TEST REPORT

1.5V Li-ion Battery Charger

Test Model: C4-AA

Report Number	:	LCSB12095006E
Applicant	:	Shenzhen XTAR Electronics Co., Ltd
Address	:	5th Floor, No.77 Xinhe Rd, Shangmugu, Pinghu Area, Longgang District, Shenzhen, Guangdong, China
Manufacturer	:	Shenzhen XTAR Electronics Co., Ltd
Address	:	5th Floor, No.77 Xinhe Rd, Shangmugu, Pinghu Area, Longgang District, Shenzhen, Guangdong, China
Prepared by	:	Shenzhen Southern LCS Compliance Testing Co., Ltd.
Address	:	101-201, Building 39, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China.
Date of receipt sample	:	December 10, 2025
Date of test	:	December 10, 2025 to December 18, 2025
Date of issue	:	December 19, 2025

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full. without prior written permission of the company, The report would be invalid without specific stamp of test institute and the signatures of approver.

TEST REPORT

Testing Laboratory.....:	Shenzhen Southern LCS Compliance Testing Co., Ltd. 101-201, Building 39, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China.	
Test Specification: **Standard.....:**	EN IEC 55014-1:2021 EN IEC 55014-2:2021 EN IEC 61000-3-2:2019+A1:2021+A2:2024 EN 61000-3-3:2013+A1:2019+A2:2021	
Equipment Under Test.....:	1.5V Li-ion Battery Charger	
Trademark.....:	XTAR®	
Test Model/Type.....:	C4-AA	
Rating.....:	Input: DC 5V 2A Output: DC 5V 0.5A*4	
Test Results .....:	**PASS**	
Compiled by.....:	Zom Zhang (Engineer)	
Check by.....:	Kris Mai (Technique principal)	
Approved by.....:	DM Gu (Manager)	
Test Report Form No.....:	TRF-4-E-028 Ver. A/1	
TRF Originator.....:	Shenzhen Southern LCS Compliance Testing Co., Ltd.	
Master TRF.....:	/	

ENVIRONMENTAL CONDITIONS

The climatic conditions during the test are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. the climatic conditions during the test were in the following Limits:

Ambient temperature	15℃ - 30℃
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa - 106 kPa

Climate values will be recorded and recorded separately if specifically required in the base standard or application product/product series standard.

POSSIBLE TEST CASE VERDICTS

Test cases does not apply to test object	N/A
Test object does meet requirement	P(Pass) / PASS
Test object does not meet requirement	F(Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒	Indicate that the conditions, standards or equipment listed is applicable to this report / test / EUT.
☐	Indicate that the conditions, standards or equipment listed is not applicable to this report / test / EUT.

REVISION HISTORY

Revision	Issue Date	Revision Content	Revised by
000	December 19, 2025	Initial Issue	-

Remark:
000) : “---”

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1. GENERAL INFORMATION

1.1. GENERAL DESCRIPTION OF THE ITEM(S)

Equipment Under Test	1.5V Li-ion Battery Charger
Test Model/Type	C4-AA
Additional Models/Type	/
Description of Model difference	/
Rating	Input: DC 5V 2A Output: DC 5V 0.5A*4
Highest internal frequency (Fx)	≤ 108 MHz
Remarks: The applicant and manufacturer information, product name, model, trademark and other information in this report are all provided by the applicant, and this laboratory is not responsible for verifying its authenticity.	

1.2. OPERATING MODE(S) USED OF TESTS

During the tests, the following operating mode(s) has(have) been used.

Operating Mode	Operating Mode description	Used for testing	
		Emission	Immunity
1	Working	☒	☒
Remarks:The laboratory conducted pre-scan of all operation modes of the EUT. This report only records the measurement data of the worst mode.			

1.3. SUPPORT / AUXILIARY EQUIPMENT FOR THE EUT

EUT has been tested using the following auxiliary equipment :

Auxeq	Model/Type	Manufacturer	Supplied by
Adapter	/	Xiaomi	/

1.4. DESCRIPTION OF TEST FACILITY

Test Location	Shenzhen Southern LCS Compliance Testing Co., Ltd. 101-201, Building 39, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China. CNAS Registration Number is L10160.

2. 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 LCS 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.

Measurement	Uncertainty (U_{lab})
Conducted disturbance (150kHz - 30MHz)	± 2.80 dB
Radiated disturbance (30MHz - 200MHz)	± 4.66 dB
Radiated disturbance (200MHz - 1GHz)	± 4.64 dB

Supplementary information:

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

3. MEASURING DEVICES AND TEST EQUIPMENT

CONDUCTED DISTURBANCE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Shield Room #1	CHENGYU	843	#1	2023-04-26	2028-04-25
2	EMI Test Receiver	R&S	ESCI	101142	2025-04-18	2026-04-17
3	10dB Attenuator	SCHWARZBECK	VTSD9561-F	9561-F159	2025-04-18	2026-04-17
4	Artificial Mains Network	SCHWARZBECK	NSLK 8127	8127716	2025-04-18	2026-04-17
5	Artificial Mains Network	SCHWARZBECK	NSLK 8163	00043	2025-04-18	2026-04-17
6	Impedance Stabilization Network	SCHWARZBECK	NTFM 8158	#120	2025-04-18	2026-04-17
7	Voltage Probe	SCHWARZBECK	KT 9420	9420401	2025-04-18	2026-04-17
8	Current Probe	R&S	EZ-17	101921	2025-02-21	2026-02-20
9	EMI Test Software	Farad	EZ_EMC	1.1.4.4	/	/

RADIATED DISTURBANCE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Semi Anechoic Chamber #1	CHENGYU	SAC-3m	03CH03-HY	2024-04-28	2029-04-27
2	EMI Test Receiver	R&S	ESCI3	101010	2025-04-18	2026-04-17
3	Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2024-07-13	2027-07-12
4	Log-periodic Antenna	SCHWARZBECK	VULB9163	5094	2025-04-19	2028-04-18
5	Horn Antenna	ETS	3115	EABF-018	2025-07-19	2028-07-18
6	Spectrum Analyzer	Agilent	N9020A	MY49061051	2025-07-16	2026-07-15
7	EMI Test Software	Farad	EZ_EMC	1.1.4.4	/	/
8	Controller System	SKET	SKC1000	/	/	/

HARMONIC CURRENT & FLICKER						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Harmonic and Flicker Analyzer	HTEC	AC2000A	/	2025-04-18	2026-04-17
2	Pure Power Supply	HTEC	HHF-5010	/	2025-04-18	2026-04-17
3	Test Software	HTEC	Harmonic	EHFM V2.1.8	/	/

ELECTROSTATIC DISCHARGE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	TESEQ	NSG 437	1615	2025-02-21	2026-02-20

ELECTRICAL FAST TRANSIENT / BURST						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EFT Generator	HTEC	HEFT51	162201	2025-04-18	2026-04-17
2	EFT Coupling Clamp	HTEC	H3C	163701	2025-05-08	2026-05-07

SURGE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Surge Generator	3CTEST	SG5006G	EC5581070	2025-04-18	2026-04-17
2	Coupling / Decoupling Network	3CTEST	SGN-5010G	EC5591033	2025-04-18	2026-04-17

INJECTED CURRENTS (RADIO-FREQUENCY COMMON MODE)

Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Shield Room #2	CHENGYU	743	#2	2023-04-26	2028-04-25
2	Conducted Susceptibility Generator	HTEC	CDG6000	126A140012016	2025-04-18	2026-04-17
3	CDN	HTEC	CDN-M2+3	A22/0382/2016	2025-04-18	2026-04-17
4	6dB Attenuator	HTEC	ATT6	HA1601	2025-04-18	2026-04-17
5	Electromagnetic Clamp	LUTHI	EM101	35535	2025-04-18	2026-04-17
6	Test Software	HUBERT	CDG 6000	V1.4.1	/	/

VOLTAGEDIPS AND SHORT INTERRUPTIONS						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Voltage Dips and Up Generator	HTEC	HPFS161P	162202	2025-04-18	2026-04-17

RADIO-FREQUENCY ELECTROMAGNETIC FIELDS						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Semi Anechoic Chamber #1	CHENGYU	SAC-3M	03CH03-HY	2025-07-29	2030-07-28
2	Power Meter	R&S	NRP-Z11	115232	2025-02-21	2026-02-20
3	Power Meter	R&S	NRP-Z11	117755	2025-02-21	2026-02-20
4	Power Amplifier	SKET	LPA 0810-150	202302457	2025-02-21	2026-02-20
5	Power Amplifier	OPHIR	5273F	1019	2025-07-16	2026-07-15
6	Power Amplifier	SKET	HAP-0306G-50W	/	2025-07-16	2026-07-15
7	RF Signal Generator	Agilent	E4438C	MY42081396	2025-07-16	2026-07-15
8	Field Generating Antenna	SKET	STLP 9129 Plus	/	/	/
9	Test Software	SKET	EMC-S	V2.1.3.23	/	/

4. VERDICT SUMMARY SECTION

This chapter present an overview of the standards and results. Refer the next chapter for details of measured test results and applied test levels.

4.1. STANDARD(S)

EN IEC 55014-1:2021 - Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus Part 1: Emission.
EN IEC 55014-2:2021 - Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity.
EN IEC 61000-3-2:2019+A1:2021+A2:2024 - Electromagnetic compatibility (EMC) Part 3-2: Limits for harmonic current emissions (equipment input current ≤16 A per phase).
EN 61000-3-3:2013+A1:2019+A2:2021 - Electromagnetic compatibility (EMC)Part 3-3: Limits for 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.

4.2. OVERVIEW OF RESULTS

EMISSION TESTS - EN IEC 55014-1, EN IEC 61000-3-2, EN 61000-3-3		
Requirement - Test case	**Limit**	**Verdict**
Conducted Disturbance - AC mains port of equipment with active IPT functions	Table 2	N/A
Magnetic field strength- equipment with active IPT functions	Table 4	N/A
Conducted Disturbance - Mains ports	Table 5, Table 6	PASS
Conducted Disturbance - Auxiliary ports	Table 5	N/A
Disturbance power in the frequency range 30 MHz to 300MHz [1]	Table 7	N/A
Radiated Disturbance in the frequency range 30 MHz to 1 GHz [1]	Table 9	PASS
Radiated Disturbance in the frequency range Above 1 GHz	Table 11	N/A
Discontinuous Disturbances - Click	Clause 4.4.2	N/A
Harmonic Current	Clause 7	N/A
Voltage Fluctuations and Flicker	Clause 5	PASS
IMMUNITY TESTS - EN IEC 55014-2		
Requirement - Test case	**Basic Standard(s)**	**Verdict**
Electrostatic Discharge	IEC/EN 61000-4-2	PASS
Radio-Frequency Electromagnetic Fields	IEC/EN 61000-4-3	PASS
Electrical Fast Transient / Burst	IEC/EN 61000-4-4	PASS
Surge	IEC/EN 61000-4-5	PASS
Injected currents	IEC/EN 61000-4-6	PASS
Voltage Dips and Short Interruptions	IEC/EN 61000-4-11	PASS

Supplementary information :

The EUT shall be assessed for emissions in the frequency range from 30 MHz to 1 000 MHz by testing in accordance with either method 1) or 2).

1) The limits for radiated disturbances in Table 9 for the selected test method shall be met.

2) The EUT shall be met disturbance power limits, But the EUT shall be also deemed to comply with the requirement of this document in the frequency range from 300 MHz to 1 000 MHz without further testing if both conditions below are fulfilled:

- the disturbance power emission from the EUT is lower than the limits of Table 7 reduced by the values of Table 8;
- the maximum clock frequency is less than 30 MHz.

5. EMISSION TESTS

5.1. CONDUCTED DISTURBANCE

Standard	EN IEC 55014-1:2021
Basic Standard(s)	CISRP 16-2-1

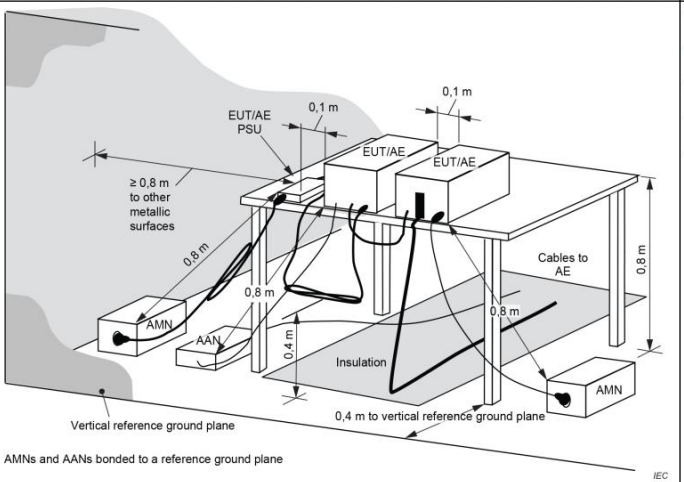
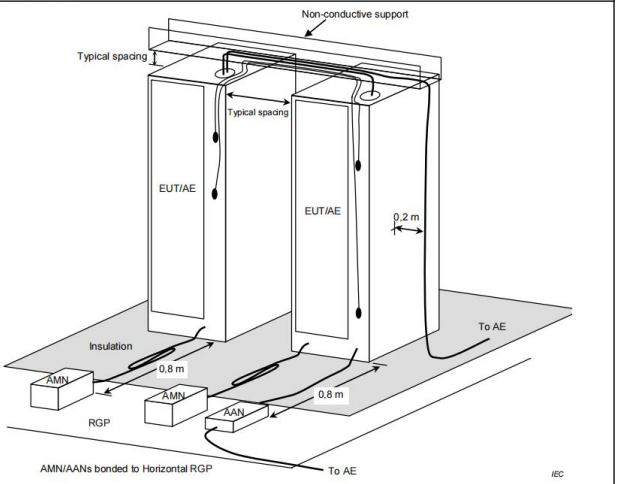
General limits

Frequency range [MHz]	Mains ports		Auxiliary ports				IF BW
	Quasi-peak [dB(µV)]	Average [dB(µV)]	Quasi-peak [dB(µV)]	Average [dB(µV)]	Quasi-peak [dB(µA)]	Average [dB(µA)]	
0,15 - 0,5	66 -56	59 - 46	80	70	40 - 30	30 - 20	9 kHz
0,5 - 5,0	56	46	74	64	30	20	
5,0 - 30	60	50	74	64			
1) At the transition frequency, the lower limit applies.							

Limits for the mains port of motor operated tools

Frequency range [MHz]	P ≤ 700W		700W < P ≤ 1000W		P > 1000W		IF BW
	Quasi-peak [dB(µV)]	Average [dB(µV)]	Quasi-peak [dB(µV)]	Average [dB(µV)]	Quasi-peak [dB(µA)]	Average [dB(µA)]	
0,15 - 0,35	66 -59	59 - 49	70 - 63	63 - 53	76 - 69	69 - 59	9 kHz
0,35 - 5,0	59	49	63	53	69	59	
5,0 - 30	64	54	68	58	74	64	
1) At the transition frequency, the lower limit applies. 2) P = rated power of the motor only.							

Test configuration

Test Setup for table-top	Test Setup for Floor standing
	

Test Procedure Description

For Table-top, EUT shall be placed at (0,8 ± 0,05) m above the reference plane of the test site selected for measurement. for Floor standing, EUT shall be placed at (0,12 ± 0,04) m above the reference plane of the test site selected for measurement.
and connected to the AC mains through artificial mains network (LISN). EUT is powered by V-type artificial power network,and the distance from LISN or ANN is 0,8m. the part of the EUT power cord exceeding 0,8m folds in parallel to form a 0,3-0,4 m eights harness.

Test Results refer to Annex A.1

5.2. RADIATED DISTURBANCE

Standard	EN IEC 55014-1:2021
Basic Standard(s)	CISRP 16-2-3
Test method	Semi Anechoic Chamber (SAC)

SAC Radiated disturbance limit in the frequency range 30 MHz - 1000 MHz

Frequency range [MHz]	Limit: Quasi-peak [dB(μV/m)]		IF BW
	3 m distance	10 m distance	
30 - 230	40	30	120 KHz
230 - 1000	47	37	
1) At the transition frequency, the lower limit applies.			

Radiated disturbance limit in the frequency range 1 GHz - 6 GHz

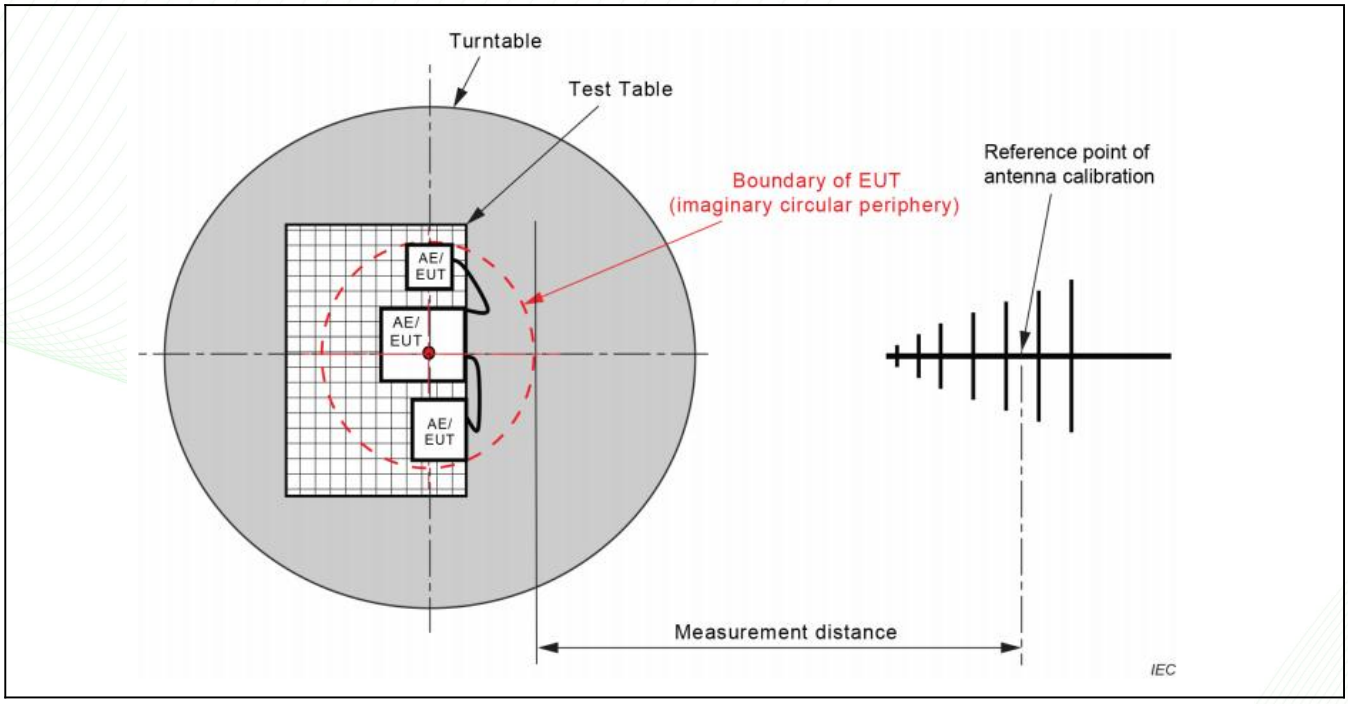
Frequency range [MHz]	Limit (3 m distance)		IF BW
	Peak [dB(μV/m)]	Average [dB(μV/m)]	
1000 - 3000	70	50	1MHz
3000 - 6000	74	54	

Required highest frequency for radiated measurement

Highest internal frequency (Fx)	Highest measured frequency
Fx ≤ 108 MHz	1 GHz
108 MHz < Fx ≤ 500 MHz	2 GHz
500 MHz < Fx ≤ 1 GHz	5 GHz
Fx > 1 GHz	5 × Fx up to a maximum of 6 GHz

1) Fx is highest fundamental frequency generated or used within the EUT or highest frequency at which it operates.

Test configuration



Test Procedure Description

The radiated disturbance test was conducted in a 3m Semi Anechoic Chamber and conforming to CISPR 16-2-3. the EUT is placed on a turntable, which is 0.8 meter high above the ground. the turntable can rotate 360 degrees to determine the position of the maximum emission level. the EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. the antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Log-periodic antenna or horn antenna is used as a receiving antenna. both horizontal and vertical polarization of the antenna is set on test.

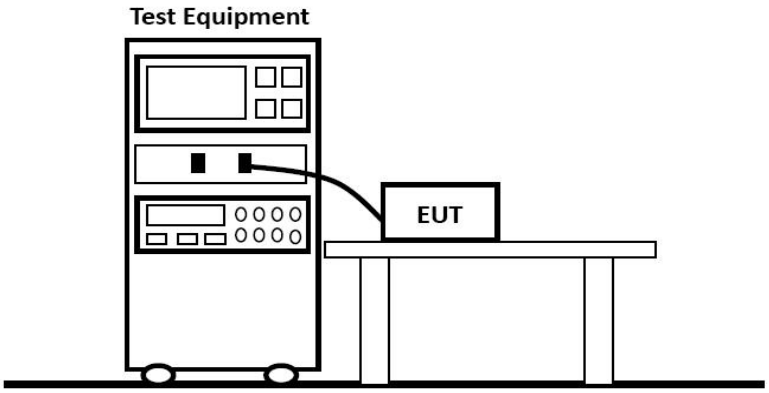
Test Results refer to Annex A.2

5.3. HARMONIC CURRENT

Standard	EN IEC 61000-3-2:2019+A1:2021+A2:2024	
Exlusions (For these categories of equipment, limits are not specified in the EN IEC 61000-3-2)	☐	Systems with nominal voltages less than 220VAC (line-to-neutral)
	☐	Lighting equipment with rated power < 5 W
	☒	Equipment with rated power of ≤ 75 W (other than lighting equipment)
	☐	Professional equipment with a total rated power >1kW
	☐	Symmetrically controlled heating elements with rated power ≤ 200 W
	☐	Independent dimmers for incandescent lamps with rated power ≤ 1kW

Classification				
☒	Class A	All equipment not specified as belonging to Class B, C or D		
☐	Class B	Portable tools		
☐	Class C	☐	Lighting equipment with active input power > 25W	
		☐	Lighting equipment with active input power ≥ 5W and ≤ 25W	
			☐	Table 3, column 2 (Power-related limits)
			☐	3rd harmonic ≤ 86%, 5th harmonic ≤ 61% and waveform conditions
			☐	THD ≤ 70%, Harmonic:3rd ≤ 35%, 5th ≤ 25%, 7th ≤ 30%, 9th and 11th ≤ 20%, 2nd ≤ 5%
☐	Class D	Personal computers, television receivers,refrigerators and freezers having one or more variable-speed drives to control compressor		

Test configuration



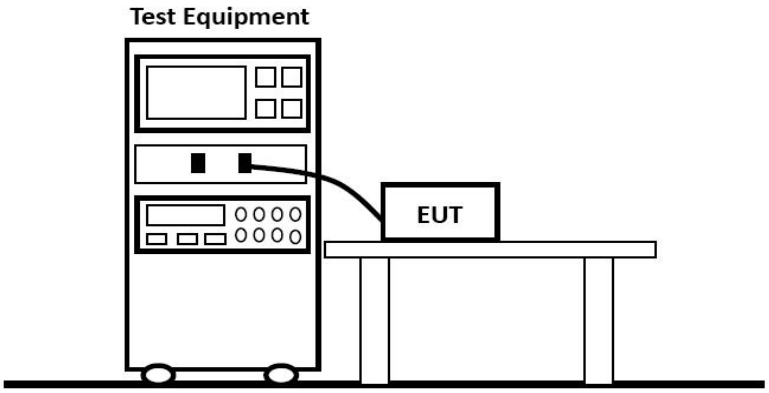
5.4. VOLTAGE FLUCTUATIONS & FLICKER

Standard	EN 61000-3-3:2013+A1:2019+A2:2021

Limit

P_{st} (Short term flicker)	☒	≤ 1	☐	Not applicable
P_{lt} (Long-term flicker)	☒	≤ 0,65	☐	Not applicable
T_{max} (Accumulated time)	☒	≤ 500 ms	☐	Not applicable
d_c (Relative voltage change)	☒	≤ 3.3%	☐	Not applicable
d_{max} (Max.voltage change)	☒	≤ 4%	☐	≤ 6%
	☐	≤ 7%	☐	Not applicable

Test configuration



Test Results refer to Annex A.3

6. IMMUNITY TESTS

6.1. PERFORMANCE CRITERIA

Standard	EN IEC 55014-2:2021

Performance criterion A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Performance criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after the test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Performance criterion C: Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Classification of apparatus		Tests and performance criteria							
		ESD	RS	PFMF	EFT	CS	Surge	Dips	Interruption
☐	Category I	---	---	---	---	---	---	---	---
☐	Category II	B	---	---	B	A	B	C	C
☐	Category III	B	A	---	B	A	B	---	---
☒	Category IV	B	A	---	B	A	B	C	C
☐	Category V	B	A	---	B	A	B	C	C

Supplementary information:

Category I: Apparatus containing no electronic control circuit.

Category II: Mains operated equipment containing electronic control circuitry with no clock frequency higher than 15 MHz.

Category III: Battery operated equipment not included in Category I.

Category IV: Mains operated equipment containing electronic control circuitry with a highest clock frequency greater than 15MHz but less than or equal to 200MHz.

Category V: Mains operated equipment containing electronic control circuitry with a highest clock frequency greater than 200MHz.

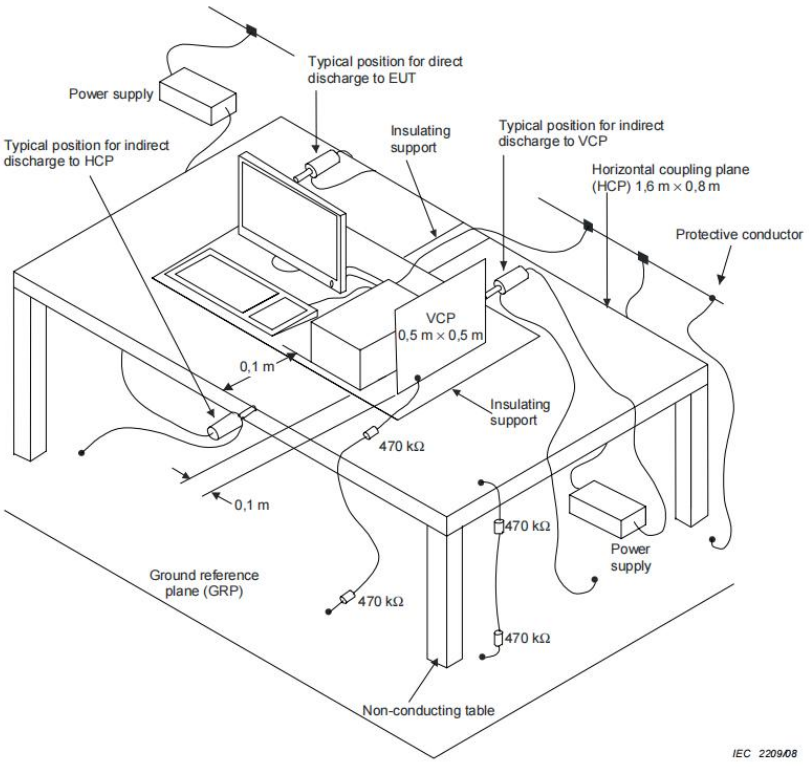
6.2. ELECTROSTATIC DISCHARGE

Electrostatic discharge (ESD) is the result of accumulated static electricity from a person or object, for example, walking on a synthetic carpet. ESD can indirectly affect the operation of equipment or damage its electronic components through direct discharge or coupling. both effects were simulated during the test. contact discharge is the preferred test method. twenty discharges (10 with positive and 10 with negative polarity) shall be applied on each accessible metallic part of the enclosure (terminals are excluded). air discharges shall be used where contact discharges cannot be applied. discharges shall be applied on the horizontal or vertical coupling planes.taken into consideration when selecting test points, paying particular attention to keyboards, dialling pads, power switches, mice, drive slots, card slots, the areas around communication ports, etc.

Requirements

Standard	EN IEC 55014-2:2021							
Basic standard	EN 61000-4-2							
Port under test	Enclosure							
Contact discharge	☒	± 2 kV	☒	± 4 kV	☐	±8 kV	☐	kV
Air discharge	☒	± 2 kV	☒	± 4 kV	☒	±8 kV	☐	kV
Number of discharges	≥ 10 per polarity with ≥ 1 sec interval							

Test configuration



Test Results refer to Annex A.4

6.3. RADIO-FREQUENCY ELECTROMAGNETIC FIELDS

During the test it is verified if the EUT has sufficient immunity against radiated electromagnetic fields.

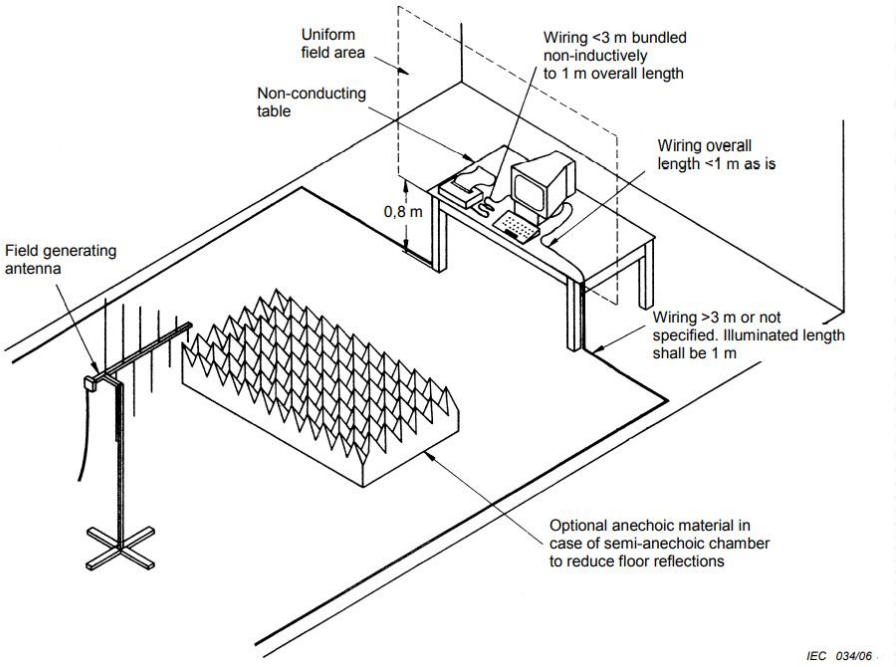
The test was carried out in a half-wave anechoic chamber with absorbent material attached to a reflective ground plate, Before the test, the test field strength needs to be calibrated. during the calibration, the corresponding relationship between the target field strength and the forward power applied to the transmitting antenna is established.during the test, except for EUT, the indoor layout is consistent with the calibration.

The EUT and its simulators are placed on a turn table which is 0,8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. both horizontal and vertical polarization of the antenna are set on test. each of the four sides of EUT must be faced this transmitting antenna and measured individually. in order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

Requirements

Standard	EN IEC 55014-2:2021			
Basic standard	EN 61000-4-3			
Port under test	Enclosure			
Frequency range	Test level	Modulation	Dwell time	Step size
80 - 1000 MHz [1]	3 V/m	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
1) Selection of the test frequency range : - Category V equipment the test frequency is 80 - 6000 MHz. - Other Classification of equipment the test frequency see EN IEC 55014-2:2021 7.2.				

Test configuration



Test Results refer to Annex A.4

6.4. ELECTRICAL FAST TRANSIENT / BURST

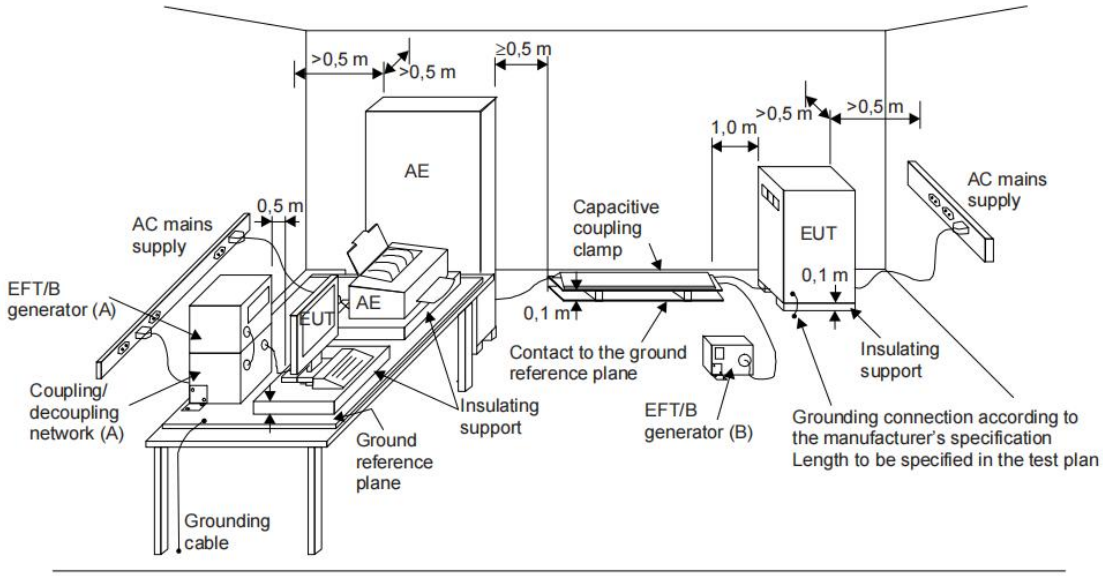
The EFT immunity test simulates the disturbances by caused of very short transient bursts.

The EUT is put on the Insulating support which is 0.1 meter high above the ground reference plane. the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5 m. both polarities of the test voltage should be applied during test, fast transients are carried out with a minimum duration of 2 min with a positive polarity and a minimum of 2 min with a negative polarity.

Requirements

Standard		EN IEC 55014-2:2021		
Basic standard		EN 61000-4-4		
Pulse characteristics		5/50ns		
Port under test		Test level	Repetition frequency	Duration
☒	AC Input / Output power	± 1000 V	5 kHz	2 min / polarity
☐	DC Input / Output power [1]	± 500 V	5 kHz	2 min / polarity
☐	Signal / control / wired network [1]	± 500 V	5 kHz	2 min / polarity
1) Only applicable to ports interfacing with cables whose whose total length may exceed 3 m.				

Test configuration



Test Results refer to Annex A.4

6.5. INJECTED CURRENTS

During the test the immunity of the EUT for conducted electromagnetic fields is checked .

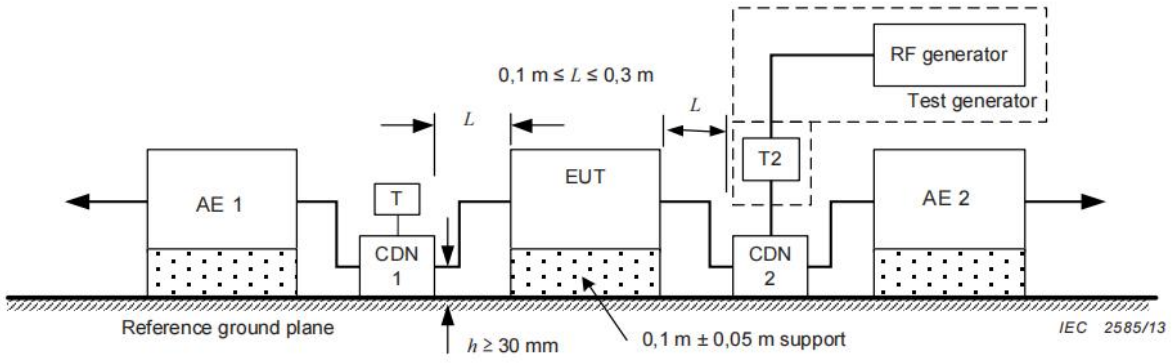
The equipment to be tested is placed on an insulating support of 0,1 m ± 0,05 m height above a reference ground plane. a non conductive roller/caster in the range of 0,1 m ± 0,05 m above the reference ground plane can be used as an alternative to an insulating support. all cables exiting the EUT shall be supported at a height of at least 30 mm above the reference ground plane.The coupling and decoupling devices shall be placed on the reference ground plane, making direct contact with it at a distance of 0,1 m to 0,3 m from the EUT.

Requirements

Standard		EN IEC 55014-2:2021			
Basic standard		EN 61000-4-6			
Frequency range [2]		0,15 - 230MHz			
Port under test		Test level	Modulation	Dwell time	Step size
☒	AC Input / Output power	3 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
☐	DC Input / Output power [1]	1 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
☐	Signal / control / Wired network [1]	1 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%

1) Only applicable to ports interfacing with cables whose whose total length may exceed 3 m.
2) Selection of the test frequency range :
- Category II equipment the test frequency is 0,15 - 230MHz.
- Other Classification of equipment the test frequency is 0,15 - 80MHz.

Test configuration



Test Results refer to Annex A.4

6.6. SURGE

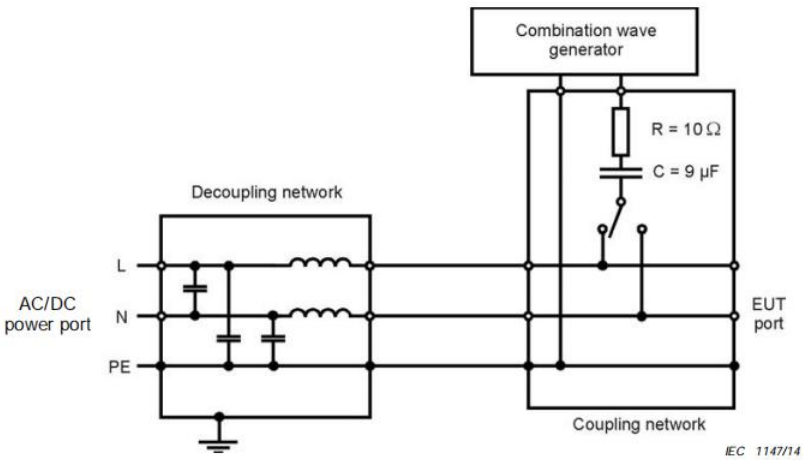
The surge immunity test is simulates unidirectional surges caused by overvoltages from switching and lightning transients.

The surge is applied to the EUT power supply terminal via the capacitive coupling network, to the EUT power supply provide a 1,0 KV 1,2/50us voltage surge (at open-circuit condition), at least 5 positive and 5 negative tests with 1 min or less repetition rate are conducted during test. and phase angles is 90°and 270°.

Requirements

Standard	EN IEC 55014-2:2021			
Basic standard	EN 61000-4-5			
Pulse wave-shape	1,2/50 μs			
Repetition rate	1 per minute or faster			
Number of pulses	5 pulses (at each polarity and phase angles)			
Port under test		Test Level	Coupling	Phase angle
☒	AC Input power	+ 1 kV	line - line	90°
		- 1 kV	line - line	270°
		+ 2 kV	line - ground [1]	90°
		- 2 kV	line - ground [1]	270°
1) No line-to-earth surges are applied to products which do not have provision for connection to earth.				

Test configuration



Test Results refer to Annex A.4

6.7. VOLTAGE DIPS AND SHORT INTERRUPTIONS

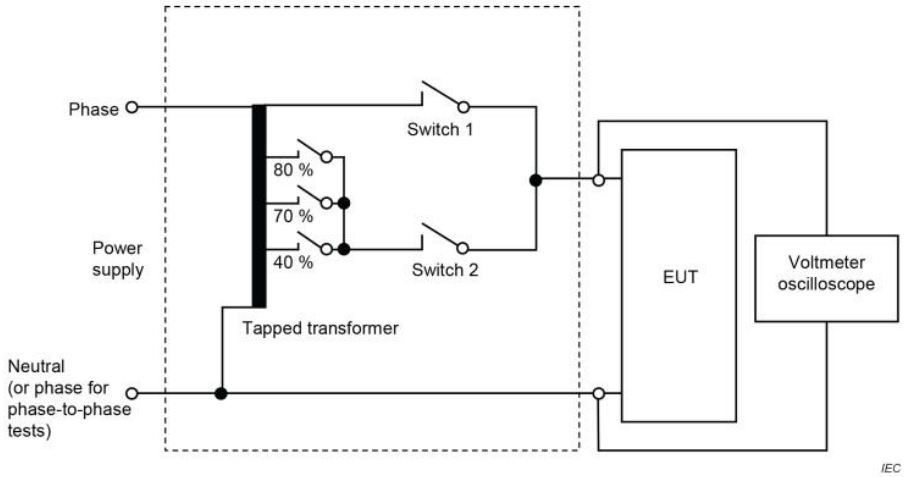
The immunity test is simulates Voltage dips and short interruptions occur due to faults in a (public or non-public) network or in installations by sudden changes of large loads.

The EUT shall be connected to the test generator for testing using the shortest power cable specified by the EUT manufacturer and, if no cable length is specified, the shortest cable suitable for the EUT, each representative mode of operation shall be tested. for short interruptions to use 0° for one of the phases.

Requirements

Standard	EN IEC 55014-2:2021		
Basic standard	EN 61000-4-11		
# of dips / interruptions	3 dips / interruptions for each test level and phase angle		
Intervals between events	≥ 10 s		
Port under test	Test level [1]	Number of periods (cycles)	
		50Hz	60Hz
AC Input power	0% of U_{NOM}	0,5	0,5
	40% of U_{NOM}	10	12
	70% of U_{NOM}	25	30
1) Where the equipment has a rated voltage range the following shall apply: - If the voltage range does not exceed 20 % of the lower voltage specified for the rated voltage range, a single voltage within that range may be specified as a basis for the test level specification. - in all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.			

Test configuration



Test Results refer to Annex A.4

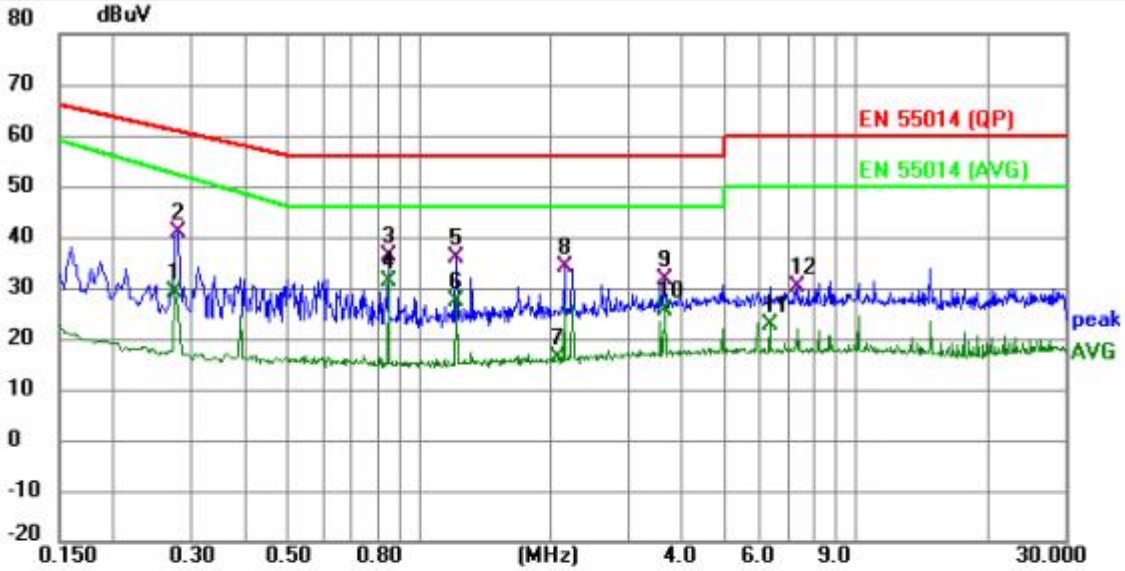
ANNEX A - TEST RESULTS

A.1. CONDUCTED DISTURBANCE TEST RESULTS

This Test Environment Conditions: 22.5℃, 53.7%RH

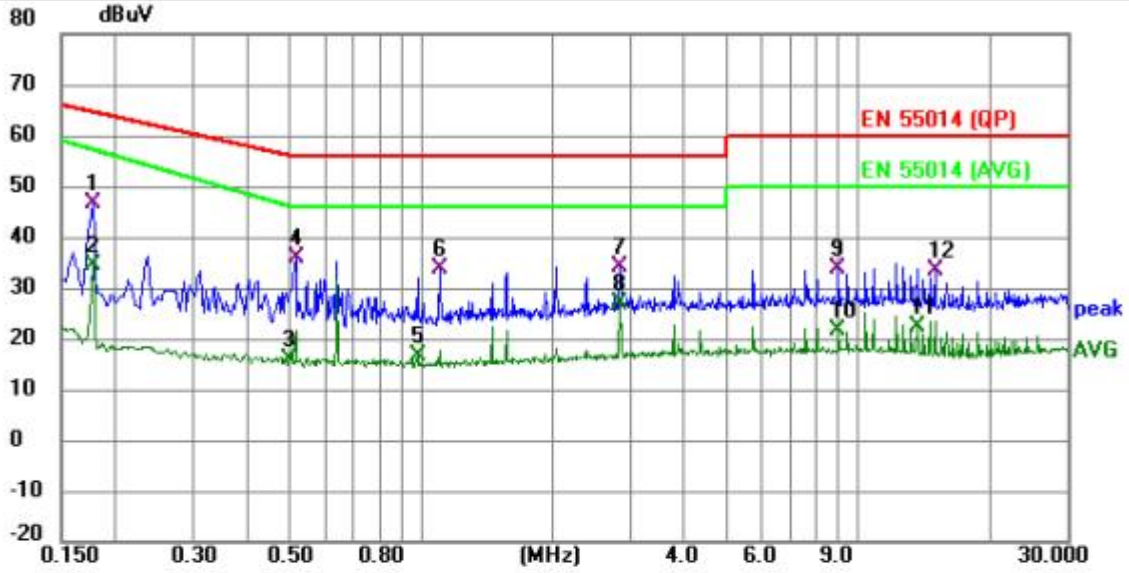
M/N: C4-AA
Input voltage: AC 230V/50Hz
Operating mode: Mode 1

Pol: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2760	8.58	20.35	28.93	52.42	-23.49	AVG	
2		0.2805	20.48	20.35	40.83	60.80	-19.97	QP	
3		0.8520	15.89	20.47	36.36	56.00	-19.64	QP	
4	*	0.8520	10.81	20.47	31.28	46.00	-14.72	AVG	
5		1.2120	15.51	20.48	35.99	56.00	-20.01	QP	
6		1.2164	6.94	20.47	27.41	46.00	-18.59	AVG	
7		2.0803	-4.29	20.45	16.16	46.00	-29.84	AVG	
8		2.1524	13.51	20.45	33.96	56.00	-22.04	QP	
9		3.6420	11.11	20.52	31.63	56.00	-24.37	QP	
10		3.6420	5.10	20.52	25.62	46.00	-20.38	AVG	
11		6.3420	2.19	20.51	22.70	50.00	-27.30	AVG	
12		7.3455	9.74	20.49	30.23	60.00	-29.77	QP	

Pol:	Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1770	26.16	20.33	46.49	64.63	-18.14	QP	
2		0.1770	14.16	20.33	34.49	57.21	-22.72	AVG	
3		0.4993	-4.25	20.11	15.86	46.02	-30.16	AVG	
4		0.5144	15.85	20.13	35.98	56.00	-20.02	QP	
5		0.9825	-3.87	20.46	16.59	46.00	-29.41	AVG	
6		1.1040	13.19	20.46	33.65	56.00	-22.35	QP	
7		2.8500	13.43	20.53	33.96	56.00	-22.04	QP	
8		2.8500	6.61	20.53	27.14	46.00	-18.86	AVG	
9		8.9745	13.22	20.59	33.81	60.00	-26.19	QP	
10		8.9745	1.18	20.59	21.77	50.00	-28.23	AVG	
11		13.6230	1.64	20.60	22.24	50.00	-27.76	AVG	
12		15.0225	12.59	20.64	33.23	60.00	-26.77	QP	

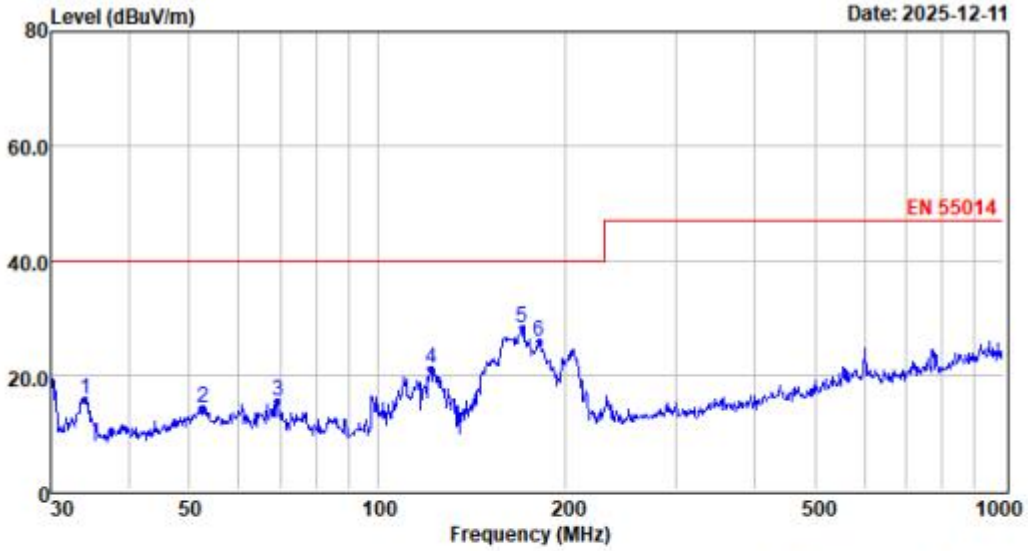
Remark:
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)

A.2. RADIATED DISTURBANCE TEST RESULTS

This Test Environment Conditions: 22.3℃, 53%RH

M/N: C4-AA
Input voltage: AC 230V/50Hz
Operating mode: Mode 1

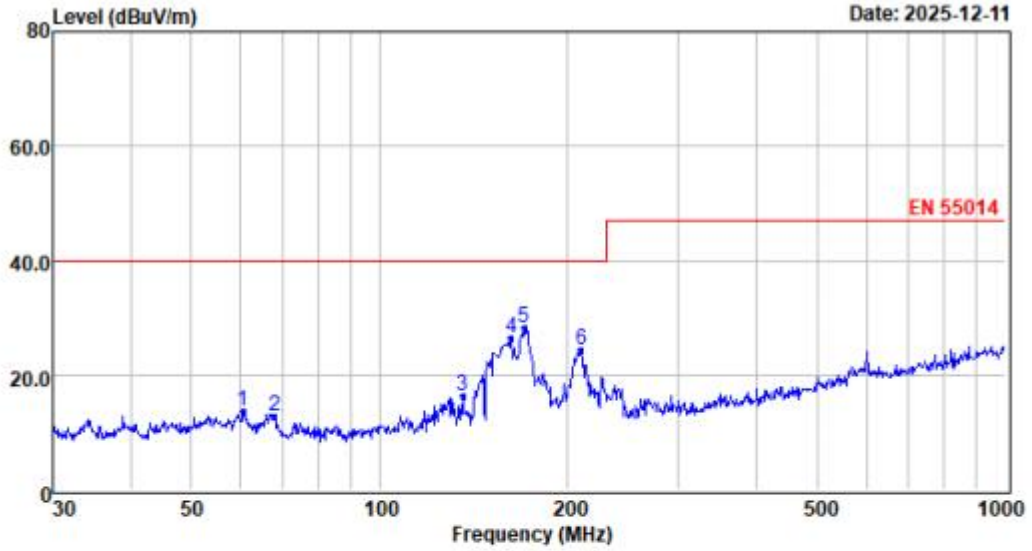
Pol:	Vertical



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	34.04	4.52	0.45	10.85	15.82	40.00	-24.18	QP
2	52.58	1.13	0.61	12.57	14.31	40.00	-25.69	QP
3	69.11	4.24	0.69	10.39	15.32	40.00	-24.68	QP
4	121.55	9.85	0.91	10.41	21.17	40.00	-18.83	QP
5	170.19	17.51	1.11	9.70	28.32	40.00	-11.68	QP
6	181.28	14.80	1.14	9.87	25.81	40.00	-14.19	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that are 20db below the official limit are not reported

Pol:	Horizontal



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	60.49	0.69	0.65	12.38	13.72	40.00	-26.28	QP
2	67.91	1.45	0.69	10.65	12.79	40.00	-27.21	QP
3	135.98	6.59	0.98	8.85	16.42	40.00	-23.58	QP
4	162.61	16.04	1.08	9.33	26.45	40.00	-13.55	QP
5	170.19	17.50	1.11	9.70	28.31	40.00	-11.69	QP
6	210.05	11.99	1.21	11.26	24.46	40.00	-15.54	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that are 20db below the official limit are not reported

Remark:
Level=Reading Level + Correction Factor
Correction Factor=Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

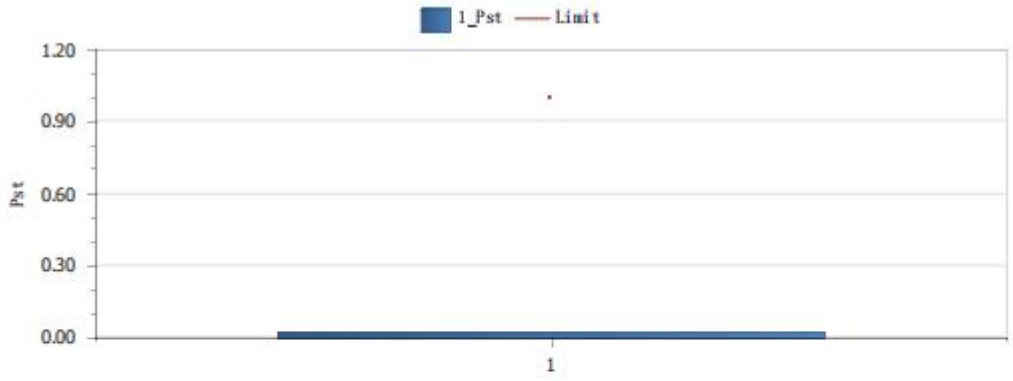
A.3. VOLTAGE FLUCTUATIONS & FLICKER TEST RESULTS

This Test Environment Conditions: 24.8℃, 55.7%RH

M/N: C4-AA
Input voltage: AC 230V/50Hz
Operating mode: Mode 1

Customer : Result : Pass

Pst and Limit



Plt and Limit

Relevant Parameter and Judgment During Test Period

Voltage at end of test	230.144V		
Voltage Fluctuation and Flicker	Test Value	Test Limit	Result
Tmax	0ms	500ms	Pass
dc	0.00%	3.30%	Pass
dmax	0.00%	4.00%	Pass
Pst	0.022	1.000	Pass
Plt	0.010	0.650	Pass

Eleml Test Parameters

Count	dc(%)	dmax(%)	Tmax(ms)	Pst	Plt
1	0.00	0.00	0.00	0.022	0.010

A.4. IMMUNITY TEST RESULTS

ELECTROSTATIC DISCHARGE TEST RESULTS					
Test model	C4-AA		Temperature	23.5℃	
Test mode	Mode 1		Humidity	52%	
Input voltage	AC 230V/50Hz		Pressure	1009mbar	
Discharge Mode	**Test Points**	**Test Voltage (kV) & polarity**	**Number of discharges/polarity**	**Discharge interval (s)**	**Performance Criteria**
Contact Discharge	Conductive surfaces	± 4	10	1	B
Air Discharge	Insulating surfaces	± 2&4&8	10	1	B
VCP	-	± 4	10	1	B
HCP	-	± 4	10	1	B
Note :					

RADIO-FREQUENCY ELECTROMAGNETIC FIELD TEST RESULTS				
Test model	C4-AA		Temperature	24.5℃
Test mode	Mode 1		Humidity	53%
Input voltage	AC 230V/50Hz		Pressure	1009mbar
Angle of EUT	**Antenna polarization**	**Frequency Range**	**Test Level**	**Performance Criteria**
0°	Vertical, Horizontal	80 - 1000 MHz	3 V/m	A
90°	Vertical, Horizontal	80 - 1000 MHz	3 V/m	A
180°	Vertical, Horizontal	80 - 1000 MHz	3 V/m	A
270°	Vertical, Horizontal	80 - 1000 MHz	3 V/m	A
Note : (1) Modulation:1kHz, 80% AM.				

ELECTRICAL FAST TRANSIENT/BURST TEST RESULTS				
Test model	C4-AA		Temperature	24.0℃
Test mode	Mode 1		Humidity	54%
Input voltage	AC 230V/50Hz		Pressure	1009mbar
Port under test	**Test Level&polarity**	**Repetition Frequency**	**Test duration /polarity**	**Performance Criteria**
AC input power	± 1 kV	5 kHz	2min	B
DC input power				
Signal / control / wired network				
Note :				

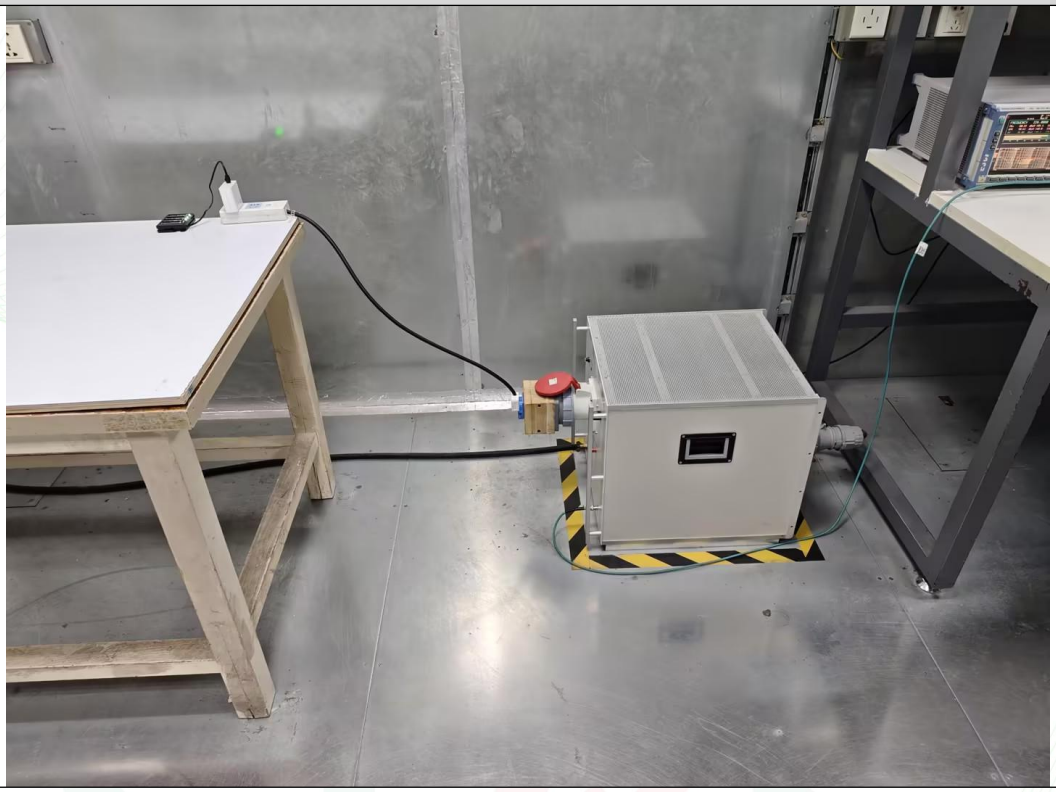
INJECTED CURRENTS TEST RESULTS				
Test model	C4-AA		Temperature	24.0℃
Test mode	Mode 1		Humidity	54%
Input voltage	AC 230V/50Hz		Pressure	1009mbar
Port under test	**Test Level**	**Coupling method**	**Dwell time**	**Performance Criteria**
AC input power	3 V	CDN	1 seconds	A
DC input power				
Signal / control / wired network				
Note: (1) Frequency range:0.15MHz - 230MHz.				

SURGE TEST RESULTS						
Test model	C4-AA			Temperature	24.0℃	
Test mode	Mode 1			Humidity	54%	
Input voltage	AC 230V/50Hz			Pressure	1009mbar	
Port under test	**Coupling**	**Test Level & polarity(kV)**	**Phase angle (°)**	**Number of surges**	**Repetition rate(s)**	**Performance criteria**
AC Input power	L - N	+ 1	90	5	60	B
		- 1	270	5	60	B
Note:						

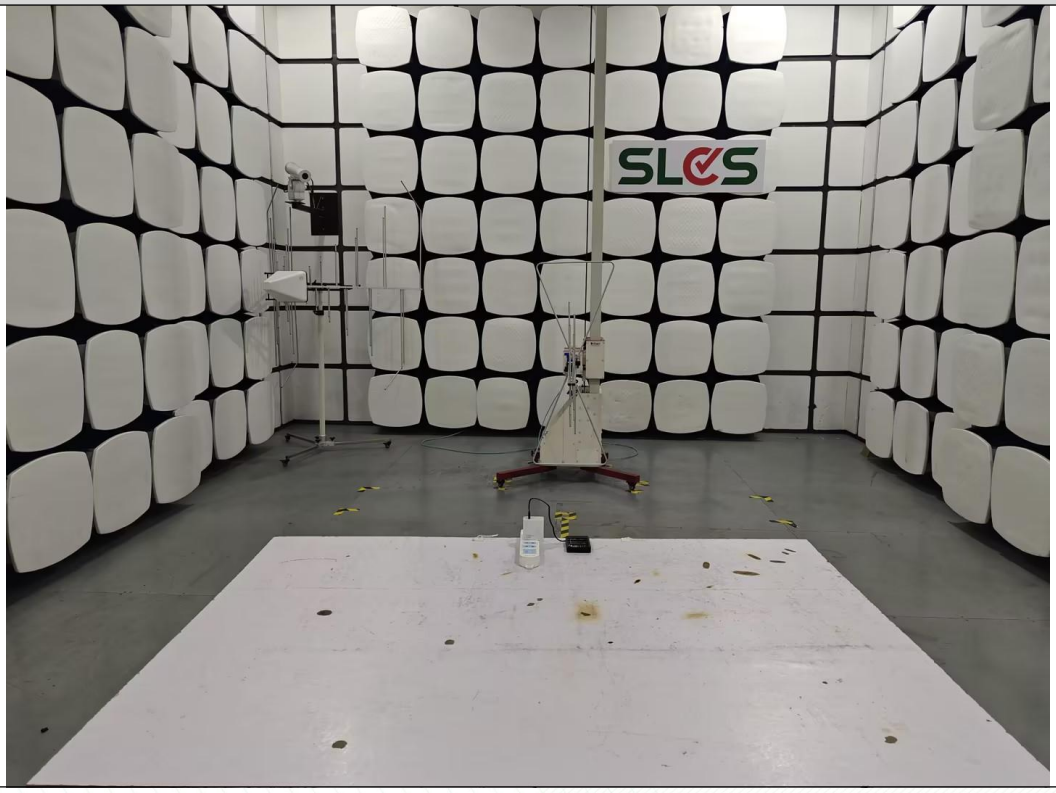
VOLTAGE DIPS AND SHORT INTERRUPTIONS TEST RESULTS					
Test model	C4-AA			Temperature	24.0℃
Test mode	Mode 1			Humidity	54%
Input voltage	AC 230V/50Hz			Pressure	1009mbar
U_{NOM} (Vac)	**Test Level (% U_{NOM})**	**Number of periods**		**Phase angle (°)**	**Performance criteria**
		50Hz	**60Hz**		
230	0	0.5	0.5	0	C
	40	10	12	0, 90, 180, 270	C
	70	25	30	0, 90, 180, 270	C
Note:					

ANNEX B - TEST PHOTOS

B.1. Conducted Disturbance

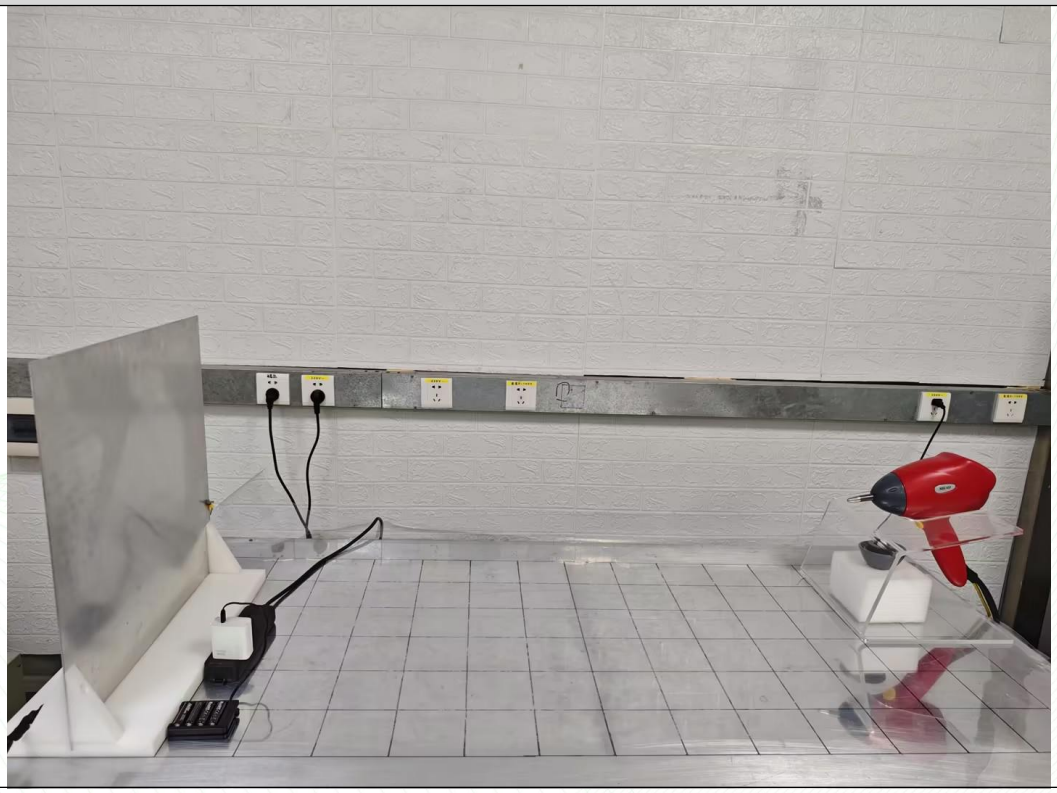


B.2. Radiated Disturbance& Radio-Frequency Electromagnetic Fields



B.3. Harmonic Current & Flicker

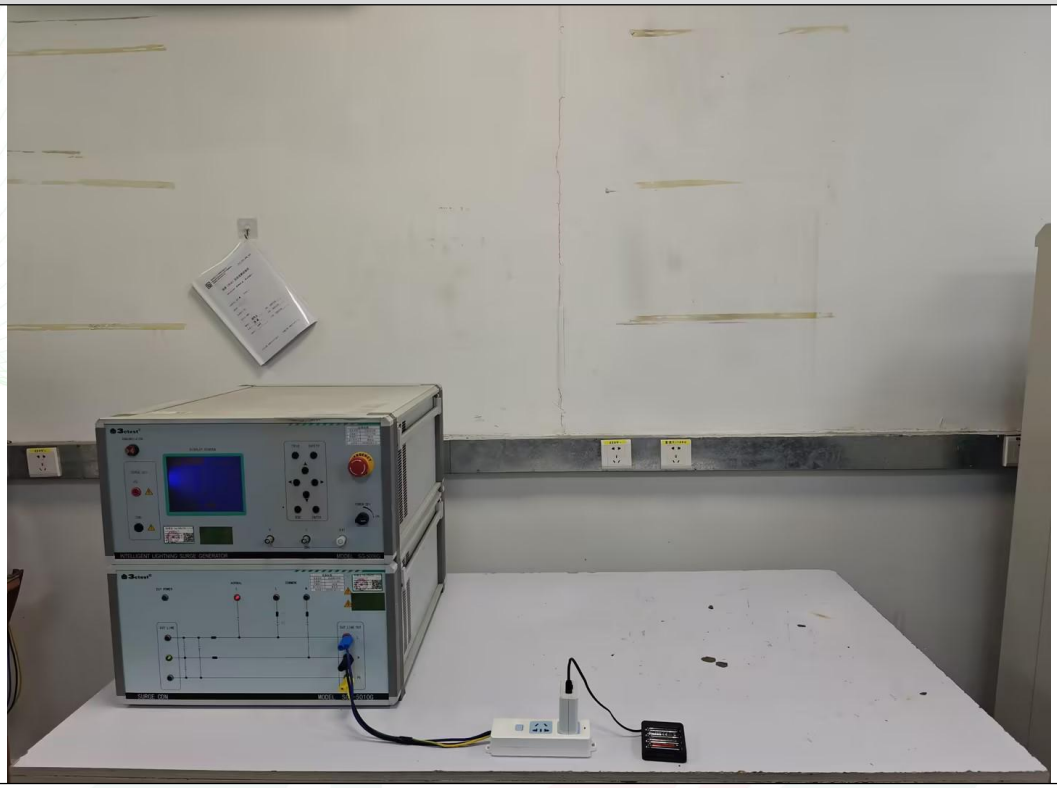
B.4. Electrostatic Discharge



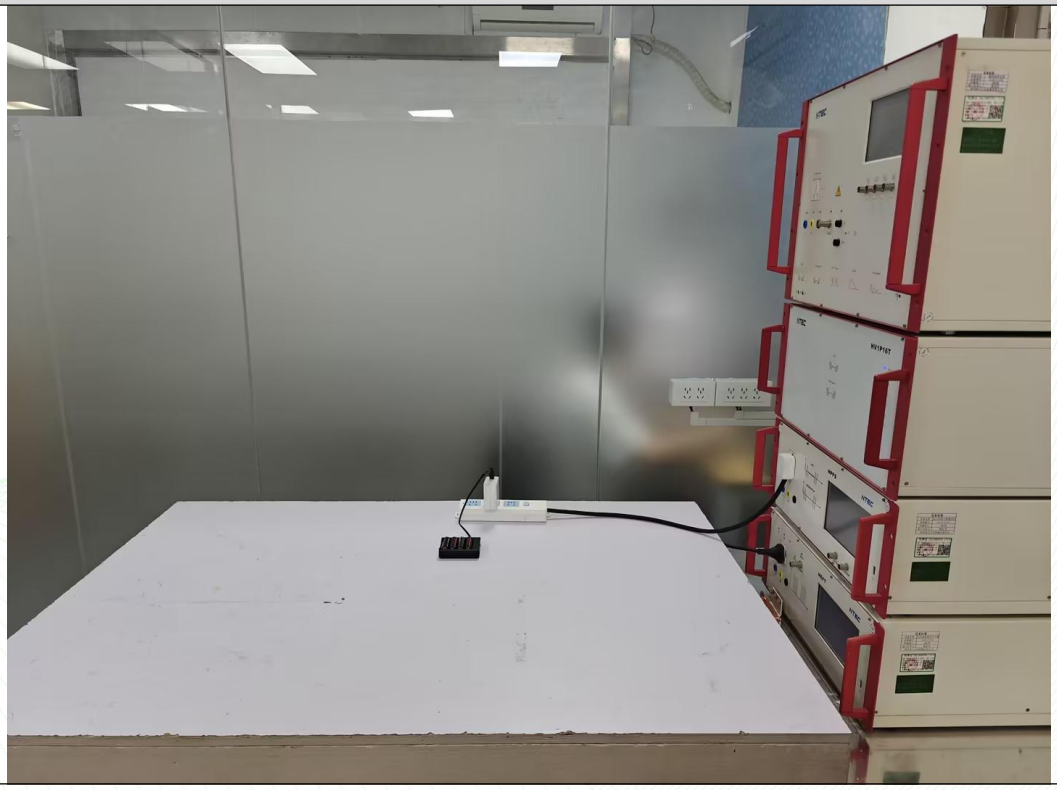
B.5. Electrical Fast Transient / Burst

B.6. Injected currents

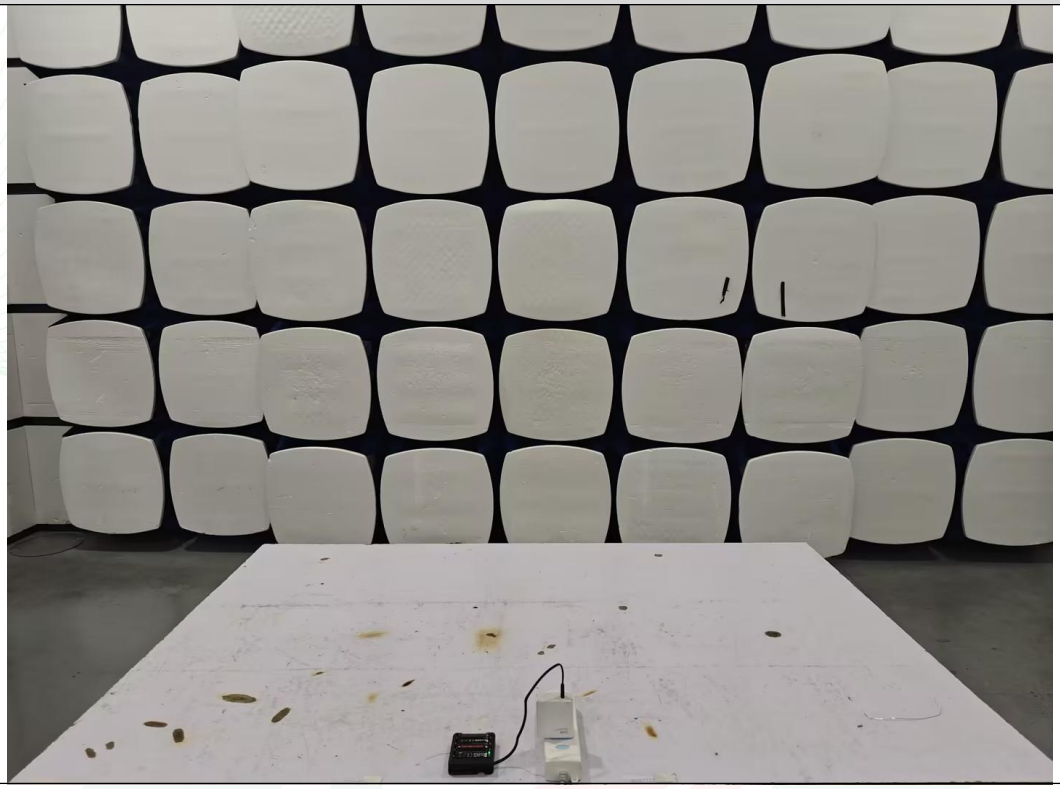
B.7. Surge



B.8. Voltage Dips and Short Interruptions



B.9. Radio-Frequency Electromagnetic Fields



ANNEX C - EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Photo.1

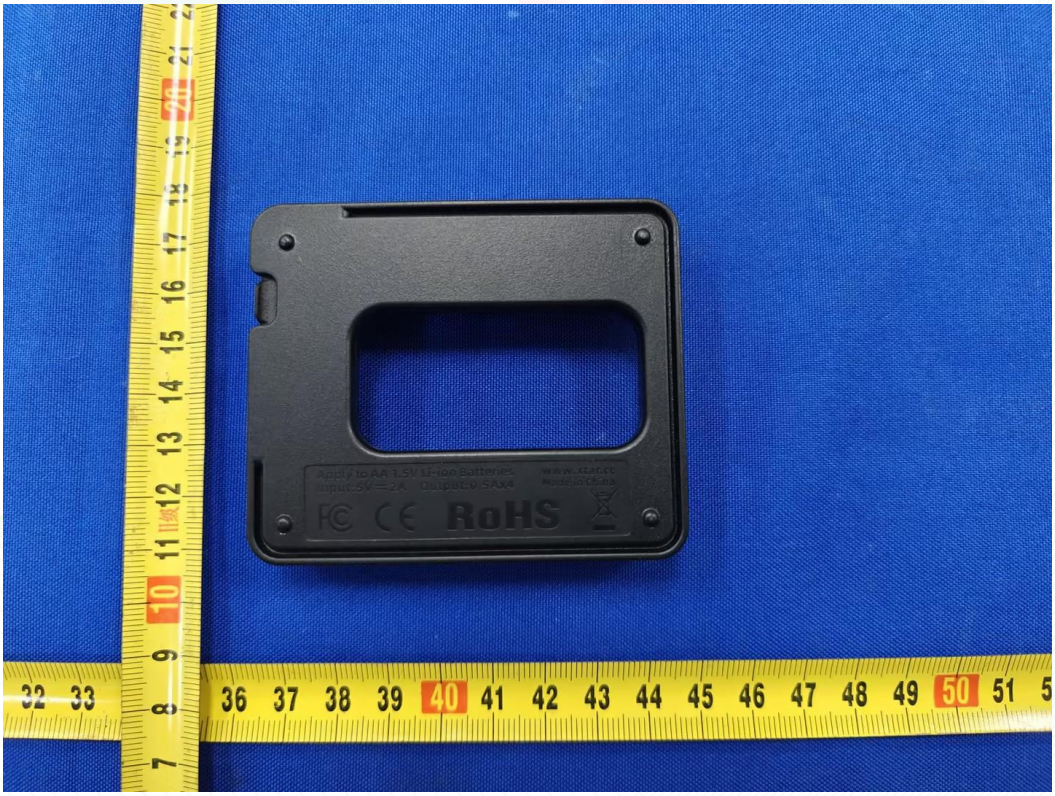


Photo.2

Photo.3

Photo.4

Photo.5

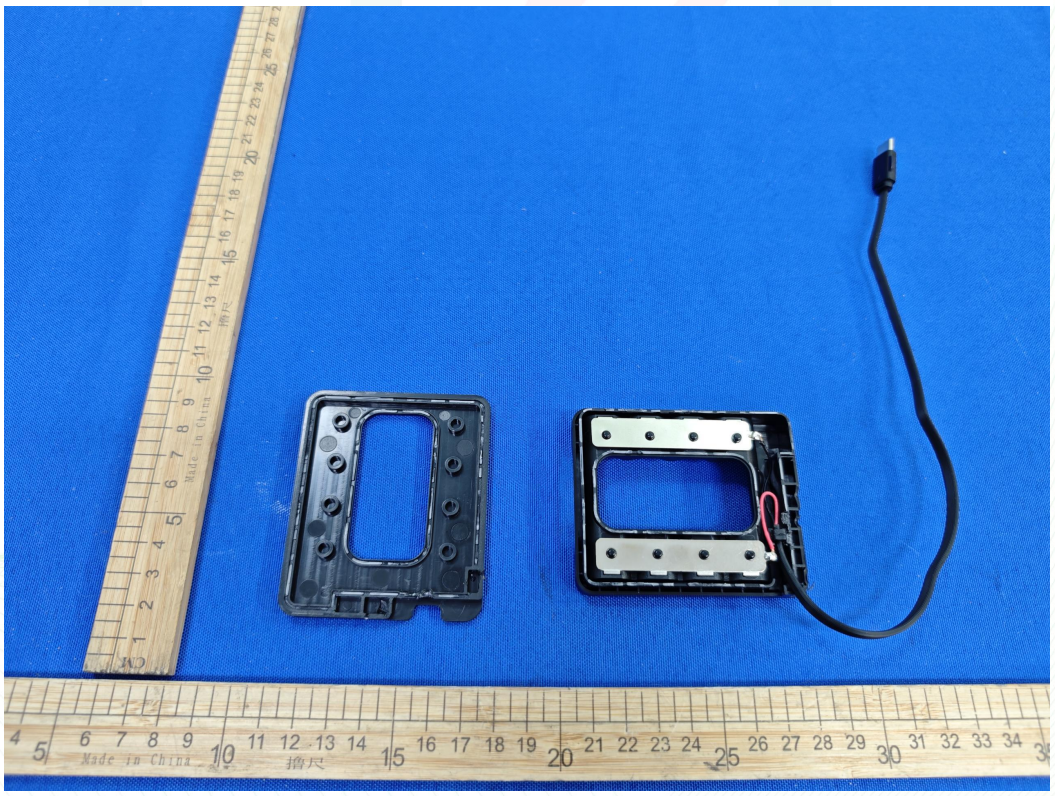


Photo.6

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