# TEST REPORT
## IEC 62368-1
## Audio/video, information and communication technology equipment
## Part 1: Safety requirements

| | |
|---|---|
| **Report Number.....:** | LCS200910024AS |
| Date of issue.....: | 2020-09-20 |
| Total number of pages.....: | 62 |
| **Applicant's name.....:** | Shenzhen Cudy Technology Co., Ltd. |
| Address.....: | Room A606, Gaoxinqi Industrial Park, Liuxianyi Road, Baoan 67 District, Shenzhen, China |
| **Test specification:** | |
| Standard .....: | IEC 62368-1: 2014(Second Edition) |
| Test procedure.....: | Type test |
| Non-standard test method .....: | N/A |
| **Test Report Form No. ..... :** | IEC62368_1B |
| Test Report Form(s) Originator .....: | UL(US) |
| Master TRF.....: | 2014-03 |



**General disclaimer:**

The test results presented in this report relate only to the object tested.

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| | | |
|---|---|---|
| Test Item description .....: | AX3000 Wi-Fi 6 Bluetooth 5.0 PCIe Adapter | |
| Trade Mark .....: | Cudy | |
| Manufacturer.....: | Same as applicant | |
| Model/Type reference .....: | WE3000S, WE3000, WE3500, WE3600, WE4000, WE3700, WE3800, WE3900 | |
| Ratings .....: | Input: 3.3V⎓0.8A | |
| | | |
| Testing procedure and testing location: | | |
| ☒ **Testing Laboratory:** | Shenzhen LCS Compliance Testing Laboratory Ltd. | |
| **Testing location/ address .....:** | Room 101, 201 Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, Guangdong, China | |
| **Tested by.....:** | Suker Dai / Project Handler | Suker Dai. |
| **Checked by.....:** | Olivia Yang / Reviewer | Olivia Yang |
| **Approved by.....:** | Hart Qiu / Technical Director | LCS TESTING LABORATORY APPROVED |


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**List of Attachments (including a total number of pages in each attachment):**

Attachment No. 1: EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES.

Attachment No. 2: Photo documentation.

**Summary of testing:**

The submitted samples were found to comply with the requirements of:

**Electrical safety**

- IEC 62368-1: 2014ED2
- EN 62368-1:2014
- EN 62368-1:2014/A11: 2017

**Testing location:**

Shenzhen LCS Compliance Testing Laboratory Ltd.

Room 101, 201 Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, Guangdong, China

**Summary of compliance with National Differences:**

**List of countries addressed:** National Differences and Group Differences. refer Attachment No. 1 for details.

☒ The product fulfils the requirements of EN 62368-1:2014+A11: 2017.

**Copy of marking plate(s):**

The artwork below may be only a draft.

**Cudy**

**AX3000 Wi-Fi 6 Bluetooth 5.0 PCIe Adapter**
**Model: WE3000S**
**Input: 3.3V⎓0.8A**
**Importer: XXXX**
**Address: XXXX**

**Shenzhen Cudy Technology Co., Ltd.**
**Room A606, Gaoxinqi Industrial Park, Liuxianyi Road, Baoan 67 District, Shenzhen, China**

**Made in China**

Remark: The height dimension of CE mark should not less than 5mm, the height dimension of WEEE symbol should not less than 7mm.



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| **TEST ITEM PARTICULARS:** | |
|---|---|
| Classification of use ……..: | ☐ Ordinary person<br>☒ Instructed person<br>☒ Skilled person<br>☐ Children likely to be present |
| Supply Connection……..: | ☐ AC Mains ☐ DC Mains<br>☒ External Circuit - not Mains connected<br>- ☒ ES1 ☐ ES2 ☐ ES3 |
| Supply % Tolerance……...: | ☐ +10%/-10%<br>☐ +20%/-15%<br>☐ +____%/ -_____%<br>☒ None |
| Supply Connection – Type……..…...: | ☐ pluggable equipment type A -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ direct plug-in<br>☐ mating connector<br>☐ pluggable equipment type B -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ permanent connection<br>☐ mating connector<br>☒ other: not directly connected to mains. |
| Considered current rating of protective device as part of building or equipment installation…..: | N/A<br>Installation location: ☐ building; ☐ equipment |
| Equipment mobility……: | ☐ movable ☐ hand-held ☐ transportable<br>☐ stationary ☒ for building-in ☐ direct plug-in<br>☐ rack-mounting ☐ wall-mounted |
| Over voltage category (OVC) ……: | ☐ OVC I ☐ OVC II ☐ OVC III<br>☐ OVC IV ☒ other: Not directly connected to mains |
| Class of equipment……: | ☐ Class I ☐ Class II ☒ Class III |
| Access location……..: | ☐ restricted access location ☒ N/A |
| Pollution degree (PD)……: | ☐ PD 1 ☒ PD 2 ☐ PD 3 |
| Manufacturer's specified maximum operating ambient……: | 45°C |
| IP protection class……..…..: | ☒ IPX0 ☐ IP__ |
| Power Systems……...: | ☐ TN ☐ TT ☐ IT - 230 V $_{L-L}$ |
| Altitude during operation (m)……...: | ☒ 2000 m or less ☐ _____ m |
| Altitude of test laboratory (m)……..: | ☒ 500 m or less ☐ _____ m |
| Mass of equipment (kg)……: | ☒ Approx. 0.052kg |



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| | |
|---|---|
| **POSSIBLE TEST CASE VERDICTS:** | |
| - test case does not apply to the test object……..: | N/A |
| - test object does meet the requirement……: | P (Pass) |
| - test object does not meet the requirement……: | F (Fail) |
| **TESTING:** | |
| Date of receipt of test item……...: | 2020-09-10 |
| Date (s) of performance of tests……..: | 2020-09-10 to 2020-09-20 |
| | |
| **GENERAL REMARKS:** | |
| **"(See Enclosure #)" refers to additional information appended to the report.**<br>**"(See appended table)" refers to a table appended to the report.**<br>**Throughout this report a ☐ comma / ☒ point is used as the decimal separator.** | |
| **Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:** | |
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... | ☐ **Yes**<br>☒ **Not applicable** |
| **When differences exist; they shall be identified in the General product information section.** | |
| **Name and address of factory (ies)……:** | Same as manufacturer |
| **GENERAL PRODUCT INFORMATION:** | |
| 1. The EUT is a AX3000 Wi-Fi 6 Bluetooth 5.0 PCIe Adapter, class III equipment.<br>2. The maximum ambient temperature is 45°C.<br>3. All models in the report are identical except appearance and model name, all test on the model WE3000S. | |


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| ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE: | |
|---|---|
| (Note 1: Identify the following six (6) energy source forms based on the origin of the energy.)<br>(Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3. | |
| **Electrically-caused injury (Clause 5):**<br>(Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification)<br>Example: +5 V dc input ES1 | |
| **Source of electrical energy** | **Corresponding classification (ES)** |
| 3.3Vdc input | ES1 |
| All internal circuits | ES1 |
| **Electrically-caused fire (Clause 6):**<br>(Note: List sub-assembly or circuit designation and corresponding energy source classification)<br>Example: Battery pack (maximum 85 watts): PS2 | |
| **Source of power or PIS** | **Corresponding classification (PS)** |
| Internal circuits | PS1 |
| **Injury caused by hazardous substances (Clause 7)**<br>(Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.)<br>Example: Liquid in filled component Glycol | |
| **Source of hazardous substances** | **Corresponding chemical** |
| N/A | None |
| **Mechanically-caused injury (Clause 8)**<br>(Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.)<br>Example: Wall mount unit MS2 | |
| **Source of kinetic/mechanical energy** | **Corresponding classification (MS)** |
| Mass of the unit | MS1 |
| **Thermal burn injury (Clause 9)**<br>(Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.)<br>Example: Hand-held scanner – thermoplastic enclosure TS1 | |
| **Source of thermal energy** | **Corresponding classification (TS)** |
| Enclosure | TS1 |
| **Radiation (Clause 10)**<br>(Note: List the types of radiation present in the product and the corresponding energy source classification.)<br>Example: DVD – Class 1 Laser Product RS1 | |
| **Type of radiation** | **Corresponding classification (RS)** |
| LED indicator light | RS1 |


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| ENERGY SOURCE DIAGRAM |
| --- |
| Indicate which energy sources are included in the energy source diagram. Insert diagram below |
| ☒ ES ☒ PS ☒ MS ☒ TS ☒ RS |



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| OVERVIEW OF EMPLOYED SAFEGUARDS | | | | |
|---|---|---|---|---|
| **Clause** | **Possible Hazard** | | | |
| 5.1 | Electrically-caused injury | | | |
| Body Part (e.g. Ordinary) | Energy Source (ES3: Primary Filter circuit) | Safeguards | | |
| | | Basic | Supplementary | Reinforced (Enclosure) |
| Ordinary | ES1: 3.3VDC input | N/A | N/A | N/A |
| Ordinary | ES1: All internal circuits | N/A | N/A | N/A |
| 6.1 | Electrically-caused fire | | | |
| Material part (e.g. mouse enclosure) | Energy Source | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| All combustible materials within equipment fire enclosure. | PS1: All Internal circuits inside the equipment enclosure | Equipment safeguard (e.g., no ignition occurs; no parts exceeding 90% of its spontaneous ignition temperature) | Equipment safeguard (e.g., control of fire spread; PCB is complied with V-0 material; All other components at least V-2 except for mounted on min. V-1 material or small parts of combustible material) | N/A |
| 7.1 | Injury caused by hazardous substances | | | |
| Body Part (e.g., skilled) | Energy Source (hazardous material) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| N/A | N/A | N/A | N/A | N/A |
| 8.1 | Mechanically-caused injury | | | |
| Body Part (e.g. Ordinary) | Energy Source (MS3:High Pressure Lamp) | Safeguards | | |
| | | Basic | Supplementary | Reinforced (Enclosure) |
| Ordinary | MS1: Mass＜7kg | N/A | N/A | N/A |
| 9.1 | Thermal Burn | | | |
| Body Part | Energy Source | Safeguards | | |


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| | | | | |
|---|---|---|---|---|
| (e.g., Ordinary) | (TS2) | Basic | Supplementary | Reinforced |
| Ordinary | TS1: Enclosure | N/A | N/A | N/A |
| Ordinary | TS1: Internal parts / circuits | N/A | N/A | N/A |
| 10.1 | Radiation | | | |
| Body Part (e.g., Ordinary) | Energy Source (Output from audio port) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| Ordinary | LED indicator light | N/A | N/A | N/A |
| Supplementary Information:<br>(1) See attached energy source diagram for additional details.<br>(2) “N” – Normal Condition; “A” – Abnormal Condition; “S” Single Fault | | | | |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **4** | **GENERAL REQUIREMENTS** | | P |
| 4.1.1 | Acceptance of materials, components and subassemblies | See appended table 4.1.2 | P |
| 4.1.2 | Use of components | Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. See also Annex G | P |
| 4.1.3 | Equipment design and construction | Evaluation of safeguards regarding limiting the outputs to fulfill ES1, and protection in regard to risk of ignition, mechanical-caused injury and thermal burn considered. | P |
| 4.1.15 | Markings and instructions.....: | (See Annex F) | P |
| 4.4.4 | Safeguard robustness | | N/A |
| 4.4.4.2 | Steady force tests.....: | | N/A |
| 4.4.4.3 | Drop tests.....: | | N/A |
| 4.4.4.4 | Impact tests.....: | | N/A |
| 4.4.4.5 | Internal accessible safeguard enclosure and barrier tests.....: | | N/A |
| 4.4.4.6 | Glass Impact tests.....: | No such glass used. | N/A |
| 4.4.4.7 | Thermoplastic material tests.....: | | N/A |
| 4.4.4.8 | Air comprising a safeguard.....: | | N/A |
| 4.4.4.9 | Accessibility and safeguard effectiveness | | N/A |
| 4.5 | Explosion | No explosion occurs during normal/abnormal operation and single fault conditions. | N/A |
| 4.6 | Fixing of conductors | | N/A |
| 4.6.1 | Fix conductors not to defeat a safeguard | | N/A |
| 4.6.2 | 10 N force test applied to .....: | | N/A |
| 4.7 | Equipment for direct insertion into mains socket - outlets | | N/A |
| 4.7.2 | Mains plug part complies with the relevant standard.....: | | N/A |
| 4.7.3 | Torque (Nm).....: | | N/A |
| 4.8 | Products containing coin/button cell batteries | No coin/button cell batteries | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | | used. | |
| 4.8.2 | Instructional safeguard | | N/A |
| 4.8.3 | Battery Compartment Construction | | N/A |
| | Means to reduce the possibility of children removing the battery.....: | | |
| 4.8.4 | Battery Compartment Mechanical Tests .....: | | N/A |
| 4.8.5 | Battery Accessibility | | N/A |
| 4.9 | Likelihood of fire or shock due to entry of conductive object.....: | No likelihood of conductive object entrying into enclosure. | P |
| **5** | **ELECTRICALLY-CAUSED INJURY** | | P |
| 5.2.1 | Electrical energy source classifications.....: | (See appended table 5.2) | P |
| 5.2.2 | ES1, ES2 and ES3 limits | ES1 | P |
| 5.2.2.2 | Steady-state voltage and current.....: | (See appended table 5.2) | P |
| 5.2.2.3 | Capacitance limits.....: | | N/A |
| 5.2.2.4 | Single pulse limits .....: | No such single pulses generated in the EUT or applied to it. | N/A |
| 5.2.2.5 | Limits for repetitive pulses .....: | No such repetitive pulses within the EUT | N/A |
| 5.2.2.6 | Ringing signals .....: | No such ringing signals within the EUT | N/A |
| 5.2.2.7 | Audio signals .....: | | N/A |
| 5.3 | Protection against electrical energy sources | ES1 circuit | N/A |
| 5.3.1 | General Requirements for accessible parts to ordinary, instructed and skilled persons | | N/A |
| 5.3.2.1 | Accessibility to electrical energy sources and safeguards | ES1 circuit can be accessed for this product. | N/A |
| 5.3.2.2 | Contact requirements | | N/A |
| | a) Test with test probe from Annex V.....: | | N/A |
| | b) Electric strength test potential (V) .....: | | N/A |
| | c) Air gap (mm) .....: | | N/A |
| 5.3.2.4 | Terminals for connecting stripped wire | No stripped wire used. | N/A |
| 5.4 | Insulation materials and requirements | | P |
| 5.4.1.2 | Properties of insulating material | | N/A |
| 5.4.1.3 | Humidity conditioning .....: | No hygroscopic material used. | N/A |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.1.4 | Maximum operating temperature for insulating materials .....: | (See appended table 5.4.1.4) | P |
| 5.4.1.5 | Pollution degree .....: | 2 | |
| 5.4.1.5.2 | Test for pollution degree 1 environment and for an insulating compound | Pollution degree 2 is applied. No insulating compound applied (however see 5.5.4). | N/A |
| 5.4.1.5.3 | Thermal cycling | See above | N/A |
| 5.4.1.6 | Insulation in transformers with varying dimensions | No such transformer. | N/A |
| 5.4.1.7 | Insulation in circuits generating starting pulses | No such starting pulses. | N/A |
| 5.4.1.8 | Determination of working voltage | | N/A |
| 5.4.1.9 | Insulating surfaces | | N/A |
| 5.4.1.10 | Thermoplastic parts on which conductive metallic parts are directly mounted | | N/A |
| 5.4.1.10.2 | Vicat softening temperature.....: | | N/A |
| 5.4.1.10.3 | Ball pressure .....: | | N/A |
| 5.4.2 | Clearances | | N/A |
| 5.4.2.2 | Determining clearance using peak working voltage | | N/A |
| 5.4.2.3 | Determining clearance using required withstand voltage .....: | | N/A |
| | a) a.c. mains transient voltage .....: | | — |
| | b) d.c. mains transient voltage .....: | Not d.c. mains. | — |
| | c) external circuit transient voltage.....: | No such transient | — |
| | d) transient voltage determined by measurement : | | — |
| 5.4.2.4 | Determining the adequacy of a clearance using an electric strength test | | N/A |
| 5.4.2.5 | Multiplication factors for clearances and test voltages .....: | | N/A |
| 5.4.3 | Creepage distances .....: | | N/A |
| 5.4.3.1 | General | | N/A |
| 5.4.3.3 | Material Group .....: | IIIa & IIIb | |
| 5.4.4 | Solid insulation | See below | N/A |
| 5.4.4.2 | Minimum distance through insulation .....: | | N/A |
| 5.4.4.3 | Insulation compound forming solid insulation | No such insulation applied. | N/A |
| 5.4.4.4 | Solid insulation in semiconductor devices | No such devices. | N/A |
| 5.4.4.5 | Cemented joints | | N/A |


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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.4.6 | Thin sheet material | | N/A |
| 5.4.4.6.1 | General requirements | | N/A |
| 5.4.4.6.2 | Separable thin sheet material | | N/A |
| | Number of layers (pcs) .....: | | N/A |
| 5.4.4.6.3 | Non-separable thin sheet material | No such insulation used within the EUT | N/A |
| 5.4.4.6.4 | Standard test procedure for non-separable thin sheet material .....: | | N/A |
| 5.4.4.6.5 | Mandrel test | | N/A |
| 5.4.4.7 | Solid insulation in wound components | | N/A |
| 5.4.4.9 | Solid insulation at frequencies >30 kHz .....: | | N/A |
| 5.4.5 | Antenna terminal insulation | No antenna terminal used. | N/A |
| 5.4.5.1 | General | | N/A |
| 5.4.5.2 | Voltage surge test | | N/A |
| | Insulation resistance (MΩ).....: | | N/A |
| 5.4.6 | Insulation of internal wire as part of supplementary safeguard .....: | No such insulation of internal wire as part of supplementary safeguard. | N/A |
| 5.4.7 | Tests for semiconductor components and for cemented joints | No tests necessary –see only 5.4.4.4. | N/A |
| 5.4.8 | Humidity conditioning | | N/A |
| | Relative humidity (%).....: | | — |
| | Temperature (°C) .....: | | — |
| | Duration (h) .....: | | — |
| 5.4.9 | Electric strength test .....: | | N/A |
| 5.4.9.1 | Test procedure for a solid insulation type test | | N/A |
| 5.4.9.2 | Test procedure for routine tests | | N/A |
| 5.4.10 | Protection against transient voltages between external circuit | No such external circuits. | N/A |
| 5.4.10.1 | Parts and circuits separated from external circuits | | N/A |
| 5.4.10.2 | Test methods | | N/A |
| 5.4.10.2.1 | General | | N/A |
| 5.4.10.2.2 | Impulse test .....: | | N/A |
| 5.4.10.2.3 | Steady-state test.....: | | N/A |


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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.11 | Insulation between external circuits and earthed circuitry .....: | No such external circuit. | N/A |
| 5.4.11.1 | Exceptions to separation between external circuits and earth | | N/A |
| 5.4.11.2 | Requirements | | N/A |
| | Rated operating voltage $U_{op}$ (V).....: | | — |
| | Nominal voltage $U_{peak}$ (V).....: | | — |
| | Max increase due to variation $U_{sp}$ .....: | | — |
| | Max increase due to ageing $\Delta U_{sa}$ .....: | | — |
| | $U_{op}= U_{peak} + \Delta U_{sp} + \Delta U_{sa}$ .....: | | — |
| 5.5 | Components as safeguards | | |
| 5.5.1 | General | | N/A |
| 5.5.2 | Capacitors and RC units | | N/A |
| 5.5.2.1 | General requirement | | N/A |
| 5.5.2.2 | Safeguards against capacitor discharge after disconnection of a connector.....: | | N/A |
| 5.5.3 | Transformers | No such component provided. | N/A |
| 5.5.4 | Optocouplers | No such component provided. | N/A |
| 5.5.5 | Relays | No such component provided. | N/A |
| 5.5.6 | Resistors | No such component provided. | N/A |
| 5.5.7 | SPD's | No such component provided. | N/A |
| 5.5.7.1 | Use of an SPD connected to reliable earthing | Class III equipment. | N/A |
| 5.5.7.2 | Use of an SPD between mains and protective earth | Class III equipment. | N/A |
| 5.5.8 | Insulation between the mains and external circuit consisting of a coaxial cable.....: | No such external circuits. | N/A |
| 5.6 | Protective conductor | | N/A |
| 5.6.2 | Requirement for protective conductors | Class III apparatus | N/A |
| 5.6.2.1 | General requirements | | N/A |
| 5.6.2.2 | Colour of insulation | | N/A |
| 5.6.3 | Requirement for protective earthing conductors | | N/A |
| | Protective earthing conductor size ($mm^2$) ..... : | | |
| 5.6.4 | Requirement for protective bonding conductors | | N/A |
| 5.6.4.1 | Protective bonding conductors | | N/A |


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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Protective bonding conductor size ($mm^2$). ..... : | | |
| | Protective current rating (A) ..... : | | |
| 5.6.4.3 | Current limiting and overcurrent protective devices | | N/A |
| 5.6.5 | Terminals for protective conductors | | N/A |
| 5.6.5.1 | Requirement | | N/A |
| | Conductor size ($mm^2$), nominal thread diameter (mm). ..... : | | N/A |
| 5.6.5.2 | Corrosion | | N/A |
| 5.6.6 | Resistance of the protective system | | N/A |
| 5.6.6.1 | Requirements | | N/A |
| 5.6.6.2 | Test Method Resistance..... : | | N/A |
| 5.6.7 | Reliable earthing | | N/A |
| 5.7 | Prospective touch voltage, touch current and protective conductor current | | N/A |
| 5.7.2 | Measuring devices and networks | | N/A |
| 5.7.2.1 | Measurement of touch current..... : | | N/A |
| 5.7.2.2 | Measurement of prospective touch voltage | | N/A |
| 5.7.3 | Equipment set-up, supply connections and earth connections | | N/A |
| | System of interconnected equipment (separate connections/single connection) ..... : | | — |
| | Multiple connections to mains (one connection at a time/simultaneous connections) ..... : | | — |
| 5.7.4 | Earthed conductive accessible parts..... : | | N/A |
| 5.7.5 | Protective conductor current | | N/A |
| | Supply Voltage (V)..... : | | — |
| | Measured current (mA)..... : | | — |
| | Instructional Safeguard..... : | | N/A |
| 5.7.6 | Prospective touch voltage and touch current due to external circuits | No external circuits. | N/A |
| 5.7.6.1 | Touch current from coaxial cables | | N/A |
| 5.7.6.2 | Prospective touch voltage and touch current from external circuits | | N/A |
| 5.7.7 | Summation of touch currents from external circuits | No external circuits. | N/A |


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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | a) Equipment with earthed external circuits Measured current (mA)..... : | | N/A |
| | b) Equipment whose external circuits are not referenced to earth. Measured current (mA) ..... : | | N/A |
| **6** | **ELECTRICALLY- CAUSED FIRE** | | P |
| 6.2 | Classification of power sources (PS) and potential ignition sources (PIS) | | P |
| 6.2.2 | Power source circuit classifications | | P |
| 6.2.2.1 | General | See the following details. | P |
| 6.2.2.2 | Power measurement for worst-case load fault ... : | (See appended table 6.2.2) | P |
| 6.2.2.3 | Power measurement for worst-case power source fault ..... : | (See appended table 6.2.2) | P |
| 6.2.2.4 | PS1 ..... : | | P |
| 6.2.2.5 | PS2 ..... : | | N/A |
| 6.2.2.6 | PS3 ..... : | | N/A |
| 6.2.3 | Classification of potential ignition sources | See the following details. | N/A |
| 6.2.3.1 | Arcing PIS ..... : | | N/A |
| 6.2.3.2 | Resistive PIS ..... : | | N/A |
| 6.3 | Safeguards against fire under normal operating and abnormal operating conditions | | N/A |
| 6.3.1 (a) | No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 C for unknown materials ..... : | | N/A |
| 6.3.1 (b) | Combustible materials outside fire enclosure | | N/A |
| 6.4 | Safeguards against fire under single fault conditions | | P |
| 6.4.1 | Safeguard Method | | N/A |
| 6.4.2 | Reduction of the likelihood of ignition under single fault conditions in PS1 circuits | | N/A |
| 6.4.3 | Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits | | N/A |
| 6.4.3.1 | General | | N/A |
| 6.4.3.2 | Supplementary Safeguards | | N/A |
| | Special conditions if conductors on printed boards are opened or peeled | | N/A |
| 6.4.3.3 | Single Fault Conditions ..... : | | N/A |
| | Special conditions for temperature limited by fuse | | N/A |
| 6.4.4 | Control of fire spread in PS1 circuits | | P |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4.5 | Control of fire spread in PS2 circuits | | N/A |
| 6.4.5.2 | Supplementary safeguards .....: | | N/A |
| 6.4.6 | Control of fire spread in PS3 circuit | No PS3 circuit | N/A |
| 6.4.7 | Separation of combustible materials from a PIS | | N/A |
| 6.4.7.1 | General .....: | | N/A |
| 6.4.7.2 | Separation by distance | | N/A |
| 6.4.7.3 | Separation by a fire barrier | | N/A |
| 6.4.8 | Fire enclosures and fire barriers | PS1 | N/A |
| 6.4.8.1 | Fire enclosure and fire barrier material properties | | N/A |
| 6.4.8.2.1 | Requirements for a fire barrier | | N/A |
| 6.4.8.2.2 | Requirements for a fire enclosure | | N/A |
| 6.4.8.3 | Constructional requirements for a fire enclosure and a fire barrier | | N/A |
| 6.4.8.3.1 | Fire enclosure and fire barrier openings | | N/A |
| 6.4.8.3.2 | Fire barrier dimensions | | N/A |
| 6.4.8.3.3 | Top Openings in Fire Enclosure: dimensions (mm) .....: | | N/A |
| | Needle Flame test | | N/A |
| 6.4.8.3.4 | Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) .....: | | N/A |
| | Flammability tests for the bottom of a fire enclosure .....: | | N/A |
| 6.4.8.3.5 | Integrity of the fire enclosure, condition met: a), b) or c) .....: | | N/A |
| 6.4.8.4 | Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating ..... : | | N/A |
| 6.5 | Internal and external wiring | | N/A |
| 6.5.1 | Requirements | | N/A |
| 6.5.2 | Cross-sectional area ($mm^2$) .....: | | |
| 6.5.3 | Requirements for interconnection to building wiring .....: | | N/A |
| 6.6 | Safeguards against fire due to connection to additional equipment | | P |
| | External port limited to PS2 or complies with Clause Q.1 | | N/A |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **7** | **INJURY CAUSED BY HAZARDOUS SUBSTANCES** | | N/A |
| 7.2 | Reduction of exposure to hazardous substances | No such hazardous substances | N/A |
| 7.3 | Ozone exposure | | N/A |
| 7.4 | Use of personal safeguards (PPE) | | N/A |
| | Personal safeguards and instructions ..... : | | |
| 7.5 | Use of instructional safeguards and instructions | | N/A |
| | Instructional safeguard (ISO 7010)..... : | | |
| 7.6 | Batteries.....: | | N/A |

| | | | |
|---|---|---|---|
| **8** | **MECHANICALLY-CAUSED INJURY** | | P |
| 8.1 | General | | P |
| 8.2 | Mechanical energy source classifications | MS1 | P |
| 8.3 | Safeguards against mechanical energy sources | | N/A |
| 8.4 | Safeguards against parts with sharp edges and corners | | P |
| 8.4.1 | Safeguards | | N/A |
| 8.5 | Safeguards against moving parts | No moving parts. | N/A |
| 8.5.1 | MS2 or MS3 part required to be accessible for the function of the equipment | | N/A |
| 8.5.2 | Instructional Safeguard..... : | | |
| 8.5.4 | Special categories of equipment comprising moving parts | | N/A |
| 8.5.4.1 | Large data storage equipment | | N/A |
| 8.5.4.2 | Equipment having electromechanical device for destruction of media | | N/A |
| 8.5.4.2.1 | Safeguards and Safety Interlocks ..... : | | N/A |
| 8.5.4.2.2 | Instructional safeguards against moving parts | | N/A |
| | Instructional Safeguard..... : | | |
| 8.5.4.2.3 | Disconnection from the supply | | N/A |
| 8.5.4.2.4 | Probe type and force (N) ..... : | | N/A |
| 8.5.5 | High Pressure Lamps | | N/A |
| 8.5.5.1 | Energy Source Classification | | N/A |
| 8.5.5.2 | High Pressure Lamp Explosion Test..... : | | N/A |



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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.6 | Stability | Classification MS1 according to table 35, line 5 and no stability requirements. | N/A |
| 8.6.1 | Product classification | | N/A |
| | Instructional Safeguard ..... : | | — |
| 8.6.2 | Static stability | | N/A |
| 8.6.2.2 | Static stability test | | N/A |
| | Applied Force .....: | | — |
| 8.6.2.3 | Downward Force Test | | N/A |
| 8.6.3 | Relocation stability test | | N/A |
| | Unit configuration during 10° tilt.....: | | — |
| 8.6.4 | Glass slide test | | N/A |
| 8.6.5 | Horizontal force test (Applied Force) .....: | | N/A |
| | Position of feet or movable parts .....: | | — |
| 8.7 | Equipment mounted to wall or ceiling | | N/A |
| 8.7.1 | Mounting Means (Length of screws (mm) and mounting surface) .....: | | N/A |
| 8.7.2 | Direction and applied force .....: | | N/A |
| 8.8 | Handles strength | | N/A |
| 8.8.1 | Classification | | N/A |
| 8.8.2 | Applied Force .....: | | N/A |
| 8.9 | Wheels or casters attachment requirements | | N/A |
| 8.9.1 | Classification | | N/A |
| 8.9.2 | Applied force .....: | | — |
| 8.10 | Carts, stands and similar carriers | | N/A |
| 8.10.1 | General | | N/A |
| 8.10.2 | Marking and instructions | | N/A |
| | Instructional Safeguard .....: | | — |
| 8.10.3 | Cart, stand or carrier loading test and compliance | | N/A |
| | Applied force .....: | | — |
| 8.10.4 | Cart, stand or carrier impact test | | N/A |
| 8.10.5 | Mechanical stability | | N/A |
| | Applied horizontal force (N) .....: | | — |
| 8.10.6 | Thermoplastic temperature stability (°C) .....: | | N/A |



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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.11 | Mounting means for rack mounted equipment | | N/A |
| 8.11.1 | General | | N/A |
| 8.11.2 | Product Classification | | N/A |
| 8.11.3 | Mechanical strength test, variable *N* ..... : | | N/A |
| 8.11.4 | Mechanical strength test 250N, including end stops | | N/A |
| 8.12 | Telescoping or rod antennas ..... | No such parts. | N/A |
| | Button/Ball diameter (mm) ..... : | | — |
| **9** | **THERMAL BURN INJURY** | | P |
| 9.2 | Thermal energy source classifications | TS1 | P |
| 9.3 | Safeguard against thermal energy sources | | P |
| 9.4 | Requirements for safeguards | | P |
| 9.4.1 | Equipment safeguard | | P |
| 9.4.2 | Instructional safeguard .....: | | N/A |
| **10** | **RADIATION** | | P |
| 10.2 | Radiation energy source classification | RS1 | P |
| 10.2.1 | General classification | | P |
| 10.3 | Protection against laser radiation | | N/A |
| | Laser radiation that exists equipment: | | — |
| | Normal, abnormal, single-fault.....: | | N/A |
| | Instructional safeguard .....: | | — |
| | Tool.....: | | — |
| 10.4 | Protection against visible, infrared, and UV radiation | | P |
| 10.4.1 | General | | P |
| 10.4.1.a) | RS3 for Ordinary and instructed persons…….: | | N/A |
| 10.4.1.b) | RS3 accessible to a skilled person ..... .: | | N/A |
| | Personal safeguard (PPE) instructional safeguard .....: | | — |
| 10.4.1.c) | Equipment visible, IR, UV does not exceed RS1: | LED as indicator only | P |
| 10.4.1.d) | Normal, abnormal, single-fault conditions ..... : | | N/A |
| 10.4.1.e) | Enclosure material employed as safeguard is opaque…… | | N/A |


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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | : | | |
| 10.4.1.f) | UV attenuation……..: | | N/A |
| 10.4.1.g) | Materials resistant to degradation UV ..... : | | N/A |
| 10.4.1.h) | Enclosure containment of optical radiation……..: | | N/A |
| 10.4.1.i) | Exempt Group under normal operating conditions……..: | | N/A |
| 10.4.2 | Instructional safeguard .....: | | N/A |
| 10.5 | Protection against x-radiation | No such x-radiation generated from the equipment | N/A |
| 10.5.1 | X- radiation energy source that exists equipment : | | N/A |
| | Normal, abnormal, single fault conditions | | N/A |
| | Equipment safeguards.....: | | N/A |
| | Instructional safeguard for skilled person ..... : | | N/A |
| 10.5.3 | Most unfavourable supply voltage to give maximum radiation .....: | | — |
| | Abnormal and single-fault condition ..... : | | N/A |
| | Maximum radiation (Pa/kg)..... : | | N/A |
| 10.6 | Protection against acoustic energy sources | Not such equipment. | N/A |
| 10.6.1 | General | | N/A |
| 10.6.2 | Classification | | N/A |
| | Acoustic output, Db(A)..... : | | N/A |
| | Output voltage, unweighted r.m.s. ..... : | | N/A |
| 10.6.4 | Protection of persons | | N/A |
| | Instructional safeguards..... : | | N/A |
| | Equipment safeguard prevent ordinary person to RS2 ..... : | | — |
| | Means to actively inform user of increase sound pressure ..... : | | — |
| | Equipment safeguard prevent ordinary person to RS2 ..... : | | — |
| 10.6.5 | Requirements for listening devices (headphones, earphones, etc.) | | N/A |
| 10.6.5.1 | Corded passive listening devices with analog input | | N/A |
| | Input voltage with 94 Db(A) $L_{Aeq}$ acoustic pressure output..... : | | — |
| 10.6.5.2 | Corded listening devices with digital input | | N/A |



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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Maximum Db(A) ..... : | | — |
| 10.6.5.3 | Cordless listening device | | N/A |
| | Maximum Db(A) ..... : | | — |
| **B** | **NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS** | | P |
| B.2 | Normal Operating Conditions | | P |
| B.2.1 | General requirements ..... : | (See summary of testing for tested models, each loaded according to its output ratings. See also appended table B.2.5.) | P |
| | Audio Amplifiers and equipment with audio amplifiers ..... : | Not such equipment. | N/A |
| B.2.3 | Supply voltage and tolerances | Manufacturer specification: max. voltage | P |
| B.2.5 | Input test ..... : | (See appended table B.2.5) | P |
| B.3 | Simulated abnormal operating conditions | | P |
| B.3.1 | General requirements ..... : | (See appended table B.3 & B.4) | P |
| B.3.2 | Covering of ventilation openings | (See appended table B.3 & B.4) | P |
| B.3.3 | D.C. mains polarity test | The EUT is not connected to a D.C. mains | N/A |
| B.3.4 | Setting of voltage selector ..... : | No voltage selector was used. | N/A |
| B.3.5 | Maximum load at output terminals ..... : | (See appended table B.3 & B.4) | P |
| B.3.6 | Reverse battery polarity | | N/A |
| B.3.7 | Abnormal operating conditions as specified in Clause E.2. | Not such equipment. | N/A |
| B.3.8 | Safeguards functional during and after abnormal operating conditions | All safeguards remained effective. | P |
| B.4 | Simulated single fault conditions | | P |
| B.4.2 | Temperature controlling device open or short-circuited ..... : | No such device used. | N/A |
| B.4.3 | Motor tests | No motors used. | N/A |
| B.4.3.1 | Motor blocked or rotor locked increasing the internal ambient temperature ..... : | | -- |
| B.4.4 | Short circuit of functional insulation | See below. | P |
| B.4.4.1 | Short circuit of clearances for functional insulation | (See appended table B.3 & B.4) | P |


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| Clause | Requirement + Test | Result - Remark | Verdict |
| B.4.4.2 | Short circuit of creepage distances for functional insulation | (See appended table B.3 & B.4) | P |
| B.4.4.3 | Short circuit of functional insulation on coated printed boards | No coated printed boards used. | N/A |
| B.4.5 | Short circuit and interruption of electrodes in tubes and semiconductors | | N/A |
| B.4.6 | Short circuit or disconnect of passive components | (See appended table B.3 & B.4) | P |
| B.4.7 | Continuous operation of components | The EUT is continuous operating type and no such components intended for short time operation or intermittent operation | N/A |
| B.4.8 | Class 1 and Class 2 energy sources within limits during and after single fault conditions | | P |
| B.4.9 | Battery charging under single fault conditions.... : | | N/A |
| **C** | **UV RADIATION** | | N/A |
| C.1 | Protection of materials in equipment from UV radiation | No UV generated from the equipment. | N/A |
| C.1.2 | Requirements | | N/A |
| C.1.3 | Test method | | N/A |
| C.2 | UV light conditioning test | | N/A |
| C.2.1 | Test apparatus | | N/A |
| C.2.2 | Mounting of test samples | | N/A |
| C.2.3 | Carbon-arc light-exposure apparatus | | N/A |
| C.2.4 | Xenon-arc light exposure apparatus | | N/A |
| **D** | **TEST GENERATORS** | | N/A |
| D.1 | Impulse test generators | | N/A |
| D.2 | Antenna interface test generator | | N/A |
| D.3 | Electronic pulse generator | | N/A |
| **E** | **TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS** | | N/A |
| E.1 | Audio amplifier normal operating conditions | Not such equipment. | N/A |
| | Audio signal voltage (V).....: | | -- |
| | Rated load impedance (Ω) .....: | | -- |
| E.2 | Audio amplifier abnormal operating conditions | | N/A |


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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **F** | **EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS** | | P |
| F.1 | General requirements | See below. | P |
| | Instructions – Language ..... : | English. | — |
| F.2 | Letter symbols and graphical symbols | | P |
| F.2.1 | Letter symbols according to IEC60027-1 | Letter symbols for quantities and units are complied with IEC 60027-1. | N/A |
| F.2.2 | Graphic symbols IEC, ISO or manufacturer specific | Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010. | P |
| F.3 | Equipment markings | | P |
| F.3.1 | Equipment marking locations | The required marking is located on the enclosure of the equipment and is easily visible. | P |
| F.3.2 | Equipment identification markings | See copy of marking plate. | P |
| F.3.2.1 | Manufacturer identification .....: | See copy of marking plate. | — |
| F.3.2.2 | Model identification .....: | See copy of marking plate. | — |
| F.3.3 | Equipment rating markings | See the following details. | P |
| F.3.3.1 | Equipment with direct connection to mains | | N/A |
| F.3.3.2 | Equipment without direct connection to mains | | P |
| F.3.3.3 | Nature of supply voltage..... : | DC | — |
| F.3.3.4 | Rated voltage..... : | See copy of marking plate. | — |
| F.3.3.4 | Rated frequency ..... : | | — |
| F.3.3.6 | Rated current or rated power..... : | See copy of marking plate. | — |
| F.3.3.7 | Equipment with multiple supply connections | Only one supply connection provided. | N/A |
| F.3.4 | Voltage setting device | No voltage setting device. | N/A |
| F.3.5 | Terminals and operating devices | See below. | N/A |
| F.3.5.1 | Mains appliance outlet and socket-outlet markings ..... : | No outlet used. | N/A |
| F.3.5.2 | Switch position identification marking..... : | No switch used. | N/A |
| F.3.5.3 | Replacement fuse identification and rating markings ..... : | | N/A |
| F.3.5.4 | Replacement battery identification marking ..... : | | N/A |
| F.3.5.5 | Terminal marking location | | N/A |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.6 | Equipment markings related to equipment classification | See below. | N/A |
| F.3.6.1 | Class I Equipment | Class III equipment. | N/A |
| F.3.6.1.1 | Protective earthing conductor terminal | | N/A |
| F.3.6.1.2 | Neutral conductor terminal | | N/A |
| F.3.6.1.3 | Protective bonding conductor terminals | | N/A |
| F.3.6.2 | Class II equipment (IEC60417-5172) | | N/A |
| F.3.6.2.1 | Class II equipment with or without functional earth | | N/A |
| F.3.6.2.2 | Class II equipment with functional earth terminal marking | | N/A |
| F.3.7 | Equipment IP rating marking .....: | IPX0 | — |
| F.3.8 | External power supply output marking | | N/A |
| F.3.9 | Durability, legibility and permanence of marking | Marking is considered to be legible and easily discernible. See also the following details. | P |
| F.3.10 | Test for permanence of markings | The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. And then again for 15 sec. With the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling and lifting of the label edge.<br>After each test, the marking remained legible. | P |
| F.4 | Instructions | | P |
| | a) Equipment for use in locations where children not likely to be present – marking | | N/A |
| | b) Instructions given for installation or initial use | | P |
| | c) Equipment intended to be fastened in place | | N/A |
| | d) Equipment intended for use only in restricted access area | | N/A |
| | e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1 | No such terminals provided. | N/A |
| | f) Protective earthing employed as safeguard | | N/A |


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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | g) Protective earthing conductor current exceeding ES2 limits | | N/A |
| | h) Symbols used on equipment | No such symbols used as a safeguard considered. | N/A |
| | i) Permanently connected equipment not provided with all-pole mains switch | Not permanently connected equipment. | N/A |
| | j) Replaceable components or modules providing safeguard function | No such markings. | N/A |
| F.5 | Instructional safeguards | No instructional safeguard is considered as necessary. | N/A |
| | Where “instructional safeguard” is referenced in the test report it specifies the required elements, location of marking and/or instruction | No instructional safeguard required in the equipment. | N/A |

| | | | |
|---|---|---|---|
| **G** | **COMPONENTS** | | P |
| **G.1** | **Switches** | | N/A |
| G.1.1 | General requirements | No switch used. | N/A |
| G.1.2 | Ratings, endurance, spacing, maximum load | | N/A |
| **G.2** | **Relays** | | N/A |
| G.2.1 | General requirements | No relay used. | N/A |
| G.2.2 | Overload test | | N/A |
| G.2.3 | Relay controlling connectors supply power | | N/A |
| G.2.4 | Mains relay, modified as stated in G.2 | | N/A |
| **G.3** | **Protection Devices** | | N/A |
| G.3.1 | Thermal cut-offs | No thermal cut-off used. | N/A |
| G.3.1.1a) &b) | Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b) | | N/A |
| G.3.1.1c) | Thermal cut-outs tested as part of the equipment as indicated in c) | | N/A |
| G.3.1.2 | Thermal cut-off connections maintained and secure | | N/A |
| G.3.2 | Thermal links | | N/A |
| G.3.2.1a) | Thermal links separately tested with IEC 60691 | No thermal link used. | N/A |
| G.3.2.1b) | Thermal links tested as part of the equipment | | N/A |
| | Aging hours (H) ..... : | | — |
| | Single Fault Condition ..... : | | — |
| | Test Voltage (V) and Insulation Resistance (Ω) . : | | — |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.3.3 | PTC Thermistors | | N/A |
| G.3.4 | Overcurrent protection devices | | N/A |
| G.3.5 | Safeguards components not mentioned in G.3.1 to G.3.5 | | N/A |
| G.3.5.1 | Non-resettable devices suitably rated and marking provided | | N/A |
| G.3.5.2 | Single faults conditions..... : | | N/A |
| **G.4** | **Connectors** | | N/A |
| G.4.1 | Spacings | No such connector with insulated surfaces accessible within the EUT | N/A |
| G.4.2 | Mains connector configuration .....: | | N/A |
| G.4.3 | Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely | | N/A |
| **G.5** | **Wound Components** | | N/A |
| G.5.1 | Wire insulation in wound components..... | | N/A |
| G.5.1.2 a) | Two wires in contact inside wound component, angle between 45° and 90° | | N/A |
| G.5.1.2 b) | Construction subject to routine testing | The routine tests are to be considered for the production based on the relevant approval (see cover page). | N/A |
| G.5.2 | Endurance test on wound components | Not applied for. | N/A |
| G.5.2.1 | General test requirements | | N/A |
| G.5.2.2 | Heat run test | | N/A |
| | Time (s).....: | | — |
| | Temperature (°C).....: | | — |
| G.5.2.3 | Wound Components supplied by mains | | N/A |
| **G.5.3** | **Transformers** | | N/A |
| G.5.3.1 | Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1).....: | | N/A |
| | Position .....: | | — |
| | Method of protection .....: | | — |
| G.5.3.2 | Insulation | | N/A |
| | Protection from displacement of windings..... : | | — |
| G.5.3.3 | Overload test .....: | | N/A |
| G.5.3.3.1 | Test conditions | | N/A |



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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.5.3.3.2 | Winding Temperatures testing in the unit | | N/A |
| G.5.3.3.3 | Winding Temperatures – Alternative test method | | N/A |
| **G.5.4** | **Motors** | | N/A |
| G.5.4.1 | General requirements | No motor used. | N/A |
| | Position .....: | | — |
| G.5.4.2 | Test conditions | | N/A |
| G.5.4.3 | Running overload test | | N/A |
| G.5.4.4 | Locked-rotor overload test | | N/A |
| | Test duration (days) .....: | | — |
| G.5.4.5 | Running overload test for d.c. motors in secondary circuits | | N/A |
| G.5.4.5.2 | Tested in the unit | | N/A |
| | Electric strength test (V) .....: | | — |
| G.5.4.5.3 | Tested on the Bench – Alternative test method; test time (h) .....: | | N/A |
| | Electric strength test (V) .....: | | — |
| G.5.4.6 | Locked-rotor overload test for d.c. motors in secondary circuits | | N/A |
| G.5.4.6.2 | Tested in the unit | | N/A |
| | Maximum Temperature .....: | | N/A |
| | Electric strength test (V) .....: | | N/A |
| G.5.4.6.3 | Tested on the bench – Alternative test method; test time (h).....: | | N/A |
| | Electric strength test (V) .....: | | N/A |
| G.5.4.7 | Motors with capacitors | | N/A |
| G.5.4.8 | Three-phase motors | | N/A |
| G.5.4.9 | Series motors | | N/A |
| | Operating voltage .....: | | — |
| **G.6** | **Wire Insulation** | | N/A |
| G.6.1 | General | | N/A |
| G.6.2 | Solvent-based enamel wiring insulation | | N/A |
| **G.7** | **Mains supply cords** | | N/A |
| G.7.1 | General requirements | | N/A |
| | Type..... : | | — |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Rated current (A) ..... : | | — |
| | Cross-sectional area ($mm^2$), (AWG)..... : | | — |
| G.7.2 | Compliance and test method | | N/A |
| G.7.3 | Cord anchorages and strain relief for non-detachable power supply cords | | N/A |
| G.7.3.2 | Cord strain relief | | N/A |
| G.7.3.2.1 | Requirements | | N/A |
| | Strain relief test force (N).....: | | — |
| G.7.3.2.2 | Strain relief mechanism failure | | N/A |
| G.7.3.2.3 | Cord sheath or jacket position, distance (mm) ....: | | — |
| G.7.3.2.4 | Strain relief comprised of polymeric material | | N/A |
| G.7.4 | Cord Entry..... : | | N/A |
| G.7.5 | Non-detachable cord bend protection | | N/A |
| G.7.5.1 | Requirements | | N/A |
| G.7.5.2 | Mass (g) .....: | | — |
| | Diameter (m).....: | | — |
| | Temperature ( °C) .....: | | — |
| G.7.6 | Supply wiring space | | N/A |
| G.7.6.2 | Stranded wire | No such wire. | N/A |
| G.7.6.2.1 | Test with 8 mm strand | | N/A |
| **G.8** | **Varistors** | | N/A |
| G.8.1 | General requirements | Not used | N/A |
| G.8.2 | Safeguard against shock | | N/A |
| G.8.3 | Safeguard against fire | | N/A |
| G.8.3.2 | Varistor overload test..... : | | N/A |
| G.8.3.3 | Temporary overvoltage..... : | | N/A |
| **G.9** | **Integrated Circuit (IC) Current Limiters** | | N/A |
| G.9.1 a) | Manufacturer defines limit at max. 5A. | No IC current limiter provided within the equipment. | N/A |
| G.9.1 b) | Limiters do not have manual operator or reset | | N/A |
| G.9.1 c) | Supply source does not exceed 250 VA .....: | | -- |
| G.9.1 d) | IC limiter output current (max. 5A).....: | | -- |
| G.9.1 e) | Manufacturers' defined drift .....: | | -- |


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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.9.2 | Test Program 1 | | N/A |
| G.9.3 | Test Program 2 | | N/A |
| G.9.4 | Test Program 3 | | N/A |
| **G.10** | **Resistors** | | N/A |
| G.10.1 | General requirements | No such resistor as safeguard used | N/A |
| G.10.2 | Resistor test | | N/A |
| G.10.3 | Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable | | N/A |
| G.10.3.1 | General requirements | | N/A |
| G.10.3.2 | Voltage surge test | | N/A |
| G.10.3.3 | Impulse test | | N/A |
| **G.11** | **Capacitor and RC units** | | N/A |
| G.11.1 | General requirements | | N/A |
| G.11.2 | Conditioning of capacitors and RC units | | N/A |
| G.11.3 | Rules for selecting capacitors | | N/A |
| **G.12** | **Optocouplers** | | N/A |
| | Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results) ..... : | | N/A |
| | Type test voltage Vini .....: | | — |
| | Routine test voltage, Vini,b .....: | | — |
| **G.13** | **Printed boards** | | P |
| G.13.1 | General requirements | See the following details. | P |
| G.13.2 | Uncoated printed boards | | P |
| G.13.3 | Coated printed boards | No coated printed board or multilayer board applied for within the equipment. | N/A |
| G.13.4 | Insulation between conductors on the same inner surface | | N/A |
| | Compliance with cemented joint requirements (Specify construction) .....: | | — |
| G.13.5 | Insulation between conductors on different surfaces | | N/A |
| | Distance through insulation ..... : | | N/A |
| | Number of insulation layers (pcs) .....: | | — |



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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.13.6 | Tests on coated printed boards | | N/A |
| G.13.6.1 | Sample preparation and preliminary inspection | | N/A |
| G.13.6.2 a) | Thermal conditioning | | N/A |
| G.13.6.2 b) | Electric strength test | | N/A |
| G.13.6.2c ) | Abrasion resistance test | | N/A |
| **G.14** | **Coating on components terminals** | | N/A |
| G.14.1 | Requirements ..... : | No coating on component terminals considered to affect creepage or clearances. | N/A |
| **G.15** | **Liquid filled components** | | N/A |
| G.15.1 | General requirements | No such device provided within the equipment. | N/A |
| G.15.2 | Requirements | | N/A |
| G.15.3 | Compliance and test methods | | N/A |
| G.15.3.1 | Hydrostatic pressure test | | N/A |
| G.15.3.2 | Creep resistance test | | N/A |
| G.15.3.3 | Tubing and fittings compatibility test | | N/A |
| G.15.3.4 | Vibration test | | N/A |
| G.15.3.5 | Thermal cycling test | | N/A |
| G.15.3.6 | Force test | | N/A |
| G.15.4 | Compliance | | N/A |
| **G.16** | **IC including capacitor discharge function (ICX)** | | N/A |
| a) | Humidity treatment in accordance with sc5.4.8 – 120 hours | | N/A |
| b) | Impulse test using circuit 2 with Uc = to transient voltage .....: | | N/A |
| C1) | Application of ac voltage at 110% of rated voltage for 2.5 minutes | | N/A |
| C2) | Test voltage .....: | | — |
| D1) | 10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer | | N/A |
| D2) | Capacitance .....: | | — |
| D3) | Resistance .....: | | — |


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| Clause | Requirement + Test | Result - Remark | Verdict |
| **H** | **CRITERIA FOR TELEPHONE RINGING SIGNALS** | | N/A |
| H.1 | General | No telephone ringing signal generated within the equipment. | N/A |
| H.2 | Method A | | N/A |
| H.3 | Method B | | N/A |
| H.3.1 | Ringing signal | | N/A |
| H.3.1.1 | Frequency (Hz) ..... : | | — |
| H.3.1.2 | Voltage (V) ..... : | | — |
| H.3.1.3 | Cadence; time (s) and voltage (V) ..... : | | — |
| H.3.1.4 | Single fault current (Ma): ..... : | | — |
| H.3.2 | Tripping device and monitoring voltage..... : | | N/A |
| H.3.2.1 | Conditions for use of a tripping device or a monitoring voltage complied with | | N/A |
| H.3.2.2 | Tripping device | | N/A |
| H.3.2.3 | Monitoring voltage (V) ..... : | | — |
| **J** | **INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION** | | N/A |
| | General requirements | | N/A |
| **K** | **SAFETY INTERLOCKS** | | N/A |
| K.1 | General requirements | No safety interlock provided. | N/A |
| K.2 | Components of safety interlock safeguard mechanism ..... | | N/A |
| K.3 | Inadvertent change of operating mode | | N/A |
| K.4 | Interlock safeguard override | | N/A |
| K.5 | Fail-safe | | N/A |
| | Compliance..... : | | N/A |
| K.6 | Mechanically operated safety interlocks | | N/A |
| K.6.1 | Endurance requirement | | N/A |
| K.6.2 | Compliance and Test method ..... : | | N/A |
| K.7 | Interlock circuit isolation | | N/A |
| K.7.1 | Separation distance for contact gaps & interlock circuit elements (type and circuit location) ..... : | | N/A |
| K.7.2 | Overload test, Current (A) ..... : | | N/A |


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| Clause | Requirement + Test | Result - Remark | Verdict |
| K.7.3 | Endurance test | | N/A |
| K.7.4 | Electric strength test ..... : | | N/A |
| **L** | **DISCONNECT DEVICES** | | N/A |
| L.1 | General requirements | | N/A |
| L.2 | Permanently connected equipment | | N/A |
| L.3 | Parts that remain energized | | N/A |
| L.4 | Single phase equipment | | N/A |
| L.5 | Three-phase equipment | | N/A |
| L.6 | Switches as disconnect devices | | N/A |
| L.7 | Plugs as disconnect devices | | N/A |
| L.8 | Multiple power sources | | N/A |
| **M** | **EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS** | | N/A |
| M.1 | General requirements | | N/A |
| M.2 | Safety of batteries and their cells | | N/A |
| M.2.1 | Requirements | | N/A |
| M.2.2 | Compliance and test method (identify method)...: | | -- |
| M.3 | Protection circuits | | N/A |
| M.3.1 | Requirements | | N/A |
| M.3.2 | Tests | | N/A |
| | - Overcharging of a rechargeable battery | | N/A |
| | - Unintentional charging of a non-rechargeable battery | | N/A |
| | - Reverse charging of a rechargeable battery | | N/A |
| | - Excessive discharging rate for any battery | | N/A |
| M.3.3 | Compliance .....: | | -- |
| M.4 | Additional safeguards for equipment containing secondary lithium battery | | N/A |
| M.4.1 | General | | N/A |
| M.4.2 | Charging safeguards | | N/A |
| M.4.2.1 | Charging operating limits | | N/A |
| M.4.2.2a) | Charging voltage, current and temperature ..... : | | -- |
| M.4.2.2 b) | Single faults in charging circuitry..... : | | -- |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.4.3 | Fire Enclosure | | N/A |
| M.4.4 | Endurance of equipment containing a secondary lithium battery | | N/A |
| M.4.4.2 | Preparation | | N/A |
| M.4.4.3 | Drop and charge/discharge function tests | | N/A |
| | Drop | | N/A |
| | Charge | | N/A |
| | Discharge | | N/A |
| M.4.4.4 | Charge-discharge cycle test | | N/A |
| M.4.4.5 | Result of charge-discharge cycle test | | N/A |
| M.5 | Risk of burn due to short circuit during carrying | | N/A |
| M.5.1 | Requirement | | N/A |
| M.5.2 | Compliance and Test Method (Test of P.2.3) | | N/A |
| M.6 | Prevention of short circuits and protection from other effects of electric current | | N/A |
| M.6.1 | Short circuits | | N/A |
| M.6.1.1 | General requirements | | N/A |
| M.6.1.2 | Test method to simulate an internal fault | | N/A |
| M.6.1.3 | Compliance (Specify M.6.1.2 or alternative method) .....: | | -- |
| M.6.2 | Leakage current (Ma) .....: | | -- |
| M.7 | Risk of explosion from lead acid and NiCd batteries | | N/A |
| M.7.1 | Ventilation preventing explosive gas concentration | | N/A |
| M.7.2 | Compliance and test method | | N/A |
| M.8 | Protection against internal ignition from external spark sources of lead acid batteries | | N/A |
| M.8.1 | General requirements | | N/A |
| M.8.2 | Test method | | N/A |
| M.8.2.1 | General requirements | | N/A |
| M.8.2.2 | Estimation of hypothetical volume *Vz* ($m^3/s$).....: | | -- |
| M.8.2.3 | Correction factors.....: | | -- |
| M.8.2.4 | Calculation of distance *d* (mm) .....: | | -- |
| M.9 | Preventing electrolyte spillage | | N/A |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.9.1 | Protection from electrolyte spillage | | N/A |
| M.9.2 | Tray for preventing electrolyte spillage | | N/A |
| M.10 | Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) .....: | | N/A |
| **N** | **ELECTROCHEMICAL POTENTIALS** | | N/A |
| | Metal(s) used.....: | Class III equipment. | -- |
| **O** | **MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES** | | N/A |
| | Figures O.1 to O.20 of this Annex applied .....: | | — |
| **P** | **SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS** | | N/A |
| P.1 | General requirements | | N/A |
| P.2.2 | Safeguards against entry of foreign object | | N/A |
| | Location and Dimensions (mm) .....: | | — |
| P.2.3 | Safeguard against the consequences of entry of foreign object | | N/A |
| P.2.3.1 | Safeguards against the entry of a foreign object | | N/A |
| | Openings in transportable equipment | | N/A |
| | Transportable equipment with metalized plastic parts.....: | | N/A |
| P.2.3.2 | Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) .....: | | N/A |
| P.3 | Safeguards against spillage of internal liquids | No such liquids. | N/A |
| P.3.1 | General requirements | | N/A |
| P.3.2 | Determination of spillage consequences | | N/A |
| P.3.3 | Spillage safeguards | | N/A |
| P.3.4 | Safeguards effectiveness | | N/A |
| P.4 | Metallized coatings and adhesive securing parts | No such construction. | N/A |
| P.4.2 a) | Conditioning testing | | N/A |
| | Tc (°C): .....: | | — |
| | Tr (°C).....: | | — |
| | Ta (°C).....: | | — |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| P.4.2 b) | Abrasion testing .....: | | N/A |
| P.4.2 c) | Mechanical strength testing.....: | | N/A |
| **Q** | **CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING** | | N/A |
| Q.1 | Limited power sources | | N/A |
| Q.1.1 a) | Inherently limited output | | N/A |
| Q.1.1 b) | Impedance limited output | | N/A |
| | - Regulating network limited output under normal operating and simulated single fault condition | | N/A |
| Q.1.1 c) | Overcurrent protective device limited output | | N/A |
| Q.1.1 d) | IC current limiter complying with G.9 | | N/A |
| Q.1.2 | Compliance and test method | | N/A |
| Q.2 | Test for external circuits – paired conductor cable | | N/A |
| | Maximum output current (A) .....: | | -- |
| | Current limiting method .....: | | -- |
| **R** | **LIMITED SHORT CIRCUIT TEST** | | N/A |
| R.1 | General requirements | No such consideration. | N/A |
| R.2 | Determination of the overcurrent protective device and circuit | | N/A |
| R.3 | Test method Supply voltage (V) and short-circuit current (A)). .....: | | N/A |
| **S** | **TESTS FOR RESISTANCE TO HEAT AND FIRE** | | N/A |
| S.1 | Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm) .....: | | — |
| | Conditioning (°C) .....: | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N/A |
| | - Material not consumed completely | | N/A |
| | - Material extinguishes within 30s | | N/A |
| | - No burning of layer or wrapping tissue | | N/A |


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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| S.2 | Flammability test for fire enclosure and fire barrier integrity | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (°C).....: | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N/A |
| | Test specimen does not show any additional hole | | N/A |
| S.3 | Flammability test for the bottom of a fire enclosure | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Cheesecloth did not ignite | | N/A |
| S.4 | Flammability classification of materials | | N/A |
| S.5 | Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (test condition), (°C).....: | | — |
| | Test flame according to IEC 60695-11-20 with conditions as set out | | N/A |
| | After every test specimen was not consumed completely | | N/A |
| | After fifth flame application, flame extinguished within 1 min | | N/A |
| **T** | **MECHANICAL STRENGTH TESTS** | | N/A |
| T.1 | General requirements | | N/A |
| T.2 | Steady force test, 10 N.....: | | N/A |
| T.3 | Steady force test, 30 N .....: | | N/A |
| T.4 | Steady force test, 100 N .....: | | N/A |
| T.5 | Steady force test, 250 N .....: | | N/A |
| T.6 | Enclosure impact test | | N/A |
| | Fall test | | N/A |
| | Swing test | | N/A |



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| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| T.7 | Drop test .....:: | | N/A |
| T.8 | Stress relief test.....:: | | — |
| T.9 | Impact Test (glass) | No glass used. | N/A |
| T.9.1 | General requirements | | N/A |
| T.9.2 | Impact test and compliance | | N/A |
| | Impact energy (J) .....:: | | — |
| | Height (m).....:: | | — |
| T.10 | Glass fragmentation test.....:: | | N/A |
| T.11 | Test for telescoping or rod antennas | No such antennas provided within the equipment. | N/A |
| | Torque value (Nm) .....:: | | — |
| **U** | **MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFECTS OF IMPLOSION** | | N/A |
| U.1 | General requirements | No CRT provided. | N/A |
| U.2 | Compliance and test method for non-intrinsically protected CRTs | | N/A |
| U.3 | Protective Screen..... ..:: | | N/A |
| **V** | **DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)** | | P |
| V.1 | Accessible parts of equipment | | P |
| V.2 | Accessible part criterion | | P |


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| 4.1.2 | TABLE: List of critical components | | | | P |
|---|---|---|---|---|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity[1] |
| Plastic enclosure | Shenzhen holide Module &plastie CO.LTD | AC68K | V-0, 120°C, min. thickness: 1.5mm | UL 94, UL 746C | UL |
| Metal enclosure | Interchangeable | Interchangeable | Min 1.6mm | IEC/EN 62368-1 | Test with appliance |
| Internal wire | Interchangeable | Interchangeable | 80°C, Min. 26AWG, | UL 758 | UL |
| PCB | SUNTAK MULTILAYER PCB CO LTD | STM-5 | V-0, 130°C | UL 94, UL 796 | UL E207844 |
| (Alternative) | SHENZHEN BOMIN ELECTRONIC CO LTD | BM-1 | V-0, 130°C | UL 94, UL 796 | UL E213371 |
| Supplementary information:<br>1) Provided evidence ensures the agreed level of compliance. See OD-CB2039. | | | | | |


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| 4.8.4, 4.8.5 | TABLE: Lithium coin/button cell batteries mechanical tests | N/A |
|---|---|---|

**(The following mechanical tests are conducted in the sequence noted.)**

| 4.8.4.2 | TABLE: Stress Relief test | — |
|---|---|---|

| Part | Material | Oven Temperature (°C) | Comments |
|---|---|---|---|
| -- | -- | -- | -- |

| 4.8.4.3 | TABLE: Battery replacement test | — |
|---|---|---|

| Battery part no. ..... | | — |
|---|---|---|
| Battery Installation/withdrawal | Battery Installation/Removal Cycle | Comments |
| | 1 | -- |
| | 2 | -- |
| | 3 | -- |
| | 4 | -- |
| | 5 | -- |
| | 6 | -- |
| | 8 | -- |
| | 9 | -- |
| | 10 | -- |

| 4.8.4.4 | TABLE: Drop test | — |
|---|---|---|

| Impact Area | Drop Distance | Drop No. | Observations |
|---|---|---|---|
| -- | -- | 1 | -- |
| -- | -- | 2 | -- |
| -- | -- | 3 | -- |

| 4.8.4.5 | TABLE: Impact | — |
|---|---|---|

| Impacts per surface | Surface tested | Impact energy (Nm) | Comments |
|---|---|---|---|
| -- | -- | -- | -- |
| -- | -- | -- | -- |
| -- | -- | -- | -- |

| 4.8.4.6 | TABLE: Crush test | — |
|---|---|---|

| Test position | Surface tested | Crushing Force (N) | Duration force applied (s) |
|---|---|---|---|
| -- | -- | -- | -- |
| -- | -- | -- | -- |

Supplementary information:



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| 4.8.5 | TABLE: Lithium coin/button cell batteries mechanical test result | N/A |
|---|---|---|

| Test position | Surface tested | Force (N) | Duration force applied (s) |
|---|---|---|---|
| -- | -- | -- | -- |
| -- | -- | -- | -- |
| Supplementary information: | | | |

| 5.2 | Table: Classification of electrical energy sources | P |
|---|---|---|

5.2.2.2 – Steady State Voltage and Current conditions

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions [1)] | Parameters | | | ES Class |
|---|---|---|---|---|---|---|---|
| | | | | U (Vrms or Vpk) | I (Apk or Arms) | Hz | |
| 1 | 3.3Vdc | Internal circuits supplied by external power supply | Normal | 3.3Vdc max. | -- | DC | ES1 |
| | | | abnormal | -- | -- | DC | |
| | | | Single fault-SC/OC | -- | -- | DC | |

Note: SC= short circuit

5.2.2.3 - Capacitance Limits

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | ES Class |
|---|---|---|---|---|---|---|
| | | | | Capacitance, nF | Upk (V) | |
| 1 | -- | -- | -- | -- | -- | -- |

Overall capacity:--

Limit: --

5.2.2.4 - Single Pulses

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
|---|---|---|---|---|---|---|---|
| | | | | Duration (ms) | Upk (V) | Ipk (mA) | |
| -- | -- | -- | Normal | -- | -- | -- | -- |
| | | | Abnormal | -- | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | -- | |

5.2.2.5 - Repetitive Pulses

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
|---|---|---|---|---|---|---|---|
| | | | | Off time (ms) | Upk (V) | Ipk (mA) | |
| -- | -- | -- | Normal | -- | -- | -- | -- |
| | | | Abnormal | -- | -- | -- | |



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Single fault – SC/OC | -- | -- | -- | |

Test Conditions:

Normal – Full load and no load.

Abnormal – Overload output

Supplementary information: SC=Short Circuit, OC=Open Circuit

| 5.4.1.4, 6.3.2, 9.0, B.2.6 | TABLE: Temperature measurements | | | | | P |
|---|---|---|---|---|---|---|
| | Supply voltage (V) .....: | 3.3Vd.c. | | -- | | — |
| | Ambient $T_{min}$ (°C) .....: | -- | -- | -- | -- | — |
| | Ambient $T_{max}$ (°C) .....: | -- | -- | -- | -- | — |
| | Tma (°C) .....: | -- | -- | -- | -- | — |
| Maximum measured temperature T of part/at: | | T (°C) | | | | Allowed $T_{max}$ (°C) |
| PCB near U1 | | 30.1 | 50.1 | -- | -- | 130 |
| Plastic enclosure inside | | 29.4 | 49.4 | -- | -- | 120 |
| Plastic enclosure outside | | 27.0 | -- | -- | -- | 77 |
| Metal enclosure outside | | 27.6 | -- | -- | -- | 60 |
| Ambient | | 25.0 | 45.0 | -- | -- | -- |

Supplementary information: * Temperature limit for TS1 of accessible enclosure according to Table 38.

Note 1: Tma should be considered as directed by appliable requirement

Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9)

| Temperature T of winding: | $t_1$ (°C) | $R_1$ (Ω) | $t_2$ (°C) | $R_2$ (Ω) | T (°C) | Allowed $T_{max}$ (°C) | Insulation class |
|---|---|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- | -- | -- |

| 5.4.1.8 | Table: working voltage measurement | | | N/A |
|---|---|---|---|---|
| Location | | RMS voltage (V) | Peak voltage (V) | Comments |
| -- | | -- | -- | -- |
| supplementary information: | | | | |
| Test voltage: V<br>Test frequency: Hz | | | | |

| 5.4.1.10.2 | TABLE: Vicat softening temperature of thermoplastics | | N/A |
|---|---|---|---|
| Penetration (mm)..... | | | — |
| Object/ Part No./Material | | Manufacturer/trademark | T softening (°C) |



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| | | |
|---|---|---|
| -- | -- | -- |
| supplementary information: -- | | |

| 5.4.1.10.3 | TABLE: Ball pressure test of thermoplastics | | N/A |
|---|---|---|---|
| Allowed impression diameter (mm) ..... | | ≤ 2 mm | — |
| Object/Part No./Material | Manufacturer/trademark | Test temperature (°C) | Impression diameter (mm) |
| -- | -- | -- | -- |
| Supplementary information: | | | |

| 5.4.2.2, 5.4.2.4 and 5.4.3 | TABLE: Minimum Clearances/Creepage distance | | | | | | N/A |
|---|---|---|---|---|---|---|---|
| Clearance (cl) and creepage distance (cr) at/of/between: | Up (V) | U r.m.s. (V) | Frequency (kHz) | Required cl (mm) | cl (mm) | Required cr (mm) | cr (mm) |
| -- | -- | -- | -- | -- | -- | -- | -- |
| Supplementary information:<br>B=Basic insulation, S=Supplementary insulation, R=Reinforced insulation.<br>Material group: IIIa/IIIb | | | | | | | |

| 5.4.2.3 | TABLE: Minimum Clearances distances using required withstand voltage | | | N/A |
|---|---|---|---|---|
| | **Overvoltage Category (OV):** | | | II |
| | **Pollution Degree:** | | | 2 |
| Clearance distanced between: | Required withstand voltage | Required cl (mm) | Measured cl (mm) | |
| -- | -- | -- | -- | |
| Supplementary information: Limits in previous table for clearance selected based on Table 15 for Required Withstand Voltage 2.5kV (mains transient voltage 2.5kV). | | | | |

| 5.4.2.4 | TABLE: Clearances based on electric strength test | | | N/A |
|---|---|---|---|---|
| Test voltage applied between: | Required cl (mm) | Test voltage (kV) peak/ r.m.s. / d.c. | Breakdown Yes / No | |
| -- | -- | -- | -- | |
| -- | -- | -- | -- | |
| Supplementary information: Using procedure 2 to determine the clearance. | | | | |

| 5.4.4.2, 5.4.4.5 c) 5.4.4.9 | TABLE: Distance through insulation measurements | N/A |
|---|---|---|


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| Distance through insulation di at/of: | Peak voltage (V) | Frequency (Hz) | Material | Required DTI (mm) | DTI (mm) |
|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- |

Supplementary information:

1. See also sub-clause 5.4.4.9.

| 5.4.9 | TABLE: Electric strength tests | | | N/A |
|---|---|---|---|---|
| Test voltage applied between: | | Voltage shape (AC, DC) | Test voltage (Vpeak) | Breakdown Yes / No |
| Basic/supplementary: | | | | |
| -- | | -- | -- | -- |
| Reinforced: | | | | |
| -- | | -- | -- | -- |

Supplementary information:
1) Each source of insulation tape tested, see appended table 4.2.1 for detail.

| 5.5.2.2 | TABLE: Stored discharge on capacitors | | | | N/A |
|---|---|---|---|---|---|
| Supply Voltage (V), Hz | Test Location | Operating Condition (N, S) | Switch position On or off | Measured Voltage (after 2 seconds) | ES Classification |
| -- | -- | -- | -- | -- | -- |

Supplementary information:

The end system may be pluggable equipment type A. Limit of ES1 applied for mains terminal as accessible part.

X-capacitors installed for testing are:

☐ bleeding resistor rating:

Notes:

A. Test Location:

Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth

B. Operating condition abbreviations:

N – Normal operating condition (e.g., normal operation, or open fuse);

S –Single fault condition (Bleeder Resistor open circuit)

| 5.6.6.2 | TABLE: Resistance of protective conductors and terminations | | | N/A |
|---|---|---|---|---|
| Accessible part | Test current (A) | Duration (min) | Voltage drop (V) | Resistance (Ω) |
| -- | -- | -- | -- | -- |

Supplementary Information:

Class III equipment.



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| 5.7.2.2, 5.7.4 | TABLE: Earthed accessible conductive part | N/A |
|---|---|---|
| Supply voltage .....: | | — |
| Location | Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7 | Touch current (mA) |
| | 1 (e closed, normal and reverse polarity p) | |
| | 2* (netural open (switch n), earth intact and normal polarity, again in reverse polarity (switch p) | |
| | 3 (for IT system, each phase conductor faulted to earth, one at a time (switch g) | |
| | 4 (for three-phase, each phase conductor open, one at a time switches I) | |
| | 5 (IT power system or three phase delta system) | |
| | 6 (three-phase for use on centre-earthed dalta supply system) | |
| | 8 (incidental electrically connected to other parts) | |
| | 1 (e open, normal and reverse polarity p) | |
| | 2* (netural open (switch n), earth intact and normal polarity, again in reverse polarity (switch p) | |

Notes:
[1] Supply voltage is the anticipated maximum Touch Voltage
[2] Earthed neutral conductor [Voltage differences less than 1% or more]
[3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3
[4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable.
[5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.
a) Not considered IT power system.
b) Not three phase equipment.
c) Not IT power system or three phase delta system.
d) Not three-phase for use on centre-earthed dalta supply system.
e) Not such parts.

| 6.2.2 | Table: Electrical power sources (PS) measurements for classification | | | | P |
|---|---|---|---|---|---|
| Source | Description | Measurement | Max Power after 3 s | Max Power after 5 s*) | PS Classification |


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| | | | | | |
|---|---|---|---|---|---|
| A | Internal circuits of the unit | Power (W) : | <15W | -- | PS1 |
| | | $V_A$ (V) : | -- | -- | |
| | | $I_A$ (A) : | -- | -- | |
| Supplementary information: Each case where unit shutdown occurred within the 3s. | | | | | |

| 6.2.3.1 | Table: Determination of Potential Ignition Sources (Arcing PIS) | | | | N/A |
|---|---|---|---|---|---|
| Location | | Open circuit voltage After 3 s (Vp) | Measured r.m.s current (Irms) | Calculated value ($V_p$ x $I_{rms}$) | Arcing PIS? Yes / No |
| See below | | -- | -- | -- | -- |
| Supplementary information: | | | | | |

| 6.2.3.2 | Table: Determination of Potential Ignition Sources (Resistive PIS) | | | | N/A |
|---|---|---|---|---|---|
| Circuit Location (x-y) | Operating Condition (Normal / Describe Single Fault) | Measured wattage or VA During first 30 s (W / VA) | Measured wattage or VA After 30 s (W / VA) | Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment) | Resistive PIS? Yes/No |
| -- | -- | -- | -- | -- | -- |

Supplementary Information:

All power dissipating components in primary and secondary circuit are considered as resistive PIS

A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter.

A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault.

| 8.5.5 | TABLE: High Pressure Lamp | N/A |
|---|---|---|
| Description | Values | Energy Source Classification |
| Lamp type ..... : | | — |
| Manufacturer ..... : | | — |
| Cat no. ..... : | | — |
| Pressure (cold) (MPa) ..... : | | MS_ |
| Pressure (operating) (MPa) ..... : | | MS_ |
| Operating time (minutes) ..... : | | — |
| Explosion method ..... : | | — |
| Max particle length escaping enclosure (mm) . : | | MS_ |



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| | | |
|---|---|---|
| Max particle length beyond 1 m (mm) .....: | | MS_ |
| Overall result .....: | | |
| Supplementary information: | | |

| B.2.5 | TABLE: Input test | | | | | | P |
|---|---|---|---|---|---|---|---|
| U (V) | I (A) | I rated (A) | P (W) | P rated (W) | Fuse No | I fuse (A) | Condition/status |
| 3.3Vd.c. | 0.73 | 0.8 | 2.409 | -- | -- | -- | Normal working |
| Supplementary information: | | | | | | | |

| B.3 & B.4 | TABLE: Abnormal operating and fault condition tests | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| Ambient temperature ($^{o}$C) .....: | | | | | 25$^{o}$C, if not specified | | | — |
| Power source for EUT: Manufacturer, model/type, output rating .: | | | | | -- | | | — |
| Component No. | Abnormal Condition | Supply voltage, (V) | Test time (ms) | Fuse no. | Fuse current, (A) | T-couple | Temp. ($^{o}$C) | Observation |
| C4 | SC | 3.3Vdc | 10mins | -- | -- | -- | -- | Unit shut down immediately, no damage, no hazardous. |
| C5 | SC | 3.3Vdc | 10mins | -- | -- | -- | -- | Unit shut down immediately, no damage, no hazardous. |
| R7 | SC | 3.3Vdc | 10mins | -- | -- | -- | -- | Unit shut down immediately, no damage, no hazardous. |

Supplementary information:
Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column “Abnormal/Fault.” Specify if test condition by indicating “Abnormal” then the condition for a Clause B.3 test or “Single Fault” then the condition for Clause B.4.

1) SC: Short-circuited; OC: Open-circuited; OL: Overloaded; BL: Blocked.
2) The test result shown all safeguards remained effective and didn’t lead to a single fault condition during abnormal operating condition; In addition all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions.
3) The test result showed no Class 1 or 2 energy source become Class 3 level during and after single fault condition.
4) The overloaded condition is applied according to annex G.5.3.3.


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| **Annex M** | **TABLE: Batteries** | **N/A** |
|---|---|---|
| The tests of Annex M are applicable only when appropriate battery data is not available | | No |
| Is it possible to install the battery in a reverse polarity position? .....: | | No |

| | Non-rechargeable batteries | | | Rechargeable batteries | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Discharging | | Un-intentional charging | Charging | | Discharging | | Reversed charging | |
| | Meas. current | Manuf. Specs. | | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. |
| Max. current during normal condition | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Max. current during fault condition | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| Test results: | | Verdict |
|---|---|---|
| - Chemical leaks | | N/A |
| - Explosion of the battery | | N/A |
| - Emission of flame or expulsion of molten metal | | N/A |
| - Electric strength tests of equipment after completion of tests | | N/A |
| Supplementary information: | | |

| **Annex M.4** | **Table: Additional safeguards for equipment containing secondary lithium batteries** | **N/A** |
|---|---|---|

| Battery/Cell No. | Test conditions | Measurements | | | Observation |
|---|---|---|---|---|---|
| | | U | I (A) | Temp (C) | |
| -- | Normal | -- | -- | -- | -- |
| -- | Abnormal | -- | -- | -- | -- |
| -- | Single fault –SC/OC | -- | -- | -- | -- |
| Supplementary Information: | | | | | |

| Battery identification | Charging at $T_{lowest}$ (°C) | Observation | Charging at $T_{highest}$ (°C) | Observation |
|---|---|---|---|---|
| -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- |
| Supplementary Information: | | | | |


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| Annex Q.1 | TABLE: Circuits intended for interconnection with building wiring (LPS) | N/A |
|---|---|---|

Note: Measured UOC (V) with all load circuits disconnected:

| Output Circuit | Components | $U_{oc}$ (V) | $I_{sc}$ (A) | | S (VA) | |
|---|---|---|---|---|---|---|
| | | | Meas. | Limit | Meas. | Limit |
| -- | -- | -- | -- | 8 | -- | 100 |
| -- | -- | -- | -- | 8 | -- | 100 |

Supplementary Information: SC=Short circuit

| T.2, T.3, T.4, T.5 | TABLE: Steady force test | N/A |
|---|---|---|

| Part/Location | Material | Thickness (mm) | Force (N) | Test Duration (sec) | Observation |
|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- |

Supplementary information:

| T.6, T.9 | TABLE: Impact tests | N/A |
|---|---|---|

| Part/Location | Material | Thickness (mm) | Vertical distance (mm) | Observation |
|---|---|---|---|---|
| -- | -- | -- | -- | -- |

Supplementary information:

| T.7 | TABLE: Drop test | N/A |
|---|---|---|

| XPart/Location | Material | Thickness (mm) | Drop Height (mm) | Observation |
|---|---|---|---|---|
| -- | -- | -- | -- | -- |

Supplementary information:

| T.8 | TABLE: Stress relief test | N/A |
|---|---|---|

| Part/Location | Material | Thickness (mm) | Oven Temperature (°C) | Duration (h) | Observation |
|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- |

Supplementary information:

| | TABLE: transformers (T1) | N/A |
|---|---|---|

| Loc. | Tested insulation | Working voltage peak / V | Working voltage rms / V | Required electric strength | Required clearance / mm | Required creepage distance / mm | Required distance thr. insul. |
|---|---|---|---|---|---|---|---|



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- | --- | --- |

| Loc. | Tested insulation | Test voltage/ V | Measured clearance / mm | Measured creepage dist./ mm | Measured distance thr. insul. / mm; number of layers |
|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- |

Supplementary information:

Construction:



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**Attachment No. 1**

**ATTACHMENT TO TEST REPORT**

**IEC 62368-1**

**EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

**(Audio/video, information and communication technology equipment - Part 1: Safety requirements)**

**Differences according to**.....: EN 62368-1:2014+A11:2017

**Attachment Form No**. .....: EU_GD_IEC62368_1B_II

**Attachment Originator .....**: Nemko AS

**Master Attachment** .....: Date 2017-09-22



| | **CENELEC COMMON MODIFICATIONS (EN)** | |
|---|---|---|
| | Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2014 are prefixed "Z". | P |
| CONTENTS | **Add** the following annexes:<br>Annex ZA (normative) Normative references to international publications with their corresponding European publications<br>Annex ZB (normative) Special national conditions<br>Annex ZC (informative) A-deviations<br>Annex ZD (informative) IEC and CENELEC code designations for flexible cords | P |
| | **Delete** all the "country" notes in the reference document (IEC 62368-1:2014) according to the following list: | P |

| | | | | | |
|---|---|---|---|---|---|
| 0.2.1 | Note | 1 | Note 3 | 4.1.15 | Note |
| 4.7.3 | Note 1 and 2 | 5.2.2.2 | Note | 5.4.2.3.2.2 Table 13 | Note c |
| 5.4.2.3.2.4 | Note 1 and 3 | 5.4.2.5 | Note 2 | 5.4.5.1 | Note |
| 5.5.2.1 | Note | 5.5.6 | Note | 5.6.4.2.1 | Note 2 and 3 |
| 5.7.5 | Note | 5.7.6.1 | Note 1 and 2 | 10.2.1 Table 39 | Note 2, 3 and 4 |
| 10.5.3 | Note 2 | 10.6.2.1 | Note 3 | F.3.3.6 | Note 3 |

| | | | |
|---|---|---|---|
| | For special national conditions, see Annex ZB. | | P |
| 1 | **Add** the following note:<br>NOTE Z1 The use of certain substances in | | P |



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| | | | |
|---|---|---|---|
| | electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU. | | |
| 4.Z1 | **Add** the following new subclause after 4.9:<br>To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. **mains**, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):<br>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment;<br>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;<br>c) it is permitted for **pluggable equipment type B** or **permanently connected equipment**, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.<br>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet. | | N/A |
| 5.4.2.3.2.4 | **Add** the following to the end of this subclause:<br>The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009. | | N/A |
| 10.2.1 | Add the following to [c] and [d] in table 39:<br>For additional requirements, see 10.5.1. | | N/A |
| 10.5.1 | **Add** the following after the first paragraph:<br>*For RS 1 compliance is checked by measurement under the following conditions:*<br>*In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or presets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.*<br>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.<br>*The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at* | | N/A |


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| | *any point 10 cm from the outer surface of the apparatus.*<br>*Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.*<br>*For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.*<br>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996. | | |
| 10.6.1 | **Add** the following paragraph to the end of the subclause:<br>EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply. | | N/A |
| 10.Z1 | **Add** the following new subclause after 10.6.5.<br>**10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz**<br>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).<br>For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body-mounted devices, attention is drawn to EN 50360 and EN 50566 | | N/A |
| G.7.1 | **Add** the following note:<br>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD. | | N/A |
| Bibliography | **Add** the following standards:<br>**Add** the following notes for the standards indicated:<br>IEC 60130-9 NOTE Harmonized as EN 60130-9.<br>IEC 60269-2 NOTE Harmonized as HD 60269-2.<br>IEC 60309-1 NOTE Harmonized as EN 60309-1.<br>IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series.<br>IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4.<br>IEC 60664-5 NOTE Harmonized as EN 60664-5.<br>IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified).<br>IEC 61508-1 NOTE Harmonized as EN 61508-1.<br>IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1.<br>IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4.<br>IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6.<br>IEC 61643-1 NOTE Harmonized as EN 61643-1. | | N/A |


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| | IEC 61643-21 NOTE Harmonized as EN 61643-21.<br>IEC 61643-311 NOTE Harmonized as EN 61643-311.<br>IEC 61643-321 NOTE Harmonized as EN 61643-321.<br>IEC 61643-331 NOTE Harmonized as EN 61643-331. | | |
| **ZB** | **ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)** | | N/A |
| 4.1.15 | **Denmark, Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>**Class I pluggable equipment type A** intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and **accessible** parts, have a marking stating that the equipment shall be connected to an earthed **mains** socket-outlet.<br>The marking text in the applicable countries shall be as follows:<br>In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.”<br>In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"<br>In **Norway**: “Apparatet må tilkoples jordet stikkontakt”<br>In **Sweden**: “Apparaten skall anslutas till jordat uttag” | | N/A |
| 4.7.3 | **United Kingdom**<br>To the end of the subclause the following is added:<br>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex | | N/A |
| 5.2.2.2 | **Denmark**<br>After the 2nd paragraph add the following:<br>A warning (marking **safeguard**) for high **touch current** is required if the **touch current** exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | | N/A |
| 5.4.11.1 and Annex G | **Finland and Sweden**<br>To the end of the subclause the following is added:<br>For separation of the telecommunication network from earth the following is applicable:<br>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either<br>• two layers of thin sheet material, each of which shall pass the electric strength test below, or<br>• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. | | N/A |


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| | If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition<br>• passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and<br>• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5kV.<br>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.<br>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:<br>• the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11;<br>• the additional testing shall be performed on all the test specimens as described in EN 60384-14;<br>the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14. | | |
| 5.5.2.1 | **Norway**<br>After the 3rd paragraph the following is added:<br>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V). | | N/A |
| 5.5.6 | **Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>Resistors used as **basic safeguard** or bridging **basic insulation** in **class I pluggable equipment type A** shall comply with G.10.1 and the test of G.10.2. | | N/A |
| 5.6.1 | **Denmark**<br>**Add** to the end of the subclause<br>Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment.<br>*Justification:*<br>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse. | | N/A |


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| | | | |
|---|---|---|---|
| 5.6.4.2.1 | **Ireland and United Kingdom**<br>After the indent for **pluggable equipment type A**, the following is added:<br>– the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug. | | N/A |
| 5.6.5.1 | To the second paragraph the following is added:<br>The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is:<br>1,25 $mm^2$ to 1,5 $mm^2$ in cross-sectional area. | | N/A |
| 5.7.5 | **Denmark**<br>To the end of the subclause the following is added:<br>The installation instruction shall be affixed to the equipment if the **protective conductor current** exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | | N/A |
| 5.7.6.1 | **Norway and Sweden**<br>To the end of the subclause the following is added:<br>The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.<br>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.<br>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:<br>“Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)”<br>NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. | | N/A |


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| | | | |
|---|---|---|---|
| | Translation to Norwegian (the Swedish text will also be accepted in Norway):<br>“Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.”<br>Translation to Swedish:<br>”Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.”. | | |
| 5.7.6.2 | **Denmark**<br>To the end of the subclause the following is added:<br>The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA . | | N/A |
| B.3.1 and B.4 | **Ireland and United Kingdom**<br>The following is applicable:<br>To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met | | N/A |
| G.4.2 | **Denmark**<br>To the end of the subclause the following is added:<br>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.<br>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.<br>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2. | | N/A |


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| | | | |
|---|---|---|---|
| | Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.<br>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.<br>Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a<br>*Justification:*<br>Heavy Current Regulations, Section 6c | | |
| G.4.2 | **United Kingdom**<br>To the end of the subclause the following is added:<br>The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply. | | N/A |
| G.7.1 | **United Kingdom**<br>To the first paragraph the following is added:<br>Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations.<br>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug. | | N/A |
| G.7.1 | **Ireland**<br>To the first paragraph the following is added:<br>Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard | | N/A |
| G.7.2 | **Ireland and United Kingdom**<br>To the first paragraph the following is added:<br>A power supply cord with a conductor of 1,25 $mm^2$ is allowed for equipment which is rated over 10 A and up to and including 13 A. | | N/A |


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Tel: +(86) 0755-8259 1330 | Fax: +(86) 0755-8259 1332 | E-mail: webmaster@lcs-cert.com | http:// www.lcs-cert.com

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|---|---|---|---|
| *ZC* | *ANNEX ZC, NATIONAL DEVIATIONS (EN)* | | |
| 10.5.2 | **Germany**<br>The following requirement applies:<br>For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking.<br>*Justification:*<br>German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.<br>**NOTE** Contact address:<br>Physikalisch-Technische Bundesanstalt,<br>Bundesallee 100,<br>D-38116 Braunschweig,<br>Tel.: Int +49-531-592-6320,<br>Internet: http://www.ptb.de | | N/A |

Note: Before placing the products in the different countries, the manufacturer must ensure that:

1. Operating Instructions, Ratings Labels and Warnings Labels written in an Accepted or Official Language of the county in question.
2. The equipment complies with the National Standards and/or Electrical Codes of the country in question.
3. Mains plugs and power cordset should be assessed to the national standard.


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Details of: External View

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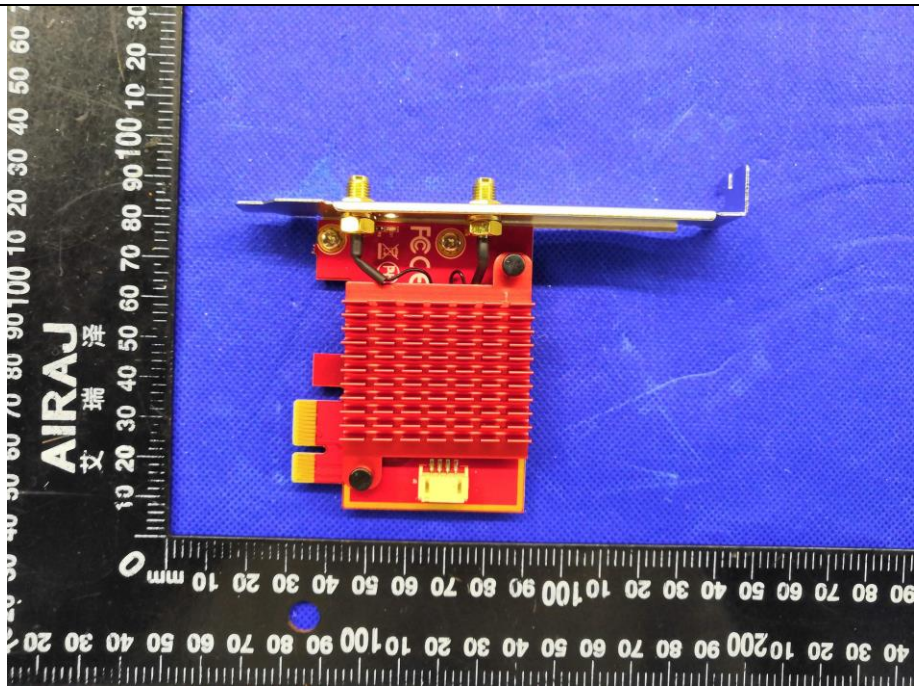


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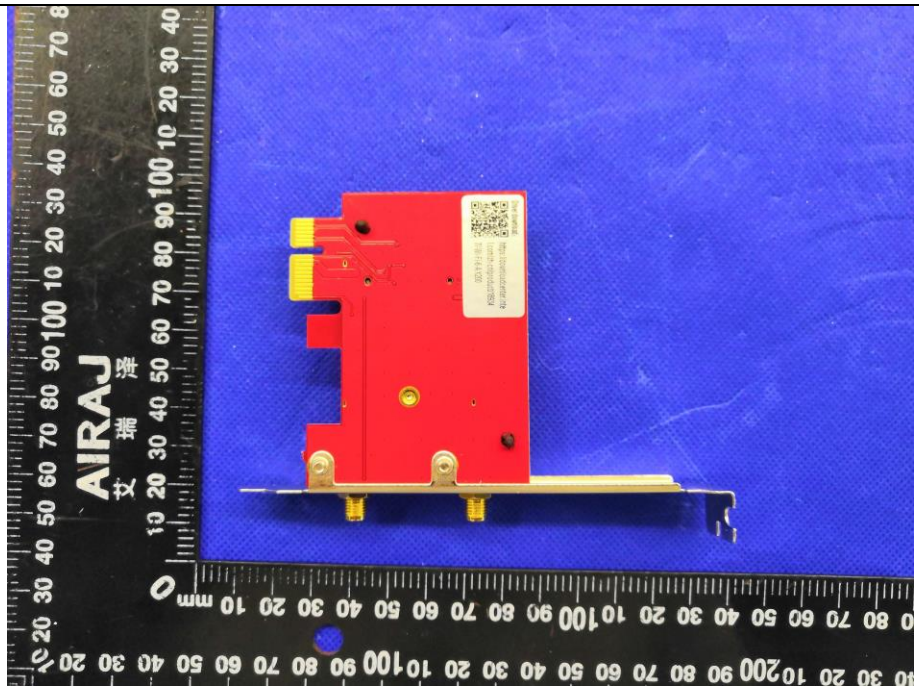


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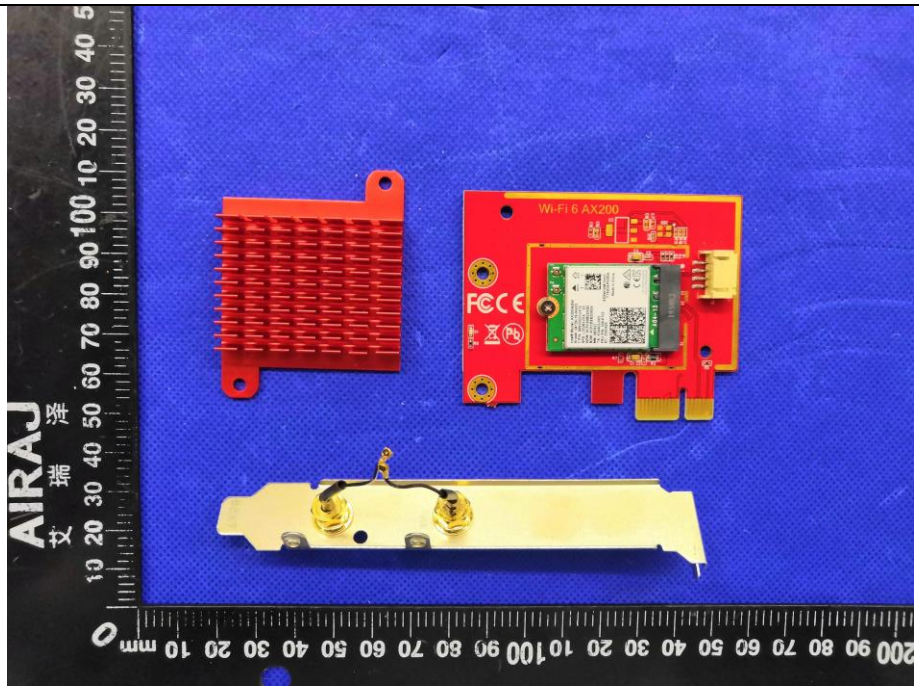



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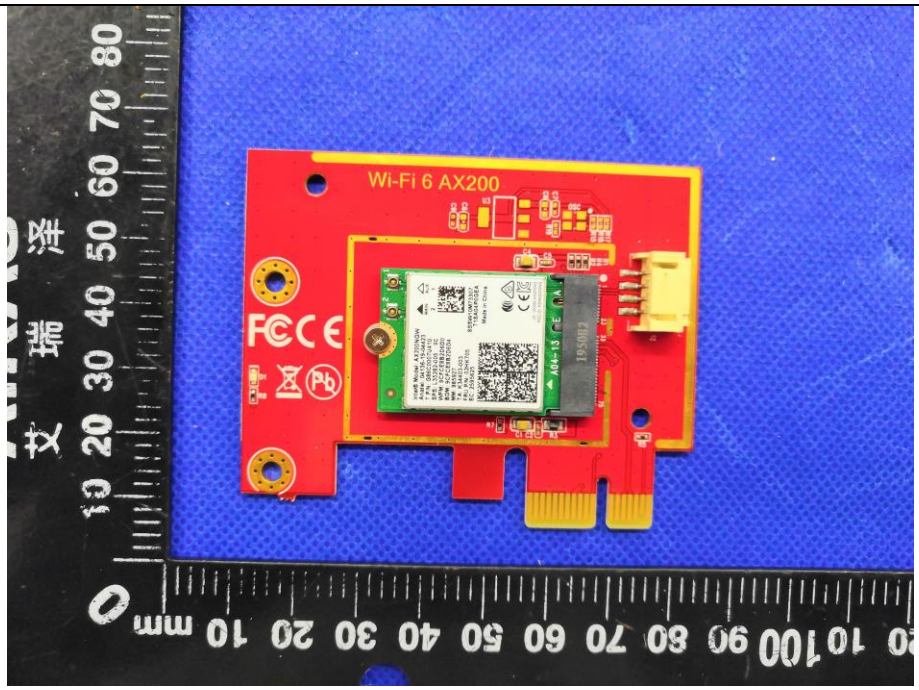
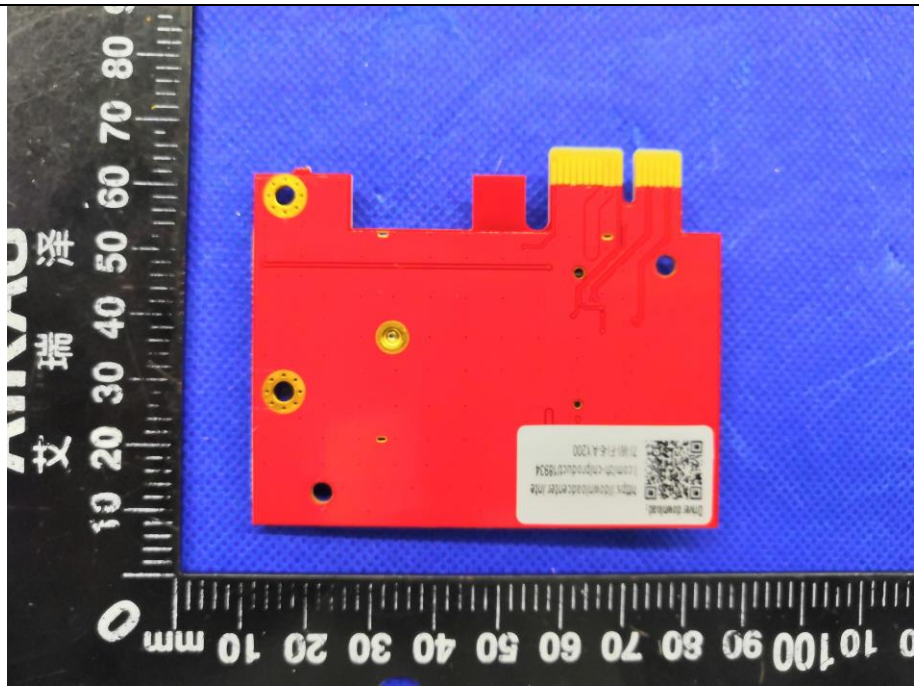
Details of: PCB View




Details of: PCB View



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