



EMC UPDATE TEST REPORT

For

Advantech Co., Ltd.

LCD Monitor

Model: PDC-170

Trade Name: ADVANTECH

Date of Test: September 4 ~ 14, 2004

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 B31128203 and this test report.

Approved by:

Reviewed by:

Kurt Chen
Director of Linkou Laboratory
Compliance Certification Services Inc.

Jessie Wang
Section Manager of Linkou Laboratory
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: LCD Monitor

Trade Name: ADVANTECH

Model: PDC-170

Detailed EUT Description: See Item 2 of this report

Date of Test: September 4 ~ 14, 2004

Applicable Standard	Class/Limit/Criterion	Test Result
EN 60601-1-2: 2001, including		
EN 55011: 1998 + A1: 1999	Class B	No non-compliance noted
IEC 61000-4-2: 1995 + A2: 2000	See Item 9 of this report	No non-compliance noted
IEC 61000-4-3: 1995 + A2: 2000	See Item 10 of this report	No non-compliance noted
IEC 61000-4-4: 1995 + A1: 2000	See Item 11 of this report	No non-compliance noted
IEC 61000-4-5: 1995 + A1: 2000	See Item 12 of this report	No non-compliance noted
IEC 61000-4-6: 1996 + A1: 2000	See Item 13 of this report	No non-compliance noted
IEC 61000-4-8: 1993 + A1: 2000	See Item 14 of this report	N/A
IEC 61000-4-11: 1994 + A1: 2000	See Item 15 of this report	No non-compliance noted
EN 61000-3-2: 2000	Class A/B/C/D	N/A
EN 61000-3-3: 1995 + A1: 2001	Limit	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 93/42/EEC 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	LCD Monitor		
Trade Name	ADVANTECH		
Model	PDC-170		
Housing Type	Plastic		
EUT Power Rating	DCV from Power Adapter		
**LCD Panel Manufacturer	SANYO	Model	TM121SV-02L11
Power Adapter Manufacturer	HiTRON	Model	HES49-12040
	MEDI-POWER ELECTRONICS INC.	Model	AD-1280MB-60
	SINPRO	Model	MPU50-105
Power Adapter Rating	For HES49-12040 I/P: AC 100-240V, 50/60Hz, 1A O/P: DC 12V, 4A For AD-1280MB-60 I/P: AC 100-240V, 60/50Hz, 1~0.5A O/P: DC 12V, 6A For MPU50-105 I/P: AC 100-240V, 47-63Hz, 1.35A O/P: DC 12V, 3.75A		
AC Power Cord Type	Unshielded, 1.8m (Detachable)		
DC Power Cable Type	Unshielded, 1.8m (Non-detachable) with a core for HES49-12040; AD-1280MB-60 Unshielded, 1.8m (Non-detachable) for MPU50-105		

I/O Port of EUT

I/O PORT TYPES	Q'TY	TESTED WITH
1). Serial Port	1	1
2). Video In Port (VGA)	1	1
3). Video In Port (DVI)	1	1
4). Line In Port	1	1
5). Up Stream USB Port	1	1
6). Down Stream USB Port	2	2



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 × 1024 Resolution + DVI Cable + HES49-12040 Power Adapter

Mode 2

1280 × 1024 Resolution + VGA Cable + HES49-12040-60 Power Adapter

Mode 3

1024 × 768 Resolution + DVI Cable + HES49-12040 Power Adapter

Mode 4

800 × 600 Resolution + DVI Cable + HES49-12040 Power Adapter

Mode 5

1280 × 1024 Resolution + DVI Cable + MPU50-105 Power Adapter

Mode 6

1280 × 1024 Resolution + VGA Cable + MPU50-105 Power Adapter

Mode 7

1024 × 768 Resolution + DVI Cable + MPU50-105 Power Adapter

Mode 8

800 × 600 Resolution + DVI Cable + MPU50-105 Power Adapter

2. After the preliminary scan, the following test mode(s) were found to produce the highest emission level.

Mode 1, 5

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	PC	D51C	7251 KN8Z 0014	FCC DoC	Compaq	VGA Cable: Shielded, 1.8m with two cores DVI Cable: Shielded, 1.8m with two cores Audio Cable: Unshielded, 1.8m Up Stream USB Cable: Unshielded, 1.8m RS232 Cable: Unshielded, 1.8m	Unshielded, 1.8m
2	Modem	DM-1414	304012261	IFAXDM1414	ACEEX	Unshielded, 1.5m	Unshielded, 1.8m
3	Printer	STYLUS C60	DR3K039425	FCC DoC	EPSON	Shielded, 1.8m	Unshielded, 1.8m
4	PS/2 Keyboard	Y-SP29	SYU30272823	FCC DoC	Logitech	Shielded, 1.8m	N/A
5	PS/2 Mouse	M-S34	HCA25200445	DZL211029	Logitech	Shielded, 1.8m	N/A
6	USB Mouse	MO19UCA	20440990	FCC DoC	HP	Down Stream USB Cable: Shielded, 1.8m	N/A
7	USB Mouse	MO19UCA	20509289	FCC DoC	HP	Down Stream USB Cable: 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.



5 FACILITIES AND ACCREDITATIONS

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 under the IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

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	ESCS30	845552/030	03/14/2005
LISN	R&S	ESH2-Z5	843285/010	01/08/2005
LISN	EMCO	3825/2	9003-1628	07/26/2005

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 # 5				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Bilog Antenna	SCHWAZBECK	VULB9163	128	01/16/2005
Spectrum Analyzer	ADVANTEST	R3261C	81720301	N.C.R
Pre-Amplifier	HP	8447F	2944A03748	01/05/2005
EMI Test Receiver	SCHAFFNER	SCR 3501	410	02/10/2005
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	04	N.C.R
RF Switch	ANRITSU	MP59B	10877	N.C.R
Site NSA	C&C Lab.	N/A	N/A	12/12/2004

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
HARMONICS SYSTEM	EMC-PARTNER	HARMONICS-1000	094	10/26/2004

Equipment Used for Immunity Measurement

ESD Test Site (IEC/EN 61000-4-2)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESD Generator	EM TEST	P30C	0603-01	08/01/2005

Radiated Electromagnetic Field Immunity Test Site (IEC/EN 61000-4-3) (80-1000MHz)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
S.G.	R&S	SMY02	100094	08/05/2005
Power Meter	R&S	NRVD	837794/029	08/06/2005
Power Sensor	R&S	URV5-Z2	835640/015	08/06/2005
Power Sensor	R&S	URV5-Z2	835640/016	08/06/2005
Power Amplifier	ar	150W1000	300300	N.C.R
Power Antenna	EMCO	93141	9712-1083	N.C.R

Radiated Electromagnetic Field Immunity Test Site (IEC/EN 61000-4-3) (1400-2500MHz)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Signal Generator	Agilent	8648C	4108A05772	07/29/2005
150 Watts 80-1000MHz Amplifier	Amplifier Research	150W1000M3	306730	Not Required
30 Watts 0.8-3.0GHz Amplifier	Amplifier Research	30S1G3M1	306722	Not Required
Power Meter	Boonton	4232A-01-02	98501	07/29/2005
Power Sensor	Boonton	51011-EMC	32920	07/29/2005
Power Sensor	Boonton	51011-EMC	32863	07/29/2005
Log-Periodic Antenna	Amplifier Research	AT1080	306709	Not Required
Microwave Horn Antenna	Amplifier Research	AT4002A	306750	Not Required
6 MHz Sweep/Function Generator	AMREL	FG-506	50608090006	05/18/2005
RF Test System Controller	Amplifier Research	SC1000M3	306666	Not Required
Field Probe	Amplifier Research	FP6001	305657	03/17/2005



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	08/25/2005

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	08/25/2005

CS Test Site (IEC/EN 61000-4-6)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
S.G.	R&S	SMY02	100094	08/05/2005
Power Meter	R&S	NRVD	837794/029	08/06/2005
Power Sensor	R&S	URV5-Z2	835640/015	08/06/2005
Power Sensor	R&S	URV5-Z2	835640/016	08/06/2005
Power Amplifier	ar	500A100A	300299	N.C.R
CDN	Lüthi	801-M3	1879	03/03/2005

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	11/13/2004
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	04/06/2005



6 TEST RESULTS

Line Conducted Emission

Model: PDC-170**Test Mode:** Mode 1**Temperature:** 28°C**Humidity:** 63% RH**Tested by:** Ken Jung**Test Results:** Pass

(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
0.230	46.70	---	62.45	52.45	-15.75	---	L1
3.433	35.60	---	56.00	46.00	-20.40	---	L1
5.031	40.10	---	60.00	50.00	-19.90	---	L1
6.182	43.70	---	60.00	50.00	-16.30	---	L1
13.041	41.70	---	60.00	50.00	-18.30	---	L1
13.156	40.90	---	60.00	50.00	-19.10	---	L1
0.230	47.40	---	62.45	52.45	-15.05	---	L2
1.494	35.60	---	56.00	46.00	-20.40	---	L2
3.786	37.70	---	56.00	46.00	-18.30	---	L2
5.281	44.10	---	60.00	50.00	-15.90	---	L2
6.195	43.70	---	60.00	50.00	-16.30	---	L2
13.174	38.60	---	60.00	50.00	-21.40	---	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.

**Line Conducted Emission****Model:** PDC-170**Test Mode:** Mode 5**Temperature:** 28°C**Humidity:** 63% RH**Tested by:** Ken Jung**Test Results:** Pass

(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
0.170	40.40	---	64.96	54.96	-24.56	---	L1
1.555	37.60	---	56.00	46.00	-18.40	---	L1
2.587	36.70	---	56.00	46.00	-19.30	---	L1
5.224	38.60	---	60.00	50.00	-21.40	---	L1
5.454	37.50	---	60.00	50.00	-22.50	---	L1
7.001	37.40	---	60.00	50.00	-22.60	---	L1
0.170	38.60	---	64.96	54.96	-26.36	---	L2
1.134	37.90	---	56.00	46.00	-18.10	---	L2
2.554	36.70	---	56.00	46.00	-19.30	---	L2
5.287	37.90	---	60.00	50.00	-22.10	---	L2
5.514	37.60	---	60.00	50.00	-22.40	---	L2
6.999	36.70	---	60.00	50.00	-23.30	---	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.

**Radiated Emission (A)****Model:** PDC-170**Test Mode:** Mode 1**Temperature:** 28°C**Humidity:** 60% RH**Detector Function:** Quasi-peak.**Antenna:** Vertical at 10m**Tested by:** Carl Chang**Test Results:** Pass

(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)
50.14	13.4	11.8	25.2	30.0	-4.8
67.12	11.6	5.6	17.2	30.0	-12.8
86.05	14.9	8.3	23.2	30.0	-6.8
125.03	14.6	11.9	26.5	30.0	-3.5
142.65	14.1	12.0	26.1	30.0	-3.9
183.58	11.4	11.4	22.8	30.0	-7.2
248.25	14.0	13.2	27.2	37.0	-9.8
324.10	10.6	16.6	27.2	37.0	-9.8
351.20	11.8	17.8	29.6	37.0	-7.4
391.20	11.0	19.6	30.6	37.0	-6.4
432.10	11.0	19.3	30.3	37.0	-6.7
487.80	10.0	20.6	30.6	37.0	-6.4
563.60	4.6	22.4	27.0	37.0	-10.0
665.00	4.4	23.6	28.0	37.0	-9.0
792.10	2.7	26.5	29.2	37.0	-7.8
817.10	5.1	27.4	32.5	37.0	-4.5

**Radiated Emission (B)****Model:** PDC-170**Test Mode:** Mode 1**Temperature:** 28°C**Humidity:** 60% RH**Detector Function:** Quasi-peak.**Antenna:** Horizontal at 10m**Tested by:** Carl Chang**Test Results:** Pass

(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)
50.00	12.3	11.9	24.2	30.0	-5.8
67.35	10.6	5.6	16.2	30.0	-13.8
86.21	14.3	8.3	22.6	30.0	-7.4
125.34	14.3	11.9	26.2	30.0	-3.8
143.61	13.4	11.8	25.2	30.0	-4.8
148.66	12.9	11.2	24.1	30.0	-5.9
182.65	10.4	11.4	21.8	30.0	-8.2
248.31	13.5	13.2	26.7	37.0	-10.3
257.00	10.8	14.2	25.0	37.0	-12.0
288.77	8.3	15.9	24.2	37.0	-12.8
304.53	11.3	15.8	27.1	37.0	-9.9
313.14	12.0	16.1	28.1	37.0	-8.9
395.29	5.8	19.8	25.6	37.0	-11.4
400.89	4.0	20.0	24.0	37.0	-13.0
426.04	5.6	19.5	25.1	37.0	-11.9
467.82	4.3	19.7	24.0	37.0	-13.0
486.93	7.0	20.6	27.6	37.0	-9.4
547.10	2.6	22.4	25.0	37.0	-12.0



621.70	2.0	22.7	24.7	37.0	-12.3
<hr/>					
687.10	4.3	23.7	28.0	37.0	-9.0
<hr/>					
734.54	7.7	25.2	32.9	37.0	-4.1
<hr/>					
878.70	3.2	27.6	30.8	37.0	-6.2
<hr/>					

**Radiated Emission (A)****Model:** PDC-170**Test Mode:** Mode 5**Temperature:** 28°C**Humidity:** 60% RH**Detector Function:** Quasi-peak.**Antenna:** Vertical at 10m**Tested by:** Carl Chang**Test Results:** Pass

(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)
84.00	18.1	7.8	25.9	30.0	-4.1
167.02	6.5	10.5	17.0	30.0	-13.0
176.80	6.5	11.3	17.8	30.0	-12.2
205.21	4.6	10.7	15.3	30.0	-14.7
214.95	10.1	10.5	20.6	30.0	-9.4
317.28	8.2	16.3	24.5	37.0	-12.5
331.70	3.3	16.9	20.2	37.0	-16.8
411.18	8.2	19.8	28.0	37.0	-9.0
532.00	2.0	22.0	24.0	37.0	-13.0
547.10	2.4	22.4	24.8	37.0	-12.2
621.01	5.1	22.7	27.8	37.0	-9.2
909.60	3.7	26.8	30.5	37.0	-6.5

**Radiated Emission (B)****Model:** PDC-170**Test Mode:** Mode 5**Temperature:** 28°C**Humidity:** 60% RH**Detector Function:** Quasi-peak.**Antenna:** Horizontal at 10m**Tested by:** Carl Chang**Test Results:** Pass

(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)
125.56	14.1	11.9	26.0	30.0	-4.0
148.21	4.2	11.3	15.5	30.0	-14.5
215.00	10.0	10.5	20.5	30.0	-9.5
304.53	11.3	15.8	27.1	37.0	-9.9
313.14	12.0	16.1	28.1	37.0	-8.9
395.29	5.8	19.8	25.6	37.0	-11.4
400.89	4.0	20.0	24.0	37.0	-13.0
426.04	5.6	19.5	25.1	37.0	-11.9
467.82	4.3	19.7	24.0	37.0	-13.0
486.93	7.0	20.6	27.6	37.0	-9.4
547.10	2.6	22.4	25.0	37.0	-12.0
621.70	2.0	22.7	24.7	37.0	-12.3
630.60	3.4	23.0	26.4	37.0	-10.6
687.10	4.3	23.7	28.0	37.0	-9.0
787.40	-4	26.4	26.0	37.0	-11.0
878.70	3.2	27.6	30.8	37.0	-6.2



7 POWER HARMONICS TEST

Port : AC mains

Basic Standard : EN 61000-3-2 (2000)

Limits : ☐ CLASS A ; ☐ CLASS B ; ☐ CLASS C ; ☐ CLASS D

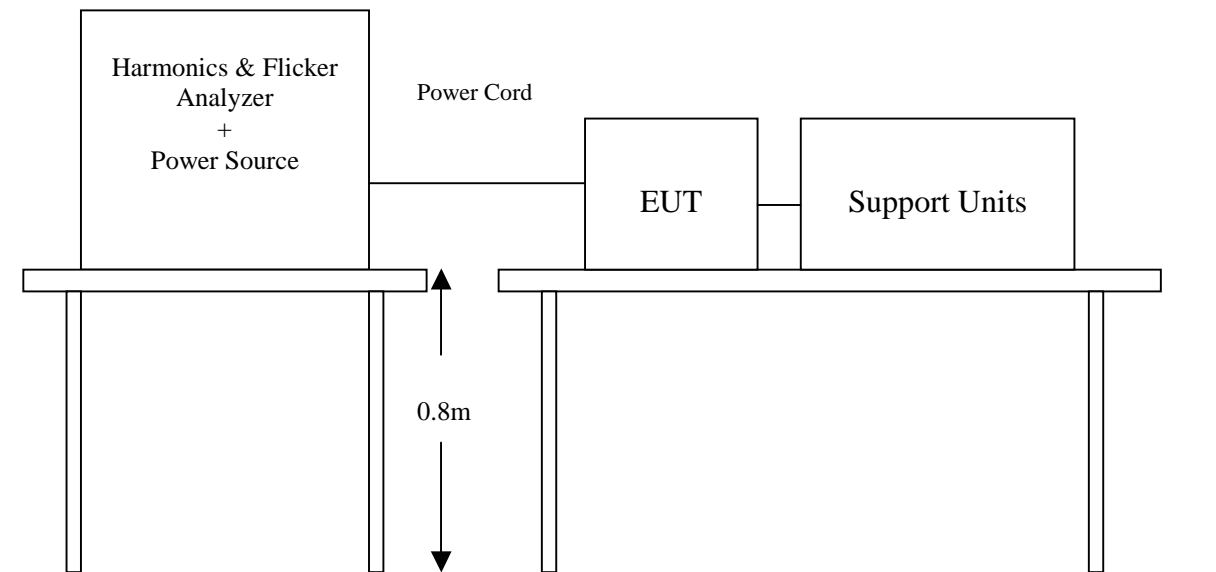
Tested by : N/A

Temperature : N/A

Humidity : N/A

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:**

- 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 :***Mode 1****EUT max Power : 38.5W****Mode 5****EUT max Power : 38.47W*

Note: According to clause 7 of EN 61000-3-2: 2000, equipment with a rated power of 75W or less, no limits apply.

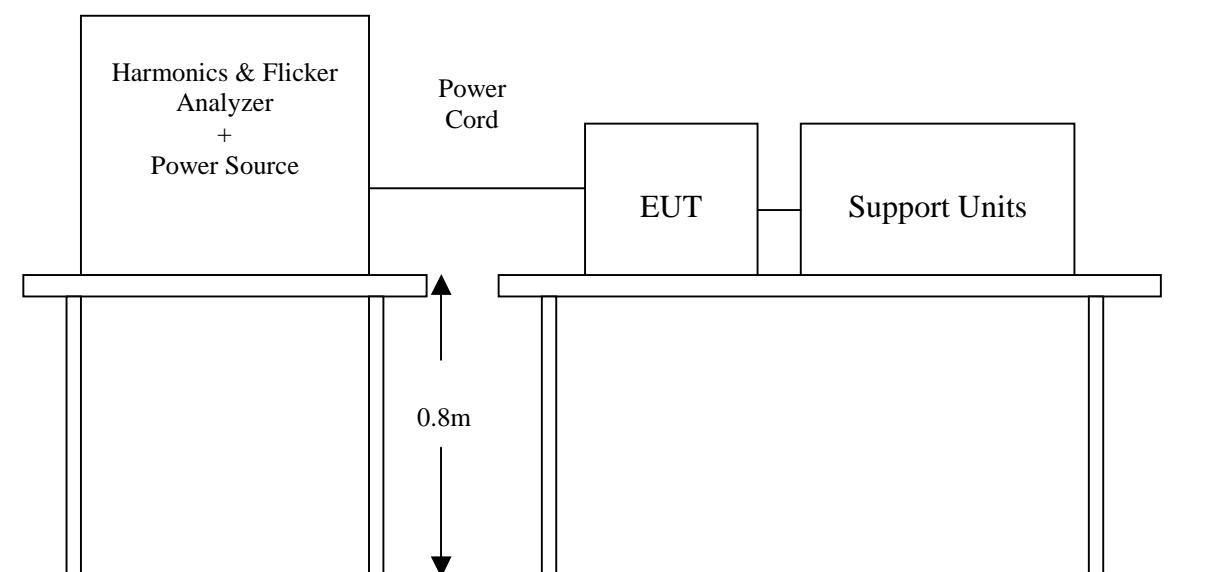
8 POWER VOLTAGE FLUCTUATION / FLICKER TEST

Port : AC mains
Basic Standard : EN 61000-3-3 (1995 + A1: 2001)
Limits : §5 of EN 61000-3-3
Tested by : Ken Jung
Temperature : 26°C
Humidity : 55% RH
Test Mode : 1, 5

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)	500	T_{dt} means maximum time that dt exceeds 3 %.
d_{max} (%)	4%	d_{max} means maximum relative voltage change.
dc (%)	3.3%	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)**Mode 1
Continue**

Test Parameter	Measurement Value	Limit	Result
P _{st}	0.072	1.0	Pass
P _{lt}	0.072	0.65	Pass
T _{dt} (ms)	0	500	Pass
d _{max} (%)	0.02%	4%	Pass
dc (%)	0.04%	3.3%	Pass

Manual Switch

Test Parameter	Measurement Value	Limit	Result
P _{st}	0.072	1.0	Pass
P _{lt}	0.072	0.65	Pass
T _{dt} (ms)	0	500	Pass
d _{max} (%)	0%	4%	Pass
dc (%)	0.03%	3.3%	Pass

**Mode 5
Continue**

Test Parameter	Measurement Value	Limit	Result
P _{st}	0.072	1.0	Pass
P _{lt}	0.072	0.65	Pass
T _{dt} (ms)	0	500	Pass
d _{max} (%)	0%	4%	Pass
dc (%)	0.02%	3.3%	Pass

Manual Switch

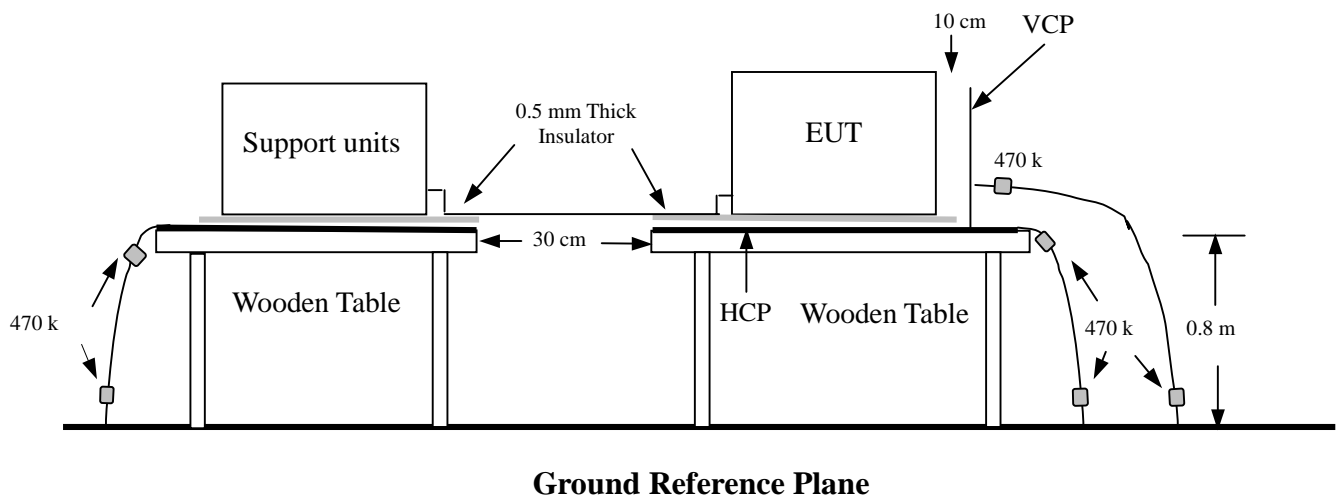
Test Parameter	Measurement Value	Limit	Result
P _{st}	0.072	1.0	Pass
P _{lt}	0.072	0.65	Pass
T _{dt} (ms)	0	500	Pass
d _{max} (%)	0.24%	4%	Pass
dc (%)	0.15%	3.3%	Pass

9 ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	: Enclosure
Basic Standard	: IEC/EN 61000-4-2
Test Level	: $\pm 2, 4, 8$ kV (Air Discharge) $\pm 2, 4, 6$ kV (Contact Discharge) $\pm 2, 4, 6$ kV (Indirect Discharge)
Performance Criterion	: The Equipment or System shall be able to provide the essential performance and remain safe.
Tested by	: Ken Jung/ George Kuo
Temperature	: $27^{\circ}\text{C}/ 25^{\circ}\text{C}$
Humidity	: 52% RH/ 51% RH
Test Mode	: 1, 5

Block Diagram of Test Setup:

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



**Test Procedure:**

The electrostatic discharges were applied as follows:

Amount of Discharges	Voltage	Coupling	Result (Pass/Fail)
10 / Point	$\pm 2, 4, 8$ kV	Air Discharge	Pass
10 / Point	$\pm 2, 4, 6$ kV	Contact Discharge	Pass
10 / Point	$\pm 2, 4, 6$ kV	Indirect Discharge HCP	Pass
10 / Point	$\pm 2, 4, 6$ kV	Indirect Discharge VCP (Left)	Pass
10 / Point	$\pm 2, 4, 6$ kV	Indirect Discharge VCP (Back)	Pass
10 / Point	$\pm 2, 4, 6$ kV	Indirect Discharge VCP (Right)	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)

Observation: No any function degraded during the tests.

Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Change of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

The Tested Points of EUT

Photo 1 of 4



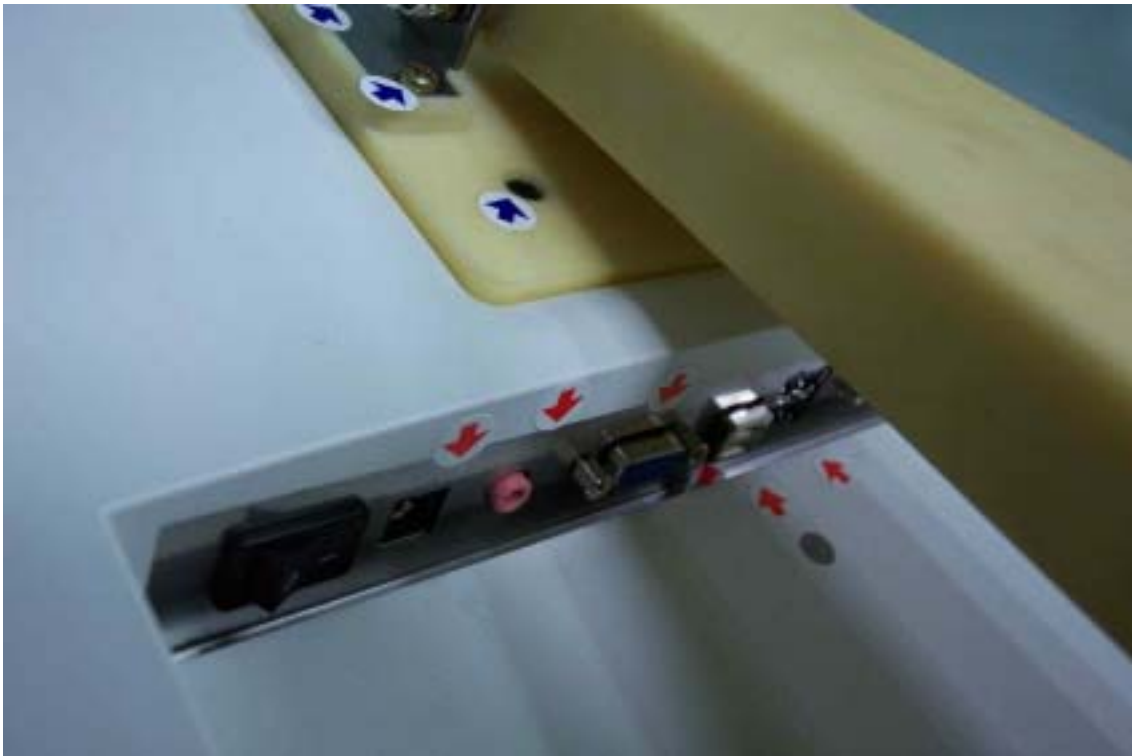
Photo 2 of 4



Photo 3 of 4



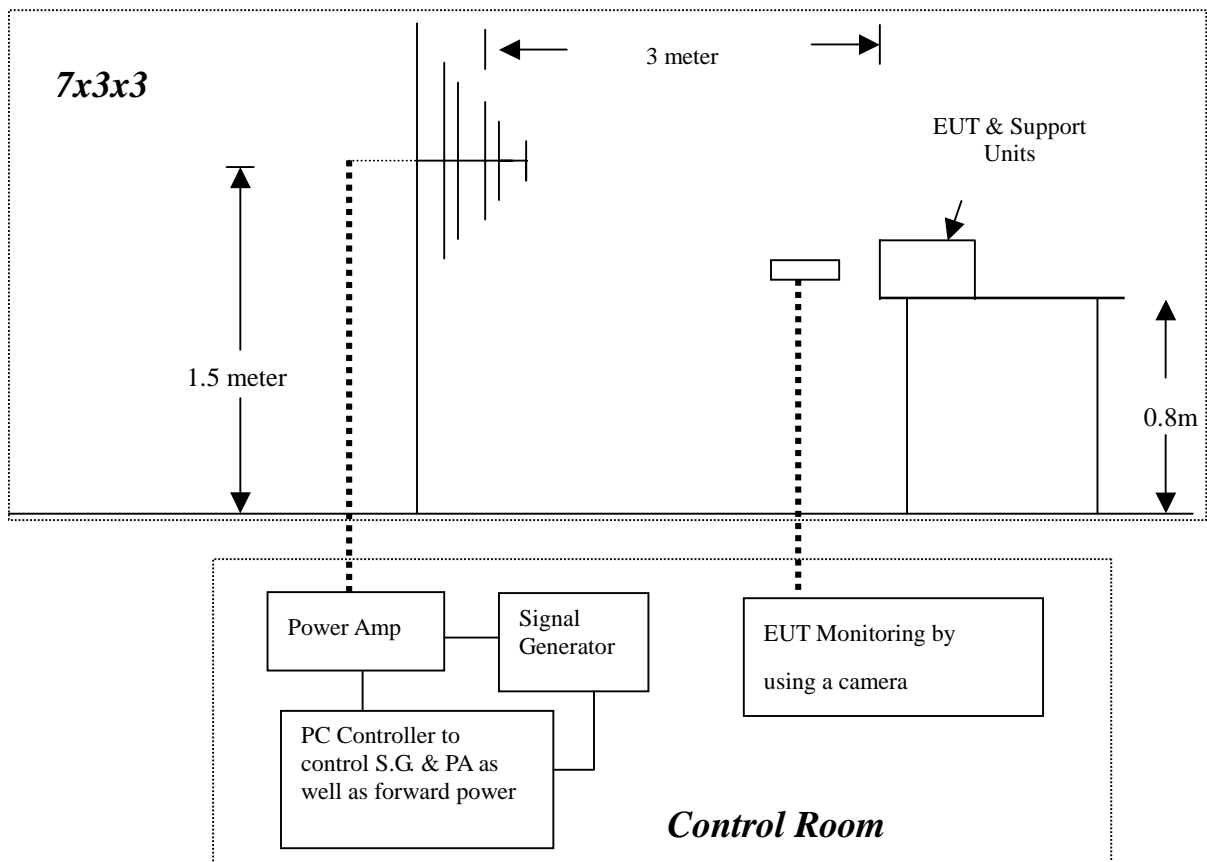
Photo 4 of 4



10 RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	: Enclosure
Basic Standard	: IEC/EN 61000-4-3
Requirements	: 10 V/m / with 80% AM. 1kHz Modulation.
Performance Criterion	: The Equipment or System shall be able to provide the essential performance and remain safe.
Tested by	: Ken Jung
Temperature	: 27°C
Humidity	: 58% RH/ 52% RH
Pressure	: 1019mbar
Test Mode	: 1, 5

Block Diagram of Test Setup:



**Test Procedure:**

Frequency Range 80MHz ~ 2500MHz

Steps : 1 % of fundamental

Dwell Time : 3 sec

Range (MHz)	Field	Modulation	Polarity	Position	Result (Pass/Fail)
80-2500	10V/m	Yes	H	0	Pass
80-2500	10V/m	Yes	V	0	Pass
80-2500	10V/m	Yes	H	90	Pass
80-2500	10V/m	Yes	V	90	Pass
80-2500	10V/m	Yes	H	180	Pass
80-2500	10V/m	Yes	V	180	Pass
80-2500	10V/m	Yes	H	270	Pass
80-2500	10V/m	Yes	V	270	Pass

Observation: No any function degraded during the tests.**Compliance Criteria:**

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

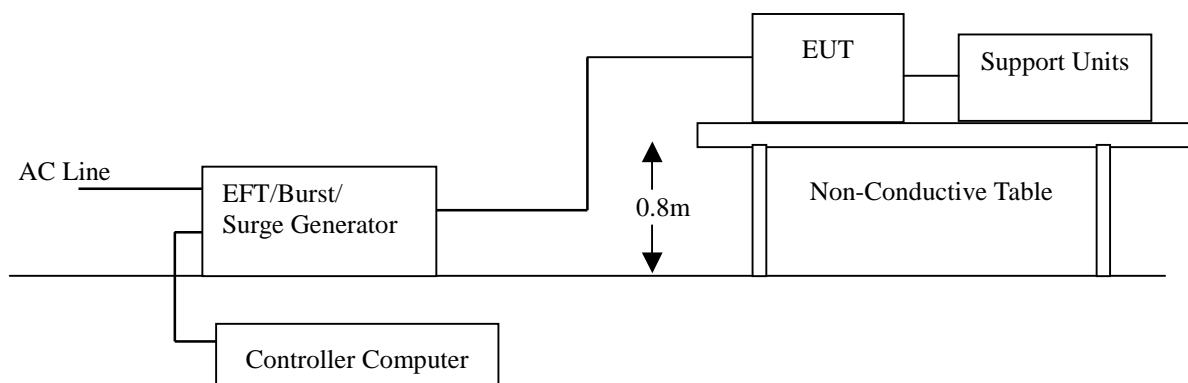
For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

11 FAST TRANSIENTS/BURST IMMUNITY TEST

Port	: On Power Supply Line
Basic Standard	: IEC/EN 61000-4-4
Requirements	: ± 2 kV for Power Supply Line
Performance Criterion	: The Equipment or System shall be able to provide the essential performance and remain safe.
Tested by	: Ken Jung
Temperature	: 28°C/ 26°C
Humidity	: 57% RH/ 53% RH
Pressure	: 1019mbar
Test Mode	: 1, 5

Block Diagram of Test Setup:



**Test Procedure:**

Impulse Frequency : 5kHz
Tr/Th : 5/50ns
Burst Duration : 15ms
Burst Period : 3Hz

Inject Line	Voltage kV	Inject Method	Result (Pass/Fail)
L	± 2	Direct	Pass
N	± 2	Direct	Pass
PE	± 2	Direct	Pass
L + N	± 2	Direct	Pass
L + PE	± 2	Direct	Pass
N + PE	± 2	Direct	Pass
L + N + PE	± 2	Direct	Pass

Observation: No any function degraded during the tests.

Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

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 : The Equipment or System shall be able to provide the essential performance and remain safe.

Tested by : Ken Jung

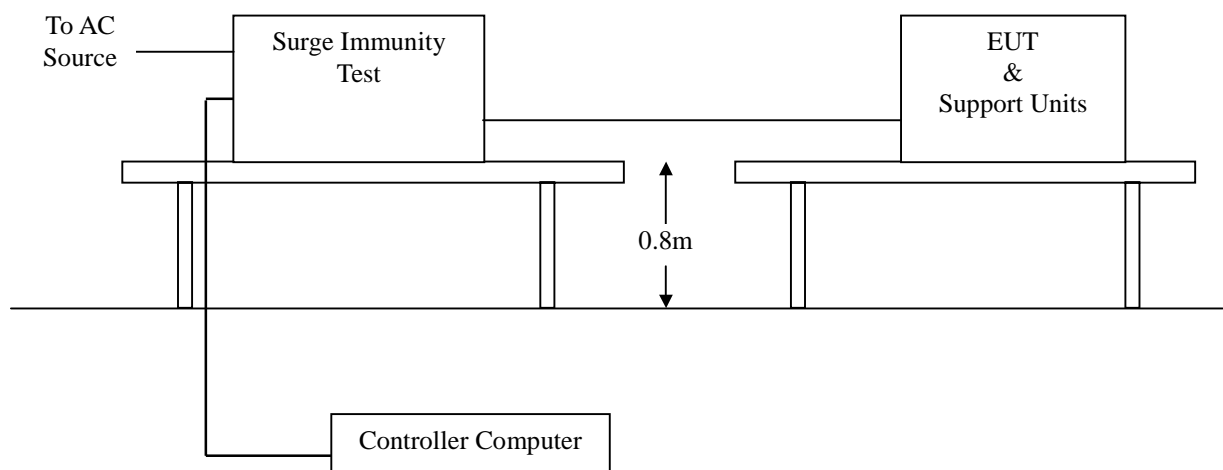
Temperature : 29°C/ 27°C

Humidity : 57% RH

Pressure : 1019mbar

Test Mode : 1, 5

Block Diagram of Test Setup:



**Test Procedure:**

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	0.5, 1	Positive	Capacitive	Pass
L1-PE	0.5, 1, 2	Positive	Capacitive	Pass
L2-PE	0.5, 1, 2	Positive	Capacitive	Pass
L1-L2	0.5, 1	Negative	Capacitive	Pass
L1-PE	0.5, 1, 2	Negative	Capacitive	Pass
L2-PE	0.5, 1, 2	Negative	Capacitive	Pass

Observation: No any function degraded during the tests.

Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

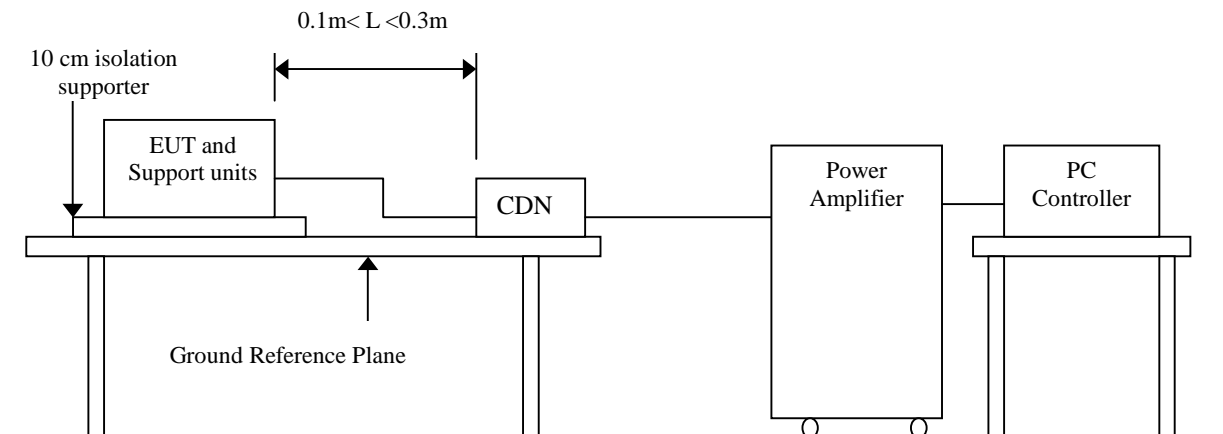
For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

13 CONDUCTED DISTURBANCE/INDUCED RADIO-FREQUENCY FIELD IMMUNITY TEST

Port	: AC Port
Basic Standard	: IEC/EN 61000-4-6
Requirements	: 10 V with 80% AM. 1kHz Modulation.
Injection Method	: CDN-M3 for Power Cord
Performance Criterion	: The Equipment or System shall be able to provide the essential performance and remain safe.
Tested by	: Ken Jung
Temperature	: 26°C
Humidity	: 57% RH
Pressure	: 1019mbar
Test Mode	: 1, 5

Block Diagram of Test Setup:



**Test Procedure:**

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

Observation: No any function degraded during the tests.**Compliance Criteria:**

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

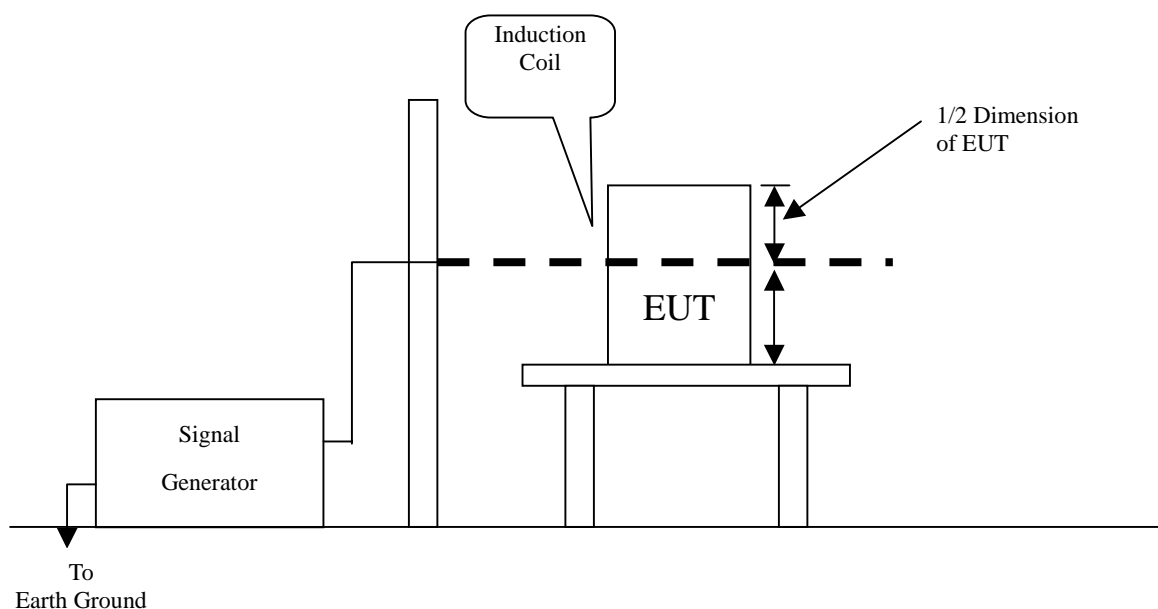
For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

14 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

Port	: Enclosure
Basic Standard	: IEC/EN 61000-4-8
Requirements	: 3 A/m
Performance Criterion	: The Equipment or System shall be able to provide the essential performance and remain safe.
Tested by	: Ken Jung
Temperature	: 27°C
Humidity	: 57% RH/ 56% RH
Pressure	: 1019mbar
Test Mode	: 1, 5

Block Diagram of Test Setup:



**Test Procedure:**

Field Strength : 3A/m

Power Freq. : 50Hz

Orientation : X, Y, Z

Orientation	Field	Result (Pass/Fail)	Remark
X	3A/m	Pass	
Y	3A/m	Pass	
Z	3A/m	Pass	

Observation: No any function degraded during the tests.**Compliance Criteria:**

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Chang of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

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)
	<5	>95	0.5
	40	60	5
	70	30	25

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

Test Interval : Min. 10 sec.

Performance Criteria : The Equipment or System shall be able to provide the essential performance and remain safe.

Tested by : Ken Jung

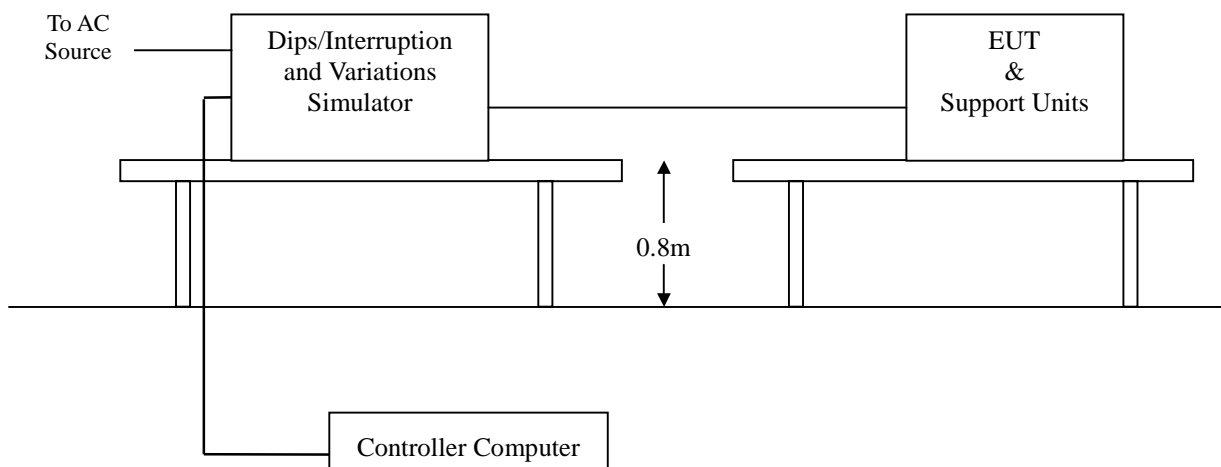
Temperature : 25 ~ 26°C/ 26 ~ 27°C

Humidity : 56 ~ 57% RH

Pressure : 1019mbar

Test Mode : 1, 5

Block Diagram of Test Setup:



**Test Procedure:**

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	Result
0	100	0.5	Normal	PASS
40	60	5	Normal	PASS
70	30	25	Normal	PASS

Voltage Interruptions:

Test Level % U _T	Reduction (%)	Duration (periods)	Observation	Result
0	100	250	EUT shut down, but can be auto recovered as the events disappear.	PASS

Note:

1. Normal - No any functions degrade during and after the test.
2. For Voltage Interruption, EQUIPMENT and SYSTEMS are allowed a deviation from the requirements of 36.202.1 j) at the IMMUNITY TEST LEVEL specified in Table 211, provided the EQUIPMENT or SYSTEM remains safe, experiences no component failures and is restorable to the pre-test state with OPERATOR intervention. Determination of compliance is based upon performance of the EQUIPMENT or SYSTEM during and after application of the test sequence.

Observation: No any function degraded during the tests.



Compliance Criteria:

Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe. The following DEGRADATIONS associated with ESSENTIAL PERFORMANCE and safety shall not be allowed:

- Component failures
- Changes in programmable parameters
- Reset to factory defaults (manufacturer's presets)
- Change of operating mode
- False alarms
- Cessation or interruption of any intended operation, even if accompanied by an alarm
- Initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm
- Error of a displayed numerical value sufficiently large to affect diagnosis or treatment
- Noise on a waveform in which the noise is indistinguishable from physiologically-produced signals or the noise interferes with interpretation of physiologically-produced signals
- Artefact or distortion in an image in which the artefact is indistinguishable from physiologically-produced signals or the distortion interferes with interpretation of physiologically-produced signals
- Failure of automatic diagnosis or treatment EQUIPMENT and SYSTEMS to diagnose or treat, even if accompanied by an alarm.

For EQUIPMENT and SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel.

The EQUIPMENT or SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from manufacturer's specifications) that does not affect ESSENTIAL PERFORMANCE or safety.

APPENDIX I - PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST (EN 55011)



RADIATED EMISSION TEST (EN 55011)



POWER 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 61000-3-3

Mode 1

ADVANTECH

Date : 2004/9/4 PM 04:49:11 V3.15

File :

Operator : KEN JUNG
EUT : LCD MONITOR
Model No. PDC-170
Remarks MODE:HITRON A/D TEMP:26 HUMD:55

Urms = 230.1V Freq = 49.987 Range: 2 A
Irms = 0.361A Ipk = 1.489A cf = 4.122
P = 37.21W Pap = 83.14VA pf = 0.447

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.30 %
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	dmax	dc	dt>Lim	Fail
		[%]	[%]	[ms]	
1	0.072	0.020	0.040	0.000	



ADVANTECH

Date : 2004/9/4 PM 05:02:29 V3.15

File :

Operator : KEN JUNG
EUT : LCD MONITOR
Model No. PDC-170
Remarks MODE:HITRON A/D TEMP:26 HUMD:55

Urms = 230.1V Freq = 49.987 Range: 2 A
Irms = 0.356A Ipk = 1.487A cf = 4.173
P = 36.96W Pap = 82.02VA pf = 0.451

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.30 %
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	dmax	dc	dt>Lim	Fail
		[%]	[%]	[ms]	
1	0.072	0.000	0.030	0.000	



Mode 5

ADVANTECH

Date : 2004/9/4 PM 04:21:52 V3.15

File :

Operator : KEN JUNG

EUT : LCD MONITOR

Model No. PDC-170

Remarks MODE:SINPRO A/D TEMP:26 HUMD:55

Urms = 230.1V Freq = 49.987 Range: 2 A

Irms = 0.369A Ipk = 1.573A cf = 4.262

P = 37.75W Pap = 84.94VA pf = 0.444

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00

dmax : 4.00 % dc : 3.30 %

dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	dmax	dc	dt>Lim	Fail
		[%]	[%]	[ms]	
1	0.072	0.000	0.020	0.000	



ADVANTECH

Date : 2004/9/4 PM 04:34:04 V3.15

File :

Operator : KEN JUNG
EUT : LCD MONITOR
Model No. PDC-170
Remarks MODE:SINPRO A/D TEMP:26 HUMD:55

Urms = 230.1V Freq = 49.974 Range: 2 A
Irms = 0.347A Ipk = 1.517A cf = 4.375
P = 34.70W Pap = 79.77VA pf = 0.435

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.30 %
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	dmax	dc	dt>Lim	Fail
		[%]	[%]	[ms]	
1	0.072	0.240	0.150	0.000	