Measurement Report

Issued Date : Jun. 26, 2003
Project No. : 03E0302
Equipment : 16 Port 10/100/1000Mbps Gigabit Ethernet Switch
Model No. : DGS-1016T; BDGS-1016T
Applicant : D-Link Corp.
No. 20 Park Ave.II, Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.

Tested by :
Neutron Engineering Inc. EMC Laboratory
Data of Test :
Jun. 24, 2003 ~ Jun. 25, 2003

Testing Engineer : (Alex Liao)

Technical Manager : (Andy Chiu)

Authorized Signatory : (George Yao)

NEUTRON ENGINEERING INC.

No. 132-1, Lane 329, Sec. 2, Palain Rd.,
Shijr City, Taipei, Taiwan
TEL : (02) 2646-5426 FAX : (02) 2646-6815

NVLAP Lab Code: 200145-0

CNLA 0659 ILAC MRA

Nemko Aut No.ELA136

VCCI R-1347 C-1410

Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

Neutron's reports apply only to the specific samples tested under conditions. It is manufacture' s responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **Neutron** shall have no liability for any declarations , inferences or generalizations drawn by the client or others from **Neutron** issued reports.

Neutron' s reports must not be used by the client to claim product endorsement by the authorities or any agency of the Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **Neutron-self**, extracts from the test report shall not be reproduced except in full with **Neutron**' s authorized written approval.

Neutron' s laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Assessment Authorities	Test Standard/Scope/Item Acceptance
NVLAP Lab Code: 200145-0	FCC Part 15 Subpart B IEC/CISPR22 AS/NZS 3548 CNS 13438
CNLA 0659 ILAC MRA	FCC Part 15 Subpart B CISPR 22/EN 55022 AS/NZS 3548 VCCI -Technical Requirement CNS 13438 SS IEC/CISPR 22 IEC/EN 61000-3-2 IEC/EN 61000-4-5 IEC/EN 61000-3-3 IEC/EN 61000-4-6 IEC/EN 61000-4-2 IEC/EN 61000-4-8 IEC/EN 61000-4-3 IEC/EN 61000-4-11 IEC/EN 61000-4-4
Nemko Aut No.ELA136	CISPR 22/EN 55022 IEC/EN 61000-3-2 IEC/EN 61000-4-5 IEC/EN 61000-3-3 IEC/EN 61000-4-6 IEC/EN 61000-4-2 IEC/EN 61000-4-8 IEC/EN 61000-4-3 IEC/EN 61000-4-11 IEC/EN 61000-4-4
VCCI R-1347 C-1410	VCCI -Technical Requirement

Table of Contents **Page**

Table of Contents **Page**

Table of Contents **Page**

1. General Information

1.1 Applicant

Name D-Link Corp.
Address No. 20 Park Ave.II, Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.

1.2 Manufacturer

Name N/A
Address N/A

1.3 Equipment Under Tested

Name: 16 Port 10/100/1000Mbps Gigabit Ethernet Switch
Trade Name: D-Link Corp.
Model No.: DGS-1016T; BDGS-1016T

1.4 OEM Brand/Model (if applicable)

OEM Brand(s)/Model(s) except the basic model in sub-clause 1.3 is(are) the follows:
OEM Brand: N/A
Model No.: N/A

1.5 Product Descriptions(Application/Features/Specification)

The EUT is a 16 Port 10/100/1000Mbps Gigabit Ethernet Switch.
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual

1.6 Connecting I/O Port(s)

16 Ports RJ 45 8P8C

1.7 Power Supplied

Power Source: AC Mains.
Power Cord: Detachable, non-shielded type.
Power Rating: AC I/P 100-240Vac, 50-60Hz/DC O/P 5Vdc, 8A

1.8 Products Covered (if applicable)

The sample tested including the following sub-system/module/accessory：

Sub-system/ Module/ Accessory	Model/Type No.	Int. Inst./ Ext. Cont.
Power Supply	SA40-050100 (LEI)	Int. Inst
Power Supply	UP0401S-05L1 (UMEC)	Int. Inst

1.9 Model Difference (Series, Versions, if any)

Except the basic model no. (model designation of the sample tested in this test report), additional model no. covered is(are)：

N/A

1.10 EUT Modifications (if applicable)

No any modification required for the EUT to comply with the standards.
Please refer to the Attachment – **A.**

1.11 Photos of EUT

Please refer to the Attachment – **C.**

2. RFI Emissions Measurement

2.1Test Facility

The test facilities used to collect the test data in this report is OS02 at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.

2.2 Standard Compliance

The test data contained in this report relate only to the item(s) listed below :

Limitation Class A

CISPR 22 :1997/EN 55022 : 1998+A1:2000

2.3 Test Methodology

Both conducted and radiated testing were performed during the max. EMI emission evaluation.

Antenna to EUT distance is 10 m.

Test procedures according to the technical standards:
CISPR 22 :1997+A1:2000 / EN 55022 : 1998+A1:2000

2.4 Deviations from Standard Test Method

N/A

2.5 Sample(s) Tested

The representative sample tested in this reports is(are): DGS-1016T

Test results in this test report relate only to the sample(s) tested.

The EUT has been tested according to the following environmental condition:

Input Power	230 Vac/50Hz
Temperature	26 ℃
Relative Humidity	70 %

2.6 Measurement Instruments

Valid measurement instruments used in this report refer to **Table-1** enclosed.

2.7 Measurement Uncertainty

The reported uncertainty of measurement **y ± U，** where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2，** providing a level of confidence of approximately **95** %。

A. Conducted Measurement :5.05dB

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
OS-01	ANSI	30MHz ~ 200MHz	H	4.59	
		30MHz ~ 200MHz	V	4.80	
		200MHz ~ 1,000MHz	H	4.47	
		200MHz ~ 1,000MHz	V	5.03	
OS-01	VCCI	30MHz ~ 200MHz	H	4.59	Only for VCCI Report
		30MHz ~ 200MHz	V	4.48	Only for VCCI Report
		200MHz ~ 1,000MHz	H	4.47	Only for VCCI Report
		200MHz ~ 1,000MHz	V	4.73	Only for VCCI Report
OS-02	ANSI	30MHz ~ 200MHz	H	4.34	
		30MHz ~ 200MHz	V	5.15	
		200MHz ~ 1,000MHz	H	5.28	
		200MHz ~ 1,000MHz	V	4.53	
OS-02	VCCI	30MHz ~ 200MHz	H	4.34	Only for VCCI Report
		30MHz ~ 200MHz	V	4.77	Only for VCCI Report
		200MHz ~ 1,000MHz	H	4.91	Only for VCCI Report
		200MHz ~ 1,000MHz	V	4.53	Only for VCCI Report

2.8 Tested System Set-Up/Configuration Details

The system was configured for testing in a typical fashion (as a user would normally use) or in-accordance with the operating configuration specified in the user's manual. A Block Diagram(please refer to the Diagram - 1) and Photos(please refer to the attachment - **B**) showing the set-up/configuration of system tested. In addition, **Table-2** and **Table-3** provide a detail of all equipment items and cables information used in the system tested.

Table -1 Measurement Instruments List

Item	Instruments	Mfr/Brand	Model/Type No.	Serial No.	Calibrated Date	Next Cali. Date	Note
1	LISN	EMCO	3825/2	9605-2539	2003-06-09	2004-06-08	
2	LISN	Rolf Heine	NNB-2/16Z	98083	2002-11-01	2003-10-31	✓
3	LISN	Rolf Heine	NNB-2/16Z	98053	2002-11-15	2003-11-14	✓
4	Pulse Limiter	Electro-Metrics	EM-7600	112644	2002-12-09	2003-12-08	✓
5	50Ω Terminator	N/A	N/A	N/A	2003-05-09	2004-05-08	✓
6	Test Cable	N/A	C01	N/A	2002-12-10	2003-12-09	✓
7	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3058	2002-10-23	2003-10-22	
8	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3060	2002-10-23	2003-10-22	✓
9	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9161	4022	2002-07-25	2003-07-24	
10	Test Cable	N/A	10M_OS01	N/A	2002-12-10	2003-12-09	
11	Test Cable	N/A	OS01-1/-2	N/A	2002-12-10	2003-12-09	
12	Test Cable	N/A	10M_OS02	N/A	2002-12-10	2003-12-09	✓
13	Test Cable	N/A	OS02-1/-2/-3	N/A	2002-12-10	2003-12-09	✓
14	RF Switch	Anritsu	MP59B	M65982	2001-12-09	2003-12-08	
15	Quasi-Peak Adapter	HP	85650A	2521A00844	2003-04-21	2003-10-20	✓
16	RF Pre-Selector	HP	85685A	2648A00417	2003-04-21	2003-10-20	✓
17	Spectrum Analyzer	HP	85680B	2634A03025	2003-04-21	2003-10-20	✓
18	Spectrum Monitor	HP	85662B	2648A13616	2003-04-21	2003-10-20	✓
19	Pre-Amplifier	Anritsu	MH648A	M09961	2002-12-09	2003-12-08	
20	Spectrum Analyzer	ADVAN TEST	R3261C	81720298	2002-08-14	2003-08-13	
21	Test Receiver	R&S	ESH3	860156/018	2002-10-22	2003-10-21	
22	Test Receiver	R&S	ESVP	860687/009	2002-12-06	2003-12-05	
23	Test Receiver	MEB	SMV41	130	2002-12-06	2003-12-05	✓
24	Test Receiver	PMM	PMM 9000	4310J01002	2002-10-06	2003-10-03	
25	Horn Antenna	EMCO	3115	9605-4803	2003-05-23	2004-05-22	
26	Test Receiver	R&S	ESMI	843977/005	2003-01-13	2004-01-12	
27	Pre-Amplifier	R&S	ESMI-Z7	1045.5020.9801 (612.278 041 00)	2003-05-19	2004-05-18	✓
28	Absorbing Clamp	R&S	MDS-21	841077/011	2002-08-23	2003-08-22	
29	Voltage Probe	R&S	ESH2-Z3	841.800/023	2002-08-28	2003-08-27	
30	Signal Generator	HP	8648A	3426A01034	2002-10-11	2004-10-08	
31	Antenna Mast	Chance Most	CMTB-1.5	N/A	N/A	N/A	✓
32	Turn Table	Chance Most	CMTB-1.5	N/A	N/A	N/A	✓

Remark :
(1)" ✓" indicates the instrument used in Test Report.
(2)" N/A" denotes No Model No. / Serial No. and No Calibration specified.

Diagram - 1
Block diagram showing the configuration of system tested

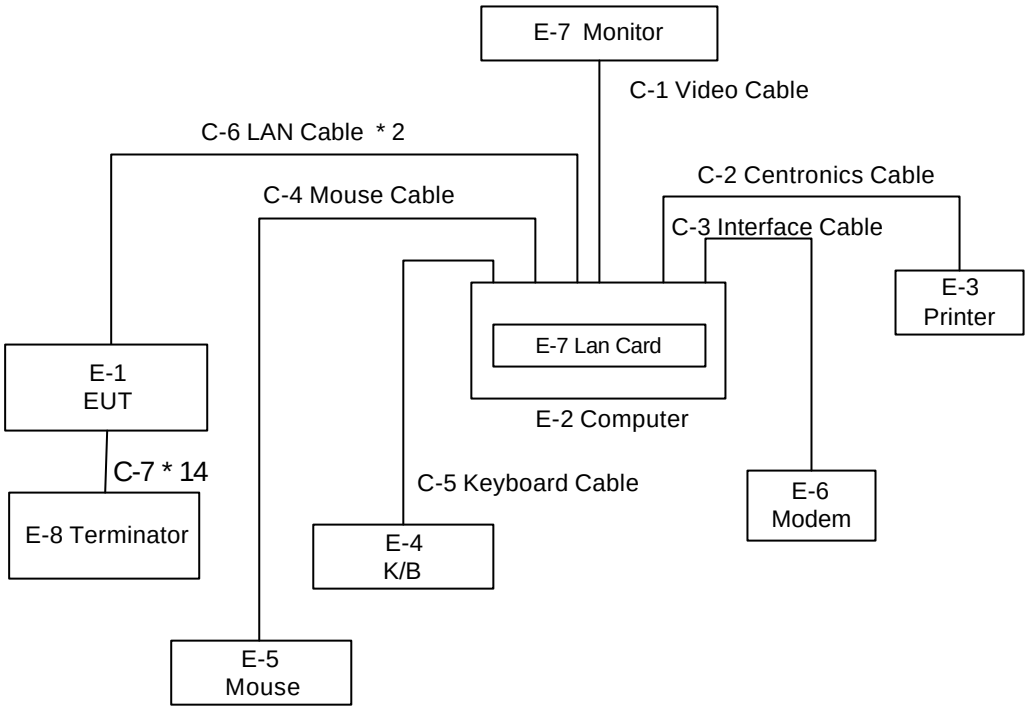


Table - 2 Equipments Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	16 Port 10/100/1000Mbps Gigabit Ethernet Switch	D-Link	DGS-1016T	N/A(3)	N/A	EUT
E-2	PC	HP	Pavilion 8801	N/A(3)	SG12460765	
E-3	Printer	SII	DPU-414	N/A(3)	1045105A	
E-4	PS/2 K/B	HP	5181	N/A(3)	N/A	
E-5	PS/2 Mouse	HP	P8131	N/A(3)	5185-1212	
E-6	Modem	ACEEX	DM-1414V	N/A(3)	8041708	
E-7	Lan Card	D-LINK	DFE-500TX	KA2APC500X2	10M/100M	
E-7	Terminator	D-Link Corp.	N/A	N/A	N/A	※

Note:

(1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.
(2) Unless otherwise marked as ※ in 『Remark』 column, Neutron consigns the support equipment to the tested system.
(3) The support equipment was authorized by Declaration of Confirmation.

Table - 3 Information of Interface Cable

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	YES	1.8M	
C-2	YES	NO	1.8M	
C-3	YES	NO	1.5M	
C-4	YES	NO	1.5M	
C-5	YES	NO	1.5M	
C-6	NO	NO	2M	
C-7	NO	NO	1.2M	

Note:

(1) Unless otherwise marked as ※ in 『Remark』 column, Neutron consigns the support equipment to the tested system.
(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.9 Max.(Worst Case) RF Emission Evaluation

(a) Both conducted and radiated testing were performed during the max. EMI emission evaluation.
(b) The system was configured for testing in a typical fashion (as a customer would normally use it). The EUT was connected to support equipment-personal computer. Peripherals of PC, such as monitor, keyboard, modem and printer were contained in this system in order to comply with the CISPR22 (1997) Rules requirement. The PC operated in the default 640 x 480 / 31.5 KHz VGA Graphic mode. This operating condition was tested and used to collect the included data.
(c) To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Mode 1 10 Mbps (Power Supply: SA40-050100)
Mode 2 100 Mbps (power supply: SA40-05100)
Mode 3 1000 Mbps (power supply: SA40-05100)
Mode 4 10 Mbps (power supply: UP0401S-05L1)
Mode 5 100 Mbps (power supply: UP0401S-05L1)
Mode 6 1000 Mbps (power supply: UP0401S-05L1)

The EUT system operated Mode 2, 3, 5, and 6, mentioned above was found to be the worst case during the pre-scanning test.
These operation modes were used for final testing and collecting test data included in this report.

2.10 EUT Operation

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The program contained on a PC hard disk and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:
1. Read (write) from (to) mass storage device (Disk).
2. Send "H" pattern to video port device (Monitor).
3. Send " H " pattern to parallel port device (Printer).
4. Send " H " pattern to serial port device (Modem).
5. EUT send/receive data to/from PC server (EUT - PC).
6. Repeated from 2 to 5 continuously.

As the keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

3. Justification

3.1 Limitations

3.1.1 Power Line Conducted Emission (Frequency Range 150KHz-30MHz)

Measurement Frequency Range (MHz)	Mains Terminal Class A Limits (dBuV)		Mains Terminals Class B Limits (dBuV)		Note CISPR FCC Std.
	QP Mode	AV Mode	QP Mode	AV Mode	
0.15 - 0.50	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 - 5.00	73.00	60.00	56.00	46.00	CISPR
5.00 - 30.0	73.00	60.00	60.00	50.00	CISPR
0.45-1.705	60.00	N/A	48.00	N/A	FCC
1.705-30.0	69.50	N/A	48.00	N/A	FCC

Notes:

(1). The tighter limit applies at the band edges.

(2). The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 Radiated Emission Limits (Frequency Range 30MHz-1000MHz)

Measurement Frequency Range (MHz)	Quasi-Peak Mode Class A Limits (dBuV/m)		Quasi-Peak Mode Class B Limits (dBuV/m)		Note CISPR FCC Std.
	10m	30m	10m	3m	
30.00 -230.00	40.00	30.00	30.00	40.00	CISPR
230.0 -1000.0	47.00	37.00	37.00	47.00	CISPR
30.00 - 88.00	39.00	N/A	30.00	40.00	FCC
88.00 - 216.0	43.50	N/A	33.50	43.50	FCC
216.0 -960.0	46.00	N/A	36.00	46.00	FCC
above 960.0	49.50	N/A	46.00	54.00	FCC

Notes:

(1). The tighter limit applies at the band edges.

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

(3). A measuring distance 0f 10m is a primary used. However, either 3m or 10m (instead of 10m) distance my be allowed. If the distance is 3m, add 10dB to the QP-limit above. If the distance is 10m, subtract 10dB from the QP-limit above.

3.2 Measurement Justification

3.2.1 Conducted Emission

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and these signals are then Quasi Peak detector mode and Average detector mode re-measured.

Data of **Table - 4**. lists the significant emission frequencies, measured levels, limits and safe margins. All readings are Peak Mode measured unless otherwise stated as QP or AV in column of " Remark ".

If the Peak Mode measured value lower than both QP Mode and AV Mode Limit, EUT shall be deemed to compliance with both QP & AV Limits and then no additional QP Mode or AV Mode measurement performed.

If additional QP or AV Mode measurement needed, and if the QP Mode measured value compliance with the QP Mode Limit and lower than AV Mode Limit, the EUT shall be deemed to meet both QP & AV Limits and then only QP Mode was measured, but AV Mode was not performed。

3.2.2 Radiated Emission

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

Data of **Table - 5**. lists the significant emission frequencies, measured levels, limits and safe margins. All readings are Peak Mode measured unless otherwise stated as QP in column of " Remark ".

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

3.3 Measurement Data

Table - 4. Conducted Emission Data

Table - 5. Radiated Emission Data

Table 4 Conducted Emission Data

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2

Judgement：Passed by -18.40 dB at 17.02 MHz ___ AVG X QP ____ Line X Neutral

Freq.	Terminal	Measured(dBuV)		Limits(dBuV)		Safe Margins	
(MHz)	L/N	QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.21	Line	56.71	*	79.00	66.00	-22.29	(QP)
0.64	Line	48.51	*	73.00	60.00	-24.49	(QP)
3.82	Line	43.55	*	73.00	60.00	-29.45	(QP)
12.32	Line	45.27	*	73.00	60.00	-27.73	(QP)
16.84	Line	50.89	*	73.00	60.00	-22.11	(QP)
24.40	Line	44.06	*	73.00	60.00	-28.94	(QP)
0.21	Neutral	55.81	*	79.00	66.00	-23.19	(QP)
0.27	Neutral	52.41	*	79.00	66.00	-26.59	(QP)
0.55	Neutral	48.91	*	73.00	60.00	-24.09	(QP)
3.28	Neutral	45.92	*	73.00	60.00	-27.08	(QP)
17.02	Neutral	54.60	*	73.00	60.00	-18.40	(QP)
24.40	Neutral	46.66	*	73.00	60.00	-26.34	(QP)

Remark：

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

(2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(3) Measuring frequency range from 150KHz to 30MHz。

Table 4 Conducted Emission Data

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 3

Judgement：Passed by -19.40 dB at 17.02 MHz ___ AVG X QP ____ Line X Neutral

Freq.	Terminal	Measured(dBuV)		Limits(dBuV)		Safe Margins	
(MHz)	L/N	QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.21	Line	56.71	*	79.00	66.00	-22.29	(QP)
0.64	Line	45.51	*	73.00	60.00	-27.49	(QP)
3.35	Line	37.31	*	73.00	60.00	-35.69	(QP)
12.32	Line	40.27	*	73.00	60.00	-32.73	(QP)
16.84	Line	46.89	*	73.00	60.00	-26.11	(QP)
24.40	Line	40.06	*	73.00	60.00	-32.94	(QP)
0.21	Neutral	55.81	*	79.00	66.00	-23.19	(QP)
0.55	Neutral	45.91	*	73.00	60.00	-27.09	(QP)
3.07	Neutral	36.44	*	73.00	60.00	-36.56	(QP)
12.32	Neutral	40.67	*	73.00	60.00	-32.33	(QP)
17.02	Neutral	53.60	*	73.00	60.00	-19.40	(QP)
24.40	Neutral	40.66	*	73.00	60.00	-32.34	(QP)

Remark：

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(3) Measuring frequency range from 150KHz to 30MHz。

Table 4 Conducted Emission Data

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 5

Judgement：Passed by -17.79 dB at 0.54 MHz ___ AVG X QP ____ Line X Neutral

Freq.	Terminal	Measured(dBuV)		Limits(dBuV)		Safe Margins	
(MHz)	L/N	QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.15	Line	53.36	*	79.00	66.00	-25.64	(QP)
0.21	Line	52.81	*	79.00	66.00	-26.19	(QP)
0.56	Line	48.61	*	73.00	60.00	-24.39	(QP)
4.27	Line	44.89	*	73.00	60.00	-28.11	(QP)
12.85	Line	48.77	*	73.00	60.00	-24.23	(QP)
15.64	Line	49.80	*	73.00	60.00	-23.20	(QP)
0.20	Neutral	58.41	*	79.00	66.00	-20.59	(QP)
0.25	Neutral	52.01	*	79.00	66.00	-26.99	(QP)
0.54	Neutral	55.21	*	73.00	60.00	-17.79	(QP)
2.93	Neutral	41.15	*	73.00	60.00	-31.85	(QP)
12.12	Neutral	51.27	*	73.00	60.00	-21.73	(QP)
16.66	Neutral	55.07	*	73.00	60.00	-17.93	(QP)

Remark：

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

(2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(3) Measuring frequency range from 150KHz to 30MHz。

Table 4 Conducted Emission Data

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 6

Judgement：Passed by -19.79 dB at 12.12 MHz ___ AVG X QP ____ Line X Neutral

Freq.	Terminal	Measured(dBuV)		Limits(dBuV)		Safe Margins	
(MHz)	L/N	QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.15	Line	53.36	*	79.00	66.00	-25.64	(QP)
0.21	Line	54.81	*	79.00	66.00	-24.19	(QP)
0.56	Line	52.61	*	73.00	60.00	-20.39	(QP)
3.68	Line	41.26	*	73.00	60.00	-31.74	(QP)
12.85	Line	42.77	*	73.00	60.00	-30.23	(QP)
24.40	Line	41.46	*	73.00	60.00	-31.54	(QP)
0.15	Neutral	53.46	*	79.00	66.00	-25.54	(QP)
0.20	Neutral	54.41	*	79.00	66.00	-24.59	(QP)
0.54	Neutral	53.21	*	73.00	60.00	-19.79	(QP)
12.12	Neutral	43.27	*	73.00	60.00	-29.73	(QP)
16.66	Neutral	53.07	*	73.00	60.00	-19.93	(QP)
24.40	Neutral	41.36	*	73.00	60.00	-31.64	(QP)

Remark：

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

(2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(3) Measuring frequency range from 150KHz to 30MHz。

Table 5 Radiated Emission Data

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2

Judgement：Passed by -9.23 dB at 125.02 MHz X Peak ___ QP ____ Hor. X Vert.

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
125.02	V	45.20	- 14.43	30.77	40.00	- 9.23	
125.02	H	44.60	- 14.43	30.17	40.00	- 9.83	
139.36	V	41.30	- 13.19	28.11	40.00	- 11.89	
153.07	V	41.30	- 12.71	28.59	40.00	- 11.41	
153.39	H	39.50	- 12.70	26.80	40.00	- 13.20	
158.86	H	39.50	- 12.68	26.82	40.00	- 13.18	
250.00	V	51.25	- 13.61	37.64	47.00	- 9.36	
375.01	V	41.65	- 9.13	32.52	47.00	- 14.48	
375.01	H	42.97	- 9.13	33.84	47.00	- 13.16	
750.01	H	35.17	0.44	35.61	47.00	- 11.39	
875.01	H	30.27	3.48	33.75	47.00	- 13.25	
875.02	V	29.97	3.48	33.45	47.00	- 13.55	

Remark：

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz；SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz。

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn' t perform。

(3) Measuring frequency range from 30MHz to 1000MHz。

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。

Table 5 Radiated Emission Data

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 3

Judgement：Passed by -8.67 dB at 625.0 MHz X Peak ___ QP X Hor. ___ Vert.

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
51.91	V	43.22	- 15.36	27.86	40.00	- 12.14	
63.74	H	40.47	- 16.25	24.22	40.00	- 15.78	
109.61	V	43.70	- 16.16	27.54	40.00	- 12.46	
142.04	H	38.42	- 13.09	25.33	40.00	- 14.67	
148.79	H	38.92	- 12.79	26.13	40.00	- 13.87	
150.93	V	41.40	- 12.72	28.68	40.00	- 11.32	
250.00	V	50.92	- 13.61	37.31	47.00	- 9.69	
250.00	H	47.35	- 13.61	33.74	47.00	- 13.26	
375.00	V	42.62	- 9.13	33.49	47.00	- 13.51	
500.00	V	39.67	- 5.63	34.04	47.00	- 12.96	
625.00	H	40.20	- 1.87	38.33	47.00	- 8.67	
750.00	H	36.80	0.44	37.24	47.00	- 9.76	

Remark：

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz；SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz。

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn‘ t perform。

(3) Measuring frequency range from 30MHz to 1000MHz。

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。

Table 5 Radiated Emission Data

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 5

Judgement：Passed by -7.23 dB at 125.01 MHz X Peak ___ QP ____ Hor. X Vert.

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
55.00	H	39.47	- 15.43	24.04	40.00	- 15.96	
80.50	H	41.80	- 18.68	23.12	40.00	- 16.88	
125.01	H	39.20	- 14.43	24.77	40.00	- 15.23	
125.01	V	47.20	- 14.43	32.77	40.00	- 7.23	
145.98	V	42.22	- 12.89	29.33	40.00	- 10.67	
159.39	V	42.72	- 12.69	30.03	40.00	- 9.97	
250.00	V	47.82	- 13.61	34.21	47.00	- 12.79	
500.00	H	38.65	- 5.63	33.02	47.00	- 13.98	
625.00	V	33.47	- 1.87	31.60	47.00	- 15.40	
625.00	H	35.22	- 1.87	33.35	47.00	- 13.65	
750.00	H	34.90	0.44	35.34	47.00	- 11.66	
875.01	V	29.25	3.48	32.73	47.00	- 14.27	

Remark：

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz；SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz。

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn‘ t perform。

(3) Measuring frequency range from 30MHz to 1000MHz。

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。

Table 5 Radiated Emission Data

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 6

Judgement：Passed by -10.57 dB at 625.00 MHz X Peak ___ QP ____ Hor. X Vert.

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
53.80	H	39.95	- 15.40	24.55	40.00	- 15.45	
80.30	H	42.25	- 18.71	23.54	40.00	- 16.46	
117.40	V	38.97	- 15.18	23.79	40.00	- 16.21	
125.00	H	38.40	- 14.43	23.97	40.00	- 16.03	
125.00	V	41.40	- 14.43	26.97	40.00	- 13.03	
147.50	V	36.05	- 12.84	23.21	40.00	- 16.79	
500.00	H	38.47	- 5.63	32.84	47.00	- 14.16	
500.00	V	39.40	- 5.63	33.77	47.00	- 13.23	
625.00	H	36.92	- 1.87	35.05	47.00	- 11.95	
625.00	V	38.30	- 1.87	36.43	47.00	- 10.57	
750.00	H	34.32	0.44	34.76	47.00	- 12.24	
750.00	V	34.05	0.44	34.49	47.00	- 12.51	

Remark：

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz；SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz。

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn‘ t perform。

(3) Measuring frequency range from 30MHz to 1000MHz。

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。

4. Immunity Test

4.1 Standard compliance/Servrity Level/Criteria

Tests Standard No.	Test Specification Level	Test Mode Test Ports	Perform. Criteria	Remark
1. ESD IEC 61000-4-2 (1995) EN 61000-4-2 (1995)	8KV air discharge 4KV contact discharge	Direct Mode	B	
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B	
2. RS IEC 61000-4-3 (1995) EN 61000-4-3 (1996)	80 MHz to 1000 MHz 3V/m(rms), 1 KHz, 80%, AM modulated	Enclosure	A	
3. EFT/Burst IEC 61000-4-4 (1995) EN 61000-4-4 (1995)	1.0KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	Power Supply Port	B	
	0.5 KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B	
4. Surges IEC 61000-4-5 (1995) EN 61000-4-5 (1995)	1 KV(5P/5N) 1.2/50(8/20) Tr/Th us	L-L	B	
	2 KV(5P/5N) 1.2/50(8/20) Tr/Th us	L-PE N-PE	B	
5 Injected Current IEC 61000-4-6 (1996) EN 61000-4-6 (1996)	0.15 MHz to 80 MHz 3V(rms), 1KHz 80%, AM Modulated 150Ω source impedance	CTL/Signal Port	A	
	0.15 MHz to 80 MHz 3V(rms), 1KHz 80%, AM Modulated 150Ω source impedance	AC Power Port	A	
	0.15 MHz to 80 MHz 3V(rms), 1KHz 80%, AM Modulated 150Ω source impedance	DC Power Port	A	N/A
6. Power Frequency Magnetic Field IEC 61000-4-8 (1993) EN 61000-4-8 (1993)	50 Hz, 1A/m	Enclosure	C	
7. Volt. Interruptions Volt. Dips IEC 61000-4-11 (1994) EN 61000-4-11 (1994)	Voltage dip＞95% Voltage dip 30% Interruption＞95%	＜5% 70% ＜5%	B C C	

* Remark:

N/A : denotes test is not applicable in this Test Report

4.2 General Performance Criteria

According to **EN55024:1998+A1:2001** standard, the general performance criteria as following:

Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion B	After the test, the equipment shall continue to operate as intended without operator Intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state if stored data allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer' s instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.3 Sample(s) Tested

The representative sample tested in this report is the same as the statements of **2.5** unless otherwise a special model no. is specified in the record (Table of Test Results).
The EUT has been tested according to the following environmental conditions:

Tested items: EN 61000-3-2 / 3 , EN 61000-4-3 / 4 / 5 / 6 / 8 / 11

Input Power	230 Vac/50Hz
Temperature	26 ℃
Relative Humidity	70 %

Tested items: EN 61000-4-2

Input Power	230 Vac/50Hz
Temperature	22 ℃
Relative Humidity	42 %

4.4 EUT Operating Condition

The EUT tested system was configured as the statements of **2.10** Unless otherwise a special operating condition is specified in the follows during the testing.

4.5 EUT Tested Results

Tested Items	Basic Standards	EUT Tested Results	Remark
1. ESD	EN 61000-4-2 IEC 61000-4-2	**Table 6** ESD Testing	
2. RF Electromagnetic Field Strength	EN 61000-4-3 IEC 61000-4-3	**Table 7** RS Testing	
3. EFT/Burst	EN 61000-4-4 IEC 61000-4-4	**Table 8** EFT/Burst Testing	
4. Surges	EN 61000-4-5 IEC 61000-4-5	**Table 9** Surges Testing	
5. Injected Current	EN 61000-4-6 IEC 61000-4-6	**Table 10** Injection Current Testing	
6. Power-frequency Magnetic-field	EN 61000-4-8 IEC 61000-4-8	**Table 11** Power Frequency Magnetic Field Testing	
7. Volt. Interruptions Volt. Dips	EN 61000-4-11 IEC 61000-4-11	**Table 12** Volt. Interruptions/ Dips Testing	

Remark: * N/A - denotes test is not applicable in this Test Report

4.6 Test Set-Up

The configuration of testing system is described as the block diagram which shown in Fig. 4-6-1,4-6-2,4-6-3,4-6-4,4-6-5,4-6-6,4-6-7,4-6-8 of test set-up configuration.

4.7 Measurement Instruments

Valid measurement instruments used in this report refer to **Table- 13** enclosed.

Fig. 4-6-1 ESD Test Set-Up Configuration

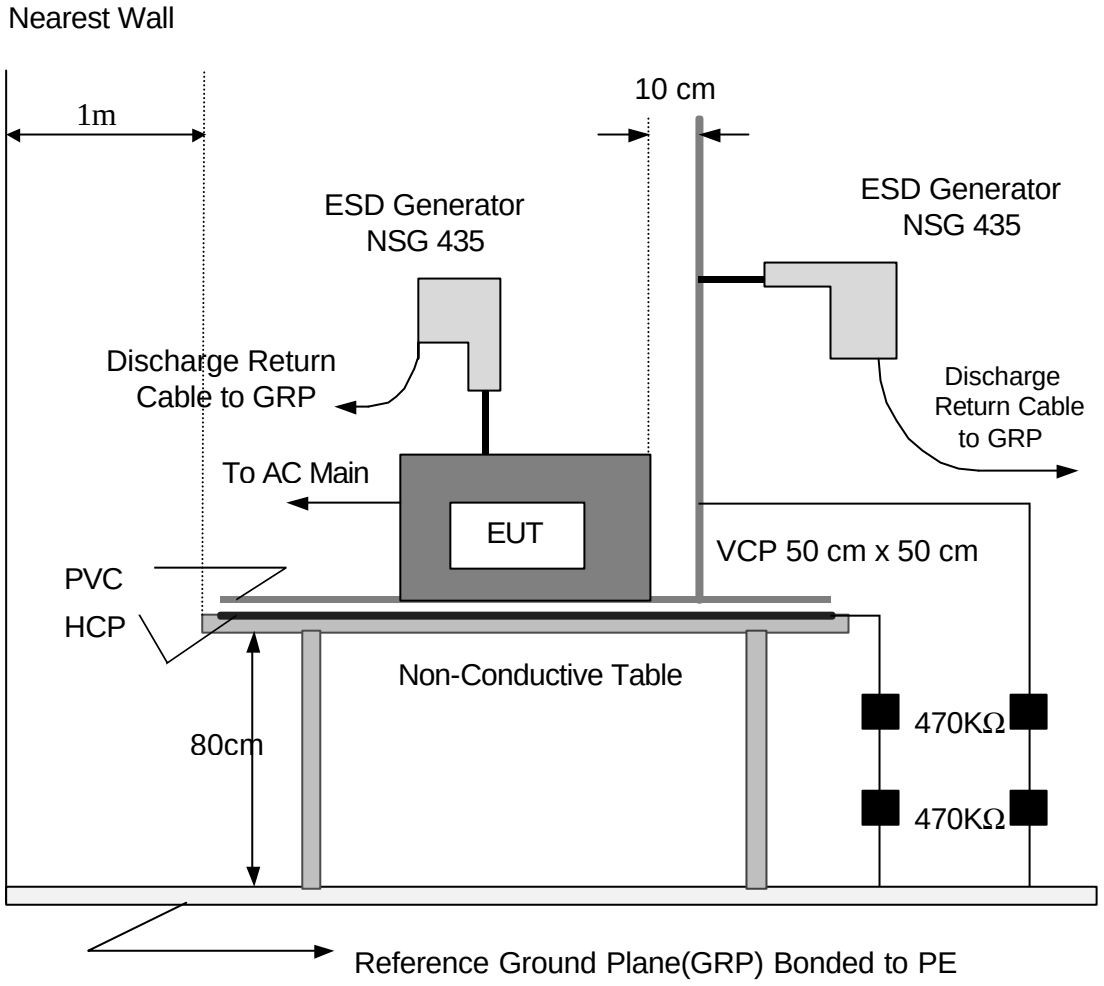
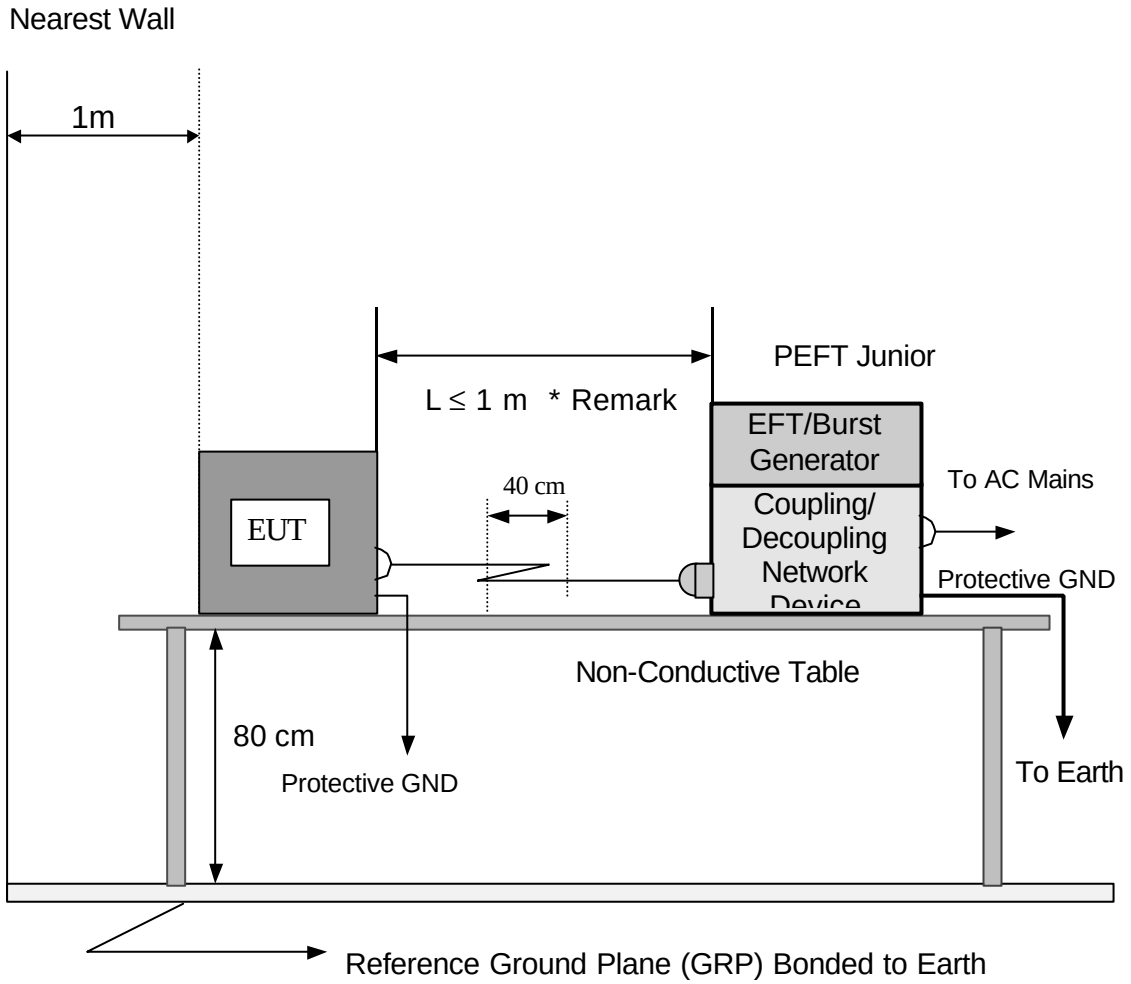


Fig. 4-6-2 EFT Test Set-Up Configuration for Power Supply Ports



Remark：

If the manufacturer provides a non-detachable power cord more than 1m long with the EUT, the excess length of this power cord shall be folded back and forth forming a bundle 30-40 cm long and situated at a distance of 10 cm above the reference ground plane(GRP).

Fig. 4-6-3 RF Electromagnetic Field Strength Test Set-Up configuration

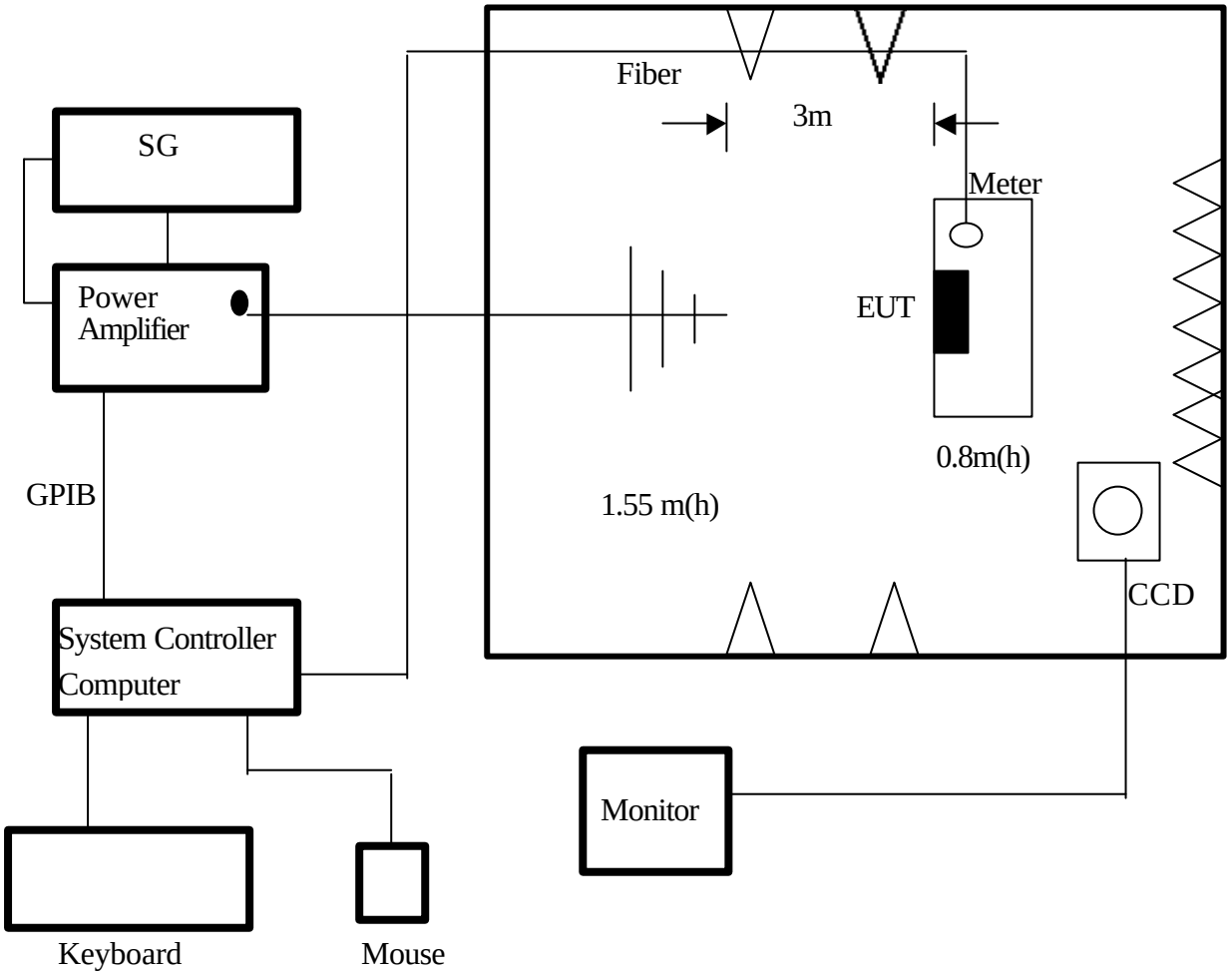
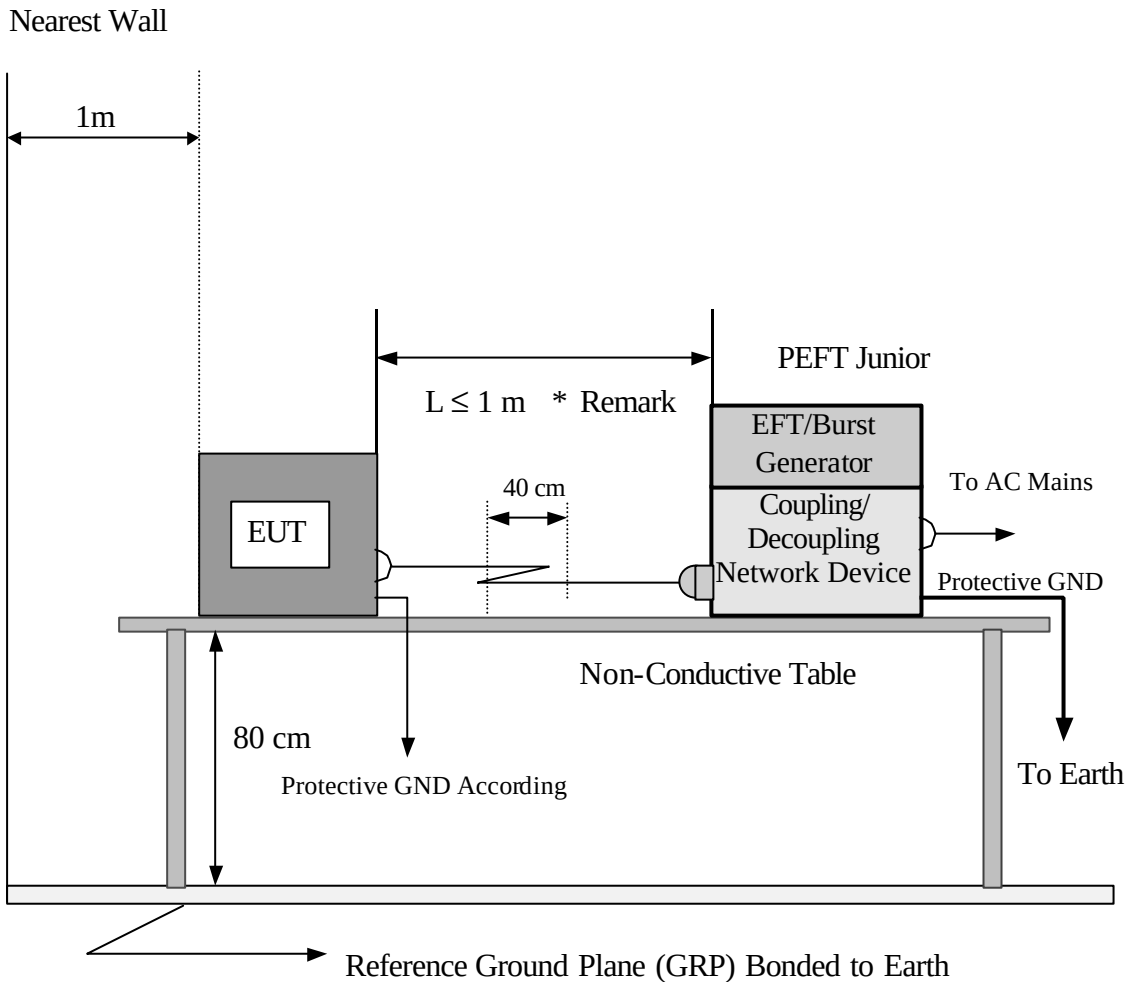


Fig. 4-6-3(A) EFT Test Set-Up Configuration for Power Supply Ports



Remark：

If the manufacturer provides a non-detachable power cord more than 1m long with the EUT, the excess length of this power cord shall be folded back and forth forming a bundle 30-40 cm long and situated at a distance of 10 cm above the reference ground plane(GRP).

Fig. 4-6-3(B) EFT Test Set-Up Configuration for CTL/Signal I/O Ports

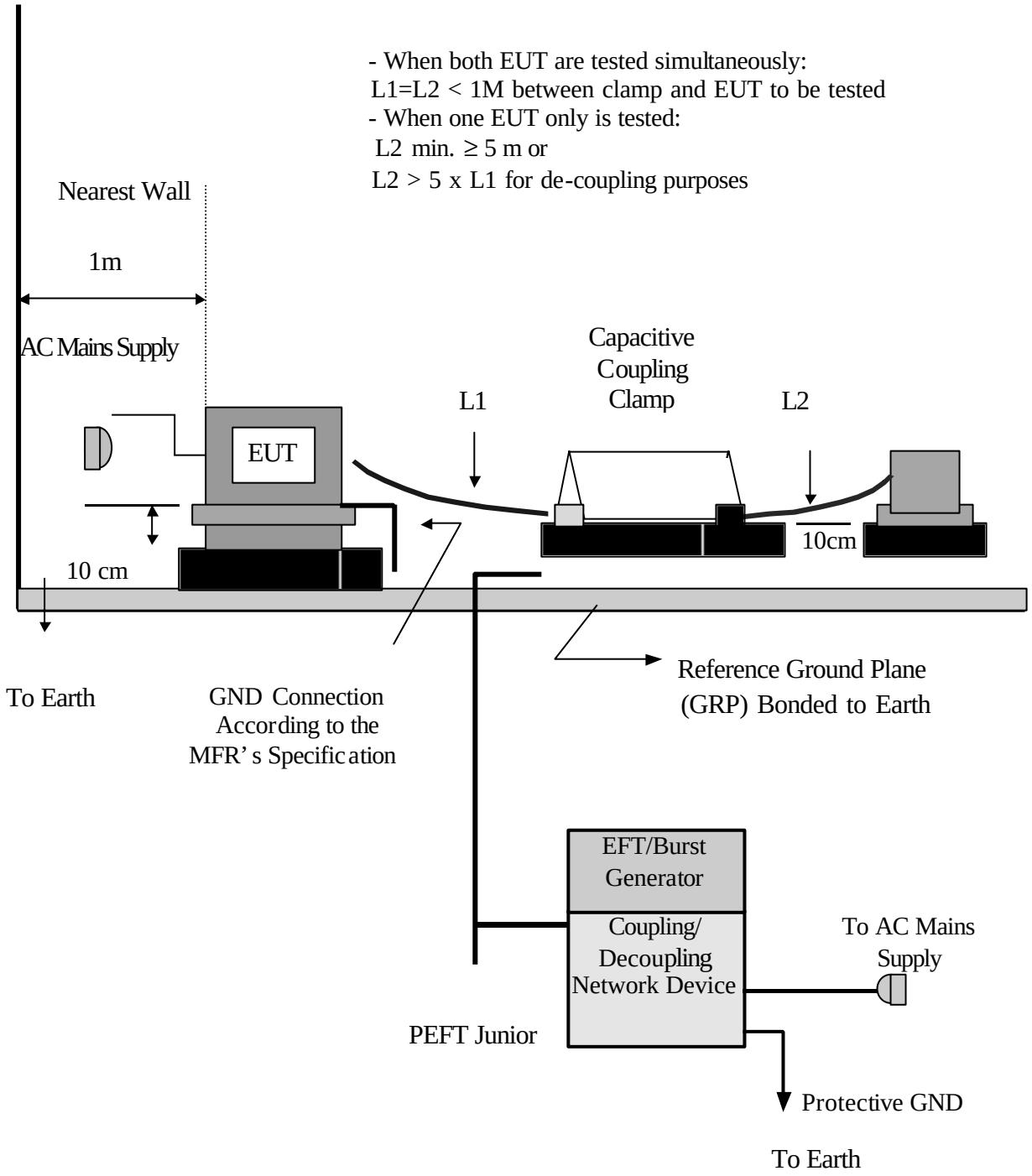


Fig. 4-6-4 Surge Test Set-Up Configuration

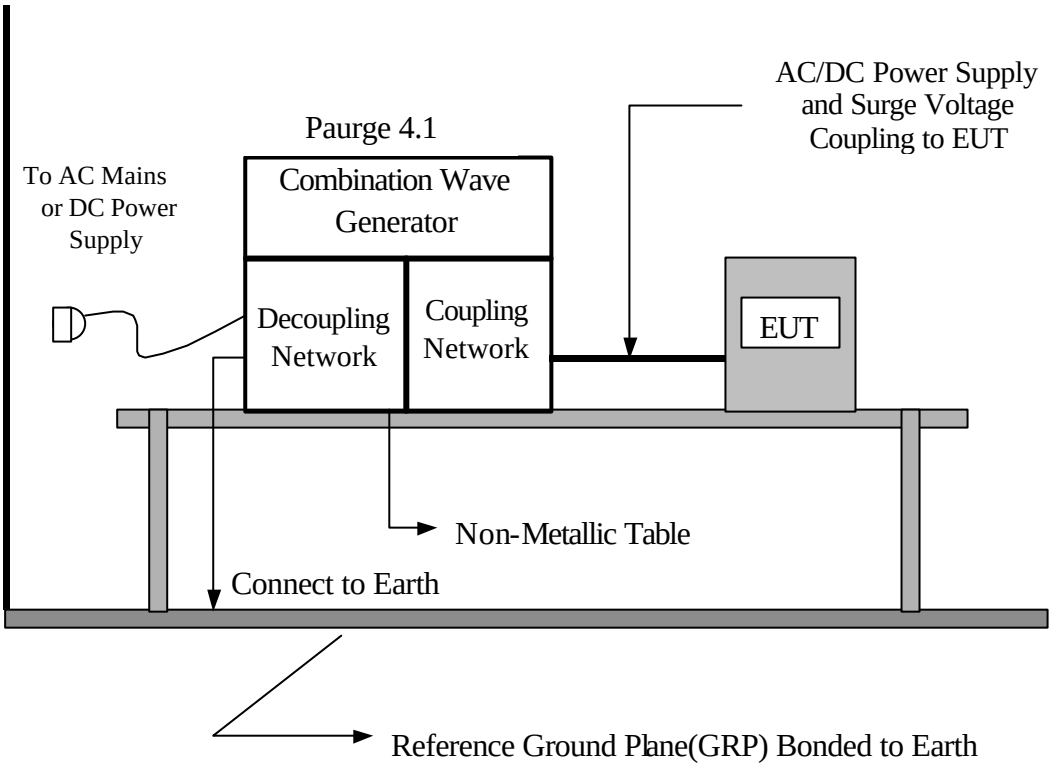


Fig. 4-6-5 Injection Current Test Set-Up Configuration

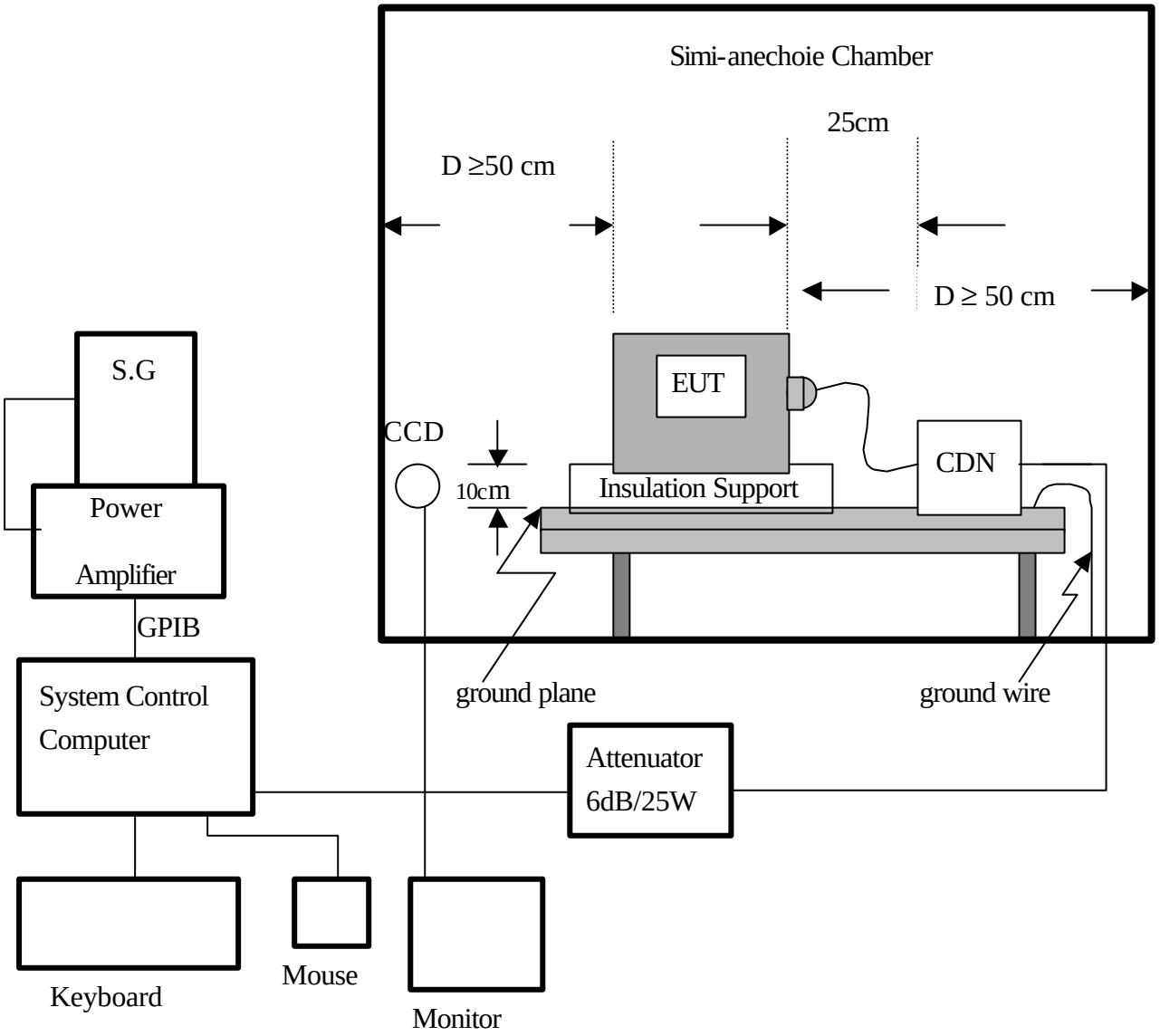


Fig. 4-6-6 Power Frequency Magnetic Field Test Set-Up Configuration

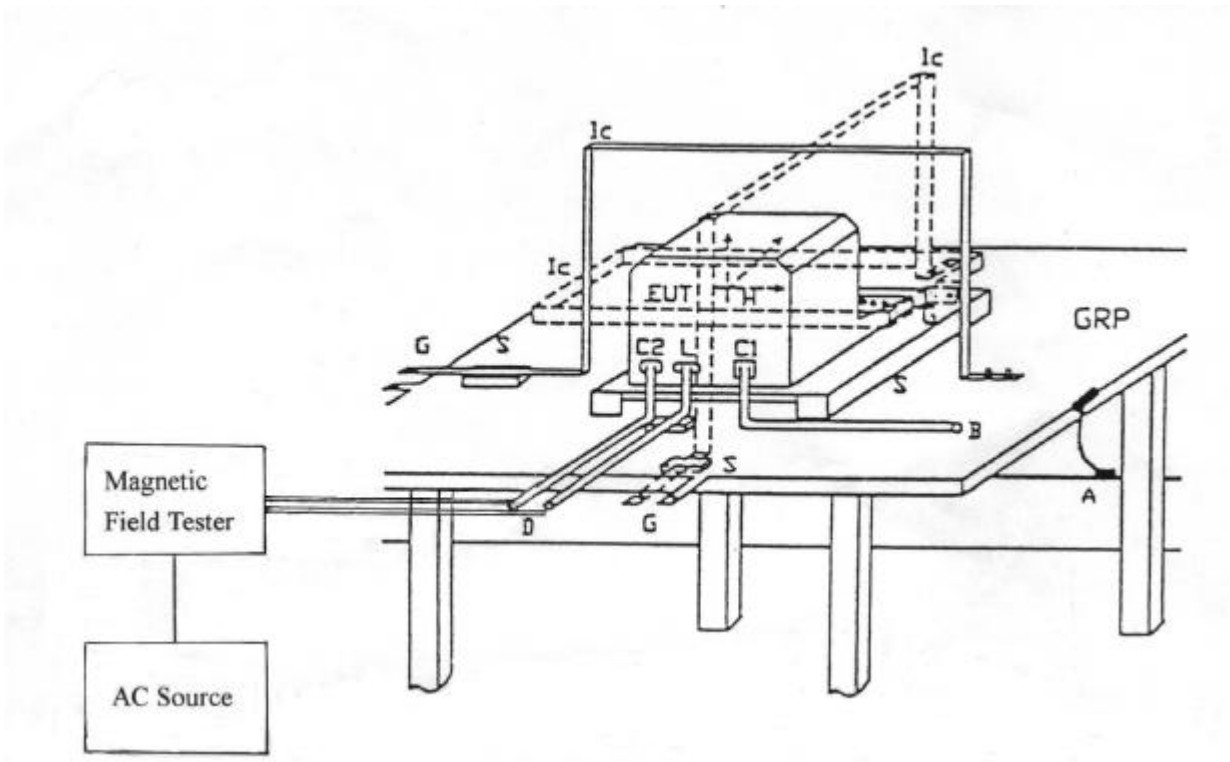


Fig. 4-6-7 Voltage Interruption/Dips Test Set-Up Configuration

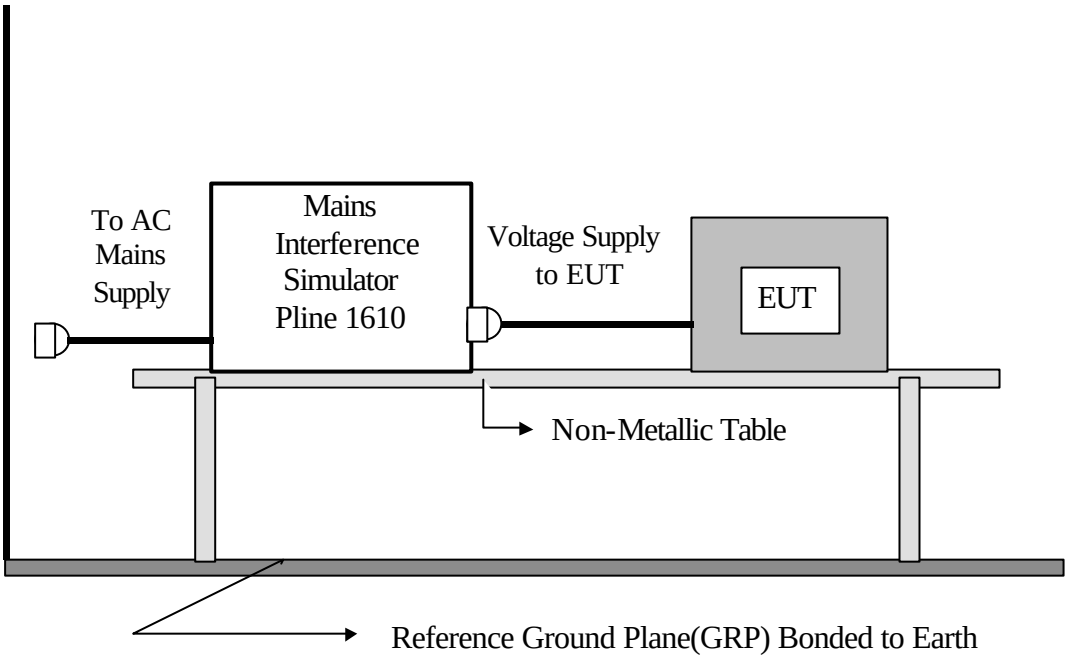


Fig. 4-6-8 Radio Frequency Electromagnetic Field Keyed Carrier

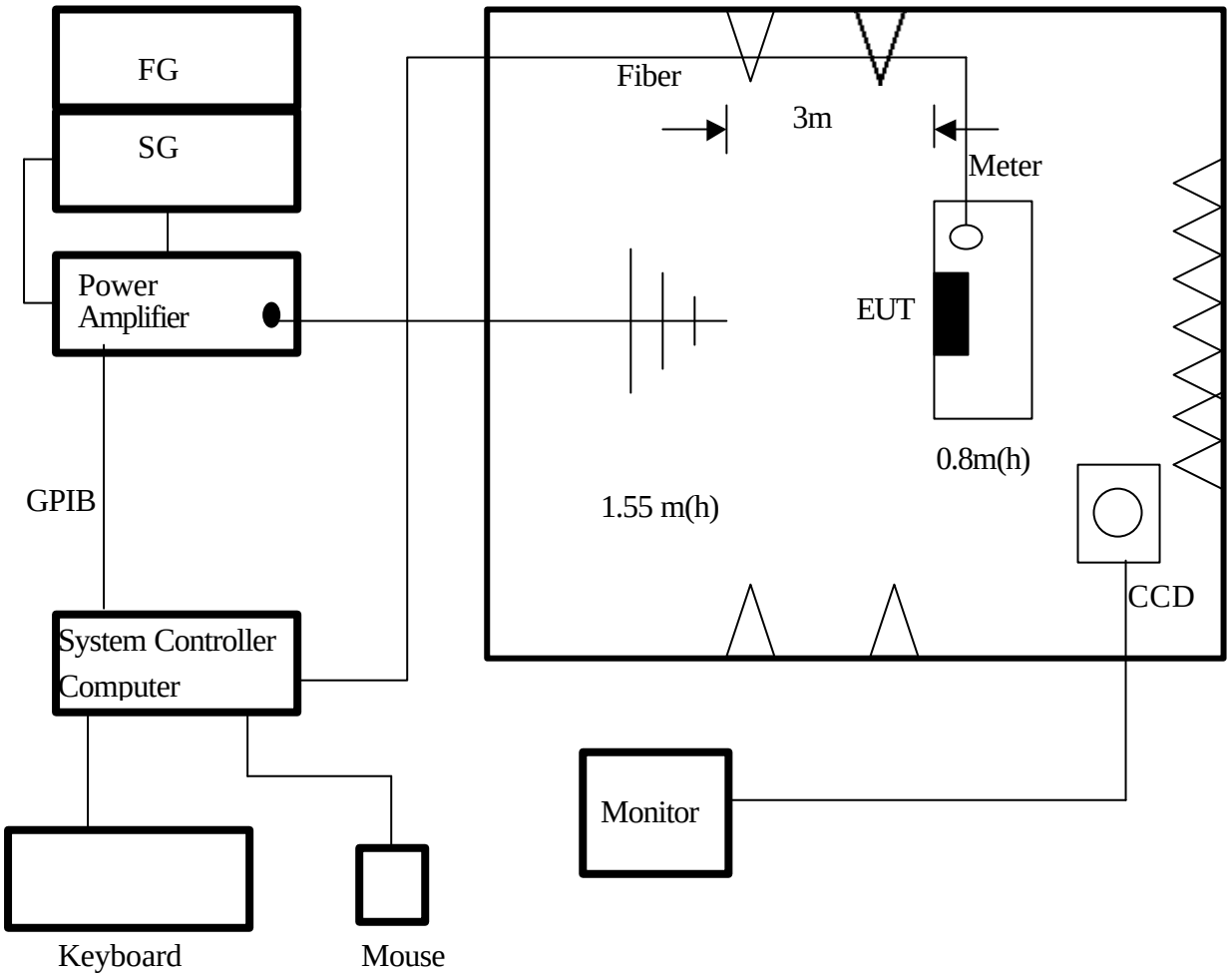


Table 6 ESD Testing

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2/3/5/6

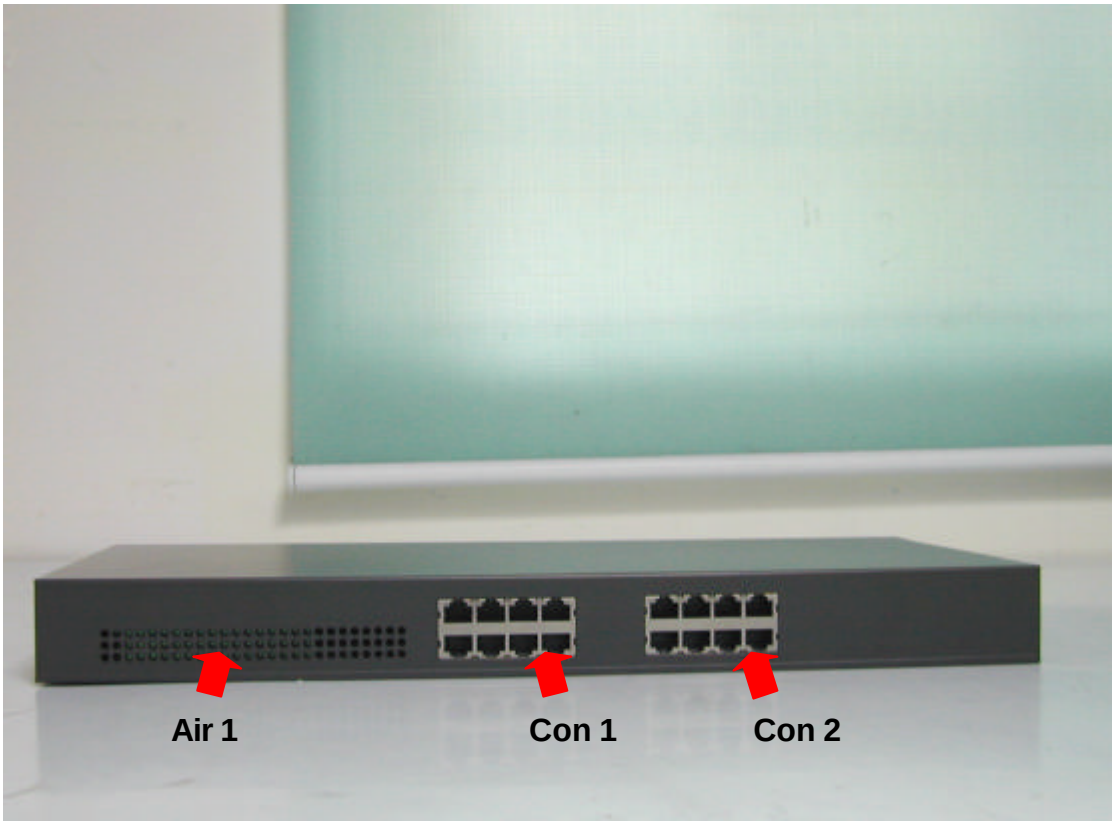
Mode	Air Discharge								Contact Discharge							
	2KV		4KV		8KV		15KV		2KV		4KV		6KV		8KV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	A	A			A	A	B	B				
2	A	A	A	A	A	A			A	A	B	B				
3	A	A	A	A	A	A			A	A	B	B				
4	A	A	A	A	A	A			A	A	B	B				
5									A	A	B	B				
6									A	A	B	B				
7									A	A	B	B				
8									A	A	B	B				
9																
10																
Criteria	**B**								**B**							
Result	**A**								**B**							
Judgment	**PASS**								**PASS**							

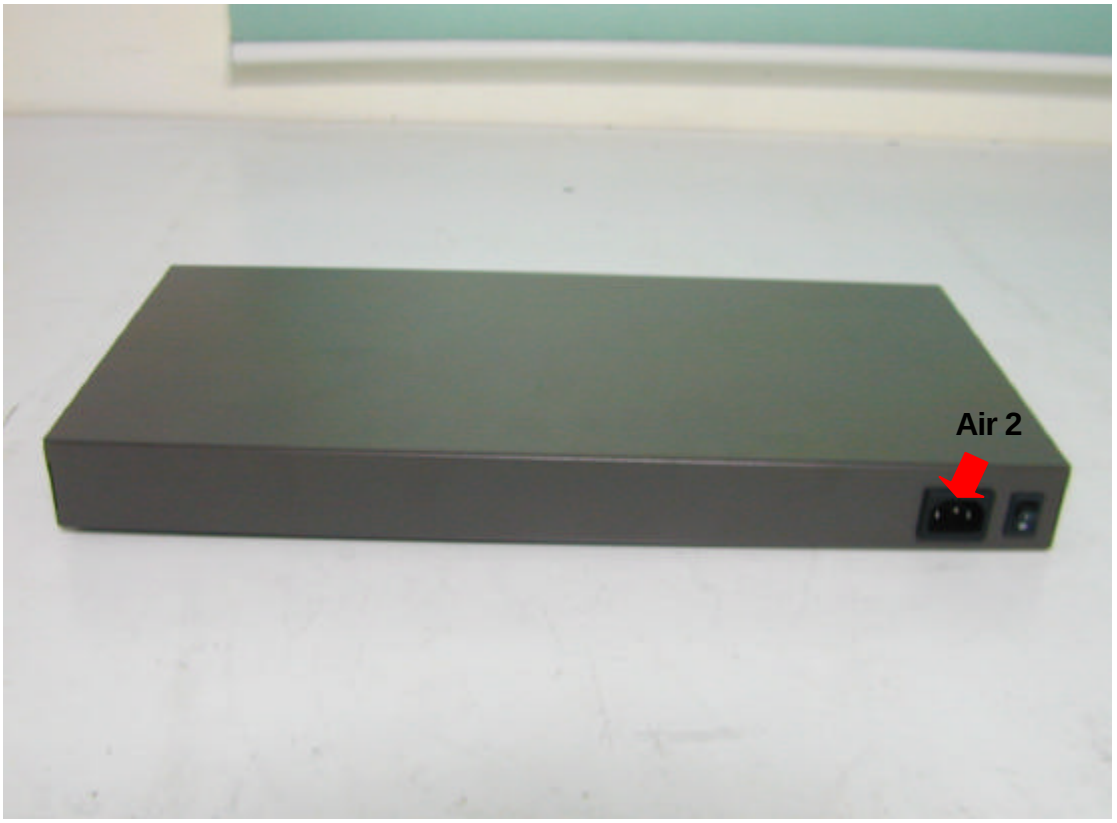
Mode	HCP Discharge								VCP Discharge							
	2KV		4KV		6KV		8KV		2KV		4KV		6KV		8KV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A					A	A	A	A				
2	A	A	A	A					A	A	A	A				
3	A	A	A	A					A	A	A	A				
4	A	A	A	A					A	A	A	A				
Criteria	**B**								**B**							
Result	**A**								**A**							
Judgment	**PASS**								**PASS**							

Note:

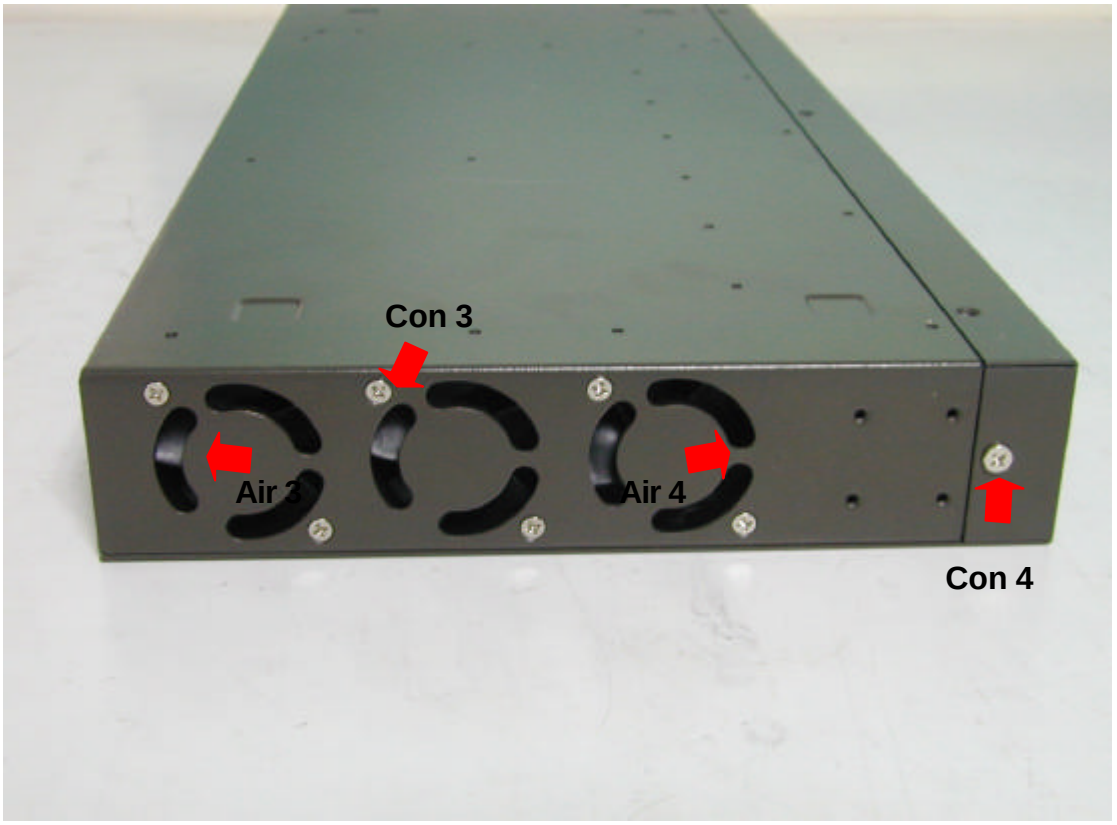
1) P/N denotes the Positive/Negative polarity of the output voltage.
2) Test condition:
   Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point.
   Air discharges: Minimum 10 times (Positive/Negative) at each point.
3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
4) The Indirect (HCP/VCP) discharges description of test point as following:
   1.left side 2.right side 3.front side 4.rear side
5) N/A - denotes test is not applicable in this test report

Photo(s) shown the location(s) of ESD evaluated





Photo(s) shown the location(s) of ESD evaluated



Photo(s) shown the location(s) of ESD evaluated

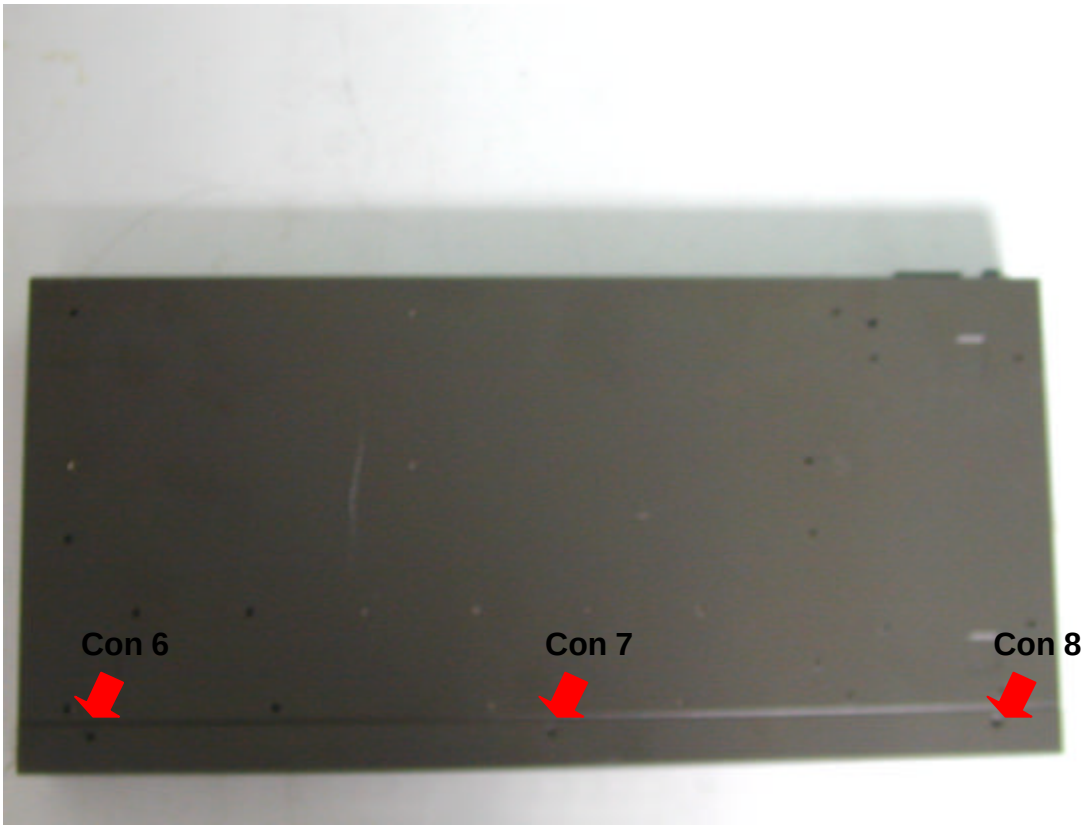


Table 7 RS Testing

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2/3/5/6

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Perform. Criteria	Results	Judgment
80MHz - 500MHz	H / V	3 V/m(rms) Modulated	**A**	**A**	**PASS**
500MHz - 1000MHz					

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) N/A - denotes test is not applicable in this test report.

Table 8 EFT/Burst Testing

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2/3/5/6

Mode	(X) AC Power Line		( ) DC Power Line		(X) Signal/Control Line	
Test Level	1KV		0.5KV		0.5KV	
Port(s)	Polarity	Results	Polarity	Results	Polarity	Results
Line (L)	P	B	P		P	
	N	B	N		N	
Neutral (N)	P	B	P		P	
	N	B	N		N	
Ground (PE)	P	B	P		P	
	N	B	N		N	
Signal/Control Line	P		P		P	B
	N		N		N	B
Criteria	**B**		**B**		**B**	
Result	**B**		**N/A**		**B**	
Judgement	**PASS**		**N/A**		**PASS**	

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.

2) N/A - denotes test is not applicable in this test report

Table 9 Surge Test Results

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2/3/5/6

Wave Form / EUT Ports Tested	1.2/50(8/20)Ti/Th us				Results	Judgement
	Polarity	Phase	Voltage	Criteria		
L - N	+/-	0°	1kV	**B**	**A**	**PASS**
	+/-	90°				
	+/-	180°				
	+/-	270°				
L - PE	+/-	0°	2KV	**B**	**A**	**PASS**
	+/-	90°				
	+/-	180°				
	+/-	270°				
N - PE	+/-	0°	2KV	**B**	**A**	**PASS**
	+/-	90°				
	+/-	180°				
	+/-	270°				
Signal Line (RJ 11)	+/-	0°	1KV	**B**	**N/A**	**N/A**
	+/-	90°				
	+/-	180°				
	+/-	270°				

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) Polarity and Numbers of Impulses：5 Pst / Ngt at each tested mode
3) N/A - denotes test is not applicable in this Test Report

Table 10 Injection Current Test Results

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2/3/5/6

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgement
Input/ Output AC. Power Port	0.15 ---80	3V(rms) Modulated	**A**	**A**	**PASS**
Input/ Output DC. Power Port	0.15 --- 80	3V(rms) Modulated	**A**	**N/A**	**N/A**
Signal Line (RJ 45)	0.15 --- 80	3V(rms) Modulated	**A**	**A**	**PASS**

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) N/A - denotes test is not applicable in this Test Report.

Table 11 Power Frequency Magnetic Field Testing

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2/3/5/6

Test Mode	Test Level	Antenna aspect	Duration (s)	Perform Criteria	Results	Judgement
Enclosure	1 A/m	X	30 s	**A**	**A**	**PASS**
Enclosure	1 A/m	Y	30 s	**A**	**A**	**PASS**
Enclosure	1 A/m	Z	30 s	**A**	**A**	**PASS**

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) N/A - denotes test is not applicable in this test report

Table 12 Tests of Voltage Interruption/DIPs

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2/3/5/6

Voltage REDUCTION	Duration (ms)	Perform Criteria	Results	Judgement
Voltage dip ＞95%	0.5	**B**	**B**	**PASS**
Voltage dip 30%	25	**C**	**B**	**PASS**
Interruption＞95%	250	**C**	**C1**	**PASS**

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2). N/A - denotes test is not applicable in this test report.

Table 13 EMS Measurement Instruments List

Item	Instruments	Mfr/Brand	Model/Type No.	Serial No.	Calibrated Date	Next Cali.Date	Note
1	ESD Simulator	Schaffner	NSG 435	ESD-001	2002-12-31	2003-12-30	✓
2	Signal Generator	IFR	2023A	202301/368	2002-03-26	2004-03-25	✓
3	Power Amplifier(RS)	M2S	AC8113-800/250A	9904-113	2002-03-27	2004-03-26	✓
4	Antenna(500W)	MESS-ELEKTRONIK	VULB9161	4022	2002-07-25	2003-07-24	✓
5	EFT Burst Tester	Haefely	PEFT-Junior	083 180-24	2001-12-05	2003-12-04	✓
6	Surge Tester	Haefely	PSURGE 4-1	083 665-01	2001-12-03	2003-12-02	✓
7	Power Amplifier(CS)	M2S	A0122-250	9902-111	2002-03-27	2004-03-26	✓
8	CDN	MEB	M3	13389	2003-05-30	2005-05-29	✓
9	CDN	MEB	M2	12127	2003-05-30	2005-05-29	
10	CDN	MEB	S1	14393	2003-05-30	2005-05-29	
11	CDN	MEB	S25	12426	2003-05-30	2005-05-29	
12	EM Clamp	MEB	KEMZ 801	14291	2001-06-20	2003-06-19	✓
13	Magnetic Field Tester	Haefely	MAG 100.1	083858-08	2003-06-05	2005-06-04	✓
14	DIP Generator	Haefely	PLINE 1610	083690-16	2001-12-05	2003-12-04	✓
15	Power Analyzer	Chroma	6630	66300000120	2001-12-03	2003-12-02	✓
16	AC Source	Chroma	6530	65300113	2001-07-02	2003-07-01	✓

Remark:

(1)" ✓" indicates the instrument used in Test Report.

(2)" N/A" - denotes tests is not applicable in Test Report

5. HARMONICS TEST

5.1 Limits

5.1.1 Limits of Harmonic Current

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. permissible harmonic current (in Ampers)	Equipment Category	Harmonic Order n	Max. permissible harmonic current (in Ampers)
Non Portable Tools or TV Receivers	odd harmonics		TV Receivers	odd harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15. 15/n		15≤n≤39	0.10. 15/n
	even harmonics			even harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
	8≤n≤40	0.23. 8/n		DC	0.05

Note: For Portable tools, a multiplication factor of 1.5 shall be applied to the limits specified in Table - I.

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. permissible harmonic current (in Ampers)	Equipment Category	Harmonic Order n	Max. permissible harmonic current (in A)	(mA/w)
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
			only odd harmonics required		

5.1.2 Limits of Fluctuation and Flicker

Tests	Limits		Descriptions
	IEC555-3	IEC 61000-3-2	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3 %	≤ 3 %	Relative Steady-State V-Chang
dmax	≤ 4 %	≤ 4 %	Maximum Relative V-change
d (t)	N/A	≤ 3% for > 200 ms	Relative V-change characteristic

5.2 Test Methodology

5.2.1 Harmonic Current Test

Tests was performed according to the procedures specified in **Clause 5.0 of IEC555-2** and/or Sub-clause **6.2 of IEC 61000-3-2** depend on which standard adopted for compliance measurement.

5.2.2 Fluctuation and Flickers Test

Tests was performed according to the Test Conditions/Assessment of Voltage Fluctu-ations specified in **Clause 5.0/6.0 of IEC555-3** and/or **Clause 6.0/4.0 of IEC 61000-3-3** depend on which standard adopted for compliance measurement.

All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter, which compliance with the specification given in IEC868, connected as the test set-up configuration described in **Section 6.**

5.3 Sample(s) Tested

The representative sample tested in this reports is the same as the statements of **2.5** unless otherwise a special model no. is specified in the record (Table of Test Results).

5.4 Test Set-Up Configuration

The test set-up configuration, including the auxiliary instruments, is sketched as block diagram of **Fig. 6-4-1** in next page.

5.5 EUT Operating Condition

The EUT tested system was configured as the statements of **2.10** unless otherwise a special operating condition is specified in the follows during the testing.

5.6 EUT Tested Results

Items	Tests	EUT Tested Results	Remark
1.	Harmonics Current	Table 14	
2.	Voltage Fluctuations/Flickers	Table 15	

*** Remark: N/A - denotes test is not applicable in this Test Report**

Fig. 5-4-1 Harmonics / Flicker Test Set-Up Configuration

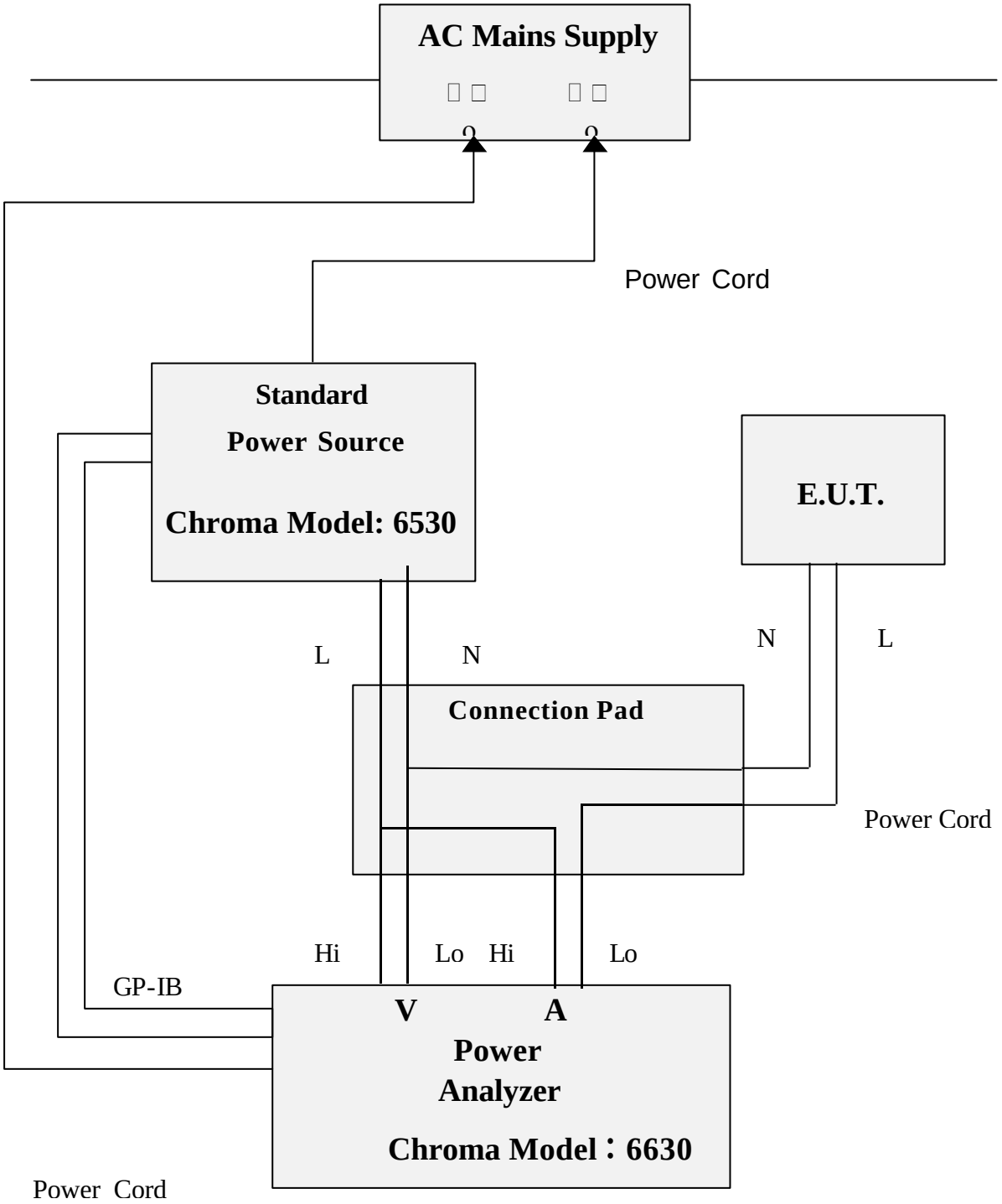


Table 14 Harmonics Current Testing

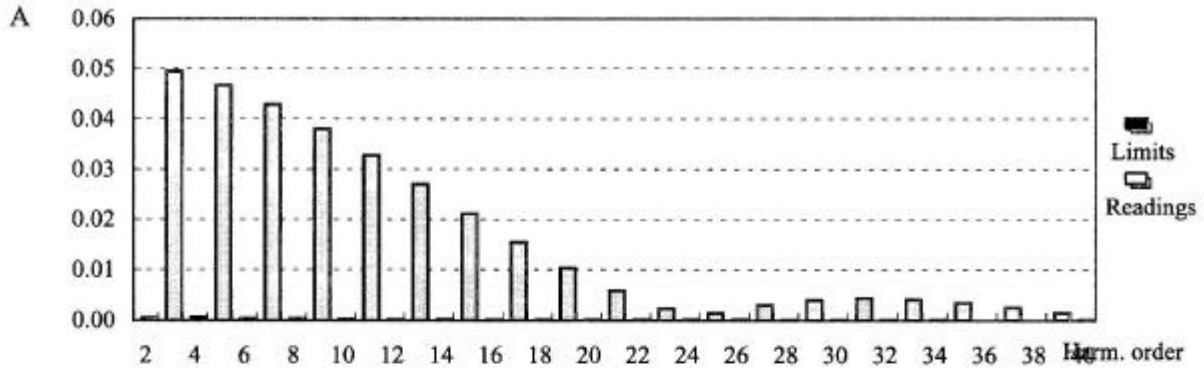
Test Condition (AC Input)： 230.68 V 0.11712 A 12.2674 W 50.00 Hz P.F. 0.45406

Standard No. Apply： ( ) IEC 555-2 ( ) Table I ( ) Table I x 1.5

(X) IEC 61000-3-2 ( ) Class A (X) Class D

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2



H#	Reading	Limit	Result	H#	Reading	Limit	Result
1	0.055420		PASS	21	0.005860		PASS
2	0.000460		PASS	22	0.000090		PASS
3	0.049430		PASS	23	0.002350		PASS
4	0.000640		PASS	24	0.000090		PASS
5	0.046740		PASS	25	0.001390		PASS
6	0.000370		PASS	26	0.000090		PASS
7	0.042900		PASS	27	0.002950		PASS
8	0.000400		PASS	28	0.000080		PASS
9	0.038090		PASS	29	0.003980		PASS
10	0.000300		PASS	30	0.000070		PASS
11	0.032740		PASS	31	0.004340		PASS
12	0.000260		PASS	32	0.000050		PASS
13	0.026960		PASS	33	0.004100		PASS
14	0.000190		PASS	34	0.000030		PASS
15	0.021110		PASS	35	0.003430		PASS
16	0.000130		PASS	36	0.000020		PASS
17	0.015450		PASS	37	0.002510		PASS
18	0.000110		PASS	38	0.000020		PASS
19	0.010320		PASS	39	0.001480		PASS
20	0.000090		PASS	40	0.000030		PASS

Test result : PASS

Remark :

Table 14 Harmonics Current Testing

Test Condition (AC Input)： 230.68 V 0.11712 A 12.2674 W 50.00 Hz P.F. 0.45406

Standard No. Apply： ( ) IEC 555-2 ( ) Table I ( ) Table I x 1.5

(X) IEC 61000-3-2 ( ) Class A (X) Class D

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2

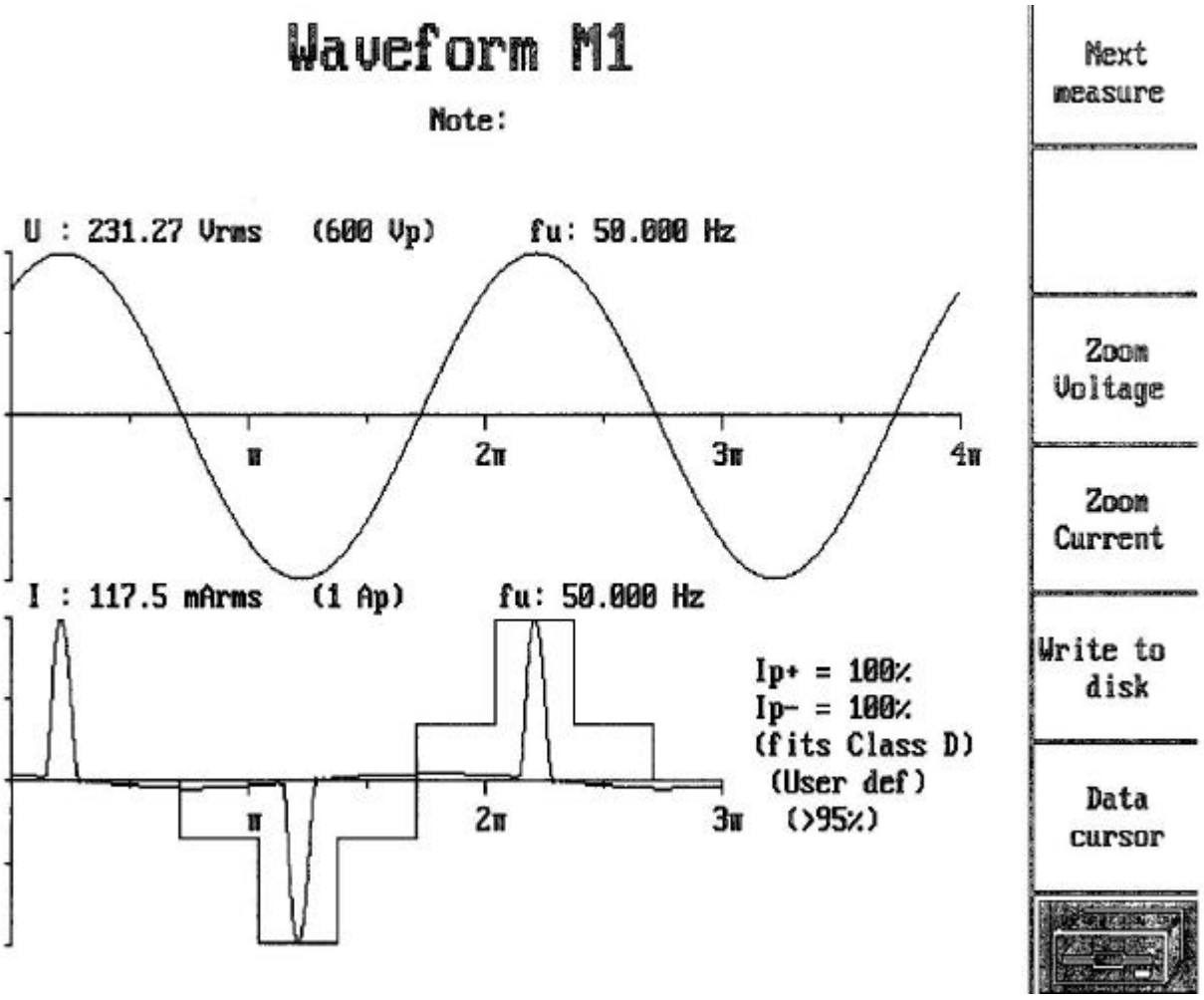
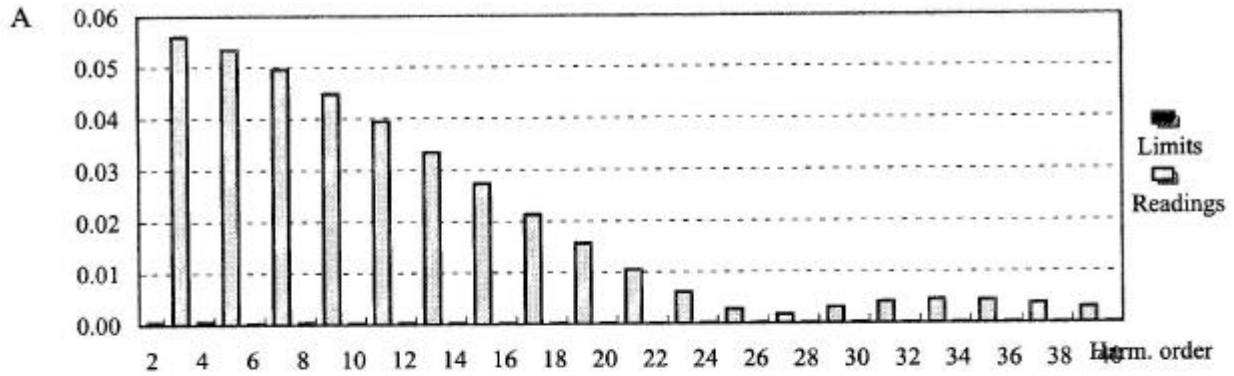


Table 14 Harmonics Current Testing

Test Condition (AC Input)： 230.68 V 0.13667 A 13.7855 W 50.00 Hz P.F. 0.43726
Standard No. Apply： ( ) IEC 555-2 ( ) Table I ( ) Table I x 1.5
(X) IEC 61000-3-2 ( ) Class A (X) Class D
Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 3



H#	Reading	Limit	Result	H#	Reading	Limit	Result
1	0.061870		PASS	21	0.010520		PASS
2	0.000540		PASS	22	0.000070		PASS
3	0.056040		PASS	23	0.006120		PASS
4	0.000580		PASS	24	0.000070		PASS
5	0.053410		PASS	25	0.002720		PASS
6	0.000310		PASS	26	0.000080		PASS
7	0.049600		PASS	27	0.001690		PASS
8	0.000350		PASS	28	0.000080		PASS
9	0.044800		PASS	29	0.003040		PASS
10	0.000260		PASS	30	0.000070		PASS
11	0.039420		PASS	31	0.004070		PASS
12	0.000230		PASS	32	0.000060		PASS
13	0.033510		PASS	33	0.004490		PASS
14	0.000160		PASS	34	0.000040		PASS
15	0.027380		PASS	35	0.004350		PASS
16	0.000120		PASS	36	0.000030		PASS
17	0.021320		PASS	37	0.003790		PASS
18	0.000090		PASS	38	0.000030		PASS
19	0.015650		PASS	39	0.002950		PASS
20	0.000070		PASS	40	0.000030		PASS

Test result : PASS
Remark :

Table 14 Harmonics Current Testing

Test Condition (AC Input)： 230.68 V 0.13667 A 13.7855 W 50.00 Hz P.F. 0.43726

Standard No. Apply： ( ) IEC 555-2 ( ) Table I ( ) Table I x 1.5

(X) IEC 61000-3-2 ( ) Class A (X) Class D

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 3

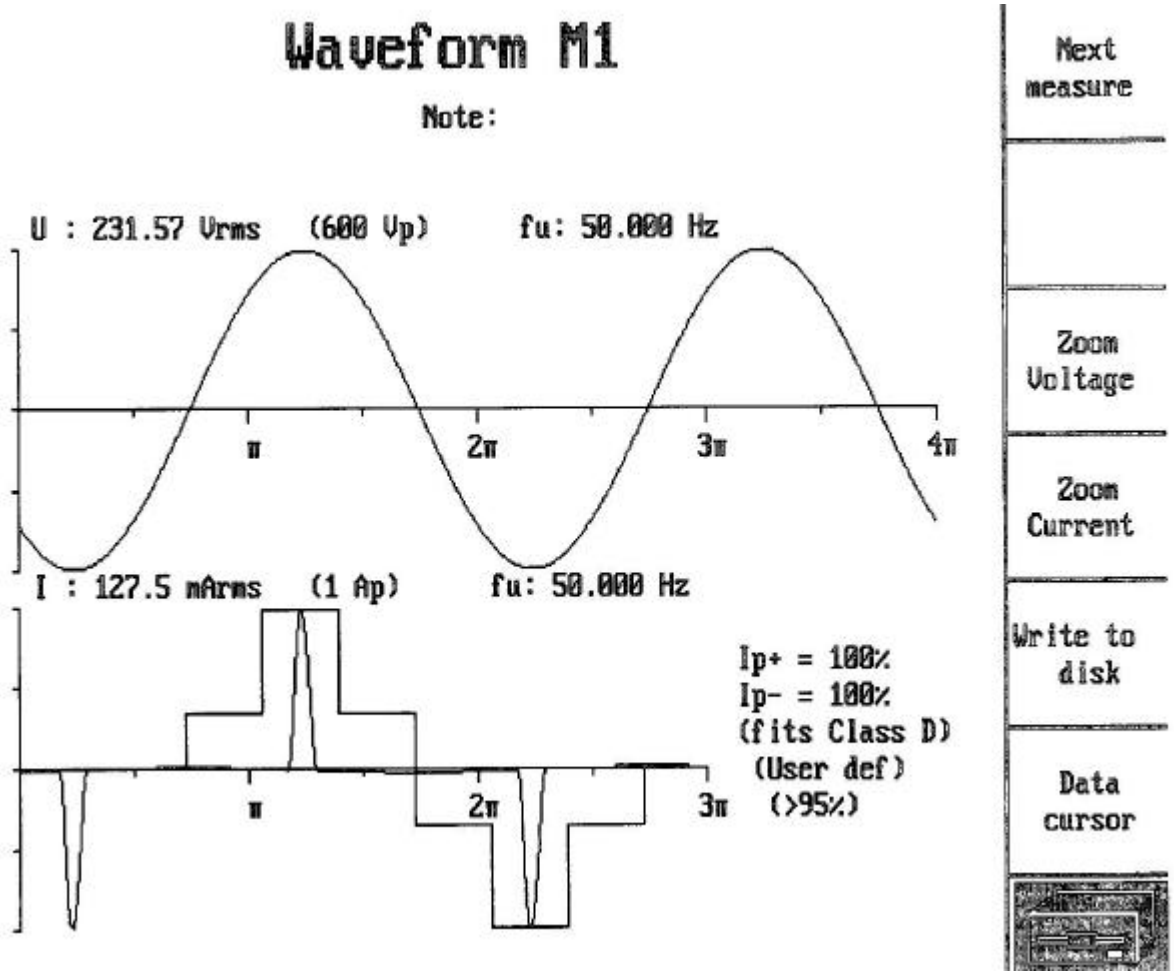
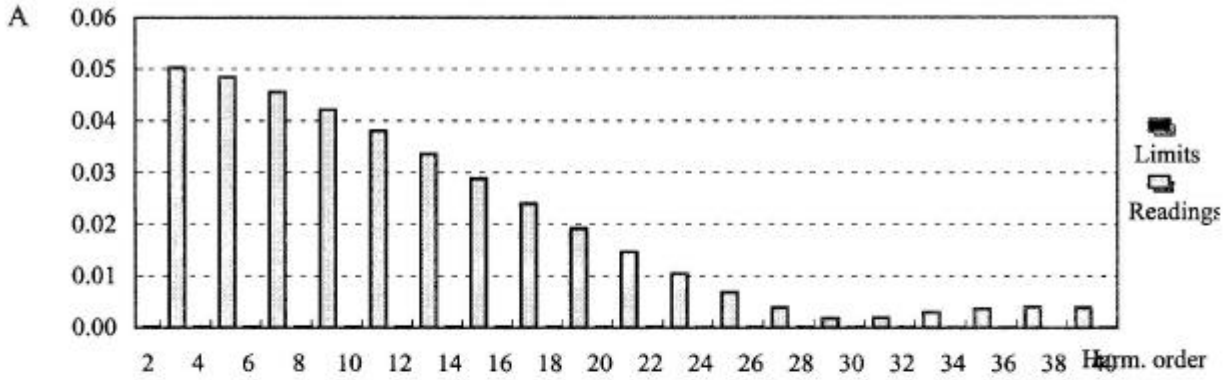


Table 14 Harmonics Current Testing

Test Condition (AC Input)： 231.05 V 0.12747 A 11.8536 W 50.00 Hz P.F. 0.40247
Standard No. Apply： ( ) IEC 555-2 ( ) Table I ( ) Table I x 1.5
(X) IEC 61000-3-2 ( ) Class A (X) Class D
Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 5



H#	Reading	Limit	Result	H#	Reading	Limit	Result
1	0.051990		PASS	21	0.014680		PASS
2	0.000140		PASS	22	0.000080		PASS
3	0.050190		PASS	23	0.010510		PASS
4	0.000140		PASS	24	0.000080		PASS
5	0.048370		PASS	25	0.006830		PASS
6	0.000120		PASS	26	0.000080		PASS
7	0.045570		PASS	27	0.003820		PASS
8	0.000100		PASS	28	0.000070		PASS
9	0.042090		PASS	29	0.001830		PASS
10	0.000080		PASS	30	0.000060		PASS
11	0.038080		PASS	31	0.001950		PASS
12	0.000070		PASS	32	0.000050		PASS
13	0.033620		PASS	33	0.002950		PASS
14	0.000050		PASS	34	0.000030		PASS
15	0.028840		PASS	35	0.003660		PASS
16	0.000050		PASS	36	0.000030		PASS
17	0.023960		PASS	37	0.003960		PASS
18	0.000060		PASS	38	0.000020		PASS
19	0.019190		PASS	39	0.003870		PASS
20	0.000070		PASS	40	0.000030		PASS

Test result : PASS
Remark :

Table 14 Harmonics Current Testing

Test Condition (AC Input)： 231.05 V 0.12747 A 11.8536 W 50.00 Hz P.F. 0.40247

Standard No. Apply： ( ) IEC 555-2 ( ) Table I ( ) Table I x 1.5

(X) IEC 61000-3-2 ( ) Class A (X) Class D

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 5

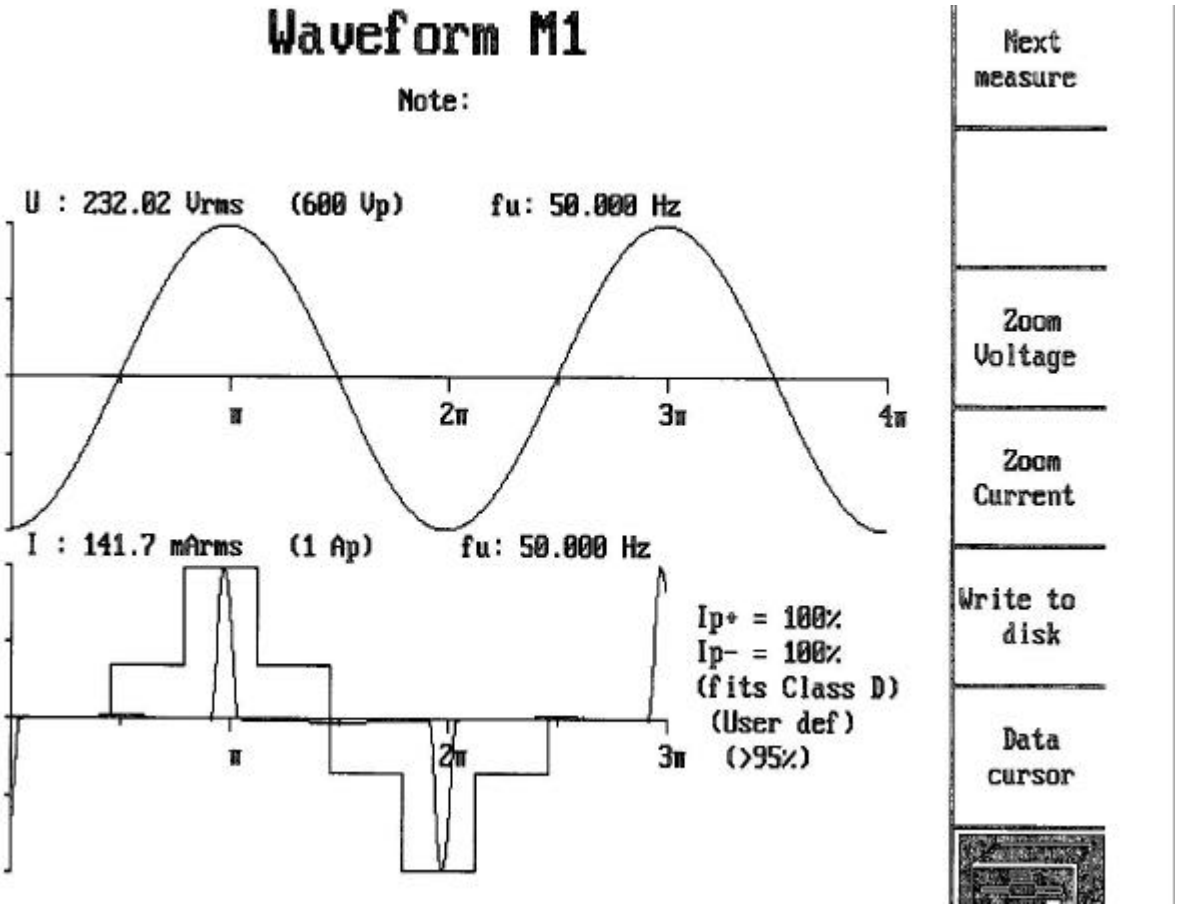
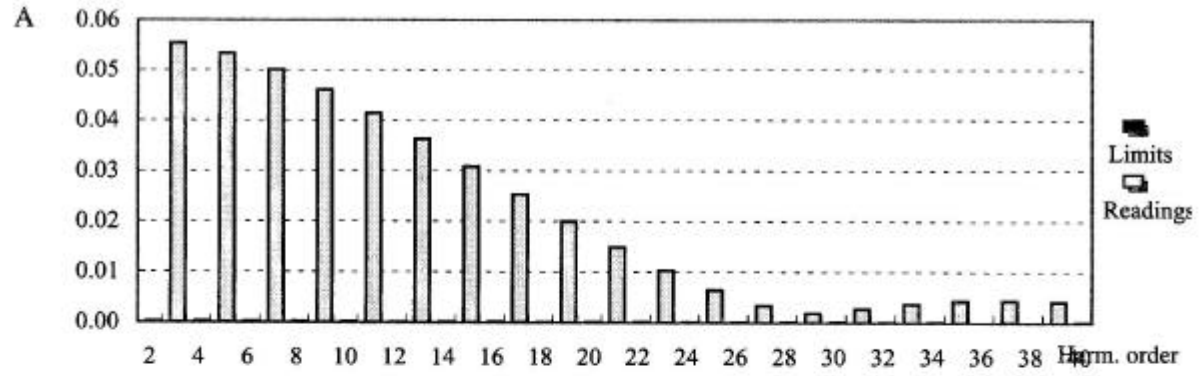


Table 14 Harmonics Current Testing

Test Condition (AC Input)： 231.05 V 0.13903 A 13.0921 W 50.00 Hz P.F. 0.40756
Standard No. Apply： ( ) IEC 555-2 ( ) Table I ( ) Table I x 1.5
(X) IEC 61000-3-2 ( ) Class A (X) Class D
Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 6



H#	Reading	Limit	Result	H#	Reading	Limit	Result
1	0.057350		PASS	21	0.014900		PASS
2	0.000150		PASS	22	0.000080		PASS
3	0.055420		PASS	23	0.010320		PASS
4	0.000150		PASS	24	0.000080		PASS
5	0.053280		PASS	25	0.006380		PASS
6	0.000140		PASS	26	0.000080		PASS
7	0.050050		PASS	27	0.003310		PASS
8	0.000110		PASS	28	0.000080		PASS
9	0.046020		PASS	29	0.001870		PASS
10	0.000080		PASS	30	0.000060		PASS
11	0.041380		PASS	31	0.002670		PASS
12	0.000060		PASS	32	0.000040		PASS
13	0.036270		PASS	33	0.003690		PASS
14	0.000040		PASS	34	0.000030		PASS
15	0.030800		PASS	35	0.004280		PASS
16	0.000050		PASS	36	0.000020		PASS
17	0.025270		PASS	37	0.004380		PASS
18	0.000060		PASS	38	0.000020		PASS
19	0.019920		PASS	39	0.004090		PASS
20	0.000070		PASS	40	0.000030		PASS

Test result : PASS
Remark :

Table 14 Harmonics Current Testing

Test Condition (AC Input)： 231.05 V 0.13903 A 13.0921 W 50.00 Hz P.F. 0.40756

Standard No. Apply： ( ) IEC 555-2 ( ) Table I ( ) Table I x 1.5

(X) IEC 61000-3-2 ( ) Class A (X) Class D

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 6

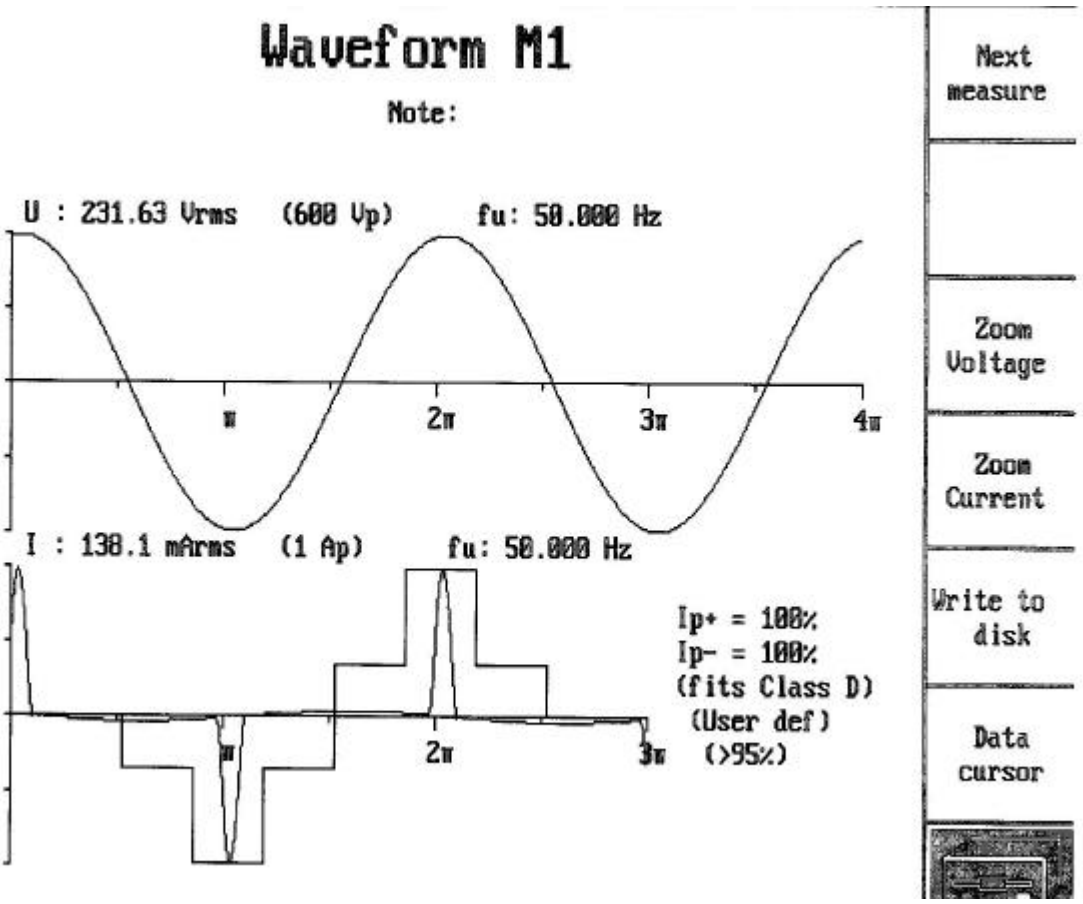


Table 15 Voltage Fluctuations/Flickers Testing

Kind of Product	Power Supply	Model No.:	SA40-050100/100M
Product Category:	N/A	Test Condition (AC Input)	
AC Mains Rating	230V, 50Hz, 1 ∅	Voltage(V) :	230.7V
Temperature(℃):	26.0 ℃	Current(mA):	116.9mA
Relative Humidity(%):	70.0 % RH	Watts(w):	12.2708w
Test Result	**Pass**	Frequency(Hz):	49.999Hz
Special Note:	N/A	Power Factor:	0.455

Datas Measured			
Test Item	**Std Limits**	**Test Reading**	**Test Result**
Relative st-st Voltage Change (dc)	3 %	0.01 %	**PASS**
Max. Relative Voltage Change(d_{max})	4 %	2.29 %	**PASS**
Duration＞3% dV(d(t) for＞200ms)	0.2 Sec.	0.05 %	**PASS**
Short Term Flicker (Pst)	1.00	0.69	**PASS**
Long Term Flicker (Plt)	0.65	N/A	N/A

Table 15 Voltage Fluctuations/Flickers Testing

Kind of Product	Power Supply	Model No.:	SA40-050100/1G
Product Category:	N/A	Test Condition (AC Input)	
AC Mains Rating	230V, 50Hz, 1 ∅	Voltage(V) :	230.7V
Temperature(℃):	26.0 ℃	Current(mA):	116.9mA
Relative Humidity(%):	70.0 % RH	Watts(w):	11.89829w
Test Result	**Pass**	Frequency(Hz):	49.999Hz
Special Note:	N/A	Power Factor:	0.455

Datas Measured			
Test Item	**Std Limits**	**Test Reading**	**Test Result**
Relative st-st Voltage Change (dc)	3 %	0.01 %	**PASS**
Max. Relative Voltage Change(d_{max})	4 %	2.29 %	**PASS**
Duration＞3% dV(d(t) for＞200ms)	0.2 Sec.	0.05 %	**PASS**
Short Term Flicker (Pst)	1.00	0.69	**PASS**
Long Term Flicker (Plt)	0.65	N/A	N/A

Table 15 Voltage Fluctuations/Flickers Testing

Kind of Product	Power Supply	Model No.:	UP0401S-05L1/100M
Product Category:	N/A	Test Condition (AC Input)	
AC Mains Rating	230V, 50Hz, 1 ∅	Voltage(V) :	230.7V
Temperature(℃):	26.0 ℃	Current(mA):	116.9mA
Relative Humidity(%):	70.0 % RH	Watts(w):	13.07786w
Test Result	**Pass**	Frequency(Hz):	49.999Hz
Special Note:	N/A	Power Factor:	0.455

Datas Measured			
Test Item	**Std Limits**	**Test Reading**	**Test Result**
Relative st-st Voltage Change (dc)	3 %	0.01 %	**PASS**
Max. Relative Voltage Change(d_{max})	4 %	2.29 %	**PASS**
Duration＞3% dV(d(t) for＞200ms)	0.2 Sec.	0.05 %	**PASS**
Short Term Flicker (Pst)	1.00	0.69	**PASS**
Long Term Flicker (Plt)	0.65	N/A	N/A

Table 15 Voltage Fluctuations/Flickers Testing

Kind of Product	Power Supply	Model No.:	UP0401S-05L1/1G
Product Category:	N/A	Test Condition (AC Input)	
AC Mains Rating	230V, 50Hz, 1 ∅	Voltage(V) :	230.7V
Temperature(℃):	26.0 ℃	Current(mA):	116.9mA
Relative Humidity(%):	70.0 % RH	Watts(w):	13.86599w
Test Result	**Pass**	Frequency(Hz):	49.999Hz
Special Note:	N/A	Power Factor:	0.455

Datas Measured			
Test Item	**Std Limits**	**Test Reading**	**Test Result**
Relative st-st Voltage Change (dc)	3 %	0.01 %	**PASS**
Max. Relative Voltage Change(d_{max})	4 %	2.29 %	**PASS**
Duration＞3% dV(d(t) for＞200ms)	0.2 Sec.	0.05 %	**PASS**
Short Term Flicker (Pst)	1.00	0.69	**PASS**
Long Term Flicker (Plt)	0.65	N/A	N/A

Attachment

Table Contents

Attachment - A.

EUT Modification Description

Attachment - B.

EUT Test Photos

1. Conducted Measurement Photos
2. Radiated Measurement Photos

Conducted Measurement Photos

Radiated Measurement Photos

Attachment – C

EUT Photos

1. Photo # 1 Front View
2. Photo # 2 Rear View
3. Photo # 3 Side View
4. Photo # 4~8 Unit Partially Disassembled

Photo # 1

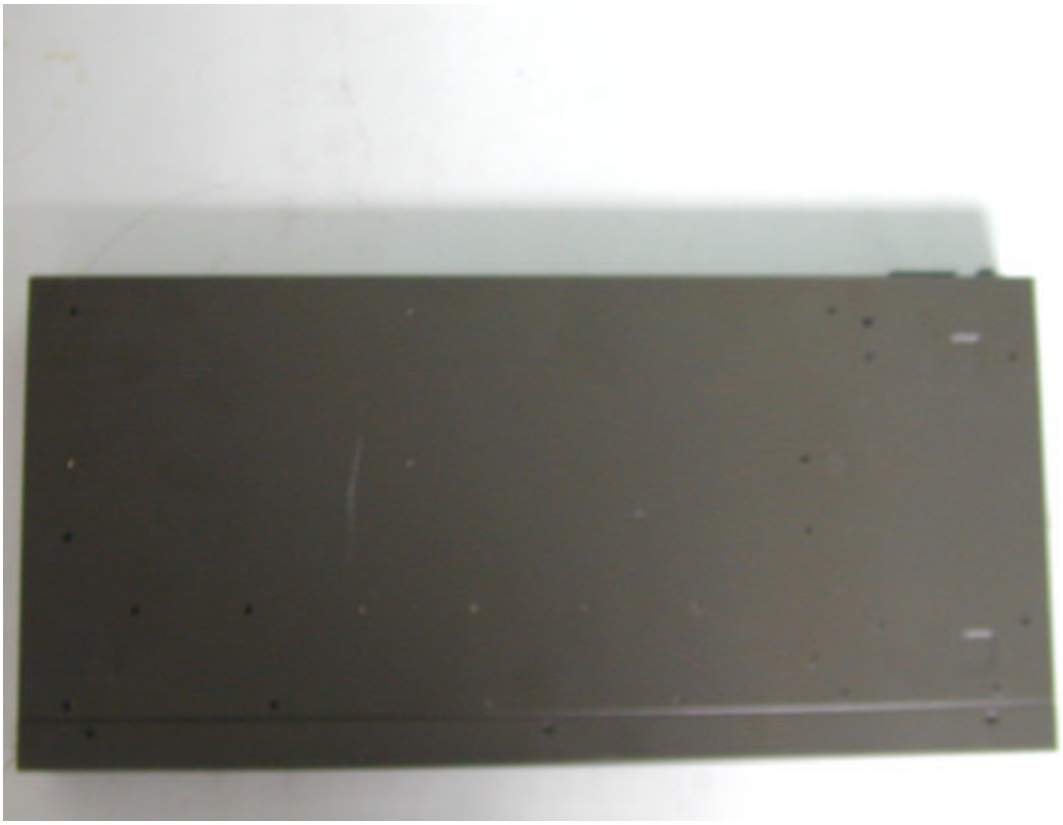


Photo # 2

Photo # 3

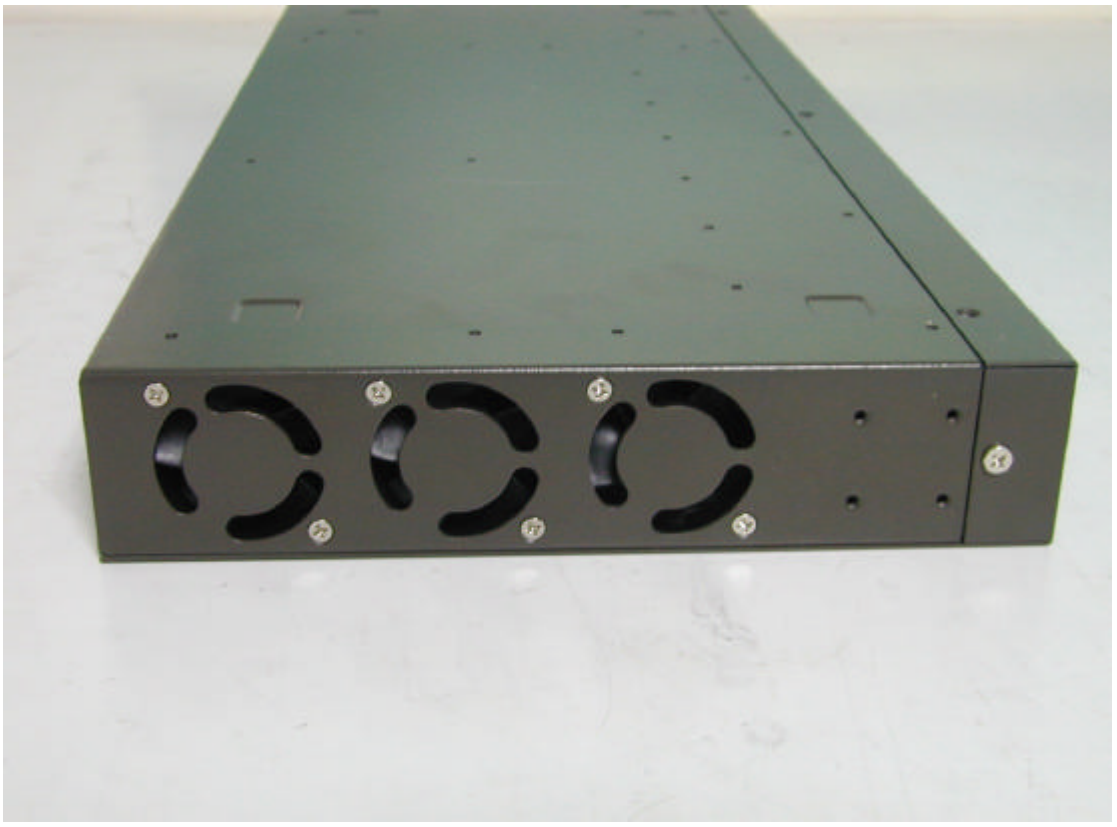


Photo # 4

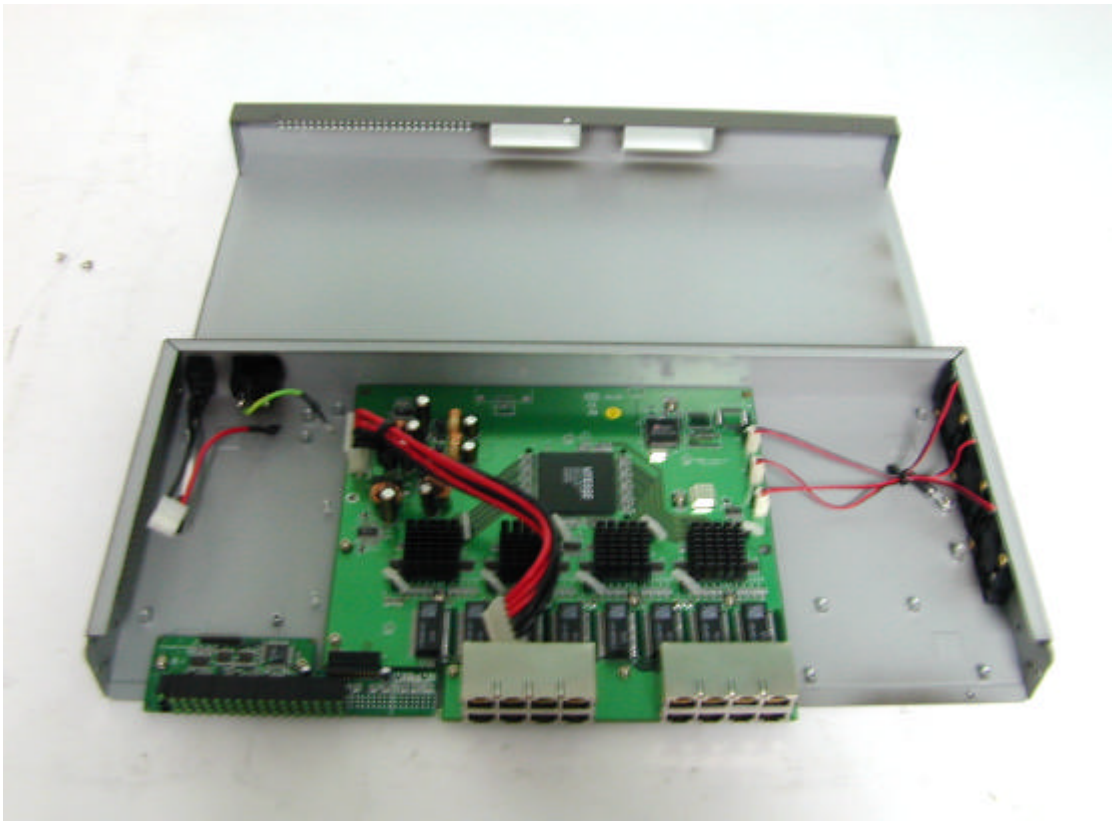
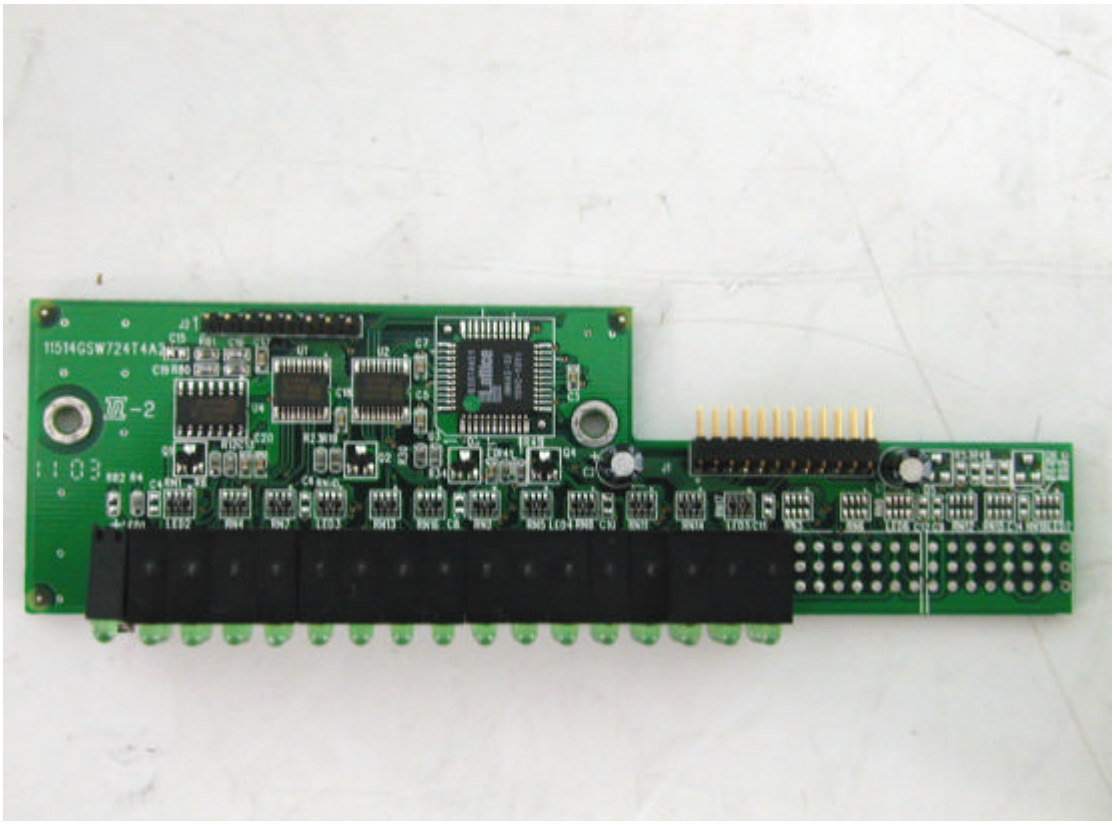


Photo # 5



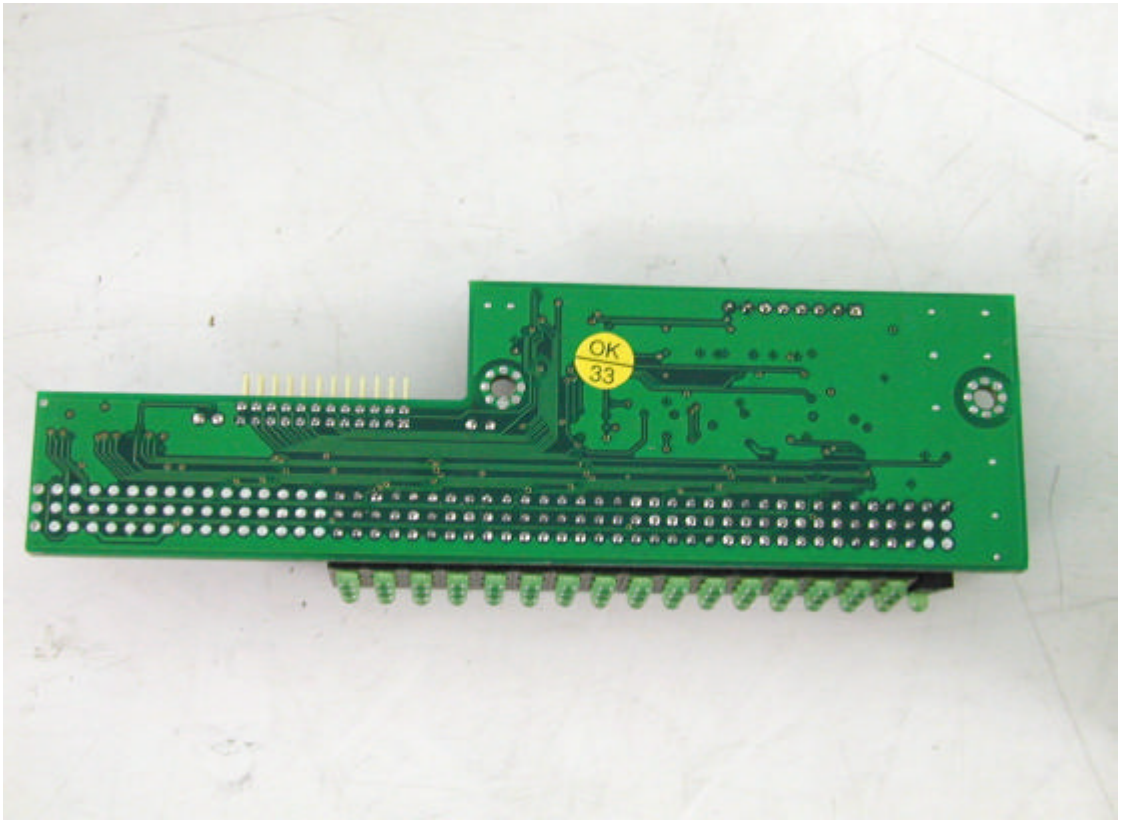
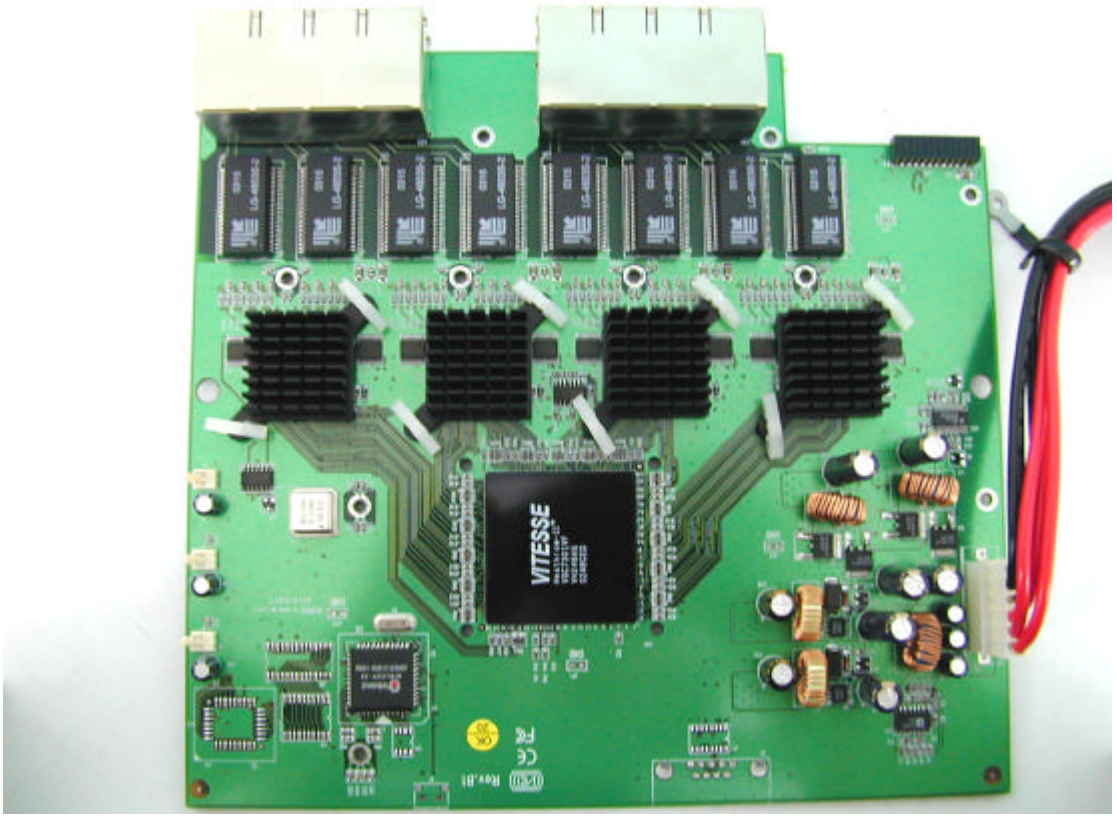


Photo # 6



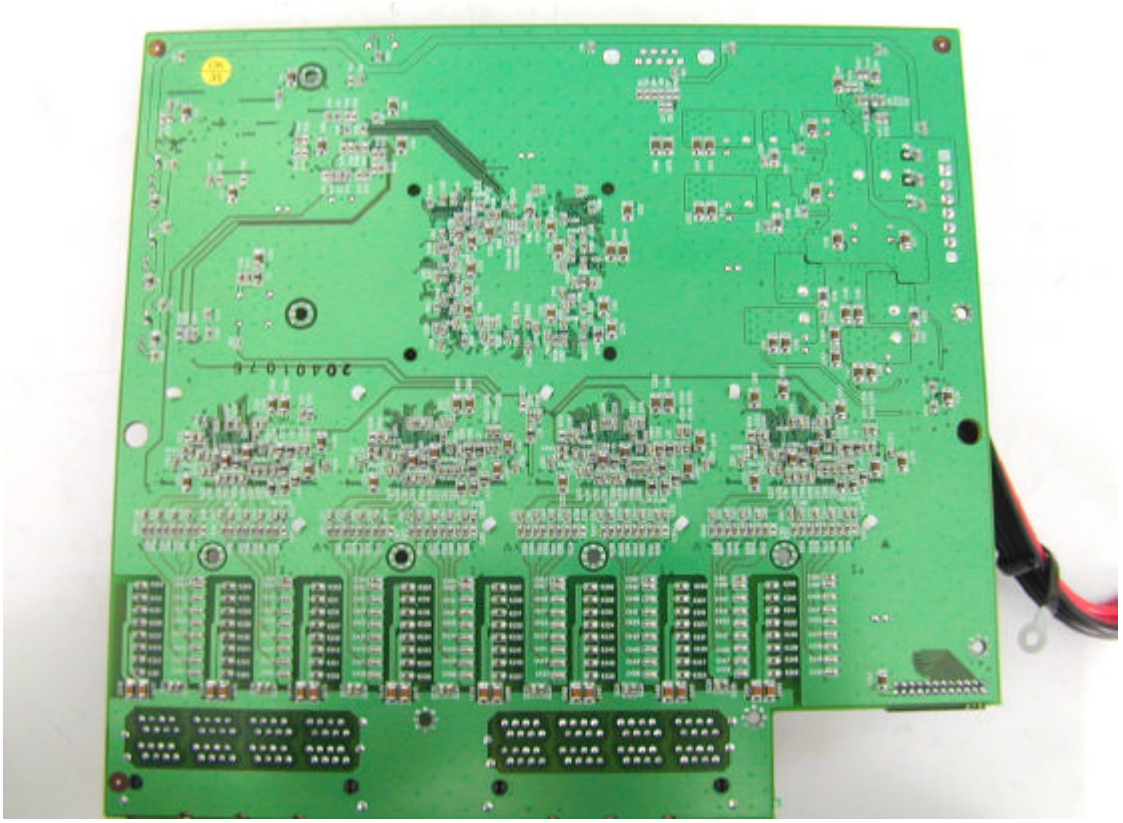
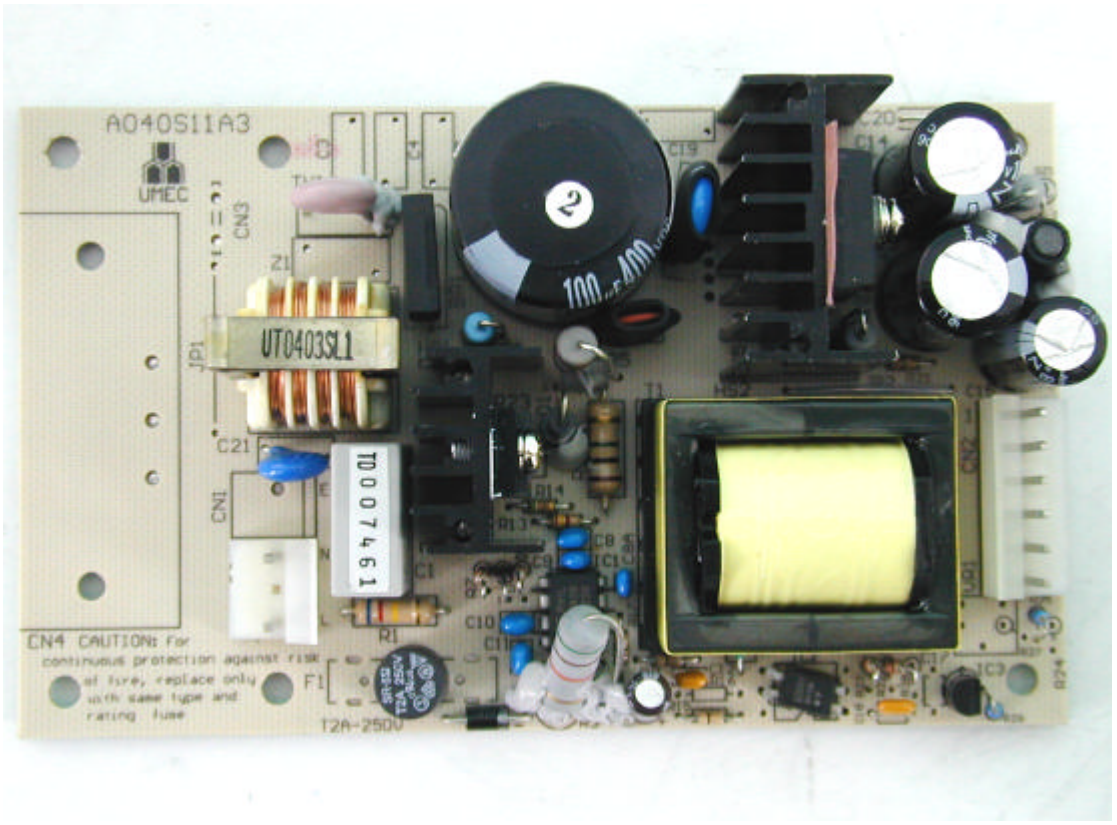


Photo # 7

Model No.:SA40-050100



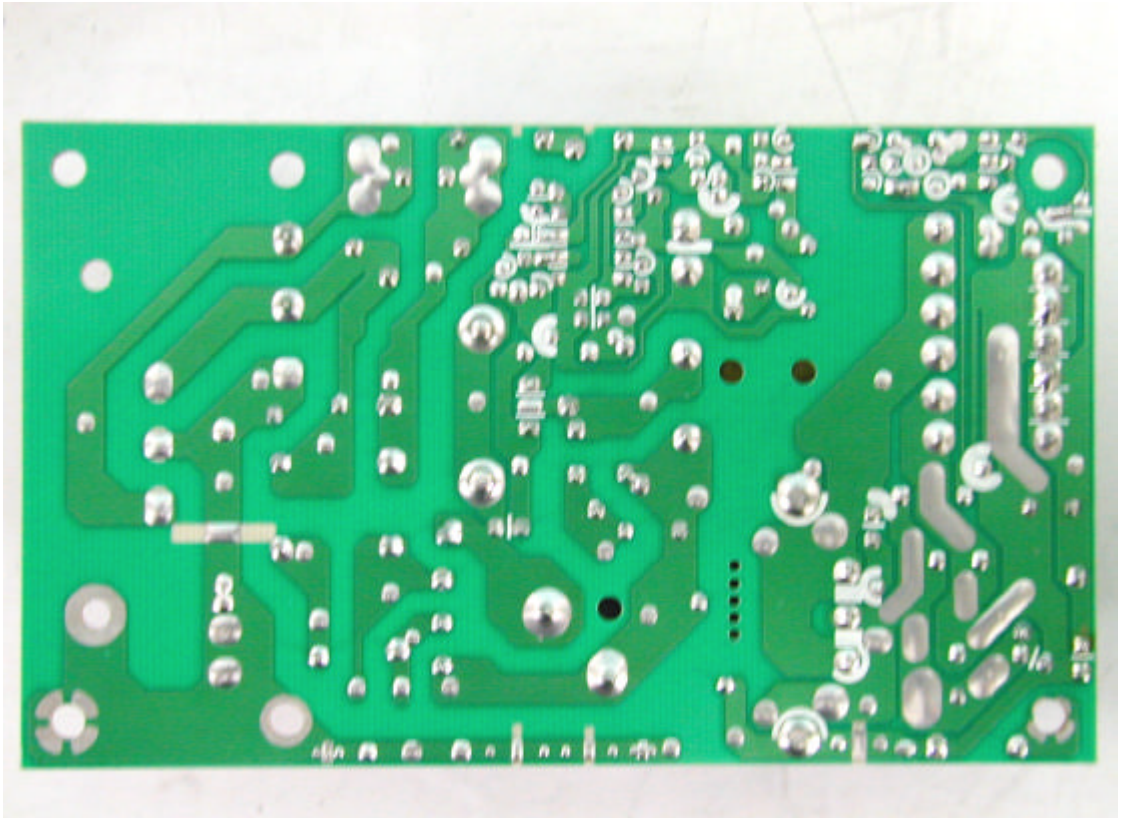


Photo # 8

Model No.:UP0401S-05L1