



Shenzhen CTL Testing Technology Co., Ltd
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Test Report

EN IEC 55015: 2019/A11: 2020

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

EN IEC 61547: 2023

Equipment for general lighting purposes - EMC immunity requirements

Report Reference No.: CTL2410187031-E

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Date of issue: Oct. 25, 2024

Laboratory Name: Shenzhen CTL Testing Technology Co., Ltd.

Address: Zone A, 1st Floor, Warehouse 2, Baisha Logistics Company, No. 3011 Shahe West Road, Nanshan District, Shenzhen, Guangdong, China

Web: www.ctl-lab.com

Testing location/ procedure: Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing methods ☐

Applicant's name: Shenzhen Pythagorean Smart Technology Co., Ltd

Address: 8th floor, 4th building of HaiTian Lanyu technology industrial park, No 5 industrial two road, Shilong Community, Shiyan Street, Baoan District, Shenzhen

Test specification:

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

Non-standard test method: /

TRF Originator: Shenzhen CTL Testing Technology Co., Ltd

Shenzhen CTL Testing Technology Co., Ltd.

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Product Name: Night Light

Trade Mark: N/A

Test voltage: DC 3.7V, DC 5V from adapter AC 230V/50Hz

Result: Pass



EMC -- TEST REPORT

Test Report No. : CTL2410187031-E	Oct. 25, 2024 Date of issue
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Equipment under Test : Night Llight

Type / Model : F6

Listed Models : N/A

Applicant : **Shenzhen Pythagorean Smart Technology Co., ltd**

Address : 8th floor, 4th building of HaiTian Lanyu technology industrial park, No 5 industrial two road, Shilong Community, Shiyan Street, Baoan District, Shenzhen

Manufacturer : **Shenzhen Pythagorean Smart Technology Co., ltd**

Address : 8th floor, 4th building of HaiTian Lanyu technology industrial park, No 5 industrial two road, Shilong Community, Shiyan Street, Baoan District, Shenzhen

Test Result	Pass
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

History of this test report

Report No.	Version	Description	Issued Date
CTL2410187031-E	V1.0	Initial Issued Report	Oct. 25, 2024

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1. TEST STANDARDS

The tests were performed according to following standards:

[EN IEC 55015: 2019/A11: 2020](#) Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

[EN IEC 61547: 2023](#) Equipment for general lighting purposes - EMC immunity requirements

[EN IEC 61000-3-2: 2019/A1: 2021](#) Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

[EN 61000-3-3: 2013/A1: 2019/A2: 2021](#) Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : Oct. 21, 2024

Sampling and Testing commenced on : Oct. 21, 2024

Testing concluded on : Oct. 25, 2024

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☐ 230V / 50 Hz ☐ 120V / 60Hz
☐ 3.7 V DC ☐ 5 V DC
☒ Other (specified in blank below)

/

2.3. Short description of the Equipment under Test (EUT)

The EUT is a Night Light.

2.4. EUT operation mode

The EUT were tested under the following modes, the final worst mode was marked in bold face and recorded in this report.

EMISSION TEST:

Description of Test Mode	Test Voltage
WORKING	DC 3.7V
WORKING+CHARGING	DC 5V from adapter AC 230V/50Hz
CHARGING	DC 5V from adapter AC 230V/50Hz

EMISSION TEST: Magnetic Field Emission

Description of Test Mode	Test Voltage
WORKING	DC 3.7V
WORKING+CHARGING	DC 5V from adapter AC 230V/50Hz
CHARGING	DC 5V from adapter AC 230V/50Hz

IMMUNITY TESTS:

Description of Test Mode	Test Voltage
WORKING	DC 3.7V
WORKING+CHARGING	DC 5V from adapter AC 230V/50Hz
CHARGING	DC 5V from adapter AC 230V/50Hz

The equipment under test was operated during the measurement under the following conditions:
Test program (customer specific)

Emission tests.....: According to EN IEC 55015: 2019/A11: 2020, searching for the highest disturbance.
Immunity tests.....: According to EN IEC 61547: 2023, searching for the highest susceptibility.
Harmonics current..... : According to EN IEC 61000-3-2: 2019/A1: 2021, searching for the highest disturbance.
Voltage fluctuation..... : According to EN 61000-3-3: 2013/A1: 2019/A2: 2021, searching for the highest disturbance.

2.5. EUT configuration:

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- o - supplied by the lab

2.6. Performance level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test relative to a performance criteria defined by its manufacturer or the requestor of the test, or agreed between the manufacturer and the purchaser of the product. Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access(hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution
- quality of data display and transmission
- quality of speech transmission

Definition related to the performance level:

- based on the used product standard
- o based on the declaration of the manufacturer, requestor or purchaser

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.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Zone A, 1st Floor, Warehouse 2, Baisha Logistics Company, No. 3011 Shahe West Road, Nanshan District,
Shenzhen, Guangdong, China

3.2. Test Facility

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

Certificated by CNAS

Registration No.:CNAS L7497

Date of issue:Feb. 15, 2024

Valid until:Feb. 14, 2030

Certificated by A2LA, USA

Registration No.:4343.01

Date of issue:Mar.12, 2024

Valid until:Feb. 28, 2026

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B.

FCC-Registration No.: 399832

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832.

3.3. Test Description

Emission Measurement		
Magnetic Field Emission (0.009~30MHz)	EN IEC 55015: 2019/A11: 2020	PASS
Conducted Disturbance	EN IEC 55015: 2019/A11: 2020	PASS
Radiation Emission	EN IEC 55015: 2019/A11: 2020	PASS
Harmonic Current	EN IEC 61000-3-2: 2019/A1: 2021	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3: 2013/A1: 2019/A2: 2021	PASS
Immunity Measurement		
Electrostatic Discharge	EN IEC 61547: 2023 IEC 61000-4-2: 2008	PASS
RF Field Strength Susceptibility	EN IEC 61547: 2023 IEC 61000-4-3: 2020	PASS
Electrical Fast Transient/Burst Test	EN IEC 61547: 2023 IEC 61000-4-4: 2012	PASS
Surge Test	EN IEC 61547: 2023 IEC 61000-4-5: 2014/A1:2017	PASS
Conducted Susceptibility Test	EN IEC 61547: 2023 IEC 61000-4-6: 2013	PASS
Power Frequency Magnetic Field Susceptibility Test	EN IEC 61547: 2023 IEC 61000-4-8: 2009	PASS
Voltage Dips and Interruptions Test	EN IEC 61547: 2023 IEC 61000-4-11: 2020	PASS

Remark:

1. The test result PASS and /or FAIL has no relationship with the measurement uncertainty.

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission(chamber 1)	30~1000MHz	$\pm 4.10\text{dB}$	(1)
Radiated Emission(chamber 2)	30~1000MHz	$\pm 4.08\text{dB}$	(1)
Radiated Emission(chamber 2)	Above 1GHz	$\pm 4.32\text{dB}$	(1)
Conducted Emission	0.15~30MHz	$\pm 3.20\text{dB}$	(1)
Conducted Emission (signal terminal)	0.15~30MHz	$\pm 2.96\text{dB}$	(1)
Disturbance Power	30~300MHz	$\pm 2.90\text{dB}$	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Equipments Used during the Test

Radiated Emission(chamber 1)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2023/02/13	2026/02/12
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2024/04/30	2025/04/29
Software:						
Name of Software:				Version:		
EZ EMC(Below 1GHz)				V1.1.4.2		

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2024/04/30	2025/04/29
2	LISN	ROHDE & SCHWARZ	ESH2-Z5	860014/010	2024/04/30	2025/04/29
3	Limitator	ROHDE & SCHWARZ	ESH3-Z2	100408	2024/04/30	2025/04/29
4	The Impedance Stability Network ISN	FISCHER CUSTOM COMMUNICATIONS,INC.	F-071115-1057-1-09	112299	2024/04/30	2025/04/29
Software:						
Name of Software:				Version:		
ES-K1				V1.71		

Harmonic Current/ Voltage Fluctuation and Flicker						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Precision Power Analyser	Newtons4th Ltd	5511(HC)	162-06781	2024/09/09	2025/09/08
2	Impedance Network	EMTRACE	IMN 161	2402	2024/09/09	2025/09/08
Software:						
Name of Software:				Version:		
IEC Soft				V 2.7.1		

Electrostatic Discharge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ESD Simulator	TESEQ AG	NSG 437	1058	2024/08/01	2025/07/31

Electrical Fast Transient/Surge/Dips

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Ultra Compact Simulator	HAEFELY	ECOMPACT4	174887	2024/08/01	2025/07/31
Software:						
Name of Software:				Version:		
EMV Check 2000				V1.27b		

Power Frequency Magnetic Field Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Ultra Compact Simulator	HTEC Instruments Ltd.	HPFMF	154402	2024/04/30	2025/04/29

Conducted Susceptibility (CS) :

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Conducted Disturbances test system	SCHLODER	CDG 6000	N/A	2024/04/30	2025/04/29
2	Amplifier	SCHLODER	4N100W-6DB	N/A	2024/04/30	2025/04/29
3	CDN	SCHLODER	CDN M2+M3	A2210225/2013	2024/04/30	2025/04/29
4	Electromagnetic forceps	SCHLODER	EMCL-20 EM-CLAMP	132A1223/2015	2024/04/30	2025/04/29

Software:

Name of Software:				Version:		
IEC/EN61000-4-6 Application software 10KHz Version				1.2.0(25.03.2013)		

Magnetic Field Emission (0.009~30MHz) :

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2024/04/30	2025/04/29
2	Triple-Loop Antenna	EVERFINE	LLA-2	1008002	2024/04/30	2025/04/29

Software:

Name of Software:				Version:		
ES-K1				V1.71		

RF Field Strength Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	SIGNAL GENERATOR	Agilent	N5181A	MY49060125	2024/04/30	2025/04/29
2	Power Amplifier	MicoTop	MPA-80-1000-250	MPA1905162	2024/04/30	2025/04/29
3	Power Amplifier	MicoTop	MPA-1000-6000-100	MPA1906282	2024/04/30	2025/04/29
4	Power Meter	Agilent	E4419B	GB43317877	2024/08/01	2025/07/31
5	Test Antenna-Bi-Log	Schwarzbeck	VULB 9118 E	N/A	2024/08/22	2027/08/21
6	Horn Antenna	Sunol Sciences Corp	DRH-118	A062013	2021/12/23	2024/12/22
7	Power transmitter	HP	8481A	2349A43969	2024/08/01	2025/07/31
8	Power transmitter	Agilent	E9301A	MQ/2217182-2	2024/08/01	2025/07/31
Software:						
Name of Software:				Version:		
EM 3				V1.1.7		

4. TEST CONDITIONS AND RESULTS

4.1. Magnetic Field Emission

For test instruments and accessories used see section 3.6.

4.1.1. Description of the test location

Test location: Conduction Lab

4.1.2. Limits of disturbance

Frequency (MHz)	Limit For Loop Diameter of 2m (dB μ A)
9K~70K	88
70K~150K	88 ~58
150K~3.0M	58~22
3.0M~30M	22

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.1.3. Description of the test set-up

4.1.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum emanation are recorded.

4.1.3.2. Test Configuration and Procedure

EUT is placed in the center of triple-loop antenna (Diameter is 2m). Turn on the neon sign, and then the induced current in the loop antenna can be detected by a current probe and measured by the receiver. Three field directions shall be measured in sequence.

4.1.4. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**

Band Width: 200Hz / 9KHz

Frequency Range: 9KHz to 150KHz / 150KHz to 30MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

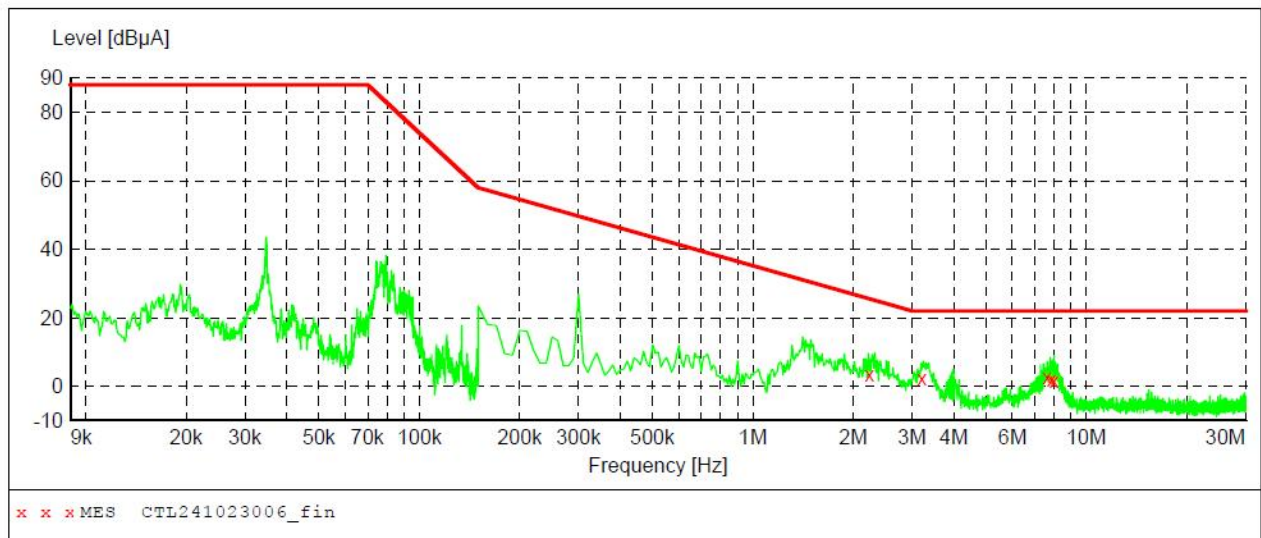
Shenzhen CTL Testing Technology Co., Ltd

Magnetic Field Emission Test EN IEC 55015: 2019/A11: 2020

EUT: F6
Manufacturer: /
Operating Condition: WORKING
Test Site: /
Operator: LOONG
Test Specification: /
Comment: /
Start of Test: 10/23/2024 / 9:38:03AM

SCAN TABLE: "Magnetic test fin"

Short Description:



MEASUREMENT RESULT: "CTL241023006_fin"

10/23/2024 9:41AM

Frequency MHz	Level dBμA	Transd dB	Limit dBμA	Margin dB	Det.	Loop	Azimuth deg
2.240000	3.30	0.0	26	22.2	QP	X	0.00
3.210000	2.20	0.1	22	19.8	QP	X	0.00
7.640000	2.50	0.1	22	19.5	QP	X	0.00
7.850000	1.90	0.1	22	20.1	QP	X	0.00
7.990000	1.60	0.1	22	20.4	QP	X	0.00

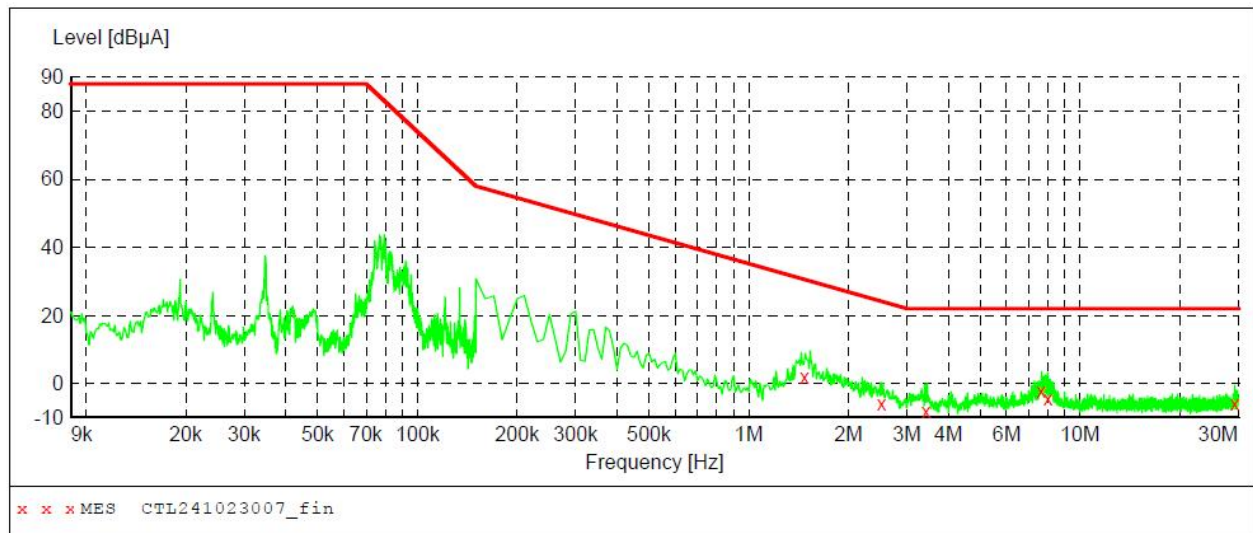
Shenzhen CTL Testing Technology Co., Ltd

Magnetic Field Emission Test EN IEC 55015: 2019/A11: 2020

EUT: F6
Manufacturer: /
Operating Condition: WORKING
Test Site: /
Operator: LOONG
Test Specification: /
Comment: /
Start of Test: 10/23/2024 / 9:41:27AM

SCAN TABLE: "Magnetic test fin"

Short Description:



MEASUREMENT RESULT: "CTL241023007_fin"

10/23/2024 9:44AM

Frequency MHz	Level dBμA	Transd dB	Limit dBμA	Margin dB	Det.	Loop	Azimuth deg
1.470000	1.90	0.0	31	28.7	QP	Y	0.00
2.520000	-6.10	0.0	24	30.2	QP	Y	0.00
3.430000	-8.10	0.1	22	30.1	QP	Y	0.00
7.640000	-2.30	0.1	22	24.3	QP	Y	0.00
8.000000	-4.40	0.1	22	26.4	QP	Y	0.00
29.250000	-5.90	0.2	22	27.9	QP	Y	0.00

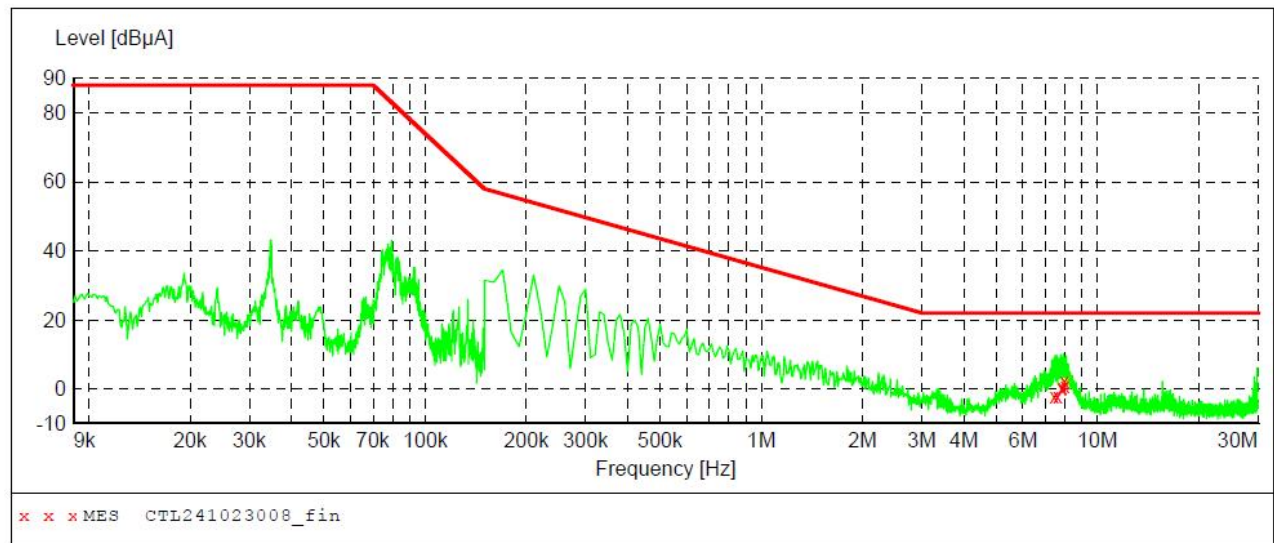
Shenzhen CTL Testing Technology Co., Ltd

Magnetic Field Emission Test EN IEC 55015: 2019/A11: 2020

EUT: F6
Manufacturer: /
Operating Condition: WORKING
Test Site: /
Operator: LOONG
Test Specification: /
Comment: /
Start of Test: 10/23/2024 / 9:45:00AM

SCAN TABLE: "Magnetic test fin"

Short Description:



MEASUREMENT RESULT: "CTL241023008_fin"

10/23/2024 9:48AM

Frequency MHz	Level dBμA	Transd dB	Limit dBμA	Margin dB	Det.	Loop	Azimuth deg
7.430000	-2.10	0.1	22	24.1	QP	Z	0.00
7.600000	-2.10	0.1	22	24.1	QP	Z	0.00
7.830000	0.10	0.1	22	21.9	QP	Z	0.00
7.850000	0.40	0.1	22	21.6	QP	Z	0.00
7.970000	2.30	0.1	22	19.7	QP	Z	0.00
7.990000	0.70	0.1	22	21.3	QP	Z	0.00

4.2. Conducted disturbance

For test instruments and accessories used see section 3.6.

4.2.1. Description of the test location

Test location: Conduction Lab

4.2.2. Limits of disturbance

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
9 K~50 K	110	—
50 K~150 K	90~80	—
150 K~0.5 M	66~56	56~46
0.5 M~5 M	56	46
5 M~30 M	60	50

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

4.2.3. Description of the test set-up

4.2.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum emanation are recorded.

4.2.3.2. Test Configuration and Procedure

EUT is placed on a nonmetal table which is 0.8 meter above the grounded reference plane. Connect the power line of the EUT to the LISN which is connected to receiver by coaxial line, then disturbance of the neutral line and live line can be detected by the receiver.

4.2.4. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**

Band Width: 9KHz

Frequency Range: 9KHz to 30MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

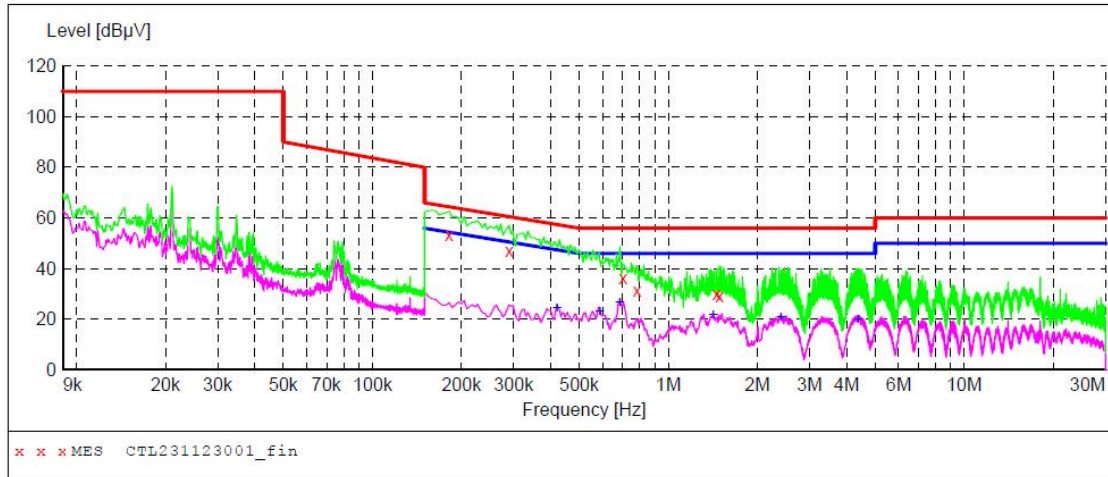
Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test EN IEC 55015: 2019/A11: 2020

EUT: F6
Manufacturer: /
Operating Condition: WORKING+CHARGING
Test Site: /
Operator: LOONG
Test Specification: AC 230V/50Hz
Comment: /
Start of Test: 10/23/2024 / 9:09:22AM

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL241123001_fin"

10/23/2024 9:13AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.181500	53.10	10.0	64	11.3	QP	N	GND
0.289500	47.10	10.0	61	13.4	QP	N	GND
0.703500	36.40	10.0	56	19.6	QP	N	GND
0.784500	31.30	10.0	56	24.7	QP	N	GND
1.455000	30.10	10.1	56	25.9	QP	N	GND
1.491000	29.20	10.1	56	26.8	QP	N	GND

MEASUREMENT RESULT: "CTL241123001_fin2"

10/23/2024 9:13AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.420000	24.80	10.0	47	22.6	AV	N	GND
0.586500	23.40	10.0	46	22.6	AV	N	GND
0.685500	26.80	10.0	46	19.2	AV	N	GND
1.419000	21.90	10.1	46	24.1	AV	N	GND
2.400000	20.90	10.1	46	25.1	AV	N	GND
4.380000	20.30	10.1	46	25.7	AV	N	GND

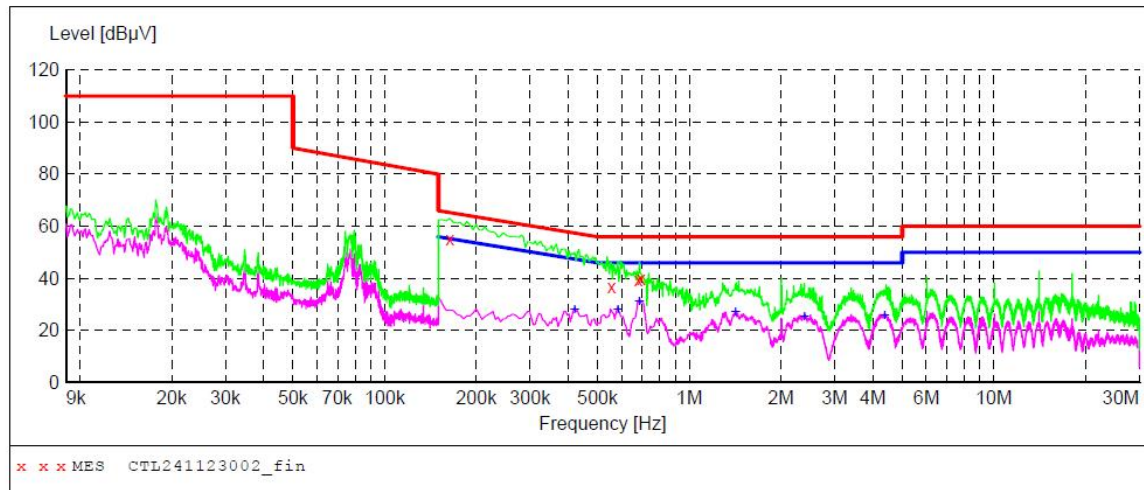
Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test EN IEC 55015: 2019/A11: 2020

EUT: F6
Manufacturer: /
Operating Condition: WORKING+CHARGING
Test Site: /
Operator: LOONG
Test Specification: AC 230V/50Hz
Comment: /
Start of Test: 10/23/2024 / 9:14:10AM

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL241123002_fin"

10/23/2024 9:18AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.163500	55.00	10.0	65	10.3	QP	L1	GND
0.555000	36.80	10.0	56	19.2	QP	L1	GND
0.681000	39.60	10.0	56	16.4	QP	L1	GND
0.694500	40.00	10.0	56	16.0	QP	L1	GND

MEASUREMENT RESULT: "CTL241123002_fin2"

10/23/2024 9:18AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.420000	28.10	10.0	47	19.3	AV	L1	GND
0.582000	28.00	10.0	46	18.0	AV	L1	GND
0.685500	31.40	10.0	46	14.6	AV	L1	GND
1.414500	27.30	10.1	46	18.7	AV	L1	GND
2.386500	25.30	10.1	46	20.7	AV	L1	GND
4.375500	25.70	10.1	46	20.3	AV	L1	GND

4.3. Radiation Emission

For test instruments and accessories used see section 3.6.

4.3.1. Description of the test location

Test location: Chamber 1

4.3.2. Limit of Radiation Emission

Test configuration and procedure see the standard EN IEC 55015: 2019/A11: 2020

4.3.3. Description of the test set-up

4.3.3.1 Operating Condition

The EUT is ON during the test, and the results of the maximum emanation are recorded.

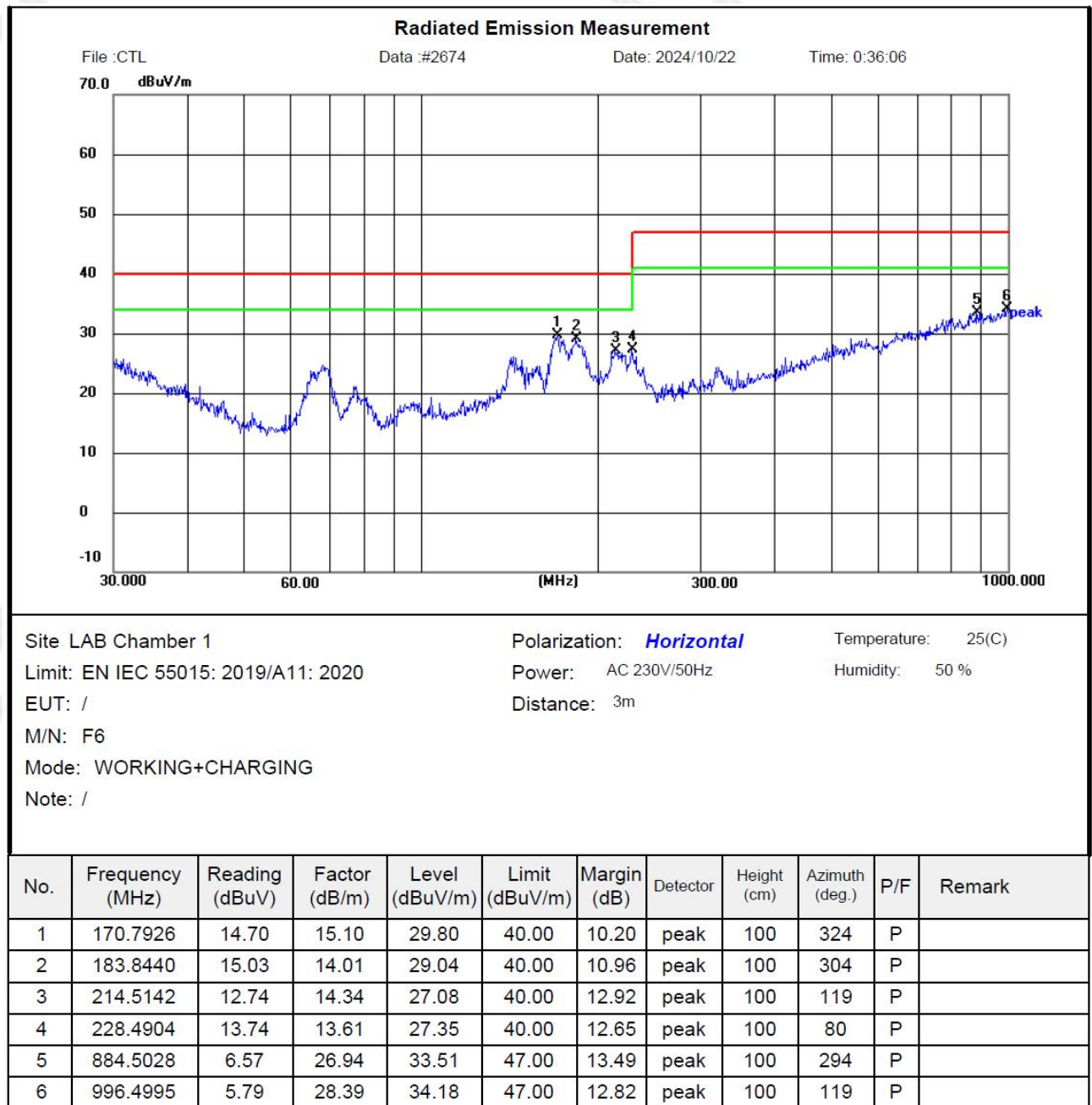
4.3.3.2 Test Configuration and Procedure

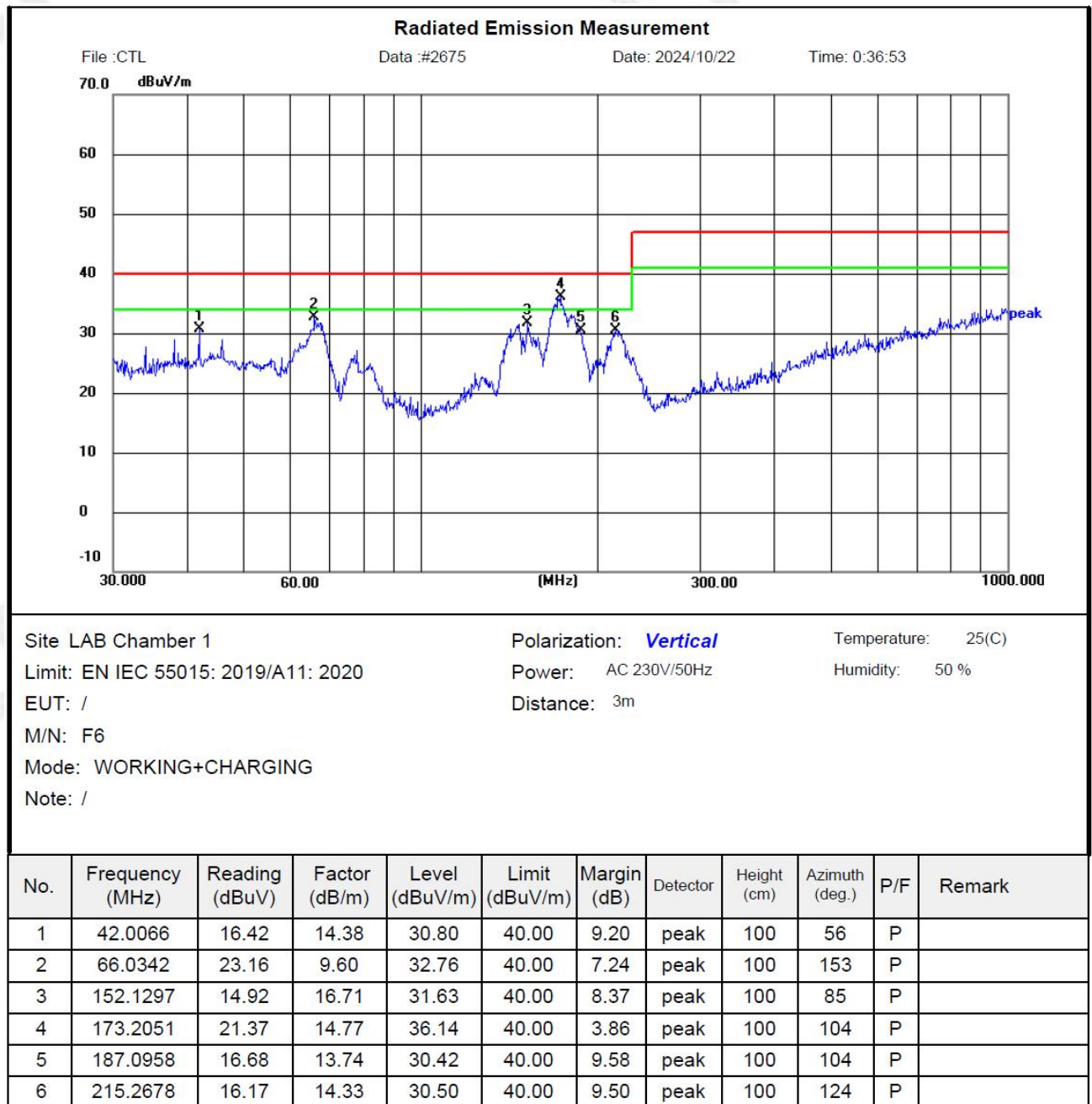
Test configuration and procedure see the standard EN IEC 55015: 2019/A11: 2020

4.3.4. Test Result

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).





4.4. Harmonic current

For test instruments and accessories used see section 3.6.

4.4.1. Description of the test location

Test location: Harmonic & Flicker Room

4.4.2. Limits of Harmonic Current

Test configuration and procedure see clause 7.1 of standard EN IEC 61000-3-2: 2019/A1: 2021.

4.4.3. Description of the test set-up

4.4.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum emanation are recorded.

4.4.3.2. Test Configuration and Procedure

Test configuration and procedure see clause 6.2.2 and Appendix C of standard EN IEC 61000-3-2: 2019/A1: 2021.

4.4.4. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The EUT is lighting equipment with a rated power less than but not equal to 5 W, limit are not specified in this test project, so the test is not applicable.

4.5. Voltage Fluctuation and Flicker

For test instruments and accessories used see section 3.6.

4.5.1. Description of the test location

Test location: Harmonic & Flicker Room

4.5.2. Limits of Voltage Fluctuation and Flicker

Test configuration and procedure see clause 5 of standard EN 61000-3-3: 2013/A1: 2019/A2: 2021.

4.5.3. Description of the test set-up

4.5.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum emanation are recorded.

4.5.3.2. Test Configuration and Procedure

Test configuration and procedure see clause 6 and Annex A or Annex B of standard EN 61000-3-3: 2013/A1: 2019/A2: 2021.

4.5.4. Test result

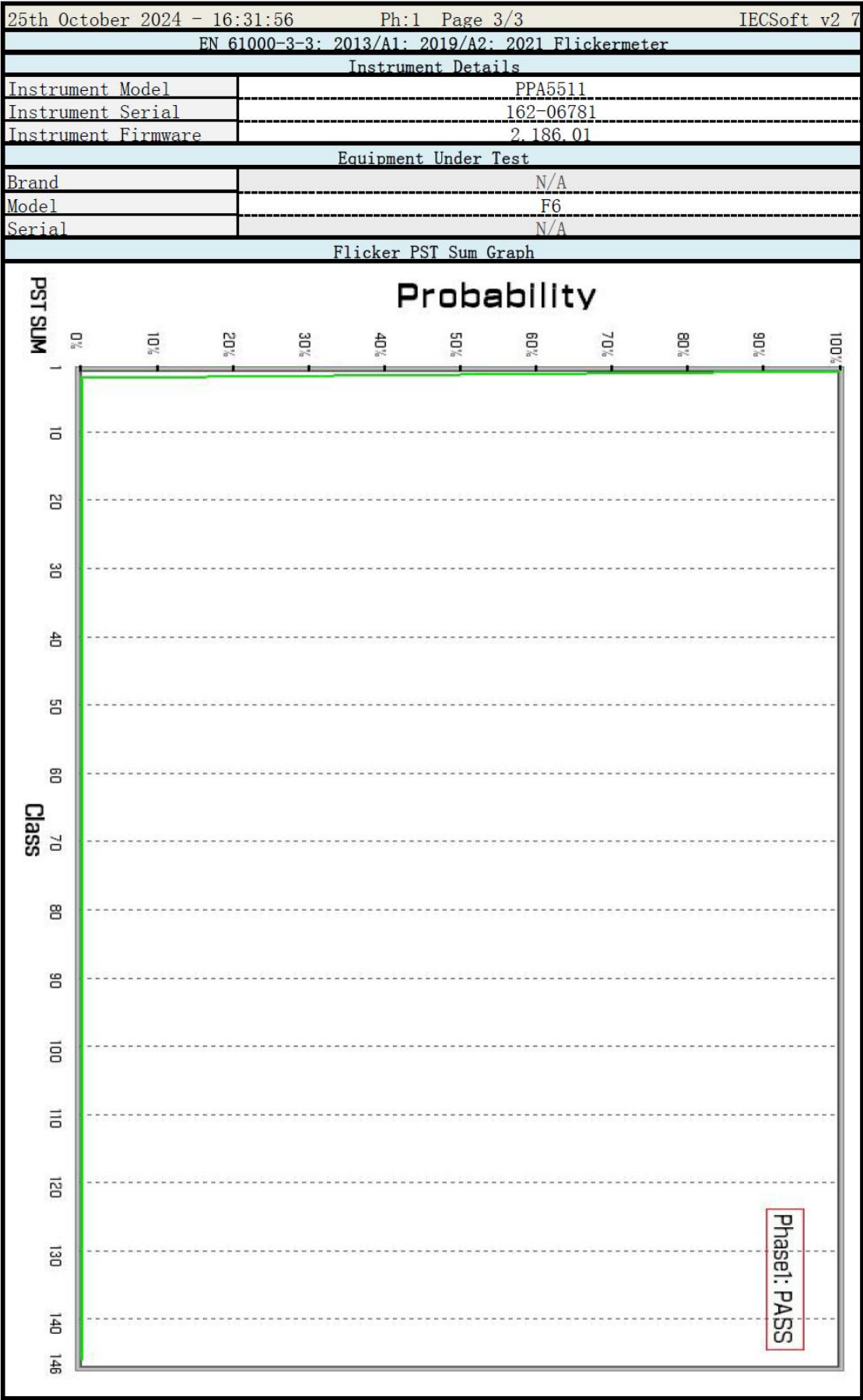
Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).

25th October 2024 - 16:31:56			Ph:1 Page :			IECSOft v2 7			
		EN 61000-3-3: 2013/A1: 2019/A2: 2021							
Flickermeter									
Instrument Details									
Instrument Model			PPA5511						
Serial Number			162-06781						
Firmware Version			2.186.01						
N4L Calibration Date			09th September 2024						
Instrument Version			Standard						
Test Settings									
Class			Voltage						
Mode			Normal (4.0%)						
Peak Current Range			100A						
PST			10 minutes						
PLT			12 PSTs						
Equipment Under Test									
Brand			N/A						
Model			F6						
Serial			N/A						
Impedance Network ID			N/A						
Test Conditions									
			User Entered			Measured			
Rated Voltage			N/A			229.823V			
Rated Current			N/A			N/A			
Rated Frequency			N/A			49.998Hz			
Rated Power			N/A			N/A			
D max			0.0477% (Limit: 4.0%)						
T max			0.0000 s (Limit: 0.5 s)						
DC max			0.0098% (Limit: 3.3%)						
Additional Test Details									
Operator			N/A						
Lab Name			N/A						
Location			N/A						
Notes									
Signature									
Results			Phase1: PASS						

25th October 2024 - 16:31:56				Ph:1 Page 2/3			IECSOft v2 7	
EN 61000-3-3: 2013/A1: 2019/A2: 2021 Flickermeter								
Instrument Details								
Instrument Model		PPA5511						
Instrument Serial		162-06781						
Instrument Firmware		2.186.01						
Equipment Under Test								
Brand		N/A						
Model		F6						
Serial		N/A						
Flicker Test Results								
PST no.	Status	DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim
1	Phasel: PASS	0.00982	0.04439	0.00000	N/A	N/A	N/A	N/A
2	Phasel: PASS	0.00982	0.04439	0.00000	N/A	N/A	N/A	N/A
3	Phasel: PASS	0.00982	0.04439	0.00000	N/A	N/A	N/A	N/A
4	Phasel: PASS	0.00982	0.04439	0.00000	N/A	N/A	N/A	N/A
5	Phasel: PASS	0.00982	0.04439	0.00000	N/A	N/A	N/A	N/A
6	Phasel: PASS	0.00982	0.04771	0.00000	N/A	N/A	N/A	N/A
7	Phasel: PASS	0.00982	0.04771	0.00000	N/A	N/A	N/A	N/A
8	Phasel: PASS	0.00982	0.04771	0.00000	N/A	N/A	N/A	N/A
9	Phasel: PASS	0.00982	0.04771	0.00000	N/A	N/A	N/A	N/A
10	Phasel: PASS	0.00982	0.04771	0.00000	N/A	N/A	N/A	N/A
11	Phasel: PASS	0.00982	0.04771	0.00000	N/A	N/A	N/A	N/A
12	Phasel: PASS	0.00982	0.04771	0.00000	N/A	N/A	N/A	N/A



4.6. Electrostatic discharge

For test instruments and accessories used see section 3.6.

4.6.1. Description of the test location and date

Test location: 1# EMC Test Room

Date of test: Oct. 25, 2024

Operator: Wei

4.6.2. Severity levels of electrostatic discharge

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

4.6.3. Description of the test set-up

4.6.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.6.3.2. Test Configuration and Procedure:

Direct Discharge:

Air Discharge:

- This test is done on a non-conductive surfaces. The round discharge tip of the Electrostatic Discharge simulator shall be approached as fast as possible then to touch the EUT. After each discharge, the simulator shall be removed from the EUT. The simulator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

Contact Discharge:

- All the procedure shall be same as air discharge, except using the acute discharge tip. The top end of the Electrostatic Discharge simulator is touch the EUT all the time when the simulator is re-triggered for a new single discharge and repeated 10 times for each pre-selected test point.

Indirect Discharge:

- The vertical coupling plane(VCP) is placed 0.1m away from EUT. The top end of Electrostatic Discharge simulator should aim at the center of one border of the VCP for at least 10 times discharge.
- The top end of Electrostatic Discharge simulator should place at the point 0.1m away from EUT on the horizontal coupling plane(HCP). At least 10 times discharge should be done for every pre-selected point around EUT.

Record any performance degradation of the EUT during the test and judge the test result according to nce criterion.

4.6.4. Test specification:Contact discharge voltage:☒ 2 kV ☒ 4 kVAir discharge voltage:☒ 2 kV ☒ 4 kV ☒ 8 kVNumber of discharges:☒ 10 ☐ 25Type of discharge:

Direct discharge

☒ Air discharge

Indirect discharge

☒ Contact discharge☒ Contact dischargePolarity:☒ Positive☒ NegativeDischarge location:☒ all external locations accessible by hand☒ horizontal coupling plane (HCP)☒ vertical coupling plane (VCP)**4.6.5. Test result**

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**Performance Criterion: **B****Remarks:** During the test no deviation was detected to the selected operation mode(s).

4.7. Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 3.6.

4.7.1. Description of the test location and date

Test location: Chamber 2

Date of test: Oct. 24, 2024

Operator: Wei

4.7.2. Severity levels of radiated, radio-frequency, electromagnetic field

Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X	Special

4.7.3. Description of the test set-up

4.7.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.7.3.2. Test Configuration and Procedure

EUT is placed on a table which is 0.8 meter above ground. The center of the transmitting antenna mounted on an antenna mast is set 3 meter away from the EUT. During the test, each of four sides of EUT will face the transmitting antenna with the turntable cycled. Both horizontal and vertical polarization of the antenna are set on test and measured individually.

In order to judge the performance of the EUT, a set of monitor system is used.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.7.4. Test specification:

Frequency range:

■ 80 MHz to 1000 MHz

Field strength:

■ 3 V/m

EUT - antenna separation:

■ 3 m

Modulation:

■ AM: 80 %
■ sinusoidal 1000Hz

Frequency step:

■ 1 % with 1 s dwell time

Antenna polarisation:

■ horizontal ■ vertical

4.7.5. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.8. Electrical fast transients / Burst

For test instruments and accessories used see section 3.6.

4.8.1. Description of the test location and date

Test location: 2# EMC Test Room

Date of test: Oct. 24, 2024

Operator: Wei

4.8.2. Severity levels of electrical fast transients / Burst

Open circuit output test voltage and repetition rate of the impulses		
Level	On power port, PE	
	V peak(KV)	Repetition rate (KHz)
1.	0.5	5 or 100
2.	1	5 or 100
3.	2	5 or 100
4.	4	5 or 100
X	Special	Special

4.8.3. Description of the test set-up

4.8.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.8.3.2. Test Configuration and Procedure

For AC power input ports:

—The EUT is connected to coupling/decoupling network which couples the EFT signal to power input lines.
During the test, both polarities of the test voltage should be applied and the duration of the test can't be less than 1mins.

Without signal / control lines and DC power lines, The EUT is unnecessary to test on these mentioned ports.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.8.4. Test specification:

Coupling network:

☒ 0.5 kV ☒ 1 kV ☐ 2 kV

Coupling clamp:

☐ 0.5 kV ☐ 1 kV ☐ 2 kV

Burst frequency:

☒ 5.0 kHz

Coupling duration:

☒ 120 s

Polarity:

☒ positive ☒ negative

4.8.5. Coupling points

Cable description:

AC power line : L, N, L+N

Screening:

☐ screened

☒ unscreened

Status:

☐ passive

☒ active

Signal transmission:

☒ analogue

☐ digital

Length:

☒ 1.0 m

4.8.6. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**

Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.9. Surge

For test instruments and accessories used see section 3.6.

4.9.1. Description of the test location and date

Test location: 2# EMC Test Room

Date of test: Oct. 25, 2024

Operator: Wei

4.9.2. Severity levels of surge

Level	Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

4.9.3. Description of the test set-up

4.9.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.9.3.2. Test Configuration and Procedure

In this test, the 1.2/50us& 8/20us surge generator must be used for AC power ports. The voltage for line to earth coupling mode is 1 time more than that for line to line. At least 5 positive and 5 negative (polarity) surge signal with a maximum 1/min repetition rate are injected to AC power lines from 4 different phase angle(90°, 270°) during the test.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.9.4. Test specification:

Pulse amplitude-Power line sym.:

☒ 0.5 kV ☐ 1 kV ☐ 2 kV ☐ 4 kV

Source impedance: 2 Ω

Pulse amplitude-Power line unsym.:

☐ 0.5 kV ☐ 1 kV ☐ 2 kV ☐ 4 kV

Source impedance: 12 Ω

Number of surges:

☒ 5 Surges/Phase angle

Phase angle:

☐ 0 ° ☒ 90 ° ☐ 180 ° ☒ 270 °

Repetition rate:

☒ 60 s

Polarity:

☒ positive ☒ negative

4.9.5. Coupling points

Cable description:

AC power line: L+N

Screening:

☐ screened

☒ unscreened

Status:

☐ passive

☒ active

Signal transmission:

☒ analogue

☐ digital

Length:

☒ 1.0 m

4.9.6. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**

Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.10. Conducted disturbances induced by radio-frequency fields

For test instruments and accessories used see section 3.6.

4.10.1. Description of the test location date

Test location: 3# EMC Test Room

Date of test: Oct. 24, 2024

Operator: Wei

4.10.2. Severity levels of conducted disturbances induced by radio-frequency fields

Level	Field Strength (V)
1.	1
2.	3
3.	10
X	Special

4.10.3. Description of the test set-up

4.10.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.10.3.2. Test Configuration and Procedure

EUT is placed on an insulating support of 0.1m high above a ground reference plane. It must be 0.3m away the CDN (coupling and decoupling network) of which the bottom is made of metallic material and placed directly on the ground plane. 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). The disturbance signal amplified by amplifier is injected to EUT through CDN.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.10.4. Test specification:

- Frequency range: ☒ 0.15 MHz to 80 MHz
- Test voltage: ☒ 3 V
- Modulation: ☒ AM: 80 %
☒ sinusoidal 1000Hz
- Frequency step: ☒ 1 % with 1 s dwell time

4.10.5. Coupling points

- Cable description (Port1): AC power line
- Screening: ☐ screened ☒ unscreened
- Status: ☐ passive ☒ active
- Signal transmission: ☒ analogue ☐ digital
- Length: ☒ 1.0 m

4.10.6. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.11. Magnetic Field Immunity

For test instruments and accessories used see section 3.6.

4.11.1. Description of the test location and date

Test location: EMC Test Room

Date of test: Oct. 24, 2024

Operator: Wei

4.11.2. Severity levels of magnetic field immunity

Level	Magnetic Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X.	Special

4.11.3. Description of the test set-up

4.11.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.11.3.2. Test Configuration and Procedure:

EUT is placed on an insulating support of 0.1m high above a table of 0.8m high. There is a minimum 1m*1m ground metallic plane put on this table. EUT is put in the center of the magnetic coil then two orientations of the magnetic coil, horizontal and vertical, shall be rotated in order to expose the EUT to the difference polarization magnetic field.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.11.4. Test specification:Test frequency: ☒ 50 HzContinuous field: ☒ 3 A/mTest duration: ☒ 5 m

Antenna factor: 0.917 A/m

Axis: ☒ x-axis ☐ y-axis ☐ z-axis**4.11.5. Test result**

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**Performance Criterion: **A****Remarks:** During the test no deviation was detected to the selected operation mode(s).

4.12. Voltage Dips and Interruptions

For test instruments and accessories used see section 3.6.

4.12.1. Description of the test location and date

Test location: 2# EMC Test Room

Date of test: Oct. 24, 2024

Operator: Wei

4.12.2. Severity levels of voltage Dips and Interruptions

Test Level (%Ut)	Voltage Dip And Short Interruptions (%Ut)	Performance Criterion	Duration (In Period)
0	100	B	0.5
70	30	C	10

4.12.3. Description of the test set-up

4.12.3.1. Operating Condition

The EUT is ON during the test, and the results of the maximum susceptible results are recorded.

4.12.3.2. Test Configuration and Procedure

EUT is connected to the simulator according to the setup outline of 12.3. When conducting the test level of 0.5 period duration, make sure that it shall start at the phase angle of 0° and 180°

4.12.4. Test specification:

Nominal Mains Voltage (V_N): ■ 230 V AC

Number of voltage fluctuations: ■ 3

Level of reduction(dip) / duration: ■ 100 % / 10ms ■ 30 % / 200ms

4.12.5. Test result

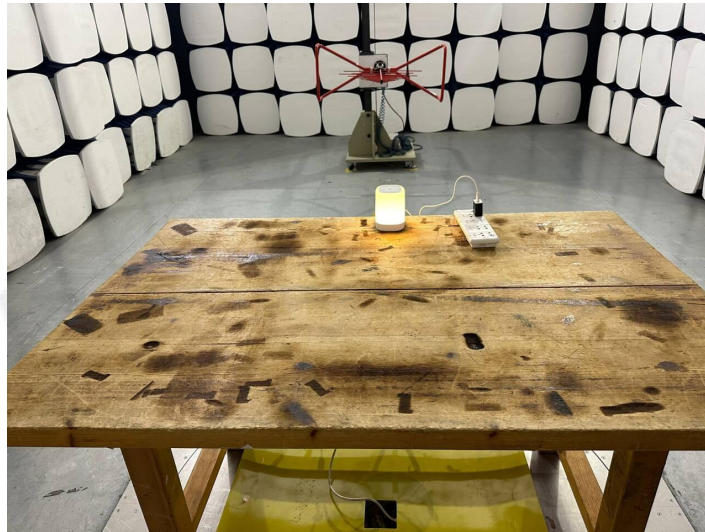
Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**
Performance Criterion **See section 4.12.2**

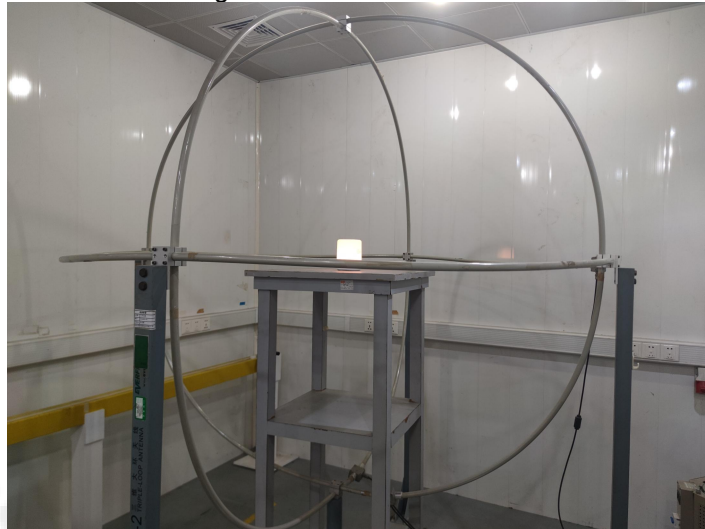
Remarks: During the test no deviation was detected to the selected operation mode(s).

5. Test Setup Photos

RADIATED EMISSION TEST



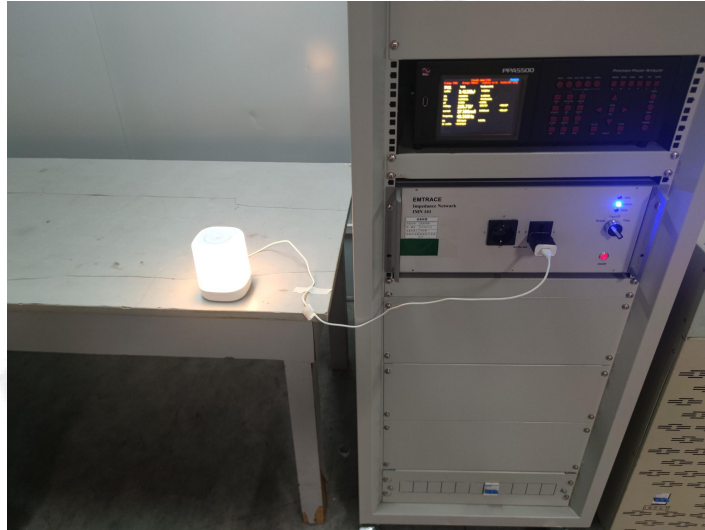
Magnetic Field Emission TEST



CONDUCTION EMISSION TEST



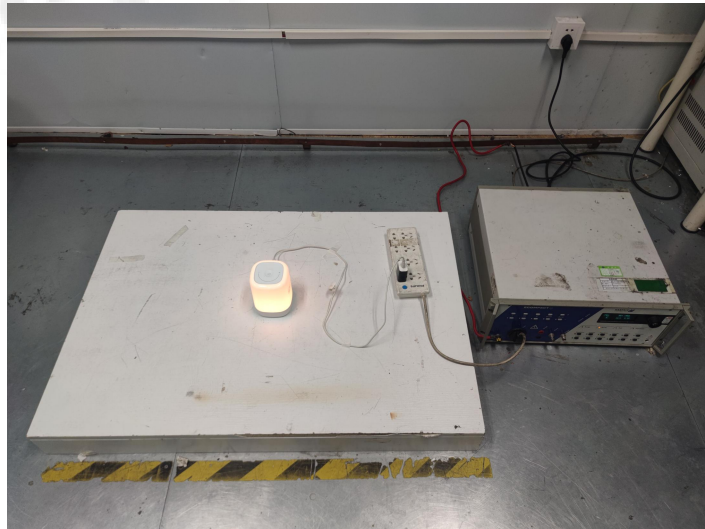
HARMONIC & FLICKER TEST



ESD TEST



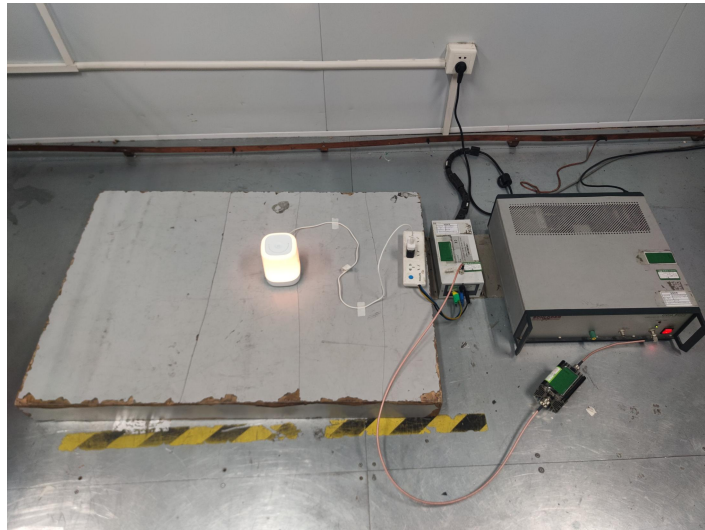
EFT/B TEST&SURGE TEST&VOLTAGE DIPS AND INTERRUPTIONS TEST



RS TEST



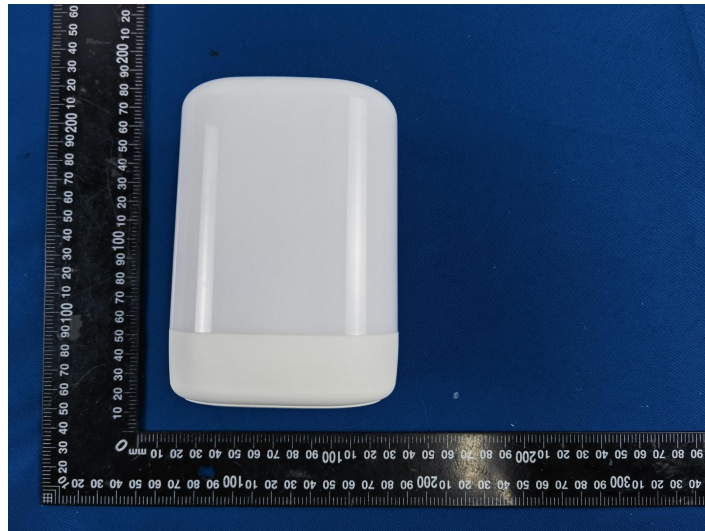
CONDUCTED SUSCEPTIBILITY TEST

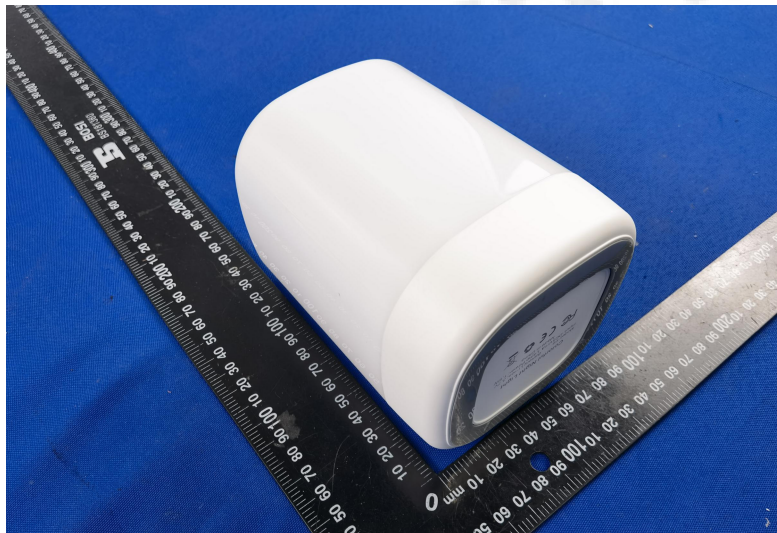


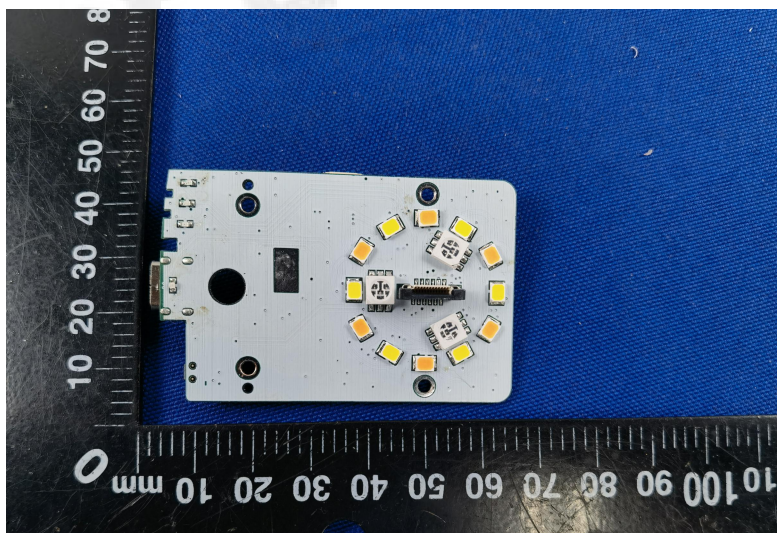
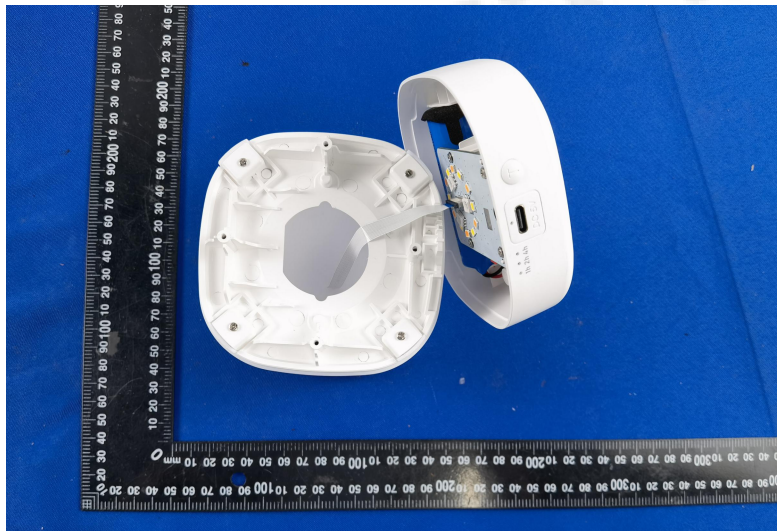
POWER-FREQUENCY MAGNETIC FIELDS TEST

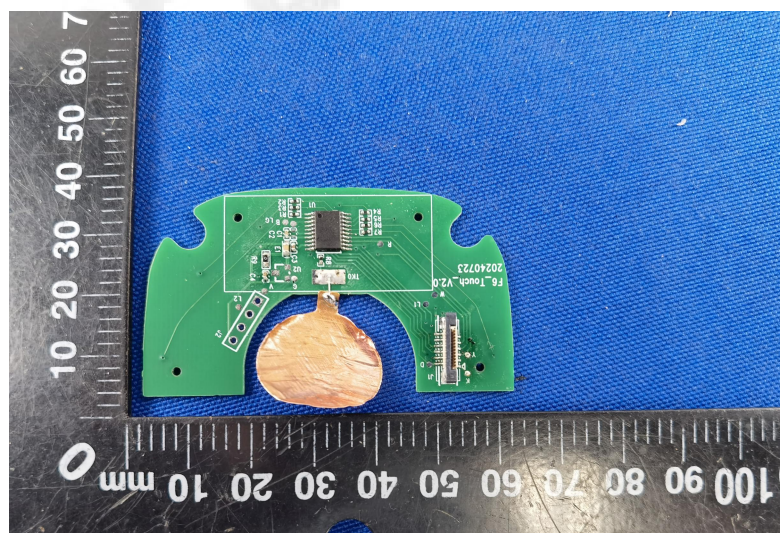
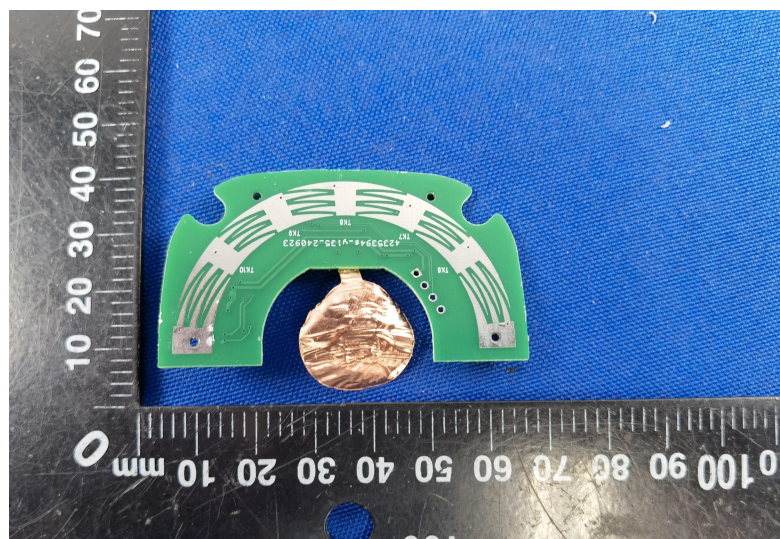
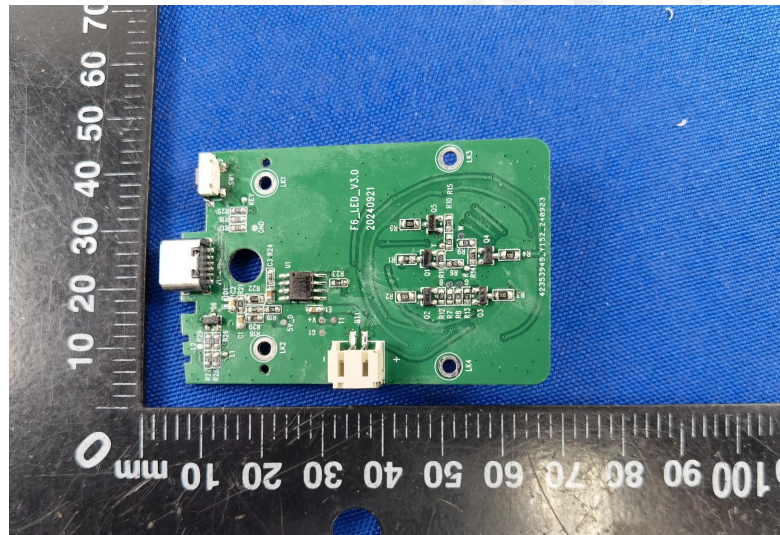


6. Photos of the EUT











.....End of Report.....