



## EMC TEST REPORT

For

Mid Ocean Brands B.V.

Hand warmer power bank

Test Model: MO6949

Prepared for : Mid Ocean Brands B.V.  
Address : 7/F., Kings Tower, 111 King Lam Street, Cheung  
Sha Wan, Kowloon, Hong Kong

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  
Tel : (+86)755-82591330  
Fax : (+86)755-82591332  
Web : www.LCS-cert.com  
Mail : webmaster@LCS-cert.com

Date of receipt of test sample : April 04, 2023  
Number of tested samples : 1  
Sample No. : A040323266  
Date of Test : April 04, 2023 ~ June 06, 2023  
Date of Report : June 06, 2023





<b>EMC TEST REPORT</b> <b>EN IEC 55014-1:2021</b> Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission <b>EN IEC 55014-2:2021</b> Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard	
<b>Report Reference No. ....:</b>	<b>LCSA040323266E001</b>
<b>Date Of Issue .....</b>	June 06, 2023
<b>Testing Laboratory Name ....:</b>	<b>Shenzhen LCS Compliance Testing Laboratory Ltd.</b>
<b>Address.....:</b>	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
<b>Testing Location/ Procedure ...:</b>	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
<b>Applicant's Name .....</b>	<b>Mid Ocean Brands B.V.</b>
<b>Address.....:</b>	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
<b>Test Specification:</b>	
<b>Standard .....</b>	EN IEC 55014-1:2021 EN IEC 55014-2:2021
<b>Test Report Form No. ....:</b>	LCSEMC-1.0
<b>TRF Originator .....</b>	Shenzhen LCS Compliance Testing Laboratory Ltd.
<b>Master TRF .....</b>	Dated 2011-03
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<b>Test Item Description.....:</b>	<b>Hand warmer power bank</b>
<b>Trade Mark.....:</b>	N/A
<b>Test Model .....</b>	MO6949
<b>Ratings.....:</b>	Please refer to page 8
<b>Result .....</b>	<b>Positive</b>

Compiled by:

Cindy Nie

Cindy Nie/ File administrators

Supervised by:

Baron Wen

Baron Wen/Technique principal

Approved by:

Gavin Liang

Gavin Liang/ Manager



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**EMC -- TEST REPORT****Test Report No. : LCSA040323266E001**June 06, 2023  
Date of issue

Test Model..... : MO6949

EUT..... : Hand warmer power bank

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

Telephone..... : /

Fax..... : /

**Manufacturer..... : 114628**

Address..... : /

Telephone..... : /

Fax..... : /

**Factory..... : 114628**

Address..... : /

Telephone..... : /

Fax..... : /

**Test Result** according to the standards on page 6:**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.



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### Revision History

Revision	Issue Date	Revisions Content	Revised By
000	June 06, 2023	Initial Issue	--







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## 1. SUMMARY OF STANDARDS AND RESULTS

### 1.1. Description of Standards and Results

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

EMISSION (EN IEC 55014-1:2021)			
Description of Test Item	Standard	Limits	Results
Radiated disturbance	EN IEC 55014-1:2021	-----	PASS
IMMUNITY (EN IEC 55014-2:2021)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	EN 61000-4-2: 2009	B	PASS
Note: N/A is an abbreviation for Not Applicable.			
Note: For Category III toys, the radio frequency electromagnetic fields test shall be applicable only for ride on toys			

Test mode:		
Mode	Working	Record
***Note: All test modes were tested, but we only recorded the worst case in this report.		





## 1.2. Description of Performance Criteria

### General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

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

#### 1.2.1. Performance criterion A

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 manufacture 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.

#### 1.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation 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 by what the user may reasonably expect from the equipment if used as intended.

#### 1.2.3. Performance criterion 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 manufacture's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.





## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

EUT	: Hand warmer power bank
Trade Mark	: N/A
Test Model	: MO6949
Power Supply	: Type-C Input: DC 5V $\Rightarrow$ 2A Type-C Output: DC 5V $\Rightarrow$ 2A USB-A Output: DC 5V $\Rightarrow$ 2A Capacity: 4000mAh/14.8Wh
EUT Clock Frequency	: $\leq 15$ MHz

### 2.2. Test Facility

#### Site Description

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

### 2.3. 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.





## 2.4.Measurement Uncertainty

Test	Parameters	Expanded Uncertainty ( $U_{lab}$ )	Expanded Uncertainty ( $U_{cispr}$ )
Coucted Emission	Level accuracy (9kHz to 150kHz)	$\pm 2.63$ dB	$\pm 3.8$ dB
	(150kHz to 30MHz)	$\pm 2.35$ dB	$\pm 3.4$ dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	$\pm 3.68$ dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	$\pm 3.48$ dB	$\pm 5.3$ dB
Radiated Emission	Level accuracy (above 1000MHz)	$\pm 3.90$ dB	$\pm 5.2$ dB

- (1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.
- (2) 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

Test Item: Radiated Disturbance (Electric Field)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	AUDIX	E3	/	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
4	EMI Test Receiver	R&S	ESR3	102311	2022-08-17	2023-08-16
5	Broadband Preamplifier	/	BP-01M18G	P190501	2022-06-16	2023-06-15

Test Item: Electrostatic Discharge						
Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	SCHLODER	SESD 230	604035	2022-07-18	2023-07-17

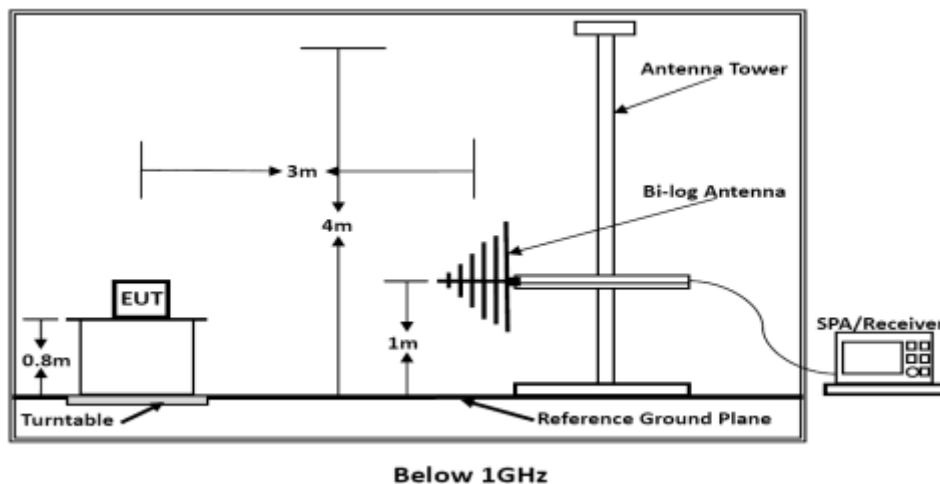




## 4. TEST RESULTS

### 4.1. RADIATED EMISSION MEASUREMENT

#### 4.1.1. Block Diagram of Test Setup



#### 4.1.2. Test Standard

EN IEC 55014-1:2021

#### 4.1.3. Radiated Emission Limits

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB $\mu$ V/m)
30-230	3	40
230-1000	3	47

\*\*\*Note:  
(1) The smaller limit shall apply at the combination point between two frequency bands.  
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

#### 4.1.4. EUT Configuration on Test

The EN IEC EN 55014-1 regulations test method must be used to find the maximum emission during radiated emission measurement.

#### 4.1.5. Operating Condition of EUT

4.1.5.1. Turn on the power.

4.1.5.2. After that, let the EUT work in test Mode 1 and measure it.



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#### 4.1.6. Test Procedure

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. By-log antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. The bandwidth of the Receiver is set at 120kHz. The frequency range from 30MHz to 1000MHz is investigated.

#### 4.1.7. Test Results

**PASS.**

Refer to attached Annex B.1



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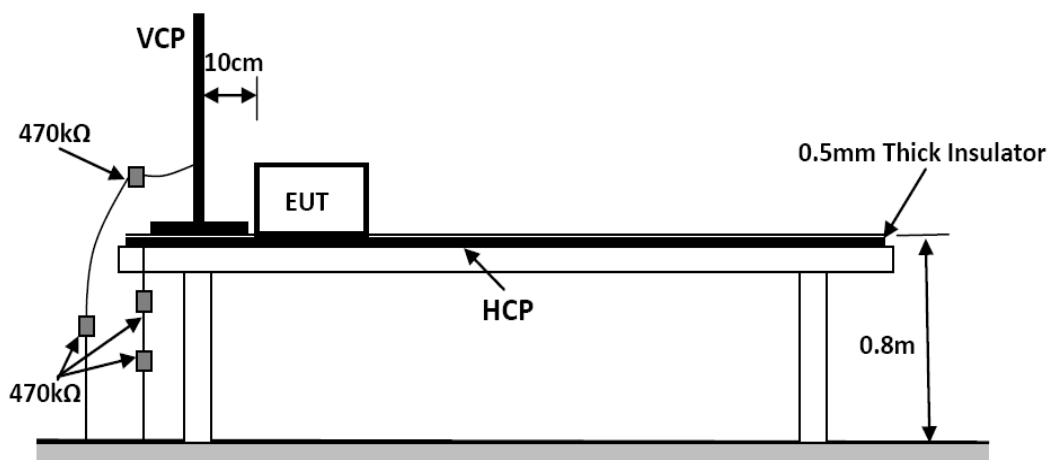
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## 4.2. Electrostatic Discharge immunity Test

### 4.2.1. Block Diagram of Test Setup



### 4.2.2. Test Standard

EN IEC 55014-2:2021 (EN 61000-4-2: 2009, Severity Level: 3 / Air Discharge:  $\pm 8\text{KV}$ , Level: 2 / Contact Discharge:  $\pm 4\text{KV}$ )

### 4.2.3. Severity Levels and Performance Criterion

#### 4.2.3.1. Severity level

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

#### 4.2.3.2. Performance criterion: B

### 4.2.4. EUT Configuration on Test

The configuration of EUT are listed in Section 4.2.1.

### 4.2.5. Operating Condition of EUT

Same as radiated emission measurement, which is listed in Section 4.1.5 except the test set up replaced by Section 4.2.1.





#### 4.2.6. Test Procedure

##### 4.2.6.1. Air Discharge

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

##### 4.2.6.2. Contact Discharge

All the procedure shall be same as Section 4.2.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

##### 4.2.6.3. Indirect Discharge For Horizontal Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

##### 4.2.6.4. Indirect Discharge For Vertical Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different, positions that the four faces of the EUT are completely illuminated.

#### 4.2.7. Test Results

**PASS.**

Refer to attached Annex B.2



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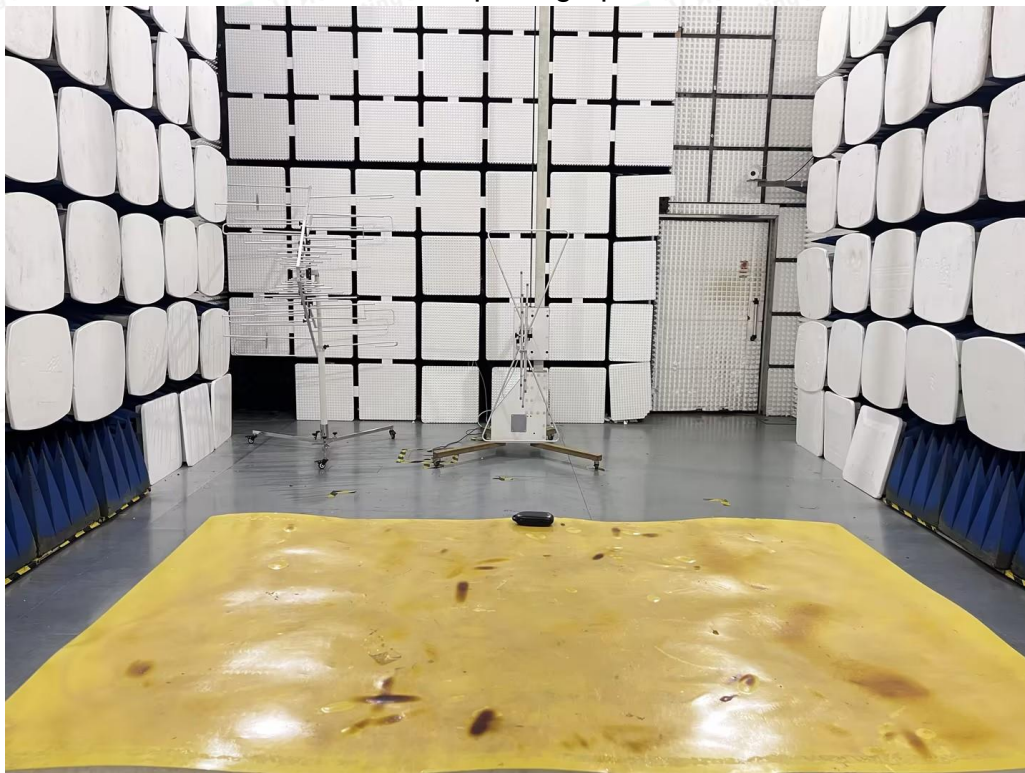
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## NNEX A

(Test photograph)



Test Setup Photo of Radiated Measurement (30MHz~1GHz)



Test Setup Photo of Electrostatic Discharge Test



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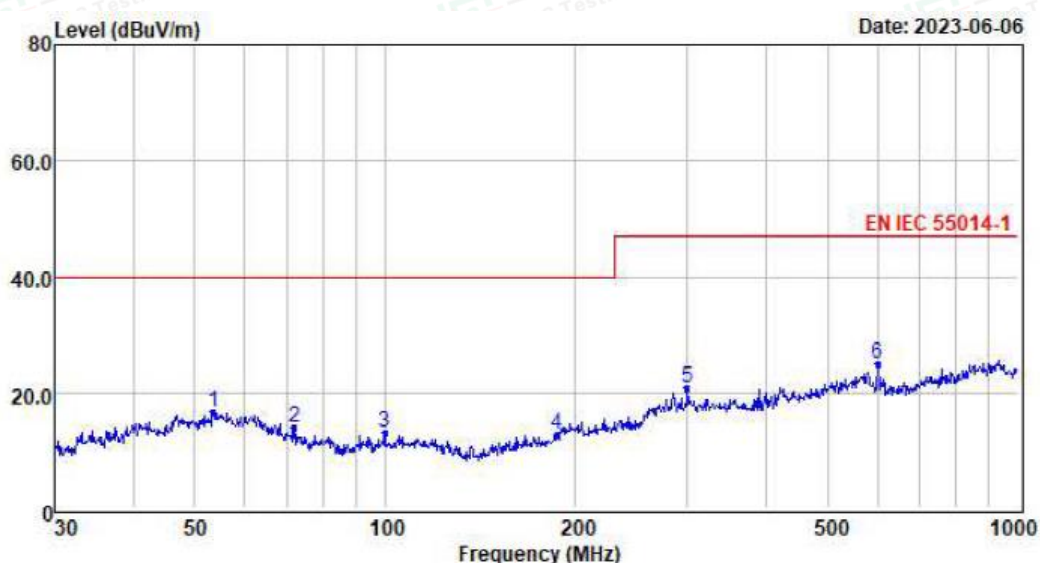
## ANNEX B

(Emission and Immunity test results)

### B.1 Radiated Disturbance Test Results (30MHz to 1000MHz)

Environmental Conditions:	22.3℃, 53.6% RH
Test Voltage:	DC
Test Model:	MO6949
Test Mode:	Working
Test Engineer:	Zi Liao
Pol:	Vertical

Detailed results are shown below



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	53.51	3.60	0.62	12.56	16.78	40.00	-23.22	QP
2	71.83	3.31	0.70	10.12	14.13	40.00	-25.87	QP
3	99.88	1.73	0.80	10.69	13.22	40.00	-26.78	QP
4	187.10	1.33	1.16	10.16	12.65	40.00	-27.35	QP
5	300.37	5.90	1.32	13.70	20.92	47.00	-26.08	QP
6	601.43	4.13	1.50	19.28	24.91	47.00	-22.09	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



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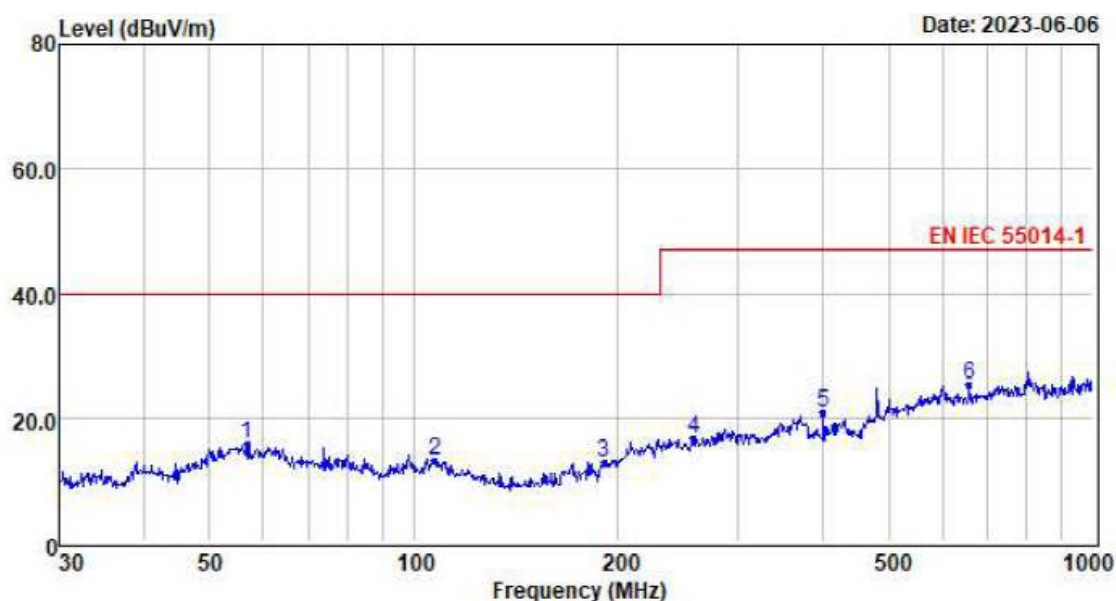
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Environmental Conditions:	22.3°C, 53.6% RH
Test Voltage:	DC
Test Model:	MO6949
Test Mode:	Working
Test Engineer:	Zi Liao
Pol:	Horizontal

Detailed results are shown below



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	56.79	2.48	0.64	12.53	15.65	40.00	-24.35	QP
2	107.51	0.91	0.84	11.23	12.98	40.00	-27.02	QP
3	190.41	1.29	1.17	10.32	12.78	40.00	-27.22	QP
4	258.33	2.81	1.27	12.68	16.76	47.00	-30.24	QP
5	400.43	4.61	1.40	14.72	20.73	47.00	-26.27	QP
6	658.84	4.93	1.68	18.62	25.23	47.00	-21.77	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



**B.2 ELECTROSTATIC DISCHARGE IMMUNITY TEST**

Electrostatic Discharge Test Results			
Standard	<input type="checkbox"/> IEC 61000-4-2 <input checked="" type="checkbox"/> EN 61000-4-2		
Applicant	Mid Ocean Brands B.V.		
EUT	Hand warmer power bank	Temperature	23.4℃
M/N	MO6949	Humidity	53.1%
Criterion	B	Pressure	1021mbar
Test Mode	Working	Test Engineer	Zi Liao

Air Discharge						
Test Points	Test Levels			Results		
	± 2KV	± 4KV	± 8KV	Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Contact Discharge						
Test Points	Test Levels		Pass	Fail	Results	
	± 2 KV	±4 KV			Performance Criterion	
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Discharge To Horizontal Coupling Plane						
Side of EUT	Test Levels		Pass	Fail	Results	
	± 2 KV	± 4 KV			Performance Criterion	
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Discharge To Vertical Coupling Plane						
Side of EUT	Test Levels		Pass	Fail	Results	
	± 2 KV	± 4 KV			Performance Criterion	
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A	<input checked="" type="checkbox"/> B



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## ANNEX C

(External and internal photos of the EUT)



Fig. 1



Fig. 2





Fig. 3



Fig. 4







Fig. 5



Fig. 6







Fig. 7

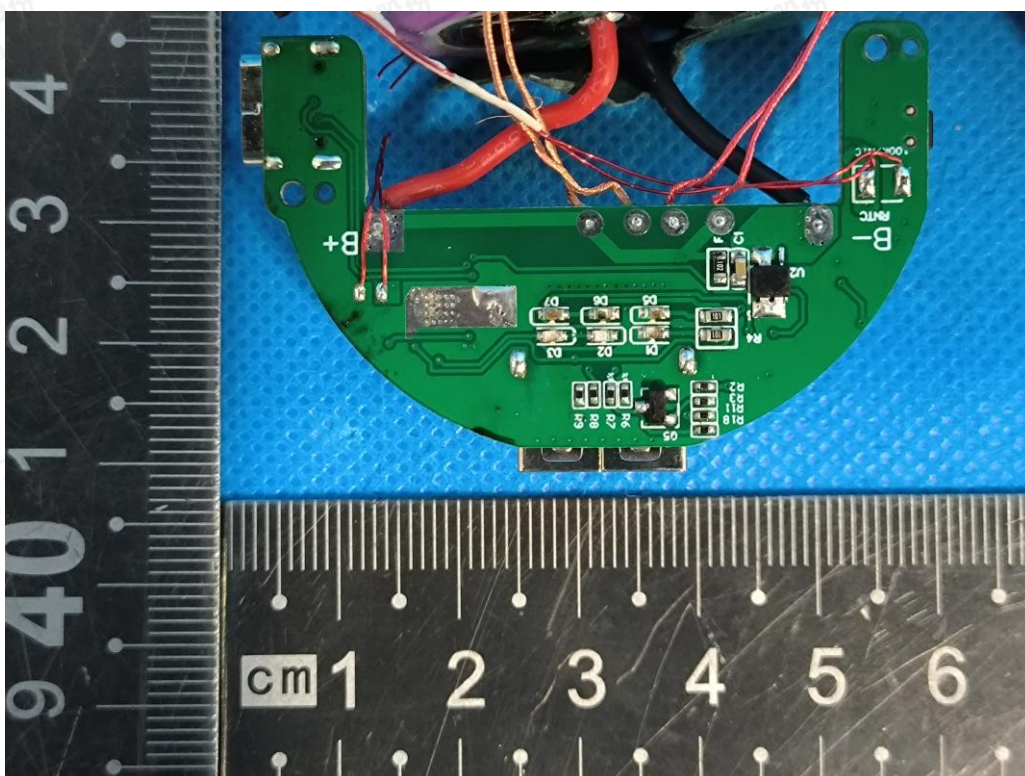


Fig. 8



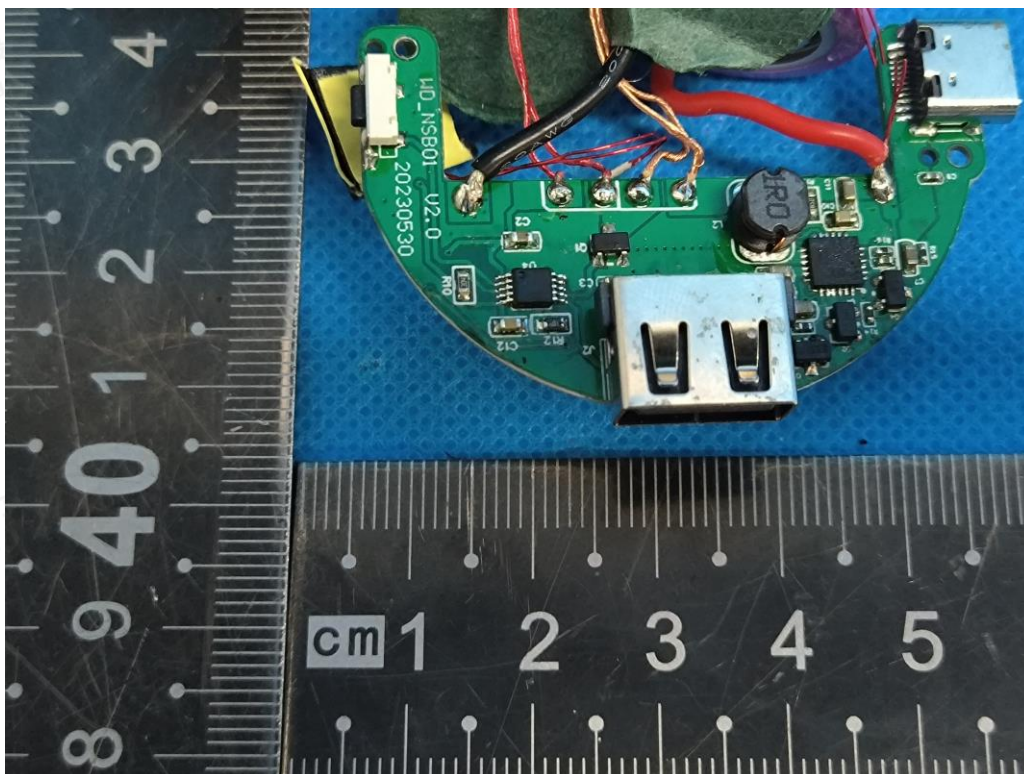


Fig. 9



Fig. 10

----- THE END OF TEST REPORT -----







## EMC TEST REPORT

For

Mid Ocean Brands B.V.

Hand warmer power bank

Test Model: MO6949

Prepared for : Mid Ocean Brands B.V.  
Address : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

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

Tel : (+86)755-82591330  
Fax : (+86)755-82591332  
Web : www.LCS-cert.com  
Mail : webmaster@LCS-cert.com

Date of receipt of test sample : April 04, 2023  
Number of tested samples : 2  
Samples number : A040323268-1, A040323268-2  
Date of Test : April 04, 2023 ~ June 06, 2023  
Date of Report : June 06, 2023



**EMC TEST REPORT**  
**EN 55032:2015/A11:2020**

Electromagnetic compatibility of multimedia equipment - Emission Requirements

**EN 55035:2017/A11:2020**

Electromagnetic compatibility of multimedia equipment – Immunity requirements

**Report Reference No. .... : LCSA040323268E001****Date of Issue..... : June 06, 2023****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..... : Mid Ocean Brands B.V.****Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong****Test Specification****Standard ..... : EN 55032:2015/A11:2020  
EN 55035:2017/A11:2020  
EN IEC 61000-3-2:2019/A1:2021  
EN 61000-3-3: 2013/A2:2021****Test Report Form No. .... : LCSEMC-1.0****TRF Originator ..... : Shenzhen LCS Compliance Testing Laboratory Ltd.****Master TRF ..... : Dated 2011-03****Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

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**Test Item Description..... : Hand warmer power bank****Trade Mark..... : N/A****Test Model ..... : MO6949****Ratings..... : Please Refer to Page 9****Result ..... : Positive****Compiled by:***Cindy Nie*

Cindy Nie/ File administrators

**Supervised by:***Baron Wen*

Baron Wen/ Technique principal

**Approved by:***Gavin Liang*

Gavin Liang/ Manager



Shenzhen LCS Compliance Testing Laboratory Ltd.

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## EMC -- TEST REPORT

Test Report No. : LCSA040323268E001	<u>June 06, 2023</u> Date of issue
-------------------------------------	---------------------------------------

**Test Model..... : MO6949**

**EUT..... : Hand warmer power bank**

**Applicant..... : Mid Ocean Brands B.V.**

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

**Telephone..... : /**

**Fax..... : /**

**Manufacturer..... : 114628**

**Address..... : /**

**Telephone..... : /**

**Fax..... : /**

**Factory..... : 114628**

**Address..... : /**

**Telephone..... :**

**Fax..... : /**

<b>Test Result</b>	<b>Positive</b>
--------------------	-----------------

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.



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## Revision History

Revision	Issue Date	Revision Content	Revised By
000	June 06, 2023	Initial Issue	/





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## 1. TEST STANDARDS

The tests were performed according to following standards:

EN 55032:2015/A11:2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements

EN 55035:2017/A11:2020 Electromagnetic compatibility of multimedia equipment – Immunity requirements

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

EN 61000-3-3: 2013/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  $\leq 16$  A per phase and not subject to conditional connection



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## 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.

Emission (EN 55032:2015/A11:2020)			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN 55032:2015/A11:2020	Class B	PASS
Conducted disturbance at telecommunication port	EN 55032:2015/A11:2020	Class B	N/A
Radiated disturbance	EN 55032:2015/A11:2020	Class B	PASS
Harmonic current emissions	EN IEC 61000-3-2:2019/A1:2021	Class A	N/A
Voltage fluctuations & flicker	EN 61000-3-3: 2013/A2:2021	-----	PASS
Immunity (EN 55035:2017/A11:2020)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	EN 61000-4-2:2009	B	PASS
Radio-frequency, Continuous radiated disturbance	EN IEC 61000-4-3:2020	A	PASS
Electrical fast transient (EFT)	EN 61000-4-4:2012	B	PASS
Surge (Input a.c. power ports)	EN 61000-4-5:2014/A1:2017	B	PASS
Surge (Telecommunication ports)		B	N/A
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6:2014/A1:2015	A	PASS
Power frequency magnetic field	EN 61000-4-8:2010	A	N/A
Voltage dips, >95% reduction	EN IEC 61000-4-11:2020/AC: 2020	B	PASS
Voltage dips, 30% reduction		C	PASS
Voltage interruptions		C	PASS
***Note: N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode 1	Charging	Record
Mode 2	Discharging	Record
***Note: All test modes were tested, but we only recorded the worst case in this report.		



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## 2.2. Description of Performance Criteria

### General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;

#### 2.2.1. Performance criterion A

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 manufacture 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.

#### 2.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation 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 by what the user may reasonably expect from the equipment if used as intended.

#### 2.2.3. Performance criterion 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 manufacture's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.



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### 3. GENERAL INFORMATION

#### 3.1. Description of Device (EUT)

EUT : Hand warmer power bank

Trade Mark : N/A

Test Model : MO6949

Power Supply : Type-C Input: DC 5V $\pm$ 2A  
Type-C Output: DC 5V $\pm$ 2A  
USB-A Output: DC 5V $\pm$ 2A  
Capacity: 4000mAh/14.8Wh

Highest internal frequency :  $F_x \leq 108\text{MHz}$

Highest internal frequency ( $F_x$ )	Highest measured frequency
$F_x \leq 108\text{ MHz}$ $108\text{ MHz} < F_x \leq 500\text{ MHz}$ $500\text{ MHz} < F_x \leq 1\text{ GHz}$ $F_x > 1\text{ GHz}$	1 GHz 2 GHz 5 GHz 5 $\times$ $F_x$ up to a maximum of 6 GHz
NOTE 1 For FM and TV broadcast receivers, $F_x$ is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies. NOTE 2 $F_x$ is defined in EN 55032 Section 3.1.19. Where $F_x$ is unknown, the radiated emission measurements shall be performed up to 6 GHz	







### 3.2. Support Equipment List

Name	Manufacturers	M/N	S/N
--	--	--	--

### 3.3. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

### 3.4. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the 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.



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### 3.5. Measurement Uncertainty

Test	Parameters	Expanded uncertainty ( $U_{lab}$ )	Expanded uncertainty ( $U_{cispr}$ )
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	$\pm 2.63$ dB $\pm 2.35$ dB	$\pm 3.8$ dB $\pm 3.4$ dB
Power Disturbance	Level accuracy (30MHz to 300MHz)	$\pm 2.90$ dB	$\pm 4.5$ dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	$\pm 3.60$ dB	$\pm 3.3$ dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	$\pm 3.68$ dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	$\pm 3.48$ dB	$\pm 5.3$ dB
Radiated Emission	Level accuracy (above 1000MHz)	$\pm 3.90$ dB	$\pm 5.2$ dB
Mains Harmonic	Voltage	$\pm 0.510\%$	N/A
Voltage Fluctuations & Flicker	Voltage	$\pm 0.510\%$	N/A
EMF	/	$\pm 21.59\%$	N/A

1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

2) 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%.



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#### 4. MEASURING DEVICES AND TEST EQUIPMENT

##### LINE CONDUCTED EMISSION

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102312	2023-02-25	2024-02-24
3	Artificial Mains	R&S	ENV216	101288	2022-06-16	2023-06-15
4	Pulse Limiter	R&S	ESH3-Z2	102750-NB	2022-08-17	2023-08-16

##### RADIATED DISTURBANCE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	AUDIX	E3	/	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
4	EMI Test Receiver	R&S	ESR3	102311	2022-08-17	2023-08-16
5	Broadband Preamplifier	/	BP-01M18G	P190501	2022-06-16	2023-06-15

##### VOLTAGE FLUCTUATION AND FLICKER/HARMONIC CURRENT EMISSIONS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD1411116	2023-02-25	2024-02-24
2	HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD1411124	2023-02-25	2024-02-24

##### ELECTROSTATIC DISCHARGE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	SCHLODER	SESD 230	604035	2022-07-18	2023-07-17

##### RF ELECTROMAGNETIC FIELD)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	MXG Vector Signal Generator	Agilent	E4438C	MY42081396(6G)	2022-06-16	2023-06-15
2	RF POWER AMPLIFIER	SKET	HAP_0306G-50W	/	2022-06-16	2023-06-15
3	RF POWER AMPLIFIER	OPHIR	5225R	1052	2022-06-16	2023-06-15
4	RF POWER AMPLIFIER	OPHIR	5273F	1019	2022-06-16	2023-06-15
5	Stacked Broadband Log Periodic Antenna	SCHWARZBEC K	STLP 9128	9128ES-145	NCR	NCR
6	Stacked Mikrowellen Log.-Per Antenna	SCHWARZBEC K	STLP 9149	9149-484	NCR	NCR
7	RS Electric field probe	narda	EP601	611WX80208	2022-06-16	2023-06-15

Note: NCR means no calibration requirement



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**ELECTRICAL FAST TRANSIENT IMMUNITY**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2022-08-17	2023-08-16

**SURGES, LINE TO LINE AND LINE TO GROUND**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2022-08-17	2023-08-16

**RF COMMON MODE**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2022-08-17	2023-08-16
2	CDN	FRANKONIA	CDN-M2+M3	A2210177	2022-06-16	2023-06-15
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2022-06-16	2023-06-15

**VOLTAGE DIPS/INTERRUPTIONS IMMUNITY TEST**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2022-06-16	2023-06-15



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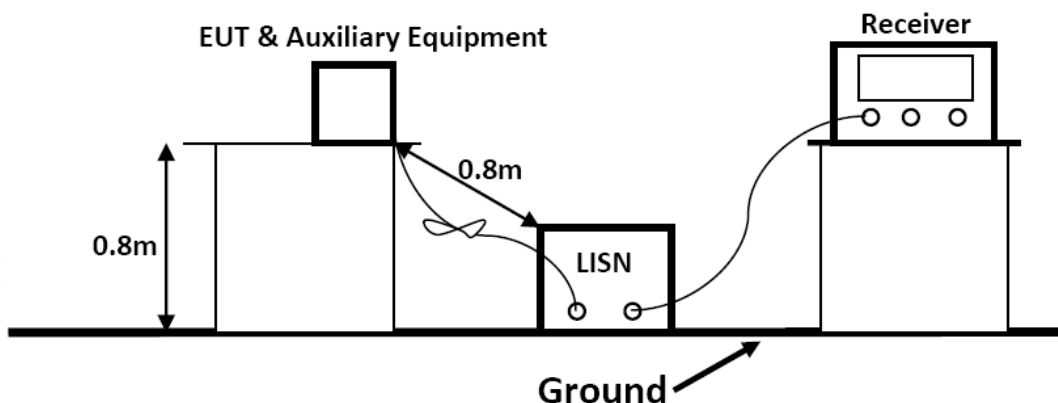
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## 5. TEST RESULTS

### 5.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

#### 5.1.1. Block Diagram of Test Setup



#### 5.1.2. Test Standard

EN 55032:2015/A11:2020 Class B

Power Line Conducted Emission Limits (Class B)		
Frequency (MHz)	Limit (dB $\mu$ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.  
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

#### 5.1.3. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the EN 55032 requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

#### 5.1.4. Operating Condition of EUT

5.1.4.1. Setup the EUT as shown on Section 5.1.1

5.1.4.2. Turn on the power of all equipments.

5.1.4.3. Let the EUT work in measuring mode(1) and measure it.



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### 5.1.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided 50-ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55032 regulations during conducted emission measurement.

The bandwidth of the field strength meter is set at 9kHz in 150kHz~30MHz.

The frequency range from 150kHz to 30MHz is investigated.

### 5.1.6. Test Results

**PASS.**

Refer to attached Annex B.1

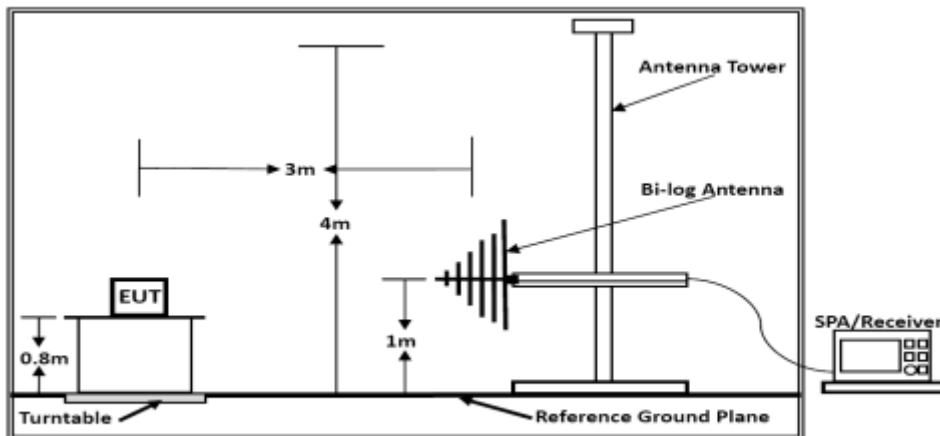




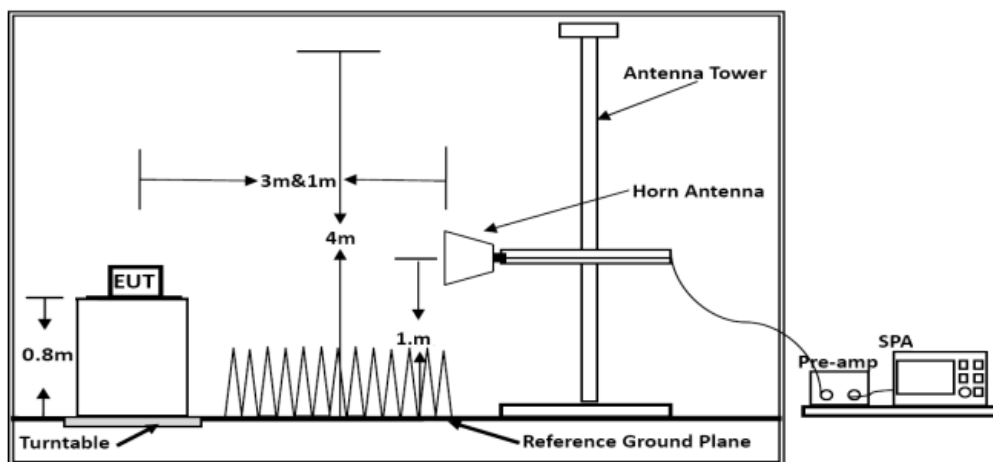


## 5.2. RADIATED EMISSION MEASUREMENT

### 5.2.1. Block Diagram of Test Setup



Below 1GHz



Above 1GHz



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### 5.2.2. Test Standard

EN 55032:2015/A11:2020 Class B

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Limits for Radiated Emission Below 1GHz			
Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dBμV/m)	
30 ~ 230	3	40	
230 ~ 1000	3	47	
***Note: (1) The smaller limit shall apply at the combination point between two frequency bands. (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.			
Limits for Radiated Emission Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
1000 ~ 3000	3	70	50
3000 ~ 6000	3	74	54
***Note: The lower limit applies at the transition frequency.			

### 5.2.3. EUT Configuration on Test

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

### 5.2.4. Operating Condition of EUT

5.2.4.1. Turn on the power.

5.2.4.2. Let the EUT work in the test mode(1) and measure it.

### 5.2.5. Test Procedure

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. By-log antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the EMI test receiver is set at RBW/VBW=120kHz/300kHz and the frequency range from 30MHz to 1000MHz is checked.

The bandwidth of the Spectrum analyzer is set at RBW/VBW=1MHz/3MHz and the frequency range from 1GHz to the frequency which about 5th carrier harmonic or 6GHz is checked.

### 5.2.6. Test Results

**PASS.**

Refer to attached Annex B.2



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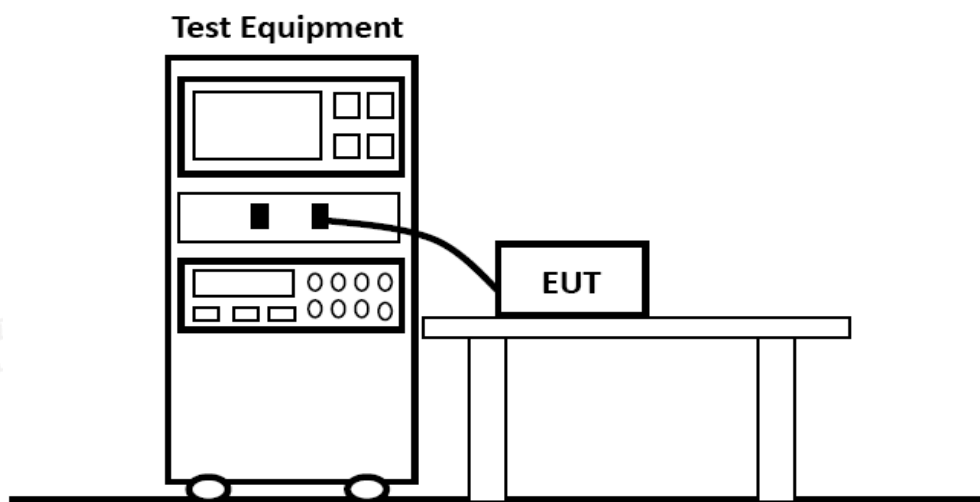
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### 5.3. HARMONIC CURRENT EMISSION MEASUREMENT

#### 5.3.1. Block Diagram of Test Setup



#### 5.3.2. Test Standard

EN IEC 61000-3-2:2019/A1:2021

#### 5.3.3. Operating Condition of EUT

Same as Section 5.2.4, except the test setup replaced as Section 5.3.1.

#### 5.3.4. Test Results

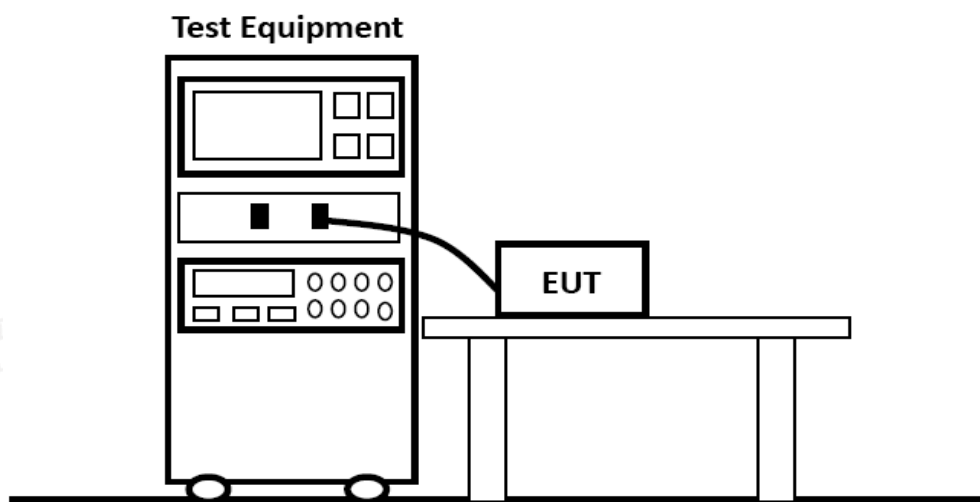
Refer to attached Annex B.3





## 5.4. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

### 5.4.1. Block Diagram of Test Setup



### 5.4.2. Test Standard

EN 61000-3-3: 2013/A2:2021

### 5.4.3. Operating Condition of EUT

Same as Section 5.2.4, except the test setup replaced as Section 5.4.1.

### 5.4.4. Test Results

**PASS.**

Refer to attached Annex B.4

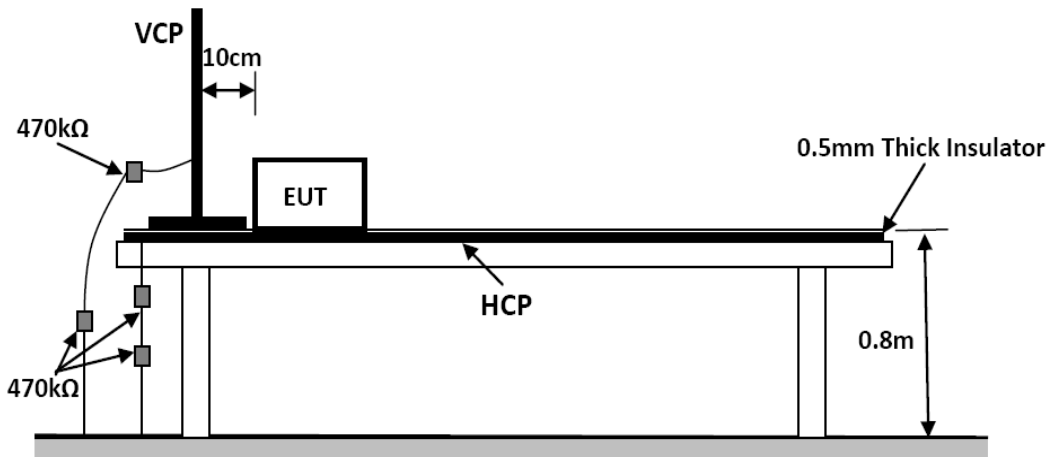






## 5.5. ELECTROSTATIC DISCHARGE IMMUNITY TEST

### 5.5.1. Block Diagram of Test Setup



### 5.5.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-2:2009, Severity Level: 3 / Air Discharge:  $\pm 8\text{KV}$ , Level: 2 / Contact Discharge:  $\pm 4\text{KV}$ )

### 5.5.3. Severity Levels and Performance Criterion

#### 5.5.3.1. Severity level

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

#### 5.5.3.2. Performance Criterion

Performance Criterion: B

### 5.5.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.5.1.

### 5.5.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 5.1.4. Except the test set up replaced by Section 5.5.1.



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### 5.5.6. Test Procedure

#### 5.2.6.1. Air Discharge

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

#### 5.2.6.2. Contact Discharge

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

#### 5.2.6.3. Indirect Discharge For Horizontal Coupling Plane

The vertical coupling plane(VCP) is placed 0.1m away from EUT. The top end of Electrostatic Discharge simulator should aim at the center of one border of the VCP for at least 25 times discharge.

#### 5.2.6.4. Indirect Discharge For Vertical Coupling Plane

The top end of Electrostatic Discharge simulator should place at the point 0.1m away from EUT on the horizontal coupling plane(HCP). At least 25 times discharge should be done for every pre-selected point around EUT.

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

### 5.5.7. Test Results

**PASS.**

Refer to attached Annex B.5



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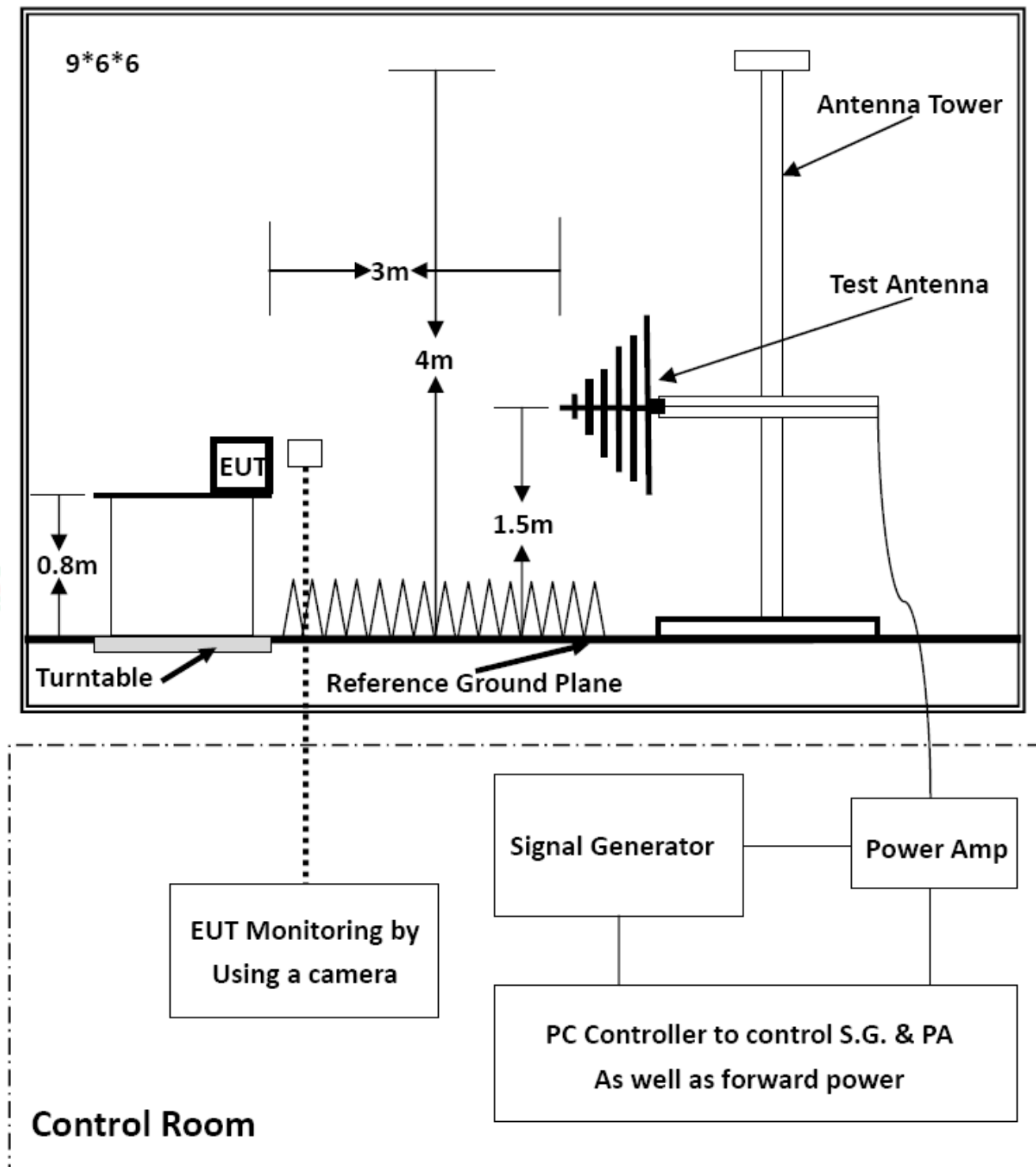
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## 5.6. RF FIELD STRENGTH SUSCEPTIBILITY TEST

### 5.6.1. Block Diagram of Test Setup



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### 5.6.2. Test Standard

EN 55035:2017/A11:2020 (EN IEC 61000-4-3:2020 Severity Level: 2, 3V/m)

### 5.6.3. Severity Levels and Performance Criterion

#### 5.6.3.1. Severity level

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

#### 5.6.3.2. Performance Criterion

Performance Criterion: A

### 5.6.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.6.1.

### 5.6.5. Operating Condition of EUT

Same as radiated emission measurement, which is listed in Section 5.2.4, except the test setup replaced as Section 5.6.1.

### 5.6.6. Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD Recording is used to monitor its screen. All the scanning conditions are as following:

Condition of Test	Remark
Fielded Strength	3 V/m (Severity Level 2)
Radiated Signal	Unmodulated
Test Frequency Range (swept test)	80-1000MHz
Test Frequency (spot test)	1800MHz, 2600MHz, 3500MHz, 5000MHz
Dwell time of radiated	0.0015 decade/s
Waiting Time	3 Sec.

### 5.6.7. Test Results

**PASS.**

Refer to attached Annex B.6



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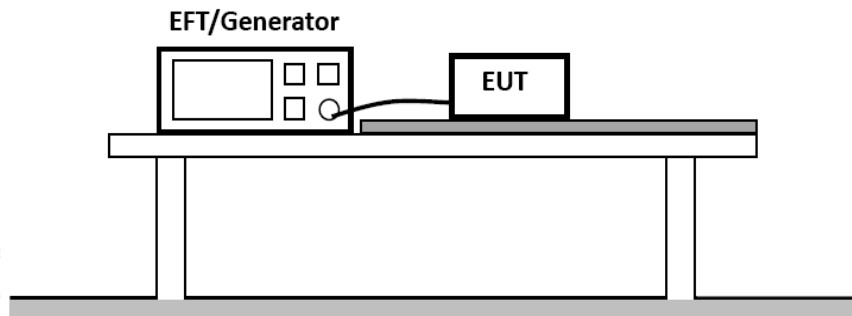
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## 5.7. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

### 5.7.1. Block Diagram of Test Setup



### 5.7.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-4:2012, Severity Level, Level 2: 1KV)

### 5.7.3. Severity Levels and Performance Criterion

#### 5.7.3.1. Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 KV	0.25 KV
2	1 KV	0.5 KV
3	2 KV	1 KV
4	4 KV	2 KV
X	Special	Special

#### 5.7.3.2. Performance Criterion

Performance Criterion: B

### 5.7.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.7.1.

### 5.7.5. Operating Condition of EUT

5.7.5.1. Setup the EUT as shown in Section 5.7.1.

5.7.5.2. Turn on the power of all equipments.

5.7.5.3. Let the EUT work in test mode(1) and measure it.



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### 5.7.6. Test Procedure

The EUT is put on the table, which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

5.7.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device, which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 mins.

5.7.6.2. For signal lines and control lines ports:

It's unnecessary to test.

5.7.6.3. For DC output line ports:

It's unnecessary to test.

### 5.7.7. Test Results

**PASS.**

Refer to attached Annex B.7



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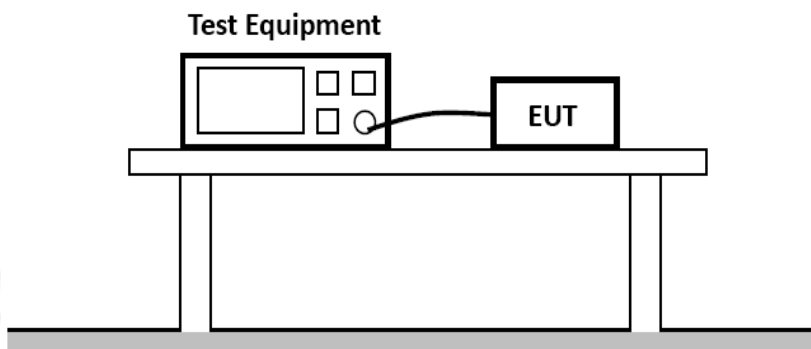
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## 5.8. SURGE IMMUNITY TEST

### 5.8.1. Block Diagram of Test Setup



### 5.8.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-5:2014/A1:2017, Severity Level: Line to Line: Level 2, 1.0KV, Line to Earth: Level 3, 2.0KV)

### 5.8.3. Severity Levels and Performance Criterion

#### 5.8.3.1. Severity level

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

#### 5.8.3.2. Performance Criterion

Performance Criterion: B

### 5.8.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.8.1.

### 5.8.5. Operating Condition of EUT

5.8.5.1. Setup the EUT as shown in Section 5.8.1.

5.8.5.1. Turn on the power of all equipments.

5.8.5.1. Let the EUT work in test mode (1) and measure it.



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### 5.8.6. Test Procedure

5.8.6.1. Set up the EUT and test generator as shown on Section 5.8.1.

5.8.6.2. For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

5.8.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

5.8.6.4. Different phase angles are done individually.

5.8.6.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

### 5.8.7. Test Results

**PASS.**

Refer to attached Annex B.8



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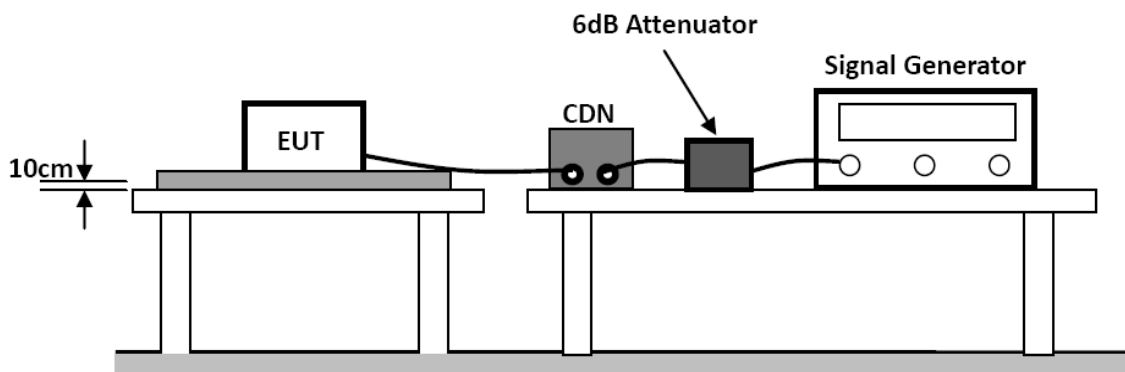
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## 5.9. INJECTED CURRENTS SUSCEPTIBILITY TEST

### 5.9.1. Block Diagram of Test Setup



### 5.9.2. Test Standard

EN 55035:2017/A11:2020(EN 61000-4-6:2014/A1:2015, Severity Level: Level 2, (0.15MHz ~ 80MHz))

### 5.9.3. Severity Levels and Performance Criterion

#### 5.9.3.1. Severity level

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

#### 5.9.3.2. Performance Criterion

Performance Criterion: A

### 5.9.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.9.1.

### 5.9.5. Operating Condition of EUT

5.9.5.1. Setup the EUT as shown in Section 5.9.1.

5.9.5.2. Turn on the power of all equipments.

5.9.5.3. Let the EUT work in test mode(1) and measure it.



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### 5.9.6. Test Procedure

- 5.9.6.1. Set up the EUT, CDN and test generators as shown on Section 5.9.1.
- 5.9.6.2. Let the EUT work in test mode and measure it.
- 5.9.6.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 5.9.6.4. The disturbance signal described below is injected to EUT through CDN.
- 5.9.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5.9.6.6. The frequency range is swept from 150kHz to 10MHz using 3V signal level, 10MHz to 30MHz using 3V to 1V signal level, 30MHz to 80MHz using 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 5.9.6.7. The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 5.9.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

### 5.9.7. Test Results

**PASS.**

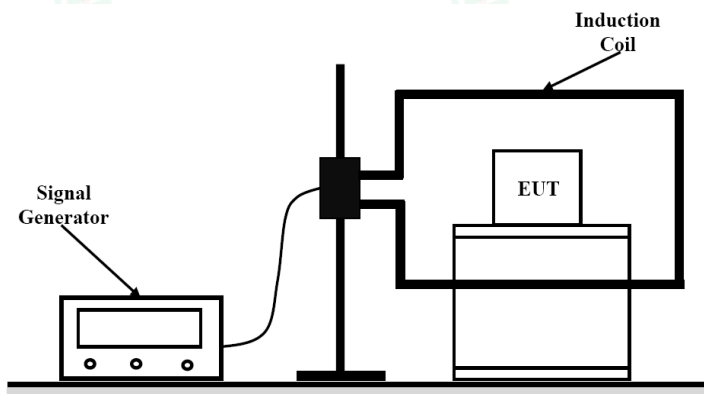
Refer to attached Annex B.9





## 5.10. MAGNETIC FIELD SUSCEPTIBILITY TEST

### 5.10.1. Block Diagram of Test Setup



### 5.10.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-8:2010, Severity Level: Level 1, 1A/m)

### 5.10.3. Severity Levels and Performance Criterion

#### 5.10.3.1. Severity level

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

#### 5.10.3.2. Performance Criterion

Performance Criterion: A

### 5.10.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.10.1.

### 5.10.5. Test Procedure

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

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

### 5.10.6. Test Results

**PASS.**

Refer to attached Annex B.10



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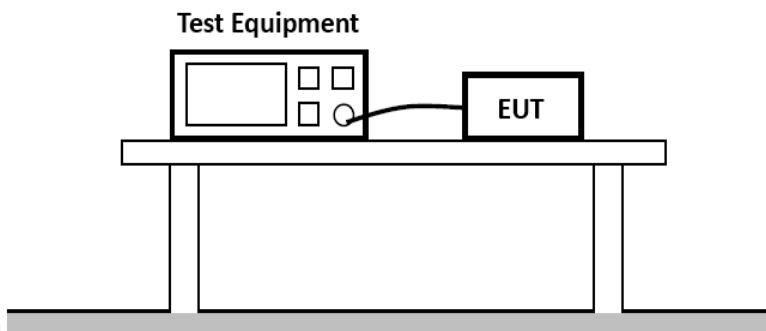
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## 5.11. VOLTAGE DIPS AND INTERRUPTIONS TEST

### 5.11.1. Block Diagram of Test Setup



### 5.11.2. Test Standard

EN 55035:2017/A11:2020 (EN IEC 61000-4-11:2020/AC: 2020)

### 5.11.3. Severity Levels and Performance Criterion

#### 5.11.3.1. Severity level

Test Level		
Voltage Reduction $\%U_T$	Voltage Dips $\%U_T$	Duration (in Period)
100	0	0.5
100	0	1
30	70	5
Voltage Reduction $\%U_T$	Voltage Dips $\%U_T$	Duration (in Period)
100	0	250

#### 5.11.3.2. Performance Criterion

Performance Criterion: B&C

### 5.11.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.11.1.

### 5.11.5. Operating Condition of EUT

5.11.5.1. Setup the EUT as shown in Section 5.11.1.

5.11.5.2. Turn on the power of all equipments.

5.11.5.3. Let the EUT work in test mode (1) and measure it.

### 5.11.6. Test Procedure

5.11.6.1. Set up the EUT and test generator as shown on Section 5.11.1.

5.11.6.2. The interruptions are introduced at selected phase angles with specified duration.

5.11.6.3. Record any degradation of performance.

### 5.11.7. Test Results

**PASS.**

Refer to attached Annex B.11



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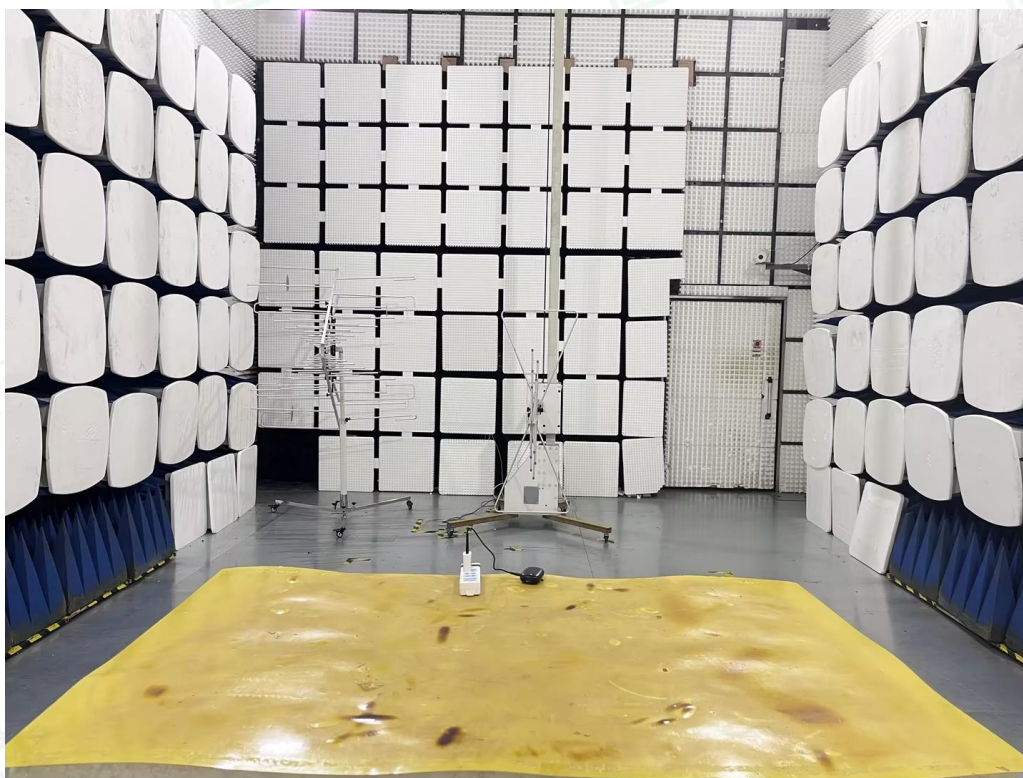


## Annex A

(Test photograph)



Test Setup Photo of Power Line Conducted Measurement



Test Setup Photo of Radiated Measurement (30MHz~1GHz)



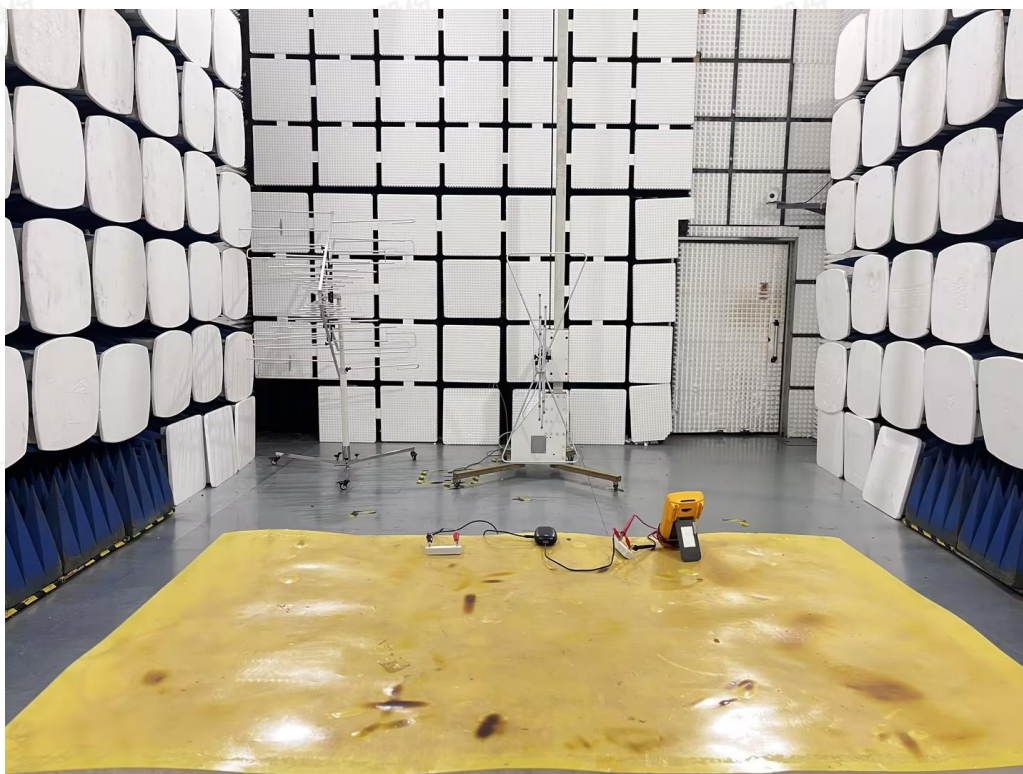
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Test Setup Photo of Radiated Measurement (30MHz~1GHz)



Test Setup Photo of RF Field Strength Susceptibility



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Test Setup Photo of Harmonic &amp; Flicker Measurement



Test Setup Photo of Electrostatic Discharge Test



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Photo of Electrical Fast Transient/Burst Test &amp; Surge Immunity Test



Test Setup Photo of Injected Currents Susceptibility Test



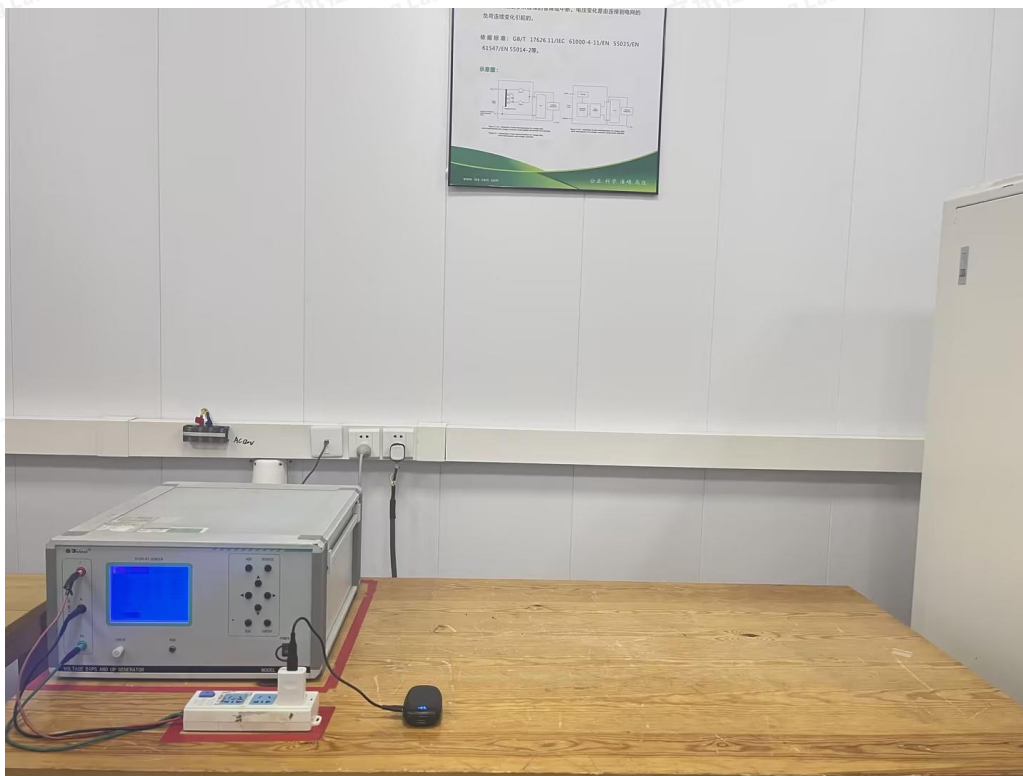
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Test Setup Photo of Voltage Dips and Interruptions Test



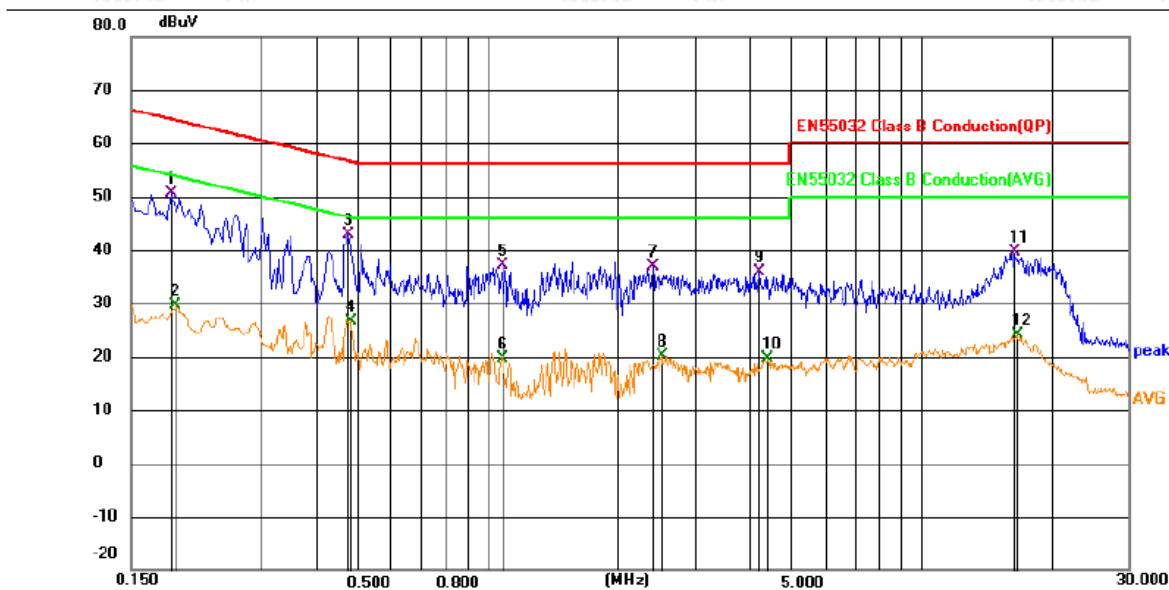
**ANNEX B**

(Emission and Immunity test results)

**B.1 POWER LINE CONDUCTED EMISSION MEASUREMENT**

Environmental Conditions:	23.3℃, 53.1% RH
Test Voltage:	AC 230V,50Hz
Test Model:	MO6949
Test Mode:	Mode 1
Test Engineer:	Zi Liao
Pol:	Line

Detailed results are shown below



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.1859	31.08	19.63	50.71	64.22	-13.51	QP	
2	0.1905	9.89	19.63	29.52	54.01	-24.49	AVG	
3 *	0.4786	23.33	19.64	42.97	56.36	-13.39	QP	
4	0.4829	7.06	19.64	26.70	46.29	-19.59	AVG	
5	1.0768	17.57	19.65	37.22	56.00	-18.78	QP	
6	1.0768	-0.08	19.65	19.57	46.00	-26.43	AVG	
7	2.4000	17.22	19.68	36.90	56.00	-19.10	QP	
8	2.5261	0.35	19.68	20.03	46.00	-25.97	AVG	
9	4.2316	16.25	19.70	35.95	56.00	-20.05	QP	
10	4.4069	0.03	19.70	19.73	46.00	-26.27	AVG	
11	16.3904	19.56	19.96	39.52	60.00	-20.48	QP	
12	16.6603	4.05	19.99	24.04	50.00	-25.96	AVG	

Note: Margin= Reading level + Correct factor – Limit

Correct Factor= Lism Factor+Cable Factor+Limiter Factor



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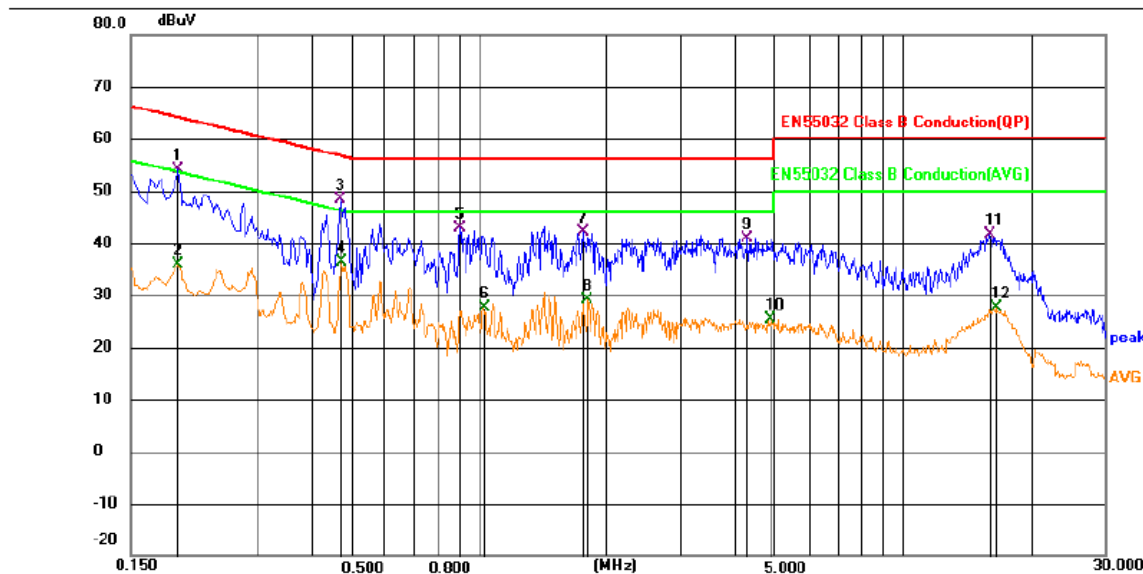
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Environmental Conditions:	23.3℃, 53.1% RH
Test Voltage:	AC 230V,50Hz
Test Model:	MO6949
Test Mode:	Mode 1
Test Engineer:	Zi Liao
Pol:	Neutral

Detailed results are shown below



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1949	34.56	19.63	54.19	63.83	-9.64	QP	
2		0.1949	16.25	19.63	35.88	53.83	-17.95	AVG	
3	*	0.4696	28.85	19.64	48.49	56.52	-8.03	QP	
4		0.4741	16.64	19.64	36.28	46.44	-10.16	AVG	
5		0.9012	23.16	19.65	42.81	56.00	-13.19	QP	
6		1.0227	7.93	19.65	27.58	46.00	-18.42	AVG	
7		1.7562	22.35	19.67	42.02	56.00	-13.98	QP	
8		1.8060	9.42	19.67	29.09	46.00	-16.91	AVG	
9		4.3125	21.08	19.80	40.88	56.00	-15.12	QP	
10		4.8525	5.56	19.80	25.36	46.00	-20.64	AVG	
11		16.0078	21.77	19.91	41.68	60.00	-18.32	QP	
12		16.6426	7.56	19.99	27.55	50.00	-22.45	AVG	

Note: Margin= Reading level + Correct factor – Limit

Correct Factor= Lism Factor+Cable Factor+Limiter Factor



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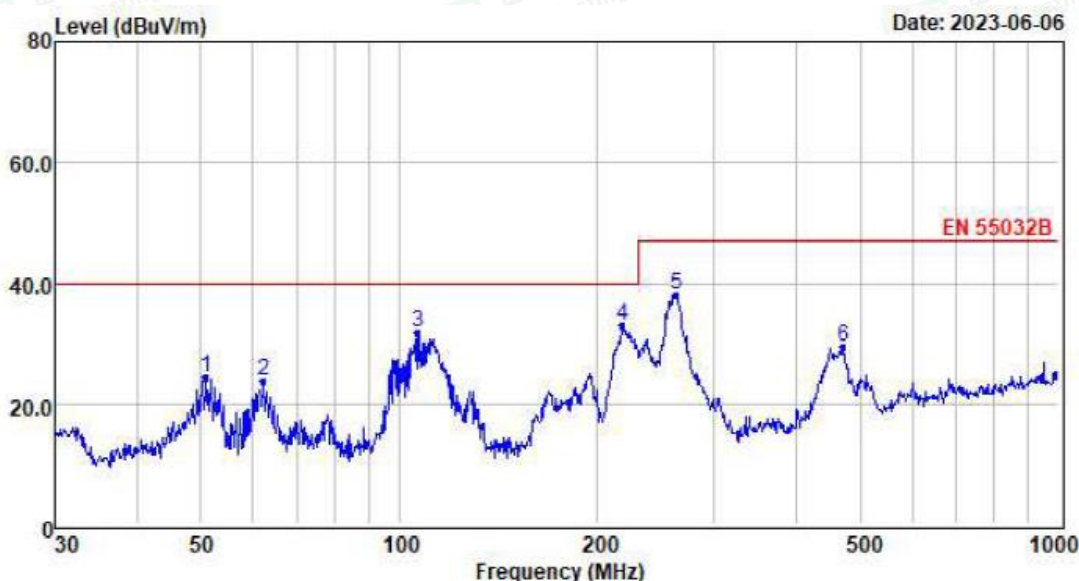
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**B.2 Radiated Disturbance Test Results (30MHz to 1000MHz)**

Environmental Conditions:	22.3℃, 53% RH
Test Voltage:	AC 230V,50Hz
Test Model:	MO6949
Test Mode:	Mode 1
Test Engineer:	Xing Mo
Pol:	Vertical
Note	

Detailed results are shown below



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	50.94	11.26	0.61	12.59	24.46	40.00	-15.54	Peak
2	62.21	11.06	0.66	11.96	23.68	40.00	-16.32	Peak
3	106.76	19.68	0.84	11.18	31.70	40.00	-8.30	Peak
4	218.31	20.16	1.23	11.62	33.01	40.00	-6.99	Peak
5	262.90	23.85	1.28	12.82	37.95	47.00	-9.05	Peak
6	472.18	11.70	1.47	16.20	29.37	47.00	-17.63	Peak

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



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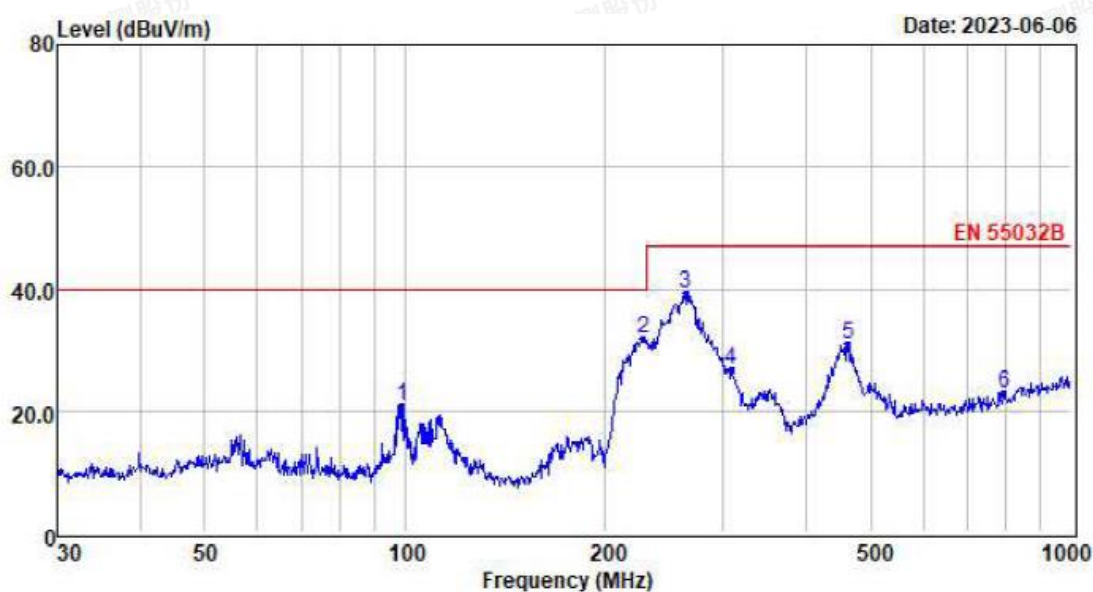
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Environmental Conditions:	22.3°C, 53% RH
Test Voltage:	AC 230V,50Hz
Test Model:	MO6949
Test Mode:	Mode 1
Test Engineer:	Xing Mo
Pol:	Horizontal
Note	

Detailed results are shown below



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	98.83	9.52	0.80	10.57	20.89	40.00	-19.11	Peak
2	227.69	18.70	1.24	11.96	31.90	40.00	-8.10	Peak
3	263.82	25.06	1.28	12.85	39.19	47.00	-7.81	Peak
4	308.91	11.76	1.33	13.63	26.72	47.00	-20.28	Peak
5	462.35	13.54	1.46	15.98	30.98	47.00	-16.02	Peak
6	793.40	1.25	1.99	19.79	23.03	47.00	-23.97	Peak

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



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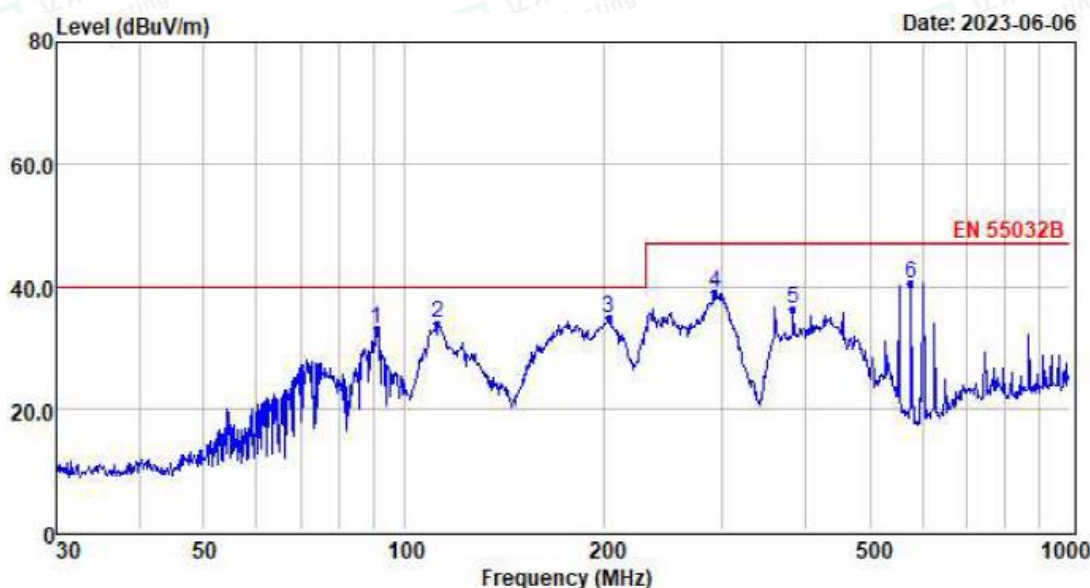
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Environmental Conditions:	22.3°C, 53% RH
Test Voltage:	DC
Test Model:	MO6949
Test Mode:	Mode 2
Test Engineer:	Xing Mo
Pol:	Vertical
Note	

Detailed results are shown below



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	90.86	22.61	0.77	9.61	32.99	40.00	-7.01	QP
2	112.13	21.72	0.87	11.22	33.81	40.00	-6.19	QP
3	202.81	22.59	1.20	10.93	34.72	40.00	-5.28	QP
4	293.08	24.02	1.31	13.57	38.90	47.00	-8.10	QP
5	383.93	20.44	1.39	14.57	36.40	47.00	-10.60	QP
6	576.64	20.41	1.50	18.57	40.48	47.00	-6.52	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



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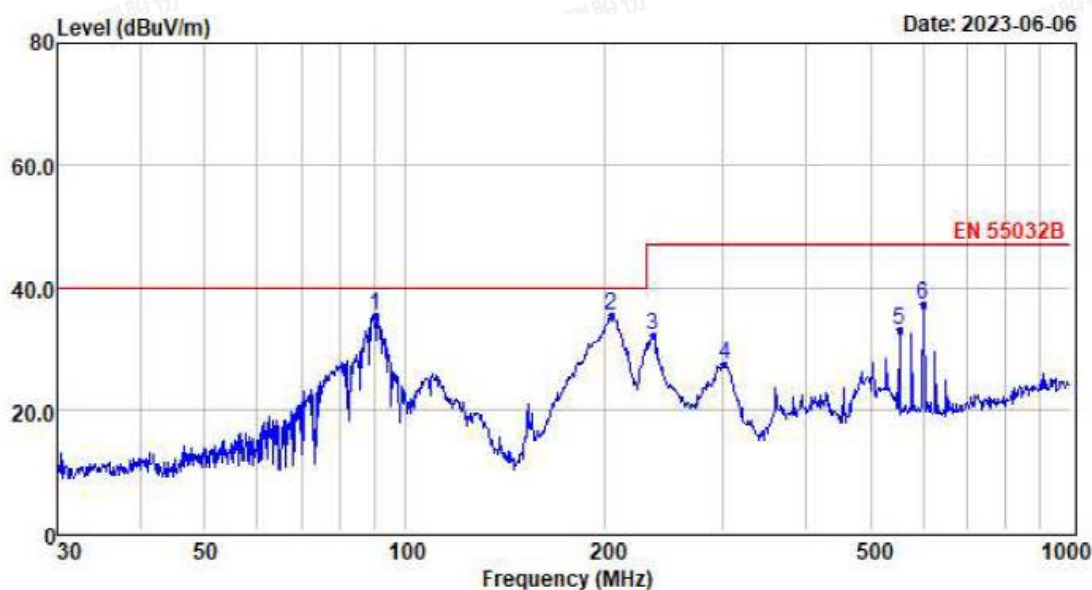
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Environmental Conditions:	22.3°C, 53% RH
Test Voltage:	DC
Test Model:	MO6949
Test Mode:	Mode 2
Test Engineer:	Xing Mo
Pol:	Horizontal
Note	

Detailed results are shown below



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	90.22	25.22	0.77	9.53	35.52	40.00	-4.48	QP
2	204.24	23.18	1.21	11.00	35.39	40.00	-4.61	QP
3	235.82	18.87	1.25	12.12	32.24	47.00	-14.76	QP
4	302.48	12.48	1.32	13.68	27.48	47.00	-19.52	QP
5	552.88	13.70	1.50	17.80	33.00	47.00	-14.00	QP
6	601.43	16.29	1.50	19.28	37.07	47.00	-9.93	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



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### B.3 HARMONIC CURRENT EMISSION MEASUREMENT

N/A

Because the power of EUT is less than 75W, according to standard EN 61000-3-2, harmonic current unnecessary to test.



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**B.4 VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT**

<b>Test Model</b>	MO6949	<b>Test Engineer</b>	Zi Liao
<b>Test Voltage</b>	AC 230V/50Hz		

Customer : xxx Result : PASS

**Pst and Limit**

**Plt and Limit**

**Relevant Parameter and Judgement During Test Period**

Vrms at the end of test(V)	229.84			
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	0.014	Test Limit	1.000	Pass
Plt	0.014	Test Limit	0.650	Pass



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## B.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST

## Electrostatic Discharge Test Results

Standard	<input type="checkbox"/> IEC 61000-4-2 <input checked="" type="checkbox"/> EN 61000-4-2		
Applicant	Mid Ocean Brands B.V.		
EUT	Hand warmer power bank	Temperature	22.3°C
M/N	MO6949	Humidity	52.3%
Criterion	B	Pressure	1021mbar
Test Mode	Mode 1	Test Engineer	Zi Liao

## Air Discharge

Test Points	Test Levels			Results		
	± 2kV	± 4kV	± 8kV	Passed	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

## Contact Discharge

Test Points	Test Levels		Results		
	± 2 kV	±4 kV	Passed	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

## Discharge To Horizontal Coupling Plane

Side of EUT	Test Levels		Results		
	± 2 kV	± 4 kV	Passed	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

## Discharge To Vertical Coupling Plane

Side of EUT	Test Levels		Results		
	± 2 kV	± 4 kV	Passed	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B



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**B.6 RF FIELD STRENGTH SUSCEPTIBILITY TEST****RF Field Strength Susceptibility Test Results**

<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-3 <input checked="" type="checkbox"/> EN IEC 61000-4-3		
<b>Applicant</b>	Mid Ocean Brands B.V.		
<b>EUT</b>	Hand warmer power bank	<b>Temperature</b>	21.3℃
<b>M/N</b>	MO6949	<b>Humidity</b>	53.2%
<b>Field Strength</b>	3 V/m	<b>Criterion</b>	A
<b>Test Mode</b>	Mode 1	<b>Test Engineer</b>	Zi Liao
<b>Test Frequency</b>	80MHz to 1000MHz (swept test) 1800MHz, 2600MHz, 3500MHz, 5000MHz (spot test)		
<b>Modulation</b>	<input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1KHz 80%		
<b>Steps</b>	1%		

	<b>Horizontal</b>	<b>Vertical</b>
<b>Front</b>	PASS	PASS
<b>Right</b>	PASS	PASS
<b>Rear</b>	PASS	PASS
<b>Left</b>	PASS	PASS

Note:



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**B.7 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST****Electrical Fast Transient/Burst Test Results**

<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-4 <input checked="" type="checkbox"/> EN 61000-4-4		
<b>Applicant</b>	Mid Ocean Brands B.V.		
<b>EUT</b>	Hand warmer power bank	<b>Temperature</b>	22.5°C
<b>M/N</b>	MO6949	<b>Humidity</b>	52.8%
<b>Test Mode</b>	Mode 1	<b>Criterion</b>	B
<b>Test Engineer</b>	Zi Liao		

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
PE			
L-N	1KV	PASS	PASS
L-PE			
N-PE			
L-N-PE			
Signal Line			
I/O Cable			

Note:



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**B.8 SURGE IMMUNITY TEST**

## Surge Immunity Test Result

<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-5 <input checked="" type="checkbox"/> EN 61000-4-5		
<b>Applicant</b>	Mid Ocean Brands B.V.		
<b>EUT</b>	Hand warmer power bank	<b>Temperature</b>	24.5°C
<b>M/N</b>	MO6949	<b>Humidity</b>	52.6%
<b>Test Mode</b>	Mode 1	<b>Criterion</b>	B
<b>Test Engineer</b>	Zi Liao		

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	90	5	1.0	PASS
	-	270	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					



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**B.9 INJECTED CURRENTS SUSCEPTIBILITY TEST**

Injected Currents Susceptibility Test Results			
Standard	<input type="checkbox"/> IEC 61000-4-6 <input checked="" type="checkbox"/> EN 61000-4-6		
Applicant	Mid Ocean Brands B.V.		
EUT	Hand warmer power bank	Temperature	23.3°C
M/N	MO6949	Humidity	52.3%
Test Mode	Mode 1	Criterion	A
Test Engineer	Zi Liao		

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 10	AC Mains	3V	A	PASS
10 ~ 30		3V ~ 1V		
30 ~ 80		1V		

Note:



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## B.10 MAGNETIC FIELD SUSCEPTIBILITY TEST

**N/A**

Applicable only to equipment containing devices intrinsically susceptible to magnetic fields, such as CRT monitors, Hall effect elements, electro-dynamic microphones, magnetic field sensors or audio frequency transformers.



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**B.11 VOLTAGE DIPS AND INTERRUPTIONS TEST**

## Voltage Dips And Interruptions Test Results

Standard	<input type="checkbox"/> IEC 61000-4-11 <input checked="" type="checkbox"/> EN IEC 61000-4-11		
Applicant	Mid Ocean Brands B.V.		
EUT	Hand warmer power bank	Temperature	25.2°C
M/N	MO6949	Humidity	51.3%
Test Mode	Mode 1	Criterion	B&C
Test Engineer	Zi Liao		

Test Level % U <sub>T</sub>	Voltage Dips & Short Interruptions % U <sub>T</sub>	Duration (in periods)	Criterion	Result
0	100	0.5P	B	PASS
70	30	25P	C	PASS
0	100	250P	C	PASS

Note:



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## ANNEX C

(External and internal photos of the EUT)



Fig. 1



Fig. 2



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Fig. 3



Fig. 4





Fig. 5



Fig. 6







Fig. 7

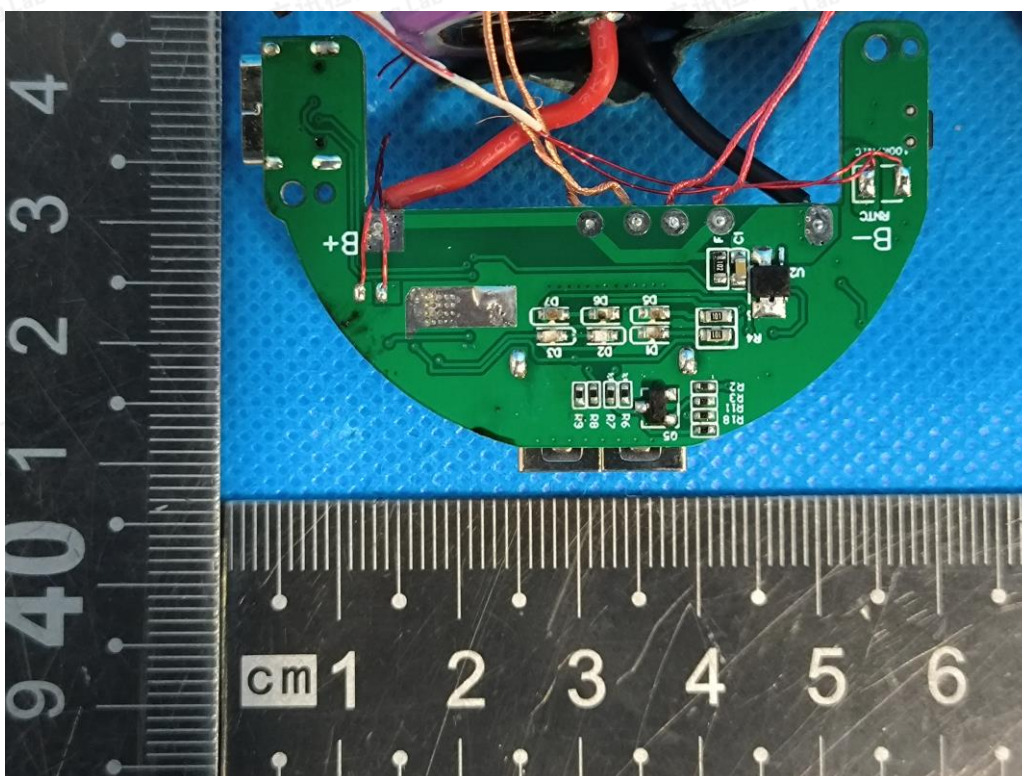


Fig. 8





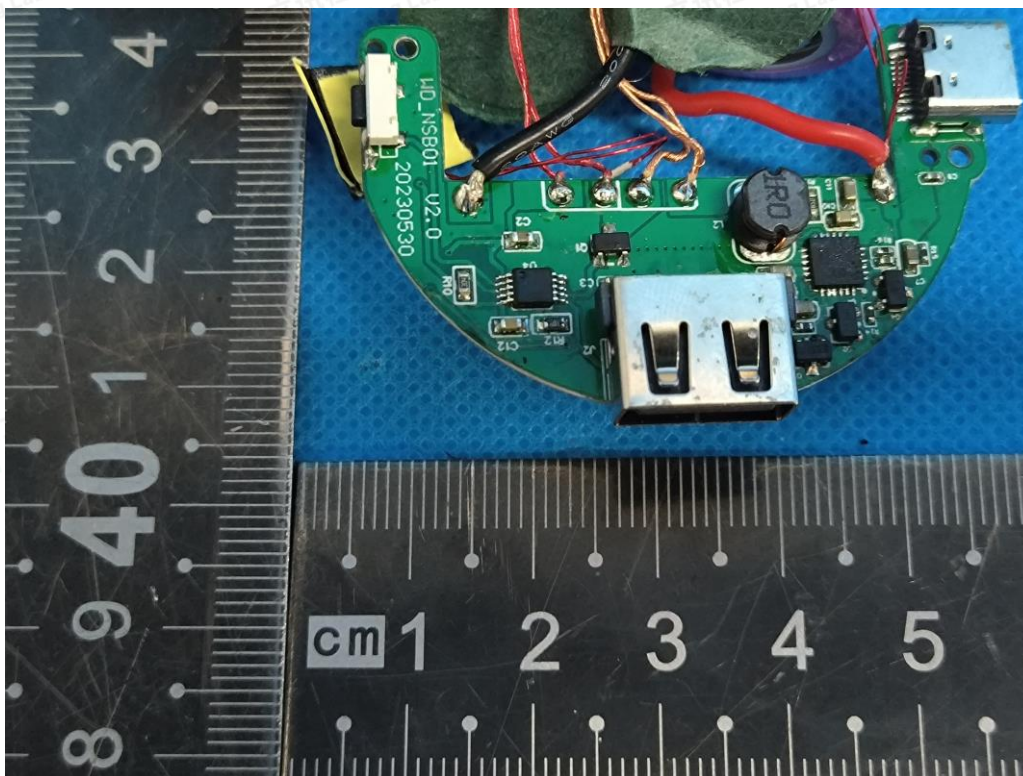


Fig. 9



Fig. 10

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