CE

EMC COMPLIANCE TEST REPORT

FOR

CPU BOARD

MODEL: PCM-6898 (N)

REPORT NUMBER: 01E9672

ISSUE DATE: August 30, 2001

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
HSIN TIEN CITY, TAIPEI, TAIWAN R.O.C.
TEL: (02) 2217-0894
FAX: (02) 2217-1254

NVLAP®

LAB CODE: SL2-IN-E-0005

COMPLIANCE
Engineering Services, Inc.
FCC, VCCI, CISPR, CE
UL, CSA, TÜV, VDE
U.S.A. : P.O.BOX 612650, SAN JOSE, CA 95161-2650
TAIPEI : P.O.BOX 17-82, HSIN TIEN, TAIWAN, R.O.C.

中華民國經濟部標準檢驗局
臺北市濟南路一段四號
BUREAU OF STANDARDS, METROLOGY AND INSPECTION
MINISTRY OF ECONOMIC AFFAIRS, REPUBLIC OF CHINA
4, SEC. 1, CHINAN ROAD, TAIPEI, TAIWAN, R. O. C.
Tel: 886-2-23431700 FAX: 886-2-23912324

To: Compliance Engineering Services, INC.

No.199 Chung Sheng Road, Hsin Tien City,
Taipei Hsien, Taiwan, R.O.C.

IN REPLY REFER TO
89-3-3000061

This Designation Document confirms that your subject measurement facility has been validated according to the **ISO/IEC Guide 25-1990** and found to be in compliance with the requirements of "Operation Guidelines of the Approval and Management of Designated EMC Laboratories."

The description of your facility has, therefore, been placed on file and the name of your organization added to the Bureau's list of facilities whose measurement data and test reports will be accepted as a basis for attesting conformity to CNS13438-1997 / CISPR22-1993, CNS13783-1-1996/ CISPR14 - 1993, CNS13439-1997 / CISPR13-1990 for Information Technology Equipment、household appliances / tools、broadcast receivers and related equipments.

It is located at: **http://www.bsmi.gov.tw**

Please reference the file numbers below in the body of all test reports containing measurements made on the corresponding facility.

For your **EMI Testing Lab**, use reference " **SL2-IN-E-0005, SL2-R1-E-0005, SL2-R2-E-0005, SL2-A1-E-0005**"

Note that this filing must be updated for any changes made to the documentation and / or facility and whenever major modifications to your documentation or major construction or repairs to your facility are completed, re-submission of the related information or the site attenuation characteristics will be required within 2 weeks.

The Designation is valid through January 10, 2003.

Taipei, February 3, 2000
For BSMI, MOEA

Chen Tso-Chen
Director General

CE

EC-Declaration of Conformity

For the following equipment:

CPU BOARD

(Product Name)

PCM-6898 (N)

(Model Designation / Trade name)

N/A

(Manufacturer Name)

AAEON Technology Inc.

(Manufacturer Address)

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

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: 1998
- [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 61000-4-11: 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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COMPLIANCE ENGINEERING SERVICES, INC. DOCUMENT NO:CCSTP4003C
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

VERIFICATION OF COMPLIANCE

Equipment Under Test:	CPU BOARD
Trade Name:	N/A
Model Number:	PCM-6898 (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: 1998 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 61000-4-11: 1994)
File Number:	01E9672
Date of test:	August 6 ~ August 22, 2001
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

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GENERAL INFORMATION

Applicant:	**AAEON Technology Inc.** 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R. O. C.
Contact Person:	Jack Chao / Deputy Director
Manufacturer:	**AAEON Technology Inc.** 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R. O. C.
File Number:	01E9672
Date of Test:	August 6 ~ August 22, 2001
Equipment Under Test:	CPU BOARD
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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. Run ReadWrite.Exe to Link EUT and Notebook PC.
4. Data Through the EUT and Transmit Between PC Systems and Notebook PC Via RJ45 Cable.

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PRODUCT INFORMATION

Housing Type:	METAL
EUT Power Rating:	Input: AC 100 ~ 127V/5A/60Hz; 200 ~ 240V/2.5A/50Hz Output: DC +3.3V: 25A, +5V: 12A, +12V: 5A, -5V: 0.2A, -12V: 1A, +5Vsb: 2A
AC power during Test:	AC 230, 50Hz
Power Supply Manufacturer:	CEMACS
Power Supply Model Number:	ENP-181
AC Power Cord Type:	Unshielded, 1.8m (Detachable)
OSC/Clock Frequencies：	X1 = 14.318 MHz, X3 = 24.576 MHz, X4 = 14.318 MHz, Y2 = 25 MHz

I/O Port of EUT:

I/O PORT TYPES	Q'TY	TESTED WITH
1). USB Port	2	2
2). PS/2 Port	2	2
3). RJ45 Port	1	1
4). DB9 Port	2	2
5). DB15 Port	2	2
6). DB25 Port	1	1
7). Phone Jack	3	3
8). RCA	1	1

Note: N/A

SUPPORT EQUIPMENT

Host Computer:

Equipment	Model#	Serial#	Trade Name
HDD	72700AP	N/A	Maxtor
RAM (SDRAM 64MB)	NT56V6620C0T-75S	N/A	NANYA
CPU	P-III 800MHz	N/A	INTEL
Chassis	ARC-6100	N/A	N/A
Power Supply	ENP-181	N/A	CEMACS

External Peripheral Devices:

No	Equipment	Model #	Serial #	FCC ID	Trade Name	Data Cable	Power Cord
1.	Keyboard	6311-TW4C/6	N/A	DoC	ACER	Un-Shielded, 1.8m	N/A
2.	Mouse	M-BB48	LZE93851294	DoC	Logitech	Un-Shielded, 1.8m	N/A
3.	Mouse	M-S34	LZE02353706	DZL211029	Logitech	Un-Shielded, 1.8m	N/A
4.	Mouse	M-BB46	N/A	DoC	Logitech	Un-Shielded, 1.8m	N/A
5.	Player	RQ-L317	N/A	N/A	Panasonic	Un-Shielded, 0.8m	N/A
6.	EAR. & MIC.	MSB-206	N/A	N/A	E.SENSE	Un-Shielded, 2.2m	N/A
7.	Joystick	SIDEWINDER PRECISION PRO	N/A	N/A	Microsoft	Un-Shielded, 2.2m	N/A
8.	Server PC	Valiant 6380iPID	SPL052980024	DoC	KDS	Un-Shielded, 30m (RJ45)	Unshielded, 1.8m
9.	Monitor	RN15AS	N/A	DoC	SAMSUNG	Un-Shielded, 1m	Unshielded, 1.8m A Ferrite Core
10.	Monitor	SYNCMASTER959NF	N/A	DoC	SAMSUNG	Shielded, 1.8m Two Ferrite Core	Unshielded, 1.8m
11.	Modem	1414	N/A	IFAXDM1414	ACEEX	Shielded, 1.4m	Unshielded, 1.8m
12.	Modem	231AA	A25331083841	BFJ9D9308US	HAYES	Shielded, 1m	Unshielded, 1.8m
13.	Printer	2225C+	2927S50444	DSI6XU2225	HP	Shielded, 1.8m	Unshielded, 1.8m

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.

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**	**11/05/00**	**11/05/01**
EMI TEST RF UNIT	**R&S**	**ESBI-RF/1005.4300.52**	**827832/003**	**11/05/00**	**11/05/01**
AMPLIFIER	**HP**	**8447D A**	**2727A05764**	**05/07/01**	**05/07/02**
ANTENNA	**SCHWARZBECK**	**VULB 9160**	**3104**	**05/17/01**	**05/17/02**
CABLE	**TIME MICROWAVE**	**LMR-400**	**N-TYPE02**	**07/09/01**	**07/09/02**

☐ **Open Area Test Site:** # E

Equipment	Manuf.	Model No.	Serial No.	Cal Date	Due Date
SPECTRUM ANALYZER	**H.P.**	**8566B**	**2937A06102**	**06/06/01**	**06/06/02**
SPECTRUM DISPLAY	**H.P.**	**85662A**	**2848A18276**	**06/06/01**	**06/06/02**
QUASI-PEAK DETECTOR	**H.P.**	**85650A**	**2811A01439**	**06/07/01**	**06/07/02**
AMPLIFIER	**H.P.**	**8447D B**	**1644A02328**	**05/07/01**	**05/07/02**
ANTENNA	**EMCO**	**3142**	**1310**	**06/30/01**	**06/30/02**
CABLE	**TIME MICROWAVE**	**LMR-400**	**N-TYPE04**	**07/09/01**	**07/09/02**

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☒ **Conducted Area Test Site:** # E

Equipment	Manuf.	Model No.	Serial No.	Cal Date	Due Date
TEST RECEIVER	**R&S**	**ESHS20**	**840455/006**	**03/15/01**	**03/15/02**
LISN	**EMCO**	**3825/2**	**1842**	**01/10/01**	**01/10/02**
LISN(EUT)	**EMCO**	**3825/2**	**1435**	**01/10/01**	**01/10/02**
ISN	**FISHER CUSTOM**	**FCC-TLISN-T4**	**20065**	**04/23/01**	**04/23/02**

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.

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	06/15/2002

For ESD test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
EMV SYSTEM / ESD Generator	SESD 2000	812006	12/07/2000	12/07/2001

For Radiated Electromagnetic Field immunity Measurement:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
R&S / Signal Generator	SMY 02	DE13751	01/11/2001	01/11/2002
IFI / "E" Field sensor/ Light Modulator Transmitter	EFS-5	A066	07/02/2001	07/02/2002
IFI / Combination Amplifier	SMX100	2067-1196	06/28/2001	06/28/2002
IFI / Leveling Pre-Amplifier	LPA-5B	714-0695	05/01/2001	05/01/2002
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	10/30/2000	10/30/2001
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	10/30/2000	10/30/2001
Telecom Lines Coupler DECOUPLER KeyTek Instruments	CM-TELCD	0104399	05/01/2001	05/01/2002
I/O Signal Line DECOUPLER KeyTek Instruments	CM-I/OCD	0103234	05/01/2001	05/01/2002

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For CS test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
R&S / Signal Generator	SMY 02	DE13751	01/11/2001	01/11/2002
IFI / Combination Amplifier	SMX100	2067-1196	06/28/2001	06/28/2002
IFI / Leveling Pre-Amplifier	LPA-5B	714-0695	05/01/2001	05/01/2002
FISCHER / Power Line Coupling Decoupling Network	FCC-801-M3-16A	99122	10/01/2000	10/01/2001
FISCHER / Bulk Current Injection Probe	F-120-9B	54	09/17/2000	09/17/2001
Narda / High Power Attenuator	769-6	02541	10/06/2000	10/06/2001

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	09/28/2000	09/28/2001
Extech Electronics / Frequency Converter	CFC-105	810390	No Calibration Required	No Calibration Required
BelMERIT / AC/DC Clamp Meter	DA 435	5A6 003019	10/11/2000	10/11/2001

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	09/16/2000	09/16/2001
FLUKE / 79 Series Ii Multimeter	79-II	66400869	01/10/2001	01/10/2002

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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 power through Host PC 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:

1. Normal Mode (Data No. : 9672E#59, 67; Date: 08/10/2001)

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

    Mode: 1.

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/m)	Limits (dBuV/m)	Margin (dB)	Reading Type (P/Q/A)	Line (L1/L2)
x.xx	**x.xx**	**x.xx**	**38.38**	**56.00**	**-17.62**	**P**	**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	66-56dBuV	56-46dBuV
500kHz-5MHz	56dBuV	46dBuV
5MHz-30MHz	60dBuV	50dBuV

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

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MEASUREMENT PROCEDURE
(COMMON MODE CONDUCTED EMISSION MEASUREMENT)

1) Selecting ISN for unscreened cable or a current probe for screened cable to take measurement.

2) The port of the EUT was connected to the remote side support equipment through the ISN/Current Probe and communication in normal condition.

3) Making a overall range scan by using the test receiver controlled by controller and record at least six highest emissions for showing in the test report.

4) 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.

5) In case of measuring on the screened cable, the current limit shall be applied, otherwise the voltage limit should be applied.

6) The following test mode(s) were scanned during the preliminary test:

Mode:

1. Lan Port (RJ45) 10M (Data No.: 9672E# 38; Date: 08/07/2001)
2. Lan Port (RJ45) 100M (Data No.: 9672E# 51; Date: 08/07/2001)

7) After the preliminary scan, we found the following test mode(s) producing the highest emission level and test date of the worst case was reported on the summary data page.

Mode: 1.

Data Sample:

Freq (MHz)	Meter Reading (dBuV)	C.F. (dB)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type (P/Q/A)
x.xx	**x.xx**	**x.xx**	**59.26**	**74.00**	**-14.74**	**P**

C.F.(Correction Factor)=Insertion Loss (9.5dB) + Cable Loss
Corrected Reading = Metering Reading + C.F.
Margin=Corrected Reading - Limits
P=Peak Reading Q=Quasi-peak A=Average Reading

Comments: **N/A**

COMMON MODE CONDUCTED EMISSION LIMIT AT TELECOMMUNICATION PORTS

☑ CE-Mark (EN 55022:1998)					
CLASS	Measuring Band	Voltage limit dB(uV)		Current limit dB(uA)	
		Q.P.	AV	Q.P.	AV
B	150kHz-500kHz	84-74	74-64	40-30	30-20
	500kHz-30MHz	74	64	30	20

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 power source from Host PC (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:

1. Normal Mode (Data No.: 9462D# 9, 10; Date: 08/06/2001)

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

Mode: 1.

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

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**	**30.82**	**37.00**	**-5.18**	**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	30
230-1000	10	37

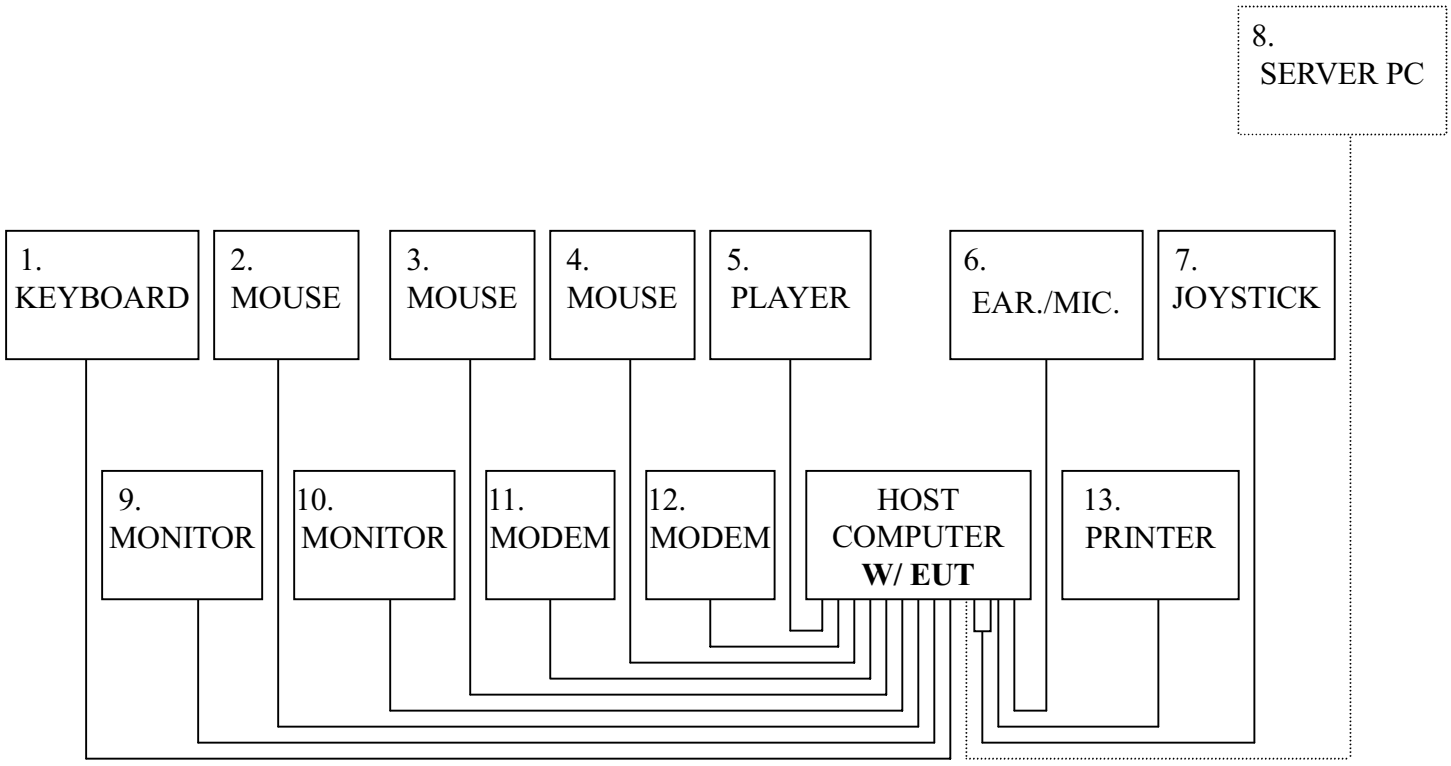
Note: The lower limit shall apply at the transition frequency.

BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators

EUT: CPU BOARD

Model Number: PCM-6898 (N)



SUMMARY DATA

(LINE CONDUCTED TEST)

Model Number: PCM-6898 (N) **Location:** Site # E

Tested by: James Liao

Test Model: Mode 1

Test Results: Passed

Temperature: 30℃ **Humidity:** 56%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)
0.598	**40.04**	**0.06**	**40.10**	**56.00**	**-15.90**	**P**	**L1**
0.404	**41.79**	**0.05**	**41.84**	**57.77**	**-15.93**	**P**	**L2**
0.627	**40.39**	**0.06**	**40.45**	**56.00**	**-15.55**	**P**	**L2**
0.994	**39.67**	**0.08**	**39.75**	**56.00**	**-16.25**	**P**	**L2**
1.071	**39.95**	**0.08**	**40.03**	**56.00**	**-15.97**	**P**	**L2**
7.137	**44.56**	**0.31**	**44.87**	**60.00**	**-15.13**	**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**

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SUMMARY DATA

(COMMON MODE CONDUCTED EMISSION MEASUREMENT)

Model Number: PCM-6898 (N) **Location:** Site # E

Tested by: James Liao

Test Mode: Mode 1

Test Results: Passed

Temperature: 32℃ **Humidity:** 60%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)
0.150	**51.47**	**9.52**	**60.99**	**84.00**	**-23.01**	**P**
0.299	**39.79**	**9.52**	**49.31**	**78.28**	**-28.97**	**P**
0.393	**45.77**	**9.55**	**55.32**	**75.99**	**-20.67**	**P**
0.595	**49.99**	**9.56**	**59.55**	**74.00**	**-14.45**	**P**
0.788	**43.31**	**9.57**	**52.88**	**74.00**	**-21.12**	**P**
9.966	**38.75**	**9.84**	**48.59**	**74.00**	**-25.41**	**A**
10.000	**66.98**	**9.84**	**76.82**	**84.00**	**-7.18**	**Q**

C.F.(Correction Factor)=Insertion Loss (9.5dB) + Cable Loss

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading

Q=Quasi-peak

A=Average Reading

Comments: **According to Note 3 on Table 4 of EN 55022:1998 standard, the limits allowed to relaxation of 10 dB over at frequency range 6 MHz to 30 MHz**

SUMMARY DATA
(RADIATED EMISSION TEST)

Model Number: PCM-6898 (N) **Location:** Site # D

Tested by: James Liao **Polar:** Vertical / Horizontal – 10m

Test Mode: Mode 1

Test Results: Passed

Temperature: 32℃ **Humidity:** 60%RH

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

Six Highest Radiated Emission Readings							
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
199.994	**35.72**	**-10.01**	**25.72**	**30.00**	**-4.29**	**P**	**V**
533.445	**32.47**	**-0.36**	**32.11**	**37.00**	**-4.89**	**P**	**V**
797.006	**27.41**	**5.04**	**32.45**	**37.00**	**-4.55**	**P**	**V**
199.828	**35.21**	**-10.01**	**25.21**	**30.00**	**-4.80**	**P**	**H**
663.561	**29.52**	**2.27**	**31.79**	**37.00**	**-5.21**	**P**	**H**
930.356	**26.60**	**7.38**	**33.98**	**37.00**	**-3.02**	**P**	**H**

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**

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

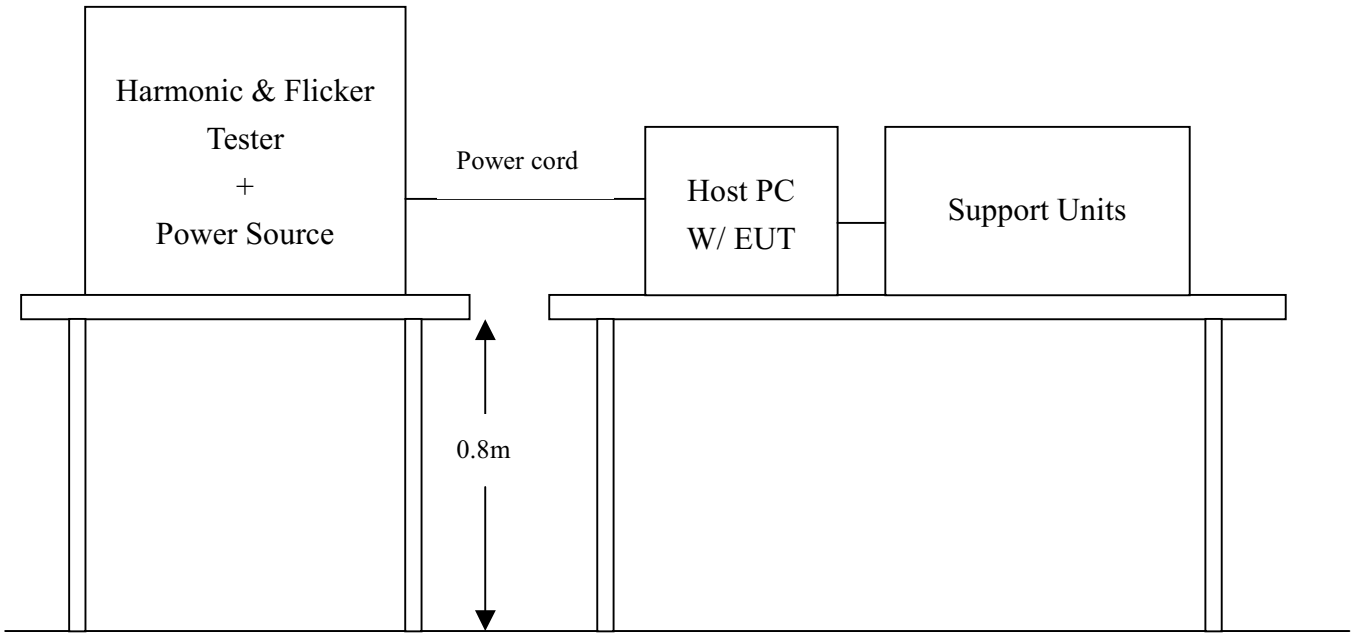
POWER HARMONICS MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-2: 1995 + A1: 1998 + A2: 1998 + A14: 2000
Limits : CLASS A
Tester : Stanley Cheng
Temperature : 26℃
Humidity : 61 %

VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-3 : 1995
Limits : Section 5 of EN 61000-3-3
Tester : Stanley Cheng
Temperature : 26℃
Humidity : 61 %

Block Diagram of Test Setup:



Result:

Please see the attached test data.

Approved by: Rick Yeh

Signature: Stanley Cheng Date: 8/23

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: 63.0%	Voltage THD Out-of-Specification?: No
Class D Equipment?: No	Fundamental Current: 0.305 A

RMS Voltage: 229.8 V	RMS Current: 0.3 A	Real Power: 65.8 W
Frequency: 50.0 Hz	Peak Current: 0.5 A	Apparent Power: 70.2 VA
Voltage THD: 0.02%	Current THD: 11.65%	Power Factor: 0.937
Maximum Power: 65.8 W	Mean Power: 65.7 W	

Active Power Statistics:

100th Percentile: 65.8 W	99th Percentile: 65.8 W	95th Percentile: 65.8
90th Percentile: 65.8 W	50th Percentile: 65.8 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	0.004	0.010
3	0.90	2.069	0.006	0.014
4	0.20	0.460	0.005	0.011
5	0.40	0.919	0.005	0.012
6	0.20	0.460	0.003	0.006
7	0.30	0.690	0.004	0.010
8	0.20	0.460	0.001	0.003
9	0.20	0.460	0.003	0.008
10	0.20	0.460	0.003	0.007
11	0.10	0.230	0.002	0.005
12	0.10	0.230	0.003	0.006
13	0.10	0.230	0.001	0.003
14	0.10	0.230	0.001	0.003
15	0.10	0.230	0.005	0.012
16	0.10	0.230	0.002	0.005
17	0.10	0.230	0.002	0.004
18	0.10	0.230	0.003	0.006
19	0.10	0.230	0.003	0.007
20	0.10	0.230	0.002	0.005
21	0.10	0.230	0.004	0.008
22	0.10	0.230	0.004	0.009
23	0.10	0.230	0.001	0.003
24	0.10	0.230	0.002	0.005
25	0.10	0.230	0.001	0.001
26	0.10	0.230	0.001	0.002
27	0.10	0.230	0.003	0.006
28	0.10	0.230	0.001	0.002
29	0.10	0.230	0.002	0.005
30	0.10	0.230	0.001	0.003
31	0.10	0.230	0.002	0.005
32	0.10	0.230	0.001	0.003
33	0.10	0.230	0.001	0.002
34	0.10	0.230	0.002	0.004
35	0.10	0.230	0.001	0.002
36	0.10	0.230	0.002	0.005
37	0.10	0.230	0.002	0.004
38	0.10	0.230	0.001	0.003
39	0.10	0.230	0.002	0.004
40	0.10	0.230	0.000	0.001

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.		0.3061		0.3030		0.0010		
2	1.0800	0.0006	0.1	0.0003	0.0	0.0001	0.0	P
3	2.3000	0.0264	1.1	0.0260	1.1	0.0001	0.0	P
4	0.4300	0.0006	0.1	0.0004	0.1	0.0000	0.0	P
5	1.1400	0.0111	1.0	0.0106	0.9	0.0002	0.0	P
6	0.3000	0.0005	0.2	0.0004	0.1	0.0000	0.0	P
7	0.7700	0.0016	0.2	0.0012	0.2	0.0001	0.0	P
8	0.2300	0.0004	0.2	0.0003	0.1	0.0000	0.0	P
9	0.4000	0.0050	1.3	0.0046	1.2	0.0002	0.0	P
10	0.1840	0.0004	0.2	0.0002	0.1	0.0000	0.0	P
11	0.3300	0.0065	2.0	0.0063	1.9	0.0001	0.0	P
12	0.1533	0.0004	0.2	0.0002	0.2	0.0000	0.0	P
13	0.2100	0.0088	4.2	0.0083	3.9	0.0002	0.1	P
14	0.1314	0.0004	0.3	0.0002	0.1	0.0000	0.0	P
15	0.1500	0.0072	4.8	0.0066	4.4	0.0002	0.1	P
16	0.1150	0.0003	0.2	0.0002	0.1	0.0000	0.0	P
17	0.1324	0.0033	2.5	0.0028	2.1	0.0001	0.1	P
18	0.1022	0.0003	0.3	0.0001	0.1	0.0000	0.0	P
19	0.1184	0.0047	4.0	0.0045	3.8	0.0001	0.0	P
20	0.0920	0.0002	0.2	0.0001	0.1	0.0000	0.0	P
21	0.1071	0.0075	7.0	0.0073	6.8	0.0001	0.1	P
22	0.0836	0.0005	0.5	0.0003	0.4	0.0000	0.0	P
23	0.0978	0.0072	7.4	0.0068	6.9	0.0002	0.2	P
24	0.0767	0.0004	0.6	0.0003	0.4	0.0000	0.1	P
25	0.0900	0.0064	7.1	0.0061	6.8	0.0001	0.1	P
26	0.0708	0.0004	0.6	0.0003	0.4	0.0000	0.1	P
27	0.0833	0.0046	5.5	0.0043	5.2	0.0001	0.1	P
28	0.0657	0.0004	0.6	0.0003	0.4	0.0000	0.1	P
29	0.0776	0.0029	3.8	0.0022	2.9	0.0002	0.3	P
30	0.0613	0.0004	0.7	0.0003	0.5	0.0000	0.1	P
31	0.0726	0.0020	2.7	0.0018	2.4	0.0001	0.1	P
32	0.0575	0.0004	0.7	0.0003	0.5	0.0000	0.1	P
33	0.0682	0.0025	3.6	0.0023	3.3	0.0001	0.1	P
34	0.0541	0.0005	1.0	0.0004	0.7	0.0000	0.1	P
35	0.0643	0.0046	7.1	0.0042	6.5	0.0002	0.3	P
36	0.0511	0.0004	0.8	0.0002	0.4	0.0001	0.1	P
37	0.0608	0.0035	5.8	0.0031	5.2	0.0001	0.2	P
38	0.0484	0.0004	0.8	0.0003	0.5	0.0000	0.1	P
39	0.0577	0.0040	7.0	0.0037	6.4	0.0001	0.2	P
40	0.0460	0.0004	0.9	0.0003	0.7	0.0000	0.1	P

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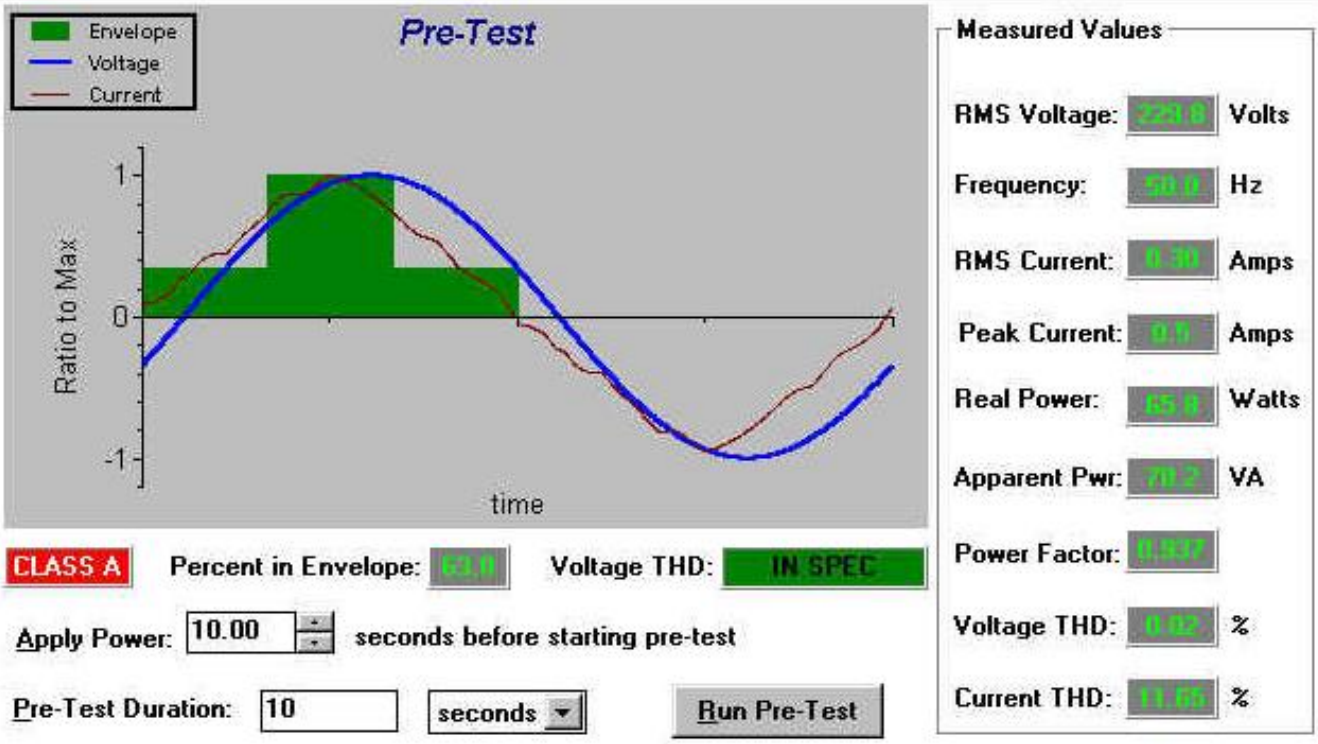
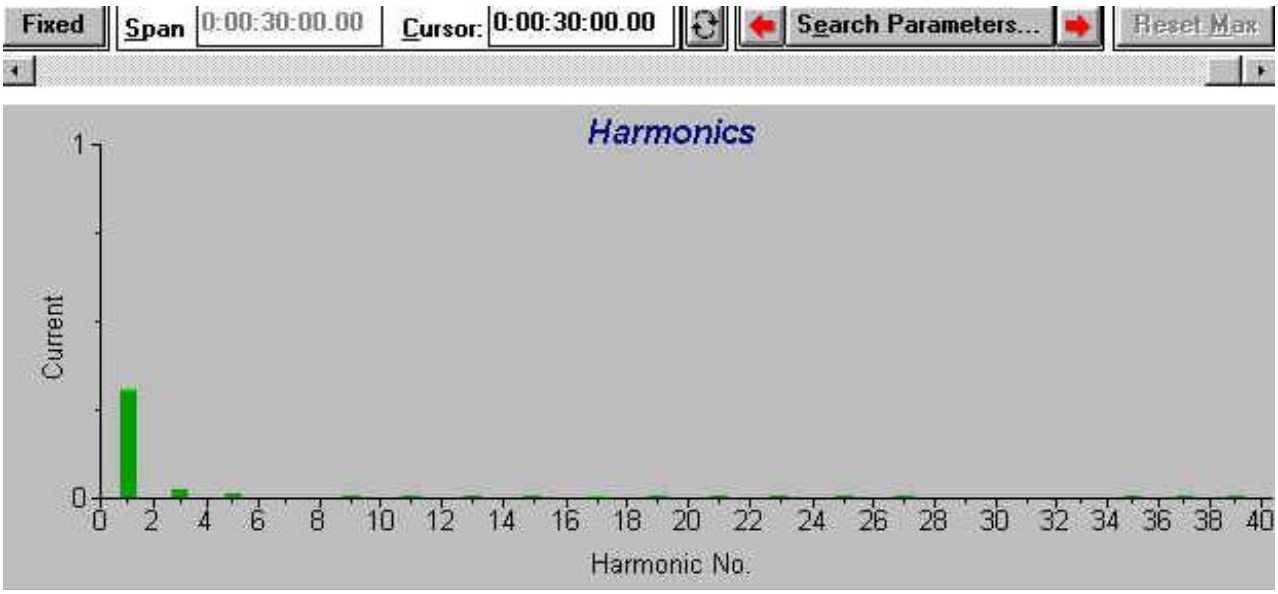
Final Test Statistics:

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(or Fail(
Fund.		0.3061							
2	1.0800	0.0006	0.1	0	0	0	0	0	P
3	2.3000	0.0264	1.1	0	0	0	0	0	P
4	0.4300	0.0006	0.1	0	0	0	0	0	P
5	1.1400	0.0111	1.0	0	0	0	0	0	P
6	0.3000	0.0005	0.2	0	0	0	0	0	P
7	0.7700	0.0016	0.2	0	0	0	0	0	P
8	0.2300	0.0004	0.2	0	0	0	0	0	P
9	0.4000	0.0050	1.3	0	0	0	0	0	P
10	0.1840	0.0004	0.2	0	0	0	0	0	P
11	0.3300	0.0065	2.0	0	0	0	0	0	P
12	0.1533	0.0004	0.2	0	0	0	0	0	P
13	0.2100	0.0088	4.2	0	0	0	0	0	P
14	0.1314	0.0004	0.3	0	0	0	0	0	P
15	0.1500	0.0072	4.8	0	0	0	0	0	P
16	0.1150	0.0003	0.2	0	0	0	0	0	P
17	0.1324	0.0033	2.5	0	0	0	0	0	P
18	0.1022	0.0003	0.3	0	0	0	0	0	P
19	0.1184	0.0047	4.0	0	0	0	0	0	P
20	0.0920	0.0002	0.2	0	0	0	0	0	P
21	0.1071	0.0075	7.0	0	0	0	0	0	P
22	0.0836	0.0005	0.5	0	0	0	0	0	P
23	0.0978	0.0072	7.4	0	0	0	0	0	P
24	0.0767	0.0004	0.6	0	0	0	0	0	P
25	0.0900	0.0064	7.1	0	0	0	0	0	P
26	0.0708	0.0004	0.6	0	0	0	0	0	P
27	0.0833	0.0046	5.5	0	0	0	0	0	P
28	0.0657	0.0004	0.6	0	0	0	0	0	P
29	0.0776	0.0029	3.8	0	0	0	0	0	P
30	0.0613	0.0004	0.7	0	0	0	0	0	P
31	0.0726	0.0020	2.7	0	0	0	0	0	P
32	0.0575	0.0004	0.7	0	0	0	0	0	P
33	0.0682	0.0025	3.6	0	0	0	0	0	P
34	0.0541	0.0005	1.0	0	0	0	0	0	P
35	0.0643	0.0046	7.1	0	0	0	0	0	P
36	0.0511	0.0004	0.8	0	0	0	0	0	P
37	0.0608	0.0035	5.8	0	0	0	0	0	P
38	0.0484	0.0004	0.8	0	0	0	0	0	P
39	0.0577	0.0040	7.0	0	0	0	0	0	P
40	0.0460	0.0004	0.9	0	0	0	0	0	P

Remarks





Approved by: Rick Yeh

Signature: Stanley Cheng Date: 8/23

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: 0.3 A	Real Power: 65.2 W
Frequency: 50.0 Hz	Peak Current: 0.5 A	Apparent Power: 69.6 VA
Voltage THD: 0.02%	Current THD: 11.79%	Power Factor: 0.936

Total Number of Failures:			Total Number of Errors:
Pst: 0	Dc: 0		None
Plt: 0	Dmax: 0		
	Dt: 0		

Final Test Summary:

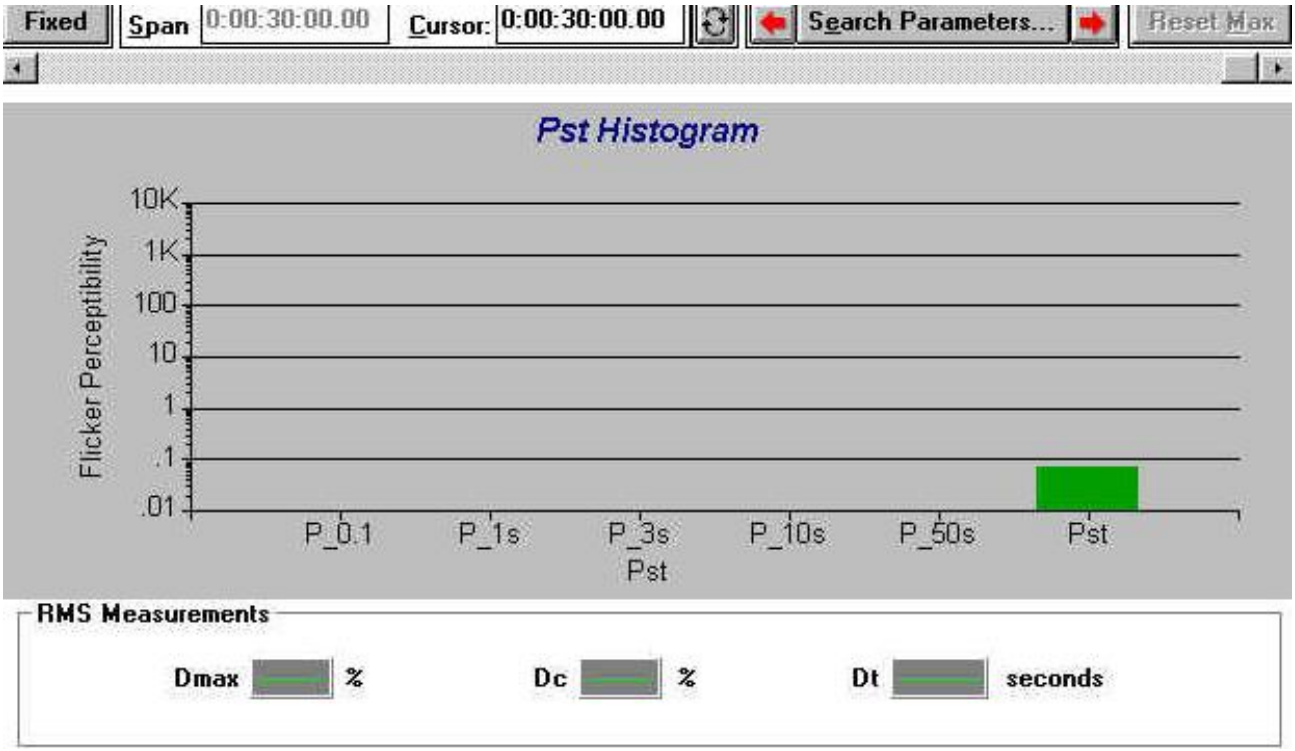
Dmax:	0.0	Pst:	0.07	P_0.1:	0.01
Dc:	0.0	Plt:	0.07	P_1s:	0.01
Dt:	0.00	Plt Threshold:	0.65	P_3s:	0.01
				P_10s:	0.01
				P_50s:	0.01

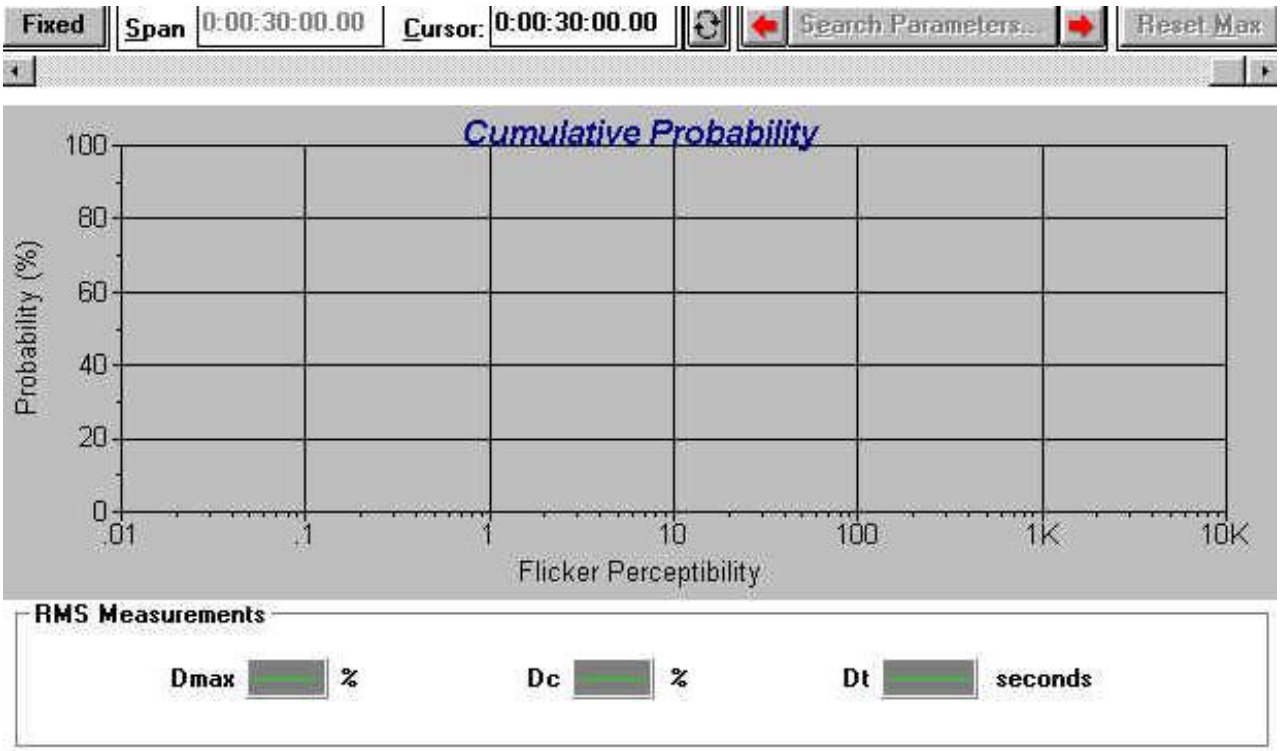
Final Test Data by Integration Period:

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





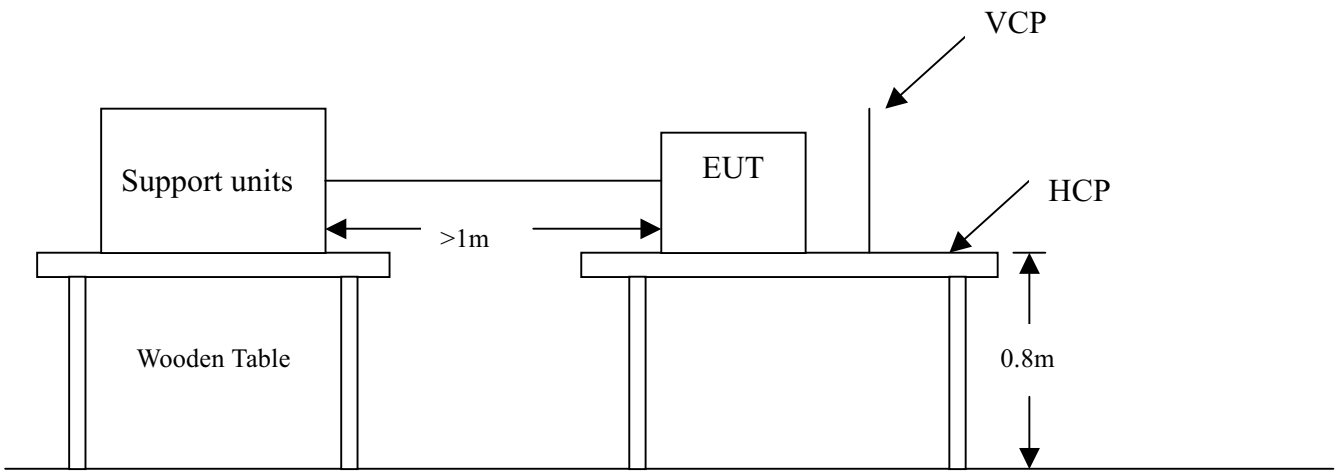
SECTION 3 IEC 61000-4-2 (ELECTROSTATIC DISCHARGE)

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	**:**	Enclosure
Basic Standard	**:**	IEC 61000-4-2
Requirements	**:**	±4kV (Contact Discharge) ±4kV (Indirect Discharge) ±8kV (Air Discharge)
Performance Criteria	**:**	B (Standard require)
Tested by	**:**	Stanley Cheng
Temperature/Humidity:		15℃ / 55%

Block Diagram of Test Setup:

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



Ground Reference Plane

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	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***

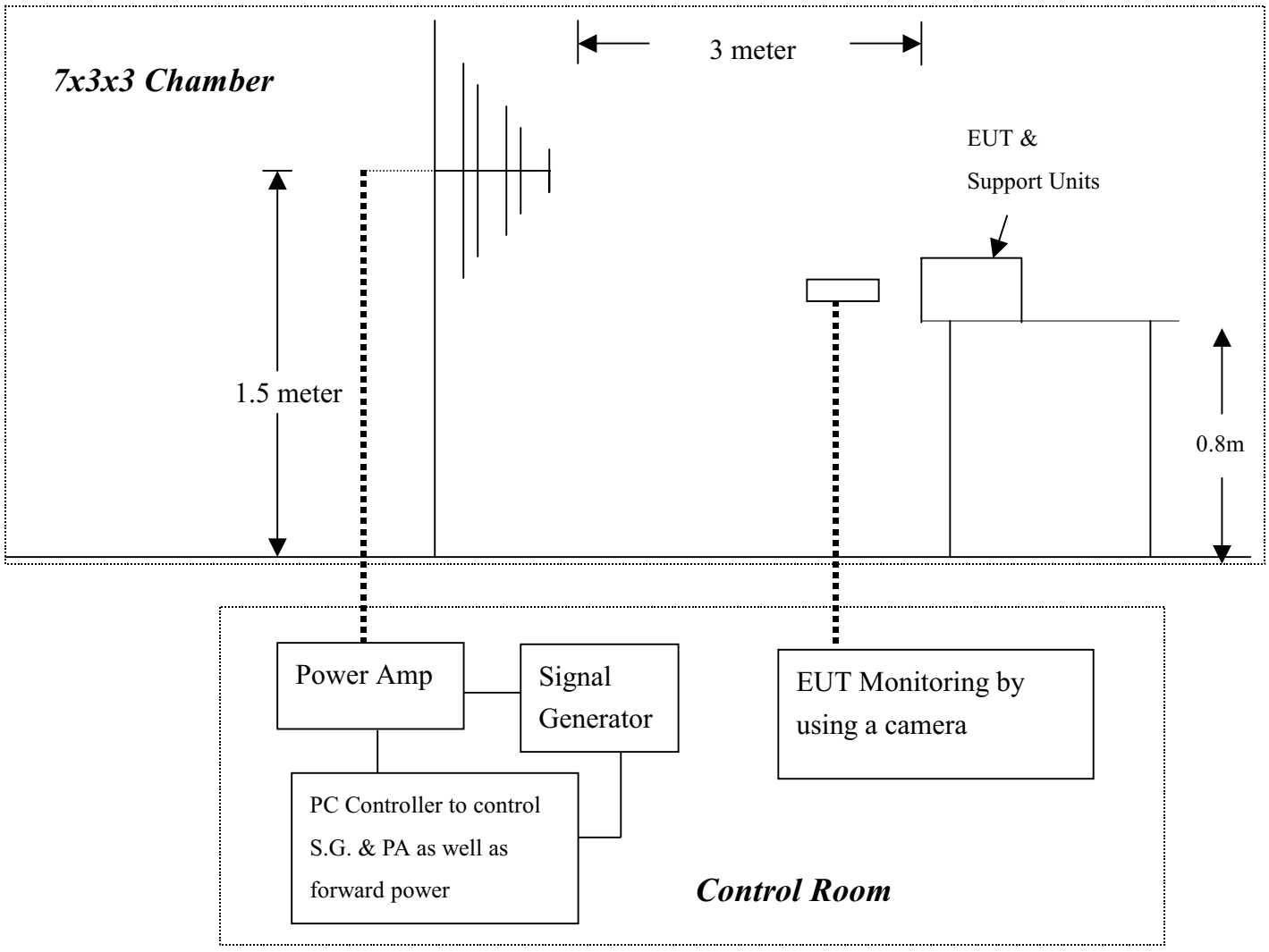
Observation: No any function degraded during the tests.

SECTION 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	:	Stanley Cheng
Temperature	:	25℃
Humidity	:	62%
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

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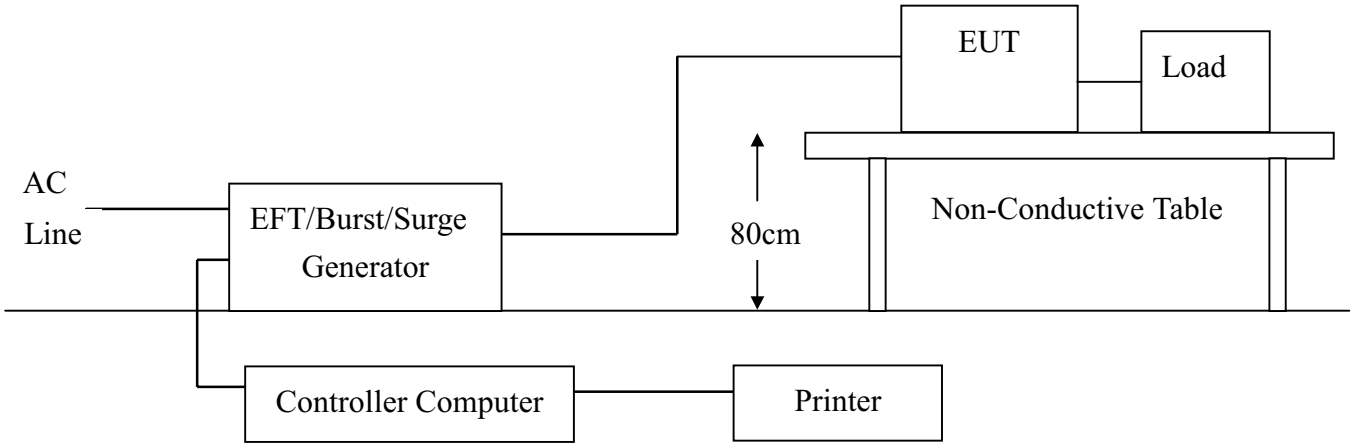
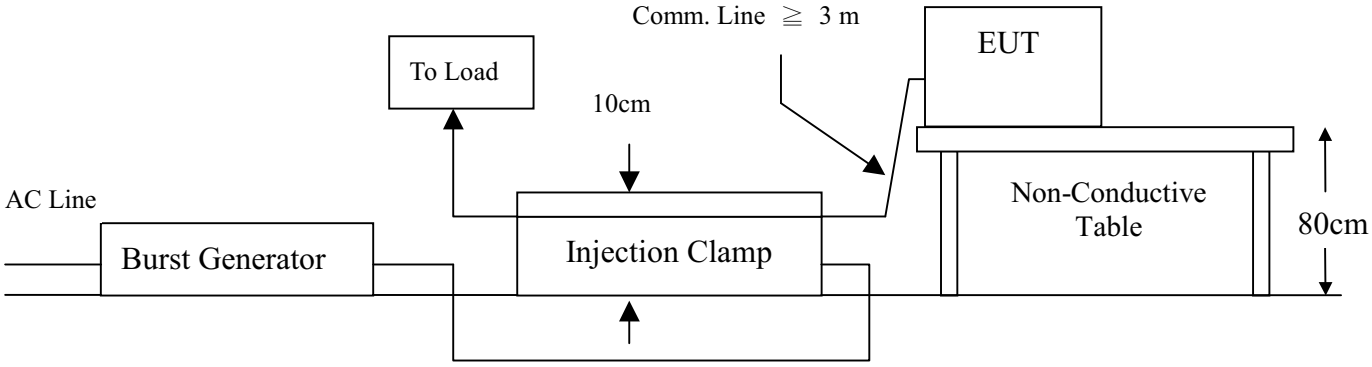
SECTION 5 IEC 61000-4-4 (FAST TRANSIENTS/BURST)

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	**:** Stanley Cheng
Temperature	**:** 26℃
Humidity	**:** 61%

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.

Test conditions:
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
L1+N	+/- 1	Direct	Pass
LAN Cable	+/- 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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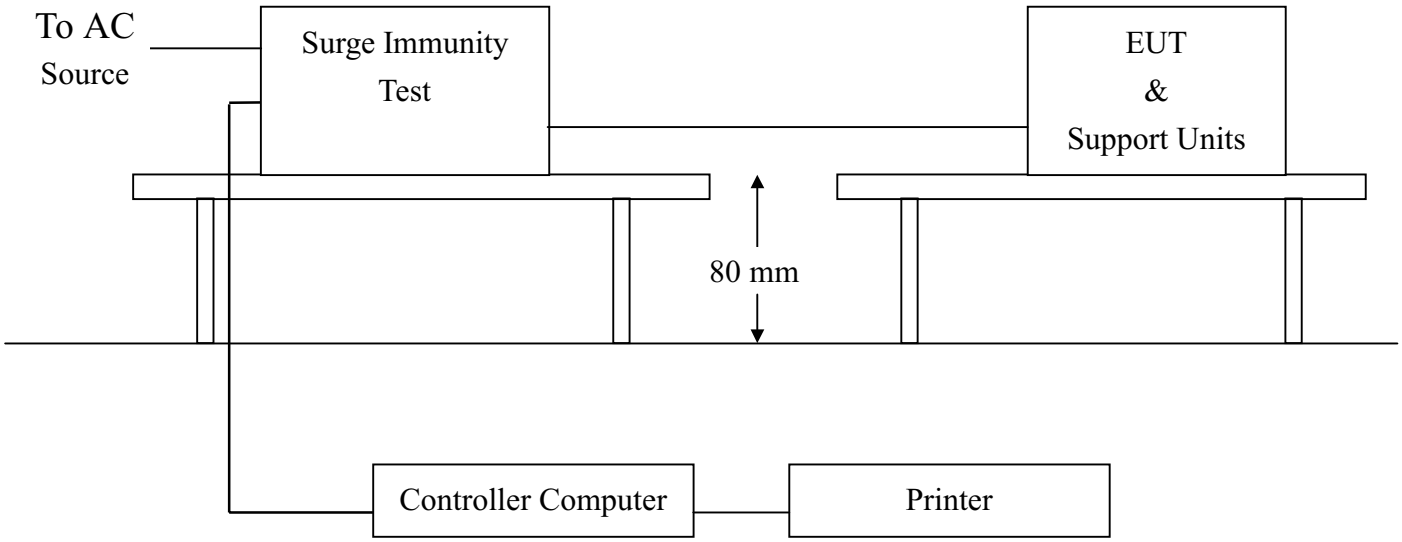
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

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	**:**	Stanley Cheng
Temperature	**:**	25℃
Humidity	**:**	62%

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:

☑ **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***

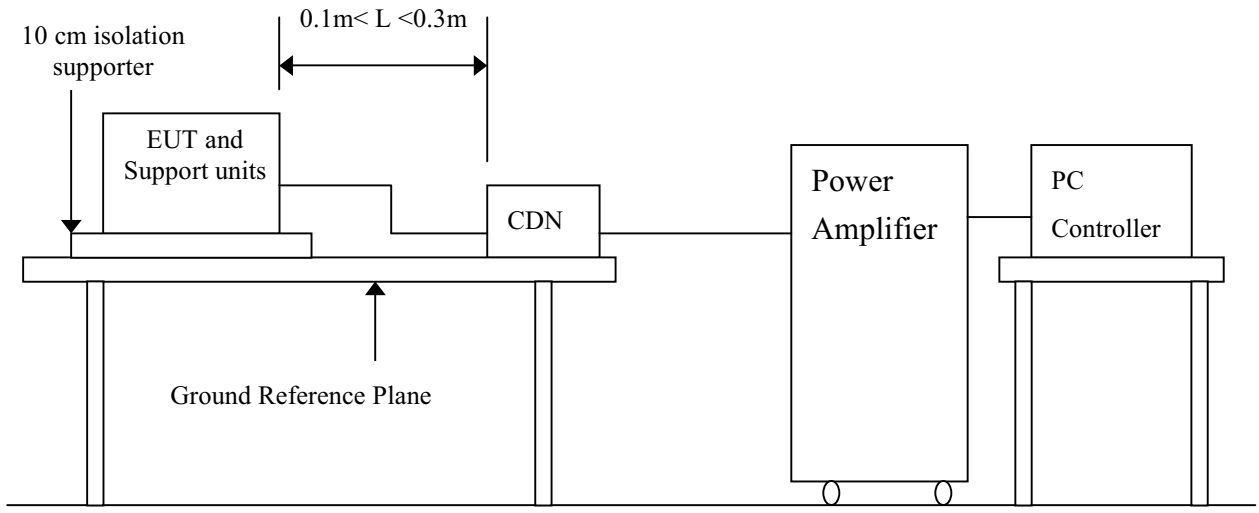
Observation: No any function degraded during the tests.

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

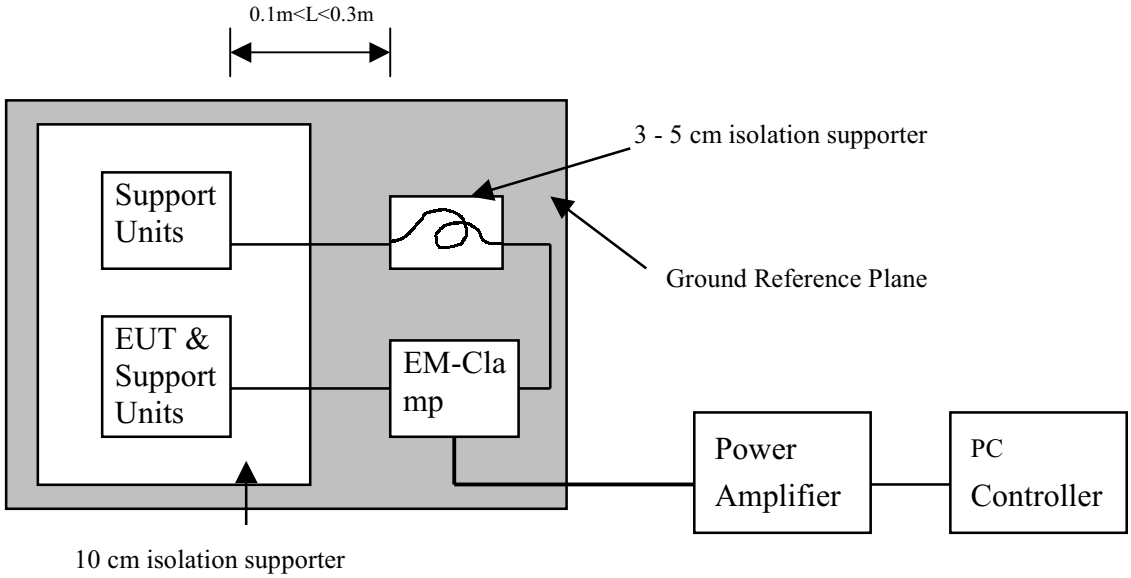
Port	**:** AC Port and Line Cable
Base Standard	**:** IEC 61000-4-6
Requirements	**:** 3 V with 80% AM. Modulation
Injection Method	**:** CDN for Power Cord Bulk Current Injection Probe for Line Cable
Deviation	**:**None
Performance Criteria	**:** A (Standard require)
Tester	**:** Stanley Cheng
Temperature	**:** 25℃
Humidity	**:** 62%
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***

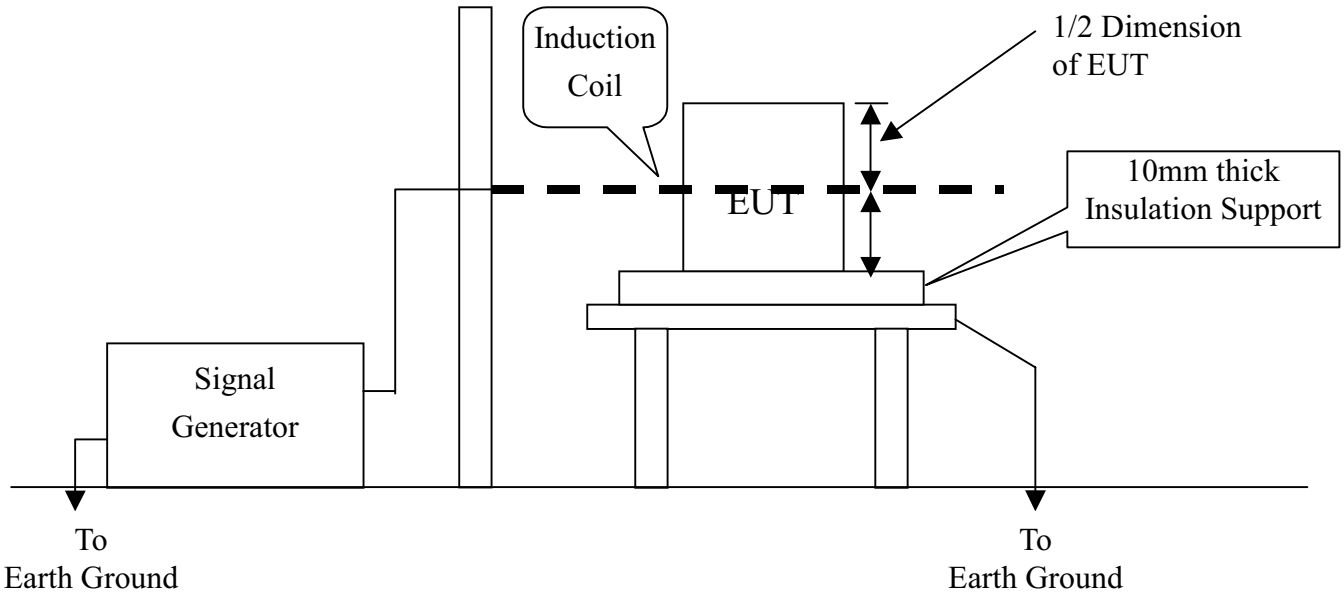
Observation: No any function degraded during the tests.

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	**:** N/A
Temperature	**:** N/A
Humidity	**:** N/A

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			
Y			
Z			

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: N/A(EUT Without any magnetic component)

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.

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

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

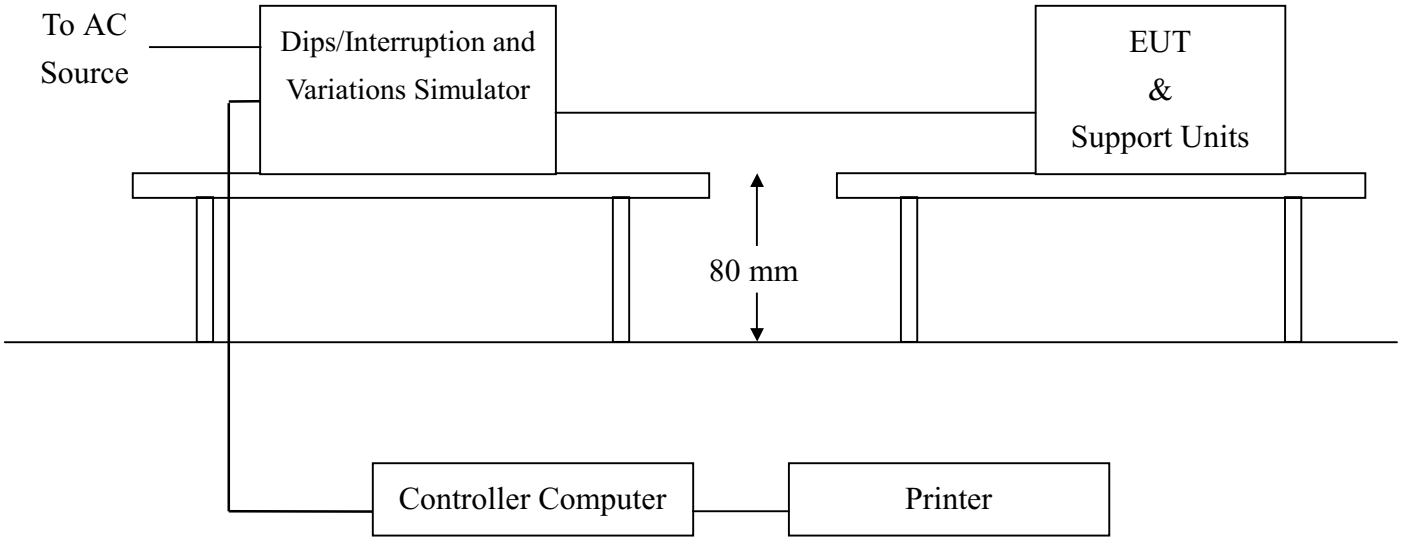
Test Interval : Min. 10 sec.

Tester : Stanley Cheng

Temperature : 26°C

Humidity : 61%

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	Host PC shut down, But EUT can be auto recovered after Host PC restart.	B

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***

APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST (EN 55022)

COMPLIANCE ENGINEERING SERVICES, INC. DOCUMENT NO:CCSTP4003C
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

COMMON MODE CONDUCTED EMISSION TEST

RADIATED EMISSION TEST (EN 55022)

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

COMPLIANCE ENGINEERING SERVICES, INC. DOCUMENT NO:CCSTP4003C
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

ELECTROSTATIC DISCHARGE TEST (IEC 61000-4-2)

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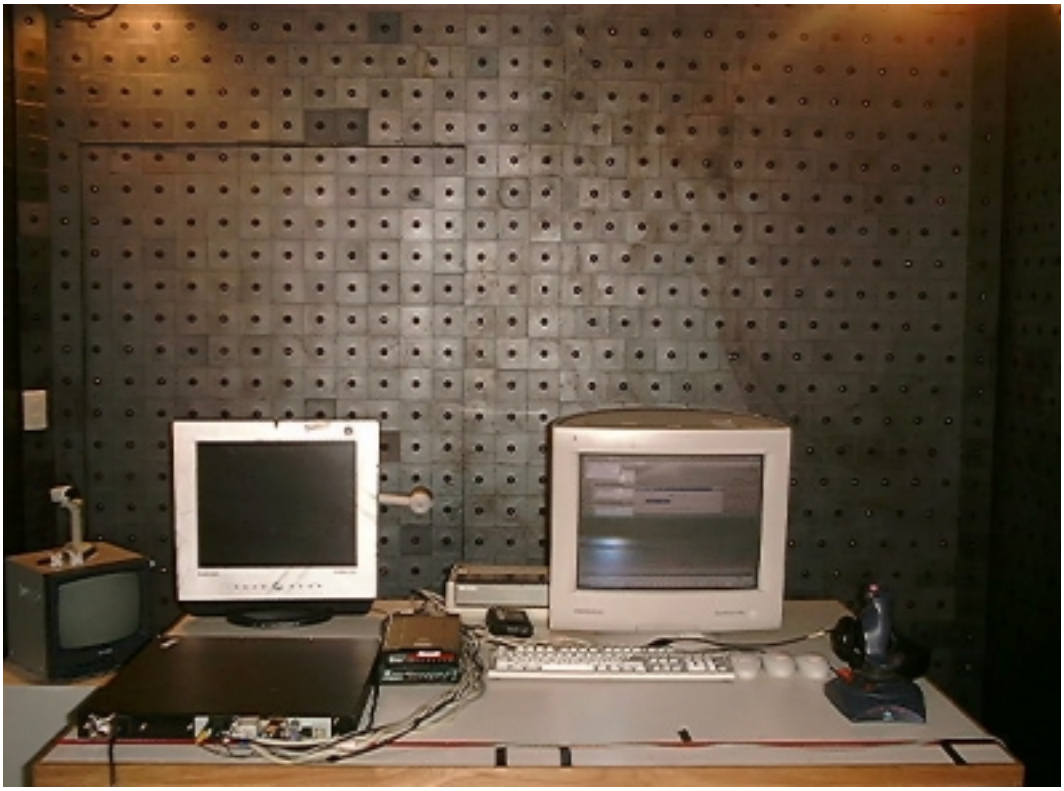
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

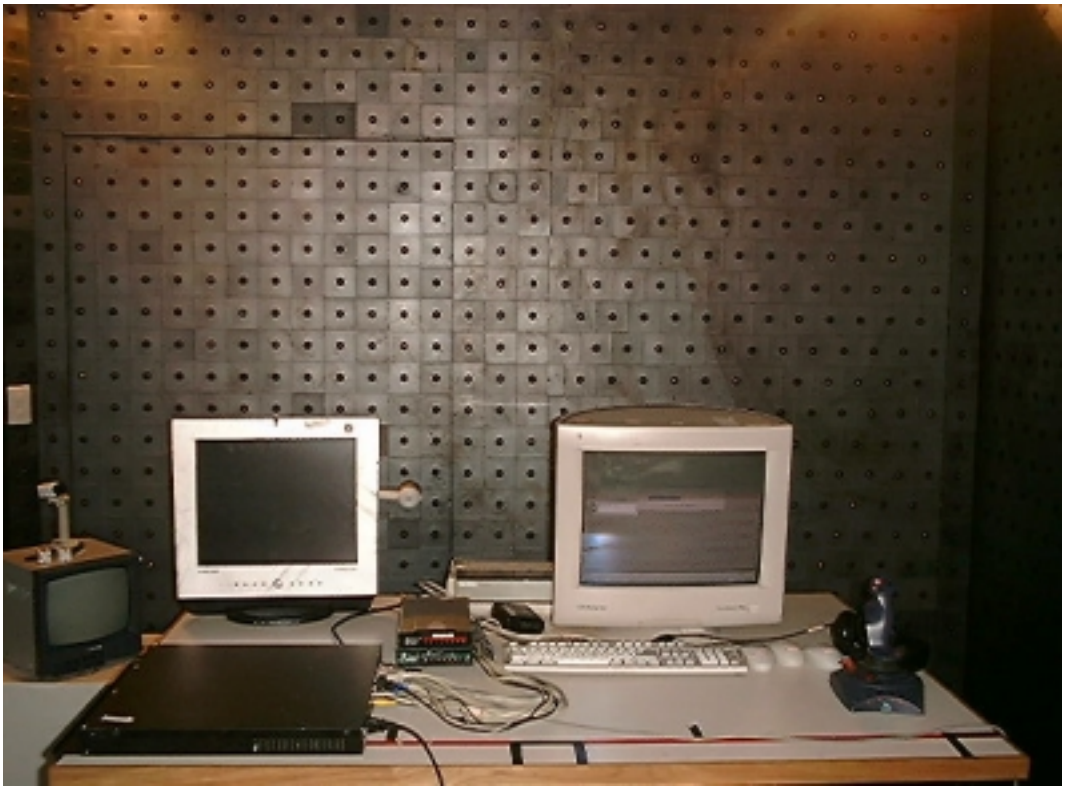
RADIATED ELECTROMAGNETIC FIELD (IEC 61000-4-3)

Front View

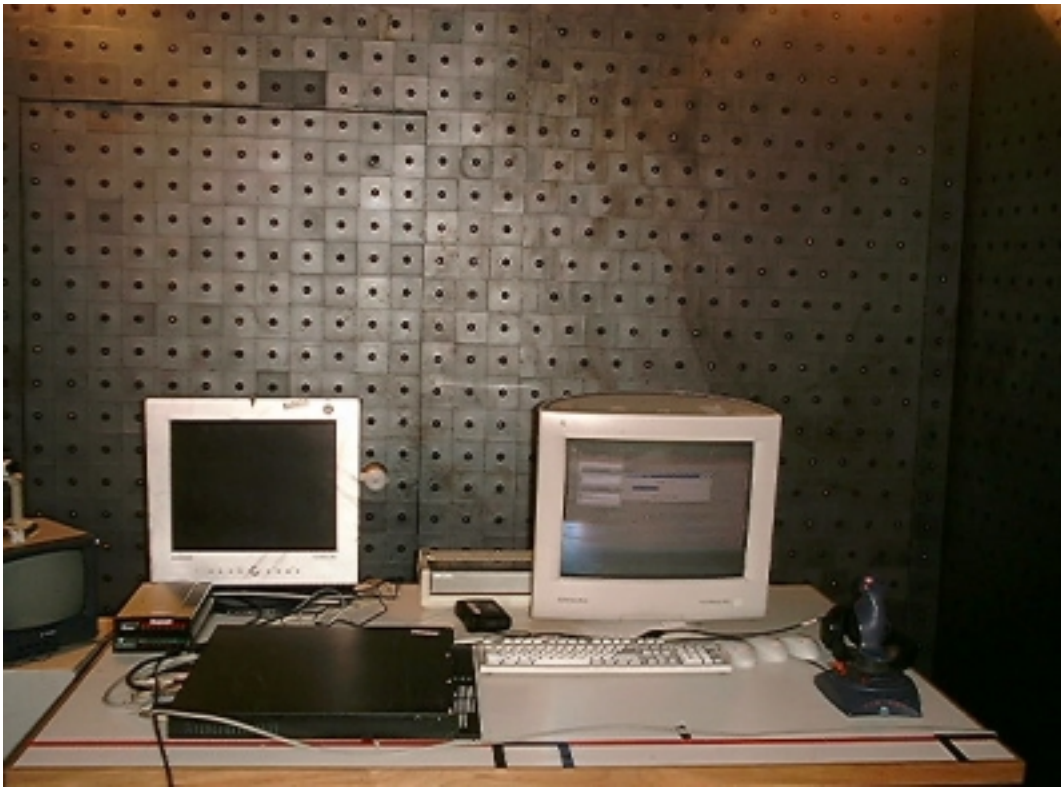
Back View



Right View



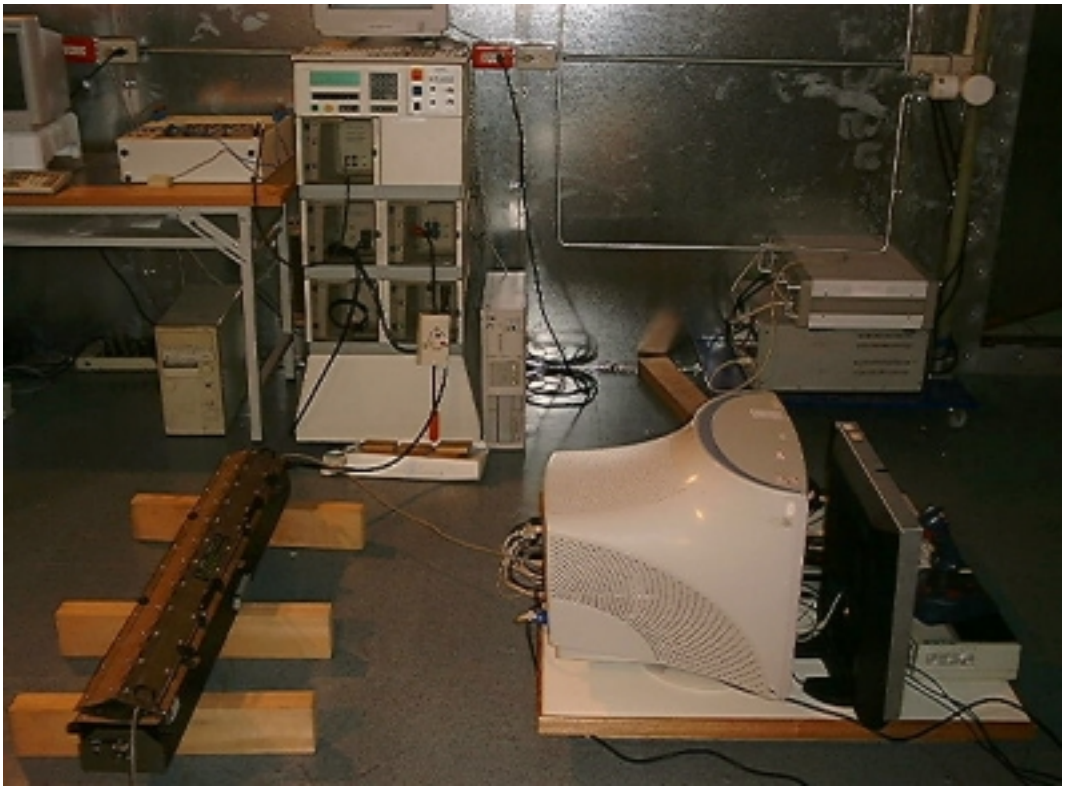
Left View



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

COMPLIANCE ENGINEERING SERVICES, INC. DOCUMENT NO:CCSTP4003C
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

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



COMPLIANCE ENGINEERING SERVICES, INC. DOCUMENT NO:CCSTP4003C
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

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

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

COMPLIANCE ENGINEERING SERVICES, INC. DOCUMENT NO:CCSTP4003C
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

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

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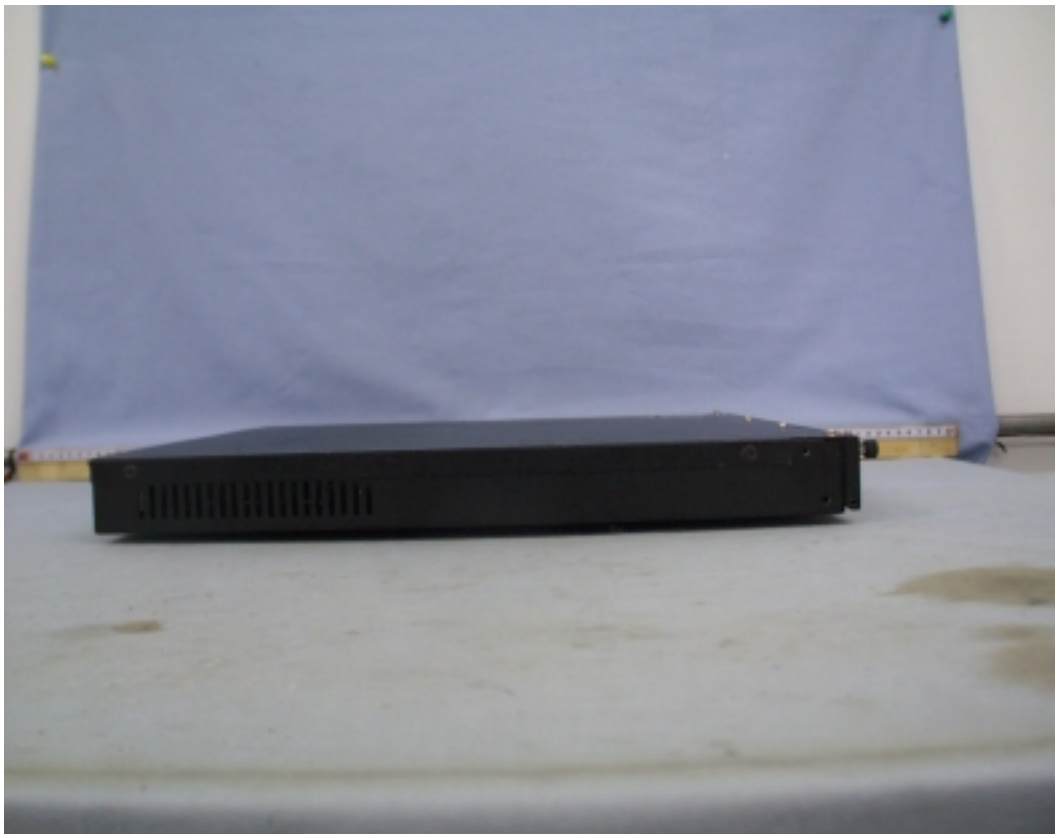
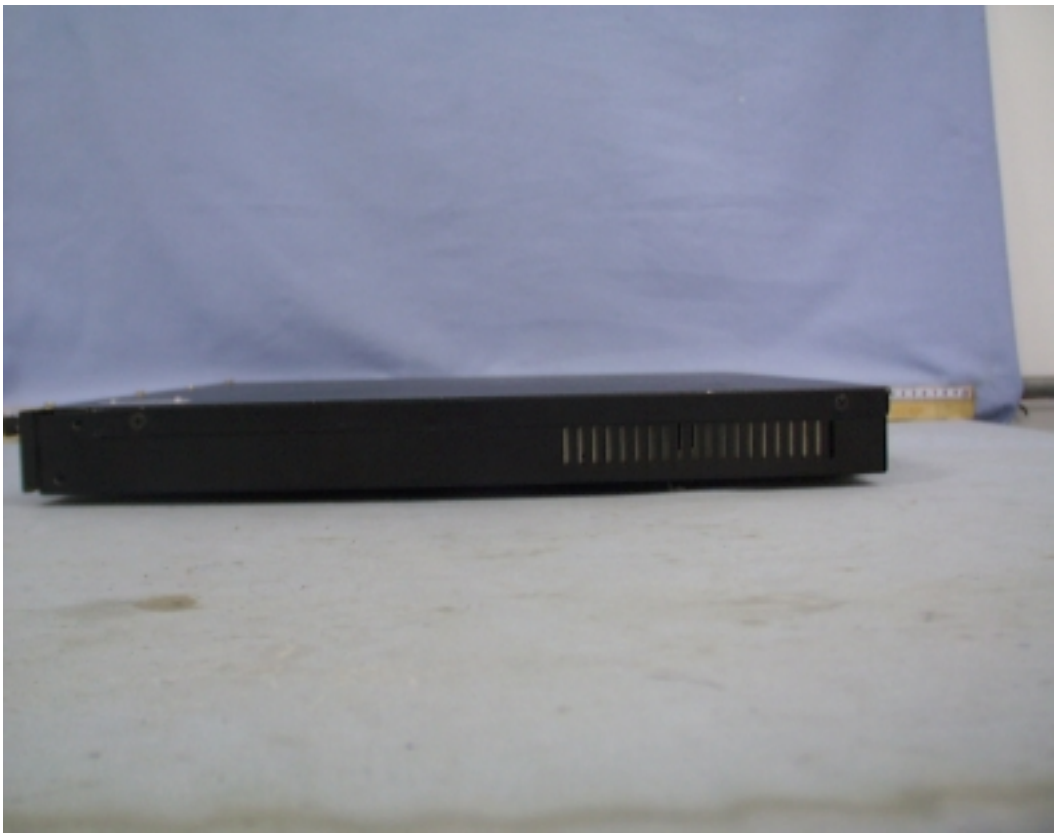
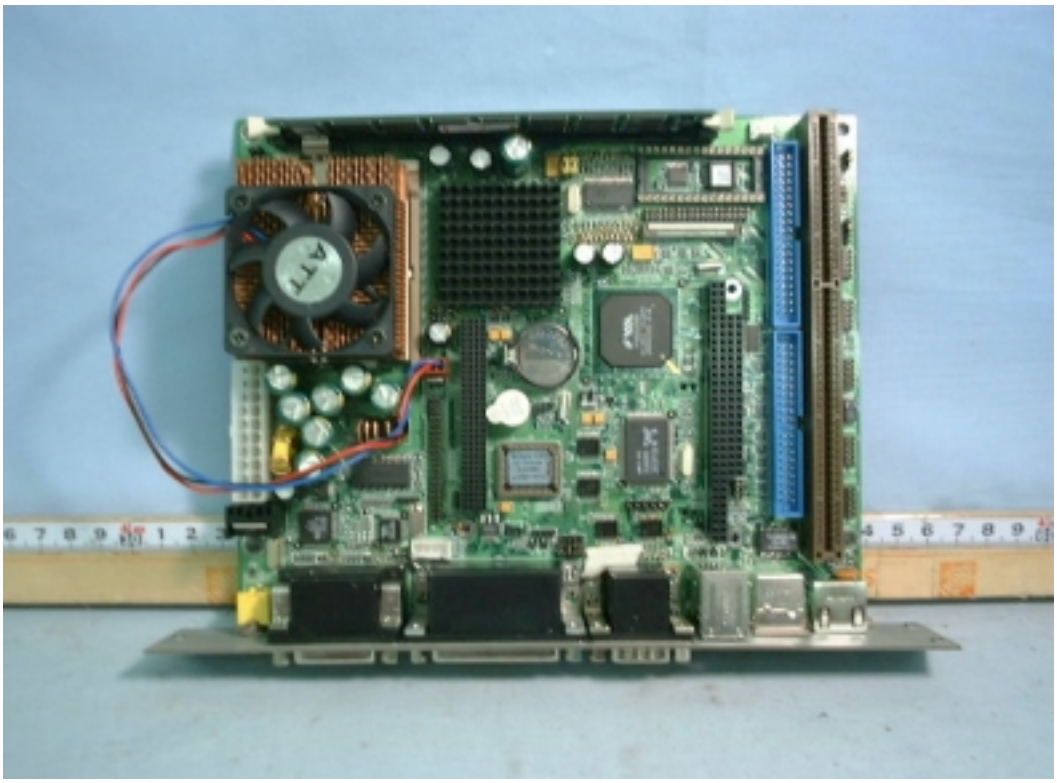
NO.199, CHUNG SHENG ROAD, HSIN TIEN, TAIPEI, TAIWAN R.O.C. TEL:(02)2217-0894/FAX:2217-1254

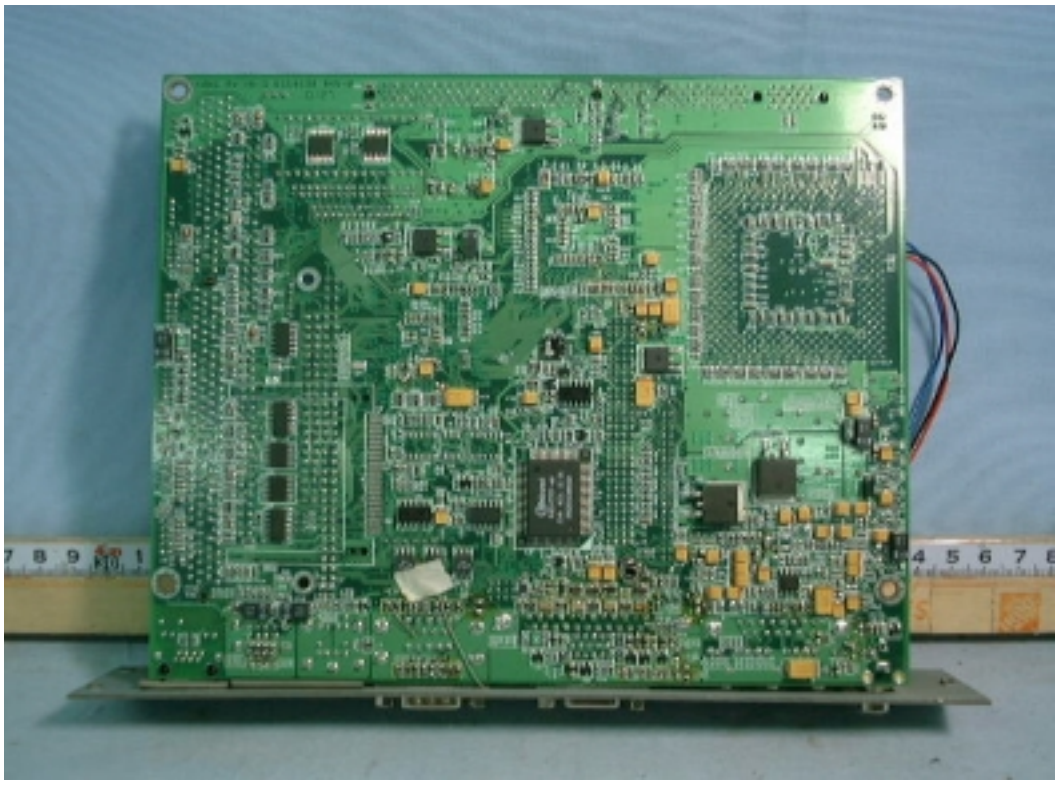
APPENDIX 2

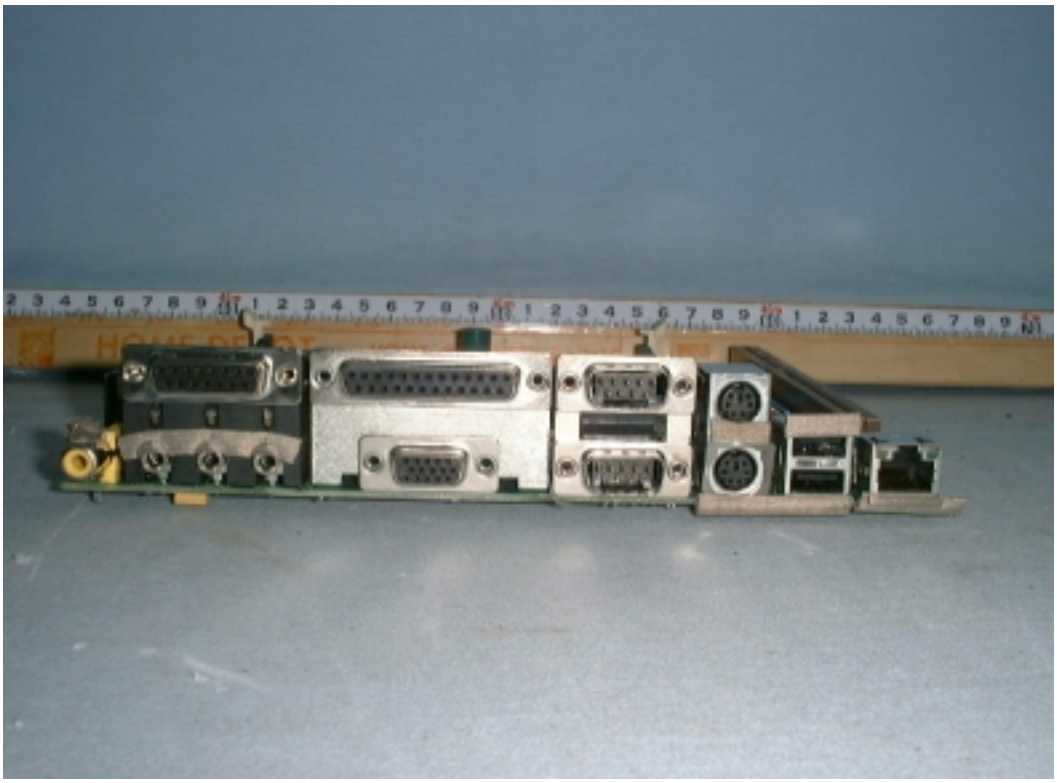
PHOTOGRAPHS OF EUT











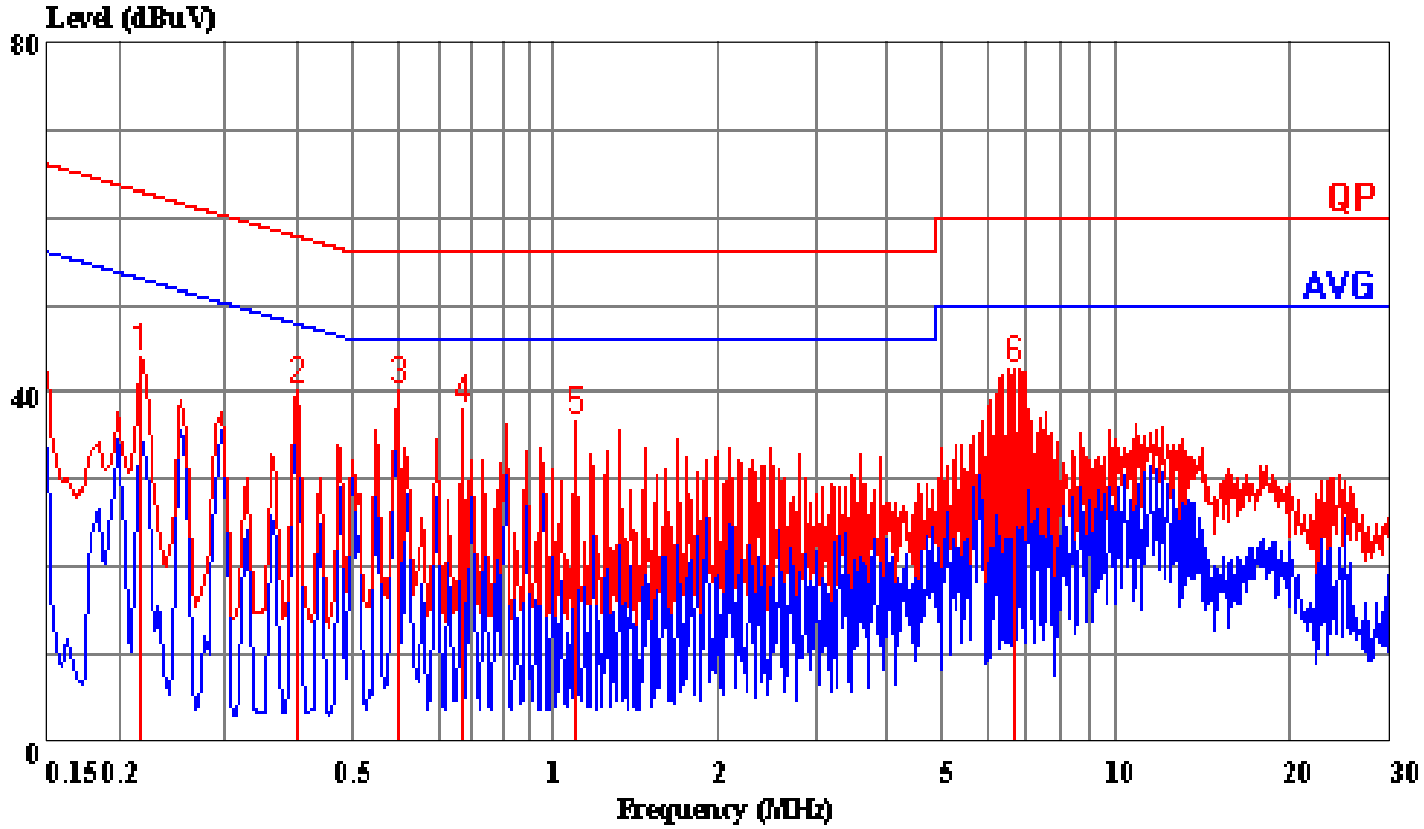
APPENDIX 3

CONDUCTED EMISSION PLOT
RADIATED EMISSION DATA

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

No. 199, Chung Sheng Road,
Hsin Tien City, Taipei,
Taiwan, R.O.C.
Tel:02-2217-0894 Fax:02-2217-1254

Data#: 80 File#: 9672e.EMI Date: 2001-08-10 Time: 07:25:47



(CES Conducted)

Trace: 58 59 Ref Trace:

Condition: LINE
Report No. : 01E9672
Test Engr. : JAMES LIAO
Company   : AAEON TECHNOLOGY INC.
EUT   : PCM-6898(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN55022 CLASS B
Mode of Op. : Normal Mode

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.217	43.99	0.02	44.01	62.92	-18.91	Peak
2	0.400	39.96	0.05	40.01	57.86	-17.85	Peak
3	0.598	40.04	0.06	40.10	56.00	-15.90	Peak
4	0.771	37.90	0.07	37.97	56.00	-18.03	Peak
5	1.210	36.66	0.09	36.75	56.00	-19.25	Peak
6	6.805	42.37	0.30	42.67	60.00	-17.33	Peak

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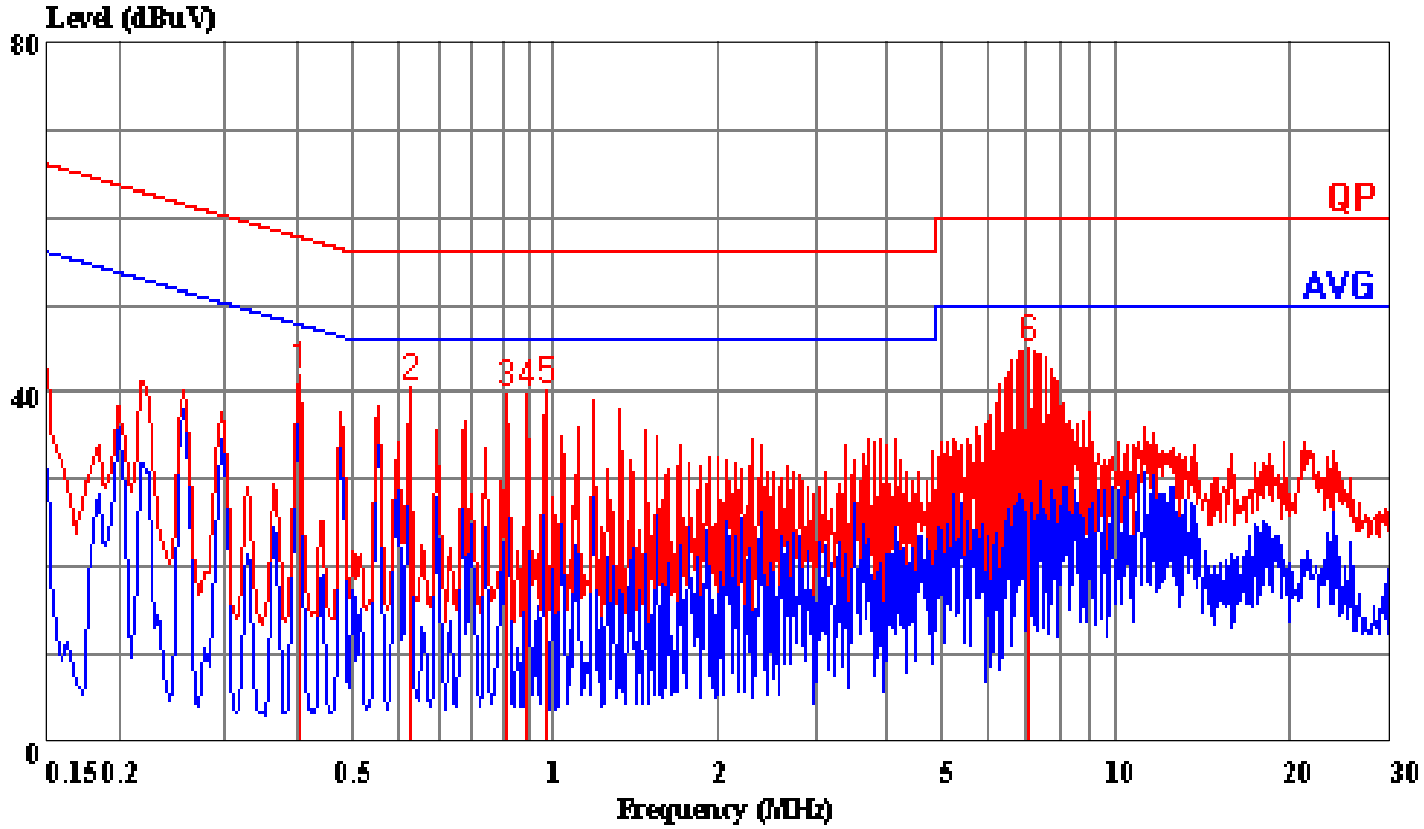
Taiwan, R.O.C.
Tel:02-2217-0894 Fax:02-2217-1254

Data#: 81 File#: 9672e.EMI Date: 2001-08-10 Time: 07:32:32



(CES Conducted)

Trace: 66 67 Ref Trace:

Condition: NEUTRAL
Report No. : 01E9672
Test Engr. : JAMES LIAO
Company   : AAEON TECHNOLOGY INC.
EUT   : PCM-6898(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN55022 CLASS B
Mode of Op. : Normal Mode

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.404	41.79	0.05	41.84	57.77	-15.93	Peak
2	0.627	40.39	0.06	40.45	56.00	-15.55	Peak
3	0.918	39.58	0.08	39.66	56.00	-16.34	Peak
4	0.994	39.67	0.08	39.75	56.00	-16.25	Peak
5	1.071	39.95	0.08	40.03	56.00	-15.97	Peak
6	7.137	44.56	0.31	44.87	60.00	-15.13	Peak

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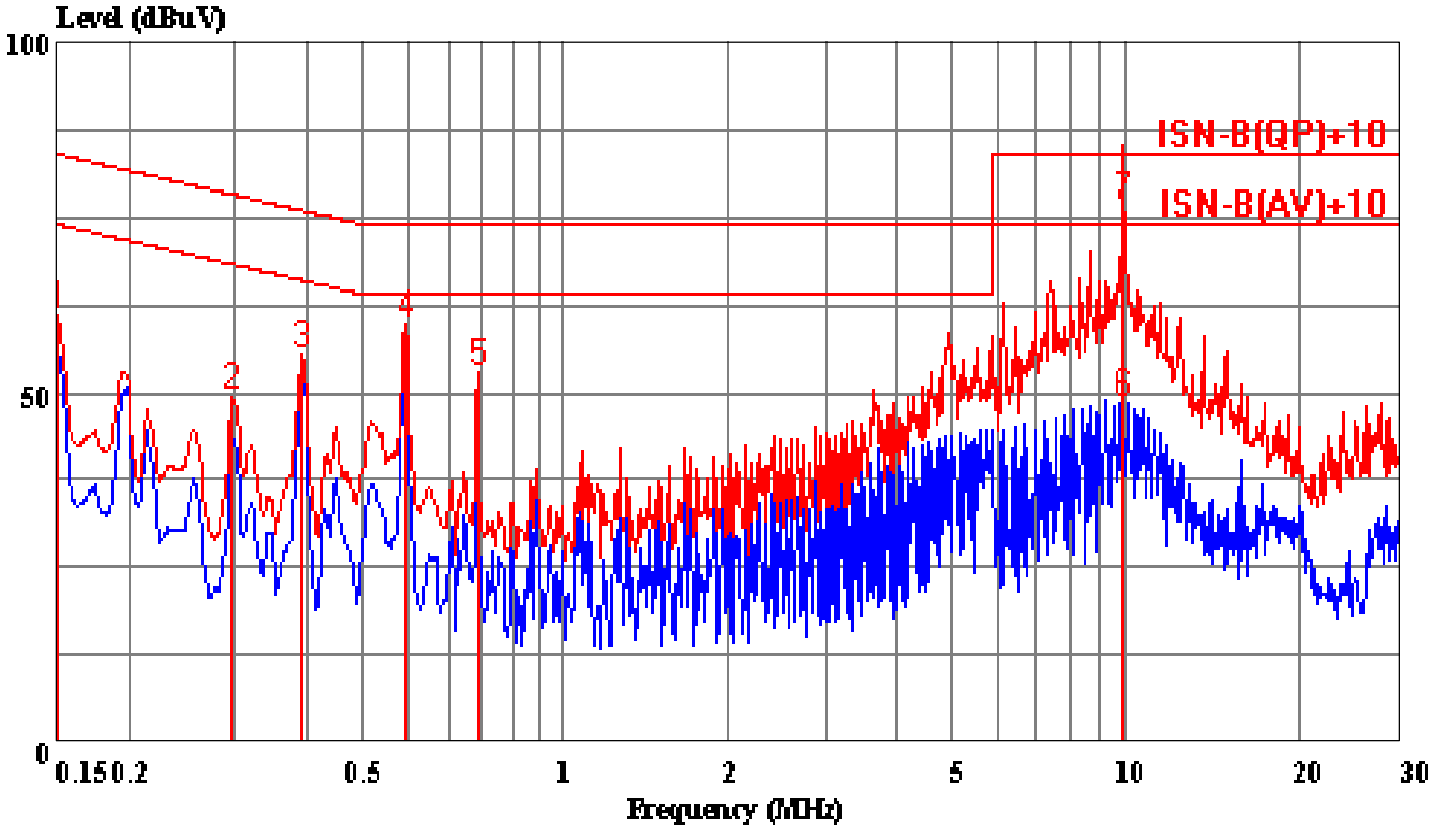
Data#: 43 File#: 9672e.EMI Date: 2001-08-07 Time: 11:04:51



(CES Conducted)

Trace: 37 38 Ref Trace:

Condition: Common Mode
Report No. : 01E9672
Test Engr. : JAMES LIAO
Company   : AAEON TECHNOLOGY INC.
EUT   : PCM-6898(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN55022 CLASS B W/ LIMIT+10dB(6-30MHz)
Mode of Op. : Lan Port(RJ45)/10M(Worst)
            : Red Trace(Peak), Blue Trace(Average)

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.150	51.47	9.52	60.99	84.00	-23.01	Peak
2	0.299	39.79	9.52	49.31	78.28	-28.97	Peak
3	0.393	45.77	9.55	55.32	75.99	-20.67	Peak
4	0.595	49.99	9.56	59.55	74.00	-14.45	Peak
5	0.788	43.31	9.57	52.88	74.00	-21.12	Peak
6	9.966	38.75	9.84	48.59	74.00	-25.41	Average
7	10.000	66.98	9.84	76.82	84.00	-7.18	QP

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Data#: 9 File#: 9462d.EMI Date: 2001-08-06 Time: 10:10:49
CCS D-Site

Condition: VERTICAL
Report No. : 01E9672
Test Engr. : JAMES LIAO
Company : AAEON TECHNOLOGY INC.
EUT : PCM-6898(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN 55022 CLASS B
Mode of Op. : NORMAL MODE

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	133.256	29.78	-8.27	21.51	30.00	-8.49	Peak
2	184.283	31.25	-8.93	22.32	30.00	-7.68	Peak
3	199.994	35.72	-10.01	25.72	30.00	-4.29	Peak
4	366.428	29.83	-3.64	26.19	37.00	-10.81	Peak
5	399.978	31.50	-2.86	28.64	37.00	-8.36	Peak
6	497.422	31.20	-1.03	30.17	37.00	-6.83	Peak
7	533.445	32.47	-0.36	32.11	37.00	-4.89	Peak
8	663.117	29.12	2.26	31.38	37.00	-5.62	Peak
9	797.006	27.41	5.04	32.45	37.00	-4.55	Peak
10	930.161	24.04	7.38	31.42	37.00	-5.58	Peak

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Data#: 10 File#: 9462d.EMI Date: 2001-08-06 Time: 10:25:45
CCS D-Site

Condition: HORIZONTAL
Report No. : 01E9672
Test Engr. : JAMES LIAO
Company   : AAEON TECHNOLOGY INC.
EUT   : PCM-6898(N)
Test Config : EUT/ALL PERIPHERALS
Type of Test: EN 55022 CLASS B
Mode of Op. : NORMAL MODE

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	133.250	29.50	-8.27	21.23	30.00	-8.77	Peak
2	184.317	30.84	-8.93	21.91	30.00	-8.09	Peak
3	199.828	35.21	-10.01	25.21	30.00	-4.80	Peak
4	366.200	24.55	-3.64	20.91	37.00	-16.09	Peak
5	399.967	31.73	-2.86	28.87	37.00	-8.13	Peak
6	499.972	32.39	-1.01	31.38	37.00	-5.62	Peak
7	533.261	27.52	-0.38	27.14	37.00	-9.86	Peak
8	663.561	29.52	2.27	31.79	37.00	-5.21	Peak
9	797.189	26.55	5.04	31.59	37.00	-5.41	Peak
10	930.356	26.60	7.38	33.98	37.00	-3.02	Peak