EMC TEST REPORT

For

Suparo Industries Ltd

45W Dual USB-C Wall Charger

Test Model: S45DB

Additional Model No.: Please Refer to Page 9

Prepared for	:	Suparo Industries Ltd
Address	:	Weir Street, Blackburn, BB2 2AN, United Kingdom
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
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Web	:	www.lcs-cert.com
Mail	:	webmaster@lcs-cert.com
Date of receipt of test sample	:	October 08, 2024
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	October 08, 2024 to October 21, 2024
Date of Report	:	October 22, 2024

TEST REPORT

Report No.	:	**LCSA09294072E**
Date of Issue	:	October 22, 2024
Testing Laboratory Name	:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name	:	**Suparo Industries Ltd**
Address	:	Weir Street, Blackburn, BB2 2AN, United Kingdom
Test Specification		
Standard	:	BS EN 55032:2015+A1:2020 BS EN IEC 61000-3-2:2019+A1:2021 BS EN 61000-3-3:2013+A2:2021 BS EN 55035:2017+A11:2020
Test Report Form No.	:	TRF-4-E-006 A/0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

Test Item Description.	:	**45W Dual USB-C Wall Charger**
Trade Mark	:	suparo
Test Model	:	S45DB
Result	:	**Positive**

Compiled by:	Supervised by:	Approved by:
Coco Song	Cary Luo	
Coco Song / File Administrator	Cary Luo/ Technique principal	Gavin Liang / Manager

TEST REPORT

Test Report No.: LCSA09294072E	October 22, 2024 Date of issue

Test Model	:	**S45DB**
EUT	:	45W Dual USB-C Wall Charger
Applicant	:	**Suparo Industries Ltd**
Address	:	Weir Street, Blackburn, BB2 2AN, United Kingdom
Telephone	:	/
Fax	:	/
Manufacturer	:	**FOSHAN G-POWER TECHNOLOGY CO.,LTD**
Address	:	B4-601, 602, 603, 604, 702, 704, SXC, No. 1 Fusheng West Road, Dafuji Community, Ronggui Street, Shunde District, Foshan City, 528300, Guangdong Province, China
Telephone	:	/
Fax	:	/
Factory	:	**FOSHAN G-POWER TECHNOLOGY CO.,LTD**
Address	:	B4-601, 602, 603, 604, 702, 704, SXC, No. 1 Fusheng West Road, Dafuji Community, Ronggui Street, Shunde District, Foshan City, 528300, Guangdong Province, China
Telephone	:	/
Fax	:	/

Test Result	**Positive**

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.

Revision History

Report Version	Issue Date	Revision Content	Revised By
000	October 22, 2024	Initial Issue	/

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Test Report Description Page

1. TEST STANDARDS

The tests were performed according to following standards:

BS EN 55032:2015+A1:2020: Electromagnetic compatibility of multimedia equipment - Emission requirements

BS 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 16A per phase)

BS EN 61000-3-3:2013+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 ≤ 16A per phase and not subject to conditional connection

BS EN 55035:2017+A11:2020: Electromagnetic compatibility of multimedia equipment - Immunity requirements.

2. SUMMARY OF STANDARDS AND RESULTS

2.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

Description of Test Item	Standard	Limits	Result
Conducted emissions from AC mains power ports (150kHz-30MHz)	BS EN 55032:2015+A1:2020	Class B	Pass
Radiated emissions (30MHz-1GHz)	BS EN 55032:2015+A1:2020	Class B	Pass
Harmonic current emission	BS EN IEC 61000-3-2:2019+A1:2021	Class A	N/A
Voltage fluctuations and flicker	BS EN 61000-3-3:2013+A2:2021	EN 61000-3-3, Clause 4	Pass
Electrostatic discharges	BS EN 55035:2017+A11:2020	Contact Discharge: +/-4kV Air Discharge: +/- 8kV	Pass
RF electromagnetic field disturbances	BS EN 55035:2017+A11:2020	3V/m, 80%, 1kHz Amp. Mod.	Pass
Electrical fast transients / burst for AC mains power ports	BS EN 55035:2017+A11:2020	1kV; 5/50ns Tr/Th; 5kHz Repetition Frequency	Pass
Surges for AC mains power ports	BS EN 55035:2017+A11:2020	1.2/50μs Tr/Td; 1kV Line to Line	Pass
Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)	BS EN 55035:2017+A11:2020	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%,1kHz Amp. Mod.	Pass
Voltage dips and interruptions	BS EN 55035:2017+A11:2020	<5% residual voltage for 0.5 periods: B, 70% residual voltage for 25 periods: C, <5% residual voltage for 250 periods: C	Pass

2.2 Description of Test Modes

No	Title	Description
TM1	Full Load(AC 230V/50Hz)	Record
TM2	Half Load	Pre-scan
TM3	No load	Pre-scan
***Note: All test modes were tested, but we only recorded the worst case in this report.		

2.3 Description of Performance Criteria

General Performance Criteria

Performance Criteria A
The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.
The performance level may be replaced by a permissible loss of performance. 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 by what the user may reasonably expect from the equipment if used as intended.
Performance Criteria B
During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.
After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended.
The performance level may be replaced by a permissible loss of performance.
If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Performance Criteria C
Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

3. GENERAL INFORMATION

3.1 Description of Device (EUT)

EUT	: 45W Dual USB-C Wall Charger
Test Model	: S45DB
Model Lists	: S45D, S45DW
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Power Supply	: Input: 100V-240V~ 50/60Hz 1.5A Max Output: C1/C2: 5V/3A, 9V/3A, 12V/3A, 15V/3A, 20V/2.25A MAX: 45W PPS:3.3V-11V/4.05A C1+C2: MAX 20W(5V/3A,9V/2.22A,12V/1.67A) 9V/2.22A, 12V/1.67A)+MAX 20W(5V/3A)
Highest Internal Frequency	: f ≤ 108MHz
Classification of Equipment	: Class B

3.2 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
/	/	/	/	/

3.3 Description of Test Facility

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.

NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.

3.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emission (150kHz to 30MHz)	± 2.35 dB
Radiated Emission (30MHz to 1000MHz)	± 3.48 dB
Voltage Fluctuations & Flicker	± 0.510%
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

4. MEASURING DEVICES AND TEST EQUIPMENT

Conducted emissions from AC mains power ports (150kHz-30MHz)				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
EMI Test Software	Farad	EZ	/	/
Artificial Mains	R&S	ENV216	101288	2025-06-05
Pulse Limiter	R&S	ESH3-Z2	102750-NB	2025-06-05
EMI Test Receiver	R&S	ESR3	102312	2025-03-01

Radiated emissions (30MHz-1GHz)				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
EMI Test Software	Farad	EZ	/	/
EMI Test Software	AUDIX	E3	/	/
By-log Antenna	SCHWARZBECK	VULB9163	01143	2027-07-19
Horn Antenna	SCHWARZBECK	3115	EABF-018	2027-07-19
EMI Test Receiver	R&S	ESR3	102311	2025-06-05
Broadband Preamplifier	/	BP-01M18G	P190501	2025-06-05
EMI Test Receiver	R&S	ESCI7	101173	2025-10-07
By-log Antenna	SchwarzZBECK	VULB9163	01565	2027-07-12

Voltage fluctuations and flicker				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD1411116	2025-03-01
HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD14111124	2025-03-01

Electrostatic discharges				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
ESD Simulator	SCHLODER	SESD 230	604035	2025-07-14

RF electromagnetic field disturbances				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
MXG Vector Signal Generator	Agilent	E4438C	MY42081396(6G)	2025-06-05
RF POWER AMPLIFIER	SKET	HAP_0306G-50W	/	2025-06-05
RF POWER AMPLIFIER	OPHIR	5225R	1052	2025-06-05
RF POWER AMPLIFIER	OPHIR	5273F	1019	2025-06-05
Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	/
Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-484	/
RS Electric field probe	narda	EP601	611WX80208	2025-06-05

Electrical fast transients / burst for AC mains power ports				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2025-06-05

Surges for AC mains power ports				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2025-06-05

Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
Simulator	FRANKONIA	CIT-10/75	A126A1195	2025-06-05
CDN	FRANKONIA	CDN-M2+M3	A2210177	2025-06-05
6dB Attenuator	FRANKONIA	DAM25W	1172040	2025-06-05

Voltage dips and interruptions				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2025-06-05

5. EMISSION TEST RESULTS (EMI)

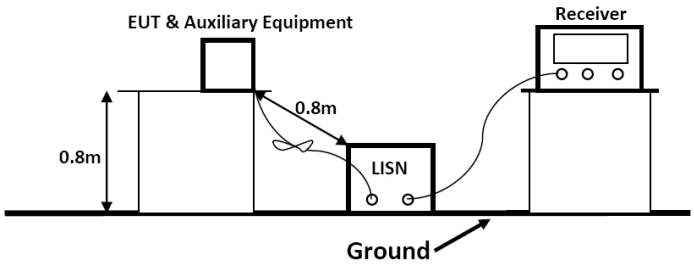
5.1 Conducted emissions from AC mains power ports (150kHz-30MHz)

Test Requirement:	Class B
Test Limit:	**Frequency Range** / **Limit (Quasi-Peak)** / **Limit (Average)** 0.15MHz to 0.5MHz / 66dB(μV) to 56dB(μV) / 56dB(μV) to 46dB(μV) 0.5MHz to 5MHz / 56dB(μV) / 46dB(μV) 5MHz to 30MHz / 60dB(μV) / 50dB(μV) Detector: / Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz
Test Method:	Clause 7 of CISPR 16-2-1:2014/AMD1:2017
Procedure:	An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. Remark: Level= Read Level+ Cable Loss+ LISN Factor

5.1.1 E.U.T. Operation:

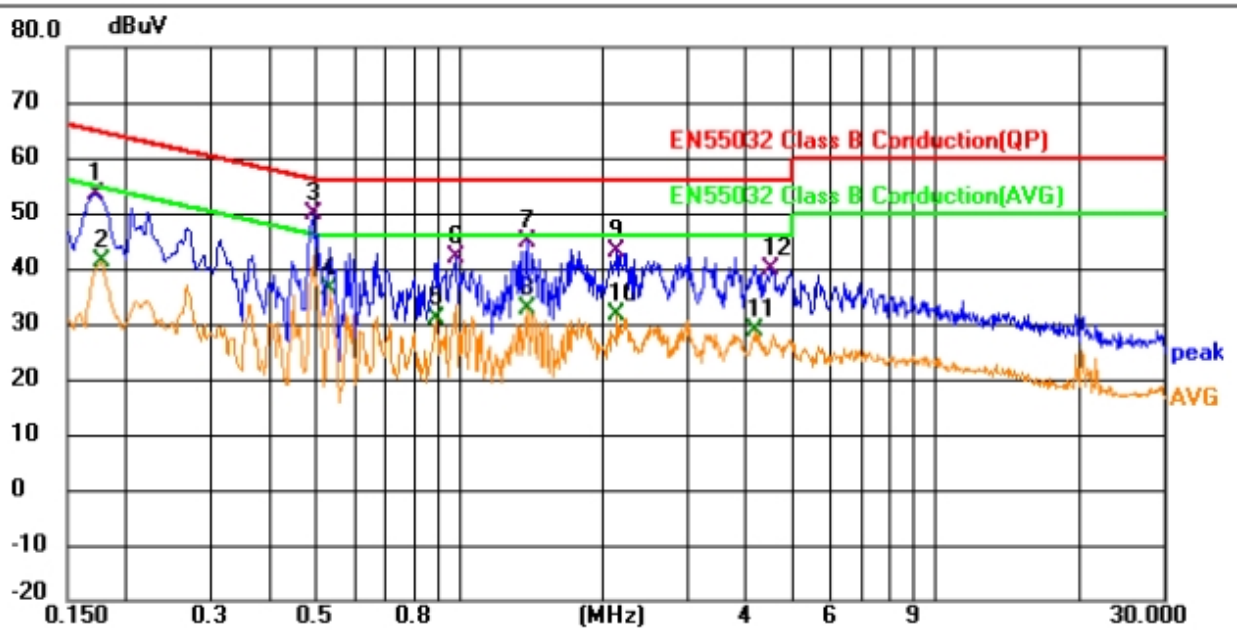
Operating Environment:			
Temperature:	22.5°C	Humidity:	53.7 %
Pre test mode:	TM1		
Final test mode:	TM1		

5.1.2 Test Setup Diagram:



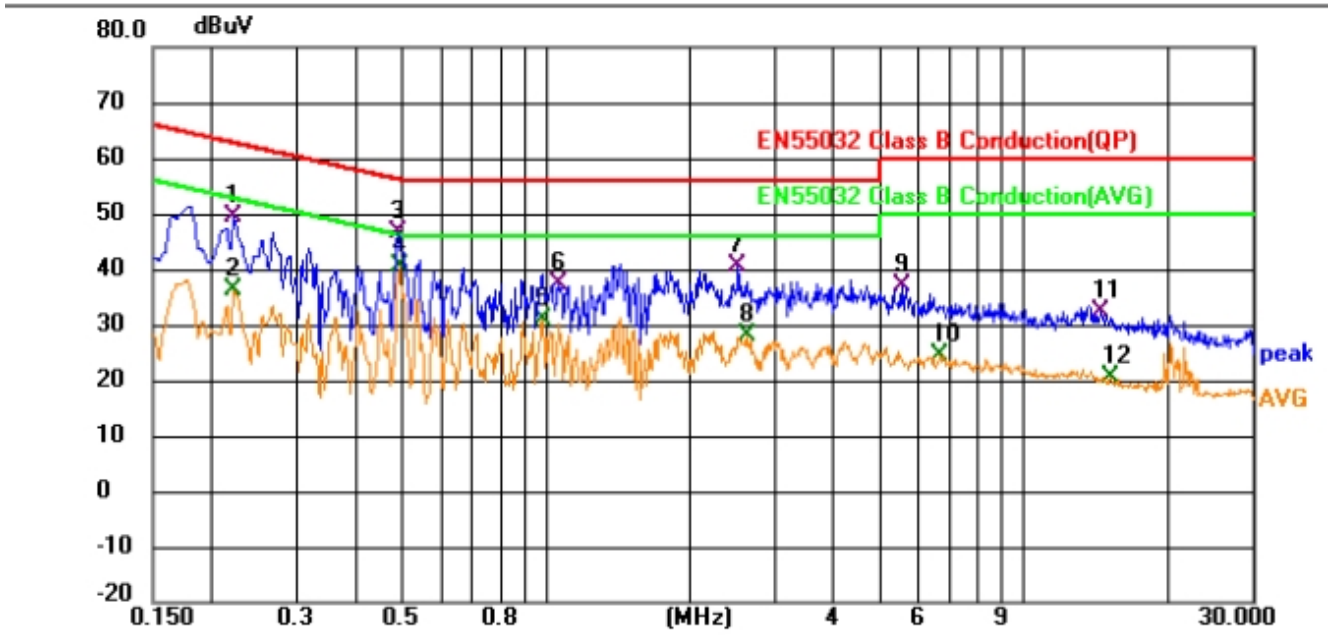
5.1.3 Test Data:

TM1 / Line: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.172	33.61	19.66	53.27	64.86	-11.59	QP	
2		0.177	21.48	19.66	41.14	54.63	-13.49	AVG	
3	*	0.492	30.01	19.67	49.68	56.13	-6.45	QP	
4		0.532	16.40	19.68	36.08	46.00	-9.92	AVG	
5		0.892	11.09	19.68	30.77	46.00	-15.23	AVG	
6		0.983	22.25	19.68	41.93	56.00	-14.07	QP	
7		1.383	25.12	19.71	44.83	56.00	-11.17	QP	
8		1.383	12.98	19.71	32.69	46.00	-13.31	AVG	
9		2.135	23.13	19.75	42.88	56.00	-13.12	QP	
10		2.135	11.93	19.75	31.68	46.00	-14.32	AVG	
11		4.191	8.92	19.73	28.65	46.00	-17.35	AVG	
12		4.511	20.05	19.74	39.79	56.00	-16.21	QP	

TM1 / Line: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.222	29.62	19.67	49.29	62.74	-13.45	QP	
2		0.222	16.55	19.67	36.22	52.74	-16.52	AVG	
3		0.487	26.93	19.67	46.60	56.22	-9.62	QP	
4	*	0.492	20.72	19.67	40.39	46.13	-5.74	AVG	
5		0.983	11.35	19.68	31.03	46.00	-14.97	AVG	
6		1.063	17.61	19.68	37.29	56.00	-18.71	QP	
7		2.526	20.60	19.77	40.37	56.00	-15.63	QP	
8		2.625	8.17	19.77	27.94	46.00	-18.06	AVG	
9		5.554	17.04	19.86	36.90	60.00	-23.10	QP	
10		6.689	4.63	19.88	24.51	50.00	-25.49	AVG	
11		14.469	12.57	19.88	32.45	60.00	-27.55	QP	
12		15.158	0.46	19.90	20.36	50.00	-29.64	AVG	

***Note: 1) Pre-scan all modes and recorded the worst case results in this report.
2) Margin= Reading level + Correct factor–Limit
Correct Factor=Lisn Factor+Cable Factor+Insertion loss of Pulse Limitter

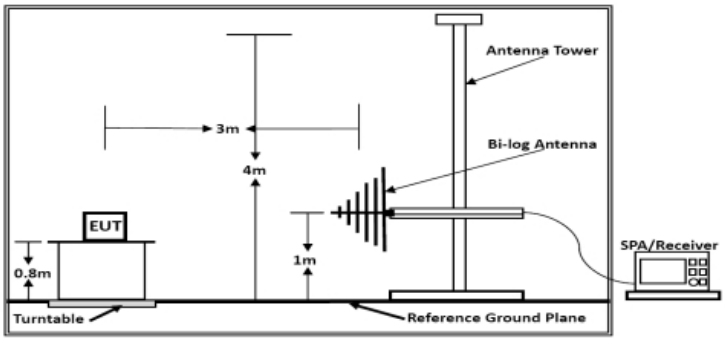
5.2 Radiated emissions (30MHz-1GHz)

Test Requirement:	Class B
Test Limit:	**Frequency (MHz)** / **Limit [dB(uV/m) at 10m]** / **Limit [dB(uV/m) at 3m]** 30 to 230 / 30 / 40 230 to 1000 / 37 / 47 Detector: / Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz
Test Method:	Clause 7.3 of CISPR 16-2-3:2016
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

5.2.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.3 °C	Humidity:	53 %
Pre test mode:	TM1		
Final test mode:	TM1		

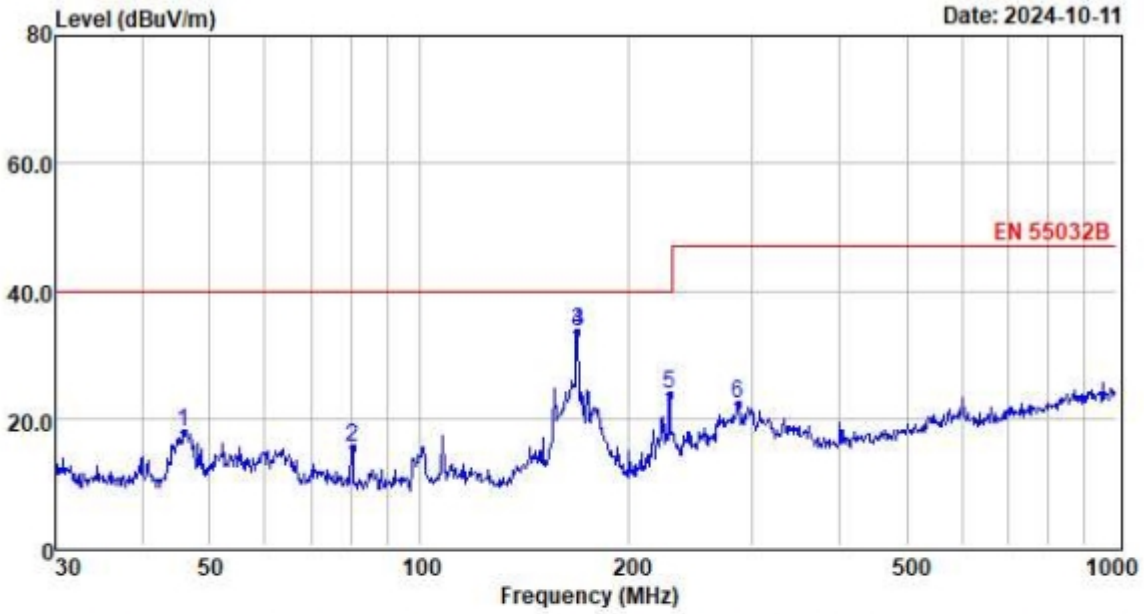
5.2.2 Test Setup Diagram:



Below 1GHz

5.2.3 Test Data:

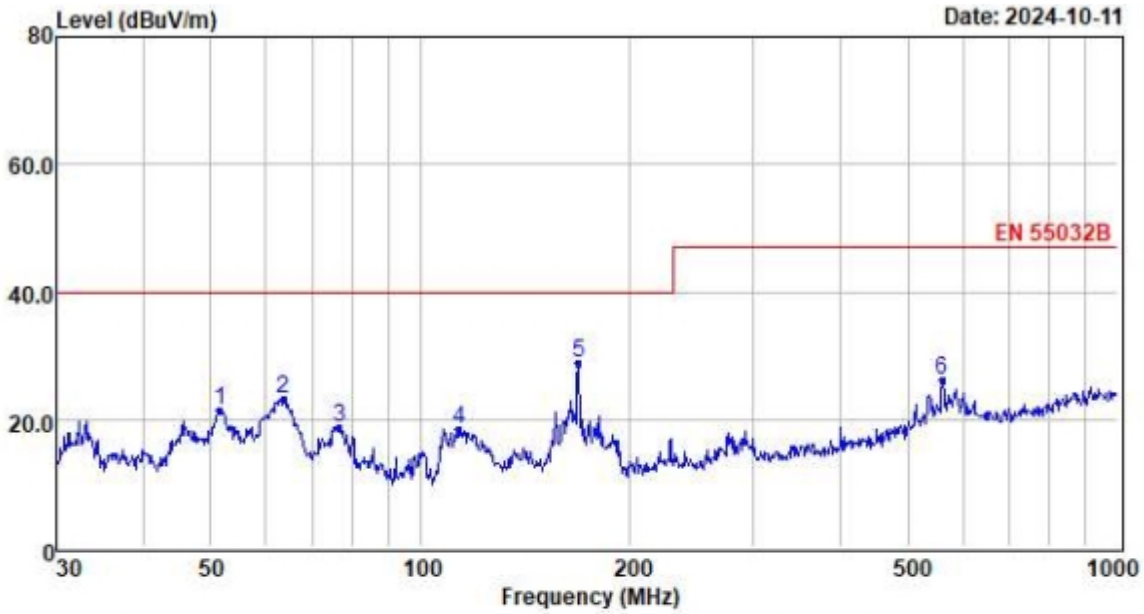
TM1 / Polarization: Horizontal



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	45.86	5.68	0.57	11.61	17.86	40.00	-22.14	QP
2	80.08	4.96	0.74	9.80	15.50	40.00	-24.50	QP
3	168.41	22.79	1.10	9.62	33.51	40.00	-6.49	QP
4	168.41	22.79	1.10	9.62	33.51	40.00	-6.49	QP
5	228.49	10.68	1.24	11.97	23.89	40.00	-16.11	QP
6	286.98	7.53	1.30	13.45	22.28	47.00	-24.72	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

TM1 / Polarization: Vertical



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	51.48	8.31	0.61	12.58	21.50	40.00	-18.50	QP
2	63.54	10.84	0.67	11.65	23.16	40.00	-16.84	QP
3	76.51	8.09	0.72	9.93	18.74	40.00	-21.26	QP
4	113.71	6.56	0.87	11.09	18.52	40.00	-21.48	QP
5	168.41	18.21	1.10	9.62	28.93	40.00	-11.07	QP
6	560.69	6.53	1.50	18.05	26.08	47.00	-20.92	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

Note:1).Pre-Scan all mode, Thus record worse case mode result in this report.
2) Margin= Reading level + Correct factor – Limit
Correct Factor=Antenna Factor+Cable Factor- Pre-amplifier Factor

5.3 Harmonic current emission

Test Requirement:	Class A
Test Limit:	Not specified
Test Method:	EN IEC 61000-3-2:2019+A1:2021

5.3.1 Conclusion:

Refer to EN IEC 61000-3-2 clause 7.1:
"For the following categories of equipment, limits are not specified in this document:
– lighting equipment with a rated power less than but not equal to 5 W;
– equipment with a rated power of 75 W or less, other than lighting equipment;"
Since the rated power of the EUT is less than above described, it is deemed to comply with the requirement.

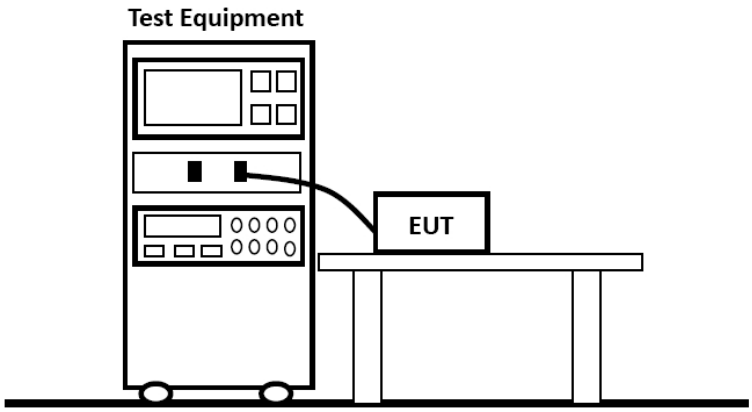
5.4 Voltage fluctuations and flicker

Test Requirement:	EN 61000-3-3, Clause 4
Test Limit:	EN 61000-3-3, Clause 5
Test Method:	EN 61000-3-3:2013+A2:2021

5.4.1 E.U.T. Operation:

Operating Environment:			
Temperature:	25 °C	Humidity:	55.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

5.4.2 Test Setup Diagram:

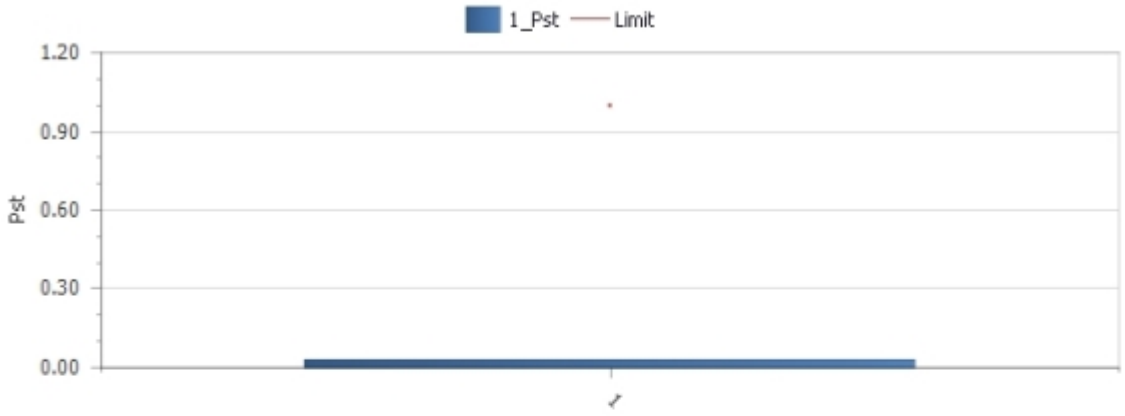


5.4.3 Test Data:

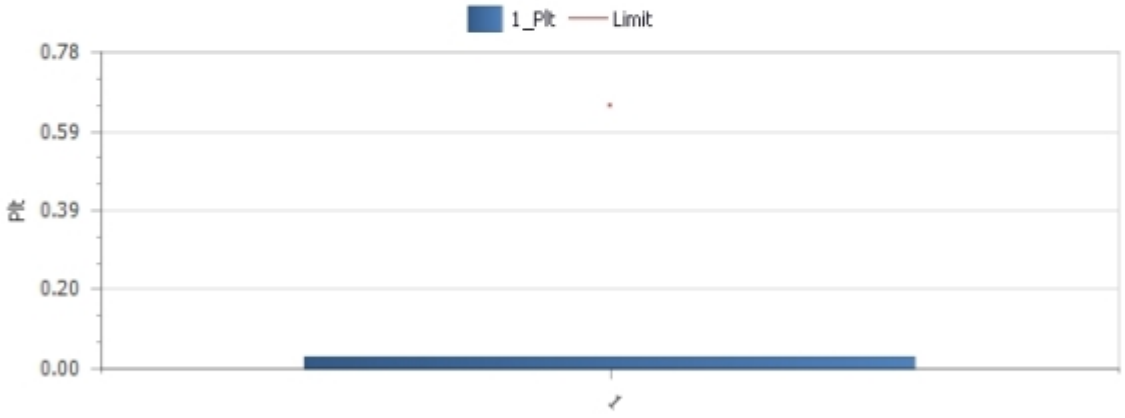
TM1

Customer : xxx Result : Pass

Pst and Limit



Plt and Limit



Relevant Parameter and Judgement During Test Period

Vrms at the end of test(V)	230.09			
Error Max(%)		Test Limit(%)		
T-max(ms)	0.00	Test Limit(ms)	500	Pass
dc(%)	0.00	Test Limit(%)	3.30	Pass
dmax(%)	0.00	Test Limit(%)	4.00	Pass
Pst	0.027	Test Limit	1.000	Pass
Plt	0.027	Test Limit	0.650	Pass

6. IMMUNITY TEST RESULTS (EMS)

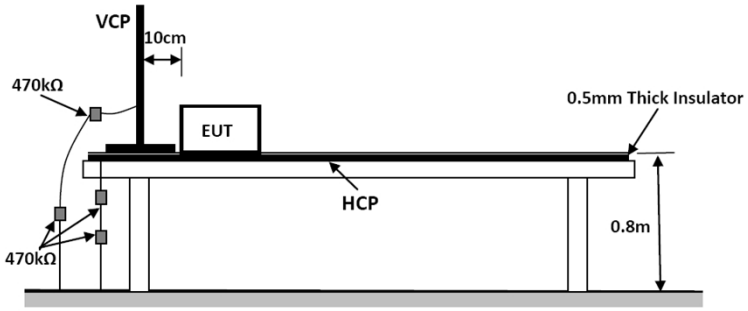
6.1 Electrostatic discharges

Test Requirement:	Contact Discharge: +/- 4kV Air Discharge: +/- 8kV
Test Method:	BS EN 61000-4-2: 2009
Procedure:	Discharge Impedance: 330Ω/150pF Number of Discharge: Minimum 10 times at each test point Discharge Mode: Single Discharge Discharge Period: 1 second minimum
Performance Criteria:	B

6.1.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.8 °C	Humidity:	52.3 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.1.2 Test Setup Diagram:



6.1.3 Test Data:

Discharge type	Volt (kV)	Polarity	Test Point	Result/ Observations
Air discharge	2,4,8	+	10	B
Air discharge	2,4,8	-	10	B
Contact discharge	4	+	10	B
Contact discharge	4	-	10	B
Horizontal Coupling	4	+	10	B
Horizontal Coupling	4	-	10	B
Vertical Coupling	4	+	10	B
Vertical Coupling	4	-	10	B

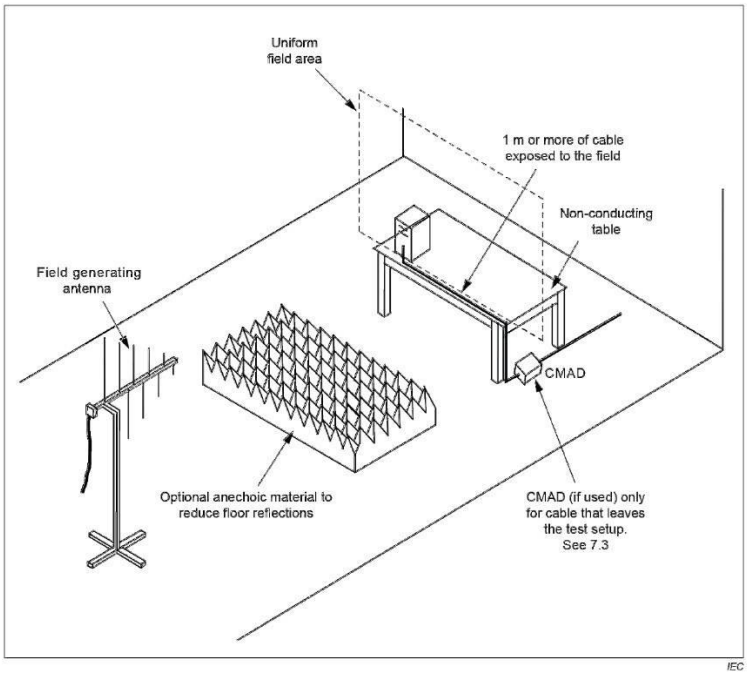
6.2 RF electromagnetic field disturbances

Test Requirement:	3V/m, 80%, 1kHz Amp. Mod.
Test Method:	BS EN IEC 61000-4-3: 2020
Procedure:	Frequency Range: 80MHz to 1GHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz Antenna Polarisation: Vertical and Horizontal Modulation: 1kHz,80% Amp. Mod,1% increment
Performance Criteria:	A

6.2.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.8 °C	Humidity:	52.3 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Frequency	Field Strength (V/m)	EUT face	Dwell time	Result/ Observations
80MHz-1GHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
1800MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
2600MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
3500MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
5000MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A

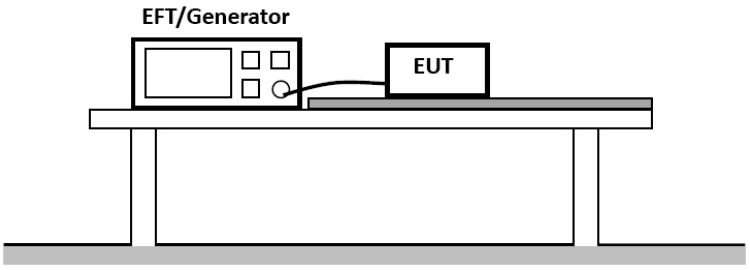
6.3 Electrical fast transients / burst for AC mains power ports

Test Requirement:	1kV; 5/50ns Tr/Th; 5kHz Repetition Frequency
Test Method:	BS EN 61000-4-4: 2012
Procedure:	Repetition Frequency: 5kHz Burst Period: 300ms Test Duration: 2 minute per level & polarity
Performance Criteria:	B

6.3.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.8 °C	Humidity:	52.3 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Port	Volt (kV)	Polarity	CDN/ Clamp	Result/ Observations
AC power port	1	+	CDN	B
AC power port	1	-	CDN	B

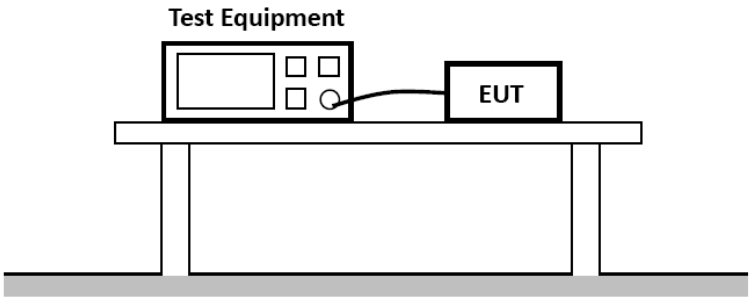
6.4 Surges for AC mains power ports

Test Requirement:	1.2/50μs Tr/Td; 1kV Line to Line
Test Method:	BS EN 61000-4-5: 2014 +A1: 2017
Procedure:	Interval: 60s between each surge No. of surges: 5 positive, 5 negative at 90°, 270°
Performance Criteria:	B

6.4.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.8 °C	Humidity:	52.3 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Port	Volt (kV)	Polarity	Phase(degree)	Result/ Observations
L-N	1	+	90°	B
L-N	1	-	270°	B

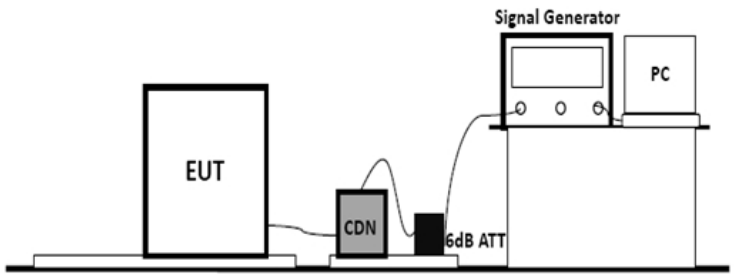
6.5 Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)

Test Requirement:	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%,1kHz Amp. Mod.
Test Method:	BS EN 61000-4-6: 2014
Procedure:	Frequency Range: 0.15MHz to 80MHz Modulation: 80%, 1kHz Amplitude Modulation Step Size: 1%
Performance Criteria:	A

6.5.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.8 °C	Humidity:	52.3 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

Port	Strength (Vrms)	CDN/Clamp	Dwell time	Result/ Observations
AC power port	3(0.15MHz-10MHz)	CDN	3s	A
AC power port	3 to 1(10MHz-30MHz, Lines)	CDN	3s	A
AC power port	1(30MHz-80MHz)	CDN	3s	A

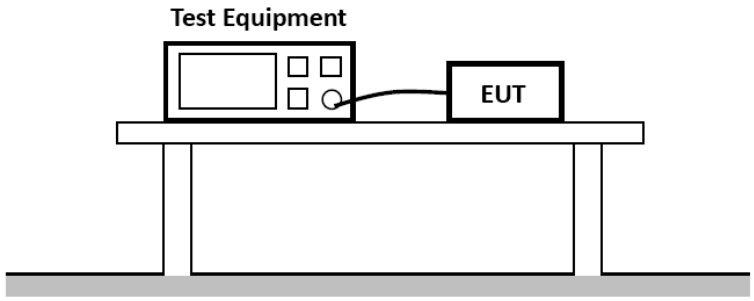
6.6 Voltage dips and interruptions

Test Requirement:	<5% residual voltage for 0.5 periods 70% residual voltage for 25 periods <5% residual voltage for 250 periods
Test Method:	BS EN IEC 61000-4-11:2020
Procedure:	<5% residual voltage for 0.5 period 70% residual voltage for 25 period <5% residual voltage for 250 period No. of Dips / Interruptions: 3 per Level Time between dropout: 10s
Performance Criteria:	B, C

6.6.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.8 °C	Humidity:	52.3 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.6.2 Test Setup Diagram:



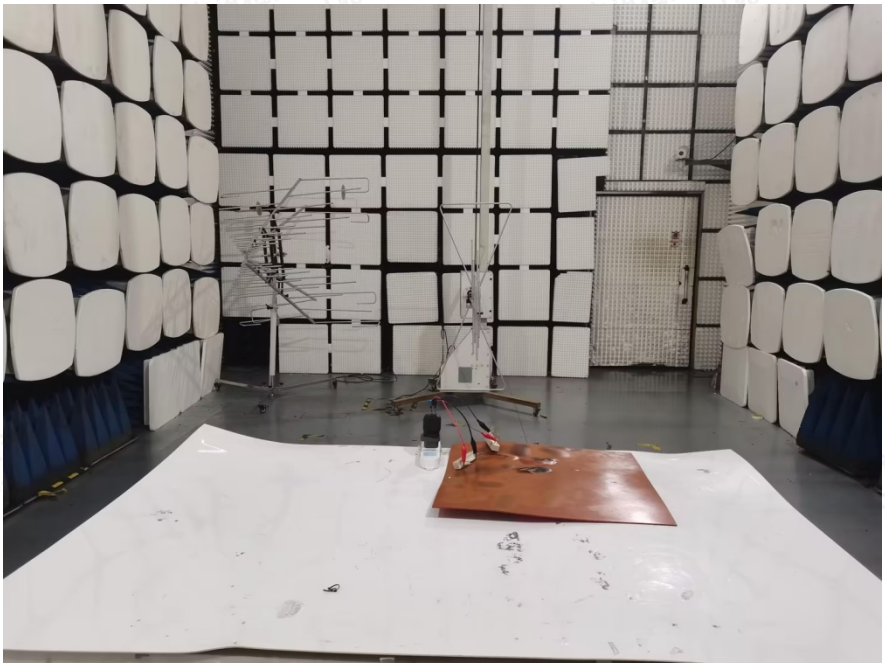
6.6.3 Test Data:

Level %UT	Phase (degree)	Duration	No. of Dips/ Interruptions	Result/ Observations
0	0°	0.5 Cycles	3	B
0	0°	250 Cycles	3	B
70	0°	25 Cycles	3	C
0	0°	0.5 Cycles	3	C
0	0°	300 Cycles	3	C
70	0°	30 Cycles	3	C

7. TEST SETUP PHOTOS

Conducted emissions from AC mains power ports (150kHz-30MHz)

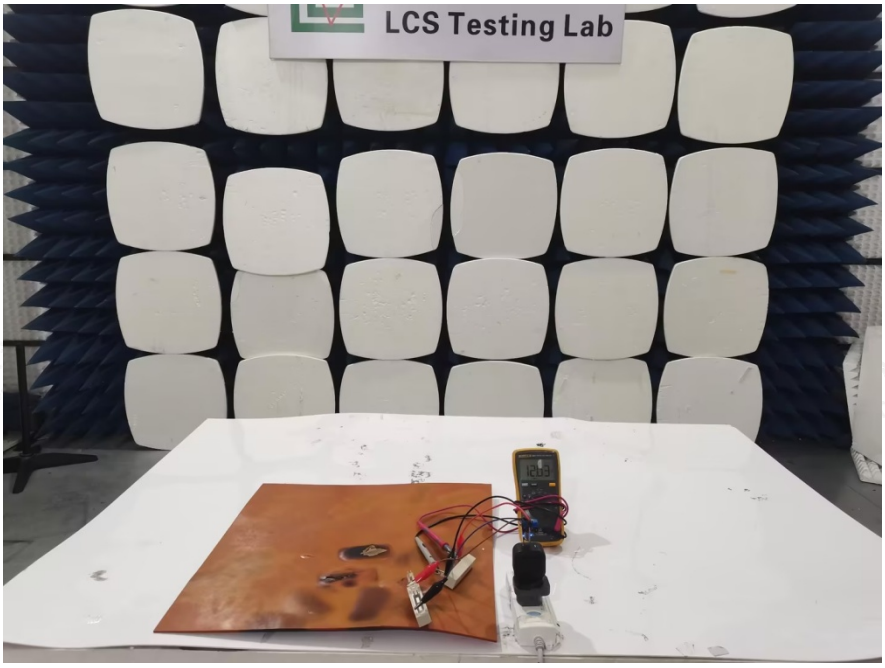
Radiated emissions (30MHz-1GHz)



Voltage fluctuations and flicker

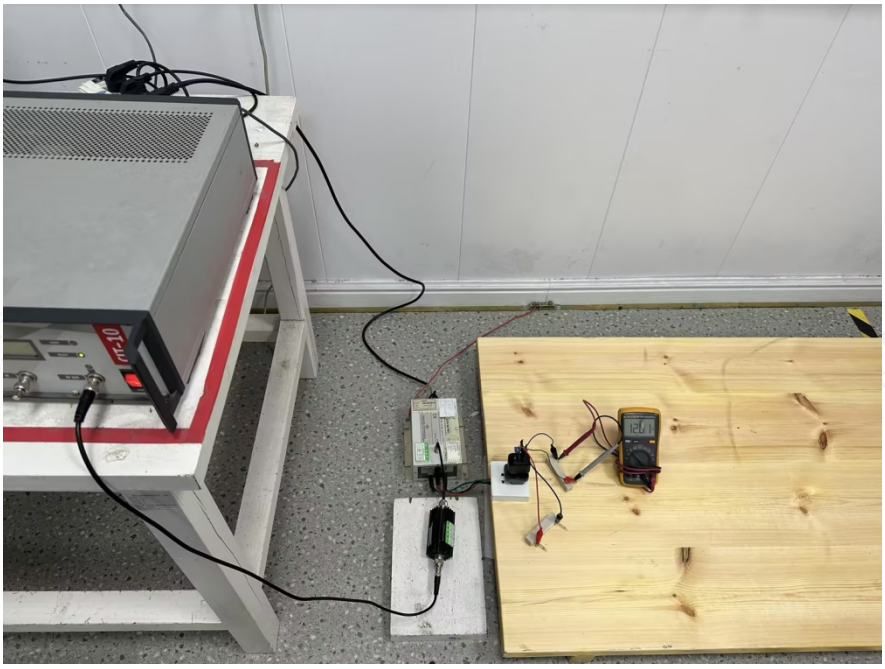
Electrostatic discharges

RF electromagnetic field disturbances

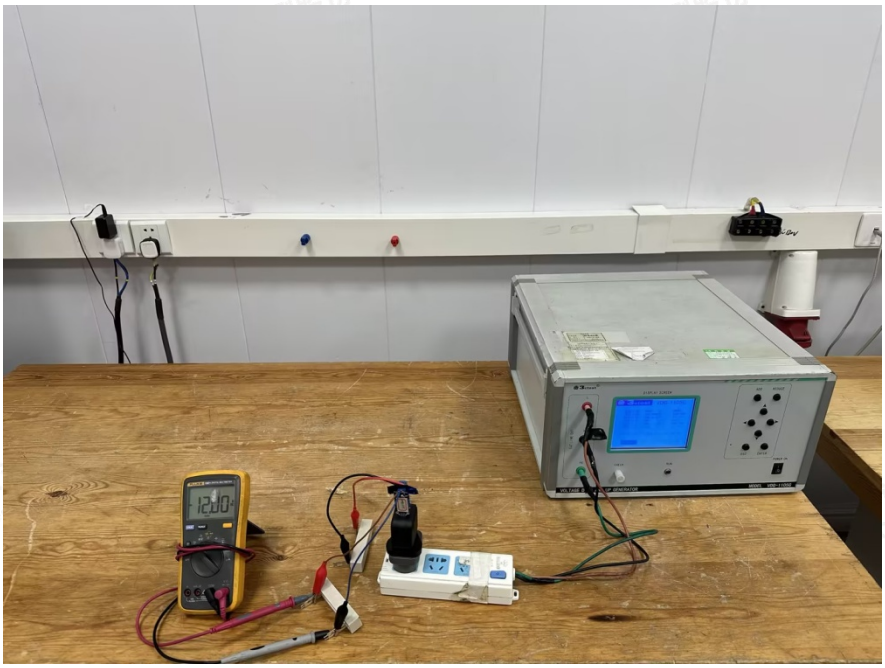


Electrical fast transients / burst for AC mains power ports
Surges for AC mains power ports

Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)



Voltage dips and interruptions



8. EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

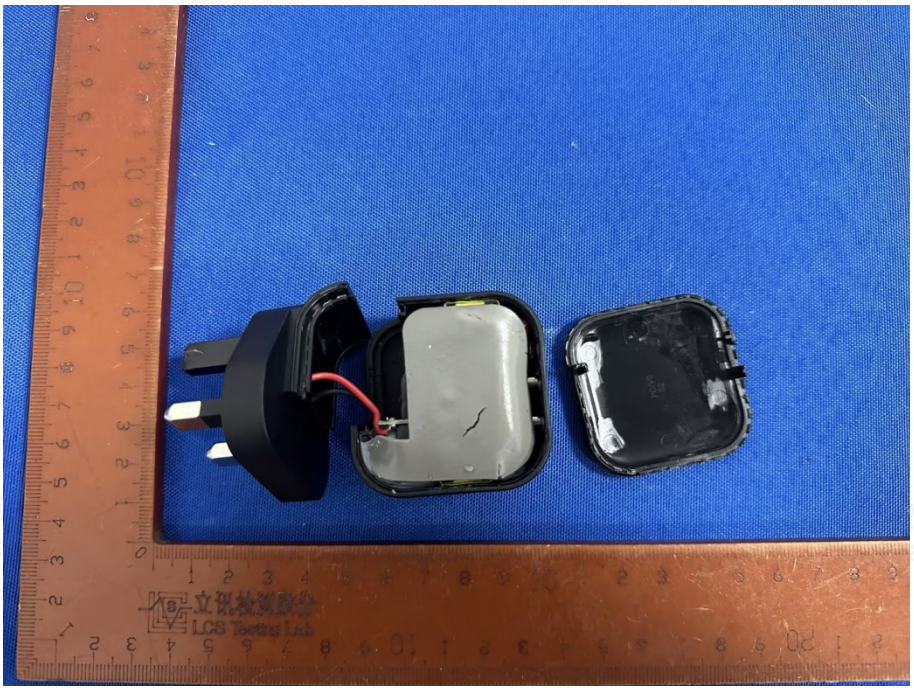


Fig. 6

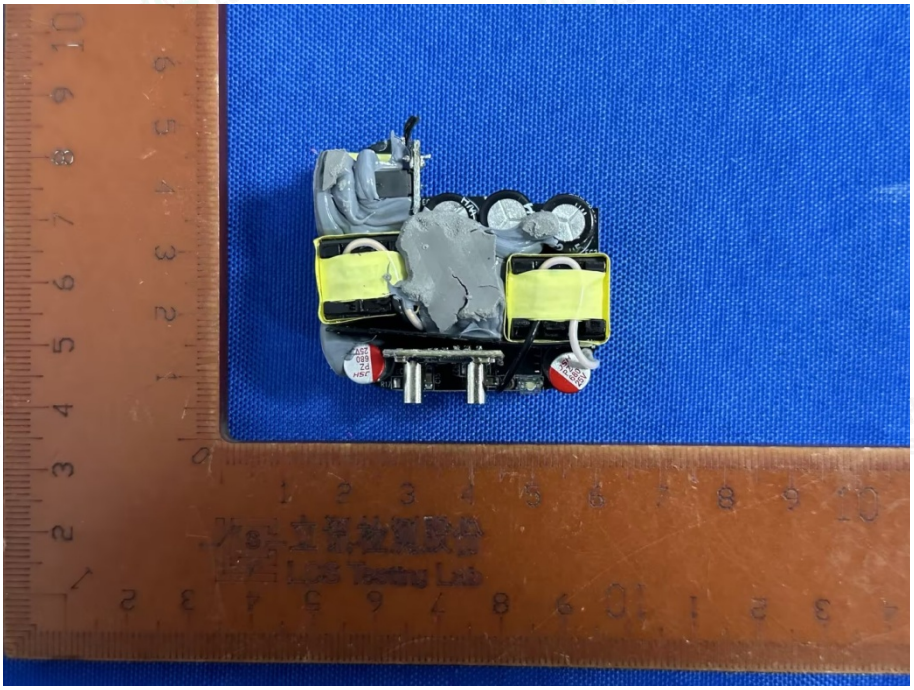


Fig. 7

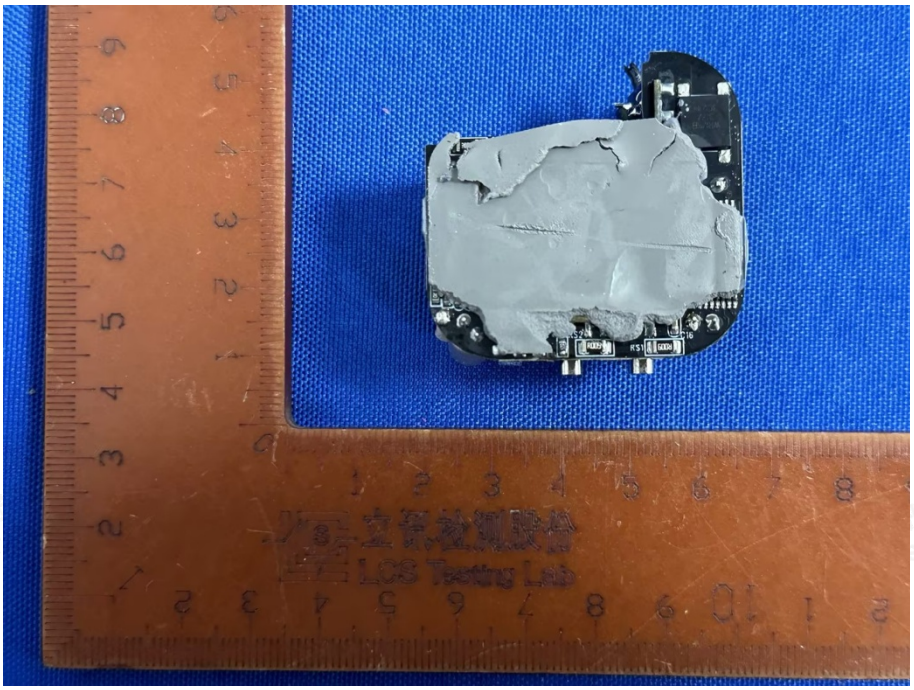


Fig. 8

--- End of Report ---