

# Certificate

Issue Date: 4/1/2011  
Ref. Report No. ISL-11LE114CE-MA

Product Name : 24GE PoE with 4 Dual speed Combo SFP Web Smart Switch  
Model(s) : **GEP-2450**  
Responsible Party : **Digital Data Communications Asia Co., Ltd.**  
Address : 8F, NO.41, Lane 221, Kang-Chien Rd., Nei-Hu Dis, Taipei, Taiwan

We, **International Standards Laboratory**, hereby certify that:

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in European Council Directive- EMC Directive 2004/108/EC. The device was passed the test performed according to :



#### Standards:

EN 55022:2006 +A1:2007 / CISPR 22:2005 +A1:2005 / AS/NZS CISPR 22: 2009  
EN 61000-3-2: 2006 and IEC 61000-3-2: 2005  
EN 61000-3-3: 2008 and IEC 61000-3-3: 2008  
EN55024:1998+A1:2001+A2:2003 / CISPR 24:1997+A1:2001+A2:2002

EN 61000-4-2: 1995+A1: 1998+A2: 2001 and IEC 61000-4-2: 1995+A1: 1998+A2: 2000  
EN 61000-4-3: 2006 + A1:2008and IEC 61000-4-3: 2006 +A1:2007  
EN 61000-4-4: 2004 +A1:2010 and IEC 61000-4-4: 2004 +A1:2010  
EN 61000-4-5: 2006 and IEC 61000-4-5: 2005  
EN 61000-4-6: 2007 and IEC 61000-4-6: 2003+A1:2004+A2: 2006  
EN 61000-4-8: 1993+A1: 2001 and IEC 61000-4-8: 1993+A1: 2000  
EN 61000-4-11: 2004 and IEC 61000-4-11: 2004

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

**International Standards Laboratory**

  
Jim Chu / Director

#### Hsi-Chih LAB:

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# **CE MARK TECHNICAL FILE**

## **AS/NZS EMC CONSTRUCTION FILE**

of

Product Name

**24GE PoE with 4 Dual speed Combo SFP Web Smart  
Switch**

Model

**GEP-2450**

Contains:

1. Declaration of Conformity
2. EN55022/CISPR 22, AS/NZS CISPR 22 EMI test report
3. EN55024/CISPR 24, EN61000-3-2 / IEC 61000-3-2, and EN61000-3-3 / IEC 61000-3-3 test report

## Declaration of Conformity

Name of Responsible Party: Digital Data Communications Asia Co., Ltd.

Address of Responsible Party: 8F, NO.41, Lane 221, Kang-Chien Rd., Nei-Hu Dis, Taipei, Taiwan

Declares that product: 24GE PoE with 4 Dual speed Combo SFP Web Smart Switch

Model: GEP-2450

Assembled by: Same as above

Address: Same as above

Conforms to the EMC Directive 2004/108/EC as attested by conformity with the following harmonized standards:

EN 55022:2006 +A1:2007 / CISPR 22:2005 +A1:2005 / AS/NZS CISPR 22: 2009: Limits and methods of measurement of Radio Interference characteristics of Information Technology Equipment.

EN55024:1998+A1:2001+A2:2003 / CISPR 24:1997+A1:2001+A2:2002: Information technology equipment-Immunity characteristics-Limits and methods of measurement.

Standard	Description	Results	Criteria
EN 61000-4-2: 1995+A1: 1998+A2: 2001 IEC 61000-4-2: 1995+A1: 1998+A2: 2000	Electrostatic Discharge	Pass	B
EN 61000-4-3:2006+A1:2008 IEC 61000-4-3:2006+A1:2007	Radio-Frequency, Electromagnetic Field	Pass	A
EN 61000-4-4: 2004 +A1:2010 IEC 61000-4-4: 2004 +A1:2010	Electrical Fast Transient/Burst	Pass	B
EN 61000-4-5: 2006 IEC 61000-4-5: 2005	Surge	Pass	B
EN 61000-4-6: 2007 IEC 61000-4-6: 2003+A1:2004+A2: 2006	Conductive Disturbance	Pass	A
EN 61000-4-8: 1993+A1: 2001 IEC 61000-4-8: 1993+A1: 2000	Power Frequency Magnetic Field	Pass	A
EN 61000-4-11: 2004 IEC 61000-4-11: 2004	Voltage Dips / Short Interruption and Voltage Variation		
	>95% in 0.5 period	Pass	B
	30% in 25 period	Pass	C
	>95% in 250 period	Pass	C

<to be continued>

Standard	Description	Results
EN 61000-3-2: 2006 IEC 61000-3-2: 2005	Limits for harmonics current emissions	Pass
EN 61000-3-3: 2008 IEC 61000-3-3: 2008	Limits for voltage fluctuations and flicker in low-voltage supply systems.	Pass

*We, Digital Data Communications Asia Co., Ltd., hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the requirements.*

-----  
Digital Data Communications Asia Co., Ltd.

**Date: 4/1/2011**

### Declaration of Conformity

Name of Responsible Party: Digital Data Communications Asia Co., Ltd.

Address of Responsible Party: 8F, NO.41, Lane 221, Kang-Chien Rd., Nei-Hu Dis, Taipei, Taiwan

Declares that product: 24GE PoE with 4 Dual speed Combo SFP Web Smart Switch

Model: GEP-2450

Assembled by: Same as above

Address: Same as above

Conforms to the C-Tick Mark requirement as attested by conformity with the following standards:

EN 55022:2006 +A1:2007 / CISPR 22:2005 +A1:2005 / AS/NZS CISPR 22: 2009: Limits and methods of measurement of Radio Interference characteristics of Information Technology Equipment.

EN55024:1998+A1:2001+A2:2003 / CISPR 24:1997+A1:2001+A2:2002: Information technology equipment-Immunity characteristics-Limits and methods of measurement.

Standard	Description	Results	Criteria
EN 61000-4-2: 1995+A1: 1998+A2: 2001 IEC 61000-4-2: 1995+A1: 1998+A2: 2000	Electrostatic Discharge	Pass	B
EN 61000-4-3:2006+A1:2008 IEC 61000-4-3:2006+A1:2007	Radio-Frequency, Electromagnetic Field	Pass	A
EN 61000-4-4: 2004 +A1:2010 IEC 61000-4-4: 2004 +A1:2010	Electrical Fast Transient/Burst	Pass	B
EN 61000-4-5: 2006 IEC 61000-4-5: 2005	Surge	Pass	B
EN 61000-4-6: 2007 IEC 61000-4-6: 2003+A1:2004+A2: 2006	Conductive Disturbance	Pass	A
EN 61000-4-8: 1993+A1: 2001 IEC 61000-4-8: 1993+A1: 2000	Power Frequency Magnetic Field	Pass	A
EN 61000-4-11: 2004 IEC 61000-4-11: 2004	Voltage Dips / Short Interruption and Voltage Variation		
	>95% in 0.5 period	Pass	B
	30% in 25 period	Pass	C
	>95% in 250 period	Pass	C

<to be continued>

Standard	Description	Results
EN 61000-3-2: 2006 IEC 61000-3-2: 2005	Limits for harmonics current emissions	Pass
EN 61000-3-3: 2008 IEC 61000-3-3: 2008	Limits for voltage fluctuations and flicker in low-voltage supply systems.	Pass

*We, Digital Data Communications Asia Co., Ltd., hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the requirements.*

-----  
Digital Data Communications Asia Co., Ltd.

**Date: 4/1/2011**

# CE TEST REPORT

of  
**EN55022 / CISPR 22 / AS/NZS CISPR 22**  
**Class A**  
**EN55024 / CISPR 24 / IMMUNITY**  
**EN61000-3-2 / EN61000-3-3**

Product : **24GE PoE with 4 Dual speed Combo SFP  
Web Smart Switch**

Model(s): **GEP-2450**

Applicant: **Digital Data Communications Asia Co., Ltd.**

Address: **8F, NO.41, Lane 221, Kang-Chien Rd.,  
Nei-Hu Dis, Taipei, Taiwan**

Test Performed by:

## **International Standards Laboratory**

<Lung-Tan LAB>

\*Site Registration No.

BSMI: SL2-IN-E-0013; TAF: 0997; IC: IC4067B-1;

VCCI: R-1435, C-1440, T-1676, G-17, R-2598, C-2845, T-1464, G-16,  
G-211

NEMKO: ELA 113B

\*Address:

No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.

Lung-Tan Hsiang, Tao Yuan County 325, Taiwan

\*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-11LE114CE-MA**

Issue Date : **4/1/2011**

This report totally contains 52 pages including this cover page and contents page.

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

This report MUST not be used to claim product endorsement by TAF, NEMKO or any agency of the Government.

This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory.

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## 1. General

### 1.1 Certification of Accuracy of Test Data

**Standards:** Please refer to 1.2

**Equipment Tested:** 24GE PoE with 4 Dual speed Combo SFP Web Smart Switch

**Model:** GEP-2450

**Applicant:** Digital Data Communications Asia Co., Ltd.

**Sample received Date:** 3/10/2011

**Final test Date:** EMI:refer to the date of test data  
EMS: 2011-03-16

**Test Site:** International Standards Laboratory  
Chamber 02; Conduction 02; Immunity02

**Test Distance:** 10M (EMI test)

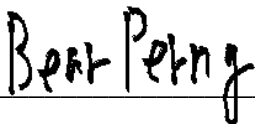
**Temperature:** refer to each site test data

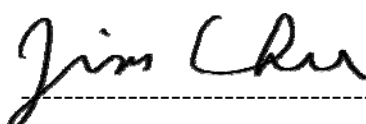
**Humidity:** refer to each site test data

**Input power:** Conduction input power: AC 230 V / 50 Hz  
Radiation input power: AC 230 V / 50 Hz  
Immunity input power: AC 230 V / 50 Hz

**Test Result:** **PASS**

**Report Engineer:** Winnie Huang

**Test Engineer:**   
\_\_\_\_\_  
Bear Perng

**Approved By:**   
-----  
Jim Chu / Director

## 1.2 Test Standards

The tests which this report describes were conducted by an independent electromagnetic compatibility consultant, International Standards Laboratory in accordance with the following

EN 55022:2006 +A1:2007 / CISPR 22:2005 +A1:2005 / AS/NZS CISPR 22: 2009: Class A: Limits and methods of measurement of Radio Interference characteristics of Information Technology Equipment.

EN55024:1998+A1:2001+A2:2003 / CISPR 24:1997+A1:2001+A2:2002: Information technology equipment-Immunity characteristics-Limits and methods of measurement.

Standard	Description	Results	Criteria
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EN 61000-4-3:2006+A1:2008 IEC 61000-4-3:2006+A1:2007	Radio-Frequency, Electromagnetic Field	Pass	A
EN 61000-4-4: 2004 +A1:2010 IEC 61000-4-4: 2004 +A1:2010	Electrical Fast Transient/Burst	Pass	B
EN 61000-4-5: 2006 IEC 61000-4-5: 2005	Surge	Pass	B
EN 61000-4-6: 2007 IEC 61000-4-6: 2003+A1:2004+A2: 2006	Conductive Disturbance	Pass	A
EN 61000-4-8: 1993+A1: 2001 IEC 61000-4-8: 1993+A1: 2000	Power Frequency Magnetic Field	Pass	A
EN 61000-4-11: 2004 IEC 61000-4-11: 2004	Voltage Dips / Short Interruption and Voltage Variation		
	>95% in 0.5 period	Pass	B
	30% in 25 period	Pass	C
	>95% in 250 period	Pass	C

Standard	Description	Results
EN 61000-3-2: 2006 IEC 61000-3-2: 2005	Limits for harmonics current emissions	Pass
EN 61000-3-3: 2008 IEC 61000-3-3: 2008	Limits for voltage fluctuations and flicker in low-voltage supply systems.	Pass

### 1.3 Description of EUT

#### EUT

Description: 24GE PoE with 4 Dual speed Combo SFP Web Smart Switch  
 Condition: Pre-Production  
 Model: GEP-2450  
 Serial Number: N/A

Highest working frequency: 25MHz  
 The radiation test should be tested till 1GHz.

#### I/O Ports:

Type	Quantity
LAN Port	24
AC Port	1
Fiber Cable Port	4

#### Test configuration:

1	EUT (Model: PSGS-1224K) + Support Unit (Model: FGS-2208G)
---	---

#### EMI Noise Source:

Crystal: 25MHz (OSC1)

#### EMI Solution:

N/A

#### 1.4 Description of Support Equipment

No.	Unit	Model Serial No.	Brand	Power Cord	FCC ID
1	Notebook1	PP81L(D620) S/N: NA	DELL	Non-shielded	FCC DOC
2	Notebook2	PP81L(D620) S/N: NA	DELL	Non-shielded	FCC DOC
3	24 ports RJ45 Resistor load	NA S/N: NA	NA	NA	NA
4	6-Port SFP + 2-Port TP/SFP L2+ Managed Switch	FGS-2208G	RUBY	Non-shielded	FCC DOC

#### 1.5 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

1. Notebook1 send singel to Notebook2 through EUT
2. Repeat the above steps.

Filename	Issued Date
Ping.exe	

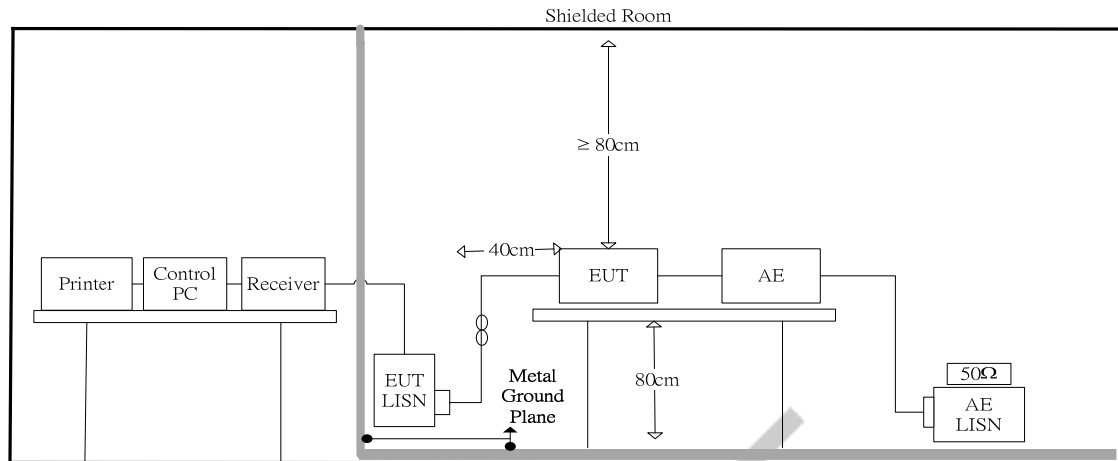
## 1.6 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cable	100V~230V to Support Unit ( FGS-2208G) SPS	1.8M	Non-shielded	Plastic Head
Fiber Data Cable	Support Unit( FGS-2208G) RX/TX Port to EUT( PSGS-1224K) RX/TX Port	1.8M	Non-shielded	Plastic Head
Fiber Data Cable*7	Support Unit ( FGS-2208G ) RX/TX Port with dummy	1.8M	Non-shielded	Plastic Head
LAN Data Cable	Support Unit (FGS-2208G)LAN Port to NB LAN(RJ-45) Port	33 feet	Non-shielded	RJ-45, Plastic Head
LAN Data Cable	Support Unit (FGS-2208G)LAN Port with dummy	1.8M	Non-shielded	RJ-45, Plastic Head
LAN to RS-232 Data Cable	Support Unit (FGS-2208G) CONSOLE Port with dummy	1.8M	Non-shielded	Metal Head
AC Power Cable	100V~230V to EUT( PSGS-1224K ) SPS	1.8M	Non-shielded	Plastic Head
LAN Data Cable	EUT (PSGS-1224K)LAN Port to NB LAN(RJ-45) Port	33 feet	Non-shielded	RJ-45, Plastic Head
LAN Data Cable*23	EUT(PSGS-1224K)LAN Port to 24 ports RJ45 Resistor load	1.8M	Non-shielded	RJ-45, Plastic Head
Fiber Data Cable*3	EUT(PSGS-1224K) RX/TX Port with dummy	1.8M	Non-shielded	Plastic Head

## 2. Power Main Port Conducted Emissions

### 2.1 Test Setup and Procedure

#### 2.1.1 Test Setup



#### 2.1.2 Test Procedure

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured.

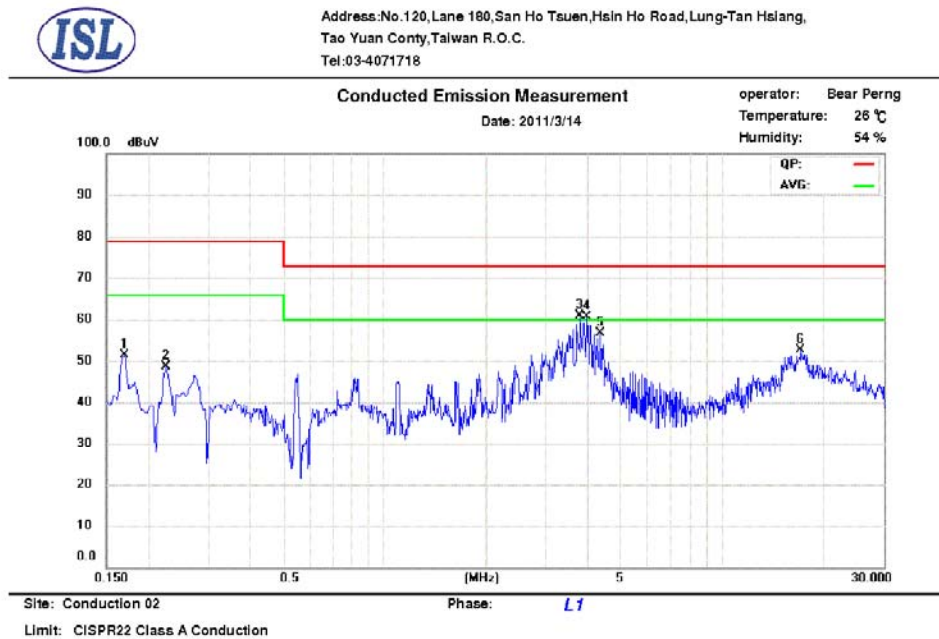
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

#### 2.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150KHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

## 2.2 Conduction Test Data: Configuration 1

**Table 2.3.1 Power Line Conducted Emissions (Hot)**



No.	Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
1	0.1677	0.11	0.01	51.15	79.0	-27.8	46.56	66.0	-19.4	
2	0.2235	0.11	0.01	47.73	79.0	-31.2	45.02	66.0	-20.9	
3	3.8020	0.21	0.13	57.15	73.0	-15.8	49.33	60.0	-10.6	
4	3.9790	0.22	0.13	58.50	73.0	-14.5	54.48	60.0	-5.52	
5	4.3406	0.23	0.13	55.05	73.0	-17.9	51.34	60.0	-8.66	
6	17.0957	0.89	0.2	50.19	73.0	-22.8	45.01	60.0	-14.9	

Note:

Margin = Corrected Amplitude - Limit

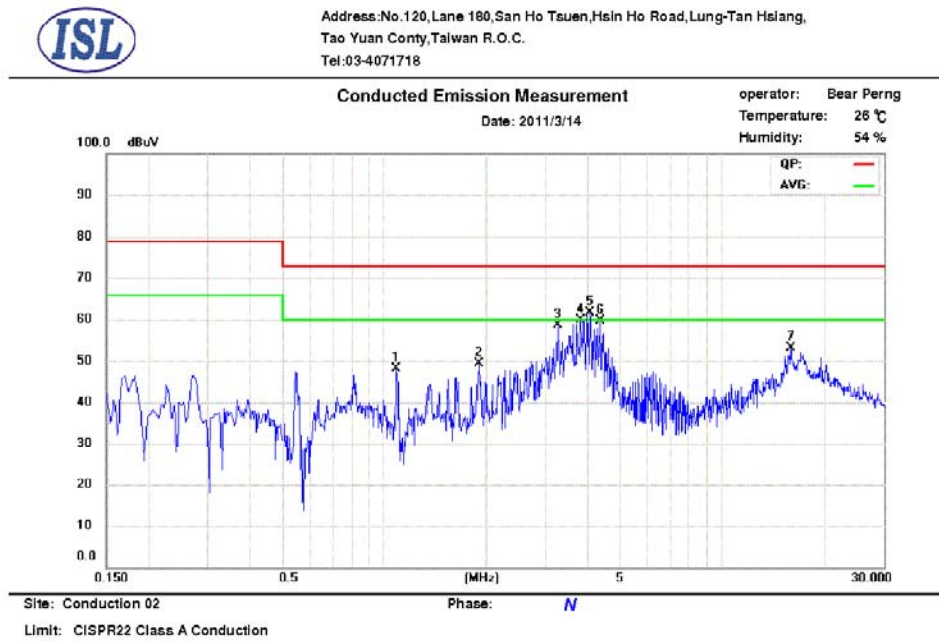
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss

A margin of -8dB means that the emission is 8dB below the limit

The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.

**Table 2.3.2 Power Line Conducted Emissions (Neutral)**



No.	Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
1	1.0854	0.14	0.04	45.04	73.0	-27.9	37.26	60.0	-22.7	
2	1.9001	0.16	0.08	46.74	73.0	-26.2	43.53	60.0	-16.4	
3	3.2573	0.19	0.11	55.91	73.0	-17.0	51.45	60.0	-8.55	
4	3.8000	0.2	0.13	58.86	73.0	-14.1	52.16	60.0	-7.84	
5	4.0710	0.21	0.13	59.76	73.0	-13.2	56.34	60.0	-3.66	
6	4.3415	0.22	0.13	57.44	73.0	-15.5	54.40	60.0	-5.60	
7	15.9190	0.6	0.2	49.90	73.0	-23.1	43.11	60.0	-16.8	

Note:

Margin = Corrected Amplitude - Limit

Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss

A margin of -8dB means that the emission is 8dB below the limit

The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

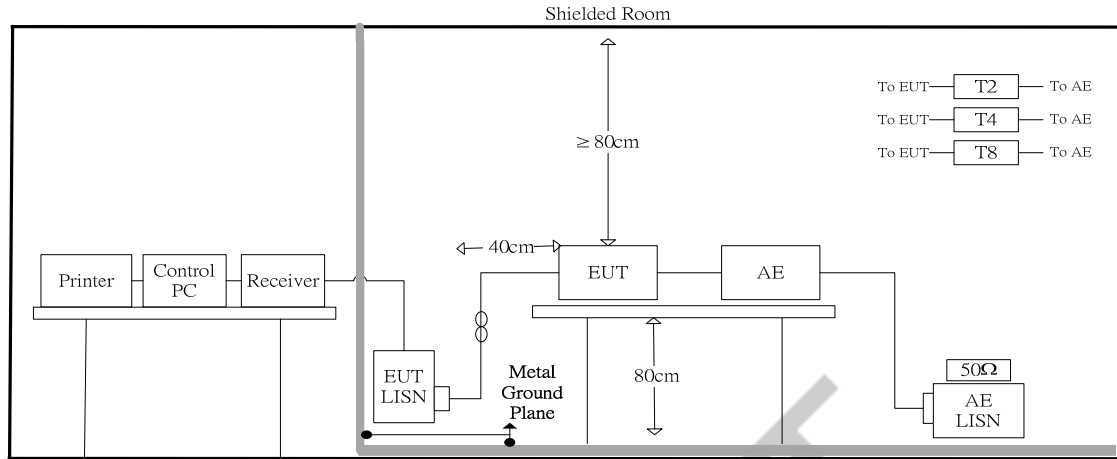
If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.



### 3. Telecommunication Port Conducted Emissions

#### 3.1 Test Setup and Procedure

##### 3.1.1 Test Setup



##### 3.1.2 Test Procedure

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

The EUT, any support equipment, and any interconnecting cables were arranged and moved to get the maximum measurement.

Power to the EUT was provided through the LISN which has the Impedance (50 Ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISN was filtered to eliminate ambient signal interference and this filter was bonded to ground. Peripheral equipment to provide a functional system (support equipment) for EUT testing was powered through a ganged, metal power outlet box bonded to the ground. AC input power for the auxiliary power outlets was obtained from the same filtered source that provides input power to the LISN.

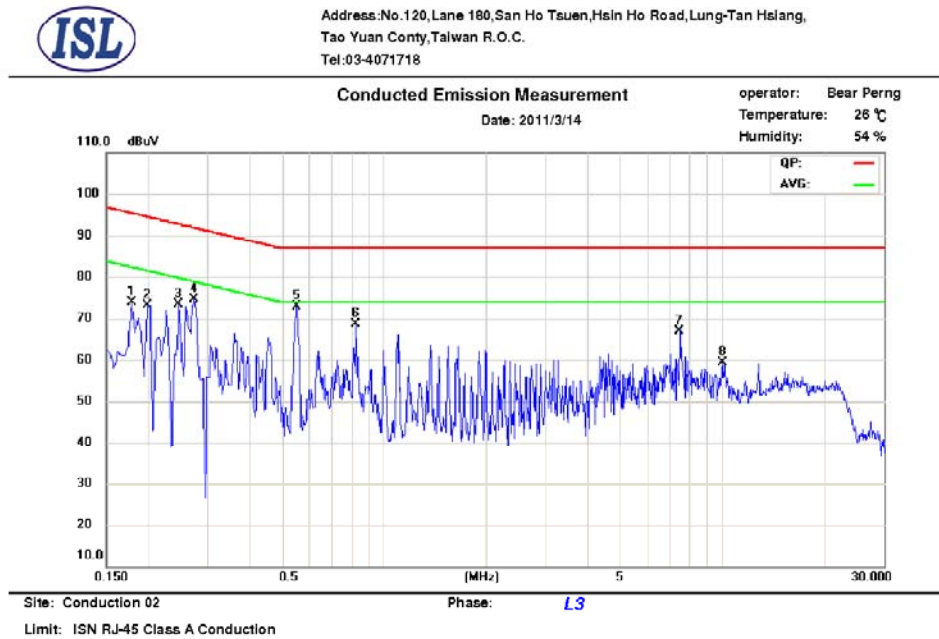
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information could be useful in reducing their amplitude.

##### 3.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150KHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

### 3.2 Test Data: LAN--10M: Configuration 1

Table 3.5.1 Telecommunication Port Conducted Emission



No.	Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct dBuV	QP Limit dBuV	QP Margin dB	AVG Correct dBuV	AVG Limit dBuV	AVG Margin dB	Note
1	0.1797	9.98	0.01	75.74	95.5	-19.7	67.68	82.5	-14.8	
2	0.1981	9.97	0.01	66.08	94.6	-28.6	38.81	81.6	-42.8	
3	0.2460	9.97	0.02	66.31	92.8	-26.5	43.05	79.8	-36.8	
4	0.2706	9.96	0.02	76.39	92.1	-15.7	64.79	79.1	-14.3	
5	0.5454	9.94	0.03	68.50	87.0	-18.5	59.51	74.0	-14.4	
6	0.8230	9.93	0.03	67.97	87.0	-19.0	50.46	74.0	-23.5	
7	7.5000	9.89	0.17	60.56	87.0	-26.4	50.27	74.0	-23.7	
8	10.0000	9.89	0.17	55.71	87.0	-31.2	53.63	74.0	-20.3	

**Note :**

Margin = Corrected Amplitude - Limit

Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss

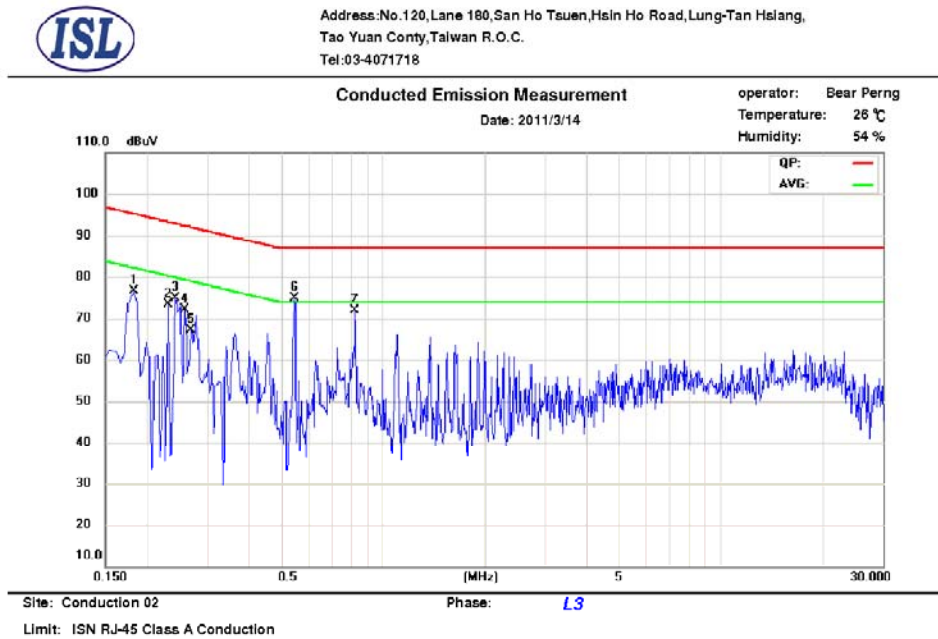
A margin of -8dB means that the emission is 8dB below the limit

The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.

### 3.3 Test Data: LAN--100M: Configuration 1

Table 3.6.1 Telecommunication Port Conducted Emission



No.	Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct dBuV	QP Limit dBuV	QP Margin dB	AVG Correct dBuV	AVG Limit dBuV	AVG Margin dB	Note
1	0.1822	9.98	0.01	75.50	95.3	-19.8	67.42	82.3	-14.9	
2	0.2303	9.97	0.02	66.22	93.4	-27.2	38.97	80.4	-41.4	
3	0.2420	9.97	0.02	66.02	93.0	-27.0	43.36	80.0	-36.6	
4	0.2576	9.96	0.02	65.92	92.5	-26.5	42.06	79.5	-37.4	
5	0.2702	9.96	0.02	76.16	92.1	-15.9	64.54	79.1	-14.5	
6	0.5463	9.94	0.03	69.51	87.0	-17.4	58.84	74.0	-15.1	
7	0.8232	9.93	0.03	67.95	87.0	-19.0	50.48	74.0	-23.5	

**Note :**

Margin = Corrected Amplitude - Limit

Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss

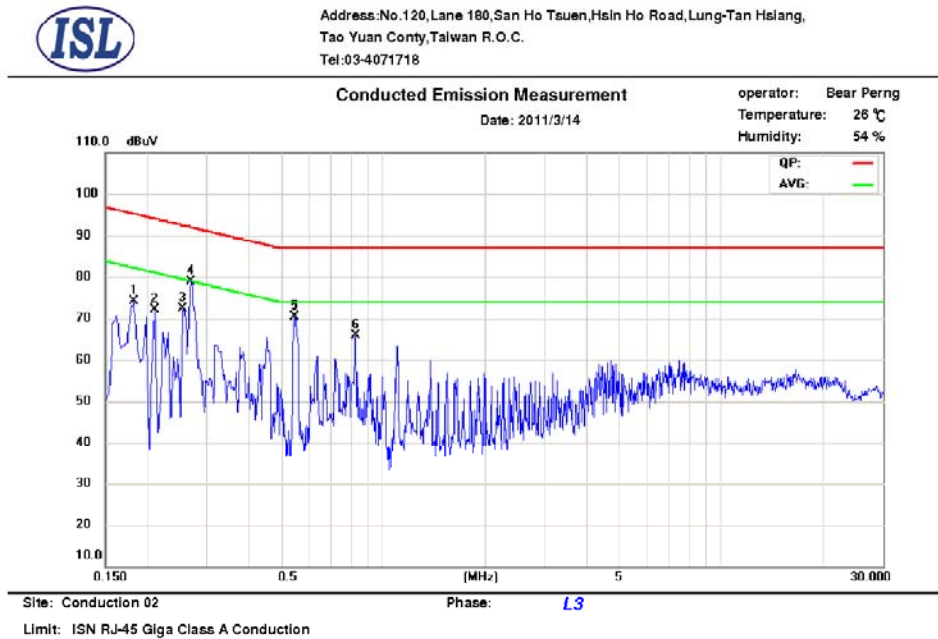
A margin of -8dB means that the emission is 8dB below the limit

The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.

### 3.4 Test Data: LAN--GIGA : Configuration 1

Table 3.7.1 Telecommunication Port Conducted Emission



No.	Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct dBuV	QP Limit dBuV	QP Margin dB	AVG Correct dBuV	AVG Limit dBuV	AVG Margin dB	Note
1	0.1802	10.17	0.01	75.82	95.4	-19.6	67.50	82.4	-14.9	
2	0.2100	10.16	0.01	65.92	94.2	-28.2	39.92	81.2	-41.2	
3	0.2538	10.15	0.02	65.51	92.6	-27.1	42.01	79.6	-37.6	
4	0.2714	10.14	0.02	76.03	92.0	-16.0	64.28	79.0	-14.7	
5	0.5470	10.08	0.03	68.70	87.0	-18.3	56.90	74.0	-17.1	
6	0.8202	10.05	0.03	65.88	87.0	-21.1	48.07	74.0	-25.9	

**Note :**

Margin = Corrected Amplitude - Limit

Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss

A margin of -8dB means that the emission is 8dB below the limit

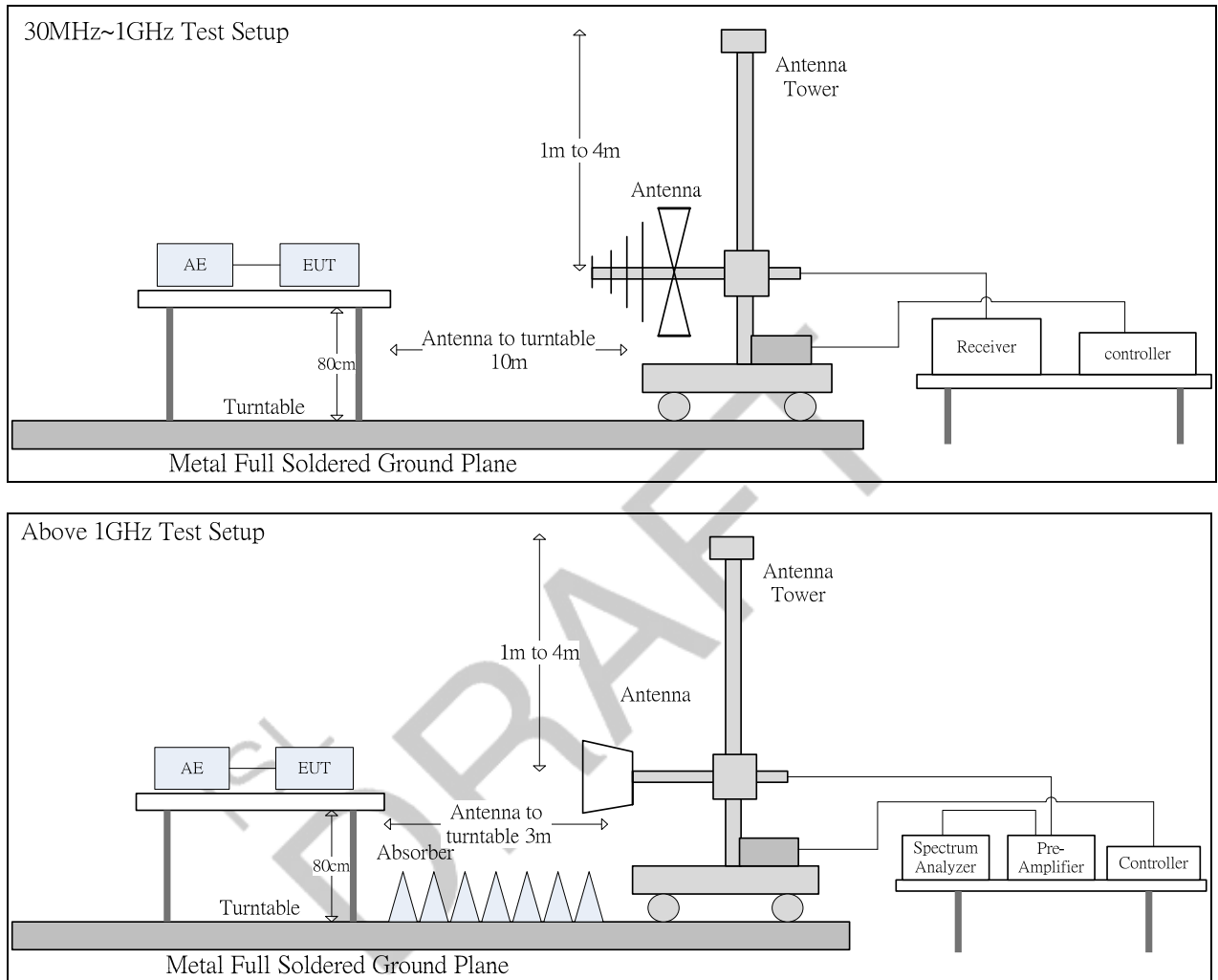
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.

## 4. Radiated Disturbance Emissions

### 4.1 Test Setup and Procedure

#### 4.1.1 Test Setup



#### 4.1.2 Test Procedure

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of 10 meter open field sites or 10 meter chamber. Desktop EUT are set up on a wooden stand 0.8 meter above the ground or floor-standing arrangement shall be placed on the horizontal ground reference plane. The test volume for a height of up to 30 cm may be obstructed by absorber placed on the ground plane.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The highest emissions between 1 GHz to 6 GHz were analyzed in details by operating

the spectrum analyzer in peak and average mode to determine the precise amplitude of the emissions.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.

The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

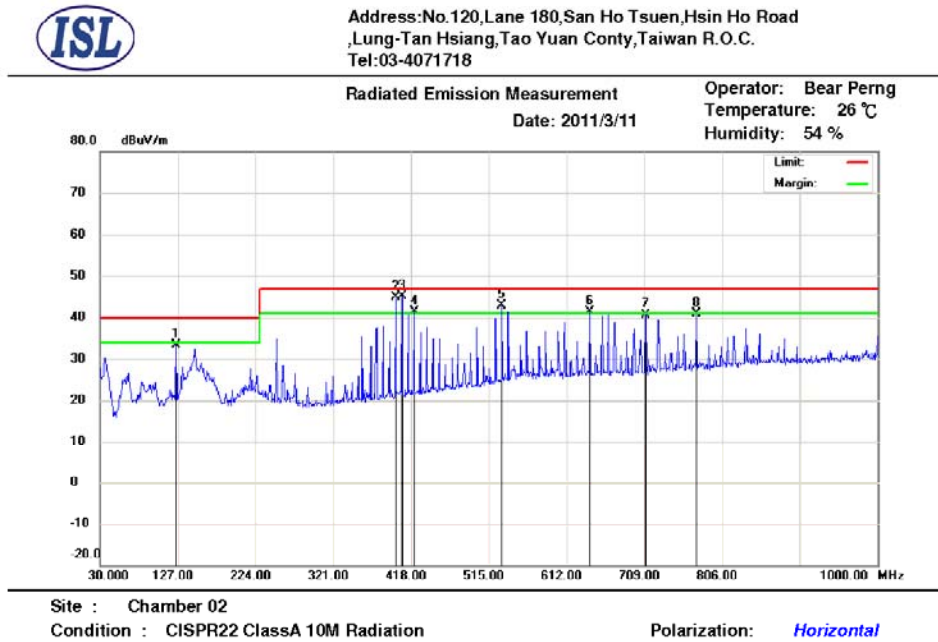
#### 4.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	30MHz--1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth:	120KHz
Frequency Range:	Above 1 GHz to 6 GHz
Detector Function:	Peak/Average Mode
Resolution Bandwidth:	1MHz

**\*\*Remarks: It is not necessary to be tested above 1 GHz to 6 GHz in this item.**

## 4.2 Radiation Test Data: Configuration 1

**Table 4.2.1 Radiated Emissions (Horizontal)**



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	125.0600	19.24	12.1	1.99	0	33.33	40.00	-6.67	326	234	peak
2	398.4400	25.56	15.66	3.56	0	44.78	47.00	-2.22	213	202	QP
3	406.2540	25.72	15.83	3.61	0	45.16	47.00	-1.84	185	203	QP
4	421.8800	21.56	16.14	3.7	0	41.40	47.00	-5.60	163	288	peak
5	531.4900	20.10	18.34	4.32	0	42.76	47.00	-4.24	137	316	peak
6	641.1000	17.47	18.93	4.87	0	41.27	47.00	-5.73	100	65	peak
7	710.9400	16.23	19.08	5.25	0	40.56	47.00	-6.44	100	327	peak
8	773.9900	15.37	19.75	5.64	0	40.76	47.00	-6.24	141	347	peak

\* Note:

Margin = Corrected Amplitude – Limit

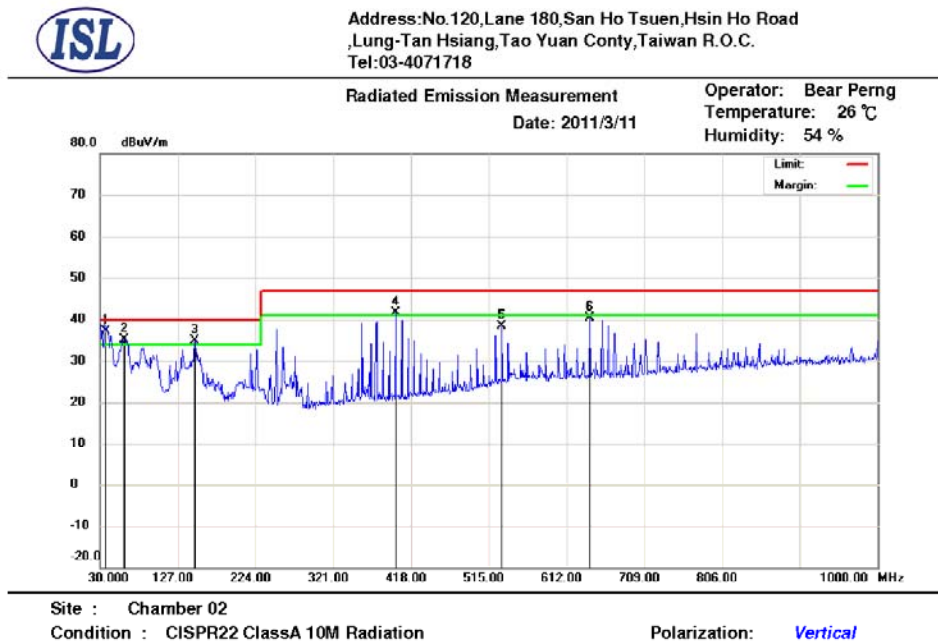
Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

BILOG Antenna Distance: 10 meters

**Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.**

**Table 4.2.2 Radiated Emissions (Vertical)**



Mk.	Frequency (MHz)	RX_R (dBuV/m)	Ant_F (dB)	Cab_L (dB)	PreAmp (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	37.3800	21.35	14.62	1.1	0	37.07	40.00	-2.93	100	320	QP
2	60.0700	27.13	6.7	1.37	0	35.20	40.00	-4.80	167	221	peak
3	148.3400	22.16	10.45	2.16	0	34.77	40.00	-5.23	121	29	peak
4	398.6000	22.33	15.66	3.56	0	41.55	47.00	-5.45	222	347	peak
5	531.4900	15.84	18.34	4.32	0	38.50	47.00	-8.50	376	147	peak
6	641.1000	16.51	18.93	4.87	0	40.31	47.00	-6.69	100	345	peak

\* Note:

Margin = Corrected Amplitude – Limit

Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

BILOG Antenna Distance: 10 meters

**Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.**



## 5. Electrostatic discharge (ESD) immunity

### 5.1 Electrostatic discharge (ESD) immunity test

Port:	Enclosure
Basic Standard:	EN 61000-4-2/ IEC EN61000-4-2 (details referred to Sec 1.2)
Test Level:	Air +/- 2 kV, +/- 4 kV, +/- 8 kV Contact +/- 2 kV, +/- 4 kV
Criteria:	B
Test Procedure	refer to ISL QA -T4-E-S7
Temperature:	25 °C
Humidity:	45%

#### Selected Test Point

**Air:** discharges were applied to slots, aperture or insulating surfaces. 10 single air discharges were applied to each selected points.

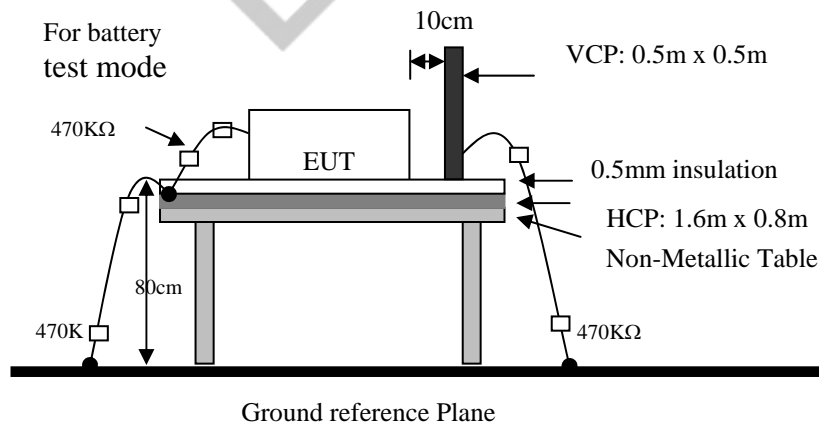
**Contact:** Total 200 discharges minimum were to the selected contact points.

**Indirect Contact Points:** 25 discharges were applied to center of one edge of VCP and each EUT side of HCP with 10 cm away from EUT.

Red arrow lines indicate the contact points, and blue arrow lines indicate the air points.

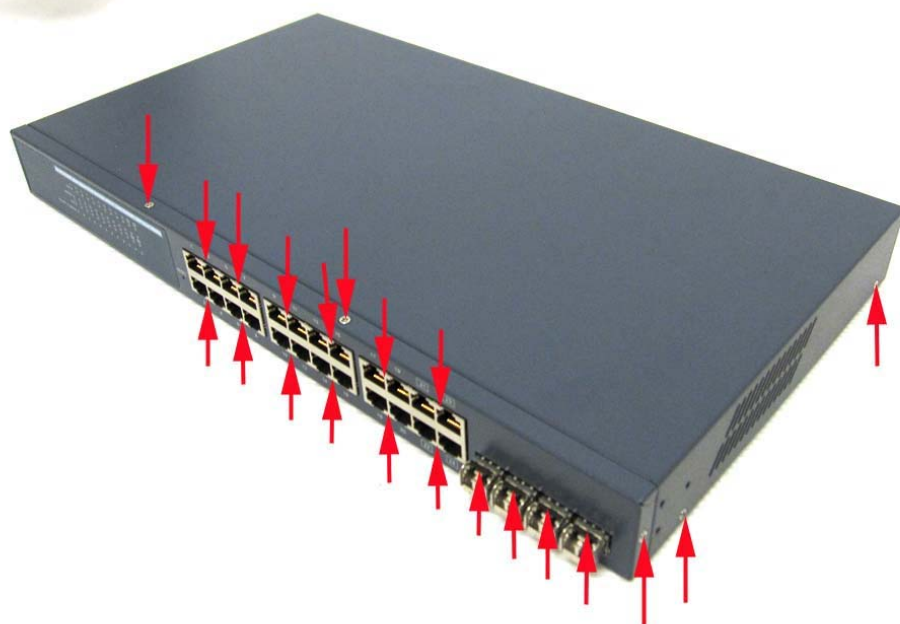
#### Test Setup

EUT is 1m from the wall and other metallic structure. When Battery test mode is needed, a cable with one 470KΩ resistor at two rare ends is connected from metallic part of EUT and screwed to HCP.



#### Test Result

**Performance of EUT complies with the given specification.**



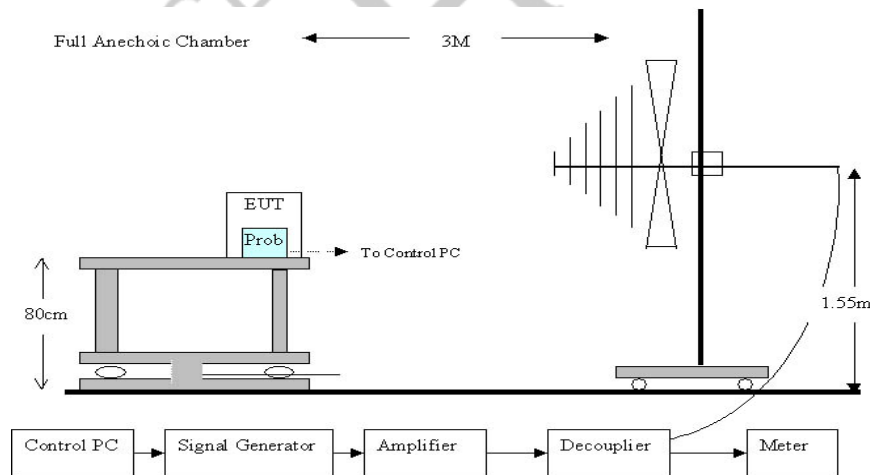
## 6. Radio-Frequency, Electromagnetic Field immunity

### 6.1 Radio-Frequency, Electromagnetic Field immunity test

Port:	Enclosure
Basic Standard:	EN 61000-4-3/ IEC EN61000-4-3 (details referred to Sec 1.2)
Test Level::	3 V/m
Modulation:	AM 1KHz 80%
Frequency range:	80 MHz~1 GHz
Frequency Step:	1% of last step frequency
Dwell time:	3s
Polarization:	Vertical and Horizontal
EUT Azimuth Angle	<input checked="" type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input checked="" type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°
Criteria:	A
Test Procedure	refer to ISL QA -T4-E-S8
Temperature:	24°C
Humidity:	54%

#### Test Setup

The field sensor is placed at one calibration grid point to check the intensity of the established fields on both polarizations. EUT is adjusted to have each side of EUT face coincident with the calibration plane. A CCD camera and speakers are used to monitor the condition of EUT for the performance judgment.



#### Test Result

Performance of EUT complies with the given specification.

## 7. Electrical Fast transients/burst immunity

### 7.1 Electrical Fast transient/burst immunity test

Port:	AC mains; Twisted Pair LAN Port
Basic Standard:	EN 61000-4-4/ IEC EN61000-4-4 (details referred to Sec 1.2)
Test Level:	<b>AC Power Port:</b> +/- 1 kV <b>Twisted Pair LAN Port (I/O Cables):</b> +/- 0.5 kV
Rise Time:	5ns
Hold Time:	50ns
Repetition Frequency:	5KHz
Criteria:	B
Test Procedure	refer to ISL QA -T4-E-S9
Temperature:	26 °C
Humidity:	56%

#### Test Procedure

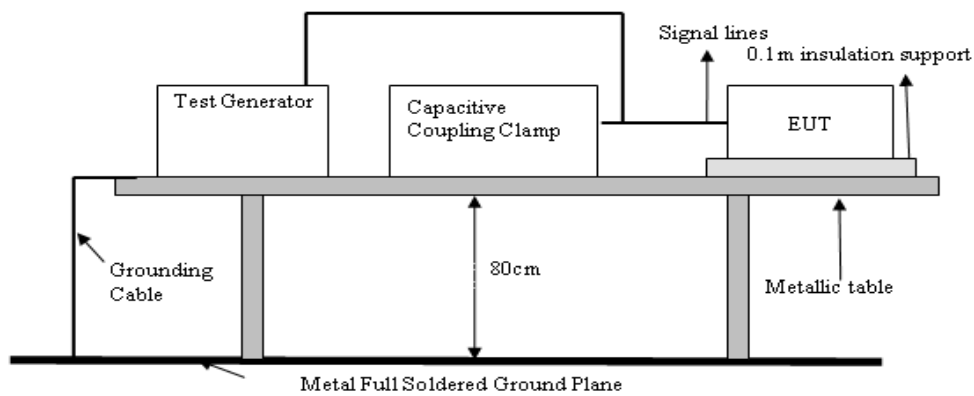
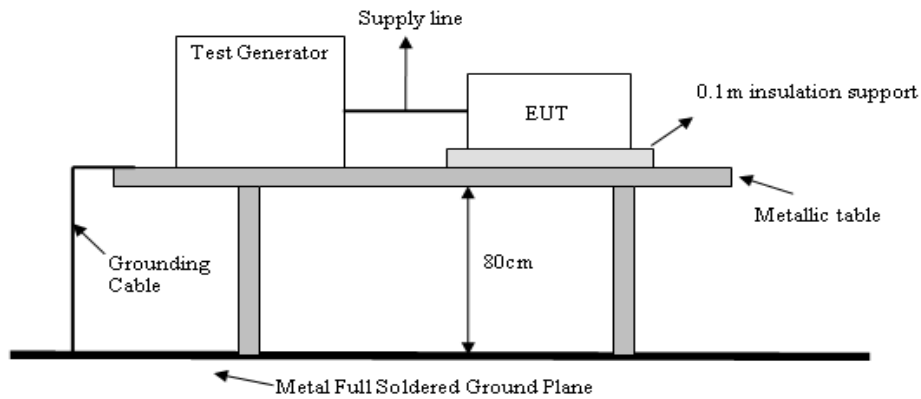
The EUT was setup on a nonconductive table 0.1 m above a reference ground plane.

Test Points	Polarity	Result	Comment
Line	+	N	60 sec
	-	N	60 sec
Neutral	+	N	60 sec
	-	N	60 sec
Ground	+	N	60 sec
	-	N	60 sec
Line to Neutral	+	N	60 sec
	-	N	60 sec
Line to Ground	+	N	60 sec
	-	N	60 sec
Neutral to Ground	+	N	60 sec
	-	N	60 sec
Line to Neutral to Ground	+	N	60 sec
	-	N	60 sec
Capacitive coupling clamp	+	N	60 sec
	-	N	60 sec

**Note:** 'N' means normal, the EUT function is correct during the test.

### **Test Setup**

EUT is at least 50cm from the conductive structure.



### **Test Result**

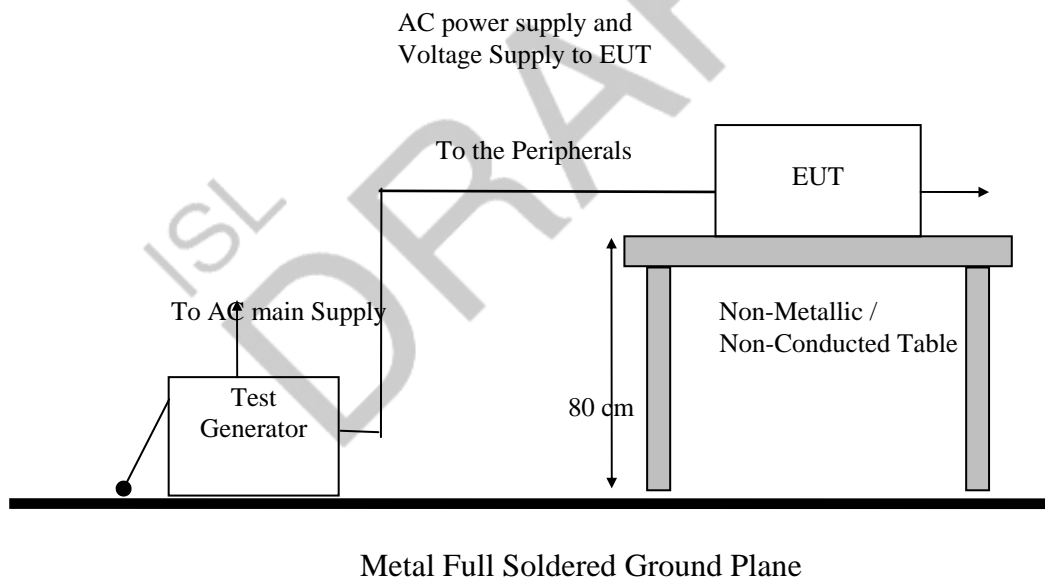
Performance of EUT complies with the given specification.

## 8. Surge Immunity

### 8.1 Surge immunity test

Port:	AC mains
Basic Standard:	EN 61000-4-5/ IEC EN61000-4-5 (details referred to Sec 1.2)
Test Level:	<b>AC Power Port:</b> Line to Line: +/- 0.5 kV, +/- 1 kV Line to Earth: +/- 0.5 kV, +/- 1 kV, +/- 2kV
Rise Time:	1.2us
Hold Time:	50us
Repetition Rate:	30 second
Angle:	<input checked="" type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input checked="" type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°
Criteria:	B
Test Procedure	refer to ISL QA -T4-E-S10
Temperature:	24°C
Humidity:	57%

#### Test Setup



#### Test Result

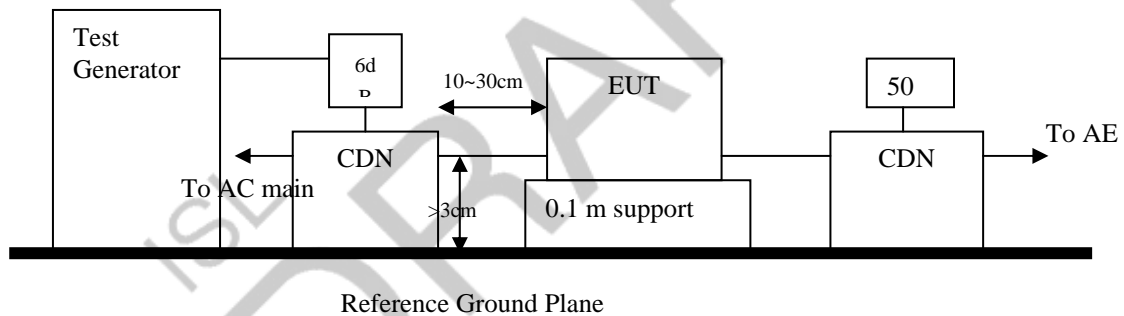
**Performance of EUT complies with the given specification.**

## 9. Immunity to Conductive Disturbance

### 9.1 Immunity to Conductive Disturbance

Port:	AC mains; Twisted Pair LAN Port
Basic Standard:	EN 61000-4-6/ IEC EN61000-4-6 (details referred to Sec 1.2)
Test Level::	3 V
Modulation:	AM 1KHz 80%
Frequency range:	0.15 MHz - 80MHz
Frequency Step:	1% of last Frequency
Dwell time:	3s
Criteria:	A
CDN Type:	CDN M2+M3, CDN T4, EM Clamp
Test Procedure	refer to ISL QA -T4-E-S11
Temperature:	22°C
Humidity:	57%

#### Test Setup



#### Test Result

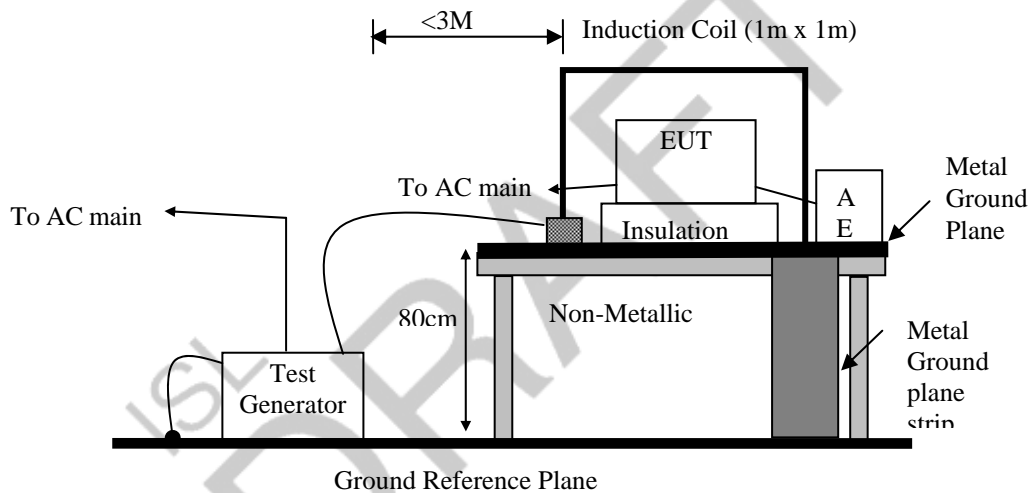
Performance of EUT complies with the given specification.

## 10. Power Frequency Magnetic Field immunity

### 10.1 Power Frequency Magnetic field immunity test

Port:	Enclosure
Basic Standard:	EN 61000-4-8/ IEC EN61000-4-8 (details referred to Sec 1.2)
Test Level:	1A/m
Polarization:	X, Y, Z
Criteria:	A
Test Procedure	refer to ISL QA -T4-E-S12
Temperature:	21°C
Humidity:	57%

#### Test Setup



#### Test Result

Performance of EUT complies with the given specification.

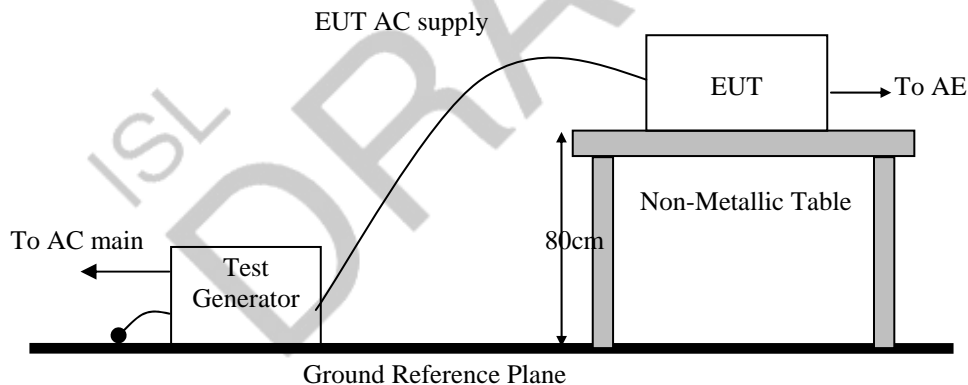


## 11. Voltage Dips, Short Interruption and Voltage Variation immunity

### 11.1 Voltage Dips, Short Interruption and Voltage Variation immunity test

Port:	AC mains
Basic Standard:	EN 61000-4-11/ IEC EN61000-4-11 (details referred to Sec 1.2)
Test Level: Criteria:	>95% in 0.5 period B
Test Level: Criteria:	30% in 25 period C
Test Level: Criteria:	>95% in 250 period C
Phase:	0°; 180°
Test intervals:	3 times with 10s each
Test Procedure	refer to ISL QA -T4-E-S13
Temperature:	23°C
Humidity:	56%

#### Test Setup



#### Test Result

Performance of EUT complies with the given specification.

## 12. Harmonics

### 12.1 Harmonics test

Port:	AC mains
Active Input Power:	>75W
Basic Standard:	EN61000-3-2/IEC 61000-3-2 (details referred to Sec 1.2)
Test Duration:	2.5min
Class:	A
Test Procedure	refer to ISL QA -T4-E-S14
Temperature:	20°C
Humidity:	57%

#### **Test Procedure**

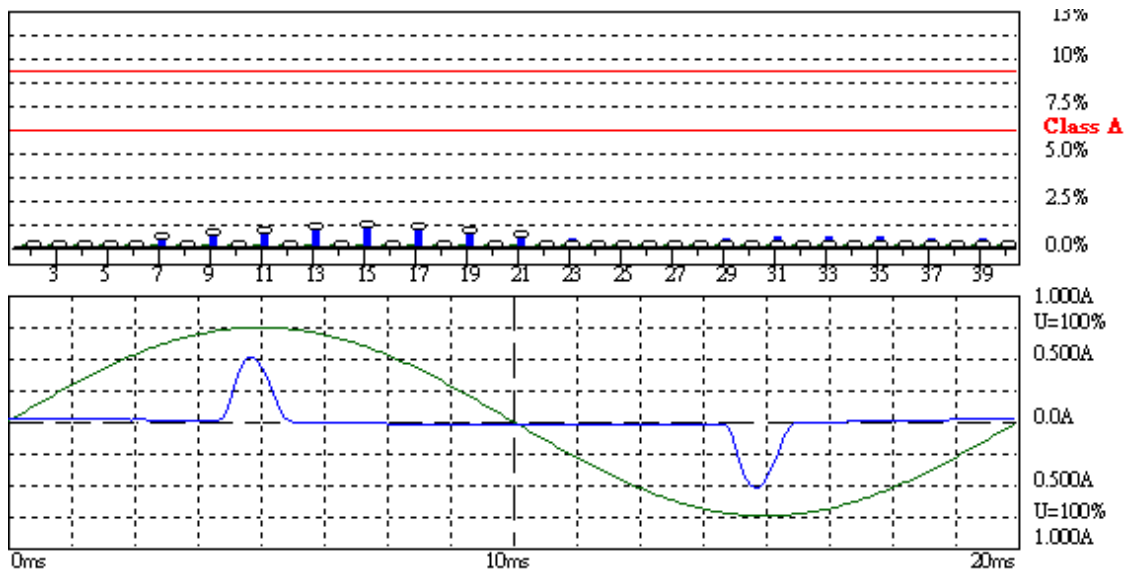
The EUT is supplied in series with shunts or current transformers from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the EUT. The EUT is configured to its rated current with additional resistive load when the testing is performed.

Equipment having more than one rated voltage shall be tested at the rated voltage producing the highest harmonics as compared with the limits.

#### **Result**

**Performance of EUT complies with the given specification.**

# **Test Data**



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

2011/3/11 PM 01:13:3

U<sub>rms</sub> = 290.3 V    P = 13.55 W    THC = 0.114 A  
 I<sub>rms</sub> = 0.127 A    pf = 0.463

Range: 1 A  
 V<sub>nom</sub>: 230 V  
 TestTime: 3 min (100%)

**Test completed, Result: PASSED**

HAR-1000 EMC-Return

Urms = 230.3V      Freq = 49.987      Range: 1 A  
 Irms = 0.127A      Ipk = 0.525A      cf = 4.135  
 P = 13.55W      S = 29.24VA      pf = 0.463  
 THDi = 87.9 %      THDu = 0.10 %      Class A

Test - Time :3min ( 100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Iavg%L [%]	Irms [A]	Irms%L [%]	Imax [A]	Imax%L [%]	Limit [A]	Status
1	50	0.0617		0.0620		0.0620			
2	100	0.0000	0.0000	0.0018	0.1695	0.0018	0.1695	1.0800	
3	150	0.0529	2.2995	0.0532	2.3114	0.0532	2.3140	2.3000	
4	200	0.0000	0.0000	0.0002	0.0568	0.0003	0.0710	0.4300	
5	250	0.0503	4.4126	0.0506	4.4384	0.0506	4.4384	1.1400	
6	300	0.0000	0.0000	0.0004	0.1424	0.0005	0.1628	0.3000	
7	350	0.0467	6.0667	0.0470	6.1035	0.0470	6.1035	0.7700	
8	400	0.0000	0.0000	0.0004	0.1592	0.0005	0.2123	0.2300	
9	450	0.0420	10.494	0.0422	10.559	0.0422	10.559	0.4000	
10	500	0.0000	0.0000	0.0004	0.2322	0.0005	0.2654	0.1840	
11	550	0.0366	11.097	0.0368	11.153	0.0369	11.171	0.3300	
12	600	0.0000	0.0000	0.0004	0.2786	0.0005	0.3582	0.1533	
13	650	0.0307	14.631	0.0309	14.707	0.0309	14.736	0.2100	
14	700	0.0000	0.0000	0.0004	0.2786	0.0005	0.3715	0.1314	
15	750	0.0248	16.511	0.0249	16.602	0.0249	16.602	0.1500	
16	800	0.0000	0.0000	0.0004	0.3715	0.0005	0.4246	0.1150	
17	850	0.0189	14.275	0.0190	14.342	0.0190	14.388	0.1324	
18	900	0.0000	0.0000	0.0004	0.3582	0.0004	0.4180	0.1022	
19	950	0.0135	11.378	0.0135	11.442	0.0135	11.442	0.1184	
20	1000	0.0000	0.0000	0.0004	0.3981	0.0004	0.4644	0.0920	
21	1050	0.0087	8.1010	0.0087	8.1462	0.0088	8.2031	0.1071	
22	1100	0.0000	0.0000	0.0004	0.4379	0.0004	0.4379	0.0836	
23	1150	0.0000	0.0000	0.0049	4.9913	0.0049	5.0537	0.0978	
24	1200	0.0000	0.0000	0.0003	0.3981	0.0003	0.3981	0.0767	
25	1250	0.0000	0.0000	0.0025	2.7805	0.0026	2.8483	0.0900	
26	1300	0.0000	0.0000	0.0003	0.4312	0.0003	0.4312	0.0708	
27	1350	0.0000	0.0000	0.0027	3.2227	0.0027	3.2959	0.0833	
28	1400	0.0000	0.0000	0.0002	0.3715	0.0002	0.3715	0.0657	
29	1450	0.0000	0.0000	0.0038	4.8774	0.0038	4.9561	0.0776	
30	1500	0.0000	0.0000	0.0002	0.3981	0.0002	0.3981	0.0613	
31	1550	0.0000	0.0000	0.0044	6.0547	0.0045	6.1388	0.0726	
32	1600	0.0000	0.0000	0.0002	0.4246	0.0002	0.4246	0.0575	
33	1650	0.0000	0.0000	0.0045	6.5348	0.0045	6.6243	0.0682	
34	1700	0.0000	0.0000	0.0002	0.4511	0.0002	0.4511	0.0541	
35	1750	0.0000	0.0000	0.0040	6.2663	0.0042	6.4562	0.0643	
36	1800	0.0000	0.0000	0.0002	0.3582	0.0002	0.4777	0.0511	
37	1850	0.0000	0.0000	0.0033	5.4199	0.0034	5.5203	0.0608	
38	1900	0.0000	0.0000	0.0002	0.3782	0.0002	0.3782	0.0484	
39	1950	0.0000	0.0000	0.0023	4.0202	0.0024	4.2318	0.0577	
40	2000	0.0000	0.0000	0.0002	0.3981	0.0002	0.5307	0.0460	

## 13. Voltage Fluctuations

### 13.1 Voltage Fluctuations test

Port:	AC mains
Basic Standard:	EN61000-3-3/IEC61000-3-3 (details referred to Sec 1.2)
Test Procedure	refer to ISL QA -T4-E-S14
Observation period:	For Pst 10min
	For Plt 2 hours
Temperature:	20°C
Humidity:	57%

#### **Test Procedure**

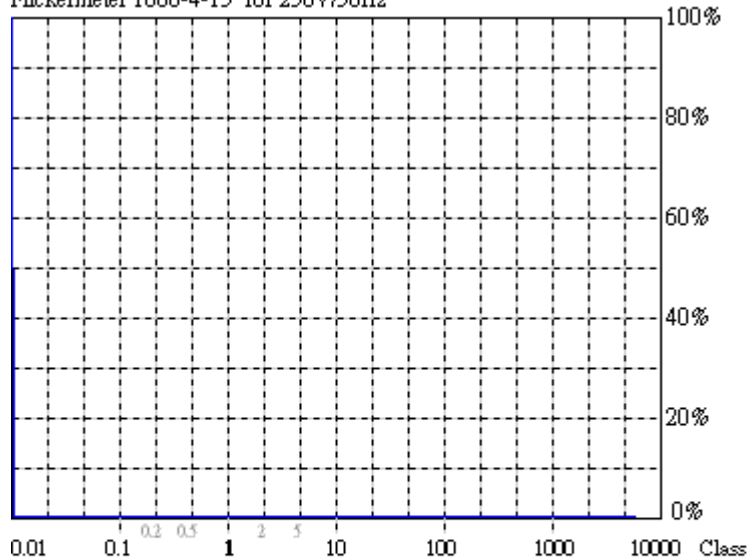
The EUT is supplied in series with reference impedance from a power source with the voltage and frequency as the nominal supply voltage and frequency of the EUT.

#### **Result**

**Performance of EUT complies with the given specification.**

## Test Data

Flickermeter 1000-4-15 for 230V/50Hz


**Flicker Emission - IEC 61000-3-3 , EN 61000-3-3 , (EN60555-3)**

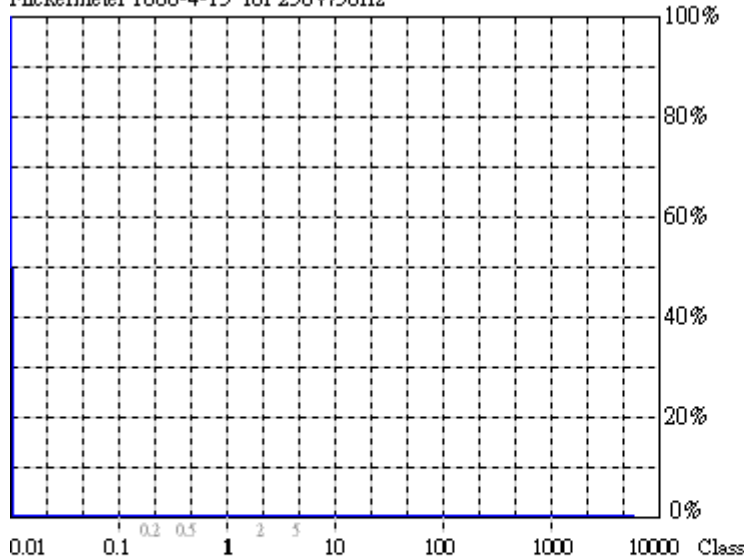
$U_{rms} = 230.3 \text{ V}$      $P = 13.57 \text{ W}$   
 $I_{rms} = 0.126 \text{ A}$      $pf = 0.466$

2011/3/11 PM 01:27:0

Range: 1 A  
 V-nom: 230 V  
 TestTime: 10 min (100%)

**Test completed, Result: PASSED**

Flickermeter 1000-4-15 for 230V/50Hz


**Flicker Emission - IEC 61000-3-3 , EN 61000-3-3 , (EN60555-3)**

$U_{rms} = 230.3 \text{ V}$      $P = 13.23 \text{ W}$   
 $I_{rms} = 0.124 \text{ A}$      $pf = 0.463$

2011/3/11 PM 03:36:3

Range: 1 A  
 V-nom: 230 V  
 TestTime: 120 min (10000%)

**Test completed, Result: PASSED**

HAR-1000 EMC-Retester

Appendix

**13.2 Appendix A: Test Equipment**

**13.2.1 Test Equipment List**

Location Con02	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction 02	Conduction 02-1 Cable	WOKEN	CFD 300-NL	Conduction 02 -1	06/21/2010	06/21/2011
Conduction 02	EMI Receiver 14	ROHDE& SCHWARZ	ESCI	101034	02/17/2011	02/17/2012
Conduction 02	ISN T4 03	FCC	FCC-TLISN-T 4-02	20254	07/20/2010	07/20/2011
Conduction 02	ISN T8 01	FCC	FCC-TLINS-T 8-02	20255	07/20/2010	07/20/2011
Conduction 02	LISN 06	R&S	ESH3-Z5	828874/009	01/12/2011	01/12/2012
Conduction 02	LISN 04	EMCO	3810/2	9604-1429	05/14/2010	05/14/2011

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation (Chamber02)	BILOG Antenna 15	Teseq GmbH	CBL6112D	27622	01/18/2011	01/18/2012
Radiation (Chamber02)	Coaxial Cable Chmb 02-10M-02	MIYAZAKI	8D-FB	Chmb 02-10M-02	10/18/2010	10/18/2011
Radiation (Chamber02)	EMI Receiver 11	ROHDE & SCHWARZ	ESCI	100568	06/18/2010	06/18/2011

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
EN61K-3-2/3	Harmonic/Flicker Test System 02	EMC PARTNER	HARMONICS -1000	143	03/25/2010	03/25/2011
EN61K-4-2	ESD Gun 05	EM TEST	Dito	V0640101838	03/10/2011	03/10/2012
EN61K-4-3	Broadband Log-Periodic Antenna	AR	AT1080	310698	N/A	N/A
EN61K-4-3	Horn Antenna 07 (Above 1GHz)	AR	AT40002A	311399	N/A	N/A
EN61K-4-3	Amplifier 80Mz~1GHz 250W	AR	250W1000A	312494	N/A	N/A
EN61K-4-3	Amplifier 800MHz~3.0GHz 60W	AR	60S1G3	312762	N/A	N/A
EN61K-4-3	Broadband coupler 10K~220Mhz	Amplifier Research	DC2500	19810	N/A	N/A
EN61K-4-3	Broadband Coupler 80M~1GHz	Amplifier Research	DC6180	20364	N/A	N/A
EN61K-4-3	Broadband Coupler 1~4GHz	Werlatone	C5291	6516	N/A	N/A
EN61K-4-3	Coaxial Cable Chmb 04-3M-2	Belden	RG-8/U	Chmb 04-3M-2	N/A	N/A
EN61K-4-3	Signal Generator 03	Anritsu	MG3642A	6200162550	04/1/2011	03/18/2012
EN61K-4-4	EFT and SURGE Test System	EM TEST	UCS-500 M6B	V0728102674	12/02/2010	12/02/2011
EN61K-4-5	CDN-UTP8	EMC-PARTNER	CDN-UTP8	017	05/03/2010	05/03/2011
EN61K-4-5	SURGE-TESTER	EMC Partner	MIG0603IN3	523	05/03/2010	05/03/2011
EN61K-4-6	CDN M2+M3 03	Frankonia	M2+M3	A3027007	07/20/2010	07/20/2011
EN61K-4-6	CDN T4 04	FCC Inc.	FCC-801-T4	02069	08/28/2010	08/28/2011
EN61K-4-6	Coaxial Cable 4-6 02-1			4-6 02-1	N/A	N/A
EN61K-4-6	Conducted Immunity Test System 02	Frankonia	CIT-10/75	102D1331	05/28/2010	05/28/2011
EN61K-4-6	EM-Clamp	Schaffner	KEMZ-801	19215	N/A	N/A
EN61K-4-8	Magnetic Field Meter 10	Combinova	MFM-10	645	02/11/2011	02/11/2012
EN61K-4-8	Magnetic Field Immunity Loop	FCC	F-1000-4-8-L-1M	01037	N/A	N/A
EN61K-4-8	Magnetic Field Test Generator	FCC	F-1000-4-8-G-125A	01038	N/A	N/A
EN61K-4-11	Voltage Dip and UP Simulator	NoiseKen	VDS-2002	VDS0640162	09/08/2010	09/08/2011

PS: N/A => The equipment does not need calibration.



### 13.2.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

Test Item	Filename	Version
EN61000-3-2	HARCS.EXE	4.14
EN61000-3-3	HARCS.EXE	4.14
EN61000-4-3	Tile.Exe	2.0.P
EN61000-4-6	EN61000-4-6 Application Software	1.13.e
EN61000-4-2	N/A	2.0
EN61000-4-4	Tema.EXE	1.69
EN61000-4-5	Tema.EXE	1.69
EN61000-4-8	N/A	
EN61000-4-11	VDS-2002Rs.EXE	2.00

Radiation/Conduction	Filename	Version	Issued Date
Lung_Tan Conduction	EZ EMC	1.1.4.2	2/10/2007
Lung_Tan Radiation	EZ EMC	1.1.4.2	1/24/2007

### 13.3 Appendix B: Uncertainty of Measurement

The measurement uncertainty refers to CISPR 16-4-2:2003. The coverage factor  $k = 2$  yields approximately a 95 % level of confidence.

<Conduction 02>:  $\pm 3.263\text{dB}$

<Chamber 02 (10M)>

Horizontal

30MHz~200MHz:  $\pm 4.251\text{ dB}$

200MHz~1GHz:  $\pm 4.380\text{ dB}$

Vertical

30MHz~200MHz:  $\pm 4.382\text{ dB}$

200MHz~1GHz:  $\pm 4.384\text{ dB}$

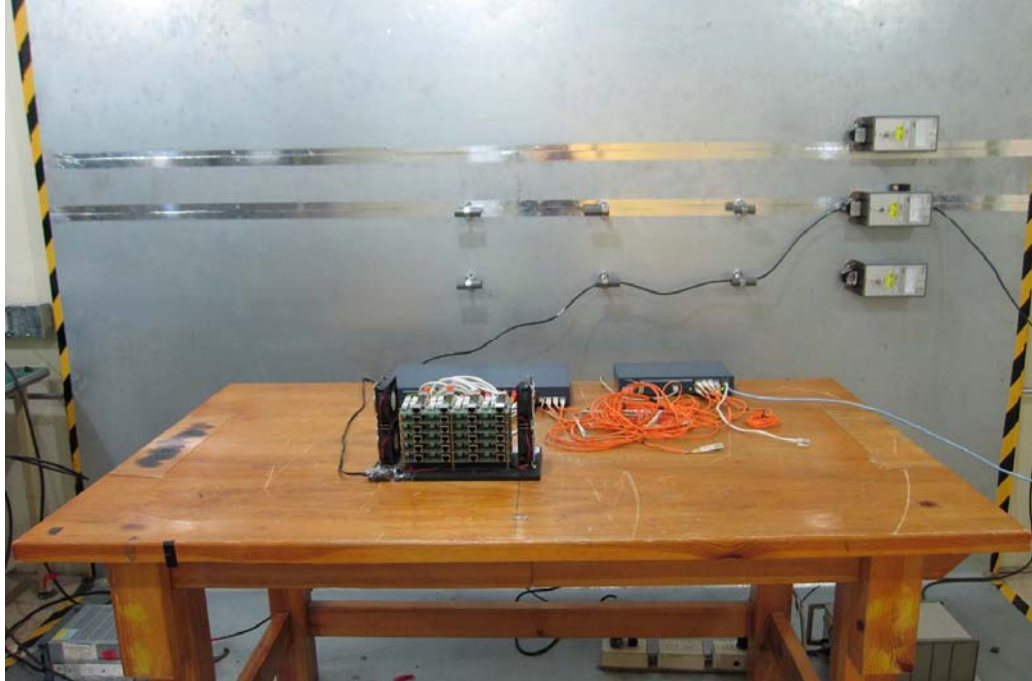
<Immunity 02>

Test item	Uncertainty
EN61000-4-2 (ESD)	
Voltage	$\pm 1.732\%$
First Peak current	$\pm 1.848\%$
current at 30ns	$\pm 1.85\%$
current at 60ns	$\pm 1.85\%$
EN61000-4-3 (RS)	$\pm 1.845\text{ dB}$
EN61000-4-4 (EFT)	
Time	$\pm 3.233\%$
Voltage	$\pm 1.848\%$
Current	$\pm 1.848\%$
EN61000-4-5 (Surge)	
Time	$\pm 1.004\%$
Voltage	$\pm 1.414\%$
Current	$\pm 1.019\%$
EN61000-4-6 (CS)	$\pm 3.308\text{dB}$
EN61000-4-8 (Magnetic)	$\pm 0.179\%$
EN61000-4-11 (Dips)	
Time	$\pm 2.8\%$
Voltage	$\pm 0.04\%$
Current	$\pm 3.646\%$
EN61000-3-2 (Harmonics)	$\pm 0.179\%$
EN61000-3-3 (Fluctuations and Flicker)	$\pm 0.179\%$

## 13.4 Appendix C: Photographs of EUT Configuration Test Set Up

### 13.4.1 Photo of Main Power Port Conducted Emission and Telecommunication Port Conducted Emission Measurement

Front View

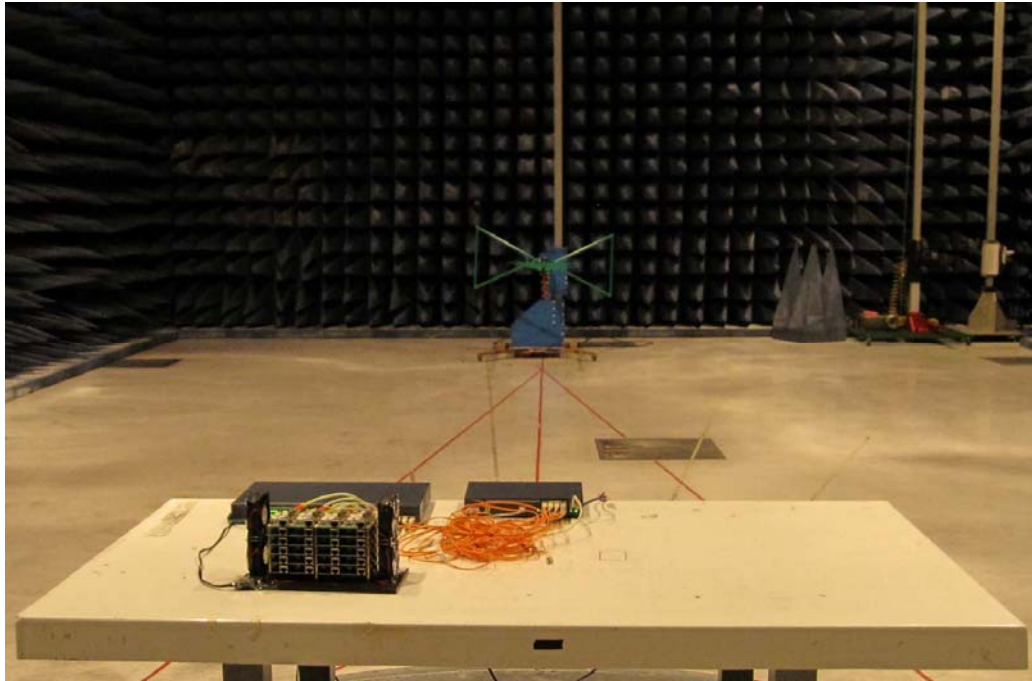


Back View

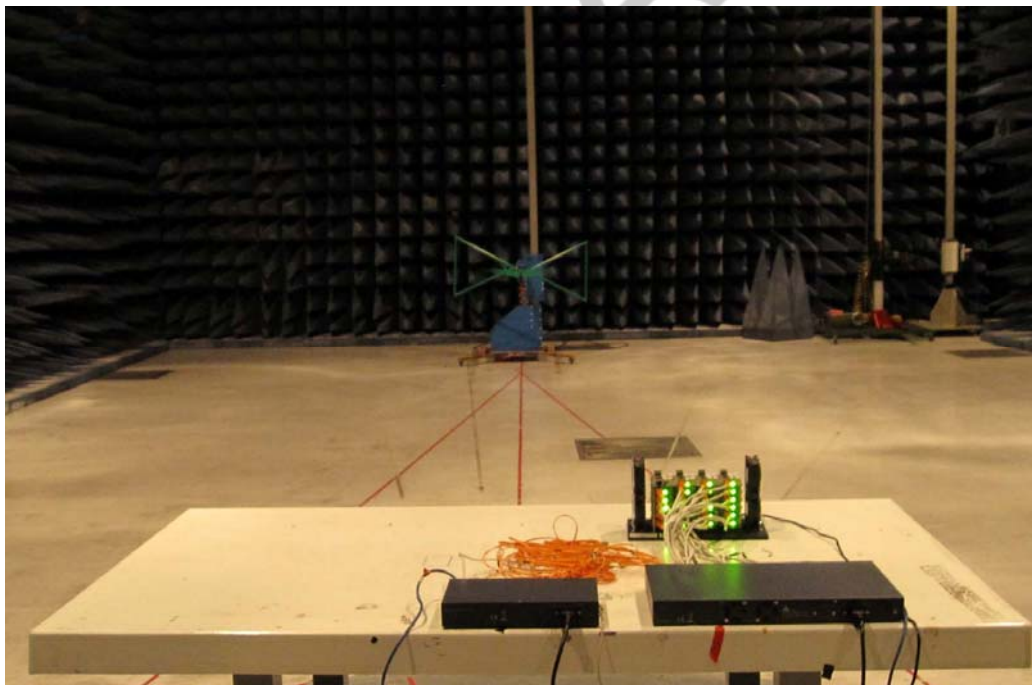


### 13.4.2 Photo of Radiated Emission Measurement

Front View

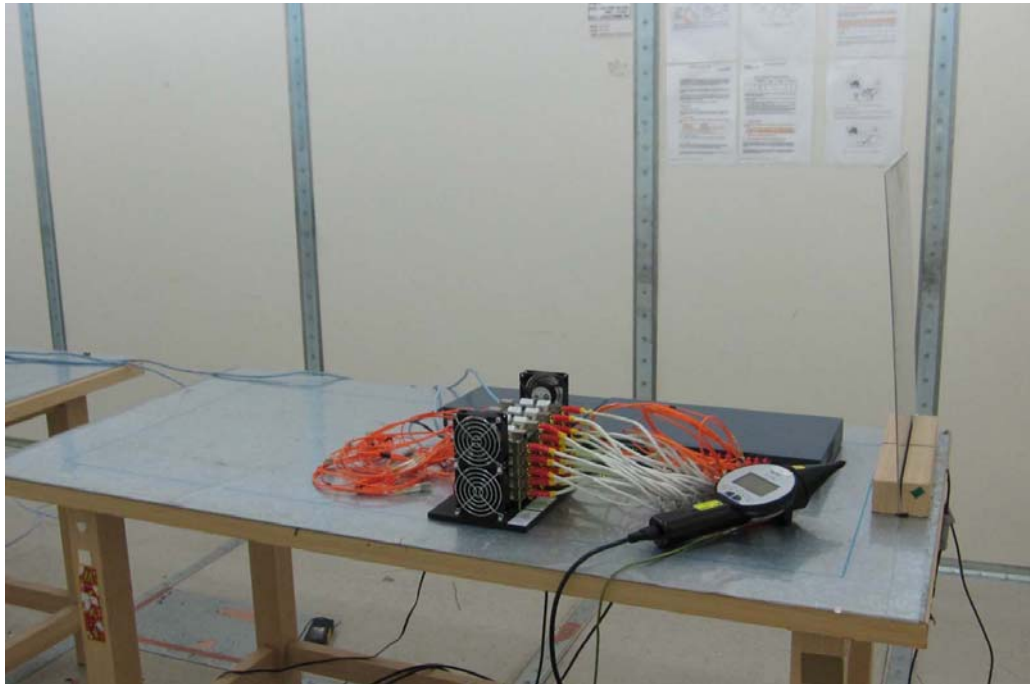


Back View

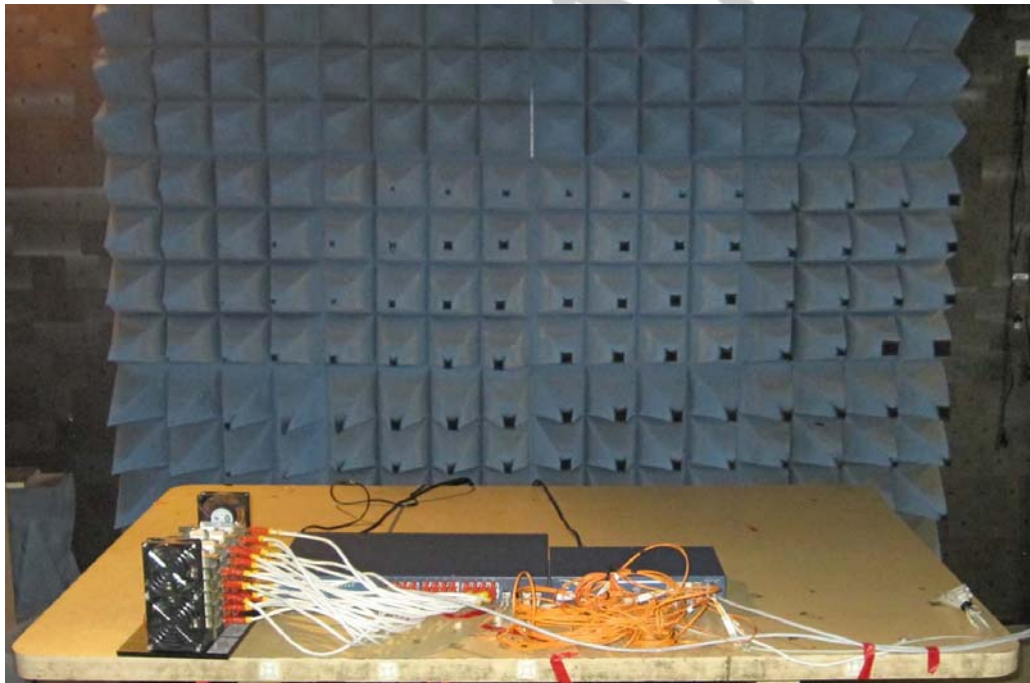




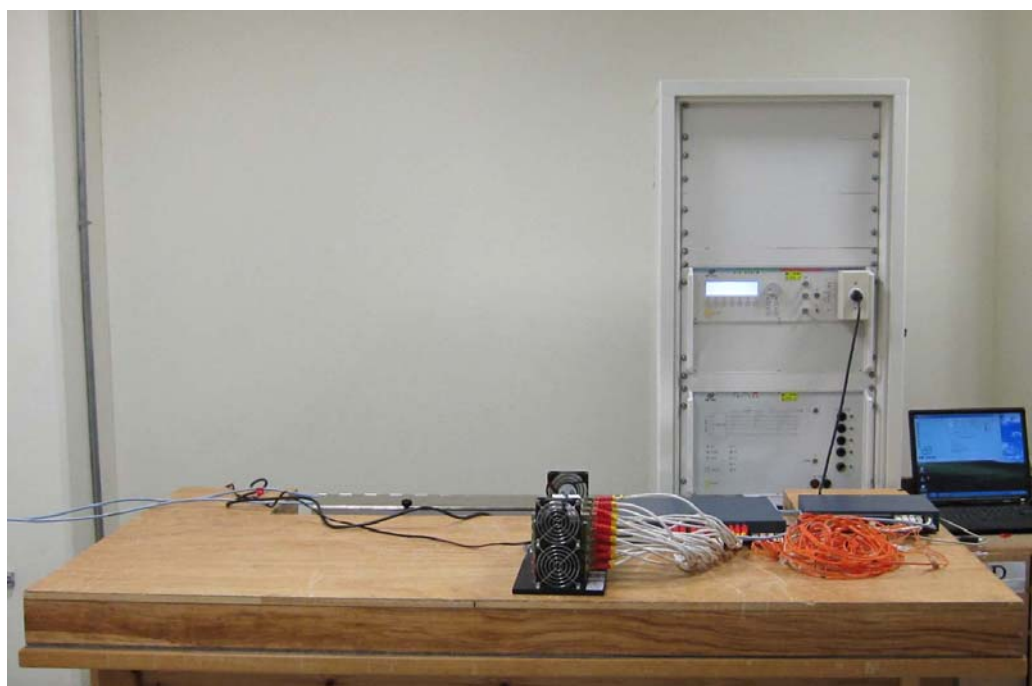
### 13.4.3 Photo of ESD Measurement



### 13.4.4 Photo of RF Field Strength Susceptibility Measurement



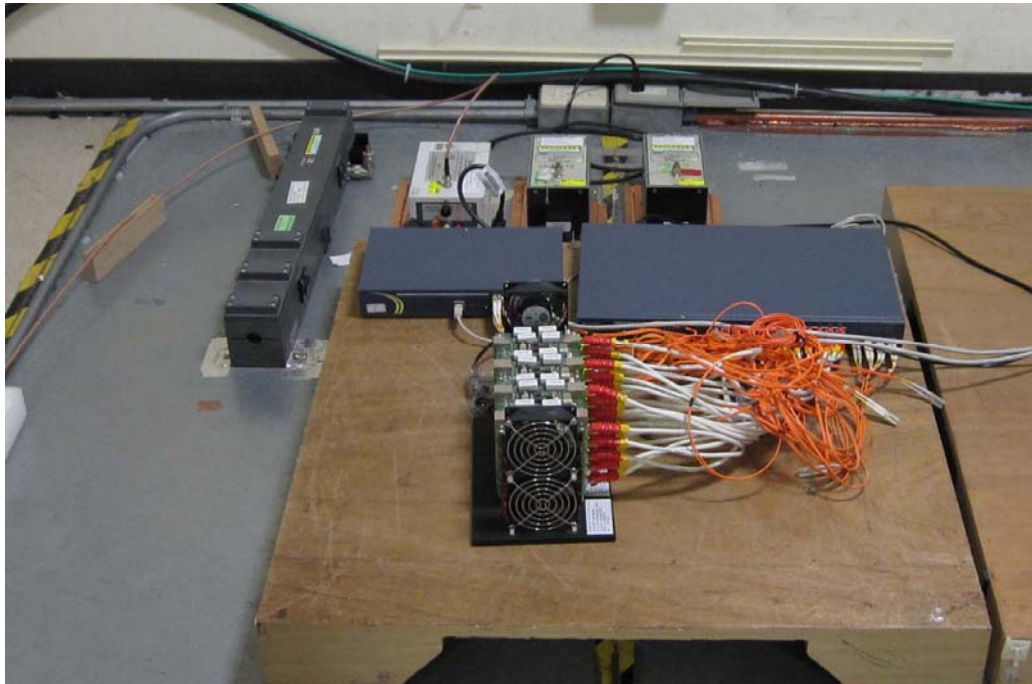
#### 13.4.5 Photo of Electrical Fast Transient/Burst Measurement



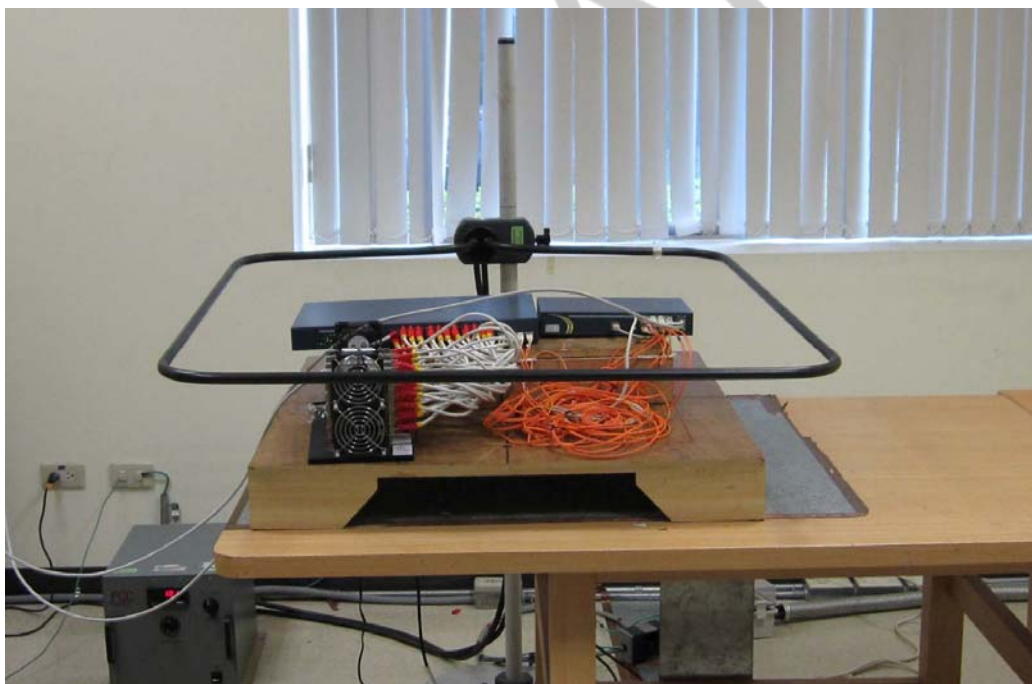
#### 13.4.6 Photo of Surge Measurement



#### 13.4.7 Photo of Conductive Measurement



#### 13.4.8 Photo of Magnetic field Measurement

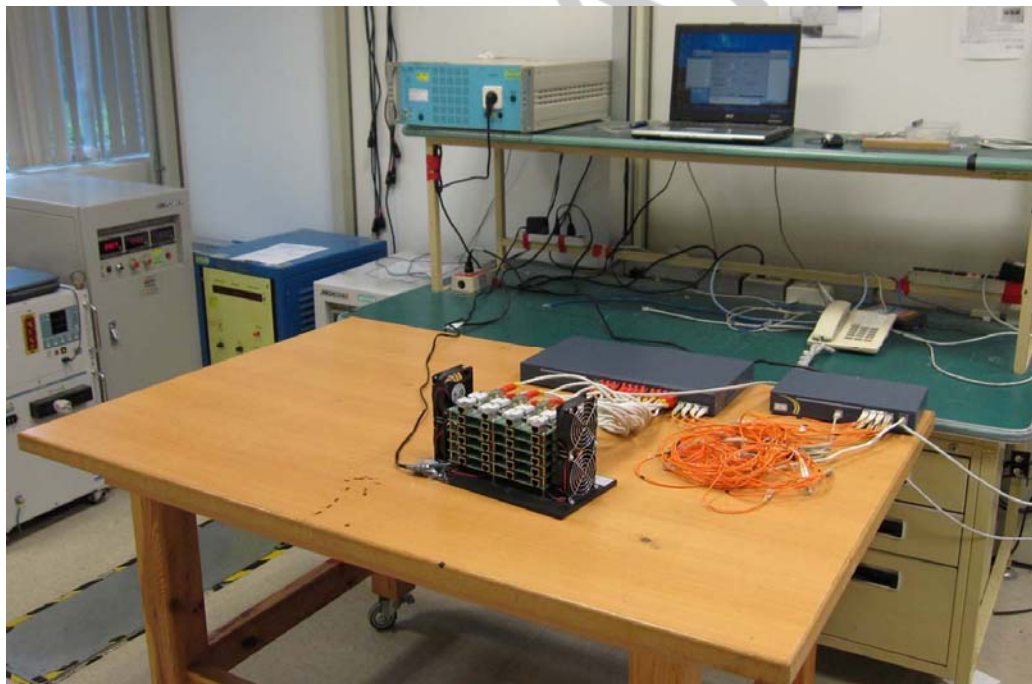




#### 13.4.9 Photo of Voltage Dips Measurement



#### 13.4.10 Photo of Harmonics and Voltage Fluctuations



### **13.5 Appendix D: Photographs of EUT**

**Please refer to the File of ISL-11LE114P-MA**

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