

# Certificate

Issue Date: 2007/11/06  
Page 1 of 2  
Ref. Report No. ISL-07HE196C  
ISL-07HE196E

Product Name: : Network Attached Storage  
: **TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, Viostor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA, VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA.NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D**

Model Number(s)

Responsible Party : **QNAP System, Inc.**  
Address : 21F,No.77,Sec. 1,Xintai 5th Rd.,  
Xizhi City,Taipei Country,221, Taiwan,R.O.C

Contact Person :

# Certificate

Issue Date: 2007/11/06  
Page 2 of 2  
Ref. Report No. ISL-07HE196C  
ISL-07HE196E

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 2004/108/EC. The device was passed the test performed according to :

## Standards:

EN55022: 1998/A1: 2000/A2: 2003; AS/NZS CISPR 22: 2004: Limits and methods of measurement of Radio Interference characteristics of Information Technology Equipment.

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

EN61000-3-2: 2000 /A2:2005; AS/NZS 61000.3.2: 2003: Limits for harmonics current emissions

EN61000-3-3: 1995/A1: 2001; AS/NZS 61000.3.3: 1998: Limits for voltage fluctuations and flicker in low-voltage supply systems.

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.

  
Jim Chu/ Director

## International Standards laboratory

### 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

### His-Chih LAB:

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

# **CE MARK TECHNICAL FILE**

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

of

Product Name

### **Network Attached Storage**

Model

**TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, VioStor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor-409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA, VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA, NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D**

Contains:

1. Declaration of Conformity
2. EN55022/CISPR 22, AS/NZS CISPR 22 EMI test report
3. EN55024, AS/NZS CISPR 24, EN61000-3-2 / AS/NZS 61000.3.2, and EN61000-3-3 / AS/NZS 61000.3.3 test report
4. Block Diagram and Schematics
- 5 Users' manual

## Declaration of Conformity

Name of Responsible Party: QNAP System, Inc.

Address of Responsible Party: 21F, No. 77, Sec. 1, Xintai 5th Rd.  
Xizhi City, Taipei Country, 221  
Taiwan, R.O.C

Declares that product: Network Attached Storage

Model: TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, VioStor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor-409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA, VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA, NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D

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:

EN55022: 1998/A1: 2000/A2: 2003; AS/NZS CISPR 22: 2004: Limits and methods of measurement of Radio Interference characteristics of Information Technology Equipment.

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

<to be continued>

Standard	Description	Results	Criteria
EN61000-4-2: 1995/A1: 1998/A2: 2001 AS/NZS 61000.4.2: 2002	Electrostatic Discharge	Pass	B
EN61000-4-3: 2002/A1: 2002 AS/NZS 61000.4.3: 1999	Radio-Frequency, Electromagnetic Field	Pass	A
EN61000-4-4: 2004 AS/NZS 61000.4.4: 2006	Electrical Fast Transient/Burst	Pass	B
EN61000-4-5: 1995/A1: 2001 AS/NZS 61000.4.5: 1999	Surge	Pass	B
EN61000-4-6: 1996/A1: 2001 AS/NZS 61000.4.6: 1999	Conductive Disturbance	Pass	A
EN61000-4-8: 1993/A1: 2001 AS/NZS 61000.4.8: 2002	Power Frequency Magnetic Field	Pass	A
EN61000-4-11: 2004 AS/NZS 61000.4.11: 2005	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: 2000 /A2:2005 AS/NZS 61000.3.2: 2003	Limits for harmonics current emissions	Pass
EN61000-3-3: 1995/A1: 2001 AS/NZS 61000.3.3: 1998	Limits for voltage fluctuations and flicker in low-voltage supply systems.	Pass

*We, QNAP System, 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.*

-----  
 QNAP System, Inc.

**Date: 2007/11/06**

## Declaration of Conformity

Name of Responsible Party: QNAP System, Inc.

Address of Responsible Party: 21F, No. 77, Sec. 1, Xintai 5th Rd.  
Xizhi City, Taipei Country, 221  
Taiwan, R.O.C

Declares that product: Network Attached Storage

Model: TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, VioStor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor-409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA, VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA, NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D

Assembled by: Same as above

Address: Same as above

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

EN55022: 1998/A1: 2000/A2: 2003; AS/NZS CISPR 22: 2004: Limits and methods of measurement of Radio Interference characteristics of Information Technology Equipment.

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

<to be continued>

Standard	Description	Results	Criteria
EN61000-4-2: 1995/A1: 1998/A2: 2001 AS/NZS 61000.4.2: 2002	Electrostatic Discharge	Pass	B
EN61000-4-3: 2002/A1: 2002 AS/NZS 61000.4.3: 1999	Radio-Frequency, Electromagnetic Field	Pass	A
EN61000-4-4: 2004 AS/NZS 61000.4.4: 2006	Electrical Fast Transient/Burst	Pass	B
EN61000-4-5: 1995/A1: 2001 AS/NZS 61000.4.5: 1999	Surge	Pass	B
EN61000-4-6: 1996/A1: 2001 AS/NZS 61000.4.6: 1999	Conductive Disturbance	Pass	A
EN61000-4-8: 1993/A1: 2001 AS/NZS 61000.4.8: 2002	Power Frequency Magnetic Field	Pass	A
EN61000-4-11: 2004 AS/NZS 61000.4.11: 2005	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: 2000 /A2:2005 AS/NZS 61000.3.2: 2003	Limits for harmonics current emissions	Pass
EN61000-3-3: 1995/A1: 2001 AS/NZS 61000.3.3: 1998	Limits for voltage fluctuations and flicker in low-voltage supply systems.	Pass

*We, QNAP System, 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.*

-----  
 QNAP System, Inc.

**Date: 2007/11/06**

# TEST REPORT

of

## EN55024 / AS/NZS CISPR 24 / IMMUNITY

## EN61000-3-2 / EN61000-3-3

Product : **Network Attached Storage**

Model(s): TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, VioStor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor-409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA, VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA, NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D

Applicant: **QNAP System, Inc.**

Address: **21F, No. 77, Sec. 1, Xintai 5th Rd.  
Xizhi City, Taipei Country, 221  
Taiwan, R.O.C**

Test Performed by:

**International Standards Laboratory**

<HC LAB>

\*Site Registration No.

BSMI: SL2-IN-E-0037; SL2-R1/R2-E-0037; TAF: 1178; NVLAP: 200234-0; IC: IC4067;

VCCI: R-341, C-354; NEMKO: ELA 113A

\*Address:

No. 65, Gu Dai Keng St.

Hsichih, Taipei Hsien 22117, Taiwan

\*Tel : 886-2-2646-2550; Fax: 886-2-2646-4641

Report No.: **ISL-07HE196E**

Issue Date : **2007/11/06**



## Contents of Report

1.	General.....	1
1.1	Certification of Accuracy of Test Data .....	1
2.	Summary .....	2
2.1	Operation Environment .....	2
2.2	Test Standards .....	2
2.3	Description of Support Equipment .....	3
2.3.1	Software for Controlling Support Unit.....	5
2.3.2	I/O Cable Condition of EUT and Support Units.....	6
2.4	Description of Equipment Under Test.....	7
3.	Electrostatic discharge (ESD) immunity .....	9
3.1	Electrostatic discharge (ESD) immunity test .....	9
4.	Radio-Frequency, Electromagnetic Field immunity .....	10
4.1	Radio-Frequency, Electromagnetic Field immunity test.....	10
5.	Electrical Fast transients/burst immunity .....	11
5.1	Electrical Fast transient/burst immunity test.....	11
6.	Surge Immunity .....	13
6.1	Surge immunity test.....	13
7.	Immunity to Conductive Disturbance.....	14
7.1	Immunity to Conductive Disturbance .....	14
8.	Power Frequency Magnetic Field immunity .....	15
8.1	Power Frequency Magnetic field immunity test .....	15
9.	Voltage Dips, Short Interruption and Voltage Variation immunity .....	16
9.1	Voltage Dips, Short Interruption and Voltage Variation immunity test .....	16
10.	Harmonics .....	17
10.1	Harmonics test.....	17
11.	Voltage Fluctuations .....	21
11.1	Voltage Fluctuations test.....	21
12.	Test Equipment List.....	23
12.1	Software for Controlling Spectrum/Receiver and Calculating Test Data.....	24
13.	Photographs .....	25
13.1	Photo of ESD measurement .....	25
13.2	Photo of RF Field Strength Susceptibility Measurement.....	25
13.3	Photo of Electrical Fast Transient/Burst measurement.....	26
13.4	Photo of Surge measurement.....	26
13.5	Photo of Conductive Measurement .....	27
13.6	Photo of Magnetic field measurement .....	27
13.7	Photo of Voltage Dips measurement.....	28
13.8	Photo of Harmonics and Voltage Fluctuations .....	28
13.9	Appendix: Photographs of EUT Please refer to the File of ISL-07HE196P.....	29

# 1. General

## 1.1 Certification of Accuracy of Test Data

**Standards:** Please refer to 2.2

**Equipment Tested:** Network Attached Storage

**Model:** TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, VioStor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor-409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA, VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA, NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D

**Applied by** QNAP System, Inc.


**Sample received Date:** 2007/10/29

**Final test Date :** 2007/11/01

**Test Site:** HC Test Site

**Test Result:** PASS

**Report Engineer:** Lily L.C. Tseng

**Test Engineer:**   
Woei Chen

Approve & Signature

  
-----  
Jim Chu / Director

Test results given in this report apply only to the specific sample(s) tested under stated test conditions. This report shall not be reproduced other than in full without the explicit written consent of ISL. This report totally contains 32 pages, including 1 cover page , 1 contents page, and 30 pages for the test description.

This test report accurately contains the test results of the above standards at the time of the test. The results in this report apply only to the sample(s) tested. This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory.

## 2. Summary

### 2.1 Operation Environment

Power supply: AC 230 V / 50 Hz

### 2.2 Test Standards

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

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

Standard	Description	Results	Criteria
EN61000-4-2: 1995/A1: 1998/A2: 2001 AS/NZS 61000.4.2: 2002	Electrostatic Discharge	Pass	B
EN61000-4-3: 2002/A1: 2002 AS/NZS 61000.4.3: 1999	Radio-Frequency, Electromagnetic Field	Pass	A
EN61000-4-4: 2004 AS/NZS 61000.4.4: 2006	Electrical Fast Transient/Burst	Pass	B
EN61000-4-5: 1995/A1: 2001 AS/NZS 61000.4.5: 1999	Surge	Pass	B
EN61000-4-6: 1996/A1: 2001 AS/NZS 61000.4.6: 1999	Conductive Disturbance	Pass	A
EN61000-4-8: 1993/A1: 2001 AS/NZS 61000.4.8: 2002	Power Frequency Magnetic Field	Pass	A
EN61000-4-11: 2004 AS/NZS 61000.4.11: 2005	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: 2000 /A2:2005 AS/NZS 61000.3.2: 2003	Limits for harmonics current emissions	Pass
EN61000-3-3: 1995/A1: 2001 AS/NZS 61000.3.3: 1998	Limits for voltage fluctuations and flicker in low-voltage supply systems.	Pass

## 2.3 Description of Support Equipment

### Support Unit 1.

Description:	External Hard Disk Case
Manufacturer :	TeraSys
Model Number:	F12-UF
Serial Number	NA
Power Supply Type:	YHI(Model:YS-1015U12) or From Personal Computer USB/1394 Port Supply
1394 Port:	one 6-Pin
USB:	one 4-Pin
Power In:	one
Power Cable:	Non-shielded, Detachable, (Can Dismantle)
FCC ID:	(Complied with FCC DOC)

### Support Unit 2.

Description:	External Hard Disk Case
Manufacturer :	TeraSys
Model Number:	F12-UF
Serial Number	NA
Power Supply Type:	YHI(Model:YS-1015U12) or From Personal Computer USB/1394 Port Supply
1394 Port:	one 6-Pin
USB:	one 4-Pin
Power In:	one
Power Cable:	Non-shielded, Detachable, (Can Dismantle)
FCC ID:	(Complied with FCC DOC)

### Support Unit 3.

Description:	External Hard Disk Case
Manufacturer :	TeraSys
Model Number:	F12-UF
Serial Number	NA
Power Supply Type:	YHI(Model:YS-1015U12) or From Personal Computer USB/1394 Port Supply
1394 Port:	one 6-Pin
USB:	one 4-Pin
Power In:	one
Power Cable:	Non-shielded, Detachable, (Can Dismantle)
FCC ID:	(Complied with FCC DOC)

### Support Unit 4.

Description:	DELL Notebook Personal Computer
Model:	Latitude D400
Serial Number:	N/A
CPU:	Pentium M- 1.5GHz(FSB 400 MHz)
A/C Adapter Type:	LITEON 65W (Model PA-1650-05D) 3 Pins
Hard Disk Driver:	Toshiba (Model: MK4019GAX) 40 GB
LAN	one 8-pins(10/100/1000Mbps)
MDC Modem:	Conexant (Model: RD01-D480)
RAM:	Nanya DDR 256MB x 1
LCD Panel:	Toshiba 12.1"XGA (Model: LTM12C505D)
Inverter:	RICOH KEIKI (Model: K3E19T5 0090)
Power Cord:	Non-shielded, Detachable

### 2.3.1 Software for Controlling Support Unit

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

- A. Used InterEMC.exe to Read and Write signal. (EUT and Extra Hard Disk)
- B. Used Tfggen.exe to Send signal to EUT RJ45 port through PC RJ45 Port.
- C. Used Finder.exe to check EUT.
- D. Repeat the above steps.

	<b>Filename</b>	<b>Issued Date</b>
Hard Disk	InterEMC.exe	04/16/2003
RJ45	Tfggen.exe	05/22/2001
EUT	Finder.exe	10/28/2007

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

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to EUT SPS	1.8M	Nonshielded, Detachable	Plastic Head
LAN Data Cable	Server to EUT RJ 45 Connector	33 feet	Non-shielded, Detachable	RJ-45, with Plastic Head
USB Data Cable*3	External Hard Disk Case USB Port to PC USB Port	2M	Non-shielded, Detachable	Metal Head

## 2.4 Description of Equipment Under Test

### EUT

Description:	Network Attached Storage Condition: Pre-Production
Model:	TS-409 Pro, TS-409, TS-409T, TS-309 Pro, TS-309, TS-309T, TS-409 Pro Deluxe, TS-409 Deluxe, TS-409M, TS-409A, TS-409G, TS-309M, TS-309A, TS-309G, VioStor-409, VioStor-409P, VioStor-409V, VioStor-409A, VioStor-409C, VioStor-409D, VioStor-409S, VioStor-409PA, VioStor-409VA, VioStor-409CA, VioStor-409SA, VioStor-409AA, VioStor-409DA, VioStor-409G, VioStor-409GA, VioStor-409L, VioStor-409LA, VioStor-409Pro, VioStor-409M, VioStor-409MA, VioStor-309, VioStor-309P, VioStor-309V, VioStor-309A, VioStor-309C, VioStor-309D, VioStor-309S, VioStor-309PA, VioStor-309VA, VioStor-309CA, VioStor-309SA, VioStor-309AA, VioStor-309DA, VioStor-309G, VioStor-309GA, VioStor-309L, VioStor-309LA, VioStor-309Pro, VioStor-309M, VioStor-309MA, NAS-409 Pro, NAS-409, NAS-309 Pro, NAS-309, NVR-409 A, NVR-409 P, NVR-409 S, NVR-409 C, NVR-409 V, NVR-409D, NVR-309 A, NVR-309 P, NVR-309 S, NVR-309 C, NVR-309V, NVR-309D
Serial Number:	N/A
Power Supply Type:	FSP (Model: FSP096-AHB) AC Input: 100~240V~2A, 50-60Hz DC Output: +12.0V / 8A Non-Shielded, Detachable (With Ferrite Core)
Power Switch Button:	one
Back Up Button:	one
DC Power Port:	one
USB 2.0 Connector:	Three (4-pins)
RJ45 Connector:	one (8-pins) (10/100M/1000M)
Hard Disk1:	Seagate (Model: ST3250620AS) 250GB (Option)
Hard Disk2:	Maxtor (Model: 6L2500S) 250GB (Option)
Hard Disk3:	HITACHI (Model: HDT725025VLA380) 250GB (Option)
Hard Disk4:	Seagate (Model: ST3400832AS) 400GB (Option)

All types of EUT Connect have been tested. The worst data listed in this test report.



Test Configuration:

Seagate (Model: ST3250620AS) 250GB +  
Maxtor (Model: 6L250OS) 250GB +  
HITACHI (Model: HDT725025VLA380) 250GB +  
Seagate (Model: ST3400832AS) 400GB +  
USB2.0 connect + LAN (1000M) + FSP (Model: FSP096-AHB) Switching Adapter

**EMI Noise Source**

Crystal: 12MHz (Y1); 33MHz (OSC1); 25MHz (OSC2); 25MHz (OSC3)

**EMI Solution:**

1. DVE Switching Adapter Cable with Ferrite Core. (Reference photo EUT-14)
2. Added one gasket on the front USB2.0 connector to contact with housing. (Reference photo EUT-15)
3. Added one gasket on the back USB2.0 connector to contact with housing. (Reference photo EUT-15)
4. Added one gasket on the RJ45 connector to contact with housing. (Reference photo EUT-15)

### 3. Electrostatic discharge (ESD) immunity

#### 3.1 Electrostatic discharge (ESD) immunity test

Port:	Enclosure
Basic Standard:	EN61000-4-2/ AS/NZS 61000.4.2 (details referred to Sec 2.2)
Test Level:	Air +/- 2 kV, +/- 4 kV, +/- 8 kV Contact +/- 2 kV, +/- 4 kV
Criteria:	B
Test Procedure	refer to ISL QA T04-S03
Temperature:	20 °C
Humidity:	60%

#### Selected Test Point

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

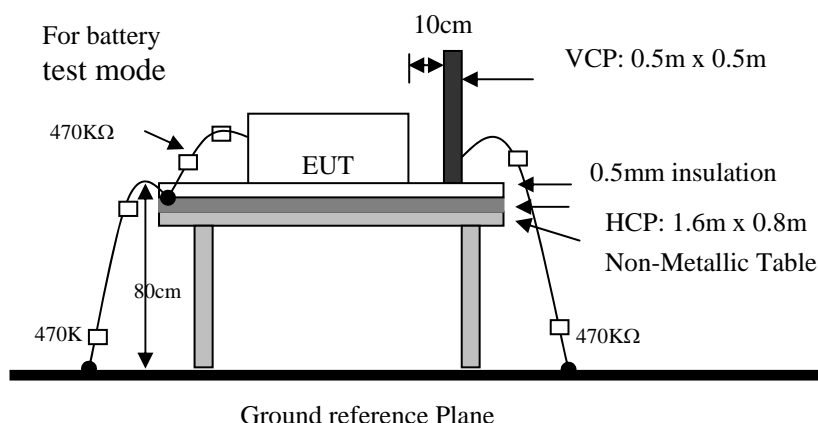
Contact: Total 200 points minimum were to the selected contact points.

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.

For final test points, please refer to EUT 16 to EUT 17 of “Appendix: Photographs of 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.**

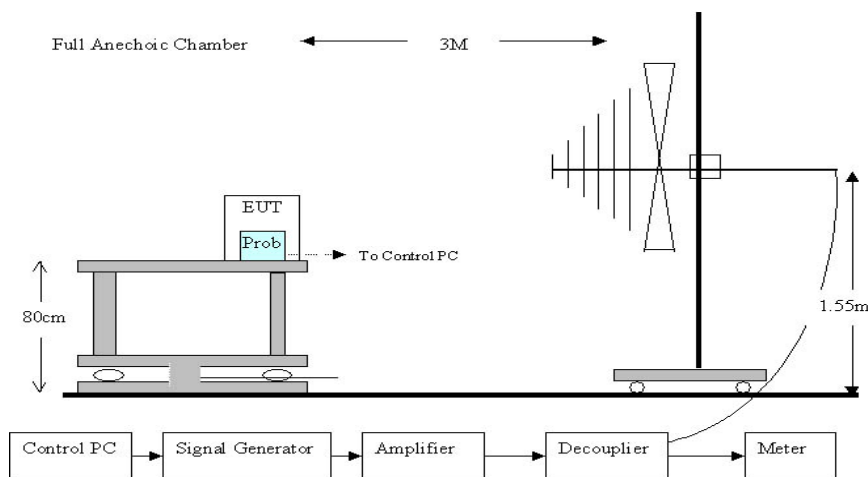
## 4. Radio-Frequency, Electromagnetic Field immunity

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

Port:	Enclosure
Basic Standard:	EN61000-4-3/ AS/NZS 61000.4.3 (details referred to Sec 2.2)
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 T04-S017
Temperature:	24°C
Humidity:	28%

#### 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.**

## 5. Electrical Fast transients/burst immunity

### 5.1 Electrical Fast transient/burst immunity test

Port:	AC mains;
Basic Standard:	EN61000-4-4/ AS/NZS 61000.4.4 (details referred to Sec 2.2)
Test Level:	<b>AC Power Port:</b> +/- 1 kV (I/O Cables): +/- 0.5 kV
Rise Time:	5ns
Hold Time:	50ns
Repetition Frequency:	5KHz
Criteria:	B
Test Procedure	refer to ISL QA T04-S05
Temperature:	20 °C
Humidity:	60%

#### Test Procedure

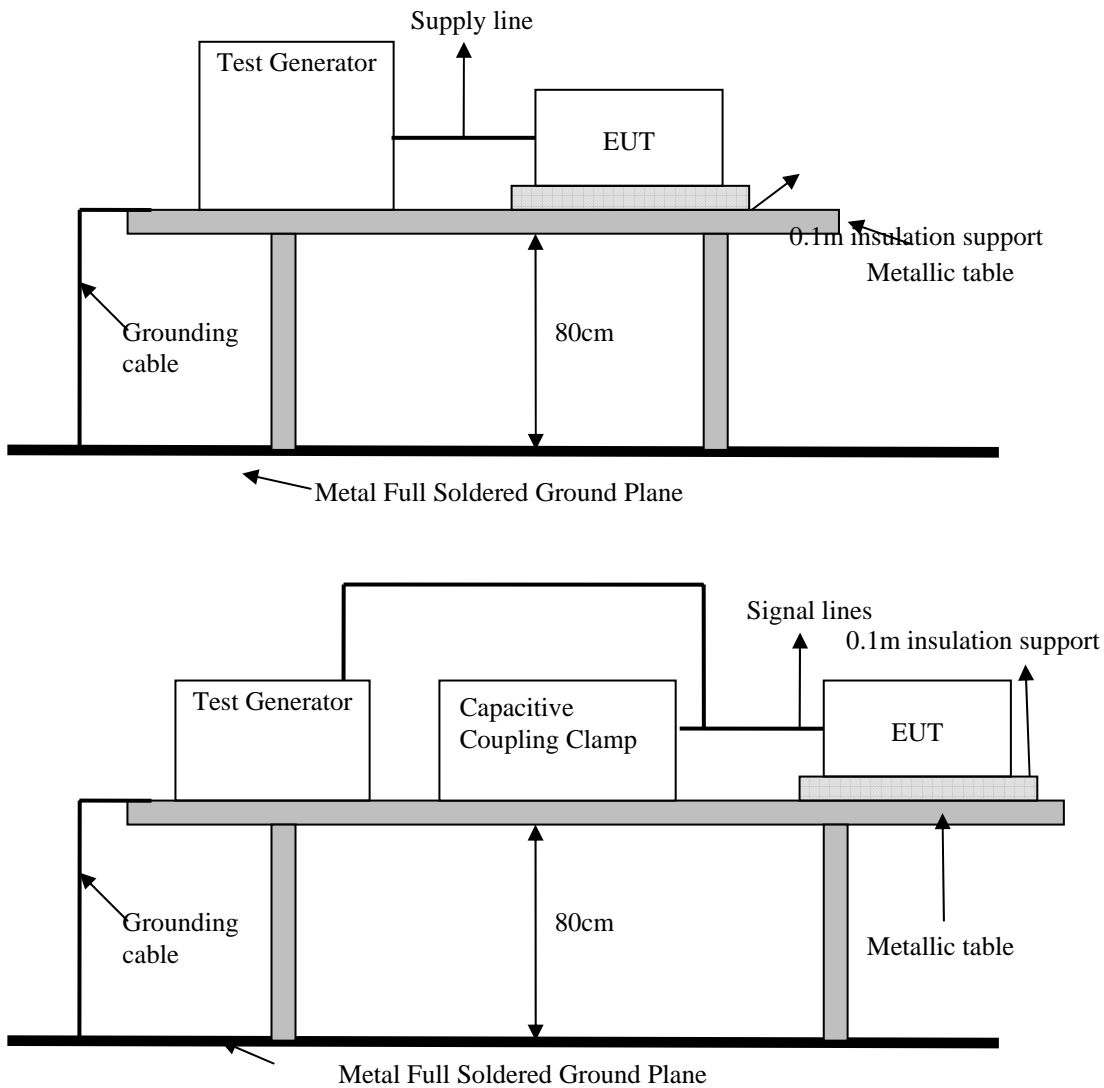
The EUT was setup on a nonconductive table 0.8 m above a reference ground plane.

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

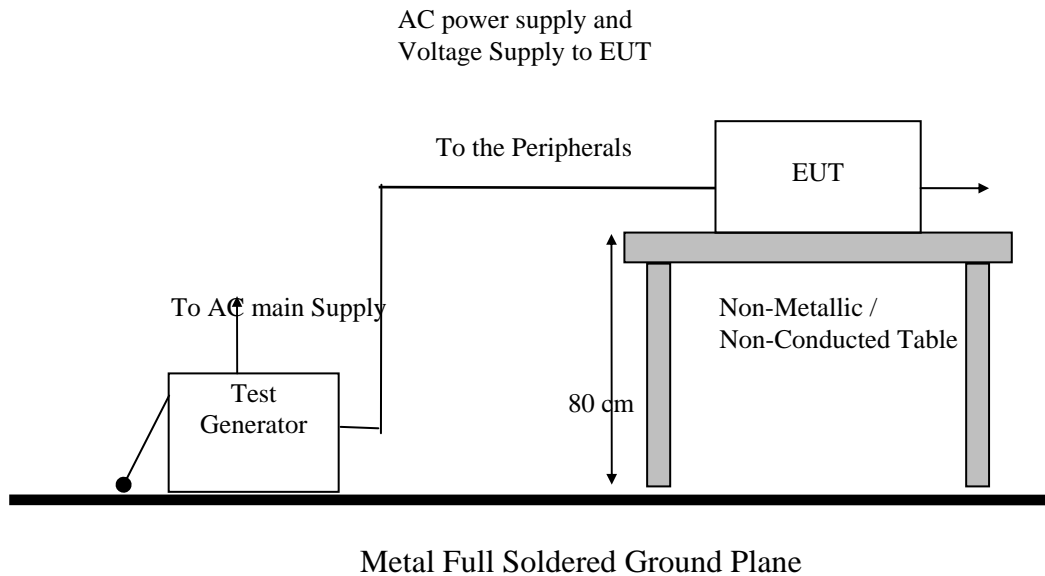
**Performance of EUT complies with the given specification.**

## 6. Surge Immunity

### 6.1 Surge immunity test

Port:	AC mains;
Basic Standard:	EN61000-4-5/ AS/NZS 61000.4.5 (details referred to Sec 2.2)
Test Level:	<b>AC Power Port:</b> Line to Line: +/- 0.5 kV, +/- 1 kV Line to Earth: +/- 0.5 kV, +/- 1 kV, +/- 2kV (I/O cable): Line to Ground: +/- 0.5 kV, +/- 1 kV
Rise Time:	1.2us
Hold Time:	50us
Repetition Rate:	60 second
Angle:	<input checked="" type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input checked="" type="checkbox"/> 270°
Criteria:	B
Test Procedure	refer to ISL QA T04-S04
Temperature:	20°C
Humidity:	60%

#### Test Setup



#### Test Result

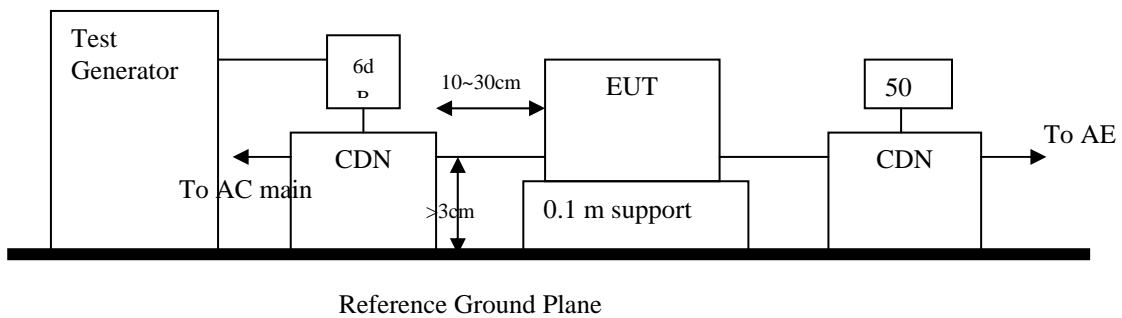
**Performance of EUT complies with the given specification.**

## 7. Immunity to Conductive Disturbance

### 7.1 Immunity to Conductive Disturbance

Port:	AC mains;
Basic Standard:	EN61000-4-6/ AS/NZS 61000.4.6 (details referred to Sec 2.2)
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
Test Procedure	refer to ISL QA T04-S08
Temperature:	20°C
Humidity:	60%

#### Test Setup



#### Test Result

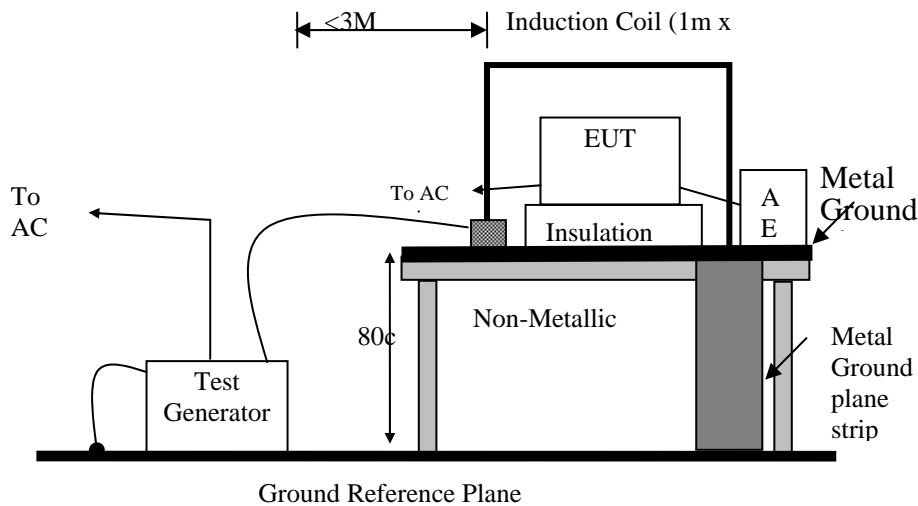
Performance of EUT complies with the given specification.

## 8. Power Frequency Magnetic Field immunity

### 8.1 Power Frequency Magnetic field immunity test

Port:	Enclosure
Basic Standard:	EN61000-4-8/ AS/NZS 61000.4.8 (details referred to Sec 2.2)
Test Level:	1A/m
Polarization:	X, Y, Z
Criteria:	A
Test Procedure	refer to ISL QA T04-S02
Temperature:	20°C
Humidity:	60%

#### Test Setup



#### Test Result

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

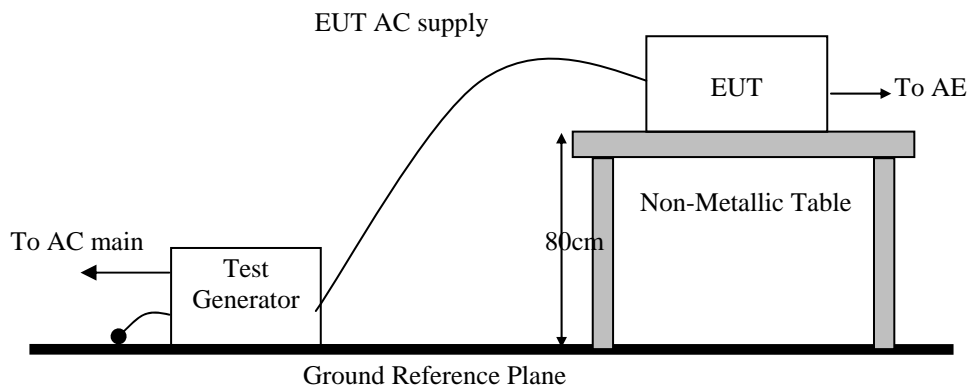


## 9. Voltage Dips, Short Interruption and Voltage Variation immunity

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

Port:	AC mains
Basic Standard:	EN61000-4-11/ AS/NZS 61000.4.11 (details referred to Sec 2.2)
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 T04-S01
Temperature:	20°C
Humidity:	60%

#### Test Setup



#### Test Result

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

## 10. Harmonics

### 10.1 Harmonics test

Port:	AC mains
Active Input Power:	>75W
Basic Standard:	EN61000-3-2/AS/NZS 61000.3.2 (details referred to Sec 2.2)
Test Duration:	2.5min
Class:	D
Test Procedure	refer to ISL QA T04-S43
Temperature:	20°C
Humidity:	60%

#### 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

**Active input power under 75W, no limit apply, declare compliance (< 75 W 時說明)**  
**Performance of EUT complies with the given specification. (> 75 W 時說明)**

Test Data

**Chroma**

ANALYZER 6630

2007.11.01 14:46:18

# Fluctuating Current Harmonics

Setup: D 50HZ      Gen setting: 1(1)      U : 229.56 V      fu: 59.997 Hz  
 Live                      Analysed periods: 16 I : 270.6 mA      P: 55.8 W  
 Module: M1              Limit: Class D (EN61000\_A14)      I1: 252.9 mA  
 LP-filter                Note:

THD=28.56 % (PF=0.897)      PASSED

No	Mean A	Max A	Limit A	No	Mean A	Max A	Limit A
1	0.2503	0.2529		2	0.0005	0.0007	
<b>3</b>	<b>0.0686</b>	<b>0.0690</b>	<b>0.1844</b>	4	0.0002	0.0002	
5	0.0187	0.0190	0.1031	6	0.0002	0.0003	
7	0.0060	0.0062	0.0542	8	0.0001	0.0002	
9	0.0050	0.0051	0.0271	10	0.0001	0.0002	
11	0.0069	0.0070	0.0190	12	0.0001	0.0002	
13	0.0045	0.0045	0.0161	14	0.0001	0.0002	
15	0.0034	0.0034	0.0139	16	0.0001	0.0002	
17	0.0042	0.0043	0.0123	18	0.0001	0.0002	
19	0.0035	0.0036	0.0110	20	0.0001	0.0002	

(Next page, Press 'arrow down' > 1 s)

Next  
measure

Select  
module

Voltage  
check



Measurement completed (150s)

Appl: 2:A14

(1215\_06)

**Chroma**

ANALYZER 6630

2007.11.01 14:47:49

# Fluctuating Current Harmonics

Setup: D 50HZ      Gen setting: 1(1)      U : 229.56 V      fu: 59.997 Hz  
 Live                      Analysed periods: 16 I : 270.6 mA      P: 55.8 W  
 Module: M1              Limit: Class D (EN61000\_A14)      I1: 252.9 mA  
 LP-filter                Note:

THD=28.56 % (PF=0.898)

(Previous page, Press 'arrow up' > 1 s)

21	0.0025	0.0026	0.0027	22	0.0002	0.0001	0.0002
23	0.0028	0.0031	0.0032	24	0.0002	0.0001	0.0002
25	0.0020	0.0022	0.0023	26	0.0001	0.0002	0.0002
27	0.0015	0.0017	0.0018	28	0.0001	0.0001	0.0001
29	0.0020	0.0022	0.0022	30	0.0001	0.0001	0.0002
31	0.0016	0.0018	0.0018	32	0.0001	0.0001	0.0002
33	0.0017	0.0019	0.0020	34	0.0001	0.0001	0.0001
35	0.0015	0.0017	0.0018	36	0.0002	0.0001	0.0002
37	0.0010	0.0013	0.0014	38	0.0001	0.0001	0.0002
39	0.0013	0.0015	0.0016	40	0.0001	0.0001	0.0001

Next  
measure

Select  
module

Voltage  
check



Measurement completed (150s)

Appl: 2:A14

(1215\_08)

**Chroma**

ANALYZER 6630

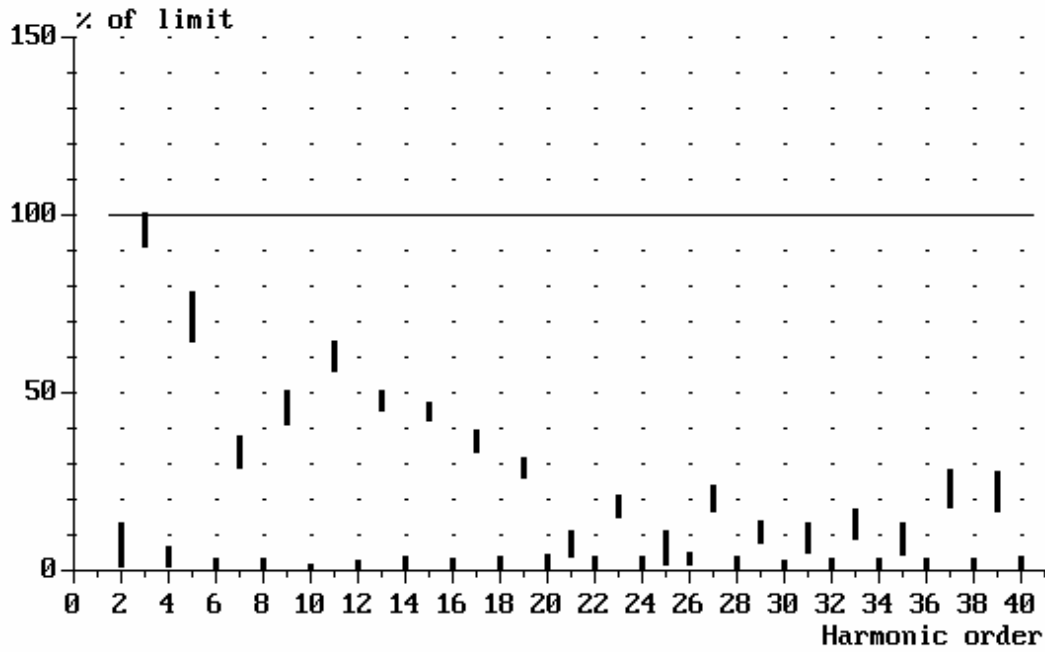
2007.11.01 14:47:09

# Voltage check M1

Setup: D 50HZ

Gen setting: 1(1)

U : 229.56 V fu: 59.997 Hz



Change to table



Measurement completed (150s)

Appl: 2:A14

(1215\_07)

## 11. Voltage Fluctuations

### 11.1 Voltage Fluctuations test

Port:	AC mains
Basic Standard:	EN61000-3-3/AS/ AS/NZS 61000.3.3 (details referred to Sec 2.2)
Test Procedure	refer to ISL QA T04-S44
Observation period:	For Pst 10min
	For Plt 2 hours
Temperature:	20°C
Humidity:	60%

#### **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

**Chroma**

ANALYZER 6630

2007.11.01 14:20:42

# Extreme Flicker-I M1

**Note:**

Numerical Reference Impedance

U: 229.4 V I: 261.2 mA f: 59.997 Hz PF: 0.893

EVALUATION:-----

Type of observation period	Short	Long	Limit
Observation time	10	120 min	
Maximum relative voltage change		0.00 %	4
Max rel steady state voltage change		0.00 %	3.3
Duration of d(t) > 3.3 %		0.00 s	0.2
Short term flicker severity		0.00	1.00
Long term flicker severity	---	0.00	0.65

Based on 12 (12) short term cycles

Next measure

Extreme time graph

Change to histogram

Write to disk

Select module

**PASSED**

Measurement completed



App1: 3:-3-3

(1311\_03)

## 12. Test Equipment List

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
EN61K-3-2/3	DC Burn-In Load 02	D-RAM	DBS-2100	2100-910027	N/A	N/A
EN61K-3-2/3	Power Analyzer 02	Chroma	6630	1068	04/16/2007	04/16/2008
EN61K-4	Thermo-Hygro Meter -4		HD-36	ISL-C-004	11/30/2006	11/30/2008
EN61K-4-2	ESD Mouse	Precision	ESD Mouse	ESD 101-214	N/A	N/A
EN61K-4-2,4,5,8,11	Test Generator -4	PRECISION	TRA1H01B	TRA1000-126	09/15/2007	09/15/2008
EN61K-4-2	ESD Generator	Schaffner	NSG 438	489	03/11/2005	03/11/2008
EN61K-4-3	BILOG Antenna 06	Schaffner	CBL6112B	2754	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 Couplier 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	02/14/2007	02/14/2008
EN61K-4-4	Digital Oscilloscope	Tektronix	TDS 684A	B010761	N/A	N/A
EN61K-4-4	EFT Clamp	Precision	1604242	CNEFT1000-1 03	N/A	N/A
EN61K-4-5	CDN-Kit -4	Precision	1604243	CDNKIT1000- 32	N/A	N/A
EN61K-4-5	CDN Surge Kit 01	EMC-PARTN ER	CDNKIT1000 T; DN-T1; DN-T2; CN-T1; CN-T2	CDNKIT1000- 24	08/06/2006	08/06/2009
EN61K-4-6	6dB Attenuator	Weinschel Corp	33-6-34	BC5975	N/A	N/A
EN61K-4-6	Amplifier 4-6	Amplifier Research	150A100	1-1-R-02157	N/A	N/A
EN61K-4-6	Attenuator 6dB 4-6	BIRO	100-A-FFN-06	0123	N/A	N/A
EN61K-4-6	CDN M2+M3	Frankonia	M2+M3	A3011016	07/05/2007	07/05/2008
EN61K-4-6	CDN T2 01	Frankonia	T2	A3010003	07/05/2007	07/05/2008
EN61K-4-6	CDN T4 01	FCC Inc.	FCC-801-T4	9721	07/05/2007	07/05/2008
EN61K-4-6	EM-Clamp 01	FCC	F-203I-23MM	539	N/A	N/A
EN61K-4-6	Coaxial Cable 4-6 01-1	Harbour Industries	M17/128-RG4 00	4-6 01-1	N/A	N/A
EN61K-4-6	Coaxial Cable 4-6 01-2	Harbour Industries	M17/128-RG4 00	4-6 01-2	N/A	N/A
EN61K-4-6	Coaxial Cable 4-6 01-3	Harbour Industries	M17/128-RG4 00	4-6 01-3	N/A	N/A
EN61K-4-6	KAL-AD RJ45S	BIRO			N/A	N/A



Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
EN61K-4-6	KAL-AD T2	BIRO			N/A	N/A
EN61K-4-6	Passive Impedance Adaptor 4-6	FCC	FCC-801-150-50-CDN	9758;9759	N/A	N/A
EN61K-4-6, CISPR 13, Antenna	Signal Generator 01	HP	8656B	2635A04675	08/17/2007	08/17/2008
EN61K-4-8	Clamp Meter 4-8	TES	3090	990900322	07/02/2007	07/02/2008
EN61K-4-8	Magnetic Field Antenna	Precision	TRAIZ44B	MF1000-23	N/A	N/A

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

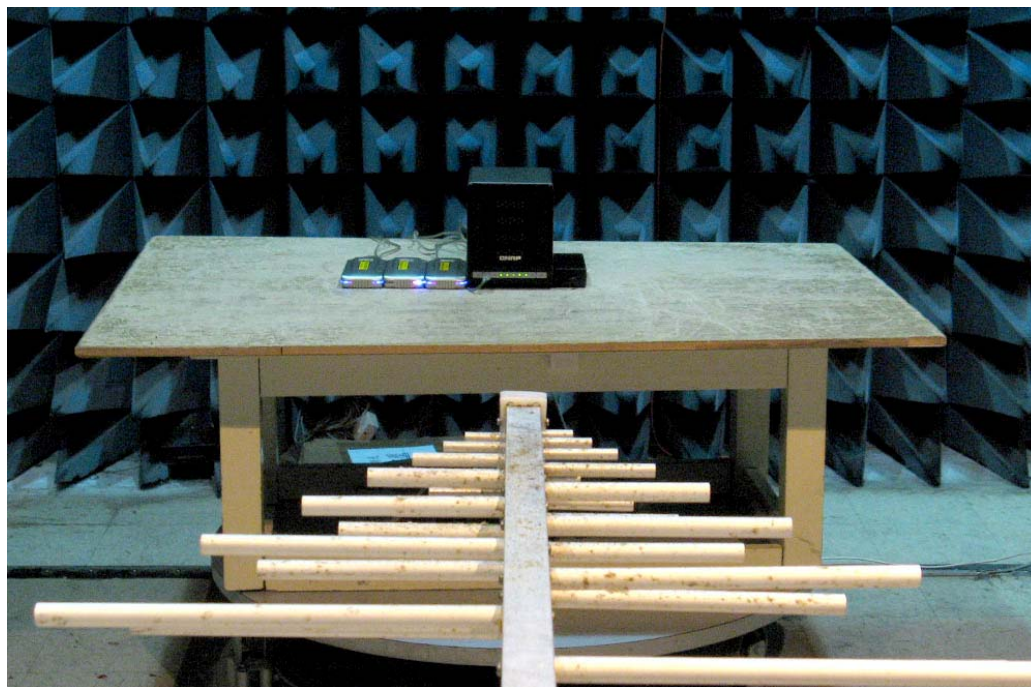
Test Item	Filename	Version
EN61000-3-2	HARCS.EXE	4.14
EN61000-3-3	HARCS.EXE	4.14
EN61000-4-3	Tile.Exe	2.0.P
EN61000-4-6	EN61000-4-6 Application Software	1.13.e
EN61000-4-2	N/A	2.0
EN61000-4-4	Tema.EXE	1.69
EN61000-4-5	Tema.EXE	1.69
EN61000-4-8	N/A	
EN61000-4-11	VDS-2002Rs.EXE	2.00

### 13. Photographs

#### 13.1 Photo of ESD measurement



#### 13.2 Photo of RF Field Strength Susceptibility Measurement



### 13.3 Photo of Electrical Fast Transient/Burst measurement

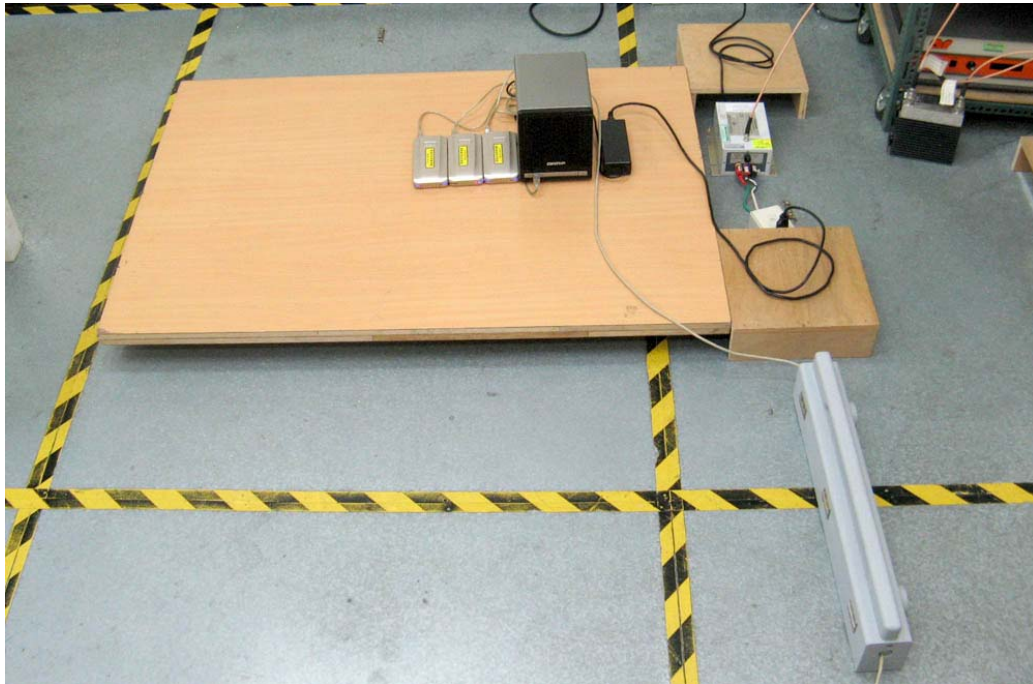


### 13.4 Photo of Surge measurement

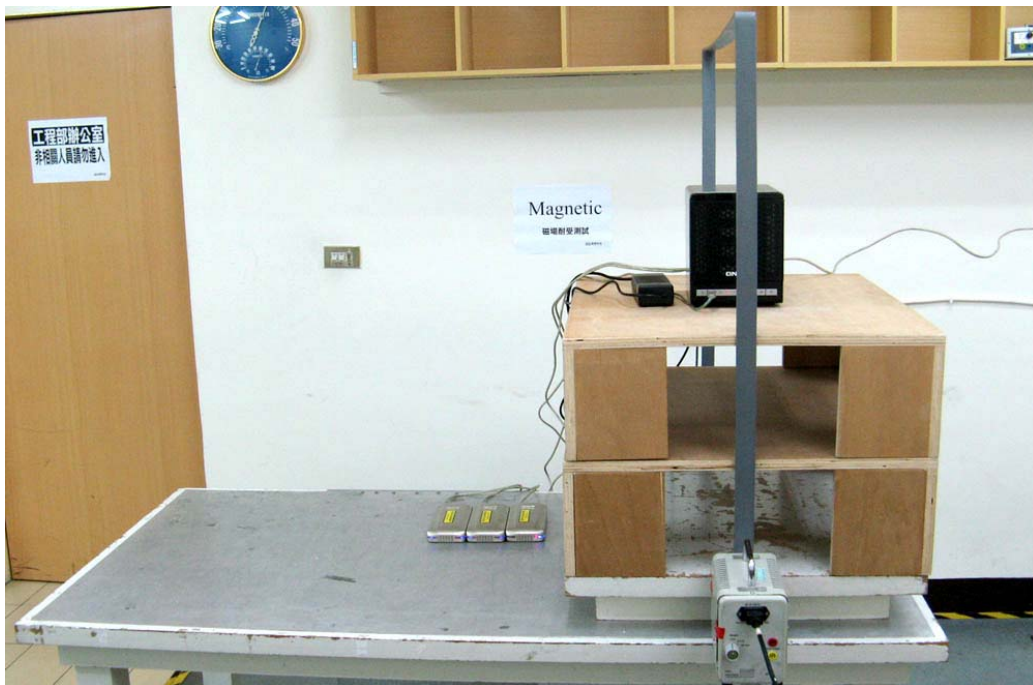




### 13.5 Photo of Conductive Measurement



### 13.6 Photo of Magnetic field measurement



### 13.7 Photo of Voltage Dips measurement



### 13.8 Photo of Harmonics and Voltage Fluctuations



### **13.9 Appendix: Photographs of EUT**

Please refer to the File of **ISL-07HE196P**