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Page 1 of 1

## VERIFICATION OF EMC COMPLIANCE

Verification No.: GLEMO09100321301V

Applicant:

Address of Applicant:

Product Description: Laser Sphere Model No: LP28-001

Sufficient samples of the product have been tested and found to be in conformity with

Test Standard: EN 55015:2006+A1:2007,

EN 61547:1995+A1:2000,

EN 61000-3-2:2006, EN 61000-3-3:2008.

As shown in the

Test Report Number(s): GLEMO09100321301

This verification of EMC Compliance has been granted to the applicant based on the results of the tests, performed by laboratory of SGS-CSTC Standards Technical Services Co., Ltd. on the sample of the above-mentioned product in accordance with the provisions of the relevant specific standards and Directive 2004/108/EC. The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.

Stephen Guo Manager CE

Date: 21 October 2009

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Member of the SGS Group (SGS SA)



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Report No.: GLEMO09100321301

Page: 1 of 31

# TEST REPORT

**Application No.:** 

GLEMO091003213LM

Applicant:

**Equipment Under Test (EUT):** 

**EUT Name:** 

Laser Sphere

Item No.:

LP28-001

Standards:

EN 55015:2006+A1:2007, EN 61547:1995+A1:2000,

EN 61000-3-2:2006, EN 61000-3-3:2008.

Date of Receipt:

14 October 2009

Date of Test:

15 to 20 October 2009

Date of Issue:

21 October 2009

Test Result:

PASS\*

In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further details.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.

Stephen Guo

Manager The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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Report No.: GLEMO09100321301

Page: 2 of 31

# 2 Test Summary

The customer requested EMC tests for a Laser Sphere.

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission on AC, 9 kHz to 30 MHz	EN 55015:2006 +A1:2007	EN 55015:2006 +A1:2007	Table 2a	PASS
Harmonic Emission on AC, 50 Hz	EN 61000-3-2:2006	EN 61000-3-2:2006	Class C	N/A
Flicker Emission on AC	EN 61000-3-3:2008	EN 61000-3-3:2008	Clause 5 of EN 61000-3-3	PASS
Electrostatic Discharge	EN 61547:1995	EN 61000-4-2:1995	Contact ± 2, 4 kV	PASS
(ESD)	+A1:2000	+A1:1998+A2:2001	Air ± 2, 4, 8 kV	7
Radiated Immunity,	EN 61547:1995	EN 61000-4-	3 V/m, 80 %,	PASS
80 MHz to 1 GHz	+A1:2000	3:2006+A1:2008	1 kHz, A.M.	FASS
Electrical Fast	EN 61547:1995			
Transients (EFT) on AC	+A1:2000	EN 61000-4-4:2004	± 0.5 &1.0 kV	PASS
Surge Immunity on AC	EN 61547:1995	EN 61000-4-5:2006	± 0.5 kV D.M. †	PASS
Surge similarity on AC	+A1:2000	EN 01000-4-3.2000	± 0.5 KV D.IVI. [	FASS
Injected Currents on AC	EN 61547:1995		3 Vrms(emf) , 80 %,	
& Control Cable, 150 kHz to 80 MHz	+A1:2000	EN 61000-4-6:2007	1 kHz, Amp. Mod.	PASS
Voltage Dips	EN 61547:1995	EN 61000-4-11:2004	0 % U <sub>T</sub> * for 0.5 per	PASS
Vollage Dips	+A1:2000	EN 01000-4-11.2004	70 % U <sub>T</sub> * for 10 per	FASS

#### **REMARKS:**

 $^{\star}$  U<sub>T</sub> is the nominal supply voltage

† D.M. - Differential Mode

N/A: Not applicable. Please refer to Section 6.3 for further details.



Report No.: GLEMO09100321301

Page: 3 of 31

## 3 Contents

		Pi	age
1	COVE	R PAGE	••••
2	TEST	SUMMARY	2
3	CONT	TENTS	3
4	GENE	RAL INFORMATION	5
	4.1 CLIE	ENT INFORMATION	5
		NERAL DESCRIPTION OF E.U.T.	
	4.3 DET	FAILS OF E.U.T.	5
	4.4 DES	SCRIPTION OF SUPPORT UNITS	5
	4.5 TES	ST LOCATION	5
	4.6 TES	T FACILITY	6
	4.7 DEV	/IATION FROM STANDARDS	7
	4.8 ABN	ORMALITIES FROM STANDARD CONDITIONS	7
	4.9 Mon	NITORING OF EUT FOR ALL IMMUNITY TEST	7
5	EQUIP	PMENTS USED DURING TEST	8
6	EMICS	SION TEST RESULTS	44
·			
		NDUCTED EMISSIONS ON MAINS TERMINALS, 9 KHZ TO 30 MHZ	11
	6.1.1	E.U.T. Operation	.12
	6.1.2	Plan View of Test Setup	
	6.1.3	Measurement Data	
	0.2 MAH	MONICS TEST RESULTS	15
	6.3.1	E.U.T. Operation	
	6.3.2	Measurement Data	10
7		NITY TEST RESULTS	
	7.1 PER	FORMANCE CRITERIA DESCRIPTION IN CLAUSE 4.2 OF EN 61547	17
		CTROSTATIC DISCHARGE(ESD)	
	7.2.1	E.U.T. Operation	
	7.2.2	Test Results	18
		NATED IMMUNITY 80 MHz TO 1000 MHz	19
	7.3.1	E.U.T. Operation	
	7.3.2	Test Results:	19
		CTRICAL FAST TRANSIENTS (EFT)	20
	7.4.1 7.4.2	E.U.T. Operation	
		Test Results:	
	7.5 SUN	E.U.T. Operation	2 i
	7.5.2	Test Results:	

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Report No.: GLEMO09100321301

Page: 4 of 31

7.6 CONDUCTED IMMUNITY 0.15MHz TO 80MH	z22
7.6.1 E.U.T. Operation	
7.6.2 Test Results:	22
7.7 VOLTAGE DIPS AND INTERBUPTIONS	23
7.7.1 E.U.T. Operation	2
7.7.2 Test Results:	23
8 PHOTOGRAPHS	24
8.1 CONDUCTED EMISSION TEST SETUP	24
	24
8.3 ESD TEST SETUP	25
8.4 EFT. SURGE, VOLTAGE DIP AND INTERRUP	TIONS TEST SETUP25
8.5 CONDUCTED IMMUNITY TEST SETUP	
8.6 EUT CONSTRUCTIONAL DETAILS	27-3



Report No.: GLEMO09100321301

Page: 5 of 31

## 4 General Information

#### 4.1 Client Information

Applicant:

Address of Applicant:

#### 4.2 General Description of E.U.T.

EUT Name:

Laser Sphere

Item No.:

LP28-001

#### 4.3 Details of E.U.T.

Power Supply:

230V AC

Adapter Details:

Model: KA23A120025033K

Input: 230-240V 50Hz 35mA

Output: 12V 250mA

Power Cord:

1.8m x 2 wires unscreened DC cables.

#### 4.4 Description of Support Units

The EUT has been tested as an independent unit.

#### 4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, 198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,

Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



Report No.: GLEMO09100321301

Page: 6 of 31

#### 4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### NVLAP (Lab Code: 200611-0)

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

#### ACM A

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

#### • SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

#### CNAS (Lab Code: L0167)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

#### FCC (Registration No.: 282399)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

### Industry Canada (Registration No.: 4620B-1)

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

Date of Registration: February 18, 2009. Valid until February 18, 2011.

#### • VCCI (Registration No.: R-2460 and C-2584)

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460 and C-2584 respectively.

#### • CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01:2006-10 and Rules of procedure IECEE 02:2006-10, and the relevant IECEE CB-Scheme Operational documents.

This certificate was issued Dec.04.2006 and valid until Oct.12.2009.



Report No.: GLEMO09100321301

Page: 8 of 31

# 5 Equipments Used during Test

	Conducted Emissi	on					
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)	
EMC0306 Shielding Room		Zhong Yu	8 x 3 x 3.8 m <sup>3</sup>	N/A	N/A	N/A	
EMC0102	LISN	Schaffner Chase	MNZ050D/1	1421	14-12-2008	14-12-2009	
EMC0118	Two-line v-netwok	Rohde & Schwarz	ENV216	3560.6550.02	18-08-2009	18-08-2010	
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	14-12-2008	14-12-2009	
EMC0107	Coaxial Cable	SGS	2m	N/A	26-11-2008	26-11-2009	
EMC0106	Voltage Probe	SGS	N/A	N/A	N/A	N/A	
EMC0120	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	20550	21-02-2009	21-02-2010	
EMC0121	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	20549	21-02-2009	21-02-2010	
EMC0122	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	20548	21-02-2009	21-02-2010	

	Harmonics / Flicke	cker test							
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)			
EMC0608	AC Power Source	California	50001iX	56627	11-03-2009	11-03-2010			
EMC0607	Power Analyzer	California	PAXS-1	72400	11-03-2009	11-03-2010			

	Electrostatic Di	scharge					
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)	
EMC0809	EMC0809 ESD Simulator EM Test AG		M Test AG Dito V0735		08-10-2009	08-10-2010	
EMC0804	ESD Ground Plane	SGS	3m x 3m	N/A	N/A	N/A	
EMC0055	Temperature, & Humidity	Shenzhen Tuojia	T218	N/A	29-07-2009	29-07-2010	

	EFT, Surge, Voltage					
No:	Test Equipment	Manufacturer	anufacturer Model No.		Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC1010	EMC Immunity Test System	Thermo KeyTek	Pro-Plus	501276	14-12-2008	14-12-2009
EMC1005	Digital Oscilloscope	Tektronix	TDS3012	B015508	18-07-2009	18-07-2010



Report No.: GLEMO09100321301 Page: 9 of 31

	Radiated Immunity									
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)				
EMC0525	Compact 3m Semi- Anechoic Chamber	Changzhou zhongyu	N/A	N/A	N/A	N/A				
EMC0516	Signal Generator	Rohde & Schwarz	SMR20	100416	18-07-2009	18-07-2010				
EMC0915	Amplifier 20M-1GHz	EMPOWER	BBS2E4ALP	1007	11-03-2009	11-03-2010				
EMC0914	Amplifier 800M- 2.5GHz	EMPOWER	BBS3Q5KIN	1006	11-03-2009	11-03-2010				
EMC0904	Power Meter	Rohde & Schwarz	NRVS	825770/074	18-07-2009	18-07-2010				
EMC0905	Power Sensor	Rohde & Schwarz	NRV-Z5	825802/013	05-10-2009	04-10-2010				
EMC0917	Dual Directional Coupler	EMCA	715-10-1.400	070031	06-10-2009	06-10-2010				
EMC0907	Electric Field Probe	Wandel & Goltermann	EMC-20	M-0063	05-11-2008	05-11-2009				
EMC0908	Oscilloscope Type 485	Tektronix	485	B144408	N/A	N/A				
EMC0909	Monitor System	Mitsubish Corp.	M-0552AB	91510185	N/A	N/A				
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	08-10-2009	08-10-2010				

	Conducted Immunity									
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)				
EMC1101	Signal Generator	Rohde & Schwarz	SMY01	825675/016	18-12-2008	18-12-2009				
EMC1102	Amplifier 0.15-230MHz	Ophirrf	GRF5048	1003	11-03-2009	11-03-2010				
EMC1103	Power Meter	Rohde & Schwarz	NRVS	825770/079	18-07-2009	18-07-2010				
EMC0905	Power Sensor	Rohde & Schwarz	NRV-Z5	825802/013	18-07-2009	18-07-2010				
EMC1105	Dual Directional coupler	Werlatone Inc.	C1795	6635	24-11-2008	24-11-2009				
EMC0908	Oscilloscope Type 485	Tektronix	485	B144408	N/A	N/A				
EMC1108	CDN M3	Schaffner Chase	CDN-M3-16	9866	14-12-2008	14-12-2009				
EMC1107	CDN M2	Schaffner Chase	CDN-M2-16	9863	14-12-2008	14-12-2009				
EMC1120	Immunity S/W Ver 4.31	Schaffner Chase	CIS9942	WHHPKB	N/A	N/A				
EMC1116	Current Probe	Schaffner Chase	CIP9136	1155	25-11-2008	25-11-2009				
EMC1117	Current Probe	Schaffner Chase	CSP8445	18	25-11-2008	25-11-2009				



Report No.: GLEMO09100321301

Page: 10 of 31

	General used equipment									
No: Test Equipment		Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)				
EMC0006	DMM	Fluke	73	70681569	23-12-2008	23-12-2009				
EMC0007	DMM	Fluke	73	70671122	23-12-2008	23-12-2009				



Report No.: GLEMO09100321301

Page: 11 of 31

### 6 Emission Test Results

### 6.1 Conducted Emissions on Mains Terminals, 9 kHz to 30 MHz

Test Requirement:

EN 55015

Test Method:

EN 55015

Test Date:

15 October 2009

Frequency Range:

9 kHz to 30 MHz

Detector:

Peak for pre-scan

200 Hz resolution bandwidth between 9 kHz & 150 kHz 9 kHz resolution bandwidth between 150 kHz & 30 MHz

#### Limit:

Frequency range	Limits				
MHz	dB (µ	ıV) <sup>a</sup>			
	Quasi-peak	Average			
0.009 to 0.05	110				
0.05 to 0.150	90-80 <sup>b</sup>				
0.150 to 0.5	66-56 <sup>b</sup>	56-46 <sup>b</sup>			
0.5 to 5.0	56°	46 <sup>c</sup>			
5.0 to 30	60	50			

<sup>&</sup>lt;sup>a</sup> At the transition frequency, the lower limit applies.

The limit decreases linearly with the logarithm of the frequency in the ranges 50 kHz to 150 kHz and 150 kHz to 0,5 MHz.

 $<sup>^</sup>c$  For electrodeless lamps and luminaires, the limit in the frequency range of 2,51 MHz to 3,0 MHz is 73 dB(µV) quasi-peak and 63 dB(µV) average.



Report No.: GLEMO09100321301

Page: 12 of 31

#### 6.1.1 E.U.T. Operation

Operating Environment:

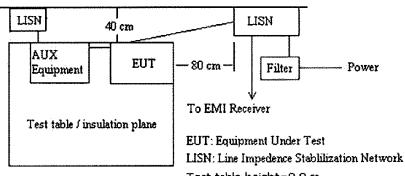
Temperature: 24.0 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

EUT Operation: Test the EUT in LED lighting mode.

Perform Peak-scan in on mode for EUT, Quasi-peak & average measurements were performed if peak emissions was detected within 6 dB of the average limit line.

#### 6.1.2 Plan View of Test Setup

#### Reference Plane



Test table height=0.8 m

#### 6.1.3 Measurement Data

An initial pre-scan was performed on the live and neutral lines in LED Lighting Mode at 230 V AC.

Quasi-peak & average measurements were performed on the live & neutral lines since peak emissions were detected within 6 dB of the average limit line.

Please see the attached peak measurement data for reference.

The following quasi-peak measurements were performed on the EUT:



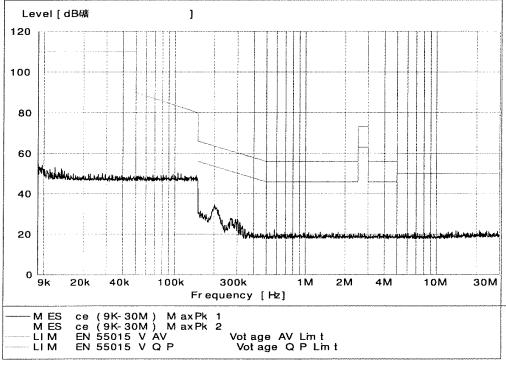
Report No.: GLEMO09100321301

Page: 13 of 31

Live Line:

Peak Scan:





Quasi-peak and Average measurement:

Frequency	Transducer	Receiver QP Reading	QP Level	Limit	Margin	Receiver AV Reading	AV Level	Limit	Margin
(MHz)	(dB)	(dBµV)	(dBµV)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dBµV)	(dB)
0.044	9.6	33.4	43.0	110.0	67.0	*	*	*	*
0.207	9.6	21.4	31.0	63.3	32.3	3.7	13.3	53.3	40.0
0.210	9.6	15.7	25.3	63.2	37.9	2.9	12.5	53.2	40.7
0.203	9.6	11.7	21.3	63.5	42.2	1.0	10.6	53.5	42.9
0.324	9.6	11.6	21.2	59.6	38.4	0.5	10.1	49.6	39.5
0.318	9.6	10.9	20.5	59.8	39.3	0.3	9.9	49.8	39.9



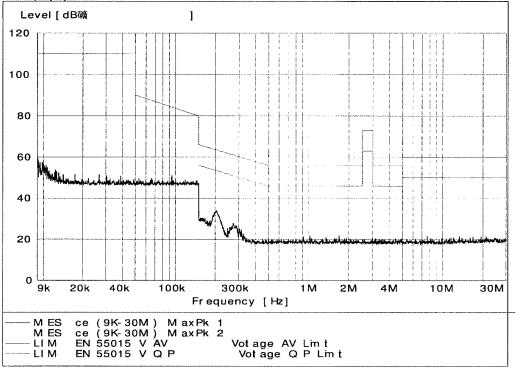
Report No.: GLEMO09100321301

Page: 14 of 31

#### **Neutral Line**

#### Peak Scan:

Level (dBµV)



Quasi-peak and Average measurement:

Frequency	Transducer	Receiver QP Reading	QP Level	Limit	Margin	Receiver AV Reading	AV Level	Limit	Margin
(MHz)	(dB)	(dBµV)	(dBµV)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dBµV)	(dB)
0.044	9.6	33.9	43.5	110.0	66.5	*	*	*	*
0.205	9.6	23.5	33.1	63.4	30.3	3.6	13.2	53.4	40.2
0.210	9.6	20.5	30.1	63.2	33.1	2.5	12.1	53.2	41.1
0.313	9.6	16.0	25.6	59.9	34.3	0.4	10.0	49.9	39.9
0.327	9.6	12.9	22.5	59.5	37.0	0.2	9.8	49.5	39.7
0.444	9.6	12.2	21.8	57.0	35.2	0.3	9.9	47.0	37.1

<sup>\*:</sup> Not requested by standards.



Report No.: GLEMO09100321301

Page: 15 of 31

#### 6.2 Harmonics Test Results

Test Requirement: EN 6

EN 61000-3-2

Test Method:

N/A: See Remark Below

Frequency range:

100Hz to 2kHz

There is no Harmonics limit applied to this LED light device whose rated power is less than 25 W in accordance with EN 61000-3-2:2006.



Report No.: GLEMO09100321301

Page: 16 of 31

#### 6.3 Flicker Test Results

Test Requirement:

EN 61000-3-3

Test Method:

EN 61000-3-3

Test Date:

20 October 2009

Class/Severity:

Clause 5 of EN 61000-3-3

Measurement Time:

10 min

Detector:

As per EN 61000-3-3

## 6.3.1 E.U.T. Operation

Operating Environment:

Temperature:

22.0 °C Humidity:

: 56% RH

Atmospheric Pressure:

1012 mbar

**EUT Operation:** 

Test the EUT in LED lighting mode.

#### 6.3.2 Measurement Data

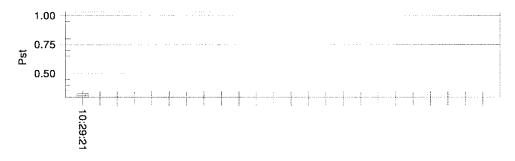
The following measurements were performed on the EUT:

#### Flicker Test Summary per EN/IEC61000-3-3 (Run time)

Test Result: Pass Status: Test Completed

#### Pst, and limit line

#### **European Limits**



#### Parameter values recorded during the test:

vrms at the end of test (Volt):	230.00			
Highest dt (%):	0.06	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.38	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.330	Test limit:	1.000	Pass



Report No.: GLEMO09100321301

Page: 17 of 31

## 7 Immunity Test Results

#### 7.1 Performance Criteria Description in Clause 4.2 of EN 61547

#### Criterion A:

During the test no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

#### Criterion B

During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min.

Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

#### Criterion C:

During and after the test any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.



Report No.: GLEMO09100321301

Page: 18 of 31

### 7.2 Electrostatic Discharge(ESD)

Test Requirement:

EN 61547

Test Method:

EN 61000-4-2

Criterion Required:

B

Test Date:

15 October 2009

Discharge Impedance:

330 Ω / 150 pF

Discharge Voltage:

Air Discharge:

2, 4, 8 kV

Contact Discharge:

2, 4 kV

VCP / HCP:

2, 4 kV

Polarity:

Positive & Negative

Number of Discharge:

Minimum 10 times at each test point

Discharge Mode:

Single Discharge

Discharge Period:

1 second minimum

### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature:

Humidity:

56% RH

Atmospheric Pressure:

1011 mbar

**EUT Operation:** 

Test the EUT in LED lighting mode.

#### 7.2.2 Test Results

### **Direct Application Test Results**

22.0 °C

Observations:

Test Point:

1. All insulated enclosure & seams.

2. All accessible metal parts of the enclosure.

Direct	Application	Test Results		
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge
2, 4, 8	+/-	1	N/A	Α
2, 4	+/-	2	Α	N/A

### **Indirect Application Test Results**

Observations:

Test Point:

1. All sides.

Indirect	Application	Test Results			
Discharge Level (kV) Polarity (+/-) Test Point			Horizontal Coupling Vertical Coupling		
2, 4	+/-	1	Α	А	

#### Results:

A: No degradation in the performance of the EUT was observed.

N/A: Not applicable (not requested by Standard)

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Report No.: GLEMO09100321301

19 of 31 Page:

### 7.3 Radiated Immunity 80 MHz to 1000 MHz

Test Requirement:

EN 61547

Test Method:

EN 61000-4-3

Criterion Required:

Test Date:

21 October 2009

Frequency Range:

80 MHz to 1 GHz 3 V/m on enclosure

Test level: Modulation:

80 %, 1 kHz Amplitude Modulation

### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature:

23.0 °C

55% RH Humidity:

Atmospheric Pressure: 1011 mbar

**EUT Operation:** Test the EUT in LED lighting mode.

#### 7.3.2 Test Results:

Frequency	Level	Modulation	EUT Face	Result / Observations	
			0° V	•	
			0° H	Α	
			90° V		
	3 V/m	1 kHz,	90° H	Α	
80 MHz-1 GHz	3 4/111	80 % Amp. Mod, 1 % increment	180° V		
			180° H	Α	
			270° V		
			270° H	Α	

#### Remarks:

A: No degradation in the performance of the E.U.T. was observed.



Report No.: GLEMO09100321301

Page: 20 of 31

#### 7.4 Electrical Fast Transients (EFT)

Test Requirement:

EN 61547

Test Method:

EN 61000-4-4

Criterion Required:

Test Date:

19 October 2009

Test Level:

0.5, 1.0 kV on AC

Polarity:

Positive & Negative

Repetition Frequency:

**Burst Duration:** 

5 kHz 300 ms

Test Duration:

2 minute per level & polarity

### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature:

25.0 °C

Humidity:

52% RH

Atmospheric Pressure:

1008 mbar

**EUT Operation:** 

Test the EUT in LED lighting mode.

## 7.4.2 Test Results:

AC Supply

Lead under Test	Level	Coupling	EUT operating	Observations
Leau unuer rest	(±kV)	Direct/Clamp	mode	(Performance Criterion)
Live & Neutral	± 0.5, 1.0	Direct	On Mode	No loss of function. (A)



Report No.: GLEMO09100321301

Page: 21 of 31

### 7.5 Surge

Test Requirement:

EN 61547

Test Method:

EN 61000-4-5

Criterion required::

C

Test Date:

19 October 2009

Test Level:

± 0.5 kV Live to Neutral

Polarity:

Positive & Negative

Generator source impedance:

2Ω

Trigger Mode:

Internal

No. of surges:

5 positive, 5 negative at 0°, 90°, 180°, 270°.

#### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0

Humidity:

52 % RH Atmospheric Pressure:

1008 mbar

EUT Operation: Test the EUT in LED lighting mode.

#### 7.5.2 Test Results:

Pulse No	Line- Line	Level (kV)	Surge Interval	Phase (deg)	Observation (Performance Criterion)
1–5	L-N	+0.5	60 s	0°	No loss of function.(A)
6–10	L-N	-0.5	60 s	0°	(A)
11–15	L-N	+0.5	60 s	90°	(A)
16–20	L-N	-0.5	60 s	90°	(A)
21–25	L-N	+0.5	60 s	180°	(A)
26–30	L-N	-0.5	60 s	180°	(A)
31–35	L-N	+0.5	60 s	270°	(A)
36-40	L-N	-0.5	60 s	270°	(A)



Report No.: GLEMO09100321301

Page: 22 of 31

### 7.6 Conducted Immunity 0.15MHz to 80MHz

Test Requirement:

EN 61547

Test Method:

EN 61000-4-6

Criterion Required:

Α

Test Date:

15 October 2009

Frequency Range:

0.15 MHz to 80 MHz

Test level:

3 V rms on AC Ports (unmodulated emf into 150  $\Omega$ )

Modulation:

80 %, 1 kHz Amplitude Modulation

## 7.6.1 E.U.T. Operation

Operating Environment:

Temperature:

Humidity:

41 % RH

Atmospheric Pressure: 1000 mbar

Test the EUT in LED lighting mode. EUT Operation:

### 7.6.2 Test Results:

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Observation (Performance Criterion)
150 kHz to 80 MHz	2 Wire AC Supply Cable	3 Vrms	80 %, 1kHz Amp. Mod.	1%	1 s	No Loss of Function (A)



Report No.: GLEMO09100321301

Page: 23 of 31

#### 7.7 Voltage Dips and Interruptions

Test Requirement:

EN 61547

Test Method:

EN 61000-4-11

Criterion Required:

30 % VD:C, 100 % VD:B

Test Date:

19 October 2009

Test Level:

 $0\ \%$  of  $U_T \mbox{(Supply Voltage)}$  for  $0.5\mbox{ Periods}$ 

70 % of U<sub>T</sub> (Supply Voltage) for 10 Periods

No. of Dips / Interruptions:

3 per Level

#### 7.7.1 E.U.T. Operation

Operating Environment:

25.0 °C

Temperature:

Humidity:

52% RH

Atmospheric Pressure:

1008 mbar

EUT Operation:

Test the EUT in LED lighting mode.

#### 7.7.2 Test Results:

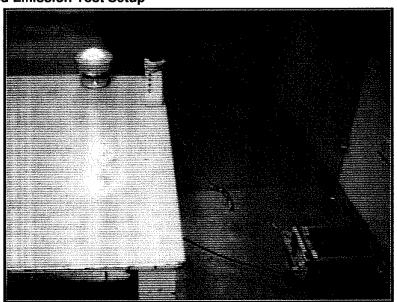
EUT operating modes	Test Level % U <sub>T</sub>	Phase	Duration of dropout in Periods	No of dropout	Time between dropout	Observations (Performance Criterion)
LED lighting mode	0	0°	0.5	3	10 s	No Loss of Function (A)
LED lighting mode	0	180°	0.5	3	10 s	No Loss of Function (A)
LED lighting mode	70	0°	10	3	10 s	No Loss of Function (A)



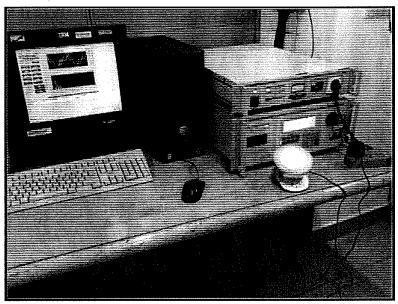
Report No.: GLEMO09100321301 Page: 24 of 31

#### **Photographs** 8

# 8.1 Conducted Emission Test Setup



## 8.2 Flicker Test Setup

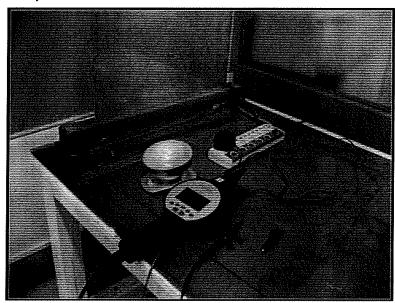


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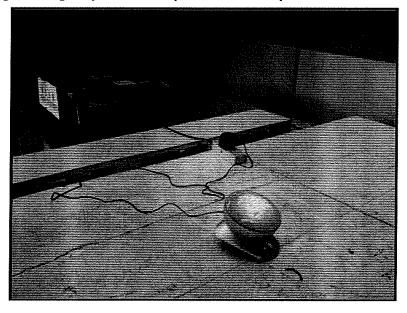


Report No.: GLEMO09100321301 Page: 25 of 31

## 8.3 ESD Test Setup



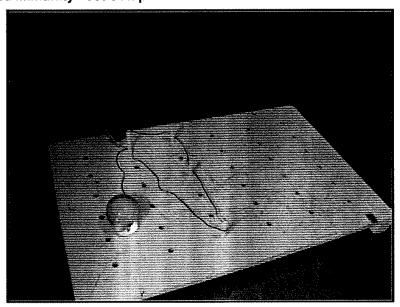
## 8.4 EFT, Surge, Voltage Dip and Interruptions Test Setup





Report No.: GLEMO09100321301 Page: 26 of 31

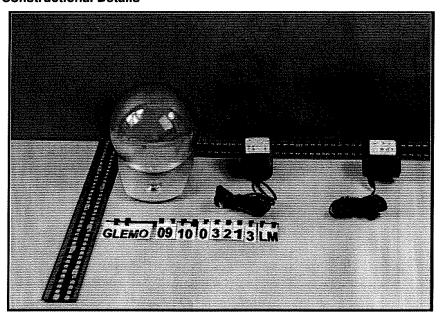
## 8.5 Conducted Immunity Test Setup

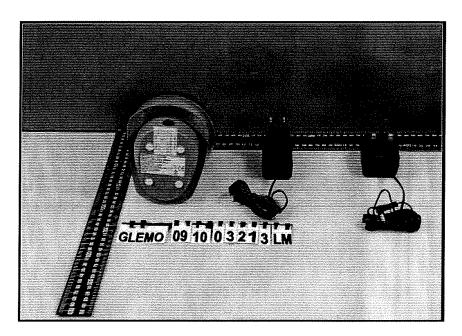




Report No.: GLEMO09100321301 Page: 27 of 31

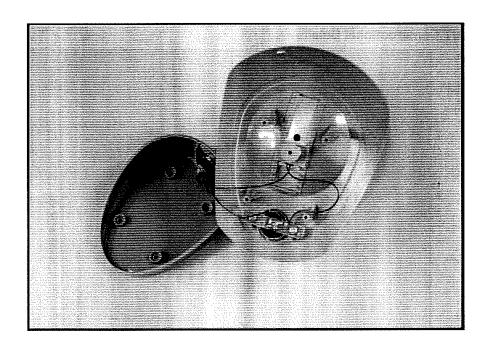
### 8.6 EUT Constructional Details

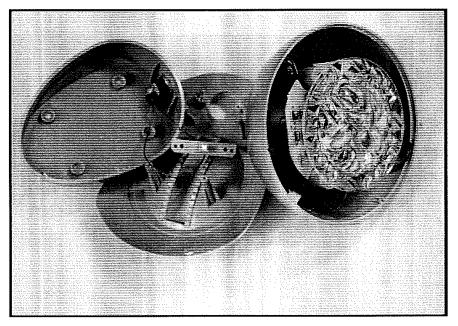






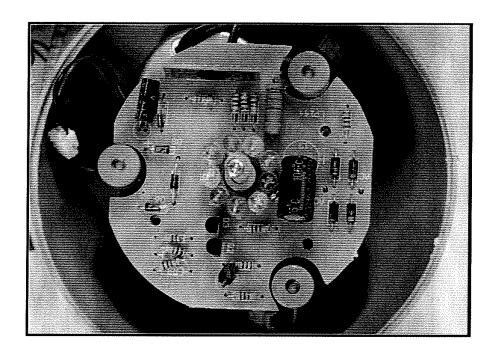
Report No.: GLEMO09100321301 Page: 28 of 31

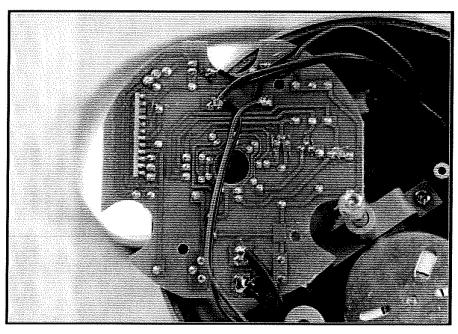






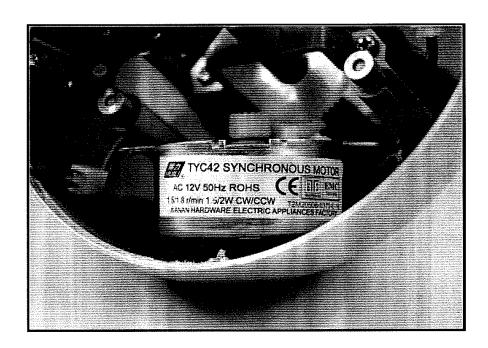
Report No.: GLEMO09100321301 Page: 29 of 31

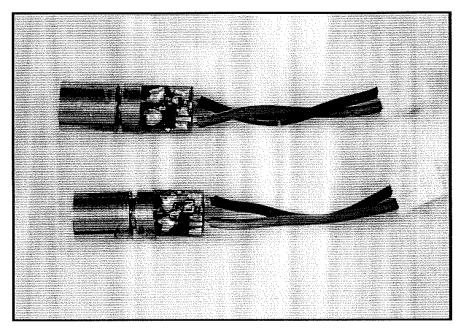






Report No.: GLEMO09100321301 Page: 30 of 31







Report No.: GLEMO09100321301 Page: 31 of 31

