



## TEST REPORT

ETSI EN 301 489-1 V2.2.3 (2019-11)/  
ETSI EN 301 489-3 V2.3.2 (2023-01)/  
ETSI EN 301 489-17 V3.2.4 (2020-09)/  
EN55032:2015+A11:2020/ EN55035:2017+A11:2020  
EN IEC 61000-3-2:2019/ EN61000-3-3:2013+A1:2019

Report Reference No.....: TZZ40505696-RE

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Date of issue.....: 2024/5/23



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Applicant's name .....: Jiangxi Small Walrus Intelligent Technology Co.,LTD

Address .....: Factory No. 1, Hengsi Road, Qianping Industrial Zone, Le 'an  
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### Test specification:

Standard .....: ETSI EN 301 489-1 V2.2.3 (2019-11)/ ETSI EN 301 489-3 V2.3.2  
(2023-01)/ETSI EN 301 489-17 V3.2.4 (2020-09)/  
EN55032:2015+A11:2020/ EN55035:2017+A11:2020  
EN IEC 61000-3-2:2019/ EN61000-3-3:2013+A1:2019

TRF Originator .....: Shenzhen Tongzhou Testing Co.,Ltd

Master TRF.....: Dated 2024-01

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Test item description .....: Smart WiFi Dome Camera

Trade Mark .....:



Model/Type reference.....: XHX-PT09-DW

List Model .....: XHX-PT10-DW, XHX-PT11-DW, XHX-PT12-DW, XHX-PT13-DW,  
SC489-DWB2, SC489-DWB3, SC489-DWB4, HHK-5362X, HHK-  
5368X, HHK-5369X, HHK-5370X, HHK-5371X, HHK-5350X, HHK-  
5320X, HHK-5362Y, HHK-5368XY, HHK-5369Y, HHK-5370Y,  
HHK-5371Y, HHK-5350Y, HHK-5320Y, HHK-5362Z, HHK-5368Z,  
HHK-5369Z, HHK-5370Z, HHK-5371Z, HHK-5350G, HHK-5320G,  
HHK-5562Y, HHK-5568XY, HHK-5569Y, HHK-5570Y, HHK-5571Y,  
HHK-5550Y, HHK-5520Y, HHK-5562Z, HHK-5568Z, HHK-5569Z,  
HHK-5570Z, HHK-5571Z, HHK-5550Z, HHK-5520Z

Hardware Version.....: V1.0

Software Version .....: V3.2.1X



Rating .....: Input:DC 12V

Result.....: **PASS**



## TEST REPORT

|                   |                |               |
|-------------------|----------------|---------------|
| Test Report No. : | TZ240505696-RE | 2024/5/23     |
|                   |                | Date of issue |

**Equipment under Test** : Smart WiFi Dome Camera

**Model /Type** : XHX-PT09-DW

**Listed Models** : XHX-PT10-DW, XHX-PT11-DW, XHX-PT12-DW, XHX-PT13-DW, SC489-DWB2, SC489-DWB3, SC489-DWB4, HHK-5362X, HHK-5368X, HHK-5369X, HHK-5370X, HHK-5371X, HHK-5350X, HHK-5320X, HHK-5362Y, HHK-5368XY, HHK-5369Y, HHK-5370Y, HHK-5371Y, HHK-5350Y, HHK-5320Y, HHK-5362Z, HHK-5368Z, HHK-5369Z, HHK-5370Z, HHK-5371Z, HHK-5350G, HHK-5320G, HHK-5562Y, HHK-5568XY, HHK-5569Y, HHK-5570Y, HHK-5571Y, HHK-5550Y, HHK-5520Y, HHK-5562Z, HHK-5568Z, HHK-5569Z, HHK-5570Z, HHK-5571Z, HHK-5550Z, HHK-5520Z

**Applicant** : Jiangxi Small Walrus Intelligent Technology Co.,LTD

**Address** : Factory No. 1, Hengsi Road, Qianping Industrial Zone, Le 'an Industrial Park, Fuzhou City, Jiangxi Province, China

**Manufacturer** : Jiangxi Small Walrus Intelligent Technology Co.,LTD

**Address** : Factory No. 1, Hengsi Road, Qianping Industrial Zone, Le 'an Industrial Park, Fuzhou City, Jiangxi Province, China

|             |      |
|-------------|------|
| Test Result | PASS |
|-------------|------|

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**\*\* Modified History \*\***

| Revision    | Description                 | Issued Data | Remark     |
|-------------|-----------------------------|-------------|------------|
| Revision 00 | Initial Test Report Release | 2024/5/23   | Andy Zhang |
|             |                             |             |            |
|             |                             |             |            |



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## **1. TEST STANDARDS**

The tests were performed according to following standards:

[ETSI EN 301 489-1 V2.2.3 \(2019-11\)](#)

ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;  
Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility

[ETSI EN 301 489-3 V2.3.2 \(2023-01\)](#)

ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;  
Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

[ETSI EN 301 489-17 V3.2.4 \(2020-09\)](#)

ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;  
Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility

[EN55032:2015+A11:2020](#) Electromagnetic compatibility of multimedia equipment - Emission Requirements

[EN55035:2017+A11:2020](#) Electromagnetic compatibility of multimedia equipment - Immunity requirements

[EN IEC 61000-3-2:2019](#) Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

[EN61000-3-3:2013+A1:2019](#) 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



## 2. SUMMARY

### 2.1. General Remarks

|                                |   |           |
|--------------------------------|---|-----------|
| Date of receipt of test sample | : | 2024/5/20 |
| Testing commenced on           | : | 2024/5/20 |
| Testing concluded on           | : | 2024/5/22 |

### 2.2. Product Description

The **Jiangxi Small Walrus Intelligent Technology Co.,LTD**'s Model: XHX-PT09-DW or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of EUT            | Smart WiFi Dome Camera                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Model(s) Number        | XHX-PT09-DW                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| List Model             | XHX-PT10-DW, XHX-PT11-DW, XHX-PT12-DW, XHX-PT13-DW, SC489-DWB2, SC489-DWB3, SC489-DWB4, HHK-5362X, HHK-5368X, HHK-5369X, HHK-5370X, HHK-5371X, HHK-5350X, HHK-5320X, HHK-5362Y, HHK-5368XY, HHK-5369Y, HHK-5370Y, HHK-5371Y, HHK-5350Y, HHK-5320Y, HHK-5362Z, HHK-5368Z, HHK-5369Z, HHK-5370Z, HHK-5371Z, HHK-5350G, HHK-5320G, HHK-5562Y, HHK-5568XY, HHK-5569Y, HHK-5570Y, HHK-5571Y, HHK-5550Y, HHK-5520Y, HHK-5562Z, HHK-5568Z, HHK-5569Z, HHK-5570Z, HHK-5571Z, HHK-5550Z, HHK-5520Z |
| Difference description | All the same except for the model name.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Hardware version       | V1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Software version       | V3.2.1X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### 2.3. Equipment under Test

#### Power supply system utilised

|                      |   |                                                                   |                                   |
|----------------------|---|-------------------------------------------------------------------|-----------------------------------|
| Power supply voltage | : | <input type="radio"/> 120V / 60 Hz                                | <input type="radio"/> 115V / 60Hz |
|                      |   | <input type="radio"/> 12 V DC                                     | <input type="radio"/> 24 V DC     |
|                      |   | <input checked="" type="radio"/> Other (specified in blank below) |                                   |

Input:DC 12V

### 2.4. Short description of the Equipment under Test (EUT)

For details, refer to the user's manual of EUT.

Serial number: Prototype



## 2.5. EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

| Test Mode | WIFI | &Battery&<br>Adapter |
|-----------|------|----------------------|
| 1         | ■    |                      |
| 2         |      | ■                    |

NOTE: 1. ■ is function state of EUT in each operation.

Scan above all test mode, found below test mode which it was worse case mode. Test results reported represents the worst case simultaneous transmission condition.

| Test item          | Test mode (Worst case operation mode) |
|--------------------|---------------------------------------|
| Radiated emission  | Mode 1                                |
| Conducted emission | Mode 1                                |
| EMS                | All Modes                             |





## 2.6. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - Supplied by the lab

|   |         |         |                           |
|---|---------|---------|---------------------------|
| ● | Adapter | Model:  | BS12A-1201000EU           |
|   |         | Input:  | INOUT:AC 100-240V 50/60Hz |
|   |         | Output: | OUTPUT:DC 12V 1A          |

## 2.7. Internal Identification of EUT used during the test

| EUT ID*        | SN or IMEI | HW Version | SW Version | Date of receipt | Type of Test |
|----------------|------------|------------|------------|-----------------|--------------|
| TZ240505696-1# | N/A        | V1.0       | V3.2.1X    | 2024/5/20       | Radio        |
| TZ240505696-2# | N/A        | V1.0       | V3.2.1X    | 2024/5/20       | SAR (EMF)    |
| TZ240505696-3# | N/A        | V1.0       | V3.2.1X    | 2024/5/20       | EMC          |

## 2.8. Performance level

### 2.8.1. For For ETSI EN 301 489-1 V2.2.3 (2019-11)

Refer to clause 6 Performance criteria as following:

## 6.0 Introduction

The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests.

For the purpose of the present document two categories of performance criteria apply:

- Performance criteria for continuous phenomena.
- Performance criteria for transient phenomena.

NOTE: Normally, the performance criteria depends upon the type of radio equipment and/or its intended application. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment.

## 6.1 Performance criteria for continuous phenomena applied to transmitters and receivers

During the test, the equipment shall:

- continue to operate as intended;
- not unintentionally transmit;
- not unintentionally change its operating state;
- not unintentionally change critical stored data.

## 6.2 Performance criteria for transient phenomena applied to transmitters and receivers

For all ports and transient phenomena with the exception described below, the following applies:

- The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data.
- After application of the transient phenomena, the equipment shall operate as intended.

For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:

- For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.
- For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

## 2.8.2. For For ETSI EN 301 489-3 V2.3.2 (2023-01)

Refer to clause 6 Performance criteria as following:

### 6.1 Introduction

For the purposes of the present document the provisions of ETSI EN 301 489-1 [1], clause 6, shall not apply. The performance criteria are used to make an assessment whether a radio equipment passes or fails immunity tests.

### 6.2 Performance Criteria

In the table below:

- performance criterion A applies for immunity tests with phenomena of a continuous nature;
- performance criterion B applies for immunity tests with phenomena of a transient nature.

NOTE: Whether a phenomenon is considered transient, continuous or otherwise is indicated in the test procedures

for the phenomenon in ETSI EN 301 489-1 [1], clause 9.

**Table 2: Performance Requirements**

| Criterion | During test                                                              | After test                                                                                                                                                  |
|-----------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A         | Operate as intended<br>No loss of function<br>No unintentional responses | Operate as intended<br>No loss of function<br>No degradation of performance<br>No loss of stored data or user programmable functions                        |
| B         | May show loss of function<br>No unintentional responses                  | Operate as intended<br>Lost function(s) shall be self-recoverable<br>No degradation of performance<br>No loss of stored data or user programmable functions |

Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in clause 5 of ETSI EN 301 489-3 .

Where the EUT has more than one mode of operation (see clause 4.5.2), an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in sufficient modes to confirm there are no such unintentional responses.

## 2.8.3. For ETSI EN 301 489-17 V3.2.4 (2020-09)

Refer to clause 6 Performance criteria as following:

### 6.1 General performance criteria

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
  - performance criteria B for immunity tests with phenomena of a transient nature;
  - performance criteria C for immunity tests with power interruptions exceeding a certain time.
- The equipment shall meet the minimum performance criteria as specified in the following clauses.

### 6.2 Performance table

**Table 2: Performance criteria**

| Criteria | During test                                                                                                            | After test<br>(i.e. as a result of the application of the test)                                                                                     |
|----------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| A        | Shall operate as intended.<br>(See note).<br>Shall be no loss of function.<br>Shall be no unintentional transmissions. | Shall operate as intended.<br>Shall be no degradation of performance.<br>Shall be no loss of function.<br>Shall be no loss of critical stored data. |
| B        | May be loss of function.                                                                                               | Functions shall be self-recoverable.<br>Shall operate as intended after recovering.<br>Shall be no loss of critical stored data.                    |
| C        | May be loss of function.                                                                                               | Functions shall be recoverable by the operator.<br>Shall operate as intended after recovering.<br>Shall be no loss of critical stored data.         |

NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.

#### 6.2.2 Minimum performance level



For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

### 6.3 Performance criteria for Continuous phenomena

The performance criteria A shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

### 6.4 Performance criteria for Transient phenomena

The performance criteria B shall apply, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as a result of the application of the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as a result of the application of the test.

**2.8.4. For EN55035:2017+A11:2020**

**Refer to clause 8 Performance criteria as following:**

**8.1 General**

General performance criteria are defined in Clauses 8.2, 8.3 and 8.4. These criteria shall be used during the testing of primary functions where no relevant annex is applicable

When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

**8.2 Performance criterion A**

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

**8.3 Performance criterion B**

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

**8.4 Performance criterion C**

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.



## 2.9. Monitoring EUT in Immunity Test

### 2.9.1. Monitoring for Continuous Phenomena Applied to the EUT

#### ■ BT Mode

At the start of the test, establish a wireless link between the EUT and CMW500(integrate BT protocol Analyzer);

During the test, observe whether the EUT operate as intended, no loss of function and no unintentional transmissions. Monitoring PER and shall exceed 10%

After the test, Check the function and critical stored data of the EUT with no degradation.

In addition, when EUT working in Idle /Receiver mode, monitor whether the transmitter unintentionally operates.

#### ■ 2.4G/5G WIFI Mode

At the start of the test, establish a wireless link between the EUT and CMW500(integrate WIFI protocol Analyzer);

During the test, observe whether the EUT operate as intended, no loss of function and no unintentional transmissions. Monitoring PER and shall exceed 10%

After the test, Check the function and critical stored data of the EUT with no degradation.

In addition, when EUT working in Idle /Receiver mode, monitor whether the transmitter unintentionally operates.

#### ■ other Mode

for Video, During and after the test, observe the Screen status by eyes or monitor to see whether there is degradation of performance

for Audio, During and after the test, Listen the Audio status by ear to discover whether there is degradation of performance

### 2.9.2. Monitoring for Transient Phenomena Applied to the EUT

#### ■ BT Mode

At the start of the test, establish a wireless link between the EUT and CMW500(integrate BT protocol Analyzer);

After the test, Check the function and critical stored data of the EUT with no degradation.

In addition, when EUT working in Idle /Receiver mode, monitor whether the transmitter unintentionally operates.

#### ■ 2.4G/5G WIFI Mode

At the start of the test, establish a wireless link between the EUT and CMW500(integrate WIFI protocol Analyzer);

After the test, Check the function and critical stored data of the EUT with no degradation.

In addition, when EUT working in Idle /Receiver mode, monitor whether the transmitter unintentionally operates.



■ **other Mode**

for Vedio, after the test, observe the Screen status by eyes or monitor to see whether there is degraation of performance

for Audio, after the test, Listen the Audio status by ear to discover whether there is degraation of performance

## **2.10. Modifications**

No modifications were implemented to meet testing criteria.



### 3. TEST ENVIRONMENT

#### 3.1. Address of the test laboratory

Shenzhen Tongzhou Testing Co.,Ltd  
1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2014) and CISPR Publication 22.

#### 3.2. Environmental conditions

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

|                       |                     |
|-----------------------|---------------------|
| Temperature:          | <u>15-35 ° C</u>    |
| Humidity:             | <u>30-60 %</u>      |
| Atmospheric pressure: | <u>950-1050mbar</u> |

#### 3.3. Configuration of Tested System

Fig. 3.3.1 Configuration of Tested System

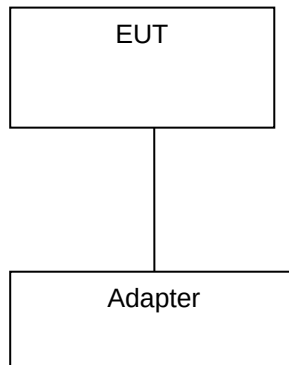


Table 3.3.1 Equipment Used in Tested System

| No. | Product | Manufacturer | Model No. | FCC ID |
|-----|---------|--------------|-----------|--------|
|     |         |              |           |        |





### 3.4. Test Description

| Requirements                                       |                                                                                  |      |
|----------------------------------------------------|----------------------------------------------------------------------------------|------|
| Radiated Emission                                  | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1<br>EN55032:2015+A11:2020 Annex A.2 | PASS |
| Conducted Emission( AC Mains)                      | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1<br>EN55032:2015+A11:2020 Annex A.3 | PASS |
| Conducted Emission( Telcommunication Ports)        | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1<br>EN55032:2015+A11:2020 Annex A.3 | N/A  |
| Harmonic Current Emissions                         | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1<br>EN IEC 61000-3-2:2019           | N/A  |
| Voltage Fluctuations and Flicker                   | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1<br>EN61000-3-3:2013+A1:2019        | PASS |
| Electrostatic Discharge                            | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2                                    | PASS |
| RF Electromagnetic Field                           | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2                                    | PASS |
| Fast Transients Common Mode                        | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2                                    | PASS |
| RF Common Mode 0,15 MHz to 80 MHz                  | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2                                    | PASS |
| Transients and Surges                              | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2                                    | N/A  |
| Voltage Dips and Interruptions                     | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2                                    | PASS |
| Surges, Line to Line and Line to Ground            | ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2                                    | PASS |
| Power Frequency Magnetic Field Susceptibility Test | EN55035:2017+A11:2020                                                            | PASS |
| Boardband impulsive conducted disturbance          | EN55035:2017+A11:2020                                                            | N/A  |

Remark: The measurement uncertainty is not included in the test result.

### 3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Tongzhou Testing Co.,Ltd is reported:

| Test Item              | Frequency Range | Uncertainty | Note |
|------------------------|-----------------|-------------|------|
| Radiation Uncertainty  | 9KHz~30MHz      | ±3.26dB     | (1)  |
|                        | 30MHz~1000MHz   | ±3.92dB     | (1)  |
|                        | 1GHz~40GHz      | ±5.62dB     | (1)  |
| Conduction Uncertainty | 150kHz~30MHz    | ±2.71dB     | (1)  |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



### 3.6. Equipments Used during the Test

| Conducted emission |                                     |                 |           |            |           |          |
|--------------------|-------------------------------------|-----------------|-----------|------------|-----------|----------|
| Item               | Test Equipment                      | Manufacturer    | Model No. | Serial No. | Last Cal. | Cal. Due |
| 1                  | EMI Test Receiver                   | ROHDE & SCHWARZ | ESCI-7    | 100849/003 | 2024/1/4  | 2025/1/3 |
| 2                  | Artificial Mains                    | ROHDE & SCHWARZ | ENV 216   | 101333-IP  | 2024/1/4  | 2025/1/3 |
| 3                  | EMI Test Software                   | ROHDE & SCHWARZ | ESK1      | V1.71      | N/A       | N/A      |
| 4                  | Wideband Radio Communication Tester | R&S             | CMW500    | 101855     | 2024/1/4  | 2025/1/3 |

| Radiated emission |                                     |              |              |            |            |            |
|-------------------|-------------------------------------|--------------|--------------|------------|------------|------------|
| Item              | Test Equipment                      | Manufacturer | Model No.    | Serial No. | Last Cal.  | Cal. Due   |
| 1                 | Test Receiver                       | R&S          | ESCI-7       | 100849/003 | 2024/1/4   | 2025/1/3   |
| 2                 | wideband Antenna                    | Schwarzbeck  | VULB 9163    | 958        | 2022/11/13 | 2025/11/12 |
| 3                 | Horn Antenna                        | Schwarzbeck  | BBHA 9120D   | 01989      | 2022/11/13 | 2025/11/12 |
| 4                 | Amplifier                           | Schwarzbeck  | BBV 9743     | 209        | 2024/1/4   | 2025/1/3   |
| 5                 | Amplifier                           | Tonscend     | TSAMP-0518SE | --         | 2024/1/4   | 2025/1/3   |
| 6                 | Postional Controller                | MF           | MF7802       | --         | --         | --         |
| 7                 | RE test software                    | Tonscend     | JS32-RE      | V5.0.0.0   | --         | --         |
| 8                 | Wideband Radio Communication Tester | R&S          | CMW500       | 101855     | 2024/1/4   | 2025/1/3   |
| 9                 | Band Reject Filter Box              | Tonscend     | JS0806-F     | TZRFA009   | 2024/1/4   | 2025/1/3   |

| Voltage Fluctuation and Flicker |                                     |              |               |            |           |           |
|---------------------------------|-------------------------------------|--------------|---------------|------------|-----------|-----------|
| Item                            | Test Equipment                      | Manufacturer | Model No.     | Serial No. | Last Cal. | Cal. Due  |
| 1                               | Harmonic & Flicker Tester           | SCHAFFNER    | CCN1000-1     | 72046      | 2023/6/15 | 2024/6/14 |
| 2                               | Power Source                        | SCHAFFNER    | NSG1007-3-240 | HK54238    | 2023/6/15 | 2024/6/14 |
| 3                               | software                            | AMETEK       | CTS 4         | V 4.6.2    |           |           |
| 4                               | Wideband Radio Communication Tester | R&S          | CMW500        | 101855     | 2024/1/4  | 2025/1/3  |

| Electrostatic Discharge |                                     |              |           |            |           |          |
|-------------------------|-------------------------------------|--------------|-----------|------------|-----------|----------|
| Item                    | Test Equipment                      | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Due |
| 1                       | ESD Simulator                       | TESEQ        | NSG 437   | 976        | 2024/1/9  | 2025/1/8 |
| 2                       | Wideband Radio Communication Tester | R&S          | CMW500    | 101855     | 2024/1/4  | 2025/1/3 |



| RF Electromagnetic Field |                                     |                |                   |             |           |           |
|--------------------------|-------------------------------------|----------------|-------------------|-------------|-----------|-----------|
| Item                     | Test Equipment                      | Manufacturer   | Model No.         | Serial No.  | Last Cal. | Cal. Due  |
| 1                        | Horn Antenna                        | COMMW          | ZAB-1-18G-50      | 20171109    | 2023/7/4  | 2024/7/3  |
| 2                        | Bilog Antenna                       | Sunol Sciences | JB3               | N/A         | 2022/7/3  | 2025/7/2  |
| 3                        | Power Amplifier                     | Micotop        | MPA-80-1000-250   | MPA1808208  | 2023/6/18 | 2024/6/17 |
| 4                        | Power Amplifier                     | Micotop        | MPA-1000-6000-100 | MPA1808210  | 2023/6/18 | 2024/6/17 |
| 5                        | Signal Switch                       | Micotop        | MSW-80-6000-PA    | MPA1808211  | 2023/6/18 | 2024/6/17 |
| 6                        | Signal generator                    | Agilent        | N5181A            | MY49060403  | 2023/6/18 | 2024/6/17 |
| 7                        | Power Meter                         | Agilent        | E4419B            | US392155053 | 2023/6/18 | 2024/6/17 |
| 8                        | Power Sensor                        | Agilent        | E9301H            | MY41495659  | 2023/6/18 | 2024/6/17 |
| 9                        | RS test software                    | Farad          | EMC-RS            | V:2.0.1.3   | --        | --        |
| 10                       | Wideband Radio Communication Tester | R&S            | CMW500            | 101855      | 2024/1/4  | 2025/1/3  |
| 11                       | Audio Analyzer                      | R&S            | UPP200            | 120175      | 2024/1/4  | 2025/1/3  |

| Fast transients common mode |                                     |              |            |            |           |           |
|-----------------------------|-------------------------------------|--------------|------------|------------|-----------|-----------|
| Item                        | Test Equipment                      | Manufacturer | Model No.  | Serial No. | Last Cal. | Cal. Due  |
| 1                           | Ultra Compact Simulator             | HTEC         | HCOMPACT 7 | 162904     | 2024/1/4  | 2025/1/3  |
| 2                           | Coupling Clamp                      | H3C          | HTEC       | 162908     | 2024/1/12 | 2025/1/11 |
| 3                           | Wideband Radio Communication Tester | R&S          | CMW500     | 101855     | 2024/1/4  | 2025/1/3  |

| Surges, line to line and line to ground |                                     |              |            |            |           |          |
|-----------------------------------------|-------------------------------------|--------------|------------|------------|-----------|----------|
| Item                                    | Test Equipment                      | Manufacturer | Model No.  | Serial No. | Last Cal. | Cal. Due |
| 1                                       | Ultra Compact Simulator             | HTEC         | HCOMPACT 7 | 162904     | 2024/1/4  | 2025/1/3 |
| 2                                       | Wideband Radio Communication Tester | R&S          | CMW500     | 101855     | 2024/1/4  | 2025/1/3 |

| PFMF |                                     |              |           |            |            |            |
|------|-------------------------------------|--------------|-----------|------------|------------|------------|
| Item | Test Equipment                      | Manufacturer | Model No. | Serial No. | Last Cal.  | Cal. Due   |
| 1    | PFMF test system                    | HTEC         | HPFMF 100 | TZE067     | 2023/10/30 | 2024/10/29 |
| 2    | Wideband Radio Communication Tester | R&S          | CMW500    | 101855     | 2024/1/4   | 2025/1/3   |



| RF common mode 0,15 MHz to 80 MHz |                                 |              |           |            |           |           |
|-----------------------------------|---------------------------------|--------------|-----------|------------|-----------|-----------|
| Item                              | Test Equipment                  | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Due  |
| 1                                 | COUPLING AND DECOUPLING NETWORK | Luthi        | CDN801-M3 | 202304/060 | 2023/6/18 | 2024/6/17 |
| 2                                 | COUPLING AND DECOUPLING NETWORK | TESEQ        | CDN T8    | 37213      | 2023/6/18 | 2024/6/17 |
| 3                                 | Signal generator                | R&S          | SML01     | 102286     | 2023/6/18 | 2024/6/17 |
| 4                                 | Power Amplifier                 | AR           | 50A220    | 0010230A   | 2023/6/18 | 2024/6/17 |
| 5                                 | Attenuator                      | Luthi        | 50W3G     | 335625     | 2023/6/18 | 2024/6/17 |
| 6                                 | CS Test software                | Farad        | CS-35     | V:2.0.1.3  | --        | --        |
| 7                                 | Integrating Sound Level         | TES          | TES-1353S | 170502155  | 2023/6/18 | 2024/6/17 |
| 8                                 | Audio Analyzer                  | R&S          | UPP200    | 120175     | 2024/1/2  | 2025/1/1  |

| Voltage Dips and Interruptions |                                         |              |            |            |           |          |
|--------------------------------|-----------------------------------------|--------------|------------|------------|-----------|----------|
| Item                           | Test Equipment                          | Manufacturer | Model No.  | Serial No. | Last Cal. | Cal. Due |
| 1                              | Ultra Compact Simulator                 | HTEC         | HCOMPACT 7 | 162904     | 2024/1/4  | 2025/1/3 |
| 2                              | Voltage Dips and interruption Simulator | HTEC         | HV1P16T    | 162907     | 2024/1/4  | 2025/1/3 |
| 3                              | Wideband Radio Communication Tester     | R&S          | CMW500     | 101855     | 2024/1/4  | 2025/1/3 |

## 4. TEST CONDITIONS AND RESULTS

### 4.1. REQUIREMENTS

#### 4.1.1. Radiated Emission

##### LIMIT

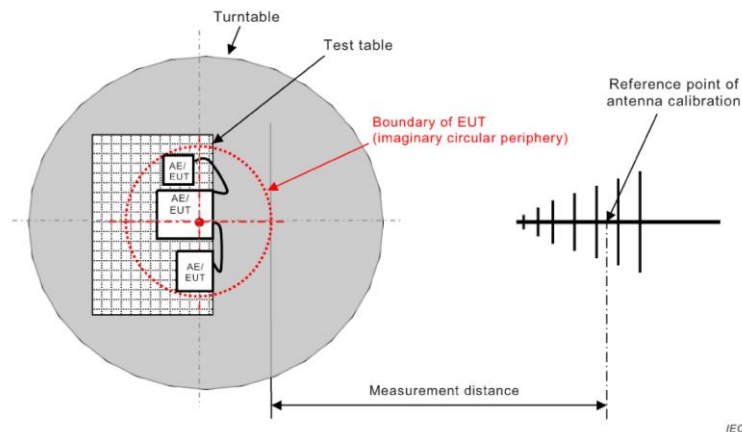
Please refer to ETSI EN 301 489-1 Clause 8.2.3

The ancillary equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A tables A.4 and A.5.

Alternatively, for ancillary equipment intended to be used exclusively in an industrial environment or telecommunication centres, the class A limits given in CENELEC EN 55032 [1], annex A tables A.2 and A.3 may be used.

If EUT is also a FM Receiver, it shall meet CENELEC EN 55032 [3], annex A tables A.6

##### TEST CONFIGURATION



**Note: Cable on the RGP must be insulated.**

##### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.2.2 and The test method shall be in accordance with CENELEC EN 55032 [1], annex A.2. for the measurement methods.

##### Climatic conditions

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

##### TEST RESULTS

|                |          |
|----------------|----------|
| Temperature:   | 22.8° C  |
| Humidity:      | 56%      |
| Test Engineer: | Tony Luo |

##### **Pass**

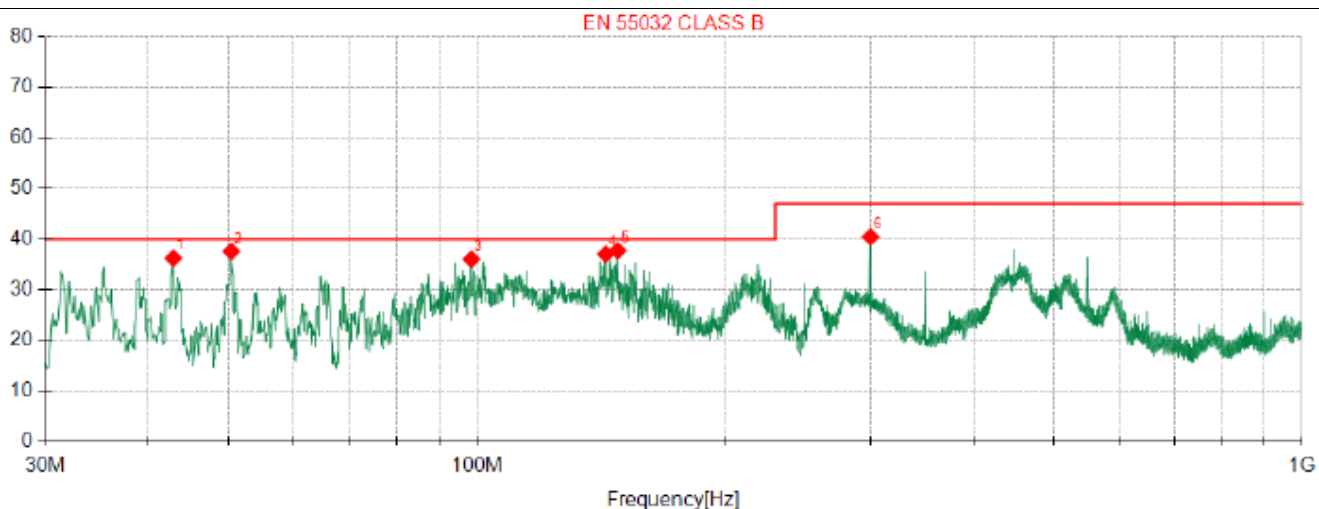
*Note 1: All Modes has been tested only list the worst case in this report.*

*Note 2: While performing the testing, the Band Reject Filter Box is used to filter the fundamental emission for avoiding test instrument overload.*



Note 3: This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position

### Radiated Emission Below 1000MHz



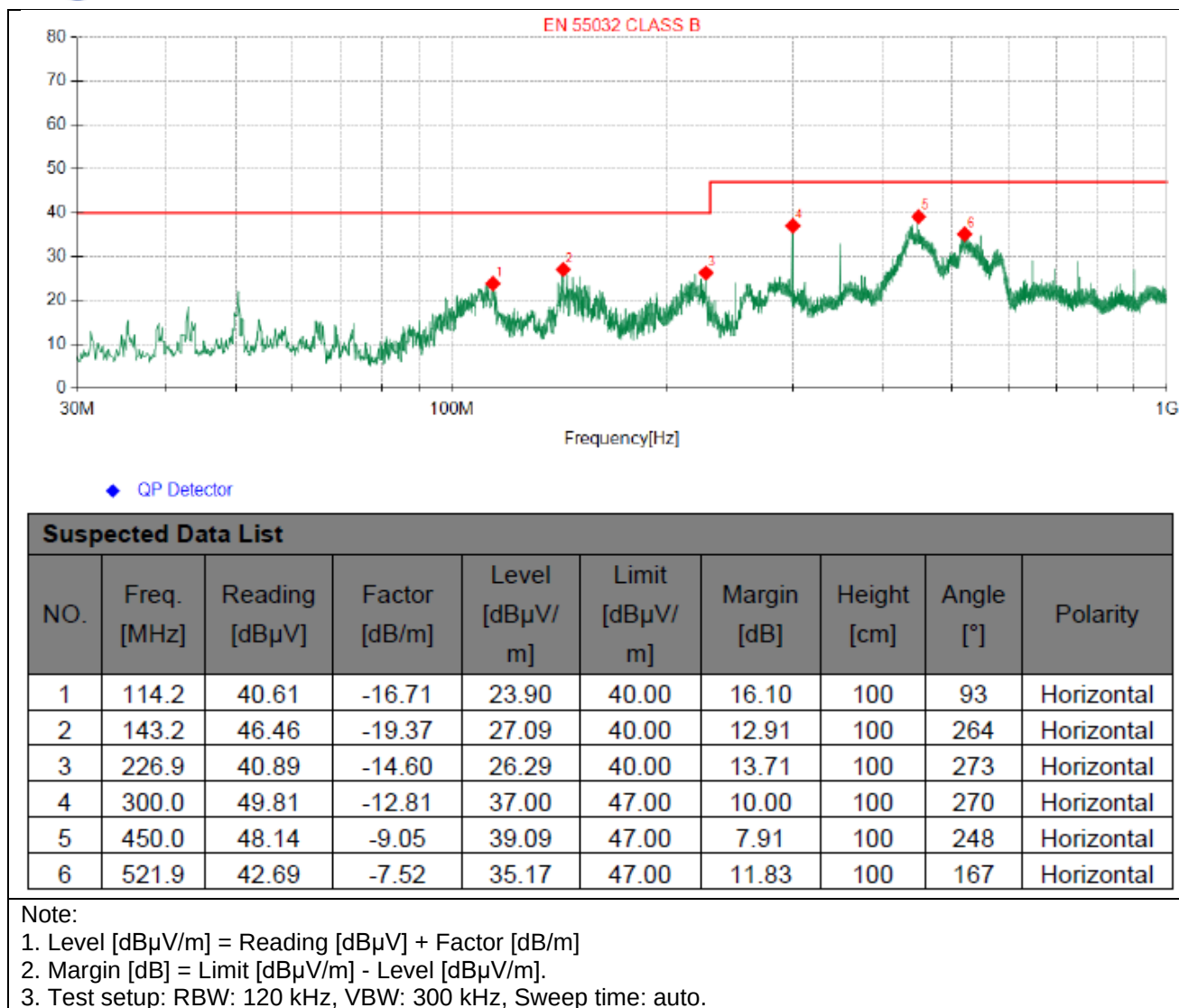
◆ QP Detector

#### Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV] | Factor [dB/m] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|-----|-------------|----------------|---------------|----------------|----------------|-------------|-------------|-----------|----------|
| 1   | 42.85       | 50.47          | -14.23        | 36.24          | 40.00          | 3.76        | 100         | 9         | Vertical |
| 2   | 50.37       | 51.79          | -14.24        | 37.55          | 40.00          | 2.45        | 100         | 3         | Vertical |
| 3   | 98.50       | 52.26          | -16.23        | 36.03          | 40.00          | 3.97        | 100         | 32        | Vertical |
| 4   | 143.2       | 56.40          | -19.37        | 37.03          | 40.00          | 2.97        | 100         | 112       | Vertical |
| 5   | 148.0       | 56.90          | -19.17        | 37.73          | 40.00          | 2.27        | 100         | 250       | Vertical |
| 6   | 300.0       | 53.26          | -12.81        | 40.45          | 47.00          | 6.55        | 100         | 324       | Vertical |

Note:

1. Level [dBμV/m] = Reading [dBμV] + Factor [dB/m]
2. Margin [dB] = Limit [dBμV/m] - Level [dBμV/m].
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.



#### Radiated Emission Above 1000MHz

| Frequency (MHz) | MaxPeak (dBuV/m) | Average (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (KHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|
| 1406.64         | 42.02            | ---              | 70             | 27.98       | 100             | 1000            | 100         | V   | 87            |
| 1341.18         | 42.08            | ---              | 70             | 27.92       | 100             | 1000            | 100         | V   | 45            |
| 2322.55         | 45.82            | ---              | 70             | 24.18       | 100             | 1000            | 100         | H   | 321           |
| 2253.19         | 47.08            | ---              | 70             | 22.92       | 100             | 1000            | 100         | H   | 309           |
| 2700.40         | 48.64            | ---              | 70             | 21.36       | 100             | 1000            | 100         | V   | 112           |
| 2908.09         | 48.07            | ---              | 70             | 21.93       | 100             | 1000            | 100         | H   | 212           |

## 4.1.2. Conducted Emission (AC Mains)

### LIMIT

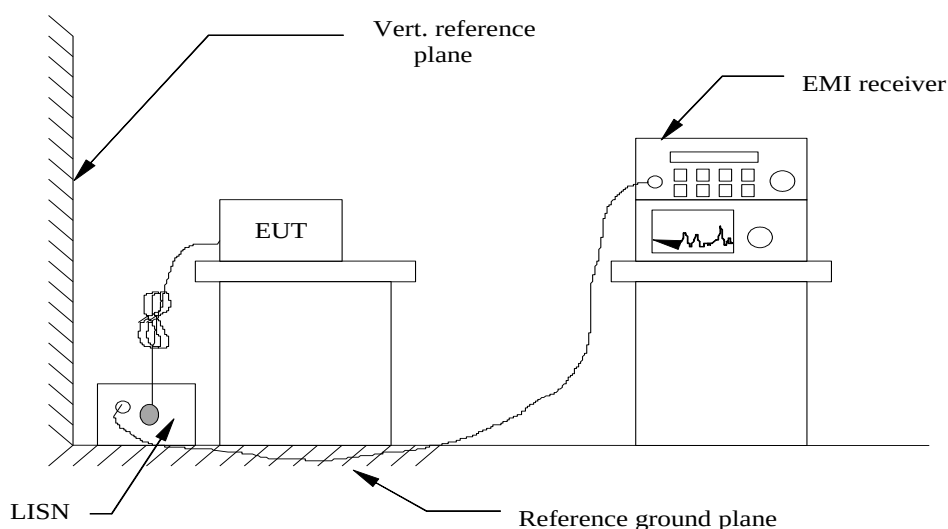
Please refer to ETSI EN 301 489-1 Clause 8.4.3

The equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A table A.10.

Alternatively, for equipment intended to be used in an industrial environment or a telecommunication centre, the class A limits given in CENELEC EN 55032 [1], annex A table A.9 can be used.

If EUT is also a FM Receiver, it shall meet CENELEC EN 55032 [3], annex A tables A.13

### TEST CONFIGURATION



### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.4.2 for the measurement methods.

### Climatic conditions

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

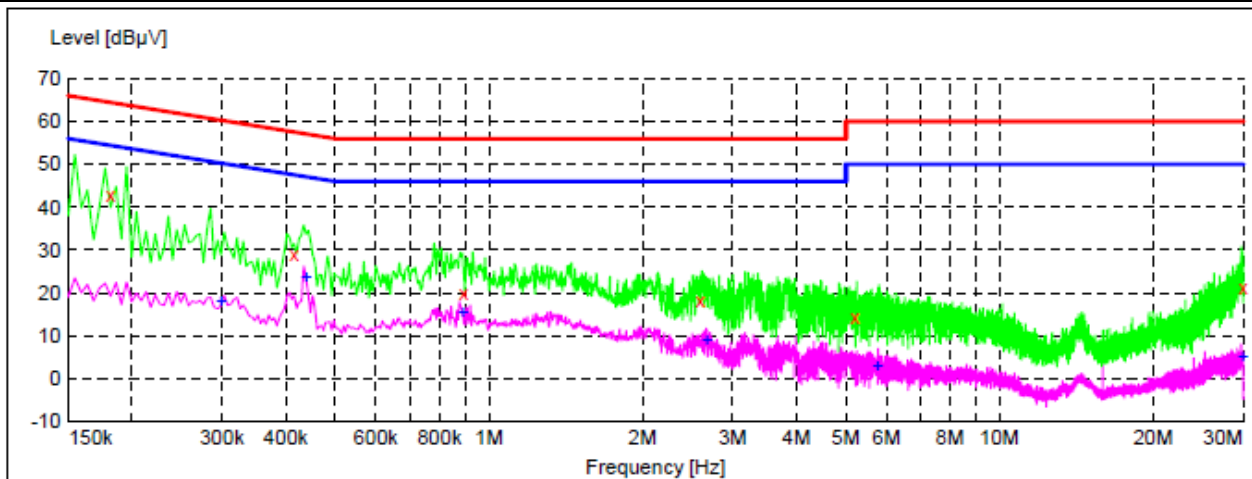
### TEST RESULTS

|                |          |
|----------------|----------|
| Temperature:   | 22.8° C  |
| Humidity:      | 56%      |
| Test Engineer: | Tony Luo |

### **Pass**

*Note: All Modes has been tested only list the worst case in this report.*



**Neutral Line**

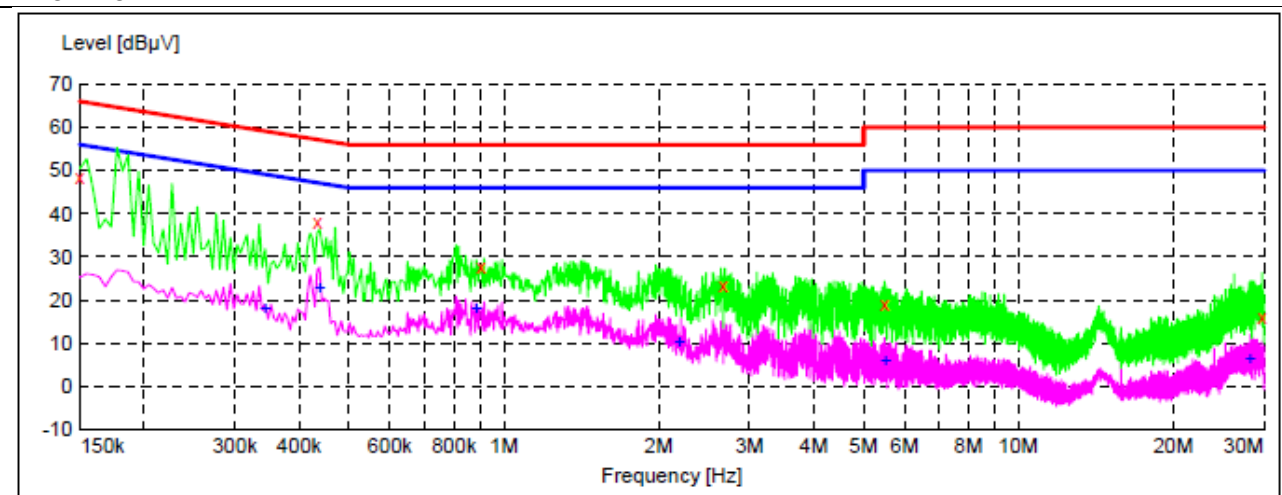
| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.181500         | 42.70         | 10.3         | 64            | 21.7         | QP       | N    | GND |
| 0.415500         | 29.20         | 10.0         | 58            | 28.3         | QP       | N    | GND |
| 0.892500         | 19.90         | 9.8          | 56            | 36.1         | QP       | N    | GND |
| 2.593500         | 18.40         | 9.7          | 56            | 37.6         | QP       | N    | GND |
| 5.212500         | 14.30         | 9.8          | 60            | 45.7         | QP       | N    | GND |
| 29.962500        | 21.30         | 10.1         | 60            | 38.7         | QP       | N    | GND |
| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
| 0.298500         | 18.30         | 10.2         | 50            | 32.0         | AV       | N    | GND |
| 0.438000         | 24.00         | 10.0         | 47            | 23.1         | AV       | N    | GND |
| 0.888000         | 15.50         | 9.8          | 46            | 30.5         | AV       | N    | GND |
| 2.670000         | 9.10          | 9.7          | 46            | 36.9         | AV       | N    | GND |
| 5.766000         | 2.90          | 9.8          | 50            | 47.1         | AV       | N    | GND |
| 29.926500        | 5.00          | 10.1         | 50            | 45.0         | AV       | N    | GND |

Note:

1.  $\text{Margin(dB)} = \text{Limit(dB}\mu\text{V)} - \text{Level(dB}\mu\text{V)}$ 

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.

**Live Line**

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.150000         | 48.60         | 9.8          | 66            | 17.4         | QP       | L1   | GND |
| 0.433500         | 38.10         | 10.0         | 57            | 19.1         | QP       | L1   | GND |
| 0.901500         | 27.60         | 9.8          | 56            | 28.4         | QP       | L1   | GND |
| 2.670000         | 23.30         | 9.7          | 56            | 32.7         | QP       | L1   | GND |
| 5.482500         | 18.90         | 9.8          | 60            | 41.1         | QP       | L1   | GND |
| 29.724000        | 16.20         | 10.1         | 60            | 43.8         | QP       | L1   | GND |
| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
| 0.343500         | 18.00         | 10.1         | 49            | 31.1         | AV       | L1   | GND |
| 0.438000         | 23.00         | 10.0         | 47            | 24.1         | AV       | L1   | GND |
| 0.883500         | 18.30         | 9.8          | 46            | 27.7         | AV       | L1   | GND |
| 2.193000         | 10.40         | 9.7          | 46            | 35.6         | AV       | L1   | GND |
| 5.505000         | 6.00          | 9.8          | 50            | 44.0         | AV       | L1   | GND |
| 28.158000        | 6.50          | 10.1         | 50            | 43.5         | AV       | L1   | GND |

Note:

1.  $\text{Margin(dB)} = \text{Limit(dB}\mu\text{V)} - \text{Level(dB}\mu\text{V)}$
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.

### 4.1.3. Conducted Emission (Telecommunication Ports)

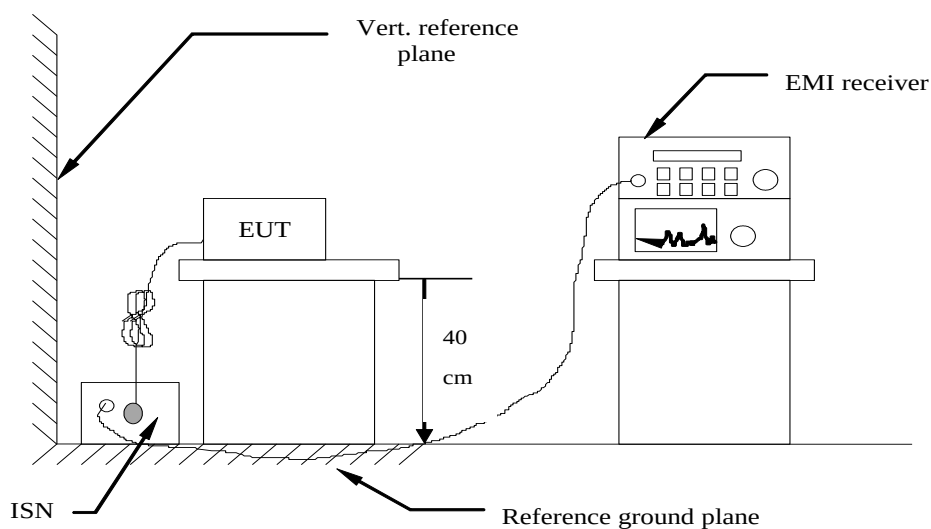
#### LIMIT

Please refer to ETSI EN 301 489-1 Clause 8.7.3

The wired network ports shall meet the class B limits given in CENELEC EN 55032 [1], annex A table A.12.

Alternatively, for equipment intended to be used exclusively in an industrial environment or a telecommunication centre, the class A limits given in CENELEC EN 55032 [1] annex A table A.11 can be used.

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.7.2 and The test method shall be in accordance with CENELEC EN 55032 [1], annex A.3. for the measurement methods.

#### Climatic conditions

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

#### TEST RESULTS

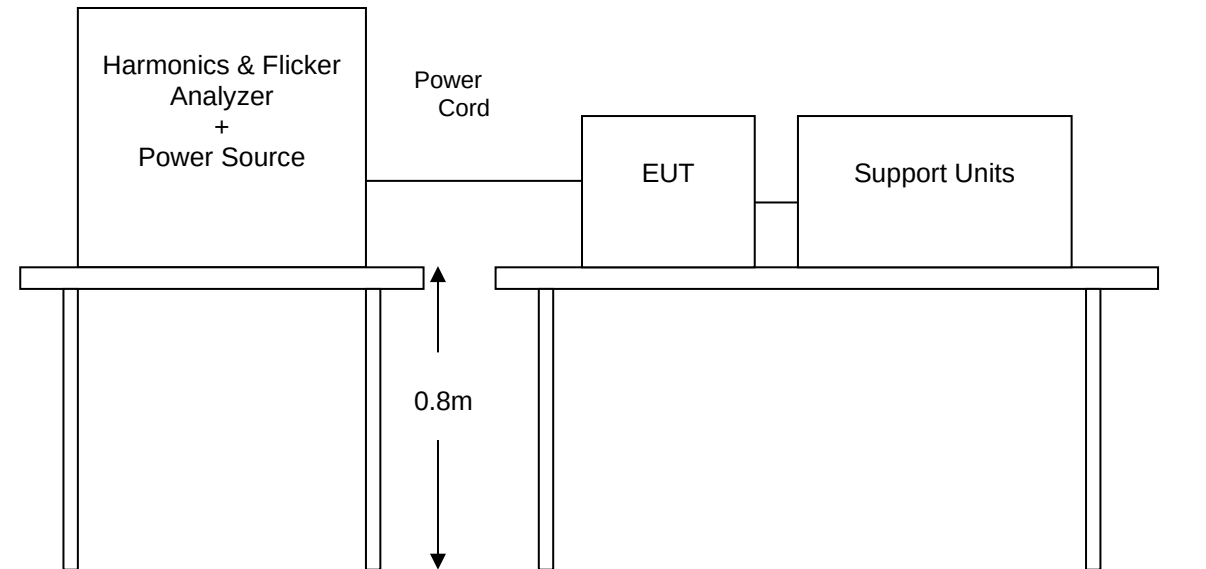
Not applicable

#### 4.1.4. Harmonic Current Emission

##### LIMIT

Please refer to EN 61000-3-2

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please refer to EN 61000-3-2 for the measurement methods.

##### Climatic conditions

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

##### TEST RESULTS

Not applicable (<75W)



#### 4.1.5. Voltage Fluctuation and Flicker

##### LIMIT

Please refer to EN 61000-3-3

##### TEST CONFIGURATION

Same as the configuration of the Harmonic Current Emission.

##### TEST PROCEDURE

Please refer to EN 61000-3-3 for the measurement methods.

##### Climatic conditions

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

##### TEST RESULTS

|                       |                                                     |
|-----------------------|-----------------------------------------------------|
| Standard used:        | EN/IEC 61000-3-3 Flicker                            |
| Short time (Pst):     | 10 min                                              |
| Observation time:     | 120 min (12 Flicker measurements)                   |
| Customer:             | Jiangxi Small Walrus Intelligent Technology Co.,LTD |
| Mains supply voltage: | AC 230V/50Hz                                        |
| E. U. T.:             | Smart WiFi Dome Camera M/N: XHX-PT09-DW             |
| Date of test:         | 2024/5/20                                           |
| Tester:               | Tony Luo                                            |

|             |      |
|-------------|------|
| Test Result | PASS |
|-------------|------|

##### Maximum Flicker results

|          | EUT values | Limit | Result |
|----------|------------|-------|--------|
| Pst      | 0.028      | 1.00  | PASS   |
| Plt      | 0.028      | 0.65  | PASS   |
| dc [%]   | 0.000      | 3.30  | PASS   |
| dmax [%] | 0.127      | 4.00  | PASS   |
| dt [s]   | 0.000      | 0.50  | PASS   |

##### Detail Flicker data

| Flicker measurement 1 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.127      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |



| Flicker measurement 2 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.093      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |

| Flicker measurement 3 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.093      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |

| Flicker measurement 4 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.091      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |

| Flicker measurement 5 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.092      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |

| Flicker measurement 6 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.095      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |

| Flicker measurement 7 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.091      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |



| Flicker measurement 8 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.094      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |

| Flicker measurement 9 | EUT values | Limit | Result |
|-----------------------|------------|-------|--------|
| Pst                   | 0.028      | 1.00  | PASS   |
| dc [%]                | 0.000      | 3.30  | PASS   |
| dmax [%]              | 0.093      | 4.00  | PASS   |
| dt [s]                | 0.000      | 0.50  | PASS   |

| Flicker measurement 10 | EUT values | Limit | Result |
|------------------------|------------|-------|--------|
| Pst                    | 0.028      | 1.00  | PASS   |
| dc [%]                 | 0.000      | 3.30  | PASS   |
| dmax [%]               | 0.094      | 4.00  | PASS   |
| dt [s]                 | 0.000      | 0.50  | PASS   |

| Flicker measurement 11 | EUT values | Limit | Result |
|------------------------|------------|-------|--------|
| Pst                    | 0.028      | 1.00  | PASS   |
| dc [%]                 | 0.000      | 3.30  | PASS   |
| dmax [%]               | 0.095      | 4.00  | PASS   |
| dt [s]                 | 0.000      | 0.50  | PASS   |

| Flicker measurement 12 | EUT values | Limit | Result |
|------------------------|------------|-------|--------|
| Pst                    | 0.028      | 1.00  | PASS   |
| dc [%]                 | 0.000      | 3.30  | PASS   |
| dmax [%]               | 0.093      | 4.00  | PASS   |
| dt [s]                 | 0.000      | 0.50  | PASS   |

## 4.1.6. Electrostatic Discharge

### LIMIT

Please refer to EN 61000-4-2

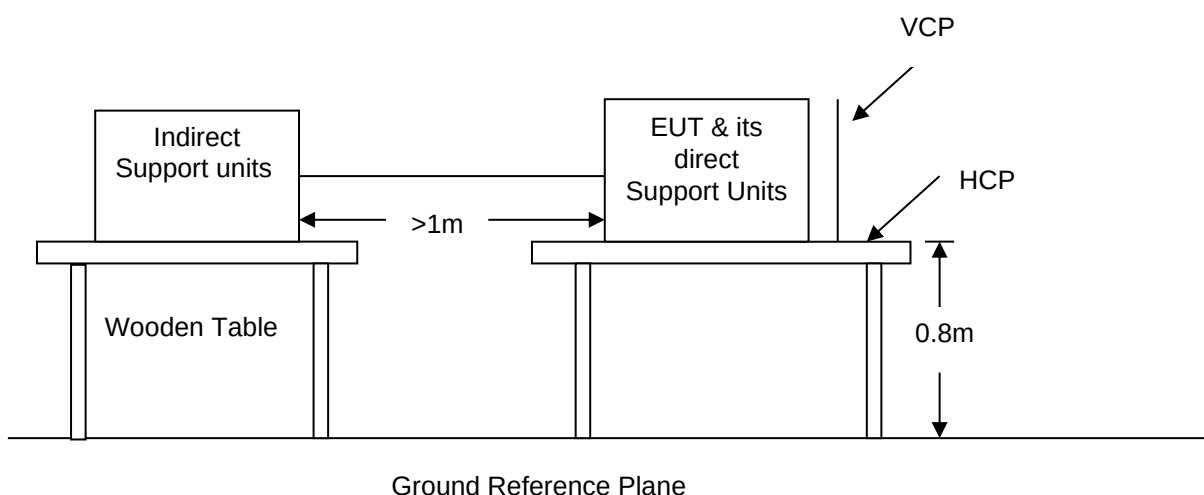
### SEVERITY LEVELS OF ELECTROSTATIC DISCHARGE

Test level: Contact Discharge at  $\pm 2\text{KV}, \pm 4\text{KV}$  Air Discharge at  $\pm 2\text{KV}, \pm 4\text{KV}, \pm 8\text{KV}$

| 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 criterion: **B**

### Test Configuration



### Test procedure

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

### Test results

|                |          |
|----------------|----------|
| Temperature:   | 22.8° C  |
| Humidity:      | 56%      |
| Test Engineer: | Tony Luo |

### **Contact Discharge:**

The ESD generator is held perpendicular to the surface to which the discharge is applied and the tip of the discharge electrode touch the surface of EUT. Then turn the discharge switch. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed



**Air Discharge:**

Air discharge is used where contact discharge can't be applied. 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 at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

**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.

**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 X 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.

**Climatic conditions**

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

**Description of the Electrostatic Discharges (ESD)**

| Point of Discharge            | Applied Voltage (KV) | Total No. of Discharge (Each Point) | Results | Criteria Level | Remark |
|-------------------------------|----------------------|-------------------------------------|---------|----------------|--------|
| Air Test Point                | ±2                   | 50                                  | Pass    | B              | -      |
|                               | ±4                   | 50                                  | Pass    | B              | -      |
|                               | ±8                   | 50                                  | Pass    | B              | -      |
| Contact Discharge Test Points | ±2                   | 50                                  | Pass    | B              |        |
|                               | ±4                   | 50                                  | Pass    | B              |        |
| VCP (4 sides)                 | ±2                   | 50                                  | Pass    | B              | -      |
|                               | ±4                   | 50                                  | Pass    | B              | -      |
| HCP (4 sides)                 | ±2                   | 50                                  | Pass    | B              | -      |
|                               | ±4                   | 50                                  | Pass    | B              | -      |

The requirements are **Fulfilled**

Performance Criterion: **B**

**Remarks:** The ancillary equipment's specification for an acceptable level of performance or degradation of performance during and/or after the ESD tests.

**Description of Discharge Point**

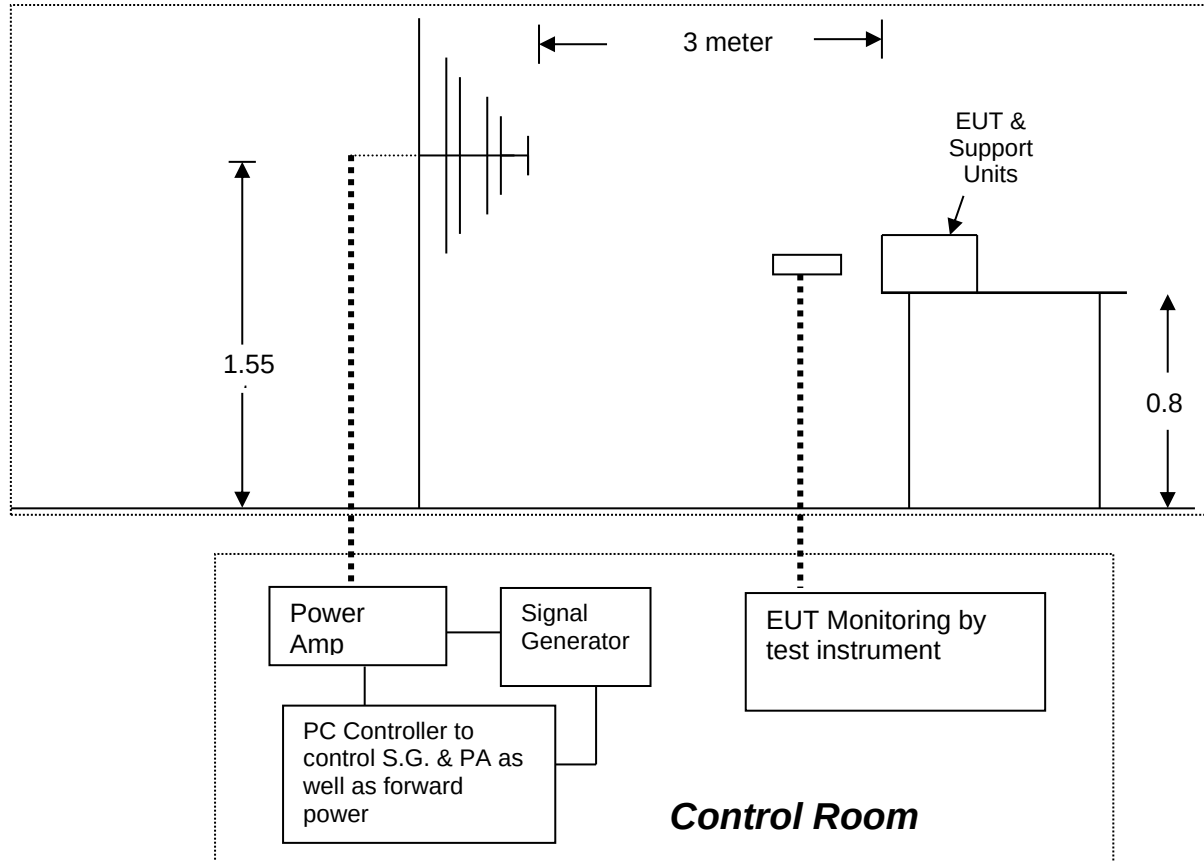
| Contact Discharge |                        | Air Discharge |                       |
|-------------------|------------------------|---------------|-----------------------|
| ○                 | Metallic Screws        | ○             | Plastic Screws        |
| ○                 | Metallic Case          | ●             | Plastic Case(gap)     |
| ●                 | Metallic Connect ports | ●             | Plastic Connect Ports |
| ●                 | Metallic Junctions     | ●             | Plastic Junctions     |
| ○                 | Others (Antenna Port)  | ○             | Others                |

#### 4.1.7. RF Electromagnetic Field

##### LIMIT

Please refer to EN 61000-4-3

##### Test Configuration



##### Test Levels of RF Electromagnetic Field

Test level: RF Field Strength: 3V/m

| Level | RF Field Strength(V/m) |
|-------|------------------------|
| 1     | 1                      |
| 2     | 3                      |
| 3     | 10                     |
| X     | Special                |

Performance criterion: **A**

##### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.2.2 and EN 61000-4-3 for the measurement methods.

**Climatic conditions**

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

**TEST RESULTS**

|                |          |
|----------------|----------|
| Temperature:   | 22.8° C  |
| Humidity:      | 56%      |
| Test Engineer: | Tony Luo |

**☒ Result of Final Tests (Operating Mode & Standby (Receiving) Mode)**

|   | Freq. Range (MHz) | Field | Modulation | Polarity | Position | Mode             | Result (Pass/Fail) |
|---|-------------------|-------|------------|----------|----------|------------------|--------------------|
| 1 | 80-1000           | 3V/m  | Yes        | H / V    | Front    | Normal Operating | Pass               |
|   | 1000-6000         | 3V/m  | Yes        | H / V    | Front    |                  | Pass               |
| 2 | 80-1000           | 3V/m  | Yes        | H / V    | Right    | Normal Operating | Pass               |
|   | 1000-6000         | 3V/m  | Yes        | H / V    | Right    |                  | Pass               |
| 3 | 80-1000           | 3V/m  | Yes        | H / V    | Back     | Normal Operating | Pass               |
|   | 1000-6000         | 3V/m  | Yes        | H / V    | Back     |                  | Pass               |
| 4 | 80-1000           | 3V/m  | Yes        | H / V    | Left     | Normal Operating | Pass               |
|   | 1000-6000         | 3V/m  | Yes        | H / V    | Left     |                  | Pass               |

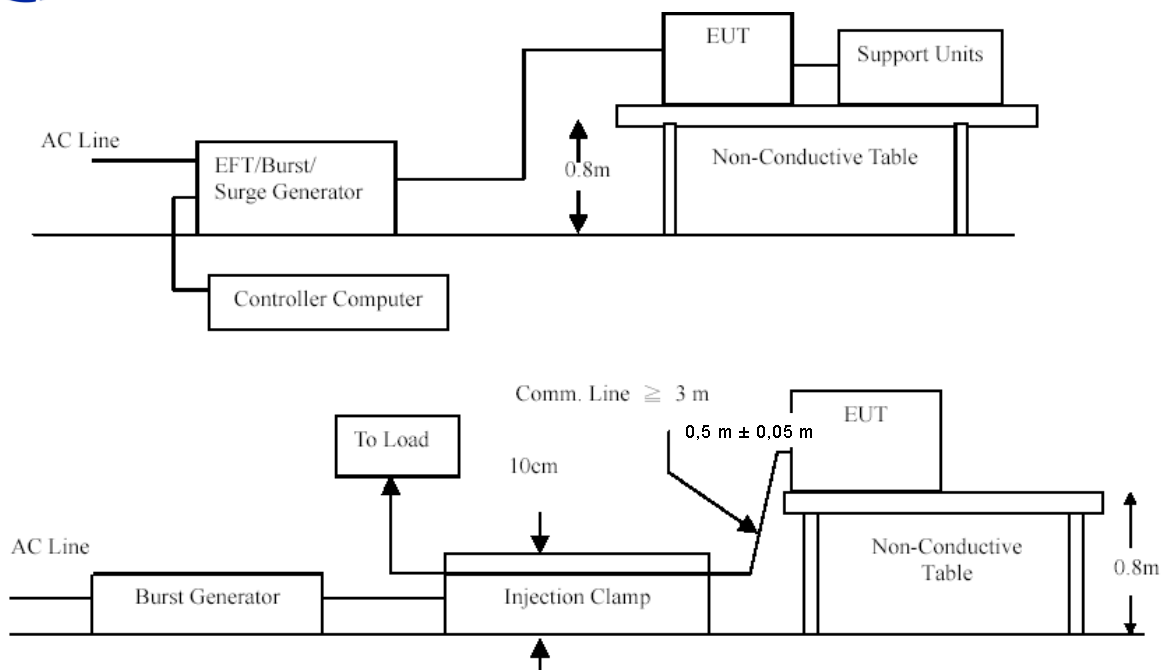
**Special conditions for EMC immunity tests(Bluetooth/WiFi):**

| EUT operating Mode | Max PER During test | PER Limit | Conclusion |
|--------------------|---------------------|-----------|------------|
| Bluetooth          | 2.5%                | 10%       | Pass       |
| WiFi               | 1.7%                | 10%       | Pass       |

**4.1.8. Fast Transients Common Mode****LIMIT**

Please refer to EN 61000-4-4

**TEST CONFIGURATION**



### **TEST PROCEDURE**

Please refer to ETSI EN 301 489-1 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

### **Climatic conditions**

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

### **TEST RESULTS**

|                |          |
|----------------|----------|
| Temperature:   | 22.8° C  |
| Humidity:      | 56%      |
| Test Engineer: | Tony Luo |

### **☒ Results of Final Tests (Operating Mode)**

Impulse Frequency: 5 kHz

Tr/Th: 5/50ns

Burst Duration: 15ms

Burst Period: 300ms

Test duration: 120s



| Injection Line                                     | Voltage (kV) | Injected Method | Result (Pass / Fail) |
|----------------------------------------------------|--------------|-----------------|----------------------|
| <input checked="" type="checkbox"/> Line           | $\pm 1$      | Direct          | Pass                 |
| <input checked="" type="checkbox"/> Neutral        | $\pm 1$      | Direct          | Pass                 |
| <input type="checkbox"/> PE                        | $\pm 1$      | Direct          | Pass                 |
| <input checked="" type="checkbox"/> Line + Neutral | $\pm 1$      | Direct          | Pass                 |
| <input type="checkbox"/> L + PE                    | $\pm 1$      | Direct          | Pass                 |
| <input type="checkbox"/> N + PE                    | $\pm 1$      | Direct          | Pass                 |
| <input type="checkbox"/> L + N + PE                | $\pm 1$      | Direct          | Pass                 |
| <input type="checkbox"/> RJ45 port (LAN cable)     | $\pm 0.5$    | Clamp           | Pass                 |
| <input type="checkbox"/> RJ11 port (Line cable)    | $\pm 0.5$    | Clamp           | Pass                 |

| PERFORMANCE CRITERIA |                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------|
| Criteria requested   | <input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C |
| Criteria meet        | <input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C |

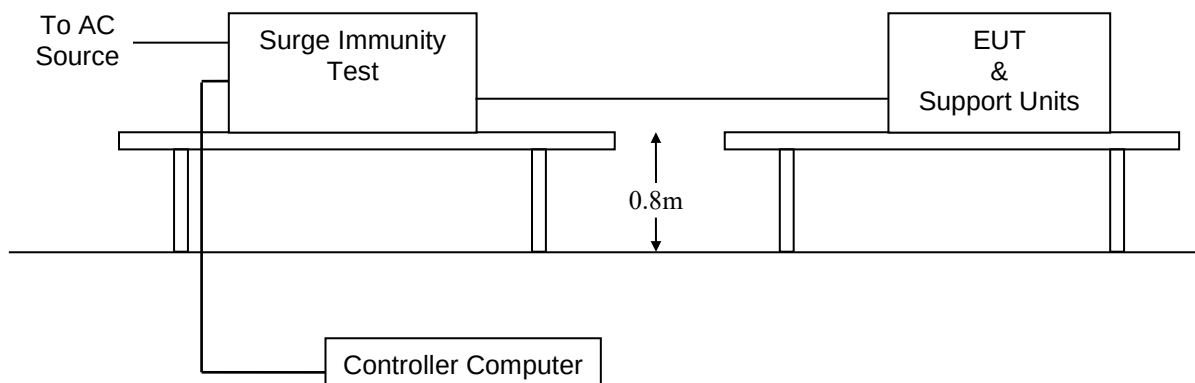


#### 4.1.9. Surges, Line to Line and Line to Ground

##### LIMIT

Please refer to EN 61000-4-5

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

##### Climatic conditions

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

##### TEST RESULTS

|                |          |
|----------------|----------|
| Temperature:   | 22.8° C  |
| Humidity:      | 56%      |
| Test Engineer: | Tony Luo |

##### ☒ Results of Final Tests (Operating Mode)

Voltage Waveform: 1.2/50 us

Current Waveform: 8/20 us

Polarity: Positive/Negative

Phase angle: 0°, 90°, 180°, 270°

| Coupling Line                                      | Voltage (kV) | Polarity   | Coupling Method | Result (Pass/Fail) |
|----------------------------------------------------|--------------|------------|-----------------|--------------------|
| <input checked="" type="checkbox"/> Line + Neutral | 1            | Pos./ Neg. | Capacitive      | Pass               |
| <input type="checkbox"/> L + PE                    | 2            | Pos./ Neg. | Capacitive      | Pass               |
| <input type="checkbox"/> N + PE                    | 2            | Pos./ Neg. | Capacitive      | Pass               |
| <input type="checkbox"/> T, R-Ground               | 0.5          | Pos./ Neg. | Capacitive      | Pass               |
| <input type="checkbox"/> RJ45 port (LAN)           | 0.5          | Pos./ Neg. | Capacitive      | Pass               |
| <input type="checkbox"/> RJ11 port (Line cable)    | 0.5          | Pos./ Neg. | Capacitive      | Pass               |

##### **PERFORMANCE CRITERIA**

Criteria requested ☐ A / ☒ B / ☐ C

Criteria meet ☐ A / ☒ B / ☐ C

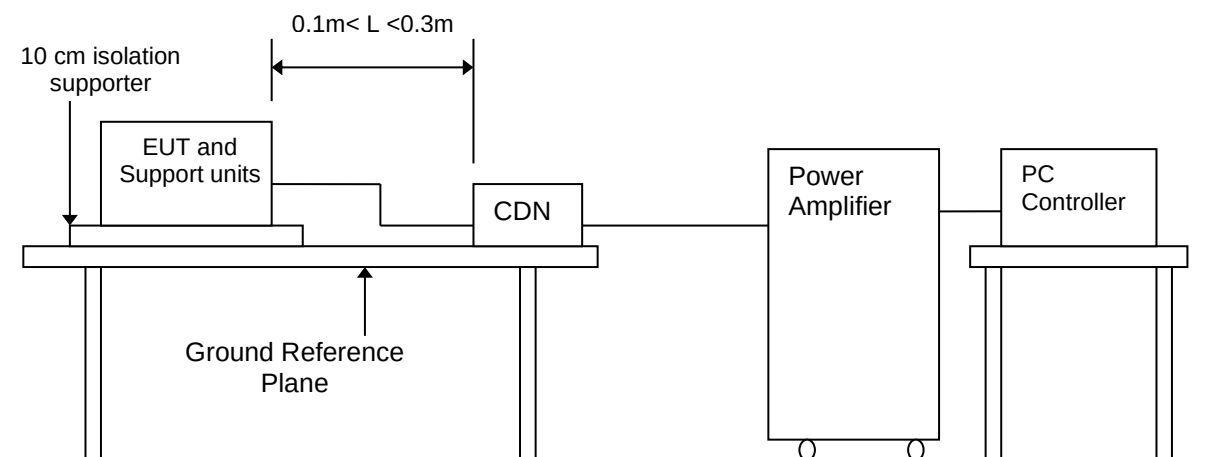


#### 4.1.10. RF- Common Mode 0.15MHz to 80MHz

##### LIMIT

Please refer to EN 61000-4-6

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.5.2 and EN 61000-4-6 for the measurement methods.

##### Climatic conditions

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

##### TEST RESULTS

|                |          |
|----------------|----------|
| Temperature:   | 22.8° C  |
| Humidity:      | 56%      |
| Test Engineer: | Tony Luo |

##### Test conditions

##### ☒ Results of Final Tests (Operating Mode)

Frequency Range: 0.15MHz~80MHz

Frequency Step: 1% of fundamental

Dwell time: 1 Sec.

☒ 80% A.M., 1 kHz Sine wave (Field Strength: 3 V/m)

☒ Coupling type: ☒ CDN / ☐ RF Current Probe/ ☐ EM CLAMP (LÜTHI)

| Range (MHz) | Field | Modulation | Injected Position | Result (Pass/Fail) |
|-------------|-------|------------|-------------------|--------------------|
| 0.15-80     | 3V    | Yes        | AC Main           | Pass               |

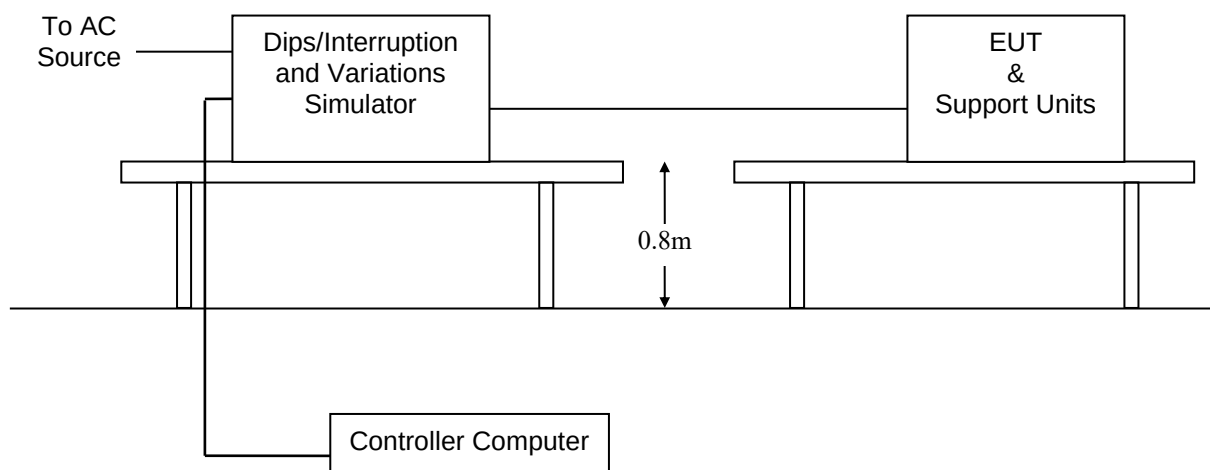
**Special conditions for EMC immunity tests**

| EUT operating Mode | Max PER During test | PER Limit | Conclusion |
|--------------------|---------------------|-----------|------------|
| Bluetooth          | 2.5%                | 10%       | Pass       |
| WiFi               | 1.7%                | 10%       | Pass       |

Special conditions for EMC immunity tests (test at receiver, the worst test result)

**4.1.11. Voltage Dips and Interruptions****LIMIT**

Please refer to EN 61000-4-11

**TEST CONFIGURATION****TEST PROCEDURE**

Please refer to ETSI EN 301 489-1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods

**Climatic conditions**

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

**TEST RESULTS**

|                |          |
|----------------|----------|
| Temperature:   | 22.8° C  |
| Humidity:      | 56%      |
| Test Engineer: | Tony Luo |

**Test conditions**

☒ Interruption at phase angles of 0, 45, 90, 135, 180, 225, 270 and 315 degree in a 10 sec-interval.

|                 | Test Level<br>(% UT) | Reduction<br>(%) | Duration |     | Criterion |
|-----------------|----------------------|------------------|----------|-----|-----------|
|                 |                      |                  | Peiod    | ms  |           |
| Voltage<br>Dips | 0                    | 100%             | 0.5      | 10  | B         |
|                 | 0                    | 100%             | 1        | 20  | B         |
|                 | 70                   | 30%              | 25       | 500 | B         |





|                      |   |      |     |      |   |
|----------------------|---|------|-----|------|---|
| Voltage Interruption | 0 | 100% | 250 | 5000 | C |
|----------------------|---|------|-----|------|---|

**Note:** The duration with a sequence of three dips/interruptions with a minimum interval of 10 s between each test event. The test level is  $U_T=100V$  and  $U_T=240V$ .

☒ **Results of Final Tests (Operating Mode)**

**$U_T=100V$**

☒ **Voltage Dips**

| Test Level<br>(% UT) | Reduction<br>(%) | Duration |     | Observation | Criterion |
|----------------------|------------------|----------|-----|-------------|-----------|
|                      |                  | Peiod    | ms  |             |           |
| 0                    | 100%             | 0.5      | 10  | Normal      | A         |
| 0                    | 100%             | 1        | 20  | Normal      | A         |
| 70                   | 30%              | 25       | 500 | Normal      | B         |

☒ **Interruptions**

| Test Level<br>(% UT) | Reduction<br>(%) | Duration |      | Observation | Criterion |
|----------------------|------------------|----------|------|-------------|-----------|
|                      |                  | Peiod    | ms   |             |           |
| 0                    | 100%             | 250      | 5000 | Normal      | B         |

**$U_T=240V$**

☒ **Voltage Dips**

| Test Level<br>(% UT) | Reduction<br>(%) | Duration |     | Observation | Criterion |
|----------------------|------------------|----------|-----|-------------|-----------|
|                      |                  | Peiod    | ms  |             |           |
| 0                    | 100%             | 0.5      | 10  | Normal      | A         |
| 0                    | 100%             | 1        | 20  | Normal      | A         |
| 70                   | 30%              | 25       | 500 | Normal      | B         |

☒ **Interruptions**

| Test Level<br>(% UT) | Reduction<br>(%) | Duration |      | Observation | Criterion |
|----------------------|------------------|----------|------|-------------|-----------|
|                      |                  | Peiod    | ms   |             |           |
| 0                    | 100%             | 250      | 5000 | Normal      | B         |

#### 4.1.12. Power Frequency Magnetic Field Susceptibility Test

##### LIMIT

Please refer to EN 61000-4-8

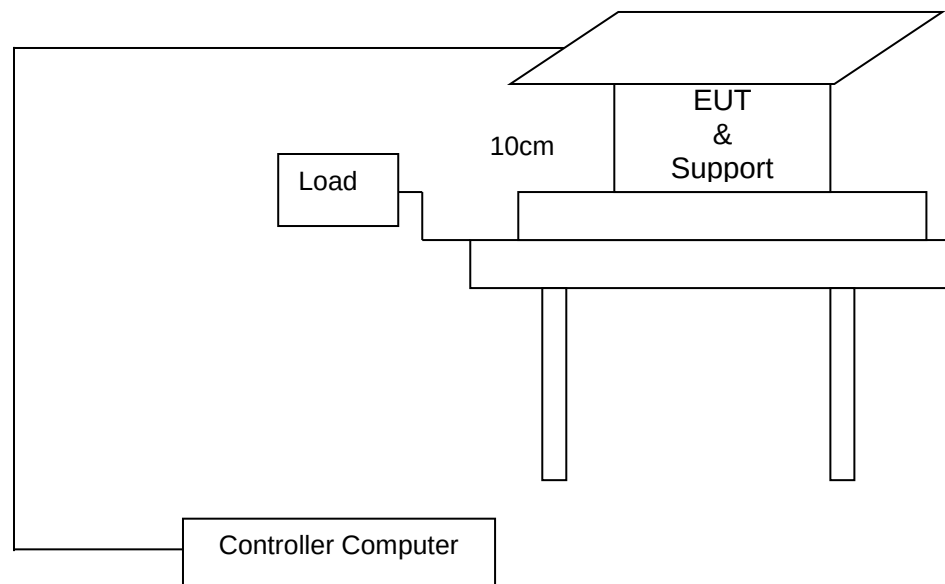
##### TEST LEVELS OF POWER FREQUENCY FIELD SUSCEPTIBILITY TEST

Test Level: 1A/m

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

Performance criterion: A

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please EN 61000-4-8 for the measurement methods.

##### TEST RESULTS

##### Climatic conditions

- ambient temperature : 25 °C
- relative humidity: 55%
- atmospheric pressure: 960 mbar

**Description of the Power Frequency Magnetic Field Susceptibility Test**

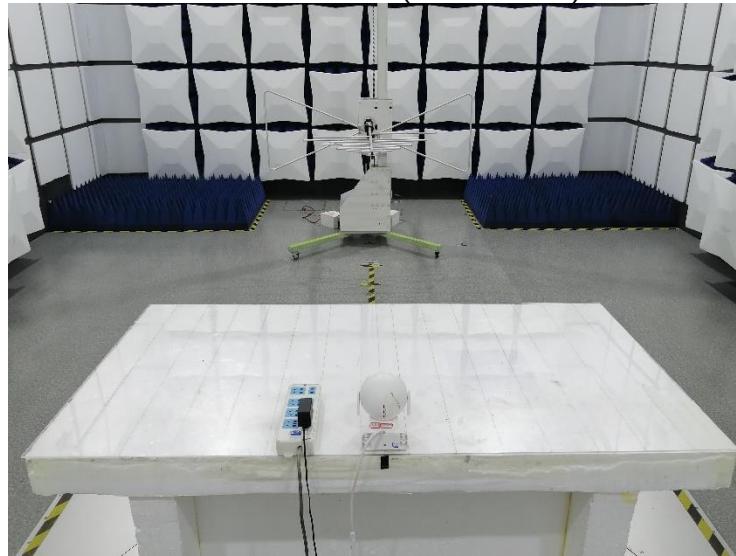
Test frequency:                           ■ 50 Hz                   ■ 60 Hz  
Continuous field:                       ■ 1 A/m  
Test duration:                           ■ 5 m  
Antenna factor:                         0.917 A/m  
Axis:                                   ■ x-axis                   ■ y-axis                   ■ z-axis

The requirements are **Fulfilled**Performance Criterion: **A**

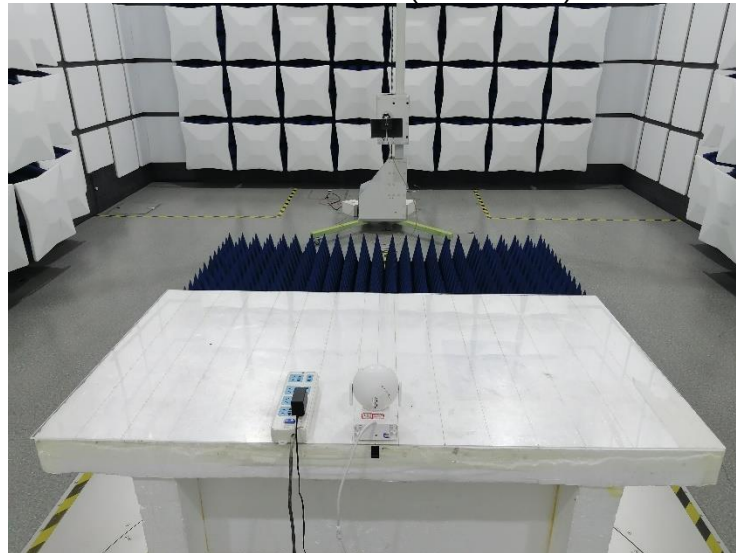
**Remarks:**     During the test no deviation was detected to the selected operation mode(s).

## 5. Test Set-up Photos of the EUT

Radiated Emission (30MHz-1GHz)



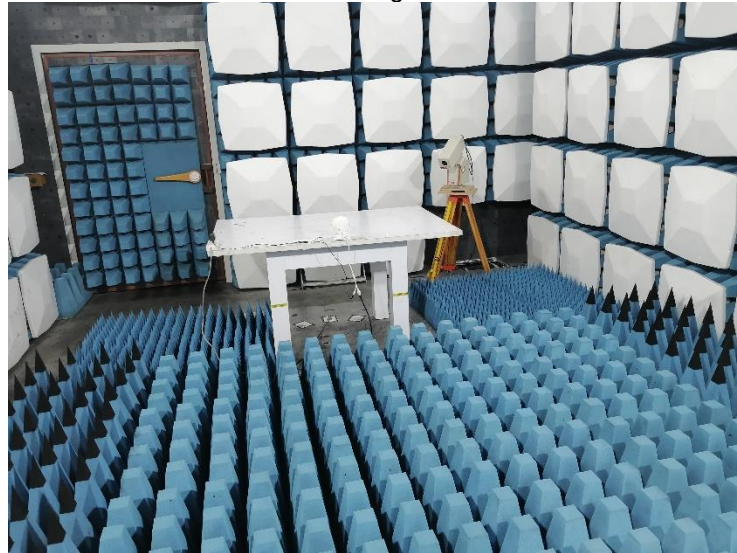
Radiated Emission (1GHz-6GHz)



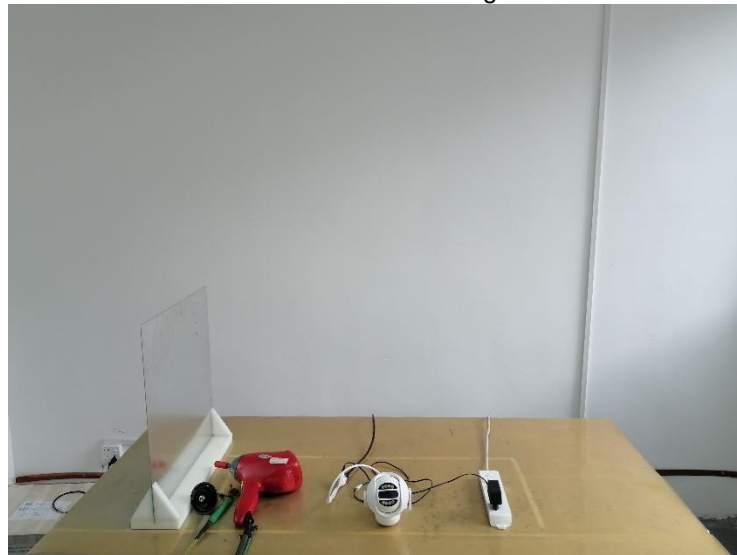
Conducted Emission (AC Mains)



RF Electromagnetic Field



Electrostatic Discharge



Fast Transients/Surges/ Voltage Dips and Interruptions





## 6. PHOTOS OF THE EUT

### External Photos



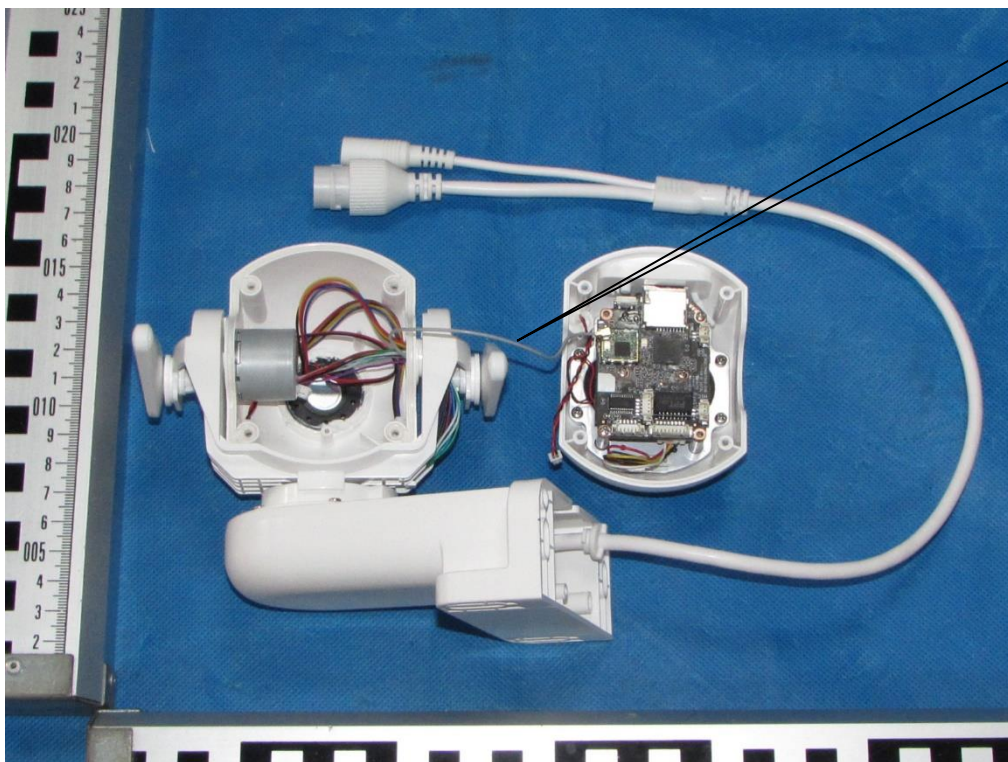






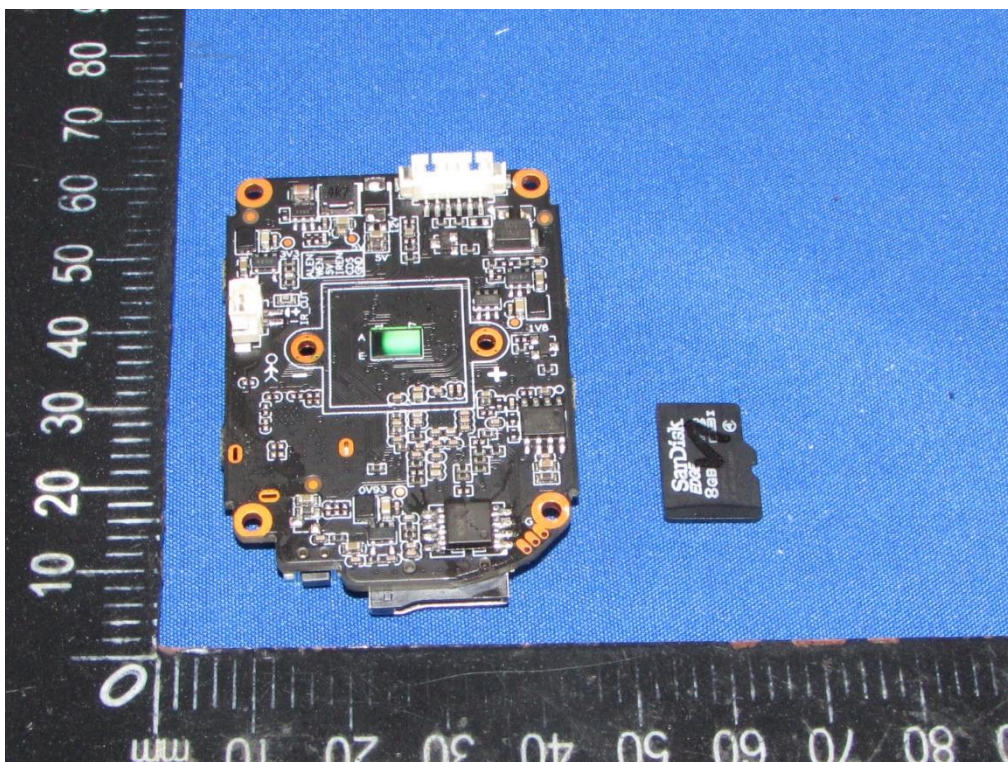
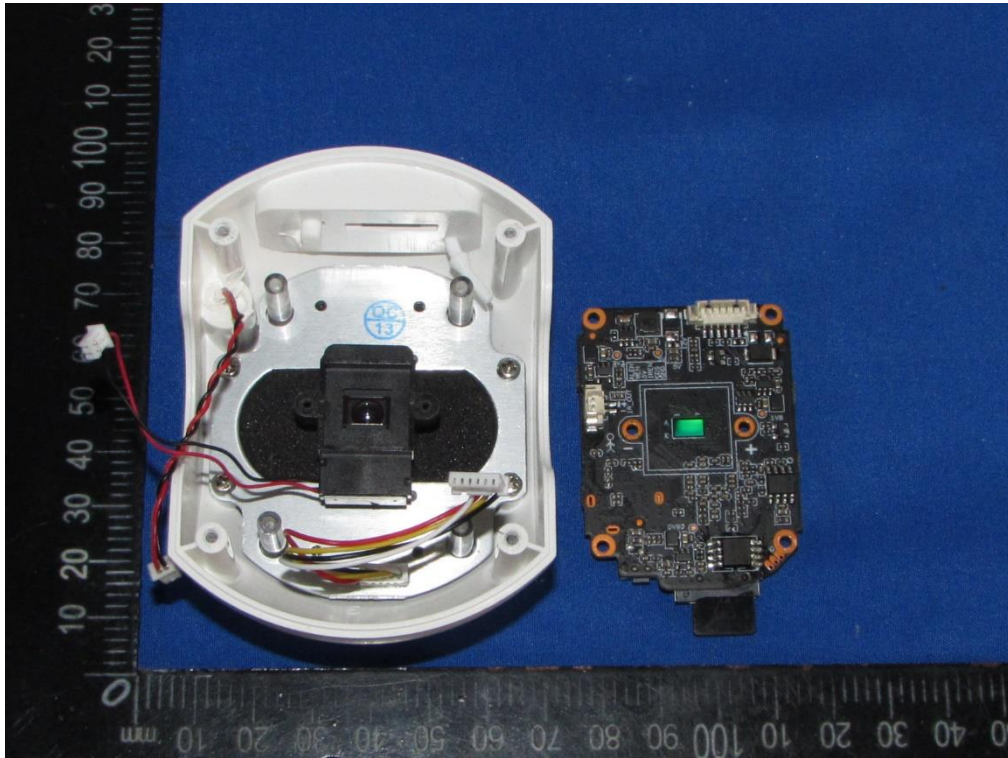




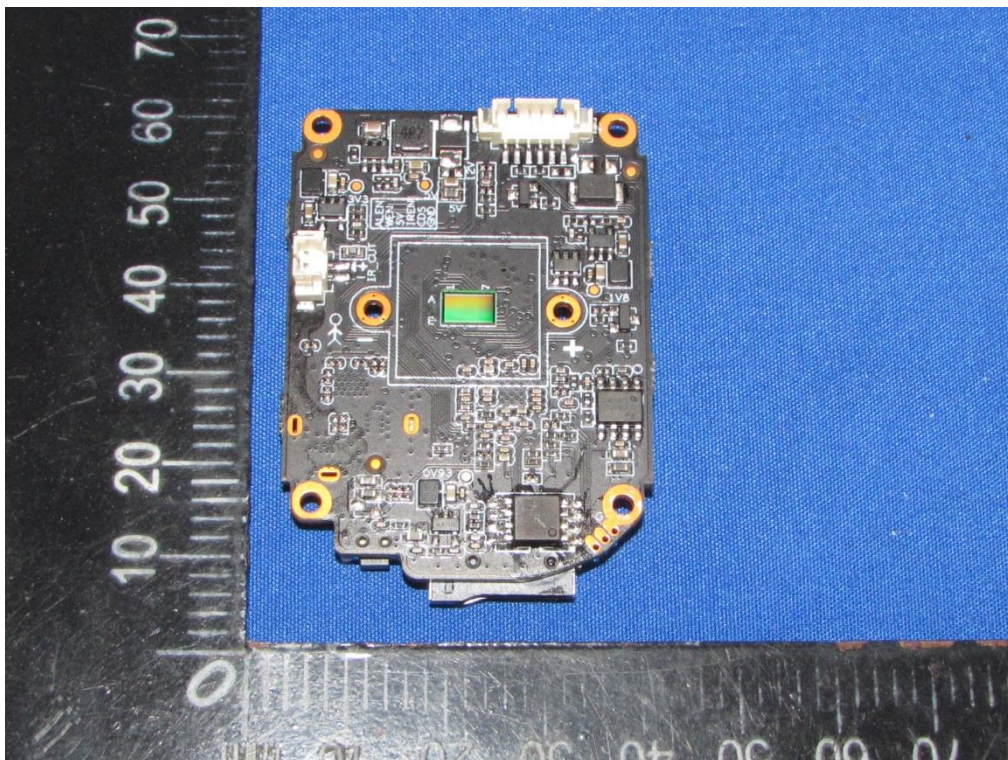
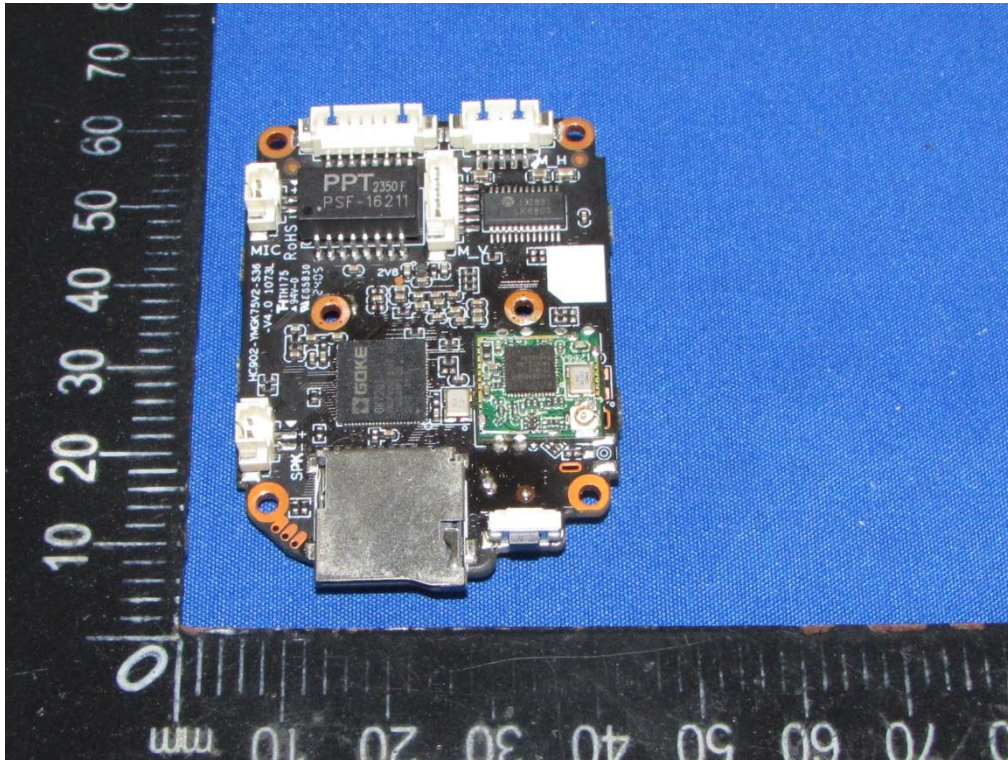
**Internal Photos**

WiFi  
antenna









.....End of Report.....