# *TEST REPORT*

| | |
|---|---|
| **Application No.:** | KSEM2409002315AT |
| **Name of Testing Laboratory preparing the Report:** | Compliance Certification Services (Kunshan) Inc. |
| **Address of Testing Laboratory preparing the Report:** | No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China. |
| **Applicant:** | Zhejiang Huaxiao Technology Co. Ltd. |
| **Address of Applicant:** | 1-3/F,Building A2,No.28 Dongqiao Road,Dongzhou Street,Fuyang District,Hangzhou,Zhejiang,China |
| **Manufacturer:** | Zhejiang Huaxiao Technology Co. Ltd. |
| **Address of Manufacturer:** | 1-3/F,Building A2,No.28 Dongqiao Road,Dongzhou Street,Fuyang District,Hangzhou,Zhejiang,China |
| **Equipment Under Test (EUT):** | |
| **EUT Name:** | Beam Detector |
| **Model No.:** | DHI-HY-BD1 |
| **Trade Mark:** | alhua TECHNOLOGY |
| **Standard(s) :** | EN IEC 61000-6-3: 2021<br>EN 50130-4: 2011 +A1:2014 |
| **Date of Receipt:** | 2024-09-06 |
| **Date of Test:** | 2024-09-24 to 2024-10-11 |
| **Date of Issue:** | 2024-10-16 |
| **Test Result:** | **Pass*** |

* In the configuration tested, the EUT complied with the standards specified above.

| Revision Record | | | |
|---|---|---|---|
| ***Version*** | **Description** | ***Date*** | ***Remark*** |
| 00 | Original | 2024-10-16 | / |
| | | | |
| | | | |

| | | | | |
|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| **Tested By** | |  | | |
| | | **Kun_Gu/Project Engineer** | | |
| **Approved By** | |  | | |
| | | **Terry Hou /Reviewer** | | |

# 2 Test Summary

| Emission Part | | | | |
|---|---|---|---|---|
| **Item** | **Standard** | **Method** | **Requirement** | **Result** |
| Conducted Emissions at AC Mains Power Port (150kHz-30MHz) | EN IEC 61000-6-3: 2021 | CISPR 16-2-1: 2014+A1:2017 | Table 4.3 | Pass |
| Radiated Emissions (30MHz-1GHz) | | CISPR 16-2-3: 2016 | Table 3.1 | Pass |
| Radiated Emissions (Above 1GHz) | | CISPR 16-2-3: 2016 | Table 3.4 | Pass |
| Harmonic Current Emission | | EN IEC 61000-3-2: 2019+A1:2021 | Class A | Pass |
| Voltage Fluctuations and Flicker | | EN 61000-3-3:2013+A1:2019+A2:2021 | Clause 5 | Pass |

| Immunity Part | | | | |
|---|---|---|---|---|
| **Item** | **Standard** | **Method** | **Requirement** | **Result** |
| Electrostatic Discharge | EN 50130-4: 2011 +A1:2014 | EN 61000-4-2:2009 | 6kV Contact Discharge, 2,4,8kV Air Discharge | Pass |
| Radiated Immunity(80MHz-2.7GHz) | | EN IEC 61000-4-3: 2020 | 10V/m, 80%, 1kHz sinusoidal Amp. Mod. | Pass |
| Electrical Fast Transients & Burst at AC Power Port | | EN 61000-4-4:2012 | 2kV, 5/50ns Tr/Td, 100kHz Repetition Frequency | Pass |
| Electrical Fast Transients & Burst at Signal Port | | EN 61000-4-4:2012 | 1kV, 5/50ns Tr/Td, 100kHz Repetition Frequency | Pass |
| Surge at AC Power Port | | EN 61000-4-5:2014 +A1:2017 | 1.2/50μs Tr/Td, 0.5,1kV Line to Line, 0.5,1,2kV Line to Ground | Pass |
| Conducted Immunity at Power Port (150kHz-100MHz) | | EN 61000-4-6:2014 | 10Vrms (emf),80%,1kHz sinusoidal Amp. Mod. | Pass |
| Conducted Immunity at Signal Port (150kHz-100MHz) | | EN 61000-4-6:2014 | 10Vrms (emf),80%,1kHz sinusoidal Amp. Mod | Pass |
| Mains Supply Voltage Variations | | EN 50130-4:2011+A1:2014 | Unom+10%, Unom-15% | Pass |
| Voltage Dips and Interruptions | | EN IEC 61000-4-11:2020 | 80 % UT for 250per, 70 % UT for 25per, 40 % UT for 10per, 0 % UT for 250per | Pass |

# 3 Contents

# 4 General Information

## 4.1 Details of E.U.T.

| | |
|---|---|
| Power supply: | DC24V by Adapter.<br>Test Voltage:AC230V/50Hz |

## 4.2 Description of Support Units

| Description | Manufacturer | Model No. | Serial No. |
|---|---|---|---|
| DC24V Adapter | Gongjin | S18B73-240A150-0K | / |
| Multimeter | / | / | / |

## 4.3 Measurement Uncertainty & Decision Rule

**Measurement Uncertainty:**

| No. | Item | Measurement Uncertainty ($U_{LAB}$) * | $U_{CISPR}$ |
|---|---|---|---|
| 1 | Conducted Emission at mains port using AMN | 2.4dB (9kHz to 150kHz) | 3.8dB (9kHz to 150kHz) |
| | | 2.2dB (150kHz to 30MHz) | 3.4dB (150kHz to 30MHz) |
| 2 | Conducted Emission at telecommunication port using AAN | 4.0 dB (150kHz to 30MHz) | 5.0dB (150kHz to 30MHz) |
| 3 | Radiated Power | 3.2dB | 4.5dB (30MHz to 300MHz) |
| 4 | Radiated Emission (10m) | 4.1 dB | 6.3dB (30MHz-1GHz) |
| 5 | Radiated Emission (3m) | 4.6 dB (30MHz-1GHz) | 6.3dB (30MHz-1GHz) |
| | | 5.0dB (1GHz-6GHz) | 5.2dB (1GHz-6GHz) |
| | | 5.2dB (6GHz-18GHz) | 5.5dB (6GHz-18GHz) |
| | | 5.3dB (18GHz-40GHz) | N/A |

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

**Decision Rule:**

• CISPR 16-4-2 for emission measurements is as below described.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

$U_{LAB}$ less than $U_{CISPR}$, therefore:

– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit.

– non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

• For immunity testing no decision rule is applicable.

## 4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

1.SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).

2.SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).

3. Sample source: sent by customer.

## 4.5 Test Facility

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

**• A2LA**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

**• FCC**

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

**• ISED**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

**• VCCI**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

## 4.6 Deviation from Standards

None

## 4.7 Abnormalities from Standard Conditions

None

# 5 Equipment List

| Conducted Emissions at AC Mains Power Port (150kHz-30MHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| EMI TEST RECEIVER | R&S | ESCI | KS301101 | 03/19/2024 | 03/18/2025 |
| TWO-LINE V-NETWORK | R&S | ENV216 | KS301197 | 01/15/2024 | 01/14/2025 |
| V (V-LISN) | SCHWARZBECK | NNLK 8129 | KS301091 | 01/15/2024 | 01/14/2025 |
| Pulse LIMITER | R&S | ESH3-Z2 | KUS1902E001 | 01/15/2024 | 01/14/2025 |
| Software | Faratronic | EZ_EMC-v 3A1 | N/A | N/A | N/A |

| Radiated Emissions (30MHz-1GHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| EMI Test Receiver | R&S | ESCI | KS301196 | 08/01/2024 | 07/31/2025 |
| Antenna | TESEQ | CBL 6112D | KUS1806E006 | 03/23/2024 | 03/22/2025 |
| Software | Faratronic | EZ_EMC v 3A1 | N/A | N/A | N/A |

| Radiated Emissions (Above 1GHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| Spectrum Analyzer | R&S | FSU26 | KS301206 | 03/19/2024 | 03/18/2025 |
| Preamplifier | PANSHAN TECHNOLOGY | LNA:1~18G | KSEM010-2 | 01/15/2024 | 01/14/2025 |
| Horn-antenna | SCHWARZBECK | BBHA9120D | KS301079 | 03/19/2024 | 03/18/2025 |
| Software | Faratronic | EZ_EMC-v 3A1 | N/A | N/A | N/A |

| Harmonic Current Emission | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| Harmonic & Flicker Tester | SCHAFFNER | CCN 1000-1 | KS301033 | 08/06/2024 | 08/05/2025 |
| AC Power Source | SCHAFFNER | NSG 1007 | KS301087 | 08/01/2024 | 07/31/2025 |
| Software | TESEQ | CTS4-v 4.24.0 | N/A | N/A | N/A |
| Harmonic/Flicker Analyzer | KIKUSUI | KHA3000 | KUS2009M002-1 | 03/19/2024 | 03/18/2025 |
| Line Impedance Network | KIKUSUI | SPEC71116 | KUS2009M002-1 | 03/19/2024 | 03/18/2025 |
| Switcher | KIKUSUI | SPEC71092 | KUS2009M002-2 | 03/19/2024 | 03/18/2025 |
| AC Power Supply(Master) | KIKUSUI | PCR24000WE2 | KUS2009M002-3 | 03/19/2024 | 03/18/2025 |
| AC Power Supply(Slave) | KIKUSUI | PCR24000WE2 | KUS2009M002-4 | 03/19/2024 | 03/18/2025 |
| Software | KIKUSUI | HarmoCapture 3-vv 2.5.2.00 | N/A | N/A | N/A |

| Voltage Fluctuations and Flicker | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| Harmonic & Flicker Tester | SCHAFFNER | CCN 1000-1 | KS301033 | 08/06/2024 | 08/05/2025 |
| AC Power Source | SCHAFFNER | NSG 1007 | KS301087 | 08/01/2024 | 07/31/2025 |
| Software | TESEQ | CTS4-v 4.24.0 | N/A | N/A | N/A |
| Harmonic/Flicker Analyzer | KIKUSUI | KHA3000 | KUS2009M002-1 | 03/19/2024 | 03/18/2025 |
| Line Impedance Network | KIKUSUI | SPEC71116 | KUS2009M002-1 | 03/19/2024 | 03/18/2025 |
| Switcher | KIKUSUI | SPEC71092 | KUS2009M002-2 | 03/19/2024 | 03/18/2025 |
| AC Power Supply(Master) | KIKUSUI | PCR24000WE2 | KUS2009M002-3 | 03/19/2024 | 03/18/2025 |
| AC Power Supply(Slave) | KIKUSUI | PCR24000WE2 | KUS2009M002-4 | 03/19/2024 | 03/18/2025 |
| Software | KIKUSUI | HarmoCapture 3-vv 2.5.2.00 | N/A | N/A | N/A |

| Electrostatic Discharge | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| ESD Simulator | EM TEST | DITO 509030 | KS301147 | 01/15/2024 | 01/14/2025 |

| Radiated Immunity(80MHz-2.7GHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| Synthesized Signal Generator | AGILENT | 83732B | KS301183 | 01/15/2024 | 01/14/2025 |
| Laser probe interface | AR Worldwide | FI7000 | KS301193-2 | 03/19/2024 | 03/18/2025 |
| E-Field Sensor | AR Worldwide | FL7006 100K-6G | KS301193-1 | 03/23/2024 | 03/22/2025 |
| Amplifier Research (80~1000MHz 150w) | AR Worldwide | 150W1000M1 | KS301139 | 08/01/2024 | 07/31/2025 |
| Amplifier Research (1~6GHz 50w) | AR Worldwide | 50S1G6M1 | KS301231 | N.C.R | N.C.R |
| Dual Directional Coupler (1-11G) | AR Worldwide | C1-A47NFNF 35dB | KS301193-5 | N.C.R | N.C.R |
| Dual Directional Coupler (80~1000MHz 400w) | AR Worldwide | DC6180 | KS301193-6 | N.C.R | N.C.R |
| RF POWER METER | BOONTON | 4232A-01 | KS301022 | 03/19/2024 | 03/18/2025 |
| POWER SENSOR | BOONTON | 51085 | H3010235-1 | 03/19/2024 | 03/18/2025 |
| POWER SENSOR | BOONTON | 51085 | H3010235-2 | 03/19/2024 | 03/18/2025 |
| Antenna | AR Worldwide | TP1000A | CZ301029 | N.C.R | N.C.R |
| Software | AR | emc ware-v 3.2.0.4 | N/A | N/A | N/A |

| Electrical Fast Transients & Burst at AC Power Port | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| EMC Immunity Tester | EMC PARTNER | Transient2000 | KS301188-1 | 08/01/2024 | 07/31/2025 |
| Coupling Network | EMC PARTNER | CN-EFT1000 | KS301188-3 | 08/01/2024 | 07/31/2025 |
| Burst Generator | SANKI | EFT-0404S | KUS2009M002-7 | 08/02/2024 | 08/01/2025 |
| Coupling and Decoupling Network | SANKI | CDN-4350 | KUS2009M002-8 | 08/12/2024 | 08/11/2025 |

| Electrical Fast Transients & Burst at Signal Port | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| EMC Immunity Tester | EMC PARTNER | Transient2000 | KS301188-1 | 08/01/2024 | 07/31/2025 |
| Coupling Network | EMC PARTNER | CN-EFT1000 | KS301188-3 | 08/01/2024 | 07/31/2025 |
| Burst Generator | SANKI | EFT-0404S | KUS2009M002-7 | 08/02/2024 | 08/01/2025 |
| Coupling and Decoupling Network | SANKI | CDN-4350 | KUS2009M002-8 | 08/12/2024 | 08/11/2025 |

| Surge at AC Power Port | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| EMC Immunity Tester | EMC PARTNER | TRA2006 | KS301188-1 | 08/01/2024 | 07/31/2025 |
| Coupling and Decoupling Network | EMC PARTNER | CDN-UTP8 | KS301188-2 | 08/01/2024 | 07/31/2025 |
| Surge Generator | SANKI | LSG-0506S | KUS2009M002-5 | 08/02/2024 | 08/01/2025 |
| Coupling and Decoupling Network | SANKI | CDN-5350 | KUS2009M002-6 | 08/12/2024 | 08/11/2025 |

| Conducted Immunity at Power Port (150kHz-100MHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| Test System for Conducted and Radiated Immunity | TESEQ | NSG 4070B | KSZ201705E003 | 01/15/2024 | 01/14/2025 |
| Amplifier | TESEQ | SCCXE75 | KSZ201705E004 | 01/15/2024 | 01/14/2025 |
| EM-Koppelzange | SCHAFFNER | KEMZ 801 | CZ301002 | 01/15/2024 | 01/14/2025 |
| Attenuator | EURO MC | 7860 ORGEVAL | CZ301084 | 03/19/2024 | 03/18/2025 |
| Directional Coupler | HIGH POWER | C21A8 | CZ750021 | 08/01/2024 | 07/31/2025 |
| CDN（Coupling and Decoupling Network) | SCHAFFNER | CDN M216 | CZ301085 | 03/19/2024 | 03/18/2025 |
| CDN（Coupling and | SCHAFFNER | CDN M316 | CZ301025 | 03/19/2024 | 03/18/2025 |

| | | | | | |
|---|---|---|---|---|---|
| Decoupling Network) | | | | | |
| CDN（Coupling and Decoupling Network) | TESEQ | CDN S751 | KS301184-2 | 03/19/2024 | 03/18/2025 |
| CDN（Coupling and Decoupling Network) | TESEQ | CDN M116 | KS301184-1 | 03/19/2024 | 03/18/2025 |
| CDN | TESEQ | CDN T2-10S | KS301286 | 03/19/2024 | 03/18/2025 |
| CDN | TESEQ | CDN T4-10S | KS301287 | 03/19/2024 | 03/18/2025 |
| CDN | 3Ctest | CDNRJ45 | KS301288 | 08/01/2024 | 07/31/2025 |
| Current Clamp | TESEQ | IP-DR250 | KS201703E001 | 01/15/2024 | 01/14/2025 |
| CDN | TESEQ | CDN M432 | KUS2003M001-1 | 01/15/2024 | 01/14/2025 |
| CDN | TESEQ | CDN M432-3LN | KUS2003M001-2 | 01/15/2024 | 01/14/2025 |
| CDN | TESEQ | CDN M532 | KUS2003M001-3 | 01/15/2024 | 01/14/2025 |
| CDN | TESEQ | CDN M232 | KSZ201706E001 | 04/13/2024 | 04/12/2025 |
| CDN | TESEQ | CDN M332 | KSZ201706E002 | 03/19/2024 | 03/18/2025 |
| Software | TESEQ | NSG 4070-v 1.3.0.1 | N/A | N/A | N/A |

| **Conducted Immunity at Signal Port (150kHz-100MHz)** | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| Test System for Conducted and Radiated Immunity | TESEQ | NSG 4070B | KSZ201705E003 | 01/15/2024 | 01/14/2025 |
| Amplifier | TESEQ | SCCXE75 | KSZ201705E004 | 01/15/2024 | 01/14/2025 |
| EM-Koppelzange | SCHAFFNER | KEMZ 801 | CZ301002 | 01/15/2024 | 01/14/2025 |
| Attenuator | EURO MC | 7860 ORGEVAL | CZ301084 | 03/19/2024 | 03/18/2025 |
| Directional Coupler | HIGH POWER | C21A8 | CZ750021 | 08/01/2024 | 07/31/2025 |
| CDN（Coupling and Decoupling Network) | SCHAFFNER | CDN M216 | CZ301085 | 03/19/2024 | 03/18/2025 |
| CDN（Coupling and Decoupling Network) | SCHAFFNER | CDN M316 | CZ301025 | 03/19/2024 | 03/18/2025 |
| CDN（Coupling and Decoupling Network) | TESEQ | CDN S751 | KS301184-2 | 03/19/2024 | 03/18/2025 |
| CDN（Coupling and Decoupling Network) | TESEQ | CDN M116 | KS301184-1 | 03/19/2024 | 03/18/2025 |
| CDN | TESEQ | CDN T2-10S | KS301286 | 03/19/2024 | 03/18/2025 |
| CDN | TESEQ | CDN T4-10S | KS301287 | 03/19/2024 | 03/18/2025 |
| CDN | 3Ctest | CDNRJ45 | KS301288 | 08/01/2024 | 07/31/2025 |
| Current Clamp | TESEQ | IP-DR250 | KS201703E001 | 01/15/2024 | 01/14/2025 |
| CDN | TESEQ | CDN M432 | KUS2003M001 | 01/15/2024 | 01/14/2025 |

| | | | | | |
|---|---|---|---|---|---|
| | | | -1 | | |
| CDN | TESEQ | CDN M432-3LN | KUS2003M001-2 | 01/15/2024 | 01/14/2025 |
| CDN | TESEQ | CDN M532 | KUS2003M001-3 | 01/15/2024 | 01/14/2025 |
| CDN | TESEQ | CDN M232 | KSZ201706E001 | 04/13/2024 | 04/12/2025 |
| CDN | TESEQ | CDN M332 | KSZ201706E002 | 03/19/2024 | 03/18/2025 |
| Software | TESEQ | NSG 4070-v 1.3.0.1 | N/A | N/A | N/A |

| **Mains Supply Voltage Variations** | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| EMC Immunity Tester | EMC PARTNER | TRA2006 | KS301188-1 | 08/01/2024 | 07/31/2025 |
| Switcher | KIKUSUI | SPEC71092 | KUS2009M002-2 | 03/19/2024 | 03/18/2025 |
| AC Power Supply(Master) | KIKUSUI | PCR24000WE2 | KUS2009M002-3 | 03/19/2024 | 03/18/2025 |
| AC Power Supply(Slave) | KIKUSUI | PCR24000WE2 | KUS2009M002-4 | 03/19/2024 | 03/18/2025 |
| Software | KIKUSUI | Quick Immunity Sequencer 2-v 4.0.3.02 | N/A | N/A | N/A |

| **Voltage Dips and Interruptions** | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| EMC Immunity Tester | EMC PARTNER | TRA2006 | KS301188-1 | 08/01/2024 | 07/31/2025 |
| Switcher | KIKUSUI | SPEC71092 | KUS2009M002-2 | 03/19/2024 | 03/18/2025 |
| AC Power Supply(Master) | KIKUSUI | PCR24000WE2 | KUS2009M002-3 | 03/19/2024 | 03/18/2025 |
| AC Power Supply(Slave) | KIKUSUI | PCR24000WE2 | KUS2009M002-4 | 03/19/2024 | 03/18/2025 |
| Software | KIKUSUI | Quick Immunity Sequencer 2-v 4.0.3.02 | N/A | N/A | N/A |

| General used equipment | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal Date** | **Cal Due Date** |
| Digital Pressure Meter | Mengde | DYM3 | CZ750023 | 01/15/2024 | 01/14/2025 |
| Temperature & Humidity Recorder | JDRK | RS-WS-N01-6J | KSEM024-1<br>KSEM024-2<br>KSEM024-3<br>KSEM024-6<br>KSEM024-7<br>KSEM024--8<br>KSEM024--9 | 03/19/2024 | 03/18/2025 |

# 6 Emission Test Results

## 6.1 Conducted Emissions at AC Mains Power Port (150kHz-30MHz)

Test Requirement: EN IEC 61000-6-3: 2021

Test Method: CISPR 16-2-1: 2014+A1:2017

Limit:

| | |
|---|---|
| 0.15M-0.5MHz | 66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average |
| 0.5M-5MHz | 56dB(μV) quasi-peak, 46dB(μV) average |
| 5M-30MHz | 60dB(μV) quasi-peak, 50dB(μV) average |
| Detector: | Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz |

### 6.1.1 E.U.T. Operation

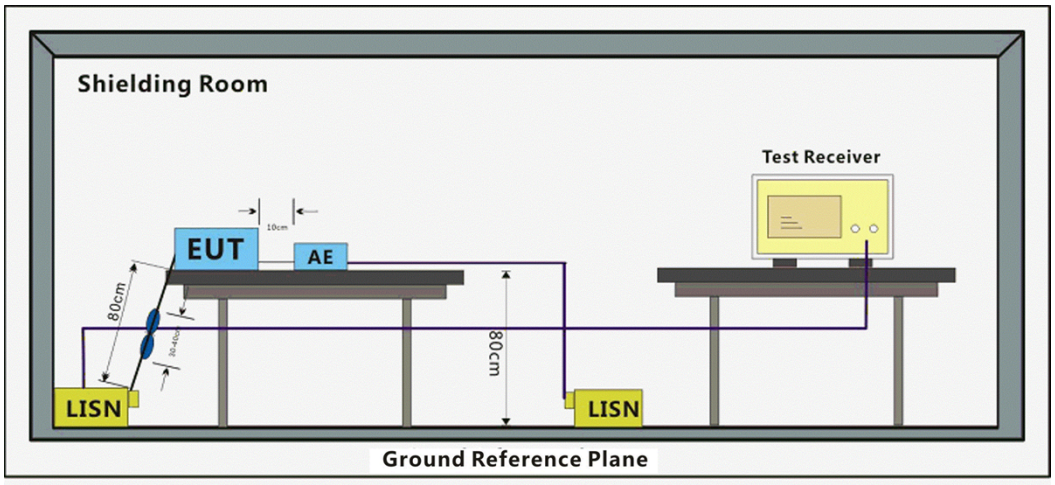
Operating Environment:

Temperature: 25.4 °C Humidity: 55.2 % RH Atmospheric Pressure: 1010 mbar

### 6.1.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 6.1.3 Test Setup Diagram




### 6.1.4 Measurement Procedure and Data

Frequency range: 150KHz-30MHz

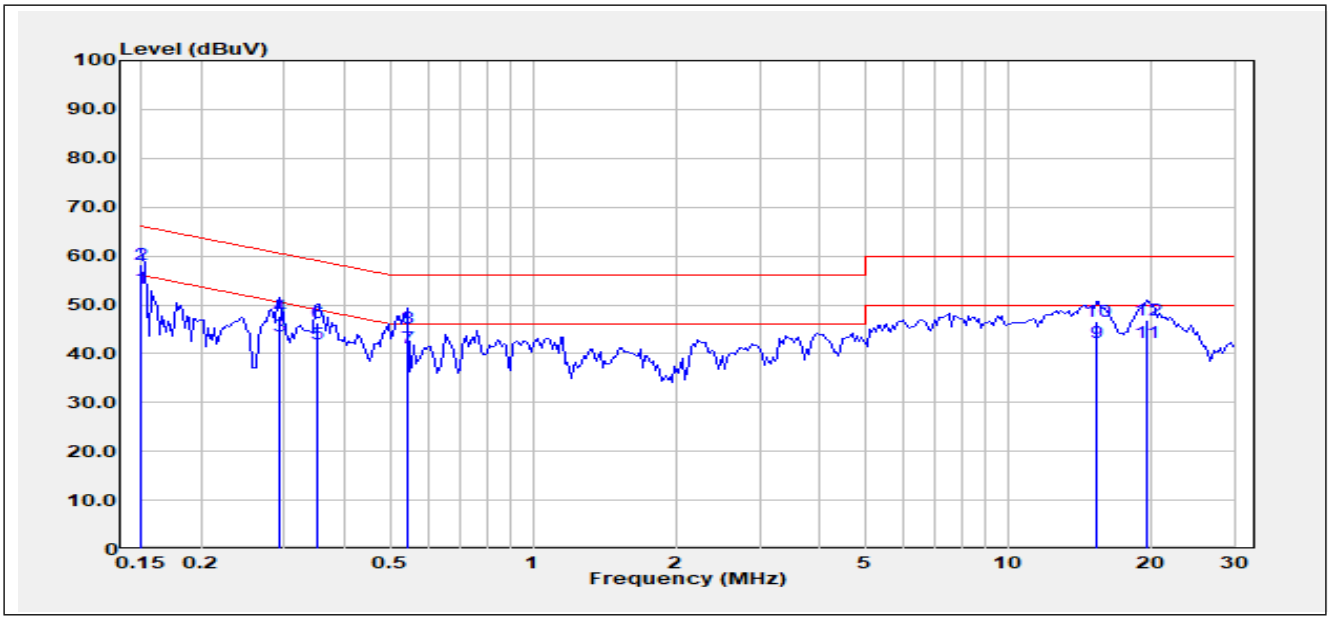
An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

The red line show in graphic is the limit in standard used in this section.

Measured Level = Read level + Cable Loss + LISN Factor

Test Mode: 01; Line: Live line

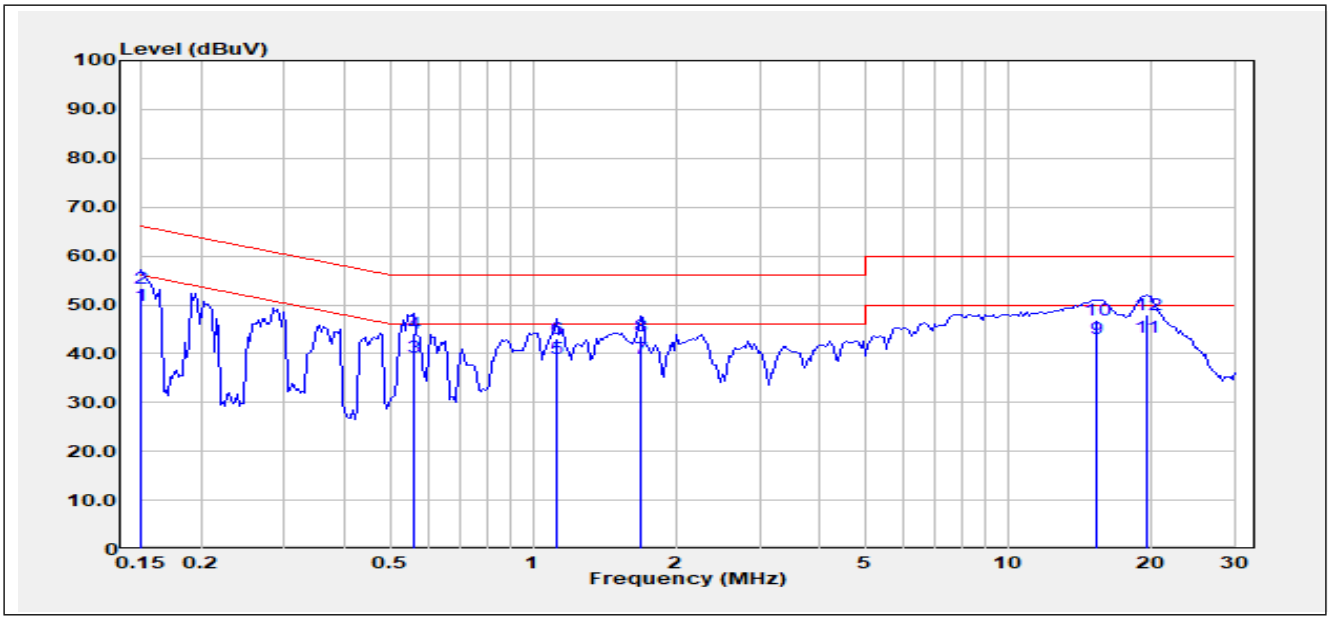
**Test Data :**




| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.1500 | 33.04 | 20.25 | 53.29 | 56.00 | -2.71 | Average |
| 2 | 0.1500 | 38.07 | 20.25 | 58.32 | 66.00 | -7.68 | QP |
| 3 | 0.2924 | 23.51 | 20.08 | 43.59 | 50.46 | -6.87 | Average |
| 4 | 0.2924 | 27.52 | 20.08 | 47.60 | 60.46 | -12.86 | QP |
| 5 | 0.3502 | 21.85 | 20.07 | 41.92 | 48.96 | -7.04 | Average |
| 6 | 0.3502 | 26.20 | 20.07 | 46.27 | 58.96 | -12.69 | QP |
| 7 | 0.5464 | 21.11 | 19.96 | 41.07 | 46.00 | -4.93 | Average |
| 8 | 0.5464 | 25.26 | 19.96 | 45.22 | 56.00 | -10.78 | QP |
| 9 | 15.3880 | 22.64 | 19.74 | 42.38 | 50.00 | -7.62 | Average |
| 10 | 15.3880 | 26.90 | 19.74 | 46.64 | 60.00 | -13.36 | QP |
| 11 | 19.6350 | 22.61 | 19.76 | 42.37 | 50.00 | -7.63 | Average |
| 12 | 19.6350 | 27.23 | 19.76 | 46.99 | 60.00 | -13.01 | QP |

Test Mode: 01; Line: Neutral Line

**Test Data :**




| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.1500 | 29.65 | 20.18 | 49.83 | 56.00 | -6.17 | Average |
| 2 | 0.1500 | 33.13 | 20.18 | 53.31 | 66.00 | -12.69 | QP |
| 3 | 0.5641 | 19.48 | 19.89 | 39.37 | 46.00 | -6.63 | Average |
| 4 | 0.5641 | 24.29 | 19.89 | 44.18 | 56.00 | -11.82 | QP |
| 5 | 1.1230 | 19.17 | 19.91 | 39.08 | 46.00 | -6.92 | Average |
| 6 | 1.1230 | 23.27 | 19.91 | 43.18 | 56.00 | -12.82 | QP |
| 7 | 1.6800 | 19.03 | 19.89 | 38.92 | 46.00 | -7.08 | Average |
| 8 | 1.6800 | 23.77 | 19.89 | 43.66 | 56.00 | -12.34 | QP |
| 9 | 15.3880 | 23.34 | 19.84 | 43.18 | 50.00 | -6.82 | Average |
| 10 | 15.3880 | 27.16 | 19.84 | 47.00 | 60.00 | -13.00 | QP |
| 11 | 19.6350 | 23.46 | 19.82 | 43.28 | 50.00 | -6.72 | Average |
| 12 | 19.6350 | 28.15 | 19.82 | 47.97 | 60.00 | -12.03 | QP |

## 6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN IEC 61000-6-3: 2021
Test Method: CISPR 16-2-3: 2016

Limit:

| | |
|---|---|
| Test Distance: | 10m |
| 30MHz-230MHz | 30 dB(μV/m) quasi-peak |
| 230MHz-1GHz | 37 dB(μV/m) quasi-peak |
| Detector: | Peak for pre-scan (120kHz resolution bandwidth) 30MHz to 1000MHz |
| | |
| Test Distance: | 3m |
| 30MHz-230MHz | 40 dB(μV/m) quasi-peak |
| 230MHz-1GHz | 47 dB(μV/m) quasi-peak |
| Detector: | Peak for pre-scan (120kHz resolution bandwidth) 30MHz to 1000MHz |

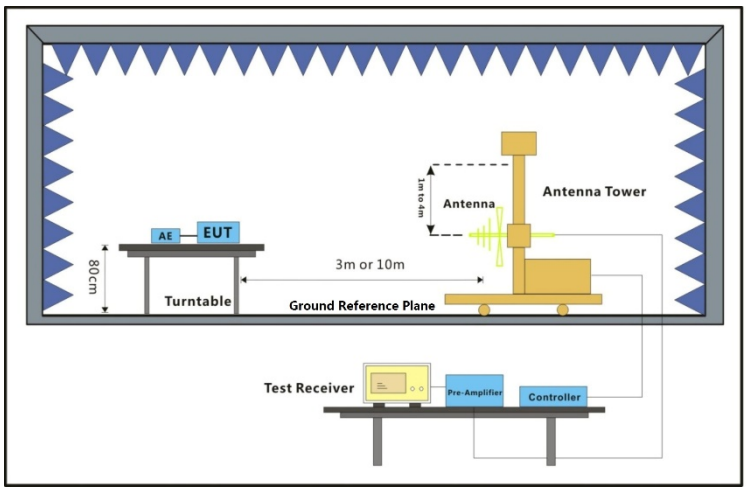
### 6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 25.6 °C Humidity: 42.0 % RH Atmospheric Pressure: 1010 mbar

### 6.2.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 6.2.3 Test Setup Diagram



### 6.2.4 Measurement Procedure and Data

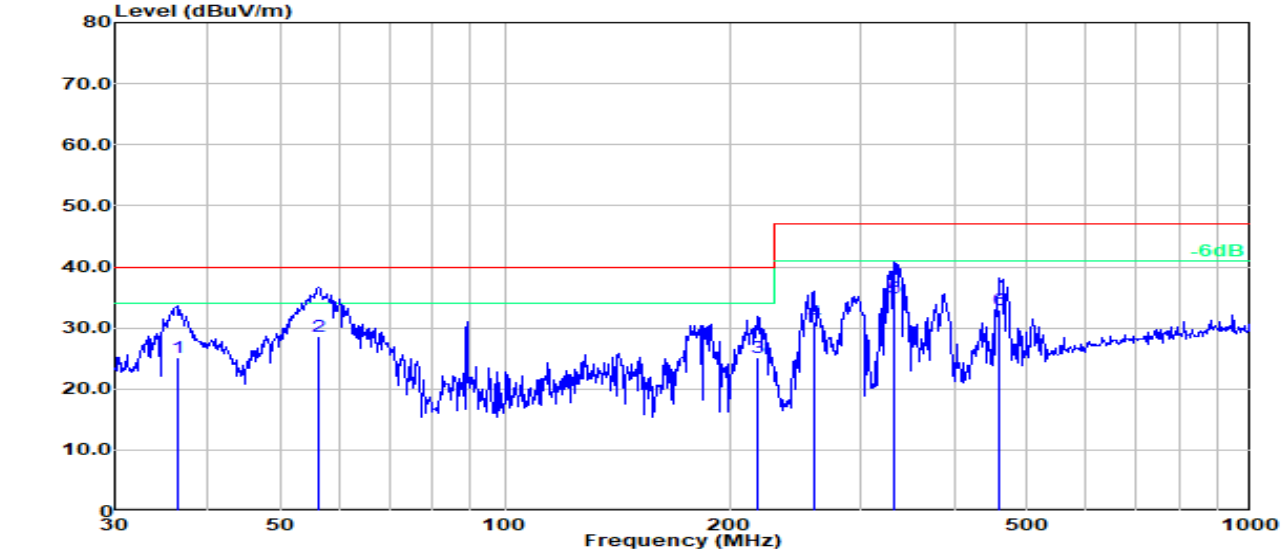
Frequency range: 30MHz-1GHz

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.The red line show in graphic is the limit in standard used in this section.

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Test Mode: 00; Polarity: Horizontal

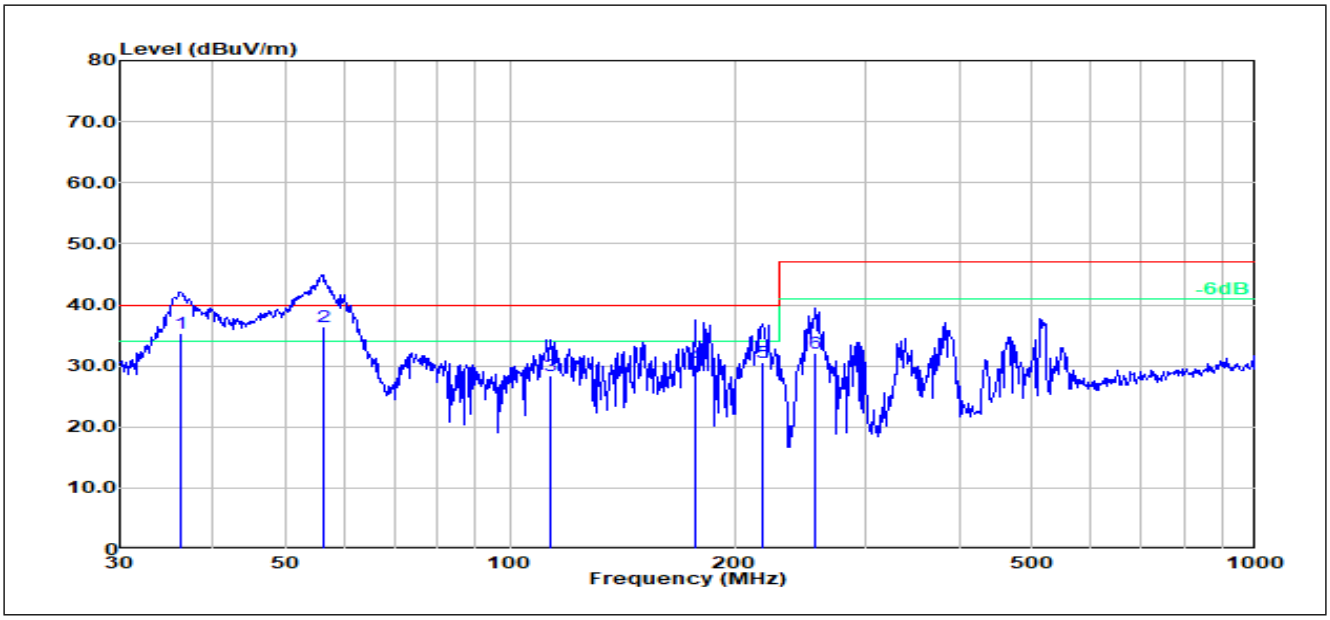
**Test Data :**




| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Height (cm) | Degree (deg.) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 36.3810 | 10.37 | 14.82 | 25.19 | 40.00 | -14.81 | 200 | 266 | QP |
| 2 | 56.1970 | 22.17 | 6.47 | 28.64 | 40.00 | -11.36 | 200 | 319 | QP |
| 3 | 217.5440 | 12.57 | 12.54 | 25.11 | 40.00 | -14.89 | 200 | 105 | QP |
| 4 | 259.2340 | 16.18 | 14.91 | 31.09 | 47.00 | -15.91 | 100 | 360 | QP |
| 5 | 332.5190 | 18.42 | 16.42 | 34.84 | 47.00 | -12.16 | 100 | 360 | QP |
| 6 | 459.1140 | 13.31 | 19.56 | 32.87 | 47.00 | -14.13 | 200 | 296 | QP |

Test Mode: 00; Polarity: Vertical

**Test Data :**




| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 36.2540 | 20.37 | 15.04 | 35.41 | 40.00 | -4.59 | 100 | 0 | QP |
| 2 | 56.1970 | 29.90 | 6.47 | 36.37 | 40.00 | -3.63 | 100 | 289 | QP |
| 3 | 113.3160 | 14.72 | 13.77 | 28.49 | 40.00 | -11.51 | 100 | 128 | QP |
| 4 | 176.8880 | 17.62 | 12.50 | 30.12 | 40.00 | -9.88 | 100 | 203 | QP |
| 5 | 218.3090 | 18.01 | 12.57 | 30.58 | 40.00 | -9.42 | 100 | 212 | QP |
| 6 | 255.6230 | 17.29 | 14.75 | 32.04 | 47.00 | -14.96 | 100 | 184 | QP |

## 6.3 Radiated Emissions (Above 1GHz)

Test Requirement: EN IEC 61000-6-3: 2021
Test Method: CISPR 16-2-3: 2016

Limit:

| Frequency range (MHz) | Radiated emissions limit(dBμV/m) | |
|---|---|---|
| | Peak | Average |
| 1000-3000 | 70 | 50 |
| 3000-6000 | 74 | 54 |

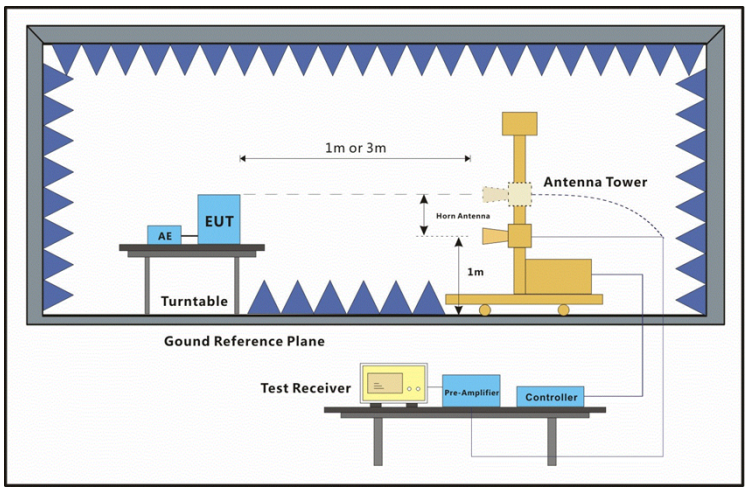
### 6.3.1 E.U.T. Operation

Operating Environment:
Temperature: 25.8 °C Humidity: 55.0 % RH Atmospheric Pressure: 1010 mbar

### 6.3.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 6.3.3 Test Setup Diagram




### 6.3.4 Measurement Procedure and Data

Frequency range: Above 1GHz

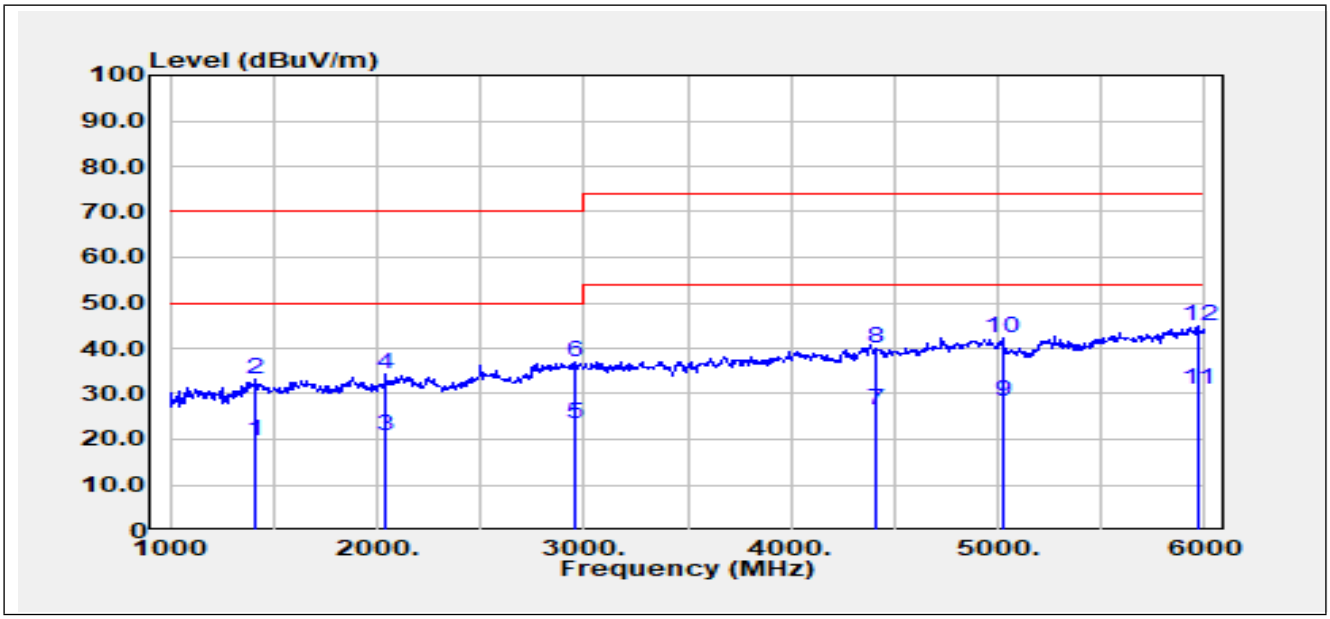
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The red line show in graphic is the limit in standard used in this section.

The EUT was measured by Horn antenna with 2 orthogonal polarities.

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Test Mode: 00; Polarity: Horizontal

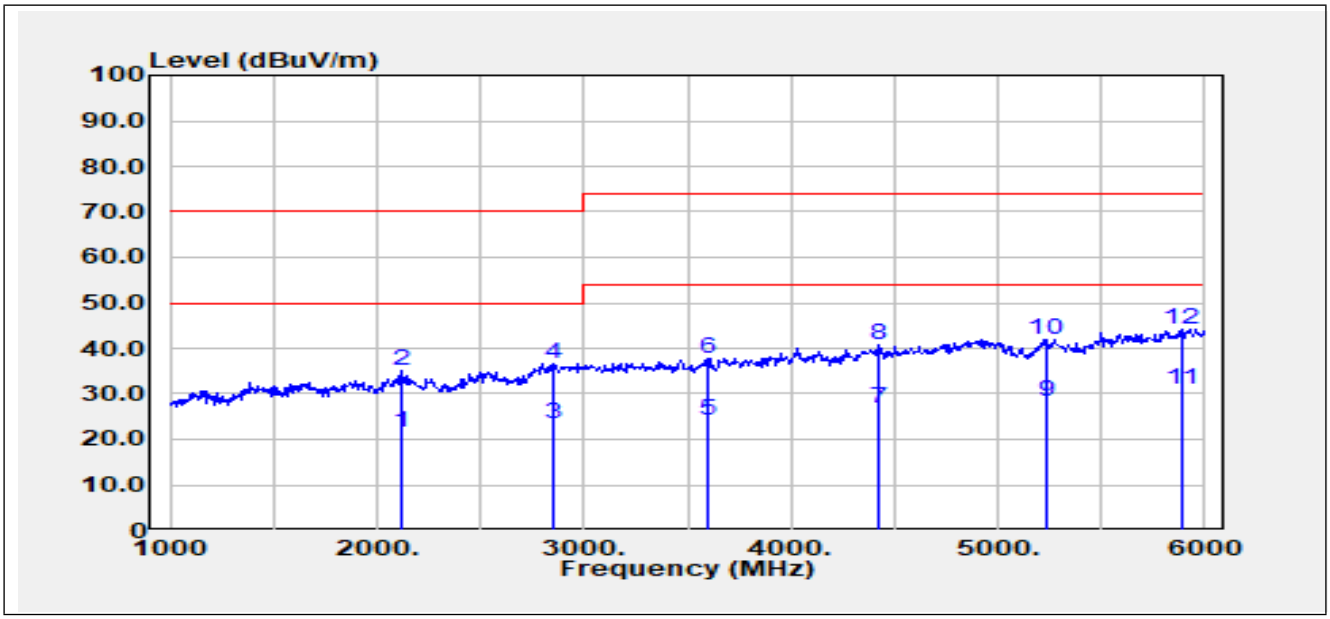
**Test Data :**




| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 1415.0000 | 40.76 | -21.20 | 19.56 | 50.00 | -30.44 | 200 | 349 | Average |
| 2 | 1415.0000 | 54.39 | -21.20 | 33.19 | 70.00 | -36.81 | 200 | 349 | Peak |
| 3 | 2040.0000 | 40.14 | -19.57 | 20.57 | 50.00 | -29.43 | 100 | 130 | Average |
| 4 | 2040.0000 | 53.92 | -19.57 | 34.35 | 70.00 | -35.65 | 100 | 130 | Peak |
| 5 | 2955.0000 | 39.31 | -15.86 | 23.45 | 50.00 | -26.55 | 100 | 66 | Average |
| 6 | 2955.0000 | 52.83 | -15.86 | 36.97 | 70.00 | -33.03 | 100 | 66 | Peak |
| 7 | 4415.0000 | 38.56 | -12.22 | 26.34 | 54.00 | -27.66 | 100 | 231 | Average |
| 8 | 4415.0000 | 52.39 | -12.22 | 40.17 | 74.00 | -33.83 | 100 | 231 | Peak |
| 9 | 5020.0000 | 38.91 | -10.45 | 28.46 | 54.00 | -25.54 | 100 | 0 | Average |
| 10 | 5020.0000 | 52.67 | -10.45 | 42.22 | 74.00 | -31.78 | 100 | 0 | Peak |
| 11 | 5965.0000 | 37.80 | -6.88 | 30.92 | 54.00 | -23.08 | 200 | 203 | Average |
| 12 | 5965.0000 | 51.77 | -6.88 | 44.89 | 74.00 | -29.11 | 200 | 203 | Peak |

Test Mode: 00; Polarity: Vertical

**Test Data :**




| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 2115.0000 | 40.86 | -19.20 | 21.66 | 50.00 | -28.34 | 100 | 235 | Average |
| 2 | 2115.0000 | 54.15 | -19.20 | 34.95 | 70.00 | -35.05 | 100 | 235 | Peak |
| 3 | 2850.0000 | 39.51 | -16.19 | 23.32 | 50.00 | -26.68 | 200 | 11 | Average |
| 4 | 2850.0000 | 52.98 | -16.19 | 36.79 | 70.00 | -33.21 | 200 | 11 | Peak |
| 5 | 3600.0000 | 38.98 | -14.74 | 24.24 | 54.00 | -29.76 | 100 | 138 | Average |
| 6 | 3600.0000 | 52.49 | -14.74 | 37.75 | 74.00 | -36.25 | 100 | 138 | Peak |
| 7 | 4420.0000 | 39.17 | -12.20 | 26.97 | 54.00 | -27.03 | 100 | 111 | Average |
| 8 | 4420.0000 | 52.86 | -12.20 | 40.66 | 74.00 | -33.34 | 100 | 111 | Peak |
| 9 | 5230.0000 | 38.19 | -9.73 | 28.46 | 54.00 | -25.54 | 200 | 189 | Average |
| 10 | 5230.0000 | 51.72 | -9.73 | 41.99 | 74.00 | -32.01 | 200 | 189 | Peak |
| 11 | 5885.0000 | 38.25 | -7.21 | 31.04 | 54.00 | -22.96 | 100 | 281 | Average |
| 12 | 5885.0000 | 51.53 | -7.21 | 44.32 | 74.00 | -29.68 | 100 | 281 | Peak |

## 6.4 Harmonic Current Emission

Test Requirement: EN IEC 61000-6-3: 2021
Test Method: EN IEC 61000-3-2: 2019+A1:2021

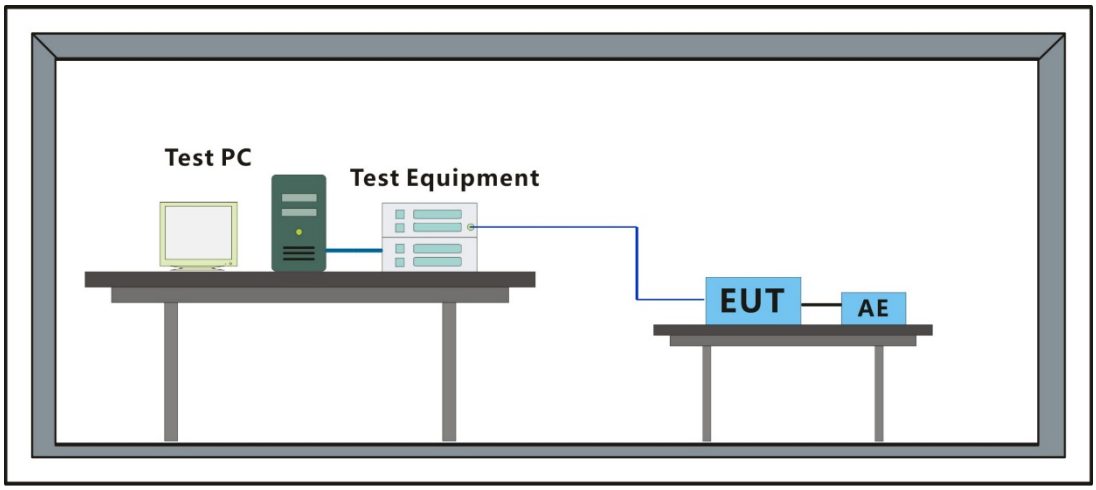
### 6.4.1 E.U.T. Operation

Operating Environment:
Temperature: 24.9 °C Humidity: 51.6 % RH Atmospheric Pressure: 1010 mbar

### 6.4.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 6.4.3 Test Setup Diagram




### 6.4.4 Measurement Procedure and Data

Frequency Range: 100Hz to 2kHz

**Test Result: Pass** **Source qualification: Normal**
**THC(A): 0.011** **I-THD(%): 200.9** **POHC(A): 0.006** **POHC Limit(A): 0.251**

**Highest parameter values during test:**

| | | | |
|---|---|---|---|
| V_RMS (Volts): | 230.26 | Frequency(Hz): | 50.00 |
| I_Peak (Amps): | 0.203 | I_RMS (Amps): | 0.015 |
| I_Fund (Amps): | 0.005 | Crest Factor: | 14.455 |
| Power (Watts): | 1.2 | Power Factor: | 0.375 |

| Harm# | Harms(avg) | 100%Limit | %of Limit | Harms(max) | 150%Limit | %of Limit | Status |
|---|---|---|---|---|---|---|---|
| 2 | 0.001 | 1.080 | N/A | 0.001 | 1.620 | N/A | Pass |
| 3 | 0.003 | 2.300 | N/A | 0.004 | 3.450 | N/A | Pass |
| 4 | 0.001 | 0.430 | N/A | 0.001 | 0.645 | N/A | Pass |
| 5 | 0.003 | 1.140 | N/A | 0.003 | 1.710 | N/A | Pass |
| 6 | 0.001 | 0.300 | N/A | 0.001 | 0.450 | N/A | Pass |
| 7 | 0.003 | 0.770 | N/A | 0.003 | 1.155 | N/A | Pass |
| 8 | 0.000 | 0.230 | N/A | 0.001 | 0.345 | N/A | Pass |
| 9 | 0.003 | 0.400 | N/A | 0.003 | 0.600 | N/A | Pass |
| 10 | 0.000 | 0.184 | N/A | 0.001 | 0.276 | N/A | Pass |
| 11 | 0.003 | 0.330 | N/A | 0.003 | 0.495 | N/A | Pass |
| 12 | 0.000 | 0.153 | N/A | 0.001 | 0.230 | N/A | Pass |
| 13 | 0.003 | 0.210 | N/A | 0.003 | 0.315 | N/A | Pass |
| 14 | 0.000 | 0.131 | N/A | 0.001 | 0.197 | N/A | Pass |
| 15 | 0.003 | 0.150 | N/A | 0.003 | 0.225 | N/A | Pass |
| 16 | 0.000 | 0.115 | N/A | 0.001 | 0.173 | N/A | Pass |
| 17 | 0.003 | 0.132 | N/A | 0.003 | 0.198 | N/A | Pass |
| 18 | 0.000 | 0.102 | N/A | 0.001 | 0.153 | N/A | Pass |
| 19 | 0.002 | 0.118 | N/A | 0.003 | 0.178 | N/A | Pass |
| 20 | 0.000 | 0.092 | N/A | 0.001 | 0.138 | N/A | Pass |
| 21 | 0.002 | 0.107 | N/A | 0.002 | 0.161 | N/A | Pass |
| 22 | 0.000 | 0.084 | N/A | 0.001 | 0.125 | N/A | Pass |
| 23 | 0.002 | 0.098 | N/A | 0.002 | 0.147 | N/A | Pass |
| 24 | 0.000 | 0.077 | N/A | 0.001 | 0.115 | N/A | Pass |
| 25 | 0.002 | 0.090 | N/A | 0.002 | 0.135 | N/A | Pass |
| 26 | 0.000 | 0.071 | N/A | 0.001 | 0.107 | N/A | Pass |
| 27 | 0.002 | 0.083 | N/A | 0.002 | 0.125 | N/A | Pass |
| 28 | 0.000 | 0.066 | N/A | 0.001 | 0.099 | N/A | Pass |
| 29 | 0.002 | 0.078 | N/A | 0.002 | 0.116 | N/A | Pass |
| 30 | 0.000 | 0.061 | N/A | 0.001 | 0.092 | N/A | Pass |
| 31 | 0.002 | 0.073 | N/A | 0.002 | 0.109 | N/A | Pass |
| 32 | 0.000 | 0.058 | N/A | 0.001 | 0.086 | N/A | Pass |
| 33 | 0.002 | 0.068 | N/A | 0.002 | 0.102 | N/A | Pass |
| 34 | 0.000 | 0.054 | N/A | 0.000 | 0.081 | N/A | Pass |
| 35 | 0.001 | 0.064 | N/A | 0.002 | 0.096 | N/A | Pass |
| 36 | 0.000 | 0.051 | N/A | 0.000 | 0.077 | N/A | Pass |
| 37 | 0.001 | 0.061 | N/A | 0.001 | 0.091 | N/A | Pass |
| 38 | 0.000 | 0.048 | N/A | 0.000 | 0.073 | N/A | Pass |
| 39 | 0.001 | 0.058 | N/A | 0.001 | 0.087 | N/A | Pass |
| 40 | 0.000 | 0.046 | N/A | 0.000 | 0.069 | N/A | Pass |

| Harm# | Harmonics V-rms | Limit V-rms | % of Limit | Status |
|---|---|---|---|---|
| 2 | 0.170 | 0.460 | 36.93 | OK |
| 3 | 0.454 | 2.072 | 21.91 | OK |
| 4 | 0.062 | 0.460 | 13.49 | OK |
| 5 | 0.041 | 0.921 | 4.44 | OK |
| 6 | 0.045 | 0.461 | 9.88 | OK |
| 7 | 0.041 | 0.691 | 5.99 | OK |
| 8 | 0.027 | 0.460 | 5.97 | OK |
| 9 | 0.028 | 0.460 | 6.14 | OK |
| 10 | 0.019 | 0.461 | 4.15 | OK |
| 11 | 0.016 | 0.230 | 6.78 | OK |
| 12 | 0.017 | 0.230 | 7.51 | OK |
| 13 | 0.016 | 0.230 | 7.16 | OK |
| 14 | 0.012 | 0.230 | 5.31 | OK |
| 15 | 0.012 | 0.230 | 5.26 | OK |
| 16 | 0.013 | 0.230 | 5.67 | OK |
| 17 | 0.013 | 0.230 | 5.57 | OK |
| 18 | 0.014 | 0.230 | 6.05 | OK |
| 19 | 0.009 | 0.230 | 3.78 | OK |
| 20 | 0.010 | 0.230 | 4.31 | OK |
| 21 | 0.013 | 0.230 | 5.73 | OK |
| 22 | 0.007 | 0.230 | 2.85 | OK |
| 23 | 0.008 | 0.230 | 3.68 | OK |
| 24 | 0.006 | 0.230 | 2.43 | OK |
| 25 | 0.009 | 0.230 | 4.07 | OK |
| 26 | 0.009 | 0.230 | 4.04 | OK |
| 27 | 0.007 | 0.230 | 2.87 | OK |
| 28 | 0.008 | 0.230 | 3.55 | OK |
| 29 | 0.008 | 0.230 | 3.41 | OK |
| 30 | 0.006 | 0.230 | 2.45 | OK |
| 31 | 0.005 | 0.230 | 2.08 | OK |
| 32 | 0.006 | 0.230 | 2.45 | OK |
| 33 | 0.007 | 0.230 | 2.99 | OK |
| 34 | 0.003 | 0.230 | 1.20 | OK |
| 35 | 0.004 | 0.230 | 1.82 | OK |
| 36 | 0.003 | 0.230 | 1.45 | OK |
| 37 | 0.005 | 0.230 | 2.25 | OK |
| 38 | 0.003 | 0.230 | 1.11 | OK |
| 39 | 0.003 | 0.230 | 1.37 | OK |
| 40 | 0.005 | 0.230 | 2.00 | OK |

## 6.5 Voltage Fluctuations and Flicker

Test Requirement: EN IEC 61000-6-3: 2021
Test Method: EN 61000-3-3:2013+A1:2019+A2:2021

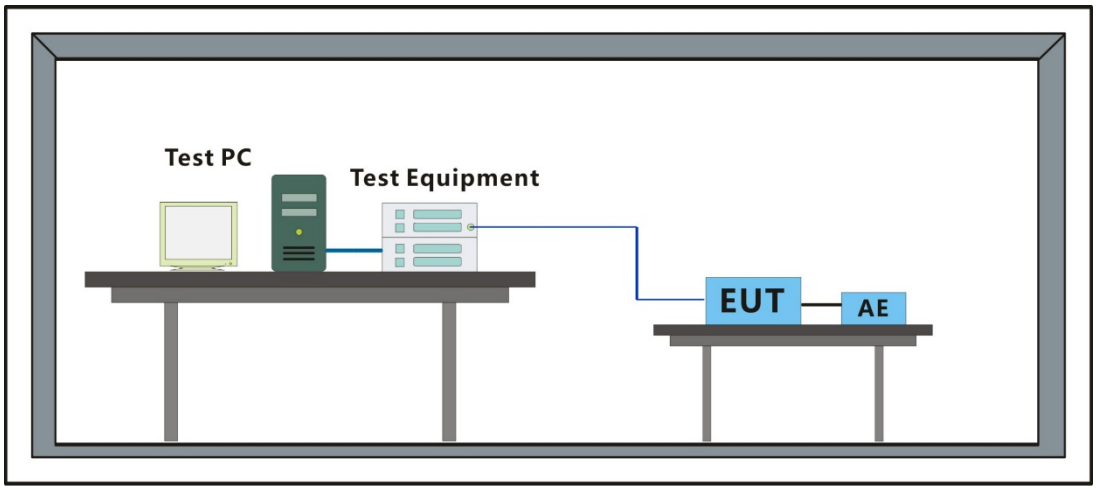
### 6.5.1 E.U.T. Operation

Operating Environment:
Temperature: 25.0 °C Humidity: 52.1 % RH Atmospheric Pressure: 1010 mbar

### 6.5.2 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 6.5.3 Test Setup Diagram




### 6.5.4 Measurement Procedure and Data

**Parameter values recorded during the test:**

| | | | | |
|---|---|---|---|---|
| Vrms at the end of test (Volt): | 230.22 | | | |
| Highest dt (%): | | Test limit (%): | | |
| T-max (mS): | 0 | Test limit (mS): | 500.0 | Pass |
| Highest dc (%): | 0.00 | Test limit (%): | 3.30 | Pass |
| Highest dmax (%): | 0.00 | Test limit (%): | 4.00 | Pass |
| Highest Pst (10 min. period): | 0.273 | Test limit: | 1.000 | Pass |
| Highest Plt (2 hr. period): | 0.119 | Test limit: | 0.650 | Pass |

# 7 Immunity Test Results

**Performance Criteria Description in EN 50130-4:2011 +A1:2014**

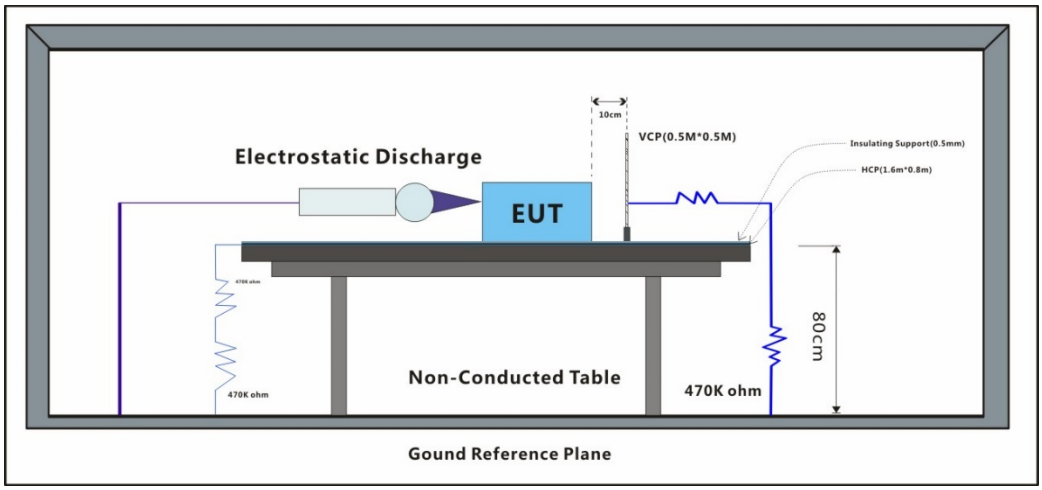
There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

For further details, please refer to Clause 7.4, 8.4, 9.4, 10.4, 11.4, 12.4 and 13.4, of EN 50130-4.

## 7.1 Electrostatic Discharge

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN 61000-4-2:2009

### 7.1.1 Test Setup Diagram




### 7.1.2 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

### 7.1.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

**7.1.4 Test Condition and Results:**

Number of Discharge: Minimum 10 times at each test point for Air Discharge; Minimum 50 times at each test point for Contact or VCP & HCP Discharge

Discharge Mode: Single Discharge

Discharge Period: 1 second minimum

Test Point 1: All insulated enclosure & seams.

Test Point 2: All accessible metal parts of the enclosure.

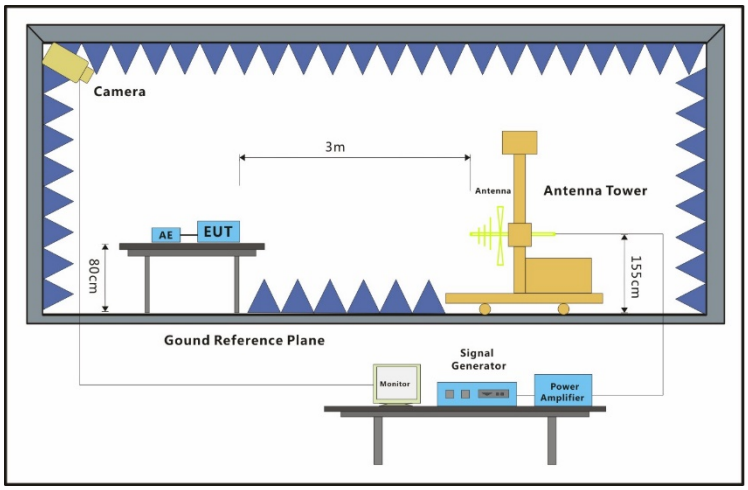
Test Point 3: All sides.

| Discharge type | Level (kV) | Polarity | Test Point | Result / Observations |
|---|---|---|---|---|
| Air Discharge | 2,4,8 | + | 1 | A |
| Air Discharge | 2,4,8 | - | 1 | A |
| Contact Discharge | 6 | + | 2 | A |
| Contact Discharge | 6 | - | 2 | A |
| Horizontal Coupling | 6 | + | 3 | A |
| Horizontal Coupling | 6 | - | 3 | A |
| Vertical Coupling | 6 | + | 3 | A |
| Vertical Coupling | 6 | - | 3 | A |
| A: No degradation in the performance of the EUT was observed | | | | |

## 7.2 Radiated Immunity(80MHz-2.7GHz)

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN IEC 61000-4-3: 2020

### 7.2.1 Test Setup Diagram




### 7.2.2 E.U.T. Operation

Operating Environment:
Temperature: 25.8 °C Humidity: 55.1 % RH Atmospheric Pressure: 1010 mbar

### 7.2.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 7.2.4 Test Condition and Results:

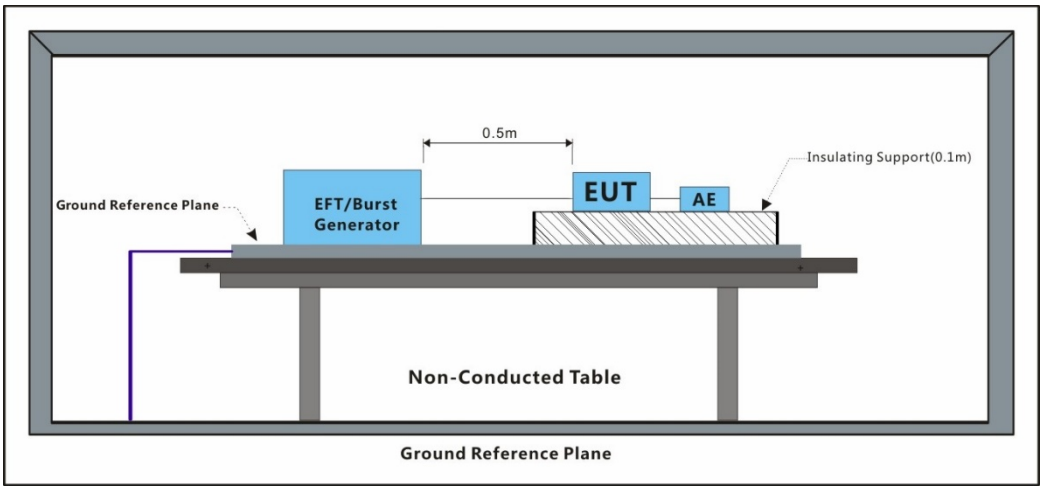
Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation

| Frequency | Level (V/m) | EUT Face | Dwell time | Result / Observations |
|---|---|---|---|---|
| 80MHz-2.7GHz | 10 | Front | 3s | A |
| 80MHz-2.7GHz | 10 | Back | 3s | A |
| 80MHz-2.7GHz | 10 | Left | 3s | A |
| 80MHz-2.7GHz | 10 | Right | 3s | A |
| 80MHz-2.7GHz | 10 | Top | 3s | A |
| 80MHz-2.7GHz | 10 | Underside | 3s | A |
| A: No degradation in the performance of the EUT was observed | | | | |

## 7.3 Electrical Fast Transients & Burst at AC Power Port

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN 61000-4-4:2012

### 7.3.1 Test Setup Diagram




### 7.3.2 E.U.T. Operation

Operating Environment:
Temperature: 21.3 °C Humidity: 48.5 % RH Atmospheric Pressure: 1010 mbar

### 7.3.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 7.3.4 Test Condition and Results:

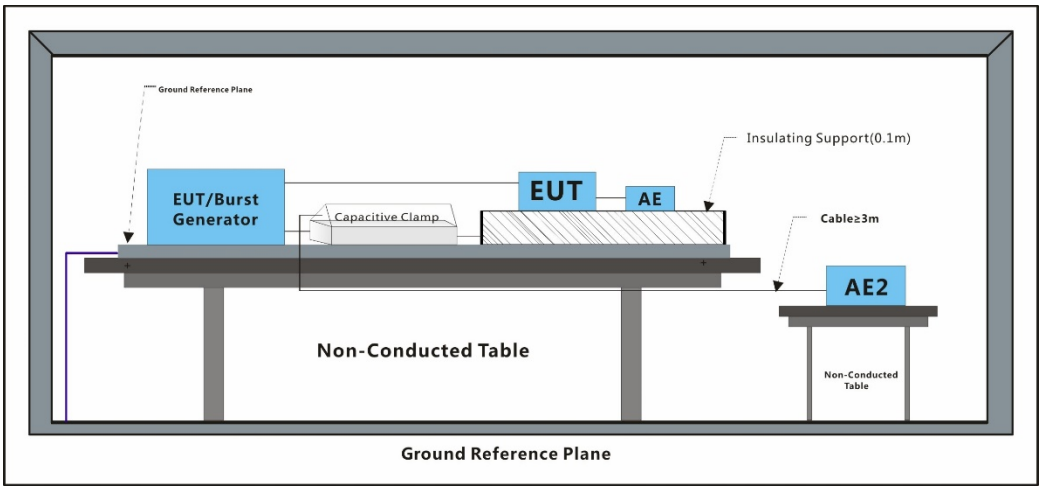
Repetition Frequency: 100kHz
Burst Period: 300ms
Test Duration: 1 minute per level & polarity

| Test Line | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|---|---|---|---|---|
| AC power port | 2 | + | CDN | A |
| AC power port | 2 | - | CDN | A |
| A: No degradation in the performance of the EUT was observed | | | | |

## 7.4 Electrical Fast Transients & Burst at Signal Port

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN 61000-4-4:2012

### 7.4.1 Test Setup Diagram




### 7.4.2 E.U.T. Operation

Operating Environment:
Temperature: 21.4 °C Humidity: 48.5 % RH Atmospheric Pressure: 1010 mbar

### 7.4.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 7.4.4 Test Condition and Results:

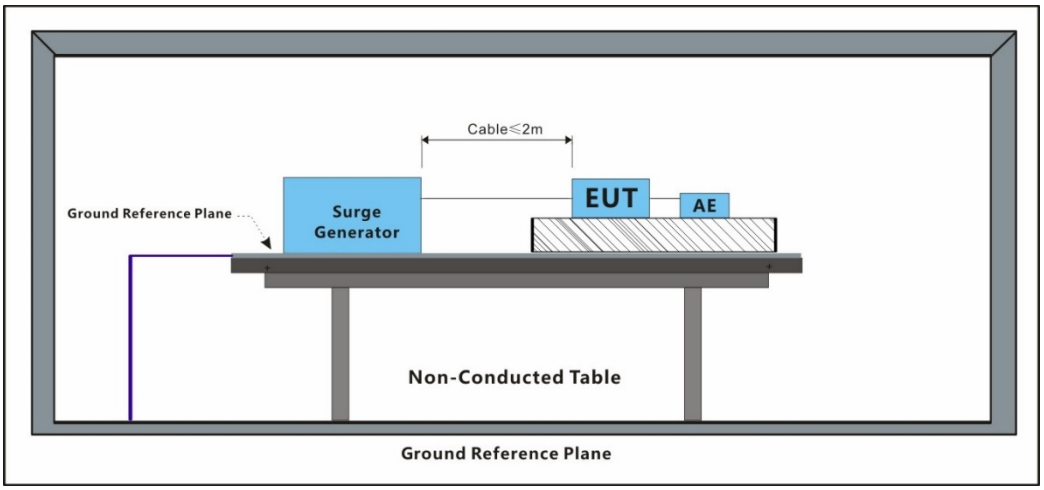
Repetition Frequency: 100kHz
Burst Period: 300ms
Test Duration: 1 minute per level & polarity

| Test Line | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|---|---|---|---|---|
| Signal Port | 1 | + | Clamp | A |
| Signal Port | 1 | - | Clamp | A |
| A: No degradation in the performance of the EUT was observed | | | | |

## 7.5 Surge at AC Power Port

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN 61000-4-5:2014 +A1:2017

### 7.5.1 Test Setup Diagram




### 7.5.2 E.U.T. Operation

Operating Environment:
Temperature: 21.6 °C Humidity: 47.5 % RH Atmospheric Pressure: 1010 mbar

### 7.5.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

**7.5.4 Test Condition and Results:**

Interval: 60s between each surge

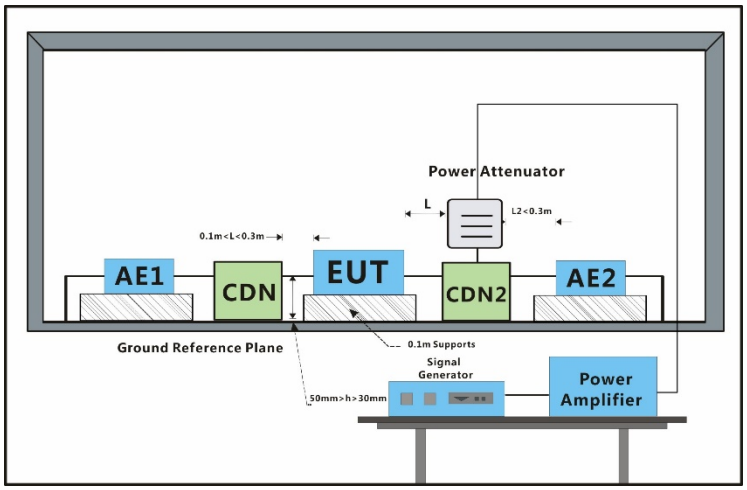
No. of surges: 5 positive, 5 negative

| Test Line | Level (kV) | Polarity | Phase (deg) | Result / Observations |
|---|---|---|---|---|
| L-N | 0.5,1 | + | 0° | A |
| L-N | 0.5,1 | - | 0° | A |
| L-N | 0.5,1 | + | 90° | A |
| L-N | 0.5,1 | - | 90° | A |
| L-N | 0.5,1 | + | 180° | A |
| L-N | 0.5,1 | - | 180° | A |
| L-N | 0.5,1 | + | 270° | A |
| L-N | 0.5,1 | - | 270° | A |
| L-PE | 0.5,1,2 | + | 0° | A |
| L-PE | 0.5,1,2 | - | 0° | A |
| L-PE | 0.5,1,2 | + | 90° | A |
| L-PE | 0.5,1,2 | - | 90° | A |
| L-PE | 0.5,1,2 | + | 180° | A |
| L-PE | 0.5,1,2 | - | 180° | A |
| L-PE | 0.5,1,2 | + | 270° | A |
| L-PE | 0.5,1,2 | - | 270° | A |
| N-PE | 0.5,1,2 | + | 0° | A |
| N-PE | 0.5,1,2 | - | 0° | A |
| N-PE | 0.5,1,2 | + | 90° | A |
| N-PE | 0.5,1,2 | - | 90° | A |
| N-PE | 0.5,1,2 | + | 180° | A |
| N-PE | 0.5,1,2 | - | 180° | A |
| N-PE | 0.5,1,2 | + | 270° | A |
| N-PE | 0.5,1,2 | - | 270° | A |
| A: No degradation in the performance of the EUT was observed | | | | |

## 7.6 Conducted Immunity at Power Port (150kHz-100MHz)

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN 61000-4-6:2014

### 7.6.1 Test Setup Diagram




### 7.6.2 E.U.T. Operation

Operating Environment:
Temperature: 21.5 °C Humidity: 47.1 % RH Atmospheric Pressure: 1010 mbar

### 7.6.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 7.6.4 Test Condition and Results:

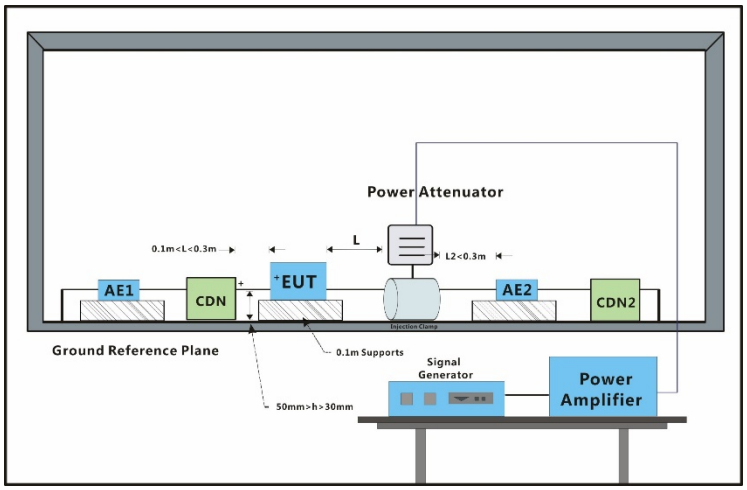
Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation

| Cable port | Level (Vrms) | CDN/Clamp | Dwell time | Result / Observations |
|---|---|---|---|---|
| AC power port | 10 | CDN | 3s | A |
| A: No degradation in the performance of the EUT was observed | | | | |

## 7.7 Conducted Immunity at Signal Port (150kHz-100MHz)

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN 61000-4-6:2014

### 7.7.1 Test Setup Diagram




### 7.7.2 E.U.T. Operation

Operating Environment:
Temperature: 21.3 °C Humidity: 46.5 % RH Atmospheric Pressure: 1010 mbar

### 7.7.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 7.7.4 Test Condition and Results:

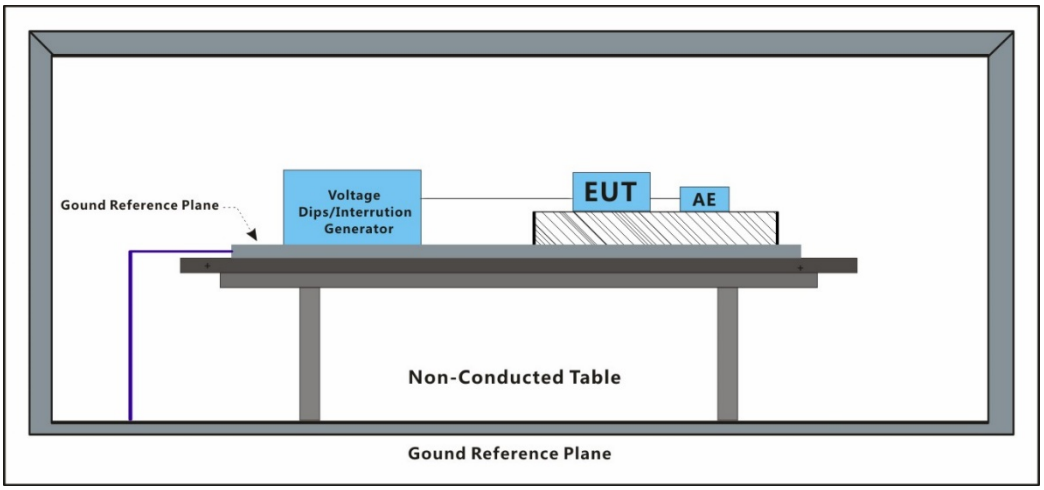
Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation

| Cable port | Level (Vrms) | CDN/Clamp | Dwell time | Result / Observations |
|---|---|---|---|---|
| Signal or Control port | 10 | CDN | 3s | A |
| A: No degradation in the performance of the EUT was observed | | | | |

## 7.8 Mains Supply Voltage Variations

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN 50130-4:2011+A1:2014

### 7.8.1 Test Setup Diagram




### 7.8.2 E.U.T. Operation

Operating Environment:
Temperature: 21.5 °C Humidity: 46.2 % RH Atmospheric Pressure: 1010 mbar

### 7.8.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

### 7.8.4 Test Condition and Results:

Voltage max.: AC 264V (Umax: Unom + 10%)
Voltage min.: AC 85V (Umin: Unom - 15%)
Unom Voltage: AC 100-240V

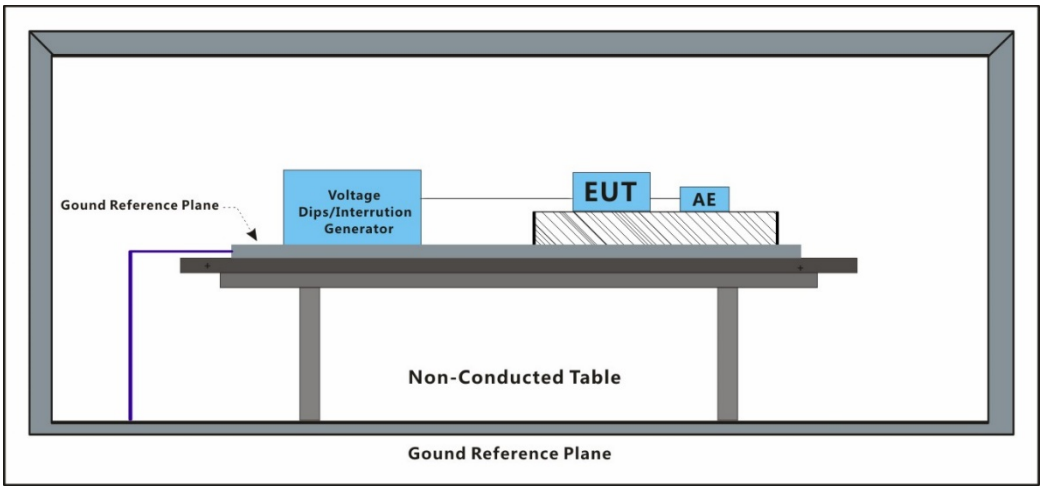
Test phenomenon description for the EUT:

1. The EUT working normal, before the conditioning.
2. Monitor the EUT during the conditioning period and detected no any changes in states, during the conditioning.
3. No degradation in the performance of the EUT was observed, after the conditioning.

## 7.9 Voltage Dips and Interruptions

Test Requirement: EN 50130-4: 2011 +A1:2014
Test Method: EN IEC 61000-4-11:2020

### 7.9.1 Test Setup Diagram




### 7.9.2 E.U.T. Operation

Operating Environment:
Temperature: 21.6 °C Humidity: 45.8 % RH Atmospheric Pressure: 1010 mbar

### 7.9.3 Test Mode Description

| Pre-scan / Final test | Mode Code | Description |
|---|---|---|
| Pre-scan | 00 | Standby mode. |
| Final test | 01 | Alarm mode. |

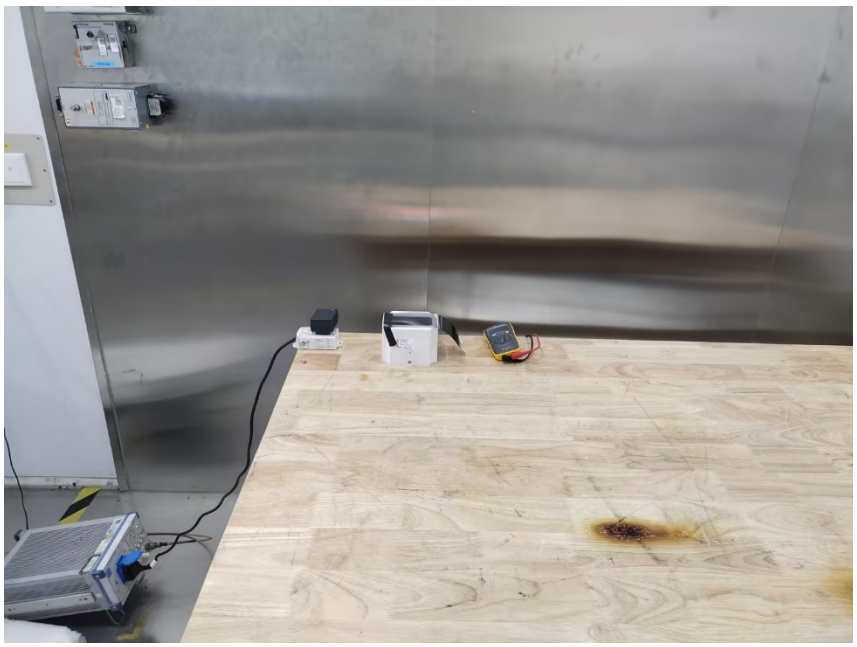
**7.9.4 Test Condition and Results:**

Performance Criterion:
0% of UT (Supply Voltage) for 250 Periods;
40% of UT for 10 Periods;
70% of UT for 25 Periods; 80% of UT for 250 Periods;
No. of Dips / Interruptions: 3 per Level
Time between dropout 10s

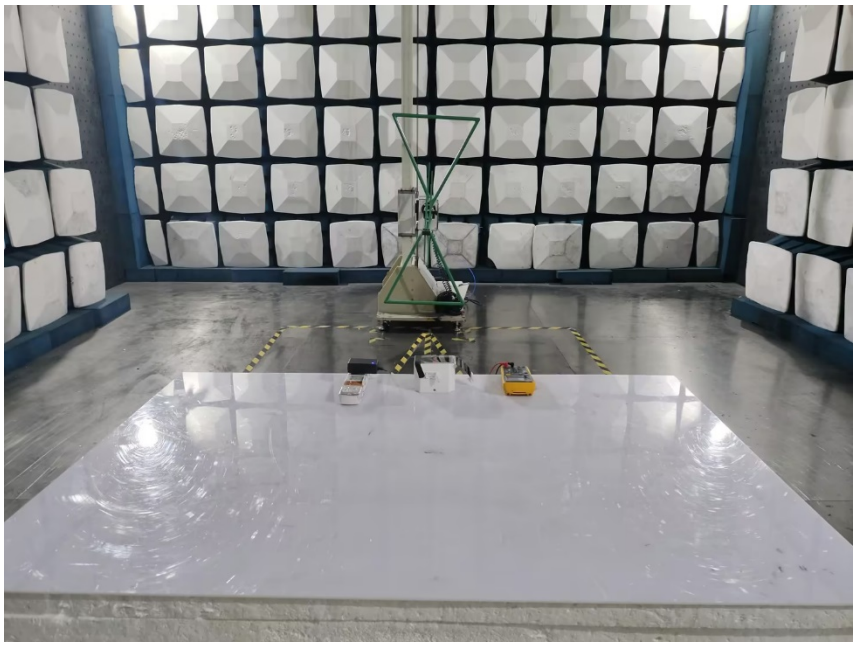
| Level % UT | Phase (deg) | Duration | No. of Dips / Interruptions | Result / Observations |
|---|---|---|---|---|
| 80 | 0° | 250 Cycles | 3 | A |
| 80 | 180° | 250 Cycles | 3 | A |
| 70 | 0° | 25 Cycles | 3 | A |
| 70 | 180° | 25 Cycles | 3 | A |
| 40 | 0° | 10 Cycles | 3 | A |
| 40 | 180° | 10 Cycles | 3 | A |
| 0 | 0° | 250 Cycles | 3 | B |
| 0 | 180° | 250 Cycles | 3 | B |
| A: No degradation in the performance of the EUT was observed<br>B: During the test,the EUT working abnormally.<br>After the test,the EUT automatically recovering working normally. | | | | |

# 8 Test Setup Photo

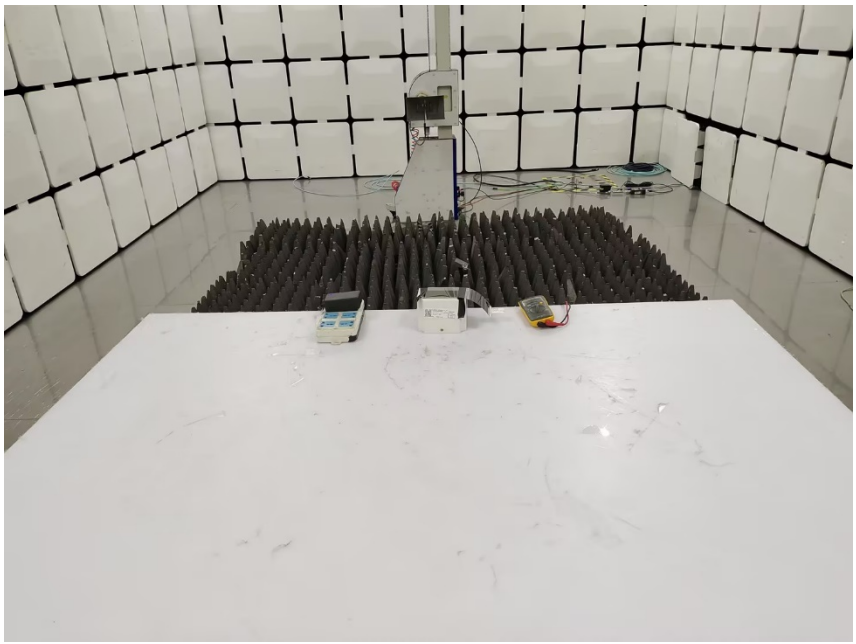
**Conducted Emissions at AC Mains Power Port (150kHz-30MHz)**



**Radiated Emissions (30MHz-1GHz)**



**Radiated Emissions (Above 1GHz)**

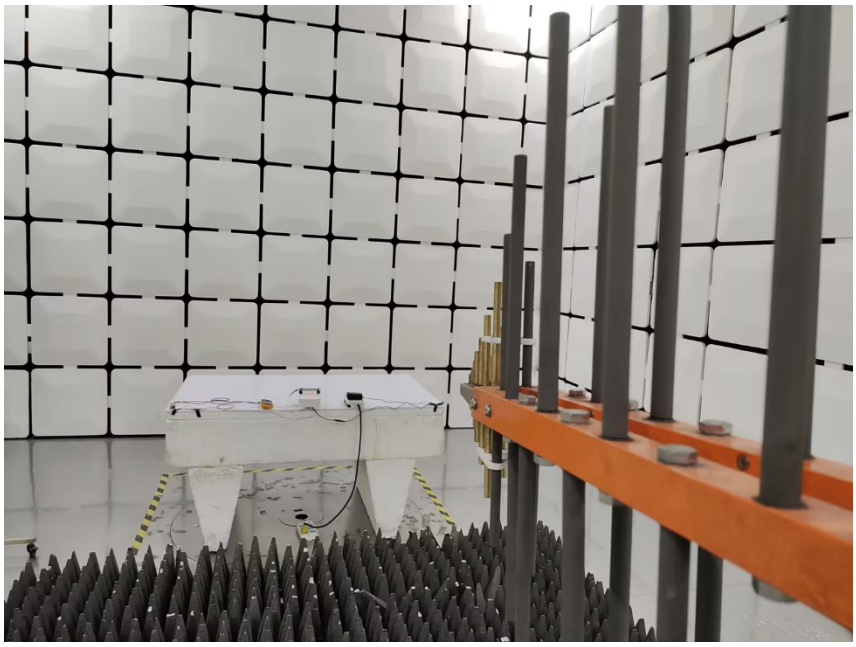


**Harmonic Current Emission**

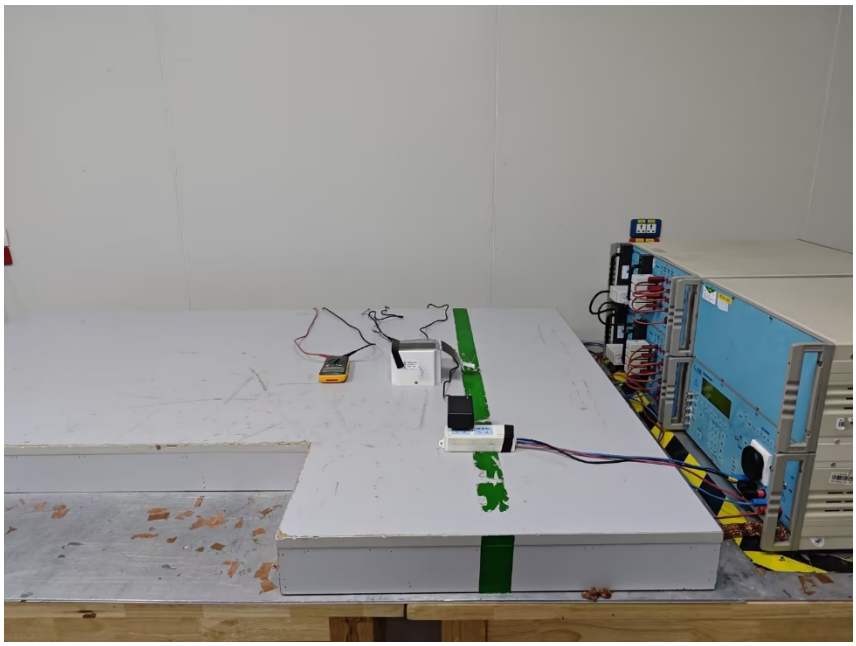
**Voltage Fluctuations and Flicker**

**Electrostatic Discharge**

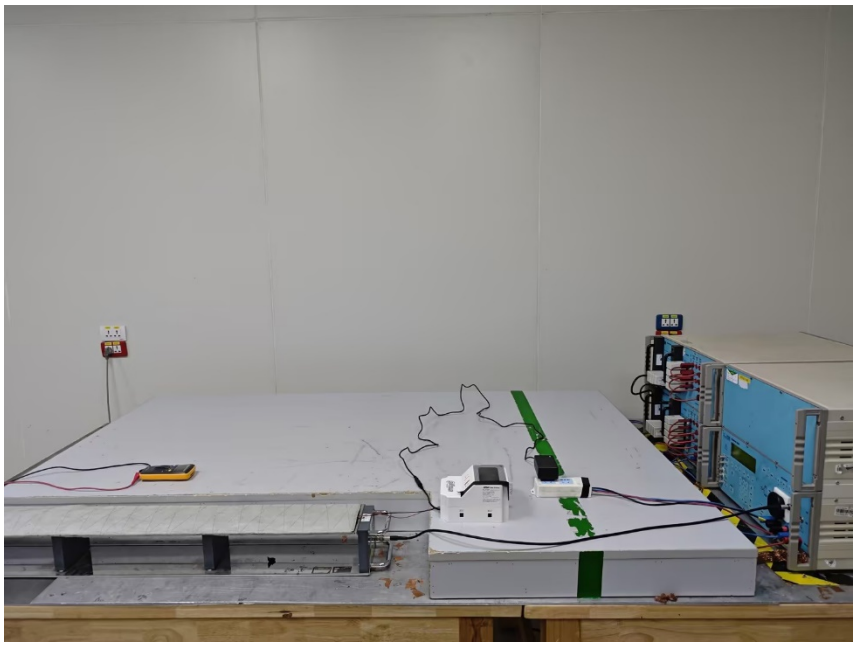
**Radiated Immunity(80MHz-2.7GHz)**



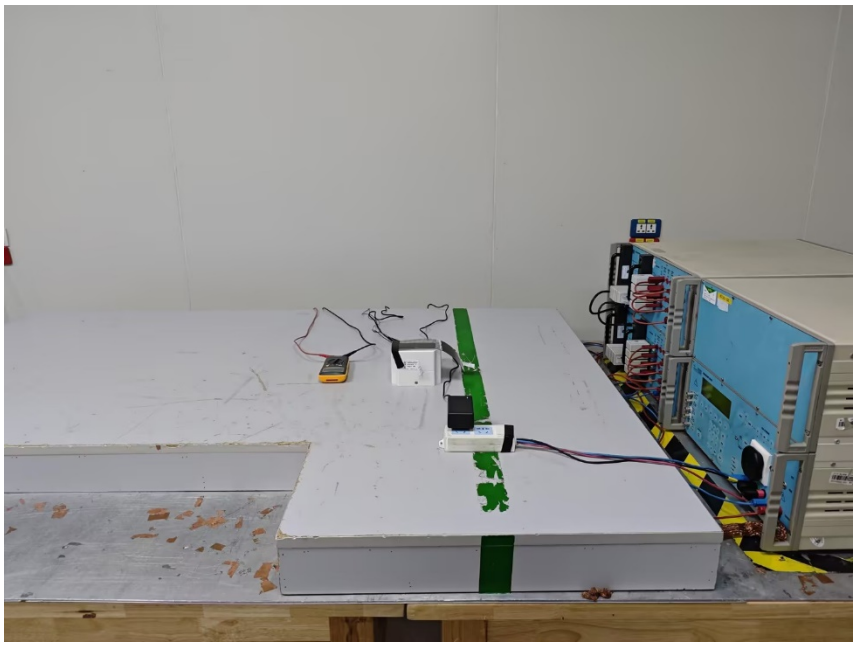
**Electrical Fast Transients & Burst at AC Power Port**



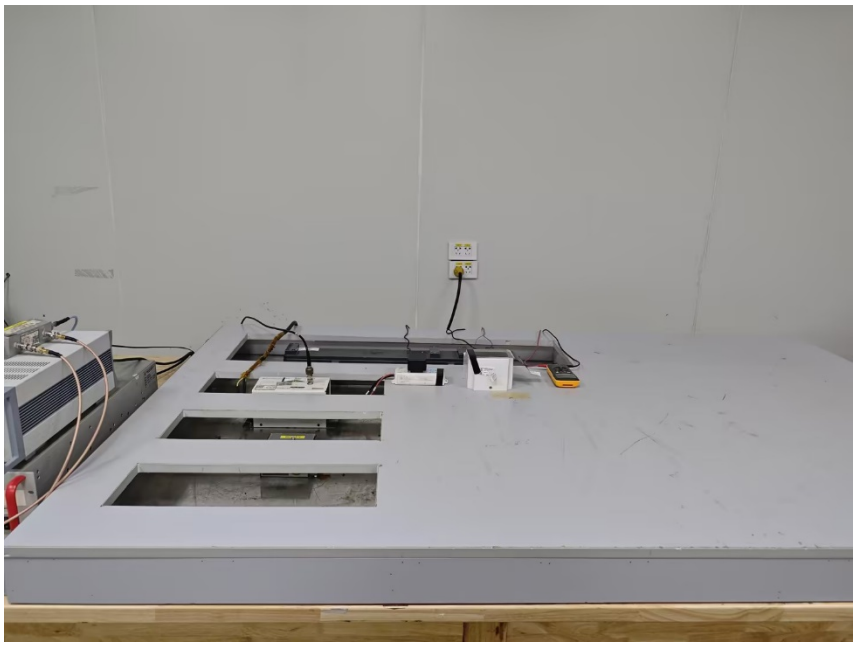
**Electrical Fast Transients & Burst at Signal Port**



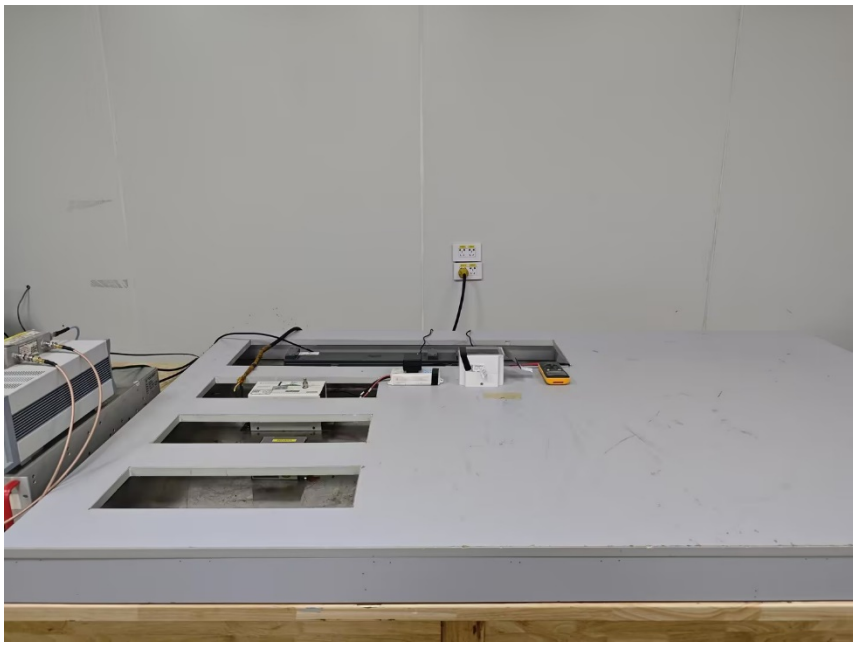
**Surge at AC Power Port**



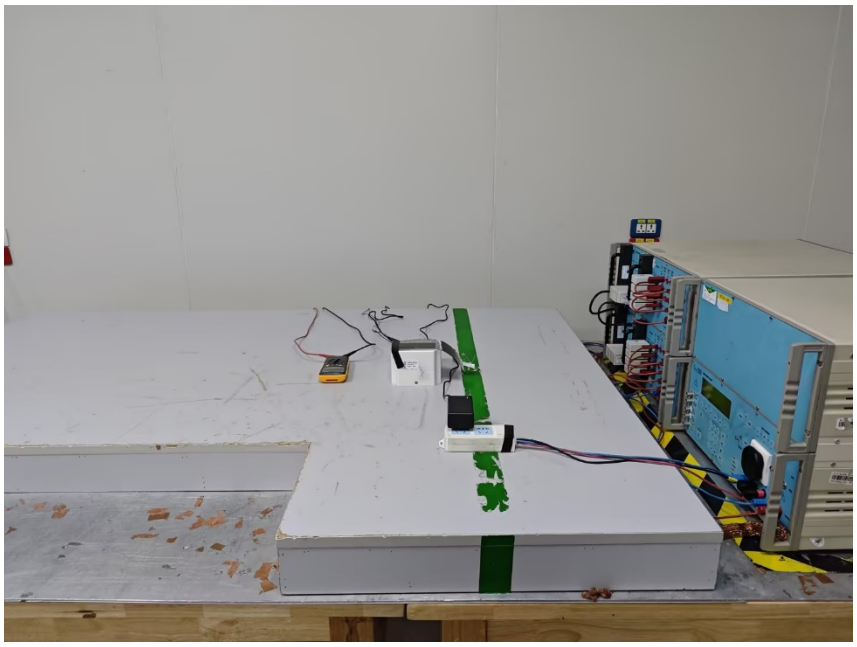
**Conducted Immunity at Power Port (150kHz-100MHz)**



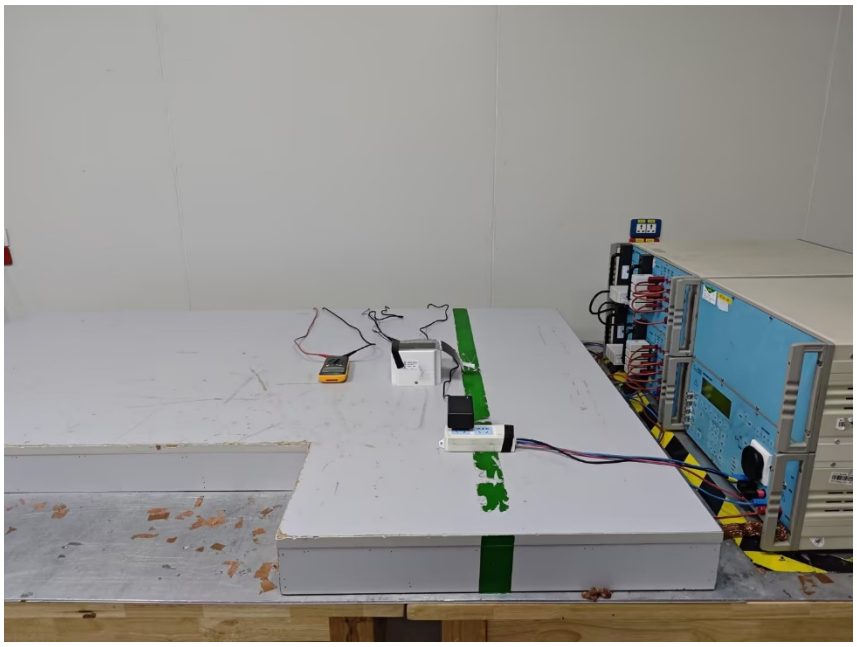
**Conducted Immunity at Signal Port (150kHz-100MHz)**



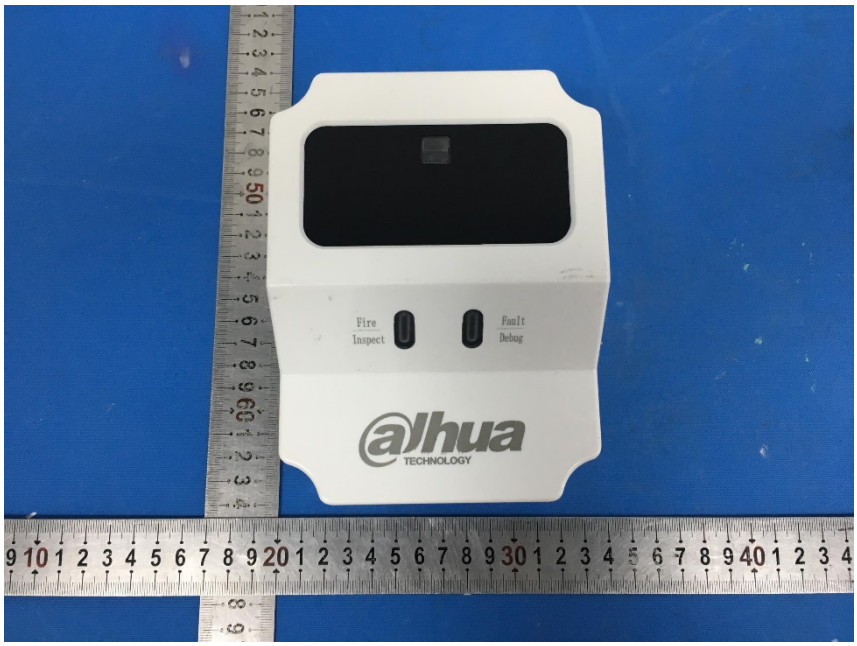
**Mains Supply Voltage Variations**



**Voltage Dips and Interruptions**

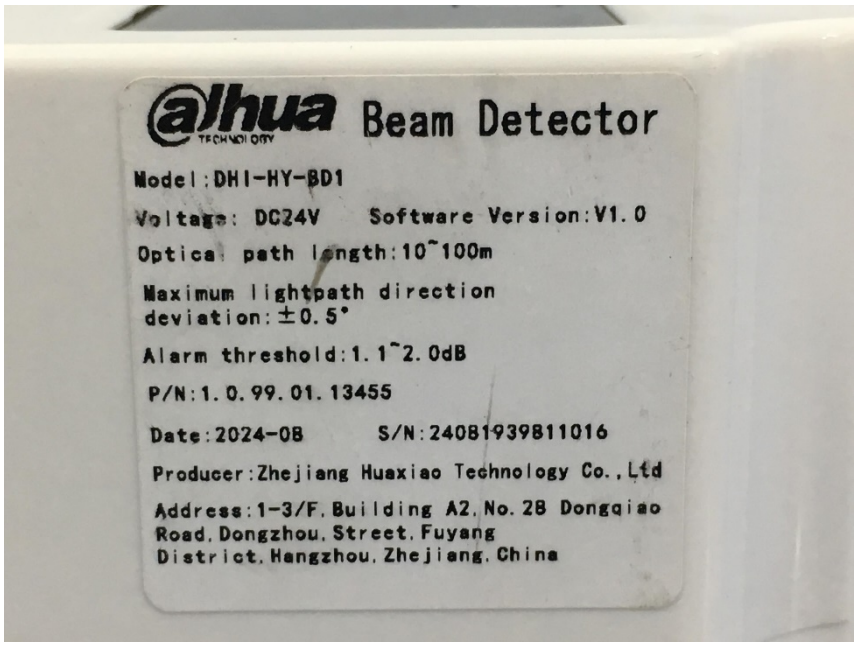


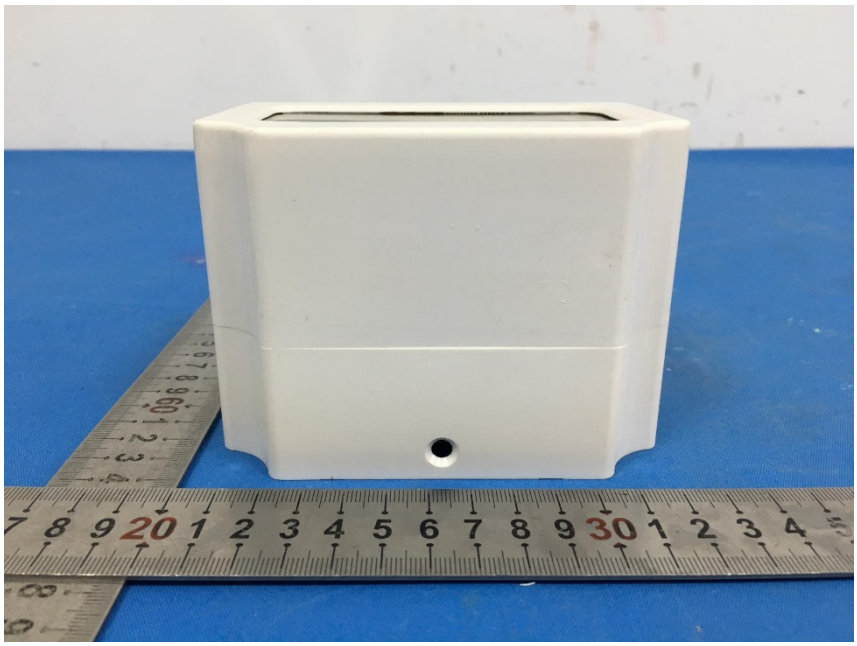
# 9 EUT Constructional Details (EUT Photos)

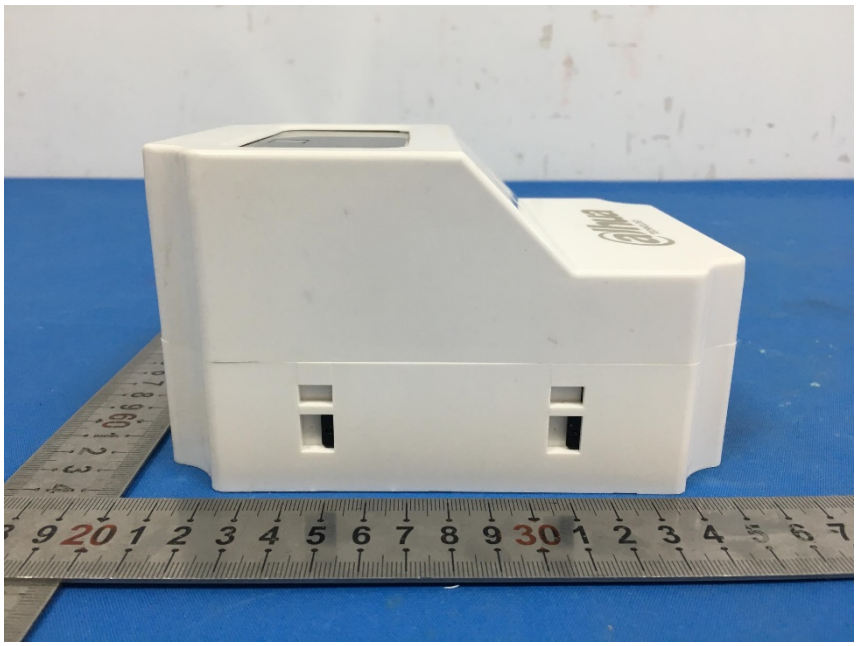


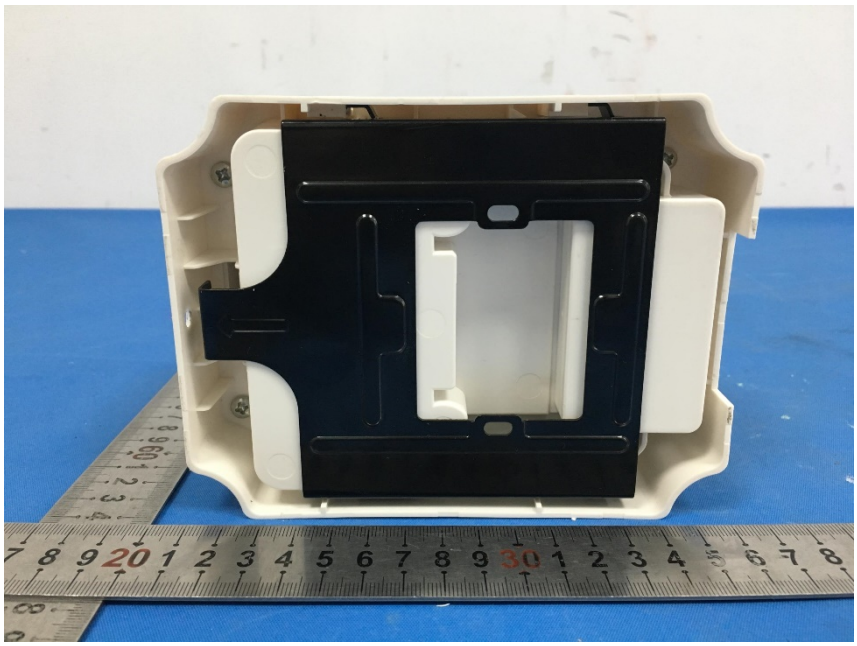


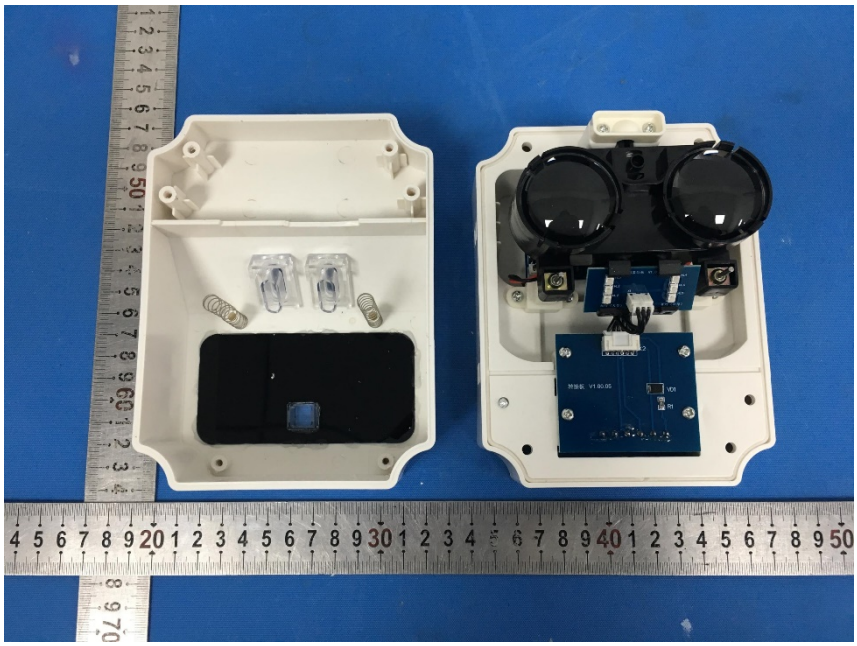
alhua
Beam Detector

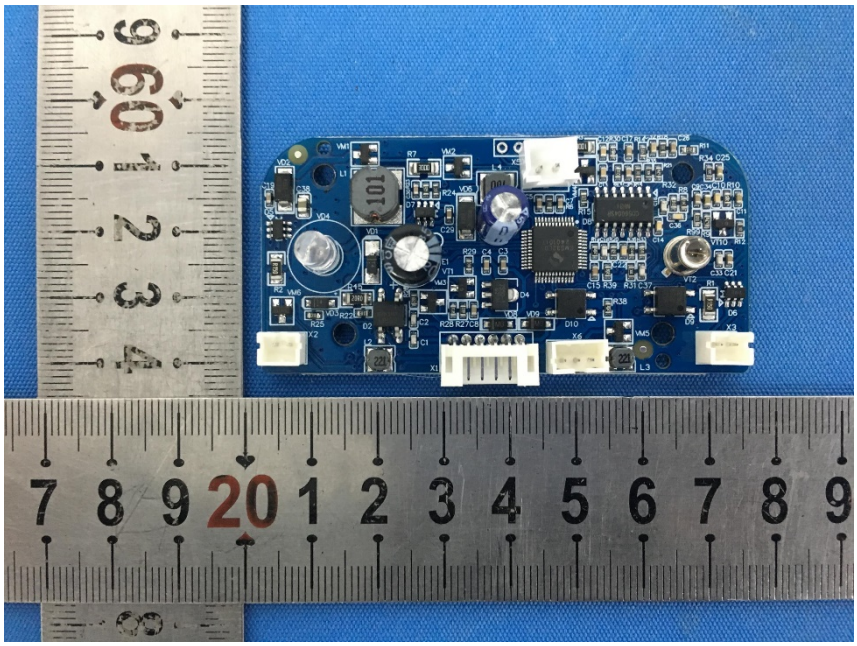

alhua
TECHNOLOGY
Beam Detector
Model:DHI-HY-BD1
Voltage: DC24V Software Version:V1.0
Optical path length:10~100m
Maximum lightpath direction deviation:±0.5°
Alarm threshold:1.1~2.0dB
P/N:1.0.99.01.13455
Date:2024-08 S/N:24081939811016
Producer:Zhejiang Huaxiao Technology Co.,Ltd
Address:1-3/F,Building A2,No.28 Dongqiao Road,Dongzhou,Street,Fuyang District,Hangzhou,Zhejiang,China

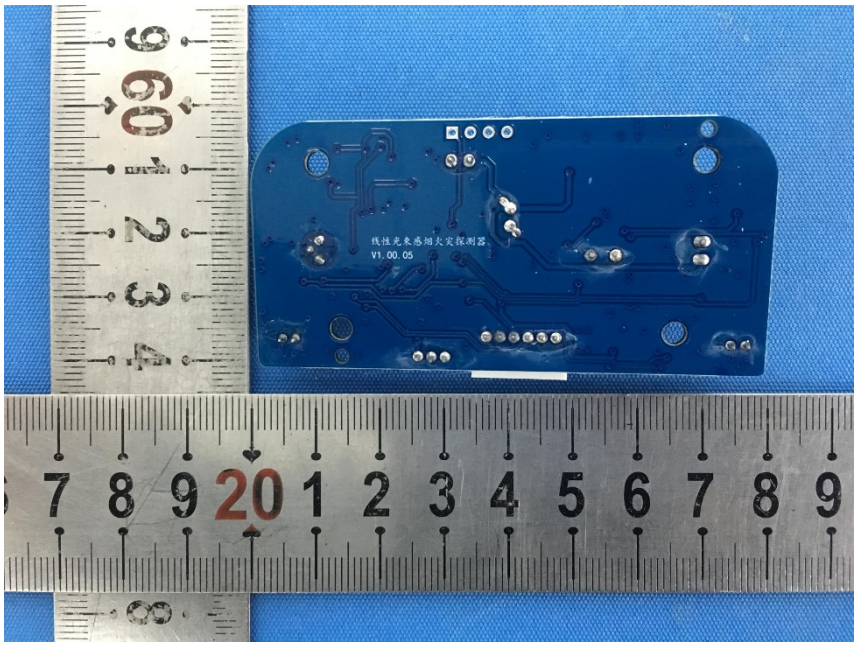


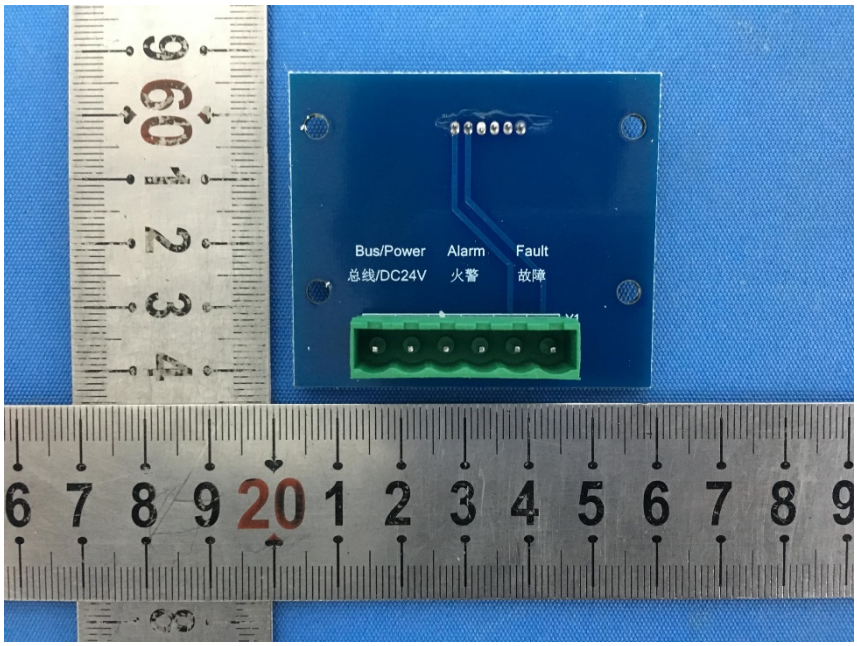


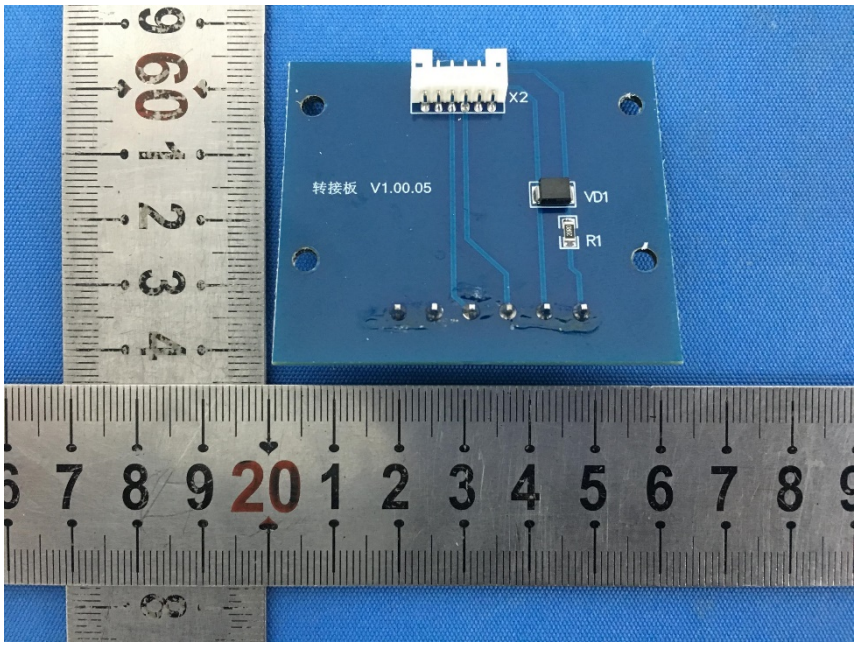


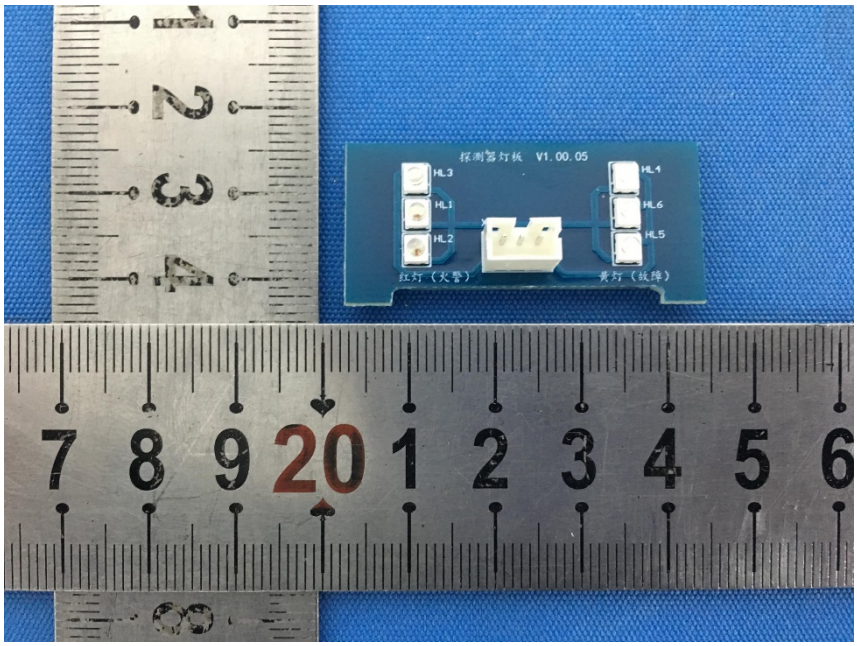


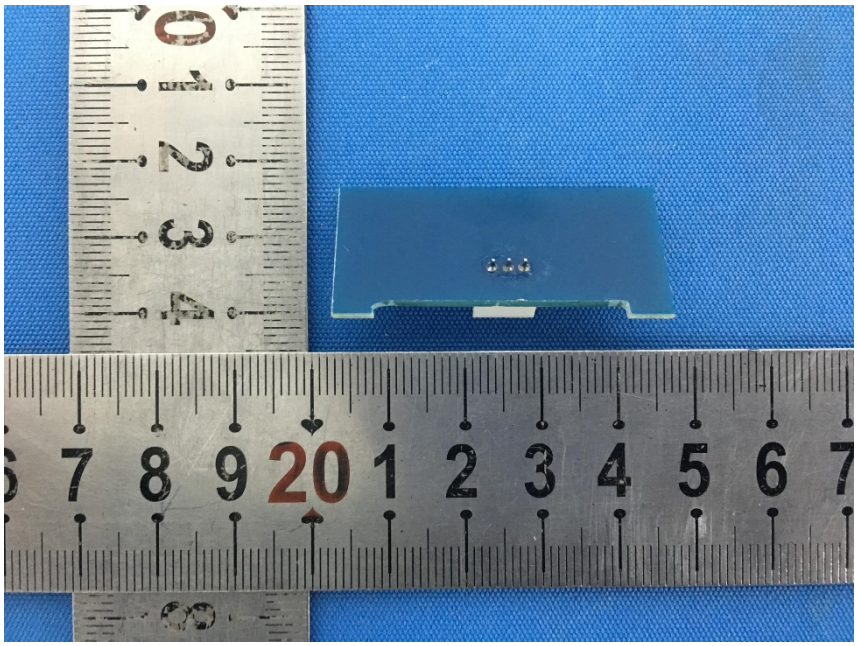



V1.00.05


Bus/Power
总线/DC24V
Alarm
火警
Fault
故障


X2
转接板 V1.00.05
VD1
R1



- End of the Report -