

TEST REPORT

Application No.: SHEN2604000954LM
Applicant: Taizhou Taili Lighting Co., Ltd
Address of Applicant: 2nd floor, Unit 2, NO.11 Building, Caideg Park, Dongcheng Linhai, 317000
 Taizhou, Zhejiang Sheng, China
Manufacturer: Taizhou Taili Lighting Co., Ltd
Address of Manufacturer: 2nd floor, Unit 2, NO.11 Building, Caideg Park, Dongcheng Linhai, 317000
 Taizhou, Zhejiang Sheng, China
Factory: Taizhou Taili Lighting Co., Ltd
Address of Factory: 2nd floor, Unit 2, NO.11 Building, Caideg Park, Dongcheng Linhai, 317000
 Taizhou, Zhejiang Sheng, China
Equipment Under Test (EUT):
EUT Name: Christmas light
Model No.: Refer to page 2
Remark: Please refer to section 2 of this report which indicates which model was
 actually tested and which were electrically identical.
Standard(s) : EN IEC 55015: 2019+A11:2020
 EN IEC 61000-3-2: 2019 +A1:2021 +A2:2024
 EN 61000-3-3: 2013 +A1:2019 +A2:2021
 EN IEC 61547: 2023
Date of Receipt: 2026-04-24
Date of Test: 2026-04-27 to 2026-05-01
Date of Issue: 2026-05-07

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

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Model No.:

TLA_G_1200, TLA_S_100, TLA_F_500L, TLA_F_1000L, TLA_S_100_B, TLA_S_200_B, TLA_S_100_S,
TLA_S_200_S, TLA_S_100_X, TLA_I_306, TLA_I_360, TLA_I_432, TLA_I_486, TLA_I_594, TLA_C_300,
TLA_C_600, TLA_N_360, TLA_N_390, TLA_P_100, TLA_P_300, TLA_X_240, TLA_X_300, TLA_X_350,
TLA_X_480, TLA_X_552, TLA_O, TLA_C, TLA_B, TLA_X1_X2_X3

X1: represents the light string type: S light string, I is icicle light, C curtain light, N is net light, F is firecracker light, P leather wire light, X is other

X2: indicates the number of lights: 1-1199

X3: represents the appearance of colored lights: B: round ball, S: star, C6:

C6 shape light, C8: C8 shape light, SN: snowflake, X: other

For example, the adapter bare light string 100 lights: TLA_S_100



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

SGS-EN 1997-001 Rev. 02-Sept-1, 2020

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Revision Record			
Version	Description	Date	Remark
00	Original	2006-05-07	/

Authorized for issue by:				
Tested By				
		Lemon Zhang/Project Engineer		
Approved By				
		Parham Zhan / Reviewer		

2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (5kHz-30MHz)	EN IEC 55015: 2019+A11:2020	CISPR 16-2-1: 2014+A1:2017	Table 1	Pass
Radiated Emissions (30MHz-1GHz)		CISPR 16-2-3: 2018 +A1:2019 +A2:2023	Table 10	Pass
Radiated Emissions (Magnetic Field Induced Current)(5kHz-30MHz) 2m loop		CISPR 16-2-3: 2018 +A1:2019 +A2:2023	Table 8	Pass
Harmonic Current Emission	EN IEC 61000-3-2: 2019 +A1:2021 +A2:2024	EN IEC 61000-3-2: 2019 +A1:2021 +A2:2024	Class C	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3: 2013 +A1:2019 +A2:2021	EN 61000-3-3: 2013 +A1:2019 +A2:2021	Clause 5	Pass

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN IEC 61547: 2020	EN 61000-4-2: 2009	±4kV Contact Discharge, ±8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz)		EN IEC 61000-4-3: 2020	3V/m, 80%, 1kHz Amp. Mod, 1% increment	Pass
Electrical Fast Transients Burst at AC Mains Power Port		EN 61000-4-4: 2012	1kV, 5/50ns Tr/Td, 5kHz Repetition Frequency	Pass
Surge at Power Port		EN 61000-4-5: 2014+A1:2017	1.2/50µs Tr/Td, ±1.0kV Line to Line	Pass
Conducted Immunity at AC Mains Power Port (150kHz-80MHz)		EN IEC 61000-4-6: 2023	3V/rms (µmf), 80%, 1kHz Amp. Mod.	Pass
Voltage Dips and Interruptions		EN IEC 61000-4-11: 2020	0 % UT for 0.5cycle, 70 % UT for 10cycles, UT is Supply Voltage	Pass

Note1: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model TLA_C_1200 was tested since their differences were the model number, light string type, number of lights, shape light and the appearance of colored lights.

Note2: About the lighting mode, we test all operation mode for EUT, and choose the worst data in this report.

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4 General Information

4.1 Details of E.U.T.

Power supply:	For adapter: JT-ELIFC3TV7.2W-H8-IP44 Input: 220-240V~ 50-60Hz 0.12A Output: 51V~ 7.2W Test Voltage: 230V~ 50Hz Sample No.: SHEM2604002954UM-M1
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4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
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The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty & Decision Rule

Measurement Uncertainty:

No.	Item	Measurement Uncertainty (U_{rel})	U_{cov}
1	Conducted Emission at mains port using AMN	3.4dB (9kHz to 150kHz)	3.8dB (9kHz to 150kHz)
		2.9dB (150kHz to 30MHz)	3.4dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	2.2dB (9kHz to 30MHz)	2.9dB (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	4.6dB (150kHz to 30MHz)	5.0dB (150kHz to 30MHz)
4	Radiated Power	3.4dB (30MHz to 300MHz)	4.5dB (30MHz to 300MHz)
5	Radiated emission	5.7dB (30MHz-1GHz)	6.3dB (30MHz-1GHz)
		4.8dB (1GHz-6GHz)	5.2dB (1GHz-6GHz)
		5.0dB (6GHz-18GHz)	5.5dB (6GHz-18GHz)
6	Radiated disturbance (disturbance current in a LLA5)	2.6dB (9kHz to 30MHz)	3.3dB (9kHz to 30MHz)

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Decision Rule:

- CISPR 16-4-2 for emission measurements is as below described.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

U_{rel} less than U_{cov} , therefore:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab
568 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China
Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).
3. Sample source: sent by customer.

4.5 Test Facility

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

• **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• **IFCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.
Company Number: 8617A

• **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14306, T-12221, G-10600 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 EMS Monitor

Visual: Monitor the lamp lighting.

5 Equipment List

Conducted Emissions at Mains Terminals (30Hz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2025/12/17	2026/12/16
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2025/12/17	2026/12/16
Line impedance stabilization network	EMCO	3816_2	SHEM019-1	2025/12/17	2026/12/16
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM009-1	2025/12/17	2026/12/16
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2023/12/16	2026/12/16
CE test Cable	/	30Hz-30MHz	SHEM172-2	2025/12/17	2026/12/16
Passive Voltage probe	Rohde & Schwarz	ESH3-Z3	SHEM008-2	2025/12/17	2026/12/16
Capacitive Voltage Probe	SCHWARZBECK	CVP9222 B	SHEM169-1	2025/07/30	2026/07/29
Current Probe	SCHWARZBECK	SW9605	SHEM170-1	2025/07/30	2026/07/29
Test Software	ESE	e3	Version: 6.191211	N/A	N/A

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2025/12/17	2026/12/16
EMI test receiver	Rohde & Schwarz	ESR7	SHEM001-1	2025/07/30	2026/07/29
CONTROLLER	INCO	CO2000	SHEM047-1	N/A	N/A
ANTENNA MAST	INCO	MA400-EP	SHEM047-2	N/A	N/A
TURN DEVICE	INCO	DE 3600-RH	SHEM047-3	N/A	N/A
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VUL89168	SHEM048-1	2025/06/31	2027/06/30
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VUL89168	SHEM002-1	2025/04/12	2027/04/11
Semi/Fully Anechoic	ST	1116*16M	SHEM078-2	2026/04/28	2029/04/27
Pre-amplifier	HP	8447D	SHEM036-1	2025/12/17	2026/12/16
Pre-amplifier	HP	8447D	SHEM143-1	2025/12/17	2026/12/16
RE test Cable	/	/	SHEM217-2	2025/07/30	2026/07/29
Test Software	ESE	e3	Version: 6.191211	N/A	N/A
Semi/Fully Anechoic	TIANDI	9*6*6M	SHEM198-1	2024/05/06	2027/05/05

Radiated Emissions (Magnetic Field Induced Current)(30Hz-30MHz) 2m loop					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3-dimensional large loop antenna,diam.2m,acc	Rohde & Schwarz	HXY29170	SHEM017-1	2025/12/17	2026/12/16
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2025/12/17	2026/12/16
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM009-1	2025/12/17	2026/12/16
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2023/12/16	2026/12/16
Loop test Cable	/	30Hz-30MHz	SHEM180-1	2025/12/17	2026/12/16
Test Software	ESE	e3	Version: 6.191211	N/A	N/A

Harmonic Current Emission

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Harmonic&Flicker analyzer	AMETEK	PACS-1	SHEM004-2	2025/07/30	2026/07/29
AC Power Source 5KVA	AMETEK	5001IX	SHEM005-2	2025/07/30	2026/07/29
Test Software	AMETEK	CTS4	Version: 4.29.0	N/A	N/A
Harmonic&Flicker analyzer	EM TEST	DPA500	SHEM004-1	2025/07/30	2026/07/29
AC Power Source 6KVA	EM TEST	ACS500	SHEM005-1	2025/07/30	2026/07/29
Test Software	EM TEST	DPA	Version: 5.1.4	N/A	N/A
Harmonic & Flicker test system	DEWETRON	DEWE2-A4	SHEM074-1	2025/07/30	2026/07/29

Voltage Fluctuations and Flicker

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Harmonic&Flicker analyzer	AMETEK	PACS-1	SHEM004-2	2025/07/30	2026/07/29
AC Power Source 5KVA	AMETEK	5001IX	SHEM005-2	2025/07/30	2026/07/29
Test Software	AMETEK	CTS4	Version: 4.29.0	N/A	N/A
Harmonic&Flicker analyzer	EM TEST	DPA500	SHEM004-1	2025/07/30	2026/07/29
AC Power Source 6KVA	EM TEST	ACS500	SHEM005-1	2025/07/30	2026/07/29
Test Software	EM TEST	DPA	Version: 5.1.4	N/A	N/A
Harmonic & Flicker test system	DEWETRON	DEWE2-A4	SHEM074-1	2025/07/30	2026/07/29

Electrostatic Discharge

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Electrostatic Discharge Simulator	TESEQ	NSG 43T	SHEM041-2	2025/07/30	2026/07/29
Electrostatic Discharge Simulator	3CTEST	EDS20H	SHEM199-1	2026/01/12	2027/01/11
Electrostatic discharge simulator	EM TEST	etc	SHEM089-1	2026/02/06	2027/02/05
Electrostatic Discharge Simulator	PRIMA	PESD-30T1	SHEM001-1	2025/12/17	2026/12/16

Radiated Immunity (30MHz-1GHz)

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMR100A	SHEM194-1	2025/12/17	2026/12/16
Power Meter	Rohde & Schwarz	NRP	SHEM067-1	2025/07/30	2026/07/29
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM067-4	2025/07/30	2026/07/29
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Antenna	SCHWARZBECK	STLP9149	SHEM131-1	N/A	N/A
Amplifier	MILMEGA	AS0845-55-55	SHEM133-1	2025/12/17	2026/12/16
Amplifier	MILMEGA	80RF1000-250	SHEM132-1	2025/12/17	2026/12/16
Amplifier	Rohde & Schwarz	BBA150-E60	SHEM171-1	2025/12/17	2026/12/16

ElectroMagnetic Field Probe	ETS-Lindgren	HE-8105	SHEM134-1	2025/08/05	2026/08/04
Semi/Fully Anechoic	ST	11'6"6M	SHEM076-2	2026/04/28	2029/04/27
Test Software	Rohde & Schwarz	EMC32	Version: 10.20.01	N/A	N/A
Power meter sensor	Rohde & Schwarz	NRP-291	SHEM057-5	2025/12/17	2026/12/16

Electrical Fast Transients Burst at AC Mains Power Port

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2025/12/17	2026/12/16
Test Software	EMC-PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM024-1	2025/07/30	2026/07/29
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM024-3	2025/07/30	2026/07/29
EFT & Surge Generator	PRIMA	PRM51045TB	SHEM200-1	2025/09/23	2026/09/22
CDN for EFT & Surge	PRIMA	PRM-CDN	SHEM200-2	2025/09/23	2026/09/22

Surge at Power Port

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2025/12/17	2026/12/16
Test Software	EMC-PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM024-1	2025/07/30	2026/07/29
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM024-3	2025/07/30	2026/07/29
EFT & Surge Generator	PRIMA	PRM51045TB	SHEM200-1	2025/09/23	2026/09/22
CDN for EFT & Surge	PRIMA	PRM-CDN	SHEM200-2	2025/09/23	2026/09/22
CDN for unsymmetrical interconnection lines (1.2/50us)	SCHAFFNER	CDN 117	SHEM024-5	2025/07/30	2026/07/29

Conducted Immunity at AC Mains Power Port (150kHz-80MHz)

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMB100A	SHEM194-1	2025/12/17	2026/12/16
Power Amplifier	HAEFFLY	PAMP250	SHEM023-1	2025/12/17	2026/12/16
6dB Attenuator	HUAXIANG	DT550-6dB-1Q-A	SHEM123-2	2025/12/17	2026/12/16
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2025/07/30	2026/07/29
Power meter sensor	Rohde & Schwarz	NRP-291	SHEM057-4	2025/07/30	2026/07/29
Coupling and Decoupling Network (CDN)	LUTHI	L-801 M1	SHEM023-5	2025/12/17	2026/12/16
Coupling and Decoupling Network (CDN)	LUTHI	L-801 M2/M3	SHEM023-6	2025/12/17	2026/12/16
Shielding Room	ZHONGYU	5'3"3M	SHEM079-6	2025/12/17	2026/12/16
Coupling and Decoupling Network	Teseq	CDN M016	SHEM168-1	2025/07/30	2026/07/29

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Test Software	Rohde & Schwarz	EMC32	Version: 10.20.01	N/A	N/A
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-5	2025/12/17	2026/12/16
Current Injection Probe	PRANA	IP-DR250	SHEM273-1	2025/12/17	2026/12/16
Test System for Conducted Immunity	TESEQ	NSG 4070	SHEM295-1	2025/12/17	2026/12/16

Voltage Dips and Interruptions

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2025/12/17	2026/12/16
Test Software	EMC-PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM234-1	2025/07/30	2026/07/29
Coupling / Decoupling Network (CDN)	TESEQ	CCN 3061	SHEM234-3	2025/07/30	2026/07/29
Manual step transformer	TESEQ	INA 6501	SHEM234-4	2025/07/30	2026/07/29

General used equipment

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Atmospheric Pressure Meter	Nanjing XiangRuiDe	DY1M3	SHEM082-2	2024/01/18	2027/01/17
Temperature&humidity recorder	Shanghai weather meter work	ZJ 1-2B	SHEM042-9-10	2025/12/18	2026/12/17
Temperature&humidity recorder	Shanghai weather meter work	ZJ 1-2B	SHEM042-5	2025/07/09	2026/07/08
Digital Temperature& humidity recorder	Jianda Ranku	RS-WS-N01-6J	SHEM247-1-6	2025/12/29	2026/12/28
Digital Multimeter	FLUKE	17B+	SHEM271-7	2025/07/07	2026/07/06
AC Power Supply	APC	KDF-31020T-V0-F0-10	SHEM216-1	2025/12/17	2026/12/16
DC Power Supply	HP	6010A	SHEM223-1	2025/12/17	2026/12/16
Multi-purpose long tester	FLUKE	317	SHEM001-2	2025/10/23	2026/10/22

6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (9kHz-30MHz)

Test Requirement: EN IEC 55015: 2019+A11:2020

Test Method: CISPR 16-2-1: 2014+A1:2017

Limit:

0.009MHz – 0.05MHz 115dB(μV) quasi-peak

0.05MHz – 0.15MHz 90dB(μV)-80dB(μV) quasi-peak

0.15MHz – 0.5MHz 65dB(μV)-55dB(μV) quasi-peak, 55dB(μV)-45dB(μV) average

0.5MHz – 5MHz 55dB(μV) quasi-peak, 45dB(μV) average

5MHz – 30MHz 60dB(μV) quasi-peak, 50dB(μV) average

Detector: Peak for pre-scan (200Hz resolution bandwidth) 0.009MHz to 0.15MHz

Peak for pre-scan (9kHz resolution bandwidth) 0.15MHz to 30MHz

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 21.6 °C

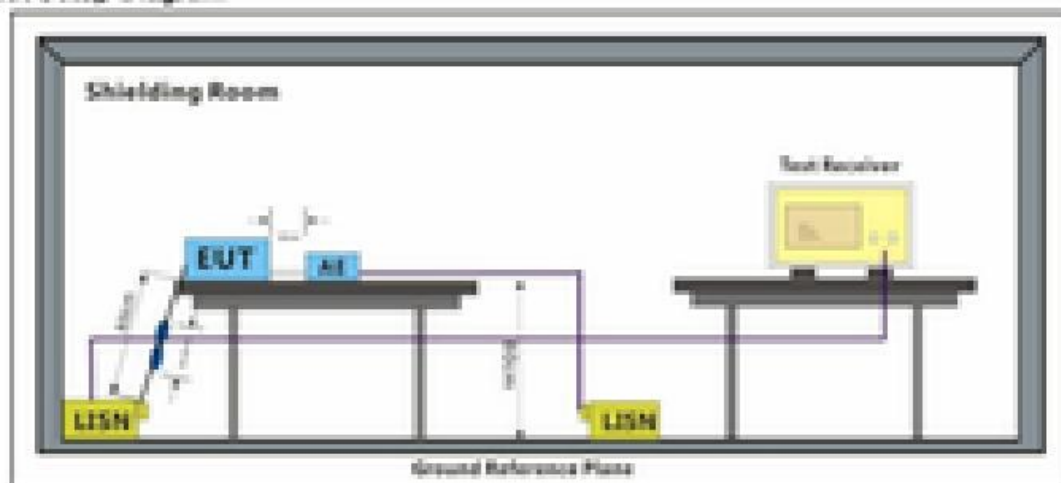
Humidity: 59.8 % RH

Atmospheric Pressure: 1008 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

6.1.3 Test Setup Diagram



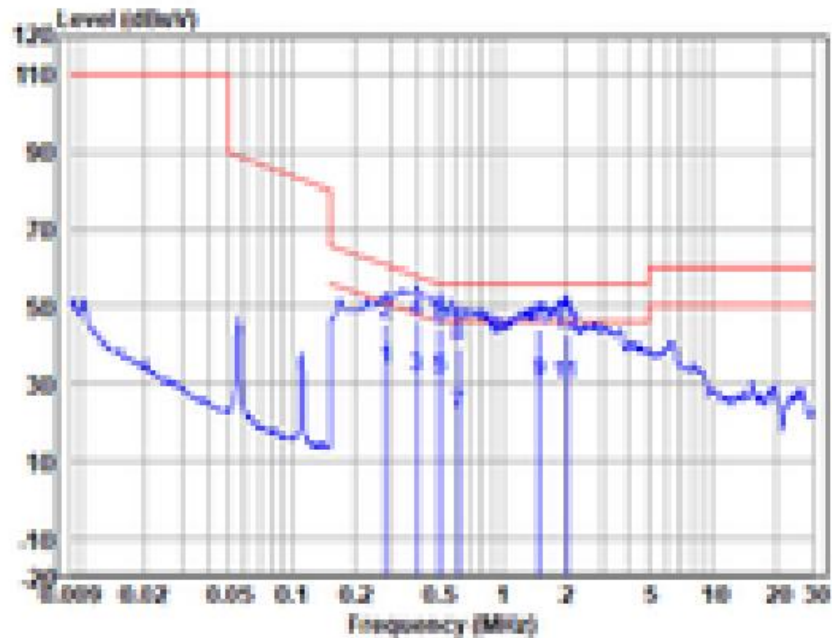
6.1.4 Measurement Procedure and Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

The red line show in graphic is the limit in standard used in this section.

Remark: Level= Read Level+ Cable Loss+ LISN Factor

Test Mode: 00; Line: Live line



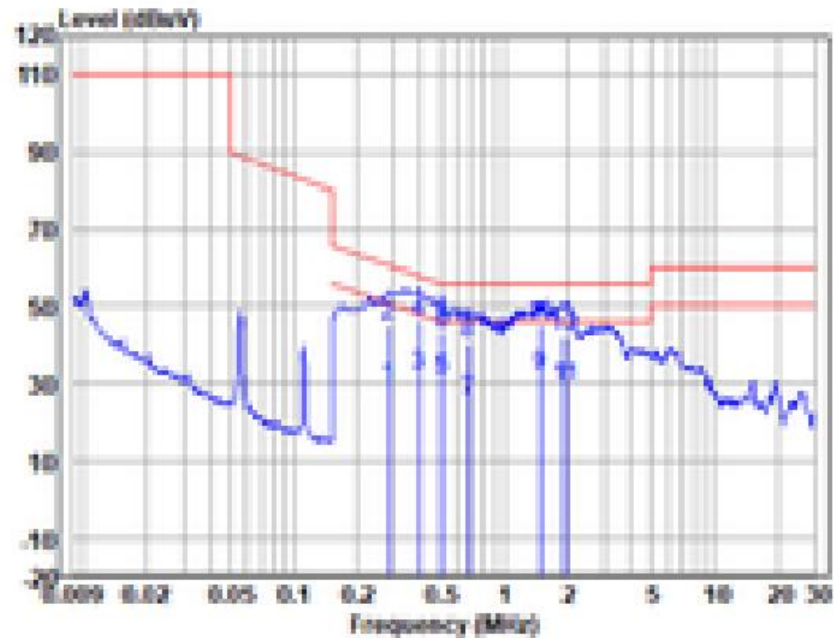
LISN : LINE
EUT/Project No : 2954LM
Test Mode : 00

	Freq (MHz)	Read Level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.20	23.85	-0.10	9.90	33.85	50.81	-16.96	Average
2	0.20	25.41	-0.10	9.90	45.41	60.81	-15.40	QP
3	0.50	21.75	-0.10	9.90	31.75	47.99	-16.24	Average
4	0.50	26.33	-0.10	9.90	46.33	57.99	-11.66	QP
5	0.50	21.17	-0.10	9.90	31.17	46.99	-15.83	Average
6	0.50	24.80	-0.10	9.90	44.81	56.99	-12.19	QP
7	0.62	21.84	-0.10	9.90	31.84	46.99	-15.16	Average
8	0.62	29.34	-0.10	9.90	39.34	56.99	-17.66	QP
9	1.51	29.87	-0.10	9.90	39.87	46.99	-7.13	Average
10	1.51	24.21	-0.10	9.90	44.21	56.99	-12.79	QP
11	1.81	19.59	-0.10	9.90	29.59	46.99	-17.41	Average
12	1.81	32.59	-0.10	9.90	42.59	56.99	-14.41	QP

Notes1: Emission Level = Read Level + LISN Factor + Cable loss

Notes2: Average in Remark means CISPR AV detector

Test Mode: 00; Line: Neutral Line



LISN : NEUTRAL
EUT/Project No : 2954LM
Test Mode : 00

	Freq (MHz)	Read Level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.20	19.21	-0.10	9.90	19.21	50.72	-31.51	Average
2	0.20	25.29	-0.10	9.90	45.29	50.72	-5.43	QP
3	0.30	22.06	-0.10	9.90	32.06	47.99	-15.93	Average
4	0.30	35.92	-0.10	9.90	45.92	57.99	-12.07	QP
5	0.50	21.83	-0.10	9.90	31.83	46.00	-14.17	Average
6	0.50	32.94	-0.10	9.90	42.94	56.00	-13.06	QP
7	0.60	15.45	-0.10	9.90	25.45	46.00	-20.55	Average
8	0.60	30.23	-0.10	9.90	40.23	56.00	-15.77	QP
9	1.50	22.42	-0.10	9.90	32.42	46.00	-13.58	Average
10	1.50	34.85	-0.10	9.90	44.85	56.00	-11.15	QP
11	1.90	19.09	-0.10	9.90	29.09	46.00	-16.91	Average
12	1.90	31.82	-0.10	9.90	41.82	56.00	-14.18	QP

Notes1: Emission Level = Read Level + LISN Factor + Cable loss

Notes2: Average in Remark means CISPR AV detector

6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN IEC 55015: 2019+A11:2020
Test Method: CISPR 16-2-3: 2018 +A1:2019 +A2:2023

Limit:

Test Distance:	3m
30MHz-230MHz:	40 dB(μ V/m) quasi-peak
230MHz-1GHz:	47 dB(μ V/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz
Test Distance:	10m
30MHz-230MHz:	30 dB(μ V/m) quasi-peak
230MHz-1GHz:	37 dB(μ V/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

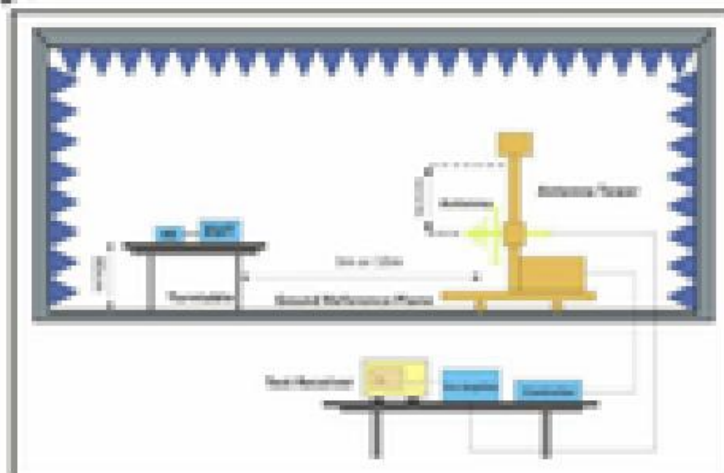
6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 22.5 °C Humidity: 51.2 % RH Atmospheric Pressure: 1020 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

6.2.3 Test Setup Diagram



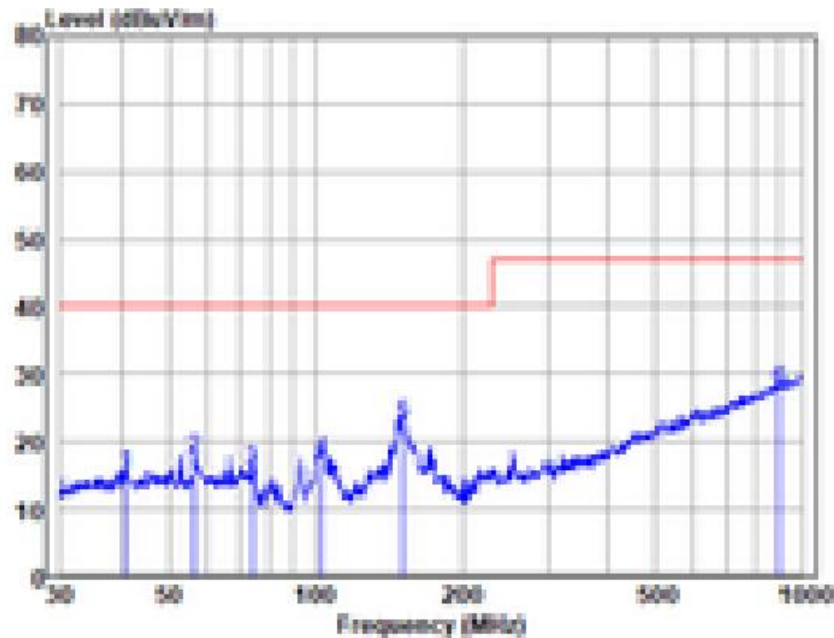
6.2.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

The red line show in graphic is the limit in standard used in this section.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Test Mode: 00; Polarity: Horizontal

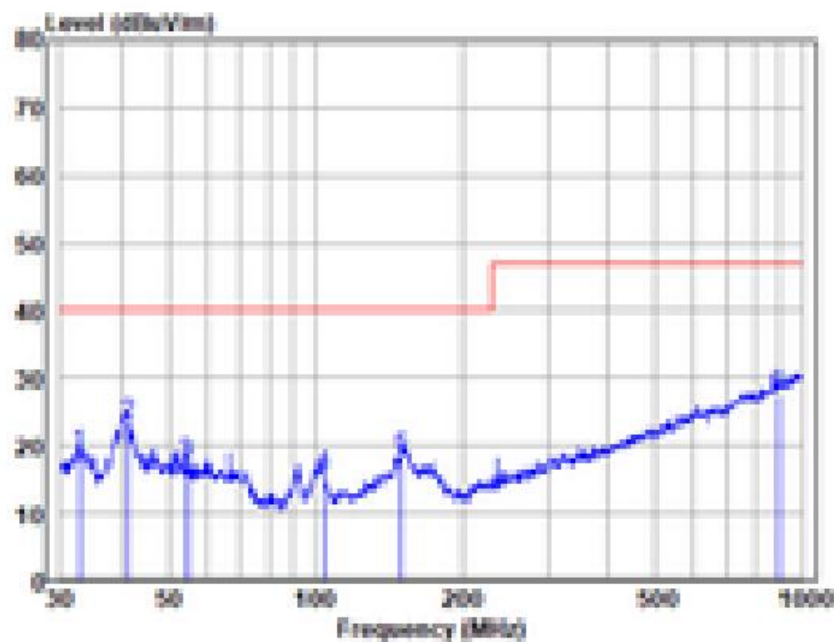


Antenna Polarity : HORIZONTAL
EUT/Project : 295-ELM
Test mode : 00

	Freq	Read Level	Antenna Factor	AUX Factor	Cable Loss	Preamp Factor	Exclusion Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	40.843	27.99	13.25	5.88	1.28	33.28	15.81	40.00	-24.99	QP
2	56.395	29.35	12.98	5.88	1.51	33.13	17.37	40.00	-22.63	QP
3	74.396	31.85	18.18	5.88	1.73	33.18	15.88	40.00	-24.34	QP
4	183.888	32.88	9.63	5.88	2.83	33.89	17.17	40.00	-22.83	QP
5	153.597	33.76	13.56	5.88	2.55	33.88	12.47	40.00	-17.53	QP
6	908.147	23.13	23.58	5.98	6.68	31.68	17.53	47.00	-19.47	QP

Note: Exclusion Level = Read Level - Antenna Factor - Cable Loss - Preamp Factor - AUX Factor

Test Mode: 00; Polarity: Vertical



Antenna Polarity : VERTICAL
EUT/Project : 2954LM
Test mode : 00

	Freq	Read Level	Antenna Factor	AUX Factor	Cable Loss	Preamp Factor	Exclusion Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	32.749	32.59	12.58	5.88	1.15	33.28	18.84	40.00	-21.16	QP
2	43.277	34.86	13.24	5.88	1.29	33.28	23.19	40.00	-16.81	QP
3	54.452	38.38	13.13	5.88	1.47	33.15	17.55	40.00	-22.45	QP
4	184.536	31.38	9.77	5.88	2.86	33.89	15.64	40.00	-24.36	QP
5	158.813	29.38	13.58	5.88	2.53	33.88	18.21	40.00	-21.79	QP
6	893.857	23.38	23.99	5.88	6.56	31.62	27.51	47.00	-19.49	QP

Note: Exclusion Level = Read Level - Antenna Factor - Cable Loss - Preamp Factor + AUX Factor

6.3 Radiated Emissions (Magnetic Field Induced Current)(9kHz-30MHz) 2m loop

Test Requirement: EN IEC 55015: 2019+A11:2020
 Test Method: CISPR 16-2-3: 2018 +A1:2019 +A2:2023

Limit:

0.009MHz-0.07MHz 55dB(μA) quasi-peak
 0.07MHz-0.15MHz 55dB(μA)-55dB(μA) quasi-peak
 0.15MHz-3MHz 55dB(μA)-22dB(μA) quasi-peak
 3MHz-30MHz 22dB(μA) quasi-peak

Detector: Peak for pre-scan (200Hz resolution bandwidth) 0.009M to 0.15MHz
 Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.3.1 E.U.T. Operation

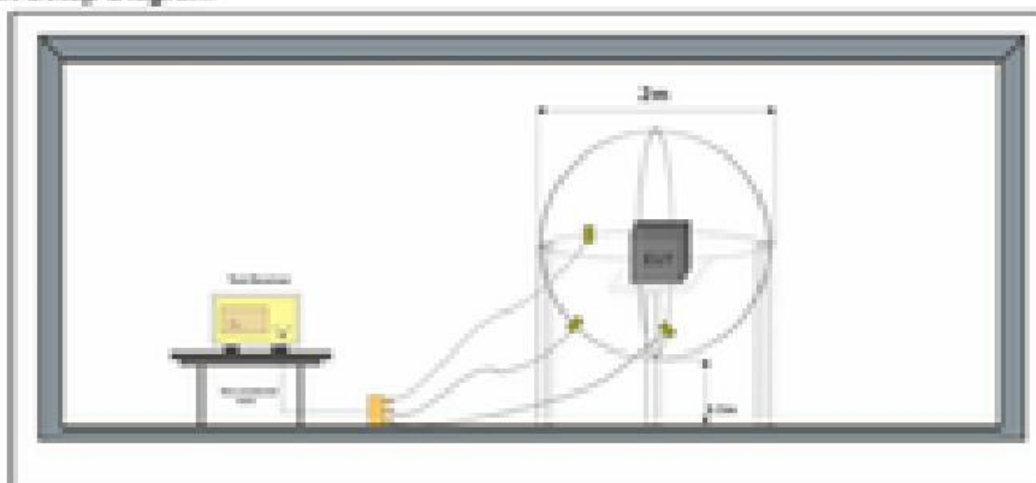
Operating Environment:

Temperature: 21.5 °C Humidity: 59.8 % RH Atmospheric Pressure: 1008 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

6.3.3 Test Setup Diagram



6.3.4 Measurement Procedure and Data

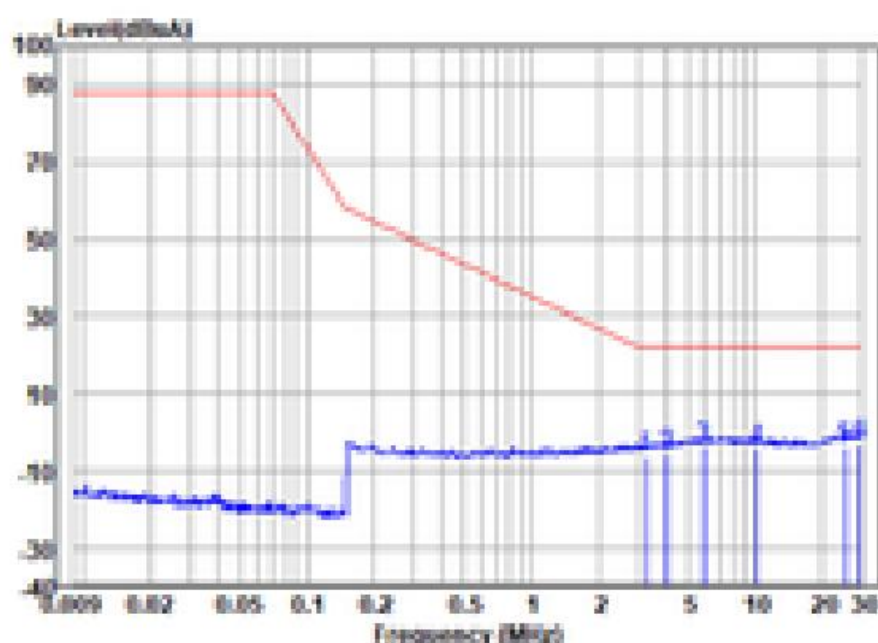
Frequency range: 9kHz-30MHz

An initial pre-scan was performed in the 2m loop antenna using the spectrum analyser in peak detection mode. The EUT was measured for X(A), Y(B), Z(C) polarities.

The red line show in graphic is the limit in standard used in this section.

Measured Level= Read Level + Cable Loss + Antenna Factor(if applicable)

Test Mode: 00; Axial X



EUT/Project No : 2954LM

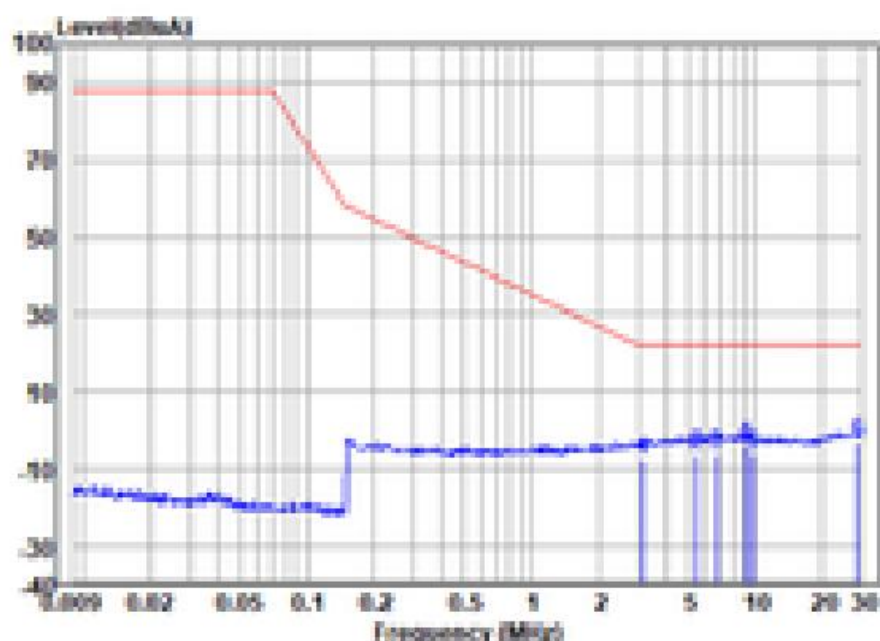
Test Mode : 00

: X

	Freq (MHz)	Read Level (dBuA)	Cable Loss (dB)	Emission Level (dBuA)	Limit (dBuA)	Over Limit (dB)	Remark
1	3.25	-6.79	0.15	-6.55	22.00	-28.55	QP
2	4.85	-5.99	0.18	-5.81	22.00	-27.81	QP
3	5.92	-4.28	0.25	-4.03	22.00	-26.03	QP
4	18.28	-4.74	0.31	-4.43	22.00	-26.43	QP
5	25.38	-4.42	0.58	-3.92	22.00	-25.92	QP
6	29.52	-3.89	0.58	-3.31	22.00	-25.31	QP

Notes: Emission Level = Read Level + Cable loss

Test Mode: 00; Axial Y

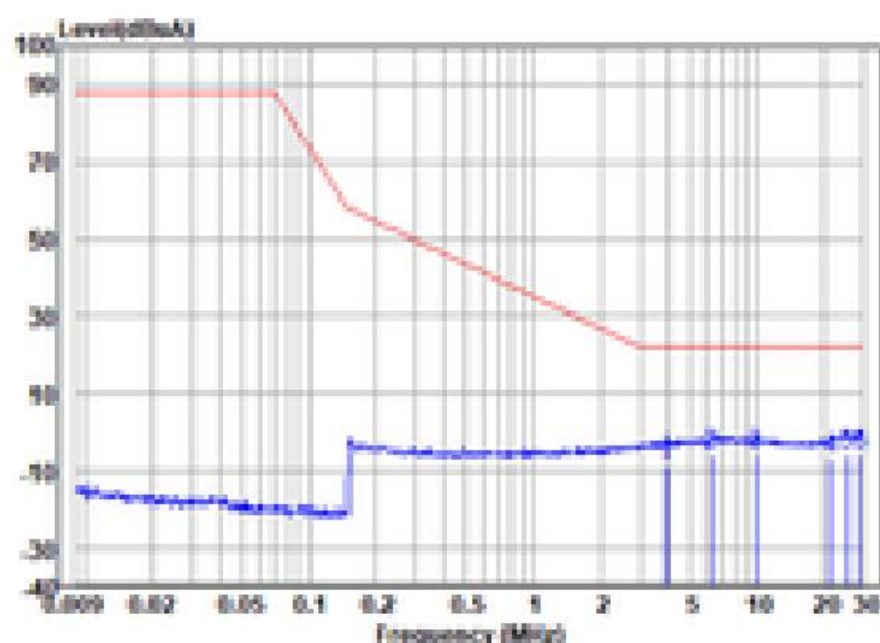


EUT/Project No : 2954LM
Test Mode : 00
: Y

	Freq (MHz)	Read Level (dBuA)	Cable Loss (dB)	Emission Level (dBuA)	Limit (dBuA)	Over Limit (dB)	Remark
1	3.17	-8.82	0.15	-7.87	22.00	-29.87	QP
2	5.51	-6.79	0.23	-6.47	22.00	-28.47	QP
3	6.69	-6.53	0.29	-6.24	22.00	-28.24	QP
4	9.18	-4.58	0.38	-4.28	22.00	-26.28	QP
5	9.79	-6.63	0.38	-6.33	22.00	-28.33	QP
6	29.84	-3.81	0.57	-3.24	22.00	-25.24	QP

Notes: Emission Level = Read Level + Cable loss

Test Mode: 00; Axial-Z



EUT/Project No : 2954LM

Test Mode : 00

: Z

	Freq (MHz)	Read Level (dBuA)	Cable Loss (dB)	Emission Level (dBuA)	Limit (dBuA)	Over Limit (dB)	Remark
1	3.92	-9.85	0.17	-8.88	22.00	-30.88	QP
2	6.27	-6.38	0.27	-5.83	22.00	-27.83	QP
3	9.87	-6.28	0.30	-5.98	22.00	-27.98	QP
4	21.34	-7.23	0.50	-6.73	22.00	-28.73	QP
5	25.30	-6.59	0.50	-6.09	22.00	-28.09	QP
6	28.81	-6.59	0.50	-6.09	22.00	-28.09	QP

Notes: Emission Level = Read Level + Cable loss

6.4 Harmonic Current Emission

Test Requirement: EN IEC 61000-3-2: 2019 +A1:2021 +A2:2024

Test Method: EN IEC 61000-3-2: 2019 +A1:2021 +A2:2024

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.1 °C

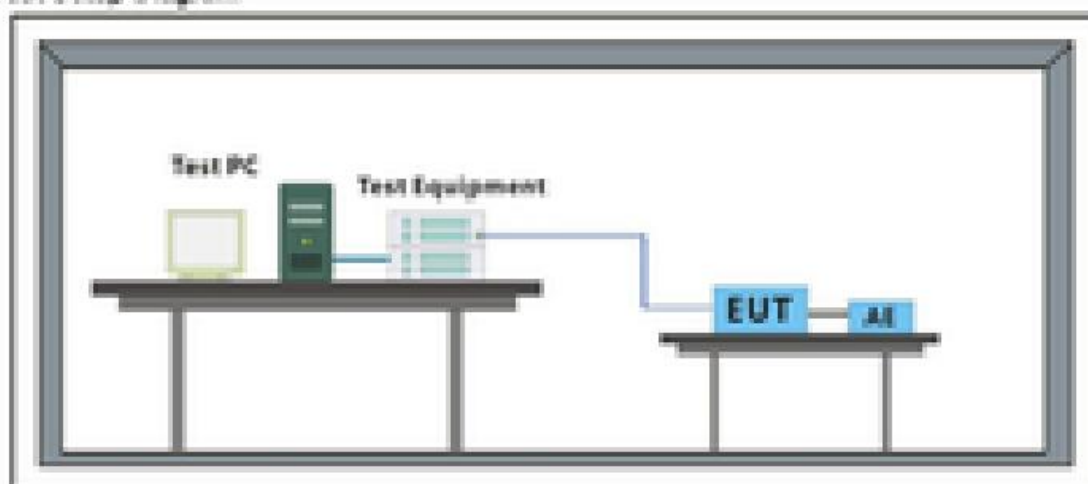
Humidity: 51.2 % RH

Atmospheric Pressure: 1018 mbar

6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

6.4.3 Test Setup Diagram



6.4.4 Measurement Procedure and Data

Frequency Range: 100Hz to 2kHz

Test Mode: 00

THD(A): 0.037 I-THD(%) : 85.9 PCHC: N/A PCHC Limit: N/A

Highest parameter values during test:

V _{RMS} (Volts):	230.32	Frequency (Hz):	50.00
I _{Peak} (Amps):	0.172	I _{RMS} (Amps):	0.060
I _{Fund} (Amps):	0.043	Crest Factor:	3.306
Power (Watts):	8.9	Power Factor:	0.664

Peak current (I_{peak}) = -172.49 mA (172.49 mA absolute)

Peak current max. phase angle = 58 degree (Pos)

Pass

Min. Current at 60 deg (I₆₀) = 125.45 mA (Pos)

Limit = 8.62 mA

Pass

Min. Current at 90 deg (I₉₀) = 45.94 mA (Pos)

Limit = 8.62 mA

Pass

I_{h3} : 29.60 Limit : 37.18

Pass

I_{h5} : 17.21 Limit : 26.37

Pass

Harmon#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.079	0.461	17.16	OK
3	0.326	2.072	15.71	OK
4	0.043	0.461	9.23	OK
5	0.057	0.921	6.21	OK
6	0.023	0.461	4.99	OK
7	0.029	0.691	4.22	OK
8	0.011	0.461	2.43	OK
9	0.020	0.461	4.26	OK
10	0.014	0.460	2.95	OK
11	0.009	0.230	3.90	OK
12	0.015	0.230	6.46	OK
13	0.008	0.230	3.57	OK
14	0.007	0.230	2.87	OK
15	0.012	0.230	5.27	OK
16	0.006	0.230	2.70	OK
17	0.005	0.230	2.02	OK
18	0.008	0.230	3.42	OK
19	0.007	0.230	3.16	OK
20	0.012	0.230	5.14	OK
21	0.007	0.230	3.00	OK
22	0.005	0.230	2.00	OK
23	0.009	0.230	4.12	OK
24	0.004	0.230	1.91	OK
25	0.012	0.230	5.10	OK
26	0.004	0.230	1.90	OK
27	0.012	0.230	5.09	OK
28	0.004	0.230	1.62	OK
29	0.008	0.230	3.57	OK
30	0.004	0.230	1.63	OK
31	0.005	0.230	1.96	OK
32	0.003	0.230	1.44	OK
33	0.005	0.230	2.18	OK
34	0.003	0.230	1.45	OK
35	0.005	0.230	2.03	OK
36	0.003	0.230	1.32	OK
37	0.004	0.230	1.75	OK
38	0.003	0.230	1.24	OK
39	0.005	0.230	2.11	OK
40	0.007	0.230	3.01	OK

6.5 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3: 2013 +A1:2019 +A2:2021

Test Method: EN 61000-3-3: 2013 +A1:2019 +A2:2021

6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.1 °C

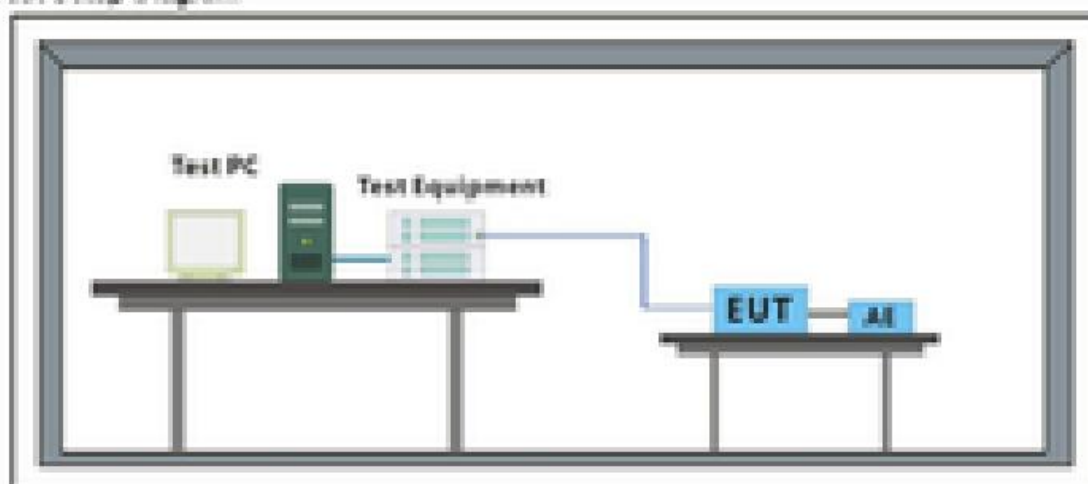
Humidity: 51.2 % RH

Atmospheric Pressure: 1018 mbar

6.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

6.5.3 Test Setup Diagram



6.5.4 Measurement Procedure and Data

Test Mode: 00

Vrms at the end of test (Volt):

230.00

T-max (mS): 0

Test limit (mS): 500.0

Pass

Highest di (%): 0.00

Test limit (%): 3.30

Pass

Highest dmax (%): 0.00

Test limit (%): 4.00

Pass

7 Immunity Test Results

Performance Criteria Description in EN IEC 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.

7.1.4 Test Condition and Results:

Performance Criterion: B for other than Road and street lighting equipment;

Performance Criterion: C for Road and street lighting equipment;

Discharge Impedance: 330 Ω / 150 pF

Discharge Voltage: Air Discharge: $\pm 2, 4, 8$ kV; Contact Discharge: ± 4 kV; VDP/HCP: ± 4 kV for other than Road and street lighting equipment;

Air Discharge: $\pm 2, 4, 8, 15$ kV; Contact Discharge: $\pm 4, 8$ kV; VDP/HCP: $\pm 4, 8$ kV for Road and street lighting equipment;

Polarity: Positive & Negative

Number of Discharge: Minimum 10 times at each test point

Discharge Mode: Single Discharge

Discharge Period: 1 second minimum

Test Point 1: All insulated enclosure & seams.

Test Point 2: All accessible metal parts of the enclosure.

Test Point 3: All sides.

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

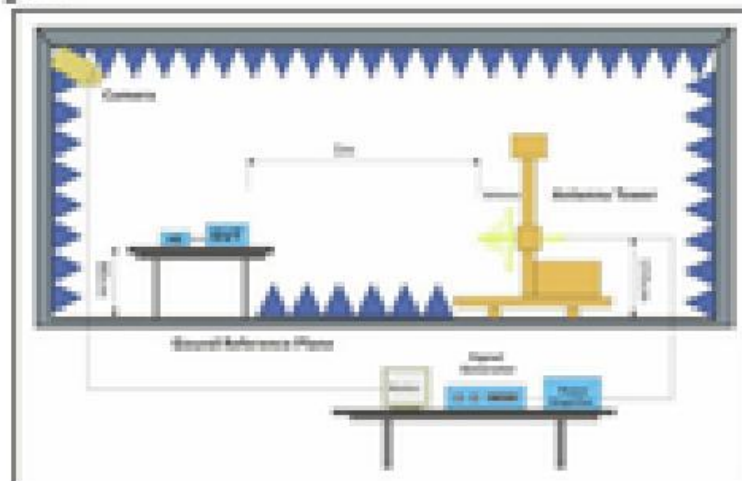
A: No degradation in the performance of the EUT was observed

7.2 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN IEC 61547: 2023

Test Method: EN IEC 61000-4-3: 2020

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 23.2 °C

Humidity: 51.4 % RH

Atmospheric Pressure: 1017 mbar

7.2.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

7.2.4 Test Condition and Results:

Performance Criterion:A

Frequency Range:80MHz to 1GHz

Test Distance:3m

Antenna Polarisation:Vertical and Horizontal

Modulation1kHz,80% Amp. Mod,1% increment

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	3s	A
80MHz-1GHz	3	Back	3s	A
80MHz-1GHz	3	Left	3s	A
80MHz-1GHz	3	Right	3s	A
80MHz-1GHz	3	Top	3s	A
80MHz-1GHz	3	Bottom	3s	A

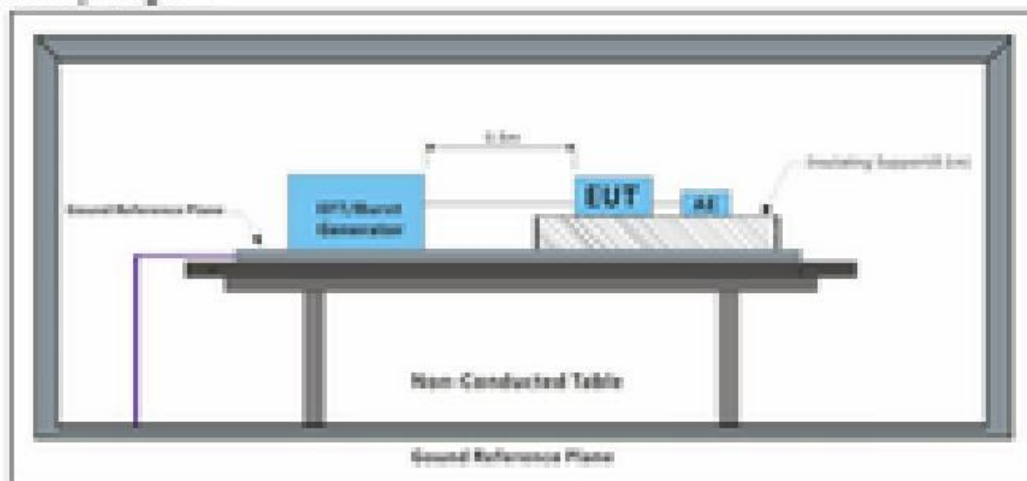
A: No degradation in the performance of the EUT was observed

7.3 Electrical Fast Transients Burst at AC Mains Power Port

Test Requirement: EN IEC 61547: 2023

Test Method: EN 61000-4-4: 2012

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C

Humidity: 44.2 % RH

Atmospheric Pressure: 1012 mbar

7.3.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

7.3.4 Test Condition and Results:

Performance Criterion:B

Repetition Frequency:5kHz

Burst Period:300ms

Test Duration:2 minute per level & polarity

Test Level:1.0kV

Polarity:Positive & Negative

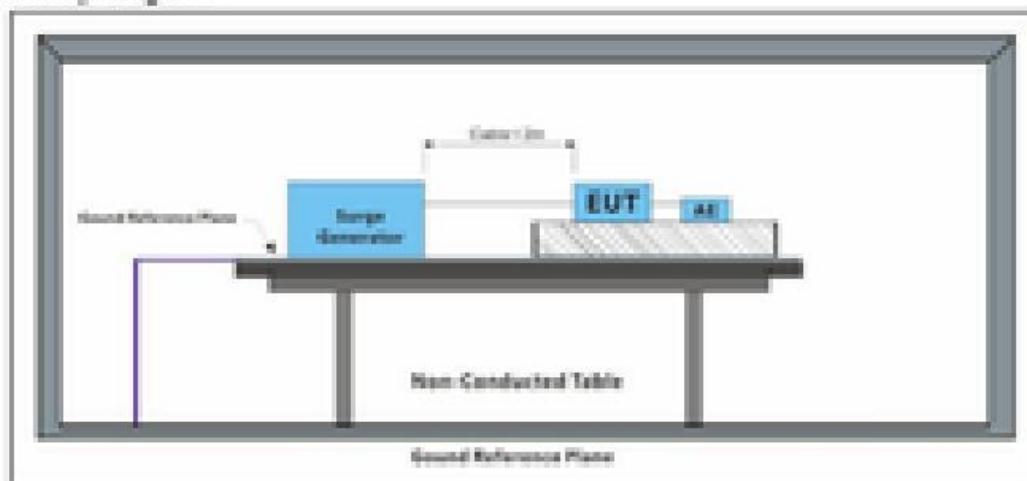
Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A
A: No degradation in the performance of the EUT was observed				

7.4 Surge at Power Port

Test Requirement: EN IEC 61547: 2023

Test Method: EN 61000-4-5: 2014 + A1:2017

7.4.1 Test Setup Diagram



7.4.2 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C

Humidity: 44.2 % RH

Atmospheric Pressure: 1012 mbar

7.4.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

7.4.4 Test Condition and Results:

Performance Criterion: B (Luminaire for emergency lighting).

Performance Criterion: C (for others lighting equipment).

Interval: 60s between each surge

Test Level: $\pm 0.5kV$ Live to Neutral for Self-ballasted lamps $\leq 25W$;

$\pm 1kV, \pm 2kV$ Live to Neutral; $\pm 2kV, \pm 4kV$ Live, Neutral to Earth for Road and street lighting equipment;

$\pm 1kV$ Live to Neutral; $\pm 2kV$ Live, Neutral to Earth for others lighting equipment.

Polarity: Positive & Negative

Generator source impedance: 20

CDN coupling impedance(Line-to-ground):100

Trigger Mode: Internal

No. of surges: 5 positive at 90°, 5 negative at 270°.

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1.0	+	90°	A
L-N	1.0	-	270°	A

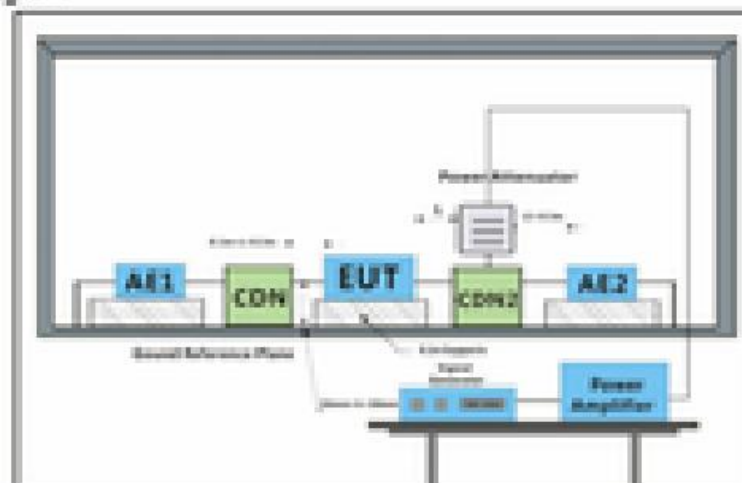
A: No degradation in the performance of the EUT was observed

7.5 Conducted Immunity at AC Mains Power Port (150kHz-80MHz)

Test Requirement: EN IEC 61547: 2023

Test Method: EN IEC 61000-4-6: 2023

7.5.1 Test Setup Diagram



7.5.2 E.U.T. Operation

Operating Environment:

Temperature: 22.3 °C

Humidity: 51.2 % RH

Atmospheric Pressure: 1015 mbar

7.5.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

7.5.4 Test Condition and Results:

Performance Criterion:A

Step Size: 1%

Frequency Range:0.15MHz to 80MHz

Modulation:80%, 1kHz Amplitude Modulation

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3	CON	3s	A

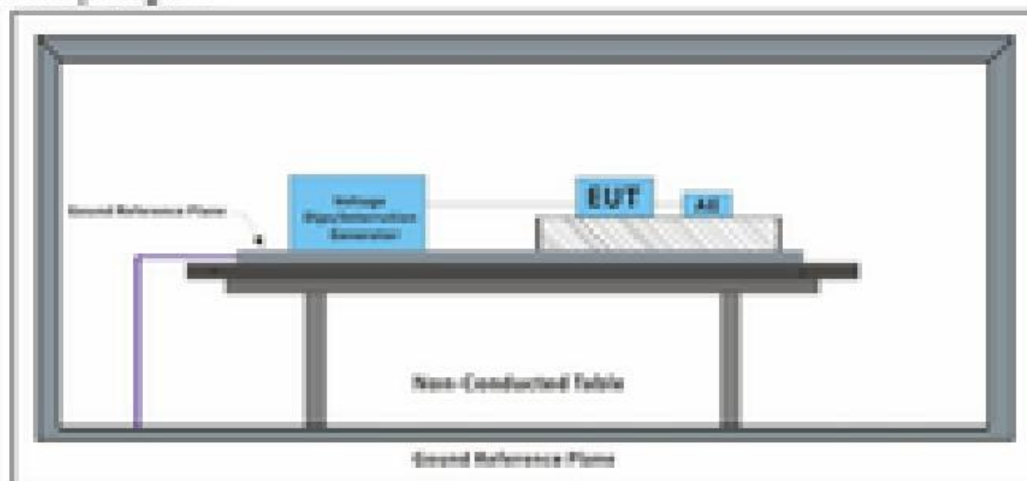
A: No degradation in the performance of the EUT was observed

7.6 Voltage Dips and Interruptions

Test Requirement: EN IEC 61547: 2023

Test Method: EN IEC 61000-4-11: 2020

7.6.1 Test Setup Diagram



7.6.2 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C

Humidity: 44.2 % RH

Atmospheric Pressure: 1012 mbar

7.6.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep the lamp lighting continuously.

7.6.4 Test Condition and Results:

Performance Criterion: 0% of UT (Rated Voltage) for 0.5 Cycle: B; 70% of UT for 10 Cycles: B.

No. of Dips / Interruptions: 3 per Level

Time between dropout: 10s

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	0.5 Cycle	3	A
0	180°	0.5 Cycle	3	A
70	0°	10 Cycles	3	A
70	180°	10 Cycles	3	A

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

8 Test Setup Photo

Conducted Emissions at Mains Terminals (9kHz-30MHz)



Radiated Emissions (30MHz-1GHz)



**Radiated Emissions (Magnetic Field Induced Current)(9kHz-30MHz)
2m loop**



Harmonic Current Emission



Voltage Fluctuations and Flicker



Electrostatic Discharge



Radiated Immunity (10MHz-1GHz)



Electrical Fast Transients Burst at AC Mains Power Port:



Surge at Power Port



Conducted Immunity at AC Mains Power Port (150kHz-80MHz)



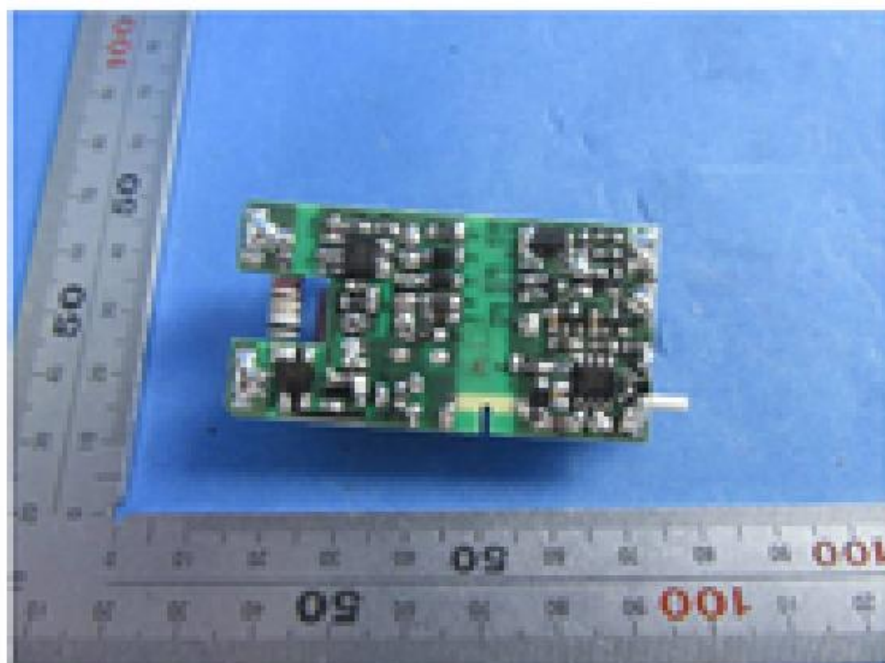
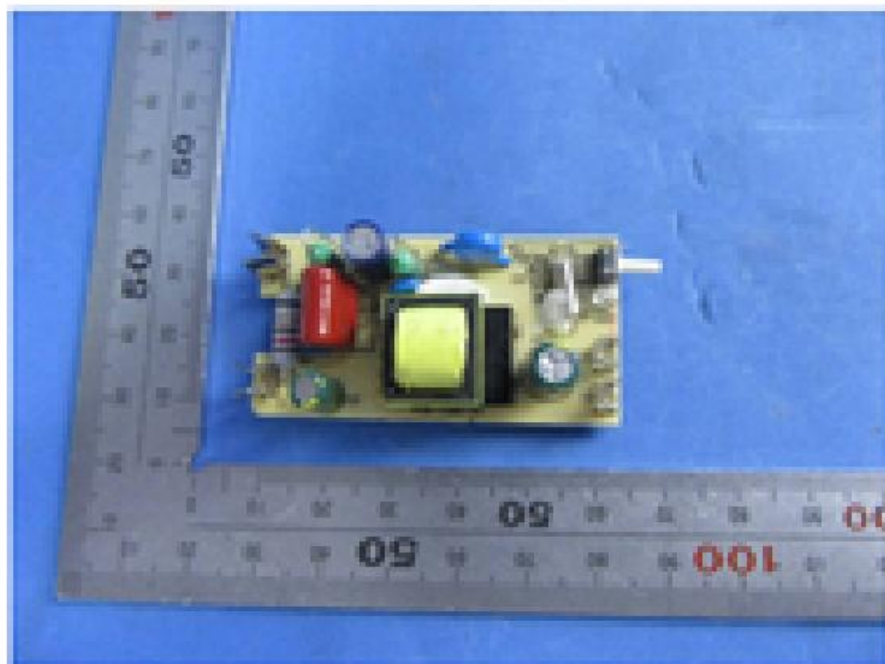
Voltage Dips and Interruptions



9 EUT Constructional Details (EUT Photos)







- End of the Report -