# TEST REPORT

## IEC 60950-1

## Information technology equipment – Safety – Part 1: General requirements

| | |
|---|---|
| **Report Number**..... : | UNI2015050504SR-3 |
| Date of issue..... : | May, 05, 2015 |
| Total number of pages …..…….: | 40 |
| **Applicant's name**..... : | Timetec Computing Sdn. Bhd. |
| Address..... : | No 6, 8 & 10, Jalan BK 3/2, Bandar Kinrara, 47180 Puchong, Selangor, Malaysia |
| **Test specification:** | |
| Standard..... : | IEC 60950-1:2005 (Second Edition) + Am 1:2009 |
| Test procedure..... : | IEC test report |
| Non-standard test method……..: | N/A |
| **Test Report Form No**..... : | IEC60950_1C |
| Test Report Form(s) Originator..... : | SGS Fimko Ltd |
| Master TRF..... : | Dated 2012-08 |



**This report is not valid as a Test Report unless signed by an approved Testing Laboratory.**

| | |
|---|---|
| Test item description..... : | Fingerprint access control & time attendance system |
| Trade Mark..... : | FingerTec |
| **Manufacturer..... :** | Same as applicant |
| **Model/Type reference.....:** | R3 |
| **Ratings..... :** | Input: 12VDC, 3A |

| | | |
|---|---|---|
| **Testing procedure and testing location:** | | |
| ☒ | **Testing Laboratory:** | Laboratory of Shenzhen United Testing Technology Co., Ltd. |
| **Testing location/ address.....:** | | 5/F., Building 7, Xinyuan Industrial Park, Xili, Nanshan District, Shenzhen, Guangdong, China |
| ☐ | **Associated Testing Laboratory:** | |
| **Testing location/ address.....:** | | |
| **Tested by (name + signature).....:** | | Steven |
| **Approved by (name + signature).....:** | | Yangdongping |
| | | |
| ☐ | **Testing procedure: TMP/CTF Stage 1:** | |
| **Testing location/ address.....:** | | |
| **Tested by (name + signature).....:** | | |
| **Approved by (name + signature).....:** | | |
| | | |
| ☐ | **Testing procedure: WMT/CTF Stage 2:** | |
| **Testing location/ address.....:** | | |
| **Tested by (name + signature).....:** | | |
| **Witnessed by (name + signature).....:** | | |
| **Approved by (name + signature).....:** | | |
| | | |
| ☐ | **Testing procedure: SMT/CTF Stage 3 or 4:** | |
| **Testing location/ address.....:** | | |
| **Tested by (name + signature).....:** | | |
| **Witnessed by (name + signature).....:** | | |
| **Approved by (name + signature).....:** | | |
| **Supervised by (name + signature).....:** | | |
| | | |

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

-Appendix 1: Photo documents.(3 pages)

**Summary of testing:**

From the result of our tests on the submitted samples, we conclude they comply with the requirements of the standards

| | |
|---|---|
| 1.7.2.1<br>Language of safety markings/instructions. | Instructions and equipment marking related to safety is applied and checked in English, the instruction and marking should be checked again when marketed in the countries using other language. |

**Tests performed (name of test and test clause):**

| Clause(s) | Test(s) |
|---|---|
| 1 | General |
| 2 | Protection from hazards |
| 3 | Wiring, connections and supply |
| 4 | Physical requirements |
| 5 | Abnormal operating and fault conditions |

**Testing location:**

Laboratory of Shenzhen United Testing Technology Co., Ltd.

5/F., Building 7, Xinyuan Industrial Park, Xili, Nanshan District, Shenzhen, Guangdong, China

**Summary of compliance with National Differences**

**List of countries addressed:**

Saudi Arabia national differences .(No differences)

☒ **The product fulfils the requirements of IEC 60950-1: 2005 (Second Edition) + Am 1: 2009**

**Copy of marking plate**

**The artwork below may be only a draft.**

FingerTec
Fingerprint access control & time attendance system
Model: R3
Input: 12V⎓, 3A
Made in Malaysia

**Note: The above marking are the minimum requirements required by the safety standard. For the final production sample, the marking which do not give rise to misunderstanding may be add**

| | |
|---|---|
| **Test item particulars.....** : | Fingerprint access control & time attendance system |
| **Equipment mobility.....** : | [] movable [] hand-held [] transportable<br>[X] stationary[] for building-in [] direct plug-in |
| **Connection to the mains.....** : | [] pluggable equipment [] type A [] type B<br>[] permanent connection<br>[] detachable power supply cord<br>[] non-detachable power supply cord<br>[X] not directly connected to the mains |
| **Operating condition.....** : | [X] continuous<br>[] rated operating / resting time: |
| **Access location .....** : | [X] operator accessible<br>[] restricted access location |
| **Over voltage category (OVC) .....** : | [] OVC I [] OVC II [] OVC III [] OVC IV<br>[] other: |
| **Mains supply tolerance (%) or absolute mains supply values .....** : | N/A |
| **Tested for IT power systems .....** : | [] Yes [X] No |
| **IT testing, phase-phase voltage (V) .....** : | |
| **Class of equipment .....** : | [] Class I [] Class II [X] Class III<br>[] Not classified |
| **Considered current rating of protective device as part of the building installation (A) .....** : | 16A |
| **Pollution degree (PD) .....** : | [] PD 1 [X] PD 2 [] PD 3 |
| **IP protection class .....** : | IP20 |
| **Altitude during operation (m) .....** : | Up to 5000m |
| **Altitude of test laboratory (m) .....** : | Below 2000m |
| **Mass of equipment (kg) .....** : | Approx. 0.43Kg |
| **Possible test case verdicts:** | |
| **- test case does not apply to the test object.....** : | N/A |
| **- test object does meet the requirement.....** : | P (Pass) |
| **- test object does not meet the requirement.....** : | F (Fail) |
| **Testing.....** : | |
| **Date of receipt of test item.....** : | 2015-04-14 |
| **Date(s) of performance of tests.....** : | 2015-04-14 to 2015-04-29 |

**General remarks:**

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

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

The related applicable CTL decisions have been considered and the requirements found fulfilled
Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.

**Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:**

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:

☐ **Yes**
☒ **Not applicable**

**When differences exist; they shall be identified in the General product information section.**

**Name and address of factory (ies)..... :** Same as applicant

**General product information:**

The product is Class III Fingerprint time attendance system intended to be in indoor use, electronic components mounted on PCB, External enclosure is plastic material of min.V-1 grade, secured by screw

All models are identical, only different in the model name. So we performed all of the tests on the representative model TA500.
Maximum recommended ambient (Tmra): 40°C

**Abbreviations used in the report:**

| | | | |
|---|---|---|---|
| - normal conditions | **N.C.** | - single fault conditions | **S.F.C** |
| - functional insulation | **OP** | - basic insulation | **BI** |
| - double insulation | **DI** | - supplementary insulation | **SI** |
| - between parts of opposite polarity | **BOP** | - reinforced insulation | **RI** |

Indicate used abbreviations (if any)

| IEC 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **1** | **GENERAL** | | **P** |
| **1.5** | **Components** | | P |
| 1.5.1 | General | See below | P |
| | Comply with IEC 60950-1 or relevant component standard | (see appended table 1.5.1). | P |
| 1.5.2 | Evaluation and testing of components | Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard.<br>Components not certified are used in accordance with their ratings and they comply with applicable parts of IEC 60950-1 and the relevant component standard.<br>Components, for which no relevant IEC-standard exists, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 60950-1. | P |
| 1.5.3 | Thermal controls | No thermal control. | N/A |
| 1.5.4 | Transformers | Class III equipment | N/A |
| 1.5.5 | Interconnecting cables | | N/A |
| 1.5.6 | Capacitors bridging insulation | | N/A |
| 1.5.7 | Resistors bridging insulation | | N/A |
| 1.5.7.1 | Resistors bridging functional, basic or supplementary insulation | | N/A |
| 1.5.7.2 | Resistors bridging double or reinforced insulation between a.c. mains and other circuits | | N/A |
| 1.5.7.3 | Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable | | N/A |
| 1.5.8 | Components in equipment for IT power systems | | N/A |
| 1.5.9 | Surge suppressors | | N/A |
| 1.5.9.1 | General | | N/A |
| 1.5.9.2 | Protection of VDRs | | N/A |
| 1.5.9.3 | Bridging of functional insulation by a VDR | | N/A |
| 1.5.9.4 | Bridging of basic insulation by a VDR | | N/A |
| 1.5.9.5 | Bridging of supplementary, double or reinforced insulation by a VDR | | N/A |
| **1.6** | **Power interface** | | **P** |

| IEC 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.6.1 | AC power distribution systems | Not directly connected to the mains | N/A |
| 1.6.2 | Input current | (see appended table 1.6.2) | P |
| 1.6.3 | Voltage limit of hand-held equipment | The equipment is not handheld equipment | N/A |
| 1.6.4 | Neutral conductor | | N/A |
| **1.7** | **Marking and instructions** | | **P** |
| 1.7.1 | Power rating and identification markings | The required marking is located on the outside surface of the equipment. | P |
| 1.7.1.1 | Power rating marking | See below | P |
| | Multiple mains supply connections.....: | Not directly connected to the mains | N/A |
| | Rated voltage(s) or voltage range(s) (V) .....: | 12VDC | P |
| | Symbol for nature of supply, for d.c. only.....: | ⎓ | P |
| | Rated frequency or rated frequency range (Hz) ....: | | N/A |
| | Rated current (mA or A) .....: | 3A | P |
| 1.7.1.2 | Identification markings | See below | P |
| | Manufacturer's name or trade-mark or identification mark .....: | FingerTec | P |
| | Model identification or type reference .....: | R3 | P |
| | Symbol for Class II equipment only .....: | Class III equipment | N/A |
| | Other markings and symbols .....: | | N/A |
| 1.7.1.3 | Use of graphical symbols | | N/A |
| 1.7.2 | Safety instructions and marking | See below. | P |
| 1.7.2.1 | General | | P |
| 1.7.2.2 | Disconnect devices | Not directly connected to the mains | N/A |
| 1.7.2.3 | Overcurrent protective device | | N/A |
| 1.7.2.4 | IT power distribution systems | | N/A |
| 1.7.2.5 | Operator access with a tool | | N/A |
| 1.7.2.6 | Ozone | The equipment does not produce Ozone. | N/A |
| 1.7.3 | Short duty cycles | The equipment is designed for continuous operation. | N/A |
| 1.7.4 | Supply voltage adjustment .....: | Full range voltage design, no Voltage adjustment. | N/A |
| | Methods and means of adjustment; reference to installation instructions .....: | | — |
| 1.7.5 | Power outlets on the equipment .....: | No standard power outlet. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7.6 | Fuse identification (marking, special fusing characteristics, cross-reference) ..... : | | N/A |
| 1.7.7 | Wiring terminals | No such terminals | N/A |
| 1.7.7.1 | Protective earthing and bonding terminals ..... : | Class III equipment | N/A |
| 1.7.7.2 | Terminals for a.c. mains supply conductors | The equipment is not permanently connected or provided with a non-detachable power supply cord. | N/A |
| 1.7.7.3 | Terminals for d.c. mains supply conductors | The equipment is not supplied from d.c mains. | N/A |
| 1.7.8 | Controls and indicators | See below | N/A |
| 1.7.8.1 | Identification, location and marking ..... : | No controls affecting safety | N/A |
| 1.7.8.2 | Colours ..... : | No indicators with colours where safety is involved | N/A |
| 1.7.8.3 | Symbols according to IEC 60417..... : | | N/A |
| 1.7.8.4 | Markings using figures ..... : | No controls | N/A |
| 1.7.9 | Isolation of multiple power sources ..... : | Only one connection to the equipment. | N/A |
| 1.7.10 | Thermostats and other regulating devices ..... : | No thermostats or other regulating devices. | N/A |
| 1.7.11 | Durability | The marking plate was subjected to the permanence of marking test. The marking plate was rubbed with cloth soaked with water for 15s and then again for 15s with the cloth soaked with petroleum spirit. After this test there was no damage to the marking plate. The marking on the label did not fade. | P |
| 1.7.12 | Removable parts | | N/A |
| 1.7.13 | Replaceable batteries ..... : | | N/A |
| | Language(s) ..... : | | — |
| 1.7.14 | Equipment for restricted access locations..... : | | N/A |

| | | | |
|---|---|---|---|
| **2** | **PROTECTION FROM HAZARDS** | | **P** |
| **2.1** | **Protection from electric shock and energy hazards** | | P |
| 2.1.1 | Protection in operator access areas | See below | P |
| 2.1.1.1 | Access to energized parts | Class III equipment only | N/A |
| | Test by inspection ..... : | | N/A |
| | Test with test finger (Figure 2A) ..... : | | N/A |
| | Test with test pin (Figure 2B) ..... : | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test with test probe (Figure 2C) .....: | No TNV circuits within the equipment. | N/A |
| 2.1.1.2 | Battery compartments | No TNV circuits within the equipment | N/A |
| 2.1.1.3 | Access to ELV wiring | No ELV circuit | N/A |
| | Working voltage (Vpeak or Vrms); minimum distance through insulation (mm) | Class III equipment | — |
| 2.1.1.4 | Access to hazardous voltage circuit wiring | No internal wiring at hazardous voltage circuit accessible to the operator. | N/A |
| 2.1.1.5 | Energy hazards .....: | No energy hazard in operator access area. Checked by means of the test finger. (see appended table 2.1.1.5) | P |
| 2.1.1.6 | Manual controls | No conductive shafts of operating knobs, handles, levers and the like in operator access areas. | N/A |
| 2.1.1.7 | Discharge of capacitors in equipment | | N/A |
| | Measured voltage (V); time-constant (s).....: | | — |
| 2.1.1.8 | Energy hazards – d.c. mains supply | Not connected to DC mains supply. | N/A |
| | a) Capacitor connected to the d.c. mains supply ...: | | N/A |
| | b) Internal battery connected to the d.c. mains supply .....: | | N/A |
| 2.1.1.9 | Audio amplifiers .....: | | N/A |
| 2.1.2 | Protection in service access areas | . | N/A |
| 2.1.3 | Protection in restricted access locations | | N/A |
| **2.2** | **SELV circuits** | | **P** |
| 2.2.1 | General requirements | | P |
| 2.2.2 | Voltages under normal conditions (V) .....: | <60V DC | P |
| 2.2.3 | Voltages under fault conditions (V) .....: | <60V DC | P |
| 2.2.4 | Connection of SELV circuits to other circuits .....: | SELV circuits are only connected to other SELV circuits | P |
| **2.3** | **TNV circuits** | | **N/A** |
| 2.3.1 | Limits | No TNV circuits within the equipment. | N/A |
| | Type of TNV circuits.....: | | — |
| 2.3.2 | Separation from other circuits and from accessible parts | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.3.2.1 | General requirements | | N/A |
| 2.3.2.2 | Protection by basic insulation | | N/A |
| 2.3.2.3 | Protection by earthing | | N/A |
| 2.3.2.4 | Protection by other constructions .....: | | N/A |
| 2.3.3 | Separation from hazardous voltages | | N/A |
| | Insulation employed.....: | | — |
| 2.3.4 | Connection of TNV circuits to other circuits | | N/A |
| | Insulation employed.....: | | — |
| 2.3.5 | Test for operating voltages generated externally | | N/A |
| **2.4** | **Limited current circuits** | | **N/A** |
| 2.4.1 | General requirements | No limited current circuits | N/A |
| 2.4.2 | Limit values | | N/A |
| | Frequency (Hz).....: | | — |
| | Measured current (mA).....: | | — |
| | Measured voltage (V).....: | | — |
| | Measured circuit capacitance (nF or µF)..... : | | — |
| 2.4.3 | Connection of limited current circuits to other circuits | | N/A |
| **2.5** | **Limited power sources** | | **N/A** |
| | a) Inherently limited output | | N/A |
| | b) Impedance limited output | | N/A |
| | c) Regulating network limited output under normal operating and single fault condition | | N/A |
| | d) Overcurrent protective device limited output | | N/A |
| | Max. output voltage (V), max. output current (A), max. apparent power (VA)..... : | | N/A |
| | Current rating of overcurrent protective device (A) .: | | — |
| | Use of integrated circuit (IC) current limiters | | N/A |
| **2.6** | **Provisions for earthing and bonding** | | **N/A** |
| 2.6.1 | Protective earthing | Class III equipment | N/A |
| 2.6.2 | Functional earthing | | N/A |
| | Use of symbol for functional earthing .....: | | — |
| 2.6.3 | Protective earthing and protective bonding conductors | | N/A |
| 2.6.3.1 | General | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.6.3.2 | Size of protective earthing conductors | | N/A |
| | Rated current (A), cross-sectional area ($mm^2$), AWG.....: | | — |
| 2.6.3.3 | Size of protective bonding conductors | | N/A |
| | Rated current (A), cross-sectional area ($mm^2$), AWG.....: | | — |
| | Protective current rating (A), cross-sectional area ($mm^2$), AWG.....: | | — |
| 2.6.3.4 | Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)..... : | | N/A |
| 2.6.3.5 | Colour of insulation.....: | | N/A |
| 2.6.4 | Terminals | | N/A |
| 2.6.4.1 | General | | N/A |
| 2.6.4.2 | Protective earthing and bonding terminals | | N/A |
| | Rated current (A), type, nominal thread diameter (mm).....: | | — |
| 2.6.4.3 | Separation of the protective earthing conductor from protective bonding conductors | | N/A |
| 2.6.5 | Integrity of protective earthing | | N/A |
| 2.6.5.1 | Interconnection of equipment | | N/A |
| 2.6.5.2 | Components in protective earthing conductors and protective bonding conductors | | N/A |
| 2.6.5.3 | Disconnection of protective earth | | N/A |
| 2.6.5.4 | Parts that can be removed by an operator | | N/A |
| 2.6.5.5 | Parts removed during servicing | | N/A |
| 2.6.5.6 | Corrosion resistance | | N/A |
| 2.6.5.7 | Screws for protective bonding | | N/A |
| 2.6.5.8 | Reliance on telecommunication network or cable distribution system | | N/A |
| **2.7** | **Overcurrent and earth fault protection in primary circuits** | | **N/A** |
| 2.7.1 | Basic requirements | Class III equipment | N/A |
| | Instructions when protection relies on building installation | | N/A |
| 2.7.2 | Faults not simulated in 5.3.7 | | — |
| 2.7.3 | Short-circuit backup protection | | N/A |
| 2.7.4 | Number and location of protective devices ..... : | | N/A |
| 2.7.5 | Protection by several devices | | N/A |
| 2.7.6 | Warning to service personnel..... : | | N/A |

| IEC 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **2.8** | **Safety interlocks** | | N/A |
| 2.8.1 | General principles | No safety interlocks or similar devices within the equipment | N/A |
| 2.8.2 | Protection requirements | | N/A |
| 2.8.3 | Inadvertent reactivation | | N/A |
| 2.8.4 | Fail-safe operation | | N/A |
| | Protection against extreme hazard | | N/A |
| 2.8.5 | Moving parts | | N/A |
| 2.8.6 | Overriding | | N/A |
| 2.8.7 | Switches, relays and their related circuits | | N/A |
| 2.8.7.1 | Separation distances for contact gaps and their related circuits (mm) ..... : | | N/A |
| 2.8.7.2 | Overload test | | N/A |
| 2.8.7.3 | Endurance test | | N/A |
| 2.8.7.4 | Electric strength test | | N/A |
| 2.8.8 | Mechanical actuators | | N/A |

| | | | |
|---|---|---|---|
| **2.9** | **Electrical insulation** | | **P** |
| 2.9.1 | Properties of insulating materials | Neither natural rubber, materials containing asbestons nor hygroscopic materials are used as insulation. No driving belts or coupling used. | P |
| 2.9.2 | Humidity conditioning | Carried out for 120 hrs. | P |
| | Relative humidity (%), temperature (°C) ..... : | 95%, 40°C (according to client's requirement) | — |
| 2.9.3 | Grade of insulation | Adequate levels of safety insulation were provided and maintained to comply with the requirements of this standard | P |
| 2.9.4 | Separation from hazardous voltages | | N/A |
| | Method(s) used ..... : | | — |

| | | | |
|---|---|---|---|
| **2.10** | **Clearances, creepage distances and distances through insulation** | | **P** |
| 2.10.1 | General | See below. | — |
| 2.10.1.1 | Frequency ..... : | Considered. | — |
| 2.10.1.2 | Pollution degrees ..... : | Pollution Degree 2. | P |
| 2.10.1.3 | Reduced values for functional insulation | | N/A |
| 2.10.1.4 | Intervening unconnected conductive parts | Considered. | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.10.1.5 | Insulation with varying dimensions | No such transfomer used. | N/A |
| 2.10.1.6 | Special separation requirements | Special separation is not used. | N/A |
| 2.10.1.7 | Insulation in circuits generating starting pulses | The circuit will not generate starting pulse. | N/A |
| 2.10.2 | Determination of working voltage | | N/A |
| 2.10.2.1 | General | Refer below: | — |
| 2.10.2.2 | RMS working voltage | | N/A |
| 2.10.2.3 | Peak working voltage | | N/A |
| 2.10.3 | Clearances | Only the functional insulation in secondary circuits complied with clause 5.3.4. | N/A |
| 2.10.3.1 | General | Refer below: | — |
| 2.10.3.2 | Mains transient voltages | | N/A |
| | a) AC mains supply .....: | Not directly connected to the a c mains | N/A |
| | b) Earthed d.c. mains supplies ..... : | Not directly connected to the d c mains | N/A |
| | c) Unearthed d.c. mains supplies .....: | Not directly connected to the d c mains | N/A |
| | d) Battery operation .....: | | N/A |
| 2.10.3.3 | Clearances in primary circuits | | N/A |
| 2.10.3.4 | Clearances in secondary circuits | | N/A |
| 2.10.3.5 | Clearances in circuits having starting pulses | | N/A |
| 2.10.3.6 | Transients from a.c. mains supply ..... : | Not connected to a c mains supply.. | N/A |
| 2.10.3.7 | Transients from d.c. mains supply ..... : | Not connected to d.c mains supply. | N/A |
| 2.10.3.8 | Transients from telecommunication networks and cable distribution systems ..... : | Not connected to telecommunication networks and cable distribution systems. | N/A |
| 2.10.3.9 | Measurement of transient voltage levels | See below. | — |
| | a) Transients from a mains supply | Measurement not relevant. | N/A |
| | For an a.c. mains supply .....: | | N/A |
| | For a d.c. mains supply .....: | | N/A |
| | b) Transients from a telecommunication network : | Not connected to telecommunication networks. | N/A |
| 2.10.4 | Creepage distances | See below. | N/A |
| 2.10.4.1 | General | Considered. | N/A |
| 2.10.4.2 | Material group and comparative tracking index | See below. | N/A |

| IEC 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | CTI tests.....: | Material group IIIb is assumed. | — |
| 2.10.4.3 | Minimum creepage distances | | N/A |
| 2.10.5 | Solid insulation | | N/A |
| 2.10.5.1 | General | | N/A |
| 2.10.5.2 | Distances through insulation | | N/A |
| 2.10.5.3 | Insulating compound as solid insulation | | N/A |
| 2.10.5.4 | Semiconductor devices | | N/A |
| 2.10.5.5. | Cemented joints | Not used cemented joints. | N/A |
| 2.10.5.6 | Thin sheet material – General | | N/A |
| 2.10.5.7 | Separable thin sheet material | | N/A |
| | Number of layers (pcs).....: | | — |
| 2.10.5.8 | Non-separable thin sheet material | Not used. | N/A |
| 2.10.5.9 | Thin sheet material – standard test procedure | | N/A |
| | Electric strength test | | — |
| 2.10.5.10 | Thin sheet material – alternative test procedure | | N/A |
| | Electric strength test | | — |
| 2.10.5.11 | Insulation in wound components | | N/A |
| 2.10.5.12 | Wire in wound components | | N/A |
| | Working voltage .....: | | N/A |
| | a) Basic insulation not under stress .....: | | N/A |
| | b) Basic, supplementary, reinforced insulation .....: | | N/A |
| | c) Compliance with Annex U .....: | | N/A |
| | Two wires in contact inside wound component; angle between 45° and 90°.....: | | N/A |
| 2.10.5.13 | Wire with solvent-based enamel in wound components | No wire with solvent-based enamel in wound components. | N/A |
| | Electric strength test | | -- |
| | Routine test | | N/A |
| 2.10.5.14 | Additional insulation in wound components | No additional insulation used | N/A |
| | Working voltage .....: | | N/A |
| | - Basic insulation not under stress .....: | | N/A |
| | - Supplementary, reinforced insulation .....: | | N/A |
| 2.10.6 | Construction of printed boards | See below. | — |
| 2.10.6.1 | Uncoated printed boards | (see appended table 2.10.3 and 2.10.4) | N/A |
| 2.10.6.2 | Coated printed boards | No special coating in order to reduce distances. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.10.6.3 | Insulation between conductors on the same inner surface of a printed board | | N/A |
| 2.10.6.4 | Insulation between conductors on different layers of a printed board | | N/A |
| | Distance through insulation | | N/A |
| | Number of insulation layers (pcs).....: | | N/A |
| 2.10.7 | Component external terminations | Coatings not used over terminations to increase effective creepage and clearance distances. | N/A |
| 2.10.8 | Tests on coated printed boards and coated components | No special coating in order to reduce distance. | N/A |
| 2.10.8.1 | Sample preparation and preliminary inspection | | N/A |
| 2.10.8.2 | Thermal conditioning | | N/A |
| 2.10.8.3 | Electric strength test | | N/A |
| 2.10.8.4 | Abrasion resistance test | | N/A |
| 2.10.9 | Thermal cycling | | N/A |
| 2.10.10 | Test for Pollution Degree 1 environment and insulating compound | | N/A |
| 2.10.11 | Tests for semiconductor devices and cemented joints | | N/A |
| 2.10.12 | Enclosed and sealed parts | | N/A |
| **3** | **WIRING, CONNECTIONS AND SUPPLY** | | **P** |
| **3.1** | **General** | | **P** |
| 3.1.1 | Current rating and overcurrent protection | Adequate cross sectional areas on internal wiring. | P |
| 3.1.2 | Protection against mechanical damage | Wireways are smooth and free from edges. Wires are adequately fixed to prevent excessive strain on wire and terminals and avoiding damage to the insulation of the conductors. | P |
| 3.1.3 | Securing of internal wiring | Internal wiring is secured against excessive strain, loosening of terminals and damage to the conductor insulation. | P |
| 3.1.4 | Insulation of conductors | Insulation on internal conductors is considered to be of adequate quality and suitable for the application and the working voltage involved. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.1.5 | Beads and ceramic insulators | No beads or similar ceramic insulators on conductors. | N/A |
| 3.1.6 | Screws for electrical contact pressure | | N/A |
| 3.1.7 | Insulating materials in electrical connections | No contact pressure through insulating material. | P |
| 3.1.8 | Self-tapping and spaced thread screws | | N/A |
| 3.1.9 | Termination of conductors | Terminations cannot become displaced so that clearances and creepage distances can be reduced. | N/A |
| | 10 N pull test | | N/A |
| 3.1.10 | Sleeving on wiring | Sleeves are not used as supplementary insulation. | N/A |
| **3.2** | **Connection to a mains supply** | | **N/A** |
| 3.2.1 | Means of connection | Refer below: | — |
| 3.2.1.1 | Connection to an a.c. mains supply | Not directly connected to the mains | N/A |
| 3.2.1.2 | Connection to a d.c. mains supply | The equipment is not for connection to a d.c. mains supply. | N/A |
| 3.2.2 | Multiple supply connections | | N/A |
| 3.2.3 | Permanently connected equipment | The equipment is not intended for permanent connection to the mains. | N/A |
| | Number of conductors, diameter of cable and conduits (mm) .....: | | — |
| 3.2.4 | Appliance inlets | Not directly connected to the mains | N/A |
| 3.2.5 | Power supply cords | | N/A |
| 3.2.5.1 | AC power supply cords | | N/A |
| | Type .....: | | — |
| | Rated current (A), cross-sectional area ($mm^2$), AWG .....: | | — |
| 3.2.5.2 | DC power supply cords | The equipment is not for connecting to d.c. mains. | N/A |
| 3.2.6 | Cord anchorages and strain relief | Not directly connected to the mains | N/A |
| | Mass of equipment (kg), pull (N) .....: | | — |
| | Longitudinal displacement (mm) .....: | | — |
| 3.2.7 | Protection against mechanical damage | Not directly connected to the mains | N/A |
| 3.2.8 | Cord guards | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Diameter or minor dimension D (mm); test mass (g) .....: | | — |
| | Radius of curvature of cord (mm).....: | | — |
| 3.2.9 | Supply wiring space | Not directly connected to the mains | N/A |
| **3.3** | **Wiring terminals for connection of external conductors** | | **N/A** |
| 3.3.1 | Wiring terminals | Not directly connected to the mains | N/A |
| 3.3.2 | Connection of non-detachable power supply cords | | N/A |
| 3.3.3 | Screw terminals | | N/A |
| 3.3.4 | Conductor sizes to be connected | | N/A |
| | Rated current (A), cord/cable type, cross-sectional area ($mm^2$).....: | | — |
| 3.3.5 | Wiring terminal sizes | | N/A |
| | Rated current (A), type, nominal thread diameter (mm) .....: | | — |
| 3.3.6 | Wiring terminal design | | N/A |
| 3.3.7 | Grouping of wiring terminals | | N/A |
| 3.3.8 | Stranded wire | | N/A |
| **3.4** | **Disconnection from the mains supply** | | **N/A** |
| 3.4.1 | General requirement | See Sub-clause 3.4.2. | --- |
| 3.4.2 | Disconnect devices | Not directly connected to the mains | N/A |
| 3.4.3 | Permanently connected equipment | | N/A |
| 3.4.4 | Parts which remain energized | | N/A |
| 3.4.5 | Switches in flexible cords | | N/A |
| 3.4.6 | Number of poles - single-phase and d.c. equipment | | N/A |
| 3.4.7 | Number of poles - three-phase equipment | | N/A |
| 3.4.8 | Switches as disconnect devices | | N/A |
| 3.4.9 | Plugs as disconnect devices | | N/A |
| 3.4.10 | Interconnected equipment | | N/A |
| 3.4.11 | Multiple power sources | | N/A |
| **3.5** | **Interconnection of equipment** | | **P** |
| 3.5.1 | General requirements | Considered. | P |
| 3.5.2 | Types of interconnection circuits .....: | SELV circuit. | P |
| 3.5.3 | ELV circuits as interconnection circuits | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.5.4 | Data ports for additional equipment | | P |
| **4** | **PHYSICAL REQUIREMENTS** | | **P** |
| **4.1** | **Stability** | | **N/A** |
| | Angle of 10° | | N/A |
| | Test force (N) .....: | | N/A |
| **4.2** | **Mechanical strength** | | **P** |
| 4.2.1 | General | Complies with the requirement also after tests described below are applied. | P |
| | Rack-mounted equipment. | No rack-mounted equipment. | N/A |
| 4.2.2 | Steady force test, 10 N | No hazard, ref. comment in appended table 2.10.3 – 2.10.4 | P |
| 4.2.3 | Steady force test, 30 N | | N/A |
| 4.2.4 | Steady force test, 250 N | No hazards. The test is performed at enclosure. | P |
| 4.2.5 | Impact test | | N/A |
| | Fall test | | N/A |
| | Swing test | | N/A |
| 4.2.6 | Drop test; height (mm) ..... : | | N/A |
| 4.2.7 | Stress relief test | No hazardous parts in the equipment | N/A |
| 4.2.8 | Cathode ray tubes | No cathode ray tubes provided | N/A |
| | Picture tube separately certified ..... : | | N/A |
| 4.2.9 | High pressure lamps | | N/A |
| 4.2.10 | Wall or ceiling mounted equipment; force (N) .....: | 50N | P |
| **4.3** | **Design and construction** | | **P** |
| 4.3.1 | Edges and corners | All edges and corners are rounded and/or smoothed. | P |
| 4.3.2 | Handles and manual controls; force (N).....: | No Handles, knobs, grips, levers and the like | N/A |
| 4.3.3 | Adjustable controls | No hazardous adjustable controls. | N/A |
| 4.3.4 | Securing of parts | No loosening of parts impairing creepage distances or clearances is likely to occur. | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.3.5 | Connection by plugs and sockets | | N/A |
| 4.3.6 | Direct plug-in equipment | | N/A |
| | Torque ..... : | | N/A |
| | Compliance with the relevant mains plug standard ..... : | | N/A |
| 4.3.7 | Heating elements in earthed equipment | No heating elements provided. | N/A |
| 4.3.8 | Batteries | See blow | P |
| | - Overcharging of a rechargeable battery | | N/A |
| | - Unintentional charging of a non-rechargeable battery | (see appended table 4.3.8) | P |
| | - Reverse charging of a rechargeable battery | (see appended table 4.3.8) | N/A |
| | - Excessive discharging rate for any battery | | N/A |
| 4.3.9 | Oil and grease | Insulation in intended use not considered to be exposed to oil or grease. | N/A |
| 4.3.10 | Dust, powders, liquids and gases | The equipment does not produce dust or use powders, liquids and gases in the equipment. | N/A |
| 4.3.11 | Containers for liquids or gases | No container for liquids or gases used | N/A |
| 4.3.12 | Flammable liquids .....: | The equipment does not contain flammable liquid | N/A |
| | Quantity of liquid (l) .....: | | N/A |
| | Flash point (°C) ..... : | | N/A |
| 4.3.13 | Radiation | | N/A |
| 4.3.13.1 | General | | N/A |
| 4.3.13.2 | Ionizing radiation | The equipment does not generate ionizing radiation. | N/A |
| | Measured radiation (pA/kg) .....: | | — |
| | Measured high-voltage (kV) .....: | | — |
| | Measured focus voltage (kV) .....: | | — |
| | CRT markings ..... : | | — |
| 4.3.13.3 | Effect of ultraviolet (UV) radiation on materials | The equipment does not produce significant UV radiation. | N/A |
| | Part, property, retention after test, flammability classification ..... : | | N/A |
| 4.3.13.4 | Human exposure to ultraviolet (UV) radiation .....: | The equipment does not produce significant UV radiation. | N/A |
| 4.3.13.5 | Lasers (including laser diodes) and LEDs | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.3.13.5.1 | Lasers (including laser diodes) | | N/A |
| | Laser class .....: | | — |
| 4.3.13.5.2 | Light emitting diodes (LEDs) | | N/A |
| 4.3.13.6 | Other types ..... : | The equipment does not generate other types of radiation. | N/A |
| **4.4** | **Protection against hazardous moving parts** | | **N/A** |
| 4.4.1 | General | No hazardous moving parts | N/A |
| 4.4.2 | Protection in operator access areas .....: | | N/A |
| | Household and home/office document/media shredders | | N/A |
| 4.4.3 | Protection in restricted access locations .....: | | N/A |
| 4.4.4 | Protection in service access areas | | N/A |
| 4.4.5 | Protection against moving fan blades | | N/A |
| 4.4.5.1 | General | | N/A |
| | Not considered to cause pain or injury. a).....: | | N/A |
| | Is considered to cause pain, not injury. b) .....: | | N/A |
| | Considered to cause injury. c) .....: | | N/A |
| 4.4.5.2 | Protection for users | | N/A |
| | Use of symbol or warning .....: | | N/A |
| 4.4.5.3 | Protection for service persons | | N/A |
| | Use of symbol or warning .....: | | N/A |
| **4.5** | **Thermal requirements** | | **P** |
| 4.5.1 | General | See below. | P |
| 4.5.2 | Temperature tests | (see appended table 4.5) | P |
| | Normal load condition per Annex L .....: | | — |
| 4.5.3 | Temperature limits for materials | (see appended table 4.5) | P |
| 4.5.4 | Touch temperature limits | (see appended table 4.5) | P |
| 4.5.5 | Resistance to abnormal heat .....: | (see appended table 4.5.5) | P |
| **4.6** | **Openings in enclosures** | | **N/A** |
| 4.6.1 | Top and side openings | No openings | N/A |
| | Dimensions (mm) .....: | | — |
| 4.6.2 | Bottoms of fire enclosures | | N/A |
| | Construction of the bottomm, dimensions (mm) ...: | | ---- |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.6.3 | Doors or covers in fire enclosures | No doors or covers in fire enclosure. | N/A |
| 4.6.4 | Openings in transportable equipment | | N/A |
| 4.6.4.1 | Constructional design measures | | — |
| | Dimensions (mm) .....: | | N/A |
| 4.6.4.2 | Evaluation measures for larger openings | | N/A |
| 4.6.4.3 | Use of metallized parts | No barrier secured by adhesive inside enclosure. | N/A |
| 4.6.5 | Adhesives for constructional purposes | No barrier or screen secured by adhesive inside enclosure. | N/A |
| | Conditioning temperature (°C), time (weeks).....: | | — |
| **4.7** | **Resistance to fire** | | **P** |
| 4.7.1 | Reducing the risk of ignition and spread of flame | Method 1 is used. | P |
| | Method 1, selection and application of components wiring and materials | (see appended table 1.5.1) | P |
| | Method 2, application of all of simulated fault condition tests | | N/A |
| 4.7.2 | Conditions for a fire enclosure | Refer below. | P |
| 4.7.2.1 | Parts requiring a fire enclosure | The fire enclosure cover all components | P |
| 4.7.2.2 | Parts not requiring a fire enclosure | | N/A |
| 4.7.3 | Materials | | P |
| 4.7.3.1 | General | Components and materials have adequate flammability classification. See appended table 1.5.1 | P |
| 4.7.3.2 | Materials for fire enclosures | Min.V-1 fire enclosure used | P |
| 4.7.3.3 | Materials for components and other parts outside fire enclosures | | N/A |
| 4.7.3.4 | Materials for components and other parts inside fire enclosures | Materials inside fire enclosure are minimum V-1 material or better | P |
| 4.7.3.5 | Materials for air filter assemblies | No air filters in the equipment | N/A |
| 4.7.3.6 | Materials used in high-voltage components | No parts exceeding 4kV | N/A |
| **5** | **ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS** | | **P** |
| 5.1 | **Touch current and protective conductor current** | | N/A |
| 5.1.1 | General | | N/A |
| 5.1.2 | Configuration of equipment under test (EUT) | | — |
| 5.1.2.1 | Single connection to an a.c. mains supply | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.1.2.2 | Redundant multiple connections to an a.c. mains supply | | N/A |
| 5.1.2.3 | Simultaneous multiple connections to an a.c. mains supply | | N/A |
| 5.1.3 | Test circuit | | N/A |
| 5.1.4 | Application of measuring instrument | | N/A |
| 5.1.5 | Test procedure | | N/A |
| 5.1.6 | Test measurements | | N/A |
| | Supply voltage (V) ..... : | | — |
| | Measured touch current (mA) ..... : | | — |
| | Max. allowed touch current (mA) ..... : | | — |
| | Measured protective conductor current (mA) ..... : | | — |
| | Max. allowed protective conductor current (mA)... : | | — |
| 5.1.7 | Equipment with touch current exceeding 3,5 mA | | N/A |
| 5.1.7.1 | General ..... : | | N/A |
| 5.1.7.2 | Simultaneous multiple connections to the supply | | N/A |
| 5.1.8 | Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks | Not connected to a telecommunication network or cable distribution systems | N/A |
| 5.1.8.1 | Limitation of the touch current to a telecommunication network or to a cable distribution system | | N/A |
| | Supply voltage (V) ..... : | | — |
| | Measured touch current (mA) ..... : | | — |
| | Max. allowed touch current (mA) ..... : | | — |
| 5.1.8.2 | Summation of touch currents from telecommunication networks | | N/A |
| | a) EUT with earthed telecommunication ports ..... : | | N/A |
| | b) EUT whose telecommunication ports have no reference to protective earth | | N/A |

| | | | |
|---|---|---|---|
| **5.2** | **Electric strength** | | **N/A** |
| 5.2.1 | General | (see appended table 5.2) | N/A |
| 5.2.2 | Test procedure | (see appended table 5.2) | N/A |

| | | | |
|---|---|---|---|
| **5.3** | **Abnormal operating and fault conditions** | | P |
| 5.3.1 | Protection against overload and abnormal operation | See appended table 5.3 | P |
| 5.3.2 | Motors | No motor | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.3.3 | Transformers | No transformers | N/A |
| 5.3.4 | Functional insulation.....: | No requirement | N/A |
| 5.3.5 | Electromechanical components | | N/A |
| 5.3.6 | Audio amplifiers in ITE .....: | tested in accordance with IEC 60065 | P |
| 5.3.7 | Simulation of faults | (see appended table 5.3) | P |
| 5.3.8 | Unattended equipment | No thermostats, temperature limiters or thermal cut-outs. | N/A |
| 5.3.9 | Compliance criteria for abnormal operating and fault conditions | See below | P |
| 5.3.9.1 | During the tests | No fire or molten metal occurred and no deformation of enclosure during the tests. | P |
| 5.3.9.2 | After the tests | | P |
| **6** | **CONNECTION TO TELECOMMUNICATION NETWORKS** | | **N/A** |
| 6.1 | Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment | | N/A |
| 6.1.1 | Protection from hazardous voltages | | N/A |
| 6.1.2 | Separation of the telecommunication network from earth | | N/A |
| 6.1.2.1 | Requirements | | N/A |
| | Supply voltage (V) .....: | | — |
| | Current in the test circuit (mA) .....: | | — |
| 6.1.2.2 | Exclusions .....: | | N/A |
| **6.2** | **Protection of equipment users from overvoltages on telecommunication networks** | | **N/A** |
| 6.2.1 | Separation requirements | | N/A |
| 6.2.2 | Electric strength test procedure | | N/A |
| 6.2.2.1 | Impulse test | | N/A |
| 6.2.2.2 | Steady-state test | | N/A |
| 6.2.2.3 | Compliance criteria | | N/A |
| **6.3** | **Protection of the telecommunication wiring system from overheating** | | **N/A** |
| | Max. output current (A) .....: | | — |
| | Current limiting method .....: | | — |
| **7** | **CONNECTION TO CABLE DISTRIBUTION SYSTEMS** | | **N/A** |
| **7.1** | **General** | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.2 | Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment | | N/A |
| 7.3 | Protection of equipment users from overvoltages on the cable distribution system | | N/A |
| 7.4 | Insulation between primary circuits and cable distribution systems | | N/A |
| 7.4.1 | General | | N/A |
| 7.4.2 | Voltage surge test | (see appended table 5.2) | N/A |
| 7.4.3 | Impulse test | (see appended table 5.2) | N/A |
| **A** | **ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE** | | **N/A** |
| **A.1** | **Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)** | | N/A |
| A.1.1 | Samples.....: | | — |
| | Wall thickness (mm).....: | | — |
| A.1.2 | Conditioning of samples; temperature (°C) .....: | | N/A |
| A.1.3 | Mounting of samples .....: | | N/A |
| A.1.4 | Test flame (see IEC 60695-11-3) | | N/A |
| | Flame A, B, C or D .....: | | — |
| A.1.5 | Test procedure | | N/A |
| A.1.6 | Compliance criteria | | N/A |
| | Sample 1 burning time (s).....: | | — |
| | Sample 2 burning time (s).....: | | — |
| | Sample 3 burning time (s).....: | | — |
| **A.2** | **Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)** | | **N/A** |
| A.2.1 | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| A.2.2 | Conditioning of samples; temperature (°C) .....: | | N/A |
| A.2.3 | Mounting of samples .....: | | N/A |
| A.2.4 | Test flame (see IEC 60695-11-4) | | N/A |
| | Flame A, B or C .....: | | — |
| A.2.5 | Test procedure | | N/A |
| A.2.6 | Compliance criteria | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Sample 1 burning time (s)..... : | | — |
| | Sample 2 burning time (s)..... : | | — |
| | Sample 3 burning time (s)..... : | | — |
| A.2.7 | Alternative test acc. to IEC 60695-11-5, cl. 5 and 9 | | N/A |
| | Sample 1 burning time (s)..... : | | — |
| | Sample 2 burning time (s)..... : | | — |
| | Sample 3 burning time (s)..... : | | — |
| **A.3** | **Hot flaming oil test (see 4.6.2)** | | N/A |
| A.3.1 | Mounting of samples | | N/A |
| A.3.2 | Test procedure | | N/A |
| A.3.3 | Compliance criterion | | N/A |
| **B** | **Annex B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)** | | **N/A** |
| **B.1** | **General requirements** | | N/A |
| | Position ..... : | | — |
| | Manufacturer ..... : | | — |
| | Type ..... : | | — |
| | Rated values ..... : | | — |
| **B.2** | **Test conditions** | | N/A |
| **B.3** | **Maximum temperatures** | (see appended table 5.3) | N/A |
| **B.4** | **Running overload test** | (see appended table 5.3) | N/A |
| **B.5** | **Locked-rotor overload test** | | N/A |
| | Test duration (days) ..... : | | — |
| | Electric strength test: test voltage (V) ..... : | | — |
| **B.6** | **Running overload test for d.c. motors in secondary circuits** | | N/A |
| B.6.1 | General | | N/A |
| B.6.2 | Test procedure | | N/A |
| B.6.3 | Alternative test procedure | | N/A |
| B.6.4 | Electric strength test; test voltage (V) ..... : | | N/A |
| **B.7** | **Locked-rotor overload test for d.c. motors in secondary circuits** | | N/A |
| B.7.1 | General | | N/A |
| B.7.2 | Test procedure | | N/A |
| B.7.3 | Alternative test procedure | | N/A |
| B.7.4 | Electric strength test; test voltage (V) ..... : | | N/A |
| **B.8** | **Test for motors with capacitors** | (see appended table 5.3) | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **B.9** | **Test for three-phase motors** | (see appended table 5.3) | N/A |
| **B.10** | **Test for series motors** | | N/A |
| | Operating voltage (V) .....: | | — |
| **C** | **Annex C, TRANSFORMERS (see 1.5.4 and 5.3.3)** | | **N/A** |
| | Position .....: | Primary to secondary | — |
| | Manufacturer .....: | (see appended table 1.5.1) | — |
| | Type .....: | (see appended table 1.5.1) | — |
| | Rated values .....: | (see appended table 1.5.1) | — |
| | Method of protection.....: | Electronic protection | — |
| C.1 | Overload test | (see appended table 5.3) | N/A |
| C.2 | Insulation | (see appended table 5.2) | N/A |
| | Protection from displacement of windings.....: | See table C.2 | N/A |
| **D** | **ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)** | | **N/A** |
| D.1 | Measuring instrument | | N/A |
| D.2 | Alternative measuring instrument | | N/A |
| **E** | **ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)** | | **N/A** |
| **F** | **ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)** | | **N/A** |
| **G** | **ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES** | | **N/A** |
| G.1 | Clearances | | N/A |
| G.1.1 | General | | N/A |
| G.1.2 | Summary of the procedure for determining minimum clearances | | N/A |
| G.2 | Determination of mains transient voltage (V) | | N/A |
| G.2.1 | AC mains supply .....: | | N/A |
| G.2.2 | Earthed d.c. mains supplies .....: | | N/A |
| G.2.3 | Unearthed d.c. mains supplies .....: | | N/A |
| G.2.4 | Battery operation .....: | | N/A |
| G.3 | Determination of telecommunication network transient voltage (V) .....: | | N/A |

| IEC 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.4 | Determination of required withstand voltage (V) | | N/A |
| G.4.1 | Mains transients and internal repetitive peaks .....: | | N/A |
| G.4.2 | Transients from telecommunication networks .....: | | N/A |
| G.4.3 | Combination of transients | | N/A |
| G.4.4 | Transients from cable distribution systems | | N/A |
| G.5 | Measurement of transient voltages (V) | | N/A |
| | a) Transients from a mains supply | | N/A |
| | For an a.c. mains supply | | N/A |
| | For a d.c. mains supply | | N/A |
| | b) Transients from a telecommunication network | | N/A |
| G.6 | Determination of minimum clearances .....: | | N/A |
| **H** | **ANNEX H, IONIZING RADIATION (see 4.3.13)** | | **N/A** |
| **J** | **ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)** | | **N/A** |
| | Metal(s) used .....: | | — |
| **K** | **Annex K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)** | | **N/A** |
| K.1 | Making and breaking capacity | | N/A |
| K.2 | Thermostat reliability; operating voltage (V) : | | N/A |
| K.3 | Thermostat endurance test; operating voltage (V) : | | N/A |
| K.4 | Temperature limiter endurance; operating voltage (V): | | N/A |
| K.5 | Thermal cut-out reliability | | N/A |
| K.6 | Stability of operation | | N/A |
| **L** | **ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)** | | **P** |
| L.1 | Typewriters | | N/A |
| L.2 | Adding machines and cash registers | | N/A |
| L.3 | Erasers | | N/A |
| L.4 | Pencil sharpeners | | N/A |
| L.5 | Duplicators and copy machines | | N/A |
| L.6 | Motor-operated files | | N/A |
| L.7 | Other business equipment | | P |
| **M** | **ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)** | | **N/A** |

| IEC 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.1 | Introduction | | N/A |
| M.2 | Method A | | N/A |
| M.3 | Method B | | N/A |
| M.3.1 | Ringing signal | | N/A |
| M.3.1.1 | Frequency (Hz) ..... : | | — |
| M.3.1.2 | Voltage (V) ..... : | | — |
| M.3.1.3 | Cadence; time (s), voltage (V) ..... : | | — |
| M.3.1.4 | Single fault current (mA) ..... : | | — |
| M.3.2 | Tripping device and monitoring voltage ..... : | | N/A |
| M.3.2.1 | Conditions for use of a tripping device or a monitoring voltage | | N/A |
| M.3.2.2 | Tripping device | | N/A |
| M.3.2.3 | Monitoring voltage (V) ..... : | | N/A |
| **N** | **ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)** | | **N/A** |
| N.1 | ITU-T impulse test generators | | N/A |
| N.2 | IEC 60065 impulse test generator | | N/A |
| **P** | **ANNEX P, NORMATIVE REFERENCES** | | **P** |
| **Q** | **ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)** | | **N/A** |
| | a) Preferred climatic categories ..... : | | N/A |
| | b) Maximum continuous voltage ..... : | | N/A |
| | c) Pulse current ..... : | | N/A |
| **R** | **ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES** | | **N/A** |
| R.1 | Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2) | | N/A |
| R.2 | Reduced clearances (see 2.10.3) | | N/A |
| **S** | **ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)** | | **N/A** |
| S.1 | Test equipment | | N/A |
| S.2 | Test procedure | | N/A |
| S.3 | Examples of waveforms during impulse testing | | N/A |
| **T** | **ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)** | | **N/A** |
| | | | — |

| IEC 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **U** | **ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)** | | **N/A** |
| | | | — |
| **V** | **ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)** | | **N/A** |
| V.1 | Introduction | | **N/A** |
| V.2 | TN power distribution systems | | **N/A** |
| **W** | **ANNEX W, SUMMATION OF TOUCH CURRENTS** | | **N/A** |
| W.1 | Touch current from electronic circuits | | **N/A** |
| W.1.1 | Floating circuits | | **N/A** |
| W.1.2 | Earthed circuits | | **N/A** |
| W.2 | Interconnection of several equipments | | **N/A** |
| W.2.1 | Isolation | | **N/A** |
| W.2.2 | Common return, isolated from earth | | **N/A** |
| W.2.3 | Common return, connected to protective earth | | **N/A** |
| **X** | **ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)** | | **N/A** |
| X.1 | Determination of maximum input current | Considered. | **N/A** |
| X.2 | Overload test procedure | | **N/A** |
| **Y** | **ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)** | | **N/A** |
| Y.1 | Test apparatus ..... : | | **N/A** |
| Y.2 | Mounting of test samples .....: | | **N/A** |
| Y.3 | Carbon-arc light-exposure apparatus .....: | | **N/A** |
| Y.4 | Xenon-arc light exposure apparatus .....: | | **N/A** |
| **Z** | **ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)** | | **N/A** |
| **AA** | **ANNEX AA, MANDREL TEST (see 2.10.5.8)** | | **N/A** |
| **BB** | **ANNEX BB, CHANGES IN THE SECOND EDITION** | | — |
| **CC** | **ANNEX CC, Evaluation of integrated circuit (IC) current limiters** | | **N/A** |
| CC.1 | General | | **N/A** |
| CC.2 | Test program 1.....: | | **N/A** |
| CC.3 | Test program 2.....: | | **N/A** |

| IEC 60950-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **DD** | **ANNEX DD, Requirements for the mounting means of rack-mounted equipment** | | **N/A** |
| DD.1 | General | | **N/A** |
| DD.2 | Mechanical strength test, variable N……..: | | **N/A** |
| DD.3 | Mechanical strength test, 250N, including end stops……: | | **N/A** |
| DD.4 | Compliance……: | | **N/A** |

| | | | |
|---|---|---|---|
| **EE** | **ANNEX EE, Household and home/office document/media shredders** | | **N/A** |
| EE.1 | General | | **N/A** |
| EE.2 | Markings and instructions | | **N/A** |
| | Use of markings or symbols……: | | **N/A** |
| | Information of user instructions, maintenance and/or servicing instructions……: | | **N/A** |
| EE.3 | Inadvertent reactivation test……: | | **N/A** |
| EE.4 | Disconnection of power to hazardous moving parts: | | **N/A** |
| | Use of markings or symbols……: | | **N/A** |
| EE.5 | Protection against hazardous moving parts | | **N/A** |
| | Test with test finger (Figure 2A) ……: | | **N/A** |
| | Test with wedge probe (Figure EE1 and EE2) ……: | | **N/A** |

| 1.5.1 | TABLE: List of critical components | P |
|---|---|---|

| Object/part No. | Manufacturer/ trademark | Type/model | Technical data | Standard (Edition / year) | Mark(s) of conformity[1]) |
|---|---|---|---|---|---|
| Enclosure | LG CHEMICAL LTD | LUPOY ER5001RF(#) | V-0, min. 2.0mm, 60°C | UL94<br>UL746 | UL E67171 |
| PCB | PALWONN ELECTRONICS (SHENZHEN) CO LTD | M3 | V-0, 130°C, min. 1.6mm | UL94<br>UL796 | UL E230435 |
| | | | | | |

| 1.6.2 | TABLE: Electrical data (in normal conditions) | | | | | P |
|---|---|---|---|---|---|---|
| U (V) | I (A) | Irated (A) | P (W) | Fuse # | Ifuse (A) | Condition/status |
| 12.0 | 0.48 | 3 | 5.76 | -- | -- | Max normal load |
| Supplementary information: | | | | | | |

| 2.1.1.5 c) 1) | TABLE: max. V, A, VA test | | | N/A |
|---|---|---|---|---|
| Voltage (rated) (V) | Current (rated) (A) | Voltage (max.) (V) | Current (max.) (A) | VA (max.) (VA) |
| | | | | |
| supplementary information: | | | | |
| | | | | |

| 2.1.1.5 c) 2) | TABLE: stored energy | N/A |
|---|---|---|
| Capacitance C (μF) | Voltage U (V) | Energy E (J) |
| -- | -- | -- |
| -- | -- | -- |
| supplementary information: | | |
| | | |

| 2.2 | TABLE: evaluation of voltage limiting components in SELV circuits | | N/A |
|---|---|---|---|
| Component (measured between) | max. voltage (V) (normal operation) | | Voltage Limiting Components |
| | V peak | V d.c. | |
| | | | -- |
| Fault test performed on voltage limiting components | Voltage measured (V) in SELV circuits (V peak or V d.c.) | | |
| | | | |
| | | | |
| Vin= | | | |

| 2.5 | TABLE: Limited power sources | | | | | N/A |
|---|---|---|---|---|---|---|
| Circuit output tested: | | | | | | |
| Note: Measured Uoc (V) with all load circuits disconnected: | | | | | | |
| Components | Sample No. | Uoc (V) | Isc (A) | | VA | |
| | | | Meas. | Limit | Meas. | Limit |
| | | | | | | |
| supplementary information: | | | | | | |
| | | | | | | |

| 2.10.2 | Table: working voltage measurement | | | N/A |
|---|---|---|---|---|
| Location | RMS voltage (V) | Peak voltage (V) | Comments | |
| | | | -- | |
| | | | -- | |
| | | | -- | |
| | | | -- | |
| supplementary information: | | | | |
| Vin = | | | | |

| 2.10.3 and 2.10.4 | TABLE: Clearance and creepage distance measurements | | | | | | N/A |
|---|---|---|---|---|---|---|---|
| Clearance (cl) and creepage distance (cr) at/of/between: | U peak (V) | U r.m.s. (V) | Required cl (mm) | cl (mm) | Required cr (mm) | cr (mm) | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Supplementary information: | | | | | | | |

| 2.10.5 | TABLE: Distance through insulation measurements | | | | N/A |
|---|---|---|---|---|---|
| Distance through insulation (DTI) at/of: | U peak (V) | U rms (V) | Test voltage (V) | Required DTI (mm) | DTI (mm) |
| | | | | | |
| Supplementary information: | | | | | |

| 4.3.8 | TABLE: Batteries | | | | | | | | | P |
|---|---|---|---|---|---|---|---|---|---|---|
| The tests of 4.3.8 are applicable only when appropriate battery data is not available | | | | | -- | | | | | -- |
| Is it possible to install the battery in a reverse polarity position? | | | | | No | | | | | P |
| | Non-rechargeable batteries | | | Rechargeable batteries | | | | | | |
| | Discharging | | Un-intentional charging | Charging | | Discharging | | Reversed charging | | |
| | Meas. current | Manuf. Specs. | | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | |
| Max. current during normal condition | 0.1mA | -- | 0 | -- | -- | -- | -- | -- | -- | |
| Max. current during fault condition | 0.1mA | -- | 0 | -- | -- | -- | -- | -- | -- | |
| | | | | | | | | | | |
| Test results: | | | | | | | | | | Verdict |
| - Chemical leaks | | | | | | No Chemical leaks | | | | P |
| - Explosion of the battery | | | | | | No Explosion of the battery | | | | P |
| - Emission of flame or expulsion of molten metal | | | | | | No Emission of flame or expulsion of molten metal | | | | P |
| - Electric strength tests of equipment after completion of tests | | | | | | No broken | | | | P |
| Supplementary information:<br>1. Non-rechargeable battery is Lithium battery | | | | | | | | | | |

| 4.3.8 | TABLE: Batteries | N/A |
|---|---|---|
| Battery category..... :<br>Manufacturer..... :<br>Type / model..... :<br>Voltage..... :<br>Capacity..... :<br>Tested and Certified by (incl. Ref. No.)..... :<br>Circuit protection diagram: N/A | | |

| 4.5 | TABLE: Thermal requirements | | | | | | P |
|---|---|---|---|---|---|---|---|
| | Supply voltage (V) .....: | -- | | 12VDC | | -- | — |
| | Ambient $T_{min}$ (°C) .....: | -- | -- | 25.2 | 40.0 | | — |
| | Ambient $T_{max}$ (°C) .....: | -- | -- | 25.2 | 40.0 | | — |
| Maximum measured temperature T of part/at: | | T (°C) | | | | | -- |
| | | Charge | | Discharge | | -- | |
| PCB near U1 | | -- | -- | 33.2 | 48.0 | -- | 130 |
| PCB near U3 | | -- | -- | 35.8 | 50.6 | -- | 130 |
| Enclosure near U1 inside | | -- | -- | 30.5 | 45.3 | -- | 60 |
| Enclosure near U1 outside | | -- | -- | 28.6 | 43.4 | -- | 60 |
| Screen | | -- | -- | 29.1 | 43.9 | -- | 95 |

| 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:

| 4.5.5 | TABLE: Ball pressure test of thermoplastic parts | | N/A |
|---|---|---|---|
| | Allowed impression diameter (mm) .....: | ≤ 2 mm | — |

| Part | Test temperature (°C) | Impression diameter (mm) |
|---|---|---|
| | -- | -- |
| | -- | -- |
| | -- | -- |

Supplementary information:--

| 4.7 | TABLE: Resistance to fire | | | | | P |
|---|---|---|---|---|---|---|
| Part | Manufacturer of material | Type of material | Thickness (mm) | Flammability class | Evidence | |
| Enclosure | LG CHEMICAL LTD | LUPOY ER5001RF(#) | V-0, min. 2.0mm, 60°C | UL94<br>UL746 | UL E67171 | |
| PCB | PALWONN ELECTRONICS (SHENZHEN) CO LTD | M3 | V-0, 130°C, min. 1.6mm | UL94<br>UL796 | UL E230435 | |

Supplementary information:--

| 5.1 | TABLE: touch current measurement | | | N/A |
|---|---|---|---|---|
| Measured between: | Measured (mA) | Limit (mA) | Comments/conditions | |
| | | | | |

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

| 5.2 | TABLE: Electric strength tests, impulse tests and voltage surge tests | | | N/A |
|---|---|---|---|---|
| Test voltage applied between: | | Voltage shape (AC, DC, impulse, surge) | Test voltage (V) | Breakdown Yes / No |
| | | | | |
| | | | | |
| Supplementary information: | | | | |

| 5.3 | TABLE: Fault condition tests | | | | | | P |
|---|---|---|---|---|---|---|---|
| | Ambient temperature (°C) .....: | | | | 25°C if not mentioned**Error! Bookmark not defined.** | | — |
| | Power source for EUT: Manufacturer, model/type, output rating .....: | | | | See page 2 | | — |
| Component No. | Fault | Supply voltage | Test time | Fuse # | Fuse current (A) | Observation | |
| U6 | S-C | 12VDC | 10min. | -- | -- | Unit shutdown immediately. Recoverable when fault removed. No damage, no hazard. | |
| U4 | S-C | 12VDC | 10min. | -- | -- | Unit normal work. No damage, no hazard. | |
| D6 | S-C | 12VDC | 10min. | -- | -- | Unit normal work. No damage, no hazard. | |
| Q1 | S-C | 12VDC | 10min. | -- | -- | Unit shutdown immediately. Recoverable when fault removed. No damage, no hazard. | |
| C035 | S-C | 12VDC | 10min. | -- | -- | Unit normal work. No damage, no hazard. | |
| Supplementary information:<br>S-C=short cicuit | | | | | | | |

**Attachment: Photos of the product:**

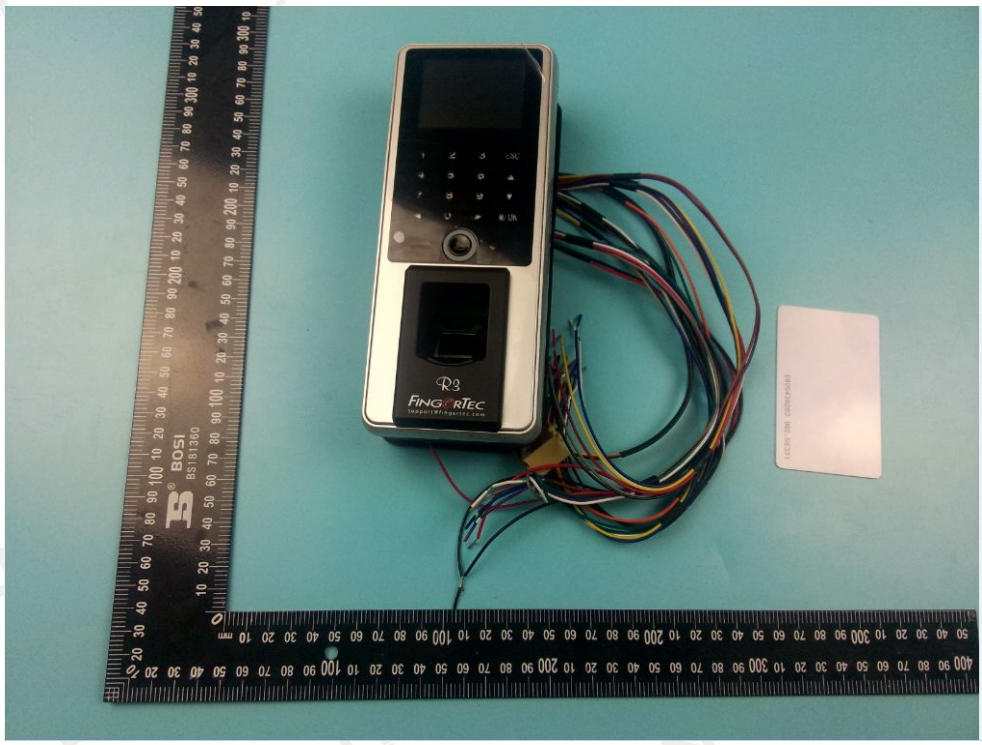


Photo : Overall view

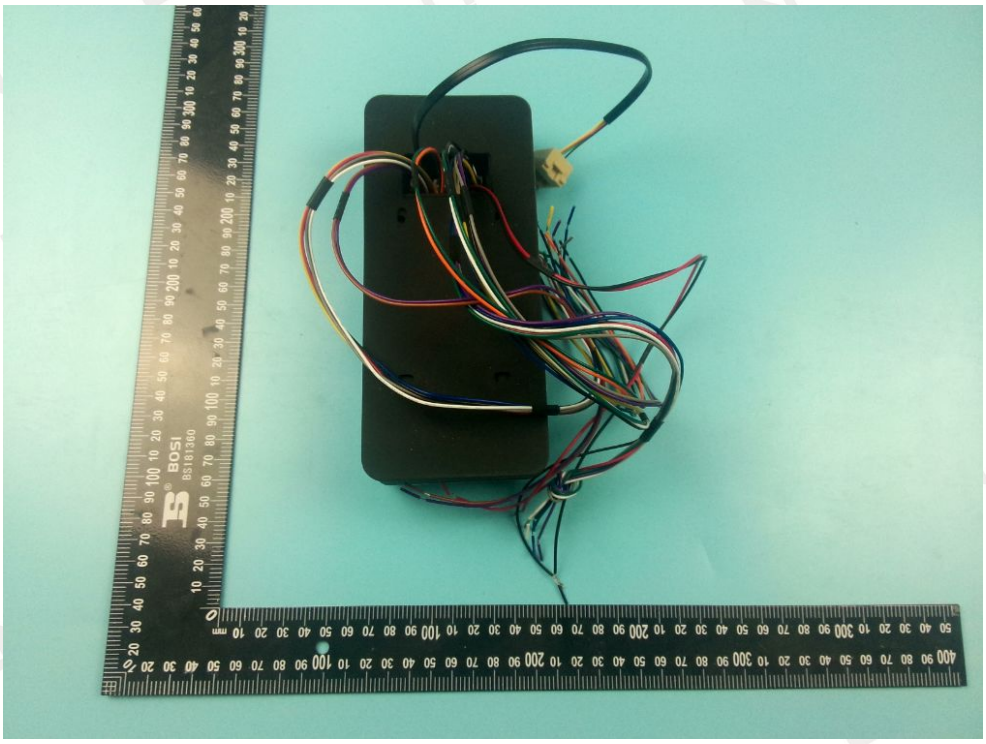


Photo : Bottom view

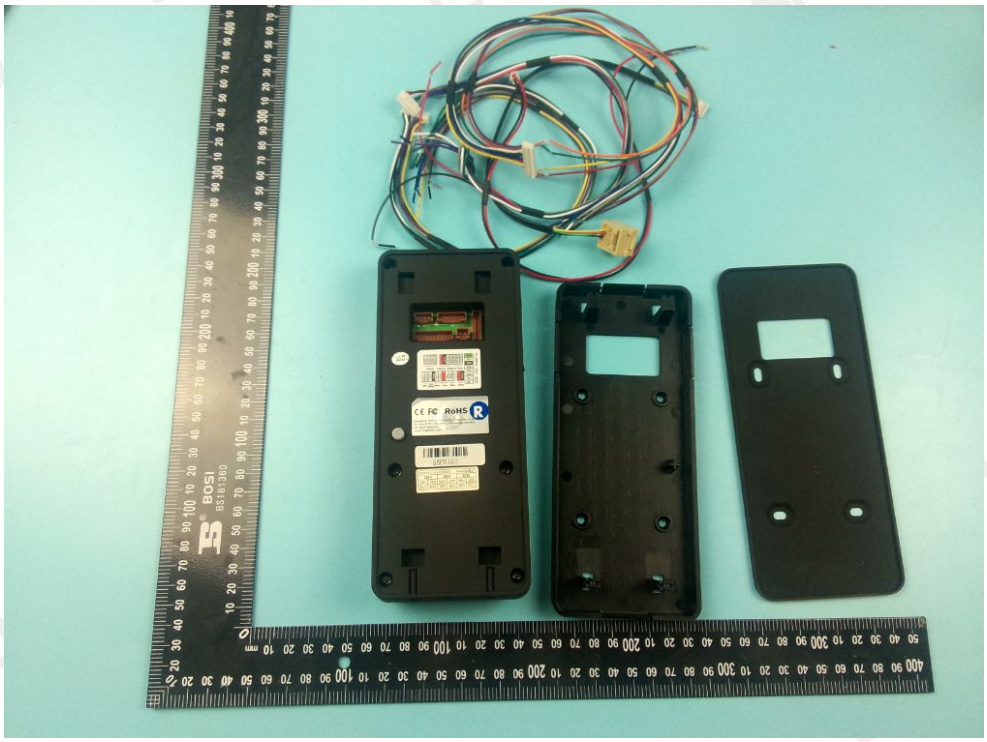

Photo : Internal view

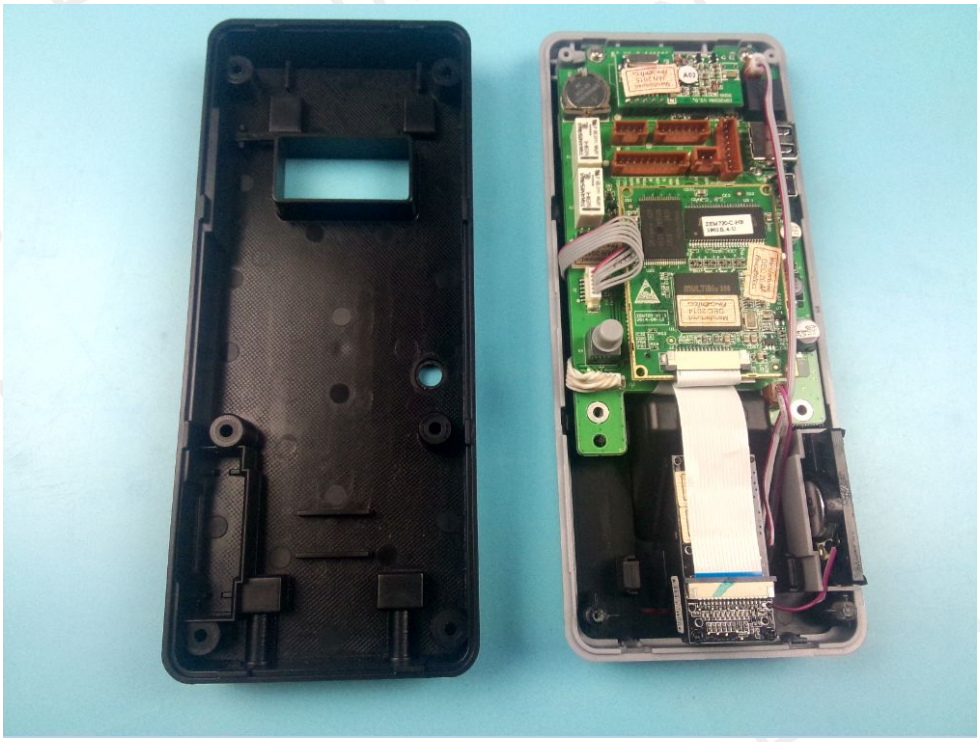

Photo : Top view of power board

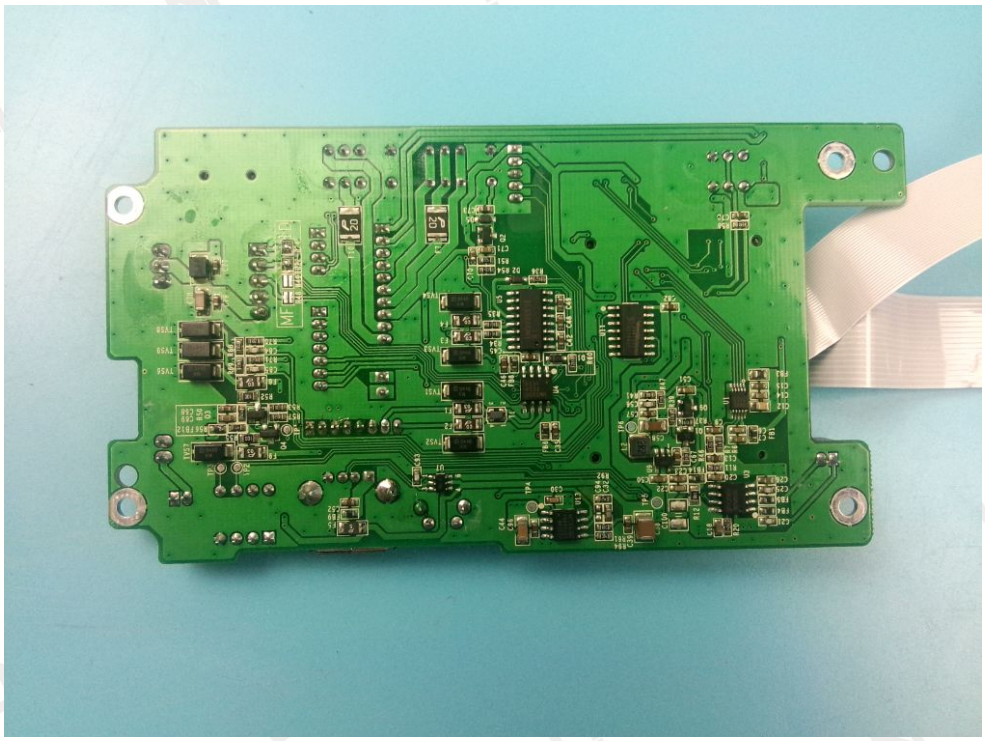

Photo : bottom view of power board

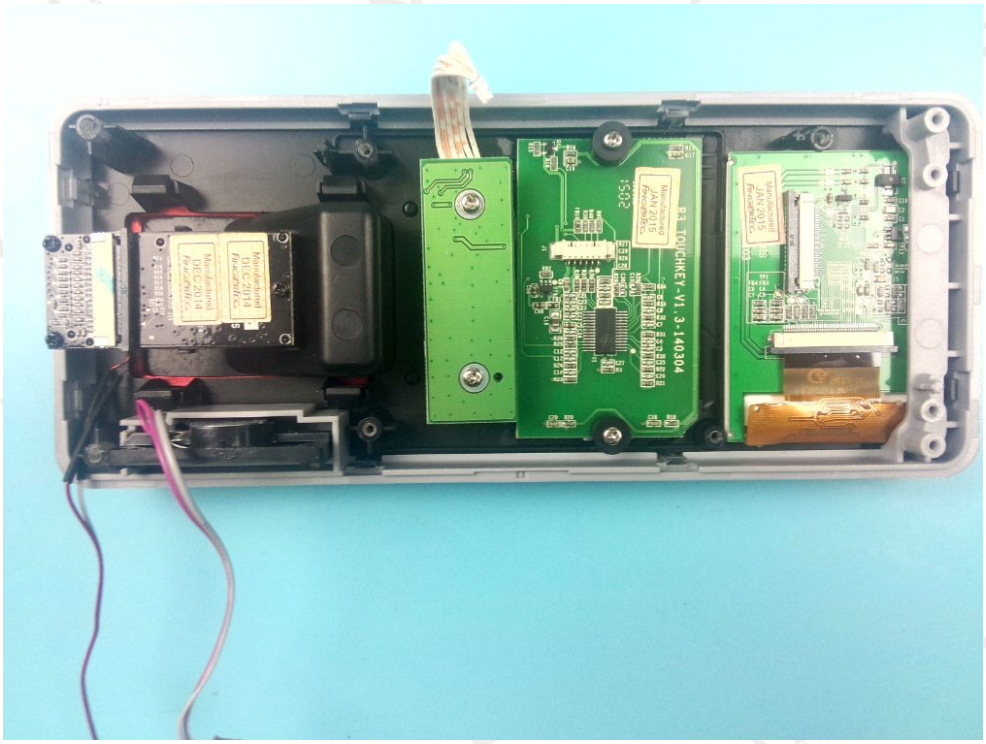

Photo : Internal view

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