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# EMC Test Report

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Report No.: AGC05443231028EE01

**PRODUCT DESIGNATION** : LCD writing tablet

**BRAND NAME** : N/A

**MODEL NAME** : M09537

**APPLICANT** : MID OCEAN BRANDS B.V

**DATE OF ISSUE** : Oct. 24, 2023

**STANDARD(S)** : EN 55032:2015+A11:2020  
EN 55035:2017+A11:2020

**REPORT VERSION** : V1.0

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**REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 24, 2023	Valid	Initial release

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**1. General information**

Applicant	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Product Designation	LCD writing tablet
Brand Name	N/A
Test Model	MO9537
Series Model(s)	N/A
Difference Description	N/A
Deviation from Standard	No any deviation from the test method
Date of receipt of test item	Oct. 20, 2023
Date of Test	Oct. 20, 2023 to Oct. 24, 2023
Test Result	Pass
Test Report Form No	AGCER-EMC-GEN-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By



Jack Gui  
(Project Engineer)

Oct. 24, 2023

Reviewed By



Calvin Liu  
(Reviewer)

Oct. 24, 2023

Approved By



Max Zhang  
(Authorized Officer)

Oct. 24, 2023

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## 2. Description of Test Configuration

### 2.1. Technical Description of Product

Categorization of Equipment	Class B equipment
Test arrangements of EUT	Table-top
Hardware Version	N/A
Software Version	N/A
Highest Internal Frequency	Less than 108MHz
EUT Input Rating	DC 3.0V by battery

### Connection Diagram of Host System



### I/O Port Information ( Applicable Not Applicable)

Port Type	Input/Output	Number	Cable Description
--	--	--	--

### 2.2. Description of Support Equipment

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

### 2.3. Description of Test Modes

No.	Test Mode Description	Worst
1	Normal operation mode	--

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### 3. Summary of Measurement Results and Uncertainty

#### 3.1. Test Specifications

EN 55032:2015+A11:2020	Electromagnetic compatibility of multimedia equipment - Emission requirements
EN 55035:2017+A11:2020	Electromagnetic compatibility of multimedia equipment - Immunity requirements

#### 3.2. Description of Measurement Results

Test items	Test Standard(s)	Verdict
Radiated emissions at frequencies up to 1 GHz	EN 55032	Pass
Electrostatic discharge	IEC 61000-4-2 <sup>a</sup>	Pass
Radio-frequency electromagnetic field	IEC 61000-4-3 <sup>a</sup>	Pass
<b>Note:</b> a. The applicable versions of the basic standards are defined in the standard which listed in the test specification.		

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## Performance table

Performance Criteria for Immunity	
Performance criterion 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 criterion 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 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 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.

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### 3.3. Description of Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Conducted emissions from the AC mains power ports	$U_c = \pm 2.9 \text{ dB}$
Radiated emissions at frequencies up to 1 GHz	$U_c = \pm 3.9 \text{ dB}$
Radiated emissions at frequencies above 1 GHz	$U_c = \pm 4.9 \text{ dB}$

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## 4. Test Facility

Laboratory name: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Laboratory Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

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

### **CNAS-Lab Code: L5488**

Attestation of Global Compliance (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories).

### **A2LA-Lab Cert. No.: 5054.02**

Attestation of Global Compliance (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This laboratory also meets the requirements of any additional program requirements in the Electrical field.

### **FCC-Registration No.: 975832**

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

### **IC-Registration No.: 24842**

### **CAB identifier: CN0063**

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

### **VCCI Membership No.: 4112**

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered in accordance with VCCI Council Rules.

VCCI Registration No. C-20098 for conducted emissions at AC main power ports

VCCI Registration No. T-20102 for conducted emissions at telecommunication ports

VCCI Registration No. R-20136 for radiated emissions below 1GHz

VCCI Registration No. G-20132 for radiated emissions above 1GHz

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## 5. Measurement of Radiated Emissions at Frequencies up to 1 GHz

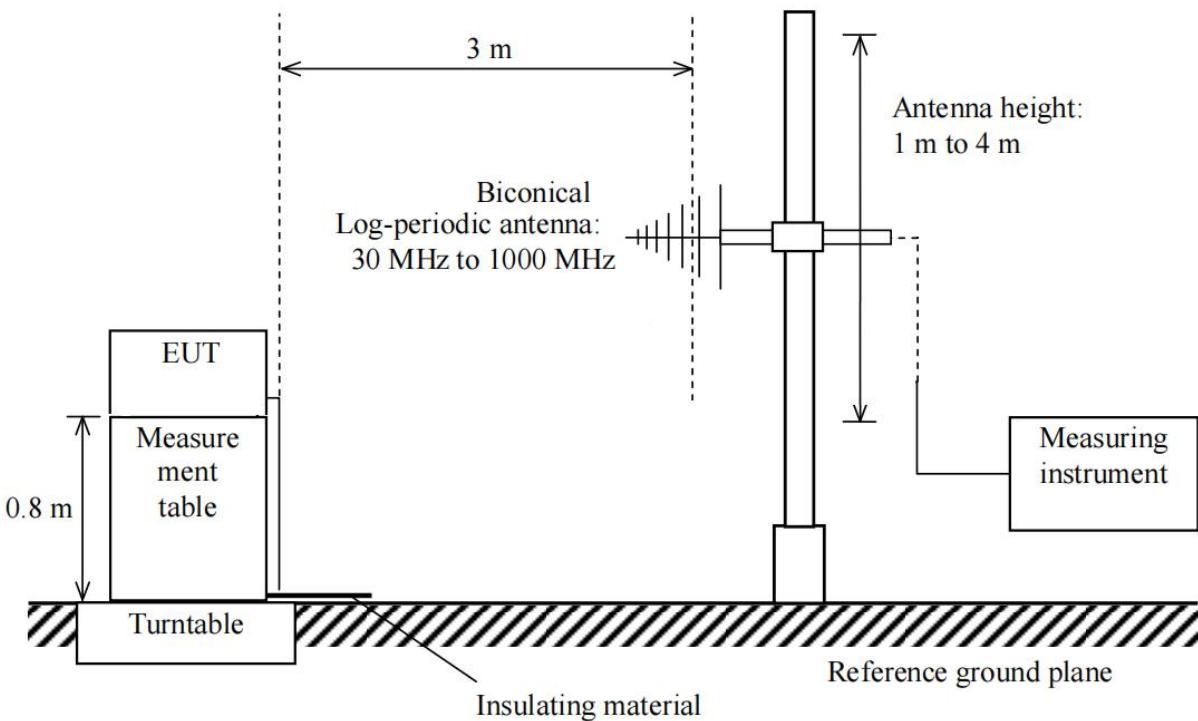
### 5.1. Requirements

Requirements for radiated emissions at frequencies up to 1 GHz at 3m distance

Test facility	Detector type/ bandwidth	Frequency Range (MHz)	Limits dB( $\mu$ V/m)	Measurement specifications
SAC	Quasi-peak/ 120kHz	30 to 230	40	Instrumentation: CISPR 16-1-1, Clauses 4, 5 Antennas: CISPR 16-1-4, Clause 4.5 Test Site: CISPR 16-1-4, Clause 6 Method: CISPR 16-2-3, Clause 7.6
		230 to 1000	47	

**Note:**  
 1. The lower limit shall apply at the transition frequency.

### 5.2. Block Diagram of Test Setup



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### 5.3. Equipment Details

Measuring Instruments					
Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
Antenna	SCHWARZBECK	VULB9168	D69250	May 11, 2023	May 10, 2025
Measuring Software					
Software Name	Manufacturer	Details			
EZ-EMC	FARA	For EMC Measurement, Version RA-03A			

### 5.4. Configuration of the EUT and method of measurement

- The EUT was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, the EUT was placed on the top surface of a measurement table, 0.8 m high from the horizontal reference plane. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 10 cm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per CISPR 16-2-3.
- All I/O cables were positioned to simulate typical actual usage as per CISPR 16-2-3.
- The maximum receiving level of radiated emissions from the EUT was measured while the turntable was rotated from 0° to 360° and the antenna height was scanned between 1 m and 4 m. The cables were laid out to attain the maximum level of radiated emissions.
- The more description of the tests, the test methods, and the test set-ups are given in the applicable test standard.
- Record at least six highest emissions relative to the limits at each frequency of interest unless the emission is 10 dB or greater below the limit.
- A radiated emission is calculated by the following equation:
  - Measurement Level dB( $\mu$ V/m) = Receiver reading dB( $\mu$ V) + Factor(dB/m)
  - Factor(dB/m) = Antenna Factor(dB/m) + Cable Loss(dB)
  - Margin= Limit-Level

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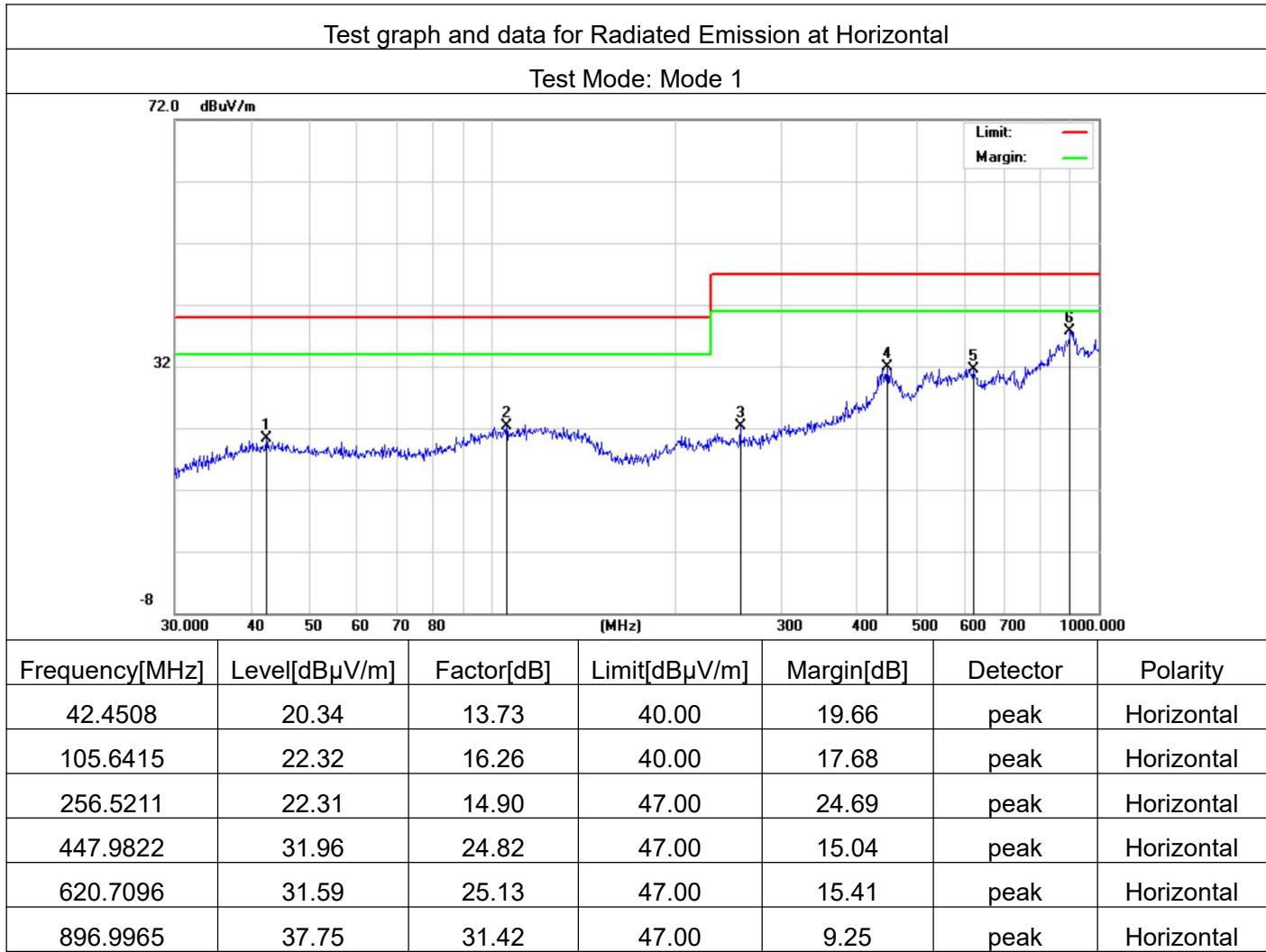
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## 5.5. Test Summary

Test Engineer	Linke	Temperature	23.1 °C
Test Date	Oct. 23, 2023	Air Pressure	985 Mbar
Worst Mode	Mode 1	Relative Humidity	60.3 %
Verdict	Pass		

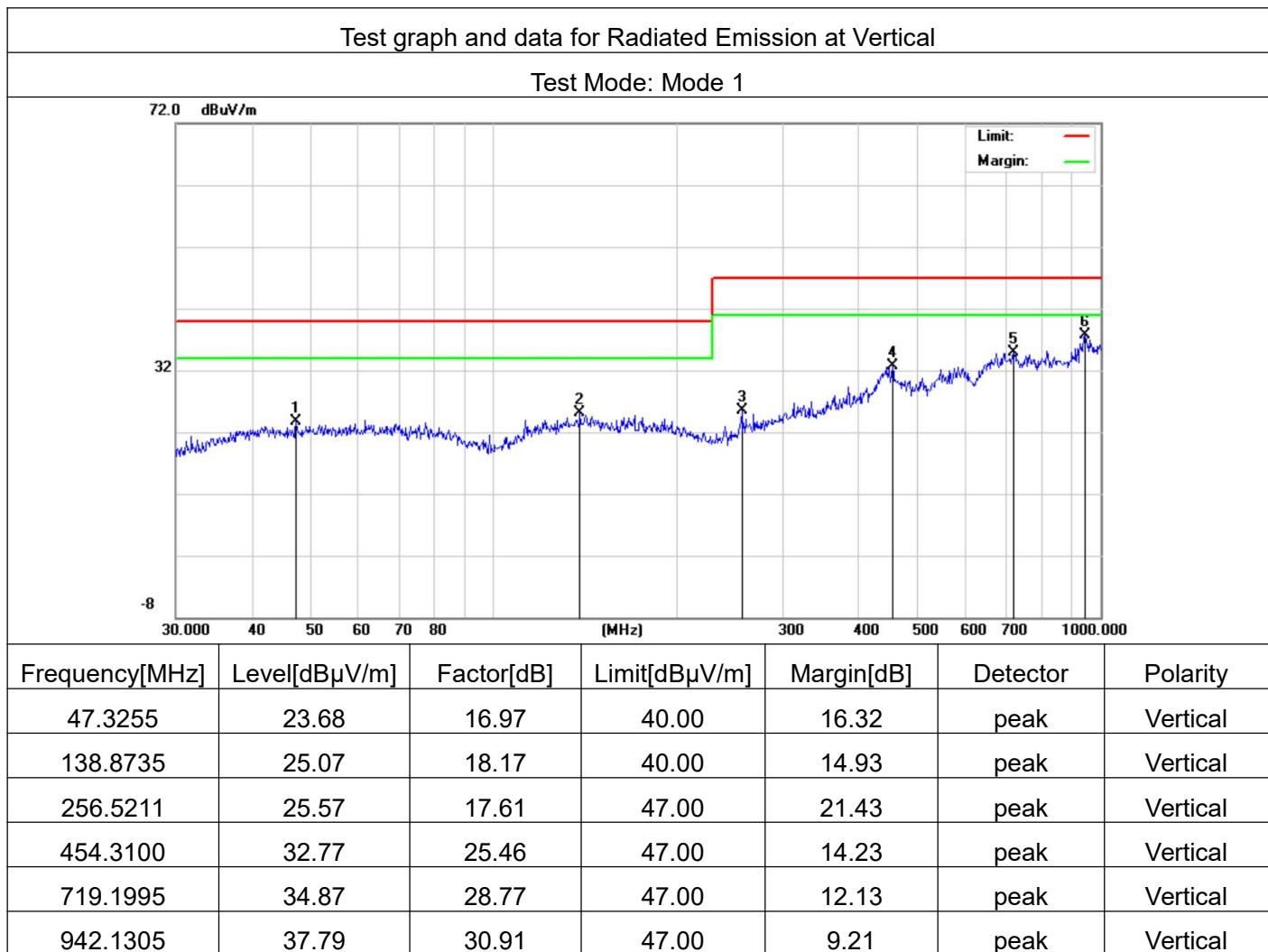


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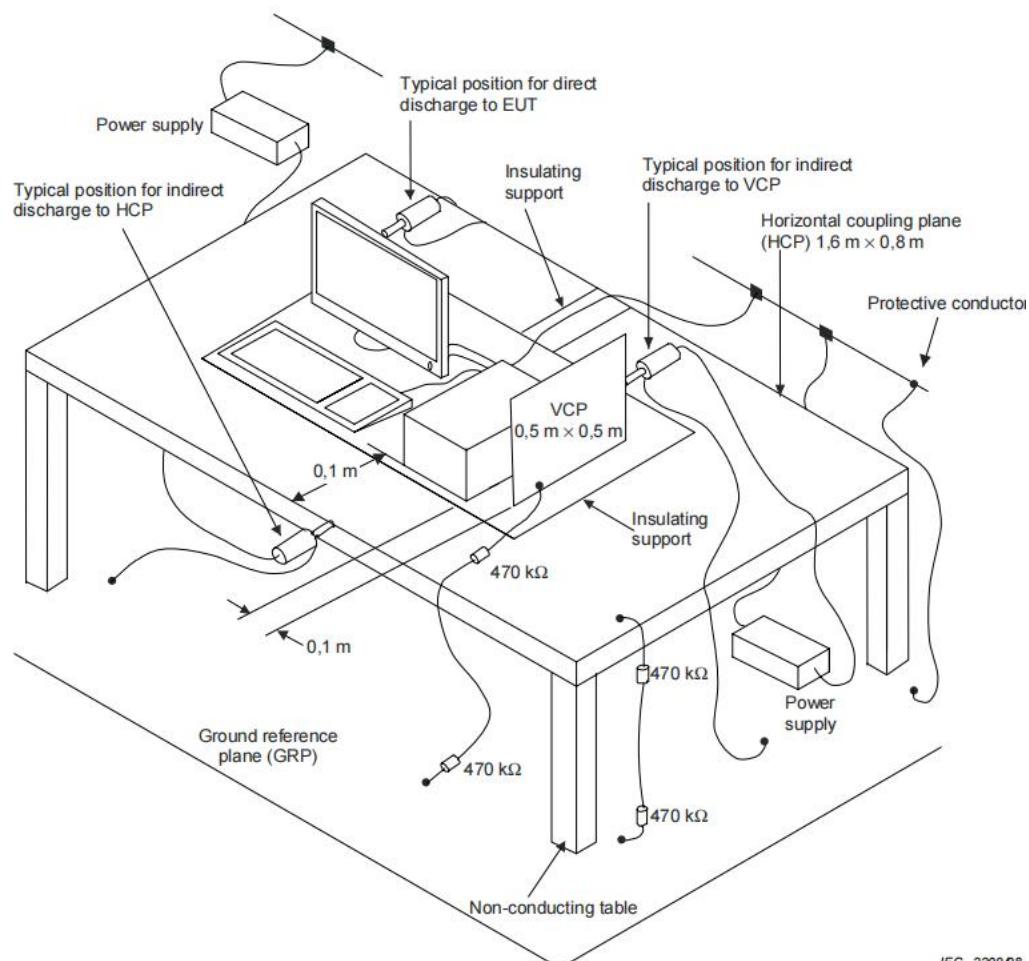
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## 6. Measurement of Electrostatic discharge

## 6.1. Requirements

Port	Enclosure
Basic Standard	IEC 61000-4-2
Test Level	$\pm 8.0$ kV (Air Discharge) $\pm 4.0$ kV (Contact Discharge) $\pm 4.0$ kV (Indirect Discharge)
Required Performance Criterion	B
Time Between Each Discharge:	1 second
Number of Discharge for Each Applied Voltage	10

## 6.2. Block Diagram of Test Setup



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### 6.3. Equipment Details

Measuring Instruments					
Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	Schaffner	NSG 438	782	Dec. 30, 2022	Dec. 29, 2023
Measuring Software					
Software Name	Manufacturer	Details			
--	--	--			

### 6.4. Configuration of the EUT and method of measurement

- a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- c. The time interval between two successive single discharges was at least 1 second.
- d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
- e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were completed.
- g. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
- h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m×0.5m) was placed vertically to and 0.1 meters from the EUT.
- i. The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance criterion defined in the report.

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## 6.5. Test Summary

Test Engineer	Sam	Temperature	24 °C
Test Date	Oct. 24, 2023	Air Pressure	985 Mbar
Test Mode(s)	Mode 1	Relative Humidity	50 %
Verdict	Pass		

Voltage	Coupling	Observation	Performance
±4kV	Contact Discharge	No degradation of performance	A
±2KV, ±4kV, ±8kV	Air Discharge	No degradation of performance	A
±4kV	Indirect Discharge HCP	No degradation of performance	A
±4kV	Indirect Discharge VCP	No degradation of performance	A

Blue line: Air discharge



Note: Contact discharge point not found.

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## 7. Measurement of Radio-Frequency Electromagnetic Field

### 7.1. Requirements

Port	Enclosure
Basic Standard	IEC 61000-4-3
Test Level	Swept test: 3V/m with 80% AM. 1kHz Modulation at 80 to 1000MHz Spot test (Frequency ( $\pm 1\%$ )): 3V/m with 80% AM. 1kHz Modulation at 1800, 2600, 3500, 5000MHz
Required Performance Criterion	A
Antenna polarization	Vertical and Horizontal
Step size increment <sup>a</sup>	1%
Dwell time <sup>b</sup>	$\leq 5$ seconds
Test Distance	3m
EUT position facing antenna	Front side, back side, left side and right side

Notes:

- Recognizing that a 1% step size is preferred, the frequency range can be swept incrementally with a step size not exceeding 4% of the previous frequency with a test level of twice the value of the specified test level in order to reduce the testing time for equipment requiring testing in multiple configurations and/or long cycle times.
- The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond. However, the dwell time shall not exceed 5 seconds at each of the frequencies during the scan. The time to exercise the EUT is not interpreted as a total time of a program or a cycle but related to the reaction time in case of failure of the EUT.

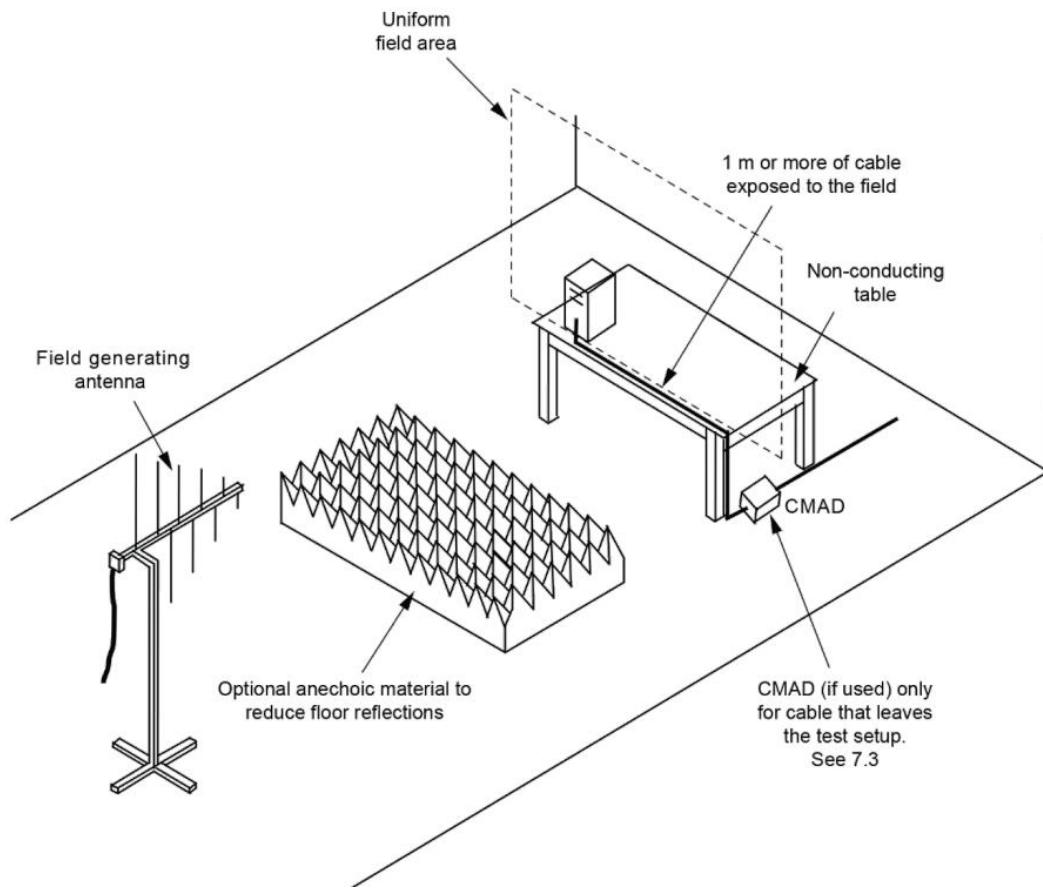
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## 7.2. Block Diagram of Test Setup



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### 7.3. Equipment Details

Measuring Instruments					
Instruments	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	Agilent	N5182A	MY50140530	Feb. 17, 2023	Feb. 16, 2024
Directional coupler	Werlatone	C5571-10	99463	Mar. 10, 2022	Mar. 09, 2024
Directional coupler	Werlatone	C5571-10	99482	Mar. 10, 2022	Mar. 09, 2024
Power Amplifier	KALMUS	7100LC	04-02/17-06-001	N/A	N/A
Power Amplifier	Milmega	AS0104-55_55	1004793	N/A	N/A
Power amplifier	rflight	NTWPA-2560100	17063183	N/A	N/A
Wideband Antenna	ETS	3142C	00060447	N/A	N/A

### Measuring Software

Software Name	Manufacturer	Details
TS+[JS35-RS]	Tonscend	For EMC measurement, version 2.0.1.8

### 7.4. Configuration of the EUT and method of measurement

- The Equipment Under Test (EUT) was positioned within the Uniform Field Area (UFA) on a supporting table, ensuring a 3-meter separation from the transmitting antenna. This setup aligns with the calibrated square area, guaranteeing field uniformity during testing. The supporting units were strategically located outside the UFA to avoid any potential interference. Nonetheless, the cables connected to the EUT were intentionally exposed to the precisely calibrated field within the UFA.
- Before testing, it will verify the proper operation of the test equipment/system. This verification will involve measuring the field strength at one point within the Uniform Field Area (UFA) at various frequencies.
- The test shall be performed according to the above requirements and block diagram which shall specify the test setup.
- The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance criterion defined in the report.

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### 7.5. Test Summary

Test Engineer	Linke	Temperature	23.9 °C
Test Date	Oct. 23, 2023	Air Pressure	985 Mbar
Test Mode(s)	Mode 1	Relative Humidity	60.5 %
Verdict	Pass		

Swept test:

Frequency	Exposed Side	Field Strength (V/m)	Observation	Performance
80MHz to 6GHz	Front	3V/m (rms)	No degradation of performance	A
80MHz to 6GHz	Left	3V/m (rms)	No degradation of performance	A
80MHz to 6GHz	Rear	3V/m (rms)	No degradation of performance	A
80MHz to 6GHz	Right	3V/m (rms)	No degradation of performance	A

Spot test (Frequency ( $\pm 1\%$ )):

Frequency	Exposed Side	Field Strength (V/m)	Observation	Performance
1800, 2600, 3500, 5000MHz	Front	3V/m (rms)	No degradation of performance	A
1800, 2600, 3500, 5000MHz	Left	3V/m (rms)	No degradation of performance	A
1800, 2600, 3500, 5000MHz	Rear	3V/m (rms)	No degradation of performance	A
1800, 2600, 3500, 5000MHz	Right	3V/m (rms)	No degradation of performance	A

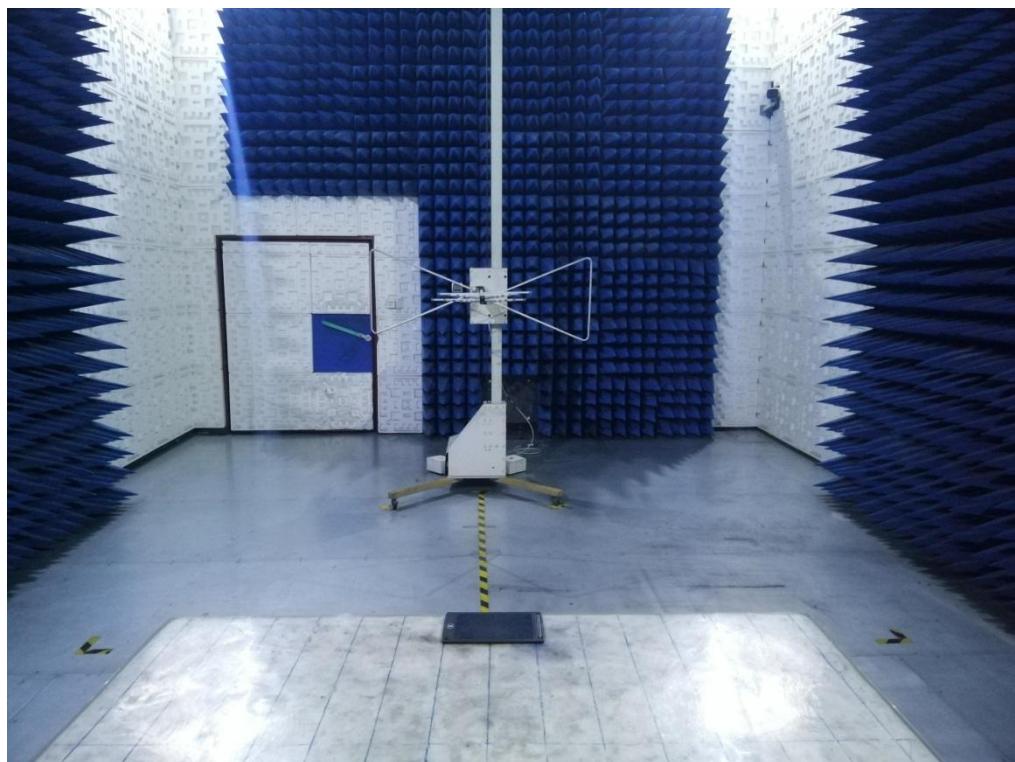
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## 8. Photographs of Test Setup



Radiated emissions at frequencies up to 1 GHz



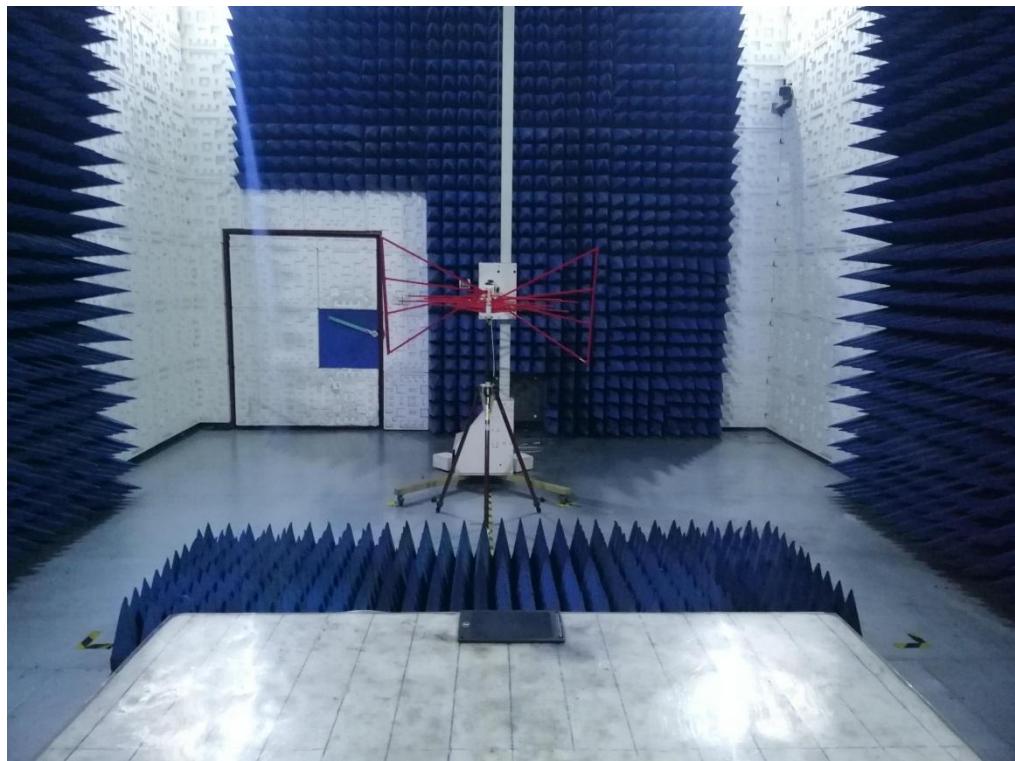
Electrostatic discharge

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Radio-frequency electromagnetic field up to 1 GHz

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## 9. Photographs of EUT



Top view of EUT



Bottom view of EUT

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Front view of EUT



Back view of EUT

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Left view of EUT



Right view of EUT

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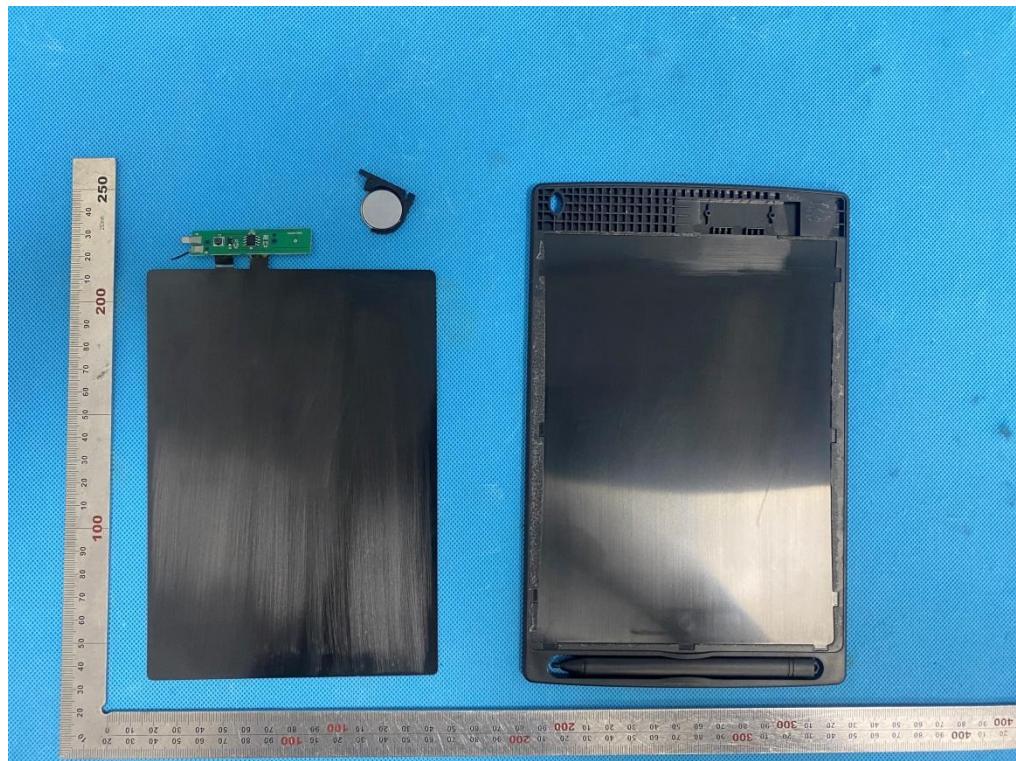
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Open view-1 of EUT



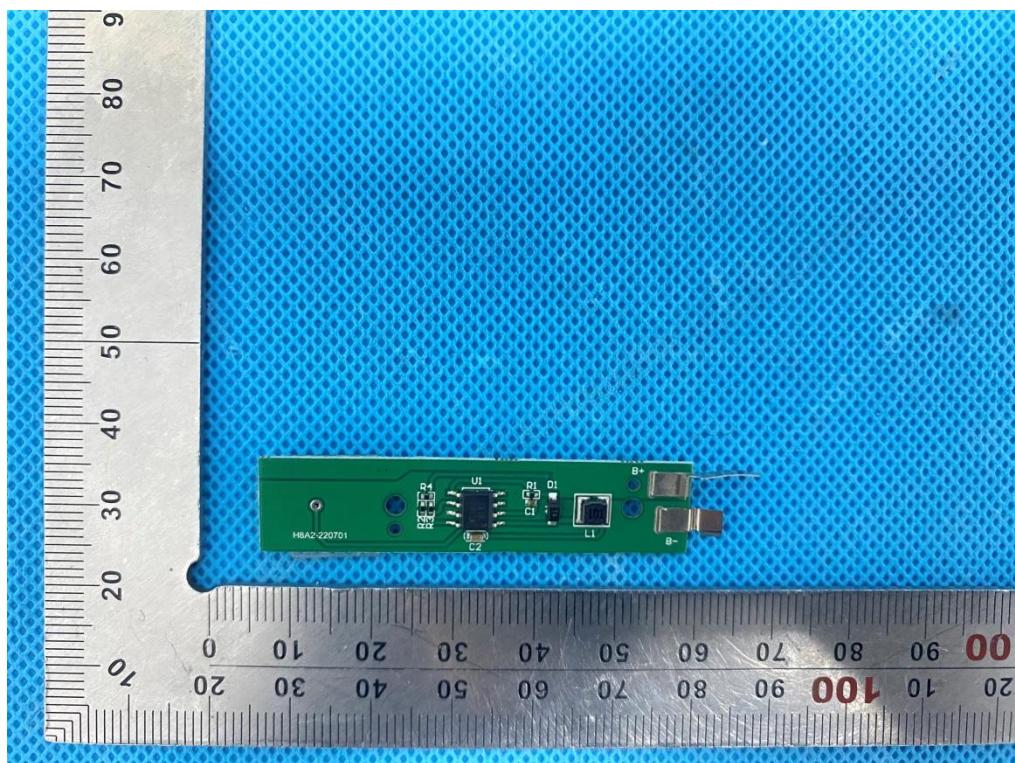
Open view-2 of EUT

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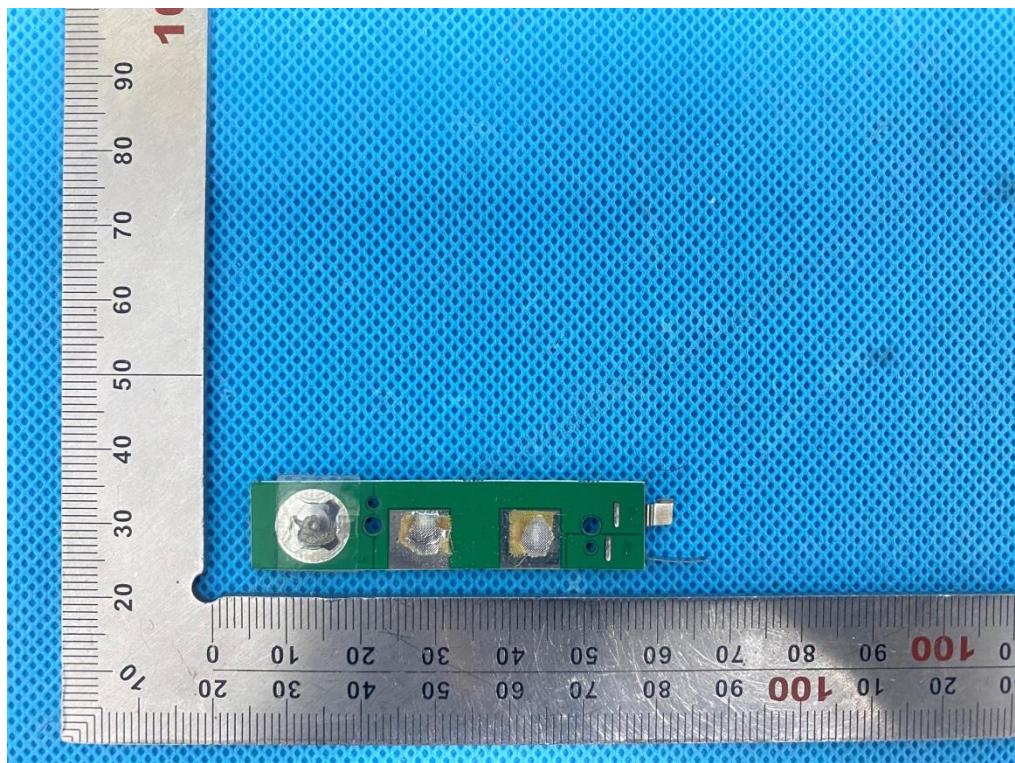
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Internal view-1 of EUT



Internal view-2 of EUT

----End of Report----

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2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract or warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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