# CE EMC TEST REPORT

| | | |
|---|---|---|
| **Applicant** | : | TPV Electronics (Fujian) Co., Ltd. |
| **Address** | : | Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R. China |
| **Equipment under Test** | : | LCD Monitor |
| **Model No.** | : | 24E4U,24P4U,24E4CV,24E4********,24P4******** ("*" = 0-9, A-Z, a-z, +, -, /, \ or blank) |
| **Report No.** | : | DDT-B25033103-1E01 |
| **Issue Date** | : | Apr. 26, 2025 |
| **Issued By** | : | Tianjin Dongdian Testing Service Co., Ltd. |
| **Address** | : | Building D-1, No. 19, Weisi Road, Microelectronics Industrial Park, Development Area, Tianjin, China.<br>Tel: +86-022-58038033, E-mail: ddt@gddt.com<br>http://www.ddttest.com |

REPORT

# CONTENTS

1 Summary of Test Results ..... 6
2 General Test Information ..... 7
2.1 Description of EUT ..... 7
2.2 Primary Function of EUT ..... 7
2.3 Port of EUT ..... 7
2.4 Accessories of EUT ..... 8
2.5 Test peripherals ..... 8
2.6 Block diagram EUT configuration for test ..... 9
2.7 EUT operating mode(s) ..... 9
2.8 Performance Criteria ..... 10
2.9 Deviations of test standard ..... 10
2.10 Test laboratory ..... 10
2.11 Measurement uncertainty ..... 11
2.12 Abbreviations ..... 11
3 Conducted Emissions (AC mains power ports) ..... 12
3.1 General Information ..... 12
3.2 Test Equipment ..... 12
3.3 Reference Standard ..... 12
3.4 Test Arrangement ..... 12
3.5 Test Specification and Limit ..... 14
3.6 Test Result ..... 14
4 Radiated Emissions (30MHz to 1GHz) ..... 16
4.1 General Information ..... 16
4.2 Test Equipment ..... 16
4.3 Reference Standard ..... 16
4.4 Test Arrangement ..... 17
4.5 Test Specification and Limit ..... 19
4.6 Test Result ..... 19
5 Radiated Emissions (Above 1GHz) ..... 21
5.1 General Information ..... 21
5.2 Test Equipment ..... 21
5.3 Reference Standard ..... 21
5.4 Test Arrangement ..... 21
5.5 Test Specification and Limit ..... 23
5.6 Test Result ..... 24
6 Harmonic Current Emissions ..... 26
6.1 General Information ..... 26
6.2 Test Equipment ..... 26
6.3 Reference Standard ..... 26
6.4 Test Arrangement ..... 26
6.5 Test Specification and Limit ..... 27
6.6 Test Result ..... 27
7 Voltage Changes, Voltage Fluctuations and Flicker ..... 29
7.1 General Information ..... 29
7.2 Test Equipment ..... 29
7.3 Reference Standard ..... 29
7.4 Test Arrangement ..... 29
7.5 Test Specification and Limit ..... 30
7.6 Test Result ..... 30
8 Electrostatic Discharge Immunity ..... 31
8.1 General Information ..... 31
8.2 Test Equipment ..... 31
8.3 Reference Standard ..... 31
8.4 Test Arrangement ..... 31
8.5 Test Specification and Limit ..... 32
8.6 Test Result ..... 32

9 Radiated, Radio-frequency, Electromagnetic Field Immunity....34
9.1 General Information....34
9.2 Test Equipment....34
9.3 Reference Standard....34
9.4 Test Arrangement....35
9.5 Test Specification and Limit....35
9.6 Test Result....36
10 Electrical Fast Transient/Burst Immunity....37
10.1 General Information....37
10.2 Test Equipment....37
10.3 Reference Standard....37
10.4 Test Arrangement....37
10.5 Test Specification and Limit....38
10.6 Test Result....39
11 Surge Immunity....40
11.1 General Information....40
11.2 Test Equipment....40
11.3 Reference Standard....40
11.4 Test Arrangement....40
11.5 Test Specification and Limit....41
11.6 Test Result....42
12 Immunity to Conducted Disturbances, Induced by Radio-frequency Fields....43
12.1 General Information....43
12.2 Test Equipment....43
12.3 Reference Standard....43
12.4 Test Arrangement....44
12.5 Test Specification and Limit....44
12.6 Test Result....45
13 Power Frequency Magnetic Field Immunity....46
13.1 General Information....46
13.2 Test Equipment....46
13.3 Reference Standard....46
13.4 Test Arrangement....46
13.5 Test Specification and Limit....47
13.6 Test Result....47
14 Voltage Dips, Short Interruptions and Voltage Variations Immunity....48
14.1 General Information....48
14.2 Test Equipment....48
14.3 Reference Standard....48
14.4 Test Arrangement....48
14.5 Test Specification and Limit....49
14.6 Test Result....49
Annex A.Test Setup Photos....50

# Test Report Declare

| | | |
|---|---|---|
| **Applicant** | : | TPV Electronics (Fujian) Co., Ltd. |
| **Address** | : | Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R. China |
| **Equipment under Test** | : | LCD Monitor |
| **Model No.** | : | 24E4U,24P4U,24E4CV,24E4********,24P4******** ("*" = 0-9, A-Z, a-z, +, -, /, \ or blank) |

**Test Standard Used:**
AS/NZS CISPR 32:2015 AMD 1:2020,BS EN 55032:2015,BS EN 55032:2015+A11:2020,BS EN 55032:2015+A1:2020,BS EN 55035:2017,BS EN 55035:2017+A11:2020,BS EN 61000-3-2:2014,BS EN 61000-3-3:2013,BS EN 61000-3-3:2013+A1:2019,BS EN 61000-3-3:2013+A2:2021,BS EN IEC 61000-3-2:2019+A1:2021,BS EN IEC 61000-3-2:2019+A2:2024,CISPR 32:2015/AMD1:2019,CISPR 35:2016,EN 55032:2015,EN 55032:2015/A11:2020,EN 55032:2015/A1:2020,EN 55035:2017,EN 55035:2017/A11:2020,EN 61000-3-2:2014,EN 61000-3-3:2013,EN 61000-3-3:2013/A1:2019,EN 61000-3-3:2013/A2:2021,EN 61000-3-3:2013/A2:2021/AC:2022-01,EN IEC 61000-3-2:2019/A1:2021,EN IEC 61000-3-2:2019/A2:2024,IEC 61000-4-11:2020/COR2:2022,IEC 61000-4-2:2025,IEC 61000-4-3:2020,IEC 61000-4-4:2012,IEC 61000-4-5:2014/AMD1:2017,IEC 61000-4-6:2023,IEC 61000-4-8:2009

**We Declare:**
The equipment described above is tested and assessed by Tianjin Dongdian Testing Service Co., Ltd. and in the configuration assessed the equipment complied with the standards specified above. The tested and assessed results are contained in this test report and Tianjin Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these assessments.
**After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above standards.**

| | | | |
|---|---|---|---|
| **Report No.:** | DDT-B25033103-1E01 | | |
| **Date of Receipt:** | Apr. 01, 2025 | **Date of Test:** | Apr. 23, 2025~Apr. 23, 2025 |

Prepared By:

Evan Zheng

Evan Zheng/Engineer

Approved By:

Aaron Zhang

Aaron Zhang/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Tianjin Dongdian Testing Service Co., Ltd.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

# Revision History

| Rev. | Revisions | Issue Date | Revised By |
|---|---|---|---|
| --- | Initial issue | Apr. 26, 2025 | |
| | | | |

# 1 Summary of Test Results

| Description of Test Item | Standard | Result |
|---|---|---|
| Conducted Emissions (AC mains power ports) | EN 55032:2015,<br>EN 55032:2015/A11:2020,<br>EN 55032:2015/A1:2020 | Pass |
| Radiated Emissions (30MHz to 1GHz) | EN 55032:2015,<br>EN 55032:2015/A11:2020,<br>EN 55032:2015/A1:2020 | Pass |
| Radiated Emissions (Above 1GHz) | EN 55032:2015,<br>EN 55032:2015/A11:2020,<br>EN 55032:2015/A1:2020 | Pass |
| Harmonic Current Emissions | EN 61000-3-2:2014,<br>EN IEC 61000-3-2:2019/A1:2021,<br>EN IEC 61000-3-2:2019/A2:2024 | N/A |
| Voltage Changes, Voltage Fluctuations and Flicker | EN 61000-3-3:2013,<br>EN 61000-3-3:2013/A1:2019,<br>EN 61000-3-3:2013/A2:2021,<br>EN 61000-3-3:2013/A2:2021/AC:2022-01 | Pass |
| Electrostatic Discharge Immunity | EN 55035:2017,<br>EN 55035:2017/A11:2020,<br>IEC 61000-4-2:2025 | Pass |
| Radiated, Radio-frequency, Electromagnetic Field Immunity | EN 55035:2017,<br>EN 55035:2017/A11:2020,<br>IEC 61000-4-3:2020 | Pass |
| Electrical Fast Transient/Burst Immunity | EN 55035:2017,<br>EN 55035:2017/A11:2020,<br>IEC 61000-4-4:2012 | Pass |
| Surge Immunity | EN 55035:2017,<br>EN 55035:2017/A11:2020,<br>IEC 61000-4-5:2014/AMD1:2017 | Pass |
| Immunity to Conducted Disturbances, Induced by Radio-frequency Fields | EN 55035:2017,<br>EN 55035:2017/A11:2020,<br>IEC 61000-4-6:2023 | Pass |
| Power Frequency Magnetic Field Immunity | EN 55035:2017,<br>EN 55035:2017/A11:2020,<br>IEC 61000-4-8:2009 | Pass |
| Voltage Dips, Short Interruptions and Voltage Variations Immunity | EN 55035:2017,<br>EN 55035:2017/A11:2020,<br>IEC 61000-4-11:2020/COR2:2022 | Pass |

# 2 General Test Information

## 2.1 Description of EUT

| | | |
|---|---|---|
| **EUT Name** | : | LCD Monitor |
| **Model Number** | : | 24E4U,24P4U,24E4CV,24E4********,24P4******** ("*" = 0-9, A-Z, a-z, +, -, /, \ or blank) |
| **Model Differences** | : | All models difference is in sale marketing. |
| **Serial Number** | : | N/A |
| **Test Model** | : | 24E4U |
| **Sample No.** | : | Y25033103-01 |
| **Power supply** | : | AC 100-240V ~ 50/60Hz |
| **Test Power supply** | : | AC 230V 50Hz, 110V 60Hz |
| **EUT Class** | : | Class B |
| **Maximum work frequency** | : | 285.5 MHz |

## 2.2 Primary Function of EUT

| Function | Description |
|---|---|
| Broadcast reception function | N/A |
| Print | N/A |
| Scan | N/A |
| Display or display output | Display |
| Musical tone generating | N/A |
| Networking | N/A |
| Audio output | Audio output function<br>(internal speaker & audio output port) |
| Telephony | N/A |
| Bluetooth | N/A |
| Other | N/A |

## 2.3 Port of EUT

| Port | Description |
|---|---|
| AC mains power ports | AC mains power port |
| DC network power port | N/A |
| Wired network port | N/A |
| Signal data/control port | One HDMI in Port, One DP in Port, One VGA in Port, Four USB-A Ports, One USB-B Port, One Audio in Port |
| Antenna port | N/A |
| Broadcast receiver tuner port | N/A |
| Audio output port | One Audio out Port, Two Speakers |
| Video output port | N/A |
| Other | N/A |

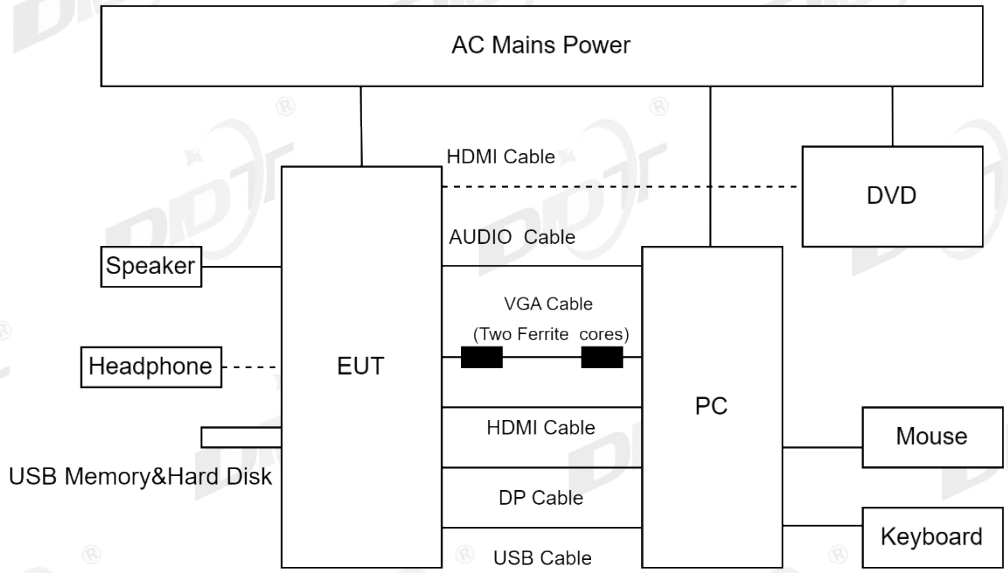
## 2.4 Accessories of EUT

| Accessories | Manufacturer | Model No. | Description | Remark |
|---|---|---|---|---|
| AC Cable | N/A | N/A | Length: 1.2m/1.5m/1.8m, Unshielded | N/A |
| DP Cable | N/A | N/A | Length: 1.2m/1.5m/1.8m, Shielded | N/A |
| HDMI Cable | N/A | N/A | Length: 1.2m/1.5m/1.8m, Shielded | N/A |
| VGA Cable | N/A | N/A | Length: 1.2m/1.5m/1.8m, Shielded | N/A |
| USB Cable | N/A | N/A | Length: 1.2m/1.5m/1.8m, Shielded | N/A |

## 2.5 Test peripherals

| Device | Manufacturer | Model No. | Description | Remark |
|---|---|---|---|---|
| Audio Cable | N/A | N/A | N/A | N/A |
| DVD | PHILIPS | TAEP200/93 | HCPE2025000750 | N/A |
| Hard Disk | TOSHIBA | DTB410 | 2157T08BTLSH | N/A |
| Headphone | N/A | N/A | N/A | N/A |
| Keyboard | DELL | N/A | N/A | N/A |
| Mouse | DELL | N/A | N/A | N/A |
| PC | LENOVO | GeekPro-14ACN | M70Q5KC0 | N/A |
| PC | SAMSUNG | DM700T6A-A99 | JVTG98EJ2C004QX | N/A |
| Speaker | JBL | GO2+ | N/A | N/A |
| Speaker | JBL | JBL GO VM | ND0035-AI6859585 | N/A |
| USB Memory | N/A | N/A | N/A | N/A |

## 2.6 Block diagram EUT configuration for test




## 2.7 EUT operating mode(s)

| | |
|---|---|
| Mode 1 | Connect HDMI cable from PC's HDMI port to EUT's HDMI Port. Connect DP cable from PC's DP port to EUT's DP Port. Connect VGA cable from PC's VGA port to EUT's VGA Port. Connect the audio cable from the PC's audio output interface to the EUT's audio input interface. Connect EUT to speaker audio out port. Connect USB cable from PC's USB port to EUT's USB-B Port. Connect hard disk and USB memory to EUT's USB-A port. Switch source to HDMI.<br>The test signal is color bars with moving picture element according to ITU-R BT 471-1. |
| Mode 2 | Connect HDMI cable from PC's HDMI port to EUT's HDMI Port. Connect DP cable from PC's DP port to EUT's DP Port. Connect VGA cable from PC's VGA port to EUT's VGA Port. Connect the audio cable from the PC's audio output interface to the EUT's audio input interface. Connect EUT to speaker audio out port. Connect USB cable from PC's USB port to EUT's USB-B Port. Connect hard disk and USB memory to EUT's USB-A port. Switch source to DP.<br>The test signal is color bars with moving picture element according to ITU-R BT 471-1. |
| Mode 3 | Connect HDMI cable from PC's HDMI port to EUT's HDMI Port. Connect DP cable from PC's DP port to EUT's DP Port. Connect VGA cable from PC's VGA port to EUT's VGA Port. Connect the audio cable from the PC's audio output interface to the EUT's audio input interface. Connect EUT to speaker audio out port. Connect USB cable from PC's USB port to EUT's USB-B Port. Connect hard disk and USB memory to EUT's USB-A port. Switch source to VGA.<br>The test signal is color bars with moving picture element according to ITU-R BT 471-1. |

## 2.8 Performance Criteria

| Criterion | Description |
|---|---|
| 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. |
| 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.<br>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.<br>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. |
| 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.<br>Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. |

## 2.9 Deviations of test standard

[Standard deviation 1] Radiated, radio-frequency, electromagnetic field immunity test was done according to IEC 61000-4-3:2020 instead of IEC 61000-4-3:2006+AMD1:2007+AMD2:2010.
[Standard deviation 2] Surge immunity test was done according to IEC 61000-4-5:2014/AMD1:2017 instead of IEC 61000-4-5:2005.
[Standard deviation 3] Radio-frequency conducted immunity test was done according to IEC 61000-4-6:2023 instead of IEC 61000-4-6:2008.
[Standard deviation 4] Voltage dips, short interruptions and voltage variations immunity tests was done according to IEC 61000-4-11:2020/COR2:2022 instead of IEC 61000-4-11:2004.
[Standard deviation 5] Electrostatic discharge immunity test was done according to IEC 61000-4-2:2025 instead of IEC 61000-4-2:2008.

## 2.10 Test laboratory

Tianjin Dongdian Testing Service Co., Ltd.
Address: Building D-1, No. 19, Weisi Road, Microelectronics Industrial Park Development Area, Tianjin, China.
Tel: +86-22-58038033, http://www.ddttest.com, Email: ddt@dgddt.com
**NVLAP** (National Voluntary Laboratory Accreditation Program) CODE: 500036-0
**CNAS** (China National Accreditation Service for Conformity Assessment) CODE: L13402

**FCC** Designation Number: CN5004; FCC Test Firm Registration Number: 368676
**ISED** (Innovation, Science and Economic Development Canada) Company Number: 27768
Conformity Assessment Body Identifier: CN0125
**VCCI** Facility Registration Number: C-20089, T-20093, R-20125, G-20122

## 2.11 Measurement uncertainty

| Test Item | Uncertainty |
|---|---|
| Conducted Emissions at Mains Power Port | 3.4 dB (150KHz-30MHz) |
| Conducted Emissions at Telecommunication Port (ISN T800) | 4.59 dB |
| Conducted Emissions at Telecommunication Port (ISN ST08) | 3.5 dB |
| Radiated Emissions (30MHz to 1GHz) | 5.2 dB (Antenna Polarize: Hor.) |
| | 5.2 dB (Antenna Polarize: Ver.) |
| Radiated Emissions (Above 1GHz) | 5.0 dB |
| Harmonic Current Emissions | 3.1 % |
| Voltage Changes, Voltage Fluctuations and Flicker | 1.7 % |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.<br>We have conducted the Electrostatic discharge, Electrical fast transient/burst, Surge, Voltage dips, short interruptions and voltage variations tests to check the uncertainty. Radiated, radio-frequency, electromagnetic field 5.4 dB. Conducted disturbances, induced by radio-frequency fields 1.1 dB. | |

## 2.12 Abbreviations

For the purposes of the present document, the following abbreviations apply:
EUT: Equipment Under Test
QP: Quasi-Peak
PK: Peak,
AV: Average
CAV: CISPR Average
CDN: Coupling Decoupling Network
AM: Amplitude Modulation
N/A: Not Applicable

# 3 Conducted Emissions (AC mains power ports)

## 3.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 14, 2025 | **Test engineer** | Wendy Sun | |
| **Climate condition** | **Ambient temperature** | 23.7°C | **Relative humidity** | 30.6% |
| | **Atmospheric pressure** | 100.5kPa | | |
| **Test place** | Shield Room 2# | | | |

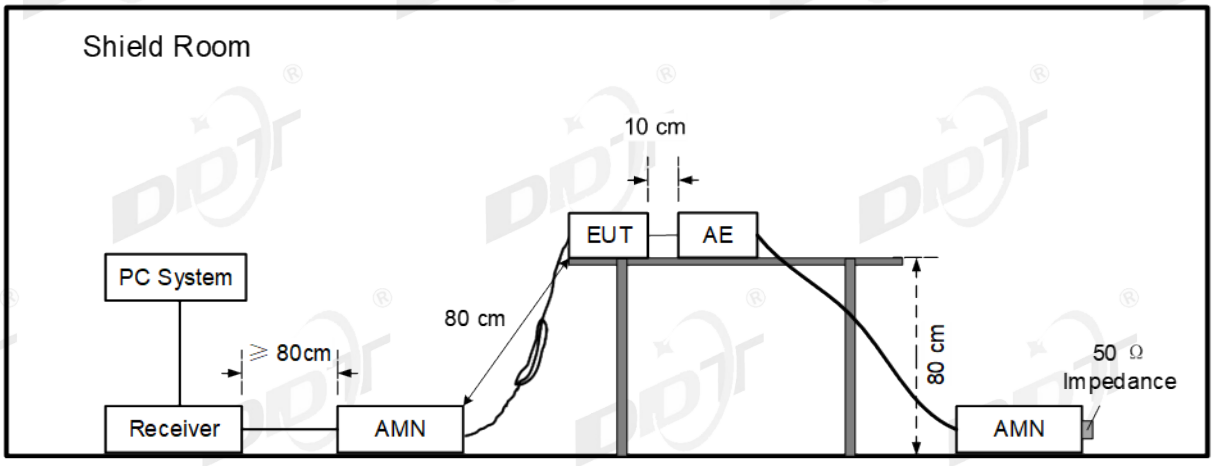
## 3.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Test Software | TOYO | EP5/CE | Ver 5.4.40 | N/A | N/A |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 100375 | Feb. 17, 2025 | 1 Year |
| Two-Line V-Network | Rohde & Schwarz | ENV216 | 101122 | Feb. 17, 2025 | 1 Year |
| Two-Line V-Network | Rohde & Schwarz | ENV216 | 101254 | Feb. 17, 2025 | 1 Year |

## 3.3 Reference Standard

EN 55032:2015,
EN 55032:2015/A11:2020,
EN 55032:2015/A1:2020

## 3.4 Test Arrangement




The EUT was placed on a non-metallic table, 80cm above the ground plane.
The EUT's power adapter was connected to the power mains through a line impedance stabilization network (AMN). which this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted disturbance.
The bandwidth of test receiver is set at 9 kHz.
The frequency range from 150 kHz to 30MHz is checked.
Pre-scan measurements were performed in all operating mode or resolution. But final measurements were performed in worst cases based on pre-scan measurements.

The EUT with following test modes were pre-tested:

| No. | Test Voltage | Operation Mode | Cable Length | Resolution | Rotation | Audio | Stand Position |
|---|---|---|---|---|---|---|---|
| 1. | 230V 50Hz | Mode 1 HDMI | 1.8m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 2. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |
| 3. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 4. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 5. | | | 1.5m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 6. | | | 1.2m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 7. | | | 1.8m | DVD | Landscape | External Speaker | HAS Stand-up |
| 8. | | Mode 2 DP | 1.8m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 9. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |
| 10. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 11. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 12. | | | 1.5m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 13. | | | 1.2m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 14. | | Mode 3 VGA | 1.8m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 15. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |
| 16. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 17. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 18. | | | 1.5m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 19. | | | 1.2m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 20. | | The worst case above with 1.5m power cord | | | Landscape | External Speaker | HAS Stand-up |

| | | | | | |
|---|---|---|---|---|---|
| 21. | | The worst case above with 1.2m power cord | Landscape | External Speaker | HAS Stand-up |
| 22. | | The worst case above with 1.8m power cord | Portrait (-90 degree) | External Speaker | HAS Stand-up |
| 23. | | The worst case above with 1.8m power cord | Portrait (-270 degree) | External Speaker | HAS Stand-up |
| 24. | | The worst case above with 1.8m power cord | Landscape | External Speaker | HAS Stand-down |
| 25. | | The worst case above with 1.8m power cord with scrolling “H” pattern | Landscape | External Speaker | HAS Stand-up |
| 26. | 110V 60Hz | The worst case above with 1.8m power cord | Landscape | External Speaker | HAS Stand-up |

## 3.5 Test Specification and Limit

Class B

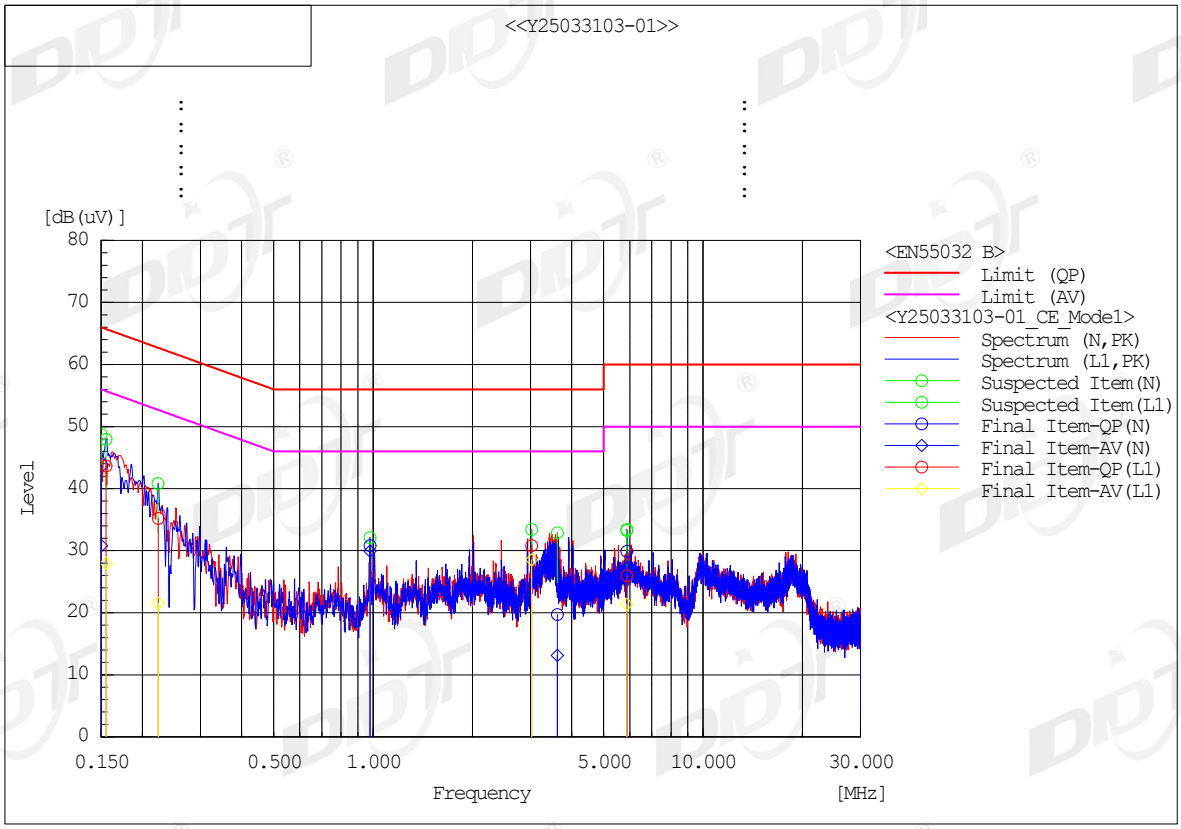
| Frequency | Quasi-Peak Level dB(μV) | Average Level dB(μV) |
|---|---|---|
| 150kHz ~ 500kHz | 66 ~ 56* | 56 ~ 46* |
| 500kHz ~ 5MHz | 56 | 46 |
| 5MHz ~ 30MHz | 60 | 50 |

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

Note for test result
Note1): According pre-test, the worst test modes decided as below and reported. Only data of worst mode was reported in test result.
Note2) Line = Polarity of input power (Live or Neutral), N: Abbreviation of Neutral Polarity, L1: Abbreviation of Live Polarity,
Note3) Level (Quasi-Peak and/or C/Average) = Meter Reading + Factor,
Note4) Factor = AMN (or AAN) Insertion Loss + Cable Loss,
Note5) Margin = Limit – Level (Quasi-Peak and/or C/Average)

## 3.6 Test Result

| Sample No. | Operation Mode | Remarks | Result |
|---|---|---|---|
| Y25033103-01 | Mode 1 | Final measurement,minimum margin 16.1 dB | Pass |
| Y25033103-01 | Mode 2 | Pre-scan measurement | Pass |
| Y25033103-01 | Mode 3 | Pre-scan measurement | Pass |




Final Result

--- N Phase ---

| No. | Frequency [MHz] | Reading QP [dB(uV)] | Reading CAV [dB(uV)] | c.f [dB] | Result QP [dB(uV)] | Result CAV [dB(uV)] | Limit QP [dB(uV)] | Limit AV [dB(uV)] | Margin QP [dB] | Margin CAV [dB] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.97948 | 20.9 | 20.0 | 9.9 | 30.8 | 29.9 | 56.0 | 46.0 | 25.2 | 16.1 |
| 2 | 5.87631 | 19.9 | 17.2 | 10.0 | 29.9 | 27.2 | 60.0 | 50.0 | 30.1 | 22.8 |
| 3 | 0.15024 | 34.1 | 21.0 | 9.8 | 43.9 | 30.8 | 66.0 | 56.0 | 22.1 | 25.2 |
| 4 | 3.6184 | 9.7 | 3.1 | 10.0 | 19.7 | 13.1 | 56.0 | 46.0 | 36.3 | 32.9 |

--- L1 Phase ---

| No. | Frequency [MHz] | Reading QP [dB(uV)] | Reading CAV [dB(uV)] | c.f [dB] | Result QP [dB(uV)] | Result CAV [dB(uV)] | Limit QP [dB(uV)] | Limit AV [dB(uV)] | Margin QP [dB] | Margin CAV [dB] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.02389 | 20.8 | 18.5 | 10.0 | 30.8 | 28.5 | 56.0 | 46.0 | 25.2 | 17.5 |
| 2 | 0.15524 | 33.9 | 18.2 | 9.8 | 43.7 | 28.0 | 65.7 | 55.7 | 22.0 | 27.7 |
| 3 | 5.88104 | 16.0 | 11.4 | 10.0 | 26.0 | 21.4 | 60.0 | 50.0 | 34.0 | 28.6 |
| 4 | 0.22327 | 25.4 | 11.7 | 9.8 | 35.2 | 21.5 | 62.7 | 52.7 | 27.5 | 31.2 |

# 4 Radiated Emissions (30MHz to 1GHz)

## 4.1 General Information

| **Test date** | Apr. 13, 2025 | **Test engineer** | Dominic Du | |
|---|---|---|---|---|
| **Climate condition** | **Ambient temperature** | 24.5°C | **Relative humidity** | 34.8% |
| | **Atmospheric pressure** | 100.1kPa | | |
| **Test place** | 10m Chamber | | | |

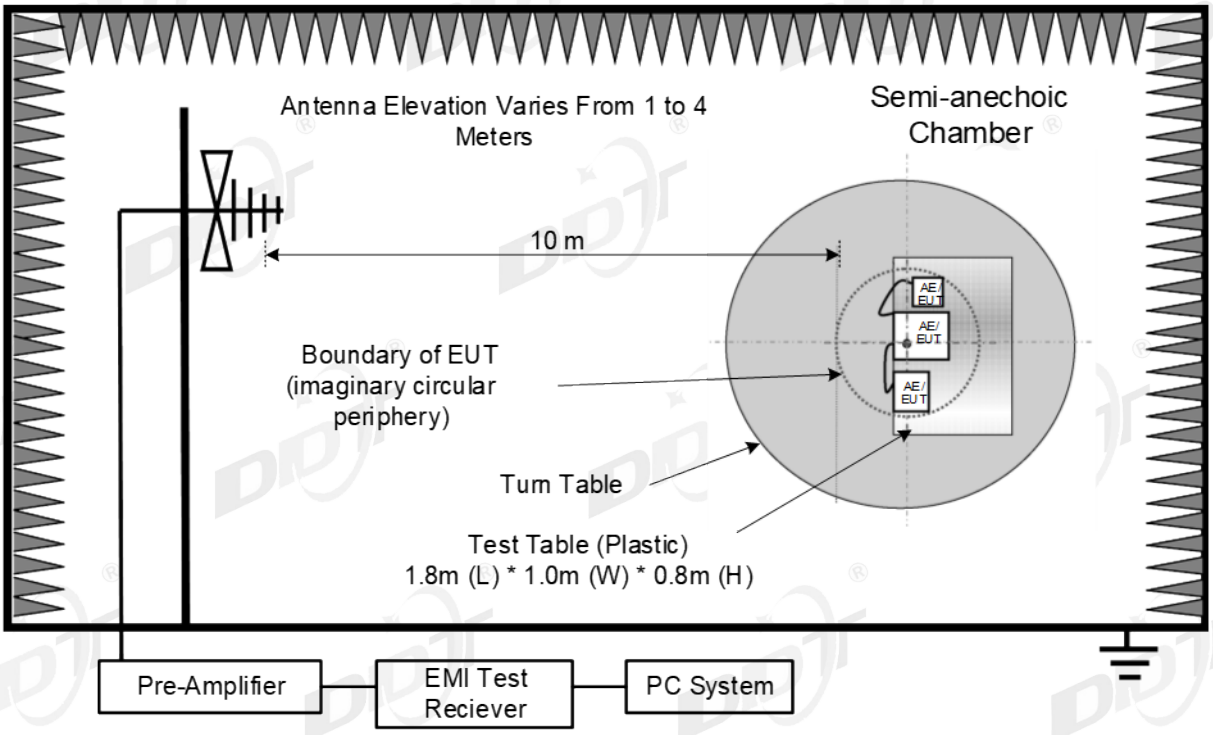
## 4.2 Test Equipment

| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal. Interval** |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101024 | Feb. 17, 2025 | 1 Year |
| BiLog Antenna | TESEQ | CBL 6112D | 29068 | Oct. 10, 2024 | 2 Year |
| Low Noise Amplifier | SONOMA | 310N | 300913 | Feb. 17, 2025 | 1 Year |
| RF Selector 4CH | TOYO | NS4904N | Selector1 | N/A | N/A |
| RF Selector 4CH | TOYO | NS4904N | Selector2 | N/A | N/A |
| Mast Control | INNCO | CONTROLLER CO2000 | ZOAA97AZ100013D | N/A | N/A |
| BiLog Antenna | TESEQ | CBL 6112D | 29069 | Oct. 10, 2024 | 2 Year |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101030 | Feb. 17, 2025 | 1 Year |
| Low Noise Amplifier | SONOMA | 310N | 334532 | Feb. 17, 2025 | 1 Year |
| Test Software | TOYO | EP5/RE | Ver 5.7.10 | N/A | N/A |

## 4.3 Reference Standard

EN 55032:2015,
EN 55032:2015/A11:2020,
EN 55032:2015/A1:2020

## 4.4 Test Arrangement




The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
Test antenna was located 10m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded.
Spectrum frequency from 30MHz to1GHz was investigated.
For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded.
For emissions from 30MHz to 1GHz, Quasi-Peak values were measured with EMI Receiver and the bandwidth of Receiver is 120 kHz.
Final measurements consisted of 3 steps. First step, frequency fine tuning to find exact emission frequency. Second step, rechecking to search for maximum height and azimuth for interference from EUT In final step, there are conducted measuring with quasi-peak detector for points which are detected from 1st step & 2nd step. Results checked manually and points close to the limit line were re-measured.
Pre-scan measurements were performed in all operating mode or condition. But final measurements were performed in worst cases based on pre-scan measurements.
The EUT with following test modes were pre-tested:

| No. | Test Voltage | Operation Mode | Cable Length | Resolution | Rotation | Audio | Stand Position |
|---|---|---|---|---|---|---|---|
| 1. | 230V 50Hz | Mode 1 HDMI | 1.8m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 2. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 4. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 5. | | | 1.5m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 6. | | | 1.2m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 7. | | | 1.8m | DVD | Landscape | External Speaker | HAS Stand-up |
| 8. | | Mode 2 DP | 1.8m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 9. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |
| 10. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 11. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 12. | | | 1.5m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 13. | | | 1.2m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 14. | | Mode 3 VGA | 1.8m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 15. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |
| 16. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 17. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 18. | | | 1.5m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 19. | | | 1.2m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 20. | | The worst case above with 1.5m power cord | | | Landscape | External Speaker | HAS Stand-up |
| 21. | | The worst case above with 1.2m power cord | | | Landscape | External Speaker | HAS Stand-up |
| 22. | | The worst case above with 1.8m power cord | | | Portrait (-90 degree) | External Speaker | HAS Stand-up |
| 23. | | The worst case above with 1.8m power cord | | | Portrait (-270 degree) | External Speaker | HAS Stand-up |

| | | | | | |
|---|---|---|---|---|---|
| 24. | | The worst case above with 1.8m power cord | Landscape | External Speaker | HAS Stand-down |
| 25. | | The worst case above with 1.8m power cord | Landscape | Headphone | HAS Stand-up |
| 26. | | The worst case above with 1.8m power cord | Landscape | Internal Speaker | HAS Stand-up |
| 27. | | The worst case above with 1.8m power cord with scrolling “H” pattern | Landscape | External Speaker | HAS Stand-up |
| 28. | | The worst mode 1920*1080@60Hz with 1.8m power cord | Landscape | Headphone | HAS Stand-up |
| 29. | | The worst mode 1920*1080@60Hz with 1.8m power cord | Landscape | Internal Speaker | HAS Stand-up |
| 30. | 110V 60Hz | The worst case above with 1.8m power cord | Landscape | External Speaker | HAS Stand-up |

## 4.5 Test Specification and Limit

Class B

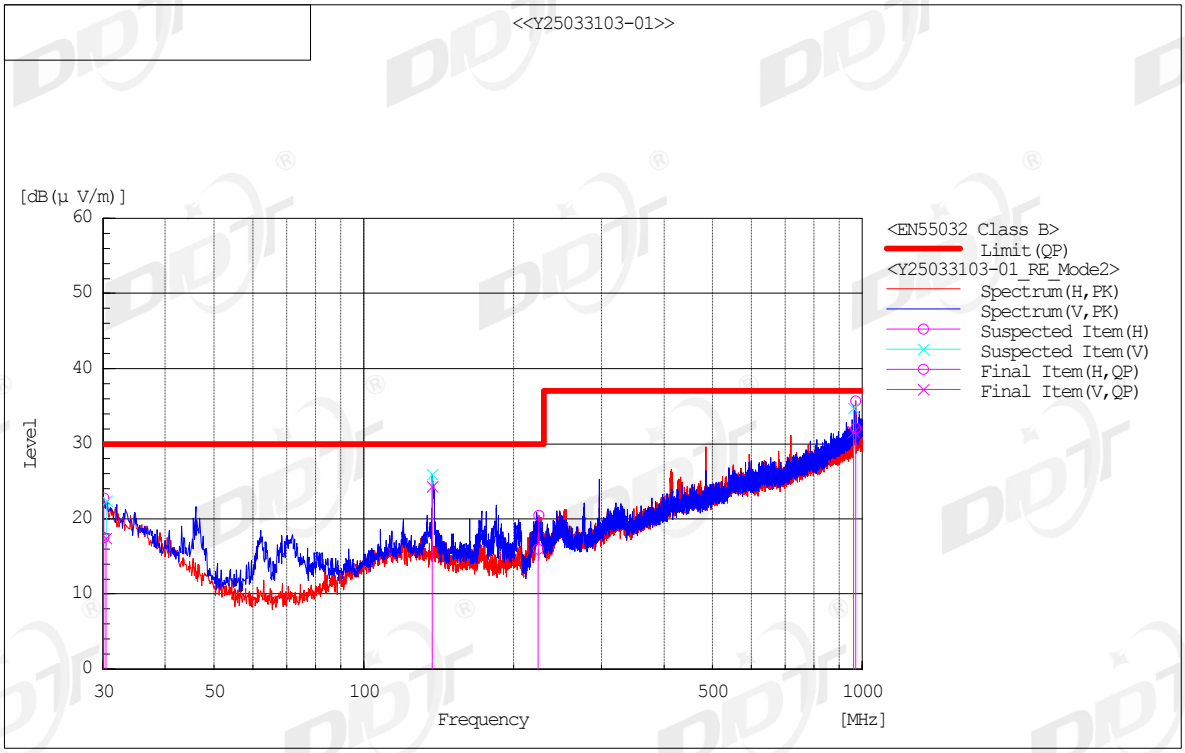
| **Frequency** | **Field Strengths Limits at 10m measuring distance dB(μV)/m** |
|---|---|
| 30MHz to 230MHz | 30 |
| 230MHz to 1000MHz | 37 |

Note: (1) The smaller limit shall apply at the cross point between two frequency bands.
(2) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

Note for test result
Note1): According pre-test, the worst test modes decided as below and reported. Only data of worst mode was reported in test result.
Note2) (P): Abbreviation of Antenna Polarity
Note3) Receiving antenna polarization: Horizontal and/or Vertical. Antenna Height: 1 m to 4 m
Note4) Level QP (Quasi-Peak) = Reading QP + Factor
Note5) Factor = Antenna Factor + Cable Loss - Amp. Gain
Note6) Margin = Limit – Level QP

## 4.6 Test Result

| **Sample No.** | **Operation Mode** | **Remarks** | **Result** |
|---|---|---|---|
| Y25033103-01 | Mode 1 | Pre-scan measurement | Pass |
| Y25033103-01 | Mode 2 | Final measurement , minimum margin 4.9 dB | Pass |
| Y25033103-01 | Mode 3 | Pre-scan measurement | Pass |




Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(μ V)] | c.f [dB(1/m)] | Result QP [dB(μ V/m)] | Limit QP [dB(μ V/m)] | Margin QP [dB] | Height [cm] | Angle [° ] | System |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.123 | H | 22.2 | -4.7 | 17.5 | 30.0 | 12.5 | 320.0 | 80.2 | 1 |
| 2 | 223.850 | H | 28.0 | -12.0 | 16.0 | 30.0 | 14.0 | 314.0 | 162.0 | 1 |
| 3 | 969.543 | H | 26.4 | 5.7 | 32.1 | 37.0 | 4.9 | 222.0 | 147.7 | 1 |
| 4 | 30.403 | V | 22.6 | -5.2 | 17.4 | 30.0 | 12.6 | 135.0 | 81.0 | 2 |
| 5 | 137.412 | V | 35.9 | -11.6 | 24.3 | 30.0 | 5.7 | 120.0 | 185.2 | 2 |
| 6 | 962.396 | V | 25.0 | 6.6 | 31.6 | 37.0 | 5.4 | 382.0 | 189.2 | 2 |

# 5 Radiated Emissions (Above 1GHz)

## 5.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 13, 2025 | **Test engineer** | Dominic Du | |
| **Climate condition** | **Ambient temperature** | 24.5°C | **Relative humidity** | 34.8% |
| | **Atmospheric pressure** | 100.1kPa | | |
| **Test place** | 10m Chamber | | | |

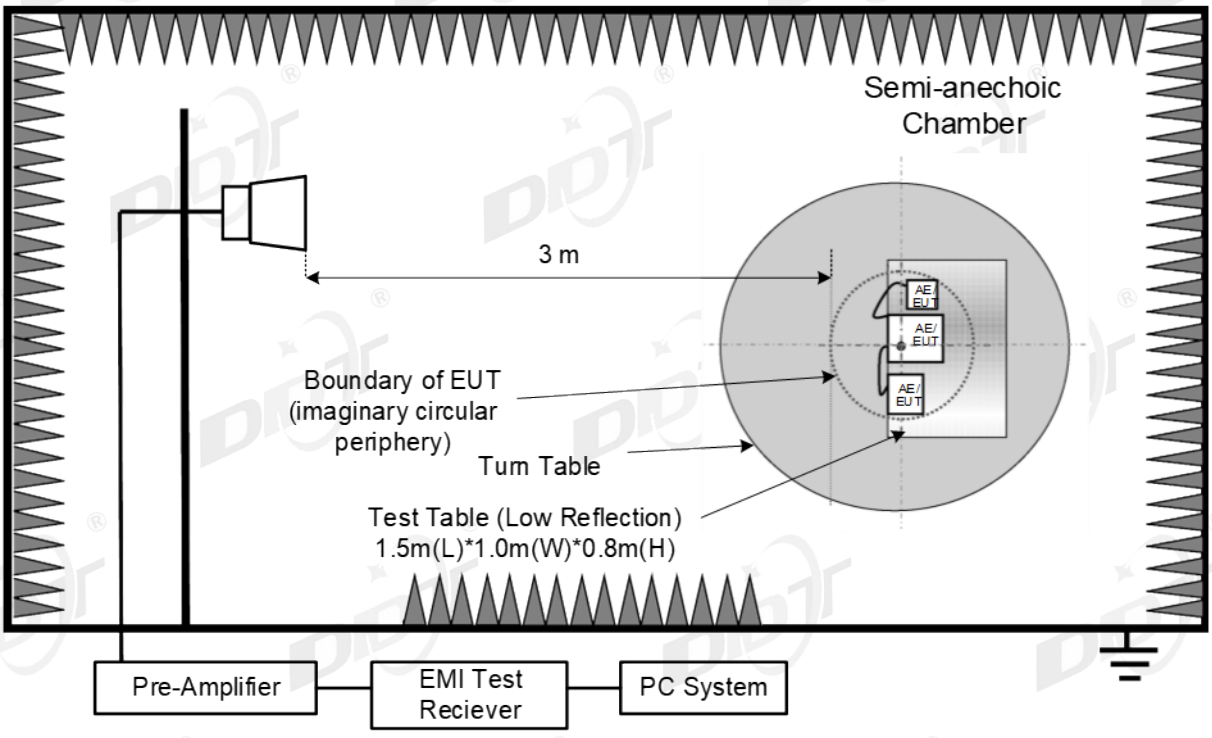
## 5.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESU26 | 100244 | Feb. 17, 2025 | 1 Year |
| Broadband Horn Antenna | TESEQ | BHA 9118 | 31754 | Oct. 11, 2023 | 2 Year |
| Amplifier | COM-MW | DPA8 1000 18000-1012 | 09211739 | Feb. 17, 2025 | 1 Year |
| Test Software | TOYO | EP5/RE | Ver 5.7.10 | N/A | N/A |

## 5.3 Reference Standard

EN 55032:2015,
EN 55032:2015/A11:2020,
EN 55032:2015/A1:2020

## 5.4 Test Arrangement




The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes.

If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.
If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.
If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.
If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.
For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz.
Measurements within 20 dB of the limit were then maximized by adjusting turntable position.
Final measurements were made using an C/Average detector.
Results checked manually and points close to the limit line were re-measured.
Pre-scan measurements were performed in all operating mode or resolution. But final measurements were performed in worst cases based on pre-scan measurements.

The EUT with following test modes were pre-tested:

| No. | Test Voltage | Operation Mode | Cable Length | Resolution | Rotation | Audio | Stand Position |
|---|---|---|---|---|---|---|---|
| 1. | 230V 50Hz | Mode 1 HDMI | 1.8m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 2. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |
| 3. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 4. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 5. | | | 1.5m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 6. | | | 1.2m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 7. | | | 1.8m | DVD | Landscape | External Speaker | HAS Stand-up |
| 8. | | Mode 2 DP | 1.8m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 9. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |
| 10. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 11. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 12. | | | 1.5m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |
| 13. | | | 1.2m | 1920*1080@120Hz | Landscape | External Speaker | HAS Stand-up |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 14. | | Mode 3 VGA | 1.8m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 15. | | | 1.8m | 1920*1080@60Hz | Landscape | External Speaker | HAS Stand-up |
| 16. | | | 1.8m | 1280*720@60Hz | Landscape | External Speaker | HAS Stand-up |
| 17. | | | 1.8m | 800*600@60Hz | Landscape | External Speaker | HAS Stand-up |
| 18. | | | 1.5m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 19. | | | 1.2m | 1920*1080@75Hz | Landscape | External Speaker | HAS Stand-up |
| 20. | | The worst case above with 1.5m power cord | | | Landscape | External Speaker | HAS Stand-up |
| 21. | | The worst case above with 1.2m power cord | | | Landscape | External Speaker | HAS Stand-up |
| 22. | | The worst case above with 1.8m power cord | | | Portrait (-90 degree) | External Speaker | HAS Stand-up |
| 23. | | The worst case above with 1.8m power cord | | | Portrait (-270 degree) | External Speaker | HAS Stand-up |
| 24. | | The worst case above with 1.8m power cord | | | Landscape | External Speaker | HAS Stand-down |
| 25. | | The worst case above with 1.8m power cord | | | Landscape | Headphone | HAS Stand-up |
| 26. | | The worst case above with 1.8m power cord | | | Landscape | Internal Speaker | HAS Stand-up |
| 27. | | The worst case above with 1.8m power cord with scrolling “H” pattern | | | Landscape | External Speaker | HAS Stand-up |
| 28. | | The worst mode 1920*1080@60Hz with 1.8m power cord | | | Landscape | Headphone | HAS Stand-up |
| 29. | | The worst mode 1920*1080@60Hz with 1.8m power cord | | | Landscape | Internal Speaker | HAS Stand-up |
| 30. | 110V 60Hz | The worst case above with 1.8m power cord | | | Landscape | External Speaker | HAS Stand-up |

## 5.5 Test Specification and Limit

Class B

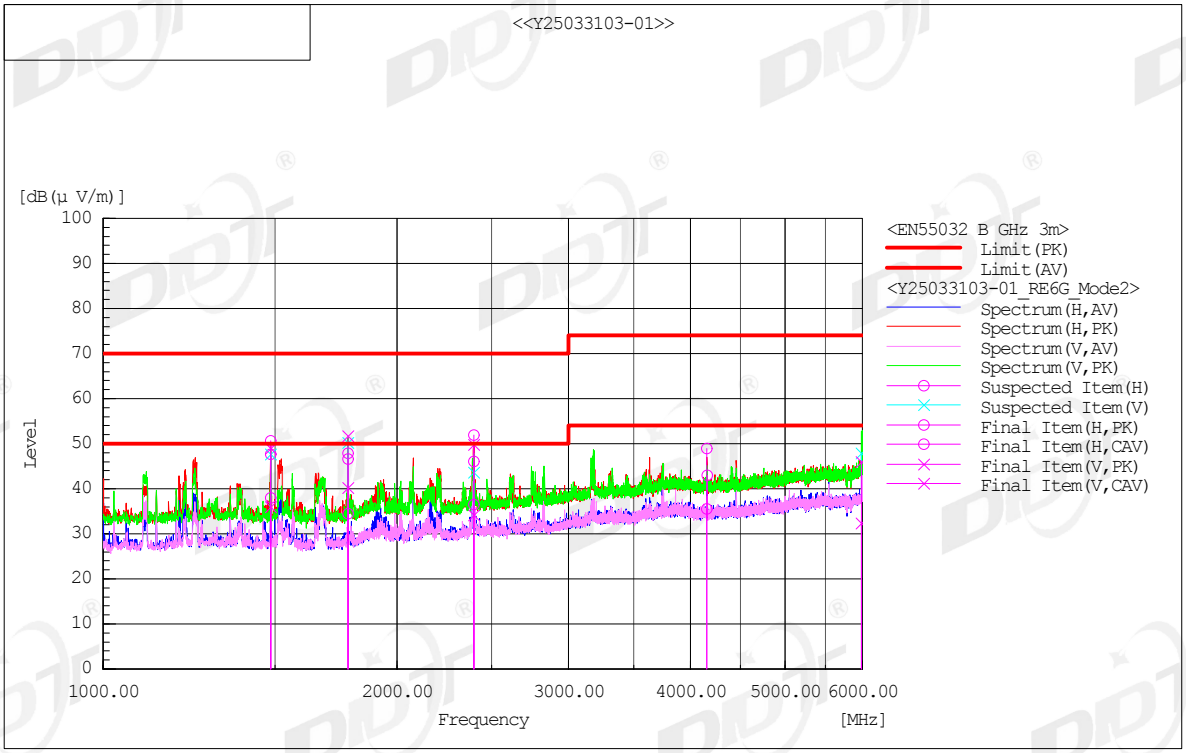
| **Frequency range Limits (GHz)** | **Limits of Class B, dB(μV/m)** | |
|---|---|---|
| | **Peak** | **C/Average** |
| 1 ~ 3 | 70 | 50 |

| | | |
|---|---|---|
| 3 ~ 6 | 74 | 54 |
| Note: The lower limit shall apply at the transition frequency | | |

Note for test result
Note1): According pre-test, the worst test modes decided as below and reported. Only data of worst mode was reported in test result.
Note2) (P) : Abbreviation of Antenna Polarity
Note3) Reading PK / C/AV: Received raw Peak / C/Average signal
Note4) Level PK / C/AV = Reading PK / C/AV + Factor, Real signal Peak / C/Average level
Note5) Factor = Antenna factor + Cable loss – Amplifier gain
Note6) Margin PK / C/AV = Limit – Level PK / C/AV

## 5.6 Test Result

| Sample No. | Operation Mode | Remarks | Result |
|---|---|---|---|
| Y25033103-01 | Mode 1 | Pre-scan measurement | Pass |
| Y25033103-01 | Mode 2 | Final measurement , minimum margin 9.8 dB | Pass |
| Y25033103-01 | Mode 3 | Pre-scan measurement | Pass |




Final Result

| No. | Frequency [MHz] | (P) | Reading PK [dB(µ V)] | Reading CAV [dB(µ V)] | c.f [dB(1/m)] | Result PK [dB(µ V/m)] | Result CAV [dB(µ V/m)] | Limit PK [dB(µ V/m)] | Limit AV [dB(µ V/m)] | Margin PK [dB] | Margin CAV [dB] | Height [cm] | Angle [° ] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1485.022 | H | 76.8 | 64.2 | -26.2 | 50.6 | 38.0 | 70.0 | 50.0 | 19.4 | 12.0 | 175.0 | 165.3 |
| 2 | 1782.034 | H | 72.7 | 60.6 | -26.1 | 46.6 | 34.5 | 70.0 | 50.0 | 23.4 | 15.5 | 183.0 | 288.8 |
| 3 | 2398.470 | H | 75.3 | 59.9 | -23.4 | 51.9 | 36.5 | 70.0 | 50.0 | 18.1 | 13.5 | 187.0 | 238.0 |
| 4 | 4157.812 | H | 67.7 | 54.3 | -18.8 | 48.9 | 35.5 | 74.0 | 54.0 | 25.1 | 18.5 | 134.0 | 123.4 |
| 5 | 1485.034 | V | 75.1 | 62.2 | -26.2 | 48.9 | 36.0 | 70.0 | 50.0 | 21.1 | 14.0 | 119.0 | 150.1 |
| 6 | 1782.036 | V | 77.8 | 66.3 | -26.1 | 51.7 | 40.2 | 70.0 | 50.0 | 18.3 | 9.8 | 172.0 | 199.3 |
| 7 | 2399.054 | V | 73.2 | 57.5 | -23.4 | 49.8 | 34.1 | 70.0 | 50.0 | 20.2 | 15.9 | 168.0 | 187.0 |
| 8 | 5987.628 | V | 60.4 | 46.7 | -14.4 | 46.0 | 32.3 | 74.0 | 54.0 | 28.0 | 21.7 | 185.0 | 181.1 |

# 6 Harmonic Current Emissions

## 6.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 14, 2025 | **Test engineer** | Wendy Sun | |
| **Climate condition** | **Ambient temperature** | 23.7°C | **Relative humidity** | 30.6% |
| | **Atmospheric pressure** | 100.5kPa | | |
| **Test place** | Shield Room 2# | | | |

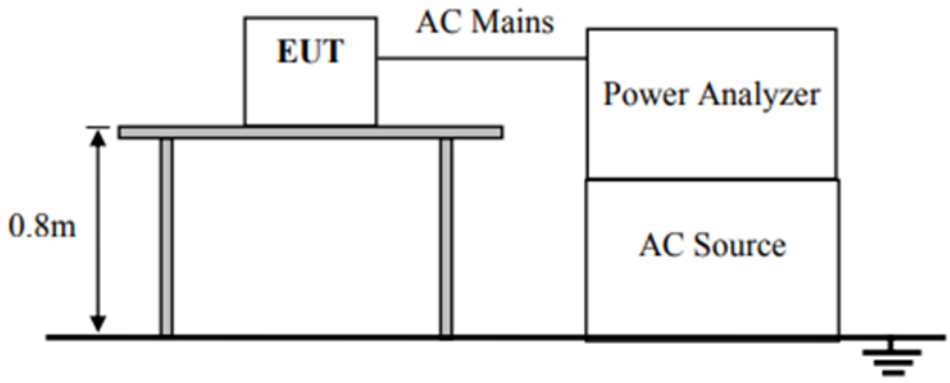
## 6.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Test Software | N4L | IEC Soft | Ver 2.4e | N/A | N/A |
| IEC Reference Impedance Network | Voltech | IEC61000-3 | IG164/2021 | Nov. 16, 2024 | 1 Year |
| High Performance Linear AC power sources | Pacific Power Source | 360-AMX | 1234 | Feb. 17, 2025 | 1 Year |
| High Performance Linear AC power sources | Pacific Power Source | 360-AMX | 1235 | Feb. 17, 2025 | 1 Year |
| Harmonics and Flicker Analyzer | Newtons4th Ltd | PPA5511 | 162-04584 | Nov. 16, 2024 | 1 Year |

## 6.3 Reference Standard

EN 61000-3-2:2014,
EN IEC 61000-3-2:2019/A1:2021,
EN IEC 61000-3-2:2019/A2:2024

## 6.4 Test Arrangement



## 6.5 Test Specification and Limit

Limits for Class D equipment

| Harmonic order | Maximum permissible harmonic current per watt | Maximum permissible harmonic current |
|---|---|---|
| n | mA/W | A |
| 3 | 3.4 | 2.30 |
| 5 | 1.9 | 1.14 |
| 7 | 1.0 | 0.77 |
| 9 | 0.5 | 0.40 |
| 11 | 0.35 | 0.33 |
| 13 ≤ n ≤ 39 (odd harmonics only) | 3.85/n | See Table 1 |

## 6.6 Test Result

| Sample No. | Operation Mode | Remarks | Result |
|---|---|---|---|
| Y25033103-01 | Mode 1 | Rated Power < 75W | N/A |

| Test Settings | | |
|---|---|---|
| Class | Class D | |
| Mode | Measure | |
| **Equipment Under Test** | | |
| Brand | N/A | |
| Model | Y25033103-01 | |
| Serial | N/A | |
| Impedance Network ID | N/A | |
| **Test Conditions** | | |
| | User Entered | Measured |
| Rated Voltage | 230.000 V | 231.262 V |
| Rated Current | N/A | 426.375 mA |
| Rated Frequency | 50.000 Hz | 50.000 Hz |
| Rated Power | N/A | 45.535 W |
| **Additional Test Information** | | |
| Measured Power Factor | 0.4618 | |
| Max Current THD | 185.50% | |
| Max THC | 0.3752A | |
| Max Power | 45.549 W | |
| Max F.Current | 202.501 mA | |
| Average F.Current | 202.386 mA | |
| Minimum Current | 100mA | |
| Test Duration | 2.5 minutes | |
| **Additional Test Details** | | |
| Operator | N/A | |
| Lab Name | N/A | |
| Location | N/A | |
| Notes | | |
| Signature | | |
| Results | Test - N/A. Rated Power < 75W | |

# 7 Voltage Changes, Voltage Fluctuations and Flicker

## 7.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 14, 2025 | **Test engineer** | Wendy Sun | |
| **Climate condition** | **Ambient temperature** | 23.7°C | **Relative humidity** | 30.6% |
| | **Atmospheric pressure** | 100.5kPa | | |
| **Test place** | Shield Room 2# | | | |

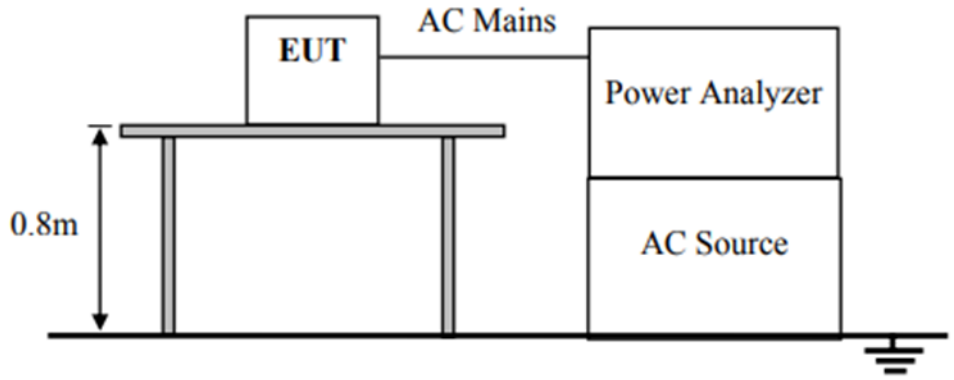
## 7.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Test Software | N4L | IEC Soft | Ver 2.4e | N/A | N/A |
| IEC Reference Impedance Network | Voltech | IEC61000-3 | IG164/2021 | Nov. 16, 2024 | 1 Year |
| High Performance Linear AC power sources | Pacific Power Source | 360-AMX | 1234 | Feb. 17, 2025 | 1 Year |
| High Performance Linear AC power sources | Pacific Power Source | 360-AMX | 1235 | Feb. 17, 2025 | 1 Year |
| Harmonics and Flicker Analyzer | Newtons4th Ltd | PPA5511 | 162-04584 | Nov. 16, 2024 | 1 Year |

## 7.3 Reference Standard

EN 61000-3-3:2013,
EN 61000-3-3:2013/A1:2019,
EN 61000-3-3:2013/A2:2021,
EN 61000-3-3:2013/A2:2021/AC:2022-01

## 7.4 Test Arrangement



## 7.5 Test Specification and Limit

| short-term flicker indicator, Pst | the relative steady-state voltage change, dc | the value of d(t) during a voltage change, d(t) >3.3 % | the maximum relative voltage change, dmax |
|---|---|---|---|
| 1.0 | 3.3 % | 500 ms | 4 % |

## 7.6 Test Result

| Sample No. | Operation Mode | Remarks | Result |
|---|---|---|---|
| Y25033103-01 | Mode 1 | N/A | Pass |

| Test Settings | | |
|---|---|---|
| Class | Voltage | |
| Mode | Normal - 4% | |
| Minimum Current | 300mA | |
| PST | 10.00 minutes | |
| PLT | 1 PSTs | |
| **Equipment Under Test** | | |
| Brand | N/A | |
| Model | Y25033103-01 | |
| Serial | N/A | |
| Impedance Network ID | N/A | |
| **Test Conditions** | | |
| | User Entered | Measured |
| Rated Voltage | 230.000 V | 231.218 V |
| Rated Current | N/A | N/A |
| Rated Frequency | 50.000 Hz | 50.000 Hz |
| Rated Power | N/A | N/A |
| D max | 0.0551% (Limit: 4%) | |
| T max | 0.0000 s (Limit: 0.5 s) | |
| DC max | 0.0064% (Limit: 3.3%) | |
| **Additional Test Details** | | |
| Operator | N/A | |
| Lab Name | N/A | |
| Location | N/A | |
| Notes | | |
| Signature | | |
| Results | Phase1: PASS | |

# 8 Electrostatic Discharge Immunity

## 8.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 17, 2025 | **Test engineer** | Oliver Liu | |
| **Climate condition** | **Ambient temperature** | 23.6°C | **Relative humidity** | 35.6% |
| | **Atmospheric pressure** | 99.9kPa | | |
| **Test place** | Shield Room 3# | | | |

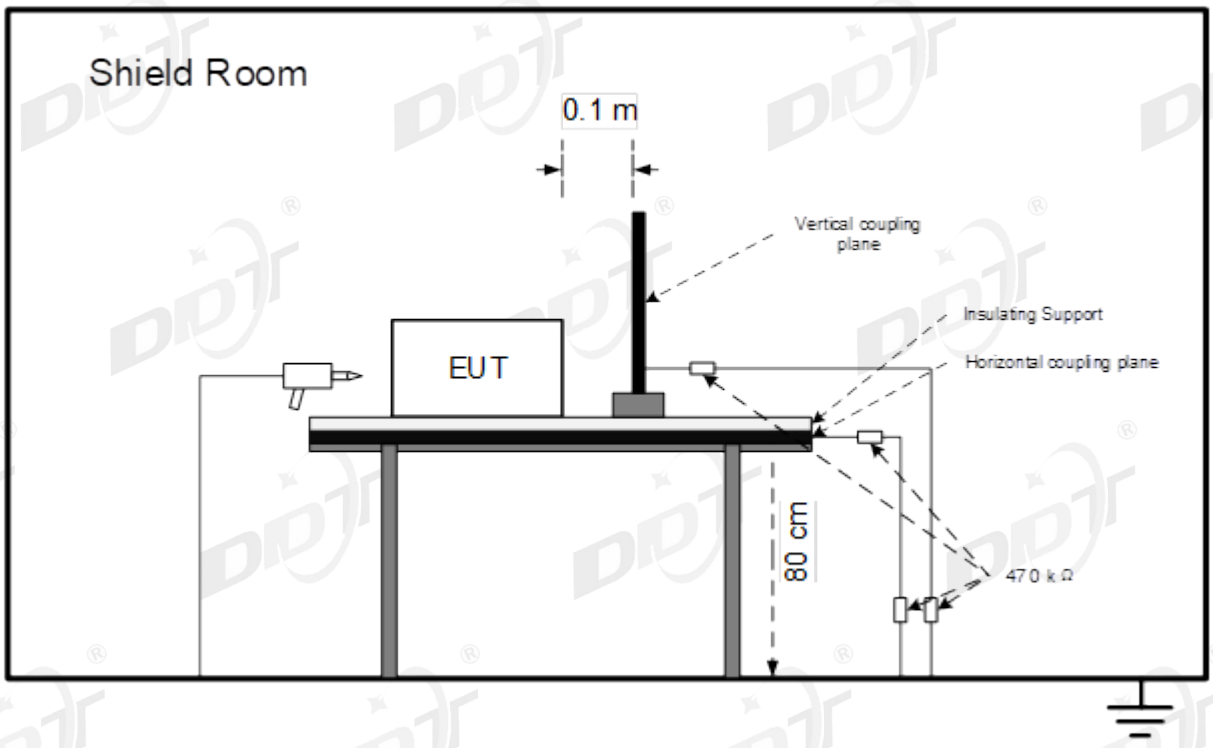
## 8.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| ESD Simulator | TESEQ | NSG 437 | 407 | Jul. 12, 2024 | 1 Year |
| Discharge Network | TESEQ | INA 4380 | 0011 | Jul. 12, 2024 | 1 Year |

## 8.3 Reference Standard

EN 55035:2017,
EN 55035:2017/A11:2020,
IEC 61000-4-2:2025

## 8.4 Test Arrangement




Air Discharge:
The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed.

Contact Discharge:
All the procedure was same as air discharge. Except that the generator was re-triggered for a new single discharge. The tip of the discharge electrode was touching the EUT before the discharge switch was operated.

Indirect discharge for horizontal coupling plane:
At least 20 single discharges were 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 20 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 8.5 Test Specification and Limit

| **Test Level** | | **Performance Criteria** |
|---|---|---|
| Air Discharge | ±2kV, ±4kV, ±8kV | B |
| Contact Discharge | ±4kV | |

## 8.6 Test Result

| Sample No. Y25033103-01 | | | | | | |
|---|---|---|---|---|---|---|
| Operation Mode | Discharge Method | Test Level | Test Point | Required | Observation | Result |
| Mode 1 | Contact Discharge | ±4 KV | 14, 15 | B | B(2) | Pass |
| Mode 1 | Air Discharge | ±2 KV | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 | B | A(1) | Pass |
| Mode 1 | Air Discharge | ±4 KV | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 | B | A(1) | Pass |
| Mode 1 | Air Discharge | ±8 KV | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 | B | B(2) | Pass |

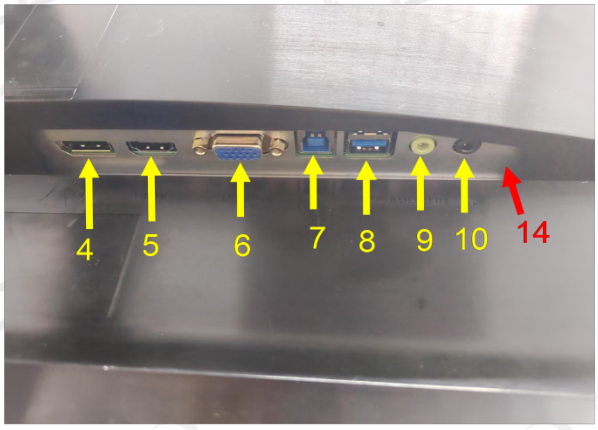
| Remark | |
|---|---|
| (1) | A: Operation as intend, no loss of function during test and after test. |
| (2) | B: Temporary image black screen, when disturbance ceases, and recovers its normal performance, without operator intervention. (Air discharge of point 1 was Criterion B. ) |

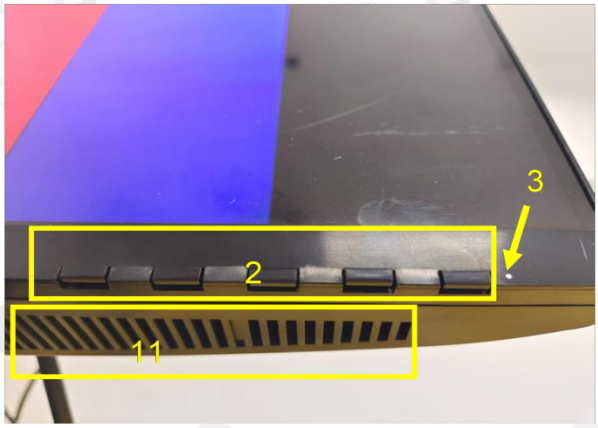
Test Point

| No. | Description | No. | Description | No. | Description |
|---|---|---|---|---|---|
| 1 | Panel | 2 | Button | 3 | Status Lamp |
| 4 | DP Port | 5 | HDMI Port | 6 | VGA Port |
| 7 | USB-B Port | 8 | USB-A Port | 9 | Audio IN Port |
| 10 | Audio Out Port | 11 | Gap | 12 | USB-A Port |
| 13 | USB-A Port | 14 | Shield Cover | 15 | Coupling Planes |

Discharge Point Photo

Contact Air




# 9 Radiated, Radio-frequency, Electromagnetic Field Immunity

## 9.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 23, 2025 | **Test engineer** | Cant Shi | |
| **Climate condition** | **Ambient temperature** | 23.4°C | **Relative humidity** | 33.4% |
| | **Atmospheric pressure** | 100.4kPa | | |
| **Test place** | 3m Chamber 1# | | | |

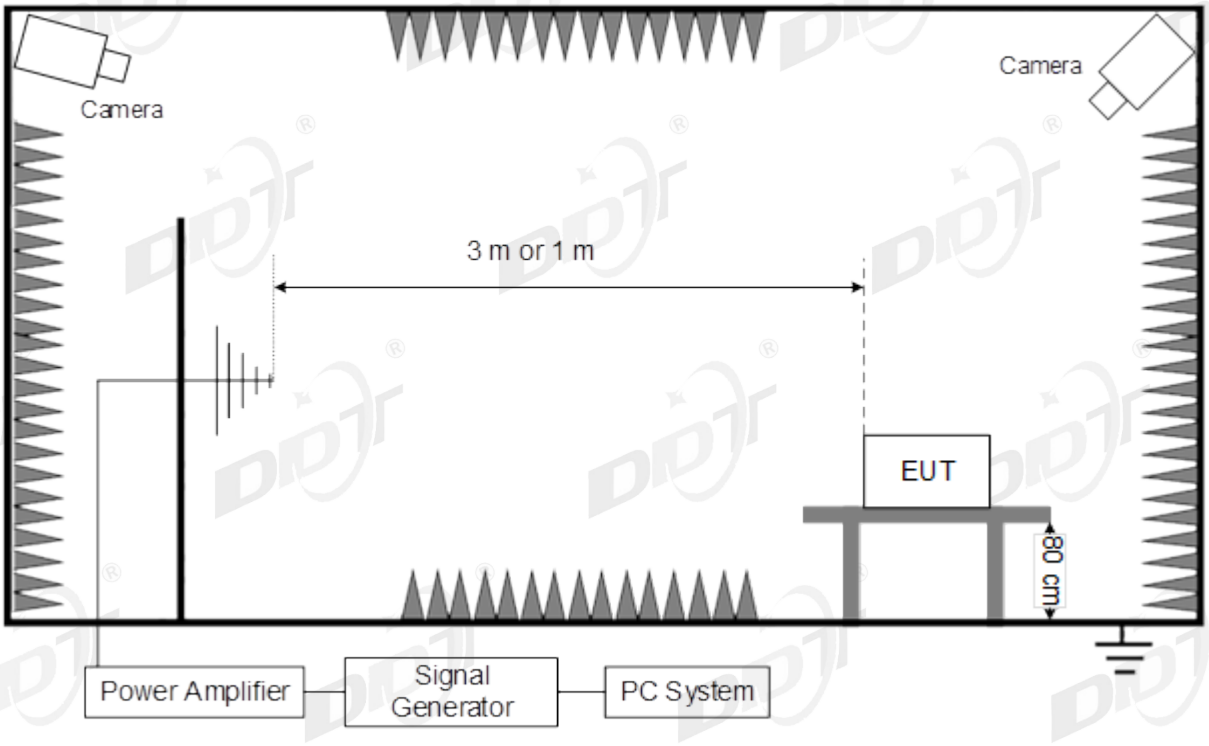
## 9.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Power Meter | Rohde & Schwarz | NRP | 102424 | Feb. 17, 2025 | 1 Year |
| Average Power Sensor | Rohde & Schwarz | NRP-Z91 | 100937 | Feb. 17, 2025 | 1 Year |
| Average Power Sensor | Rohde & Schwarz | NRP-Z91 | 100938 | Feb. 17, 2025 | 1 Year |
| Audio Analyzer | Rohde & Schwarz | UPV | 101525 | Feb. 17, 2025 | 1 Year |
| Stacked Logarithmic-Periodic Broadband Antenna | SCHWARZBECK | STLP 9149 | 9149-059 | N/A | N/A |
| Microwave Signal Generator | Rohde & Schwarz | SMB100A | 104909 | Feb. 17, 2025 | 1 Year |
| Special - Stacked Log Periodic Antenna | SCHWARZBECK | STLP 9128 E special | 9128ES-171 | N/A | N/A |
| RF Switch for Radiated | SKET | RS_DC06G-AMC-3C | SK2020081901 | N/A | N/A |
| Power Amplifier | SKET | HAP_01G032G-250W | 202104178 | Aug. 02, 2024 | 1 Year |
| Power Amplifier | SKET | HAP_03G06G-75W | SK202106221 | Aug. 02, 2024 | 1 Year |
| Power Amplifier(Combiner) | SKET | HAP_80M200M/200M1G-2000/1000W | 202102154 | Aug. 02, 2024 | 1 Year |
| Test Software | SKET | EMC-S | V2.1.4.15 | N/A | N/A |

## 9.3 Reference Standard

EN 55035:2017,
EN 55035:2017/A11:2020,
IEC 61000-4-3:2020

## 9.4 Test Arrangement




The EUT is initially placed with one face coincident with the calibration plane. The EUT face being illuminated shall be contained within the UFA unless partial illumination is being applied.
The frequency ranges to be considered are swept with the signal modulated, pausing to adjust the RF signal level or to switch oscillators and antennas as necessary.
Where the frequency range 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. The sensitive frequencies (e.g., clock frequencies) shall be analyzed separately according to the requirements in product standards.
The test shall normally be performed with the generating antenna facing each side of the EUT. When equipment can be used in different orientations (i.e. vertical or horizontal) all sides shall be exposed to the field during the test. When technically justified, some EUTs can be tested by exposing fewer faces to the generating antenna. In other cases, as determined for example by the type and size of EUT or the frequencies of test, more than four azimuths may need to be exposed. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.

## 9.5 Test Specification and Limit

| **Swept frequency test** | | **Performance Criteria** |
|---|---|---|
| Frequency (MHz) | 80 to 1000 | A |
| Field Strength | 3V/m rms voltage level of the unmodulated signal | |
| Modulation | AM modulated to a depth of 80% by a sine wave of 1kHz (note 1) | |
| Step Size | 1% increments | |
| Dwell time | ＜5 Sec. | |

| **Spot frequency test** | | **Performance Criteria** |
|---|---|---|
| Frequency (MHz) | 1800, 2600, 3500, 5000 | A |
| Field Strength | 3V/m rms voltage level of the unmodulated signal | |
| Modulation | AM modulated to a depth of 80% by a sine wave of 1kHz (note 1) | |
| Dwell time | ＜5 Sec. | |

Note 1: The 1kHz modulation may be replaced by a different audio modulation frequency more appropriate for a given EUT if, for example, 1kHz is not within the operating audio range of the EUT.

For audio output function (if applied):
Performance criterion A
During the test the audio output function shall be maintained. The measured acoustic interference ratio and/or the measured electrical interference ratio during the test shall be -20 dB or better.

## 9.6 Test Result

| Sample No. Y25033103-01 | | | | | | |
|---|---|---|---|---|---|---|
| Frequency Range & Field Strength | | | | | | |
| 80MHz ~ 1000MHz | | | 3V/m | | | |
| 1800MHz, 2600MHz, 3500MHz, 5000MHz | | | 3V/m | | | |
| Steps: 1% | | Dwell time: 1s | | Modulation: 1KHz 80% AM | | |
| Operation Mode | EUT Position | Antenna: Horizontal | | Antenna: Vertical | | Result |
| | | Required | Observation | Required | Observation | |
| Mode 1 | Front side | A | A(1) | A | A(1) | Pass |
| Mode 1 | Back side | A | A(1) | A | A(1) | Pass |
| Mode 1 | Left side | A | A(1) | A | A(1) | Pass |
| Mode 1 | Right side | A | A(1) | A | A(1) | Pass |
| Remark | | | | | | |
| (1) | A: Operation as intend, no loss of function during test and after test. | | | | | |

| Audio output function result: □ this device without audio output function. | | | |
|---|---|---|---|
| Method | Port | Acoustic interference ratio L1-L0 (dB) Required: ≤-20dB | Result |
| √acoustic measurement | Speaker | -41.70 | Pass |
| √electrical measurement | Audio out | -37.14 | Pass |

# 10 Electrical Fast Transient/Burst Immunity

## 10.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 16, 2025 | **Test engineer** | Oliver Liu | |
| **Climate condition** | **Ambient temperature** | 23.6°C | **Relative humidity** | 41.7% |
| | **Atmospheric pressure** | 99.5kPa | | |
| **Test place** | Shield Room 3# | | | |

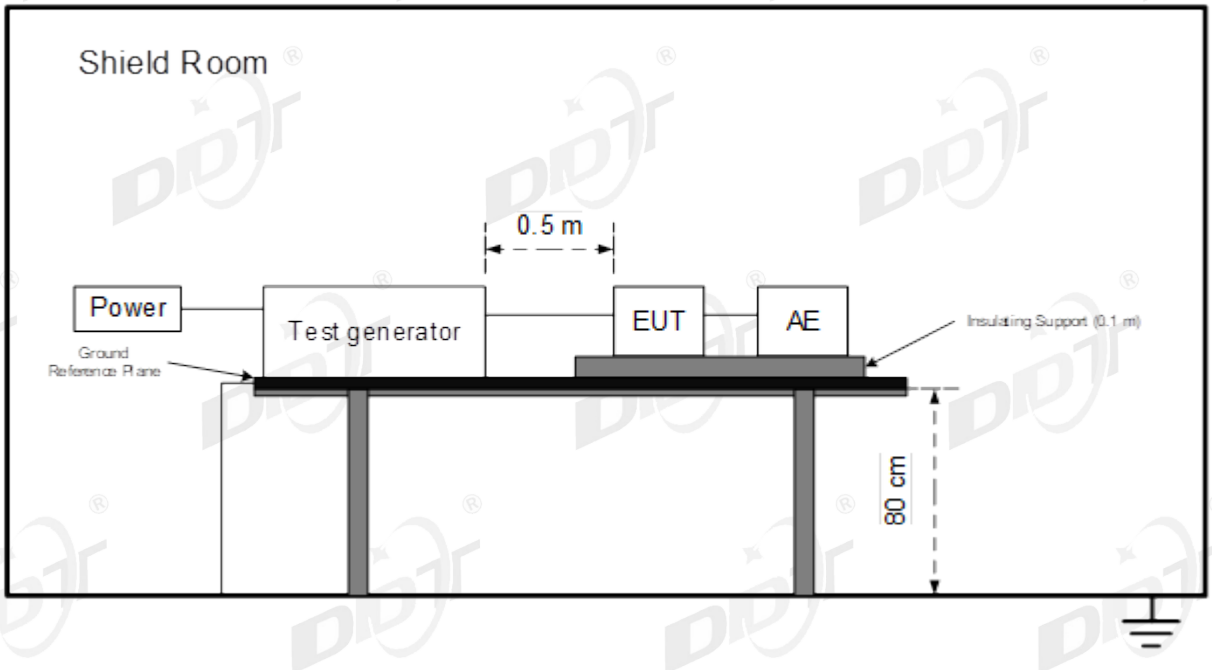
## 10.2 Test Equipment

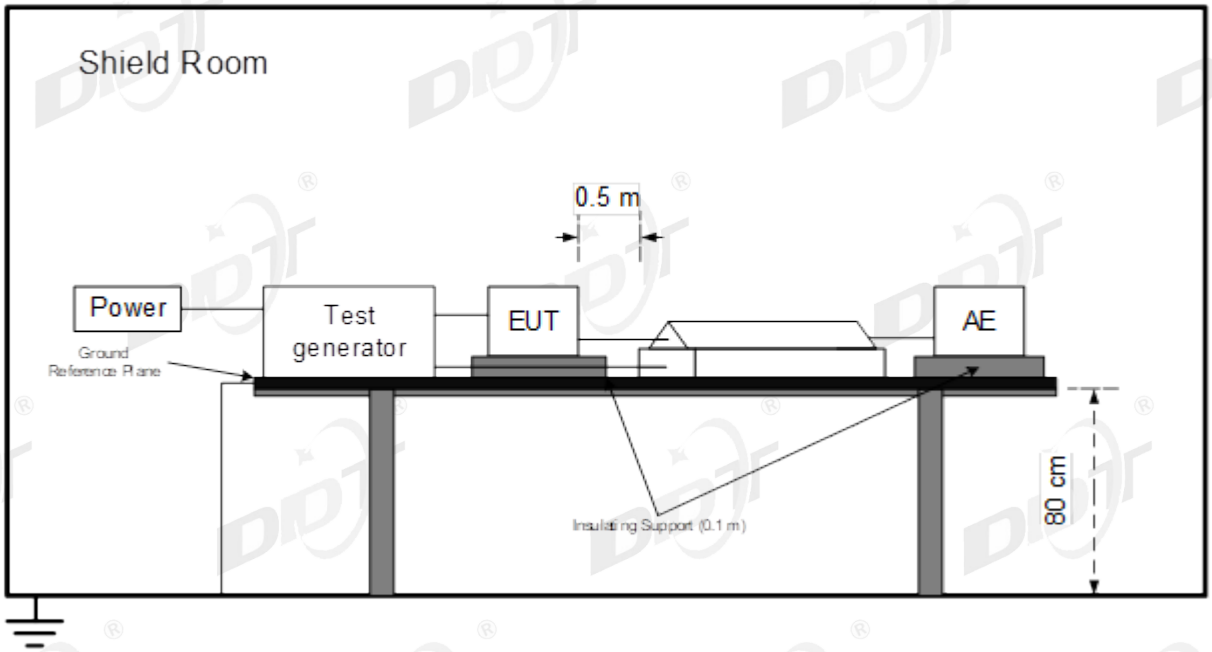
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Multifunction Generator Systems | TESEQ | NSG 3060 | 210 | Feb. 17, 2025 | 1 Year |
| Automated single phase Coupling/Decoupling Networks | TESEQ | CDN 3061 | 1326 | Feb. 17, 2025 | 1 Year |

## 10.3 Reference Standard

EN 55035:2017,
EN 55035:2017/A11:2020,
IEC 61000-4-4:2012

## 10.4 Test Arrangement






The EUT and its simulators were placed on the ground reference plane and were insulated from it by an insulating support 0.1m ± 0.01m thick.
The minimum distance between the EUT and all other conductive structures (e.g. the walls of a shielded room), except the ground reference plane shall be more than 0,5 m.
Al cables to the EUT shall be placed on the insulation support 0,1 m above the ground reference plane. Cables not subject to electrical fast transients shall be routed as far as possible from the cable under test to minimize the coupling between the cables.

## 10.5 Test Specification and Limit

| **Test Level** | | | **Performance Criteria** |
|---|---|---|---|
| Test voltage | ±1kV For AC mains Port | ±0.5kV for DC input or signal Port | B |
| Repetition Frequency | 5kHz | 5kHz | |
| Burst Duration | 15ms | 15ms | |
| Burst Period | 300ms | 300ms | |
| Inject Time(s) | 120s | 120s | |
| Inject Method | Direct for AC mains port | Direct for signal port<br>Direct for dc input port | |
| Inject Line | AC Mains of adapter | DC input of adapter or<br>Capacitive coupling clamp | |

Note: This test shall be additionally performed on analogue/digital data ports, and DC network power ports, of radio equipment and associated ancillary equipment, if the cables may be longer than 3 m.

## 10.6 Test Result

| Sample No. Y25033103-01 | | | | | | |
|---|---|---|---|---|---|---|
| Injected Port | AC Mains Power | | Coupling | Direct | | |
| Burst Period: | 300ms | | Test Time: | 120s | | |
| Repetition Frequency | 5KHz | | Burst Durations | 15ms | | |
| Operation Mode | Line | Test Voltage | Required | Observation | | Result |
| | | | | Positive | Negative | |
| Mode 1 | L | ±1kV | B | B(1) | B(1) | Pass |
| Mode 1 | N | ±1kV | B | B(1) | B(1) | Pass |
| Mode 1 | PE | ±1kV | B | B(1) | B(1) | Pass |
| Mode 1 | L-N | ±1kV | B | B(1) | B(1) | Pass |
| Mode 1 | L-PE | ±1kV | B | B(1) | B(1) | Pass |
| Mode 1 | N-PE | ±1kV | B | B(1) | B(1) | Pass |
| Mode 1 | L-N-PE | ±1kV | B | B(1) | B(1) | Pass |
| Remark | | | | | | |
| (1) | B: Temporary image flicker, when disturbance ceases, and recovers its normal performance, without operator intervention. | | | | | |

# 11 Surge Immunity

## 11.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 16, 2025 | **Test engineer** | Oliver Liu | |
| **Climate condition** | **Ambient temperature** | 23.6°C | **Relative humidity** | 41.7% |
| | **Atmospheric pressure** | 99.5kPa | | |
| **Test place** | Shield Room 3# | | | |

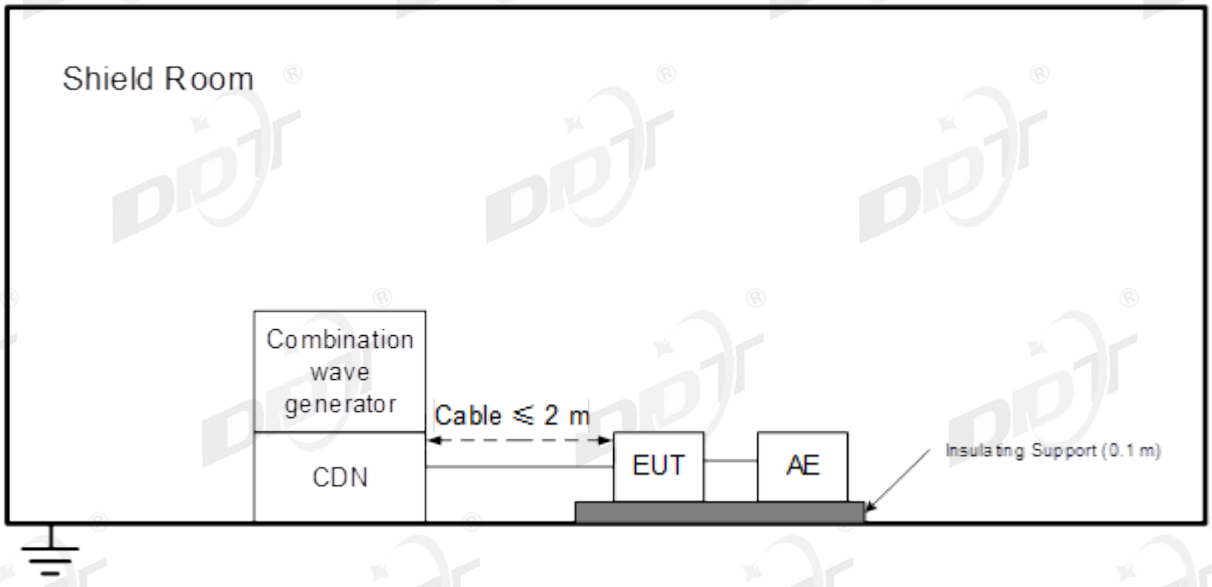
## 11.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Multifunctional Generator | EMTEST | UCS 500N7.1 | P1303110687 | Feb. 17, 2025 | 1 Year |
| 3-Phase Coupling Decoupling Network | EMTEST | CNI 503B7 | V1250114298 | Feb. 17, 2025 | 1 Year |
| Test Software | EM TEST | iec.control | Version 5.2.3 | N/A | N/A |

## 11.3 Reference Standard

EN 55035:2017,
EN 55035:2017/A11:2020,
IEC 61000-4-5:2014/AMD1:2017

## 11.4 Test Arrangement




EUT should be configure in representative operating conditions.
At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.
Different phase angles are done individually, if applied.
Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

## 11.5 Test Specification and Limit

| **Test level for AC mains ports** | | **Performance Criterion** |
|---|---|---|
| Line to Line | 1kV 1.2/50(8/20) μs | B |
| Line to Ground | 2kV 1.2/50(8/20) μs | B |
| **Analogue/digital data port, Port type: unshielded symmetrical** | | **Performance Criterion** |
| Line to Ground | 1 kV and 4kV 10/700(5/320) μs (used with the primary protection) | C |
| Line to Ground | 1 kV 10/700(5/320) μs (used without the primary protection) | C |
| Note: Applicable only to ports which, according to the manufacturer's specification, the cable lengths greater than 3m. | | |
| **Analogue/digital data port, Port type: coaxial or shielded** | | **Performance Criterion** |
| Shield to ground | 0.5 kV 1.2/50(8/20) μs | B |
| Note: Applicable only to ports which, according to the manufacturer's specification, the cable lengths greater than 3m. | | |
| **DC network power port** | | **Performance Criterion** |
| Line to reference ground | 0.5 kV 1.2/50(8/20) μs | B |
| Note: Applicable only to ports which, according to the manufacturer's specification,<br>(1) The cable lengths greater than 3m;<br>(2) May connect directly to outdoor cables.<br>(3) Where the surge coupling network for the 10/700 (5/320) μs waveform affects the functioning of high speed data ports, the test shall be carried out using a 1,2/50 (8/20) μs waveform and appropriate coupling network.<br>(4) The number of pulses applied shall be as follows:<br>Five positive pulses line-to-neutral at 90° phase<br>Five negative pulses line-to-neutral at 270° phase<br>The following additional pulses are required only if the EUT has an earth connection or if the EUT is earthed via any AE.<br>Five positive pulses line-to-earth at 90° phase<br>Five negative pulses line-to-earth at 270° phase<br>Five negative pulses neutral-to-earth at 90° phase<br>Five positive pulses neutral-to-earth at 270° phase | | |

## 11.6 Test Result

| Sample No. Y25033103-01 | | | | | | |
|---|---|---|---|---|---|---|
| Injected Port | AC Mains Power | | Wave Type | 1.2/50us-8/20us | | |
| Pulse Interval | 60s | | Pulse times: | 5 times at each polarity | | |
| Operation Mode | Coupling Line | Level | Required | Observation | | Result |
| | | | | Positive | Negative | |
| Mode 1 | L-N | ±0.5kV | B | A(1) | A(1) | Pass |
| Mode 1 | L-N | ±1kV | B | A(1) | A(1) | Pass |
| Mode 1 | L-PE | ±0.5kV | B | A(1) | A(1) | Pass |
| Mode 1 | L-PE | ±1kV | B | A(1) | A(1) | Pass |
| Mode 1 | L-PE | ±2kV | B | A(1) | A(1) | Pass |
| Mode 1 | N-PE | ±0.5kV | B | A(1) | A(1) | Pass |
| Mode 1 | N-PE | ±1kV | B | A(1) | A(1) | Pass |
| Mode 1 | N-PE | ±2kV | B | A(1) | A(1) | Pass |
| Remark | | | | | | |
| (1) | A: Operation as intend, no loss of function during test and after test. | | | | | |

# 12 Immunity to Conducted Disturbances, Induced by Radio-frequency Fields

## 12.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 16, 2025 | **Test engineer** | Oliver Liu | |
| **Climate condition** | **Ambient temperature** | 23.6°C | **Relative humidity** | 41.7% |
| | **Atmospheric pressure** | 99.5kPa | | |
| **Test place** | Shield Room 3# | | | |

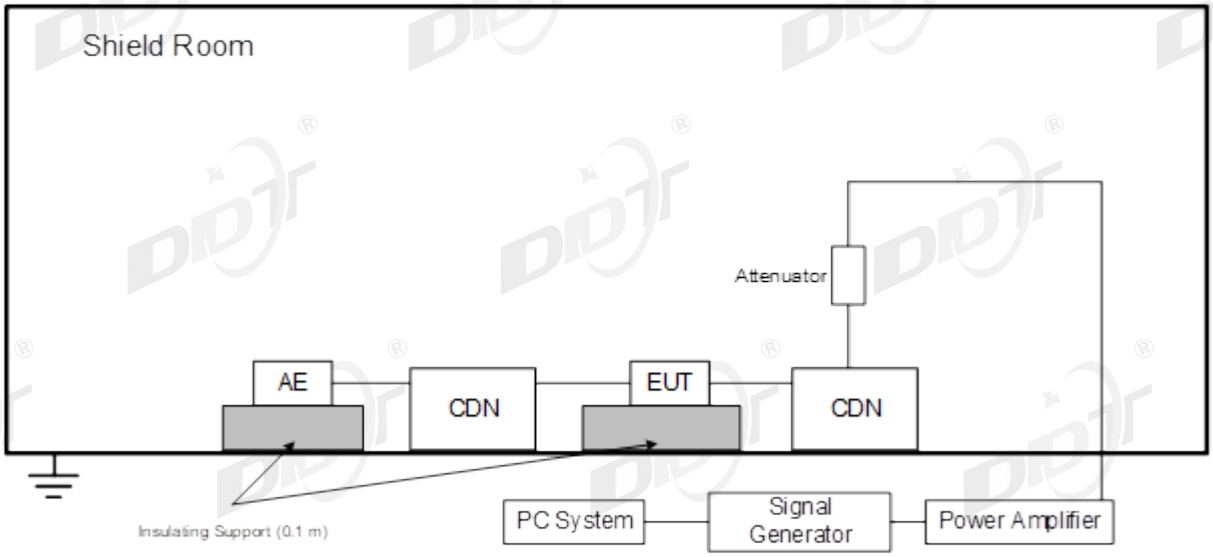
## 12.2 Test Equipment

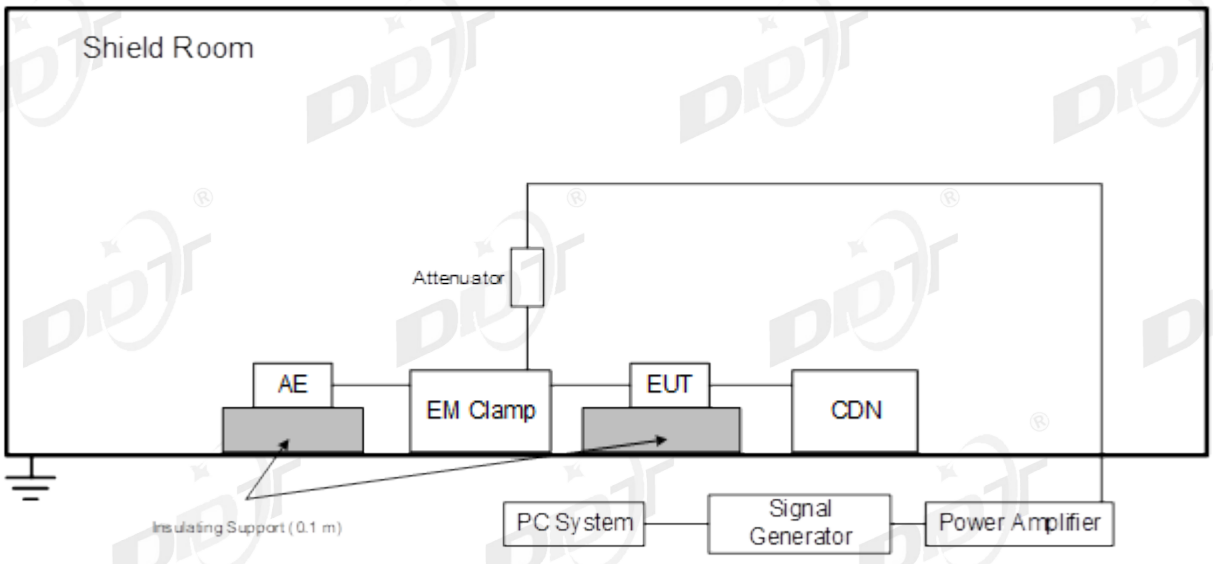
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Audio Analyzer | Rohde & Schwarz | UPV | 101525 | Feb. 17, 2025 | 1 Year |
| Microwave Signal Generator | Rohde & Schwarz | SMB100A | 103231 | Feb. 17, 2025 | 1 Year |
| COUPLING / DECOUPLING NETWORK | TESEQ | CDN M016 | 28987 | Feb. 17, 2025 | 1 Year |
| RF Power Amplifiers | AR | 75A250A | 0332892 | Feb. 17, 2025 | 1 Year |
| Directional Coupler | AR | DC2600M2 | 0333399 | Feb. 17, 2025 | 1 Year |
| Power Meter | Rohde & Schwarz | NRVS | 101785 | Feb. 17, 2025 | 1 Year |
| Coaxial voltage measurement probe | Rohde & Schwarz | URV5-Z4 | 100215 | Feb. 17, 2025 | 1 Year |
| COUPLING / DECOUPLING NETWORK | TESEQ | CDN M016 | 30436 | Feb. 17, 2025 | 1 Year |
| Bi-Directional RF Attenuators | Bird | 75-A-FFN-06 | 0751 | N/A | N/A |
| Test Software | Rohde & Schwarz | EMC32 | Ver 10.28.00 | N/A | N/A |

## 12.3 Reference Standard

EN 55035:2017,
EN 55035:2017/A11:2020,
IEC 61000-4-6:2023

## 12.4 Test Arrangement




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 at a distance 0.1 m to 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be at least 30 mm.
The disturbance signal described below is injected to EUT through CDN.
The EUT operates within its operational mode(s).
Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

## 12.5 Test Specification and Limit

| **Test Level** | | **Performance Criteria** |
|---|---|---|
| Frequency and Field Strength | 0.15MHz to 10MHz, 3V rms voltage level of the unmodulated signal | A |
| | 10MHz to 30MHz, 3V to 1V rms voltage level of the | |

| | | |
|---|---|---|
| | unmodulated signal | |
| | 30MHz to 80MHz, 1V rms voltage level of the unmodulated signal | |
| Modulation | AM modulated to a depth of 80% by a sine wave of 1kHz, (note 1) | |
| Step Size | 1% increments | |
| Dwell time | ＜5 Sec. | |

Note 1: The 1kHz modulation may be replaced by a different audio modulation frequency more appropriate for a given EUT if, for example, 1kHz is not within the operating audio range of the EUT.

For audio output function (if applied):
Performance criterion A
During the test the audio output function shall be maintained. The measured acoustic interference ratio and/or the measured electrical interference ratio during the test shall be -20 dB or better.

## 12.6 Test Result

| Sample No. Y25033103-01 | | | | | | |
|---|---|---|---|---|---|---|
| Steps: 1% | | Dwell time: 1s | | Modulation: 1KHz 80% AM | | |
| Operation mode | Frequency Range | Injected Position | Level | Required | Observation | Result |
| Mode 1 | 0.15MHz ~ 10MHz | AC Mains Power | 3V | A | A(1) | Pass |
| Mode 1 | 10MHz ~ 30MHz | AC Mains Power | 3V ~ 1V | A | A(1) | Pass |
| Mode 1 | 30MHz ~ 80MHz | AC Mains Power | 1V | A | A(1) | Pass |
| Remark | | | | | | |
| (1) | A: Operation as intend, no loss of function during test and after test. | | | | | |

| Audio output function result: □ this device without audio output function. | | | |
|---|---|---|---|
| Method | Port | Acoustic interference ratio L1-L0 (dB) Required: ≤-20dB | Result |
| √acoustic measurement | Speaker | -36.43 | Pass |
| √electrical measurement | Audio Out | -37.69 | Pass |

# 13 Power Frequency Magnetic Field Immunity

## 13.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 16, 2025 | **Test engineer** | Oliver Liu | |
| **Climate condition** | **Ambient temperature** | 23.6°C | **Relative humidity** | 41.7% |
| | **Atmospheric pressure** | 99.5kPa | | |
| **Test place** | Shield Room 3# | | | |

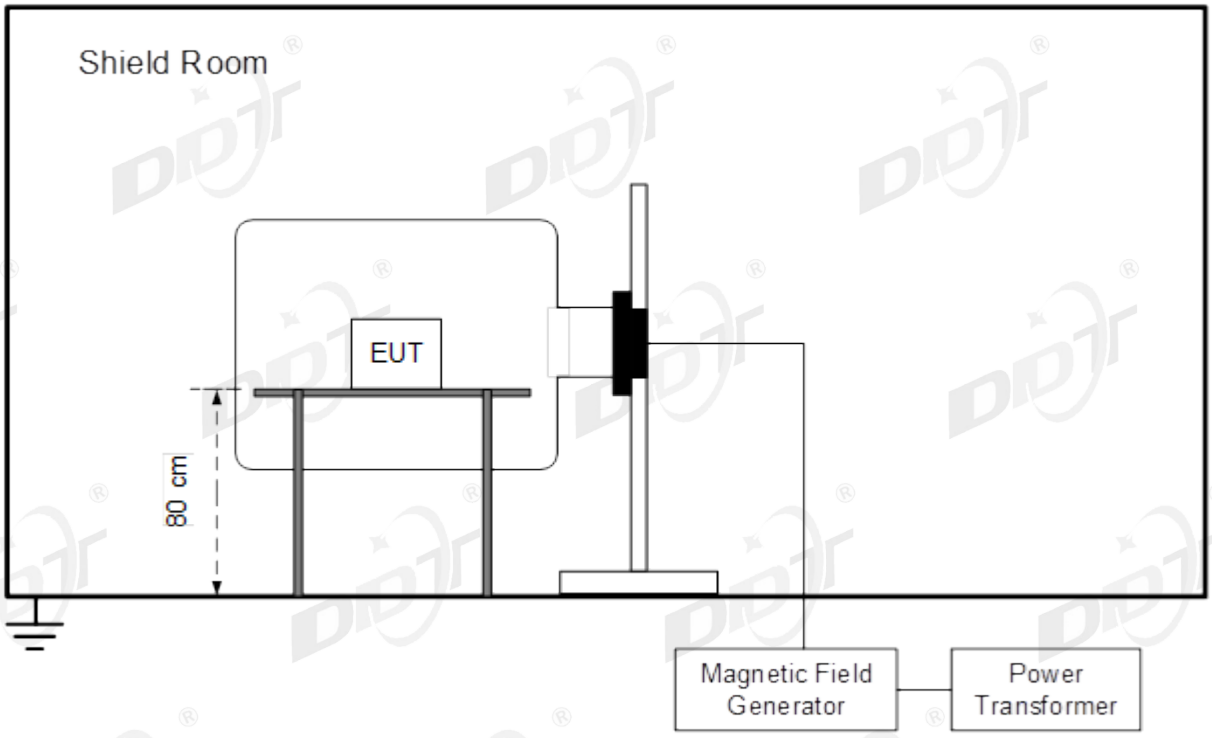
## 13.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Magnetic Coil | EMTEST | MS 100N | 0512-13 | Feb. 17, 2025 | 1 Year |
| Power transformer | EMTEST | MC 2630 | 0912-65 | Feb. 17, 2025 | 1 Year |
| Multifunctional Generator | EMTEST | UCS 500N7.1 | P1303110687 | Feb. 17, 2025 | 1 Year |
| Motor Variac | EMTEST | MV 2616 | P1303109290 | Feb. 17, 2025 | 1 Year |
| Test Software | EM TEST | iec.control | Version 5.2.3 | N/A | N/A |

## 13.3 Reference Standard

EN 55035:2017,
EN 55035:2017/A11:2020,
IEC 61000-4-8:2009

## 13.4 Test Arrangement




The EUT shall be subjected to the test magnetic field by using the induction coil of standard

dimensions (1m*1m). Then induction coil shall then be rotated by 90°in order to expose the EUT to the test field with different orientations.

## 13.5 Test Specification and Limit

| **Magnetic Field Strength (A/m)** | **Performance Criterion** |
|---|---|
| 1 | A |

## 13.6 Test Result

| Sample No. Y25033103-01 | | | | | |
|---|---|---|---|---|---|
| Operation Mode | Test Level | Coil Orientation | Required | Observation | Result |
| Mode 1 | 1A/m | X | A | A(1) | Pass |
| Mode 1 | 1A/m | Y | A | A(1) | Pass |
| Mode 1 | 1A/m | Z | A | A(1) | Pass |
| Remark | | | | | |
| (1) | A: Operation as intend, no loss of function during test and after test. | | | | |

# 14 Voltage Dips, Short Interruptions and Voltage Variations Immunity

## 14.1 General Information

| | | | | |
|---|---|---|---|---|
| **Test date** | Apr. 16, 2025 | **Test engineer** | Oliver Liu | |
| **Climate condition** | **Ambient temperature** | 23.6°C | **Relative humidity** | 41.7% |
| | **Atmospheric pressure** | 99.5kPa | | |
| **Test place** | Shield Room 3# | | | |

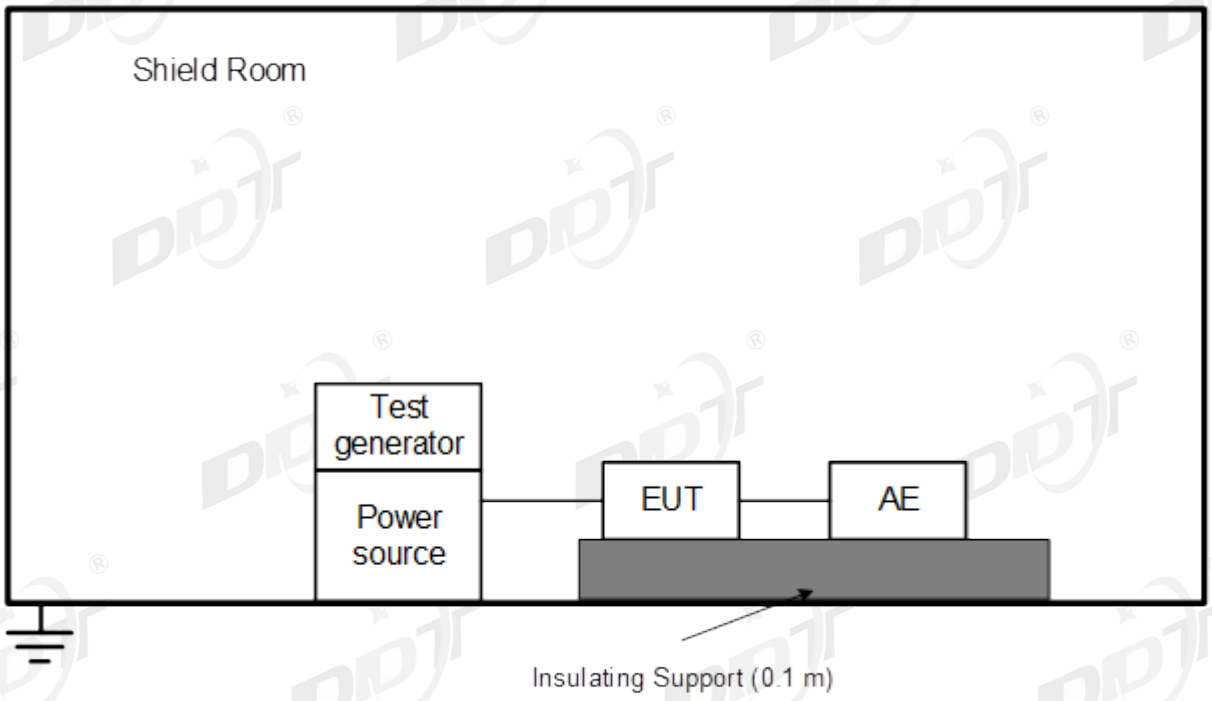
## 14.2 Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Multifunctional Generator | EMTEST | UCS 500N7.1 | P1303110687 | Feb. 17, 2025 | 1 Year |
| Motor Variac | EMTEST | MV 2616 | P1303109290 | Feb. 17, 2025 | 1 Year |
| Test Software | EM TEST | iec.control | Version 5.2.3 | N/A | N/A |

## 14.3 Reference Standard

EN 55035:2017,
EN 55035:2017/A11:2020,
IEC 61000-4-11:2020/COR2:2022

## 14.4 Test Arrangement




The EUT and test generator were setup as shown. The interruptions are introduced at selected phase angles with specified duration. Record any degradation of performance.

## 14.5 Test Specification and Limit

| Test Level %UT | Duration (in period) | Performance Criterion |
|---|---|---|
| ＜5 | 0.5 | B |
| 70 | 25 for 50Hz/30 for 60Hz | C |
| ＜5 | 250 for 50Hz/300 for 60Hz | C |

## 14.6 Test Result

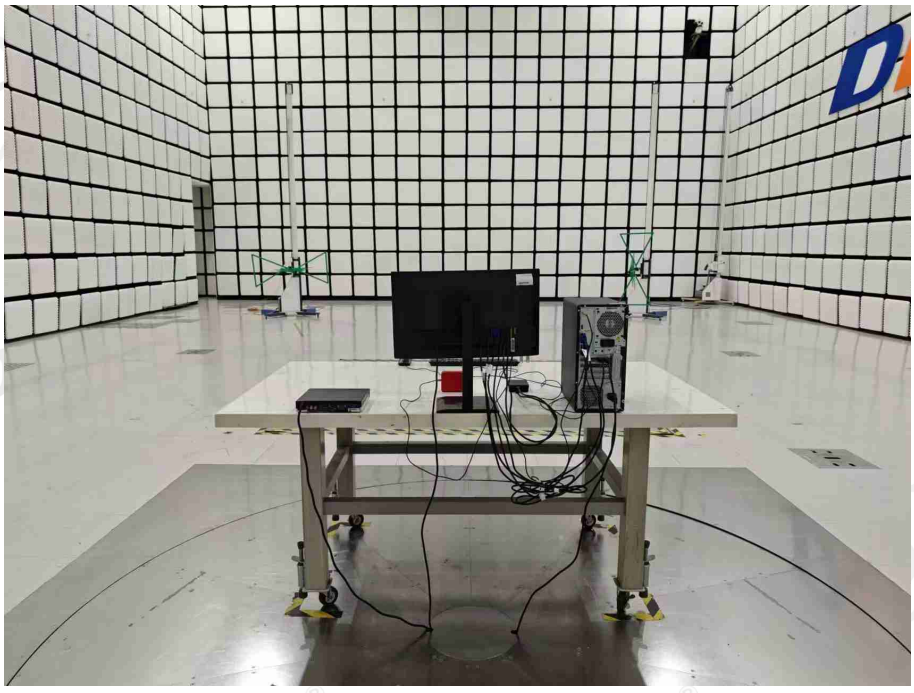
| Sample No. Y25033103-01 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Operation Mode | Operation Voltage | %Ur | Phase Angle | Duration (in period) | Required | Observation | Result |
| Mode 1 | 100V 60Hz | 0 | 0°,180° | 0.5P | B | A(1) | Pass |
| Mode 1 | 100V 60Hz | 70 | 0°,180° | 30P | C | A(1) | Pass |
| Mode 1 | 100V 60Hz | 0 | 0°,180° | 300P | C | B(2) | Pass |
| Mode 1 | 240V 50Hz | 0 | 0°,180° | 0.5P | B | A(1) | Pass |
| Mode 1 | 240V 50Hz | 70 | 0°,180° | 25P | C | A(1) | Pass |
| Mode 1 | 240V 50Hz | 0 | 0°,180° | 250P | C | B(2) | Pass |

| Remark | |
|---|---|
| (1) | A: Operation as intend, no loss of function during test and after test. |
| (2) | B: Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention. |

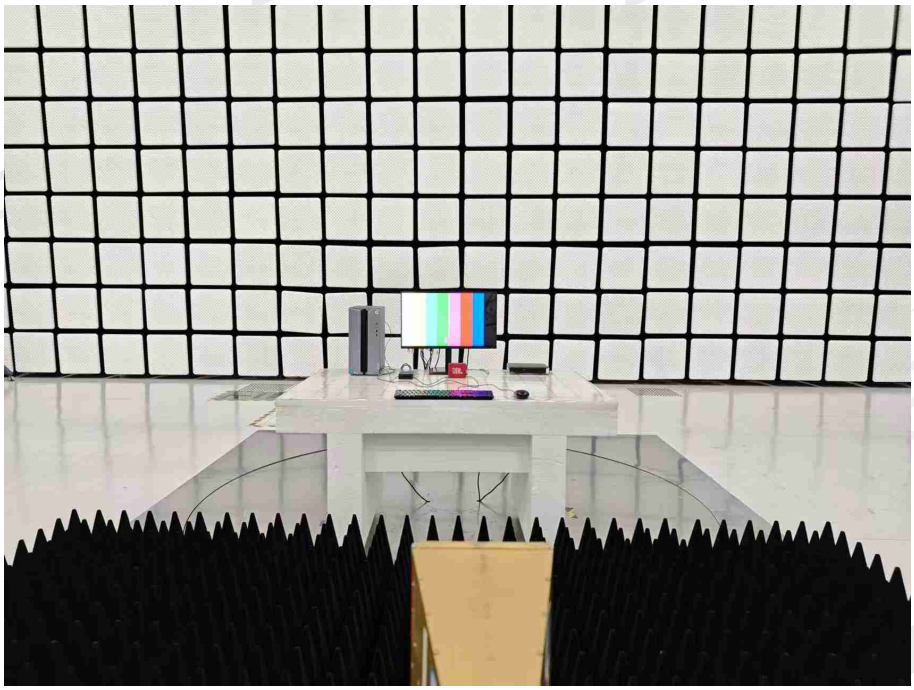
# Annex A.Test Setup Photos

## A.1 Conducted Emissions (AC mains power ports)

## A.2 Radiated Emissions (30MHz to 1GHz)



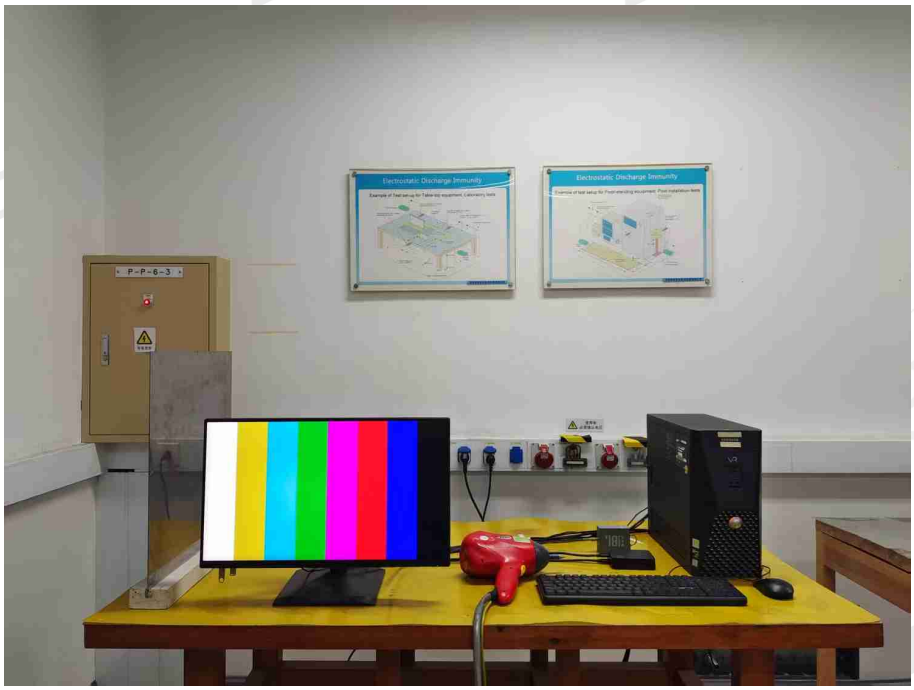
## A.3 Radiated Emissions (Above 1GHz)



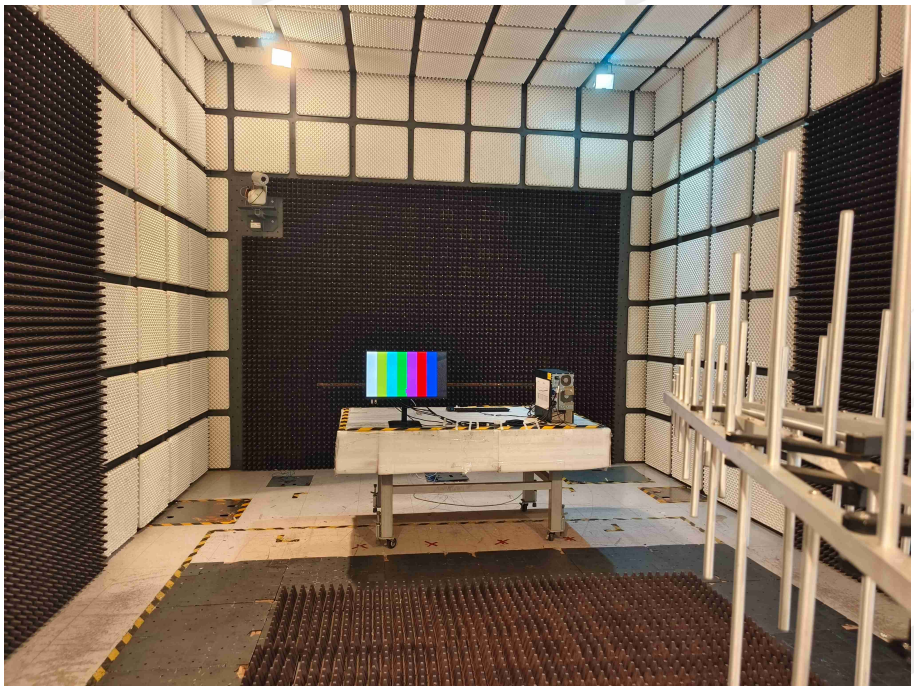
## A.4 Harmonic Current Emissions

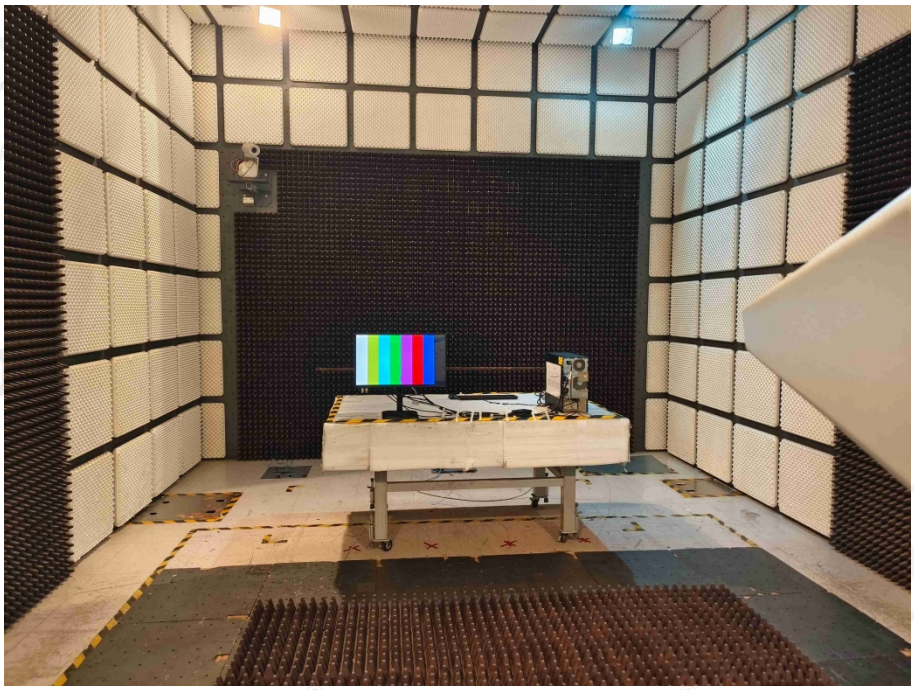
## A.5 Voltage Changes, Voltage Fluctuations and Flicker

## A.6 Electrostatic Discharge Immunity

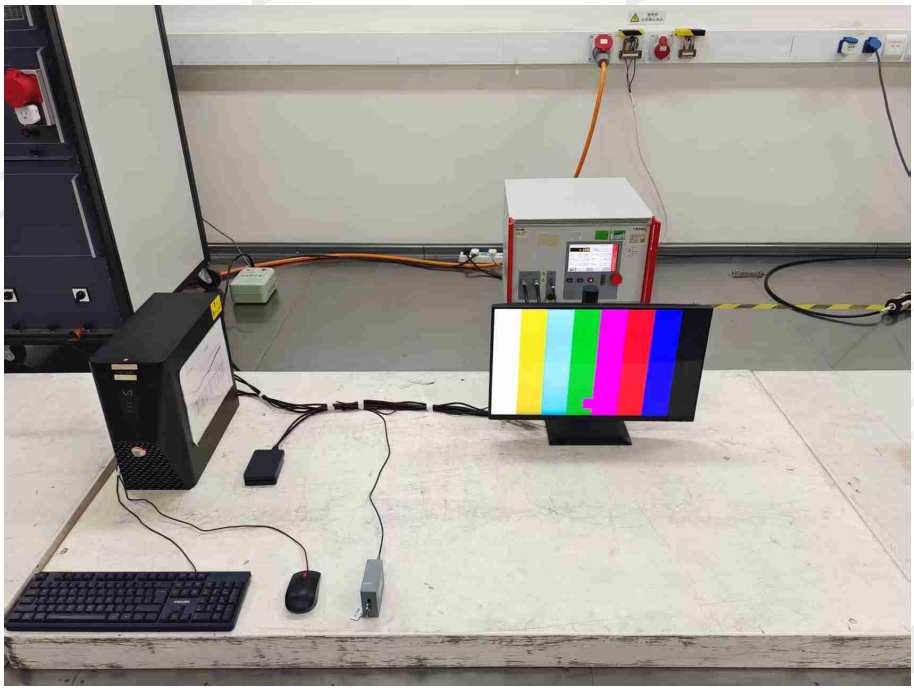


## A.7 Radiated, Radio-frequency, Electromagnetic Field Immunity

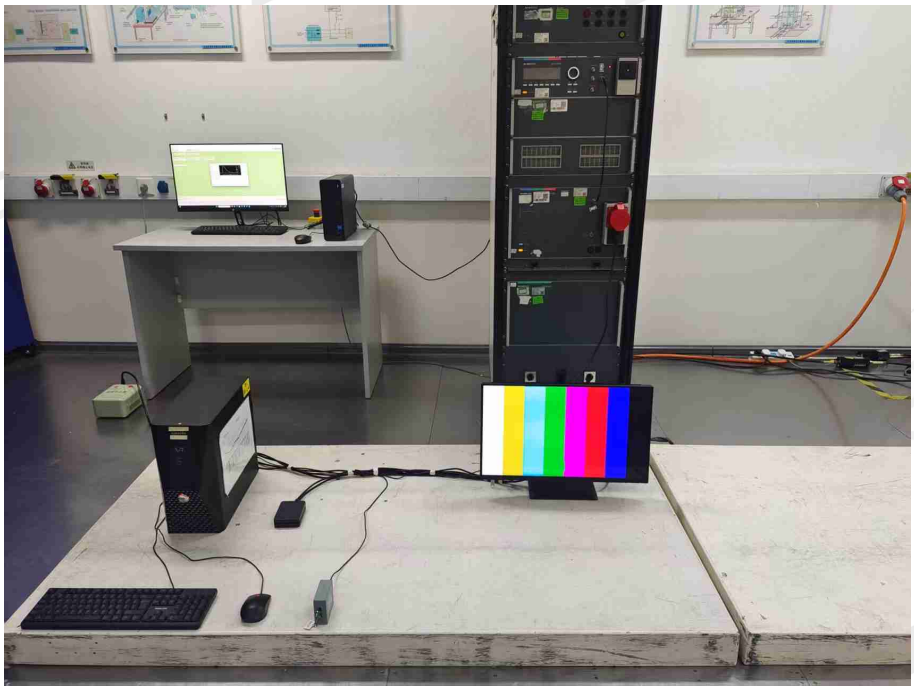




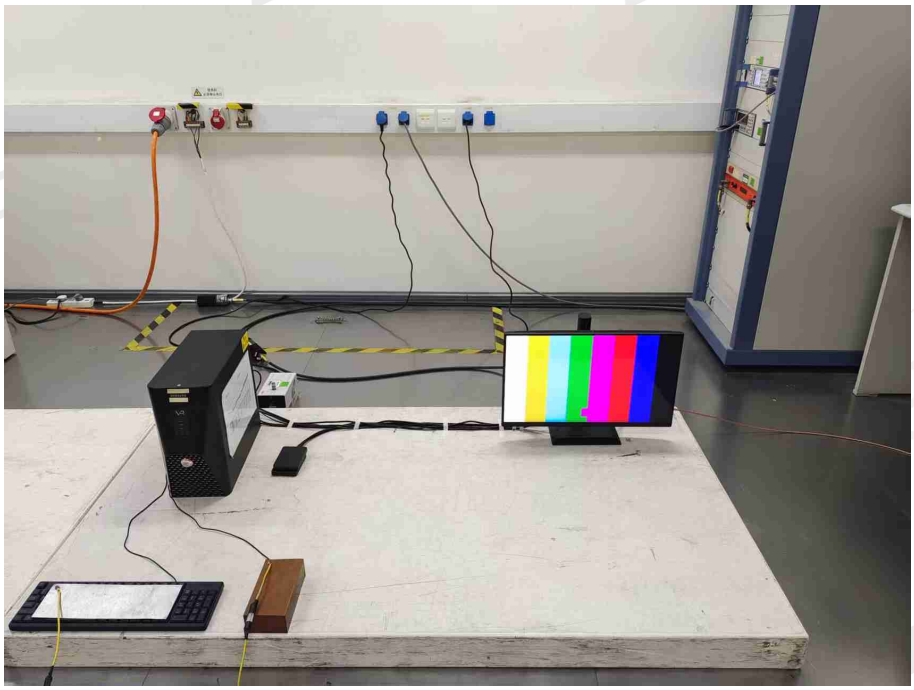
## A.8 Electrical Fast Transient/Burst Immunity



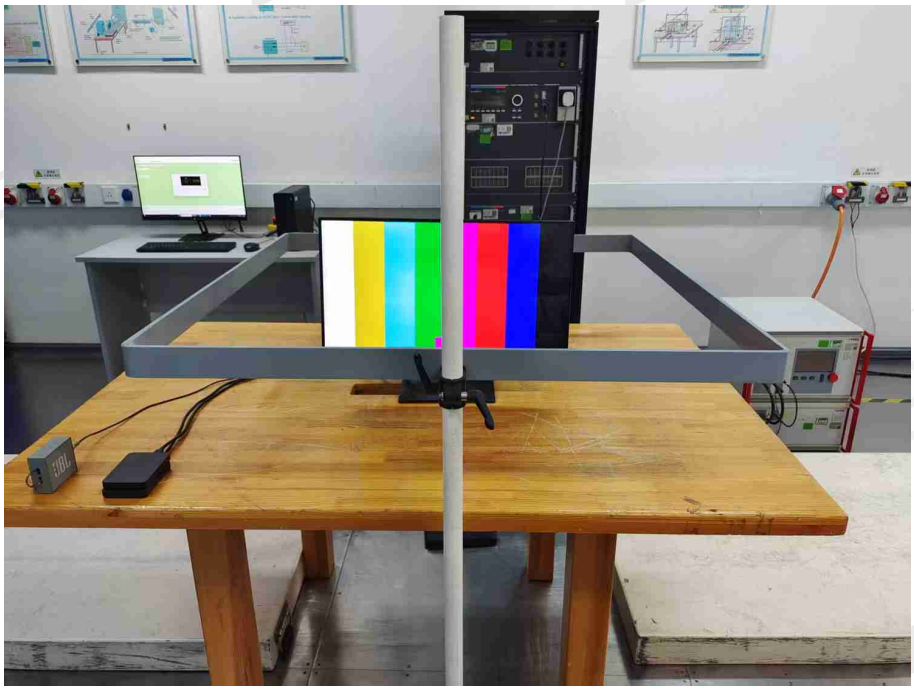
## A.9 Surge Immunity



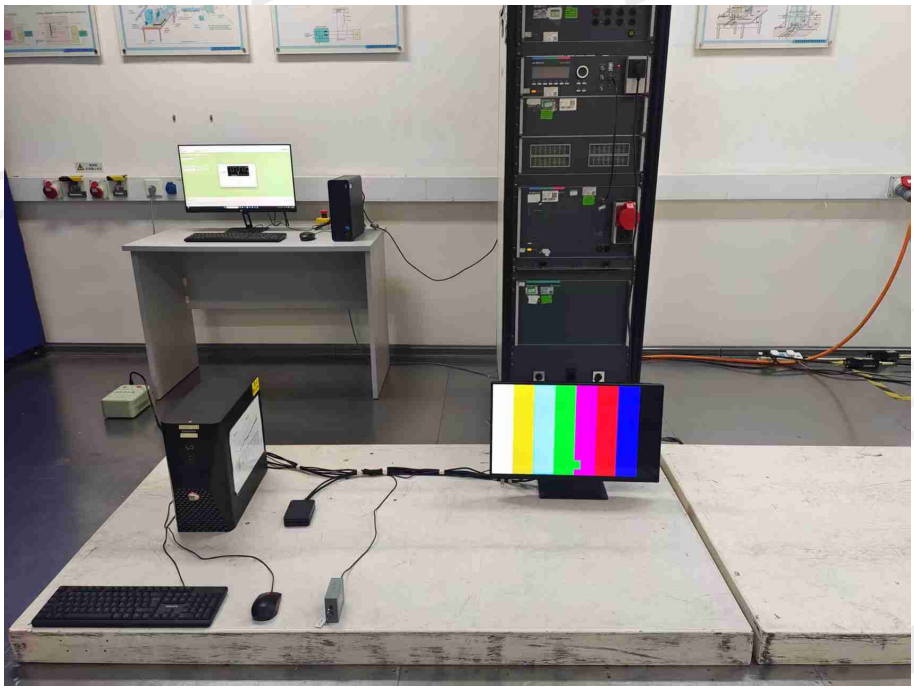
## A.10 Immunity to Conducted Disturbances, Induced by Radio-frequency Fields



## A.11 Power Frequency Magnetic Field Immunity



## A.12 Voltage Dips, Short Interruptions and Voltage Variations Immunity



# Statement

1. The report is invalid without the inspection and testing special seal of the company.
2. This report is invalid if altered.
3. This report is responsible for the conformance testing of sample(s) received.
4. This report shall not be reproduced, without the written approval of test laboratory. The copy of the report not stamped again with the inspection and testing special seal is invalid.
5. Item with "☆" was subcontracted to other laboratories.
6. The report without CMA mark indicated that either test item(s) not accredited by CMA or test item(s) accredited by CMA but the report is only used for development or quality control which purposes within the company that has no effect on social proof.
7. Any objections must be raised to our company within 15 days on receiving the report, overdue will not be accepted.
8. The sample(s) must be collected within three months, overdue will be dealt with by our company.
9. The report is invalid without the signature of editor, reviewer, approver.

Test Institution: Tianjin Dongdian Testing Service Co., Ltd.

Address: Building D-1, No. 19, Weisi Road, Microelectronics Industrial Park Development Area, Tianjin, China.

Postcode: 300385

Tel: 022-58038033

Fax: 022-58038033

Website: http://www.ddttest.com

# END OF REPORT