

TEST REPORT

Application No.: SHEM2204002794LM
Applicant: Ningbo Brightenlux Electric Appliance Co.,Ltd
Address of Applicant: NO.688 JIYI Area,Xidian Town, Ninghai, Ningbo, Zhejiang 315613,China
Manufacturer: Ningbo Brightenlux Electric Appliance Co.,Ltd
Address of Manufacturer: NO.688 JIYI Area,Xidian Town, Ninghai, Ningbo, Zhejiang 315613,China
Factory: Ningbo Brightenlux Electric Appliance Co.,Ltd
Address of Factory: NO.688 JIYI Area,Xidian Town, Ninghai, Ningbo, Zhejiang 315613,China
Equipment Under Test (EUT):
EUT Name: RECHARGEABLE LED HEADLAMP
Model No.: BT-HL9040,BT-HL9001,BT-HL9002,BT-HL9041,BT-HL9004,
BT-HL9006,BT-HL9080,BT-HL9081,BT-HL9082,BT-HL9100,
BT-HL9101,BT-HL9068,BT-HL9067,BT-HL9077,BT-HL9078,
BT-HL9069,BT-HL9055,BT-HL9070,BT-HL9075,BT-HL9036,
BT-HL9039,BT-HL9047,BT-HL9056,BT-HL9079,BT-HL9083,
BT-HL9084,BT-HL9066,BT-HL9023R,BT-HL9005R,BT-HI9013
BT-HL9027,BT-HL9007,BT-HL9085,BT-HL9086,BT-HL9087
BT-HL9052,BT-HL9088,BT-HL9072,BT-HL9089,BT-HL9053
BT-HL9038,BT-HL9020,BT-HL9049,BT-HL9010,BT-HL9018,
BT-HL9019,BT-HL9102,BT-HL9103,BT-HL9104,BT-HL9105,BT-HL9107;□
□ Please refer to section 2 of this report which indicates which model was
actually tested and which were electrically identical.
Standard(s) : EN IEC 55015:2019+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019
EN 61547:2009
Date of Receipt: 2022-05-04
Date of Test: 2022-05-05 to 2022-05-08
Date of Issue: 2022-05-09

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

Parlam Zhan

Parlam Zhan
Laboratory Manager



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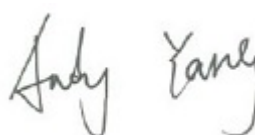
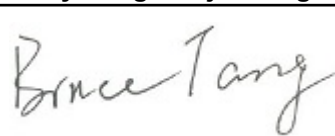
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Revision Record			
Version	Description	Date	Remark
00	Original	2022-05-09	/

Authorized for issue by:				
				
		Andy Yang /Project Engineer		
				
		Bruce Tang /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	N/A	Pass
Radiated Emissions (30MHz-1GHz)	EN IEC 55015:2019+A11:2020	CISPR 32:2015	N/A	Pass
Radiated Emissions (Magnetic field Induced Current)(9kHz-30MHz)	EN IEC 55015:2019+A11:2020	EN IEC 55015:2019+A11:2020	N/A	Pass
Harmonic Current Emission	EN IEC 61000-3-2:2019+A1:2021	EN IEC 61000-3-2:2019+A1:2021	Class C	N/A*
Voltage Fluctuations and Flicker	EN 61000-3-3:2013+A1:2019	EN 61000-3-3:2013+A1:2019	Clause 5 of EN 61000-3-3	Pass

N/A: Not applicable

N/A*: Not applicable, please refer to section 6.4 of this report for details.

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 61547:2009	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass
Electrical Fast Transients/Burst at Power Port	EN 61547:2009	EN 61000-4-4:2012	1kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass
Surge at Power Port	EN 61547:2009	EN 61000-4-5:2014 +A1:2017	1.2/50µs Tr/Td 0.5kV Line to Line 1kV Line to Ground	Pass
Conducted Immunity at Power Port (150kHz-80MHz)	EN 61547:2009	EN 61000-4-6:2014	3Vrms (emf),80%,1kHz Amp. Mod.	Pass
Voltage Dips and Interruptions	EN 61547:2009	EN 61000-4-11:2004 +A1:2017	0 % UT for 0.5per 70 % UT for 10per UT is Supply Voltage	Pass

Note: Declaration of EUT Family Grouping:

There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model BT-HL9040 was tested since their differences are model number, trade name and appearance.



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4 General Information

4.1 Details of E.U.T.

Power supply: For Charging mode:
Adapter information by sgs
Input: AC 100-240V 50/60Hz
Output: 5V 0.5A
For Lighting mode: DC 3.7V
Test voltage: AC 230V 50Hz and DC 3.7V
Cables & Ports: DC cable 1m

4.2 Description of Support Units

Description	Manufacturer	Model No.
Adapter	HUAWEI	5V 0.5A

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission at mains port using AMN	2.6dB (9kHz to 150kHz)
		2.4dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	1.8 dB (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	4.2 dB (150kHz to 30MHz)
4	Radiated Power	3.2dB
5	Radiated Emission	4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
6	Radiated Disturbance (disturbance current in a LLAS)	2.4dB (9kHz to 30MHz)

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



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4.4 Test Location

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Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

sub-contracted at:

Ningbo Joysun Product Testing Service Co., Ltd.

No. 66, Qingyi Road, Hi-Tech Distric, Ningbo, Zhejiang, China

4.5 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 6332.01)**

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

- **FCC (Designation Number: CN1301)**

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

- **ISED (CAB Identifier: CN0020)**

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

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: Monitor the lamp lighting.



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5 Equipment List

CE

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
EMI receiver	ESCI	100708	R&S	2023/3/7
Artificial mains network	ENV216	101022	R&S	2023/3/7
Artificial mains network	ESH2-Z5	100198	R&S	2023/3/7
Pulse Limiter	ESH3-Z2	100847	R&S	2023/3/7
Control Room2	(11.2*5.2*3.3)	N/A	Albatross	2023/3/1

RE

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
EMI receiver	ESU26	100224	R&S	2023/3/7
Combined antenna	VULB 9163	9163-563	SCHWARZBECK	2024/1/25
Horn antenna	HF907	100147	R&S	2023/3/17
Preamplifier	SCU18	10042	R&S	2023/3/7
Semi -Anechoic Chamber	3M (9.1*5.8*5.7)	N/A	Albatross	2023/1/2
EMI receiver	ESR 7	101203	R&S	2023/3/7
Combined antenna	VULB 9163	9163-560	SCHWARZBECK	2023/3/17
Semi -Anechoic Chamber	5M (12.1*7.3*6)	N/A	Albatross	2023/1/2

RE Loop

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
EMI receiver	ESCI	101213	R&S	2023/3/7
Three ring antenna	SWB-HXYZ9170	175	SCHWARZBECK	2023/3/7
Shielding Room1	(10*6.1*3.3)	N/A	Albatross	2023/3/1

Voltage Fluctuations and Flicker

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Harmonic and flicker test system	DPA500	V0746103124	EM TEST	2023/3/7
AC Power Source	500lix-400-413	58311	CI	2023/3/7
Shielding Room1	(10*6.1*3.3)	N/A	Albatross	2023/3/1
Harmonic and flicker test system(3phase)	DPA503	V0828104013	EM TEST	2023/3/7
AC Power Source	61705	617050000124	Chroma	2023/3/7
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2023/3/1

ESD

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
ESD gun	dito	DITO B07040	EM TEST	2023/3/7

RI

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Semi -Anechoic Chamber	3M (9.1*5.8*5.7)	N/A	Albatross	2023/1/2
LOGPERIODIC ANTENNA	AT1080	325189	AR	2023/3/7
Horn antenna	AT4002A	328236	AR	2023/3/7



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Coupling/Decoupling Network	DC6180M1	328058	AR	2023/3/7
Coupling/Decoupling Network	DC7144M1	327100	AR	2023/3/7
POWER AMPLIFIER	250W1000A	327579	AR	2023/3/7
POWER AMPLIFIER	80S1G3	327495	AR	2023/3/7
Integrated measurement system	IMS	100012	R&S	2023/3/7
Smart sensor technology	NRP-Z91	100520	R&S	2023/3/7
POWER AMPLIFIER	BBA150	103010	R&S	2023/3/7
Signal source	SMB100A	114943	R&S	2023/3/7

EFT

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Burst test system	NX8-3-690-32	P2111250014	EM TEST	2023/3/7
Surge, Burst and Dip test system	UCS500-M6B	V0746103125	EM TEST	2023/3/7
booster	MV2616	V0746103126	EM TEST	2023/3/7
Coupling clamp	HFK	0108-27	EM TEST	2023/3/7
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2023/3/1

Surge

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Surge test system	VCS 500N8.5	P2051246299	EM TEST	2023/3/7
Surge, Burst and Dip test system	UCS500-M6B	V0746103125	EM TEST	2023/3/7
booster	MV2616	V0746103126	EM TEST	2023/3/7
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2023/3/1

Dips

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Dip test system	PFS 503N32	P2051246036	EM TEST	2023/3/7
Surge, Burst and Dip test system	UCS500-M6B	V0746103125	EM TEST	2023/3/7
booster	MV2616	V0746103126	EM TEST	2023/3/7
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2023/3/1

CI

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Attenuator	75-A-FFN-06	1606	BIRD	2023/3/7
CDN for Two/There Supply Main Line	CDN-M2+3	A2210412/2016	Frankonia	2023/3/7
Decoupling network	F-203I-23MM-DCN	8225	FISCHER	2023/3/7
EM injection clamp	F-203I-23MM	8562	FISCHER	2023/3/7
Conduct Immunity Test System	CIT-10-75	126B1413/2016	Frankonia	2023/3/7
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2023/3/1



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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
Frequency Range:	9kHz to 30MHz
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

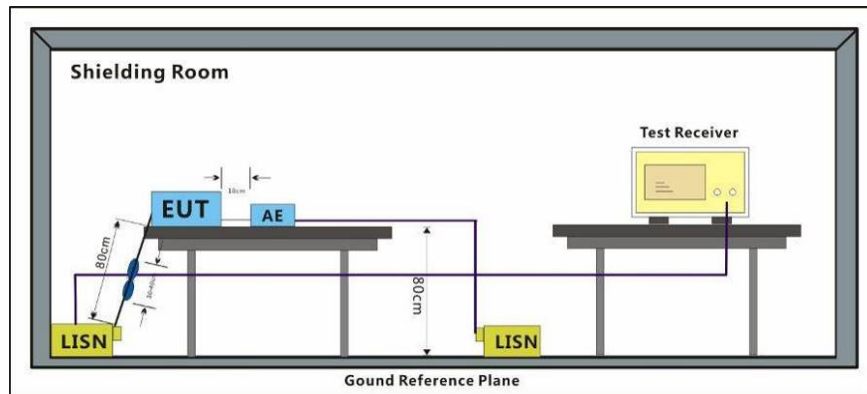
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Charging mode: Keep EUT charging continuously.

6.1.2 Test Setup Diagram



6.1.3 Measurement 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.



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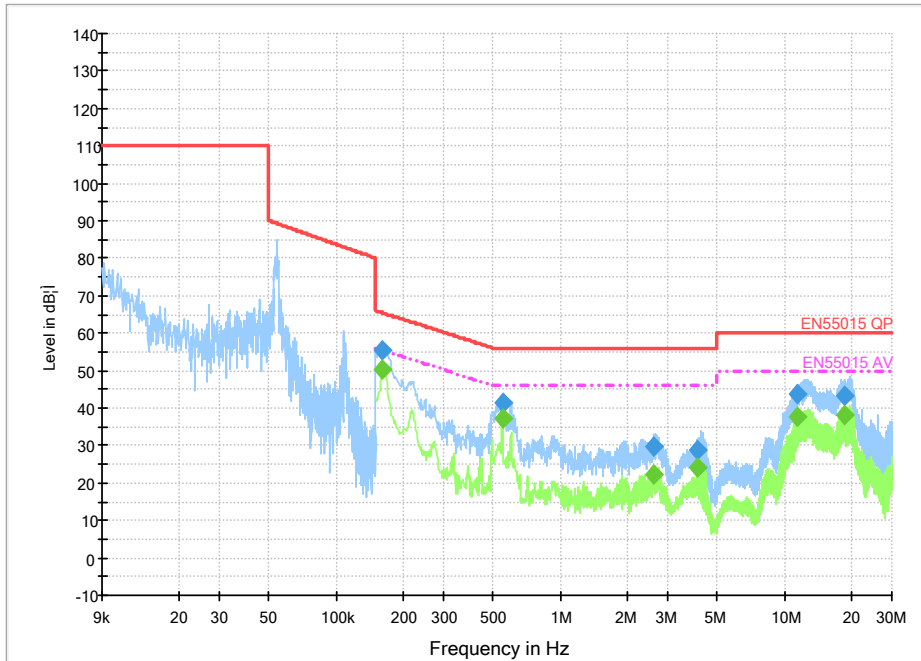
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Mode:a; Line:Live Line

Voltage with 2-Line-LISN(9kHz-30MHz)-sgs



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.1600000	55.2	1000.0	9.000	Off	L1	10.8	10.3	65.5	
0.5510000	41.6	1000.0	9.000	Off	L1	10.7	14.4	56.0	
2.6200000	29.6	1000.0	9.000	Off	L1	10.8	26.4	56.0	
4.0710000	28.8	1000.0	9.000	Off	L1	10.8	27.2	56.0	
11.3820000	43.8	1000.0	9.000	Off	L1	10.9	16.2	60.0	
18.3070000	43.1	1000.0	9.000	Off	L1	10.9	16.9	60.0	

Final Result 2

Frequency (MHz)	CAverage (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.1600000	50.5	1000.0	9.000	Off	L1	10.8	5.0	55.5	
0.5510000	37.4	1000.0	9.000	Off	L1	10.7	8.6	46.0	
2.6200000	22.1	1000.0	9.000	Off	L1	10.8	23.9	46.0	
4.0710000	24.0	1000.0	9.000	Off	L1	10.8	22.0	46.0	
11.3820000	37.5	1000.0	9.000	Off	L1	10.9	12.5	50.0	
18.3070000	38.0	1000.0	9.000	Off	L1	10.9	12.0	50.0	



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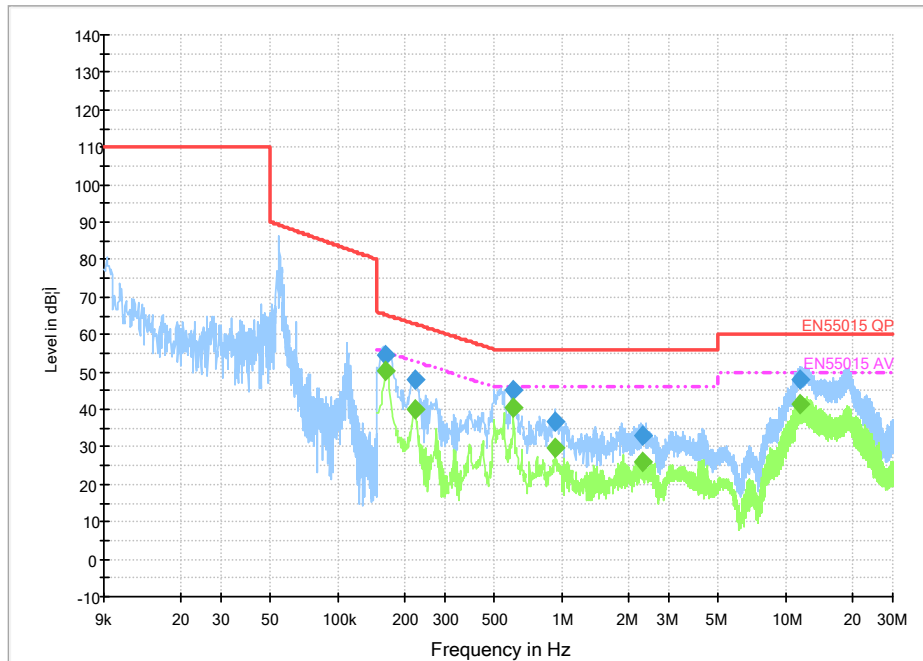
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Mode:a; Line:Neutral Line

Voltage with 2-Line-LISN(9kHz-30MHz)-sgs



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.1640000	54.3	1000.0	9.000	Off	N	10.8	11.2	65.5	
0.2220000	48.1	1000.0	9.000	Off	N	10.8	16.1	64.2	
0.6090000	45.0	1000.0	9.000	Off	N	10.7	11.0	56.0	
0.9380000	36.6	1000.0	9.000	Off	N	10.8	19.4	56.0	
2.2910000	33.0	1000.0	9.000	Off	N	10.8	23.0	56.0	
11.5780000	48.1	1000.0	9.000	Off	N	10.9	11.9	60.0	

Final Result 2

Frequency (MHz)	CAverage (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.1640000	50.2	1000.0	9.000	Off	N	10.7	5.3	55.5	
0.2220000	40.2	1000.0	9.000	Off	N	10.7	14.0	54.2	
0.6090000	40.3	1000.0	9.000	Off	N	10.7	5.7	46.0	
0.9380000	29.6	1000.0	9.000	Off	N	10.8	16.4	46.0	
2.2910000	25.9	1000.0	9.000	Off	N	10.8	20.1	46.0	
11.5780000	41.6	1000.0	9.000	Off	N	11.0	8.4	50.0	



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6.2 Radiated Emissions (30MHz-1GHz)

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

Test Method: CISPR 32:2015

Frequency Range: 30MHz to 1GHz

Measurement Distance: 3m

Limit:

30MHz-230MHz 40 dB(μ V/m) quasi-peak

230MHz-1GHz 47 dB(μ V/m) quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

6.2.1 E.U.T. Operation

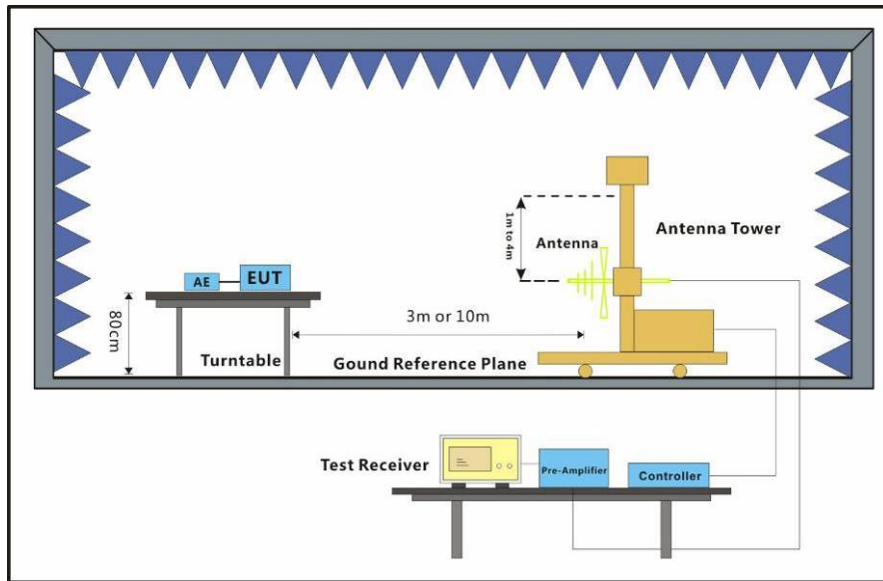
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Charging mode: Keep EUT charging continuously.

b: Lighting mode: Keep EUT lighting continuously.

6.2.2 Test Setup Diagram

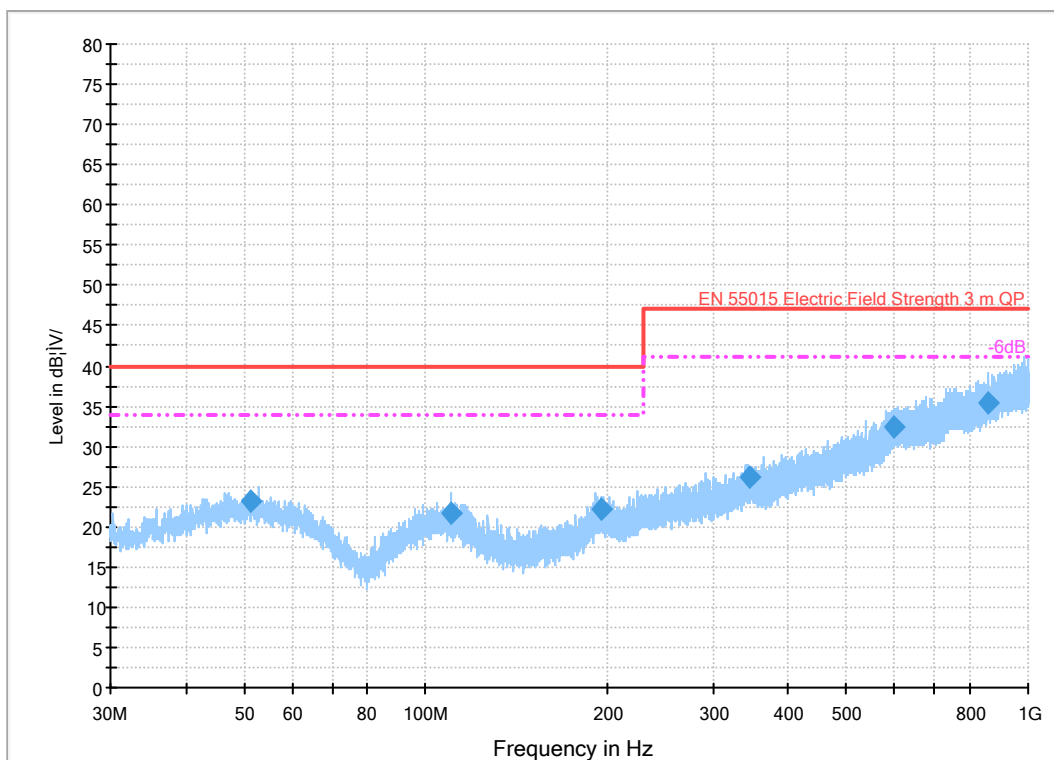


6.2.3 Measurement Data

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.

Mode:a; Polarization:Horizontal

Radiated EMI Auto Test (30-1000MHz)-EMC-1



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
51.404667	23.3	1000.0	120.000	173.3	H	0.0	14.7	16.7
109.895667	21.8	1000.0	120.000	104.8	H	235.0	12.9	18.2
195.934667	22.2	1000.0	120.000	119.2	H	0.0	13.3	17.8
345.282333	26.2	1000.0	120.000	125.0	H	357.0	17.3	20.8
596.771000	32.3	1000.0	120.000	188.0	H	0.0	22.6	14.7
854.985000	35.5	1000.0	120.000	109.0	H	94.0	25.6	11.5

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dB μ V/m)	Comment
51.404667	40.0	
109.895667	40.0	
195.934667	40.0	
345.282333	47.0	
596.771000	47.0	
854.985000	47.0	



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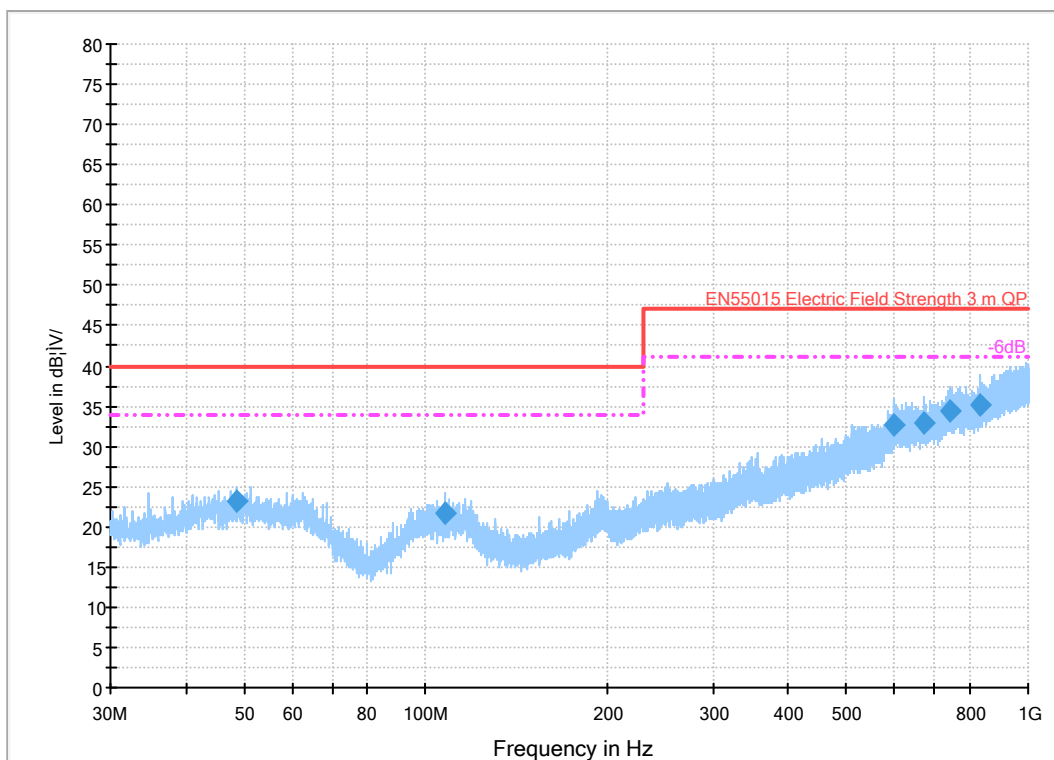
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Mode:a; Polarization:Vertical

Radiated EMI Auto Test (30-1000MHz)-EMC-1



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
48.462333	23.3	1000.0	120.000	119.4	V	0.0	14.6	16.7
107.438333	21.8	1000.0	120.000	120.0	V	220.0	13.1	18.2
600.424667	32.6	1000.0	120.000	178.0	V	190.0	22.6	14.4
670.685000	32.8	1000.0	120.000	152.0	V	0.0	23.1	14.2
739.264000	34.4	1000.0	120.000	144.0	V	126.0	24.6	12.6
830.444000	35.1	1000.0	120.000	137.0	V	7.0	25.2	11.9

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dB μ V/m)	Comment
48.462333	40.0	
107.438333	40.0	
600.424667	47.0	
670.685000	47.0	
739.264000	47.0	
830.444000	47.0	



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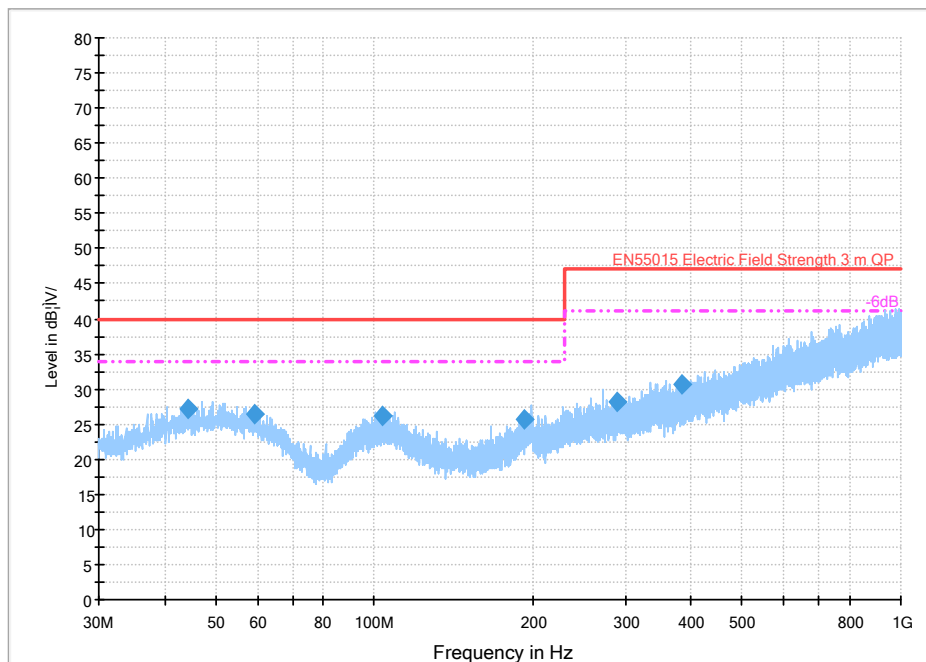
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Mode:b; Polarization:Horizontal

Radiated EMI Auto Test (30-1000MHz)-SGS-1



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
44.226667	27.1	1000.0	120.000	137.9	H	221.0	14.3	12.9
59.294000	26.5	1000.0	120.000	184.9	H	294.0	13.7	13.5
103.784667	26.1	1000.0	120.000	162.0	H	231.0	13.3	13.9
192.733667	25.7	1000.0	120.000	155.0	H	144.0	12.7	14.3
290.251000	28.3	1000.0	120.000	194.0	H	324.0	15.3	18.7
385.278667	30.7	1000.0	120.000	218.0	H	0.0	17.8	16.3

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dB μ)	Comment
44.226667	40.0	
59.294000	40.0	
103.784667	40.0	
192.733667	40.0	
290.251000	47.0	
385.278667	47.0	

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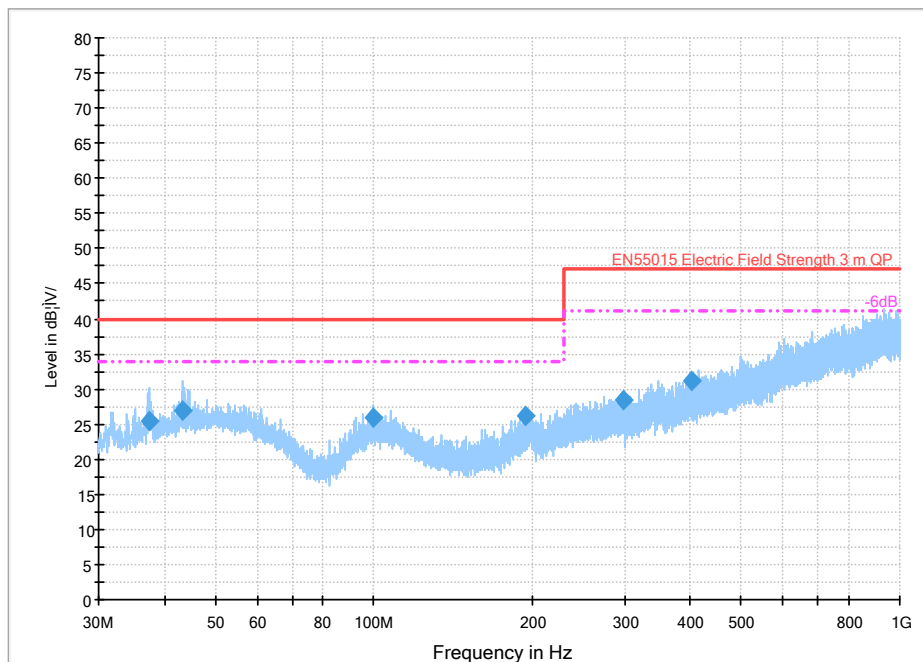
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Mode:b; Polarization:Vertical

Radiated EMI Auto Test (30-1000MHz)-SGS-1



Final Result 1

Frequency (MHz)	QuasiPeak (dB μV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
37.533667	25.3	1000.0	120.000	188.9	V	189.0	12.5	14.7
43.418333	26.9	1000.0	120.000	132.9	V	31.0	14.2	13.1
99.678333	26.0	1000.0	120.000	170.0	V	136.0	13.2	14.0
194.997000	26.2	1000.0	120.000	108.9	V	147.0	13.2	13.8
299.013333	28.4	1000.0	120.000	164.0	V	294.0	15.5	18.6
401.898000	31.2	1000.0	120.000	175.0	V	56.0	18.3	15.8

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dB μV)	Comment
37.533667	40.0	
43.418333	40.0	
99.678333	40.0	
194.997000	40.0	
299.013333	47.0	
401.898000	47.0	

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
Frequency Range:	9kHz to 30MHz
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

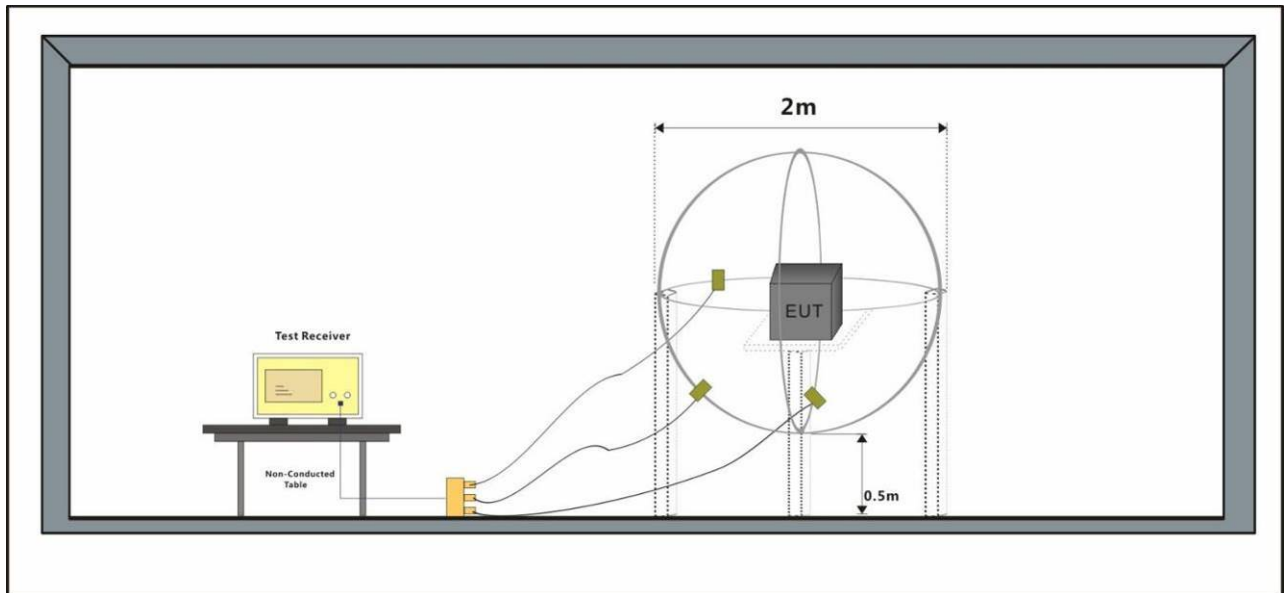
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Charging mode: Keep EUT charging continuously.

b: Lighting mode: Keep EUT lighting continuously.

6.3.2 Test Setup Diagram



6.3.3 Measurement 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.



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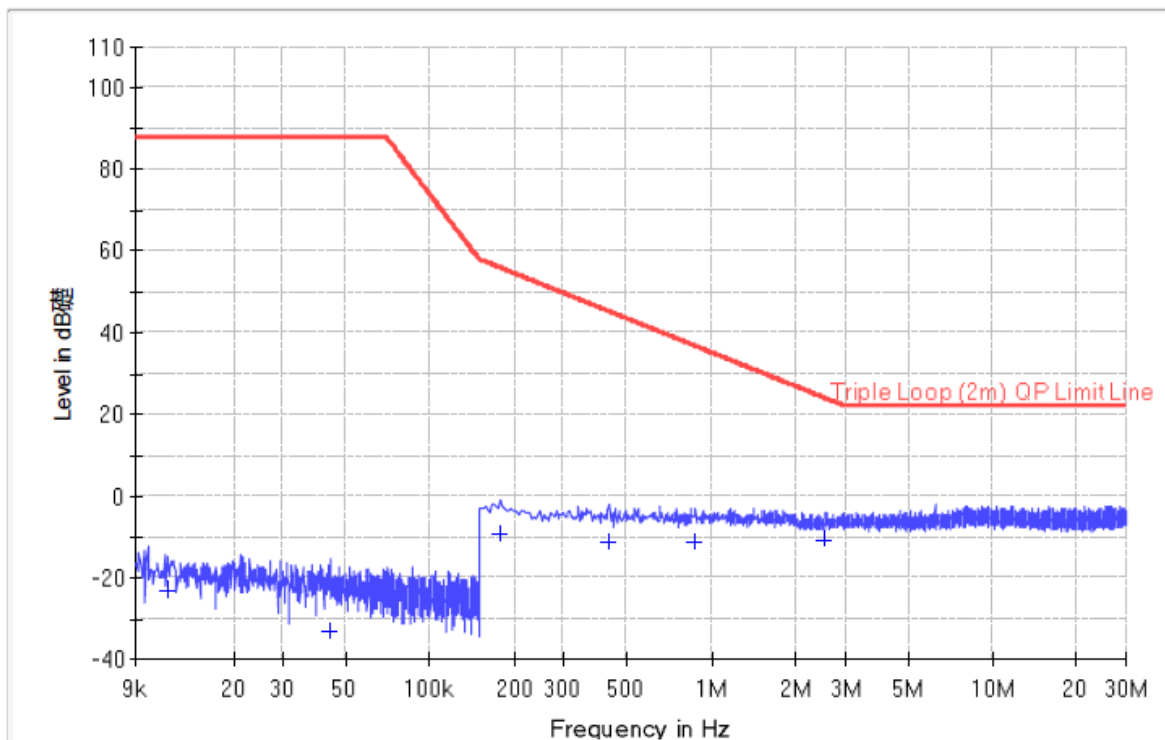
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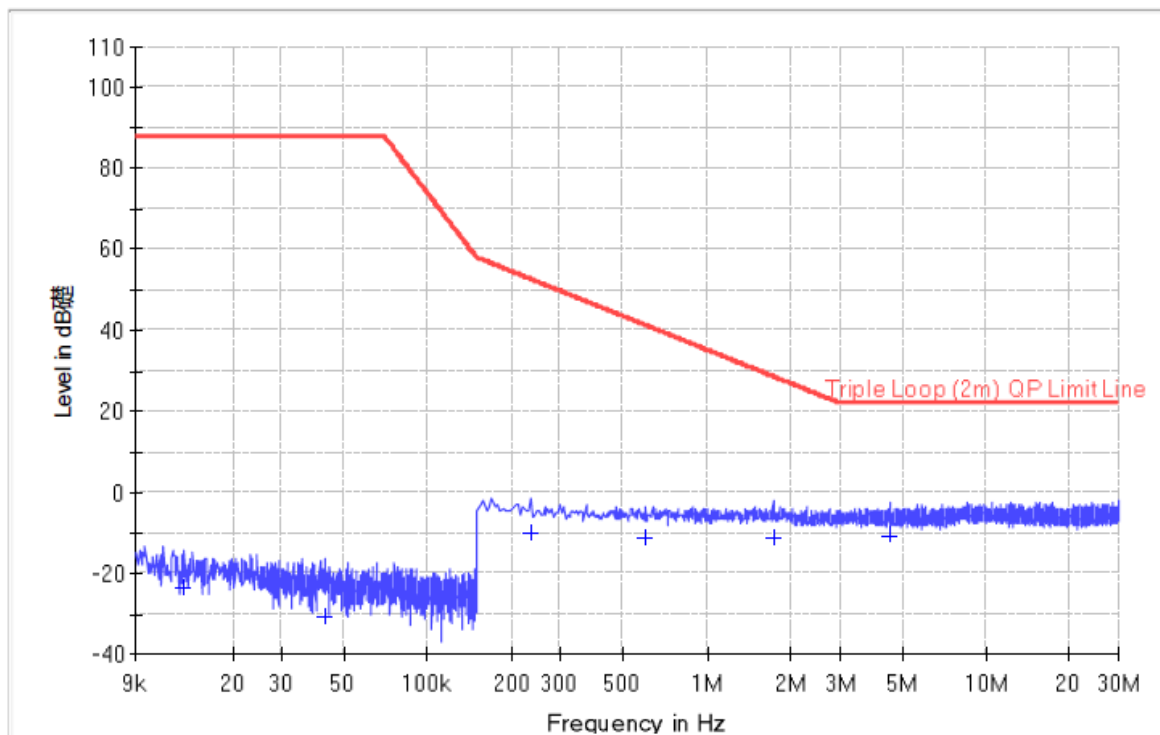
Mode:a; Axial:X



Limit and Margin-QP

Frequency (MHz)	QuasiPeak (dBμA)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop fram	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμA)	Comment
0.011720	-23.1	1000.0	0.200	X	0.0	111.1	88.0	
0.044520	-33.3	1000.0	0.200	X	0.0	121.3	88.0	
0.178000	-9.0	1000.0	9.000	X	0.0	64.9	55.9	
0.434000	-11.2	1000.0	9.000	X	0.0	56.4	45.2	
0.882000	-11.4	1000.0	9.000	X	0.1	48.1	36.7	
2.558000	-10.8	1000.0	9.000	X	0.1	34.7	23.9	

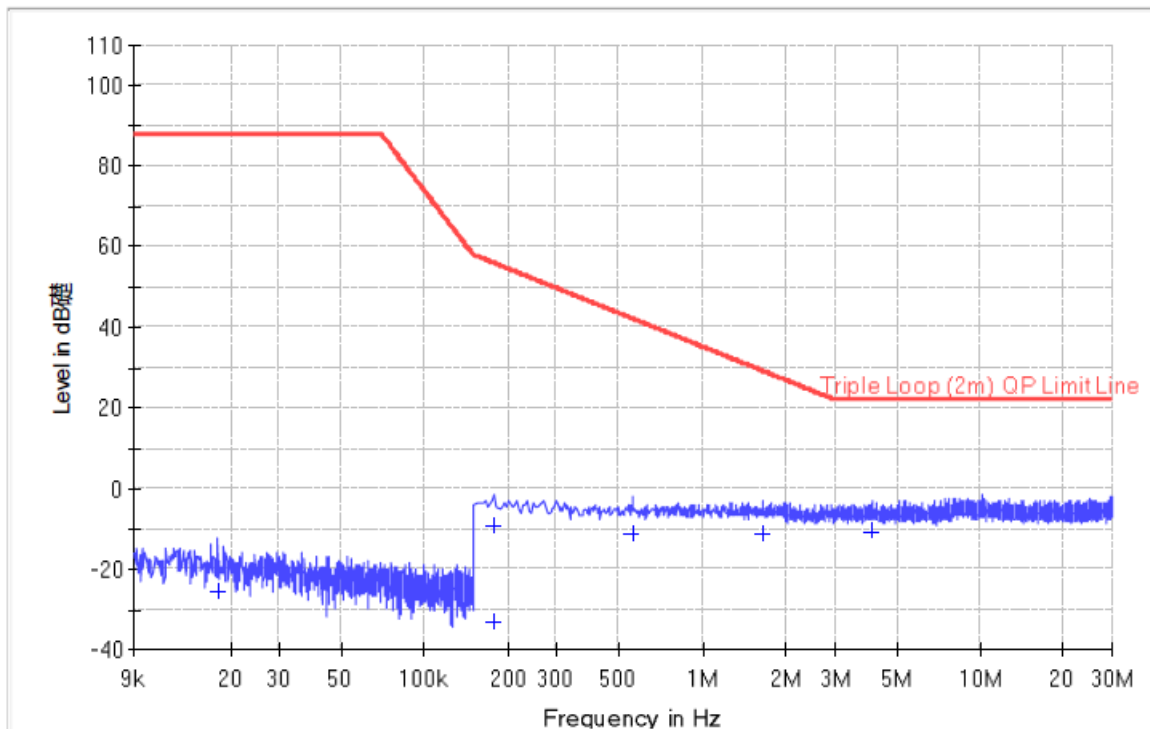
Mode:a; Axial:Y



Limit and Margin-QP

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0.013400	-23.8	1000.0	0.200	Y	0.0	111.8	88.0	
0.043080	-30.6	1000.0	0.200	Y	0.0	118.6	88.0	
0.234000	-10.2	1000.0	9.000	Y	0.0	62.9	52.7	
0.606000	-11.3	1000.0	9.000	Y	0.0	52.5	41.2	
1.726000	-11.3	1000.0	9.000	Y	0.1	39.9	28.6	
4.566000	-10.6	1000.0	9.000	Y	0.2	32.6	22.0	

Mode:a; Axial:Z



Limit and Margin-QP

Frequency (MHz)	QuasiPeak (dBμA)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop frame	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμA)	Comment
0.018040	-25.4	1000.0	0.200	Z	0.0	113.4	88.0	
0.178000	-33.3	1000.0	0.200	Z	0.0	89.2	55.9	
0.178000	-9.1	1000.0	9.000	Z	0.0	65.0	55.9	
0.562000	-11.5	1000.0	9.000	Z	0.0	53.6	42.1	
1.654000	-11.3	1000.0	9.000	Z	0.1	40.5	29.2	
4.070000	-10.6	1000.0	9.000	Z	0.1	32.6	22.0	



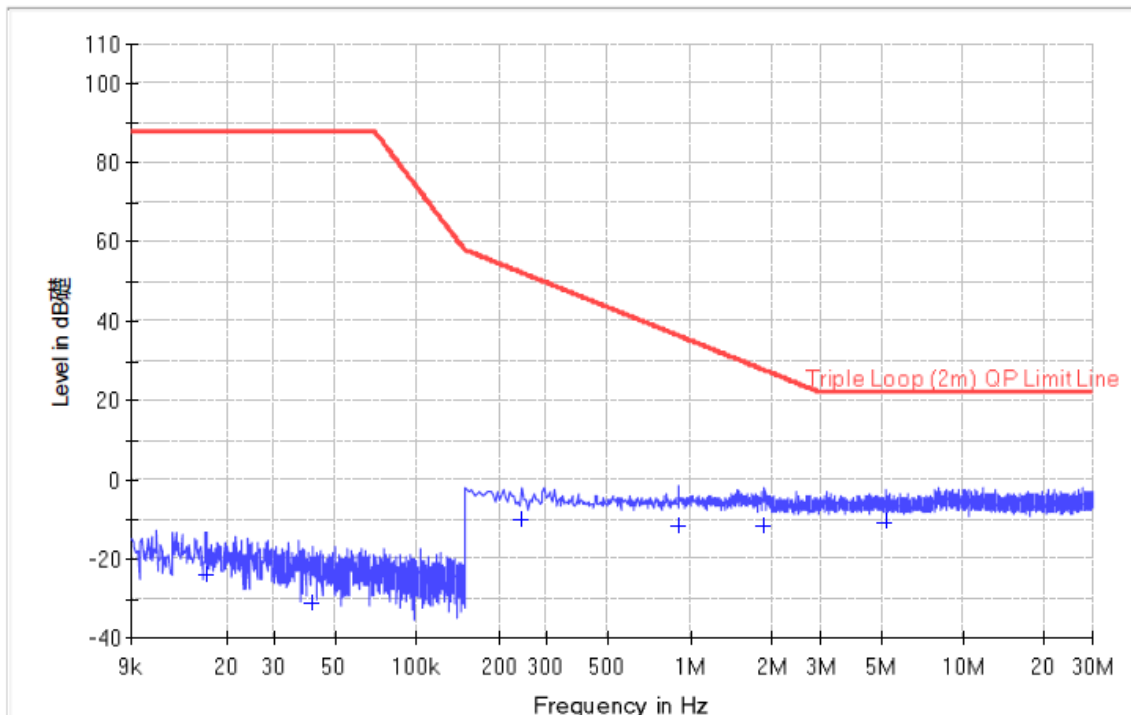
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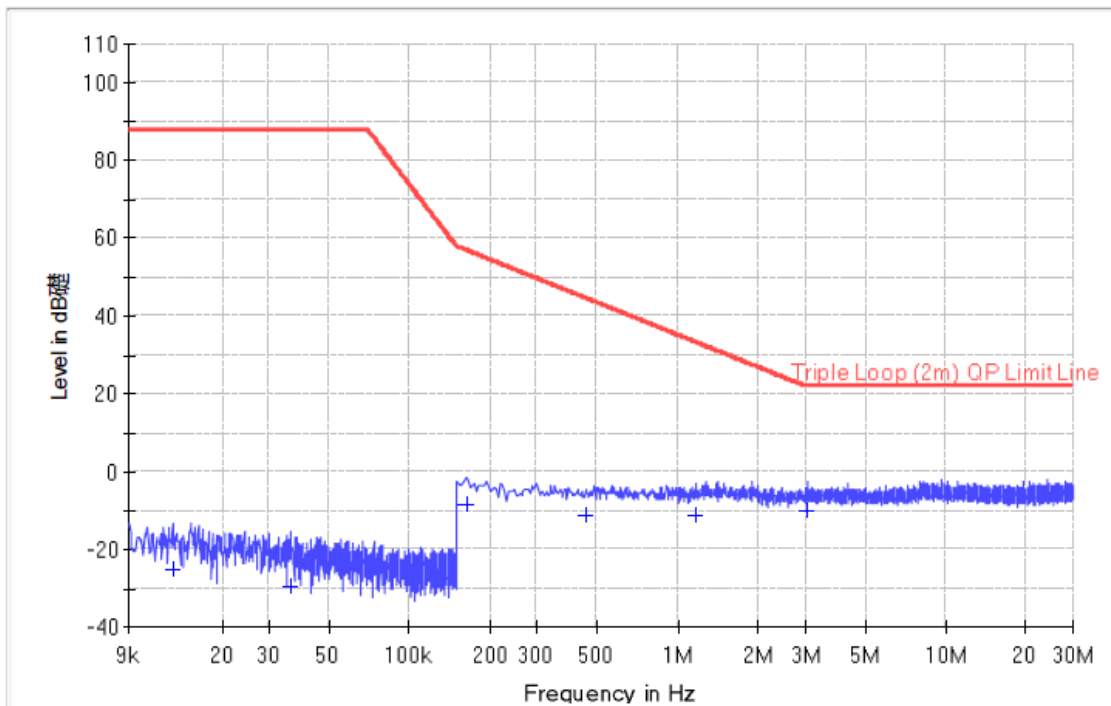
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Limit and Margin-QP

Frequency (MHz)	QuasiPeak (dBμA)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop frame	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμA)	Comment
0.016840	-24.2	1000.0	0.200	X	0.0	112.2	88.0	
0.041640	-31.4	1000.0	0.200	X	0.0	119.4	88.0	
0.242000	-10.3	1000.0	9.000	X	0.0	62.6	52.3	
0.910000	-11.6	1000.0	9.000	X	0.1	47.9	36.3	
1.878000	-11.5	1000.0	9.000	X	0.1	39.1	27.6	
5.202000	-10.6	1000.0	9.000	X	0.2	32.6	22.0	

Mode:b; Axial:Y



Limit and Margin-QP

Frequency (MHz)	QuasiPeak (dBμA)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop fram	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμA)	Comment
0.013080	-25.0	1000.0	0.200	Y	0.0	113.0	88.0	
0.036200	-29.8	1000.0	0.200	Y	0.0	117.8	88.0	
0.162000	-8.6	1000.0	9.000	Y	0.0	65.7	57.1	
0.454000	-11.3	1000.0	9.000	Y	0.0	56.0	44.7	
1.178000	-11.3	1000.0	9.000	Y	0.1	44.5	33.2	
3.070000	-10.4	1000.0	9.000	Y	0.1	32.4	22.0	



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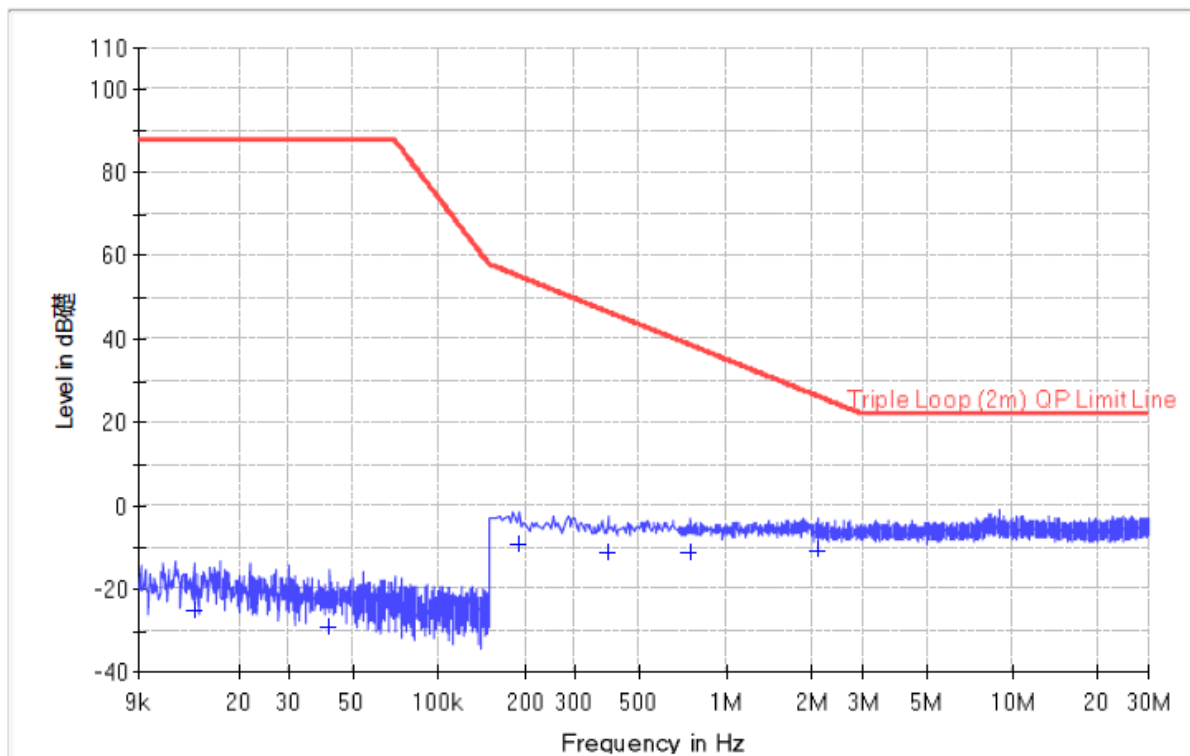
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Limit and Margin-QP

Frequency (MHz)	QuasiPeak (dBμA)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop fram	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμA)	Comment
0.014040	-25.0	1000.0	0.200	Z	0.0	113.0	88.0	
0.041720	-29.1	1000.0	0.200	Z	0.0	117.1	88.0	
0.190000	-9.4	1000.0	9.000	Z	0.0	64.6	55.2	
0.390000	-11.0	1000.0	9.000	Z	0.0	57.5	46.5	
0.754000	-11.4	1000.0	9.000	Z	0.1	50.0	38.6	
2.094000	-10.8	1000.0	9.000	Z	0.1	37.1	26.3	



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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

Frequency Range: 100Hz to 2kHz

6.4.1 Measurement Data

There is no requirement for lighting equipment with a rated power less than but not equal to 5 W, for details please refer to clause 7.1 of EN IEC 61000-3-2:2019+A1:2021



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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

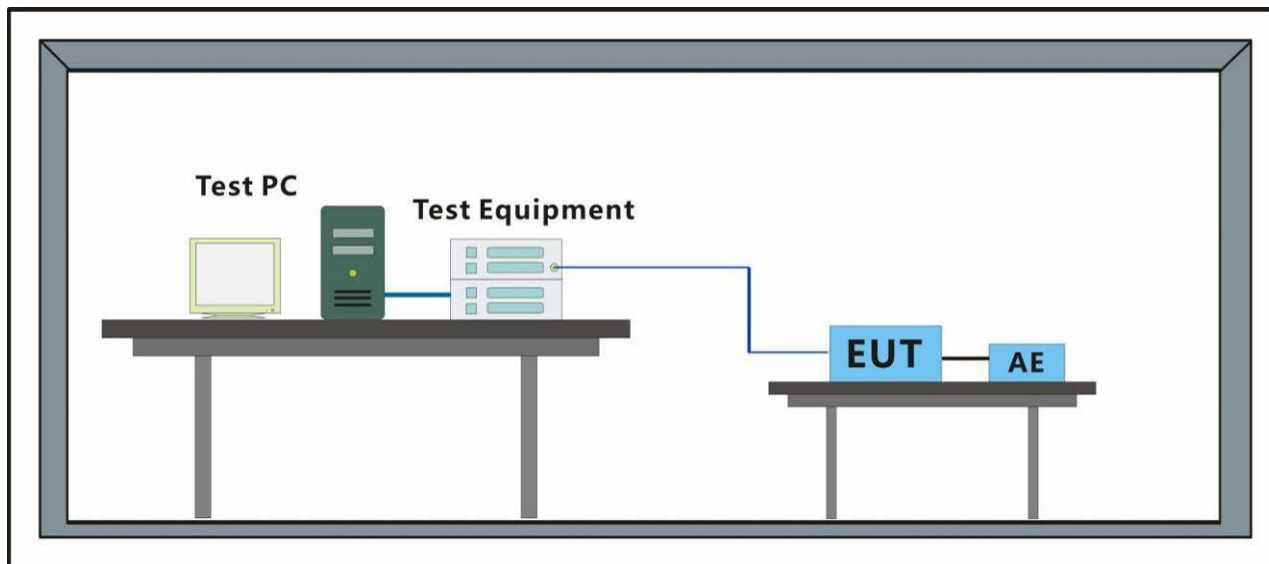
6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Charging mode: Keep EUT charging continuously.

6.5.2 Test Setup Diagram



6.5.3 Measurement Data

Mode:a

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	< 0.15	4.00	PASS
Tmax [s]	0.000	0.50	PASS



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7 Immunity Test Results

7.1 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.



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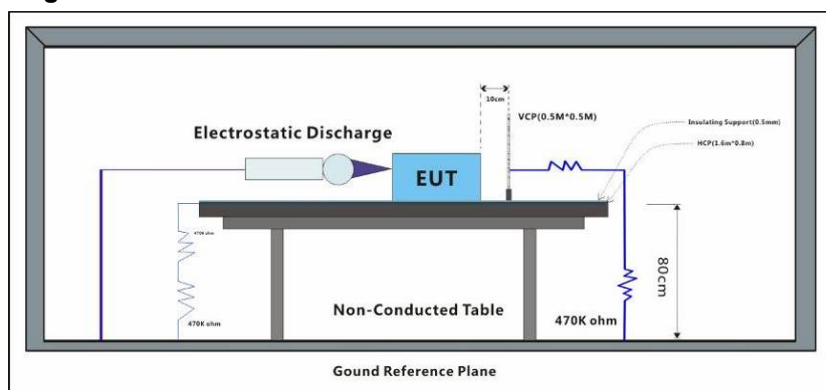
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7.2 Electrostatic Discharge

Test Requirement: EN 61547:2009
 Test Method: EN 61000-4-2:2009
 Performance Criterion: B
 Discharge Impedance: 330Ω/150pF
 Number of Discharge: Minimum 10 times at each test point
 Discharge Mode: Single Discharge
 Discharge Period: 1 second minimum

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Charging mode: Keep EUT charging continuously.
 b: Lighting mode: Keep EUT lighting continuously.

7.2.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

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

Results:

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



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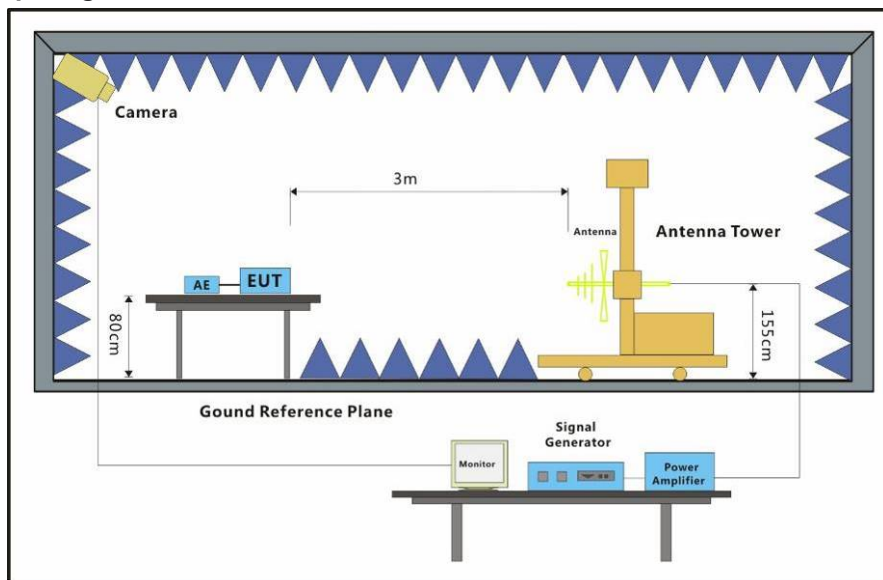
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7.3 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 61547:2009
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010
 Performance Criterion: A
 Frequency Range: 80MHz to 1GHz
 Antenna Polarisation: Vertical and Horizontal
 Modulation: 1kHz,80% Amp. Mod,1% increment

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Charging mode: Keep EUT charging continuously.
 b: Lighting mode: Keep EUT lighting continuously.

7.3.3 Test Results:

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	Underside	3s	A

Results:

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

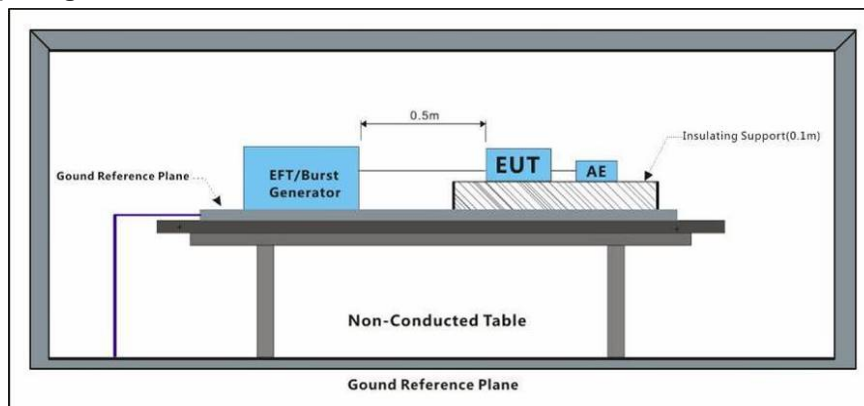


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7.4 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 61547:2009
 Test Method: EN 61000-4-4:2012
 Performance Criterion: B
 Repetition Frequency: 5kHz
 Burst Period: 300ms
 Test Duration: 2 minute per level & polarity

7.4.1 Test Setup Diagram



7.4.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Charging mode: Keep EUT charging continuously.

7.4.3 Test Results:

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A

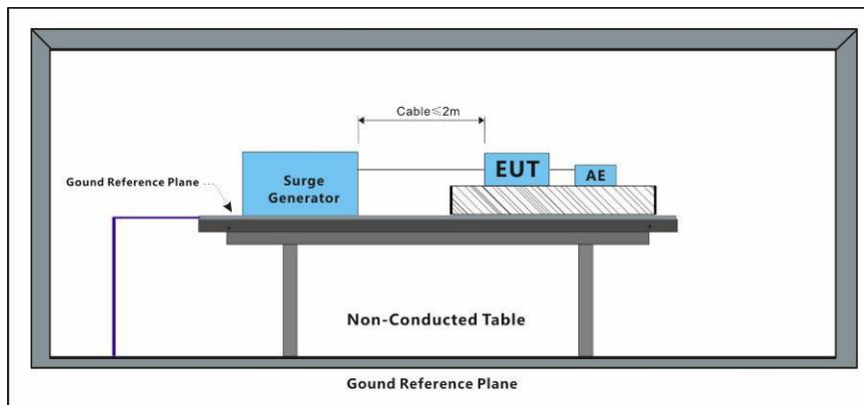
Results:

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

7.5 Surge at Power Port

Test Requirement: EN 61547:2009
Test Method: EN 61000-4-5:2014 +A1:2017
Performance Criterion: C
No. of surges: 5 positive at 90°, 5 negative at 270°.

7.5.1 Test Setup Diagram



7.5.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar
Test mode: a: Charging mode: Keep EUT charging continuously.

7.5.3 Test Results:

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	0.5	+	90°	A
L-N	0.5	-	270°	A
L-PE	1	+	90°	A
L-PE	1	-	270°	A
N-PE	1	+	90°	A
N-PE	1	-	270°	A

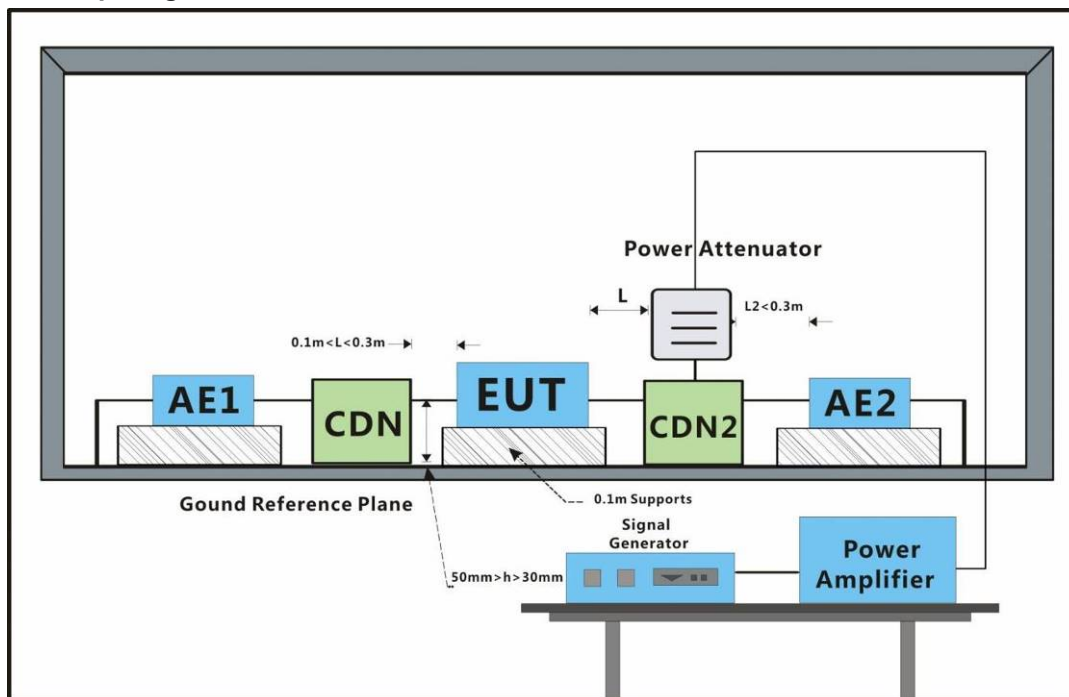
Results:

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

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

Test Requirement: EN 61547:2009
 Test Method: EN 61000-4-6:2014
 Performance Criterion: A
 Frequency Range: 0.15MHz to 80MHz
 Modulation: 80%, 1kHz Amplitude Modulation
 Step Size: 1%

7.6.1 Test Setup Diagram



7.6.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Charging mode: Keep EUT charging continuously.

7.6.3 Test Results:

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

Results:

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



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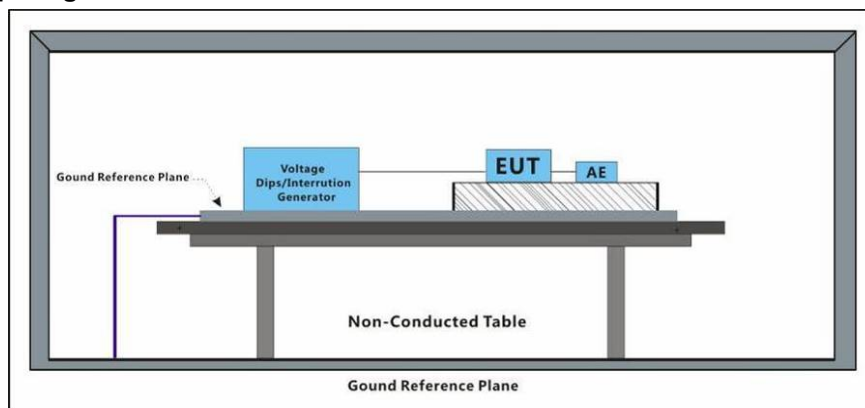
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7.7 Voltage Dips and Interruptions

Test Requirement: EN 61547:2009
Test Method: EN 61000-4-11:2004 +A1:2017
Performance Criterion: 0% of UT (Supply Voltage) for 0.5 Periods:B; 70 % of UT for 10 Periods:C
No. of Dips / Interruptions: 3 per Level
Time between dropout 10s

7.7.1 Test Setup Diagram



7.7.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar
Test mode: a: Charging mode: Keep EUT charging continuously.

7.7.3 Test Results:

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

Results:

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

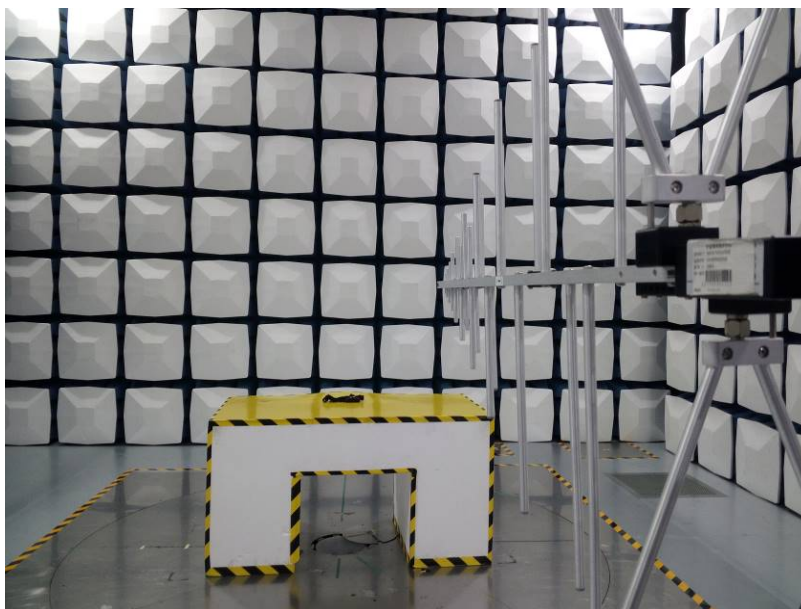
8 Photographs

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



8.2 Radiated Emissions (30MHz-1GHz) Test Setup





8.3 Radiated Emissions (Magnetic field Induced Current)(9kHz-30MHz) Test Setup





8.4 Harmonic Current Emission & Voltage Fluctuations and Flicker Test Setup



8.5 Electrostatic Discharge Test Setup



8.6 Radiated Immunity (80MHz-1GHz) Test Setup



8.7 Electrical Fast Transients/Burst at Power Port Test Setup



8.8 Surge at Power Port Test Setup



8.9 Conducted Immunity at Power Port (150kHz-80MHz) Test Setup



8.10 Voltage Dips and Interruptions Test Setup



8.11 EUT Constructional Details (EUT Photos)





- End of the Report -



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