

TEST REPORT

EN 62368-1

Audio/video, information and communication technology equipment –

Part 1: Safety requirements

Report reference No: RDG190802003-SF

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Testing laboratory: Bay Area Compliance Laboratories Corp. (Dongguan)

Address: No.69, Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan,
Guangdong, China

Testing location: See above

Applicant's name: Shenzhen Sonoff Technologies Co., Ltd.

Address.....: Room 1001, 10F, Building 8, Lianhua Industrial Park, Longyuan
Road, Longhua District, Shenzhen, GD, China

Manufacturer's name.....: Same as applicant

Address.....: Same as applicant

Factory's name: N/A

Address.....: N/A

Standard: EN 62368-1:2014+A11:2017

Test sample(s) received: 2019-08-02

Test in period.....: 2019-08-02 to 2019-08-26

Procedure deviation: N/A

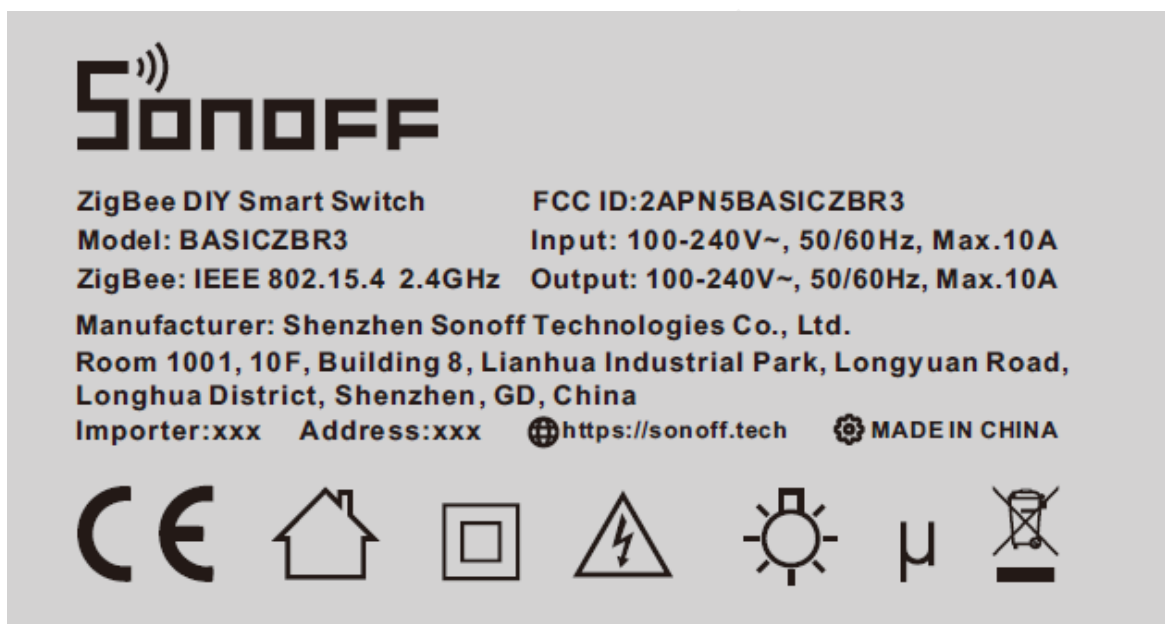
Non-standard test method: N/A

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the specific product described herein. It must not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

| | |
|---------------------------|--|
| Type of test object | : ZigBee DIY Smart Switch |
| Trademark | : SONOFF |
| Tested model | : BASICZBR3 |
| Manufacturer..... | : Same as applicant |
| Rating..... | : EUT Input: 100-240V~, 50/60Hz, Max.10A; Output: 100-240V~, 50/60Hz, Max.10A |

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Note:

- The CE marking and WEEE symbol (if any) should be at least 5.0mm and 7.0mm respectively in height.

| | |
|--|--|
| Test item particulars.....: | |
| Classification of use by.....: | <input checked="" type="checkbox"/> Ordinary person <input type="checkbox"/> Instructed person <input type="checkbox"/> Skilled person <input type="checkbox"/> Children likely to be present |
| Supply Connection.....: | <input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains <input type="checkbox"/> External Circuit - not directly connected to the mains <input type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input checked="" type="checkbox"/> ES3 |
| Supply % Tolerance.....: | <input checked="" type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> +__%/-__% <input type="checkbox"/> None |
| Supply Connection - Type | <input type="checkbox"/> pluggable equipment type A – <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> mating connector <input type="checkbox"/> pluggable equipment type B – <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input type="checkbox"/> other: |
| Considered current rating of protective device as part of building or equipment installation.....: | <u>16</u> A; Installation location: <input checked="" type="checkbox"/> building; <input type="checkbox"/> equipment |
| Equipment mobility.....: | <input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input checked="" type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in <input type="checkbox"/> rack-mounting <input checked="" type="checkbox"/> wall-mounted |
| Over voltage category (OVC) | <input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: |
| Class of equipment.....: | <input type="checkbox"/> Class I <input checked="" type="checkbox"/> Class II <input type="checkbox"/> Class III |
| Access location.....: | <input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> N/A |
| Pollution degree (PD) | <input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3 |
| Manufacturer's specified maximum operating ambient.....: | 40°C |
| IP protection class | <input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP__ |
| Power Systems | <input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - ____ V _{L-L} |
| Altitude during operation (m) | <input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> ____ m |
| Altitude of test laboratory (m) | <input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> ____ m |
| Mass of equipment (kg).....: | <input checked="" type="checkbox"/> 0.054kg |

Possible test case verdicts.....:

- test case does not apply to the test object.....: N(N/A)
- test object does meet the requirement.....: P(ass)
- test object does not meet the requirement.....: F(ail)

General remarks:

"(see remark #)" refers to a remark appended to the report.

(see appended table)" refers to a table appended to the report.

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

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Throughout this report a ☐comma/ ☒point is used as the decimal separator.

Summary of testing:

All tests were performed at the worst case and all test results complied with the standard on the cover page.

General product information:

1. The product is designed as ZigBee DIY Smart Switch, model is BASICZBR3, information and communication technology equipment.
2. The product is class II equipment, supplied by 100-240V AC mains.
3. All the circuits of EUT are considered as primary circuits.
4. The ZigBee DIY Smart Switch's top enclosure is secured to bottom enclosure by screws.
5. Before placing the products in the different countries, the manufacturer must ensure that: Operating Instructions, Ratings Labels and Warnings Labels are in an Accepted or Official Language of the country in question; The equipment complies with the National Standards and/or Electrical Codes of the country, province or city or in question.

| ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE: | |
|--|-----------------------------------|
| <p>(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (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.)</p> | |
| <p>Electrically-caused injury (Clause 5): (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input ES1</p> | |
| Source of electrical energy | Corresponding classification (ES) |
| All internal circuits | ES3 |
| <p>Electrically-caused fire (Clause 6): (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts): PS2</p> | |
| Source of power or PIS | Corresponding classification (PS) |
| All internal circuits | PS3 |
| <p>Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component Glycol</p> | |
| Source of hazardous substances | Corresponding chemical |
| N/A | N/A |
| <p>Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit MS2</p> | |
| Source of kinetic/mechanical energy | Corresponding classification (MS) |
| Sharp edges and corners do not cause pain or injury | MS1 |
| Equipment mass < 7kg | MS1 |
| Installation height > 2m | MS3 |
| <p>Thermal burn injury (Clause 9) (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.) Example: Hand-held scanner – thermoplastic enclosure TS1</p> | |
| Source of thermal energy | Corresponding classification (TS) |
| External surfaces | TS1 for accessible parts |
| <p>Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product RS1</p> | |
| Type of radiation | Corresponding classification (RS) |
| Indicating LED is used | RS1 |

| ENERGY SOURCE DIAGRAM |
|---|
| Indicate which energy sources are included in the energy source diagram. Insert diagram below |
| ES3, PS3, MS3, TS1, RS1 for all circuits <input checked="" type="checkbox"/> ES <input checked="" type="checkbox"/> PS <input checked="" type="checkbox"/> MS <input checked="" type="checkbox"/> TS <input checked="" type="checkbox"/> RS |

| 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 | ES3: all internal circuits | See clause 5.3 | Enclosure | Enclosure |
| 6.1 | Electrically-caused fire | | | |
| Material part (e.g. mouse enclosure) | Energy Source (PS2: 100 Watt circuit) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| Enclosure | PS3: all internal circuits | See clause 6.3 | See clause 6.4 | -- |
| 7.1 | Injury caused by hazardous substances | | | |
| Body Part (e.g., skilled) | Energy Source (hazardous material) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| -- | -- | -- | -- | -- |
| 8.1 | Mechanically-caused injury | | | |
| Body Part (e.g. Ordinary) | Energy Source (MS3: High Pressure Lamp) | Safeguards | | |
| | | Basic | Supplementary | Reinforced (Enclosure) |
| Ordinary | MS1: Equipment mass<7kg | -- | -- | -- |
| Ordinary | MS1: edges and corners | -- | -- | -- |
| Ordinary | MS3: Installation height > 2m | -- | -- | -- |
| 9.1 | Thermal Burn | | | |
| Body Part (e.g., Ordinary) | Energy Source (TS2) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| Ordinary | TS1: plastic enclosure | -- | -- | -- |
| 10.1 | Radiation | | | |

| Body Part (e.g., Ordinary) | Energy Source (Output from audio port) | Safeguards | | |
|---|---|------------|---------------|------------|
| | | Basic | Supplementary | Reinforced |
| Indicating LED is used | RS1 | -- | -- | -- |
| Supplementary Information: (1) See attached energy source diagram for additional details. (2) "N" – Normal Condition; "A" – Abnormal Condition; "S" Single Fault. | | | | |

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|------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4 | GENERAL REQUIREMENTS | | P |
| 4.1.1 | Acceptance of materials, components and subassemblies | | P |
| 4.1.2 | Use of components | | P |
| 4.1.3 | Equipment design and construction | | P |
| 4.1.15 | Markings and instructions..... : | (See Annex F) | P |
| 4.4.4 | Safeguard robustness | See below. | P |
| 4.4.4.2 | Steady force tests..... : | (See Annex T.2 and T.5) | P |
| 4.4.4.3 | Drop tests : | | N |
| 4.4.4.4 | Impact tests : | (See Annex T.6) | P |
| 4.4.4.5 | Internal accessible safeguard enclosure and barrier tests..... : | | N |
| 4.4.4.6 | Glass Impact tests..... : | | N |
| 4.4.4.7 | Thermoplastic material tests : | After 7 hours and cooling down to room temperature, no shrinkage, distortion or loosening any enclosure part was noticeable on the EUT. Test was performed for all sources of enclosure material, detail see Annex T.8. | P |
| 4.4.4.8 | Air comprising a safeguard..... : | (See Annex T) | P |
| 4.4.4.9 | Accessibility and safeguard effectiveness | Complied. | P |
| 4.5 | Explosion | | P |
| 4.6 | Fixing of conductors | | P |
| 4.6.1 | Fix conductors not to defeat a safeguard | | P |
| 4.6.2 | 10 N force test applied to : | Internal conductor | P |
| 4.7 | Equipment for direct insertion into mains socket - outlets | | N |
| 4.7.2 | Mains plug part complies with the relevant standard..... : | Should be evaluated in final destination | N |
| 4.7.3 | Torque (Nm) : | | N |
| 4.8 | Products containing coin/button cell batteries | | N |
| 4.8.2 | Instructional safeguard | | N |
| 4.8.3 | Battery Compartment Construction | | N |
| | Means to reduce the possibility of children removing the battery..... : | | — |
| 4.8.4 | Battery Compartment Mechanical Tests : | | N |
| 4.8.5 | Battery Accessibility | | N |

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|------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.9 | Likelihood of fire or shock due to entry of conductive object.....: | | N |
| 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 | See below | P |
| 5.2.2.2 | Steady-state voltage and current | See appended table 5.2 | P |
| 5.2.2.3 | Capacitance limits..... | See appended table 5.2 | P |
| 5.2.2.4 | Single pulse limits | | N |
| 5.2.2.5 | Limits for repetitive pulses | | N |
| 5.2.2.6 | Ringing signals | | N |
| 5.2.2.7 | Audio signals | | N |
| 5.3 | Protection against electrical energy sources | | P |
| 5.3.1 | General Requirements for accessible parts to ordinary, instructed and skilled persons | | P |
| 5.3.2.1 | Accessibility to electrical energy sources and safeguards | | P |
| 5.3.2.2 | Contact requirements | See below | P |
| | a) Test with test probe from Annex V..... | No access with test probe to any ES3 circuit or parts. | P |
| | b) Electric strength test potential (V) | | N |
| | c) Air gap (mm) | | N |
| 5.3.2.4 | Terminals for connecting stripped wire | | N |
| 5.4 | Insulation materials and requirements | | P |
| 5.4.1.2 | Properties of insulating material | | P |
| 5.4.1.3 | Humidity conditioning | (See appended table 5.4.8) | P |
| 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 | | N |
| 5.4.1.5.3 | Thermal cycling | | N |
| 5.4.1.6 | Insulation in transformers with varying dimensions | | N |
| 5.4.1.7 | Insulation in circuits generating starting pulses | | N |
| 5.4.1.8 | Determination of working voltage | | P |
| 5.4.1.9 | Insulating surfaces | | P |
| 5.4.1.10 | Thermoplastic parts on which conductive metallic parts are directly mounted | | P |

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|------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.1.10.2 | Vicat softening temperature | | N |
| 5.4.1.10.3 | Ball pressure | (See appended table 5.4.1.10.3) | P |
| 5.4.2 | Clearances | | P |
| 5.4.2.2 | Determining clearance using peak working voltage | | P |
| 5.4.2.3 | Determining clearance using required withstand voltage | (See appended table 5.4.2.2, 5.4.2.4 and 5.4.3) | P |
| | a) a.c. mains transient voltage..... | 2500 Vpk considered for Overvoltage Cat. II | — |
| | b) d.c. mains transient voltage | | — |
| | c) external circuit transient voltage..... | | — |
| | d) transient voltage determined by measurement | | — |
| 5.4.2.4 | Determining the adequacy of a clearance using an electric strength test | Using procedure 2 to determine the clearance according to 5.4.2.3. | N |
| 5.4.2.5 | Multiplication factors for clearances and test voltages | | N |
| 5.4.3 | Creepage distances..... | (See appended table 5.4.2.2, 5.4.2.4 and 5.4.3) | P |
| 5.4.3.1 | General | | P |
| 5.4.3.3 | Material Group | IIIb | — |
| 5.4.4 | Solid insulation | | P |
| 5.4.4.2 | Minimum distance through insulation | (See appended table 5.4.4.2) | P |
| 5.4.4.3 | Insulation compound forming solid insulation | | N |
| 5.4.4.4 | Solid insulation in semiconductor devices | | N |
| 5.4.4.5 | Cemented joints | | N |
| 5.4.4.6 | Thin sheet material | | N |
| 5.4.4.6.1 | General requirements | | N |
| 5.4.4.6.2 | Separable thin sheet material | | N |
| | Number of layers (pcs) | | N |
| 5.4.4.6.3 | Non-separable thin sheet material | | N |
| 5.4.4.6.4 | Standard test procedure for non-separable thin sheet material | | N |
| 5.4.4.6.5 | Mandrel test | | N |
| 5.4.4.7 | Solid insulation in wound components | (See Annex G.5) | P |
| 5.4.4.9 | Solid insulation at frequencies >30 kHz | | N |
| 5.4.5 | Antenna terminal insulation | | N |
| 5.4.5.1 | General | | N |
| 5.4.5.2 | Voltage surge test | | N |

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|------------|--|------------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Insulation resistance (MΩ) | | — |
| 5.4.6 | Insulation of internal wire as part of supplementary safeguard..... | | N |
| 5.4.7 | Tests for semiconductor components and for cemented joints | | N |
| 5.4.8 | Humidity conditioning | | P |
| | Relative humidity (%) | 93 | — |
| | Temperature (°C) | 40 | — |
| | Duration (h) | 120 | — |
| 5.4.9 | Electric strength test..... | (See appended table 5.4.9) | P |
| 5.4.9.1 | Test procedure for a solid insulation type test | | P |
| 5.4.9.2 | Test procedure for routine tests | | N |
| 5.4.10 | Protection against transient voltages between external circuit | | N |
| 5.4.10.1 | Parts and circuits separated from external circuits | | N |
| 5.4.10.2 | Test methods | | N |
| 5.4.10.2.1 | General | | N |
| 5.4.10.2.2 | Impulse test | | N |
| 5.4.10.2.3 | Steady-state test | | N |
| 5.4.11 | Insulation between external circuits and earthed circuitry | | N |
| 5.4.11.1 | Exceptions to separation between external circuits and earth | | N |
| 5.4.11.2 | Requirements | | N |
| | Rated operating voltage U_{op} (V) | | — |
| | Nominal voltage U_{peak} (V) | | — |
| | Max increase due to variation U_{sp} | | — |
| | Max increase due to ageing ΔU_{sa} | | — |
| | $U_{op} = U_{peak} + \Delta U_{sp} + \Delta U_{sa}$ | | — |
| 5.5 | Components as safeguards | | |
| 5.5.1 | General | | P |
| 5.5.2 | Capacitors and RC units | | P |
| 5.5.2.1 | General requirement | | P |
| 5.5.2.2 | Safeguards against capacitor discharge after disconnection of a connector..... | | P |
| 5.5.3 | Transformers | not used as a Insulation safeguard | P |
| 5.5.4 | Optocouplers | | N |

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|------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.5.5 | Relays | Complied | P |
| 5.5.6 | Resistors | Complied | P |
| 5.5.7 | SPD's | | P |
| 5.5.7.1 | Use of an SPD connected to reliable earthing | | N |
| 5.5.7.2 | Use of an SPD between mains and protective earth | | N |
| 5.5.8 | Insulation between the mains and external circuit consisting of a coaxial cable..... : | | N |
| 5.6 | Protective conductor | | N |
| 5.6.2 | Requirement for protective conductors | | N |
| 5.6.2.1 | General requirements | | N |
| 5.6.2.2 | Colour of insulation | | N |
| 5.6.3 | Requirement for protective earthing conductors | | N |
| | Protective earthing conductor size (mm ²) : | | — |
| 5.6.4 | Requirement for protective bonding conductors | | N |
| 5.6.4.1 | Protective bonding conductors | | N |
| | Protective bonding conductor size (mm ²). : | | — |
| | Protective current rating (A) : | | — |
| 5.6.4.3 | Current limiting and overcurrent protective devices | | N |
| 5.6.5 | Terminals for protective conductors | | N |
| 5.6.5.1 | Requirement | | N |
| | Conductor size (mm ²), nominal thread diameter (mm). : | | N |
| 5.6.5.2 | Corrosion | | N |
| 5.6.6 | Resistance of the protective system | | N |
| 5.6.6.1 | Requirements | | N |
| 5.6.6.2 | Test Method Resistance (Ω) : | | N |
| 5.6.7 | Reliable earthing | | N |
| 5.7 | Prospective touch voltage, touch current and protective conductor current | | P |
| 5.7.2 | Measuring devices and networks | Figure 4 of IEC 60990 was used in determining of the limit of ES1. | P |
| 5.7.2.1 | Measurement of touch current : | (See appended table 5.7.2.2, 5.7.4) | P |
| 5.7.2.2 | Measurement of prospective touch voltage | | P |
| 5.7.3 | Equipment set-up, supply connections and earth connections | Clause 4, 5.3 and 5.4 of IEC 60990:1999 applied. | P |

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|------------|---|------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | System of interconnected equipment (separate connections/single connection) | Single equipment | — |
| | Multiple connections to mains (one connection at a time/simultaneous connections) | Single equipment | — |
| 5.7.4 | Earthed conductive accessible parts | | N |
| 5.7.5 | Protective conductor current | | N |
| | Supply Voltage (V) | | — |
| | Measured current (mA) | | — |
| | Instructional Safeguard | | N |
| 5.7.6 | Prospective touch voltage and touch current due to external circuits | | N |
| 5.7.6.1 | Touch current from coaxial cables | | N |
| 5.7.6.2 | Prospective touch voltage and touch current from external circuits | | N |
| 5.7.7 | Summation of touch currents from external circuits | | N |
| | a) Equipment with earthed external circuits Measured current (mA) | | N |
| | b) Equipment whose external circuits are not referenced to earth. Measured current (mA) | | N |

| | | | |
|-----------|--|--|---|
| 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 | PS3 | P |
| 6.2.2.1 | General | See below. | 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 | | N |
| 6.2.2.5 | PS2 | | N |
| 6.2.2.6 | PS3 | (See appended table 6.2.2) | P |
| 6.2.3 | Classification of potential ignition sources | | P |
| 6.2.3.1 | Arcing PIS | (See appended table 6.2.3) | P |
| 6.2.3.2 | Resistive PIS | (See appended table 6.2.3) | P |
| 6.3 | Safeguards against fire under normal operating and abnormal operating conditions | | P |
| 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 | No ignition, no temperature more than 300 °C | P |

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|------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.3.1 (b) | Combustible materials outside fire enclosure | No such material. | N |
| 6.4 | Safeguards against fire under single fault conditions | | P |
| 6.4.1 | Safeguard Method | Control fire spread | P |
| 6.4.2 | Reduction of the likelihood of ignition under single fault conditions in PS1 circuits | | N |
| 6.4.3 | Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits | | N |
| 6.4.3.1 | General | | N |
| 6.4.3.2 | Supplementary Safeguards | | N |
| | Special conditions if conductors on printed boards are opened or peeled | | N |
| 6.4.3.3 | Single Fault Conditions | | N |
| | Special conditions for temperature limited by fuse | | N |
| 6.4.4 | Control of fire spread in PS1 circuits | | N |
| 6.4.5 | Control of fire spread in PS2 circuits | | N |
| 6.4.5.2 | Supplementary safeguards | | N |
| 6.4.6 | Control of fire spread in PS3 circuit | | P |
| 6.4.7 | Separation of combustible materials from a PIS | Fire enclosure provided. | N |
| 6.4.7.1 | General..... | | N |
| 6.4.7.2 | Separation by distance | | N |
| 6.4.7.3 | Separation by a fire barrier | | N |
| 6.4.8 | Fire enclosures and fire barriers | See below | P |
| 6.4.8.1 | Fire enclosure and fire barrier material properties | The V-0 material is used for the fire enclosure (overall enclosure). | P |
| 6.4.8.2.1 | Requirements for a fire barrier | | N |
| 6.4.8.2.2 | Requirements for a fire enclosure | | P |
| 6.4.8.3 | Constructional requirements for a fire enclosure and a fire barrier | | N |
| 6.4.8.3.1 | Fire enclosure and fire barrier openings | | N |
| 6.4.8.3.2 | Fire barrier dimensions | | N |
| 6.4.8.3.3 | Top Openings in Fire Enclosure: dimensions (mm) | | N |
| | Needle Flame test | | N |
| 6.4.8.3.4 | Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) | No opening | N |
| | Flammability tests for the bottom of a fire enclosure | | N |
| 6.4.8.3.5 | Integrity of the fire enclosure, condition met: a), b) or c) | | N |

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|------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4.8.4 | Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating.....: | Fire enclosure is made of V-0 material. | P |
| 6.5 | Internal and external wiring | | N |
| 6.5.1 | Requirements | | N |
| 6.5.2 | Cross-sectional area (mm ²): | | — |
| 6.5.3 | Requirements for interconnection to building wiring: | | N |
| 6.6 | Safeguards against fire due to connection to additional equipment | | N |
| | External port limited to PS2 or complies with Clause Q.1 | | N |

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

| | | | |
|----------|---|---------------------------------------|---|
| 8 | MECHANICALLY-CAUSED INJURY | | P |
| 8.1 | General | See below. | P |
| 8.2 | Mechanical energy source classifications | MS3 | P |
| 8.3 | Safeguards against mechanical energy sources | | N |
| 8.4 | Safeguards against parts with sharp edges and corners | Only MS1, no sharp edges and corners. | P |
| 8.4.1 | Safeguards | | N |
| 8.5 | Safeguards against moving parts | No moving parts. | N |
| 8.5.1 | MS2 or MS3 part required to be accessible for the function of the equipment | | N |
| 8.5.2 | Instructional Safeguard: | | — |
| 8.5.4 | Special categories of equipment comprising moving parts | | N |
| 8.5.4.1 | Large data storage equipment | | N |
| 8.5.4.2 | Equipment having electromechanical device for destruction of media | | N |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.5.4.2.1 | Safeguards and Safety Interlocks | | N |
| 8.5.4.2.2 | Instructional safeguards against moving parts | | N |
| | Instructional Safeguard | | — |
| 8.5.4.2.3 | Disconnection from the supply | | N |
| 8.5.4.2.4 | Probe type and force (N) | | N |
| 8.5.5 | High Pressure Lamps | | N |
| 8.5.5.1 | Energy Source Classification | | N |
| 8.5.5.2 | High Pressure Lamp Explosion Test | | N |
| 8.6 | Stability | Mass<7.0kg | P |
| 8.6.1 | Product classification | MS1 | P |
| | Instructional Safeguard | | — |
| 8.6.2 | Static stability | | N |
| 8.6.2.2 | Static stability test | | N |
| | Applied Force | | — |
| 8.6.2.3 | Downward Force Test | | N |
| 8.6.3 | Relocation stability test | | N |
| | Unit configuration during 10° tilt | | — |
| 8.6.4 | Glass slide test | | N |
| 8.6.5 | Horizontal force test (Applied Force) | | N |
| | Position of feet or movable parts | | — |
| 8.7 | Equipment mounted to wall or ceiling | Mass<7kg, May be mounted >2M, MS3 | P |
| 8.7.1 | Mounting Means (Length of screws (mm) and mounting surface) | | P |
| 8.7.2 | Direction and applied force | Four times the weight, each point in the mounting system push force, pull force for 1 min, after test, no hazards. | P |
| 8.8 | Handles strength | | N |
| 8.8.1 | Classification | | N |
| 8.8.2 | Applied Force | | N |
| 8.9 | Wheels or casters attachment requirements | | N |
| 8.9.1 | Classification | | N |
| 8.9.2 | Applied force | | — |
| 8.10 | Carts, stands and similar carriers | | N |
| 8.10.1 | General | | N |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.10.2 | Marking and instructions | | N |
| | Instructional Safeguard | | — |
| 8.10.3 | Cart, stand or carrier loading test and compliance | | N |
| | Applied force | | — |
| 8.10.4 | Cart, stand or carrier impact test | | N |
| 8.10.5 | Mechanical stability | | N |
| | Applied horizontal force (N)..... | | — |
| 8.10.6 | Thermoplastic temperature stability (°C) | | N |
| 8.11 | Mounting means for rack mounted equipment | | N |
| 8.11.1 | General | | N |
| 8.11.2 | Product Classification | | N |
| 8.11.3 | Mechanical strength test, variable <i>N</i> | | N |
| 8.11.4 | Mechanical strength test 250N, including end stops | | N |
| 8.12 | Telescoping or rod antennas..... | | N |
| | Button/Ball diameter (mm) | | — |

| | | | |
|----------|--|--|---|
| 9 | THERMAL BURN INJURY | | P |
| 9.2 | Thermal energy source classifications | The EUT considered be as TS1, refer to the appended table 5.4.1.5, 6.3.2, 9.0, B.2.6, B.2.7 and B3, B4 | P |
| 9.3 | Safeguard against thermal energy sources | Temperature of enclosure classed as TS1. | P |
| 9.4 | Requirements for safeguards | | N |
| 9.4.1 | Equipment safeguard | | N |
| 9.4.2 | Instructional safeguard | | N |

| | | | |
|-----------|--|------------------------|---|
| 10 | RADIATION | | P |
| 10.2 | Radiation energy source classification | See below | P |
| 10.2.1 | General classification | RS1: indicating lights | P |
| 10.3 | Protection against laser radiation | | N |
| | Laser radiation that exists equipment: | | — |
| | Normal, abnormal, single-fault | | N |
| | Instructional safeguard | | — |
| | Tool..... | | — |
| 10.4 | Protection against visible, infrared, and UV radiation | See below | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 10.4.1 | General | RS1: indicating lights | P |
| 10.4.1.a) | RS3 for Ordinary and instructed persons.....: | | N |
| 10.4.1.b) | RS3 accessible to a skilled person | | N |
| | Personal safeguard (PPE) instructional safeguard.....: | | — |
| 10.4.1.c) | Equipment visible, IR, UV does not exceed RS1. : | | N |
| 10.4.1.d) | Normal, abnormal, single-fault conditions | | P |
| 10.4.1.e) | Enclosure material employed as safeguard is opaque.....: | | P |
| 10.4.1.f) | UV attenuation.....: | | N |
| 10.4.1.g) | Materials resistant to degradation UV | | N |
| 10.4.1.h) | Enclosure containment of optical radiation | | N |
| 10.4.1.i) | Exempt Group under normal operating conditions.....: | | N |
| 10.4.2 | Instructional safeguard | | N |
| 10.5 | Protection against x-radiation | | N |
| 10.5.1 | X- radiation energy source that exists equipment: | | N |
| | Normal, abnormal, single fault conditions | | N |
| | Equipment safeguards | | N |
| | Instructional safeguard for skilled person.....: | | N |
| 10.5.3 | Most unfavourable supply voltage to give maximum radiation | | — |
| | Abnormal and single-fault condition | | N |
| | Maximum radiation (pA/kg) | | N |
| 10.6 | Protection against acoustic energy sources | | N |
| 10.6.1 | General | | N |
| 10.6.2 | Classification | | N |
| | Acoustic output, dB(A).....: | | N |
| | Output voltage, unweighted r.m.s.: | | N |
| 10.6.4 | Protection of persons | | N |
| | Instructional safeguards | | N |
| | Equipment safeguard prevent ordinary person to RS2.....: | | — |
| | Means to actively inform user of increase sound pressure.....: | | — |
| | Equipment safeguard prevent ordinary person to RS2.....: | | — |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 10.6.5 | Requirements for listening devices (headphones, earphones, etc.) | | N |
| 10.6.5.1 | Corded passive listening devices with analog input | | N |
| | Input voltage with 94 dB(A) L_{Aeq} acoustic pressure output | | — |
| 10.6.5.2 | Corded listening devices with digital input | | N |
| | Maximum dB(A)..... | | — |
| 10.6.5.3 | Cordless listening device | | N |
| | 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 Test Item Particulars and appended test tables) | P |
| | Audio Amplifiers and equipment with audio amplifiers | | N |
| B.2.3 | Supply voltage and tolerances | | 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) | P |
| B.3.2 | Covering of ventilation openings | | N |
| B.3.3 | D.C. mains polarity test | | N |
| B.3.4 | Setting of voltage selector..... | | N |
| B.3.5 | Maximum load at output terminals | | N |
| B.3.6 | Reverse battery polarity | | N |
| B.3.7 | Abnormal operating conditions as specified in Clause E.2. | No audio amplifier | N |
| B.3.8 | Safeguards functional during and after abnormal operating conditions | (See appended table B.3) | P |
| B.4 | Simulated single fault conditions | | P |
| B.4.2 | Temperature controlling device open or short-circuited | | N |
| B.4.3 | Motor tests | No such components | N |
| B.4.3.1 | Motor blocked or rotor locked increasing the internal ambient temperature | | N |
| B.4.4 | Short circuit of functional insulation | See below. | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| B.4.4.1 | Short circuit of clearances for functional insulation | The functional insulation was short-circuited. See appended table B.4 | P |
| B.4.4.2 | Short circuit of creepage distances for functional insulation | The functional insulation was short-circuited. See appended table B.4 | P |
| B.4.4.3 | Short circuit of functional insulation on coated printed boards | See appended table B.4 | P |
| B.4.5 | Short circuit and interruption of electrodes in tubes and semiconductors | | N |
| B.4.6 | Short circuit or disconnect of passive components | See appended table B.4 | P |
| B.4.7 | Continuous operation of components | | N |
| B.4.8 | Class 1 and Class 2 energy sources within limits during and after single fault conditions | See appended table B.4 | P |
| B.4.9 | Battery charging under single fault conditions | | N |
| C | UV RADIATION | | N |
| C.1 | Protection of materials in equipment from UV radiation | | N |
| C.1.2 | Requirements | | N |
| C.1.3 | Test method | | N |
| C.2 | UV light conditioning test | | N |
| C.2.1 | Test apparatus | | N |
| C.2.2 | Mounting of test samples | | N |
| C.2.3 | Carbon-arc light-exposure apparatus | | N |
| C.2.4 | Xenon-arc light exposure apparatus | | N |
| D | TEST GENERATORS | | N |
| D.1 | Impulse test generators | | N |
| D.2 | Antenna interface test generator | | N |
| D.3 | Electronic pulse generator | | N |
| E | TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS | | N |
| E.1 | Audio amplifier normal operating conditions | | N |
| | Audio signal voltage (V) | | — |
| | Rated load impedance (Ω) | | N |
| E.2 | Audio amplifier abnormal operating conditions | | N |
| F | EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS | | P |
| F.1 | General requirements | See below. | P |
| | Instructions – Language | English | — |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| F.2 | Letter symbols and graphical symbols | Complied | P |
| F.2.1 | Letter symbols according to IEC 60027-1 | Complied | P |
| F.2.2 | Graphic symbols IEC, ISO or manufacturer specific | Complied | P |
| F.3 | Equipment markings | | P |
| F.3.1 | Equipment marking locations | Outside of enclosure, visual | P |
| F.3.2 | Equipment identification markings | See below. | P |
| F.3.2.1 | Manufacturer identification | See marking plate. | — |
| F.3.2.2 | Model identification | See marking plate. | — |
| F.3.3 | Equipment rating markings | See below. | P |
| F.3.3.1 | Equipment with direct connection to mains | | P |
| F.3.3.2 | Equipment without direct connection to mains | | N |
| F.3.3.3 | Nature of supply voltage | See marking plate. | — |
| F.3.3.4 | Rated voltage | See marking plate. | — |
| F.3.3.4 | Rated frequency | See marking plate. | — |
| F.3.3.6 | Rated current or rated power | See marking plate. | — |
| F.3.3.7 | Equipment with multiple supply connections | | N |
| F.3.4 | Voltage setting device | | N |
| F.3.5 | Terminals and operating devices | | N |
| F.3.5.1 | Mains appliance outlet and socket-outlet markings..... | | N |
| F.3.5.2 | Switch position identification marking | | N |
| F.3.5.3 | Replacement fuse identification and rating markings..... | | N |
| F.3.5.4 | Replacement battery identification marking | | N |
| F.3.5.5 | Terminal marking location | | N |
| F.3.6 | Equipment markings related to equipment classification | | P |
| F.3.6.1 | Class I Equipment | | N |
| F.3.6.1.1 | Protective earthing conductor terminal | | N |
| F.3.6.1.2 | Neutral conductor terminal | | N |
| F.3.6.1.3 | Protective bonding conductor terminals | | N |
| F.3.6.2 | Class II equipment (IEC 60417-5172) | | P |
| F.3.6.2.1 | Class II equipment with or without functional earth | See marking plate. | P |
| F.3.6.2.2 | Class II equipment with functional earth terminal marking | | N |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.7 | Equipment IP rating marking | | — |
| F.3.8 | External power supply output marking | See marking plate. | P |
| F.3.9 | Durability, legibility and permanence of marking | | P |
| F.3.10 | Test for permanence of markings | | P |
| F.4 | Instructions | | P |
| | a) Equipment for use in locations where children not likely to be present - marking | | P |
| | b) Instructions given for installation or initial use | | P |
| | c) Equipment intended to be fastened in place | | N |
| | d) Equipment intended for use only in restricted access area | | N |
| | e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1 | | N |
| | f) Protective earthing employed as safeguard | | N |
| | g) Protective earthing conductor current exceeding ES 2 limits | | N |
| | h) Symbols used on equipment | | P |
| | i) Permanently connected equipment not provided with all-pole mains switch | | N |
| | j) Replaceable components or modules providing safeguard function | | N |
| F.5 | Instructional safeguards | | P |
| | Where “instructional safeguard” is referenced in the test report it specifies the required elements, location of marking and/or instruction | | P |
| G | COMPONENTS | | P |
| G.1 | Switches | | N |
| G.1.1 | General requirements | | N |
| G.1.2 | Ratings, endurance, spacing, maximum load | | N |
| G.2 | Relays | | P |
| G.2.1 | General requirements | Approved relay used | P |
| G.2.2 | Overload test | | N |
| G.2.3 | Relay controlling connectors supply power | | N |
| G.2.4 | Mains relay, modified as stated in G.2 | | N |
| G.3 | Protection Devices | | P |
| G.3.1 | Thermal cut-offs | | N |
| G.3.1.1a) &b) | Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b) | | N |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| G.3.1.1c) | Thermal cut-outs tested as part of the equipment as indicated in c) | | N |
| G.3.1.2 | Thermal cut-off connections maintained and secure | | N |
| G.3.2 | Thermal links | | N |
| G.3.2.1a) | Thermal links separately tested with IEC 60691 | | N |
| G.3.2.1b) | Thermal links tested as part of the equipment | | N |
| | Aging hours (H) | | — |
| | Single Fault Condition | | — |
| | Test Voltage (V) and Insulation Resistance (Ω) .. | | — |
| G.3.3 | PTC Thermistors | | N |
| G.3.4 | Overcurrent protection devices | Safety resistor protection | N |
| G.3.5 | Safeguards components not mentioned in G.3.1 to G.3.5 | | P |
| G.3.5.1 | Non-resettable devices suitably rated and marking provided | | P |
| G.3.5.2 | Single faults conditions | | P |
| G.4 | Connectors | | P |
| G.4.1 | Spacings | | P |
| G.4.2 | Mains connector configuration | | N |
| G.4.3 | Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely | | N |
| G.5 | Wound Components | | P |
| G.5.1 | Wire insulation in wound components | | N |
| G.5.1.2 a) | Two wires in contact inside wound component, angle between 45° and 90° | | N |
| G.5.1.2 b) | Construction subject to routine testing | | N |
| G.5.2 | Endurance test on wound components | | N |
| G.5.2.1 | General test requirements | | N |
| G.5.2.2 | Heat run test | | N |
| | Time (s) | | — |
| | Temperature (°C) | | — |
| G.5.2.3 | Wound Components supplied by mains | | N |
| G.5.3 | Transformers | | P |
| G.5.3.1 | Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1) | | P |
| | Position | | — |
| | Method of protection | | — |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| G.5.3.2 | Insulation | | P |
| | Protection from displacement of windings | | — |
| G.5.3.3 | Overload test..... | | P |
| G.5.3.3.1 | Test conditions | | P |
| G.5.3.3.2 | Winding Temperatures testing in the unit | | P |
| G.5.3.3.3 | Winding Temperatures - Alternative test method | | N |
| G.5.4 | Motors | | N |
| G.5.4.1 | General requirements | No such components | N |
| | Position | | — |
| G.5.4.2 | Test conditions | | N |
| G.5.4.3 | Running overload test | | N |
| G.5.4.4 | Locked-rotor overload test | | N |
| | Test duration (days) | | — |
| G.5.4.5 | Running overload test for d.c. motors in secondary circuits | | N |
| G.5.4.5.2 | Tested in the unit | | N |
| | Electric strength test (V)..... | | — |
| G.5.4.5.3 | Tested on the Bench - Alternative test method; test time (h) | | N |
| | Electric strength test (V)..... | | — |
| G.5.4.6 | Locked-rotor overload test for d.c. motors in secondary circuits | | N |
| G.5.4.6.2 | Tested in the unit | | N |
| | Maximum Temperature | | N |
| | Electric strength test (V) | | N |
| G.5.4.6.3 | Tested on the bench - Alternative test method; test time (h) | | N |
| | Electric strength test (V)..... | | N |
| G.5.4.7 | Motors with capacitors | | N |
| G.5.4.8 | Three-phase motors | | N |
| G.5.4.9 | Series motors | | N |
| | Operating voltage | | — |
| G.6 | Wire Insulation | | N |
| G.6.1 | General | | N |
| G.6.2 | Solvent-based enamel wiring insulation | | N |
| G.7 | Mains supply cords | | N |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| G.7.1 | General requirements | Shall be evaluated in final system. | N |
| | Type | | — |
| | Rated current (A) | | — |
| | Cross-sectional area (mm ²), (AWG) | | — |
| G.7.2 | Compliance and test method | | N |
| G.7.3 | Cord anchorages and strain relief for non-detachable power supply cords | | N |
| G.7.3.2 | Cord strain relief | | N |
| G.7.3.2.1 | Requirements | | N |
| | Strain relief test force (N) | | — |
| G.7.3.2.2 | Strain relief mechanism failure | | N |
| G.7.3.2.3 | Cord sheath or jacket position, distance (mm) ... | | — |
| G.7.3.2.4 | Strain relief comprised of polymeric material | | N |
| G.7.4 | Cord Entry | | N |
| G.7.5 | Non-detachable cord bend protection | | N |
| G.7.5.1 | Requirements | | N |
| G.7.5.2 | Mass (g) | | — |
| | Diameter (m) | | — |
| | Temperature (°C) | | — |
| G.7.6 | Supply wiring space | | N |
| G.7.6.2 | Stranded wire | | N |
| G.7.6.2.1 | Test with 8 mm strand | | N |
| G.8 | Varistors | | P |
| G.8.1 | General requirements | Approved varistor used | P |
| G.8.2 | Safeguard against shock | | P |
| G.8.3 | Safeguard against fire | | N |
| G.8.3.2 | Varistor overload test | | N |
| G.8.3.3 | Temporary overvoltage | | N |
| G.9 | Integrated Circuit (IC) Current Limiters | | N |
| G.9.1 a) | Manufacturer defines limit at max. 5A. | | N |
| G.9.1 b) | Limiters do not have manual operator or reset | | N |
| 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 | | — |
| G.9.2 | Test Program 1 | | N |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| G.9.3 | Test Program 2 | | N |
| G.9.4 | Test Program 3 | | N |
| G.10 | Resistors | | N |
| G.10.1 | General requirements | | N |
| G.10.2 | Resistor test | | N |
| G.10.3 | Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable | | N |
| G.10.3.1 | General requirements | | N |
| G.10.3.2 | Voltage surge test | | N |
| G.10.3.3 | Impulse test | | N |
| G.11 | Capacitor and RC units | | N |
| G.11.1 | General requirements | | N |
| G.11.2 | Conditioning of capacitors and RC units | | N |
| G.11.3 | Rules for selecting capacitors | | N |
| G.12 | Optocouplers | | N |
| | Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results) | | N |
| | Type test voltage Vini | | — |
| | Routine test voltage, Vini,b | | — |
| G.13 | Printed boards | | P |
| G.13.1 | General requirements | | P |
| G.13.2 | Uncoated printed boards | | P |
| G.13.3 | Coated printed boards | | N |
| G.13.4 | Insulation between conductors on the same inner surface | | N |
| | Compliance with cemented joint requirements (Specify construction) | | — |
| G.13.5 | Insulation between conductors on different surfaces | | N |
| | Distance through insulation..... | | N |
| | Number of insulation layers (pcs) | | — |
| G.13.6 | Tests on coated printed boards | | N |
| G.13.6.1 | Sample preparation and preliminary inspection | | N |
| G.13.6.2a) | Thermal conditioning | | N |
| G.13.6.2b) | Electric strength test | | N |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| G.13.6.2c) | Abrasion resistance test | | N |
| G.14 | Coating on components terminals | | N |
| G.14.1 | Requirements | | N |
| G.15 | Liquid filled components | | N |
| G.15.1 | General requirements | | N |
| G.15.2 | Requirements | | N |
| G.15.3 | Compliance and test methods | | N |
| G.15.3.1 | Hydrostatic pressure test | | N |
| G.15.3.2 | Creep resistance test | | N |
| G.15.3.3 | Tubing and fittings compatibility test | | N |
| G.15.3.4 | Vibration test | | N |
| G.15.3.5 | Thermal cycling test | | N |
| G.15.3.6 | Force test | | N |
| G.15.4 | Compliance | | N |
| G.16 | IC including capacitor discharge function (ICX) | | N |
| a) | Humidity treatment in accordance with sc5.4.8 – 120 hours | | N |
| b) | Impulse test using circuit 2 with $U_c = t_o$ transient voltage | | N |
| C1) | Application of ac voltage at 110% of rated voltage for 2.5 minutes | | N |
| C2) | Test voltage | | — |
| D1) | 10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer | | N |
| D2) | Capacitance | | — |
| D3) | Resistance | | — |
| H | CRITERIA FOR TELEPHONE RINGING SIGNALS | | N |
| H.1 | General | | N |
| H.2 | Method A | | N |
| H.3 | Method B | | N |
| H.3.1 | Ringling signal | | N |
| 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): | | — |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| H.3.2 | Tripping device and monitoring voltage | | N |
| H.3.2.1 | Conditions for use of a tripping device or a monitoring voltage complied with | | N |
| H.3.2.2 | Tripping device | | N |
| H.3.2.3 | Monitoring voltage (V) | | — |
| J | INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION | | N |
| | General requirements | | N |
| K | SAFETY INTERLOCKS | | N |
| K.1 | General requirements | | N |
| K.2 | Components of safety interlock safeguard mechanism | | N |
| K.3 | Inadvertent change of operating mode | | N |
| K.4 | Interlock safeguard override | | N |
| K.5 | Fail-safe | | N |
| | Compliance | | N |
| K.6 | Mechanically operated safety interlocks | | N |
| K.6.1 | Endurance requirement | | N |
| K.6.2 | Compliance and Test method | | N |
| K.7 | Interlock circuit isolation | | N |
| K.7.1 | Separation distance for contact gaps & interlock circuit elements (type and circuit location) | | N |
| K.7.2 | Overload test, Current (A) | | N |
| K.7.3 | Endurance test | | N |
| K.7.4 | Electric strength test | | N |
| L | DISCONNECT DEVICES | | N |
| L.1 | General requirements | Shall be evaluated in final system. | N |
| L.2 | Permanently connected equipment | | N |
| L.3 | Parts that remain energized | | N |
| L.4 | Single phase equipment | | N |
| L.5 | Three-phase equipment | | N |
| L.6 | Switches as disconnect devices | | N |
| L.7 | Plugs as disconnect devices | | N |
| L.8 | Multiple power sources | | N |
| M | EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS | | N |
| M.1 | General requirements | | N |
| M.2 | Safety of batteries and their cells | | N |

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|------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.2.1 | Requirements | | N |
| M.2.2 | Compliance and test method (identify method).. : | | N |
| M.3 | Protection circuits | | N |
| M.3.1 | Requirements | | N |
| M.3.2 | Tests | | N |
| | - Overcharging of a rechargeable battery | | N |
| | - Unintentional charging of a non-rechargeable battery | | N |
| | - Reverse charging of a rechargeable battery | | N |
| | - Excessive discharging rate for any battery | | N |
| M.3.3 | Compliance : | | N |
| M.4 | Additional safeguards for equipment containing secondary lithium battery | | N |
| M.4.1 | General | | N |
| M.4.2 | Charging safeguards | | N |
| M.4.2.1 | Charging operating limits | | N |
| M.4.2.2a) | Charging voltage, current and temperature..... : | | — |
| M.4.2.2 b) | Single faults in charging circuitry : | | — |
| M.4.3 | Fire Enclosure | | N |
| M.4.4 | Endurance of equipment containing a secondary lithium battery | | N |
| M.4.4.2 | Preparation | | N |
| M.4.4.3 | Drop and charge/discharge function tests | | N |
| | Drop | | N |
| | Charge | | N |
| | Discharge | | N |
| M.4.4.4 | Charge-discharge cycle test | | N |
| M.4.4.5 | Result of charge-discharge cycle test | | N |
| M.5 | Risk of burn due to short circuit during carrying | | N |
| M.5.1 | Requirement | | N |
| M.5.2 | Compliance and Test Method (Test of P.2.3) | | N |
| M.6 | Prevention of short circuits and protection from other effects of electric current | | N |
| M.6.1 | Short circuits | | N |
| M.6.1.1 | General requirements | | N |
| M.6.1.2 | Test method to simulate an internal fault | | N |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| M.6.1.3 | Compliance (Specify M.6.1.2 or alternative method) | | N |
| M.6.2 | Leakage current (mA) | | N |
| M.7 | Risk of explosion from lead acid and NiCd batteries | | N |
| M.7.1 | Ventilation preventing explosive gas concentration | | N |
| M.7.2 | Compliance and test method | | N |
| M.8 | Protection against internal ignition from external spark sources of lead acid batteries | | N |
| M.8.1 | General requirements | | N |
| M.8.2 | Test method | | N |
| M.8.2.1 | General requirements | | N |
| M.8.2.2 | Estimation of hypothetical volume V_z (m ³ /s) | | — |
| M.8.2.3 | Correction factors | | — |
| M.8.2.4 | Calculation of distance d (mm) | | — |
| M.9 | Preventing electrolyte spillage | | N |
| M.9.1 | Protection from electrolyte spillage | | N |
| M.9.2 | Tray for preventing electrolyte spillage | | N |
| M.10 | Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) | | N |
| N | ELECTROCHEMICAL POTENTIALS | | N |
| | Metal(s) used | | — |
| O | MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES | | P |
| | Figures O.1 to O.20 of this Annex applied..... | Considered | — |
| P | SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS | | N |
| P.1 | General requirements | | N |
| P.2.2 | Safeguards against entry of foreign object | | N |
| | Location and Dimensions (mm) | | — |
| P.2.3 | Safeguard against the consequences of entry of foreign object | | N |
| P.2.3.1 | Safeguards against the entry of a foreign object | | N |
| | Openings in transportable equipment | | N |
| | Transportable equipment with metalized plastic parts | | N |

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|------------|---|-----------------|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| P.2.3.2 | Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) : | | N |
| P.3 | Safeguards against spillage of internal liquids | | N |
| P.3.1 | General requirements | | N |
| P.3.2 | Determination of spillage consequences | | N |
| P.3.3 | Spillage safeguards | | N |
| P.3.4 | Safeguards effectiveness | | N |
| P.4 | Metallized coatings and adhesive securing parts | | N |
| P.4.2 a) | Conditioning testing | | N |
| | Tc (°C)..... : | | — |
| | Tr (°C) : | | — |
| | Ta (°C) : | | — |
| P.4.2 b) | Abrasion testing : | | N |
| P.4.2 c) | Mechanical strength testing : | | N |
| Q | CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING | | N |
| Q.1 | Limited power sources | | N |
| Q.1.1 a) | Inherently limited output | | N |
| Q.1.1 b) | Impedance limited output | | N |
| | - Regulating network limited output under normal operating and simulated single fault condition | | N |
| Q.1.1 c) | Overcurrent protective device limited output | | N |
| Q.1.1 d) | IC current limiter complying with G.9 | | N |
| Q.1.2 | Compliance and test method | | N |
| Q.2 | Test for external circuits – paired conductor cable | | N |
| | Maximum output current (A) : | | — |
| | Current limiting method..... : | | — |
| R | LIMITED SHORT CIRCUIT TEST | | N |
| R.1 | General requirements | | N |
| R.2 | Determination of the overcurrent protective device and circuit | | N |
| R.3 | Test method Supply voltage (V) and short-circuit current (A)). : | | N |
| S | TESTS FOR RESISTANCE TO HEAT AND FIRE | | N |
| 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 |

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|------------|--|-------------------------|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Samples, material | | — |
| | Wall thickness (mm) | | — |
| | Conditioning (°C) | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N |
| | - Material not consumed completely | | N |
| | - Material extinguishes within 30s | | N |
| | - No burning of layer or wrapping tissue | | N |
| S.2 | Flammability test for fire enclosure and fire barrier integrity | | N |
| | Samples, material | | — |
| | Wall thickness (mm) | | — |
| | Conditioning (°C) | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N |
| | Test specimen does not show any additional hole | | N |
| S.3 | Flammability test for the bottom of a fire enclosure | | N |
| | Samples, material | | — |
| | Wall thickness (mm) | | — |
| | Cheesecloth did not ignite | | N |
| S.4 | Flammability classification of materials | | N |
| 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 |
| | Samples, material | | — |
| | Wall thickness (mm) | | — |
| | Conditioning (test condition), (°C)..... | | — |
| | Test flame according to IEC 60695-11-20 with conditions as set out | | N |
| | After every test specimen was not consumed completely | | N |
| | After fifth flame application, flame extinguished within 1 min | | N |
| T | MECHANICAL STRENGTH TESTS | | P |
| T.1 | General requirements | | P |
| T.2 | Steady force test, 10 N | For internal components | P |
| T.3 | Steady force test, 30 N | | N |

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|------------|---|--------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| T.4 | Steady force test, 100 N | | N |
| T.5 | Steady force test, 250 N | (See appended table T.5) | P |
| T.6 | Enclosure impact test | (See appended table T.6) | P |
| | Fall test | | P |
| | Swing test | | P |
| T.7 | Drop test | | N |
| T.8 | Stress relief test | (See appended table T.8) | P |
| T.9 | Impact Test (glass) | | N |
| T.9.1 | General requirements | | N |
| T.9.2 | Impact test and compliance | | N |
| | Impact energy (J) | | — |
| | Height (m) | | — |
| T.10 | Glass fragmentation test | | N |
| T.11 | Test for telescoping or rod antennas | | N |
| | Torque value (Nm) | | — |
| U | MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION | | N |
| U.1 | General requirements | | N |
| U.2 | Compliance and test method for non-intrinsically protected CRTs | | N |
| U.3 | Protective Screen | | N |
| V | DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES) | | N |
| V.1 | Accessible parts of equipment | | N |
| V.2 | Accessible part criterion | | N |

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

| 4.1.2 | TABLE: List of critical components | | | | | P |
|-----------------------|--|-------------------|------------------|---|---|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity ¹⁾ | |
| AC connector (J3, J4) | Ningbo Goosvn Electronic Co., Ltd. | GS002 | 250V, 17.5A | EN 60998-1 EN 60998-2-1 |  No.0P161216. NGEQ03 | |
| (Alt.) | Dongguan Changhe Electronics Co., Ltd. | CA350-00-500 | 250V, 10A | EN 60998-1 EN 60998-2-1 | VDE 40021481 | |
| (Alt.) | Dongguan Changhe Electronics Co., Ltd. | CA350-04-500 | 250V, 10A | EN 60998-1 EN 60998-2-1 | VDE 40021481 | |
| Varistor (RV1) | Hongzhi Enterprises Ltd. | HEL10D471K | Min.300V 85°C | IEC 61051-1 IEC 61051-2 IEC 61051-2-2 | VDE 40037512 Comply with Annex Q | |
| (Alt.) | HuiZhou Lien Shun Electronic Co., Ltd. | ZOV10D471K | Min.300V 85°C | IEC 61051-1 IEC 61051-2 IEC 61051-2-2 | VDE 40005858 Comply with Annex Q | |
| (Alt.) | Thinking Electronic Industrial Co., Ltd. | TVR10471 | Min.300V 85°C | IEC 61051-1 IEC 61051-2 IEC 61051-2-2 | VDE 40005944 Comply with Annex Q | |
| (Alt.) | Shantou High-New Technology Dev.Zone Songtian Enterprise Co., Ltd. | STE-10D471K | Min.300V 85°C | IEC 61051-1 IEC 61051-2 IEC 61051-2-2 | VDE 40023049 Comply with Annex Q | |
| Fuse resistor (F1) | DONGGUAN SAVOL ELECTRON CO., LTD. | FKN-1WS-T52-J-10R | 10 Ω, 1W | EN 62368-1: 2014+A11:2017 | Test with appliance | |
| (Alt.) | Shenzhen Xin Caiyun Electronics Co., Ltd | KNP1W 10R 5% | 10 Ω, 1W | EN 62368-1: 2014+A11:2017 | Test with appliance | |
| Relay (K1) | SHENZHEN GOLDEN ELECTRICAL APPLIANCES CO., LTD. | GI-1A-5DH | 10A, 250VAC | EN 61810-1: 2015 | TUV R 50160373 | |
| (Alt.) | SANYOU RELAYS Relays for advanced technology | SJ-S-105DMH | 10A, 250VAC | IEC 61810-1: 2015 EN 61810-1: 2015 | VDE 40002146 TUV R 50142420 | |
| (Alt.) | ZHEJIANG FANHAR ELECTRONICS CO., LTD. | W11-1A2ST-H DC5V | 10A, 250VAC | EN 61810-1: 2015 | TUV R 50332879 | |

| EN 62368-1 | | | | | |
|--------------------|--|-----------------|---|---------------------------|---------------------|
| Clause | Requirement + Test | | Result - Remark | | Verdict |
| X-Capacitor (C5) | SURETOP TECHNOLOGY Co. Ltd. | MPX | Type: X2; AC 275V; 0.033μf, 105°C | EN 60384-14: 2013 | VDE 40034508 |
| (Alt.) | Guangdong JURCC electronics Co., LTD. | MPX/MKP | Type: X2; AC 275V; 0.033μf, 110°C | EN 60384-14: 2013 | VDE 40034920 |
| Y-Capacitor (C7) | Shantou High-New Technology Dev.Zone Songtian Enterprise Co., Ltd. | CD221K | Type: Y1, 220pf, 125°C, 250Vac | IEC 60384-14: 2013 | VDE 40025754 |
| (Alt.) | Shantou Xinwei electronic Co., Ltd. | CD221K | Type: Y1, 220pf, 125°C, 250Vac | IEC 60384-14: 2013 | VDE 40038760 |
| (Alt.) | Hongzhi Enterprises Ltd. | CD221K | Type: Y1, 220pf, 125°C, 250Vac | IEC 60384-14: 2013 | VDE 40038760 |
| Bridge Diode (BR1) | Goodwork Semiconductor Co., Ltd. | DBS8 | Maximum repetitive peak reverse voltage: 800V Operating temperature: 150°C | EN 62368-1: 2014+A11:2017 | Test with appliance |
| (Alt.) | Nantong Zhenxiong Electronics Technology Co., Ltd. | ABS8 | Maximum repetitive peak reverse voltage: 800V Operating temperature: 150°C | EN 62368-1: 2014+A11:2017 | Test with appliance |
| (Alt.) | Shangdong Jingdao Microelectronics Co.,Ltd | ABS8-12 | Maximum repetitive peak reverse voltage: 800V Operating temperature: 150°C | EN 62368-1: 2014+A11:2017 | Test with appliance |
| (Alt.) | Shenzhen Xilong electronics Co.,Ltd | ABS8 | Maximum repetitive peak reverse voltage: 800V Operating temperature: 150°C | EN 62368-1: 2014+A11:2017 | Test with appliance |
| PCB | SHENZHEN LINGHANGDA ELECTRONICS CO LTD | LH-1 | V-0, 130°C | UL 796 | UL E316475 |
| (Alt.) | Interchangeable | Interchangeable | V-1 or better, Min. 130°C | UL 796 | UL |

| EN 62368-1 | | | | | |
|---|---|------------|----------------------------------|---------------------------|---------------------|
| Clause | Requirement + Test | | Result - Remark | | Verdict |
| Plastic enclosure | SABIC INNOVATIVE PLASTICS US L L C | 940(f1) | V-0, 80°C, Min. thickness: 1.2mm | UL 94, UL 746 | UL E121562 |
| Transformer (U2) | DONGGUAN RUNZHI ELECTRONIC TECHNOLOGY CO. LTD. | EE10-2.5mH | CLASS B | EN 62368-1: 2014+A11:2017 | Test with appliance |
| -Magnet wire | DONG GUAN YIDA INDUSTRIAL CO LTD | XUEW/130 | 130°C | UL 1446 | UL E344055 |
| -Bobbin | CHANG CHUN PLASTICS CO LTD | T375J | V-0, 150°C | UL 94 | UL E59481 |
| -Insulation Tape | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | PZ | 130°C | UL 510 | UL E165111 |
| - Varnish | QUALIPOLY CHEMICAL CORP | 1032BIH | 130°C | UL 1446 | UL E213437 |
| - Tube | DONGGUAN CITY CHANGJIE METALS & PLASTIC PRODUCTS CO LTD | CJ-TT-T | 200°C, 300V | UL 224 | UL E338209 |
| - Triple Insulated Wire | Shanghai Hengyi Special Cable Co., Ltd. | HY-F | 130°C | IEC 60950-1 | VDE 40042631 |
| Supplementary information: | | | | | |
| 1) An asterisk indicates a mark which assures the agreed level of surveillance. | | | | | |

| | | | | |
|---|--|----------|-----------------------|----------|
| 4.8.4, 4.8.5 | TABLE: Lithium coin/button cell batteries mechanical tests | | | N |
| (The following mechanical tests are conducted in the sequence noted.) | | | | |
| 4.8.4.2 | TABLE: Stress Relief test | | | — |
| Part | | Material | Oven Temperature (°C) | Comments |
| -- | | -- | -- | -- |

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|------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | |
|---|--|------------------------------------|--------------------|----------------------------|
| 4.8.4, 4.8.5 | TABLE: Lithium coin/button cell batteries mechanical tests | | | N |
| (The following mechanical tests are conducted in the sequence noted.) | | | | |
| 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: | | | | |
| | | | | |

| | | | | |
|---------------|--|----------------|-----------|----------------------------|
| 4.8.5 | TABLE: Lithium coin/button cell batteries mechanical test result | | | N |
| Test position | | Surface tested | Force (N) | Duration force applied (s) |
| -- | | -- | -- | -- |

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|------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| |
|----------------------------|
| 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 | Parameters | | | ES Class |
| | | | | U (Vrms or Vpk) | I (Apk or Arms) | Hz | |
| 1 | 264Vac | All circuits | Normal | -- | -- | -- | ES3 |
| | | | Abnormal | -- | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | -- | |
| 2 | 264Vac | Plastic enclosure to earth | Normal | -- | -- | -- | ES1 |
| | | | Abnormal | -- | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | -- | |

| 5.2.2.3 - Capacitance Limits | | | | | | |
|------------------------------|----------------|-------------------------------------|----------------------------|-----------------|---------|----------|
| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | ES Class |
| | | | | Capacitance, nF | Upk (V) | |
| 1 | 264V, 50Hz | L-N | Normal | 33 | 8 | ES2 |
| | | | Abnormal | 33 | 8 | |
| | | | Single fault – BR1 pin3 OC | 33 | 192 | |

| 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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|--|--------------------|--|----------------------|-----------------|----|----|---------|
| Clause | Requirement + Test | | | Result - Remark | | | Verdict |
| | | | Single fault – SC/OC | -- | -- | -- | |
| Test Conditions: Normal – Abnormal - Supplementary information: | | | | | | | |
| | | | | | | | |

| 5.4.1.4, 6.3.2, 9.0, B.2.6 | | TABLE: Temperature measurements | | | | | P |
|--|--------------------------|---------------------------------|---------------------|--------------------|----------------|-------------------------------|------------------|
| | Supply voltage (V) | 90V 60Hz | | 264V 50Hz | | — | |
| | Ambient Tmin (°C) | 29.0 | Shift to 40 °C | 28.8 | Shift to 40 °C | — | |
| | Ambient Tmax (°C) | 29.5 | | 29.5 | | — | |
| | Tma (°C) | 40.0 | | 40.0 | | — | |
| Maximum measured temperature T of part/at: | | T (°C) | | | | Allowed T _{max} (°C) | |
| Ambient | | 29.5 | 40.0 | 28.8 | 40.0 | -- | |
| Varistor (RV1) | | 36.4 | 46.9 | 37.4 | 48.6 | 85 | |
| X-Capacitor (C5) | | 37.0 | 47.5 | 39.1 | 50.3 | 105 | |
| Relay (K1) | | 40.5 | 51.0 | 42.9 | 54.1 | 85 | |
| C2 body | | 42.2 | 52.7 | 44.8 | 56.0 | 105 | |
| U2 winding | | 41.3 | 51.8 | 45.1 | 56.3 | 110 | |
| U2 core | | 45.9 | 56.4 | 52.0 | 63.2 | 110 | |
| C7 body | | 47.4 | 57.9 | 54.1 | 65.3 | 125 | |
| PCB near J3 | | 44.8 | 55.3 | 49.3 | 60.5 | 130 | |
| PCB near J4 | | 35.6 | 46.1 | 36.5 | 47.7 | 130 | |
| PCB near U1 | | 46.6 | 57.1 | 58.5 | 69.7 | 130 | |
| PCB near BR1 | | 39.9 | 50.4 | 42.9 | 54.1 | 130 | |
| Internal of plastic enclosure | | 40.1 | 50.6 | 42.1 | 53.3 | 80 | |
| Supplementary information: | | | | | | | |
| Temperature T of winding: | t ₁ (°C) | R ₁ (Ω) | t ₂ (°C) | R ₂ (Ω) | T (°C) | Allowed T _{max} (°C) | Insulation class |
| -- | -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | | |
| | | | | | | | |

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|--|---------------------------------|----------|---------|-----------------|--------|----------------------|---------------------|
| Clause | Requirement + Test | | | Result - Remark | | | Verdict |
| 5.4.1.4, 6.3.2, 9.0, B.2.6 | TABLE: Temperature measurements | | | | | | P |
| | Supply voltage (V) | 90V 60Hz | | 264V 50Hz | | — | |
| | Ambient Tmin (°C) | 29.0 | -- | 28.8 | -- | — | |
| | Ambient Tmax (°C) | 29.5 | | 29.5 | | — | |
| | Tma (°C) | -- | | -- | | — | |
| Maximum measured temperature T of part/at: | | T (°C) | | | | Allowed Tmax (°C) | |
| Ambient | | 29.5 | -- | 28.8 | -- | -- | |
| Top of plastic enclosure | | 38.4 | -- | 40.6 | -- | 77 | |
| Bottom of plastic enclosure | | 34.5 | -- | 35.6 | -- | 77 | |
| Side of plastic enclosure | | 36.1 | -- | 38.8 | -- | 77 | |
| Supplementary information: | | | | | | | |
| Temperature T of winding: | t1 (°C) | R1 (Ω) | t2 (°C) | R2 (Ω) | T (°C) | Allowed Tmax (°C) | Insulation class |
| -- | -- | -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | | |

| | | | | | |
|----------------------------|------------------------------------|-----------------|------------------|----------|---|
| 5.4.1.8 | Table: working voltage measurement | | | | P |
| Location | | RMS voltage (V) | Peak voltage (V) | Comments | |
| L-N | | 240 | 420 | -- | |
| supplementary information: | | | | | |
| | | | | | |

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

| | | | | |
|-------------------|--|--|--|----------|
| 5.4.1.10.3 | TABLE: Ball pressure test of thermoplastics | | | P |
|-------------------|--|--|--|----------|

| EN 62368-1 | | | |
|--|--------------------------|-----------------------|--------------------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Allowed impression diameter (mm) | | ≤ 2 mm | — |
| Object/Part No./Material | Manufacturer/trademark | Test temperature (°C) | Impression diameter (mm) |
| Plastic enclosure | See appended table 4.1.2 | 125 | 1.16 |
| Supplementary information: | | | |

| | | | | | | | |
|--|--|--------------|------------------------------|------------------|----------------------|-------------------------------|----------|
| 5.4.2.2, 5.4.2.4 and 5.4.3 | TABLE: Minimum Clearances/Creepage distance | | | | | | P |
| Clearance (cl) and creepage distance (cr) at/of/between: | Up (V) | U r.m.s. (V) | Frequency (kHz) ¹ | Required cl (mm) | cl (mm) ² | Required ³ cr (mm) | cr (mm) |
| Functional insulation: | | | | | | | |
| L to circuits/components front fuse resistor F1 | 420 | 240 | <30 | 1.5 | 2.7 | 2.4 | 2.7 |
| Output: L to N | 420 | 240 | <30 | 1.5 | 2.9 | 2.4 | 2.9 |
| Two pins of fuse resistor F1 | 420 | 240 | <30 | 1.5 | 2.7 | 2.4 | 2.7 |
| Reinforced insulation: | | | | | | | |
| Internal hazardous live parts to screws of fix enclosure | 420 | 240 | <30 | 3.0 | >10 | 4.8 | >10 |
| Internal hazardous live parts to accessible gap of enclosure | 420 | 240 | <30 | 3.0 | >10 | 4.8 | >10 |
| Supplementary information: | | | | | | | |
| Note 1: Only for frequency above 30 kHz | | | | | | | |
| Note 2: See table 5.4.2.4 if this is based on electric strength test | | | | | | | |
| Note 3: Provide Material Group | | | | | | | |

| | | | | |
|---|--|----------------------------|------------------|------------------|
| 5.4.2.3 | TABLE: Minimum Clearances distances using required withstand voltage | | | P |
| | Overvoltage Category (OV): | | | II |
| | Pollution Degree: | | | 2 |
| Clearance distanced between: | | Required withstand voltage | Required cl (mm) | Measured cl (mm) |
| Functional insulation: | | | | |
| L to circuits/components front fuse resistor F1 | | 2500Vpeak | 1.5 | 2.7 |
| Output: L to N | | 2500Vpeak | 1.5 | 2.9 |
| Two pins of fuse resistor F1 | | 2500Vpeak | 1.5 | 2.7 |
| Reinforced insulation: | | | | |
| Internal hazardous live parts to | | 2500Vpeak | 3.0 | >10 |

| EN 62368-1 | | | |
|--|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| screws of fix enclosure | | | |
| Internal hazardous live parts to accessible gap of enclosure | 2500Vpeak | 3.0 | >10 |
| 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 |
| Test voltage applied between: | Required cl (mm) | Test voltage (kV) peak/ r.m.s. / d.c. | Breakdown Yes / No | |
| -- | -- | -- | -- | |
| -- | -- | -- | -- | |
| Supplementary information: | | | | |
| | | | | |

| | | | | | | |
|---------------------------------------|--|-----------------|--------------------------|-------------------|----------|----------|
| 5.4.4.2, 5.4.4.5 c) 5.4.4.9 | TABLE: Distance through insulation measurements | | | | | P |
| Distance through insulation di at/of: | Peak voltage (V) | Frequency (kHz) | Material | Required DTI (mm) | DTI (mm) | |
| Plastic enclosure | 420 | <30 | See appended table 4.1.2 | 0.4 | 1.2 | |
| Supplementary information: | | | | | | |
| | | | | | | |

| | | | | | |
|--------------------------------------|---------------------------------------|------------------|--------------------|--|----------|
| 5.4.9 | TABLE: Electric strength tests | | | | P |
| Test voltage applied between: | Voltage shape (AC, DC) | Test voltage (V) | Breakdown Yes / No | | |
| Basic | | | | | |
| L to N before fuse (F1 disconnected) | DC | 2500Vp | No | | |
| Reinforce | | | | | |
| L/N to plastic enclosure | DC | 4000Vp | No | | |
| Supplementary information: | | | | | |
| | | | | | |

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

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

| | | | | | |
|------------|-----|-----------------|----|--------|-----|
| 264V, 50Hz | L-N | N | -- | 8Vpk | ES1 |
| 264V, 50Hz | L-N | S (BR1 pin3 OC) | -- | 192Vpk | ES2 |

Supplementary information:

X-capacitors installed for testing are:

☐ bleeding resistor rating:

☐ ICX:

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

OC: Open Circuit.

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

| 5.7.2.2, 5.7.4 | TABLE: Earthed accessible conductive part | | N |
|---|---|--------------------|---|
| 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 | -- | |
| | 2* | -- | |
| | 3 | -- | |
| | 4 | -- | |
| | 5 | -- | |
| | 6 | -- | |
| Supplementary Information: | | | |
| 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 | | | |

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

[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.

| 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 |
| A | All internal circuits | Power (W) : | -- | -- | PS3 |
| | | V _A (V) : | -- | -- | |
| | | I _A (A) : | -- | -- | |

Supplementary Information:

- (*) Measurement taken only when limits at 3 seconds exceed PS1 limits.
- Internal primary circuits was considered as PS3.

| 6.2.3.1 | Table: Determination of Potential Ignition Sources (Arcing PIS) | | | P |
|-----------------------|---|--|---|----------------------|
| Location | Open circuit voltage After 3 s (V _p) | Measured r.m.s current (I _{rms}) | Calculated value (V _p x I _{rms}) | Arcing PIS? Yes / No |
| All internal circuits | -- | -- | -- | Yes |
| -- | -- | -- | -- | -- |

Supplementary information: Internal primary circuits was considered as PS3.

An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V_p) and normal operating condition rms current (I_{rms}) is greater than 15.

| 6.2.3.2 | Table: Determination of Potential Ignition Sources (Resistive PIS) | | | | P |
|------------------------|--|---|--|--|-----------------------|
| 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 |
| All internal circuits | -- | -- | -- | -- | Yes |
| -- | -- | -- | -- | -- | -- |

Supplementary Information: Internal primary circuits was considered as PS3.

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

If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification.

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.

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

| 8.5.5 | TABLE: High Pressure Lamp | | N |
|--|---------------------------|------------------------------|---|
| 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_ | |
| 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 (KW) | P rated (W) | Fuse No | I fuse (A) | Condition/status | |
| 90V50Hz | 10.051 | -- | 0.895 | -- | F1 | 10.051 | Max. normal operating condition, load 10A | |
| 90V60Hz | 10.051 | -- | 0.895 | -- | F1 | 10.051 | Ditto | |
| 100V50Hz | 10.050 | 10 | 1.002 | -- | F1 | 10.050 | Ditto | |
| 100V60Hz | 10.050 | 10 | 1.003 | -- | F1 | 10.050 | Ditto | |
| 240V50Hz | 10.043 | 10 | 2.404 | -- | F1 | 10.043 | Ditto | |
| 240V60Hz | 10.043 | 10 | 2.405 | -- | F1 | 10.043 | Ditto | |
| 264V50Hz | 10.043 | -- | 2.637 | -- | F1 | 10.043 | Ditto | |
| 264V60Hz | 10.043 | -- | 2.641 | -- | F1 | 10.043 | Ditto | |
| Supplementary information: | | | | | | | | |
| | | | | | | | | |

| B.3 & B.4 | TABLE: Abnormal operating and fault condition tests | | | | | | | | P |
|--|---|--------------------|----------------|----------|------------------|--------------------------|------------|-------------|---|
| Ambient temperature (°C) | | | | | | 25-28.7°C | | | — |
| Power source for EUT: Manufacturer, model/type, output rating .: | | | | | | see appended table 4.1.2 | | | — |
| Component No. | Abnormal Condition | Supply voltage (V) | Test time (ms) | Fuse No. | Fuse current (A) | T-couple | Temp. (°C) | Observation | |

| EN 62368-1 | | | | | | | | |
|---------------------------------|--------------------|--------|--------|----|--------------------|----|----|---|
| Clause | Requirement + Test | | | | Result - Remark | | | Verdict |
| C8 | SC | 240VAC | 30mins | F1 | 10.043A to 0.0024A | -- | -- | Unit shut down immediately, no molten metal dropped, no fire occurred, no hazard. |
| C13 | SC | 240VAC | 30mins | F1 | 10.043A to 0.0024A | -- | -- | Unit shut down immediately, no molten metal dropped, no fire occurred, no hazard. |
| R6 | SC | 240VAC | 30mins | F1 | 10.043A Max. | -- | -- | The EUT working normally, No hazards. |
| R26 | SC | 240VAC | 30mins | F1 | 10.043A Max. | -- | -- | The EUT working normally, No hazards. |
| U1 (Pin1-8) | SC | 240VAC | 30mins | F1 | 10.043A to 0.0024A | -- | -- | Unit shut down immediately, no molten metal dropped, no fire occurred, no hazard. |
| Transformer (U2) | OL | 240VAC | 2hrs | F1 | 10.617A Max. | -- | -- | When load 0.6A, the EUT output shut down, continue for 2hrs, the max. temperature: U2 core: 59.6°C U2 winding: 53.4°C Internal plastic near U2: 47.5°C Plastic enclosure outside near U2: 42.8°C Ambient: 27.8°C recoverable, no hazards. |
| Transformer (U2) Pin (P1-P2) | SC | 240VAC | 1s | F1 | 10.043A to 0A | -- | -- | The component of fuse resistor F1 damaged, repeat for ten times, the test result are the same. Unrecoverable, no hazards. |
| BR1(Pin1-2) | SC | 240VAC | 1s | F1 | 10.043A to 0A | -- | -- | The component of fuse resistor F1 damaged, repeat for ten times, the test result are the same. Unrecoverable, no hazards. |
| C6 | SC | 240VAC | 1s | F1 | 10.043A to 0A | -- | -- | The component of fuse resistor F1 damaged, repeat for ten times, the test result are the same. Unrecoverable, no hazards. |

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

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.

| Annex M | TABLE: Batteries | | | | | | | | N |
|---|----------------------------|---------------|-------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|---------------|
| The tests of Annex M are applicable only when appropriate battery data is not available | | | | | | | | | -- |
| Is it possible to install the battery in a reverse polarity position? | | | | | | | | | -- |
| | Non-rechargeable batteries | | | Rechargeable batteries | | | | | |
| | Discharging | | Un-intentional charging | Charging | | Discharging | | Reversed charging | |
| | Meas. current | Manuf. Specs. | | Meas. Current (A) | Manuf. Specs. (A) | Meas. Current (A) | Manuf. Specs. (A) | Meas. current | Manuf. Specs. |
| Max. current during normal condition | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Max. current during fault condition | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | | | | |
| Test results: | | | | | | | | | Verdict |
| - Chemical leaks | | | | | | | | | N |
| - Explosion of the battery | | | | | | | | | N |
| - Emission of flame or expulsion of molten metal | | | | | | | | | N |
| - Electric strength tests of equipment after completion of tests | | | | | | | | | N |
| Supplementary information: | | | | | | | | | |
| | | | | | | | | | |

| | | | | | | |
|----------------------------|---|--------------|-------|-----------|-------------|---|
| Annex M.4 | Table: Additional safeguards for equipment containing secondary lithium batteries | | | | | N |
| Battery/Cell No. | Test conditions | Measurements | | | Observation | |
| | | U (V) | I (A) | Temp (°C) | | |
| | | | | | | |
| | | | | | | |
| Supplementary Information: | | | | | | |

| EN 62368-1 | | | | |
|----------------------------|-------------------------------|-------------|--------------------------------|-------------|
| Clause | Requirement + Test | | Result - Remark | Verdict |
| | | | | |
| Battery identification | Charging at T_{lowest} (°C) | Observation | Charging at $T_{highest}$ (°C) | Observation |
| -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |
| | | | | |

| Annex Q.1 | TABLE: Circuits intended for interconnection with building wiring (LPS) | | | | | N |
|---|---|---------------------|---------------------|-------|--------|-------|
| Note: Measured UOC (V) with all load circuits disconnected: | | | | | | |
| Output Circuit | Components | U _{oc} (V) | I _{sc} (A) | | S (VA) | |
| | | | Meas. | Limit | Meas. | Limit |
| -- | -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | |
| | | | | | | |

| T.2, T.3, T.4, T.5 | TABLE: Steady force test | | | | | P |
|----------------------------|--------------------------|----------------|-----------|---------------------|---|---|
| Part/Location | Material | Thickness (mm) | Force (N) | Test Duration (sec) | Observation | |
| Internal components | -- | -- | 10 | 5s | No reduction the clearances and creepage distances | |
| Plastic enclosure | See appended table 4.1.2 | Min.1.2mm | 250 | 5s | Enclosure remained intact, no crack opening developed. No insulation breakdown. | |
| Supplementary information: | | | | | | |
| | | | | | | |

| T.6, T.9 | TABLE: Impact tests | | | | P |
|------------------------|----------------------------|----------------|------------------------|---|----------|
| Part/Location | Material | Thickness (mm) | Vertical distance (mm) | Observation | |
| On horizontal surfaces | See appended table 4.1.2 | Min.1.2mm | 1300mm | Enclosure remained intact, no crack opening developed. No insulation breakdown. | |
| On vertical surfaces | See appended table 4.1.2 | Min.1.2mm | 1300mm | Enclosure remained intact, no crack opening developed. No insulation breakdown. | |

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

| |
|----------------------------|
| Supplementary information: |
| |

| T.7 | TABLE: Drop tests | | | | N |
|----------------------------|-------------------|----------------|------------------|-------------|---|
| Part/Location | Material | Thickness (mm) | Drop Height (mm) | Observation | |
| -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | |
| | | | | | |

| T.8 | TABLE: Stress relief test | | | | | P |
|----------------------------|---------------------------|----------------|-----------------------|--------------|---|---|
| Part/Location | Material | Thickness (mm) | Oven Temperature (°C) | Duration (h) | Observation | |
| Plastic enclosure | See appended table 4.1.2 | Min.1.2mm | 70 | 7 | Enclosure remained intact, no crack opening developed. No insulation breakdown. | |
| Supplementary information: | | | | | | |

Appendix A - EUT PHOTOS



Photo 1 top view

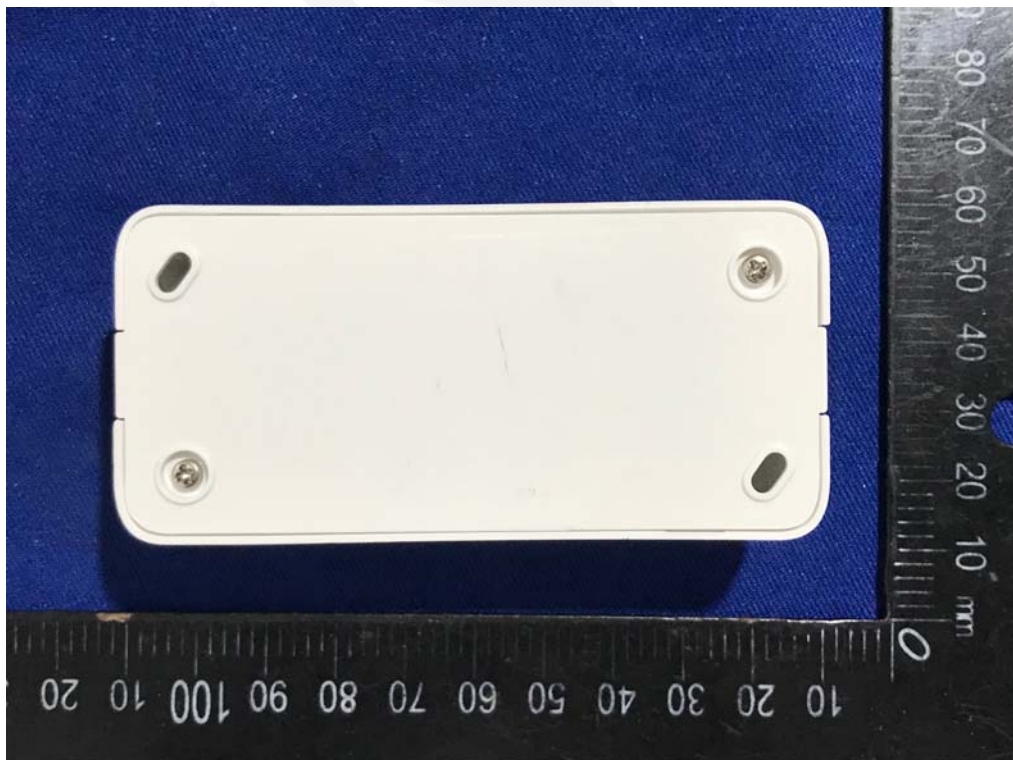


Photo 2 bottom view



Photo 3 side view



Photo 4 side view



Photo 5 internal view

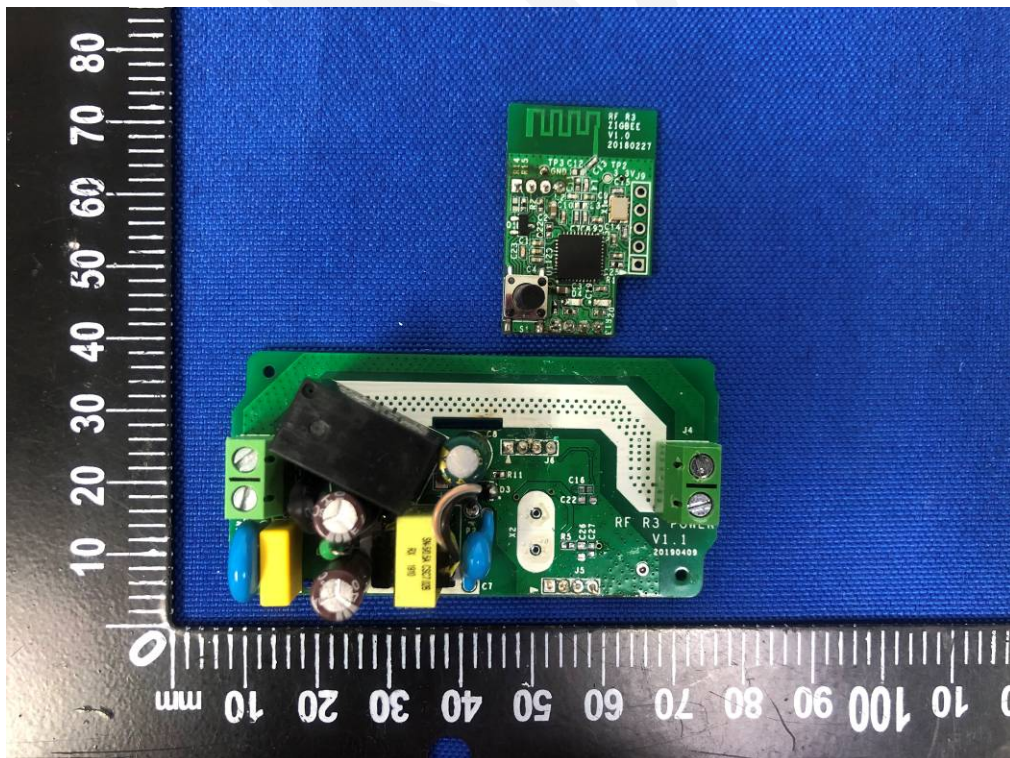


Photo 6 PCB top view

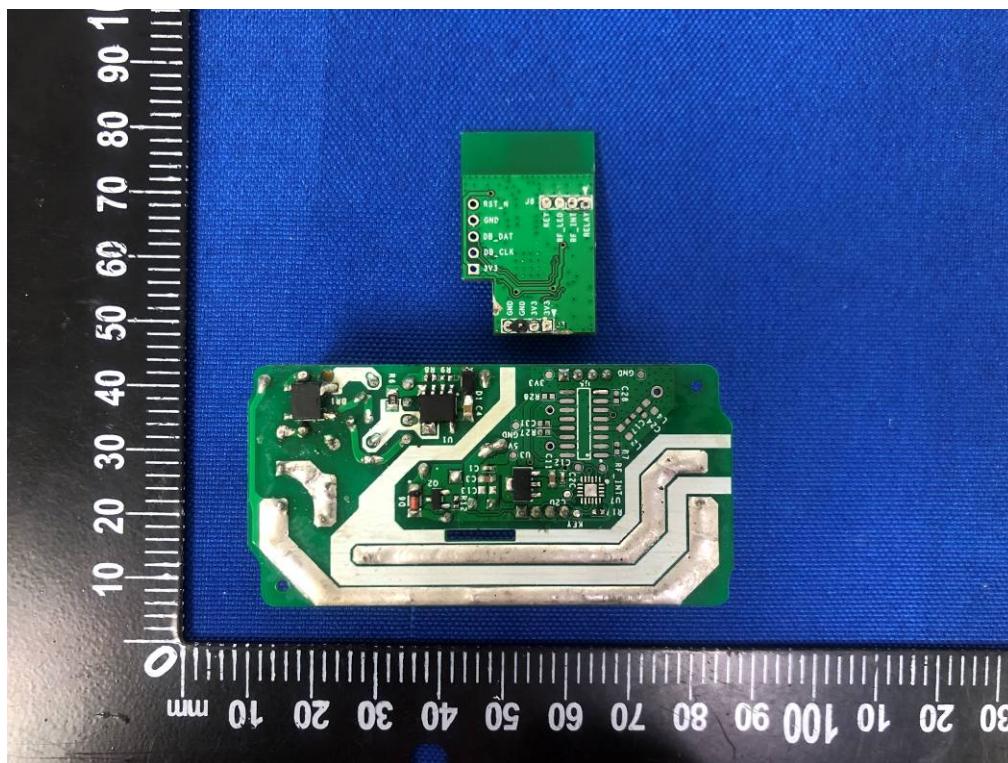


Photo 7 PCB bottom view

Appendix B - Test equipment list

| Equipment Description | Model No. | Equipment No. | Manufacturer | Last Cal | Cal Due |
|--------------------------------------|-------------|---------------|----------------|------------|------------|
| Hygrothermograph | HTC-1 | T-08-QA074 | N/A | 2019-03-08 | 2020-03-07 |
| Digital Multimeter | 15B | T-08-SF072 | FLUKE | 2019-03-17 | 2020-03-17 |
| Electric load | 3710A | T-08-SF077 | ITEK POWER | 2018-12-14 | 2019-12-14 |
| Hybrid Recorder | DR240 | T-08-SF008 | YOKOGAWA | 2019-03-10 | 2020-03-09 |
| AC power supply | VPS1060 | T-08-EE020 | EVERFINE | 2019-07-23 | 2020-07-22 |
| Digital Power meter | WT210 | T-08-SF276 | YOKOGAWA | 2019-03-08 | 2020-03-07 |
| Push-pull Scale | SN-300 | T-08-SF115 | shandu | 2019-07-23 | 2020-07-22 |
| Drop test board | ITAV | F-08-SF153 | BACL | N/A | N/A |
| Stop Watch | PC396 | T-08-SF086 | huibo industry | 2019-03-08 | 2020-03-07 |
| Steel tape | HILOCK-19 | T-08-SF100 | TAJIMA | 2018-06-15 | 2023-06-14 |
| Electron Balance | HZ-ALC-20C+ | T-08-SF035 | hengzhizhan | 2019-03-26 | 2020-03-26 |
| Digital caliper | 0~150mm | T-08-SF219 | liao si | 2019-07-23 | 2020-07-22 |
| High power LED aging dc power supply | B12005 | T-08-SF200 | BACL | 2019-04-10 | 2020-04-09 |
| High Temperature Test Chamber | DP1000 | T-08-SF001 | DONGZHIXU | 2019-07-23 | 2020-07-23 |
| Ball pressure fixture | FZ-1104 | T-08-SF034 | HANYANG | 2019-03-08 | 2020-03-07 |
| Steel ball | FZ-1112A | T-08-SF031 | HANYANG | 2019-03-14 | 2020-03-13 |
| Oscilloscope Probe | P6015A | T-08-SF142-1 | TEKTRONIX | 2019-03-08 | 2020-03-07 |
| Digital real-time oscilloscope | TDS220 | T-08-SF142 | TEKTRONIX | 2018-12-19 | 2019-12-19 |
| Humidity tester | ESX-4CA | T-08-SF040 | ESPEC | 2019-03-10 | 2020-03-09 |
| Hi-pot Tester | CS2672C | T-08-SF081 | changsheng | 2019-07-23 | 2020-07-22 |
| Measuring network, touch current | GS-JCDLP4 | T-08-SF222 | GAOSHENG | 2019-03-08 | 2021-03-07 |

Appendix C - Directions

1. The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
5. This report cannot be reproduced except in full, without prior written approval of the Company.
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FINAL