TEST REPORT

Application No.:	GZEM2204002016LM
Applicant:	Blueview Elec-optic Tech Co., Ltd
Address of Applicant:	No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Chengdu, Sichuan, China
Manufacturer:	Blueview Elec-optic Tech Co., Ltd
Address of Manufacturer:	No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Chengdu, Sichuan, China
Factory:	Blueview Elec-optic Tech Co., Ltd
Address of Factory:	No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Chengdu, Sichuan, China
Equipment Under Test (EUT):	
EUT Name:	LED border tubing and contour lighting
Model No.:	Please refer to page 2 for details. ♣
♣	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark:	蓝景 BLUEVIEW
Standard(s) :	EN IEC 55015: 2019+A11:2020 EN 61547: 2009 EN IEC 61000-3-2: 2019+A1:2021 EN 61000-3-3: 2013+A1: 2019
Date of Receipt:	2022-04-21
Date of Test:	2022-04-25 to 2022-05-09
Date of Issue:	2022-06-30
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager

Model No.:

FB-R-27161, FB-R-05028, B-R-10056, FB-R-14084

FB-R-X, FB-W-X, FB-O-X, FB-G-X, FB-RY-X, FB-Y-X, FB-B-X, FB-XR-X, FB-XW-X, FB-XO-X, FB-XG-X, FB-XY-X, FB-XB-X (X=any number or Alphabet)

757, 9PC2, BC2-X, BCX, BP2-X, BQ5-A, BTH, CSX, KPT8-X, MX-X, MN-X, MZ18-X, PC2, PJ2, PQX-X, PSX-X, PTX-X, PZX-X, PXX-X, QGX-X, SG2-X, SM2-X, SSX, STX-X, TYL, Z18-X, Z19-X, Rui2, Rui3, Rui6, B2S, B18, N2, K2, O3030-X, O60-X, DMX, DMX-X-X, BV-AL-X, BV-B-X, BV-SMD-X, (X=any number or Alphabet)

BP2-X, BPS300, BPS-X, BV-BARAL-2835, X-BAR-X-X-X, CF146-OS, CF150-OS, CG2-X, FB-X, FYD2-X, H2, H3, H5, JL2, JYDX, JYL2, JYLT2, QBPS-X, QYD8, Y6, YD2-X, YD3-X, YD7-X, YD8X, YL2, YLD2, YZ9, (X=any number or Alphabet)

CCX-GX-X-X, FX-X-X-24-X, FX-HX-X-24-X, FX-FX-X-24-X, FX-XX-X-24-X, CX-X-X-24-X, LX-X-X-24-X, CX-HX-X-24-X, SX-X-X-24-X, SX-SX-X-24-X, MN-X-X-24-X, TX-XX-X-24-X, (V)(P)TW-X-X-24-X, FWSL2216-X-X, TCCN-HX-X-X, DMXN-XX-5050-X-X, DX-XX-X-24-X, H25,H150 (X=any number or Alphabet). number or Alphabet)

NDFXXX, NCRXXXX, NDRXXX, NMRXXX, NSFXXXX, NSRXXXX, NMFXXXX, CRXXXX N2-X

the former two X=the width of product

the latter two X=the height of product ♣

Revision Record			
Version	**Report No.**	**Date**	**Remark**
01	GZEM220400201601	2022-06-30	Original

Authorized for issue by:				
		Damon Guan **Damon Guan/Project Engineer**		
		Terry Lai **Terry Lai/Reviewer**		

2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at Mains Terminals (9kHz-30MHz)	EN IEC 55015: 2019+A11:2020	EN IEC 55015:2019 +A11:2020	Table 1	Pass
CDNE Method (30-300MHz)		EN IEC 55015:2019 +A11:2020	Table 10	Pass
Radiated Emissions (Magnetic Field Induced Current) (9kHz-30MHz)		EN IEC 55015:2019 +A11:2020	Table 8	Pass
Harmonic Current Emission	EN IEC 61000-3-2: 2019+A1:2021	EN IEC 61000-3-2: 2019+A1:2021	Class C	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3: 2013+A1: 2019	EN 61000-3-3: 2013+A1: 2019	Clause 5	Pass

Immunity Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Electrostatic Discharge	EN 61547: 2009	EN 61000-4-2:2009	4kV Contact Discharge, 8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz)		EN 61000-4-3: 2006 +A1: 2008+A2: 2010	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, 0.5kV Line to Line, 1.0kV Line to Ground	Pass
Conducted Immunity at AC Mains Power Port (150kHz-80MHz)		EN 61000-4-6:2014	3Vrms (emf),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

Note:

E.U.T./EUT means Equipment Under Test.

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

♣ Declaration of EUT Family Grouping:

Model No.:

FB-R-27161, FB-R-05028, B-R-10056, FB-R-14084

FB-R-X, FB-W-X, FB-O-X, FB-G-X, FB-RY-X, FB-Y-X, FB-B-X, FB-XR-X, FB-XW-X, FB-XO-X, FB-XG-X, FB-XY-X, FB-XB-X (X=any number or Alphabet)

757, 9PC2, BC2-X, BCX, BP2-X, BQ5-A, BTH, CSX, KPT8-X, MX-X, MN-X, MZ18-X, PC2, PJ2, PQX-X, PSX-X, PTX-X, PZX-X, PXX-X, QGX-X, SG2-X, SM2-X, SSX, STX-X, TYL, Z18-X, Z19-X, Rui2, Rui3, Rui6, B2S, B18, N2, K2, O3030-X, O60-X, DMX, DMX-X-X, BV-AL-X, BV-B-X, BV-SMD-X, (X=any number or Alphabet)

BP2-X, BPS300, BPS-X, BV-BARAL-2835, X-BAR-X-X-X, CF146-OS, CF150-OS, CG2-X, FB-X, FYD2-X, H2, H3, H5, JL2, JYDX, JYL2, JYLT2, QBPS-X, QYD8, Y6, YD2-X, YD3-X, YD7-X, YD8X, YL2, YLD2, YZ9, (X=any number or Alphabet)

CCX-GX-X-X, FX-X-X-24-X, FX-HX-X-24-X, FX-FX-X-24-X, FX-XX-X-24-X, CX-X-X-24-X, LX-X-X-24-X, CX-HX-X-24-X, SX-X-X-24-X, SX-SX-X-24-X, MN-X-X-24-X, TX-XX-X-24-X, (V)(P)TW-X-X-24-X, FWSL2216-X-X, TCCN-HX-X-X, DMXN-XX-5050-X-X, DX-XX-X-24-X, H25,H150 (X=any number or Alphabet). number or Alphabet)

NDFXXX, NCRXXXX, NDRXXX, NMRXXX, NSFXXXX, NSRXXXX, NMFXXXX, CRXXXX N2-X

the former two X=the width of product

the latter two X=the height of product

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on the color temperature.

Therefore only one model **FB-R-27161** was tested in this report.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply: DC 24V

Cable(s): About 0.1m x 2 wires unscreened DC input cable.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
DC Power Supply	GWINSTEK	GPS-3030DD (Input: AC100-240V, 50/60Hz; Output: DC Max.30V, 3A)	EMC0008
LED Driver	MEAN WELL	LPF-25-24(Input: 100-240V, 50/60Hz; Output: DC 24V, 1.05A)	/

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (9kHz-30MHz)	3.18dB (9kHz to 150kHz), 2.76dB (150kHz to 30MHz)
CDNE Method (30-300MHz)	3.46dB(30MHz-300MHz)
Radiated Emissions (Magnetic Field Induced Current)(9kHz-30MHz)	3.08dB(9kHz to 150kHz), 3.12dB(150kHz to 30MHz)(LLAS)

Remark:

The U_{lab} (lab Uncertainty) is less than U_{cispr} (CISPR Uncertainty), so the test results

– 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 Co., Ltd., Guangzhou Branch 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.

4.5 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 accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

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.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **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-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 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-12460, C-12584, G-20107 and T-11179 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 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 EMS Monitor

Visual: LED lighting of the EUT.

5 Equipment List

Conducted Emissions at Mains Terminals (9kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial Cable	HangTianXing	2m	EMC0107	2020-09-09	2022-09-08
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	2019-10-20	2022-10-19
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2021-09-24	2022-09-23
EMI Test Receiver (9kHz-3.6GHz)	Rohde & Schwarz	ESR3	EMC2221	2021-06-01	2022-05-31
Test Software E3r	Audix	Ver.6.11812	GZE100-77	N/A	N/A
Conical Metal Housing	SGS-EMC	N/A	EMC0167	2022-04-14	2024-04-13

CDNE Method (30-300MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial Cable	HangTianXing	2m	EMC0107	2020-09-09	2022-09-08
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	2019-10-20	2022-10-19
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2021-09-24	2022-09-23
EMI Test Receiver (9kHz-3.6GHz)	Rohde & Schwarz	ESR3	EMC2221	2021-06-01	2022-05-31
Test Software E3r	Audix	Ver.6.11812	GZE100-77	N/A	N/A
6dB Attenuator	HP	8491A	EMC2062	2022-03-29	2024-03-28
Coupling Decoupling Network M2	SCHWARZBECK	CDNE-M2	EMC2175	2021-06-22	2022-06-21
Coupling Decoupling Network M3	SCHWARZBECK	CDNE-M3	EMC2176	2021-06-22	2022-06-21

Radiated Emissions (Magnetic Field Induced Current)(9kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Amplifier (9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2022-04-06	2024-04-05
EMI Test Receiver (1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Harmonic Current Emission					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Digital power analyzer for harmonics & flicker testing	EMTEST	DPA 500N	EMC2235	2022-04-21	2023-04-20
Programmable multifunctional ac/dc power source	EMTEST	NETWAVE 7-400	EMC2234	2022-04-21	2023-04-20
NET.Control	EMTEST	Ver 3.2.0	GZE100-80	N/A	N/A

Voltage Fluctuations and Flicker					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Digital power analyzer for harmonics & flicker testing	EMTEST	DPA 500N	EMC2235	2022-04-21	2023-04-20
Programmable multifunctional ac/dc power source	EMTEST	NETWAVE 7-400	EMC2234	2022-04-21	2023-04-20
NET.Control	EMTEST	Ver 3.2.0	GZE100-80	N/A	N/A

Electrostatic Discharge					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Temperature & Humidity	Shanghai Meteorological Instrument Factory Co., Ltd.	ZJ1-2B	EMC0078	2021-07-04	2022-07-03
ESD Ground Plane	SGS-EMC	3m x 3m	EMC0804	N/A	N/A
Aneroid Barometer	Shanghai Meteorological Instrument Factory Co., Ltd.	YM3	EMC2181	2021-11-26	2022-11-25
ESD Simulator-E	EMTEST	NX30	EMC2186	2022-02-27	2023-02-26

Radiated Immunity (80MHz-1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
743 Compact 3m Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	EMC0525	2019-10-20	2022-10-19
Monitor System	Mitsubish Corp.	M-0552AB	EMC0909	N/A	N/A
Oscilloscope	Tektronix	TDS3052C	EMC2055	2021-11-23	2022-11-22
Laser Probe Interface	RF Microwave Instrumentation	FI7000	EMC2089	N/A	N/A
Open Switch And Control Unit	Rohde & Schwarz	OSP130	EMC2090	N/A	N/A
Broadband Amplifier (80MHz~1GHz/250W)	Rohde & Schwarz	BBA150	EMC2091	2021-12-17	2022-12-16
Signal Generator (9kHz-6GHz)	Rohde & Schwarz	SMB100A	EMC2093	2021-12-17	2022-12-16
Laser Probe	RF Microwave Instrumentation	FL7006	EMC2094	2022-03-03	2023-03-02
NRP-Z91 Power Sensor (9kHz-6GHz)	Rohde & Schwarz	NPR-Z91	EMC2095	2021-12-17	2022-12-16
NRP-Z91 Power Sensor (9kHz-6GHz)	Rohde & Schwarz	NPR-Z91	EMC2096	2021-12-17	2022-12-16
High-Gain Log-preiodic Antenna	Rohde & Schwarz	HL046E	EMC2097	2022-02-14	2025-02-13
RI Cable	Rohde & Schwarz	7m	EMC2098	2021-05-24	2022-05-23
Test Software EMC32	Rohde & Schwarz	Ver. 9.26.00	GZE100-63	N/A	N/A

Electrical Fast Transients Burst at AC Mains Power Port					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Oscilloscope	Tektronix	TDS3052C	EMC2055	2021-11-23	2022-11-22
TRANSIENT-2000 test system	EMC-PARTNER	TRA1Z191N	EMC2192	2021-05-19	2022-05-18
Test Software WIN 3000	TESEQ AG	Ver 1.3.2	GZE100-68	N/A	N/A

Surge at Power Port					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Oscilloscope	Tektronix	TDS3052C	EMC2055	2021-11-23	2022-11-22
TRANSIENT-2000 test system	EMC-PARTNER	TRA1Z191N	EMC2192	2021-05-19	2022-05-18
Test Software WIN 3000	TESEQ AG	Ver 1.3.2	GZE100-68	N/A	N/A

Conducted Immunity at AC Mains Power Port (150kHz-80MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Dual Directional coupler	Werlatone Inc.	C1795	EMC1105	2021-05-19	2022-05-18
CDN M2	Schaffner Chase	CDN-M2-16	EMC1107	2020-10-23	2023-10-22
CDN M2/M3	Elektronik-Feinmechanik	L-801:M2/M3	EMC2048	2020-08-21	2022-08-20
Test System for Conducted and Radiated Immunity	TESEQ AG	NSG 4070B-80	EMC2115	2021-11-23	2022-11-22
Test Software NSG4070_Ctrl1	TESEQ AG	Ver.1.3.0.1	GZE100-72	N/A	N/A
Oscilloscope	Tektronix	TDS3052C	EMC2055	2021-11-23	2022-11-22

Voltage Dips and Interruptions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Oscilloscope	Tektronix	TDS3052C	EMC2055	2021-11-23	2022-11-22
TRANSIENT-2000 test system	EMC-PARTNER	TRA1Z191N	EMC2192	2021-05-19	2022-05-18
Test Software WIN 3000	TESEQ AG	Ver 1.3.2	GZE100-68	N/A	N/A

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05

6 Emission Test Results

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

Test Requirement:	EN IEC 55015: 2019+A11:2020
Test Method:	EN IEC 55015:2019+A11:2020
Limit:	
0.009MHz – 0.05MHz	110dB(μV) quasi-peak
0.05MHz – 0.15MHz	90dB(μV)-80dB(μV) quasi-peak
0.15MHz – 0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5MHz – 5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5MHz – 30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (200Hz resolution bandwidth) 0.009M to 0.15MHz
	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.1.1 E.U.T. Operation

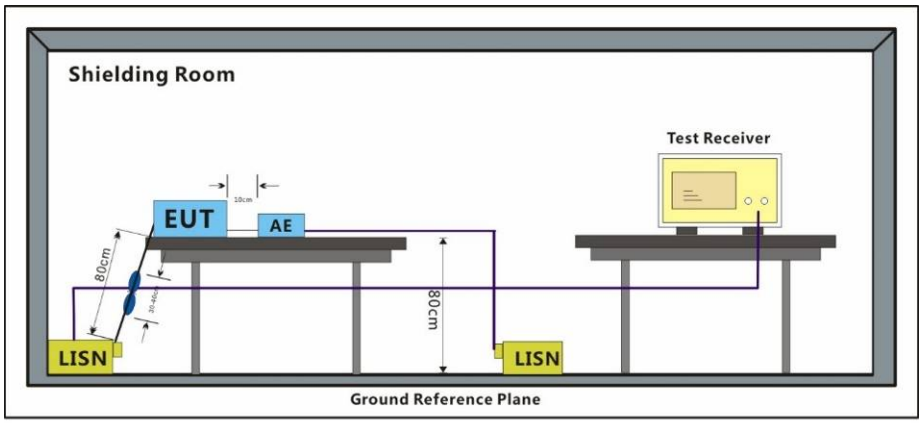
Operating Environment:

Temperature: 23.4 °C Humidity: 52.6 % RH Atmospheric Pressure: 1020 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

6.1.3 Test Setup Diagram



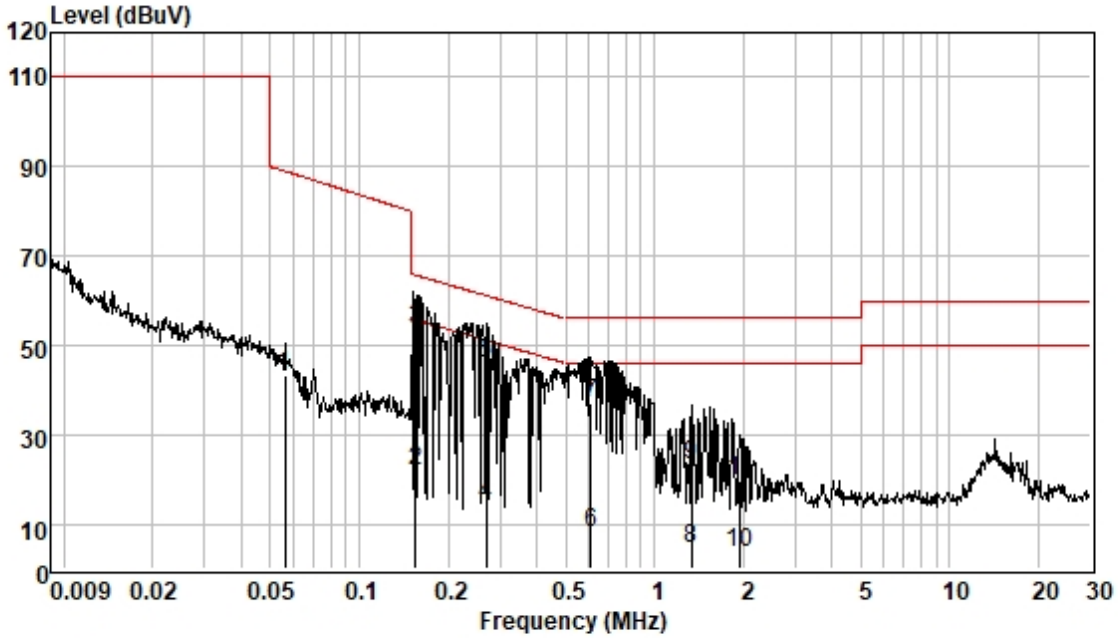
6.1.4 Measurement Procedure and Data

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

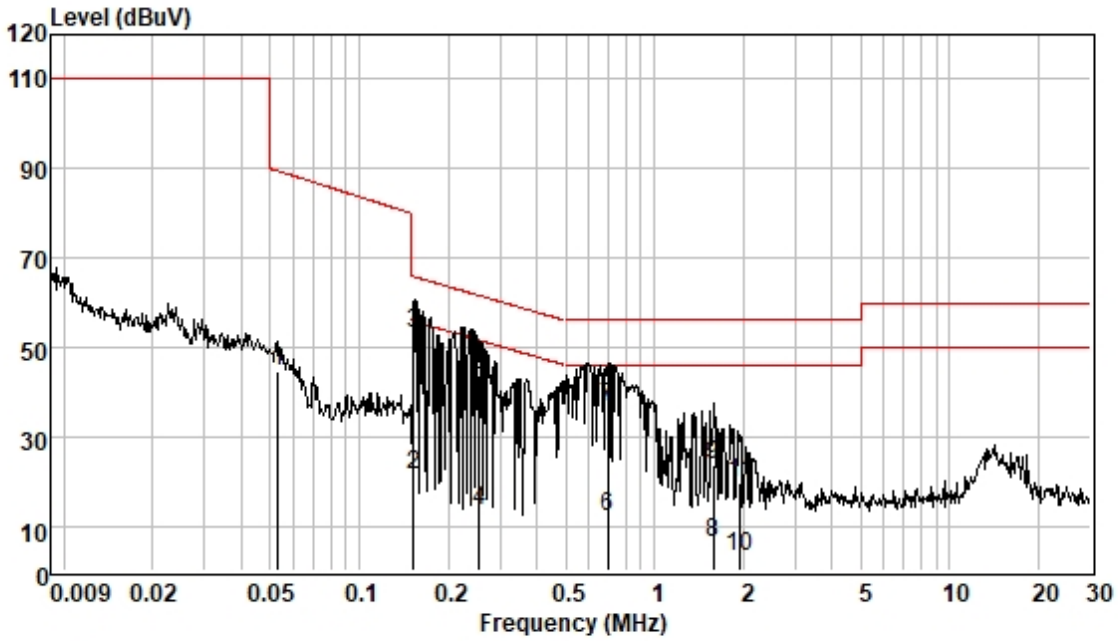
Test Mode: 00; Line: Live line



Pol :LINE
Mode :
Model :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.056	33.68	0.05	9.48	43.21	88.96	-45.75	QP
2	0.156	12.04	0.06	9.54	21.64	55.69	-34.05	Average
3	0.156	44.00	0.06	9.54	53.60	65.69	-12.09	QP
4	0.270	4.53	0.06	9.57	14.16	51.12	-36.96	Average
5	0.270	36.16	0.06	9.57	45.79	61.12	-15.33	QP
6	0.611	-1.82	0.07	9.59	7.84	46.00	-38.16	Average
7	0.611	27.25	0.07	9.59	36.91	56.00	-19.09	QP
8	1.331	-5.27	0.09	9.60	4.42	46.00	-41.58	Average
9	1.331	13.31	0.09	9.60	23.00	56.00	-33.00	QP
10	1.949	-6.25	0.12	9.60	3.47	46.00	-42.53	Average
11	1.949	9.69	0.12	9.60	19.41	56.00	-36.59	QP

Test Mode: 00; Line: Neutral Line



Pol :NEUTRAL
Mode :
Model :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.053	35.23	0.05	9.47	44.75	89.45	-44.70	QP
2	0.153	12.02	0.06	9.53	21.61	55.82	-34.21	Average
3	0.153	43.47	0.06	9.53	53.06	65.82	-12.76	QP
4	0.255	3.69	0.06	9.56	13.31	51.60	-38.29	Average
5	0.255	33.91	0.06	9.56	43.53	61.60	-18.07	QP
6	0.697	2.22	0.07	9.59	11.88	46.00	-34.12	Average
7	0.697	27.10	0.07	9.59	36.76	56.00	-19.24	QP
8	1.585	-3.58	0.10	9.59	6.11	46.00	-39.89	Average
9	1.585	13.99	0.10	9.59	23.68	56.00	-32.32	QP
10	1.949	-6.38	0.12	9.59	3.33	46.00	-42.67	Average
11	1.949	9.94	0.12	9.59	19.65	56.00	-36.35	QP

6.2 CDNE Method (30-300MHz)

Test Requirement:	EN IEC 55015: 2019+A11:2020
Test Method:	EN IEC 55015:2019+A11:2020
Limit:	
30MHz-100MHz	64dB(μV)-54dB(μV) quasi-peak
100MHz-230MHz	54dB(μV) quasi-peak
230MHz-300MHz	54-51dB(μV) quasi-peak
Detector:	Peak for pre-scan Quasi-Peak for final test (120 kHz resolution bandwidth)

6.2.1 E.U.T. Operation

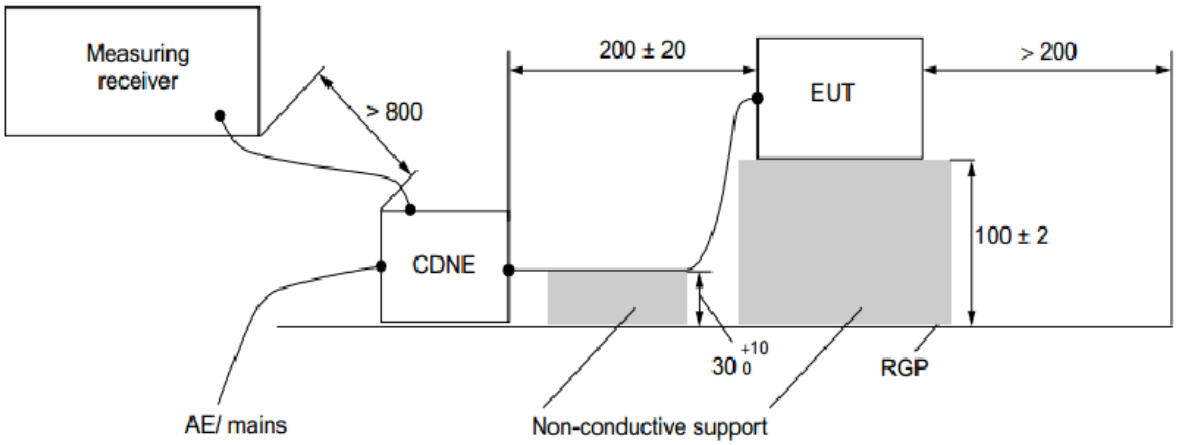
Operating Environment:

Temperature: 23.0 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and Data

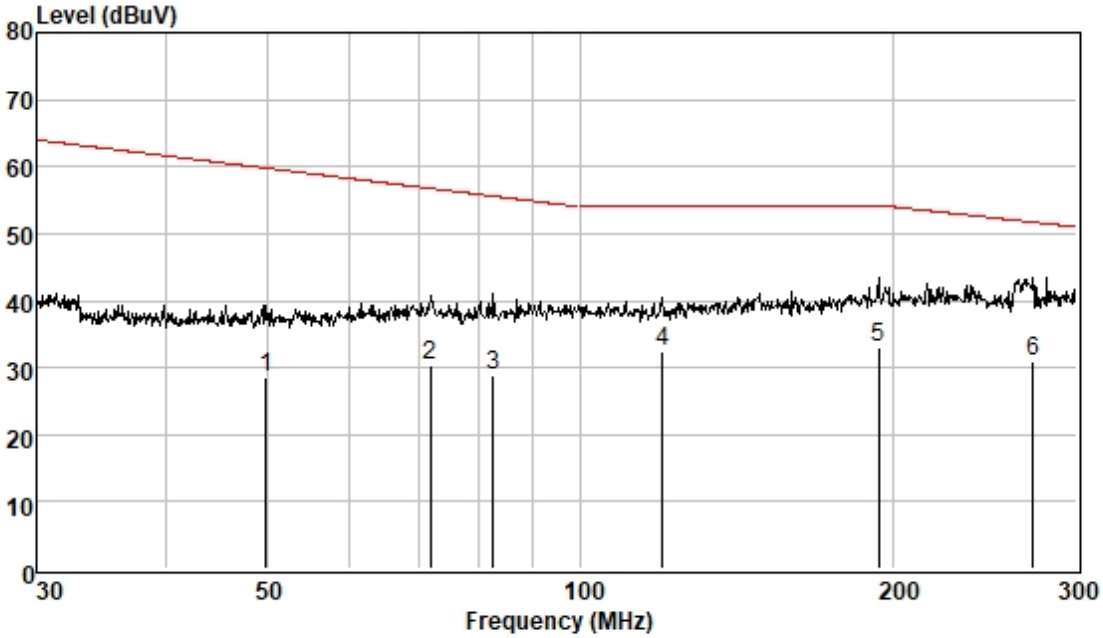
Frequency range: 30MHz-300MHz

An initial pre-scan was performed with peak detector.Quasi-Peak 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+ CDNE Factor

Test Mode: 00



Mode :
Model :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	CDNE Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	49.902	8.39	0.54	19.53	28.46	59.77	-31.31	QP
2	71.799	10.06	0.66	19.51	30.23	56.75	-26.52	QP
3	82.437	8.75	0.70	19.51	28.96	55.60	-26.64	QP
4	119.983	11.89	0.87	19.53	32.29	54.00	-21.71	QP
5	193.696	12.10	1.12	19.79	33.01	54.00	-20.99	QP
6	272.346	9.20	1.37	20.41	30.98	51.72	-20.74	QP

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

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

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

Limit:

0.009MHz-0.07MHz	69dB(μA/m) quasi-peak
0.07MHz-0.15MHz	69dB(μA/m)-39dB(μA/m) quasi-peak
0.15MHz-4MHz	39dB(μA/m)-3dB(μA/m) quasi-peak
4MHz-30MHz	3dB(μA/m) 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

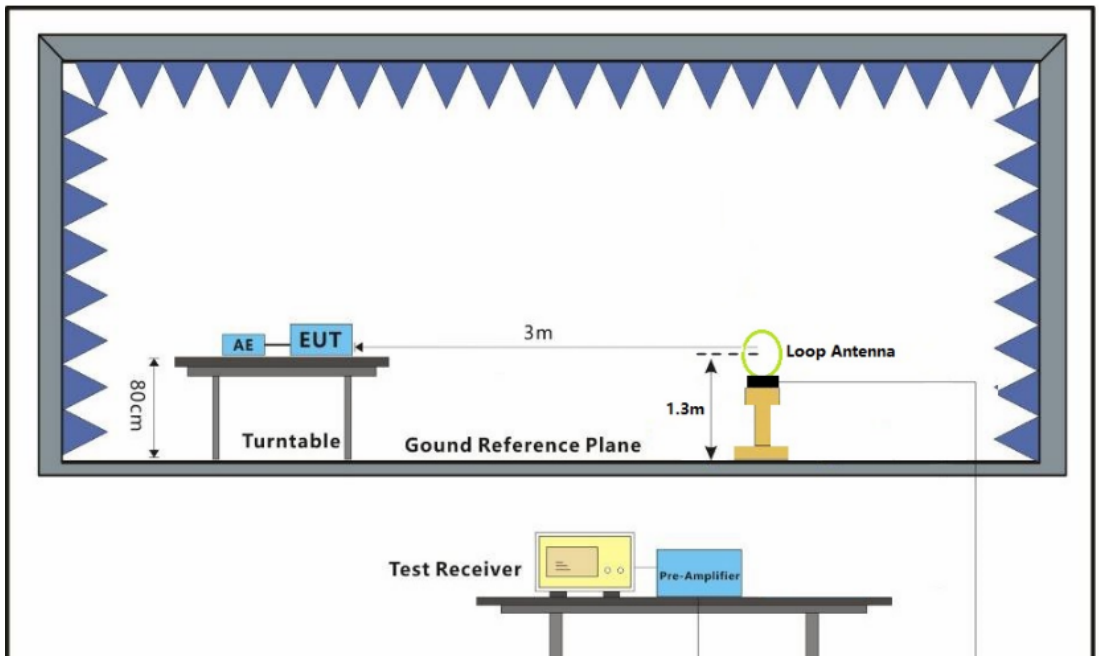
Operating Environment:

Temperature: 22.3 °C Humidity: 58.9 % RH Atmospheric Pressure: 1020 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

6.3.3 Test Setup Diagram

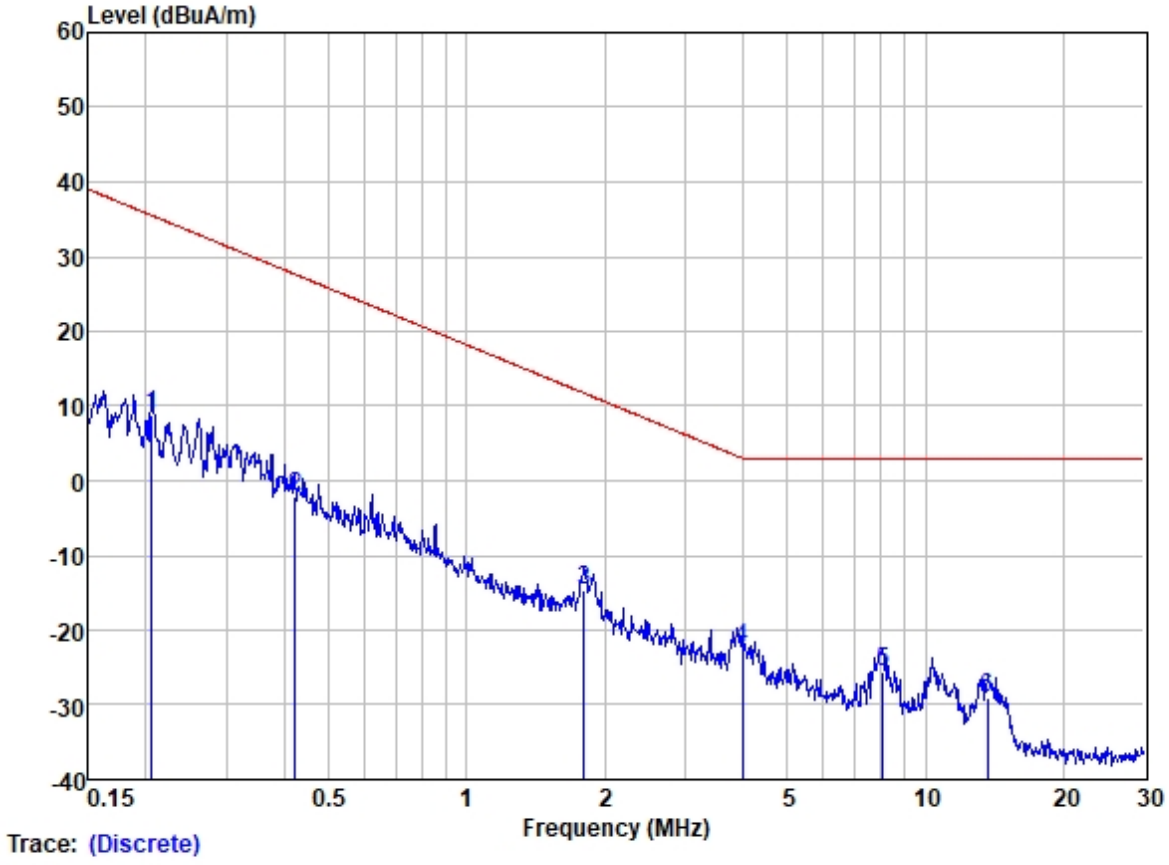


6.3.4 Measurement Procedure and Data

An initial pre-scan was performed in the 2m loop antenna using the spectrum analyser in peak detection mode.

Remark: Level= Read Level+ Cable Loss

Test Mode: 00; Polarity: Horizontal; 150kHz-30MHz

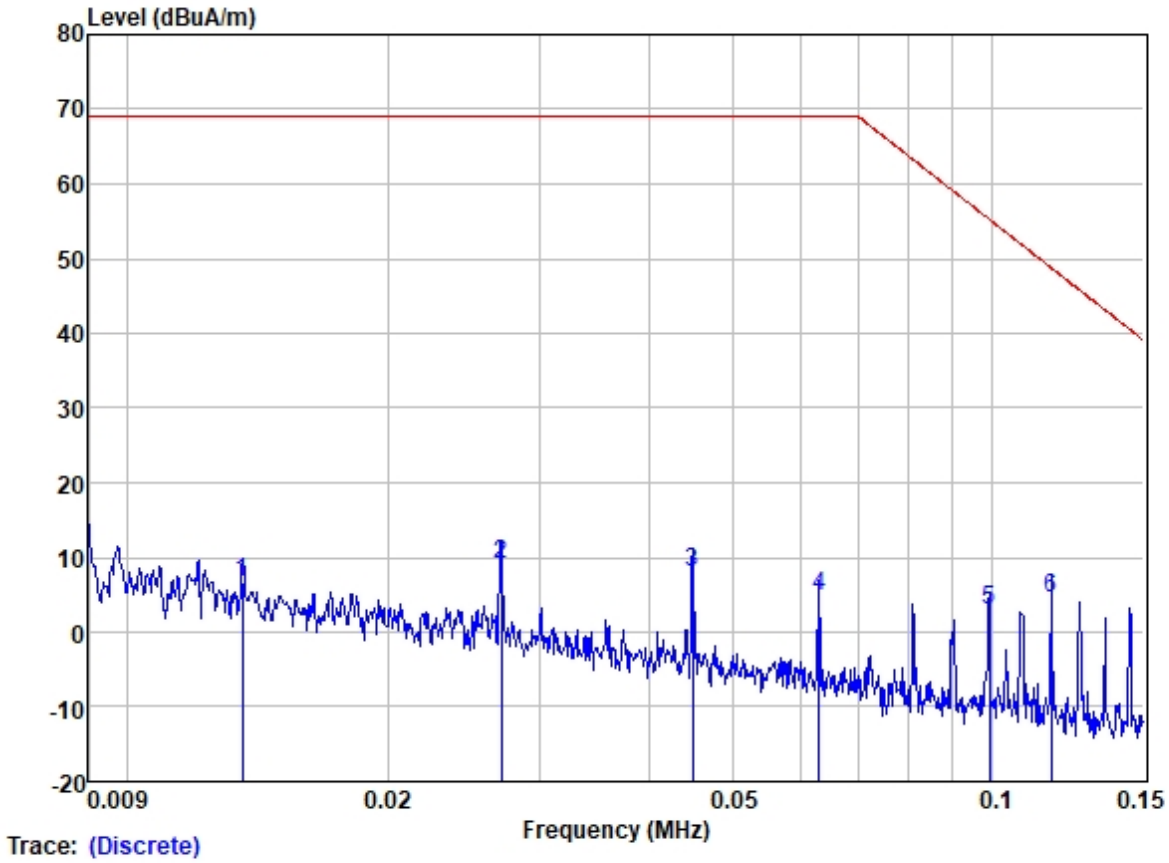


Trace: (Discrete)

Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuA/m	dBuA/m	dB		
1	0.206	77.86	-39.68	0.05	29.45	8.78	35.51	-26.73	HORIZONTAL	QP
2	0.424	67.00	-39.68	0.06	29.42	-2.04	27.61	-29.65	HORIZONTAL	QP
3	1.800	54.12	-39.69	0.19	29.38	-14.76	11.75	-26.51	HORIZONTAL	QP
4	3.985	46.39	-39.87	0.33	29.34	-22.49	3.04	-25.53	HORIZONTAL	QP
5	8.062	44.07	-40.80	0.48	29.30	-25.55	3.00	-28.55	HORIZONTAL	QP
6	13.623	41.16	-41.63	0.58	29.25	-29.14	3.00	-32.14	HORIZONTAL	QP

Test Mode: 00; Polarity: Horizontal; 9kHz-150kHz

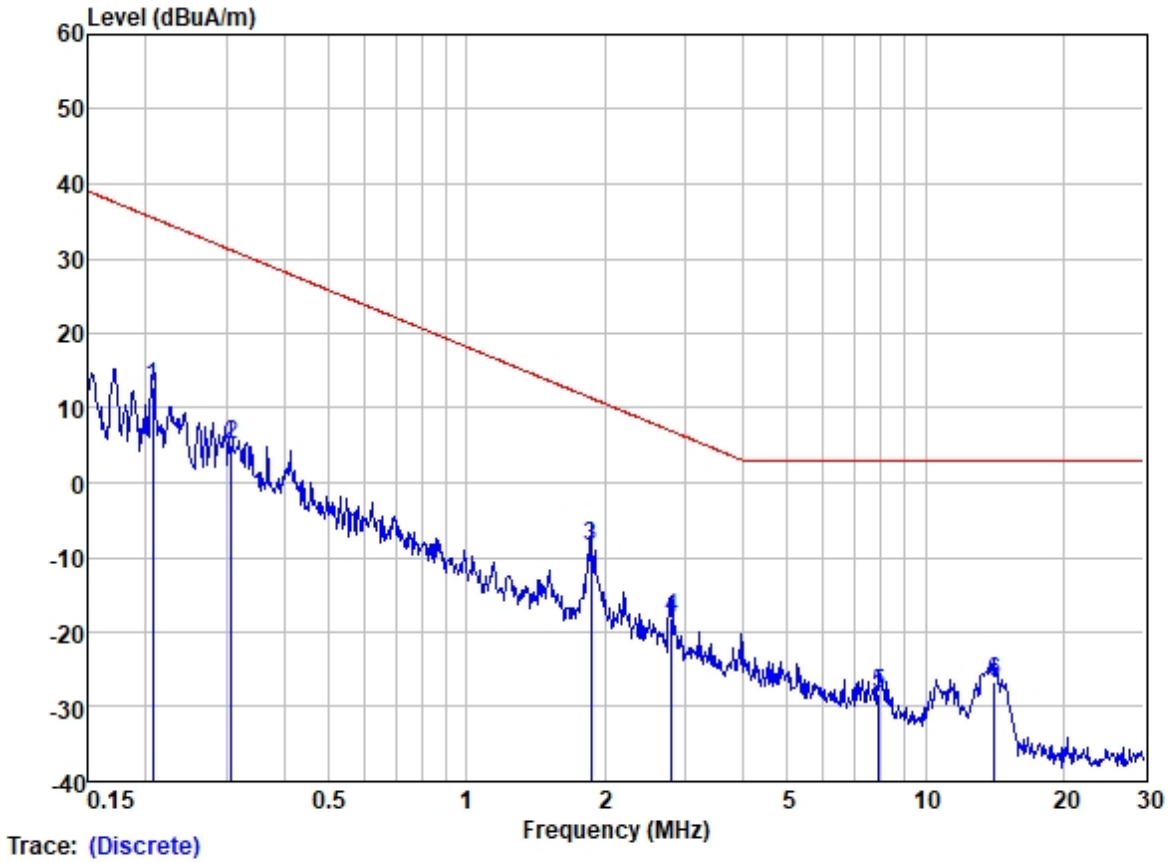


Trace: (Discrete)

Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuA/m	dBuA/m	dB		
1	0.014	69.95	-35.19	0.05	28.24	6.57	69.00	-62.43	HORIZONTAL	QP
2	0.027	75.93	-38.37	0.05	28.62	8.99	69.00	-60.01	HORIZONTAL	QP
3	0.045	76.31	-39.22	0.05	29.24	7.90	69.00	-61.10	HORIZONTAL	QP
4	0.063	73.68	-39.45	0.05	29.36	4.92	69.00	-64.08	HORIZONTAL	QP
5	0.099	71.99	-39.58	0.05	29.47	2.99	55.28	-52.29	HORIZONTAL	QP
6	0.117	73.41	-39.59	0.05	29.47	4.40	48.75	-44.35	HORIZONTAL	QP

Test Mode: 00; Polarity: Vertical; 150kHz-30MHz

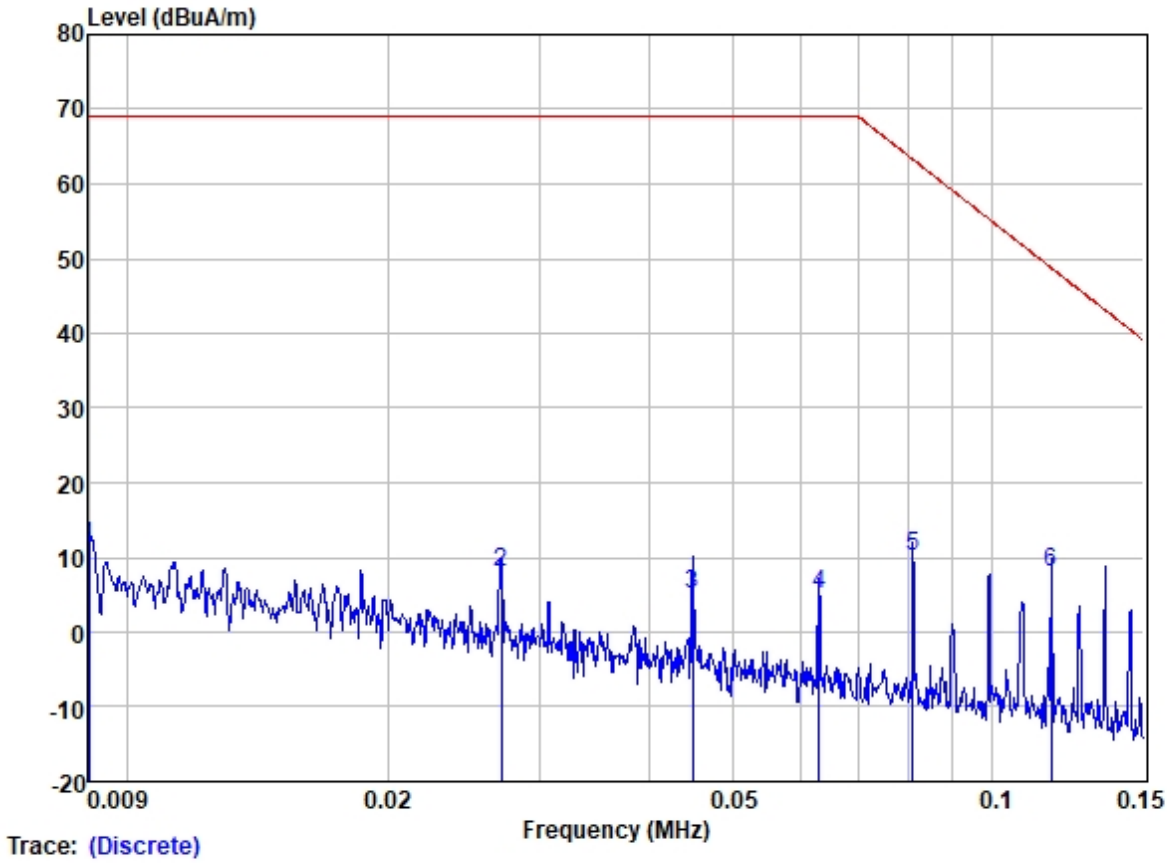


Trace: (Discrete)

Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuA/m	dBuA/m	dB		
1	0.207	82.00	-39.68	0.05	29.45	12.92	35.46	-22.54	VERTICAL	QP
2	0.307	74.14	-39.66	0.05	29.44	5.09	31.16	-26.07	VERTICAL	QP
3	1.868	60.28	-39.69	0.19	29.38	-8.60	11.35	-19.95	VERTICAL	QP
4	2.794	50.61	-39.69	0.30	29.37	-18.15	6.93	-25.08	VERTICAL	QP
5	7.935	41.46	-40.79	0.48	29.30	-28.15	3.00	-31.15	VERTICAL	QP
6	14.138	43.80	-41.68	0.59	29.25	-26.54	3.00	-29.54	VERTICAL	QP

Test Mode: 00; Polarity: Vertical; 9kHz-150kHz



Trace: (Discrete)

Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuA/m	dBuA/m	dB		
1	0.009	72.09	-32.57	0.05	28.15	11.42	69.00	-57.58	VERTICAL	QP
2	0.027	74.84	-38.37	0.05	28.62	7.90	69.00	-61.10	VERTICAL	QP
3	0.045	73.54	-39.22	0.05	29.24	5.13	69.00	-63.87	VERTICAL	QP
4	0.063	73.88	-39.45	0.05	29.36	5.12	69.00	-63.88	VERTICAL	QP
5	0.081	78.94	-39.55	0.05	29.43	10.01	63.25	-53.24	VERTICAL	QP
6	0.117	76.98	-39.59	0.05	29.47	7.97	48.75	-40.78	VERTICAL	QP

6.4 Harmonic Current Emission

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

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

6.4.1 E.U.T. Operation

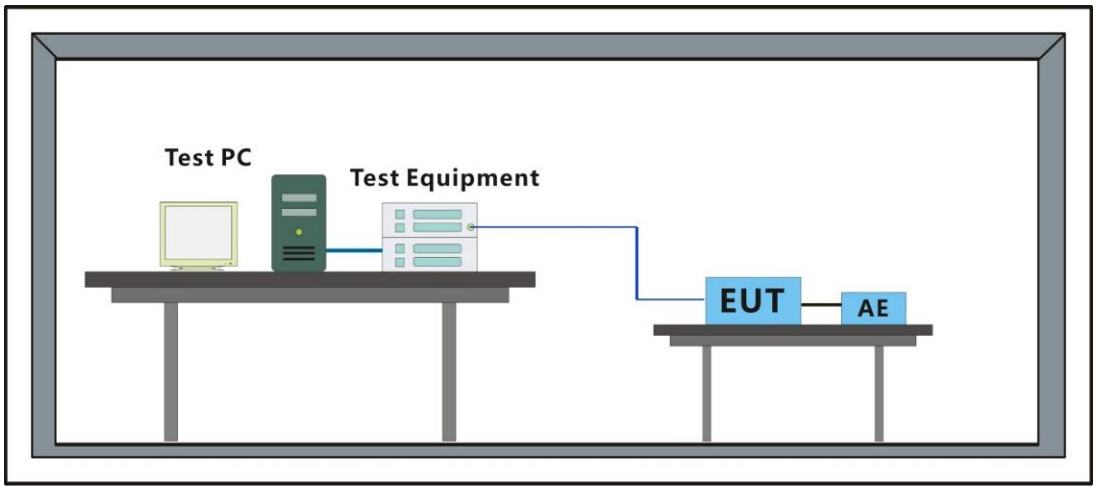
Operating Environment:

Temperature: 24.5 °C Humidity: 60.9 % RH Atmospheric Pressure: 1005 mbar

6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

6.4.3 Test Setup Diagram



6.4.4 Measurement Procedure and Data

Frequency Range: 100Hz to 2kHz

Test Mode: 00

Standard Specific Results for IEC 61000-3-2 (Edition 5.1)

Standard Group:	Industry
Standard Name:	IEC 61000-3-2 (Edition 5.1)
	Limits for harmonic current emissions (equipment input current < 16 A per phase)
Device Under Test:	PASS
Power Source:	PASS
Connection Type:	L - N
Classification:	Class C (Rated power ≥ 5 W and ≤ 25 W, Power-related limits)
Appli. of Limits:	less than or equal to 150 % (Without POHC Enhancement)
Test Duration:	30 s

Check Harmonics 2..40			
First detected harmonic order > 150 %			
Line 1:	None		
Harmonics orders > 150 %			
Line 1:	None		
Harmonics orders with average > 100 %			
Line 1:	None		

Measured values			
Fundamental Current			
Line 1:	0.107 A		
Active input Power			
Line 1:	23.89 W *		
Circuit power factor			
Line 1:	0.965 *		

** Absolute value.*

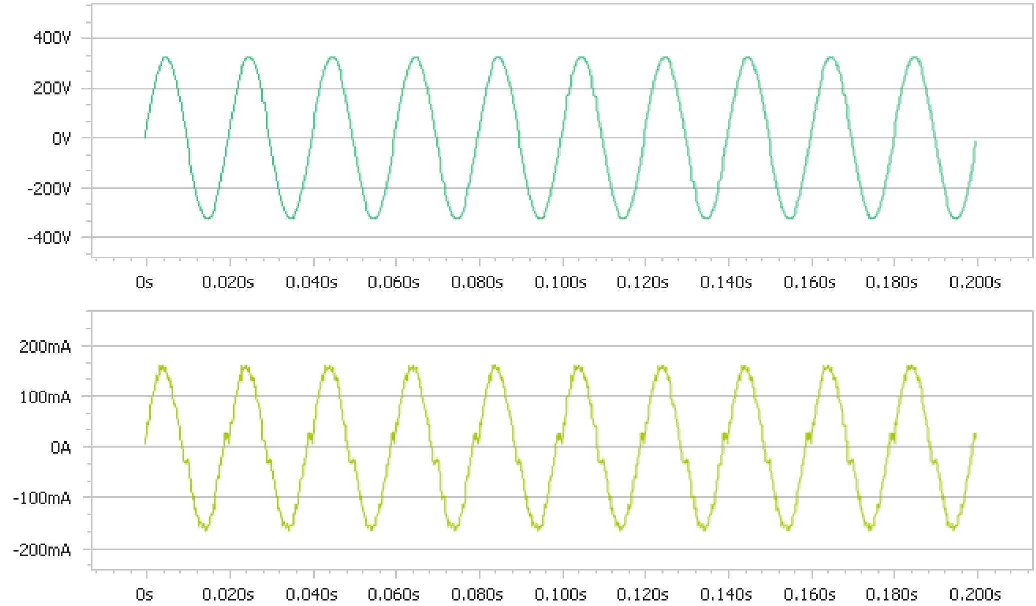
Current Test Result

Average and Maximum harmonic current results									
Hn	Average				Maximum				Harmonic Result
	Ieff [A]	of Limit [%]	Limit [A]	Result	Ieff [A]	of Limit [%]	Limit [A]	Result	
1	0.106				0.107				
2	0.001				0.001				
3	0.009	11.188	0.081	PASS	0.009	7.511	0.122	PASS	PASS
4	0.001				0.001				
5	0.005	11.324	0.045	PASS	0.005	7.656	0.068	PASS	PASS
6	0.001				0.001				
7	0.003	13.669	0.024	n/a	0.003	9.291	0.036	n/a	PASS
8	0.001				0.001				
9	0.002	16.866	0.012	n/a	0.002	11.652	0.018	n/a	PASS
10	0.001				0.001				
11	0.002	25.262	0.008	n/a	0.002	17.314	0.013	n/a	PASS
12	0.001				0.001				
13	0.001	16.581	0.007	n/a	0.001	11.706	0.011	n/a	PASS
14	0.001				0.001				
15	0.001	13.068	0.006	n/a	0.001	9.485	0.009	n/a	PASS
16	0.001				0.001				
17	0.001	13.378	0.005	n/a	0.001	9.566	0.008	n/a	PASS
18	0.001				0.001				
19	0.001	15.100	0.005	n/a	0.001	10.893	0.007	n/a	PASS
20	0.001				0.001				
21	0.001	23.320	0.004	n/a	0.001	16.484	0.007	n/a	PASS
22	0.001				0.001				
23	0.001	20.790	0.004	n/a	0.001	14.822	0.006	n/a	PASS
24	0.001				0.001				
25	0.001	22.870	0.004	n/a	0.001	18.524	0.006	n/a	PASS
26	0.001				0.002				
27	0.001	37.847	0.003	n/a	0.002	31.259	0.005	n/a	PASS
28	0.001				0.001				
29	0.001	28.550	0.003	n/a	0.001	21.286	0.005	n/a	PASS
30	0.001				0.001				
31	0.001	24.251	0.003	n/a	0.001	17.529	0.004	n/a	PASS
32	0.001				0.001				
33	0.001	23.287	0.003	n/a	0.001	16.672	0.004	n/a	PASS
34	0.001				0.001				
35	0.001	23.654	0.003	n/a	0.001	17.199	0.004	n/a	PASS
36	0.001				0.001				
37	0.001	29.390	0.002	n/a	0.001	21.108	0.004	n/a	PASS
38	0.001				0.001				
39	0.001	24.781	0.002	n/a	0.001	17.547	0.004	n/a	PASS
40	0.001				0.001				

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

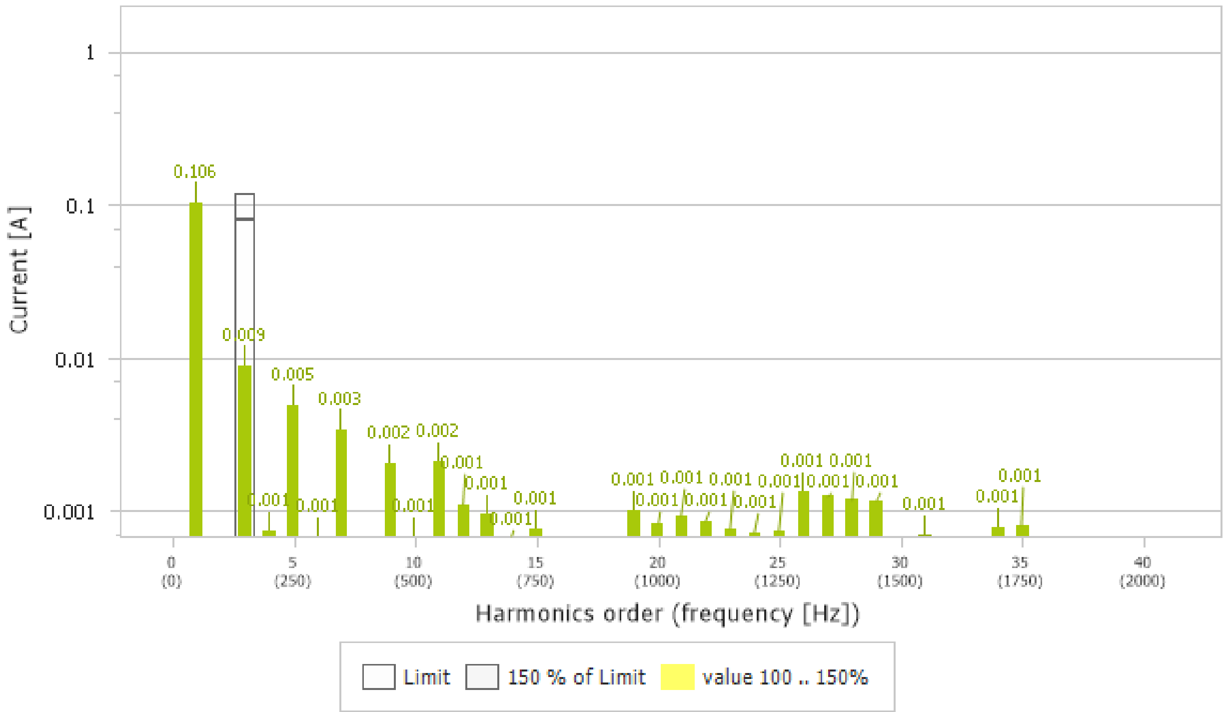
Time Window 1

Time Domain of Time Window 1



Harmonics of Time Window 1 (Line 1)

Harmonics of Time Window 1



Maximum / Average Values	
	Line 1
Maximum Values	
Frequency	50 Hz
Voltage RMS	230.5 V
Current RMS	0.1077 A
Peak Current	0.1691 A
Fundamental Current	0.1070 A
Current Crest Factor	1.572
Active Power P	23.94 W
Power Factor	0.9655
Total Harmonic Current (THC)	0.01232 A
Instantaneous Partial Odd Harmonic Current (Inst. POHC)	3.202e-3 A
Total Harmonic Distortion Current (THDC)	0.1154
Average Values	
Total Harmonic Current (THC)	0.01224 A
Instantaneous Partial Odd Harmonic Current (Inst. POHC)	2.701e-3 A
Total Harmonic Distortion Current (THDC)	0.1147

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center, EEC Laboratory.
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6.5 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3: 2013+A1: 2019
Test Method: EN 61000-3-3: 2013+A1: 2019

6.5.1 E.U.T. Operation

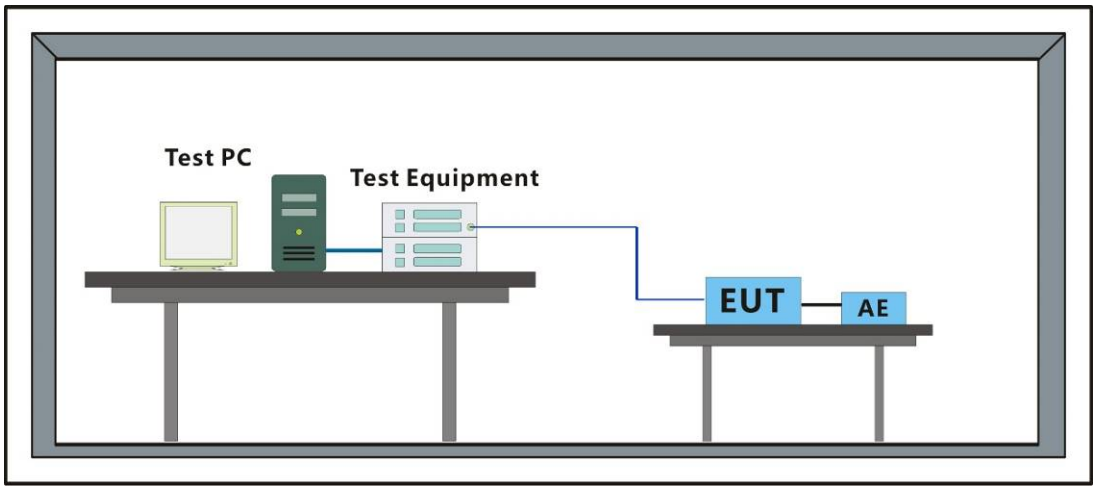
Operating Environment:

Temperature: 24.5 °C Humidity: 60.5 % RH Atmospheric Pressure: 1005 mbar

6.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

6.5.3 Test Setup Diagram



6.5.4 Measurement Procedure and Data

Test Mode: 00

Flicker Results

Standard Specific Results for IEC 61000-3-3 (Edition 3.2)

Standard Group: Industry

Standard Name: IEC 61000-3-3 (Edition 3.2)
Limitation of voltage changes, voltage fluctuations and flicker
in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase
and not subject to conditional connection

Test Condition: General Test Conditions

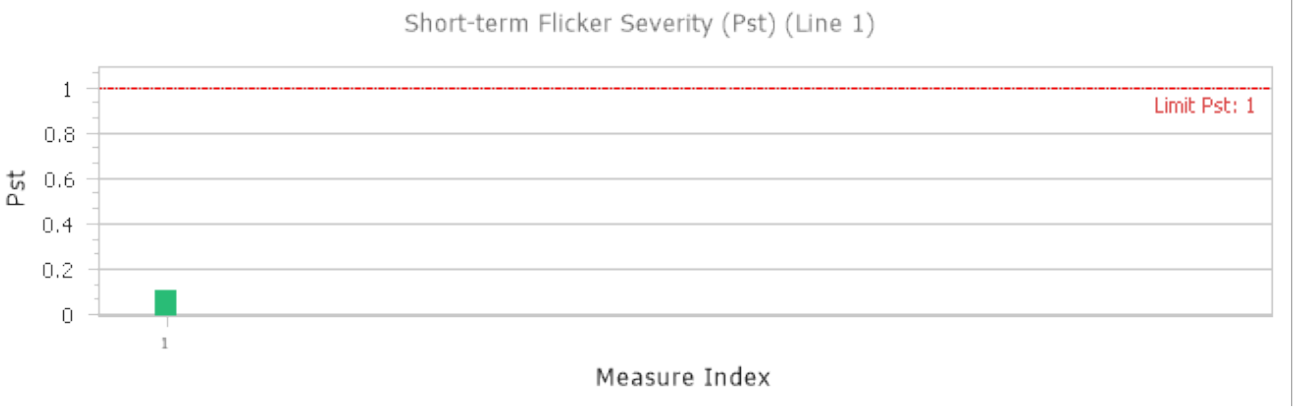
Analysis Status: PASS

Flicker Measurements Settings	
Main Line:	230V, 50Hz
Flicker Meter:	230V / 50Hz
Flicker Impedance:	Zref
Observation Time:	1 × 10 min
Measurements:	1

Flicker Measurements					
	P_{lt}	Max P_{st}	Max d_c	Max d_{max}	Max T_{max}
Line 1:	0.049	0.113	0	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

Flicker Individual Measurements												
Measurement	P_{st} [ ]			d_c [%]			d_{max} [%]			T_{max} [s]		
	Value	Limit	Result	Value	Limit	Result	Value	Limit	Result	Value	Limit	Result
#1	0.11	1.00	PASS	0.00	3.30	PASS	< 0.2	4.00	PASS	0.00	0.50	PASS

Pst Data



7 Immunity Test Results

Performance Criteria Description in EN 61547: 2009

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.

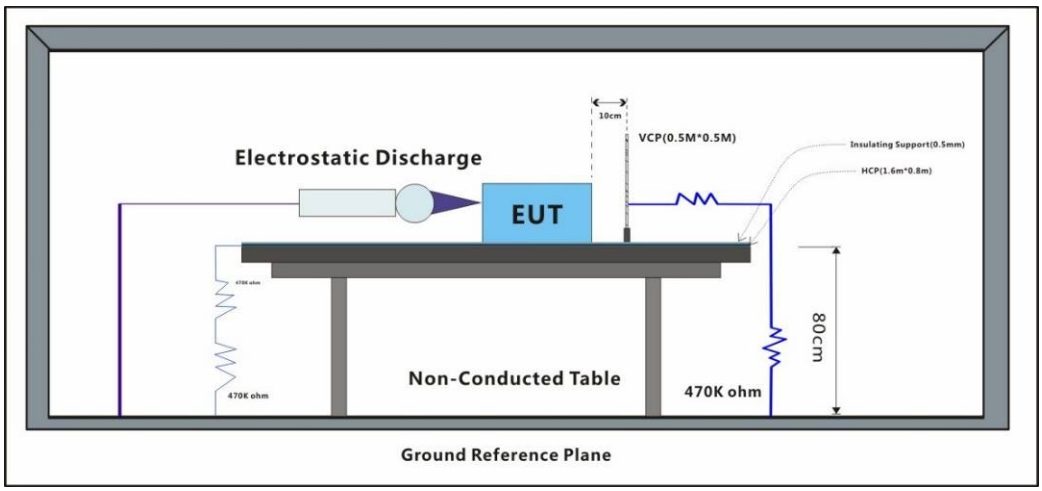
Criterion C: During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and/or operating the regulating control.

7.1 Electrostatic Discharge

Test Requirement: EN 61547: 2009

Test Method: EN 61000-4-2:2009

7.1.1 Test Setup Diagram



7.1.2 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C Humidity: 50.6 % RH Atmospheric Pressure: 1005 mbar

7.1.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

7.1.4 Test Condition and Results:

Performance Criterion: B
Discharge Impedance: 330 Ω / 150 pF
Discharge Voltage: Air Discharge: 2,4,8 kV; Contact Discharge:4 kV; VCP/HCP: 4 kV.
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.

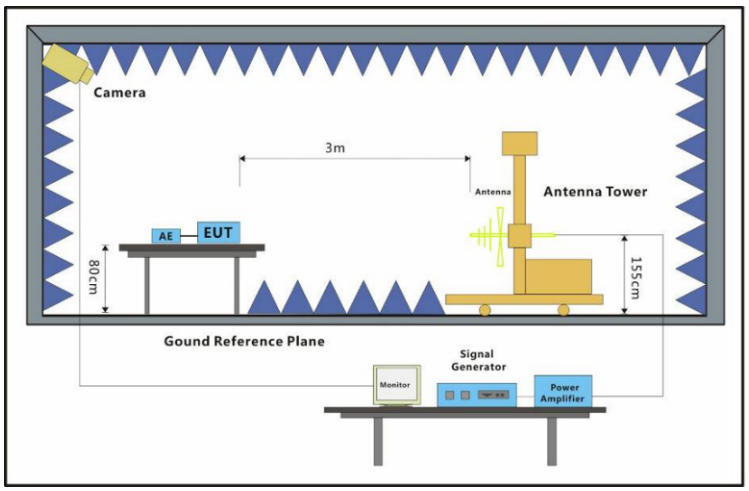
Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	N/A
Contact Discharge	4	-	2	N/A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A
A: No degradation in the performance of the EUT was observed N/A: Not applicable.				

7.2 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 61547: 2009

Test Method: EN 61000-4-3: 2006 +A1: 2008+A2: 2010

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 21.6 °C Humidity: 60.2 % RH Atmospheric Pressure: 1020 mbar

7.2.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

7.2.4 Test Condition and Results:

Performance Criterion: A

Frequency Range:80MHz to 1GHz

Test Distance:3m

Antenna Polarisation: Vertical and Horizontal

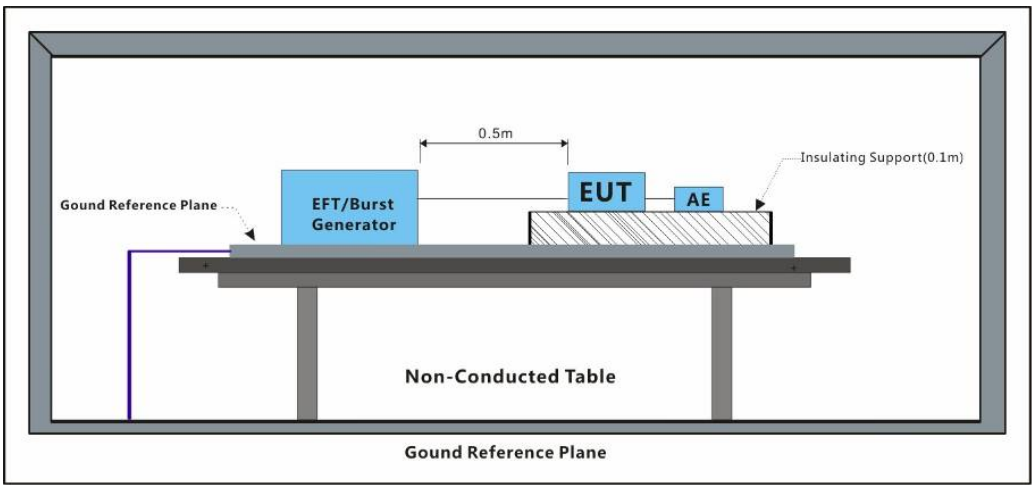
Modulation1kHz,80% Amp. Mod,1% increment

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 61547: 2009
Test Method: EN 61000-4-4:2012

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 64.9 % RH Atmospheric Pressure: 1005 mbar

7.3.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

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

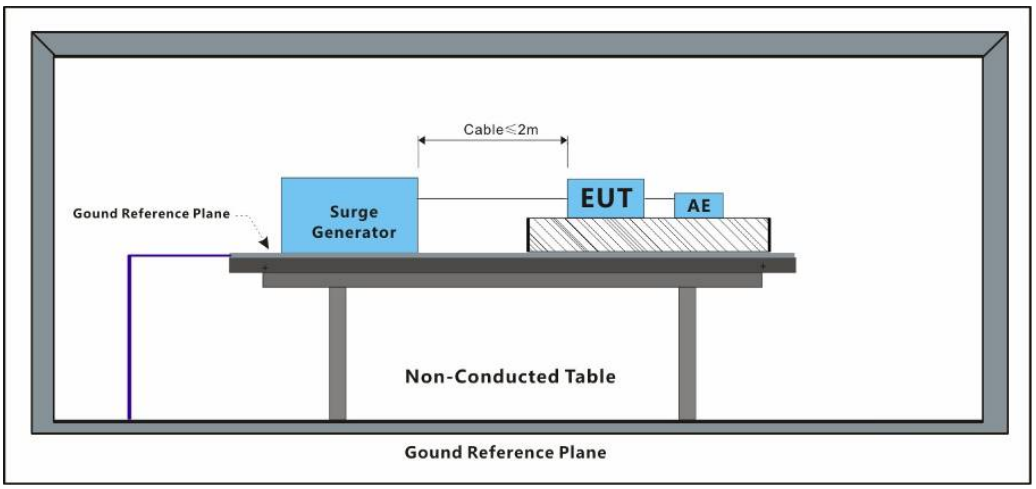
Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A
A: No degradation in the performance of the EUT was observed				

7.4 Surge at Power Port

Test Requirement: EN 61547: 2009

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: 24.6 °C Humidity: 64.9 % RH Atmospheric Pressure: 1005 mbar

7.4.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

7.4.4 Test Condition and Results:

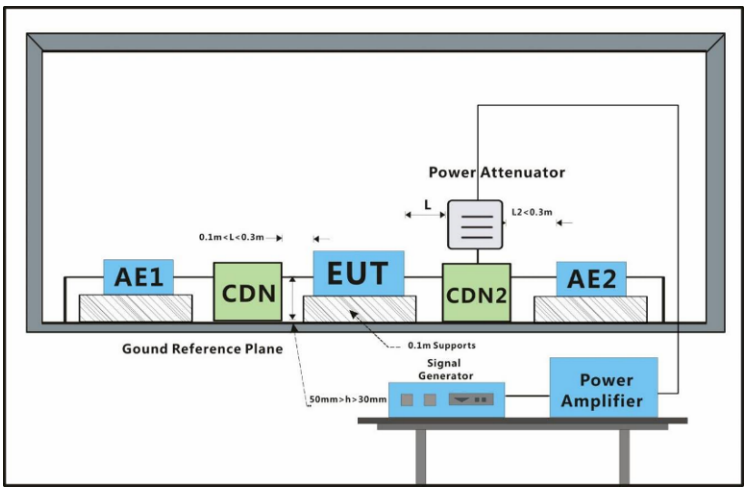
Performance Criterion: B (Luminaire for emergency lightingc),
Performance Criterion: C (for others lighting equipment).
Interval: 60s between each surge
Test Level: ±0.5kV Live to Neutral; ±1kV Live, Neutral to Earth
Polarity: Positive & Negative
Generator source impedance: 2Ω
CDN coupling impedance(Line-to-ground):10Ω
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	0.5	+	90°	A
L-N	0.5	-	270°	A
L-PE	1.0	+	90°	A
L-PE	1.0	-	270°	A
N-PE	1.0	+	90°	A
N-PE	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 61547: 2009
Test Method: EN 61000-4-6:2014

7.5.1 Test Setup Diagram



7.5.2 E.U.T. Operation

Operating Environment:
Temperature: 24.6 °C Humidity: 64.9 % RH Atmospheric Pressure: 1005 mbar

7.5.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

7.5.4 Test Condition and Results:

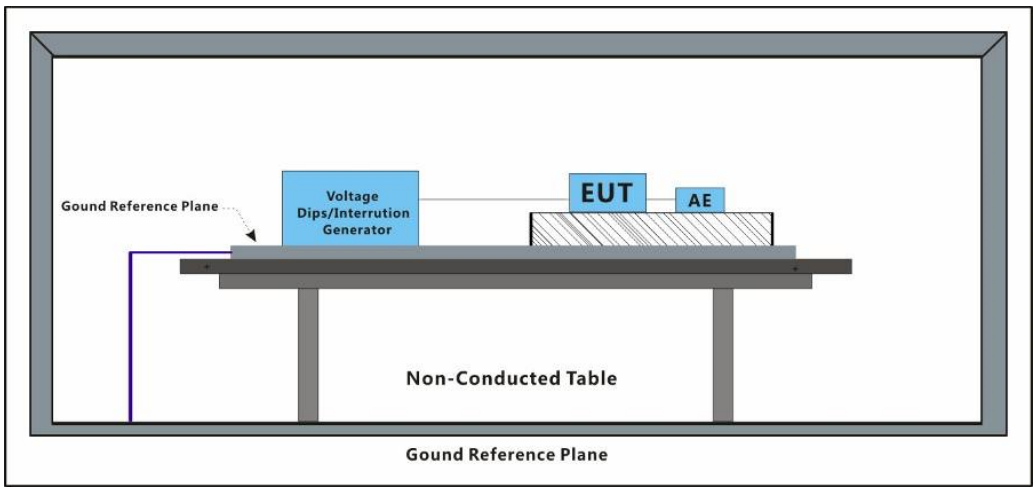
Performance Criterion: A
Step Size 1%
Frequency Range:0.15MHz to 80MHz
Modulation:80%, 1kHz Amplitude Modulation

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3	CDN	3s	A
A: No degradation in the performance of the EUT was observed				

7.6 Voltage Dips and Interruptions

Test Requirement: EN 61547: 2009
Test Method: EN IEC 61000-4-11:2020

7.6.1 Test Setup Diagram



7.6.2 E.U.T. Operation

Operating Environment:
Temperature: 24.6 °C Humidity: 64.9 % RH Atmospheric Pressure: 1005 mbar

7.6.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Test the EUT in LED lighting mode.

7.6.4 Test Condition and Results:

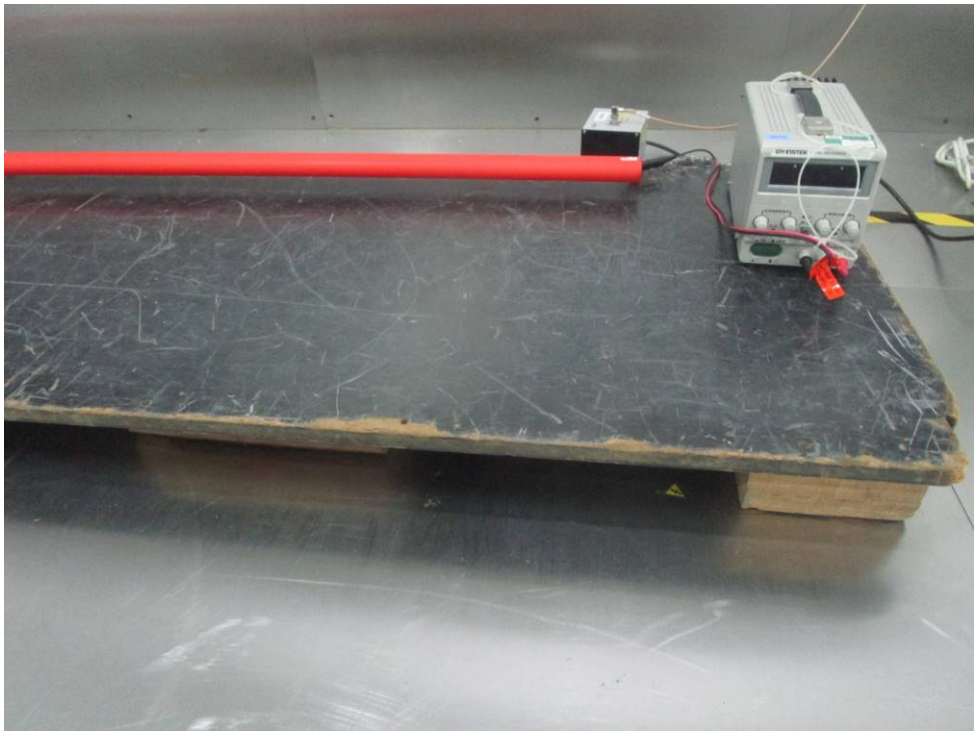
Performance Criterion:0% of UT (Rated Voltage) for 0.5 Cycle: B; 70% of UT for 10 Cycles: C.
No. of Dips / Interruptions:3 per Level
Time between dropout10s

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

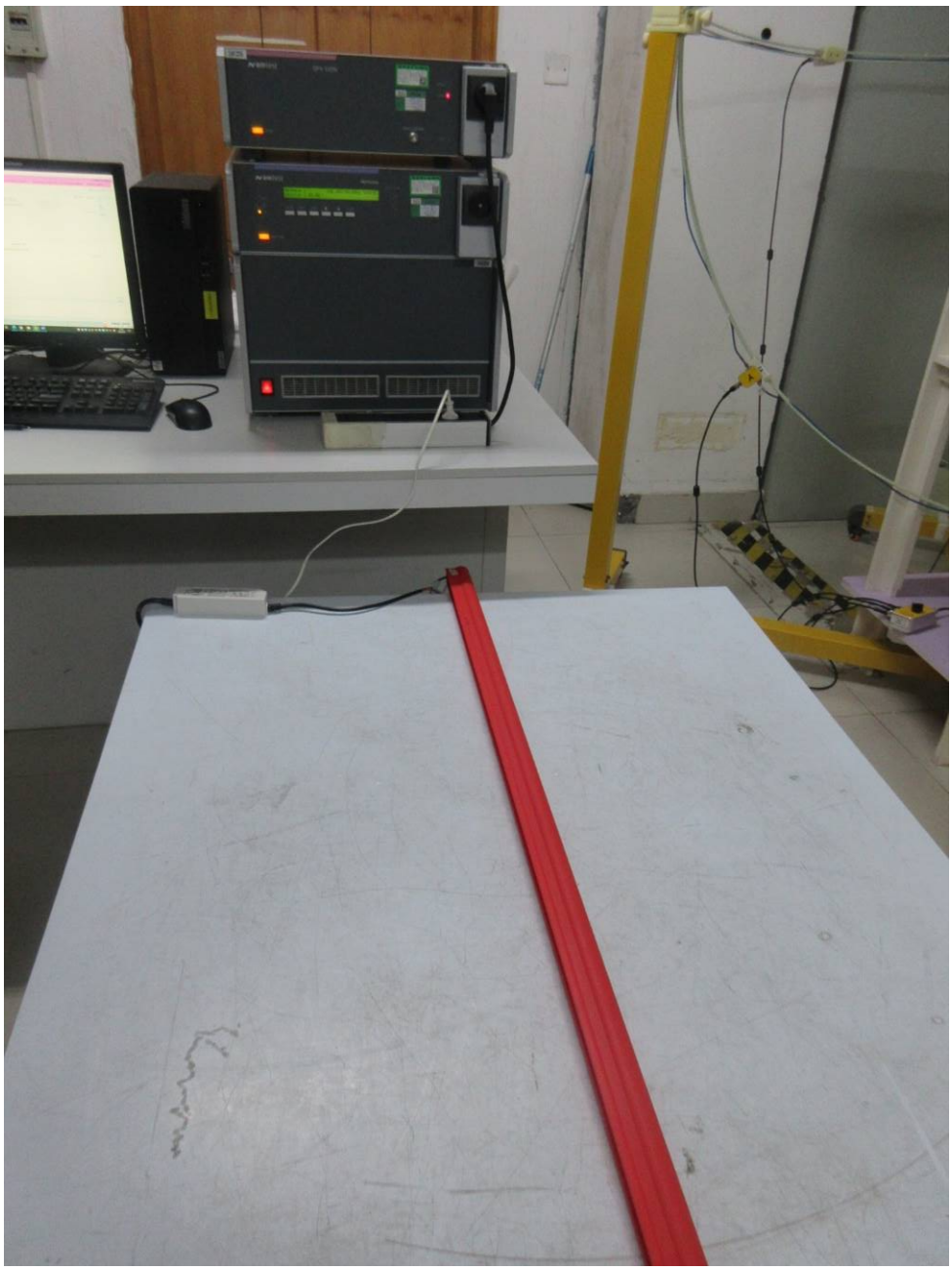
Conducted Emissions at Mains Terminals (9kHz-30MHz)

CDNE Method (30-300MHz)

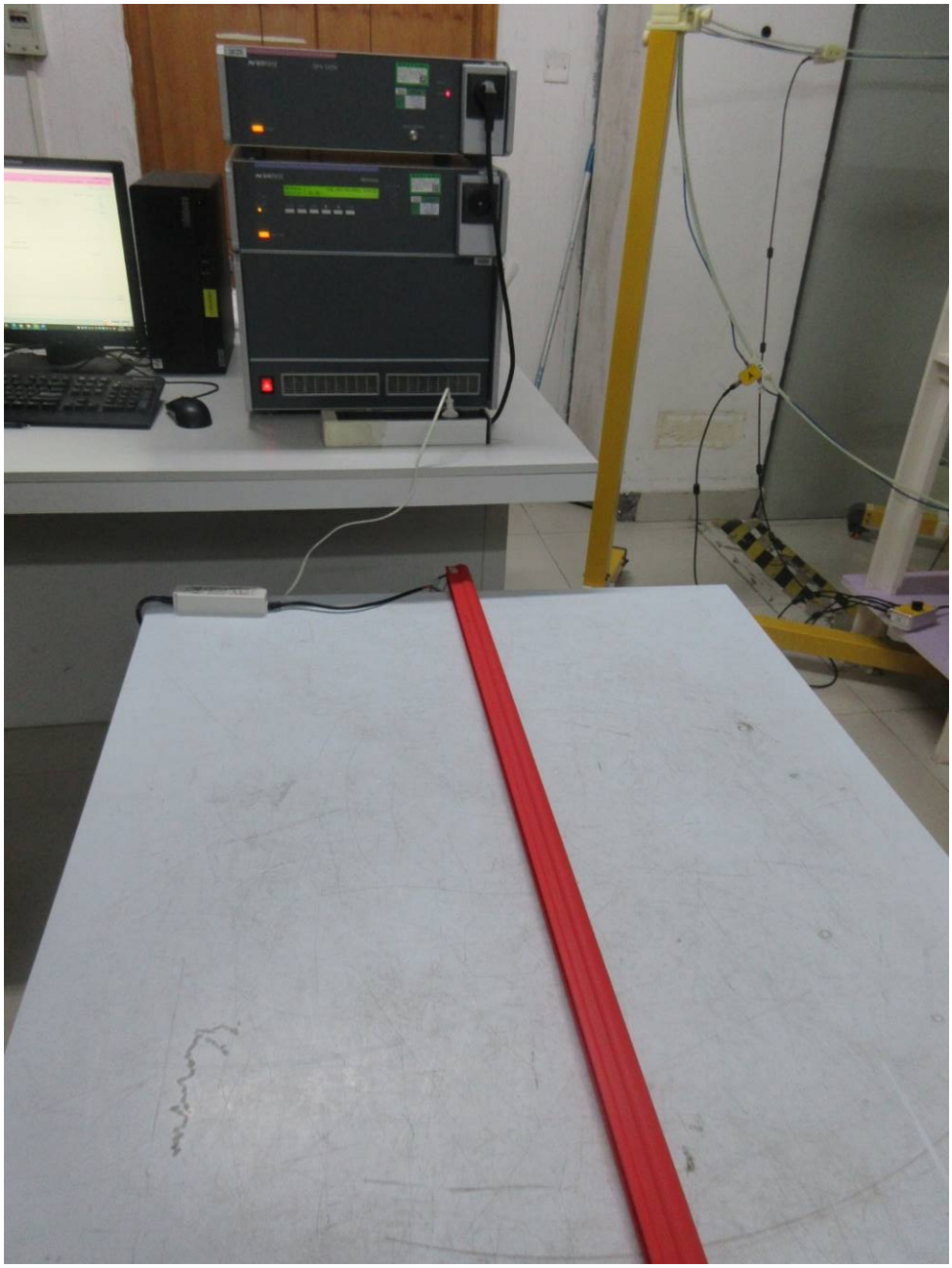


Radiated Emissions (Magnetic Field Induced Current)(9kHz-30MHz)

Harmonic Current Emission

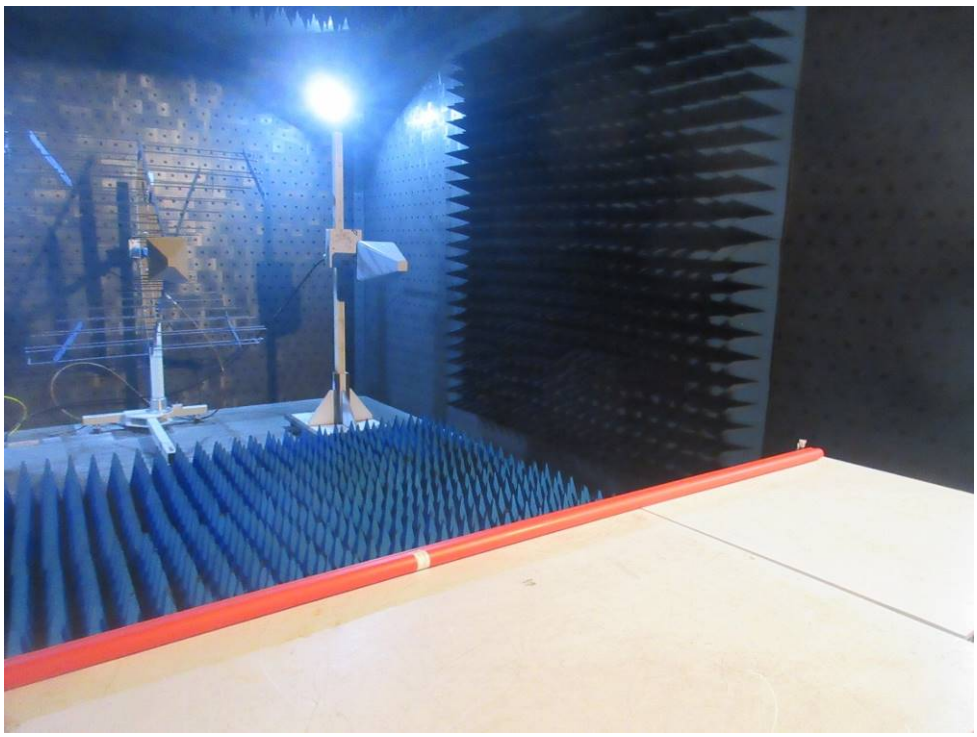


Voltage Fluctuations and Flicker



Electrostatic Discharge

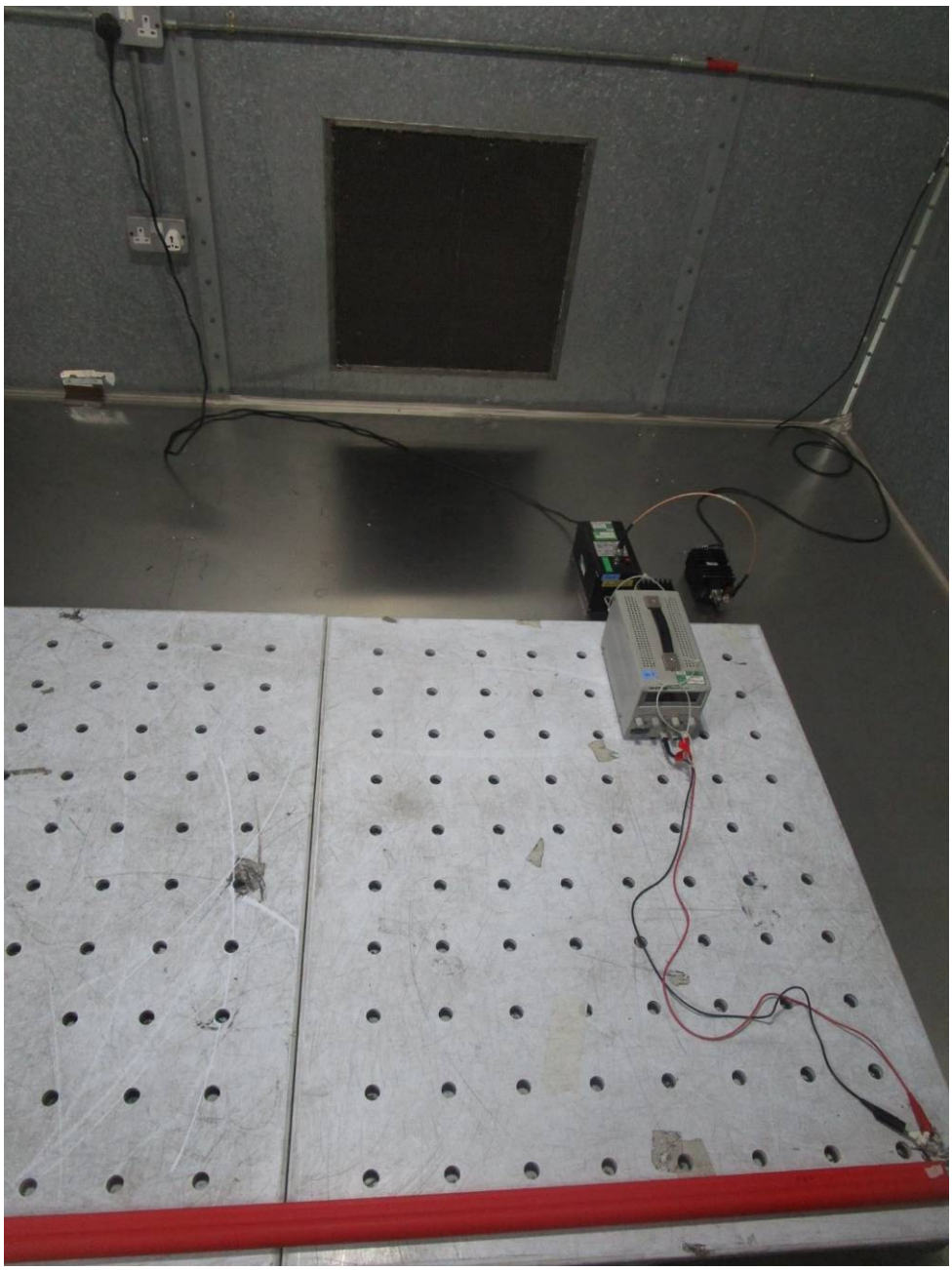
Radiated Immunity (80MHz-1GHz)



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 -