TEST REPORT

Applicant:	BRAYTRON S.R.L.
Address of Applicant:	B.DUL IULIU MANIU, NR.616, CORP B, ETAJ 1 SECTOR 6, 061129, BUCHAREST, ROMANIA

Equipment Under Test (EUT)

Product Name:	LED EXIT LAMP
Brand Name:	Braytron
Model No.:	Please Refer To Page 5-7.
Applicable standards:	EN IEC 55015:2019+A11:2020
	EN IEC 61547: 2023
	EN IEC 61000-3-2:2019+A1:2021
	EN 61000-3-3:2013+A1:2019+A2:2021
Date of sample receipt:	June 5, 2024
Date of Test:	June 5, 2024 To June 12, 2024
Date of report issued:	June 12, 2024
Test Result :	PASS *

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

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

Authorized Signature

Kevin Wang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*June 12, 2024*	*Original*

Prepared By: Gary Wang ***Date:*** *June 12, 2024*

Project Engineer

Reviewed By: Kevin Wang ***Date:*** *June 12, 2024*

Reviewer

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4 Test Summary

Test Item	Test Requirement	Test Method	Class / Severity	Result
Radiated Emissions (30MHz-1000MHz)	EN IEC 55015	EN IEC 55015	Table 10	Pass
Radiated Emissions (9kHz-30MHz)	EN IEC 55015	EN IEC 55015	Table 8	Pass
Conducted Emissions	EN IEC 55015	EN IEC 55015	Table 1	Pass
Harmonic Current Emission	EN IEC 61000-3-2	EN IEC 61000-3-2	Class C	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3	EN 61000-3-3	Clause 5 of EN61000-3-3	Pass
Electrostatic discharges	EN IEC 61547	EN 61000-4-2	Contact ± 4 kV Air± 8 kV	Pass
Radiated Immunity	EN IEC 61547	EN 61000-4-3	3V/m 80%, 1kHz, AM	Pass
Electrical Fast Transients	EN IEC 61547	EN 61000-4-4	AC ± 1.0kV	Pass
Surges	EN IEC 61547	EN 61000-4-5	1kV Line to Line 2kV Line to Ground	Pass
Conducted Immunity	EN IEC 61547	EN 61000-4-6	3Vrms (emf), 80%, 1kHz Amp. Mod.	Pass
Voltage dips and Interruptions	EN IEC 61547	EN 61000-4-11	0 % UT for 0.5per 70 % UT for 10per UT is Supply Voltage	Pass

Remark:

UT is the nominal supply voltage.*

N/A: Not applicable.

Model No.:

BC14-00900	BC01-00130	BC01-00230	BC01-00330
BC01-00430	BC14-00500	BC14-00600	BC14-00700
BC14-00800	BC14-00900	BC14-01000	BC14-01100
BC14-01110	BC14-01120	BC14-01130	BC14-01140
BC14-00153	BC14-00253	BC14-00353	BC14-00453
BC14-00553	BC14-00653	BC14-00753	BC14-007XX
BC14-008XX	BC14-009XX	BC14-010XX	BC14-011XX
BC14-012XX	BC14-013XX	BC14-014XX	BC14-015XX
BC14-016XX	BC14-017XX	BC14-018XX	BC14-019XX
BC14-020XX	BC14-021XX	BC14-022XX	BC14-023XX
BC14-024XX	BC14-025XX	BC14-026XX	BC14-027XX
BC14-028XX	BC14-029XX	BC14-030XX	BC14-031XX
BC14-032XX	BC14-033XX	BC14-034XX	BC14-035XX
BC14-036XX	BC14-037XX	BC14-038XX	BC14-039XX
BC14-040XX	BC14-041XX	BC14-042XX	BC14-043XX
BC14-044XX	BC14-045XX	BC15-001XX	BC15-002XX
BC15-003XX	BC15-004XX	BC15-005XX	BC15-006XX
BC15-007XX	BC15-008XX	BC15-009XX	BC15-010XX
BC15-011XX	BC15-012XX	BC15-013XX	BC15-014XX
BC15-015XX	BC15-016XX	BC15-017XX	BC15-018XX
BC15-019XX	BC15-020XX	BC15-021XX	BC15-022XX
BC15-023XX	BC15-024XX	BC15-025XX	BC15-026XX
BC15-027XX	BC15-028XX	BC15-029XX	BC15-030XX
BC15-031XX	BC15-032XX	BC15-033XX	BC15-034XX
BC15-035XX	BC15-036XX	BC15-037XX	BC14-X01XX
BC14-X02XX	BC14-X03XX	BC14-X04XX	BC14-X05XX
BC14-X06XX	BC14-X07XX	BC14-X08XX	BC14-X09XX
BC14-X10XX	BC14-X11XX	BC14-X12XX	BC14-X13XX
BC14-X14XX	BC14-X15XX	BC14-X16XX	BC14-X17XX
BC14-X18XX	BC14-X19XX	BC14-X20XX	BC14-X21XX
BC14-X22XX	BC14-X23XX	BC14-X24XX	BC14-X25XX
BC14-X26XX	BC14-X27XX	BC14-X28XX	BC14-X29XX
BC14-X30XX	BC14-X31XX	BC14-X32XX	BC14-X33XX

BC14-X34XX	BC14-X35XX	BC14-X36XX	BC14-X37XX
BC14-X38XX	BC14-X39XX	BC14-X40XX	BC14-X41XX
BC14-X42XX	BC14-X43XX	BC14-X44XX	BC14-X45XX
BC14-X46XX	BC14-X47XX	BC14-X48XX	BC14-X49XX
BC14-X50XX	BC14-X51XX	BC14-X52XX	BC14-X53XX
BC14-X54XX	BC14-X55XX	BC14-X56XX	BC14-X57XX
BC14-X58XX	BC14-X59XX	BC14-X60XX	BC14-X61XX
BC14-X62XX	BC14-X63XX	BC14-X64XX	BC14-X65XX
BC14-X66XX	BC14-X67XX	BC14-X68XX	BC14-X69XX
BC14-X70XX	BC14-X71XX	BC14-X72XX	BC14-X73XX
BC14-X74XX	BC14-X75XX	BC14-X76XX	BC14-X77XX
BC14-X78XX	BC14-X79XX	BC14-X80XX	BC14-X81XX
BC14-X82XX	BC14-X83XX	BC14-X84XX	BC14-X85XX
BC14-X86XX	BC14-X87XX	BC14-X88XX	BC14-X89XX
BC14-X90XX	BC14-X91XX	BC14-X92XX	BC14-X93XX
BC14-X94XX	BC14-X95XX	BC14-X96XX	BC14-X97XX
BC14-X98XX	BC15-X01XX	BC15-X02XX	BC15-X03XX
BC15-X04XX	BC15-X05XX	BC15-X06XX	BC15-X07XX
BC15-X08XX	BC15-X09XX	BC15-X10XX	BC15-X11XX
BC15-X12XX	BC15-X13XX	BC15-X14XX	BC15-X15XX
BC15-X16XX	BC15-X17XX	BC15-X18XX	BC15-X19XX
BC15-X20XX	BC15-X21XX	BC15-X22XX	BC15-X23XX
BC15-X24XX	BC15-X25XX	BC15-X26XX	BC15-X27XX
BC15-X28XX	BC15-X29XX	BC15-X30XX	BC15-X31XX
BC15-X32XX	BC15-X33XX	BC15-X34XX	BC15-X35XX
BC15-X36XX	BC15-X37XX	BC15-X38XX	BC15-X39XX
BC15-X40XX	BC15-X41XX	BC15-X42XX	BC15-X43XX
BC15-X44XX	BC15-X45XX	BC15-X46XX	BC15-X47XX
BC15-X48XX	BC15-X49XX	BC15-X50XX	BC15-X51XX
BC15-X52XX	BC15-X53XX	BC15-X54XX	BC15-X55XX
BC15-X56XX	BC15-X57XX	BC15-X58XX	BC15-X59XX
BC15-X60XX	BC15-X61XX	BC15-X62XX	BC15-X63XX
BC15-X64XX	BC15-X65XX	BC15-X66XX	BC15-X67XX

BC15-X68XX	BC15-X69XX	BC15-X70XX	BC15-X71XX
BC15-X72XX	BC15-X73XX	BC15-X74XX	BC15-X75XX
BC15-X76XX	BC15-X77XX	BC15-X78XX	BC15-X79XX
BC15-X80XX	BC15-X81XX	BC15-X82XX	BC15-X83XX
BC15-X84XX	BC15-X85XX	BC15-X86XX	BC15-X87XX
BC15-X88XX	BC15-X89XX	BC15-X90XX	BC15-X91XX
BC15-X92XX	BC15-X93XX	BC15-X94XX	BC15-X95XX
BC15-X96XX	BC15-X97XX	BC15-X98XX	
X=0,1,2,3,4,5,6,7,8,9			
Remark: All models are identical in the same PCB layout, interior structure and electrical circuits. The only differences are the model name and appearance color for commercial purpose.			

5 General Information

5.1 Client Information

Applicant:	BRAYTRON S.R.L.
Address of Applicant:	B.DUL IULIU MANIU, NR.616, CORP B, ETAJ 1 SECTOR 6, 061129, BUCHAREST, ROMANIA
Manufacturer:	DEMGRUP INTERNATIONAL LIGHTING LIMITED
Address of Manufacturer:	UNIT D 16/F, ONE CAPITAL PLACE, 18 LUARD ROAD, WAN CHAI, HONG KONG

5.2 General Description of E.U.T

Product Name:	LED EXIT LAMP
Brand Name:	Braytron
Model No.:	Please Refer To Page 5-7.
Test Model No.:	BC14-00900
Power Supply:	AC220-240V, 50/60Hz or DC3.7V, 2.2AH lithium battery

5.3 Test mode

Mains On mode	Keep the EUT lighting and charging
Emergency mode	Keep the EUT lighting and power by battery

5.4 Description of Support Units

None.

5.5 Deviation from Standards

None.

5.6 Abnormalities from Standard Conditions

None.

5.7 Monitoring of EUT for All Immunity Test

Visual:	Monitor the lighting of EUT
Audio:	N/A

6 Test Instruments List

Radiated Emission:

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	N/A	N/A
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	ROHDE & SCHWARZ	ESRP	GTS602	Mar. 16 2024	Mar. 15 2025
4	BiConiLog Antenna	SCHWARZBECK	VULB 9168	GTS606	Mar. 16 2024	Mar. 15 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 21 2023	June. 20 2024
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 21 2023	June. 20 2024
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 21 2023	June. 20 2024
9	Coaxial Cable	GTS	N/A	GTS211	June. 21 2023	June. 20 2024
10	Coaxial cable	GTS	N/A	GTS210	June. 21 2023	June. 20 2024
11	Coaxial Cable	GTS	N/A	GTS212	June. 21 2023	June. 20 2024
12	Amplifier(100kHz-3GHz)	N/A	LNA 0920N	GTS605	Mar. 16 2024	Mar. 15 2025
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 21 2023	June. 20 2024
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 21 2023	June. 20 2024
15	Band filter	Amindeon	82346	GTS219	June. 21 2023	June. 20 2024
16	Power Meter	Anritsu	ML2495A	GTS540	June. 21 2023	June. 20 2024
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 21 2023	June. 20 2024
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 21 2023	June. 20 2024
19	Splitter	Agilent	11636B	GTS237	June. 21 2023	June. 20 2024
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 21 2023	June. 20 2024
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 6 2023	Oct. 5 2024
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 6 2023	Oct. 5 2024
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 6 2023	Oct. 5 2024
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 21 2023	June. 20 2024

Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.14 2022	May.13 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 21 2023	June. 20 2024
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 21 2023	June. 20 2024
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 21 2023	June. 20 2024
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 21 2023	June. 20 2024
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 21 2023	June. 20 2024

9	ISN	SCHWARZBECK	NTFM 8158	GTS565	June. 21 2023	June. 20 2024

ESD

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	ESD Simulator	KIKUSUI	KES4021A	GTS242	June. 21 2023	June. 20 2024
2	Thermo meter	KTJ	TA328	GTS243	June. 21 2023	June. 20 2024

Conducted Immunity

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Signal Generator	ROHDE & SCHWARZ	SMB 100A	GTS553	June. 21 2023	June. 20 2024
2	CDN	LionCEL	CDN-M3-16	GTS554	June. 21 2023	June. 20 2024
3	CDN	CYBERTEK	EM 5070	GTS559	June. 21 2023	June. 20 2024
4	Power amplifier	rflight	NTWPA-00010475	GTS555	June. 21 2023	June. 20 2024
5	ATT	SUNWAVE	SJ-50-06DB	GTS556	June. 21 2023	June. 20 2024
6	Clamp	SCHAFFNER	KEMZ 801	GTS558	June. 21 2023	June. 20 2024

Harmonic/ Flicker

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Power Analyzer H/F	EMTEST	DPA500	GTS235	June. 21 2023	June. 20 2024
2	AC POWER SUPPLY	EMTEST	ACS500	GTS236	June. 21 2023	June. 20 2024
3	Thermo meter	KTJ	TA328	GTS256	June. 21 2023	June. 20 2024

EFT, Surge, Voltage dips and Interruption

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	EMTEST system	EMTEST	UCS500N	GTS239	June. 21 2023	June. 20 2024
2	Clamp	EMTEST	HFK	GTS557	June. 21 2023	June. 20 2024
3	Thermo meter	KTJ	TA328	GTS238	June. 21 2023	June. 20 2024

Radiated Immunity

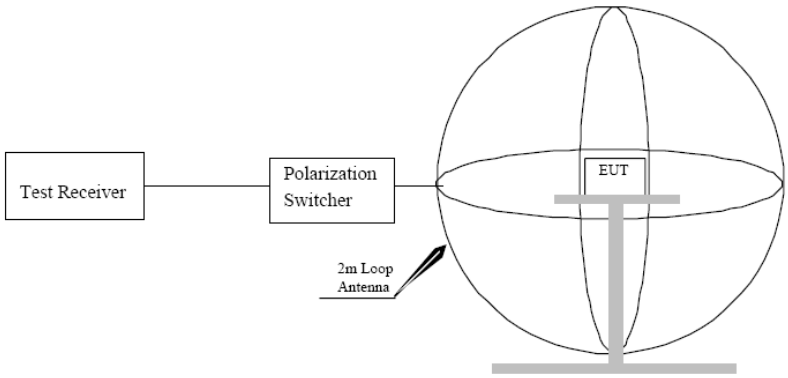
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Fully-Anechoic Chamber 2	Chang Zhou Zhong Shuo	854	SEM001-05	April. 07, 2024	April. 06, 2025
2	Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	April. 07, 2024	April. 06, 2025
3	Stacked Log.-Per.-Broadband Antenna (70MHz-10GHz)	Schwarzbeck	STLP 9129	SEM003-25	N/A	N/A
4	Signal Generator (9kHz-6GHz)	Rohde & Schwarz	SMB100A	SEM006-11	April. 07, 2024	April. 06, 2025
5	Broadband Amplifier (80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	Sep. 19 2024	Sep. 18 2025
6	Broadband Amplifier(800MHz-3GHz)	Rohde & Schwarz	BBA150-D110	SEM005-13	April. 07, 2024	April. 06, 2025
7	Broadband Amplifier(2.5GHz-	Rohde & Schwarz	BBA150-E60	SEM005-16	April. 07, 2024	April. 06, 2025

	6GHz)					
8	Measurement Software	Rohde & Schwarz	EMC32 V9.25.00	N/A	N/A	N/A

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 21 2023	June. 20 2024
2	Barometer	ChangChun	DYM3	GTS255	June. 21 2023	June. 20 2024

7 Emission Test Results

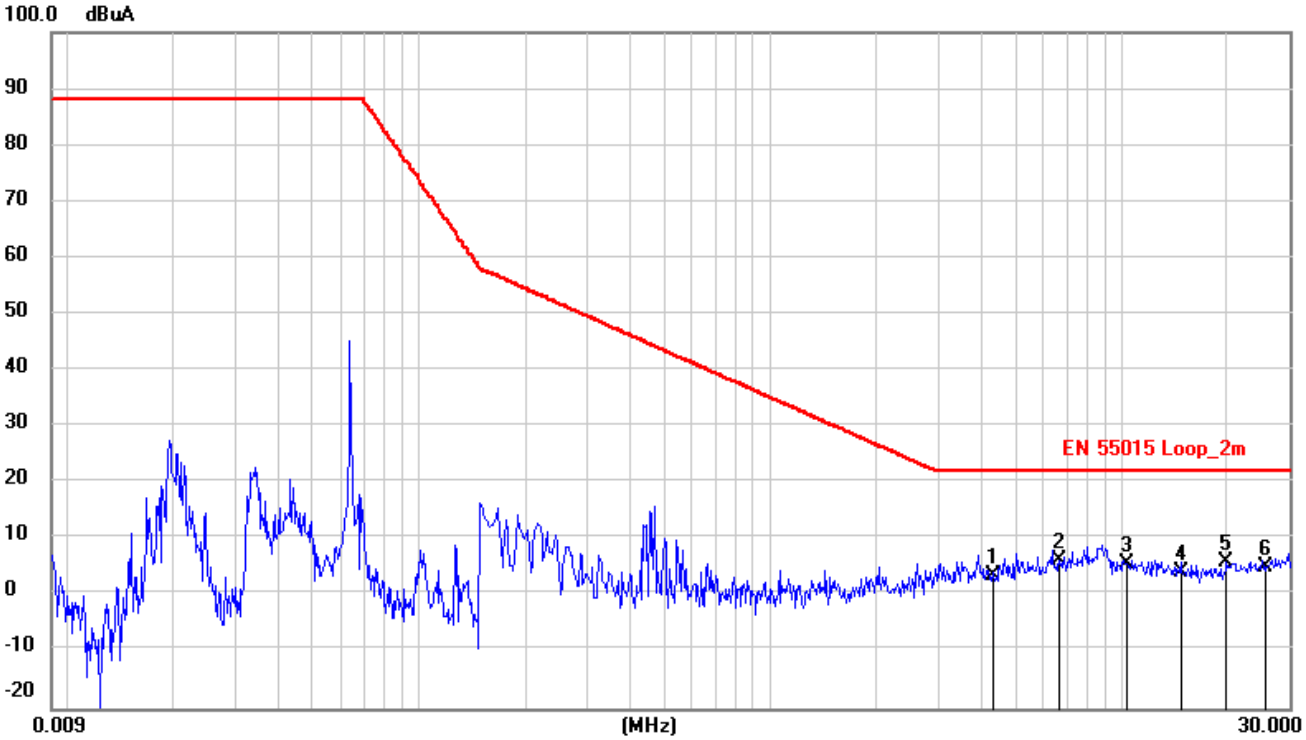
7.1 Radiated Emissions (9kHz-30MHz)

<table>
<tr><td>Test Requirement:</td><td colspan="3">EN IEC 55015</td></tr>
<tr><td>Test Method:</td><td colspan="3">EN IEC 55015</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="3">9kHz to 30MHz</td></tr>
<tr><td>Limit:</td><td colspan="3">
<table>
<tr><th>Frequency range (MHz)</th><th>Limits for loop diameter
dBuA @2m</th></tr>
<tr><td>0.009-0.070</td><td>88</td></tr>
<tr><td>0.070-0.150</td><td>88 to 58*</td></tr>
<tr><td>0.15-3.0</td><td>58 to22*</td></tr>
<tr><td>3.0-30</td><td>22</td></tr>
</table>
*Decreasing linearly with the logarithm of the frequency.
For electrodeless lamps and luminaires, the limit in the frequency range of 2,2 MHz to 3,0 MHz is 58 dB(μA) for 2 m, 51dB(μA) for 3 m and 45 dB(μA) for 4 m loop diameter.
</td></tr>
<tr><td>Test Setup:</td><td colspan="3"> 
</td></tr>
<tr><td>Test procedure</td><td colspan="3">1. An initial pre-scan was performed in the 2m loop antenna using the spectrum analyser in peak detection mode.
2. The EUT was measured for X(A), Y(B), Z(C) polarities.
3. No further quasi-peak measurements were performed since no peak emissions from the EUT were detected within 6dB of the limit for 2m diameter loop antenna.</td></tr>
<tr><td>Test Instruments:</td><td>Temp.: 25 °C</td><td>Humid.: 50%</td><td>Press.: 1012mbar</td></tr>
<tr><td>Measurement Record:</td><td colspan="3">Uncertainty: ± 4.5dB</td></tr>
<tr><td>Test Instruments:</td><td colspan="3">Refer to section 6 for details</td></tr>
<tr><td>Test mode:</td><td colspan="3">Refer to section 5.3 for details.</td></tr>
<tr><td>Test results:</td><td colspan="3">Pass</td></tr>
</table>

Measurement Data

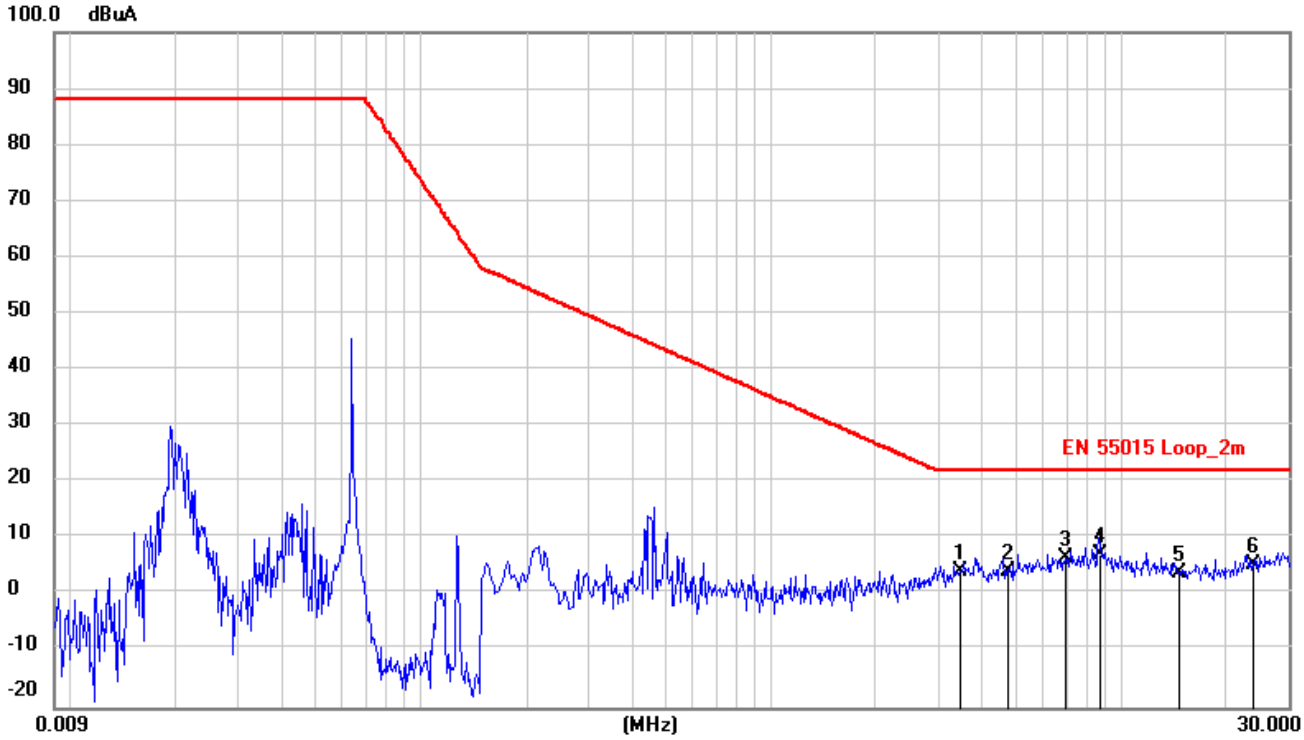
Pretest at all of the listed modes, and found Mains On mode is the worst mode. Only the data of the worst mode is recorded in the report.

Axial: X



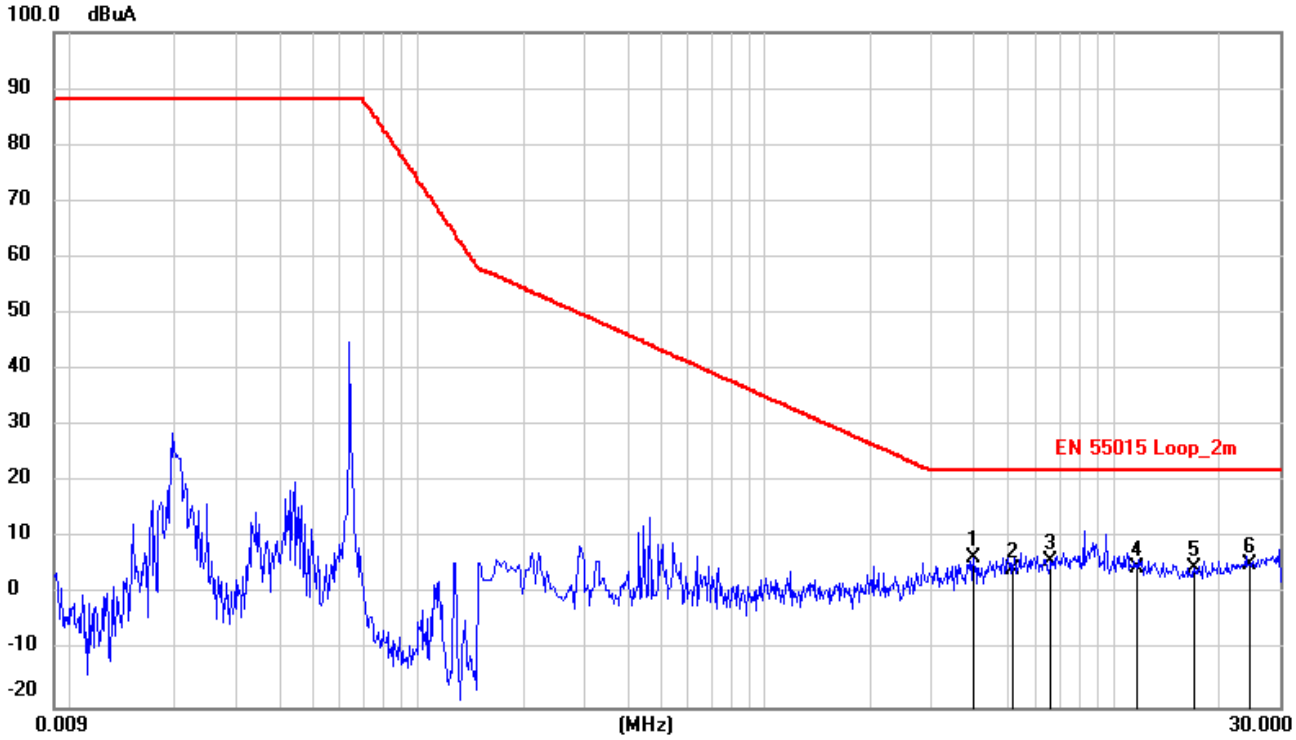
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuA)	dB	(dBuA)	(dBuA)	(dB)	
1	4.3351	-31.37	34.86	3.49	22.00	-18.51	QP
2	6.6751	-28.96	35.09	6.13	22.00	-15.87	QP
3	10.4326	-29.20	34.71	5.51	22.00	-16.49	QP
4	14.8516	-30.47	34.66	4.19	22.00	-17.81	QP
5	19.8466	-28.80	34.69	5.89	22.00	-16.11	QP
6	25.7731	-30.23	35.16	4.93	22.00	-17.07	QP

Axial: Y



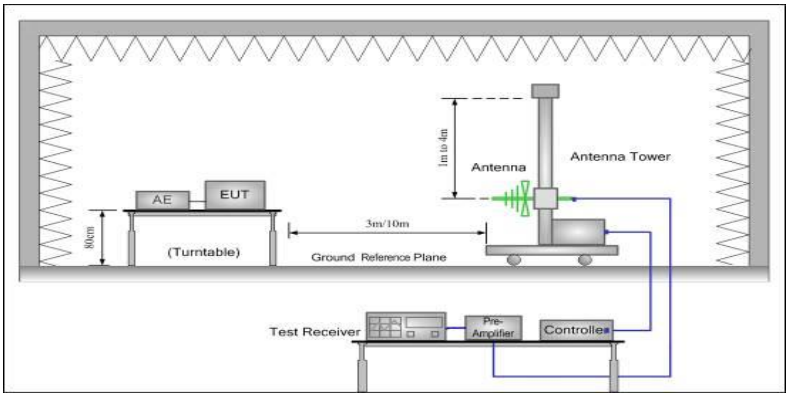
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuA)	dB	(dBuA)	(dBuA)	(dB)	
1	3.4891	-30.45	34.55	4.10	22.00	-17.90	QP
2	4.7581	-30.83	34.92	4.09	22.00	-17.91	QP
3	6.9631	-28.67	35.09	6.42	22.00	-15.58	QP
4	8.6776	-27.84	34.88	7.04	22.00	-14.96	QP
5	14.6491	-30.76	34.66	3.90	22.00	-18.10	QP
6	23.7391	-29.56	35.01	5.45	22.00	-16.55	QP

Axial: Z



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuA)	dB	(dBuA)	(dBuA)	(dB)	
1	3.9751	-28.30	34.79	6.49	22.00	-15.51	QP
2	5.1450	-30.65	34.99	4.34	22.00	-17.66	QP
3	6.6301	-29.06	35.10	6.04	22.00	-15.96	QP
4	11.6251	-30.05	34.70	4.65	22.00	-17.35	QP
5	17.0296	-29.84	34.67	4.83	22.00	-17.17	QP
6	24.6616	-29.61	35.08	5.47	22.00	-16.53	QP

7.2 Radiated Emissions (30MHz-1000MHz)

Test Requirement:	EN IEC 55015
Test Method:	EN IEC 55015
Test Frequency Range:	30MHz to 1000MHz
Measurement Distance:	3m
Limit:	Frequency range(MHz) / Limit (dBuV/m) 30 to 230 / 40.00 230 to 1000 / 47.00
Test setup:	
Test procedure	1. The radiated emissions test was conducted in a semi-anechoic chamber. 2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT. 4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.
Test Instruments:	Temp.: 25 °C / Humid.: 50% / Press.: 1012mbar
Measurement Record:	**Uncertainty: ± 4.50dB**
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Pass

Measurement Data

Pretest at all of the listed modes, and found Mains On mode is the worst mode. Only the data of the worst mode is recorded in the report.

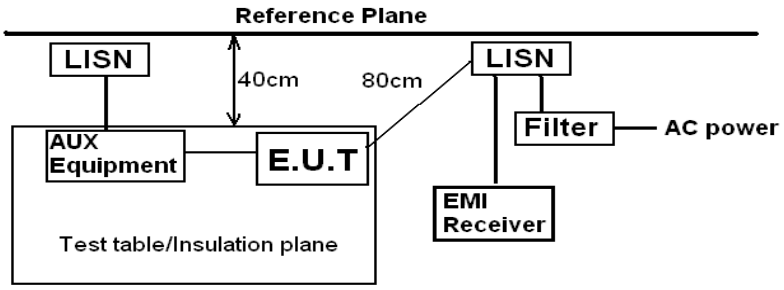
Test mode:	Mains On mode	Antenna Polarity:	Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.2111	36.07	-4.61	31.46	40.00	-8.54	QP
2 *	103.8055	50.56	-17.33	33.23	40.00	-6.77	QP
3	158.1123	45.32	-16.82	28.50	40.00	-11.50	QP
4	187.7530	40.87	-16.51	24.36	40.00	-15.64	QP
5	556.7744	32.00	-8.32	23.68	47.00	-23.32	QP
6	948.7610	28.11	0.36	28.47	47.00	-18.53	QP

Test mode:	Mains On mode	Antenna Polarity:	Vertical

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	30.2111	53.45	-17.79	35.66	40.00	-4.34	QP
2	36.3814	47.48	-16.64	30.84	40.00	-9.16	QP
3	72.8466	54.03	-20.12	33.91	40.00	-6.09	QP
4	102.3596	51.38	-21.76	29.62	40.00	-10.38	QP
5	188.4125	42.51	-16.58	25.93	40.00	-14.07	QP
6	932.2715	28.81	-0.04	28.77	47.00	-18.23	QP

7.3 Conducted Emissions

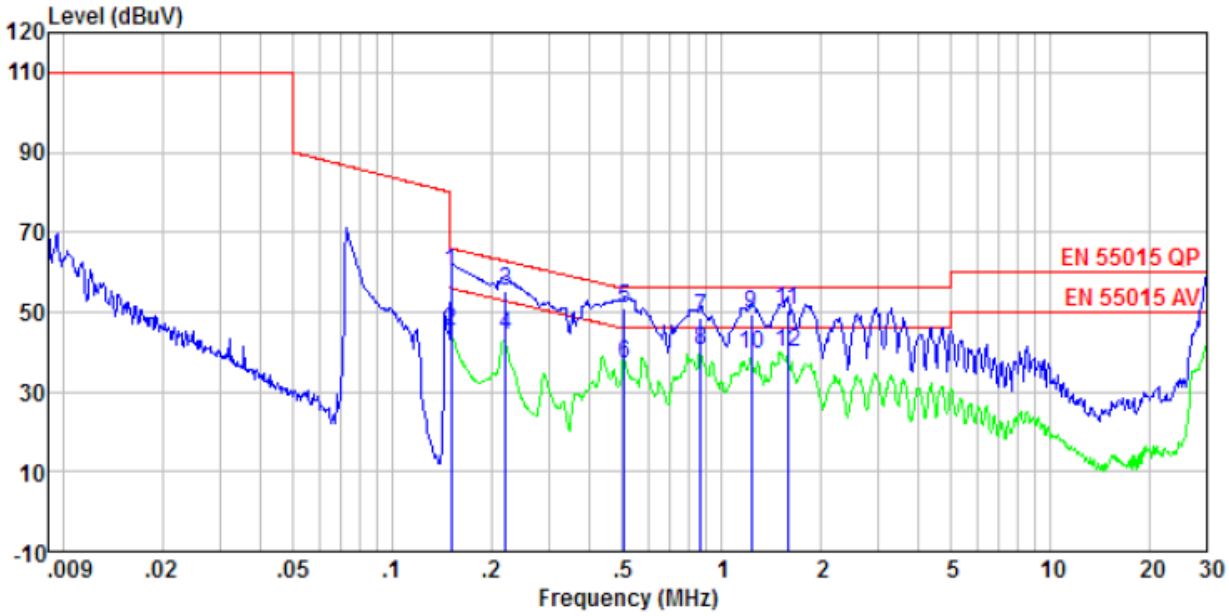
<table>
<tr><td>Test Requirement:</td><td colspan="3">EN IEC 55015</td></tr>
<tr><td>Test Method:</td><td colspan="3">EN IEC 55015</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="3">9kHz to 30MHz</td></tr>
<tr><td>Limit:</td><td colspan="3">
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.009-0.05</td><td>110</td><td>-</td></tr>
<tr><td>0.05-0.15</td><td>90-80*</td><td>-</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test setup:</td><td colspan="3"> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test procedure</td><td colspan="3">1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to EN55022 Class B on conducted measurement.</td></tr>
<tr><td>Test Instruments:</td><td>Temp.: 25 °C</td><td>Humid.: 50%</td><td>Press.: 1012mbar</td></tr>
<tr><td>Measurement Record:</td><td colspan="3">Uncertainty: ± 3.45dB</td></tr>
<tr><td>Test Instruments:</td><td colspan="3">Refer to section 6 for details</td></tr>
<tr><td>Test mode:</td><td colspan="3">Refer to section 5.3 for details.</td></tr>
<tr><td>Test results:</td><td colspan="3">Pass</td></tr>
</table>

Measurement Data

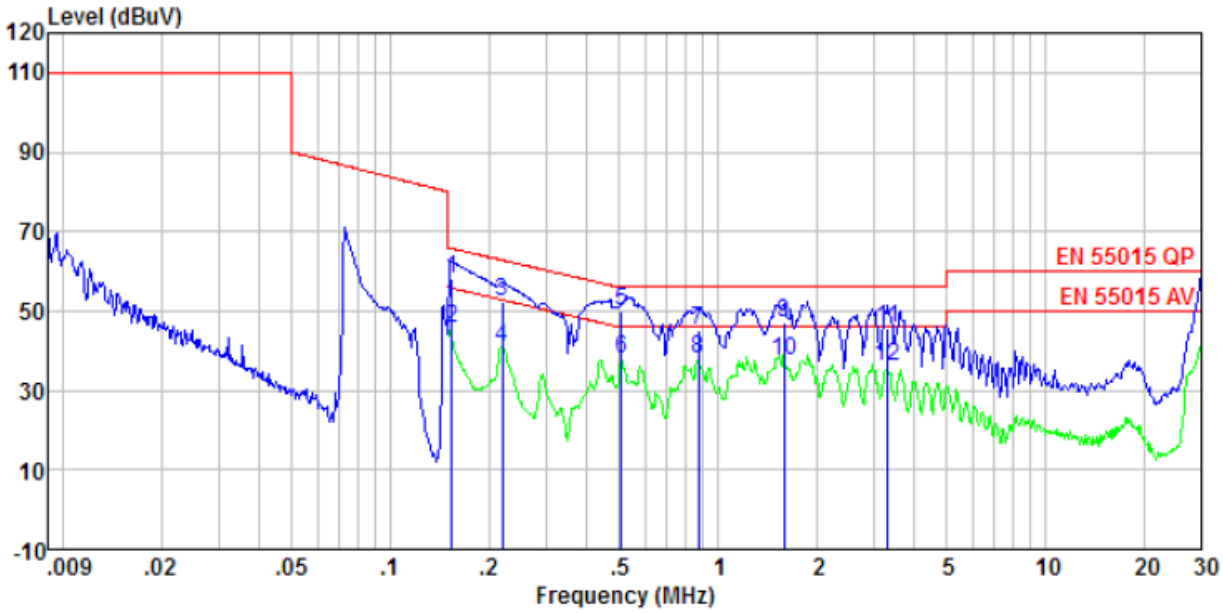
Pretest at all of the listed modes, and found Mains On mode is the worst mode. Only the data of the worst mode is recorded in the report.

Test mode:	Mains On mode	Antenna Polarity:	Line



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	59.72	0.40	0.07	60.19	65.92	-5.73	QP
0.15	44.72	0.40	0.07	45.19	55.92	-10.73	Average
0.22	54.58	0.40	0.11	55.09	62.75	-7.66	QP
0.22	43.58	0.40	0.11	44.09	52.75	-8.66	Average
0.51	50.41	0.31	0.11	50.83	56.00	-5.17	QP
0.51	36.41	0.31	0.11	36.83	46.00	-9.17	Average
0.87	48.13	0.22	0.14	48.49	56.00	-7.51	QP
0.87	40.13	0.22	0.14	40.49	46.00	-5.51	Average
1.24	48.93	0.20	0.16	49.29	56.00	-6.71	QP
1.24	38.93	0.20	0.16	39.29	46.00	-6.71	Average
1.59	50.28	0.20	0.17	50.65	56.00	-5.35	QP
1.59	39.28	0.20	0.17	39.65	46.00	-6.35	Average

Test mode:	Mains On mode	Antenna Polarity:	Neutral



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	57.85	0.40	0.07	58.32	65.79	-7.47	QP
0.15	45.23	0.40	0.07	45.70	55.79	-10.09	Average
0.22	51.91	0.40	0.11	52.42	62.82	-10.40	QP
0.22	40.50	0.40	0.11	41.01	52.82	-11.81	Average
0.51	49.64	0.31	0.11	50.06	56.00	-5.94	QP
0.51	37.65	0.31	0.11	38.07	46.00	-7.93	Average
0.87	44.90	0.22	0.14	45.26	56.00	-10.74	QP
0.87	37.82	0.22	0.14	38.18	46.00	-7.82	Average
1.59	46.71	0.20	0.17	47.08	56.00	-8.92	QP
1.59	37.20	0.20	0.17	37.57	46.00	-8.43	Average
3.30	45.48	0.20	0.19	45.87	56.00	-10.13	QP
3.30	35.43	0.20	0.19	35.82	46.00	-10.18	Average

7.4 Harmonics Current Emission

Test Requirement:	EN IEC 61000-3-2		
Test Method:	EN IEC 61000-3-2		
Frequency range:	100Hz to 2kHz		
Measurement Time:	2.5 min		
Class/Severity:	Class C		
Detector:	As per EN 61000-3-2		
Test environment:	Temp.:24 °C	Humid.: 51%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

7.5 Voltage Fluctuations and Flicker

Test Requirement:	EN 61000-3-3		
Test Method:	EN 61000-3-3		
Class/Severity:	Clause 5 of EN 61000-3-3		
Measurement Time:	10 min		
Detector:	As per EN 61000-3-3		
Test environment:	Temp.:24 °C	Humid.: 51%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

Measurement Data

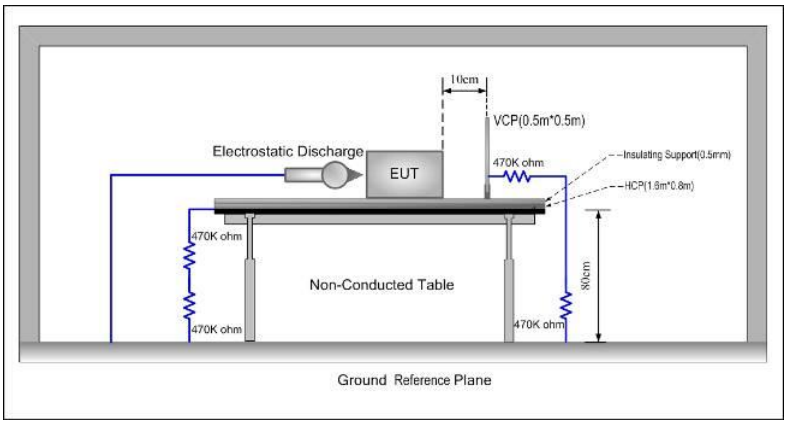
	EUT values	Limit	Result
Pst	0.044	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.048	4.00	PASS
dt [s]	0.000	0.50	PASS

8 Immunity Test Results

8.1 Performance Criteria Description of 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(30min for high pressure gas discharge lamps). 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 light source(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.

8.2 Electrostatic Discharge

Test Requirement:	EN IEC 61547
Test Method:	EN 61000-4-2
Discharge Voltage:	Contact Discharge: ±4kV Air Discharge: ±8kV HCP/VCP: ±4kV
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point.
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Performance Criterion:	B
Test setup:	
Test Procedure:	1. Air discharge: The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure was repeated until all the air discharge completed 2. Contact Discharge: The test was applied on conductive surfaces of EUT. the generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated. 3. Indirect discharge for horizontal coupling plane At least 10 single discharges shall be applied at the front edge of each HCP opposite the centre point of each unit of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge. Consideration should be given to exposing all sides of the EUT.

	4. Indirect discharge for vertical coupling plane At least 10 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.		
Test environment:	Temp.: 24 °C	Humid.: 51%	Press.: 1012mbar
Test mode:	Refer to section 5.3 for detail		
Test Instruments:	Refer to section 6 for details		
Test results:	Pass		

Measurement Record:

Test points:	I: N/A
	II: Seams

Direct discharge

Discharge Voltage (KV)	Type of discharge	Test points	Observations (Performance Criterion)	Result
± 4	Contact	I	N/A	N/A
± 8	Air	II	A	Pass

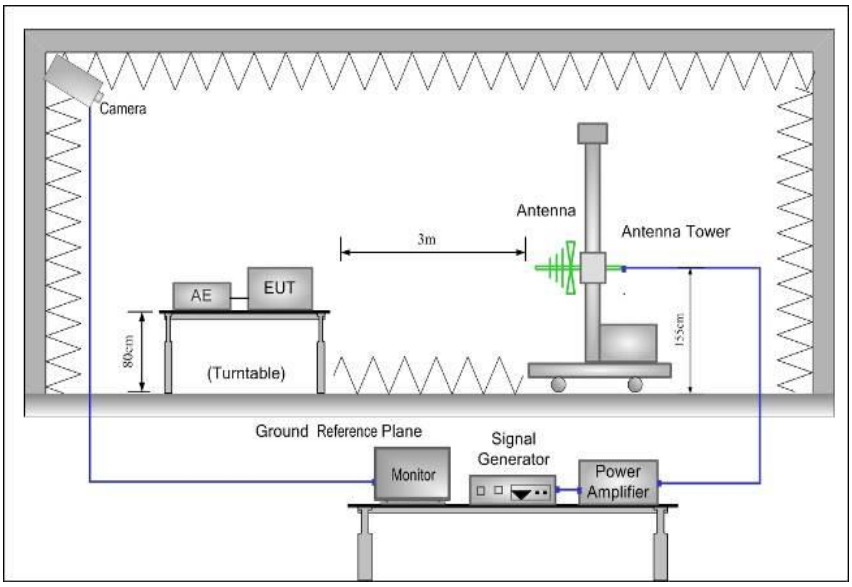
Indirect discharge

Discharge Voltage (KV)	Type of discharge	Test points	Observation Performance	Result
± 4	HCP-Bottom/Top/ Front/Back/Left/Right	Edge of the HCP	A	Pass
± 4	VCP-Front/Back /Left/Right	Center of the VCP	A	Pass

Remark:

Performance Criteria: A, B, C: Refer to section 8.1 for details

8.3 Radiated Immunity

Test Requirement:	EN IEC 61547
Test Method:	EN 61000-4-3
Frequency range:	80MHz to 1GHz
Test Level:	3V/m
Modulation:	80%, 1kHz Amplitude Modulation
Performance Criterion:	A
Test setup:	
Test Procedure:	1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items. 2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length. 3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area). 4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary.Where the frequency range was swept incrementally, the step size was not exceed 1 % of the preceding frequency value. 5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0,5 s. 6. The test normally was performed with the generating antenna facing

	each side of the EUT. 7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. 8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to monitor the performance of the EUT.		
Test environment:	Temp.: 25 °C	Humid.: 52%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

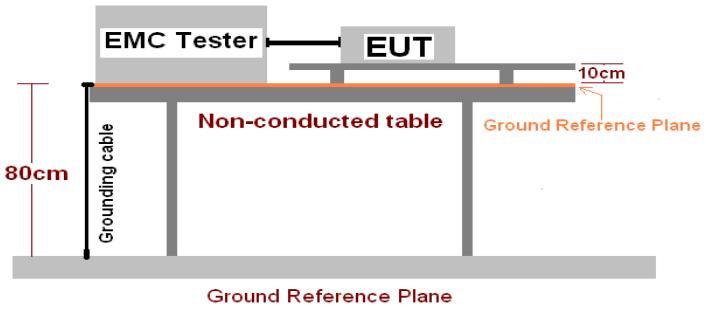
Measurement Record:

Frequency	Level	Modulation	Antenna Polarization	EUT Face	**Observations** (Performance Criterion)
80 MHz-1 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A
			H		A
			V	Rear	A
			H		A
			V	Left	A
			H		A
			V	Right	A
			H		A
			V	Top	A
			H		A
			V	Bottom	A
			H		A

Remarks:

Performance Criteria: A, B, C: Refer to section 8.1 for details

8.4 Electrical fast transients

Test Requirement:	EN IEC 61547		
Test Method:	EN 61000-4-4		
Test Level:	1.0kV on AC port		
Polarity:	Positive & Negative		
Repetition Frequency:	5kHz		
Burst Duration:	15ms		
Burst Period:	300ms		
Test Duration:	2 minute per level & polarity		
Performance Criterion:	B		
Test setup:			
Test Procedure:	1. The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. 2. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. 3. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables. 4. The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal. 5. Each of the Line and Neutral conductors is impressed with burst noise for 2 minutes. 6. The length of the signal and power lines between the coupling device and the EUT is 0.5m		
Test environment:	Temp.: 26 °C	Humid.: 54%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

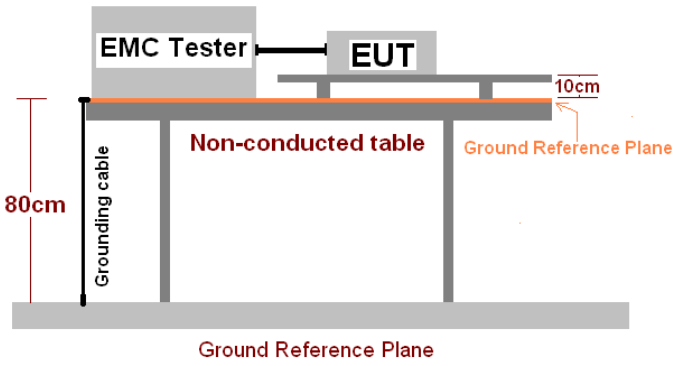
Measurement Record:

Lead under Test	**Level (±kV)**	**Coupling Direct/Clamp**	**Observations** (Performance Criterion)	Result
L	± 1.0	Direct	A	Pass
N	± 1.0	Direct	A	Pass
L-N	± 1.0	Direct	A	Pass

Remarks:

Performance Criteria: A, B, C: Refer to section 8.1 for details

8.5 Surges

<table>
<tr><td>Test Requirement:</td><td colspan="3">EN IEC 61547</td></tr>
<tr><td>Test Method:</td><td colspan="3">EN 61000-4-5</td></tr>
<tr><td>Test Level:</td><td colspan="3">
<table>
<tr><td rowspan="2">Characteristics</td><td colspan="2">Test Levels</td></tr>
<tr><td>Self-ballasted lamps</td><td>Lighting equipment (except self-ballasted lamps≤25W)</td></tr>
<tr><td>Line to line</td><td>±0.5kV</td><td>±1kV</td></tr>
<tr><td>Line to ground</td><td>N/A</td><td>±2kV</td></tr>
</table>
Note: In addition to the specified test level, all lower test levels as detailed in IEC 61000-4-5 should also be satisfed.
</td></tr>
<tr><td>Polarity:</td><td colspan="3">Positive & Negative</td></tr>
<tr><td>Generator source impedance:</td><td colspan="3">2Ω (line-line coupling)</td></tr>
<tr><td>No. of surges:</td><td colspan="3">5 positive at 90°, 5 negative at 270°</td></tr>
<tr><td>Performance Criterion:</td><td colspan="3">C</td></tr>
<tr><td>Test setup:</td><td colspan="3"> 
</td></tr>
<tr><td>Test procedure</td><td colspan="3">1. For line-to-line coupling mode, provide a 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral lines to ground.
2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.
3. Different phase angles are done individually.
4. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.</td></tr>
<tr><td>Test environment:</td><td>Temp.: 26 °C</td><td>Humid.: 53%</td><td>Press.: 1012mbar</td></tr>
<tr><td>Test Instruments:</td><td colspan="3">Refer to section 6 for details</td></tr>
<tr><td>Test mode:</td><td colspan="3">Refer to section 5.3 for details</td></tr>
<tr><td>Test results:</td><td colspan="3">Pass</td></tr>
</table>

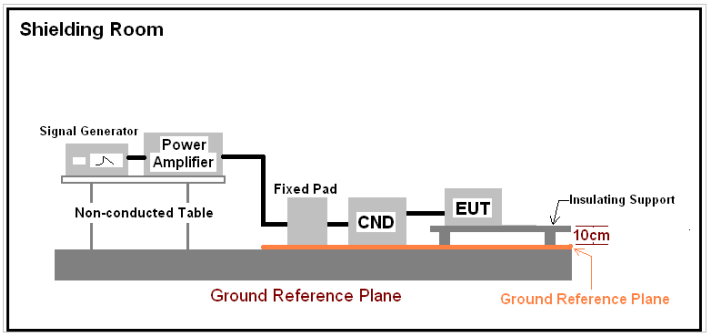
Measurement Record:

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observations (Performance Criterion)	Result
L-N	+1	5	60s	90°	A	Pass
	-1			270°		

Remarks:

Performance Criteria: A, B, C: Refer to section 8.1 for details

8.6 Conducted Immunity

Test Requirement:	EN IEC 61547		
Test Method:	EN 61000-4-6		
Frequency range:	0.15MHz to 80MHz		
Test Level:	3V rms on AC Ports (unmodulated emf into 150 Ω)		
Modulation:	80%, 1kHz Amplitude Modulation		
Performance Criterion:	A		
Test setup:			
Test Procedure:	1. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible). 2. The disturbance signal described below is injected to EUT through CDN. 3. The EUT operates within its operational mode(s) under intended climatic conditions after power on. 4. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.		
Test environment:	Temp.: 24 °C	Humid.: 51%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

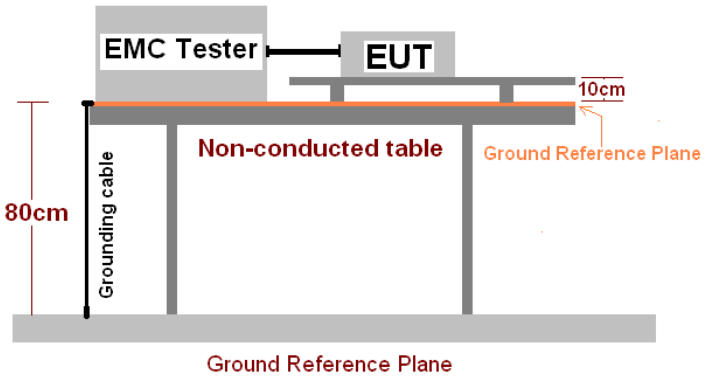
Measurement Record:

Frequency	Injected Position	Level	Modulation	Observations (Performance Criterion)	Result
150kHz to 80MHz	AC Mains	3Vrms	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=2seconds	A	Pass

Remark:

Performance Criteria: A, B, C: Refer to section 8.1 for details

8.7 Voltage Dips and Interruptions

Test Requirement:	EN IEC 61547
Test Method:	EN 61000-4-11
Test Level:	0% of U_T (Supply Voltage) for 0.5 Periods 70 % of U_T (Supply Voltage) for 10 Periods
No. of Dips / Interruptions:	3 per Level
Performance Criterion:	100% VD ----Performance criterion: B 30% VD ----Performance criterion: B
Test setup:	
Test Procedure:	1. The EUT and test generator were setup as shown on above setup photo. 2. The interruptions are introduced at selected phase angles with specified duration. 3. Record any degradation of performance.
Test environment:	Temp.: 26 °C | Humid.: 53% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

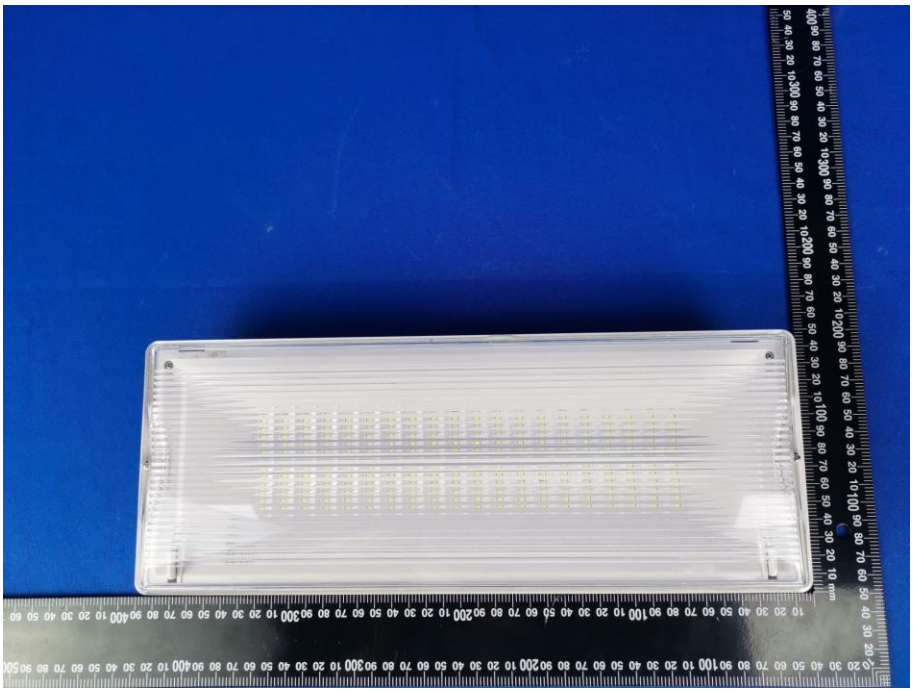
Measurement Record:

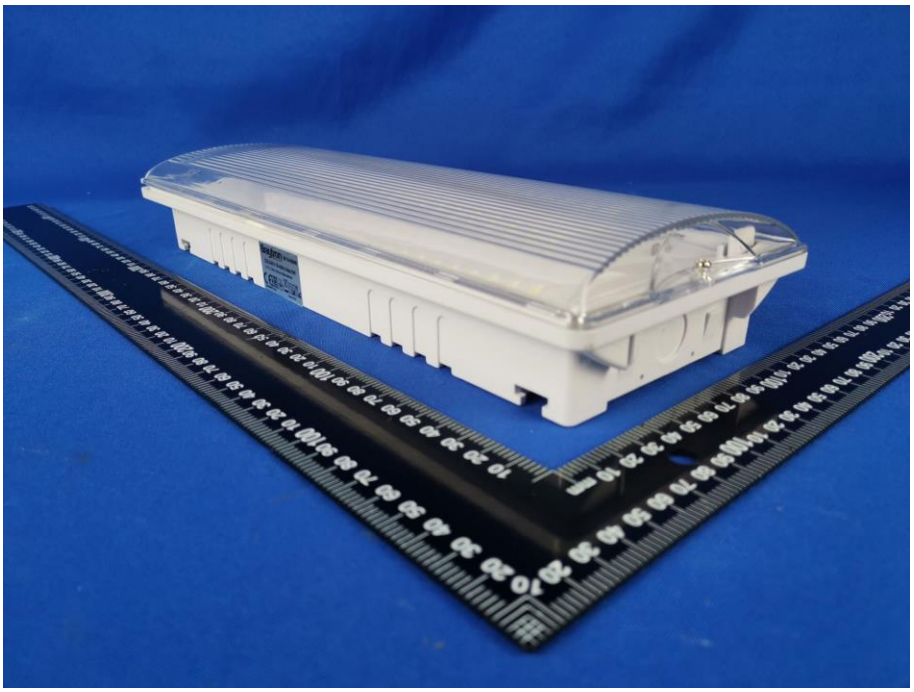
Test Level % UT	Duration (Periods)	Phase angle	No. of drop out	Time between dropout	Observations (Performance Criterion)	Result
0	0.5	0°,90°,180°,270°	3	10s	A	Pass
70	10	0°,90°,180°,270°	3	10s	B	Pass

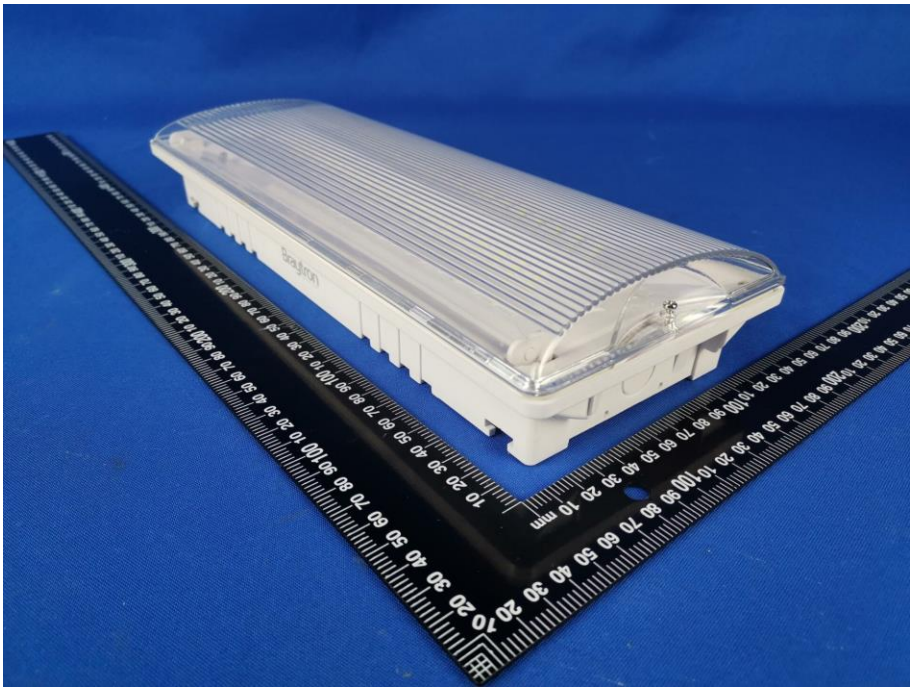
Remark:

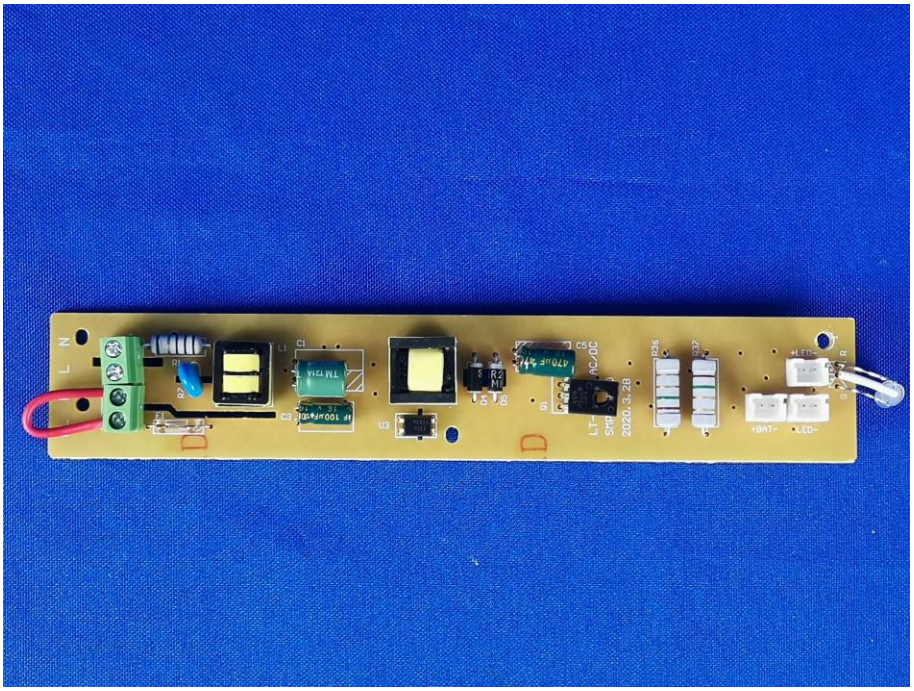
Performance Criteria: A, B, C: Refer to section 8.1 for details

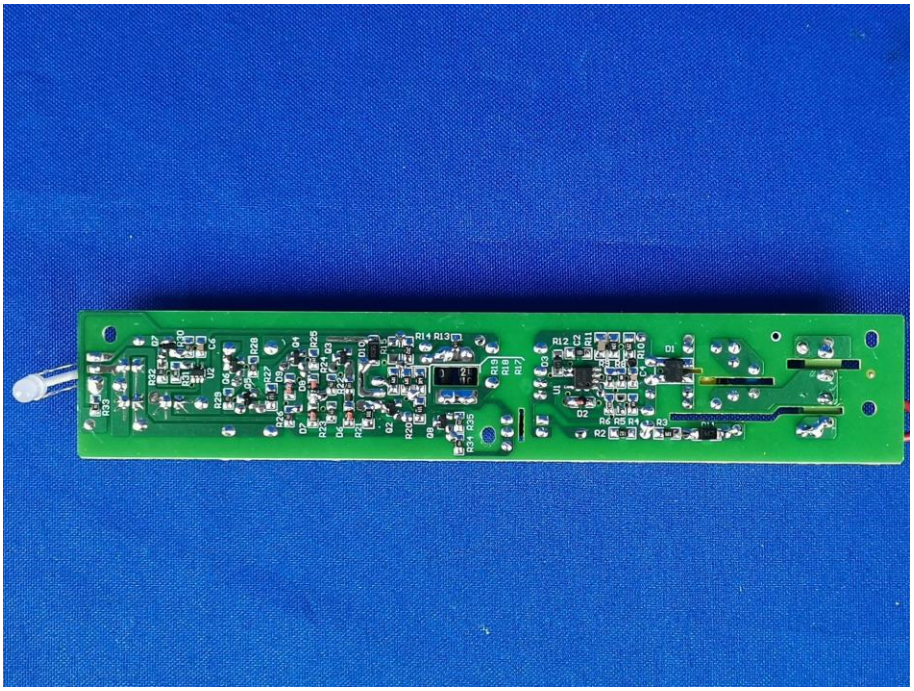
9 EUT Constructional Details











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