



EMC TEST REPORT

Report No.: SET2019-02915

Product: Hearing Aid

Trade name: /

Model No. : JH-D26

Applicant: HUIZHOU JINGHAO MEDICAL TECHNOLOGY CO.,LTD

Issued by: CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

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Test Report

Product..... : Hearing Aid

Model No. : JH-D26

Trade name..... : /

Applicant..... : HUIZHOU JINGHAO MEDICAL TECHNOLOGY CO.,LTD

Applicant Address..... : FLOOR 6, HUICHENG INDUSTRY BUILDING, NO.9
HUIFENG DONG`ER ROAD, ZHONGKAI HIGH-TECH
ZONE, HUIZHOU, GUANGDONG, CHINA

Manufacturer : HUIZHOU JINGHAO MEDICAL TECHNOLOGY CO.,LTD

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ZONE, HUIZHOU, GUANGDONG, CHINA

Test Standards : **IEC 60118-13:2016** Electroacoustics – Hearing aids –Part 13:
Electromagnetic compatibility (EMC)

Test Result..... : PASS

Tested by :

Reviewed by..... :

Approved by :



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1 General Information

1.1 Description of EUT

The EUT is a ITE (in the ear) Hearing Aids.

For a more detailed features description about the EUT, please refer to the manufacture's specification or the User's Manual.

1.2 Objective

Perform Electromagnetic Susceptibility (EMS) tests for IEC standard compliance.

1.3 Test Standards and Results

The EUT has been tested according to IEC 60118-13:2016

IEC 60118-13:2016	Electroacoustics - Hearing aids - Part 13: Electromagnetic compatibility (EMC)
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The results are as follow:

IMMUNITY (IEC 60118-13:2016)		
Basic Standard	Test Type	Result
IEC 61000-4-2:2008	Electrostatic discharge immunity	PASS
IEC 61000-4-3: 2006 + A1:2007+A2:2010	Radiated, radio frequency electromagnetic field immunity	PASS
IEC 61000-4-8: 2009	Power frequency magnetic field immunity	PASS



1.4 List of Equipments Used

Description	Manufacturer	Model No.	Serial No.	Cal. Due Date
EMS Antenna, BiLog	Amplifier Research	AR AT1080	A0304249	2020.10.09
Power Meter	Agilent	E4417	A130301280	2020.03.26
Signal Generator	ROHDE&SCHWARZ	SML27	A140901958	2020.09.09
Power Amplifier	Amplifier Research	700S 1G4	A130601340	2020.06.19
Field Monitor	Amplifier Research	AR FM5004	305128	2020.10.08
Audio Analyzer	ROHDE&SCHWARZ	UPL	A0304214	2019.05.08
ESD Simulator	3C TEST	EDS30T	A161002598	2019.06.11
Power Frequency Magnetic Field Generator	HAEFELY	MAG100.1	A0103109	2019.06.06

NOTE: Equipments listed above have been calibrated and are in the period of validation.

1.5 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35 °C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

1.6 Test Facility

Shenzhen Electronic Product Quality Testing Center (SET) is a third party testing organization accredited by China National Accreditation Committee for Laboratories (CNACL) according to ISO/IEC 17025. The accreditation certificate number is **L1659**.

The EMC chamber site No.1 (EMC12.8×6.8×6.4(m)), and the radiated and conducted Emission test equipments of SET are constructed and calibrated to meet the FCC requirements ANSI C63.4:2001 and CISPR 22/EN 55022. The FCC Registration Number is **261302**.

The EMC chamber site No.1 (EMC12.8×6.8×6.4(m)) also complies with Canada standard RSS 212, and acceptable to Industry Canada for the performance of radiated measurements. The Industry Canada Registration Number is IC 5915.

2 Immunity Test

2.1 Electrostatic Discharge Immunity Test

2.1.1 Test Specification

Basic Standard:	IEC 61000-4-2
Discharge Impedance	330 Ω / 150 pF
Discharge Voltage:	Air Discharge :2 kV, 4 kV Contact Discharge :8 kV
Polarity:	Positive / Negative
Discharge Mode:	Single discharge
Discharge Period:	1 second minimum

2.1.2 Test Procedure

The discharges shall be applied in two ways:

a. Contact discharges to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three contact test points shall each receive at least 50 direct contact discharges. If no direct contact test points are available, at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

b. Air discharges at slots and apertures and insulating surfaces:

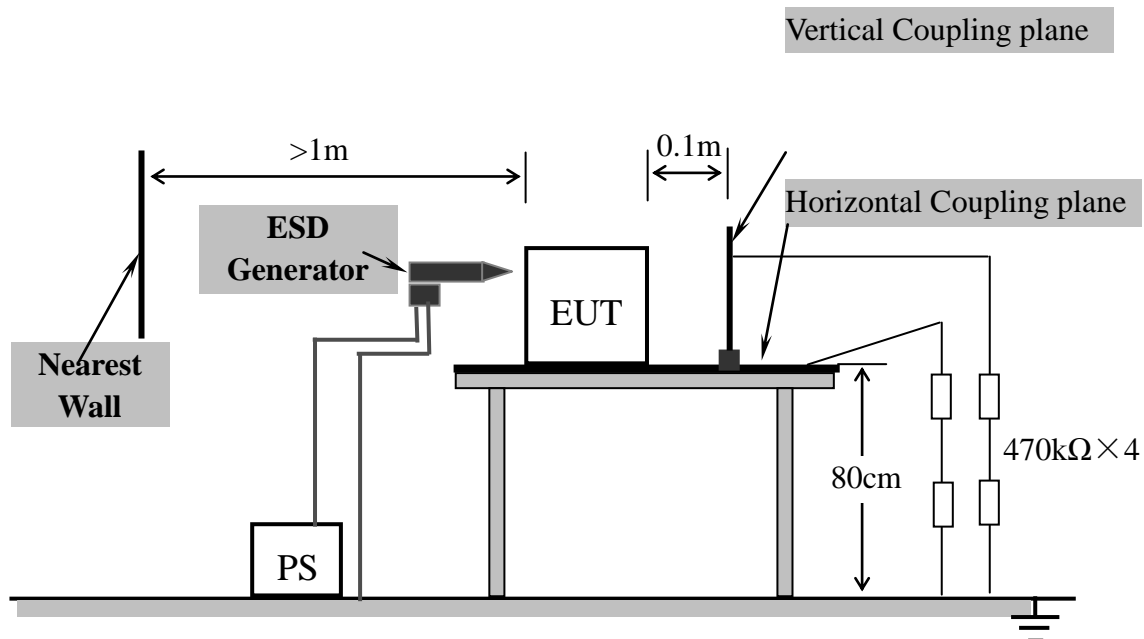
On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled selected test point for each such area.

The basic test procedure was in accordance with IEC 61000-4-2:

- 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 50 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 50 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 $0.5\text{m} \times 0.5\text{m}$) was placed vertically to and 0.1 meters from the EUT.

2.1.3 Test Setup



For the actual test configuration, please refer to Appendix II: Photographs of the Test Configuration.



2.1.4 Test Result

Test Points	Discharge Level (kV)	Discharge Mode	Observation	Comply with Criterion
Aperture of the cover	$\pm 2, \pm 4$	Air	Note(1)	A
HCP	± 8	Contact	Note(1)	A
VCP	± 8	Contact	Note(1)	A

NOTE:

(1). The EUT continued to operate as intended. No degradation of performance was observed.



2.2 Radiated, Radio Frequency Electromagnetic Field Immunity Test

2.2.1 Test Specification

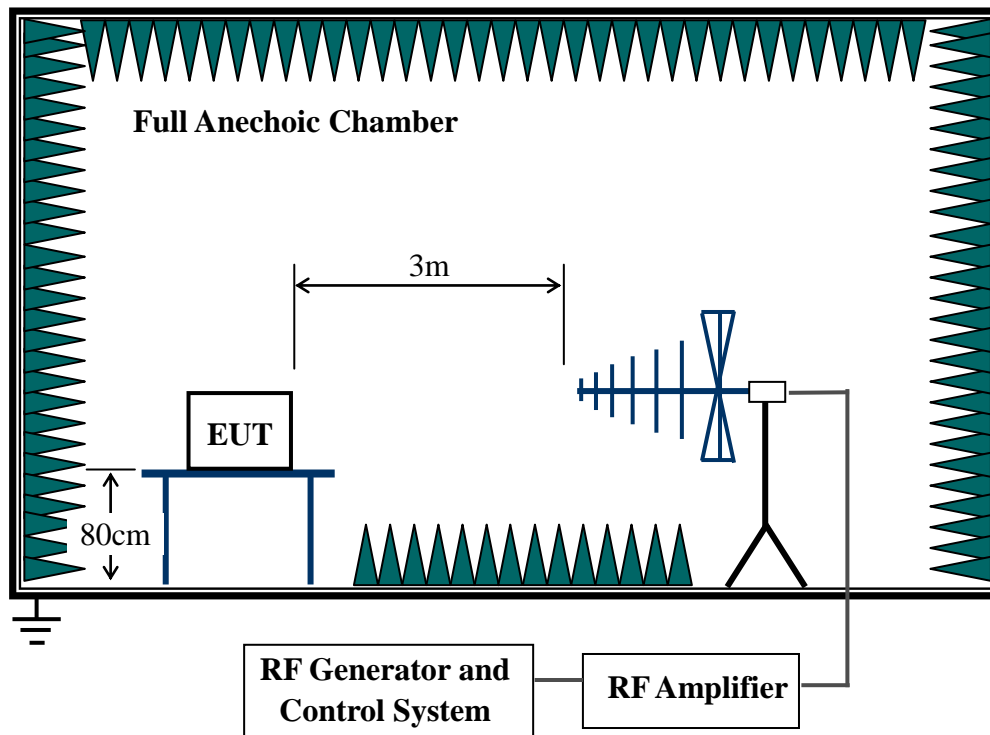
Basic Standard:	IEC 61000-4-3
Frequency Range:	800 MHz – 960MHz, 1400MHz-2000MHz, 2000-2700MHz
Field Strength:	Bystander compatibility:90V/m(700-960MHz), 50V/m(1400-2000 MHz), 35V/m(2000-2700MHz).
Modulation:	1kHz sine wave, 80%, AM modulation
Frequency Step:	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance:	3m
Antenna Height:	1.5m
Dwell Time:	1 second for 1kHz modulation

2.2.2 Test Procedure

The test procedure was in accordance with IEC 61000-4-3.

- a. The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- b. The frequency range is swept from 700 MHz - 960MHz , 1400MHz-2000MHz and 2000-2700MHz with the signal 80% amplitude modulated with sine wave. In order to represent the worst case condition, the modulation frequencies shall be 1 kHz and.
- c. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- d. The minimum dwell time shall be based upon the time required for the equipment or system to be exercised (if applicable) and adequately respond to the test signal. The dwell time shall be at least 1s for 1kHz modulation, and shall be no less than the respond time of the slowest responding function plus the setting time of the radiated RF immunity test system.
- e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

2.2.3 Test Setup



For the actual test configuration, please refer to Appendix II: Photographs of the Test Configuration.



2.2.4 Test Result

Test Conditions	Polarity	Azimuth	Observation	Result
700-960MHz, 90V/m 1kHz Sine 80% AM	V&H	0	Note(1)	Pass
	V&H	90	Note(1)	Pass
	V&H	180	Note(1)	Pass
	V&H	270	Note(1)	Pass
1400-2000 MHz, 50V/m, 1Hz Sine 80% AM	V&H	0	Note(1)	Pass
	V&H	90	Note(1)	Pass
	V&H	180	Note(1)	Pass
	V&H	270	Note(1)	Pass
2000-2700MHz, 35V/m 1kHz Sine 80% AM	V&H	0	Note(1)	Pass
	V&H	90	Note(1)	Pass
	V&H	180	Note(1)	Pass
	V&H	270	Note(1)	Pass

NOTE:

- (1). The EUT continued to operate as intended during and after the test. The IRIL (input related interference level) is less than 55dB.
- (2). The EUT is complied with the Bystander compatibility.

2.3 Power Frequency Magnetic Field Immunity Test

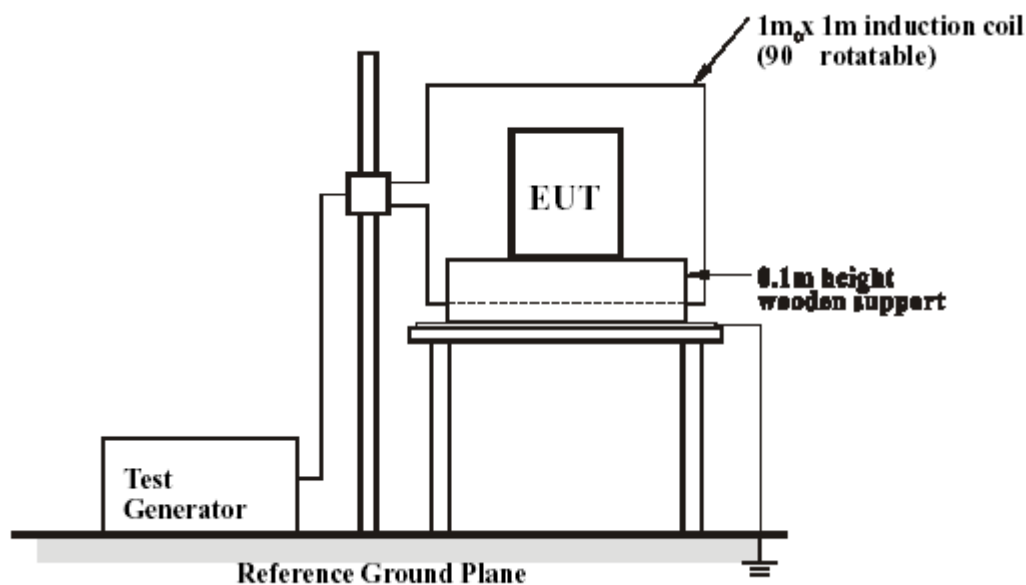
2.3.1 Test Specification

Basic Standard:	IEC 61000-4-8
Frequency Range:	50Hz/60 Hz
Field Strength:	3A/m
Observation Time:	5 minutes
Inductance Coil:	Rectangular type, 1m × 1m
Performance Criterion:	Criterion A

2.3.2 Test Procedure

- The equipment is configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m thick insulating support.
- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

2.3.3 Test Setup





For the actual test configuration, please refer to Appendix II: Photographs of the Test Configuration.

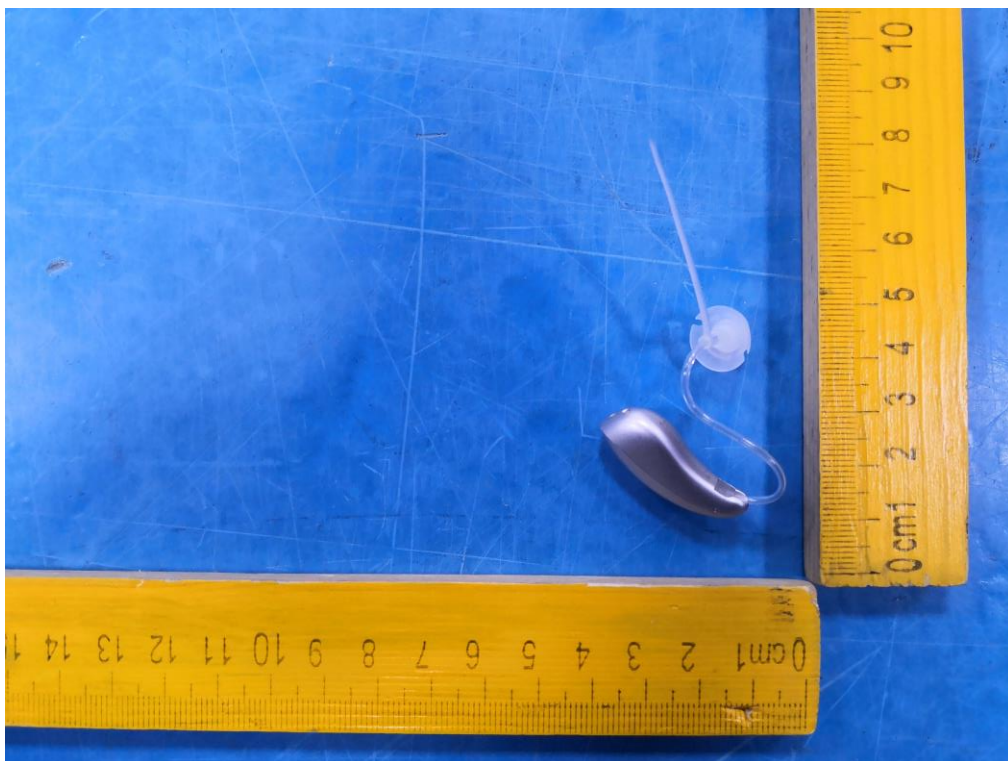
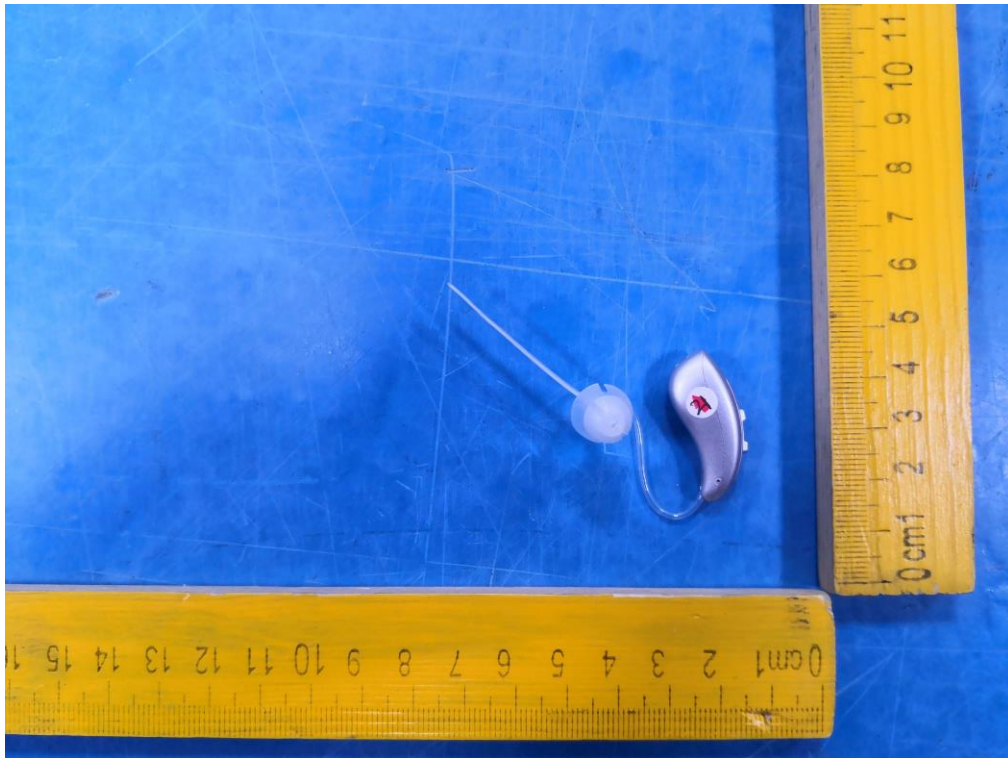
2.3.4 Test Result

Direction	Field Strength(A/m)	Observation	Comply with Criterion
X	1	Note(1)	A
Y	1	Note(1)	A
Z	1	Note(1)	A

NOTE:

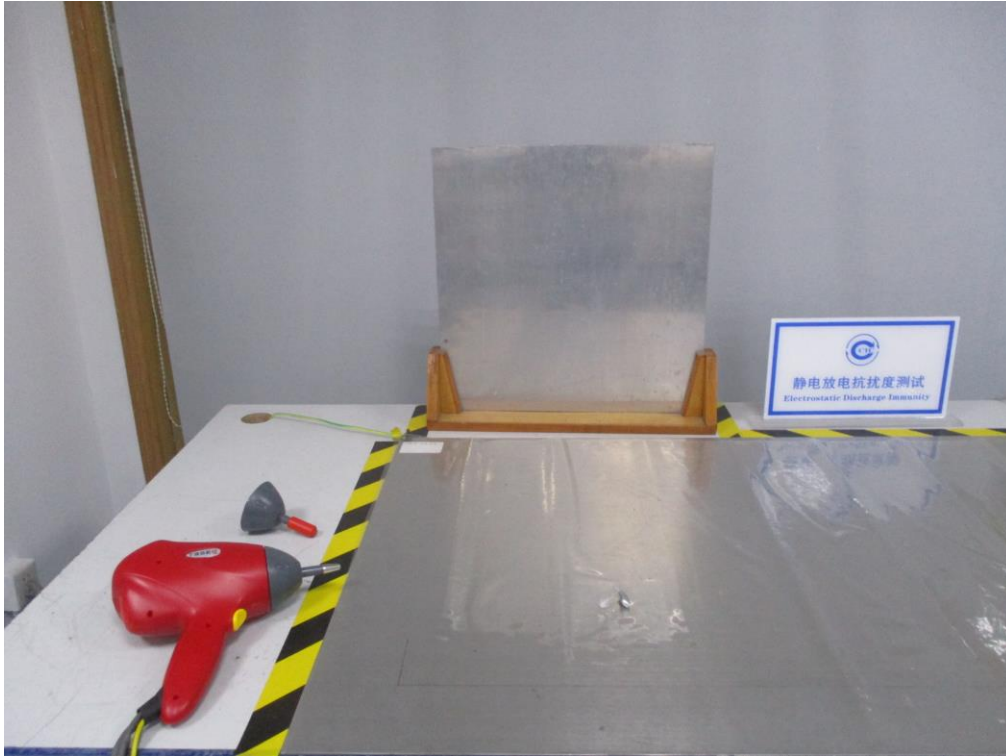
(1). The EUT continued to operate as intended. No degradation of performance was observed.

Appendix I: Photographs of the EUT

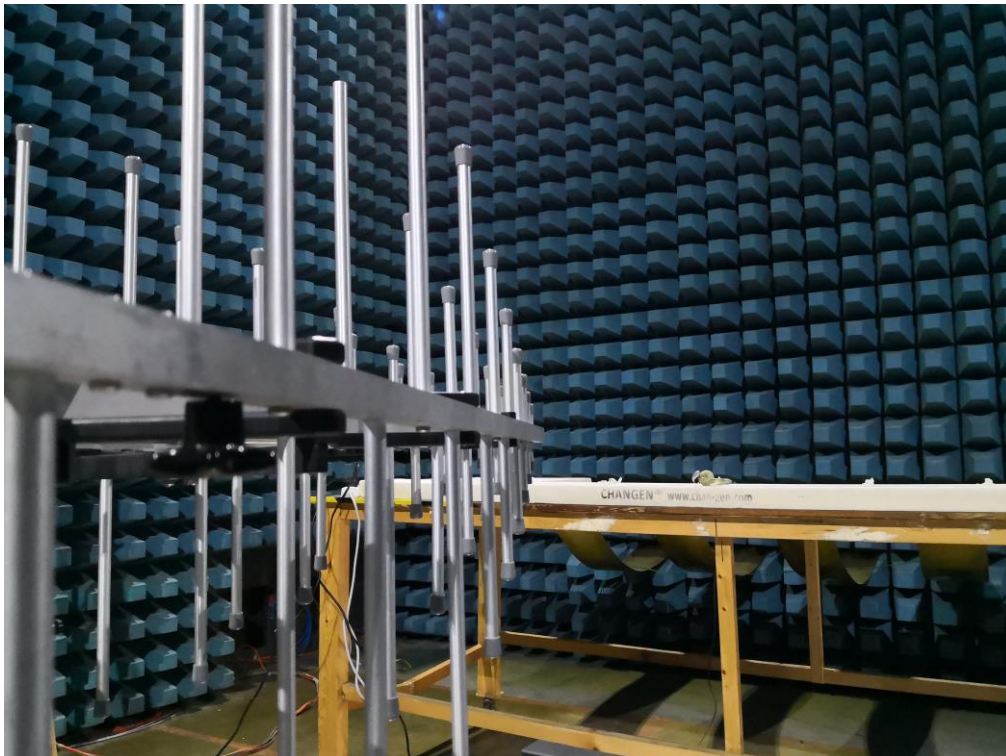


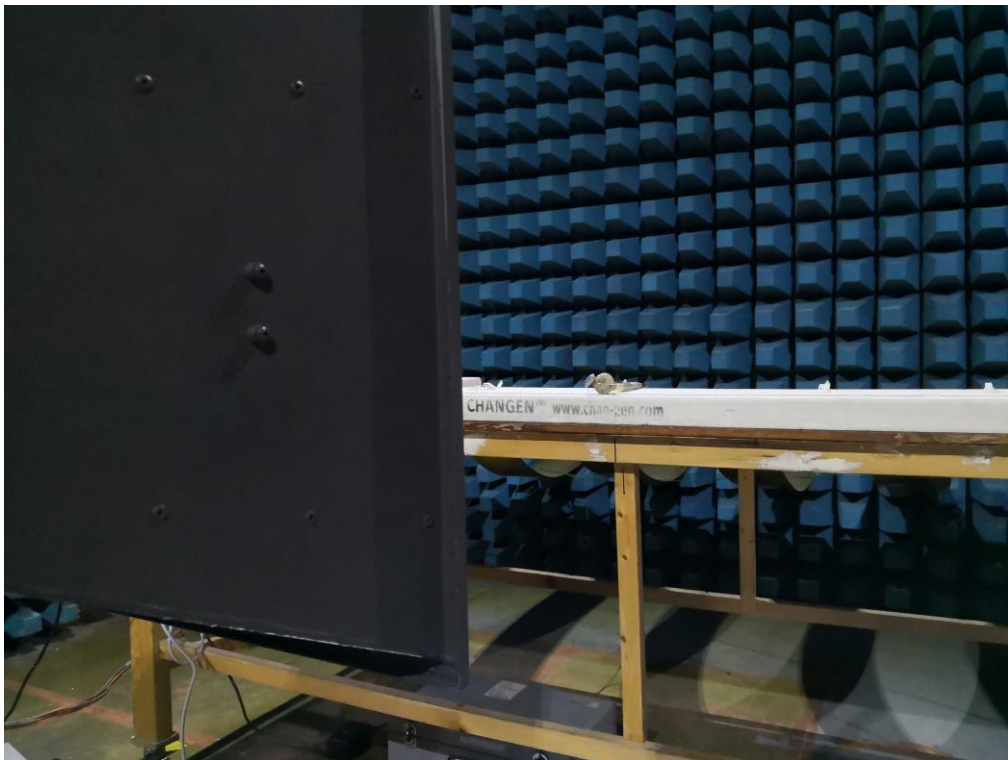
Appendix II: Photographs of the Test Configuration

1. Electrostatic discharge immunity

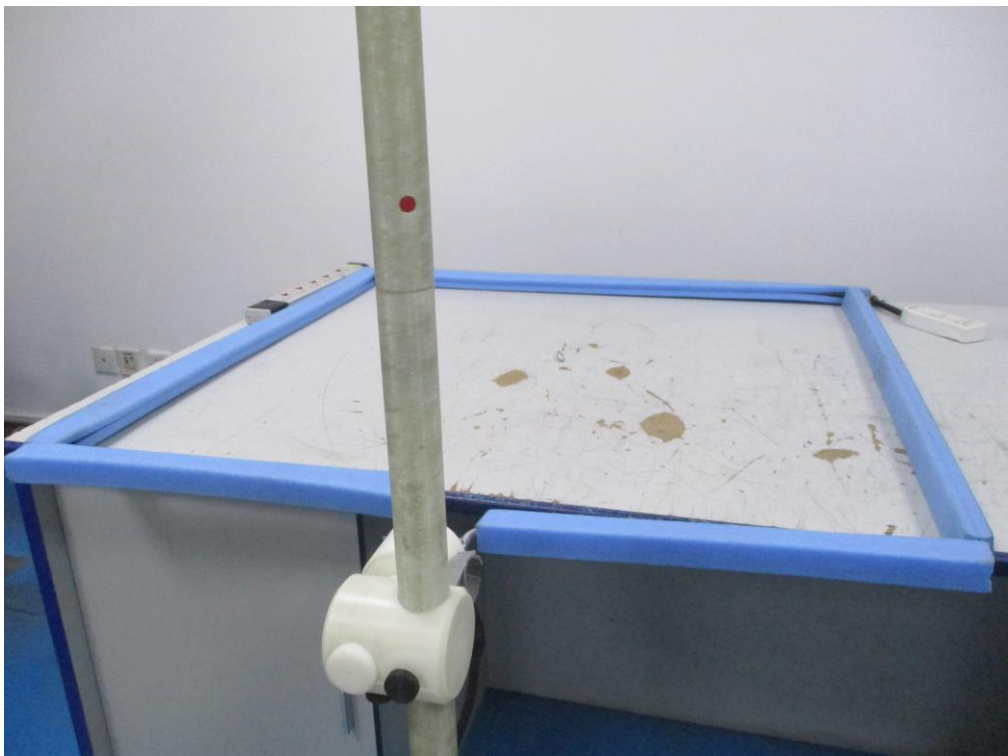


2. Radiated, radio frequency electromagnetic field immunity





3. Power frequency magnetic field immunity



End of Report



STATEMENT

1. The test report is invalid without stamp of laboratory.
2. The test report is invalid without signature of person(s) testing and authorizing.
3. The test report is invalid if erased and corrected.
4. Test results of the report is valid to the test samples if sampling by client.
5. “☆” item to be outside the scope of authorized by CNAS.
6. “☆” item to be outside the scope of CMA, the test method、 data and results are available for reference..
7. The test report shall not be reproduced except in full, without written approval of the laboratory.
8. If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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