

Certificate

Issue Date: 10/4/2011
Ref. Report No. ISL-11LE220CE-MA

Product Name : Server
Model(s) : **NVRmini2-2Bay**
Brand : **NUUO**
Responsible Party : **NUUO Inc.**
Address : C Block, 18 Sihyuan St. Jhongjheng District, 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
EN61000-3-2:2006 A1:2009, A2:2009
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: 2009 and IEC 61000-4-2: 2008
EN 61000-4-3: 2006 + A1:2008 and 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: 2009 and IEC 61000-4-6: 2008
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
Jim Chu / Director

Hsi-Chih LAB:

No. 65, Gu Dai Keng St., Hsichih District,
New Taipei City 22117, Taiwan
Tel: 886-2-2646-2550; Fax: 886-2-2646-4641



Lung-Tan LAB:

No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Lung-Tan Hsiang, Tao Yuan County 325, Taiwan
Tel: 886-3-407-1718; Fax: 886-3407-1738



CE MARK TECHNICAL FILE

AS/NZS EMC CONSTRUCTION FILE

of

Product Name

Server

Model

NVRmini2-2Bay

Brand

NUUO

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
4. Certificate of EN60950-1
5. Block Diagram and Schematics
6. Users' manual

Declaration of Conformity

Name of Responsible Party: NUUO Inc.
Address of Responsible Party: C Block, 18 Sihyuan St. Jhongjheng District,
Taipei, Taiwan
Declares that product: Server
Model: NVRmini2-2Bay
Brand: NUUO
Assembled by: DONG GUAN GIGABYTE ELECTRONICS CO., LTD.
NINGBO GIGABYTE TECHNOLOGY CO., LTD.
Address: Yue Yuen One Rd., Yue Yuen Industrial Park, He Lu
Industrial District, Huang Jiang Town, Dong Guan City,
Guang Dong Province, P.R.C. (523758)
N0.9 Chuangye 2 Road, Western Area, Ningbo Free Trade
Zone, Beilun, Ningbo City, Zhejiang Province, P.R.C.
Postcode :315800

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 61000-4-2:2009 IEC 61000-4-2:2008	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 61000-4-6:2009 IEC 61000-4-6:2008	Conductive Disturbance	Pass	A
EN 61000-4-8: 1993+A1: 2001 IEC 61000-4-8: 1993+A1: 2000	Power Frequency Magnetic Field	Pass	A

<to be continued>

Standard	Description	Results	Criteria
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
EN61000-3-2:2006 A1:2009, A2:2009	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

Conforms to the Low Voltage Directive 2006/95/EC, 93/68/EEC as attested by conformity with the following harmonized standard:

EN60950-1:2006+A11:2009: Safety of Information Technology Equipment Including electrical business equipment

We, NUUO Inc. , 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.

Derek Hu
NUUO Inc.

Date: 10/4/2011

Declaration of Conformity

Name of Responsible Party: NUUO Inc.
Address of Responsible Party: C Block, 18 Sihyuan St. Jhongjheng District,
Taipei, Taiwan
Declares that product: Server
Model: NVRmini2-2Bay
Brand: NUUO
Assembled by: DONG GUAN GIGABYTE ELECTRONICS CO., LTD.
NINGBO GIGABYTE TECHNOLOGY CO., LTD.
Address: Yue Yuen One Rd., Yue Yuen Industrial Park, He Lu
Industrial District, Huang Jiang Town, Dong Guan City,
Guang Dong Province, P.R.C. (523758)
N0.9 Chuangye 2 Road, Western Area, Ningbo Free Trade
Zone, Beilun, Ningbo City, Zhejiang Province, P.R.C.
Postcode :315800

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 61000-4-2:2009 IEC 61000-4-2:2008	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 61000-4-6:2009 IEC 61000-4-6:2008	Conductive Disturbance	Pass	A
EN 61000-4-8: 1993+A1: 2001 IEC 61000-4-8: 1993+A1: 2000	Power Frequency Magnetic Field	Pass	A

<to be continued>

Standard	Description	Results	Criteria
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
EN61000-3-2:2006 A1:2009, A2:2009	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, NUUO Inc. , 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.

 Derek Hu
 NUUO Inc.

Date: 10/4/2011

CE TEST REPORT

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

Product : **Server**

Model(s): **NVRmini2-2Bay**

Brand: **NUUO**

Applicant: **NUUO Inc.**

Address: **C Block, 18 Sihyuan St. Jhongjheng District,
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-11LE220CE-MA**

Issue Date : **10/4/2011**

This report totally contains 48 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.

Contents of Report

1.	General.....	1
1.1	Certification of Accuracy of Test Data	1
1.2	Test Standards	2
1.3	Description of EUT	3
1.4	Description of Support Equipment	4
1.5	Software for Controlling Support Unit.....	5
1.6	I/O Cable Condition of EUT and Support Units	6
2.	Power Main Port Conducted Emissions	7
2.1	Test Setup and Procedure	7
2.2	Conduction Test Data: Configuration 1	8
3.	Telecommunication Port Conducted Emissions	10
3.1	Test Setup and Procedure	10
3.2	Test Data: LAN--10M	11
3.3	Test Data: LAN--100M	12
3.4	Test Data: LAN--GIGA.....	13
4.	Radiated Disturbance Emissions	14
4.1	Test Setup and Procedure	14
4.2	Radiation Test Data: Configuration 1.....	16
5.	Electrostatic discharge (ESD) immunity	20
5.1	Electrostatic discharge (ESD) immunity test	20
6.	Radio-Frequency, Electromagnetic Field immunity.....	22
6.1	Radio-Frequency, Electromagnetic Field immunity test.....	22
7.	Electrical Fast transients/burst immunity	23
7.1	Electrical Fast transient/burst immunity test	23
8.	Surge Immunity	25
8.1	Surge immunity test.....	25
9.	Immunity to Conductive Disturbance.....	26
9.1	Immunity to Conductive Disturbance	26
10.	Power Frequency Magnetic Field immunity	27
10.1	Power Frequency Magnetic field immunity test	27
11.	Voltage Dips, Short Interruption and Voltage Variation immunity	28
11.1	Voltage Dips, Short Interruption and Voltage Variation immunity test.....	28
12.	Harmonics	29
12.1	Harmonics test.....	29
13.	Voltage Fluctuations	32
13.1	Voltage Fluctuations test.....	32
14.	Appendix.....	34
14.1	Appendix A: Test Equipment.....	34
14.2	Appendix B: Uncertainty of Measurement	37
14.3	Appendix C: Photographs of EUT Configuration Test Set Up.....	39
14.4	Appendix D: Photographs of EUT Please refer to the File of ISL-11LE220P-MA46	

1. General

1.1 Certification of Accuracy of Test Data

Standards: Please refer to 1.2

Equipment Tested: Server

Model: NVRmini2-2Bay

Brand: NUUO

Applicant: NUUO Inc.

Sample received Date: 5/9/2011

Final test Date: EMI:refer to the date of test data
EMS: 2011-05-13

Test Site: International Standards Laboratory
Chamber 02; Chamber 14; Conduction 02; Immunity02

Test Distance: 10M; 3M (above1GHz) (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: Kate Shi

Test Engineer: Hasan Yu
Hasan Yu

Approved By: Jim Chu
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 B: 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 61000-4-2:2009 IEC 61000-4-2:2008	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 61000-4-6:2009 IEC 61000-4-6:2008	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
EN61000-3-2:2006 A1:2009, A2:2009	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:	Server
Condition:	Pre-Production
Model:	NVRmini2-2Bay
Serial Number:	N/A
Brand:	NUUO
Power cord:	Non-shielded

The devices can be installed inside the EUT are listed below:

Device	Manufacturer	Model Number
Mother board	GigaByte	GC-SCM25T
HDD	Seagate	250G ST3250620AS
	WD	500G WD5002ABYS-18B1B0
Power Supply	APD	DA-40A19 Input: 100~240V, 50~60Hz/1.0A Output: 19V/2.1A

The I/O ports of EUT are listed below:

I/O Port Type	Quantity
USB 2.0 Port	Two
LAN Port(10Mbps/100Mbps/1Gbps)	One

For test configuration:

Configuration	1
Mother board	GigaByte GC-SCM25T
HDD	Seagate 250G ST3250620AS*1 WD 500G WD5002ABYS-18B1B0*1
Power Supply	APD DA-40A19

EMI Noise Source:

Crystal:

25MHz (X1), 32.768KHz (X2), 25MHz(X3), 25MHz(X4), 12MHz(X6), 12MHz(X7)

EMI solution:

1. Adding aluminum tape(vendor: Tex chu 110(L)*50(W) *0.1 (H)mm) on the case contact (Please refer to the photo report red arrow point 1 in EUT-15)
2. Adding core(vendor: King core RC 16*28*9 -M2) on Adapter Type cable(Please refer to the photo report red arrow point 1 in EUT-16)

1.4 Description of Support Equipment

EMI Configuration 1 Support unit 1~3

EMS Configuration 1 Support unit 1、4~5

No	Unit	Model / Serial No.	Brand	Power Cord	FCC ID
1	Notebook Personal Computer	Latitude D620 S/N: N/A	DELL	Non-shielded	FCC DOC
2	External Hard Disk Case	RD1000 S/N: NA	DELL	Non-shielded	FCC DOC
3	External Hard Disk Case	RD1000 S/N: NA	DELL	Non-shielded	FCC DOC
4	External Hard Disk Case	HD-CE1.0TU2-A2 S/N: N/A	BUFFALO	Non-shielded	FCC DOC
5	External Hard Disk Case	HD-CE1.0TU2-A2 S/N: N/A	BUFFALO	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. Copy data to EUT hard disk through EUT LAN port.
2. Copy data to External Hard Disk Case through EUT LAN port.
3. Repeat the above steps.

	File	Issue Date
LAN	Ping.exe	
HDD	Cute FTP 8 Professional	2009/7/2
External Hard Disk Case	Cute FTP 8 Professional	2009/7/2

1.6 I/O Cable Condition of EUT and Support Units

For EMI test Configuration:

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cable	110V/(240V) to EUT SPS	1.8M	Non-shielded	Plastic Head
USB Data Cable *2	External Hard Disk Case to EUT USB Port	1.8M	Shielded	Metal Head
LAN Data Cable	NB LAN(RJ-45) Port to EUT LAN port	33 feet	Non-shielded	RJ-45, Plastic Head

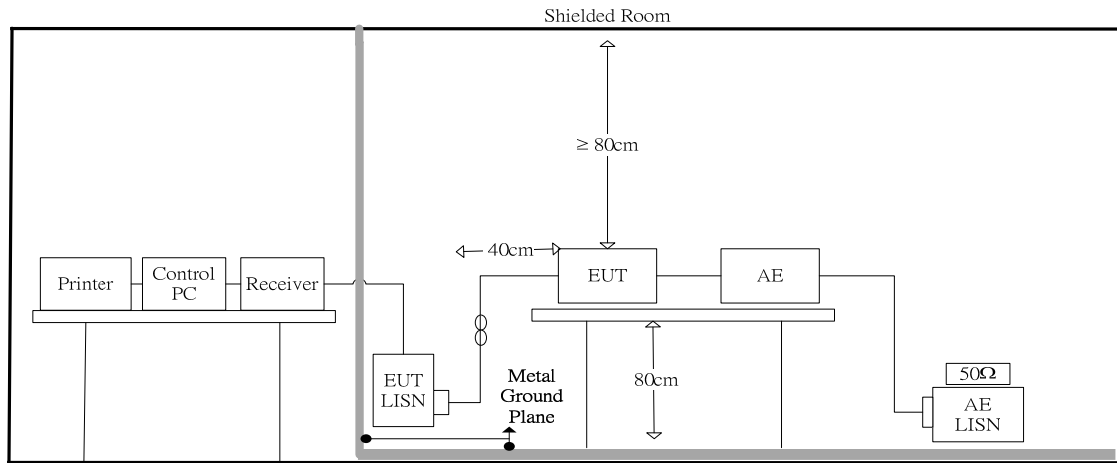
For EMS test Configuration:

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cable	110V/(240V) to EUT SPS	1.8M	Non-shielded	Plastic Head
USB Data Cable *2	External Hard Disk Case to EUT USB Port	1.0M	Shielded	Metal Head
LAN Data Cable	NB LAN(RJ-45) Port to EUT LAN port	33 feet	Non-shielded	RJ-45, 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.

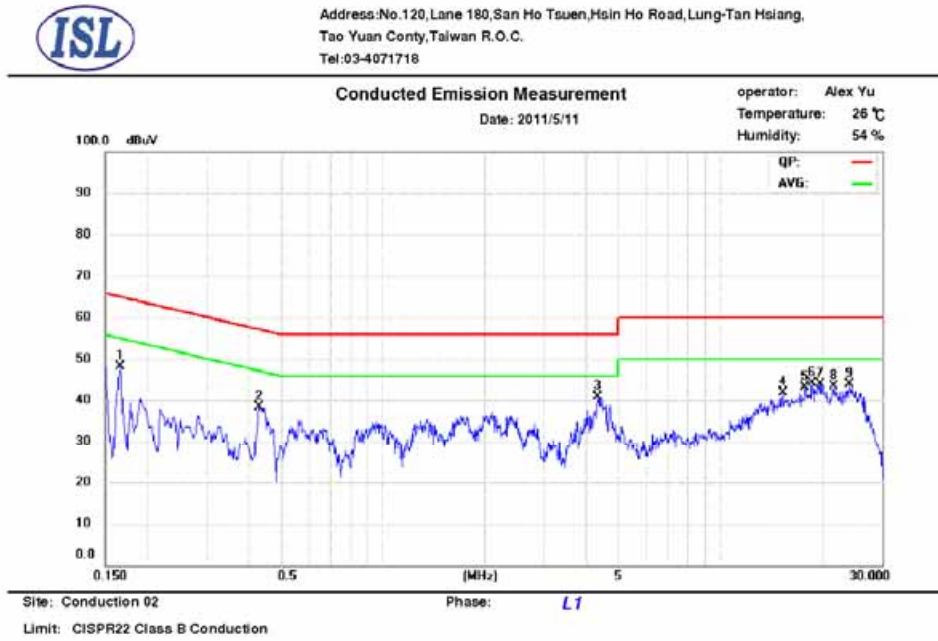
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

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 2.2.1 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	0.1660	0.11	0.01	46.60	65.1	-18.5	30.58	55.1	-24.5	
2	0.4300	0.11	0.03	36.51	57.2	-20.7	29.95	47.2	-17.3	
3	4.3340	0.23	0.13	35.40	56.0	-20.6	27.62	46.0	-18.3	
4	15.2660	0.82	0.2	34.78	60.0	-25.2	28.15	50.0	-21.8	
5	17.7860	0.92	0.2	35.13	60.0	-24.8	27.14	50.0	-22.8	
6	18.6420	0.95	0.2	35.80	60.0	-24.2	26.82	50.0	-23.1	
7	19.7940	0.99	0.2	36.22	60.0	-23.7	27.70	50.0	-22.3	
8	21.6500	1.06	0.21	34.64	60.0	-25.3	26.76	50.0	-23.2	
9	24.0220	1.14	0.22	36.20	60.0	-23.8	28.66	50.0	-21.3	

Note:

Margin = Corrected Amplitude - Limit

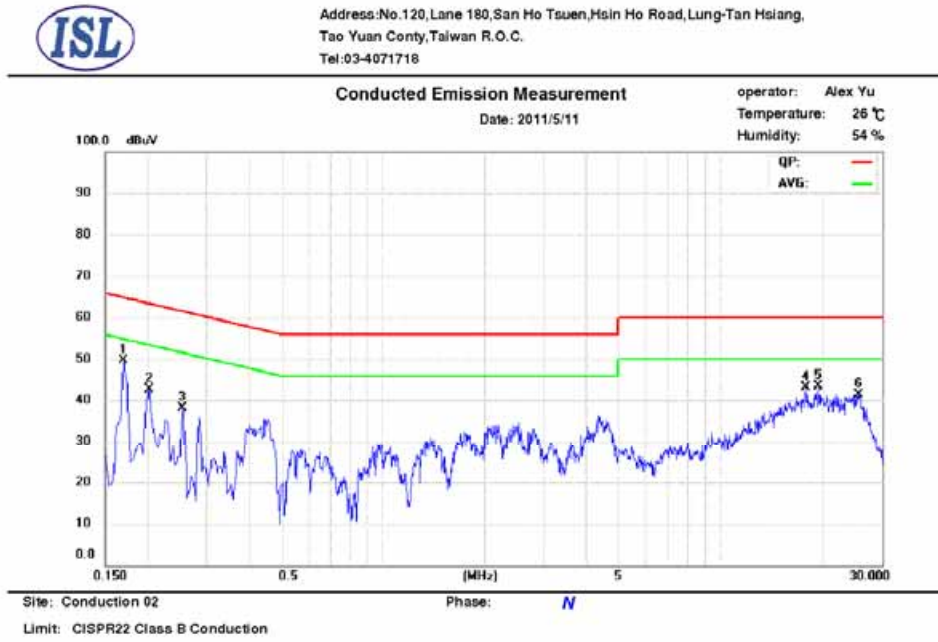
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss

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.

Table 2.2.2 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	0.1700	0.13	0.01	48.15	64.9	-16.8	35.65	54.9	-19.3	
2	0.2020	0.13	0.01	41.01	63.5	-22.5	28.95	53.5	-24.5	
3	0.2540	0.13	0.02	35.20	61.6	-26.4	22.92	51.6	-28.7	
4	17.9260	0.63	0.2	35.46	60.0	-24.5	26.57	50.0	-23.4	
5	19.4980	0.65	0.2	35.71	60.0	-24.2	27.04	50.0	-22.9	
6	25.7260	0.76	0.22	35.44	60.0	-24.5	27.23	50.0	-22.7	

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

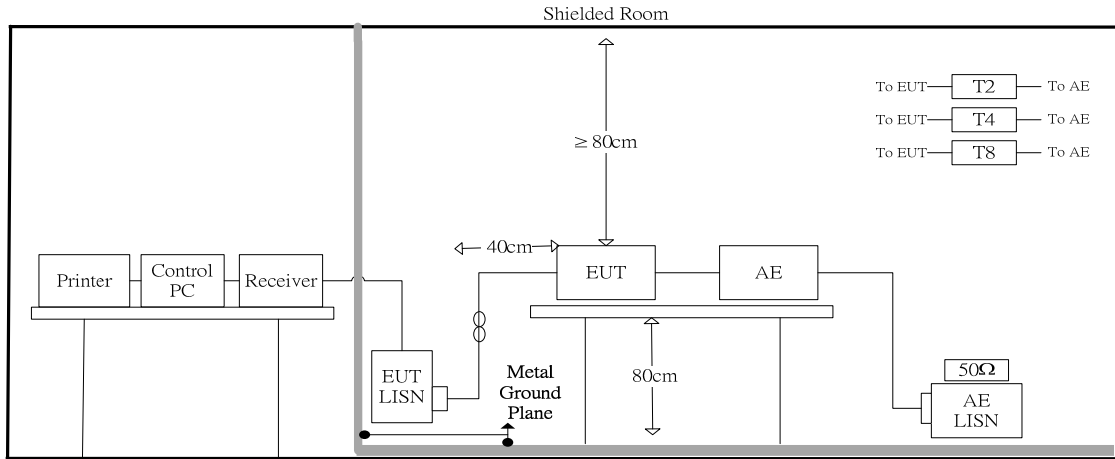
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

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.

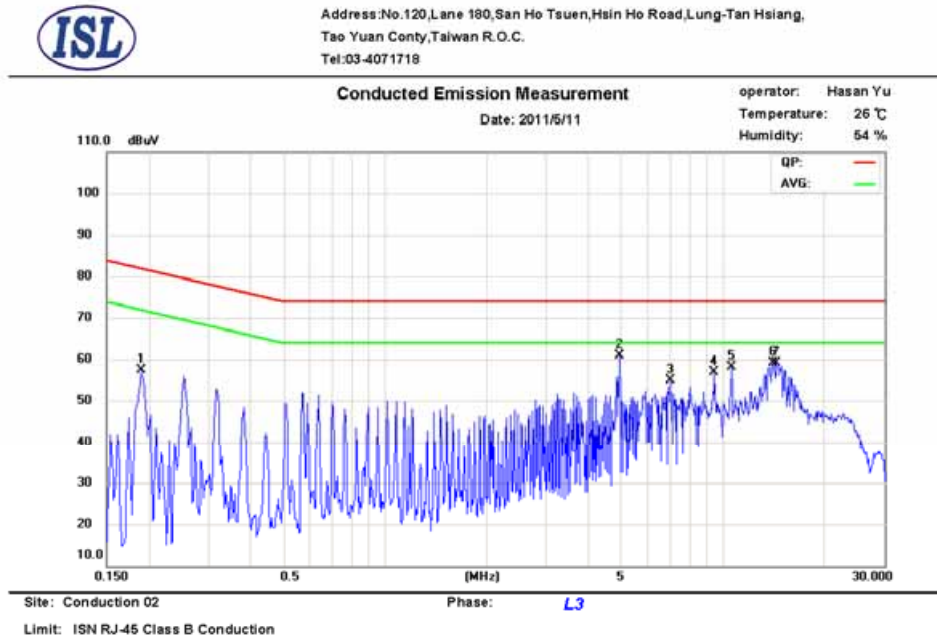
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information could be useful in reducing their amplitude.

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

Table 3.2.1 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	0.1900	9.97	0.01	56.31	82.0	-25.7	53.58	72.0	-18.4	
2	4.9460	9.9	0.14	53.75	74.0	-20.2	43.16	64.0	-20.8	
3	6.9580	9.9	0.16	46.50	74.0	-27.5	34.43	64.0	-29.5	
4	9.4017	9.89	0.17	51.35	74.0	-22.6	40.82	64.0	-23.1	
5	10.5980	9.89	0.17	52.12	74.0	-21.8	45.41	64.0	-18.5	
6	14.0340	9.87	0.19	54.92	74.0	-19.0	44.47	64.0	-19.5	
7	14.4820	9.86	0.2	51.79	74.0	-22.2	40.71	64.0	-23.2	

Note :

Margin = Corrected Amplitude - Limit

Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss

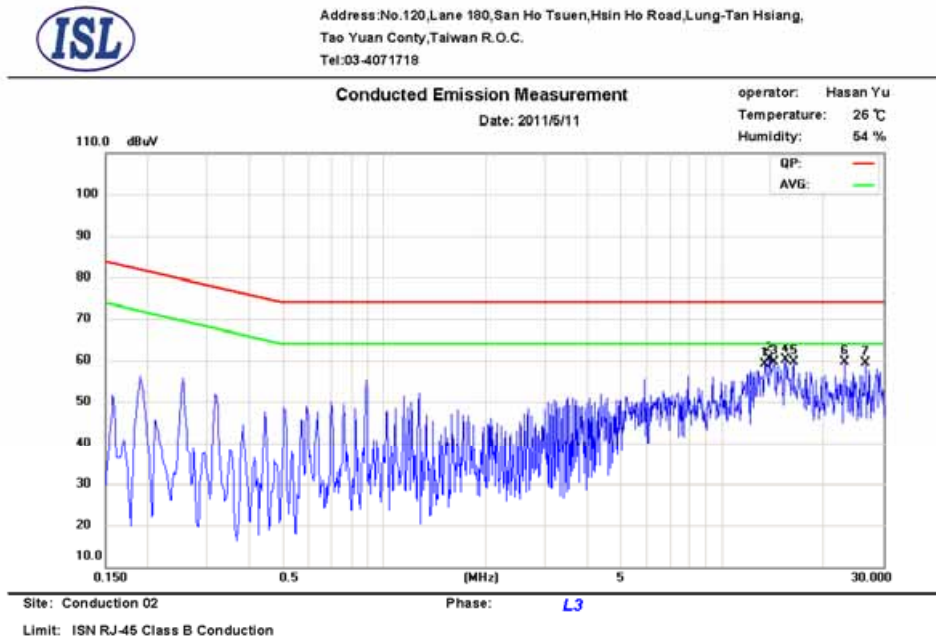
A margin of -8dB means that the emission is 8dB below the limit

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

Table 3.3.1 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	13.3578	9.87	0.19	58.57	74.0	-15.4	55.34	64.0	-8.66	
2	13.7823	9.87	0.19	56.04	74.0	-17.9	48.44	64.0	-15.5	
3	14.2154	9.86	0.2	58.22	74.0	-15.7	54.26	64.0	-9.74	
4	15.4337	9.86	0.2	57.92	74.0	-16.0	52.68	64.0	-11.3	
5	16.2300	9.86	0.2	58.65	74.0	-15.3	55.98	64.0	-8.02	
6	23.1300	9.83	0.21	59.10	74.0	-14.9	55.55	64.0	-8.45	
7	26.6100	9.83	0.23	58.62	74.0	-15.3	55.05	64.0	-8.95	

Note :

Margin = Corrected Amplitude - Limit

Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss

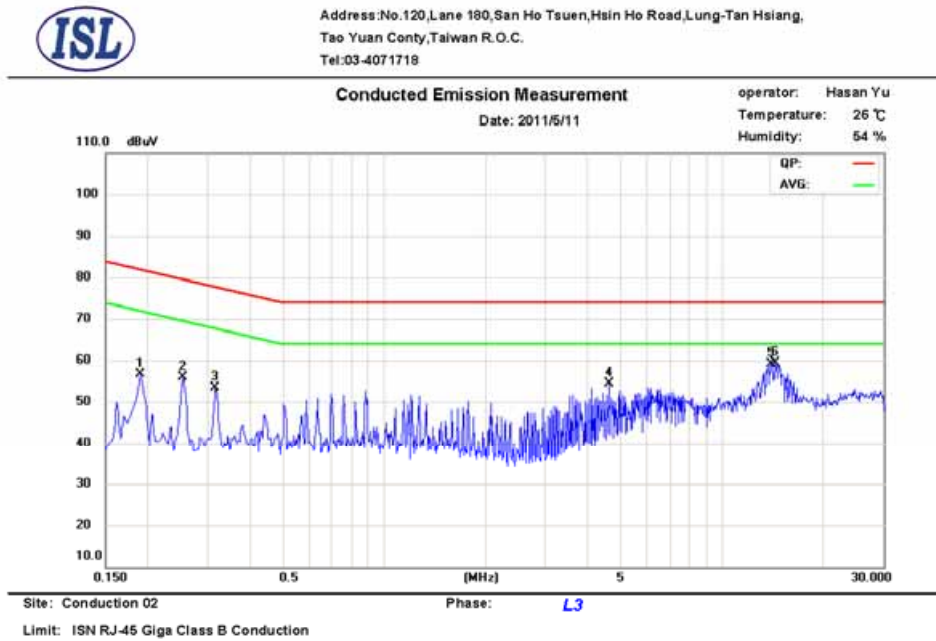
A margin of -8dB means that the emission is 8dB below the limit

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

Table 3.4.1 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	0.1900	10.17	0.01	55.64	82.0	-26.4	52.72	72.0	-19.3	
2	0.2540	10.15	0.02	54.43	79.6	-25.2	51.71	69.6	-17.9	
3	0.3180	10.13	0.02	52.39	77.7	-25.3	50.90	67.7	-16.8	
4	4.6380	9.96	0.14	50.74	74.0	-23.2	47.56	64.0	-16.4	
5	13.9780	10.01	0.19	54.65	74.0	-19.3	45.71	64.0	-18.2	
6	14.3500	10.01	0.2	55.87	74.0	-18.1	49.82	64.0	-14.1	

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

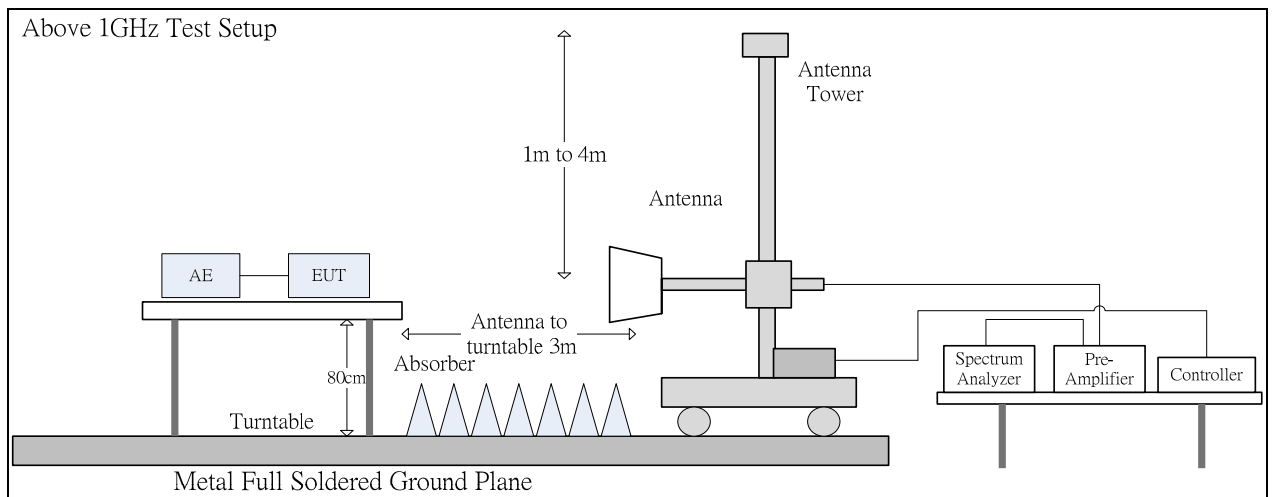
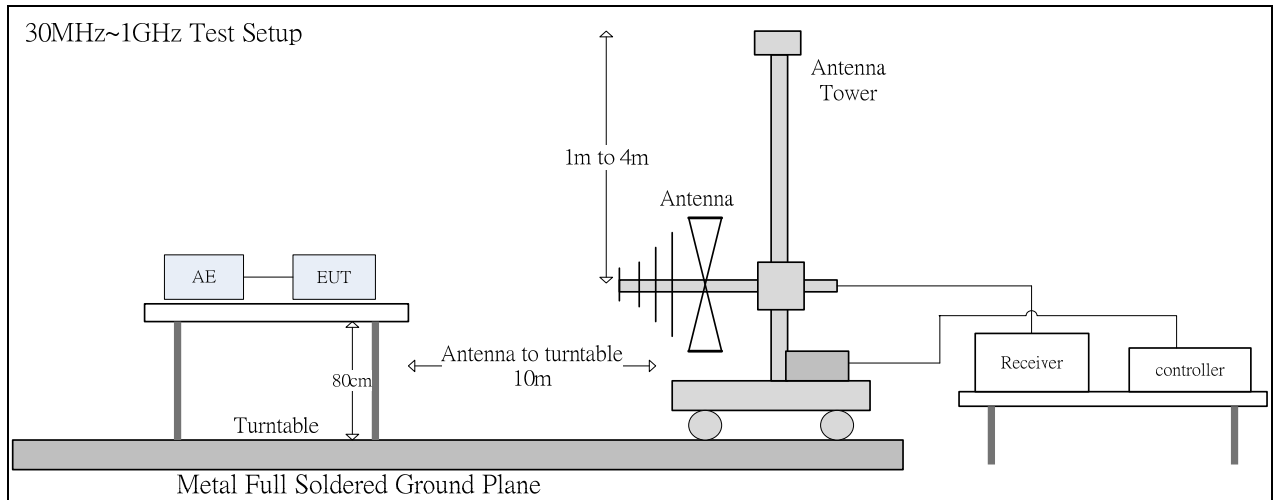
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

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.

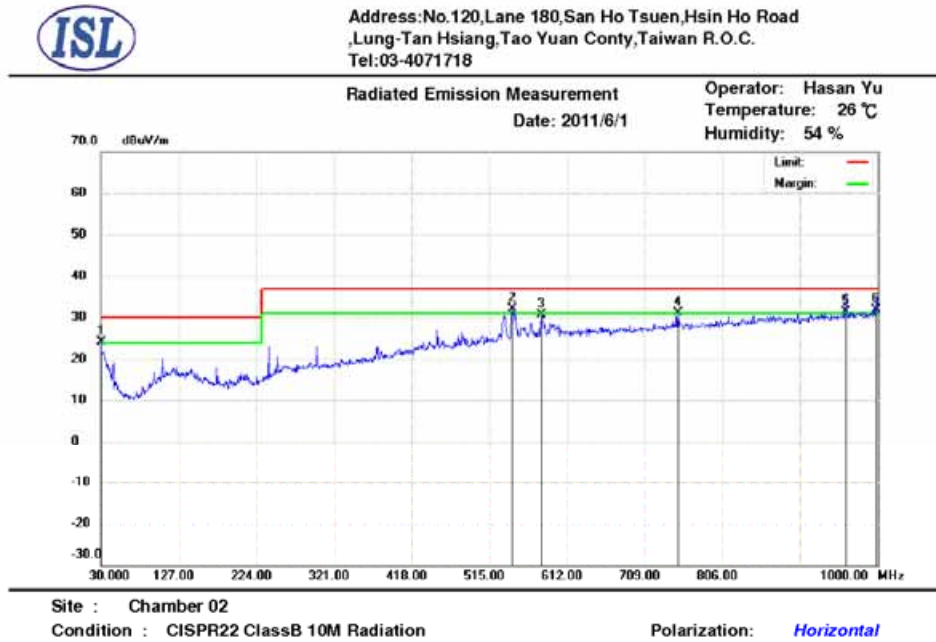
The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency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

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	30.0000	4.19	19	0.99	0.00	24.18	30.00	-5.82	100	102	peak
2	544.1000	9.00	18.72	4.39	0.00	32.11	37.00	-4.89	290	51	peak
3	579.9900	7.27	18.72	4.56	0.00	30.55	37.00	-6.45	100	47	peak
4	750.7100	5.99	19.7	5.48	0.00	31.17	37.00	-5.83	251	10	peak
5	959.9900	3.67	20.98	6.64	0.00	31.29	37.00	-5.71	122	311	QP
6	997.6200	3.72	21.28	6.83	0.00	31.83	37.00	-5.17	218	108	QP

* 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.



Address: No. 120, Lane 180, San Ho Tsuen, Hsin Ho Road
Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

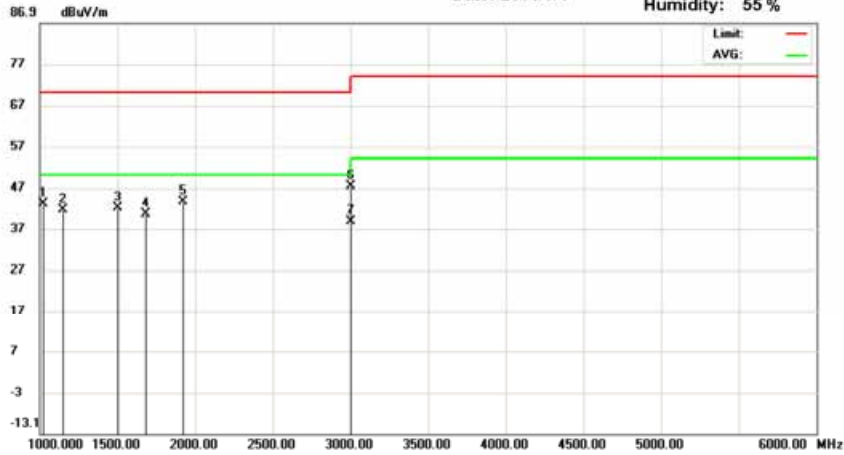
Radiated Emission Measurement

Date: 2011/6/1

Operator: Hasan Yu

Temperature: 25 °C

Humidity: 55 %



Site : Chamber 14

Condition : CE Class B Radiation (Peak)

Polarization: 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	1020.000	59.33	28.6	1.46	46.3	43.09	70.00	-26.91	207	204	peak
2	1150.000	57.72	28.6	1.55	46.3	41.57	70.00	-28.43	137	102	peak
3	1500.000	58.01	28.6	1.79	46.3	42.10	70.00	-27.90	125	104	peak
4	1680.000	55.00	29.86	1.9	46.34	40.42	70.00	-29.58	100	27	peak
5	1920.000	56.44	31.54	2.04	46.38	43.64	70.00	-26.36	341	181	peak
6	3000.000	57.67	33.6	2.63	46.6	47.30	70.00	-22.70	193	73	peak
7	3000.060	49.03	33.6	2.63	46.6	38.66	54.00	-15.34	100	315	AVG

* Note:

Margin = Corrected Amplitude – Limit

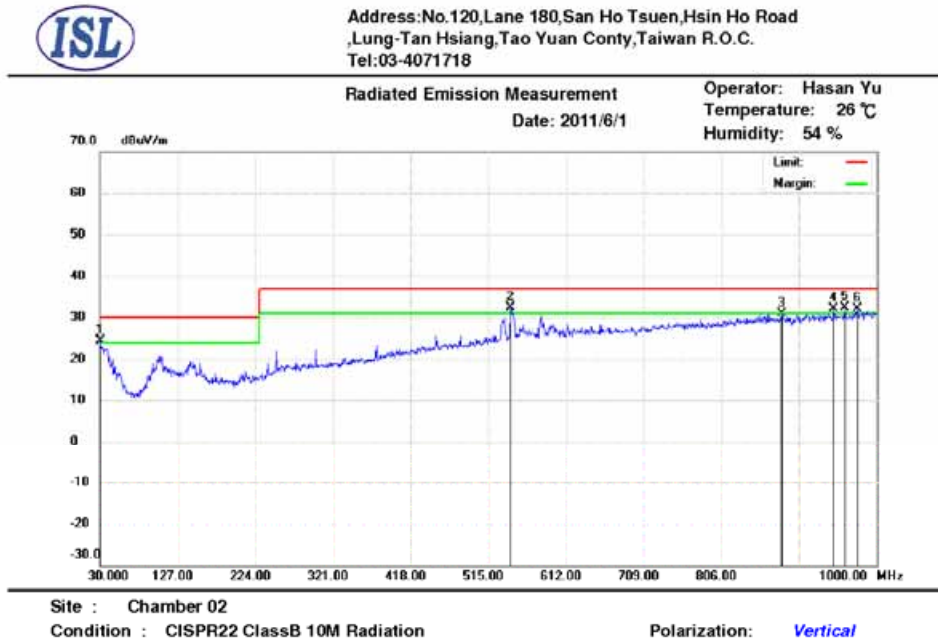
Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain

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

Horn Antenna Distance: 3 meters

Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average 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	30.0000	4.44	19	0.99	0.00	24.43	30.00	-5.57	100	275	peak
2	542.1600	9.42	18.66	4.38	0.00	32.46	37.00	-4.54	356	13	peak
3	881.6600	4.12	20.43	6.27	0.00	30.82	37.00	-6.18	239	113	peak
4	946.6500	4.64	20.87	6.58	0.00	32.09	37.00	-4.91	205	340	peak
5	960.2300	4.88	20.98	6.64	0.00	32.50	37.00	-4.50	223	75	peak
6	975.7500	4.26	21.11	6.72	0.00	32.09	37.00	-4.91	231	64	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

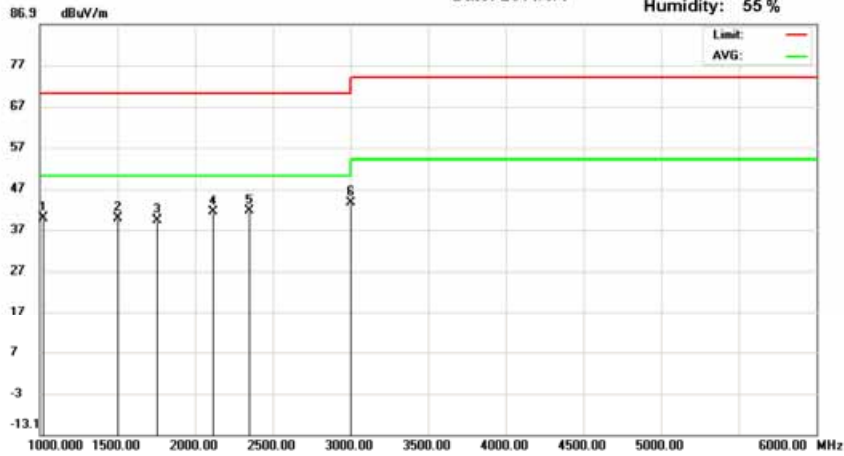
Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.



Address: No. 120, Lane 180, San Ho Tsuen, Hsin Ho Road
Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.
Tel: 03-4071718

Radiated Emission Measurement
Date: 2011/6/1

Operator: jason
Temperature: 25 °C
Humidity: 55 %



Site : Chamber 14

Condition : CE Class B Radiation (Peak)

Polarization: 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	1020.000	55.94	28.6	1.46	46.3	39.70	70.00	-30.30	100	192	peak
2	1500.000	55.69	28.6	1.79	46.3	39.78	70.00	-30.22	143	204	peak
3	1755.000	53.20	30.39	1.94	46.35	39.18	70.00	-30.82	211	7	peak
4	2115.000	53.23	32.31	2.15	46.42	41.27	70.00	-28.73	100	109	peak
5	2350.000	52.93	32.73	2.29	46.47	41.48	70.00	-28.52	253	199	peak
6	3000.000	54.00	33.6	2.63	46.6	43.63	70.00	-26.37	135	152	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

Horn Antenna Distance: 3 meters

Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average 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:	24 °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.

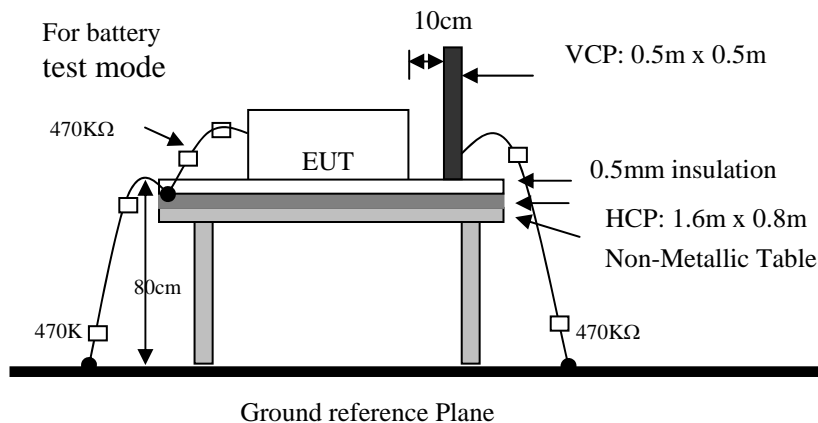
Contact: Total 200 discharges minimum were to the selected contact points.

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.

Figure 1: Test Point Assignments Discharge:

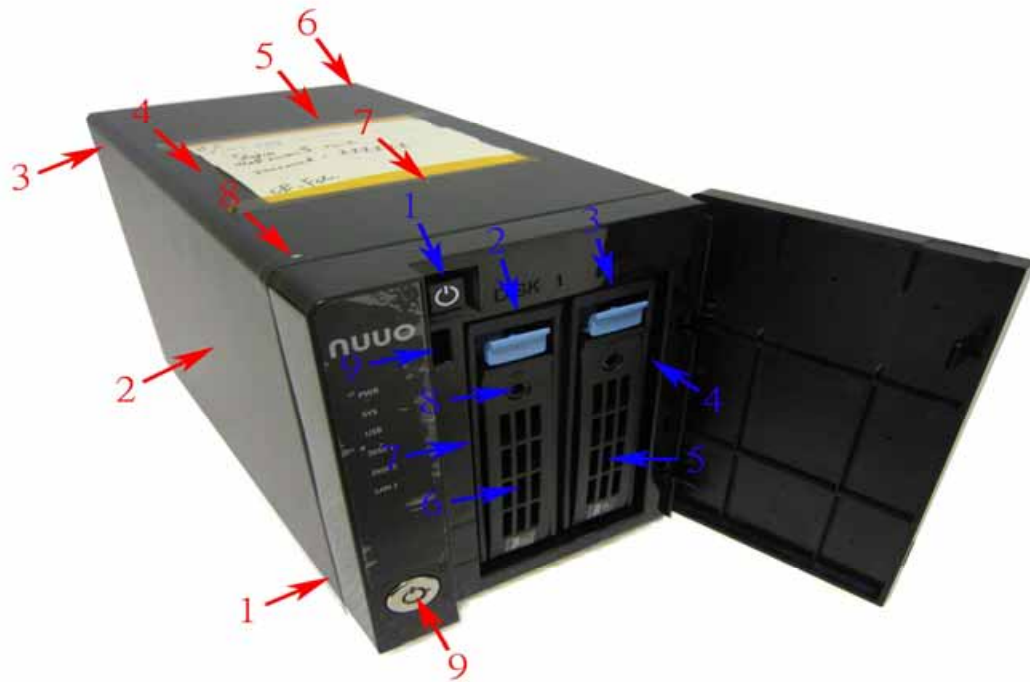
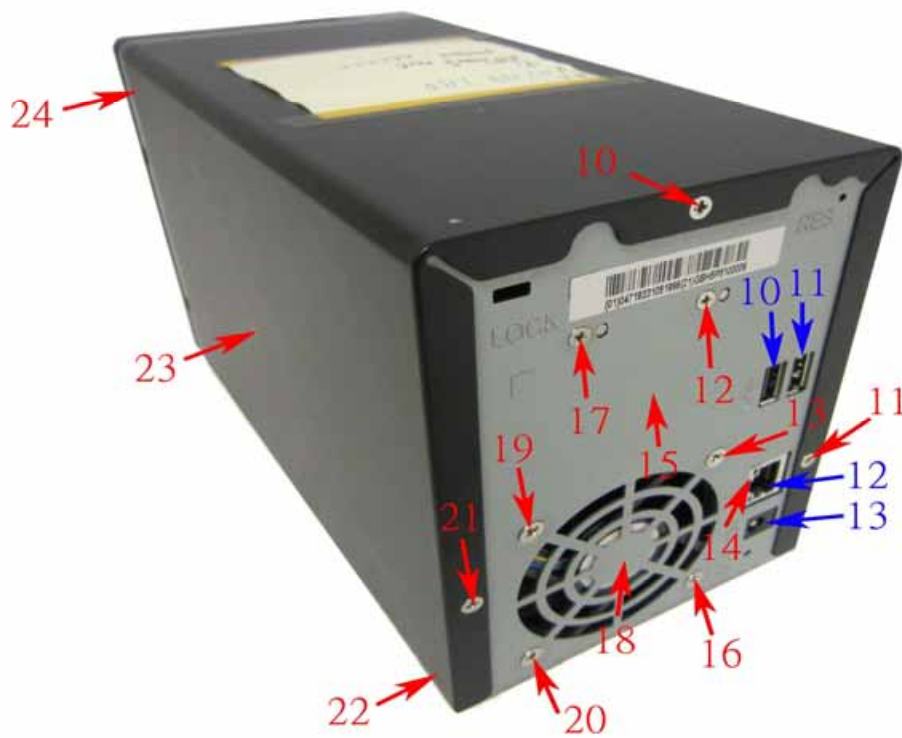


Figure 2 Test Point Assignments Discharge:



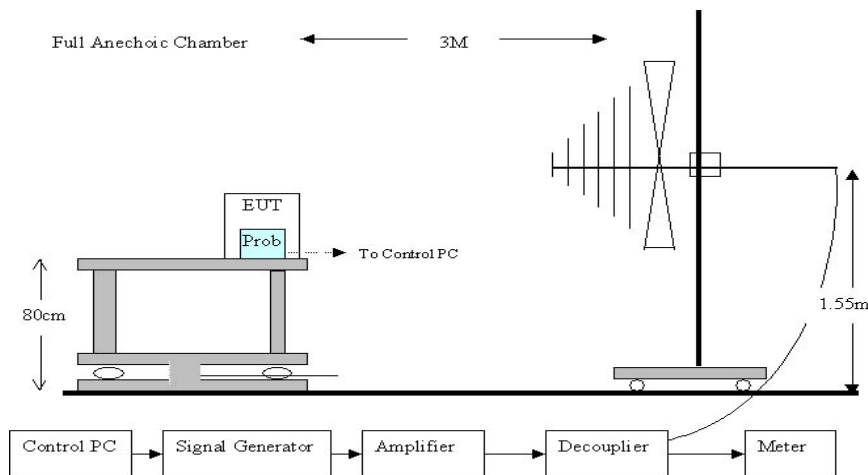
6. Radio-Frequency, Electromagnetic Field immunity

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:	55%

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:	AC Power Port: +/- 1 kV Twisted Pair LAN Port (I/O Cables): +/- 0.5 kV
Rise Time:	5ns
Hold Time:	50ns
Repetition Frequency:	5KHz
Criteria:	B
Test Procedure	refer to ISL QA -T4-E-S9
Temperature:	24°C
Humidity:	54%

Test Procedure

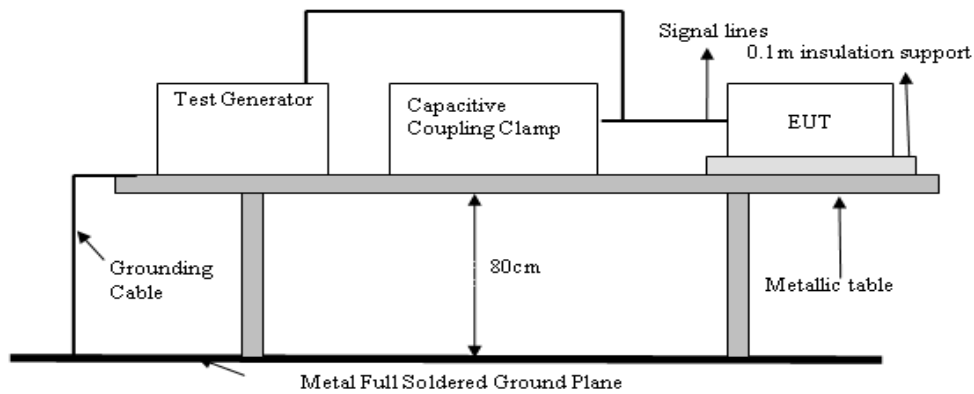
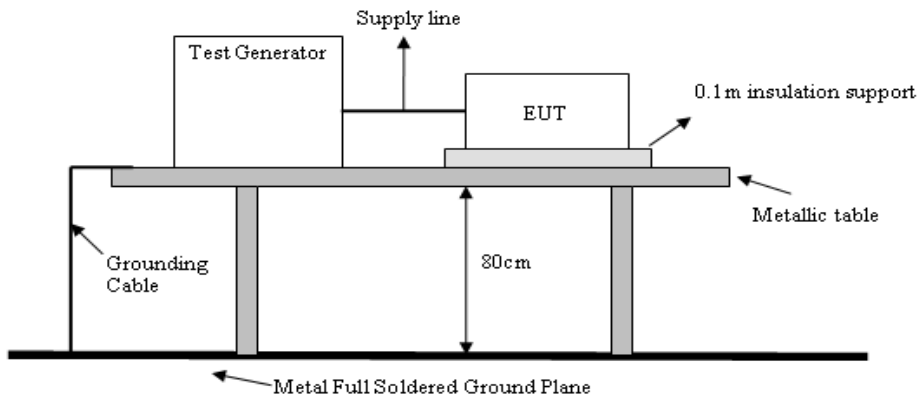
The EUT was setup on a nonconductive table 0.1 m above a reference ground plane.

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

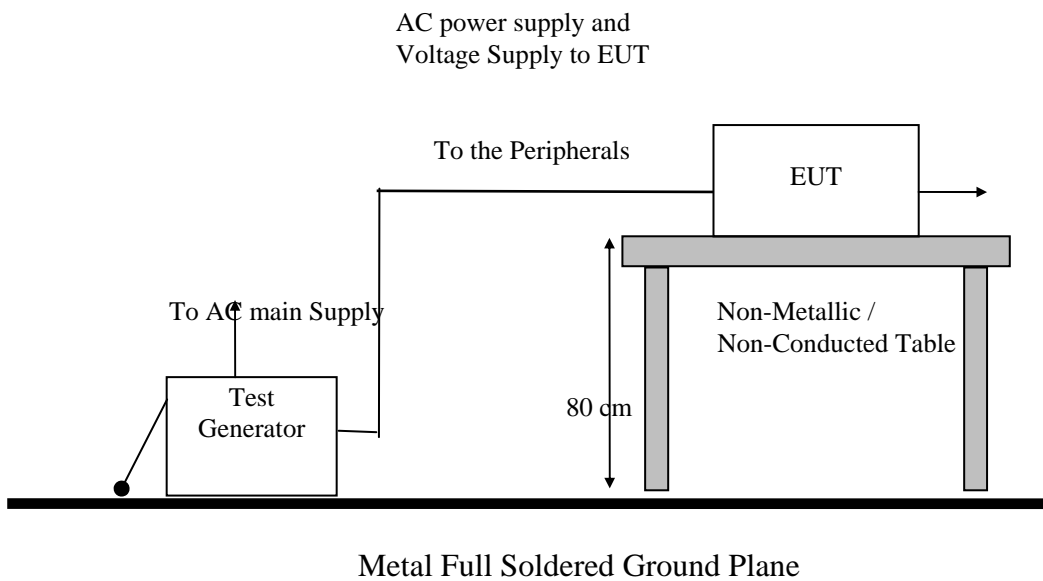
Performance of EUT complies with the given specification.

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:	AC Power Port: 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:	54%

Test Setup



Test Result

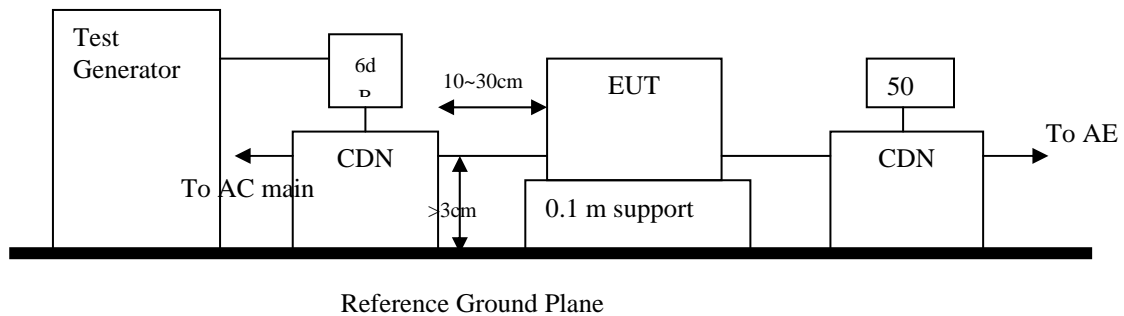
Performance of EUT complies with the given specification.

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:	24°C
Humidity:	54%

Test Setup



Test Result

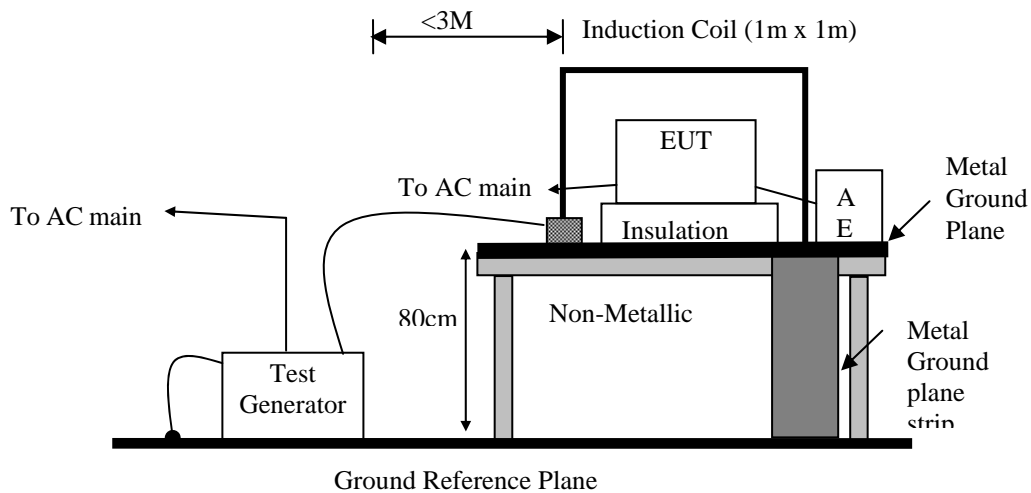
Performance of EUT complies with the given specification.

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:	25°C
Humidity:	55%

Test Setup



Test Result

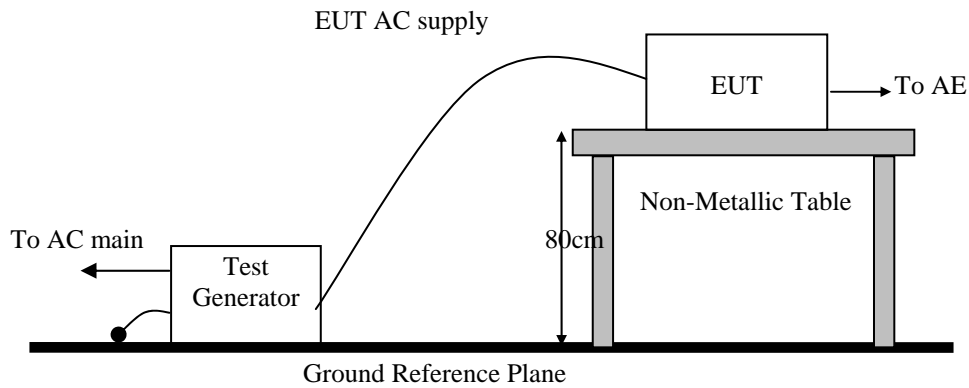
Performance of EUT complies with the given specification.

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:	EN61000-4-11/IEC61000-4-11 (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:	24°C
Humidity:	54%

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 (details referred to Sec 1.2)
Test Duration:	2.5min
Class:	A
Test Procedure	refer to ISL QA -T4-E-S14
Temperature:	25°C
Humidity:	54%

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.

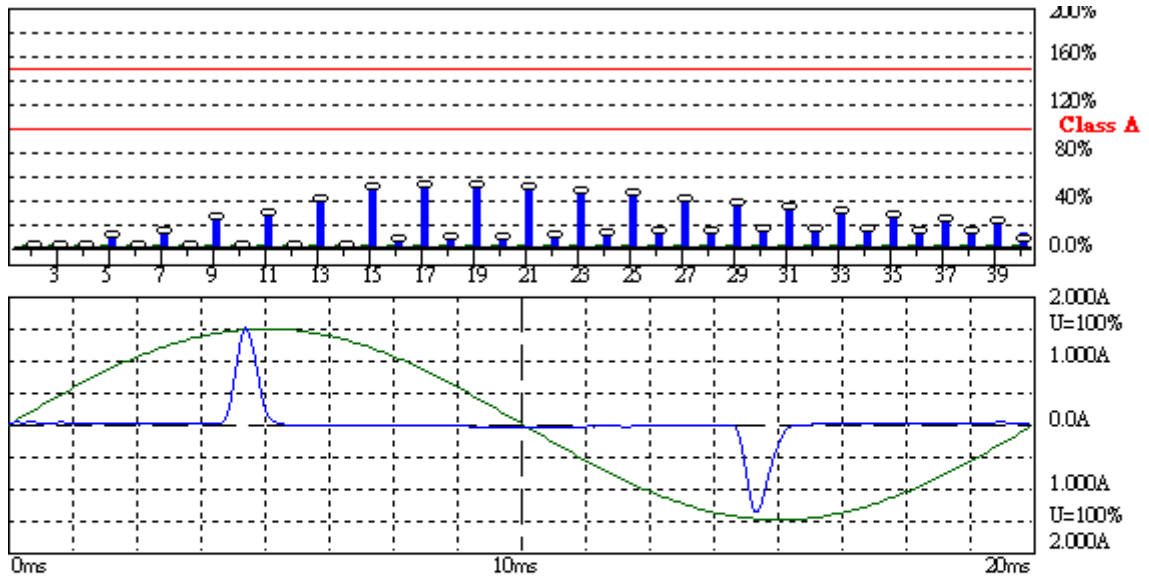
Test Data

Urms = 230.3V Freq = 49.987 Range: 2 A
 Irms = 0.281A Ipk = 1.647A cf = 5.858
 P = 23.90W S = 64.77VA pf = 0.369
 THDi = 92.8 % 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	0.1097		0.1099		0.1111			
2	100	0.0000	0.0000	0.0010	0.0904	0.0018	0.1695	1.0800	
3	150	0.1017	4.4217	0.1013	4.4051	0.1025	4.4582	2.3000	
4	200	0.0000	0.0000	0.0012	0.2839	0.0021	0.4826	0.4300	
5	250	0.0995	8.7315	0.0991	8.6948	0.1003	8.8019	1.1400	
6	300	0.0000	0.0000	0.0016	0.5290	0.0024	0.8138	0.3000	
7	350	0.0961	12.481	0.0958	12.445	0.0968	12.572	0.7700	
8	400	0.0000	0.0000	0.0022	0.9553	0.0028	1.2207	0.2300	
9	450	0.0916	22.889	0.0913	22.827	0.0922	23.041	0.4000	
10	500	0.0000	0.0000	0.0028	1.5259	0.0034	1.8576	0.1840	
11	550	0.0861	26.079	0.0859	26.042	0.0865	26.227	0.3300	
12	600	0.0000	0.0000	0.0035	2.3087	0.0042	2.7068	0.1533	
13	650	0.0798	38.001	0.0797	37.958	0.0802	38.191	0.2100	
14	700	0.0000	0.0000	0.0044	3.3437	0.0049	3.7152	0.1314	
15	750	0.0730	48.680	0.0730	48.665	0.0734	48.910	0.1500	
16	800	0.0053	4.6371	0.0051	4.4582	0.0056	4.8828	0.1150	
17	850	0.0659	49.803	0.0660	49.897	0.0662	49.989	0.1324	
18	900	0.0061	5.9479	0.0060	5.8514	0.0063	6.2097	0.1022	
19	950	0.0587	49.588	0.0588	49.685	0.0591	49.891	0.1184	
20	1000	0.0067	7.3055	0.0066	7.1650	0.0071	7.6957	0.0920	
21	1050	0.0516	48.170	0.0519	48.421	0.0520	48.535	0.1071	
22	1100	0.0073	8.6888	0.0072	8.6113	0.0077	9.1951	0.0836	
23	1150	0.0448	45.814	0.0450	46.045	0.0452	46.170	0.0978	
24	1200	0.0077	9.9808	0.0076	9.8718	0.0081	10.509	0.0767	
25	1250	0.0384	42.715	0.0387	42.996	0.0388	43.132	0.0900	
26	1300	0.0079	11.123	0.0078	11.039	0.0083	11.729	0.0708	
27	1350	0.0327	39.181	0.0330	39.551	0.0330	39.551	0.0833	
28	1400	0.0079	12.024	0.0078	11.889	0.0083	12.632	0.0657	
29	1450	0.0275	35.445	0.0277	35.715	0.0278	35.872	0.0776	
30	1500	0.0078	12.684	0.0078	12.738	0.0081	13.136	0.0613	
31	1550	0.0231	31.759	0.0233	32.123	0.0233	32.123	0.0726	
32	1600	0.0075	12.991	0.0074	12.950	0.0078	13.587	0.0575	
33	1650	0.0193	28.323	0.0194	28.467	0.0195	28.646	0.0682	
34	1700	0.0070	12.933	0.0070	12.857	0.0072	13.308	0.0541	
35	1750	0.0162	25.191	0.0162	25.255	0.0164	25.445	0.0643	
36	1800	0.0064	12.525	0.0065	12.658	0.0066	12.897	0.0511	
37	1850	0.0136	22.446	0.0137	22.483	0.0139	22.884	0.0608	
38	1900	0.0057	11.730	0.0057	11.849	0.0059	12.101	0.0484	
39	1950	0.0115	20.013	0.0116	20.101	0.0118	20.524	0.0577	
40	2000	0.0020	4.2943	0.0050	10.880	0.0050	10.880	0.0460	



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

$U_{rms} =$	230.3	V	$P =$	23.90	W	$THC =$	0.273	A	Range:	2 A
$I_{rms} =$	0.281	A	$pf =$	0.369					$V_{nom}:$	230 V
									TestTime:	3 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Return

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:	23°C
Humidity:	52%

Test Procedure

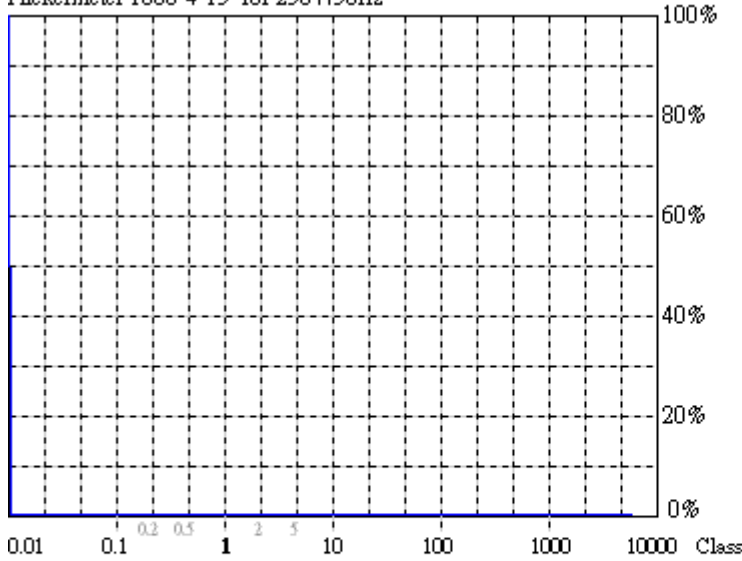
The EUT is supplied in series with reference impedance from a power source with the voltage and frequency as the nominal supply voltage and frequency of the EUT.

Result

Performance of EUT complies with the given specification.

Test Data

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



Actual Flicker (Fl): 0.00
Short-term Flicker (Pst): 0.07
 Limit (Pst): 1.00
Long-term Flicker (Plt): 0.07
 Limit (Plt): 0.65
Maximum Relative Volt. Change (dmax): 0.00%
 Limit (dmax): 4.00%
Relative Steady-state Voltage Change (dc): 0.06%
 Limit (dc): 3.30%
Maximum Interval exceeding 3.30% (dt): 0.00ms
 Limit (dt>Lim): 500ms

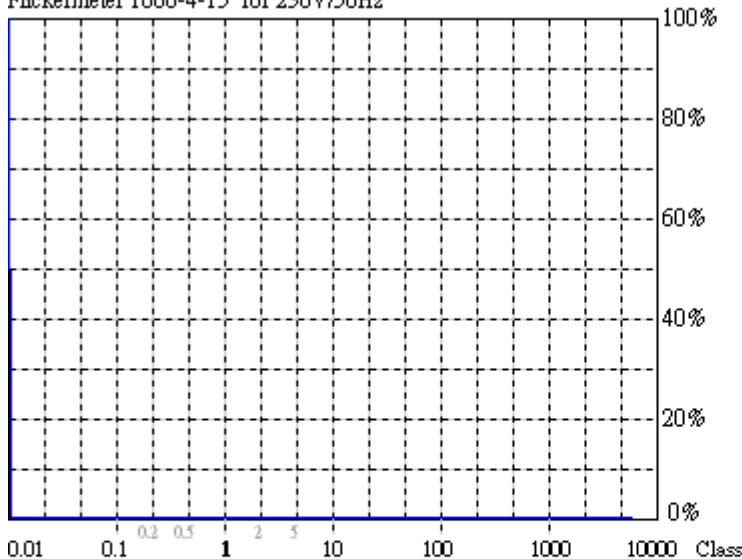
Flicker Emission - IEC 61000-3-3 , EN 61000-3-3 , (CEN60555-3)

U_{rms} = 230.3 V P = 22.33 W
 I_{rms} = 0.240 A pf = 0.404

Range: 2 A
 V_{nom}: 230 V
 TestTime: 10 min (100%)

Test completed, Result: PASSED

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



Actual Flicker (Fl): 0.00
Short-term Flicker (Pst): 0.07
 Limit (Pst): 1.00
Long-term Flicker (Plt): 0.07
 Limit (Plt): 0.65
Maximum Relative Volt. Change (dmax): 0.00%
 Limit (dmax): 4.00%
Relative Steady-state Voltage Change (dc): 0.03%
 Limit (dc): 3.30%
Maximum Interval exceeding 3.30% (dt): 0.00ms
 Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3 , (CEN60555-3)

U_{rms} = 230.3 V P = 23.41 W
 I_{rms} = 0.251 A pf = 0.405

Range: 2 A
 V_{nom}: 230 V
 TestTime: 120 min (10000%)

Test completed, Result: PASSED

HAR-1000 EMC-Refer

14. Appendix

14.1 Appendix A: Test Equipment

14.1.1 Test Equipment List

Location Con02	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
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	05/14/2011	05/14/2012
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	10/15/2010	10/15/2011
Conduction 02	ISN T8 01	FCC	FCC-TLINS-T 8-02	20255	10/15/2010	10/15/2011

Location Chamber02	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 Chamber14	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation (Chamber14)	Spectrum Analyzer 21	Agilent	N9010A	MY49060537	07/13/2010	07/13/2011
Rad. Above 1GHz (Chamber14)	Horn Antenna 06	ETS	3117	00066665	09/28/2010	09/28/2011
Rad. Above 1GHz (Chamber14)	SUCOFLEX 1GHz~18GHz cable	HUBER SUHNER	Sucoflex 106	67618/6 and 67619/6	02/09/2011	02/09/2012
Rad. Above 1GHz (Chamber14)	Preamplifier 13	MITEQ	JS44-0010180 0-25-10P-44	1329256	06/10/2010	06/10/2011

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	03/23/2011	03/23/2012
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~4.2GHz 50W	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 02	HP	8648B	3642U01040	06/24/2010	06/24/2011
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	05/03/2011	05/03/2012
EN61K-4-5	SURGE-TESTER	EMC Partner	MIG0603IN3	523	05/03/2011	05/03/2012
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.

14.1.2 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

14.2 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>: ± 3.263 dB

<Chamber 02 (10M)>

Horizontal

30MHz~200MHz: ± 4.251 dB

200MHz~1GHz: ± 4.380 dB

Vertical

30MHz~200MHz: ± 4.382 dB

200MHz~1GHz: ± 4.384 dB

<Chamber 14 (3M)>

1GHz~18GHz ± 3.722 dB

<Immunity 02>

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

14.3 Appendix C: Photographs of EUT Configuration Test Set Up

14.3.1 Photo of Main Power Port Conducted Emission and Telecommunication Port Conducted Emission Measurement

Front View

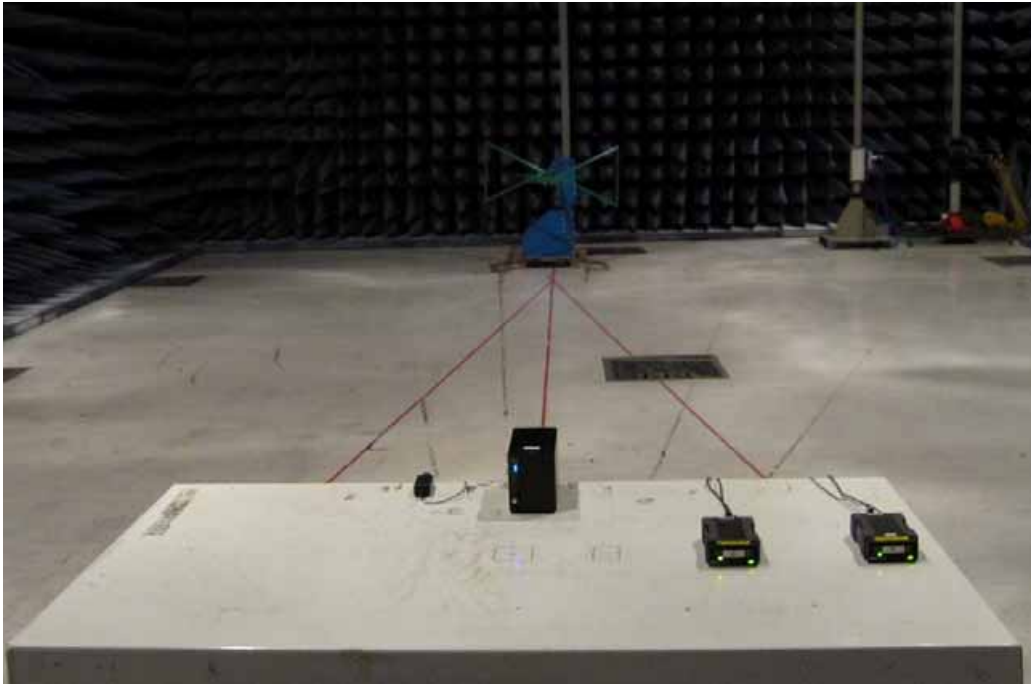


Back View

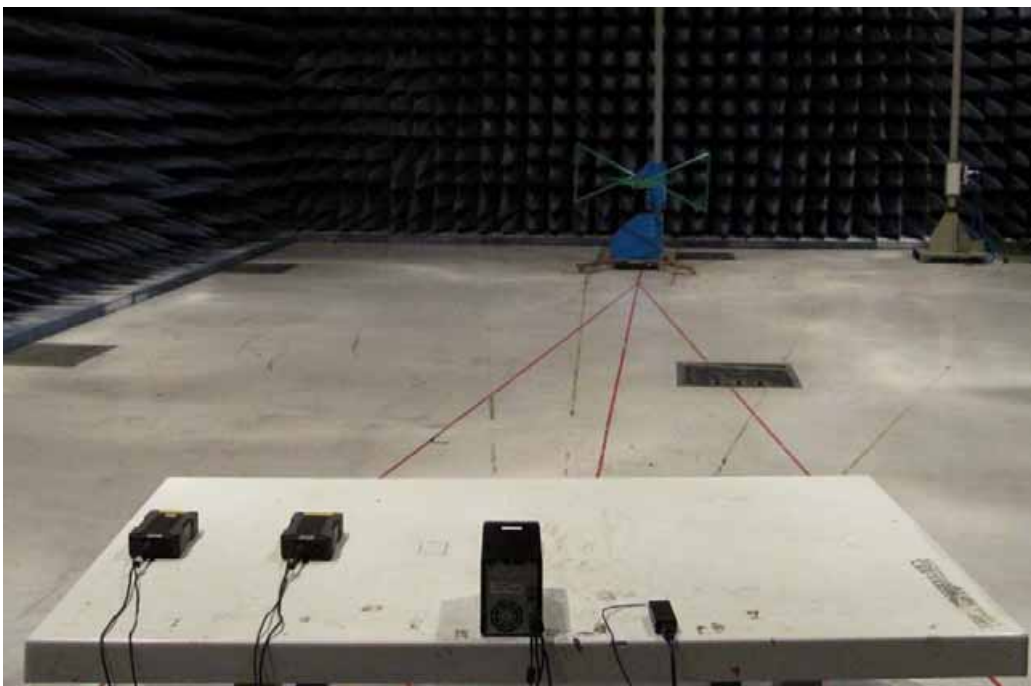


14.3.2 Photo of Radiated Emission Measurement

Front View



Back View



14.3.3 Photo of ESD Measurement



14.3.4 Photo of RF Field Strength Susceptibility Measurement



14.3.5 Photo of Electrical Fast Transient/Burst Measurement



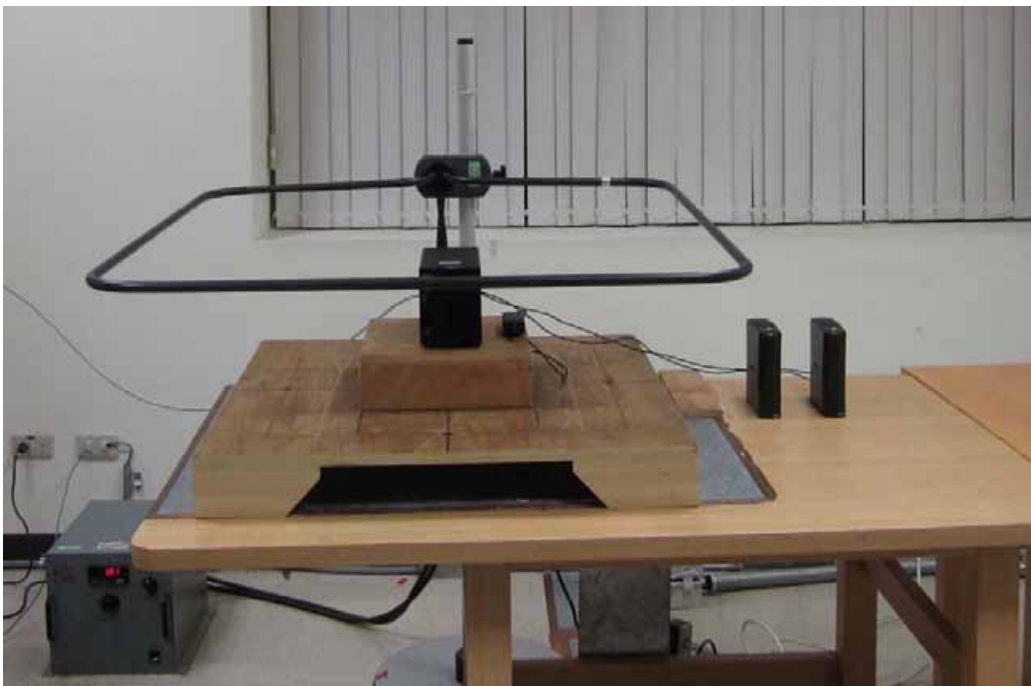
14.3.6 Photo of Surge Measurement



14.3.7 Photo of Conductive Measurement



14.3.8 Photo of Magnetic field Measurement



14.3.9 Photo of Voltage Dips Measurement



14.3.10 Photo of Harmonics and Voltage Fluctuations



14.4 Appendix D: Photographs of EUT

Please refer to the File of ISL-11LE220P-MA