



EMC TEST REPORT
For
Suparo Industries Ltd
140W Triple USB-C Wall Charger
Test Model: S140W

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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Date of receipt of test sample : October 8, 2024
Number of tested samples : 1
Serial number : Prototype
Date of Test : October 8, 2024 to October 24, 2024
Date of Report : October 25, 2024





TEST REPORT

Report No.	: LCSA09294074E
Date of Issue	: October 25, 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 <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing method <input type="checkbox"/>
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
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Test Item Description.	: 140W Triple USB-C Wall Charger
Trade Mark	: 
Test Model	: S140W
Result	: Positive

Compiled by:

Coco Song / File Administrator

Supervised by:

Cary Luo/ Technique principal

Approved by:

Gavin Liang / Manager





TEST REPORT

Test Report No.: LCSA09294074E	<u>October 25, 2024</u> Date of issue
---------------------------------------	--

Test Model	: S140W
EUT	: 140W Triple 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 25, 2024	Initial Issue	/





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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 $\leq 16A$ 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	Pass
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	: 140W Triple USB-C Wall Charger
Test Model	: S140W
Power Supply	Input: AC 100-240V 50~60Hz, 3A
	Power Output: 100W(Max.)
	USB-C1: PD-5V/3A, 9V/3A, 12V/3A, 15V/3A, 20V/5A
	28V/5A(Max140W) PPS: 4-11V/5A 4-21V/4A
Power Supply	USB-C2: PD:5V/3A, 9V/3A, 12V/3A, 15V/3A, 20V/5A
	(Max 100W) PPS: 4-11V/5A 4-21V/4A
	USB-C3: PD: 5V/3A, 9V/3A, 12V/2.5A, 15V/2A, 20V/1.5A
(Max 30W) PPS: 4-11V/3A	
Highest Internal Frequency	: $f \leq 108\text{MHz}$
Classification of Equipment	: Class B

3.2 Support equipment List

The EUT was tested as an independent device.

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)	$\pm 2.35\text{ dB}$
Radiated Emission (30MHz to 1000MHz)	$\pm 3.48\text{ dB}$
Mains Harmonic	$\pm 0.510\%$
Voltage Fluctuations & Flicker	$\pm 0.510\%$
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 Pre-amplifier	/	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	P624486CD1411124	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)

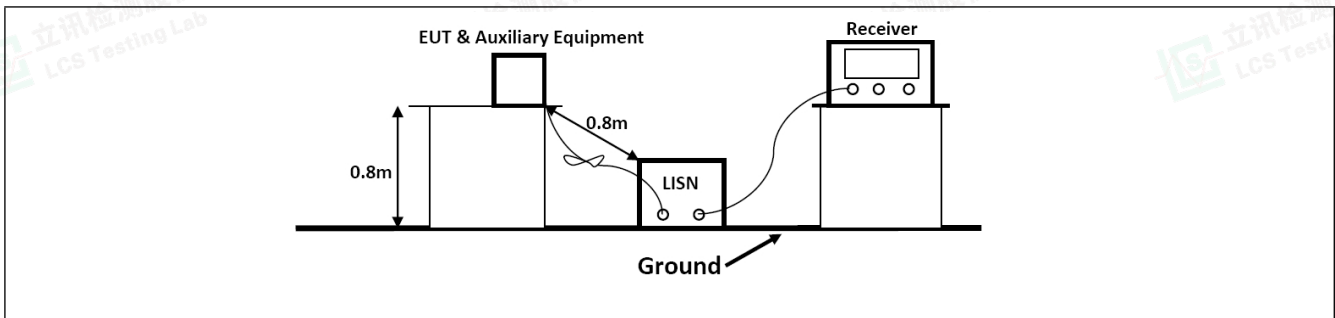
5.1 Conducted emissions from AC mains power ports (150kHz-30MHz)

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		

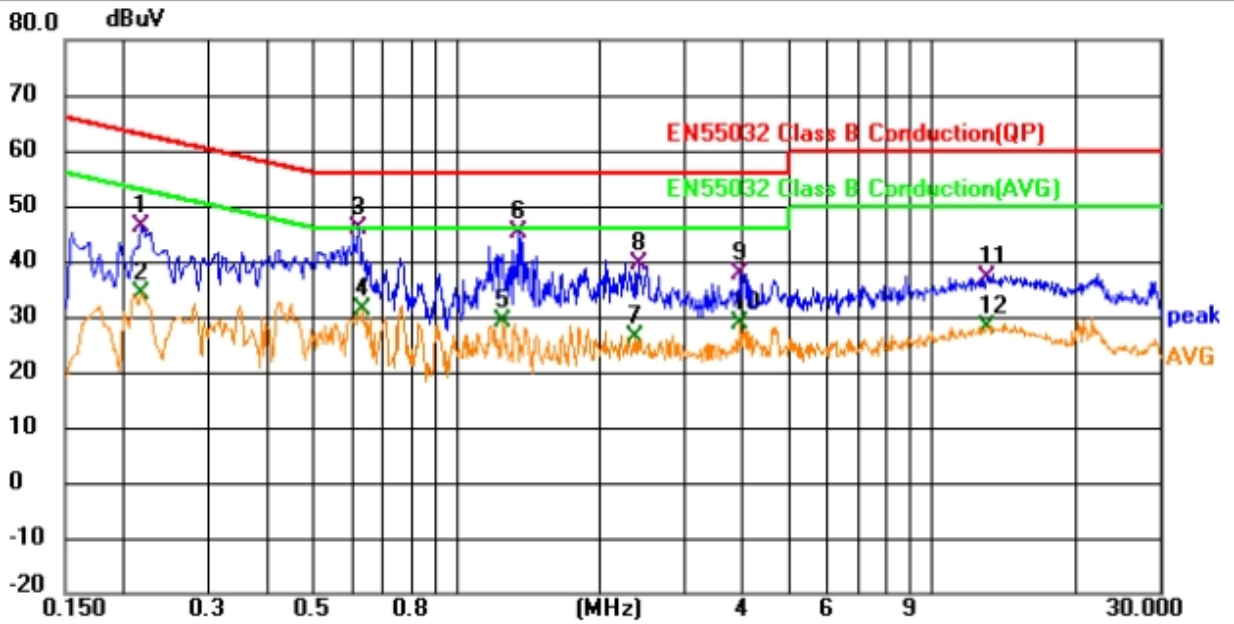
5.1.2 Test Setup Diagram:





5.1.3 Test Data:

TM1 / Line: Line

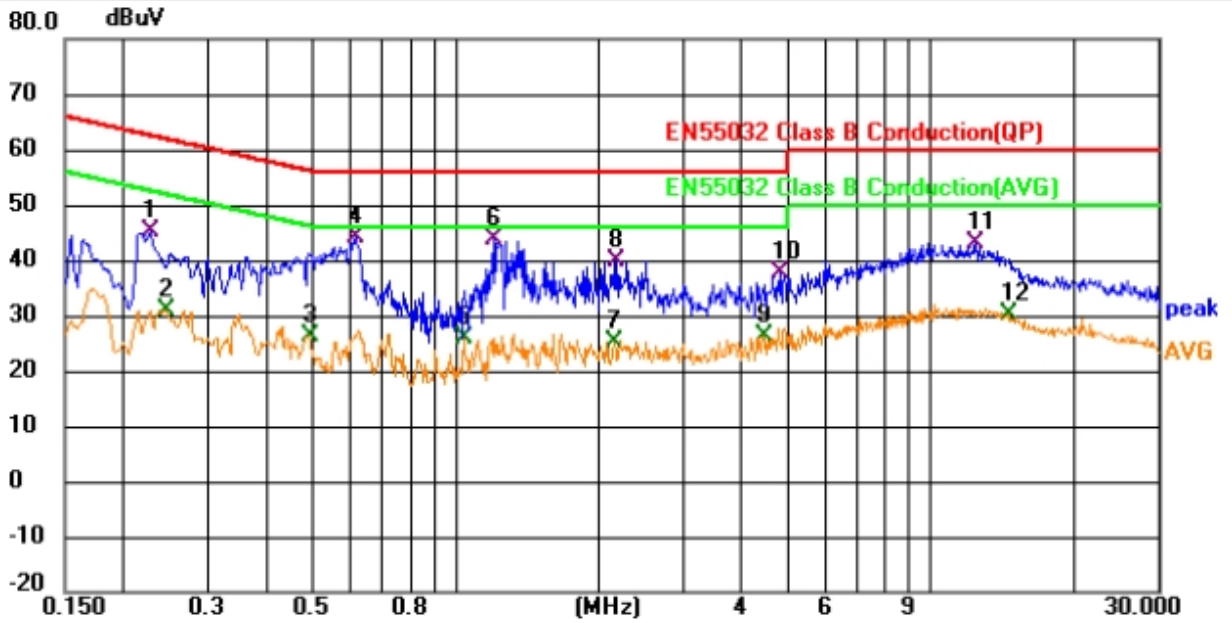


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.217	26.59	19.67	46.26	62.93	-16.67	QP	
2		0.217	14.55	19.67	34.22	52.93	-18.71	AVG	
3	*	0.623	26.26	19.70	45.96	56.00	-10.04	QP	
4		0.631	11.38	19.70	31.08	46.00	-14.92	AVG	
5		1.252	9.56	19.70	29.26	46.00	-16.74	AVG	
6		1.347	25.50	19.70	45.20	56.00	-10.80	QP	
7		2.364	6.67	19.74	26.41	46.00	-19.59	AVG	
8		2.413	19.71	19.74	39.45	56.00	-16.55	QP	
9		3.962	17.80	19.73	37.53	56.00	-18.47	QP	
10		3.962	9.15	19.73	28.88	46.00	-17.12	AVG	
11		13.043	17.22	19.87	37.09	60.00	-22.91	QP	
12		13.043	8.15	19.87	28.02	50.00	-21.98	AVG	





TM1 / Line: Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.227	25.63	19.67	45.30	62.56	-17.26	QP	
2		0.246	11.37	19.67	31.04	51.89	-20.85	AVG	
3		0.491	6.45	19.67	26.12	46.15	-20.03	AVG	
4	*	0.614	24.43	19.70	44.13	56.00	-11.87	QP	
5		1.037	6.09	19.68	25.77	46.00	-20.23	AVG	
6		1.197	24.12	19.70	43.82	56.00	-12.18	QP	
7		2.144	5.37	19.76	25.13	46.00	-20.87	AVG	
8		2.178	20.13	19.76	39.89	56.00	-16.11	QP	
9		4.430	6.42	19.84	26.26	46.00	-19.74	AVG	
10		4.797	17.67	19.84	37.51	56.00	-18.49	QP	
11		12.384	23.03	19.89	42.92	60.00	-17.08	QP	
12		14.594	10.14	19.88	30.02	50.00	-19.98	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





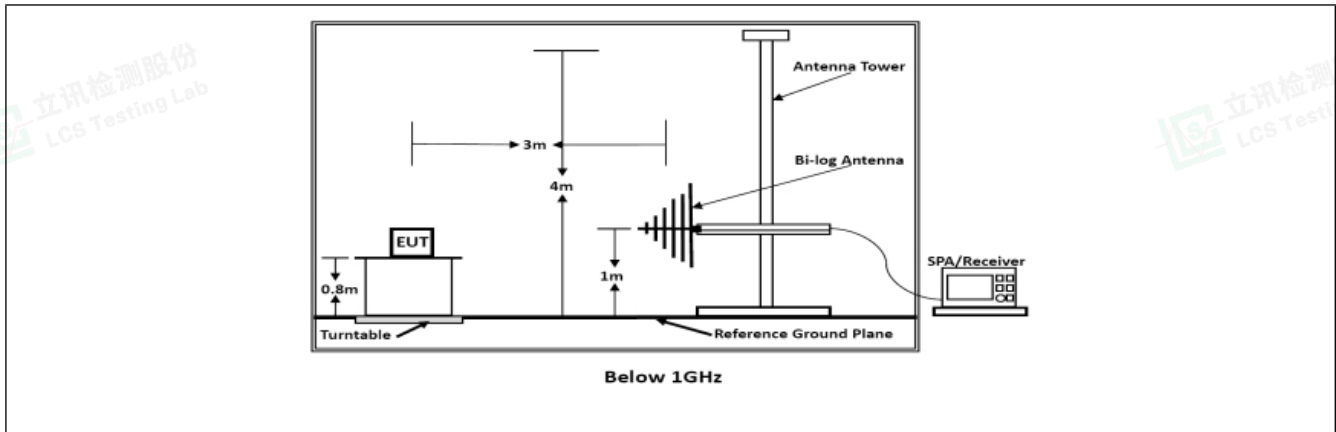
5.2 Radiated emissions (30MHz-1GHz)

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:	26.4 °C	Humidity:	54.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

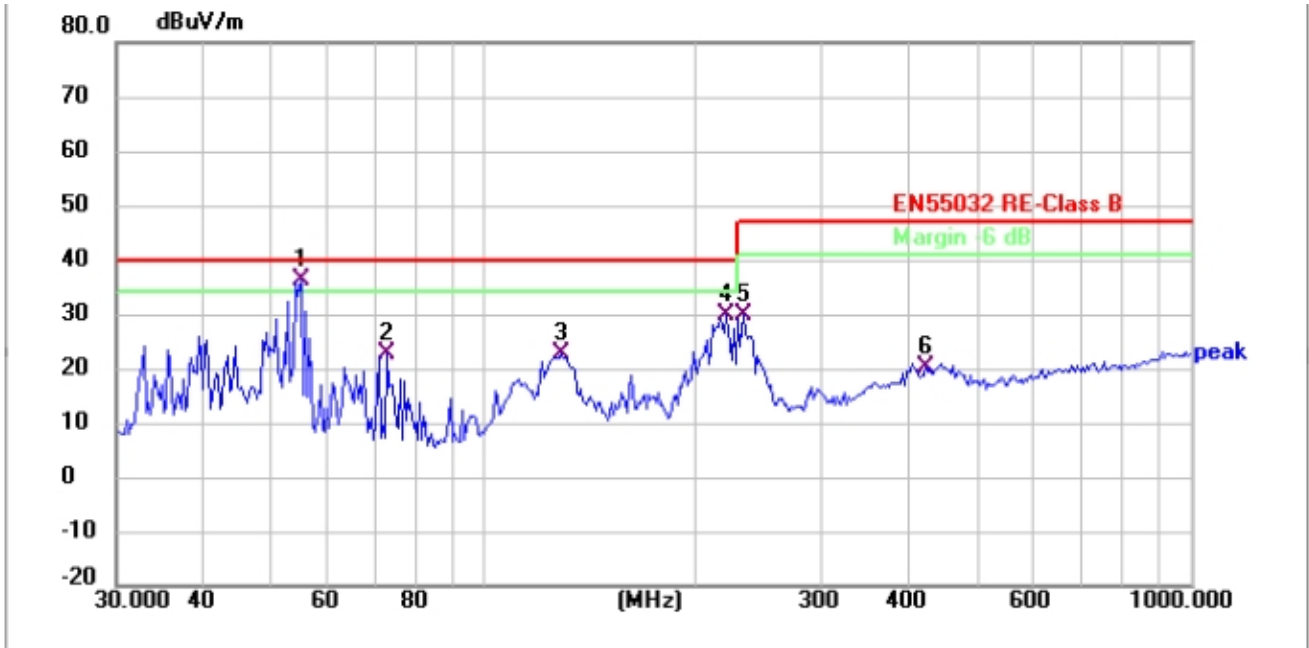
5.2.2 Test Setup Diagram:





5.2.3 Test Data:

TM1 / Polarization: Horizontal

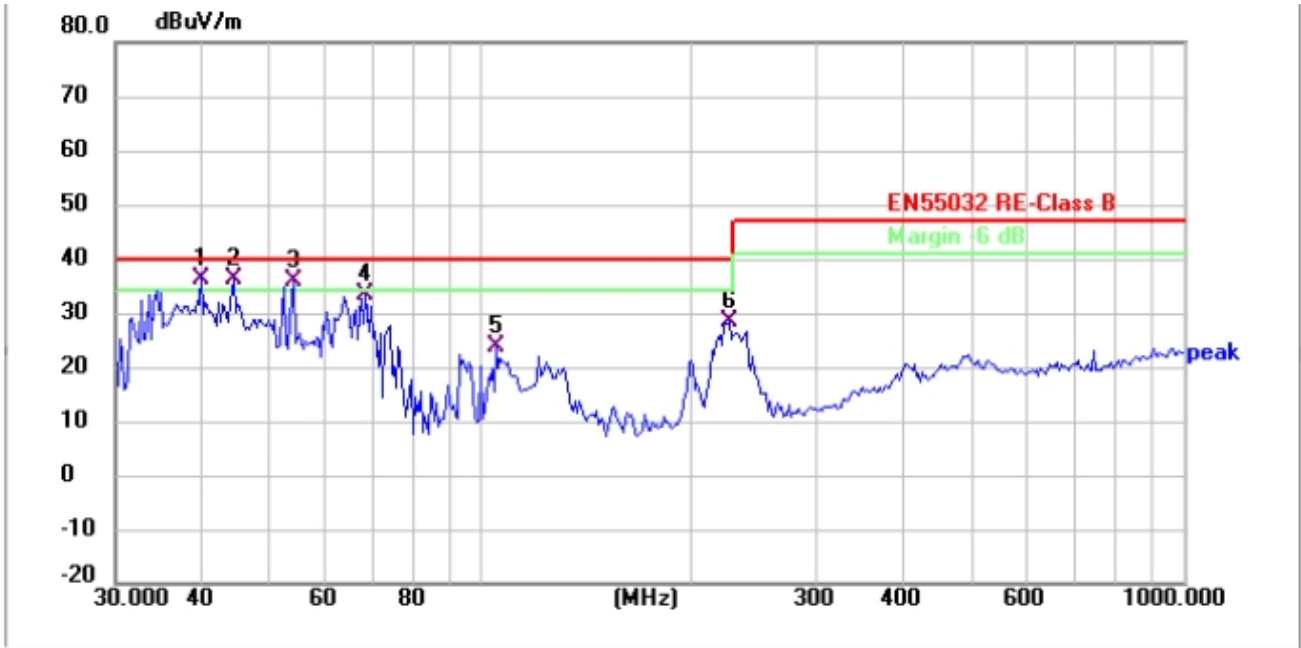


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	54.901	54.44	-18.16	36.28	40.00	-3.72	QP	P	
2	72.720	44.15	-21.47	22.68	40.00	-17.32	QP	P	
3	128.486	44.25	-21.61	22.64	40.00	-17.36	QP	P	
4	219.179	49.01	-19.29	29.72	40.00	-10.28	QP	P	
5	231.853	48.76	-18.78	29.98	47.00	-17.02	QP	P	
6	421.329	34.18	-13.84	20.34	47.00	-26.66	QP	P	





TM1 / Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 !	39.737	54.58	-18.26	36.32	40.00	-3.68	QP	P	
2 *	44.154	54.13	-17.78	36.35	40.00	-3.65	QP	P	
3 !	53.756	53.78	-18.02	35.76	40.00	-4.24	QP	P	
4	68.263	54.23	-20.81	33.42	40.00	-6.58	QP	P	
5	104.798	42.48	-18.58	23.90	40.00	-16.10	QP	P	
6	225.427	47.47	-19.04	28.43	40.00	-11.57	QP	P	

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





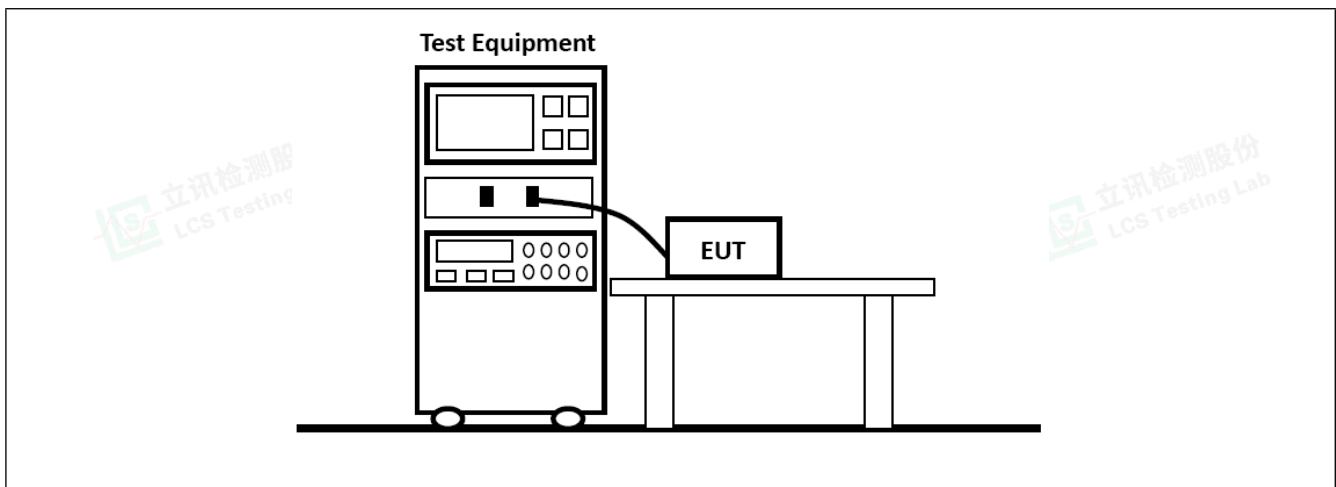
5.3 Harmonic current emission

Test Requirement:	Class A																													
Test Limit:	<table border="1"> <thead> <tr> <th>Harmonic order <i>h</i></th> <th>Maximum permissible harmonic current A</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">Odd harmonics</td> </tr> <tr> <td>3</td> <td>2,30</td> </tr> <tr> <td>5</td> <td>1,14</td> </tr> <tr> <td>7</td> <td>0,77</td> </tr> <tr> <td>9</td> <td>0,40</td> </tr> <tr> <td>11</td> <td>0,33</td> </tr> <tr> <td>13</td> <td>0,21</td> </tr> <tr> <td>$15 \leq h \leq 39$</td> <td>$0,15 \frac{15}{h}$</td> </tr> <tr> <td colspan="2" style="text-align: center;">Even harmonics</td> </tr> <tr> <td>2</td> <td>1,08</td> </tr> <tr> <td>4</td> <td>0,43</td> </tr> <tr> <td>6</td> <td>0,30</td> </tr> <tr> <td>$8 \leq h \leq 40$</td> <td>$0,23 \frac{8}{h}$</td> </tr> </tbody> </table>		Harmonic order <i>h</i>	Maximum permissible harmonic current A	Odd harmonics		3	2,30	5	1,14	7	0,77	9	0,40	11	0,33	13	0,21	$15 \leq h \leq 39$	$0,15 \frac{15}{h}$	Even harmonics		2	1,08	4	0,43	6	0,30	$8 \leq h \leq 40$	$0,23 \frac{8}{h}$
Harmonic order <i>h</i>	Maximum permissible harmonic current A																													
Odd harmonics																														
3	2,30																													
5	1,14																													
7	0,77																													
9	0,40																													
11	0,33																													
13	0,21																													
$15 \leq h \leq 39$	$0,15 \frac{15}{h}$																													
Even harmonics																														
2	1,08																													
4	0,43																													
6	0,30																													
$8 \leq h \leq 40$	$0,23 \frac{8}{h}$																													
Test Method:	BS EN IEC 61000-3-2:2019+A1:2021																													

5.3.1 E.U.T. Operation:

Operating Environment:			
Temperature:	25 °C	Humidity:	55 %
Pre test mode:	TM1		
Final test mode:	TM1		

5.3.2 Test Setup Diagram:

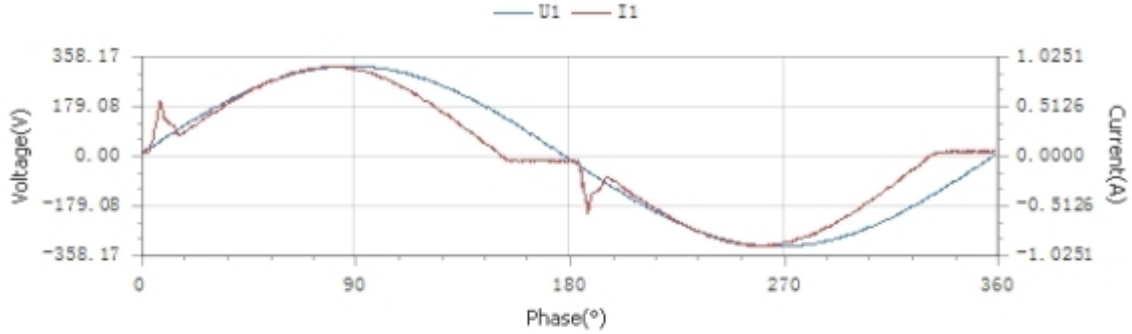




5.3.3 Test Data:

Customer : xxx

Result : Pass



立讯检测股份
Testing Lab



立讯检测股份
LCS Testing Lab

立讯检测股份
LCS Testing Lab

立讯检测股份
LCS Testing Lab





Customer : xxx

Result : Pass

Total Current Harmonic ans Some Odd Harmonic Parameters

THC(A)	0.1086	THD(%)	18.67	POHC(A)	0.0289	POHC Limit(A)	0.2514
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Maximum Value of Relevant Parameter During Test Period

Urms(V)	230.09	Freq(Hz)	49.999
Irms(A)	0.5920	Ipeak(A)	0.9402
I1(A)	0.5821	ICF	1.5950
P(W)	130.76	λ	0.9597

Determination of Harmonics and Limits

Order (n)	Harmonics Current Avg. (A)	100% Limit(A)	Limit Percent (%)	Harmonics Current Max. (A)	150% Limit(A)	Limit Percent (%)	Result
2	0.0003	1.0800	N/A	0.0006	1.6200	N/A	Pass
3	0.0932	2.3000	4.05	0.0945	3.4500	2.74	Pass
4	0.0008	0.4300	N/A	0.0018	0.6450	N/A	Pass
5	0.0161	1.1400	1.41	0.0174	1.7100	1.02	Pass
6	0.0008	0.3000	N/A	0.0018	0.4500	N/A	Pass
7	0.0128	0.7700	1.66	0.0134	1.1550	1.16	Pass
8	0.0008	0.2300	N/A	0.0017	0.3450	N/A	Pass
9	0.0189	0.4000	4.73	0.0197	0.6000	3.28	Pass
10	0.0008	0.1840	N/A	0.0017	0.2760	N/A	Pass
11	0.0189	0.3300	5.73	0.0195	0.4950	3.94	Pass
12	0.0008	0.1533	N/A	0.0016	0.2300	N/A	Pass
13	0.0158	0.2100	7.52	0.0161	0.3150	5.11	Pass
14	0.0008	0.1314	N/A	0.0015	0.1971	N/A	Pass
15	0.0134	0.1500	8.93	0.0137	0.2250	6.09	Pass
16	0.0007	0.1150	N/A	0.0015	0.1725	N/A	Pass
17	0.0139	0.1324	10.50	0.0142	0.1985	7.15	Pass
18	0.0007	0.1022	N/A	0.0014	0.1533	N/A	Pass
19	0.0147	0.1184	12.42	0.0149	0.1776	8.39	Pass
20	0.0007	0.0920	N/A	0.0013	0.1380	N/A	Pass
21	0.0142	0.1071	13.26	0.0144	0.1607	8.96	Pass
22	0.0007	0.0836	N/A	0.0012	0.1255	N/A	Pass
23	0.0124	0.0978	12.68	0.0128	0.1467	8.73	Pass
24	0.0006	0.0767	N/A	0.0011	0.1150	N/A	Pass
25	0.0104	0.0900	11.56	0.0110	0.1350	8.15	Pass
26	0.0006	0.0708	N/A	0.0011	0.1062	N/A	Pass
27	0.0093	0.0833	11.16	0.0100	0.1250	8.00	Pass
28	0.0006	0.0657	N/A	0.0010	0.0986	N/A	Pass
29	0.0089	0.0776	11.47	0.0096	0.1164	8.25	Pass
30	0.0006	0.0613	N/A	0.0009	0.0920	N/A	Pass
31	0.0083	0.0726	11.43	0.0092	0.1089	8.45	Pass
32	0.0006	0.0575	N/A	0.0009	0.0863	N/A	Pass
33	0.0073	0.0682	10.70	0.0082	0.1023	8.02	Pass
34	0.0005	0.0541	N/A	0.0008	0.0812	N/A	Pass
35	0.0060	0.0643	9.33	0.0070	0.0964	7.26	Pass
36	0.0005	0.0511	N/A	0.0008	0.0767	N/A	Pass
37	0.0050	0.0608	8.22	0.0060	0.0912	6.58	Pass
38	0.0005	0.0484	N/A	0.0007	0.0726	N/A	Pass
39	0.0047	0.0577	N/A	0.0055	0.0865	N/A	Pass
40	0.0005	0.0460	N/A	0.0007	0.0690	N/A	Pass





Customer : xxx

Result : Pass

Determination of Voltage Relevant Parameter During Test Period

Item	Nominal Value	Tested Value	Error Value	Allowable Error Value	Result
Urms (V)	230.00	230.11	0.11	±2.0%	Pass
Frequency (Hz)	50.000	49.998	0.002	±0.5%	Pass
CFU	1.4100	1.4157	0.0057	±0.01	Pass
Peak-Volt Phase	90.00	89.45	0.55	±3	Pass

Determination of Voltage Harmonics and Limits

Order (n)	Uhdf	Limit (%)	Limit Percent (%)	Result
1	100%	---	---	---
2	0.01%	0.20	4.96%	Pass
3	0.01%	0.90	1.12%	Pass
4	0.00%	0.20	1.25%	Pass
5	0.00%	0.40	1.13%	Pass
6	0.00%	0.20	1.37%	Pass
7	0.00%	0.30	1.13%	Pass
8	0.00%	0.20	1.25%	Pass
9	0.01%	0.20	2.96%	Pass
10	0.00%	0.20	2.08%	Pass
11	0.00%	0.10	3.16%	Pass
12	0.00%	0.10	4.50%	Pass
13	0.01%	0.10	5.01%	Pass
14	0.00%	0.10	2.76%	Pass
15	0.00%	0.10	3.87%	Pass
16	0.00%	0.10	2.06%	Pass
17	0.00%	0.10	1.69%	Pass
18	0.00%	0.10	1.71%	Pass
19	0.00%	0.10	4.14%	Pass
20	0.00%	0.10	1.83%	Pass
21	0.01%	0.10	7.14%	Pass
22	0.00%	0.10	1.79%	Pass
23	0.01%	0.10	7.77%	Pass
24	0.00%	0.10	1.85%	Pass
25	0.01%	0.10	7.52%	Pass
26	0.00%	0.10	1.83%	Pass
27	0.01%	0.10	9.40%	Pass
28	0.00%	0.10	1.89%	Pass
29	0.01%	0.10	9.14%	Pass
30	0.00%	0.10	1.94%	Pass
31	0.01%	0.10	8.55%	Pass
32	0.00%	0.10	1.88%	Pass
33	0.01%	0.10	8.46%	Pass
34	0.00%	0.10	2.05%	Pass
35	0.01%	0.10	6.80%	Pass
36	0.00%	0.10	1.93%	Pass
37	0.01%	0.10	6.31%	Pass
38	0.00%	0.10	1.95%	Pass
39	0.01%	0.10	6.75%	Pass
40	0.00%	0.10	1.94%	Pass





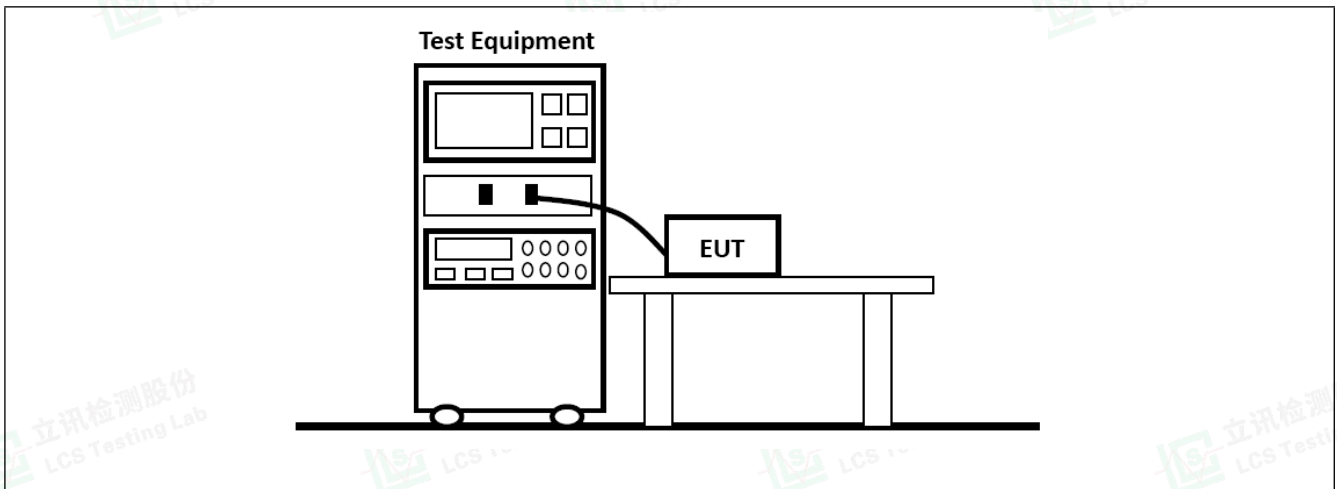
5.4 Voltage fluctuations and flicker

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

5.4.1 E.U.T. Operation:

Operating Environment:			
Temperature:	25 °C	Humidity:	55 %
Pre test mode:	TM1		
Final test mode:	TM1		

5.4.2 Test Setup Diagram:





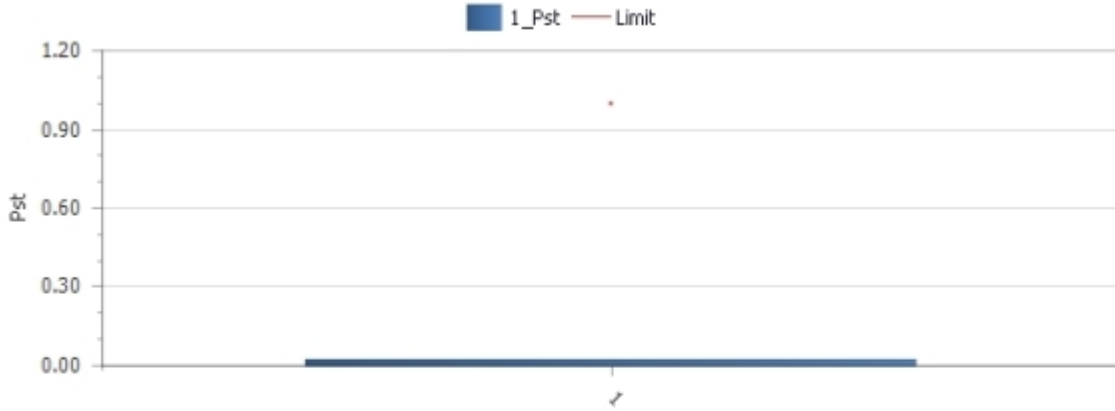
5.4.3 Test Data:

TM1

Customer : xxx

Result : Pass

Pst and Limit



Relevant Parameter and Judgement During Test Period

Vrms at the end of test(V)	229.90			
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	0.021	Test Limit	1.000	Pass





6. IMMUNITY TEST RESULTS (EMS)

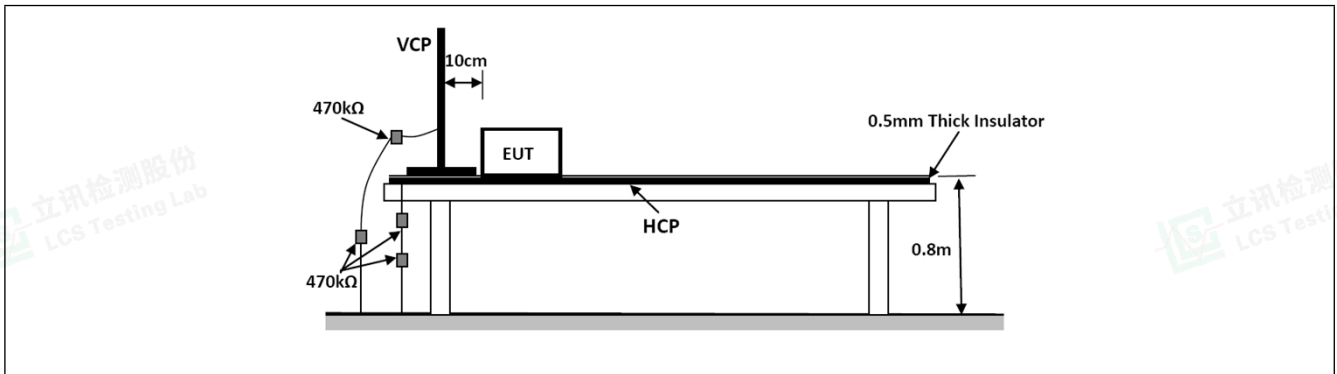
6.1 Electrostatic discharges

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:	23.4 °C	Humidity:	55.7 %
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





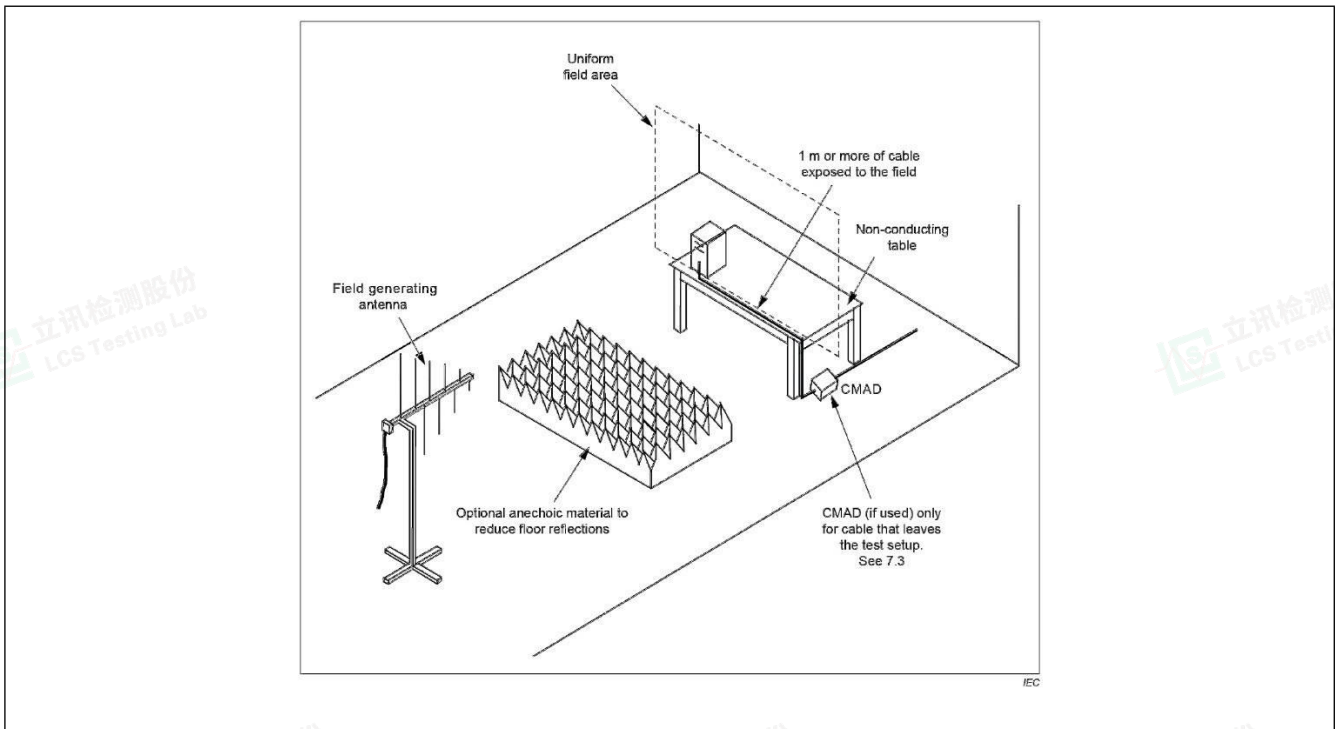
6.2 RF electromagnetic field disturbances

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:	23.4 °C	Humidity:	55.7 %
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

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





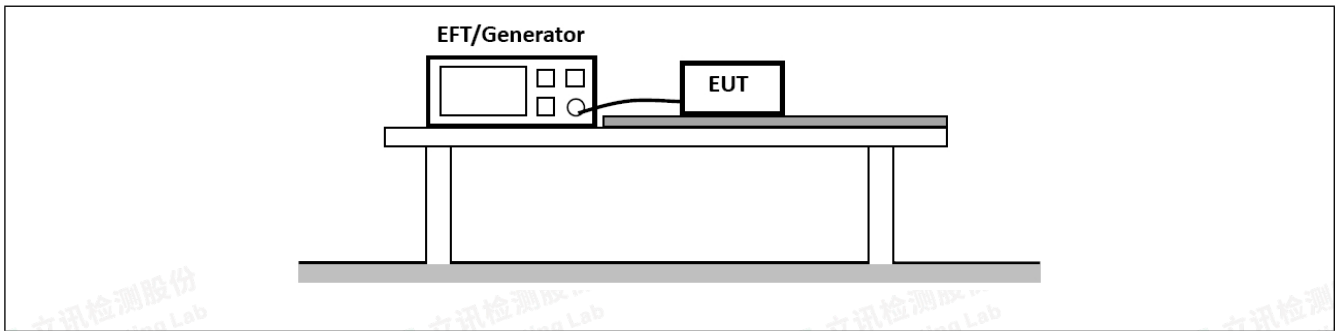
6.3 Electrical fast transients / burst for AC mains power ports

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:	23.4 °C	Humidity:	55.7 %
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





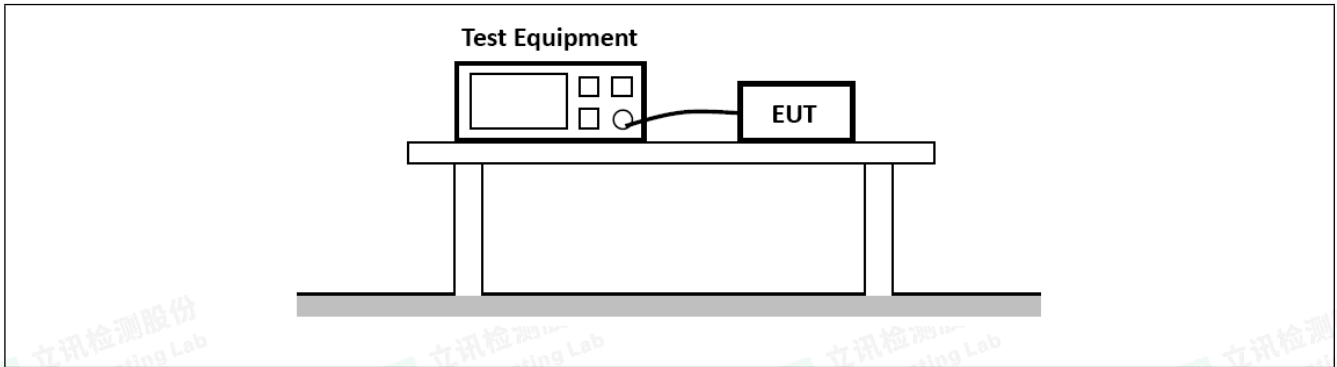
6.4 Surges for AC mains power ports

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:	23.4 °C	Humidity:	55.7 %
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
L-PE	2	+	90°	B
L-PE	2	-	270°	B
N-PE	2	+	90°	B
N-PE	2	-	270°	B





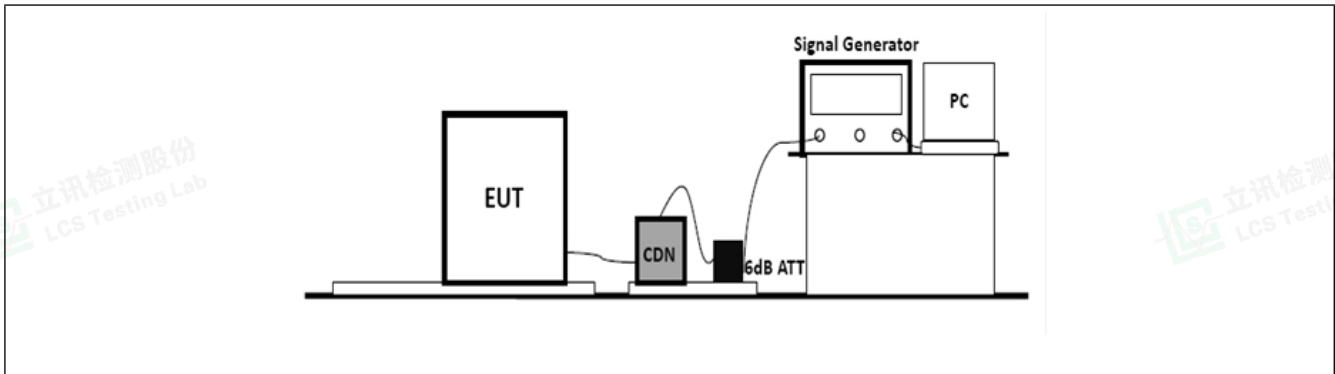
6.5 Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)

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:	23.4 °C	Humidity:	55.7 %
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





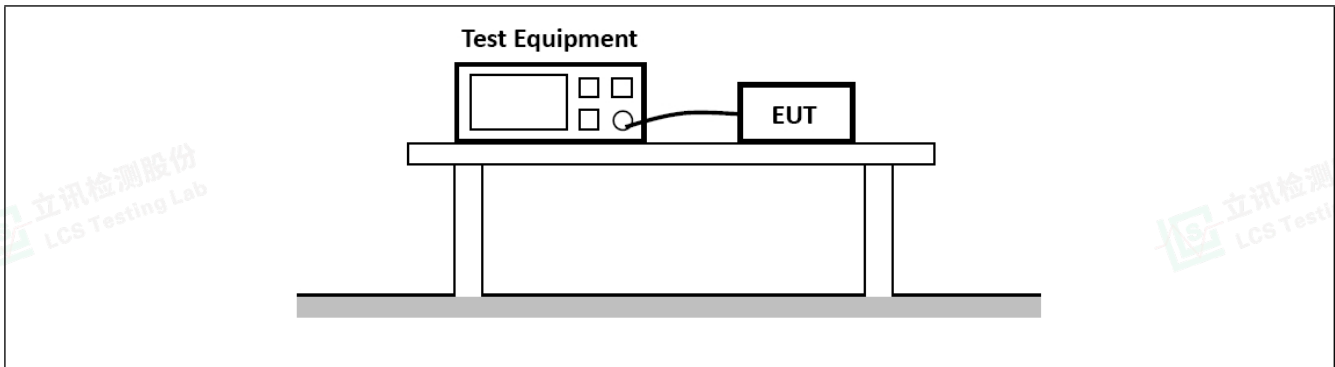
6.6 Voltage dips and interruptions

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:	23.4 °C	Humidity:	55.7 %
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)

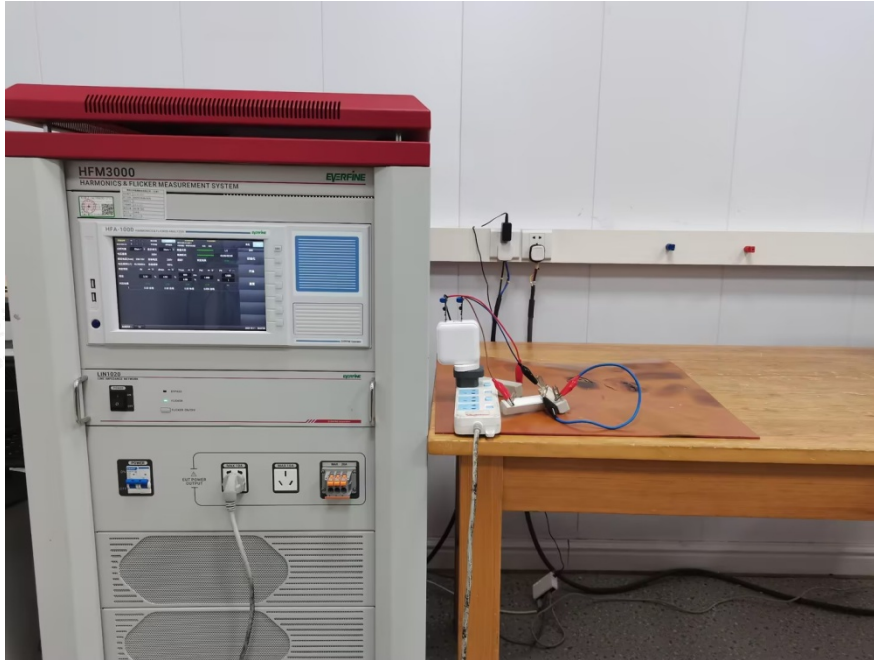


Radiated emissions (30MHz-1GHz)





Harmonic current emission Voltage fluctuations and flicker



Electrostatic discharges

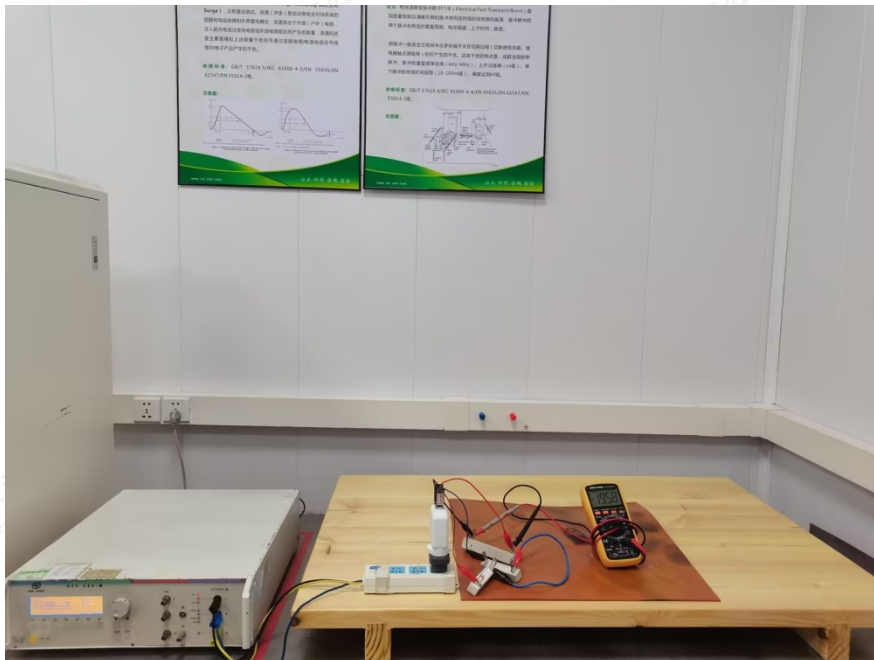




RF electromagnetic field disturbances

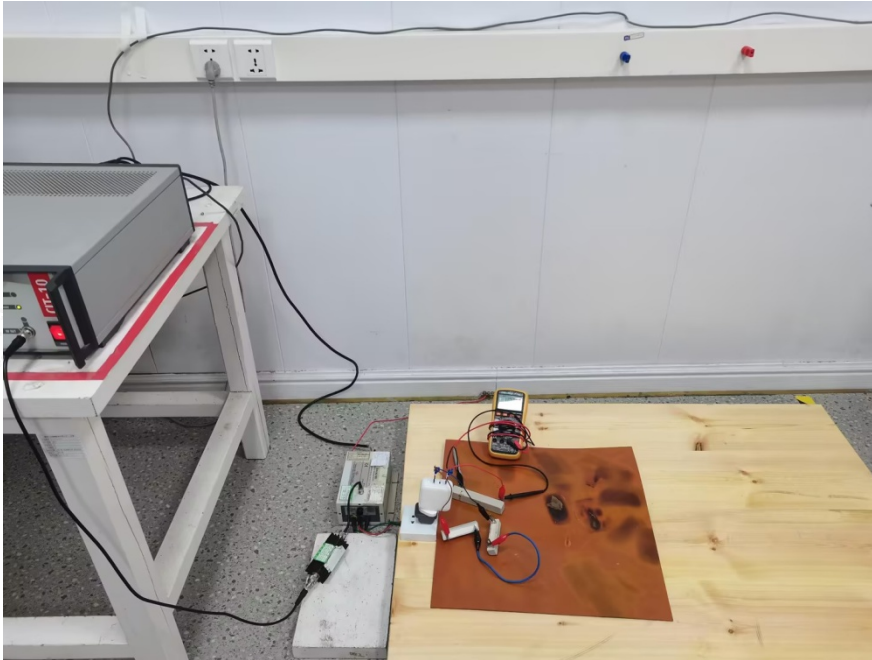


Electrical fast transients / burst for AC mains power ports Surges for AC mains power ports

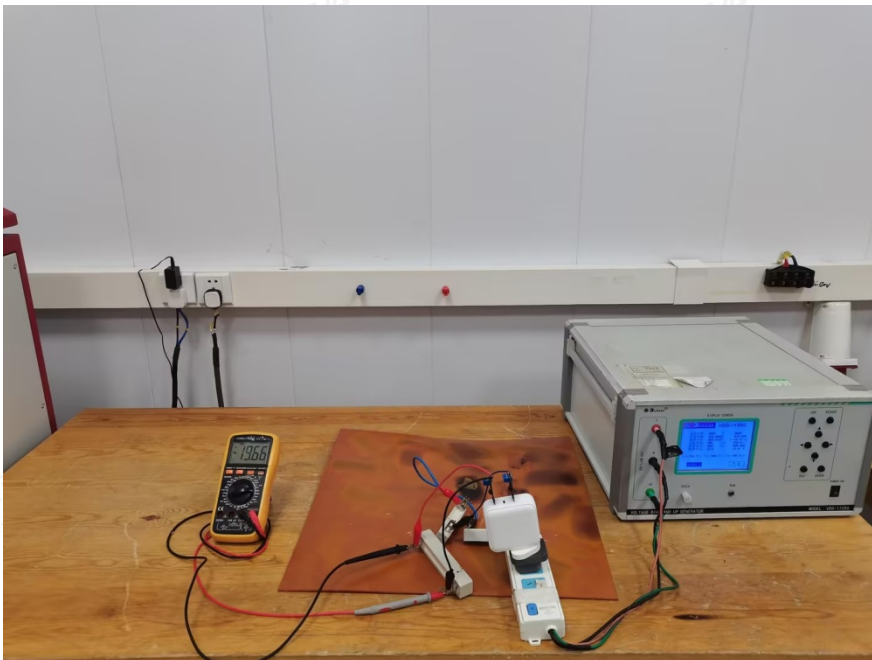




Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)



Voltage dips and interruptions





8. EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)



Fig. 1



Fig. 2



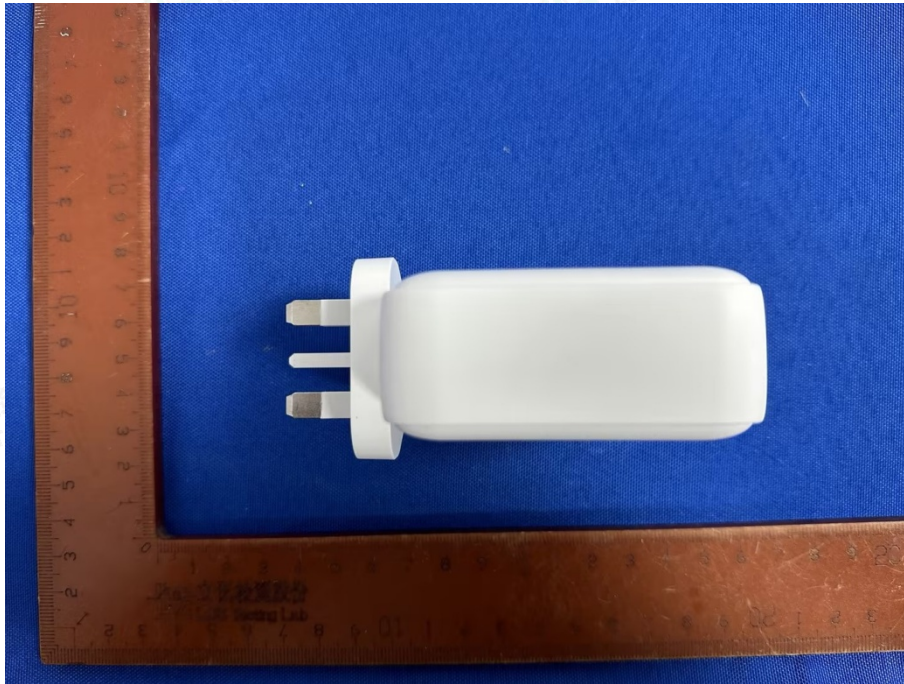


Fig. 3



Fig. 4



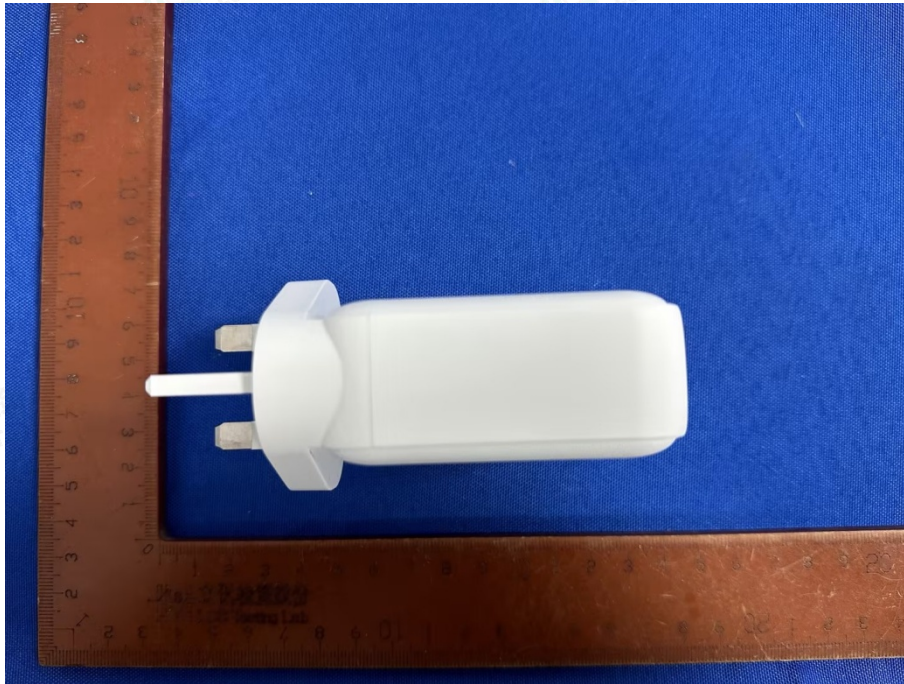


Fig. 5



Fig. 6





Fig. 7

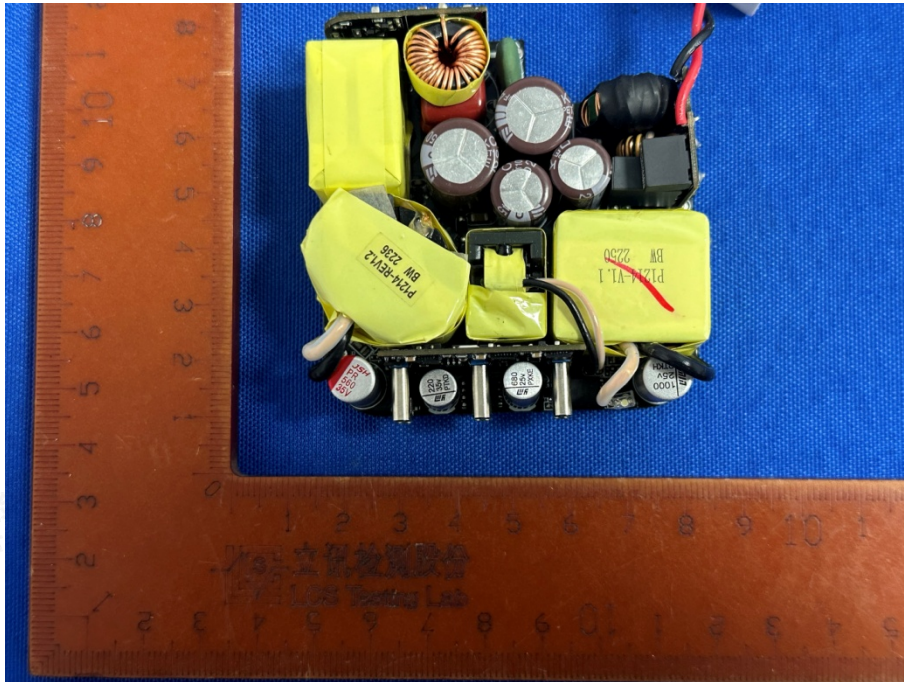


Fig. 8



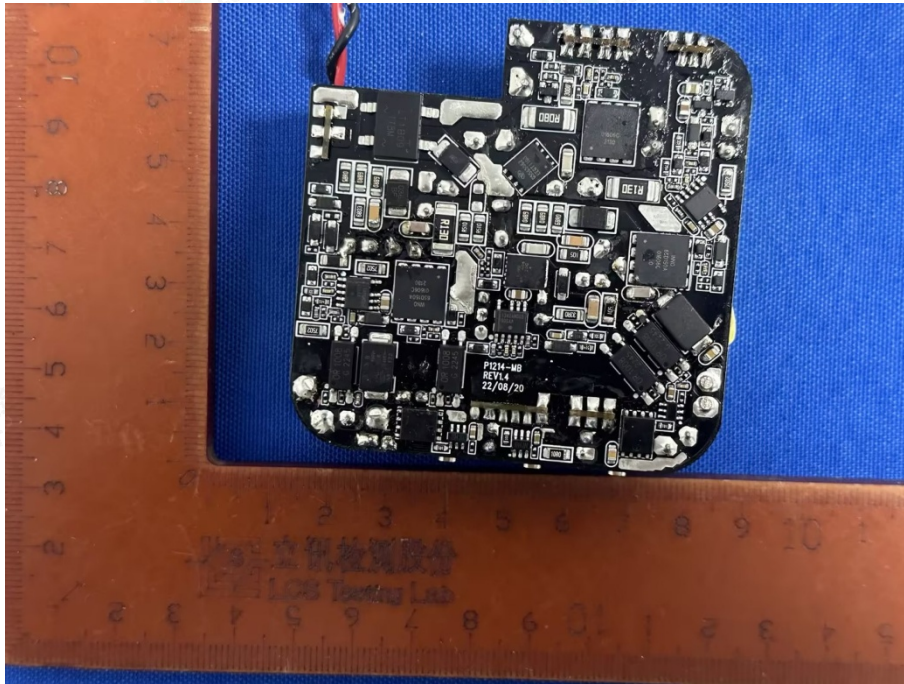


Fig. 9



-- End of Report --

