



EMC UPDATE TEST REPORT

For

PANEL PC

Applicant : Advantech Co., Ltd.
Trade Name : ADVANTECH
Model Number : TPC-1260X (X= A~ Z or Blank)
**TPC-1260 a b-cde
Date : November 15, 2001
Date of test : Nov. 11 ~ Nov. 14, 2001
Revision : 00
Regulations : See below

Standards	Results (Pass/Fail)
EN 55022: 1998 (Class A)	PASS
EN 55011:1998 (Group 1, Class A)	PASS
EN 61000-3-2: 1995 + A1: 1998 + A2: 1998 + A14: 2000	PASS
EN 61000-3-3: 1995	PASS
EN 55024: 1998 (following EN 61000-6-2:1999 test level)	PASS
- IEC 61000-4-2: 1995 + A2: 2000 (EN61000-4-2: 1995)	PASS
- IEC 61000-4-3: 1995 (EN 61000-4-3:1995)	PASS
- IEC 61000-4-4: 1995 (EN 61000-4-4:1995)	PASS
- IEC 61000-4-5: 1995 (EN 61000-4-5:1995)	PASS
- IEC 61000-4-6: 1996 (EN 61000-4-6:1996)	PASS
- IEC 61000-4-8: 1993 (EN 61000-4-8:1993)	PASS
- IEC 61000-4-11: 1994 (EN 61000-4-11:1994)	PASS

Description of Rev.00

1. Applicant adds one Trade name and one Model number for marketing purpose only.
2. Applicant adds one LCD Panel and one Inverter Board for re-test.
(Please refer to have ** mark items on this report)
3. Other information please refers to the Rev.00 and this (011017) test report.

Approved by Authorized Signatory:

Kurt Chen / Q.A. Manager



PRODUCT INFORMATION

Housing Type:	Plastic with metal plate		
EUT Power Rating:	115/230VAC, 50/60Hz, 1.5/0.8A		
AC Power during Test	230VAC/50Hz		
Power Supply Manufacturer:	Skynet		
Power Supply Model Number:	SNP-PA59		
AC Power Cord Type:	Unshielded, 1.8m (Detachable)		
DC Power Cable Type:	Unshielded, 1.5m (Non-detachable)		
CPU Manufacture:	Intel	Type:	Transmeta Crusoe™ TM5400 533MHz
OSC/Clock Frequencies:	66MHz		
Memory Capacity:		Install:	128MB
12.0" TFT LCD Panel Manufacturer:	Toshiba	Model:	LTM12C289
	**SANYO	Model:	MXS121022010
**Inverter Board Manufacturer:	Zin-Power	Model:	HY1006
Flash Card Manufacturer:	COMPACTFTASH	Model:	Sun Disk 32
VGA Card Manufacturer:	On board		

I/O Port of EUT

I/O PORT TYPES	Q'TY	TESTED WITH
1) Parallel Port	1	1
2) Serial Port	3	3
3) PS/2 Keyboard/ Mouse Port	2	2
4) LAN Port	1	1
5) USB Port	1	1
6) RS485 Port	1	1

Note: 1. Client consigns only one Model sample to test. (Model Number: TPC-1260T). Therefore, the testing Lab. just guarantees the units, which have been tested.

****2. The Model No: TPC-1260 a b-cde the means of a b-cde are list as below:**

a: LCD Type; "T" means TFT LCD, "S" means STN LCD.

b: Extension (optimal); "E" means enhancement.

cde: Options to standard model;

"X" (optional) means without touchscreen.

"CE" means Windows CE.

"XCE" means without touchscreen but with Windows CE.

"GNI" means the software GeniDaq.

Also means customers' name for OEM cases.



SUPPORT EQUIPMENT

No.	Equipment	Model #	Serial #	FCC ID	Trade Name	Data Cable	Power Cord
1)	Printer	2225C	3125S98198	DSI6XU2225	HP	Shielded, 1.8m	Unshielded, 1.8m
2)	Modem	231AA	A27631083840	BFJ9D9308US	Hayes	Shielded, 1.8m	Unshielded, 1.8m
3)	PS/2 Keyboard	SK-2800C	B1C790BCPJCN09	GYUR79SK	Compaq	Shielded, 1.8m	N/A
4)	PS/2 Mouse	M-CAA43	LZA11752603	FCC DoC	Logitech	Shielded, 1.8m	N/A
5)	USB Mouse	M-BB48	LZE93050159	FCC DoC	Logitech	Shielded, 1.8m	N/A
6)	Serial Mouse	M-MM43	LZE94052791	FCC DoC	Logitech	Shielded, 1.9m	N/A
7)	Serial Mouse	M-MM43	LZE93352988	FCC DoC	Logitech	Shielded, 1.9m	N/A
8)	RS485 to RS232 Adapter	ADAM-4571	N/A	N/A	Adventech	Shielded, 0.2m	N/A
9)	PC (Remote)	IPC-6806	N/A	N/A	Adventech	LAN Cable: Unshielded, 15m	Unshielded, 1.8m
10)	Monitor (Remote)	GDM-17SE2T	7138048	AK8GDM17SE2T	SONY	Shielded, 1.8m with one core	Unshielded, 1.8m
11)	PS/2 Keyboard (Remote)	SK-2800C	B1C790BCPJCN0T	GYUR79SK	Compaq	Shielded, 1.6m	N/A
12)	PS/2 Mouse (Remote)	M-CAA43	LZA11750827	FCC DoC	Logitech	Shielded, 1.8m	N/A

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.

BLOCK DIAGRAM OF TEST SETUP

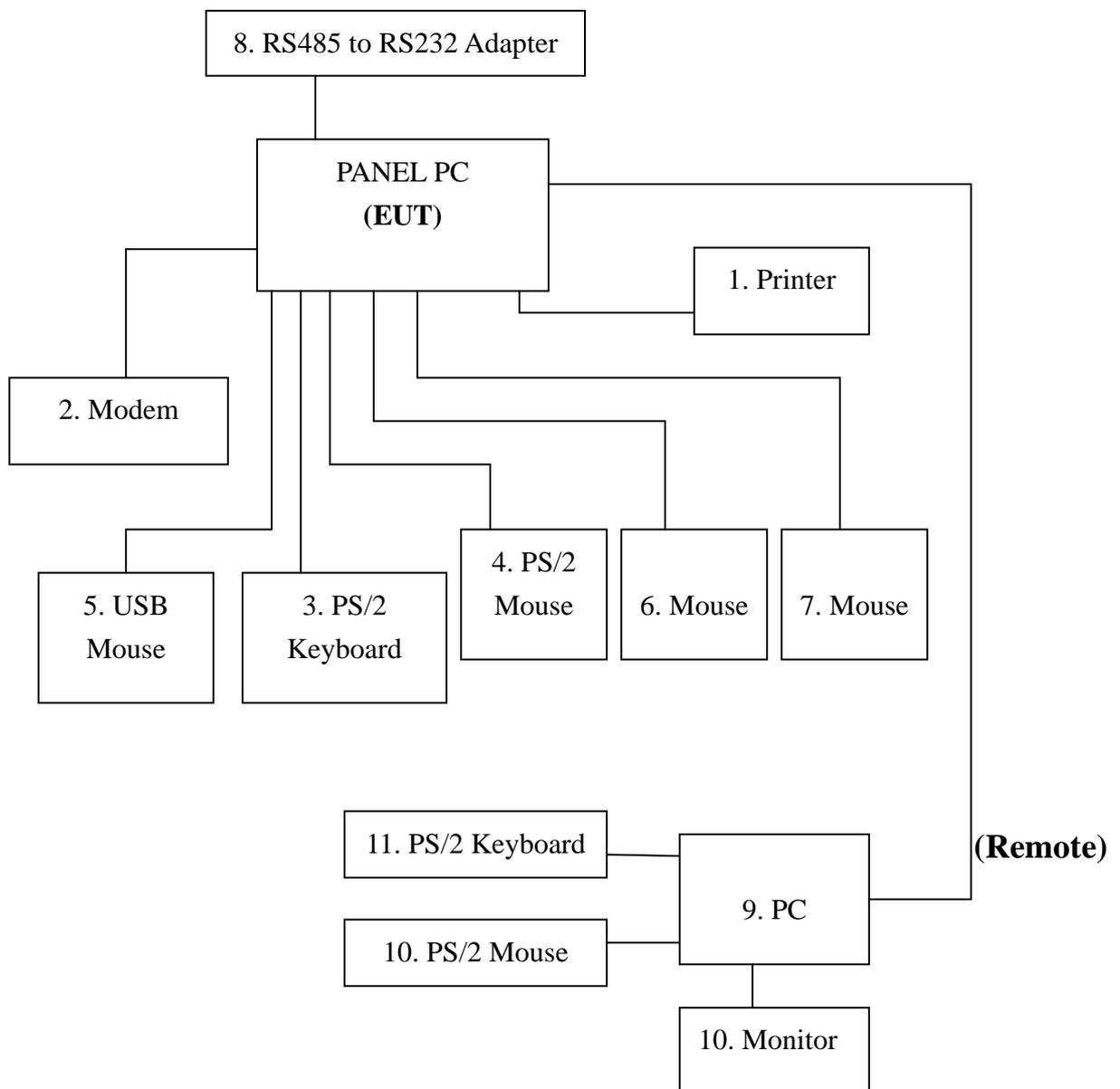
System Diagram of Connections between EUT and Simulators

EUT: PANEL PC

Trade Name: ADVANTECH

Model Number: TPC-1260T

Power Cord: Unshielded, 1.8m





TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at C & C Laboratory, Co., Ltd. for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2-1988 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10kHz to 1.0 / 2.0 GHz.

Equipment used during the tests:

Conducted Emission Test Site: # 4

Conducted Emission Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
EMI Test Receiver	R&S	ESHS10	843743/015	12/15/2000	12/14/2001
LISN	R&S	ENV 4200	8303261016	11/18/2000	11/17/2001
LISN	EMCO	3825/2	9003/1382	02/08/2001	02/07/2002

Radiation Emission Test site:

Open Area Test Site: # 4

Open Area Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
Spectrum Analyzer	ADVANTEST	R3132	91700456	02/21/2001	02/20/2002
EMI Test Receiver	R&S	ESVS10	846285/016	04/16/2001	04/15/2002
Precision Dipole	SCHWAZBECK	VHAP	998/999	05/17/2001	05/16/2002
Precision Dipole	SCHWAZBECK	UHAP	981/982	05/17/2001	05/16/2002
Bilog Antenna	CHASE	CBL 6112B	2462	01/16/2001	01/15/2002
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	11/24/2000	11/23/2001
Spectrum Analyzer	ADVANTEST	R3132	91700456	02/21/2001	02/20/2002

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
HAEFELY/ TRENCH Harmonic & Flicker Tester	PHF 555	080 419-25	Oct. 12, 2001	Oct. 11, 2002

For ESD test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
HAEFELY/ TRENCH ESD Generator	PESD 1600	H710203	Sep. 01, 2001	Aug. 31, 2002

For Radiated Electromagnetic Field immunity Measurement:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
Maconi / Signal Generator	2022D	119246/003	Aug. 20, 2001	Aug. 19, 2002
M2S / Power Amplifier	A00181/ 1000	9801-112	N/A	N/A
M2S / Power Amplifier	AC8113/ 800-250A	9801-179	N/A	N/A
Wandel & Goltormann / EM-Radiation Meter	EMR-30	L-0013	Mar. 13, 2001	Mar. 15, 2002
EMCO Power Antenna	93141	9712-1083	N/A	N/A

For Fast Transients/Burst test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
HAEFELY TRENCH / Fast Transients/Burst Generator	PEFT-JUNIOR	583 333-117	Aug. 21, 2001	Aug. 20, 2002
HAEFELY TRENCH / Clamp	093 506.1	080 421.13	N/A	N/A

For CS test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
Maconi / Signal Generator	2022D	119246/003	Aug. 20, 2001	Aug. 19, 2002
Lüthi / CDN	801-M3	1879	Mar. 05, 2001	Mar. 04, 2002
C.D.N / CDN M2	CDN-M2	A3002010	Apr. 17, 2001	Apr. 16, 2002
M2S / Power Amplifier	A00181/1000	9801-112	N/A	N/A
MEB / Clamp	KEMZ-801	13 602	N/A	N/A

For Surge Immunity test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
HAEFELY TRENCH / Surge Tester	PSURGE 4010	583 334-71	Sep. 01, 2001	Aug. 31, 2002
HAEFELY TRENCH / CDN	IP6.2	148342	Mar. 22, 2001	Mar. 21, 2002
HAEFELY TRENCH / CDN	DEC1A	148050	Apr. 06, 2001	Apr. 05, 2002

For Power Frequency Magnetic Field Immunity test:

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
F.W.BELL / TRIAX ELF Magnetic Field Meter	4090	9711	Oct. 30,2001	Oct. 29, 2002
HAEFELY TRENCH / Magnetic Field Tester	MAG 100.1	080 938-01	N/A	N/A

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

Manufacturer/Type	Model No.	Serial No.	Last Cal.	Cal. Due
HAEFELY TRENCH / Dips / Interruption and Variations Simulator	PLINE 1610	080 344-05	Feb. 08, 2001	Feb. 07, 2002



EUT Configuration during measurement:

1) Pre-scan mode are list as below:

Mode:

1. 640 x 480 Resolution

2) After pre-scan, found mode 1 producing the highest emission level, used this mode for all final test.



SUMMARY DATA

(LINE CONDUCTED TEST)

Model Number: TPC-1260T

Location: Site # 4

Tested by: Allen Wang

Test Mode: Mode 1

Test Results: Passed

Temperature: 23°C

Humidity: 65%RH

(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	57.60	---	79.00	66.00	-21.40	---	L1
16.040	38.20	---	73.00	60.00	-34.80	---	L1
19.060	38.80	---	73.00	60.00	-34.20	---	L1
20.460	41.20	---	73.00	60.00	-31.80	---	L1
21.260	41.90	---	73.00	60.00	-31.10	---	L1
22.850	37.90	---	73.00	60.00	-35.10	---	L1
0.150	57.20	---	79.00	66.00	-21.80	---	L2
18.650	39.80	---	73.00	60.00	-33.20	---	L2
20.460	44.40	---	73.00	60.00	-28.60	---	L2
21.060	44.90	---	73.00	60.00	-28.10	---	L2
22.460	39.10	---	73.00	60.00	-33.90	---	L2
23.970	39.50	---	73.00	60.00	-33.50	---	L2

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

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



SUMMARY DATA

(RADIATED EMISSION TEST)

Model Number: TPC-1260T

Location: Site # 4

Tested by: Allen Wang

Polar: Vertical---10m

Test Mode: Mode 1

Detector Function: Quasi-Peak

Test Results: Passed

Temperature: 23°C

Humidity: 67%RH

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

Freq. (MHz)	Raw Data (dBuV/m)	Corr. Factor (dB)	Emiss. Level (dBuV/m)	Limits	Margin (dB)
48.20	21.1	11.9	33.0	40.0	-7.0
99.46	23.3	12.0	35.3	40.0	-4.7
166.42	25.6	10.9	36.5	40.0	-3.5
400.80	20.7	18.8	39.5	47.0	-7.5
533.70	16.3	21.2	37.5	47.0	-9.5
665.28	16.4	21.9	38.3	47.0	-8.7



SUMMARY DATA

(RADIATED EMISSION TEST)

Model Number: TPC-1260T

Location: Site # 4

Tested by: Allen Wang

Polar: Horizontal – 10m

Test Mode: Mode 1

Detector Function: Quasi-Peak

Test Results: Passed

Temperature: 23°C

Humidity: 67%RH

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

Freq. (MHz)	Raw Data (dBuV/m)	Corr. Factor (dB)	Emiss. Level (dBuV/m)	Limits	Margin (dB)
99.60	19.3	12.0	31.3	40.0	-8.7
166.52	24.6	10.9	35.5	40.0	-4.5
233.02	26.7	12.3	39.0	47.0	-8.0
398.28	20.6	18.7	39.3	47.0	-7.7
533.08	20.6	21.2	41.8	47.0	-5.2
798.60	16.0	24.5	40.5	47.0	-6.5

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

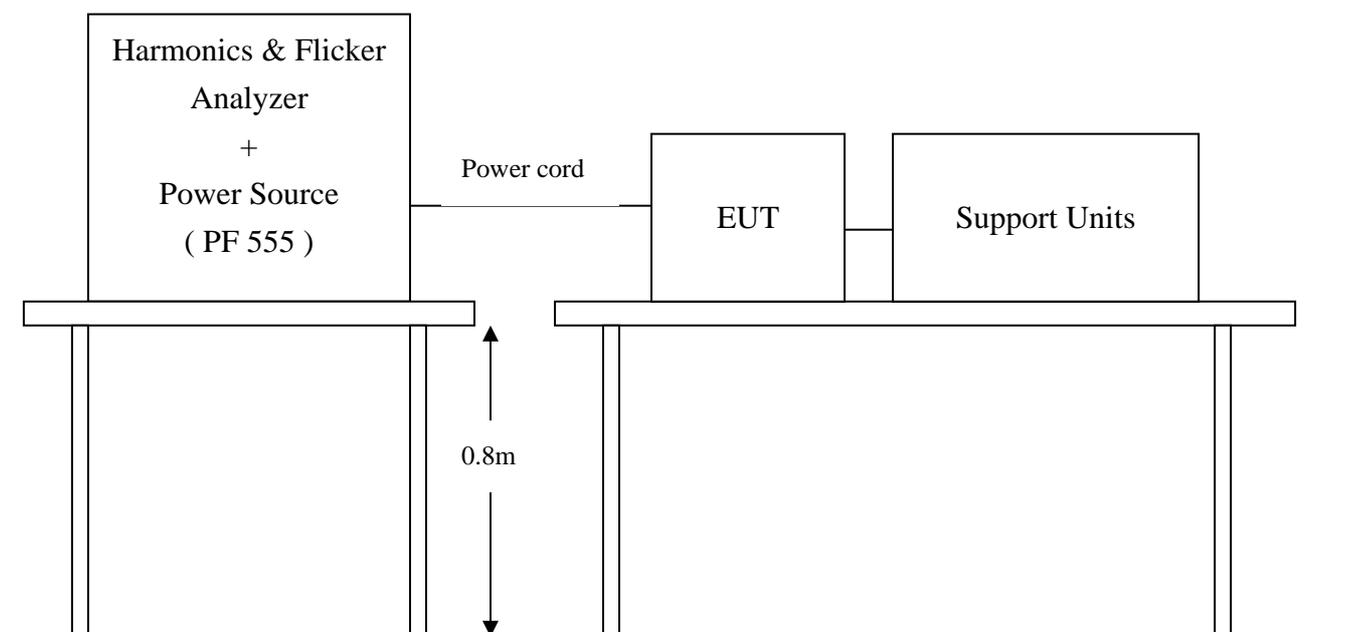
POWER HARMONICS MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-2: 1995 +A1: 1998 + A2: 1998
Limits : Class A, Class D
Tester : Allen Wang
Temperature : 28°C
Humidity : 51%

VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-3 (1995)
Limits : §5 of EN 61000-3-3
Tester : Allen Wang
Temperature : 28°C
Humidity : 51%

Block Diagram of Test Setup:



Result:

Please see the attached test data.



EN 61000-3-2 TEST REPORT 2001/11/11 01:53 PM

Unit: PANEL PC
Model No.: TPC-1260T
Remarks: Temp: 28°C Humiod: 51%
Operator: Allen Wang

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 Wattes: 26.2W.



TEST DATA

Result: PASS

Harmonic Current Results

Hn	AMPS	LO Limit	HI Limit	Result
0	0.000	0.000	0.000	PASS
1	0.131	NaN	NaN	PASS
2	0.001	1.080	1.080	PASS
3	0.093	2.300	2.300	PASS
4	0.001	0.430	0.430	PASS
5	0.085	1.140	1.140	PASS
6	0.001	0.300	0.300	PASS
7	0.079	0.770	0.770	PASS
8	0.001	0.230	0.230	PASS
9	0.070	0.400	0.400	PASS
10	0.001	0.184	0.184	PASS
11	0.062	0.330	0.330	PASS
12	0.001	0.153	0.153	PASS
13	0.052	0.210	0.210	PASS
14	0.000	0.131	0.131	PASS
15	0.043	0.150	0.150	PASS
16	0.000	0.115	0.115	PASS
17	0.034	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	0.000	0.084	0.084	PASS
23	0.011	0.098	0.098	PASS



24	0.000	0.077	0.077	PASS
25	0.006	0.090	0.090	PASS
26	0.000	0.071	0.071	PASS
27	0.002	0.083	0.083	PASS
28	0.000	0.066	0.066	PASS
29	0.003	0.078	0.078	PASS
30	0.000	0.061	0.061	PASS
31	0.004	0.073	0.073	PASS
32	0.000	0.058	0.058	PASS
33	0.004	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	0.002	0.058	0.058	PASS
40	0.000	0.046	0.046	PASS

END OF REPORT



EN 61000-3-3 TEST REPORT 2001/11/11 02:25 PM

Unit: PANEL PC
Model No.: TPC-1260T (CONTINUE)
Remarks: Temp: 28°C Humiod: 51%
Operator: Allen Wang

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: 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 %	0.00	3.00	PASS true
dmax %	0.00	4.00	PASS true
d(t) sec.	0.00	0.20	PASS true
Power Source Data			
Source Pst max	0.020	0.400	PASS true
% THD	0.03	3.00	PASS true

END OF REPORT



EN 61000-3-3 TEST REPORT 2001/11/11 02:10 PM

Unit: PANEL PC

Model No.: TPC-1260T (MANUAL SWITCH)

Remarks: Temp: 28°C Humiod: 51%

Operator: Allen Wang

=====

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: 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 %	0.00	3.00	PASS	true
dmax %	0.00	4.00	PASS	true
d(t) sec.	0.00	0.20	PASS	true

Power Source Data

Source Pst max	0.020	0.400	PASS	true
% THD	0.03	3.00	PASS	true

END OF REPORT

SECTION 1 - IMMUNITY TESTS

(EN 55024:1998 Following EN 61000-6-2:1999 test level)

**Electrostatic discharge (ESD) immunity test (IEC 61000-4-2)
(With Deviation)**

**Radiated electromagnetic field (RS) immunity test
(IEC 61000-4-3) (With Deviation)**

Fast transient / Burst (EFT) immunity test (IEC 61000-4-4)

Surge immunity test (IEC 61000-4-5)

**Conducted disturbances inducted by radio-frequency fields, (CS)
immunity test (IEC 61000-4-6)**

Power-frequency magnetic field immunity test (IEC 61000-4-8)

**Voltage dips, short interruption and voltage variation
immunity test (IEC 61000-4-11)**

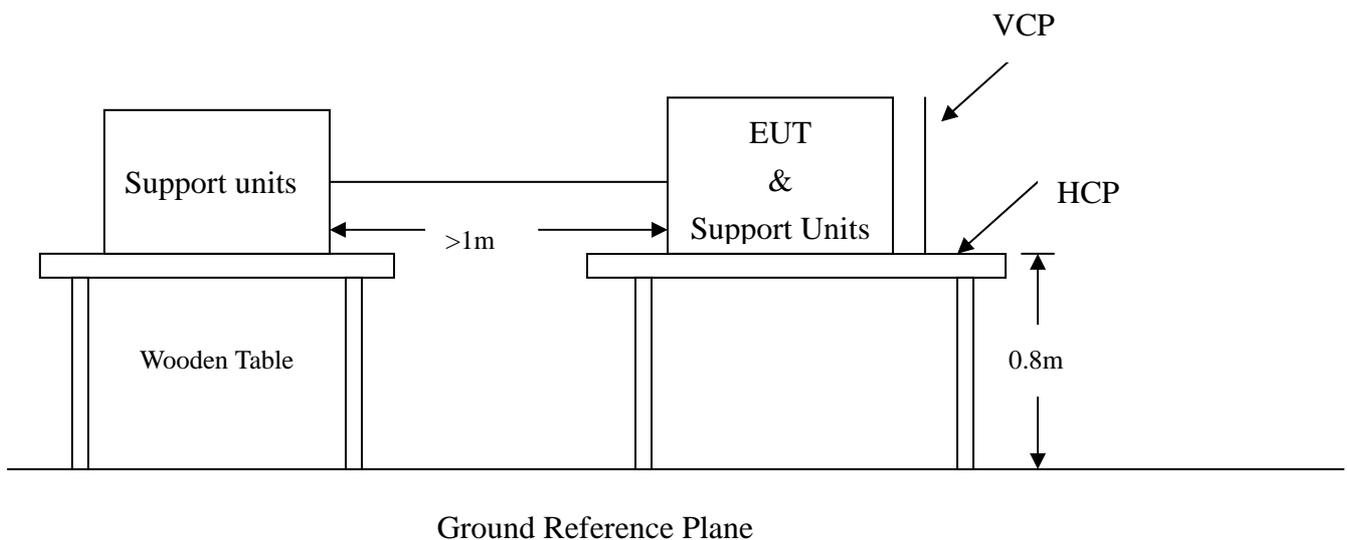
1. IEC 61000-4-2

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	: Enclosure
Basic Standard	: EN 61000-4-2
Requirements	: $\pm 8\text{kV}$ (Air Discharge) $\pm 4\text{kV}$ (Contact Discharge) $\pm 4\text{kV}$ (Indirect Discharge)
Performance Criteria	: B (Standard Required)
Tester	: Allen Wang
Temperature/Humidity	: 28°C / 51%

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 support units were located 1 m minimum away from the EUT.
3. A scroll 'H' test program was loaded and executed in Windows mode.
4. The EUT sent above message to EUT 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 55024:1998; 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. Putting a mark on EUT to show tested points. The following test condition was followed during the tests.

Note: As per A2 to IEC 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.

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 (Left)	Pass
Mini 25 /Point	±4kV	Indirect Discharge VCP (Back)	N/A
Mini 25 /Point	±4kV	Indirect Discharge VCP (Right)	Pass
Mini 10 /Point	±8kV	Air Discharge	Pass

***** The tested points to EUT please refer to attach pages.**

(Blue arrow mark for contact discharge, 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 **FAILED**

Observation: No any function degraded during the tests.

The Tested Points of EUT

(Photo 1 of 2)



(Photo 2 of 2)

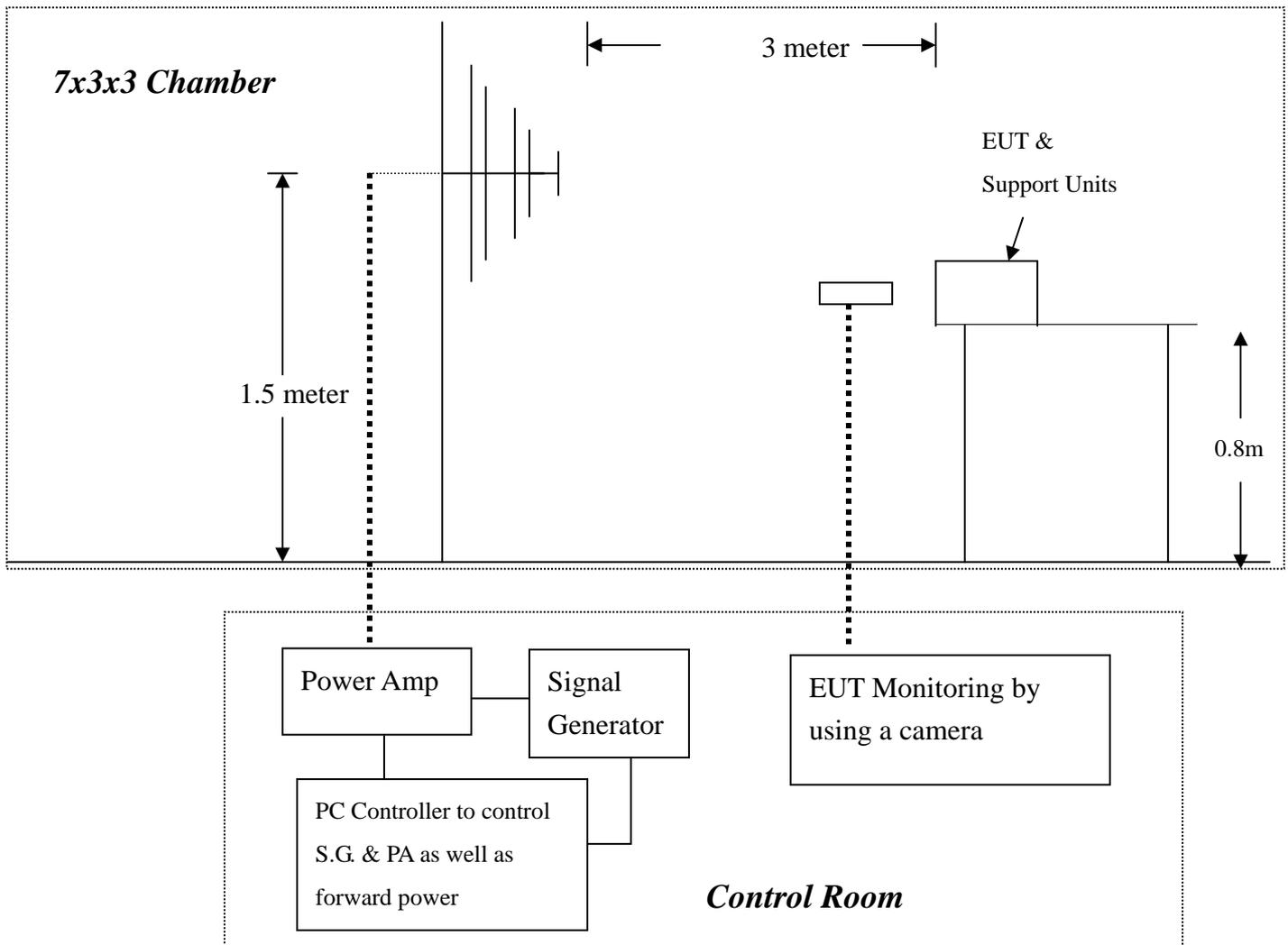


2. IEC 61000-4-3

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port : Enclosure
Basic Standard : IEC 61000-4-3
Requirements : 10 V/m / with 80% AM. 1kHz Modulation.
Performance Criteria : A (Standard Required)
Tester : Allen Wang
Temperature : 28°C
Humidity : 51%

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 61000-4-3.
2. A scroll ‘H’ messages were displayed on part of screen of EUT and an enlarged ‘H’ characters were displayed on the other part of screen of EUT.
3. Adjusting the monitoring camera to monitor the ‘H’ message as clear as possible.
4. Setting the testing parameters of RS test software per IEC 61000-4-3.
5. Performing the test at each side of with specified level from 80MHz to 1000MHz at 1% steps.
6. Recording the test result in following table.
7. It is not necessary to perform test as per annex A of EN 55024:1998 if the EUT doesn’t belong to TTE product.

IEC 61000-4-3 Preliminary test condition:

Test level : 10V/m
Steps : 4 % of fundamental
Dwell Time : 3 sec

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

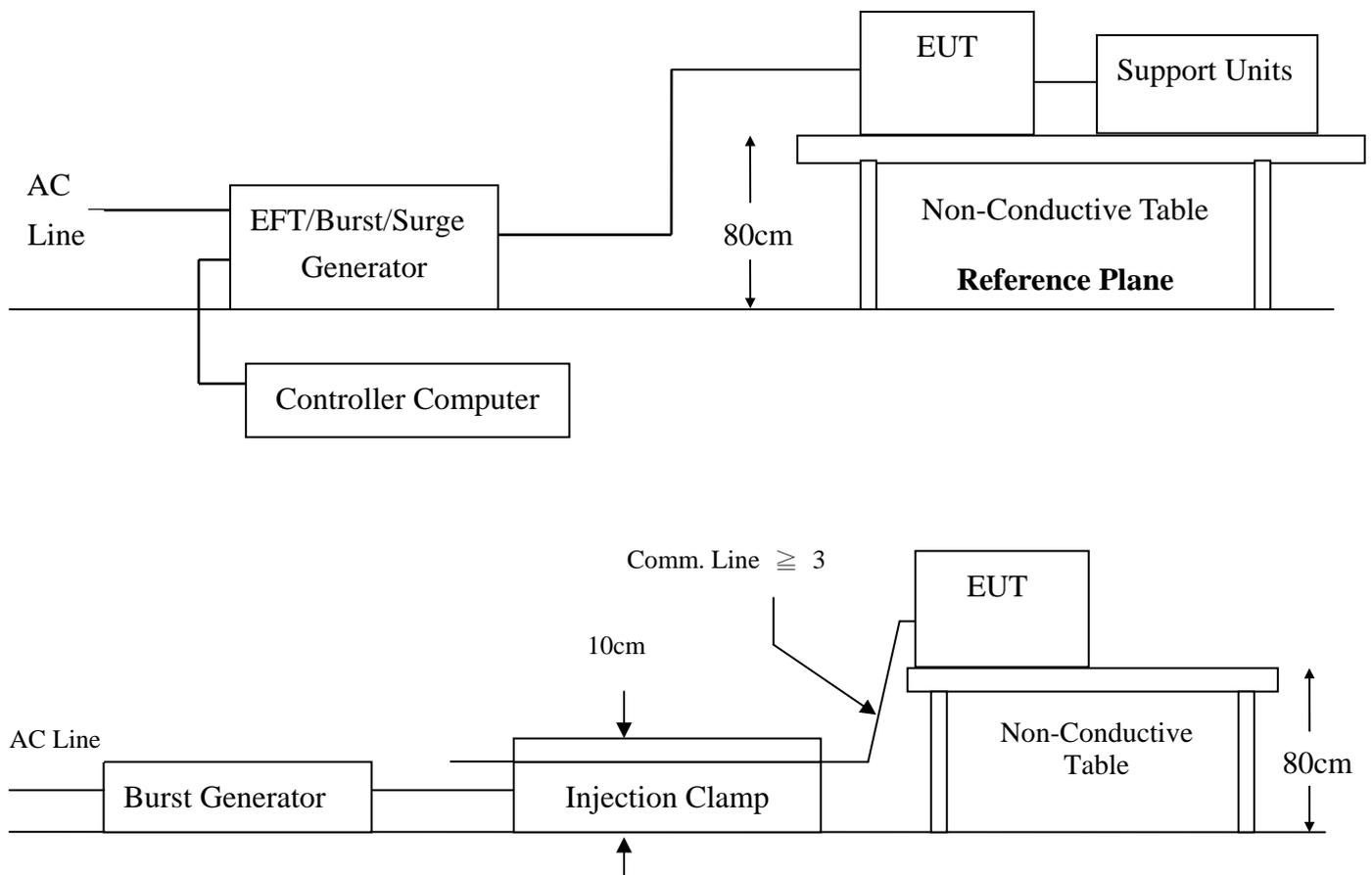
Observation: No any function degraded during the tests.

3. IEC 61000-4-4

FAST TRANSIENTS/BURST IMMUNITY TEST

Port	: On Power Supply Line and Data Cable
Basic Standard	: IEC 61000-4-4
Requirements	: $\pm 1\text{kV}$ for Power Supply Line $\pm 0.5\text{kV}$ for LAN Cable
Performance Criteria	: B (Standard required)
Tested by	: Allen Wang
Temperature	: 28°C
Humidity	: 51%

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 sent to EUT filling the screens with upper case of “H” patterns.
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: 5/50n

Burst Duration: 15ms

Burst Period: 3Hz

Inject Line	Voltage kV	Inject Method	Result (Pass/Fail)
L1	±1	Direct	Pass
N	±1	Direct	Pass
PE	±1	Direct	Pass
L1 + N	±1	Direct	Pass
L1 + PE	±1	Direct	Pass
N + PE	±1	Direct	Pass
L1 + N + PE	±1	Direct	Pass
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 **FAILED**

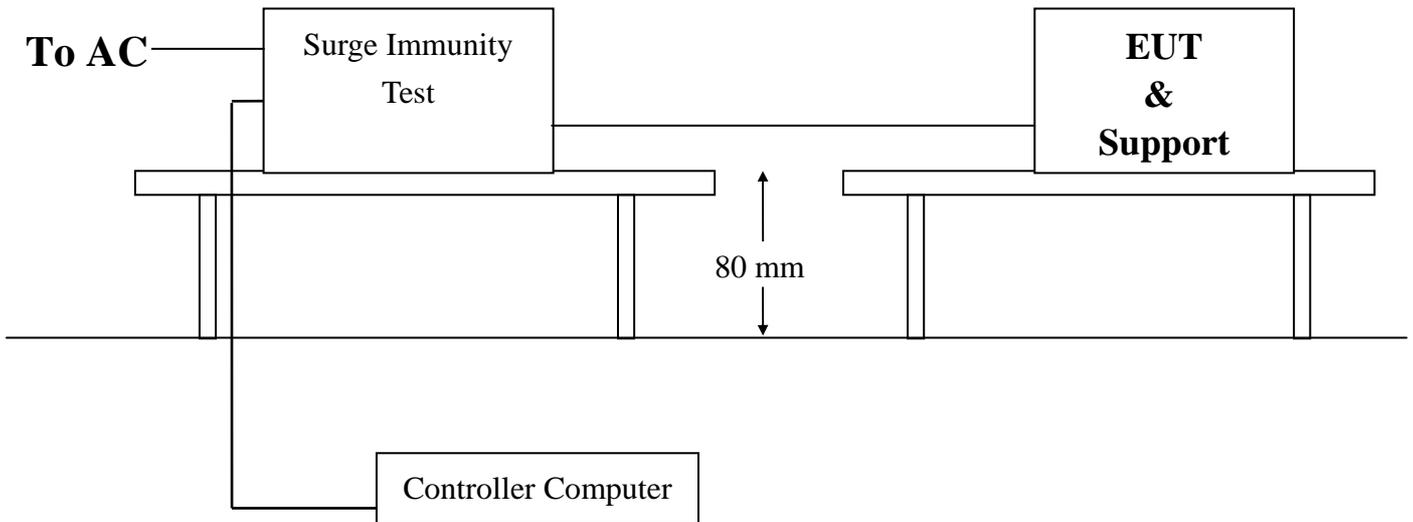
Observation: No any function degraded during the tests.

4. IEC 61000-4-5

SURGE IMMUNITY TEST

Port	: Power Cord
Basic Standard	: IEC 61000-4-5
Requirements	: $\pm 1\text{kV}$ (Line to Line) : $\pm 2\text{kV}$ (Line to Ground)
Performance Criteria	: B (Standard require)
Tester	: Allen Wang
Temperature	: 28°C
Humidity	: 51%

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 sent to EUT filling the screens with upper case of “H” patterns.
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	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 **FAILED**

Observation: No any function degraded during the tests.

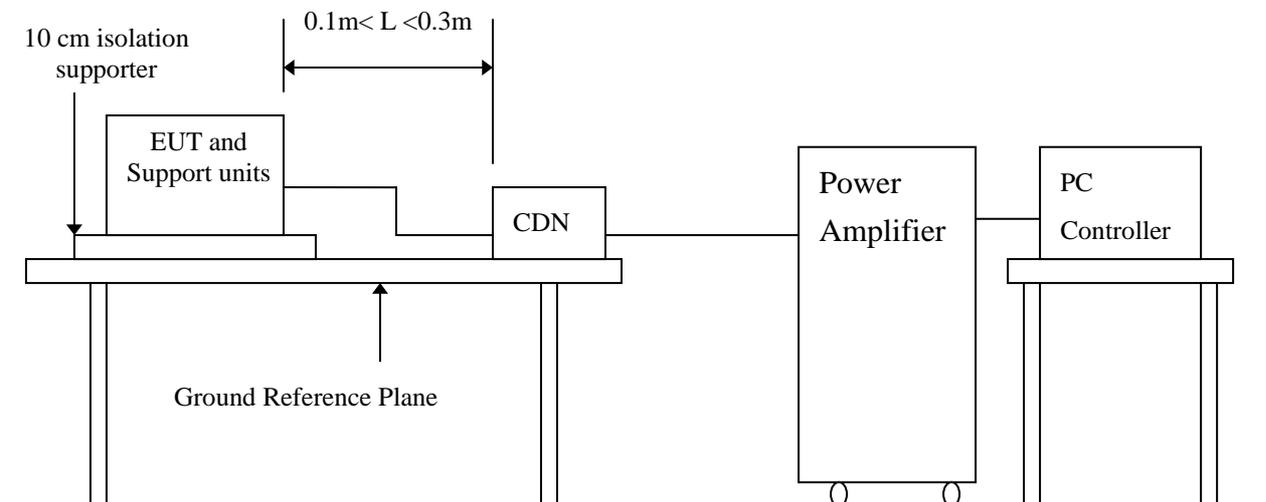
5. IEC 61000-4-6

CONDUCTED DISTURBANCE /INDUCED BY RADIO-FREQUENCY FIELD

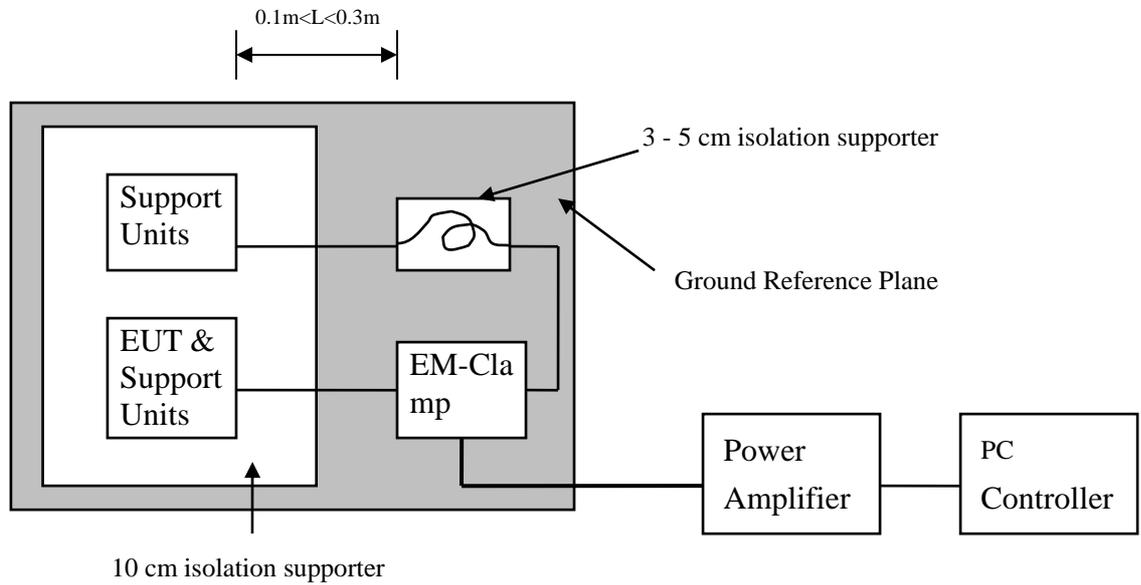
Port	: AC Port and Data Cable
Basic Standard	: IEC 61000-4-6
Requirements	: 10V with modulated
Injection Method	: CDN-M3 for Power Cord EM-Clamp for LAN Cable
Performance Criteria	: A (Standard require)
Tested by	: Allen Wang
Temperature	: 28°C
Humidity	: 51%

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. A 'H' messages were displayed on screen of 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:

- 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**

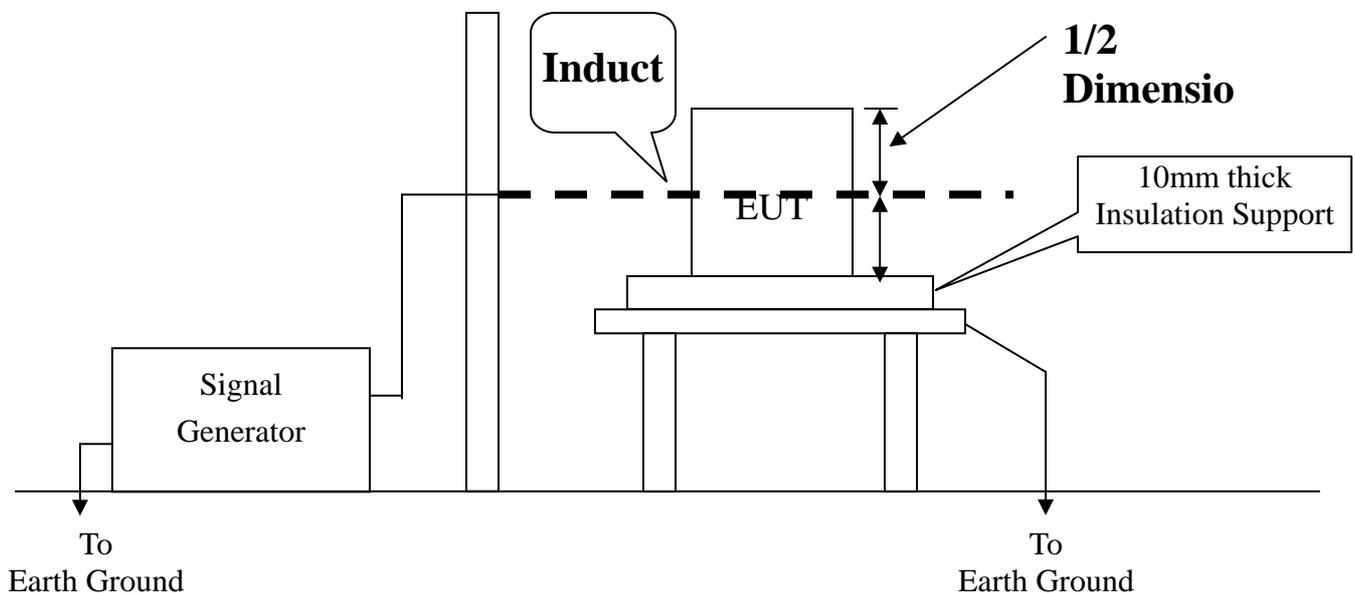
Observation: No any function degraded during the tests.

6. IEC 61000-4-8

(POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST)

Port	: Enclosure
Basic Standard	: IEC 61000-4-8
Requirements	: 30 A/m
Performance Criteria	: A (Standard Required)
Tester	: Allen Wang
Temperature	: 28°C
Humidity	: 51%

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 sent to the screen of EUT and filling the screen with upper case of “H” patterns.
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° (Y direction) then repeat step 3 to 7.
9. Rotating the induction coil by 90° again (Z direction) then repeat step 3 to 7.

*. Test conditions:

Field Strength: 30A/m
Power Freq.: 50Hz
Orientation: X, Y, Z

Orientation	Field	Result (Pass/Fail)	Remark
X	30A	Pass	
Y	30A	Pass	
Z	30A	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.

7. 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 ANGLE 0, 45, 90, 135, 180, 225, 270, 315 degrees

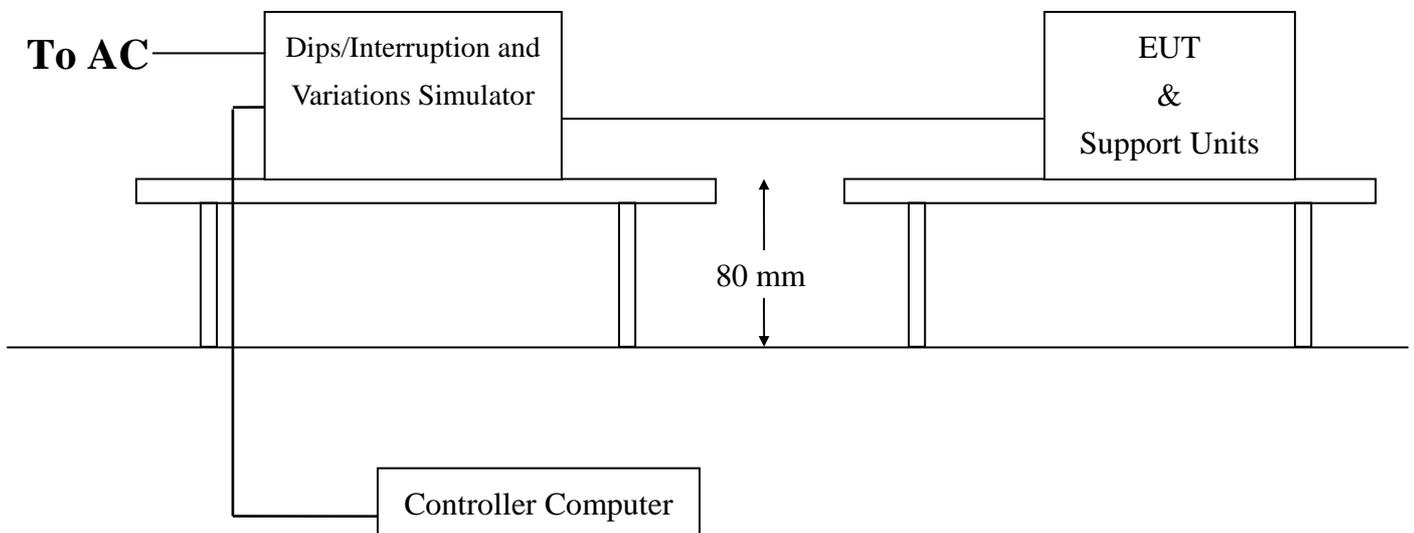
Voltage Dips (EN55024)	Test Level % U_T	Reduction (%)	Duration	Performance Criteria
	<5	>95	0.5(periods)	B
	70	30	25(periods)	C

Voltage Dips (EN61000-6-2)	Test Level % U_T	Reduction (%)	Duration	Performance Criteria
	70	30	10ms	B
	40	60	100 and 1000ms	C

Voltage Interceptions (EN55024) (EN61000-6-2)	Test Level % U_T	Reduction (%)	Duration	Performance Criteria
	<5	>95	250(periods)	C

Test Interval : Min. 10 sec.
Tester : Allen Wang
Temperature : 28°C
Humidity : 51%

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 sent to EUT filling the screens with upper case of “H” patterns.
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 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
70	30	0.5(10ms)	Normal	A
40	60	5(100ms)	Normal	A
40	60	50(1000ms)	Normal	A

Voltage Interruptions:

Test Level % U _T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
0	100	250 (5000ms)	EUT shut down, but can be recovered by manual, as the evens disappear.	C

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.

<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAILED
---	--



APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST (EN 55022)



RADIATED EMISSION TEST (EN 55022)



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



ELECTROSTATIC DISCHARGE TEST (EN 61000-4-2)



RADIATED ELECTROMAGNETIC FIELD (IEC 61000-4-3)



FAST TRANSIENTS/BURST TEST (EN 61000-4-4)



SURGE IMMUNITY TEST (IEC 61000-4-5)



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



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



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





APPENDIX 2

PHOTOGRAPHS OF EUT

Front View of EUT



Rear View of EUT



Right View of EUT



Left View of EUT



Front View of Power Adaptor



Rear View of Power Adaptor

