# EMC TEST REPORT

| | |
|---|---|
| Equipment | Power adapter |
| Trademark | N/A |
| Model No. | See “General Information” on page 5 to 6 |
| Applicant | Shenzhen Anthy Electronics Co., Ltd.<br>401, Building E, Longtianli Industrial Park, No.11 Zhangyi Road, Zhang Ge Community, Fucheng subdistrict, Longhua District, 518110, Shenzhen, PEOPLE'S REPUBLIC OF CHINA |
| Manufacturer | Sichuan Anthy Electronics Co., Ltd.<br>4/F, Building 3, Intellective Manufacturing Garden (First-stage), South of Qihe Road, Economic Development Area, 635000 Dazhou, Sichuan, PEOPLE'S REPUBLIC OF CHINA |
| Prepared by | Shenzhen An-Teng Testing Service Co., Ltd.<br>Floor 5, No. 11, Hebei Industrial Zone, Hualian Community, Longhua Street, Longhua District, Shenzhen, China. |
| Report No. | ATJC24032080003400E |
| Date of Test | Mar. 20 – Mar. 25, 2024 |
| Date of Issue | April 23, 2024 |
| Test Standard(s) | EN 55032:2015+A1:2020, EN 55035:2017+A11:2020<br>EN IEC 61000-3-2:2019+A1:2021, EN 61000-3-3:2013+A2:2021 |

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

Tested : Cris Song / Engineer Date : April 23, 2024

Approved : Henry Tian / Manager Date : April 23, 2024

***Note:***

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of ATJC. This document may be altered or revised by ATJC personnel only, and shall be noted in the revision of the document.*

# Revision History

| Rev. | Issue Date | Revisions | Effect Page | Revised By |
|---|---|---|---|---|
| 0 | April 23, 2024 | Initial Issue | All Page | Cris Song |
| | | | | |

# Table of Contents

# 1. TEST SUMMARY

| Emission | | | |
|---|---|---|---|
| Requirement - Test | Test Method | Limit | Result |
| Conducted Emission | EN 55032:2015+A1:2020 | Class B | PASS |
| Radiated emissions at frequencies up to 1 GHz | | Class B | PASS |
| Radiated emissions at frequencies above 1 GHz | | Class B | N/A |
| Harmonic current emissions | EN IEC 61000-3-2:2019+A1:2021 | Class A | PASS |
| Voltage changes, voltage fluctuations and flicker | EN 61000-3-3:2013+A2:2021 | Clause 5 | PASS |
| **Immunity (EN 55035:2017+A11:2020)** | | | |
| Requirement - Test | Test Method | Performance criteria | Result |
| Electrostatic discharges (ESD) | EN 61000-4-2:2009 | B | PASS |
| Electromagnetic field | EN IEC 61000-4-3:2020 | A | PASS |
| Electrical fast transients/burst (EFT/B) | EN 61000-4-4:2012 | B | PASS |
| Surges | EN 61000-4-5:2014+A1:2017 | B | PASS |
| Conducted RF | EN 61000-4-6:2014 | A | PASS |
| Power frequency magnetic field | EN 61000-4-8:2010 | A | N/A |
| Voltage dips and Short interruptions | EN IEC 61000-4-11:2020 | B & C | PASS |

***Remark:***
N/A is abbreviation for Not Applicable.
The test was carried out in all the test modes, only the worst data are list in report.

# 2. GENERAL INFORMATION

## 2.1. Description of EUT

| | |
|---|---|
| Equipment | Power adapter |
| Trademark | N/A |
| Model Name | AE100-B |
| Serial No. | See below model list |
| Model Difference | Same series models have the same circuit diagram, layout, transformer and construction, except the specification of secondary components are different.<br>Each models has two different color of enclosure: white and black, two types of plug: EU plug and BS plug. |
| Rated Power Supply | See below model list |
| Rated Power | 100W Max |
| Normal Testing Voltage | Input: 230V/50Hz<br>Output: 20VDC, 5A |
| Configuration | ☒ Table-top ☐ Floor-standing |
| Accessory Device | N/A |
| Cable Supplied | N/A |

***Note:***

1. Other Accessory Device List and Details

| Description | Manufacturer | Model | Note |
|---|---|---|---|
| -- | -- | -- | -- |
| | | | |

External I/O Cable

| Cable Description | Shielded Type | Ferrite Core | Length(m) | Note |
|---|---|---|---|---|
| - | ☐Shielded ☐Non-shielded | ☐Yes ☐No | | |
| | | | | |

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

Model list:

| **Model name** | **Input voltage** | **Output voltage** | **Output current** | **Output power** |
|---|---|---|---|---|
| RXMCT-85W | 200-240V~, 50/60Hz, 2A Max | 20V | 4.25A | 85W |
| RXMCL-85W | | 18.5V | 4.6A | 85W |
| AF185460 | | 18.5V | 4.6A | 85W |

| | | | | |
|---|---|---|---|---|
| AF200425 | | 20V | 4.25A | 85W |
| AFUA09 | | 15V-20V | MAX 5A | 90W |
| AE85 | | 20V | 4.25A | 85W |
| AE85-B | | 18.5V | 4.6A | 85W |
| AE67-B | | 20V | 3.35A | 67W |
| AE65-B | | 20V | 3.25A | 65W |
| AE61-B | | 20V | 3.05A | 61W |
| AE60 | | 16.5V | 3.65A | 60W |
| AE45-B | | 14.85V | 3.05A | 45W |
| AE45-B1 | | 14.5V | 3.1A | 45W |
| A85-B | | 18.5V | 4.6A | 85W |
| A85 | | 20V | 4.25A | 85W |
| A67 | | 20V | 3.35A | 67W |
| A65 | | 20V | 3.25A | 65W |
| A61 | | 20V | 3.05A | 61W |
| A60 | | 16.5V | 3.65A | 60W |
| A45 | | 14.85V | 3.05A | 45W |
| A45-B | | 14.5V | 3.1A | 45W |
| AE100-B | | 5V-20V | MAX 5A | 100W |
| AE96-B | | 5V-20V | MAX 4.8A | 96W |
| AE90-B | | 5V-20V | MAX 4.5A | 90W |
| AE87-B | | 5V-20V | MAX 4.35A | 87W |
| AE67-B | | 5V-20V | MAX 3.35A | 67W |
| AE65-B | | 5V-20V | MAX 3.25A | 65W |
| AE61-B | | 5V-20V | MAX 3.05A | 61W |
| AE45-B | | 5V-20V | 2.25A | 45W |
| AF100-B | | 5V-20V | MAX 5A | 100W |
| AF96-B | | 5V-20V | MAX 4.8A | 96W |
| AF90-B | | 5V-20V | MAX 4.5A | 90W |
| AF87-B | | 5V-20V | MAX 4.35A | 87W |
| AF67-B | | 5V-20V | MAX 3.35A | 67W |
| AF65-B | | 5V-20V | MAX 3.25A | 65W |
| AF61-B | | 5V-20V | MAX 3.05A | 61W |
| AF45-B | | 5V-20V | 2.25A | 45W |
| AFxxxyyy | | 5V-20V | 0.00A-5.00A | 100W Max |
| AFxxxyyy: “xxx” represent output voltage, can be 500 to 200, 500 means 5.00V, etc.; “yyy” represent outpout current, can be 001 to 500, 0.01 means 0.01A, etc. | | | | |

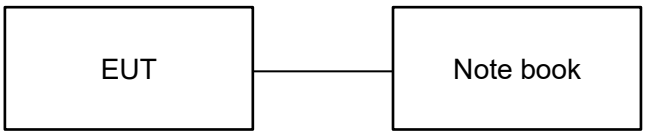
## 2.2. Operating Condition of EUT

| Test mode | Description |
|---|---|
| 1 | Working |
| 2 | |

## 2.3. Test Conditions

Temperature: 15-35℃
Relative Humidity: 30-60 %
Atmospheric pressure: 800hPa-1060hPa

## 2.4. Block Diagram of EUT Configuration



# 3. FACILITIES

## 3.1. Test Facility

**ATJC-LAB**

Floor 5, No. 11, Hebei Industrial Zone, Hualian Community, Longhua Street, Longhua District, Shenzhen, China.

## 3.2. Test Instruments

Radiated Emission Measurement (Test software: EZ-EMC Ver. FA-03A2 RE)

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Double Ridged Broadband Horn Antenna | Schwarzbeck | BBHA 9120D | 1911 | 2024-10-30 |
| 2 | TRILOG Broadband Antenna | Schwarzbeck | VULB 9168 | 869 | 2024-10-30 |
| 3 | Amplifier | Agilent | 8449B | 3008A01838 | 2024-10-30 |
| 4 | Amplifier | HP | 8447E | 2945A02747 | 2024-10-30 |
| 5 | EMI TEST RECEIVER | ROHDE&SCHWARZ | ESPI7 | 100362 | 2024-10-30 |
| 6 | Coaxial cable | ETS | RFC-SNS-100 -NMS-80 NI | / | 2024-10-30 |
| 7 | Coaxial cable | ETS | RFC-SNS-100 -NMS-20 NI | / | 2024-10-30 |
| 8 | Coaxial cable | ETS | RFC-SNS-100 -SMS-20 NI | / | 2024-10-30 |
| 9 | Coaxial cable | ETS | RFC-NNS-10 0-NMS-300 NI | / | 2024-10-30 |

Electrostatic Discharge Test

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | ESD Simulator | TESTQ | NSG437 | 329 | 2024-10-30 |

RF electromagnetic field Test

| Item | Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Signal Generator | Agilent | N5182A | MY47420195 | 2024-10-30 |
| 2 | Log-Bicon Antenna | Schwarzbeck | VULB9161 | 9128ES-128 | 2024-10-30 |
| 3 | Power Amplifier | AR | 150W1000M1 | 342526 | 2024-10-30 |
| 4 | Microwave Horn Antenna | AR | AT4002A | 322279 | 2024-10-30 |
| 5 | Power Amplifier | AR | 25S1G4A | 321116 | 2024-10-30 |

## 4. Measurement Uncertainty

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4.

| Test | Parameters | Expanded Uncertainty ($U_{Lab}$) | Expanded Uncertainty ($U_{Cispr}$) |
|---|---|---|---|
| Conducted Emission | Level Accuracy: 150kHz to 30MHz | ±1.22 dB | ±3.6 dB |
| Radiated Emission | Level Accuracy: 30MHz to 1000 MHz | ±3.67 dB | ±5.2 dB |
| Radiated Emission | Level Accuracy: Above 1000MHz | ±4.79 dB | N/A |

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

# 5. Emission

## 5.1. Conducted Emission

### 5.1.1. Limit

Requirements for conducted emissions from the AC mains power ports of Class A equipment

| Frequency range MHz | Coupling device | Detector type / bandwidth | Class A limits dB(μV) |
|---|---|---|---|
| 0,15 to 0,5 | AMN | Quasi Peak / 9 kHz | 79 |
| 0,5 to 30 | | | 73 |
| 0,15 to 0,5 | | Average / 9 kHz | 66 |
| 0,5 to 30 | | | 60 |

Requirements for conducted emissions from the AC mains power ports of Class B equipment

| Frequency range MHz | Coupling device | Detector type / bandwidth | Class B limits dB(μV) |
|---|---|---|---|
| 0,15 to 0,5 | AMN | Quasi Peak / 9 kHz | 66 to 56 |
| 0,5 to 5 | | | 56 |
| 5 to 30 | | | 60 |
| 0,15 to 0,5 | | Average / 9 kHz | 56 to 46 |
| 0,5 to 5 | | | 46 |
| 5 to 30 | | | 50 |

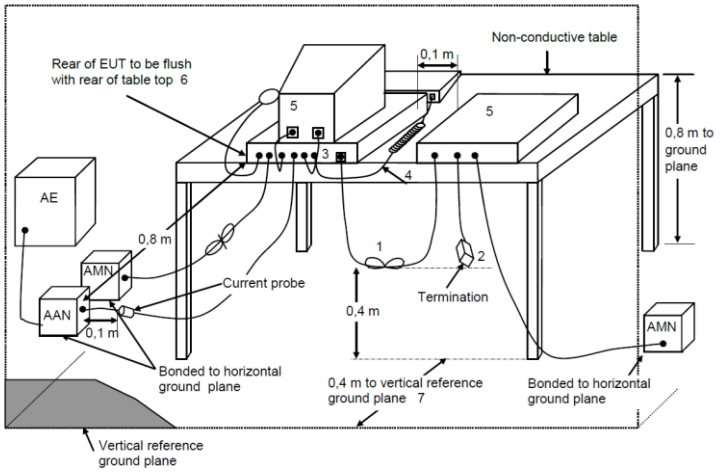
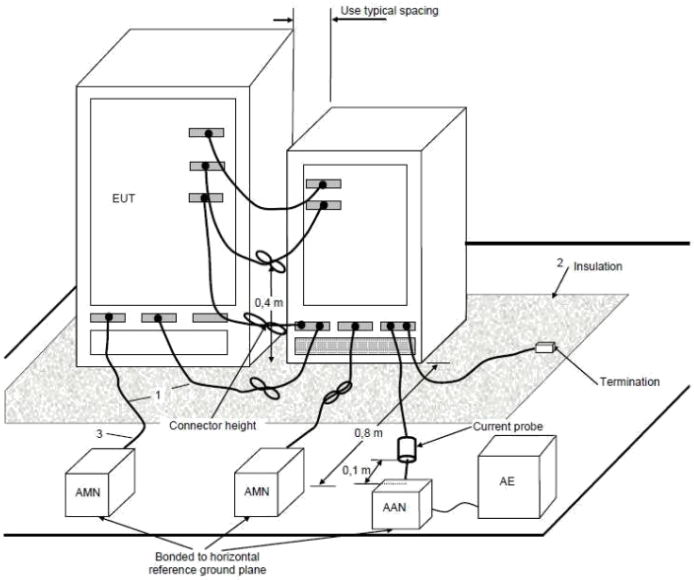
Requirements for asymmetric mode conducted emissions from Class A equipment

| Frequency range MHz | Coupling device | Detector type / bandwidth | Class A limits dB(μV) |
|---|---|---|---|
| 0,15 to 0,5 | AAN | Quasi Peak / 9 kHz | 97 to 87 |
| 0,5 to 30 | | | 87 |
| 0,15 to 0,5 | | Average / 9 kHz | 84 to 74 |
| 0,5 to 30 | | | 74 |

Requirements for asymmetric mode conducted emissions from Class B equipment

| Frequency range MHz | Coupling device | Detector type / bandwidth | Class B limits dB(μV) |
|---|---|---|---|
| 0,15 to 0,5 | AAN | Quasi Peak / 9 kHz | 84 to 74 |
| 0,5 to 30 | | | 74 |
| 0,15 to 0,5 | | Average / 9 kHz | 74 to 64 |
| 0,5 to 30 | | | 64 |

### 5.1.2. Test Setup

| For table-top equipment | For floor standing equipment |
|---|---|
|  |  |



### 5.1.3. Test Procedure

Measurement was performed in shielded room, and instruments used were followed CISPR 16-2-1 clause7.

Detailed test procedure was following clause 7 of CISPR 16-2-1.

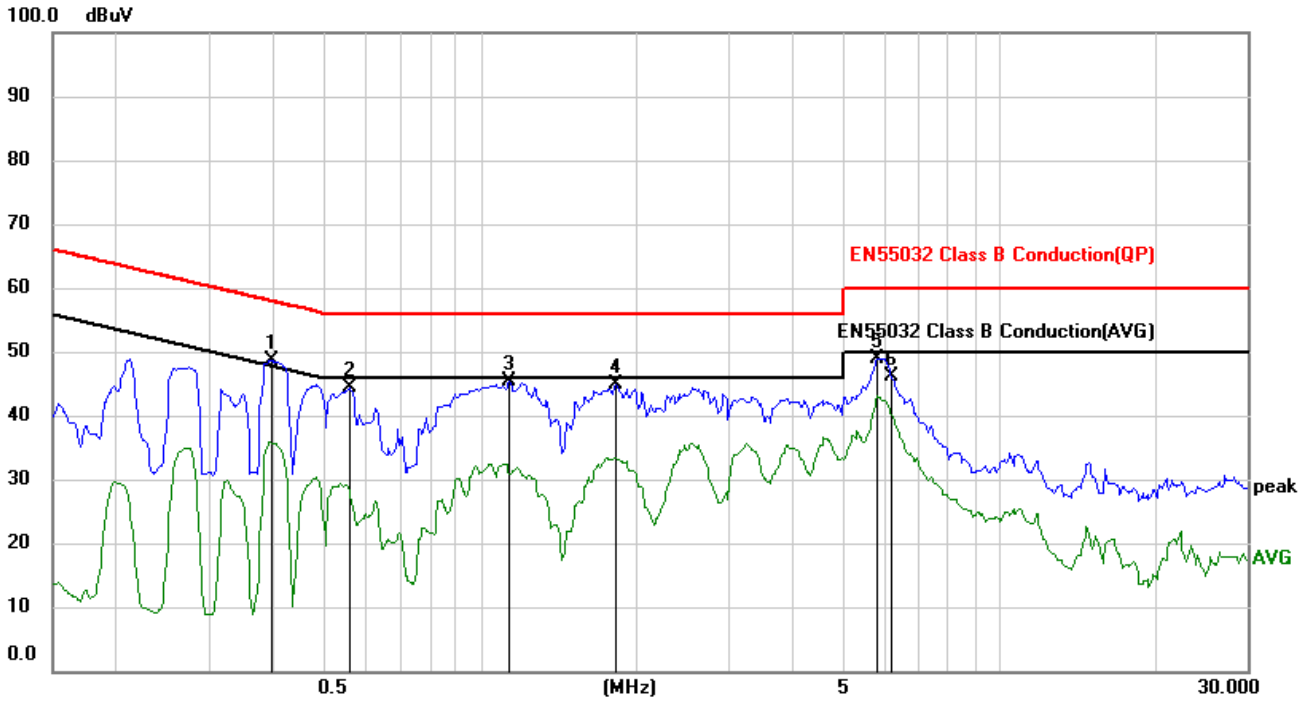
Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

### 5.1.4. Test Results

**PASS**

Please refer to the following page.

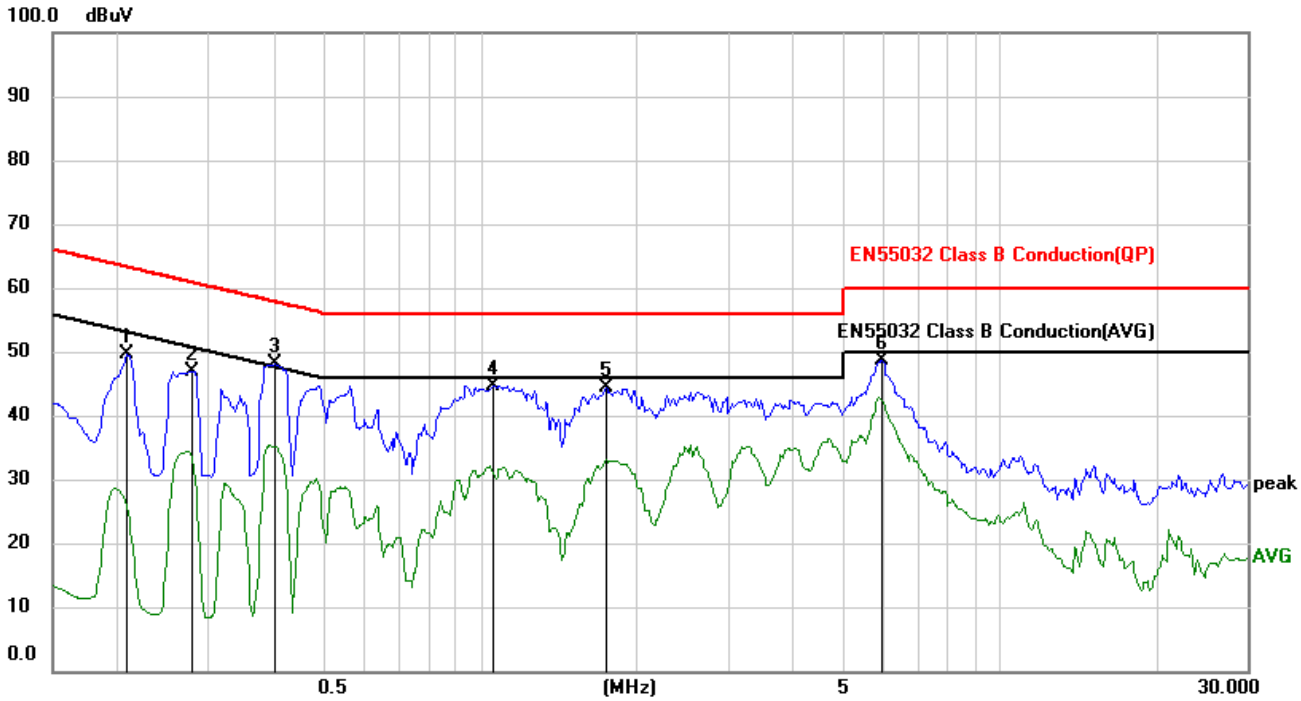
Phase: L




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.3957 | 38.16 | 10.43 | 48.59 | 57.94 | -9.35 | peak |
| 2 | | 0.5595 | 33.74 | 10.54 | 44.28 | 56.00 | -11.72 | peak |
| 3 | | 1.1406 | 34.41 | 10.89 | 45.30 | 56.00 | -10.70 | peak |
| 4 | | 1.8192 | 33.97 | 10.84 | 44.81 | 56.00 | -11.19 | peak |
| 5 | | 5.8158 | 37.77 | 11.21 | 48.98 | 60.00 | -11.02 | peak |
| 6 | | 6.1860 | 34.73 | 11.28 | 46.01 | 60.00 | -13.99 | peak |

Note: Result=Reading+Factor
Over Limit=Result-Limit

Phase: N




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | | 0.2085 | 39.40 | 10.20 | 49.60 | 63.26 | -13.66 | peak |
| 2 | | 0.2787 | 36.66 | 10.24 | 46.90 | 60.85 | -13.95 | peak |
| 3 | * | 0.4035 | 37.73 | 10.30 | 48.03 | 57.78 | -9.75 | peak |
| 4 | | 1.0587 | 33.85 | 10.80 | 44.65 | 56.00 | -11.35 | peak |
| 5 | | 1.7451 | 33.64 | 10.82 | 44.46 | 56.00 | -11.54 | peak |
| 6 | | 5.9367 | 37.70 | 10.91 | 48.61 | 60.00 | -11.39 | peak |

Note: Result=Reading+Factor
Over Limit=Result-Limit

## 5.2. Radiated emissions

### 5.2.1. Limit

Requirements for radiated emissions at frequencies up to 1 GHz for class A equipment

| Frequency range MHz | Measurement | | | Class B limits dB(μV/m) |
|---|---|---|---|---|
| | Facility | Distance m | Detector type / bandwidth | |
| 30 to 230 | SAC | 3 | Quasi Peak / 120 kHz | 50 |
| 230 to 1 000 | | | | 57 |

Requirements for radiated emissions at frequencies above 1 GHz for class A equipment

| Frequency range MHz | Measurement | | | Class B limits dB(μV/m) |
|---|---|---|---|---|
| | Facility | Distance m | Detector type / bandwidth | |
| 1 000 to 3 000 | FSOATS | 3 | Average / 1MHz | 56 |
| 3 000 to 6 000 | | | | 60 |
| 1 000 to 3 000 | | 3 | Average / 1MHz | 76 |
| 3 000 to 6 000 | | | | 80 |

Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment

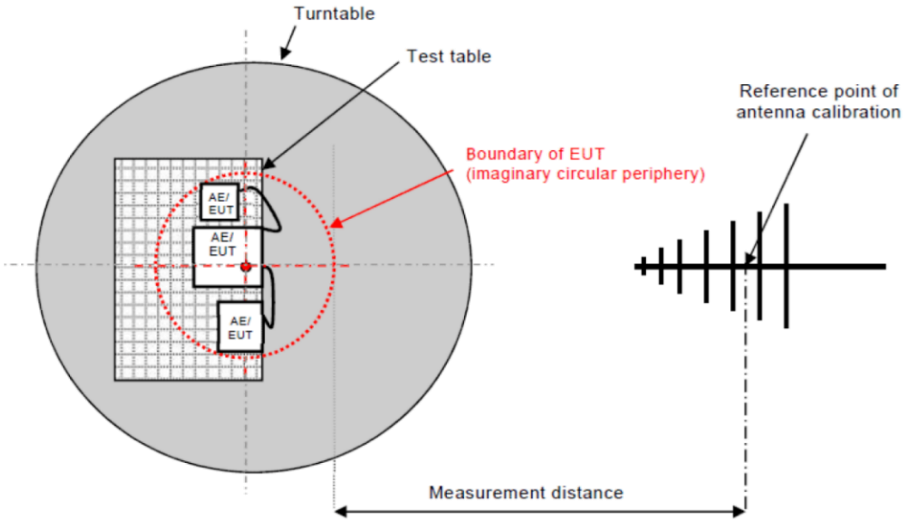
| Frequency range MHz | Measurement | | | Class B limits dB(μV/m) |
|---|---|---|---|---|
| | Facility | Distance m | Detector type / bandwidth | |
| 30 to 230 | SAC | 3 | Quasi Peak / 120 kHz | 40 |
| 230 to 1 000 | | | | 47 |

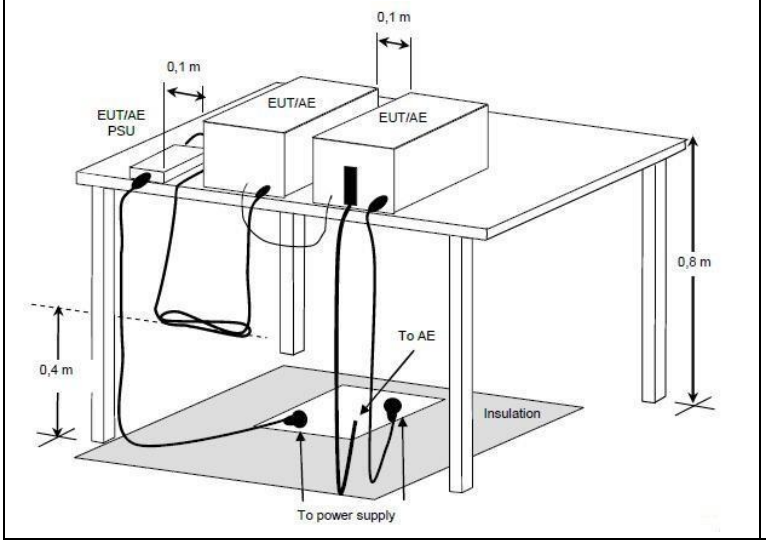
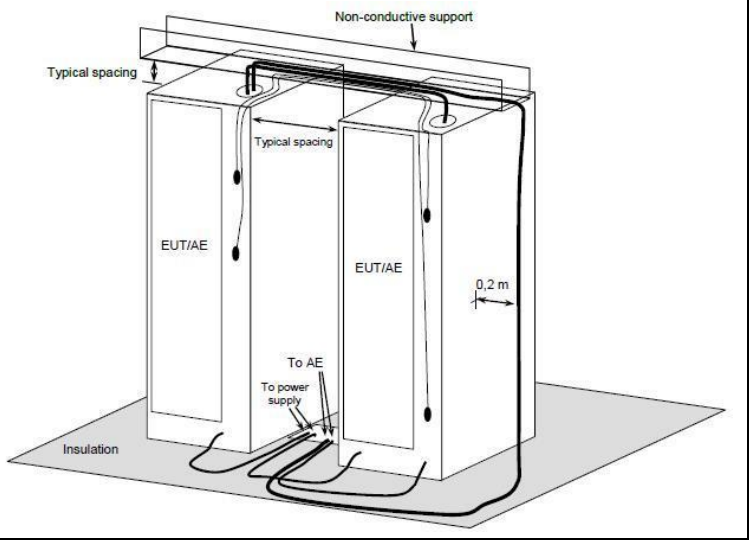
Requirements for radiated emissions at frequencies above 1 GHz for class B equipment

| Frequency range MHz | Measurement | | | Class B limits dB(μV/m) |
|---|---|---|---|---|
| | Facility | Distance m | Detector type / bandwidth | |
| 1 000 to 3 000 | FSOATS | 3 | Average / 1MHz | 50 |
| 3 000 to 6 000 | | | | 54 |
| 1 000 to 3 000 | | 3 | Average / 1MHz | 70 |
| 3 000 to 6 000 | | | | 74 |

## 5.2.2. Block Diagram of Test Setup

Measurement distance




| For table-top equipment | For floor standing equipment |
|---|---|
|  |  |





## 5.2.3. Test Procedure

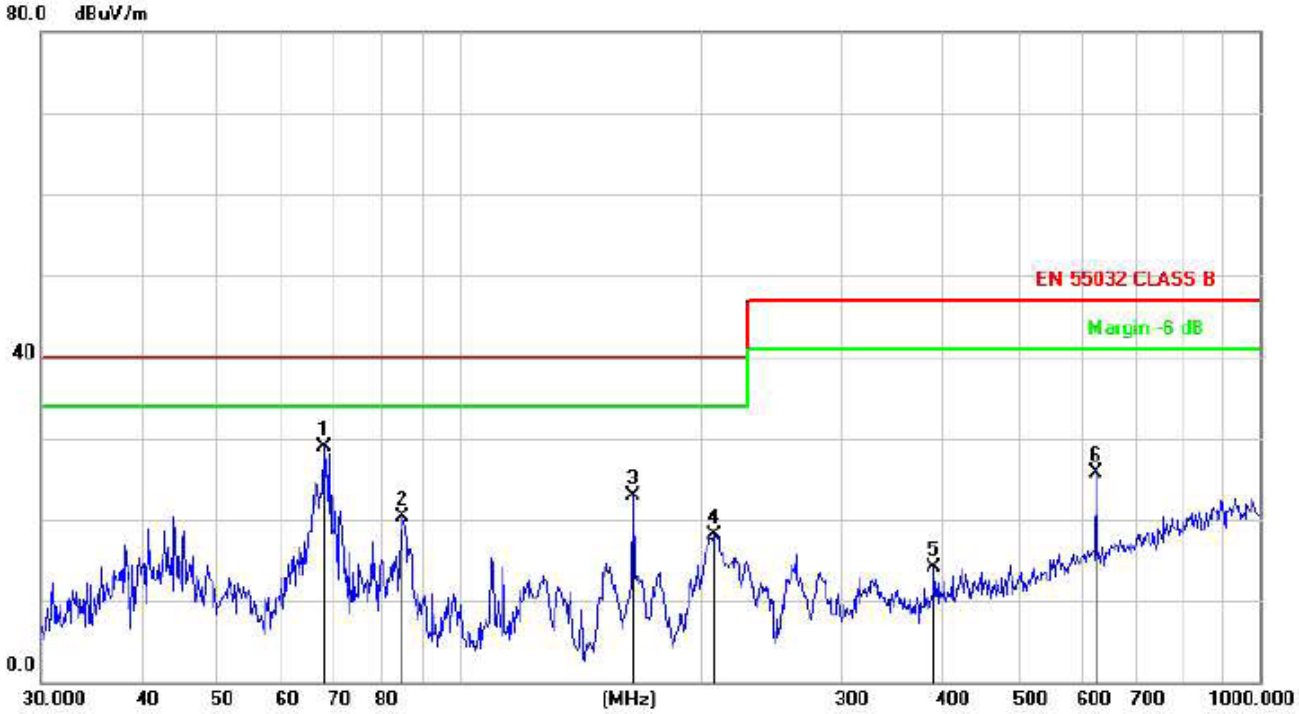
The measurement was performed in a semi-anechoic chamber.
The distance from EUT to receiving antenna is 3 meters.
Measurement was performed according to clause 7.3 of CISPR 16-2-3.

## 5.2.4. Test Results

**PASS**

Please refer to the following page.

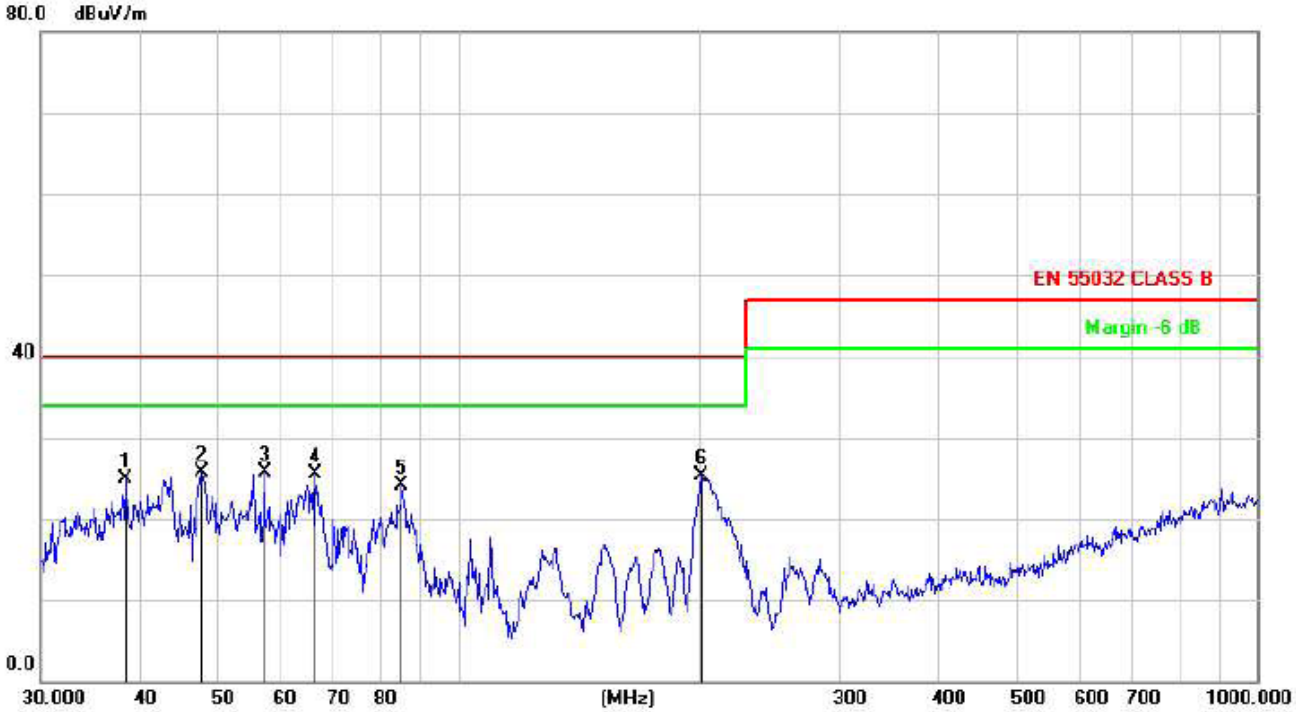
Polarization: H




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | * | 67.6751 | 48.45 | -19.54 | 28.91 | 40.00 | -11.09 | peak |
| 2 | | 84.9995 | 42.35 | -21.96 | 20.39 | 40.00 | -19.61 | peak |
| 3 | | 164.9075 | 41.20 | -18.31 | 22.89 | 40.00 | -17.11 | peak |
| 4 | | 207.8501 | 38.59 | -20.53 | 18.06 | 40.00 | -21.94 | peak |
| 5 | | 392.0951 | 29.60 | -15.43 | 14.17 | 47.00 | -32.83 | peak |
| 6 | | 625.0780 | 35.73 | -10.10 | 25.63 | 47.00 | -21.37 | peak |

Note: Result=Reading+Factor
Over Limit=Result-Limit

Polarization: V




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 38.3462 | 42.51 | -17.65 | 24.86 | 40.00 | -15.14 | peak |
| 2 | | 47.8260 | 42.99 | -17.29 | 25.70 | 40.00 | -14.30 | peak |
| 3 | * | 57.1914 | 43.59 | -17.87 | 25.72 | 40.00 | -14.28 | peak |
| 4 | | 66.2662 | 44.81 | -19.28 | 25.53 | 40.00 | -14.47 | peak |
| 5 | | 84.9995 | 46.14 | -21.96 | 24.18 | 40.00 | -15.82 | peak |
| 6 | | 201.3930 | 46.13 | -20.91 | 25.22 | 40.00 | -14.78 | peak |

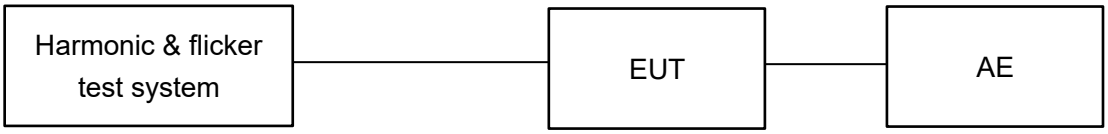
Note: Result=Reading+Factor
Over Limit=Result-Limit

## 5.3. Harmonic current emissions

### 5.3.1. Test Specifications

| | | |
|---|---|---|
| Basic Standard(s) | : | EN IEC 61000-3-2:2019+A1:2021 |
| Measurement Equipment requirement | : | IEC 61000-4-7 |
| Measured Harmonics | : | 1 - 40 |
| Equipment Class | : | ☒ A ☐ B ☐ C ☐ D |
| Limits | : | ☒ Clause 7.2 & Table 1<br>☐ Clause 7.3 & Table 1<br>☐ Clause 7.5 & Table 3 |

### 5.3.2. Test Setup




### 5.3.3. Test Procedure

Harmonics of the fundamental current were measured up to 40 order harmonics using a digital power meter with an analogue output and frequency analyzer which was integrated in the harmonic & flicker test system. The measurements were carried out under steady conditions.

☒ Active input power > 25 W

☐ Active input power ≤ 25 W

### 5.3.4. Test Results

**PASS**

Please refer to the following page.

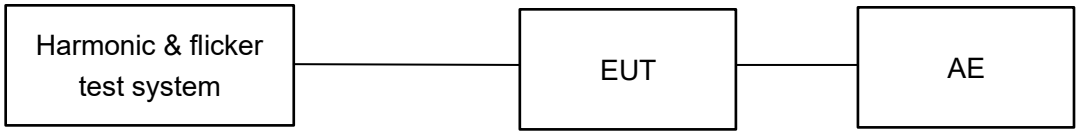
| | | | | | | |
|---|---|---|---|---|---|---|
| Fundamental : | | 373.1 | | | | |
| 2 : | 1080.0 | 1.6 | 0.1 | 3.6 | 0.3 | Pass |
| 3 : | 2300.0 | 352.6 | 15.3 | 354.6 | 15.4 | Pass |
| 4 : | 430.0 | 1.8 | 0.4 | 3.4 | 0.8 | Pass |
| 5 : | 1140.0 | 323.6 | 28.4 | 324.7 | 28.5 | Pass |
| 6 : | 300.0 | 2.0 | 0.7 | 3.0 | 1.0 | Pass |
| 7 : | 770.0 | 283.7 | 36.8 | 284.1 | 36.9 | Pass |
| 8 : | 230.0 | 2.0 | 0.9 | 2.6 | 1.1 | Pass |
| 9 : | 400.0 | 236.4 | 59.1 | 237.1 | 59.3 | Pass |
| 10 : | 184.0 | 1.9 | 1.0 | 2.4 | 1.3 | Pass |
| 11 : | 330.0 | 186.2 | 56.4 | 187.5 | 56.8 | Pass |
| 12 : | 153.3 | 1.8 | 1.2 | 2.1 | 1.4 | Pass |
| 13 : | 210.0 | 137.3 | 65.4 | 139.2 | 66.3 | Pass |
| 14 : | 131.4 | 1.5 | 1.1 | 1.8 | 1.4 | Pass |
| 15 : | 150.0 | 94.1 | 62.7 | 96.1 | 64.1 | Pass |
| 16 : | 115.0 | 1.2 | 1.0 | 1.6 | 1.4 | Pass |
| 17 : | 132.3 | 60.7 | 45.9 | 62.3 | 47.1 | Pass |
| 18 : | 102.2 | 1.0 | 1.0 | 1.4 | 1.4 | Pass |
| 19 : | 118.4 | 41.1 | 34.7 | 41.8 | 35.3 | Pass |
| 20 : | 92.0 | 0.8 | 0.9 | 1.3 | 1.4 | Pass |
| 21 : | 107.1 | 35.4 | 33.1 | 35.7 | 33.3 | Pass |
| 22 : | 83.6 | 0.7 | 0.8 | 1.1 | 1.3 | Pass |
| 23 : | 97.8 | 35.3 | 36.1 | 35.7 | 36.5 | Pass |
| 24 : | 76.7 | 0.6 | 0.8 | 1.0 | 1.3 | Pass |
| 25 : | 90.0 | 33.4 | 37.1 | 33.5 | 37.2 | Pass |
| 26 : | 70.8 | 0.6 | 0.8 | 0.9 | 1.3 | Pass |
| 27 : | 83.3 | 28.2 | 33.9 | 28.5 | 34.2 | Pass |
| 28 : | 65.7 | 0.6 | 0.9 | 0.8 | 1.2 | Pass |
| 29 : | 77.6 | 20.9 | 26.9 | 21.4 | 27.6 | Pass |
| 30 : | 61.3 | 0.5 | 0.8 | 0.6 | 1.0 | Pass |
| 31 : | 72.6 | 13.3 | 18.3 | 13.9 | 19.1 | Pass |
| 32 : | 57.5 | 0.4 | 0.7 | 0.5 | 0.9 | Pass |
| 33 : | 68.2 | 8.4 | 12.3 | 8.6 | 12.6 | Pass |
| 34 : | 54.1 | 0.3 | 0.6 | 0.5 | 0.9 | Pass |
| 35 : | 64.3 | 8.4 | 13.1 | 8.9 | 13.8 | Pass |
| 36 : | 51.1 | 0.3 | 0.6 | 0.5 | 1.0 | Pass |
| 37 : | 60.8 | 9.9 | 16.3 | 10.3 | 16.9 | Pass |
| 38 : | 48.4 | 0.3 | 0.6 | 0.5 | 1.0 | Pass |
| 39 : | 57.7 | 10.1 | 17.5 | 10.2 | 17.7 | Pass |
| 40 : | 46.0 | 0.3 | 0.7 | 0.4 | 0.9 | Pass |
| 21 - 39 : | 251.4 | 73.2 | 29.1 | 73.6 | 29.3 | - |

## 5.4. Voltage changes, voltage fluctuations and flicker

### 5.4.1. Test Specifications

| | | |
|---|---|---|
| Basic Standard(s) | : | EN 61000-3-3:2013+A2:2021 |
| Measurement Equipment requirement | : | IEC 61000-4-15 |
| Limits | : | Clause 5 |

### 5.4.2. Test Setup




#### 4.4.2.1. Definition

Flicker: impression of unsteadiness of visual sensation induced by a lighting stimulus whose luminance or spectral distribution fluctuates with time.

$P_{st}$: Short-term flicker indicator the flicker severity evaluated over a short period (in minutes);

$P_{st}$=1 is the conventional threshold of irritability

$P_{lt}$: long-term flicker indicator; the flicker severity evaluated over a long period (a few hours) using successive $P_{st}$ values.

dc: the relative steady-state voltage change

$d_{max}$: the maximum relative voltage change

d(t): the value during a voltage change

#### 4.4.2.2. Test Procedure

The following limits apply

-- "$P_{lt}$" shall not exceed 0.65.

-- "$P_{st}$" shall not exceed 1.0.

-- "dc" shall not exceed 3.3%.

-- "d(t)" shall not exceed 3.3% for more than 500ms.

-- "$d_{max}$" shall not exceed:

☐ 4% without additional conditions,

☐ 6% switched manually or automatically more than twice per day,

☐ 7% attended whilst in use or switched automatically for no more than twice per day or attended while in use.

☐ For manual switch, dmax is measured in accordance with Annex B of standard, average dmax is calculated from 24 times measurement.

☒ The EUT is unlikely to produce significant voltage fluctuations or flicker by technical analysis and evaluation. So it is deemed to fulfil the requirements without testing.

5.4.3. Test Results

**N/A**

# 6. Immunity

**Performance criteria**

Performance criterion **A**
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 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.

Performance criterion **B**
After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena 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.
During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. 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.

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. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

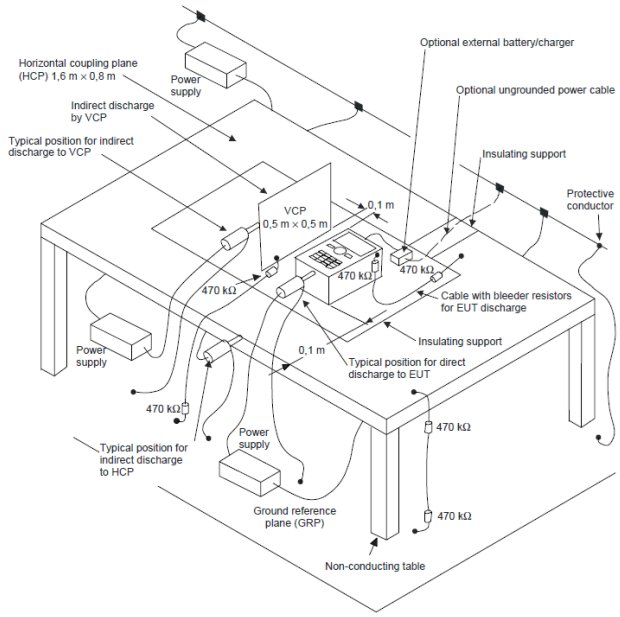
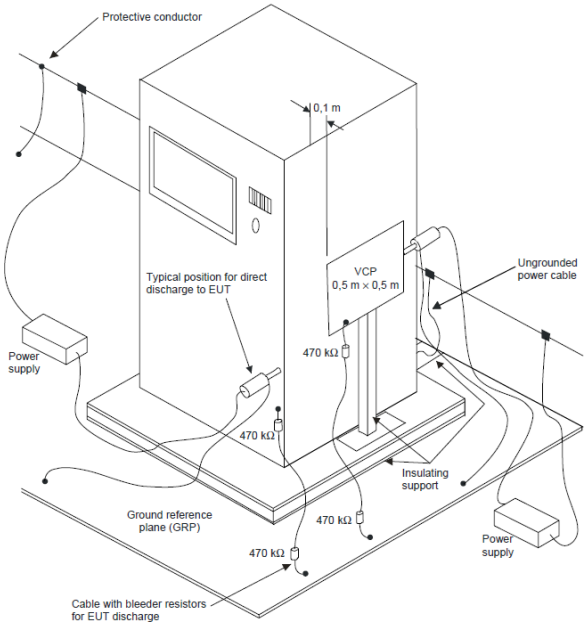
## 6.1. Electrostatic discharge

### 6.1.1. Test Levels and Performance Criterion

| Characteristics | Test levels |
|---|---|
| Air discharge | ±8 kV |
| Contact discharge | ±4 kV |

Performance criterion: **B**

### 6.1.2. Test Setup

| For table-top equipment | For floor standing equipment |
|---|---|
|  |  |



### 6.1.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-2 clause 8.
The test method and equipment were specified by EN 61000-4-2.

### 6.1.4. Test Results

**PASS**

Please refer to the following page.

| No. | Location of discharge | Polarity | Discharge | Number of discharges | Test level kV | Result |
|---|---|---|---|---|---|---|
| 1 | HCP top side | P&N | C | 25 | 4 | PASS |
| 3 | HCP bottom side | P&N | C | 25 | 4 | PASS |
| 5 | VCP right side | P&N | C | 25 | 4 | PASS |
| 7 | VCP left side | P&N | C | 25 | 4 | PASS |
| 9 | Points on conductive surface | P&N | C | 25 | 4 | PASS |
| 10 | Points on non-conductive surface | P&N | A | 10 | 8 | PASS |
| HCP = Horizontal coupling plate VCP = Vertical coupling plate N = Negative P = Positive<br>A = Air discharge C = Contact discharge | | | | | | |

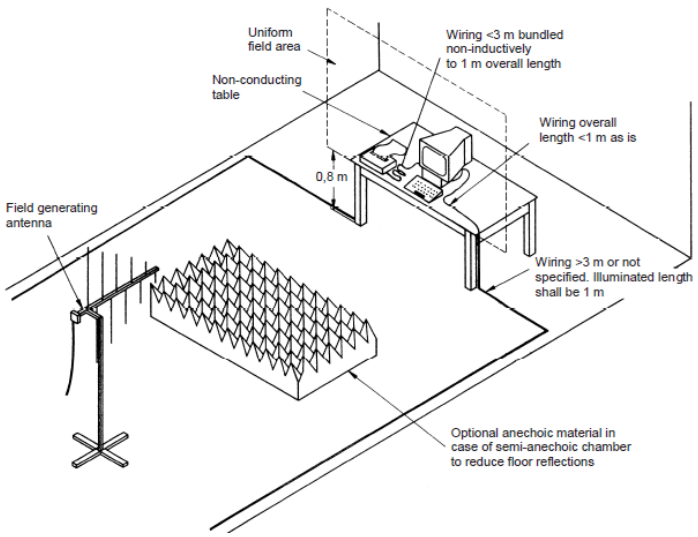
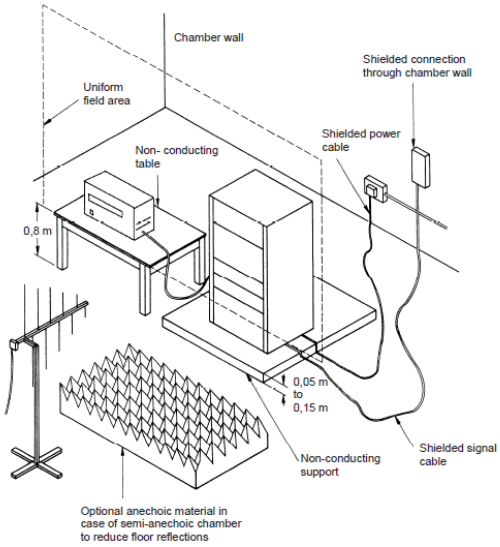
## 6.2. Radio-frequency electromagnetic field

### 6.2.1. Test Levels and Performance Criterion

| Characteristics | Test levels |
|---|---|
| Frequency range | 80 MHz to 1 000 MHz |
| Test level | 3 V/m (unmodulated) |
| Modulation | 1 kHz, 80 % AM, sine wave |

Performance criterion: **A**

### 6.2.2. Test Setup

| For table-top equipment | For floor standing equipment |
|---|---|
|  |  |

### 6.2.3. Test Procedure

Measurement was performed in full-anechoic chamber.
Measurement procedure was applied according to EN 61000-4-3 clause 8.
The test method and equipment was specified by EN 61000-4-3.

### 6.2.4. Test Results

**PASS**

| Enclosure | Horizontal | Vertical |
|---|---|---|
| Front | PASS | PASS |
| Right Side | PASS | PASS |
| Left Side | PASS | PASS |
| Rear | PASS | PASS |

## 6.3. Fast transients

### 6.3.1. Test Levels and Performance Criterion

Test levels at ports for signal and control lines

| Characteristics | Test levels |
|---|---|
| Test level | ±0.5 kV (peak) |
| Rise time/hold time | 5/50 ns |
| Repetition frequency | 5 kHz |
| **NOTE 1** Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3 m.<br>**NOTE 2** Change of state commands are not applied during the test. | |

Test levels at input and output d.c. power ports

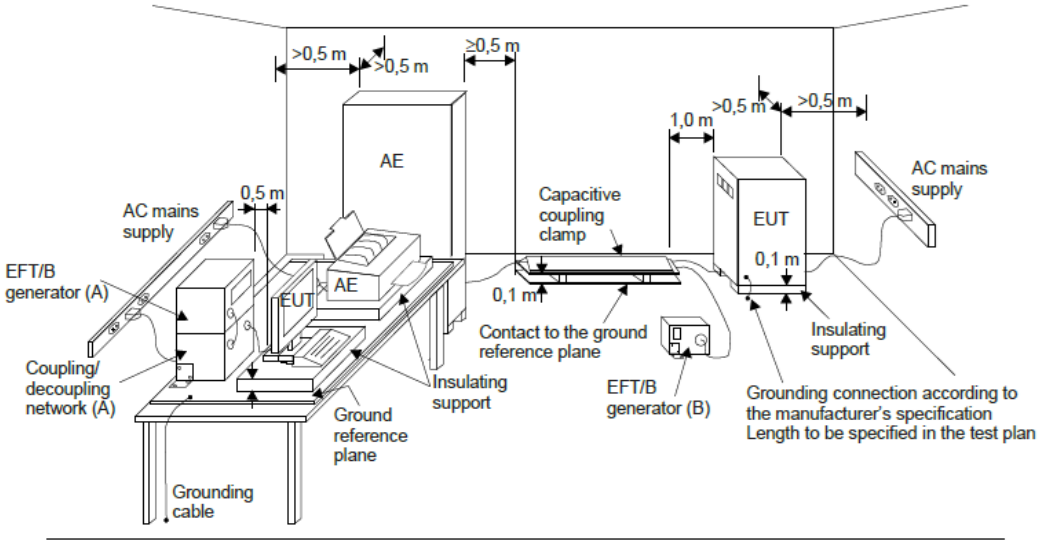
| Characteristics | Test levels |
|---|---|
| Test level | ±0.5 kV (peak) |
| Rise time/hold time | 5/50 ns |
| Repetition frequency | 5 kHz |
| **NOTE** Not applicable to equipment not connected to the mains while in use. | |

Test levels at input and output a.c. power ports

| Characteristics | Test levels |
|---|---|
| Test level | ±1 kV (peak) |
| Rise time/hold time | 5/50 ns |
| Repetition frequency | 5 kHz |

Performance criterion: **B**

### 6.3.2. Test Setup




### 6.3.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-4 clause 8.
The test method and equipment was specified by EN 61000-4-4.

### 6.3.4. Test Results

**PASS**

| Location | Level (kV) | Polarity (P/N) | Result |
|---|---|---|---|
| AC power ports | 1 | P/N | Pass |
| DC power ports | 0,5 | P/N | N/A |
| Signal and control lines | 0,5 | P/N | N/A |

## 6.4. Injected currents (radio-frequency common mode)

### 6.4.1. Test Levels and Performance Criterion

Test levels at ports for signal and control lines

| Characteristics | Test levels |
|---|---|
| Frequency range | 0.15 MHz to 80 MHz |
| Test level | 3 V r.m.s. (unmodulated) |
| Modulation | 1 kHz, 80 % AM, sine wave |
| Source impedance | 150 Ω |
| **NOTE** Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3 m. | |

Test levels at input and output d.c. power ports

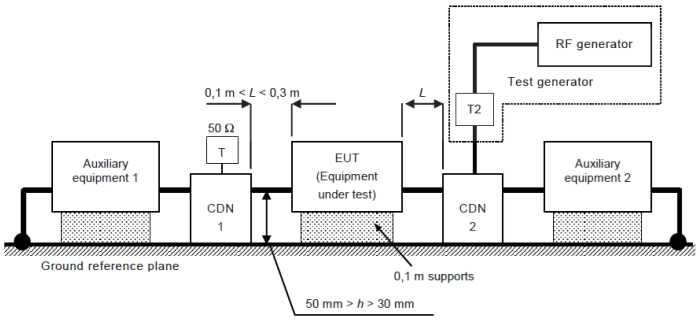
| Characteristics | Test levels |
|---|---|
| Frequency range | 0.15 MHz to 80 MHz |
| Test level | 3 V r.m.s. (unmodulated) |
| Modulation | 1 kHz, 80 % AM, sine wave |
| Source impedance | 150 Ω |
| **NOTE** Only applicable to equipment that is connected to the mains while in use. | |

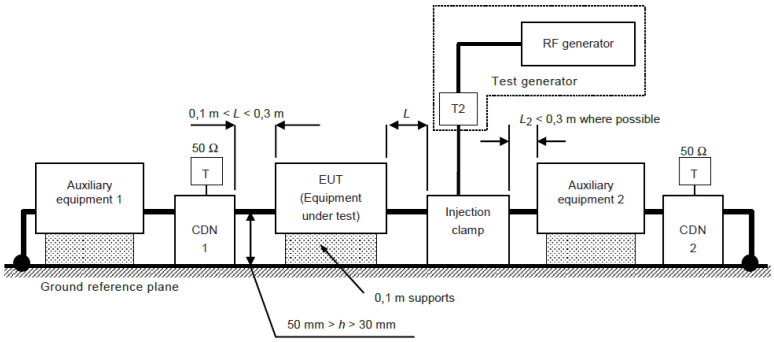
Test levels at input and output a.c. power ports

| Characteristics | Test levels |
|---|---|
| Frequency range | 0.15 MHz to 80 MHz |
| Test level | 3 V r.m.s. (unmodulated) |
| Modulation | 1 kHz, 80 % AM, sine wave |
| Source impedance | 150 Ω |
| **NOTE** Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3 m. | |

Performance criterion: **A**

## 6.4.2. Test Setup




## 6.4.3. Test Procedure

Measurement procedure was applied according to EN 61000-4-6 clause 8.
The test method and equipment was specified by EN 61000-4-6.

## 6.4.4. Test Results

**PASS**

| Injected point | Frequency (MHz) | Level (e.m.f) | Modulation | Result |
|---|---|---|---|---|
| AC power ports | 0.15 to 80 | 3V | 80%, 1 kHz, AM | PASS |
| DC power ports | 0.15 to 80 | 3V | 80%, 1 kHz, AM | N/A |
| Signal and control lines | 0.15 to 80 | 3V | 80%, 1 kHz, AM | N/A |

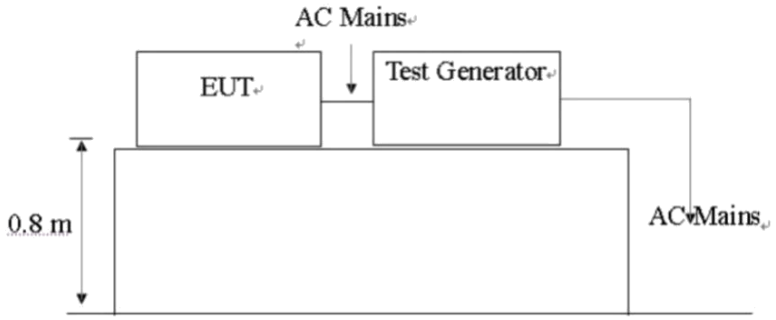
## 6.5. Surges

### 6.5.1. Test Levels and Performance Criterion

| Characteristics | | Test levels | | |
|---|---|---|---|---|
| | | Device | | |
| | | Self-ballasted lamps and semi-luminaires | Luminaires and independent auxiliaries | |
| | | | Input power | |
| | | | ≤25 W | >25 W |
| Wave-shape data | | 1.2/50 μs | 1.2/50 μs | 1.2/50 μs |
| Test levels | line to line | ±0.5 kV | ±0.5 kV | ±1.0 kV |
| | line to ground | ±1.0 kV | ±1.0 kV | ±2.0 kV |
| **NOTE** In addition to the specified test level, all lower test levels as detailed in IEC 61000-4-5 should also be satisfied. | | | | |

Performance criterion: **B**

### 6.5.2. Test Setup




### 6.5.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-5 clause 8.
The test method and equipment was specified by EN 61000-4-5.

### 6.5.4. Test Results

**PASS**

Please refer to the following page.

| Location | Level(kV) | Polarity(P/N) | Result |
|---|---|---|---|
| Luminaires and independent auxiliaries >25 W (line to line) | 1 | P/N | Pass |
| Luminaires and independent auxiliaries >25 W (line to ground) | 2 | P/N | N/A |
| Luminaires and independent auxiliaries ≤25 W (line to line) | 0,5 | P/N | N/A |
| Luminaires and independent auxiliaries ≤25 W (line to ground) | 1.0 | P/N | N/A |
| Self-ballasted lamps and semi-luminaires (line to line) | 0,5 | P/N | N/A |
| Self-ballasted lamps and semi-luminaires (line to ground) | 1.0 | P/N | N/A |

## 6.6. Voltage dips and Short interruptions

### 6.6.1. Test Levels and Performance Criterion

Voltage dips – Test levels at input a.c. power ports

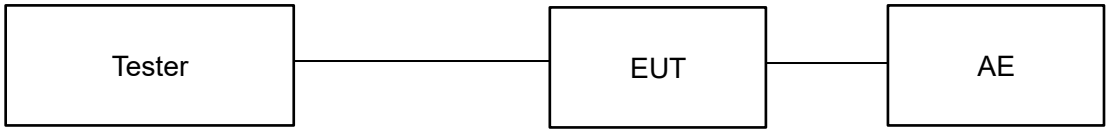
| Characteristics | Test levels |
|---|---|
| Test voltage level | 70 % |
| Number of periods | 10 |

Voltage short interruptions – Test levels at input a.c. power ports

| Characteristics | Test levels |
|---|---|
| Test voltage level | 0 % |
| Number of periods | 0.5 |

Performance criterion: **C & B**

### 6.6.2. Test Setup




### 6.6.3. Test Procedure

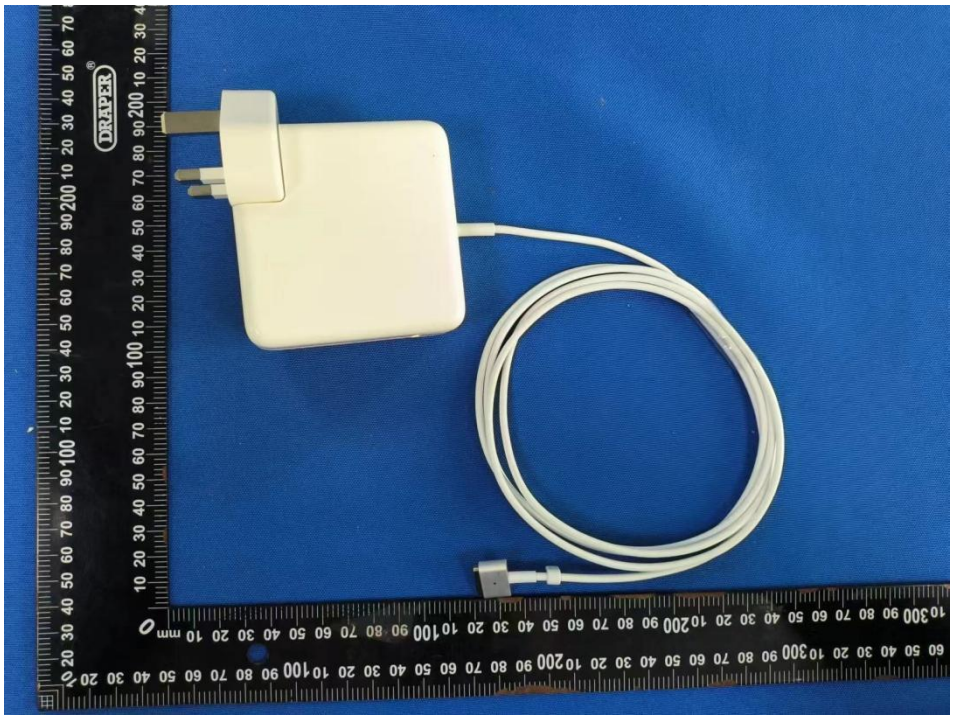
Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-11 clause 8.
The test method and equipment was specified by EN 61000-4-11.

### 6.6.4. Test Results

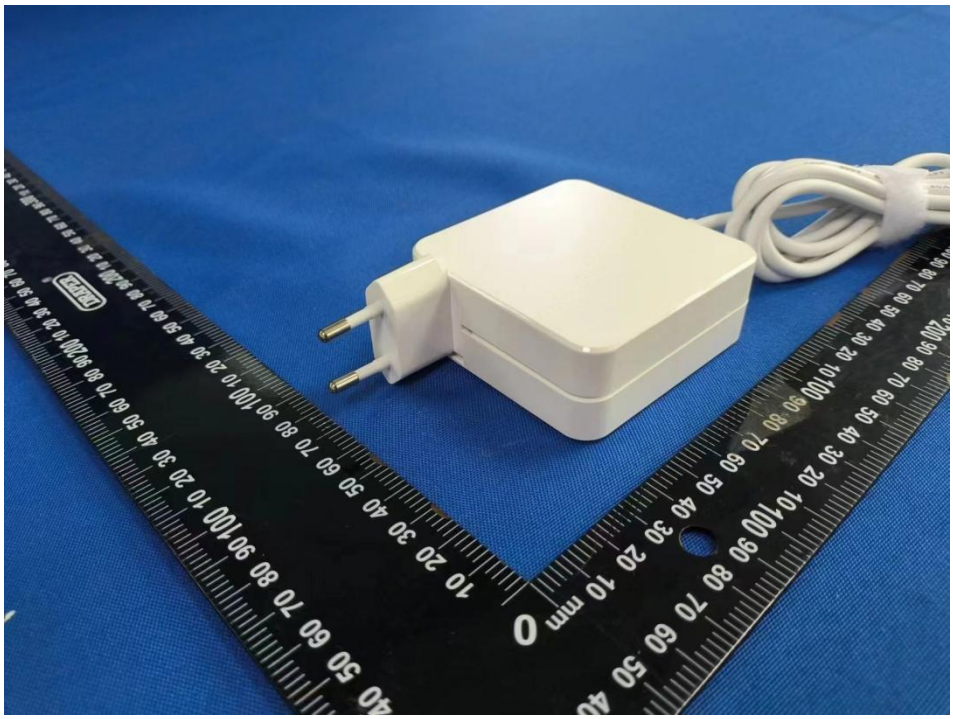
**PASS**

| Test level $\%U_T$ | Voltage dips & short interruptions $\%U_T$ | Duration [Cycles] | Result |
|---|---|---|---|
| 70 | 30 | 10 | Pass |
| 0 | 100 | 0.5 | Pass |
| **Remark:** $U_T$ is the rated voltage for the equipment. | | | |

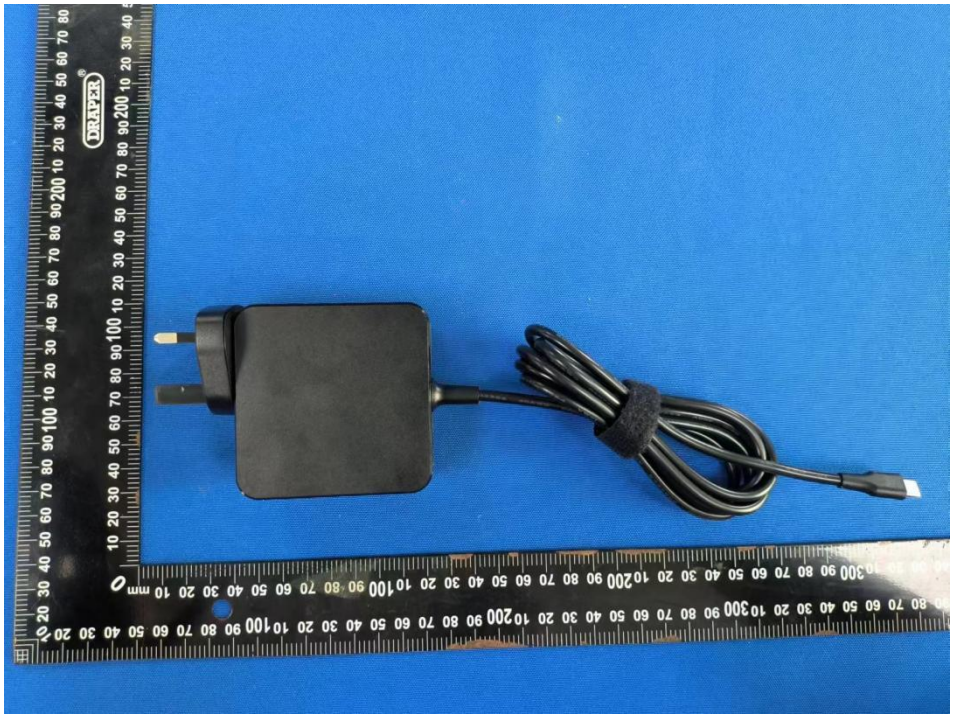
# 7. Photographs of EUT

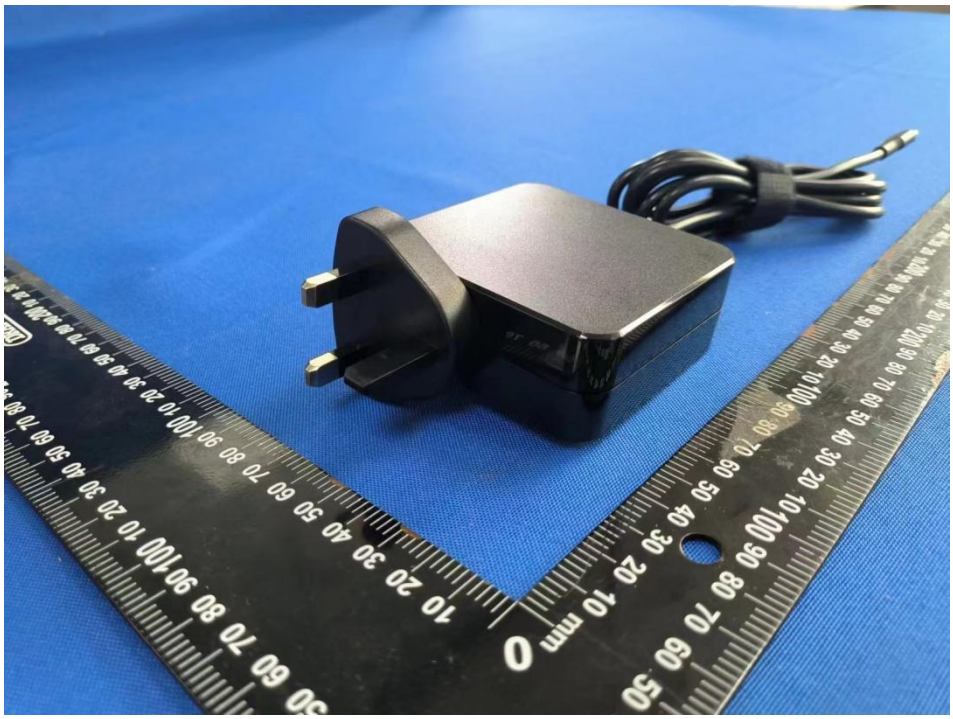
| Photographs of EUT |
| --- |
|  |
| AF200425 |
|  |
| AE85 |

**Photographs of EUT - AE100-B**



**Photographs of EUT - AE100-B**





**------ End of Report ------**