EMC Test Report

Report No.: STS2410059E01

Issued for

Mid Ocean Brands B.V.

7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

Product Name:	5 panel LED light baseball cap
Brand Name:	N/A
Model Name:	MO2439
Series Model(s):	N/A
Test Standards:	EN IEC 55015:2019/A11:2020 EN IEC 61547:2023 EN IEC 61000-3-2:2019/A1:2021 EN 61000-3-3:2013/A2:2021

TEST REPORT

Applicant's Name..... :	Mid Ocean Brands B.V.
Address ..... :	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer's Name ..... :	Mid Ocean Brands B.V.
Address ..... :	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

Product Description

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Brand Name ..... :	N/A
Model Name ..... :	MO2439
Series Model(s) ..... :	N/A
Test Standards ..... :	EN IEC 55015:2019/A11:2020 EN IEC 61547:2023 EN IEC 61000-3-2:2019/A1:2021 EN 61000-3-3:2013/A2:2021

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

Date of Test .....:

Date of Receipt of Test Item .....:	15 Oct. 2024
Date (s) of Performance of Tests.....:	15 Oct. 2024 ~ 22 Oct. 2024
Date of Issue.....:	22 Oct. 2024
Test Result.....:	**Pass**

Testing Engineer : Stan · Deng

(Star Deng)

Technical Manager : Tony Liu

(Tony Liu)

Authorized Signatory : Bovey Yang

(Bovey Yang)

SHENZHEN STS TEST SERVICES CO., LTD. TESTING APPROVAL

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	22 Oct. 2024	STS2410059E01	ALL	Initial Issue

1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgement	Remark
EN IEC 55015:2019/A11:2020	Conducted Emission on AC And Telecom Port 150kHz to 30MHz	------	PASS	
	Radiated Emission	------	PASS	
	Magnetic field radiation harassment	------	PASS	
EN IEC 61000-3-2:2019/A1:2021	Harmonic Current Emission	Class C	N/A	
EN 61000-3-3:2013/A2:2021	Voltage Fluctuations & Flicker	------	PASS	
EMC Immunity				
Section EN IEC 61547:2023	Test Item	Performance Criteria	Judgement	Remark
EN 61000-4-2:2009	Electrostatic discharges	B	PASS	
EN IEC 61000-4-3:2020	Continuous RF electromagnetic field disturbances	A	PASS	
EN 61000-4-4:2012	Electrical fast transients/burst	B	PASS	
EN 61000-4-5:2014/A1:2017	Surges	B	PASS	
EN 61000-4-6:2014+AC:2015	Continuous induced RF disturbances	A	PASS	
EN 61000-4-8:2010	Power frequency magnetic field	A	PASS	
EN IEC 61000-4-11:2020	Voltage dips and interruptions	B / C	PASS	NOTE (2)

NOTE:

(1) “N/A” denotes test is not applicable in this Test Report

(2) Voltage Dip: 100% reduction – Performance Criteria **B**

Voltage Dip: 30% reduction – Performance Criteria **C**

1.1 TEST FACTORY

Company Name:	SHENZHEN STS TEST SERVICES CO.,LTD.
Address:	101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China
Telephone:	+86-755 3688 6288
Fax:	+86-755 3688 6277
Registration No.:	FCC test Firm Registration Number: 625569
	IC test Firm Registration Number: 12108A
	A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U · (dB)	NOTE
STSC01	CISPR 16-4-2	9KHz ~ 150KHz	2.19	
		150KHz ~ 30MHz	2.53	

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U · (dB)	NOTE
STSC02	CISPR 16-4-2	30MHz ~ 1000MHz	4.18	
		1GHz ~ 6GHz	4.90	

C. Magnetic field radiation harassment:

Test Site	Method	Measurement Frequency Range	U · (dB)	NOTE
STSC01	CISPR 16-4-2	9KHz ~ 30MHz	1.91	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	5 panel LED light baseball cap
Brand Name	N/A
Model Name	MO2439
Series Model(s)	N/A
Model Difference	N/A
Product Description	The EUT is a 5 panel LED light baseball cap Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as a Lighting Device. More details of EUT technical specification, please refer to the User's Manual.
Rating	Input: DC 5V
Battery	N/A
Adapter	N/A
Hardware Version Number	N/A
Software Version Number	N/A

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Charging + Lighting mode

For Conducted Test	
Final Test Mode	Description
Mode 1	Charging + Lighting mode

For Radiated Test	
Final Test Mode	Description
Mode 1	Charging + Lighting mode

For EMS Test	
Final Test Mode	Description
Mode 1	Charging + Lighting mode

Note:

1. For conducted emission test, test mode 1 was the worst case and only this mode was presented in this report.
2. For radiated emission test, test mode 1 was the worst case and only this mode was presented in this report.

2.3 DESCRIPTION OF THE TEST SETUP

The EUT has been tested with associated equipment below and the test setup please refer to appendix 1 - test setup.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
E-1	Adapter	SZTY	TPA-46050100VU	N/A	N/A
C-1	USB Cable	N/A	N/A	110cm	NO

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.

(2) “YES” means “with core”; “NO” means “without core”.

2.4 MEASUREMENT INSTRUMENTS LIST

2.4.1 CONDUCTED TEST SITE

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESCI	101427	2024.9.23	2025.9.22
LISN	R&S	AiT-F01220	8130179	2024.9.23	2025.9.22
Absorbing Clamp	R&S	MDS-21	100668	2024.4.15	2025.4.14
CE Cable	N/A	C01	N/A	2024.9.23	2025.9.22
Temperature & Humidity	Mieo	HH660	N/A	2024.9.24	2025.9.23
Testing Software	EZ-EMC(Ver.STSLAB-03A1 CE)				

2.4.2 RADIATED TEST SITE

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESCI	101427	2024.9.23	2025.9.22
Bi-log Antenna	TESEQ	CBL6111D	45873	2024.9.24	2025.9.23
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1343	2024.9.24	2025.9.23
Pre-amplifier(1G-26.5G)	Agilent	HP8449B	3008A02383	2024.2.23	2025.2.22
Pre-amplifier(0.1M-3GHz)	EM	EM330	060665	2024.2.23	2025.2.22
Spectrum Analyzer	Agilent	N9020A	MY49100060	2024.9.23	2025.9.22
RE Cable (9K-1G)	N/A	R01	N/A	2024.9.23	2025.9.22
RE Cable (1G-26G)	N/A	R02	N/A	2024.9.23	2025.9.22
Temperature & Humidity	Mieo	HH660	N/A	2024.9.24	2025.9.23
SAC	ChengYu	9*6*6	N/A	2023.9.05	2026.9.06
Testing Software	EZ-EMC(Ver.STSLAB-03A1 RE)				

2.4.3 THREE LOOP

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Three Loop	ZNINAN	ZN30401	13018	2024.9.23	2025.9.22
EMI Test Receiver	R&S	ESCI	101427	2024.9.23	2025.9.22
Loop Cable	N/A	C03	N/A	2024.9.23	2025.9.22
Temperature & Humidity	Mieo	HH660	N/A	2024.9.24	2025.9.23

2.4.4 HARMONICS AND FLICKER

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Harmonic Voltage & Flicker	LAPLACE	AC 2000A	311217	2024.9.23	2025.9.22
AC Power Source	MTONI	PHF-5010	631169	2024.9.23	2025.9.22
Temperature & Humidity	Mieo	HH660	N/A	2024.9.24	2025.9.23
Testing Software	HA-PC Link Version 3.03				

2.4.5 ESD

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
ESD TEST GENERATOR	TESEQ	NSG438	1175	2024.9.24	2025.9.23
Temperature & Humidity	N/A	WS1066	N/A	2024.2.22	2025.2.21

2.4.6 RS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Power Meter	Agilent	E4419B	QB43312265	2024.9.23	2025.9.22
Power Sensor	hp	E9300A	US39210170	2024.9.23	2025.9.22
Power Sensor	hp	E9300A	US39210476	2024.9.23	2025.9.22
Signal Generator	Agilent	N5181A	MY56144718	2024.9.23	2025.9.22
Power Amplifier	MICOTOP	MPA-80-1000-250	MPA1711489	2024.9.23	2025.9.22
Power Amplifier	MICOTOP	MPA-1000-6000-100	MPA1904132	2024.9.23	2025.9.22
RS Test Antenna (80-1GHz)	SCHWARZBECK	VULP 9118E	000999	N/A	N/A
RS Test Antenna (1G-10GHz)	SCHWARZBECK	STLP 9149	000648	N/A	N/A
Universal Radio Communication Tester	R&S	CMU200	116337	2024.2.25	2025.2.24
Audio Analyzer	R&S	UPL	100689	2024.3.20	2025.3.19
Audio Breakthrough Shielding Box	SKET	SB_ABT/C35	N/A	N/A	N/A
Ear Simulator	SKET	AE_ABT/C35	N/A	N/A	N/A
Mouth Simulator	SKET	AM_ABT/C35	N/A	N/A	N/A
1KHz Standard Source	SKET	MSC_ABT/C35	N/A	2024.9.24	2025.9.23
Field Probe	Narda	EP601	611WX80261	2024.2.23	2025.2.22
Temperature & Humidity	Mieo	HH660	N/A	2024.9.24	2025.9.23
Testing Software	EMC-S V1.4.0.53				

2.4.7 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Surger Generator	HTEC	HCWG 100	225202	2024.2.23	2025.2.22
Surger Generator	HTEC	HTW	152104	2024.9.23	2025.9.22
VOLTAGE DIPS & INTERRUPTIONS Generator	HTEC	HPFS 161P	143803	2024.2.23	2025.2.22
EFT/B Generator	HTEC	HEFT 51	1920001	2024.9.23	2025.9.22
Temperature & Humidity	Mieo	HH660	N/A	2024.9.24	2025.9.23

2.4.8 INJECTION CURRENT

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
CS	SCHLODER	CDG-6000-25	126A1280/2014	2024.9.23	2025.9.22
CDN	SCHLODER	CDN-M2+3	A2210275/2014	2024.9.23	2025.9.22
EM Clamp	FISCHER	F-203I-23MM	445	2024.4.22	2025.4.21
Attenuator	Nemtest	ATT-6DB-100	A100W224	2024.9.23	2025.9.22
Universal Radio Communication Tester	R&S	CMU200	116337	2024.2.25	2025.2.24
Audio Analyzer	R&S	UPL	100689	2024.3.20	2025.3.19
Audio Breakthrough Shielding Box	SKET	SB_ABT/C35	N/A	N/A	N/A
Ear Simulator	SKET	AE_ABT/C35	N/A	N/A	N/A
Mouth Simulator	SKET	AM_ABT/C35	N/A	N/A	N/A
1KHz Standard Source	SKET	MSC_ABT/C35	N/A	2024.9.24	2025.9.23
Temperature & Humidity	Mieo	HH660	N/A	2024.9.24	2025.9.23

2.4.9 PFMF

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
MF Generator	HTEC	HMFG-COMB	143903	2024.9.24	2025.9.23
Magnetic Field Coil	HTEC	HCOIL 100	143808	2024.9.24	2025.9.23
Temperature & Humidity	Mieo	HH660	N/A	2024.9.24	2025.9.23

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION

(Frequency Range 9KHz-30MHz)

FREQUENCY (MHz)	Maximum RF Line Voltage	
	Quasi-peak	Average
0.009 ~ 0.05	110	---
0.05 ~ 0.15	90 - 80 *	---
0.15 ~ 0.5	66 - 56 *	56 - 46 *
0.5 ~ 5	56.00	46.00
5 ~ 30	60.00	50.00

Note: (1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 LOAD TERMINAL CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Maximum RF Line Voltage	
	Quasi-peak	Average
0.15 ~ 0.5	80	70
0.5 ~ 30	74	64

Note: (1) The tighter limit applies at the band edges.

3.1.3 CONTROL TERMINAL CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Maximum RF Line Voltage	
	Quasi-peak	Average
0.15 ~ 0.5	84 - 74*	74 - 64*
0.5 ~ 30	74	64

Note: (1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

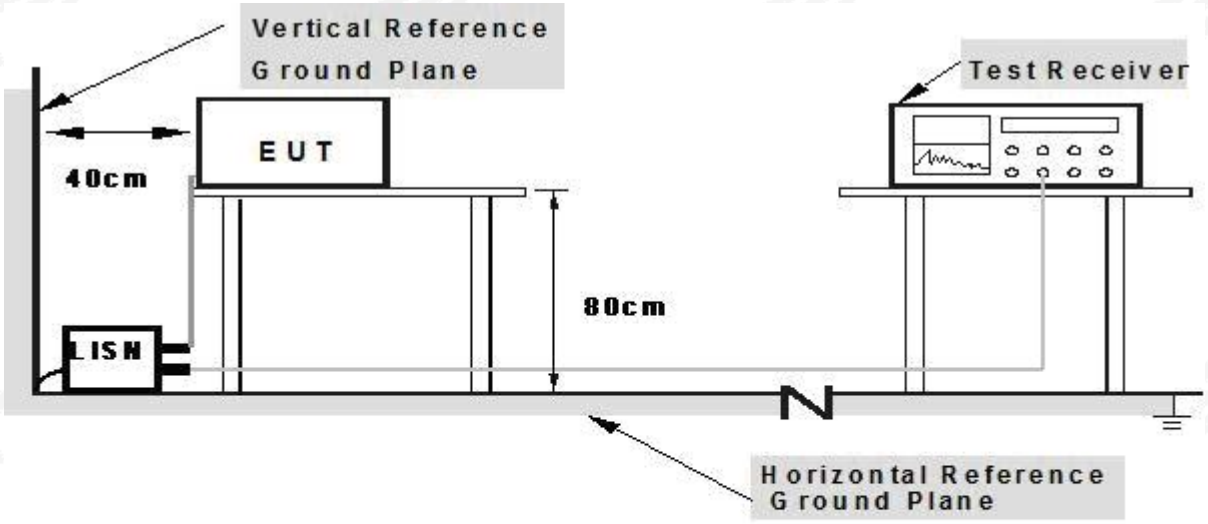
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.009 MHz
Stop Frequency	30 MHz
IF Bandwidth	200Hz and 9 kHz

3.1.4 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.6 EUT OPERATING CONDITIONS

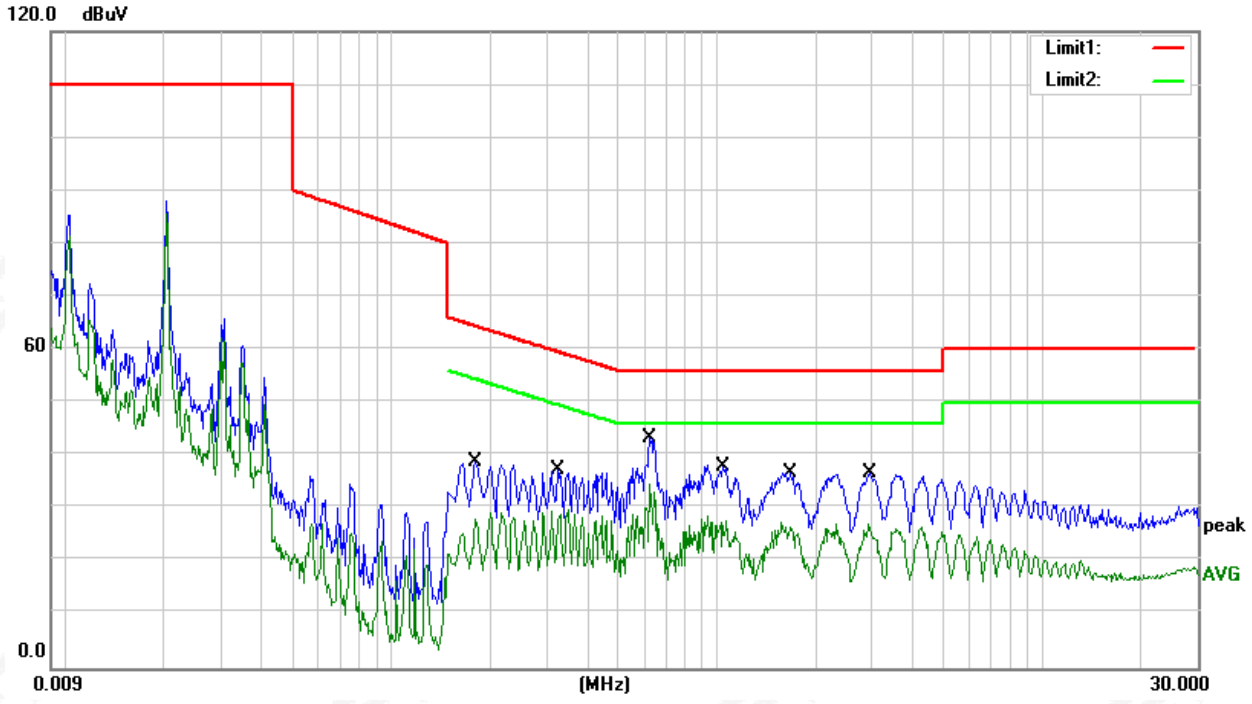
The EUT tested system was configured as the statements of **2.3** described unless otherwise a special operating condition is specified in the following during the testing.

3.1.7 TEST RESULTS

Temperature:	25.1℃	Relative Humidity:	59%
Phase:	L	Test Mode:	Mode 1
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.17

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1820	19.15	19.77	38.92	64.39	-25.47	QP
2	0.1820	9.50	19.77	29.27	54.39	-25.12	AVG
3	0.3260	17.09	20.17	37.26	59.55	-22.29	QP
4	0.3260	9.79	20.17	29.96	49.55	-19.59	AVG
5	0.6260	23.54	19.89	43.43	56.00	-12.57	QP
6	0.6260	14.90	19.89	34.79	46.00	-11.21	AVG
7	1.0500	18.08	19.77	37.85	56.00	-18.15	QP
8	1.0500	8.00	19.77	27.77	46.00	-18.23	AVG
9	1.6900	17.08	19.79	36.87	56.00	-19.13	QP
10	1.6900	7.60	19.79	27.39	46.00	-18.61	AVG
11	2.9540	16.93	19.83	36.76	56.00	-19.24	QP
12	2.9540	7.19	19.83	27.02	46.00	-18.98	AVG

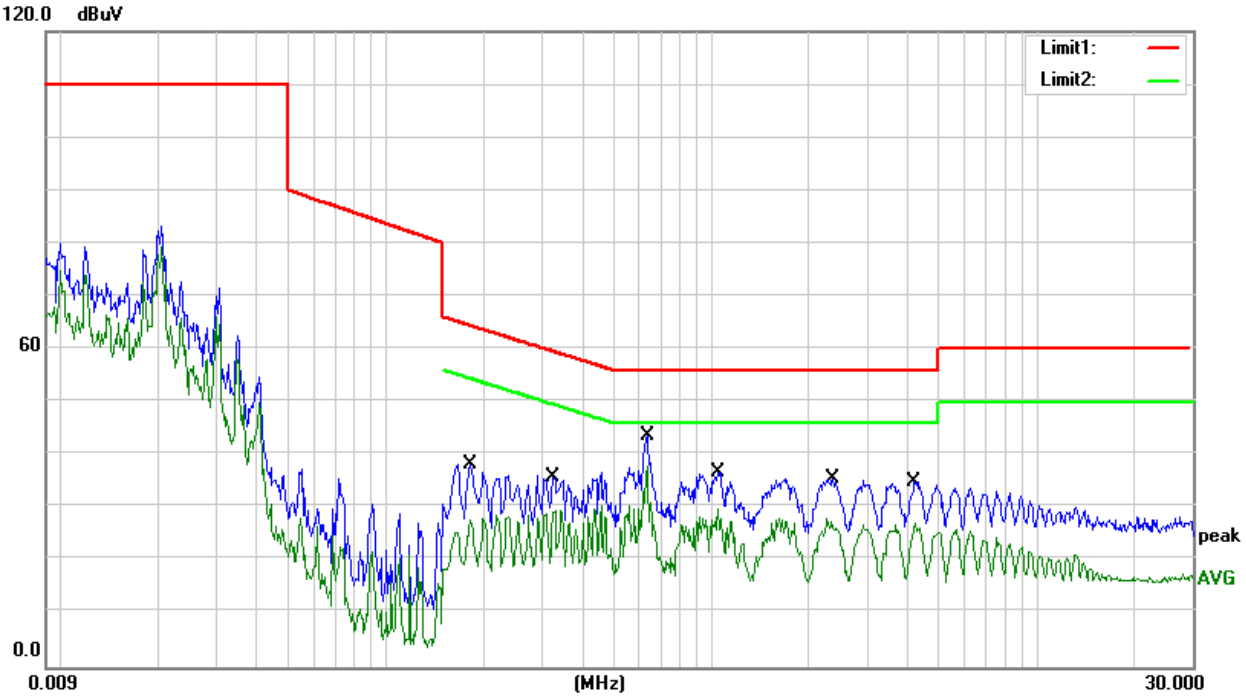
Remark:
1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor = Insertion loss + Cable loss



Temperature:	25.1℃	Relative Humidity:	59%
Phase:	N	Test Mode:	Mode 1
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.17

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1820	18.48	19.82	38.30	64.39	-26.09	QP
2	0.1820	8.98	19.82	28.80	54.39	-25.59	AVG
3	0.3260	15.66	20.20	35.86	59.55	-23.69	QP
4	0.3260	9.50	20.20	29.70	49.55	-19.85	AVG
5	0.6340	23.76	19.88	43.64	56.00	-12.36	QP
6	0.6340	18.17	19.88	38.05	46.00	-7.95	AVG
7	1.0500	17.10	19.77	36.87	56.00	-19.13	QP
8	1.0500	10.01	19.77	29.78	46.00	-16.22	AVG
9	2.3580	15.74	19.90	35.64	56.00	-20.36	QP
10	2.3580	8.23	19.90	28.13	46.00	-17.87	AVG
11	4.2100	15.06	19.93	34.99	56.00	-21.01	QP
12	4.2100	7.27	19.93	27.20	46.00	-18.80	AVG

Remark:
1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor = Insertion loss + Cable loss



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF THE RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	☒ 2m	☐ 3m	☐ 4m
	dB(μA)	dB(μA)	dB(μA)
9 KHz ~ 70 KHz	88	81	75
70 KHz ~ 150 KHz	88 to 58	81 to 51	75 to 45
150 KHz ~ 3 MHz	58 to 22	51 to 15	45 to 9
3 MHz ~ 30 MHz	22	15 to 16	9 to 12

FREQUENCY (MHz)	At 10m	At 3m
	dBuV/m	dBuV/m
30 ~ 230	30	40
230 ~ 1000	37	47

Notes:

(1) The limit for radiated test was performed in the following: CISPR 15.

(2) The tighter limit applies at the band edges.

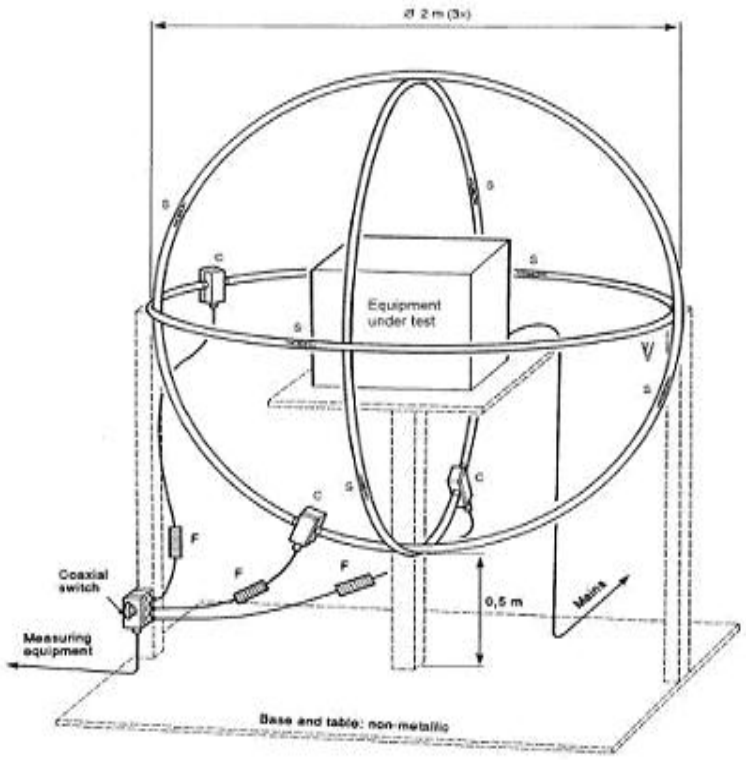
(3) Emission level (dBuV/m) = 20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

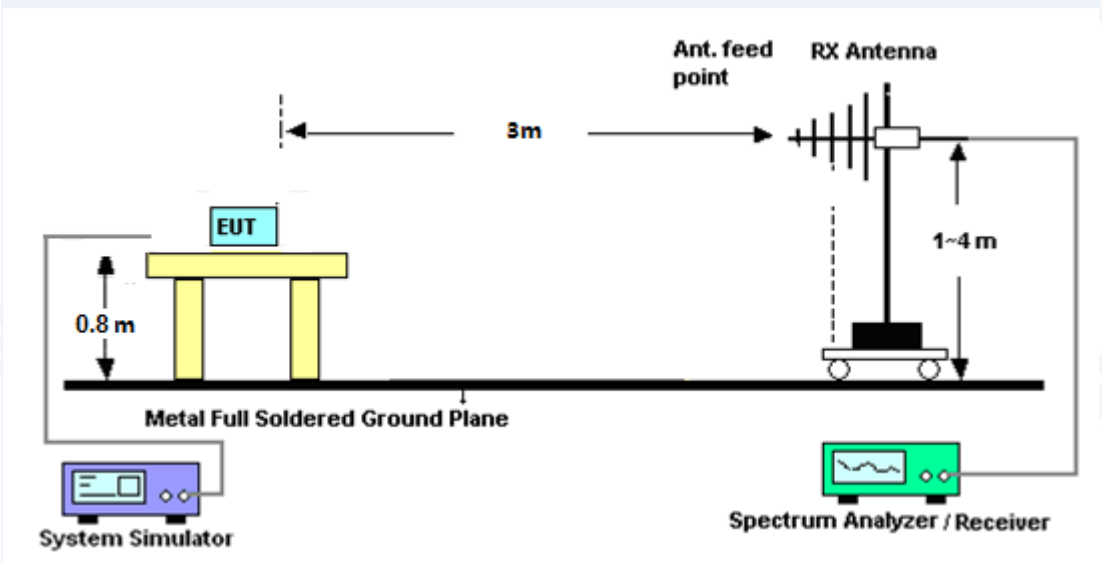
a. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. EUT as the center to the edge of the auxiliary device, the distance from the maximum edge to the center of the antenna is 3 meter.
c. The height of antenna is varied from 1 meter to 4 meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meter and the rotatable table was turned from 0 degrees to 360 degree to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 30 MHz



(B) Radiated Emission Test Set-Up Frequency Below 1000MHz



3.2.4 EUT OPERATING CONDITIONS

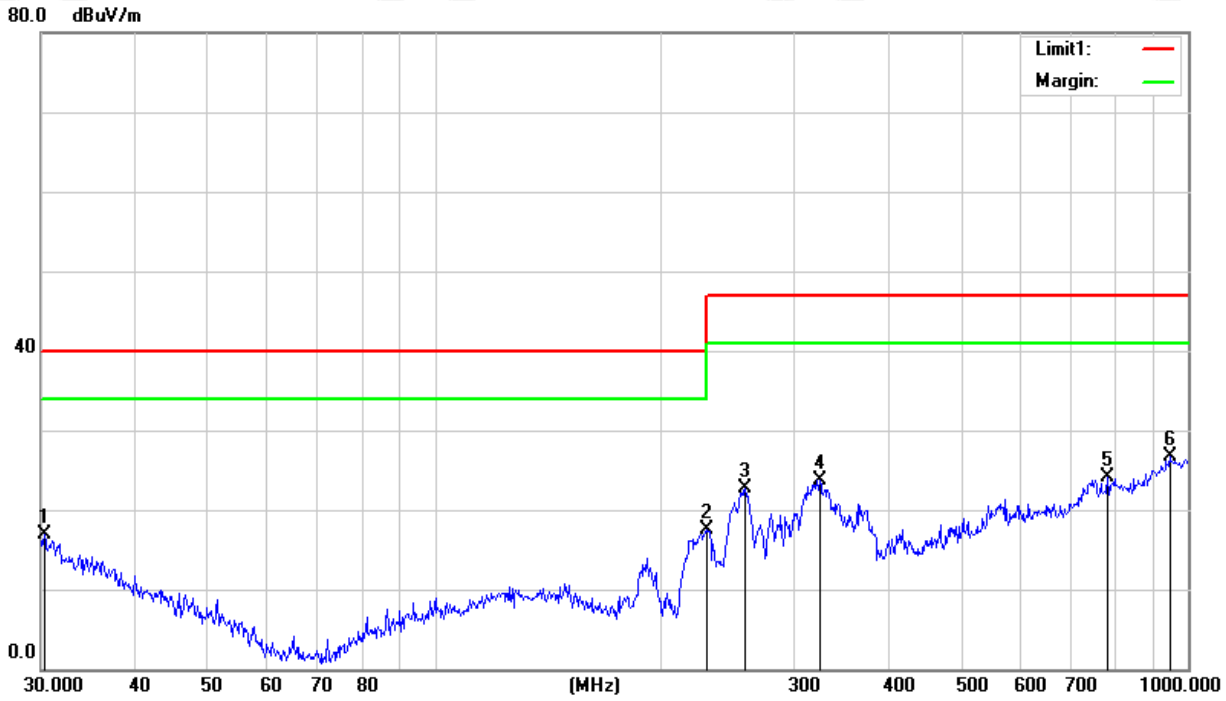
The EUT tested system was configured as the statements of **2.3** described unless otherwise a special operating condition is specified in the following during the testing.

3.2.5 TEST RESULTS (30MHz~1000MHz)

Temperature:	26.1℃	Relative Humidity:	53%
Phase:	Horizontal	Test Mode:	Mode 1
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.16

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.3173	28.17	-11.21	16.96	40.00	-23.04	QP
2	229.2931	36.17	-18.74	17.43	40.00	-22.57	QP
3	258.3264	37.78	-15.13	22.65	47.00	-24.35	QP
4	324.4561	38.65	-14.95	23.70	47.00	-23.30	QP
5	782.3453	29.41	-5.36	24.05	47.00	-22.95	QP
6	945.4400	28.99	-2.27	26.72	47.00	-20.28	QP

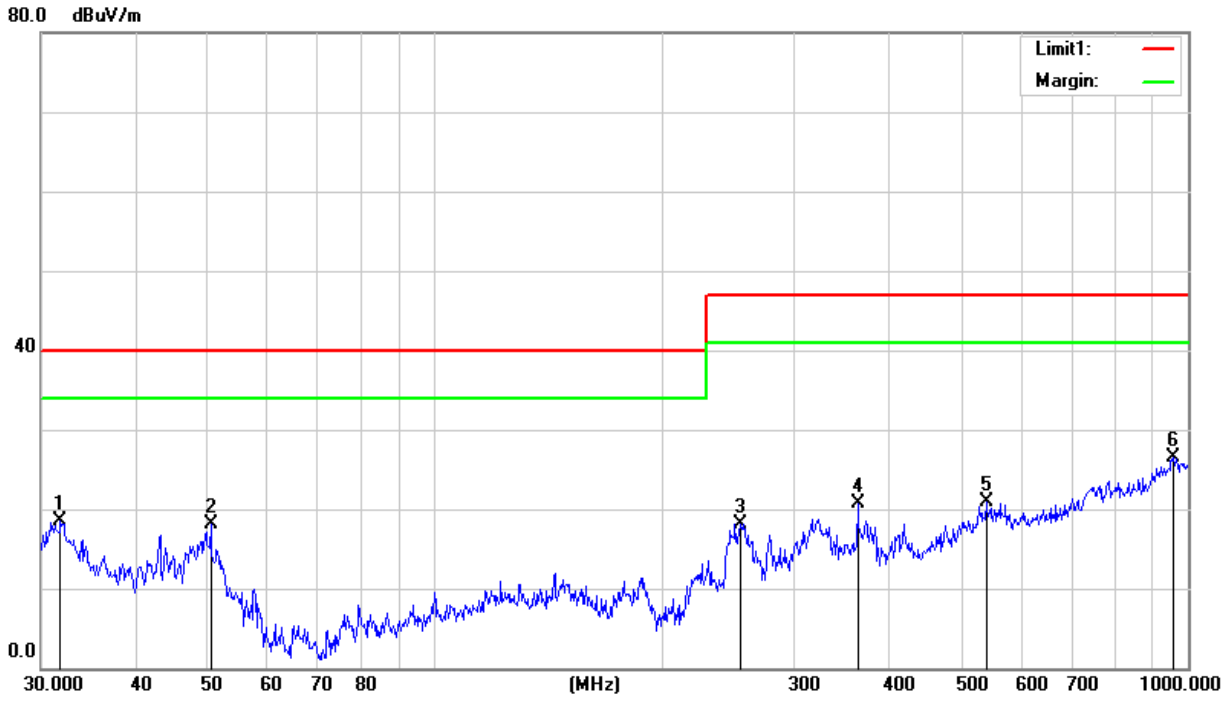
Remark:
1. All readings are Quasi-Peak
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor= Cable Loss +Antenna Factor-Amplifier Gain



Temperature:	26.1℃	Relative Humidity:	53%
Phase:	Vertical	Test Mode:	Mode 1
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.16

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.8427	30.65	-12.06	18.59	40.00	-21.41	QP
2	50.4090	39.93	-21.82	18.11	40.00	-21.89	QP
3	254.7284	34.27	-16.13	18.14	47.00	-28.86	QP
4	364.2595	34.99	-14.29	20.70	47.00	-26.30	QP
5	539.4775	30.21	-9.29	20.92	47.00	-26.08	QP
6	955.4381	28.53	-2.02	26.51	47.00	-20.49	QP

Remark:
1. All readings are Quasi-Peak
2. Margin = Result (Result =Reading + Factor)–Limit
3. 3. Factor= Cable Loss +Antenna Factor-Amplifier Gain



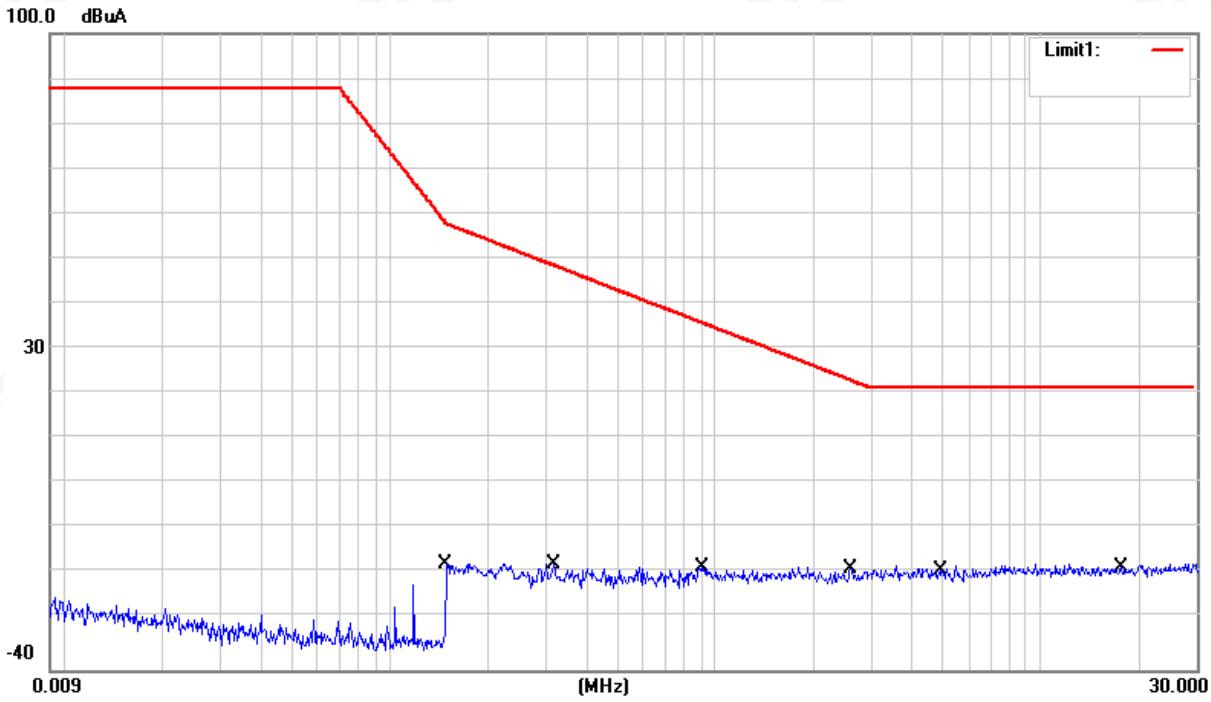
3.2.6 TEST RESULTS (0.009~30MHz)

Temperature:	24.3℃	Relative Humidity:	41%
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.17
Test Mode:	Mode 1		

X

No.	Frequency (MHz)	Reading (dBuA)	Correct Factor (dB)	Results (dBuA)	Limit (dBuA)	Margin (dB)	Detector
1	0.1500	-26.84	10.01	-16.83	58.00	-74.83	QP
2	0.3180	-26.71	10.01	-16.70	48.97	-65.67	QP
3	0.9060	-27.44	10.01	-17.43	36.39	-53.82	QP
4	2.5900	-27.73	10.03	-17.70	23.77	-41.47	QP
5	4.8500	-28.12	10.05	-18.07	22.00	-40.07	QP
6	17.8500	-28.88	10.20	-18.68	22.00	-40.68	QP

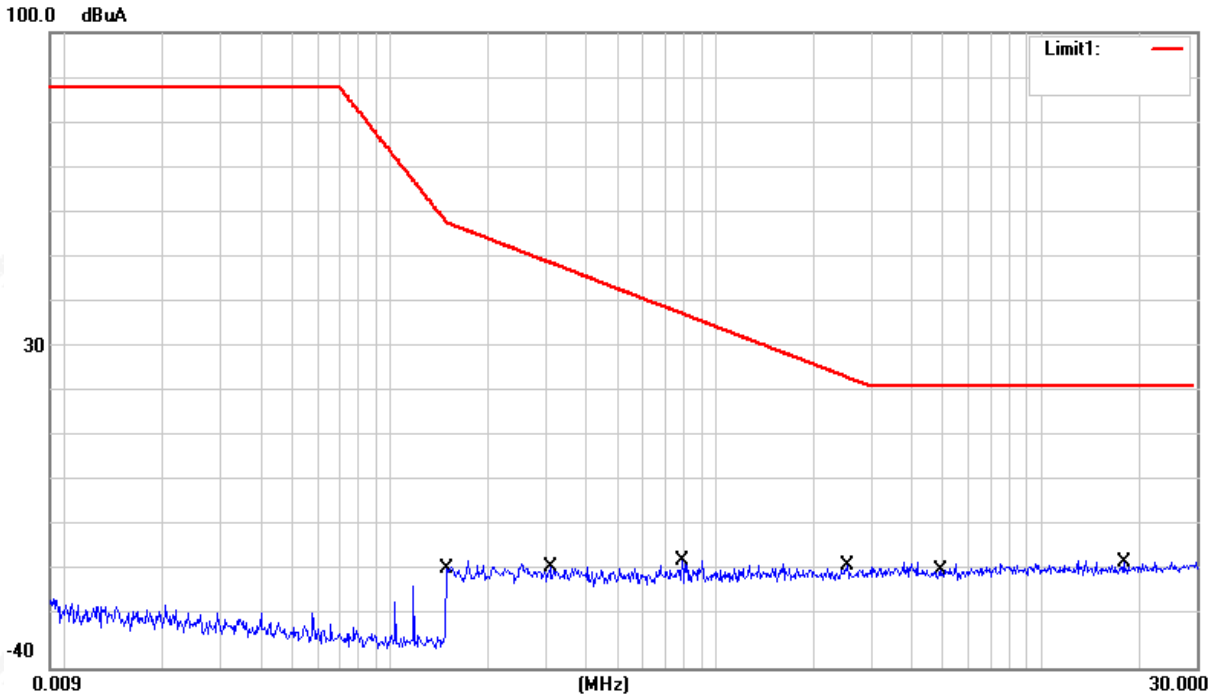
Remark:
1. All readings are Quasi-Peak
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor = Insertion loss + Cable loss



Y

No.	Frequency (MHz)	Reading (dBuA)	Correct Factor (dB)	Results (dBuA)	Limit (dBuA)	Margin (dB)	Detector
1	0.1500	-28.03	10.01	-18.02	58.00	-76.02	QP
2	0.3100	-27.93	10.01	-17.92	49.28	-67.20	QP
3	0.7860	-26.46	10.01	-16.45	38.10	-54.55	QP
4	2.5460	-27.61	10.03	-17.58	23.97	-41.55	QP
5	4.8500	-28.48	10.05	-18.43	22.00	-40.43	QP
6	17.8500	-26.82	10.20	-16.62	22.00	-38.62	QP

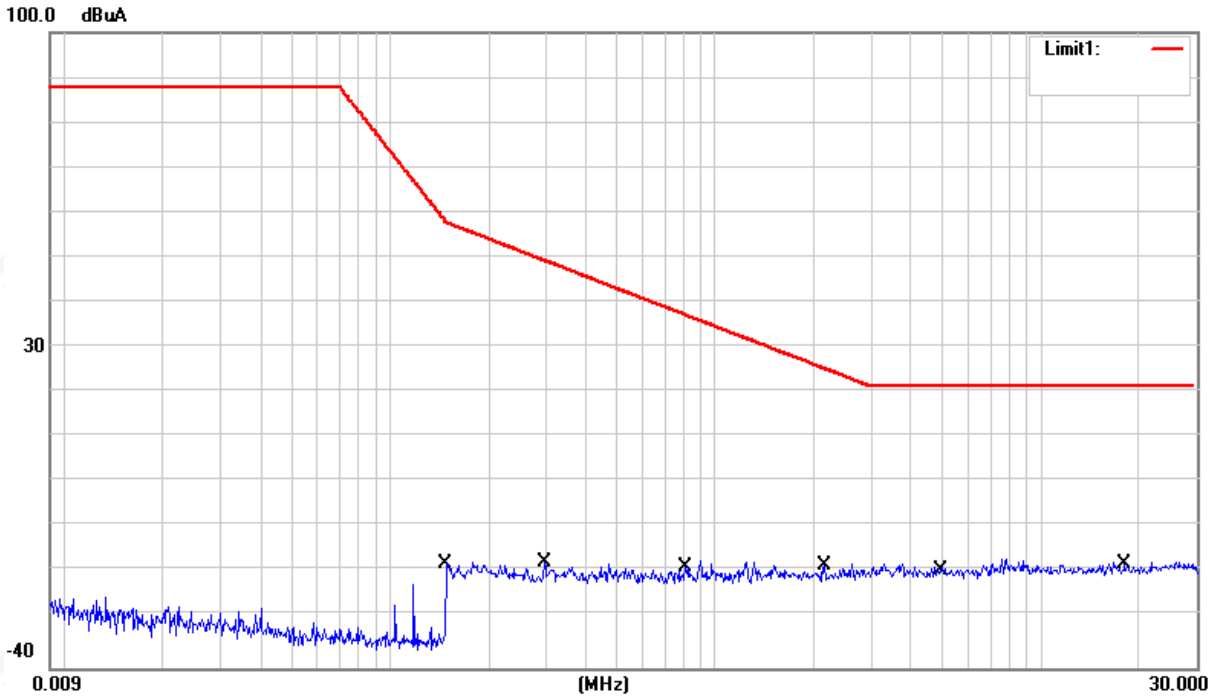
Remark:
1. All readings are Quasi-Peak
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor = Insertion loss + Cable loss



Z

No.	Frequency (MHz)	Reading (dBuA)	Correct Factor (dB)	Results (dBuA)	Limit (dBuA)	Margin (dB)	Detector
1	0.1500	-27.08	10.01	-17.07	58.00	-75.07	QP
2	0.2980	-26.69	10.01	-16.68	49.75	-66.43	QP
3	0.8060	-27.63	10.01	-17.62	37.79	-55.41	QP
4	2.1580	-27.61	10.02	-17.59	25.96	-43.55	QP
5	4.8500	-29.31	10.05	-19.26	22.00	-41.26	QP
6	17.8500	-28.77	10.20	-18.57	22.00	-40.57	QP

Remark:
1. All readings are Quasi-Peak
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor = Insertion loss + Cable loss



3.3 HARMONICS CURRENT

3.3.1 LIMITS OF THE HARMONICS CURRENT

Harmonic Current Test Limit(C)

Harmonic order (n)	**Maximum permissible harmonic current Expressed as a percentage of the input Current at the fundamental frequency %**
2	2
3	30.λ
5	10
7	7
9	5
15≤n≤39 (odd harmonics only)	3
Remark: λ is the circuit power factor	

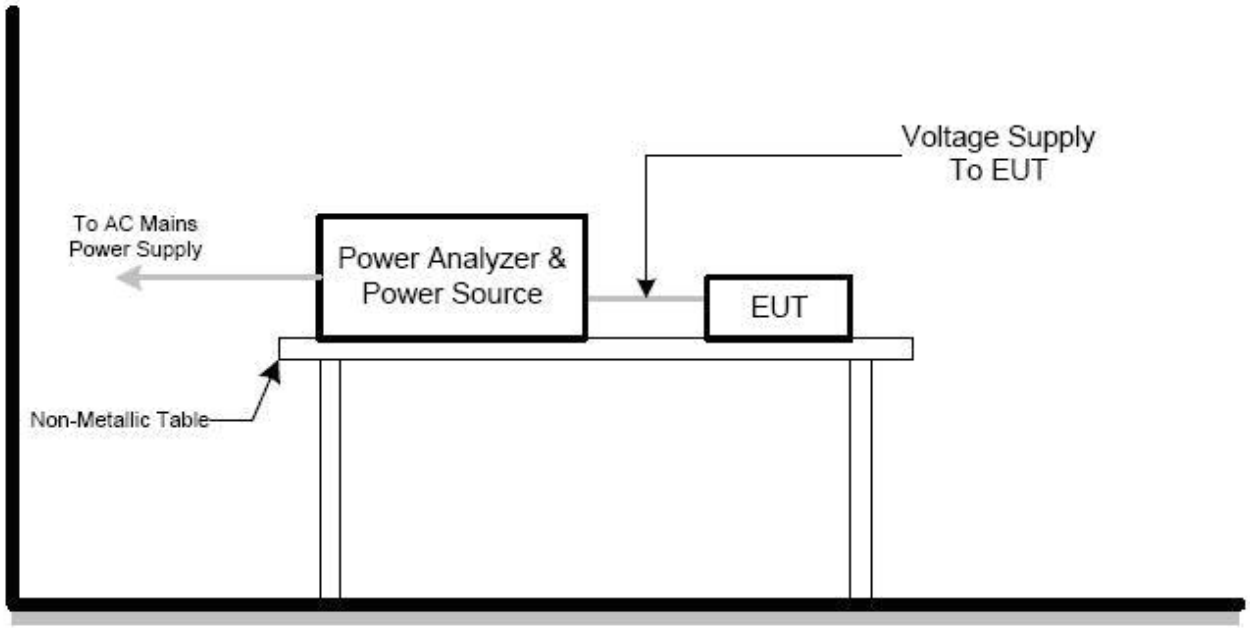
3.3.2 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
b. The classification of EUT is according to section 5 of EN IEC 61000-3-2. The EUT is classified as follows:
Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
Class B: Portable tools. Portable tools; Arc welding equipment which is not professional equipment.
Class C: Lighting equipment.
Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.
c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

3.3.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** described unless otherwise a special operating condition is specified in the following during the testing.

3.3.4 TEST SETUP



3.3.5 TEST RESULTS

Temperature:	25℃	Relative Humidity:	45%
Test Voltage:	N/A	Test Date:	N/A

The LED input active power is less than 5 w, exemption.

3.4 VOLTAGE FLUCTUATION AND FLICKERS

3.4.1 LIMITS OF THE VOLTAGE FLUCTUATION AND FLICKERS

Tests	Limit	Descriptions
	IEC/EN 61000-3-3	
P_{st}	≤ 1.0,Tp= 10 min.	Short Term Flicker Indicator
P_{lt}	≤0.65,Tp=2 hr.	Long Term Flicker Indicator
$T_{dt(s)}$	≤ 3.3%	Relative Steady-State V-Chang
d_{max}(%)	≤ 4%	Maximum Relative V-Chang
d_c(%)	≤ 3.3% for > 500ms	Relative V-change Characteristic

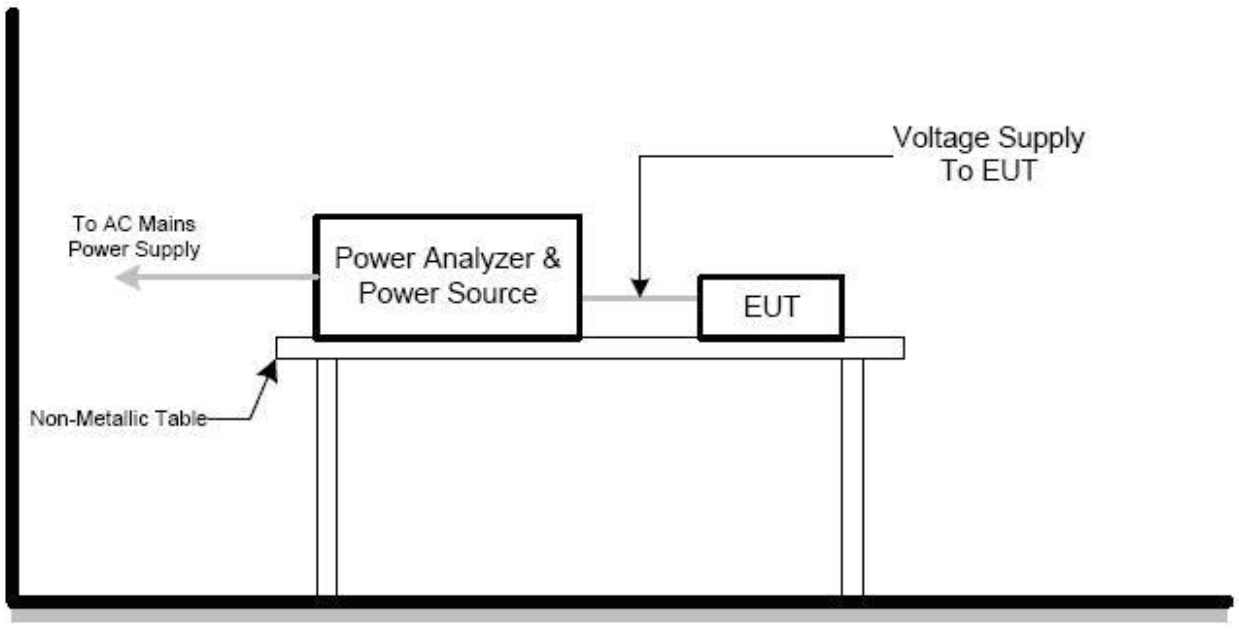
3.4.2 TEST PROCEDURE

b. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of IEC/EN 61000-3-3 depend.
c. All types of voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.4.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** described unless otherwise a special operating condition is specified in the following during the testing.

3.4.5 TEST SETUP



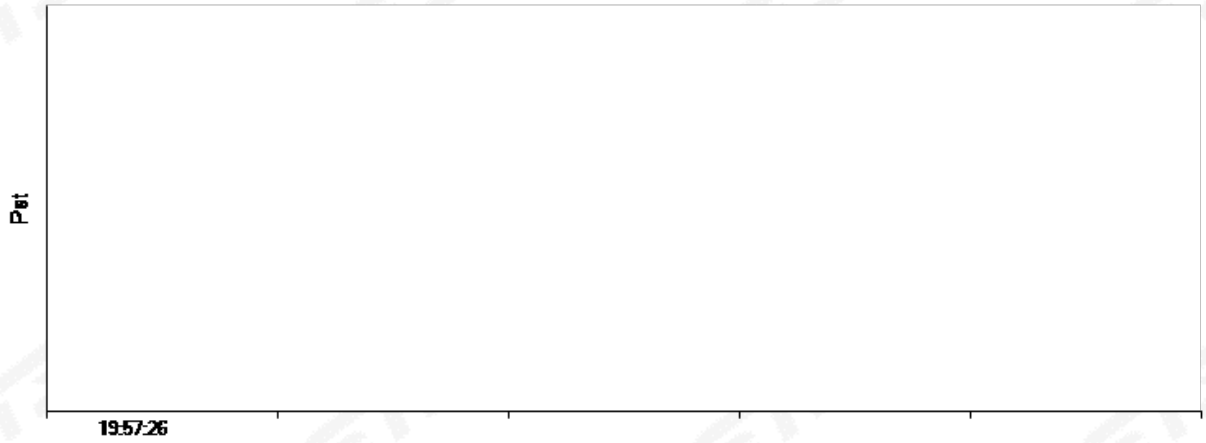
3.3.6 TEST RESULTS

EUT: 5 panel LED light baseball cap **Operator: STAR**
Test category: IEC 61000-3-3 Ed3.1:2017 **Model/Type:MO2439**
Measurement standard: IEC 61000-15 Ed2.0:2010 **Serial number:**
Test date:2024-10-18 Start time: 19:47:25 End time: 19:57:26
Test duration (sec):600
Describe:

Load Power : 2.600 W **Power Factor:0.351**
Load Current : 0.017 mArms **Crest Factor:4.412**
Nominal Voltage : 229.97 Vrms

Test Result: pass **Status: Test Completed**

Psti and limit line **European Limits**



Result:

T-max (ms):	**0.00**	**Test limit (ms):**	**500.00**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.00**	**Test limit:**	**1.00**	**Pass**

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

Tests Standard No.	TEST SPECIFICATION	Test Mode Test Ports	Perform. Criteria
1. ESD IEC/EN 61000-4-2	8KV air discharge 4KV contact discharge	Direct Mode	B
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz, 1000Hz, 80%, AM modulated	Enclosure	A
3. EFT/Burst IEC/EN 61000-4-4	5/50ns Tr/Th 5KHz Repetition Freq.	Power Supply Port	B
	5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B
4. Surges IEC/EN 61000-4-5	1.2/50(8/20) Tr/Th us	L-N	B
	1.2/50(8/20) Tr/Th us	L-PE N-PE	B
5. Injected Current IEC/EN 61000-4-6	0.15 MHz to 80 MHz, 1000Hz 80 % , AM Modulated 150Ω source impedance	CTL/Signal Port	A
	0.15 MHz to 80 MHz, 1000Hz 80 % , AM Modulated 150Ω source impedance	AC Power Port	A
	0.15 MHz to 80 MHz, 1000Hz 80 % , AM Modulated 150Ω source impedance	DC Power Port	A
6. Power Frequency Magnetic Field IEC/EN 61000-4-8	50/60 Hz,	Enclosure	A
7. Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dip 100% Voltage dip 30%	AC Power Port	B C

4.2 GENERAL PERFORMANCE CRITERIA

According to **EN 61547** standard, the general performance criteria as following:

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. Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.

4.2.1 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.2** or **2.3** unless otherwise a special operating condition is specified in the following during the testing.

4.3 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

4.3.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance:	B
Discharge Voltage:	Air Discharge: 2KV/4KV/8KV (Direct) Contact Discharge: 4KV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: at least 10 times on each point Contact Discharge: at least 10 times on each point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

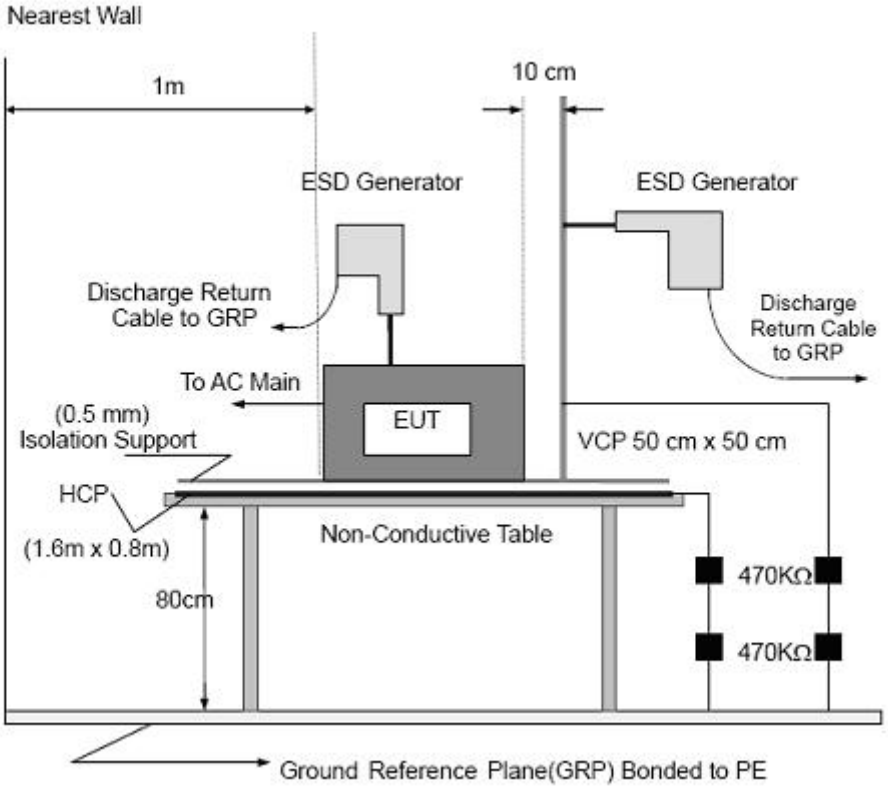
4.3.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manners:

a. Vertical Coupling Plane (VCP):
The coupling plane of dimensions 0.5m x 0.5m, is placed parallel to and positioned at a distance 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

4.3.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meter high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940kΩ total impedance. The equipment under test was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 0.8-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1 meter thickness. The GRP was consisted of a sheet of aluminum that is at least 0.25mm thick, and extended at least 0.5 meter from the EUT on all sides.

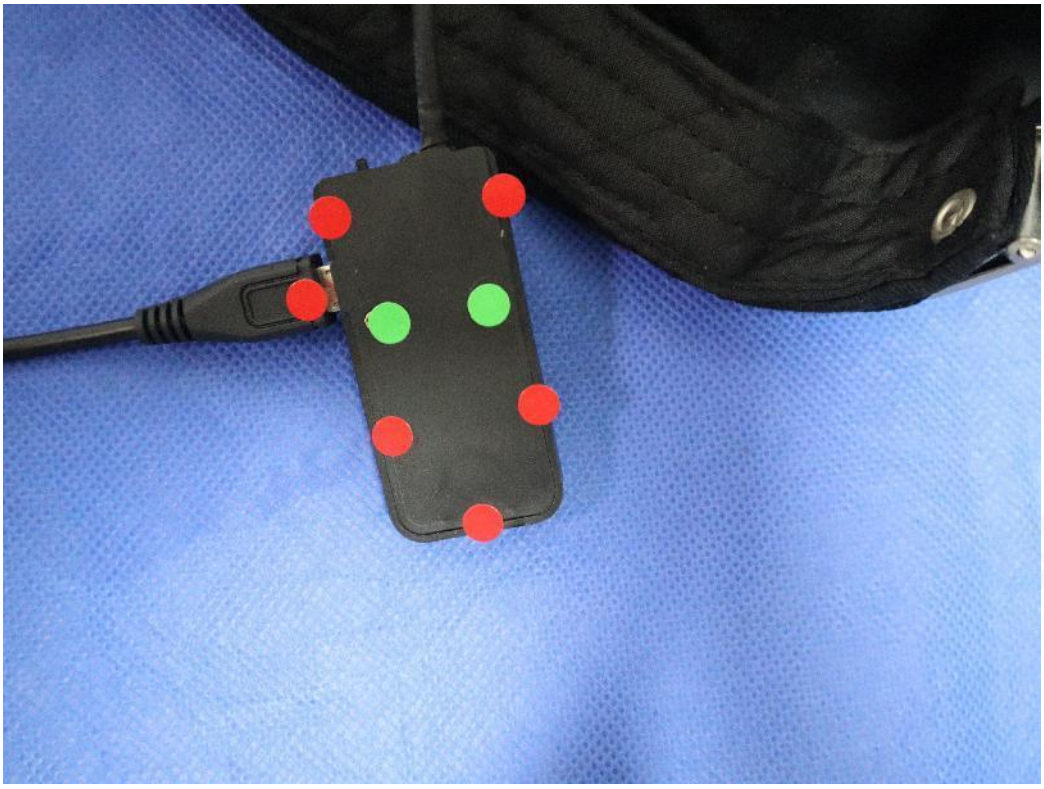
4.3.4 TEST RESULTS

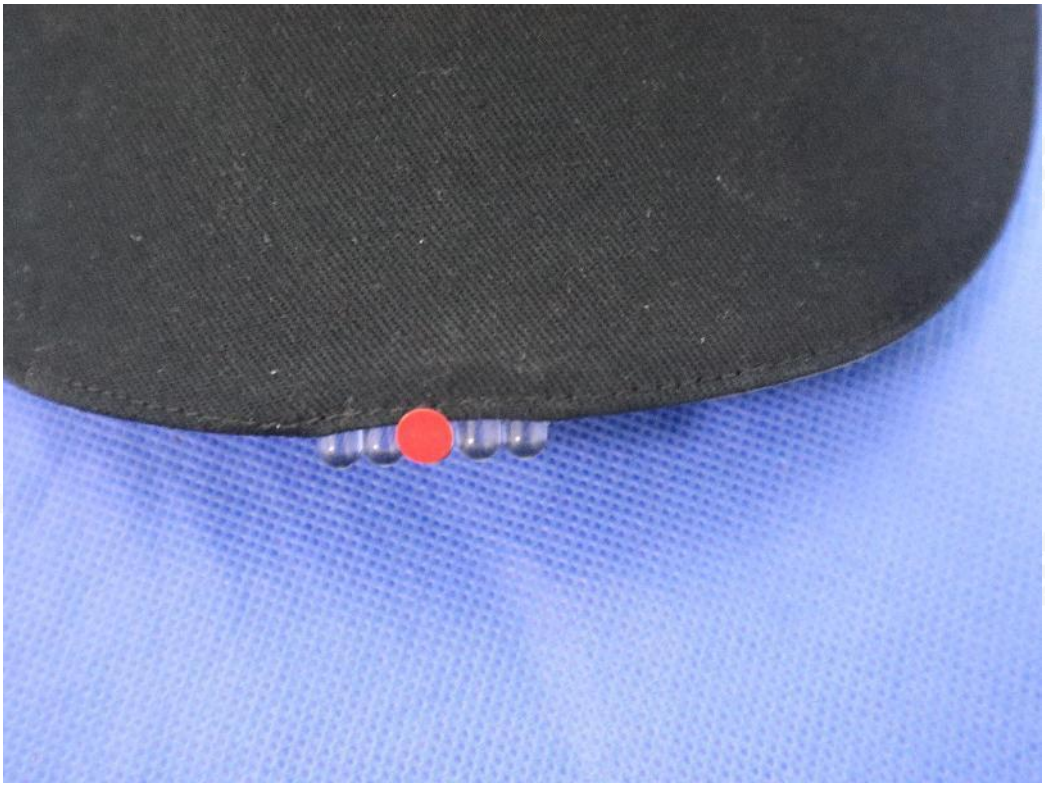
Temperature:	24.1℃	Relative Humidity:	50%
Pressure:	1017.8hPa	Test Voltage:	AC 230V/50Hz
Test Mode:	Mode 1	Test Date:	2024.10.22

Discharge Level	Polarity	Test Points	Contact Discharge	Air Discharge	Criterion	Test Result
4	+/-	VCP/HCP	Note	N/A	B	A
4	+/-	Green Dot	Note	N/A	B	A
4,8	+/-	Red Dot	N/A	Note	B	A

Note: The EUT function was correct during the test
Red Dot —Air Discharged
Green Dot —Contact Discharged

The Photo for Discharge Points of EUT





4.4 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance:	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	3s

4.4.2 TEST PROCEDURE

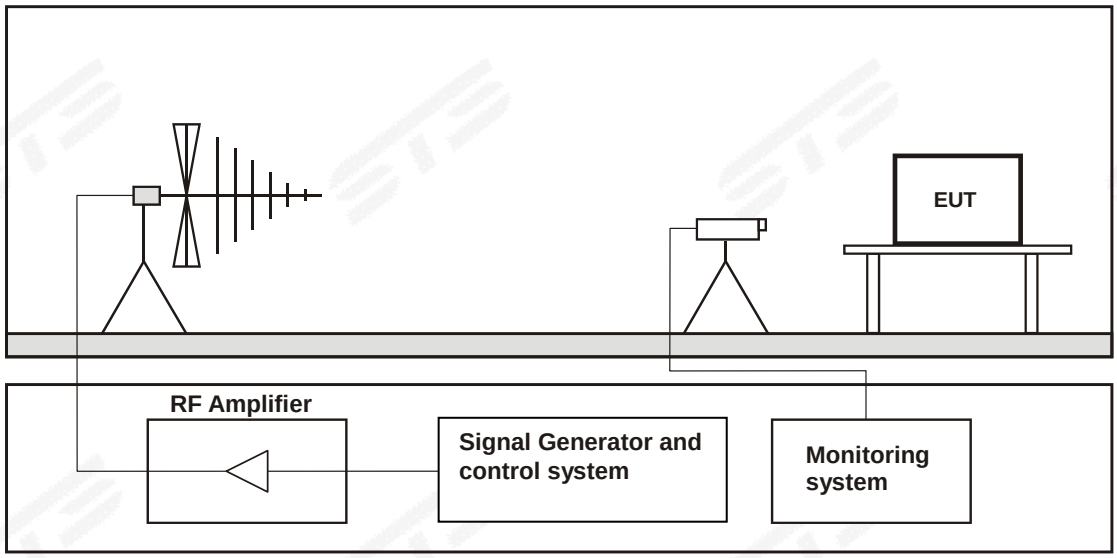
a. The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

b. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sine-wave. The rate of sweep did not exceed 3s, where the frequency range is swept incrementally, the step size was 1% of preceding frequency value.

c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.4.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meter in height. The system under test was connected to the power and signal wire according to the relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meter in height. The system under test was connected to the power and signal wire according to the relevant installation instructions.

4.4.4 TEST RESULTS

Temperature:	24.1℃	Relative Humidity:	50%
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.22
Test Mode:	Mode 1		

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgement
80MHz - 1000MHz	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	A	A	PASS
			Rear			
			Left			
			Right			

4.5 ELECTRICAL FAST TRANSIENT (EFT)

4.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance:	B
Test Voltage:	Power Line: 1 KV Signal/Control Line: 0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15ms
Burst Period:	300ms
Test Duration:	Not less than 2 min.

4.5.2 TEST PROCEDURE

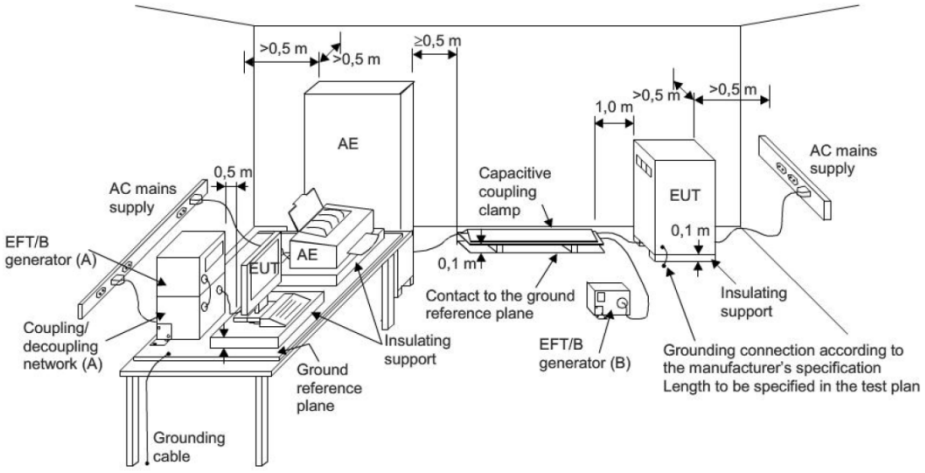
The EUT and support units were located on a wooden table 0.8m&0.1m away from ground reference plane. A 1.0 meter long power cord was attached to EUT during the test.

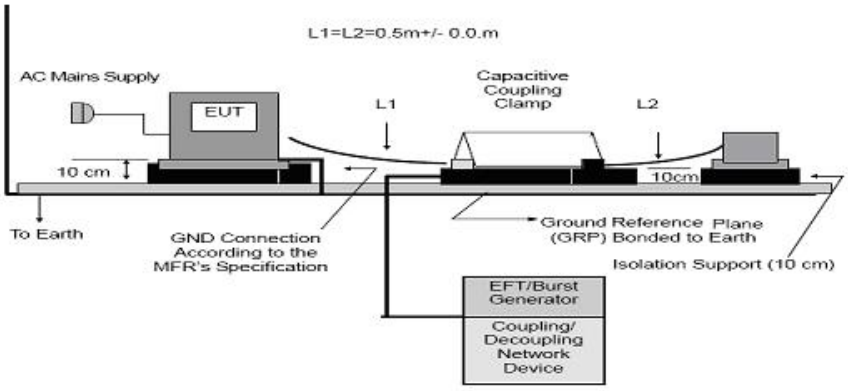
a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.

b. Both positive and negative polarity discharges were applied.

c. The duration time of each test sequential was 2 minutes.

4.5.3 TEST SETUP





Note:

TABLE-TOP EQUIPMENT

a. Table-top equipment and equipment normally mounted on ceilings or walls as well as built-in equipment shall be tested with the EUT located (0.1 ± 0.01) m above the ground reference plane.
b. Testing of large table-top equipment or multiple systems can be performed on the floor; maintaining the same distances as for the test setup of table-top equipment.
c. The test generator and the coupling/decoupling network shall be bonded to the ground reference plane.
d. The ground reference plane shall be a metallic sheet (copper or aluminum) of 0.25mm minimum thickness; other metallic materials may be used , but they shall have at least 0.65 mm minimum thickness.
e. The minimum size of the ground reference plane is 0.8m x 1m. The actual size depends on the dimension of the EUT.
f. The ground reference plane shall project beyond the EUT by at least 0.1m on all sides.
g. The ground reference plane shall be connected to the earth (PE) for safety reasons.
h. The EUT shall be arranged and connected to satisfy its functional requirements according to the equipment installation specifications.
i. The minimum distance between the EUT and all other conductive structures (including the generator, AE and the walls of a shielded room), except the ground reference plane, shall be more than 0.5m.
j. AII cables to the EUT shall be placed on the insulation support 0.1m above the ground reference plane. Cables not subject to electrical fast transients shall be routed as far as possible from the cable under test to minimize the coupling between the cables.
k. The EUT shall be connected to the earth system in accordance with the manufacturer's installation specifications; no additional earth connections are allowed.
l. The connection impedance of the coupling/decoupling network earth cables to the ground reference plane and all connectors shall provide a low inductance.
m. Either a direct coupling network or a capacitive clamp shall be used for the application of the test voltages. The test voltages shall be coupled to all of the EUT ports in turn including those between two units of equipment involved in the test, unless the length of the interconnecting cable makes it impossible to test.

FLOOR-STANDING EQUIPMENT

When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces (including the generator), except the ground reference plane beneath the coupling clamp and beneath the EUT, shall be at least 0.5m.

The distance between any coupling devices and the EUT shall be (0.5 - 0/+0.1) m for tabletop equipment testing, and (1.0 ± 0.1) m for floor standing equipment, unless otherwise specified in product standards. When it is not physically possible to apply the distances mentioned above, other distances can be used and shall be recorded in the test report.

The cable between the EUT and the coupling device, if detachable, shall be as short as possible to comply with the requirements of this clause. If the manufacturer provides a cable exceeding the distance between the coupling device and the point of only of the EUT, the excess length of this cable shall be bundled and situated at a distance of 0.1m above the ground reference plane. When a capacitive clamp is used as a coupling device, the excess cable length shall be bundled at the AE side.

Parts of the EUT with interconnecting cables of a length less than 3m, which are not tested, shall be placed on the insulating support. The parts of the EUT shall have a distance of 0.5m between them. Excess cable length shall be bundled.

4.5.4 TEST RESULTS

Temperature:	24.1℃	Relative Humidity:	50%
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.22
Test Mode:	Mode 1		

Coupling Line		Test level (KV)								Criterion	Result
		0.5		1		2		4			
		+	-	+	-	+	-	+	-		
AC line	L	**A**	**A**	**A**	**A**					**B**	**PASS**
	N	**A**	**A**	**A**	**A**						**PASS**
	PE										
	L+N	**A**	**A**	**A**	**A**						**PASS**
	L+PE										
	N+PE										
	L+N+PE										
DC Line											
Signal Line											

4.6 SURGE TESTING

4.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance:	B
Wave-Shape:	Combination Wave 1.2/50μs Open Circuit Voltage
Test Voltage:	See below Table 1
Surge Input/Output:	L-N, L-PE, N-PE
Generator Source:	(L-N)2 ohm between networks
Impedance:	(L-PE, N-PE)12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0°/90°/180°/270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

Table 1:Test Levels at input a. c. power ports

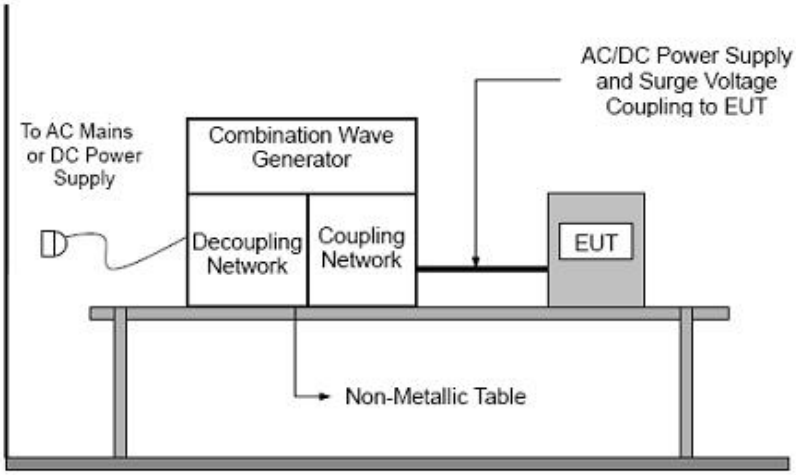
Characteristics	Test levels		
	Device		
	Self-ballasted lamps and semi-luminaires	Luminaires and independent auxiliaries	
		Input power	
		≤25W	>25W
Wave-shape data	1,2/50	1,2/50μs	1,2/50μs
Test levels line to line	±0.5 KV	±0.5 KV	±1.0 KV
Line to ground	±1.0 KV	±1.0 KV	±2.0 KV

4.6.2 TEST PROCEDURE

a. For EUT power supply:
The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meter in length (or shorter).

b. For test applied to unshielded unsymmetrical operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meter in length (or shorter).

4.6.3 TEST SETUP



4.6.4 TEST RESULTS

Temperature:	24.1℃	Relative Humidity:	50%
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.22
Test Mode:	Mode 1		

Coupling Line			Test level								Criterion	Result
			0.5 KV		1 KV		2 KV		4 KV			
			+	-	+	-	+	-	+	-		
AC line	L-N	0°									B	
		90°	**A**									**PASS**
		180°										
		270°		**A**								**PASS**
	L-PE	0°										
		90°										
		180°										
		270°										
	N-PE	0°										
		90°										
		180°										
		270°										
DC network power port												
Signal Line												

Note: 1) N/A - denotes test is not applicable in this test report.

4.7 CONDUCTED RADIO FREQUENCY DISTURBANCES (CS)

4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance:	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	3s

4.7.2 TEST PROCEDURE

The EUT shall be tested within its intended operating and climatic conditions.

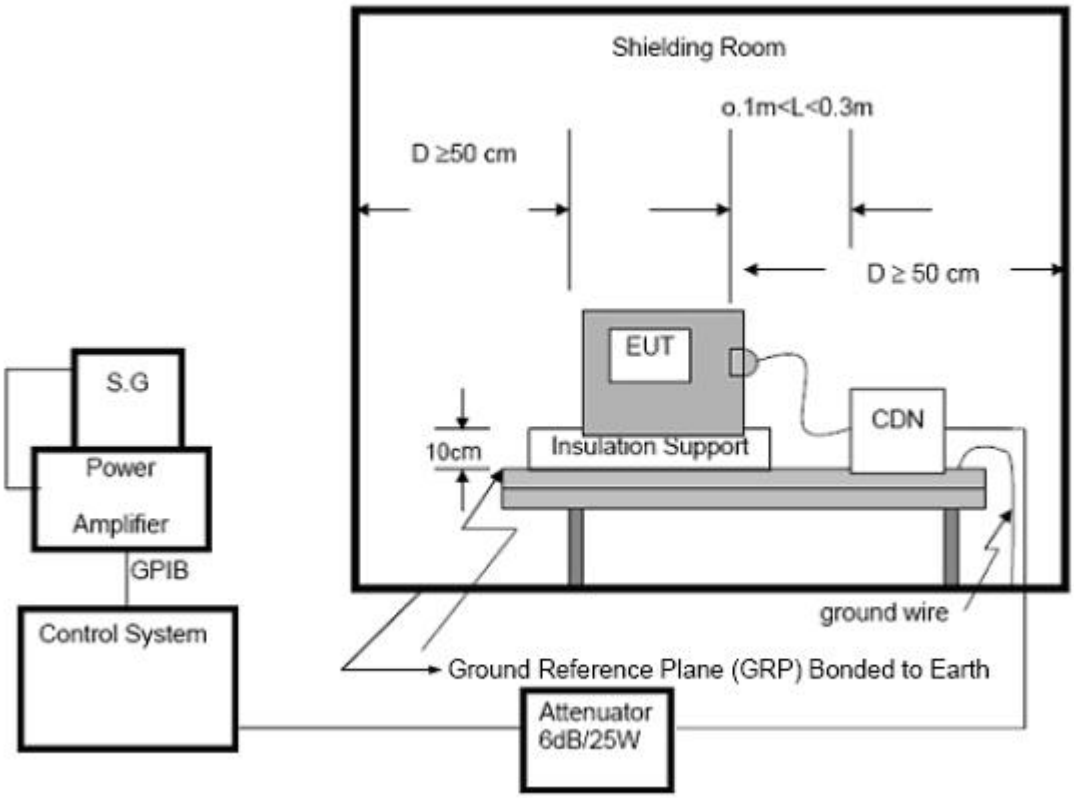
The test shell performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.

The frequency range was swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal was modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate was 3s. Where the frequency range is swept incrementally, the step size was 1 % of preceding frequency value from 150kHz to 80MHz.

The dwell time at each frequency was less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency (ies) and harmonics or frequencies of dominant interest, was analyzed separately.

Attempts was made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

4.7.3 TEST SETUP



NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meter height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meter and 0.3 meter from the projected geometry of the EUT on the ground reference plane.

4.7.4 TEST RESULTS

Temperature:	24.1℃	Relative Humidity:	50%
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.22
Test Mode:	Mode 1		

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgement
Input/ Output AC. Power Port	0.15 - 80	3V(rms) AM Modulated 1000Hz, 80%	A	A	PASS
Input/ Output DC. Power Port	0.15 - 80		N/A	N/A	N/A
Signal Line	0.15 - 80		N/A	N/A	N/A

Note: 1) N/A - denotes test is not applicable in this test report.

4.8 POWER FREQUENCY MAGNETIC FIELD TESTING

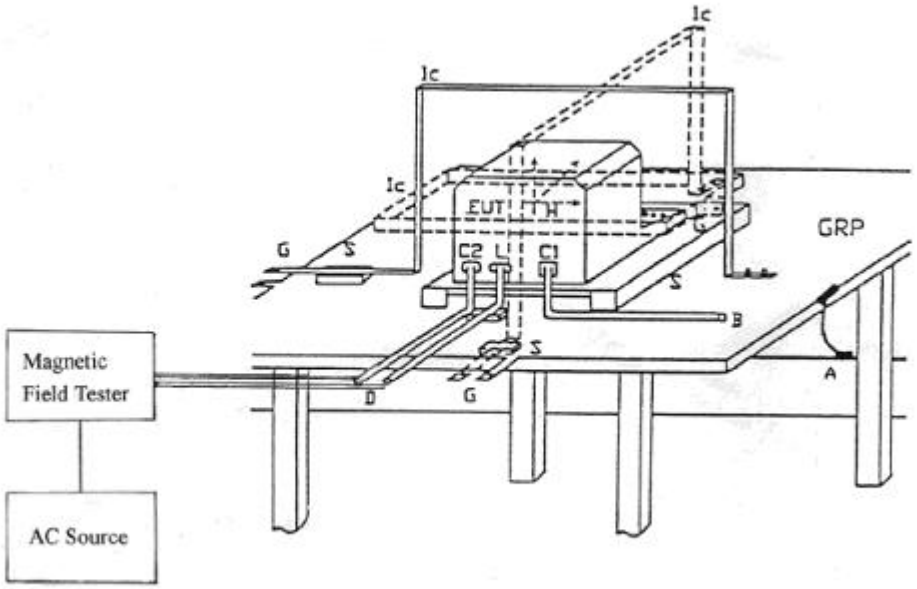
4.8.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-8
Required Performance:	A
Frequency Range:	50Hz
Field Strength:	3 A/m
Observation Time:	1 minute
Inductance Coil:	Rectangular type, 1mx1m

4.8.2 TEST PROCEDURE

a. The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
b. The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

4.8.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

4.8.4 TEST RESULTS

Temperature:	24.1℃	Relative Humidity:	50%
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.22
Test Mode:	Mode 1		

Test Mode	Test Level	inductive coil	Duration (s)	Perform Criteria	Results	Judgement
Enclosure	3A/m	X	300s	A	A	PASS
Enclosure	3A/m	Y	300s	A	A	PASS
Enclosure	3A/m	Z	300s	A	A	PASS

4.9 VOLTAGE INTERRUPTION/DIPS TESTING (DIPS)

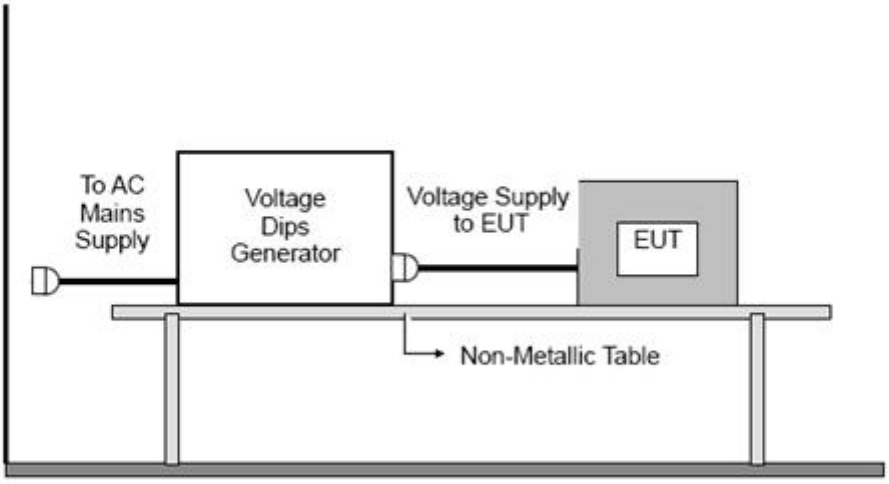
4.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance:	B (For 100% Voltage Dips, 0.5 Cycle) C (For 30% Voltage Dips, 10 Cycles)
Test Duration Time:	Minimum 3 test events in sequence
Interval between Event:	Minimum 10 seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

4.9.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.9.3 TEST SETUP



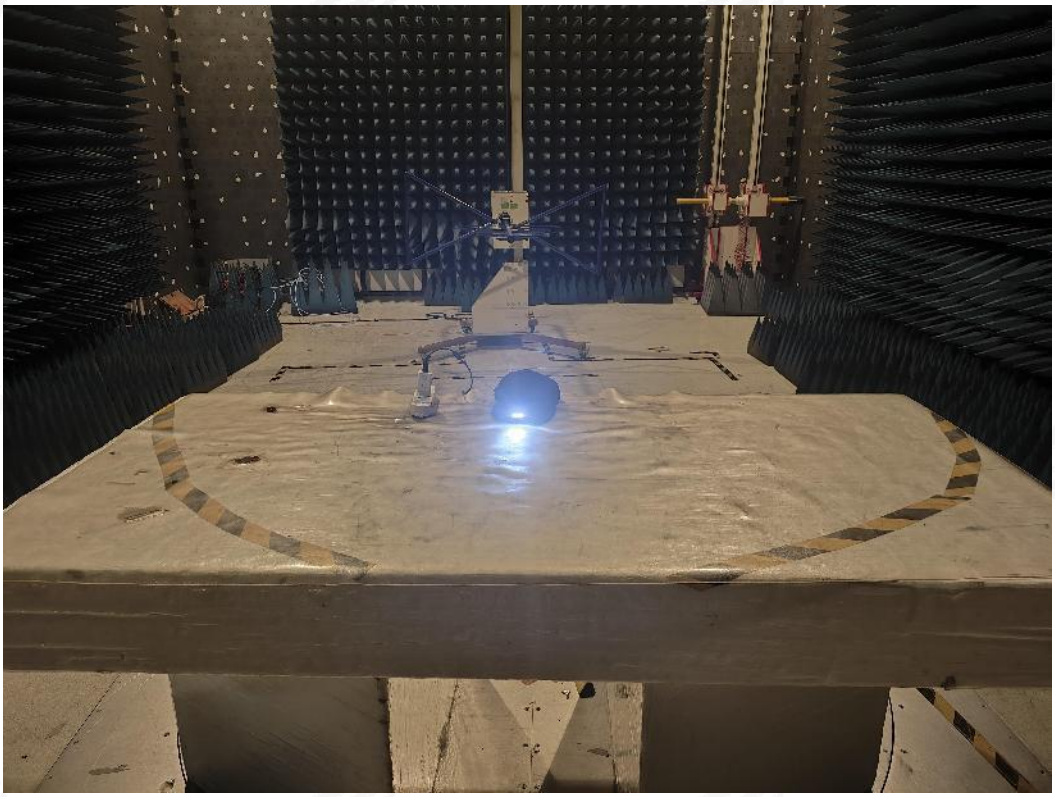
4.9.4 TEST RESULTS

Temperature:	24.1℃	Relative Humidity:	50%
Test Voltage:	AC 230V/50Hz	Test Date:	2024.10.22
Test Mode:	Mode 1		

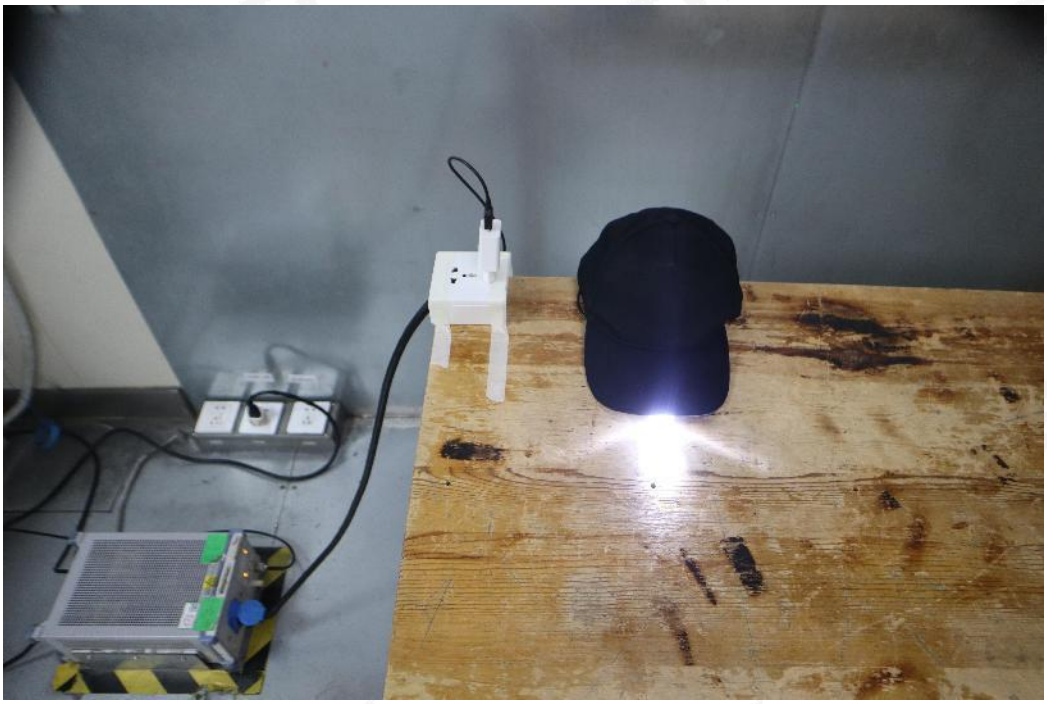
Interruption & Dips	Duration (T)	Perform Criteria	Results	Judgement
Interruption 0%	0.5	B	A	PASS
Voltage dip 70%	10	C	A	PASS

APPENDIX 1 - TEST SETUP

RE (30 - 1000 MHz)



CE



LOOP

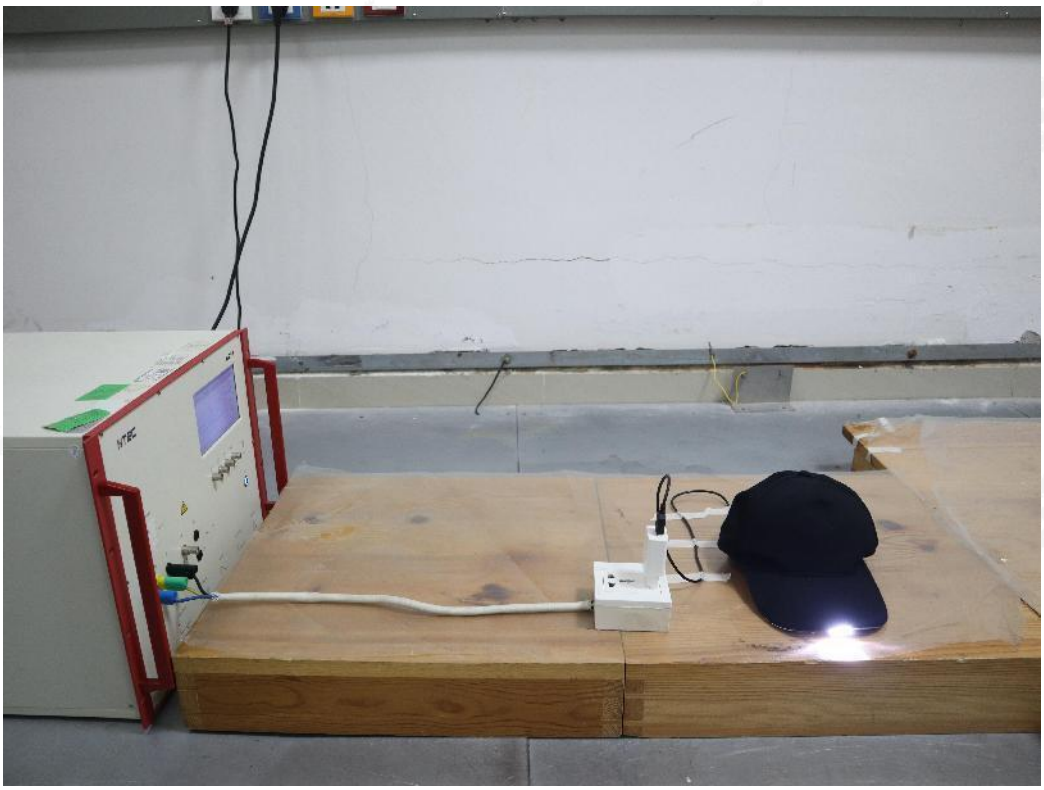

Magnetic field test

FICKER

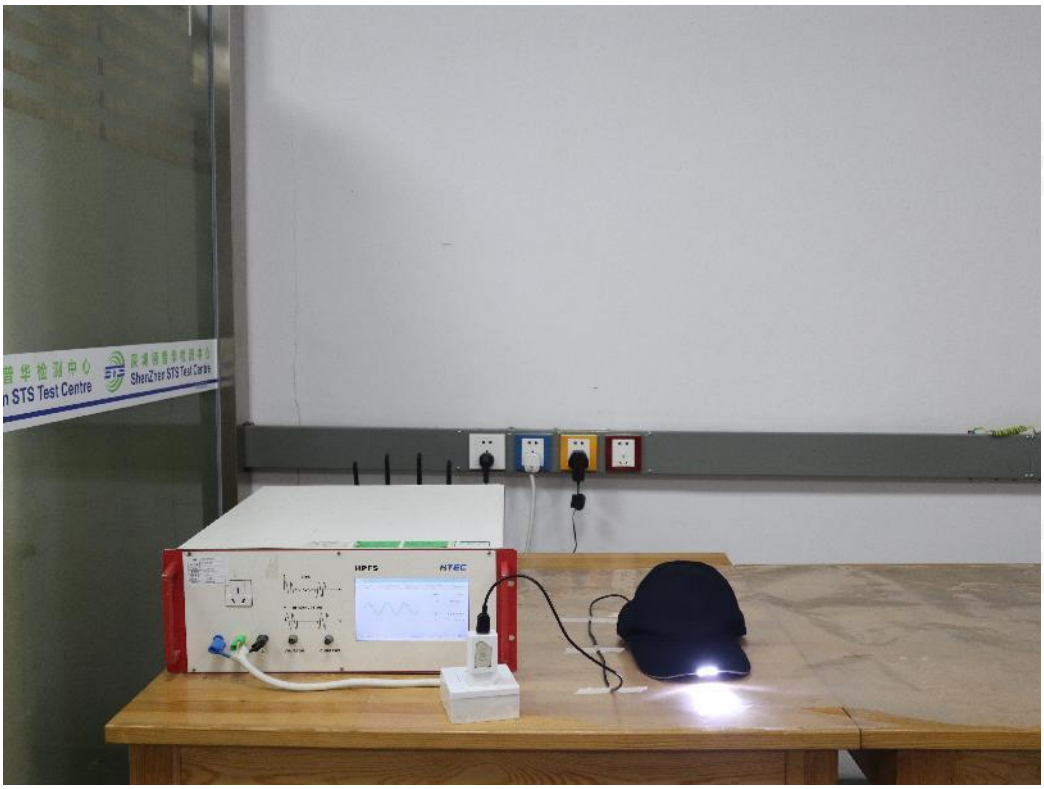

LAPLACE INSTRUMENTS LTD
AC POWER SOURCE

SURGE

EFT

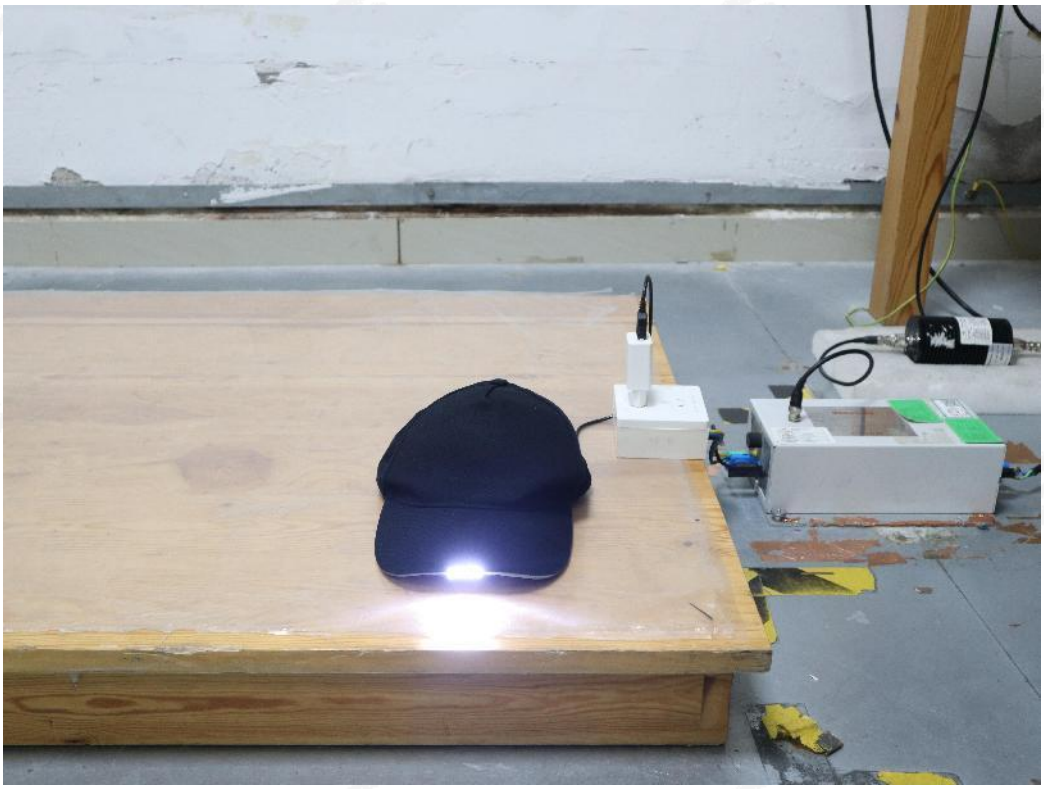


DIPS

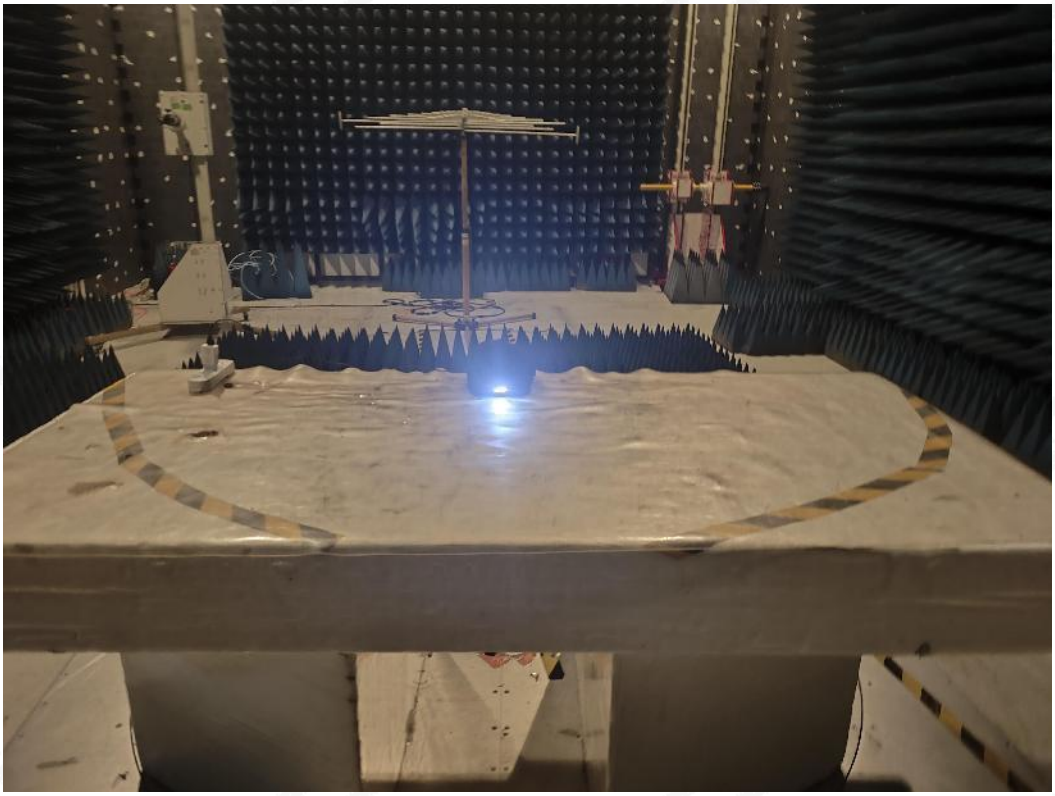


ESD

CS



RS (80 - 1000 MHz)



PFMF

※※※※※END OF THE REPORT※※※※※