CE

EMC COMPLIANCE TEST REPORT

FOR

CPU Board

MODEL: GENE-4312 (N)

REPORT NUMBER: 02E9923

ISSUE DATE: January 23, 2002

Prepared for

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

Prepared by

COMPLIANCE ENGINEERING SERVICES, INC.
No. 199, CHUNG SHENG ROAD
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NVLAP®

LAB CODE: SL2-IN-E-0005

COMPLIANCE
Engineering Services, Inc.
FCC, VCCI, CISPR, CE
UL, CSA, TÜV, VDE
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CE

EC-Declaration of Conformity

For the following equipment:

CPU Board

(Product Name)

GENE-4312 (N)

(Model Designation / Trade name)

AAEON Technology Inc.

(Manufacturer Name)

5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R. O. C.

(Manufacturer Address)

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive (89/336/EEC, Amended by 92/31/EEC, 93/68/EEC & 98/13/EC), For the evaluation regarding the Electromagnetic Compatibility (89/336/EEC, Amended by 92/31/EEC, 93/68/EEC & 98/13/EC), the following standards are applied:

V	EN 55022: 1997
V	EN 61000-3-2: 1995 + A1: 1998 + A2: 1998 + A14: 2000
V	EN 61000-3-3: 1995
V	EN55024: 1998
	IEC 61000-4-2: 1995 + A2: 2000; IEC 61000-4-3: 1995; IEC 61000-4-4: 1995; IEC 61000-4-5: 1995; IEC 61000-4-6: 1996, IEC 61000-4-8: 1993, IEC 61000-4-11: 1994

The following manufacturer / importer or authorized representative established within the EUT is responsible for this declaration:

(Company Name)

(Company Address)

Person responsible for making this declaration:

(Name, Surname)

(Position / Title)

(Place) (Date) (Legal Signature)

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NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

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VERIFICATION OF COMPLIANCE

Equipment Under Test:	CPU Board
Trade Name:	N/A
Model Number:	GENE-4312 (N)
Agency Series:	N/A
Applicant:	**AAEON Technology Inc.** 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R. O. C.
Manufacturer:	**AAEON Technology Inc.** 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R. O. C.
Type of Test:	EMC Directive 89/336/EEC for CE Marking
Technical Standards:	EN 55022: 1997 EN 61000-3-2: 1995 + A1: 1998 + A2: 1998 + A14: 2000 EN 61000-3-3: 1995 EN 55024: 1998 (IEC 61000-4-2: 1995 + A2: 2000, IEC 61000-4-3: 1995, IEC 61000-4-4: 1995, IEC 61000-4-5: 1995, IEC 61000-4-6: 1996, IEC 61000-4-8: 1993, IEC 61000-4-11: 1994)
File Number:	02E9923
Date of test:	January 11, 2002 ~ January 16, 2002
Deviation:	N/A
Condition of Test Sample:	Normal

The above equipment was tested by Compliance Engineering Services, Inc. for compliance with the requirements set forth in EMC Directive 89/336/EEC and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Approved by Authorized Signatory: Rick Yeo

RICK YEO / EMC MANAGER

GENERAL INFORMATION

Applicant:	**AAEON Technology Inc.** 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R. O. C.
Contact Person:	Milo Wang / Q. E. Dept. Engineer
Manufacturer:	**AAEON Technology Inc.** 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R. O. C.
File Number:	02E9923
Date of Test:	January 11, 2002 ~ January 16, 2002
Equipment Under Test:	CPU Board
Model Number:	GENE-4312 (N)
Agency Series:	N/A
Type of Test:	EMC Directive 89/336/EEC for CE Marking
Technical Standards:	EN 55022: 1997 EN 61000-3-2: 1995 + A1: 1998 + A2: 1998 + A14: 2000 EN 61000-3-3: 1995 EN 55024: 1998 (IEC 61000-4-2: 1995 + A2: 2000, IEC 61000-4-3: 1995, IEC 61000-4-4: 1995, IEC 61000-4-5: 1995, IEC 61000-4-6: 1996, IEC 61000-4-8: 1993, IEC 61000-4-11: 1994)
Frequency Range (EN 55022):	150kHz to 30MHz for Line Conducted Test 30MHz to 1000MHz for Radiated Emission Test
Test Site:	**Compliance Engineering Services, Inc.** No. 199, Chung Sheng Road Hsin Tien City, Taipei Taiwan, R. O. C.

SYSTEM DESCRIPTION

EUT Test Procedure:

1. Windows 98 Boots System.
2. Run Winemc.Exe To Activate All Peripherals And Display “H” Pattern On Monitor Screen.
3. Data Through the EUT and Transmit Between Server Notebook and EUT Via RJ45 Cable.

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PRODUCT INFORMATION

Housing Type:	METAL
EUT Power Rating:	DC 12V to AC Adaptor
AC power during Test:	230VAC / 50Hz From AC Adaptor
AC Adaptor Manufacturer:	CHI
AC Adaptor Model Number:	CH-1205
AC Power Cord Type:	Un-shielded, 1.8m (Detachable)
DC Cable Type:	Shielded, 0.8m (Non-Detachable), Two ferrite cores on the cable of DC Jack
OSC/Clock Frequencies：	X2, X3 = 25 MHz; Y3= 14.318MHz

I/O Port of EUT:

I/O PORT TYPES	Q' TY	TESTED WITH
1). USB Port	2	2
2). PS/2 Port	1	1
3). RJ45 Port	2	1
4). Mini-DB26	1	N/A
5). DB9 Port (Serial)	2	2
6). DB15 Port (VGA)	1	1
7). DB25 Port (Parallel)	1	1
8). Phone Jack	3	3
9). RCA (Video)	1	1
10). S-Video (Video)	1	1

Note: N/A

SUPPORT EQUIPMENT

Host Computer:

Equipment	Model#	Serial#	Trade Name
Hard Driver	DARA-206000	N/A	IBM
RAM (SDRAM 64MB PC100)	D4564163G5-A10-9JF	N/A	NEC
CPU	GX1-300MHz	N/A	Cyrix
Chassis	AEC-6000	N/A	AAEON
Power Board	AEC-6000 Rev.A0.2	N/A	AAEON

External Peripheral Devices:

No	Equipment	Model #	Serial #	FCC ID	Trade Name	Data Cable	Power Cord
1.	Player	RQ-L309GT	N/A	N/A	PANASONIC	Unshielded, 1.2m	N/A
2.	Mic.&Ear.	MSB-206	N/A	N/A	E.SENSE	Unshielded, 2.3 m	N/A
3.	USB Mouse	MU3UE	N/A	DoC	ACROX	Shielded, 1.7m	N/A
4.	USB Mouse	MU3UE	N/A	DoC	ACROX	Shielded, 1.7m	N/A
5.	PS/2 Mouse	M-S34	LZED1303050	DZL211029	LOGITECH	Shielded, 1.9m	N/A
6.	PS/2 Keyboard	6311-TW4C/6	N/A	DoC	ACER	Shielded, 1.7m	N/A
7.	Monitor	RB15NS	N/A	DoC	SAMSUNG	Unshielded, 1.4m	Shielded, 1. 8m With a core
8.	Modem	2496CF	N/A	N/A	DATATRONICS	Shielded, 1.4 m	Unshielded, 1.8m
9.	Modem	231AA	A25331083841	BFJ9D9308US	HAYES	Shielded, 0.8 m	Unshielded, 1.8m
10.	Printer	2225C	2550540697	BS46XU2225C	HP	Shielded, 1.8 m	Unshielded, 1.8m
11.	Monitor	RB17NS	N/A	DoC	SAMSUNG	Unshielded, 1.8m	Shielded, 1. 8m With a core
12.	Monitor	PH19HS	N/A	DoC	SAMSUNG	Shielded, 1.8m With two cores	Unshielded, 1.8m
13.	Server Notebook	PT900L-09G4H	X1046383J	N/A	Toshiba	Unshielded, 30m (RJ45)	Unshielded, 1.8m
14.	Cable	N/A	N/A	N/A	N/A	Unshielded, 1.0m(RJ45)	N/A

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals.
Grounding: Grounding was in accordance with the manufacturer' s requirements and conditions for the intended use.

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TEST EQUIPMENT LIST (EMISSION)

Instrumentation: The following list contains equipment used at Compliance Engineering Services, Inc.. for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2-1988 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 9kHz to 1.0 / 2.0 GHz.

Equipment used during the tests:

☒ **Open Area Test Site:** #D

Equipment	Manuf.	Model No.	Serial No.	Cal Date	Due Date
EMI TEST DISPLAY	**R&S**	**DSAI-D 804.8932.52**	**827832/001**	**10/29/01**	**10/28/02**
EMI TEST RF UNIT	**R&S**	**ESBI-RF/1005.4300.52**	**827832/003**	**10/29/01**	**10/28/02**
AMPLIFIER	**HP**	**8447DB**	**1644A02328**	**05/07/01**	**05/06/02**
ANTENNA	**SCHWARZBECK**	**VULB 9160**	**3104**	**05/17/01**	**05/16/02**
CABLE	**TIME MICROWAVE**	**LMR-400**	**N-TYPE02**	**07/09/01**	**07/08/02**
ANTENNA (1-18GHz)	**EMCO**	**3115**	**5761**	**02/23/01**	**02/22/02**
CABLE (1-18GHz)	**JYEBAO**	**N30-L142-1**	**N/A**	**03/02/01**	**03/02/02**
AMPLIFIER (1-26GHz)	**MITEQ**	**NSP2600-44**	**646455**	**02/26/01**	**02/26/02**

☒ **Conducted Area Test Site:** Conducted Room

Equipment	Manuf.	Model No.	Serial No.	Cal Date	Due Date
TEST RECEIVER	**R&S**	**ESHS20**	**840455/006**	**03/15/01**	**03/14/02**
LISN	**SOLAR**	**8012-50-R-24-BNC**	**8305114**	**07/23/01**	**07/22/02**
LISN(EUT)	**EMCO**	**3825/2**	**9108-1842**	**01/11/02**	**01/10/03**

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

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TEST EQUIPMENT LIST

For Power Harmonic & Voltage Fluctuation/Flicker Measurement:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
HP / Harmonic & Flicker Tester	6842A	3531A-000142	06/15/2001	06/14/2002

For ESD test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
SCHAFFNER / ESD Generator	NSG 435	5205	01/03/2002	01/02/2003

For Radiated Electromagnetic Field immunity Measurement:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
R&S / Signal Generator	SMY 02	DE13751	01/10/2002	01/09/2003
IFI / "E" Field sensor/ Light Modulator Transmitter	EFS-5	713-0695	06/29/2001	06/28/2002
IFI / Combination Amplifier	SMX100	2067-1196	06/28/2001	06/27/2002
IFI / Leveling Pre-Amplifier	LPA-5B	714-0695	05/01/2001	04/30/2002
EMCO / Biconilog Antenna	3142	9609-1087	No Calibration Required	No Calibration Required

For Fast Transients/Burst test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
KeyTek Instruments / EFT Generator	E421	9502326	11/01/2001	10/31/2002
KeyTek Instruments / Capacitive Clamp	CCL-4	9503290	No Calibration Required	No Calibration Required

For Surge Immunity test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
Surger Generator KeyTek Instruments	E501	9502324	11/01/2001	10/31/2002
Telecom Lines Coupler DECOUPLER KeyTek Instruments	CM-TELCD	0104399	05/01/2001	04/30/2002
I/O Signal Line DECOUPLER KeyTek Instruments	CM-I/OCD	0103234	05/01/2001	04/30/2002

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For CS test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
R&S / Signal Generator	SMY 02	DE13751	01/10/2002	01/09/2003
IFI / Combination Amplifier	SMX100	2067-1196	06/28/2001	06/27/2002
IFI / Leveling Pre-Amplifier	LPA-5B	714-0695	05/01/2001	04/29/2002
FISCHER / Power Line Coupling Decoupling Network	FCC-801-M3-16A	99122	10/27/2001	10/26/2002
FISCHER / Bulk Current Injection Probe	F-120-9B	54	10/30/2001	10/29/2002
Narda / High Power Attenuator	769-6	02541	10/26/2001	10/25/2002

For Power Frequency Magnetic Field test :

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
Haefely / Magic Field Tester	MAG 100.1	081436-02	No Calibration Required	No Calibration Required
Extech Electronics / Frequency Converter	CFC-105	810390	No Calibration Required	No Calibration Required
CHY/ AC/DC Clamp Meter	932C	2K0900285	10/25/2001	10/24/2002

For Voltage Dips/Short Interruption and Voltage Variation Immunity test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
Haefely / Dips/Inerruption/Variations Tester	PLINE 1610	081568-06	08/06/2001	08/05/2002
FLUKE / 79 Series Ii Multimeter	79-II	66400868	07/03/2001	07/02/2002

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SECTION 1 EN 55022 (LINE CONDUCTED & RADIATED EMISSION)

MEASUREMENT PROCEDURE
(PRELIMINARY LINE CONDUCTED EMISSION TEST)

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user' s manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

2) Support equipment, if needed, was placed as per EN 55022.

3) All I/O cables were positioned to simulate typical actual usage as per EN 55022.

4) The EUT received DC 12V power through AC Adaptor and Line Impedance Stabilization Network (LISN) which supplied power source of 230VAC/ 50Hz and was grounded to the ground plane.

5) All support equipment received power from a second LISN supplying power of 110VAC/60Hz, if any.

6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.

7) Analyzer / Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.

8) During the above scans, the emissions were maximized by cable manipulation.

9) The following test mode were scanned during the preliminary test:

Mode:

No.	Mode of operation	Date	Data Report/Plot No.
1	**640 X 480**	**01/11/2002**	**9462F#(85)**
2	**800 X 600**	**01/11/2002**	**9462F#(77)**
3	**1024 X 768**	**01/11/2002**	**9462F#(130, 131)**

10) After the preliminary scan, we found the following test mode producing the highest emission level.

Mode: 3.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

MEASUREMENT PROCEDURE
(FINAL LINE CONDUCTED EMISSION TEST)

1) EUT and support equipment was set up on the test bench as per step 10 of the preliminary test.

2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Q.P. mode, then the emission signal was re-checked using an A.V. detector.

3) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq (MHz)	Meter Reading (dBuV)	C.F. (dB)	Corrected Reading (dBuV)	Limits (dBuV)	Margin (dB)	Reading Type (P/Q/A)	Line (L1/L2)
x.xx	**x.xx**	**x.xx**	**48.38**	**66.00**	**-17.62**	**A**	**L1**

C.F.(Correction Factor)=Insertion Loss + Cable Loss
Corrected Reading = Metering Reading + C.F.
Margin=Corrected Reading - Limits

P=Peak Reading L1=Hot
Q=Quasi-peak L2=Neutral
A=Average Reading

Comments: **N/A**

LINE CONDUCTED EMISSION LIMIT (EN 55022)

Frequency	Maximum RF Line Voltage	
	Q.P.	AVERAGE
150kHz-500kHz	79dBuV	66dBuV
500kHz-5MHz	73dBuV	60dBuV
5MHz-30MHz	73dBuV	60dBuV

Note: The lower limit shall apply at the transition frequency.

MEASUREMENT PROCEDURE
(PRELIMINARY RADIATED EMISSION TEST)

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

2) Support equipment, if needed, was placed as per EN 55022.

3) All I/O cables were positioned to simulate typical actual usage as per EN 55022.

4) The EUT received DC 12V power source from AC Adaptor (AC 230V/50Hz) to the outlet socket under the turntable. All support equipment received 110VAC/60Hz power from another socket under the turntable, if any.

5) The antenna was placed at 10 meter away from the EUT as stated in EN 55022. The antenna connected to the analyzer via a cable and at times a pre-amplifier would be used.

6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

7) The following test mode were scanned during the preliminary test:

Mode:

No.	Mode of operation	Date	Data Report/Plot No.
1	**640 X 480**	**01/11/2002**	**9462D#(05)**
2	**800 X 600**	**01/11/2002**	**9462D#(06)**
3	**1024 X 768**	**01/11/2002**	**9462D#(02, 07)**

8) After the preliminary scan, we found the following test mode producing the highest emission level.

Mode: 3.

Then, the EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for final testing.

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MEASUREMENT PROCEDURE
(FINAL RADIATED EMISSION TEST)

1) EUT and support equipment were set up on the turntable as per step 8 of the preliminary test.

2) The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

3) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Peak reading is presented. If EUT emission level was less-2dB to the limit, then the emission signal was re-checked using a Q.P. detector.

4) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq (MHz)	Meter Reading (dBuV)	C.F. (dB/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type P/Q/A	Pol. H/V
x.xx	**x.xx**	**x.xx**	**40.82**	**47.00**	**-6.18**	**P**	**V**

C.F.(Correction Factor)=Antenna Factor + Cable Loss + Attenuator(6dB) - Amplifier Gain
Corrected Reading = Metering Reading + C.F.
Margin=Corrected Reading – Limits

P=Peak Reading H=Horizontal Polarization/Antenna
Q=Quasi-peak V=Vertical Polarization/Antenna
A=Average Reading

Comments: **N/A**

RADIATED EMISSION LIMIT

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBu V/m/ Q.P.)
30-230	10	40
230-1000	10	47

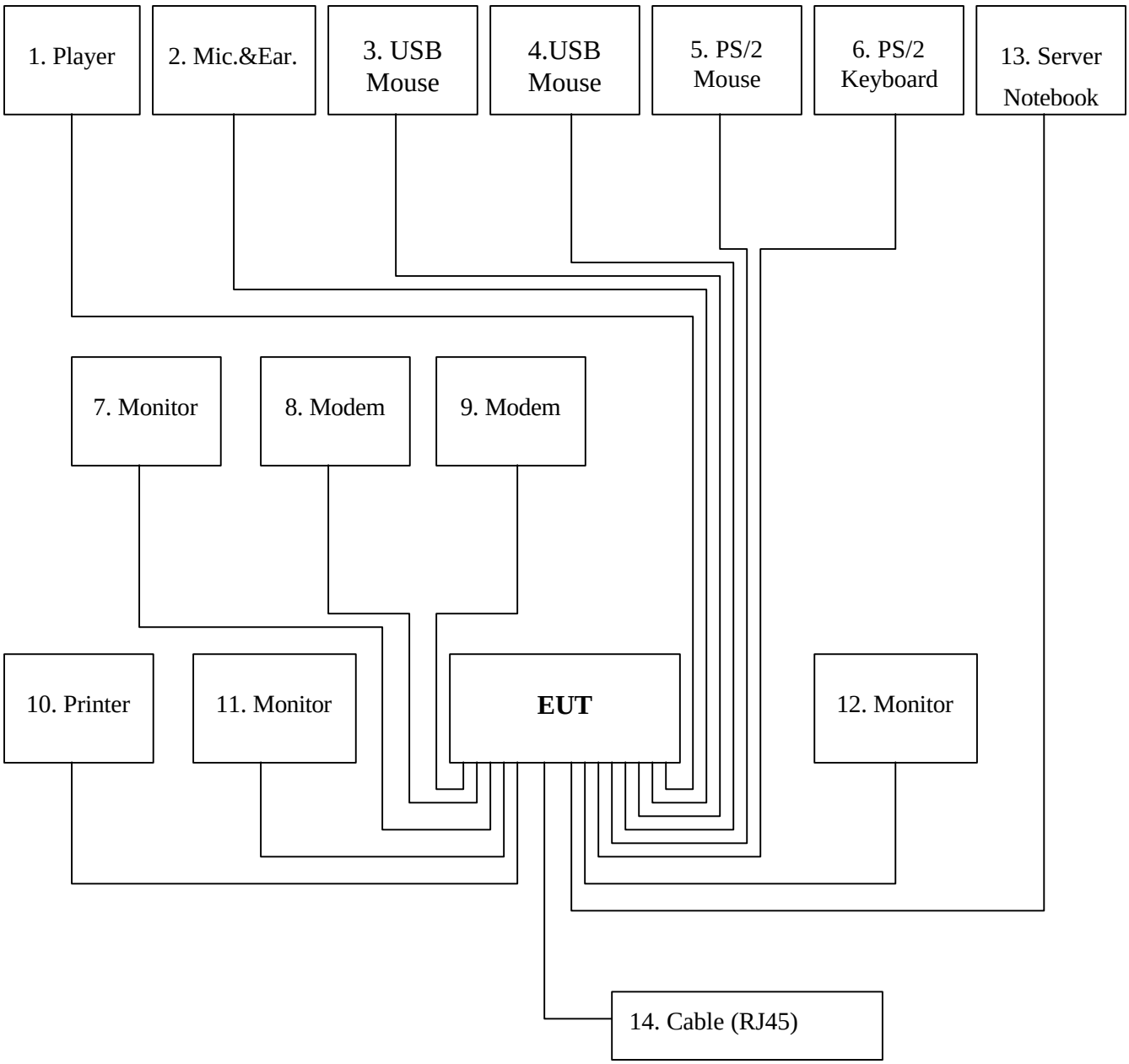
Note: The lower limit shall apply at the transition frequency.

BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators

EUT: CPU Board

Model Number: GENE-4312 (N)



SUMMARY DATA

(LINE CONDUCTED TEST)

Model Number: GENE-4312 (N) **Location:** Conducted Room

Tested by: James Liao

Test Model: Mode 3

Test Results: Passed

Temperature: 21℃ **Humidity:** 74%RH

(The chart below shows the highest readings taken from the final data)

Six Highest Conducted Emission Readings							
Frequency Range Investigated				150 kHz TO 30 MHz			
Freq (MHz)	Meter Reading (dBuV)	C.F. (dB)	Corrected Reading (dBuV)	Limits (dBuV)	Margin (dB)	Reading Type (P/Q/A)	Line (L1/L2)
0.183	**48.91**	**0.02**	**48.93**	**79.00**	**-30.07**	**P**	**L1**
0.549	**41.63**	**0.05**	**41.68**	**73.00**	**-31.32**	**P**	**L1**
3.584	**42.58**	**0.21**	**42.79**	**73.00**	**-30.21**	**P**	**L1**
0.183	**47.67**	**0.02**	**47.69**	**79.00**	**-31.31**	**P**	**L2**
0.243	**44.97**	**0.02**	**44.99**	**79.00**	**-34.01**	**P**	**L2**
0.549	**43.43**	**0.05**	**43.48**	**73.00**	**-29.52**	**P**	**L2**

C.F.(Correction Factor)=Insertion Loss + Cable Loss

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading L1=Hot

Q=Quasi-peak L2=Neutral

A=Average Reading

Comments: **N/A**

SUMMARY DATA
(RADIATED EMISSION TEST)

Model Number: GENE-4312 (N) **Location:** Site # D

Tested by: Cliff Lai **Polar:** Vertical / Horizontal– 10m

Test Mode: Mode 3

Test Results: Passed

Temperature: 20℃ **Humidity:** 73%RH

(The chart below shows the highest readings taken from the final data)

Frequency Range Investigated (30 MHz TO 1000 MHz)							
Freq (MHz)	Meter Reading (dBuV)	C.F. (dB/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type P/Q/A	Pol. H/V
134.000	**41.10**	**-6.46**	**34.64**	**40.00**	**-5.36**	**P**	**V**
147.900	**42.24**	**-5.36**	**36.88**	**40.00**	**-3.12**	**P**	**V**
177.200	**40.29**	**-6.30**	**33.99**	**40.00**	**-6.01**	**P**	**V**
110.578	**43.21**	**-10.21**	**33.00**	**40.00**	**-7.00**	**P**	**H**
133.929	**43.57**	**-8.19**	**35.38**	**40.00**	**-4.62**	**P**	**H**
147.371	**44.83**	**-7.24**	**37.59**	**40.00**	**-2.41**	**P**	**H**

C.F.(Correction Factor)=Antenna Factor + Cable Loss - Amplifier Gain (+ Attenuator 6dB)

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading H=Horizontal Polarization/Antenna

Q=Quasi-peak V=Vertical Polarization/Antenna

A=Average Reading

Comments: **N/A**

SECTION 2 EN 61000-3-2 & EN 61000-3-3 (POWER HARMONICS & VOLTAGE FLUCTUATION/FLICKER)

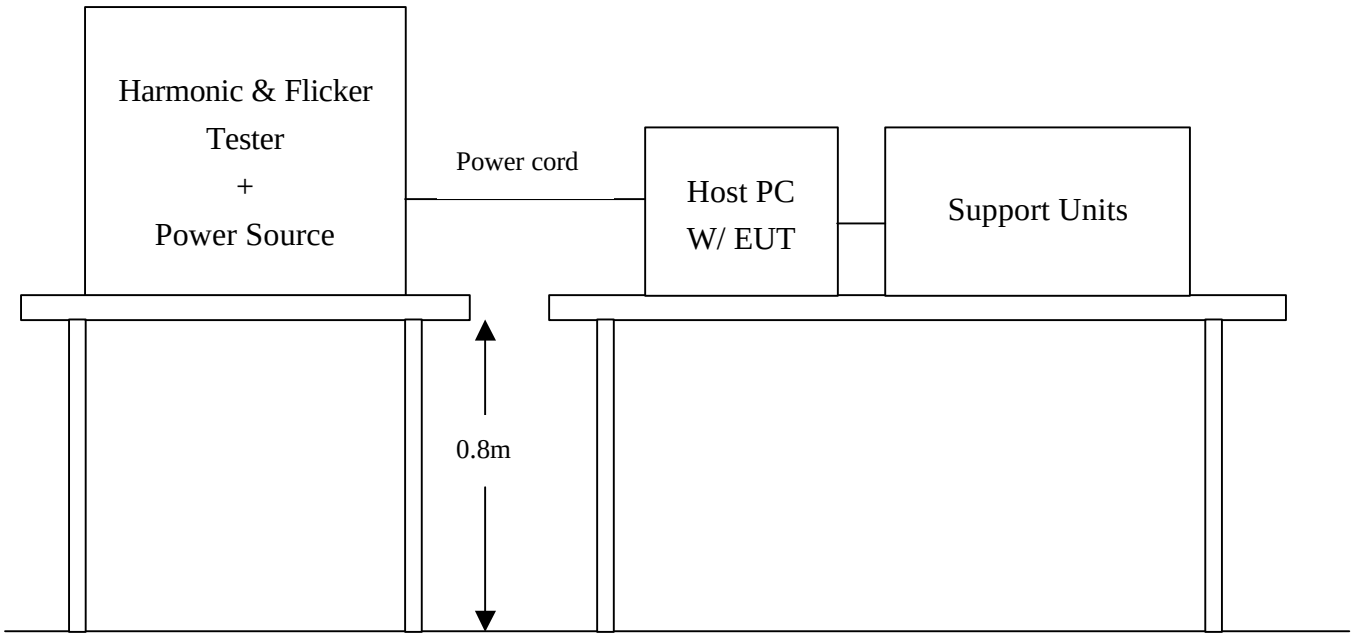
POWER HARMONICS MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-2: 1995 + A1: 1998 + A2: 1998 + A14: 2000
Limits : CLASS D
Tester : Bill Huang
Temperature : 23℃
Humidity : 60 %

VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-3 : 1995
Limits : Section 5 of EN 61000-3-3
Tester : Bill Huang
Temperature : 23℃
Humidity : 60 %

Block Diagram of Test Setup:



Result:

Please see the attached test data.

Approved by: Vince Chiang

Signature: Bill Huang Date: 1/14

Final Test Result: PASS

Settings and Test Conditions Compliant to the Standard: Yes

Test Equipment Used:

Agilent 6842A Harmonic/Flicker Test System with serial number:
HFTS Software Version: A.05.03
Date Last Calibrated:

Test Equipment Settings:

Line Voltage: 230.00 V	Current Measurement Range: High
Line Frequency: 50 Hz	Measurement Window Type: Rectangular
Device Class: D	Measurement Delay: 10 seconds
RMS Current Limit: 13.1 A	Quasi-stationary Test Duration: 30.00 minutes
Peak Current Limit: 80.8 A	Class Determination Pre-test Duration: 10.00 seconds
Number of Records: 5625	

Overrides:

Test Limit Source (Power Measurements/Statistics): Maximum
Power Overrides: None
Test Limit Overrides: None

Pre-test Results for Class Determination:

Percent in Envelope: 100.0%	Voltage THD Out-of-Specification?: No	
Class D Equipment?: Yes	Fundamental Current: 0.066 A	
RMS Voltage: 229.8 V	RMS Current: 0.1 A	Real Power: 12.1 W
Frequency: 50.0 Hz	Peak Current: 0.7 A	Apparent Power: 33.3 VA
Voltage THD: 0.02%	Current THD: 88.09%	Power Factor: 0.362
Maximum Power: 12.1 W	Mean Power: 12.0 W	

Active Power Statistics:

100th Percentile: 12.1 W	99th Percentile: 12.0 W	95th Percentile: 12.0
90th Percentile: 12.0 W	50th Percentile: 11.7 W	

Total Number of Failures:	Total Number of Errors:
None	None

Pre-Test Source Voltage Harmonics Data:

Harmonic Number	Limit (%)	Limit (Volts)	Max (%)	Max (Volts)
Fund.			100.0	229.851
2	0.20	0.460	0.006	0.014
3	0.90	2.069	0.005	0.012
4	0.20	0.460	0.005	0.011
5	0.40	0.919	0.006	0.013
6	0.20	0.460	0.002	0.005
7	0.30	0.690	0.004	0.010
8	0.20	0.460	0.001	0.003
9	0.20	0.460	0.004	0.009
10	0.20	0.460	0.003	0.007
11	0.10	0.230	0.003	0.007
12	0.10	0.230	0.003	0.006
13	0.10	0.230	0.005	0.012
14	0.10	0.230	0.001	0.003
15	0.10	0.230	0.004	0.009
16	0.10	0.230	0.003	0.006
17	0.10	0.230	0.007	0.016
18	0.10	0.230	0.003	0.006
19	0.10	0.230	0.007	0.015
20	0.10	0.230	0.001	0.003
21	0.10	0.230	0.006	0.014
22	0.10	0.230	0.003	0.007
23	0.10	0.230	0.003	0.007
24	0.10	0.230	0.003	0.006
25	0.10	0.230	0.005	0.011
26	0.10	0.230	0.002	0.004
27	0.10	0.230	0.003	0.006
28	0.10	0.230	0.001	0.002
29	0.10	0.230	0.005	0.011
30	0.10	0.230	0.002	0.006
31	0.10	0.230	0.003	0.006
32	0.10	0.230	0.001	0.002
33	0.10	0.230	0.003	0.007
34	0.10	0.230	0.001	0.002
35	0.10	0.230	0.001	0.003
36	0.10	0.230	0.003	0.007
37	0.10	0.230	0.002	0.005
38	0.10	0.230	0.002	0.004
39	0.10	0.230	0.001	0.003
40	0.10	0.230	0.001	0.003

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Final Test Data:

Harmonic Number	Standard Limit (A rms)	Maximum Value (A rms)	Maximum Value (% Limit)	Mean Value (A rms)	Mean Value (% Limit)	Standard Deviation (A rms)	Standard Deviation (% Limit)	Pass (P) or Fail (F)
Fund.		0.0782		0.0659		0.0006		
2		0.0016		0.0010		0.0001		
3	2.3000	0.0656	2.9	0.0516	2.2	0.0006	0.0	P
4		0.0016		0.0011		0.0001		
5	1.1400	0.0635	5.6	0.0501	4.4	0.0006	0.1	P
6		0.0011		0.0008		0.0001		
7	0.7700	0.0603	7.8	0.0478	6.2	0.0006	0.1	P
8		0.0009		0.0006		0.0001		
9	0.4000	0.0564	14.1	0.0451	11.3	0.0005	0.1	P
10		0.0007		0.0004		0.0001		
11	0.3300	0.0519	15.7	0.0419	12.7	0.0004	0.1	P
12		0.0006		0.0003		0.0001		
13	0.2100	0.0469	22.3	0.0385	18.3	0.0004	0.2	P
14		0.0007		0.0003		0.0001		
15	0.1500	0.0417	27.8	0.0349	23.3	0.0003	0.2	P
16		0.0006		0.0003		0.0001		
17	0.1324	0.0363	27.4	0.0311	23.5	0.0002	0.2	P
18		0.0007		0.0003		0.0001		
19	0.1184	0.0307	25.9	0.0271	22.9	0.0002	0.2	P
20		0.0006		0.0002		0.0001		
21	0.1071	0.0252	23.5	0.0232	21.6	0.0001	0.1	P
22		0.0005		0.0002		0.0001		
23	0.0978	0.0200	20.4	0.0193	19.7	0.0001	0.1	P
24		0.0005		0.0002		0.0001		
25	0.0900	0.0159	17.7	0.0155	17.2	0.0002	0.2	P
26		0.0005		0.0002		0.0001		
27	0.0833	0.0123	14.8	0.0119	14.2	0.0002	0.2	P
28		0.0005		0.0002		0.0001		
29	0.0776	0.0092	11.8	0.0087	11.2	0.0002	0.3	P
30		0.0006		0.0002		0.0001		
31	0.0726	0.0064	8.8	0.0058	8.0	0.0002	0.3	P
32		0.0005		0.0002		0.0001		
33	0.0682	0.0039	5.8	0.0034	5.0	0.0002	0.3	P
34		0.0005		0.0002		0.0001		
35	0.0643	0.0031	4.7	0.0018	2.9	0.0001	0.2	P
36		0.0005		0.0002		0.0001		
37	0.0608	0.0041	6.7	0.0017	2.8	0.0001	0.2	P
38		0.0004		0.0002		0.0001		
39	0.0577	0.0049	8.6	0.0025	4.3	0.0002	0.3	P
40		0.0004		0.0002		0.0001		

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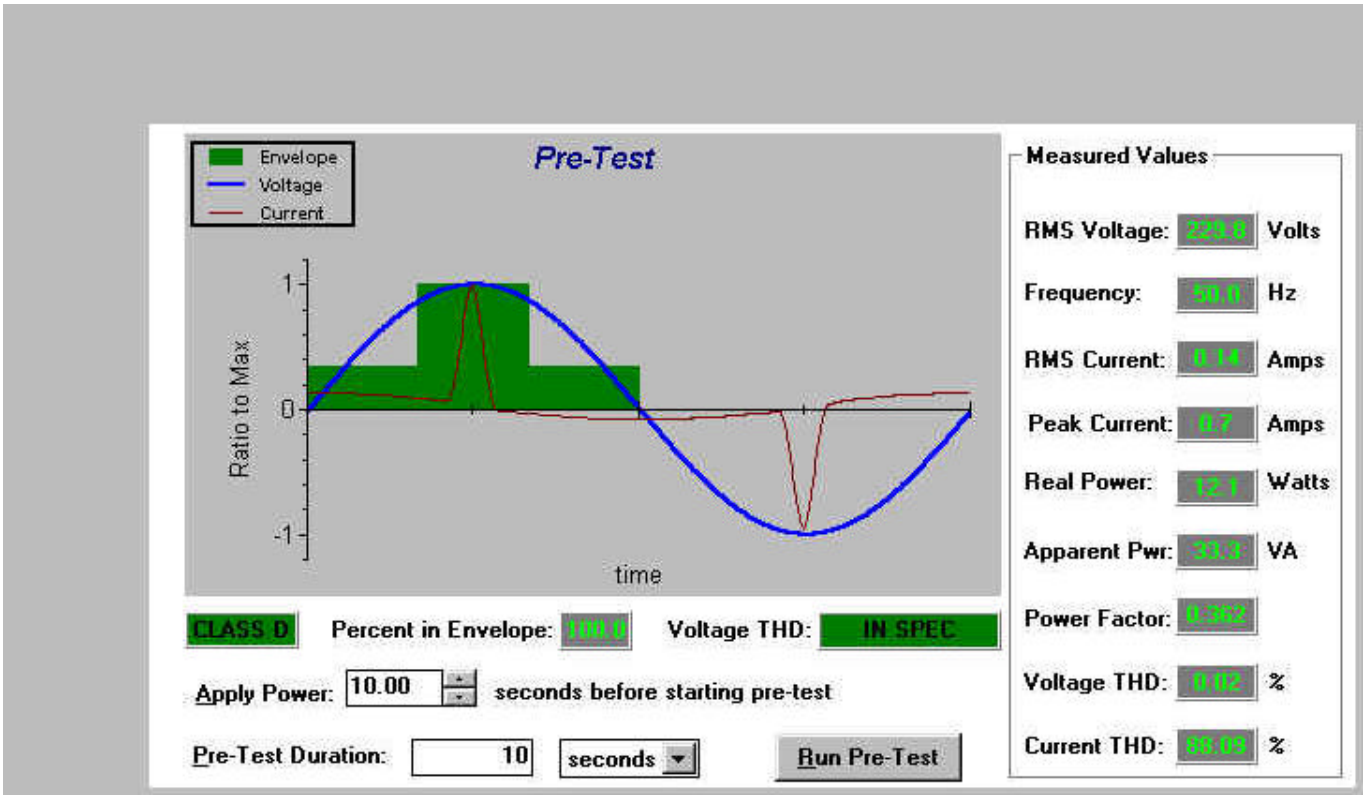
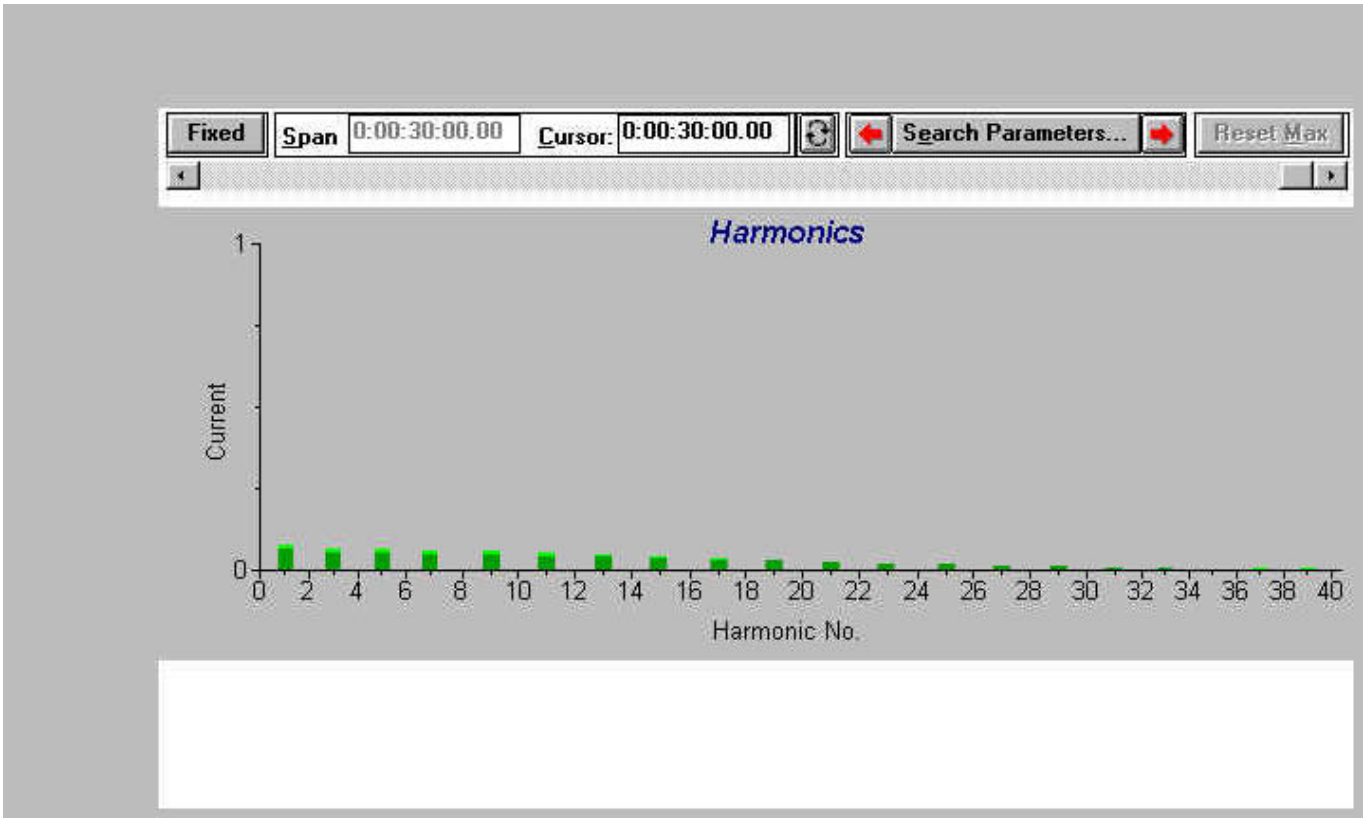
Final Test Statistics:

Harmonic Number	Standard Limit (A rms)	Maximum Value (A rms)	Maximum Value (% Limit)	>50% of Limit (Count)	>75% of Limit (Count)	>90% of Limit (Count)	>95% of Limit (Count)	>100% of Limit (Count)	Pass (P) or Fail (F)
Fund.		0.0782							
2		0.0016		0	0	0	0	0	
3	2.3000	0.0656	2.9	0	0	0	0	0	P
4		0.0016		0	0	0	0	0	
5	1.1400	0.0635	5.6	0	0	0	0	0	P
6		0.0011		0	0	0	0	0	
7	0.7700	0.0603	7.8	0	0	0	0	0	P
8		0.0009		0	0	0	0	0	
9	0.4000	0.0564	14.1	0	0	0	0	0	P
10		0.0007		0	0	0	0	0	
11	0.3300	0.0519	15.7	0	0	0	0	0	P
12		0.0006		0	0	0	0	0	
13	0.2100	0.0469	22.3	0	0	0	0	0	P
14		0.0007		0	0	0	0	0	
15	0.1500	0.0417	27.8	0	0	0	0	0	P
16		0.0006		0	0	0	0	0	
17	0.1324	0.0363	27.4	0	0	0	0	0	P
18		0.0007		0	0	0	0	0	
19	0.1184	0.0307	25.9	0	0	0	0	0	P
20		0.0006		0	0	0	0	0	
21	0.1071	0.0252	23.5	0	0	0	0	0	P
22		0.0005		0	0	0	0	0	
23	0.0978	0.0200	20.4	0	0	0	0	0	P
24		0.0005		0	0	0	0	0	
25	0.0900	0.0159	17.7	0	0	0	0	0	P
26		0.0005		0	0	0	0	0	
27	0.0833	0.0123	14.8	0	0	0	0	0	P
28		0.0005		0	0	0	0	0	
29	0.0776	0.0092	11.8	0	0	0	0	0	P
30		0.0006		0	0	0	0	0	
31	0.0726	0.0064	8.8	0	0	0	0	0	P
32		0.0005		0	0	0	0	0	
33	0.0682	0.0039	5.8	0	0	0	0	0	P
34		0.0005		0	0	0	0	0	
35	0.0643	0.0031	4.7	0	0	0	0	0	P
36		0.0005		0	0	0	0	0	
37	0.0608	0.0041	6.7	0	0	0	0	0	P
38		0.0004		0	0	0	0	0	
39	0.0577	0.0049	8.6	0	0	0	0	0	P
40		0.0004		0	0	0	0	0	

Remarks





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Approved by: Vince Chiang

Signature: Bill Huang Date: 1/14

Final Test Result: PASS

Settings and Test Conditions Compliant to the Standard: Yes

Test Equipment Used:

Agilent 6842A Harmonic/Flicker Test System with serial number:
HFTS Software Version: A.05.03
Date Last Calibrated:

Test Equipment Settings:

Line Voltage: 230.00 V	Pst Integration Time: 10 minutes
Line Frequency: 50 Hz	Pst Integration Periods: 3
Measurement Delay: 10.0 seconds	Test Duration: 00:30:00
RMS Current Limit: 13.1 A	Peak Current Limit: 80.8 A

Overrides:

Pst/Plt Test Limit Overrides: None
RMS Test Limit Overrides: None

Equipment Under Test Pre-test Results:

RMS Voltage: 229.8 V	RMS Current: 0.1 A	Real Power: 12.1 W
Frequency: 50.0 Hz	Peak Current: 0.7 A	Apparent Power: 33.6 VA
Voltage THD: 0.02%	Current THD: 88.34%	Power Factor: 0.359

Total Number of Failures:

Pst: 0	Dc: 0	
Plt: 0	Dmax: 0	
	Dt: 0	

Total Number of Errors:

None

Final Test Summary:

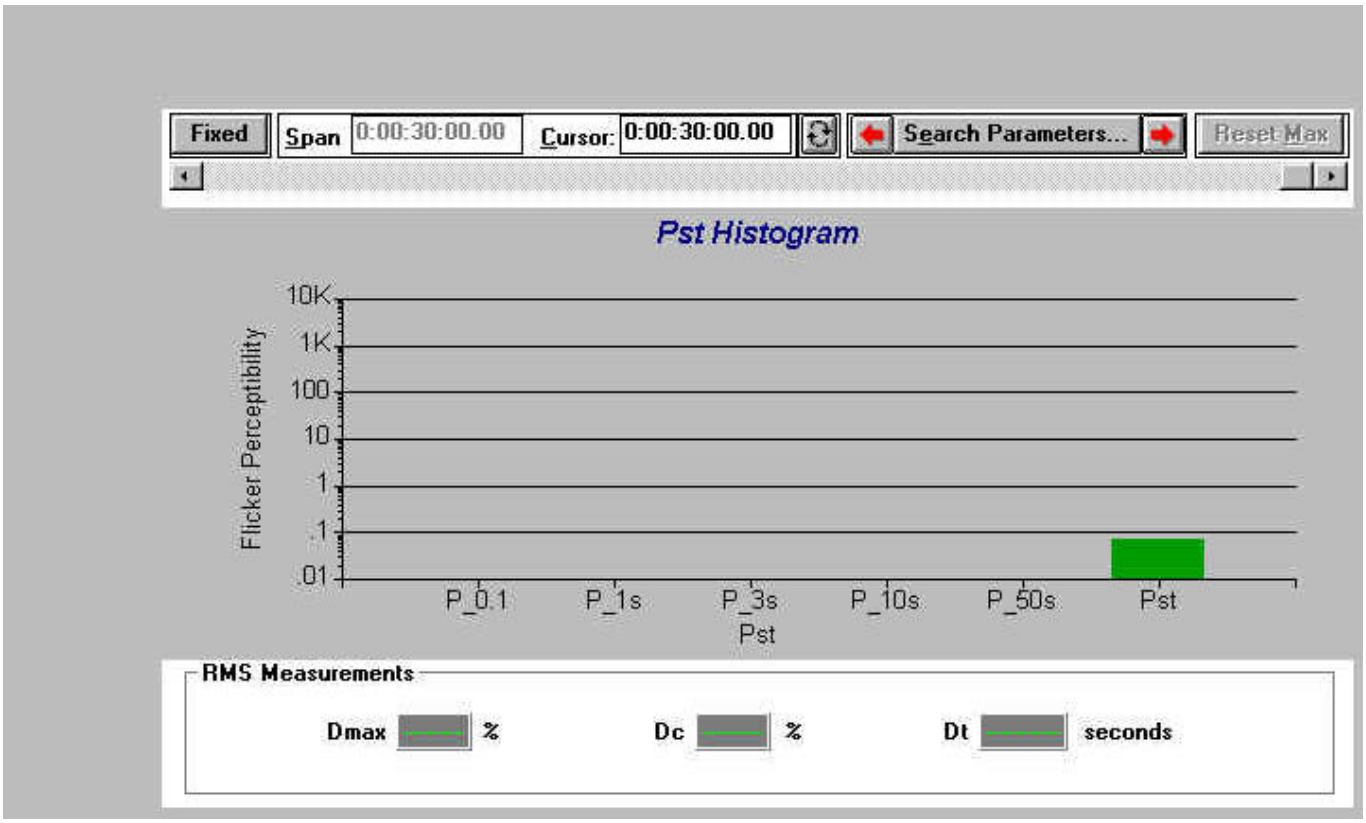
Dmax:	0.0	Pst:	0.07	P_0.1:	0.01
Dc:	0.0	Plt:	0.07	P_1s:	0.01
Dt:	0.00	Plt Threshold:	0.65	P_3s:	0.01
				P_10s:	0.01
				P_50s:	0.01

Final Test Data by Integration Period:

Number of Integration Periods: 3

Integration Periods	Pst (P.U.)	P_0.1 (P.U.)	P_1.0s (P.U.)	P_3.0s (P.U.)	P_10s (P.U.)	P_50s (P.U.)	Dc (%)	Dmax (%)	Dt (seconds)	Pass(P) or Fail(F)
1	0.07	0.01	0.01	0.01	0.01	0.01	-----	-----	--------	N/A
2	0.07	0.01	0.01	0.01	0.01	0.01	-----	-----	--------	N/A
3	0.07	0.01	0.01	0.01	0.01	0.01	-----	-----	--------	N/A

Remarks



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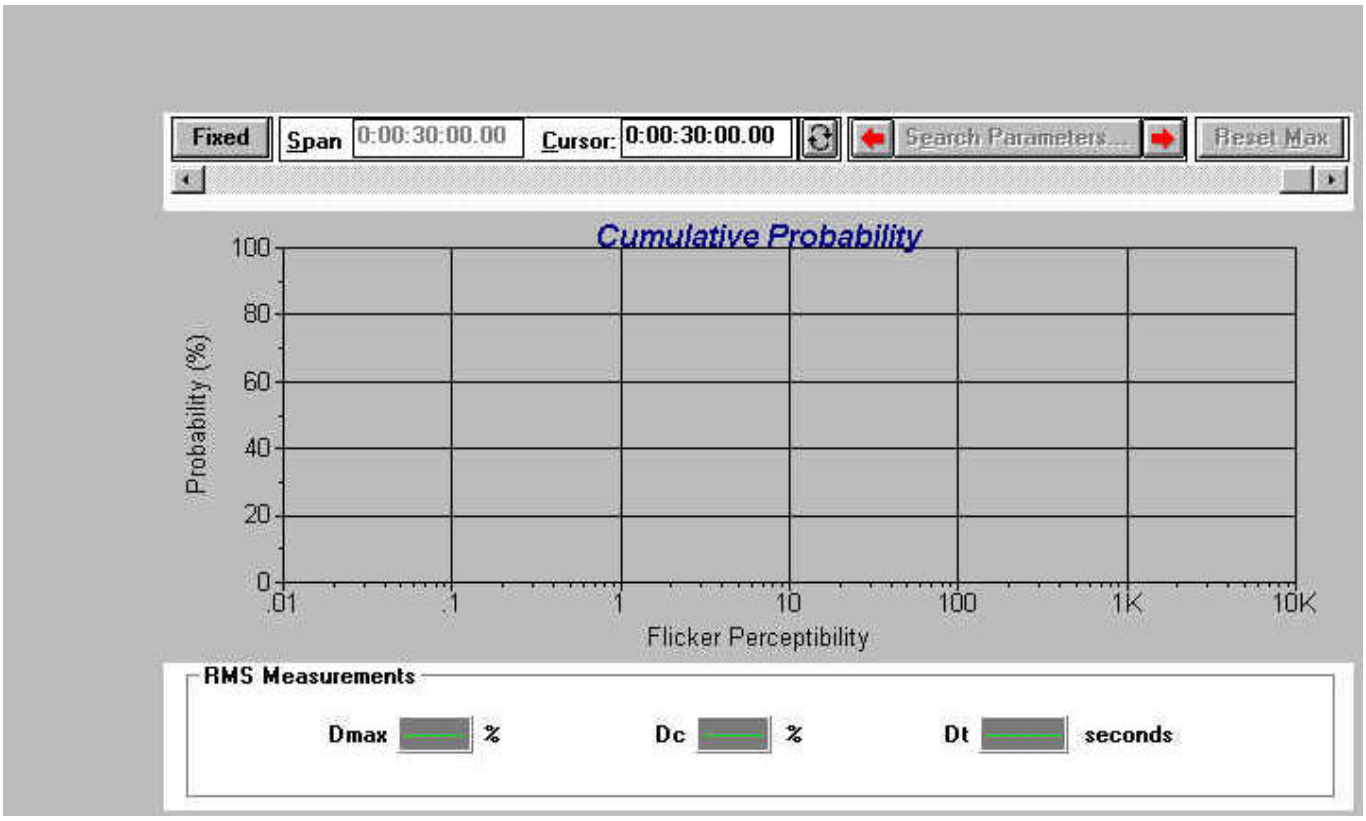


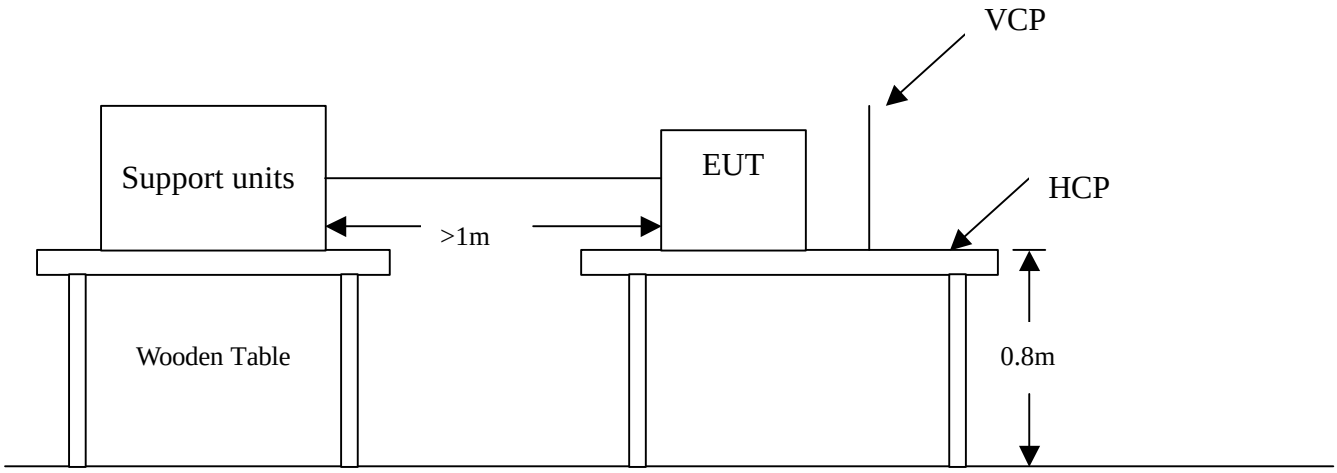
SECTION 3 IEC 61000-4-2 (ELECTROSTATIC DISCHARGE)

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	**:**	Enclosure
Basic Standard	**:**	IEC 61000-4-2
Requirements	**:**	±4kV (Contact Discharge)
		±4kV (Indirect Discharge)
Performance Criteria	**:**	B (Standard require)
Tested by	**:**	Bill Huang
Temperature/Humidity:		15℃ / 42%

Block Diagram of Test Setup:

(The 470 k ohm resistors are installed per standard requirement)



Ground Reference Plane

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Test Procedure:

1. The EUT was located 0.1 m minimum from all side of the HCP.
2. The support units were located 1 m minimum away from the EUT.
3. A communication test program was loaded and executed in Windows mode.
4. PC sent transmit data to remote side via EUT.
5. As per the requirement of EN 55024; applying direct contact discharge at the sides other than front of EUT at minimum 50 discharges (25 positive and 25 negative) if applicable, can't be applied direct contact discharge side of EUT then the indirect discharge shall be applied. One of the test points shall be subjected to at least 50 indirect discharge (contact) to the front edge of horizontal coupling plane.
6. Other parts of EUT where it is not possible to perform contact discharge then selecting appropriate points of EUT for air discharge, a minimum of 10 single air discharges shall be applied.
7. The application of ESD to the contact of open connectors is not required.
8. Putting a mark on EUT to show tested points. The following test condition was followed during the tests.

The electrostatic discharges were applied as follows:

Amount of Discharges	Voltage	Coupling	Result (Pass/Fail)
Mini 25 /Point	±4kV	Contact Discharge	Pass
Mini 25 /Point	±4kV	Indirect Discharge HCP (Front)	Pass
Mini 25 /Point	±4kV	Indirect Discharge VCP (Back)	Pass
Mini 25 /Point	±4kV	Indirect Discharge VCP (Left)	Pass
Mini 25 /Point	±4kV	Indirect Discharge VCP (Right)	Pass
Mini 10 /Point	±8kV	Air Discharge	N/A

Performance & Result:

☑ **Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐ **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☑ ***PASS*** ☐ ***FAILED***

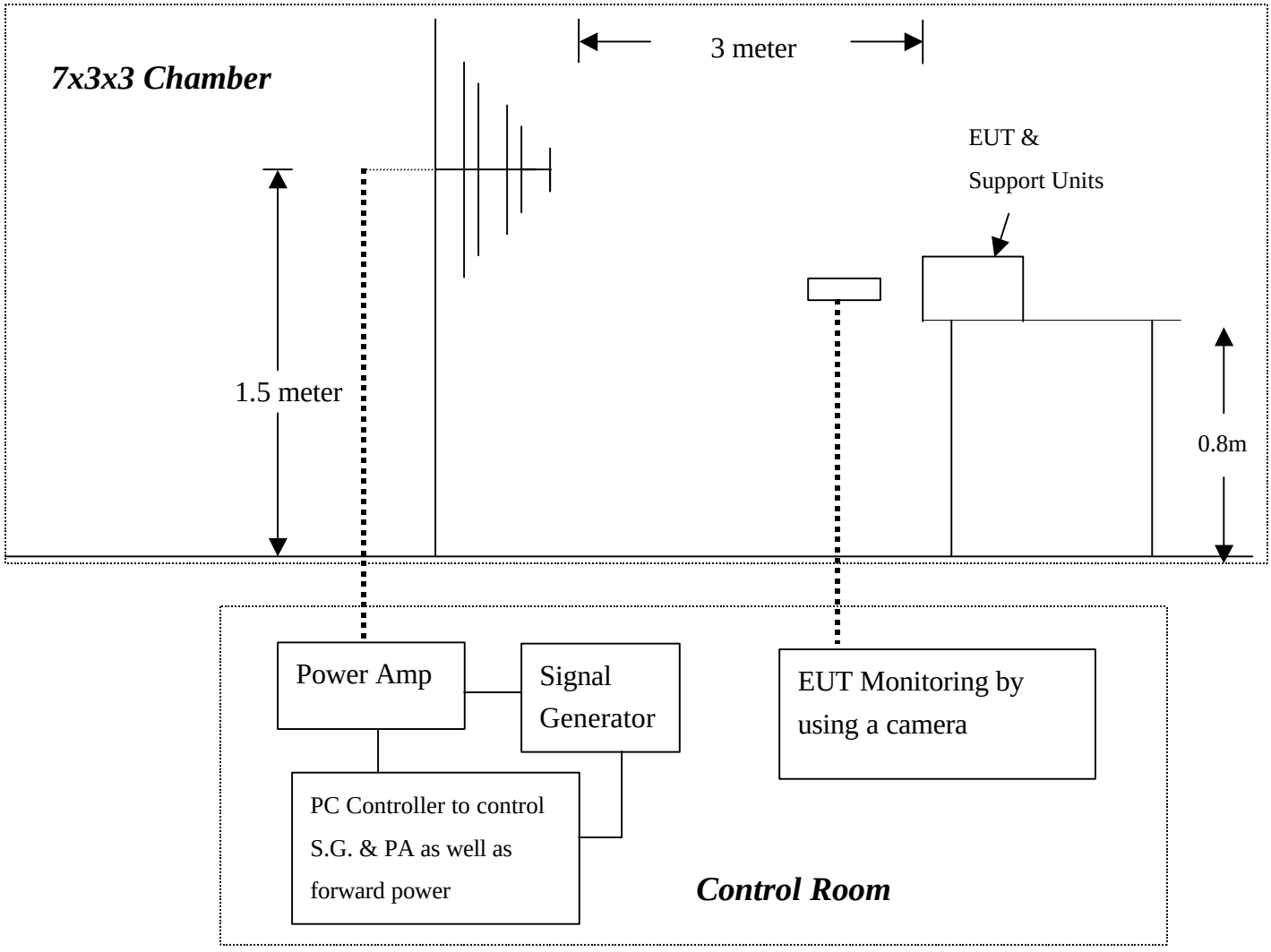
Observation: No any function degraded during the tests.

SECTION 4 IEC 61000-4-3 (RADIATED ELECTROMAGNETIC FIELD)

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	**:**	Enclosure
Basic Standard	**:**	IEC 61000-4-3
Requirements	**:**	3 V/m / with 80% AM. 1kHz Modulation
Performance Criteria	**:**	A (Standard require)
Tester	**:**	Bill Huang
Temperature	**:**	23℃
Humidity	**:**	71%
Note	**:**	The EUT not have acoustic interfaces, the annex A of EN 55024 should not be applied.

Block Diagram of Test Setup:



Test Procedure:

1. The EUT and support units were located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity.
2. Adjusting the cables to be exposed to the electromagnetic filed as possible.
3. Performing a Radiated Emission Scan in range of 30 to 1000 MHz prior to do RS test and records the more higher emission frequencies for the reference of RS test, due to antenna effectiveness.
4. Adjusting the monitoring camera to monitor the "H" message as clear as possible.
5. Setting the testing parameters of RS test software per IEC 61000-4-3.
6. Referring to the tested data of step 3 to performing the RS test from 80 to 1000 MHz.
7. Recording the test result in following table.
8. Changing the EUT to the other side and repeat step 3 to 6, until 4 sides of EUT were verified.

IEC 61000-4-3 Final test conditions:

Test level : 3V/m
Steps : 1 % of fundamental
Dwell Time : 3 sec

Range (MHz)	Field	Modulation	Polarity	Position (°)	Result (Pass/Fail)
80-1000	3V	Yes	H	Front	Pass
80-1000	3V	Yes	V	Front	Pass
80-1000	3V	Yes	H	Right	Pass
80-1000	3V	Yes	V	Right	Pass
80-1000	3V	Yes	H	Back	Pass
80-1000	3V	Yes	V	Back	Pass
80-1000	3V	Yes	H	Left	Pass
80-1000	3V	Yes	V	Left	Pass

Performance & Result:

[V] **Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

[ ] **Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

[ ] **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

[V] ***PASS***	[ ] ***FAILED***
Observation: No any function degraded during the tests.	

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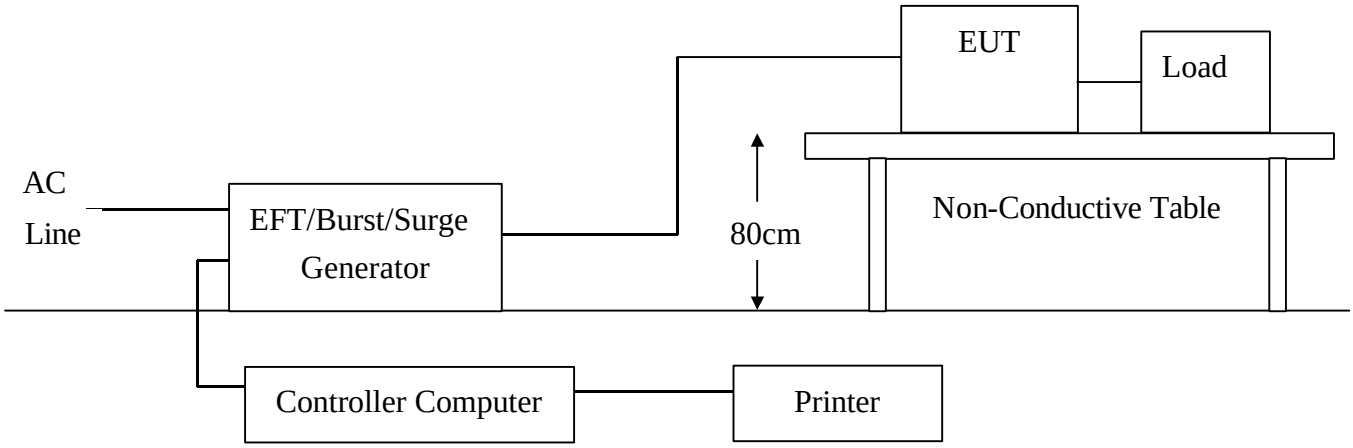
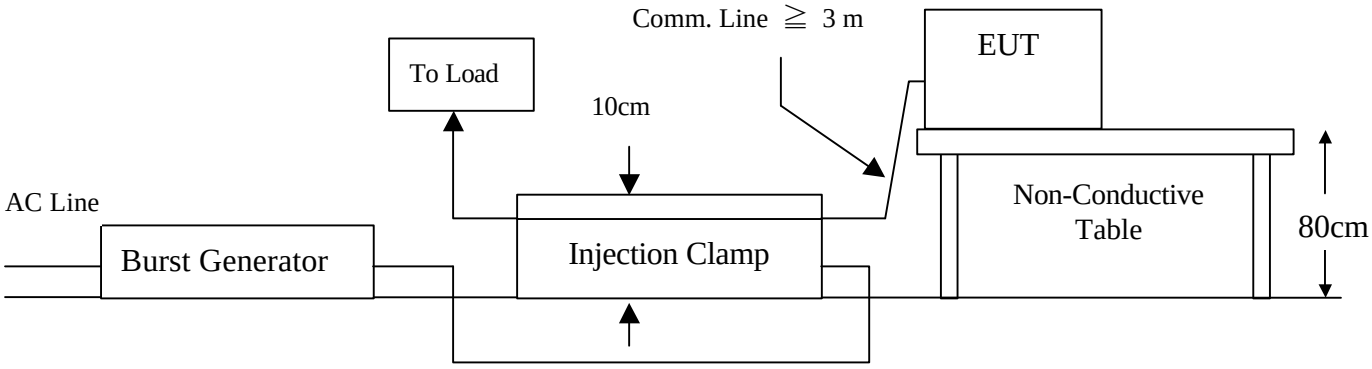
SECTION 5 IEC 61000-4-4 (FAST TRANSIENTS/BURST)

FAST TRANSIENTS/BURST IMMUNITY TEST

Port	**:** On Power Lines and Data Line
Basic Standard	**:** IEC 61000-4-4
Requirements	**:** ±1kV for Power Supply Lines ±0.5kV to Data Line
Performance Criteria	**:** B (Standard require)
Tested by	**:** Bill Huang
Temperature	**:** 21℃
Humidity	**:** 71%

Block Diagram of Test Setup:





Test Procedure:

1. The EUT and support units were located on a wooden table 0.8 m away from ground reference plane.
2. A 1.0 meter long power cord was attached to EUT during the test.
3. The length of communication cable between communication port and clamp was keeping within 1 meter.
4. A test program was loaded and executed in Windows mode.
5. The data was display on the monitor and filling the screens.
6. The test program exercised related support units sequentially.
7. Repeating step 3 to 6 through the test.
8. Recording the test result as shown in following table.

Impulse Frequency: 5kHz
Tr/Th: 5/50ns
Burst Duration: 15ms
Burst Period: 300mS

Inject Line	Voltage kV	Inject Method	Result (Pass/Fail)
L1	±1	Direct	Pass
N	±1	Direct	Pass
PE	±1	Direct	Pass
L1+N	±1	Direct	Pass
L1+PE	±1	Direct	Pass
N+PE	±1	Direct	Pass
L1 + N + PE	±1	Direct	Pass
RJ11	±0.5	Clamp	Pass

Performance & Result:

[V] **Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

[ ] **Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

[ ] **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

[V] ***PASS*** [ ] ***FAILED***

Observation: No any function degraded during the tests.

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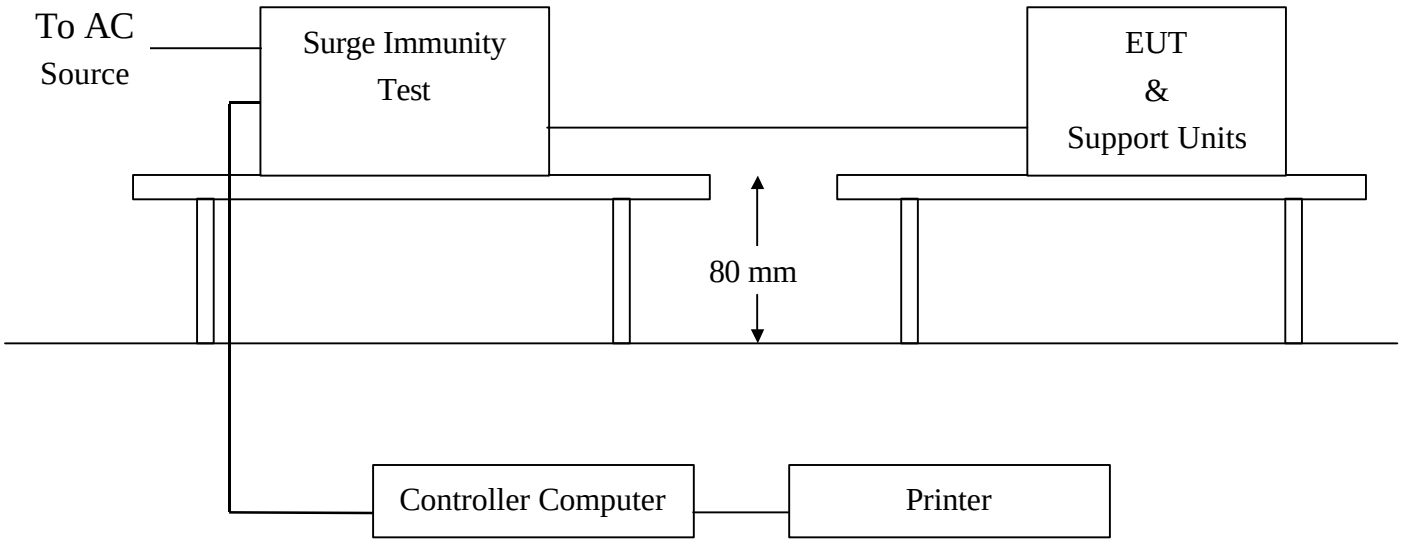
SECTION 6 IEC 61000-4-5 (SURGE IMMUNITY)

SURGE IMMUNITY TEST

Port	**:**	Power Cord
Basic Standard	**:**	IEC 61000-4-5
Requirements	**:**	+/- 1kV (Line to Line of Power Port)
		+/- 2kV (Line to Eatrth of Power Port)
Performance Criteria	**:**	B (Standard require)
Tester	**:**	Bill Huang
Temperature	**:**	21℃
Humidity	**:**	70%

Block Diagram of Test Setup:



Test Procedure:

1. The EUT and support units were located on a wooden table 0.8 m away from ground floor.
2. A test program was loaded and executed in Windows mode.
3. The data was display on the monitor and filling the screens.
4. The test program exercised related support units sequentially.
5. Repeating step 3 to 4 through the test.
6. Recording the test result as shown in following table.

Test conditions:

Voltage Waveform : 1.2/50 us
Current Waveform : 8/20 us
Polarity : Positive/Negative
Phase angle : 0°, 90°, 270°
Number of Test : 5

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Result (Pass/Fail)
L1-L2、 L1-PE、 L2-PE	1	Positive	Capacitive	Pass
L1-L2、 L1-PE、 L2-PE	1	Negative	Capacitive	Pass
L1-PE、L2-PE	2	Positive	Capacitive	Pass
L1-PE、L2-PE	2	Negative	Capacitive	Pass

Performance & Result:

[V] **Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

[ ] **Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

[ ] **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

[V] ***PASS*** [ ] ***FAILED***

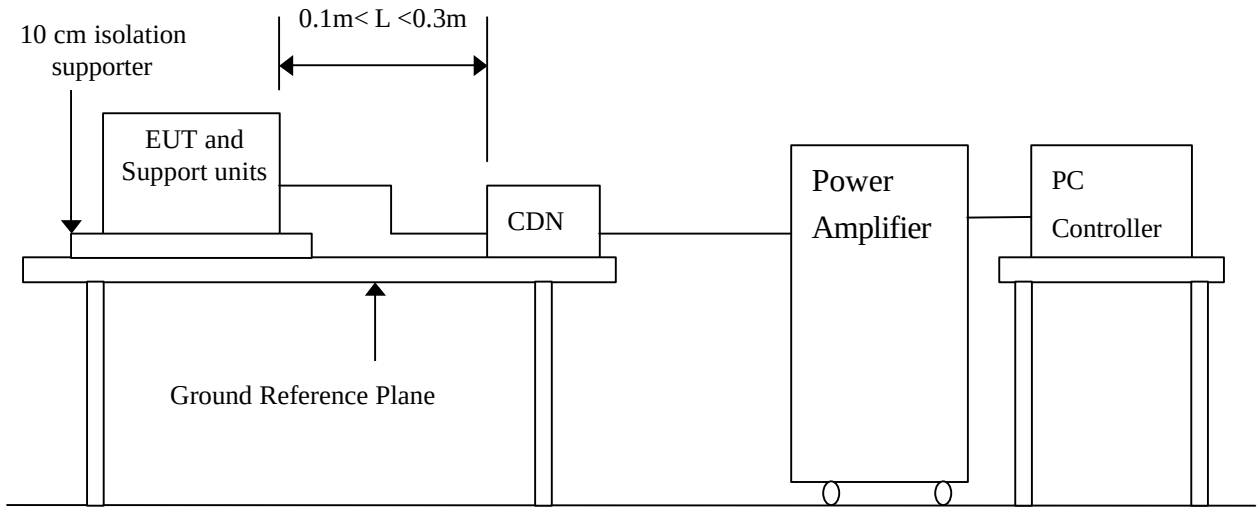
Observation: No any function degraded during the tests.

SECTION 7 IEC 61000-4-6 (CONDUCTED DISTRBANCE/INDUCED BY RADIO-FREQUENCY FIELD)

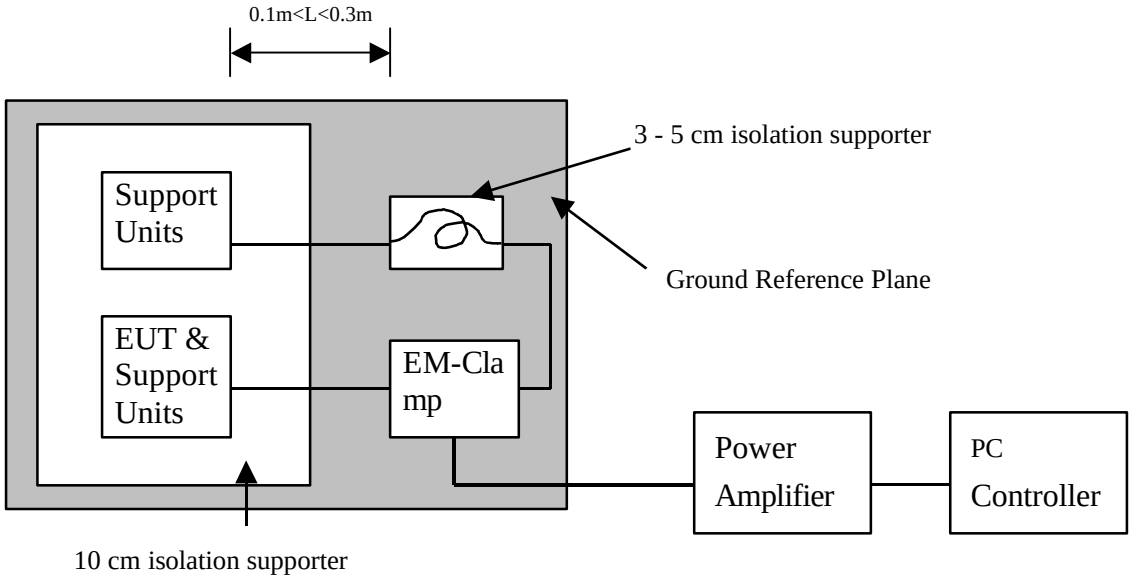
Port	**:** AC Port and Line Cable
Base Standard	**:** IEC 61000-4-6
Requirements	**:** 3 V with 80% AM. Modulation
Injection Method	**:** CDN for Power Cord Bulk Current Injection Probe for Line Cable
Deviation	**:**None
Performance Criteria	**:** A (Standard require)
Tester	**:** Bill Huang
Temperature	**:** 20℃
Humidity	**:** 70%
Note	**:** The EUT not have acoustic interfaces, the annex A of EN 55024 should not be applied.

Block Diagram of Test Setup:

Side view:



Top view:



Test Procedure:

1. The EUT and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.
2. Transmit data messages were displayed on screen of Monitor.
3. Adjusting the monitoring camera to monitor the transmit data message as clear as possible.
4. Setting the testing parameters of CS test software per EN 61000-4-6.
5. Recording the test result in following table.

Test conditions:

Frequency Range : 0.15MHz-80MHz

Frequency Step : 1% of fundamental

Dwell Time : 3 sec

Range (MHz)	Field	Modulation	Result (Pass/Fail)
0.15-80	3V	Yes	Pass

Performance & Result:

☑ **Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐ **Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐ **Criteria C:** Temporary loss of function is allowed, provided the functions self-recoverable or can be restored by the operation of controls.

☑ ***PASS*** ☐ ***FAILED***

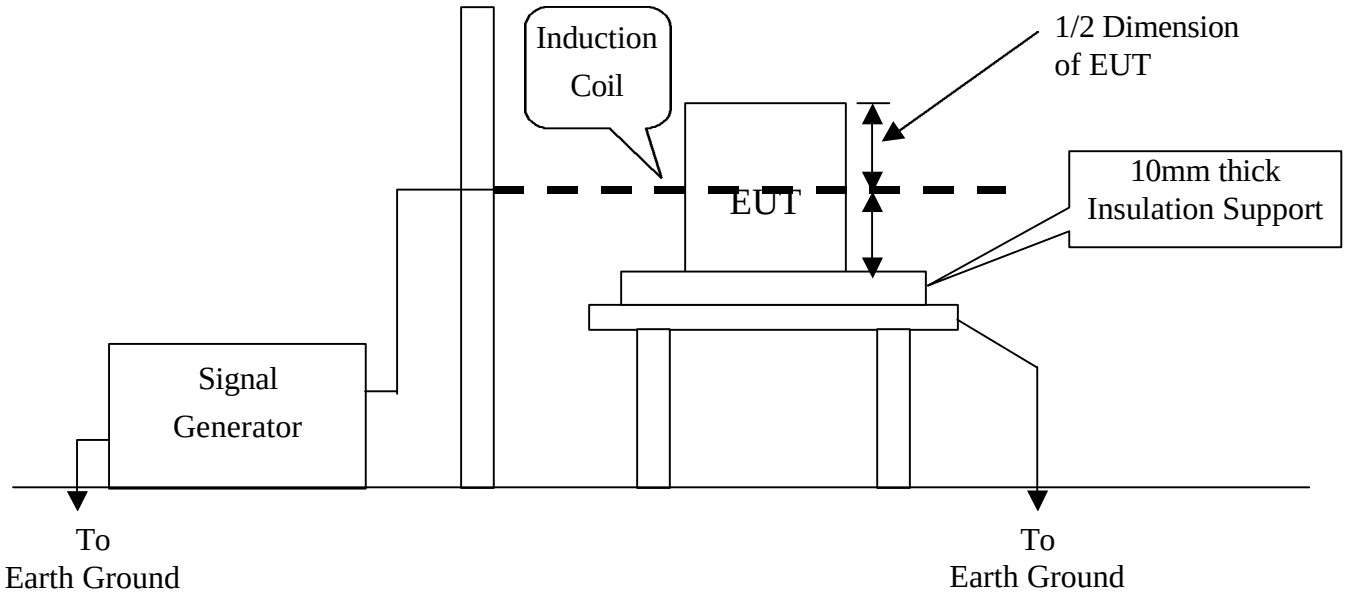
Observation: No any function degraded during the tests.

SECTION 8 IEC 61000-4-8 (POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST)

POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

Port	**:** Enclosure
Basic Standard	**:** IEC 61000-4-8
Requirements	**:** 1 A/m
Performance Criteria	**:** A (Standard Required)
Tester	**:** Bill Huang
Temperature	**:** 20℃
Humidity	**:** 70%

Block Diagram of Test Setup:



Test Procedure:

1. The EUT and support units were located on Ground Reference Plane with the interposition of a 0.1 m thickness insulation support.
2. Putting the induction coil on horizontal direction.(X direction)
3. A test program was loaded and executed in Windows mode.
4. The data was displayed on the screen of Monitor and filling the screen.
5. The test program exercised related support units sequentially.
6. Repeating step 3 to 5 through the test.
7. Recording the test result as shown in following table.
8. Rotating the induction coil by 90^{o} (Y direction) then repeat step 3 to 7.
9. Rotating the induction coil by 90^{o} again (Z direction) then repeat step 3 to 7.

*. Test conditions:
Field Strength: 1A/m
Power Freq.: 50Hz
Orientation: X, Y, Z

Orientation	Field	Result (Pass/Fail)	Remark
X	1A	Pass	No any function degraded during the tests.
Y	1A	Pass	No any function degraded during the tests.
Z	1A	Pass	No any function degraded during the tests.

Performance & Result:

[V] **Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

[ ] **Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

[ ] **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

[V] ***PASS*** [ ] ***FAILED***
Observation: No any function degraded during the tests.

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SECTION 9 IEC 61000-4-11 (VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS)

VOLTAGE DIPS / SHORT INTERRUPTIONS

Port : AC mains

Basic Standard : IEC 61000-4-11 (1994)

Requirement : Phase angles 0, 45, 90, 135, 180, 225, 270, 315 degrees.

Voltage Dips	Test Level % U_T	Reduction (%)	Duration (periods)	Performance Criteria
	<5	>95	0.5	B
	70	30	25	C

Voltage Interceptions	Test Level % U_T	Reduction (%)	Duration (periods)	Performance Criteria
	<5	>95	250	C

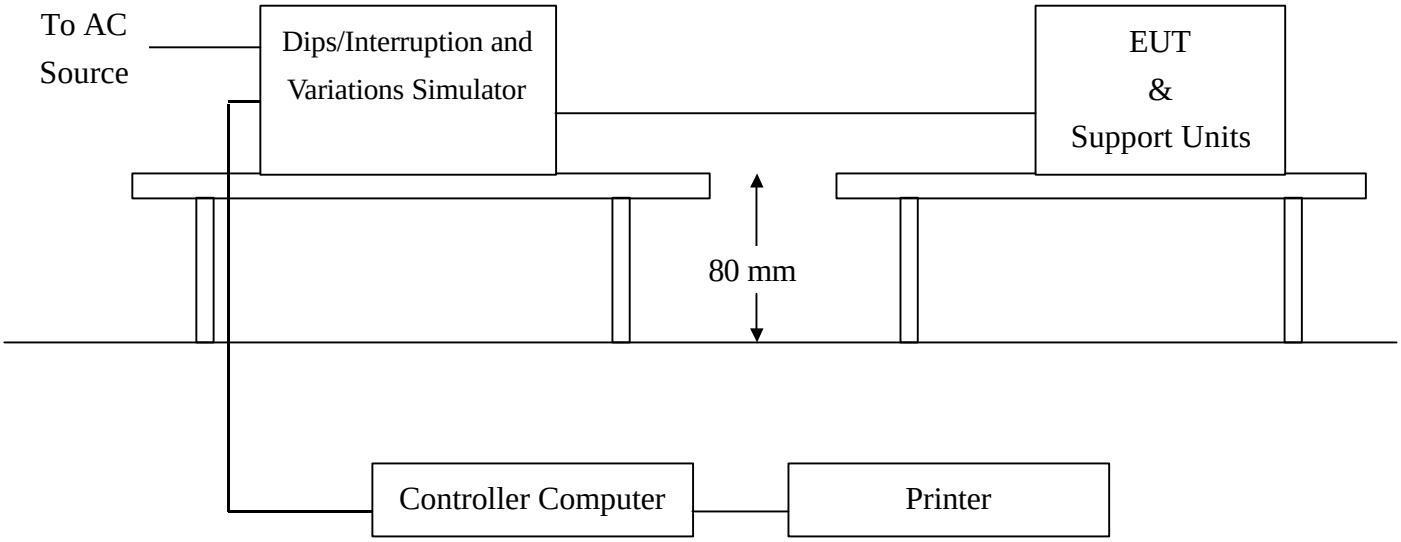
Test Interval : Min. 10 sec.

Tester : Bill Huang

Temperature : 20°C

Humidity : 70%

Block Diagram of Test Setup:



Test Procedure:

1. The EUT and support units were located on a wooden table, 0.8 m away from ground floor.
2. A test program was loaded and executed in Windows mode.
3. The data was displayed on the monitor and filling the screens.
4. The test program exercised related support units sequentially.
5. Setting the parameter of tests and then Perform the test software of test simulator.
6. Conditions changes to occur at 0 degree crossover point of the voltage waveform.
7. Repeating step 3 to 4 through the test.
8. Recording the test result in test record form.

Test conditions:

The duration with a sequence of three dips/interruptions with interval of 10s minimum (between each test events)

Voltage Dips:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
0	100	0.5	Normal	A
70	30	25	Normal	A

Voltage Interruptions:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
0	100	250	EUT shut down, But EUT can be auto recovered after EUT restart.	C

Normal: No any functions degrade during and after the test.

Performance & Result:

Criteria A: The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

[V] ***PASS***	[ ] ***FAILED***

Observation: No any function degraded during the tests.

APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST (EN 55022)

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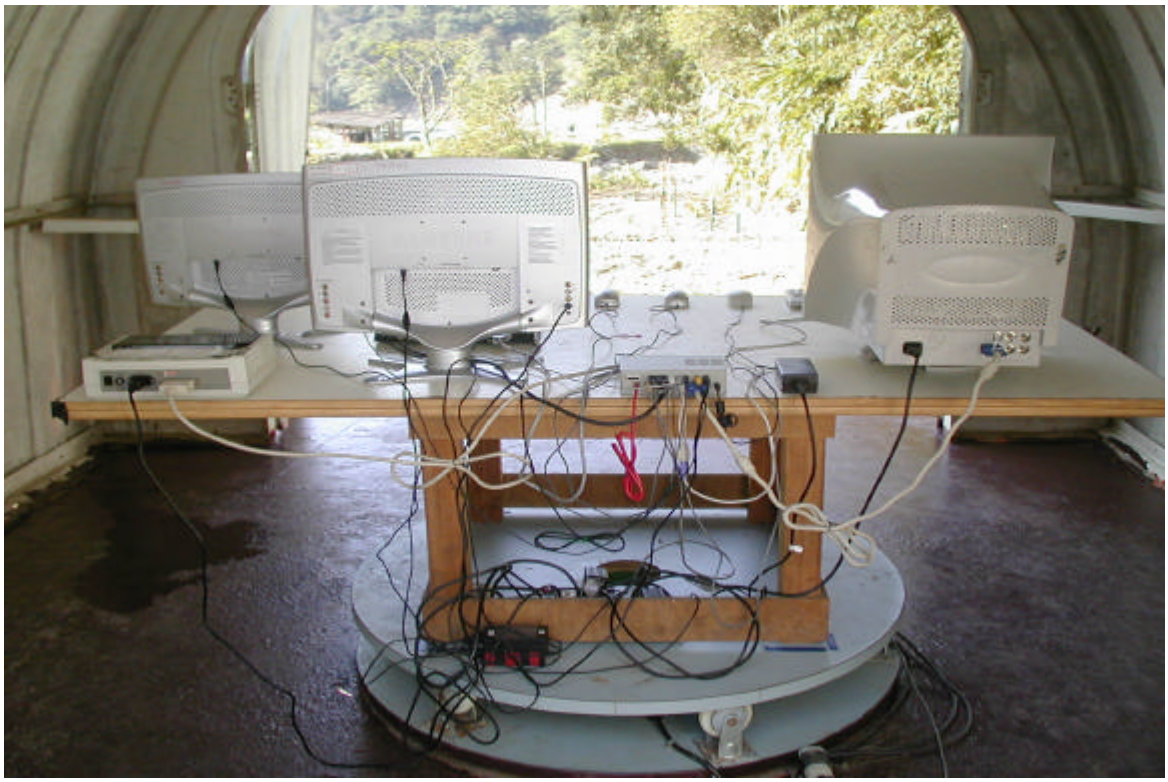
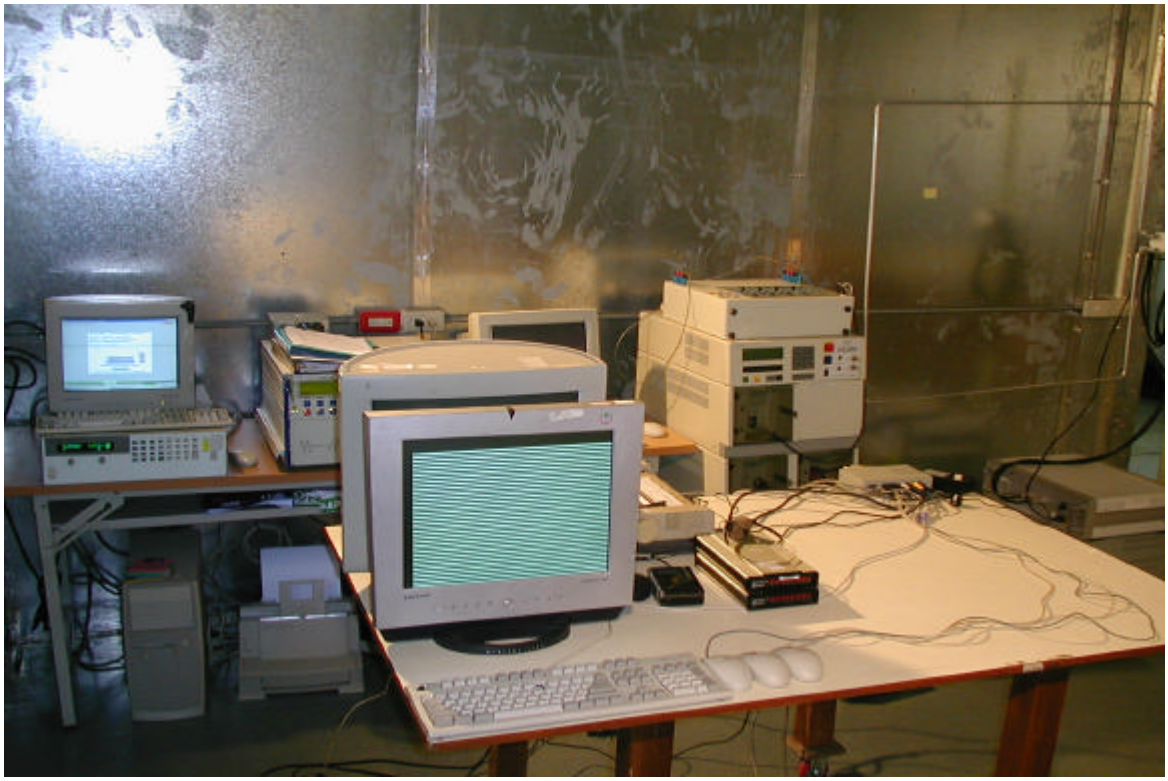
RADIATED EMISSION TEST (EN 55022)



POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST (EN 61000-3-2, EN 61000-3-3)



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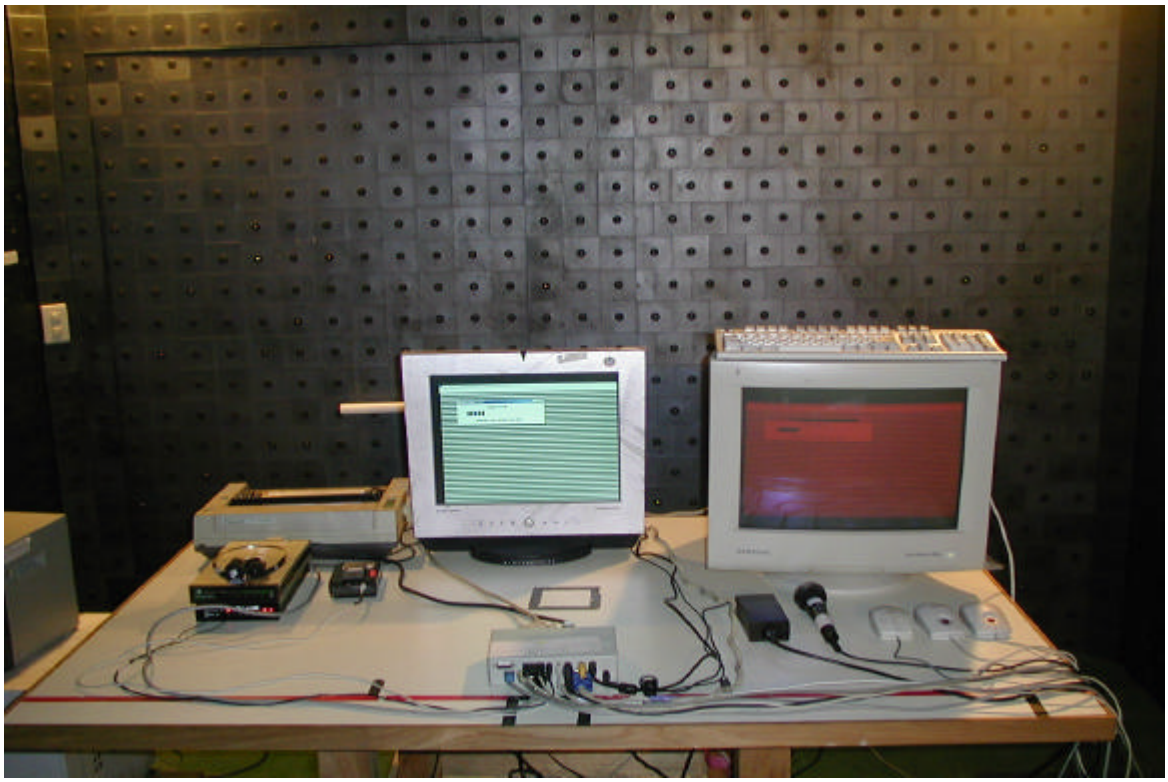
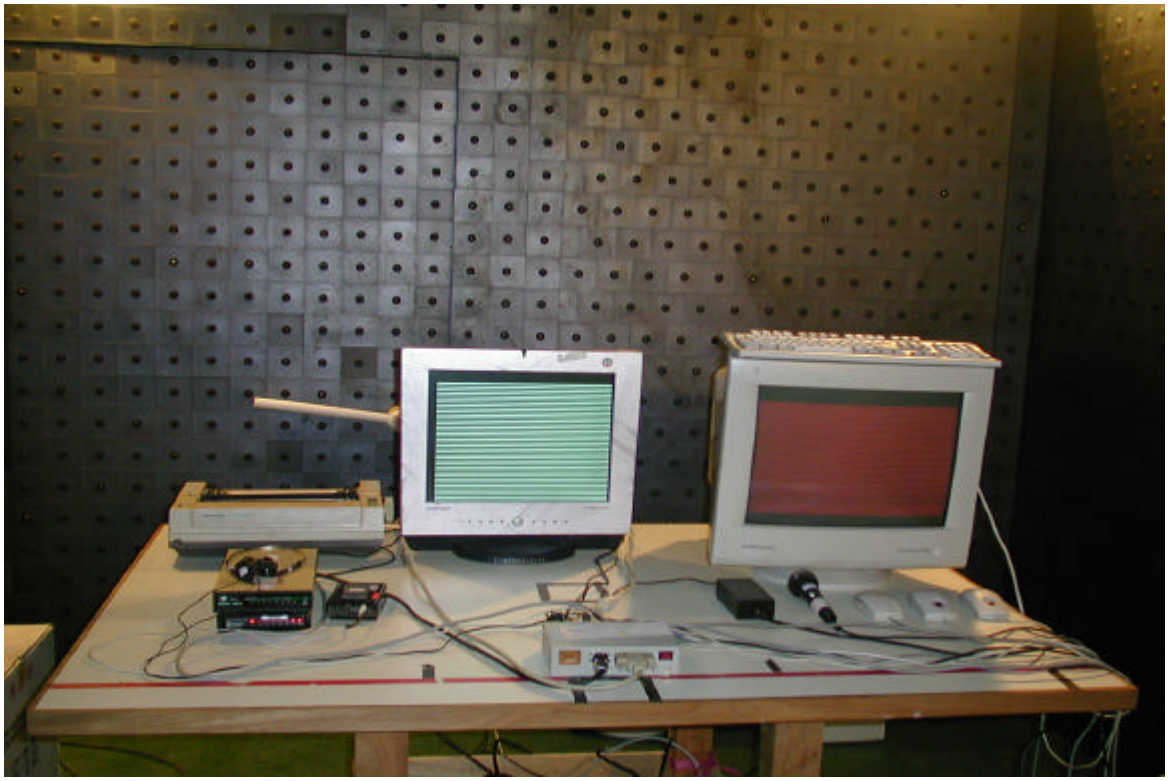
ELECTROSTATIC DISCHARGE TEST (IEC 61000-4-2)

RADIATED ELECTROMAGNETIC FIELD (IEC 61000-4-3)

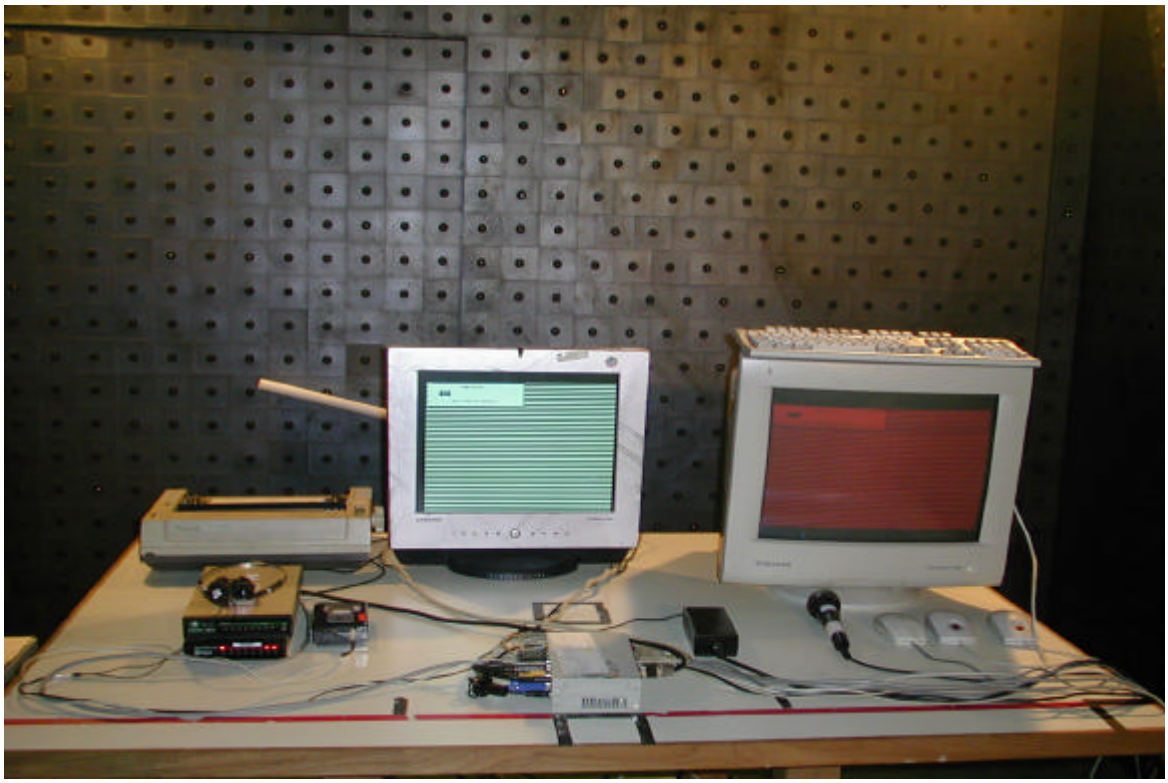
Front View



Back View

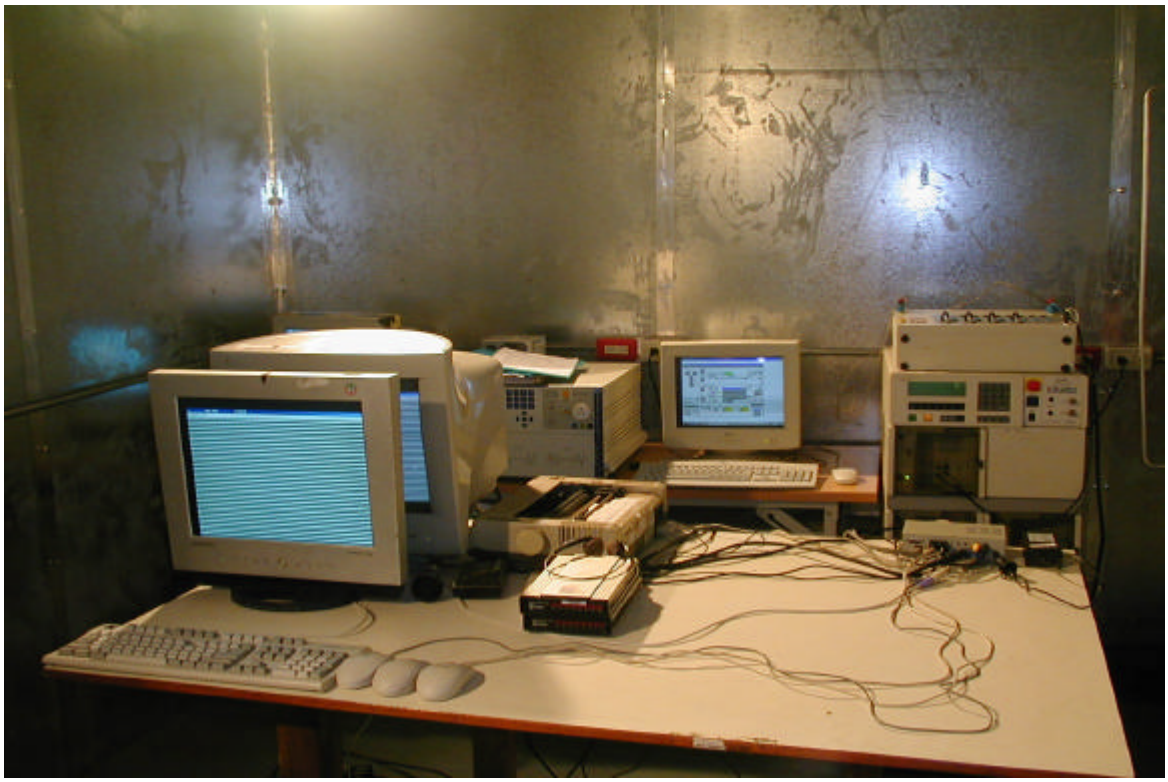


Right View



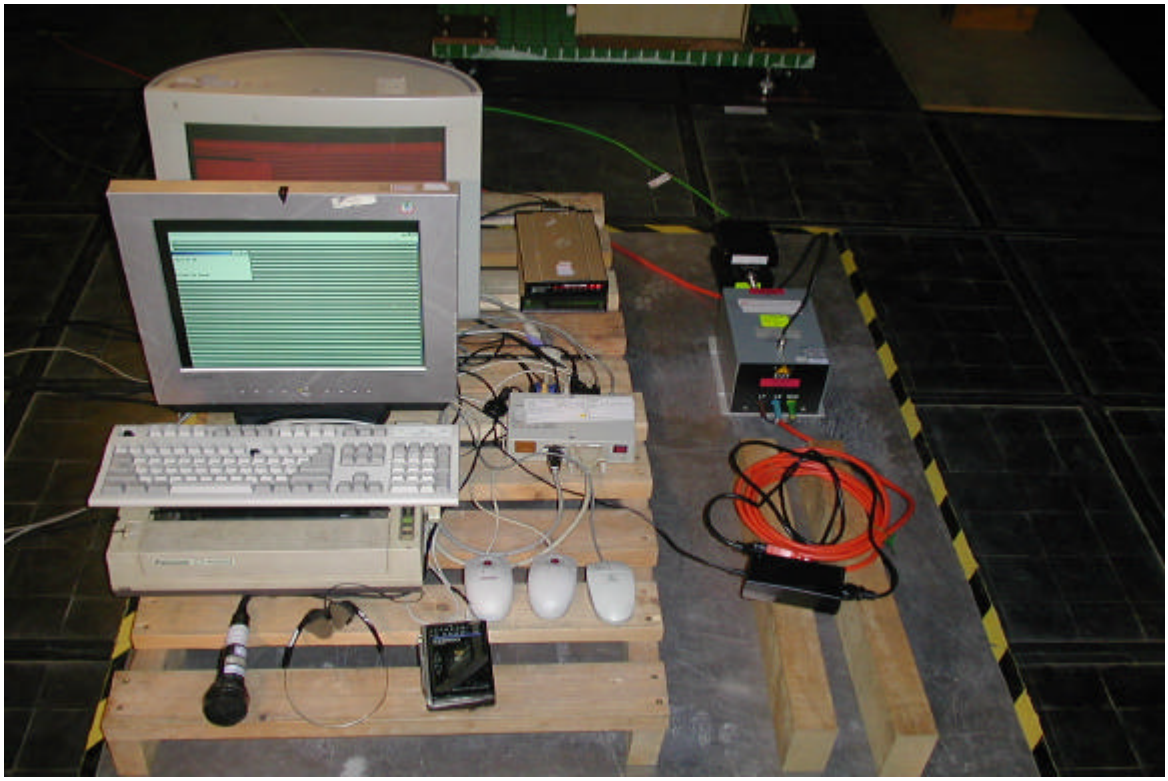
Left View

FAST TRANSIENTS/BURST TEST & SURGE IMMUNITY TEST (IEC 61000-4-4/5 For Power)



FAST TRANSIENTS/BURST TEST(IEC 61000-4-4 For I/O)

CONDUCTED DISTURBANCE, INDUCED BY RADIO-FREQUENCY FIELDS TEST (IEC 61000-4-6 For Power)



(IEC 61000-4-6 For I/O)

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POWER FREQUENCY MAGNETIC FIELD (IEC 61000-4-8)

IEC 61000-4-8 X

IEC 61000-4-8 Y

IEC 61000-4-8 Z

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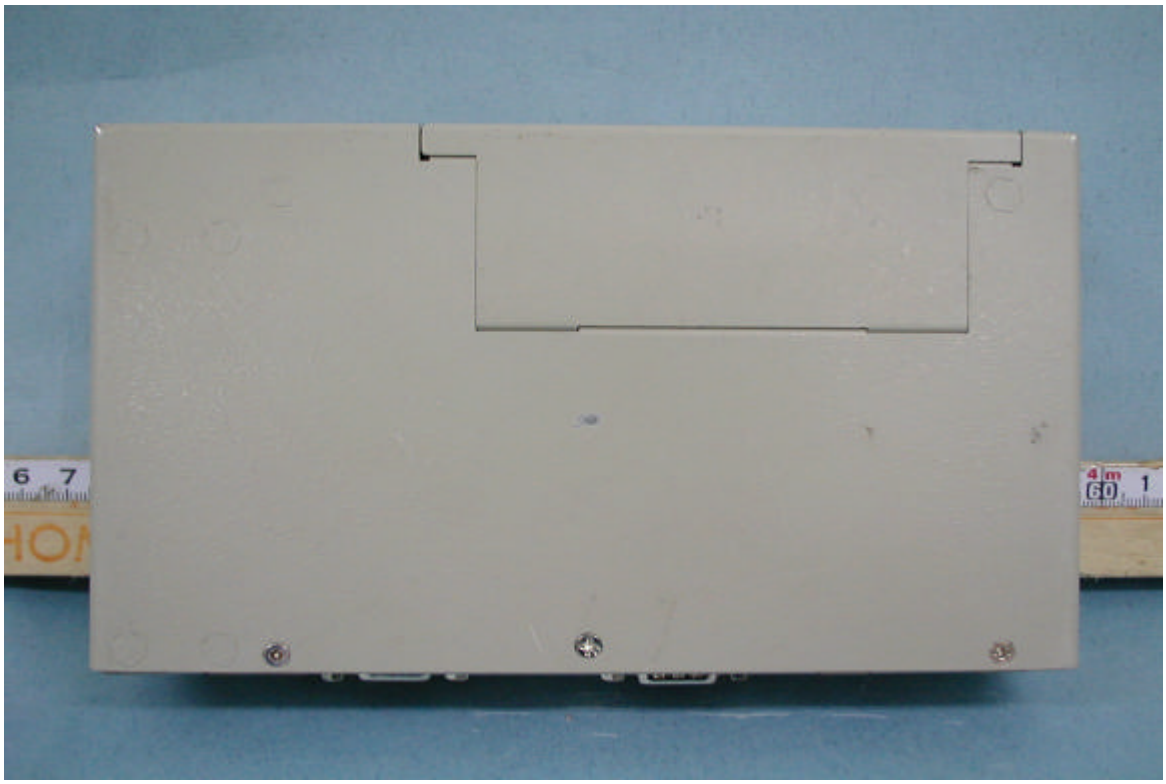
VOLTAGE DIPS / INTERRUPTION TEST (IEC 61000-4-11)

APPENDIX 2

PHOTOGRAPHS OF EUT



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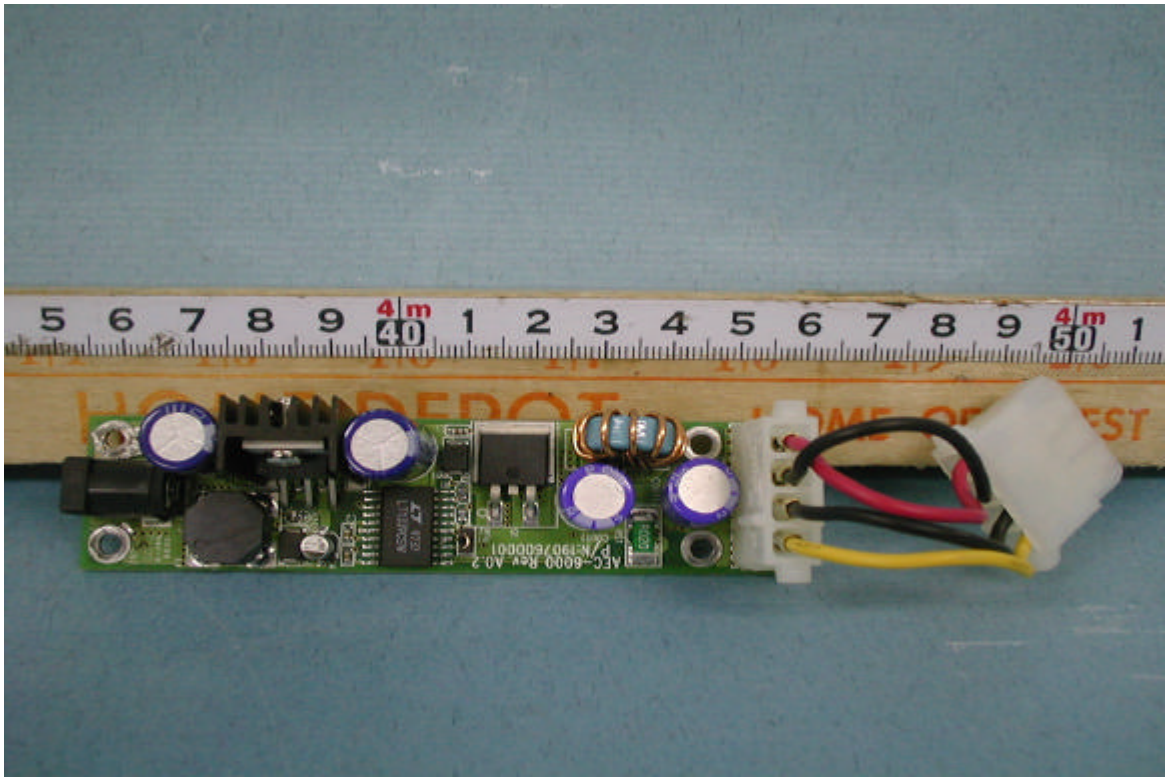

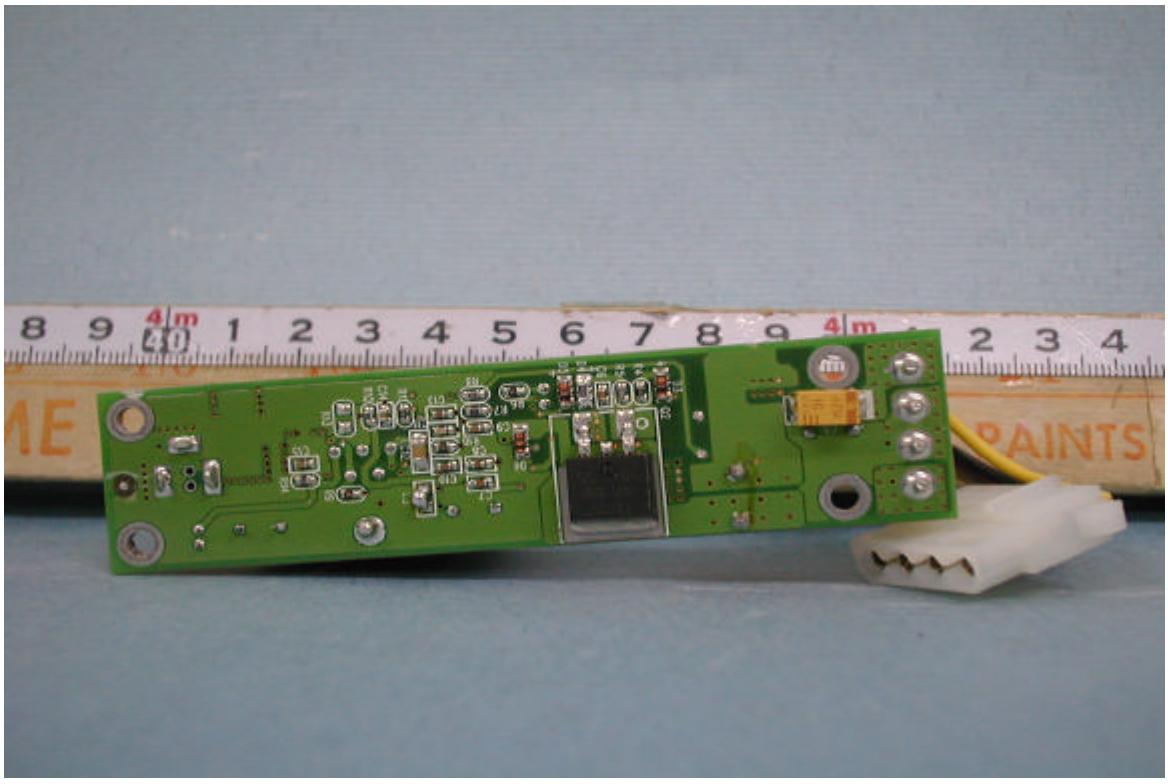

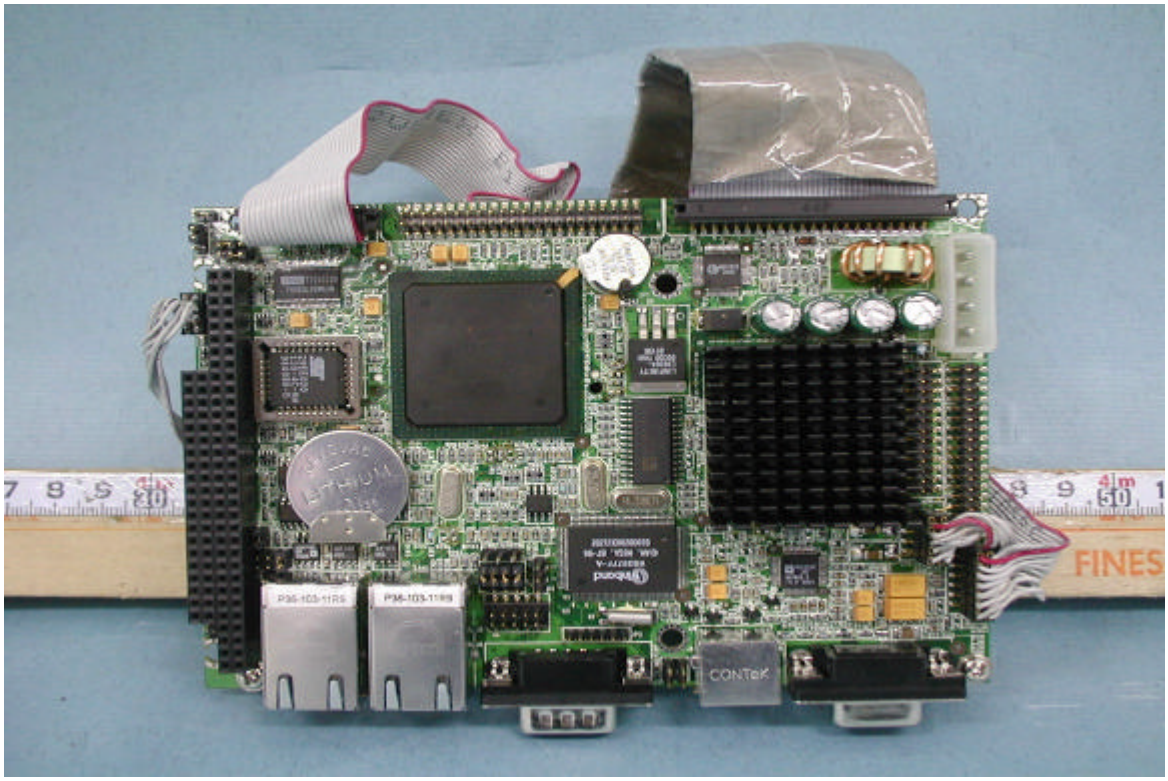

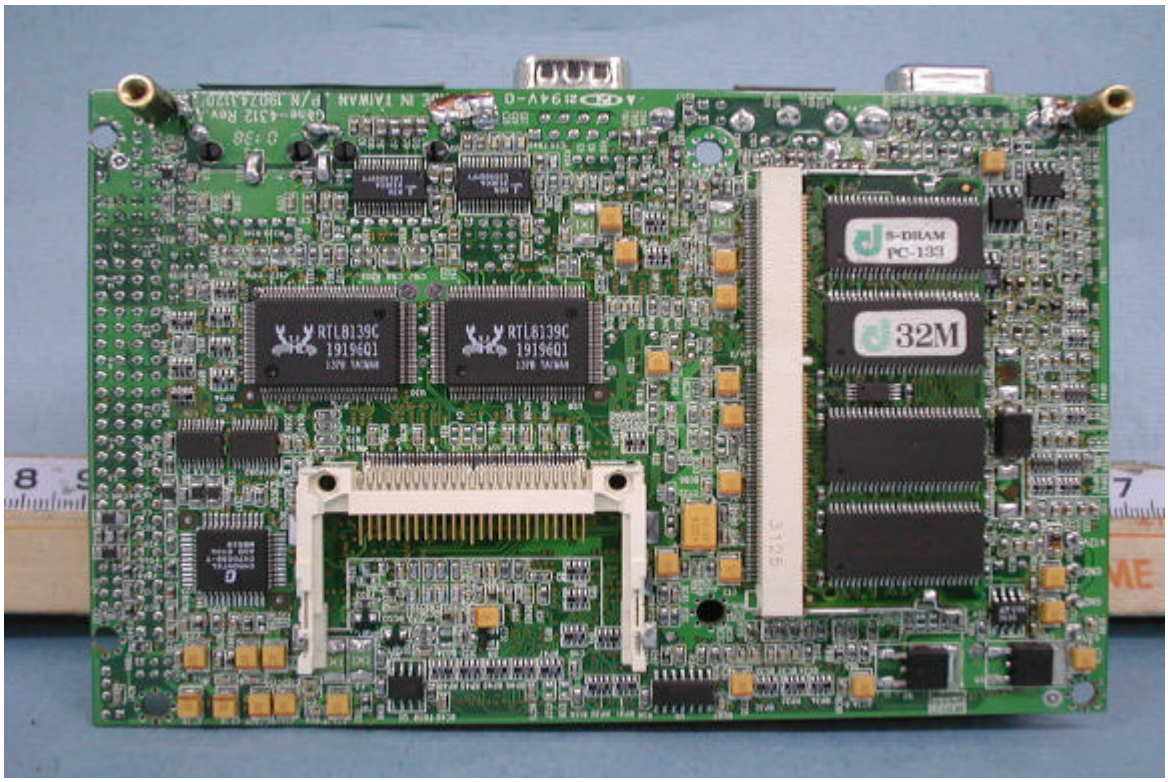

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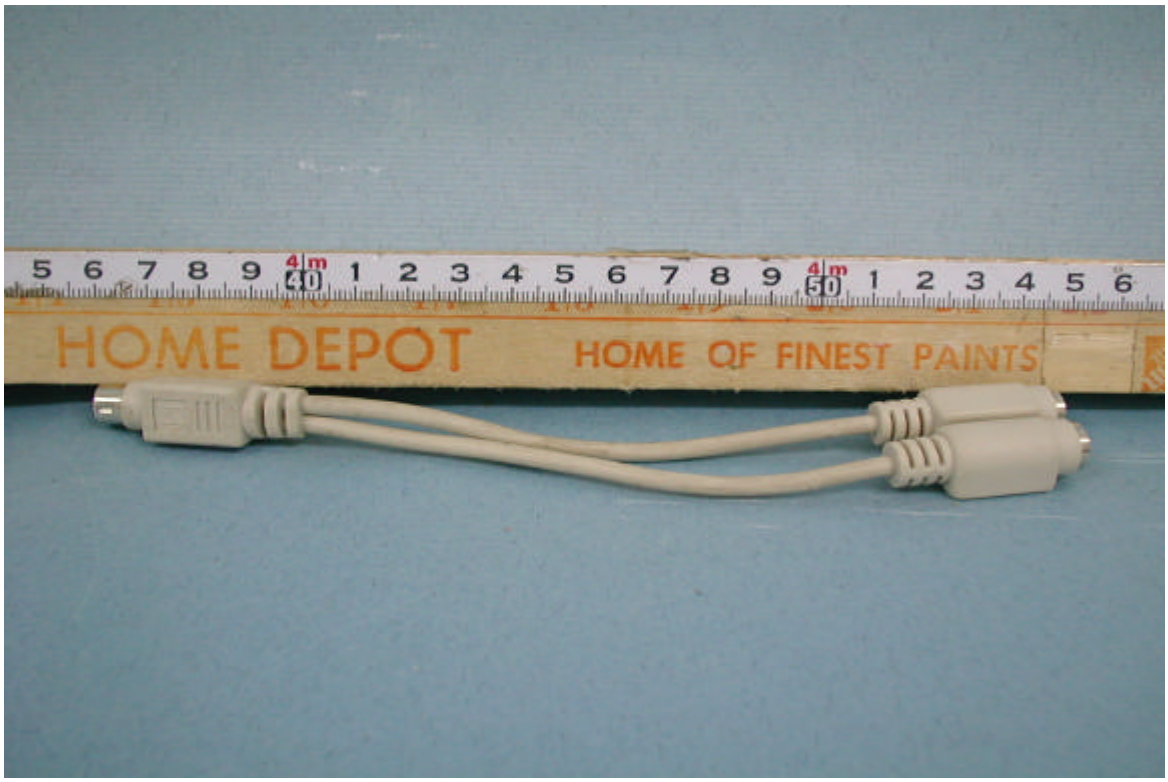

APPENDIX 3

CONDUCTED EMISSION PLOT
RADIATED EMISSION DATA

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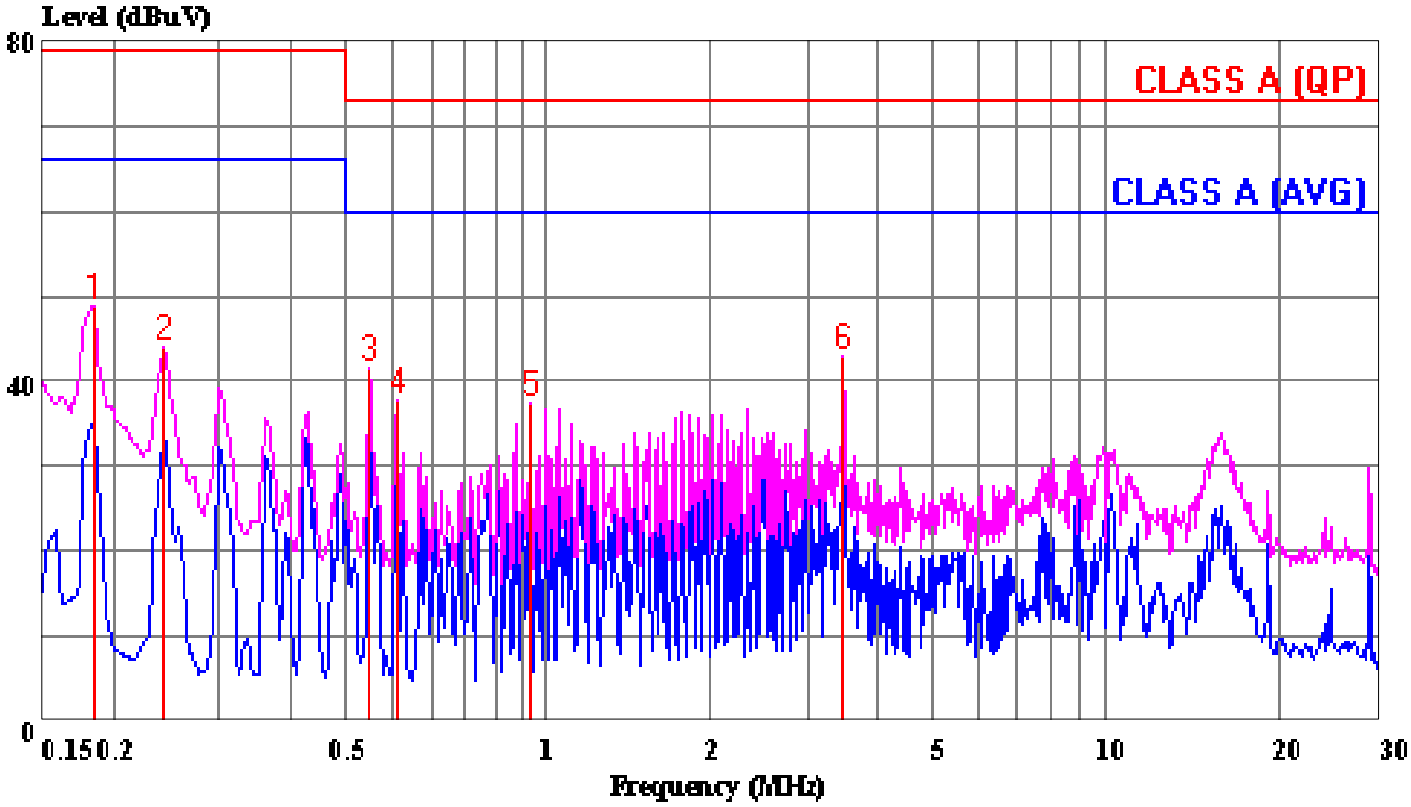
Tel:02-2217-0894 Fax:02-2217-1254

Data#: 130 File#: 9462f.EMI Date: 2002-01-11 Time: 19:18:10



(Compliance D-Site)

Trace: 100 101 Ref Trace:

Condition: LINE
Report No. : 02E9923
Test Engr. : JAMES LIAO
Company   : AAEON Technology, Inc.
EUT   : GENE-4312(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : 1024X768(WORST)

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.183	48.91	0.02	48.93	79.00	-30.07	Peak
2	0.243	43.90	0.02	43.92	79.00	-35.08	Peak
3	0.549	41.63	0.05	41.68	73.00	-31.32	Peak
4	0.611	37.75	0.06	37.81	73.00	-35.19	Peak
5	1.037	37.20	0.08	37.28	73.00	-35.72	Peak
6	3.584	42.58	0.21	42.79	73.00	-30.21	Peak

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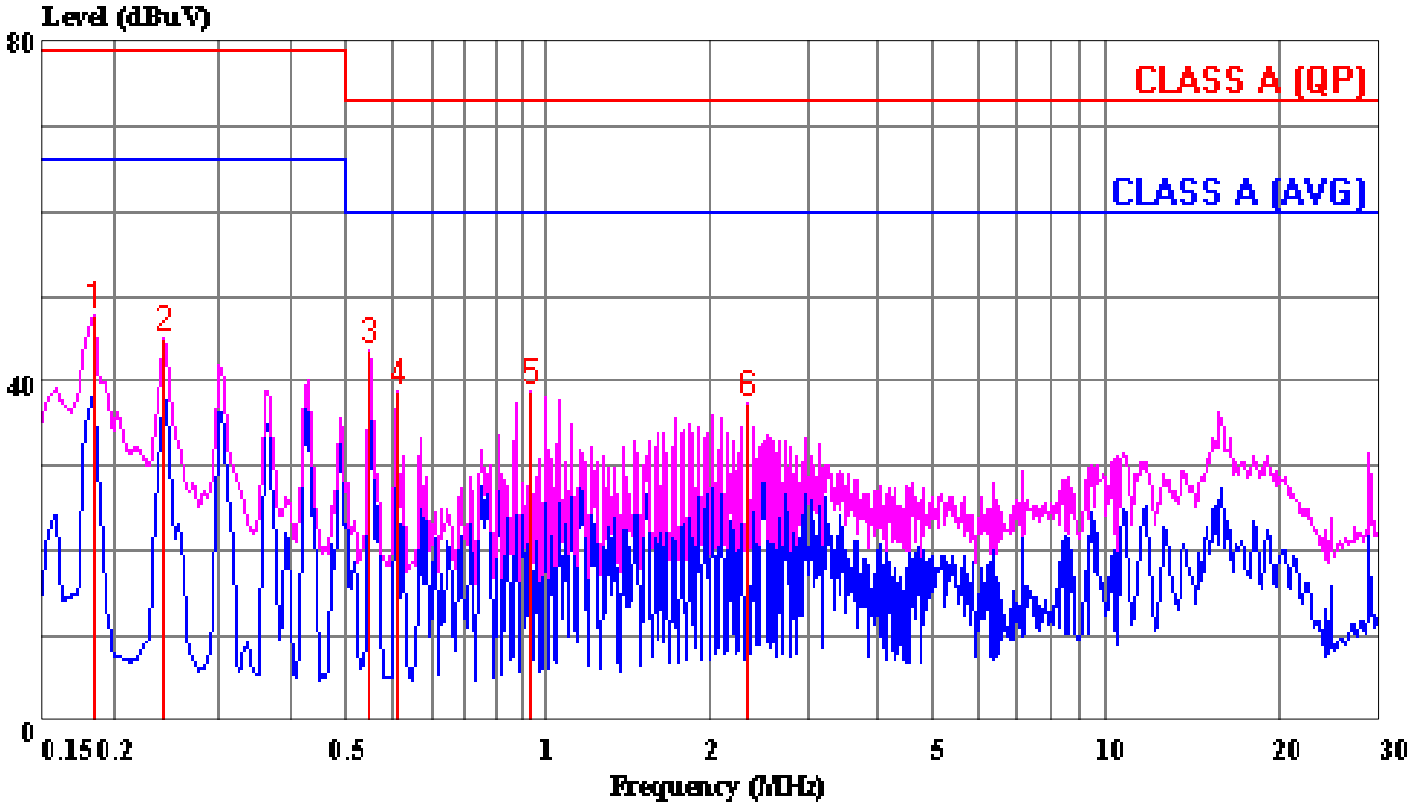
Hsin Tien City, Taipei,
Taiwan, R.O.C.
Tel:02-2217-0894 Fax:02-2217-1254

Data#: 131 File#: 9462f.EMI Date: 2002-01-11 Time: 19:44:03



(Compliance D-Site)

Trace: 124 125 Ref Trace:

Condition: NEUTRAL
Report No. : 02E9923
Test Engr. : JAMES LIAO
Company   : AAEON Technology, Inc.
EUT   : GENE-4312(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : 1024X768(WORST)

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.183	47.67	0.02	47.69	79.00	-31.31	Peak
2	0.243	44.97	0.02	44.99	79.00	-34.01	Peak
3	0.549	43.43	0.05	43.48	73.00	-29.52	Peak
4	0.611	38.67	0.06	38.73	73.00	-34.27	Peak
5	1.037	38.58	0.08	38.66	73.00	-34.34	Peak
6	2.448	37.25	0.15	37.41	73.00	-35.59	Peak

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Taiwan, R.O.C.
Tel:02-2217-0894 Fax:02-2217-1254

Data#: 2 File#: 9462d.emi Date: 2002-01-11 Time: 11:50:29
CCS D-Site

Condition: VERTICAL / 10m
Report No. : 02E9923
Test Engr. : CLIFF LAI
Company : AAEON Technology, Inc.
EUT : GENE-4312(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : 1024X768(WORST)

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	48.044	38.84	-8.15	30.70	40.00	-9.31	Peak
2	65.831	39.68	-8.61	31.07	40.00	-8.93	Peak
3	73.887	42.63	-10.78	31.85	40.00	-8.15	Peak
4	110.600	41.33	-9.16	32.17	40.00	-7.83	Peak
5	134.000	41.10	-6.46	34.64	40.00	-5.36	Peak
6	147.900	42.24	-5.36	36.88	40.00	-3.12	Peak
7	167.000	38.54	-5.62	32.92	40.00	-7.08	Peak
8	177.200	40.29	-6.30	33.99	40.00	-6.01	Peak
9	206.556	37.22	-7.94	29.28	40.00	-10.72	Peak
10	250.667	41.79	-6.20	35.59	47.00	-11.41	Peak
11	300.000	37.01	-4.79	32.22	47.00	-14.78	Peak

COMPLIANCE Engineering Service, Inc.
FCC,VCCI,CISPR,CE
UL,CSA,TUV

No. 199, Chung Sheng Road,
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Tel:02-2217-0894 Fax:02-2217-1254

Data#: 7 File#: 9462d.emi Date: 2002-01-11 Time: 13:48:15
CCS D-Site

Condition: HORIZONTAL / 10m
Report No. : 02E9923
Test Engr. : CLIFF LAI
Company : AAEON Technology, Inc.
EUT : GENE-4312(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN 55022 CLASS A
Mode of Op. : 1024X768(WORST)

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	47.991	34.80	-9.51	25.29	40.00	-14.72	Peak
2	65.749	39.58	-9.86	29.72	40.00	-10.29	Peak
3	73.711	41.10	-11.99	29.11	40.00	-10.89	Peak
4	110.578	43.21	-10.21	33.00	40.00	-7.00	Peak
5	133.929	43.57	-8.19	35.38	40.00	-4.62	Peak
6	147.371	44.83	-7.24	37.59	40.00	-2.41	Peak
7	167.407	36.84	-7.46	29.38	40.00	-10.62	Peak
8	177.007	39.38	-8.20	31.18	40.00	-8.82	Peak
9	205.693	37.65	-9.76	27.89	40.00	-12.11	Peak
10	250.547	39.88	-6.63	33.25	47.00	-13.75	Peak
11	300.022	42.02	-4.91	37.11	47.00	-9.89	Peak