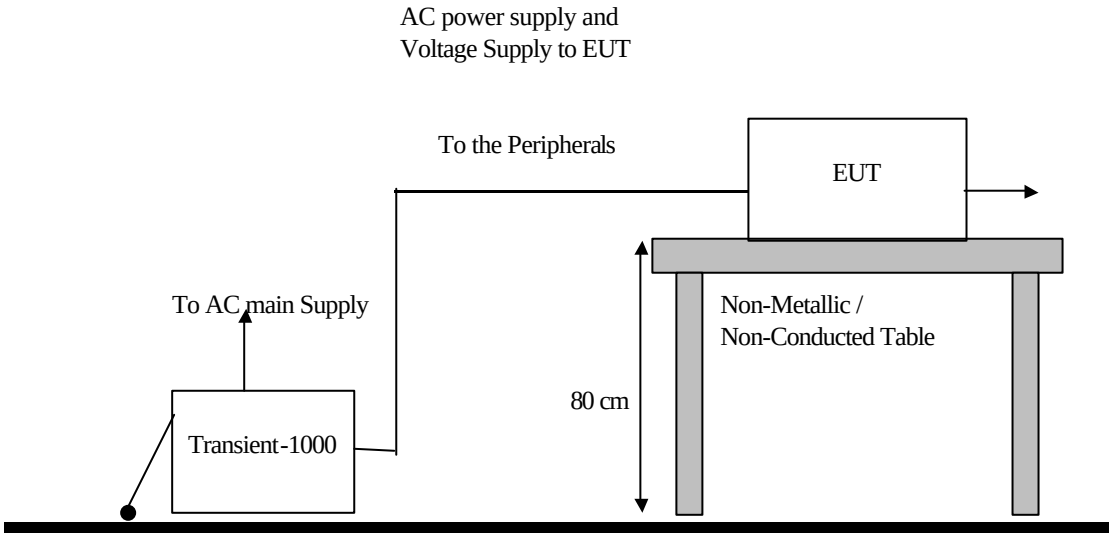
Performance of EUT complies with the given specification.

7. Surge Immunity

7.1 Surge immunity test

Port:	AC mains and Telephone Line
Basic Standard:	EN61000-4-5
Criteria:	B
Rise Time:	1.2us
Hold Time:	50us
Temperature:	25 degree C
Humidity:	58%
Test Level:	AC Power Port: 1 kV (line to line), 2kV (line to earth) Telephone Line: 1kV (line to ground)
Repetition Rate:	☑ 30 second
Angle:	☑ 0° ☑ 90° ☑ 270°
Polarity:	☑ positive ☑ negative°

Test Setup



Metal Full Soldered Ground Plane

Test Result

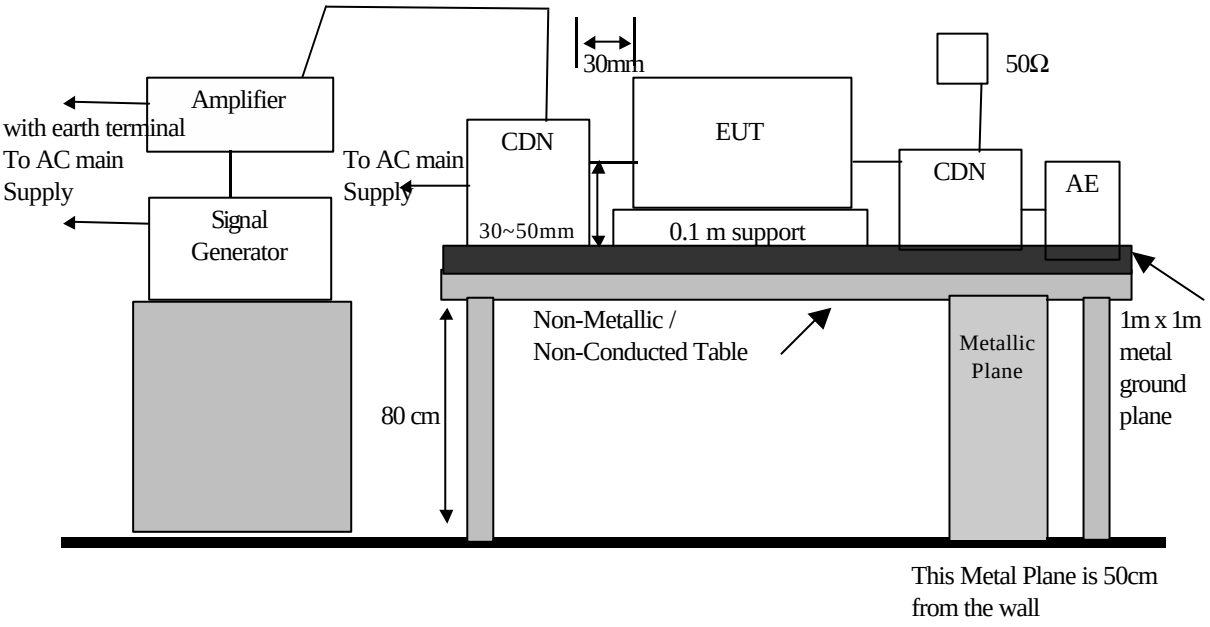
Performance of EUT complies with the given specification.

8. Immunity to Conductive Disturbance

8.1 Immunity to Conductive Disturbance

Port:	AC mains
Basic Standard:	EN61000-4-6
Test Level:	3 V
Modulation	AM 1KHz 80%
Criteria:	A
Frequency range:	0.15 MHz - 80MHz
Step:	1% of last Frequency
Step time:	1000 mS
Temperature:	25 degree C
Humidity:	58%

Test Setup



Metal Full Soldered Ground Plane

Test Result

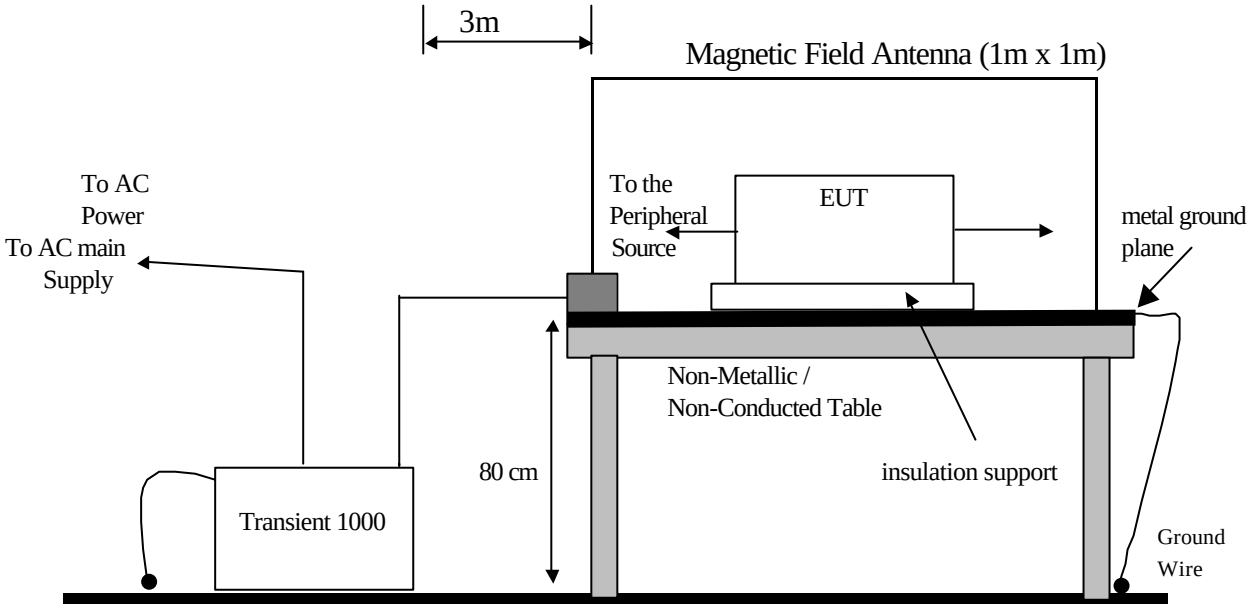
Performance of EUT complies with the given specification.

9. Power Frequency Magnetic Field immunity

9.1 Power Frequency Magnetic field immunity test

Port:	Enclosure
Basic Standard:	EN61000-4-8
Requirements:	3 A/m 50Hz
Criteria:	A
Orientation:	X, Y, Z
Temperature:	25 degree C
Humidity:	58%

Test Setup



Metal Full Soldered Ground Plane

Test Result

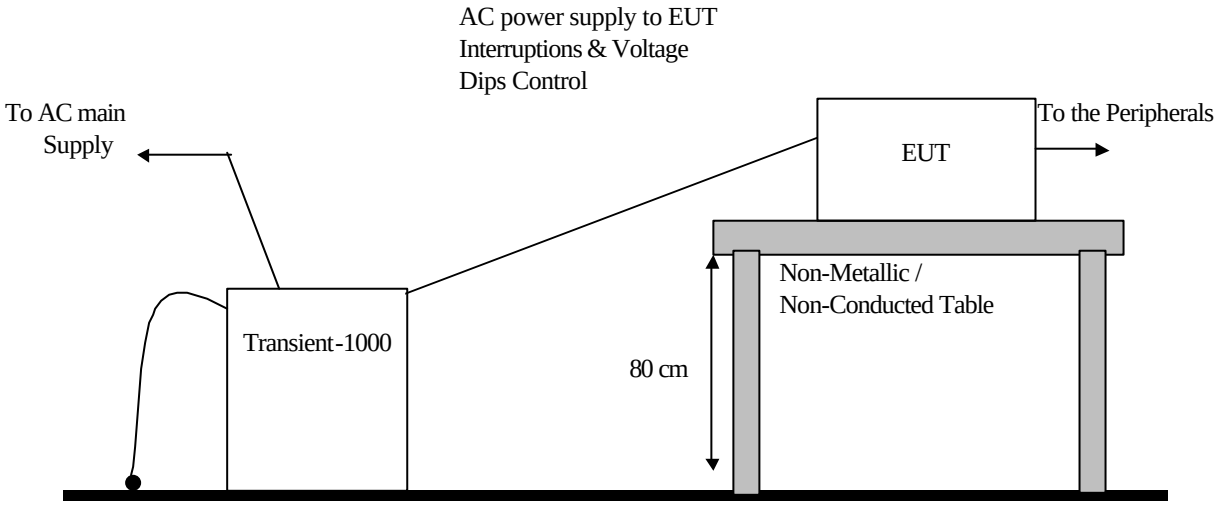
Performance of EUT complies with the given specification.

10. Voltage Dips, Short Interruption and Voltage Variation immunity

10.1 Voltage Dips, Short Interruption and Voltage Variation immunity test

Port:	AC mains
Basic Standard:	EN61000-4-11
Phase:	0°
Test intervals:	3 times with 10s each
Voltage Dips:	>95% in 0.5 period
Criteria:	B
Voltage Dips:	30% in 25 period
Criteria:	C
Voltage Interruption:	>95% in 250 period
Criteria:	C

Test Setup



Metal Full Soldered Ground Plane

Test Result

Performance of EUT complies with the given specification.

11. Harmonics

11.1 Harmonics test

Port:	AC mains
Active Input Power:	<=75W
Basic Standard:	EN61000-3-2
Test Duration:	3min.
Class:	A

Test Procedure

The EUT is supplied in series with shunts or current transformers from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the EUT. The EUT is configured to its rated current with additional resistive load when the testing is performed.

Equipment having more than one rated voltage shall be tested at the rated voltage producing the highest harmonics as compared with the limits.

Result

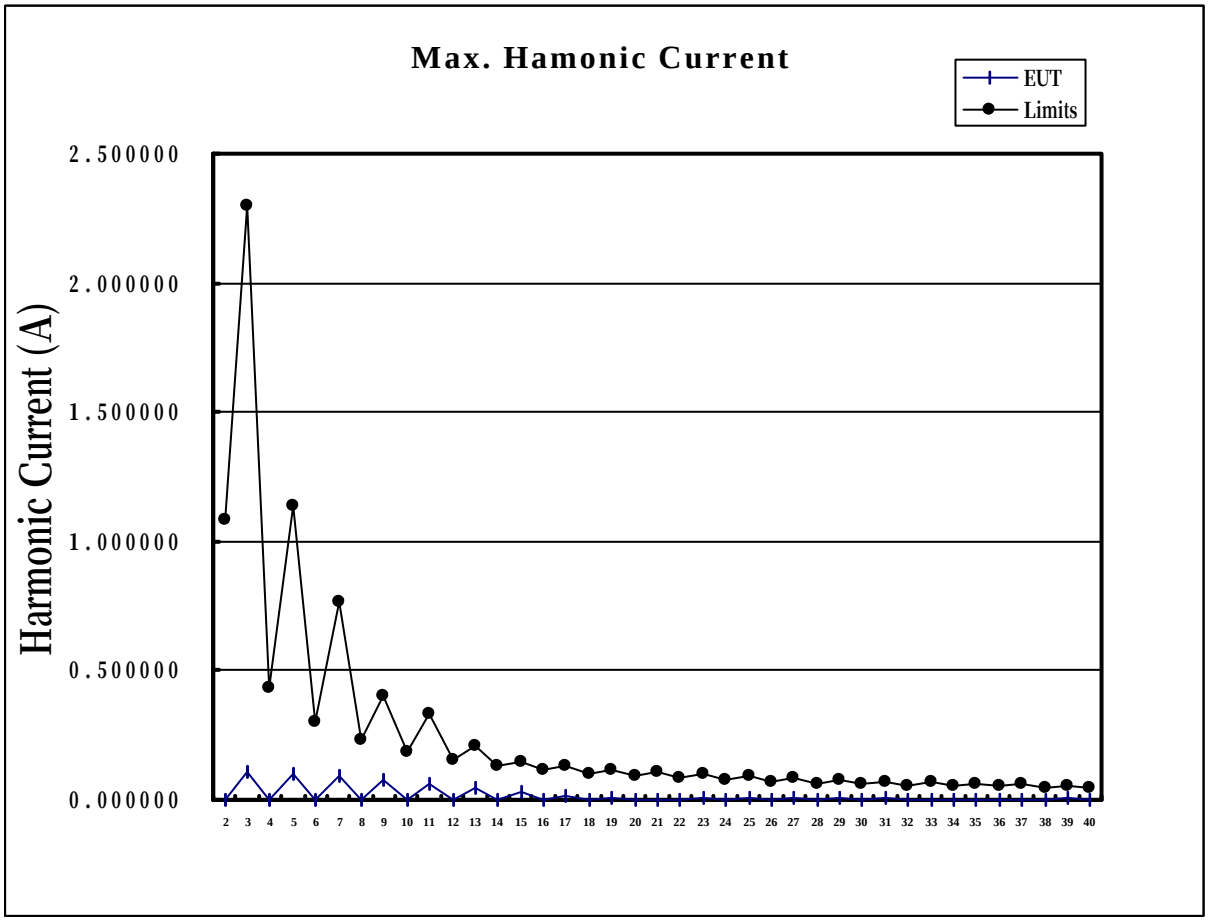
Performance of EUT complies with the given specification.

Test Data

Power (W)	Power Factor	Power Voltage	Power Current
26.489	0.467	229.934	0.134

Maximum permissible harmonic current (A)

Order	Data	Order	Data	Order	Data
1		16	0.0002	31	0.0055
2	0.0019	17	0.0157	32	0.0003
3	0.1103	18	0.0003	33	0.0029
4	0.0017	19	0.0052	34	0.0004
5	0.1014	20	0.0004	35	0.0016
6	0.0014	21	0.0029	36	0.0003
7	0.0893	22	0.0003	37	0.0028
8	0.0011	23	0.0075	38	0.0003
9	0.0753	24	0.0003	39	0.0042
10	0.0007	25	0.0095	40	0.0002
11	0.0592	26	0.0003	41	
12	0.0005	27	0.0097	42	
13	0.0436	28	0.0003	43	
14	0.0003	29	0.0079	44	
15	0.0284	30	0.0004	45	



12. Voltage Fluctuations

12.1 Voltage Fluctuations test

Port:	AC mains
Basic Standard:	EN61000-3-3
Observation period:	For Pst 10min
	For Plt 2 hours

Test Procedure

The EUT is supplied in series with reference impedance from a power source with the voltage and frequency as the nominal supply voltage and frequency of the EUT.

Result

Performance of EUT complies with the given specification.

13. Test Equipment List

Location Remark	Equipment	Brand	Model	Start Service Date	Last Cal. Date	Next Cal. Date
2,4,5,8,11	Test Generator	PRECISION	TRA1000-126 S/N: TRA1H01B	6/30/1994	8/9/2000	8/9/2001
3,6	Power meter	HP	438A S/N: 3513U06187	10/23/1997	10/23/2000	10/23/2001
3,6	Power Sensor	HP	8482A S/N: 3318A29614	10/23/1997	1/03/2000	1/03/2001
3	Signal Generator	HP	8648B S/N: 3642U01040	6/30/1997	3/13/2001	3/13/2003
3	BILOG Antenna	CHASE	CBL6112 S/N: 2077	10/20/1998	1/10/2001	1/09/2002
3	Power Amplifier	Amplifier Research	100W1000M1 S/N:	3/31/1996	N/A	N/A
3	Field Strength Sensor	Amplifier Research	FP2000 S/N: 15397	3/31/1996	N/A	N/A
3	Field Strength Meter	Amplifier Research	FM2000 S/N: A285000011	3/31/1996	N/A	N/A
3	Thermo-hygrometer	CRECER	S/N: ISL-C-003	11/26/1999	1/12/2001	1/11/2002
4	Clamp	Precision	1604242 S/N: CNEFT1000-103	6/30/1994	N/A	N/A
5,6	CDN	FCC Inc.	FCC-801-T2 S/N:9720	6/30/1994	1/11/2001	1/10/2002
6	CDN	FCC Inc.	FCC-801-T4 S/N: 9721	6/30/1994	1/11/2001	1/10/2002
6	CDN	FCC Inc.	FCC-801-M3-25A S/N: 2032	6/30/1994	1/11/2001	1/10/2002
6	Signal Generator	HP	8656B S/N: 2635A04675	6/30/1992	8/17/2000	8/17/2001
6	Power Amplifier	Amplifier Research	150A100 S/N: 1-1-R-02157	3/1/1996	N/A	N/A
6	Passive Impedance Adapter	FCC Inc.	FCC-801-150-50-CDN S/N: 9758 & 9759	3/1/1996	N/A	N/A
6	50 ohms load	Weinschel Corp	1429-4 S/N: DB3318	3/1/1996	N/A	N/A
6	6dB Attenuator	Weinschel Corp	33-6-34 S/N: BC5975	3/1/1996	N/A	N/A
8	Magnetic Field Antenna	Precision	TRAIZ44B S/N: MF1000-23	8/30/1997	N/A	N/A
8	Clamp Meter	TES	3090 S/N: 990900322	5/09/2001	5/09/2001	5/09/2002
*2, *3	3-Channel Power Analysis System	Xitron Technologies	2503AH S/N: 25015940001	6/30/1994	2/09/2001	2/09/2002
*2, *3	Frequency Converter	Extech Electronics	CFC-110	6/30/1994	N/A	N/A
2,4,5,6,8,11	Thermo-hygrometer	MICROLIFE	S/N: ISL-C-004	11/26/1999	1/12/2001	1/12/2002

*Note: ***: The equipment is sent for calibration.*

Location Remark List:

2: EN61000-4-2 **3**: EN61000-4-3 **4**: EN61000-4-4 **5**: EN61000-4-5
6: EN61000-4-6 **8**: EN61000-4-8 **11**: EN61000-4-11
***2**: EN61000-3-2 ***3**:EN61000-3-3

14. Photographs

14.1 Photos of ESD measurement

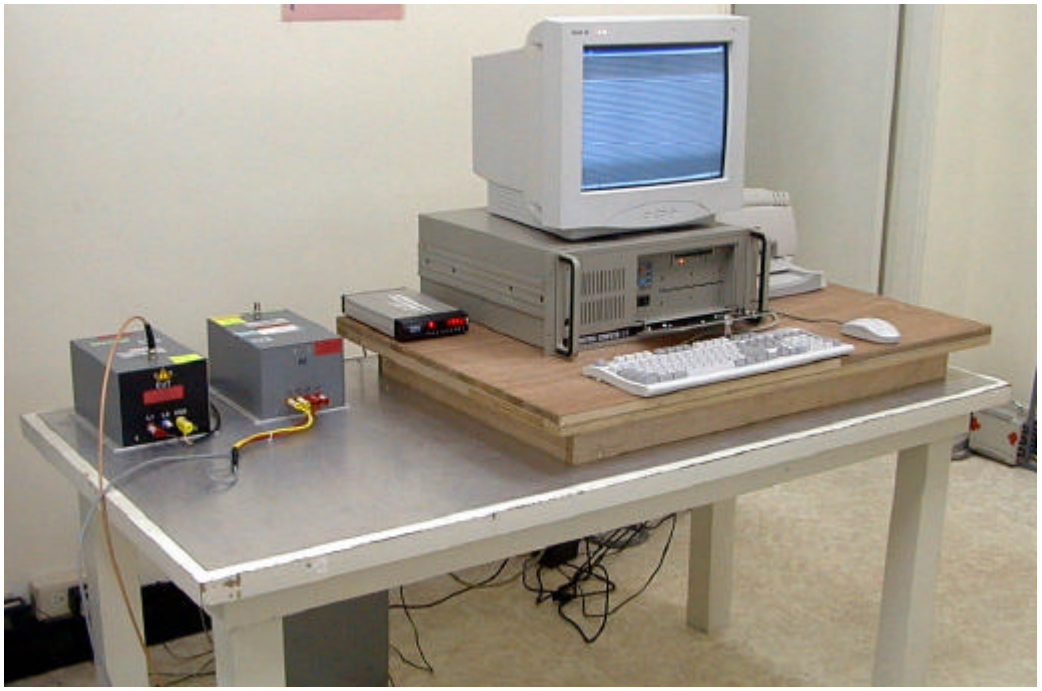
14.2 Photos of RF Field Strength Susceptibility Measurement

.

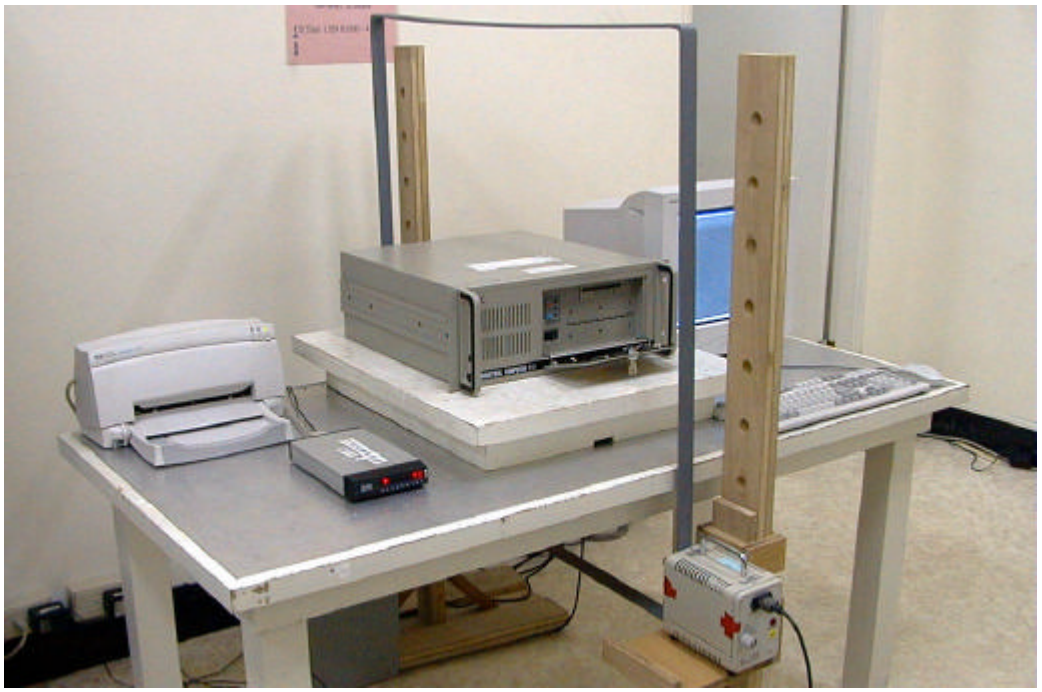
14.3 Photos of Electrical Fast Transient/Burst measurement

14.4 Photos of Surge measurement

14.5 Photo of Conductive Measurement



14.6 Photo of Magnetic field measurement



14.7 Photos of Voltage Dips measurement

14.8 Photos of Harmonics and Voltage Fluctuations

14.9 Appendix: Photographs of EUT

Please find this appendix in the File of **ISL-01B084P**