



**FCC 47 CFR PART 15 SUBPART B & IC ICES-003**

**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.**

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## 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.....	7
5.1	FACILITIES.....	7
5.2	TABLE OF ACCREDITATIONS AND LISTINGS.....	8
6	SETUP OF EQUIPMENT UNDER TEST.....	9
6.1	SETUP DIAGRAM.....	9
6.2	SUPPORT EQUIPMENT.....	9
7	POWERLINE CONDUCTED & RADIATED EMISSION TEST.....	10
7.1	LIMIT.....	10
7.2	TEST PROCEDURE OF LINE CONDUCTED EMISSION.....	11
7.3	TEST PROCEDURE OF RADIATED EMISSION.....	12
7.4	TEST RESULTS.....	13
	APPENDIX I - PHOTOGRAPHS OF TEST SETUP.....	16



# 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	Test Result
FCC Part 15 Subpart B, IC ICES-003	Class B	No non-compliance noted
<b>Deviation from Applicable Standard</b>		
None		

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in the FCC Part 15, Subpart B, and Industry Canada ICES-003. The measurement procedures were according to ANSI C63.4: 2003. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

Approved by:

Reviewed by:

Johnny Liu  
Section Manager  
Compliance Certification Services Inc.

Amanda Wu  
Section Manager  
Compliance Certification Services Inc.



## 2 EUT DESCRIPTION

<b>Product</b>	Cat5 KVM Extender
<b>Trade Name</b>	UNICLASS
<b>Model</b>	UKE-100
<b>Model Discrepancy</b>	N/A
<b>Housing Type</b>	Metal
<b>Power Supply</b>	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	
<b>Operating System</b>	Windows XP
<b>Program Sequence</b>	<ol style="list-style-type: none"> <li>1. EMI test program (file name: EMCTEST) was loaded and executed in "Windows XP" mode.</li> <li>2. The detect signal was sent to EUT.</li> <li>3. Data was sent to the monitor, filling the screen with upper case of "H" patterns.</li> <li>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.</li> <li>5. Repeat 2 to 4.</li> </ol>

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

### 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 equivalent 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
EMI Test Receiver	R&S	ESVS20	838804/004	01/17/2008
Spectrum Analyzer	R&S	FSP30	100112	10/10/2007
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/30/2008
Pre-Amplifier	MITEC	AFS42-00102650	924206	N.C.R.
Pre-Amplifier	MITEC	AMF-6F-260400	945377	N.C.R.
Bilog Antenna	SCHWAZBECK	VULB9163	145	07/03/2008
Turn Table	EMCO	2081-1.21	9709-1885	N.C.R.
Antenna Tower	EMCO	2075-2	9707-2060	N.C.R.
Controller	EMCO	2090	9709-1256	N.C.R.
RF Switch	ANRITSU	MP59B	M53867	N.C.R.
Site NSA	CCS	N/A	N/A	05/04/2008

**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
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.



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

## 5.2 TABLE OF 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	Brand	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)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

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

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

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

#### Maximum permissible level of Radiated Emission measured at 3 meter

Frequency (MHZ)	Class A (dBuV/m)		Class B (dBuV/m)	
	Average	Peak	Average	Peak
Above 1000	59.3	79.3	53.9	73.9

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

#### Maximum permissible level of Radiated Emission measured at 3 meter

Frequency (MHz)	Field Strength (µV/m at 3-meter) Average	Field Strength (dBuV/m at 3-meter) Average
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

*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 ANSI C63.4 (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 ANSI C63.4.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The test equipment EUT installed received AC power, 120VAC/60Hz, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipment received power from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a EMI Test Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to the Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Receiver.
- 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 step 10 of 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 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 ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC power source, 120VAC/60Hz, from the outlet socket under the turntable. All support equipment received power from another socket under the turntable.
- The antenna was placed at 10 meter away from the EUT as stated in ANSI C63.4. 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 40GHz maximum, if any. 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 step 8 of the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 40GHz maximum, if any. 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.



## 7.4 TEST RESULTS

### Powerline Conducted Emission

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

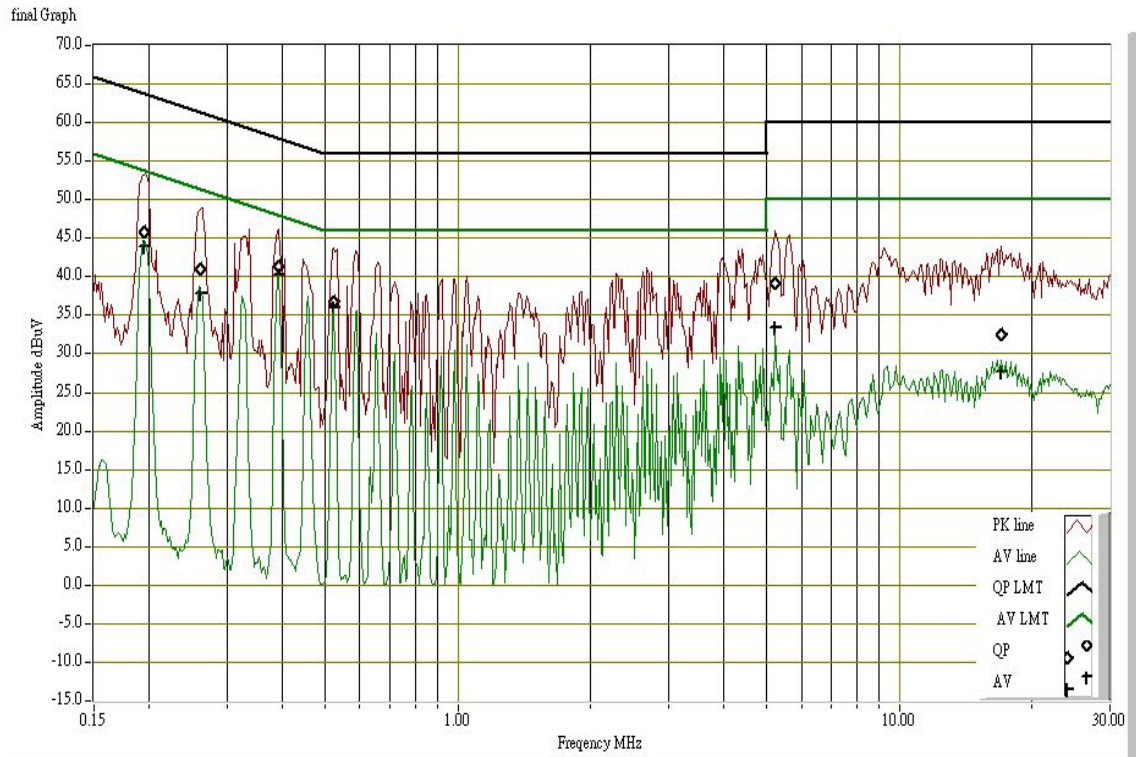
Frequency (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.195	45.790	43.940	0.110	45.900	44.050	63.821	53.821	-17.921	-9.771	L1
0.262	40.990	37.870	0.100	41.090	37.970	61.368	51.368	-20.278	-13.398	L1
0.393	41.270	40.280	0.100	41.370	40.380	58.000	48.000	-16.630	-7.620	L1
0.524	36.770	36.070	0.100	36.870	36.170	56.000	46.000	-19.130	-9.830	L1
5.242	39.220	33.430	0.224	39.444	33.654	60.000	50.000	-20.556	-16.346	L1
17.047	32.530	27.770	0.964	33.494	28.734	60.000	50.000	-26.506	-21.266	L1
0.195	45.650	43.320	0.110	45.760	43.430	63.821	53.821	-18.061	-10.391	L2
0.260	40.650	36.360	0.100	40.750	36.460	61.431	51.431	-20.681	-14.971	L2
0.390	41.460	41.320	0.100	41.560	41.420	58.064	48.064	-16.504	-6.644	L2
0.458	40.650	39.820	0.100	40.750	39.920	56.729	46.729	-15.979	-6.809	L2
0.586	38.810	38.290	0.100	38.910	38.390	56.000	46.000	-17.090	-7.610	L2
4.840	33.870	28.990	0.184	34.054	29.174	56.000	46.000	-21.946	-16.826	L2

**Remark:**

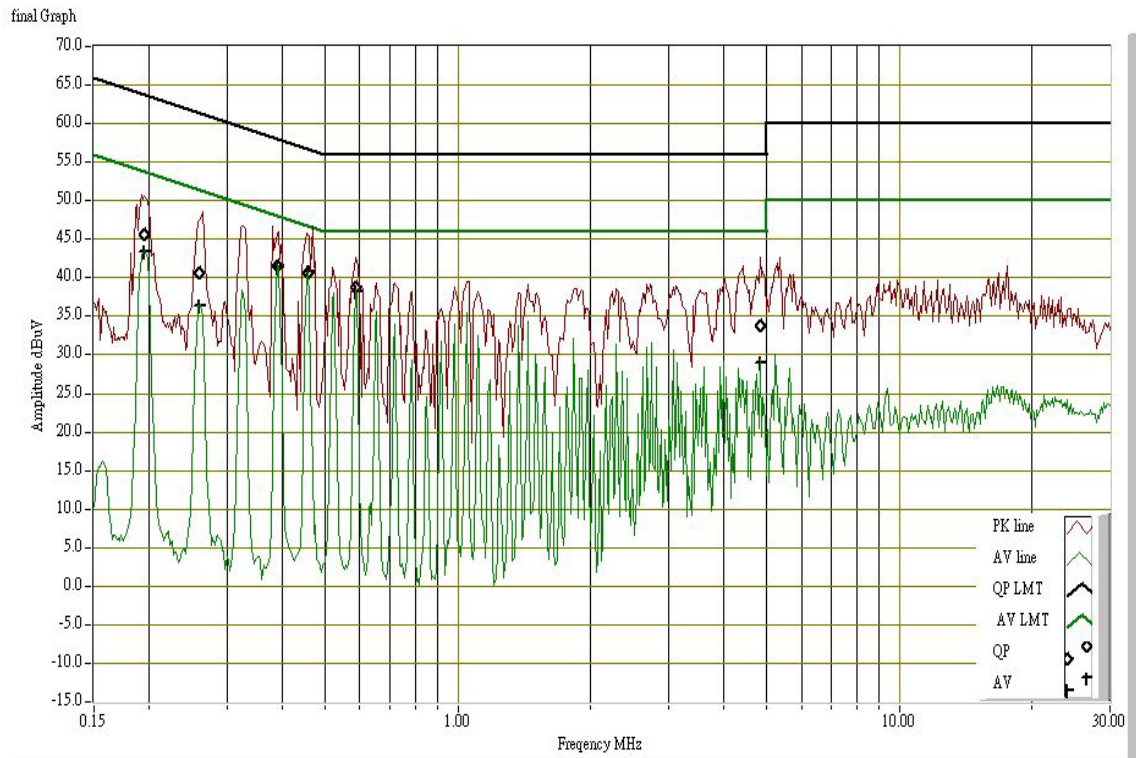
1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 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 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz 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 to 1GHz was 100kHz.

## APPENDIX I - PHOTOGRAPHS OF TEST SETUP

### POWERLINE CONDUCTED EMISSIONS SETUP PHOTOS





## RADIATED EMISSION SETUP PHOTOS

