



CE EMC

TEST REPORT

For

Cat5 KVM Extender

Model: UKE-100

Trade Name: UNICLASS

Issued to

UNICLASS TECHNOLOGY CO., LTD.
4F, No. 98, Ming Chuan Rd., Hsin-Tien,
Taipei, Taiwan, R.O.C.

Issued by



Compliance Certification Services Inc.
No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,
Taoyuan Hsien, (338) Taiwan, R.O.C.
<http://www.ccsemc.com.tw>
service@tw.ccsemc.com



Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document.



TABLE OF CONTENTS

1	TEST RESULT CERTIFICATION.....	3
2	EUT DESCRIPTION.....	4
3	TEST METHODOLOGY.....	5
3.1	EUT SYSTEM OPERATION.....	5
3.2	DECISION OF FINAL TEST MODE.....	5
4	INSTRUMENT AND CALIBRATION.....	6
4.1	MEASURING INSTRUMENT CALIBRATION.....	6
4.2	TEST AND MEASUREMENT EQUIPMENT.....	6
5	FACILITIES AND ACCREDITATIONS.....	10
5.1	FACILITIES.....	10
5.2	LABORATORY ACCREDITATIONS AND LISTINGS.....	11
6	SETUP OF EQUIPMENT UNDER TEST.....	12
6.1	SETUP DIAGRAM.....	12
6.2	SUPPORT EQUIPMENT.....	12
7	POWERLINE CONDUCTED & RADIATED EMISSION TEST.....	13
7.1	LIMIT.....	13
7.2	TEST PROCEDURE OF LINE CONDUCTED EMISSION.....	14
7.3	TEST PROCEDURE OF COMMON MODE CONDUCTED EMISSION FOR TELECOMMUNICATION PORT.....	15
7.4	TEST PROCEDURE OF RADIATED EMISSION.....	16
7.5	TEST RESULTS.....	17
8	POWER HARMONICS TEST.....	20
9	POWER VOLTAGE FLUCTUATION / FLICKER TEST.....	23
10	ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST.....	26
11	RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST.....	32
12	FAST TRANSIENTS/BURST IMMUNITY TEST.....	35
13	SURGE IMMUNITY TEST.....	38
14	CONDUCTED DISTRBANCE/INDUCED RADIO-FREQUENCY FIELD IMMUNITY TEST.....	40
15	POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST.....	42
16	VOLTAGE DIPS / SHORT INTERRUPTIONS.....	44
	APPENDIX I – PHOTOGRAPHS OF TEST SETUP.....	46



1 TEST RESULT CERTIFICATION

Applicant: UNICLASS TECHNOLOGY CO., LTD.
4F, No. 98, Ming Chuan Rd., Hsin-Tien,
Taipei, Taiwan, R.O.C.

Manufacturer: UNICLASS TECHNOLOGY CO., LTD.
4F, No. 98, Ming Chuan Rd., Hsin-Tien,
Taipei, Taiwan, R.O.C.

Equipment Under Test: Cat5 KVM Extender

Trade Name: UNICLASS

Model: UKE-100

Detailed EUT Description: See Item 2 of this report

Date of Test: August 10 ~ 13, 2007

Applicable Standard	Class/Limit/Criterion	Test Result
EN 55022: 1998 + A1: 2000 + A2: 2003	Class B	No non-compliance noted
EN 61000-3-2: 2000	Class D	No non-compliance noted
EN 61000-3-3: 1995 + A1: 2001	Limit	No non-compliance noted
EN 55024: 1998 + A1: 2001 + A2: 2003, including		
IEC 61000-4-2: 1995 + A1: 1998 + A2: 2000	Criterion B	No non-compliance noted
IEC 61000-4-3: 2002 + A1: 2002	Criterion A	No non-compliance noted
IEC 61000-4-4: 2004	Criterion B	No non-compliance noted
IEC 61000-4-5: 1995 + A1: 2000	Criterion B	No non-compliance noted
IEC 61000-4-6: 1996 + A1: 2000	Criterion A	No non-compliance noted
IEC 61000-4-8: 1993 + A1: 2000	Criterion A	No non-compliance noted
IEC 61000-4-11: 1994 + A1: 2000	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 2004/108/EC, Amended by 92/31/EEC and 93/68/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.

Approved by:

Reviewed by:

Johnny Liu
Section Manager
Compliance Certification Services Inc.

Amanda Wu
Section Manager
Compliance Certification Services Inc.



2 EUT DESCRIPTION

Product	Cat5 KVM Extender
Trade Name	UNICLASS
Model Number	UKE-100
Model Discrepancy	N/A
Housing Type	Metal
EUT Power Rating	Power adapter 1: Model: M7-10US08R-A I/P: AC 100-240V, 50-60Hz, 0.5A O/P: DC 9V, 1.11A Power adapter 2: Model: M7-10US08R-D I/P: AC 100-240V, 50-60Hz, 0.5A O/P: DC 9V, 1.11A



3 TEST METHODOLOGY

3.1 EUT SYSTEM OPERATION

Software Used During the Test	
Operating System	Windows XP
Program Sequence	<ol style="list-style-type: none"> 1. EMI test program (file name: EMCTEST) was loaded and executed in "Windows XP" mode. 2. The detect signal was sent to EUT. 3. Data was sent to the monitor, filling the screen with upper case of "H" patterns. 4. Test program sequentially all related I/O's of Host PC include EUT and sent "H" patterns to all applicable output ports of Host PC. 5. Repeat 2 to 4.

Remark: Test program is self-repeating throughout the test.

3.2 DECISION OF FINAL TEST MODE

The EUT (model: UKE-100) comes with two types of power adapters (M7-10US08R-A & M7-10US08R-D) for sale. After the preliminary test, the power adapter with model M7-10US08R-A was found to emit the worst emissions and therefore had been tested under operating condition.

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

Mode 1
Operating

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

Mode 1

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



4 INSTRUMENT AND CALIBRATION

4.1 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.

4.2 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

Open Area Test Site # 3				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilnet	E4411B	MY41440314	N.C.R.
Spectrum Analyzer	R&S	FSP30	100112	10/10/2007
EMI Test Receiver	R&S	ESVS30	828488/004	03/12/2008
Pre-Amplifier	Anritsu	MH648A	M18767	08/30/2008
Pre-Amplifier	MITEQ	AFS42-00102650-42-10P-42	966468	04/26/2008
Bilog Antenna	Schwazbeck	VULB9163	144	03/30/2008
Horn Antenna	EMCO	3115	00022250	04/15/2008
Loop Antenna	EMCO	6502	2356	N.C.R.
Turn Table	Chance Most	CM-T003-1	T807-6	N.C.R.
Antenna Tower	Chance Most	CM-A003-1	A807-6	N.C.R.
Controller	CCS	CC-C-1F	N/A	N.C.R.
RF Switch	Anritsu	MP59B	M53867	N.C.R.
Site NSA	CCS	N/A	N/A	05/04/2008
Decoupling Network	FCC	F-201-DCN-5-6MM	34	06/04/2008
Test S/W	LabVIEW 6.1 (CCS OATS EMI SW V2.6)			

Remark: The measurement uncertainty is less than +/- 4.0235dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver 9kHz-30MHz	Rohde & Schwarz	ESHS30	828144/003	10/31/2007
Two-Line V-Network 9kHz-30MHz	Schaffner	NNB41	03/10013	06/12/2008
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	04/01/2008
ISN 9kHz-30MHz	FCC	FCC-TLISN-T4	20167	09/15/2007
Test S/W	LABVIEW (V 6.1)			

Remark: The measurement uncertainty is less than +/- 2.81dB, 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	EMC-Partner	HAR1000-1P	107	05/21/2008
Test S/W	HARCS (Ver. 4.0)			

Equipment Used for Immunity Measurement

ESD Test Site (IEC 61000-4-2)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESD Simulator	NoiseKen	ESS-2001	ESS0210582	11/15/2007

Radiated Electromagnetic Field Immunity Test Site (IEC 61000-4-3)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Signal Generator	Agilent	8648C	4108A05772	10/23/2007
150 Watts 80-1000MHz Amplifier	Amplifier Research	150W1000M3	306730	N.C.R.
30 Watts 0.8-3.0GHz Amplifier	Amplifier Research	30S1G3M1	306722	N.C.R.
Power Meter	Boonton	4232A-01-02	98601	10/25/2007
Power Sensor	Boonton	51011-EMC	32920	10/25/2007
Power Sensor	Boonton	51011-EMC	32863	10/25/2007
Log-Periodic Antenna	Amplifier Research	AT1080	306709	N.C.R.
Microwave Horn Antenna	Amplifier Research	AT4002A	306750	N.C.R.
RF Test System Controller	Amplifier Research	SC1000M3	306666	N.C.R.
Field Probe	Amplifier Research	FP6001	305657	04/17/2008
0.8-4.2GHz	Amplifier Research	DC7144A	N/A	N.C.R.
80-1000MHz	Amplifier Research	DC6180A	N/A	N.C.R.
Antenna Tower	Amplifier Research	TP2000	N/A	N.C.R.
Probe Stand	Amplifier Research	PS2000	N/A	N.C.R.
Test S/W	SW1005 (Release 1.4)			



Fast Transients/Burst Test Site (IEC 61000-4-4)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ECAT Control Center	KeyTek	E-Class Series 100	9502325	03/08/2008
Capacitor Clamp	KeyTek	CCL-4	9503290	N.C.R.
Test S/W	E400 Burstware (V4.19 (c))			

Surge Immunity Test Site (IEC 61000-4-5)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ECAT Control Center	KeyTek	E-Class Series 100	9502325	03/08/2008
External Coupler / Decoupler For Telecom Lines	KeyTek	CM-TELCD	0104399	N.C.R.
I/O Signal Line Coupler / Decoupler	KeyTek	CM-I / OCD	0103234	N.C.R.
Test S/W	E500 Surgeware (V4.19cc)			

CS Test Site (IEC 61000-4-6)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Signal Generator	Agilent	8648C	4108A05773	09/19/2007
75 Watts 10kHz-250MHz Amplifier	Amplifier Research	75A250AM1	306334	N.C.R.
Power Meter	Boonton	4232A-01-02	98501	09/15/2007
Power Sensor	Boonton	51011-EMC	32862	09/15/2007
Power Sensor	Boonton	51011-EMC	32864	09/15/2007
Power Line Coupling Decoupling Network	Fischer Custom Communications, Inc.	FCC-801-M2-16A	03026	09/15/2007
Power Line Coupling Decoupling Network	Fischer Custom Communications, Inc.	FCC-801-M3-16A	03027	09/15/2007
Signal Line Coupling Decoupling Network	Fischer Custom Communications, Inc.	FCC-801-T2	03016	09/15/2007
Signal Line Coupling Decoupling Network	Fischer Custom Communications, Inc.	FCC-801-T4	03017	09/15/2007
EM Injection Clamp	Fischer Custom Communications, Inc.	F-203I-23mm	421	09/15/2007
Passive Impedance Adapters	Fischer Custom Communications, Inc.	FCC-801-150-50-CDN	03053&03054	09/15/2007
Calibration Fixture	Fischer Custom Communications, Inc.	F-203I-CF-23mm	408	09/15/2007
Signal Line Coupling Decoupling Network	Fischer Custom Communications, Inc.	FCC-801-T8-RJ45	04024	09/15/2007
Attenuator	Amplifier Research	HFP-575-3/6-NM	NF201875106	N.C.R.
Coupler	Amplifier Research	DC2600A	306621	N.C.R.
Test S/W	SW1005 (Release 1.4)			



Power Frequency Magnetic Field Immunity Test Site (IEC 61000-4-8)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Magnetic Field Tester	Haefely Trench	MAG100.1	081436-02	N.C.R.
Frequency Converter	Extech Electronics	CFC-105	810390	N.C.R.
Digital Multimeter	DHA	CM-312A	ET93C-06-208-01	05/31/2008
EMF Tester Electromagnetic Field	TES	1390	020401598	05/17/2008

Voltage Dips/Short Interruption and Voltage Variation Immunity Test Site (IEC 61000-4-11)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Dips/Interruption and Variations Simulator	Haefely Trench	PLINE 1610	081568-06	08/06/2008
Test S/W	WinPATS (V. 3.26)			



5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045








No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

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

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/ EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	 ACCREDITED No. 0824-01
USA	FCC	3/10 meter Open Area Test Sites (93105, 90471) / 3M Semi Anechoic Chamber (965860) to perform FCC Part 15/18 measurements	 93105, 90471 965860
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	 R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	 ELA 124a ELA 124b ELA 124c
Taiwan	TAF	EN 300 328, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	 Testing Laboratory 0363
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	 SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014
Canada	Industry Canada	3/10 meter Open Area Test Sites (IC 2324C-3, IC 2324C-5) / 3M Semi Anechoic Chamber (IC 6106)	 IC 2324C-3 IC 2324C-5 IC 6106

* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



6 SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP DIAGRAM

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

6.2 SUPPORT EQUIPMENT

No	Equipment	Trade Name	Model	Serial No.	FCC ID	Data Cable	Power Cord
1.	PC	HP	DX-6120	SGH5330GK7	FCC DoC	N/A	Unshielded, 1.8m
2.	PC	HP	PL926AV	SGH528048P	FCC DoC	N/A	Unshielded, 1.8m
3.	CRT Monitor	Samsung	959NF	AQ19H2RT706139P	FCC DoC	Shielded, 1.8m with 2 cores	Unshielded, 1.8m
4.	LCD Monitor	Samsung	173P	DII17H4JXB04968Y	FCC DoC	Shielded, 1.8m with 2 cores	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
5.	LCD Monitor	SAMSUNG	959NF	AQ19H2RT706121B	FCC DoC	Shielded, 1.8m with 2 cores	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
6.	LCD Monitor	LG	L1740PQ	503KGXA2K858	BEJL17NU	Shielded, 1.8m with 2 cores	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
7.	PS/2 Keyboard	Logitech	Y-SJ17	SY528UK	FCC DoC	Shielded, 1.8m	N/A
8.	PS/2 Keyboard	Logitech	Y-SJ17	SY528UK	FCC DoC	Shielded, 1.8m	N/A
9.	PS/2 Keyboard	hp	KB-0316	355630-AB1	FCC DoC	Shielded, 1.8m	N/A
10.	PS/2 Keyboard	COMPAQ	KB-0133	N/A	FCC DoC	Shielded, 1.8m	N/A
11.	PS/2 Mouse	Logitech	M-S34	HCA25200400	DZL211029	Shielded, 1.8m	N/A
12.	PS/2 Mouse	Logitech	M-S34	HCA25200475	DZL211029	Shielded, 1.8m	N/A
13.	PS/2 Mouse	Logitech	M-S34	LZC85106992	FCC DoC	Shielded, 1.8m	N/A
14.	PS/2 Mouse	Logitech	M-S34	HCA25200251	DZL211029	Shielded, 1.8m	N/A
15.	Printer	EPSON	STYLUS C60	DR3K039633	FCC DoC	Shielded, 1.8m	Unshielded, 1.8m
16.	Printer	EPSON	STYLUS C60	DR3K041995	FCC DoC	Shielded, 1.8m	Unshielded, 1.8m
17.	Multimedia Earphone	Labtec	Axis-301	N/A	FCC DoC	Unshielded, 1.8m	N/A
18.	Multimedia Earphone	Ergotech	ET-E220	N/A	FCC DoC	Unshielded, 1.8m	N/A
19.	Modem	ACEEX	DM-1414	304012269	IFAXDM1414	Shielded, 1.8m	Unshielded, 1.8m

Remark: 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.

7 POWERLINE CONDUCTED & RADIATED EMISSION TEST

7.1 LIMIT

Maximum permissible level of Line Conducted Emission

Frequency (MHZ)	Class A (dBuV/m)		Class B (dBuV/m)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

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

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

CLASS A

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

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

CLASS B

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

Remark: 1. The lower limit shall apply at the transition frequency.

2. According to Note 3 on table 4 of EN 55022: 1998 standard, a relaxation of 10 dB over the frequency range of 6 MHz to 30 MHz is allowed for high-speed services having significant spectral density in this band. However, this relaxation is restricted to the common mode disturbance converted by the cable from the wanted signal.

Maximum permissible level of Radiated Emission measured at 10 meter

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

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



7.2 TEST PROCEDURE OF LINE CONDUCTED EMISSION

Procedure of Preliminary Test

- The EUT was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per EN 55022.
- All I/O cables were positioned to simulate typical actual usage as per EN 55022.
- The test equipment EUT installed received AC power, 230VAC/50Hz, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipments received power from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.2 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.2 producing the highest emission level.
- The EUT configuration and cable configuration of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.



7.3 TEST PROCEDURE OF COMMON MODE CONDUCTED EMISSION FOR TELECOMMUNICATION PORT

- Selecting ISN for unscreened cable or a current probe for screened cable to take measurement.
- The port of the EUT was connected to the remote side support equipment through the ISN/Current Probe and communication in normal condition.
- Making a overall range scan by using the test receiver controlled by controller and record at least six highest emissions for showing in the test report.
- Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- In case of measuring on the screened cable, the current limit shall be applied, otherwise the voltage limit should be applied.
- The following test mode was scanned during the preliminary test:

Not applicable, because EUT has no LAN port or modem port.



7.4 TEST PROCEDURE OF RADIATED EMISSION

Procedure of Preliminary Test

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per EN 55022.
- All I/O cables were positioned to simulate typical usage as per EN 55022.
- The EUT received AC power source, 230VAC/50Hz, from the outlet socket under the turntable. All support equipments received power from another socket under the turntable.
- The antenna was placed at 10 meter away from the EUT as stated in EN 55022. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 3.2 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.2 producing the highest emission level.
- The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.



7.5 TEST RESULTS

Powerline Conducted Emission

Operation Mode: Mode 1**Test Date:** August 10, 2007**Temperature:** 25°C**Humidity:** 55% RH**Tested by:** Eric Cheng

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.160	51.270	48.700	0.180	51.450	48.880	65.464	55.464	-14.014	-6.584	L1
0.213	48.090	45.700	0.100	48.190	45.800	63.088	53.088	-14.898	-7.288	L1
0.372	44.960	41.710	0.100	45.060	41.810	58.456	48.456	-13.396	-6.646	L1
0.532	46.610	43.640	0.100	46.710	43.740	56.000	46.000	-9.290	-2.260	L1
9.453	43.860	39.010	0.645	44.505	39.655	60.000	50.000	-15.495	-10.345	L1
11.175	38.100	34.560	0.724	38.824	35.284	60.000	50.000	-21.176	-14.716	L1
0.156	46.640	42.520	0.188	46.828	42.708	65.674	55.674	-18.846	-12.966	L2
0.213	45.410	42.520	0.100	45.510	42.620	63.088	53.088	-17.578	-10.468	L2
0.266	40.950	38.560	0.100	41.050	38.660	61.242	51.242	-20.192	-12.582	L2
0.532	44.590	43.700	0.100	44.690	43.800	56.000	46.000	-11.310	-2.200	L2
9.230	34.440	29.670	0.623	35.063	30.293	60.000	50.000	-24.937	-19.707	L2
11.086	31.470	26.960	0.722	32.192	27.682	60.000	50.000	-27.808	-22.318	L2

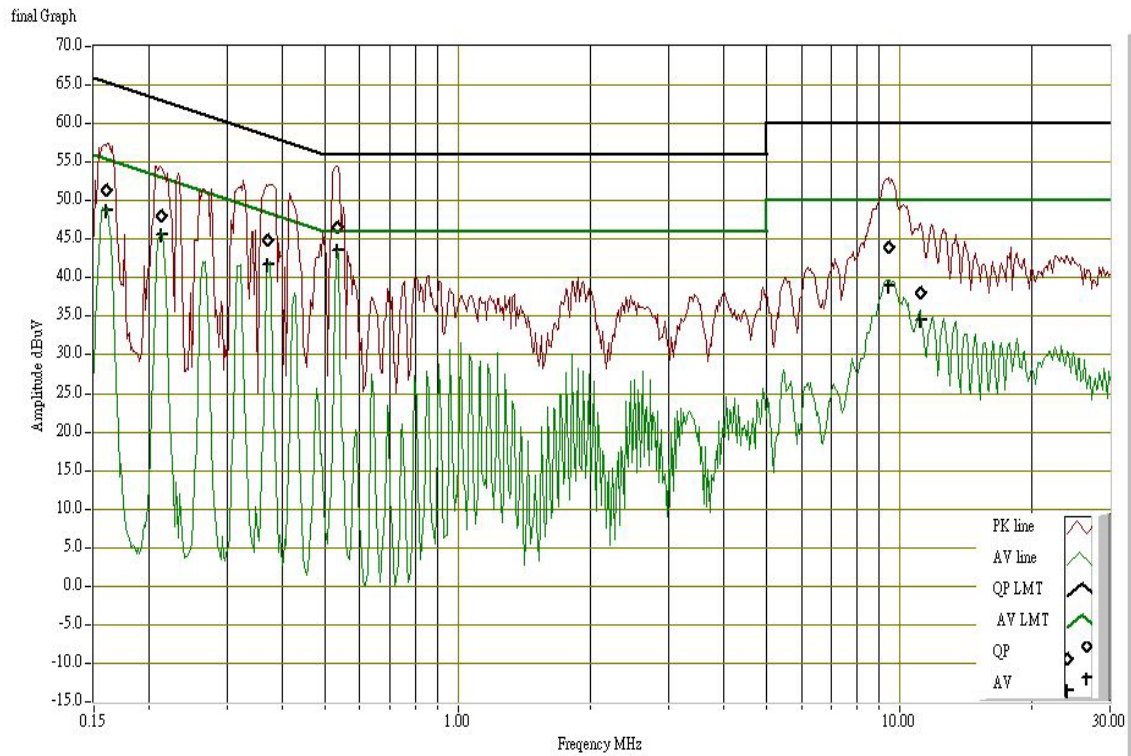
Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

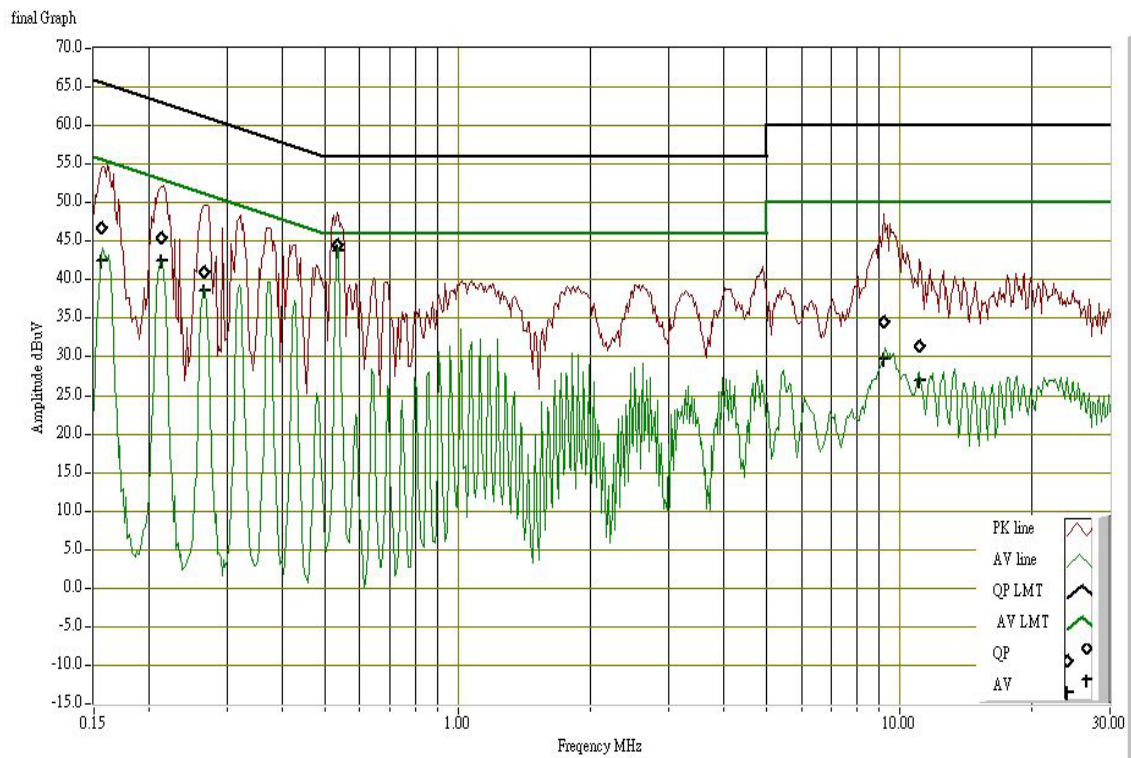


Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)



**Radiated Emission****Operation Mode:** Mode 1**Test Date:** August 13, 2007**Temperature:** 26°C**Tested by:** Eric Cheng**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Detector Mode (PK/QP)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit 10m (dBuV/m)	Margin (dB)
59.10	V	QP	9.50	12.99	22.49	30.00	-7.51
141.55	V	QP	10.50	9.32	19.82	30.00	-10.18
163.38	V	QP	8.80	10.22	19.02	30.00	-10.98
253.10	V	QP	6.40	14.38	20.78	37.00	-16.22
536.83	V	QP	6.20	20.90	27.10	37.00	-9.90
648.37	V	QP	5.80	22.74	28.54	37.00	-8.46
55.27	H	QP	10.10	13.20	23.30	30.00	-6.70
134.27	H	QP	15.50	9.79	25.29	30.00	-4.71
182.78	H	QP	8.10	11.33	19.43	30.00	-10.57
253.10	H	QP	12.00	14.38	26.38	37.00	-10.62
612.00	H	QP	6.40	22.38	28.78	37.00	-8.22
752.65	H	QP	4.90	23.59	28.49	37.00	-8.51

Remark:

1. Measuring frequencies from 30MHz to 1GHz.
2. Radiated emissions measured in frequency range from 30MHz to 1000MHz were made with an instrument using Peak /Quasi-peak detector mode.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser; with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. The IF bandwidth of SPA between 30MHz and 1GHz was 100 kHz.



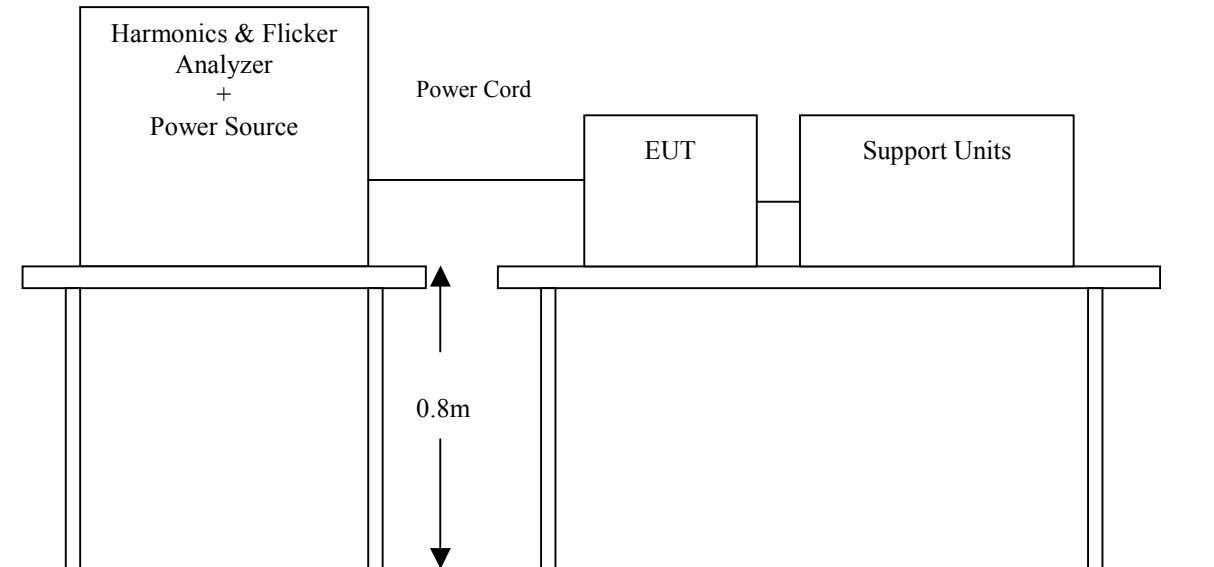
8 POWER HARMONICS TEST

Port : AC mains
Basic Standard : EN 61000-3-2
Limits : CLASS A; CLASS B; CLASS C; CLASS D
Tested by : Eric Cheng
Temperature : 25°C
Humidity : 55% RH

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:

No non-compliance noted.



Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2)

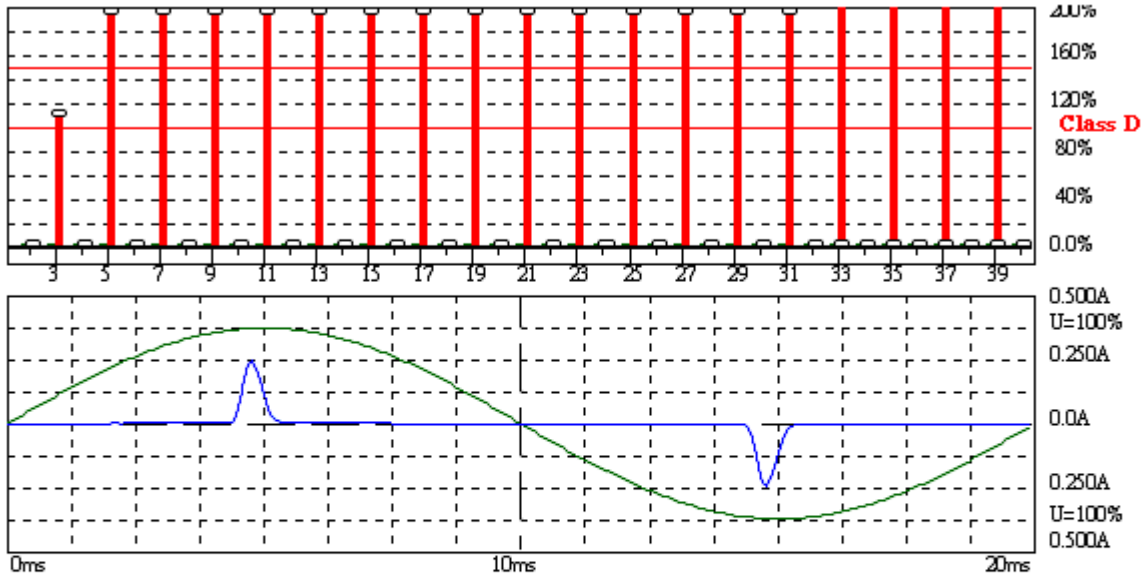
Cat5 KVM Extender

UKE-100

Eric Cheng

Remarks

Temp : 25°C Humidity : 55% RH



Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2)

2007/8/10 PM 09:05:1

U _{rms} =	229.9	V	P =	3.939	W	THC =	0.043	A	Range:	0.5	A
I _{rms} =	0.044	A	pf =	0.388		P _{max} =	3.939	W	V _{nom} :	230	V
									TestTime:	5	min (100%)

UKE-100

Temp : 25°C Humidity : 55% RH

BAR-1000 EMC-Print

Full Bar : Actual Values

Empty Bar : Maximum Values

Blue : Current , Green : Voltage , Red : Failed

According to EN 61000-3-2, for the following categories of equipment, limits are not specified in this standard:

Remark:

1. Limits may be defined in a future amendment or revision of the standard. Equipment with a rated power of 75W or less, other than lighting equipment.
2. This value may be reduced from 75W to 50W in the future, subject to approval by National Committees at that time.

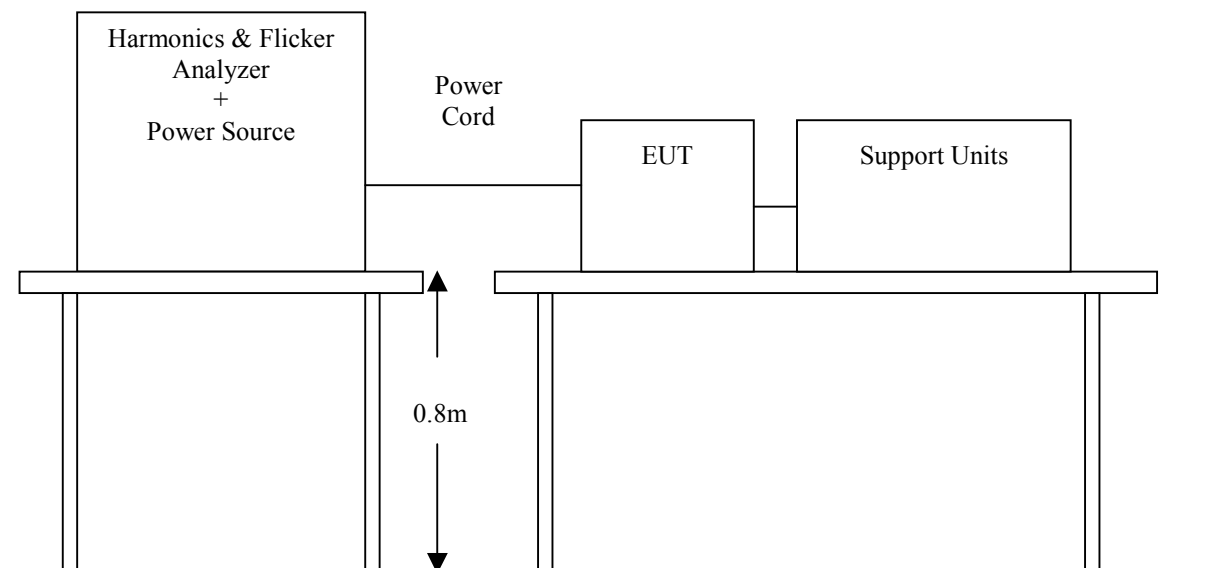
9 POWER VOLTAGE FLUCTUATION / FLICKER TEST

Port : AC mains
Basic Standard : EN 61000-3-3
Limits : §5 of EN 61000-3-3
Tested by : Eric Cheng
Temperature : 25°C
Humidity : 55% RH

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:

No non-compliance noted.



Measurement

Date : 2007/8/10 PM 09:22:1 V4.15

File :

Cat5 KVM Extender

UKE-100

Eric Cheng

Remarks

Temp : 25'C Humidity : 55% RH

Urms = 229.9V Freq = 49.948 Range: 0.5 A
Irms = 0.043A Ipk = 0.240A cf = 5.528
P = 3.939W S = 9.991VA pf = 0.394

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

LIN (Line Impedance Network) : L: 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 = 0.076

Table with 10 columns: Pst, P50s, P10s, P3s, P1s, P0.1s, Fli, dmax, dc, dt>Lim. Row 1: 0.076, 0.010, 0.010, 0.011, 0.015, 0.021, 0.002, 0.000, 0.000, 0.000.

10 ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port : Enclosure

Basic Standard : IEC 61000-4-2

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

Performance Criterion : B (Standard Required)

Tested by : Eric Cheng

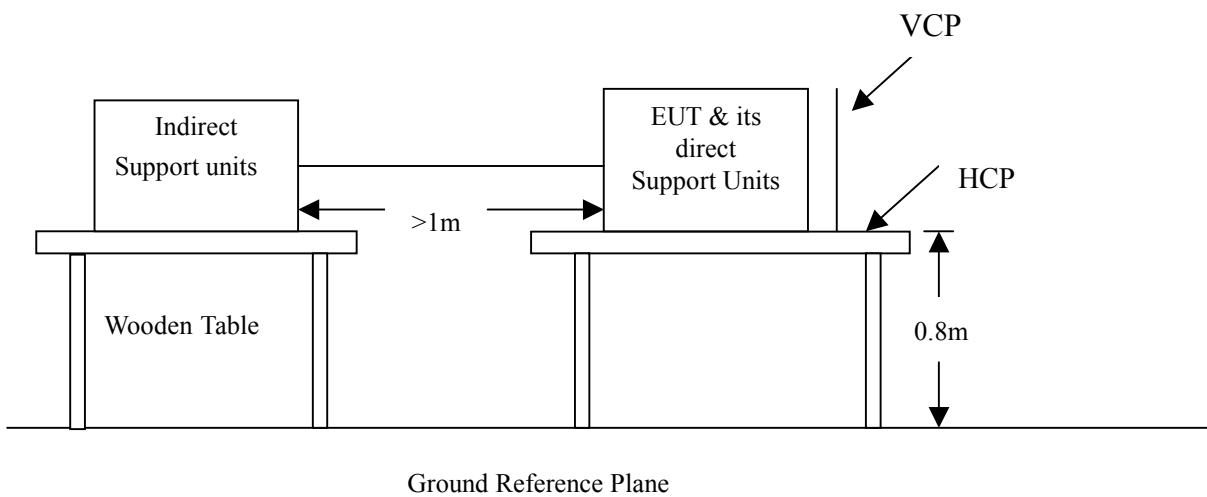
Temperature : 25°C

Humidity : 55% RH

Pressure : 1005mbar

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 monitor and related peripherals through the test.
5. Active the communication function if the EUT with such port(s).
6. As per the requirement of EN 55024; applying direct contact discharge at the sides other than front of EUT at minimum 50 discharges (25 positive and 25 negative) if applicable, can’t be applied direct contact discharge side of EUT then the indirect discharge shall be applied. One of the test points shall be subjected to at least 50 indirect discharge (contact) to the front edge of horizontal coupling plane.
7. Other parts of EUT where it is not possible to perform contact discharge then selecting appropriate points of EUT for air discharge, a minimum of 10 single air discharges shall be applied.
8. The application of ESD to the contact of open connectors is not required.
9. The EUT direct connection units also need to be applied ESD at the port of EUT cable connected.
10. To simulate a single ESD event (either by air or by contact discharge), the charge on the EUT shall be removed prior to each applied ESD pulse. The charge on the metallic point or part to which the ESD pulse is to be applied, for example, connector shells, battery charge pins, metallic antennae, shall be removed prior to each applied ESD test pulse. When one or several metallic accessible parts are subject to the ESD test, the charge shall be removed from the point where the ESD pulse is to be applied, as no guarantee can be given about the resistance between this and other accessible points on the product.
11. Putting a mark on EUT to show tested points. The following test condition was followed during the tests.

Remark: As per IEC 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	Test Result (Criterion)
Min. 20 / Point	± 8 kV	Air Discharge	A
Min. 50 / Point	± 4 kV	Contact Discharge	A
Min. 50 / Point	± 4 kV	Indirect Discharge HCP (Front)	A
Min. 50 / Point	± 4 kV	Indirect Discharge VCP (Right)	A
Min. 50 / Point	± 4 kV	Indirect Discharge VCP (Left)	A
Min. 50 / Point	± 4 kV	Indirect Discharge VCP (Back)	A

Remark: For tested points to EUT, refer to the enclosed pages. Be aware that the Blue mark is for contact discharge, and the red mark is for air discharge.



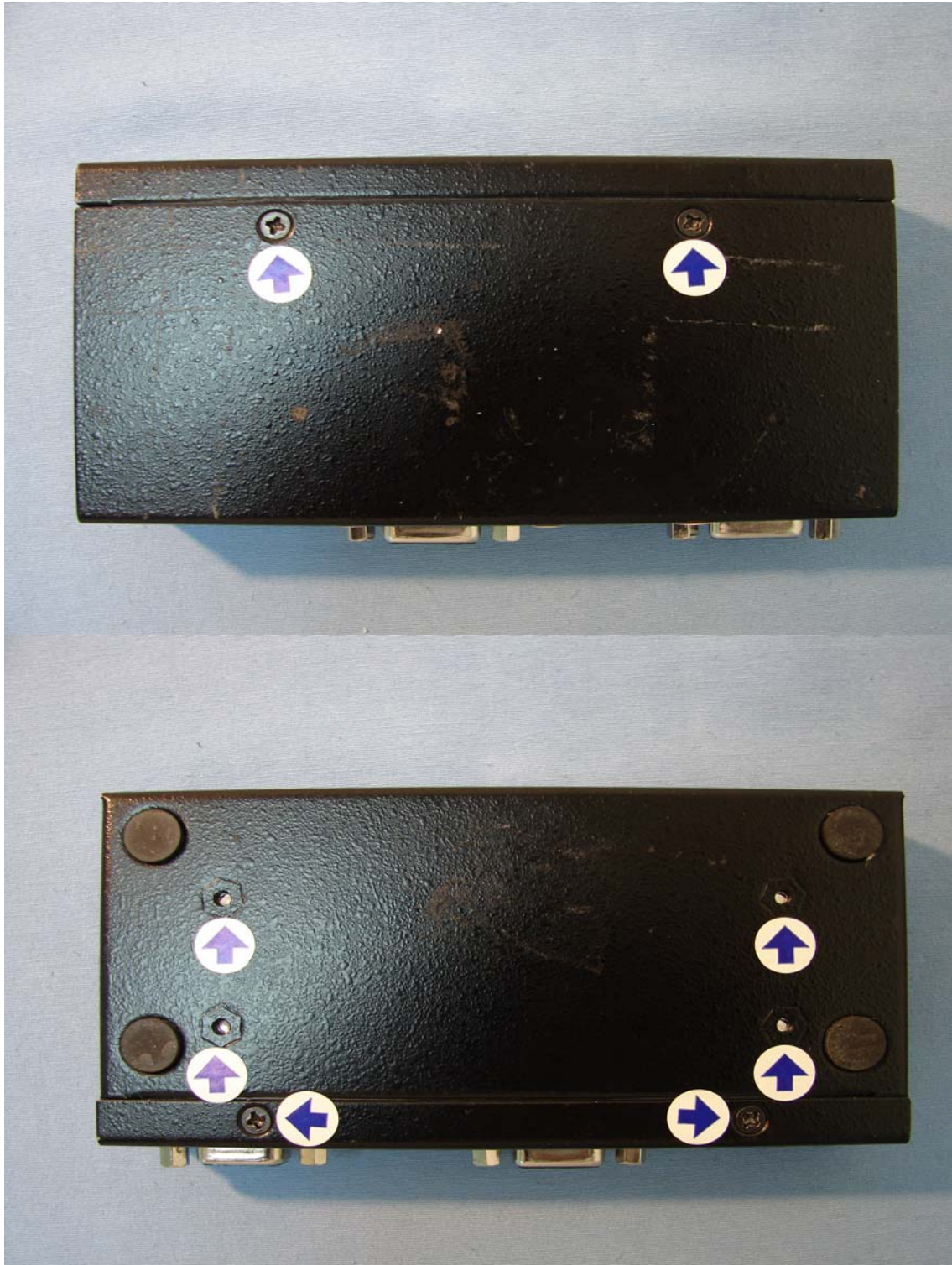
Performance & Result:

- 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



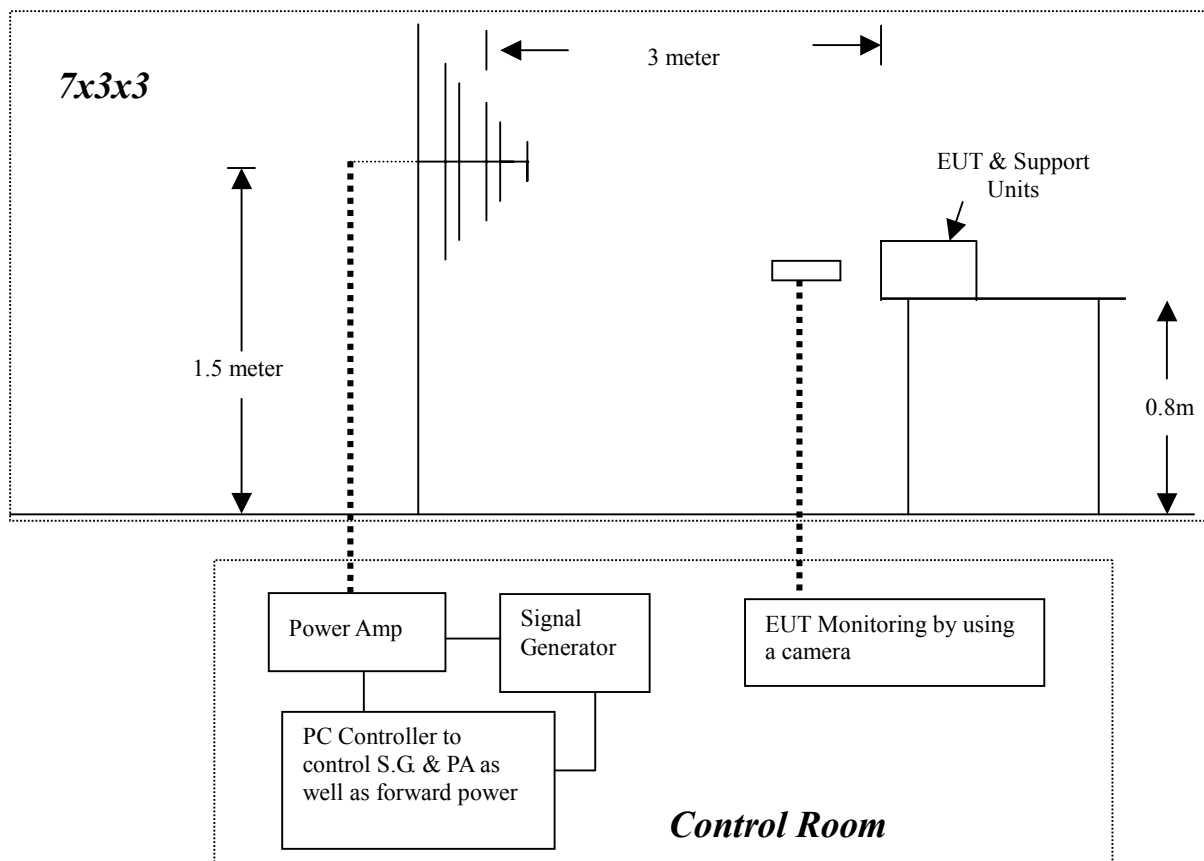




11 RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	: Enclosure
Basic Standard	: IEC 61000-4-3
Requirements	: 3 V/m / with 80% AM. 1 kHz Modulation.
Performance Criterion	: A (Standard Required)
Tested by	: Eric Cheng
Temperature	: 25°C
Humidity	: 55% RH
Pressure	: 1005mbar

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. Setting the testing parameters of RS test software per IEC 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.

Preliminary test conditions:

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

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Test Result (Criterion)
80-1000	6V/m	Yes	H	Front	A
80-1000	6V/m	Yes	V	Front	A
80-1000	6V/m	Yes	H	Right	A
80-1000	6V/m	Yes	V	Right	A
80-1000	6V/m	Yes	H	Back	A
80-1000	6V/m	Yes	V	Back	A
80-1000	6V/m	Yes	H	Left	A
80-1000	6V/m	Yes	V	Left	A

Final test conditions:

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

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Test Result (Criterion)
80-1000	3V/m	Yes	H	Front	A
80-1000	3V/m	Yes	V	Front	A



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 FAST TRANSIENTS/BURST IMMUNITY TEST

Port : On Power Supply Lines and Data Line

Basic Standard : IEC 61000-4-4

Requirements : ± 1 kV for Power Supply Line

Performance Criterion : B (Standard Required)

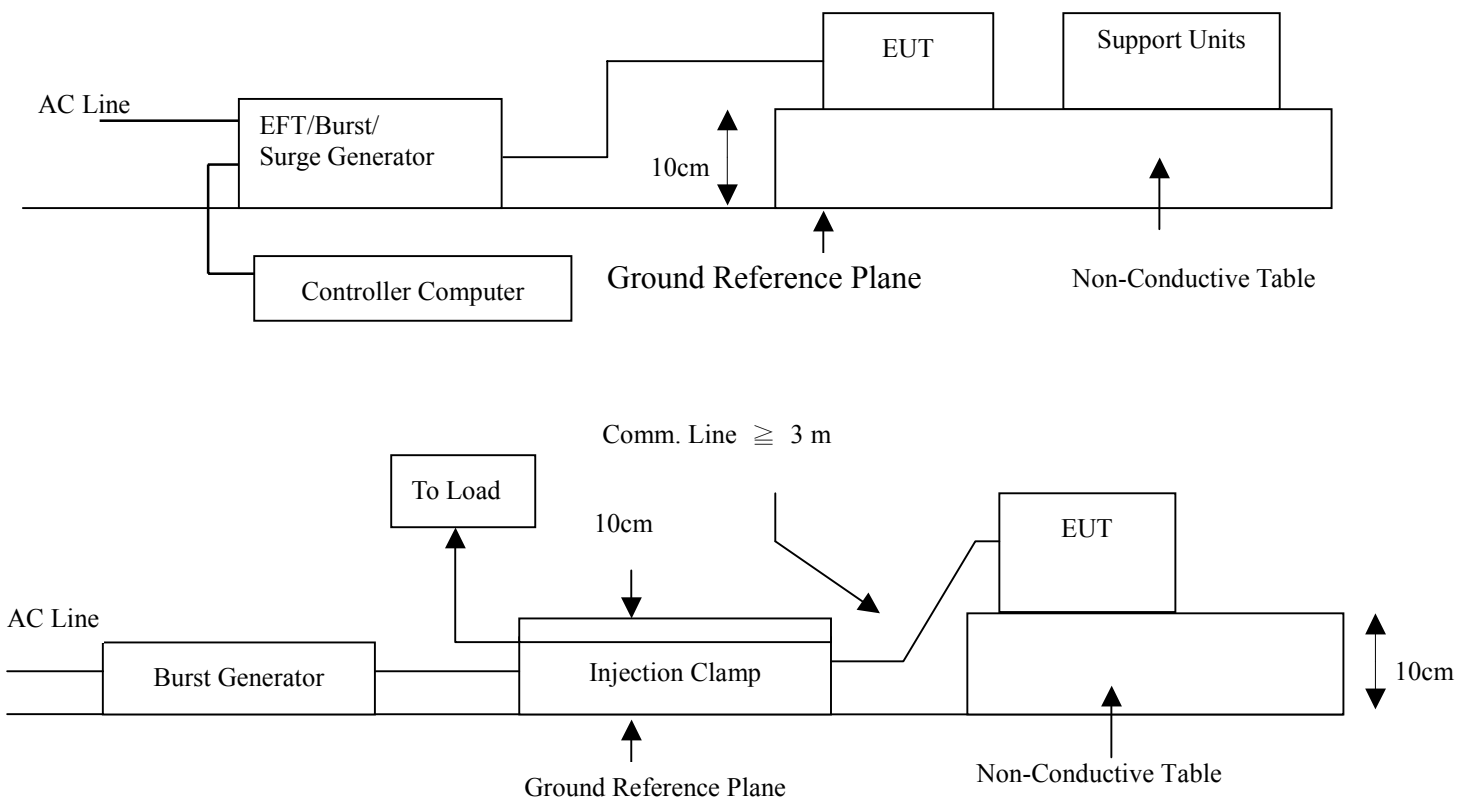
Tested by : Eric Cheng

Temperature : 25°C

Humidity : 55% RH

Pressure : 1005mbar

Block Diagram of Test Setup:





Test Procedure:

1. The EUT and support units were located on a wooden table 0.1 m away from ground reference plane.
2. A 0.5m long power cord was attached to EUT during the test.
3. The length of communication cable between communication port and clamp was keeping within 0.5m.
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	Test Result (Criterion)
<input checked="" type="checkbox"/> Line	±1	Direct	A
<input checked="" type="checkbox"/> Neutral	±1	Direct	A
<input type="checkbox"/> PE	±1	Direct	N/A
<input checked="" type="checkbox"/> Line + Neutral	±1	Direct	A
<input type="checkbox"/> L + PE	±1	Direct	N/A
<input type="checkbox"/> N + PE	±1	Direct	N/A
<input type="checkbox"/> L + N + PE	±1	Direct	N/A
<input type="checkbox"/> RJ45 port (LAN cable)	±0.5	Clamp	N/A
<input type="checkbox"/> RJ11 port (Line cable)	±0.5	Clamp	N/A



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.

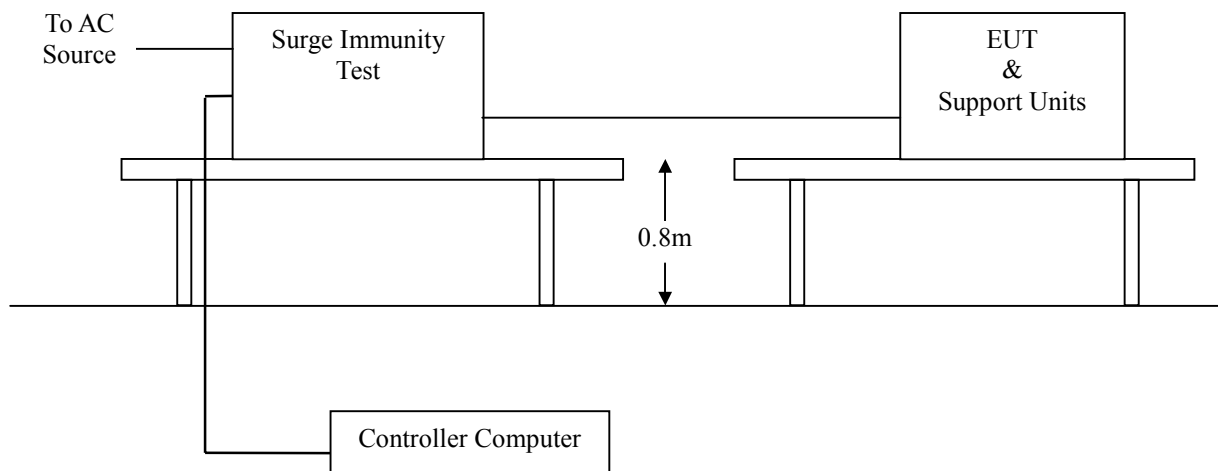
PASS **FAIL**

Observation: No function degraded during the tests.

13 SURGE IMMUNITY TEST

- Port : Power Cord
- Basic Standard : IEC 61000-4-5
- Requirements : ± 1 kV (Line to Line)
- Performance Criterion : B (Standard Required)
- Tested by : Eric Cheng
- Temperature : 25°C
- Humidity : 55% RH
- Pressure : 1005mbar

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 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	Test Result (Criterion)
<input checked="" type="checkbox"/> Line + Neutral	1	Pos./ Neg.	Capacitive	A
<input type="checkbox"/> L + PE	2	Pos./ Neg.	Capacitive	N/A
<input type="checkbox"/> N + PE	2	Pos./ Neg.	Capacitive	N/A
<input type="checkbox"/> T, R-Ground	1	Pos./ Neg.	Capacitive	N/A
<input type="checkbox"/> L1, 2, 3, 4-G	1	Pos./ Neg.	Capacitive	N/A

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.

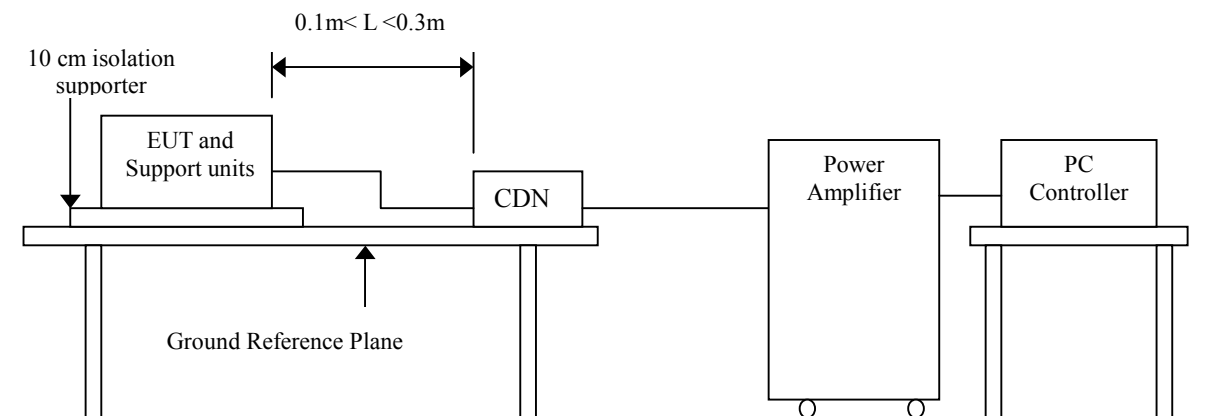
<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL
Observation: No function degraded during the tests.

14 CONDUCTED DISTURBANCE/INDUCED RADIO-FREQUENCY FIELD IMMUNITY TEST

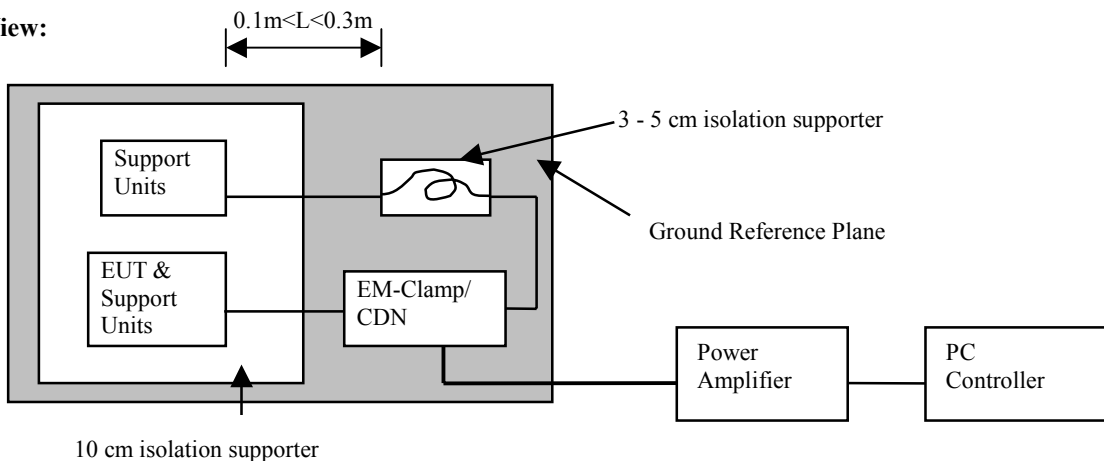
Port	: AC Port and Data Line
Basic Standard	: IEC 61000-4-6
Requirements	: 3 V with 80% AM. 1 kHz Modulation.
Injection Method	: CDN-M2 for Power Cord
Performance Criterion	: A (Standard Required)
Tested by	: Eric Cheng
Temperature	: 25°C
Humidity	: 55% RH
Pressure	: 1005mbar

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 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

CDN: FCC-801-M2-16A / FCC-801-M3-16A

FCC-801-T4 / FCC-801-T2

Range (MHz)	Field	Modulation	Test Result (Criterion)
0.15-80	3V	Yes	A

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.

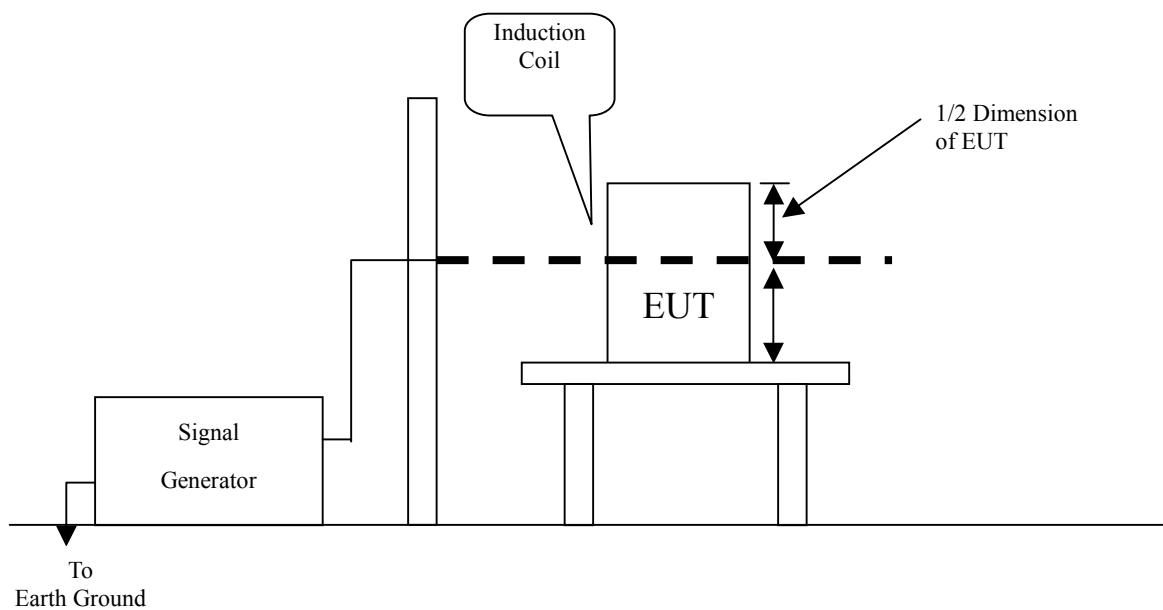
PASS **FAIL**

Observation: No function degraded during the tests.

15 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

Port	: Enclosure
Basic Standard	: IEC 61000-4-8
Requirements	: 1 A/m
Performance Criterion	: A (Standard Required)
Tested by	: Eric Cheng
Temperature	: 25°C
Humidity	: 55% RH
Pressure	: 1005mbar

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	Test Result (Criterion)
X	1A/m	A
Y	1A/m	A
Z	1A/m	A

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"/> FAIL
Observation: No function degraded during the tests.

16 VOLTAGE DIPS / SHORT INTERRUPTIONS

Port : AC mains

Basic Standard : IEC 61000-4-11

Requirement : PHASE ANGLE 0, 45, 90, 135, 180, 225, 270, 315 degrees

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

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

Test Interval : Min. 10 sec.

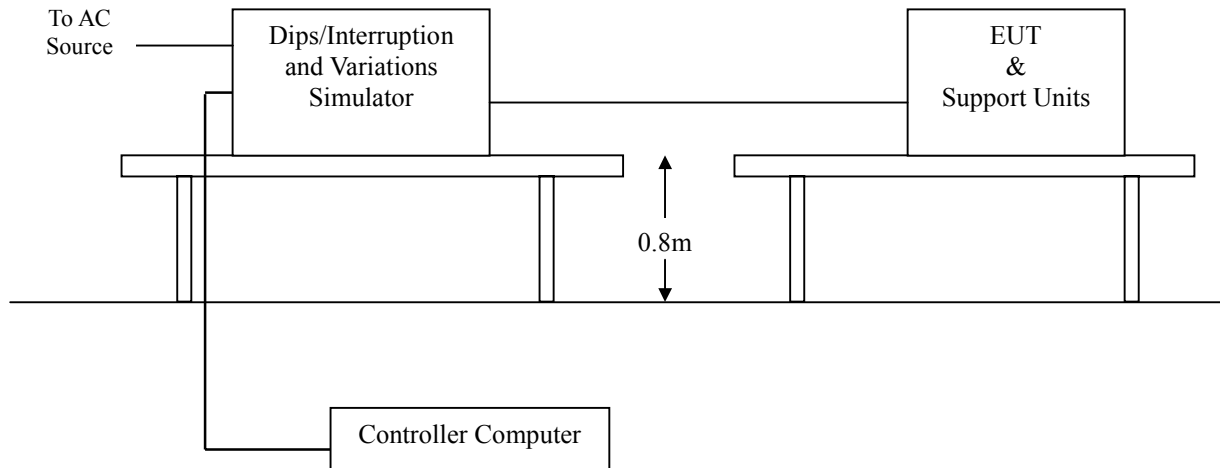
Tested by : Eric Cheng

Temperature : 25°C

Humidity : 55% RH

Pressure : 1005mbar

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 manually as the events disappeared.	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"/> FAIL

APPENDIX I – PHOTOGRAPHS OF TEST SETUP

POWERLINE 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 (IEC 61000-4-2)



RADIATED ELECTROMAGNETIC FIELD TEST (IEC 61000-4-3)



FAST TRANSIENTS/BURST TEST (IEC 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)

