



**CE EMC**

**TEST REPORT**

**For**

**P III Level CPU Card**

**Model: SOM-2366**

**Trade Name: ADVANTECH**

Issued for

**Advantech Co., Ltd.**

**No. 1, Alley 20, Lane 26, Rueiguang Road, Neihu District,  
Taipei 114, Taiwan, R.O.C.**

Issued by

**COMPLIANCE CERTIFICATION SERVICES INC.**

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# 1 TEST RESULT CERTIFICATION

**Applicant:** **Advantech Co., Ltd.**  
No. 1, Alley 20, Lane 26, Rueiguang Road,  
Neihu District, Taipei 114, Taiwan, R.O.C.

**Manufacturer:** **Advantech Co., Ltd.**  
No. 1, Alley 20, Lane 26, Rueiguang Road,  
Neihu District, Taipei 114, Taiwan, R.O.C.

**Equipment Under Test:** P III Level CPU Card

**Trade Name:** ADVANTECH

**Model:** SOM-2366

**Detailed EUT Description:** See Item 2 of this report

**Date of Test:** September 4 ~ 6, 2003

Applicable Standard	Class/Limit/Criterion	Test Result
EN 55022: 1998	Class B	No non-compliance noted
EN 61000-3-2:1995 + A1 + A2: 1998	Class A/ D	No non-compliance noted
EN 61000-3-3:1995	Limit	No non-compliance noted
<b>EN 55024:1998, including</b>		
IEC 61000-4-2: 2001	Criterion B	No non-compliance noted
IEC 61000-4-3: 1995	Criterion A	No non-compliance noted
IEC 61000-4-4: 1995	Criterion B	No non-compliance noted
IEC 61000-4-5: 1995	Criterion B	No non-compliance noted
IEC 61000-4-6: 1996	Criterion A	No non-compliance noted
IEC 61000-4-8: 1993	Criterion A	No non-compliance noted
IEC 61000-4-11: 1994	Criterion B/C/C	No non-compliance noted
<b>Deviation from Applicable Standard</b>		
None		

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in the EMC Directive 89/336/EMC and the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

**Approved by:**

Jonson Lee  
Director of Linkou Laboratory  
Compliance Certification Services Inc.

**Reviewed by:**

Jessie Wang  
Section Manager of Linkou Laboratory  
Compliance Certification Services Inc.



## 2 EUT DESCRIPTION

<b>Product</b>	P III Level CPU Card
<b>Trade Name</b>	ADVANTECH
<b>Model</b>	SOM-2366
<b>Housing Type</b>	N/A
<b>EUT Power Rating</b>	DCV from Power Supply of Host PC

### I/O Port of EUT

<b>I/O PORT TYPES</b>	<b>Q'TY</b>	<b>TESTED WITH</b>
1. Parallel Port	1	1
2. Serial Port	1	1
3. Video-Out Port (VGA)	1	1
4. PS/2 Keyboard Port	1	1
5. PS/2 Mouse Port	1	1
6. Audio In Port	1	1
7. Audio Out Port	1	1
8. Microphone Port	1	1
9. USB Port	2	2
10. LAN Port	1	1



### 3 TEST METHODOLOGY

#### 3.1 EUT SYSTEM OPERATION

1. EUT was installed at internal of PC.
2. EMI test program (file name: EMCTEST. EXE) was loaded and executed in “Window 98” mode.
3. Data was sent to monitor and filling the screen with upper case of “H” patterns.
4. Test program sequentially exercised all related I/O’s and accessories of Host PC (included EUT), and sent “H” patterns to all applicable output ports of Host PC (included EUT).
5. Repeat 3 to 4.

*Note: Test program is self-repeating throughout the test.*

#### 3.2 DECISION OF FINAL TEST MODE

1. The following test mode was scanned during the preliminary test:

**Mode 1**

1280\*1024 Resolution

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Mode 1

Then, the EUT configuration and cable configuration of the above highest emission mode was chosen for all final test items.



## 4 SETUP OF EQUIPMENT UNDER TEST

### Setup Diagram

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### Support Equipment

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	Monitor	959NF	AQ19H2RT706137Y	FCC DoC	SAMSUNG	Shielded, 1.8m with cores	Unshielded, 1.8m
2	Modem	DM-1414	0304012270	IFAXDM1414	ACEEX	Unshielded, 1.2m	N/A
3	Printer	STYLUS C60	DR3K041995	FCC DoC	EPSON	Unshielded, 1.8m	N/A
4	PS/2 Keyboard	Y-SP29	SYU30272826	FCC DoC	Logitech	Shielded, 1.6m	N/A
5	PS/2 Mouse	MO19UCA	020440967	FCC DoC	HP	Shielded, 1.8m	N/A
6	USB Mouse	MO19UCA	020509282	FCC DoC	HP	Shielded, 1.8m	N/A
7	USB Mouse	MO19UCA	020509264	FCC DoC	HP	Shielded, 1.8m	N/A
8	Walkman	N/A	N/A	N/A	N/A	N/A	N/A
9	Earphone + Microphone	Axis-301	N/A	N/A	Labtec	Shielded, 1.8m	N/A
<b>PC Configuration</b>							
FDD Manufacturer	TEAC		Model		FD-235HF		
HDD Manufacturer	Quantum		Model		3.5 SERIES		
CD-ROM Manufacturer	TEAC		Model		CD-40E		
Mother Board Manufacturer	ADVANTECH		Model		SOM-DV20003A1		
Power Supply Manufacturer	Seventeam		Model		St-250AR		

**Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

**Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.



## **5 FACILITIES AND ACCREDITATIONS**

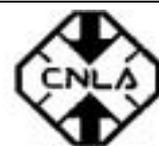
### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at CCS Taiwan Linkou Lab at No. 81-1, Lane 210, Bade Rd., 2, Luchu Hsiang, Taoyuan Hsien, Taiwan, R.O.C.

The measurement facilities are constructed in conformance with the requirements of CISPR 16-1, ANSI C63.4 and other equivalent standards.

## 5.2 LABORATORY ACCREDITATIONS AND LISTINGS

The test facilities used to perform Electromagnetic compatibility tests are registered or accredited by the organizations listed in the following table which includes the recognized scope specifically.

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP	EN 55011, EN 55014-1, AS/NZS 1044, CNS 13783-1, EN 55022, CNS 13438, EN 61000-3-2, EN 61000-3-3, ANSI C63.4, FCC OST/MP-5, AS/NZS 3548 IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11	 200600-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	 93105, 90471
Japan	VCCI	3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements	 R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328-2, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	 ELA 124a ELA 124b ELA 124c
Taiwan	CNLA	EN 300 328-1, EN 300 328-2, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS 3548, CNS 13022-1, IEC 1000-4-3/4/5/6/8/11, CNS 13022-2/3	 0363 ILAC MRA
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	 SL2-IS-E-0014 / IN-E-0014 /A1-E-0014 /R1-E-0014 /R2-E-0014 /L1-E-0014
Canada	Industry Canada	RSS212, Issue 1	 IC 3991-3 IC 3991-4

*Note: No part of this report may be used to claim or imply product endorsement by CNLA, NVLAP or other government agency.*



## 6 INSTRUMENT AND CALIBRATION

### 6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 6.2 TEST AND MEASUREMENT EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective manual.

#### Equipment Used for Emission Measurement

Conducted Emission Test Site # 4					
EQUIPMENT	MFR	MODEL	SERIAL NUMBER	LAST CAL.	CAL. DUE
EMI Test Receiver	R&S	ESCS30	845552/030	02/18/2003	02/17/2004
LISN	R&S	ENV 4200	830326/016	03/05/2003	03/04/2004
LISN	EMCO	3825/2	9003/1382	02/26/2003	02/25/2004
2X2 WIRE ISN	R&S	ENY22	100020	06/28/2003	06/27/2004
FOUR WIRE ISN	R&S	ENY41	100006	06/28/2003	06/27/2004

*Note: The measurement uncertainty is less than +/- 2.83dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*



Open Area Test Site # 4					
EQUIPMENT	MFR	MODEL	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	ADVANTEST	R3132	91700456	N/A	N/A
EMI Test Receiver	R&S	ESVS10	846285/016	04/11/2003	04/10/2004
Bilog Antenna	CHASE	CBL 6112B	2462	01/11/2003	01/10/2004
Turn Table	Chance most	N/A	N/A	N.C.R	N.C.R
Antenna Tower	Chance most	N/A	N/A	N.C.R	N.C.R
Controller	Chance most	N/A	N/A	N.C.R	N.C.R
RF Switch	ANRITSU	MP59B	M51067	N.C.R	N.C.R
Site NSA	C&C Lab.	N/A	N/A	08/9/2003	08/08/2004
Thermo-Hygro Meter	SATO	N/A	SITE4	05/13/2003	05/12/2004

*Note: The measurement uncertainty is less than +/- 3.36dB, which is evaluated as per the NAMAS NIS 81 and CISPR A/291/CDV.*

Power Harmonic & Voltage Fluctuation/Flicker Test Site (EN 61000-3-2&-3-3)					
EQUIPMENT	MFR	MODEL	SERIAL NUMBER	LAST CAL.	CAL DUE.
Harmonic & Flicker Tester	HAEFELY TRENCH	PHF555	080 419-25	10/14/2002	10/13/2003

### Equipment Used for Immunity Measurement

ESD Test Site (EN 61000-4-2)					
EQUIPMENT	MFR	MODEL	SERIAL NUMBER	LAST CAL.	CAL DUE.
ESD Generator	EM TEST	P30C	0603-01	02/27/2003	02/26/2004

Radiated Electromagnetic Field Immunity Test Site (EN 61000-4-3)					
EQUIPMENT	MFR	MODEL	SERIAL NUMBER	LAST CAL.	CAL DUE.
S.G.	R&S	SMY02	100094	08/06/2003	08/05/2004
Power Amplifier	AR	150W1000	300300	N/A	N/A
Power Antenna	EMCO	93141	9712-1083	N/A	N/A



<b>Fast Transients/Burst Test Site (EN 61000-4-4)</b>					
<b>EQUIPMENT</b>	<b>MFR</b>	<b>MODEL</b>	<b>SERIAL NUMBER</b>	<b>LAST CAL.</b>	<b>CAL DUE.</b>
Fast Transients/Burst Generator	HAEFELY TRENCH	PEFT-JUNIOR	583 333-117	08/20/2003	08/19/2004
Clamp	HAEFELY TRENCH	093 506.1	080 421.13	N/A	N/A

<b>Surge Immunity Test Site (EN 61000-4-5)</b>					
<b>EQUIPMENT</b>	<b>MFR</b>	<b>MODEL</b>	<b>SERIAL NUMBER</b>	<b>LAST CAL.</b>	<b>CAL DUE.</b>
Surge Tester	HAEFELY TRENCH	PSUGER 4010	583 334-71	08/20/2003	08/19/2004
CDN	HAEFELY TRENCH	IP6.2	148342	N/A	N/A
CDN	HAEFELY TRENCH	DEC1A	148050	N/A	N/A

<b>Conducted Immunity Test Site (EN 61000-4-6)</b>					
<b>EQUIPMENT</b>	<b>MFR</b>	<b>MODEL</b>	<b>SERIAL NUMBER</b>	<b>LAST CAL.</b>	<b>CAL DUE.</b>
S.G.	R&S	SMY02	100094	08/06/2003	08/05/2004
Power Amplifier	AR	500A100A	300299	N/A	N/A
CDN	Lüthi	801-M3	1879	02/26/2003	02/25/2004
CDN	MEB	M2	A3002010	04/28/2003	04/27/2004
CDN	SCHAFFNER	T400	16906	10/17/2002	10/16/2003

<b>Power Frequency Magnetic Field Immunity Test Site (EN 61000-4-8)</b>					
<b>EQUIPMENT</b>	<b>MFR</b>	<b>MODEL</b>	<b>SERIAL NUMBER</b>	<b>LAST CAL.</b>	<b>CAL DUE.</b>
TRIAX ELF Magnetic Field Meter	F.W.BELL	4090	9711	10/21/2002	10/20/2003
Magnetic Field Tester	HAEFELY TRENCH	MAG 100.1	080 938-01	N/A	N/A

<b>Voltage Dips/Short Interruption and Voltage Variation Immunity Test Site (EN 61000-4-11)</b>					
<b>EQUIPMENT</b>	<b>MFR</b>	<b>MODEL</b>	<b>SERIAL NUMBER</b>	<b>LAST CAL.</b>	<b>CAL DUE.</b>
Dips/Interruption and Variations Simulator	HAEFELY TRENCH	PLINE 1610	080 344-05	03/28/2003	03/27/2004



## 7 LINE CONDUCTED & RADIATED EMISSION TEST

### 7.1 LIMIT

#### Maximum permissible level of Line Conducted Emission

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

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

#### Maximum permissible level of Common Mode Conducted Emission (Telecommunication Ports)

##### CLASS A

FREQUENCY (MHz)	Voltage Limit (dBuV)		Current Limit (dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	97 - 87	84 - 74	53 - 43	40 - 30
0.5 - 30.0	87	74	43	30

##### CLASS B

FREQUENCY (MHz)	Voltage Limit (dBuV)		Current Limit (dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	84 - 74	74 - 64	40 - 30	30 - 20
0.5 - 30.0	74	64	30	20

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

#### Maximum permissible level of Radiated Emission measured at 10 meter

FREQUENCY (MHz)	Class A (dBuV/m)	Class B (dBuV/m)
	Quasi-peak	Quasi-peak
30 - 230	40	30
230 - 1000	47	37

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



## **7.2 TEST PROCEDURE OF LINE CONDUCTED EMISSION**

### **Procedure of Preliminary Test**

- The EUT was set up as per the test configuration to simulate typical 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.
- Support equipment, if needed, was placed as per EN 55022.
- All I/O cables were positioned to simulate typical actual usage as per EN 55022.
- The test equipment EUT installed received AC power, 230V/50Hz, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipment received power from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.2 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.2 producing the highest emission level.
- The EUT configuration and cable configuration of the above highest emission level were recorded for reference of the final test.

### **Procedure of Final Test**

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- 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 Average limit in Q.P. mode, then the emission signal was re-checked using an Average detector.
- The test data of the worst-case condition(s) was recorded.



Data Sample:

Freq. MHz	Q.P. Raw dBuV	Average Raw dBuV	Q.P. Limit dBuV	Average Limit dBuV	Q.P. Margin dB	Average Margin dB	Note
x.xx	43.95	---	56.00	46.00	-12.05	---	L1

- Freq. = Emission frequency in MHz
- Raw dBuV = Uncorrected Analyzer/Receiver reading + Insertion loss of LISN, if it > 0.5 dB
- Limit dBuV = Limit stated in standard
- Margin dB = Reading in reference to limit
- Note = Current carrying line of reading
- “---“ = The emission level complied with the Average limits, with at least 2dB margin limits, so no further recheck.

**Calculation Formula**

$$\text{Margin (dB)} = \text{RAW (dBuV)} - \text{Limit (dBuV)}$$

**7.3 TEST PROCEDURE OF COMMON MODE CONDUCTED EMISSION FOR TELECOMMUNICATION PORT**

- Selecting ISN for unscreened cable or a current probe for screened cable to take measurement.
- The port of the EUT was connected to the remote side support equipment through the ISN/Current Probe and communication in normal condition.
- 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.
- 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.
- In case of measuring on the screened cable, the current limit shall be applied, otherwise the voltage limit should be applied.
- The following test mode was scanned during the preliminary test:

**Mode 1**  
10/100 Mbps

- After the preliminary scan, we found the following test mode(s) producing the highest emission level and test data of the worst case was recorded.

Mode 1



**Data Sample:**

Freq. (MHz)	Q.P. Raw (dBuV)	AV. Raw (dBuV)	Q.P. Limit (dBuV)	AV. Limit (dBuV)	Q.P. Margin (dB)	AV. Margin (dB)	Note
x.xx	43.95	---	87.00	74.00	-43.05	---	---

- Freq.: Emission frequency
- Raw: Uncorrected Analyzer / Receiver reading
- Limit: Limit stated in standard
- Margin: Reading in reference to limit
- Note: Current carrying line of reading
- “-“: The emission level complied with the Average limits, with at least 2 dB margin, so no further recheck.

**7.4 TEST PROCEDURE OF RADIATED EMISSION**

**Procedure of Preliminary Test**

- The equipment was set up as per the test configuration to simulate typical 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. 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.
- Support equipment, if needed, was placed as per EN 55022.
- All I/O cables were positioned to simulate typical usage as per EN 55022.
- The EUT received AC power source, 230V/50Hz, from the outlet socket under the turntable. All support equipment received power from another socket under the turntable.
- The antenna was placed at 10 meter away from the EUT as stated in EN 55022. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- 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.
- The test mode(s) described in Item 3.2 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.2 producing the highest emission level.
- The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.



**Procedure of Final Test**

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- 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.
- 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 Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.

**Data Sample:**

Freq. (MHz)	Raw Data (dBuV)	Corr. Factor (dB/m)	Emiss. Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
xx.xx	14.00	12.20	26.20	30.00	-3.80

- Freq. = Emission frequency in MHz
- Raw Data (dBuV) = Uncorrected Analyzer / Receiver reading
- Corr. Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
- Emiss. Level (dBuV/m) = Raw reading converted to dBuV/m and CF added
- Limit (dBuV/m) = Limit stated in standard
- Margin (dB) = Reading in reference to limit
- P = Peak Reading
- Q = Quasi-peak Reading
- A = Average Reading

**Calculation Formula**

Margin (dB) = Emiss. Level (dBuV/m) – Limits (dBuV/m)

Emission Level (dBuV/m) = Raw Data (dBuV) + Corr. Factor (dB/m)



### 7.5 TEST RESULTS

#### Line Conducted Emission

**Model:** SOM-2366

**Test Mode:** 1

**Temperature:** 29 °C

**Humidity:** 64% RH

**Test Results:** Pass

**Tested by:** Michael Chen

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

FREQ MHz	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.150	47.40	---	66.00	56.00	-18.60	---	L1
1.030	30.50	---	56.00	46.00	-25.50	---	L1
3.590	27.10	---	56.00	46.00	-28.90	---	L1
6.690	29.20	---	60.00	50.00	-30.80	---	L1
16.230	34.00	---	60.00	50.00	-26.00	---	L1
17.940	32.30	---	60.00	50.00	-27.70	---	L1
0.150	45.90	---	66.00	56.00	-20.10	---	L2
1.030	30.50	---	56.00	46.00	-25.50	---	L2
3.600	25.40	---	56.00	46.00	-30.60	---	L2
4.860	27.20	---	56.00	46.00	-28.80	---	L2
16.230	33.10	---	60.00	50.00	-26.90	---	L2
18.370	32.80	---	60.00	50.00	-27.20	---	L2

L1 = Line One (Hot side) / L2 = Line Two (Neutral side)

**NOTE:** “---” denotes the emission level was or more than 12dB below the Average limit, so no re-check anymore.



**Common Mode Conducted Emission**

**Model:** SOM-2366

**Test Mode:** 1

**Temperature:** 26 °C

**Humidity:** 67% RH

**Test Results:** Pass

**Tested by:** George Kuo

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

FREQ MHz	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
16.228	68.50	---	84.00	74.00	-15.50	---	10Base
19.709	69.30	---	84.00	74.00	-14.70	---	10Base
23.129	72.20	69.10	84.00	74.00	-11.80	-4.90	10Base
26.610	69.30	---	84.00	74.00	-14.70	---	10Base
27.160	68.70	---	84.00	74.00	-15.30	---	10Base
28.686	68.20	---	84.00	74.00	-15.80	---	10Base
5.055	56.70	---	74.00	64.00	-17.30	---	100Base
6.250	64.70	---	84.00	74.00	-19.30	---	100Base
7.554	65.00	---	84.00	74.00	-19.00	---	100Base
10.000	58.30	---	84.00	74.00	-25.70	---	100Base
11.251	60.20	---	84.00	74.00	-23.80	---	100Base
15.000	55.50	---	84.00	74.00	-28.50	---	100Base

**NOTE:**

1. “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.
2. According to Note 3 on table 4 of EN 55022: 1998 standard, the Limits allowed to relaxation of 10dB over at frequency range 6 MHz to 30MHz.



**Radiated Emission (A)**

**Model:** SOM-2366

**Test Mode:** Mode 1

**Temperature:** 29°C

**Detector Function:** Quasi-peak.

**Humidity:** 60% RH

**Antenna:** Vertical at 10m

**Test Results:** Pass

**Tested by:** Arno Hsieh

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

Freq. (MHz)	Raw Data (dBuV)	Corr. Factor (dB/m)	Emiss. Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
147.07	10.1	13.9	24.0	30.0	-6.0
198.00	15.0	12.7	27.7	30.0	-2.3
298.64	6.1	18.0	24.1	30.0	-12.9
364.80	13.2	18.9	32.1	37.0	-4.9
432.60	4.2	21.2	25.4	37.0	-11.6
531.20	3.1	24.4	27.5	37.0	-9.5



**Radiated Emission (B)**

**Model:** SOM-2366

**Test Mode:** Mode 1

**Temperature:** 29°C

**Detector Function:** Quasi-peak.

**Humidity:** 60% RH

**Antenna:** Horizontal at 10m

**Test Results:** Pass

**Tested by:** Arno Hsieh

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

Freq. (MHz)	Raw Data (dBuV)	Corr. Factor (dB/m)	Emiss. Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
165.88	10.0	13.1	23.1	30.0	-6.9
228.33	7.8	13.3	21.1	30.0	-8.9
232.15	13.1	13.9	27.0	37.0	-10.0
298.91	9.4	18.0	27.4	37.0	-9.6
433.51	9.3	21.2	30.5	37.0	-6.5
570.71	4.6	24.8	29.4	37.0	-7.6



## 8 POWER HARMONICS TEST

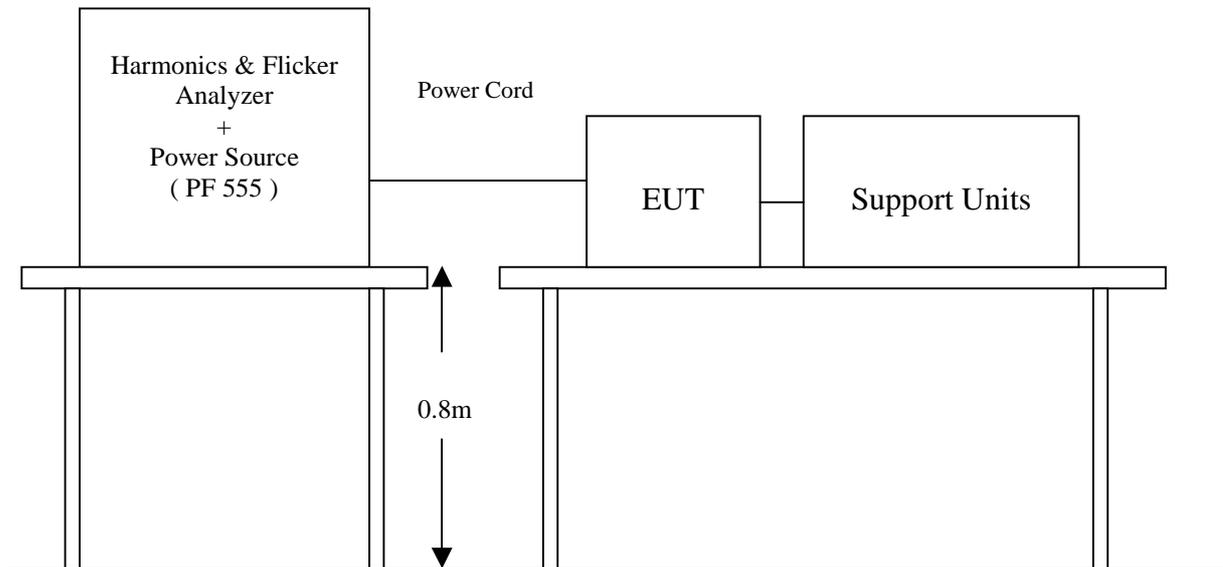
**Port** : AC mains  
**Basic Standard** : EN 61000-3-2 (1995 + A1 + A2: 1998)  
**Limits** :  CLASS A ;  CLASS D  
**Tested by** : Michael Chen  
**Temperature** : 27°C  
**Humidity** : 56% RH

### Limit:

Limits for Class A equipment	
Harmonics Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15x15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23x8/n

Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd Harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15<=n<=39	3.85/n	0.15x15/n

**Block Diagram of Test Setup:**



**Test Procedure:**

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- b. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

**Test Result :** (See Appendix II for details)

<input checked="" type="checkbox"/> <b>PASS</b> <input type="checkbox"/> <b>FAIL</b>
--

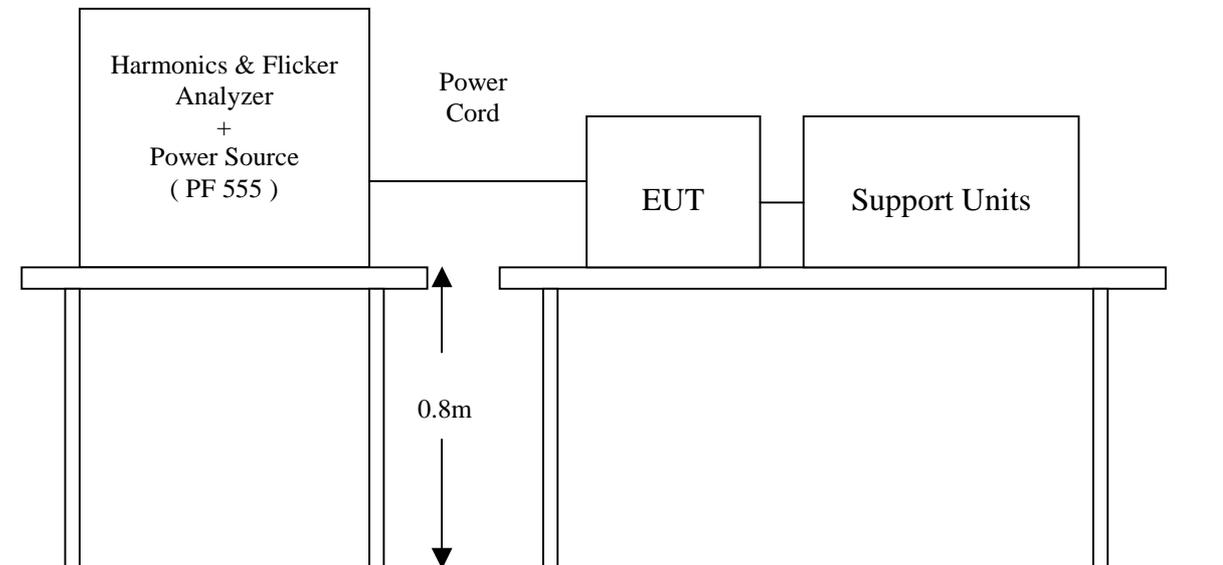
## 9 POWER VOLTAGE FLUCTUATION / FLICKER TEST

**Port** : AC mains  
**Basic Standard** : EN 61000-3-3 (1995)  
**Limits** : §5 of EN 61000-3-3  
**Tested by** : Michael Chen  
**Temperature** : 27°C  
**Humidity** : 56%

**Limit:**

TEST ITEM	LIMIT	REMARK
$P_{st}$	1.0	$P_{st}$ means short-term flicker indicator.
$P_{lt}$	0.65	$P_{lt}$ means long-term flicker indicator.
$T_{dt}$ (ms)	200	$T_{dt}$ means maximum time that dt exceeds 3 %.
$d_{max}$ (%)	4%	$d_{max}$ means maximum relative voltage change.
dc (%)	3%	dc means relative steady-state voltage change

**Block Diagram of Test Setup:**





**Test Procedure:**

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
- b. During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

**Test Result 1:** (See Appendix II for details)

\* Continue

TEST PARAMETER	MEASUREMENT VALUE	LIMIT	RESULT
P <sub>st</sub>	0.001	1.0	Pass
P <sub>lt</sub>	0.001	0.65	Pass
T <sub>dt</sub> (ms)	0.003	200	Pass
d <sub>max</sub> (%)	0.002%	4%	Pass
dc (%)	0.003 %	3%	Pass

**Test Result 2:** (See Appendix II for details)

\* Manualswitch

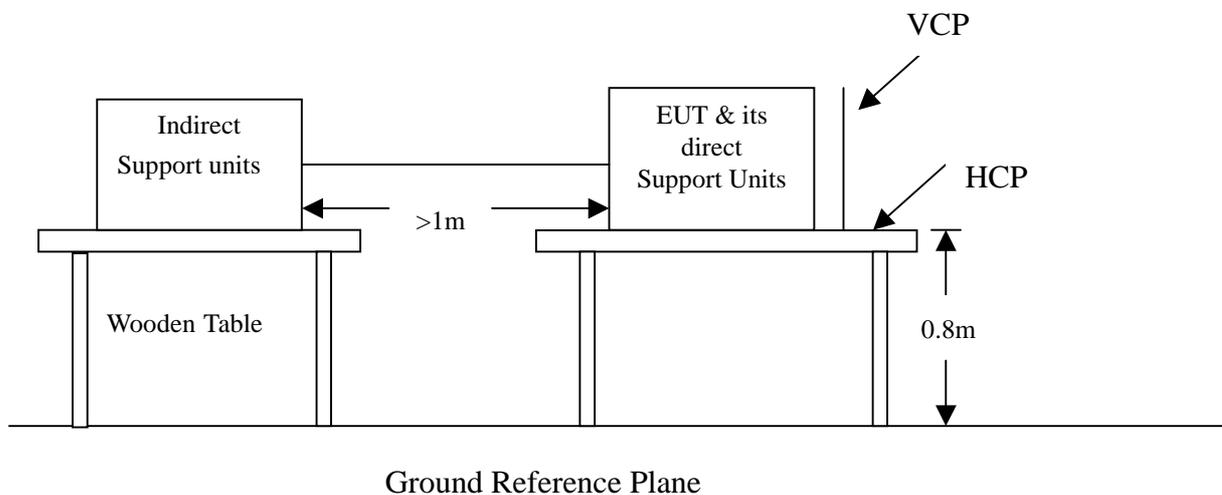
TEST PARAMETER	MEASUREMENT VALUE	LIMIT	RESULT
P <sub>st</sub>	0.042	1.0	Pass
P <sub>lt</sub>	0.042	0.65	Pass
T <sub>dt</sub> (ms)	0.009	200	Pass
d <sub>max</sub> (%)	0.009%	4%	Pass
dc (%)	0.009%	3%	Pass

## 10 ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

<b>Port</b>	: Enclosure
<b>Basic Standard</b>	: IEC/EN 61000-4-2
<b>Test Level</b>	: $\pm 8$ kV (Air Discharge) $\pm 4$ kV (Contact Discharge) $\pm 4$ kV (Indirect Discharge)
<b>Performance Criterion</b>	: B (Standard Required)
<b>Tested by</b>	: George Kuo
<b>Temperature</b>	: 26°C
<b>Humidity</b>	: 54%
<b>Pressure</b>	: 1018mbar

### Block Diagram of Test Setup:

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





**Test Procedure:**

1. The Host PC (included EUT) was located 0.1 m minimum from all side of the HCP.
2. The indirect support units were located 1m minimum away from the EUT, but direct support unit was/ were located at same location as EUT on the HCP and keep at a distance of 10 cm with EUT.
3. A scroll 'H' test program was loaded and executed in Windows 2000 mode.
4. The Host PC (included EUT) sent above message to monitor and related peripherals through the test.
5. Active the communication function if the EUT with such port(s).
6. 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.
7. 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.
8. The application of ESD to the contact of open connectors is not required.
9. The Host PC (included EUT) direct connection units also need to be applied ESD at the port of EUT cable connected
10. Putting a mark on EUT to show tested points. The following test condition was followed during the tests.

**Note:** As per IEC/EN 61000-4-2, two 470k bleed resistors cable is connected between the EUT and HCP during the test applicable for power ungrounded or battery operating unit only.

The electrostatic discharges were applied as follows:

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

**\*\*For the tested points to EUT, please refer to attached page.**  
(Blue arrow mark for Contact Discharge and red arrow mark for Air Discharge)



*The Tested Points of EUT*





**Performance & Result:**

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

**PASS**       **FAIL**

**Observation:** No function degraded during the tests.

## 11 RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

**Port** : Enclosure

**Basic Standard** : IEC/EN 61000-4-3

**Requirements** : 10 V/m / with 80% AM. 1kHz Modulation.  
(Customer Requested)

**Performance Criterion** : A (Standard Required)

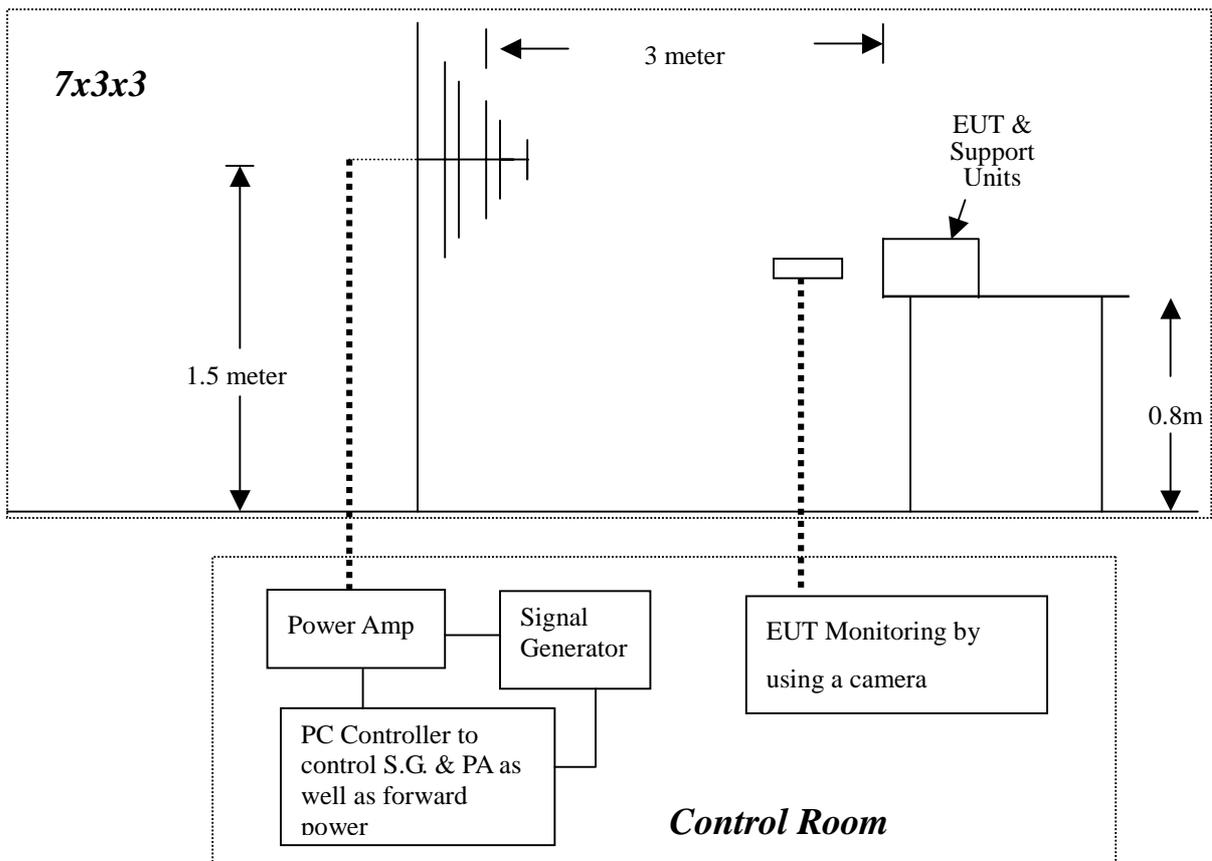
**Tested by** : George Kuo

**Temperature** : 26°C

**Humidity** : 54%

**Pressure** : 1018mbar

### Block Diagram of Test Setup:





**Test Procedure:**

1. The Host PC (included EUT) was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with Host PC (included EUT) were exposed to the calibrated field as per IEC/EN 61000-4-3.
2. Set the testing parameters of RS test software per IEC/EN 61000-4-3.
3. Performed the pre-test at each side of Host PC (included EUT) with double specified level (6V/m) at 4% steps.
4. From the result of pre-test in step 3, choice the worst side of Host PC (included EUT) for final test from 80 MHz to 1000 MHz at 1% steps.
5. Recorded the test result in following table.

**Preliminary test conditions:**

Test level : 10V/m  
 Steps : 1 % of fundamental  
 Dwell Time : 3 sec

Range (MHz)	Field	Modulation	Polarity	Position	Result (Pass/Fail)
80-1000	10V/m	Yes	H	Front	Pass
80-1000	10V/m	Yes	V	Front	Pass
80-1000	10V/m	Yes	H	Right	Pass
80-1000	10V/m	Yes	V	Right	Pass
80-1000	10V/m	Yes	H	Back	Pass
80-1000	10V/m	Yes	V	Back	Pass
80-1000	10V/m	Yes	H	Left	Pass
80-1000	10V/m	Yes	V	Left	Pass



**Performance & Result:**

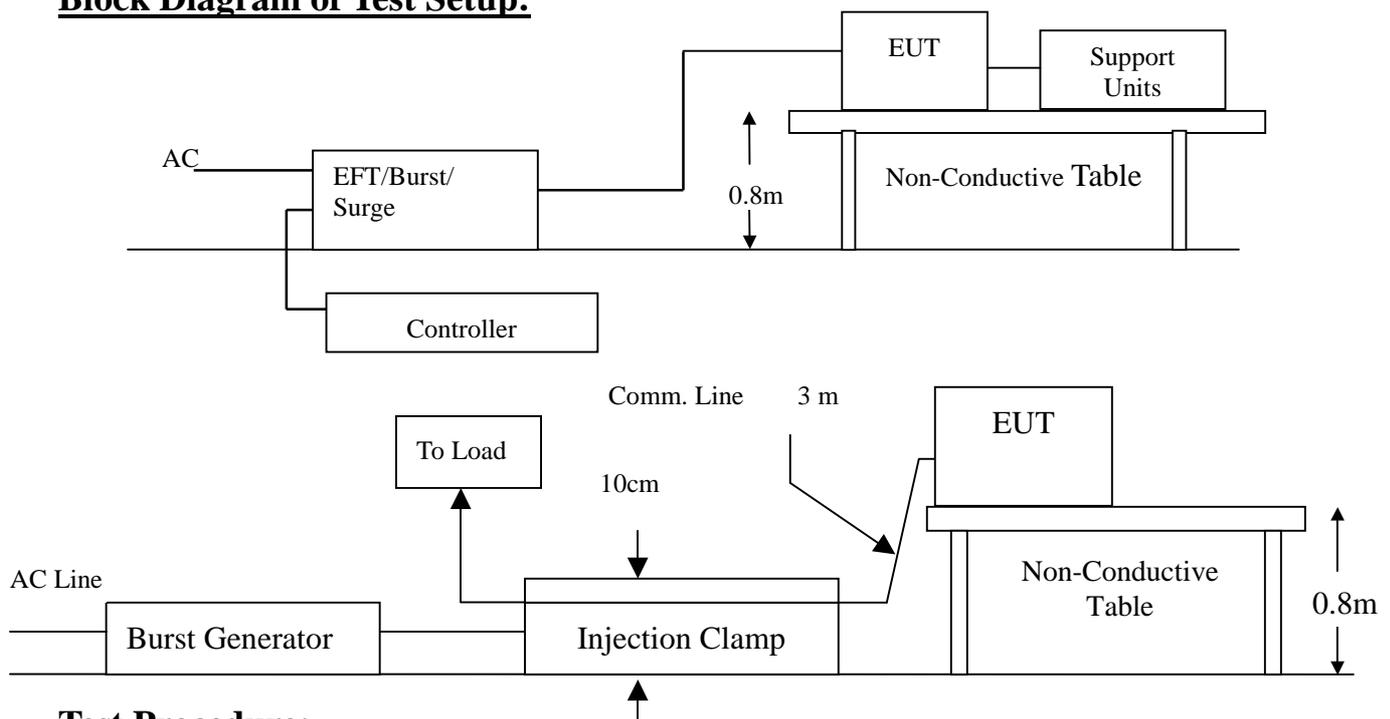
- Criterion A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
  
- Criterion 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.
  
- Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

<input checked="" type="checkbox"/> <b>PASS</b> <input type="checkbox"/> <b>FAIL</b>
<b>Observation:</b> No function degraded during the tests.

## 12 FAST TRANSIENTS/BURST IMMUNITY TEST

<b>Port</b>	: On Power Supply Lines and Data cable
<b>Basic Standard</b>	: IEC/EN 61000-4-4
<b>Requirements</b>	: $\pm 1$ kV for Power Supply Line $\pm 0.5$ kV to LAN Cable
<b>Performance Criteria</b>	: B (Standard Required)
<b>Tested by</b>	: George Kuo
<b>Temperature</b>	: 26°C
<b>Humidity</b>	: 54%
<b>Pressure</b>	: 1018mbar

### Block Diagram of Test Setup:



### Test Procedure:

1. The Host PC (included 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 Host PC (included EUT) during the test.
3. The length of communication cable between communication port and clamp was keeping within 1 meter.
4. Injected test voltage to the Host PC (included EUT) ports from minimum to standard request or client request.
5. Recorded the test result as shown in following table.



**Test conditions:**

Impulse Frequency : 5kHz

Tr/Th : 5/50ns

Burst Duration : 15ms

Burst Period : 3Hz

Inject Line	Voltage kV	Inject Method	Result (Pass/Fail)
L	± 1	Direct	Pass
N	± 1	Direct	Pass
PE	± 1	Direct	Pass
L + N	± 1	Direct	Pass
L + PE	± 1	Direct	Pass
N + PE	± 1	Direct	Pass
L + N + PE	± 1	Direct	Pass
LAN Cable	± 0.5	Clamp	Pass

**Performance & Result:**

**Criterion 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.

**Criterion 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.

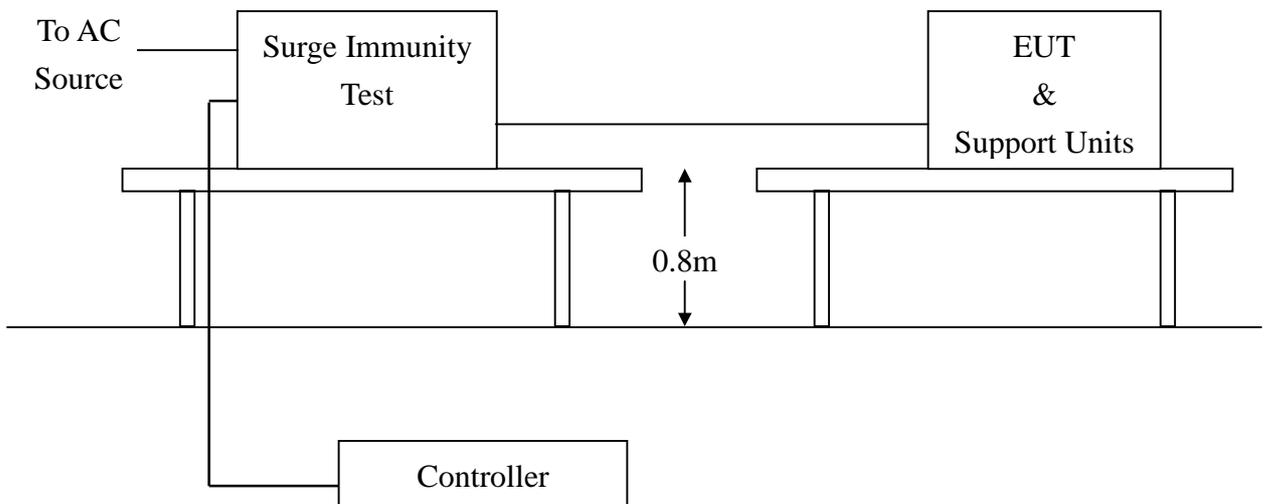
**Criterion C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

<input checked="" type="checkbox"/> <b>PASS</b> <input type="checkbox"/> <b>FAIL</b>
<b>Observation:</b> No function degraded during the tests.

## 13 SURGE IMMUNITY TEST

<b>Port</b>	: Power Cord
<b>Basic Standard</b>	: IEC/EN 61000-4-5
<b>Requirements</b>	: $\pm 1$ kV (Line to Line) $\pm 2$ kV (Line to Ground)
<b>Performance Criteria</b>	: B (Standard Required)
<b>Tested by</b>	: George Kuo
<b>Temperature</b>	: 26 °C
<b>Humidity</b>	: 54%
<b>Pressure</b>	: 1018 mbar

### Block Diagram of Test Setup:



### Test Procedure:

1. The Host PC (included EUT) and support units were located on a wooden table 0.8 m away from ground floor.
2. Injected test voltage to the Host PC (included EUT) ports from minimum to standard request or client request.
3. Recorded 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	1	Positive	Capacitive	Pass
L1-PE	2	Positive	Capacitive	Pass
L2-PE	2	Positive	Capacitive	Pass
L1-L2	1	Negative	Capacitive	Pass
L1-PE	2	Negative	Capacitive	Pass
L2-PE	2	Negative	Capacitive	Pass

**Performance & Result:**

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

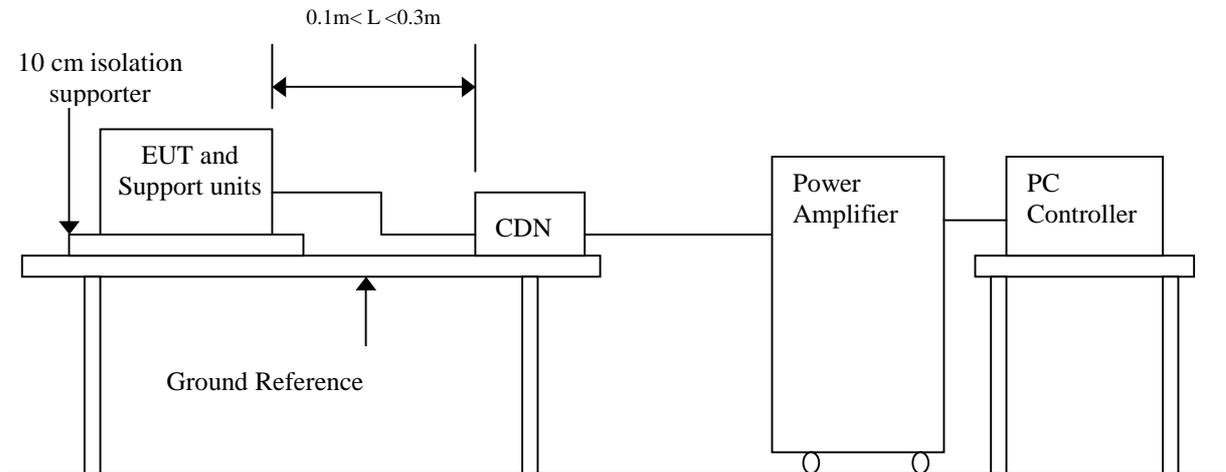
<input checked="" type="checkbox"/> <b>PASS</b> <input type="checkbox"/> <b>FAIL</b>
<b>Observation:</b> No function degraded during the tests.

## 14 CONDUCTED DISTURBANCE/INDUCED RADIO-FREQUENCY FIELD IMMUNITY TEST

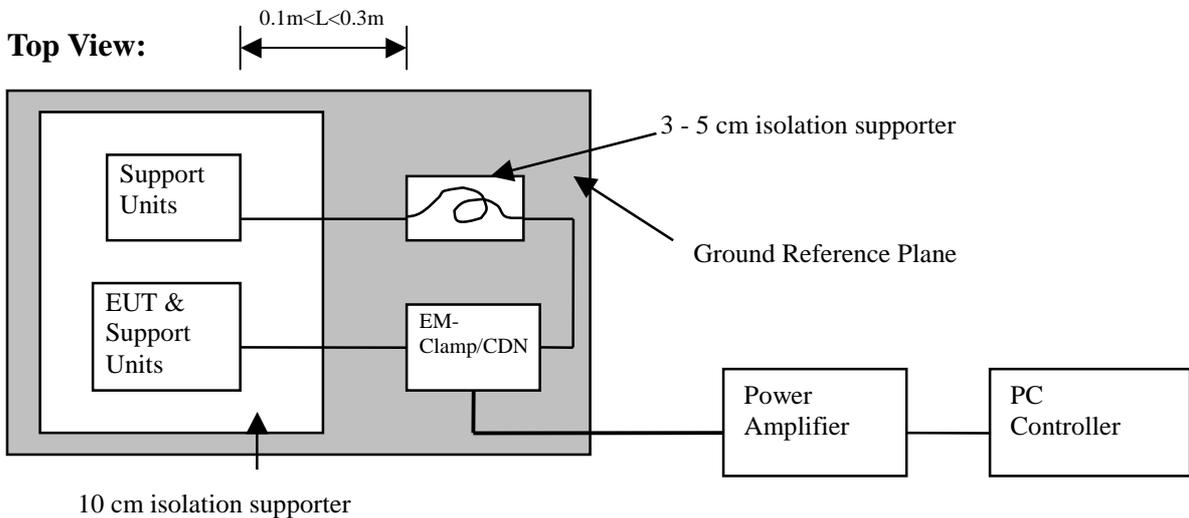
<b>Port</b>	: AC Port
<b>Basic Standard</b>	: IEC/EN 61000-4-6
<b>Requirements</b>	: 10 V, with 80% AM. 1kHz Modulation. (Customer Requested)
<b>Injection Method</b>	: CDN-M3 for Power Cord CDN-T4 for LAN Cable
<b>Performance Criterion</b>	: A (Standard Required)
<b>Tested by</b>	: George Kuo
<b>Temperature</b>	: 26 °C
<b>Humidity</b>	: 54%
<b>Pressure</b>	: 1018 mbar

### Block Diagram of Test Setup:

#### Side View:



#### Top View:





**Test Procedure:**

1. The Host PC (included 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. A 'H' messages were displayed on screen of Host PC (included EUT).
3. Adjusting the monitoring camera to monitor the 'H' message as clear as possible.
4. Setting the testing parameters of CS test software per IEC 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	10V	Yes	Pass

**Performance & Result:**

**Criterion 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.

**Criterion 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.

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

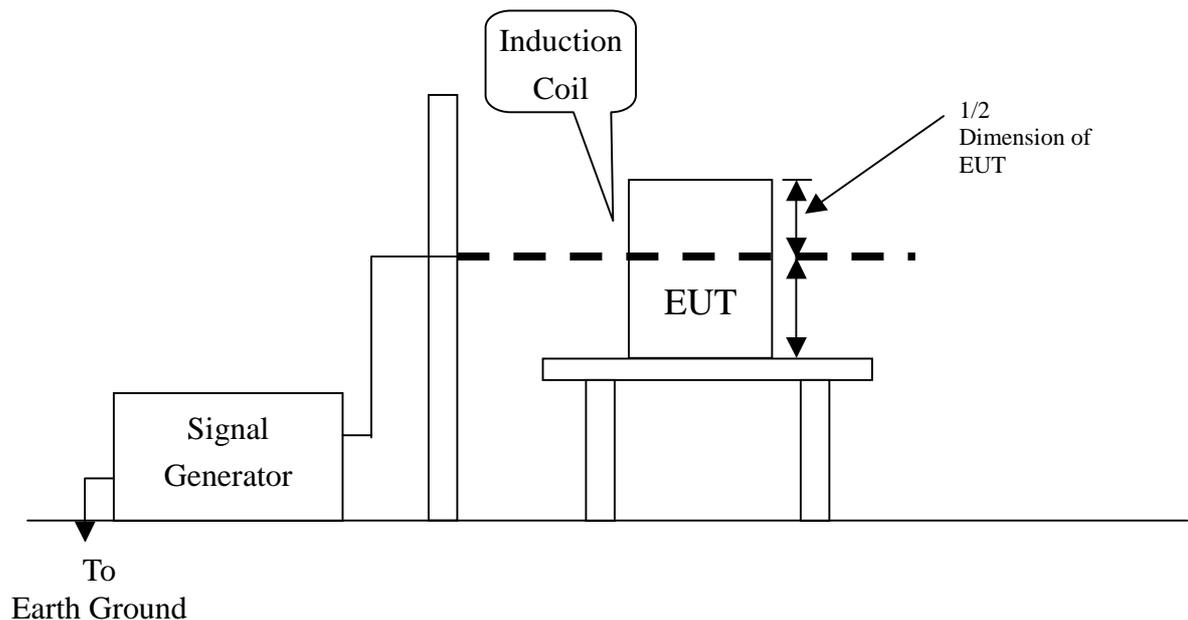
<input checked="" type="checkbox"/> <b>PASS</b> <input type="checkbox"/> <b>FAIL</b>
--

**Observation:** No function degraded during the tests.

## 15 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

<b>Port</b>	: Enclosure
<b>Basic Standard</b>	: IEC/EN 61000-4-8
<b>Requirements</b>	: 30 A/m (Customer Requested)
<b>Performance Criterion</b>	: A (Standard Required)
<b>Tested by</b>	: George Kuo
<b>Temperature</b>	: 26°C
<b>Humidity</b>	: 54%
<b>Pressure</b>	: 1018 mbar

### Block Diagram of Test Setup:



### Test Procedure:

1. The Host PC (included EUT) and support units were located on Ground Reference Plane with the interposition of a 0.1 m thickness insulation support.
2. Put the induction coil on horizontal direction. ( X direction )
3. Rotated the induction coil by 90° ( Y direction ).
4. Rotated the induction coil by 90° ( Z direction ).
5. Recorded the test result as shown in following table.



**Test conditions:**

Field Strength: 30A/m

Power Freq.: 50Hz

Orientation: X, Y, Z

Orientation	Field	Result (Pass/Fail)	Remark
X	30A/m	Pass	As the client's request
Y	30A/m	Pass	As the client's request
Z	30A/m	Pass	As the client's request

**Performance & Result:**

**Criterion 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.

**Criterion 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.

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

<input checked="" type="checkbox"/> <b>PASS</b> <input type="checkbox"/> <b>FAIL</b>
<p><b>Observation:</b> No function degraded during the tests.</p>

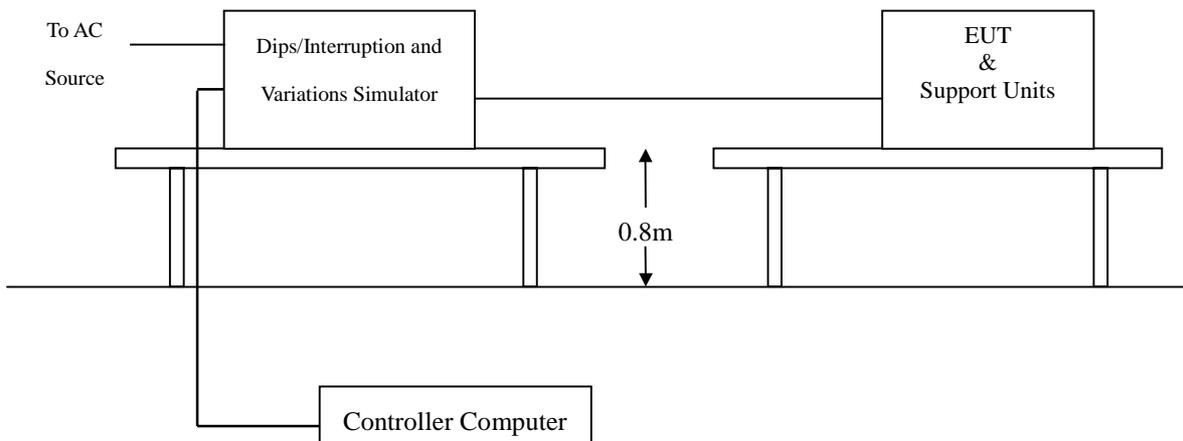
## 16 VOLTAGE DIPS / SHORT INTERRUPTIONS

**Port** : AC mains  
**Basic Standard** : IEC/EN 61000-4-11  
**Requirement** : PHASE ANGLE 0, 45, 90, 135, 180, 225, 270, 315 degrees  
**Test Interval** : Min. 10 sec.  
**Tested by** : George Kuo  
**Temperature** : 26 °C  
**Humidity** : 54%  
**Pressure** : 1018 mbar

Voltage Dips	Test Level % U <sub>T</sub>	Reduction (%)	Duration ( periods )	Performance Criterion
	<5	>95	0.5	B
	70	30	25	C

Voltage Interruptions	Test Level % U <sub>T</sub>	Reduction (%)	Duration ( periods )	Performance Criterion
	<5	>95	250	C

### Block Diagram of Test Setup:





**Test Procedure:**

1. The Host PC (included EUT) and support units were located on a wooden table, 0.8 m away from ground floor.
2. Set the parameter of tests and then performed the test software of test simulator.
3. Changed Condition to occur at 0 degree crossover point of the voltage waveform.
4. Recorded the test result in test record form.

**Test conditions:**

The duration with a sequence of three dips/interruptions with interval of 10 sec. minimum (Between each test event)

**Voltage Dips:**

Test Level % U <sub>T</sub>	Reduction (%)	Duration (periods)	Observation	Meet Performance Criterion
0	100	25	Normal	A
70	30	0.5	Normal	A

**Voltage Interruptions:**

Test Level % U <sub>T</sub>	Reduction (%)	Duration (periods)	Observation	Meet Performance Criterion
0	100	250	EUT shut down but can be recovered by manual, as the events disappear.	C

**Note:** "Normal" means no any functions degrade during and after the test.

**Performance & Result:**

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

<input checked="" type="checkbox"/> <b>PASS</b>	<input type="checkbox"/> <b>FAIL</b>
---	--------------------------------------

## APPENDIX I - PHOTOGRAPHS OF TEST SETUP

### LINE CONDUCTED EMISSION TEST (EN 55022)





**COMMON MODE CONDUCTED EMISSION**



**RADIATED EMISSION TEST (EN55022)**





## POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST



### ELECTROSTATIC DISCHARGE TEST



### ELECTROSTATIC DISCHARGE TEST





## RADIATED ELECTROMAGNETIC FIELD TEST



### FAST TRANSIENTS/BURST TEST (Power Line)



### FAST TRANSIENTS/BURST TEST (LAN Port)





## SURGE IMMUNITY TEST



**CONDUCTED DISTURBANCE, INDUCED BY RADIO-FREQUENCY FIELDS TEST (Power Line)**



**CONDUCTED DISTURBANCE, INDUCED BY RADIO-FREQUENCY FIELDS TEST (LAN Port)**



### **POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST**



### **VOLTAGE DIPS / INTERRUPTION TEST**





## APPENDIX II – TEST RESULT OF EN 61000-3-2/-3

-----  
EN 61000-3-2 TEST REPORT 2003/9/5 06:48 PM  
-----

Unit: P III Level Cpu Card

Model No.: SOM-2366

Remarks: Temp: 27 Humid: 56%

Operator: Michael Chen

=====

### TEST SETUP

-----

Test Freq.: 50.00 Hz. Test Voltage: 230.0 vac  
Waveform : SINE Test Time: 2.5 min.  
Classification : CLASS A Test Type: STEADY-STATE

Prog. Zo Enabled: YES Prog. Zo: 0.000

Motor Driven with Phase Angle Control: NO  
Impedance selected: DIRECT

Synthetic R+L Enabled: NO  
Resistance: 0.380 Ohms Inductance: 460.000 uH

Max Watts: 66.9W



TEST DATA

-----

Result: PASS

Harmonic Current Results

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Hn	AMPS	LO Limit	HI Limit	Result
0	0.000	0.000	0.000	PASS
1	0.130	NaN	NaN	PASS
2	0.002	1.080	1.080	PASS
3	0.115	2.300	2.300	PASS
4	0.002	0.430	0.430	PASS
5	0.107	1.140	1.140	PASS
6	0.002	0.300	0.300	PASS
7	0.097	0.770	0.770	PASS
8	0.001	0.230	0.230	PASS
9	0.086	0.400	0.400	PASS
10	0.001	0.184	0.184	PASS
11	0.074	0.330	0.330	PASS
12	0.001	0.153	0.153	PASS
13	0.061	0.210	0.210	PASS
14	0.000	0.131	0.131	PASS
15	0.048	0.150	0.150	PASS
16	0.000	0.115	0.115	PASS
17	0.036	0.132	0.132	PASS
18	0.000	0.102	0.102	PASS
19	0.025	0.118	0.118	PASS
20	0.000	0.092	0.092	PASS



21	0.017	0.107	0.107	PASS
22	0.001	0.084	0.084	PASS
23	0.011	0.098	0.098	PASS
24	0.001	0.077	0.077	PASS
25	0.006	0.090	0.090	PASS
26	0.000	0.071	0.071	PASS
27	0.003	0.083	0.083	PASS
28	0.000	0.066	0.066	PASS
29	0.005	0.078	0.078	PASS
30	0.000	0.061	0.061	PASS
31	0.005	0.073	0.073	PASS
32	0.000	0.058	0.058	PASS
33	0.005	0.068	0.068	PASS
34	0.000	0.054	0.054	PASS
35	0.004	0.064	0.064	PASS
36	0.000	0.051	0.051	PASS
37	0.003	0.061	0.061	PASS
38	0.000	0.048	0.048	PASS
39	0.003	0.058	0.058	PASS
40	0.000	0.046	0.046	PASS

END OF REPORT



-----  
EN 61000-3-3 TEST REPORT 2003/9/5 07:02 PM  
-----

Unit: P III Level CPU Card (Continue)

Model No.: SOM-2366

Remarks: Temp: 27 Humid: 56%

Operator: Michael Chen

-----  
Test Freq.: 50.00 Hz. Test Voltage: 230.0 vac

Waveform : SINE

Test Time: 10.0 min. Tshort: 10.0 min.

Prog. Zo Enabled: YES Prog. Zo: 0.000

Voltage Change less than once per Hour: NO

Impedance selected: DIRECT

Synthetic R+L Enabled: NO

Resistance: 0.380 Ohms Inductance: 460.000 uH



TEST DATA

-----

Result: PASS

	EUT Data	Limit	Result	Test Enabled
Pst max	0.001	1.00	PASS	true
Plt max	0.001	0.65	PASS	true
dc %	0.003	3.00	PASS	true
dmax %	0.002	4.00	PASS	true
d(t) sec.	0.003	0.20	PASS	true
Power Source Data				
Source Pst max	0.020	0.400	PASS	true
% THD	0.030	3.000	PASS	true

END OF REPORT



-----  
EN 61000-3-3 TEST REPORT 2003/9/5 07:17 PM  
-----

Unit: P III Level Cpu Card (Manual Switch)

Model No.: SOM-2366

Remarks: Temp: 27 Humid: 56%

Operator: Michael Chen

-----  
Test Freq.: 50.00 Hz. Test Voltage: 230.0 vac

Waveform : SINE

Test Time: 10.0 min. Tshort: 10.0 min.

Prog. Zo Enabled: YES Prog. Zo: 0.000

Voltage Change less than once per Hour: NO

Impedance selected: DIRECT

Synthetic R+L Enabled: NO

Resistance: 0.380 Ohms Inductance: 460.000 uH



TEST DATA

-----

Result: PASS

	EUT Data	Limit	Result	Test Enabled
Pst max	0.042	1.00	PASS	true
Plt max	0.042	0.65	PASS	true
dc %	0.009	3.00	PASS	true
dmax %	0.009	4.00	PASS	true
d(t) sec	0.009	0.20	PASS	true

Power Source Data

Source Pst max	0.020	0.400	PASS	true
% THD	0.030	3.000	PASS	true

END OF REPORT