



EMC UPDATE TEST REPORT

For

Advantech Co., Ltd.

Panel PC

**Model: POC-173XX-YY-ZZ (X = 0 ~ 9
or A ~ Z, Y = 0 ~ 9 or A ~ Z, Z = 0 ~ 9, A ~ Z or Blank)**

Trade Name: ADVANTECH

Date of Test: September 30 ~ October 20, 2003

Revision: 01

Description of Rev. 01:

1. Applicant adds one LCD Panel to re-test.
(Please refer to have ** mark items on this report)
2. Other information, please refer to the 021085 and this test report.

Approved by:

Jonson Lee
Director of Linkou Laboratory
Compliance Certification Services Inc.

Reviewed by:

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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: Panel PC

Trade Name: ADVANTECH

Model: POC-173XX-YY-ZZ
(X = 0 ~ 9 or A ~ Z, Y = 0 ~ 9 or A ~ Z, Z = 0 ~ 9, A ~ Z or Blank)

Detailed EUT Description: See Item 2 of this report

Date of Test: September 30 ~ October 20, 2003

Deviation: None

Applicable Standard	Class/Limit/Criterion	Test Result
EN 55022: 1998	Class B	No non-compliance noted
EN 61000-3-2: 1995 + A1: 1998 + A2: 1998	Class A	No non-compliance noted
EN 61000-3-3: 1995	Limit	No non-compliance noted
EN 55024: 1998, including		
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
Deviation from Applicable Standard		
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.



2 EUT DESCRIPTION

Product	Panel PC		
Trade Name	ADVANTECH		
Model	POC-173XX-YY-ZZ (X = 0 ~ 9 or A ~ Z, Y = 0 ~ 9 or A ~ Z, Z = 0 ~ 9, A ~ Z or Blank)		
Housing Type	Plastic		
EUT Power Rating	100~250VAC, 50/60Hz, 3A		
AC Power Cord Type	Unshielded, 1.8m (Detachable)		
Power Supply Manufacturer	SKYNET	Model	SNP-8086-M
CPU Manufacture	Intel	Type	PIII 1GHz
OSC/Clock Frequencies	133 MHz		
FDD Manufacturer	NEC	Model	FD1238T
17" TFT LCD Panel Manufacturer	AU	Model	M170EN04
			** M170EN05
HDD Manufacturer	FUJITSU	Model	MHR2020AT
CD-ROM Manufacturer	ASUS	Model	SCD-2400

**I/O Port of EUT:**

I/O Port Type	Q'TY	Tested with
1). Parallel Port	1	1
2). Serial Port	4	4
3). PS/2 Keyboard Port	1	1
4). Video-Out Port	1	1
5). Audio In Port	1	1
6). Audio Out Port	1	1
7). Microphone Port	1	1
8). Game Port	1	1
9). LAN Port	1	1
10). USB Port	2	2

Note:

- The means of "X" (X = A~Z, 0 ~ 9 or Blank) on the model number is different Panel as per customer declaration.
 - The "CD" is Panel PC with the CD-ROM Device.
 - The "CR" is Panel PC with the CD-RW Device.
 - The "DR" is Panel PC with the DVD-ROM Device.
 - The "EW" is Panel PC Without Device.
- The means of "YY" (Y = 0 ~ 9 or A ~ Z) on the model number is different Power Supply as per customer declaration.
 - The "AC" is for the AC Power Supply.
- The means of "ZZ" (Z = 0 ~ 9, A ~ Z or Blank) on the model number is for the touch screen function as per customer declaration.
 - The "VT" is Panel PC with Touch Screen.
 - The "Blank" is Panel PC without Touch Screen.
- Client consigns only one model sample (Model Number : POC-173CD-AC-VT) to test. Therefore, testing Lab. just guarantees the units, which have been tested.



3 TEST METHODOLOGY

3.1 DECISION OF FINAL TEST MODE

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

Mode 1

1280 x 1024 (100Mbps) + M170EN05 LCD Panel

Mode 2

1280 x 1024 (10Mbps) + M170EN05 LCD Panel

Mode 3

1024 x 768 (100Mbps) + M170EN05 LCD Panel

Mode 4

800 x 600 (100Mbps) + M170EN05 LCD Panel

2. After preliminary test, found mode 1 producing the highest emission level, used this mode for all final test.



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	AQ19H2RT706122K	FCC DoC	SAMSUNG	Shielded, 1.8m with two cores	Unshielded, 1.8m
2.	Modem	DM-1414	0304012263	IFAXDM1414	ACEEX	Shielded, 1.5m with a core	Unshielded, 1.8m
3.	Modem	DM-1414	0304012269	IFAXDM1414	ACEEX	Shielded, 1.5m with a core	Unshielded, 1.8m
4.	Printer	STYLUS C60	DR3K041737	FCC DoC	EPSON	Shielded, 1.8m	Unshielded, 1.8m
5.	PS/2 Keyboard (One to two adapter)	KB-0133	N/A	FCC DoC	Compaq	Shielded, 1.8m	N/A
6.	PS/2 Mouse (One to two adapter)	M-S69	N/A	FCC DoC	Compaq	Shielded, 1.8m	N/A
7.	Joystick	G-ZA-PHI	PHB01600992	FCC DoC	Logitech	Shielded, 1.8m	N/A
8.	USB 2.0 External HDD	F12-U	A0100214-2Bq0039	FCC DoC	TeraSyS	Shielded, 1.5m	N/A
9.	USB 2.0 External HDD	F12-U	A0100214-33i0019	FCC DoC	TeraSyS	Shielded, 1.5m	N/A
10.	Walkman	RQ-L10	HB004471	FCC DoC	Panasonic	Unshielded, 1.8m	N/A
11.	Multimedia Headset	Axis-301	N/A	FCC DoC	Labtec	Unshielded, 2.8m	N/A
12.	Mouse	M-MM43	LZE93353024	FCC DoC	Logitech	Shielded, 1.8m	N/A
13.	Mouse	M-MM43	LZE94052771	FCC DoC	Logitech	Shielded, 1.8m	N/A
14.	HUB	TL-5008DS	XT942040616	N/A	Link Pro	LAN Cable: Unshielded, 10m	Unshielded, 1.5m
15.	Notebook PC (Remote)	Valiant 6380i9TD	N/A	FCC DoC	KDS	LAN Cable: Unshielded, 1.5m	AC Cable: Unshielded, 1.8m DC Cable: Unshielded, 1.8m with a core

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 INSTRUMENT AND CALIBRATION

5.1 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.

5.2 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 # 3				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESHS30	828144/003	08/07/2004
LISN	R&S	ESH2-Z5	843285/010	01/19/2004
LISN	EMCO	3825/2	9003-1628	07/27/2004
2X2 WIRE ISN	R&S	ENY22	100020	06/27/2004
FOUR WIRE ISN	R&S	ENY41	100006	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 # 3				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	ADVANTEST	R3261A	N/A	N.C.R
EMI Test Receiver	R&S	ESVS20	838804/004	01/08/2004
Pre-Amplifier	HP	8447D	2944A09173	03/02/2004
Bilog Antenna	SCHWAZBECK	VULB9163	128	07/04/2004
Turn Table	EMCO	2081-1.21	9709-1885	N.C.R
Antenna Tower	EMCO	2075-2	9707-2060	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R
Site NSA	C&C	N/A	N/A	09/05/2004
Thermo-Hygro Meter	SATO	N/A	SITE3	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 Measurement (EN 61000-3-2&-3-3)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Harmonic & Flicker Tester	HAEFELY TRENCH	PHF555	080 419-25	09/25/2004

Equipment Used for Immunity Measurement

ESD Test Site (IEC/EN 61000-4-2)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESD Generator	SCHAFFNER	NSG438	170	04/23/2004

Radiated Electromagnetic Field Immunity Test Site (IEC/EN 61000-4-3)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
S.G.	R&S	SMY02	100094	08/05/2004
Power Meter	R&S	NRVD	837794/029	N.C.R.
Power Amplifier	ar	150W1000	300300	N.C.R
Power Antenna	EMCO	93141	9712-1083	N.C.R

Fast Transients/Burst Test Site (IEC/EN 61000-4-4)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Fast Transients/Burst Generator	HAEFELY TRENCH	PEFT- JUNIOR	583 333-117	08/19/2004
Clamp	HAEFELY TRENCH	093 506.1	080 421.13	N.C.R

Surge Immunity Test Site (IEC/EN 61000-4-5)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Surge Tester	HAEFELY TRENCH	PSUGER 4010	583 334-71	08/19/2004



CS Test Site (IEC/EN 61000-4-6)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
S.G.	R&S	SMY02	100094	08/05/2004
Power Meter	R&S	NRVD	837794/029	N.C.R.
Power Amplifier	ar	500A100A	300299	N.C.R
CDN	Lüthi	801-M3	1879	02/25/2004
CDN	FRANKONIA	CDN-M2	A3002010	04/27/2004
CDN	SCHAFFNER	T400	16906	10/16/2004

Power Frequency Magnetic Field Immunity Test Site (IEC/EN 61000-4-8)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
TRIAX ELF Magnetic Field Meter	F.W.BELL	4090	9711	10/19/2004
Magnetic Field Tester	HAEFELY TRENCH	MAG 100.1	080 938-01	N.C.R

Voltage Dips/Short Interruption and Voltage Variation Immunity Test Site (IEC/EN 61000-4-11)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Dips/Interruption and Variations Simulator	HAEFELY TRENCH	PLINE 1610	080 344-05	03/27/2004



6 TEST RESULTS

Line Conducted Emission

Model: POC-173CD-AC-VT**Test Mode:** Mode 1**Temperature:** 27°C**Humidity:** 63% RH**Tested by:** Bill Cheng**Test Results:** Passed

(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
2.332	39.10	---	56.00	46.00	-16.90	---	L1
2.357	39.00	---	56.00	46.00	-17.00	---	L1
14.592	43.00	---	60.00	50.00	-17.00	----	L1
14.778	42.30	---	60.00	50.00	-17.70	---	L1
17.200	42.30	---	60.00	50.00	-17.70	---	L1
18.400	41.60	---	60.00	50.00	-18.40	---	L1
0.193	47.00	---	63.90	53.90	-16.90	---	L2
1.518	42.00	---	56.00	46.00	-14.00	---	L2
2.552	40.70	---	56.00	46.00	-15.30	---	L2
3.952	39.00	---	56.00	46.00	-17.00	---	L2
14.610	42.80	---	60.00	50.00	-17.20	---	L2
14.819	42.30	---	60.00	50.00	-17.70	---	L2

L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

Note: “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

**Common Mode Conducted Emission****Model:** POC-173CD-AC-VT**Test Mode:** Mode 1**Temperature:** 30°C**Humidity:** 68% RH**Tested by:** Ethan Huang**Test Results:** Passed

(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
2.337	62.00	---	74.00	64.00	-12.00	---	10Base
3.585	63.20	51.10	74.00	64.00	-10.80	-12.90	10Base
6.304	64.40	53.80	84.00	74.00	-19.60	-20.20	10Base
7.499	73.10	64.50	84.00	74.00	-10.90	-9.50	10Base
9.999	63.60	54.60	84.00	74.00	-20.40	-19.40	10Base
12.499	74.00	67.10	84.00	74.00	-10.00	-6.90	10Base
1.022	67.80	61.60	74.00	64.00	-6.20	-2.40	100Base
5.297	62.20	59.30	74.00	64.00	-11.80	-4.70	100Base
7.922	65.60	61.70	84.00	74.00	-18.40	-12.30	100Base
10.060	66.30	62.30	84.00	74.00	-17.70	-11.70	100Base
13.418	68.90	65.10	84.00	74.00	-15.10	-8.90	100Base
18.241	64.60	63.20	84.00	74.00	-19.40	-10.80	100Base

L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

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:** POC-173CD-AC-VT**Test Mode:** Mode 1**Temperature:** 30°C**Humidity:** 60% RH**Detector Function:** Quasi-peak.**Antenna:** Vertical at 10m**Tested by:** Louis Tang**Test Results:** Passed

(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)
50.80	13.7	11.4	25.1	30.0	-4.9
70.88	19.5	5.7	25.2	30.0	-4.8
132.00	15.7	12.1	27.8	30.0	-2.2
141.70	10.1	12.1	22.2	30.0	-7.8
400.00	15.0	20.0	35.0	37.0	-2.0
617.09	3.6	22.6	26.2	37.0	-10.8

**Radiated Emission (B)****Model:** POC-173CD-AC-VT**Test Mode:** Mode 1**Temperature:** 30°C**Humidity:** 60% RH**Detector Function:** Quasi-peak.**Antenna:** Horizontal at 10m**Tested by:** Louis Tang**Test Results:** Passed

(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)
118.10	9.6	11.7	21.3	30.0	-8.7
132.00	12.0	12.1	24.1	30.0	-5.9
229.20	10.9	10.8	21.7	30.0	-8.3
377.90	1.5	19.0	20.5	37.0	-16.5
400.00	14.8	20.0	34.8	37.0	-2.2
620.00	5.1	22.7	27.8	37.0	-9.2

**Radiated Emission (A)****Model:** POC-173CD-AC-VT**Test Mode:** Mode 1**Temperature:** 31°C**Humidity:** 70% RH**Detector Function:** Quasi-peak.**Antenna:** Vertical at 10m**Tested by:** Louis Tang**Test Results:** Passed

(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)
47.85	10.1	16.1	26.2	30.0	-3.8
54.03	8.4	14.9	23.3	30.0	-6.7
107.99	10.6	13.4	24.0	30.0	-6.0
162.07	14.5	11.1	25.6	30.0	-4.4
216.07	10.1	15.5	25.6	30.0	-4.4
378.12	8.4	18.4	26.8	37.0	-10.2
434.05	3.0	20.6	23.6	37.0	-13.4
595.16	4.2	23.7	27.9	37.0	-9.1

**Radiated Emission (B)****Model:** POC-173CD-AC-VT**Test Mode:** Mode 1**Temperature:** 31°C**Humidity:** 70% RH**Detector Function:** Quasi-peak.**Antenna:** Horizontal at 10m**Tested by:** Louis Tang**Test Results:** Passed

(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)
108.03	14.5	13.4	27.9	30.0	-2.1
108.07	4.5	13.4	17.9	30.0	-12..1
194.47	11.0	14.0	25.0	30.0	-5.0
200.52	11.2	14.7	25.9	30.0	-4.1
216.06	12.4	15.5	27.9	30.0	-2.1
378.14	9.4	18.5	27.9	37.0	-9.1

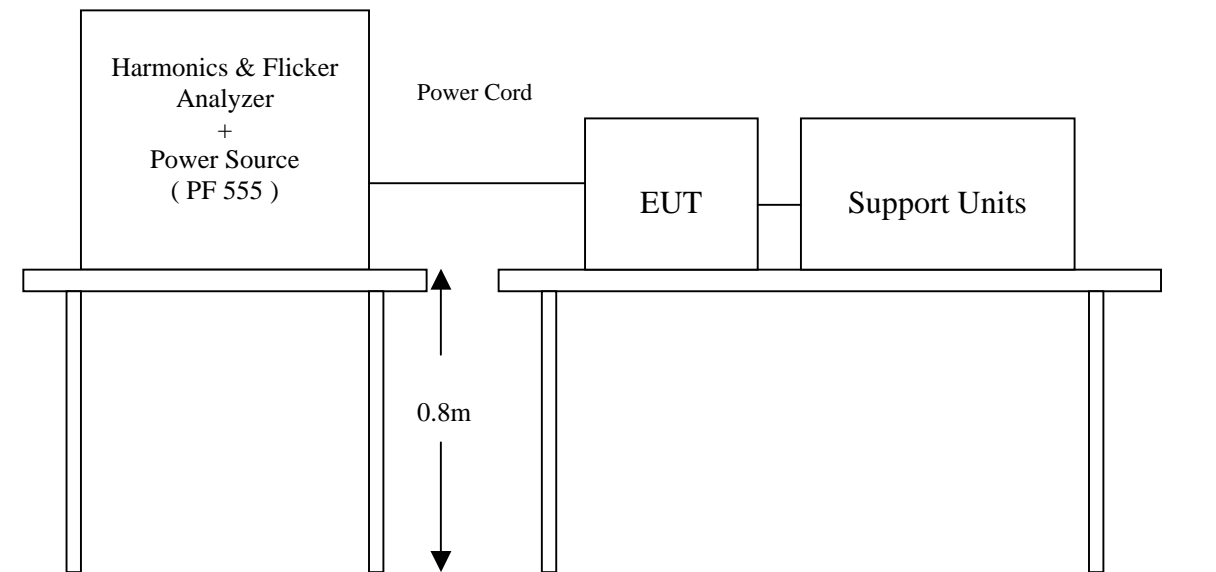


7 POWER HARMONICS TEST

Port : AC mains
Basic Standard : EN 61000-3-2 (1995 + A1: 1998 + A2: 1998)
Limits : ☒ CLASS A ; ☐ CLASS D
Tested by : Michael Chen
Temperature : 23°C
Humidity : 55%

Limit:

Limits for Class A equipment		Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current A	Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd harmonics		Odd Harmonics only		
3	2.30	3	3.4	2.30
5	1.14	5	1.9	1.14
7	0.77	7	1.0	0.77
9	0.40	9	0.5	0.40
11	0.33	11	0.35	0.33
13	0.21	13	0.30	0.21
15<=n<=39	0.15x15/n	15<=n<=39	3.85/n	0.15x15/n
Even harmonics				
2	1.08			
4	0.43			
6	0.30			
8<=n<=40	0.23x8/n			

Block Diagram of Test Setup:**Test Procedure:**

- 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.
- 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)***PASS******FAIL***

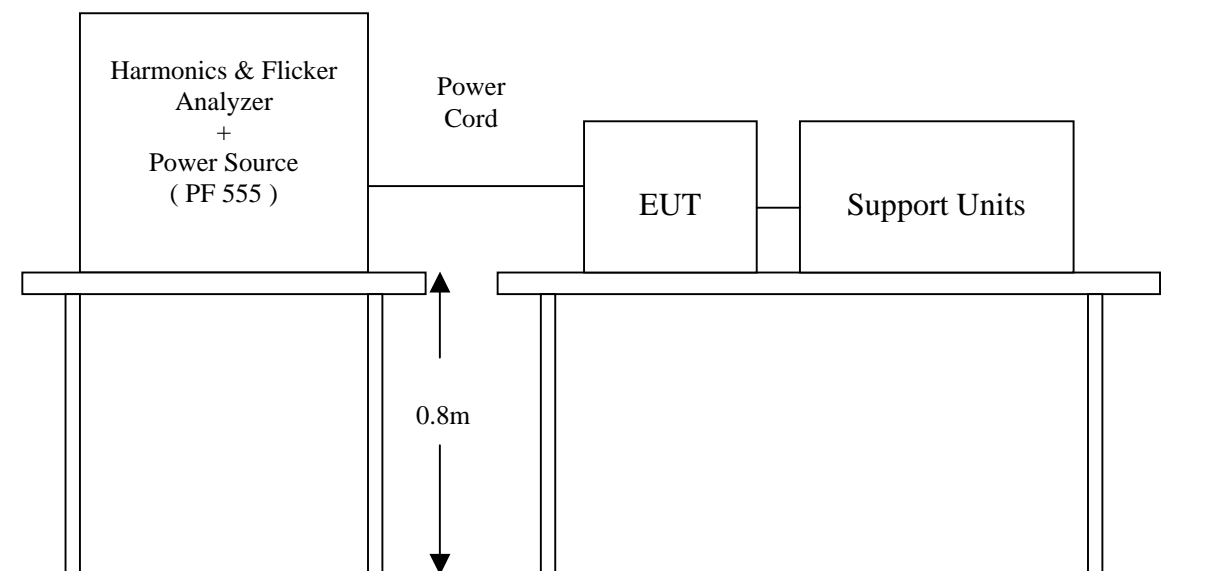
8 POWER VOLTAGE FLUCTUATION / FLICKER TEST

Port : AC mains
Basic Standard : EN 61000-3-3 (1995)
Limits : §5 of EN 61000-3-3
Tested by : Michael Chen
Temperature : 23°C
Humidity : 55%

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: (See Appendix II for details)

** Continue

Test Parameter	Measurement Value	Limit	Result
P _{st}	0.001	1.0	Pass
P _{lt}	0.001	0.65	Pass
T _{dt} (ms)	2	200	Pass
d _{max} (%)	0.002%	4%	Pass
dc (%)	0.004%	3%	Pass

** Manual Switch

Test Parameter	Measurement Value	Limit	Result
P _{st}	0.038	1.0	Pass
P _{lt}	0.038	0.65	Pass
T _{dt} (ms)	8	200	Pass
d _{max} (%)	0.009%	4%	Pass
dc (%)	0.009%	3%	Pass

9 ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port : Enclosure

Basic Standard : IEC/EN 61000-4-2

Test Level : ± 8 kV (Air Discharge)
 ± 4 kV (Contact Discharge)
 ± 4 kV (Indirect Discharge)

Performance Criterion : B (Standard Required)

Tested by : Michael Chen

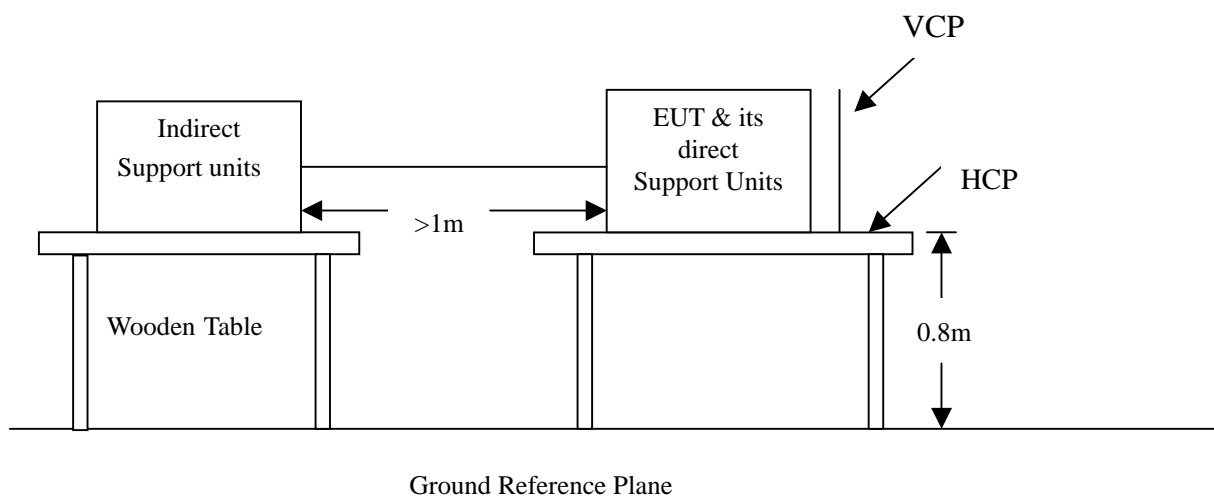
Temperature : 23°C

Humidity : 54% RH

Pressure : 1017mbar

Block Diagram of Test Setup:

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



**Test Procedure:**

1. The EUT was located 0.1 m minimum from all side of the HCP.
2. The indirect support units were located 1 m 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 XP mode.
4. The EUT sent above message to LCD Panel of Notebook PC at remote side 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 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	Pass
Mini 25 /Point	± 4 kV	Indirect Discharge VCP (Front)	Pass
Mini 25 /Point	± 4 kV	Indirect Discharge VCP (Right)	N/A
Mini 25 /Point	± 4 kV	Indirect Discharge VCP (Left)	N/A
Mini 25 /Point	± 4 kV	Indirect Discharge VCP (Back)	N/A

****For the tested points to EUT, please refer to attached page.**

(Blue arrow mark for Contact Discharge and red arrow mark for Air Discharge)



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** ☐ **FAIL**

Observation: No function degraded during the tests.

The Tested Points of EUT



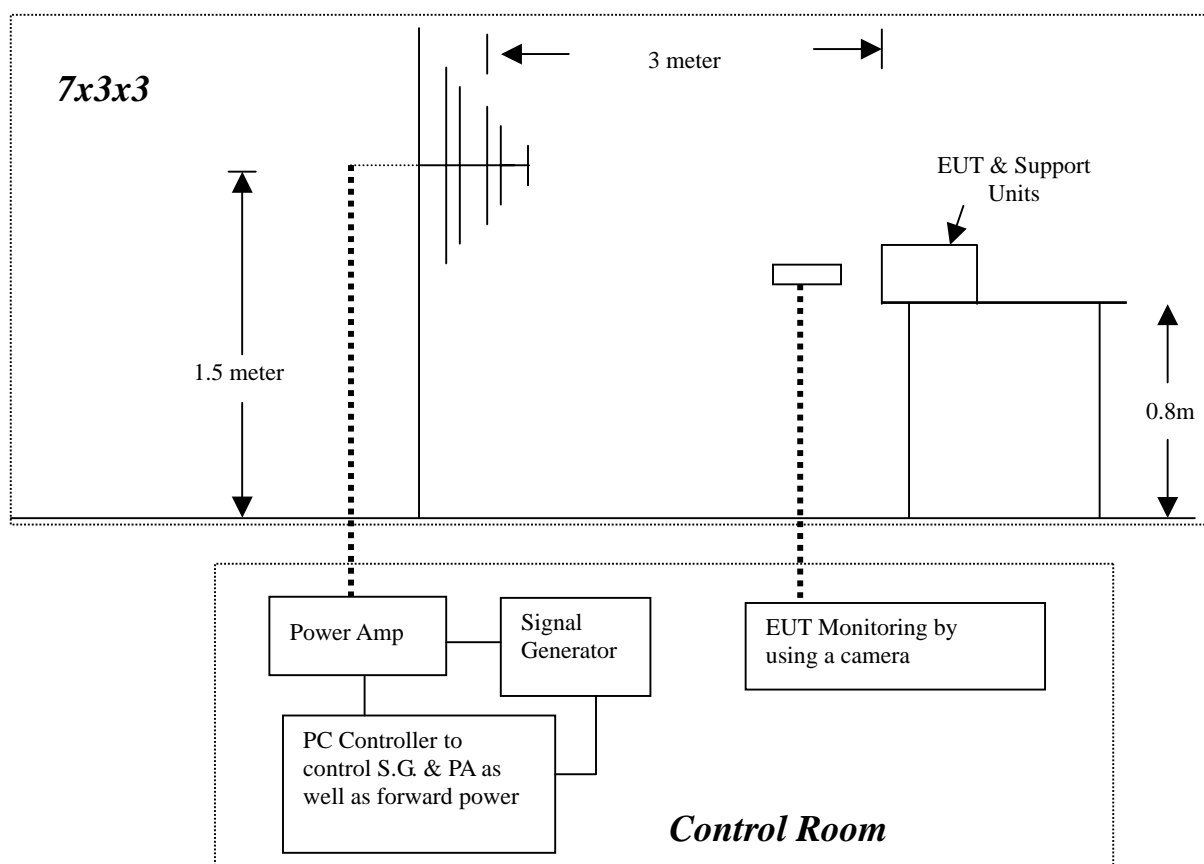




10 RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port : Enclosure
Basic Standard : IEC/EN 61000-4-3
Requirements : 3 V/m / with 80% AM. 1kHz Modulation.
Performance Criterion : A (Standard Required)
Tested by : Michael Chen
Temperature : 27°C
Humidity : 62% RH
Pressure : 1014mbar

Block Diagram of Test Setup:



**Test Procedure:**

1. The 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 EUT were exposed to the calibrated field as per IEC/EN 61000-4-3.
2. Setting the testing parameters of RS test software per IEC/EN 61000-4-3.
3. Performing the pre-test at each side of with double specified level (6V/m) at 4% steps.
4. From the result of pre-test in step 5, choice the worst side of EUT for final test from 80 MHz to 1000 MHz at 1% steps.
5. Recording the test result in following table.
6. It is not necessary to perform test as per annex A of EN 55024 if the EUT doesn't belong to ITE product.

Preliminary test conditions:

Test level : 6V/m
Steps : 4 % of fundamental
Dwell Time : 3 sec

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

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/m	Yes	H	Front	Pass
80-1000	3V/m	Yes	V	Front	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.

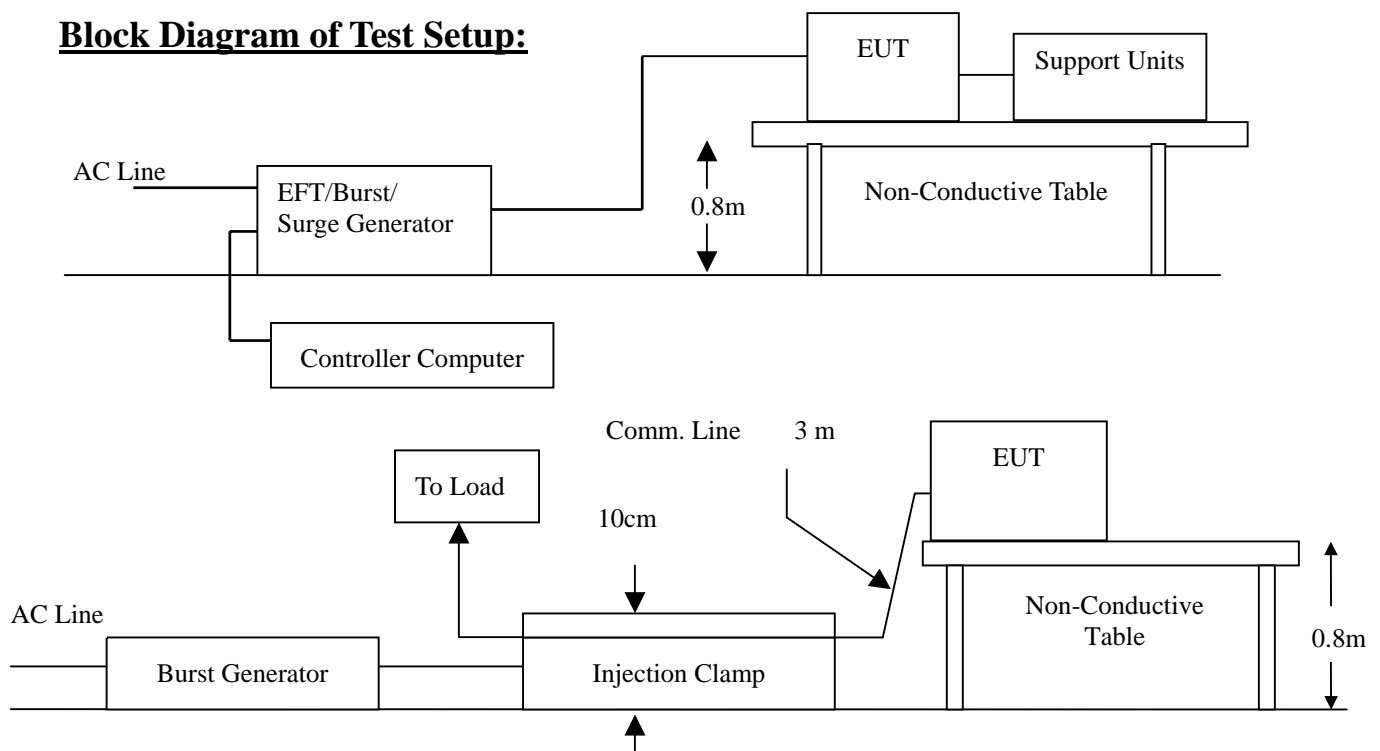
☒ **PASS** ☐ **FAIL**

Observation: No function degraded during the tests.

11 FAST TRANSIENTS/BURST IMMUNITY TEST

Port	: On Power Supply Lines and Data Lines
Basic Standard	: IEC/EN 61000-4-4
Requirements	: ± 1 kV for Power Supply Line ± 0.5 kV for LAN Cables
Performance Criteria	: B (Standard Required)
Tested by	: Michael Chen
Temperature	: 25°C
Humidity	: 56% RH
Pressure	: 1017mbar

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. Injected test voltage to the EUT ports from minimum to standard request or client request.
5. Recording 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
RJ 45 Port (LAN Cable)	± 0.5	Clamp	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** ☐ **FAIL****Observation:** No function degraded during the tests.

12 SURGE IMMUNITY TEST

Port : Power Cord

Basic Standard : IEC/EN 61000-4-5

Requirements : ± 1 kV (Line to Line)
 ± 2 kV (Line to Ground)

Performance Criteria : B (Standard Required)

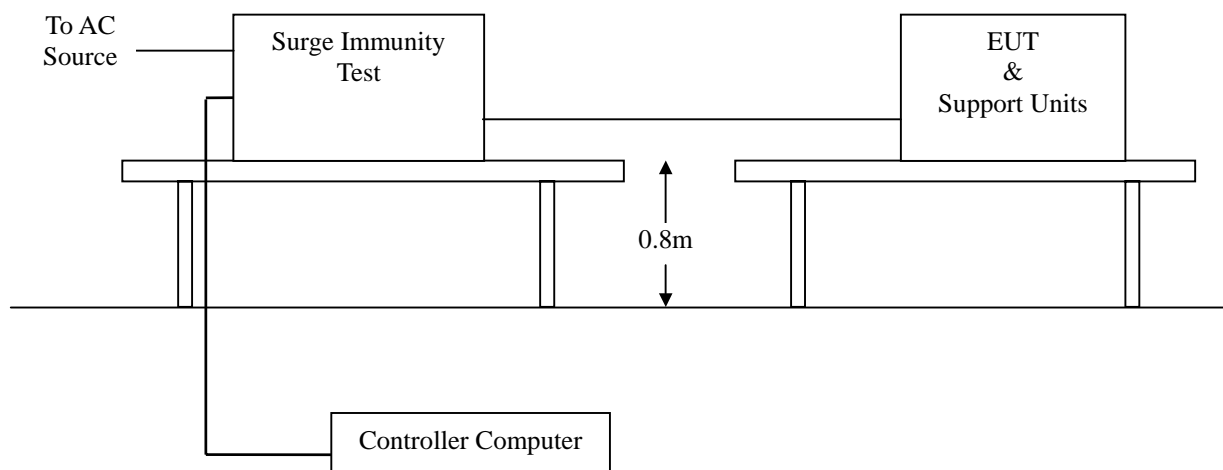
Tested by : Michael Chen

Temperature : 25°C

Humidity : 55% RH

Pressure : 1017mbar

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. Injected test voltage to the EUT ports from minimum to standard request or client request.
3. Recording the test result as shown in following table.

**Test conditions:**

Voltage Waveform : 1.2/50 μ s
Current Waveform : 8/20 μ s
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:

- ☒ **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** ☐ **FAIL**

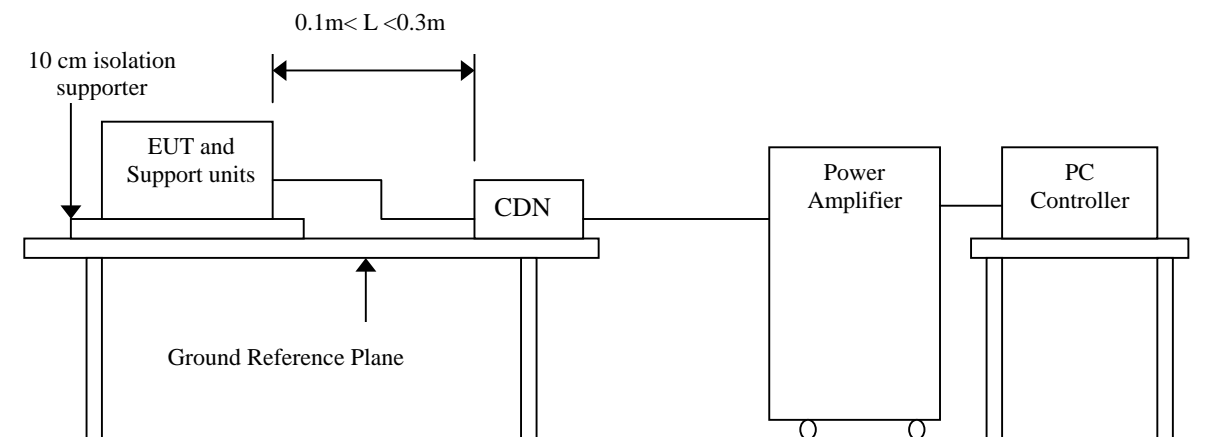
Observation: No function degraded during the tests.

13 CONDUCTED DISTURBANCE/INDUCED RADIO-FREQUENCY FIELD IMMUNITY TEST

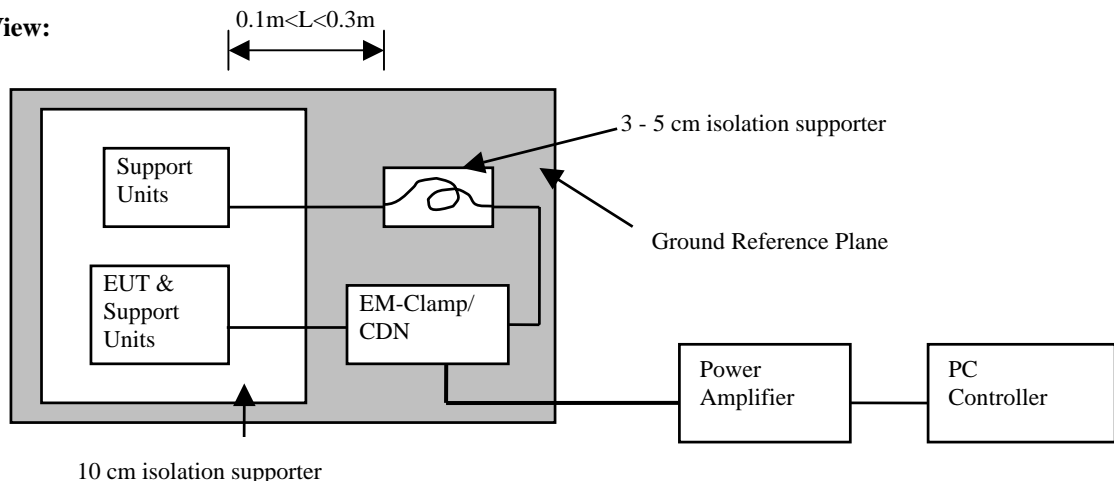
Port	: AC Port and Signal Lines
Basic Standard	: IEC/EN 61000-4-6
Requirements	: 3 V with 80% AM. 1kHz Modulation.
Injection Method	: CDN-M3 for Power Cord CDN-T4 for LAN Cable
Performance Criterion	: A (Standard Required)
Tested by	: Michael Chen
Temperature	: 27°C
Humidity	: 62% RH
Pressure	: 1014mbar

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. Setting the testing parameters of CS test software as per IEC/EN 61000-4-6.
3. 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:

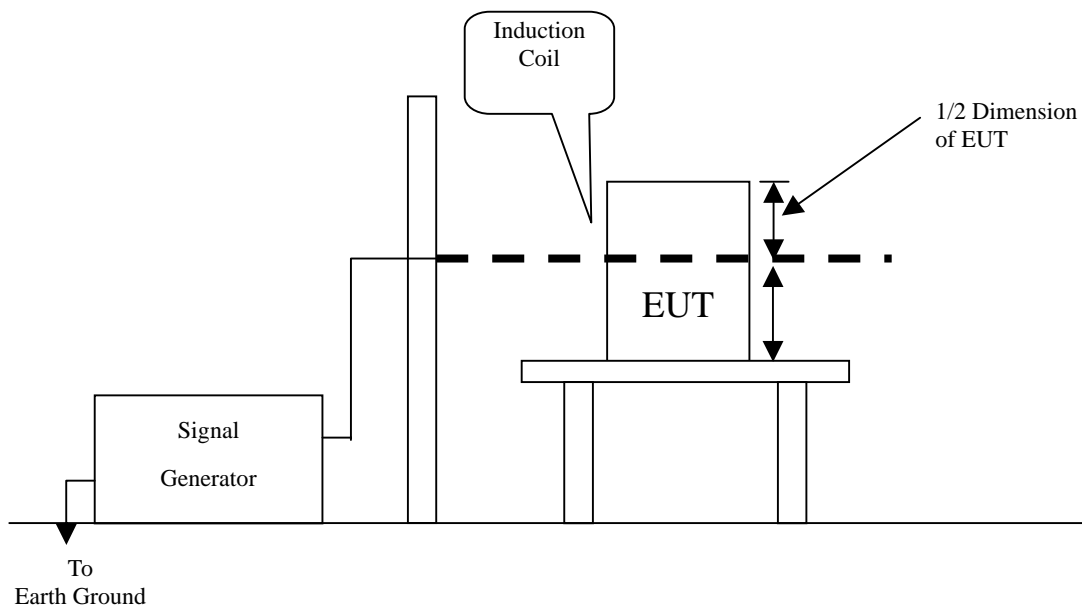
- ☒ **Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of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

14 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

Port : Enclosure
Basic Standard : IEC/EN 61000-4-8
Requirements : 1 A/m
Performance Criterion : A (Standard Required)
Tested by : Michael Chen
Temperature : 26°C
Humidity : 56% RH
Pressure : 1017mbar

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. Rotating the induction coil by 90° (Y direction)
4. Rotating the induction coil by 90° again (Z direction)
5. Recording the test result as shown in following table.

**Test conditions:**

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

Orientation	Field	Result (Pass/Fail)	Remark
X	1A/m	Pass	
Y	1A/m	Pass	
Z	1A/m	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** ☐ **FAIL**

Observation: No function degraded during the tests.

15 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

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

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

Test Interval : Min. 10 sec.

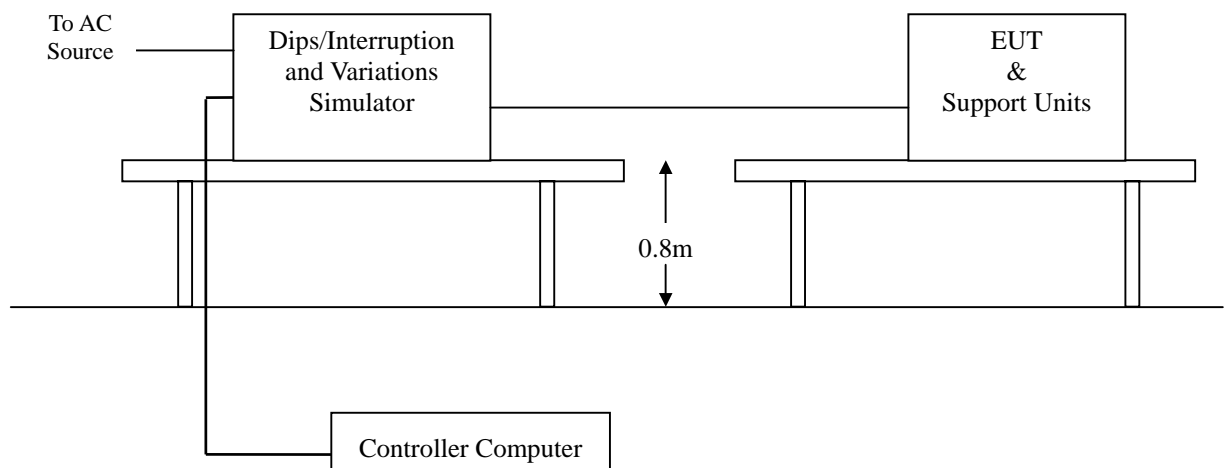
Tested by : Michael Chen

Temperature : 25 °C

Humidity : 55% RH

Pressure : 1017mbar

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. Setting the parameter of tests and then Perform the test software of test simulator.
3. Conditions changes to occur at 0 degree crossover point of the voltage waveform.
4. Recording the test result in test record form.

**Test conditions**

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

Voltage Dips:

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

Voltage Interruptions:

Test Level % U _T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
0	100	250	EUT shut down but can be recovered by manual, as the events disappears	C

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

Performance & Result:

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

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

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

**PASS****FAIL**

APPENDIX I - PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST (EN 55022)





COMMON MODE CONDUCTED EMISSION TEST



RADIATED EMISSION TEST (EN 55022)



POWER HARMONIC & VOLTAGE FLUCTUATION / FLICKER TEST



ELECTROSTATIC DISCHARGE TEST





RADIATED ELECTROMAGNETIC FIELD TEST



FAST TRANSIENTS/BURST TEST





SURGE IMMUNITY TEST



CONDUCTED DISTURBANCE, INDUCED BY RADIO-FREQUENCY FIELDS TEST



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 2003/10/17 05:13 PM

Unit: Panel PC

Model No.: POC-173CD-AC-VT

Remarks: Temp: 23°C Humid: 55%

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: 0.250 uH

Max Watts: 70.9W



TEST DATA

Result: PASS

Harmonic Current Results

Hn	AMPS	LO Limit	HI Limit	Result
0	0.000	0.000	0.000	PASS
1	0.314	NaN	NaN	PASS
2	0.008	1.080	1.080	PASS
3	0.275	2.300	2.300	PASS
4	0.008	0.430	0.430	PASS
5	0.252	1.140	1.140	PASS
6	0.007	0.300	0.300	PASS
7	0.220	0.770	0.770	PASS
8	0.006	0.230	0.230	PASS
9	0.181	0.400	0.400	PASS
10	0.004	0.184	0.184	PASS
11	0.139	0.330	0.330	PASS
12	0.003	0.153	0.153	PASS
13	0.099	0.210	0.210	PASS
14	0.003	0.131	0.131	PASS
15	0.066	0.150	0.150	PASS
16	0.002	0.115	0.115	PASS
17	0.045	0.132	0.132	PASS
18	0.002	0.102	0.102	PASS
19	0.027	0.118	0.118	PASS
20	0.002	0.092	0.092	PASS



21	0.021	0.107	0.107	PASS
22	0.002	0.084	0.084	PASS
23	0.026	0.098	0.098	PASS
24	0.002	0.077	0.077	PASS
25	0.026	0.090	0.090	PASS
26	0.001	0.071	0.071	PASS
27	0.023	0.083	0.083	PASS
28	0.001	0.066	0.066	PASS
29	0.018	0.078	0.078	PASS
30	0.001	0.061	0.061	PASS
31	0.015	0.073	0.073	PASS
32	0.001	0.058	0.058	PASS
33	0.011	0.068	0.068	PASS
34	0.001	0.054	0.054	PASS
35	0.008	0.064	0.064	PASS
36	0.001	0.051	0.051	PASS
37	0.011	0.061	0.061	PASS
38	0.001	0.048	0.048	PASS
39	0.011	0.058	0.058	PASS
40	0.001	0.046	0.046	PASS

END OF REPORT



EN 61000-3-3 TEST REPORT 2003/10/17 05:29 PM

Unit: Panel PC

Model No.: POC-173CD-AC-VT (CONTINUE)

Remarks: Temp: 23°C Humid: 55%

Operator: Michael Chen

=====

TEST SETUP

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: 0.250 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 %	0.004	3.00	PASS	true
dmax %	0.002	4.00	PASS	true
d(t) sec.	0.002	0.20	PASS	true

Power Source Data

Source Pst max	0.021	0.400	PASS	true
% THD	0.030	3.000	PASS	true

END OF REPORT



EN 61000-3-3 TEST REPORT 2003/10/17 05:57 PM

Unit: Panel PC

Model No.: POC-173CD-AC-VT (MANUALSWITCH)

Remarks: Temp: 23°C Humid: 55%

Operator: Michael Chen

=====

TEST SETUP

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: 0.250 uH



TEST DATA

Result: PASS

	EUT Data	Limit	Result	Test Enabled
Pst max	0.038	1.00	PASS	true
Plt max	0.038	0.65	PASS	true
dc %	0.009	3.00	PASS	true
dmax %	0.009	4.00	PASS	true
d(t) sec.	0.008	0.20	PASS	true

Power Source Data

Source Pst max	0.021	0.400	PASS	true
% THD	0.030	3.000	PASS	true

END OF REPORT