TEST REPORT

Application No.:	GZEM2201000284LM
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 Strip
Model No.:	AWHE1608-D-X
Standard(s) :	EN 61000-3-3: 2013+A1: 2019 EN IEC 55015: 2019+A11:2020 EN IEC 61000-3-2: 2019+A1: 2021 EN 61547: 2009
Date of Receipt:	2022-01-18
Date of Test:	2022-01-19 to 2022-05-25
Date of Issue:	2022-05-30
Test Result:	**Pass***

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

Kobe Jian
EMC Laboratory Manager

Revision Record			
Version	**Report No.**	**Date**	**Remark**
01	GZEM220100028401	2022-05-30	Original

Authorized for issue by:				
		Michael Huang **Michael Huang/Project Engineer**		
		Terry Lai **Terry Lai/Reviewer**		

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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**
Radiated Emissions (30MHz-1GHz)		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, 1.0kV Line to Line	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

**: The EUT passed Conducted Emissions at Mains Terminals (9kHz-30MHz) and Radiated Emissions (30MHz-1GHz) test after modification.

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.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply: AC 230V 50/60Hz
Rated Power: 321W
Test voltage: AC 230V

Cable(s): 2 wires x about 1.6m unscreened AC mains cable.
(The AC cable, supply by the SGS).

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

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (9kHz-30MHz)	3.18dB (9kHz to 150kHz), 2.76dB (150kHz to 30MHz)
Radiated Emissions (30MHz-1GHz)	5.00dB (30MHz-1GHz):3m; 4.38dB (30MHz-1GHz):10m
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

**: The EUT passed Conducted Emissions at Mains Terminals (9kHz-30MHz) and Radiated Emissions (30MHz-1GHz) test after modification.

4.8 EMS Monitor

Visual: LED lighting of the EUT.
Audio: N/A
Other: N/A

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	2022-05-20	2023-05-19
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

Radiated Emissions (30MHz-1GHz)					
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	2022-05-16	2023-05-15
EMI Test Receiver (1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2022-05-20	2023-05-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Trilog Broadband Antenna (25MHz-1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2022-03-03	2025-03-02

Radiated Emissions (Magnetic Field Induced Current)(9kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Coaxial Cable (RE 2m Loop)	INFINITE	CC223N-10	EMC0703	2021-06-28	2023-06-27
2m Large Loop Antenna System (ZN3040)	ZHINAN	ZN3040	EMC2187	2022-03-26	2024-03-25

Harmonic Current Emission					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Power Analyzer	California	PACS	EMC0607	2022-03-26	2023-03-25
AC Power Source	California	50001iX	EMC0608	2022-03-26	2023-03-25
Test Software CTS4	California	Ver 4.14.0	GZE100-66	N/A	N/A

Voltage Fluctuations and Flicker					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Power Analyzer	California	PACS	EMC0607	2022-03-26	2023-03-25
AC Power Source	California	50001iX	EMC0608	2022-03-26	2023-03-25
Test Software CTS4	California	Ver 4.14.0	GZE100-66	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	2022-05-20	2023-05-19
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
EMC Immunity Test System	TESEQ AG	NSG 3060; CDN3061; INA 6502 CIB; CND3425	EMC2072	2021-12-17	2022-12-16
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**
Tesla Meter	KANETEC CO., LTD.	TM-701	EMC2078	2020-11-17	2023-11-16
PFMF Generator	Hangzhou EVERFINE	EMS61000-8K	EMC2061	2020-08-21	2022-08-20
Three Phases CDN for Surge	TESEQ AG	CDN 3063	EMC2108	2022-05-16	2023-05-15
Surge DC CDN 42Ω	TESEQ AG	CDN117	EMC2108-AE1	2020-01-10	2023-01-09
Modular Impulse Surge Generator	EMC PARTNER	MIG0603EN	EMC2059	2021-12-17	2022-12-16
High Speed Signal Surge CDN	EMC PARTNER	CDN-UTP	EMC2060	2021-12-17	2022-12-16

Conducted Immunity at AC Mains Power Port (150kHz-80MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Tesla Meter	KANETEC CO., LTD.	TM-701	EMC2078	2020-11-17	2023-11-16
PFMF Generator	Hangzhou EVERFINE	EMS61000-8K	EMC2061	2020-08-21	2022-08-20
Three Phases CDN for Surge	TESEQ AG	CDN 3063	EMC2108	2022-05-16	2023-05-15
Modular Impulse Surge Generator	EMC PARTNER	MIG0603EN	EMC2059	2021-12-17	2022-12-16
High Speed Signal Surge CDN	EMC PARTNER	CDN-UTP	EMC2060	2021-12-17	2022-12-16

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
EMC Immunity Test System	TESEQ AG	NSG 3060; CDN3061; INA 6502 CIB; CND3425	EMC2072	2021-12-17	2022-12-16
Test Software WIN 3000	TESEQ AG	Ver 1.3.2	GZE100-68	N/A	N/A

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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

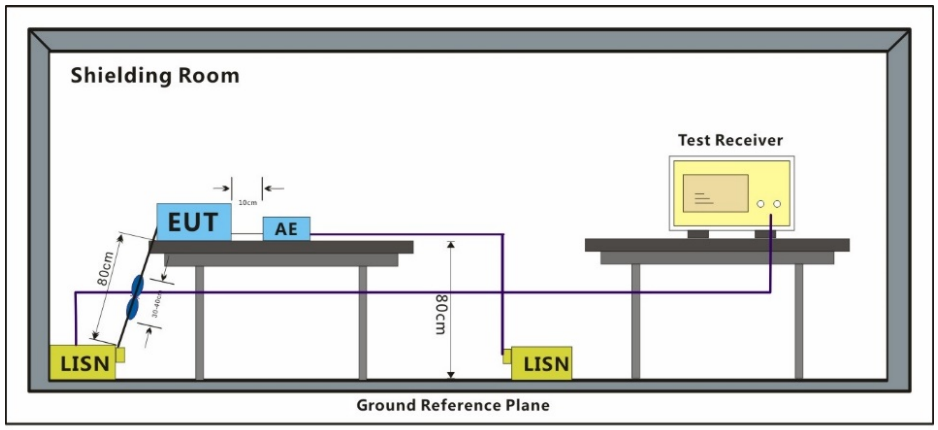
Operating Environment:

Temperature: 23.1 °C Humidity: 52.7 % RH Atmospheric Pressure: 1005 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



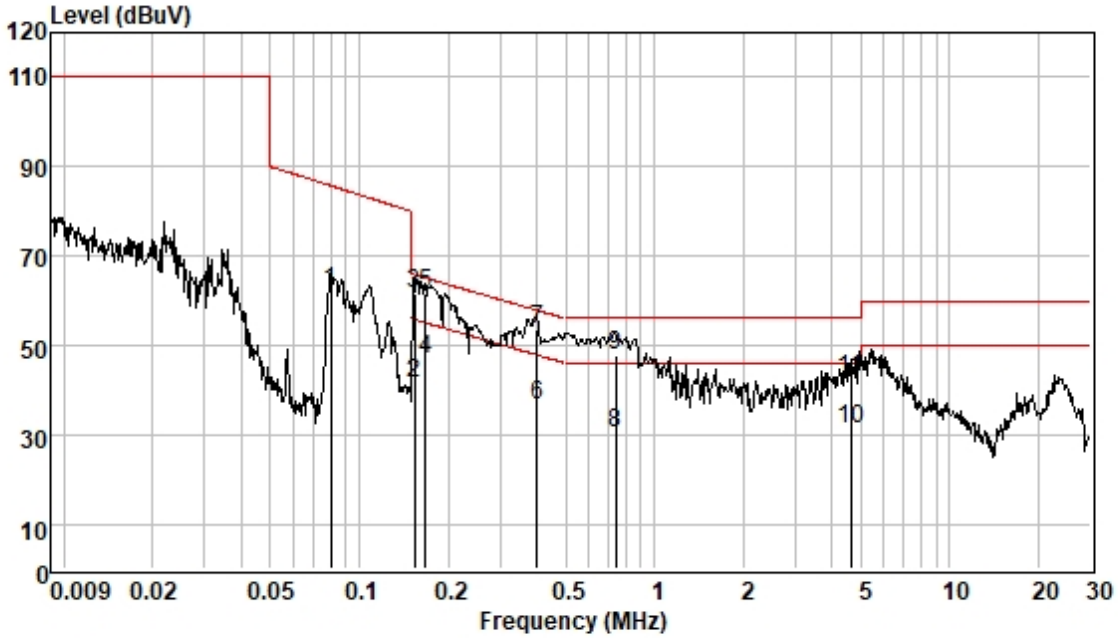
6.1.4 Measurement Procedure and Data

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

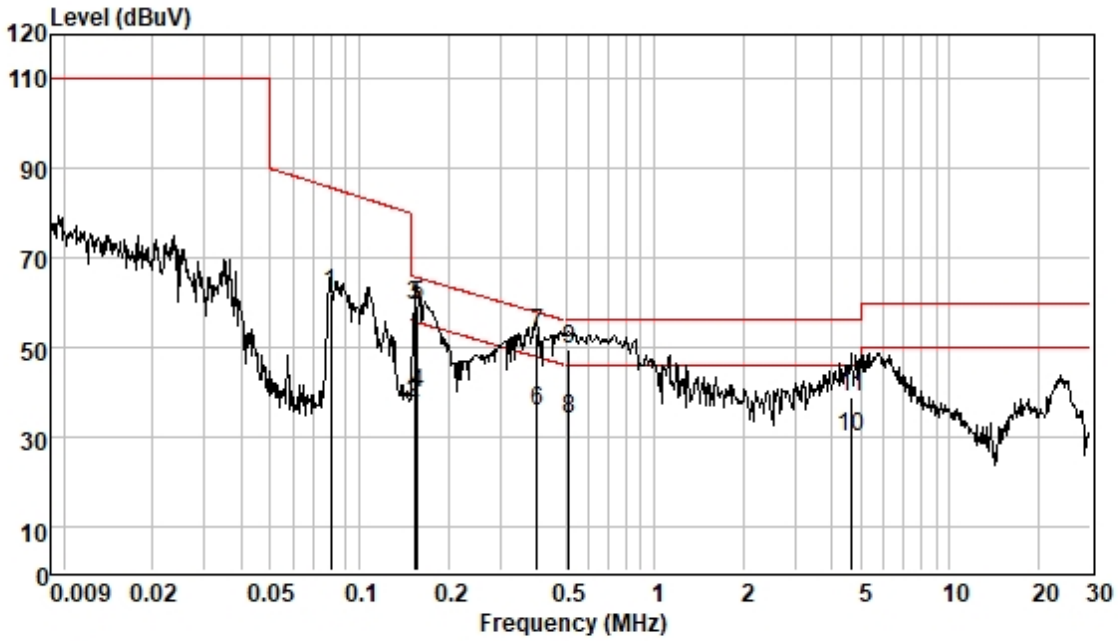
Test Mode: 00; Line: Live line



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	0.080	52.51	0.05	9.49	62.05	85.69	-23.64	QP
2	0.154	32.03	0.06	9.54	41.63	55.78	-14.15	Average
3	0.154	51.90	0.06	9.54	61.50	65.78	-4.28	QP
4	0.168	37.27	0.06	9.55	46.88	55.08	-8.20	Average
5	0.168	51.93	0.06	9.55	61.54	65.08	-3.54	QP
6	0.400	27.01	0.06	9.58	36.65	47.86	-11.21	Average
7	0.400	43.77	0.06	9.58	53.41	57.86	-4.45	QP
8	0.739	20.47	0.07	9.59	30.13	46.00	-15.87	Average
9	0.739	38.10	0.07	9.59	47.76	56.00	-8.24	QP
10	4.622	21.25	0.18	9.65	31.08	46.00	-14.92	Average
11	4.622	32.44	0.18	9.65	42.27	56.00	-13.73	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	0.080	52.53	0.05	9.47	62.05	85.71	-23.66	QP
2	0.154	27.95	0.06	9.53	37.54	55.78	-18.24	Average
3	0.154	49.77	0.06	9.53	59.36	65.78	-6.42	QP
4	0.157	30.01	0.06	9.53	39.60	55.60	-16.00	Average
5	0.157	49.86	0.06	9.53	59.45	65.60	-6.15	QP
6	0.400	25.87	0.06	9.58	35.51	47.86	-12.35	Average
7	0.400	43.59	0.06	9.58	53.23	57.86	-4.63	QP
8	0.513	24.20	0.07	9.58	33.85	46.00	-12.15	Average
9	0.513	40.03	0.07	9.58	49.68	56.00	-6.32	QP
10	4.672	19.91	0.18	9.65	29.74	46.00	-16.26	Average
11	4.672	29.04	0.18	9.65	38.87	56.00	-17.13	QP

6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN IEC 55015: 2019+A11:2020
Test Method: EN IEC 55015:2019+A11:2020
Limit:
Test Distance: 10m
30MHz-230MHz 30 dB(μV/m) quasi-peak
230MHz-1GHz 37 dB(μV/m) quasi-peak
Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

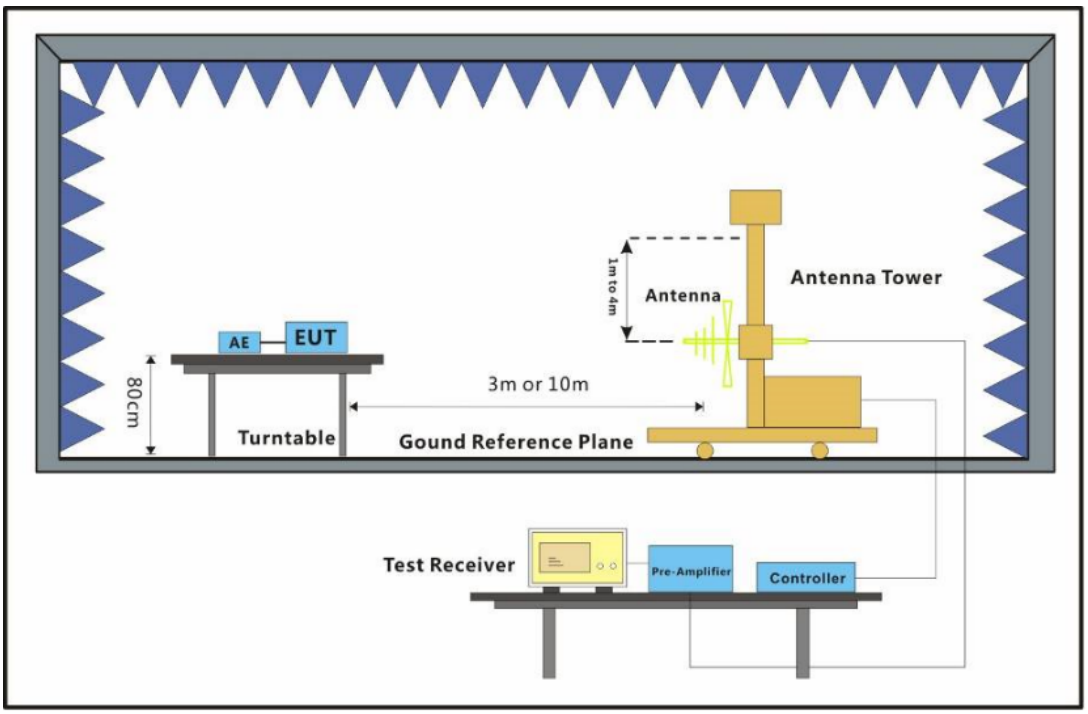
6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 22.4 °C Humidity: 61.6 % RH Atmospheric Pressure: 1005 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



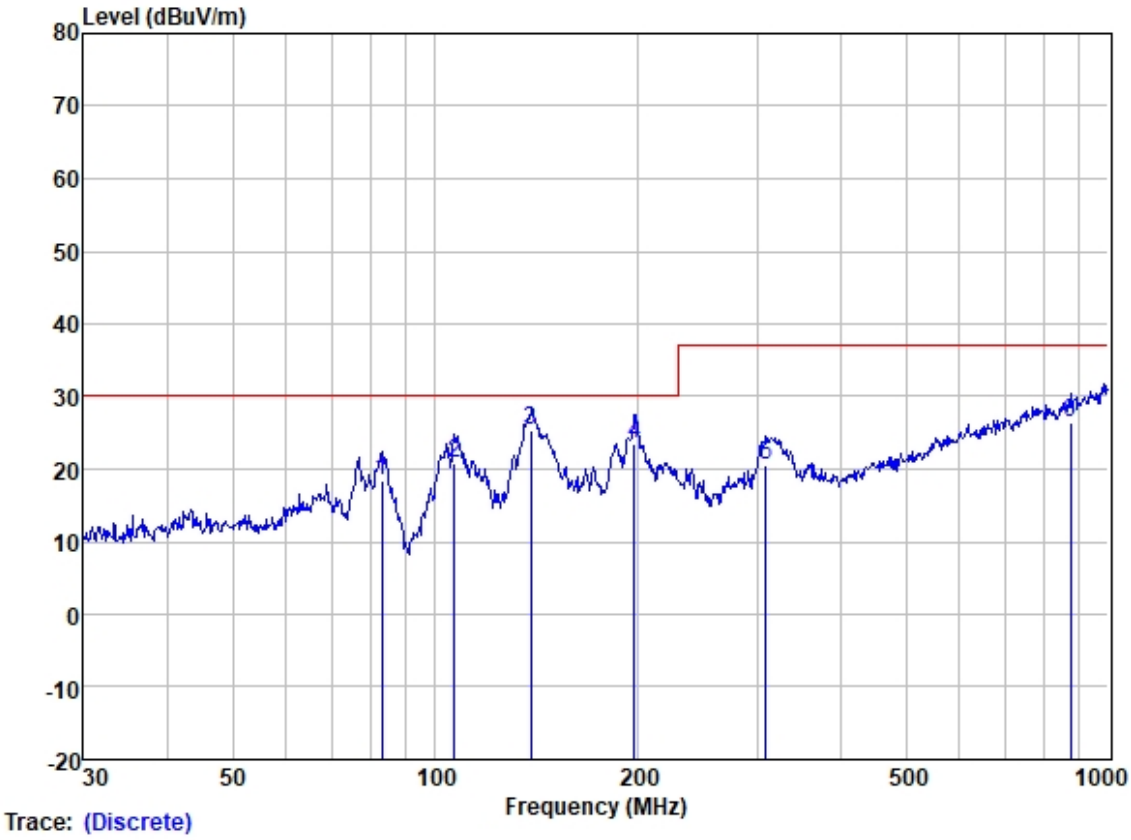
6.2.4 Measurement Procedure and Data

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

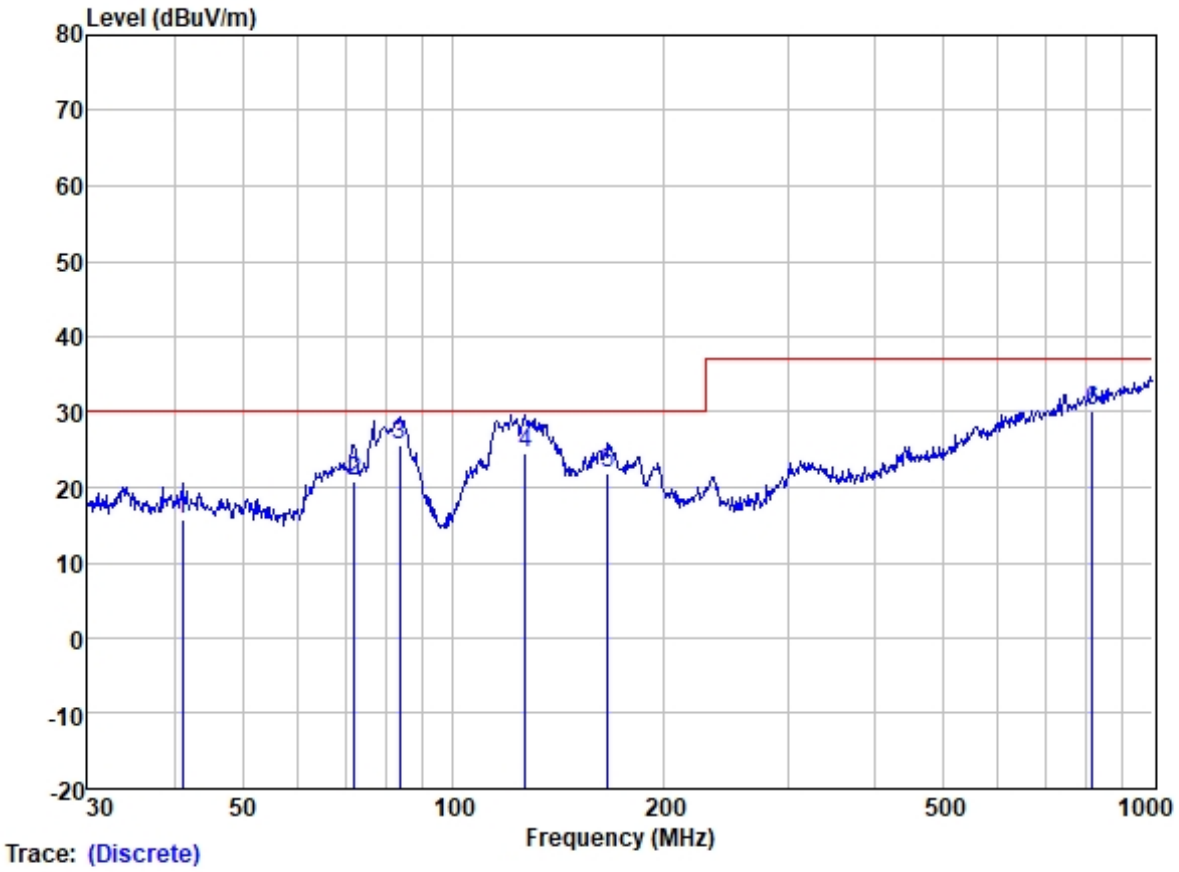
Test Mode: 00; Polarity: Horizontal



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

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	83.230	35.93	8.14	1.51	27.09	18.49	30.00	-11.51	HORIZONTAL	QP
2	106.759	36.03	10.15	1.77	27.07	20.88	30.00	-9.12	HORIZONTAL	QP
3	138.387	37.09	13.07	2.07	26.94	25.29	30.00	-4.71	HORIZONTAL	QP
4	197.200	37.27	10.47	2.51	26.73	23.52	30.00	-6.48	HORIZONTAL	QP
5	309.998	29.88	13.90	3.23	26.60	20.41	37.00	-16.59	HORIZONTAL	QP
6	878.322	24.61	22.98	6.79	27.88	26.50	37.00	-10.50	HORIZONTAL	QP

Test Mode: 00; Polarity: Vertical



Trace: (Discrete)

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

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	40.988	28.08	13.60	1.10	27.18	15.60	30.00	-14.40	VERTICAL	QP
2	72.084	34.92	11.50	1.43	27.12	20.73	30.00	-9.27	VERTICAL	QP
3	83.816	43.20	8.04	1.53	27.09	25.68	30.00	-4.32	VERTICAL	QP
4	126.772	38.00	11.66	1.93	27.01	24.58	30.00	-5.42	VERTICAL	QP
5	166.068	32.86	13.40	2.37	26.78	21.85	30.00	-8.15	VERTICAL	QP
6	818.834	29.02	22.80	6.30	28.00	30.12	37.00	-6.88	VERTICAL	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	88dB(μA) quasi-peak
0.07MHz-0.15MHz	88dB(μA)-58dB(μA) quasi-peak
0.15MHz-3MHz	58dB(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

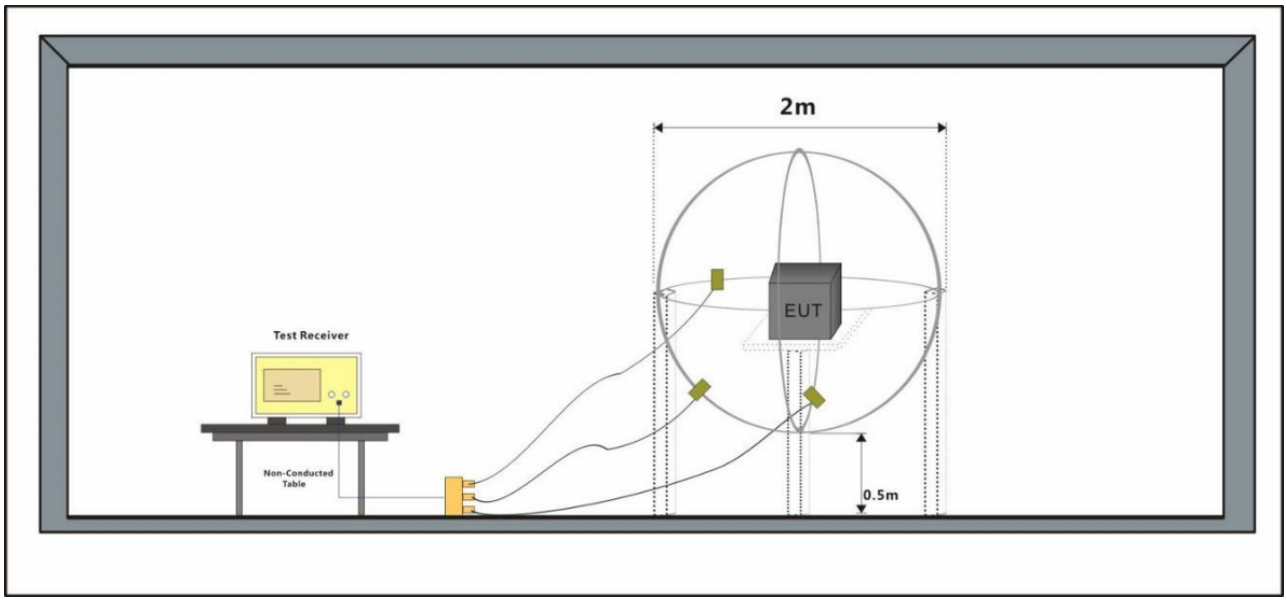
Operating Environment:

Temperature: 21.4 °C Humidity: 54.1 % RH Atmospheric Pressure: 1018 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

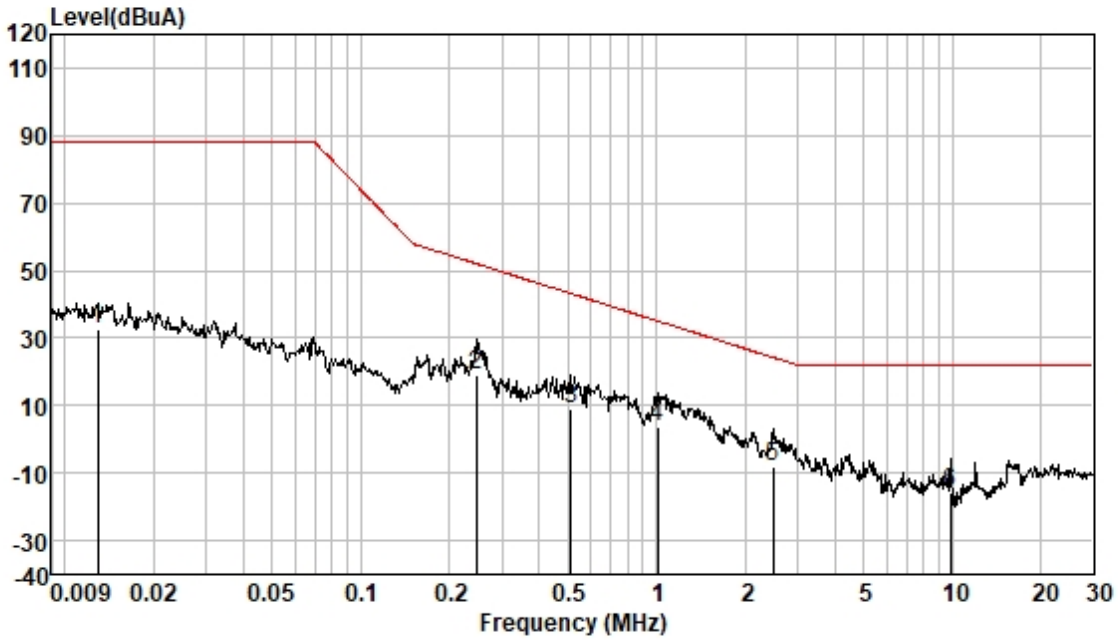


6.3.4 Measurement Procedure and Data

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

Remark: Level= Read Level+ Cable Loss

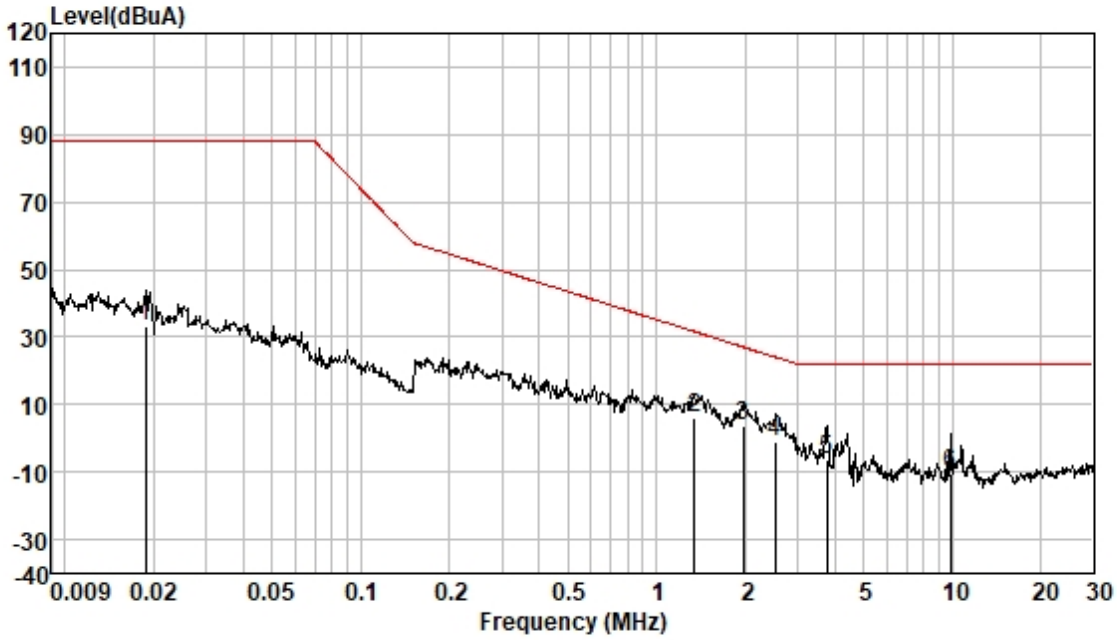
Test Mode: 00



loop : X
Test Mode:
Model :

Frequency MHz	Read level dBuV	Cable Loss dB	Antenna Factor dB	Measured level dBuA	Limit Line dBuA	Over limit dB	Remark
0.01	32.58	0.00	-0.15	32.43	88.00	-55.57	QP
0.25	18.91	0.10	-0.16	18.85	52.04	-33.19	QP
0.52	8.93	0.10	0.00	9.03	43.17	-34.14	QP
1.01	3.54	0.10	0.00	3.64	35.08	-31.44	QP
2.49	-8.85	0.26	0.42	-8.17	24.26	-32.43	QP
9.87	-17.33	0.60	0.90	-15.83	22.00	-37.83	QP

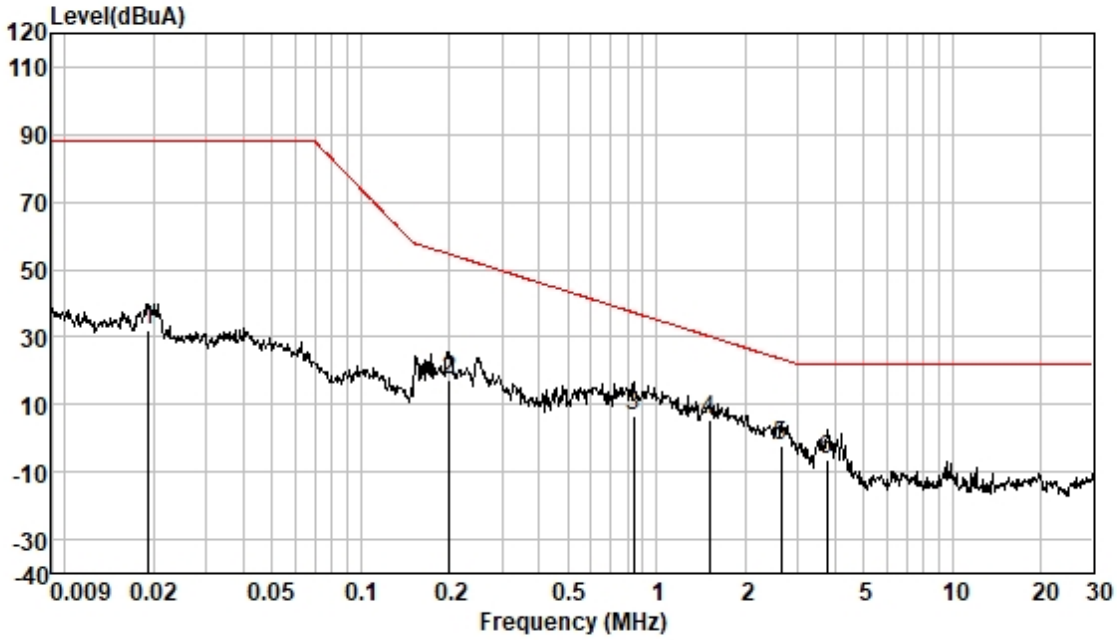
Test Mode: 00



loop : Y
Test Mode:
Model :

Frequency MHz	Read level dBuV	Cable Loss dB	Antenna Factor dB	Measured level dBuA	Limit Line dBuA	Over limit dB	Remark
0.02	32.92	0.00	0.09	33.01	88.00	-54.99	QP
1.34	5.66	0.13	0.00	5.79	31.66	-25.87	QP
1.97	3.12	0.20	0.20	3.52	27.08	-23.56	QP
2.53	-1.45	0.26	0.25	-0.94	24.06	-25.00	QP
3.76	-7.00	0.38	0.39	-6.23	22.00	-28.23	QP
9.87	-12.22	0.60	0.89	-10.73	22.00	-32.73	QP

Test Mode: 00



loop : Z
Test Mode:
Model :

Frequency MHz	Read level dBuV	Cable Loss dB	Antenna Factor dB	Measured level dBuA	Limit Line dBuA	Over limit dB	Remark
0.02	31.78	0.00	0.09	31.87	88.00	-56.13	QP
0.20	17.54	0.10	-0.20	17.44	54.57	-37.13	QP
0.84	6.54	0.10	-0.18	6.46	37.32	-30.86	QP
1.50	5.00	0.17	0.10	5.27	30.30	-25.03	QP
2.63	-2.67	0.28	0.26	-2.13	23.57	-25.70	QP
3.76	-7.36	0.38	0.39	-6.59	22.00	-28.59	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

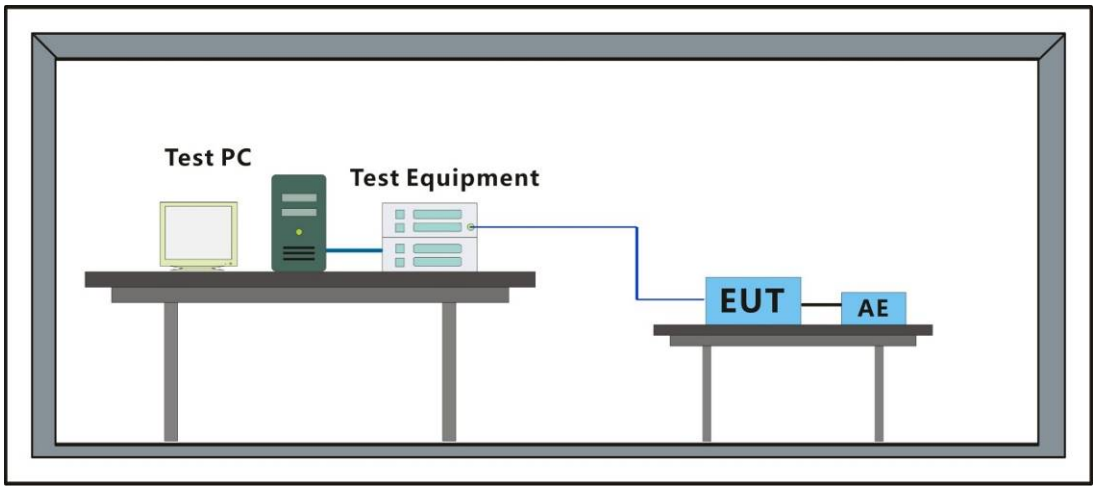
Operating Environment:

Temperature: 23.1 °C Humidity: 65.6 % RH Atmospheric Pressure: 1018 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

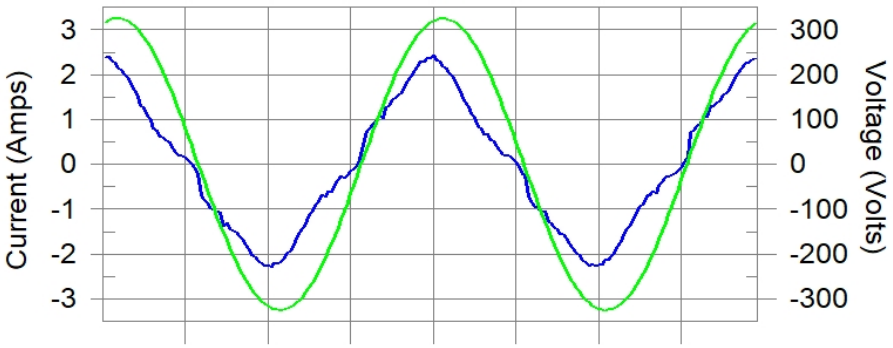
Test Mode: 00

Harmonics – Class-C per IEC 61000-3-2:2018/AMD1:2020(Run time)

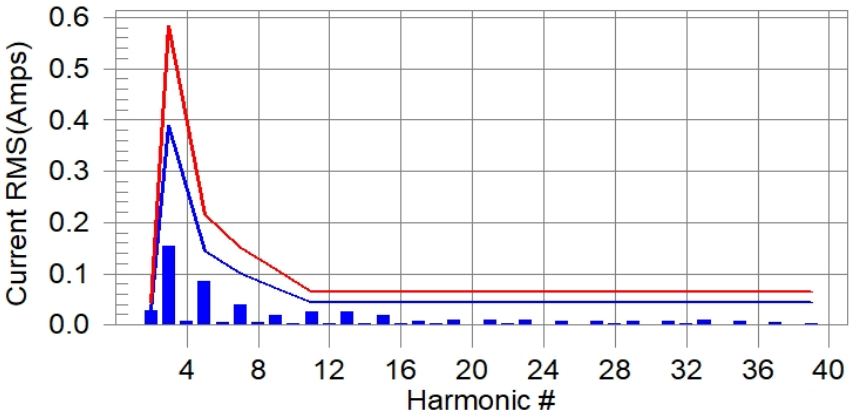
Test category: Class-C (European limits) **Test Margin: 100**
Test duration (min): 2.5

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class C limit line **European Limits**



Test result: Pass **Worst harmonics H2-75.0% of 150% limit, H2-99.4% of 100% limit**

Test Mode: 00

Current Test Result Summary (Run time)

Test category: Class-C (European limits) **Test Margin: 100**
Test duration (min): 2.5

Test Result: Pass **Source qualification: Normal**
THC(A): 0.191 **I-THD(%): 13.2** **POHC(A): 0.023** **POHC Limit(A): 0.137**

Highest parameter values during test:

V_RMS (Volts):	230.09	Frequency(Hz):	50.00
I_Peak (Amps):	2.446	I_RMS (Amps):	1.455
I_Fund (Amps):	1.442	Crest Factor:	1.682
Power (Watts):	321.6	Power Factor:	0.961

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.029	0.029	99.4	0.032	0.043	75.0	Pass
3	0.155	0.389	39.8	0.157	0.584	26.9	Pass
4	0.006	0.000	N/A	0.007	0.000	N/A	Pass
5	0.085	0.144	59.1	0.086	0.216	39.7	Pass
6	0.005	0.000	N/A	0.006	0.000	N/A	Pass
7	0.039	0.101	38.5	0.039	0.151	26.0	Pass
8	0.005	0.000	N/A	0.005	0.000	N/A	Pass
9	0.019	0.072	26.5	0.019	0.108	18.0	Pass
10	0.003	0.000	N/A	0.003	0.000	N/A	Pass
11	0.025	0.043	58.0	0.026	0.065	39.4	Pass
12	0.003	0.000	N/A	0.004	0.000	N/A	Pass
13	0.027	0.043	61.5	0.027	0.065	41.4	Pass
14	0.003	0.000	N/A	0.003	0.000	N/A	Pass
15	0.020	0.043	45.8	0.020	0.065	31.3	Pass
16	0.002	0.000	N/A	0.002	0.000	N/A	Pass
17	0.006	0.043	N/A	0.006	0.065	N/A	Pass
18	0.002	0.000	N/A	0.002	0.000	N/A	Pass
19	0.009	0.043	21.7	0.010	0.065	15.0	Pass
20	0.001	0.000	N/A	0.001	0.000	N/A	Pass
21	0.010	0.043	22.2	0.010	0.065	14.9	Pass
22	0.002	0.000	N/A	0.002	0.000	N/A	Pass
23	0.009	0.043	20.5	0.009	0.065	14.2	Pass
24	0.001	0.000	N/A	0.001	0.000	N/A	Pass
25	0.007	0.043	N/A	0.007	0.065	N/A	Pass
26	0.001	0.000	N/A	0.002	0.000	N/A	Pass
27	0.007	0.043	N/A	0.007	0.065	N/A	Pass
28	0.003	0.000	N/A	0.003	0.000	N/A	Pass
29	0.008	0.043	N/A	0.008	0.065	N/A	Pass
30	0.001	0.000	N/A	0.002	0.000	N/A	Pass
31	0.008	0.043	N/A	0.008	0.065	N/A	Pass
32	0.002	0.000	N/A	0.003	0.000	N/A	Pass
33	0.009	0.043	20.6	0.009	0.065	14.1	Pass
34	0.001	0.000	N/A	0.002	0.000	N/A	Pass
35	0.007	0.043	N/A	0.007	0.065	N/A	Pass
36	0.001	0.000	N/A	0.001	0.000	N/A	Pass
37	0.004	0.043	N/A	0.004	0.065	N/A	Pass
38	0.001	0.000	N/A	0.001	0.000	N/A	Pass
39	0.003	0.043	N/A	0.003	0.065	N/A	Pass
40	0.001	0.000	N/A	0.001	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

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

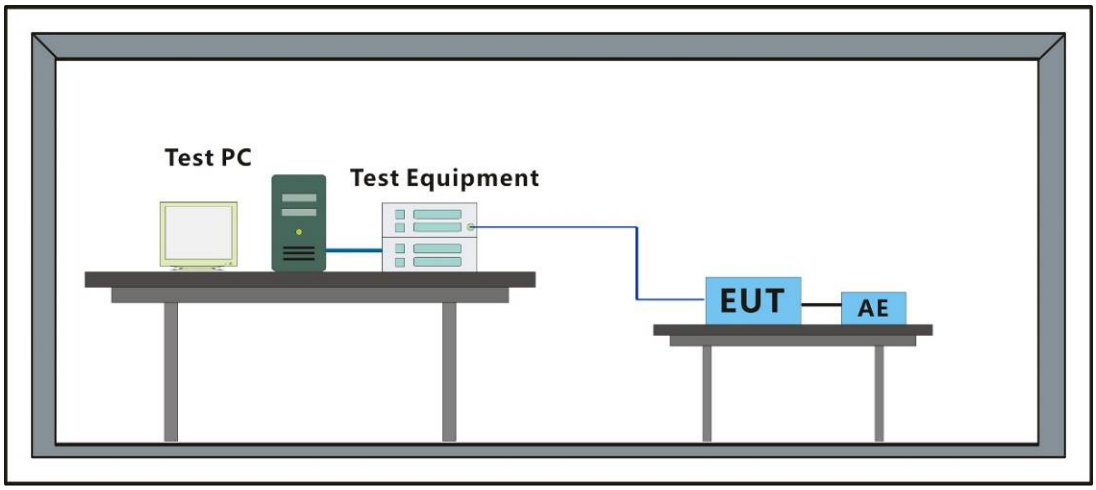
Operating Environment:

Temperature: 23.1 °C Humidity: 65.4 % RH Atmospheric Pressure: 1018 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

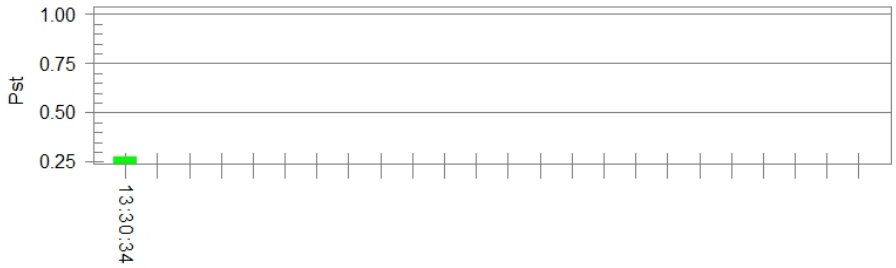
Test Mode: 00

Flicker Test Summary per IEC61000-3-3 (Run time)

Test category: dt,dmax,dc and Pst (European limits) **Test Margin: 100**
Test duration (min): 10

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):	**229.60**			
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.279**	**Test limit:**	**1.000**	**Pass**

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.

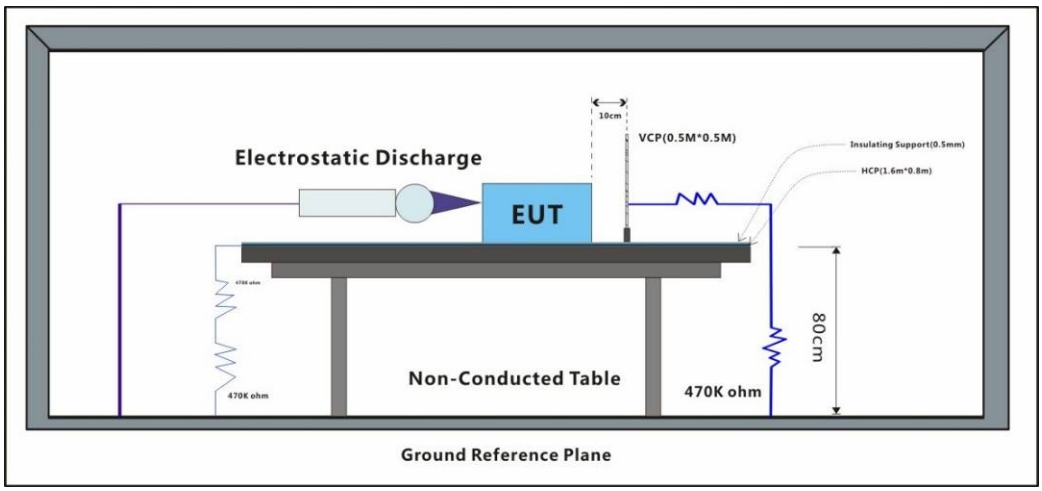
Criterion C: During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and/or operating the regulating control.

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: 23.1 °C Humidity: 65.3 % RH Atmospheric Pressure: 1018 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.

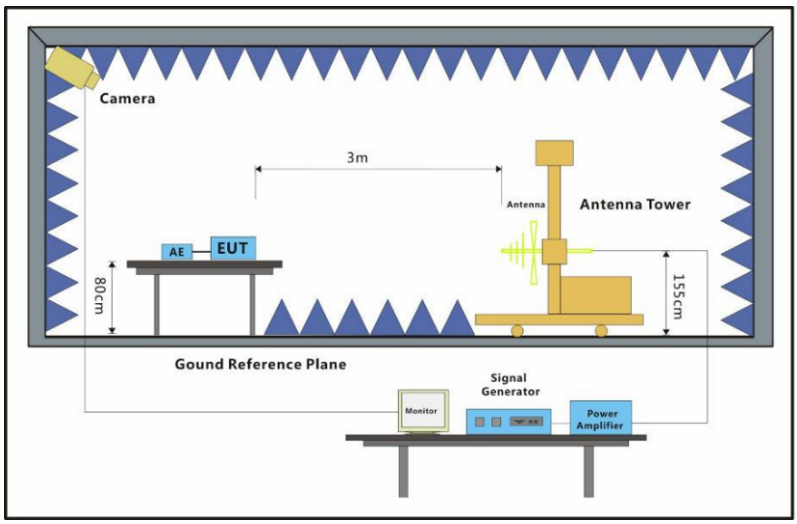
Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A
A: No degradation in the performance of the EUT was observed				

7.2 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 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: 21.5 °C Humidity: 57.2 % RH Atmospheric Pressure: 1018 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

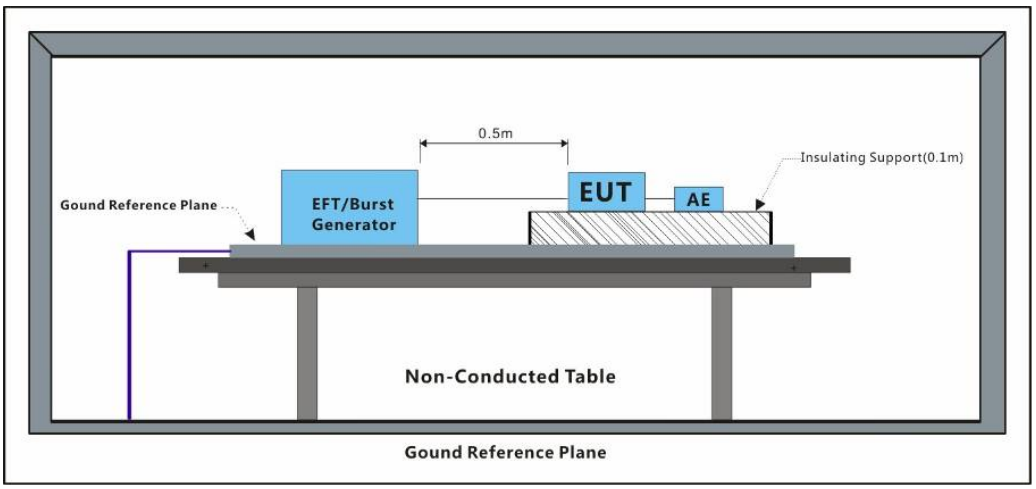
Modulation1kHz,80% Amp. Mod,1% increment

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: 22.1 °C Humidity: 67.3 % RH Atmospheric Pressure: 1018 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

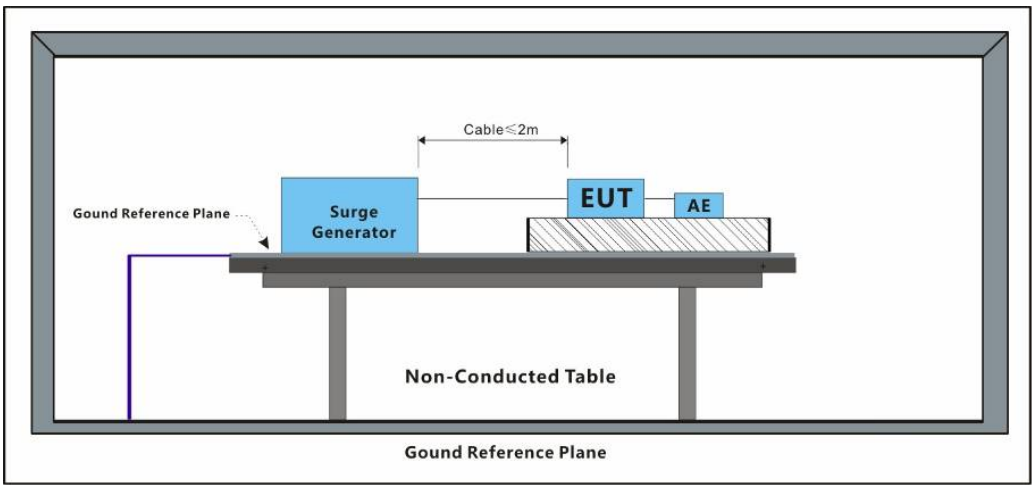
Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A
A: No degradation in the performance of the EUT was observed				

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: 22.1 °C Humidity: 67.3 % RH Atmospheric Pressure: 1018 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 lighting),

Performance Criterion: C (for others lighting equipment).

Interval: 60s between each surge

Test Level: ±1kV Live to Neutral

Polarity: Positive & Negative

Generator source impedance: 2Ω

Trigger Mode: Internal

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

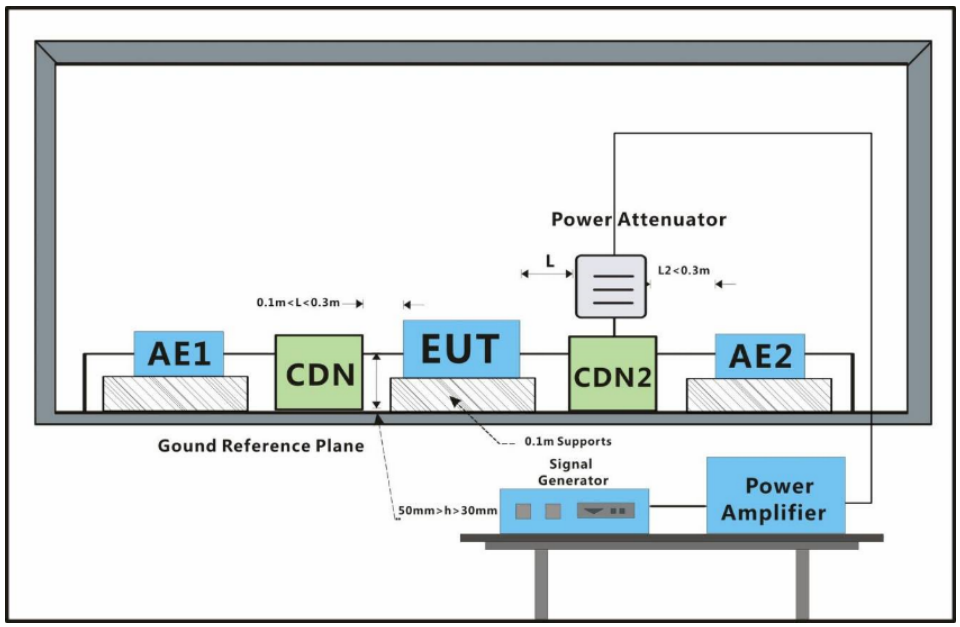
Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1.0	+	90°	B
L-N	1.0	-	270°	B
B: During test, the light flashed. After test, it could recover automatically.				

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: 22.1 °C Humidity: 67.3 % RH Atmospheric Pressure: 1018 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

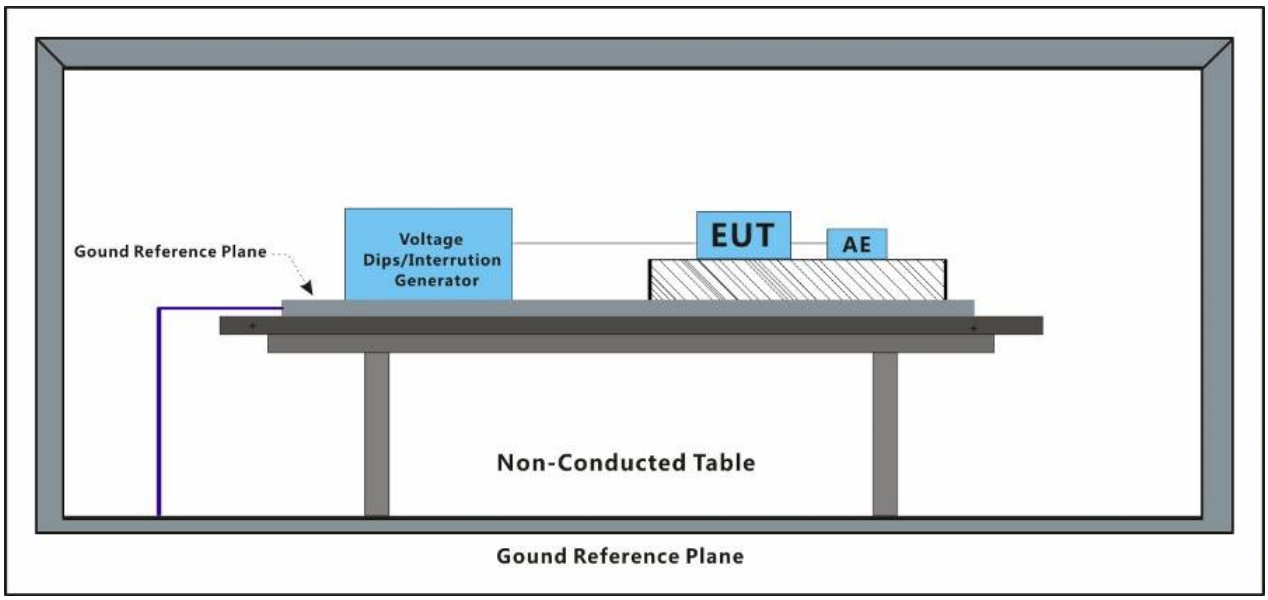
Modulation:80%, 1kHz Amplitude Modulation

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: 22.1 °C Humidity: 67.3 % RH Atmospheric Pressure: 1018 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:

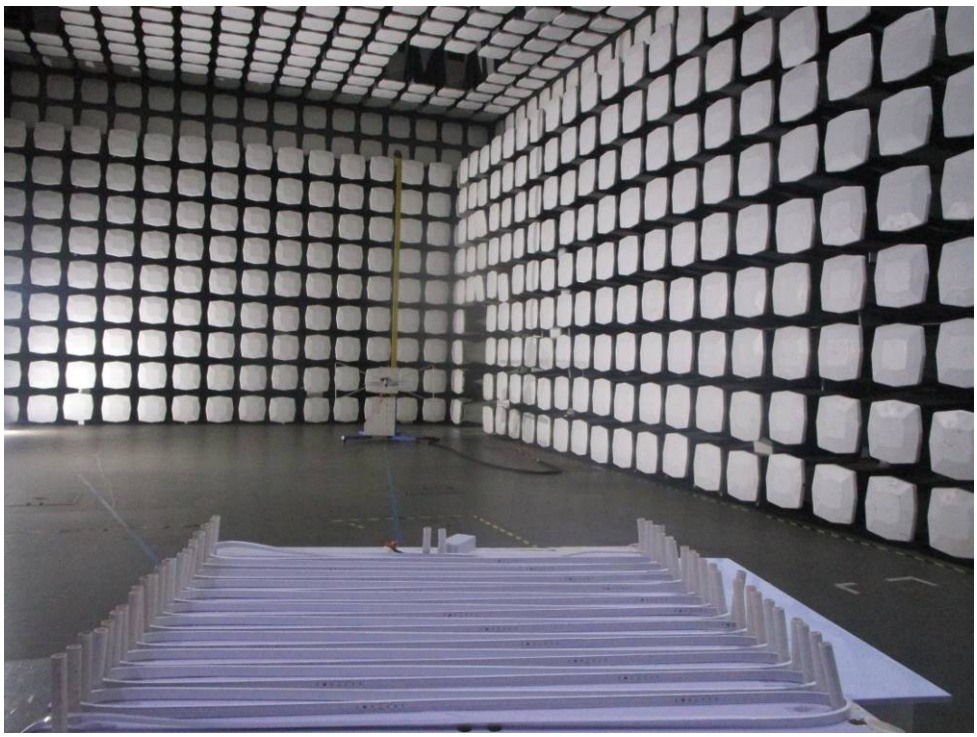
Performance Criterion:0% of UT (Rated Voltage) for 0.5 Cycle: B; 70% of UT for 10 Cycles: C.
No. of Dips / Interruptions:3 per Level
Time between dropout10s

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				

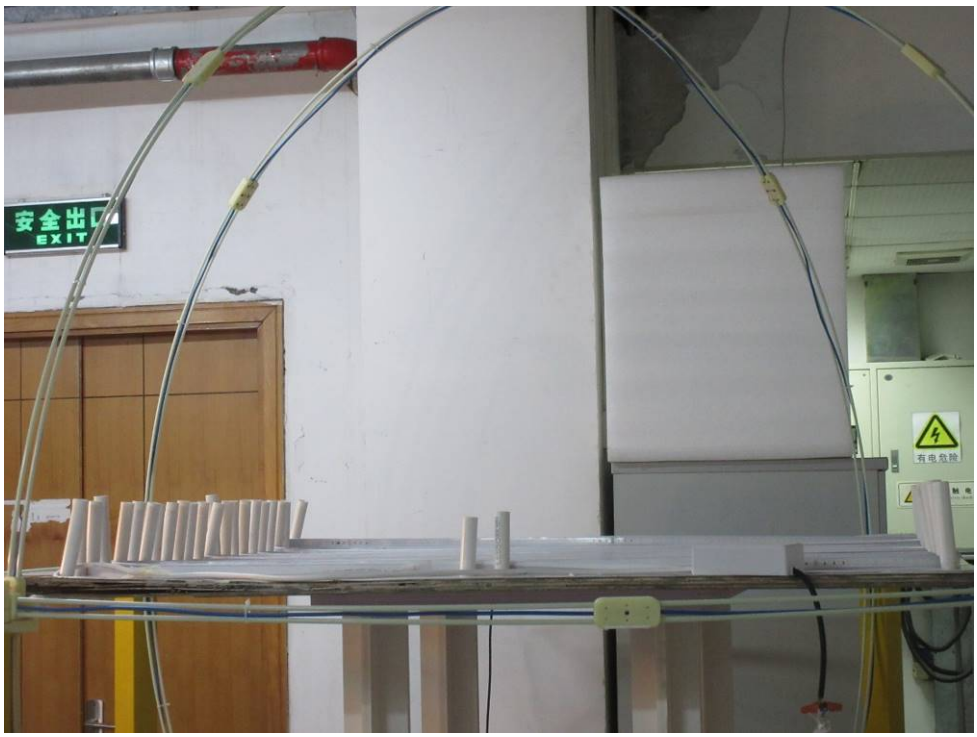
8 Test Setup Photo

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

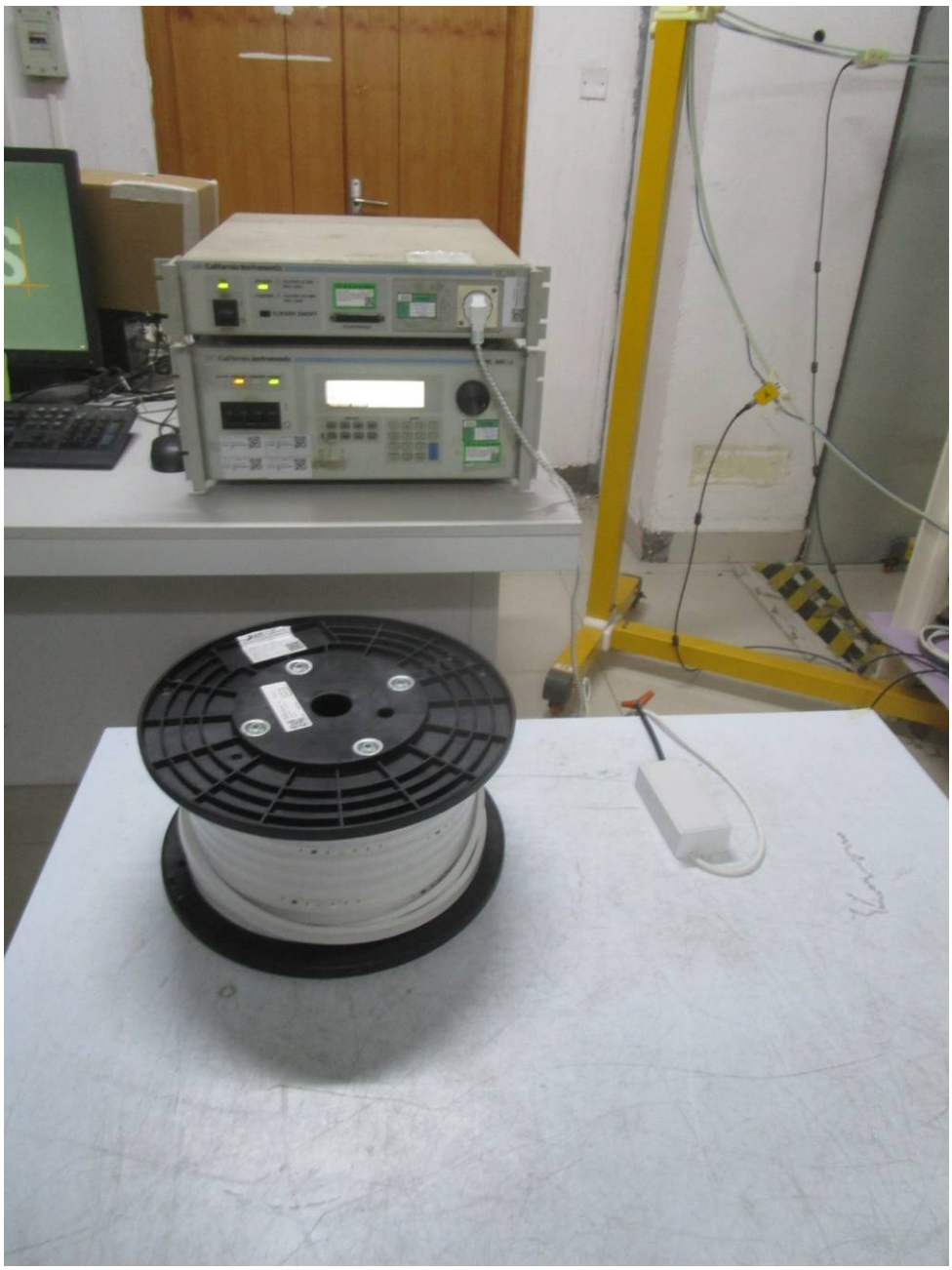
Radiated Emissions (30MHz-1GHz)



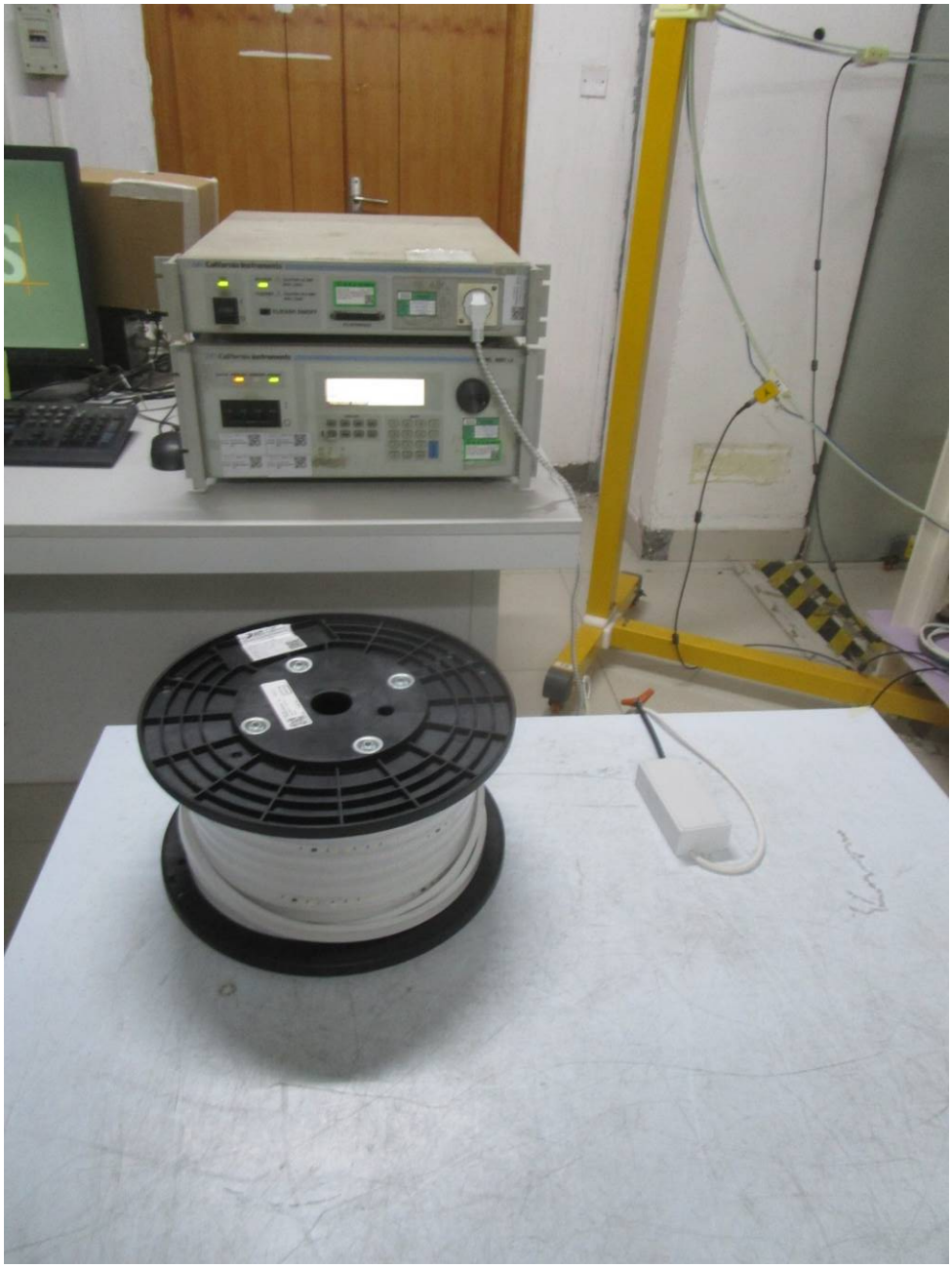
Radiated Emissions (Magnetic Field Induced Current)(9kHz-30MHz)



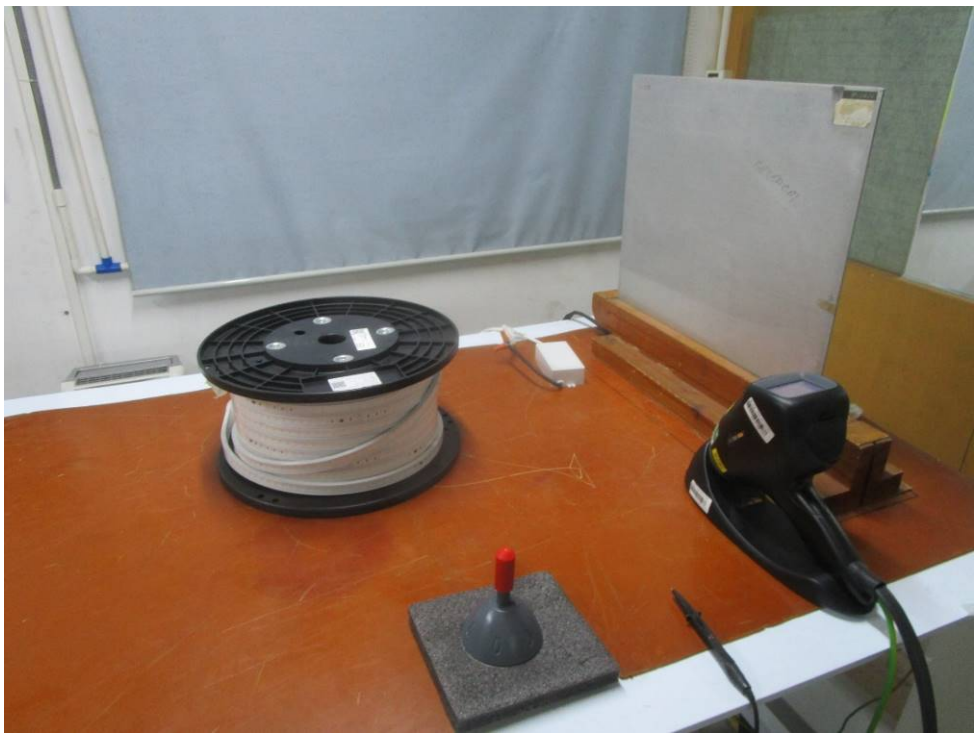
Harmonic Current Emission



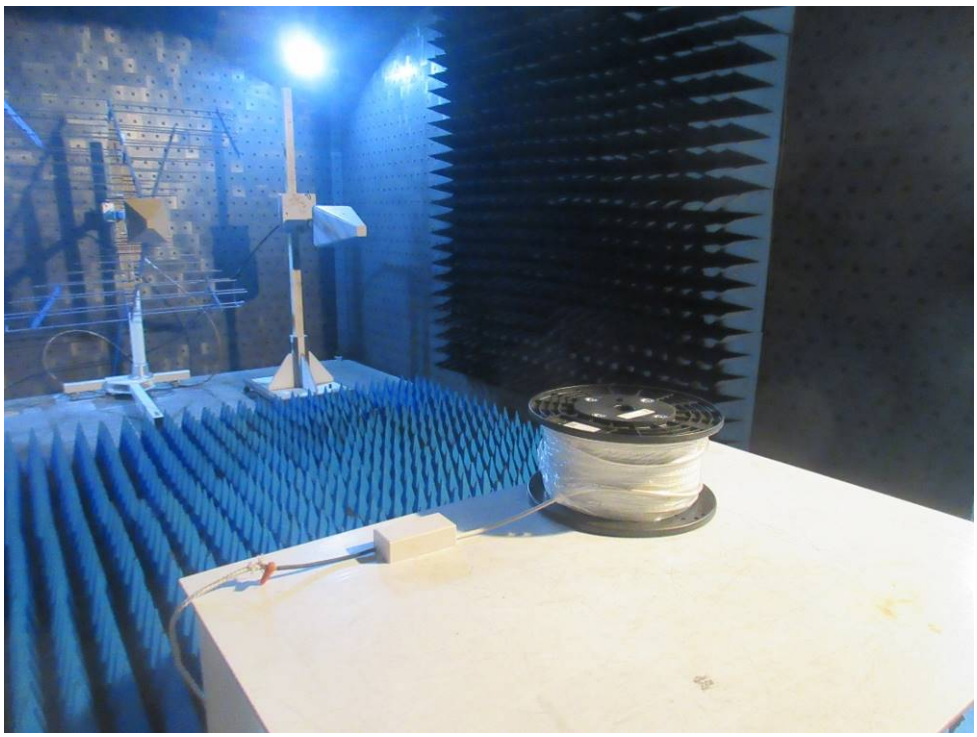
Voltage Fluctuations and Flicker



Electrostatic Discharge



Radiated Immunity (80MHz-1GHz)



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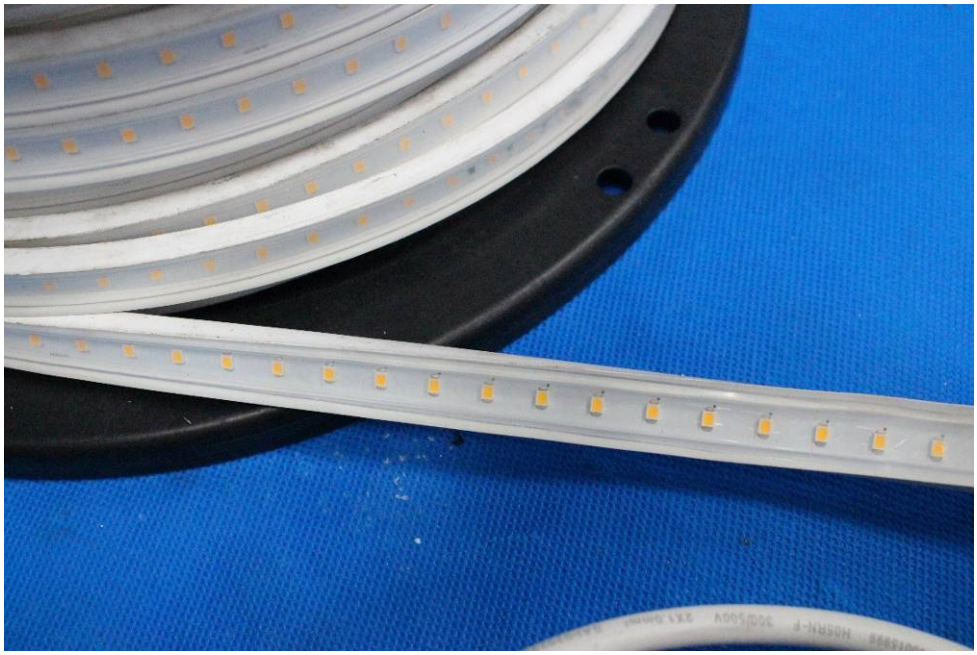
Electrical Fast Transients Burst at AC Mains Power Port

Surge at Power Port

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

Voltage Dips and Interruptions

9 EUT Constructional Details (EUT Photos)



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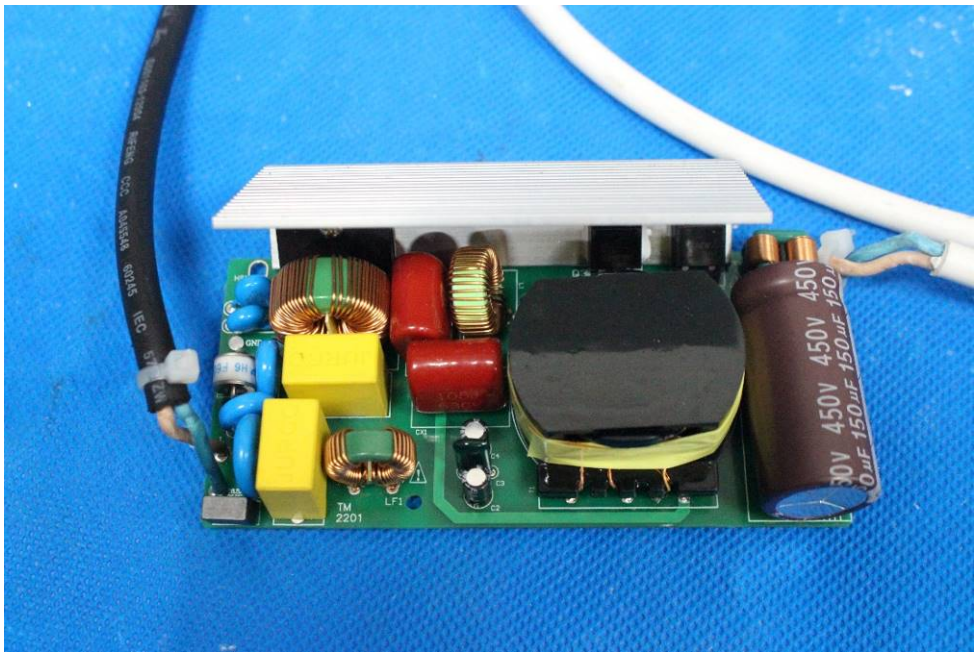

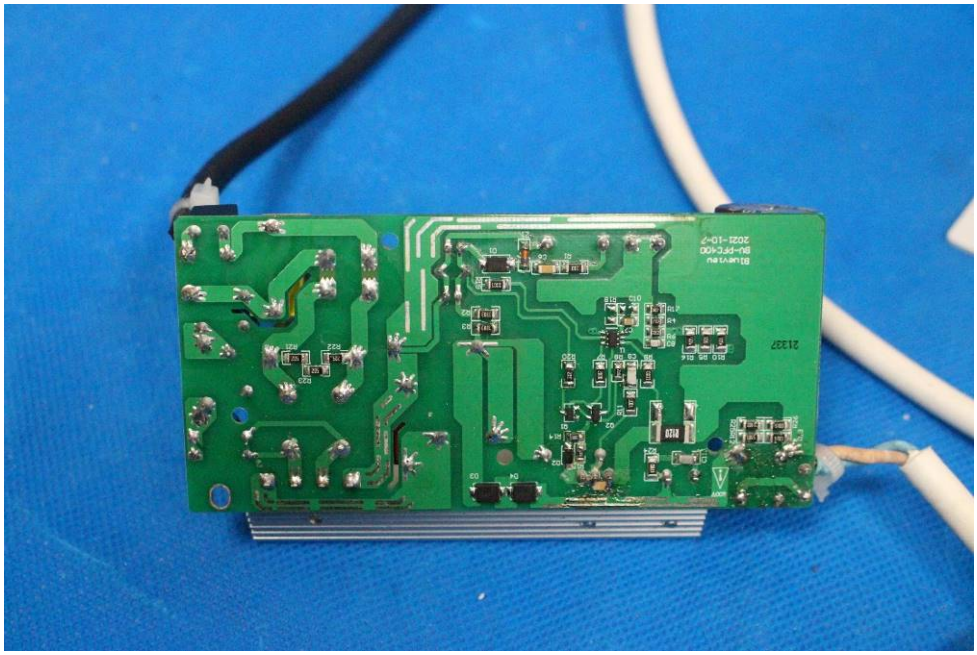

- End of the Report -

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