# EMC Test Report

Report No.: STS2507196E01

Issued for

Mid Ocean Brands B.V.

Unit 711-
716, 7/F., Tower A, 83 King Lam Street Cheung Sha Wan,
Kowloon, Hong Kong

| | |
|---|---|
| Product Name: | Torch with emergency hammer |
| Brand Name: | N/A |
| Model Name: | MO6941 |
| Series Model(s): | N/A |
| Test Standards: | EN IEC 55015:2019/A11:2020<br>EN IEC 61547:2023 |

# TEST REPORT

| | |
|---|---|
| **Applicant's Name**..... : | Mid Ocean Brands B.V. |
| Address ..... : | Unit 711-716, 7/F., Tower A, 83 King Lam Street Cheung Sha Wan, Kowloon, Hong Kong |
| **Manufacturer's Name** ..... : | Mid Ocean Brands B.V. |
| Address ..... : | Unit 711-716, 7/F., Tower A, 83 King Lam Street Cheung Sha Wan, Kowloon, Hong Kong |

**Product description**

| | |
|---|---|
| Product Name ..... : | Torch with emergency hammer |
| Brand Name ..... : | N/A |
| Model Name ..... : | MO6941 |
| Series Model(s) ..... : | N/A |
| **Test Standards**..... : | EN IEC 55015:2019/A11:2020<br>EN IEC 61547:2023 |

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

**Date of Test**.....:

| | |
|---|---|
| Date of Receipt of Test Item ..... : | 30 July 2025 |
| Date (s) of Performance of Tests..... : | 30 July 2025 ~ 04 Aug. 2025 |
| Date of Issue..... : | 04 Aug. 2025 |
| Test Result..... : | **Pass** |

Testing Engineer : Stan · Deng

(Star Deng)

Technical Manager : Brave Wu

(Brave Wu)

Authorized Signatory : Bovey Yang

(Bovey Yang)

SHENZHEN STS TEST SERVICES CO., LTD. TESTING APPROVAL

# TABLE OF CONTENTS

## Revision History

| Rev. | Issue Date | Report No. | Effect Page | Contents |
|---|---|---|---|---|
| 00 | 04 Aug. 2025 | STS2507196E01 | ALL | Initial Issue |
| | | | | |

## 1. TEST SUMMARY

Test procedures according to the technical standards:

| EMC Emission | | | | |
|---|---|---|---|---|
| Standard | Test Item | Limit | Judgment | Remark |
| EN IEC 55015:2019/A11:2020 | Conducted Emission on AC And Telecom Port 150kHz to 30MHz | ------ | N/A | |
| | Radiated Emission | ------ | PASS | |
| | Magnetic field radiation harassment | ------ | PASS | |
| **EMC Immunity** | | | | |
| Section EN 61547:2023 | Test Item | Performance Criteria | Judgment | Remark |
| EN IEC 61000-4-2:2025 | Electrostatic Discharge | B | PASS | |
| EN IEC 61000-4-3:2020 | Continuous RF electromagnetic field disturbances | A | PASS | |
| EN 61000-4-4:2012 | Electrical fast transients/burst | B | N/A | |
| EN 61000-4-5:2014/A1:2017 | Surges | B | N/A | |
| EN IEC 61000-4-6:2023 | Continuous induced RF disturbances | A | N/A | |
| EN 61000-4-8:2010 | Power Frequency Magnetic Field | A | N/A | |
| EN IEC 61000-4-11:2020 | Voltage dips and interruptions | B / C | N/A | |

NOTE:

(1) For client's request and manual description, the test will not be executed.

(2) "N/A" denotes test is not applicable in this Test Report.

## 1.1 TEST FACTORY

| | |
|---|---|
| Company Name: | Shenzhen STS Test Services Co. Ltd. |
| Address: | 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China |
| Telephone: | +86-755 3688 6288 |
| Fax: | +86-755 3688 6277 |
| Registration No.: | IC Registration No.: 12108A |
| | FCC test Firm Registration Number: 625569 |
| | A2LA Certificate No.: 4338.01 |

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **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** %.

A. Conducted Measurement :

| Test Site | Method | Measurement Frequency Range | U · (dB) | NOTE |
|---|---|---|---|---|
| STSC01 | CISPR 16-4-2 | 9KHz-150KHz | 2.32 | |
| | | 150 KHz ~ 30MHz | 3.06 | |

B. Radiated Measurement :

| Test Site | Method | Measurement Frequency Range | U · (dB) | NOTE |
|---|---|---|---|---|
| STSC02 | CISPR 16-4-2 | 30MHz ~ 1000MHz | 4.23 | |
| | | 1GHz ~ 6GHz | 5.13 | |

C. Magnetic field radiation harassment:

| Test Site | Method | Measurement Frequency Range | U · (dB) | NOTE |
|---|---|---|---|---|
| STSC01 | CISPR 16-4-2 | 9KHz ~ 30MHz | 2.50 | |

# 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| Product Name | Torch with emergency hammer |
| Brand Name | N/A |
| Model Name | MO6941 |
| Series Model | N/A |
| Model Difference | N/A |
| Product Description | The EUT is a Torch with emergency hammer<br><br>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as a Lighting Device. More details of EUT technical specification, please refer to the User's Manual. |
| Rating | Input: 2x1.5VDC AAA Battery |
| Battery | N/A |
| Adapter | N/A |
| Hardware version number | N/A |
| Software version number | N/A |

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|---|---|
| Mode 1 | Lighting Mode |

| **For Radiated Test** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | Lighting Mode |

| **For EMS Test** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | Lighting Mode |

## 2.3 DESCRIPTION OF TEST SETUP


## 2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | Note |
|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A |

| Item | Equipment | Ferrite Core | Length | Note |
|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A |

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

## 2.5 MEASUREMENT INSTRUMENTS LIST

### 2.5.1 RADIATED TEST SITE

| Kind of Equipment | Manufacturer | Type No. | Serial No. | Last Calibration | Calibrated Until |
|---|---|---|---|---|---|
| EMI Test Receiver | R&S | ESCI | 101427 | 2024.9.23 | 2025.9.22 |
| Bi-log Antenna | TESEQ | CBL6111D | 45873 | 2024.9.28 | 2025.9.27 |
| Horn Antenna | SCHWARZBECK | BBHA 9120D | 9120D-1343 | 2024.9.28 | 2025.9.27 |
| Pre-amplifier(1G-26.5G) | Agilent | HP8449B | 3008A02383 | 2025.2.22 | 2026.2.21 |
| Pre-amplifier(0.1M-3GHz) | EM | EM330 | 060665 | 2025.2.22 | 2026.2.21 |
| Spectrum Analyzer | Agilent | N9020A | MY49100060 | 2024.9.23 | 2025.9.22 |
| RE Cable (9K-1G) | N/A | R01 | N/A | 2024.9.23 | 2025.9.22 |
| RE Cable (1G-26G) | N/A | R02 | N/A | 2024.9.23 | 2025.9.22 |
| Temperature & Humidity | Mieo | HH660 | N/A | 2024.9.26 | 2025.9.25 |
| SAC | ChengYu | 9*6*6 | N/A | 2023.9.05 | 2026.9.06 |
| Testing Software | EZ-EMC(Ver.STSLAB-03A1 RE) | | | | |

### 2.5.2 THREE LOOP

| Kind of Equipment | Manufacturer | Type No. | Serial No. | Last Calibration | Calibrated Until |
|---|---|---|---|---|---|
| Three Loop | ZNINAN | ZN30401 | 13018 | 2024.9.23 | 2025.9.22 |
| EMI Test Receiver | R&S | ESCI | 101427 | 2024.9.23 | 2025.9.22 |
| Loop Cable | N/A | C03 | N/A | 2024.9.23 | 2025.9.22 |
| Temperature & Humidity | Anymetre | JR900 | 240686 | 2024.10.15 | 2025.10.14 |

### 2.5.3 ESD

| Kind of Equipment | Manufacturer | Type No. | Serial No. | Last Calibration | Calibrated Until |
|---|---|---|---|---|---|
| ESD TEST GENERATOR | TESEQ | NSG438 | 1175 | 2024.10.14 | 2025.10.13 |
| Temperature & Humidity | N/A | WS1066 | N/A | 2025.2.25 | 2026.2.24 |

### 2.5.4 RS

| Kind of Equipment | Manufacturer | Type No. | Serial No. | Last Calibration | Calibrated Until |
|---|---|---|---|---|---|
| Power Meter | Agilent | E4419B | QB43312265 | 2024.9.23 | 2025.9.22 |
| Power Sensor | hp | E9300A | US39210170 | 2024.9.23 | 2025.9.22 |
| Power Sensor | hp | E9300A | US39210476 | 2024.9.23 | 2025.9.22 |
| Signal Generator | Agilent | N5181A | MY56144718 | 2024.9.23 | 2025.9.22 |
| Power Amplifier | MICOTOP | MPA-80-1000-250 | MPA1711489 | 2024.9.23 | 2025.9.22 |
| Power Amplifier | MICOTOP | MPA-1000-6000-100 | MPA1904132 | 2024.9.23 | 2025.9.22 |
| RS Test Antenna (80-1GHz) | SCHWARZBECK | VULP 9118E | 000999 | N/A | N/A |
| RS Test Antenna (1G-10GHz) | SCHWARZBECK | STLP 9149 | 000648 | N/A | N/A |
| Universal Radio Communication Tester | R&S | CMU200 | 116337 | 2025.2.22 | 2026.2.21 |
| Audio Analyzer | R&S | UPL | 100689 | 2025.2.22 | 2026.2.21 |
| Audio Breakthrough Shielding Box | SKET | SB_ABT/C35 | N/A | N/A | N/A |
| Ear Simulator | SKET | AE_ABT/C35 | N/A | N/A | N/A |
| Mouth Simulator | SKET | AM_ABT/C35 | N/A | N/A | N/A |
| 1KHz Standard Source | SKET | MSC_ABT/C35 | N/A | 2024.9.24 | 2025.9.23 |
| Field Probe | Narda | EP601 | 611WX80261 | 2025.2.26 | 2026.2.25 |
| Temperature & Humidity | Anymetre | JR900 | 240686 | 2024.10.15 | 2025.10.14 |
| Testing Software | EMC-S V1.4.0.53 | | | | |

# 3. EMC EMISSION TEST

## 3.1 CONDUCTED EMISSION MEASUREMENT

### 3.1.1 POWER LINE CONDUCTED EMISSION

**(Frequency Range 9KHz-30MHz)**

| FREQUENCY (MHz) | Maximum RF Line Voltage | |
|---|---|---|
| | Quasi-peak | Average |
| 0.009-0.05 | 110 | --- |
| 0.05-0.15 | 90 - 80 * | --- |
| 0.15 -0.50 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 56.00 | 46.00 |
| 5.0 -30.0 | 60.00 | 50.00 |

Note: (1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

### 3.1.2 LOAD TERMINAL CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Maximum RF Line Voltage | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 -0.50 | 80 | 70 |
| 0.50 -30.0 | 74 | 64 |

Note: (1) The tighter limit applies at the band edges.

### 3.1.3 CONTROL TERMINAL CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Maximum RF Line Voltage | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 -0.50 | 84 - 74* | 74 - 64* |
| 0.50 -30.0 | 74 | 64 |

Note: (1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.009 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 200Hz and 9 kHz |

### 3.1.4 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

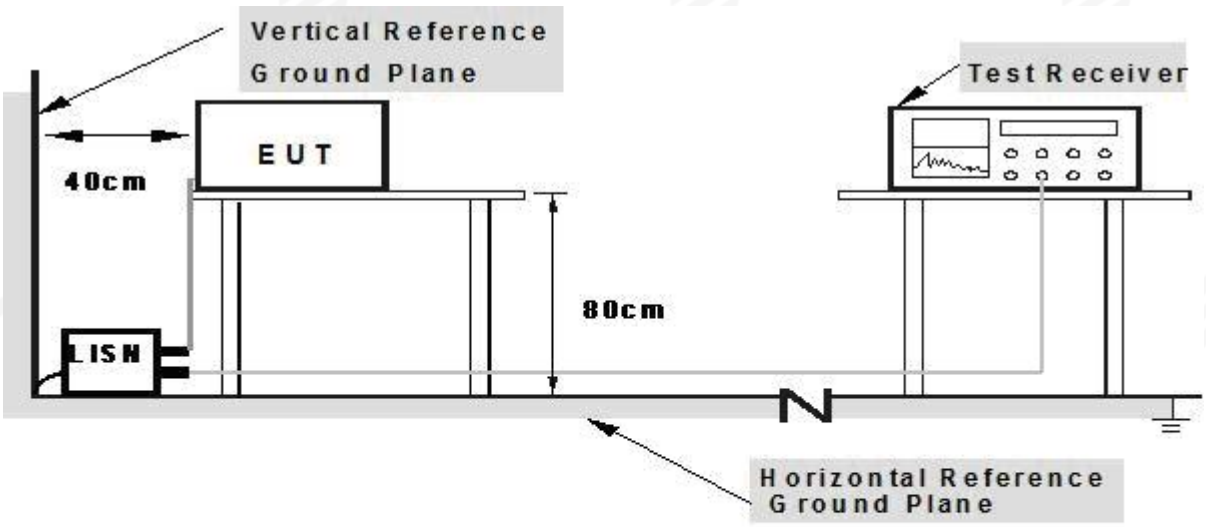
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.5 TEST SETUP




**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.1.7 TEST RESULTS

| | | | |
|---|---|---|---|
| Temperature: | --℃ | Relative Humidity: | --% |
| Phase: | L/N | Test Mode: | N/A |
| Test Voltage**:** | N/A | Test Date: | N/A |

Note: test is not applicable.

## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

| FREQUENCY (MHz) | ☒ 2m | ☐ 3m | ☐ 4m |
|---|---|---|---|
| | dB(μA) | dB(μA) | dB(μA) |
| 9 KHz~ 70 KHz | 88 | 81 | 75 |
| 70 KHz ~ 150 KHz | 88 to 58 | 81 to 51 | 75 to 45 |
| 150 KHz ~ 3 MHz | 58 to 22 | 51 to 15 | 45 to 9 |
| 3 MHz ~ 30 MHz | 22 | 15 to 16 | 9 to 12 |

| FREQUENCY (MHz) | At 10m | At 3m |
|---|---|---|
| | dBuV/m | dBuV/m |
| 30 – 230 | 30 | 40 |
| 230 – 1000 | 37 | 47 |

Notes:

(1) The limit for radiated test was performed according to as following:CISPR 15.

(2) The tighter limit applies at the band edges.

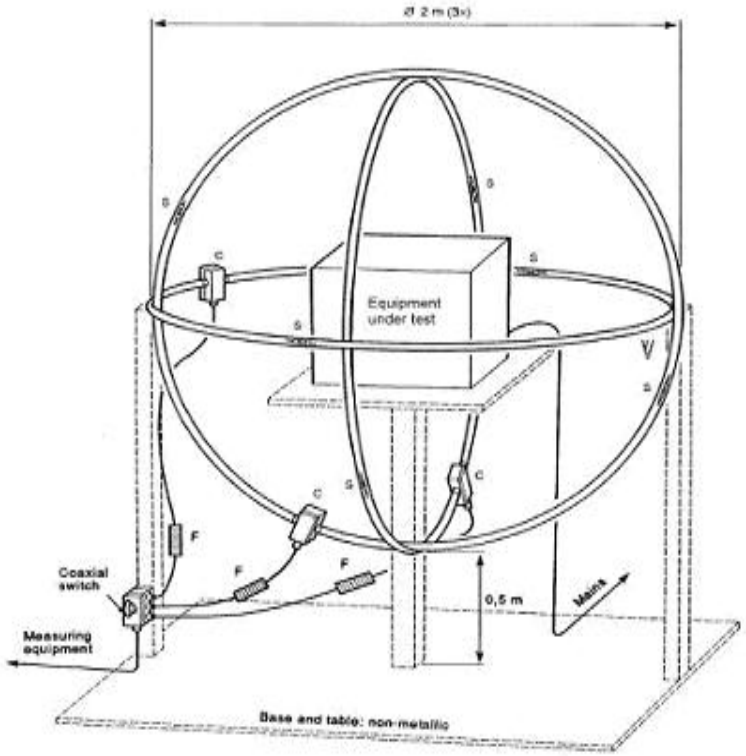
(3) Emission level (dBuV/m)=20log Emission level (uV/m).

### 3.2.2 TEST PROCEDURE

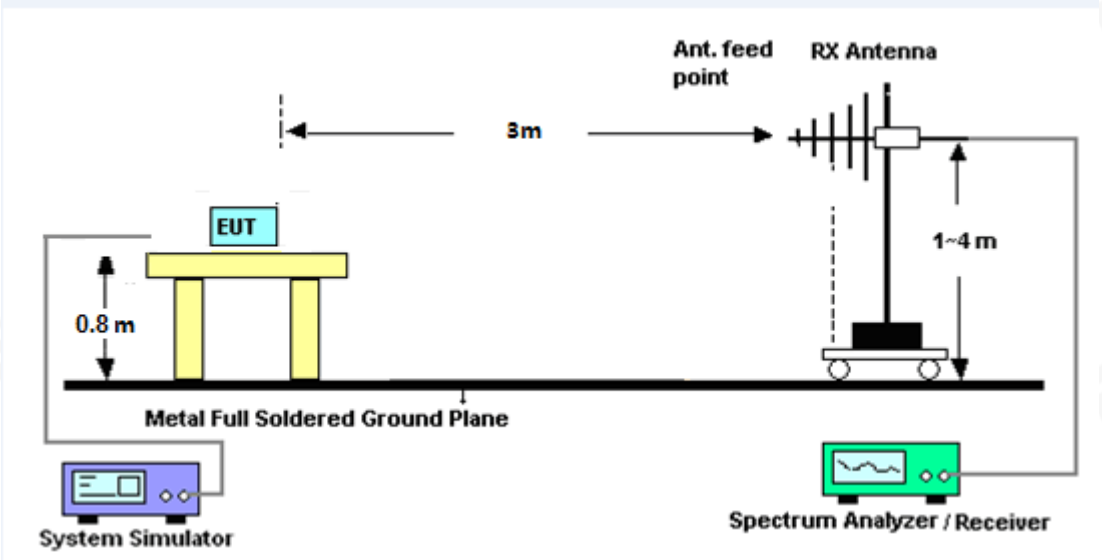
a. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. EUT as the center to the edge of the auxiliary device, the distance from the maximum edge to the center of the antenna is 3 meter.
c. The height of antenna is varied from 1 meter to 4 meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meter and the rotatable table was turned from 0 degrees to 360 degree to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 30 MHz




(B) Radiated Emission Test Set-Up Frequency Below 1000MHz




### 3.2.4 EUT OPERATING CONDITIONS

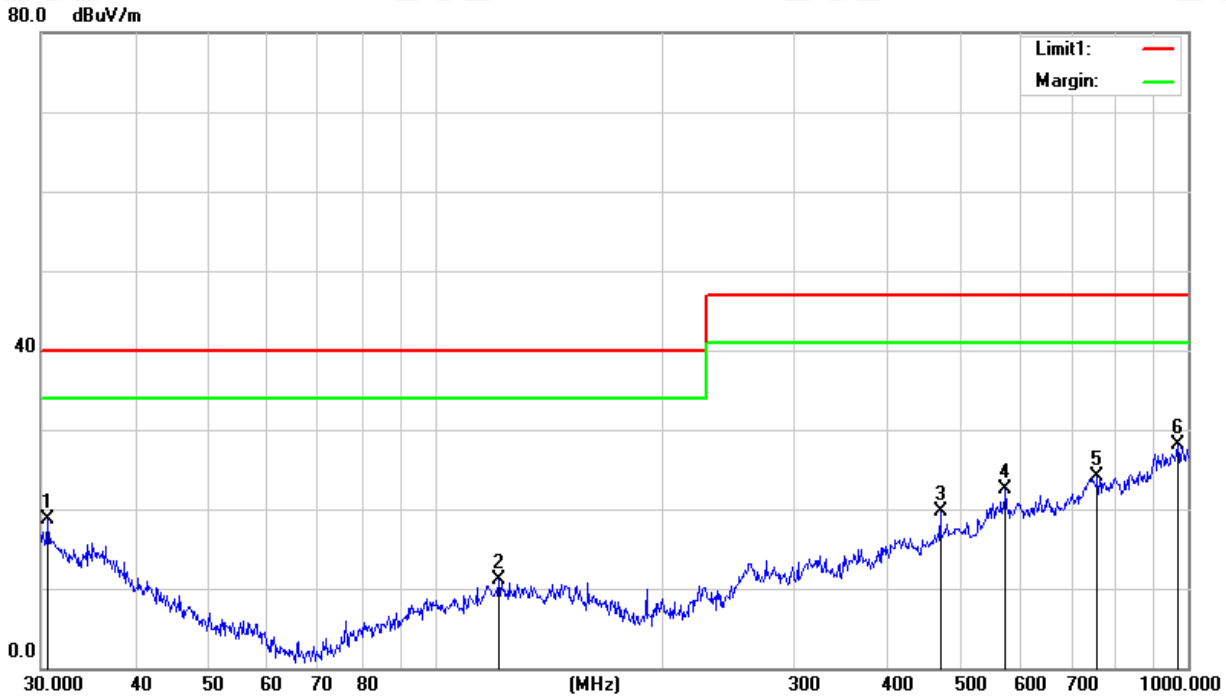
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.2.5 TEST RESULTS (30MHz-1000MHz)

| | | | |
|---|---|---|---|
| Temperature: | 26.1℃ | Relative Humidity: | 53% |
| Phase: | Horizontal | Test Mode: | Mode 1 |
| Test Voltage: | DC 3V from battery | Test Date: | 2025.07.30 |

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Results (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 30.6380 | 30.16 | -11.39 | 18.77 | 40.00 | -21.23 | QP |
| 2 | 121.5486 | 29.34 | -18.24 | 11.10 | 40.00 | -28.90 | QP |
| 3 | 468.8762 | 31.06 | -11.38 | 19.68 | 47.00 | -27.32 | QP |
| 4 | 572.6144 | 30.95 | -8.52 | 22.43 | 47.00 | -24.57 | QP |
| 5 | 758.0408 | 29.47 | -5.41 | 24.06 | 47.00 | -22.94 | QP |
| 6 | 968.9338 | 30.18 | -1.98 | 28.20 | 47.00 | -18.80 | QP |

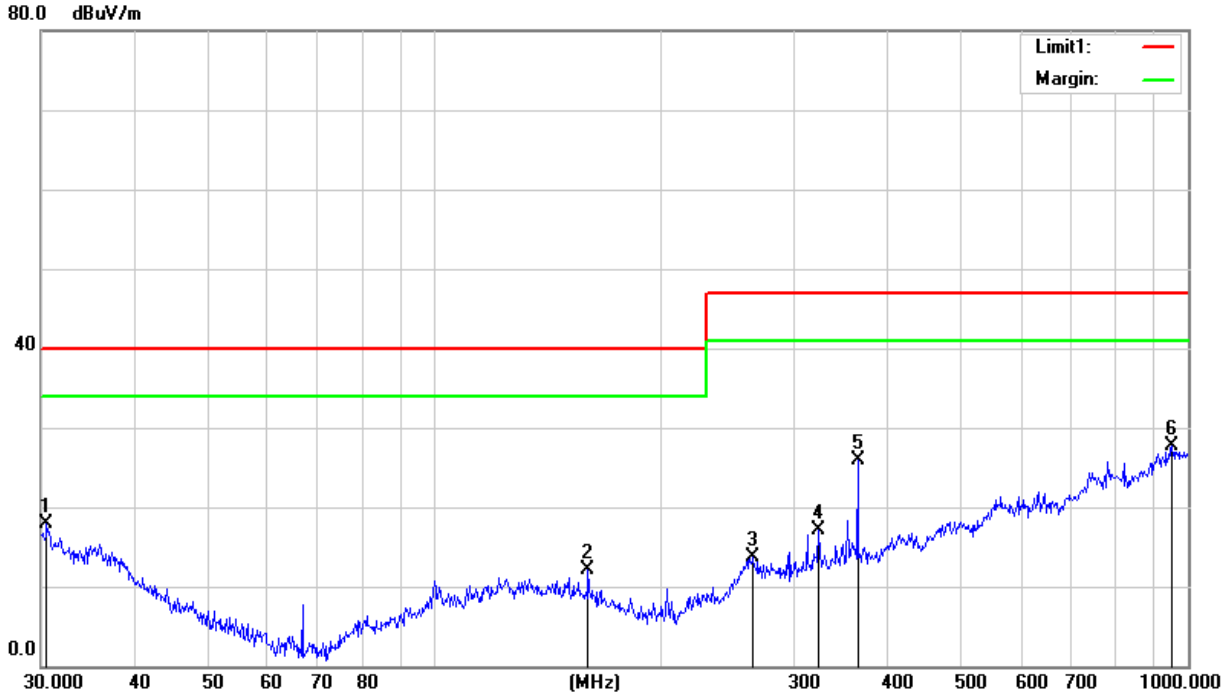
Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor )–Limit.
3. Factor= Cable Loss +Antenna Factor-Amplifier Gain.



| | | | |
|---|---|---|---|
| Temperature: | 26.1℃ | Relative Humidity: | 53% |
| Phase: | Vertical | Test Mode: | Mode 1 |
| Test Voltage: | DC 3V from battery | Test Date: | 2025.07.30 |

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Results (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 30.5306 | 29.21 | -11.32 | 17.89 | 40.00 | -22.11 | QP |
| 2 | 159.7844 | 30.86 | -18.66 | 12.20 | 40.00 | -27.80 | QP |
| 3 | 264.7457 | 29.13 | -15.40 | 13.73 | 47.00 | -33.27 | QP |
| 4 | 323.3204 | 31.91 | -14.90 | 17.01 | 47.00 | -29.99 | QP |
| 5 | 364.2595 | 40.27 | -14.29 | 25.98 | 47.00 | -21.02 | QP |
| 6 | 952.0937 | 29.73 | -2.10 | 27.63 | 47.00 | -19.37 | QP |

Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor )–Limit.
3. Factor= Cable Loss +Antenna Factor-Amplifier Gain.



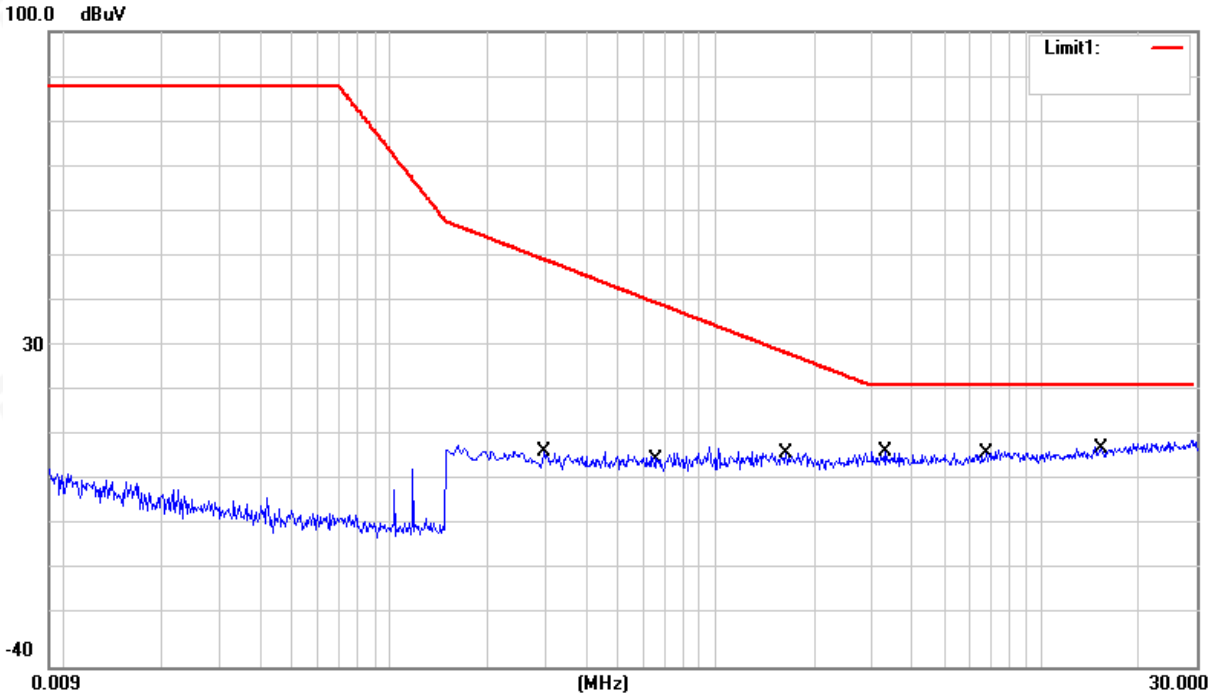
### 3.2.6 TEST RESULTS (0.009~30MHz)

| Temperature: | 26.1℃ | Relative Humidity: | 59% |
|---|---|---|---|
| Test Voltage: | DC 3V from battery | Test Date: | 2025.07.31 |
| Test Mode: | Mode 1 | | |

X

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Results (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.2980 | -14.40 | 21.65 | 7.25 | 49.75 | -42.50 | QP |
| 2 | 0.6800 | -17.44 | 21.89 | 4.45 | 39.84 | -35.39 | QP |
| 3 | 1.6540 | -14.85 | 22.07 | 7.22 | 29.16 | -21.94 | QP |
| 4 | 3.3180 | -15.06 | 22.37 | 7.31 | 22.00 | -14.69 | QP |
| 5 | 6.8060 | -11.98 | 19.15 | 7.17 | 22.00 | -14.83 | QP |
| 6 | 15.5000 | -12.89 | 19.35 | 6.46 | 22.00 | -15.54 | QP |

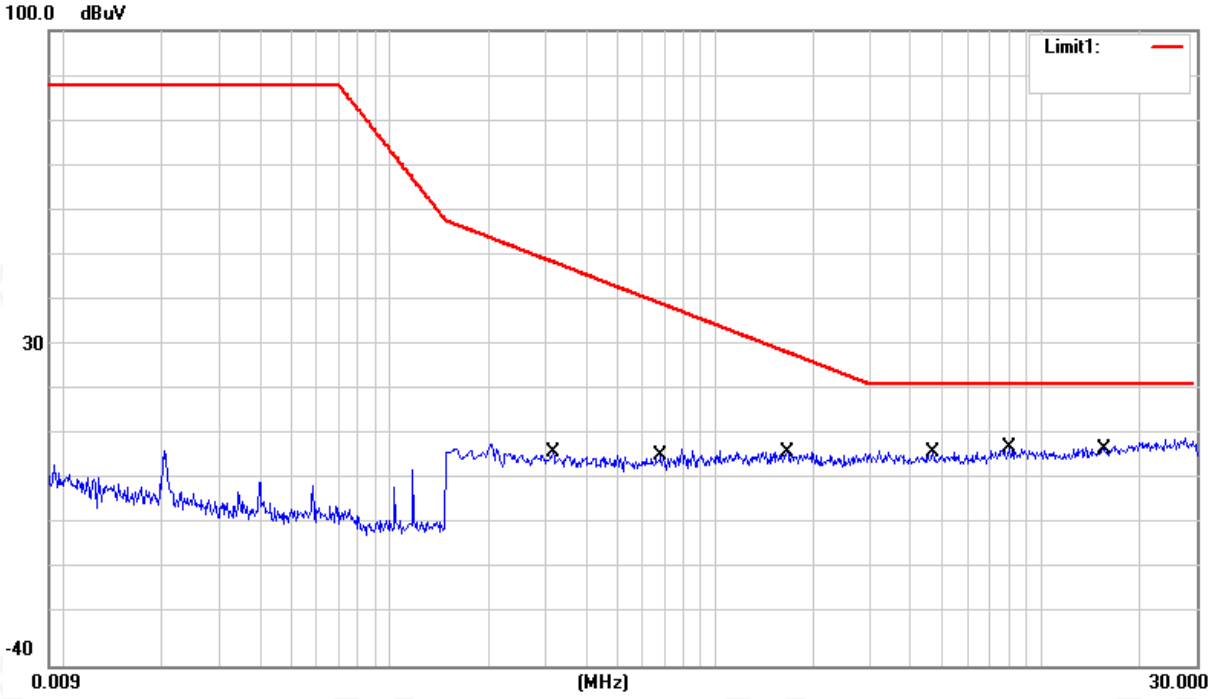
Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor )–Limit.
3. Factor= Insertion loss + Cable loss.



Y

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Results (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.3180 | -14.67 | 21.67 | 7.00 | 48.97 | -41.97 | QP |
| 2 | 0.6800 | -15.45 | 21.89 | 6.44 | 39.84 | -33.40 | QP |
| 3 | 1.6580 | -14.93 | 22.07 | 7.14 | 29.13 | -21.99 | QP |
| 4 | 4.6620 | -15.95 | 23.02 | 7.07 | 22.00 | -14.93 | QP |
| 5 | 8.0220 | -4.23 | 12.36 | 8.13 | 22.00 | -13.87 | QP |
| 6 | 15.5000 | -11.62 | 19.35 | 7.73 | 22.00 | -14.27 | QP |

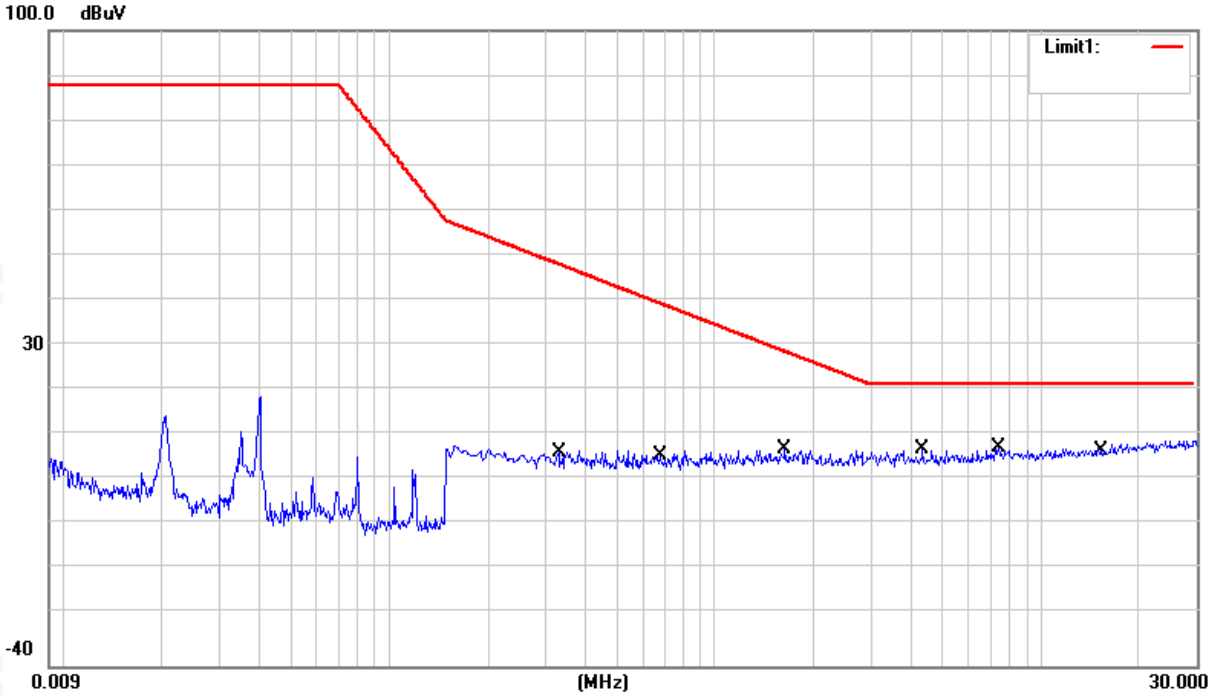
Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor )–Limit.
3. Factor= Insertion loss + Cable loss.



Z

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Results (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.3300 | -14.76 | 21.68 | 6.92 | 48.53 | -41.61 | QP |
| 2 | 0.6800 | -16.39 | 21.89 | 5.50 | 39.84 | -34.34 | QP |
| 3 | 1.6380 | -14.42 | 22.08 | 7.66 | 29.27 | -21.61 | QP |
| 4 | 4.3340 | -15.15 | 22.83 | 7.68 | 22.00 | -14.32 | QP |
| 5 | 7.4300 | -7.57 | 15.55 | 7.98 | 22.00 | -14.02 | QP |
| 6 | 15.5000 | -12.90 | 19.35 | 6.45 | 22.00 | -15.55 | QP |

Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor )–Limit.
3. Factor= Insertion loss + Cable loss.



# 4. EMC IMMUNITY TEST

## 4.1 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

| Tests<br>Standard No. | TEST SPECIFICATION | Test Mode<br>Test Ports | Perform.<br>Criteria |
|---|---|---|---|
| 1. ESD<br>IEC/EN 61000-4-2 | 8KV air discharge<br>4KV contact discharge | Direct Mode | B |
| | 4KV HCP discharge<br>4KV VCP discharge | Indirect Mode | B |
| 2. RS<br>IEC/EN 61000-4-3 | 80 MHz to 1000 MHz, 1000Hz, 80%,<br>AM modulated | Enclosure | A |

## 4.2 GENERAL PERFORMANCE CRITERIA

According to **EN 61547** standard, the general performance criteria as following:

| | |
|---|---|
| **Criterion A** | During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended. |
| **Criterion B** | During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test, the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given. |
| **Criterion C** | During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and/or operating the regulating control. Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended. |

### 4.2.1 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

## 4.3 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

### 4.3.1 TEST SPECIFICATION

| | |
|---|---|
| Basic Standard: | IEC/EN 61000-4-2 |
| Discharge Impedance: | 330 ohm / 150 pF |
| Required Performance: | B |
| Discharge Voltage: | Air Discharge：8KV (Direct)<br>Contact Discharge：4KV (Direct/Indirect) |
| Polarity: | Positive & Negative |
| Number of Discharge: | Air Discharge: at least 10 times on each point<br>Contact Discharge: at least 10 times on each point |
| Discharge Mode: | Single Discharge |
| Discharge Period: | 1 second minimum |

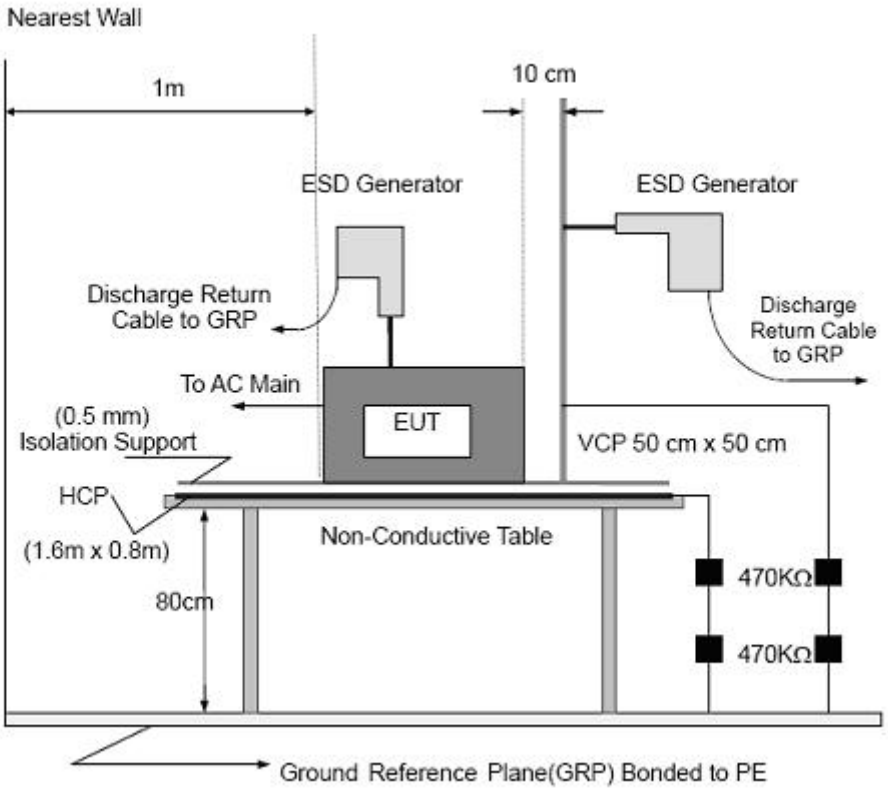
### 4.3.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

### 4.3.3 TEST SETUP




Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meter high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940kΩ total impedance. The equipment under test was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 0.8-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1 meter thickness. The GRP was consisted of a sheet of aluminum that is at least 0.25mm thick, and extended at least 0.5 meter from the EUT on all sides.

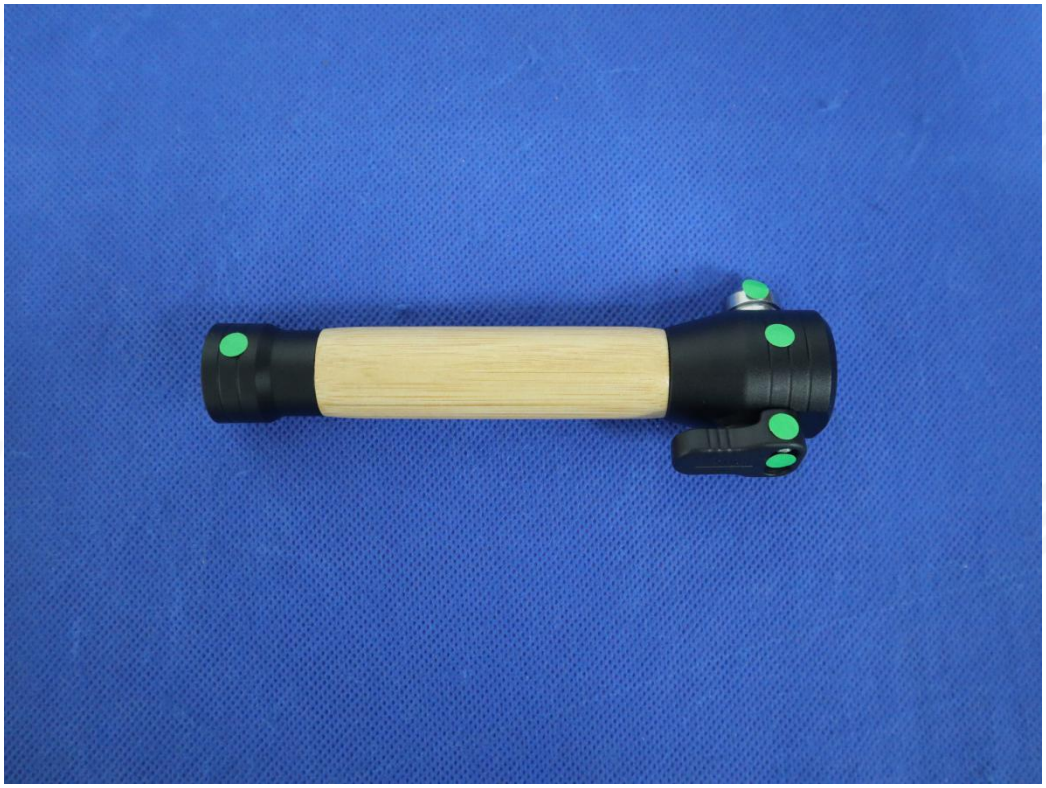
### 4.3.4 TEST RESULTS

| | | | |
|---|---|---|---|
| Temperature: | 24.1℃ | Relative Humidity: | 50% |
| Test Date: | 2025.08.01 | Test Mode: | Mode 1 |
| Test Voltage: | DC 3V from battery | | |

| Discharge Level | Polarity | Test Points | Contact Discharge | Air Discharge | Criterion | Test Result |
|---|---|---|---|---|---|---|
| 4 | +/- | VCP/HCP | Note | N/A | B | A |
| 4 | +/- | Green Dot | Note | N/A | B | A |

Note: The EUT function was correct during the test
Red Dot —Air Discharged
Green Dot —Contact Discharged

## The Photo for Discharge Points of EUT



## 4.4 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

### 4.4.1 TEST SPECIFICATION

| | |
|---|---|
| Basic Standard: | IEC/EN 61000-4-3 |
| Required Performance: | A |
| Frequency Range: | 80 MHz - 1000 MHz |
| Field Strength: | 3 V/m |
| Modulation: | 1kHz Sine Wave, 80%, AM Modulation |
| Frequency Step: | 1 % of fundamental |
| Polarity of Antenna: | Horizontal and Vertical |
| Test Distance: | 3 m |
| Antenna Height: | 1.5 m |
| Dwell Time: | at least 3 seconds |

### 4.4.2 TEST PROCEDURE

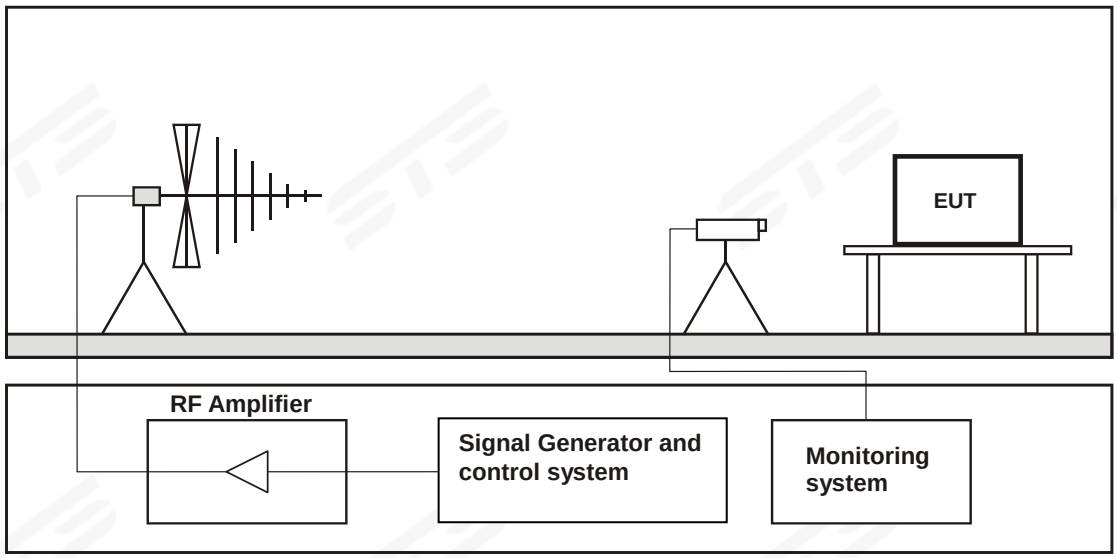
a) The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

b) The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sine-wave. The rate of sweep did not exceed 3s, where the frequency range is swept incrementally, the step size was 1% of preceding frequency value.

c) The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

e) The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

### 4.4.3 TEST SETUP




Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

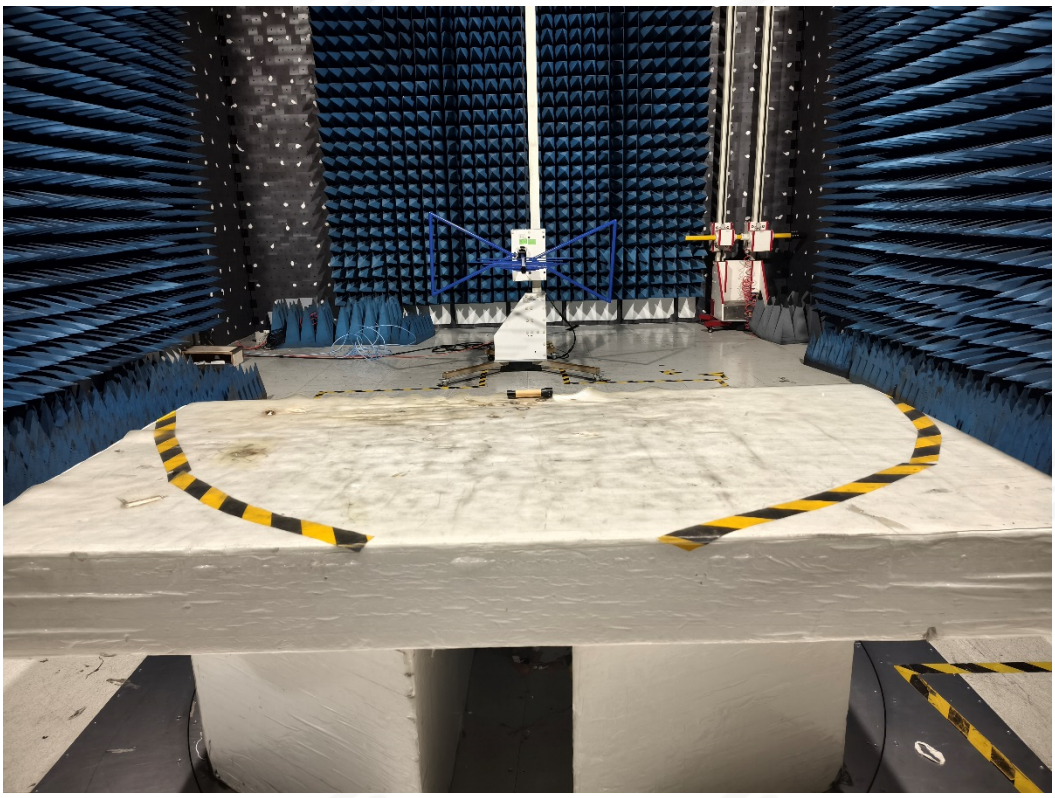
### 4.4.4 TEST RESULTS

| | | | |
|---|---|---|---|
| Temperature: | 24.1℃ | Relative Humidity: | 50% |
| Test Date: | 2025.08.01 | Test Mode: | Mode 1 |
| Test Voltage: | DC 3V from battery | | |

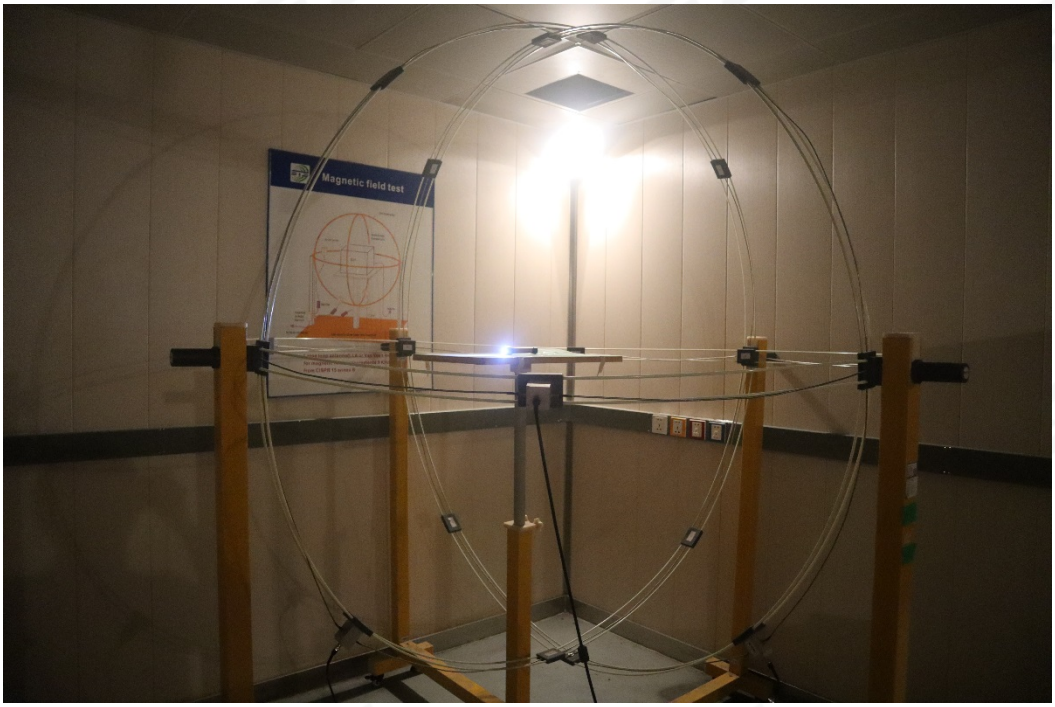
| Frequency Range (MHz) | RF Field Position | R.F. Field Strength | Azimuth | Perform. Criteria | Results | Judgment |
|---|---|---|---|---|---|---|
| 80MHz - 1000MHz | H / V | 3 V/m (rms) AM Modulated 1000Hz, 80% | Front | A | A | PASS |
| | | | Rear | | | |
| | | | Left | | | |
| | | | Right | | | |

# APPENDIX 1-PHOTO TEST OF EUT

RE (30 - 1000 MHz )

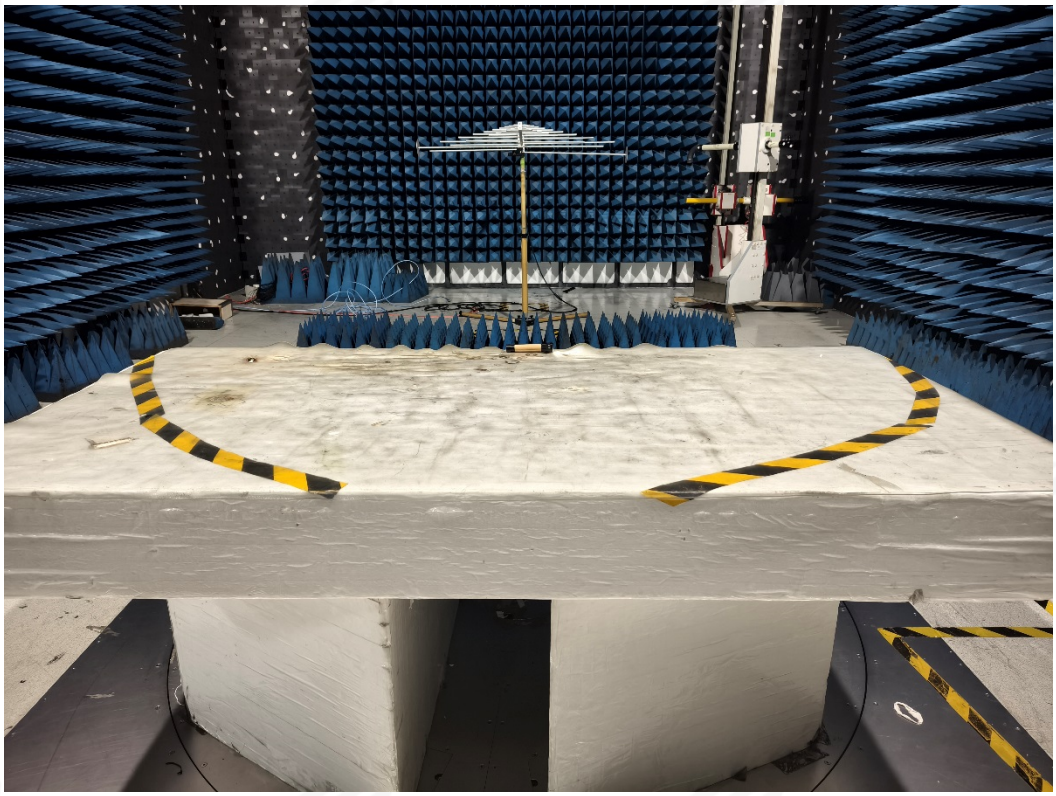


LOOP



ESD

RS (80 - 1000 MHz)



※※※※※END OF THE REPORT※※※※※