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CNAS L5662



**EN 55032:2015+A11:2020+A1:2020**

**EN 55035:2017+A11:2020**

**EN IEC 61000-3-2:2019+A1:2021**

**EN 61000-3-3:2013+A1:2019+A2:2021**

**BS EN 55032:2015+A11:2020+A1:2020**

**BS EN 55035:2017+A11:2020**

**BS EN IEC 61000-3-2:2019+A1:2021**

**BS EN 61000-3-3:2013+A2:2021**

## **TEST REPORT**

For

**SHENZHEN TENDA TECHNOLOGY CO.,LTD.**

6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052

**Tested Model: TC3T24C**

|  |   |
|--|---|
| <b>Report Type:</b><br>Original Report | <b>Product Type:</b><br>Smart IP Camera   |
| <b>Report Number:</b>                  | 2502R47809E-01  |
| <b>Report Date:</b>                    | 2025/4/2  |
| <b>Reviewed By:</b>                    | Joe Li<br>Project Engineer <i>Joe Li</i>  |
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DOCUMENT REVISION HISTORY

| Revision Number | Report Number  | Description of Revision | Date of Revision |
|-----------------|----------------|-------------------------|------------------|
| 1.0             | 2502R47809E-01 | Original Report         | 2025/4/2         |

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|   |                                      |
|---|--------------------------------------|
| <b>EUT Name:</b>                                    | Smart IP Camera                      |
| <b>EUT Model:</b>                                   | TC3T24C                              |
| <b>Rated Input Voltage:</b>                         | DC12V from adapter or DC48V from POE |
| <b>The Highest Operating Frequency<sup>▲</sup>:</b> | 1000MHz                              |
| <b>Serial Number:</b>                               | 2ZNT-1                               |
| <b>EUT Received Date:</b>                           | 2025/3/13                            |
| <b>EUT Received Status:</b>                         | Good                                 |

### Objective

This report is prepared on behalf of **SHENZHEN TENDA TECHNOLOGY CO.,LTD.** in accordance with EN 55032:2015+A11:2020+A1:2020 and BS EN 55032:2015+A11:2020+A1:2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements; EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 Electromagnetic compatibility of multimedia equipment - Immunity requirements; EN IEC 61000-3-2:2019+A1:2021 and BS EN IEC 61000-3-2:2019+A1:2021 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase); EN 61000-3-3:2013+A1:2019+A2:2021 and BS EN 61000-3-3:2013+A2:2021 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.

The objective is to determine the compliance of EUT with:

EN 55032:2015+A11:2020+A1:2020  
EN 55035:2017+A11:2020  
EN IEC 61000-3-2:2019+A1:2021  
EN 61000-3-3:2013+A1:2019+A2:2021  
BS EN 55032:2015+A11:2020+A1:2020  
BS EN 55035:2017+A11:2020  
BS EN IEC 61000-3-2:2019+A1:2021  
BS EN 61000-3-3:2013+A2:2021.

### Test Methodology

All measurements contained in this report were conducted with EN 55032:2015+A11:2020+A1:2020 and BS EN 55032:2015+A11:2020+A1:2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements; EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 Electromagnetic compatibility of multimedia equipment - Immunity requirements; EN IEC 61000-3-2:2019+A1:2021 and BS EN IEC 61000-3-2:2019+A1:2021 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase); EN 61000-3-3:2013+A1:2019+A2:2021 and BS EN 61000-3-3:2013+A2:2021 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.

## Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1<sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China.

## Declarations

The information marked ▲ is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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Each test item follows the test standard(s) without deviation.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

#### Test Mode:

M1: Normal working(Powered by Adapter)

M2: Normal working(Powered by POE)

### Equipment Modifications

No modification was made to the EUT.

### EUT Exercise Software

Software " LanTest20 & V2.0.0.2" was used in test.

### Support Equipment List and Details

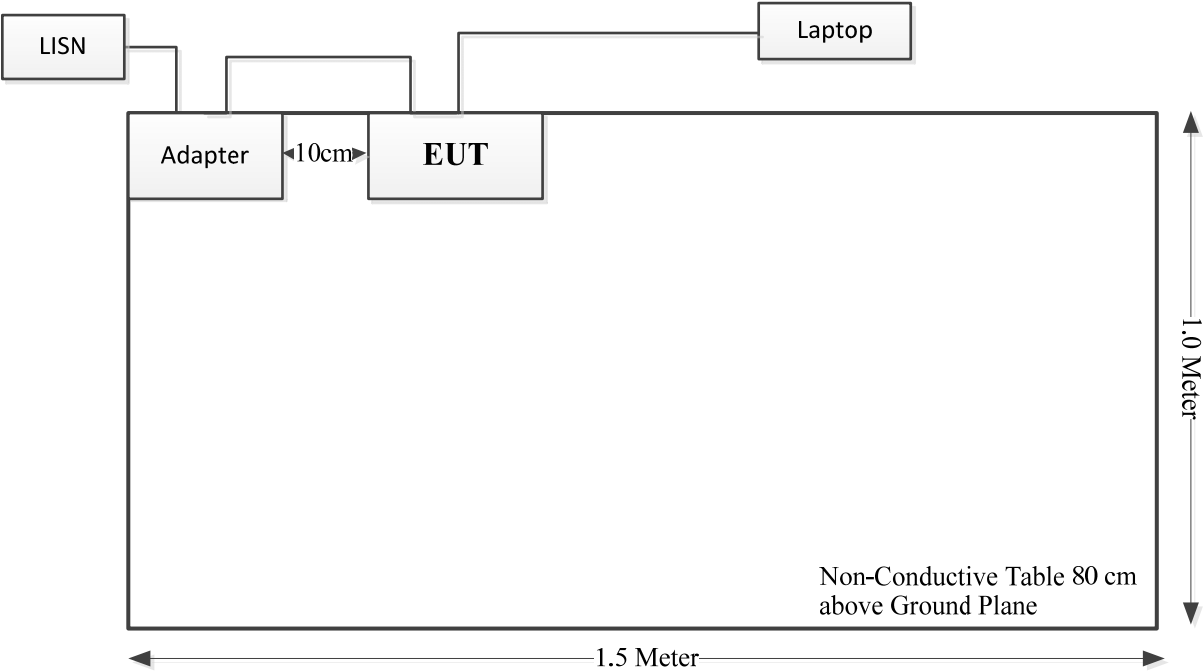
| Manufacturer | Description | Model        | Serial Number     |
|--------------|-------------|--------------|-------------------|
| DELL         | Laptop      | E6410        | EMZBPC21103001    |
| CWT          | Adapter     | 2ABB018F EU  | 11-20030001-06578 |
| I.T.E        | POE         | G1080-PoE48G | EMZBPA21206001    |
| Lenovo       | Laptop      | E480         | PF-1QQYYYP 19/06  |

### Support Cable List and Details

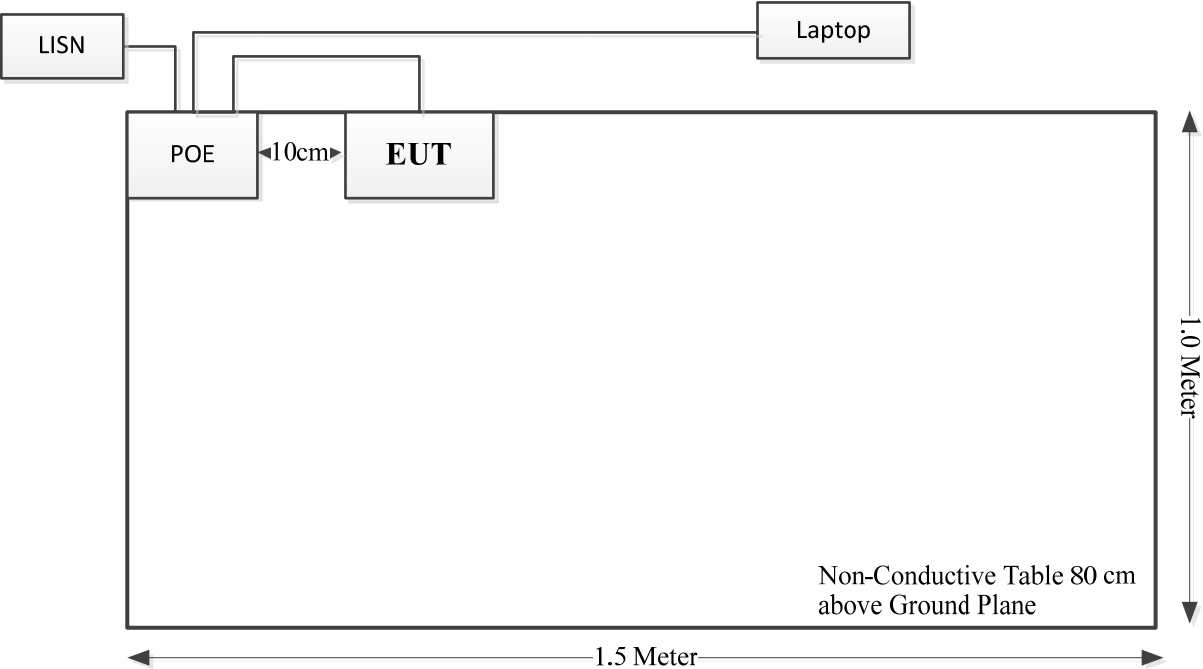
| Cable Description | Shielding Cable | Ferrite Core | Length (m) | From Port | To     |
|-------------------|-----------------|--------------|------------|-----------|--------|
| AC Cable          | NO              | NO           | 1          | POE       | LISN   |
| DC Cable          | NO              | NO           | 1          | Adapter   | EUT    |
| RJ45 Cable        | No              | No           | 1          | EUT       | POE    |
| RJ45 Cable        | No              | No           | 15         | EUT       | Laptop |
| RJ45 Cable        | No              | No           | 15         | POE       | Laptop |

Block Diagram of Test Setup

M1:



M2:





## Test Equipment List

| Manufacturer                  | Description  | Model          | Serial Number    | Calibration Date | Calibration Due Date |
|-------------------------------|--|----------------|------------------|------------------|----------------------|
| Conducted emission            |  |                |                  |                  |                      |
| R&S                           | LISN   | ENV216         | 101614           | 2024/9/5         | 2025/9/4             |
| MICRO-COAX                    | Coaxial Cable                                      | C-NJNJ-50      | C-0200-01        | 2024/9/5         | 2025/9/4             |
| R&S                           | EMI Test Receiver                                  | ESCI           | 101121           | 2024/9/5         | 2025/9/4             |
| Audix                         | Test Software                                      | E3             | 191218 V9        | N/A              | N/A                  |
| TESEQ                         | ISN  | T800           | 34379            | 2024/8/26        | 2025/8/25            |
| Radiated emissions below 1GHz |  |                |                  |                  |                      |
| Sunol Sciences                | Hybrid Antenna                                     | JB3            | A060611-1        | 2023/9/6         | 2026/9/5             |
| Narda                         | Coaxial Attenuator                                 | 779-6dB        | 04269            | 2023/9/6         | 2026/9/5             |
| Unknown                       | Coaxial Cable                                      | C-NJNJ-50      | C-1000-01        | 2024/7/1         | 2025/6/30            |
| Unknown                       | Coaxial Cable                                      | C-NJNJ-50      | C-0400-04        | 2024/7/1         | 2025/6/30            |
| Unknown                       | Coaxial Cable                                      | C-NJNJ-50      | C-0530-01        | 2024/7/1         | 2025/6/30            |
| Sonoma                        | Amplifier  | 310N           | 185914           | 2024/8/26        | 2025/8/25            |
| R&S                           | EMI Test Receiver                                  | ESCI           | 100224           | 2024/8/26        | 2025/8/25            |
| Audix                         | Test Software                                      | E3             | 191218 V9        | N/A              | N/A                  |
| Radiated emissions above 1GHz |  |                |                  |                  |                      |
| AH                            | Horn Antenna                                       | SAS-571        | 1177             | 2023/2/22        | 2026/2/21            |
| HUBER+SUHNER                  | Coaxial Cable                                      | SUCOFLEX 126EA | MY369/26/26EA    | 2024/7/1         | 2025/6/30            |
| Mini-Circuits                 | Preamplifier                                       | ZVZ-183-S+     | 5696001267       | 2025/2/14        | 2026/2/13            |
| R&S                           | Spectrum Analyzer                                  | FSP 38         | 100478           | 2024/9/5         | 2025/9/4             |
| Audix                         | Test Software                                      | E3             | 191218 V9        | N/A              | N/A                  |
| EFT & Surge & Dips            |  |                |                  |                  |                      |
| EM TEST                       | Single-phase Toroidal Transformer With Autowinding | V4780          | 0811-10          | 2024/5/15        | 2025/5/14            |
| EM TEST                       | Ultra Compact Generator                            | UCS 500N5      | V1204111721      | 2024/5/15        | 2025/5/14            |
| EM TEST                       | Capacitive Coupling Clamp                          | HFK            | 0908-20          | 2024/5/15        | 2025/5/14            |
| EM TEST                       | CDN  | CNV 504A       | V0523100466      | 2024/5/15        | 2025/5/14            |
| Flicker                       |  |                |                  |                  |                      |
| EVERFINE                      | Harmonic & Flicker Measurement System              | HFM3000        | P630850CD1411115 | 2024/9/5         | 2025/9/4             |
| EVERFINE                      | Harmonic & Flicker Testing Power Source            | HFS-4000       | P624486CD1411122 | 2024/9/5         | 2025/9/4             |
| ESD                           |  |                |                  |                  |                      |
| TESEQ                         | ESD Generator                                      | NSG 438        | 1019             | 2024/9/6         | 2025/9/5             |
| CS                            |  |                |                  |                  |                      |
| HP                            | Signal Generator                                   | 8648A          | 3426A00831       | 2024/10/17       | 2025/10/16           |
| AR                            | Power Amplifier                                    | 15A250         | 12934            | N/A              | N/A                  |
| Werlatone                     | Dual Directional Coupler                           | C5091-10       | 113192           | N/A              | N/A                  |
| NARDA                         | Coaxial Attenuator                                 | 769-6          | 02754            | N/A              | N/A                  |
| HP                            | Power Meter  | EPM-441A       | GB37481494       | 2024/9/5         | 2025/9/4             |
| Agilent                       | Power sensor                                       | 8482A          | US37296108       | 2024/9/5         | 2025/9/4             |
| COM-POWER                     | CDN  | M325E          | 521064           | 2024/8/26        | 2025/8/25            |

|                    |                           |            |            |            |            |
|--------------------|---------------------------|------------|------------|------------|------------|
| COM-POWER          | CDN                       | T8E        | 581607     | 2023/8/18  | 2026/8/17  |
| PFMF               |                           |            |            |            |            |
| Haefely            | Magnetic Field Tester     | MAG 100.1  | 080136-09  | N/A        | N/A        |
| Global Engineering | Loop Antenna              | 1313-S1-1M | 4080511    | N/A        | N/A        |
| Daoxiang           | AC Transformer            | TDGC2-5KVA | F-08-EM011 | N/A        | N/A        |
| FLUKE              | Clamp Meter               | 317        | 42270435WS | 2024/9/6   | 2025/9/5   |
| F.W.BELL           | Gauss Meter               | 4190       | 0808 003   | 2022/4/25  | 2025/4/24  |
| RS                 |                           |            |            |            |            |
| AR                 | Antenna                   | ATL80M1G   | 0351400    | N/A        | N/A        |
| AR                 | Antenna                   | ATT700M12G | 0349410    | N/A        | N/A        |
| HP                 | Signal Generator          | 8665B      | 3438a00584 | 2024/9/5   | 2025/9/4   |
| AR                 | Power Amplifier           | 500W1000C  | 0353561    | N/A        | N/A        |
| AR                 | Power Amplifier           | 60S1G6     | 0348711    | N/A        | N/A        |
| PASTERNAK          | Dual Directional Coupler  | PE2239-30  | 1711       | N/A        | N/A        |
| Agilent            | Power Meter               | E4419B     | MY45103907 | 2024/10/18 | 2025/10/17 |
| Agilent            | E-Series Avg Power Sensor | E9301A     | MY41497625 | 2024/10/18 | 2025/10/17 |
| Agilent            | E-Series Avg Power Sensor | E9301A     | MY41497628 | 2024/9/5   | 2025/9/4   |

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Environmental Conditions

| Test Item:         | Conducted emission | Radiated emissions below 1GHz | Radiated emissions above 1GHz | EMS        | Flicker   |
|--------------------|--------------------|-------------------------------|-------------------------------|------------|-----------|
| Temperature:       | 20.6 °C            | 22.7 °C                       | 20.2 °C                       | 21~22.4 °C | 22.4 °C   |
| Relative Humidity: | 46%                | 49%                           | 44%                           | 39~50%     | 43%       |
| ATM Pressure:      | 101.7kPa           | 101.6kPa                      | 101.5kPa                      | 101.7kPa   | 101.7kPa  |
| Tester:            | Yukin Qiu          | Willem Qiu                    | Lancer Zhang                  | Lane Sun   | Lane Sun  |
| Test Date:         | 2025/3/18          | 2025/3/22                     | 2025/3/31                     | 2025/3/18  | 2025/3/18 |

**SUMMARY OF TEST RESULTS**

| SN | Rule and Clause                          | Description of Test                                 | Test Result     |
|----|--|---|-----------------|
| 1  | EN 55032 and BS EN 55032 Clause A.3      | Conducted emissions                                 | Compliant       |
| 2  | EN 55032 BS EN 55032 Clause A.2          | Radiated emissions                                  | Compliant       |
| 3  | EN 55035 and BS EN 55035 Clause 4.2.1    | Electrostatic discharges IEC 61000-4-2              | Compliant       |
| 4  | EN 55035 and BS EN 55035 Clause 4.2.2.2  | Continuous radiated disturbances IEC 61000-4-3      | Compliant       |
| 5  | EN 55035 and BS EN 55035 Clause 4.2.2.3  | Continuous conducted disturbances IEC 61000-4-6     | Compliant       |
| 6  | EN 55035 and BS EN 55035 Clause 4.2.3    | Power frequency magnetic fields IEC 61000-4-8       | Compliant       |
| 7  | EN 55035 and BS EN 55035 Clause 4.2.4    | Electrical fast transients/burst IEC 61000-4-4      | Compliant       |
| 8  | EN 55035 and BS EN 55035 Clause 4.2.5    | Surges IEC 61000-4-5                                | Compliant       |
| 9  | EN 55035 and BS EN 55035 Clause 4.2.6    | Voltage dips and short interruptions IEC 61000-4-11 | Compliant       |
| 10 | EN IEC 61000-3-2 and BS EN IEC 61000-3-2 | Harmonic current emissions                          | Not applicable* |
| 11 | EN 61000-3-3 and BS EN 61000-3-3         | Voltage fluctuations and flicker                    | Compliant       |

Note:

Not applicable\*: The maximum power of this EUT is less than 75W.

# 1 - CONDUCTED EMISSIONS

## Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cisp}$  of Table 1, then:

- 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.

If  $U_{lab}$  is greater than  $U_{cisp}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cisp})$ , exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cisp})$ , exceeds the disturbance limit.

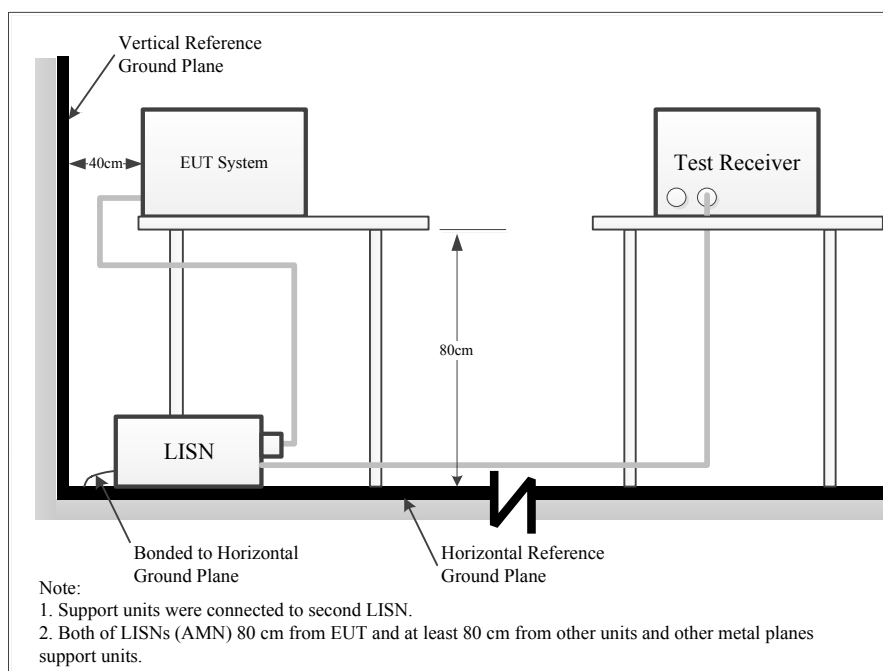
Based on CISPR 16-4-2-2011\*, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.12 dB (150 kHz to 30 MHz), and conducted disturbance at telecommunication port using AAN is 5.0 dB (150 kHz to 30 MHz).

Table 1 - Values of  $U_{cisp}$

| Measurement   | $U_{cisp}$ |
|---|------------|
| Conducted disturbance at mains port using AMN (9 kHz to 150 kHz)              | 3.8 dB     |
| (150 kHz to 30 MHz)   | 3.4 dB     |
| Conducted disturbance at mains port using voltage probe (9 kHz to 30 MHz)     | 2.9 dB     |
| Conducted disturbance at telecommunication port using AAN (150 kHz to 30 MHz) | 5.0 dB     |
| Conducted disturbance at telecommunication port using CVP (150 kHz to 30 MHz) | 3.9 dB     |
| Conducted disturbance at telecommunication port using CP (150 kHz to 30 MHz)  | 2.9 dB     |

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

## Test System Setup



The setup of EUT is according with CISPR 16-1-1:2010+A1:2010+A2 2014\*, CISPR 16-2-1:2008+A1:2010+A2 2013\* measurement procedure. The specification used was the EN 55032 and BS EN 55032 Class A limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

The adapter was connected to a 230V/50Hz AC line power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

| Frequency Range  | IF B/W |
|------------------|--------|
| 150 kHz - 30 MHz | 9 kHz  |

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:

Corr. = Cable loss + Factor of coupling device

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit -Result

### Test Procedure

During the conducted emissions test, the adapter was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the Quasi-peak and average detection mode.

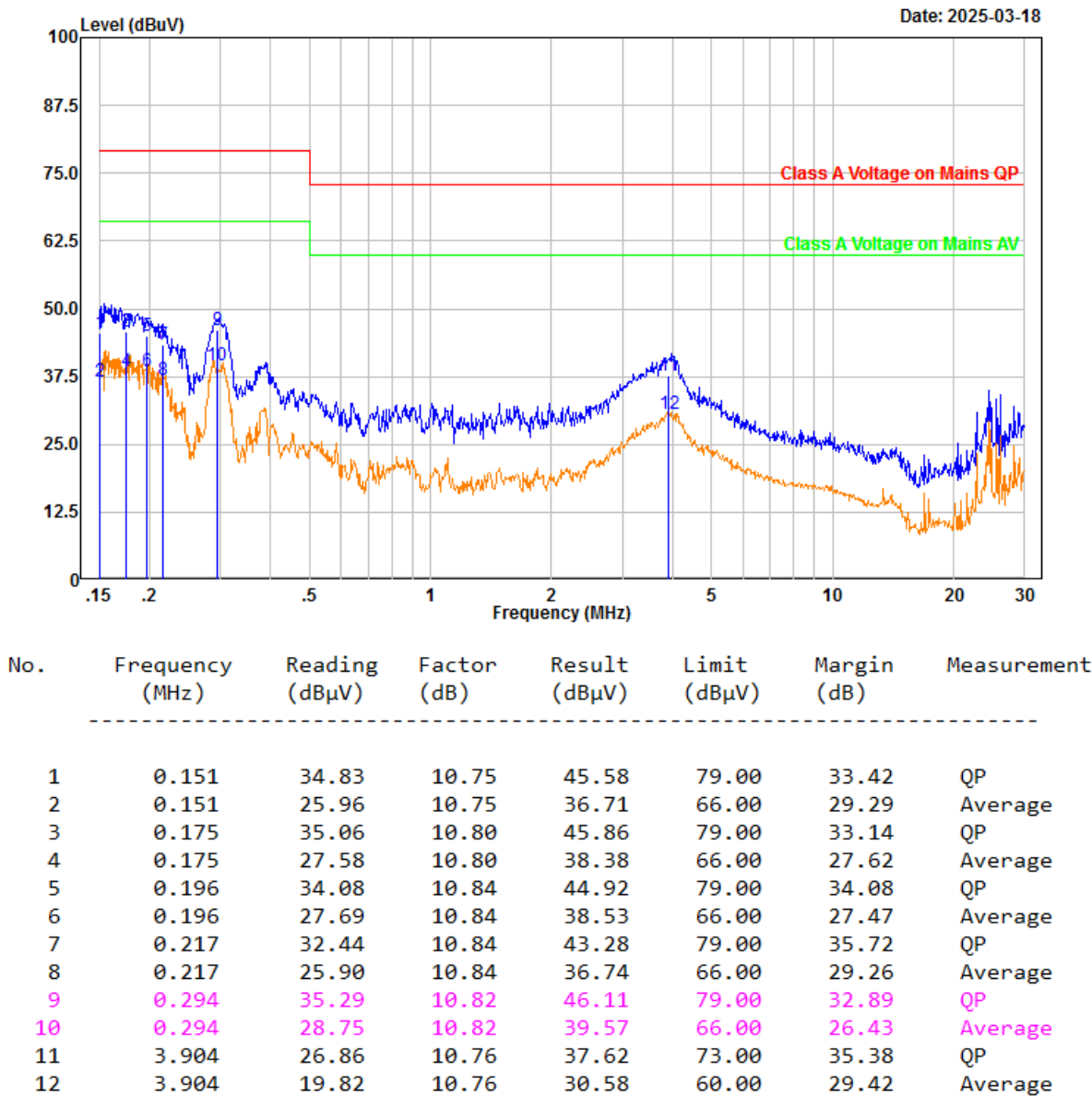
The report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

Test Data

Please refer to following table and plots:

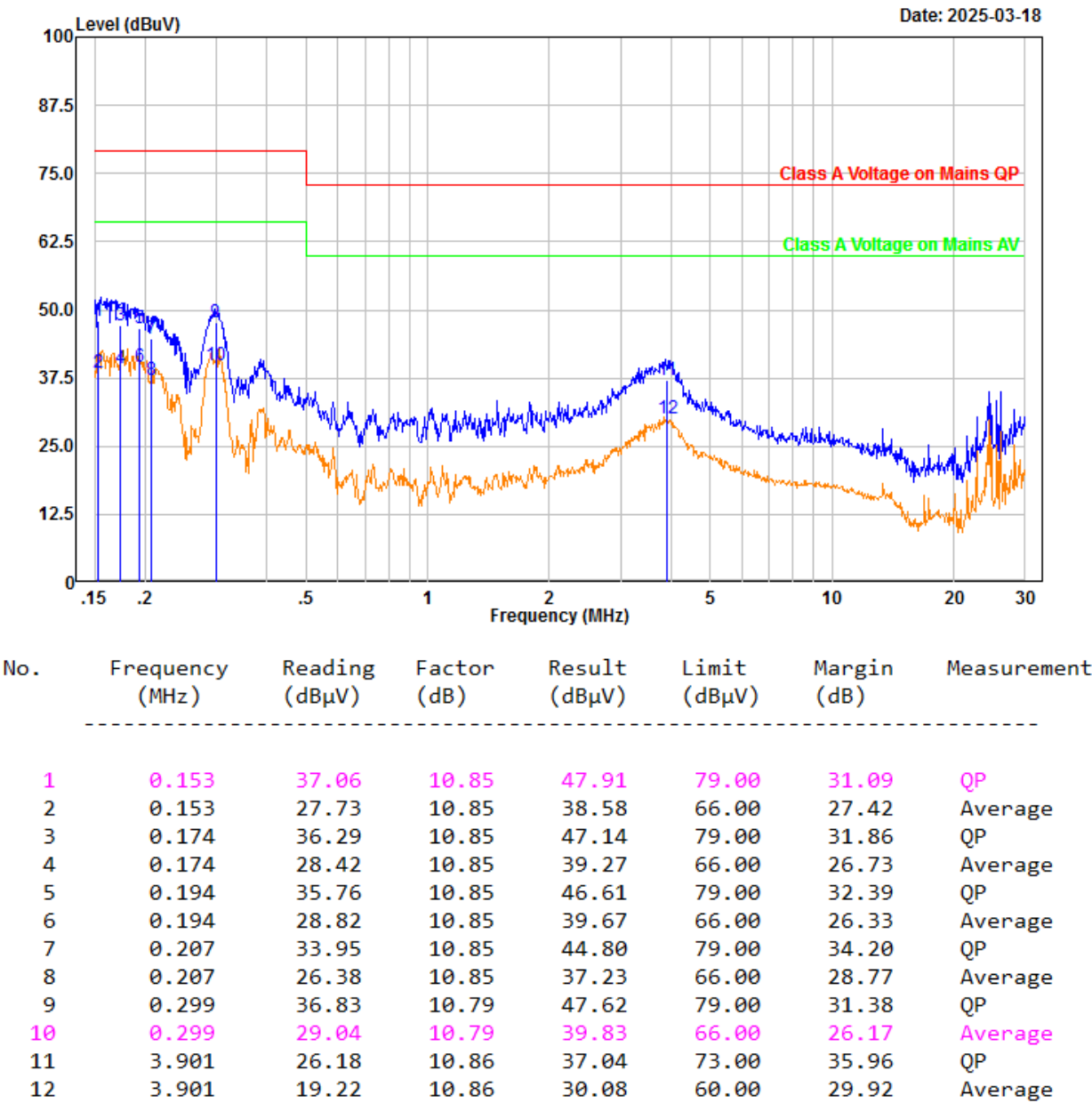
Project No.: 2502R47809E-EM  
Port: Line  
Test Mode: M1  
Note:

Serial No.: 2ZNT-1  
Tester: Yukin Qiu



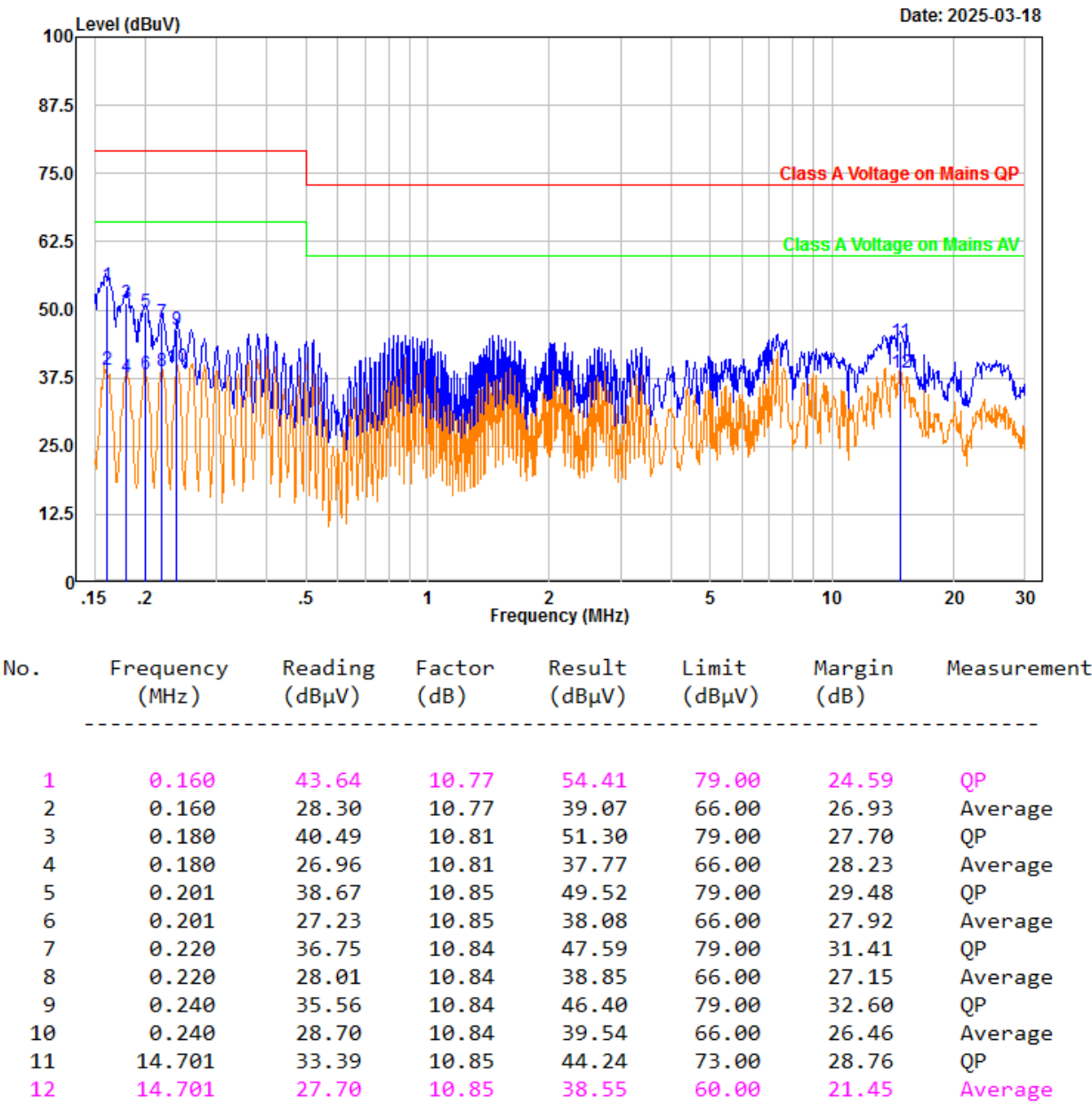
Project No.: 2502R47809E-EM  
Port: neutral  
Test Mode: M1  
Note:

Serial No.: 2ZNT-1  
Tester: Yukin Qiu



Project No.: 2502R47809E-EM  
Port: Line  
Test Mode: M2  
Note:

Serial No.: 2ZNT-1  
Tester: Yukin Qiu

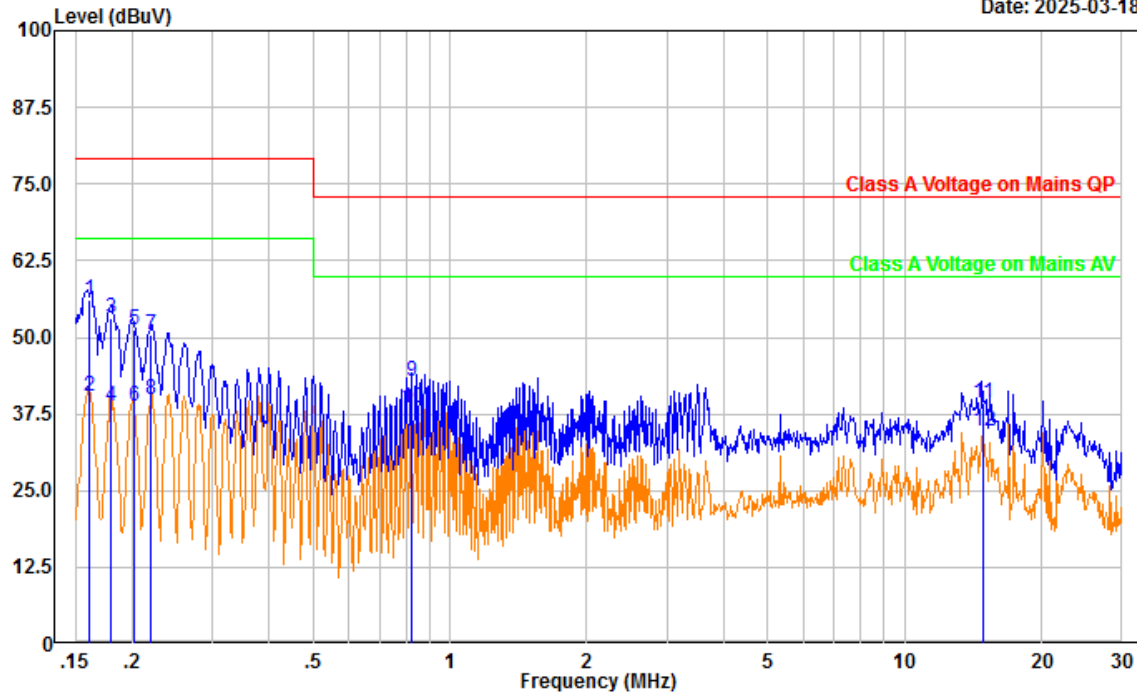




Project No.: 2502R47809E-EM  
Port: neutral  
Test Mode: M2  
Note:

Serial No.: 2ZNT-1  
Tester: Yukin Qiu

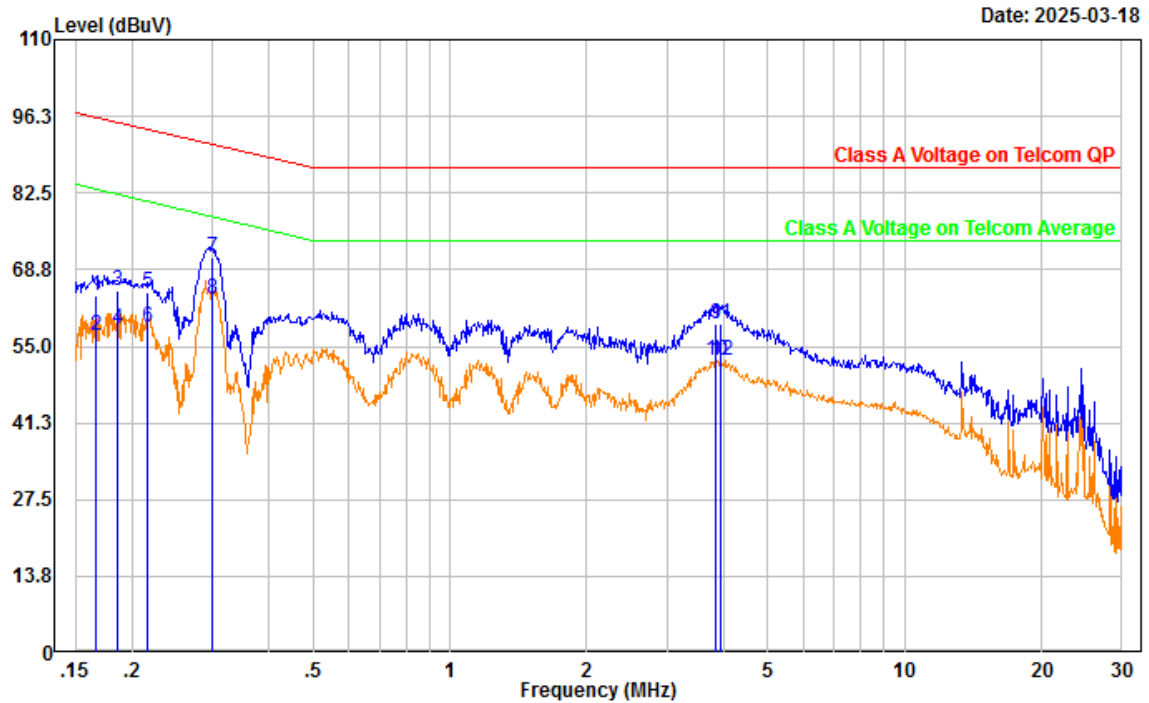
Date: 2025-03-18



| No. | Frequency<br>(MHz) | Reading<br>(dBμV) | Factor<br>(dB) | Result<br>(dBμV) | Limit<br>(dBμV) | Margin<br>(dB) | Measurement |
|-----|--------------------|-------------------|----------------|------------------|-----------------|----------------|-------------|
| 1   | 0.160              | 45.28             | 10.85          | 56.13            | 79.00           | 22.87          | QP          |
| 2   | 0.160              | 29.40             | 10.85          | 40.25            | 66.00           | 25.75          | Average     |
| 3   | 0.180              | 42.37             | 10.85          | 53.22            | 79.00           | 25.78          | QP          |
| 4   | 0.180              | 27.95             | 10.85          | 38.80            | 66.00           | 27.20          | Average     |
| 5   | 0.201              | 40.50             | 10.85          | 51.35            | 79.00           | 27.65          | QP          |
| 6   | 0.201              | 27.91             | 10.85          | 38.76            | 66.00           | 27.24          | Average     |
| 7   | 0.220              | 39.69             | 10.83          | 50.52            | 79.00           | 28.48          | QP          |
| 8   | 0.220              | 29.07             | 10.83          | 39.90            | 66.00           | 26.10          | Average     |
| 9   | 0.822              | 31.96             | 10.79          | 42.75            | 73.00           | 30.25          | QP          |
| 10  | 0.822              | 27.57             | 10.79          | 38.36            | 60.00           | 21.64          | Average     |
| 11  | 14.825             | 28.56             | 10.86          | 39.42            | 73.00           | 33.58          | QP          |
| 12  | 14.825             | 23.75             | 10.86          | 34.61            | 60.00           | 25.39          | Average     |

Project No.: 2502R47809E-EM  
Tester: Yukin Qiu  
Note : M1

Serial No.: 2ZNT-1  
Test Mode: 10Mbps

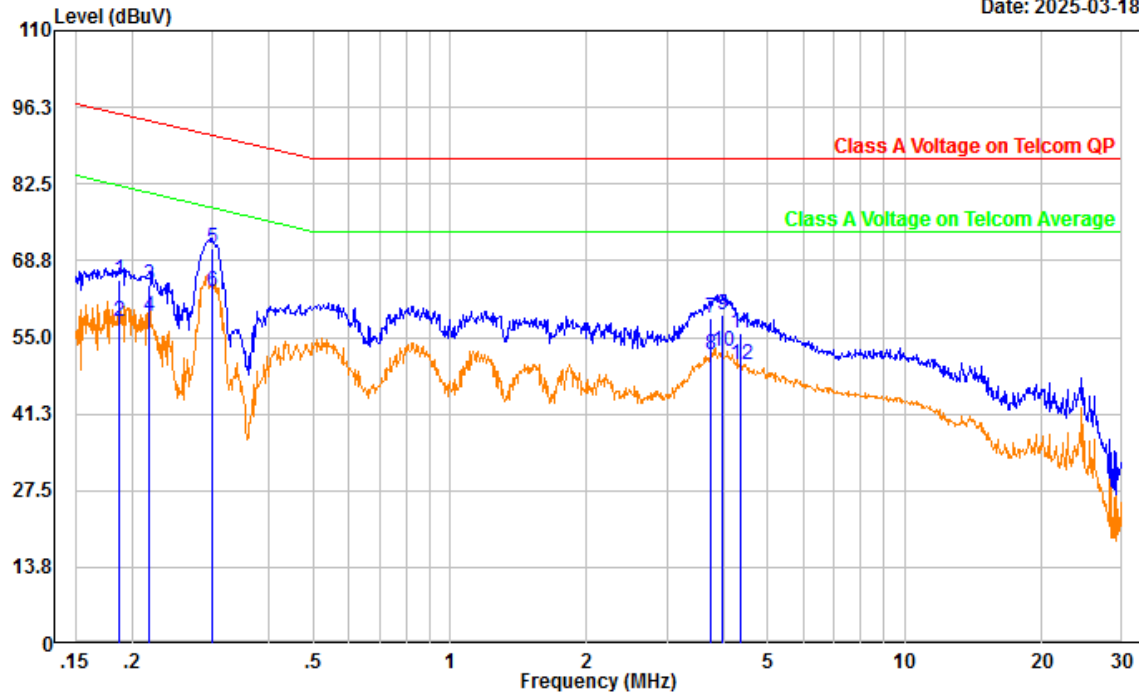


| No. | Frequency<br>(MHz) | Reading<br>(dBμV) | Factor<br>(dB) | Result<br>(dBμV) | Limit<br>(dBμV) | Margin<br>(dB) | Measurement |
|-----|--------------------|-------------------|----------------|------------------|-----------------|----------------|-------------|
| 1   | 0.166              | 54.07             | 10.15          | 64.22            | 96.15           | 31.93          | QP          |
| 2   | 0.166              | 46.85             | 10.15          | 57.00            | 83.15           | 26.15          | Average     |
| 3   | 0.185              | 54.92             | 10.10          | 65.02            | 95.25           | 30.23          | QP          |
| 4   | 0.185              | 47.92             | 10.10          | 58.02            | 82.25           | 24.23          | Average     |
| 5   | 0.216              | 54.64             | 10.02          | 64.66            | 93.96           | 29.30          | QP          |
| 6   | 0.216              | 48.44             | 10.02          | 58.46            | 80.96           | 22.50          | Average     |
| 7   | 0.299              | 61.25             | 9.82           | 71.07            | 91.26           | 20.19          | QP          |
| 8   | 0.299              | 53.54             | 9.82           | 63.36            | 78.26           | 14.90          | Average     |
| 9   | 3.839              | 49.50             | 9.56           | 59.06            | 87.00           | 27.94          | QP          |
| 10  | 3.839              | 42.78             | 9.56           | 52.34            | 74.00           | 21.66          | Average     |
| 11  | 3.939              | 49.44             | 9.56           | 59.00            | 87.00           | 28.00          | QP          |
| 12  | 3.939              | 42.93             | 9.56           | 52.49            | 74.00           | 21.51          | Average     |

Project No.: 2502R47809E-EM  
Tester: Yukin Qiu  
Note : M1

Serial No.: 2ZNT-1  
Test Mode: 100Mbps

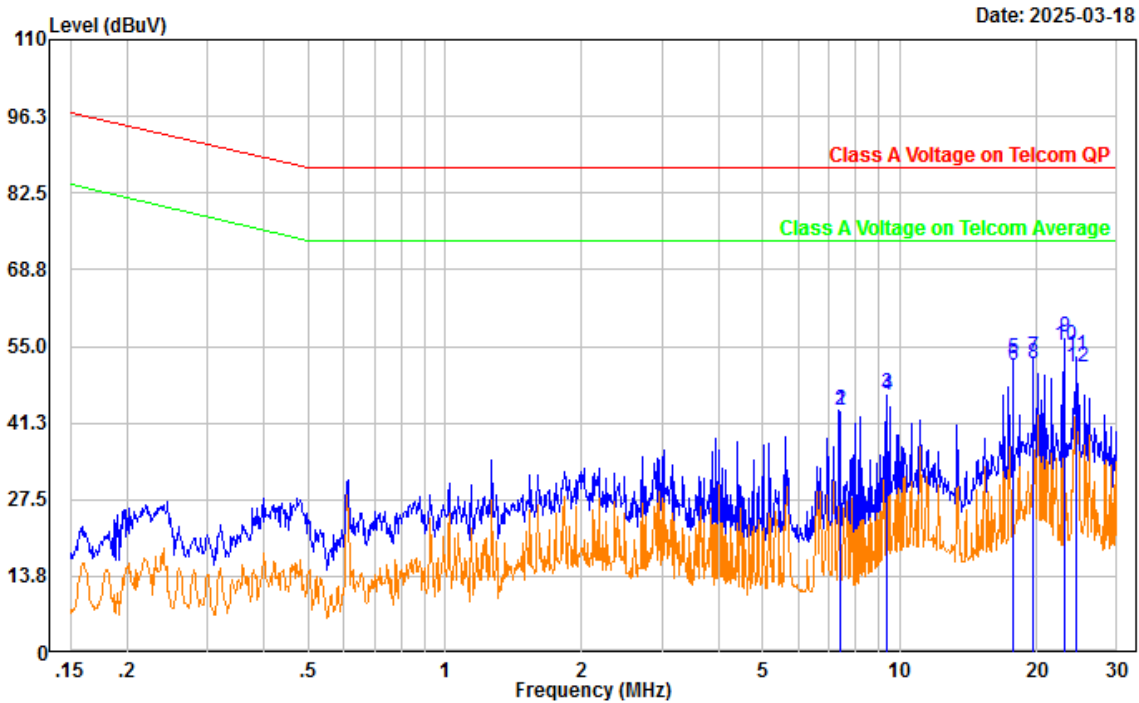
Date: 2025-03-18



| No. | Frequency (MHz) | Reading (dBμV) | Factor (dB) | Result (dBμV) | Limit (dBμV) | Margin (dB) | Measurement |
|-----|-----------------|----------------|-------------|---------------|--------------|-------------|-------------|
| 1   | 0.188           | 55.11          | 10.09       | 65.20         | 95.14        | 29.94       | QP          |
| 2   | 0.188           | 47.72          | 10.09       | 57.81         | 82.14        | 24.33       | Average     |
| 3   | 0.218           | 54.45          | 10.00       | 64.45         | 93.88        | 29.43       | QP          |
| 4   | 0.218           | 48.67          | 10.00       | 58.67         | 80.88        | 22.21       | Average     |
| 5   | 0.299           | 61.20          | 9.82        | 71.02         | 91.26        | 20.24       | QP          |
| 6   | 0.299           | 53.49          | 9.82        | 63.31         | 78.26        | 14.95       | Average     |
| 7   | 3.741           | 48.89          | 9.55        | 58.44         | 87.00        | 28.56       | QP          |
| 8   | 3.741           | 42.22          | 9.55        | 51.77         | 74.00        | 22.23       | Average     |
| 9   | 3.961           | 49.43          | 9.56        | 58.99         | 87.00        | 28.01       | QP          |
| 10  | 3.961           | 42.82          | 9.56        | 52.38         | 74.00        | 21.62       | Average     |
| 11  | 4.357           | 46.27          | 9.55        | 55.82         | 87.00        | 31.18       | QP          |
| 12  | 4.357           | 40.47          | 9.55        | 50.02         | 74.00        | 23.98       | Average     |

Project No.: 2502R47809E-EM  
Tester: Yukin Qiu  
Note : M2

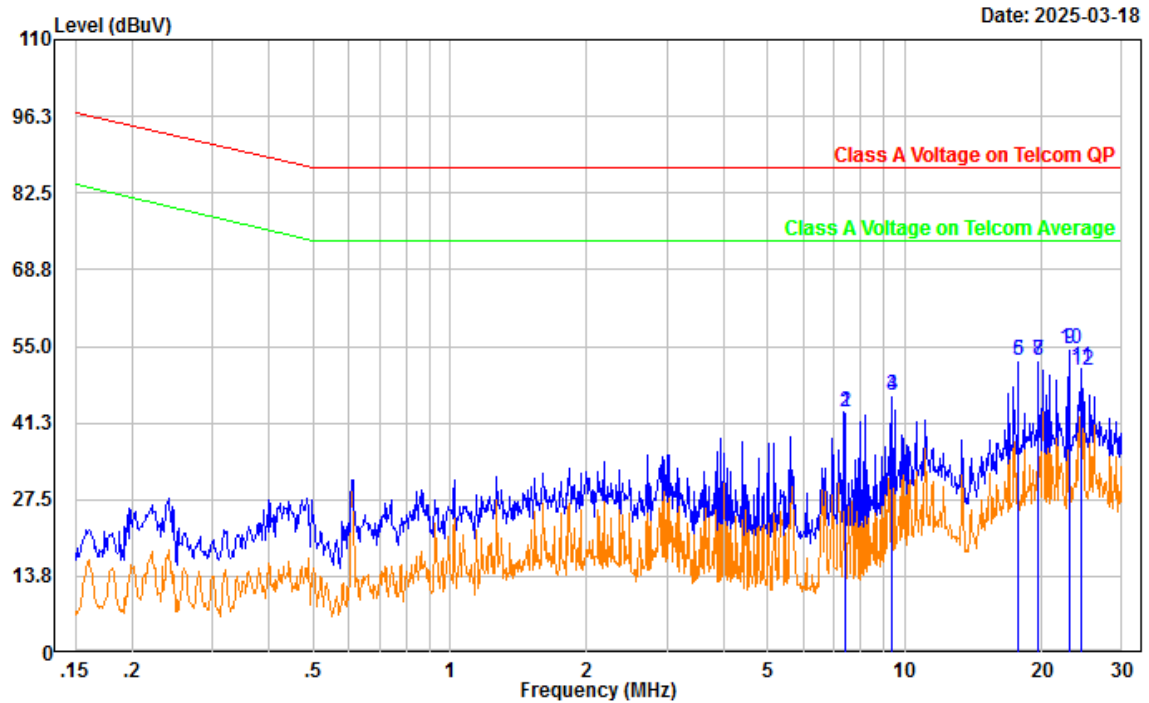
Serial No.: 2ZNT-1  
Test Mode: 10Mbps



| No. | Frequency (MHz) | Reading (dBμV) | Factor (dB) | Result (dBμV) | Limit (dBμV) | Margin (dB) | Measurement |
|-----|-----------------|----------------|-------------|---------------|--------------|-------------|-------------|
| 1   | 7.374           | 33.94          | 9.45        | 43.39         | 87.00        | 43.61       | QP          |
| 2   | 7.374           | 33.95          | 9.45        | 43.40         | 74.00        | 30.60       | Average     |
| 3   | 9.388           | 36.99          | 9.52        | 46.51         | 87.00        | 40.49       | QP          |
| 4   | 9.388           | 36.68          | 9.52        | 46.20         | 74.00        | 27.80       | Average     |
| 5   | 17.696          | 43.18          | 9.67        | 52.85         | 87.00        | 34.15       | QP          |
| 6   | 17.696          | 42.03          | 9.67        | 51.70         | 74.00        | 22.30       | Average     |
| 7   | 19.707          | 43.30          | 9.76        | 53.06         | 87.00        | 33.94       | QP          |
| 8   | 19.707          | 42.13          | 9.76        | 51.89         | 74.00        | 22.11       | Average     |
| 9   | 23.130          | 46.74          | 9.86        | 56.60         | 87.00        | 30.40       | QP          |
| 10  | 23.130          | 45.22          | 9.86        | 55.08         | 74.00        | 18.92       | Average     |
| 11  | 24.349          | 43.31          | 9.90        | 53.21         | 87.00        | 33.79       | QP          |
| 12  | 24.349          | 41.41          | 9.90        | 51.31         | 74.00        | 22.69       | Average     |

Project No.: 2502R47809E-EM  
Tester: Yukin Qiu  
Note : M2

Serial No.: 2ZNT-1  
Test Mode: 100Mbps



| No. | Frequency<br>(MHz) | Reading<br>(dBμV) | Factor<br>(dB) | Result<br>(dBμV) | Limit<br>(dBμV) | Margin<br>(dB) | Measurement |
|-----|--------------------|-------------------|----------------|------------------|-----------------|----------------|-------------|
| 1   | 7.374              | 33.79             | 9.45           | 43.24            | 87.00           | 43.76          | QP          |
| 2   | 7.374              | 33.90             | 9.45           | 43.35            | 74.00           | 30.65          | Average     |
| 3   | 9.389              | 36.66             | 9.52           | 46.18            | 87.00           | 40.82          | QP          |
| 4   | 9.389              | 36.72             | 9.52           | 46.24            | 74.00           | 27.76          | Average     |
| 5   | 17.694             | 42.87             | 9.67           | 52.54            | 87.00           | 34.46          | QP          |
| 6   | 17.694             | 42.71             | 9.67           | 52.38            | 74.00           | 21.62          | Average     |
| 7   | 19.710             | 42.83             | 9.76           | 52.59            | 87.00           | 34.41          | QP          |
| 8   | 19.710             | 42.72             | 9.76           | 52.48            | 74.00           | 21.52          | Average     |
| 9   | 23.130             | 44.62             | 9.86           | 54.48            | 87.00           | 32.52          | QP          |
| 10  | 23.130             | 44.65             | 9.86           | 54.51            | 74.00           | 19.49          | Average     |
| 11  | 24.350             | 41.42             | 9.90           | 51.32            | 87.00           | 35.68          | QP          |
| 12  | 24.350             | 40.75             | 9.90           | 50.65            | 74.00           | 23.35          | Average     |

## 2 - RADIATED EMISSIONS

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cisp}$  of Table 1, then:

- 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.

If  $U_{lab}$  is greater than  $U_{cisp}$  of Table 1, then:

- Compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cisp})$ , exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cisp})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2:2011<sup>\*</sup>, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB.

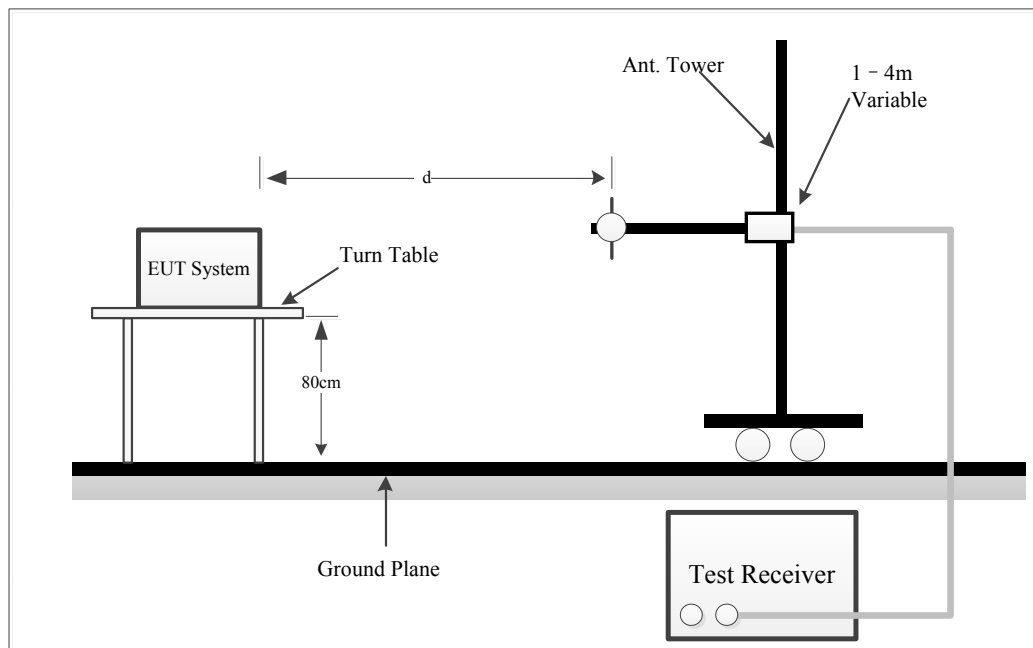
Table 1 - Values of  $U_{cisp}$

| Measurement  | $U_{cisp}$ |
|--|------------|
| Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz) | 6.3 dB     |
| Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)                   | 5.2 dB     |
| Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)                  | 5.5 dB     |

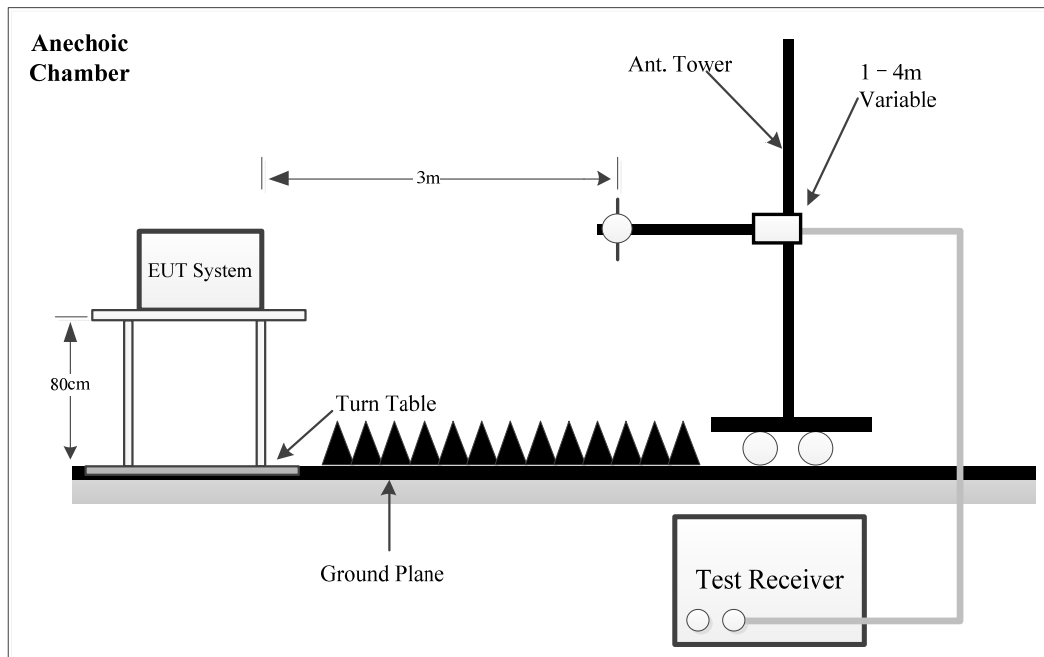
Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

### Test System Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests below 1GHz were performed in 3 meters, above 1GHz were performed in the 3 meters, using the setup accordance with the CISPR 16-1-1:2010+A1:2010+A2:2014<sup>\*</sup>, CISPR 16-1-4:2010 + A1:2012<sup>\*</sup>, CISPR 16-2-3:2010+A1:2010+A2:2014<sup>\*</sup>. The specification used was EN 55032 and BS EN 55032 Class A limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

## EMI Test Receiver and Spectrum Analyzer Setup

The system was investigated from 30 MHz to 6 GHz.

During the radiated emission test, the EMI test receiver(Below 1GHz) and Spectrum Analyzer(Above 1GHz) were set with the following configurations:

| Frequency Range   | RBW     | Video B/W | IF B/W | Measurement |
|-------------------|---------|-----------|--------|-------------|
| 30 MHz - 1000 MHz | 100 kHz | 300 kHz   | /      | Peak        |
|                   | /       | /         | 120kHz | QP          |
| Above 1 GHz       | 1 MHz   | 3 MHz     | /      | Peak        |
|                   | 1 MHz   | 10Hz      | /      | Ave.        |

## Test Procedure

During the radiated emissions, maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

If the maximized peak measured value complies with under the QP limit more than 6dB, it is unnecessary to perform QP measurement.

## Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$\text{Result} = \text{Meter Reading} + \text{Corrected}$$

Note:

$$\text{Corrected} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

Or

$$\text{Corrected} = \text{Antenna Factor} + \text{Cable Loss} + \text{Insertion loss of attenuator} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Result}$$



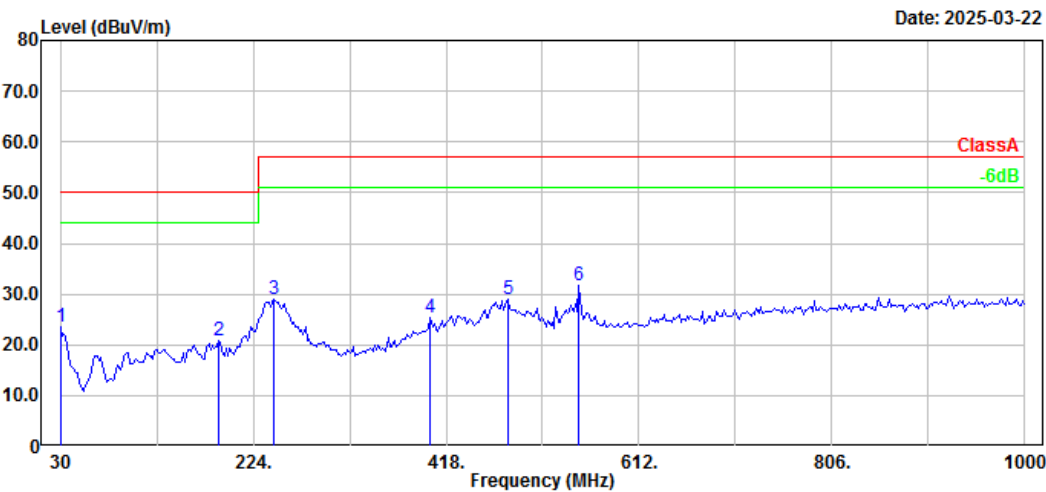
Test Data

Please refer to following table and plots:

Below 1G

Project No.: 2502R47809E-EM  
Polarization: Horizontal  
Test Mode: M1  
Note:

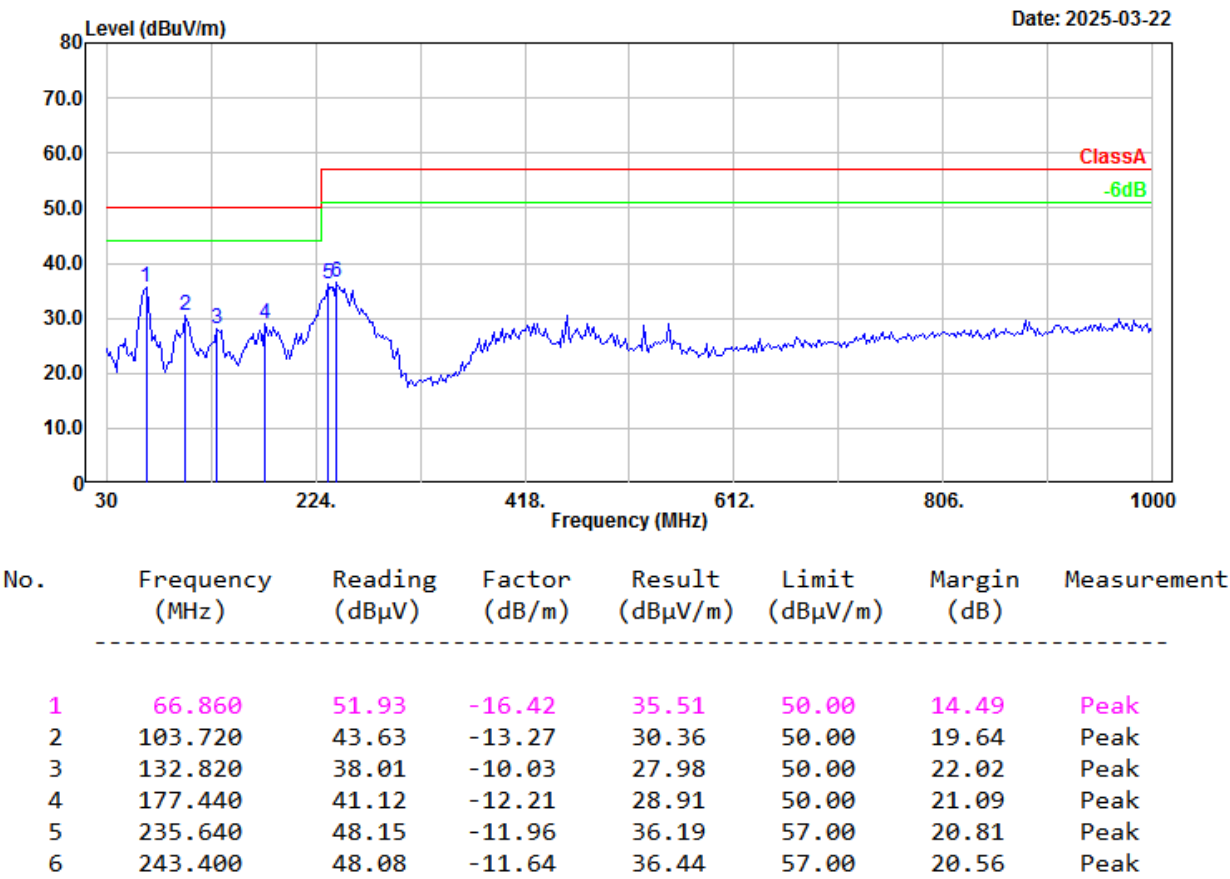
Serial No.: 2ZNT-1  
Tester: Willem Qiu



| No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Measurement |
|-----|-----------------|----------------|---------------|-----------------|----------------|-------------|-------------|
| 1   | 30.000          | 27.30          | -3.80         | 23.50           | 50.00          | 26.50       | Peak        |
| 2   | 189.080         | 33.07          | -12.15        | 20.92           | 50.00          | 29.08       | Peak        |
| 3   | 245.340         | 40.48          | -11.57        | 28.91           | 57.00          | 28.09       | Peak        |
| 4   | 402.480         | 32.28          | -6.91         | 25.37           | 57.00          | 31.63       | Peak        |
| 5   | 480.080         | 33.61          | -4.71         | 28.90           | 57.00          | 28.10       | Peak        |
| 6   | 551.860         | 35.26          | -3.41         | 31.85           | 57.00          | 25.15       | Peak        |

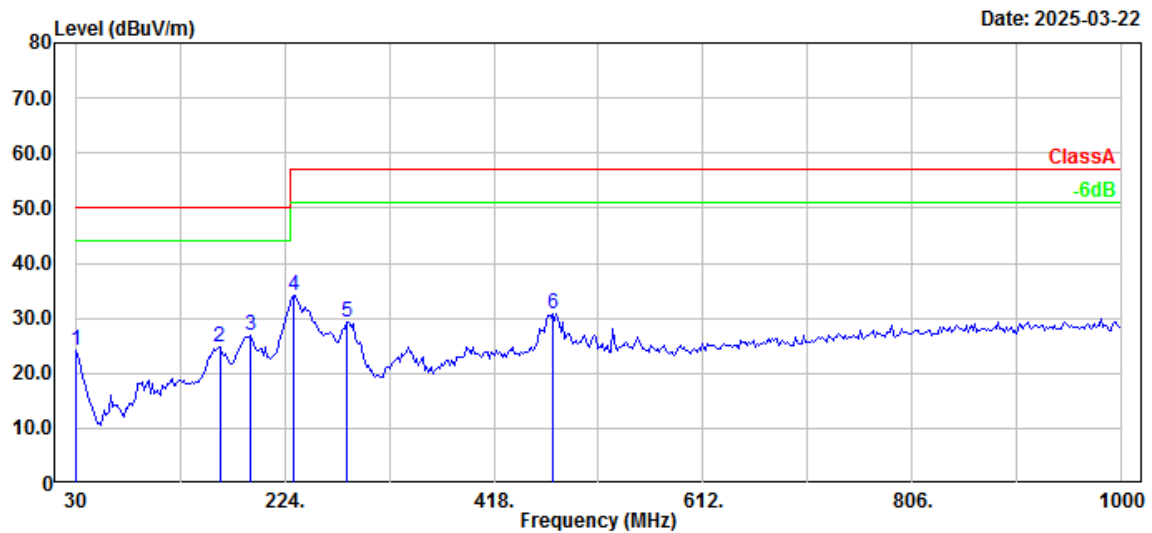
Project No.: 2502R47809E-EM  
Polarization: Vertical  
Test Mode: M1  
Note:

Serial No.: 2ZNT-1  
Tester: Willem Qiu



Project No.: 2502R47809E-EM  
Polarization: Horizontal  
Test Mode: M2  
Note:

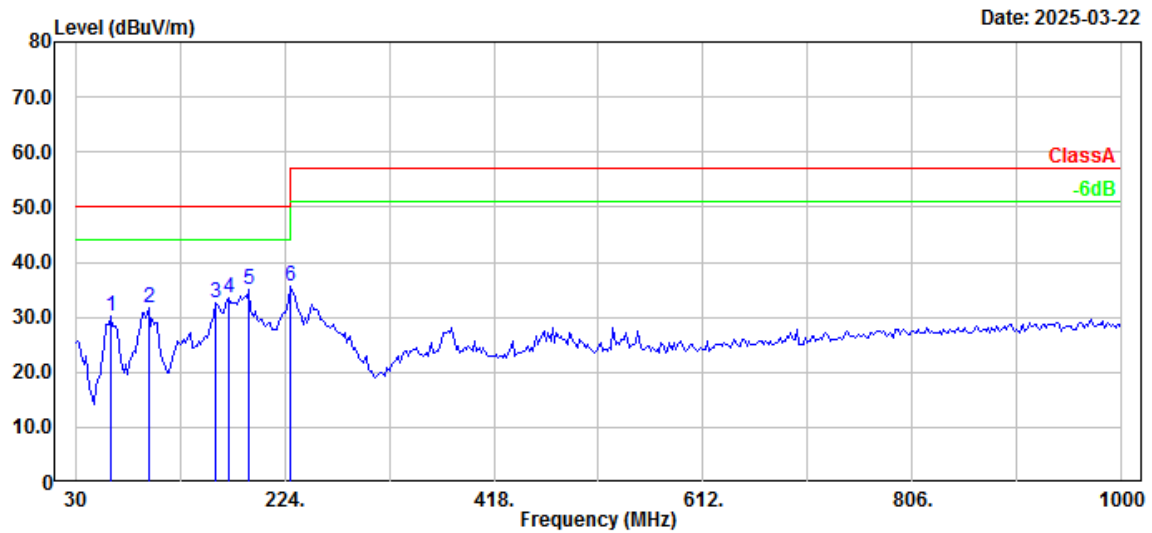
Serial No.: 2ZNT-1  
Tester: Willem Qiu



| No. | Frequency (MHz) | Reading (dBμV) | Factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Measurement |
|-----|-----------------|----------------|---------------|-----------------|----------------|-------------|-------------|
| 1   | 30.000          | 27.84          | -3.80         | 24.04           | 50.00          | 25.96       | Peak        |
| 2   | 163.860         | 36.01          | -11.39        | 24.62           | 50.00          | 25.38       | Peak        |
| 3   | 192.960         | 38.86          | -11.94        | 26.92           | 50.00          | 23.08       | Peak        |
| 4   | 231.760         | 46.39          | -12.14        | 34.25           | 57.00          | 22.75       | Peak        |
| 5   | 282.200         | 38.93          | -9.70         | 29.23           | 57.00          | 27.77       | Peak        |
| 6   | 472.320         | 35.68          | -4.87         | 30.81           | 57.00          | 26.19       | Peak        |

Project No.: 2502R47809E-EM  
Polarization: Vertical  
Test Mode: M2  
Note:

Serial No.: 2ZNT-1  
Tester: Willem Qiu

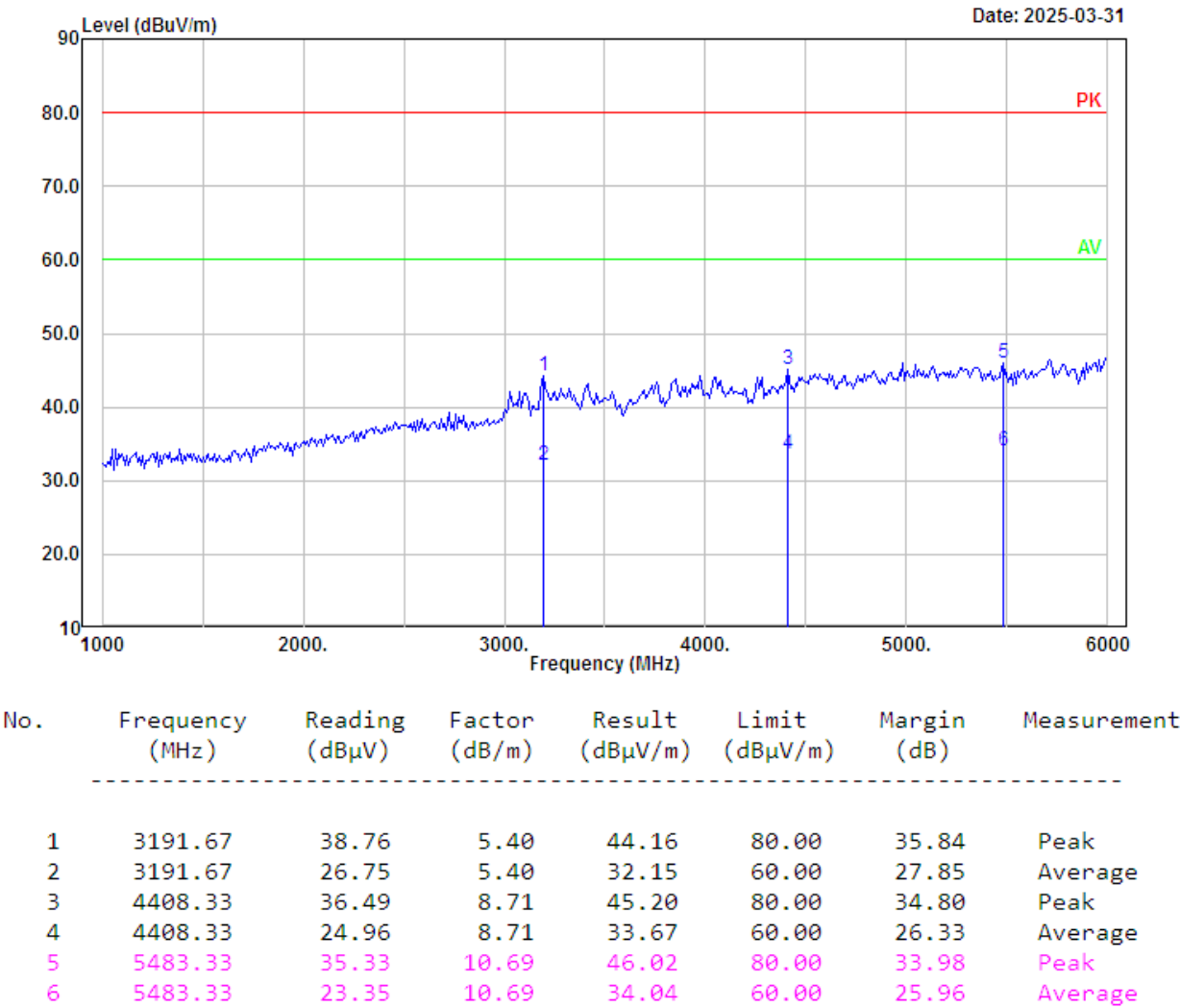


| No. | Frequency<br>(MHz) | Reading<br>(dBμV) | Factor<br>(dB/m) | Result<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) | Measurement |
|-----|--------------------|-------------------|------------------|--------------------|-------------------|----------------|-------------|
| 1   | 62.980             | 46.66             | -16.56           | 30.10              | 50.00             | 19.90          | Peak        |
| 2   | 97.900             | 46.65             | -14.83           | 31.82              | 50.00             | 18.18          | Peak        |
| 3   | 159.980            | 43.73             | -11.15           | 32.58              | 50.00             | 17.42          | Peak        |
| 4   | 171.620            | 45.50             | -11.87           | 33.63              | 50.00             | 16.37          | Peak        |
| 5   | 191.020            | 46.93             | -12.06           | 34.87              | 50.00             | 15.13          | Peak        |
| 6   | 229.820            | 47.86             | -12.23           | 35.63              | 50.00             | 14.37          | Peak        |

Above 1G

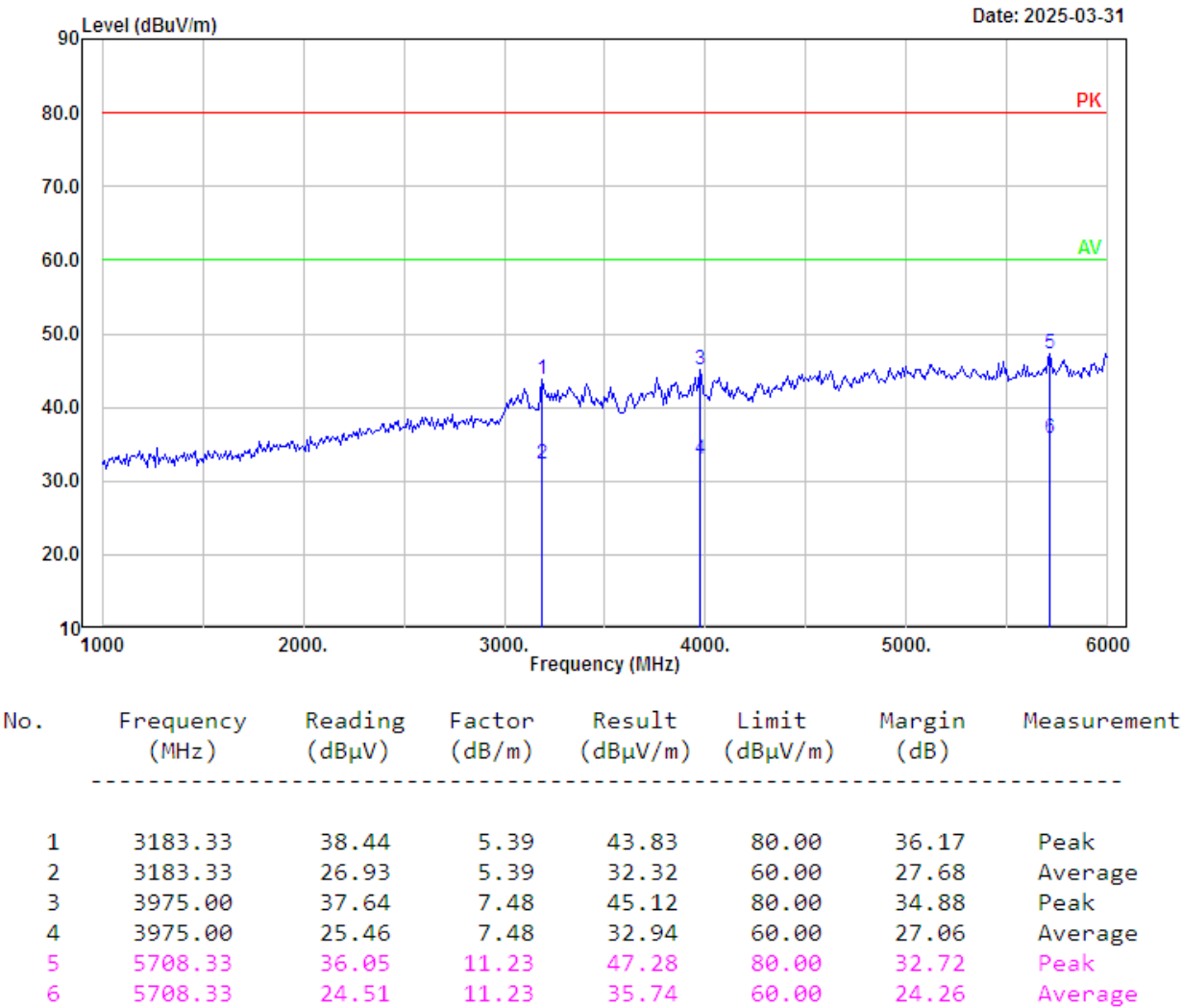
Project No.: 2502R47809E-EM  
Polarization: Horizontal  
Test Mode: M1  
Note:

Serial No.: 2ZNT-1  
Tester: Lancer Zhang



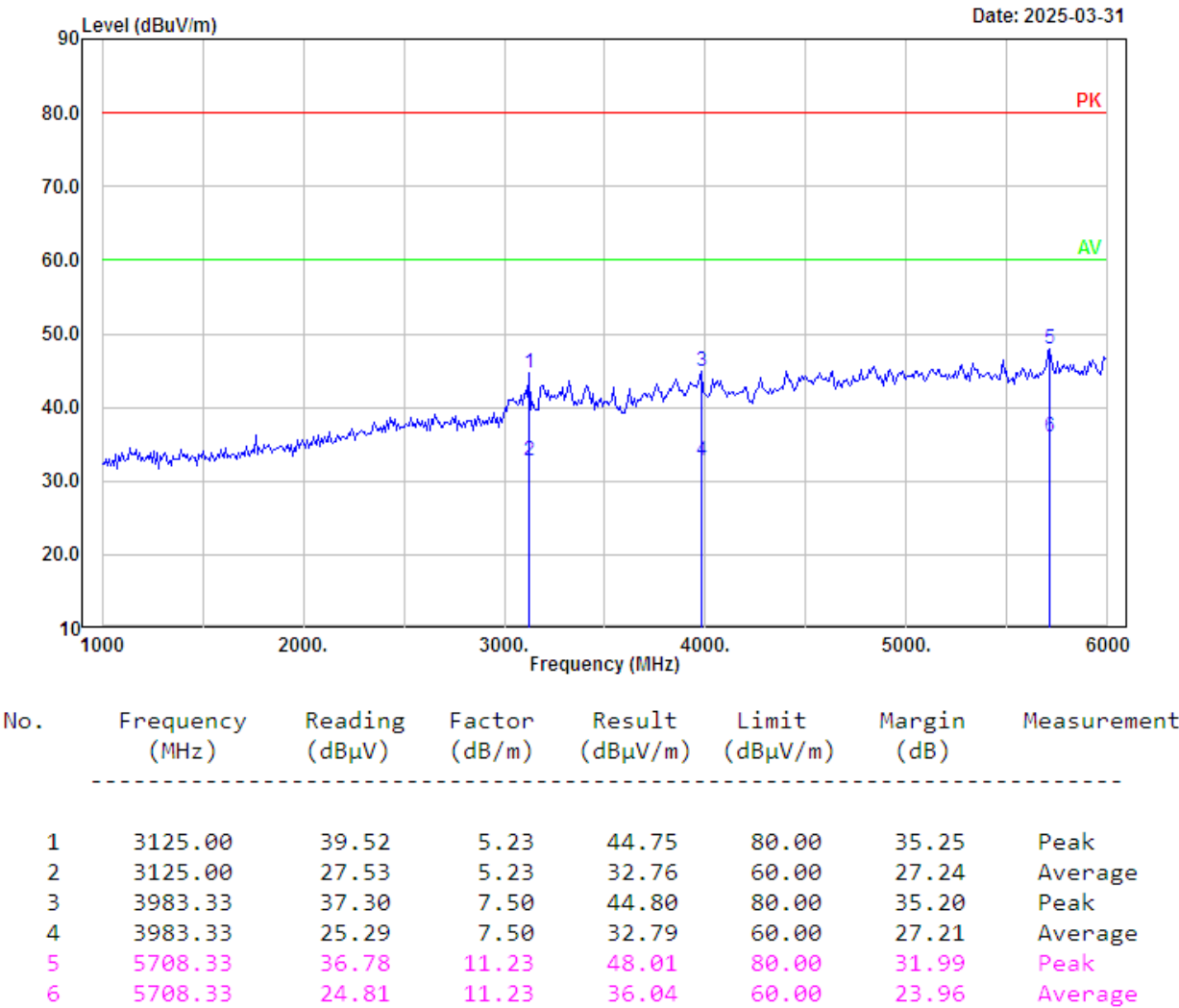
Project No.: 2502R47809E-EM  
Polarization: Vertical  
Test Mode: M1  
Note:

Serial No.: 2ZNT-1  
Tester: Lancer Zhang



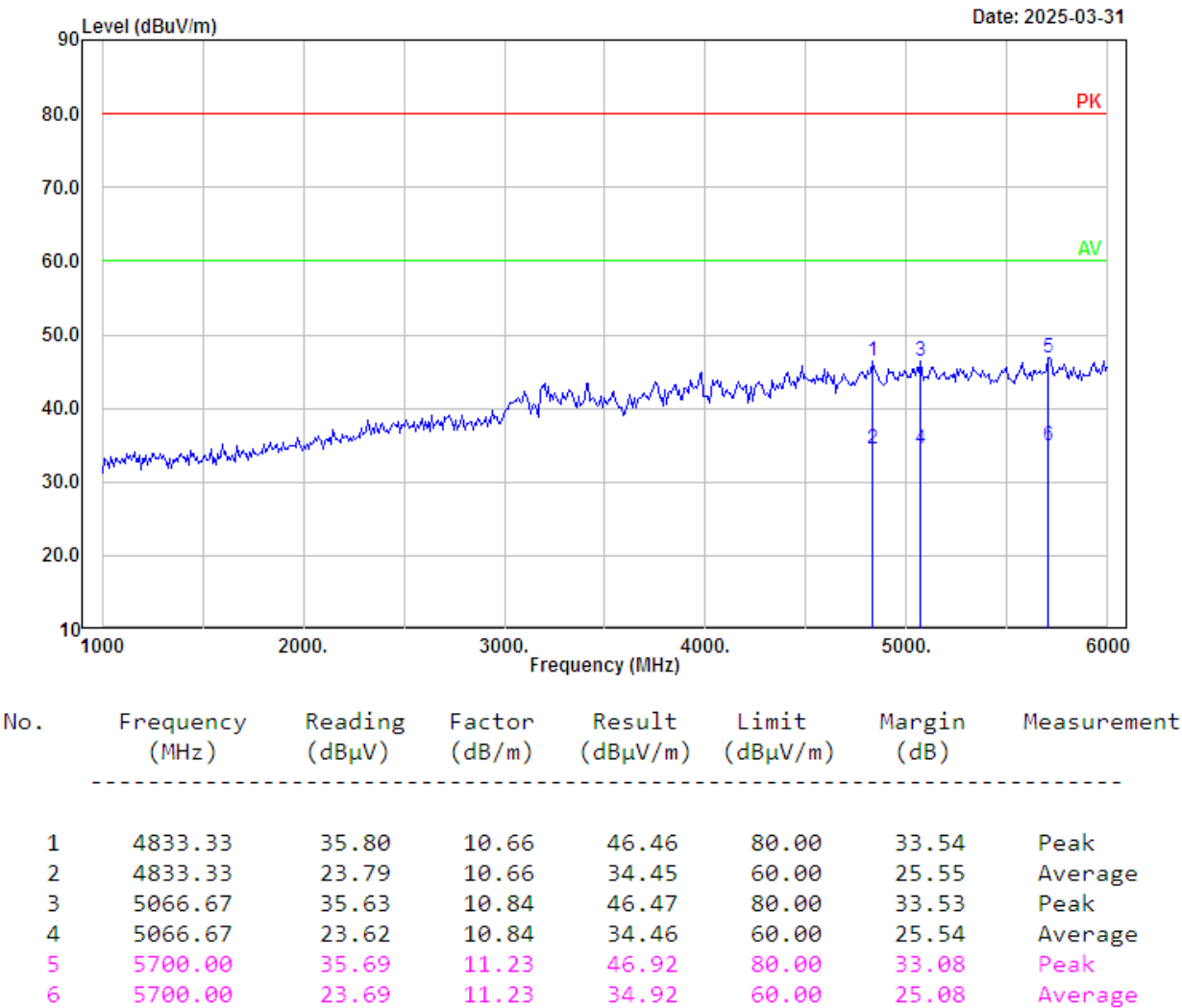
Project No.: 2502R47809E-EM  
Polarization: Horizontal  
Test Mode: M2  
Note:

Serial No.: 2ZNT-1  
Tester: Lancer Zhang



Project No.: 2502R47809E-EM  
Polarization: Vertical  
Test Mode: M2  
Note:

Serial No.: 2ZNT-1  
Tester: Lancer Zhang





### 3 - ELECTROSTATIC DISCHARGES IEC 61000-4-2

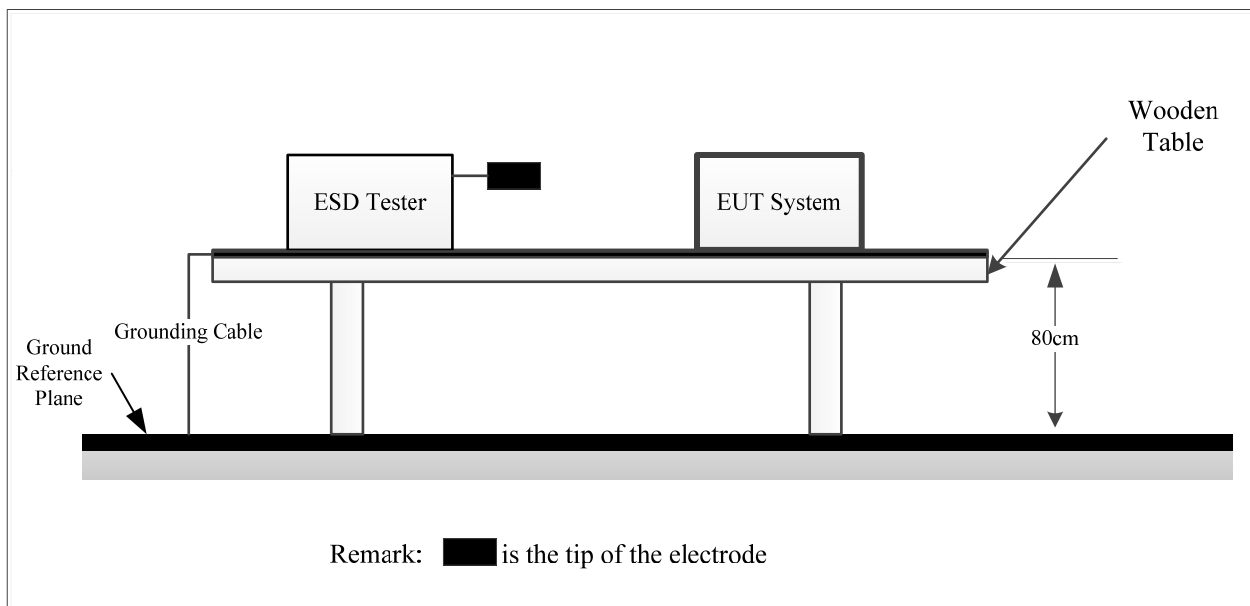
#### Measurement Uncertainty

$U_{lab}$  (measurement uncertainty of lab) and  $U_{EN}$  (measurement uncertainty of EN 61000-4-2) please refer to the following:

| Parameter          | $U_{EN}$    | $U_{lab}$ |
|--------------------|-------------|-----------|
| Rise time $t_r$    | $\leq 15\%$ | 15%       |
| Peak current $I_p$ | $\leq 7\%$  | 6.3%      |
| Current at 30 ns   | $\leq 7\%$  | 6.3%      |
| Current at 60 ns   | $\leq 7\%$  | 6.3%      |

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

#### Test System Setup



IEC61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on an insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

#### Test Standard

EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 (IEC 61000-4-2:2008)

Test level 3 for Air Discharge at  $\pm 8$  kV

Test level 2 for Contact Discharge at  $\pm 4$  kV

**Test Level**

| Level | Test Voltage<br>Contact Discharge (±kV) | Test Voltage<br>Air Discharge (±kV) |
|-------|---|-------------------------------------|
| 1.    | 2                                       | 2                                   |
| 2.    | 4                                       | 4                                   |
| 3.    | 6                                       | 8                                   |
| 4.    | 8                                       | 15                                  |
| X.    | Special                                 | Special                             |

**Performance criteria: B**

**Test Procedure****Air Discharge:**

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

**Contact Discharge:**

All the procedure shall be same as Section 8.3.1 of IEC 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

**Indirect discharge for horizontal coupling plane:**

At least 10 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

**Indirect discharge for vertical coupling plane:**

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

## Test Data

Please refer to following tables:

**Test Mode:** M1-M2

**Note:**

**Table 1: Electrostatic Discharge Immunity (Air Discharge)**

| Test Points Location                      | Test Level |       |       |       |       |       |        |        |
|---|------------|-------|-------|-------|-------|-------|--------|--------|
|   | -2 kV      | +2 kV | -4 kV | +4 kV | -8 kV | +8 kV | -15 kV | +15 kV |
| Non-metallic Shell                        | A          | A     | A     | A     | A     | A     | /      | /      |
| RJ45 Port                                 | A          | A     | A     | A     | A     | A     | /      | /      |
| DC Port                                   | A          | A     | A     | A     | A     | A     | /      | /      |
| Camera                                    | A          | A     | A     | A     | A     | A     | /      | /      |
| Seam                                      | A          | A     | A     | A     | A     | A     | /      | /      |
| Required Performance Criteria:B           |            |       |       |       |       |       |        |        |
| Description of Performance reduction: N/A |            |       |       |       |       |       |        |        |

**Table 2: Electrostatic Discharge Immunity (Direct Contact)**

| Test Points Location                      | Test Level |       |       |       |       |       |       |       |
|---|------------|-------|-------|-------|-------|-------|-------|-------|
|   | -2 kV      | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| Metal shell                               | A          | A     | A     | A     | /     | /     | /     | /     |
| Required Performance Criteria:B           |            |       |       |       |       |       |       |       |
| Description of Performance reduction: N/A |            |       |       |       |       |       |       |       |

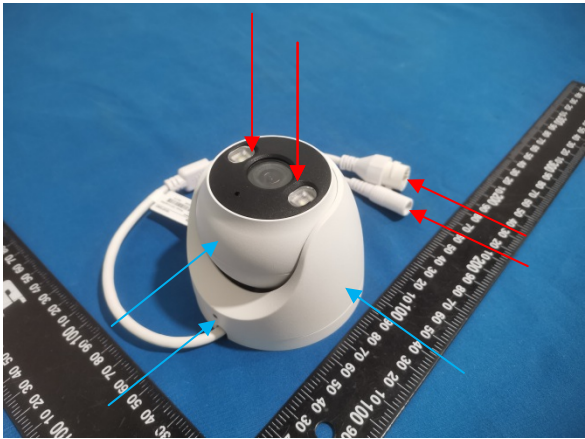
**Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)**


| Test Points Location                      | Test Level |       |       |       |       |       |       |       |
|---|------------|-------|-------|-------|-------|-------|-------|-------|
|   | -2 kV      | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| Front Side                                | A          | A     | A     | A     | /     | /     | /     | /     |
| Back Side                                 | A          | A     | A     | A     | /     | /     | /     | /     |
| Left Side                                 | A          | A     | A     | A     | /     | /     | /     | /     |
| Right Side                                | A          | A     | A     | A     | /     | /     | /     | /     |
| Top Side                                  | A          | A     | A     | A     | /     | /     | /     | /     |
| Bottom Side                               | A          | A     | A     | A     | /     | /     | /     | /     |
| Required Performance Criteria:B           |            |       |       |       |       |       |       |       |
| Description of Performance reduction: N/A |            |       |       |       |       |       |       |       |


**Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)**

| Test Points Location                      | Test Level |       |       |       |       |       |       |       |
|---|------------|-------|-------|-------|-------|-------|-------|-------|
|   | -2 kV      | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV |
| Front Side                                | A          | A     | A     | A     | /     | /     | /     | /     |
| Back Side                                 | A          | A     | A     | A     | /     | /     | /     | /     |
| Left Side                                 | A          | A     | A     | A     | /     | /     | /     | /     |
| Right Side                                | A          | A     | A     | A     | /     | /     | /     | /     |
| Required Performance Criteria:B           |            |       |       |       |       |       |       |       |
| Description of Performance reduction: N/A |            |       |       |       |       |       |       |       |

ESD Location Photo



Air Discharge: 

Direct Contact: 

4 - CONTINUOUS RADIATED DISTURBANCES IEC 61000-4-3

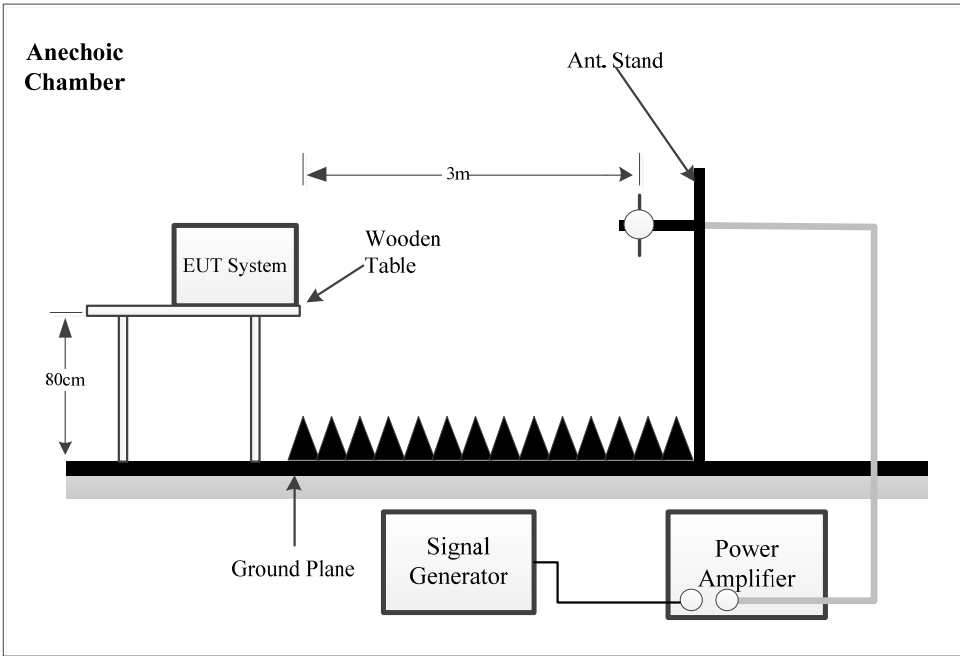
Measurement Uncertainty

$U_{lab}$  (measurement uncertainty of lab) and  $U_{EN}$  (measurement uncertainty of EN 61000-4-3) please refer to the following:

| Parameter           | $U_{EN}$ | $U_{lab}$ |
|---------------------|----------|-----------|
| Calibration process | 1.88 dB  | 1.88 dB   |
| Level setting       | 2.19 dB  | 2.19 dB   |

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



Test Standard

EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020  
(IEC 61000-4-3:2006+A1:2007+A2:2010★)  
Test level 2 at 3V/ m (80MHz to 1GHz)  
Test level 2 at 3V/ m (1.8GHz, 2.6GHz, 3.5GHz, 5GHz)

**Test Level**

| Level | Field Strength V/m |
|-------|--------------------|
| 1.    | 1                  |
| 2.    | 3                  |
| 3.    | 10                 |
| X.    | Special            |

**Performance criteria: A**

- A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacture as a permissible loss of performance.
- B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.
- C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.
- D. The apparatus is broken, cannot be normal operated.

**Test Procedure**

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera was used to monitor the EUT.

**Test Data**

Please refer to following tables:

**Test Mode:** M1-M2

**Note:**

| Condition of Test    | Remarks                  |
|----------------------|--------------------------|
| Field Strength       | 3V/m                     |
| RF Signal            | 1 kHz, 80% AM, sine wave |
| Sweep Frequency Step | 1 %, logarithmic         |
| Dwell Time           | 1 Sec                    |

**Table 1: Radiated RF-Electromagnetic Field Immunity, Swept Test**

| Frequency Range (MHz)                     | Front Side |      | Rear Side |      | Left Side |      | Right Side |      | Top Side |      | Bottom Side |      |
|---|------------|------|-----------|------|-----------|------|------------|------|----------|------|-------------|------|
|   | VERT       | HORI | VERT      | HORI | VERT      | HORI | VERT       | HORI | VERT     | HORI | VERT        | HORI |
| 80-1000                                   | A          | A    | A         | A    | A         | A    | A          | A    | A        | A    | A           | A    |
| Required Performance Criteria: A          |            |      |           |      |           |      |            |      |          |      |             |      |
| Description of Performance reduction: N/A |            |      |           |      |           |      |            |      |          |      |             |      |

**Table 2: Radiated RF-Electromagnetic Field Immunity, Spot Test**

| Spot Test Frequency (MHz)                 | Front Side |      | Rear Side |      | Left Side |      | Right Side |      | Top Side |      | Bottom Side |      |
|---|------------|------|-----------|------|-----------|------|------------|------|----------|------|-------------|------|
|   | VERT       | HORI | VERT      | HORI | VERT      | HORI | VERT       | HORI | VERT     | HORI | VERT        | HORI |
| 1800, 2600, 3500, 5000                    | A          | A    | A         | A    | A         | A    | A          | A    | A        | A    | A           | A    |
| Required Performance Criteria: A          |            |      |           |      |           |      |            |      |          |      |             |      |
| Description of Performance reduction: N/A |            |      |           |      |           |      |            |      |          |      |             |      |

## 5 - CONTINUOUS CONDUCTED DISTURBANCES IEC 61000-4-6

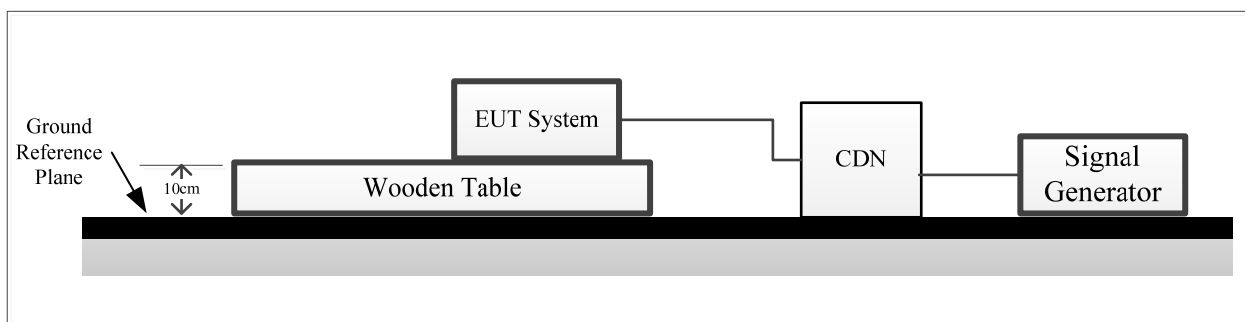
### Measurement Uncertainty

$U_{lab}$  (measurement uncertainty of lab) and  $U_{EN}$  (measurement uncertainty of EN 61000-4-6) please refer to the following:

| Parameter               | $U_{EN}$ | $U_{lab}$ |
|-------------------------|----------|-----------|
| CDN calibration process | 1.27 dB  | 1.27 dB   |
| CDN test process        | 1.36 dB  | 1.36 dB   |

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

### Test Setup



### Test Standard

EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 (IEC 61000-4-6:2008\*)

Test level 2 at 3 V (r.m.s.), 0.15MHz ~ 10MHz,

Test level 3-1 V (r.m.s.), 10MHz ~ 30MHz,

Test level 1 at 1 V (r.m.s.), 30MHz ~ 80MHz,

### Test Level

| Level | Voltage Level (r.m.s.) (V) |
|-------|----------------------------|
| 1     | 1                          |
| 2     | 3                          |
| 3     | 10                         |
| X     | Special                    |

Performance criteria: A



## Test Procedure

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s.
- 7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

## Test Data

Please refer to following tables:

**Test Mode: M1-M2**

**Note:**

**Table 1: AC mains power input port**

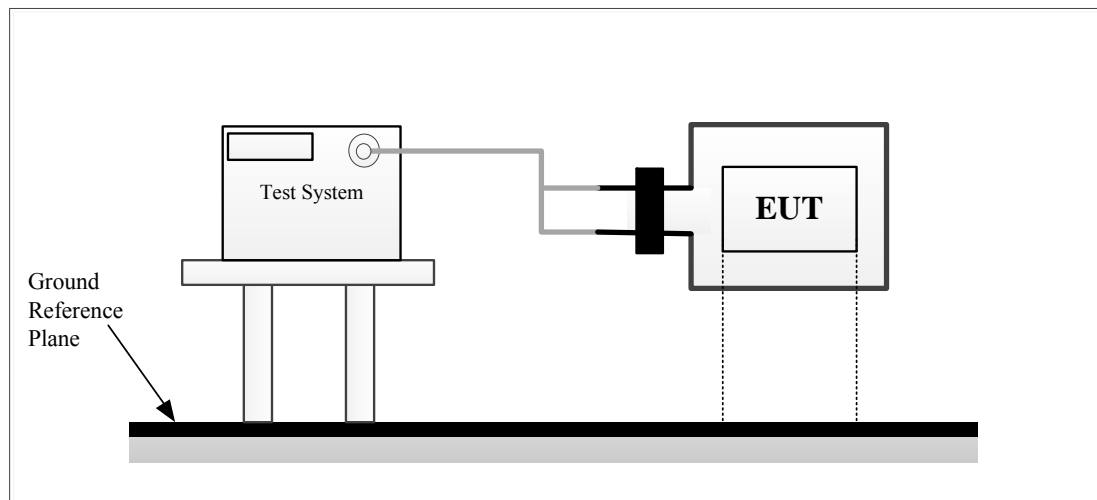
| Signal Type  | Frequency Range (MHz) | Voltage Level (r.m.s.) | Perform Criterion |
|--|-----------------------|------------------------|-------------------|
| Modulation: Amplitude<br>80%, 1kHz sine wave<br>Dwell Time 1 Sec | 0.15-10               | 3V                     | A                 |
|  | 10-30                 | 3V-1V                  | A                 |
|  | 30-80                 | 1V                     | A                 |
| Required Performance Criteria: A                                 |                       |                        |                   |
| Description of Performance reduction: N/A                        |                       |                        |                   |

**Table 2: Signal Port :PoE**

| Signal Type  | Frequency Range (MHz) | Voltage Level (r.m.s.) | Perform Criterion |
|--|-----------------------|------------------------|-------------------|
| Modulation: Amplitude<br>80%, 1kHz sine wave<br>Dwell Time 1 Sec | 0.15-10               | 3V                     | A                 |
|  | 10-30                 | 3V-1V                  | A                 |
|  | 30-80                 | 1V                     | A                 |
| Required Performance Criteria: A                                 |                       |                        |                   |
| Description of Performance reduction: N/A                        |                       |                        |                   |

## 6 - POWER FREQUENCY MAGNETIC FIELDS IEC 61000-4-8

### Test Setup



### Test Standard

EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 (IEC 61000-4-8:2009)  
Test level 1 at 1A/ m

### Test Level

| Level | Magnetic Field Strength A/m |
|-------|-----------------------------|
| 1     | 1                           |
| 2     | 3                           |
| 3     | 10                          |
| 4     | 30                          |
| 5     | 100                         |
| X.    | Special                     |

**Performance criteria: A**

### Test Procedure

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m\*1m). The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

Test Data

Please refer to following tables:

Test Mode: M1-M2

Note:

| Level                                     | Magnetic Field Strength<br>(A/m) | X<br>(Horizontal) | Y<br>(Vertical) | Z<br>(Special) |
|---|----------------------------------|-------------------|-----------------|----------------|
| 1   | 1                                | A                 | A               | A              |
| 2   | 3                                | /                 | /               | /              |
| 3   | 10                               | /                 | /               | /              |
| 4   | 30                               | /                 | /               | /              |
| 5   | 100                              | /                 | /               | /              |
| X   | Special                          | /                 | /               | /              |
| Required Performance Criteria: A          |                                  |                   |                 |                |
| Description of Performance reduction: N/A |                                  |                   |                 |                |

7 - ELECTRICAL FAST TRANSIENTS/BURST IEC 61000-4-4

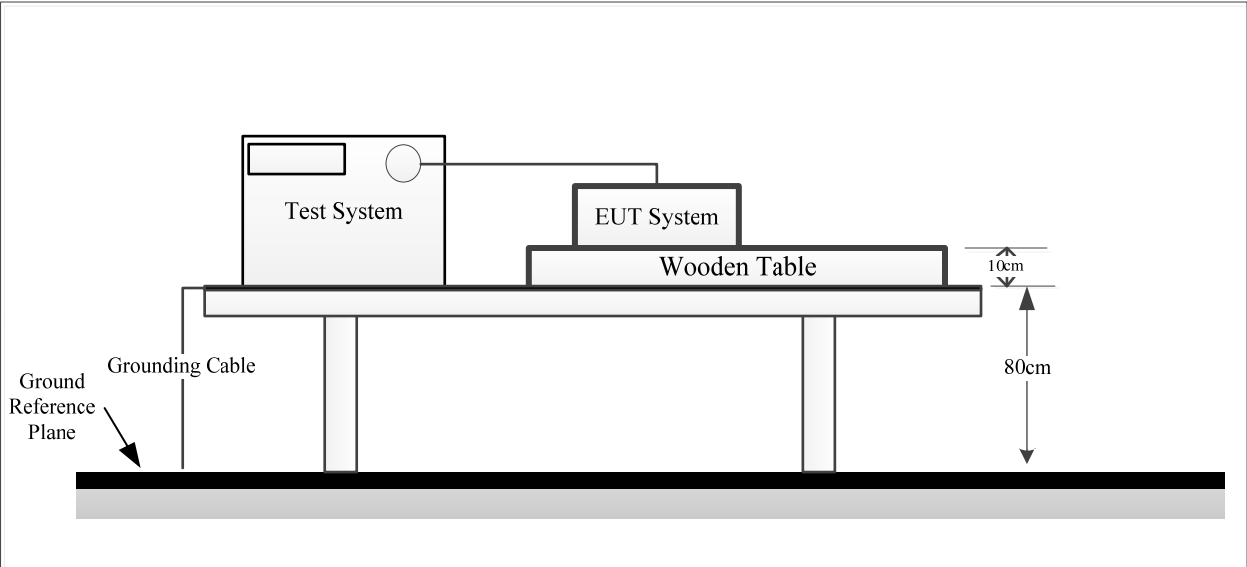
Measurement Uncertainty

$U_{lab}$  (measurement uncertainty of lab) and  $U_{EN}$  (measurement uncertainty of EN 61000-4-4) please refer to the following:

| Parameter                 | $U_{EN}$ | $U_{lab}$ |
|---------------------------|----------|-----------|
| Rise time $t_r$           | 6.20%    | 6.20%     |
| Peak voltage value $V_p$  | 8.60%    | 8.60%     |
| Voltage pulse width $t_w$ | 5.90%    | 5.90%     |

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



Test Standard

EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 (IEC 61000-4-4:2012)  
AC mains: Test level 2 at 1 kV  
Signal port: Test level 2 at 0.5 kV

**Test Level**

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

**Performance criteria: B****Test Procedure**

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

**Test Data**

*Please refer to following tables:*

**Test Mode:** M1

**Note:**

**AC Mains Power Input Ports**

| Test Line                                 | Test Level (kV) |      |      |      |      |      |      |      |
|---|-----------------|------|------|------|------|------|------|------|
|   | +0.5            | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| L   | A               | A    | A    | A    | /    | /    | /    | /    |
| N   | A               | A    | A    | A    | /    | /    | /    | /    |
| Earth                                     | /               | /    | /    | /    | /    | /    | /    | /    |
| L+N                                       | A               | A    | A    | A    | /    | /    | /    | /    |
| L + Earth                                 | /               | /    | /    | /    | /    | /    | /    | /    |
| N + Earth                                 | /               | /    | /    | /    | /    | /    | /    | /    |
| L+N+Earth                                 | /               | /    | /    | /    | /    | /    | /    | /    |
| Required Performance Criteria: B          |                 |      |      |      |      |      |      |      |
| Description of Performance reduction: N/A |                 |      |      |      |      |      |      |      |

**Signal Ports:**

| Test Ports  | Test Level (kV) |      |      |      |      |      |      |      |
|---|-----------------|------|------|------|------|------|------|------|
|   | +0.5            | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| RJ45  | A               | A    | /    | /    | /    | /    | /    | /    |
| Required Performance Criteria: B<br>Description of Performance reduction: N/A |                 |      |      |      |      |      |      |      |

Test Mode: M2

Note:

**AC Mains Power Input Ports**

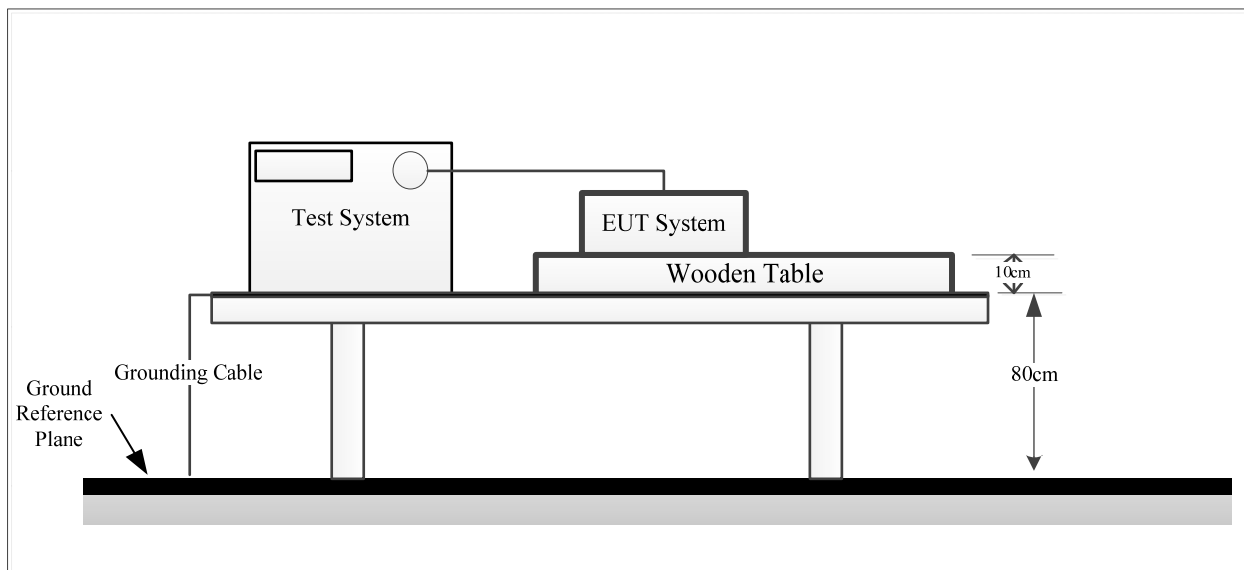
| Test Line   | Test Level (kV) |      |      |      |      |      |      |      |
|---|-----------------|------|------|------|------|------|------|------|
|   | +0.5            | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| L   | A               | A    | A    | A    | /    | /    | /    | /    |
| N   | A               | A    | A    | A    | /    | /    | /    | /    |
| Earth   | A               | A    | A    | A    | /    | /    | /    | /    |
| L+N   | A               | A    | A    | A    | /    | /    | /    | /    |
| L + Earth   | A               | A    | A    | A    | /    | /    | /    | /    |
| N + Earth   | A               | A    | A    | A    | /    | /    | /    | /    |
| L+N+Earth   | A               | A    | A    | A    | /    | /    | /    | /    |
| Required Performance Criteria: B<br>Description of Performance reduction: N/A |                 |      |      |      |      |      |      |      |

**Signal Ports:**

| Test Ports  | Test Level (kV) |      |      |      |      |      |      |      |
|---|-----------------|------|------|------|------|------|------|------|
|   | +0.5            | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| PoE   | A               | A    | /    | /    | /    | /    | /    | /    |
| Required Performance Criteria: B<br>Description of Performance reduction: N/A |                 |      |      |      |      |      |      |      |

## 8 - SURGES IEC 61000-4-5

### Test System Setup



### Test Standard

EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 (IEC 61000-4-5:2005★)

AC Mains: L-N: Test level 3 at 1kV, Line-Ground: Test level 3 at 2kV

Signal port: Test level 2 at 1kV

### Test Level

| Level | Open-circuit test voltage $\pm 10\%$ |                |
|-------|--------------------------------------|----------------|
|       | kV                                   |                |
|       | Line-to-line                         | Line-to-ground |
| 1     | N/A                                  | 0.5            |
| 2     | 0.5                                  | 1              |
| 3     | 1                                    | 2              |
| 4     | 2                                    | 4              |
| X     | Special                              | Special        |

### Performance criteria: B

### Test Procedure

- 1) Provide disturbance signal described below is injected to EUT.
- 2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 3) Different phase angles are done individually.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

**Test Data**

Please refer to following tables:

Test Mode: M1

Note:

**Table 1: AC mains power input port**

| No.                                       | Voltage | Poll | Path | Phase Angle | Perform<br>Criterion |
|---|---------|------|------|-------------|----------------------|
| 1   | 0.5kV   | +    | L- N | 90          | A                    |
| 1   | 0.5kV   | -    | L- N | 270         | A                    |
| 2   | 1kV     | +    | L- N | 90          | A                    |
| 2   | 1kV     | -    | L- N | 270         | A                    |
| Required Performance Criteria: B          |         |      |      |             |                      |
| Description of Performance reduction: N/A |         |      |      |             |                      |

**Table 2: PoE I/O Circuit and Lines**

| No.                                       | Voltage | Poll | Path        | Perform<br>Criterion |
|---|---------|------|-------------|----------------------|
| 1   | 0.5kV   | ±    | Line-Ground | A                    |
| 2   | 1kV     | ±    | Line-Ground | A                    |
| Required Performance Criteria: C          |         |      |             |                      |
| Description of Performance reduction: N/A |         |      |             |                      |



Test Mode: M2

Note:

Table 1: AC mains power input port

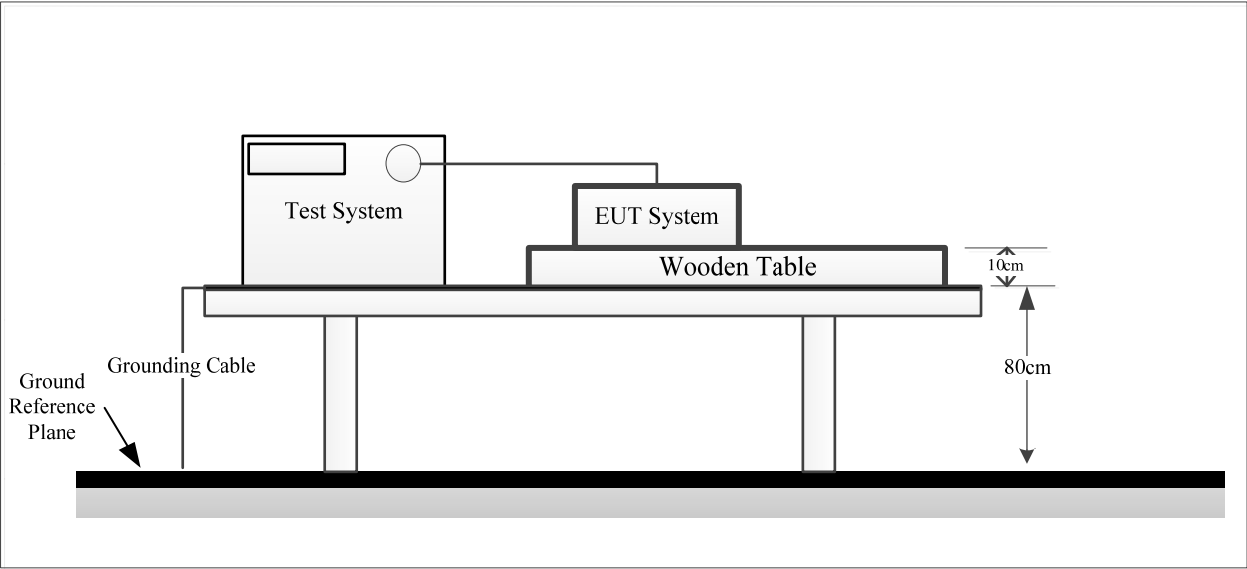
| No.                                       | Voltage | Poll | Path      | Phase Angle | Perform Criterion |
|---|---------|------|-----------|-------------|-------------------|
| 1   | 0.5kV   | +    | L- N, L-G | 90          | A                 |
| 1   | 0.5kV   | -    | L- N, L-G | 270         | A                 |
| 1   | 0.5kV   | -    | N-G       | 90          | A                 |
| 1   | 0.5kV   | +    | N-G       | 270         | A                 |
| 2   | 1kV     | +    | L- N, L-G | 90          | A                 |
| 2   | 1kV     | -    | L- N, L-G | 270         | A                 |
| 2   | 1kV     | -    | N-G       | 90          | A                 |
| 2   | 1kV     | +    | N-G       | 270         | A                 |
| 3   | 2kV     | +    | L-G       | 90          | A                 |
| 3   | 2kV     | -    | L-G       | 270         | A                 |
| 3   | 2kV     | -    | N-G       | 90          | A                 |
| 3   | 2kV     | +    | N-G       | 270         | A                 |
| Required Performance Criteria: B          |         |      |           |             |                   |
| Description of Performance reduction: N/A |         |      |           |             |                   |

Table 2: PoE I/O Circuit and Lines

| No.                                       | Voltage | Poll | Path        | Perform Criterion |
|---|---------|------|-------------|-------------------|
| 1   | 0.5kV   | ±    | Line-Ground | A                 |
| 2   | 1kV     | ±    | Line-Ground | A                 |
| Required Performance Criteria: C          |         |      |             |                   |
| Description of Performance reduction: N/A |         |      |             |                   |

9 -VOLTAGE DIPS AND SHORT INTERRUPTIONS IEC 61000-4-11

Test Setup



Test Standard

EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 (IEC 61000-4-11:2004★)

Test levels and Performance Criterion

Test Level

| Test Level | U2 (% Reduction) | Duration (Periods) | Performance Criteria |
|------------|------------------|--------------------|----------------------|
| 1          | >95              | 0.5                | B                    |
| 2          | 30               | 25                 | C                    |
| 3          | >95              | 250                | C                    |

Test Procedure

- 1) The interruption is introduced at selected phase angles with specified duration.
- 2) Record any degradation of performance.

**Test Data**

*Please refer to following tables:*

**Test Mode:** M1-M2

**Note:**

**Table 1: Voltage Dips/Interruptions Test**

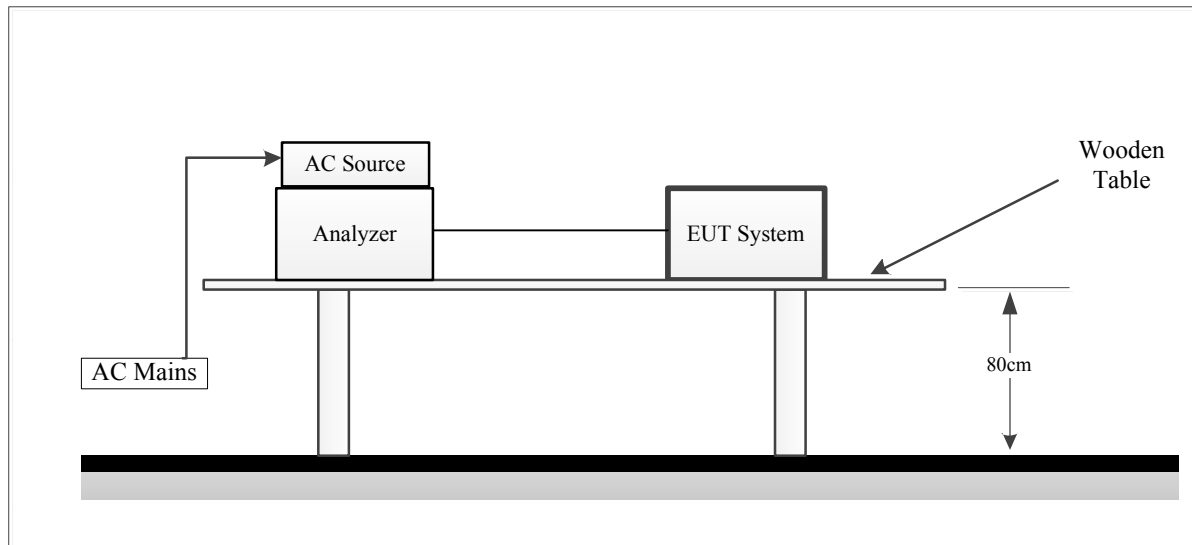
| Residual Voltage (%) | Td (Number of cycles) | Phase Angle (°) | N | Result | Required Performance Criteria |
|----------------------|-----------------------|-----------------|---|--------|-------------------------------|
| <5                   | 0.5                   | 0/90/180/270    | 3 | A      | B                             |
| 70                   | 25                    | 0/90/180/270    | 3 | A      | C                             |
| <5                   | 250                   | 0/90/180/270    | 3 | B      | C                             |

Description of Performance reduction:

B indicates that the power supply of the EUT was interrupted during the test, and the EUT was restarted. After the test, it can automatically return to normal use.

## 11 -VOLTAGE FLUCTUATIONS AND FLICKER

### Test System Setup



### Test Standard

EN 61000-3-3:2013+A1:2019+A2:2021 and BS EN 61000-3-3:2013+A2:2021

### Flicker Test Limits:

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of Pst shall not be greater than 1,0;
- the value of Plt shall not be greater than 0,65;
- the value of d(t) during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the relative steady-state voltage change, dc, shall not exceed 3,3 %;
- the maximum relative voltage change dmax, shall not exceed
  - a) 4 % without additional conditions;
  - b) 6 % for equipment which is:
    - Switched manually, or
    - Switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a dmax of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0,65.

- c) 7 % for equipment which is
  - attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
  - switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic

switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

## Test Data

*Please refer to following tables:*

|                   |  |
|-------------------|--|
| Short time (Pst): | 10 min   |
| Observation time: | 120 min (12 Flicker measurement)   |
| Test Mode:        | M1: Normal working(Powered by Adapter)<br>M2: Normal working(Powered by POE) |
| Power Source:     | AC 230V/50Hz   |
| Test Result       | PASS   |

## Maximum Flicker results (M1)

|          | EUT values | Limit | Result |
|----------|------------|-------|--------|
| Pst      | 0.015      | 1.00  | PASS   |
| Plt      | 0.007      | 0.65  | PASS   |
| dc [%]   | 0.000      | 3.30  | PASS   |
| dmax [%] | 0.000      | 4.00  | PASS   |
| dt [s]   | 0.000      | 0.50  | PASS   |

## Maximum Flicker results (M2)

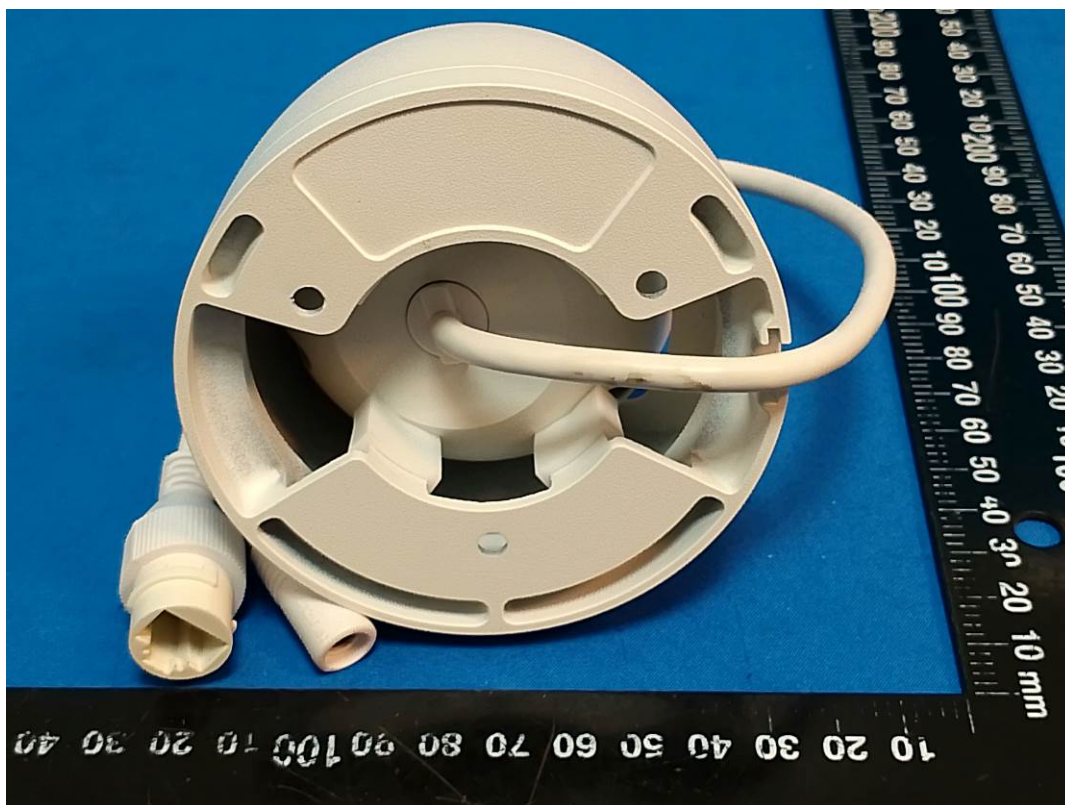
|          | EUT values | Limit | Result |
|----------|------------|-------|--------|
| Pst      | 0.016      | 1.00  | PASS   |
| Plt      | 0.007      | 0.65  | PASS   |
| dc [%]   | 0.000      | 3.30  | PASS   |
| dmax [%] | 0.000      | 4.00  | PASS   |
| dt [s]   | 0.000      | 0.50  | PASS   |

## EXHIBIT A - EUT PHOTOGRAPHS



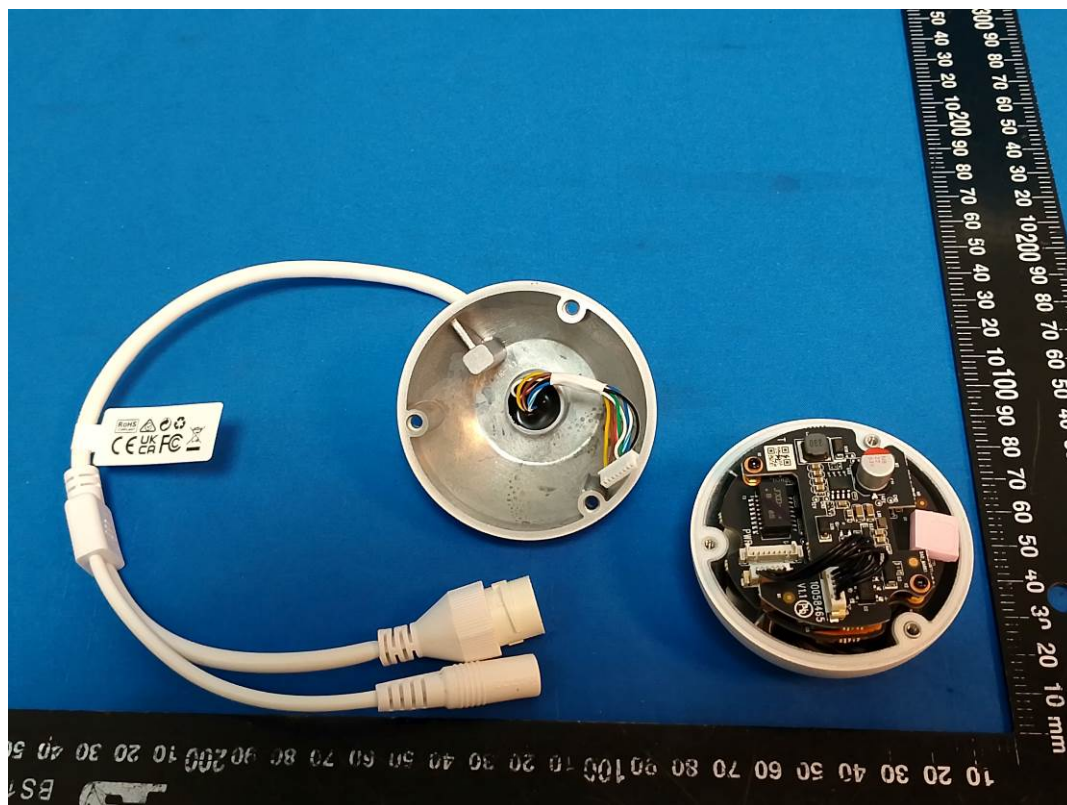




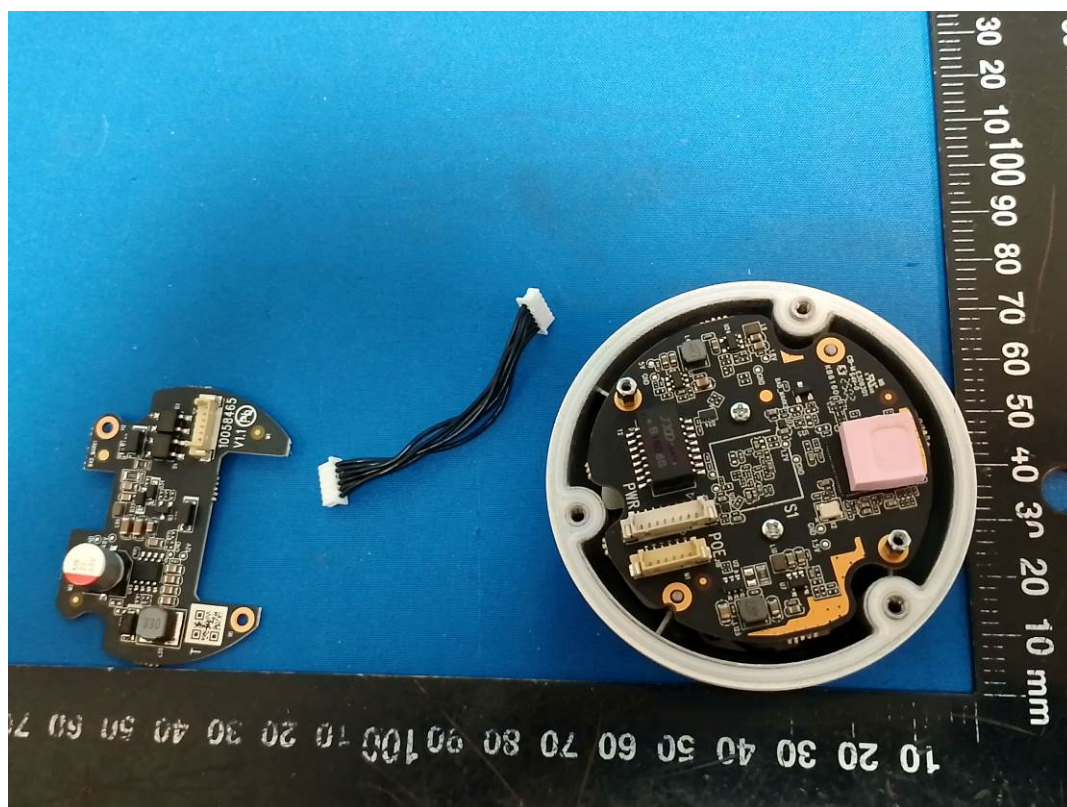
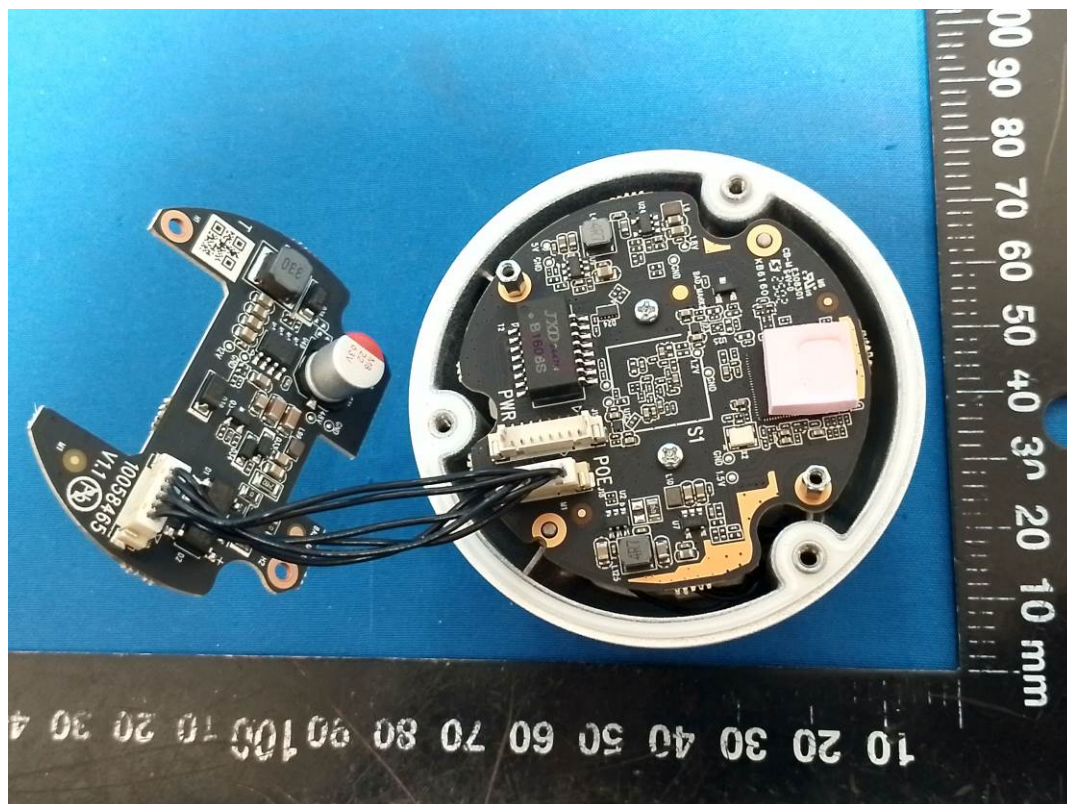




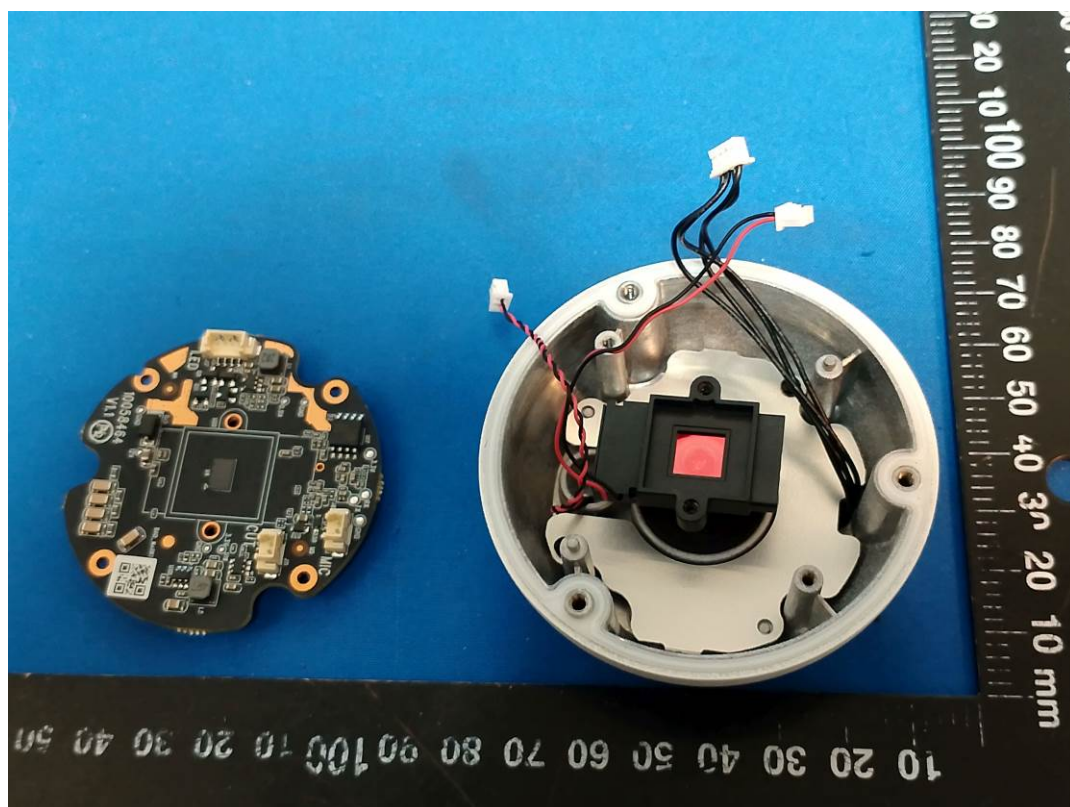
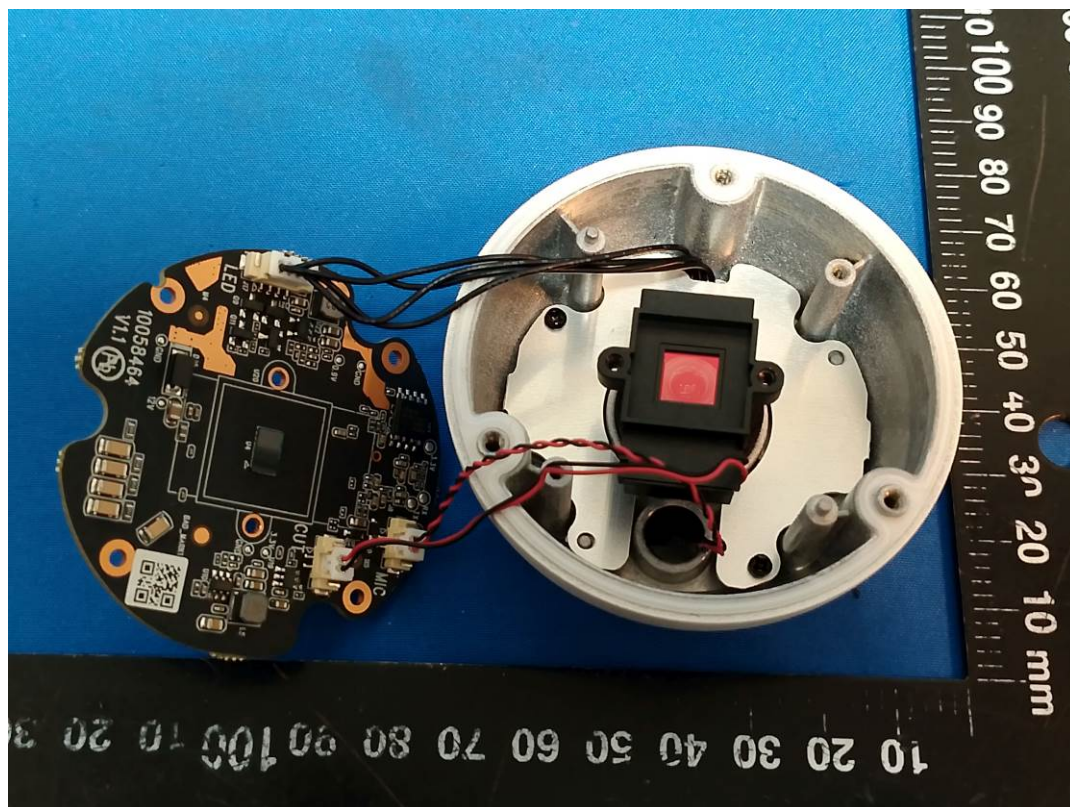


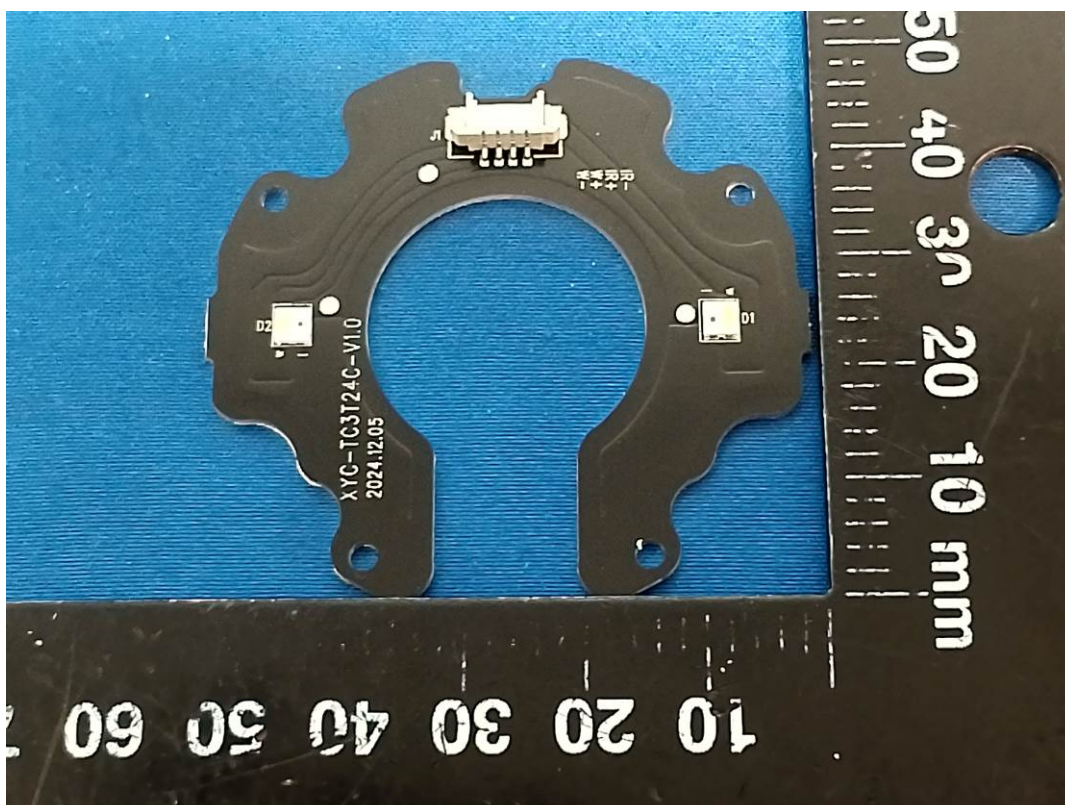
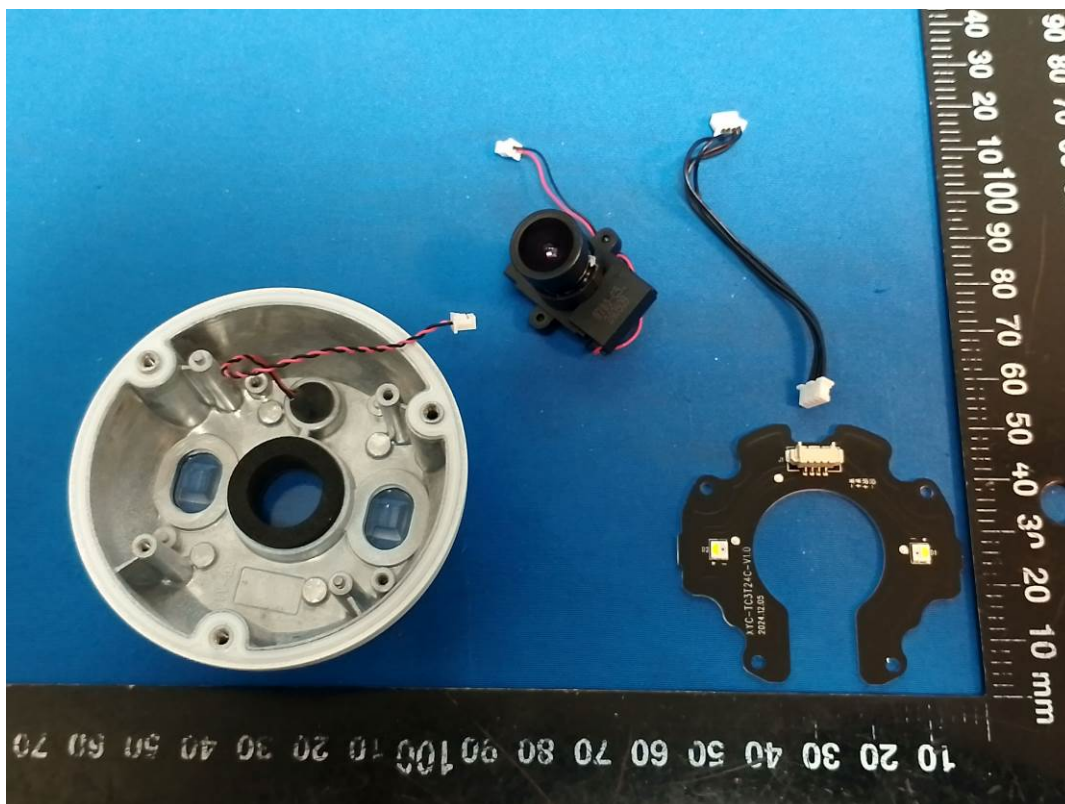




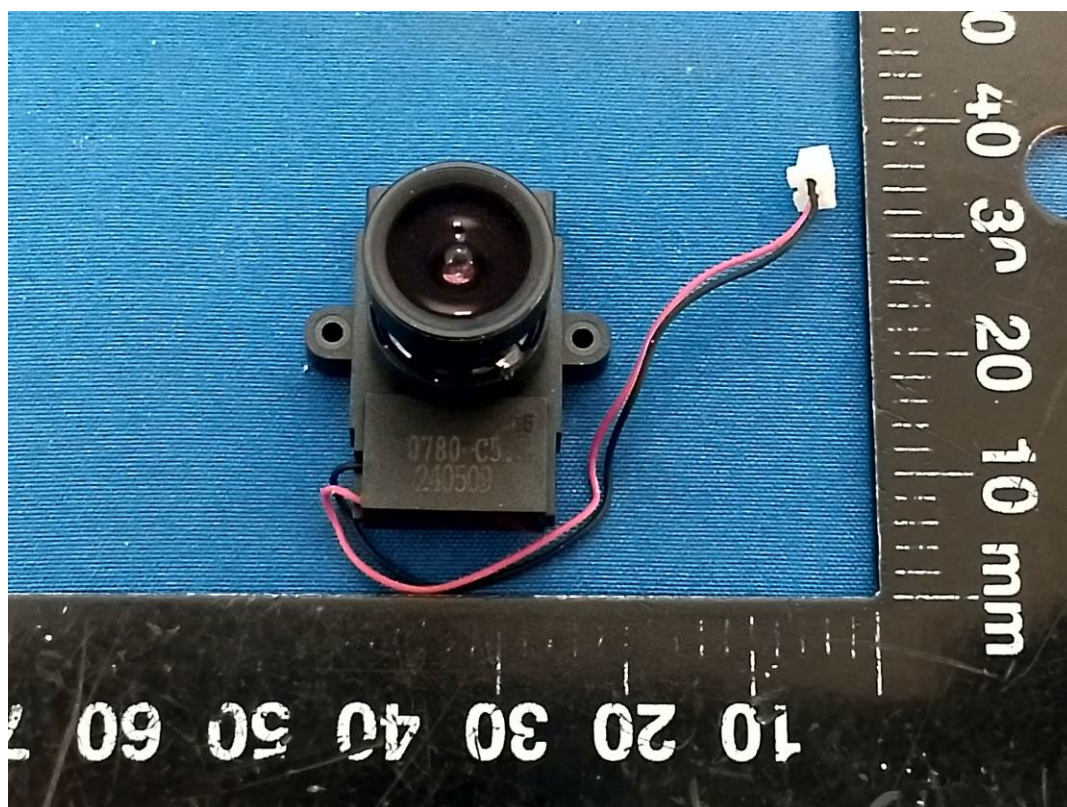
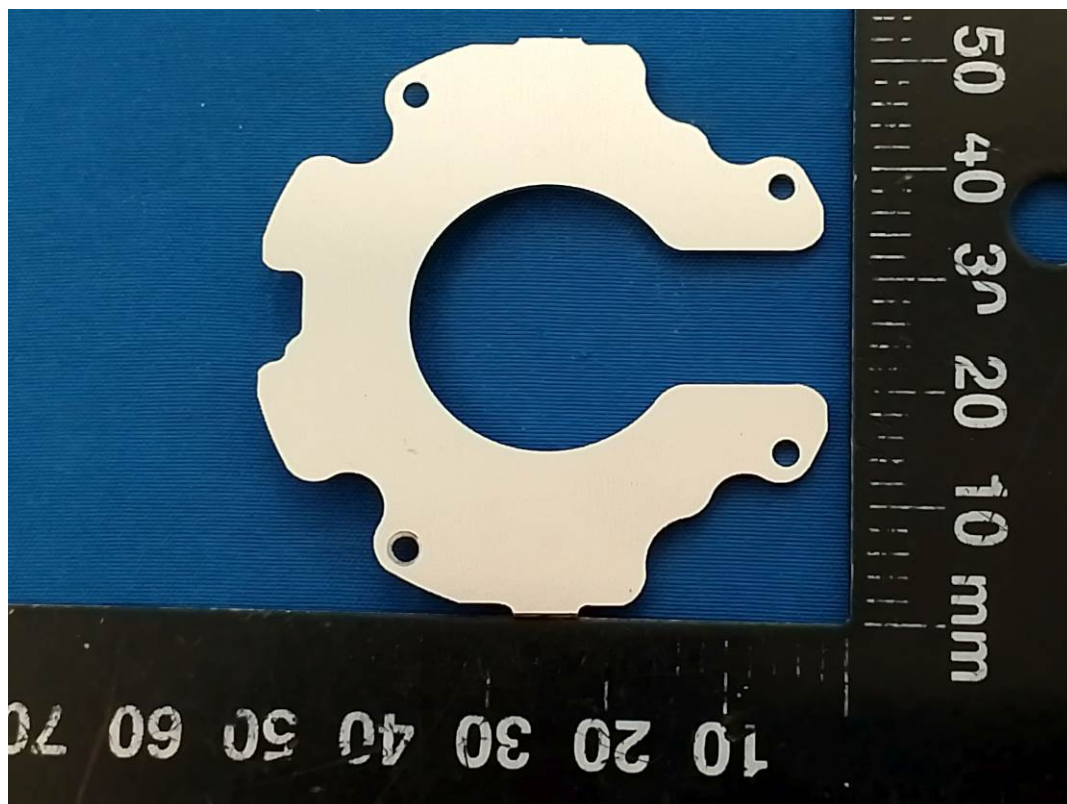




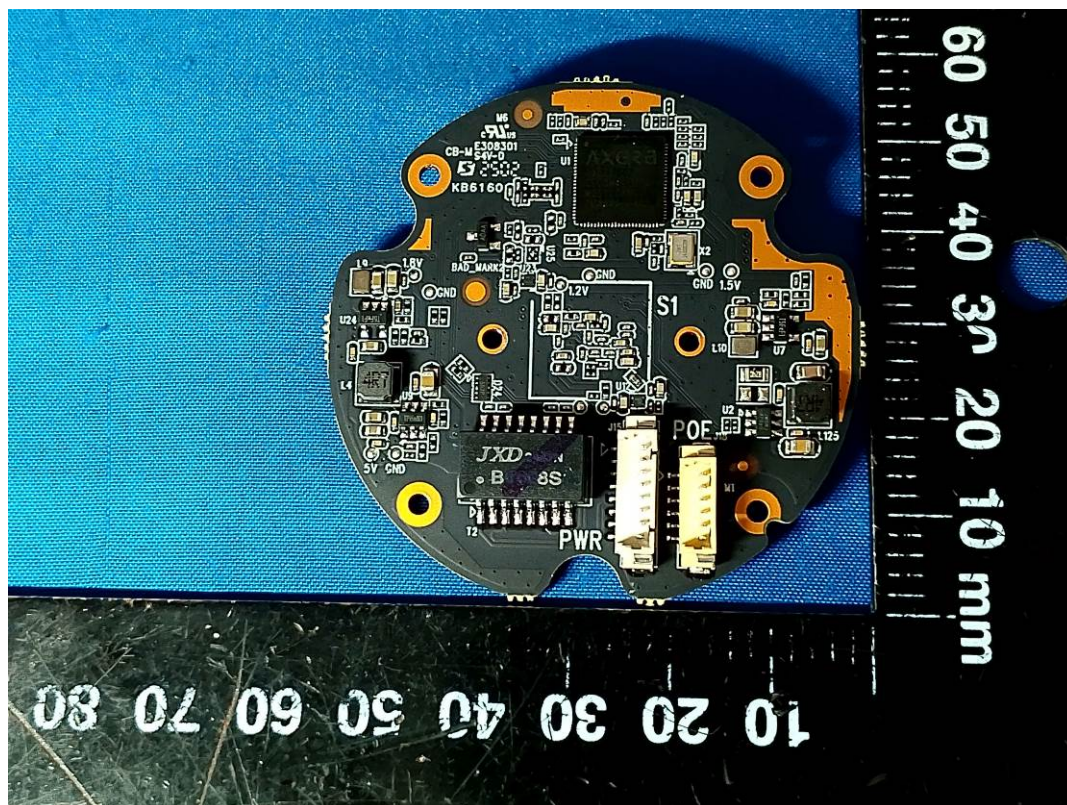
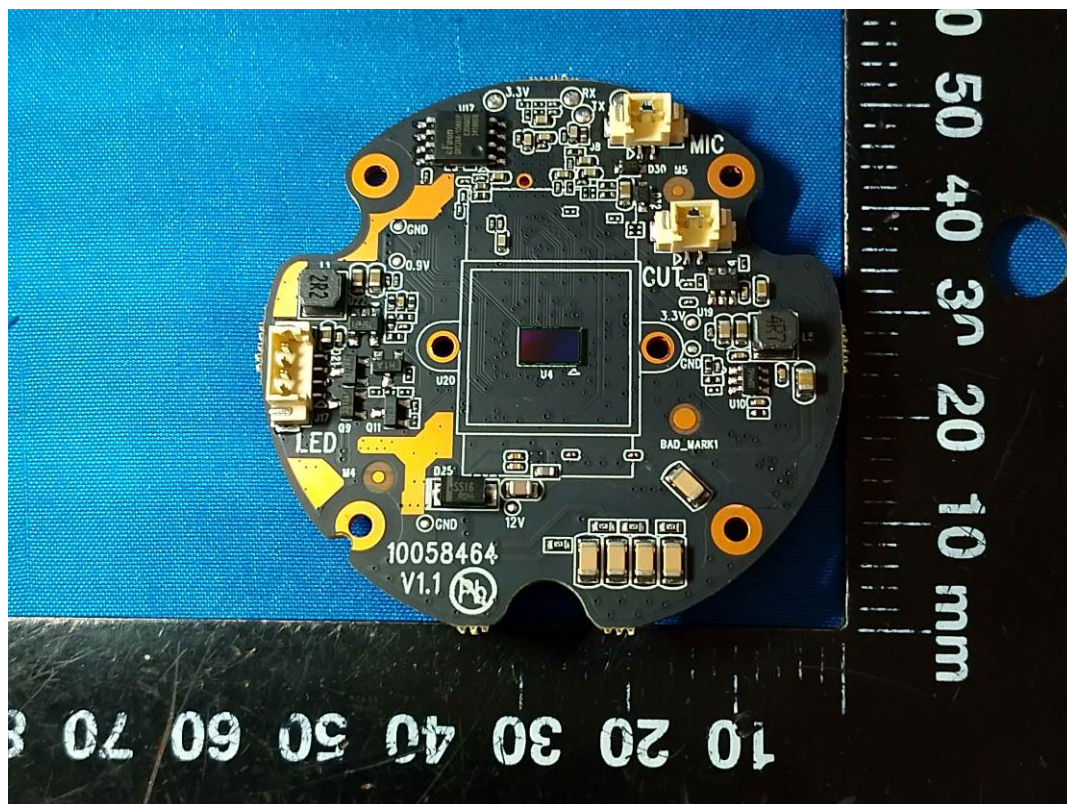




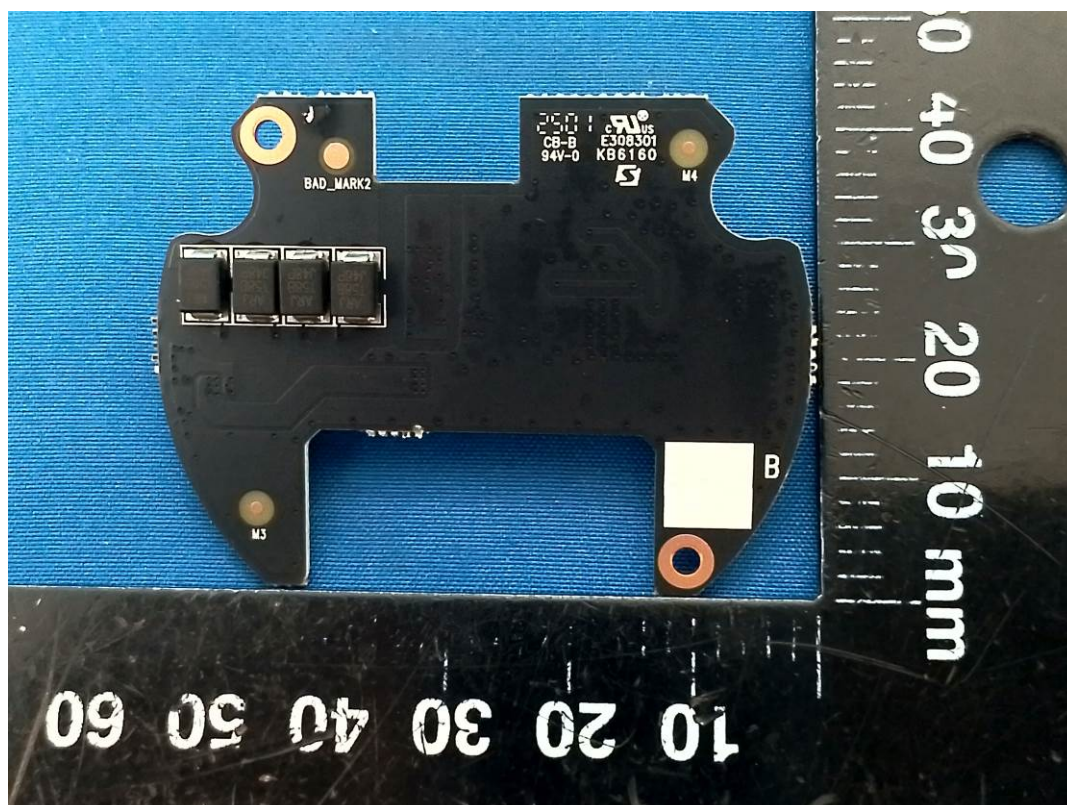
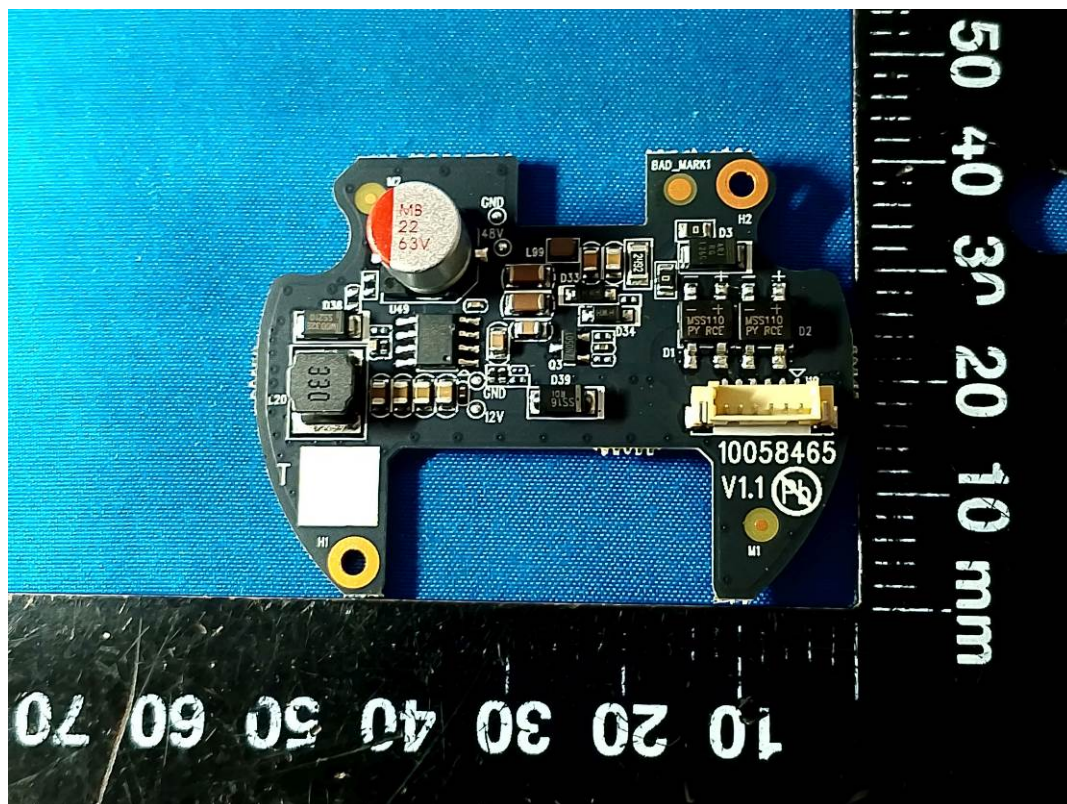














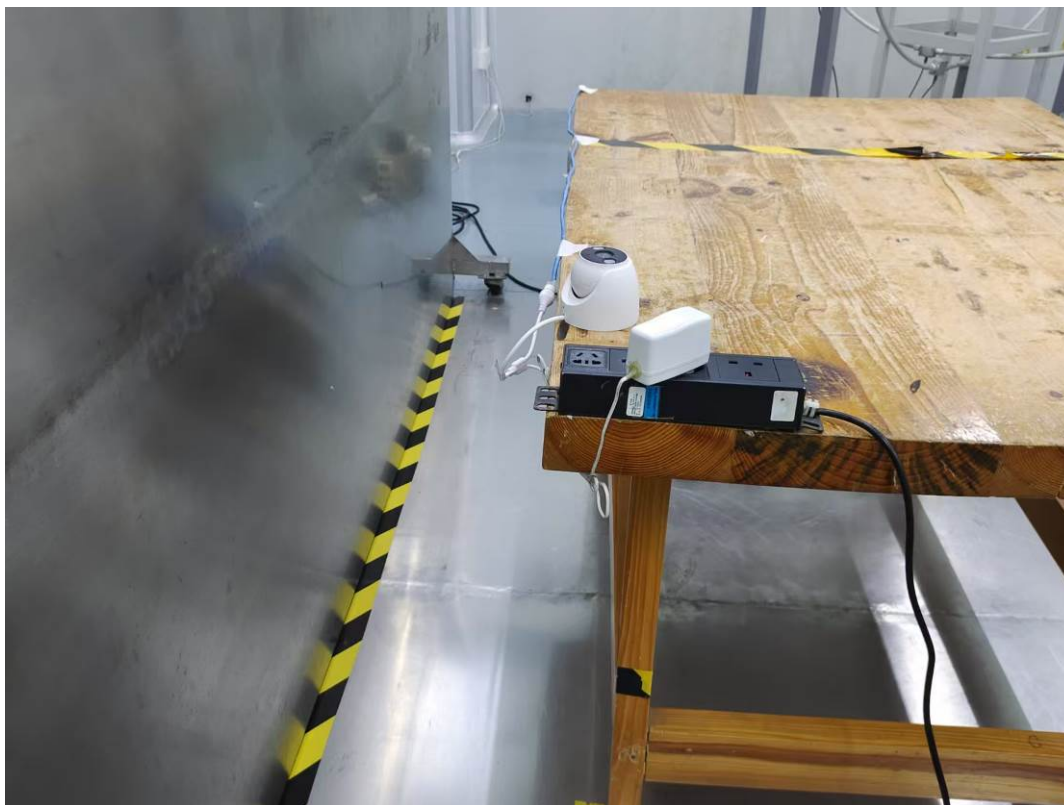
## EXHIBIT B - TEST SETUP PHOTOGRAPHS

### Conducted emissions

Conducted emissions front View-M1



Conducted emissions side View-M1



Conducted emissions front View-M2

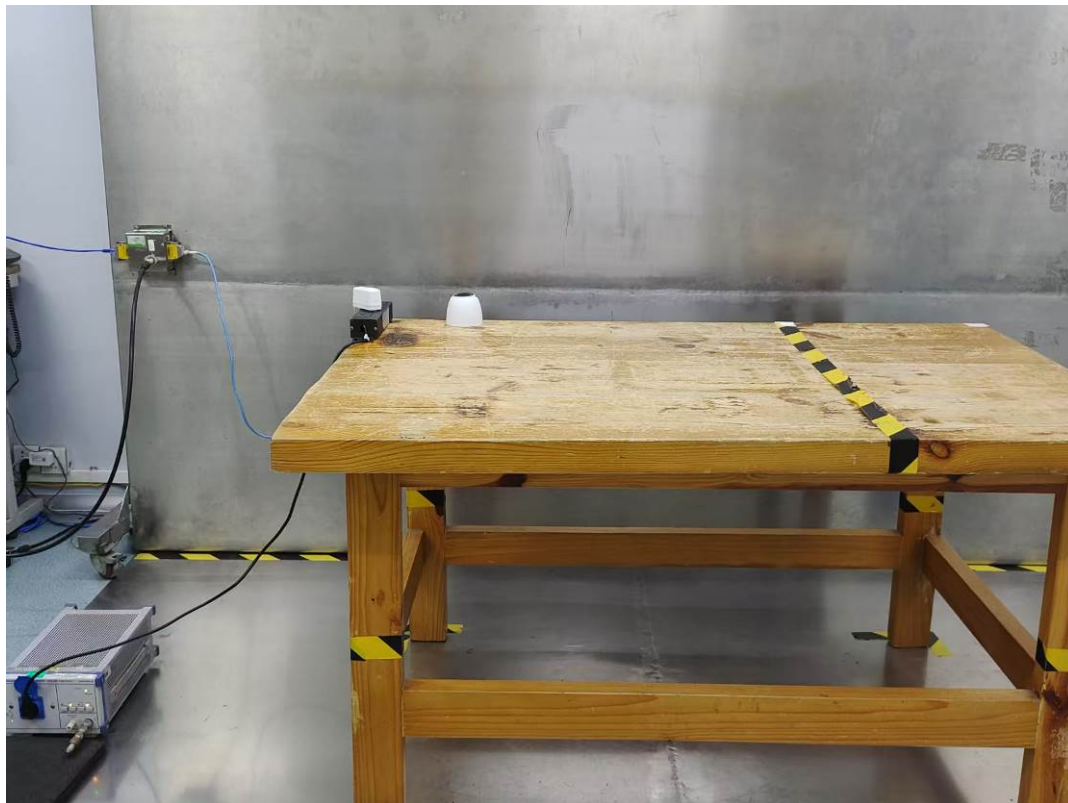


Conducted emissions side View-M2





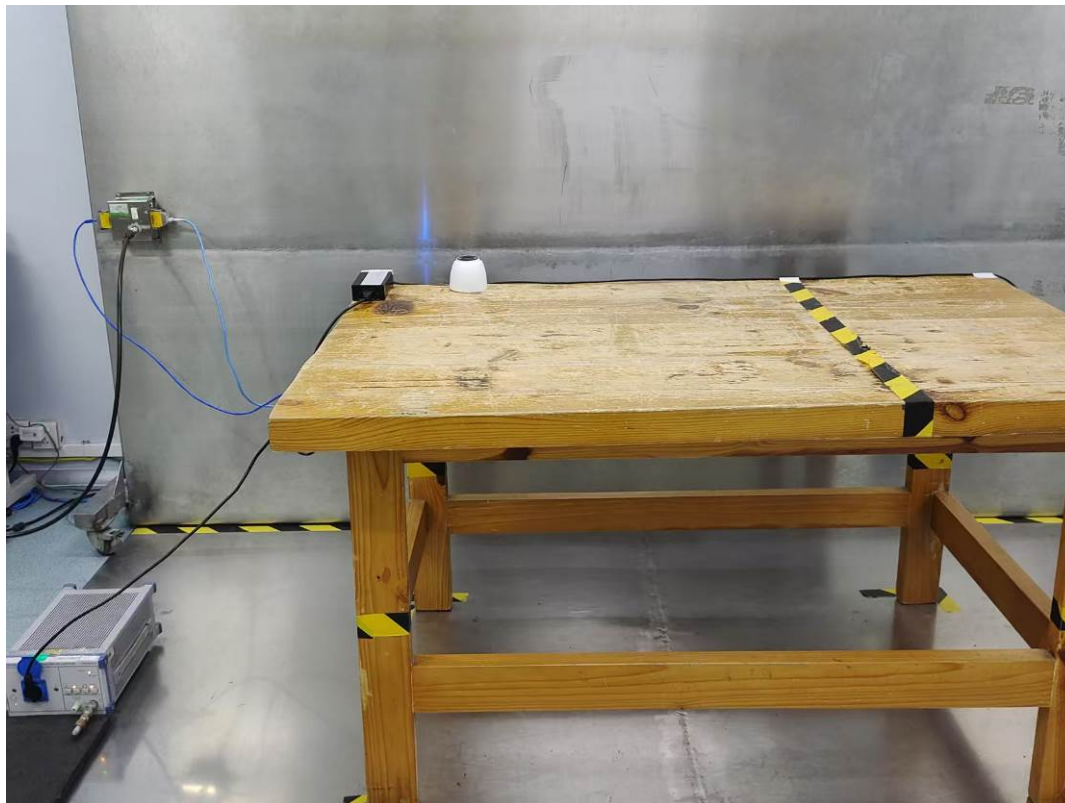
Conducted emissions ISN front View-M1



Conducted emissions ISN side View-M1



Conducted emissions ISN front View-M2



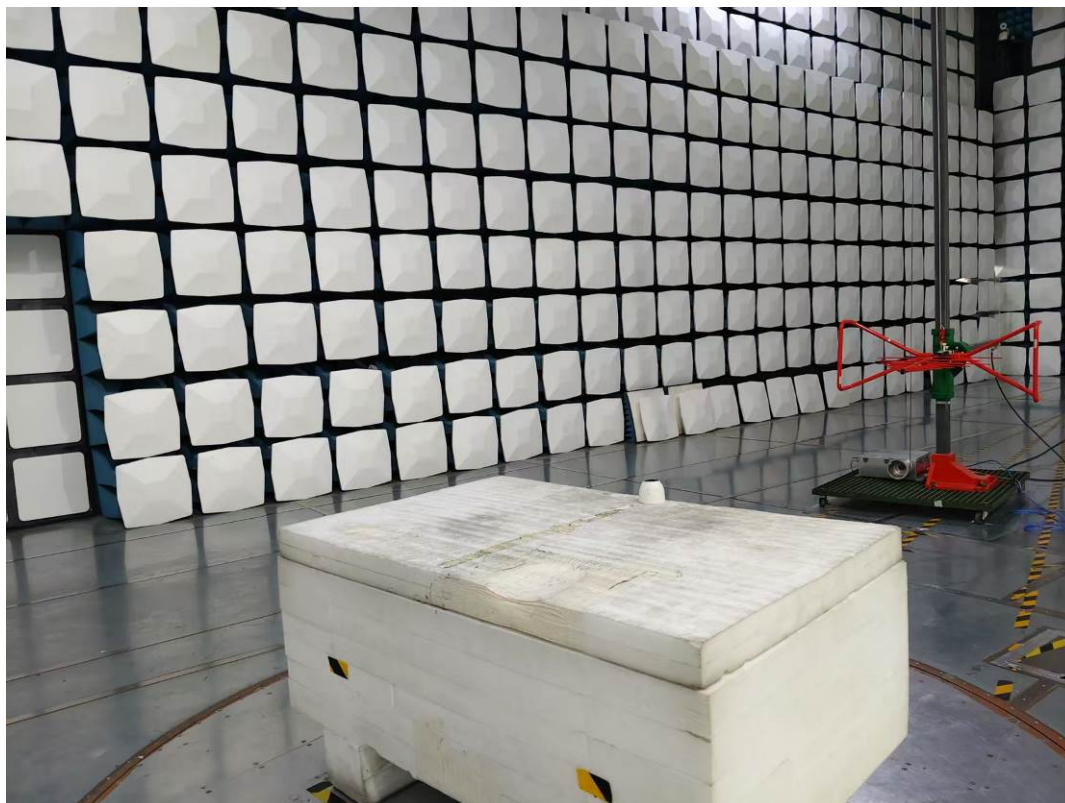
Conducted emissions ISN side View-M2





## Radiated Emissions

Radiated Emissions Below 1GHz front View-M1



Radiated Emissions Below 1GHz rear View-M1



Radiated Emissions Below 1GHz front View-M2

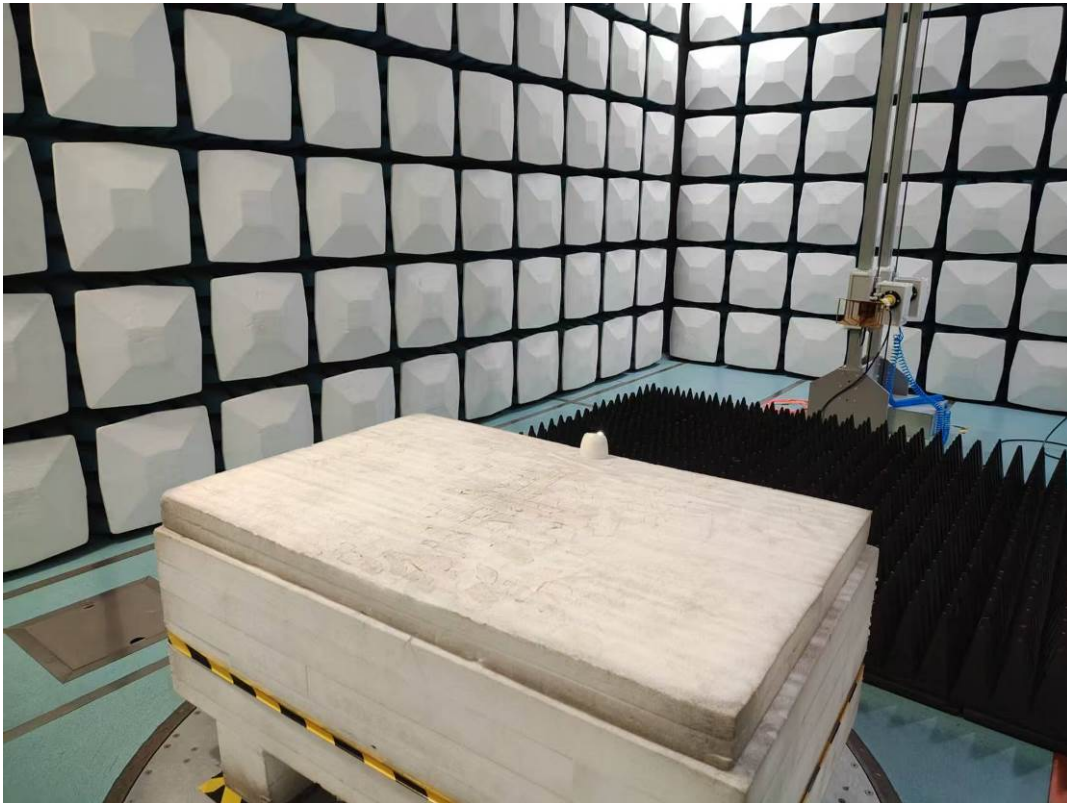


Radiated Emissions Below 1GHz rear View-M2





Radiated Emissions Above 1GHz front View-M1



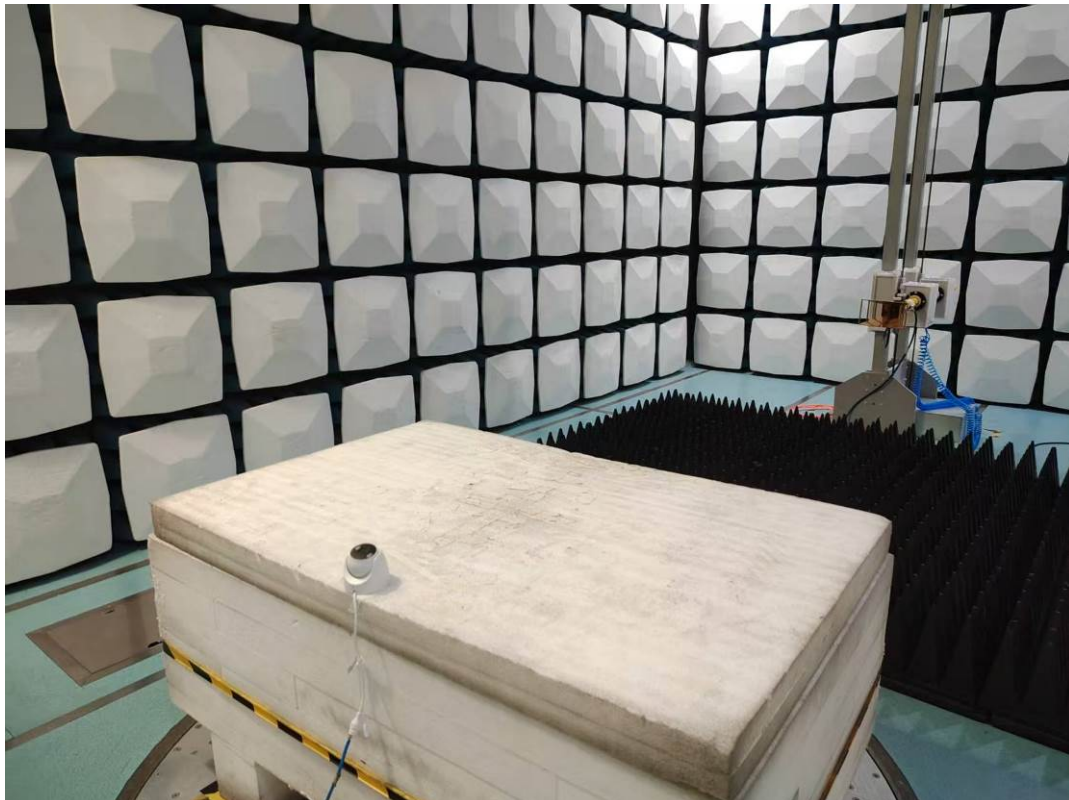
Radiated Emissions Above 1GHz rear View-M1



Radiated Emissions Above 1GHz front View-M2



Radiated Emissions Above 1GHz rear View-M2





## ESD

Test Setup Photo View-M1

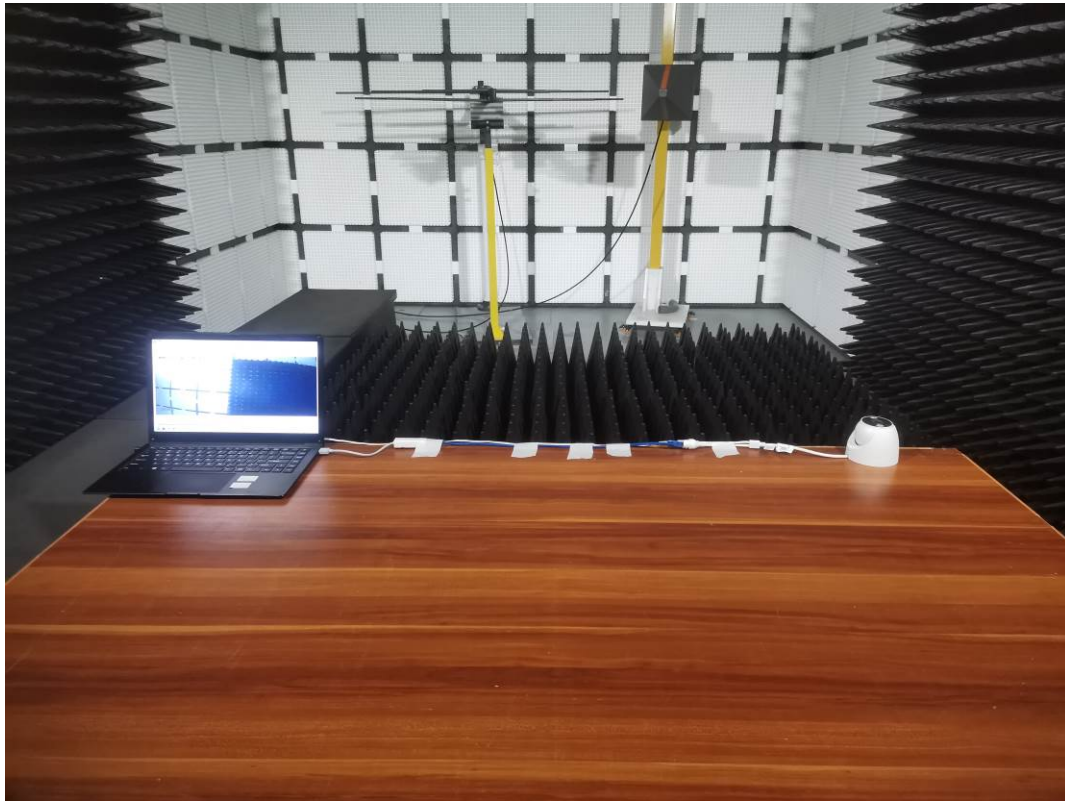


Test Setup Photo View-M2

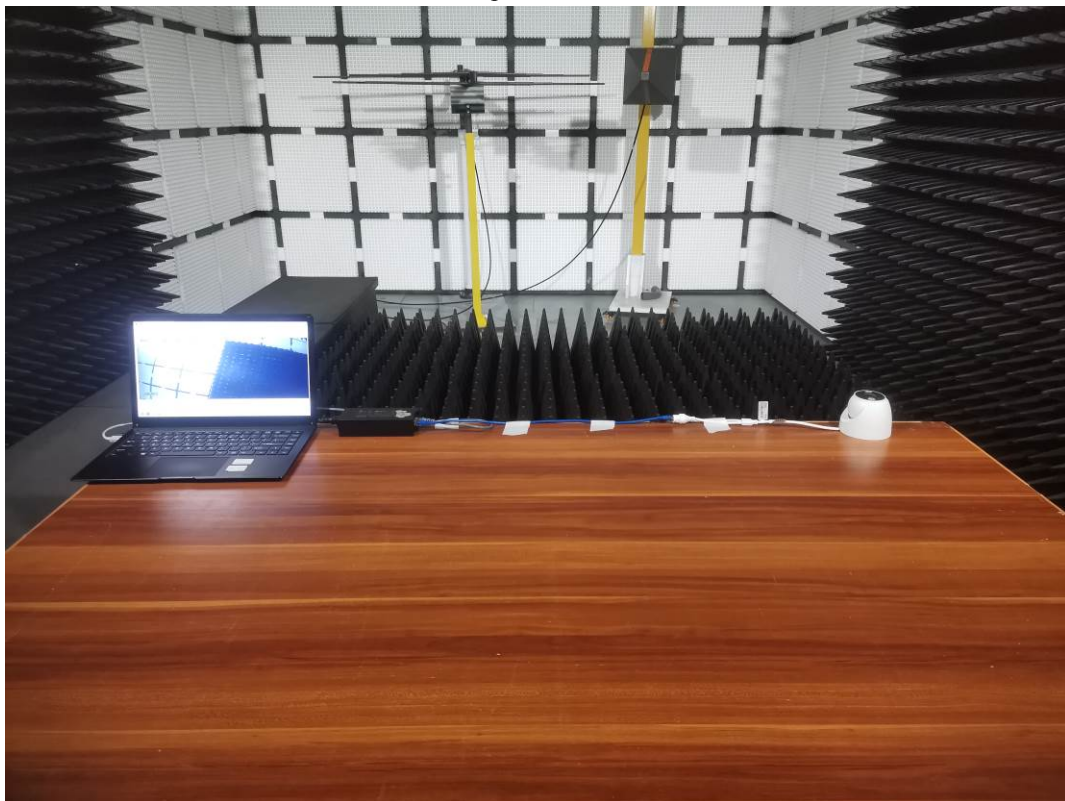


RS

Test Setup Photo View-M1



Test Setup Photo View-M2



## EFT

Test Setup Photo View-M1



Test Setup Photo View-M2





PoE Port Test Setup Photo View-M1



PoE Port Test Setup Photo View-M2



## Dips

Test Setup Photo View-M1



Test Setup Photo View-M2



CS

Test Setup Photo View-M1



Test Setup Photo View-M2





PoE Port Test Setup Photo View-M1



PoE Port Test Setup Photo View-M2



## Flicker

Test Setup Photo View-M1



Test Setup Photo View-M2





## Surge

Test Setup Photo View-M1



Test Setup Photo View-M2



PoE Port Test Setup Photo View-M1

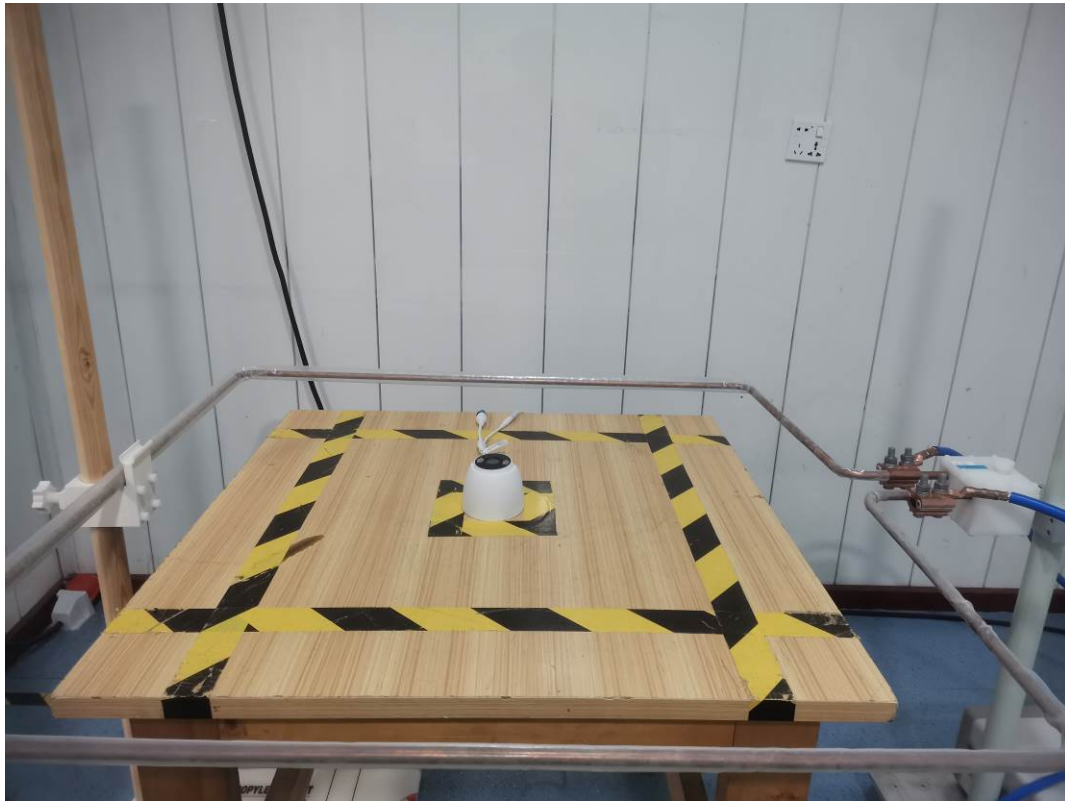


PoE Port Test Setup Photo View-M2

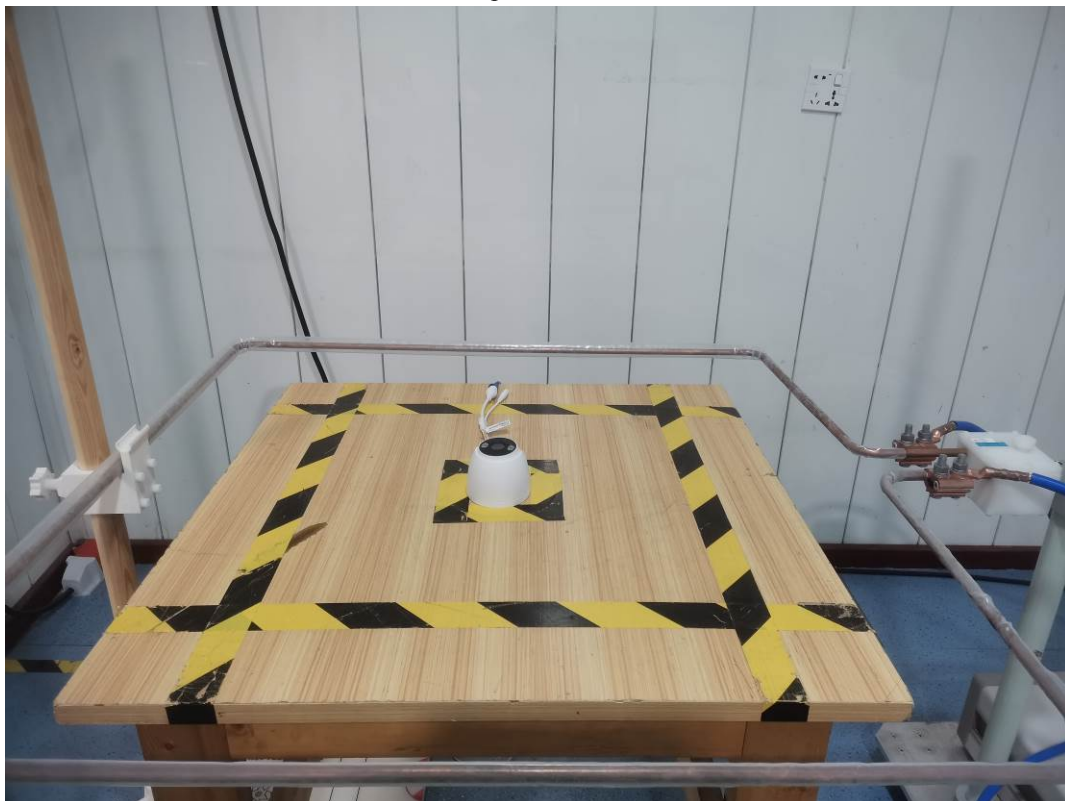


**PFMF**

Test Setup Photo View-M1



Test Setup Photo View-M2



**\*\*\*\*\*END OF REPORT\*\*\*\*\***